



*1995 SEMINAR INFORMATION*  
**"HOW TO SURVIVE IN 95"**

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# "HOW TO SURVIVE IN '95"

## INTRODUCTION

IN THE SECOND MANUAL OF THE "how to survive in '95" Seminar we continue the General Motors Portion of the Seminar. Concluding with the Up Dates and fixes to the 4L60E, 4L80E and the 4T60E transaxle. With the General Motors segment concluded the manual then details the Updates to the FORD E4OD with the Video Section on This Transmission and the AODE. We have included additional information and updates to both of these transmissions.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

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THM 4L60-E  
NEW LO/REVERSE PISTON

**NEVER RE-USE CASTING NUMBER 8681725!**

**ALWAYS REPLACE THE LOW/REVERSE PISTON  
WITH CASTING NUMBER 8685550!**

OEM PART NUMBER FOR THE NEW L/R  
PISTON IS 8685549

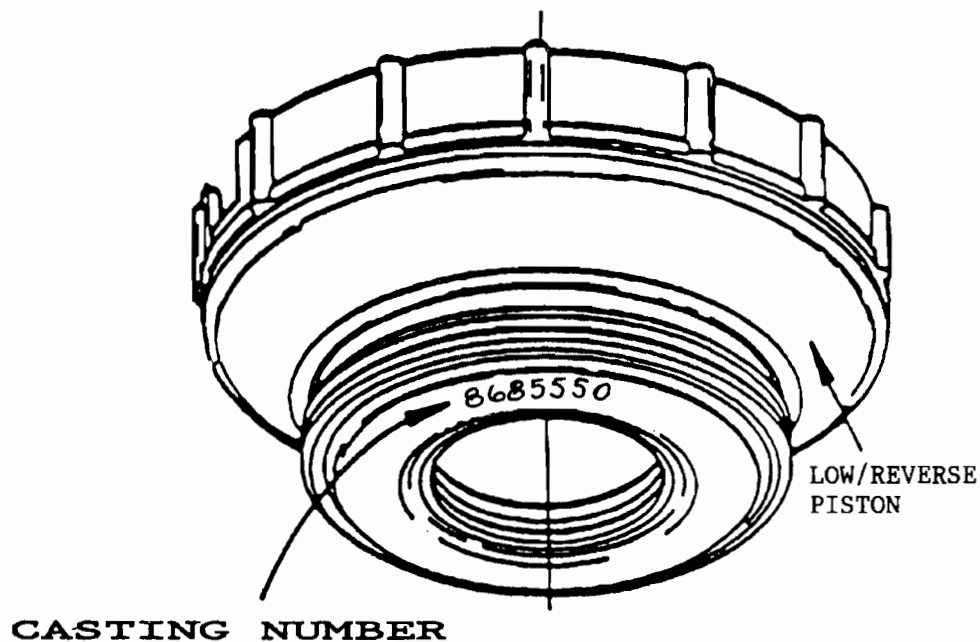


Figure 25

## THM 4L60-E PREMATURE LOW/REVERSE CLUTCH FAILURE

**COMPLAINT:** Premature and/or repeat failure of the Low/Reverse clutch pack, and may happen in as little as 5000 miles.

**CAUSE:** The cause may be, the Low/Reverse clutch not totally exhausting the apply oil when the shift lever is moved from Park to Drive position. The Low/Reverse clutch is applied in Park on this transmission.

**CORRECTION:** STEP 1: Drill a .030" hole through the Low/Reverse piston in the area shown in Figure 26. This will provide an immediate exhaust for reverse oil when the selector is placed in Drive.

STEP 2: Remove the BALL ONLY from the capsule in the reverse passage at the rear of case worm track area, as shown in Figure 27. Leave the capsule in the case. This will allow larger volume of oil to the piston to overcome the leak we have created with the hole. We have now created a feed-bleed system.

STEP 3: IF YOU HAVE A "T" TRUCK, which is the small "S" type truck with 4 wheel drive, REMOVE AND DISCARD THE BRACE FROM TRANSMISSION TO TRANSFER CASE, as shown in figure 28

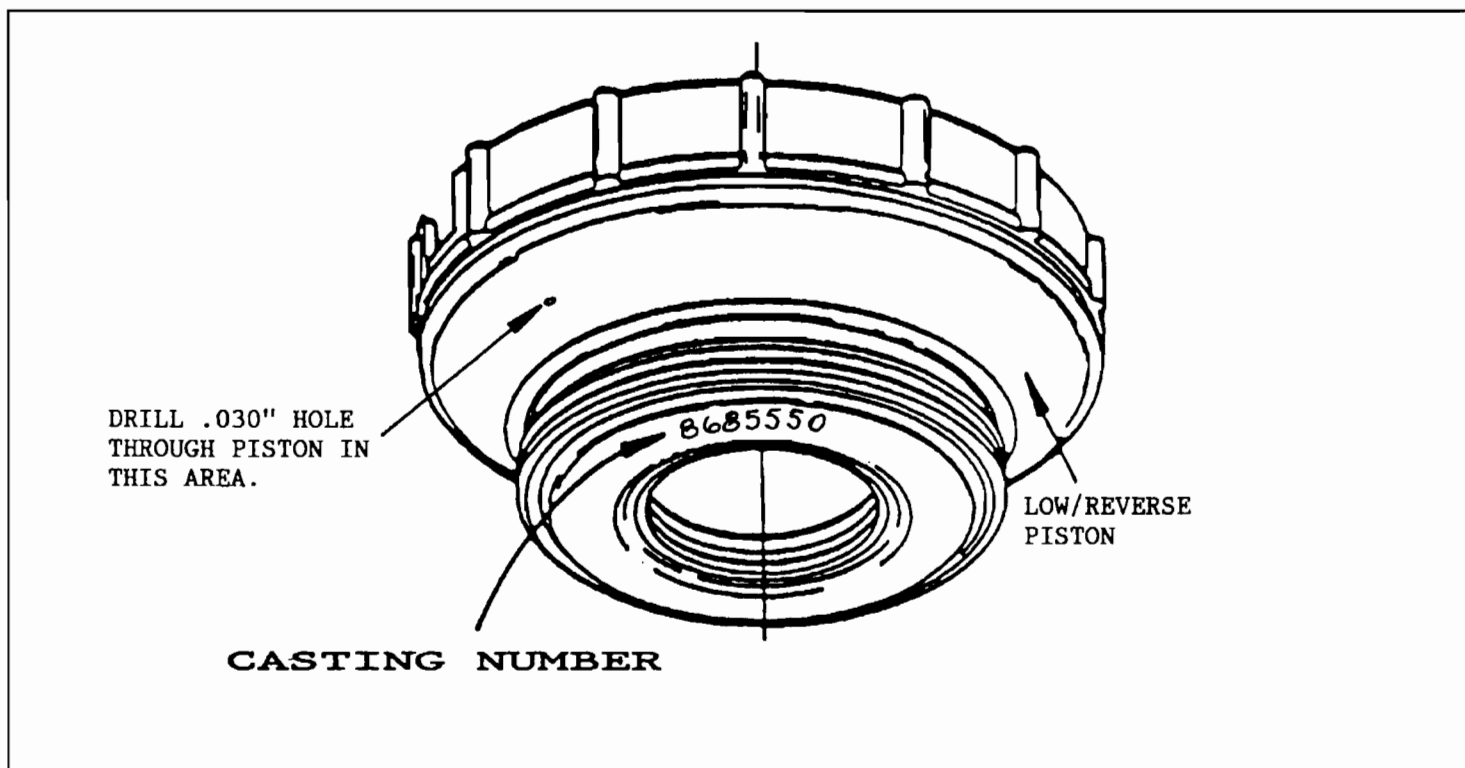
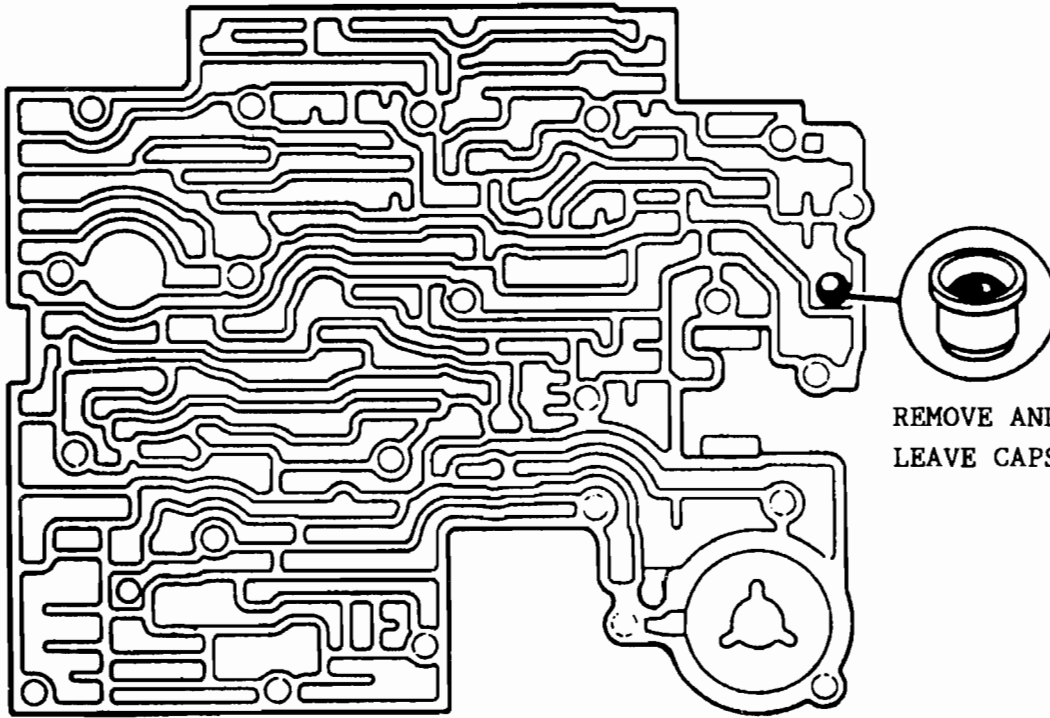
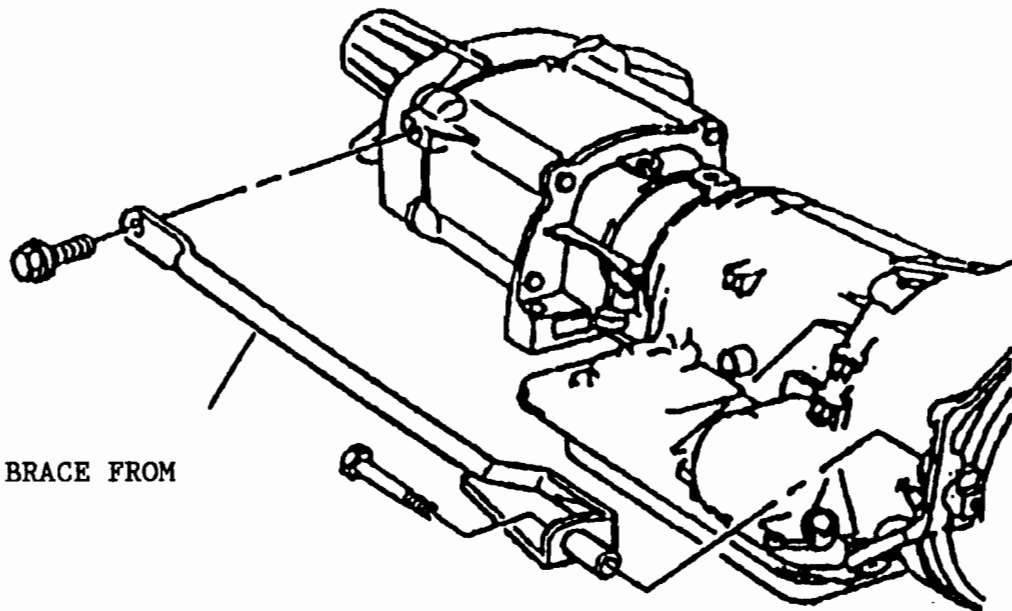


Figure 26



REMOVE AND DISCARD BALL ONLY.  
LEAVE CAPSULE IN THE CASE.

Figure 27



REMOVE AND DISCARD THIS BRACE FROM  
ALL 4WD "T" TRUCKS.

Figure 28

THM 4L60-E  
PREMATURE 3 - 4 CLUTCH FAILURE

**COMPLAINT:** Premature failure of the 3-4 clutch pack and may happen in as little 5000 miles. The vehicle may also exhibit a very soft 2-3 shift.

**CAUSE:** The cause may be, not enough clamping force for the 3-4 clutch pack due to the 3-4 load release spring assemblies.

**CORRECTION:** **STEP 1:** Remove and discard the five 3-4 load release spring assemblies in the input housing and located between the steel plates and the input housing, as shown in Figure 29.

**STEP 2:** Ensure that the hole in the spacer plate marked "A" is present, and at least .093" in diameter. If not, drill one in the spacer plate in that location .093" in diameter. (See Figure 30).

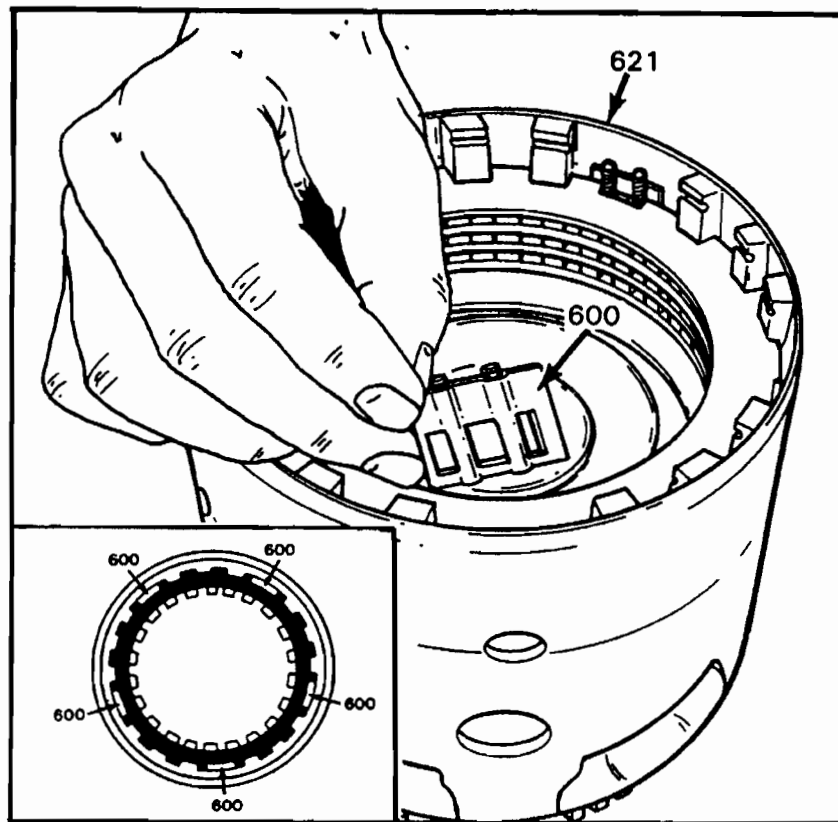
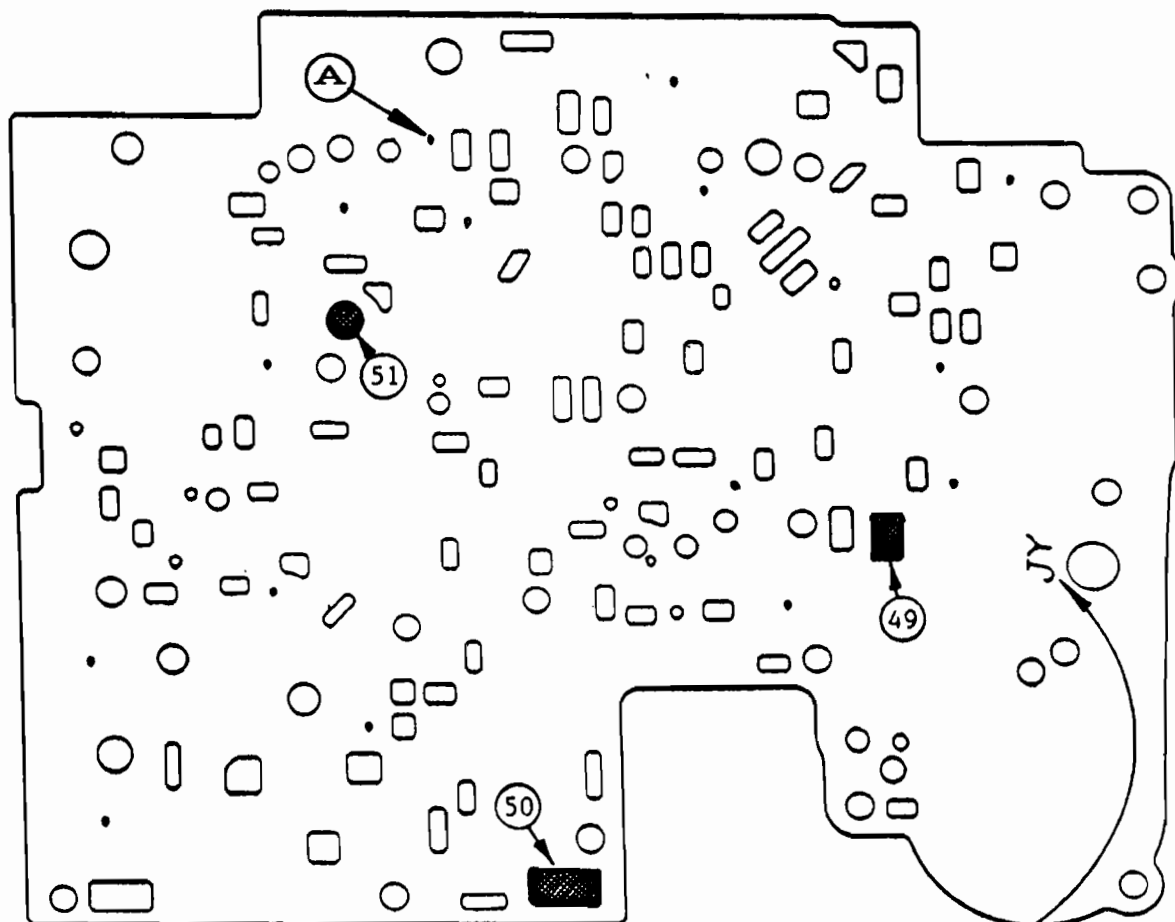


Figure 29

4L60-E SPACER PLATE CHART  
AND SPACER PLATE SCREEN LOCATION



IDENTIFICATION CODE

- 49 SPACER PLATE SCREEN SNAPS INTO PLATE FROM CASE SIDE. PART NO. 8683769  
50 SPACER PLATE SCREEN SNAPS INTO PLATE FROM CASE SIDE. PART NO. 8683768  
51 SPACER PLATE SCREEN SNAPS INTO PLATE FROM VALVE BODY SIDE (NOT USED ON ALL MODELS)

PART NO.	8684122	8684123	8684124	8684125	8684126
I.D. CODE	JV	JW	JX	JY	JZ
FITS THESE MODELS	MJD MND MSD TAD TBD MDD	SHD TLD CAD CBD KAD TWD	CCD CFD KBD	CHD KCD CJD	CKD CLD KDD
1993 MODEL SPACER PLATE CHART					

Figure 30



## THM 4L60 AND 4L60-E PREMATURE FAILURE OF THE INPUT SPRAG

- COMPLAINT:** Complaints will vary depending on the failure mode of the input sprag. If the sprag failure results in "Not Holding", the complaint will be;  
"No Movement in the D4 Range!"  
If the sprag failure results "Not Freewheeling" the complaint will be;  
"Tie-up When Shifting Into 4th Gear"!
- CAUSE:** The cause may be the type of input sprag being used. The manufacturer is currently using an input sprag manufactured by SKF.
- CORRECTION:** Install an input sprag manufactured by BORG-WARNER. The sprags are easy to identify, as the SKF sprag Does Not use an inner cage and the BORG-WARNER sprag Does use an inner cage, as shown in Figure 31.

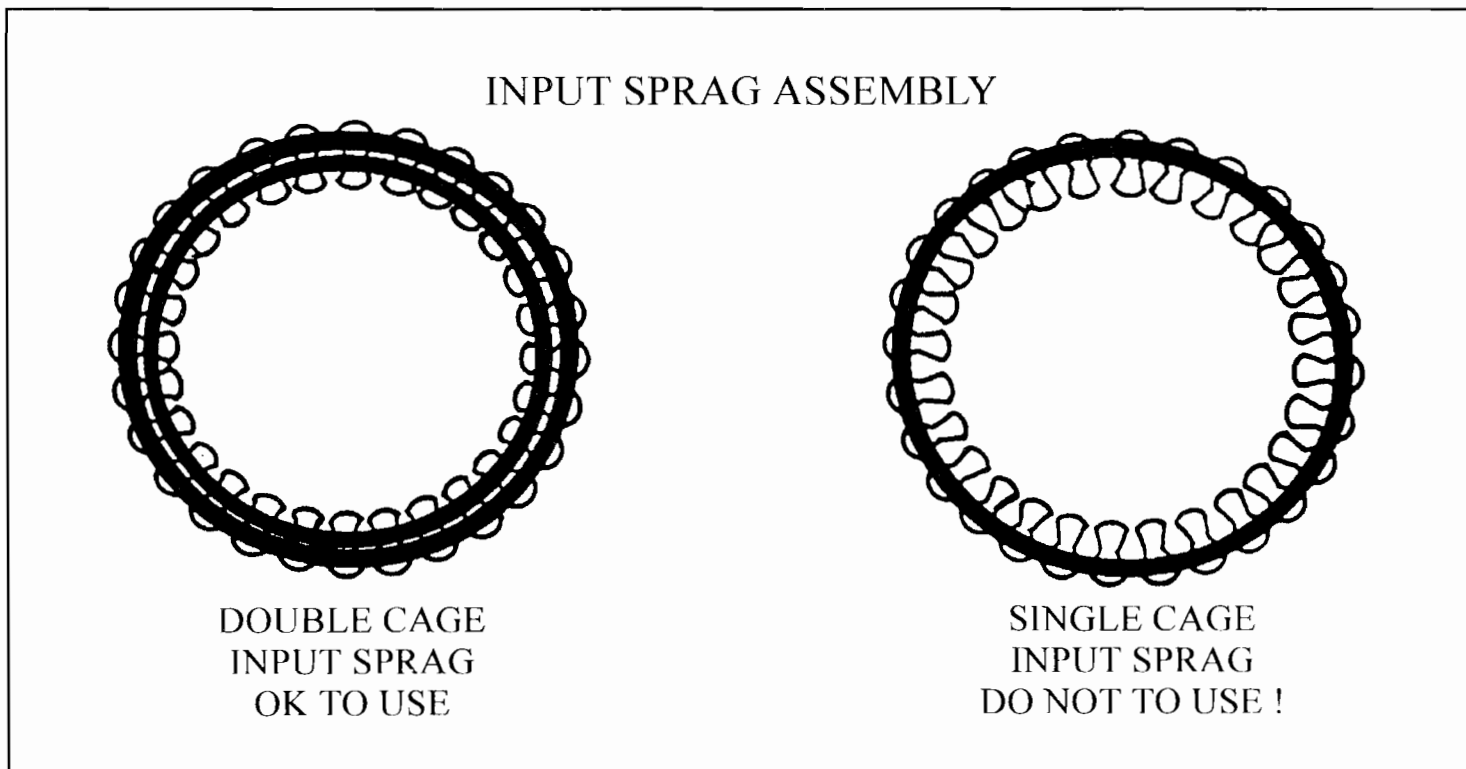


Figure 31



## THM 4L60-E ACCUMULATOR ASSEMBLY CHANGE

**CHANGE:** Beginning at the start of production 1994, all THM 4L60-E transmissions were built with the 1-2 accumulator piston and spring reversed, and an inner spring added to the 1-2 accumulator (See Figure 32). Also some models no longer use a 3-4 accumulator spring.

**REASON:** New calibrations for shift pleaseability concerns.

**PARTS AFFECTED:**

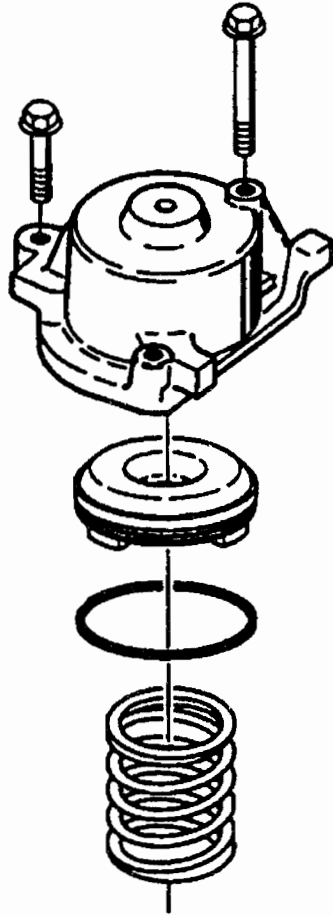
- (1) 1-2 ACCUMULATOR ASSEMBLY - Now uses 2 springs on all models, and the piston and spring assemblies now go into the housing just the opposite of the 1993 models. Refer to Figure 33 for the assembly procedure and spring color code chart for 1994 models. Refer to Figure 34 for assembly procedure and spring color code chart for 1993 models.
- (2) 3-4 ACCUMULATOR ASSEMBLY - For 1994, SOME MODELS do not use the 3-4 accumulator spring. Refer to Figure 33 for proper 3-4 accumulator spring and the usage.

**INTERCHANGEABILITY:**

The parts listed above are not interchangeable with any previous models. Refer to Figures 33 and 34 for proper assembly procedure and spring color code charts for the model you are building.

## 1- 2 ACCUMULATOR ASSEMBLY

1993 MODELS



1994 MODELS

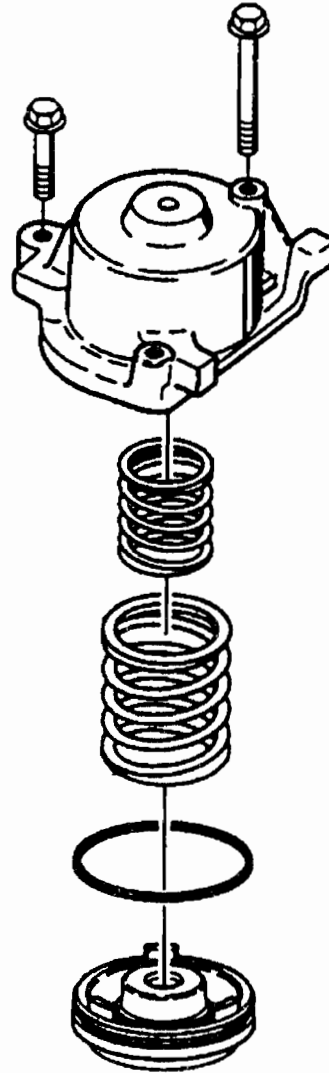
SEE FIGURES 33 AND 34 FOR  
ACCUMULATOR SPRING IDENTIFICATION

Figure 32

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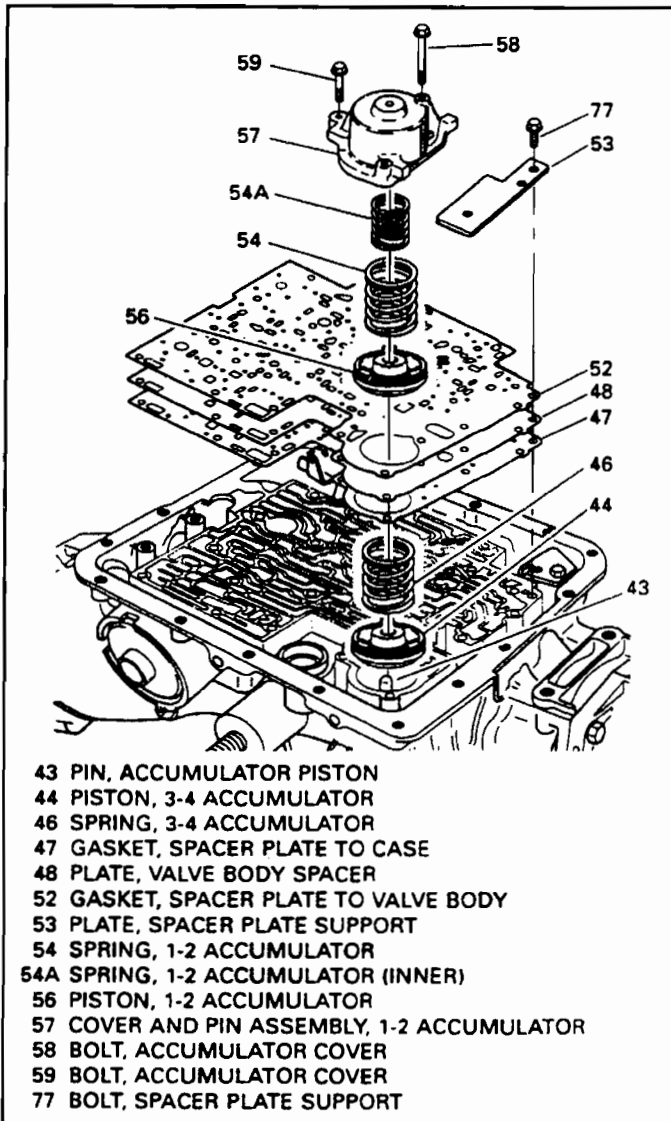


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THM 4L60-E ACCUMULATOR ASSEMBLY  
AND ACCUMULATOR SPRING IDENTIFICATION  
1994 MODELS ONLY



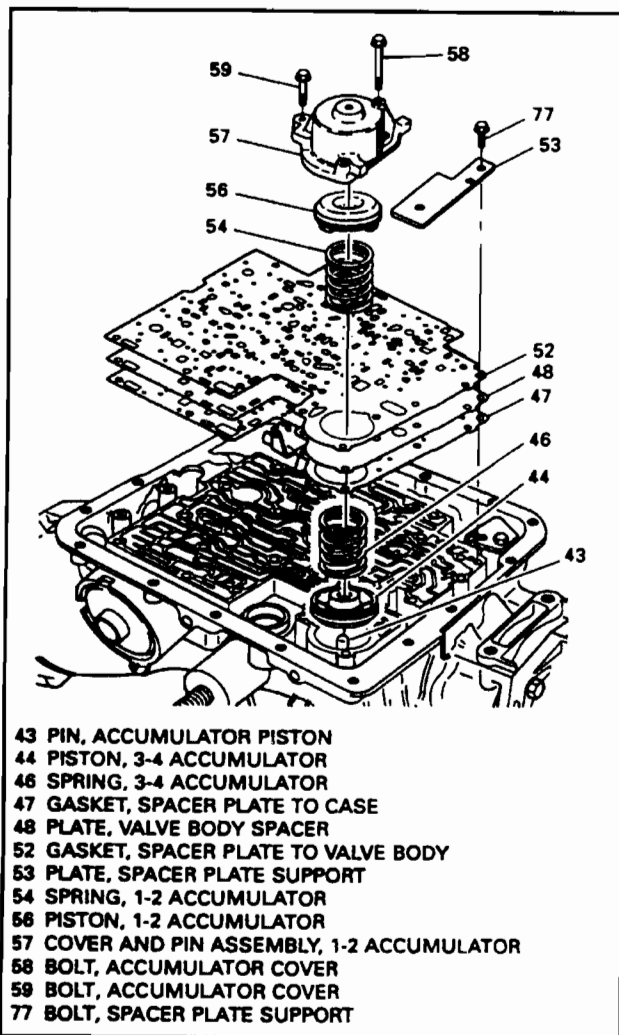
1-2 ACCUMULATOR SPRING COLOR		
1994 MODELS	INNER	OUTER
CA, CB, CH, CJ, CP, FD, KA, KC, MD, MJ, MN, MS, SF, SH, TA, TB, TL, TW	NO PAINT	YELLOW
CC, CF, CM, CU, KB, KP	PINK	YELLOW
HD, SA	NO PAINT	VIOLET
HB	WHITE	VIOLET
BB, BC	ORANGE	VIOLET
AH, BF, BW	ORANGE	YELLOW
FF, YD	WHITE	DK GREEN

3-4 ACCUMULATOR SPRING COLOR	
1994 MODELS	COLOR
CA, CB, FD, FF, HB, HD, KA, MD, MJ, MM, MS, SF, SH, TA, TB, TL, TW, YD	LT BLUE
CM, CU, KP	RED
BB, BC	DK GREEN
AH, BF, BW	VIOLET
CC, CF, CH, CJ, CP, KB, KC, SA	NOT USED

Figure 33

THM 4L60-E ACCUMULATOR ASSEMBLY  
AND ACCUMULATOR SPRING IDENTIFICATION  
1993 MODELS ONLY



1993 MODELS	1-2 ACCUMULATOR SPRING COLOR	3-4 ACCUMULATOR SPRING COLOR
CHD, CJD, KCD	ORANGE, LT. GREEN, WHITE OR PLAIN	VIOLET
CAD, CBD, KAD, MJD, MND	ORANGE, LT. GREEN, WHITE OR PLAIN	DK. GREEN
CCD, CFD, KBD	ORANGE, LT. GREEN, WHITE OR PLAIN	RED
SHD, TLD	DK. GREEN	LT. BLUE
CKD, CLD, KDD, MDD, MSD, TAD, TBD	ORANGE, LT. GREEN, WHITE OR PLAIN	YELLOW

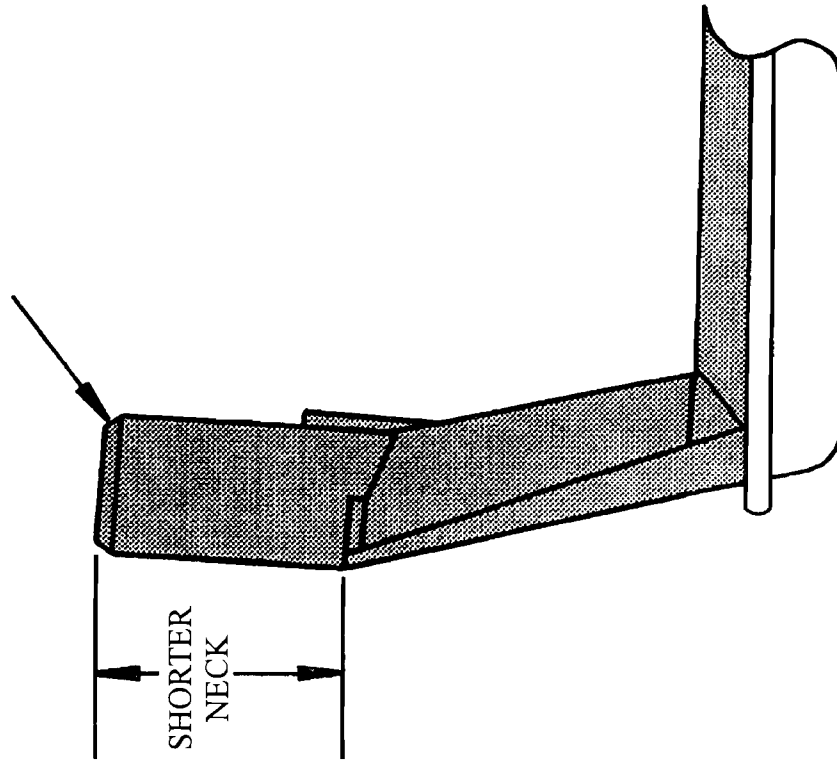
Figure 34



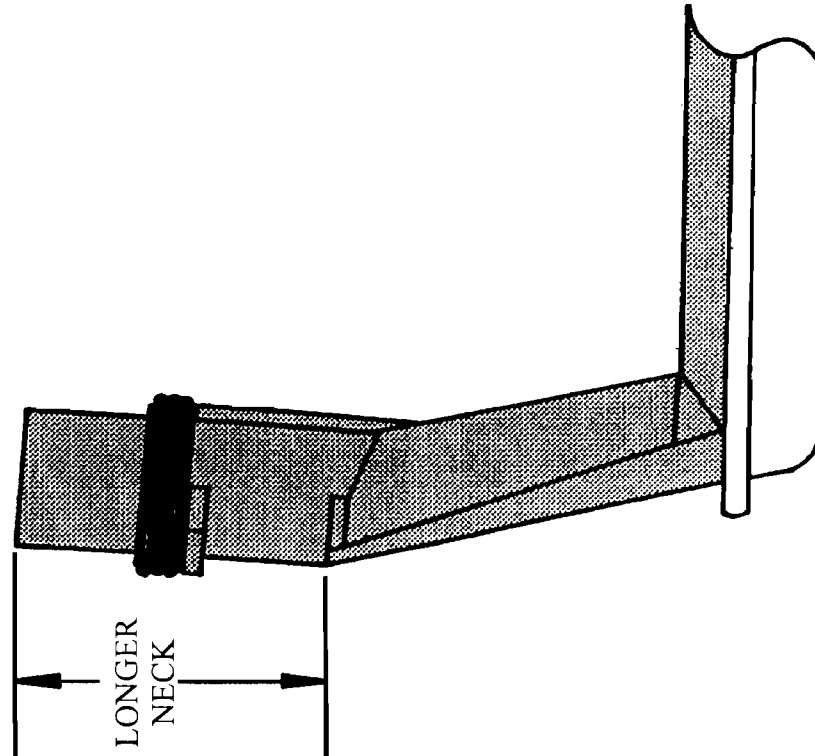
THM 4L60-E  
NEW FILTER SEAL AND  
REQUIRED NEW DESIGN FILTER

- CHANGE: At the start of production for all 1994 model THM 4L60-E transmissions, there has been a new design filter seal introduced that Requires a new design filter for the bottom pan.
- REASON: Greatly reduces pump cavitation, and filter "Swimming" concerns.
- PARTS AFFECTED:
- (1) FILTER SEAL - New design filter seal is a metal clad lip type seal that grips the filter neck much tighter than the previous design filter seal. (See Figure 34A). The new design filter seal presses into the oil pump cover filter bore.
  - (2) BOTTOM PAN FILTER - The new design filter neck is approximately .360" SHORTER than the previous design filter neck, and the filter stops on neck are in different locations to accommodate the new design filter seal (See Figure 34A). Filter neck is also chamfered to prevent damage to the seal during installation.
- INTERCHANGEABILITY:
- (1) The previous design filter CANNOT be used with the new design filter seal, because the length of the filter neck will-not allow enough pan clearance and you WILL break the filter neck as you tighten down the bottom pan.
  - (2) The new design filter and new design filter seal WILL back service all previous model THM 4L60-E transmissions, when used as a package. The only way that you can currently purchase the seal is in the service package listed below.
  - (3) The new design filter seal CANNOT be used on any THM 4L60 (700-R4) transmissions because the filter bore in the pump covers are different dimensions.
- SERVICE INFORMATION:
- |  |          |
|--|----------|
| Bottom Pan Filter (New Design) .....         | 8685774  |
| Filter Service Package (Includes Seal) ..... | 24200796 |

NEW DESIGN FILTER SEAL  
IS PRESSED INTO PUMP



NEW DESIGN



PREVIOUS DESIGN

Figure 34A



**COMPLAINT:** Repeated and/or premature burning of the 2-4 band assembly, with nothing else in the transmission showing any signs of burning.

**CAUSE:** The cause may be, a weak or collapsed 4th apply piston return spring, located on the servo apply pin, that will not allow the band to fully release on a 4-3 downshift. Compress the spring on the bench, while it is still installed on the servo pin, and hold compressed for about 30 seconds. Release the compression and check for servo pin movement, back and forth, in the piston assembly. If there is servo pin end play, the spring needs to be replaced.

**CORRECTION:** Remove and discard the OEM spring from the servo apply pin. Replace the 4th apply piston return spring with part number K004, available through Shift Technology Products. Reinstall washer and "E" clip, as shown in Figure 35.

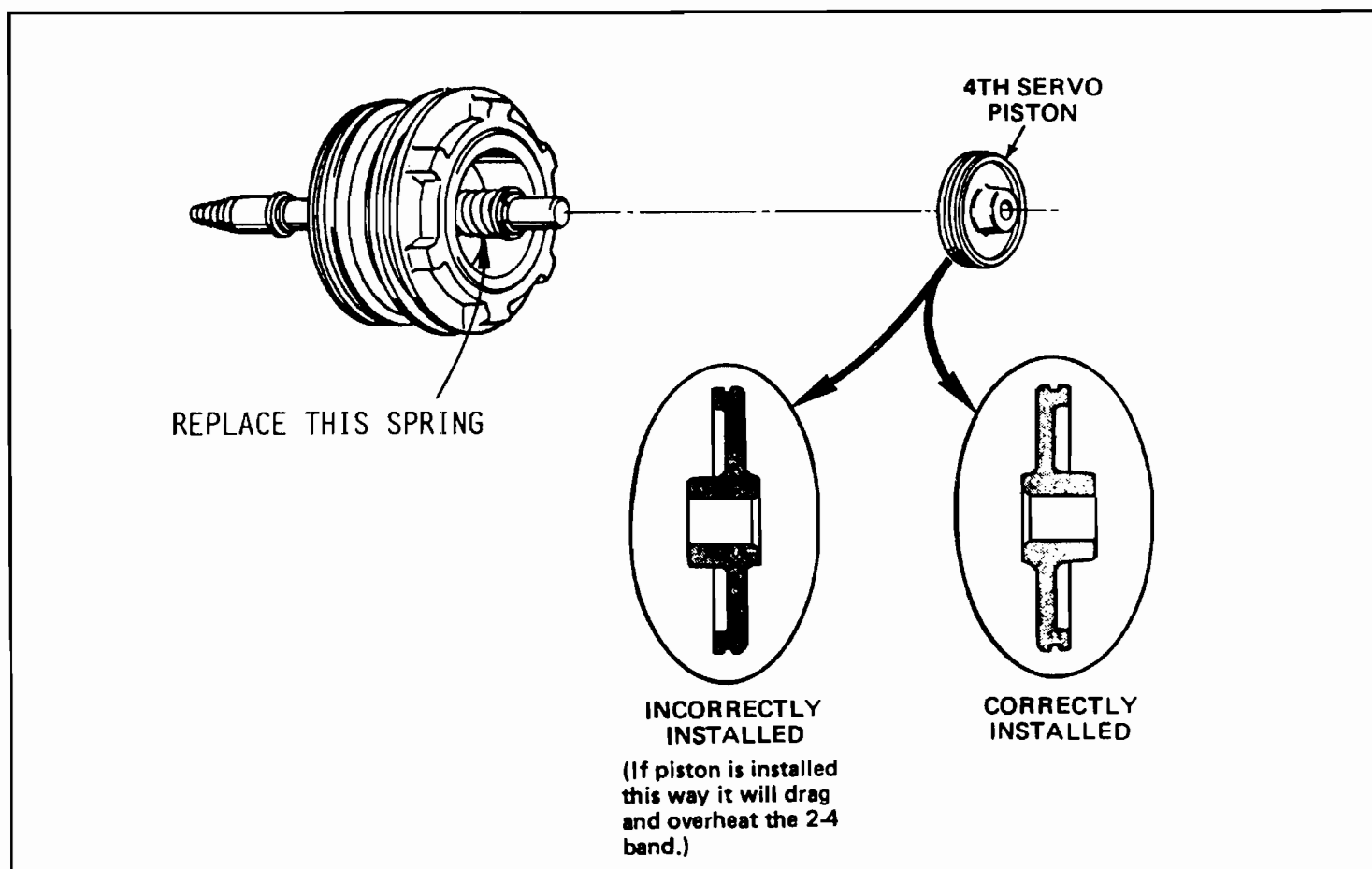


Figure 35

1995 SEMINAR INFORMATION  
SLIDE  
THM 4L80-E/4L80-EHD  
NEW SHIFT SOLENOID ASSEMBLIES

**COMPLAINT:** Beginning on November 11, 1993 (Julian Date 315) all THM 4L80-E/4L80-EHD transmissions were built with revised shift solenoid assemblies.

**REASON:** Revised internal seal material for increased durability.

**PARTS AFFECTED:**

- (1) SHIFT SOLENOID "A" - Revised internal seal material, and is now PURPLE in color, instead of the previous Gray (See Figure 36).
- (2) SHIFT SOLENOID "B" - Revised internal seal material, and is now TAN in color, instead of the previous Green (See Figure 36).

**INTERCHANGEABILITY:** The new Shift Solenoids will retro-fit back on ALL previous models of the THM 4L80-E/4L80-EHD transmissions.

**SERVICE INFORMATION:**

Shift Solenoid "A" (PURPLE) .....	24201004
Shift Solenoid "B" (TAN) .....	24201005

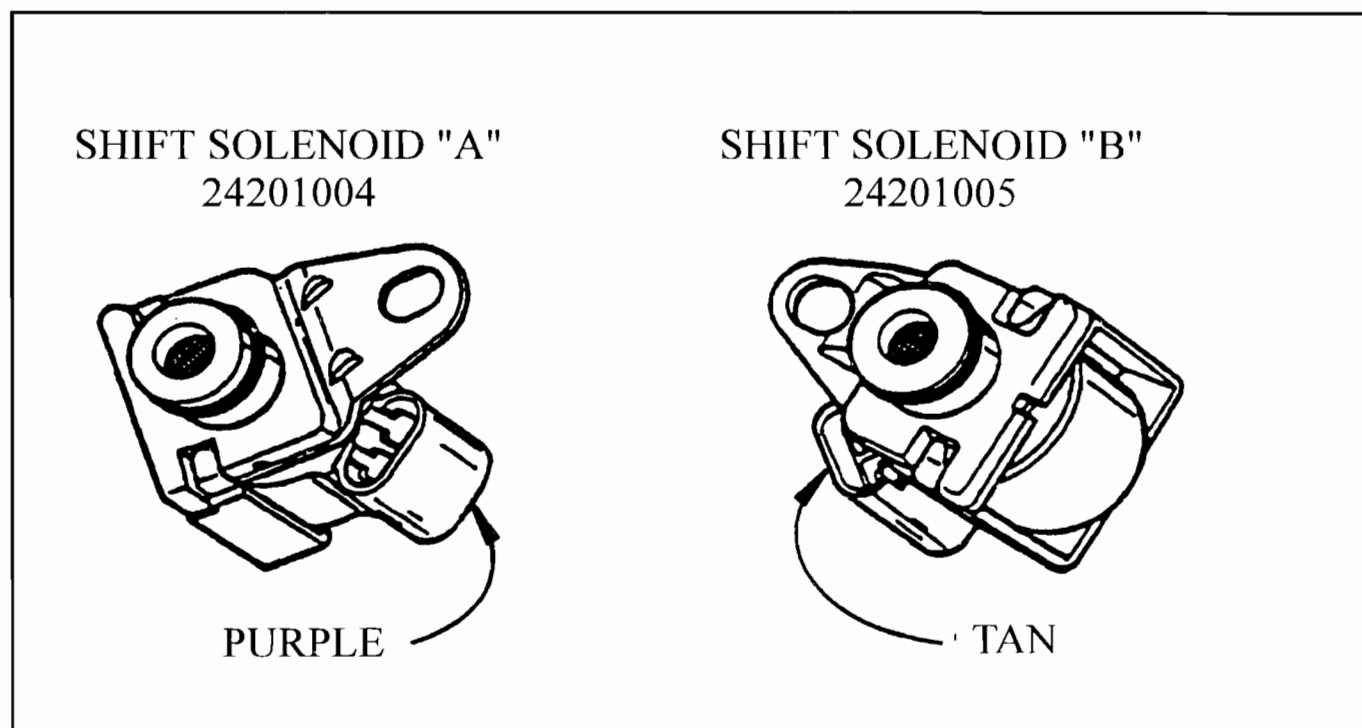


Figure 36

THM 4L80-E/4L80-EHD  
NO 3RD GEAR, MANUAL OR AUTOMATIC  
TRANSMISSION SHIFTS 1 - 2 - 4

**COMPLAINT:** After rebuild, the transmission has no 3rd gear manual or automatic, and will upshift 1-2-4. The vehicle will still have reverse.

**CAUSE:** The cause may be, the roll pin that retains the 3rd/Reverse checkball bushing and bore plug in the valve body, has been mislocated through the hole in the bore plug, as shown in Figure 37.

**CORRECTION:** Position the roll pin in front of the bore plug, as shown Figure 37. The roll pin will be visible when looking at the end of the bore, after the valve train has been installed, if you have assembled it correctly (See Figure 37).

