



Technical Service Information

FORD 4R100 PRELIMINARY INFORMATION

CHANGE: Beginning at the start of production for 1999 models, Ford Motor Company introduced a new transmission in some F250, F350, F450 and F550 Super Duty Trucks, equipped with the 5.4L, 6.8L and 7.3L engines. Basically the new 4R100 is a revised version of the previous E4OD transmission with a Power-Take-Off (PTO) window on the side of the case (See Figure 1). The revisions that have occurred however, have created many major engineering changes that have affected many internal and external parts that will affect service.

REASON: Provided a PTO option for Ford Motor Company.

PARTS AFFECTED:

- (1) **TRANSMISSION CASE** - Now has a PTO window added to the left side of the case directly behind the front pump area, and a Turbine Speed Sensor has been added at the top of the case and triggered by a revised coast clutch drum (See Figure 2). Another change to the rear of the case is the addition of a Lube Orifice Plug to the Rear of the case, as shown in Figure 4, which also changes the extension housings.
- (2) **TURBINE SPEED SENSOR** - Added to the top front of the case on some models, as shown in Figure 2. We have also provided you with the resistance readings and OEM part numbers on both Turbine Speed Sensors, as the PTO and Non-PTO models use different sensors. Refer to Figure 2 for turbine speed sensor information.
- (3) **OUTPUT SHAFT SENSOR** - Output Shaft Speed sensor was added to the top of the extension housing on some models, as shown in Figure 2. OSS is triggered by an added rotor pressed onto the output shaft, which requires a new tool to position the speed rotor properly *if* it is removed during overhaul, as shown in Figure 3. The park gear is also now pressed onto the output shaft, and the number 13 thrust washer has been changed to a thrust bearing as shown in Figure 3. We have provided you with the resistance reading and the OEM part number for the output shaft speed sensor. Refer to Figure 2 for output shaft speed sensor information.
- (4) **LUBE ORIFICE PLUG** - Added to the rear of the case in the lube circuit to provide added lubrication to the extension housing bushing on 2WD models. To retain common cases the 4WD models will also have the lube orifice plug installed, as well as E4OD cases produced after July 24, 1997. Lube Orifice Plug is available under OEM part number F81Z-7E380-AA, and should be replaced on rebuild. Refer to Figure 4.
- (5) **EXTENSION HOUSING** - Has an added boss or shoulder to retain the lube orifice plug in position in the transmission case, as shown in Figure 5. Notice that the 6.8L and 7.3L, 2 wheel drive extension housing has added a new passage to the extension housing bushing, much like the 4L80-E. All 4R100 and E4OD transmissions equipped with the lube orifice plug *must* use an extension housing with the shoulder or boss. Failure to do so could blow the lube orifice plug out and exhaust all lube oil, which would be catastrophic. Refer to Figure 5.

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PARTS AFFECTED: (Continued)

- (6) **MANUAL SHIFT LEVER** - There are two different external shift levers for this unit, one for Non-PTO transmissions and one for transmissions with the PTO option, as shown in Figure 6. We have provided you with the "Stamping" number as well as the OEM part number for both, as shown in Figure 6.
- (7) **COOLER BYPASS VALVE** - Similar to the Cooler Bypass Valve on the E4OD that provides lubrication to the transmission in case of blocked or partially blocked coolers. We have given you OEM part numbers for both and both bypass valves are illustrated in Figure 7.
- (8) **TRANSMISSION COOLERS** - Most F-Series vehicles over 8500 GVW equipped with the 4R100 transmission have an external "Oil-To-Air" cooler **only**. Due to the internal design of the "Oil-To-Air" cooler, it cannot be adequately flushed to remove contaminants, and requires replacement during transmission rebuild. The only exception is that F-Series vehicles over 8500 GVW equipped with the 5.4L engine also uses a radiator "In-Tank" cooler in addition to the "Oil-To-Air" cooler. Refer to Figure 8 for transmission cooler information.
- (9) **FRONT PUMP COVER** - The pump cover is basically the same as the E4OD, but has a different valve line-up in the Converter Clutch Control Valve bore. The gasoline applications all have an "On-Off" lock-up solenoid and the 7.3L diesel applications all have a Pulse Width Modulated (PWM) lock-up solenoid. This changes the Converter Clutch Control Valve line-ups in the pump cover, as shown in Figure 9.
- (10) **FRONT PUMP STATOR SHAFT** - With the addition of the PTO gear on the front of the coast clutch drum, it was necessary to move the coast clutch sealing ring grooves up on the pump stator shaft to accommodate the coast clutch drum moving. There are currently three different Pump Stator Shafts used in production and all three are illustrated in Figure 10. One is the current E4OD shaft which is used with the "Cast Iron" coast clutch drum with 5.4L and 6.8L engines **without** the PTO option. Two is the shaft with the relocated sealing rings and a bushing in the pump tower, which is used with the "Stamped Steel" coast clutch drum with 5.4L and 6.8L engines **without** the PTO option. Third is the shaft with the relocated sealing rings and a caged needle bearing in the pump tower, which is used with the "Stamped Steel" coast clutch drum with 6.8L and 7.3L engines **with** the PTO option. Refer to Figure 10.
- (11) **COAST CLUTCH DRUM AND STEEL PLATES** - There is now a revised "Stamped Steel" coast clutch drum introduced with the 4R100 transmission. There are currently three different coast clutch drums used in production and all three are illustrated in Figure 11. One is the current E4OD coast clutch drum which is "Cast Iron" and uses the current steel plates. Two is the new design "Stamped Steel" coast clutch drum without the PTO gear pressed on it and uses a new design coast clutch steel plate to accommodate the new drum. Third is the new design "Stamped Steel" coast clutch drum with the PTO gear pressed on it and uses the new design coast clutch steel plates to accommodate the new drum. The new design "Stamped Steel" coast clutch drum now has the overdrive roller clutch inner cam made on the drum and the overdrive sun gear is pressed into the new design drum, which changes the assembly process of the overdrive roller clutch. Refer to Figure 11.
- (12) **COAST CLUTCH PISTON** - The coast clutch piston in the new design coast clutch drum is now a stamped steel, molded rubber seals assembly and is illustrated in Figure 12. The new design piston assembly requires a new seal protector tool, Rotunda No. 307-387, to install the piston and seal assembly into the new design stamped steel coast clutch drum (See Figure 12).

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Technical Service Information

PARTS AFFECTED: (Continued)

- (13) **OVERDRIVE ROLLER CLUTCH** - The overdrive roller clutch inner cam is now made onto the new design coast clutch drum, instead of being splined like the previous models were, and is illustrated in Figure 13. The new design overdrive roller clutch assembly is now assembled onto the inner cam on the new design drum. The overdrive roller clutch outer race is still located in the overdrive ring gear next to the overdrive carrier and the number 13 thrust washer between the two is now plastic, but the cage and roller assembly are now assembled over the inner race on the new design coast clutch drum. Refer to Figure 13.
- (14) **OVERDRIVE FRICTION PLATES** - Now have wider teeth to accommodate the new design stamped steel coast clutch drum assembly when it is used, as illustrated in Figure 14.
- (15) **VALVE BODY CHECKBALL LOCATIONS** - Valve body checkball locations are illustrated in Figure 15 and now has two 1/4" checkballs and two 5/16" checkballs. This of course changes the lower valve body spacer plate as illustrated in Figure 16. The new design spacer plate has only one hole over the bathtub where the checkball was removed. The case checkball locations remain the same as the 1996-Up configuration, and this illustration is included for reference and shown in Figure 17.
- (16) **VALVE LINE-UPS IN VALVE BODY** - Have changed from the previous models and are illustrated in Figure 18, with a valve description and legend shown in Figure 19.
- (17) **SOLENOID BODY** - There are now two different Solenoid Bodies, depending on whether you have a gasoline or diesel model. Since the diesel models now have a Pulse Width Modulated (PWM) converter clutch application, the resistance on the converter clutch solenoid in the Solenoid Body is going to be different. We have included the OEM part numbers for both solenoid bodies and resistance charts for all solenoids in Figure 20, and you will find solenoid application and pin function charts in Figures 21 and 22.
- (18) **TROUBLE CODES** - Abbreviations are listed in Figure 23 and OBD II Trouble Codes are listed in numerical order in Figures 24 through 28.

INTERCHANGEABILITY:

All of the parts listed above are model sensitive, and some of the parts listed above cannot be intermixed with E4OD parts. With this unit you will have to be very carefull if replacement of the various components becomes necessary.

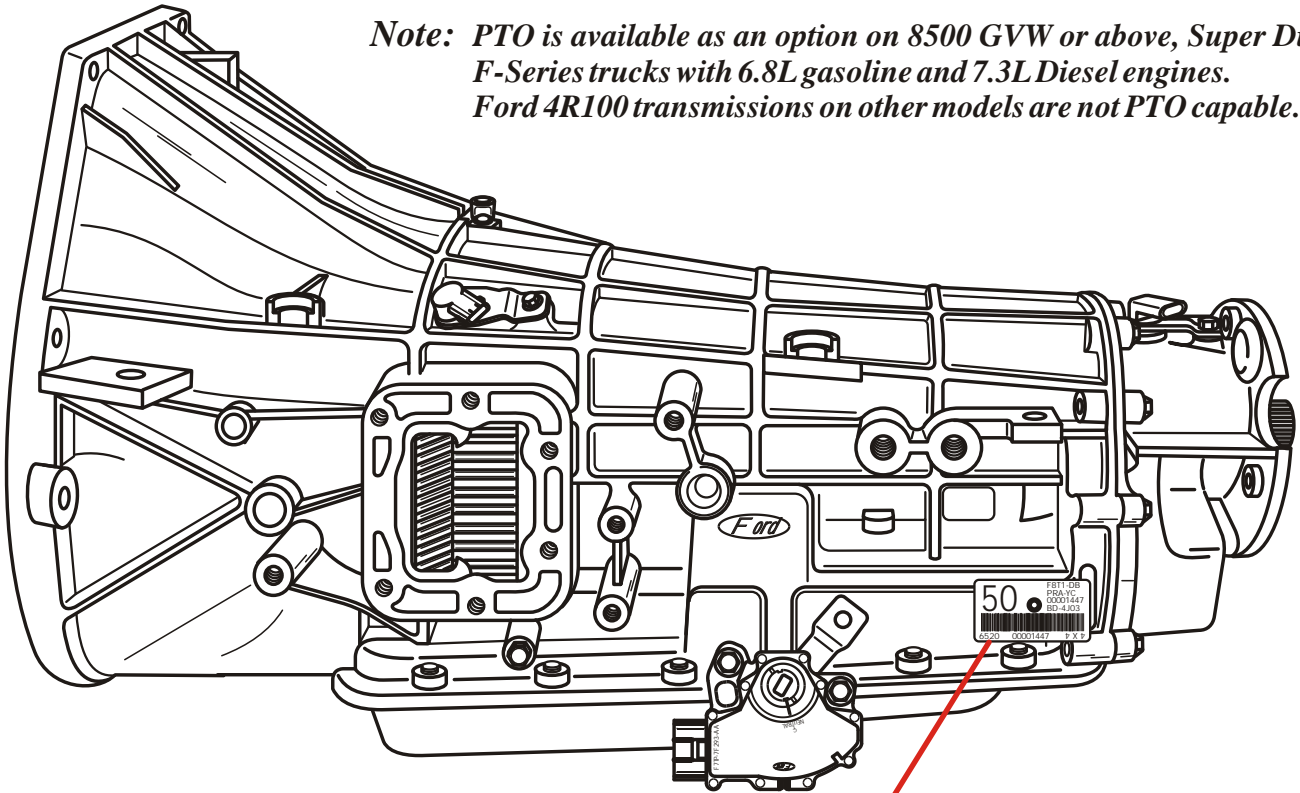
SERVICE INFORMATION:

Turbine Shaft Speed Sensor (PTO Models Only)	F81Z-7M101-BA
Turbine Shaft Speed Sensor (Non-PTO Models Only)	F81Z-7M101-AA
Output Shaft Speed Sensor (All Models)	F81Z-7M101-AA
Lube Orifice Plug (Plastic)	F81Z-7E380-AA
External Manual Shift Lever (With PTO Option)	F81Z-7A256-AA
External Manual Shift Lever (Without PTO Option)	F7UZ-7A256-BB
Cooler Bypass Valve Assembly	F81Z-7H322-AA
Coast Clutch Piston (New Design)	F81Z-7A262-AA
Solenoid Body Assembly (Gasoline Engine Only)	F81Z-7G391-BA
Solenoid Body Assembly (Diesel Engine Only)	F81Z-7G391-AB
Overdrive Roller Clutch And Cage Assembly	F81Z-7A089-AB

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FORD 4R100 WITH POWER TAKE OFF OPTION

Note: PTO is available as an option on 8500 GVW or above, Super Duty F-Series trucks with 6.8L gasoline and 7.3L Diesel engines. Ford 4R100 transmissions on other models are not PTO capable.



