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"The Seminar to See for 2003" Technical Seminar

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“The Seminar to See for 2003”

Introduction

The White “Seminar to See for 2003” began with valuable General Motors information and finished with needful tech for Ford. The Red Manuals picks up again with needful tech for Ford and ends with up to date data for Chrysler units. Part of that up to date data for Chrysler is a very useful 41TE and 42LE Unit Identification List that helps the shop ID stock units for proper vehicle application. This list in itself makes coming to ATSG’s Seminar to See for 2003 a worth while investment.

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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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FORD/MAZDA CD4E

TORQUE CONVERTER CLUTCH SLIPPAGE

COMPLAINT: The vehicle came into shop with a 628 or P1744 TCC slip code stored. The Turbine Speed Sensor tests good. There are a number of valve body concerns that could cause this as well, but the reason in this case is not valve body or internal transmission related. This can also occur if a seemingly "clean" converter is reused.

CAUSE: The torque converter is the problem. Internal wear of the torque converter is the reason for TCC slippage and the codes that are stored. The turbine hub slots have worn down, restricting the flow of transmission fluid to the apply side of the converter clutch, See Figure 1. This causes converter slippage even when all other related components are good.

CORRECTION: To test the converter for this problem, insert a turbine shaft into the converter. Pour ATF into the shaft at the bushing end.
If the turbine hub is not worn, the fluid drain into the converter almost as fast as you can pour it in.
If the turbine hub is worn, the fluid will back up the turbine shaft and take some time to finally drain down into the converter.

SERVICE INFORMATION:

For an excellent explanation of this problem as well as other CD4E TCC slip problems, refer to the September, 2001 Transmission Digest Magazine article by Sonnax Technical Director, Bob Warnke.

FORD/MAZDA CD4E
TORQUE CONVERTER CLUTCH SLIPPAGE

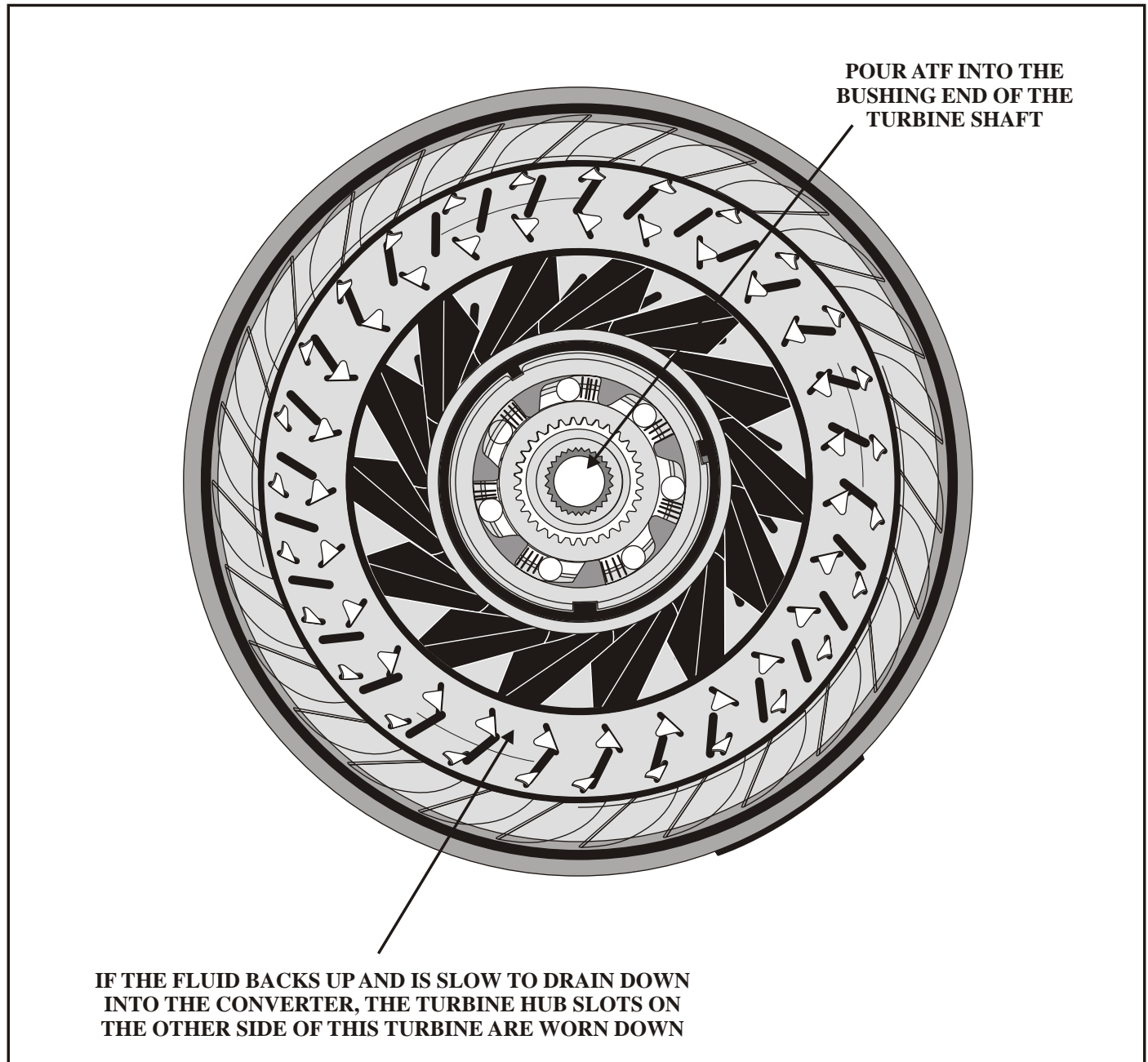


Figure 1



FORD/MAZDA CD4E
PERSISTENT GEAR RATIO ERROR
OR TCC SLIP CODES

COMPLAINT: After Turbine Speed Sensor (TSS) replacement, TCC slip codes 628 or P1744 maybe stored. Gear ratio error codes 645, 646, 647, 648, PO731, PO732, PO733 or PO734 may also be stored. After clearing these codes, they immediately return during the road test. No matter what parts are replaced, or what procedure is followed, these codes keep returning.

CAUSE: *The cause, believe it or not, is the replacement Turbine Speed Sensor.* The replacement TSS was redesigned and has an *enclosed* pickup as seen in Figure 2. The previous design TSS has an *exposed* pickup also seen in Figure 2. It seems, when the pickup was enclosed, the air gap between the TSS and the reverse clutch hub was increased. When the signal was checked and compared to the previous sensor signal, the new sensor signal exhibited a voltage difference but, when checked with an oscilloscope the previous sensor puts out a wider pattern than the current design sensor which means, the computer has more time to read the signal with the previous design sensor. In other words, with the current design turbine sensor, the computer does not have enough time to read the signal and may miss alternate signal pulses which causes the above complaint, on some models only.

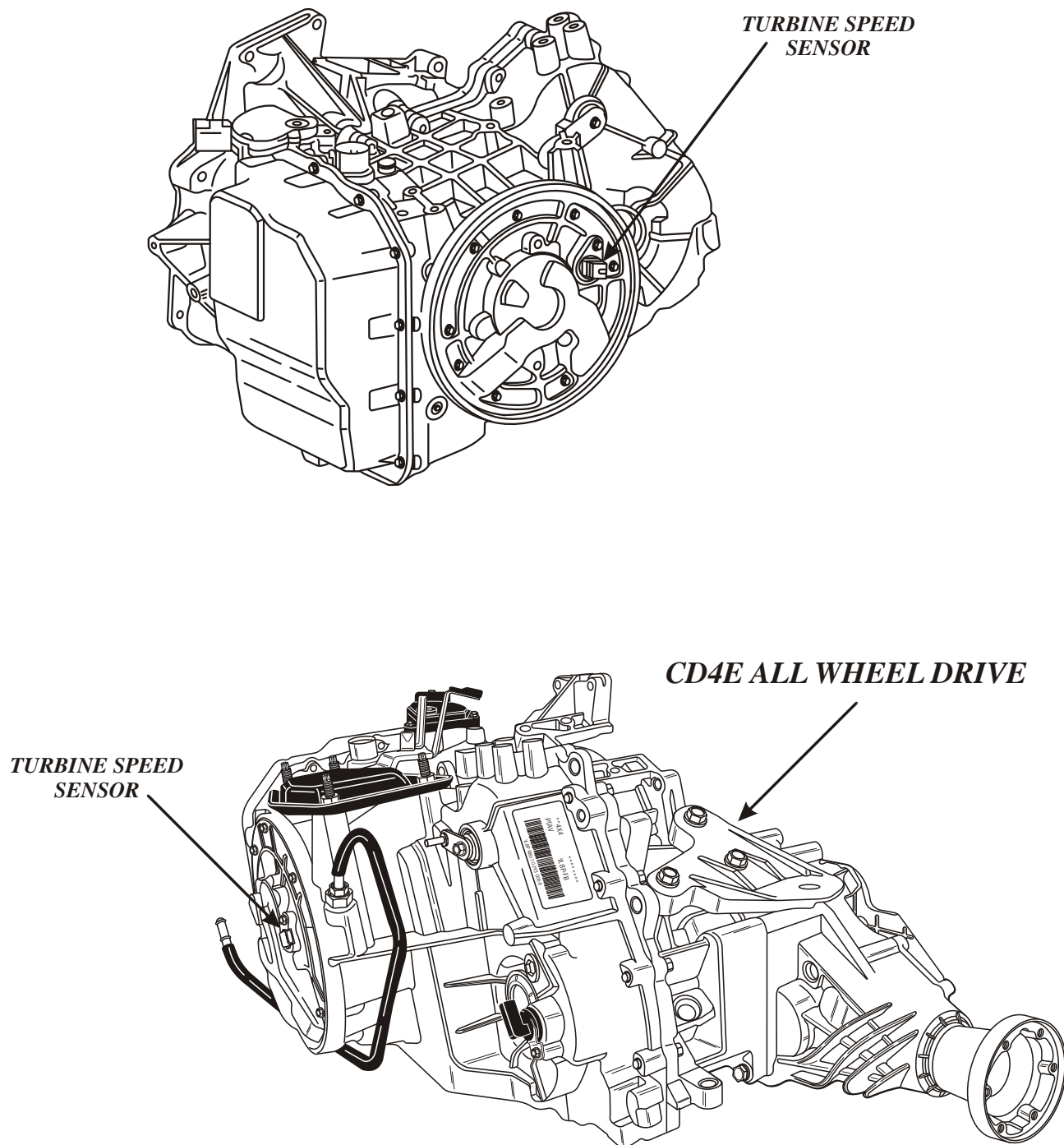
CORRECTION: Ford Motor Co. has now released a new design white TSS with a "green" connector that is to be used on 1994-1997 Probe vehicles, as shown in Figure 2. The new design white TSS with the "black" connector is to be used on "All Other" models using the CD4E transaxle, as shown in Figure 2. Install the proper TSS depending on the model that you are working on and service part numbers are shown below.

SERVICE INFORMATION:

Turbine Shaft Sensor, 1994-1997 Probe Only, Green Connector F7RZ-7M101-KA
Turbine Shaft Sensor, All Other Models, Black Connector 1S7Z-7M101KA

Raybestos

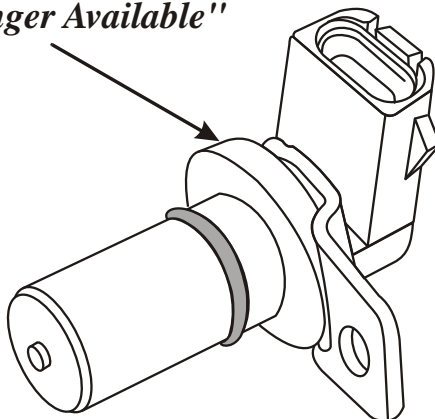
FORD/MAZDA CD4E



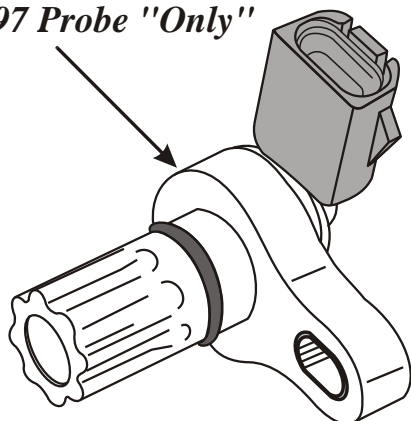
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Figure 1

"All Black" Sensor
Part Number F7RZ-7M101-AA
"No longer Available"

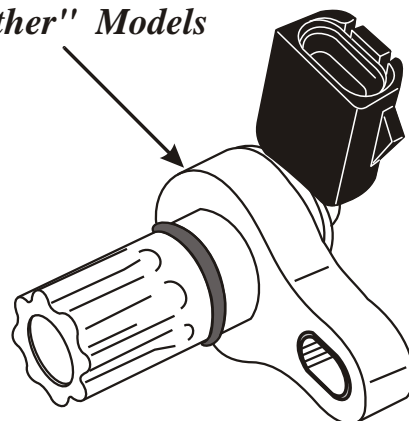


White With "Green" Connector
Part Number F7RZ-7M101-KA
1994-1997 Probe "Only"



550 - 950 Ohms

White With "Black" Connector
Part Number 1S7Z-7M101-KA
"All Other" Models



625 - 1150 Ohms

Figure 2

Rostra



FORD AXODE (AX4S) HARSH 1-2 UPSHIFT, OR FLARE ON 1-2 UPSHIFT

COMPLAINT: Some 1995-Up Ford Windstar Vans may exhibit a harsh 1-2 upshift, either before and/or after overhaul of the transaxle. Some 1995-Up Ford Taurus, Mercury Sable or Lincoln Continental may exhibit a soft or flare on the 1-2 upshift either before or after overhaul.

CAUSE: The cause may be, a valve body spacer plate designed for the Taurus, Sable, Continental passenger car family, has been installed on a Windstar Van, creating a harsh 1-2 upshift. If the Windstar Van valve body spacer plate, is installed on the Taurus, Sable, Continental family of vehicles, the result will be a soft or flared 1-2 upshift. ***Obviously these two spacer plates are different.*** Refer to Figures 1 and 2, using the two holes over the 1-2 capacity modulator valve area, for identification.

CORRECTION: Install the proper valve body spacer plate for the Ford family that you happen to be servicing at this time. Refer to the illustration in Figure 1 to identify the valve body spacer plate for the Windstar Van. Refer to the illustration in Figure 2 to identify the valve body spacer plate for the Taurus, Sable and Continental family.

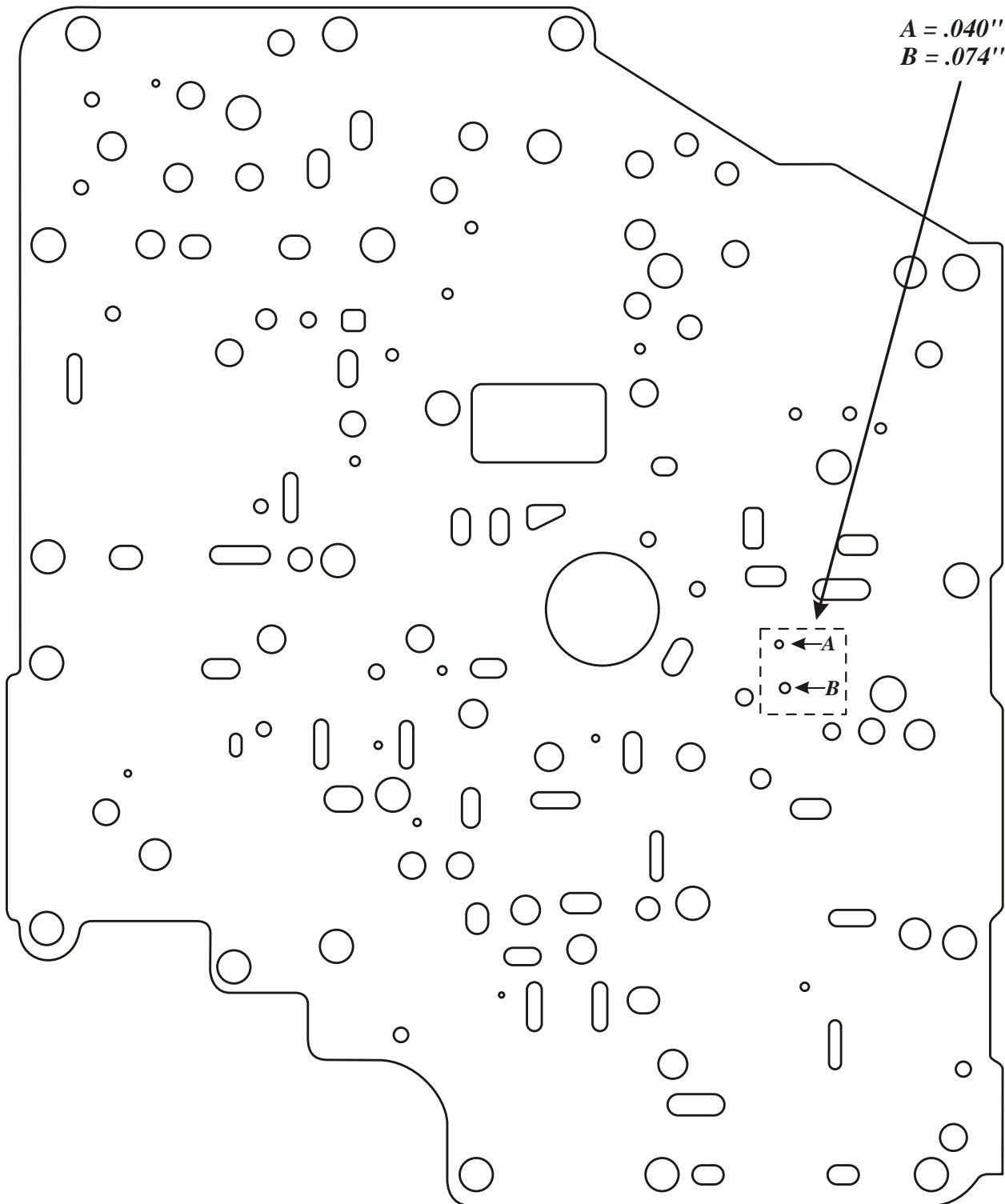
Special Note: The valve bodies and castings are exactly the same in the 1-2 capacity modulator valve area, but the valve body casting and spacer plate changed again in 1999 in a different area. These same concerns may be encountered by changing a complete valve body, that included a spacer plate, trying to fix a totally different concern. Use Figures 1 and 2, using the two holes over the 1-2 capacity modulator valve area, to identify the valve body spacer plates. Refer to the chart in Figure 3 for OEM part numbers.

SERVICE INFORMATION:

OEM part numbers are found in Figure 3 and are also available from some suppliers.

***Many Thanks To:
"Dynamic Dino"
Lee Myles, New York***

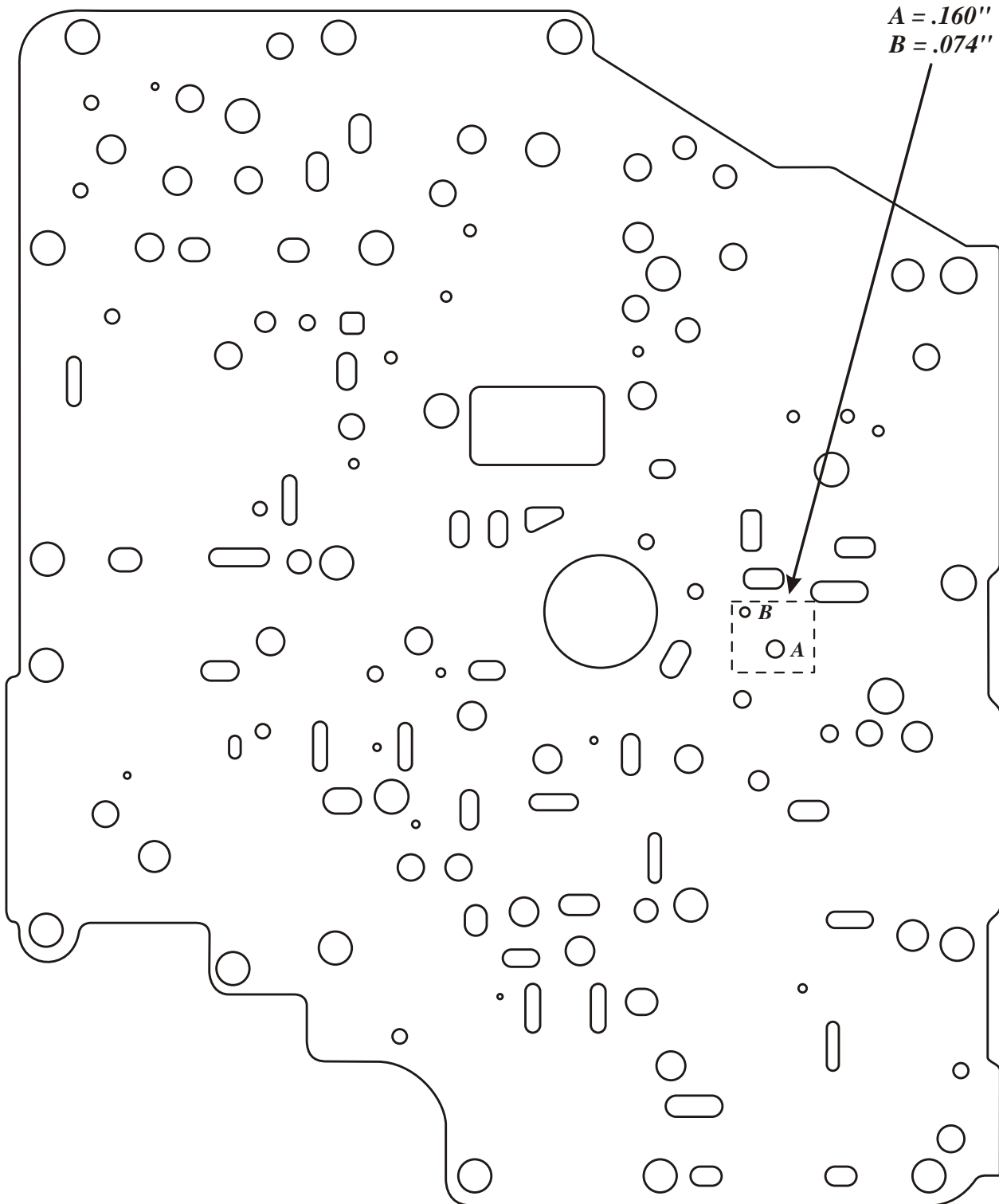
"WINDSTAR" SPACER PLATE IDENTIFICATION



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Figure 1

"TAURUS FAMILY" SPACER PLATE IDENTIFICATION



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Figure 2

AXODE (AX4S)

PUMP AND VALVE BODY SPACER PLATE IDENTIFICATION

AX4S BONDED PUMP SPACER PLATES

<i>OEM Part Number</i>	<i>Code</i>	<i>Application</i>	<i>Model Year</i>	<i>Engine</i>
F5DZ-7R167-A	AH	<i>Lincoln Continental</i>	1994	3.8L
		<i>Ford Taurus/Sable and Windstar</i>	1994-1995	ALL
F58Z-7R167-A	51	<i>Ford Windstar</i>	1995-1998	3.0L
		<i>Ford Windstar, Ford Taurus/Sable</i>	1996-1998	3.8L
X2FZ-7R167-AA	99	<i>Ford Windstar, Ford Taurus/Sable</i>	1999-2002	3.0L/3.8L

AX4S BONDED VALVE BODY SPACER PLATES

<i>OEM Part Number</i>	<i>Code</i>	<i>Application</i>	<i>Model Year</i>	<i>Engine</i>
F5DZ-7Z490-B	31	<i>Ford Taurus SHO</i>	1994-1995	3.2L
F5DZ-7Z490-C	40	<i>Ford Taurus/Sable</i>	1994-1995	3.0L
F5DZ-7Z490-D	41	<i>Lincoln Continental</i>	1994	3.8L
		<i>Ford Taurus/Sable</i>	1994-1995	3.8L
F58Z-7Z490-A	58	<i>Ford Windstar</i>	1995	3.8L
F58Z-7Z490-B	53	<i>Ford Windstar</i>	1995	3.0L
F6DZ-7Z490-FB	42(97)*	<i>Ford Taurus/Sable</i>	1996-1998	3.0L
F68Z-7Z490-A	47(67)*	<i>Ford Windstar</i>	1996-1997	3.8L
F88Z-7Z490-AA	98	<i>Ford Windstar</i>	1998	3.0L/3.8L
XF2Z-7Z490-AA	99	<i>Ford Taurus/Sable</i>	1999	3.0L
XF2Z-7Z490-AA	99	<i>Ford Windstar (W/VB's XD29-AB/AC/BB)</i>	1999	3.0L/3.8L
YF1Z-7Z490-AA	00	<i>Ford Taurus/Sable</i>	2000-2002	3.0L

OEM Part Number F6DZ-7Z490-FB has a "42" code and replaces the "97" code, as the "97" code spacer plate is no longer available.

OEM Part Number F68Z-7Z490-A has a "47" code and replaces the "67" code, as the "67" code spacer plate is no longer available.

CAUTION: *Part Numbers are subject to change or supercede without notice.*

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Figure 3

Transgo



FORD AXODE
1991-2002 OIL PUMP AND VALVE BODY
CHECKBALL LOCATION CHANGES

This bulletin provides you with the checkball locations and changes for all AXODE (AX4S) model transaxles from 1991 through 2002, for both the oil pump and the valve body, as everything changed again in model year 1999.

<i>Vehicle Line</i>	<i>Up To And Including Serial Number</i>	<i>Model Code</i>
<i>1991 Taurus/Sable 3.8L</i>	<i>54553</i>	<i>PNA-EA</i>
<i>1991 Taurus/Sable 3.0L</i>	<i>195343</i>	<i>PNA-EC</i>
<i>1991 Continental 3.8L</i>	<i>39653</i>	<i>PNA-EB</i>
<i>1991 All Police 3.8L</i>	<i>10936</i>	<i>PNA-EE</i>

OIL PUMP

"Early" 1991 Only - Uses 5 checkballs in the locations shown in Figure 1. Use chart above to determine Early or Late transaxle by serial number.

"Late" 1991 Only - Uses 4 checkballs in the locations shown in Figure 1. Use chart above to determine Early or Late transaxle by serial number.

1992-1998 Only - Uses 4 checkballs but in different locations, as shown in Figure 2. B-13 checkball was eliminated and B-2 checkball was added.

1999-2002 Only - Uses 3 checkballs in the locations shown in Figure 2. B-5 checkball was eliminated.

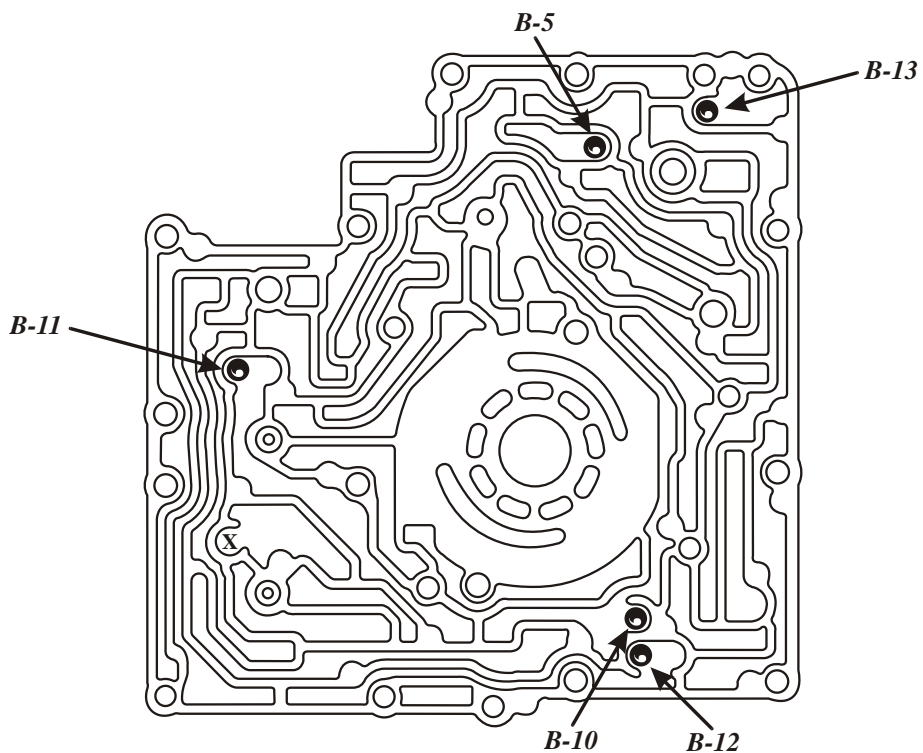
VALVE BODY

1991-1992 Only - Uses 7 checkballs, as shown in Figure 3.

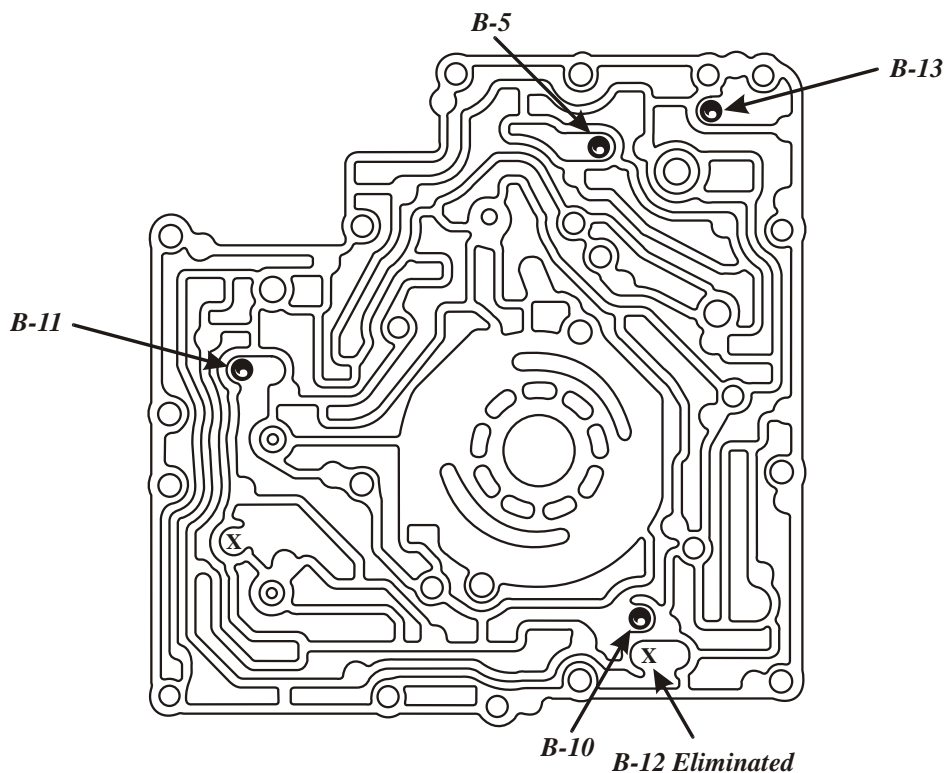
1992-1998 Only - Uses 6 checkballs, as shown in Figure 4. The No. 7 Checkball was eliminated.

1999-2002 Only - Uses 6 checkballs, as shown in Figure 5. Also notice that one relief valve moved.

CHECKBALL LOCATIONS "EARLY" 1991 "ONLY"



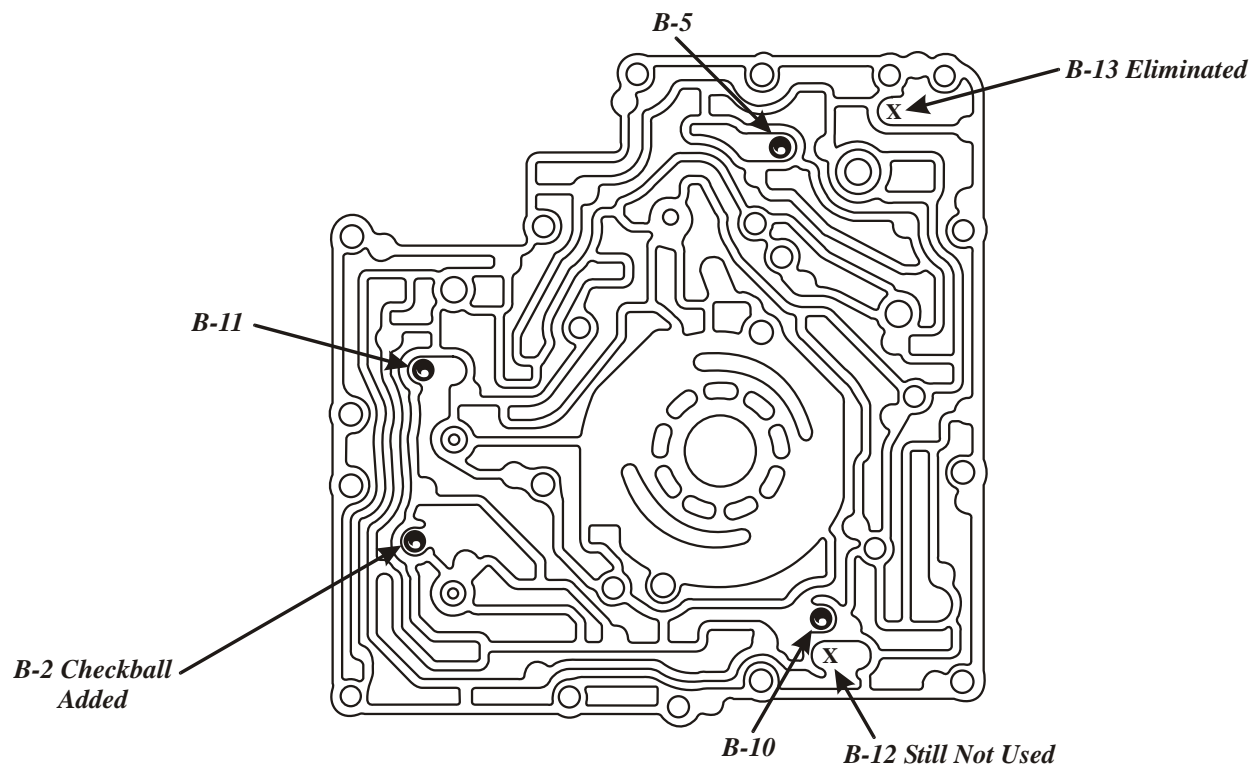
CHECKBALL LOCATIONS "LATE" 1991 "ONLY"



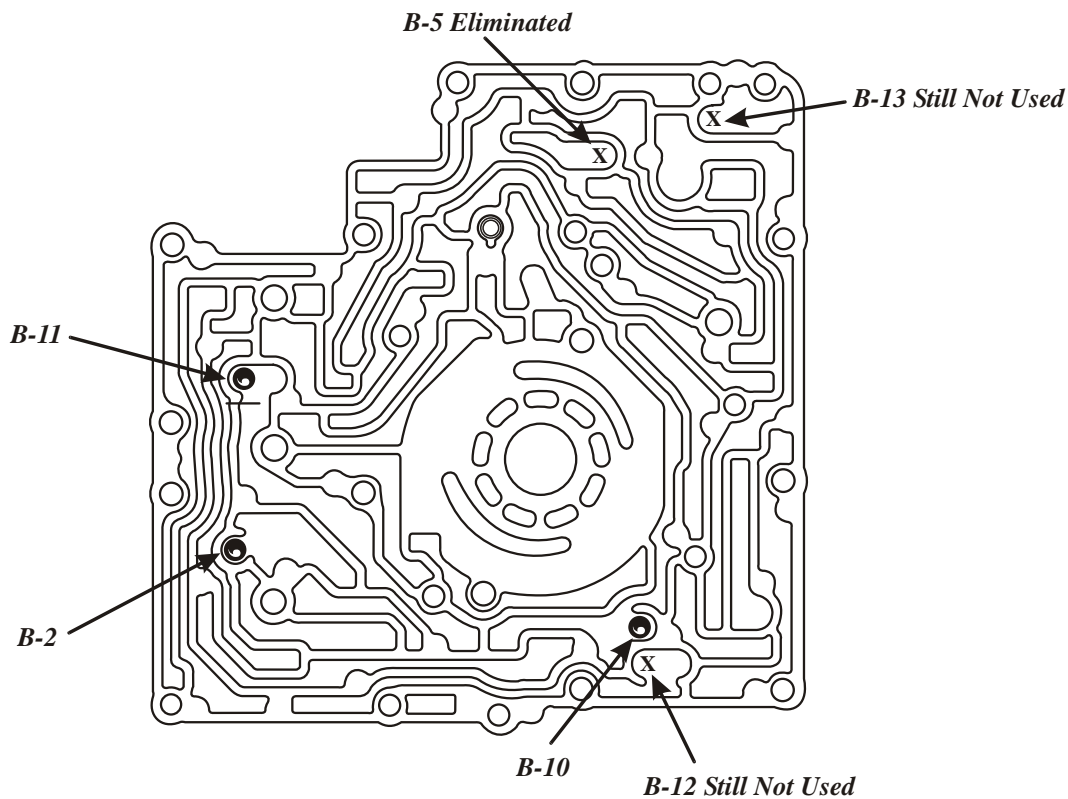
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Figure 1

CHECKBALL LOCATIONS 92-98 MODELS "ONLY"



CHECKBALL LOCATIONS 1999 AND LATER "ONLY"