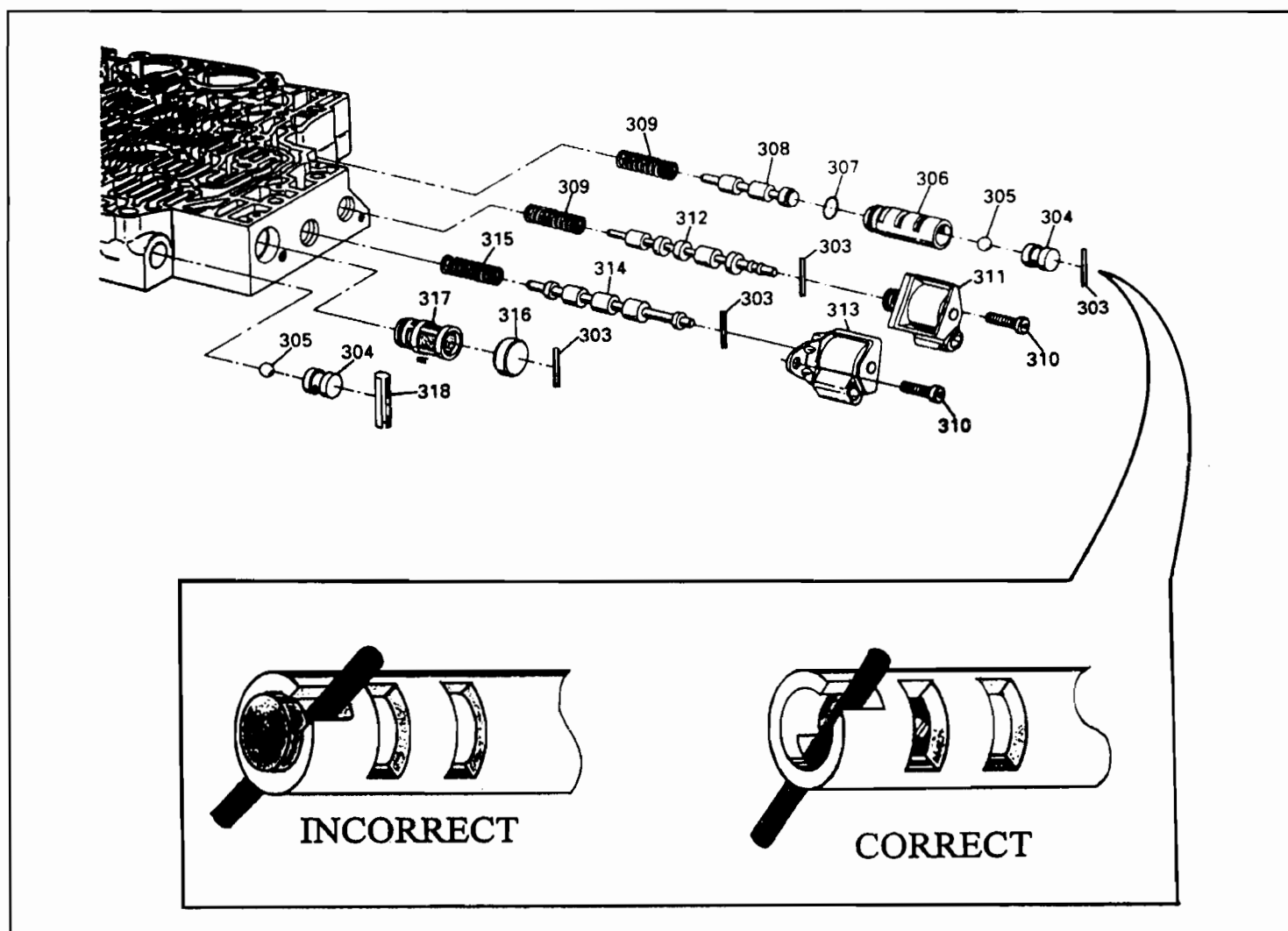


Figure 37



THM 4L80-E

NEW FORCE MOTOR FOR 1994

NEW ELECTRONICS FOR 1994

CHANGE:

Beginning at the start of production 1994, ALL THM 4L80-E transmissions were built with a new Force Motor, new Spacer Plate, and elimination of the torque signal compensator valve in the accumulator housing. The new force motor operates at the 614 Hz (Cycles per Second) instead of the previous 292.5 Hz, which obviously requires a new PCM. With the new design force motor, the need for the cleaning cycle is eliminated, so the force motor is no longer pulsed every 10 seconds by the PCM/TCM.

REASON:

Improved line pressure stability, and standardization, as the same part number will now fit 4L80-E, 4L60-E, and 4T80-E.

PARTS AFFECTED:

- (1) FORCE MOTOR - New design that does not require torque signal oil be sent back to the end of the enclosed spool valve, so the feed passage and the screen in the end of it were eliminated, as shown in Figure 38. The armature housing is also smaller in diameter than the previous force motor, and is now Black in color (See Figure 38).
- (2) SPACER PLATE - The orificed feed hole for torque signal oil in the spacer plate, marked "A" in Figure 39, has been eliminated to accommodate the new design force motor (See Figure 39).
- (3) TORQUE SIGNAL COMPENSATOR VALVE - Eliminated because it is no longer needed to absorb torque signal pulses created by the previous model PCM. The torque signal feed passage is no longer drilled in the accumulator housing on 1994 models (See Figures 40 and 41)

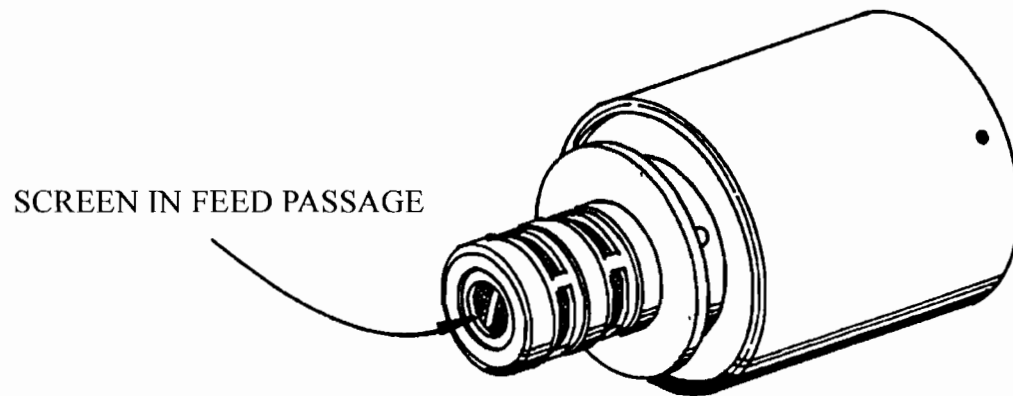
INTERCHANGEABILITY:

NONE OF THE PARTS LISTED ABOVE WILL INTERCHANGE WITH PREVIOUS MODELS.

SERVICE INFORMATION:

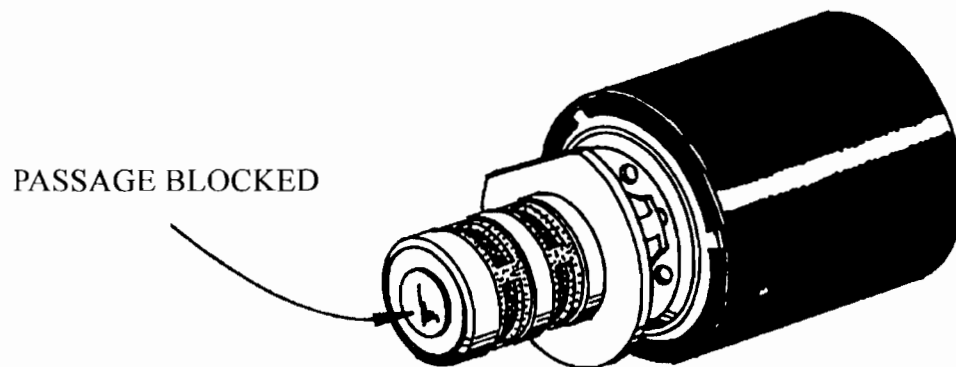
Force Motor, 91-93 Models .....8677314  
Force Motor, 94-Up Models .....8684216

FORCE MOTOR (PRESSURE CONTROL SOLENOID)  
1991 - 1993 MODELS ONLY!



OEM PART NUMBER 8677314  
(OPERATES AT 292.5 Hz LEVEL)

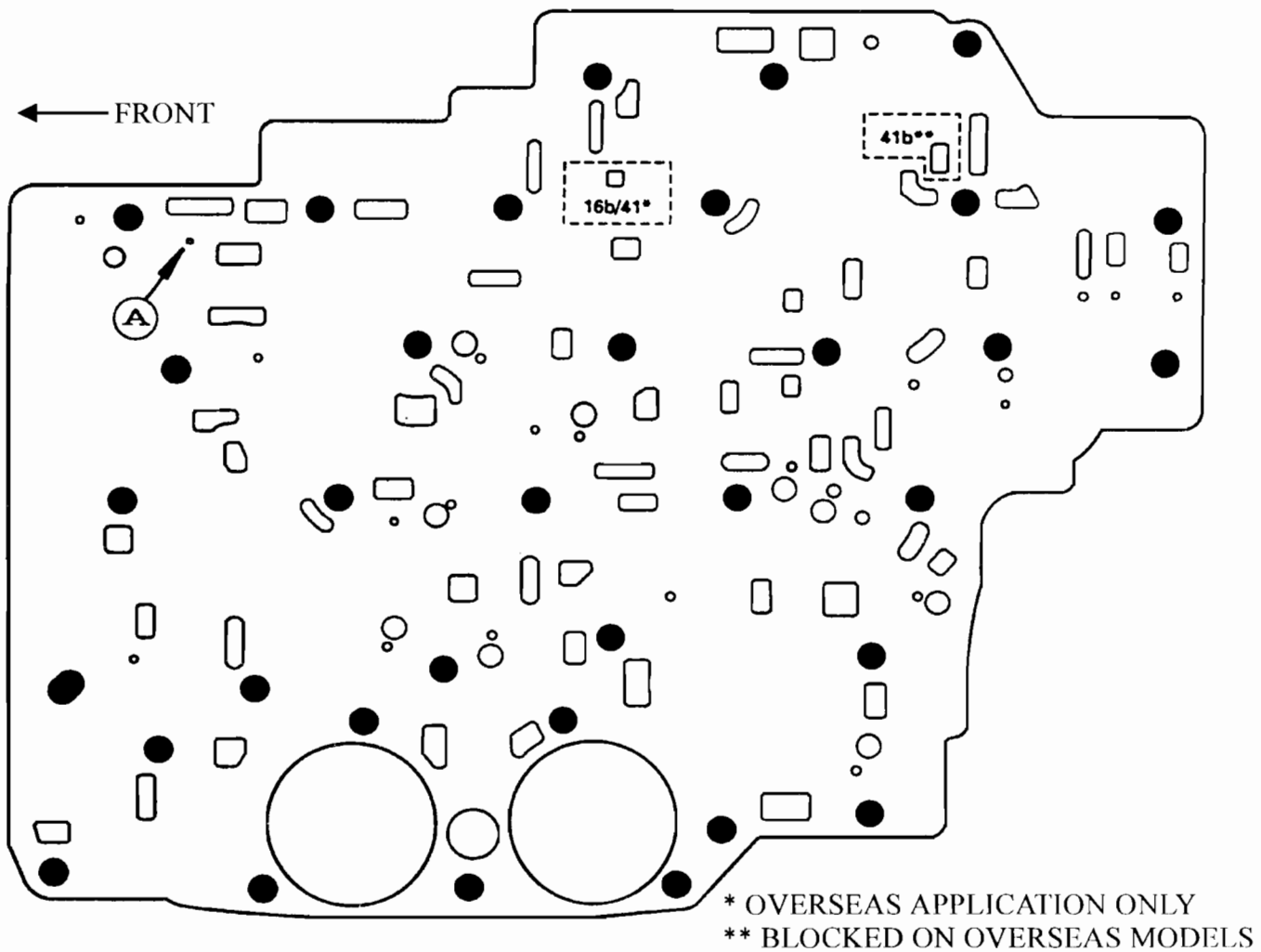
FORCE MOTOR (PRESSURE CONTROL SOLENOID)  
1994-UP MODELS ONLY!



OEM PART NUMBER 8684216  
(OPERATES AT 614 Hz LEVEL)

Figure 38

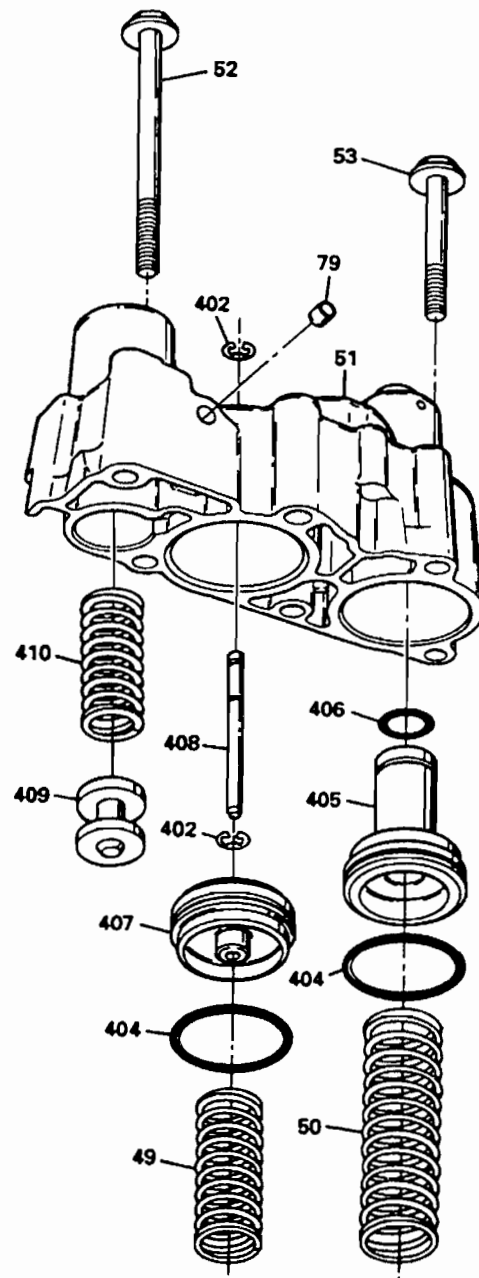
THM 4L80-E SPACER PLATE



HOLE "A" ELIMINATED IN THE 1994 MODEL SPACER PLATE.

Figure 39

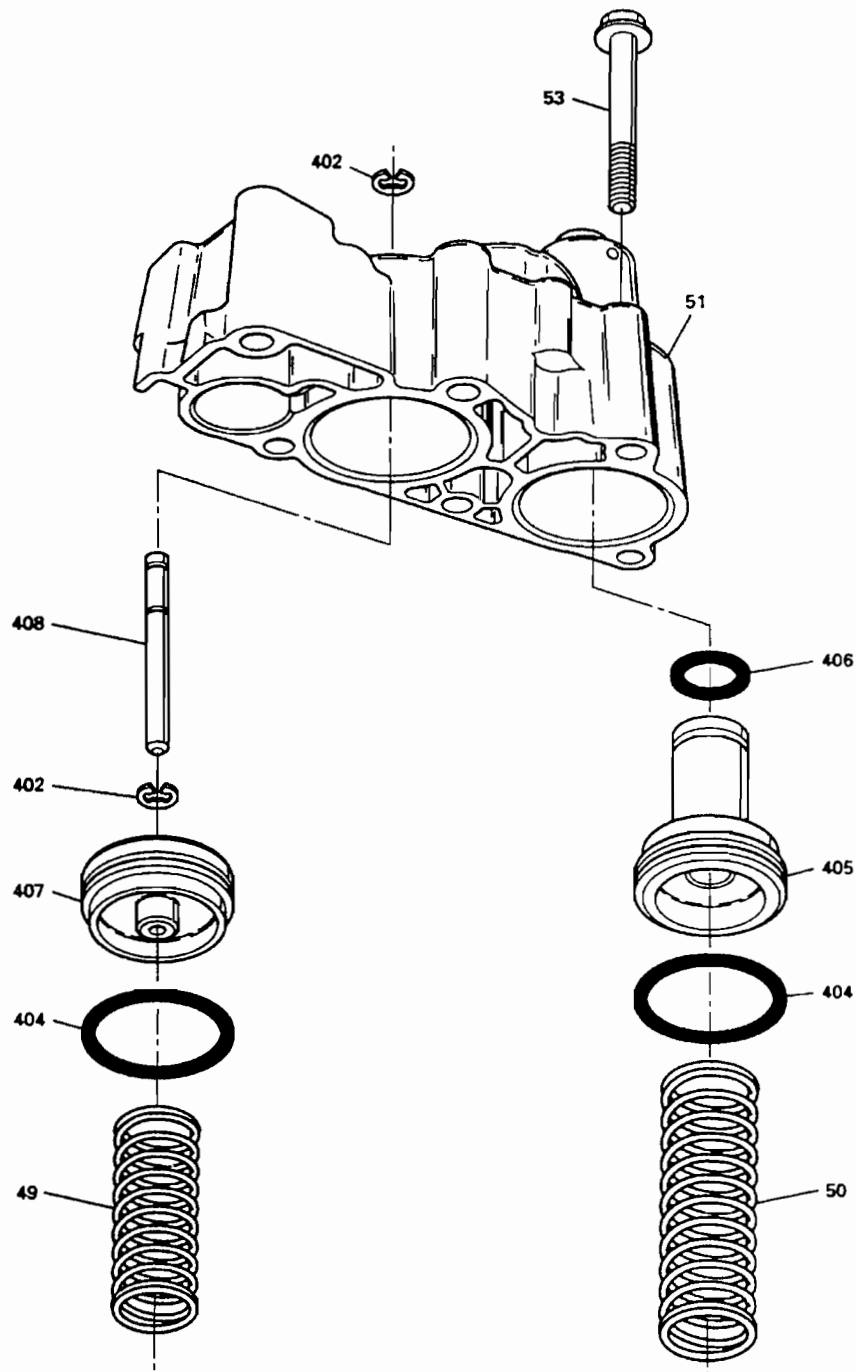
1991 - 1993 ACCUMULATOR HOUSING



- 49 SPRING, 4TH CLUTCH ACCUM. PISTON
- 50 SPRING, 3RD CLUTCH ACCUM. PISTON
- 51 HOUSING, ACCUMULATOR
- 52 BOLT, ACCUM. HOUSING TO VALVE BODY (LONG)
- 53 BOLT, ACCUM. HOUSING TO VALVE BODY (SHORT)
- 79 PLUG, DIRECT OIL GAL (.25 DIA. CUP)
- 402 RING, SNAP
- 404 SEAL, (1.615) SQUARE CUT
- 405 PISTON, 3RD CLUTCH ACCUMULATOR
- 406 SEAL, (.859) SQUARE CUT
- 407 PISTON, 4TH CLUTCH ACCUMULATOR
- 408 PIN, 4TH CLUTCH ACCUMULATOR PISTON
- 409 VALVE, TORQUE SIGNAL COMPENSATOR
- 410 SPRING, T.S. COMPENSATOR

Figure 40

1994-UP MODELS  
ACCUMULATOR HOUSING



- 49 SPRING, 4TH CLUTCH ACCUM. PISTON
- 50 SPRING, 3RD CLUTCH ACCUM. PISTON
- 51 HOUSING, ACCUMULATOR
- 53 BOLT, ACCUM. HOUSING TO VALVE BODY
- 402 RING, SNAP

- 404 SEAL, (1.615) SQUARE CUT
- 405 PISTON, 3RD CLUTCH ACCUMULATOR
- 406 SEAL, (.859) SQUARE CUT
- 407 PISTON, 4TH CLUTCH ACCUMULATOR
- 408 PIN, 4TH CLUTCH ACCUMULATOR PISTON

Figure 41

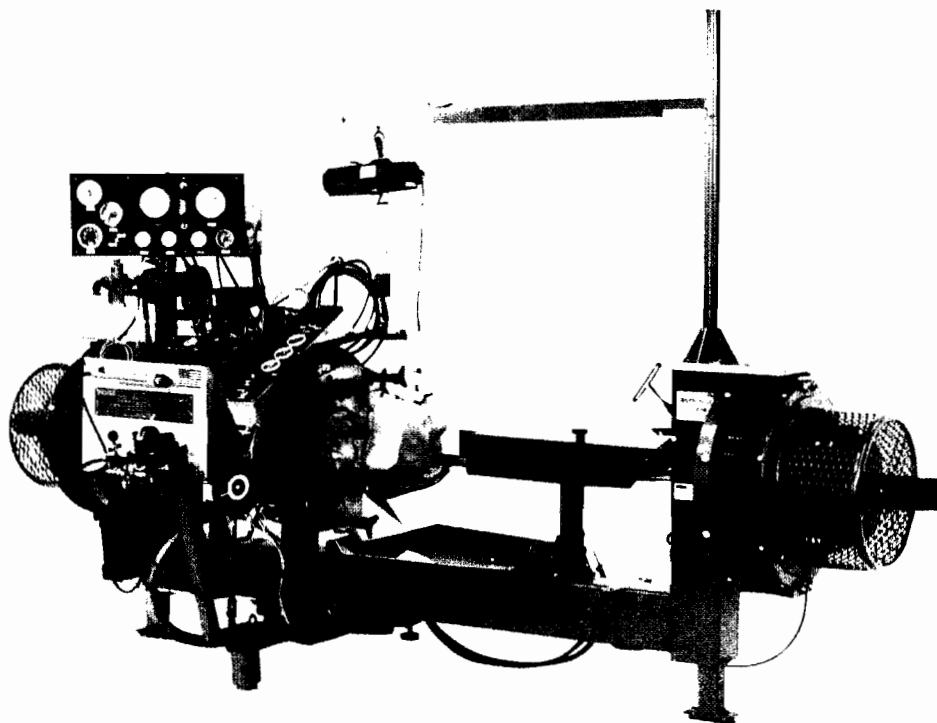


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## THM 4L80-E NO LINE PRESSURE RISE

**COMPLAINT:** No line pressure rise when the throttle is opened. Line pressure remains at approximately 45 psi. and will produce soft mushy shifts. When the case connector is removed and/or the force motor voltage is removed, line pressure remains at minimum.

**CAUSE:** The cause may be that the cup plug has blown out of the torque signal passage in the accumulator body. See Figure 42 for the location of the cup plug.

**CORRECTION:** Replace the cup plug and stake it in place to prevent it from coming out again.

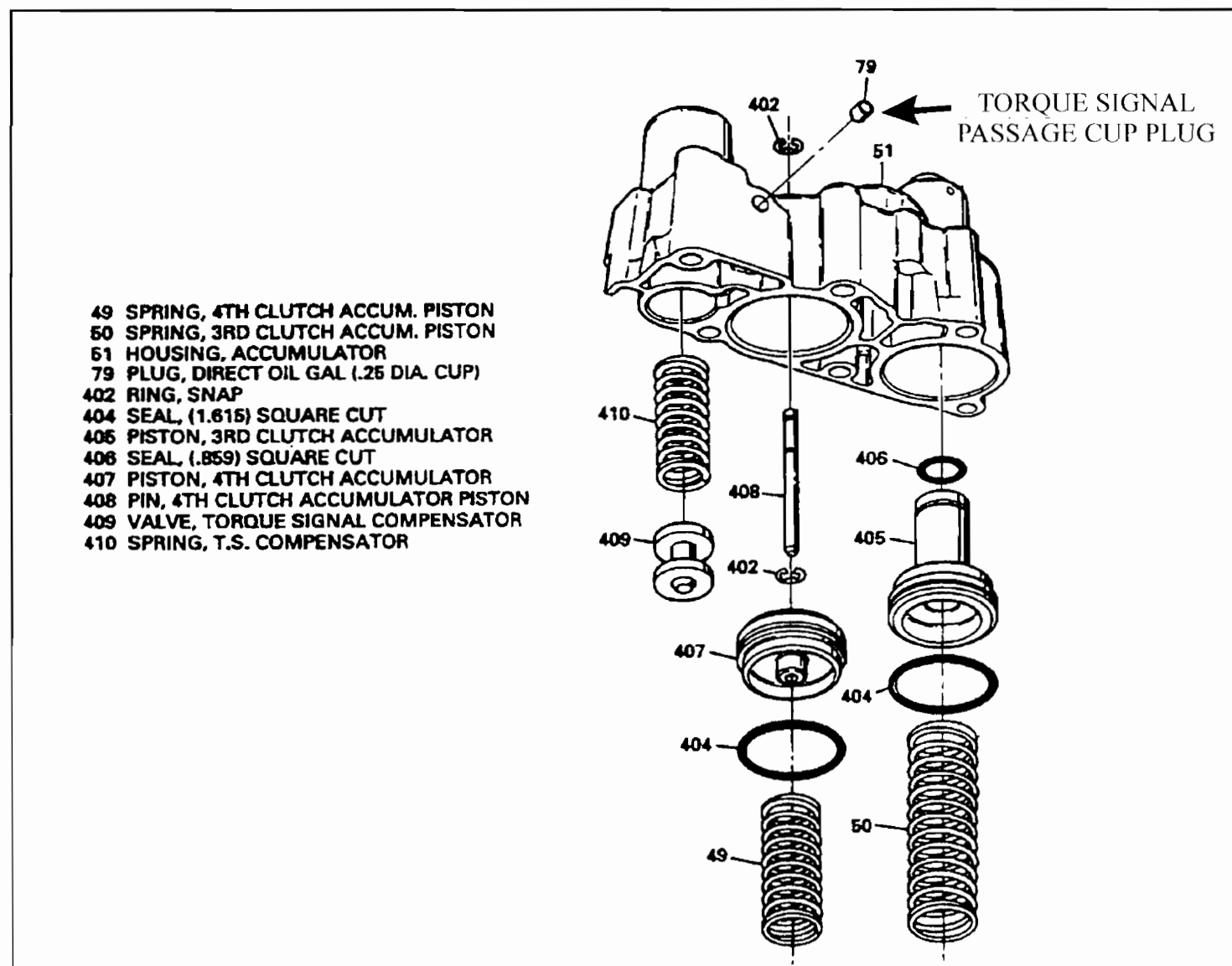


Figure 42



THM 4L80-E / 4L80-EHD  
NEW DESIGN CASE CONNECTOR FOR 1993

CHANGE: Beginning on May 25, 1993 (Julian Date 145) a new case connector and wiring harness assembly went into production on all THM 4L80-E/4L80-EHD transmissions (See Figure 44).

REASON: Greatly decreased the possibility of bending the case connector terminals and ease of assembly.

PARTS AFFECTED:

- (1) CASE CONNECTOR AND INTERNAL WIRING HARNESS - Now has a much more durable case connector and REVISED pin locations.  
Refer to Figure 43 for previous transmission case connector.  
Refer to Figure 44 for new transmission case connector.
- (2) EXTERNAL VEHICLE HARNESS CONNECTOR - Changed to accommodate the new design transmission case connector and REVISED cavity locations.  
Refer to Figure 45 for new design vehicle harness connector.

INTERCHANGEABILITY:

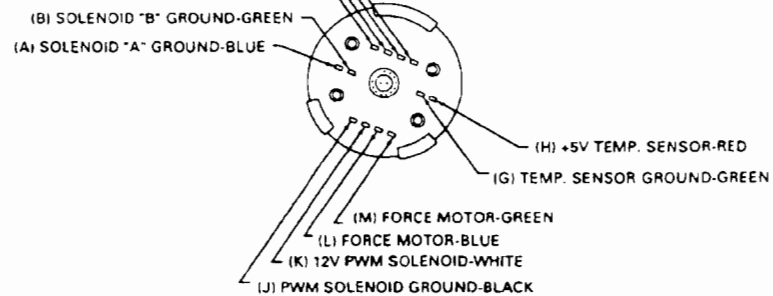
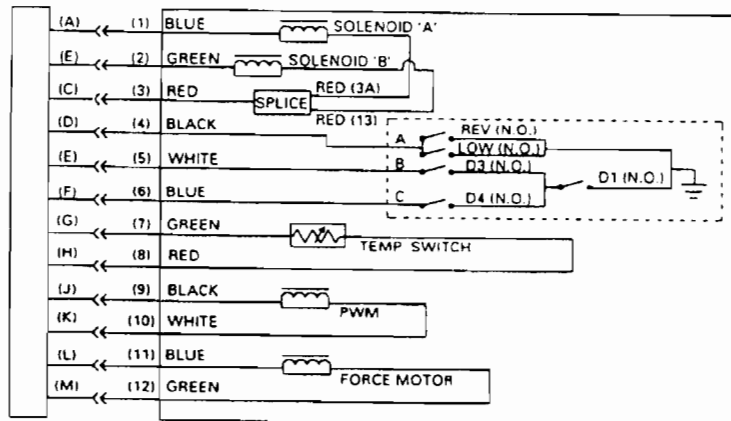
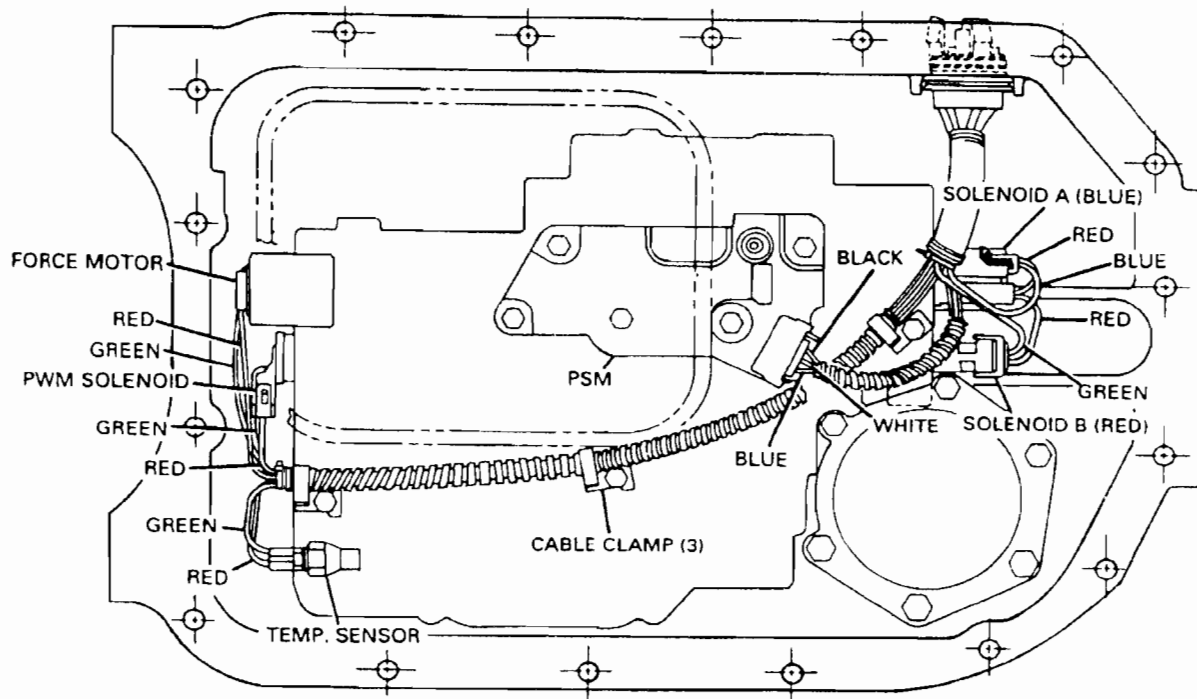
There is now available a new service package, OEM part number 24200161, that will update ANY previous model THM 4L80-E/4L80-EHD transmission to the new design case connector, and includes the following:

1. New design transmission case connector and internal wiring harness.
2. New design external vehicle harness connector that requires cutting and splicing the new connector to the existing vehicle harness.  
Use the chart provided in Figure 44 as a guide.

SERVICE INFORMATION:

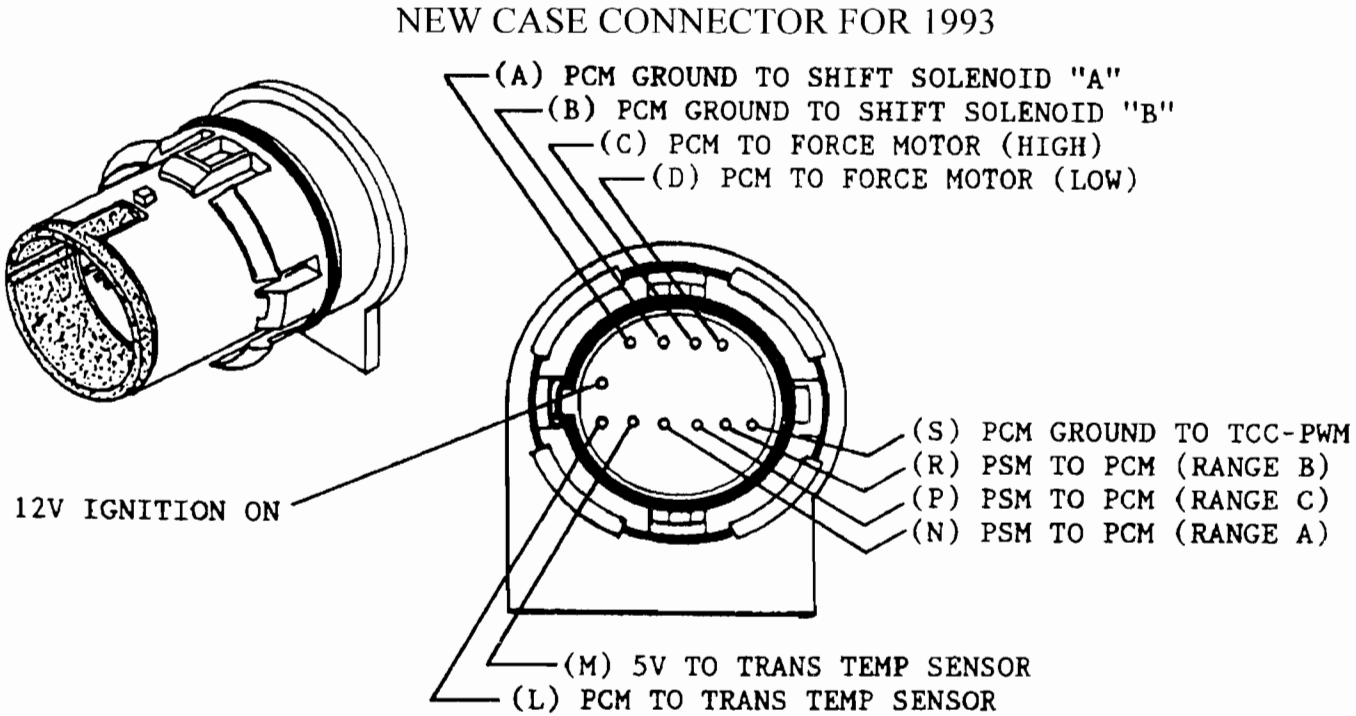
UPDATE SERVICE PACKAGE (Includes the following) .....24200161

1. New Design Transmission Case Connector, and Internal Wiring Harness Assembly.
2. New Design External Vehicle Harness Connector.



PREVIOUS CASE CONNECTOR

Figure 43

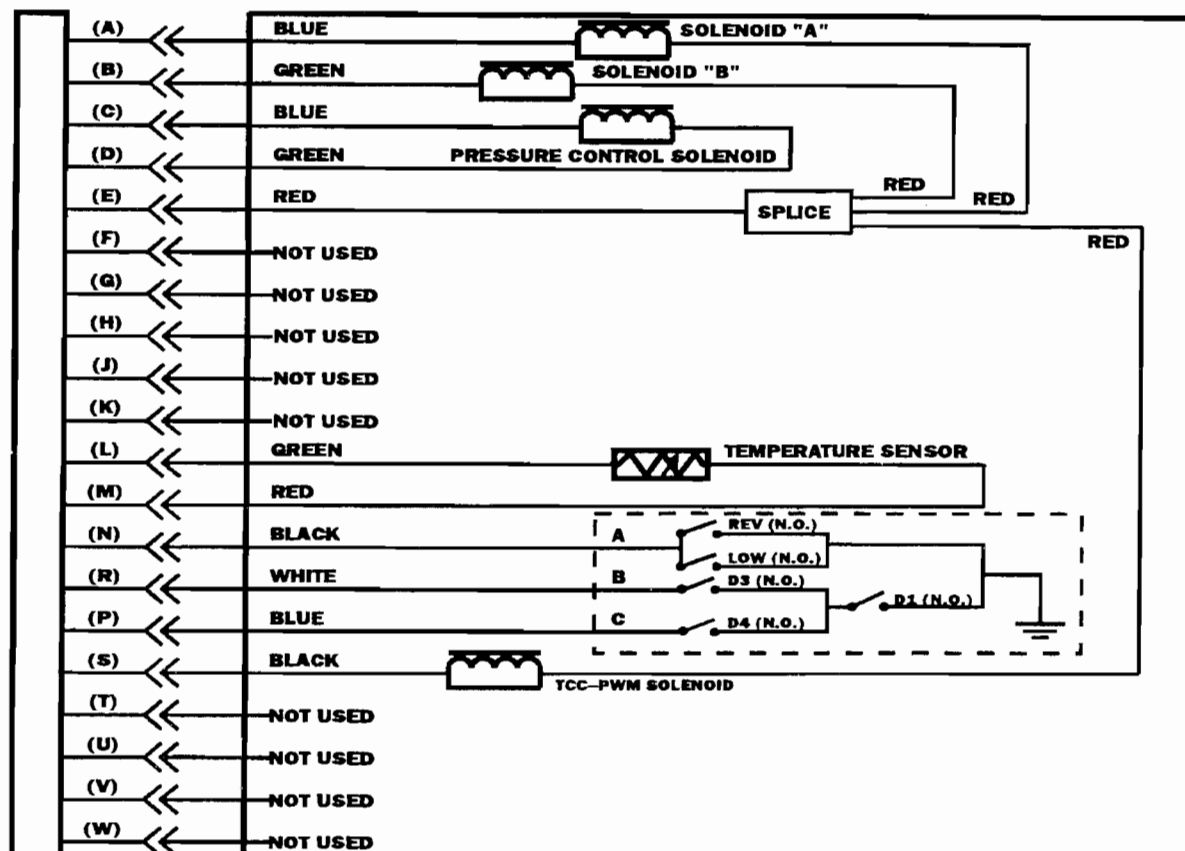


OLD CAVITY	NEW CAVITY	FUNCTION
A	A	PCM GROUND TO SHIFT SOLENOID "A"
B	B	PCM GROUND TO SHIFT SOLENOID "B"
L	C	PCM TO FORCE MOTOR (HIGH)
M	D	PCM TO FORCE MOTOR (LOW)
C	E	12V IGNITION ON, TO SOLENOIDS
G	L	PCM TO TRANS TEMP SENSOR
H	M	5V TO TRANS TEMP SENSOR
D	N	PSM TO PCM (RANGE A)
F	P	PSM TO PCM (RANGE C)
E	R	PSM TO PCM (RANGE B)
J	S	PCM GROUND TO TCC-PWM SOLENOID

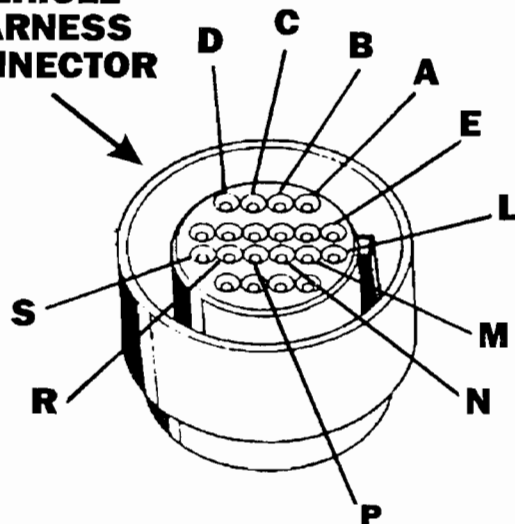
NEW CASE CONNECTOR FOR 1993

Figure 44

1993 WIRING SCHEMATIC AND  
EXTERNAL HARNESS CONNECTOR



VEHICLE  
HARNESS  
CONNECTOR



- A PCM GROUND TO SHIFT SOLENOID "A"
- B PCM GROUND TO SHIFT SOLENOID "B"
- C PCM TO FORCE MOTOR (HIGH)
- D PCM TO FORCE MOTOR (LOW)
- E 12V IGNITION ON, TO SOLENOIDS
- L PCM TO TRANS TEMP SENSOR
- M 5V TO TRANS TEMP SENSOR
- N PSM TO PCM (RANGE A)
- P PSM TO PCM (RANGE C)
- R PSM TO PCM (RANGE B)
- S PCM GROUND TO TCC-PWM SOLENOID

Figure 45



THM 4L80-E  
SELECTOR LEVER MOVES BY ITSELF  
LOW OR NO LINE PRESSURE RISE  
2ND GEAR STARTS

COMPLAINT: NO. 1: Manual shift lever moves from the overdrive position to the reverse position, ALL BY ITSELF!

NO. 2: Very little or no line pressure rise with throttle opening.

NO. 3: 2nd gear starts with no upshift.

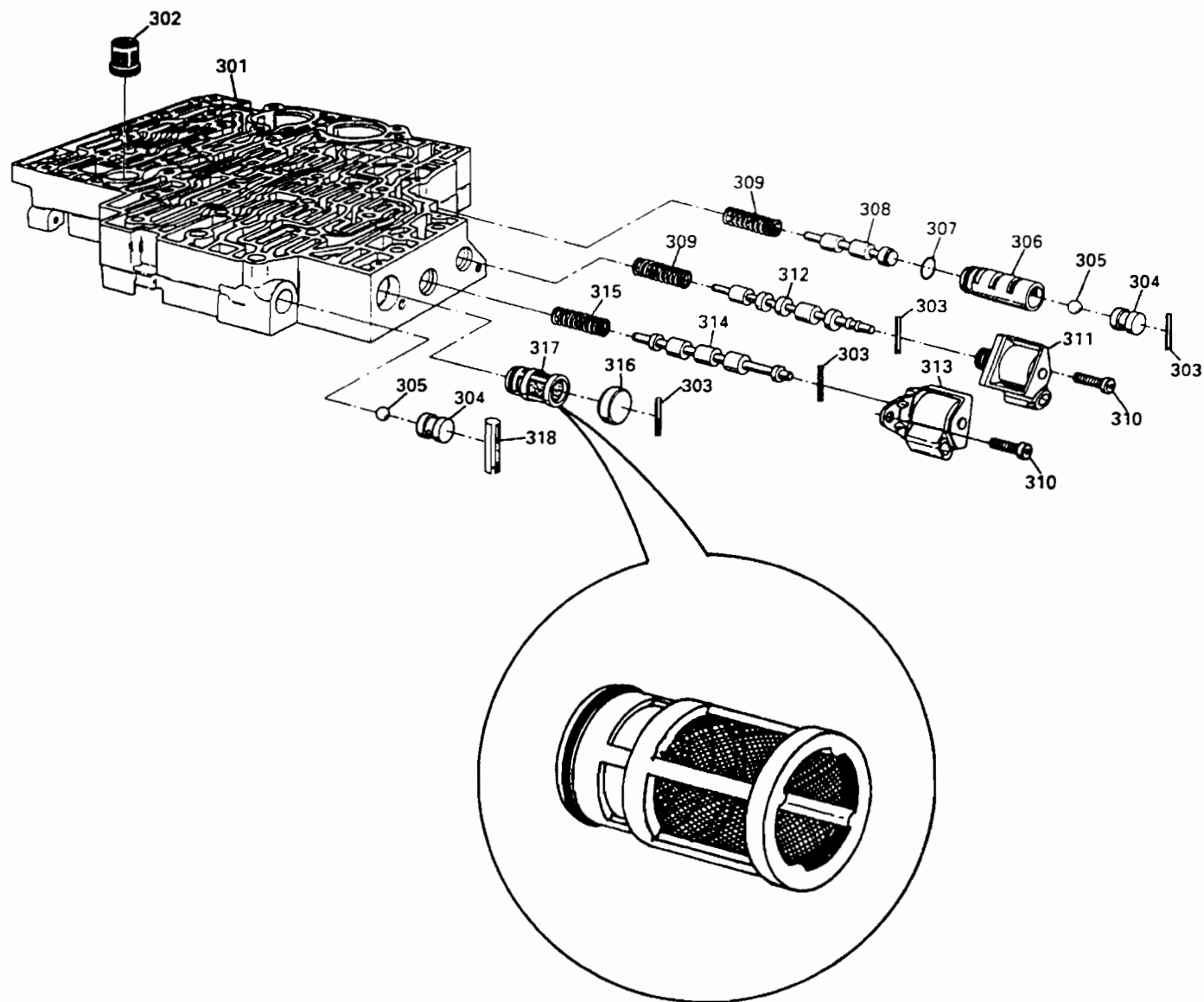
CAUSE: For ALL of the concerns listed above, the cause may be a broken Actuator Feed Screen located INSIDE of the valve body as shown in Figure 46.

NOTE: If the Actuator Feed Screen breaks and a portion of the screen blocks the exhaust passage, IT CAN FORCE THE MANUAL VALVE AND LINKAGE TO THE REVERSE POSITION!

CORRECTION: Replace the Actuator Feed Screen, located INSIDE the valve body with OEM part number 8661709. Refer to Figure 46 for location. We recommend that this screen be replaced on every rebuild and some kit suppliers are now putting this screen in the gasket set.

SERVICE INFORMATION:

Actuator Feed Screen .....8661709.



- 301 BODY, CONTROL VALVE
- 302 SCREEN FILTER, PRESSURE CONTROL SOL. FEED
- 303 PIN, COILED SPRING
- 304 PLUG, CHECKBALL
- 305 BALL (.375 DIA.)
- 306 BUSHING, 3RD/REVERSE CHECKBALL
- 307 SEAL, O-RING
- 308 VALVE, 3-4 SHIFT
- 309 SPRING, SHIFT VALVE RETURN (2-3 & 3-4)
- 310 BOLT, SOLENOID (1-2 & 2-3 SHIFT, PRESSURE CONTROL SOLENOID)
- 311 2-3 SHIFT SOLENOID & O-RING ASSEMBLY
- 312 VALVE, 2-3 SHIFT
- 313 1-2 SHIFT SOLENOID & O-RING ASSEMBLY
- 314 VALVE, 1-2 SHIFT
- 315 SPRING, 1-2 SHIFT VALVE RETURN

- 316 PLUG, SHIFT SOLENOID FEED FILTER
- 317 FILTER, SHIFT SOLENOID FEED
- 318 SLEEVE, LO/REVERSE CHECKBALL

Figure 46





## 1995 SEMINAR INFORMATION

33

### SLIDE THM 4T60-E NEW DESIGN OUTPUT SHAFT WITHOUT NEEDLE BEARING

**CHANGE:** Beginning on June 1, 1993 (Julian Date 152) ALL THM 4T60-E transaxles were built with a new design output shaft **WITHOUT** a caged needle bearing, a new 4th clutch hub and shaft, a new input housing assembly, and a new input sun gear.

**REASON:** To eliminate a transaxle vibration at an engine speed between 3000-5000 RPM, when in 2nd gear **ONLY**, and increase pleaseability concerns.

#### PARTS AFFECTED:

- (1) OUTPUT SHAFT - Caged needle bearing located in the center of the output shaft has been eliminated, as shown in Figure 47.
- (2) INPUT/3RD CLUTCH HOUSING ASSEMBLY - Caged needle bearing **ADDED** to the input housing assembly, and located on the inside diameter of the input shaft, as shown in Figure 48.
- (3) 4TH CLUTCH HUB AND SHAFT - Hardened sleeve added to the shaft next to the splines that is 1.310" in diameter, and rides in the added bearing in the input/3rd clutch housing, as shown in Figure 48.
- (4) INPUT SUN GEAR - Since the sun gear no longer rides on a bearing, it was not necessary to machine the surface finish on the inside diameter. The inside diameter has been reduced preventing it from being installed into transaxle with a bearing on the output shaft.

#### INTERCHANGEABILITY:

The parts listed above will back service ALL 4T60-E transaxles when used as a package, and will also service 4T60 (440-T4) transaxles back to 1989. The 4th clutch hub and shaft assembly will back service all 4T60 (440-T4) and 4T60-E transaxles, and is compatible with previous design level parts. The input sun gear inside diameter has been reduced preventing it from being installed in transaxle with a bearing on the output shaft. Previous input sun gear OEM part number 8682441 (For Dual Sprag) can be used in either application.

#### SERVICE INFORMATION:

4th Clutch Hub and Shaft Assembly (New Design) .....	24201094
Output Shaft (New Design) .....	8683560
Input/3rd Clutch Housing and Bearing Asm (New Design) .....	8651937
Input Sun Gear (New Design) .....	8683559
Vibration Repair Package	
(Includes 4 Parts Listed Above) .....	8651936

PREVIOUS DESIGN OUTPUT SHAFT

CAGED NEEDLE BEARING



NEW DESIGN OUTPUT SHAFT  
WITH BEARING REMOVED



Figure 47

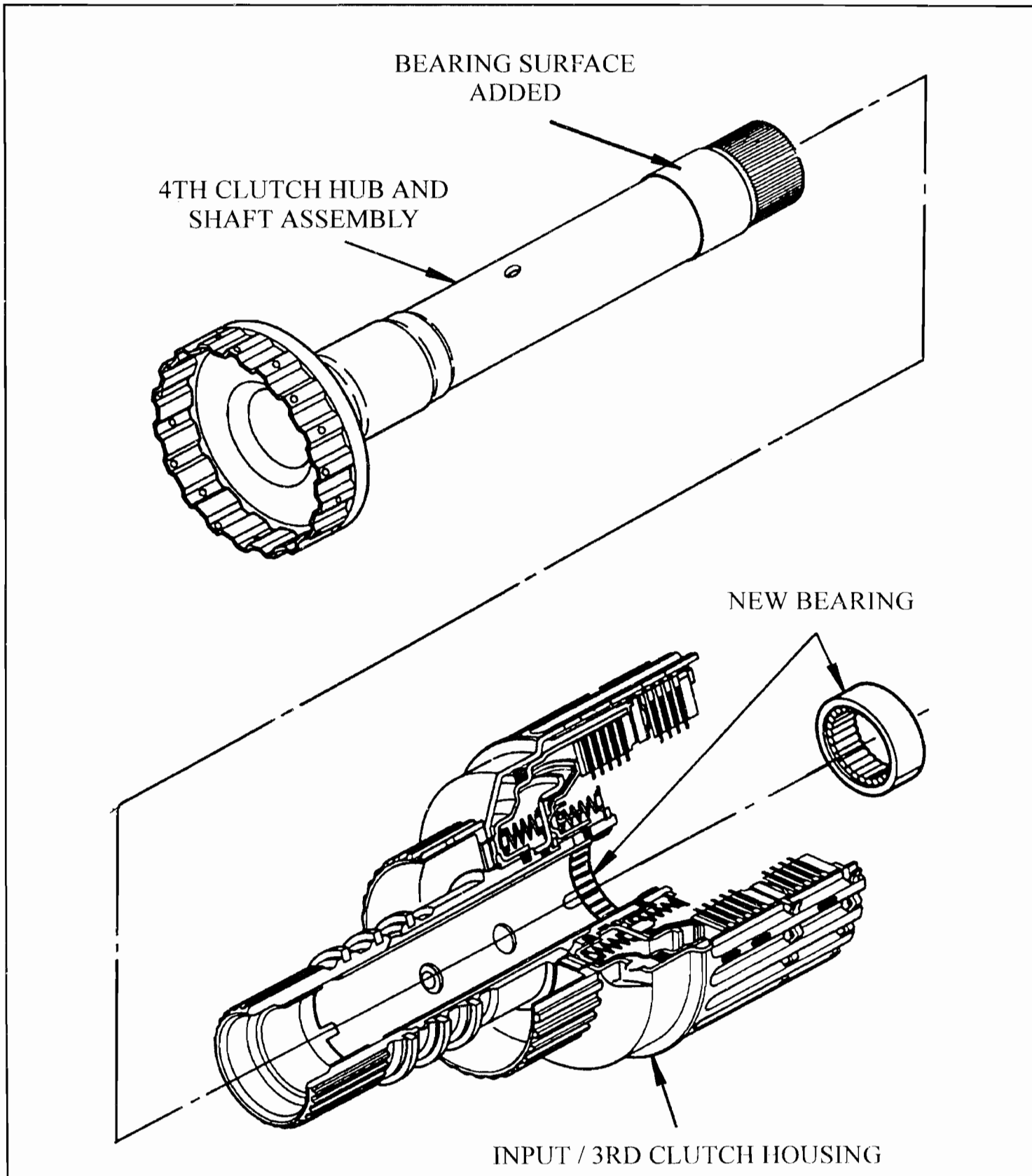


Figure 48

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THM 4T60-E  
1-2 ROLLER CLUTCH FAILURE

COMPLAINT: NO. 1: Some 1991-1993 models equipped with the THM 4T60-E transaxle may exhibit a no movement condition, with the selector lever in the D4 or D3 ranges, but will move when the selector lever is placed into D2 or Lo range.