F4 = 1994
F5 = 1995
F6 = 1996
F7 = 1997
F8 = 1998
F9 = 1999



Assembly Part Number (Prefix and Suffix)
Transmission Model
Serial Number
Build Date - (Year, Month, Day)

A = JAN	G = JUL
B = FEB	H = AUG
C = MAR	J = SEP
D = APR	K = OCT
E = MAY	L = NOV
F = JUN	M = DEC

IDENTIFICATION TAG LOCATION AND INFORMATION

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Figure 1

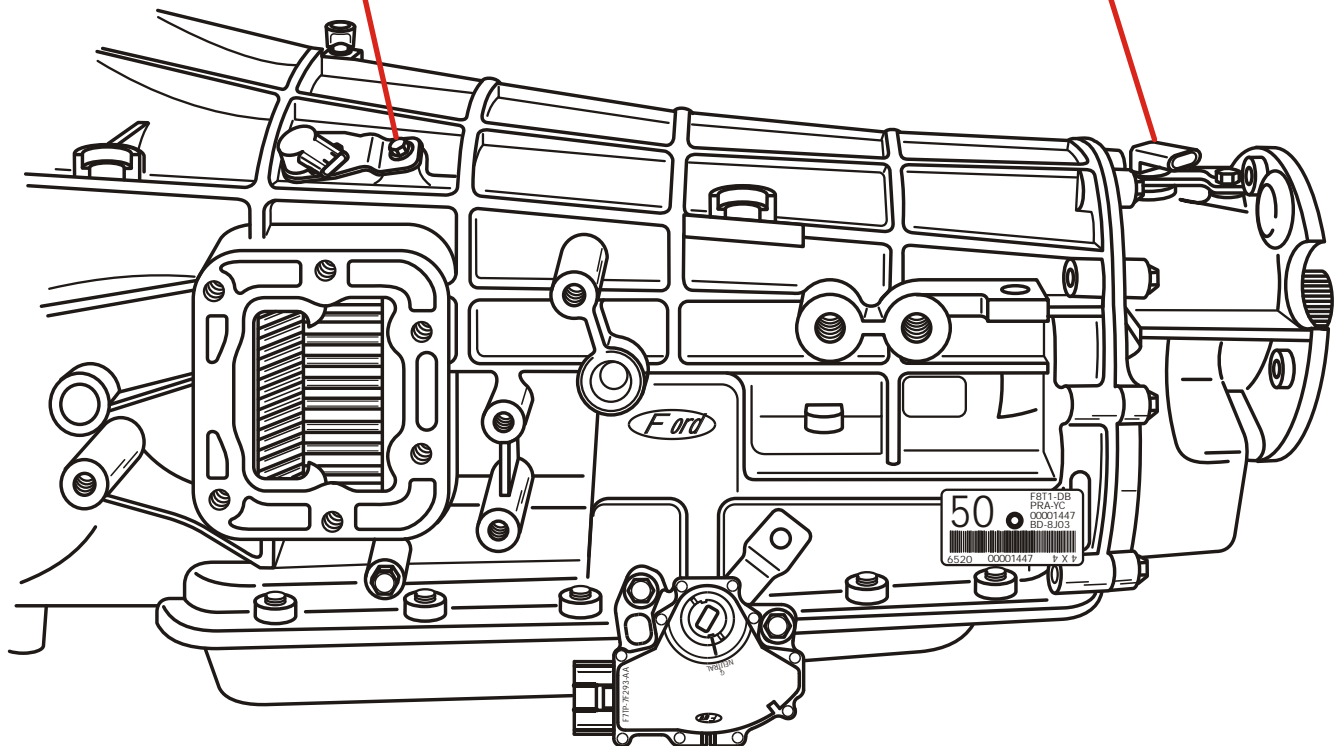
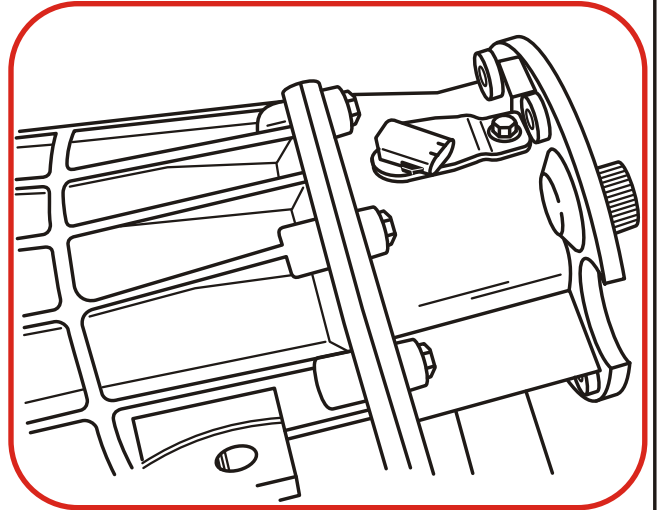
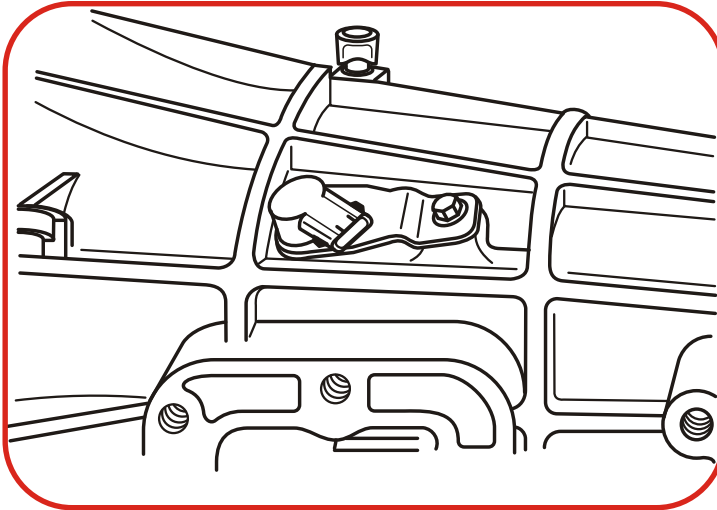
Turbine Shaft Speed Sensor

*PTO Models Only = 496-1244 Ohms Resistance
Part Number F81Z-7M101-BA*

*Non PTO Models Only = 781-1979 Ohms Resistance
Part Number F81Z-7M101-AA*

Output Shaft Speed Sensor

*All Models = 781-1979 Ohms Resistance
Part Number F81Z-7M101-AA*



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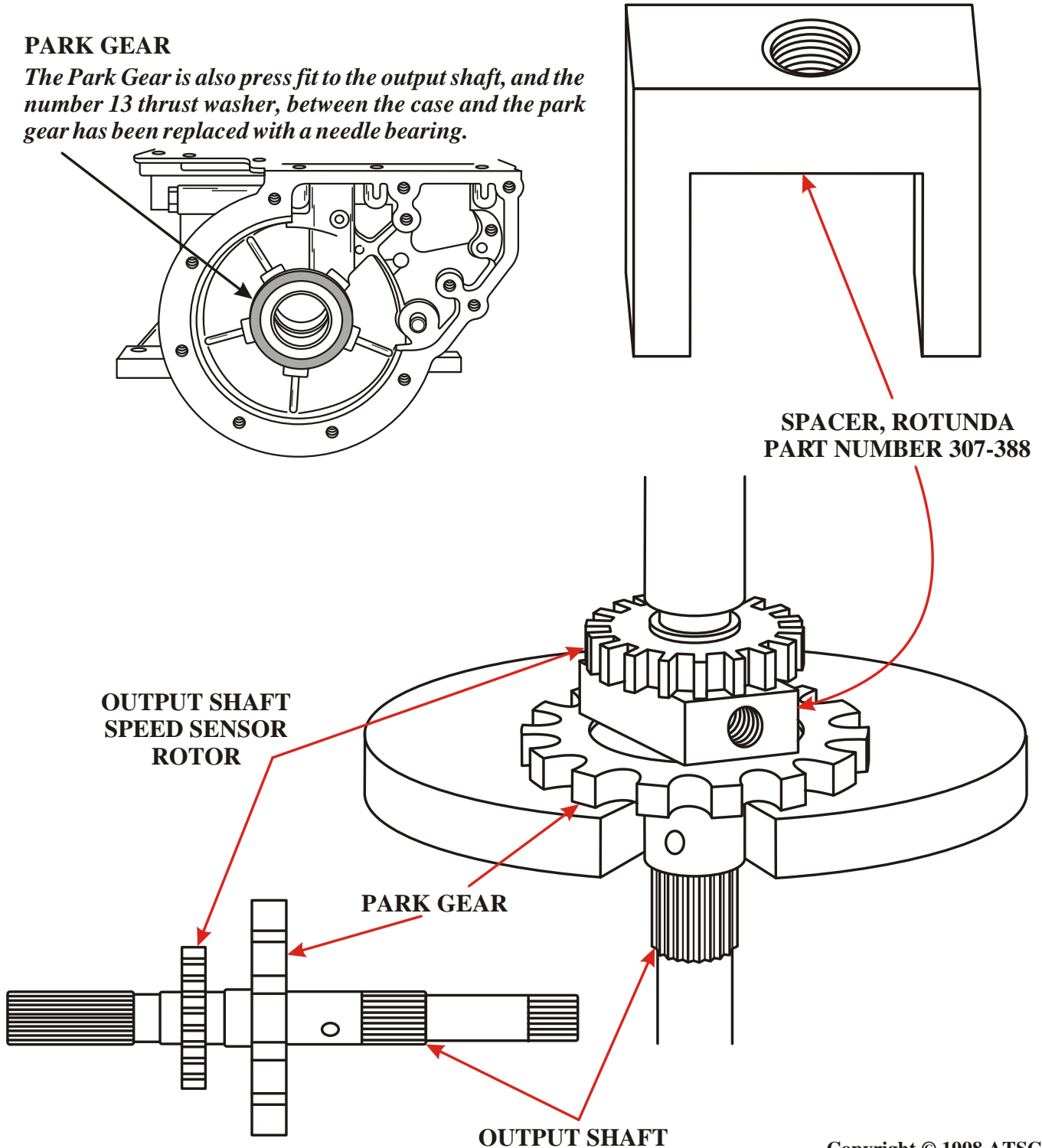
Figure 2

FORD 4R100 OUTPUT SHAFT SPEED SENSOR ROTOR

Output Shaft Speed Sensor Rotor is press fit to the output shaft and requires new Spacer Tool, Rotunda No. 307-388 for spacing the speed sensor rotor the proper distance from the park gear, if it was removed from the output shaft during service.

PARK GEAR

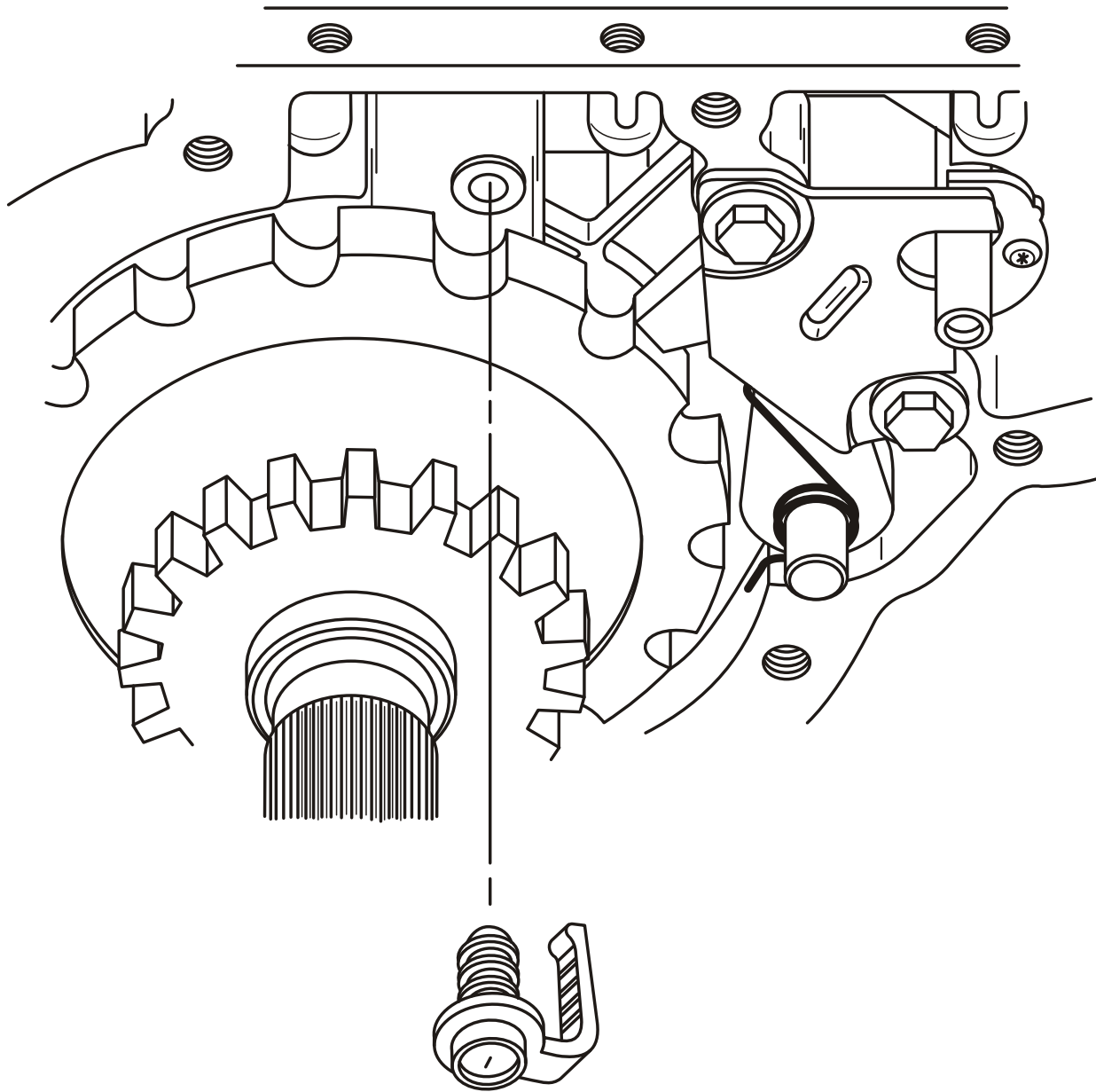
The Park Gear is also press fit to the output shaft, and the number 13 thrust washer, between the case and the park gear has been replaced with a needle bearing.