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Figure 2

**AXODE (AX4S) 1991-1992 ONLY
CHECKBALL AND RELIEF VALVE LOCATIONS**

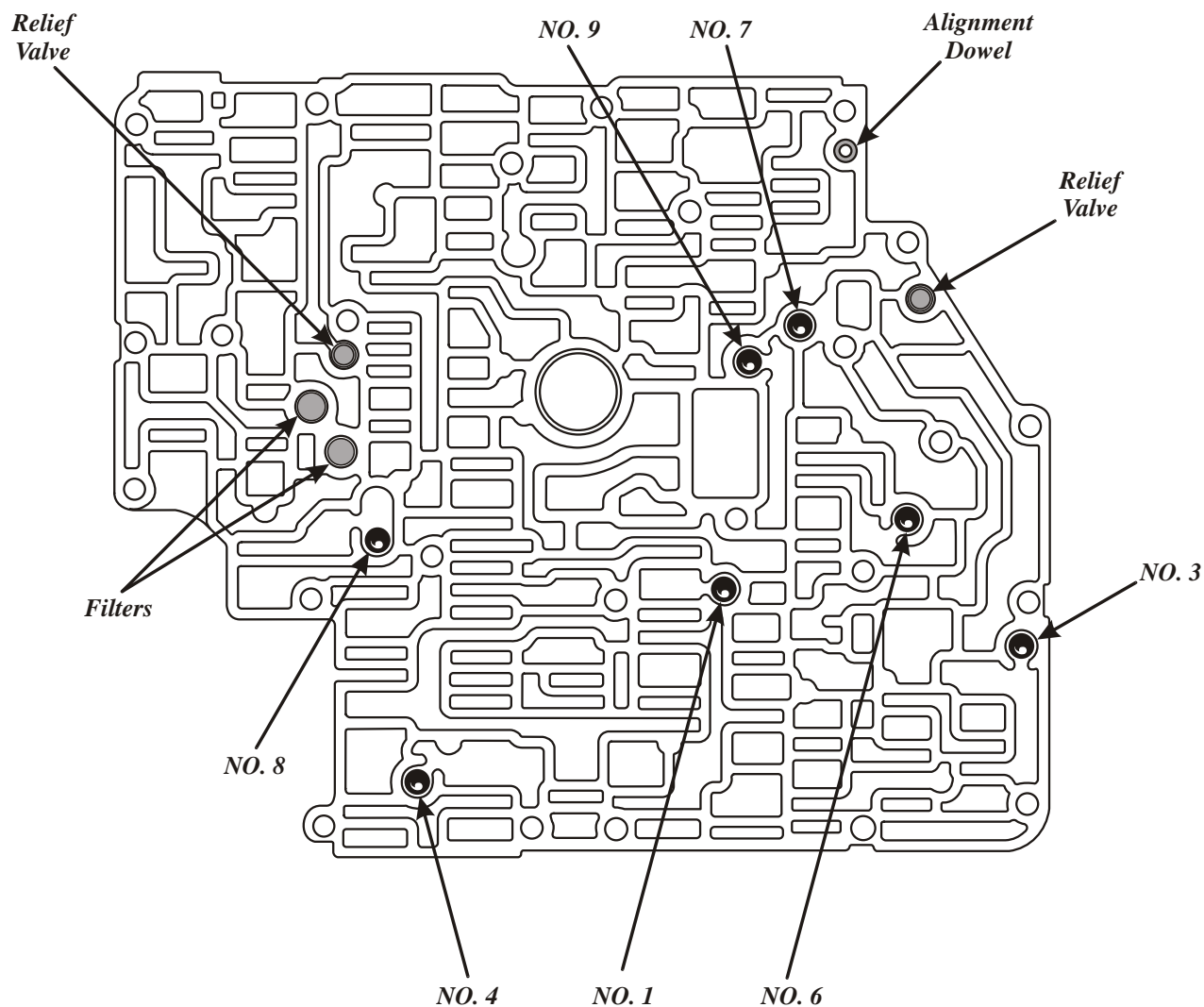


Figure 3

A & Reds

**AXODE (AX4S) 1993-1998
CHECKBALL AND RELIEF VALVE LOCATIONS**

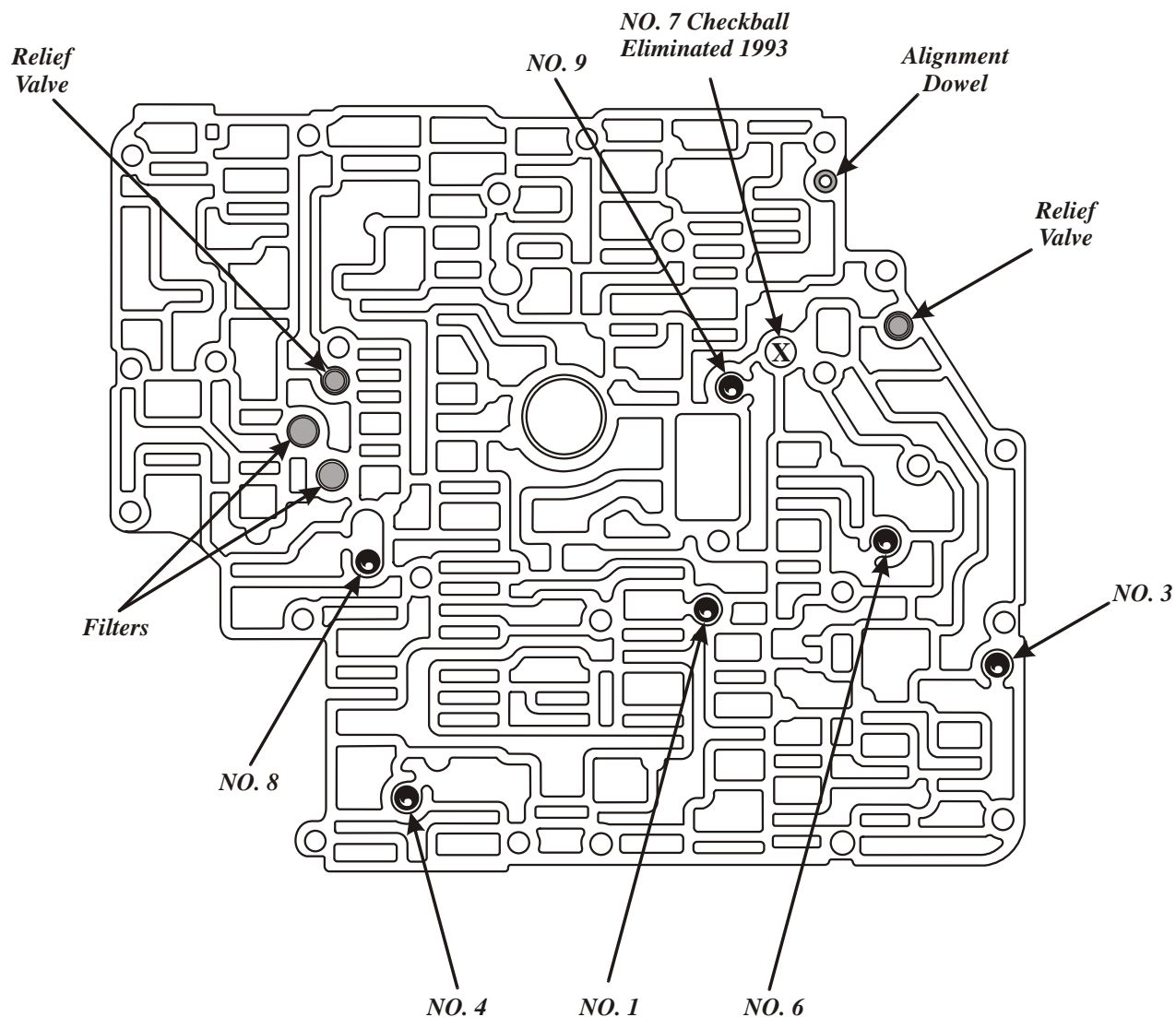
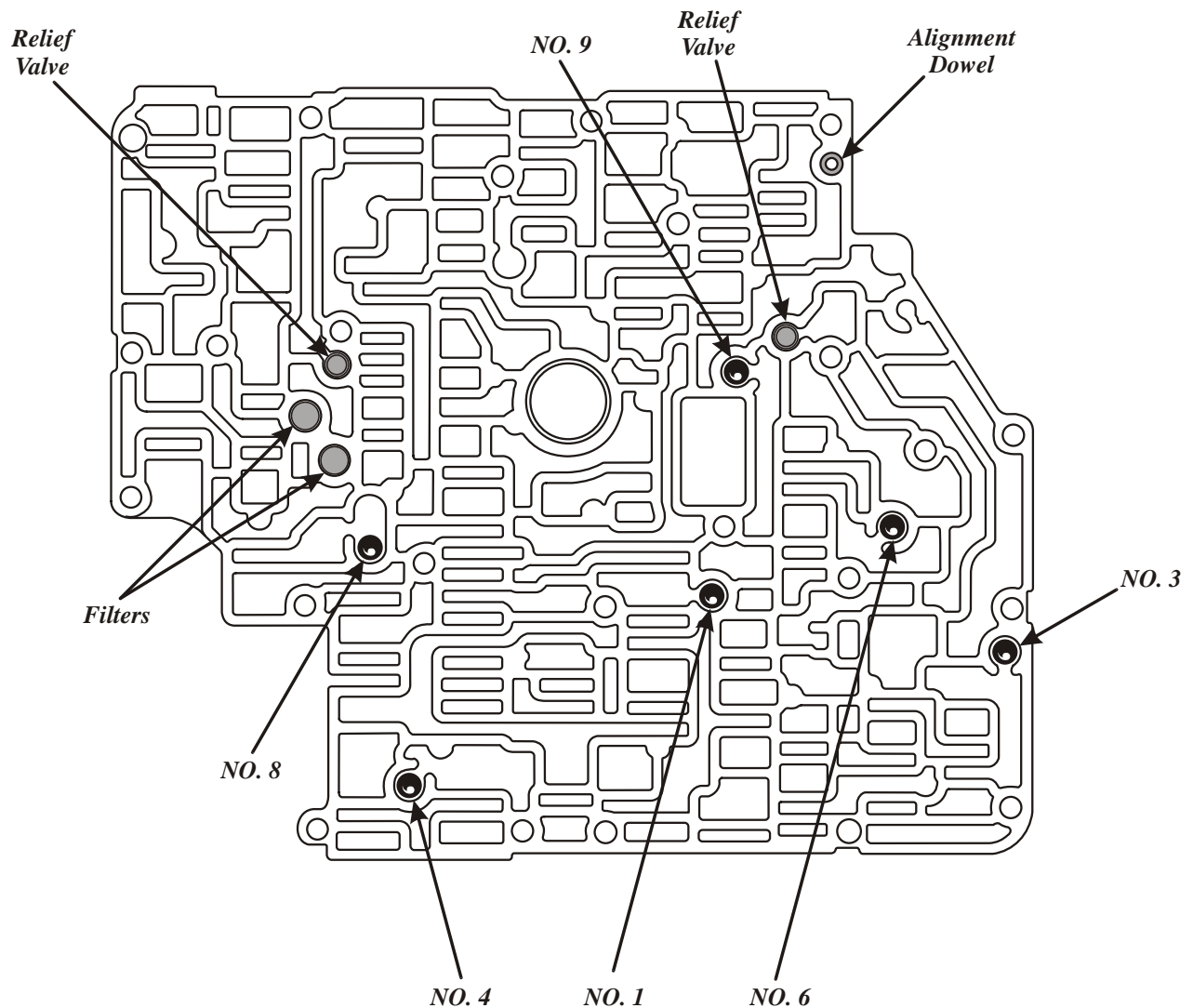


Figure 4

**AXODE (AX4S) 1999-2002
CHECKBALL AND RELIEF VALVE LOCATIONS**



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Figure 5

FORD AX4S

DRIVE TO NEUTRAL GARAGE SHIFT SHUDDER

COMPLAINT: A shudder on a garage shift out of drive into neutral, or a harsh drive to neutral engagement is felt. This may be present before and after overhaul.

CAUSE: A worn Low/Intermediate Drum Bushing, as seen in figure 1, causes this complaint because the Low/Intermediate drum cocks off centerline when the 1-2 band releases or grabs the drum. This could be compared to a warped brake drum or rotor that causes a pulsation in the brake pedal.

CORRECTION: Make certain to inspect this bushing and replace it as necessary as seen in figure 2.

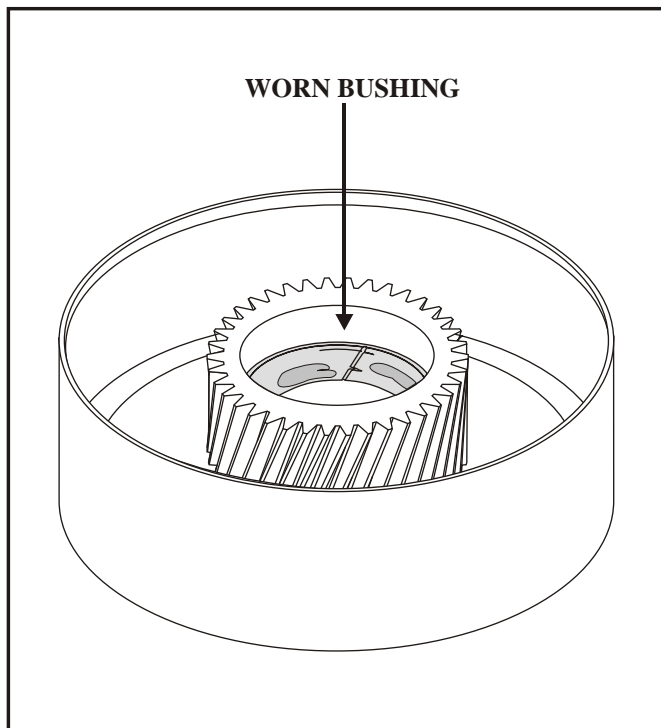


Figure 1

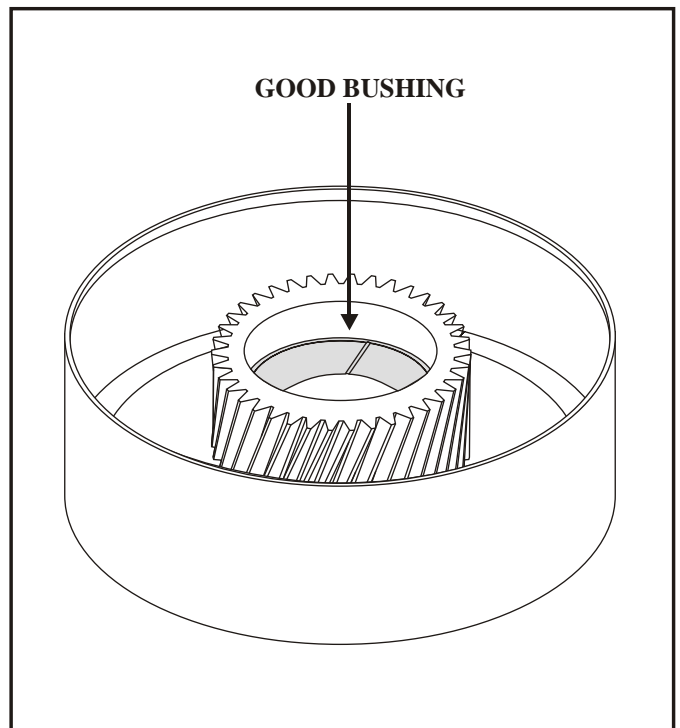


Figure 2

HFT

FORD AX4S/AX4N NO REVERSE

COMPLAINT: After overhaul, vehicles built after 1999, equipped with the AX4S or AX4N transmissions may exhibit a "no engagement" in Reverse.

CAUSE: The cause may be, that the *Previous Design* Channel Plate Gasket, was used on a *Late Design* case as shown in Figure 1. When this happens, Reverse apply pressure will be exhausted back into the case because of the gasket hanging over the case casting.

CORRECTION: AX4S-Refer to Figure 1 to identify the correct Channel Plate Gasket for the application of vehicle you are working on.
AX4N-Refer to Figure 2 to identify the correct Channel Plate Gasket for the application of vehicle you are working on.

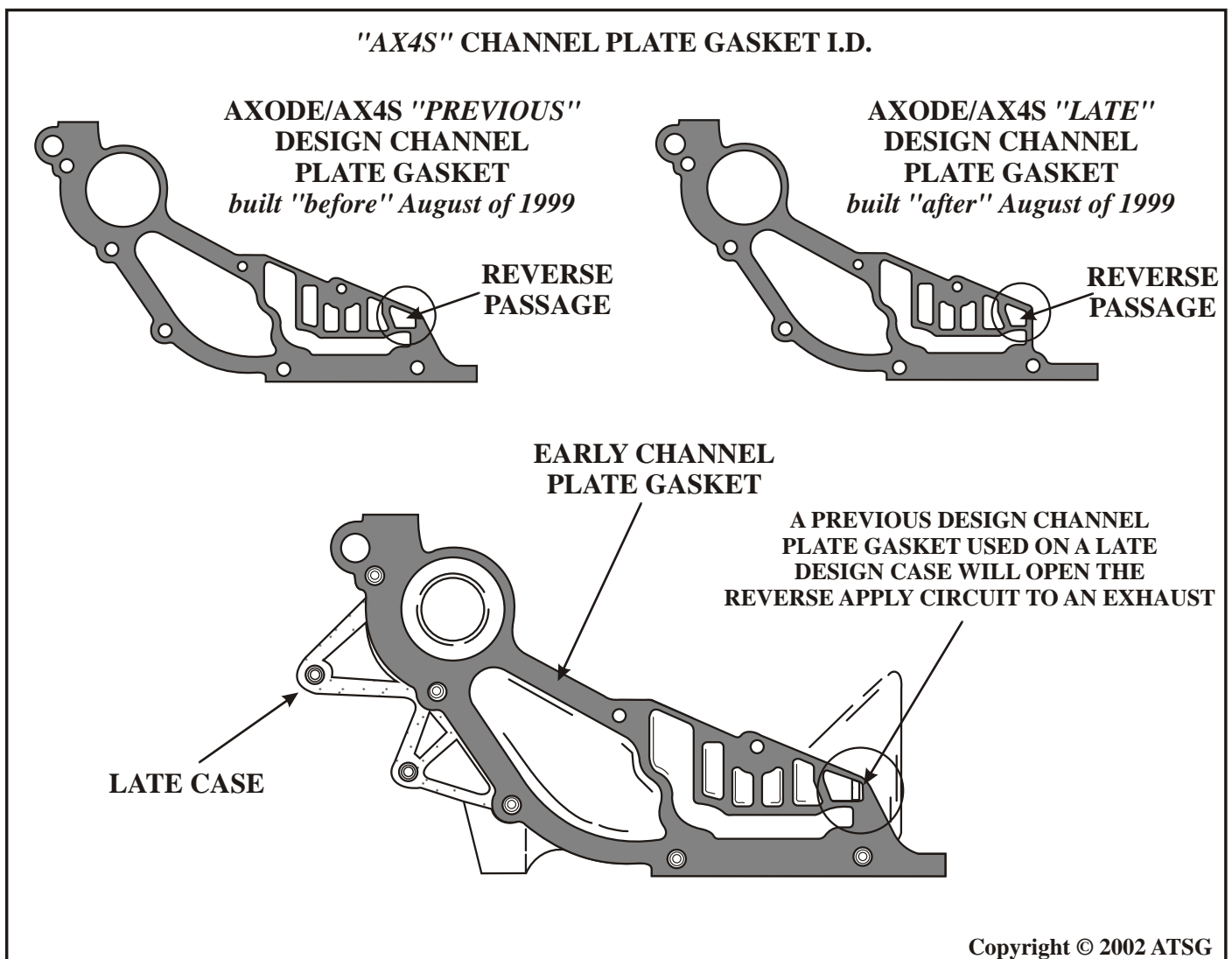
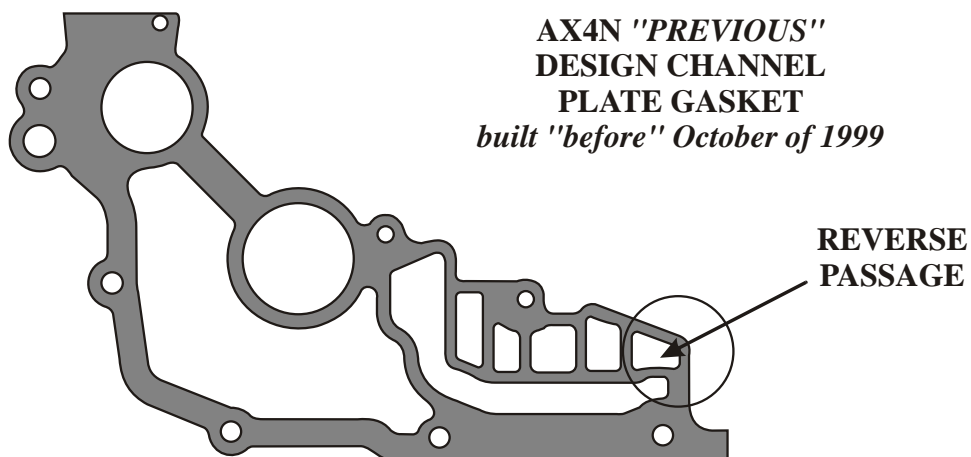
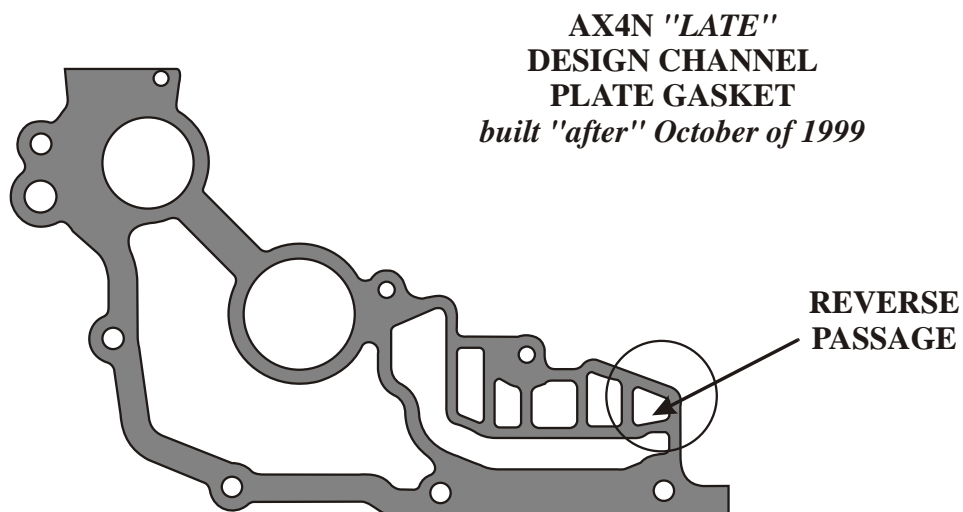


Figure 1

"AX4N" CHANNEL PLATE GASKET I.D.



"AX4N" CHANNEL PLATE GASKET I.D.



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Figure 2



FORD AXOD/AXODE FORWARD CLUTCH PACK CHANGE LOW SPRAG OUTER RACE CHANGE

CHANGE: Beginning at start of production for 1992 models, all AXODE transaxles were built with a revised low sprag outer race that required revisions on the forward clutches, both lined and steel plates, a new pressure plate and "Wave" plate.

REASON: Improved durability and reliability of the low sprag outer race.

PARTS AFFECTED:

- (1) LOW SPRAG OUTER RACE - The outer diameter of the race was increased from 4.575" to 4.825", and the width of the race was increased from .600" to .725", as shown in Figure 1. *The Inside Diameter of the sprag race Did Not Change.*
- (2) FORWARD CLUTCH FRICTION PLATES - Have an increased amount of teeth to 57 Teeth from the previous 52 Teeth, to accommodate the increased diameter of the sprag outer race, as shown in Figure 2.
- (3) FORWARD CLUTCH STEEL PLATES - Have an increased inside diameter to 4.920" from the previous 4.720", to accommodate the increased diameter of the sprag outer race, as shown in Figure 3.
- (4) FORWARD CLUTCH PRESSURE PLATE - Has an increased inside diameter to 4.930" from the previous 4.730", to accommodate the increased diameter of the sprag outer race, as shown in Figure 4.
- (5) FORWARD CLUTCH "WAVE" PLATE - Has an increased inside diameter to 4.930" from the previous 4.730", to accommodate the increased diameter of sprag outer race (See Figure 5).

INTERCHANGEABILITY:

None of the parts listed above are interchangeable with previous design parts. If the sprag outer race is upgraded to the latest design, the forward clutch components *must* also be upgraded to the latest design level.

When *all* of the above parts are changed as a service package, they *will* retro-fit back to *all* previous model AXOD/AXODE transaxles.

SERVICE INFORMATION:

Forward Clutch Friction Plates (2nd Design)	F2DZ-7B164-A
Forward Clutch Steel Plates (2nd Design)	F2DZ-7B442-A
Forward Clutch "Wave" Plate (2nd Design)	F2DZ-7E085-A
Forward Clutch Pressure Plate (2nd Design)	F2DZ-7B066-A
Forward Clutch Overhaul Kit (Includes Low Sprag Outer Race)	F2DZ-7D171-A

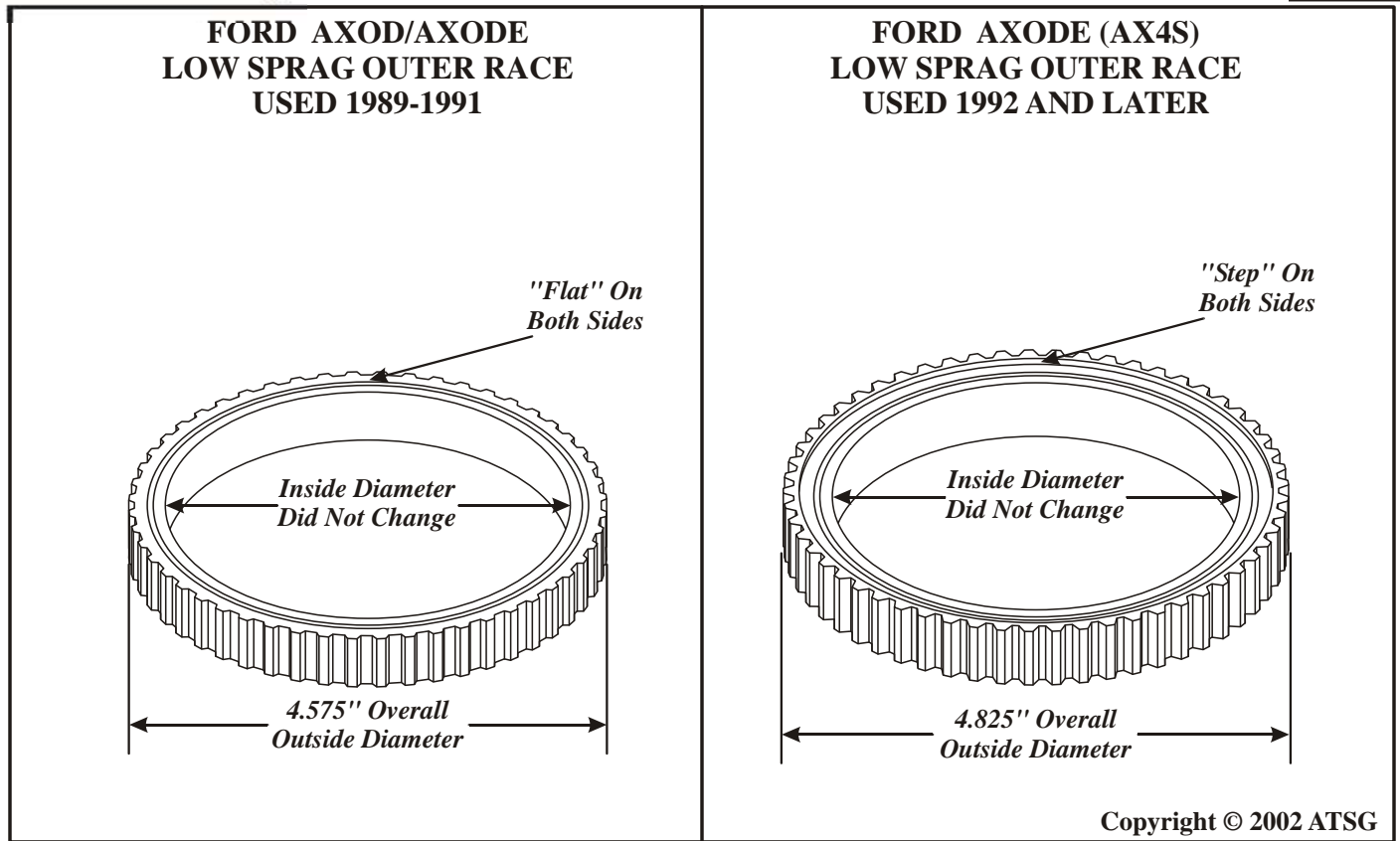


Figure 1

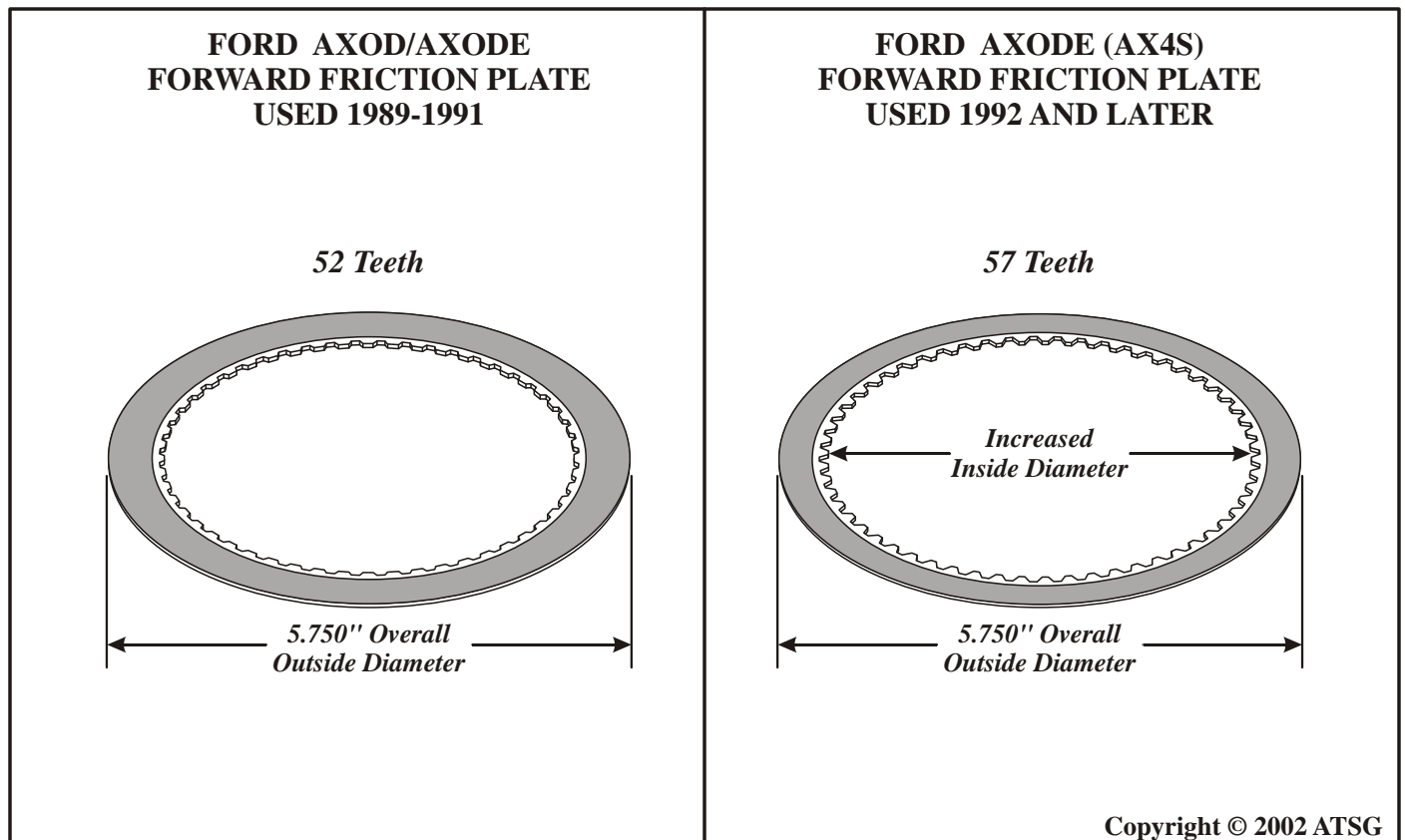
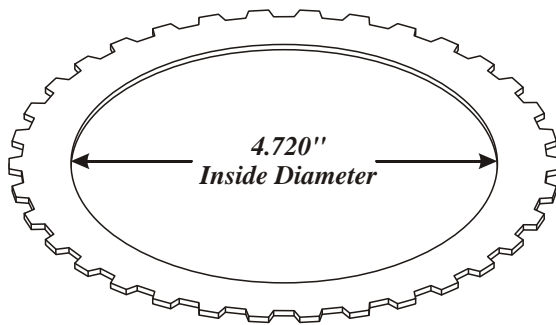


Figure 2

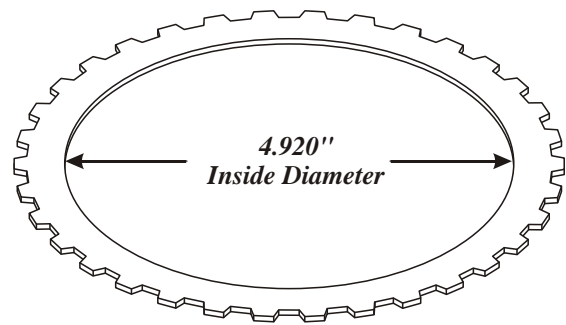
**FORD AXOD/AXODE
FORWARD STEEL PLATE
USED 1989-1991**

34 Teeth



**FORD AXODE (AX4S)
FORWARD STEEL PLATE
USED 1992 AND LATER**

34 Teeth

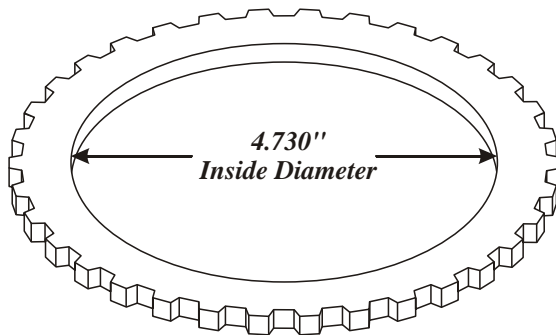


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Figure 3

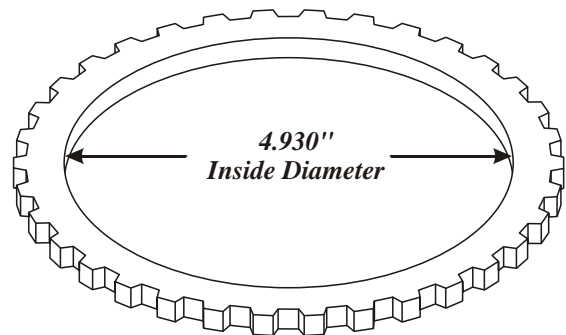
**FORD AXOD/AXODE
FORWARD STEEL PLATE
USED 1989-1991**

34 Teeth



**FORD AXODE (AX4S)
FORWARD STEEL PLATE
USED 1992 AND LATER**

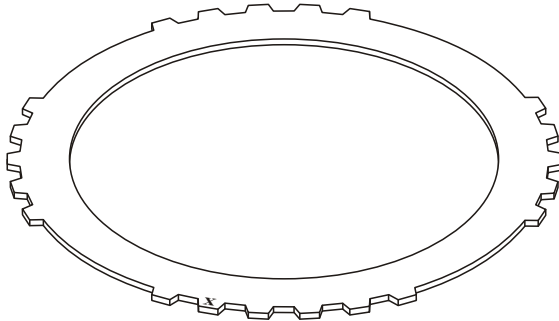
34 Teeth



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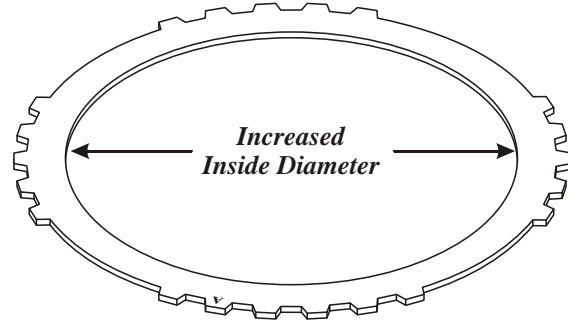
Figure 4

**FORD AXOD/AXODE
FORWARD "WAVE" PLATE
USED 1989-1991**



*21 External Teeth
Inside Diameter 4.730"
Material Is .075" Thick
I.D. Stamped "X" On 1 Tooth
Part Number F0DZ-7E085-A*

**FORD AXODE (AX4S)
FORWARD "WAVE" PLATE
USED 1992 AND LATER**



*21 External Teeth
Inside Diameter 4.930"
Material Is .083" Thick
I.D. Stamped "A" On 1 Tooth
Part Number F2DZ-7E085-A*

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Figure 5

FORD E4OD/4R100 DELAYED REVERSE

COMPLAINT: Before or even after overhaul the transmission experiences a delayed bang shift into reverse.

CAUSE: One reason could be a timing problem whereby the Direct Clutches are applying before the Low Reverse Clutch applies. With the Direct Clutches on first, the gear train begins to spin, when the Low/Reverse Clutch finally applies, reverse is engaged harshly as it stops the gear train from spinning. One possible reason for the late Low/Reverse Clutch apply is a weak spring on the Low/Reverse Modulator Valve, which is the valve next to the Manual Valve (See Figure 1).

CORRECTION: Double the existing spring tension on the Low/Reverse Modulator Valve Spring. Also available from Superior Transmission Parts is a "No Bang" Reverse Engagement spring kit that contains three springs.

