INDEX
FORD & CHRYSLER

ADVERTISER'S

AUTOMATIC TRANSMISSION SERVICE GROUP
9200 South Dadeland Bulevard Suite 720
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INTRODUCTION

ATSG welcomes you to the year 2000 and WOW the changes we have seen in this 20th century! One of the more significant changes seen is how ATSG's Tech team continues to remain on the cutting edge of today's ever-changing automotive technology. This means valuable and useful information to those who attend ATSG's seminars presenting information in both Video and Slides all in Manuals that can be brought back to the shop to be used the very next business day. That is why for the year 2000, ATSG is proud to present another well orchestrated DO NOT MISS seminar appropriately named "FIXES TODAY FOR Y2K!"

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

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ROBERT D. CHERRNAY
TECHNICAL DIRECTOR

JIM DIAL
TECHNICAL CONSULTANT

JERRY GOTT
TECHNICAL CONSULTANT

DAVID CHALKER
TECHNICAL CONSULTANT

ED KRUSE
TECHNICAL CONSULTANT

GREGORY LIPNICK
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TECHNICAL SERVICE INFORMATION

FORD AODE / 4R70W SHUDDERS

(Another Use For **LUBEGARD® Highly Friction Modified ATF Supplement**)

ISSUE: In the Ford AODE and 4R70W, a shudder or vibration may occur under light-to-moderate acceleration above 35 mph in third or fourth gear, or during a 3-4 upshift or a 4-3 downshift. This condition may be caused by the converter clutch. The condition normally is noticed on vehicles with 20,000 or more miles when the torque-converter clutch engages or disengages and the vehicle is under light load.

ACTION: It has been found that by changing the vehicles transmission fluid and adding the **LUBEGARD® Highly Friction Modified ATF Supplement** you can **ELIMINATE** the problem. The vehicle may have to be driven up to 100 miles for the condition to be corrected.

FORD 4R44E/4R55E/5R55E
DELAYED ENGAGEMENTS AND / OR SLIPPING

COMPLAINT: Some vehicles equipped with the 4R44E/4R55E may exhibit delayed engagements in forward & reverse and / or a slipping condition.

CAUSE: One cause may be, that the Extension Housing Lube Orifice may have been left out of the valve body causing a loss of line pressure.

CORRECTION: Remove the valve body and ensure that the Extension Housing Lube Orifice is in the proper location, as shown in Figure 1.

NOTE: IN THE EVENT THE EXTENSION HOUSING LUBE ORIFICE IS LOST OR MISSING AND HAS TO BE REPLACED, THE ORIFICE SIZE IS .020".

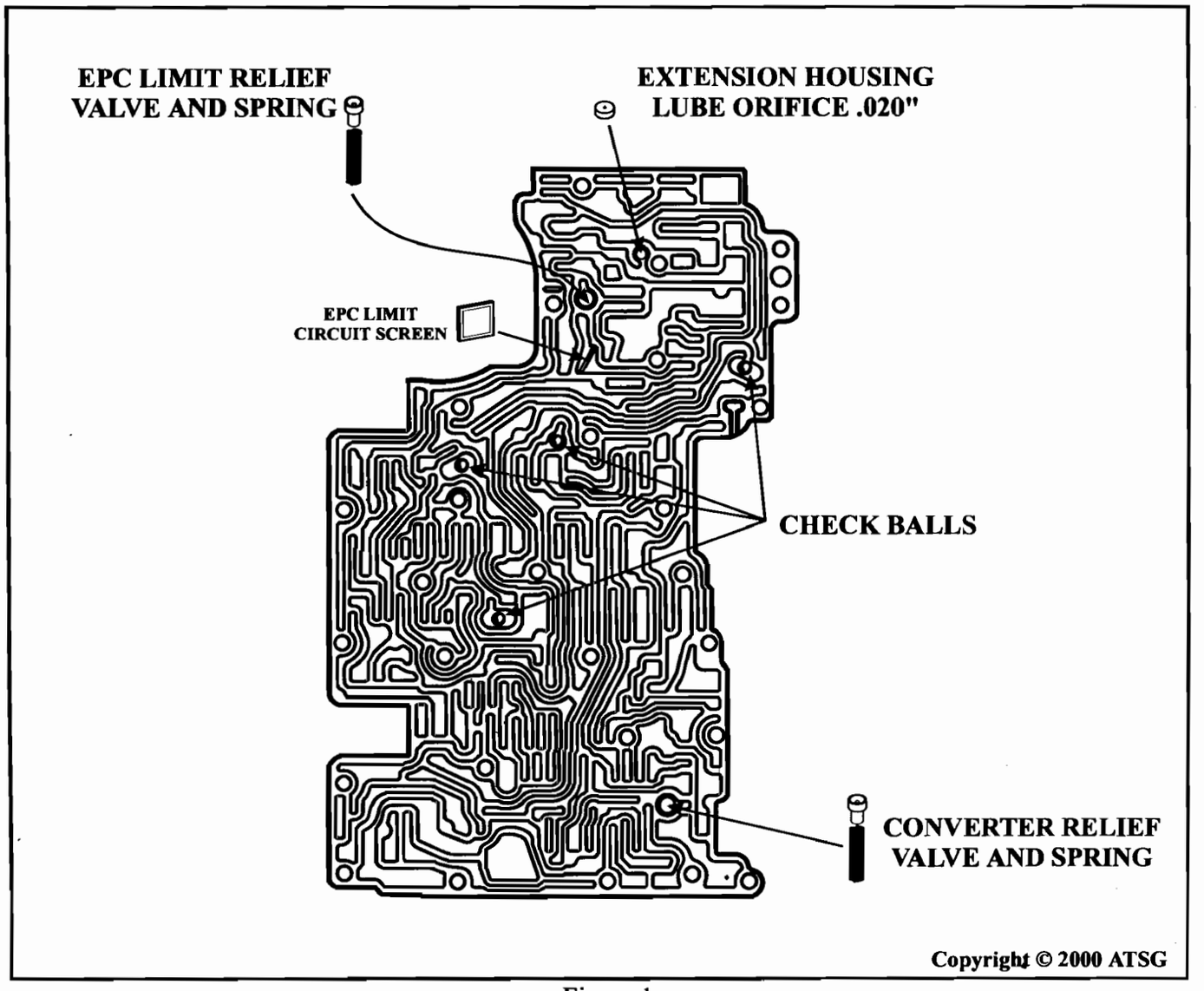

Figure 1

FORD 4R44E/4R55E
DELAYED FORWARD ENGAGEMENT

COMPLAINT: Some vehicles equipped with the 4R44E/4R55E may exhibit a delayed forward engagement condition.

CAUSE: One cause may be, an insufficient volume of oil fed to the forward clutch circuit.

CORRECTION: **(1)** Remove and discard the forward engagement control valve spring as shown in Figure 1.

(2) Replace the pressure regulator spring with a yellow pressure regulator spring from the valve body of an A4LD transmission as shown in Figure 1.

NOTE: If the yellow pressure regulator spring from an A4LD valve body is not available, some aftermarket A4LD valve body kits contain a ***PURPLE*** pressure regulator spring that can be used in place of the yellow A4LD pressure regulator spring.