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Figure 3

FORD 4R100 LUBE ORIFICE LOCATION



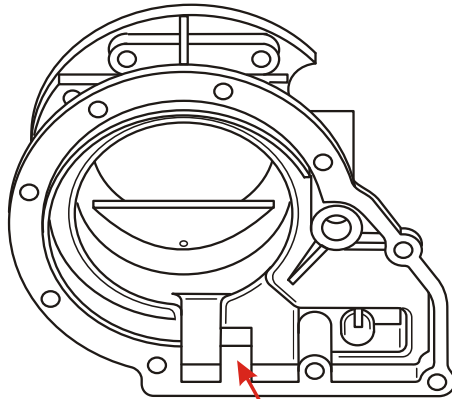
**LUBE ORIFICE PLUG
FORD PART NUMBER
F81Z-7E380-AA**

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Figure 4

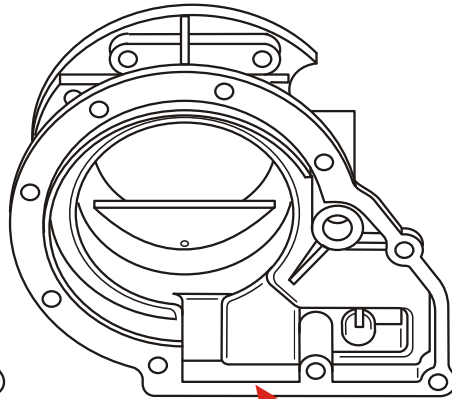
EXTENSION HOUSINGS

**4R100 TYPICAL
4 WHEEL DRIVE**



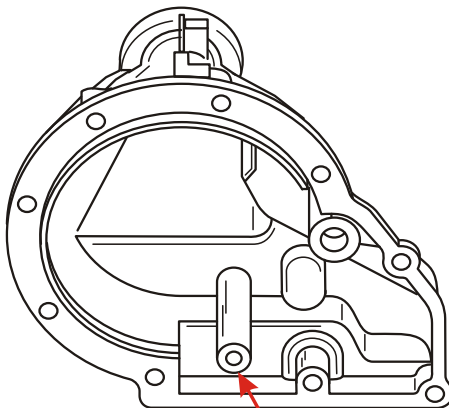
SHOULDER

**E4OD 4X4 WITHOUT
LUBE PLUG**



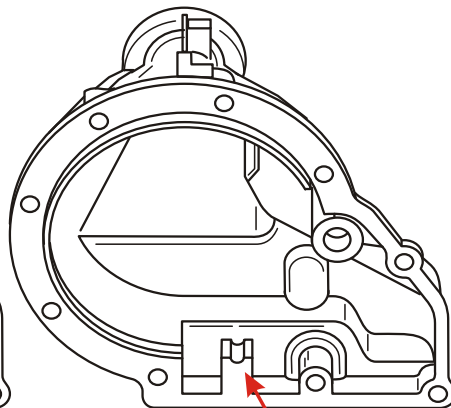
NO SHOULDER

**FORD 4R100
6.8L AND 7.3L
2 WHEEL DRIVE**



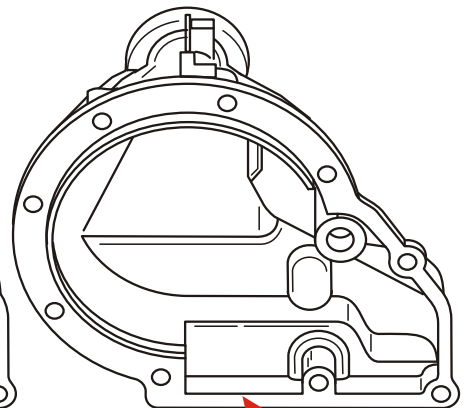
ADDED BOSS

**ALL OTHER
2 WHEEL DRIVE
APPLICATIONS**



SHOULDER

**E4OD WITHOUT
LUBE PLUG**



NO SHOULDER

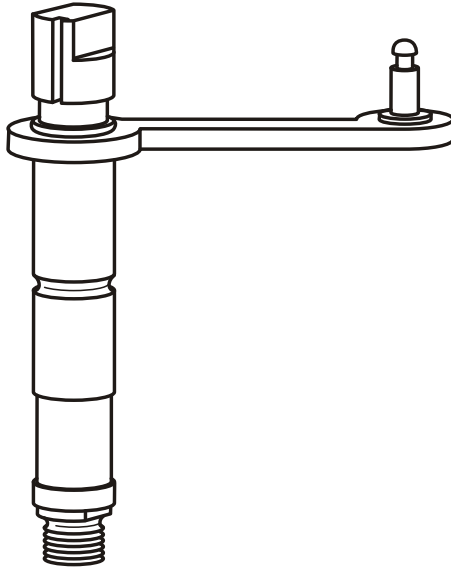
NOTE: *Extension Housings are model sensitive. Refer to Ford Motor Co. parts list for proper part numbers.*