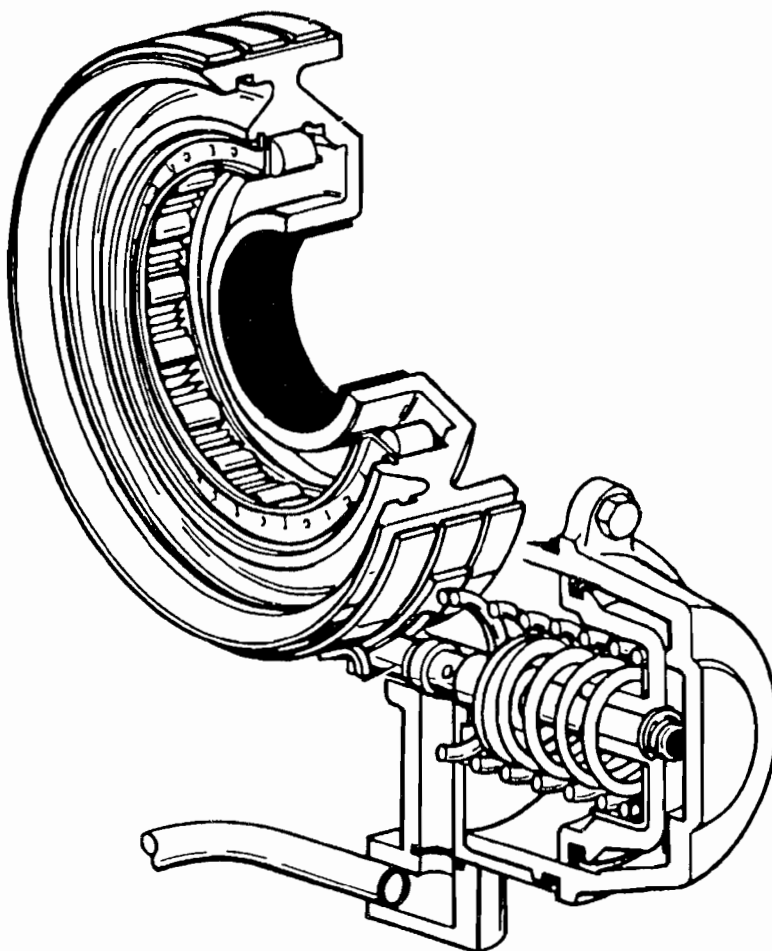
NO. 2: When the engine RPM is increased with the selector lever in the Park and/or Neutral position, you may hear a noise that sounds like "Marbles in a Can", but still moves and shifts properly.

CAUSE: The cause for both complaints listed above is a 1-2 roller clutch failure. (See Figure 49)

CORRECTION: Replace the 1-2 Roller Clutch Assembly and any related parts that may be damaged or broken.

**WARNING: DO NOT EXCEED 3000 RPM WITH THE SELECTOR LEVER IN REVERSE AND THE WHEELS OFF THE GROUND.  
IF YOU DO THIS, YOU CAN FAIL THE 1-2 ROLLER CLUTCH BEFORE IT EVER LEAVES THE SHOP!**

THM 4T60-E  
1-2 ROLLER CLUTCH ASSEMBLY



**WARNING: DO NOT EXCEED 3000 RPM WITH THE SELECTOR LEVER  
IN REVERSE AND THE WHEELS OFF THE GROUND.  
IF YOU DO THIS, YOU CAN FAIL THE 1-2 ROLLER CLUTCH  
BEFORE IT EVER LEAVES THE SHOP!**

Figure 49



SLIDE  
THM 4T60-E

1993 4TH CLUTCH PACK CHANGES

CHANGE: Beginning at the Start Of Production for 1993 THM 4T60-E transaxles, ALL models were built with revised dimensions for the 4th clutch plates, the 4th clutch piston, and channel plate (See Figures 50, 51, and 53).

REASON: Approximately .020" less clutch clearance for improved clutch durability.

PARTS AFFECTED:

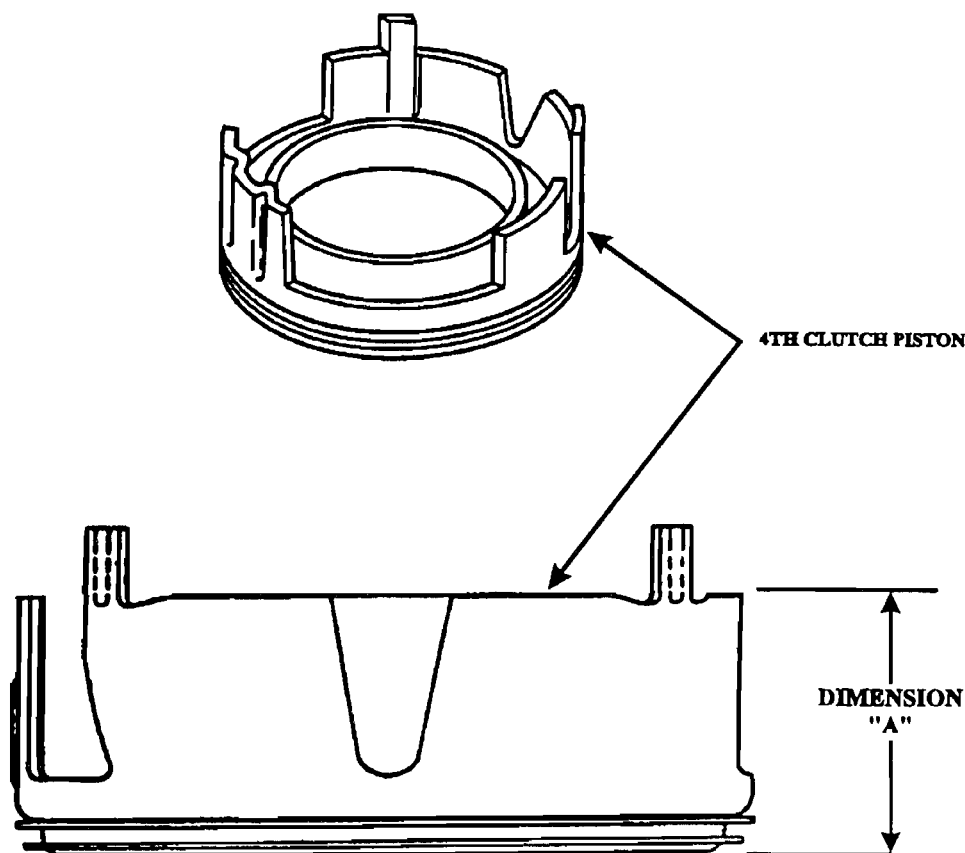
- (1) 4TH CLUTCH PISTON - Height of the piston apply legs, as measured in Figure 50, has changed slightly on both minimum and maximum tolerances.
- (2) 4TH CLUTCH APPLY PLATE - Changed to a "Flat" plate instead of the previous "Tapered" plate, and the thickness changed to .133" instead of the previous .163", as shown in Figure 51. There are now two of these .133" thick plates used in the 4th clutch stack-up, as shown in Figure 51.
- (3) 4TH CLUTCH STEEL PLATES - Thickness was increased to .077" instead of the previous .073", and the "Notch" was removed from the tab for I.D. as shown in Figure 51. The new 4th clutch stack now uses only one of these plates and is the same thickness and part number as the early 440-T4 steel plate (See Figure 51).
- (4) 4TH CLUTCH FIBER PLATES - Very minimal thickness change as shown in Figure 51.
- (5) CHANNEL PLATE - The depth in the 4th clutch area, as measured from the gasket surface to the 4th clutch surface, was increased to .792" instead of the previous .772" to accommodate the revised 4th clutch stack-up (See Figure 52). This distance MUST be measured with a depth micrometer for accuracy. 91-92 Channel Plate Casting Number = "Varies" 93-94 Channel Plate Casting Number = 8682217

INTERCHANGEABILITY:

- (1) The 4th Clutch Piston will interchange in all models without problems as the piston heights all still measure within .003" of one another.
- (2) The 4th Clutch Fiber Plates will interchange in all models as the thickness change was only .003".
- (3) The 91-92 Steel Plate stack-up MUST be used with the 91-92 Channel Plate. If the 91-92 Steel Plate stack-up is used with the 93-94 Channel Plate, the clutch clearance measures .086" (TOO LOOSE).
- (4) The 93-94 Steel Plate stack-up MUST be used with the 93-94 Channel Plate. If the 93-94 Steel Plate stack-up is used with the 91-92 Channel Plate, the clutch clearance measures .025" (TOO TIGHT).

YEAR	DESCRIPTION	NO. USED	PART NUMBER
91-92	4TH CLUTCH STEEL PLATE, .073" THICKNESS.....	2	8661006
91-92	4TH CLUTCH LINED PLATE, .067" THICKNESS.....	2	18017246
91-92	4TH CLUTCH APPLY PLATE, .062" THICKNESS.....	1	8661004
93-94	4TH CLUTCH STEEL PLATE, .077" THICKNESS.....	1	8656767
93-94	4TH CLUTCH LINED PLATE, .070" THICKNESS.....	2	8685066
93-94	4TH CLUTCH APPLY PLATE, .133" THICKNESS.....	2	8680771

4TH CLUTCH PISTON



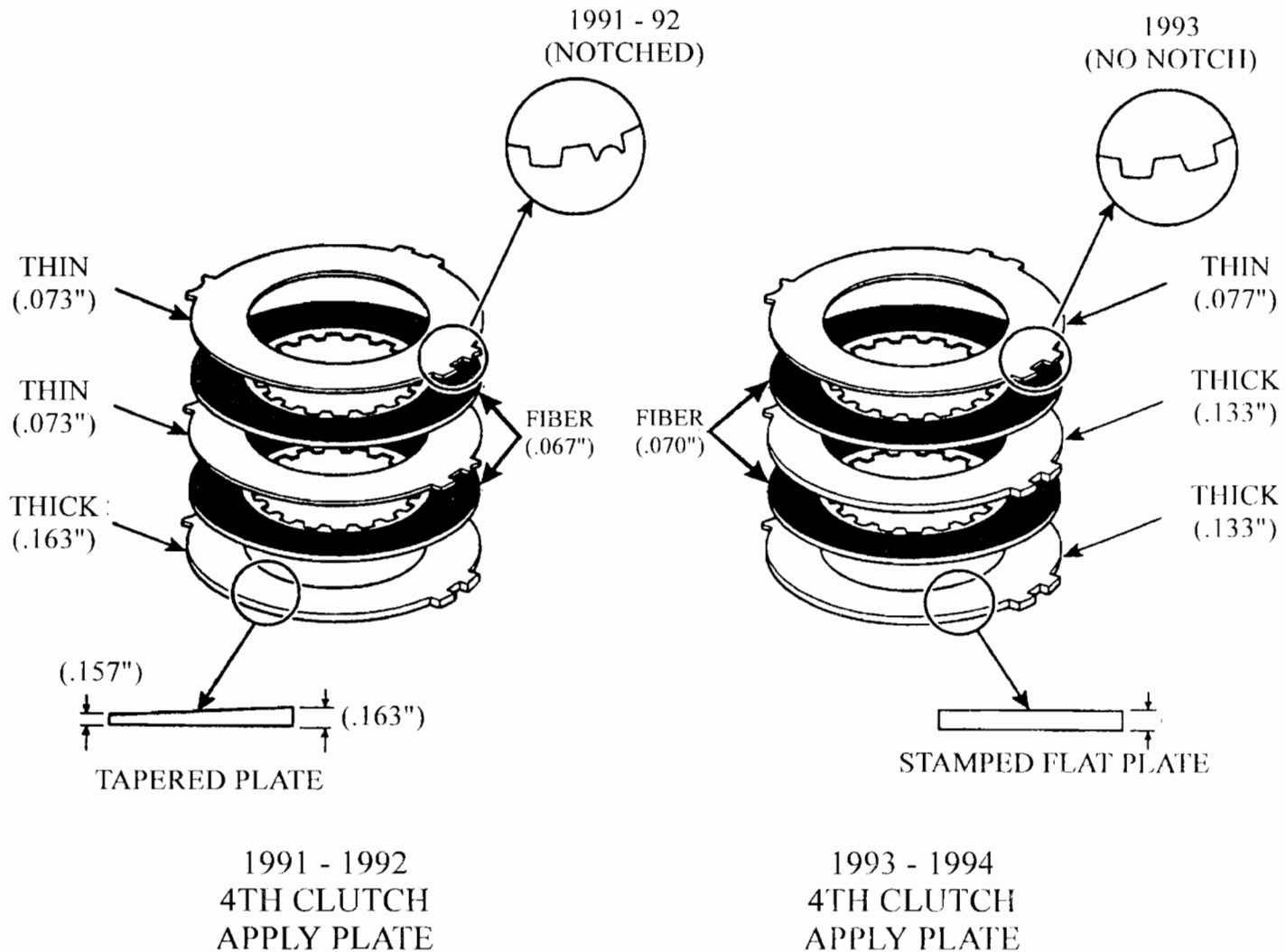
91-92 PISTON, DIMENTION "A" = 1.992" - 2.007"

91-92 PISTON, DIMENTION "A" = 1.980" - 1.996"

Figure 50



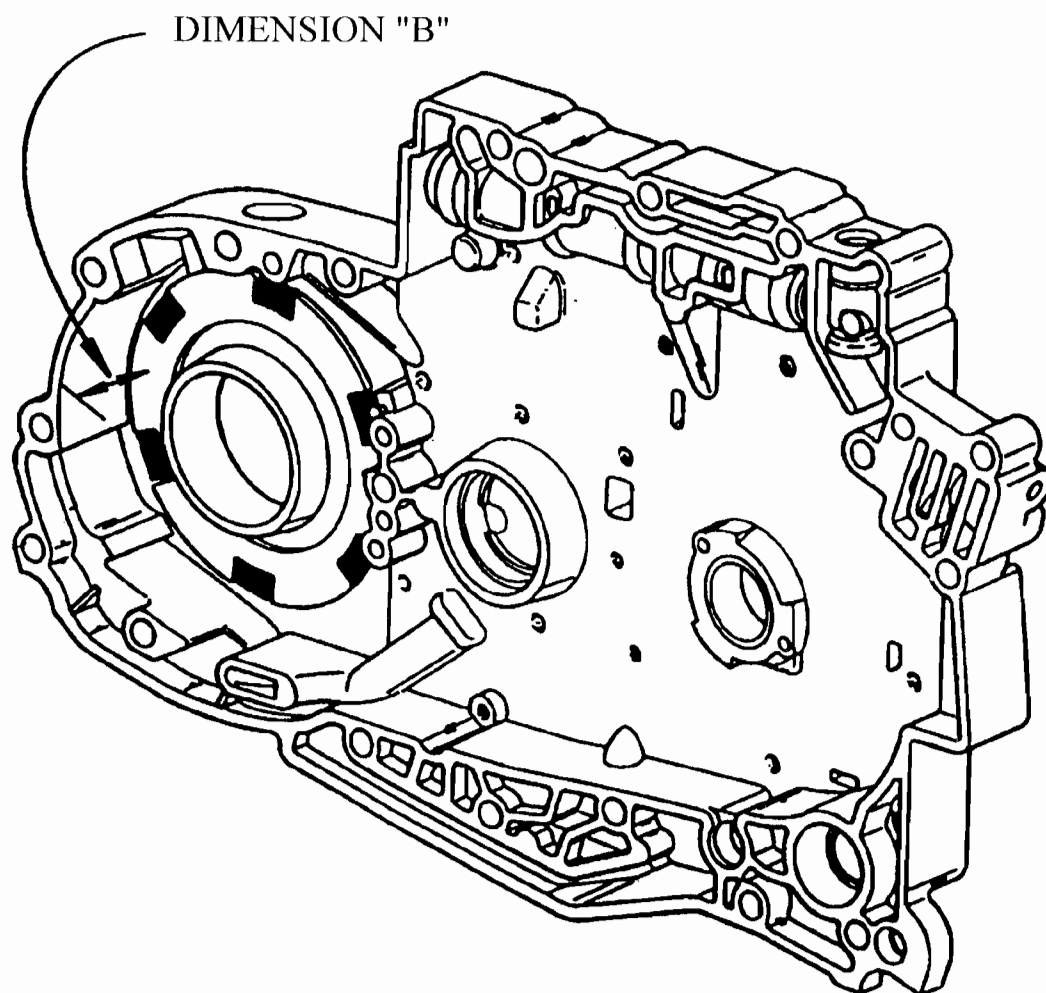
### 4TH CLUTCH STACK-UP



YEAR	DESCRIPTION	NO. USED	PART NUMBER
91-92	4TH CLUTCH STEEL PLATE, .073" THICKNESS.....	2	8661006
91-92	4TH CLUTCH LINED PLATE, .067" THICKNESS.....	2	18017246
91-92	4TH CLUTCH APPLY PLATE, .062" THICKNESS.....	1	8661004
93-94	4TH CLUTCH STEEL PLATE, .077" THICKNESS.....	1	8656767
93-94	4TH CLUTCH LINED PLATE, .070" THICKNESS.....	2	8685066
93-94	4TH CLUTCH APPLY PLATE, .133" THICKNESS.....	2	8680771

Figure 51

# CHANNEL PLATE



91 - 92 CHANNEL PLATE, DIMENSION "B" = .772"

93 - 94 CHANNEL PLATE, DIMENSION "B" = .792"

THIS DIMENSION SHOULD BE MEASURED FROM THE GASKET SURFACE  
TO 4TH CLUTCH SURFACE, WITH A DEPTH MICROMETER, AS SHOWN.

Figure 52

## THM 4T60 AND THM 4T60-E BEARING WHINE IN 1ST, 2ND, AND 3RD GEAR

### COMPLAINT:

Some 1990 - 1993 vehicles equipped with the THM 4T60 or THM 4T60-E transaxle, may exhibit a bearing whine noise that can be heard while moving in 1st, 2nd, and 3rd gear, and is most audible on the drivers side of the vehicle while in 2nd gear under light acceleration. This bearing whine CANNOT be heard in Park or Neutral.

### CAUSE:

The cause may be, an improperly installed Channel Plate to 4th Clutch Hub Bearing assembly (Figure 53), causing the needle bearings to leave indentation marks on the bearing race.

### CORRECTION:

Replace the Channel Plate to 4th Clutch Hub Bearing Assembly with OEM part number 8656393, and use "Hand Pressure Only" to install the bearing assembly into the channel plate (See Figure 53). The part number is the same for both the THM 4T60 and the 4T60-E transaxles.

SERVICE INFORMATION: Bearing Asm. Channel Plate/4th Clutch Hub .....8656393

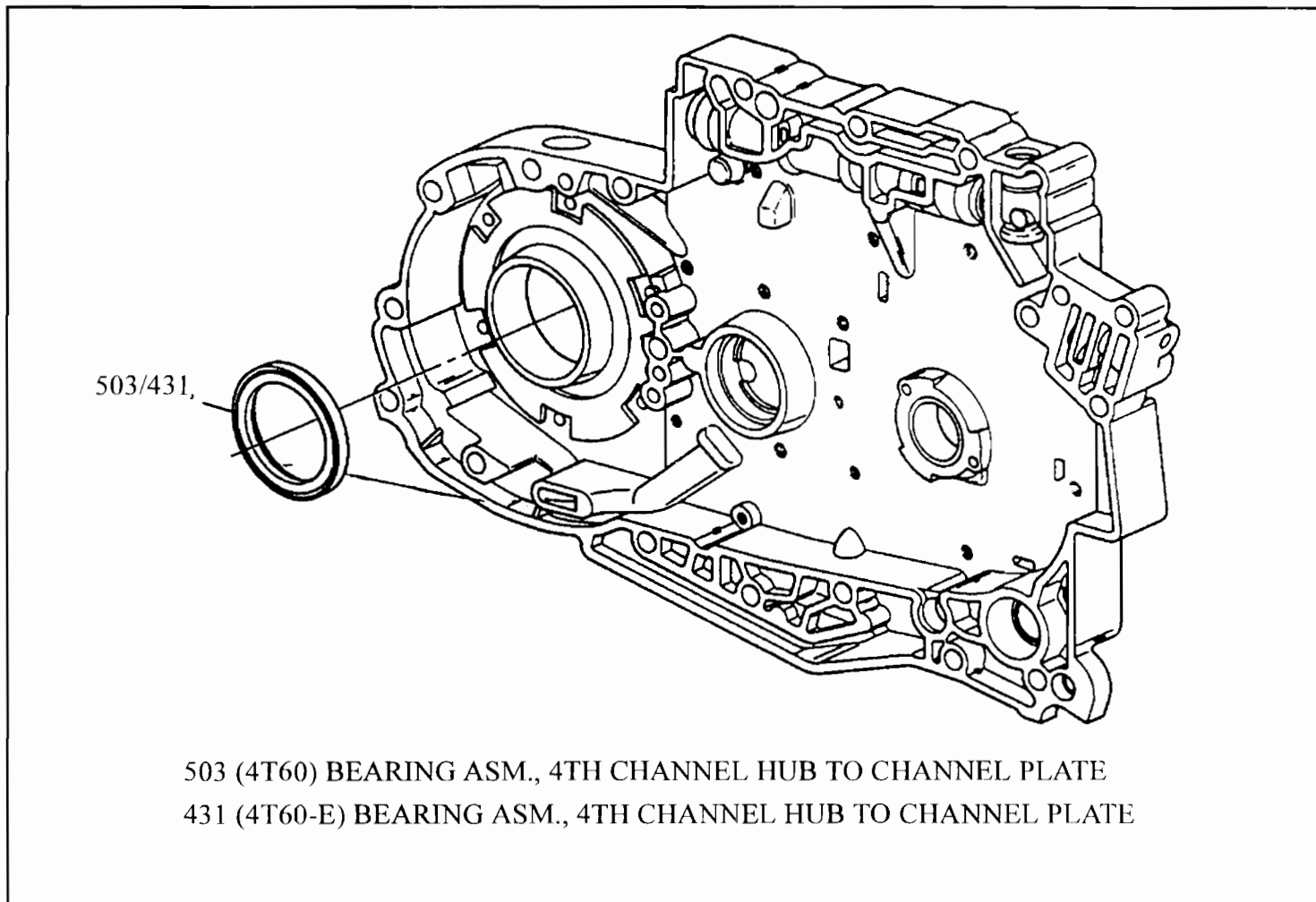


Figure 53



CHANGE: Beginning at Start Of Production for the 1994 model year, "Some" models of the THM 4T60-E transaxle received a new structural side cover made of cast aluminum, instead of the stamped steel side cover.

REASON: Structural side cover is now used for mounting purposes in some models.

PARTS AFFECTED:

- (1) STRUCTURAL SIDE COVER - Now made of cast aluminum with drilled and tapped bosses for mounting into the vehicle (See Figure 54). There are currently two different structural side covers used in different car bodies, one with four cast bosses (See Figure 56), and one with six cast bosses (See Figure 57).
- (2) SIDE COVER GASKET - Now has rubber bead molded onto thin steel gasket, and is reusable as long as the rubber bead is not broken. Also uses a lathe-cut rubber seal that fits into a groove inside the structural side cover, and replaces the previous doughnut gasket (See Figure 54).
- (3) CHANNEL PLATE - The six studs that come through the channel plate in the doughnut gasket area have been eliminated, and the sealing surface made wider to accommodate the new lathe-cut seal ring (See Figure 55)
- (4) SIDE COVER RETAINING BOLTS - Have all been changed to accommodate the new structural side cover. There are currently three~different types of the retaining bolts used per vehicle, and are shown in Figures 56 and 57, along with their proper locations. Refer to Figures 56 and 57, depending on the model you are working on. Refer to Figure 58 for the stamped steel cover.

INTERCHANGEABILITY:

NONE of the new parts listed above can be used on ANY previous model THM 4T60-E transaxles.

The Structural Side Covers MUST be used on the 1994 models that are shown in Figures 56 and 57.

STRUCTURAL SIDE COVER

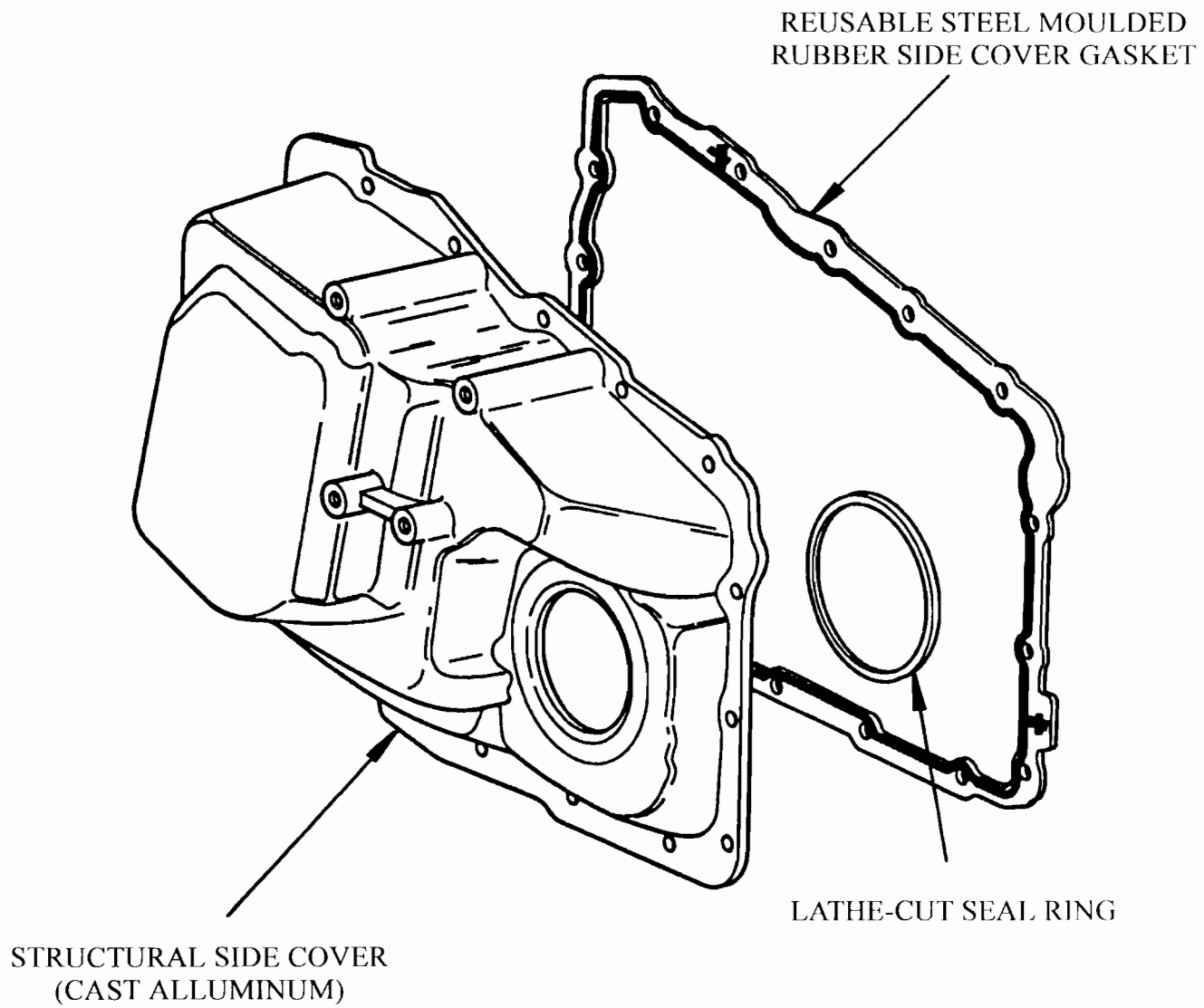
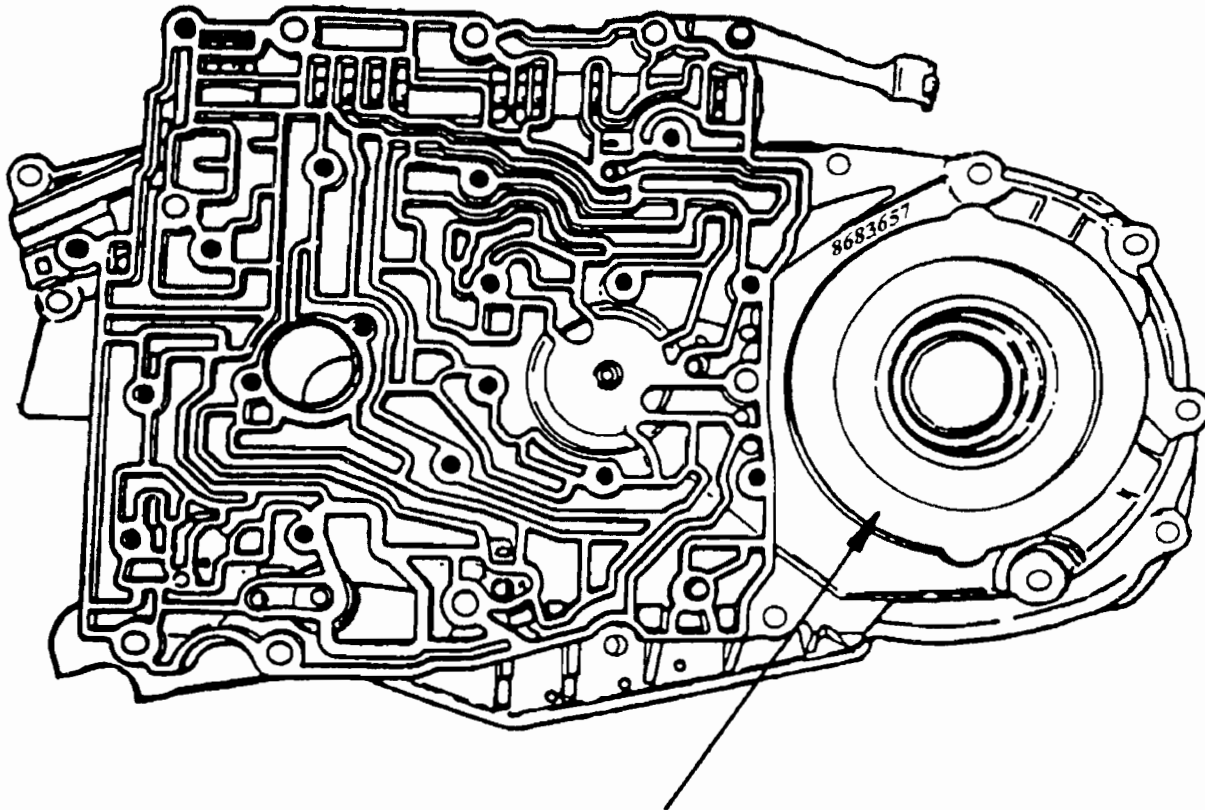


Figure 54

CHANNEL PLATE FOR  
STRUCTURAL SIDE COVER



CHANGED AREA OF CHANNEL PLATE

Figure 55

"4 BOSS" STRUCTURAL SIDE COVER  
AND PROPER BOLT LOCATIONS  
FITS ONLY THE FOLLOWING "W" BODIES  
1994 CHEVROLET LUMINA  
1994 BUICK REGAL  
1994 OLDS CUTLAS SUPREME  
1994 PONTIAC GRAND PRIX

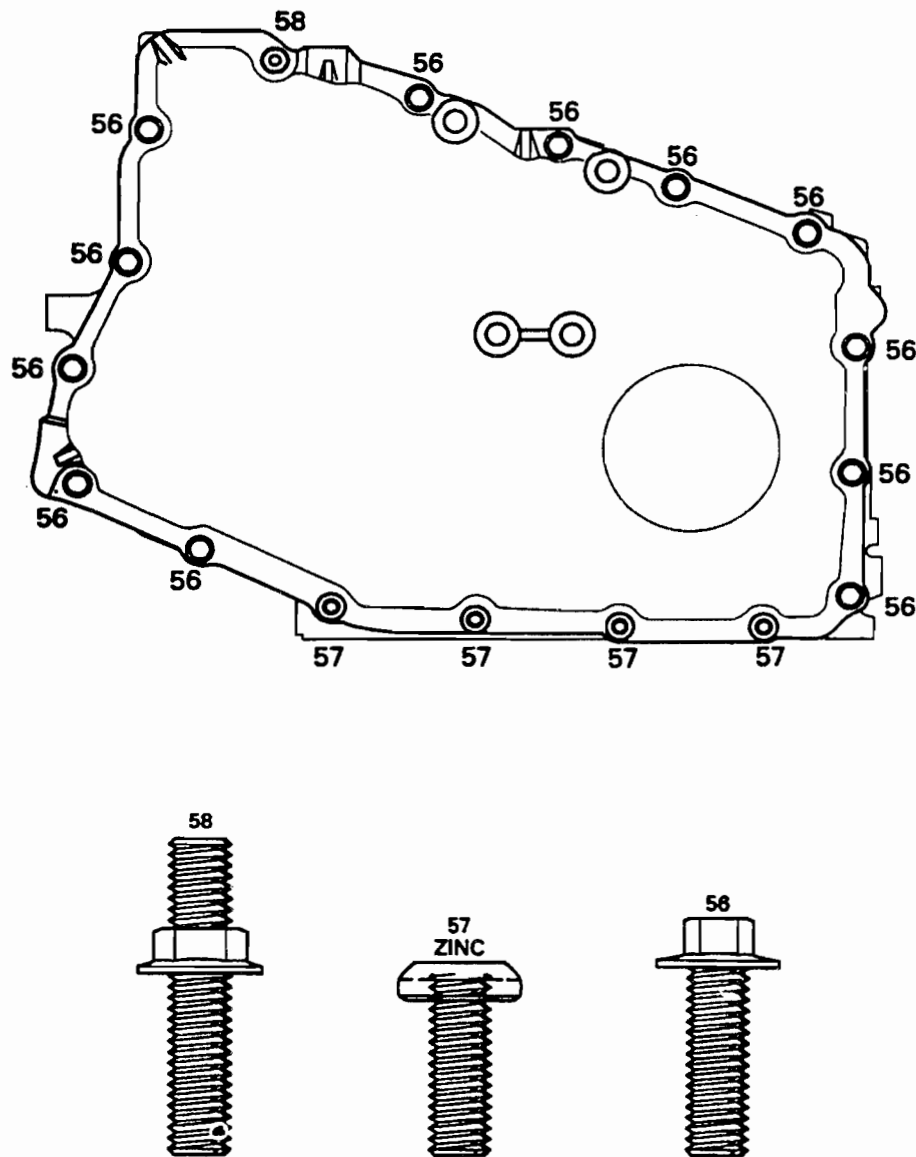


Figure 56

"6 BOSS" STRUCTURAL SIDE COVER  
AND PROPER BOLT LOCATIONS  
FITS ONLY THE FOLLOWING "L" AND "N" BODIES

1994 CHEVROLET BERETTA (L)  
1994 CHEVROLET CORSICA (L)  
1994 BUICK SKYLARK (N)  
1994 OLDSMOBILE ACHIEVA (N)  
1994 PONTIAC GRAND AM (N)

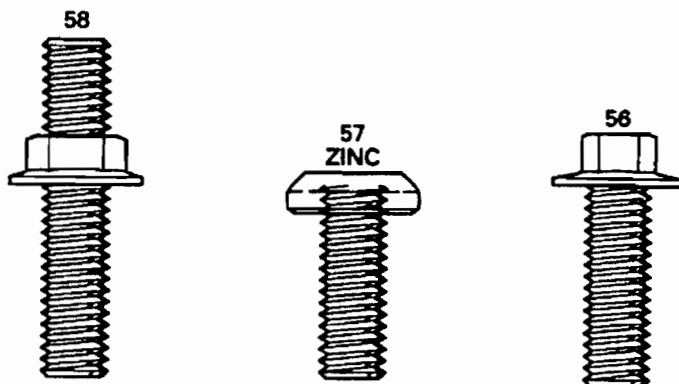
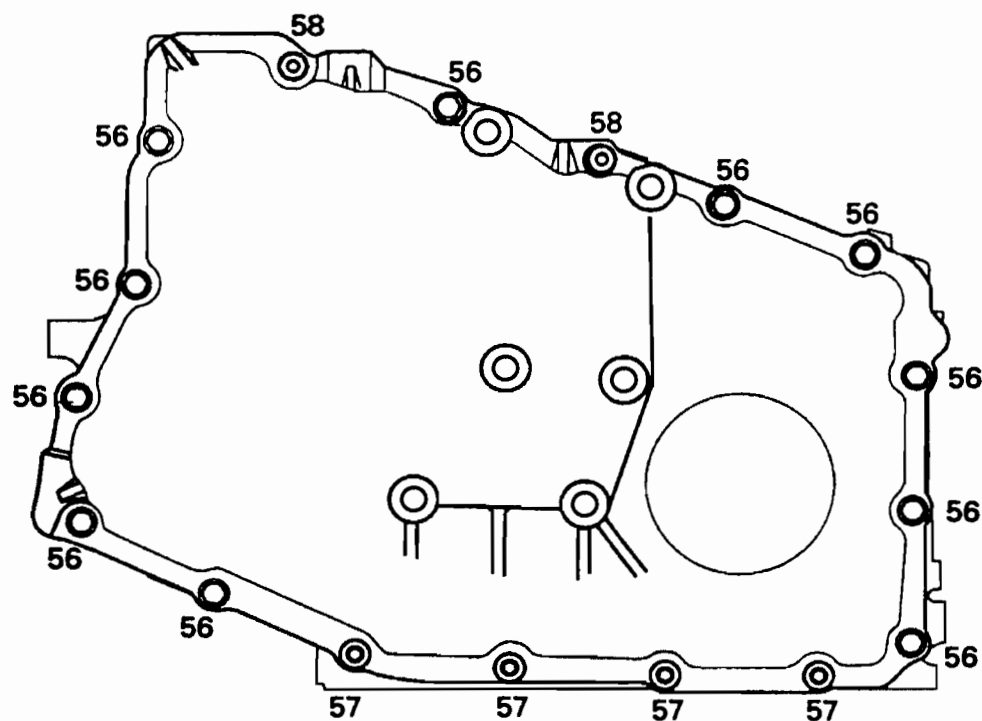


Figure 57



STAMPED STEEL SIDE COVER  
FITS ALL OTHER 1994 MODEL

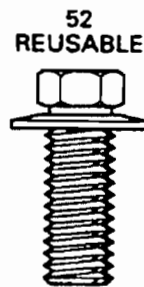
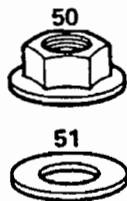
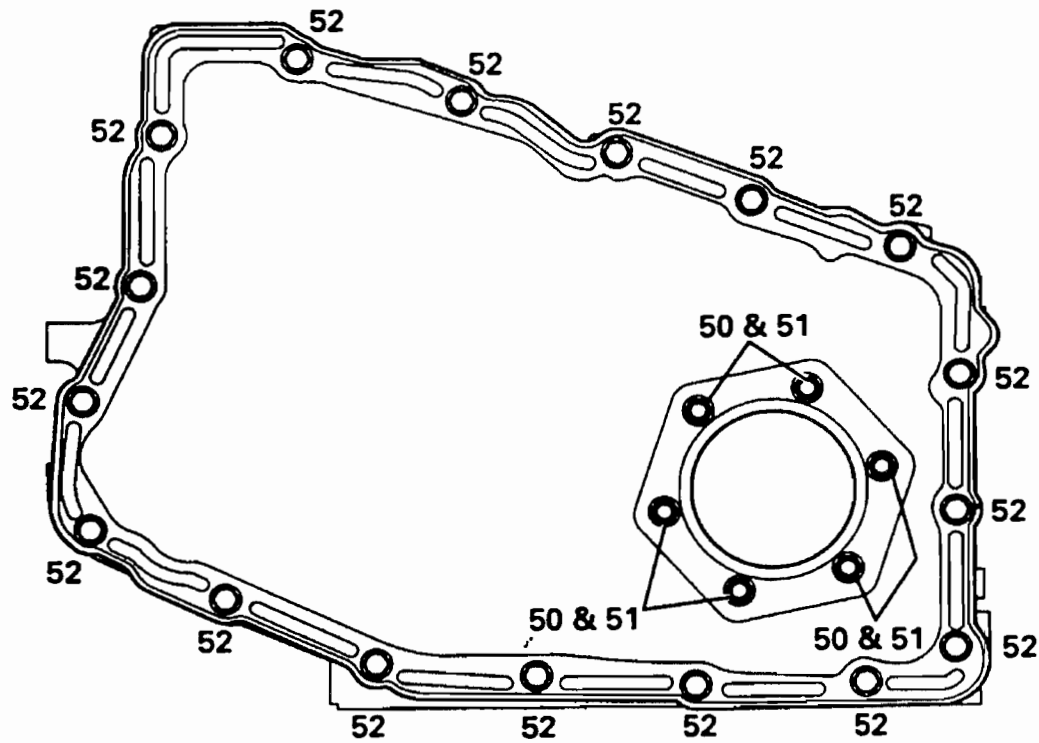


Figure 58



CHANGE: Beginning at the Start Of Production, for all 1993 model THM 4T60-E transaxles, a complete hydraulics change was implemented, with a revised converter clutch regulator valve line-up, revised accumulator valve bushings in the valve body, and shift valves with revised dimensions.

REASON: Calibration changes for improved shift feel and improved durability.

PARTS AFFECTED:

- (1) VALVE BODY CASTING - The aluminum plug and retainer clip for converter clutch regulator valve were eliminated, and replaced with a new bushing and new style retainer, as shown in Figure 59.  
The 1-2 accumulator valve bushings (Both Primary and Secondary), the 2-3 accumulator valve bushing, and the 3-4 accumulator valve bushing were revised to accommodate new design retainers with more holding capacity as shown in Figure 59. The 2-3 Shift Valve and the 3-2 Manual Downshift Valve received some dimensional changes, as shown in Figure 60.  
These changes required changes in the Valve Body Casting, in the worm track areas of both sides, and the differences are shown in Figure 61. Note that there are not any check ball location changes.
- (2) VALVE BODY SPACER PLATE - Different hole spacing to accommodate the valve body and channel plate casting changes. Also the 91-92 hydraulics spacer plate has the TCC solenoid orifice in the spacer plate, and the 93-94 hydraulics requires the same screen and orifice assembly, with "O" ring, that is currently used in the THM 440-T4 transaxle and is shown Figures 62 and 63.
- (3) VALVE BODY GASKETS - Both the valve body to spacer plate, and spacer plate to channel plate gaskets change to accommodate the revised hydraulics. They are easily identified by the OEM part number ink stamped on each gasket. Refer to Figure 64 for proper identification.
- (4) CHANNEL PLATE ASSEMBLY - There are casting changes in the worm track area to accommodate the valve body changes, as shown in Figure 65. The Channel Plate can be easily identified by the casting number. Refer to Figure 66 for casting number location. The casting number for the 91-92 hydraulics is 8667284, and casting number for the 93-94 hydraulics is 8682217, and is shown in Figure 66.  
There was also a change in the Lo Blow Off Valve and Seat, which is also located in the channel plate. These changes are shown in Figure 67.

INTERCHANGEABILITY:

NONE of the parts listed above will interchange with previous design level parts.  
IF YOU CHANGE ONE PIECE YOU MUST CHANGE THEM ALL!