Note: A delayed engagement could also occur by the following reasons:

1. A loose tension plate on the tail of the spacer plate where the ID notches are.
2. A leak in the L/R, Direct or Coast Clutch circuit.
3. Excessive clearance in the L/R, Direct or Coast Clutch pack.
4. A malfunctioning MLPS
5. Low line pressure
6. Low fluid level

SERVICE INFORMATION:

Superior Transmission Parts "No Bang" Reverse Engagement Springs (3).....K043

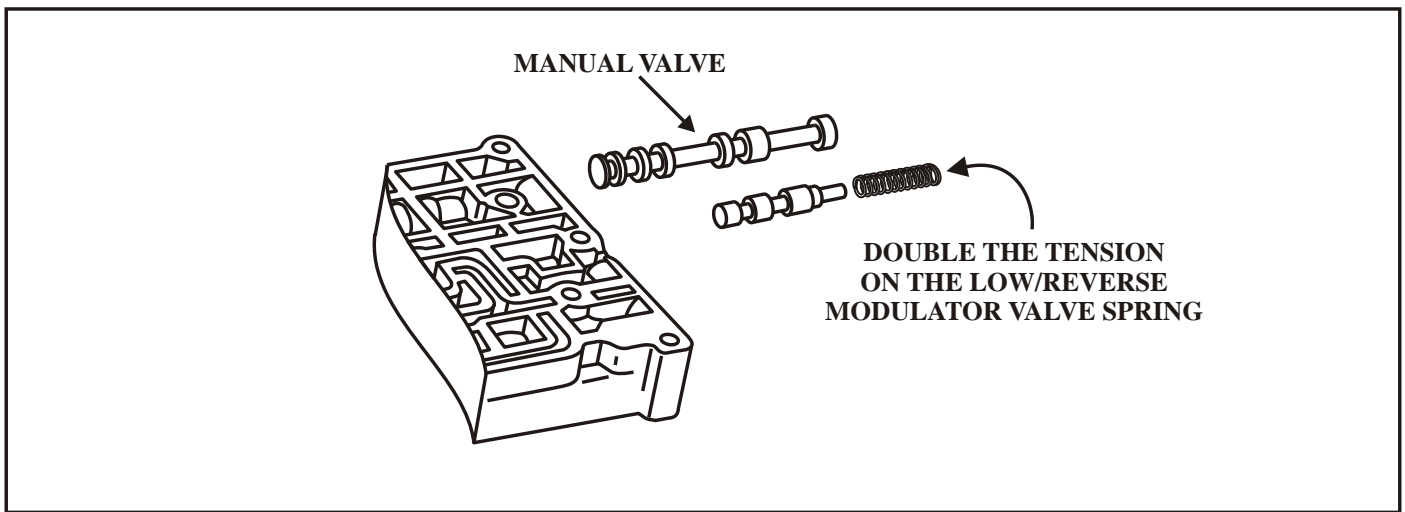


Figure 1



E4OD 2 WHEEL DRIVE PICK UP's STACKED UP-SHIFTS

COMPLAINT: Before or after overhaul, the vehicle exhibits rapid up-shifts. It is noticed that when the speed sensor is unplugged it stays in first gear.

CAUSE: Some 2 wheel drive F-Series Pick Up's may have been equipped with a 4x4 wiring harness. Should the "4x4 LOW" signal wire become grounded in some way, a false signal is sent to the PCM causing the rapid up-shift. Since the vehicle is 2 wheel drive, the 4x4 parameter may be overlooked.

CORRECTION: All 1989 and some 1990 vehicles, the cause of the problem can not be detected with the use of a scanner as data stream is not available. On vehicles with data stream capabilities, the 4x4 Switch "ON/OFF" status can be observed through the scanner. With 2 wheel drive vehicles this status should remain "OFF" at all times. If an "ON" status is observed, the wire has been grounded in some way or the PCM is malfunctioning.

Four Wheel Drive vehicles will of course have the wiring for the four wheel low switch located in the transfer case as seen in figure 1.

It is this switch that sends the 4WLOW signal by grounding the circuit going to terminal #12 at the EEC-IV processor as seen in figure 2, or terminal #14 at the EEC-V processor as seen in figure 3.

A quick method in deciphering a wire or PCM concern, locate the number 12 wire in the 60 pin PCM connector as shown in Figure 2 or, the number 14 wire in the 104 pin PCM connector as shown in Figure 3. This is the 4x4 signal wire and since it is not used on 2 wheel drive vehicles, cut it. The "ON/OFF" parameter should change to "OFF" if this wire was shorted to ground and the vehicle should operate correctly. If the parameter remains "ON", the PCM is faulty.

For the early 1989 and 1990 vehicles that do not provide data stream, cut the number 12 wire (See Figure 2) and take it for a road test. If the problem remains, Engine load, TPS and VSS parameters will need to be checked with a multi-meter for proper operation before condemning the PCM.

E4OD 2 WHEEL DRIVE PICK UP's STACKED UP-SHIFTS

DESCRIPTION: The low range switch is located on the transfer case cover. It provides an indication of when the 4x4 transfer case gear system is in the **LOW** range. This signal modifies shift schedule for 4x4L transfer case gear ratio.

SYMPTOMS:

1. Failed on...Early shift schedule in 4x2 and 4x4H.
2. Failed off...Shifts delayed in 4x4L.

NOTE: If the 4x4 low indicator lamp fuse is blown, the transmission will shift according to 4x4 low shift schedule regardless of transfer case position.

POSSIBLE DTC's: 47, 633, 691, P1729, P1781

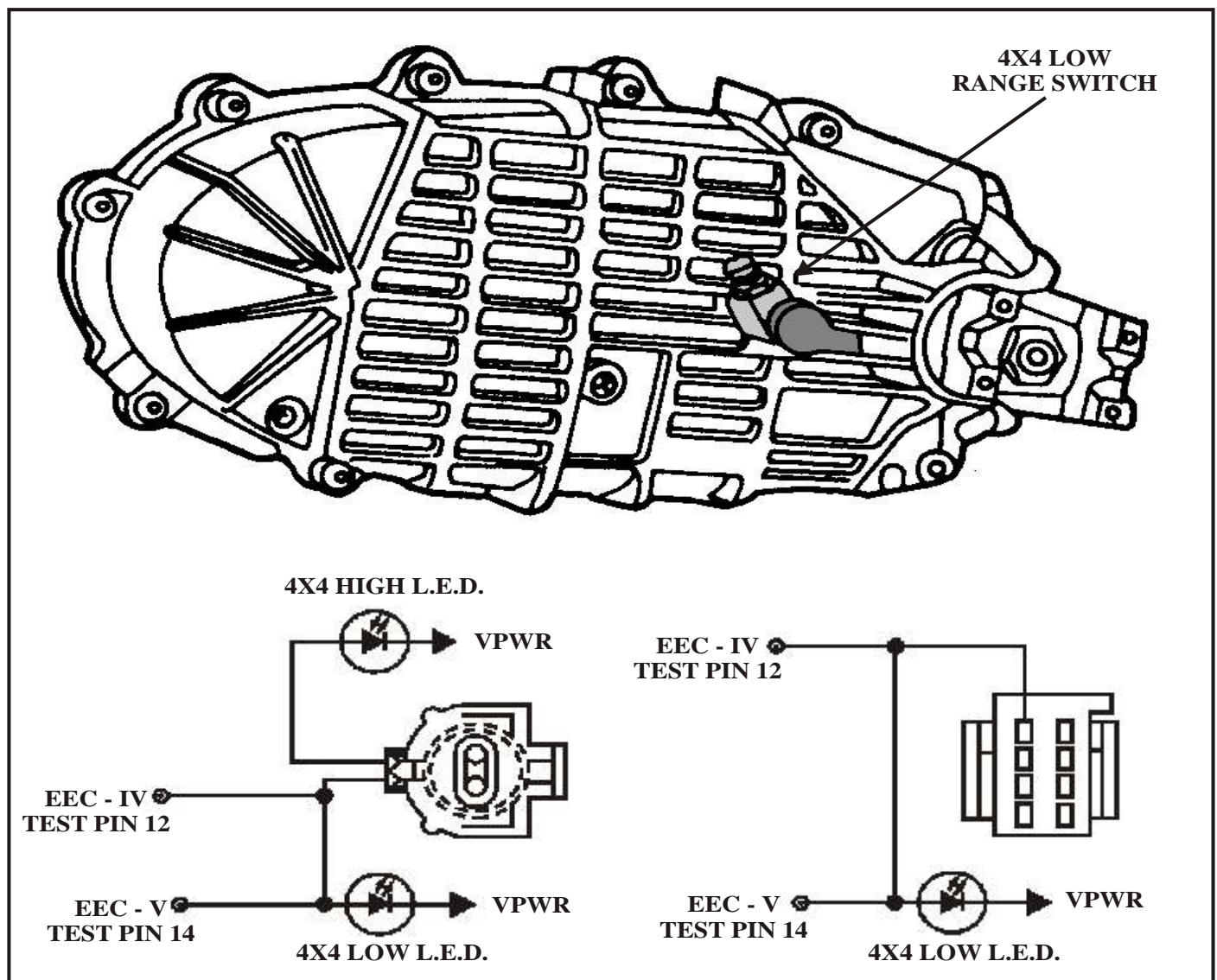
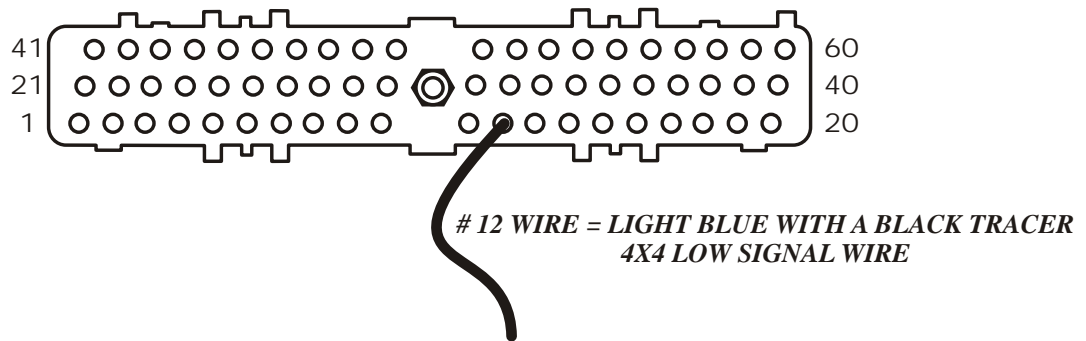


Figure 1

Superior

E4OD 2 WHEEL DRIVE PICK UP's STACKED UP-SHIFTS

EEC-IV PROCESSOR WIRE SIDE OF THE 60 PIN CONNECTOR VIEW



Note: 1995 4.9 Liter California F Series may have the 4x4 Low Signal Wire at terminal 42. It will still be a Light Blue Wire with a Black Tracer.

Figure 2

EEC-V PROCESSOR WIRE SIDE OF THE 104 PIN CONNECTOR VIEW

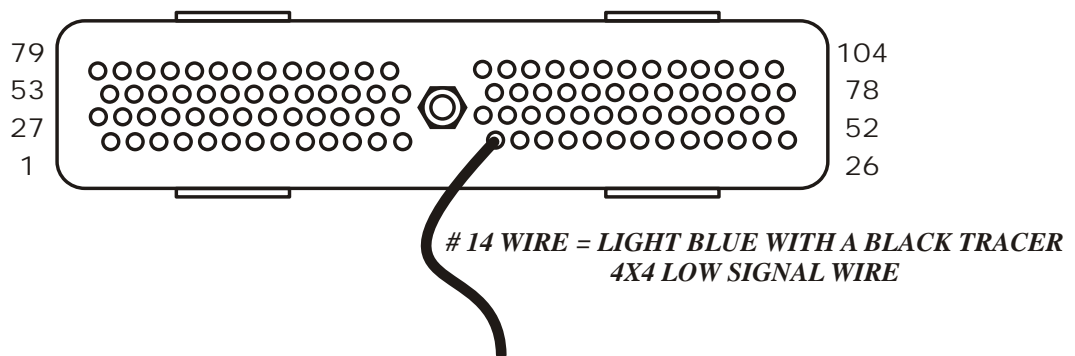


Figure 3



FORD 4R100 NEW DESIGN SUN SHELL

CHANGE: There is now a new design Sun Shell with "Tabs" added to the center of the sun shell slots, as shown in Figure 1, implemented by Ford Motor Co. as a running change, during the 2000 model year. This change eliminated the need for the number 8 thrust washer between the forward and direct drums. This also required a new installation tool for the assembly process.

REASON: Main reason for this change was cost savings.

PARTS AFFECTED:

- (1) INPUT SUN SHELL - New design have "Tabs" added to the center of the sun shell slots, as shown in Figure 1, which now support the direct drum for the required clearance between the direct and forward clutch housings, and allows elimination of the number 8 thrust washer.
- (2) DIRECT CLUTCH HOUSING - Manufactured "Without" slots in the center hub, as they were no longer needed to accept the number 8 thrust washer tabs. Both design direct drums are illustrated in Figure 2.
- (3) NUMBER 8 THRUST WASHER - Eliminated (See Figure 2).
- (4) INSTALLATION TOOL - New tool required for installation, to accommodate the changes in the sun shell slots and works with both design sun shells, as shown in Figure 3.

INTERCHANGEABILITY:

The 1st design Sun Shell is no longer available from Ford Motor Co, as the 2nd design Sun Shell *will* retro-fit back on all models, with or without the number 8 thrust washer.

The 2nd design Direct Clutch Housing (No Slots For Washer) *must* be used with the 2nd design Sun Shell, as there are no accommodations for the number 8 thrust washer.

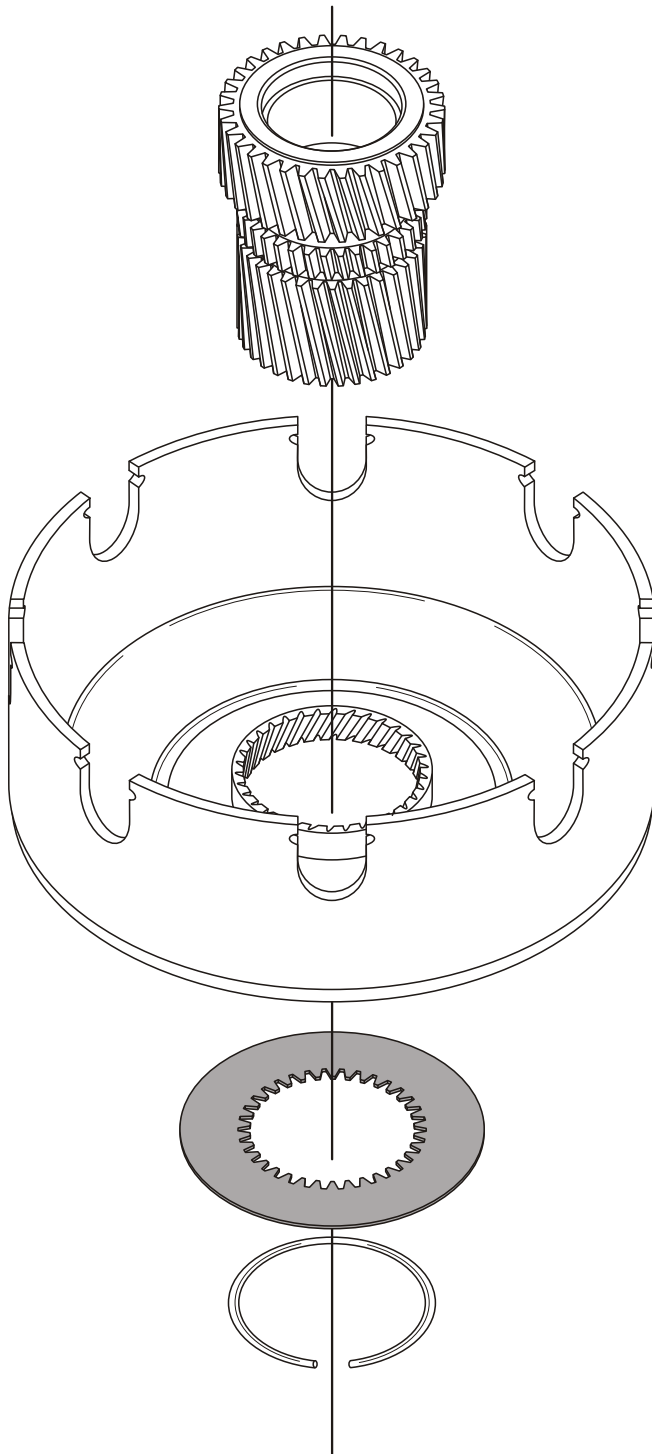
Refer to "Service Information" below for current OEM part numbers.

SERVICE INFORMATION:

Direct Clutch Housing, 2nd Design (Without 4 Tab Washer)	YC3Z-7D044-BA
Direct Clutch Housing, 1st Design (With 4 Tab Washer)	F81Z-7D044-BA
Sun Shell, Hardened, 2nd Design	YC3Z-7D064-BA
Sun Shell, Regular, 2nd Design	YC3Z-7D064-AA
Direct to Forward Drum (No. 8) 4 Tab Thrust Washer	E9TZ-7C096-A
Loading Tool, New Design	307-436

PREVIOUS DESIGN SUN SHELL

"No Longer Available From Ford"

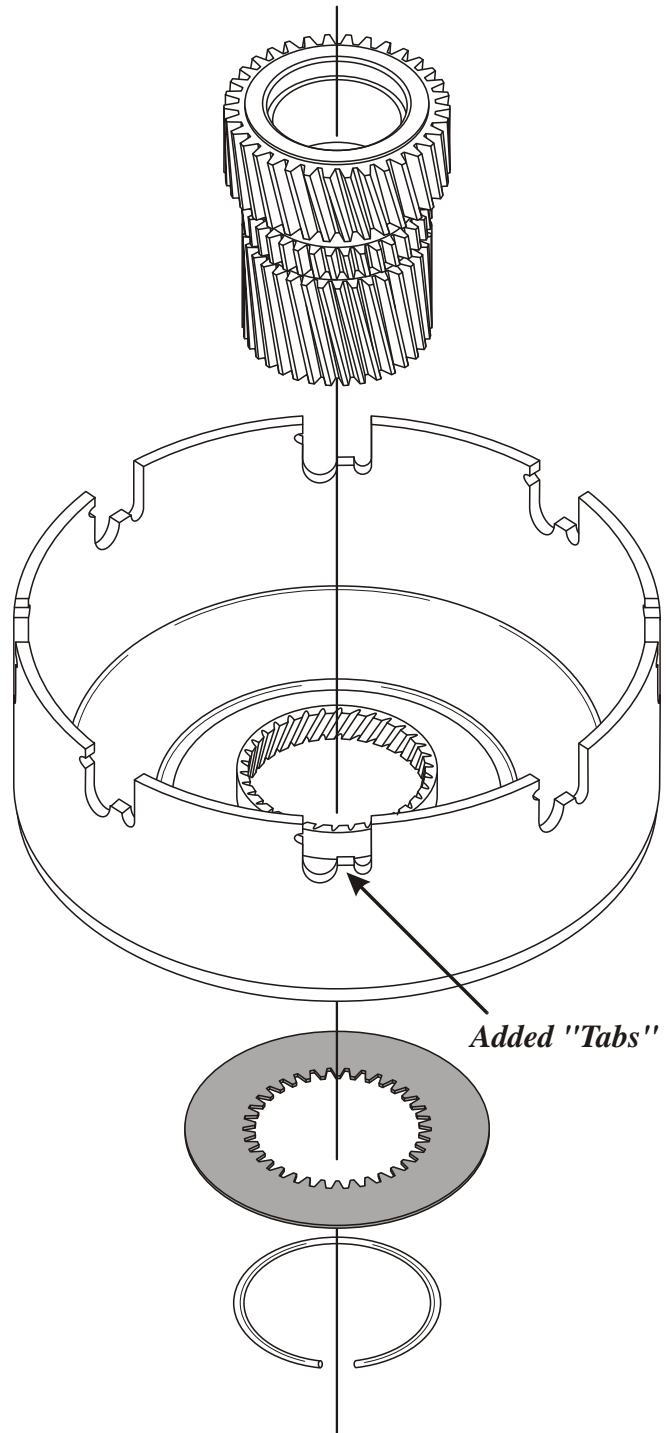


*May Be Used With "ONLY"
The Previous Design Direct Drum
And Requires The No. 8 Washer
(See Figure 2)*

NEW DESIGN SUN SHELL

Hardened = YC3Z-7D064-BA

Regular = YC3Z-7D064-AA



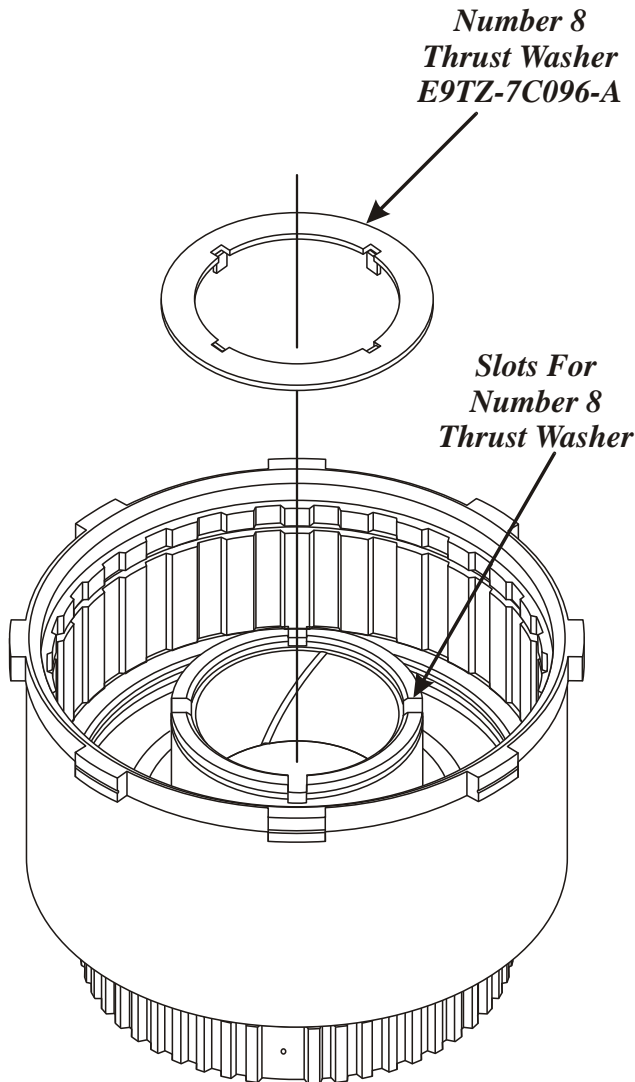
*May Be Used With
Both Design Direct Drums
With Or Without Washer
(See Figure 2)*

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Figure 1

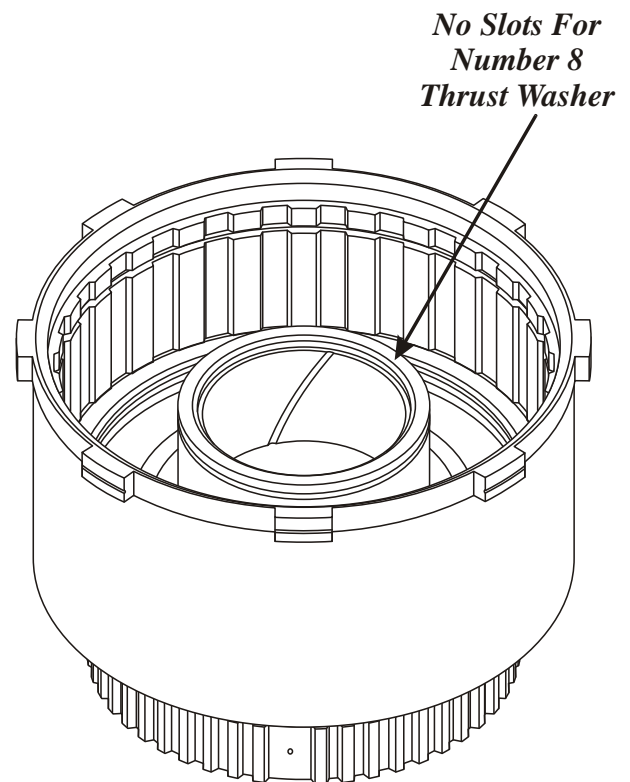
SeaTac

**PREVIOUS DESIGN DIRECT CLUTCH
DRUM "WITH" SLOTS FOR THE
NUMBER 8 THRUST WASHER
PART NO. F81Z-7D044-BA**



*May Be Used With
Both Design Sun Shells
(See Figure 1)*

**NEW DESIGN DIRECT CLUTCH
DRUM "WITHOUT" SLOTS FOR THE
NUMBER 8 THRUST WASHER
PART NO. YC3Z-7D044-BA**



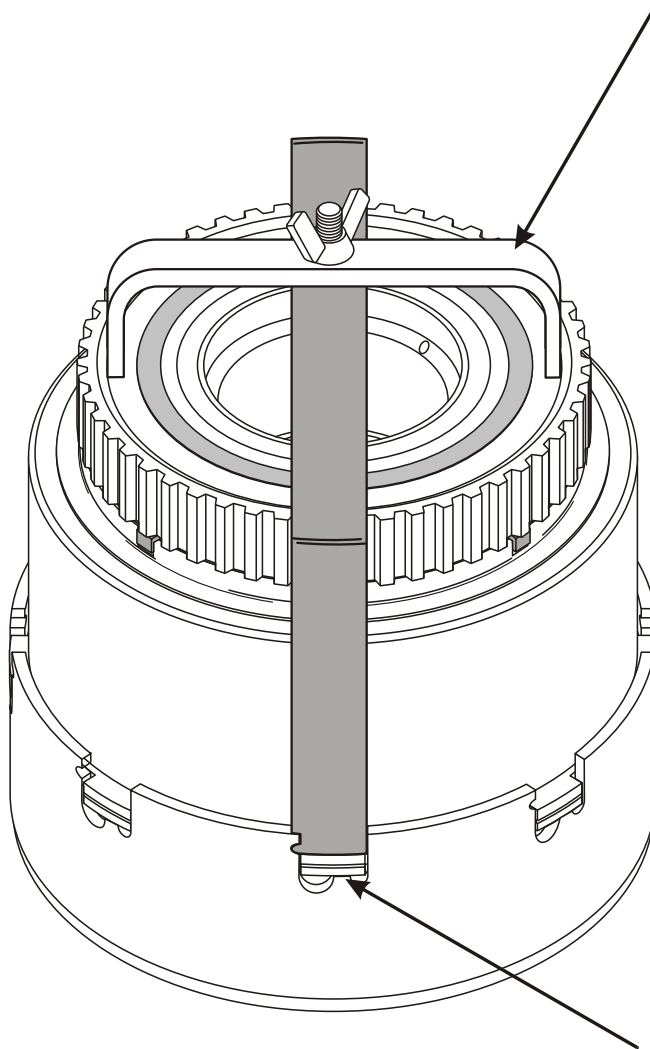
*May Be Used With "ONLY"
The New Design Sun Shell
(See Figure 1)*

Figure 2

ATEC

NEW DESIGN LOADING TOOL

*New Design Loading Tool
Works On Both Sun Shells
Available From Ford Motor Co.
Under Part Number 307-436*



*Lugs On Direct Clutch Housing
Now Supported By "Tabs" Added
To Center of Sun Shell Slots Which
Allowed Elimination Of The
Number 8 Thrust Washer*

Figure 3



FORD 4R100 INTERMEDIATE "DIODE" FREEWHEEL

COMPLAINT: Some Ford Motor Company vehicles equipped with the 4R100 transmission may exhibit premature failure of the newly introduced Intermediate "Diode" Freewheel device that was installed in model year 2001 and illustrated in Figure 1.

CAUSE: The cause may be, more than expected load factors.

CORRECTION: The Intermediate "Diode" is ***no longer serviced*** by Ford Motor Company. The part number now supercedes to all of the previous design level parts, which include the direct clutch housing, intermediate sprag assembly, outer race to direct drum thrust washer, and the intermediate friction plates. All of the previous design level parts are illustrated in Figure 2, along with the OEM part numbers. The intermediate frictions must be replaced because the tooth count on the outer race between the diode and the sprag are different.

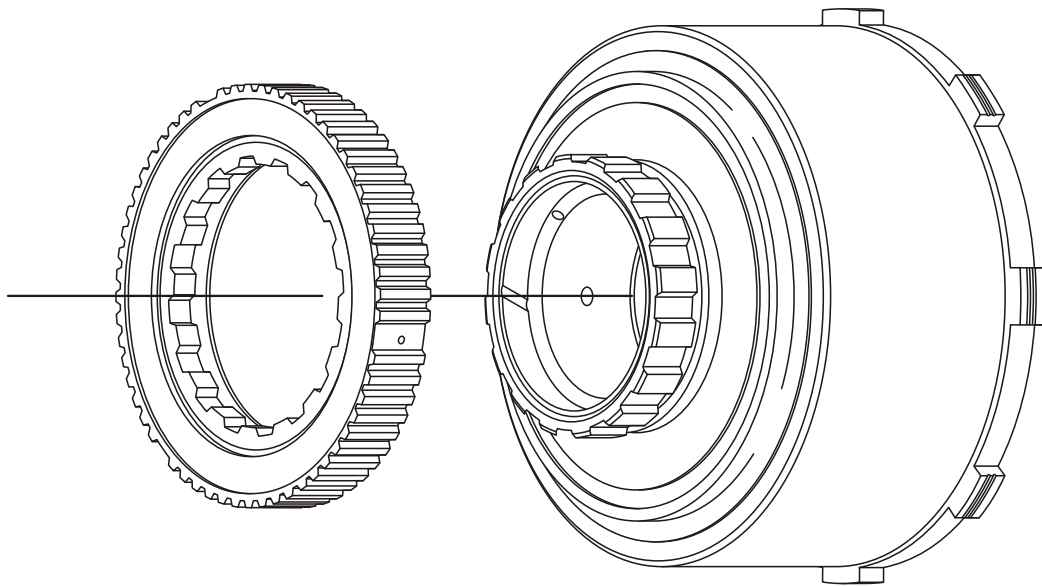
Special Note: ATSG recommends replacing the Intermediate "Diode" during service, even if it has not yet failed, to protect yourself from possible future failures.

SERVICE INFORMATION:

Direct Clutch Housing, 2nd Design (Without 4 Tab Washer)	YC3Z-7D044-BA
Direct Clutch Housing, 1st Design (With 4 Tab Washer)	F81Z-7D044-BA
Sun Shell, Hardened, 2nd Design	YC3Z-7D064-BA
Sun Shell, Regular, 2nd Design	YC3Z-7D064-AA
Direct to Forward Drum 4 Tab Thrust Washer	E9TZ-7C096-A
Direct Drum to Outer Sprag Race Thrust Washer	E9TZ-7G401-A
Intermediate Sprag Assembly	E9TZ-7A089-B
Intermediate Friction Plates (Special 50 Tooth, 3 Required)	1C3Z-7B164-BA

4R100 INTERMEDIATE "DIODE"

No Longer Available For Service



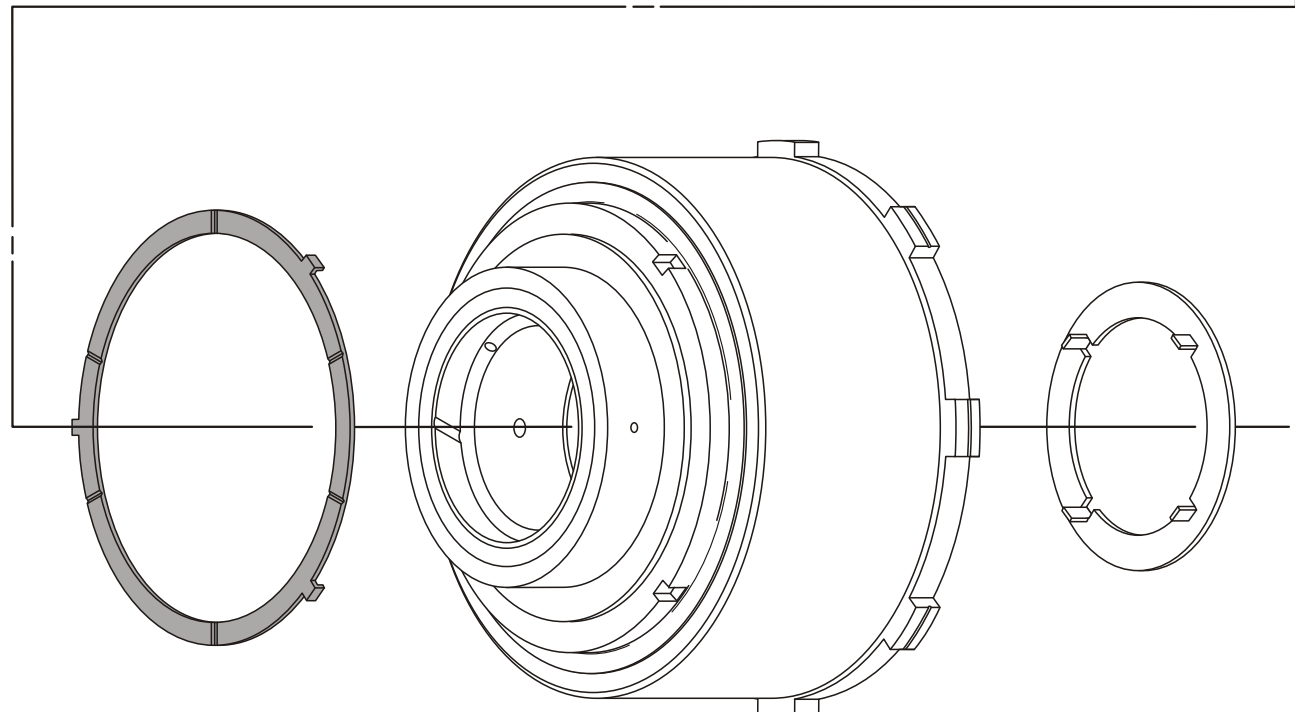
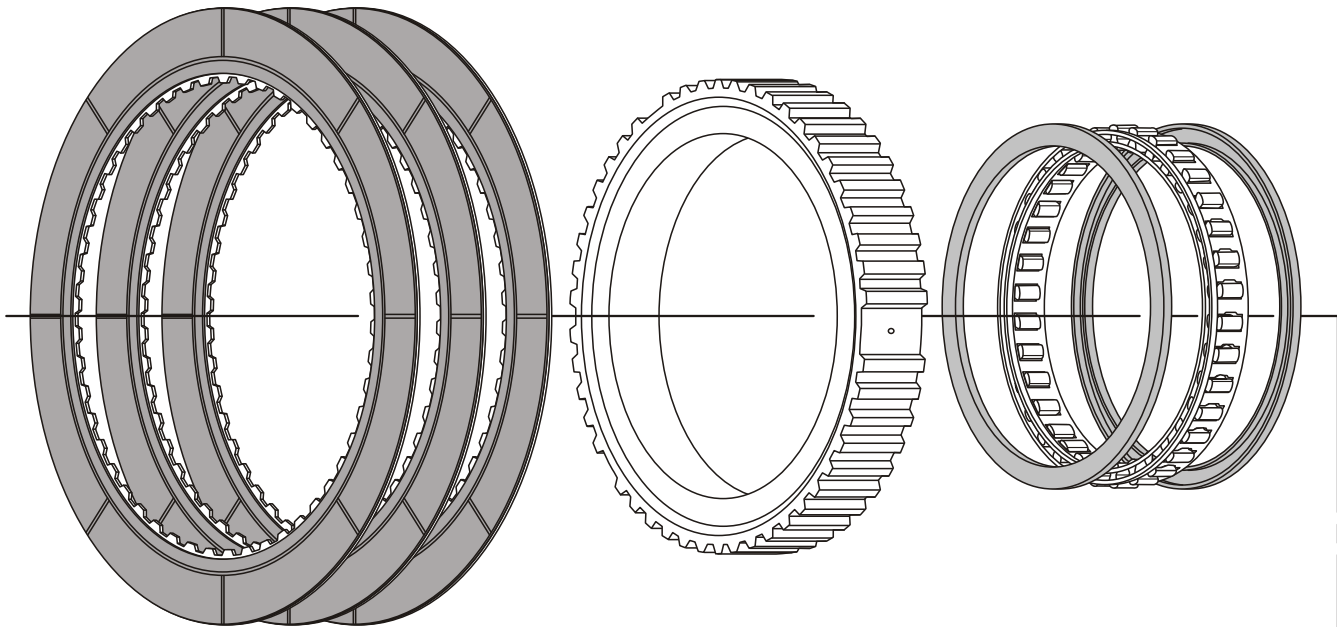
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Figure 1

PARTS NEEDED TO REPLACE INTERMEDIATE DIODE

Intermediate Friction Plates
Part Number 1C3Z-7B164-BA
(3 Required)

Intermediate Sprag Assembly
Part Number E9TZ-7A089-B



Outer Race To Drum Thrust Washer
Part Number E9TZ-7G401-A

Direct Clutch Housing
Part No. YC3Z-7D044-BA (No Washer)
Part No. F81Z-7D044-BA (With Washer)

4 Tab Thrust Washer
Part Number E9TZ-7C096-A

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Figure 2



FORD 4R70W

ERRATIC SPEEDOMETER OPERATION

- COMPLAINT:** A Ford vehicle comes into the shop with a complaint of the digital speedometer indicating 20 MPH with the engine running in Park and miles are accumulating on the odometer. Applying the brakes causes the speedometer reading to drop to zero. When a scan tool was connected to the vehicles diagnostic connector, miles per hour on the scan tool read zero even though the speedometer read 20 MPH. The miles per hour reading on the speedometer will fluctuate with throttle opening.
- CAUSE:** One of the cruise control cables that are routed too close to the back of the alternator had rubbed through and was shorting out on the alternators battery connection. (Refer to Figure 1)
As a result of this shorting out, one or more diodes on the rectifier bridge inside the alternator was allowing a large amount of "AC Ripple" into the vehicles electrical system. The speedometer picked this "Ripple" up and indicated vehicle speed and mileage added to the odometer but the PCM was not affected therefore the scan tool indicated NO vehicle speed.
"AC Ripple" can best be described as an AC voltage signal "piggybacking" on a level of DC voltage which causes interference with other electrical systems in the vehicle.
- CORRECTION:** In most cases the alternator and the cruise control cable will need to be replaced. Make certain the cruise control cable and the back of the alternator have adequate clearance between them.