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4R44E/4R55E VALVE BODY

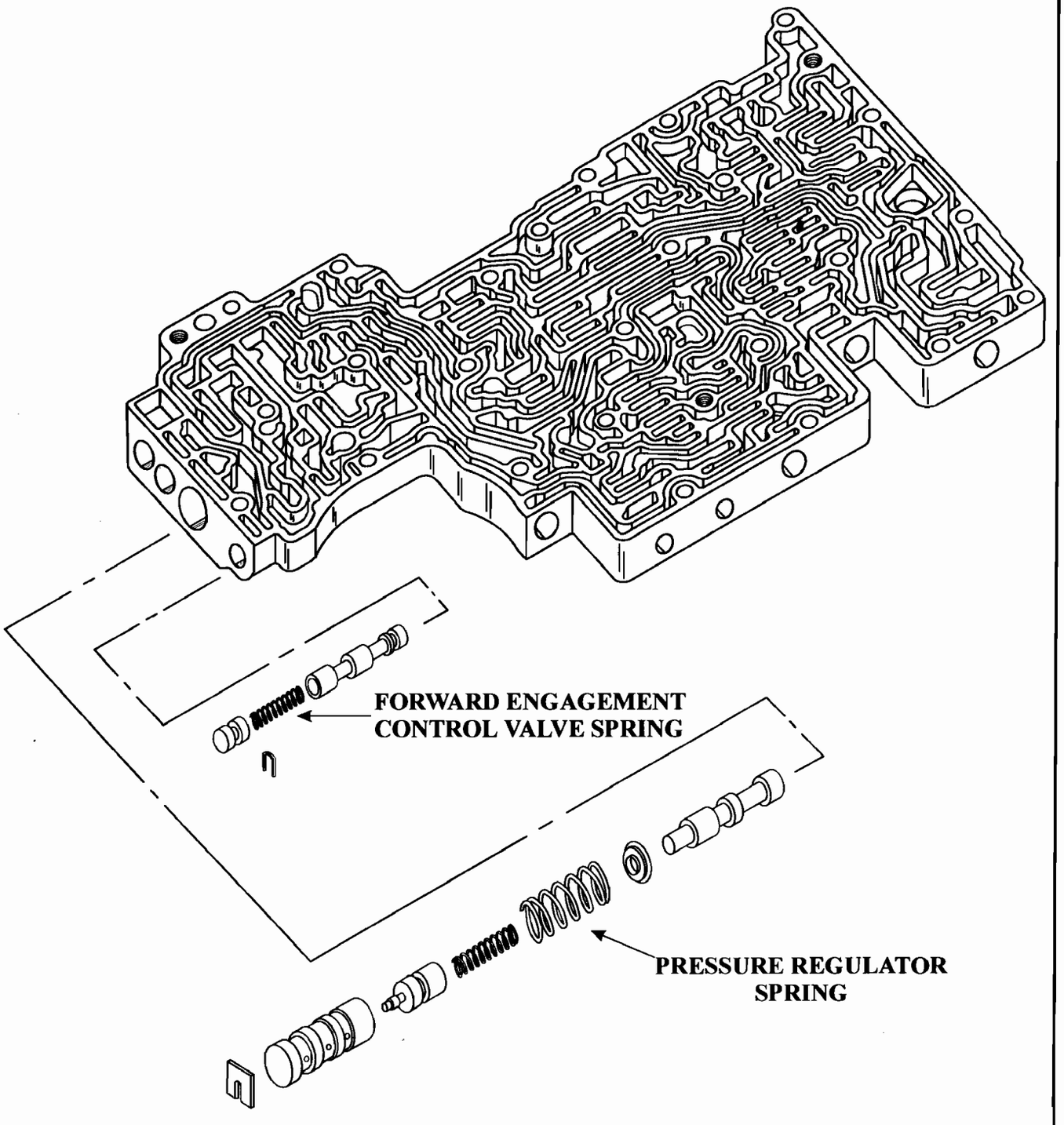

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Figure 1

FORD 4R44E/4R55E
NO FORWARD ENGAGEMENT IN THE OVERDRIVE RANGE

COMPLAINT: Some Vehicles equipped with the 4R44E/4R55E, may exhibit a no forward engagement condition in the Overdrive range but will move in manual 2nd, Low, and Reverse,

CAUSE: One cause may be, that the bore plug that retains the Forward Modulator Valve, in the valve body, was installed backwards.

CORRECTION: Remove the valve body and inspect the Forward Modulator Control Valve line up and ensure the retaining plug between the Forward Modulator Control Valve spring and the EPC boost valve is installed correctly as shown in Figure 1.

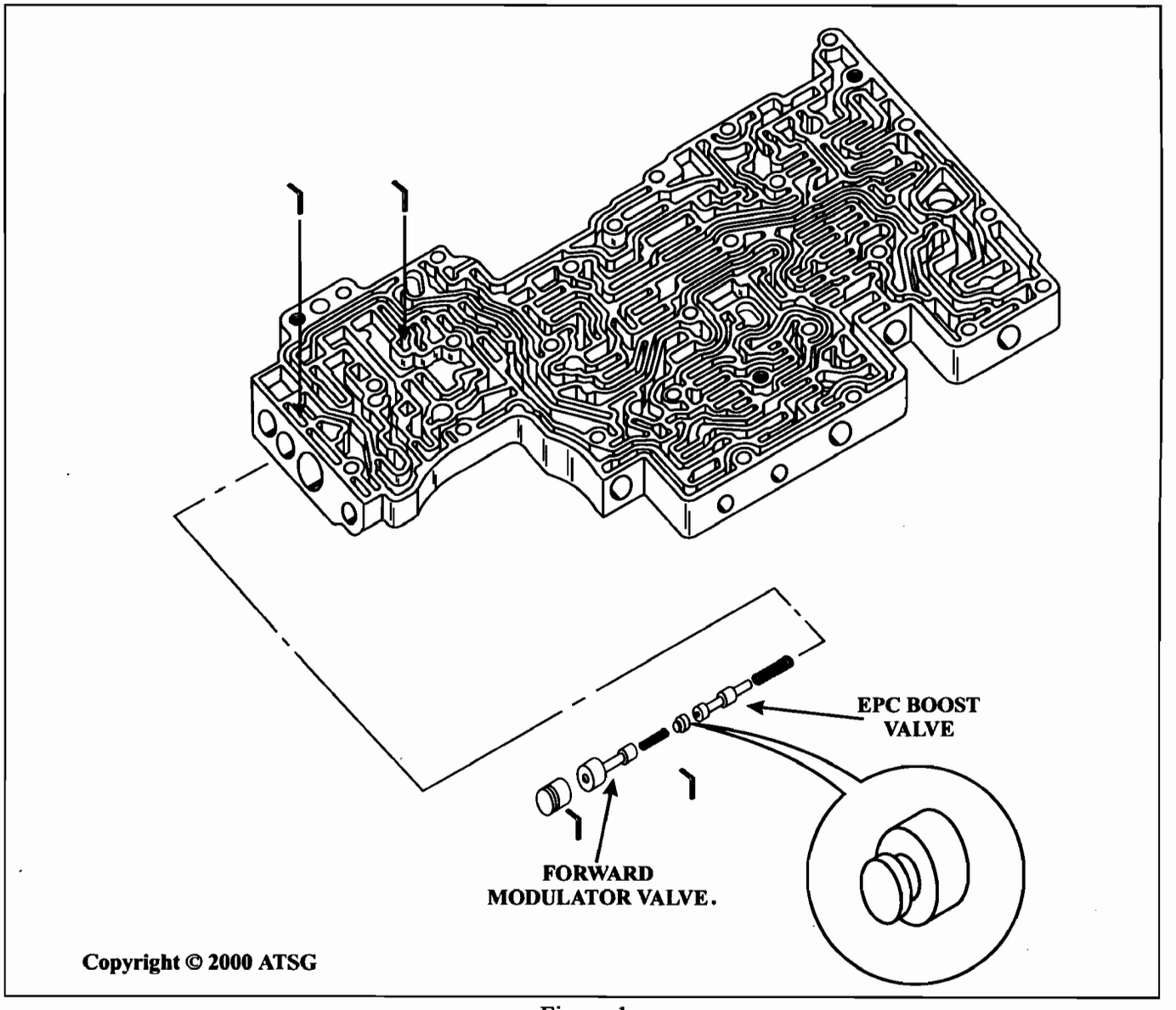

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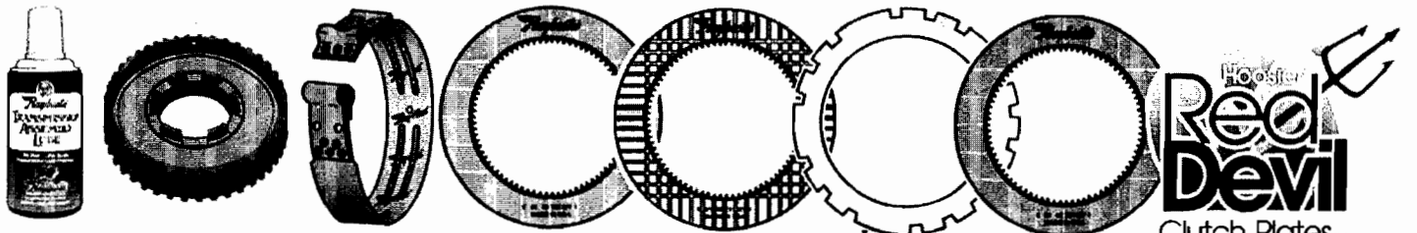
Figure 1

There's a New Flag in Town!