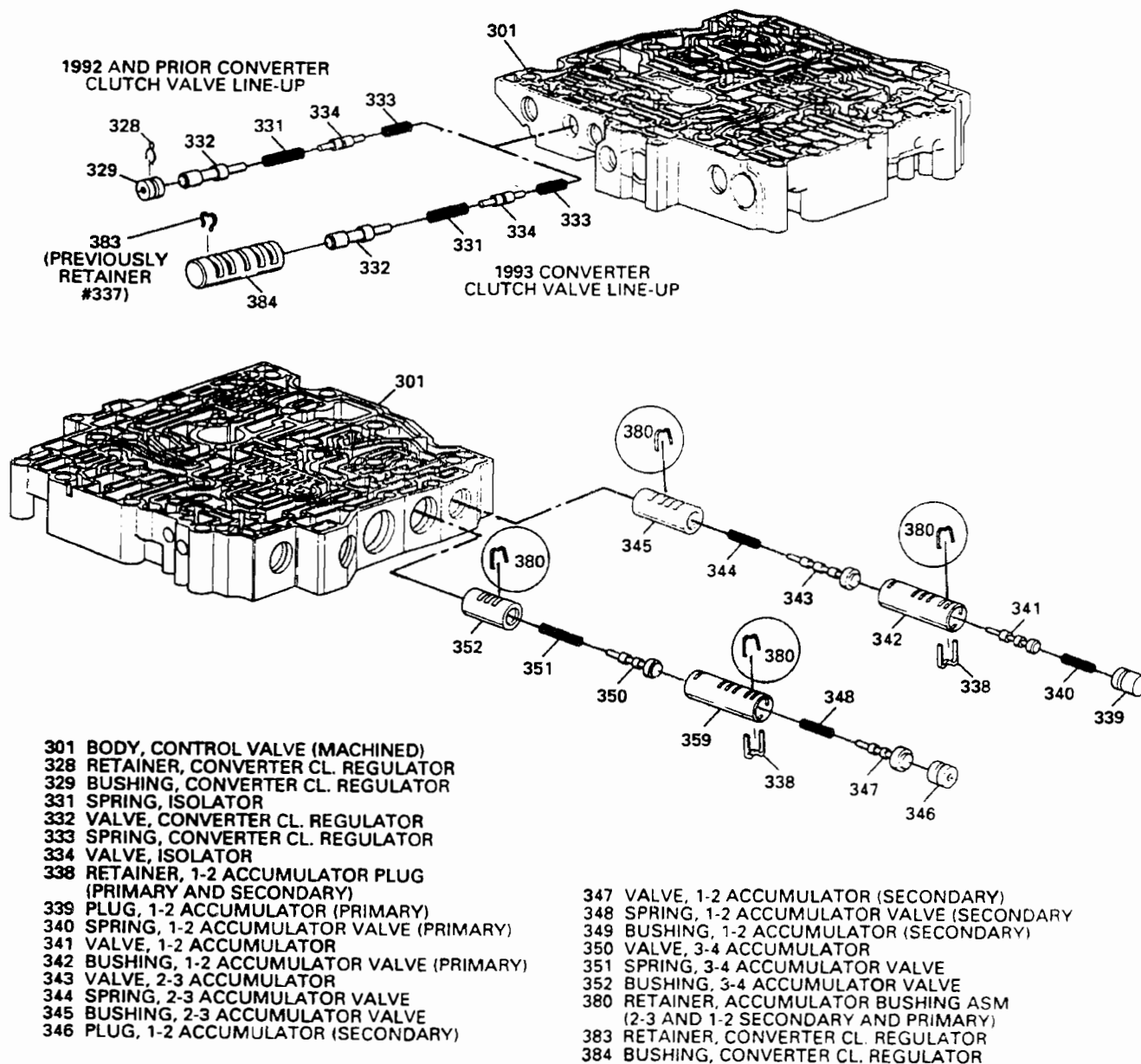
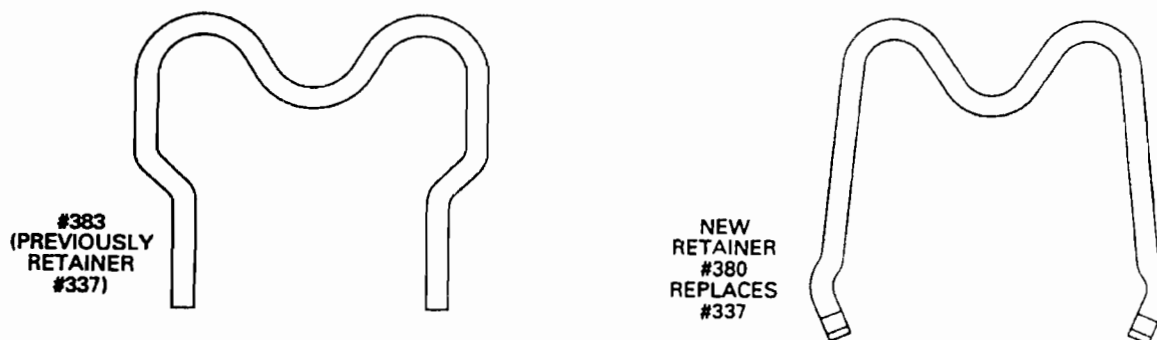
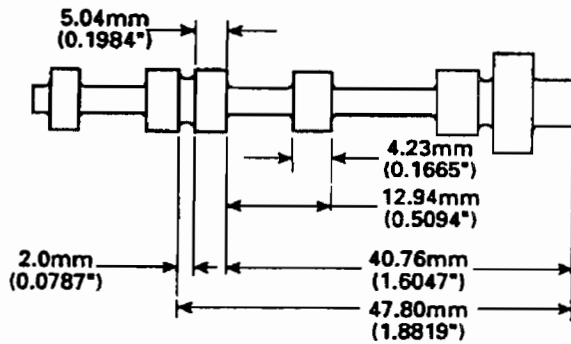
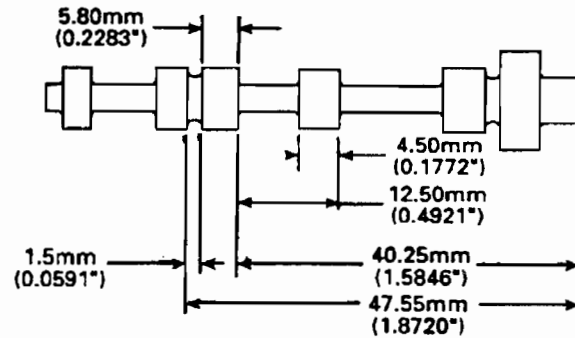


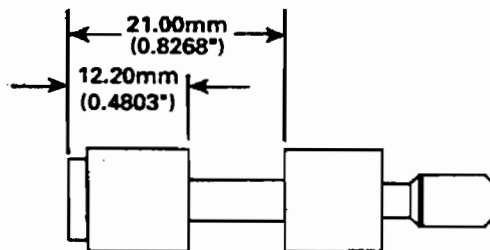
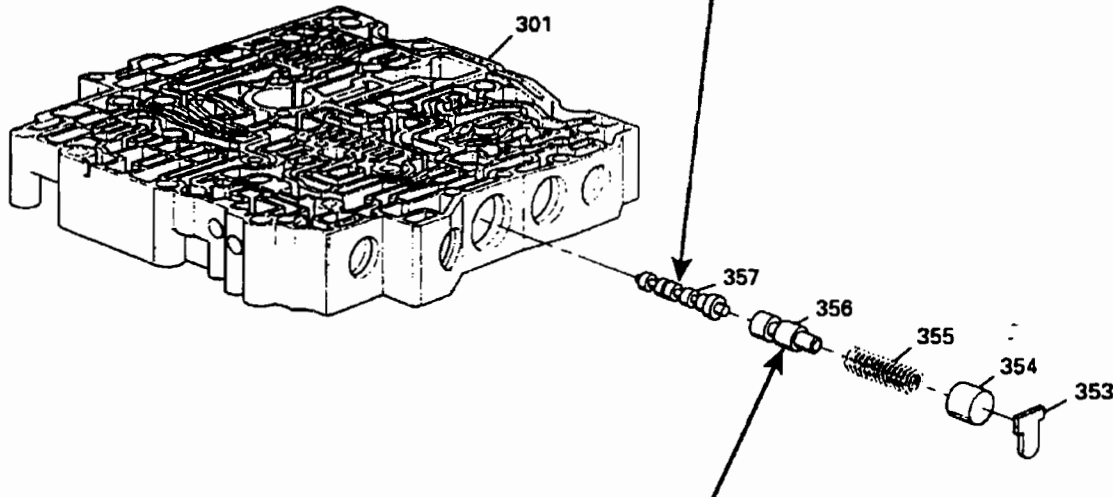
Figure 59



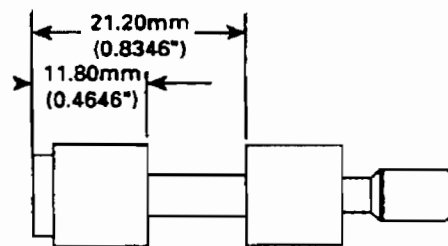
1991 - 1992 2/3 SHIFT VALVE



1993 2/3 SHIFT VALVE

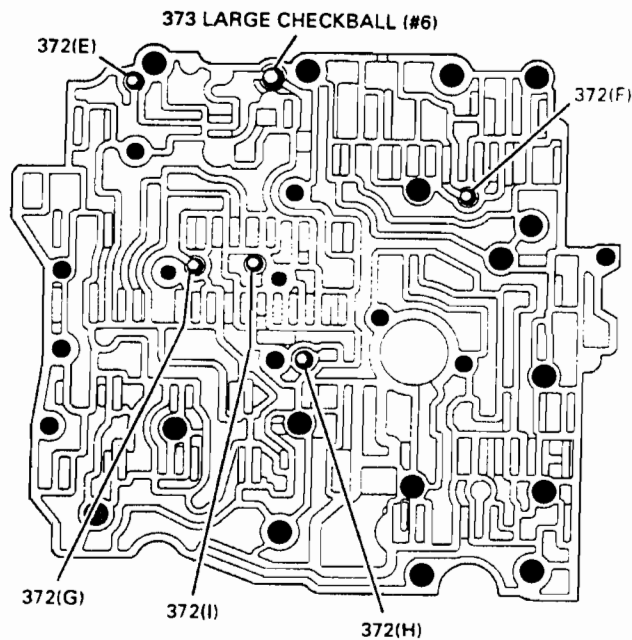


1991 - 1992 3/2 MANUAL  
DOWNSHIFT VALVE

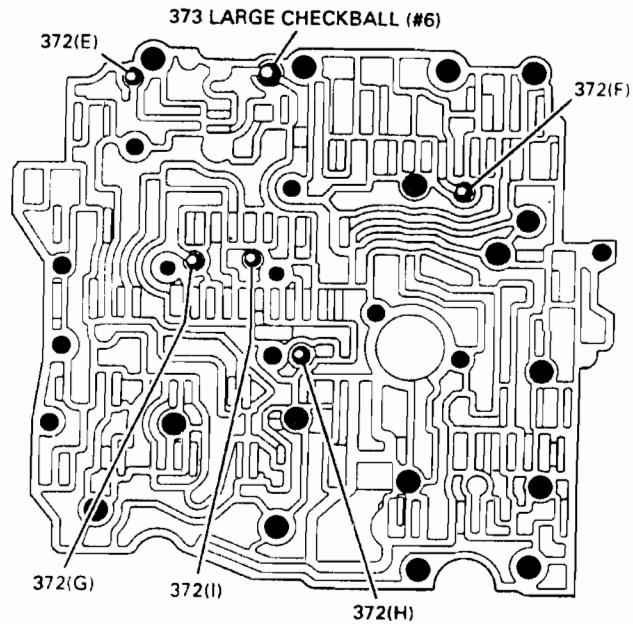


1993 3/2 MANUAL  
DOWNSHIFT VALVE

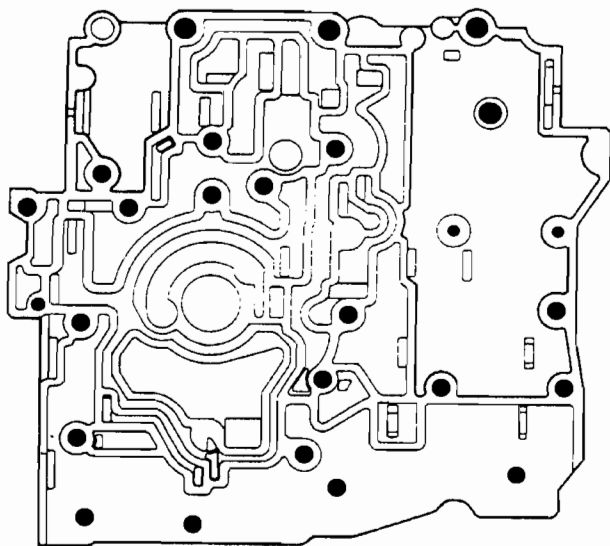
Figure 60



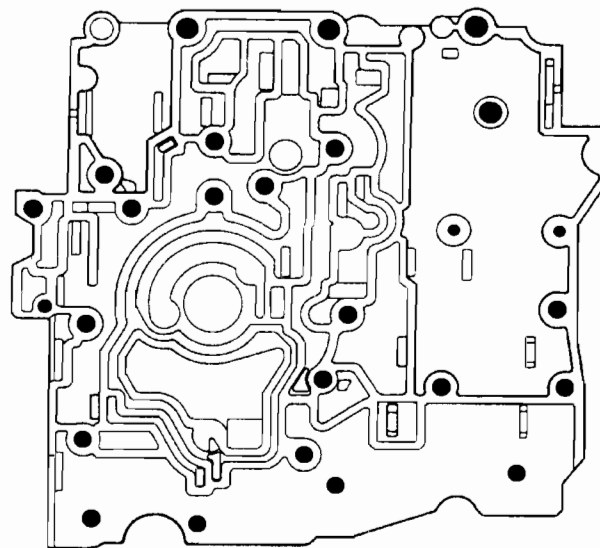
1991 - 92 VALVE BODY  
(CHANNEL PLATE SIDE)



1993 - 94 VALVE BODY  
(CHANNEL PLATE SIDE)



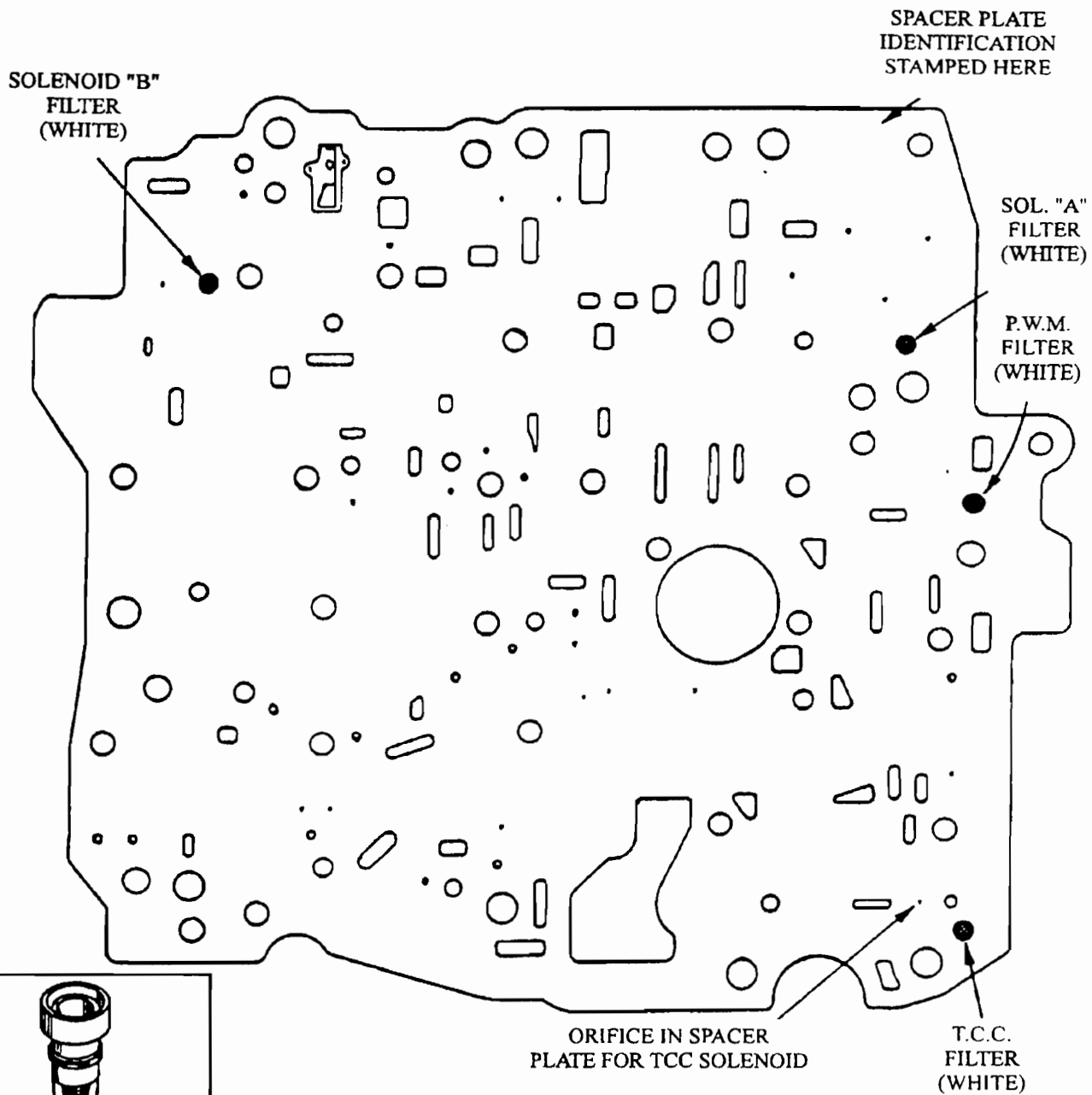
1991 - 92 VALVE BODY  
(PUMP SIDE)



1993 - 94 VALVE BODY  
(PUMP SIDE)

Figure 61

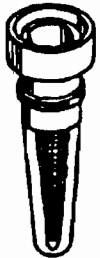
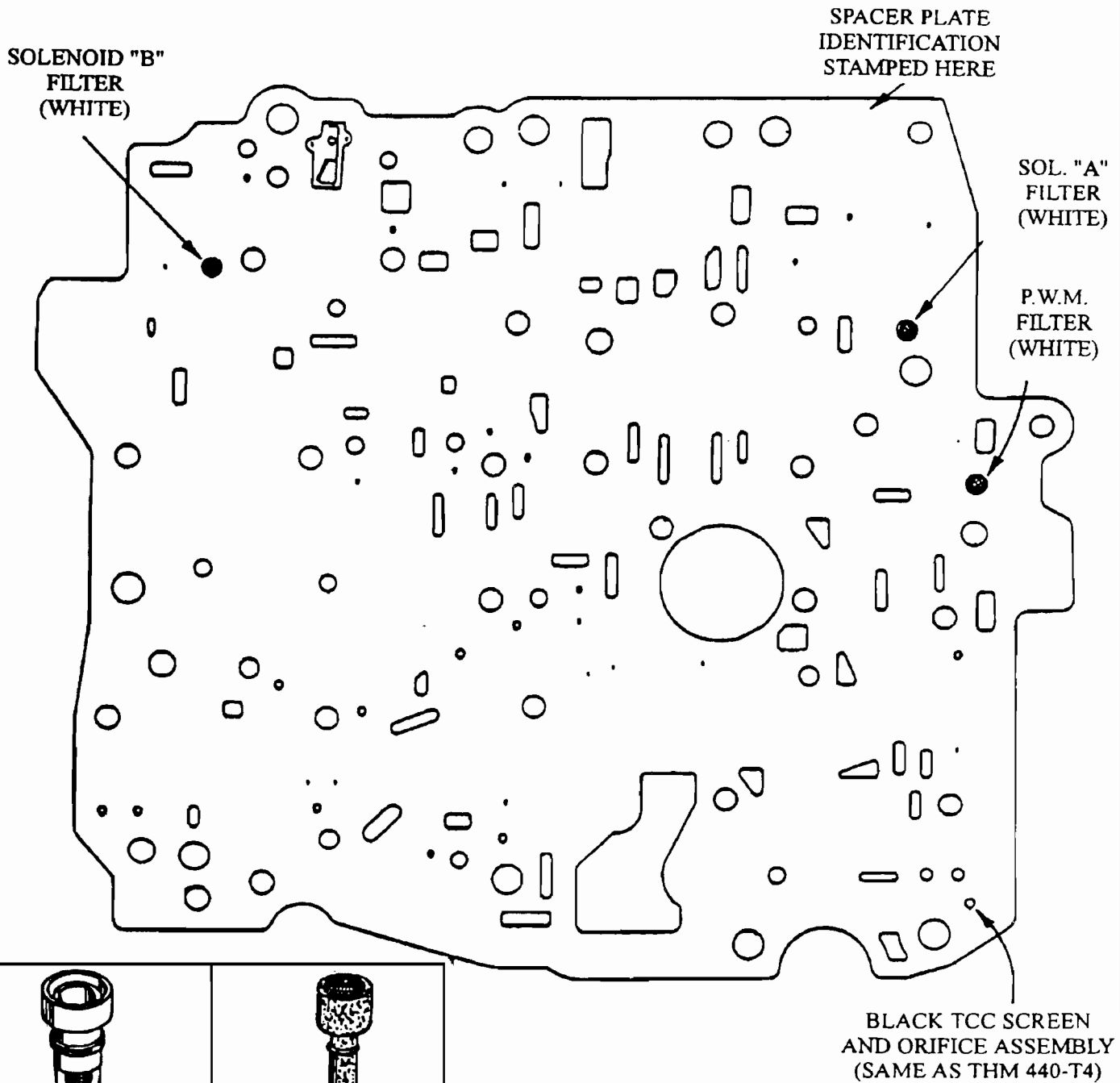
91 -92 HYDRAULICS SPACER PLATE



WHITE SCREEN  
8651658

Figure 62

93 - 94 HYDRAULICS SPACER PLATE



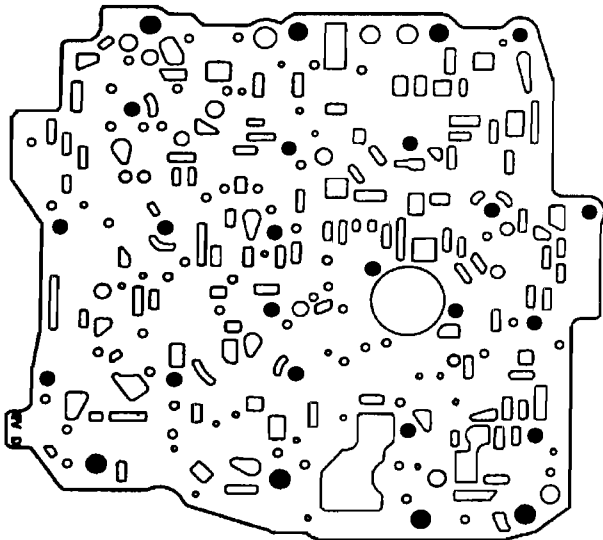
WHITE SCREEN  
8651658



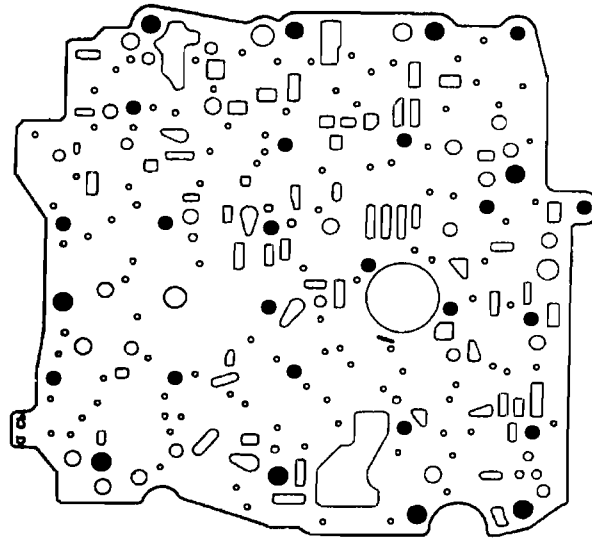
BLACK SCREEN  
8658060

Figure 63

91 - 92 SPACER PLATE GASKETS

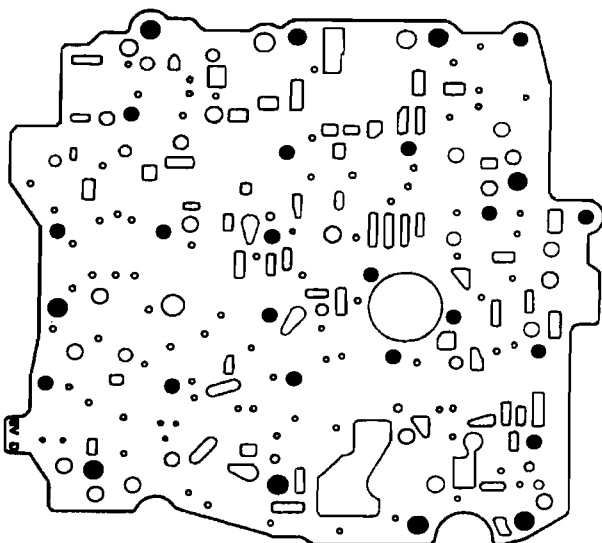


1991 - 92 GASKET  
(VALVE BODY TO SPACER PLATE)  
INK STAMPED 8678762

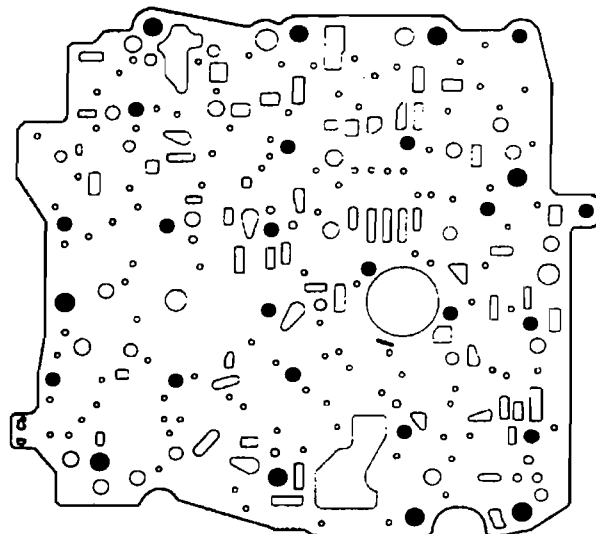


1991 - 92 GASKET  
(SPACER PLATE TO CHANNEL PLATE)  
INK STAMPED 8678761

93 - 94 SPACER PLATE GASKETS



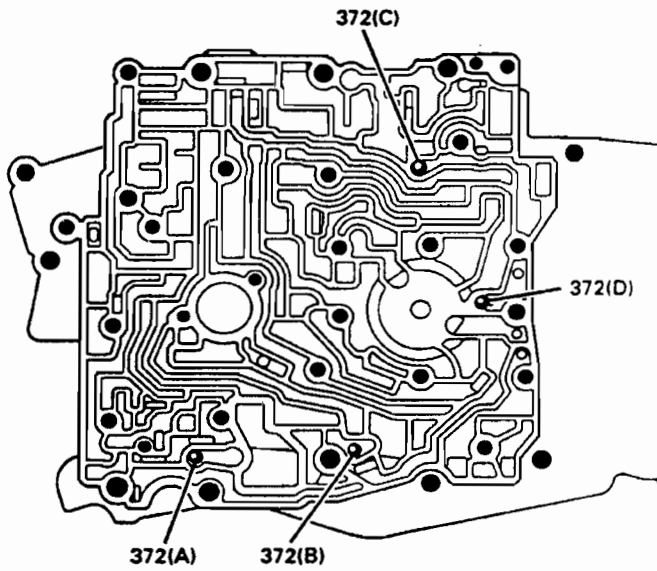
1993 - 94 GASKET  
(VALVE BODY TO SPACER PLATE)  
INK STAMPED 8682281



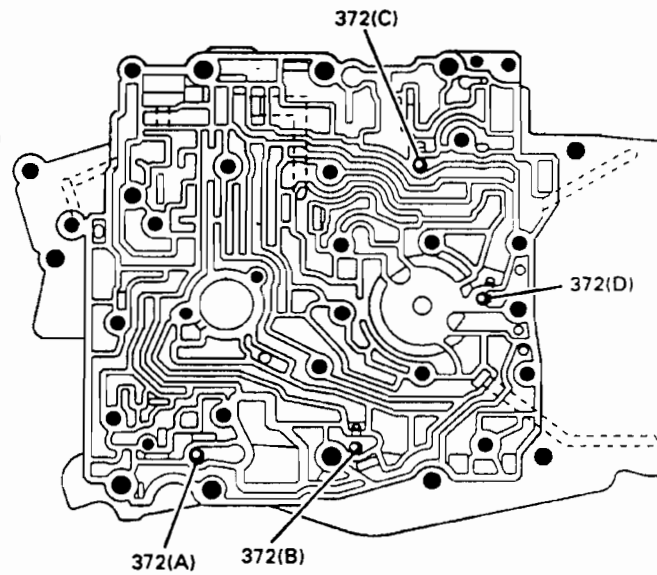
1993 - 94 GASKET  
(SPACER PLATE TO CHANNEL PLATE)  
INK STAMPED 8682280

Figure 64

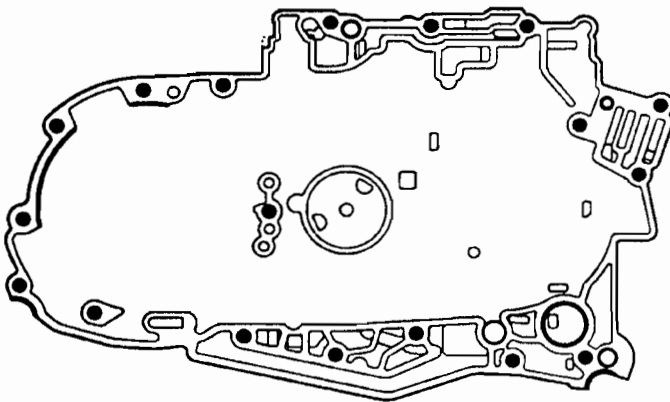




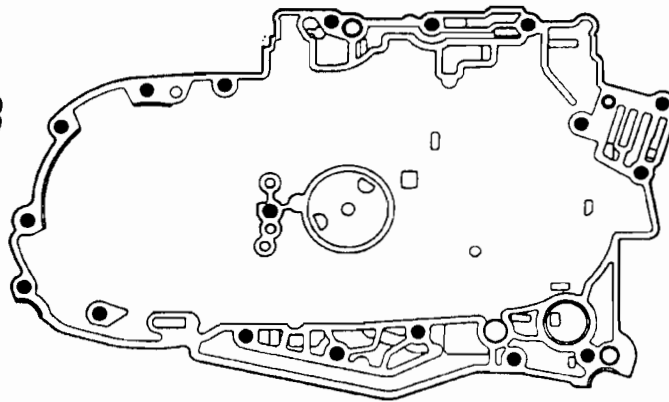
1991 - 92 CHANNEL PLATE  
(VALVE BODY SIDE)



1993 - 94 CHANNEL PLATE  
(VALVE BODY SIDE)



1991 - 92 CHANNEL PLATE  
(CASE SIDE)



1993 - 94 CHANNEL PLATE  
(CASE SIDE)

Figure 65

91 - 92 HYDRAULICS = 8667284  
93 - 94 HYDRAULICS = 8682217

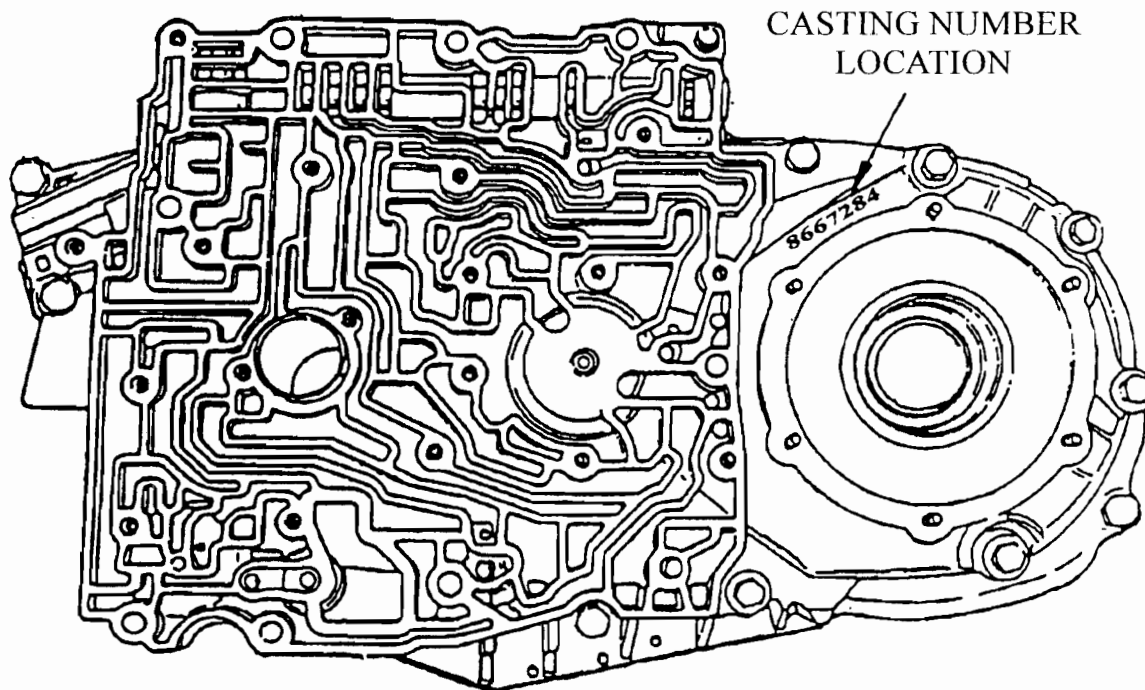
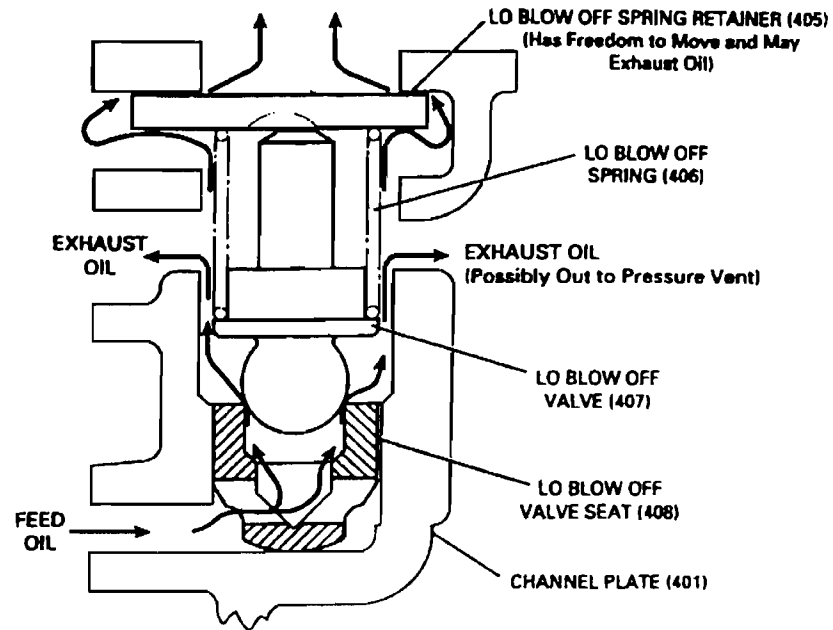
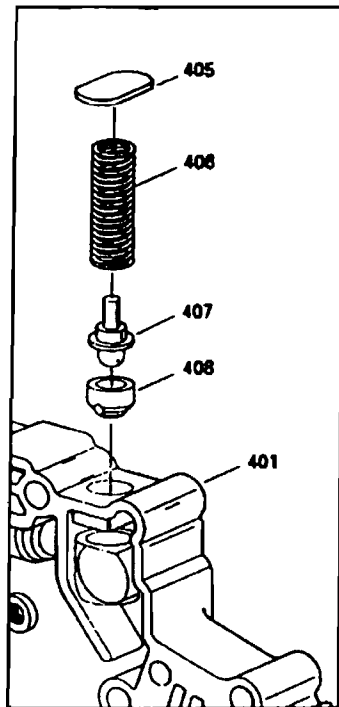
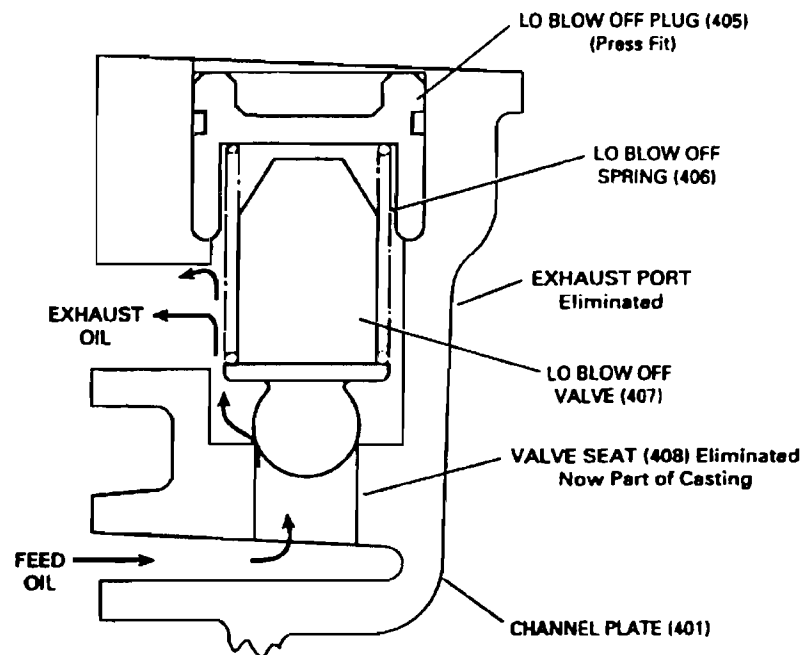
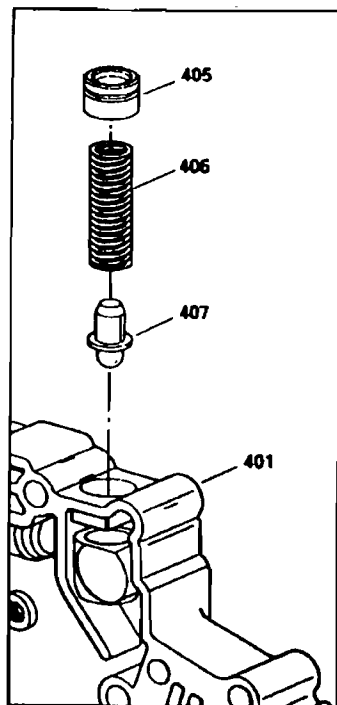


Figure 66



91 - 92 LO BLOW OFF VALVE AND SEAT



93 - 94 LO BLOW OFF VALVE AND SEAT

Figure 67

# Transmission Troubleshooting Breakthrough

## Snap-on Tools Adds Automatic Transmission Troubleshooting Capability to Hand-held Scan Tool

Kenosha WI—Snap-on Tools Corporation has introduced a unique solution to diagnosing and repairing automatic transmission problems with a hand-held scan tool, the *Fast-Track Transmission Troubleshooter*.

The *Fast-Track Transmission Troubleshooter* system consists of a single cartridge for the Snap-on MT2500 Scanner, and the accompanying *Fast-Track User's Manual*.

### Proven Methods

The *Transmission Troubleshooter* is the first vehicle diagnostic system that specifically addresses automatic transmission diagnosis and repair needs.

The first in the next generation of *Fast-Track Troubleshooter* products, the *Transmission Troubleshooter* follows the proven methods of previous *Fast-Track Troubleshooters*. Experienced and first-time users, alike, will find using the *Transmission Troubleshooter* to be easy, fast, and effective.

### Offers New Capability To General Repair Shops

"Is this an engine problem or a transmission problem?" No longer does the general repair shop need to send a possible transmission problem down the street for further diagnosis.

The *Transmission Troubleshooter* is based on the real-world experience of master transmission technicians. The *Troubleshooter* helps determine if the symptoms are engine or transmission-related. On-line maintenance tips also include recommended service intervals.

### A Must For The Transmission Specialty Shops

Electronically-controlled transmissions are now common production technology for all carmakers, and the Snap-on Scanner is already the tool of choice for many transmission shops.

The GM, Ford, and Chrysler primary cartridges for the MT2500 Scanner already offer automatic code gathering, data parameter monitoring, and many functional tests necessary for diagnosing problems in electronically-controlled transmissions.

The *Transmission Troubleshooter* takes using a scan tool beyond problem diagnosis; the *Troubleshooter* also offers repair and rebuild information.

Most other sources of information are based on factory service manuals, and typically don't include field experience. The *Troubleshooter* is based on field experience, and offers the insight of specialists working on transmissions every day. Not only does the *Troubleshooter* offer the most efficient and effective way to repair and rebuild transmissions, but it also offers insight into the techniques used to prevent those unwanted (and now unnecessary!) comebacks.

### A Single Cartridge For GM, Ford, and Chrysler Vehicles

The *Transmission Troubleshooter* cartridge contains an on-line checklist of troubleshooting tips for common transmission problems on GM, Ford, and Chrysler vehicles. The 3-in-1 cartridge is used in tandem with any of the Snap-on domestic primary cartridges (GM, Ford, or Chrysler).

### The User's Manual

The reference bulletins in the 128-page *User's Manual* contain additional information to support many *Troubleshooter* tips when special instructions, specifications, or other information is required. The reference bulletins are compiled primarily from the experience of master transmission technicians, as well as from information in carmakers' service manuals, technical service bulletins, and independent sources of service data (including telephone helplines).

### "User-Friendly" Organization

The *Transmission Troubleshooter* gives you specific tips for specific problems, on specific transmissions. Each transmission menu in the *Transmission Troubleshooter* is organized with a "Read First" introduction followed by four major sections that group the tips and other information into basic categories:

- Section 1 contains tips for frequently seen symptoms and codes, as well as road testing tips.
- Section 2 contains factory-recommended service information, leak tips, and adjustments that you can make while the transmission is in the vehicle.
- Section 3 contains tips for transmission removal and repair, including subassembly inspection and repair tips. Also included in this section are case and valve body tips.
- Section 4 contains technical information such as, adjustment and test procedures, specifications, listings of related service bulletins, and commonly used abbreviations.

The checks in each *Transmission Troubleshooter* tip begin with the most likely cause of a problem or with the tests that should be made first. The checks then progress through other possible causes and tests. All checks in a tip are common causes of a problem or important basic tests, and the most important are listed first.

### Order Today

To order the MT2500-6992 *Transmission Troubleshooter*, or to get more information on the MT2500 Scanner and *Fast-Track Troubleshooter* systems, contact your local Snap-on Dealer, or contact Snap-on Tools Corporation at (800) 424-7226.

**Phone: (800) 424-7226 for more information today.**

**Snap-on**<sup>®</sup>

© 1993 Snap-on Tools Corporation, Kenosha, WI.

**New Product**  
Now Available  
**Asian Import Fast-Track™ Transmission**  
(Model MT2500-6493)  
—Ask your dealer  
for details!

CHANGE: Beginning at Start Of Production for 1993 THM 4T60 and THM 4T60-E transaxles, all models were produced with a revised oil pump pivot pin and pump casting.

REASON: Cost savings to produce.

PARTS AFFECTED:

- (1) OIL PUMP PIVOT PIN - Now has a groove machined around the diameter of the pivot pin to establish the air bleed in the decrease oil circuit, as shown in Figure 68.
- (2) PUMP CASTING - The threaded brass air bleed plug that screwed into the pump casting has been eliminated, as shown in Figure 68. This hole is now cast shut.

INTERCHANGEABILITY:

- (1) When servicing models WITH the brass air bleed plug, the SOLID pivot pin MUST be used.
- (2) When servicing models WITHOUT the brass air bleed plug, the GROOVED pivot pin MUST be used (See Figure 68).

SERVICE INFORMATION:

Solid Oil Pump Pivot Pin .....8649477

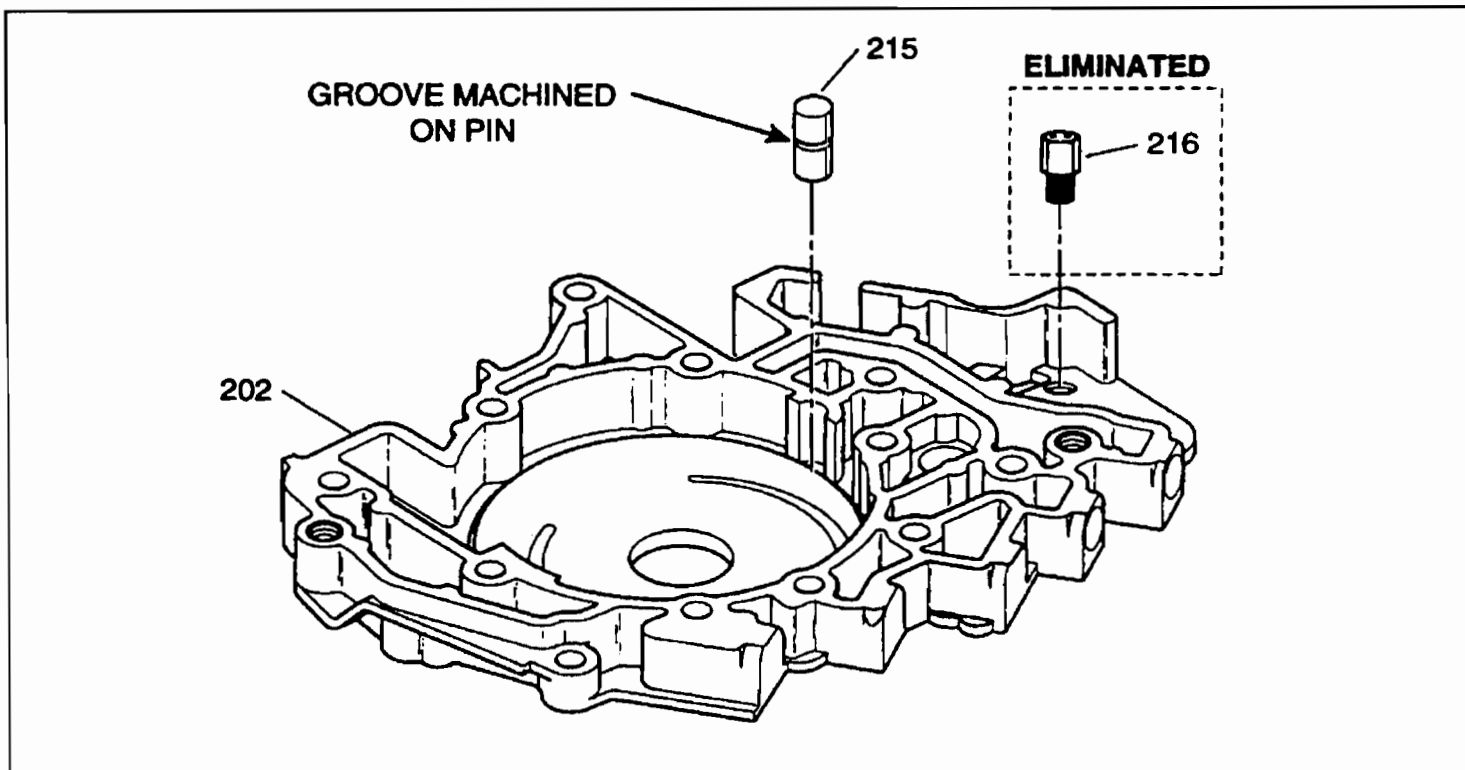


Figure 68



**CHANGE:**Beginning at Start Of Production for 1994, all THM 4T60-E transaxles have a re-designed Vehicle Wiring Harness, a re-designed Internal Transaxle Wiring Harness, and the pins in the 7-way case connector DO NOT have the same function as the previous models. There is also one 1993 pull-ahead model, 3BHW, used in the Oldsmobile Cutlass Supreme with the 3.1L engine, that uses the re-designed wiring.

**REASON:** The addition of the temperature sensor in the 1994 model transaxles created the need for the wiring to be totally re-designed. Since the temperature sensor required two pins on the case connector and only one was available, it became necessary to combine the 12V power source on one pin "E", instead of the previous two pins "A" & "E".

**PARTS AFFECTED:**

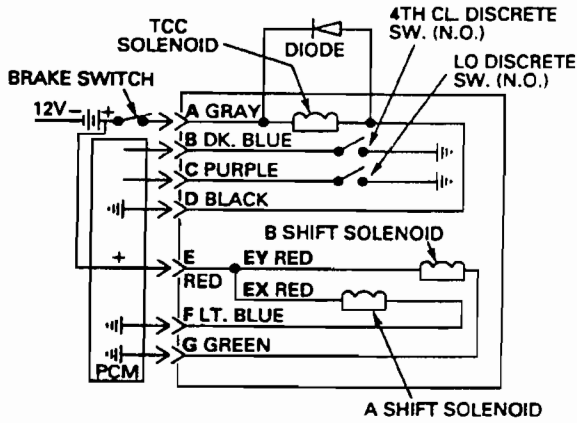
- (1) **VEHICLE WIRING HARNESS** - Cavity function changes to accommodate the new design wiring, as shown in Figure 69, which includes both previous and the new design electrical schematics.
- (2) **INTERNAL TRANSAXLE WIRING HARNESS** - Cavity function changes to accommodate the re-designed wiring. Refer to Figures 70, 71, 72, and 73, which will depend on the model you are working on.
- (3) **TEMPERATURE SENSOR** - Added internally to the transaxle to give the PCM transaxle temperature information. There are 2 different types of the temperature sensor. One sensor is screwed into the channel plate near the TCC accumulator bore and monitors cooler fluid temperature. Refer to Figure 73 for this sensor. The other type sensor is incorporated into the wiring harness and clips to the valve body spacer plate, as shown in Figure 70. Regardless of which type temperature sensor you have, the wires will go through terminals "F" & "G" in the new case connector.

**INTERCHANGEABILITY:**

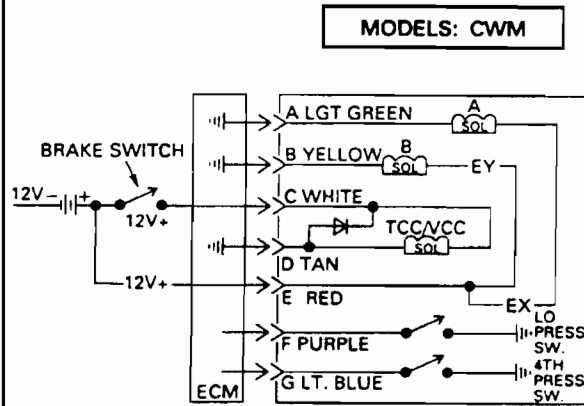
NONE OF THE PARTS LISTED ABOVE ARE INTERCHANGEABLE WITH ANY OF THE PREVIOUS DESIGN LEVEL PARTS, AS DAMAGE TO ELECTRICAL SYSTEM AND COMPONENTS CAN OCCUR.

**WARNING:** NONE OF THE BREAK-OUT BOXES CURRENTLY AVAILABLE FROM THEAFTERMARKET SOURCES AND USED TO SHIFT THE TRANSAXLE THRU THE SHIFT PATTERN. ARE COMPATABLE WITH 1994 MODEL 4T60-E, DAMAGE TO THE ELECTRICAL COMPONENTS AND/OR BREAK-OUT BOX MAY OCCUR.