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Figure 5

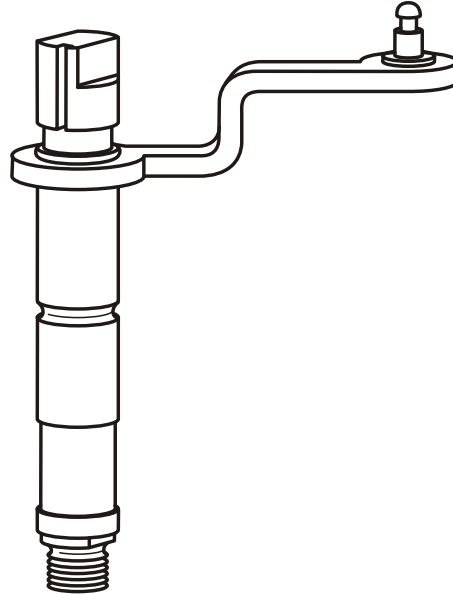
FORD 4R100 MANUAL SHIFT LEVERS

"With" PTO OPTION
STAMPED F81P-AA



FORD PART NUMBER
F81Z-7A256-AA

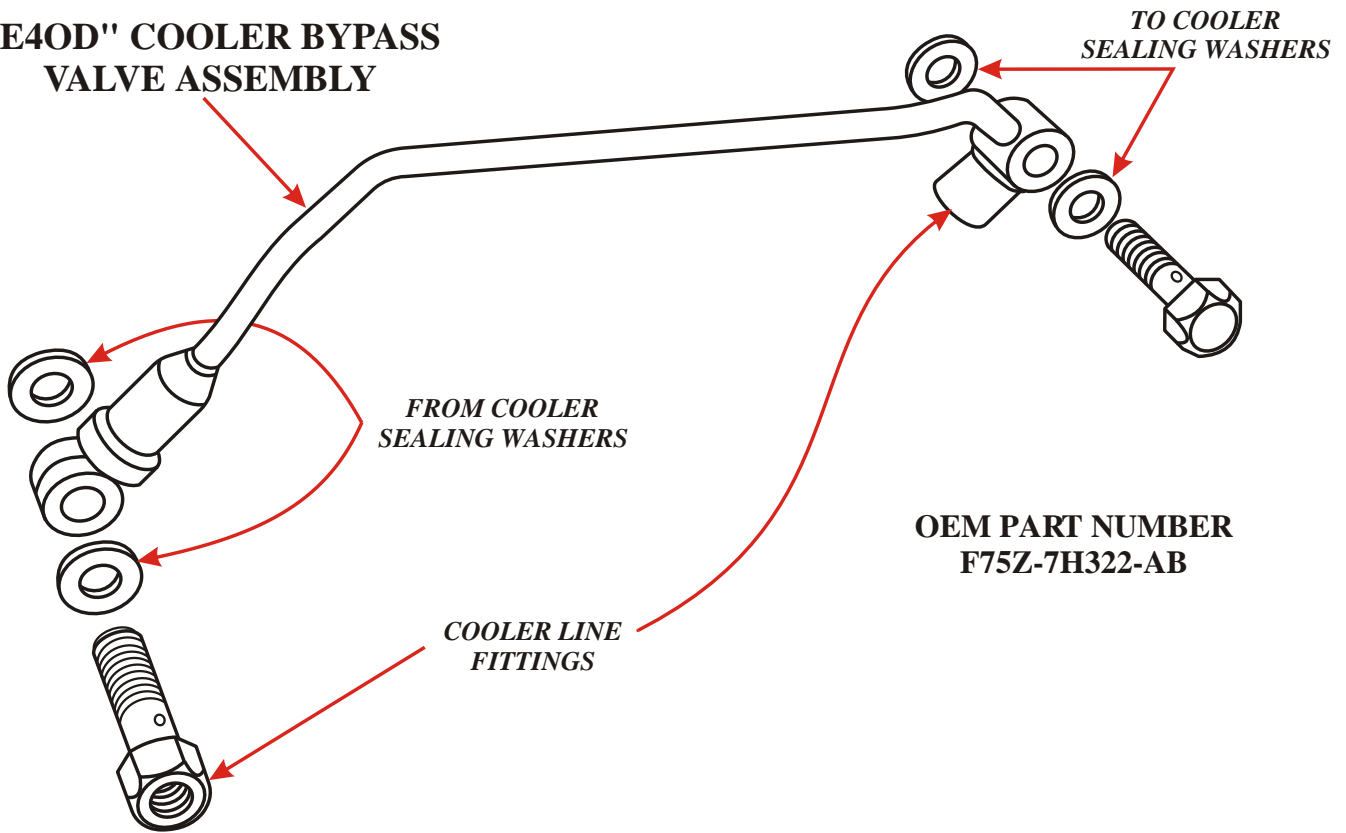
"Without" PTO OPTION
STAMPED F75P-BB



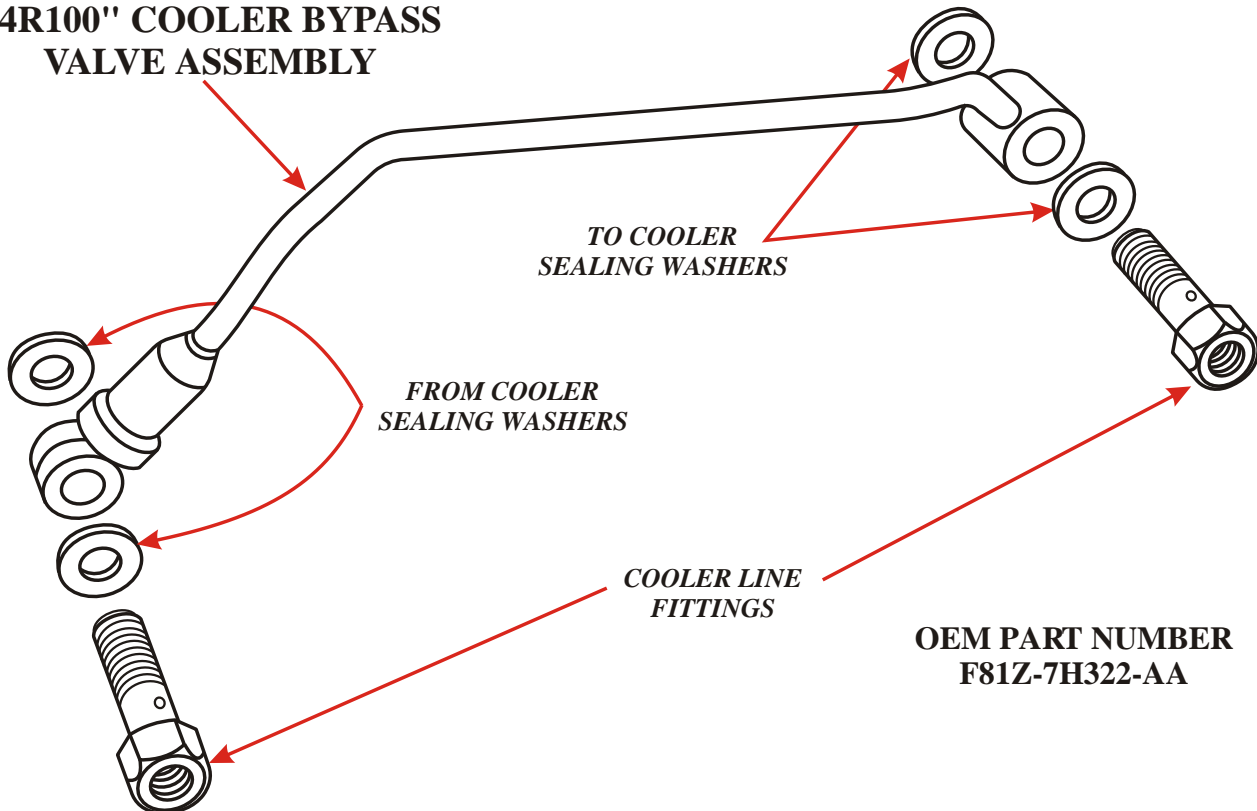
FORD PART NUMBER
F7UZ-7A256-BB

Figure 6

"E4OD" COOLER BYPASS VALVE ASSEMBLY



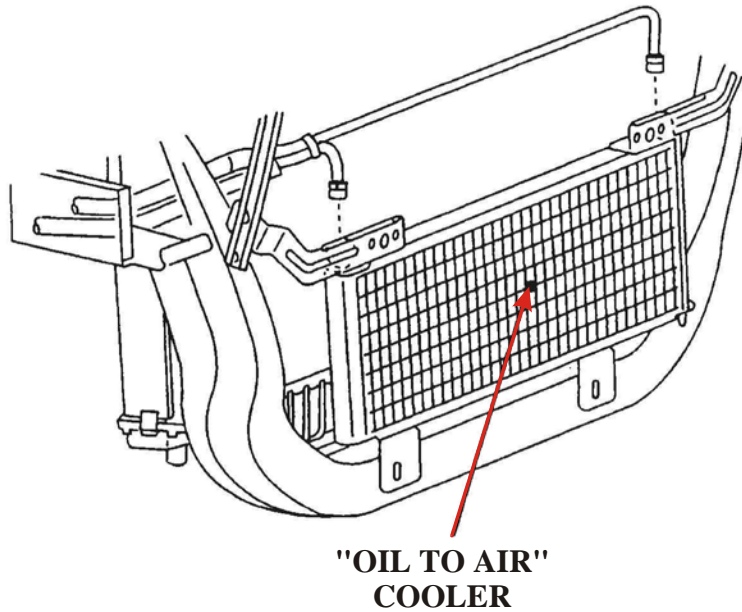
"4R100" COOLER BYPASS VALVE ASSEMBLY



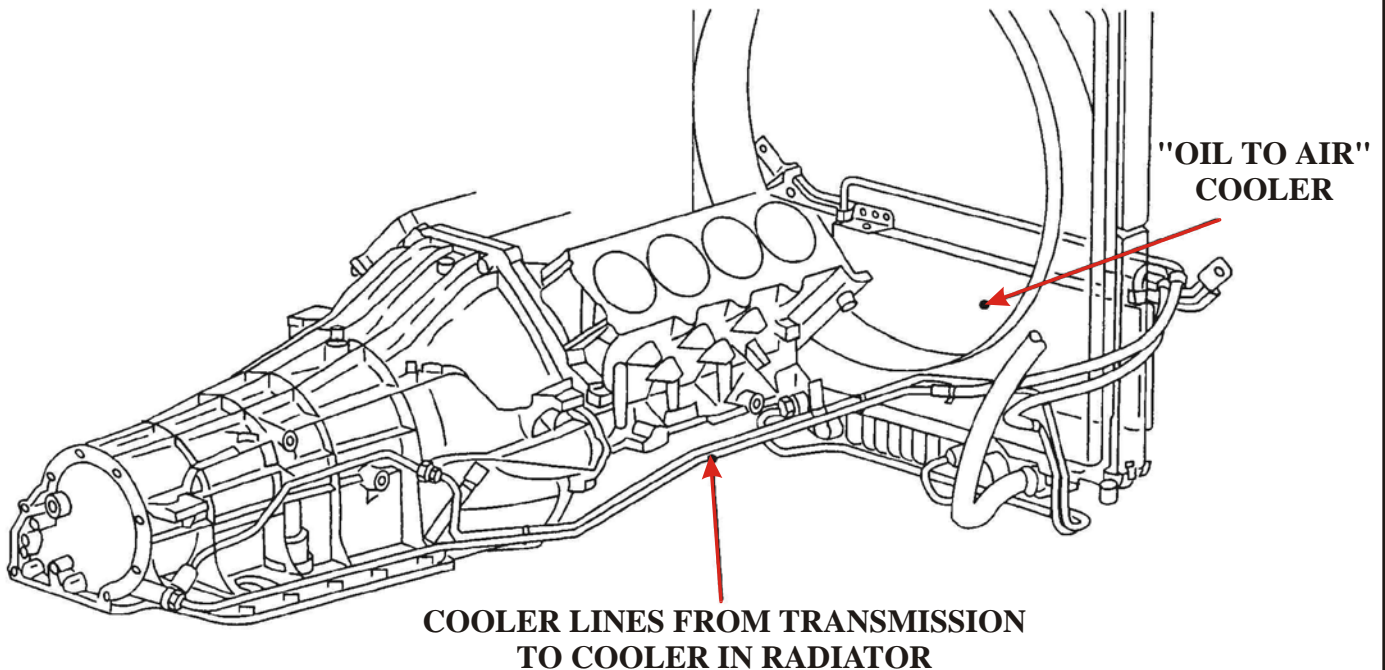
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Figure 7

Most F-Series vehicles over 8500 GVW equipped with the 4R100 transmission have an external "Oil-To-Air" cooler only. Due to the internal design the "Oil-To-Air" cooler cannot be adequately flushed to remove contaminants, and requires replacement during transmission rebuild.



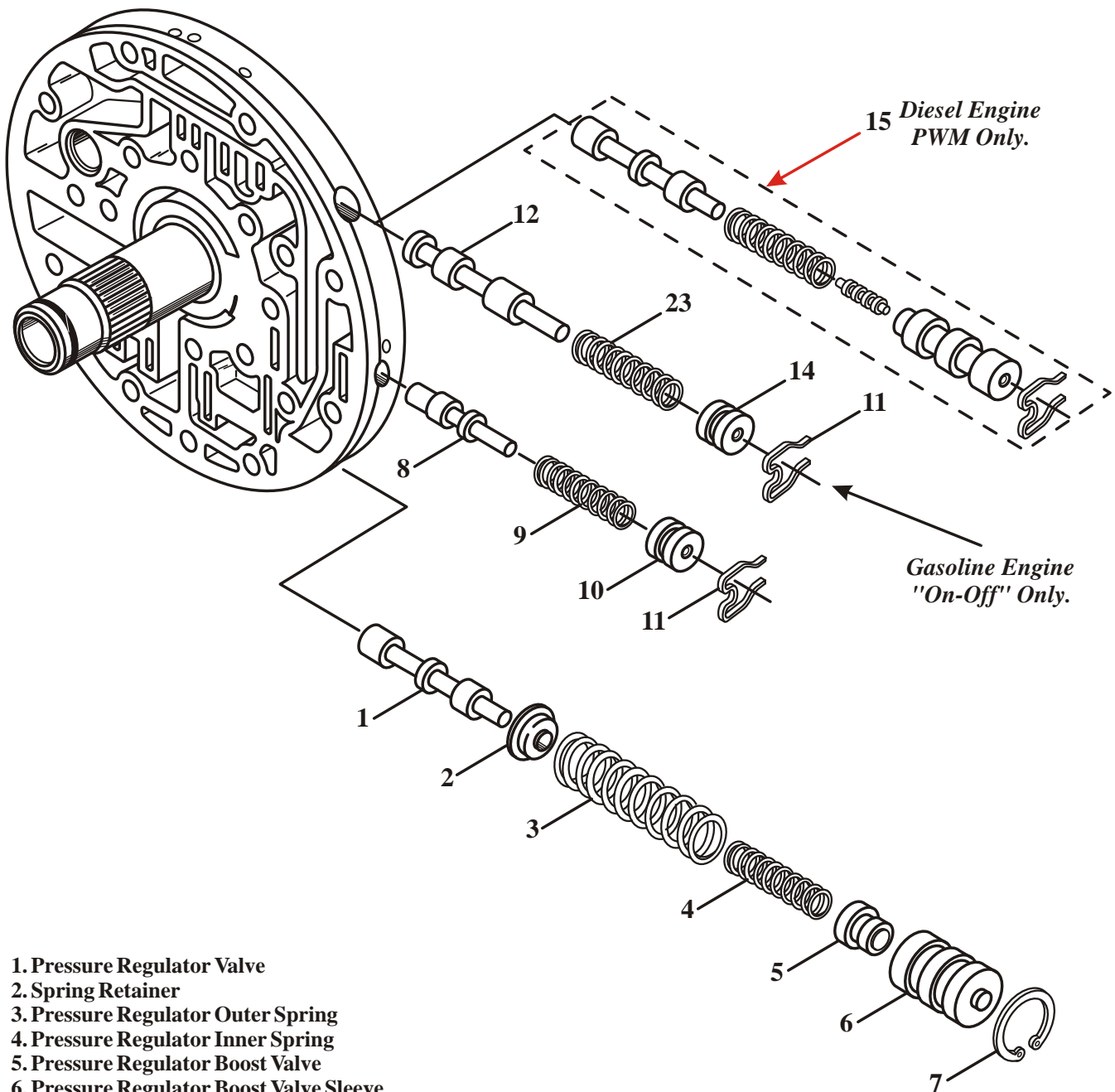
The only exception is that F-Series vehicles over 8500 GVW equipped with the 5.4L engine also uses a radiator "In-Tank" cooler in addition to the "Oil-To-Air" cooler.



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Figure 8

FORD 4R100 VALVE LINE-UPS IN PUMP ASSEMBLY

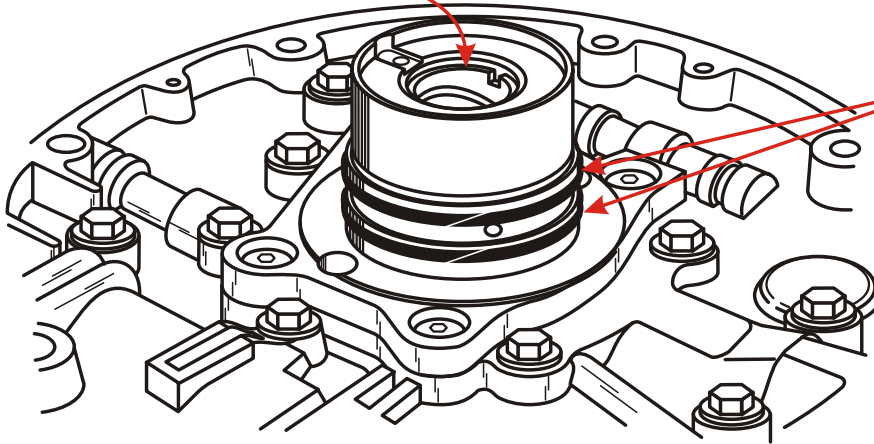


1. Pressure Regulator Valve
2. Spring Retainer
3. Pressure Regulator Outer Spring
4. Pressure Regulator Inner Spring
5. Pressure Regulator Boost Valve
6. Pressure Regulator Boost Valve Sleeve
7. Snap Ring
8. Converter Clutch Regulator Valve
9. Converter Clutch Regulator Spring
10. Converter Clutch Regulator Bore Plug
11. Bore Plug Retainer
12. Converter Clutch Control Valve (Gas "On-Off" Only)
13. Converter Clutch Control Spring (Gas "On-Off" Only)
14. Converter Clutch Control Bore Plug
15. Converter Clutch Control Line-up (Diesel "PWM" Only)

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Figure 9

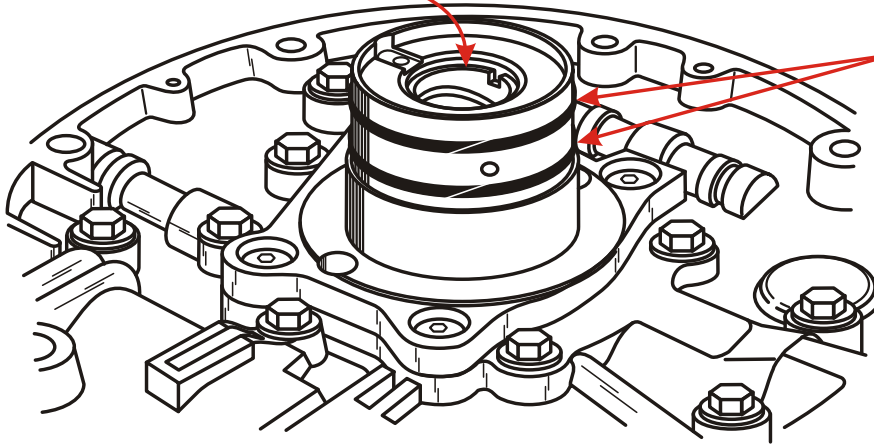
BUSHING



**COAST CLUTCH
SEAL RINGS ARE
LOW ON PUMP TOWER
(LIKE E40D)**

**USED WITH THE "CAST IRON" COAST CLUTCH DRUM
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**

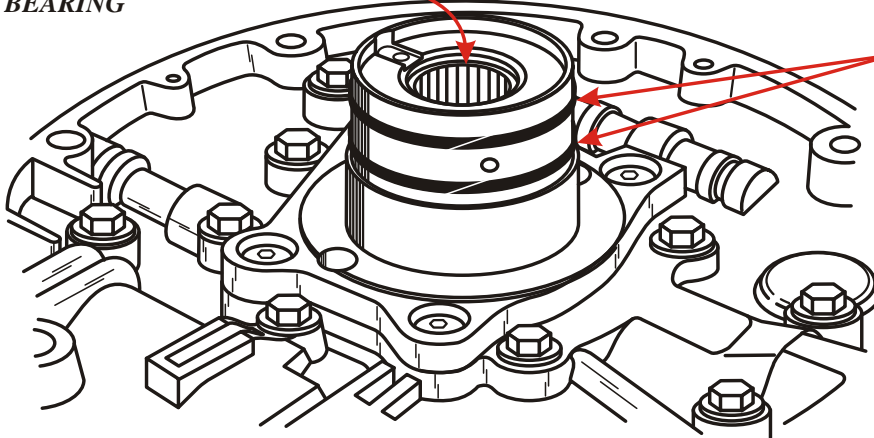
BUSHING



**COAST CLUTCH
SEAL RINGS ARE HIGHER
ON THE PUMP TOWER**

**USED WITH THE "STAMPED STEEL" COAST CLUTCH DRUM
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**

**CAGED NEEDLE
BEARING**

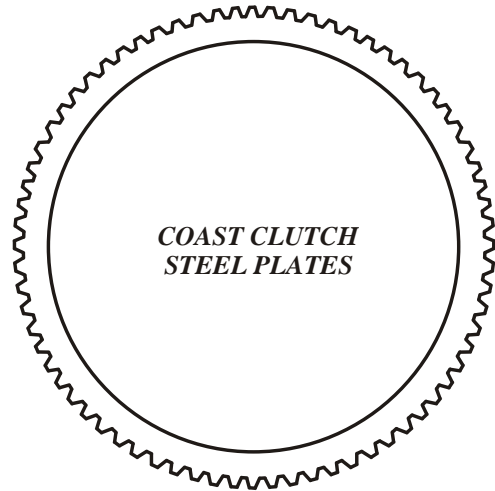
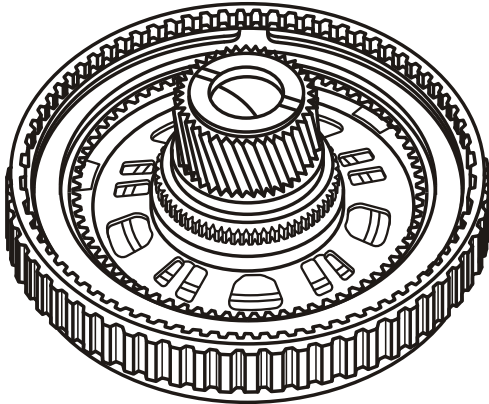