Raybestos receives QS 9000 certification!

Raybestos has long been recognized as a quality supplier to original equipment manufacturers in the U.S. and overseas. Our successful completion of QS 9000 certification assures the quality of Raybestos clutch plates to world class manufacturers everywhere. This same quality goes into all of our materials and processes to produce the highest quality parts, including those used every day in the aftermarket. Daily driving demands Raybestos quality ... see your Raybestos distributor for all of Raybestos' Performance Through Technology products.



Transmission Assembly Lube | **Mechanical Diode®** | **Ray-flex® Transmission Band** | **Blue Plate Special®** | **Friction and aTs™ Friction Plate** | **Steel Plate** | **Red Devil Clutch Plates™**

Performance Through Technology.®
Supplying World Class Products to the World!

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AFTERMARKET PRODUCTS COMPANY

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FORD 4R44E/4R55E/5R55E

RETAINER LOCATIONS

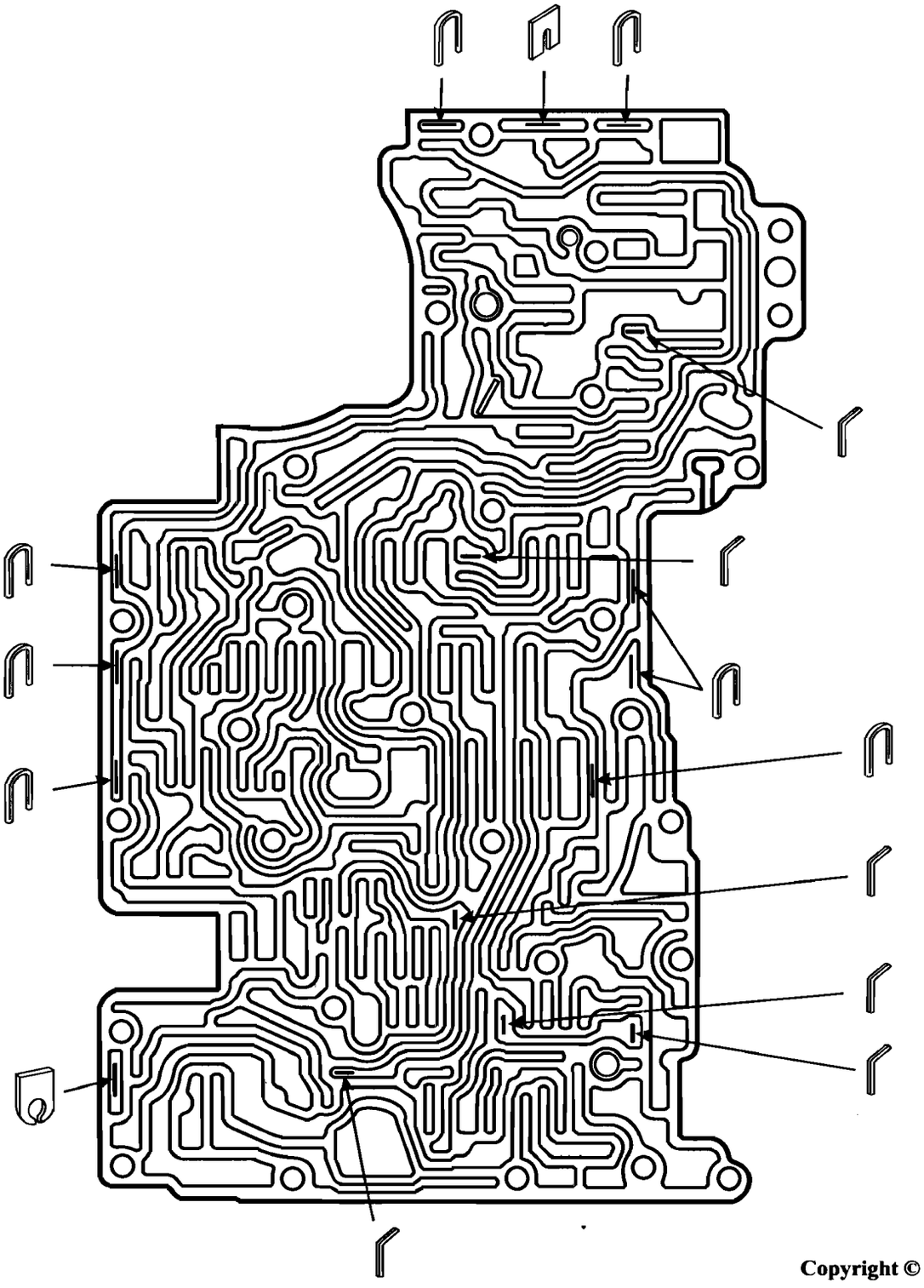

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Figure 1

FORD E4OD
PREMATURE OVERDRIVE CLUTCH FAILURE (INCREASED CAPACITY)

COMPLAINT: Some vehicles equipped with the E4OD transmission may exhibit premature failure of the overdrive clutches, especially heavier loaded vehicles.

CAUSE: The cause may be, not enough clutch capacity for the overdrive clutch.

CORRECTION: Install 3 clutches in the overdrive clutch pack by purchasing a thinner, .320" thick backing plate, to replace the previous .490" thick backing plate. The 3 clutch backing plate is available under OEM part number F3TZ-7B066-A. Refer to Figure 1 for both 2 clutch and 3 clutch stack-ups.

SERVICE INFORMATION:

Overdrive Clutch Backing Plate (3 Clutch) F3TZ-7B066-A
Overdrive Clutch Backing Plate (2 Clutch) E9TZ-7B066-B

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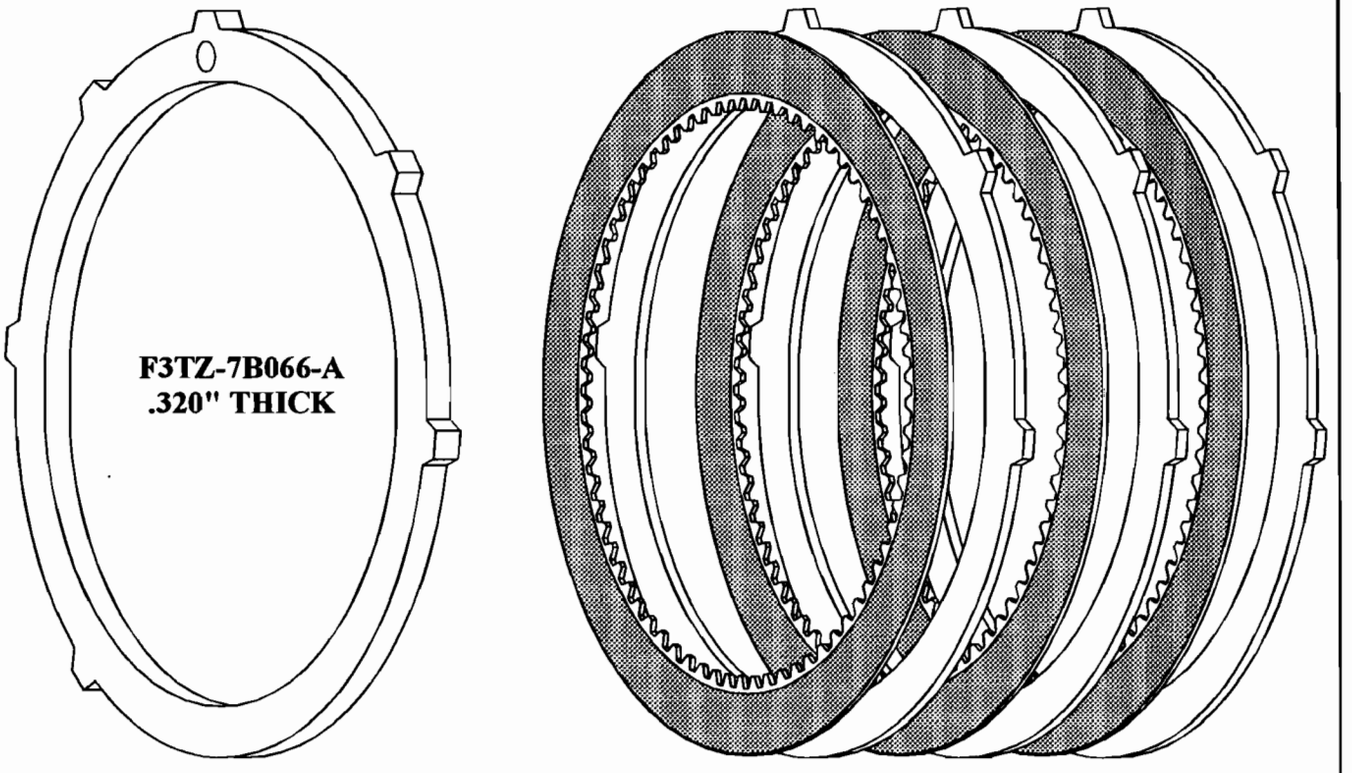
E4OD 3 PLATE OVERDRIVE CLUTCH STACK-UP