FORD 4R70W
ERRATIC SPEEDOMETER OPERATION

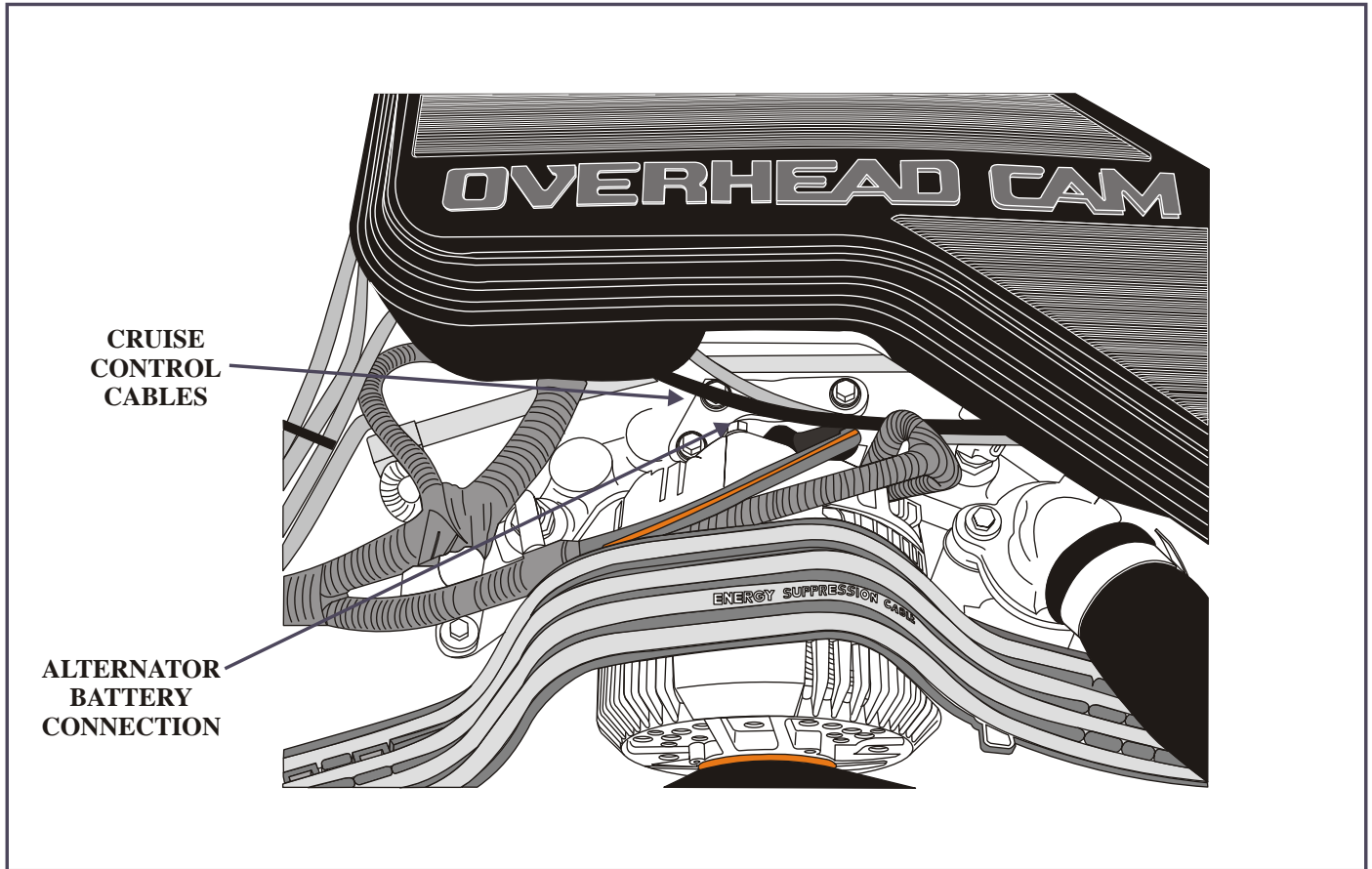


Figure 1

FORD AODE/4R70W

1996 AND LATER VALVE BODY GASKET CHANGE

COMPLAINT: Clarity needed towards valve body gasket application.

REASON: There has been revisions made to the valve body and spacer plate due to calibration and control concerns which necessitated changes made to the gaskets

The *previous* spacer plate to case gasket was part number **F7AZ-7C155-AA** and had a green stripe. The *revised* gasket part number is **1L3Z-7C155-AA** and it has a green identification stripe. This gasket will retrofit to all applications and years from 1996 to present.

INTERCHANGEABILITY:

The spacer plate to valve body gasket with part number **XW7Z-7D100-AA** has a white identification stripe and is used for 1996 to 2000 (See Figure 1). The spacer plate to valve body gasket with part number **1W7Z-7D100-AB** has a Light Blue identification stripe and is used for all 2001 and up applications. This gasket will NOT retrofit back to any previous model years (See Figure 1).

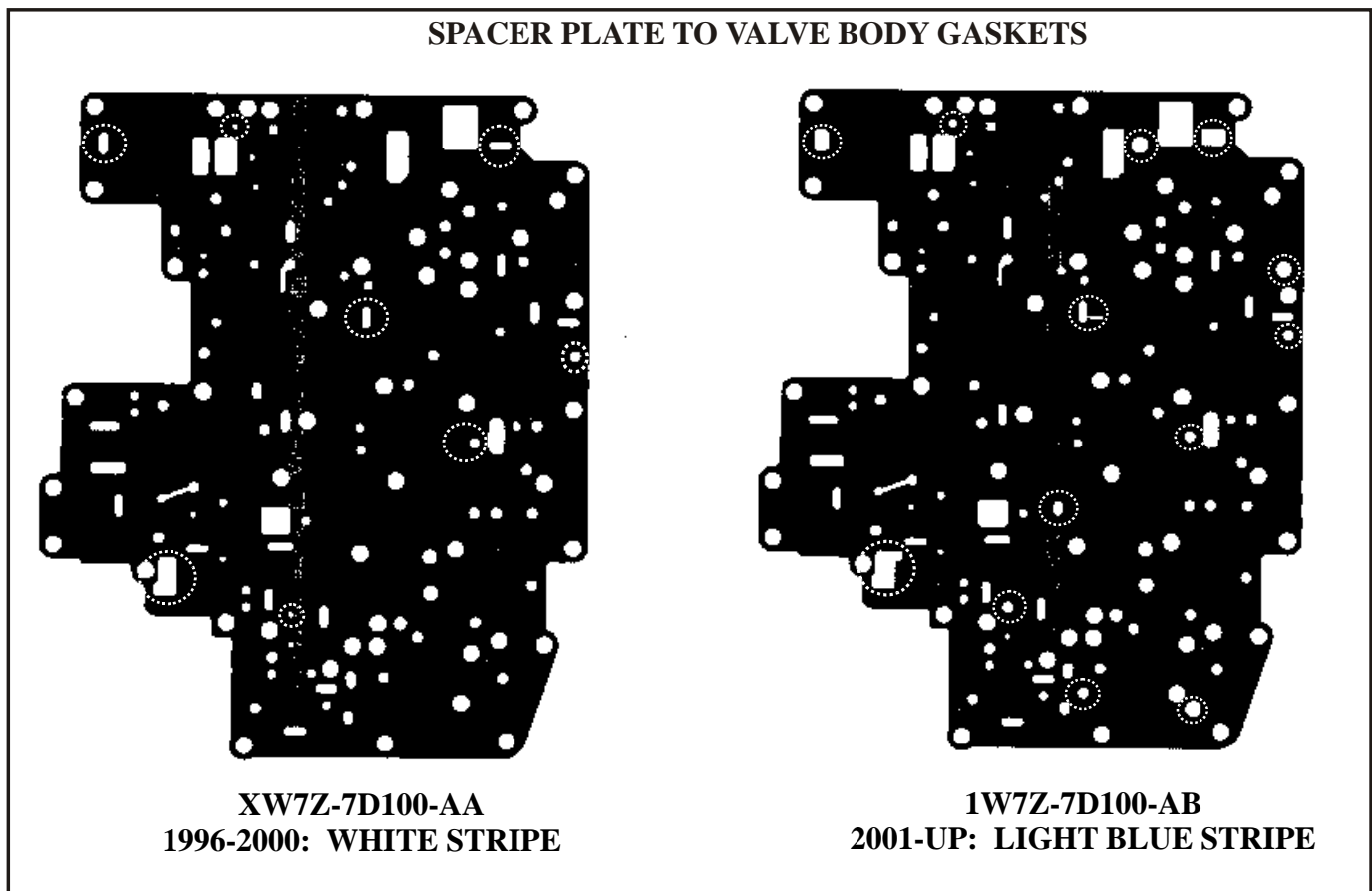


Figure 1



FORD 4R44E/55E

VALVE BODY GASKET BLOW OUT

COMPLAINT: The 1999 or Later Ford vehicle equipped with the 4R44E/4R55E Transmission comes into the shop with a complaint of delayed engagement into drive and reverse. May have codes PO732 (Incorrect 2nd Gear Ratio) and P1756 (Shift Solenoid #2 Performance Fault) stored with complaints of a delayed 1-2 shift or no 1-2 shift.

CAUSE: The upper valve body gasket has blown out along the edge right above shift solenoid #2 as shown in figure 1. The gasket area that is damaged is located directly over the line pressure and Shift Solenoid #2 oil passages as illustrated in figure 2. The gasket appears to have been over-tightened. Apparently, this condition leads to the storage of the above codes, which results in a *Failure Mode Effects Management (FMEM)* condition which will blow the already weakened gasket out resulting in the above complaints.

CORRECTION: It has been ATSG's experiences that this gasket problem seems to only occur on 1999 and later models, and that the only repair necessary is to replace the valve body gaskets and torque the valve body to factory specifications which is 71-97 in lbs (8-11 N-m).

However, anytime a valve body gasket has blown out, it is always a good practice to check the flatness of the affected areas.

FORD 4R44E/55E
VALVE BODY GASKET BLOW OUT

UPPER VALVE BODY GASKET

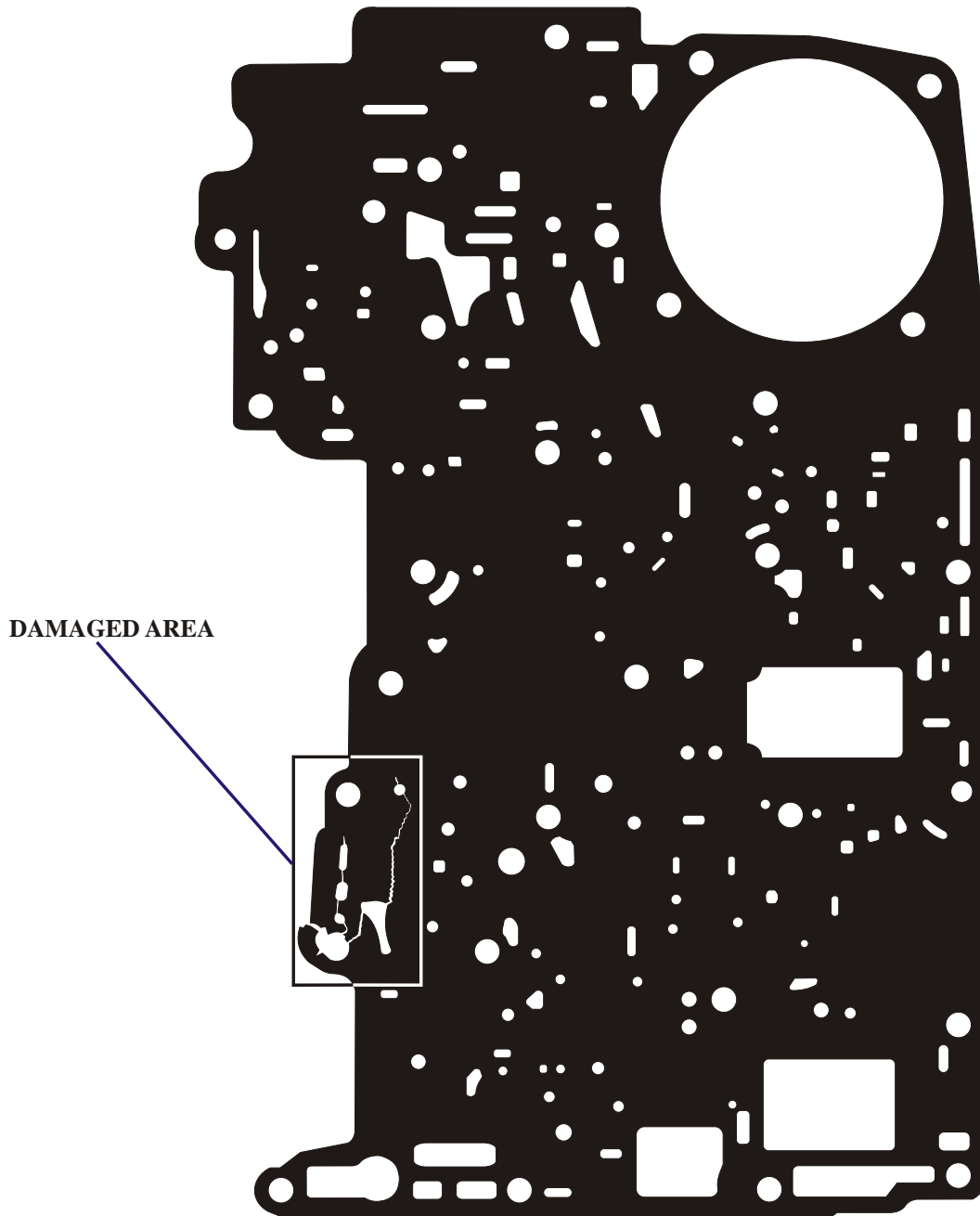


Figure 1

FORD 4R44E/55E

VALVE BODY GASKET BLOW OUT

TRANSMISSION CASE OIL PASSAGES

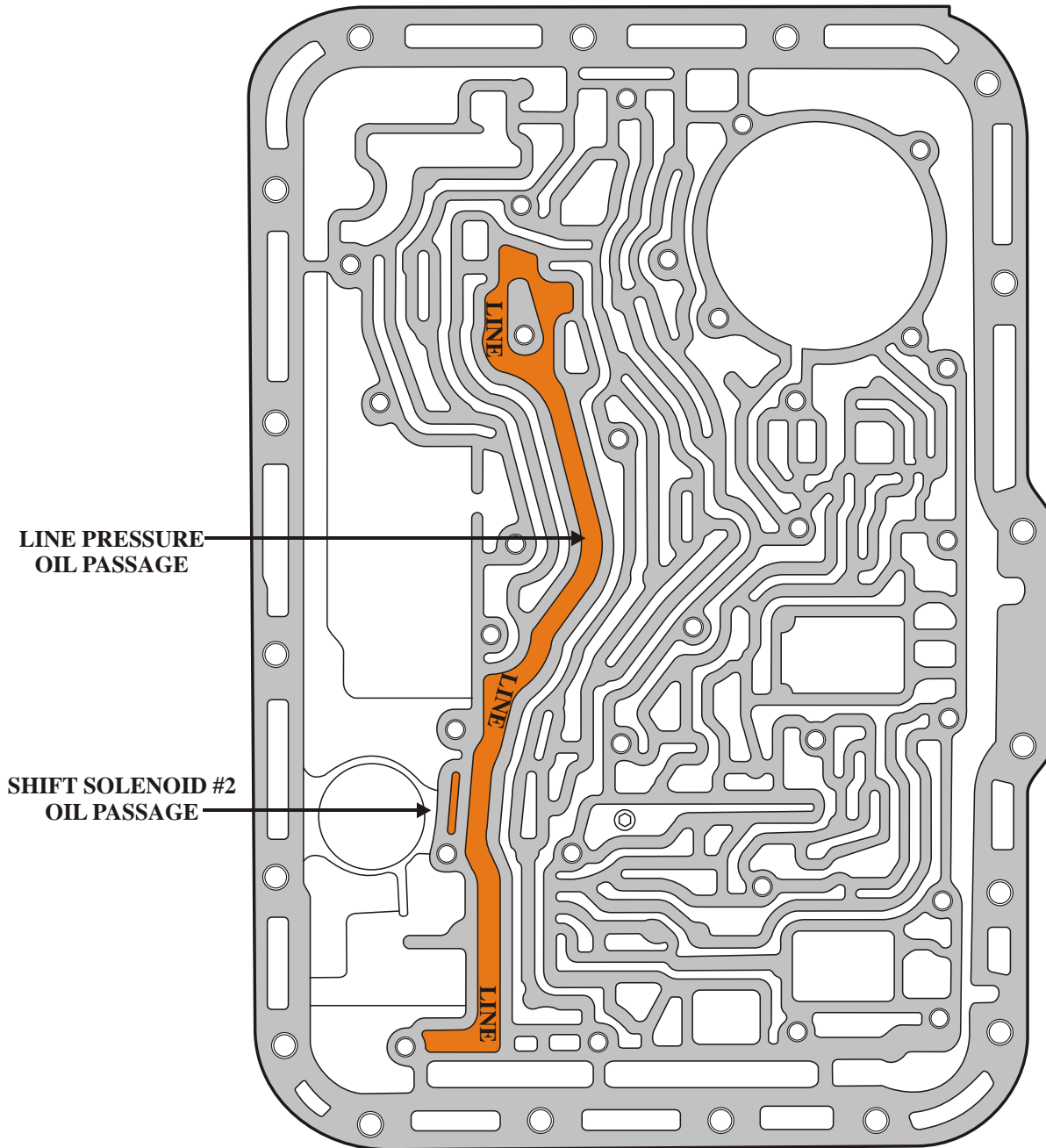


Figure 2



4R44/55E and 5R55E
DELAYED ENGAGEMENT WHEN HOT

- COMPLAINT:** After a rebuild, the vehicle exhibits a delayed engagement when hot. Other symptoms that can accompany this concern is soft or flared up shifts. Particularly the 2 to 3 on 4R units and 3-4 on 5R units. Common building practices such as replacing the pressure regulator valve spring with an A4LD yellow spring, tweaking the EPC solenoid 1/8 turn in and eliminating the engagement control valve spring have all been employed and still the problem persists.
- CAUSE:** During rebuild, the center support bolt was overlooked and not tightened down causing a loss of clutch apply pressure (See Figure 1). If a line gauge was installed on the unit, a sluggish line rise may be observed with base line pressure being 10 to 20 pounds lower than factory specifications.
- CORRECTION:** Tighten the anchor bolt with a 5 mm Allen wrench 80 to 115 inch pounds.

**4R44/55E and 5R55E
DELAYED ENGAGEMENT WHEN HOT**

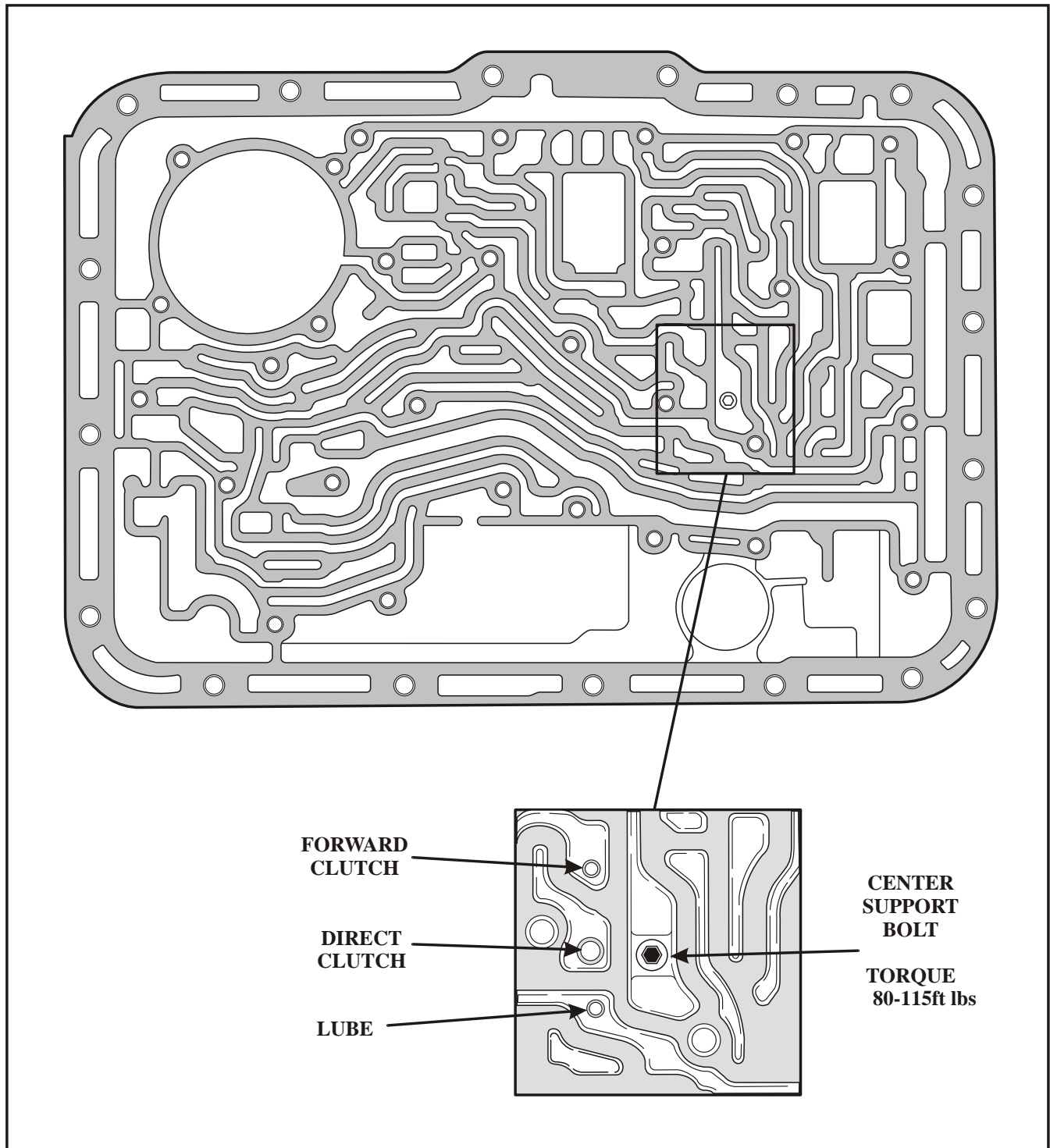


Figure 1



2000-01 FORD RANGER

HARSH/DELAYED SHIFTS

- COMPLAINT:** Some 2000-2001 Ford Ranger Trucks built before January 2, 2001 may exhibit delayed or harsh upshifts accompanied by an erratic or inoperative speedometer with DTC P0500, P0501 or P0503 VSS codes stored.
In addition to the above complaints, the ABS warning lamp will be illuminated along with associated ABS system codes. The vehicle may also exhibit a rough idle condition with driveability codes P0176 and P1721 stored.
- CAUSE:** A deteriorated weather pack seal at the C309 connector (2000 models) or the C340 connector (2001 models), located under the drivers seat, illustrated in figure 1, has allowed water intrusion into the connector resulting in corrosion of the various circuits contained in these connectors causing the above complaints.
- CORRECTION:** Disconnect the above mentioned connector and verify that water intrusion has occurred. Next, determine the extent of the damage the connector terminals have sustained. If the connector terminals are in good condition, dry the connectors out, and apply a liberal amount of dielectric grease to the connectors. Acquire from Ford parts department, a new Rubber Connector Boot and Plastic Connector Cap and install them.
If terminal damage has occurred, the terminal ends will have to be replaced which are also available from Ford parts department and will require an extensive soldering operation in order to insure a proper connection.
Figure 2 shows the 2000 Ranger C309 connector and its terminal and circuit identification, while figure 3 illustrates the 2001 Ranger C340 connector information.

Refer to Factory TSB 01-5-2.

SERVICE INFORMATION:

<i>Rubber Connector Boot.....</i>	<i>1L5Z-14A099-AA</i>
<i>Plastic Connector Cap.....</i>	<i>1L5Z-14A541-AA</i>
<i>Terminal Ends (Female Side) Silver Finish, 1.6mm.....</i>	<i>F67Z-14487-AA</i>
<i>Terminal Ends (Female Side) Gold Finish, 1.6mm.....</i>	<i>E6DZ-14487-AA</i>
<i>Terminal Ends (Female Side) Gold Finish, 2.8mm.....</i>	<i>F6DZ-14487-AB</i>
<i>Terminal Ends (Male Side) Silver Finish, 1.6mm.....</i>	<i>E7EB-14461-BA</i>
<i>Terminal Ends (Male Side) Gold Finish, 1.6mm.....</i>	<i>F6TZ-14461-AA</i>
<i>Terminal Ends (Male Side) Silver Finish, 2.8mm.....</i>	<i>F6DZ-14461-CA</i>
<i>Terminal Ends (Male Side) Silver Finish, 1.6mm.....</i>	<i>E5DZ-14461-A</i>

**2000-01 FORD RANGER
HARSH/DELAYED SHIFTS**

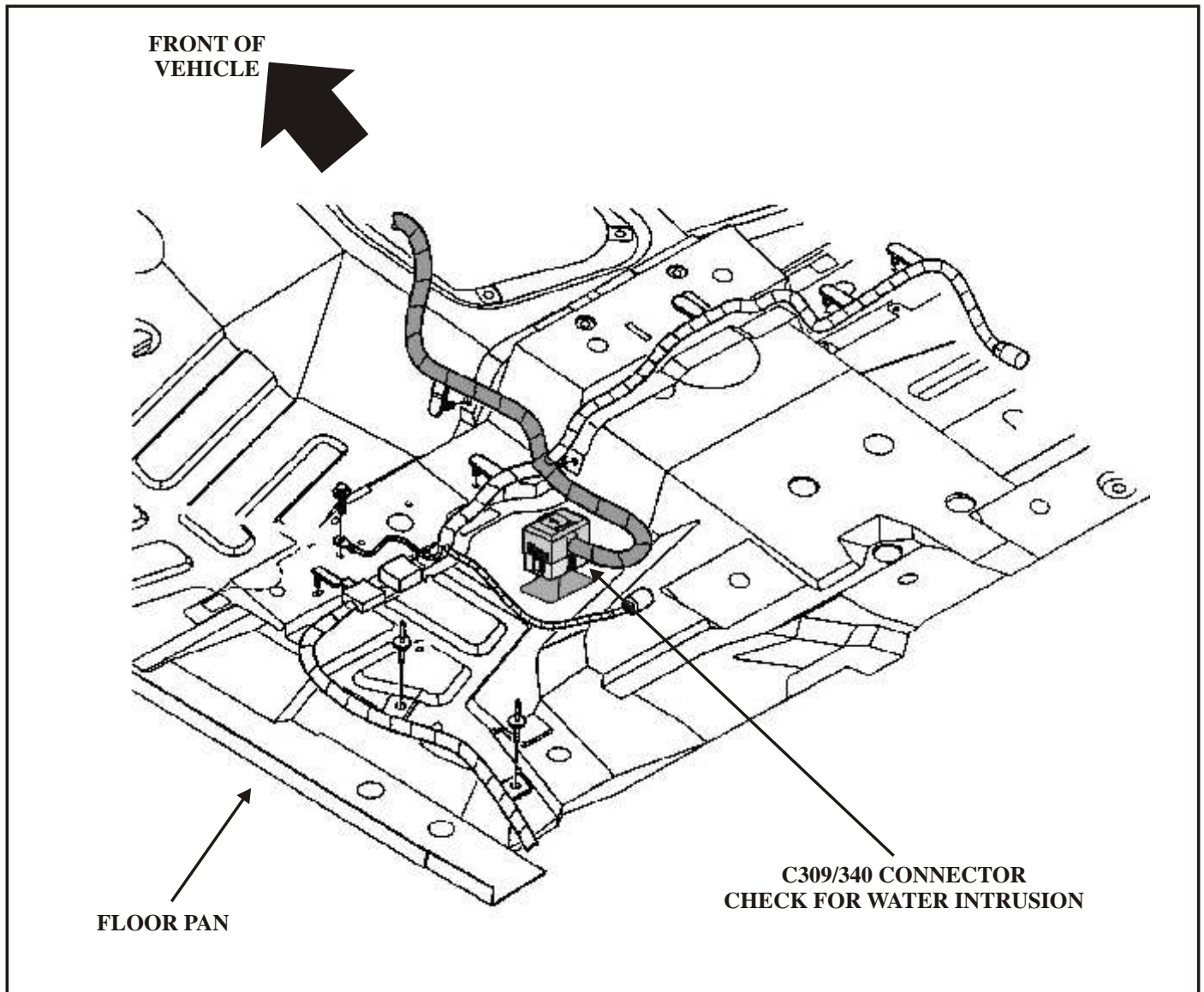
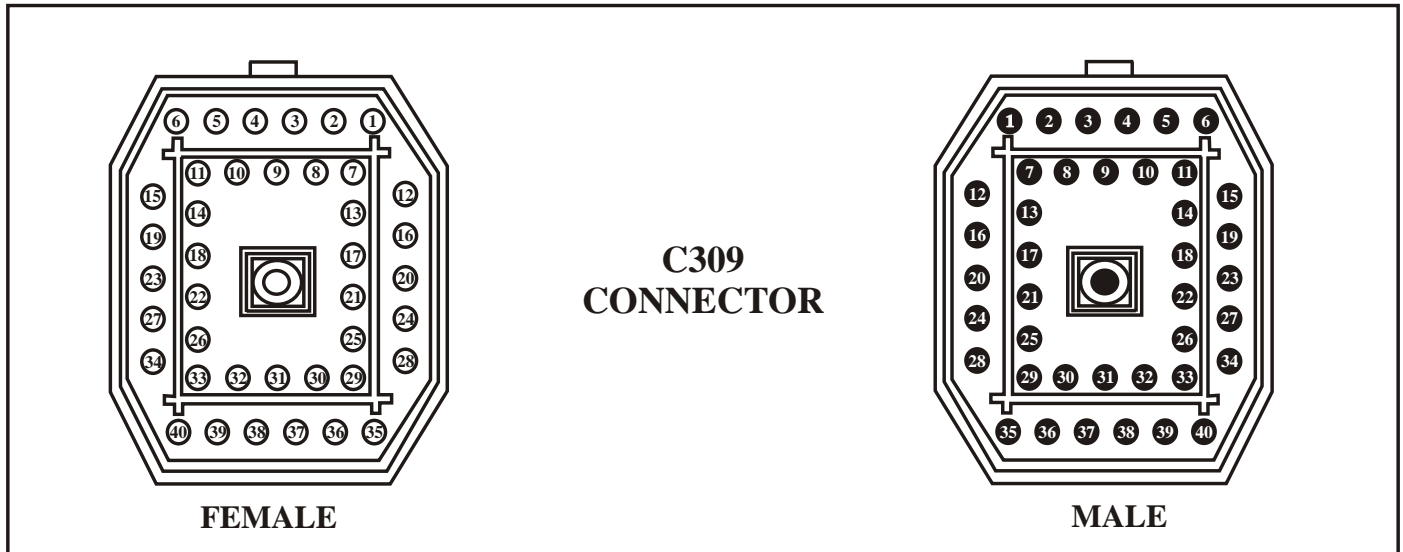


Figure 1

2000-01 FORD RANGER

HARSH/DELAYED SHIFTS

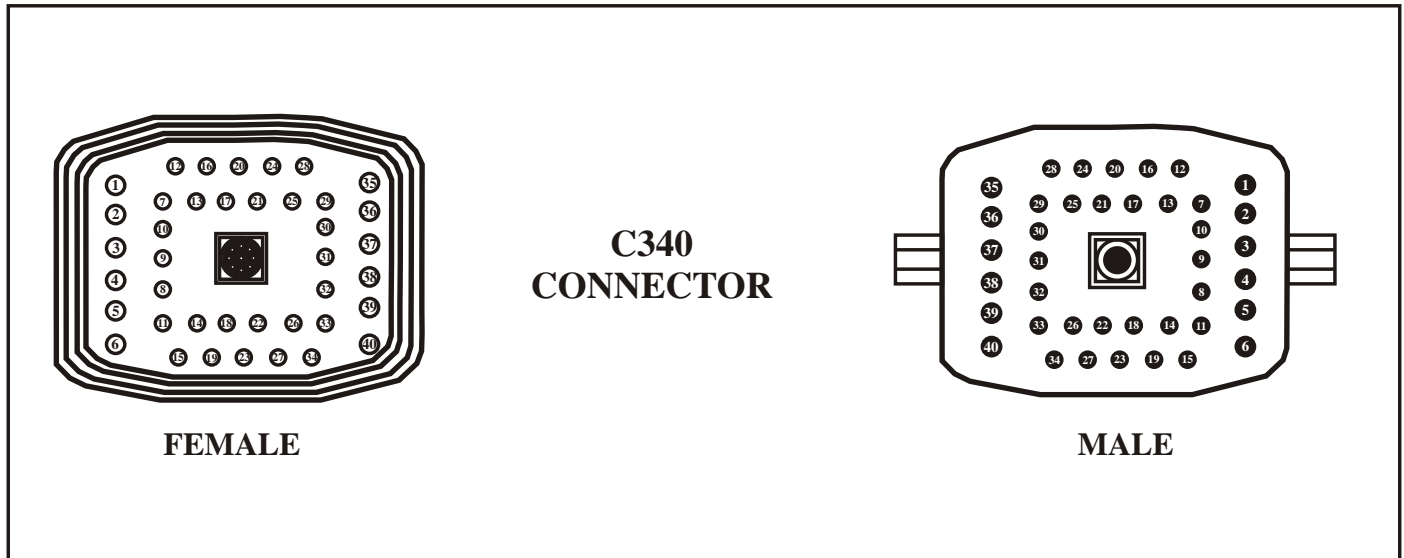


TERMINAL NUMBER	CIRCUIT NUMBER	WIRE COLOR	TERMINAL NUMBER	CIRCUIT NUMBER	WIRE COLOR
1	57	BLACK	21	519	LT GREEN/BLACK
2	NOT USED	-----	22	836	ORANGE/WHITE
3	NOT USED	-----	23	34	LT BLUE/ORANGE
4	NOT USED	-----	24	778	ORANGE
5	57	BLACK	25	9	LT GRN/ORANGE
6	787	PINK/BLACK	26	140	BLACK/PINK
7	640	RED/YELLOW	27	886	ORANGE/BLACK
8	29	YELLOW/WHITE	28	777	YELLOW
9	770	WHITE	29	351	BROWN/WHITE
10	791	RED/PINK	30	570	BLACK/WHITE
11	52	YELLOW	31	NOT USED	-----
12	779	BROWN	32	14	BROWN
13	64	DK GREEN	33	771	VIOLET/YELLOW
14	91	VIOLET/WHITE	34	764	BROWN/WHITE
15	762	YELLOW/WHITE	35	374	DK BLUE/WHITE
16	359	GRAY/RED	36	378	BROWN/YELLOW
17	523	RED/PINK	37	962	BROWN/WHITE
18	5	ORANGE/LT BLUE	38	887	YELLOW
19	763	ORANGE/WHITE	39	511	LT GREEN
20	21	DK GRN/LT GRN	40	NOT USED	-----

Figure 2

2000-01 FORD RANGER

HARSH/DELAYED SHIFTS



TERMINAL NUMBER	CIRCUIT NUMBER	WIRE COLOR	TERMINAL NUMBER	CIRCUIT NUMBER	WIRE COLOR
1	57	BLACK	21	519	LT GREEN/BLACK
2	NOT USED	-----	22	NOT USED	-----
3	NOT USED	-----	23	34	LT BLUE/ORANGE
4	778	ORANGE	24	NOT USED	-----
5	777	YELLOW	25	9	LT GRN/ORANGE
6	787	PINK/BLACK	26	140	BLACK/PINK
7	NOT USED	-----	27	NOT USED	-----
8	29	YELLOW/WHITE	28	NOT USED	-----
9	770	WHITE	29	351	BROWN/WHITE
10	791	RED/PINK	30	396	BLACK/ORANGE
11	52	YELLOW	31	NOT USED	-----
12	NOT USED	-----	32	14	BROWN
13	64	DK GREEN	33	771	VIOLET/YELLOW
14	91	VIOLET/WHITE	34	764	BROWN/WHITE
15	762	YELLOW/WHITE	35	374	DK BLUE/WHITE
16	359	GRAY/RED	36	378	BROWN/YELLOW
17	523	RED/PINK	37	962	BROWN/WHITE
18	5	ORANGE/LT BLUE	38	NOT USED	-----
19	763	ORANGE/WHITE	39	511	LT GREEN
20	NOT USED	-----	40	NOT USED	-----

Figure 3

ALTO



47RE/5.9 LITER DIESEL CUMMINS TORQUE CONVERTER CLUTCH CYCLES IN AND OUT

COMPLAINT: 5.9 Liter vehicles with the 47RE transmission experiences a cycling in and out of lock up concern during highway speed.

CAUSE: There are many possibilities such as a malfunctioning brake switch or brake support bracket. Temperature sensors, alternators, throttle position sensors, vehicle speed sensors to name a few. Chrysler has even issued a reprogramming procedure (Bulletin #18-02-99) for 1996 and later vehicles which compensates for alternator or TPS noise correcting this complaint. Reports of TCC shuttle has also occurred while driving with a scanner is attached to the data link connector. Unplug the scanner and the problem goes away. One other possibility that may go overlooked is a defective ECM with 1998 and later vehicles. These vehicles are equipped with an Accelerator Pedal Position Sensors (APPS) rather than a TPS. The APPS sends a typical TPS signal to the ECM and the ECM sends that signal to the PCM. Should the ECM malfunction, the incorrect signal is received by the PCM causing the shuttle shift complaint (See Figure 1).

CORRECTION: The APPS is located at the front left of the Engine Compartment under a plastic protective cover (See Figure 2). When the cover is removed it can be seen how the accelerator pedal cable operates a throttle cam which is attached to a mounting plate (See Figure 3). On the back side of this assembly is the where the APPS is located (See Figure 4). The APPS connector terminal identification is shown in Figure 5. The number 3 terminal sends a typical .5 to 3.5-4.0 throttle opening signal voltage to the ECM at connector terminal # 25 (See Figure 6). The ECM in turn sends that same signal to the PCM from ECM terminal # 28 to PCM terminal # 23 in the C1 Black connector (See Figure 7). Simply inspect the voltage from the APPS to the ECM to insure that the APPS is functioning correctly. Then inspect the signal from the ECM to the PCM. If the signal is incorrect, the ECM will need to be replaced. For further verification that an ECM needs to be replaced, cut the wire entering terminal 23 in the PCM's black C1 connector. Run a jumper lead from terminal 3 in the APPS connector to terminal 23 in the C1 connector. If the direct signal from the APPS into the PCM corrects the problem, the ECM has been confirmed faulty.