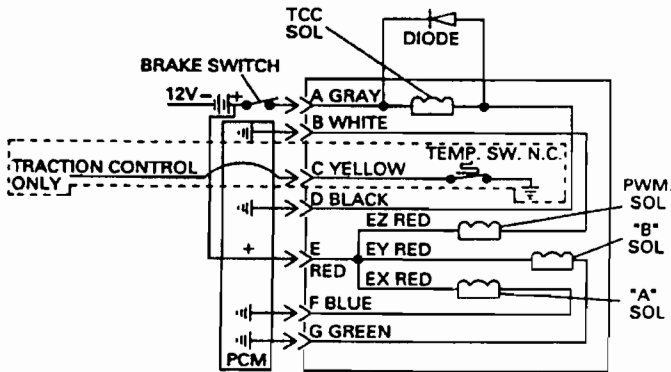
### 1991 - 1993 PRESSURE SWITCH MODELS



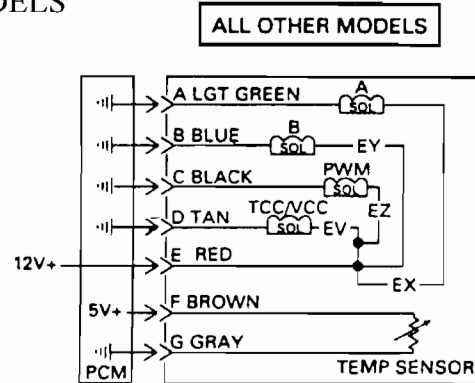
### 1994 PRESSURE SWITCH MODELS



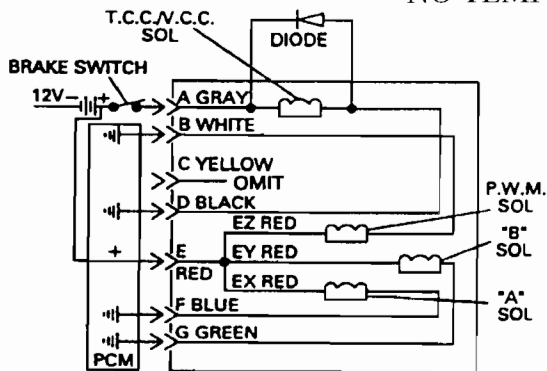
### 1993 TEMP SENSOR MODELS



### 1994 TEMP SENSOR MODELS



### 1993 NO TEMP SENSOR MODELS



### 1994 NO TEMP SENSOR MODELS

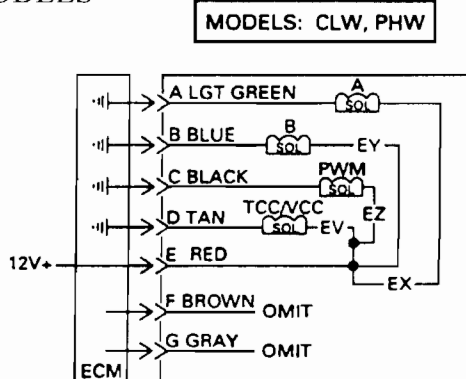


Figure 69



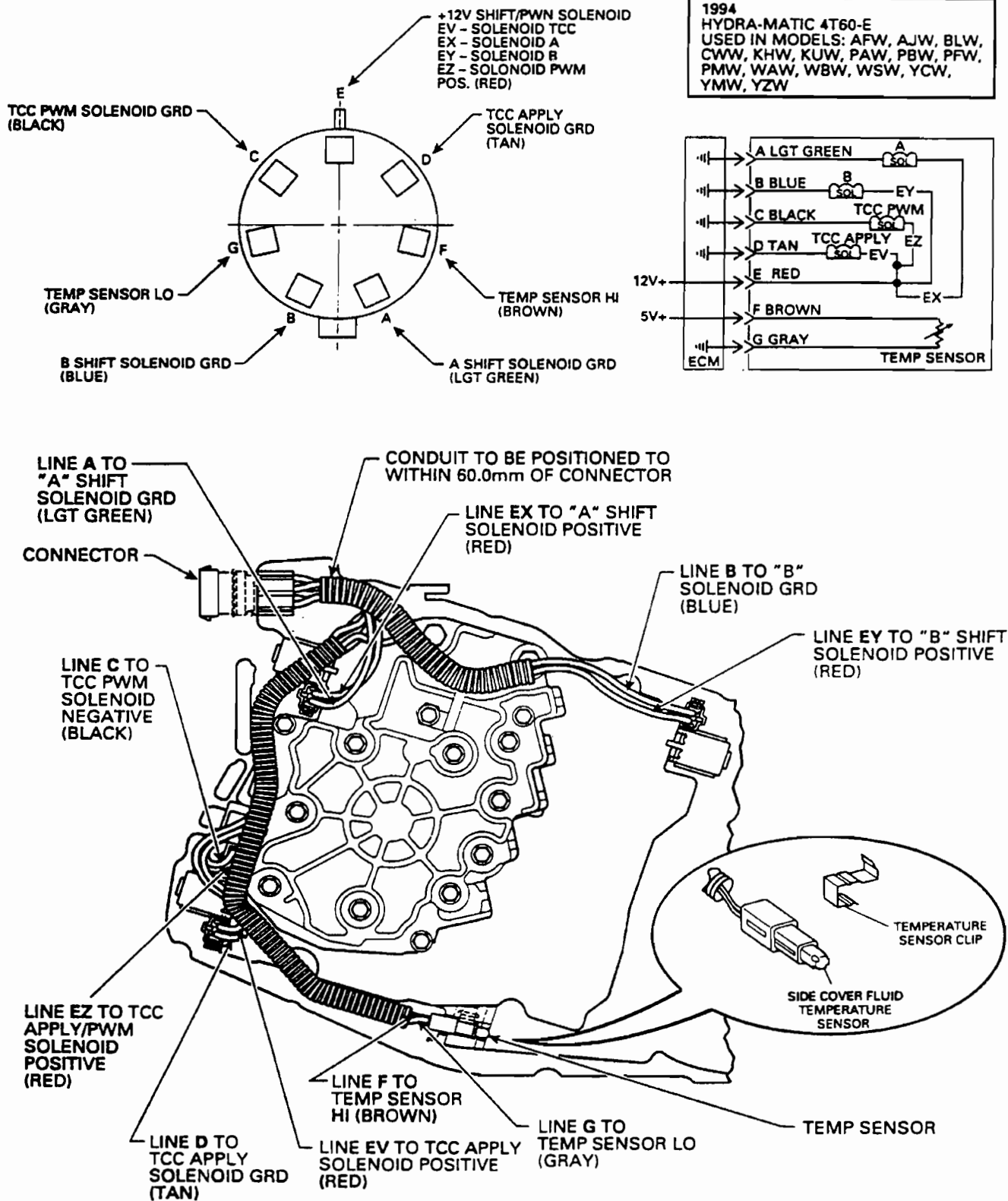


Figure 70

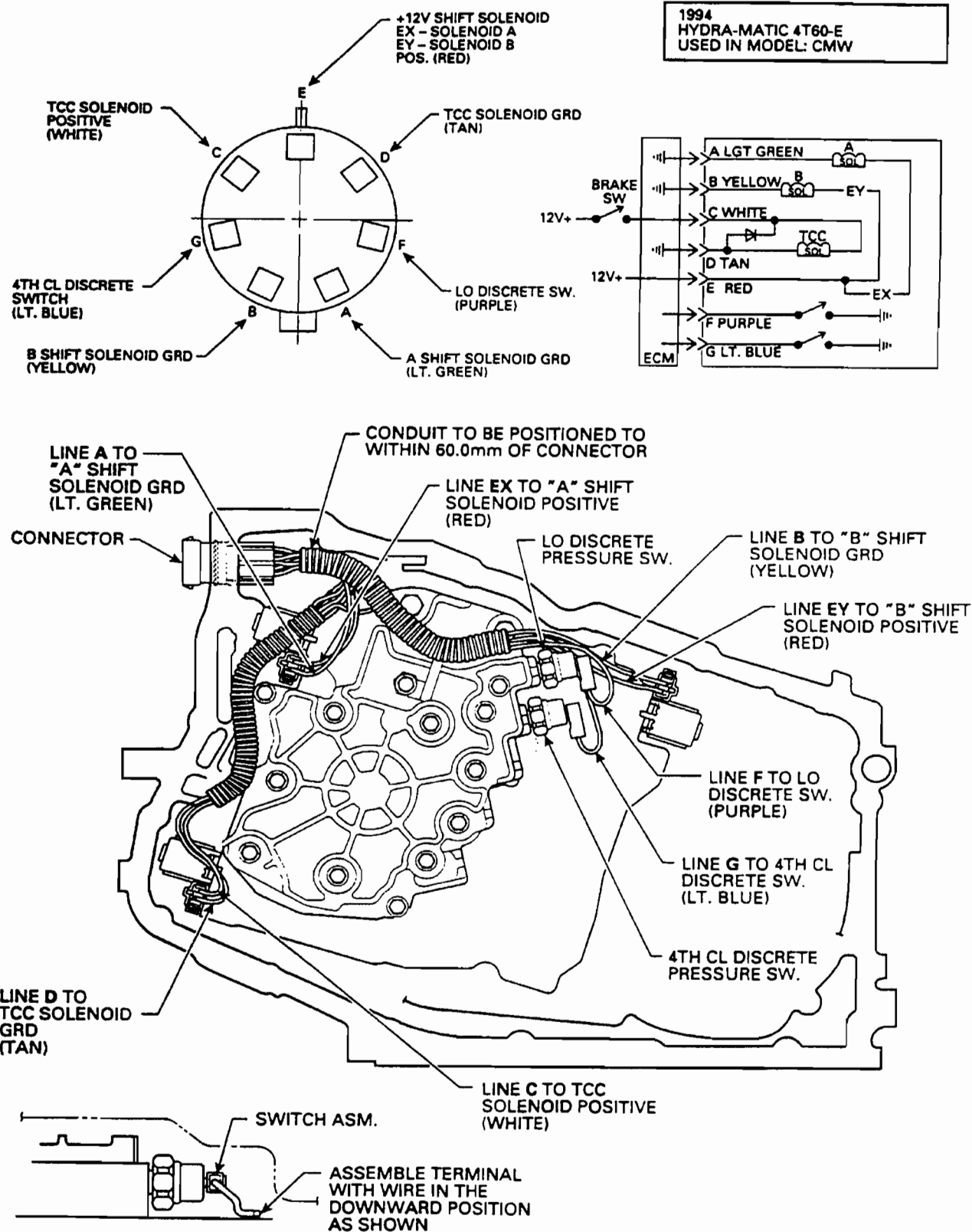


Figure 71

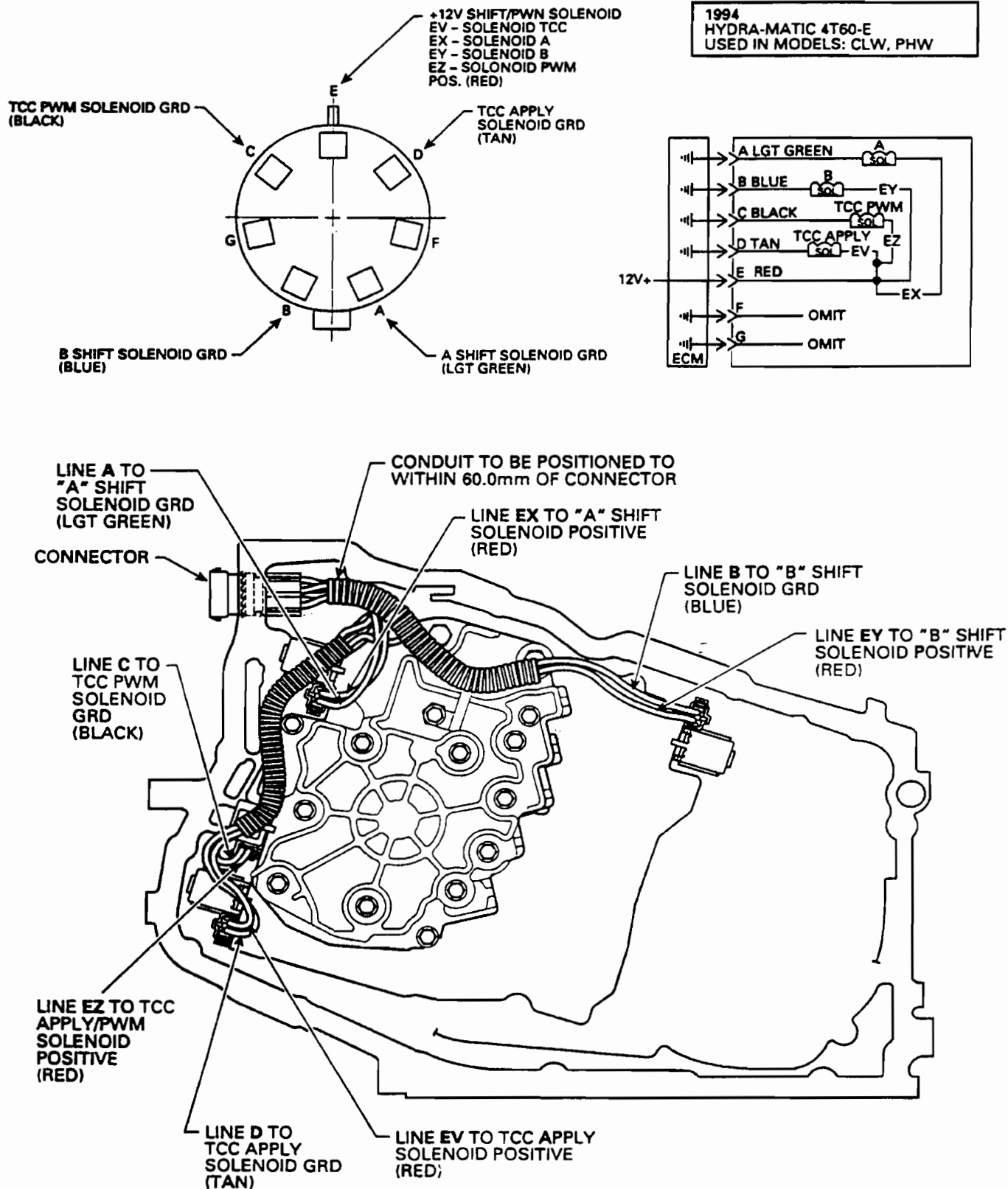


Figure 72

1994 MODEL: ATW

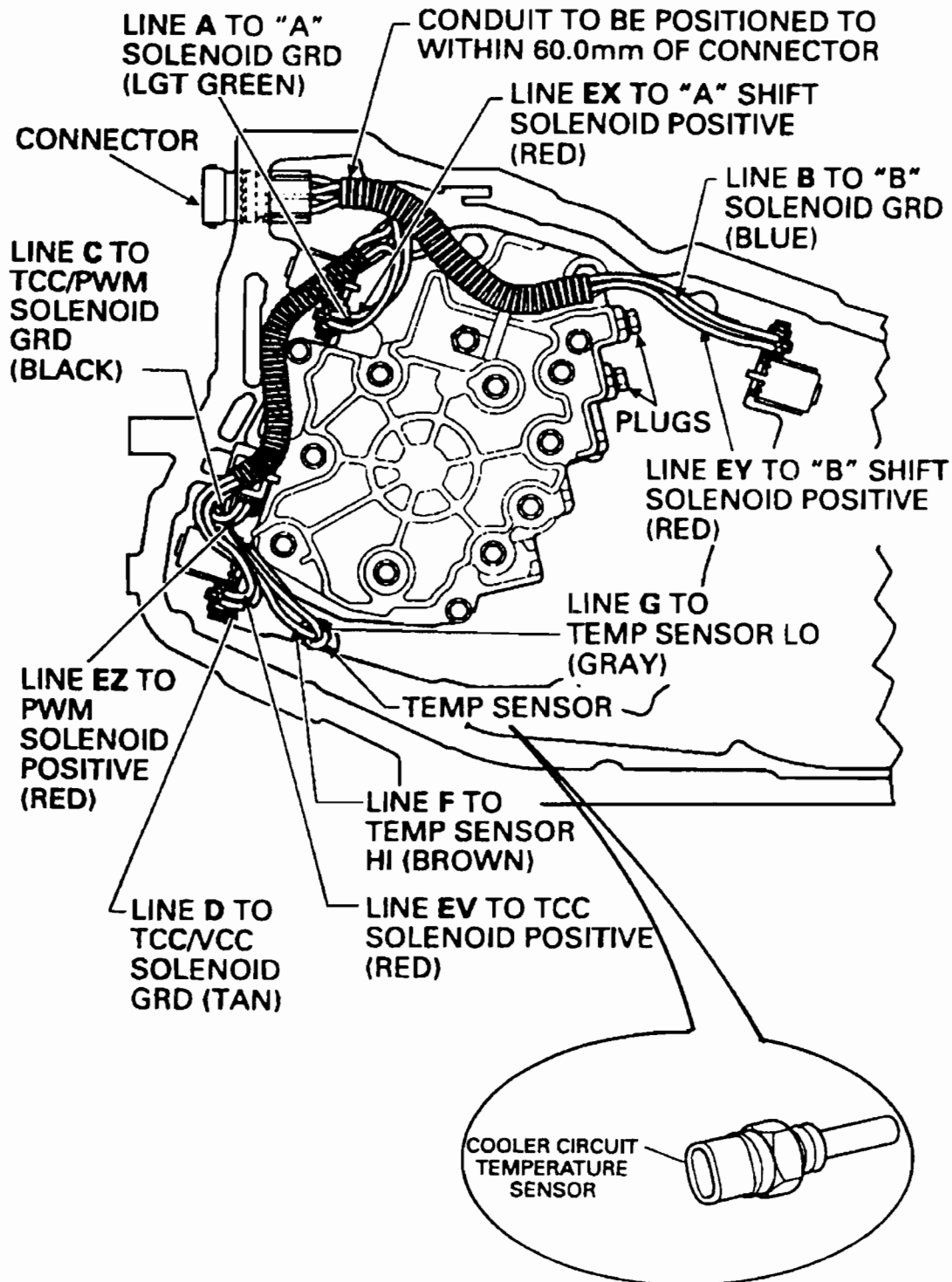


Figure 73

1995 SEMINAR INFORMATION  
SLIDE  
THM 4T60-E  
TORQUE CONVERTER DISCOLORATION

**COMPLAINT:** Some 1991-1994 vehicles equipped with the THM 4T60-E transaxle, may display a torque converter that is discolored, and turned Blue or Black.

**CAUSE:** The cause may be, the plastic spring retainer located inside of the "TO COOLER" (Large) fitting has melted, and is blocking and/or restricting cooler flow.

**CORRECTION:** Remove the "TO COOLER" (Large) fitting and inspect the spring retainer inside the fitting, as shown in Figure 74. If the spring retainer is plastic and/or melted, replace the fitting with OEM part number 24202550, which has a steel retainer. It is advisable to replace the "TO COOLER" fitting, even if the spring retainer is not melted, IF it has the plastic spring retainer. If the spring retainer IS melted, the cooler in the radiator needs a thorough flushing, and possibly replacement.

**SERVICE INFORMATION:**

Cooler Line Fitting (Steel Spring Retainer) .....24202550

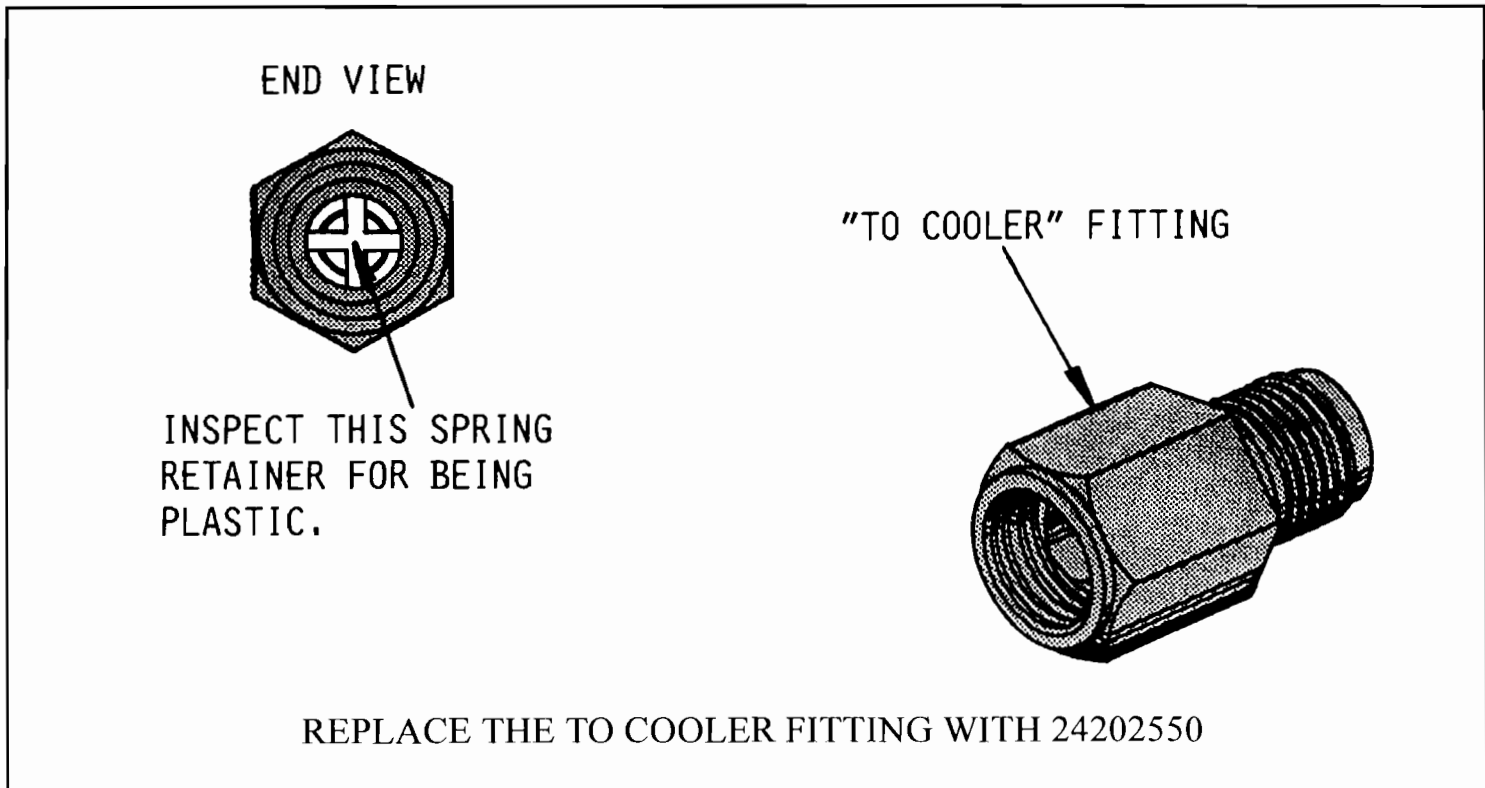


Figure 74



## FORD E4OD NEW DESIGN CENTER SUPPORT SERVICE KIT WITH BALL BEARING

### CHANGE

There is now available, from FORD MOTOR Co., a new design center support service kit with a ball bearing in the center support. This new service package is available under OEM part number **F4TZ-7A130-B**, and will service all past model E4OD transmissions, 1989 thru 1994 model years only. The parts in this service kit are different dimensions than 1995 model year production parts. Refer to Figure 1 for service kit contents.

The reason for this update is to increase the transmission durability.

### PARTS AFFECTED:

**(1) Center Support**-Different machining dimensions on the inside bore, to accommodate an added ball bearing that will now support the overdrive center shaft. The new design ball bearing center support assembly can be identified as a service part, by the letter "S" stamped on the hub, in the location shown in Figure 2. The service kit Ball Bearing Center Support has a different dimensions than 1995 production ball bearing center support. Refer to Dimension "A" on cutaway drawing in Figure 2.

**(2) Overdrive Center Shaft**-Different machining dimensions on the center shaft to accommodate the added ball bearing, and the pilot on the center shaft has been removed. The new design Overdrive Center Shaft can be identified as a "Service Part", by the letter "S" stamped on the shaft in one of two places, as shown in Figure 3. The Service Kit Overdrive Center Shaft has different dimensions than the 1995 model year production overdrive center shaft, as shown in Figure 3.

**SPECIAL NOTE;** There is also an updated Overdrive Carrier and Input Shaft, available under OEM part number **F4TZ-7B446-B**, to help improve durability. Both pieces have different dimensions than the previous parts, as shown in Figure 6. The new overdrive carrier hub is 12mm (.472) shorter than the previous model, and the internal splines now run the full length of the hub. The Input Shaft is also 12mm (.472) shorter than the previous models, to accommodate the new overdrive carrier, and has I.D. groove cut shaft for identification see Figure 6.

**(3) Output Shaft**-Small bushing **MUST** be removed and the orifice cup plug included in the service kit **MUST** be installed, to accommodate the removal of the pilot from the overdrive center shaft. This will now ensure that lube oil will be directed to the proper areas. Refer to Figure 4 for the bushing removal and orifice cup plug installation.

The orifice cup plug in this service kit is different dimensions than the 1995 production models, and will **ONLY** an output shaft that had the bushing.



### PARTS AFFECTED:

(4) **No. 5 Needle Bearing**-Make certain the No.5 Needle Bearing from service kit is installed with the service kits parts **REGARDLESS** of whether your unit had one or did not have one. Some 1994 model year transmissions were built with some or all of the parts that "the number 5 needle bearing. Make certain that the number 5 needle bearing from the service kit is installed.

### INTERCHANGEABILITY:

(1) This service kit will service all past model E4OD transmissions 1989 thru 1994 model years, when used in its entirety, and is recommended.

(2) The parts in the Service Kit are different dimensions than the 1995 model year production parts and **WILL NOT** interchange with them see Figures 2 and 3.

(3) Some 1994 model year transmissions were built with some or all of the parts that "**Resemble**" the parts in this service kit. When servicing these units use all of the parts in this kit **EXCEPT** , , the orifice cup plug in the output shaft and it is different diameter. The service kit orifice cup plug will fit **ONLY** an output shaft that had a bushing.

(4) The Overdrive Carrier Assembly and Input Shaft are matching components and **MUST** be serviced as a package.

#### **DO NOT MIX LONG AND SHORT COMPONENTS**

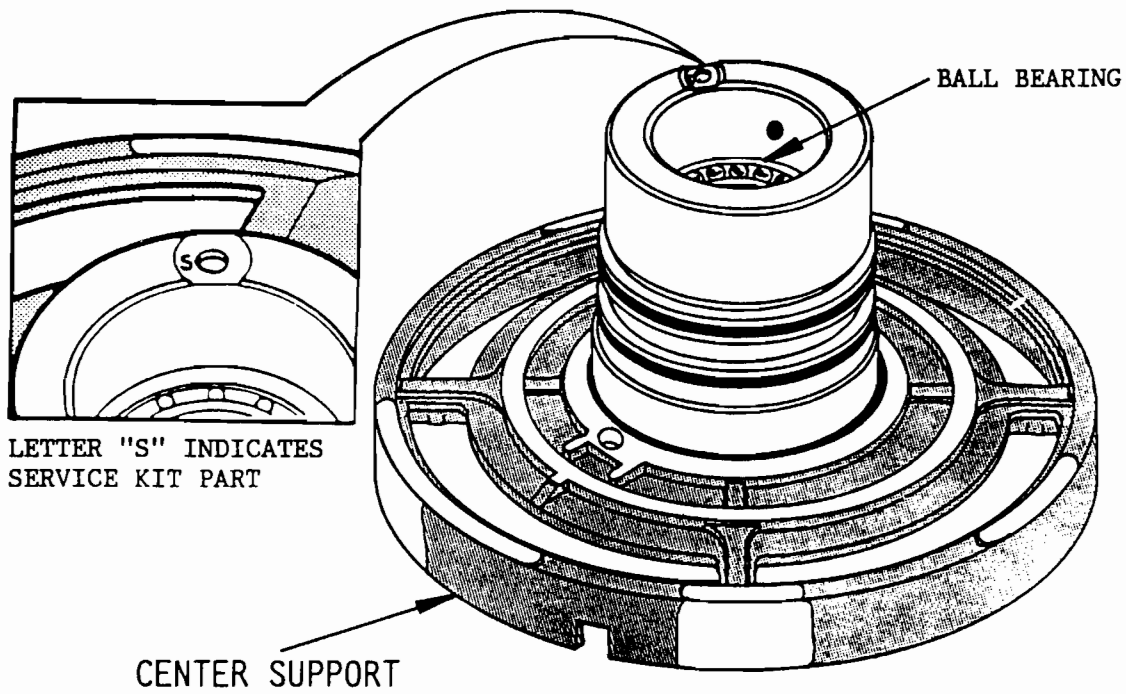
Refer to Figure 7 to ensure that you have built the unit with the matching components. The Input Shaft must extend 1.5" past the end of the oil pump stator, if the correct input shaft and overdrive carrier were used. Refer to Figure 7 for proper assembly dimensions.

### SERVICE INFORMATION

Ball bearing Center Support Service Kit  
Overdrive Carrier / Input Shaft Service Kit

F4TZ-7A130-B  
F4TZ-7B446-B

F4TZ-7A130-B SERVICE KIT CONTENTS



THE LETTER "S" COULD BE IN EITHER LOCATION. THE "S" INDICATES SERVICE KIT PART

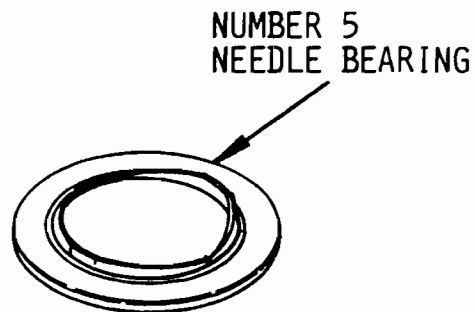
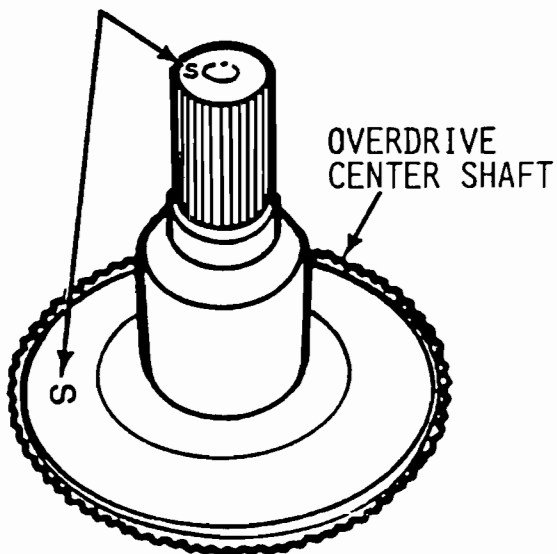
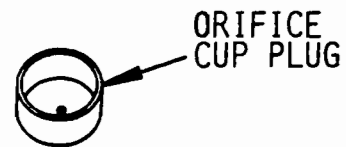
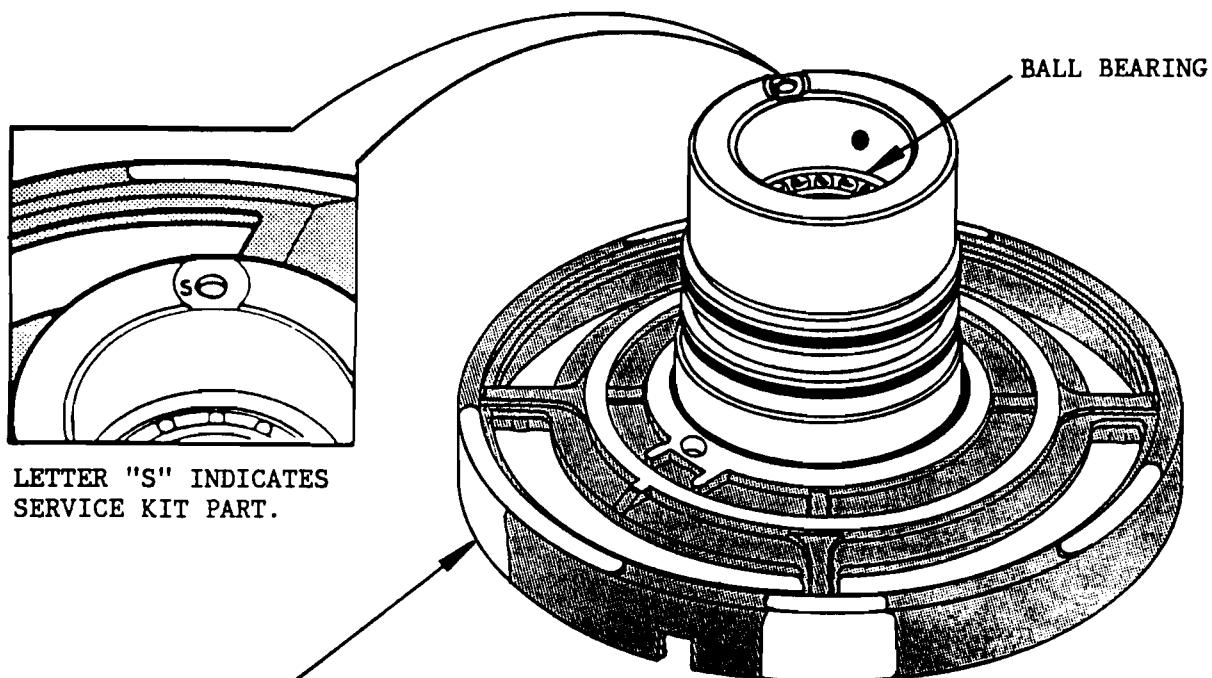


Figure 1

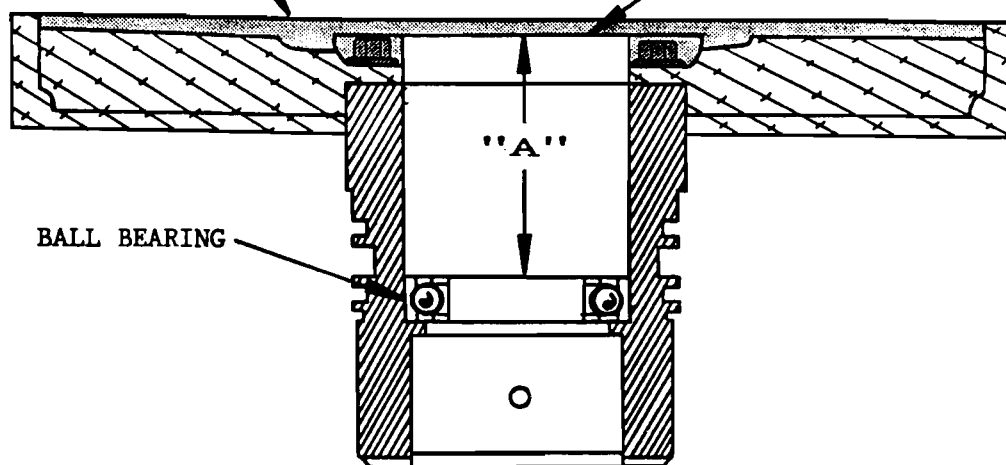


# BALL BEARING CENTER SUPPORT



CENTER SUPPORT

NO. 5 NEEDLE BEARING SURFACE.



DIMENSION "A"

SERVICE KIT PART = 2.062"  
1995 PRODUCTION = 1.838"

Figure 2

# OVERDRIVE CENTER SHAFT

## DIMENSION "A"

SERVICE KIT PART = 1.938"  
1995 PRODUCTION = 1.710"

## DIMENSION "B"

SERVICE KIT PART = 2.368"  
1995 PRODUCTION = 2.592"

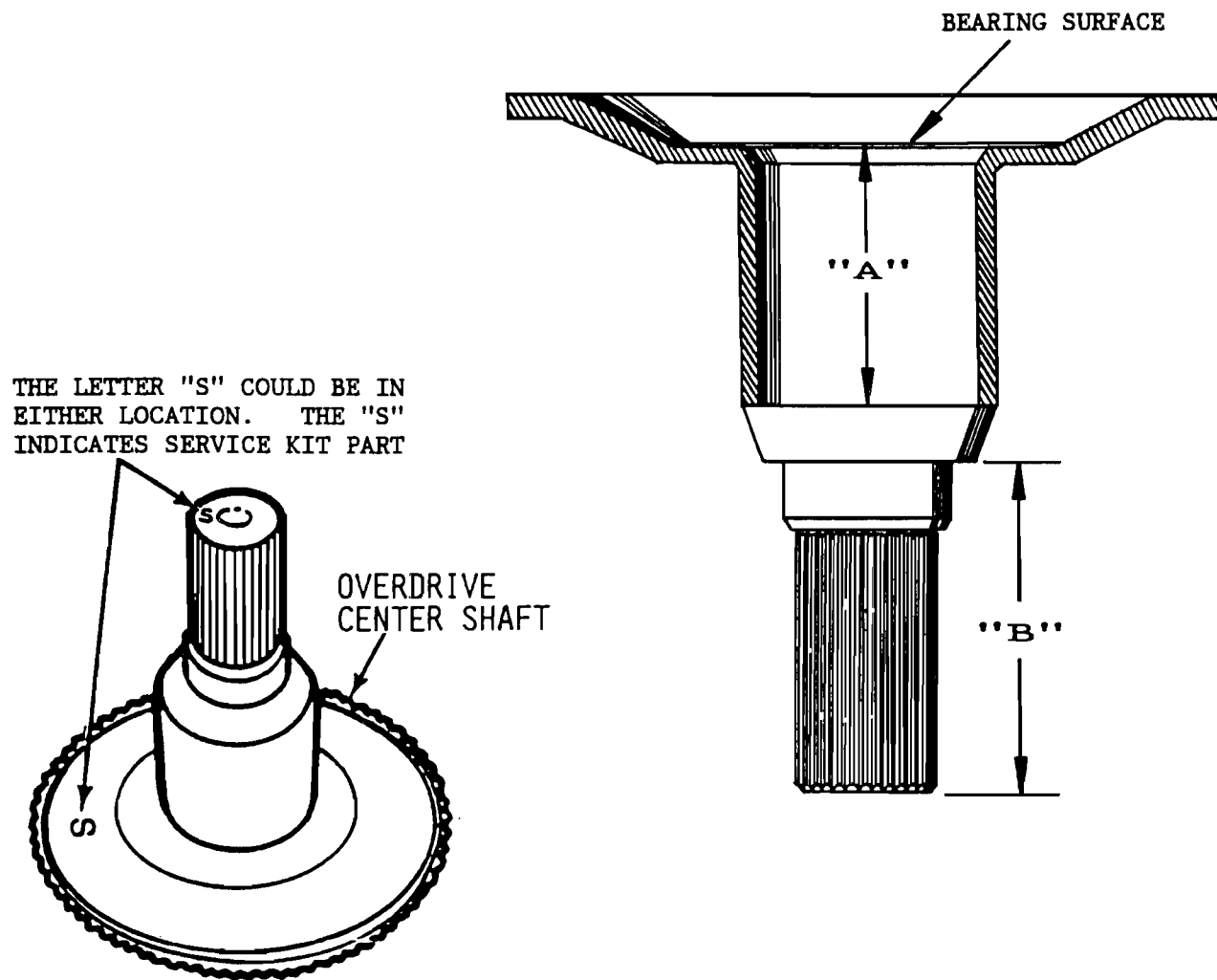
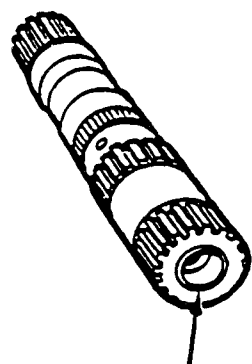
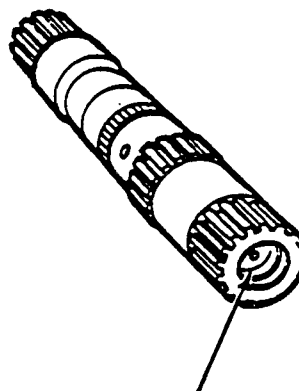


Figure 3

OUTPUT SHAFT

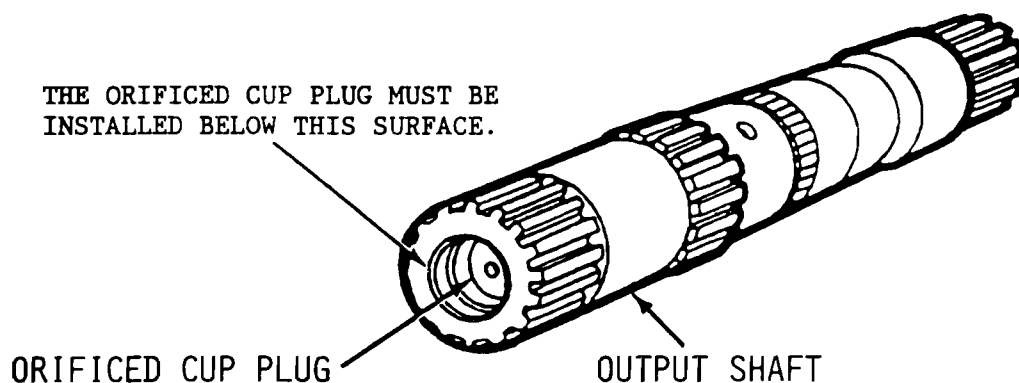


REMOVE BUSHING



INSTALL ORIFICED CUP PLUG  
FROM SERVICE KIT

THE ORIFICED CUP PLUG MUST BE  
INSTALLED BELOW THIS SURFACE.



NOTE: THE ORIFICED CUP PLUG IN THIS SERVICE KIT IS DIFFERENT  
DIMENSIONS THAN 1995 PRODUCTION MODELS, AND WILL FIT  
ONLY AN OUTPUT SHAFT WITH A BUSHING.

Figure 4

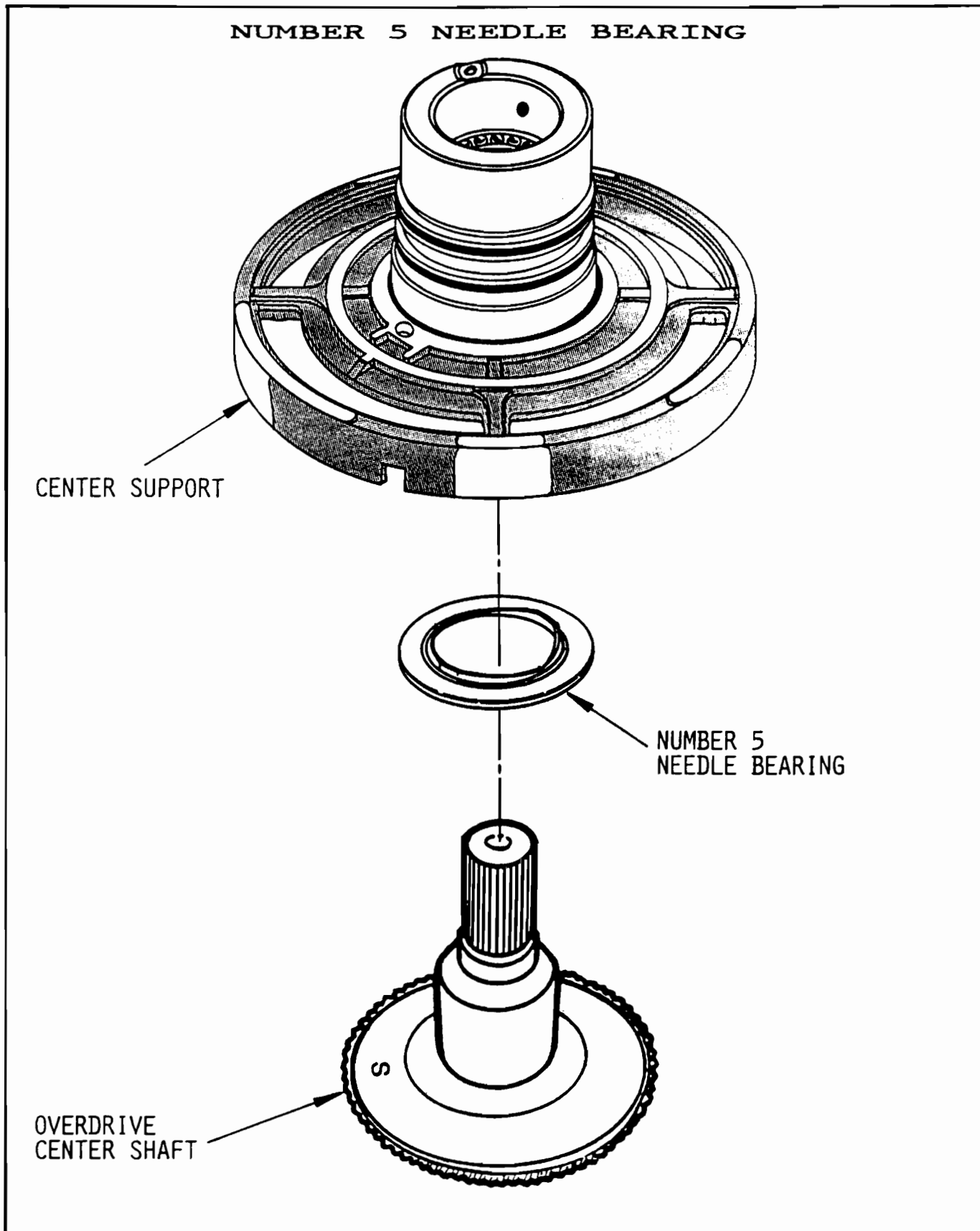


Figure 5

# ANSWERMATIC®

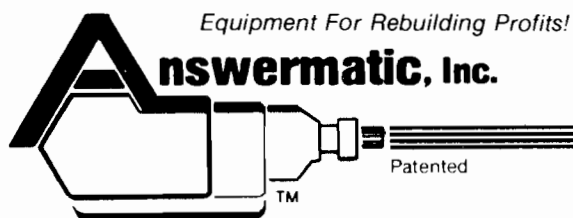
## ANSWERS YOU CAN TAKE TO THE BANK!

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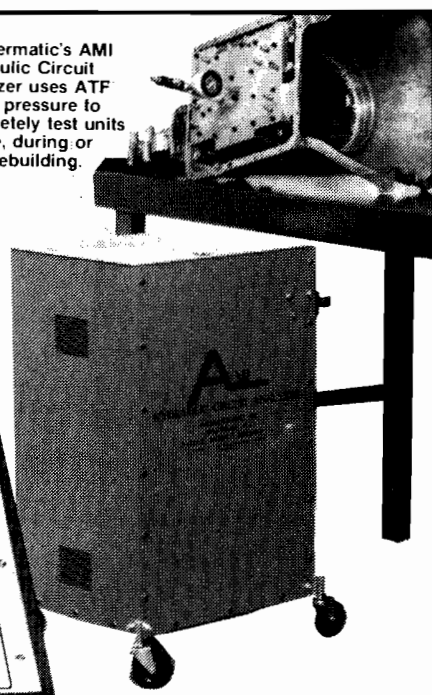
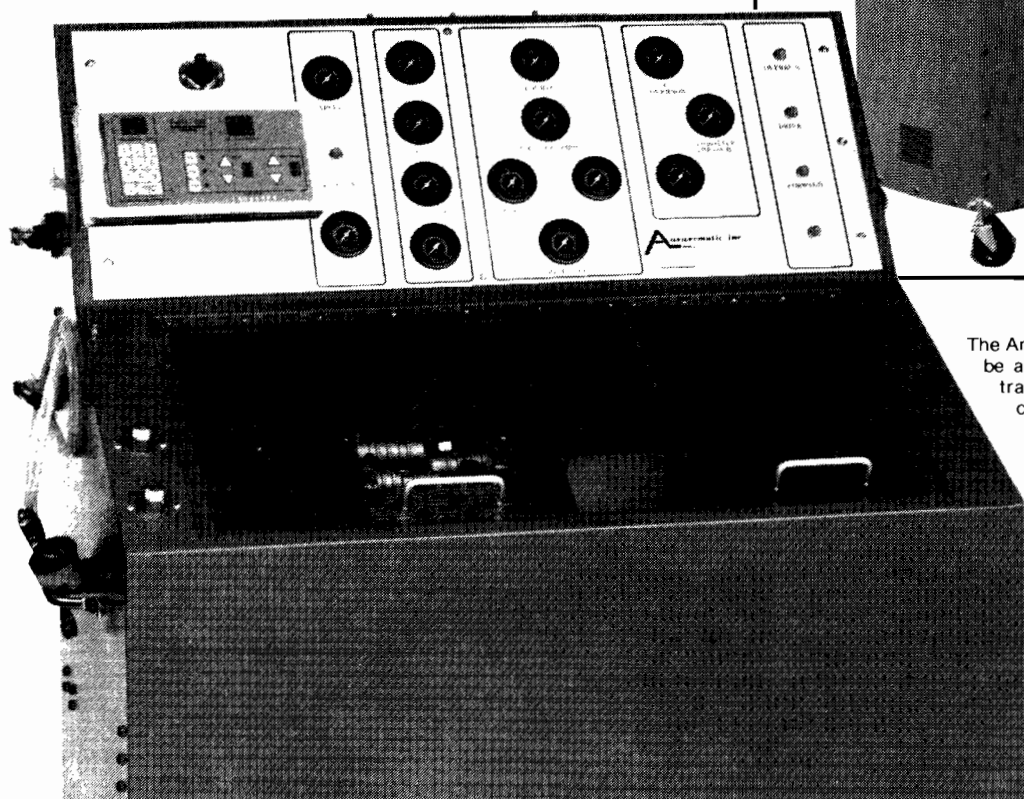
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The Answermatic VBT-2000 can be adapted to test electronic transmissions using any compatible electronic exciter, such as the TRAN-X shown here.

Answermatic®  
Patent #4809544, 4998437  
Other patents pending.