E4OD 2 PLATE OVERDRIVE CLUTCH STACK-UP

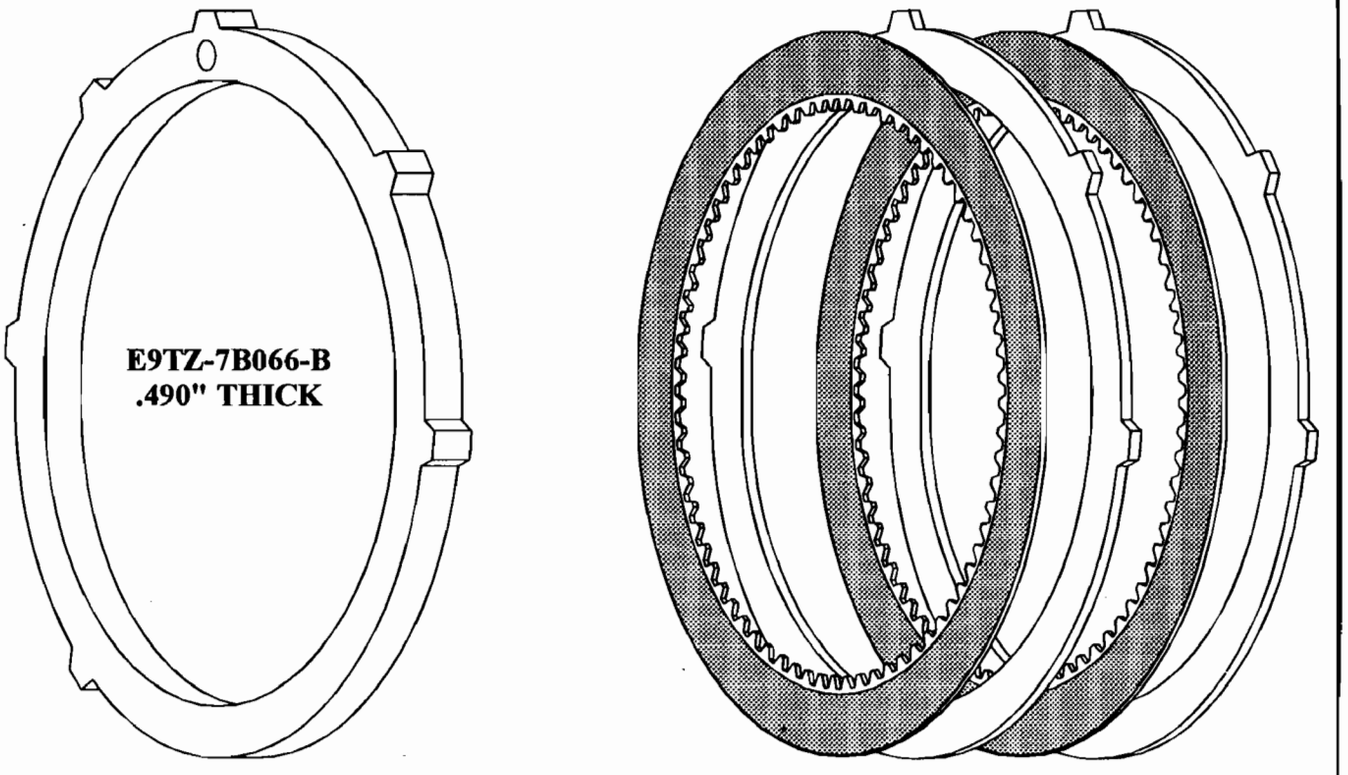


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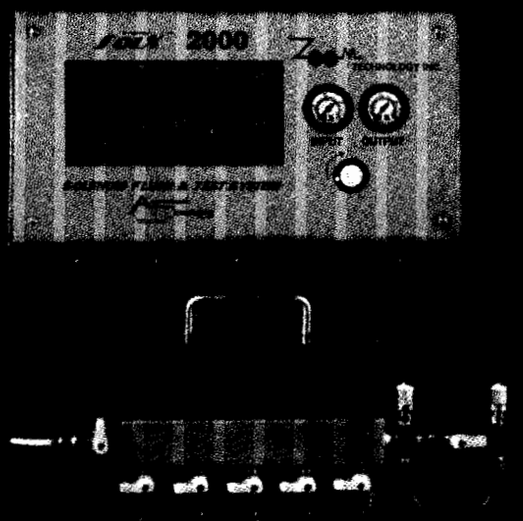
Figure 1

You can be sure of your solenoids



FLOW - TEMPERATURE - Oil flow and oil temperature can be digitally measured. **Helps you sort out bad solenoids quickly.**

OIL HEATER - Optional heated oil allows you to take advantage of the natural detergency of transmission fluid when it is hot as well as simulate normal operating conditions of the solenoid! **Give your solenoids a royal flush!**

SOLENOID DEMAGNETIZER - The optional solenoid demagnetizer lets you quickly demagnetize the solenoid and any metal material within it prior to flushing and testing.

MULTIMODE CONTROLLER - The Sol-X™ controller has 4 separate modes of operation:

MANUAL mode provides you with manual control of the solenoid on-off cycle.

CYCLE 1 mode provides a fast on off exercising of the solenoid.

CYCLE 2 mode provides an aggressive continuous flush cycling of the solenoid being tested.

FLUSH mode combines the features of the **CYCLE 2** mode with a built in Timer!! Walk away and come back when the **"TIMER FINISHED ALARM"** sounds. It's as simple as popping corn in a microwave oven.

MULTIMETER - The Sol-X™ multimeter allows you to continuously electrically evaluate the solenoid being tested. **Find opens, shorts and intermittents fast!**

SOLENOID DRIVE - Eight separate driver channels are provided to allow continuity checks of solenoid packs and harnessed solenoids.

SOLENOID POWER - Solenoid drives can be set up to operate either connected to ground or connected to common positive.

ON/OFF DUTY - Complete duty cycling controls are provided to allow either simple ON/OFF testing or PULSE WIDTH MODULATION (PWM) testing. Pulse width duties are set digitally to within 1% and are very stable and repeatable. **Repeatability means profit!**

FREQUENCY - You can select from 5 available operating frequencies for testing PWM solenoids.

SIZE - Bench top design is approximately 24"H x 22"W x 23"D. Operates from standard shop power.