SERVICE INFORMATION:

APPS.....53031575AF

TORQUE CONVERTER CLUTCH CYCLES IN AND OUT

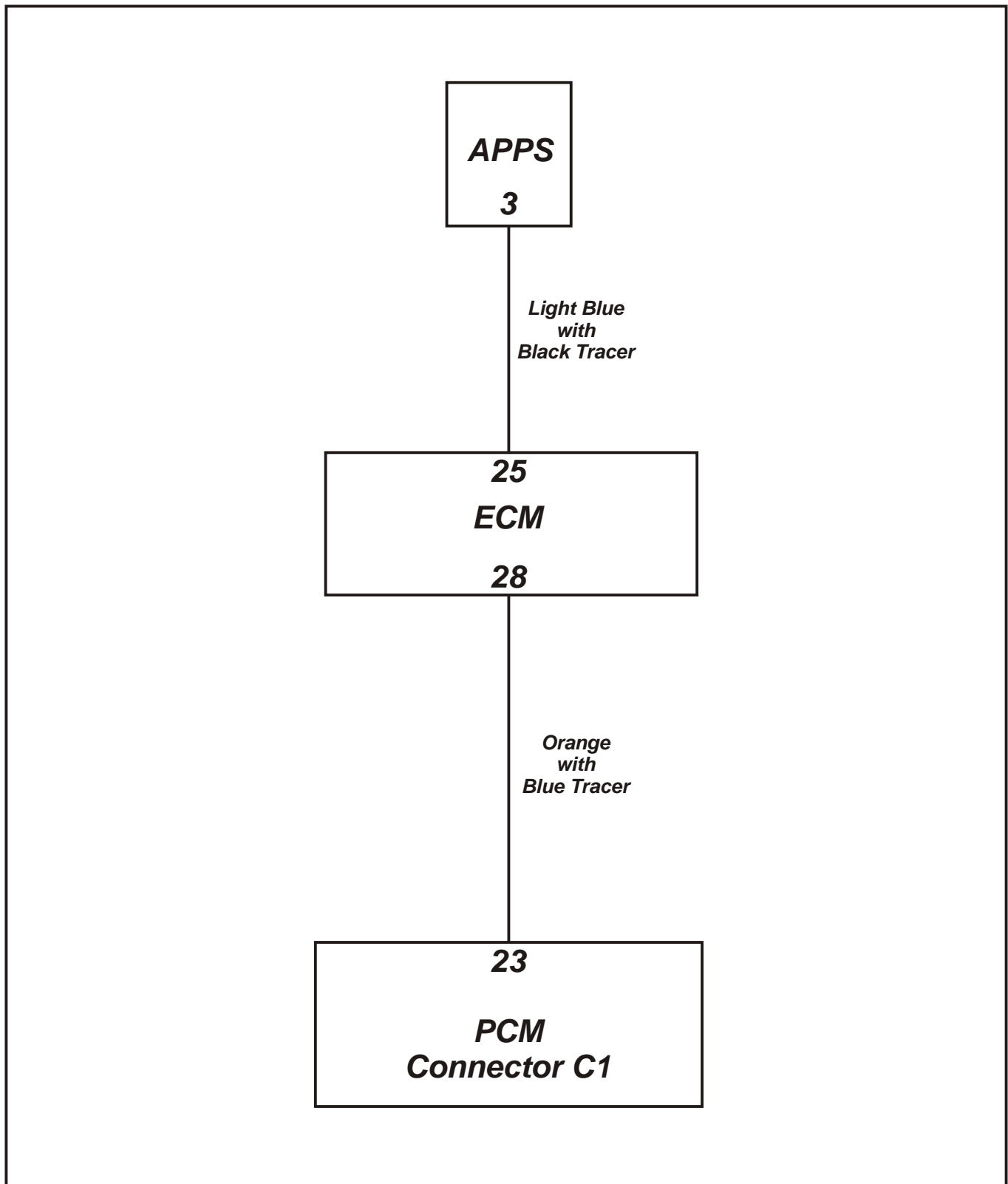


Figure 1

Torrington

TORQUE CONVERTER CLUTCH CYCLES IN AND OUT

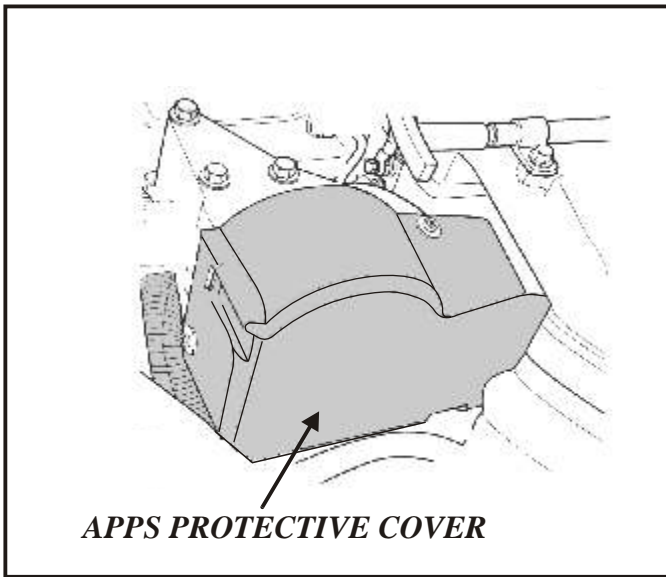


Figure 2

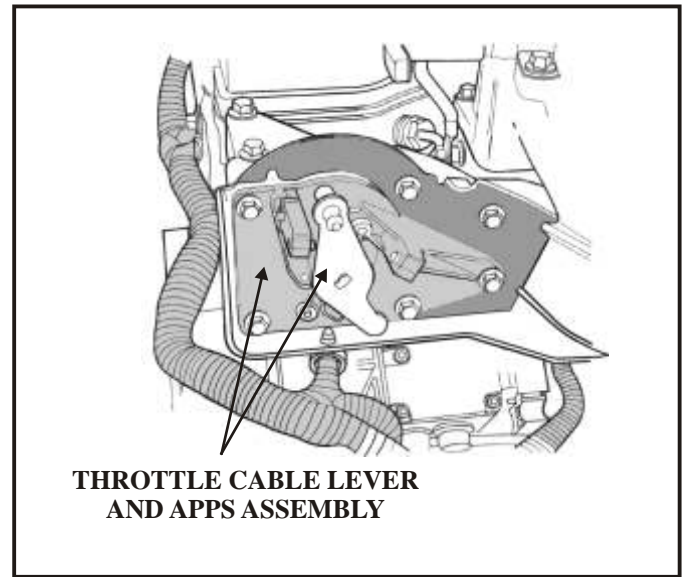


Figure 3

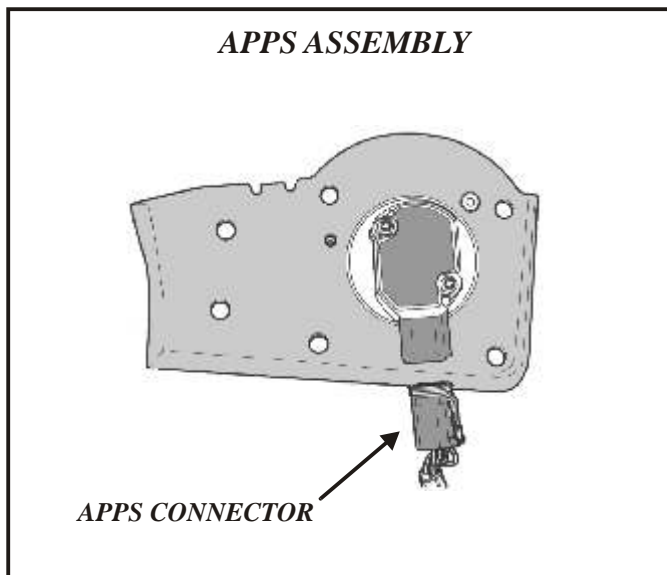


Figure 4

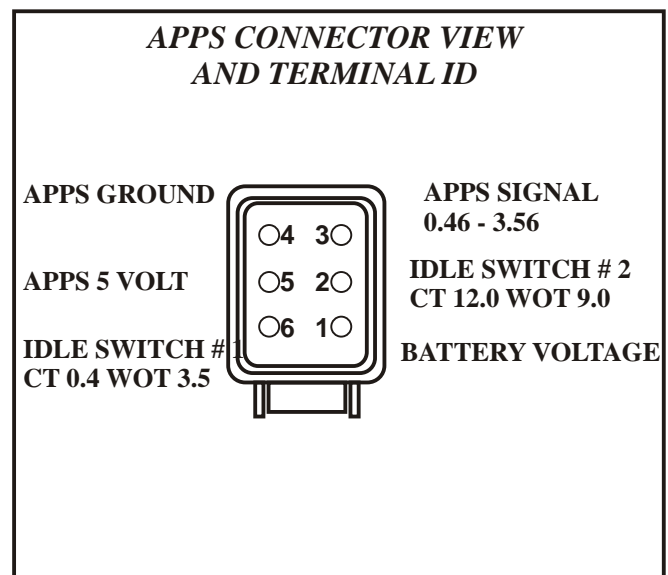
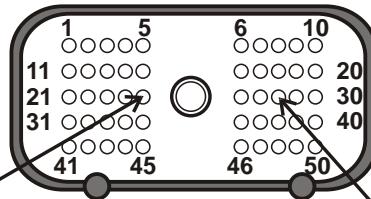
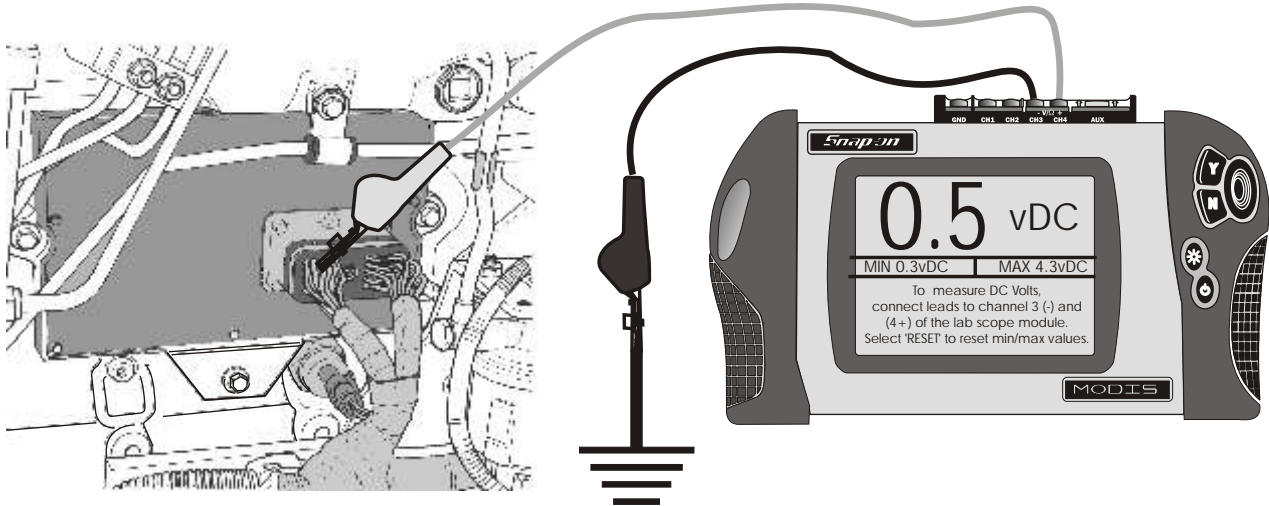


Figure 5

TORQUE CONVERTER CLUTCH CYCLES IN AND OUT

**THE ECM IS LOCATED NEAR THE CENTER
OF THE ENGINE UNDER THE FUEL/FILTER HOUSING**



**APPS TERMINAL # 3 THROTTLE OPENING
SIGNAL VOLTAGE TO TERMINAL # 25 IN THE ECM**

**TERMINAL # 28 IN THE ECM
SENDS A THROTTLE POSITION
VOLTAGE SIGNAL TO TERMINAL
23 IN THE PCM BLACK
CI CONNECTOR**

Figure 6

TORQUE CONVERTER CLUTCH CYCLES IN AND OUT

**THE PCM IS LOCATED ON THE PASSENGER SIDE FIREWALL
OR ABOVE THE PASSENGER SIDE WHEEL WELL
COVER IN THE ENGINE COMPARTMENT.**

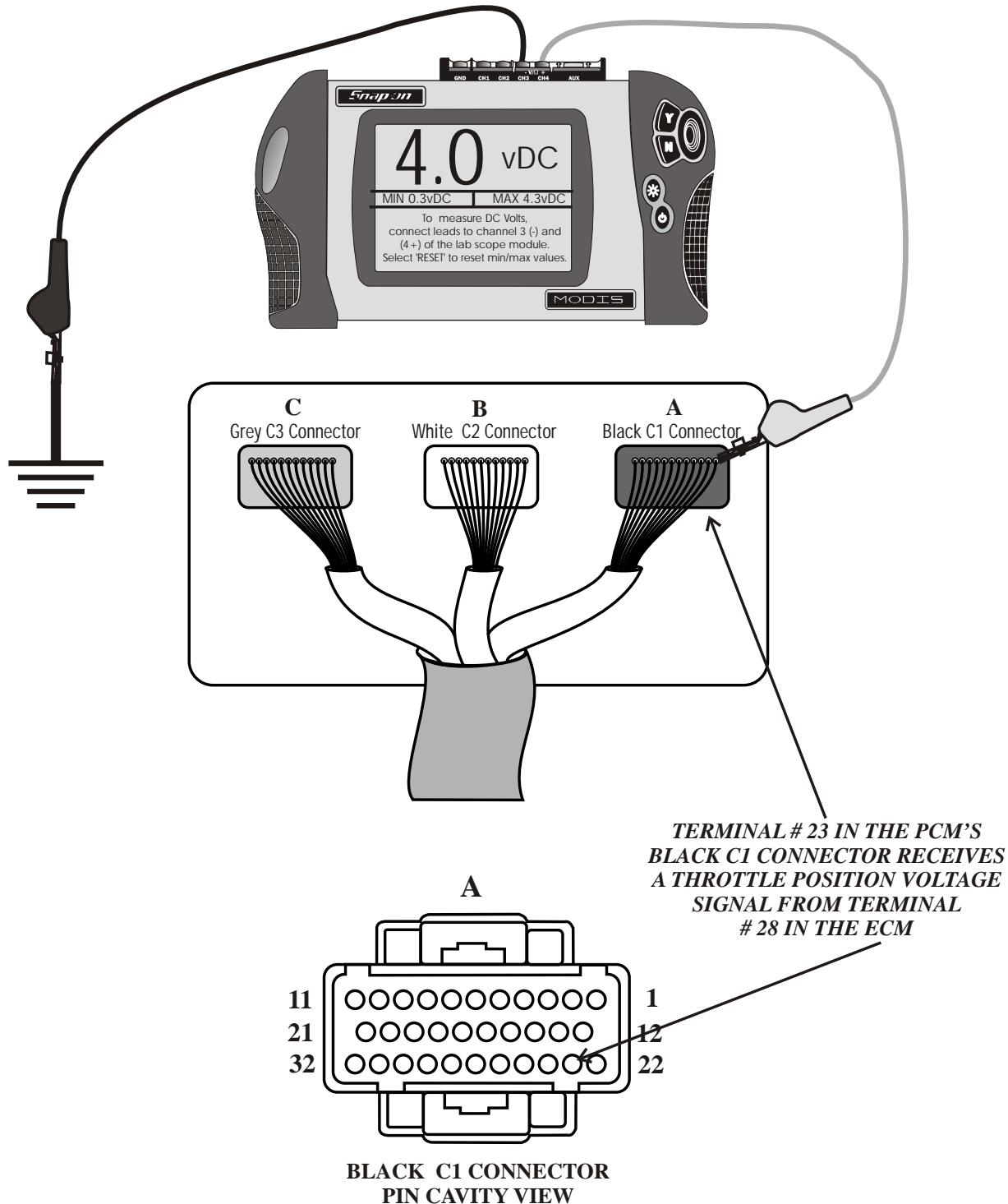


Figure 7

Torrington

CHRYSLER RWD TRANSMISSIONS

QUICK DISCONNECT 1/2" COOLING LINES

COMPLAINT: Chrysler rear wheel drive transmissions with quick disconnect 1/2" cooling lines may experience repeated front line clip melt down failures.

CAUSE: RWD transmissions behind diesel engines are the most common to experience this complaint after heavy trailer towing or reverse to drive rocking situations. This causes the front cooling line (which is the line out to the cooler) to be the recipient of the high fluid temperatures produced by the converter. The front quick disconnect clip assembly suffers greatly under these conditions.

CORRECTION: Replace the transmission quick disconnect fittings with threaded fittings that will not melt. This will require 2 cooling lines with the appropriate attaching fittings, 2 case fittings to accommodate the case threads and line fittings plus, approximately 2 feet of flexible hydraulic lines to attach the new lines to the existing lines.

SERVICE INFORMATION:

Fittings:

(2 Case Fittings).....52028764AA

Cooling Lines:

(1 Front Line*).....5011244AA

(1 Rear Line).....52028673

* This front cooling line part number includes the one/way check valve and temperature sensor port.

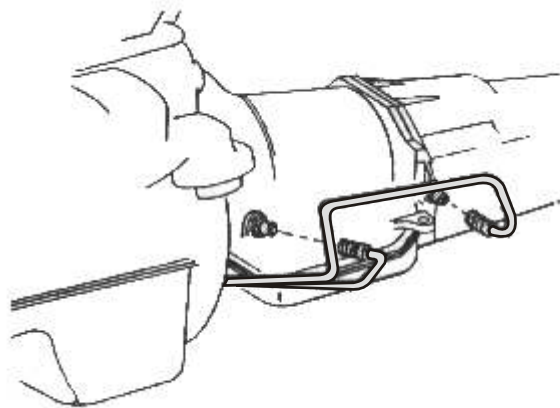


Figure 1



1991-99 JEEP WITH GAS ENGINES

DOUBLE BUMP SHIFT

COMPLAINT: The vehicle exhibits what feels like a "double bump" when the transmission upshifts accompanied by an engine miss. There are NO engine or transmission codes stored. In many instances the transmission is overhauled, only to have the same complaint.

CAUSE: The cause is a faulty Camshaft Position (CMP) Sensor which is not bad enough to store a code, but produces the "double bump" shift feel and the engine miss. The CMP Sensor is a Hall Effect Sensor that is located inside the distributor as illustrated in figure 1.

CORRECTION: First connect a voltmeter to Terminal 2 of the distributor connector (Refer to Figure 2) and to a **GOOD KNOWN ground**, it should have .3 volts or less. This is the CMP Sensor ground.

Next, connect the voltmeter to terminal 3 and 2 of the distributor connector as shown in figure 2, it should have 8 volts up to the 1995 model year or 5 volts for 1996 and later models. This is the supply voltage for the CMP Sensor.

Finally, connect a scope or waveform viewer to distributor connector terminals 1 and 2, this will be the CMP Sensor signal which can be compared to the waveform patterns in figures 3 and 4.

The sensor creates a 0 to 5 volt toggled signal. Being a Hall Effect type sensor it also requires a voltage supply and ground and the signal format is a digital square wave type.

The CMP Sensor operation is unique because it produces a **LOW** toggle signal during one revolution of the crankshaft, (See Figure 3), and a **HIGH** toggle signal for the next complete revolution of the crankshaft (See Figure 4).

The illustration of the distributor in figure 5 shows that the CMP Sensor exciter ring only goes half way around the distributor base, which creates the high toggle signal per 360° of crankshaft rotation, and a low toggle signal for the next 360° of crankshaft rotation as illustrated in the oscilloscope waveform patterns in figures 3 and 4.

1991-99 JEEP WITH GAS ENGINES DOUBLE BUMP SHIFT

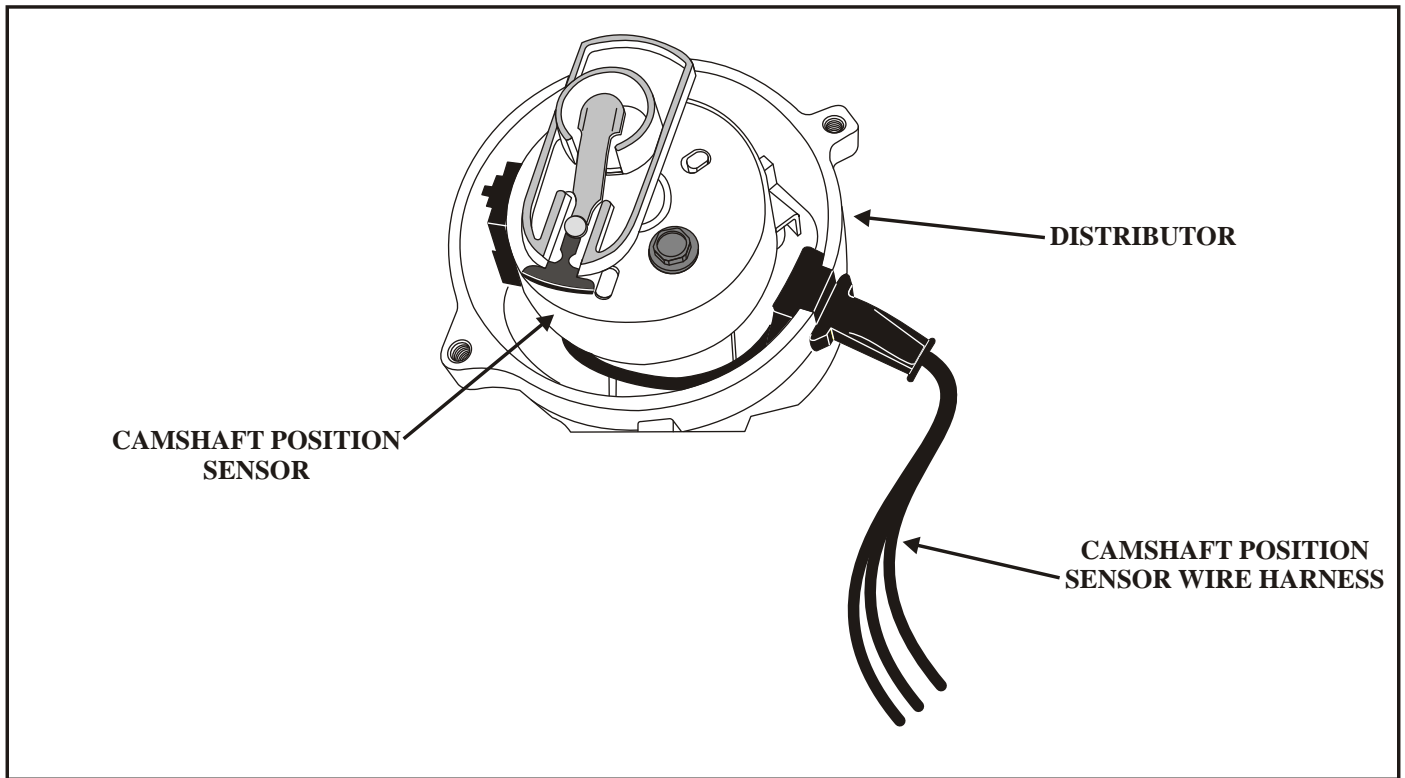


Figure 1

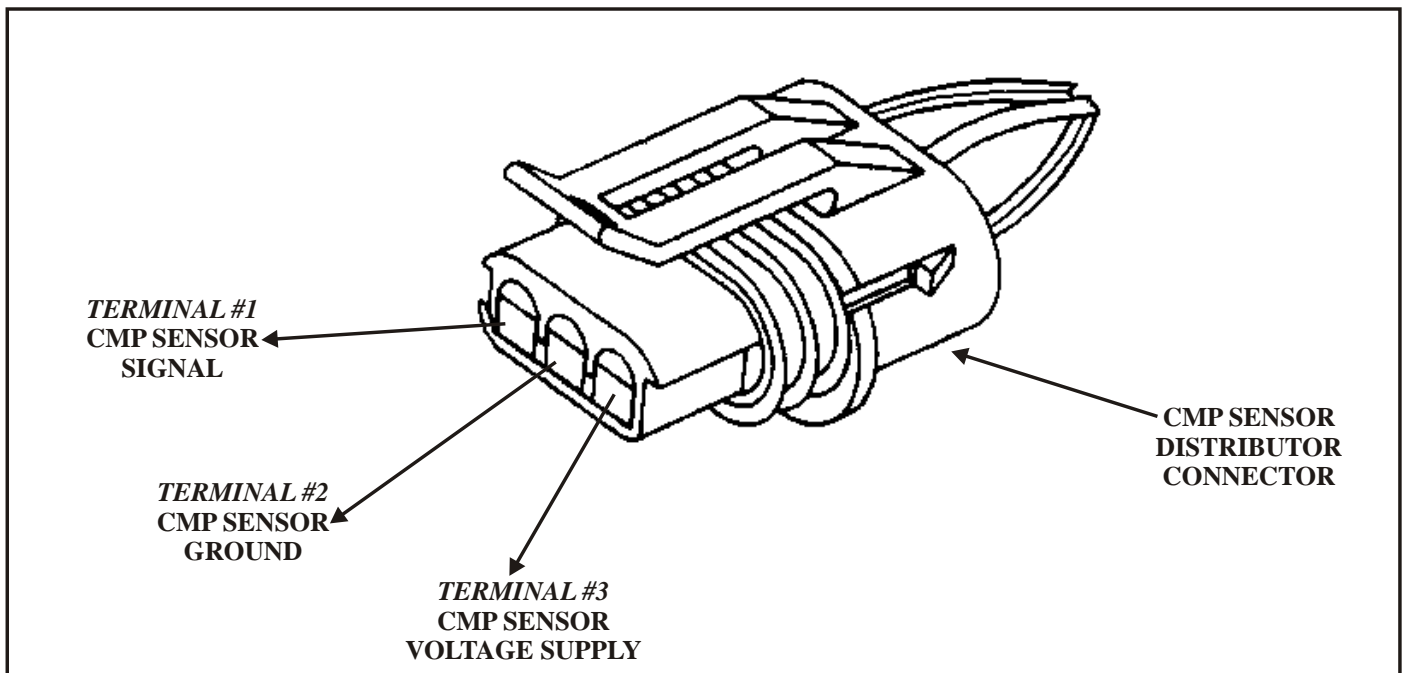


Figure 2

1991-99 JEEP WITH GAS ENGINES

DOUBLE BUMP SHIFT

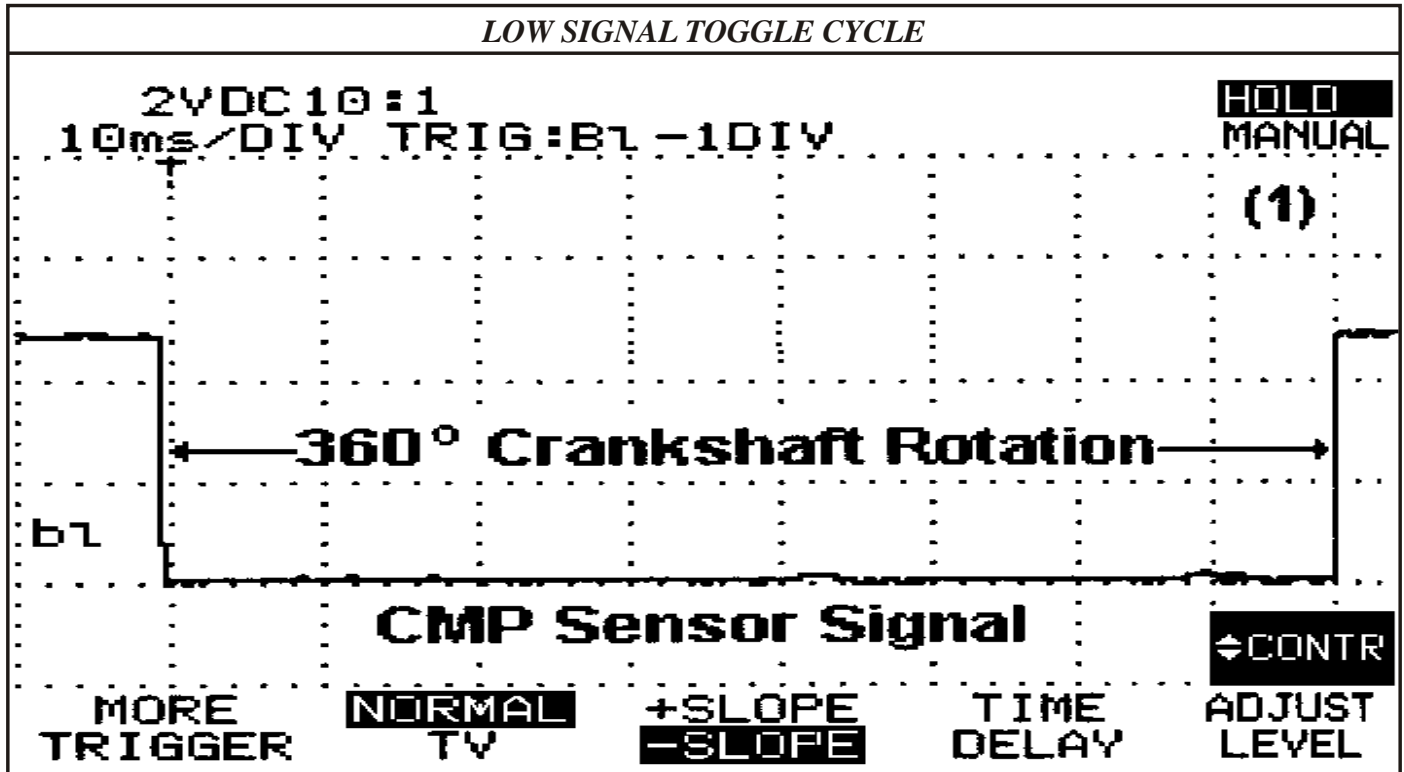


Figure 3

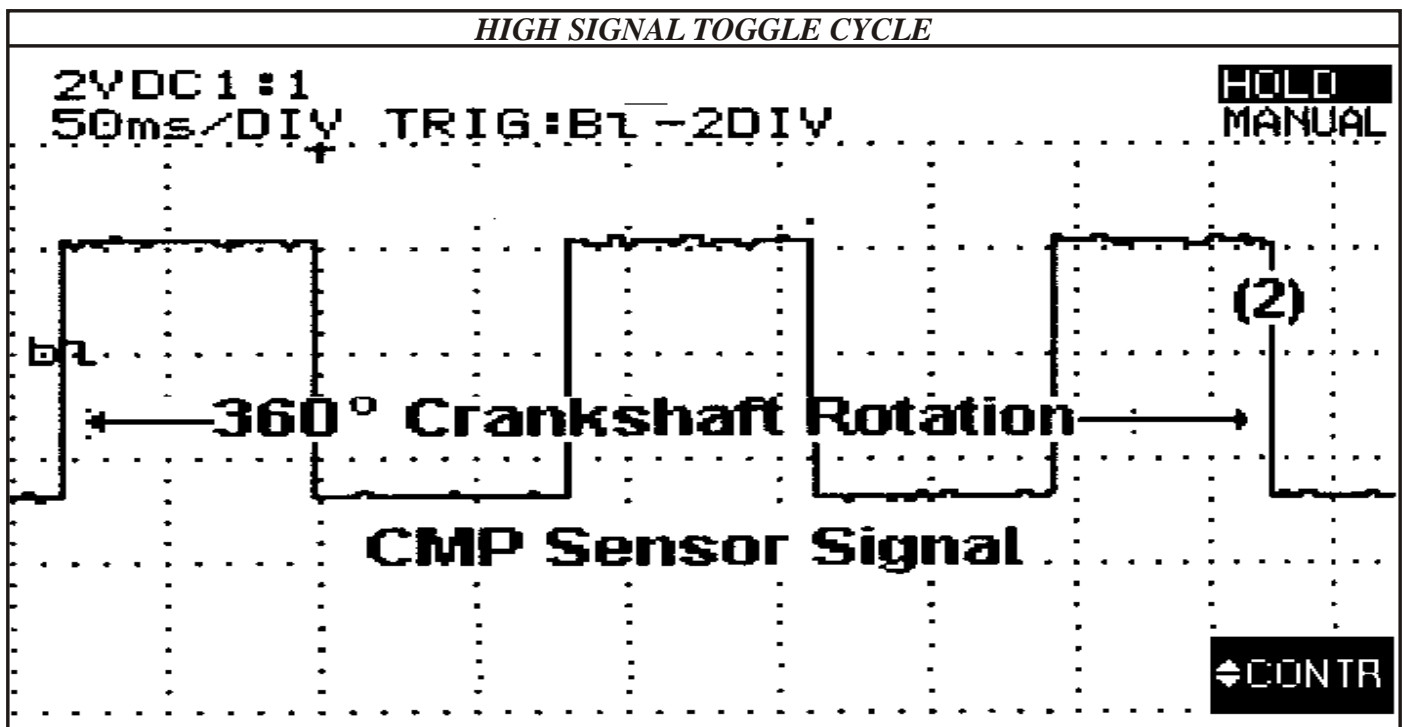


Figure 4

1991-99 JEEP WITH GAS ENGINES
DOUBLE BUMP SHIFT

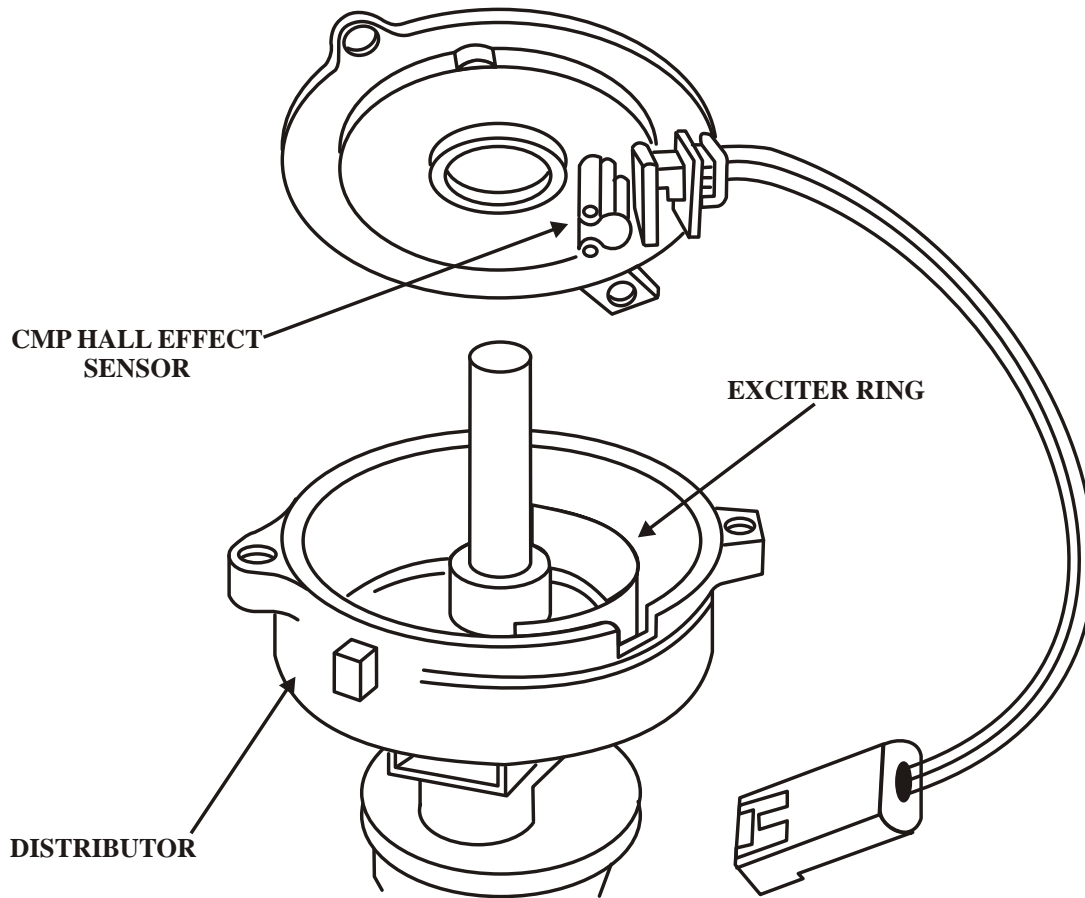


Figure 5



41TE and 42LE DELAYED ENGAGEMENTS

COMPLAINT: The transaxle experiences delayed engagements for lengths of time greater than three seconds under different temperature conditions. This excludes any delayed engagement complaints on start up after the vehicle has been parked for several days as this is to be considered normal. The fluid may also appear foamy or contain air bubbles indicating cavitation.

CAUSE: The variety of possibilities are as follows:

1. Low fluid level
2. Restricted filter or malfunctioning filter and/or filter O'ring
3. Pressure regulator valve stuck or sticking
4. Malfunctioning pump
5. Low/Reverse Clutch circuit leaks
6. Operational problems with the Low/Reverse #1 check ball in the valve body
7. Underdrive Clutch circuit leaks
8. PRNDL Switch or switch circuit malfunction
9. Electrical noise in the OSS circuit

CORRECTION: Low fluid level, filter concerns, pressure regulator or pump problems may be accompanied with pressure switch codes and/or code 35 "Loss of Pump Prime." The first step would be to observe the fluid level on the stick before starting the vehicle and then observe the level with the vehicle running. The fluid level before starting the vehicle should be above the full mark. Once the vehicle has been started, the level should drop to the full mark.

If the fluid is low it will need to be filled to the full mark and checked to see if this resolved the complaint. If it had, the leak causing the low fluid level will need to be identified and repaired.

However, if the level didn't drop quickly or drop at all to the full mark, the filter may be restricted and will need to be investigated. If the filter is restricted, the material restricting the filter would determine the next logical repair procedure.

If the fluid level seemed to have risen, the pump may be drawing air as a result of an incorrectly installed filter or the O'ring is not sealing and will need to be investigated and repaired.