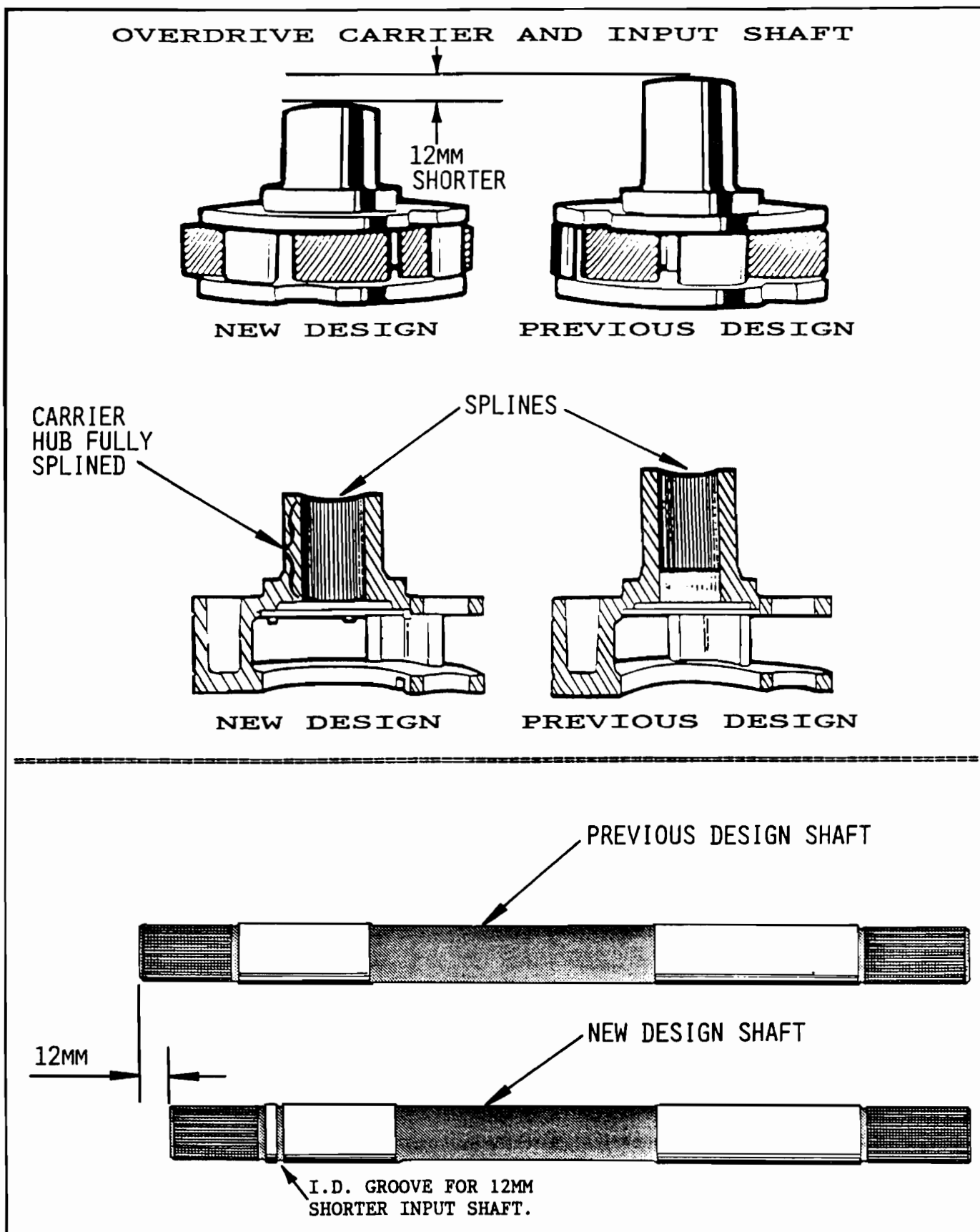
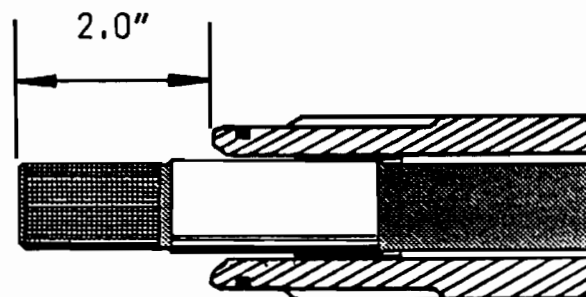


Figure 6

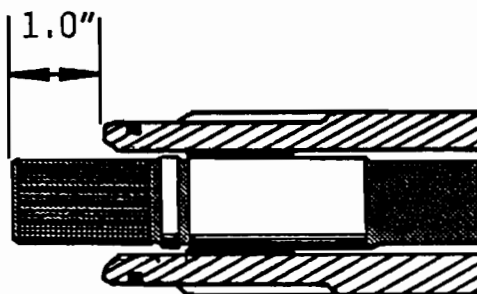
OVERDRIVE CARRIER AND INPUT SHAFT USAGE

INCORRECT



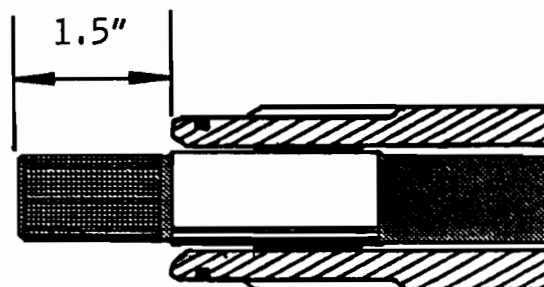
PREVIOUS (LONG) INPUT SHAFT USED  
WITH NEW DESIGN OVERDRIVE CARRIER

INCORRECT



NEW DESIGN (SHORT) INPUT SHAFT USED  
WITH PREVIOUS OVERDRIVE CARRIER

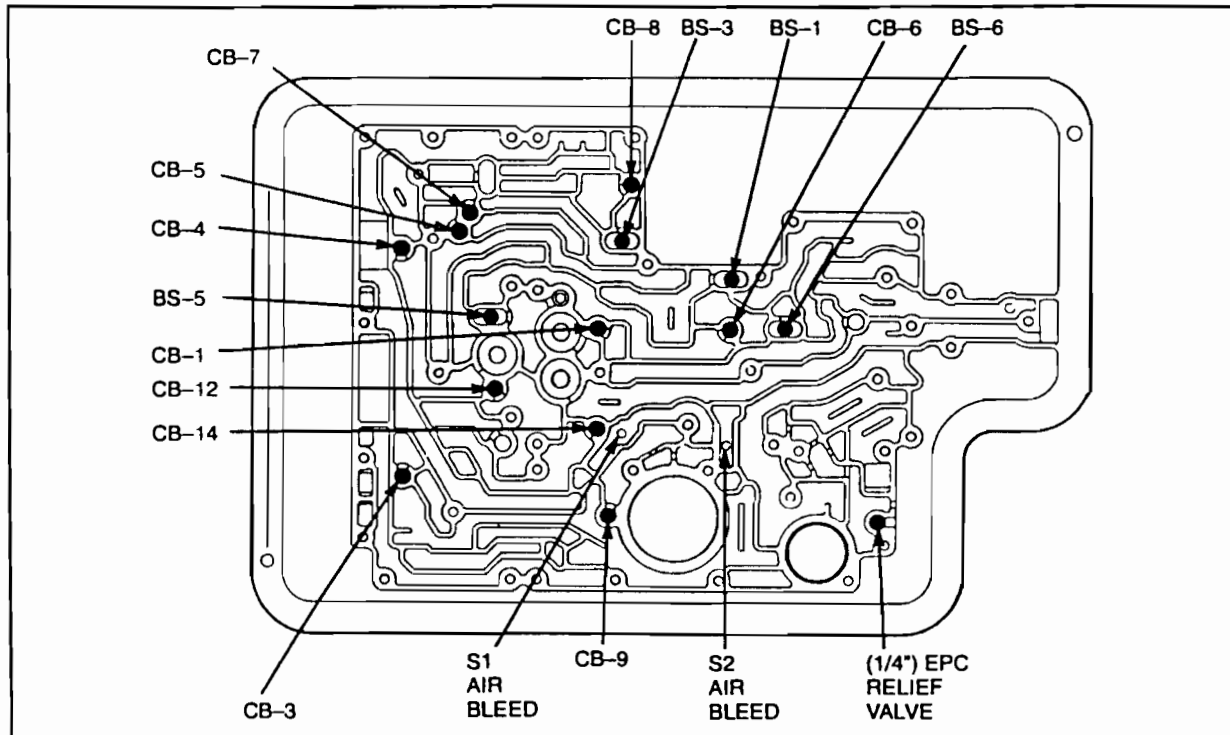
CORRECT USAGE



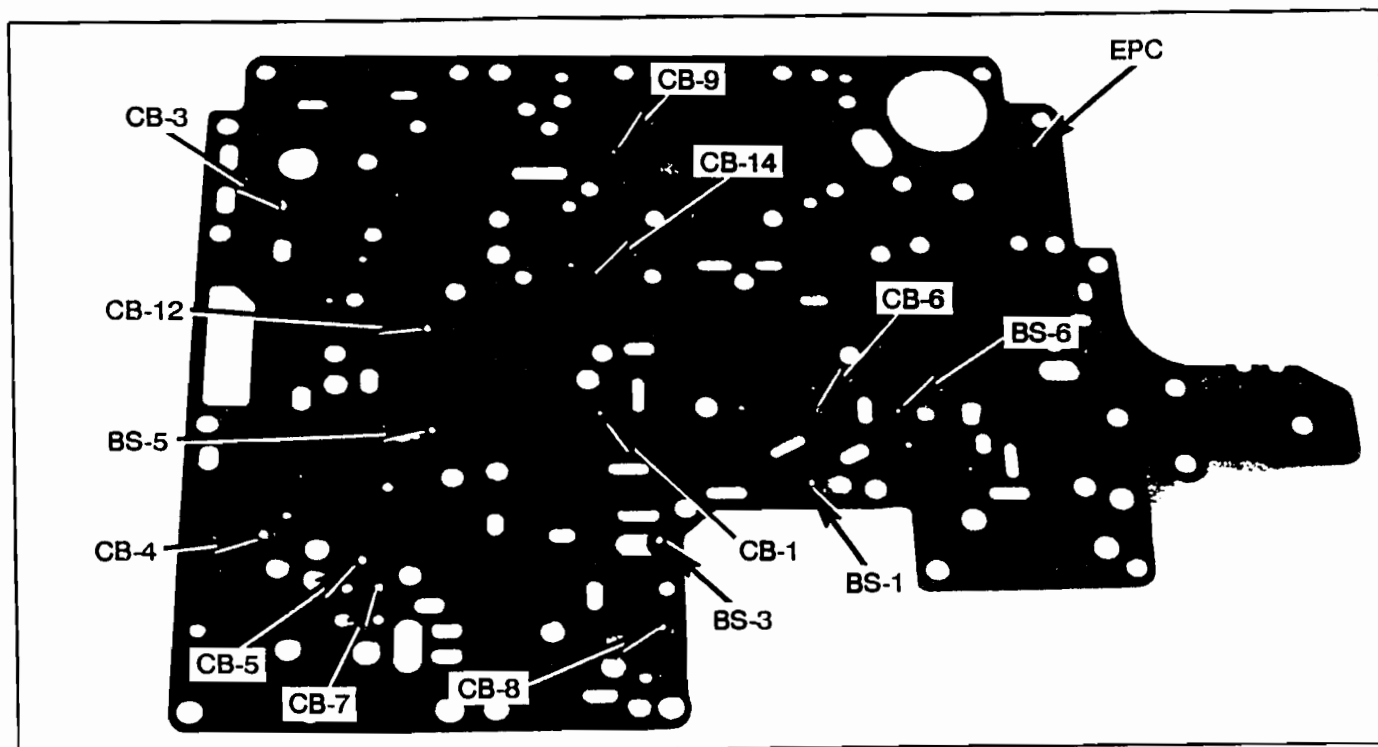
THE INPUT SHAFT MUST EXTEND 1.5" PAST THE END OF THE PUMP STATOR  
IF THE CORRECT INPUT SHAFT AND OVERDRIVE CARRIER WERE USED.

Figure 7

# **FORD E4OD CHECK BALL LOCATION** **EARLY 1989 14 CHECK BALLS** **PLUS STEEL EPC CHECK BALL**

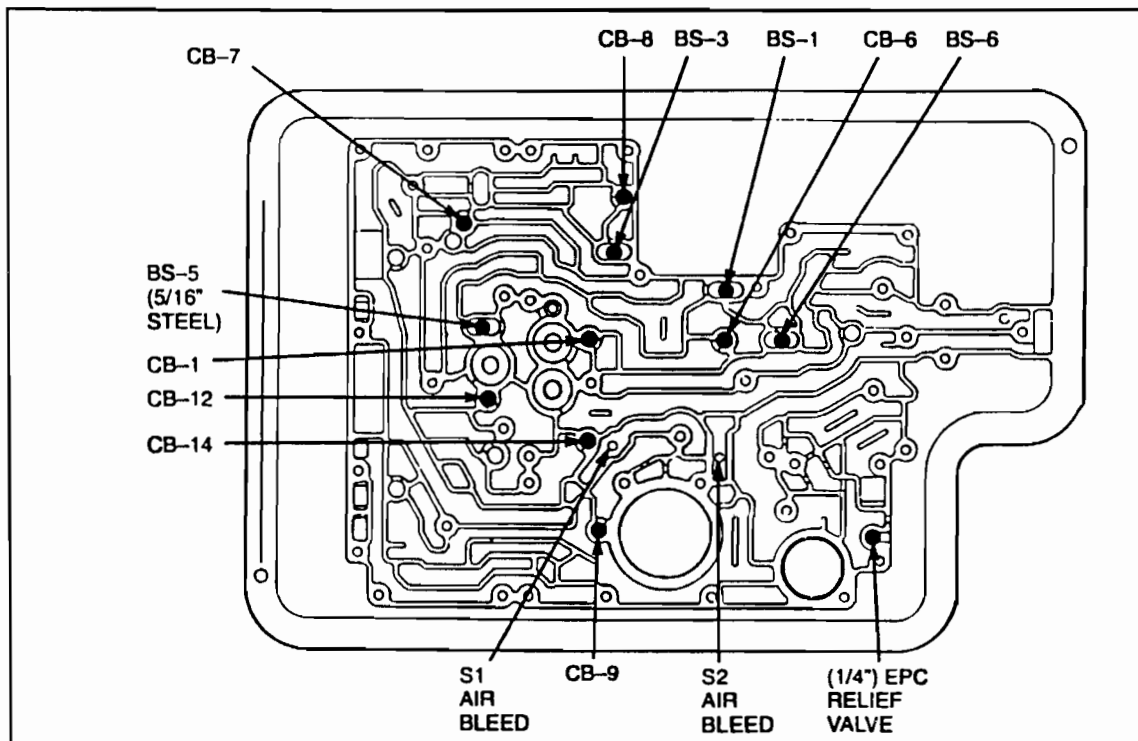


## **GASKET AND SEPARATOR PLATE** **GASKET FITS EARLY AND LATE 1989**

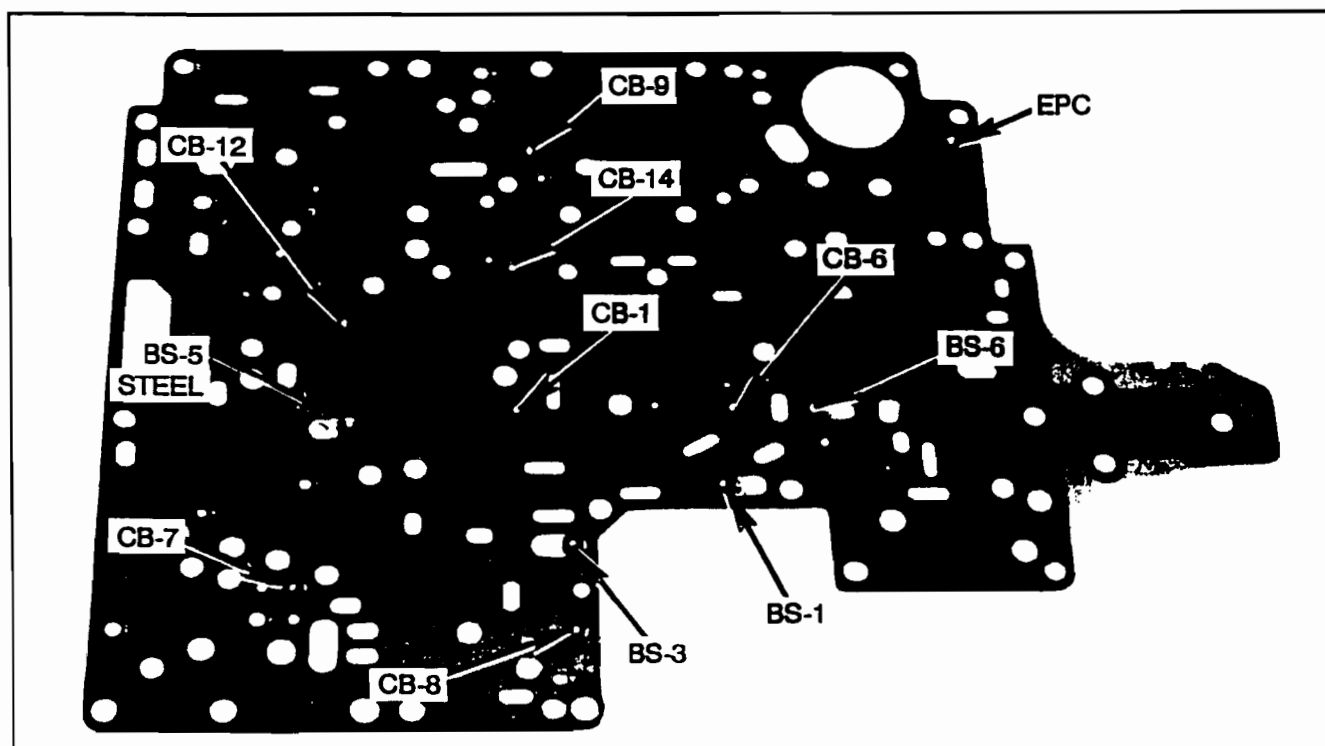




# **FORD E4OD CHECK BALL LOCATION LATE 1989 11 CHECK BALLS PLUS STEEL EPC CHECK BALL**

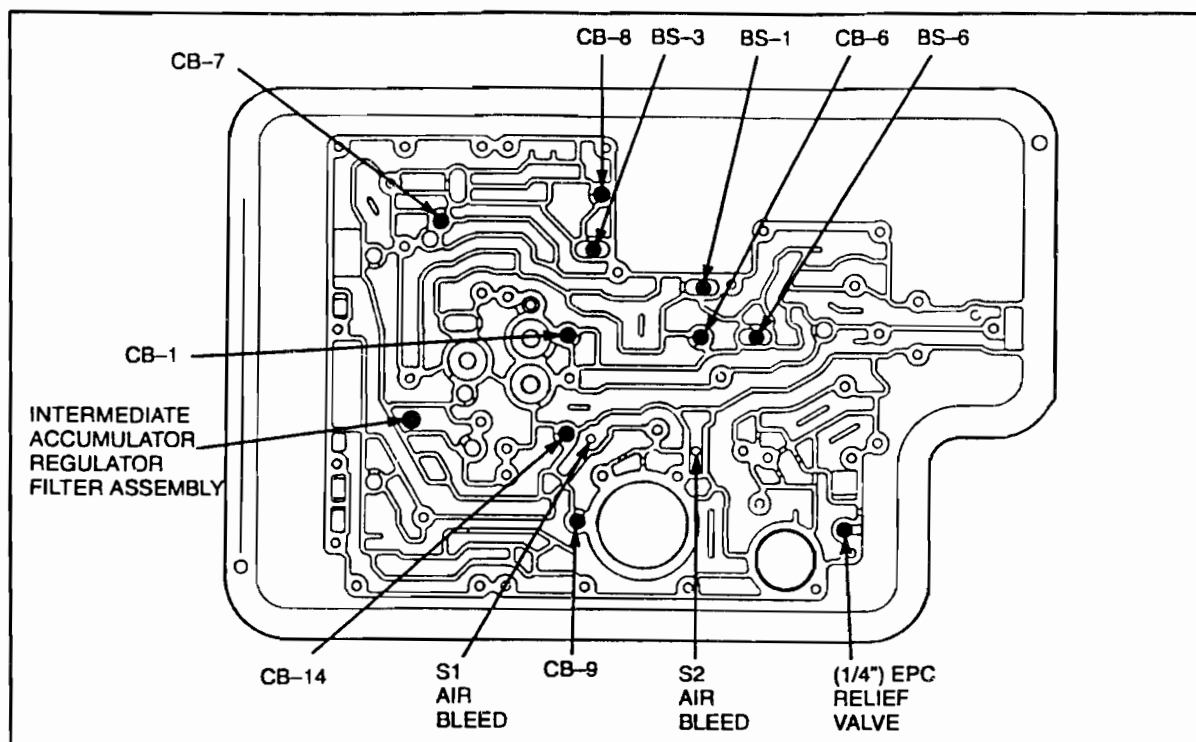


## **GASKET AND SEPARATOR PLATE GASKET FITS LATE AND EARLY 1989**

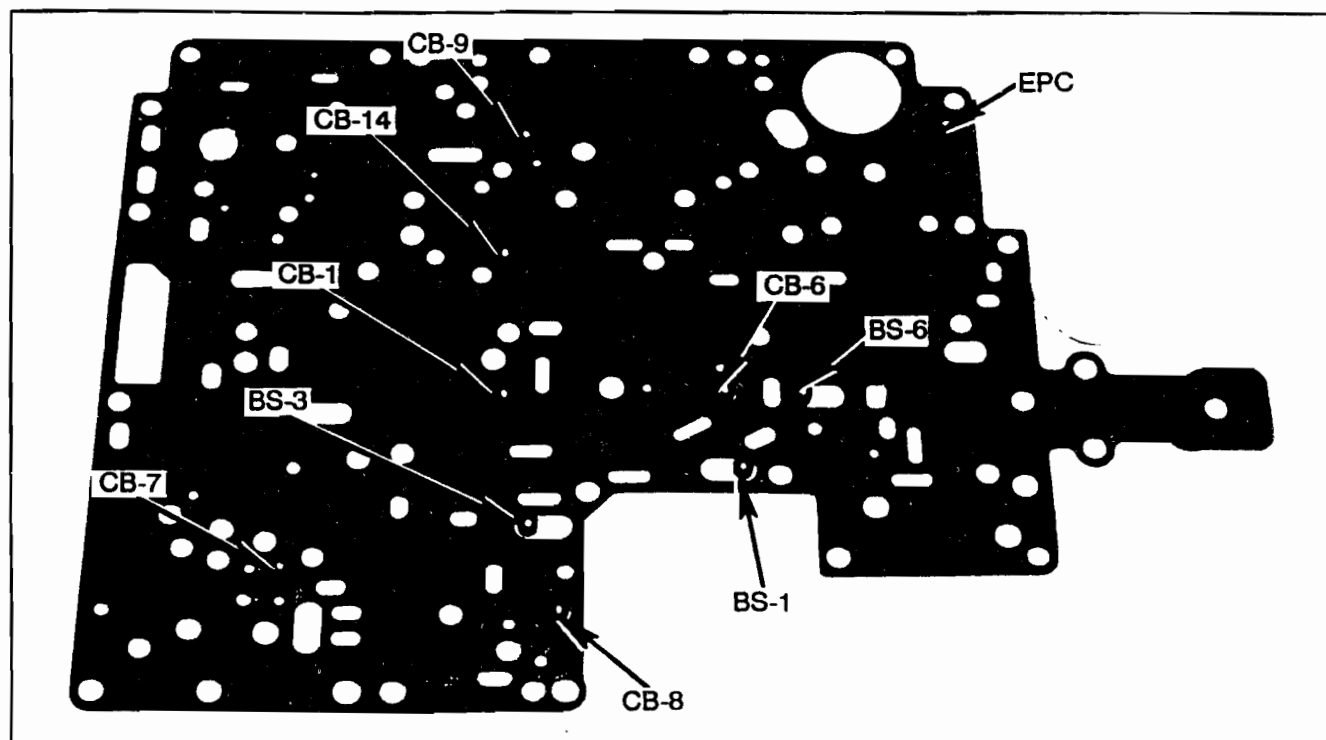




# FORD E4OD CHECK BALL LOCATION 1990-1994 9 CHECK BALLS PLUS STEEL EPC CHECK BALL



## GASKET AND SEPARATOR PLATE 1990 THRU 1994



## CHECK BALL AND BALL SHUTTLE FUNCTIONS

- CB-1:** Feeds reverse flow through 4-3-2 shift timing valve.
- CB-3:** Bypasses intermediate accumulator plunger feed orifice during 2-1.
- CB-4:** Bypasses overdrive accumulator plunger feed orifice during 4-3.
- CB-5:** Bypasses direct accumulator plunger feed orifice during 3-2.
- CB-6:** Forces direct clutch to exhaust through orifice during 3-2 downshift.
- CB-7:** Forces overdrive clutch to exhaust through orifice during 4-3 downshift.
- CB-8:** Forces coast clutch feed fluid through orifice for 4-3 downshift and manual 1 or 2 pull-ins while allowing free exhaust.
- CB-9:** Forces band servo apply pressure through orifice while bypassing the orifice on exhaust.
- CB-12:** Facilitates fast exhaust of direct clutch when coming out of reverse.
- CB-13:** (Main Control Body) Forces forward engagement pressure through orifice while allowing free exhaust.
- CB-14:** Forces intermediate clutch to exhaust through orifice during 2-1 downshift.

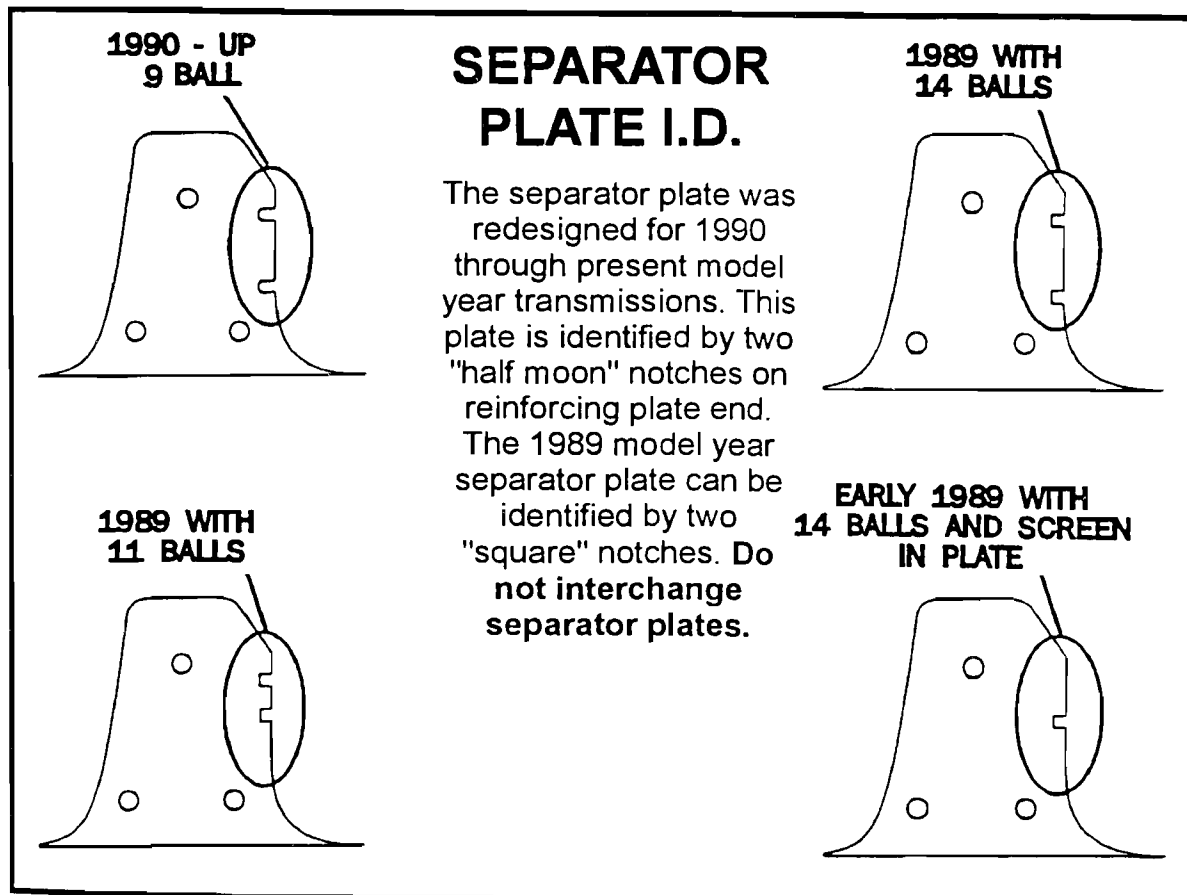
- BS-1:** Separates manual two flow and reverse flow to the 4-3-2 timing valve and the coast clutch shift valve.
- BS-2:** (Main Control Body) Separates manual two flow and solenoid two flow into the 1-2 manual transition valve which supplies flow to prevent 1-2 shift valve from shifting.
- BS-3:** Separates solenoid four flow from either the manual two flow or the reverse flow which shifts the coast clutch shift valve.
- BS-5:** Separates reverse flow and direct clutch accumulator flow into the direct clutch.
- BS-6:** Separate two and reverse flow at low reverse modulator valve.

### EPC Relief Valve (Spring and 1/4" Steel Ball)

Electronic Pressure Control blowoff valve controls EPC pressure to a maximum of 690 kPa (100 psi).

### Air Bleed Check Balls

Solenoid 1, Solenoid 2 and electronic pressure hydraulic circuits have air bleed check balls. Their purpose is to rid the circuits of air and ensure an immediate response at startup. The S1 and S2 air bleeds are located in the transmission case. The EPC air bleed is located in the pump control body.





**VIDEO**

**FORD AODE**

**FALLS OUT OF 4TH INTO NEUTRAL REPEAT INTERMEDIATE  
ROLLER CLUTCH FAILURE REPEAT OVERDRIVE BAND FAILURE  
FORWARD DRUM AND / OR STATOR FAILURE**

**COMPLAINT;**

Some 1992-1993 model year Crown Victoria and Grand Marquis vehicles may exhibit any or all of the repeat failures listed above. Usually the vehicle comes in with 20 to 40 thousand original miles, and after overhaul, you experience a repeat failure in 1500 to 2500 miles.

**CAUSE:**

ATSG feels that the repeat intermediate roller clutch failures are because of excess RPM of the reverse drum after an overdrive band failure. When the PCM commands 4th gear the forward clutch releases and the overdrive band is applied.

**CORRECTION:**

If for whatever reason the overdrive band IS NOT CAPABLE of holding the reverse drum and the forward clutch released, the reverse drum will be spinning 3 times engine speed. Since the intermediate clutch is still applied, this puts the intermediate roller clutch into an environment that is not capable of surviving. There can be MANY causes for the repeat failures, and we are going to list all problem areas known at the time of this printing.

Number (1)-There is now a new design EPC solenoid available under OEM part number F3AZ-7G383-A. ALWAYS replace the EPC solenoid with the new design, and ensure that the retaining bracket is secured in the proper position. The retaining bracket must be installed with the FORK of the bracket over the body of the EPC solenoid, and the bracket secured with valve body bolt in the location shown in Figure 1. The EPC solenoid may have to be repositioned slightly for the fork of the bracket to engage in position. Refer to Figure 1. Manual shift lever must be removed from the case to replace the EPC Solenoid.

Number (2)-There is now a New Design Shift solenoid Assembly available under OEM part number F4AZ-7G484-A. ALWAYS replace the Shift Solenoid Assembly with the new design, as shown Figure 2.

Number (3)-There is now available a New Design Reverse Drum and Intermediate Roller Clutch Assembly with the following revisions:

1. Improved spring design for the rollers.
2. Revised cam to improve oil distribution.
3. Grooved outer race to reduce vibration.
4. Elimination of the Gap between the outer race and reverse drum for improved roller clutch cage support.
5. Reverse drum assembly now balanced in production.
6. Machining tolerances reduced on reverse drum.

ALWAYS replace the Reverse Drum and Intermediate Roller Clutch Asm. with the new design F4AZ-7D044-A as shown in Figure 3. Or install the spiral snap ring from a THM 125 / 440 T4 final drive (part number 11501326) in place of the original snap ring for the intermediate roller clutch retainer.



**CORRECTION;**

Number (4)-There are new design Forward Clutch Sealing Rings, available part number **F4AZ-7D019-AA** that are plated ALWAYS replace the forward clutch sealing rings with the new design as shown in Figure 4.

Number (5)-Some early model units were built with forward drum and/or Pump Support (stator), with a defective micro finish where the sealing rings ride in the pump support. Replacing these parts will eliminate these concerns. The new design forward drum part number is **F3LY-7F207-A** and the new design Pump Support now available under part number **F4AZ-7A108-A** (See Figure 5).

Number (6)-Inspect the .020" bleed orifice located in the overdrive servo bore, in the location as shown in Figure 6. This bleed orifice is difficult to see, but **MUST** be there, and **MUST BE OPEN**, for the overdrive band apply properly. ALWAYS inspect this bleed orifice to ensure that it is free of all contamination, and open to the inside of the case (See Figure 6).

Number (7)-The Manual Lever Position Sensor (MLPS) is very susceptible to contamination from road water, snow and mud.

ALWAYS replace the MLPS with the revised service level MLPS that is more resistant to internal contamination with the following part numbers.

1992 Models (Crown Victoria and Grand Marquis)....**F2VY-7A247-A**

1993 Models (Crown Victoria and Grand Marquis)....**F3VY-7A247-A**

DO NOT USE MLPS WITH DATE CODES OF 2J21 THRU 2L06

The date code is stamped on the outer cover as shown in Figure 7.

Number (8) There is a New Design Output Shaft Speed Sensor, available under part number **F4AZ-7H103-A** (See Figure 8).

ALWAYS replace the Output Shaft Speed Sensor with the new design. If you have tried to remove the geartrain before removing the output shaft speed sensor from the case, and whacked the OSS with the gear train, the OSS becomes a **MANDATORY REPLACEMENT PART**, even if it is the new design.

Number (9)-The vehicle wiring harness solenoid connector is very susceptible to contamination from road water, snow and mud. It is located at the right rear of the transmission case.

ALWAYS blow the vehicle wiring harness solenoid connector from both sides with compressed air, to remove any moisture that may have accumulated. Use a small amount of electrical grease, FORD part number **F2AZ-19584-A**, on the connector cavities to prevent corrosion.

**THIS MUST BE A NON-CONDUCTIVE GREASE.**

Number (10)-Use extra care when installing the overdrive servo piston to ensure that the return spring does not get "cocked" in the bore. This would prevent the overdrive band from fully applying and burn the overdrive band very rapidly.



## 1995 SEMINAR INFORMATION VIDEO

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### CORRECTION:

Number (11)-There are new calibration Powertrain Control Modules (PCM), available for 1992 and 1993 models, which have a revised shift and TCC operating strategy.

**YOU MUST MATCH THE CALIBRATION NUMBER TO THE PART NUMBER.**

Calibration number is found on a white sticker usually located on the end of the left door or on the left door jam (Drivers side).

**ALWAYS** replace the PCM on any 1992 model vehicle, using the calibration numbers and part numbers listed below **IF IT HAS NOT BEEN UPDATE.**

1992 Model, (Crown Victoria and Grand Marquis) 93-3-13

(Calibration 2-18F-ROO).....	F2PZ-12A650-RA
(Calibration 2-18G-ROO).....	F2PZ-12A650-SA
(Calibration 2-18H-ROO).....	F2PZ-12A650-TA
(Calibration 2-18I- ROO).....	F2PZ-12A650-UA
(Calibration 2-18M-ROO).....	F2PZ-12A650-VA
(Calibration 2-18N-ROO).....	F2PZ-12A650-XA

**ALWAYS** replace the PCM on any 1993 model vehicle, using the calibration numbers and part numbers listed below, **IF ANY HAVE NOT BEEN UPDATED.**

1993 Model (crown Victoria and Grand Marquis) 93-12-11

(Calibration 3-18G-ROO)	
(Calibration 3-18G-R1O).....	F3VY-12A650-HD
(Calibration 3-18G-ROO)	
(Calibration 3-18G-R1O).....	F3VY-12A650-JC
(Calibration 3-18I-ROO)	
(Calibration 3-18I-R1O).....	F3VY-12A650-KC
(Calibration 3-18M-ROO)	
(Calibration 3-18M-R1O).....	F3VY-12A650-LD
(Calibration 3-18N-ROO)	
(Calibration 3-18N-R1O).....	F3VY-12A650-MC

### CORRECTION:

Number (12) ATSG has found that the bottom pan at times runs low on fluid at extended high vehicle speeds, ATSG recommends that the transmission be overfilled by approx. 3/4 of a quart which brings the fluid level to the pan rail. And make a new mark on the dipstick.

Number(13)—**ALWAYS** check and verify all line pressures, and that you have a line pressure rise with throttle opening, **BEFORE** the vehicle is delivered back to the customer. Use the Chart in Figure 9 for line pressure specifications, and the locations of the various pressure taps.

### PART NUMBERS

EPC Solenoid New Design	F3AZ-7G383-A	Fwd Cl Drum(New)	F3LY-7F207-A
Shift Solenoid Assy. (New)	F4AZ-7G484-A	Pump Support (New)	F4AZ-7A108-A
Rev. Drum Int Roller Cl. (New)	F4AZ-7D044-A	MLPS 1992 Crown /Marquis	F2VY-7A247-A
Fwd Cl Sealing Rings (New)	<b>F4AZ-7D019-A</b>	MLPS 1993 Crown/Marquis	F3VY-7A247-A
OSS (New Design)	F4AZ-7H103-A	Electrical Grease	F2AZ-19584-A

*Automatic Transmission Service Group*

# EPC SOLENOID AND BRACKET

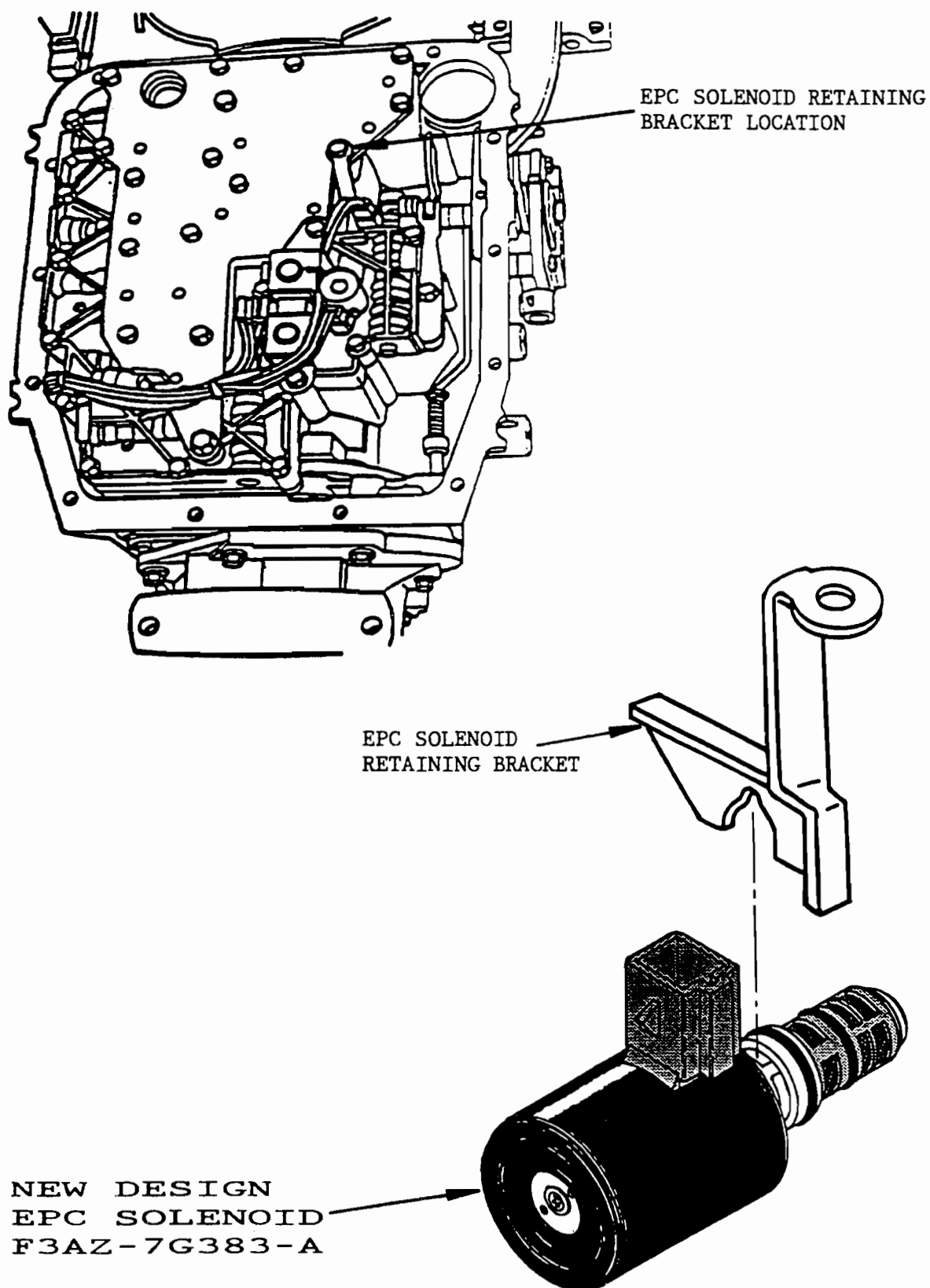
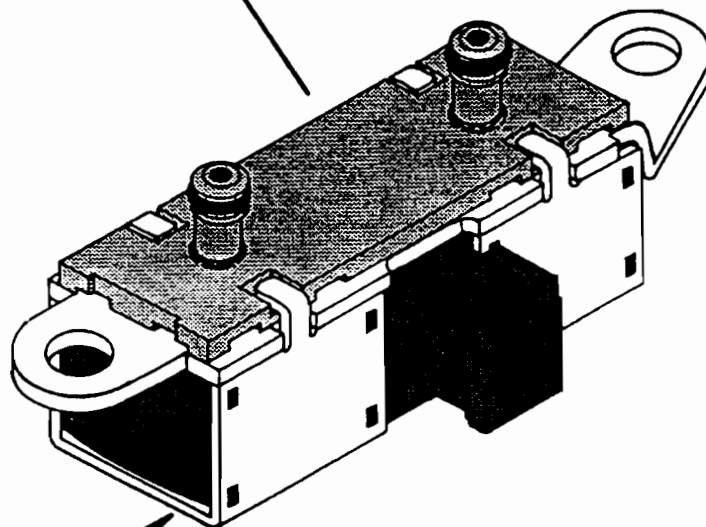
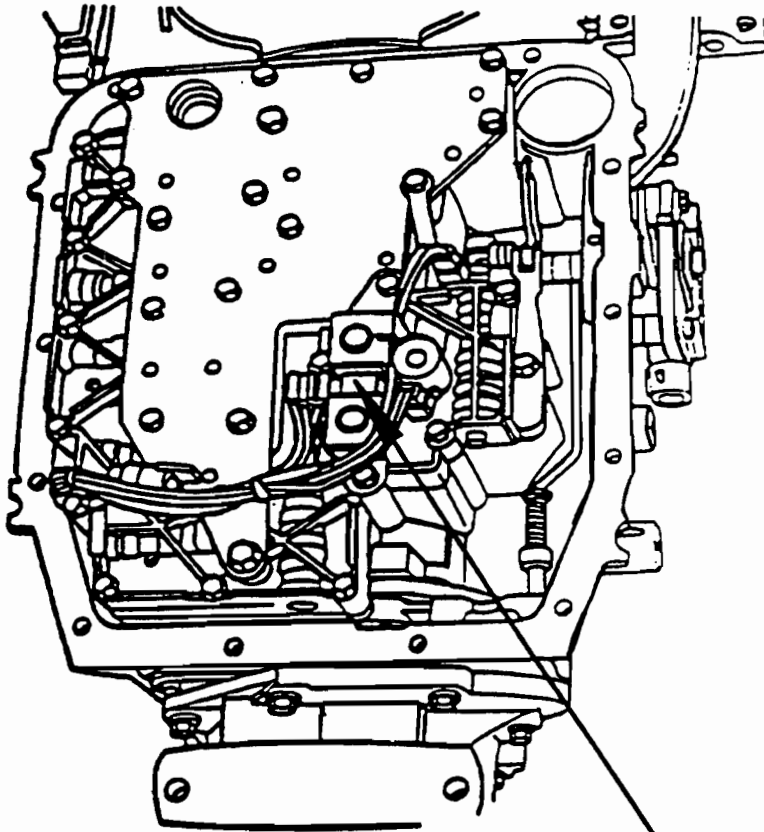


Figure 1

SHIFT SOLENOID ASSEMBLY



NEW DESIGN  
SHIFT SOLENOID ASSEMBLY  
F4AZ-7G484-A

Figure 2



NEW DESIGN REVERSE DRUM AND  
INTERMEDIATE ROLLER CLUTCH ASSEMBLY

F4AZ-7D044-A

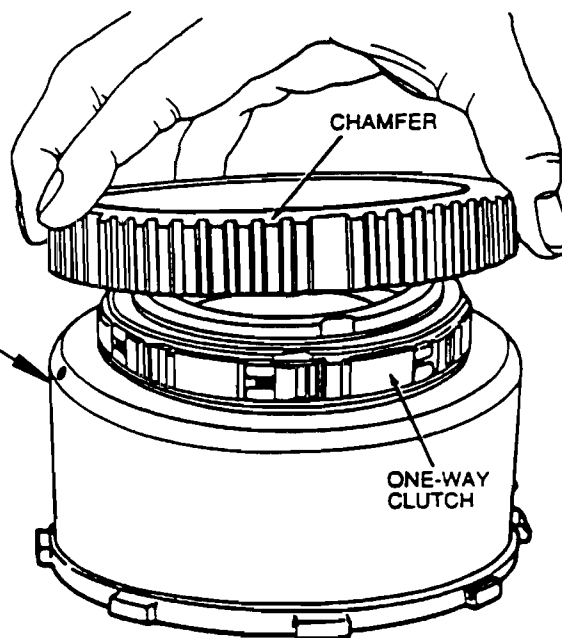
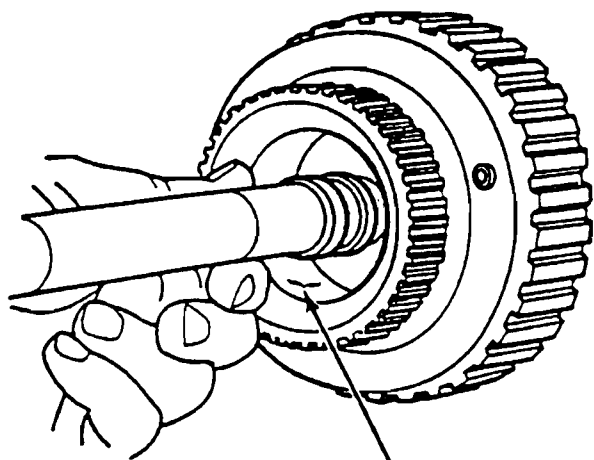


Figure 3

NEW DESIGN FORWARD CLUTCH SEALING RINGS

F4AZ-7D019-A



INSPECT FORWARD CLUTCH  
CYLINDER BORE FOR DAMAGE

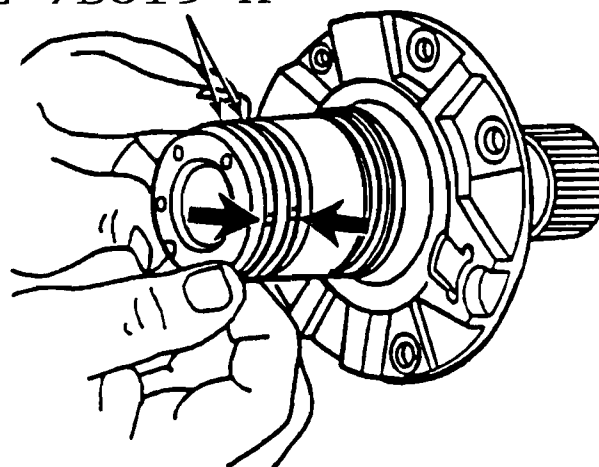
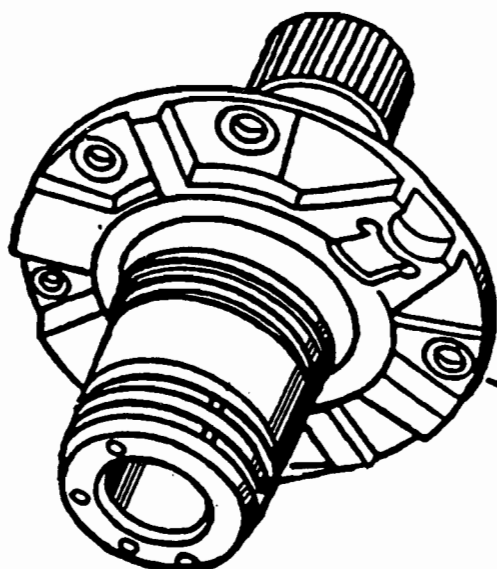
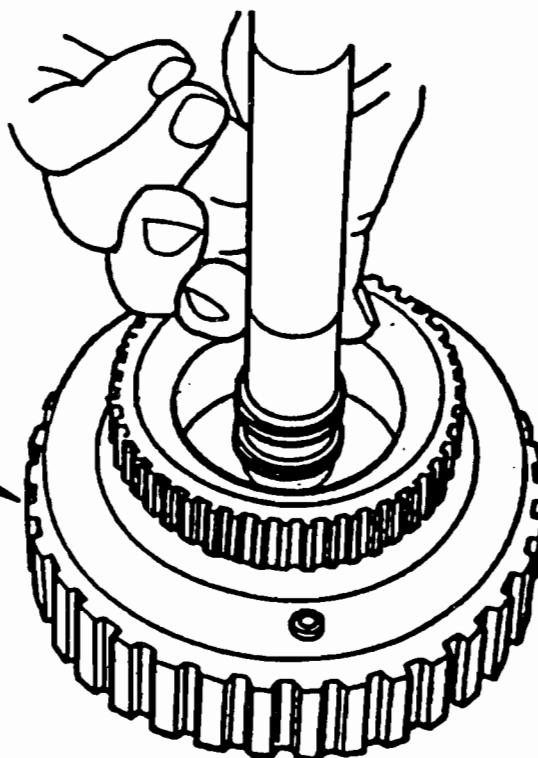


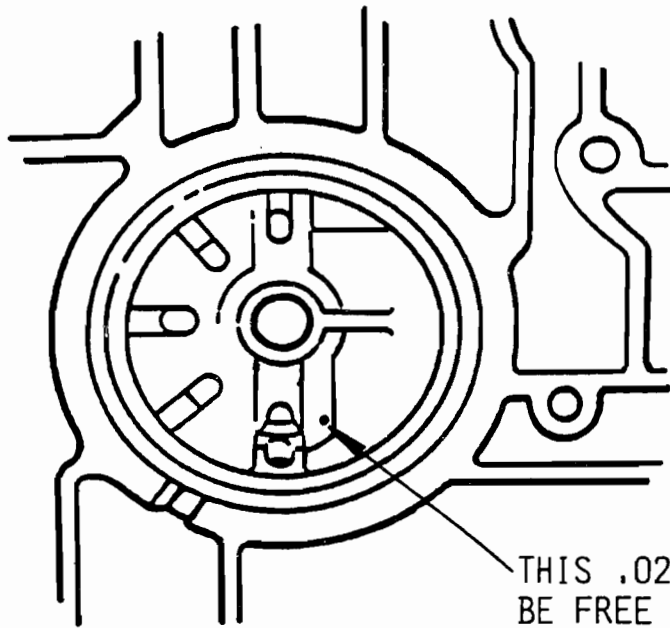
Figure 4

NEW DESIGN  
FORWARD CLUTCH DRUM  
F3LY-7F207-A



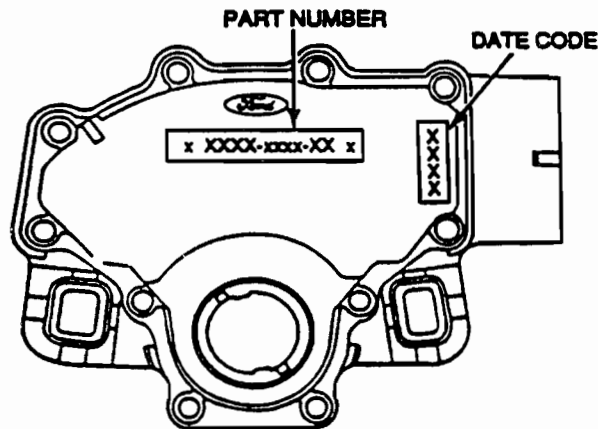
NEW DESIGN  
PUMP SUPPORT  
F4AZ-7A108-A

Figure 5



THIS .020" BLEED ORIFICE MUST  
BE FREE FROM CONTAMINATION.

Figure 6



BUILD DATE CODES			
YEAR CODE		MONTH CODE	
1991 - 1	JAN - A	APR - D	JUL - G
1992 - 2	FEB - B	MAY - E	AUG - H
1993 - 3	MAR - C	JUN - F	SEP - J
			OCT - K
			NOV - L
			DEC - M

THERE IS NO LETTER "I" IN THE DATE CODE.