CHECK OUT OUR UNIQUE FEATURES:

6 CHANNEL MANIFOLD - Fast and flexible solenoid adapter set-up. **Handles individual solenoids as well as solenoid packs!**

SOLENOID ADAPTERS - A complete line of specific solenoid adapters and solenoid pack plates are available. **The Sol-X™ handles all your solenoid testing needs.**

PRESSURE GAUGES - Input and output oil pressure can be accurately set and measured for proper solenoid testing.

ZOOM TECHNOLOGY, INC.

1003 Industrial Drive • West Berlin, NJ 08091

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Answermatic Division

FORD E4OD
MISSED SHIFTS

COMPLAINT: After rebuild, any vehicle equipped with the E4OD transmission may exhibit a condition of "missed shifts" on 2nd, 3rd and/or 4th gears. The scanner reveals "No Codes Present", and when manually shifting with an aftermarket shift box, the same condition exists.

CAUSE: The cause may be, one or more of the accumulator regulator valves sticking, all of which are located in the accumulator valve body. Refer to Figures 2 and 3. The hydraulic diagrams in Figure 1 will illustrate the hydraulic effect of a sticking accumulator regulator valve.

CORRECTION: Remove the accumulator valve body and inspect the accumulator regulator valve for the particular shift that you are concerned with. If the 1-2 shift was missing, and you have a 1991 model or later, ensure that the spring loaded screen is in the case under the main spacer plate. If none of the accumulator valves seem to be sticking it may be necessary to replace the complete accumulator valve body. Ensure that you install the proper accumulator valve body for the model that you are working on, as they will not interchange. The 1989-1994 models are identified with "E9" or "F4" in the casting number and 1995-1997 models are identified with "F5" in the casting number. Refer to Figures 2 and 3.