It is possible that the pump is the problem as well. Foaming of the fluid can usually be detected the moment the dip stick is removed confirming a cavitation concern. A Cooler By-pass valve stuck in the open position will also produce high foamy fluid levels. The location of the By-Pass Valve is in a case passage underneath the pump as shown in figure 1. Figures 2 and 3 show an exploded view of the By-Pass Valve in the stuck open and closed positions.

If the fluid level is correct and delayed engagements persist, the pressure regulator could be stuck or sticking. This can be verified by either checking it physically or with a pressure gauge. A physical check would be to pull the valve body down and remove and clean the pressure regulator valve to ensure its proper operation.



41TE and 42LE DELAYED ENGAGEMENTS

CORRECTION

Continued:

To check it with a pressure gauge, attach the gauge to both the Low/Reverse Pressure tap and Underdrive tap (See Figure 4). In drive with the brake applied and engine rpm brought up to 1,000 rpms, both circuits should be approximately 120 psi. If both are the same but significantly low, the pressure regulator valve and/or pump needs to be repaired or replaced.

If just the low/reverse pressure is down, the low/reverse clutch circuit has a leak and will need to be repaired. This could mean a problem with the accumulator piston seals, the L/R piston seals or dog dish and gasket. It is possible that this type of failure may be accompanied with codes 36, 50 and/or 51 and produce a bump, while slowing down, complaint.

One other possibility regarding the L/R clutch circuit is the # 1 shuttle ball in the valve body (See Figure 5). If there is insufficient clearance for the ball to roll when the unit gets hot, the ball can stick or drag against the spacer plate and cause a delayed low/reverse clutch apply. The minimum acceptable clearance from the top of the ball to the surface of the valve body given by the manufacturer is 0.007". Typically approximately 0.040" is seen but some valve body casting have been known to have a shallow of a bathtub pocket pinching the ball against the plate when hot. This ball has since been eliminated and replaced with a Low/Reverse Switch Valve (See Figure 6). This newer style valve body is available for non Transmission Range Switch style valve bodies and TRS style valve bodies.

If just the Underdrive pressure is down, the Underdrive clutch circuit has a leak and will need to be repaired. This could mean a problem with the accumulator piston seals and/or the Underdrive piston seals and O'rings. It is possible that this type of failure may be accompanied with codes 36 and 51 and produce a delay from neutral to OD when cold.

When the PRNODL switch causes delays in Drive and Reverse, many times it is intermittent and produces a **FALSE** code 24 for a Low/Reverse Pressure Switch malfunction. The switch can stick or freeze sending erroneous erratic signals to the TCM which makes it difficult to spot on the scanner unless it is so bad that the problem is consistent enough to catch it on data stream. If the PRNODL switch is questionable, change the switch.

Enough electrical noise in the Output Shaft Speed (OSS) sensor could initiate the reverse block out feature in the TCM. 1996 and later TRS style units have incorporated into the switch a temperature sensor. This sensor shares the same ground at the TCM that both the TSS and OSS share and that is terminal 13 (*The OSS uses terminals 13 and 14 and the TSS uses 13 and 52 at the TCM*). While idling in Park, the OSS should read 0 rpms. If output rpm should exceed 400 rpms, the reverse block out feature will be initiated. If noise is present, each wire will need to be investigated to determine the source of the noise to be eliminated. **Tip...**could be an ignition wire running close to the RPM sensor wires.

SERVICE INFORMATION:

41TE and 42LE DELAYED ENGAGEMENTS

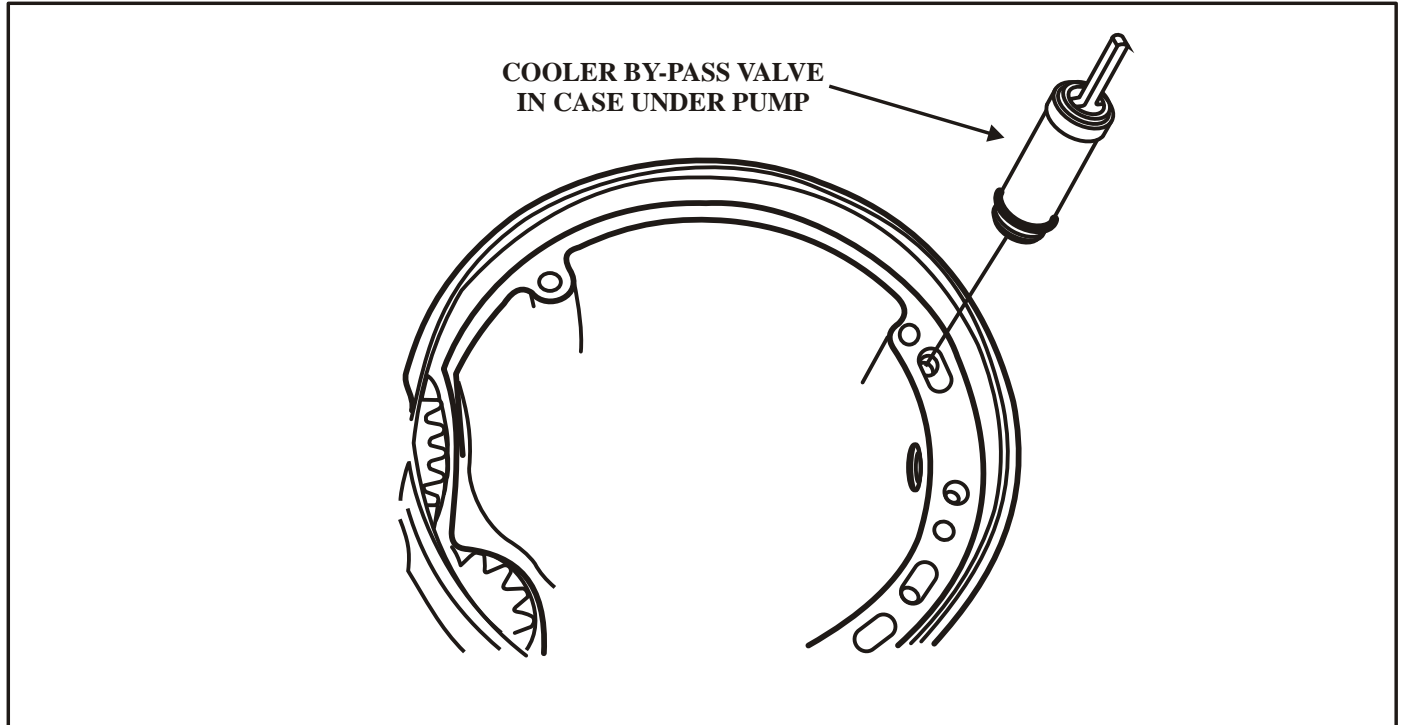


Figure 1

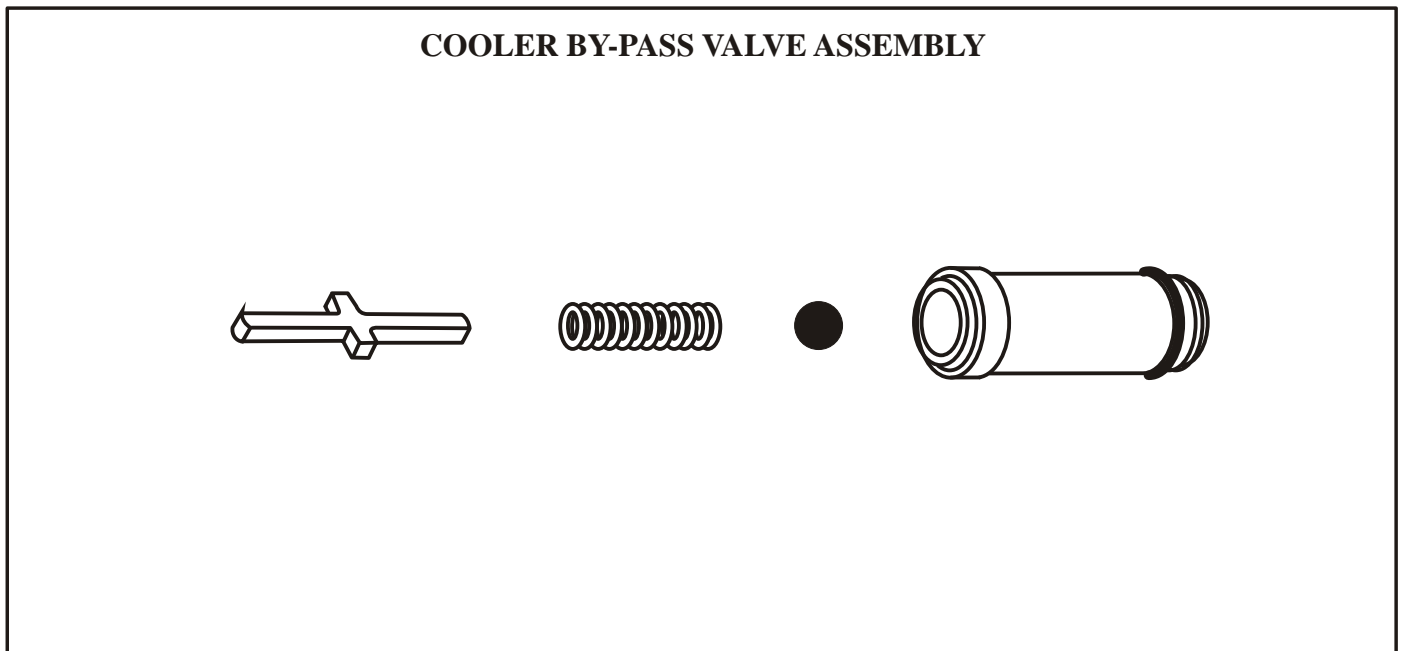
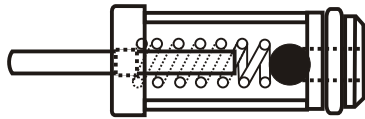


Figure 2

41TE and 42LE DELAYED ENGAGEMENTS



Cooler By-Pass Valve with ball on its seat

Cooler By-Pass Valve with ball stuck off of its seat

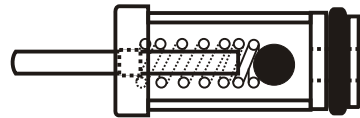


Figure 3

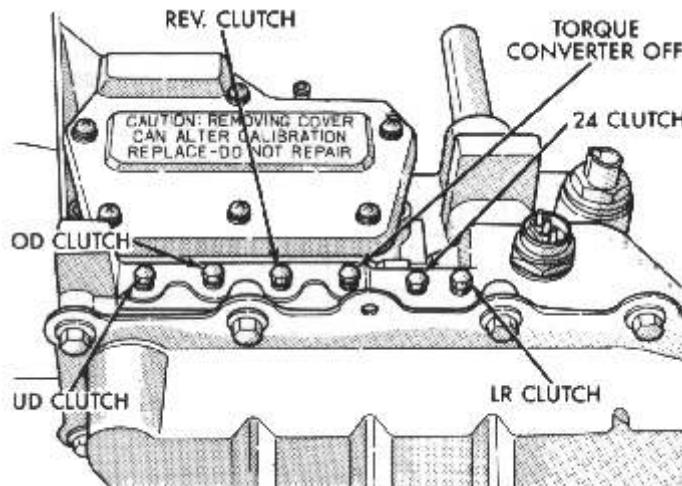


Figure 4

41TE and 42LE DELAYED ENGAGEMENTS

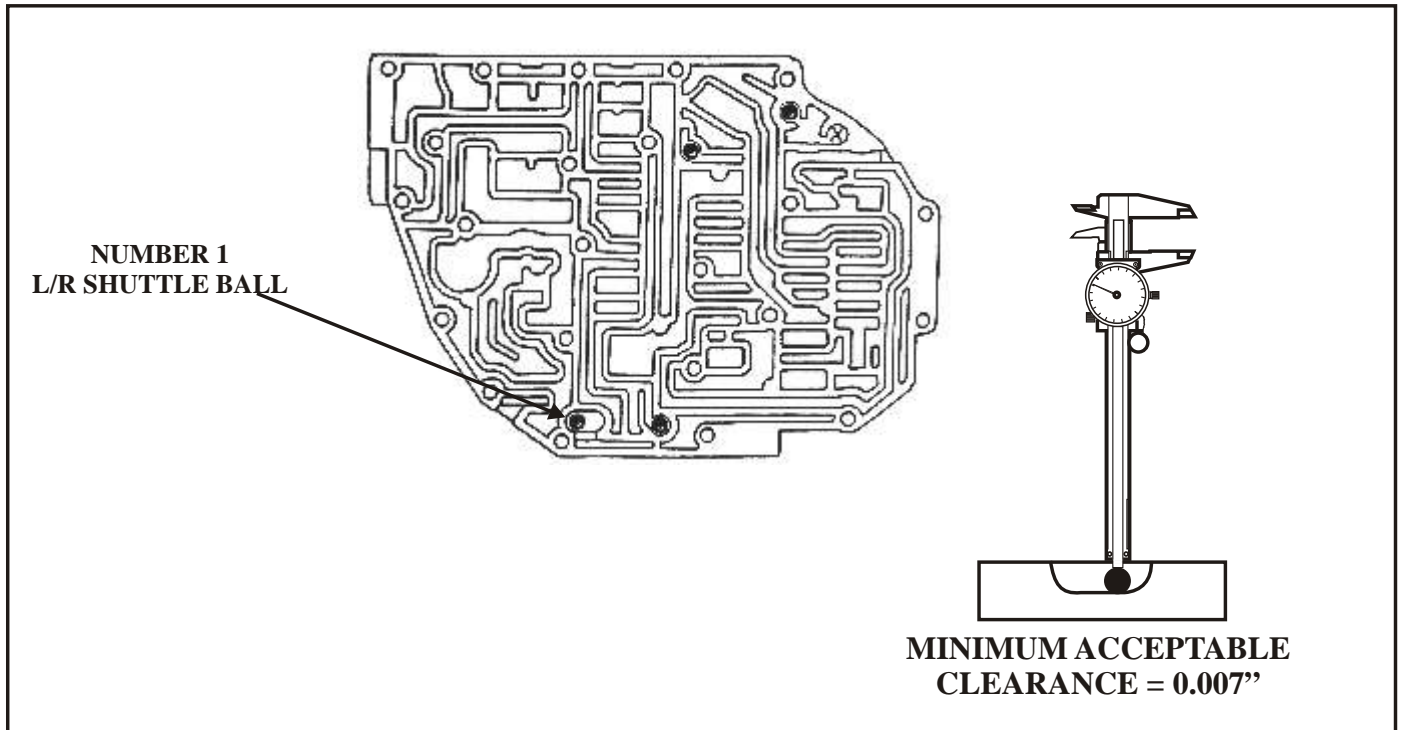


Figure 5

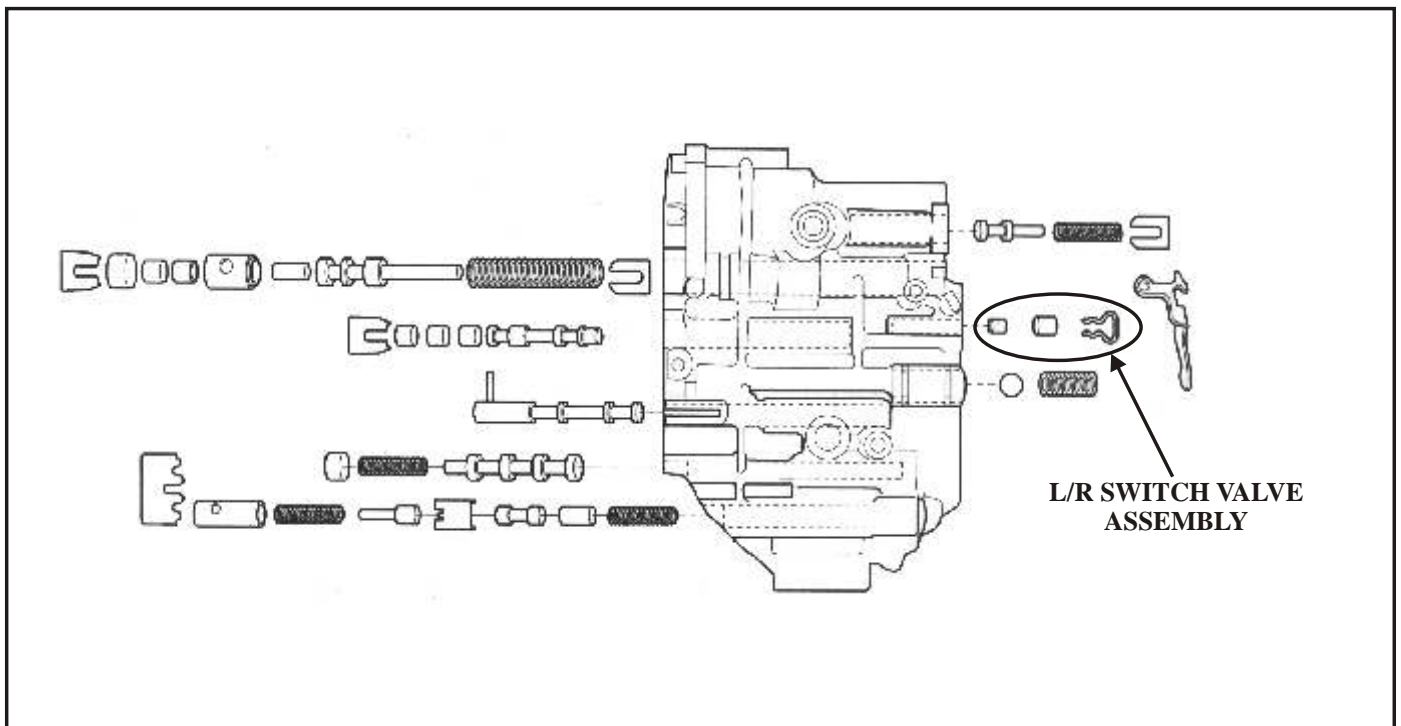


Figure 6



CHRYSLER A604 GEAR RATIO IDENTIFICATION FOR MODEL YEARS 1989 THRU 2002

Proper identification of the transaxle gear ratio is mandatory on the 41TE (A604), as gear ratios are different from model to model and will not interchange. The transaxle is identified by the "Last 3 Digits" of the OEM part number and there are currently four different procedures that may be used to accomplish this.

Procedure No. One:

There is a bar code label located externally on the case directly above the PRNODL and neutral safety switches, as shown in Figure 1. The first three numbers on the bar code label are the last three numbers of the OEM part number, as shown in Figure 1. After you have these numbers, refer to Figures 2 through 10 for the identification of the unit that you have. Refer to Figures 11 through 15 for quick reference.

Procedure No. Two:

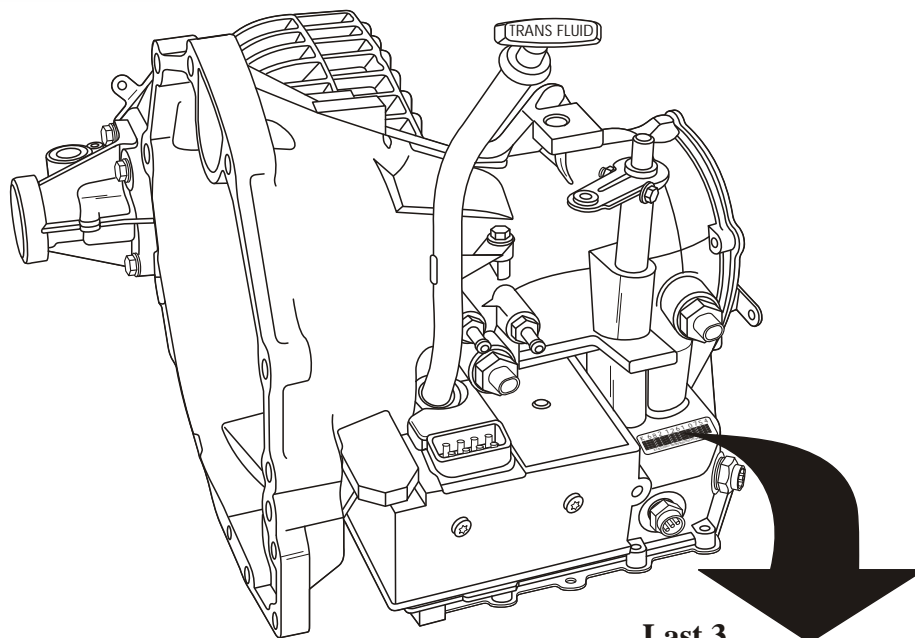
There is also a white label attached to the transfer gear cover, as shown in Figure 1. The three numbers on this label are also the last three numbers of the OEM part number, as shown in Figure 1. After you have these numbers, refer to Figures 2 through 10 for the identification of the unit that you have.

Procedure No. Three:

The most permanent form of external identification is an etching in the case, located near the transfer gear cover, as shown in Figure 1. This etching in the case will include the complete OEM part number, as shown in Figure 1. After you have the complete part number, refer to Figures 2 through 10 for the identification of the unit that you have. Refer to Figures 11 through 15 for quick reference.

Procedure No. Four:

Disassemble the unit and start counting the teeth for identification.

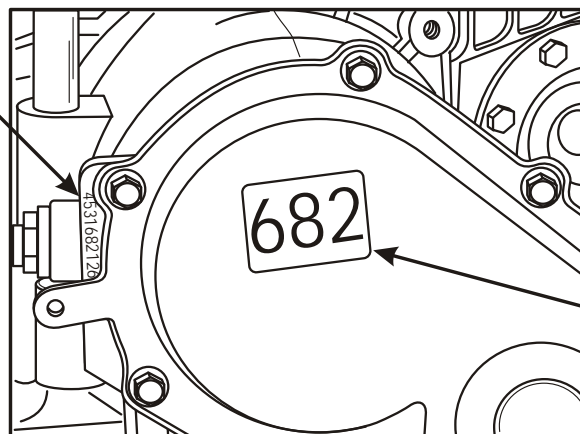


Last 3 Of Part No.	Julian Date	Sequence Number
--------------------------	----------------	--------------------



PART NUMBER	JULIAN DATE	SEQ. NO.
PK# 4531682	1261	0754

(ETCHED ON CASE)



NUMBER ON TAG ON
GEAR COVER IS LAST 3
OF PART NUMBER)

*Example given reveals a 1990 3.3L transaxle
with a 2.36 overall ratio that has 27.5 degree
transfer and output gears (54T/59T) and a
16T/60T ring and pinion gear set.
(Refer to Figures 2 through 10)*

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Figure 1

"1989" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4446659	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4471895	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4530030	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531632	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531664	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531687	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4713052	1989	3.0L	2.38	46T/50T (32°)	16T/60T			
4728182	1989	3.0L	2.38	46T/50T (32°)	16T/60T			
4761821	1989	3.0L	2.38	46T/50T (32°)	16T/60T			

"1990" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4446530	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4531551	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531552	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4531630	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4531681	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531682	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4531495	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531496	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4531671	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T			
4531672	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T			
4713053	1990	3.0L	2.38	46T/50T (32°)	16T/60T			
4713054	1990	3.3L	2.38	46T/50T (32°)	16T/60T			
4728180	1990	3.0L	2.38	46T/50T (32°)	16T/60T			
4728181	1990	3.3L	2.38	46T/50T (32°)	16T/60T			
4728181	1990	3.3L	2.49	49T/47T (32°)	17T/59T			
4741743	1990	3.0L	2.38	46T/50T (32°)	16T/60T			
4741744	1990	3.3L	2.38	46T/50T (32°)	16T/60T			

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Figure 2

"1991" 41TE (A604) PRODUCTION PART NUMBERS

[illegible]

Figure 3

"1992" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4659076	91-94	3.3L 4X4	2.38	46T/50T (32°)	16T/60T			
4659359	1992	3.8L	2.19	54T/59T (27.5°)	17T/59T			
4659360	1992	3.0L	2.52	58T/55T (27.5°)	17T/59T			
4659361	1992	3.3L	2.52	58T/55T (27.5°)	17T/59T			
4659362	92-93	3.3L 4X4	2.38	46T/50T (32°)	16T/60T			
4723555	1992	3.3L	2.49	49T/47T (32°)	17T/59T			
4741746	91-92	3.8L	2.20	46T/50T (32°)	17T/59T			
4741747	91-92	3.0L	2.49	49T/47T (32°)	17T/59T			
4741748	1992	3.3L	2.49	49T/47T (32°)	17T/59T			
4741749	1992	3.3L 4X4	2.38	46T/50T (32°)	16T/60T			

"1993" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4567645	1993	3.8L	2.20	46T/50T (32°)	17T/59T			
4567646	1993	3.0L	2.49	49T/47T (32°)	17T/59T			
4567647	1993	3.3L	2.49	49T/47T (32°)	17T/59T			
4567989	1993	3.3L 4X4	2.49	49T/47T (32°)	17T/59T			
4659076	91-94	3.3L 4X4	2.38	46T/50T (32°)	16T/60T			
4659362	92-93	3.3L 4X4	2.38	46T/50T (32°)	16T/60T			
4659764	93-95	3.8L	2.38	46T/50T (32°)	16T/60T			
4713486	1993	3.8L	2.20	46T/50T (32°)	17T/59T			
4713487	1993	3.0L	2.49	49T/47T (32°)	17T/59T			
4713488	1993	3.3L	2.49	49T/47T (32°)	17T/59T			

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Figure 4

"1994" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4567500	1994	2.0L	2.69	49T/47T (32°)	16T/60T			
4567692	1994	2.5L	2.69	49T/47T (32°)	16T/60T			
4567981	1994	2.0L	2.81	50T/46T (32°)	16T/60T			
4659071	1994	3.8L	2.20	46T/50T (32°)	17T/59T			
4659072	1994	3.0L	2.49	49T/47T (32°)	17T/59T			
4659073	1994	3.3L	2.49	49T/47T (32°)	17T/59T			
4659074	1994	3.3L 4X4	2.49	49T/47T (32°)	17T/59T			
4659075	1994	3.8L	2.38	46T/50T (32°)	16T/60T			
4659076	91-94	3.8L 4X4	2.38	46T/50T (32°)	16T/60T			
4659764	93-95	3.8L	2.38	46T/50T (32°)	16T/60T			
4740826	1994	3.8L	2.20	46T/50T (32°)	17T/59T			
4740827	1994	3.0L	2.49	49T/47T (32°)	17T/59T			
4740828	1994	3.3L	2.49	49T/47T (32°)	17T/59T			

"1995" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4659764	93-95	3.8L	2.38	46T/50T (32°)	16T/60T			
4659777	1995	3.3L 4X4	2.49	49T/47T (32°)	17T/59T			
4659902	1995	2.0L	2.81	50T/46T (32°)	16T/60T			
4659903	1995	2.0L	2.69	49T/47T (32°)	16T/60T			
4659904	1995	3.0L	2.49	49T/47T (32°)	17T/59T			
4659905	1995	3.3L	2.49	49T/47T (32°)	17T/59T			
4659907	1995	3.8L 4X4	2.38	46T/50T (32°)	16T/60T			
4659908	1995	2.5L	2.69	49T/47T (32°)	16T/60T			
4659902	1995	2.0L	2.81	50T/46T (32°)	16T/60T			
4659906	1995	3.8L	2.38	46T/50T (32°)	16T/60T			
4761822	1995	2.0L	2.69	49T/47T (32°)	16T/60T			
4761823	1995	2.5L	2.69	49T/47T (32°)	16T/60T			
4761824	1995	2.0L	2.81	50T/46T (32°)	16T/60T			
4778903	1995	2.0L	2.69	49T/47T (32°)	16T/60T			
4778904	1995	3.0L	2.49	49T/47T (32°)	17T/59T			
4778908	1995	2.5L	2.69	49T/47T (32°)	16T/60T			

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Figure 5



"2003" SEMINAR INFORMATION

SLIDE

81

"1996" 41TE (A604) PRODUCTION PART NUMBERS								
PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4799712	1996	3.3L	2.49	49T/47T (32°)	17T/59T			
4799713	1996	3.8L	2.38	46T/50T (32°)	16T/60T			
4799714	1996	3.8L (4X4)	2.38	46T/50T (32°)	16T/60T			
4799715	1996	2.4L	2.69	49T/47T (32°)	16T/60T			
4799716	1996	2.0L	2.69	49T/47T (32°)	16T/60T			
4799717	1996	2.0L	2.81	50T/46T (32°)	16T/60T			
4799718	1996	2.5L	2.69	49T/47T (32°)	16T/60T			
4799719	1996	2.4L Turbo	2.49	49T/47T (32°)	17T/59T			

Figure 6

"1997" 41TE (A604) PRODUCTION PART NUMBERS

[illegible]

"1997" 41TE (A604) "SERVICE" PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4567624	1997	3.8L (4X4)	2.38	46T/50T (32°)	16T/60T			
4798923	1997	3.0L	2.49	49T/47T (32°)	17T/59T			
4798924	1997	3.3L	2.49	49T/47T (32°)	17T/59T			
4798928	1997	3.8L (4X4)	2.49	49T/47T (32°)	17T/59T			
4883553	1997	2.0L	2.69	49T/47T (32°)	16T/60T			
4883554	1997	2.5L	2.69	49T/47T (32°)	16T/60T			
4883555	1997	3.3L	2.49	49T/47T (32°)	17T/59T			
4883557	1997	3.8L	2.38	46T/50T (32°)	16T/60T			
4883558	1997	3.3L	2.49	49T/47T (32°)	17T/59T			
4883782	1997	3.0L	2.49	49T/47T (32°)	17T/59T			
4883783	1997	3.3L	2.49	49T/47T (32°)	17T/59T			
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Figure 7

"1998" 41TE (A604) PRODUCTION PART NUMBERS

[illegible]

"1998" 41TE (A604) "SERVICE" PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF			
4567624	1998	3.8L (4X4)	2.38	46T/50T (32°)	16T/60T			
4798923	1998	3.0L	2.49	49T/47T (32°)	17T/59T			
4798924	1998	3.3L	2.49	49T/47T (32°)	17T/59T			
4798928	1998	3.8L (4X4)	2.49	49T/47T (32°)	17T/59T			
4883553	1998	2.0L	2.69	49T/47T (32°)	16T/60T			
4883554	1998	2.5L	2.69	49T/47T (32°)	16T/60T			
4883555	1998	3.3L	2.49	49T/47T (32°)	17T/59T			
4883557	1998	3.8L	2.38	46T/50T (32°)	16T/60T			
4883558	1998	3.3L	2.49	49T/47T (32°)	17T/59T			
4883782	1998	3.0L	2.49	49T/47T (32°)	17T/59T			
4883783	1998	3.3L	2.49	49T/47T (32°)	17T/59T			
4883784	1998	3.8L	2.38	46T/50T (32°)	16T/60T			
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Figure 8



"2003" SEMINAR INFORMATION

SLIDE

84**"1999" 41TE (A604) PRODUCTION PART NUMBERS**

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	"SERVICE" PART NO.
4800305AA	1999	3.0L	2.49	49T/47T (32°)	17T/59T	5014305AA
4800444AA	1999	2.4L	2.69	49T/47T (32°)	16T/60T	5011444AA
4800445AA	1999	3.3L	2.49	49T/47T (32°)	17T/59T	5011445AA
4800446AA	1999	3.8L	2.37	46T/50T (32°)	15T/56T	5011446AA
4800447AA	1999	3.8L (4X4)	2.37	46T/50T (32°)	15T/56T	5011447AA
4800448AA	1999	2.0L/2.4L	2.69	49T/47T (32°)	16T/60T	5011448AA
4800449AA	1999	2.5L	2.69	49T/47T (32°)	16T/60T	5011449AA
4800450AA	1999	2.0L	2.81	50T/46T (32°)	16T/60T	5011450AA
4800451AA	1999	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	5011451AA

"2000" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	"SERVICE" PART NO.
4800305AA	2000	3.0L	2.49	49T/47T (32°)	17T/59T	5014305AA
4800444AA	2000	2.4L	2.69	49T/47T (32°)	16T/60T	5011444AA
4800445AA	2000	3.3L	2.49	49T/47T (32°)	17T/59T	5011445AA
4800446AA	2000	3.8L	2.37	46T/50T (32°)	15T/56T	5011446AA
4800447AA	2000	3.8L (4X4)	2.37	46T/50T (32°)	15T/56T	5011447AA
4800448AA	2000	2.0L/2.4L	2.69	49T/47T (32°)	16T/60T	5011448AA
4800449AA	2000	2.5L	2.69	49T/47T (32°)	16T/60T	5011449AA
4800450AA	2000	2.0L	2.81	50T/46T (32°)	16T/60T	5011450AA
4800451AA	2000	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	5011451AA

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Figure 9



"2003" SEMINAR INFORMATION

SLIDE

85**"2001" 41TE (A604) PRODUCTION PART NUMBERS**

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	"SERVICE" PART NO.
4799922AA	2001	2.7L	2.69	49T/47T (32°)	16T/60T	4886922AA
4800269AA	2001	2.4L	2.69	49T/47T (32°)	16T/60T	5067269AA
4800281AA	2001	2.0L	2.81	50T/46T (32°)	16T/60T	5067281AA
4800707AA	2001	3.3L (4X4)	2.49	49T/47T (32°)	17T/59T	5012707AA
4800918AA	2001	3.8L (4X4)	2.37	46T/50T (32°)	15T/56T	5003918AA
4800930AA	2001	2.4L	2.69	49T/47T (32°)	16T/60T	5010930AA
4800931AA	2001	3.3L	2.49	49T/47T (32°)	17T/59T	5010931AA
4800932AA	2001	3.8L	2.37	46T/50T (32°)	15T/56T	5010932AA
4800956AA	2001	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	5014956AA

"2002" 41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	"SERVICE" PART NO.
4799922AB	2002	2.7L	2.69	49T/47T (32°)	16T/60T	NOT AVAILABLE
4800269AB	2002	2.4L	2.69	49T/47T (32°)	16T/60T	NOT AVAILABLE
4800281AB	2002	2.0L	2.81	50T/46T (32°)	16T/60T	NOT AVAILABLE
4800707AB	2002	3.3L (4X4)	2.49	49T/47T (32°)	17T/59T	NOT AVAILABLE
4800918AB	2002	3.8L (4X4)	2.37	46T/50T (32°)	15T/56T	NOT AVAILABLE
4800930AB	2002	2.4L	2.69	49T/47T (32°)	16T/60T	NOT AVAILABLE
4800931AB	2002	3.3L	2.49	49T/47T (32°)	17T/59T	NOT AVAILABLE
4800932AB	2002	3.8L	2.37	46T/50T (32°)	15T/56T	NOT AVAILABLE
4800956AB	2002	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	NOT AVAILABLE

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Figure 10

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41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	
4446530	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4446659	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4471895	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4530030	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531487	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4531488	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4531495	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531496	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531551	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531552	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531630	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531664	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531671	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531672	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531681	1990	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531682	1990	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531687	1989	3.0L	2.36	54T/59T (27.5°)	16T/60T	
4531688	1991	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4531689	1991	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4531690	1991	3.3L	2.52	58T/55T (27.5°)	17T/59T	
4531691	1991	3.3L (4X4)	2.36	54T/59T (27.5°)	16T/60T	
4531969	1991	3.3L (4X4)	2.36	54T/59T (27.5°)	16T/60T	
4531972	1991	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4531973	1991	3.3L	2.36	54T/59T (27.5°)	16T/60T	
4543989	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4543990	1991	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4543992	1991	3.3L	2.52	58T/55T (27.5°)	17T/59T	
4567500	1994	2.0L	2.69	49T/47T (32°)	16T/60T	
4567624	1998	3.8L (4X4)	2.38	46T/50T (32°)	16T/60T	"SERVICE" PART NUMBER
4567624	1997	3.8L (4X4)	2.38	46T/50T (32°)	16T/60T	"SERVICE" PART NUMBER
4567645	1993	3.8L	2.20	46T/50T (32°)	17T/59T	
4567646	1993	3.0L	2.49	49T/47T (32°)	17T/59T	
4567647	1993	3.3L	2.49	49T/47T (32°)	17T/59T	
4567692	1994	2.5L	2.69	49T/47T (32°)	16T/60T	
4567847	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	Copyright © 2002 ATSG

Figure 11

41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	
4567848	1991	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4567849	1991	3.3L	2.52	58T/55T (27.5°)	17T/59T	
4567850	1991	3.3L 4X4	2.36	54T/59T (27.5°)	16T/60T	
4567857	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4567981	1994	2.0L	2.81	50T/46T (32°)	16T/60T	
4567989	1993	3.3L 4X4	2.49	49T/47T (32°)	17T/59T	
4638748	1991	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4638749	1991	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4638750	1991	3.3L	2.52	58T/55T (27.5°)	17T/59T	
4659071	1994	3.8L	2.20	46T/50T (32°)	17T/59T	
4659072	1994	3.0L	2.49	49T/47T (32°)	17T/59T	
4659073	1994	3.3L	2.49	49T/47T (32°)	17T/59T	
4659074	1994	3.3L 4X4	2.49	49T/47T (32°)	17T/59T	
4659075	1994	3.8L	2.38	46T/50T (32°)	16T/60T	
4659076	91-94	3.8L 4X4	2.38	46T/50T (32°)	16T/60T	
4659359	1992	3.8L	2.19	54T/59T (27.5°)	17T/59T	
4659360	1992	3.0L	2.52	58T/55T (27.5°)	17T/59T	
4659361	1992	3.3L	2.52	58T/55T (27.5°)	17T/59T	
4659362	92-93	3.3L 4X4	2.38	46T/50T (32°)	16T/60T	
4659764	93-95	3.8L	2.38	46T/50T (32°)	16T/60T	
4659777	1995	3.3L 4X4	2.49	49T/47T (32°)	17T/59T	
4659902	1995	2.0L	2.81	50T/46T (32°)	16T/60T	
4659903	1995	2.0L	2.69	49T/47T (32°)	16T/60T	
4659904	1995	3.0L	2.49	49T/47T (32°)	17T/59T	
4659905	1995	3.3L	2.49	49T/47T (32°)	17T/59T	
4659907	1995	3.8L 4X4	2.38	46T/50T (32°)	16T/60T	
4659908	1995	2.5L	2.69	49T/47T (32°)	16T/60T	
4713052	1989	3.0L	2.38	46T/50T (32°)	16T/60T	
4713053	1990	3.0L	2.38	46T/50T (32°)	16T/60T	
4713054	1990	3.3L	2.38	46T/50T (32°)	16T/60T	
4713486	1993	3.8L	2.20	46T/50T (32°)	17T/59T	
4713487	1993	3.0L	2.49	49T/47T (32°)	17T/59T	
4713488	1993	3.3L	2.49	49T/47T (32°)	17T/59T	
4723553	1991	3.8L	2.20	46T/50T (32°)	17T/59T	
4723554	1991	3.0L	2.49	49T/47T (32°)	17T/59T	Copyright © 2002 ATSG