**COAST CLUTCH
SEAL RINGS ARE HIGHER
ON THE PUMP TOWER**

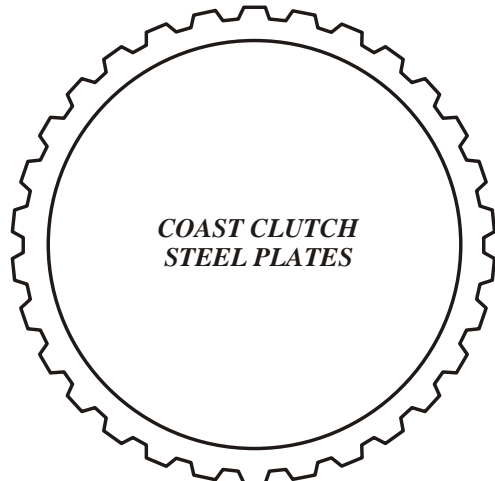
**USED WITH THE "STAMPED STEEL" COAST CLUTCH DRUM
WITH 6.8L AND 7.3L "WITH" PTO OPTION**

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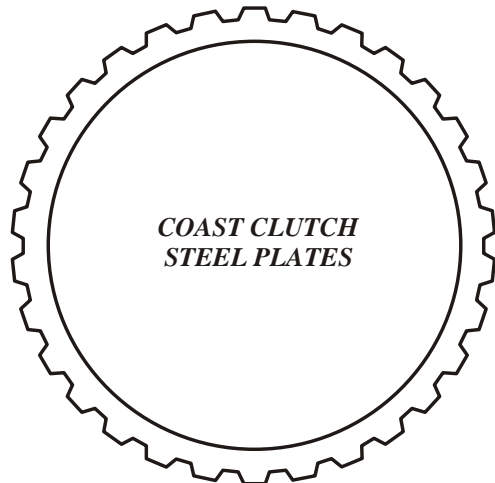
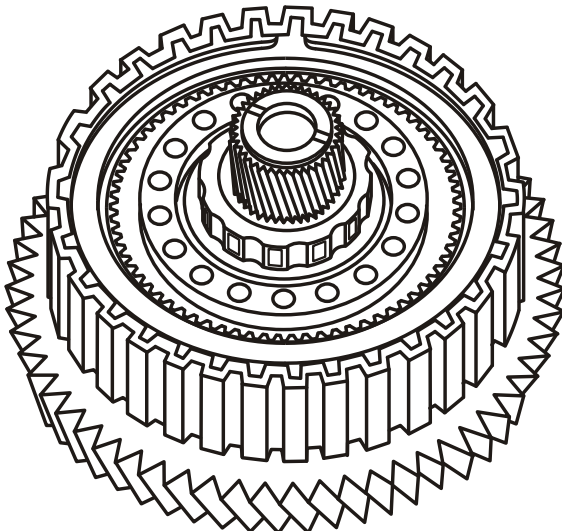
Figure 10



**"CAST IRON" COAST CLUTCH DRUM USED
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**



**"STAMPED STEEL" COAST CLUTCH DRUM USED
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**



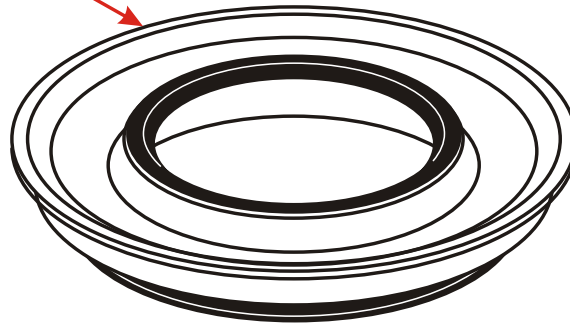
**"STAMPED STEEL" COAST CLUTCH DRUM USED
WITH 6.8L AND 7.3L "WITH" PTO OPTION**

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Figure 11

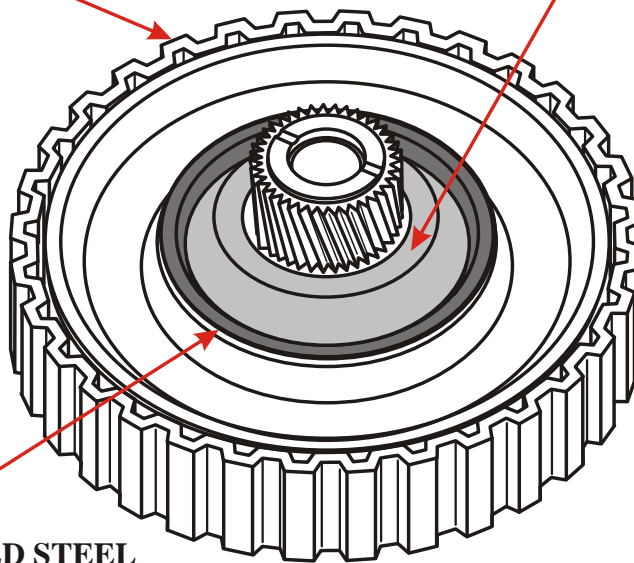
STAMPED STEEL MOLDED RUBBER COAST CLUTCH PISTON FOR NEW DESIGN COAST CLUTCH DRUM

**NEW DESIGN STAMPED STEEL,
MOLDED RUBBER SEAL PISTON
OEM PART NUMBER F81Z-7A262-AA**



**NEW DESIGN STAMPED STEEL
COAST CLUTCH DRUM**

**LIP SEAL PROTECTOR
ROTUNDA NO. 307-387**



**NEW DESIGN STAMPED STEEL
MOLDED RUBBER PISTON**

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Figure 12

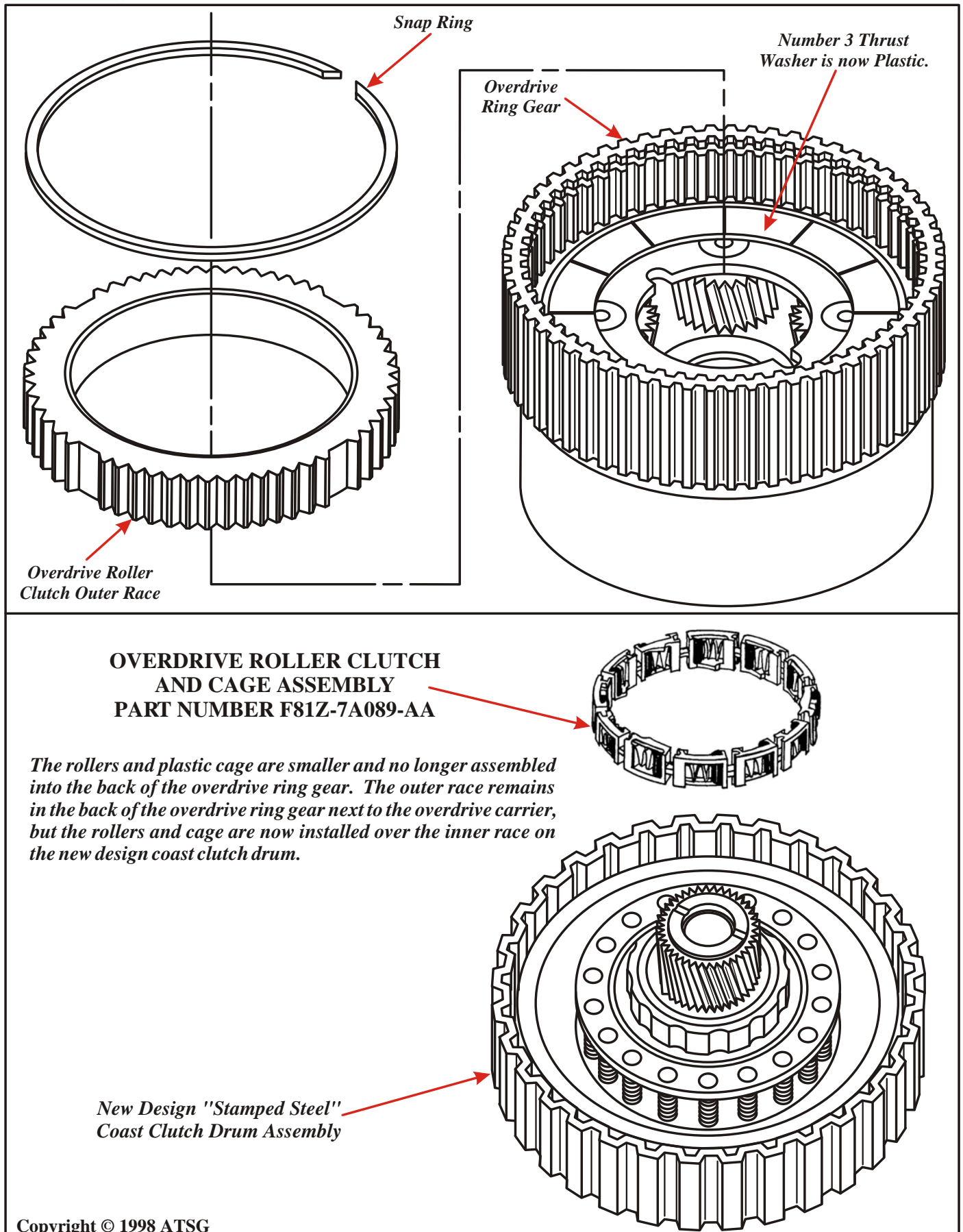
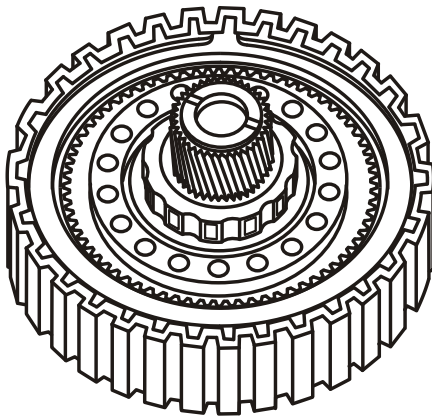
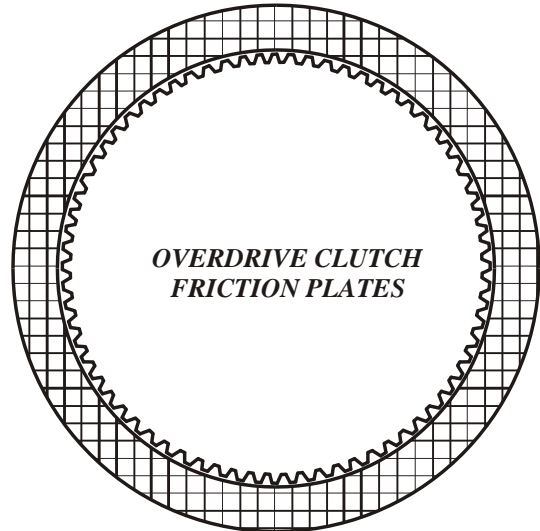


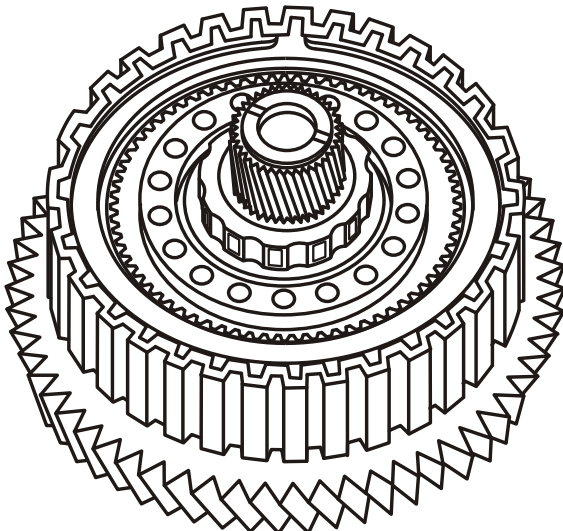
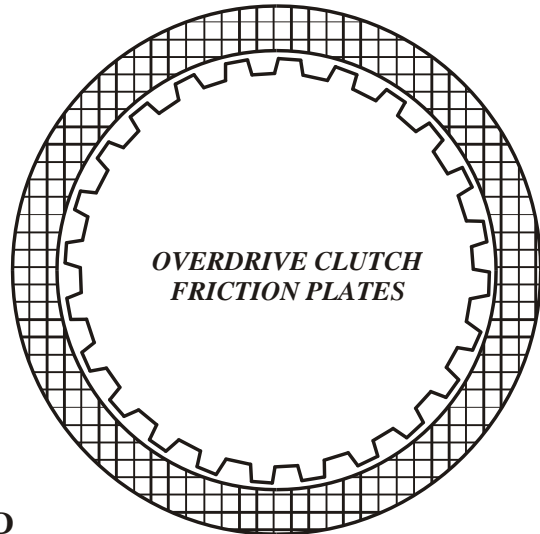
Figure 13