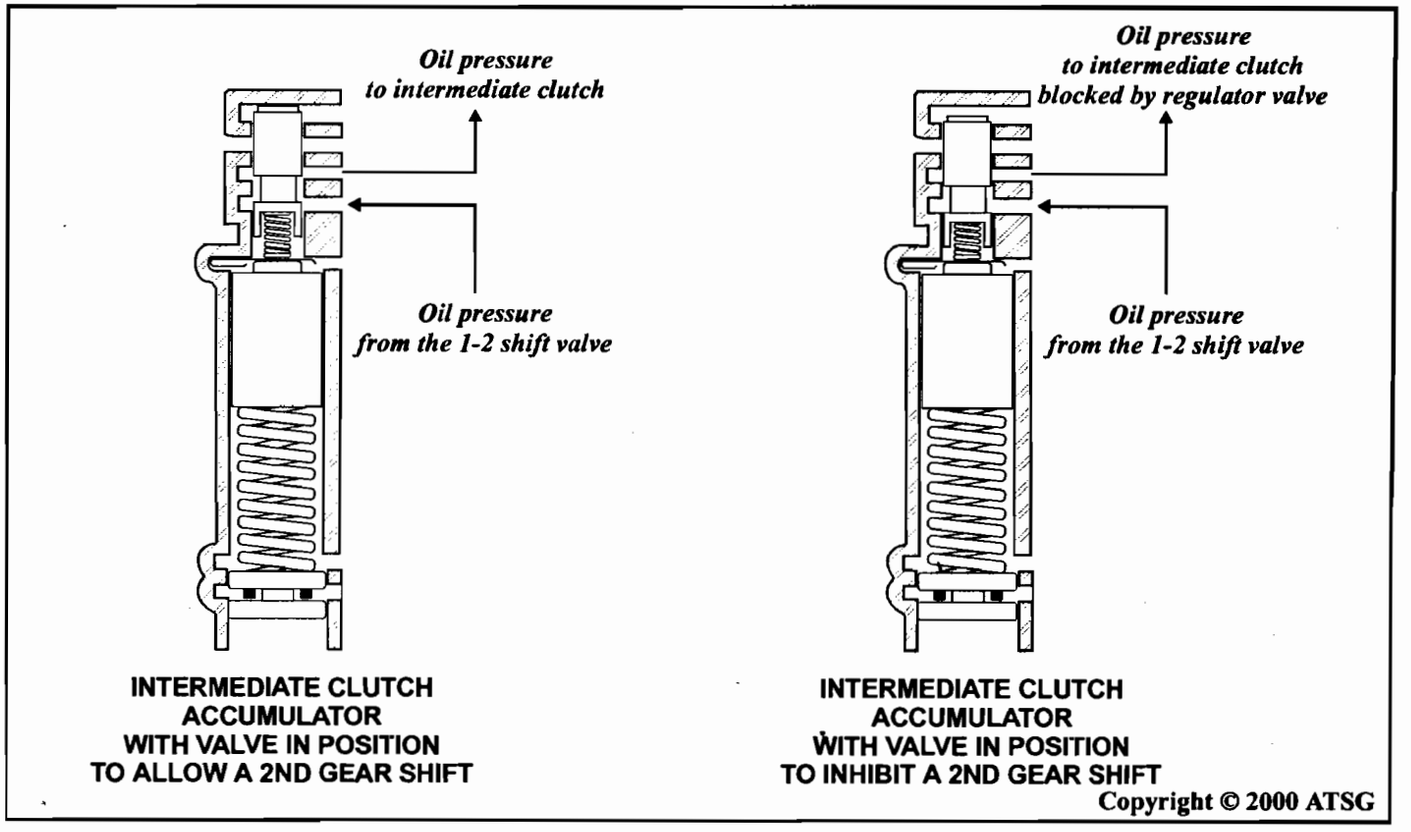

Figure 1

E4OD 1989-1994 ACCUMULATOR VALVE BODY

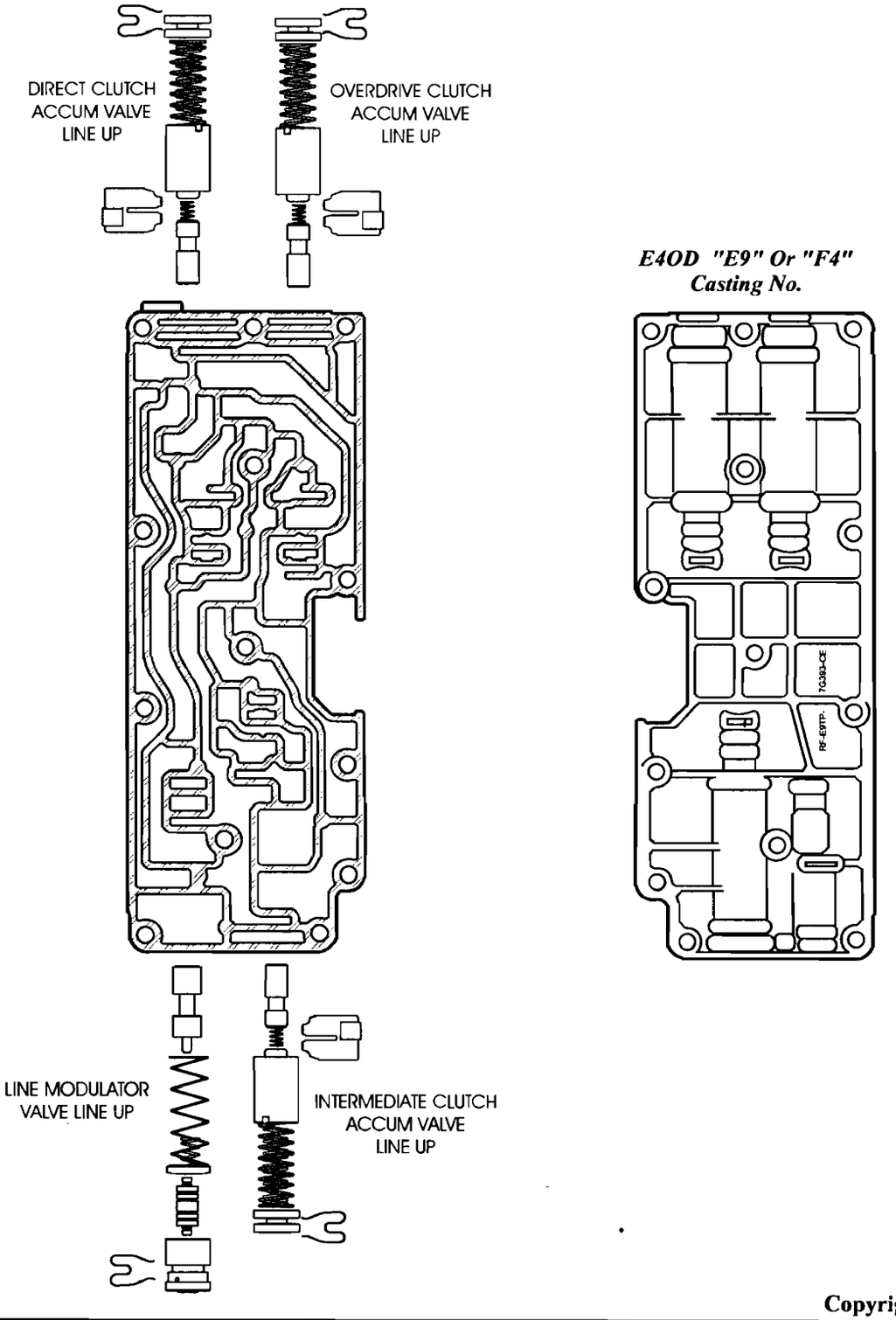

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Figure 2

E4OD 1995-1997 ACCUMULATOR VALVE BODY

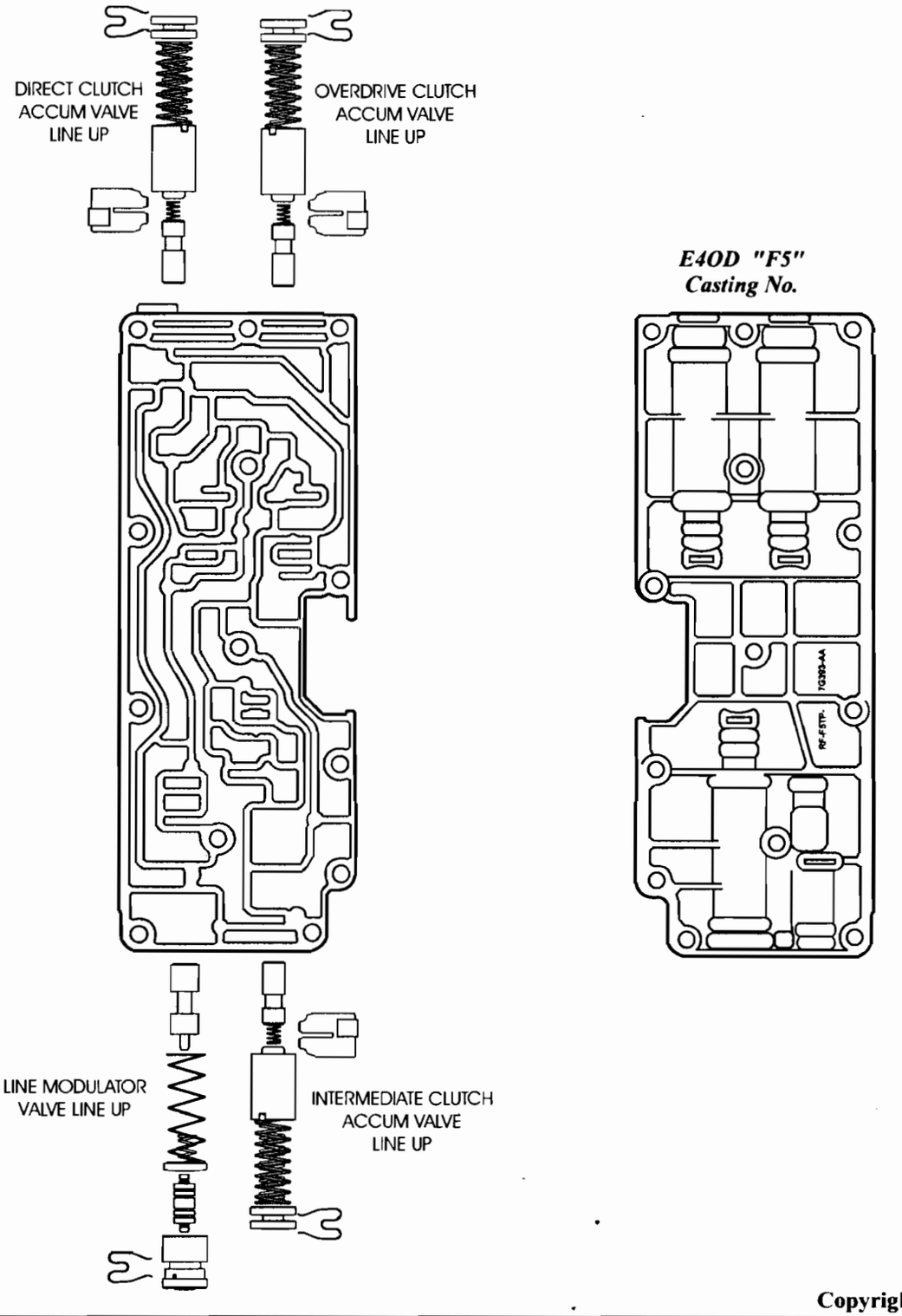

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Figure 3

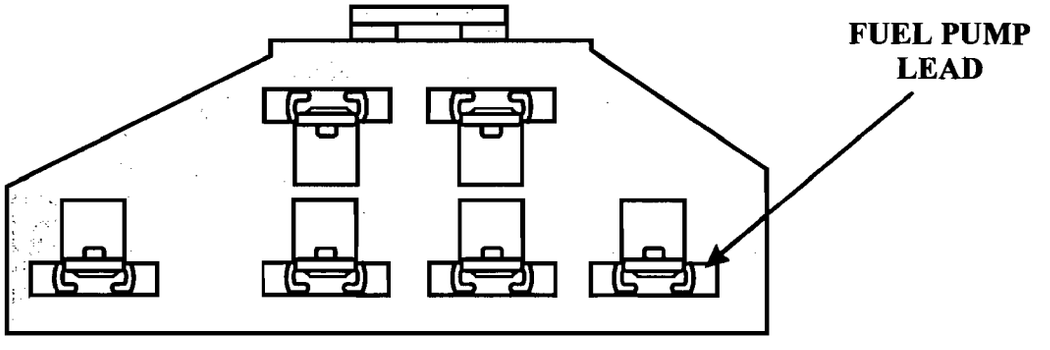
FORD E4OD
ENGINE STALLS IN REVERSE

COMPLAINT: Some 1994-95 Ford trucks, equipped with the Programable Speedometer Odometer Module, may exhibit erratic speedometer operation, as well as an occasional engine stall when the selector is placed in Reverse. ***NOTE: This complaint is commonly mistaken for Torque Convertor Clutch application in Reverse.***

CAUSE: The cause may be, a faulty Programable Speedometer Odometer Module, indicating the vehicle is traveling at speeds in excess of 100 mph in Reverse. When the Powertrain Control Module recognizes this, it may go into an ***Overspeed Protection Program***. When in this program, the Powertrain Control Module may remove the ground signal applied to the Fuel Pump Relay resulting in fuel shut-off.

CORRECTION: Disconnect the Rear ABS sensor from the differential to disable speedometer operation completely. If the problem still persists and the speedometer is still showing high vehicle speed, ground the terminal shown in the diagnostic connector shown in Figure 1 as a test, to ensure that the fuel pump is not being shut off. If the stalling condition is cured, replace the Programable Speedometer Odometer Module (Complete Speedometer Head).
If the stalling condition still persists it may be a plugged transmission oil cooler, partially open TCC solenoid, or pump halves that have not been torqued properly or they are cross-leaking. Repair and/or replace as necessary.

DIAGNOSTIC CONNECTOR



NOTE: Grounding this terminal is only for a test. It will allow the fuel pump to run continuously with the ignition ON.