Figure 12

41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	
4723555	1992	3.3L	2.49	49T/47T (32°)	17T/59T	
4728180	1990	3.0L	2.38	46T/50T (32°)	16T/60T	
4728181	1990	3.3L	2.38	46T/50T (32°)	16T/60T	
4728182	1989	3.0L	2.38	46T/50T (32°)	16T/60T	
4728923	1991	3.3L 4X4	2.38	46T/50T (32°)	16T/60T	
4740826	1994	3.8L	2.20	46T/50T (32°)	17T/59T	
4740827	1994	3.0L	2.49	49T/47T (32°)	17T/59T	
4740828	1994	3.3L	2.49	49T/47T (32°)	17T/59T	
4741743	1990	3.0L	2.38	46T/50T (32°)	16T/60T	
4741744	1990	3.3L	2.38	46T/50T (32°)	16T/60T	
4741746	91-92	3.8L	2.20	46T/50T (32°)	17T/59T	
4741747	91-92	3.0L	2.49	49T/47T (32°)	17T/59T	
4741748	1992	3.3L	2.49	49T/47T (32°)	17T/59T	
4741749	1992	3.3L 4X4	2.38	46T/50T (32°)	16T/60T	
4761821	1989	3.0L	2.38	46T/50T (32°)	16T/60T	
4761822	1995	2.0L	2.69	49T/47T (32°)	16T/60T	
4761823	1995	2.5L	2.69	49T/47T (32°)	16T/60T	
4761824	1995	2.0L	2.81	50T/46T (32°)	16T/60T	
4778903	1995	2.0L	2.69	49T/47T (32°)	16T/60T	
4778904	1995	3.0L	2.49	49T/47T (32°)	17T/59T	
4778908	1995	2.5L	2.69	49T/47T (32°)	16T/60T	
4798923	97-98	3.0L	2.49	49T/47T (32°)	17T/59T	"SERVICE" PART NUMBER
4798924	97-98	3.3L	2.49	49T/47T (32°)	17T/59T	"SERVICE" PART NUMBER
4798928	97-98	3.8L 4X4	2.49	49T/47T (32°)	17T/59T	"SERVICE" PART NUMBER
4799712	1996	3.3L	2.49	49T/47T (32°)	17T/59T	
4799713	1996	3.8L	2.38	46T/50T (32°)	16T/60T	
4799714	1996	3.8L 4X4	2.38	46T/50T (32°)	16T/60T	
4799715	1996	2.4L	2.69	49T/47T (32°)	16T/60T	
4799716	1996	2.0L	2.69	49T/47T (32°)	16T/60T	
4799717	1996	2.0L	2.81	50T/46T (32°)	16T/60T	
4799718	1996	2.5L	2.69	49T/47T (32°)	16T/60T	
4799719	1996	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	
4799922AA	2001	2.7L	2.69	49T/47T (32°)	16T/60T	"SERVICE" = 4886269AA
4799922AB	2002	2.7L	2.69	49T/47T (32°)	16T/60T	"SERVICE" = Not Available
4800269AA	2001	2.4L	2.69	49T/47T (32°)	16T/60T	"SERVICE" = 5067269AA

Figure 13



"2003" SEMINAR INFORMATION

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41TE (A604) PRODUCTION PART NUMBERS

PART NO.	YEAR	ENGINE	RATIO	GEARS TR/OP	DIFF	
4800269AB	2002	2.4L	2.69	49T/47T (32°)	16T/60T	Service No. Not Available
4800281AA	2001	2.0L	2.81	50T/46T (32°)	16T/60T	Service = 5067281AA
4800281AB	2002	2.0L	2.81	50T/46T (32°)	16T/60T	Service No. Not Available
4800305AA	99-00	3.0L	2.49	49T/47T (32°)	17T/59T	Service = 5014305AA
4800444AA	99-00	2.4L	2.69	49T/47T (32°)	16T/60T	Service = 5011444AA
4800445AA	99-00	3.3L	2.49	49T/47T (32°)	17T/59T	Service = 5011445AA
4800446AA	99-00	3.8L				Service = 5011446AA
4800447AA	99-00	3.8L 4X4	2.37	46T/50T (32°)	15T/56T	Service = 5011447AA
4800448AA	99-00	2.0L/2.4L	2.69	49T/47T (32°)	16T/60T	Service = 5011448AA
4800449AA	99-00	2.5L	2.69	49T/47T (32°)	16T/60T	Service = 5011449AA
4800450AA	99-00	2.0L	2.81	50T/46T (32°)	16T/60T	Service = 5011450AA
4800451AA	99-00	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	Service = 5011451AA
4800630	1997	2.4L	2.69	49T/47T (32°)	16T/60T	
4800631	1997	3.3L	2.49	49T/47T (32°)	17T/59T	
4800632	1997	3.8L	2.38	46T/50T (32°)	16T/60T	
4800633	1997	3.8L 4X4	2.38	46T/50T (32°)	16T/60T	
4800634	1997	2.0L/2.4L	2.69	49T/47T (32°)	16T/60T	
4800635	1997	2.5L	2.69	49T/47T (32°)	16T/60T	
4800636	1997	2.0L	2.81	50T/46T (32°)	16T/60T	
4800638	1997	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	
4800707AA	2001	3.3L 4X4	2.49	49T/47T (32°)	17T/59T	Service = 5012707AA
4800707AB	2002	3.3L 4X4	2.49	49T/47T (32°)	17T/59T	Service No. Not Available
4800850	1998	2.4L	2.69	49T/47T (32°)	16T/60T	
4800851	1998	3.3L	2.49	49T/47T (32°)	17T/59T	
4800852	1998	3.8L	2.38	46T/50T (32°)	16T/60T	
4800853	1998	3.8L 4X4	2.38	46T/50T (32°)	16T/60T	
4800854	1998	2.0L/2.4L	2.69	49T/47T (32°)	16T/60T	
4800855	1998	2.5L	2.69	49T/47T (32°)	16T/60T	
4800856	1998	2.0L	2.81	50T/46T (32°)	16T/60T	
4800858	1998	2.4L Turbo	2.49	49T/47T (32°)	17T/59T	
4800859	1998	3.0L	2.49	49T/47T (32°)	17T/59T	
4800918AA	2001	3.8L 4X4	2.37	46T/50T (32°)	15T/56T	Service = 5003918AA
4800918AB	2002	3.8L 4X4	2.37	46T/50T (32°)	15T/56T	Service No. Not Available
4800930AA	2001	2.4L	2.69	49T/47T (32°)	16T/60T	Service = 5010930AA
4800930AB	2002	2.4L	2.69	49T/47T (32°)	16T/60T	Service No. Not Available

Figure 14



**CHRYSLER A670 (31TH)
NEW DESIGN "DUAL CYCLOIDAL"
OIL PUMP ASSEMBLY FOR 2000 MODEL YEAR**

CHANGE: The Chrysler A670 (31TH) transaxle has recieved a new design oil pump assembly as a running 1999 model year change. The new oil pump design is called a "Dual Cycloidal" pump and replaces the current gear pump design, as illustrated in Figure 1.

REASON: The new design oil pump has increased flow and capacity at low idle speeds, also has reduced flow at high speeds which reduces the load on the engine resulting in improved fuel economy. The new design oil pump is also quieter than the current gear pump.

PARTS AFFECTED:

- (1) PUMP HOUSING - Revised (Larger) suction and pressure cavities, also revised machining in the pump rotor pocket area. The new design inner and outer rotor are smaller in diameter.
- (2) PUMP HOUSING BUSHING - The bushing material has been changed from bronze to aluminum, to help improve wear characteristics.
- (3) INNER ROTOR - Has a new outside diameter, 6 new thicknesses, and new tooth geometry, as shown in Figure 1.
- (4) OUTER ROTOR - Has a new outside diameter, 6 new thicknesses, and new tooth geometry, as shown in Figure 1.
- (5) STATOR SHAFT SUPPORT ASSEMBLY - Has revised (Larger) suction and pressure ports to accommodate the new design "Dual Cycloidal" pump rotors, as shown in Figure 1.

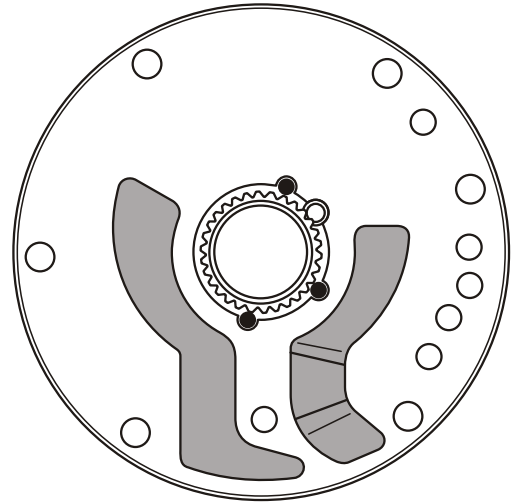
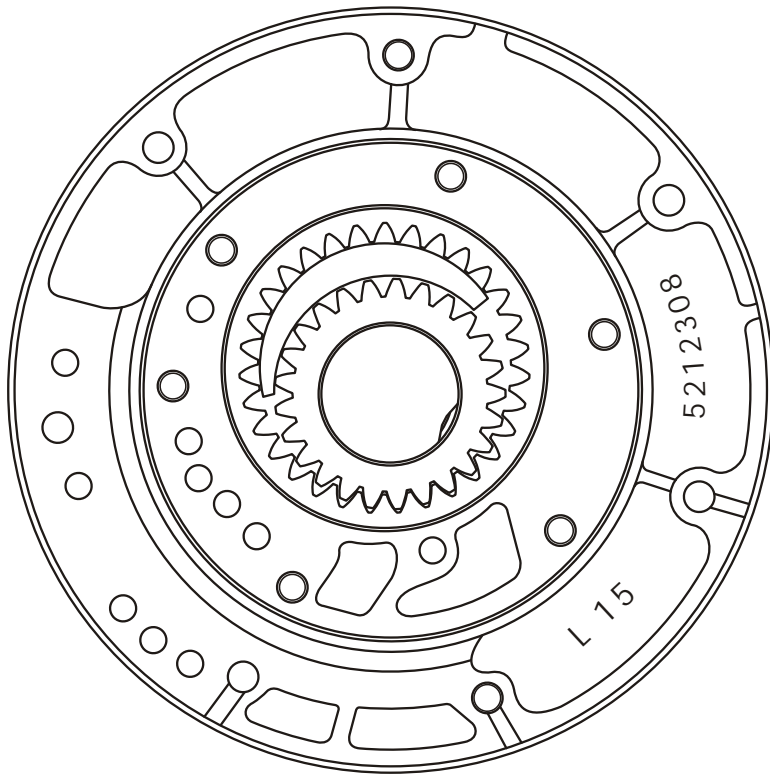
INTERCHANGEABILITY:

None of the parts listed above will interchange with previous design level parts. Even though the old and new parts will bolt together, they *will not* function properly. However, the complete "Dual Cycloidal" pump assembly when used as a service package, will retro-fit back for past model service.

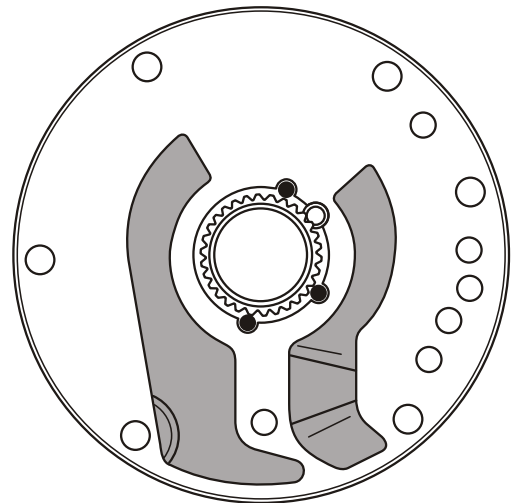
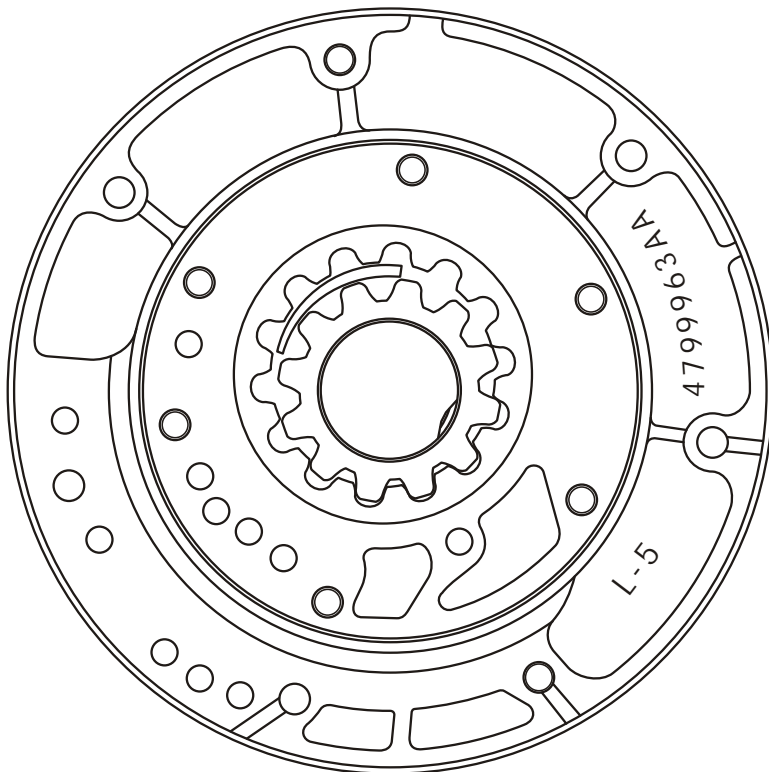
SERVICE INFORMATION:

Dual Cycloidal Pump Assembly Complete	4799955AA
Pump Housing Bushing, Aluminum	4659515
Inner Rotor (6 Different Selectives)	4659719-724
Outer Rotor (6 Different Selectives)	4659725-730
Reaction Shaft Support Assembly (New Design)	4799957AA

PREVIOUS DESIGN PUMP ASSEMBLY



NEW DESIGN "DUAL CYCLOIDAL" PUMP ASSEMBLY



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Figure 1



CHRYSLER 31TH (A670) NEW DESIGN COOLER BY-PASS SYSTEM

CHANGE: The Chrysler 31TH (A670) transaxle has been revised to include a cooler by-pass system and was changed during the 1999 model year as a running change (See Figure 1).

REASON: This new system will allow lube oil to by-pass the transaxle oil cooler in the vehicle under extreme cold conditions and feed oil directly back into the lube circuit. This will improve durability at extreme cold conditions, instead of restricting lube oil to the transaxle and possibly resulting in a failure.

PARTS AFFECTED:

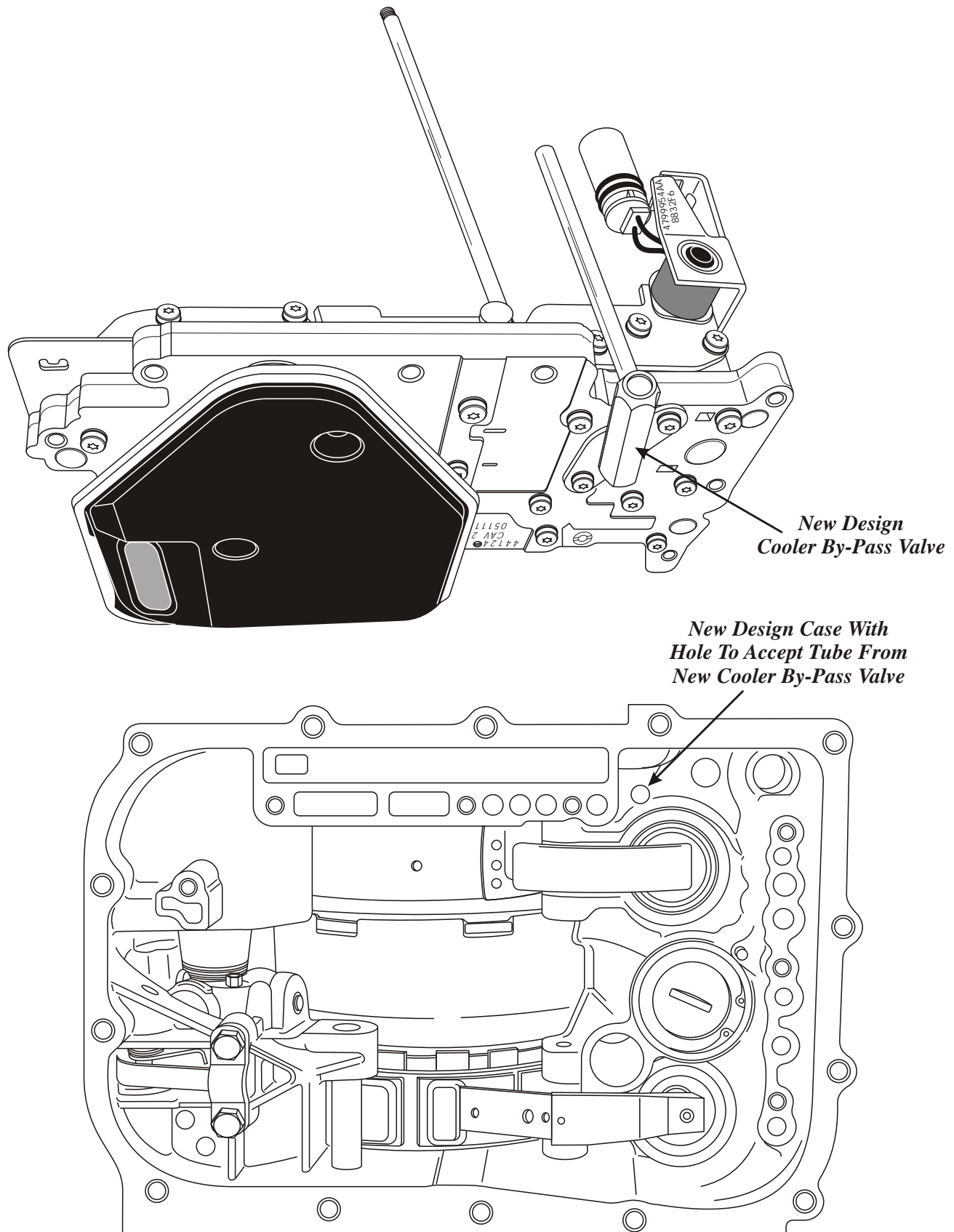
- (1) **TRANSAXLE CASE** - A new drilled hole has been added in the valve body face area, as shown in Figure 1, to the cooler return circuit of the case. The pump face cooler return hole has also been made larger and relocated, to align with case lube circuit.
- (2) **PUMP GASKET** - The hole in the pump gasket for the cooler return circuit has been relocated in the gasket to accommodate the relocated hole in the case.
- (3) **VALVE BODY TRANSFER PLATE** - The transfer plate has a drilled through hole and a pocket to accept the by-pass valve seal, and two added screw holes to accommodate the added cooler by-pass valve assembly (See Figure 1).
- (4) **COOLER BY-PASS SEAL** - The new seal locates in the pocket of the transfer plate and seals against the new cooler by-pass valve assembly.
- (5) **COOLER BY-PASS VALVE ASSEMBLY** - The valve assembly consists of a spring loaded ball inside of a body/tube that is attached to the transfer plate with two new screws and inserted into the new case lube circuit hole, as shown in Figure 1.

INTERCHANGEABILITY:

None of the parts listed above can be used with any previous design transaxles, unless they are used as a service package together.

SERVICE INFORMATION:

Transfer Plate (New Design)	4377811AD
Cooler By-Pass Valve Assembly	4800018AA
Cooler By-Pass Seal	4800019AA
Pump Gasket (New Design)	4269661AB
Transaxle Case (New Design)	Model Dependent On Engine Size



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Figure 1



ISUZU 4L30-E WRONG GEAR STARTS / ERRATIC SHIFTS

COMPLAINT: After overhaul, Isuzu vehicles equipped with the 4L30-E transmission may exhibit, a 3rd gear start, an up shift to 4th, a downshift to 1st then a up shift to 2nd condition or a 4th gear start downshift to 3rd, downshift to 2nd then a downshift to 1st, or a 2nd gear start, downshift to 1st, up shift to 4th then a downshift to 3rd, instead of starting in 1st up shifting to 2nd, up shifting to 3rd then an up shift to 4th.

CAUSE: The cause may be, that during the overhaul the shift solenoids were replaced and the technician installed the new solenoids in the wrong holes on the valve body, or the technician received two 1-2/3-4 solenoids, or the technician received two 2-3 solenoids instead of *one* 1-2/3-4 solenoid and *one* 2-3 solenoid. The reason for the confusion is because some part suppliers have mistakenly described one of the solenoids as a seal so the solenoid part number that is correct may be duplicated which will equal 2 of the same solenoid.

The other concern is when the solenoids are put in the wrong holes. The only thing that identifies the 2 solenoids correct locations on the valve body, are the two tabs located in Figure 1, which fold over very easily when the solenoids are tapped into the valve body.

The reason for all of these problems are that the two solenoids look the same but are very different. The 1-2 / 3-4 solenoid is N.C. (normally closed), and the 2-3 solenoid is N.O. (normally open) as shown in Figure 2. When these solenoids are put into the wrong holes in the valve body or two of the same solenoids are used, the solenoids hydraulic function on the shift valve that it controls may be completely opposite of its normal function. See Figures 3 thru 6 for a partial hydraulic schematic of the two solenoids normal function and application from 1st thru 4th gear compared to a situation where two 2-3 solenoids were used and what gear ranges you will receive hydraulically.

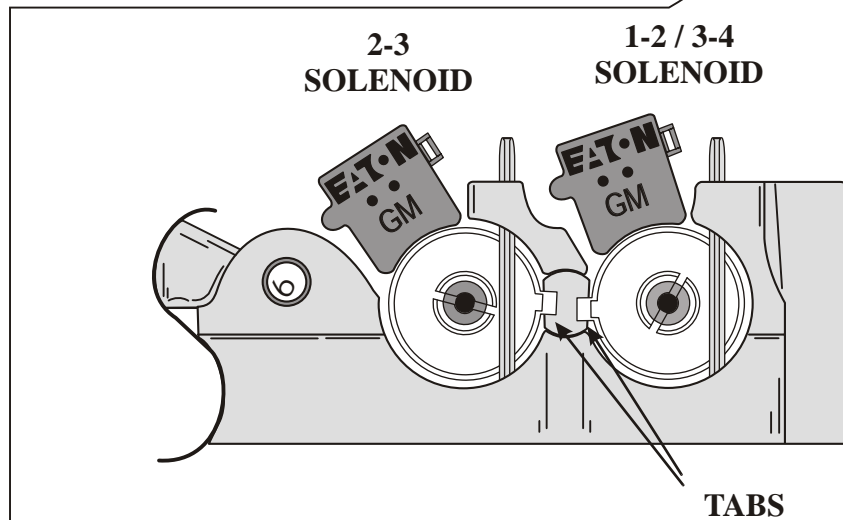
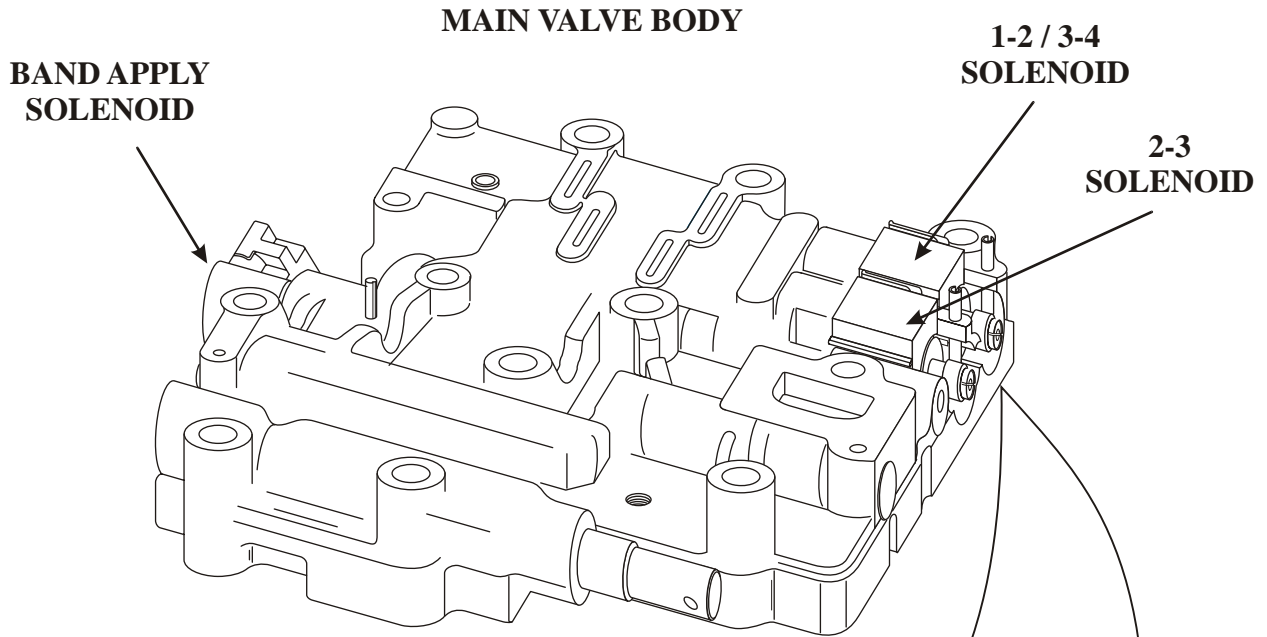
CORRECTION: Refer to Figure 1 and ensure that the 1-2 / 3-4 and 2-3 solenoid are in the right locations using the tab locations shown.

SERVICE INFORMATION:

1-2 / 3-4 SOLENOID (ISUZU part no.).....	8960145930
1-2 / 3-4 SOLENOID (G.M. part no.).....	96014593
2-3 SOLENOID (ISUZU part no.).....	8960143240
2-3 SOLENOID (G.M. part no.).....	96014224

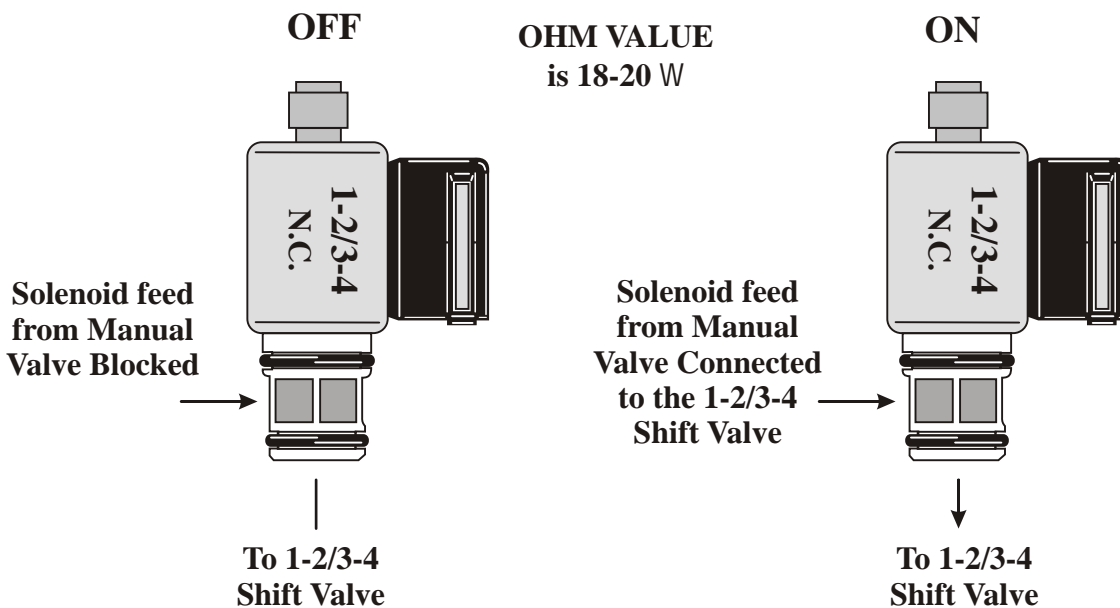
ZOOM

1-2 / 3-4 AND 2-3 SOLENOID LOCATION



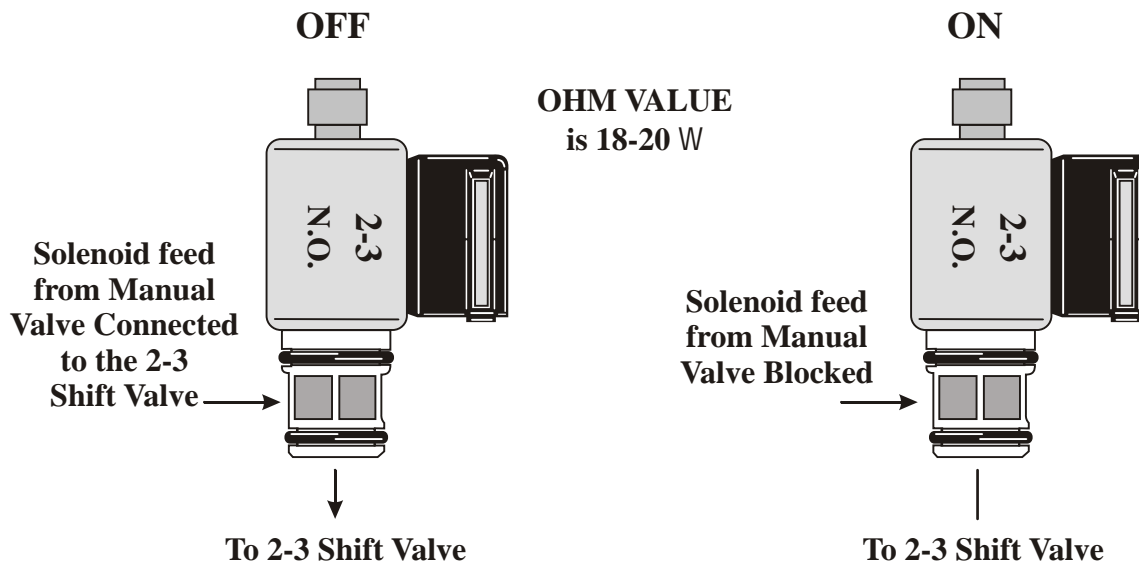
These 2 solenoids look identical. The only thing that keeps the technician from putting them into the wrong slots in the valve body are these 2 tabs as shown above.

1-2 / 3-4 SOLENOID CHECK



Summary: When the 1-2 / 3-4 Solenoid is OFF, solenoid feed from the Manual Valve, (Drive ranges) is blocked which keeps the 1-2 / 3-4 shift valve from stroking against its spring. When the 1-2 / 3-4 Solenoid is ON, solenoid feed from the Manual Valve, (Drive ranges) passes thru the solenoid and is connected to the 1-2 / 3-4 shift valve stroking it.

2-3 SOLENOID CHECK



Summary: When the 2-3 Solenoid is OFF, solenoid feed from the Manual Valve, (Drive ranges) passes thru the solenoid and is connected to the 2-3 shift valve stroking it. When the 2-3 Solenoid is ON, solenoid feed from the Manual Valve, (Drive ranges) is blocked to the 2-3 shift valve keeping the valve from stroking against its spring.

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Figure 2

ISUZU 4L30-E

DTC 32 AND 65

COMPLAINT: After overhaul, ISUZU vehicles equipped with the 4L30-E transmission may exhibit a Check Trans Light flashing along with Diagnostic Trouble Codes 32 (Force Motor Circuit open) and 65 (Transmission oil temperature sensor open).

CAUSE: The cause may be that during removal of the front internal harness connector, the locking tab, on the front case connector shown in Figure 7, was broken off.
The reason for the trouble codes setting is because the locking tab is also a *locating* tab so the internal harness can only be plugged connected in 1 way. When the locating tab is broken the internal harness can be plugged in any direction.

CORRECTION: Replace the front case connector if needed and ensure the internal harness is connected correctly by indexing the locating tab on the back of the Front Case Connector with the locating notch on the Internal Harness Connector as shown in Figure 8.

SERVICE INFORMATION:

FRONT CASE CONNECTOR (G.M. part no.).....96015408

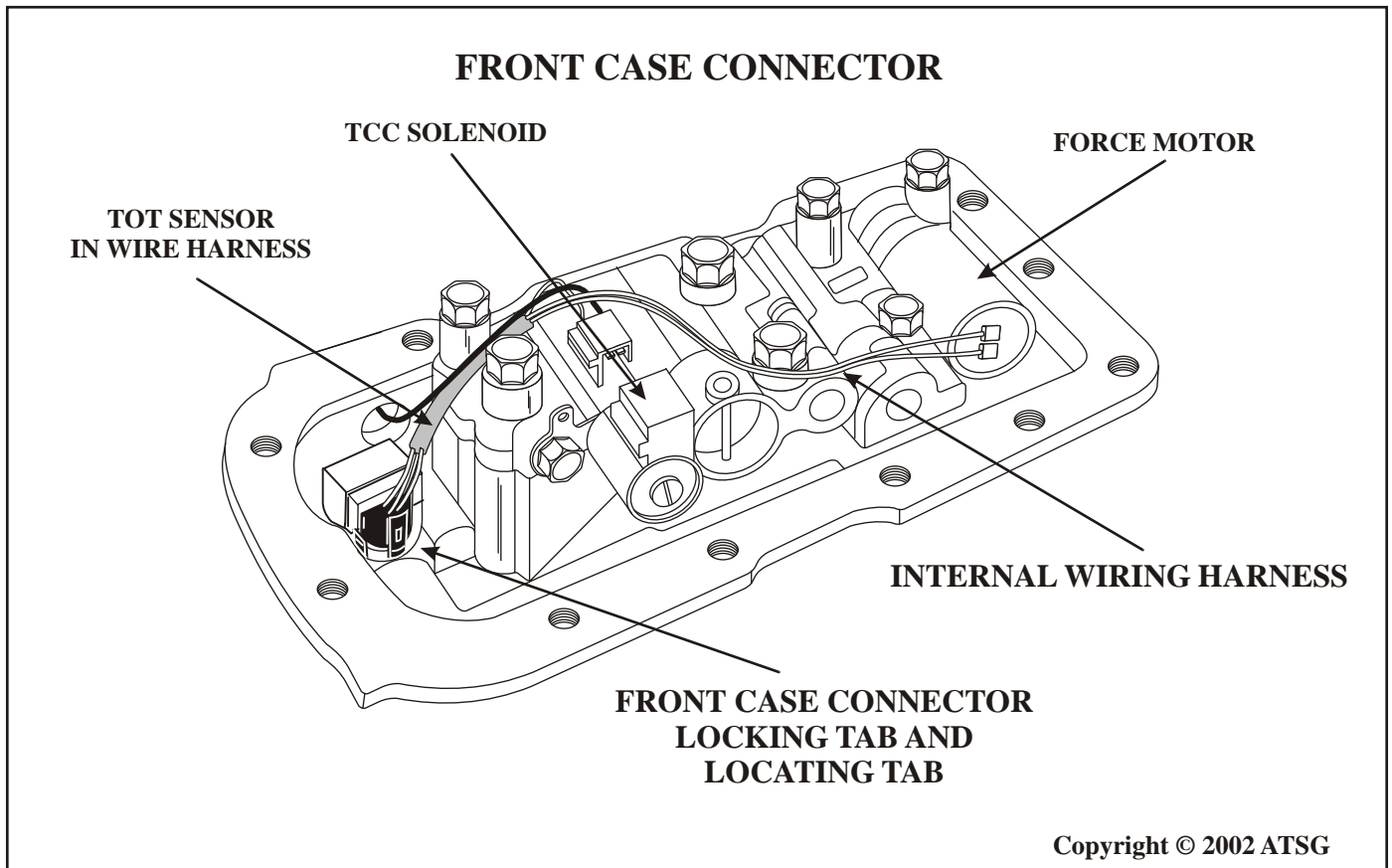
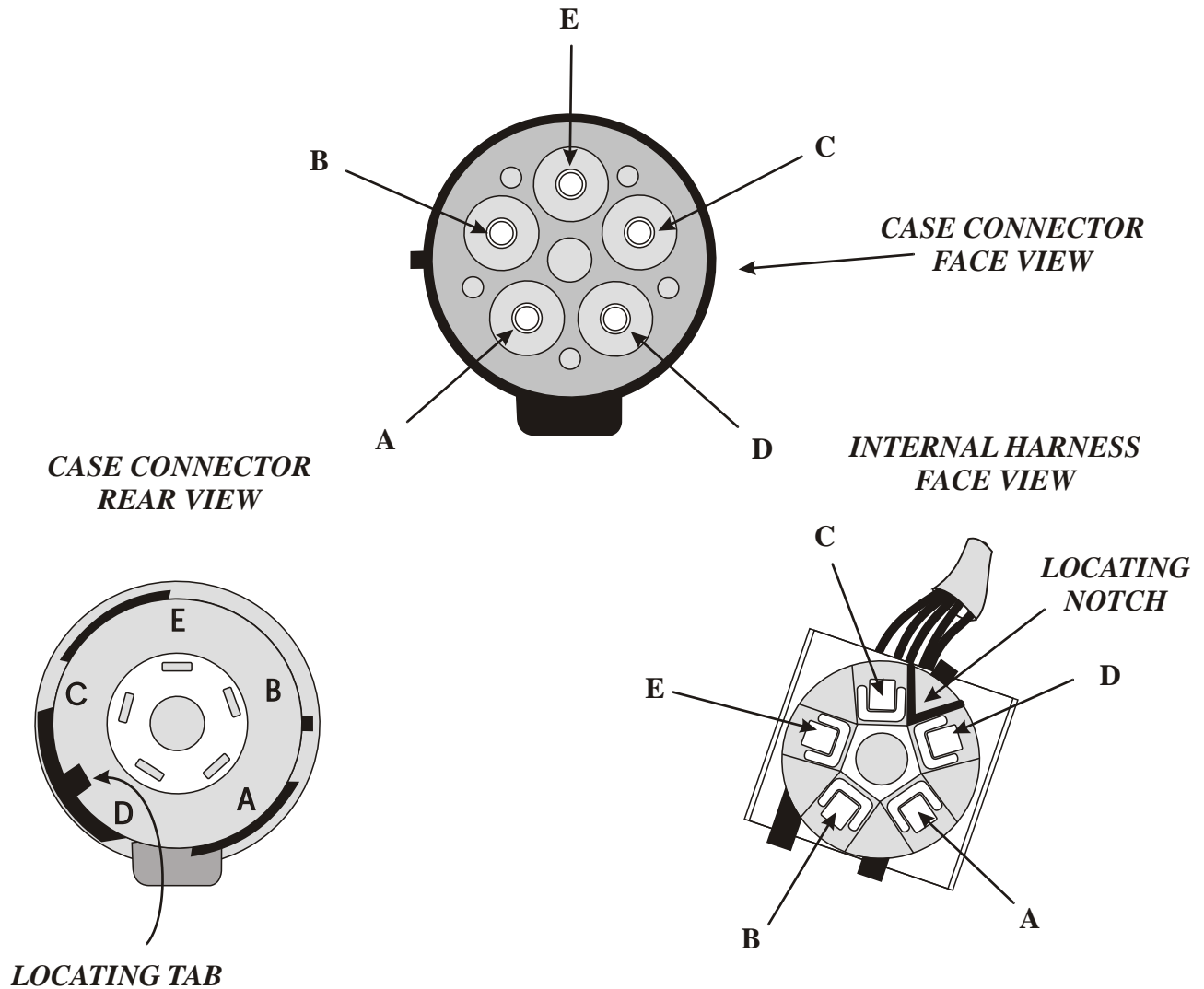


Figure 7

**ISUZU 4L30-E
FRONT CASE CONNECTOR
AND INTERNAL HARNESS I.D.**



TERMINAL I.D.	FUNCTION	WIRE COLOR
A	TCC	WHITE
B	FORCE MOTOR HIGH	ORANGE
C	TRANS TEMP INPUT	WHITE
D	TRANS TEMP GROUND	WHITE
E	FORCE MOTOR LOW	GREY

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Figure 8

ISUZU 4L30-E DTC 43 (90-93 MODELS)

COMPLAINT: Before or after overhaul, 1990-1993 vehicles equipped with the 4L30-E transmission, may exhibit a Check Trans light flashing, indicating a trouble code has been set, as soon as the vehicle is started. A Diagnostic Trouble Code 43 "Ground Control Relay Circuit Fault" was found to be set when the self diagnostics procedure to retrieve the code was performed.