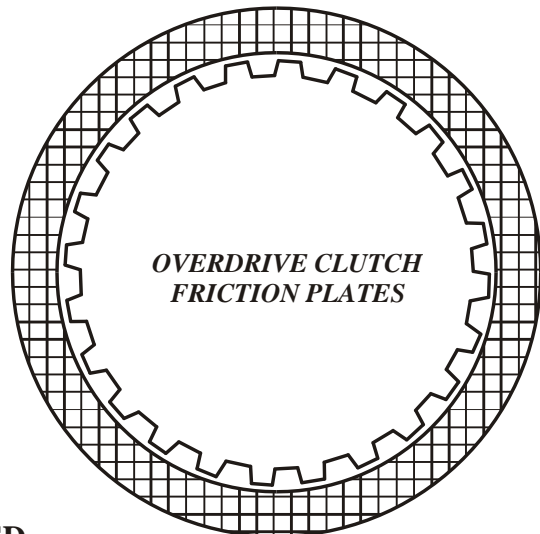
**"CAST IRON" COAST CLUTCH DRUM USED
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**



**"STAMPED STEEL" COAST CLUTCH DRUM USED
WITH 5.4L AND 6.8L "WITHOUT" PTO OPTION**



**"STAMPED STEEL" COAST CLUTCH DRUM USED
WITH 6.8L AND 7.3L "WITH" PTO OPTION**

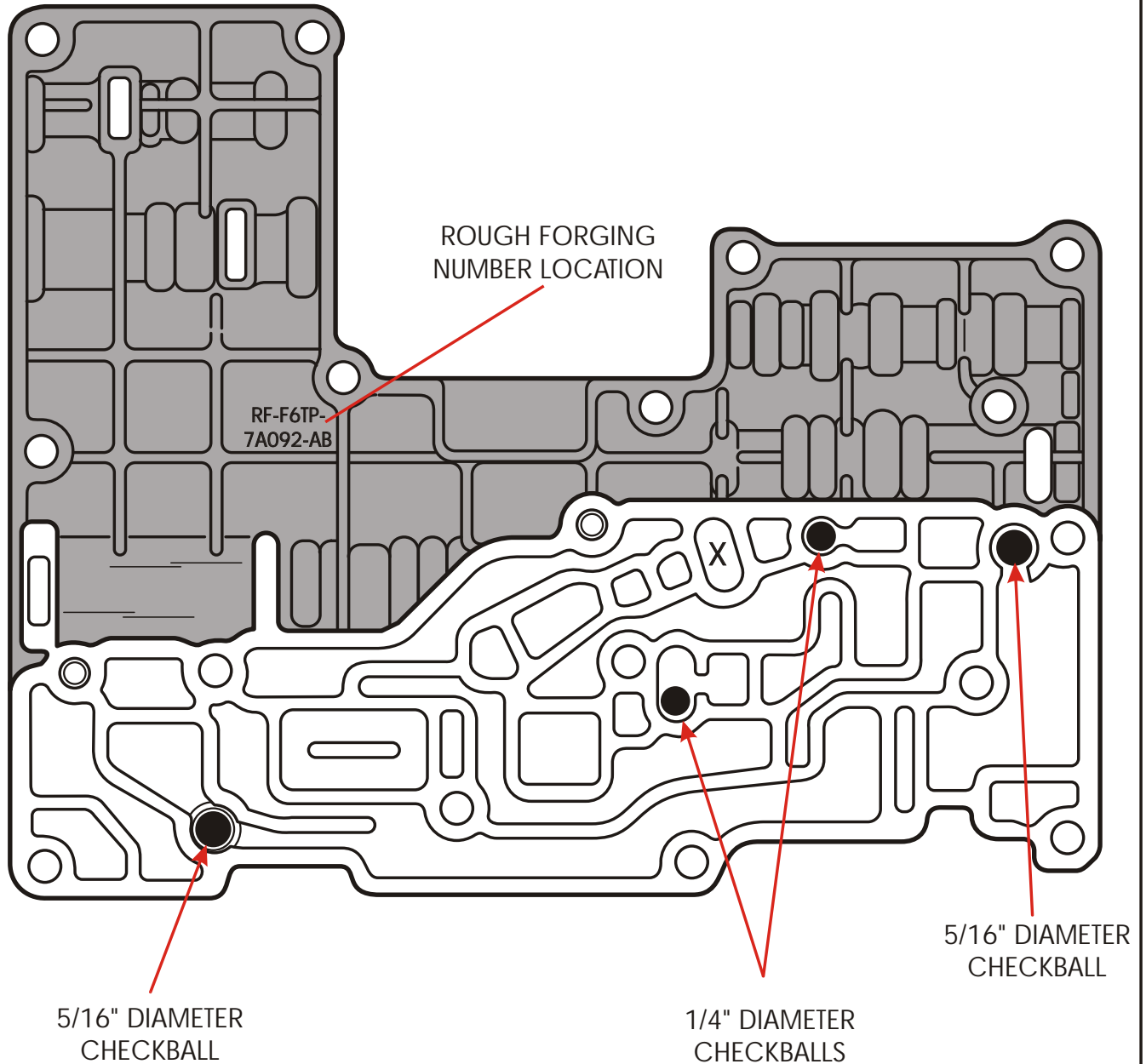


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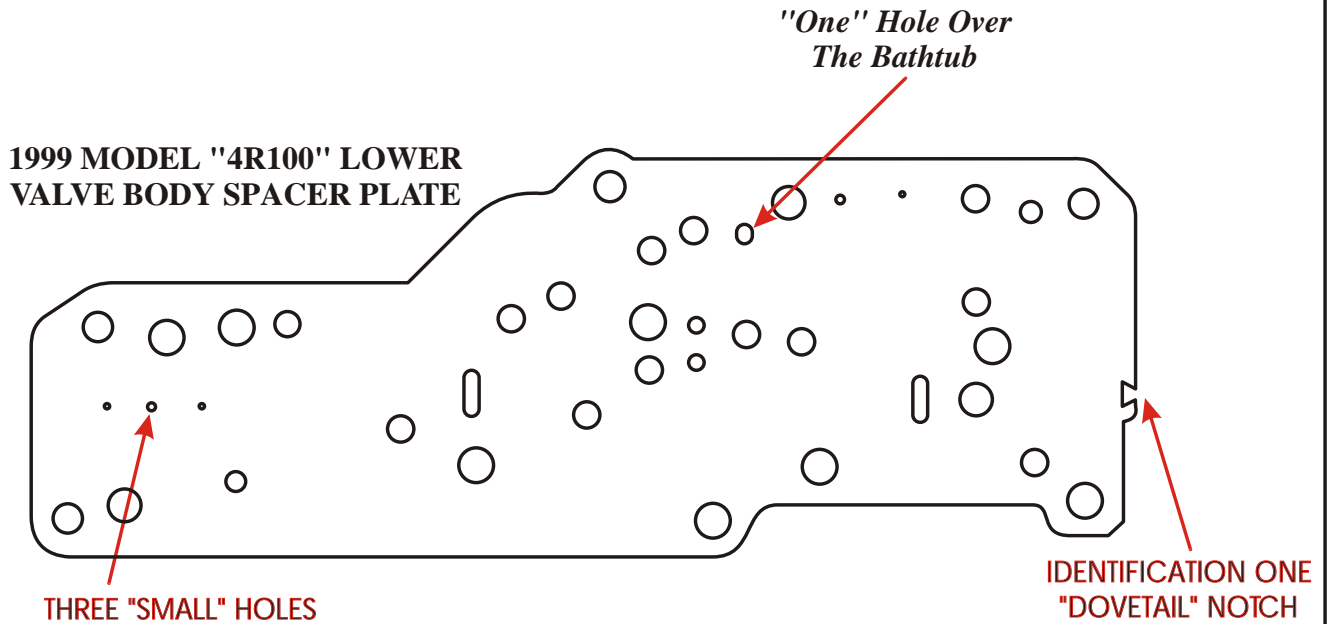
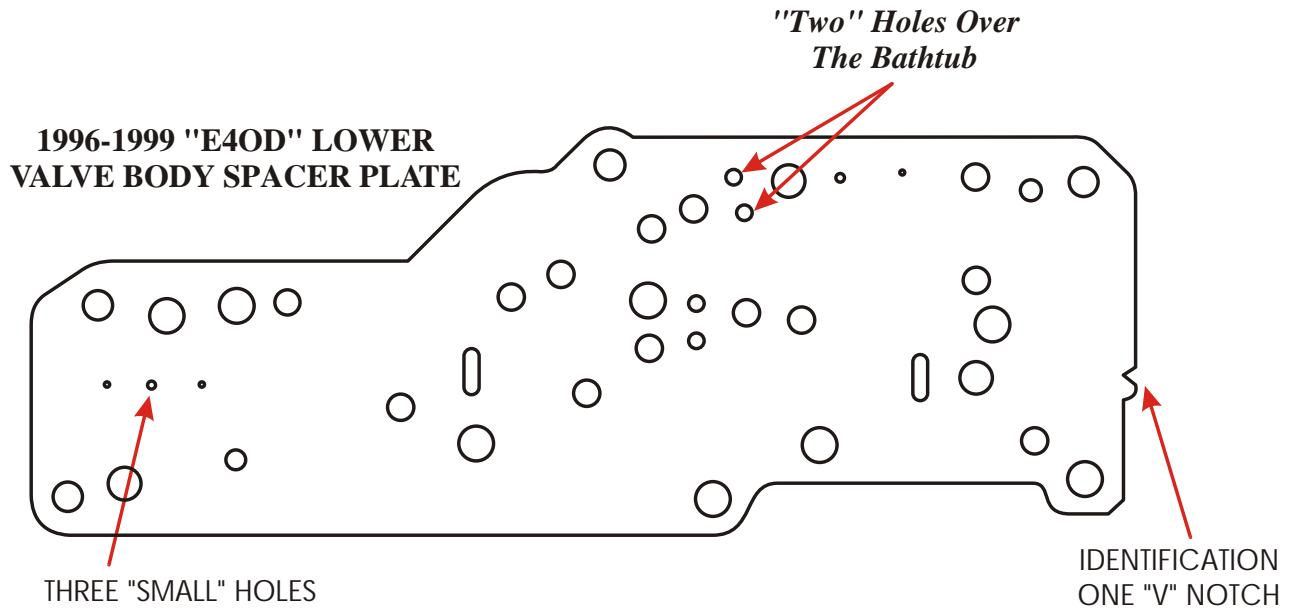
Figure 14

FORD 4R100

**4R100 VALVE BODY CHECKBALL LOCATIONS
REQUIRES TWO 1/4" RUBBER BALLS,
AND TWO 5/16" RUBBER BALLS**

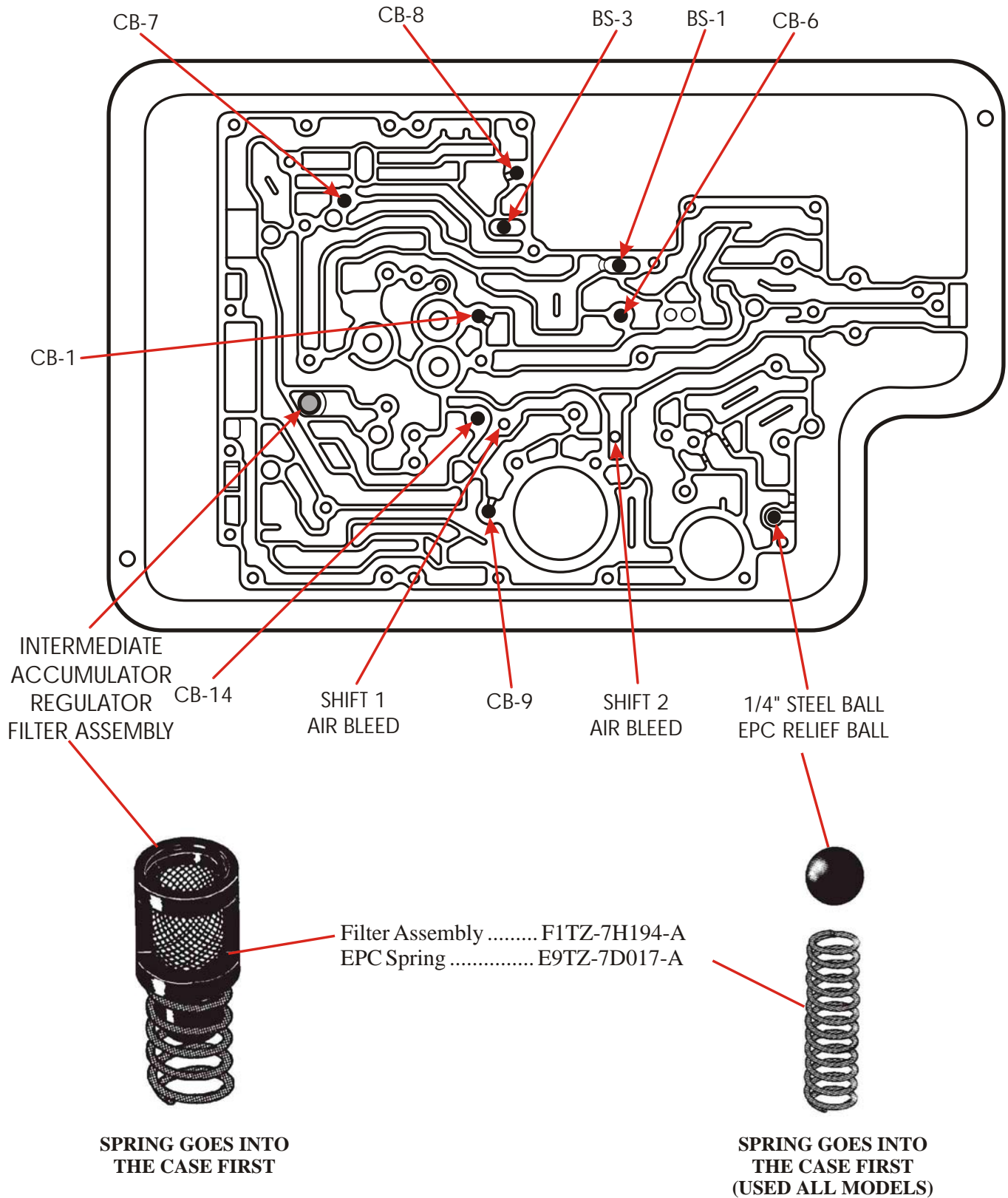


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1999 4R100 CASE CHECKBALL LOCATIONS REQUIRES EIGHT (5/16") RUBBER BALLS