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Figure 1

FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

COMPLAINT: The transmission takes off in 4th gear, Line pressure is high, Scan tool can not initiate Self-Tests or store service codes and the battery(s) may run down.

CAUSE: The above complaints can be caused by a faulty PCM Power Relay, formally called an EEC Power Relay for gas applications and a TECA Relay for diesel applications, which is either stuck off or stuck on.
The PCM Power Relay supplies power to the PCM at pins 37 and 57 and to pin 1 for keep alive power on vehicles equipped with an ECC-IV system and to pins 71 and 97 and to pin 55 for keep alive power on vehicles equipped with an EEC-V system. The PCM Power Relay also supplies power directly to the solenoid block at pins 1 and 12 on some models and directly to pin 1 only on other models.

CORRECTION: Diagnose the relay circuits by using the illustration in figure 1 and then replace the relay if necessary. Use the illustrations in figures 2 thru 7 to locate the PCM Power Relay.
The wiring diagram in figure 8 illustrates a PCM Power Relay system that supplies power ***directly*** to terminals 1 and 12 of the solenoid block.
The wiring diagram in figure 9 illustrates a PCM Power Relay system that supplies power ***directly*** to pin 12 only of the solenoid block and supplies power ***indirectly*** to pin 1 of the solenoid block via pin 35 from the PCM.

NOTE: If the PCM Power Relay has no power to the direct battery feed terminal, check the condition of fusible link "A" and "B" coming off the positive battery cable as shown in the wiring diagrams in figures 8 and 9.
REMEMBER, not all relay applications supply power directly to pins 1 and 12 at the solenoid block for EPC and shift solenoid power, some only supply power directly to pin 1 for the shift solenoids up to and including 1994 models.
1995 and later models have power supplied directly to both pins 1 and 12.

SERVICE INFORMATION:

Early PCM Power Relay*.....*E3AZ-12A646-A
Late PCM Power Relay*.....*F0AZ-14N089-A