1992 CROWN VICTORIA AND GRAND MARQUIS  
1993 CROWN VICTORIA AND GRAND MARQUIS

F2VY-7A247-A  
F3VY-7A247-A

Figure 7

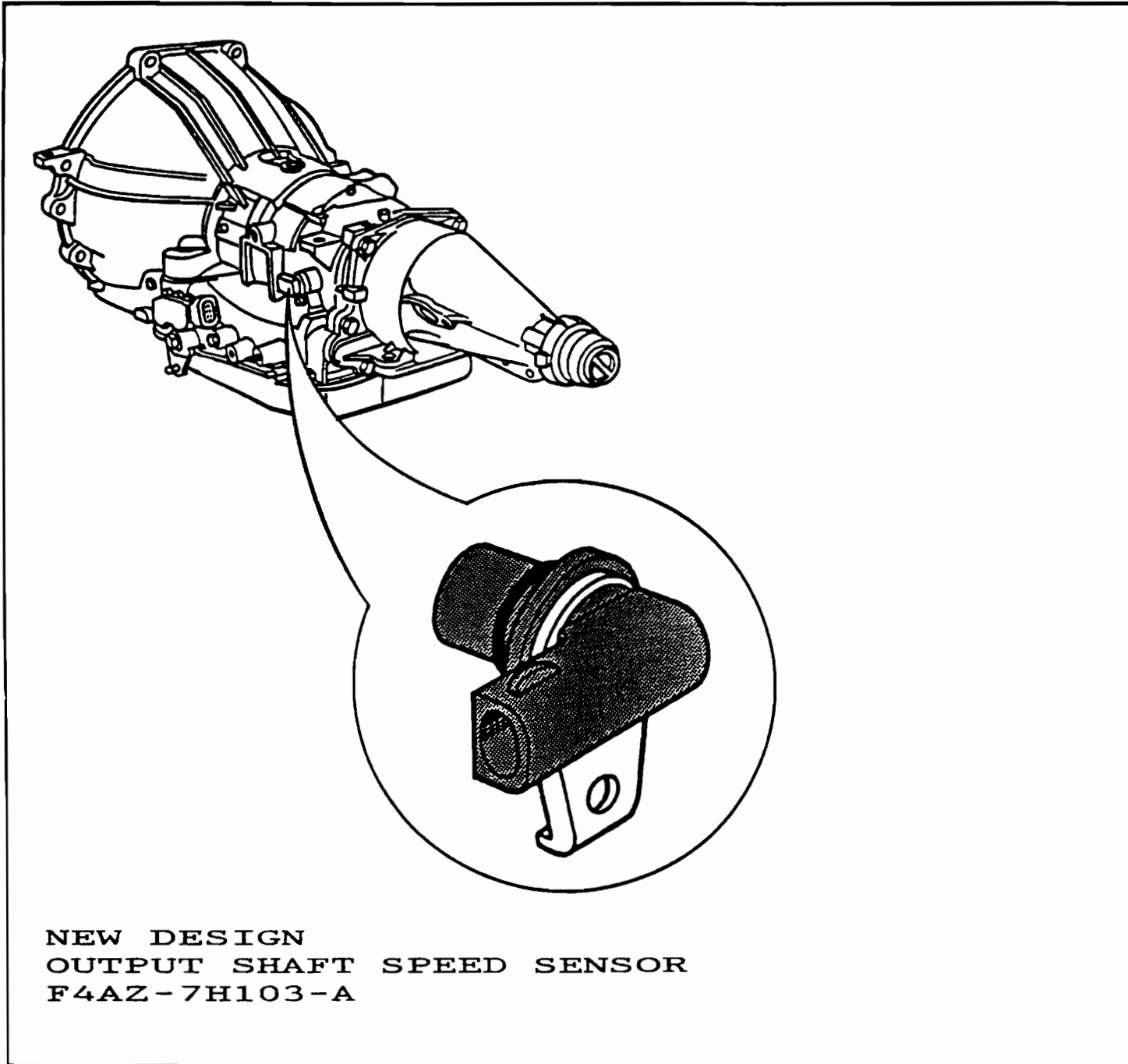


Figure 8

## AOD-E PRESSURE CHECK

### Diagnostic Pressure Chart

Pressure At Idle (Closed Throttle)					
GEAR	EPC (TV) 88	LINE	FORWARD CLUTCH	INTERMEDIATE CLUTCH	DIRECT CLUTCH
1M 1D	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	310-517 kPa (45-75 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)
2M 2D	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	310-517 kPa (45-75 psi)	310-517 kPa (45-75 psi)	0-34 kPa (0-5 psi)
3	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	310-517 kPa (45-75 psi)	310-517 kPa (45-75 psi)	310-517 kPa (45-75 psi)
4	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	0-34 kPa (0-5 psi)	310-517 kPa (45-75 psi)	310-517 kPa (45-75 psi)
R	0-62 kPa (0-9 psi)	552-827 kPa (80-120 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)
P	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)
N	0-62 kPa (0-9 psi)	345-517 kPa (50-75 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)

### Pressures at Wide Open Throttle (WOT) Stall

GEAR	EPC (TV)	LINE	FORWARD CLUTCH	INTERMEDIATE CLUTCH	DIRECT CLUTCH
1M 1D	573-842 kPa (83-93 psi)	1104-1447 kPa (160-210 psi)	1035-1447 kPa (150-210 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)
R	573-842 kPa (83-93 psi)	1517-1930 kPa (220-280 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)	0-34 kPa (0-5 psi)

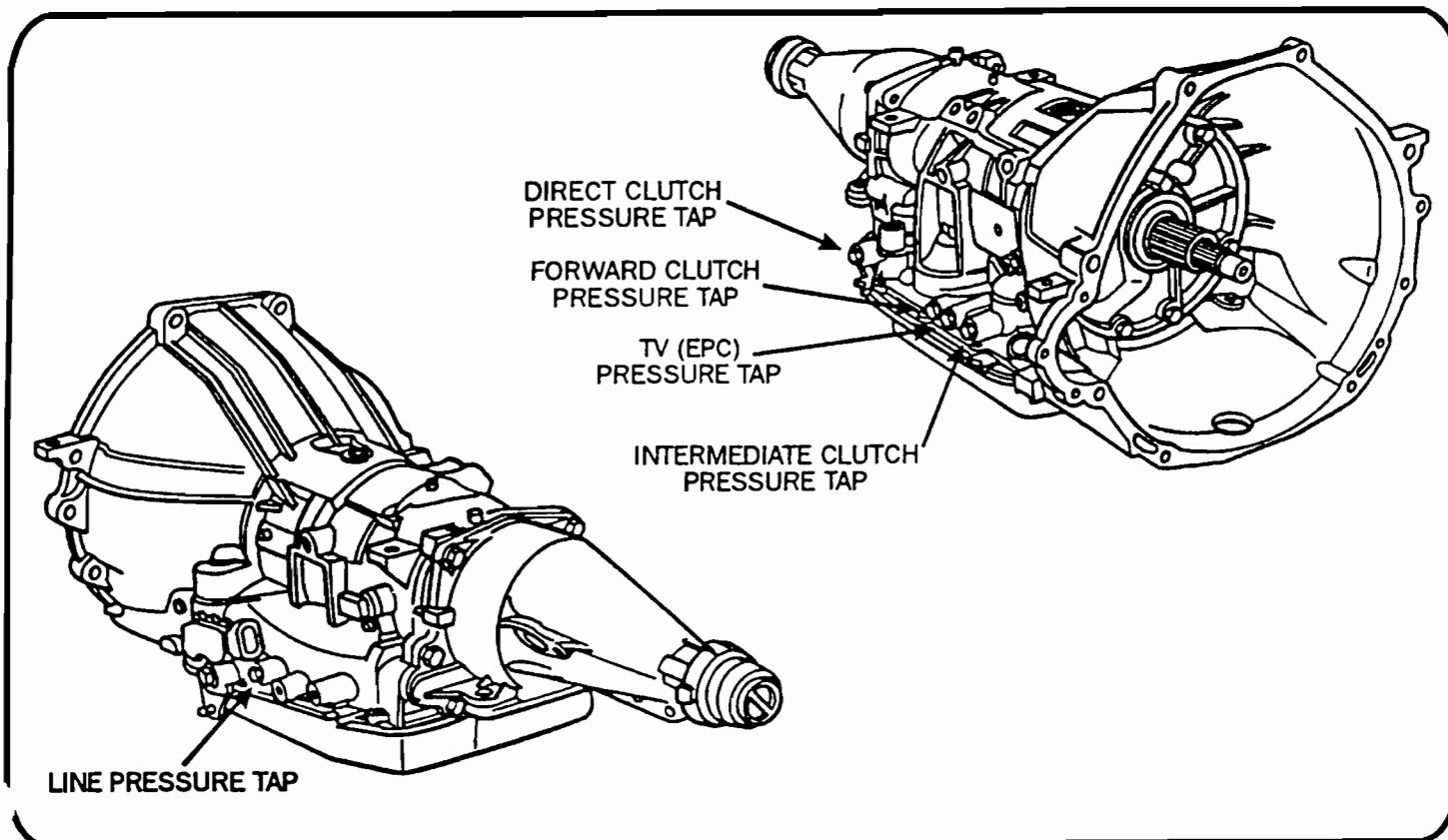


Figure 9

## VIDEO

**FORD AODE-4R70W**  
**VALVE BODY- SEPARATOR PLATE**

Manual Selector Indicator with D-3-1 or OD-3-1 has 1/8" wide passage by manual valve Figure 1. In Figure 2 the separator plate has two (2) additional holes above the manual valve location.

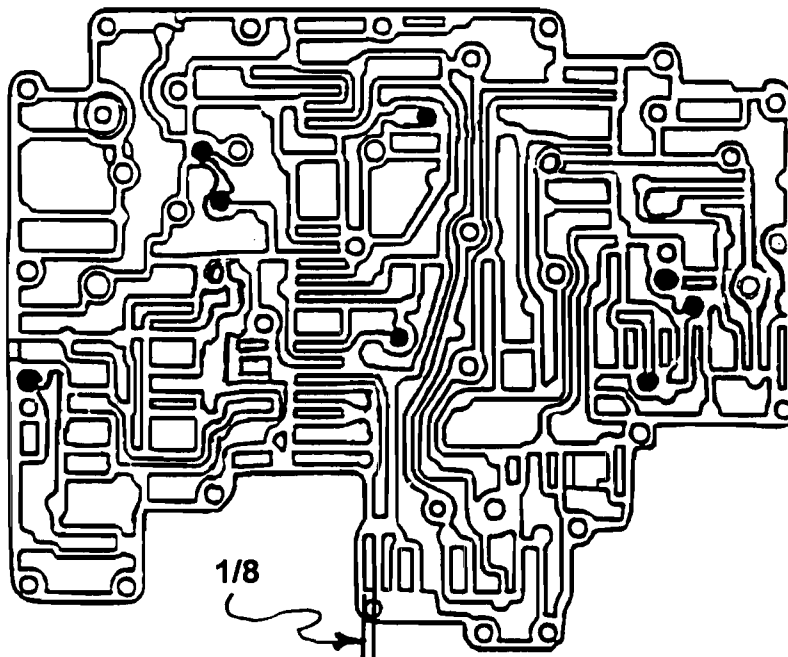


FIGURE 1

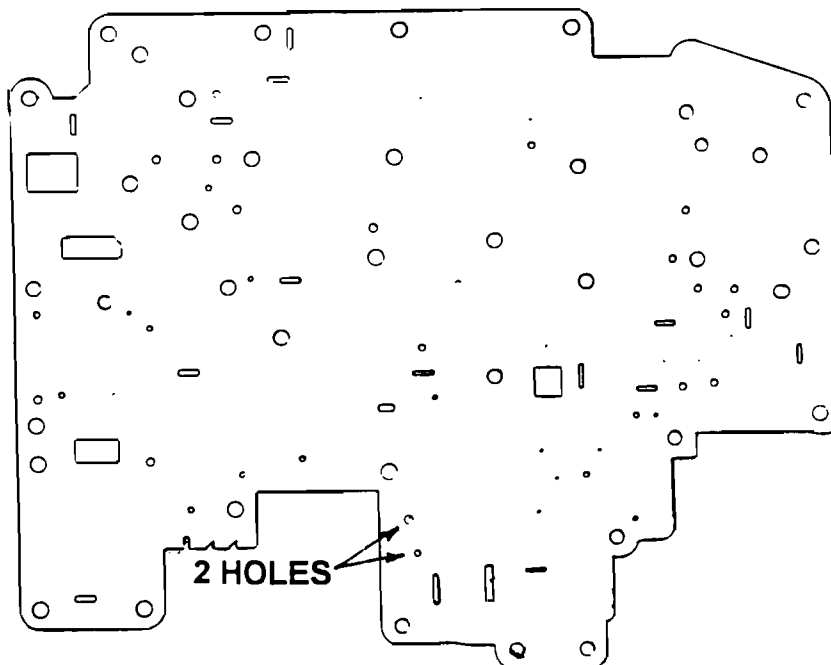


FIGURE 2

## VIDEO

# FORD AODE-4R70W

## VALVE BODY-SEPARATOR PLATE

(CONT'D)

Manual Selector Indicator with D-2-1 and the Overdrive Cancel button has a  $\frac{3}{8}$ " wide passage by the manual valve Figure 3. In Figure 4 the separator does NOT have the two (2) holes above the manual valve location.

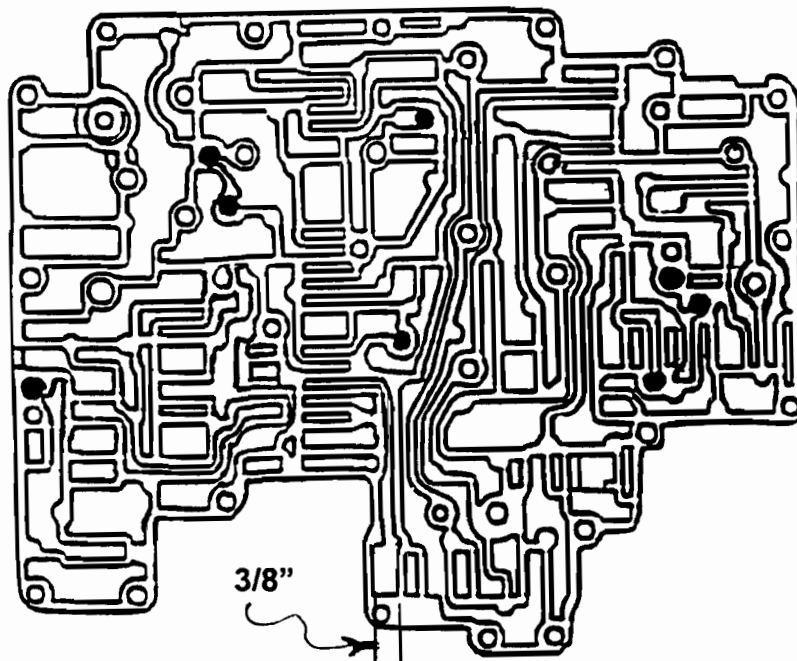


FIGURE 3

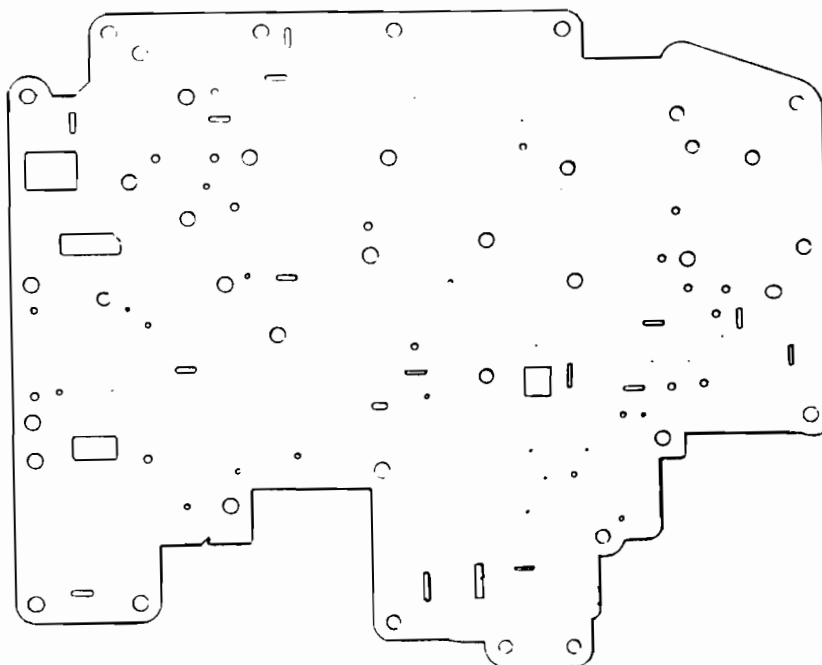


FIGURE 4

## FORD AODE

### Flare on 1-2 upshift or no Second gear

**Complaint:** Vehicles may experience a flare on the 1-2 upshift or a 1-3 shift. A no second gear condition.

**Cause:** This may be caused by a damaged intermediate clutch outer piston seal, due to an improperly machined seal groove for the outer piston seal.

**Correction:** Replace the intermediate piston if improperly machined. Check figure 1, which shows the the machining error. The new piston part number is F2AZ-7E005-A.

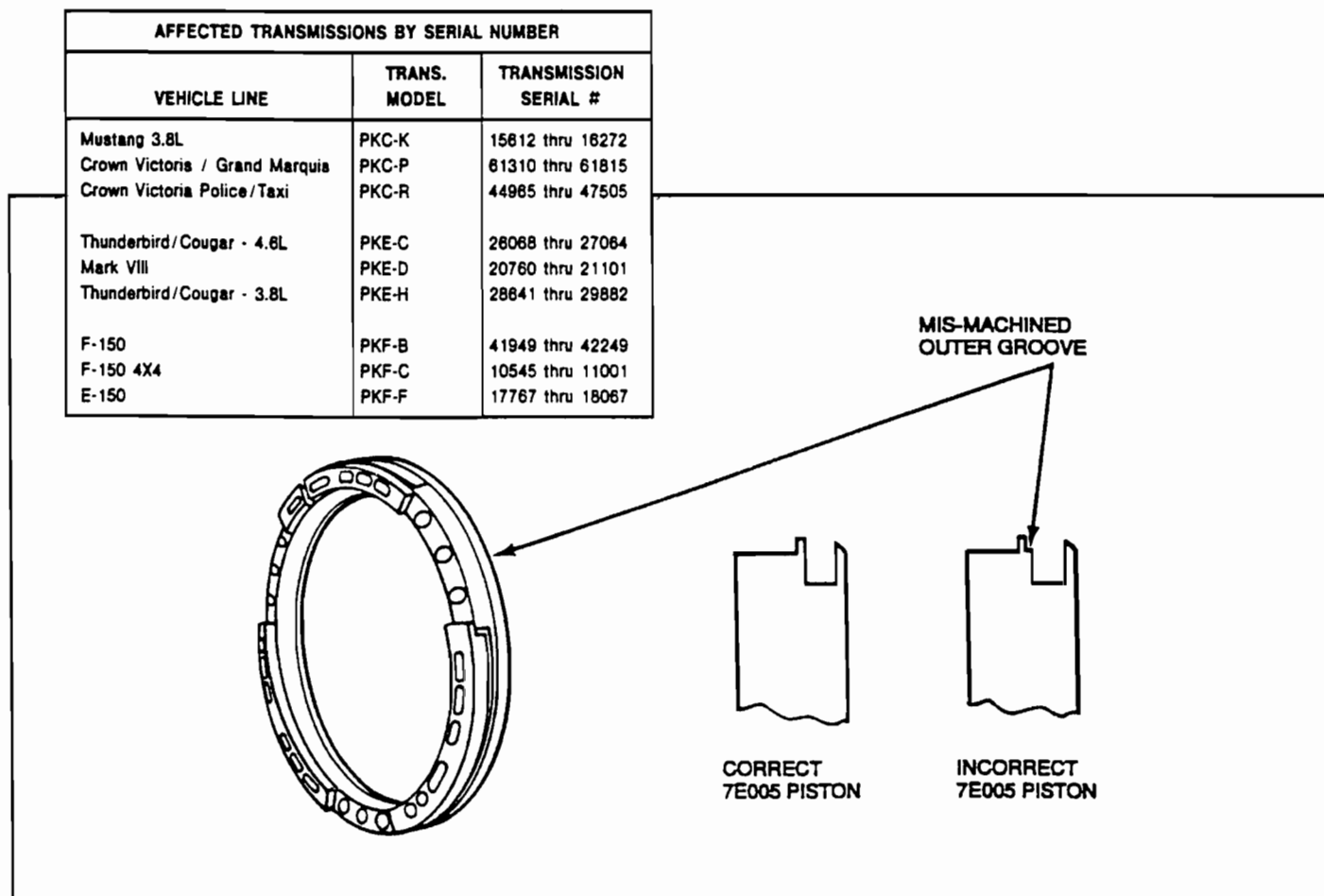


Figure 1





## FORD EEC IV SCANNER UPDATE

Beginning in 1989, some Ford vehicles with the EEC IV control system had continuous data stream capability. Each year, Ford added this feature to more of their vehicles. Ford calls this data communication link (DCL) system. Until recently, no aftermarket hand held scanners could receive and translate this data stream. This year, Snap-On introduced a domestic "Combo" cartridge that will read the data stream on those Ford vehicles.

Ford uses electronic controls on four different transmissions. The A4LD has electronic controls for 4th gear and lock-up. The Ford truck E4OD is completely controlled by the EEC IV system. The AXODE and AODE are also controlled by the EEC IV.

On certain models, transmission diagnosis is enhanced with this new data stream capability remember, not all Ford vehicles with data stream capability have electronically controlled transmission. Also remember, not all Ford vehicles with electronically controlled transmissions use the latest EEC IV system with DCL.

To identify which Ford cars use the DCL system, refer to the chart in Figure 1. To identify which Ford Trucks use the DCL system, refer to the chart in Figure 2.

### CARS

1989	1990	1991	1992	1993	1994
CONTINENTAL 3.8 L.	CONTINENTAL 3.8 L.	CONTINENTAL 3.8 L.	CONTINENTAL 3.8 L.	CONTINENTAL 3.8 L.	CONTINENTAL 3.8 L.
	TAURUS/SABLE 3.0 & 3.8 L.	TAURUS/SABLE 3.0 & 3.8 L.	TAURUS/SABLE 3.0 & 3.8 L.	TAURUS/SABLE 3.0, 3.2, & 3.8 L.	TAURUS/SABLE 3.0, 3.2, & 3.8 L.
	TOWN CAR 5.0 L.	TOWN CAR 4.6 L.	TOWN CAR 4.6 L.	TOWN CAR 4.6 L.	TOWN CAR 4.6 L.
	T-BIRD/COUGAR 3.8 L.	T-BIRD/COUGAR 3.8 & 5.0 L.	T-BIRD/COUGAR 3.8 & 5.0 L. (HO)	CROWN VICT/ G. MARQUIS 4.6 L.	CROWN VICT/ G. MARQUIS 4.6 L.
	PROBE 3.0 L.	SC / XR7 3.8 L.	SC / XR7 3.8 L.	MARK VIII 4.6 L. (4V)	MARK VIII 4.6 L. (4V)
		PROBE 3.0 L.	PROBE 3.0 L.	T-BIRD/COUGAR 3.8 & 5.0 L.	T-BIRD/COUGAR 3.8 L.
		ESCORT/TRACER 1.9 L.	ESCORT/TRACER 1.9 L.	SC / XR7 3.8 L.	ESCORT/TRACER 1.9 L.
		MUSTANG 2.3 L.	MUSTANG 2.3 L.	ESCORT/TRACER 1.9 L.	SC 3.8 L.
			TEMPO/TOPAZ 2.3HSC & 3.0 L.	MUSTANG 2.3 L.	MUSTANG 5.0 L.
				TEMPO/TOPAZ 2.3HSC & 3.0 L.	TEMPO/TOPAZ 2.3 & 3.0 L.

Figure 1.

# FORD EEC IV CONTINUED

## TRUCKS

1990	1991	1992	1993	1994
RANGER 2.3 L.	RANGER 3.0 & 4.0 L.	RANGER 2.3 L.(OHC)	RANGER 2.3 L.(OHC)	RANGER 2.3 L.
RANGER/BRONCO II 2.9 L.(CAL.)	AEROSTAR 4.0 L.	RANGER/AEROSTAR 3.0 & 4.0 L.	RANGER/AEROSTAR 3.0 & 4.0 L.	RANGER/AEROSTAR 3.0 & 4.0 L.
BRONCO/E&F 4.9 L.	EXPLORER 4.0 L.	EXPLORER 4.0 L.	EXPLORER 4.0 L.	EXPLORER 4.0 L.
BRONCO/E&F 5.0&5.8 L.(E4OD)	BRONCO/E&F 5.0&5.8 L.(E4OD)	BRONCO/E&F 5.0&5.8 L.(E4OD)	BRONCO/F 5.0 L.(E4OD)	BRONCO/F 4.9 (E4OD),5.0 L.
	BRONCO/E&F 4.9 L. (ALL)	BRONCO/E&F 4.9 L. (ALL)	BRONCO/E&F 4.9 L. (ALL)	E - SERIES 4.9 L.
	F - SERIES 7.0 L.	E & F - SERIES 5.8 L.(C6.MT)	BRONCO, E & F 5.8 L.(E4OD)	F - SERIES 7.0 L.
		F - SERIES 7.0 L.	F - SERIES 7.0 L.	E & F - SERIES 7.5 L.
			F - SERIES 5.8 L. (HO)	BRONCO, E & F 5.0 L.(E4OD,AODE)
			E - SERIES 5.0 L. (AODE)	BRONCO, E & F 5.8 L.(E4OD)
			E - SERIES 5.8 L. (E4OD, MT)	

Figure 2.

## FORD E4OD

### NO FORWARD ENGAGEMENT

**COMPLAINT:** A no forward movement condition, until the manual shift lever is placed in Manual Low position.

**CAUSE:** The cause may be, an incorrectly installed New Plastic Caged Low Roller Clutch Assembly.

**CORRECTION:** Use the following procedure any time the Low Roller Clutch is being replaced using the New Plastic Caged Low Roller Clutch Assembly.

(1) Remove the upper snap ring, brass bushing, roller clutch assembly, and lower snap ring, as Shown in Figure 1.

**DISCARD ALL PARTS REMOVED**

(2) Install the New Plastic Cage Roller Clutch Assembly through the REAR side of the Reverse Clutch Hub, with the tabs on the rear edge. Seat the Low Roller Clutch into the Reverse Clutch Hub, and rotate clockwise to set rollers and lock tabs in place. Refer to Figure 2 for proper installation.

**SERVICE INFORMATION:** 94-8-20

Plastic Caged Low Roller Clutch Assembly

F3TZ-7A089-A

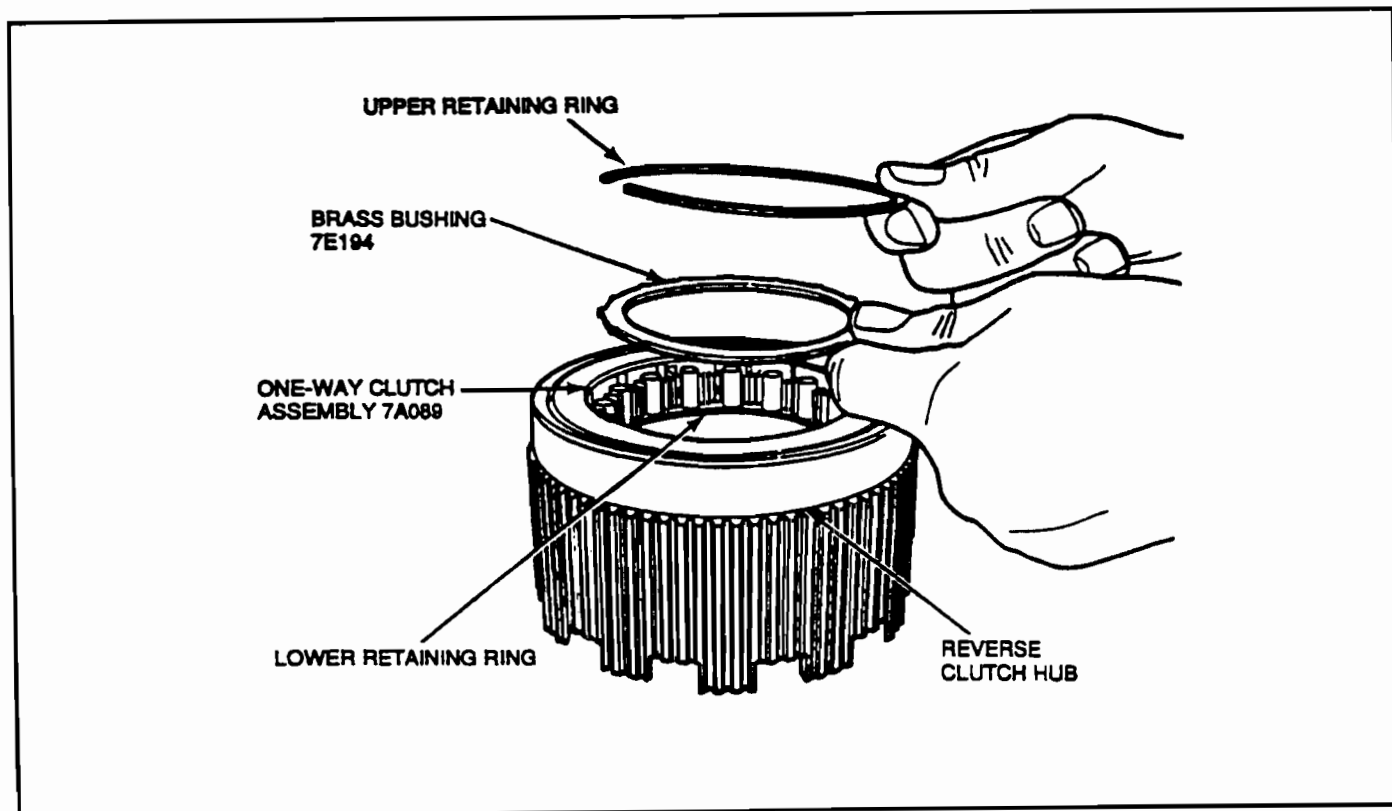
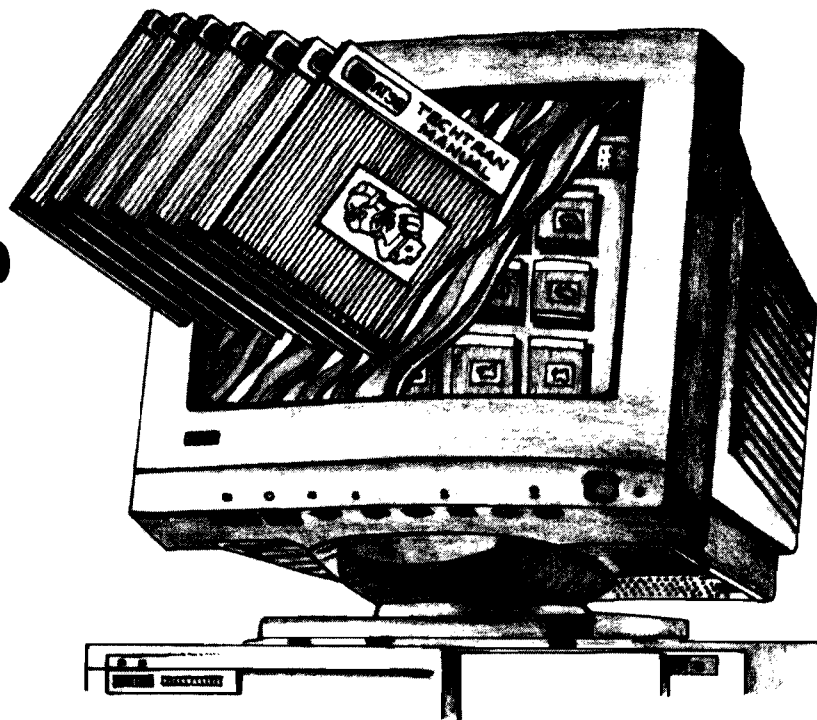


Figure 1

# Another First ...



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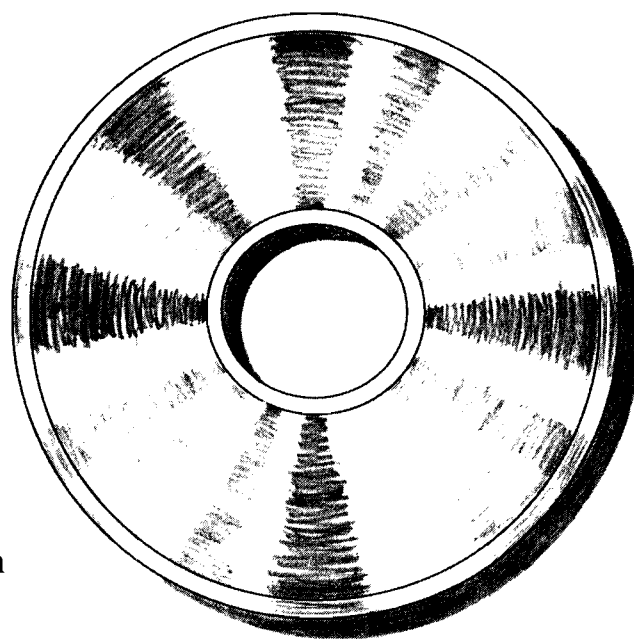
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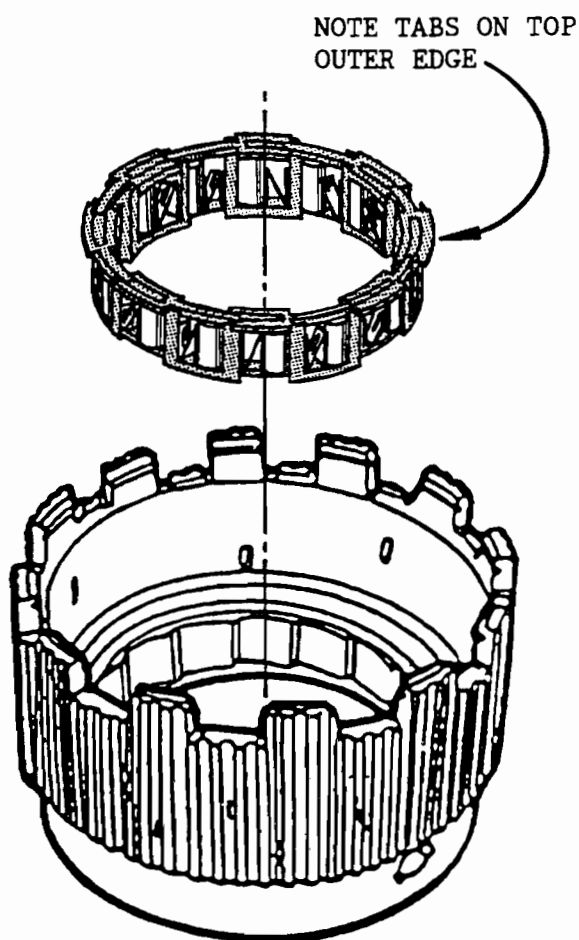
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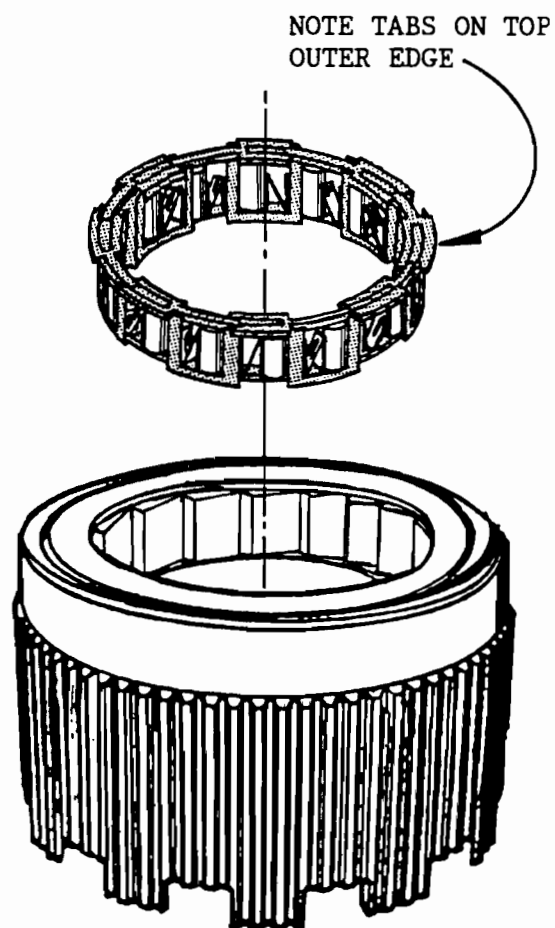
# E4OD PLASTIC LOW ROLLER CLUTCH ASSEMBLY

## INCORRECTLY INSTALLED



CAUTION: IF ROLLER CLUTCH IS INSTALLED  
IN THIS DIRECTION, THE CLUTCH  
WILL FREEWHEEL BOTH DIRECTIONS.

## CORRECTLY INSTALLED



DISCARD BOTH SNAP RINGS. THEY ARE NOT  
USED WITH THE PLASTIC ROLLER CLUTCH.

Figure 2

## E4OD CONVERTER DRAINBACK

**COMPLAINT:**

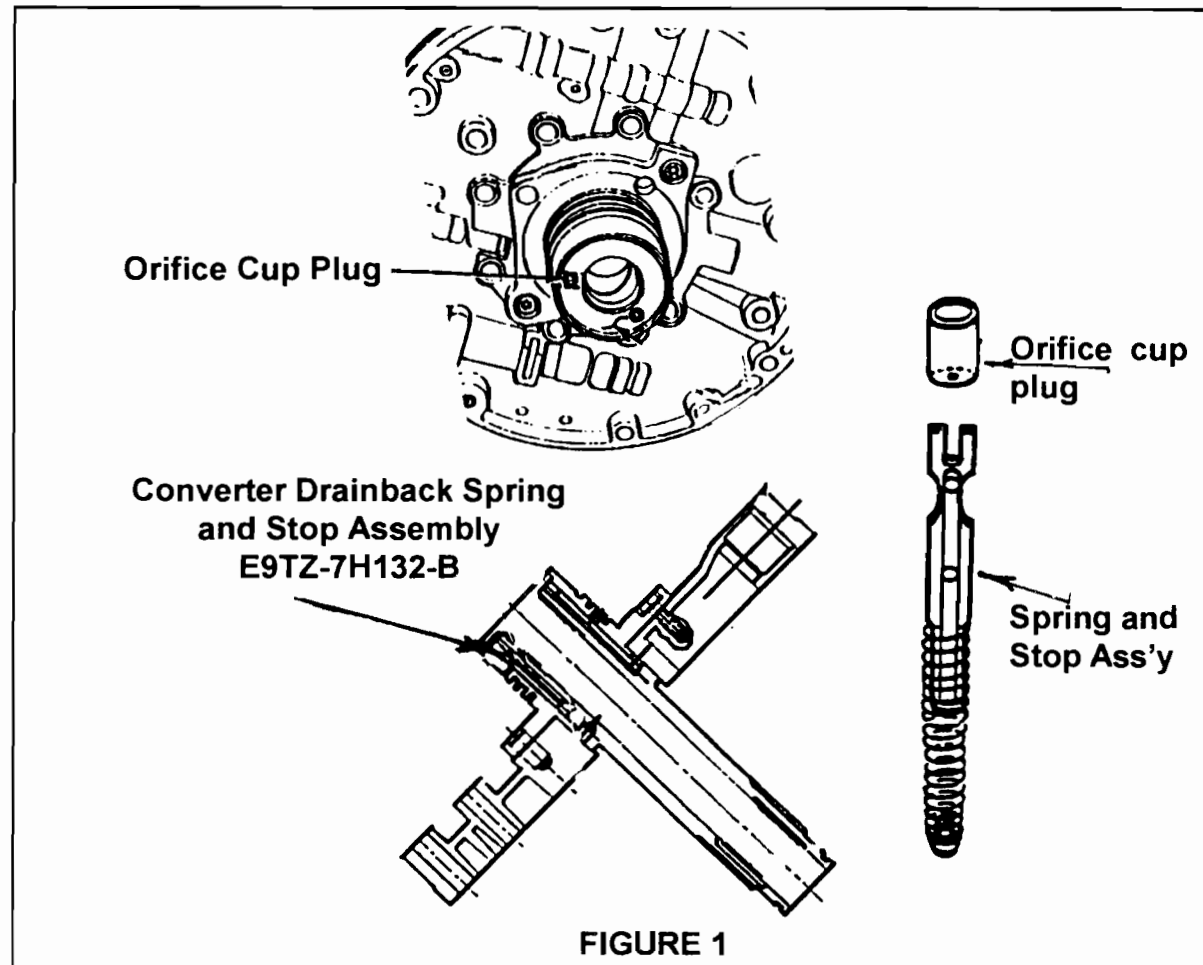
Delay engagement forward and reverse after vehicle sets up for several hours or overnight.

**CAUSE:**

Converter drain back. Usually the converter drainback valve, (plastic) distorts and does not seat. Allowing fluid in the converter to drain back to the transmission.

**CORRECTION:**

Replace the converter drainback spring and stop assembly. See Figure 1 which illustrates the spring and stop assembly. Service Kit Part Number E9TZ-7H132-B.





## SLIDE

**FORD E4OD  
NO 2-3 UPSHIFT**

**COMPLAINT:** Some 1990-1994 Bronco, Econoline and "F" Series Trucks may exhibit a no 2-3 upshift condition. Refer to the chart in Figure 1 for specific model transmissions that are affected.

**CAUSE:** The cause may be, cross leakage between the spacer plate and valve body and/or transmission case, created by distortion of the separator plate.

**CORRECTION;** Remove the valve body spacer plate, and inspect for spacer plate distortion in the area shown in Figure 2. Both valve body gaskets must be removed to see the distortion.  
If spacer plate is distorted, replace it with OEM part number **F4TZ-7A008-A**, and re-install using new valve body gaskets. Refer to Figure 3 for the new spacer plate I.D.

**NOTE:** Be sure to perform diagnostics (Line Pressure and Scanner Test) to ensure no electrical problems exist that might create high line pressure.

**SERVICE INFORMATION:**

Valve Body Spacer Plate  
Gasket, Valve Body/Spacer Plate  
Gasket, Spacer Plate/Case  
Oil Pan Gasket

F4TZ-7A008-A  
F1TZ-7C155-A  
F0TZ-7D100-A  
E9TZ-7A191-A

MODELS AFFECTED	ADDITIONAL INFORMATION
<b>1990/91</b>	
F0TP	ALL
F0UP	ALL
F1TP	ALL
<b>1992/93/94</b>	
F2TP	ONLY TRANSMISSION BUILD DATES PRIOR TO 12-21-93
F2UP	-
F3TP	-
F3UP	-
F4TP	-

Figure 1

SLIDE

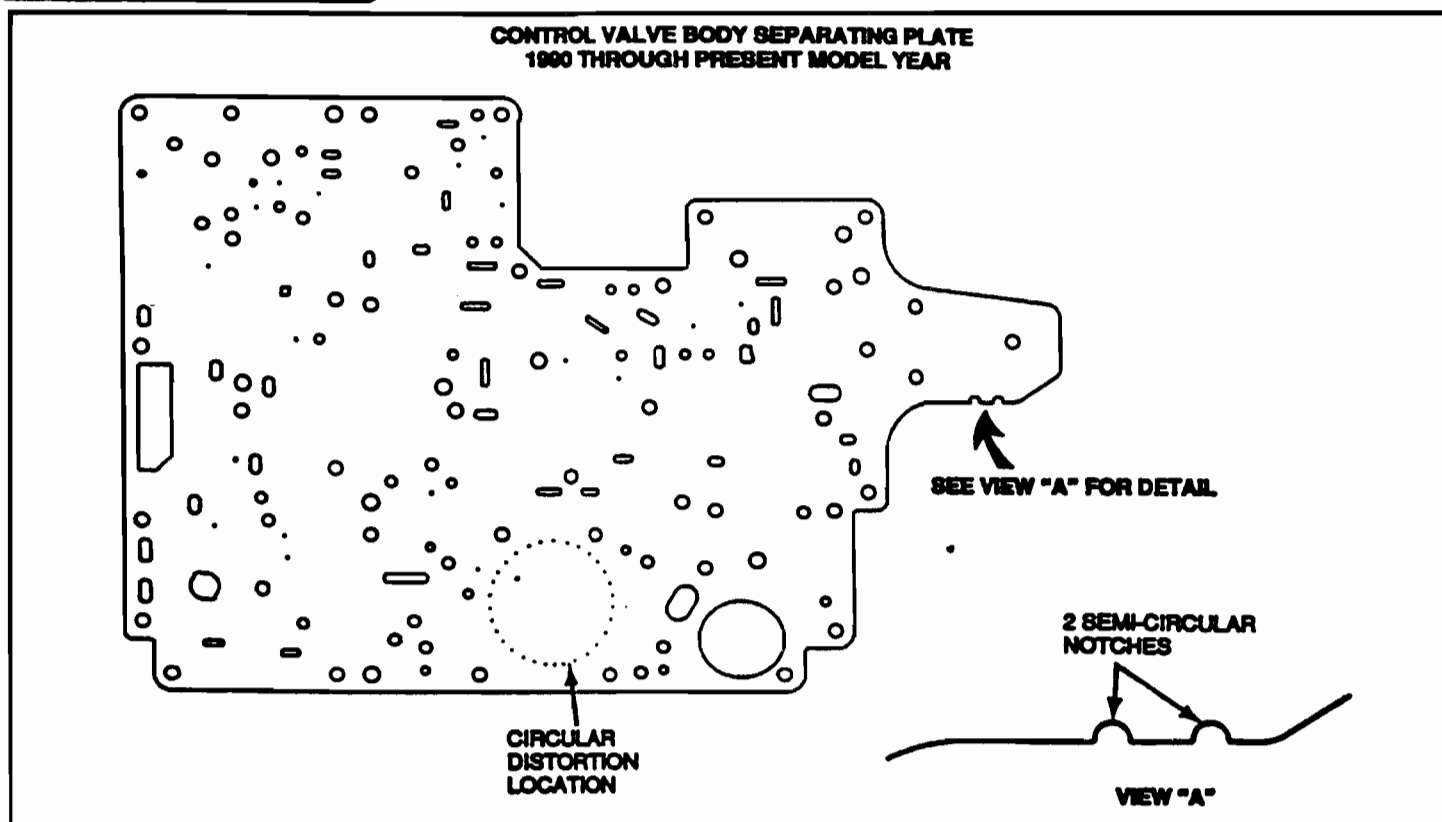


Figure 2

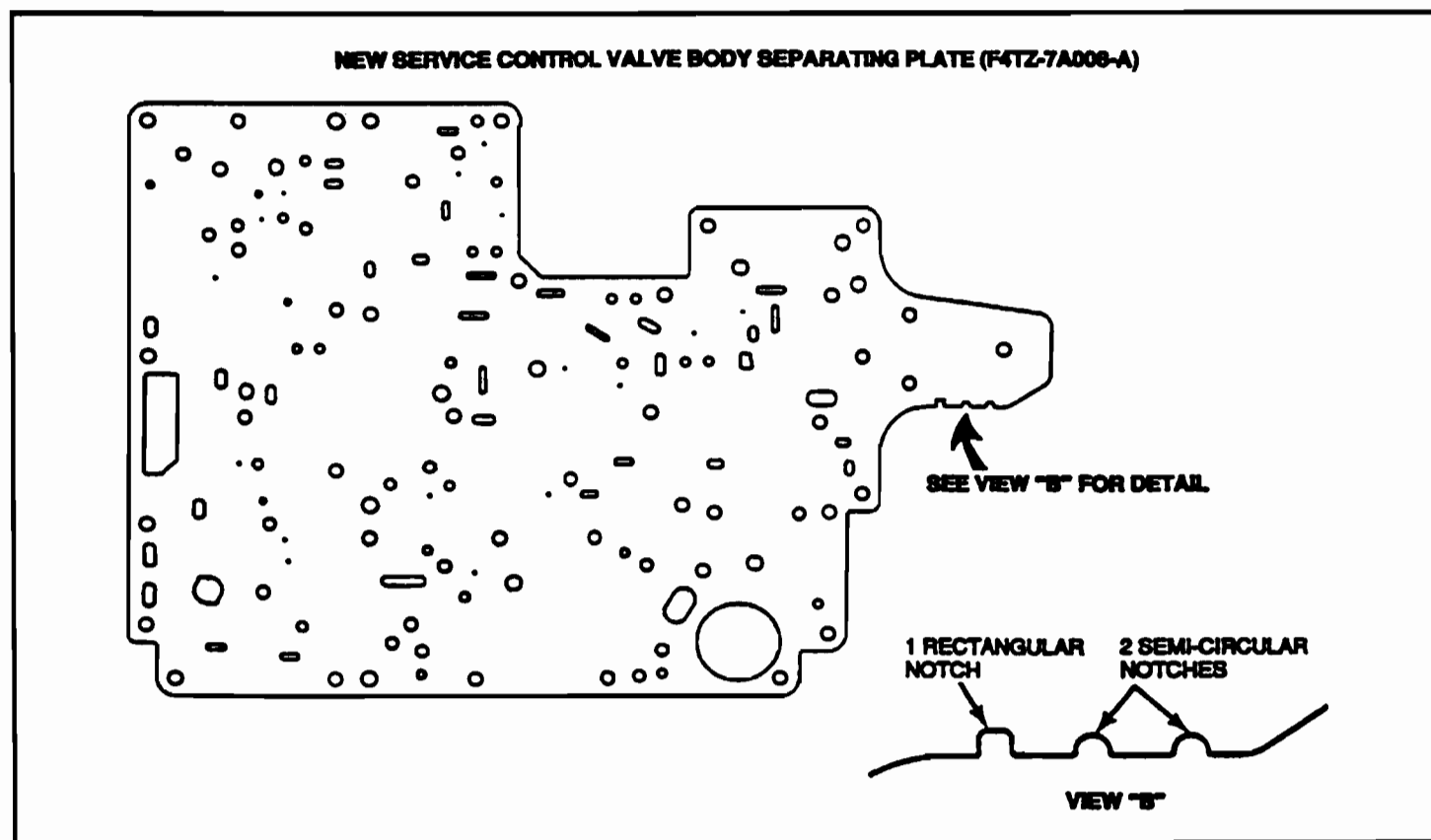


Figure 3



## FORD E40D DELAYED ENGAGEMENT

### COMPLAINT:

A delayed engagement of 10-30 seconds, after setting for an extended period of time.

### CAUSE:

The cause may be, converter drain back through the cooler.

### CORRECTION:

Install an in-line check valve. **OEM part number F0TZ-7D174-A**, in the "COOLER RETURN LINE" going to the REAR case fitting.

(See Figure 1)

**NOTE:** MAKE SURE THAT THE FLOW DIRECTION ARROW STAMPED ON THE CHECK VALVE POINTS TOWARDS THE REAR COOLER FITTING, OR A TRANSMISSION FAILURE WILL RESULT.