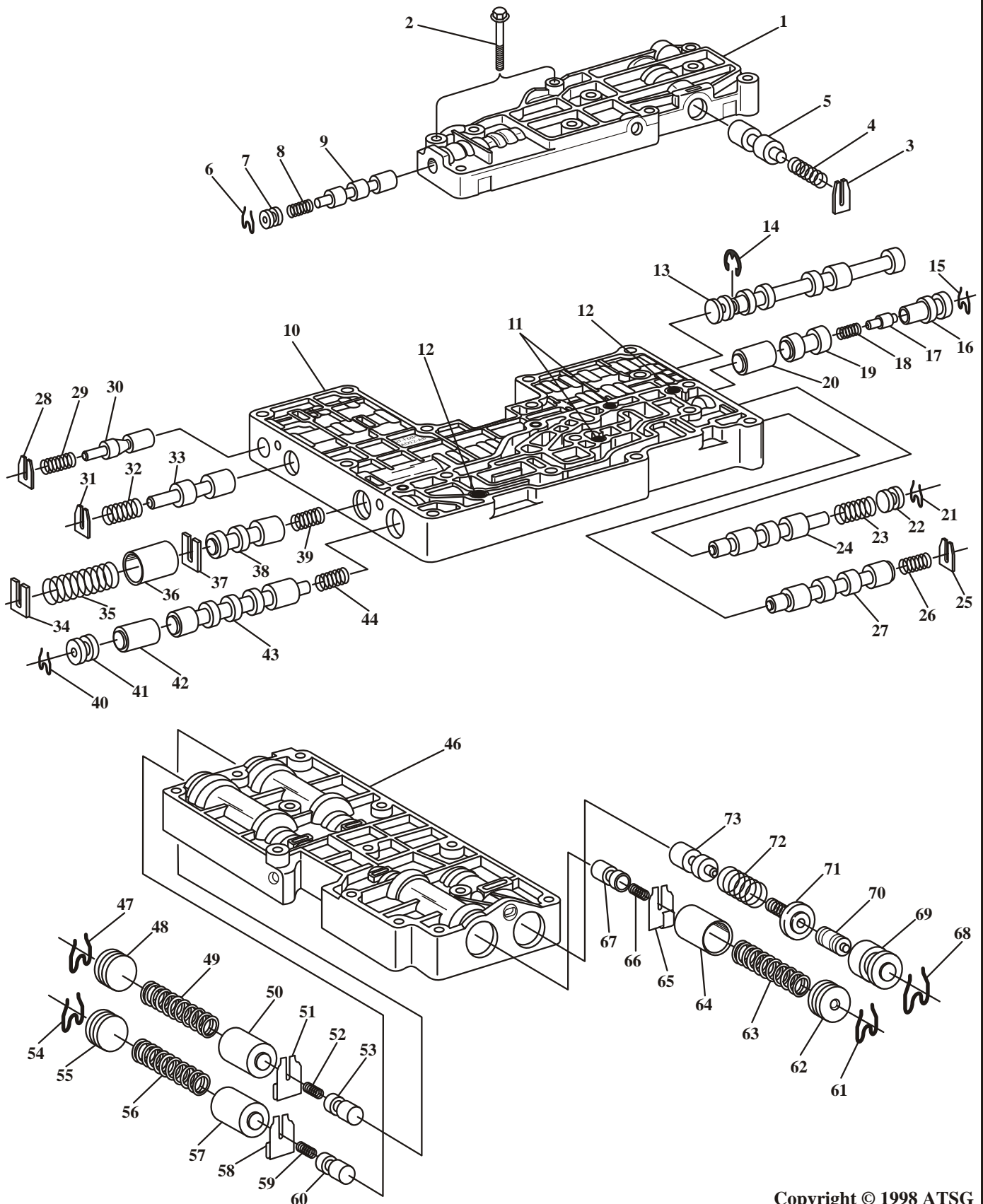


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Figure 17

AUTOMATIC TRANSMISSION SERVICE GROUP

FORD 4R100 MAIN, LOWER, AND ACCUMULATOR VALVE BODIES DISASSEMBLED



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Figure 18
AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

FORD 4R100 MAIN, LOWER, AND ACCUMULATOR VALVE BODY LEGEND

<i>Item</i>	<i>Description</i>	<i>Item</i>	<i>Description</i>
1	Lower Valve Body	47	Spring Clip Bore Plug Retainer
2	Hex Head Bolt, M1 X 36 (2 Required)	48	Direct Clutch Accumulator Regulator Plunger Bore Plug
3	Retaining Plate	49	Direct Clutch Accumulator Regulator Plunger Spring
4	Manual 1-2 Transition Valve Spring	50	Direct Clutch Accumulator Regulator Plunger
5	Manual 1-2 Transition Valve	51	Direct Clutch Accumulator Regulator Valve Retainer
6	Spring Clip Bore Plug Retainer	52	Direct Clutch Accumulator Regulator Valve Spring
7	Engagement Valve Bore Plug	53	Direct Clutch Accumulator Regulator Valve
8	Engagement Valve Spring	54	Spring Clip Bore Plug Retainer
9	Engagement Valve	55	O.D. Clutch Accumulator Regulator Plunger Bore Plug
10	Main Valve Body	56	O.D. Clutch Accumulator Regulator Plunger Spring
11	Checkball 1/4", 2 Required (7E195)	57	O.D. Clutch Accumulator Regulator Plunger
12	Checkball 5/16", 2 Required (7E195)	58	O.D. Clutch Accumulator Regulator Valve Retainer
13	Manual Control Valve	59	O.D. Clutch Accumulator Regulator Valve Spring
14	Manual Valve "E" Clip	60	O.D. Clutch Accumulator Regulator Valve
15	Spring Clip Bore Plug Retainer	61	Spring Clip Bore Plug Retainer
16	Low Reverse Modulator Valve Sleeve	62	Int. Clutch Accumulator Regulator Plunger Bore Plug
17	Low Reverse Modulator Valve Plunger	63	Int. Clutch Accumulator Regulator Plunger Spring
18	Low Servo Modulator Valve Spring	64	Int. Clutch Accumulator Regulator Plunger
19	Low Servo Modulator Valve	65	Int. Clutch Accumulator Regulator Valve Retainer
20	Low Reverse Modulator Valve	66	Int. Clutch Accumulator Regulator Valve Spring
21	Spring Clip Bore Plug Retainer	67	Int. Clutch Accumulator Regulator Valve
22	3-4 Shift Valve Bore Plug	68	Spring Clip Bore Plug Retainer
23	3-4 Shift Valve Spring	69	Line Pressure Modulator Plunger Sleeve
24	3-4 Shift Valve	70	Line Pressure Modulator Plunger
25	Retaining Plate	71	Line Pressure Modulator Spring And Retainer Assembly
26	2-3 Shift Valve Spring	72	Line Pressure Modulator Valve Spring
27	2-3 Shift Valve	73	Line Pressure Modulator Valve
28	Retaining Plate		
29	Solenoid Regulator Valve Spring		
30	Solenoid Regulator Valve		
31	Retaining Plate		
32	Coast Clutch Shift Valve Spring		
33	Coast Clutch Shift Valve		
34	Retaining Plate		
35	4-3-2 Shift Timing Control Valve Plunger Spring		
36	4-3-2 Shift Timing Control Valve Plunger		
37	Retaining Plate		
38	4-3-2 Shift Timing Valve		
39	4-3-2 Shift Timing Valve Spring		
40	Spring Clip Bore Plug Retainer		
41	1-2 Shift Valve Bore Plug		
42	1-2 Shift Valve		
43	Drive 2 Valve		
44	1-2 Shift Valve Spring		
46	Accumulator Valve Body (7G422 Model Sensitive)		

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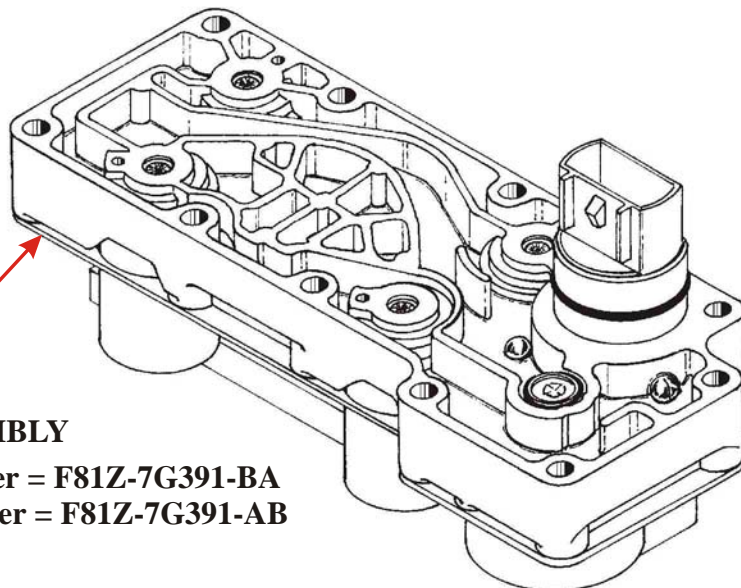
Figure 19

AUTOMATIC TRANSMISSION SERVICE GROUP

FORD 4R100 SOLENOID RESISTANCE CHARTS

<i>Solenoid Resistance Chart</i>		
<i>Solenoid</i>	<i>Solenoid Body Pin Numbers</i>	<i>Resistance</i>
<i>Shift Solenoid "B" (2)</i>	<i>1 and 2</i>	<i>20-30 Ohms</i>
<i>Shift Solenoid "A" (1)</i>	<i>1 and 3</i>	<i>20-30 Ohms</i>
<i>TCC Solenoid, Gasoline (On-Off)</i>	<i>1 and 4</i>	<i>20-30 Ohms</i>
<i>TCC Solenoid, Diesel (PWM)</i>	<i>1 and 4</i>	<i>10-20 Ohms</i>
<i>Coast Clutch Solenoid</i>	<i>1 and 5</i>	<i>20-30 Ohms</i>
<i>Electronic Pressure Control Solenoid</i>	<i>11 and 12</i>	<i>3.0-5.0 Ohms</i>
<i>Transmission Fluid Temp Sensor</i>	<i>7 and 8</i>	<i>See Chart Below</i>

<i>Transmission Fluid Temperature</i>		
<i>°C</i>	<i>°F</i>	<i>Resistance</i>
<i>-40 to -20</i>	<i>-40 to -4</i>	<i>1062k - 284k W</i>
<i>-19 to -1</i>	<i>-3 to 31</i>	<i>284k - 100k W</i>
<i>0 - 20</i>	<i>32-68</i>	<i>100k - 37k W</i>
<i>21-40</i>	<i>69-104</i>	<i>37k - 16k W</i>
<i>41-70</i>	<i>105-158</i>	<i>16k - 5k W</i>
<i>71-90</i>	<i>159-194</i>	<i>5k - 2.7k W</i>
<i>91-110</i>	<i>195-230</i>	<i>2.7k - 1.5k W</i>
<i>111-130</i>	<i>231-266</i>	<i>1.5k - 0.8k W</i>
<i>131-150</i>	<i>267-302</i>	<i>0.8k - 0.54k W</i>



SOLENOID ASSEMBLY

Gasoline Engines Only - Part Number = F81Z-7G391-BA
Diesel Engines Only ----- Part Number = F81Z-7G391-AB

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Shift Solenoid Application Chart

<i>Selector Lever Range</i>	<i>Commanded Gear</i>	<i>Shift Solenoid "A"</i>	<i>Shift Solenoid "B"</i>	<i>TCC Solenoid</i>	<i>Coast Clutch Solenoid</i>
P/R/N	1	ON	OFF	*	*
Ⓓ	1	ON	OFF	*	*
Ⓓ	2	ON	ON	*	*
Ⓓ	3	OFF	ON	*	*
Ⓓ	4	OFF	OFF	*	*
Ⓓ <i>Cancel First Through 3rd Gear Only, SSA, SSB, TCC, Same as Overdrive, CCS Always On.</i>					
MANUAL 2	2	*	*	*	ON
MANUAL 1	2	OFF	OFF	OFF	ON
MANUAL 1	1	ON	OFF	OFF	ON

* Controlled by PCM

SHIFT SOLENOID "A" ALWAYS OFF

<i>PCM Gear Commanded</i>	<i>Selector Lever Position</i>		
	Ⓓ	2	1
	<i>Actual Gear Obtained</i>		
1st	4	2	1
2nd	3	2	2
3rd	3	2	2
4th	4	2	2

SHIFT SOLENOID "B" ALWAYS OFF

<i>PCM Gear Commanded</i>	<i>Selector Lever Position</i>		
	Ⓓ	2	1
	<i>Actual Gear Obtained</i>		
1st	1	2	1
2nd	1	2	1
3rd	4	2	2
4th	4	2	2

SHIFT SOLENOID "A" ALWAYS ON

<i>PCM Gear Commanded</i>	<i>Selector Lever Position</i>		
	Ⓓ	2	1
	<i>Actual Gear Obtained</i>		
1st	1	2	1
2nd	2	2	1
3rd	2	2	1
4th	1	2	1

SHIFT SOLENOID "B" ALWAYS ON

<i>PCM Gear Commanded</i>	<i>Selector Lever Position</i>		
	Ⓓ	2	1
	<i>Actual Gear Obtained</i>		
1st	2	2	1
2nd	2	2	1
3rd	3	2	2
4th	3	2	2