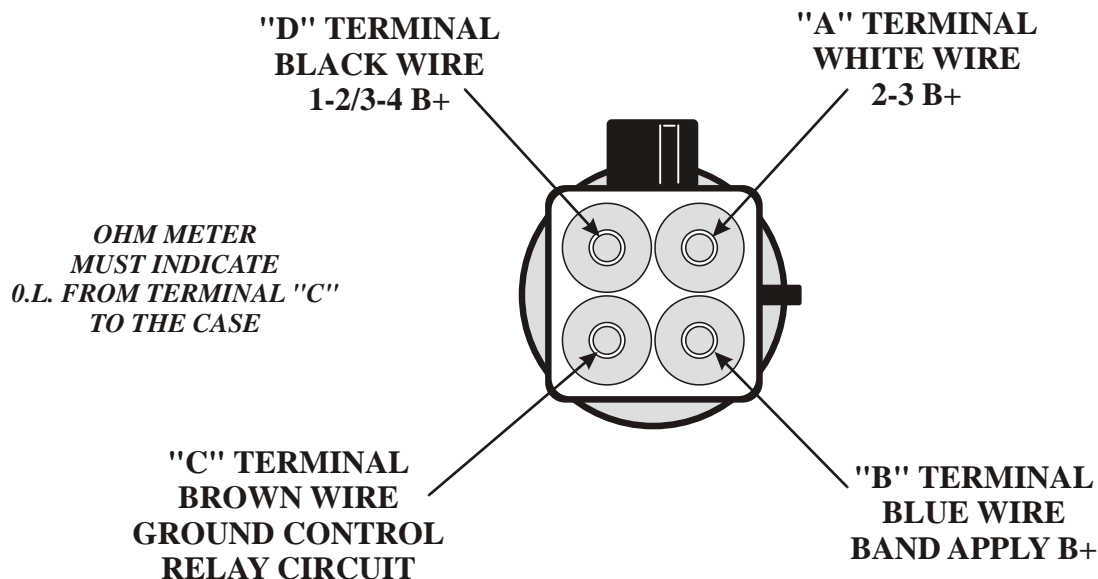
CAUSE: The cause may be that the Protective Conduit, as shown in Figure 10, had become very brittle from heat and had deteriorated causing the splice to contact the valve body.
The Transmission Control Module controls the Shift and Band Apply solenoids on the Positive side, for gear changes and Band control. The Transmission Control Module also controls the Ground side of these solenoids thru an internal relay, which is connected from Terminal 54 at the TCM to the "C" terminal, which is connected to all three solenoids, at the case connector as shown in Figure 9.
The reason the code 43 sets is because the TCM detected that the Ground Control Relay circuit was already grounded before the TCM could ground it.

CORRECTION: Inspect the Protective Conduit as shown in Figure 10 and replace the internal harness if needed. After the pan is put back on the case, take an ohm meter and connect the positive terminal to terminal "C," as shown in Figure 9, and the Negative terminal to the case and make sure that the meter indicates an open circuit.

SERVICE INFORMATION:

INTERNAL WIRING HARNESS (G.M. part no.).....96014855

CASE CONNECTOR TERMINAL AND INTERNAL WIRE COLOR IDENTIFICATION



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Figure 9
Automatic Transmission Service Group

REAR INTERNAL HARNESS WIRE I.D.

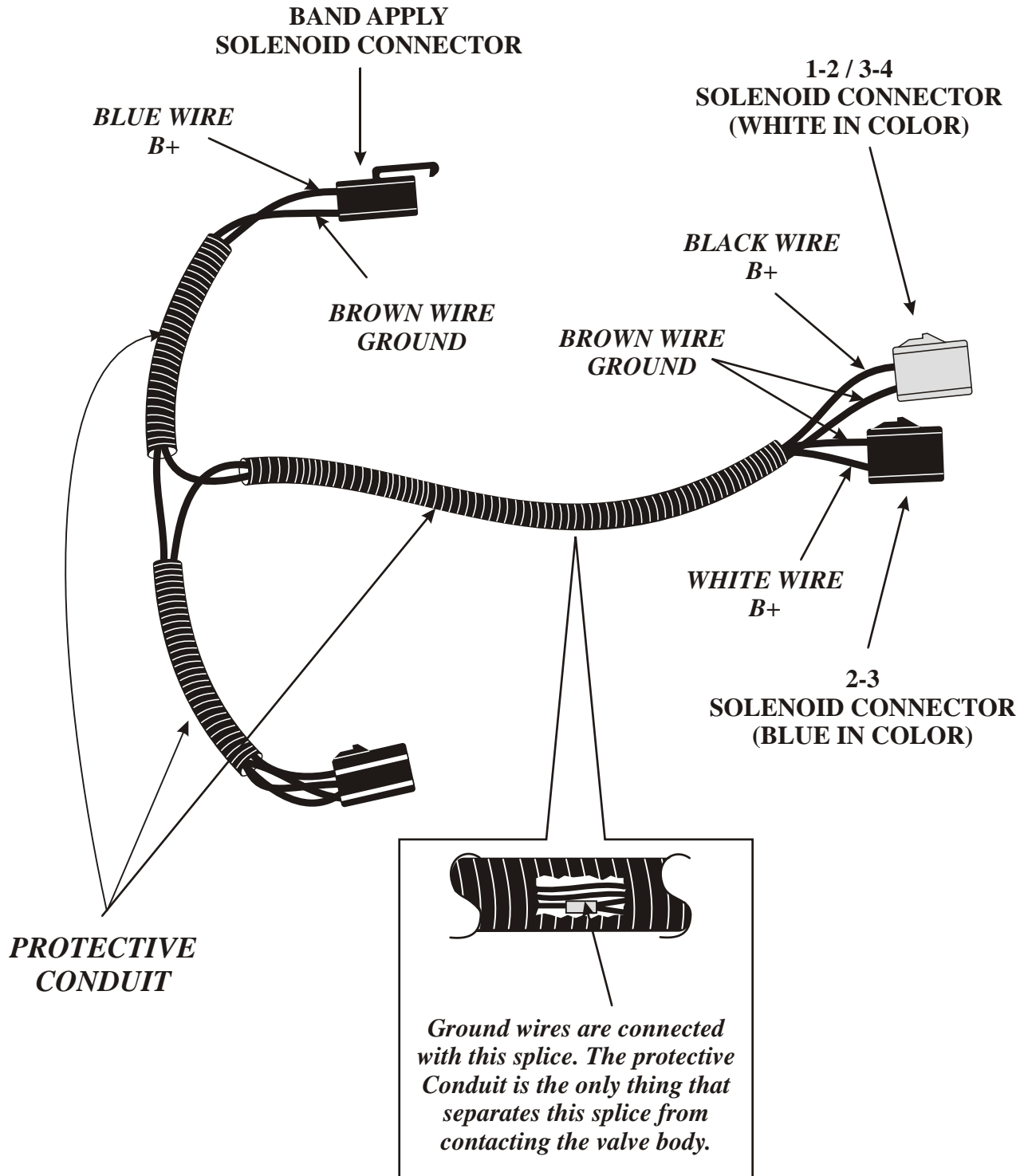


Figure 10
Automatic Transmission Service Group

4L30-E HONDA PASSPORT

DTC 1860

COMPLAINT: 1996 Honda Passport, equipped with 4L30-E transmissions may exhibit a Check Engine light flashing along with a Diagnostic Trouble Code 1860, Torque Converter Clutch Solenoid Circuit.

CAUSE: The cause may be, an insufficient ground connection for the Torque Converter Clutch Solenoid.
The first design solenoid ground, as shown in Figure 12, was connected to the terminal that was part of the TCC solenoid bracket.
The second design solenoid ground, also shown in Figure 12, is now connected to a valve body bolt in the rear pan.
The reason for this change was to provide a better ground path for the solenoid because of the gaskets between the pump, overdrive housing and the main case.

CORRECTION: Install the new ground kit, available "only," from ISUZU, as shown in Figure 11.

SERVICE INFORMATION:

GROUND KIT (ISUZU part no.).....8-96041-331-0
Contents of kit:
1 Ground wire for TCC solenoid
1 TCC Solenoid
1 Adapter case pan gasket
1 Main case pan gasket
28 6 mm pan bolts
2 Drain and Fill plug gaskets

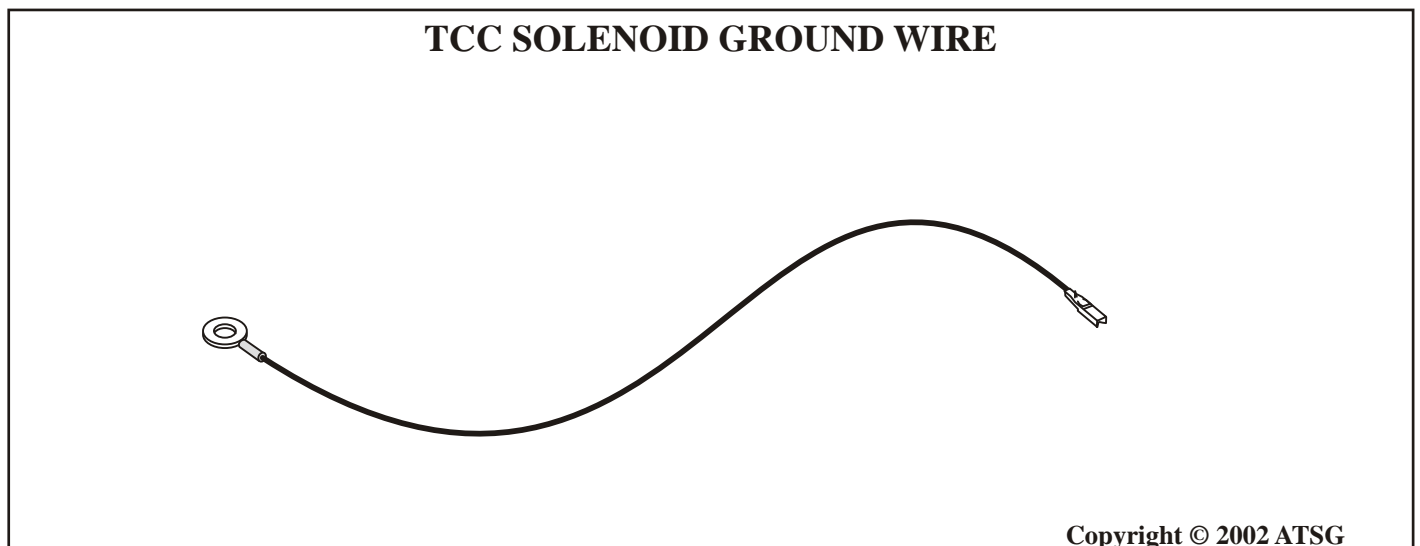
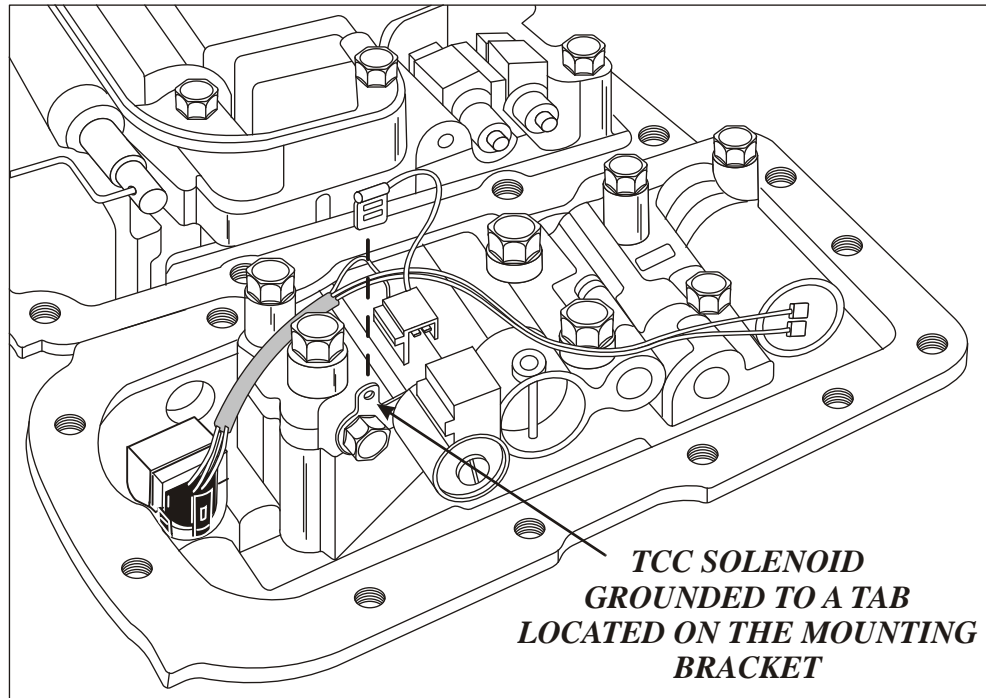
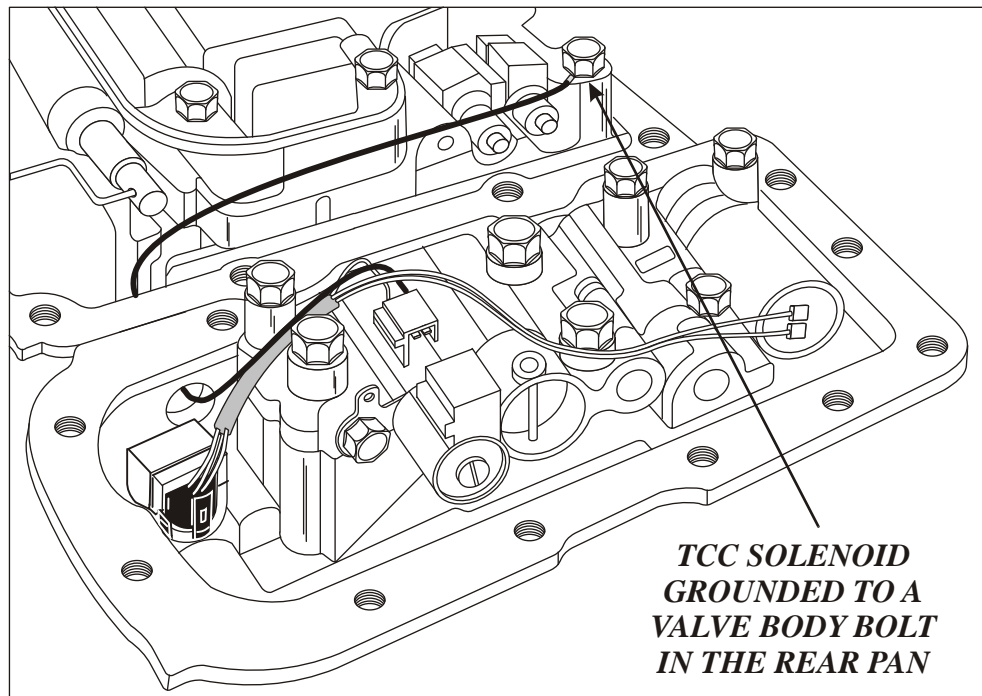


Figure 11

FIRST DESIGN TCC SOLENOID GROUND



SECOND DESIGN TCC SOLENOID GROUND



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Figure 12



VOLKSWAGEN/AUDI SCAN TOOL DIAGNOSTICS

CODES & DATA RETRIEVAL

COMPLAINT: Communicating with Volkswagen/Audi Group Transmission Control Modules (TCM) is difficult without a scan tool. Even when a VAG 1551 factory scan tool is obtained, a lot of the data is displayed in data blocks that are impossible to interpret without a factory manual which is necessary to translate these data blocks. It is also difficult to initiate a return to certain basic settings or relearn procedures that are mandatory for proper vehicle operation.

CAUSE: Until now, aftermarket scan tools did not interface with the TCM. This would create the need to take the vehicle to the dealer before any work is done for diagnostics and after the work is done for the necessary relearn or "return to basic settings" procedures.

CORRECTION: A comprehensive diagnostic program is now available for download into your service bay or lap top computer which has the ability to scan virtually all the modules in Volkswagen/ Audi vehicles. The program contains the necessary diagnostic cables to connect your lap top or shop PC computer to the vehicles diagnostic connector. The software for the program is downloaded from the VAG-COM website as well as other pertinent information about using and setting up the program. Also found on the website are many of the questions that may arise about the program.

VAG-COM offers data in a clear and concise manner that does NOT require data block translation such as that displayed by the VAG1551 factory scan tool in the example shown in figures 1 and 2 for a 1998 Jetta with the 01M transaxle.

Some of the display screens that are available for display when using VAG-COM are illustrated in figures 3 to 8.

*The VAG-COM web address is **ROSS-TECH.COM**.*

VAG SCAN TOOL DATA DISPLAY

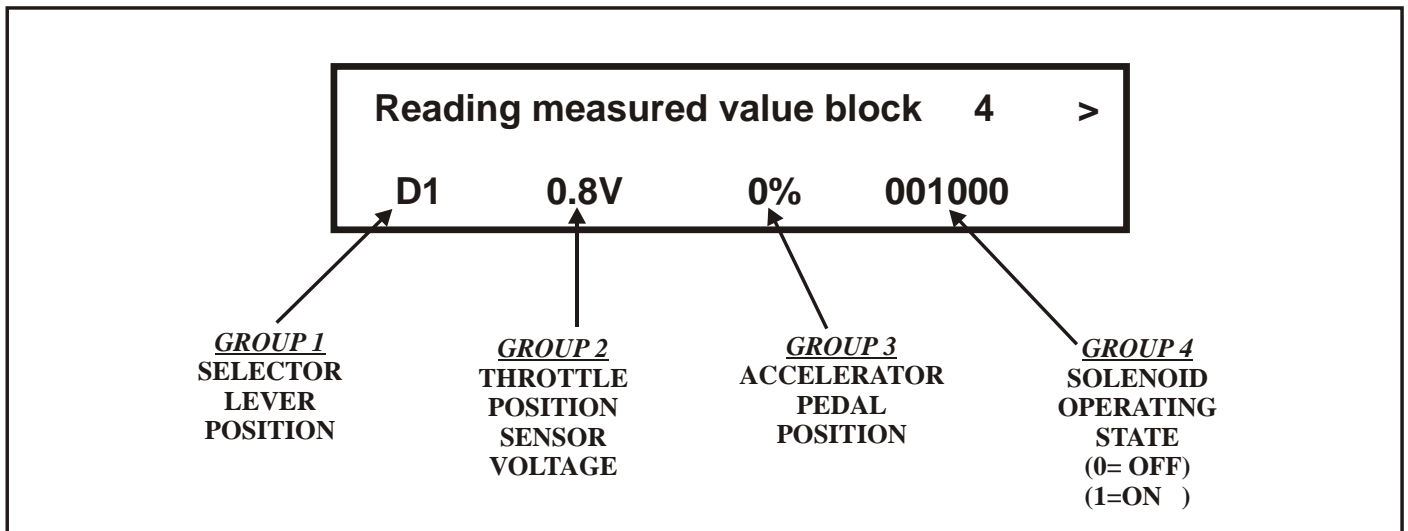


Figure 1

SOLENOID OPERATING STATE...BLOCK 4 - GROUP 4 - DISPLAY 1

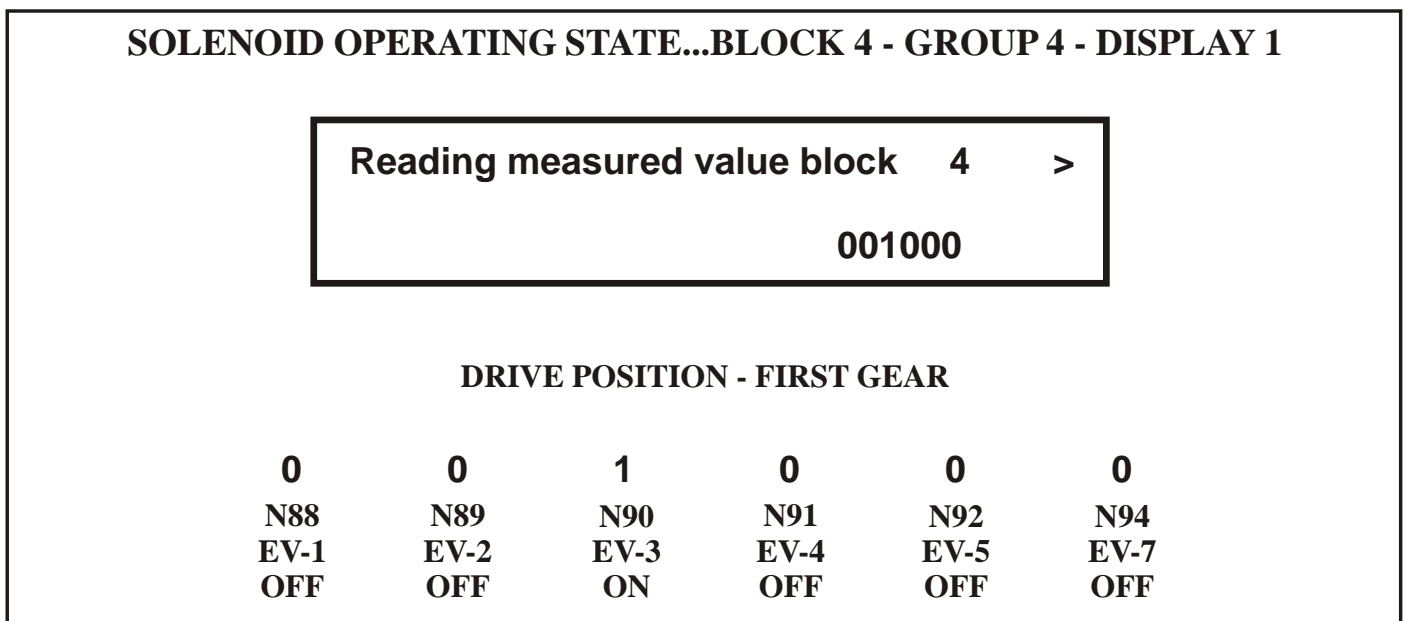


Figure 2



VAG CODES & DATA RETRIEVAL

VAG-COM

VAG-COM
Release 208.1

Select Control Module
Select an individual Control Module such as Engine, ABS, Airbag, etc.
Select

Auto-Test
An automatic scan of all controllers for DTCs will be available in a future version
Not Implemented Yet!

Control Module Finder
Scans an address range for ISO9141 compliant control modules
Control Module Finder

OBD-II Functions
Test for OBD-II Compatability, Additional Functionality Available Separately
OBD-II

Macro Functions
Macro Functions will be available in a future version
Not Implemented Yet!

Program Options
Select Comm Port, Set Debug and Protocol Options, etc.
Options

About Exit

Figure 3

VAG-COM: Select Control Module

VAG-COM
Select Control Module

Common Modules

01 - Engine	02 - Auto Trans	03 - ABS Brakes	08 - HVAC
15 - Airbags	17 - Instruments	22 - AWD	35 - Cent. Locks
37 - Navigation	45 - Int. Monitor	46 - Cent. Conv.	56 - Radio

Direct Entry
Address-Word 01-7F Go!

Less Common Modules
Display

Go Back

Figure 4



"2003" SEMINAR INFORMATION VIDEO

113

VAG CODES & DATA RETRIEVAL

VAG-COM: Open Controller

Comm Status
IC-1 TE-0 RE-0
Protocol: KW1281

VAG-COM

Open Controller

Controller Info

VAG Number: **06A 906 032 CL** Component: **1.8 I 5V 110kW TLG01 V004**
Soft Coding: **06500** Shop#: **WSC 00000**
Extra:
Extra:

Basic Functions

Fault Codes - 02

Readiness - 15

Meas. Blocks - 08

Future Exp.

Single Reading - 09

Future Exp.

Advanced Functions

Login - 11

Recode - 07

Basic Settings - 04

Adaptation - 10

Output Tests - 04

Future Exp.

Close Controller, Go Back - 06

Figure 5

VAG-COM: Fault Codes

VAG-COM

Fault Codes

Controller Info

VAG Number: **06A 906 032 CL** Component: **1.8 I 5V 110kW TLG01 V004**

Fault Codes

01192 - Torque Converter Clutch Malfunction
00258 - Solenoid Valve EV1 Electrical Fault - N88
00532 - B+ Supply Voltage Insufficient
00652 - Final Drive Ratio Signal Incorrect/Implausible

Print Codes

Copy Codes

Clear Codes - 05

Go Back

Figure 6

VAG CODES & DATA RETRIEVAL

VAG-COM: Measuring Blocks / Basic Settings
[X]

Sample Rate:

Label File: 06A-906-032.LBL

VAG-COM

Measuring Blocks

Group <input type="text" value="003"/>	Up Dn	Go!	At Idle 800/min Idle speed 700-820 rpm	2.33 g/s Air mass in 2.0-4.5 g/s	1.6% Throt Angle 0.2-4.0%	3.8* Ignit Angle 0-12 BTDC
Group <input type="text" value="115"/>	Up Dn	Go!	Running at Elevated RPM 800/min Engine Speed 700-6800 RPM	18.0% Engine Load 15 -150%	1000 mbar Spec. Boost 990-1800 mbar	1010 mbar Actual Boost <=1800 mbar
Group <input type="text" value="120"/>	Up Dn	Go!	Running at Elevated RPM 800/min Engine Speed 700-6800 RPM	399.8 Nm Spec Load 0-399 Nm	0.0 Nm Curr Load 0-260 Nm	TCS Off ASR Status active yes/no

Refer to Service Manual!

Figure 7

VAG-COM: Select Control Module
[X]

VAG-COM

Select ControlModule

Less Common Modules

09 - Elec. Ctrl. Mod.	11 - Eng. Elect. II	12 - Clutch	13 - Dist. Ctrl.
14 - Suspension	16 - Steering Wheel	18 - Aux. Heater	19 - CAN Gateway
24 - Anti-Slip	25 - Immobilizer	26 - Auto Roof	29 - Left Light
34 - Level Ctrl.	36 - Driver's Seat	39 - Right Light	41 - Diesel Pump
44 - Steering Assist	47 - Sound Sys.	49 - Auto Light Sw.	55 - H. Light Range
65 - Tire Pressure	66 - Seat/Mirror Adj.	75 - Emerg. Call	76 - Parking Aid

Figure 8

Ross-Tech



VOLKSWAGEN/AUDI 01M

K1, K2 & K3 CLUTCH AIR CHECK ERROR

COMPLAINT: When the K1, K2 or K3 clutch is air checked, assembled onto the pump with or without the pump gasket in place, these clutch assemblies do not air check properly.
A large volume of air is escaping from what appears to be the pump cover or drum assemblies which causes the technician to waste a lot of time looking for the cause of the problem.

CAUSE: The K1, K2 and the K3 clutch feed holes in the pump gasket is perfectly round, but the corresponding feed holes in the pump cover are not as shown in figures 1 and 2, therefore, when air checking the these clutch assemblies through the gasket, the air is actually blowing out of the irregularly shaped clutch feed holes in the pump cover causing the technician to think there is a leak in these clutch circuits.

CORRECTION: Because the K1, K2 and K3 clutch feed holes in the pump cover are oddly shaped, it is even difficult to air check them without the gasket in place.
Using a thin tipped blow gun, stuff a shop wipe into the feed hole with the blow gun wrapped in it and insert them into the odd shaped clutch feed hole in the pump cover and air check them in this manner.

NOTE: Make certain that the staked in cup plugs in the top of the ring tower, as seen in figure 3, are in place. There have been situations where one or more of these plugs have blown out or are leaking.

VOLKSWAGEN/AUDI 01M

K1, K2 & K3 CLUTCH AIR CHECK ERROR

PUMP AND DRUM ASSEMBLIES WITH GASKET

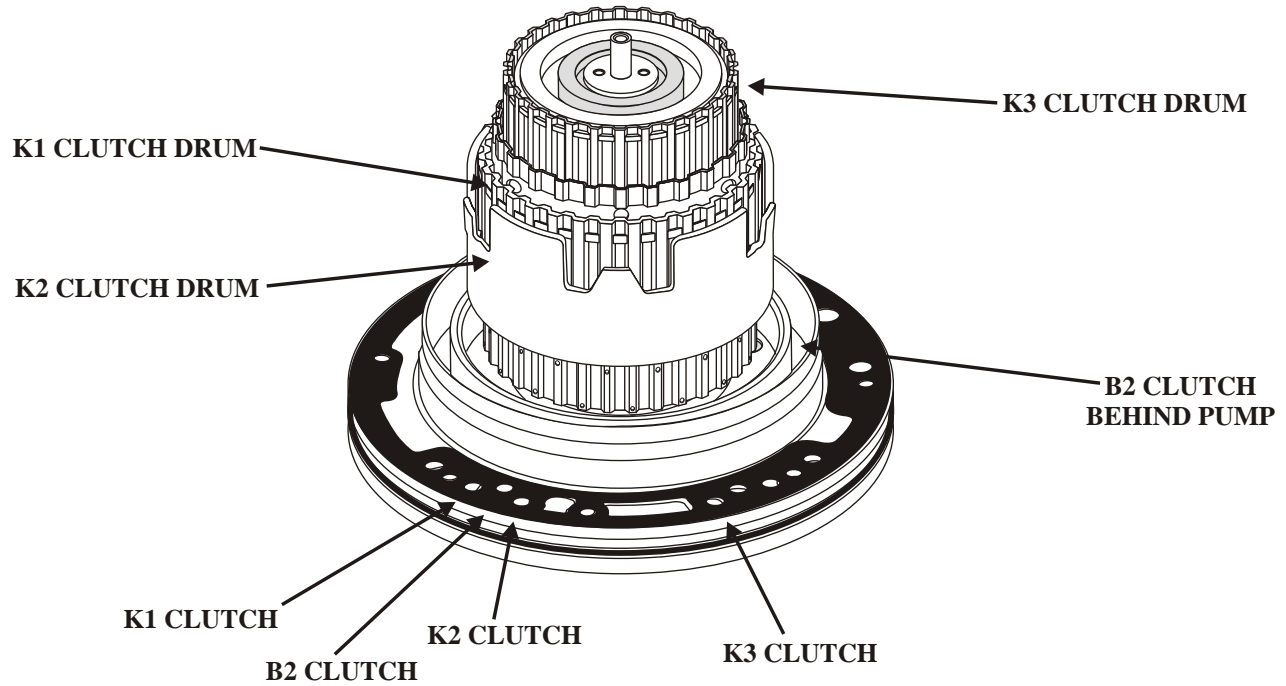


Figure 1

PUMP AND DRUM ASSEMBLIES WITHOUT GASKET

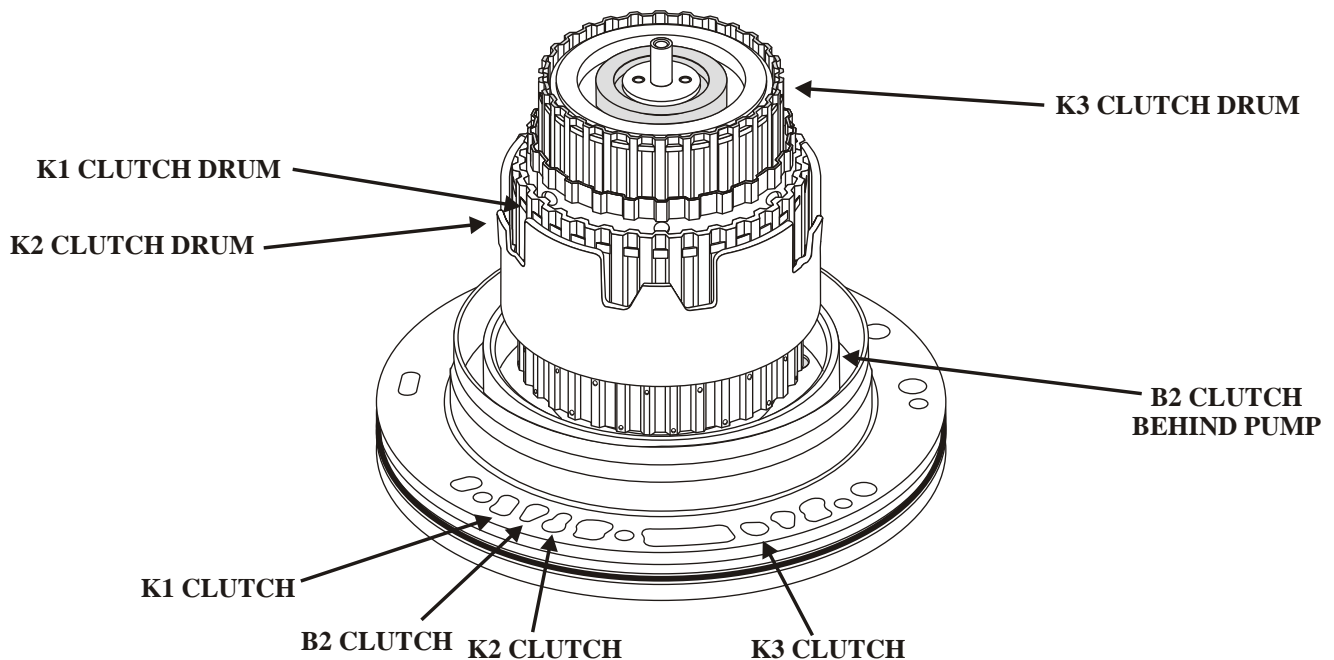
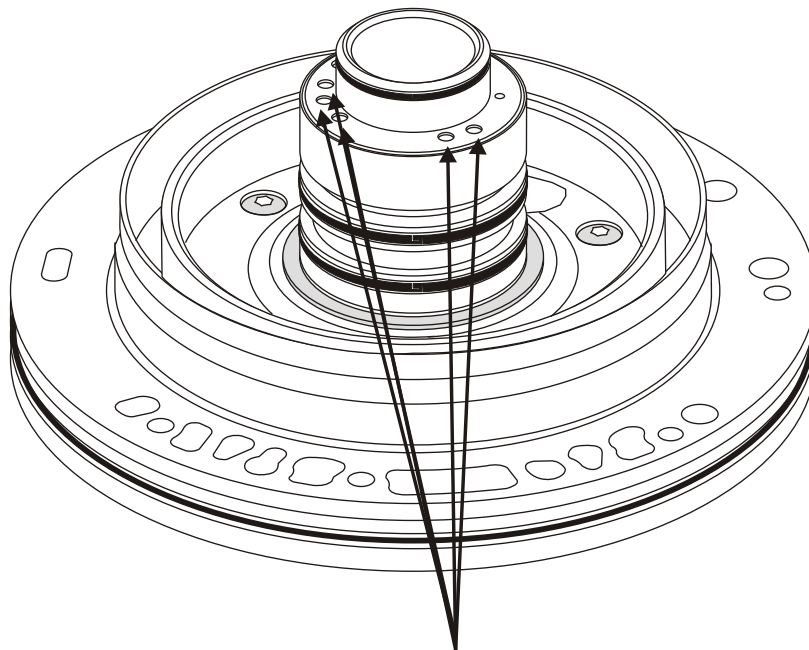


Figure 2

VOLKSWAGEN/AUDI 01M

K1, K2 & K3 CLUTCH AIR CHECK ERROR



**MAKE CERTAIN THE SIX STAKED IN
CUP PLUGS ARE PRESENT AND NOT
LEAKING**

Figure 3

ATSG

DACCO

RN Rebuilders

Techpack