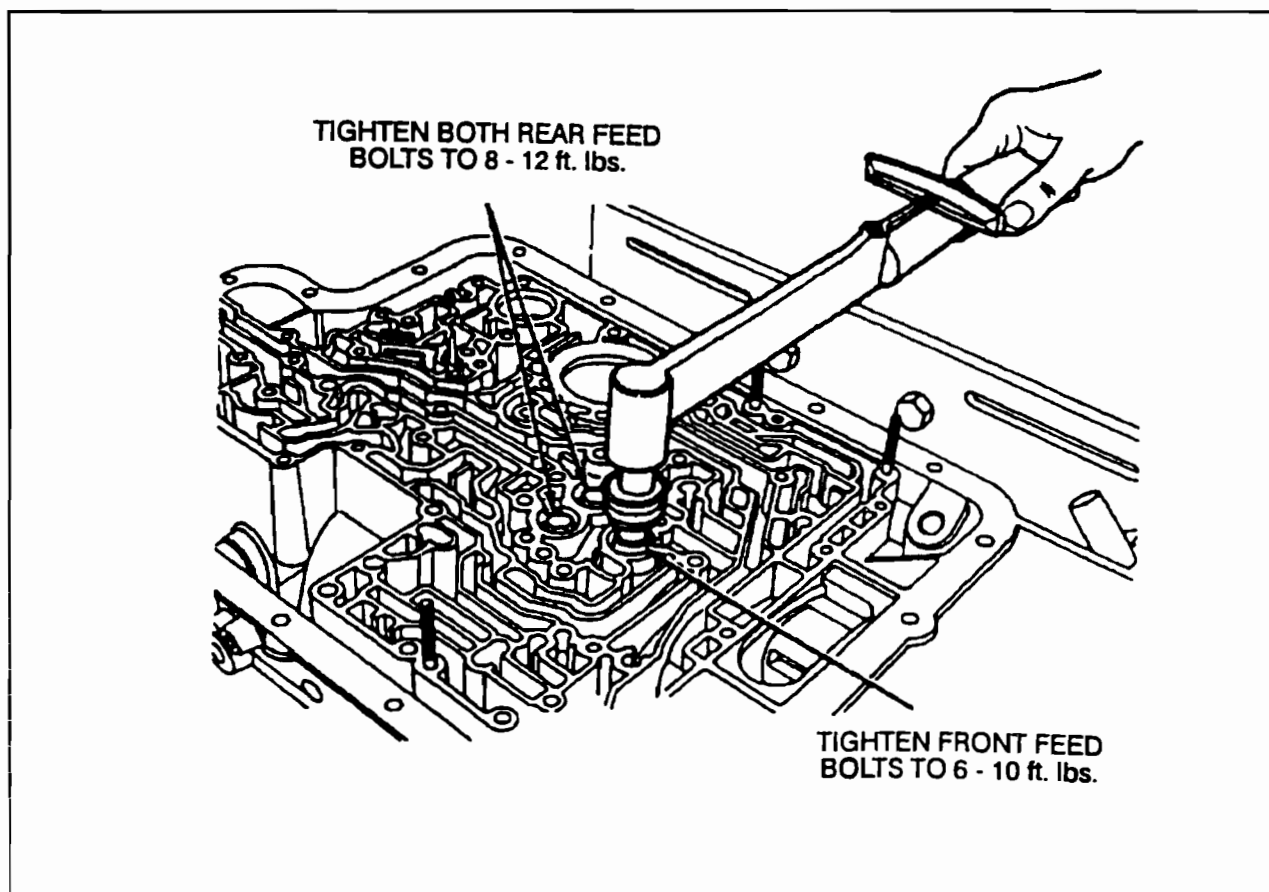


FIGURE 1

# A CONTINUING TRADITION OF... **SUPERIOR INNOVATION**

**SHIFT**  
TECHNOLOGY PRODUCTS  
A DIVISION OF SUPERIOR TRANSMISSION PARTS, INC.

## The AXOD Dam

This AXOD Lube Correction Package will do the following:

- Helps eliminate front and rear planetary failure.
- Increases volume of fluid to the planetary assemblies.
- Improves cooling of the front and rear planetary assemblies.

**THE HIGHEST QUALITY AFTERMARKET PARTS AVAILABLE -- EASY TO INSTALL**

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THE SIMPLE SOLUTION

**SHIFT**  
TECHNOLOGY PRODUCTS  
A DIVISION OF SUPERIOR TRANSMISSION PARTS, INC.

## The 400 Kit

1965 Through 1993

The 400 Shift Correction Package deals with the following problems:

- Soft late shifts
- Soft 2-3 shifts
- Harsh reverse engagement
- Clutch chatter
- Bind up in manual low when hot
- HD snap ring included to prevent case damage

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**SUPERIOR**  
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THE SIMPLE SOLUTION

**SHIFT**  
TECHNOLOGY PRODUCTS  
A DIVISION OF SUPERIOR TRANSMISSION PARTS, INC.

## The AXOD Kit

The AXOD Shift Correction Package deals with the following problems:

- Late shifts
- 2-3 flex
- Soft or sloppy 1-2 shifts
- Downshift bump
- Inadequate lube oil
- Converter chatter
- 2nd gear starts
- Spin up on 2-3 upshifts
- Improves overall performance

**THE HIGHEST QUALITY AFTERMARKET PARTS AVAILABLE -- EASY TO INSTALL**

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THE SIMPLE SOLUTION

Our Shift Technology Products Shift Correction Packages continue to set industry standards for quality and performance. Find out why more and more transmission professionals are depending on Superior Innovation!

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## FORD E4OD UPGRADES

### CONVERTER COVER DISCOLORATION-BURNED CLUTCHES AND FLUID- EXCESSIVE BUSHING WEAR LOW ONE-WAY CLUTCH MALFUNCTION

A number of changes have been made to upgrade the E4OD transmission and improve its durability and reliability. These improvements should be made when the above mentioned concerns have been exhibited at teardown. Install the following upgraded components at time of overhaul.

#### OVERHEATING, CONVERTER COVER DISCOLORATION, CLUTCHES BURNED AND BURNT FLUID.

If overheating, converter cover discoloration, clutches burned, and / or burnt fluid are noted at teardown and the transmission build date is before 3/30/92, replace with the following upgraded components in normal rebuild procedures.

—Install revised front oil pump assembly

#### F5TZ-7A103-A.

Use the Powertrain Control Module listed in the Powertrain Control Module Usage Chart if build dates are prior to those listed below.

BUILD DATE CHART	
ENGINE	BUILD DATE
4.9L	3/16/92
5.0L	3/25/92
5.8L	7/14/92 (Less Than 8500 GVW)
5.8L	7/29/92 (Greater Than 8500 GVW)
7.3L Diesel	2/17/92
7.5L	2/17/92

If the the low one way clutch located at the rear of the transmission appears to have overheated, check for proper lube flow. If cooler flow is within specifications, remove the converter drain back valve located at the rear of the transmission. Verify that the check valve ball is moving freely by pushing on the ball using a small screwdriver. Replace the check valve with the appropriate valve assembly as noted below if the checkball does not move freely.

**F0TZ-7D174-B (5/16" Dia. Cooler Lines)**

**F0TZ-7D174-C (3/8" Dia. Cooler Lines)**

#### OTHER UPGRADED COMPONENTS

An upgraded Fuel Injection Pump Lever sensor (FIPL)/Throttle Position (TP) (F2TZ-9B989-C) should be installed on E-Series and F-Series vehicles. Follow the FIPL / TP installation and adjustment section of this service bulletin.

An auxiliary cooler should be added to all 7.3 L Diesel units that do not already have one. Refer to the Auxiliary Oil Cooler Installation Procedure in Figures 4 thru 7 in this bulletin for parts and instructions.

A new converter should be installed as noted in the following E4OD Torque Converter Chart.

E4OD TORQUE CONVERTER CHART		
ENGINE	PART NUMBER	ID
4.9L	F1TZ-7902-DRM	L
5.0L	F1TZ-7902-ERM	M
5.8L	F1TZ-7902-ERM	M
7.3L Diesel (non turbo)	F1TZ-7902-CRM	K
7.5L	F1TZ-7902-DRM	L

See **FAILURE MODE EFFECTS**  
**MANAGEMENT (FMEM)** Diesel application



1995 SEMINAR INFORMATION  
SLIDE

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SERVICE INFORMATION: (94-12-14)

POWERTRAIN CONTROL MODULE USAGE CHART				
ENGINE	VEHICLE	CALIBRATIONS AFFECTED	APPLICATION	PCM PART NUMBER
4.9L	Econoline	52K	49S / ALT / CAN	F3TZ-12A650-ABB
		52Q	CALIF.	F3TZ-12A650-ACB
	F-Series (SWB)/Bronco	52H	49S / ALT / CAL	F3TZ-12A650-YB
	F-Series (LWB)	52J		F3TZ-12A650-ZB
	F-Series (SWB)/Bronco	52S	CALIF.	F3TZ-12A650-AAB
	F-Series (LWB)	52R	CALIF.	F3TZ-12A650-AEB
5.0L	F-Series/Bronco	1-54L-R10	49S / CAN	F2TZ-12A650-AHB
		2-54L-R00		
		2-54L-R10		
		2-54L-R12		
		1-54P-R10	CALIF.	F2TZ-12A650-AJB
		1-54P-R11		
		2-54P-R00		
		2-54P-R10		
		2-54P-R12		
		1-54X-R10	ALT	F2TZ-12A650-AKB
		1-54X-R11		
		2-54X-R00		
		2-54X-R10		
		2-54X-R12		
5.8L	F-250/350 E-250/350	1-76A-R00	50S	F2TZ-12A650-PB
	F-150/Bronco (3.55)	1-64E-R10	49S / CAN / ALT	F2TZ-12A650-CC
	F-250 LD (4.10)	2-64E-R10		
	F-150 (3.08)/F-250 LD (3.55)	1-64H-R10		F2TZ-12A650-MC
		2-64H-R10		
	Bronco (3.08)	1-64J-R10		F2TZ-12A650-RC
		2-64J-R10		
	E-150/E-250 LD	1-64K-R10		F2TZ-12A650-LB
		2-64K-R00		
	F-150 (4.10)	1-64M-R10		F2TZ-12A650-BAC
		2-64M-R10		
	F-150 (4.10)	1-64P-R10	CALIF.	F2TZ-12A650-BBC
		2-64P-R10		
	E-150/E-250 LD	2-64R-R00		F2TZ-12A650-DB
		1-64R-R10		
	F-150/Bronco (3.55)	2-64S-R10		F2TZ-12A650-BSB
	F-250 LD (4.10)	1-64R-R10		
7.5L	Econoline	98E	50S	F2PZ-12A650-AWA
	F-Series	98A	50S	F2PZ-12A650-AXA
	Super Duty	98B	50S	F2PZ-12A650-ANA
7.3L Diesel (Non Turbo Only)	F-Series/Econoline	89J	50S	F4TZ-12B565-AA
	Super Duty	89J	50S	F4TZ-12B565-BA
	Econoline, F-Series	89X	ALT	F4TZ-12B565-CA
	Super Duty	89X	ALT	F4TZ-12B565-DA



## CASE BUSHING WEAR AND SUN GEAR BUSHING WEAR

If case bushing wear, sun gear bushing wear, excessive wear in the i.l.D. of the center support, output shaft bushing wear (located in front of the output shaft), and /or low one-way clutch malfunctions are noted at teardown, replace with the following components.

### Ball Bearing Center Support Kit (F4TZ-7A130-B)

On transmissions built before 3/30/92, the following components should also be replaced.

New balanced low/reverse clutch hub  
(F3TZ-7B067-A)

New unitized plastic cage low one-way clutch  
(F3TZ-7A089-A)

New reverse planetary with minor diameter fit  
(F2TZ-7D006-A). When the reverse planet is replaced, thrust washers numbers 10B and 11 must be replaced.

New case bushings of harder material  
(F2TZ-7025-A front F2TZ-7025-B rear)  
refer to Figures 10 thru 18.

Overdrive planet and input shaft kit  
(F4TZ-7B446-B)

New sun gear with harder bushings  
(E9TZ-7D063-A).

## FORWARD CLUTCH SPLINE WEAR

If forward clutch friction plate spline wear is observed, install new forward clutch plates with harder spline teeth (F2TZ-7B164-A) in conjunction with normal overhaul procedures.

## FAILURE MODE EFFECTS MANAGEMENT (FMEM) ENHANCEMENTS (7.3L DIESEL ONLY)

The new strategy will flash the transmission control indicator light (TCIL) when the vehicle experiences certain failure modes. The table below outlines when the TCIL will be flashed and what codes will be set during the identified failure mode.

FAILURE MODE	CODES	TCIL STATE
EPC short to ground	99	Flash
EPC open circuit	99	Flash
MLP sensor	67	No
TOT over temperature	68	Flash
TOT open circuit	56	No
TOT short	66	No
FIPL/TP noisy	33	Flash
FIPL/TP short	53	Flash
FIPL/TP open circuit	63	Flash
FIPL/TP below FIPL low	43	Flash
MAP	22	No
RPM	14	Flash
VSS	29	Flash
TCC excessive slippage	62	Flash
Missed 1-2 shift	49	Flash
Missed 2-3 shift	59	Flash
Missed 3-4 shift	69	Flash
4x4 low input	47	No

## CODE 62 SERVICE PROCEDURE

1 Verify proper transmission functions by performing diagnostic procedures specified in the Powertrain Control/Emissions Diagnostic for DTC or the ATSG Domestic Pass Book.

2 Verify proper PCM level as noted in the Powertrain Control Usage Chart located on the preceding page.

**CODE 62 SERVICE continued)**

3 If steps 1 and 2 do not resolve the concern, a transmission slippage concern may exist. If no transmission component damage is evident, a new torque converter may be required. Refer to the E4OD Torque Converter Chart.

**FIPL/TP INSTALLATION AND AJUSTMENT  
PROCEDURE**

**NOTE:***The FIPL/TP Sensor should be checked every 5,000 Miles80000 Kilometers and,if needed adjusted.*

The Fuel Injection Pump Lever (FIPL) Throttle Position (TP) sensor is used on E-250-350,F-250-350, and F Super Duty vehicles equipped with a 7.3L Diesel engine and an E4OD automatic transmission. The FIPL/TP sensor is a potentiometer attached to the fuel injection pump and is operated by the throttle lever Figure 1.

The FIPL/TP sensor is incorporated to provide an electrical signal, which is proportional to the amount of fuel being delivered, as an input to the Powertrain Control MOdule (PCM). Based on this information ,PCM provides the proper shift scheduling and torque capacity.

If a malfunction occurs in the FIPL/TP sensor circuit, the electrical signal sent to the PCM will be recognized as erroneous. When this out-of-specification signal is detected, the PCM will provide a high capacity operating mode that protects the transmission from potential damage. This operating mode includes includes maximum TV pressure, resulting in harsh upshifts and engagements and a singular shift schedule regardless of accelerator pedal position, resulting in the 1-2, 2-3, and 3-4 shifts occuring at a speed equal to a heavy (but not wide open) throttle setting.

If harsh or poorly scheduled shifts are encountered, perform Key On, Engine Off Self Test to determine the appropriate repair to be performed and correct as necessary before proceeding. If it is necessary to service the FIPL/TP Sensor, refer to the following

**NOTE:***To check the FIPL/TP sensor for proper operation and to make any adjustments, the engine must be turned off.*

1. Perform Key-On, Engine-Off Self-Test and wait for all the fault codes.

**NOTE:***The throttle must be held to the floor during Key-On Engine-Off Self Test until the codes have begun to be displayed on the scanner tool.*

2. After the last fault code has been read, press the Transmission Control Switch (TCS). This will initiate the FIPL/TP Sensor adjustment mode.

3. Remove the throttle cable from the throttle lever on the right side of the fuel injection pump.

4. Insert the VRH Setting Gauge Block T92T-7B200-AH (.515") (13.06mm) between the gauge block boss and the maximum throttle travel screw, Figure 2. Hold the throttle lever open against the gauge block. A steady tone indicates the FIPL/TP is properly adjusted.

**NOTE:***The FIPL/TP sensor bracket is permanently attached to the pump with tamper-proof screws. Movement of the bracket is not normally used as a means for adjustment. If required adjustment of the FIPL/TP sensor may be accomplished by utilizing the clearance between the sensor-to-bracket screws and the sensor.*

**NOTE:***If the FIPL/TP sensor bracket is loose, remove the epoxy from the bracket-to-pump mounting screws, adjust the FIPL/TP sensor/bracket assembly to obtain a steady tone, re-tighten the screws, and reapply epoxy to the screw heads.*

## E4OD UPDATES CONT'D

5. To Adjust, proceed as follows:

a. Loosen the two (2) screws that attach the FIPL/sensor to the mounting bracket Figure 3.

b. Rotate the FIPL/TP sensor until a steady tone is heard from the scanner.

c. If the setting is too low there will be a slow beep (1 per second) If set too high it will fast beep (4 per second).

d. Once a steady tone is heard, tighten the attaching screws to 8-10.5 Nm (71-93 in/lb).

e. If the FIPL/TP sensor cannot be adjusted to obtain a steady tone, adjustment may be attempted by loosening the bracket attaching bolts and rotating the bracket.

f. If a steady tone is still cannot be obtained, refer to the DQ pinpoint tests ion the "Powertrain Control/Emissions Diagnosis Manual.

6. Remove the gauge block.

a. Cycle the throttle lever from idle to wide open throttle (WOT) five (5) times.

b. Reinsert the gauge block to verify the setting.

c. If the tone is not steady, than re-adjustment is necessary.

d. Repeat this procedure from step 5.

7. Remove the gauge block. Reattach the throttle cable.

8. Start the engine. Check throttle operation and transmission shift scheduling and quality.

**Warning: Do not turn the maximum throttle travel screw. This screw has been preset and should not be adjusted.**

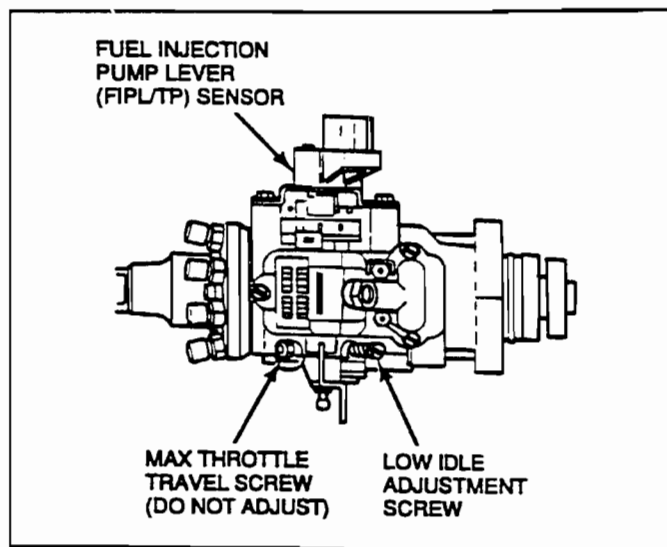


Figure 1

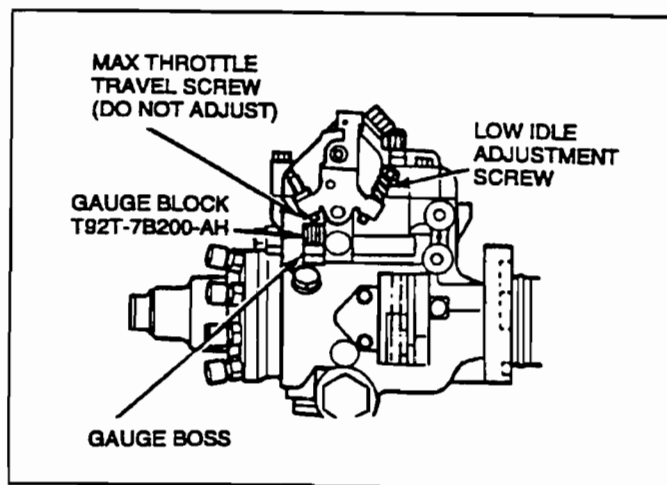


Figure 2

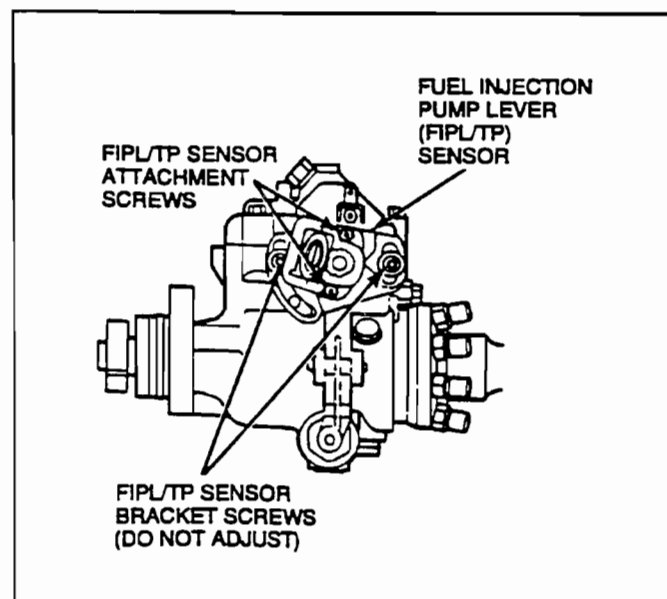


Figure 3





## E4OD AUXILIARY OIL COOLERS

(Cont'd)

### AUXILIARY OIL COOLER INSTALLATION PROCEDURE 1989-92 7.3L DIESEL

**NOTE:** *The heater bypass system must be checked and updated as required.*

#### TRANSMISSION AUXILIARY OIL COOLER INSTALLATION (FIGURE 4)

1. Attach the auxiliary oil cooler bracket (**F4TZ-7B142-A**) to the radiator support using two (2) screws (N610959-S36, 6.3x1.81x19.0 hex head).
2. Attach the auxiliary oil cooler bracket (**E3TZ-7B142-A**) to the radiator support brace using two (2) screws (N610959-S36 6.3x1.81x19.0 hex head).
3. Align the auxiliary cooler (**E4TZ-7A095-B**) secure the cooler to the right hand bracket.
4. Using one (1) clip (N803284-S100) and one (1) screw (N610959-S36, 6.3x1.81x19.0 hex head), secure the auxiliary cooler to the left hand bracket.
5. Torque screws in steps 1,2,3 and 4 to 4-8 ft/lb (5-11 Nm).

#### AUXILIARY COOLER LINE INSTALLATION FIGURE 5

1. Trace the rear transmission cooler return line to the radiator in-tank cooler outlet fitting.
2. Disconnect the rubber hose from the radiator in-tank cooler outlet fitting.
3. Using bulk hose (**D5AZ-7B093-A**) and hose clamps (376240-S100), connect the auxiliary transmission oil cooler outlet fitting to the auxiliary transmission oil cooler inlet (top fitting).

4. Tighten the hose clamps installed in Step 3.

5. Using bulk hose (**D5AZ-7B093-A**) and hose clamps (376240-S100), connect the auxiliary transmission oil cooler outlet (bottom fitting) to the rear transmission cooler return line and tighten the hose clamps.

6. With the engine running, check the transmission fluid level and top off as required. Check for leaks at all connections.

### 1989-91 E-SERIES 7.3L DIESEL 48 PLATE AUXILIARY OIL COOLER INSTALLATION

**NOTE:** *The heater bypass system should be checked and updated as required.*

#### TRANSMISSION AUXILIARY OIL COOLER INSTALLATION (FIGURE 6)

1. Attach auxiliary oil cooler bracket (**E7UZ-6K743-A**) to radiator grille support (**E3UZ-8182-A** needed if vehicle not equipped) using two (2) screw and washer assemblies (55981-S2 1/4-14x1/2 hex washer head tapping) Tighten to 4-8 ft/lb (5-11 Nm).
2. If the vehicle is equipped with radiator/grille support, go to step 3. Attach the radiator/grille support to the radiator core support using two (2) screw washer assemblies (57030-S2, 1/4-20x9 hex head lock) and two (2) U-nuts (45263-S101, 1/4-20). Tighten to 7-11 ft/lb (9.5-15 Nm).
3. Attach auxiliary oil cooler bracket (**E7UZ-6K743-A**) to the radiator core support using two (2) screw and washer assemblies (55981-S2, 1/4-14x1/2 hex washer head tapping). Tighten to 4-8 ft/lb (5-11 Nm).
4. Position the transmission auxiliary cooler on the mounting brackets so the inlet and outlet face the right hand (passenger) side of the vehicle.



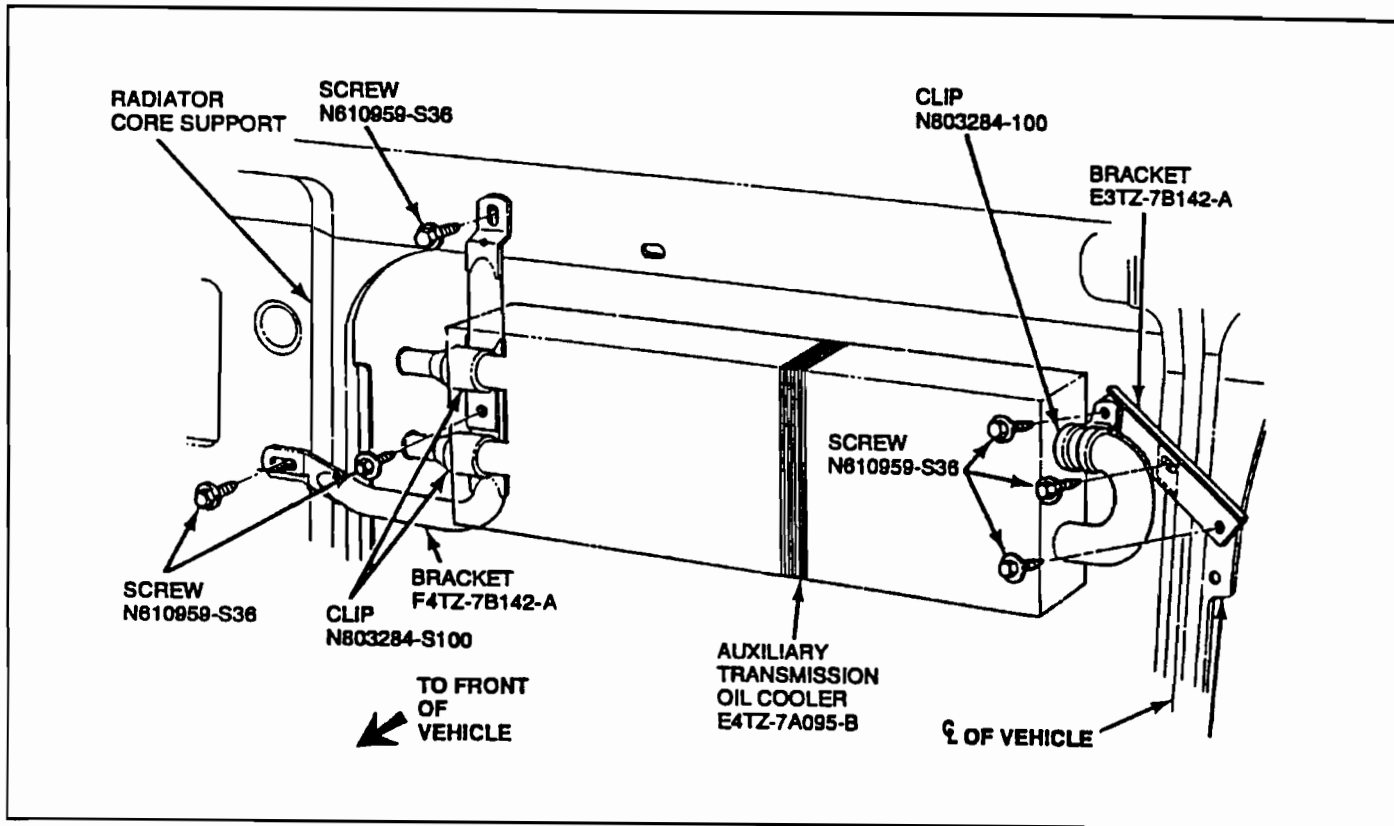


Figure 4

**TRANSMISSION OIL COOLING SYSTEM — WITH AUXILIARY OIL COOLER**  
**1990 F250/350, F-SUPER DUTY AND F53 STRIPPED CHASSIS —**  
**8 CYL. 7.3L DIESEL**

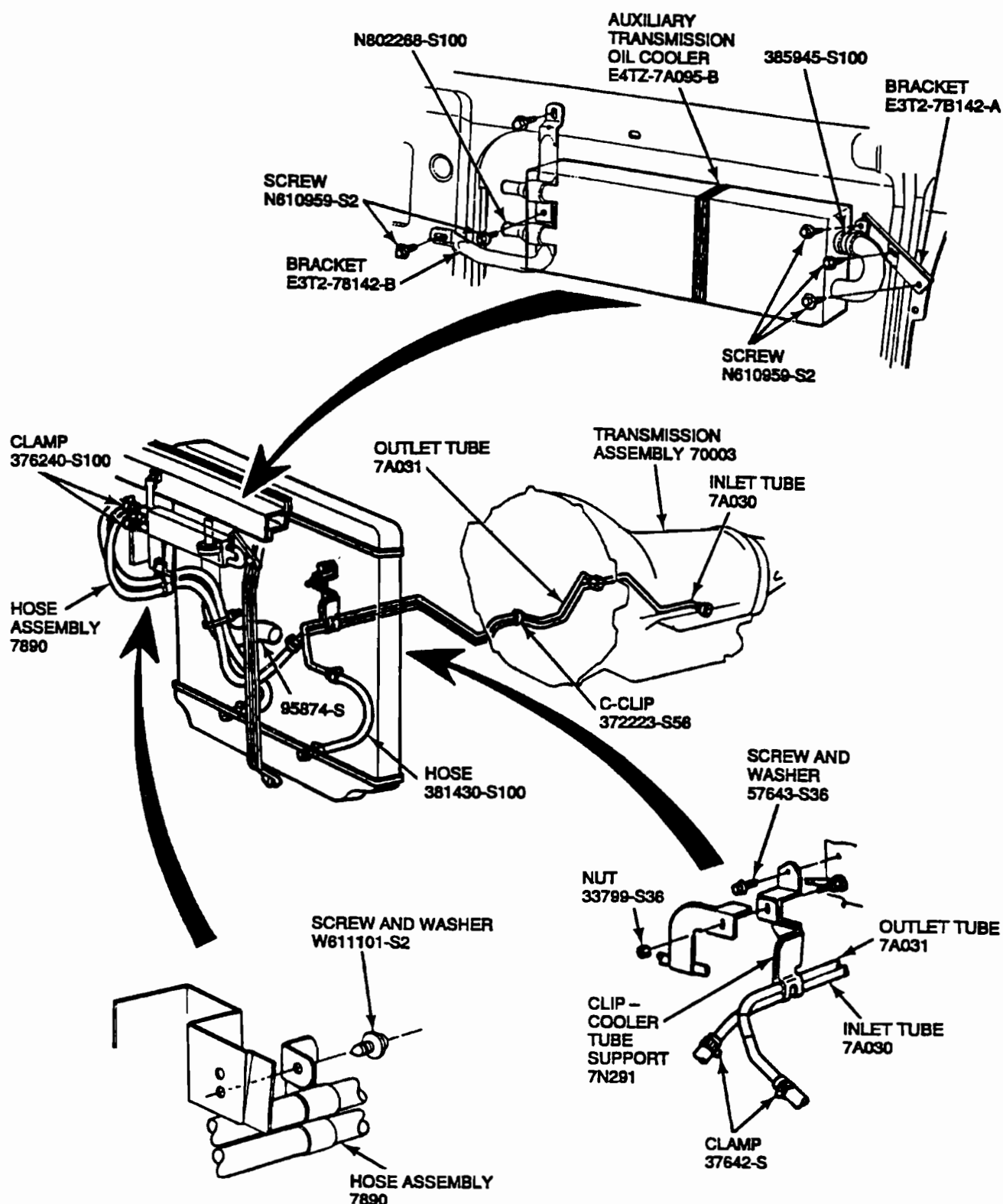


Figure 5

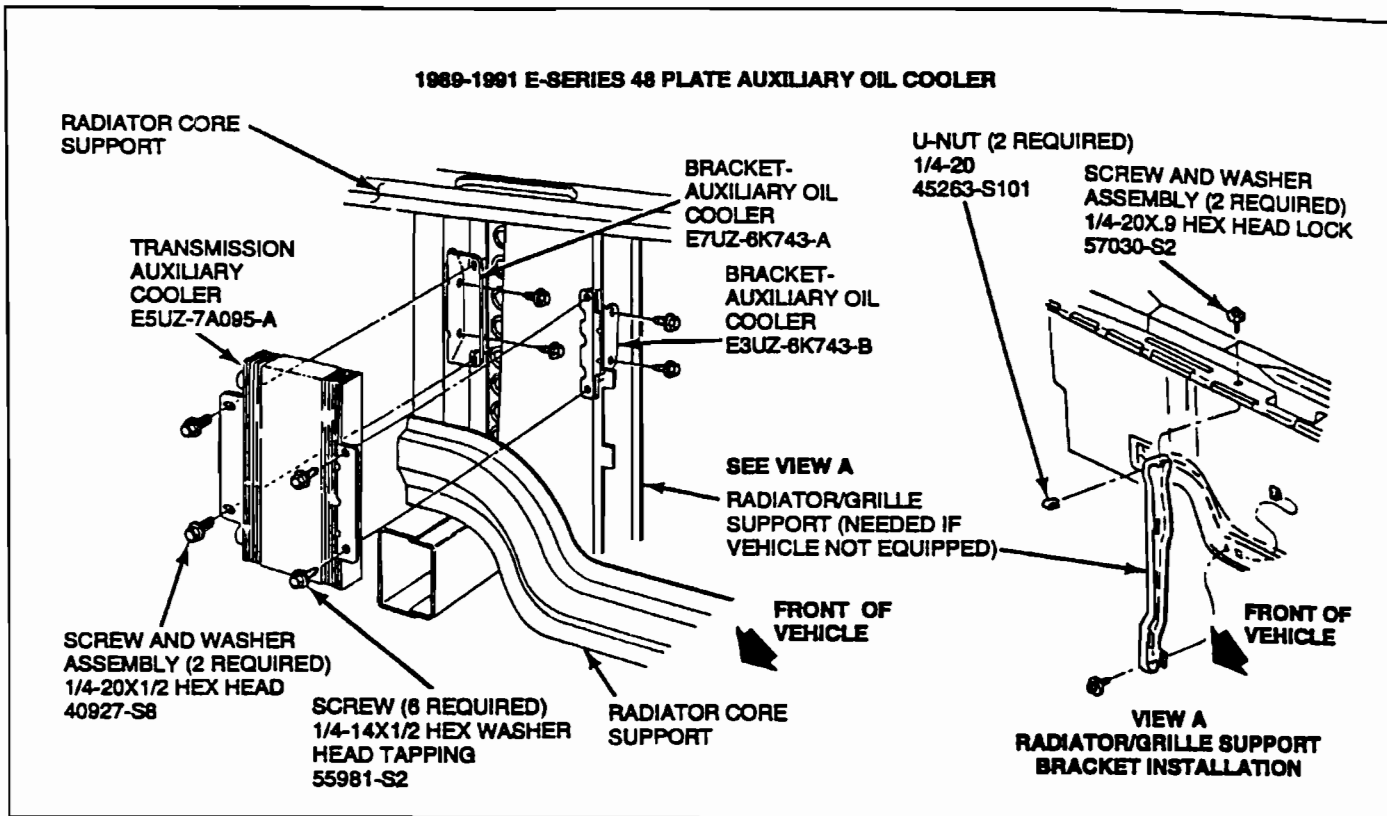


Figure 6

## E4OD AUXILIARY OIL COOLER (CONT'D)

5. Attach the cooler to the brackets using two (2) screws (55981-S2 1/4-14x1/2 hex washer head tapping) on the left hand side and two (2) screw and washer assemblies (40927-S8, 1/4-20x1/2 hex head) on the right hand side. Tighten to 4-8 ft/lb (5-11 Nm).

### AUXILIARY COOLER LINE INSTALLATION (FIGURE 7)

1. Trace the rear transmission cooler inlet line to the radiator in-tank cooler outlet fitting.

2. Disconnect the rubber hose from the radiator in-tank cooler outlet fitting.

3. Form the bottom auxiliary cooler line by using 5/16" (7.9mm) outside diameter steel tubing.

a. Bend the line as required so it goes down the front side of the radiator core support and under the radiator.

b. On the end that is to be connected to the auxiliary cooler, double flare and install fitting (87944-S8).

c. Form a small mushroom on the other end of this line for a rubber hose connection.

4. Install the bottom auxiliary cooler line to the auxiliary cooler.

5. Connect the bottom auxiliary cooler line to the rear transmission cooler inlet line by using the rubber hose disconnected in Step 2. If the rubber hose is too short, use bulk hose (D5AZ-7B093-A) to make a longer section.

6. Form the top auxiliary cooler line by using 5/16" (7.9mm) outside diameter steel tubing.

a. Bend the line as required so it follows the bottom line down the front side of the radiator core support and under the radiator.

b. On the end that is to be connected to the auxiliary cooler, double flare and install fitting (87944-S8)

c. Form a small mushroom on the other end of this line for a rubber hose connection.

7. Install the top auxiliary cooler line to the auxiliary cooler.

8. Use bulk hose (D5AZ-7B093-A) and hose clamps to connect the top auxiliary cooler line to the radiator in-tank cooler outlet fitting.

9. With the engine running, check the transmission fluid level and top off as required.

10. Check for leaks at all connections.

### 1992 7.3L DIESEL AUXILIARY COOLER INSTALLATION PROCEDURE E-SERIES TRANSMISSION AUXILIARY OIL COOLER INSTALLATION FIGURE 8

1. Align the auxiliary oil cooler (F2UZ-7A095-A) to the radiator support and hand start one (1) screw (N610957-S36) thru the cooler into the radiator support.

2. Secure two (2) screws (N610957-S36) thru the left hand cooler bracket and into the radiator support.

3. Secure one (1) screw (N610957-S36) thru the right hand cooler bracket and into the radiator/grille support.

4. Tighten screws in Steps 1, 2, and 3 to 4-8 ft/lb (5-11 Nm)

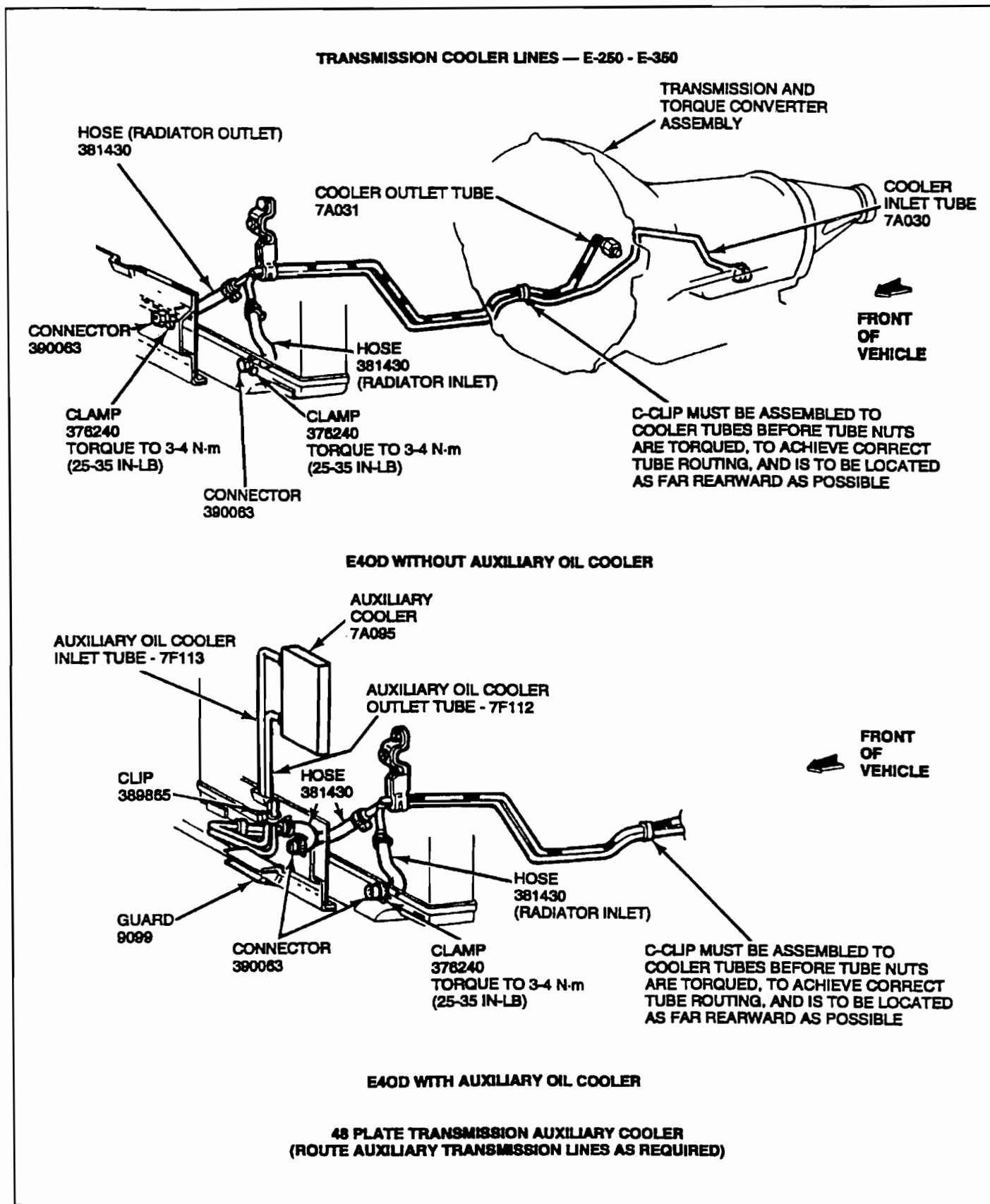


Figure 7

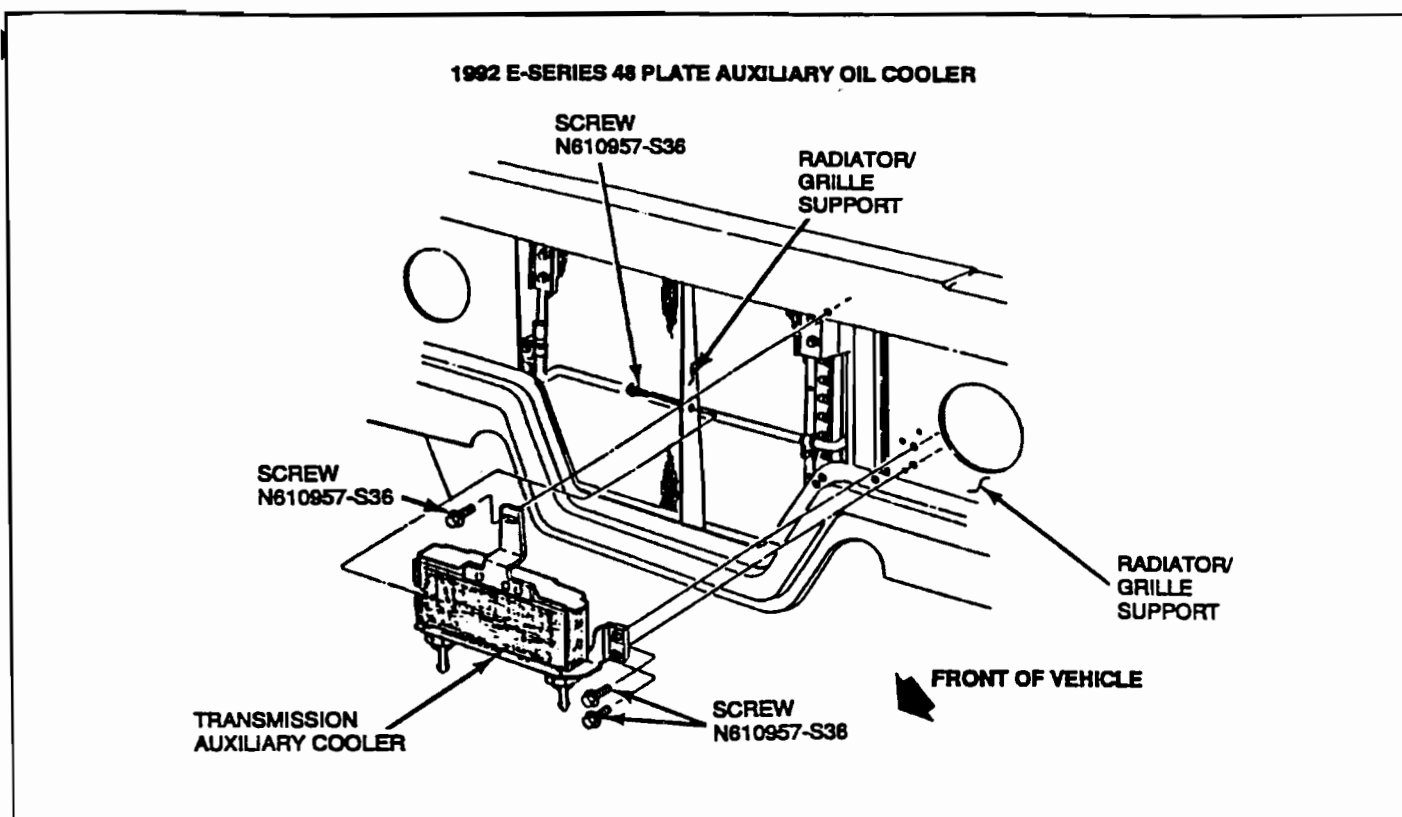


Figure 8



## E4OD AUXILIARY OIL COOLERS

(cont'd)

### AUXILIARY COOLER LINE INSTALLATION (FIGURE 9)

1. Trace the rear transmission cooler return line to the radiator in-tank cooler fitting.
2. Disconnect the rubber hose from the radiator in-tank cooler outlet fitting.
3. Form the right hand auxiliary cooler line by using 5/16" (7.9mm) outside diameter steel tubing.
  - a. Bend the line as required so it goes down and along the front side of the radiator core support and under the radiator.
  - b. Form mushrooms on both ends of this line.
  - c. Use bulk hose (**D5AZ-7B093-A**) and hose clamps (376240-S100) to connect the line to the right hand auxiliary cooler fitting and radiator in-tank cooler outlet fitting.
  - d. Tighten the hose clamps.
4. Form the left hand auxiliary cooler line by using 5/16" (7.9mm) outside diameter steel tubing.
  - a. Bend the line as required so it goes down and along the front side of the radiator core under the radiator.
  - b. Form mushrooms on both ends of line.
  - c. Use bulk hose (**D5AZ-7B093-A**) and hose clamps to connect the line to the left hand cooler fitting and transmission return line.
  - d. Tighten hose clamps.
5. With engine running check transmission fluid level and top off as required.
6. Check for leaks at all connections.

PART NUMBER	PART NAME
F1TZ-7902-DRM	Torque Converter
F1TZ-7902-CRM	Torque Converter
F1TZ-7902-ERM	Torque Converter
FOTZ-7D174-B	Drainback Checkvalve
FOTZ-7D174-C	Drainback Checkvalve
F3TZ-7B067-A	Low/Reverse Clutch Hub
F4TZ-7A130-B	Center Support Kit
F2TZ-7D006-A	Reverse Planetary
E9TZ-7A166-A	Thrust Washers (2 Req'd.)
F4TZ-7B446-B	Overdrive Planet Input Shaft Service Kit
F2TZ-7025-A	Bushing - Front
E9TZ-7D063-A	Sun Gear
F3TZ-7A089-A	Low One-Way Clutch Kit
F2TZ-7B164-A	Forward Clutch Plate
F2TZ-7025-B	Bushing - Rear
F4TZ-7B142-A	Auxiliary Cooler Bracket
E3UZ-8182-A	Radiator/Grille Support
376240-S100	Clamp

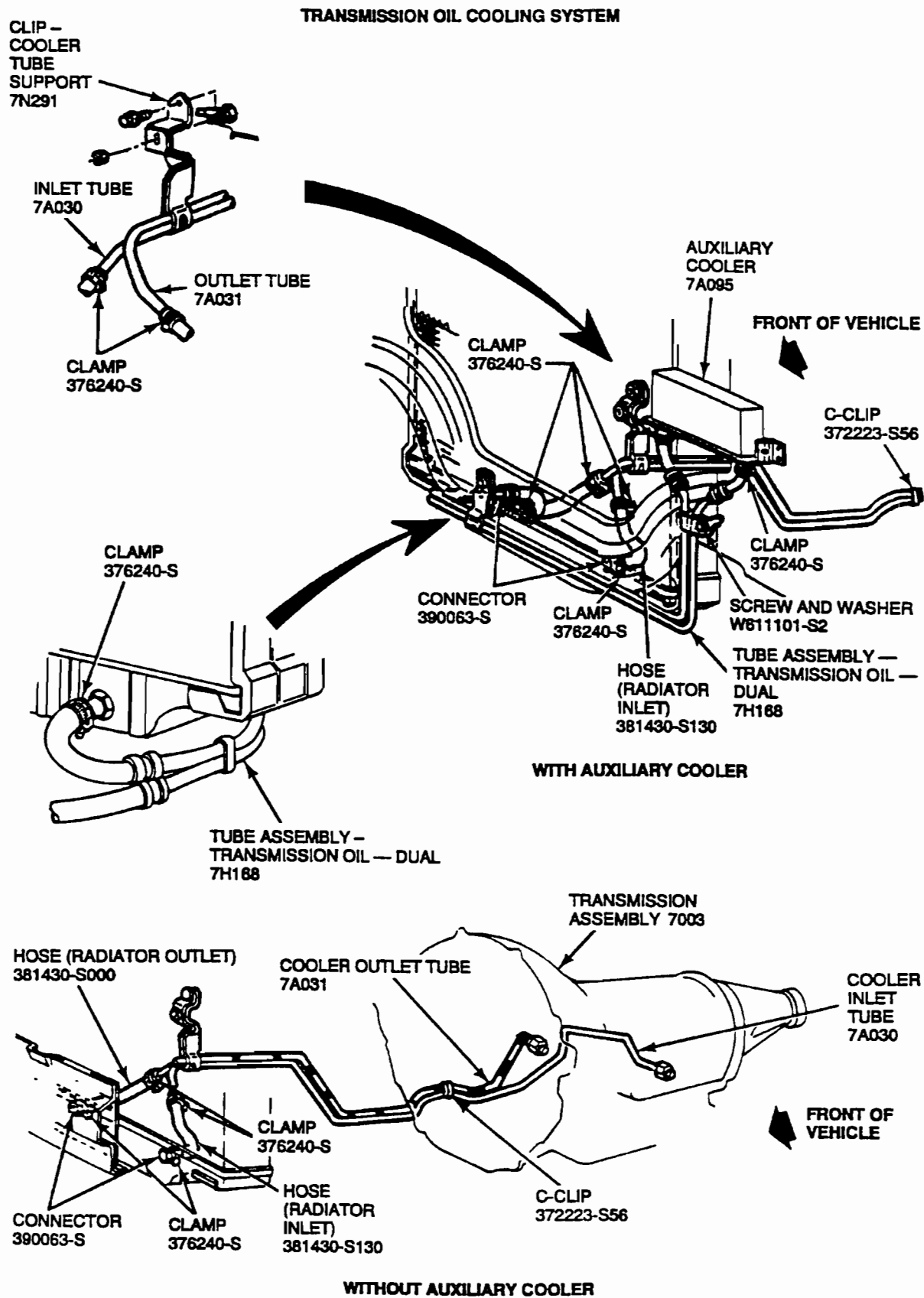


Figure 9