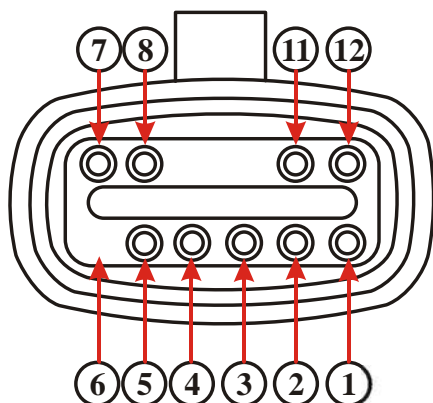
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Figure 21

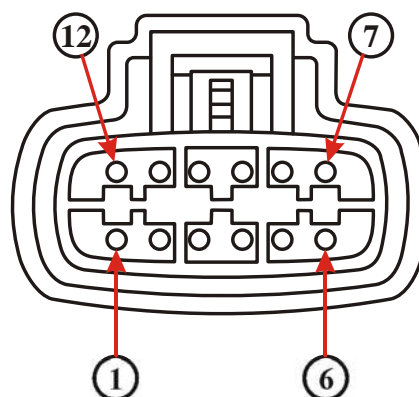
FORD 4R100

SOLENOID BODY PIN IDENTIFICATION AND FUNCTION

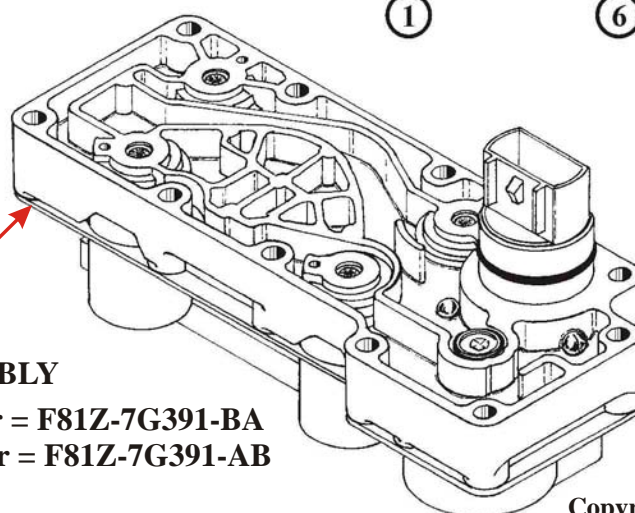
SOLENOID BODY CONNECTOR



VEHICLE HARNESS CONNECTOR



SOLENOID ASSEMBLY



Gasoline Engines Only - Part Number = F81Z-7G391-BA
Diesel Engines Only ----- Part Number = F81Z-7G391-AB

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Solenoid Connector Pin Identification and Function

Pin No.	Description	PCM Connector Pin	
		Gas & Diesel (Cal)	Diesel (49 State)
1	Vehicle Power In For Solenoids (VPWR)	71, 97	71, 97
2	Shift Solenoid "B" (2) Ground from PCM	11	1
3	Shift Solenoid "A" (1) Ground from PCM	6	27
4	Converter Clutch Solenoid Ground from PCM	54	28
5	Coast Clutch Solenoid Ground from PCM	20	53
6	Not Used		
7	Transmission Fluid Temp Sensor	37	37
8	Transmission Fluid Temp Sensor (Signal Return)	91	91
9	Not Used		
10	Not Used		
11	Electronic Pressure Control (EPC)	81	81
12	Vehicle Power In For EPC Solenoid (VPWR)	71, 97	71, 97

Figure 22



Technical Service Information

1999 FORD 4R100			
<i>Abbreviation Description</i>			
<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
4X4L	4X4 Low Switch	MIL	Malfunction Indicator Lamp
ABS	Antilock Brake System	OCT ADJ	Octane Adjust
A/C	Air Conditioning	OSS	Output Shaft Sensor
ACCS	Air Conditioning Clutch Status	PCM	Powertrain Control Module
AP	Accelerator Pedal Position Sensor	PIP	Profile Ignition Pickup
ARPMDES	Ancillary Engine Speed Desired	RPM	Engine Speed
BARO	Barometric Pressure Sensor	SCCS	Speed Control Command Switch
BOO	Brake ON/OFF Switch	SS1	Shift Solenoid "1"
BPA	Brake Pressure Applied	SS2	Shift Solenoid "2"
BPP	Brake Pedal Position	SSA	Shift Solenoid "A"
CCS	Coast Clutch Solenoid	SSB	Shift Solenoid "B"
CPP	Clutch Pedal Position	SPOUT	Spark Output
CRUISE	Cruise Control Mode (Driving)	TCC	Torque Converter Clutch
DLC	Data Link Connector	TCIL	Trans Control Indicator Lamp
DTC	Diagnostic Trouble Code	TCS	Transmission Control Switch
DTC CNT	Diagnostic Trouble Code Count	TFT	Transmission Fluid Temperature
DTR	Digital Transmission Range Sensor	TP	Throttle Position Sensor
EBP	Exhaust Back Pressure	TSS	Turbine Shaft Speed Sensor
ECT	Engine Coolant Temperature	VPWR	Vehicle Power Supply
EOT	Engine Oil Temperature	VREF	Vehicle Reference Voltage
EPC	Electronic Pressure Control	VSS	Vehicle Speed Sensor
EPR	Exhaust Pressure Regulator	WOT	Wide Open Throttle
FUEL PW	Fuel Pulse Width		
GPC	Glow Plug Control Duty Cycle		
IAT	Intake Air Temperature		
ICP	Injector Control Pressure Sensor		
IPR	Injector Pressure Regulator		
IVS	Idle Validation Switch		
KAM	Keep Alive Memory		
KAPWR	Keep Alive Power		
KOEO	Key On Engine Off		
KOEO	Key On Engine Running		
MAF	Mass Air Flow Sensor		
MAP	Manifold Absolute Pressure Sensor		

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Figure 23



Technical Service Information

1999 FORD 4R100 <i>Diagnostic Trouble Code Chart</i>		
<i>Diagnostic Code</i>	<i>Description</i>	<i>Symptom</i>
P0102 P0103	MAF sensor system fails to operate in a normal manner, which may cause a transmission concern.	High EPC pressure. Firm shifts and engagements. May flash TCIL.
P0107 P0108	BARO sensor circuit signal higher or lower than expected.	Firm shift feel, late shifts at higher altitudes.
P0122	(TP) Throttle Position sensor or (AP) Accelerator Pedal Position sensor below specification during normal operation.	Harsh engagements, firm shift feel, abnormal shift schedule, abnormal TCC operation or does not engage.
P0123	(TP) Throttle Position sensor or (AP) Accelerator Pedal Position sensor above or below normal specifications during normal operation.	Harsh engagements, firm shift feel, abnormal shift schedule, abnormal TCC operation or does not engage.
P0235	MAP sensor or circuit open, shorted to ground or to 5V.	Firm shift feel, late shifts at higher altitudes.
P0236	MAP sensor signal higher or lower than expected or no response due to vacuum hose circuit damaged, disconnected or restricted.	Firm shift feel, late shifts at higher altitudes.
P0237	MAP sensor out of On-Board Diagnostics range. No response during Dynamic Response (Goose) test.	Rerun On-Board Diagnostics and perform "Goose" test when asked.
P0340 P0341 P0344	(DI) Distributor Ignition circuit concern or (CKP) Crankshaft Position sensor failure.	Engine will stall or will not run. May flash TCIL.
P0500 P0503	Insufficient or intermittent vehicle speed input from VSS/ABS.	Harsh engagements, firm shift feel, abnormal shift pattern, unexpected downshifts may occur at closed throttle, abnormal TCC operation or engages only at WOT. May flash TCIL.
P0571	(BPP) Brake Pedal Position switch failure, or not connected.	Failed off. TCC will not disengage when brake is applied.
P0703	(BPP) Brake Pedal Position switch failure, or not connected.	Failed off. TCC will not disengage when brake is applied.
P0705	(DTR) Digital Transmission Range sensor circuit malfunction.	Harsh engagements, firm shift feel. May flash TCIL.
P0708	(DTR) Digital Transmission Range sensor circuit malfunction.	Slight increase in EPC pressure.
P0712	TFT sensor circuit grounded, exceeds scale set for temperature of 315°F.	Harsh engagements, firm shift feel, abnormal shift schedule, abnormal TCC operation or does not engage.
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Figure 24



Technical Service Information

1999 FORD 4R100		
<i>Diagnostic Trouble Code Chart</i>		
<i>Diagnostic Code</i>	<i>Description</i>	<i>Symptom</i>
P0713	TFT sensor circuit open, exceeds scale set for temperature of minus 40°F.	TCC and stabilized shift schedule may be enabled sooner after cold start. May flash TCIL.
P0715	Insufficient input from TSS sensor.	Set DTC, Flash TCIL and Flash MIL.
P0717	TSS sensor signal intermittent.	Set DTC, Flash TCIL.
P0718	TSS sensor signal noisy.	Set DTC.
P0720	Insufficient input from OSS sensor.	Set DTC, Flash TCIL and Flash MIL.
P0721	OSS sensor signal noisy.	Set DTC.
P0722	OSS sensor signal intermittent.	Set DTC, Flash TCIL.
P0731	1-2 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0732	2-3 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0733	3-4 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0741	The PCM picked up an excessive amount of TCC slippage during normal operation.	TCC slippage/erratic or no torque converter clutch operation. Flash TCIL.
P0743	TCC Solenoid circuit failure.	<i>Short Circuit:</i> Engine stalls in "D" or "2" at idle with brake applied. <i>Open Circuit:</i> TCC never engaged.
P0750	SSA circuit failure.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0755	SSB circuit failure.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.

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Figure 25



Technical Service Information

1999 FORD 4R100 <i>Diagnostic Trouble Code Chart</i>		
<i>Diagnostic Code</i>	<i>Description</i>	<i>Symptom</i>
P0781	1-2 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0782	2-3 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P0783	3-4 shift error because of SSA, SSB, or internal transmission components.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P1100 P1101	MAF sensor system fails to operate in a normal manner, which may cause a transmission concern.	High EPC pressure. Firm shifts and engagements. May flash TCIL.
P1111	System Pass.	No Codes Detected.
P1120	Throttle Position Sensor voltage lower than expected.	Harsh engagements, firm shift feel, abnormal shift schedule, abnormal TCC operation or does not engage.
P1124	Throttle Position Sensor out of On-Board Diagnostics range during KOEO test.	TP sensor (Gas Engines) not at idle position during KOEO test.
P1280	Injection Control Pressure (ICP) sensor circuit failure (Diesel Engine), or out of range low.	May result in firm shifts.
P1281	Injection Control Pressure (ICP) sensor circuit failure (Diesel Engine), or out of range high.	May result in firm shifts.
P1460 P1463 P1464	A/C switch error.	<i>Failed On:</i> EPC pressure slightly low with A/C off. <i>Failed Off:</i> EPC pressure slightly low with A/C on.
P1500	Insufficient or intermittent vehicle speed input from VSS/ABS.	Harsh engagements, firm shift feel, abnormal shift pattern, unexpected downshifts may occur at closed throttle, abnormal TCC operation or engages only at WOT. May flash TCIL.

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Figure 26



Technical Service Information

1999 FORD 4R100 <i>Diagnostic Trouble Code Chart</i>		
<i>Diagnostic Code</i>	<i>Description</i>	<i>Symptom</i>
P1702	Digital Transmission Range (DTR) sensor signal intermittent.	Erratic harsh shift engagements.
P1703	(BPP) Brake Pedal Position switch not actuated during KOER test.	Failed on or not connected, TCC will not engage at less than one-third throttle opening.
P1704	Digital Transmission Range (DTR) sensor misaligned or failed electronically.	Increase in EPC pressure.
P1705	Digital Transmission Range (DTR) sensor not run in park or neutral during On-Board Diagnostics KOEO or KOER tests.	Rerun On-Board Diagnostics.
P1711	Transmission not at operating temperature during On-Board Diagnostics.	Warm vehicle to normal operating temperature and rerun On-Board Diagnostics.
P1713	No change in TFT sensor - Low range.	May flash TCIL.
P1714	SSA mechanical failure detected.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P1715	SSB mechanical failure detected.	Improper gear selection depending on failure mode and transmission range selector position. Refer to shift solenoid operation chart.
P1718	No change in TFT sensor - High range.	May flash TCIL.
P1728	Excessive amount of transmission slippage has been detected.	Transmission slippage, erratic or no TCC operation. May flash TCIL.
P1729	4X4 Low switch circuit failure.	Early or delayed shift schedule.
P1740	TCC solenoid mechanical failure detected.	Harsh shift, may flash TCIL.
P1744	The PCM picked up an excessive amount of TCC slippage during normal operation.	TCC slippage/erratic or no torque converter clutch operation. Flash TCIL.
P1746	Failure of the EPC control pressure driver located inside the PCM.	Open circuit causes maximum EPC pressure, harsh engagements and shifts. May flash TCIL.
P1747	EPC shorted circuit failure, or PCM.	Shorted circuit causes minimum EPC pressure, limits engine torque with partial fuel shut off and heavy misfire. Flashing TCIL.
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Figure 27



Technical Service Information

1999 FORD 4R100 <i>Diagnostic Trouble Code Chart</i>		
<i>Diagnostic Code</i>	<i>Description</i>	<i>Symptom</i>
P1754	CCS circuit failure.	<i>Failed Off:</i> No third gear engine braking in O.D. cancel. <i>Failed On:</i> Third gear engine braking in O.D. range. Coast clutch may be damaged causing eventual failure.
P1760	EPC signal intermittent short.	Short circuit causes minimum EPC pressure.
P1780	TCS not cycled during the On-Board Diagnostics or the circuit is open or shorted.	No overdrive cancel when switch is cycled.
P1781	4X4 Low switch circuit failure.	Early or delayed shift schedule.
P1783	Transmission Fluid Temperature has exceeded 270°F.	Slight increase in EPC pressure. May flash TCIL.
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Figure 28