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

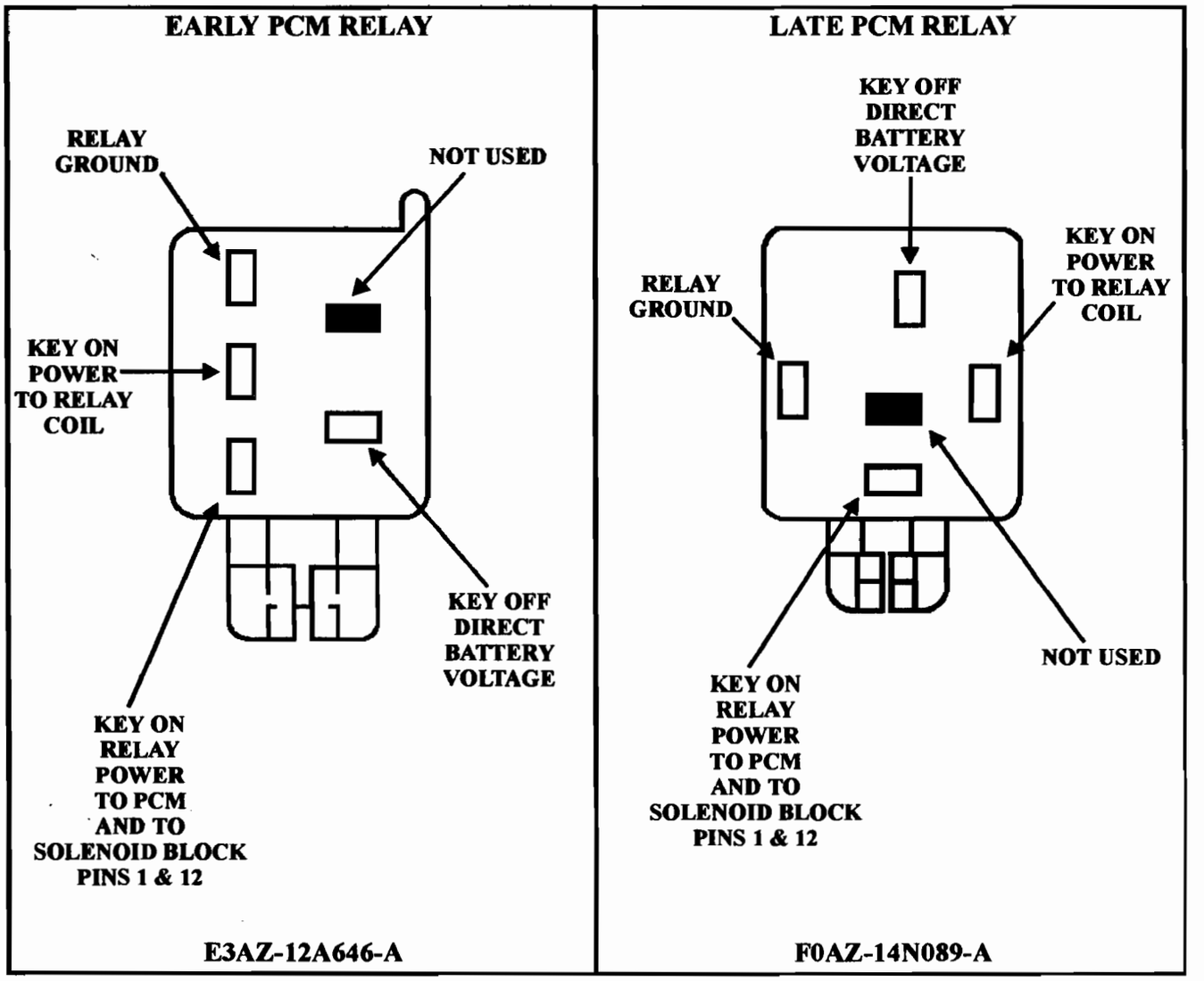

Figure 1

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

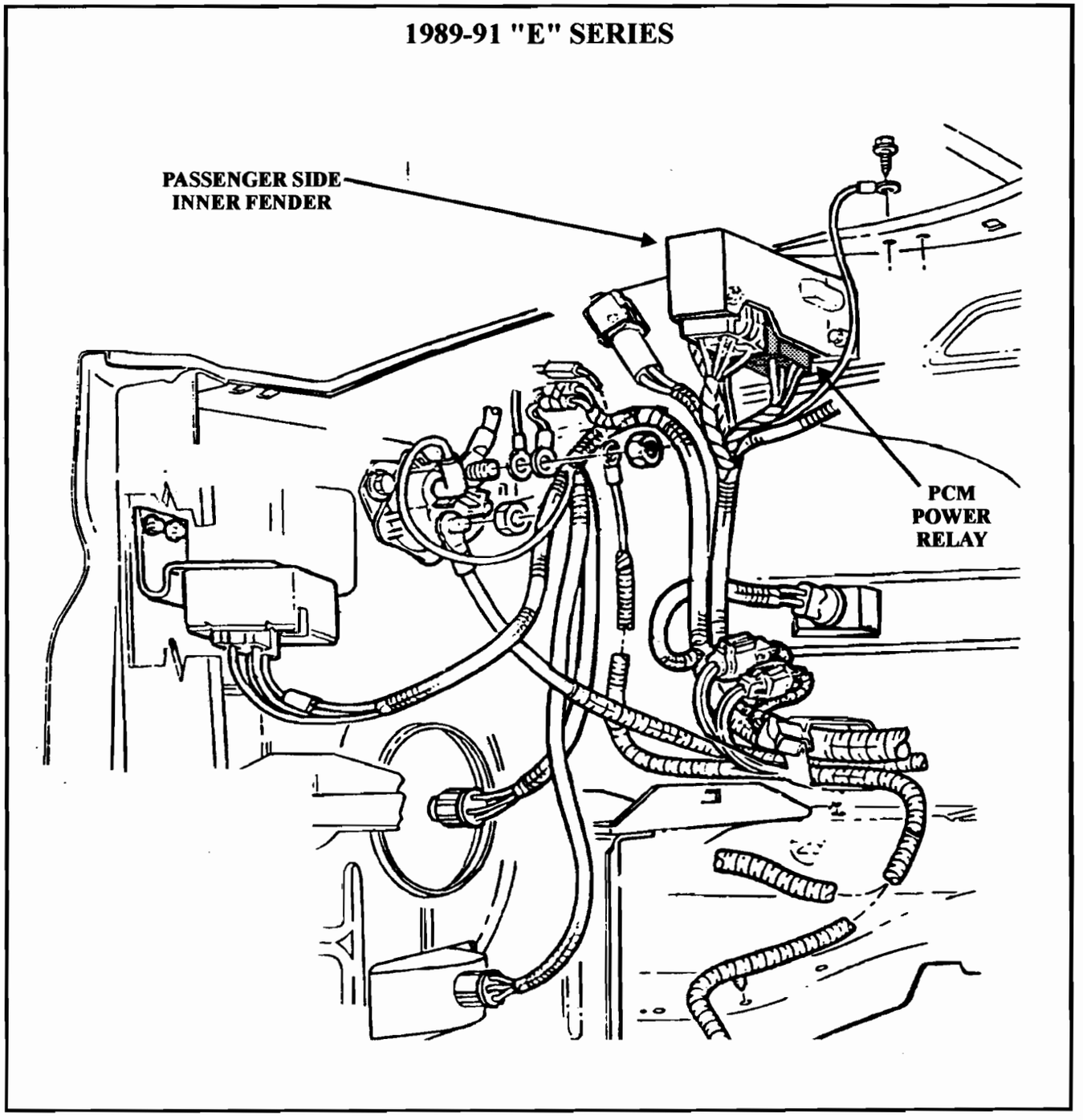

Figure 2

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

1989-91 "F" SERIES

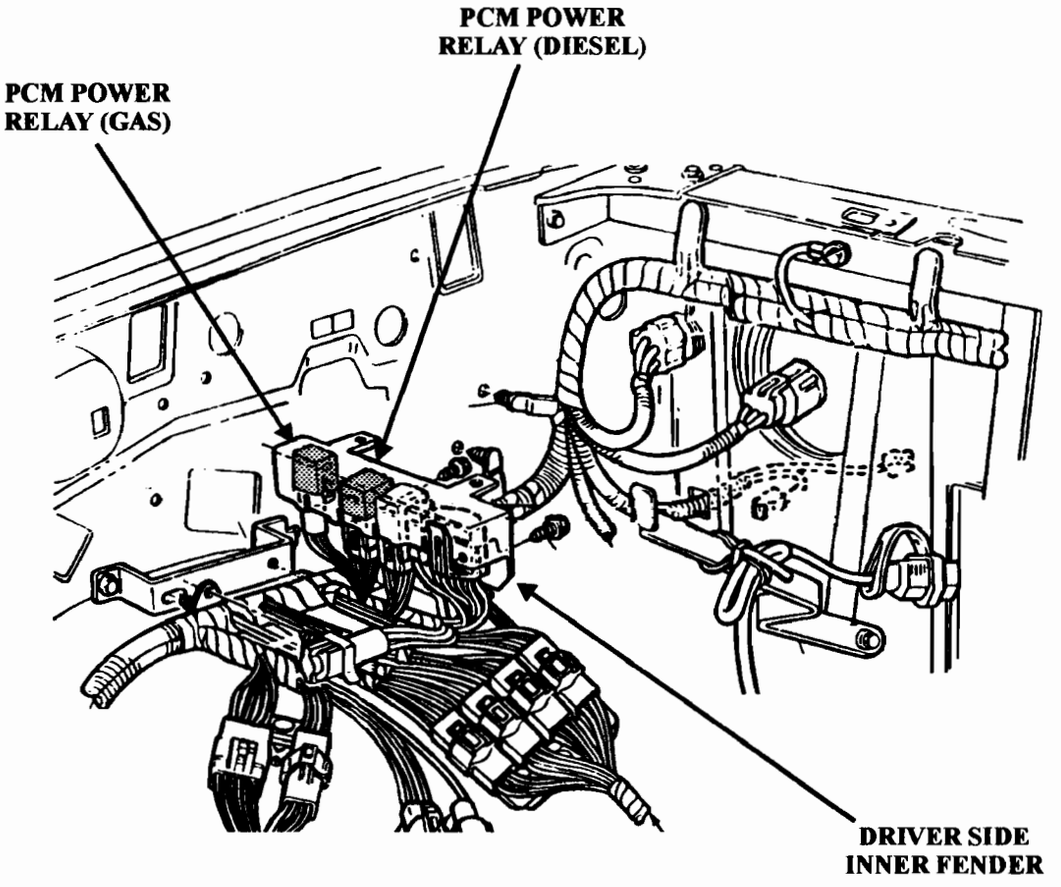

Figure 3

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IT TAKES SOMETHING EXTRA TO STAND OUT FROM THE COMPETITION!

NEW!

SHIFT KITS FOR AUTOMATIC IMPORTS

NEW!

SK® GF4A-EL

PROBE ALL 1993, 1994-97 WITH 2.5L (4EAT-GF) MAZDA 1994-97 MX6/626 WITH 2.5L MILLENIA 1995-97 WITH 2.5L

Rough 1-2 shift complaint without removing trans. Bang 1-2 shift--Rough 2-3 shift. 2-3 cutloose and burned plates. Won't move forward or reverse. Low line pressure--Total Burnup. Pump wear & low or no cooler flow.

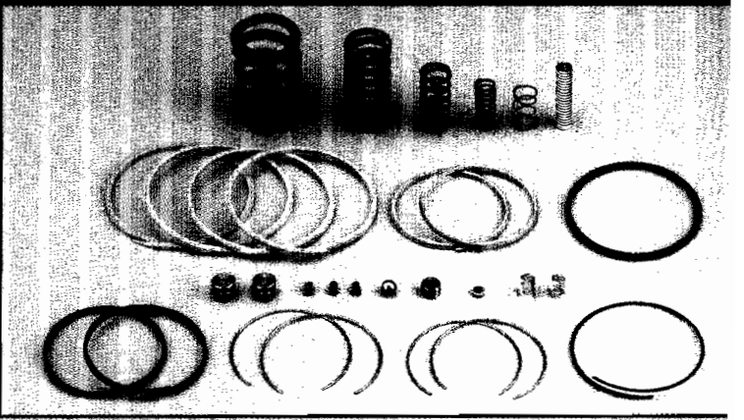
SK® RE4F02A & RL4F02A SHIFT KIT®

MAXIMA 85-96 • PULSAR 88-90 STANZA 86-90

- Falls out of gear at stop sign HOT.
- Delayed forward engagement.
- No 3rd after a 3-2 or 4-2 Kickdown.
- 4-3 or 4-2 Kickdown runaway.
- Burns up the 3-4 clutches
- Direct clutch (3rd) Inner seal leak; Wears flat or opens up.
- Soft 1-2 and 2-3
- Hi-temp Low-Shrink rings assure quality shifts & extended durability.

RE4R01A Shift Kit

FOR NISSAN, MAZDA, AND SUBARU 4SP-RWD



Direct Clutch (3rd) burnup 2-3 Cutloose Long soft 3rd. Planet Burnup--Long, soft or slide 1-2--band failure--Long 3-4 Lube failure, overheat and total burnup

Accumulator Springs, Pressur Regulator Spring, Steel Plugs, Ne Cap Plug, Check Ball and Clutch Sea

SK® KM-175/77

MITSUBISHI, HYUNDAI AND DODGE 1988UP ALL 4-SPD WITH OR WITHOUT LOCKUP.

2-3 cutloose and/or long soft 3rd--Front clutch burnup(3rd) 3-4 neutral--4-2 kickdown runaway--Coast downshift bang long slide 1-2 shift--Long 3-4--No reverse or no forward. Won't fill converter--Low/no cooler flow--Wrong fluid level.

ADDITIONAL SHIFT KITS FOR AUTOMATIC IMPORTS

- **SK CD4E-JR - For Mazda**
- **SK G4A - For FOR**
- **SK N4AEL - For RX7**

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

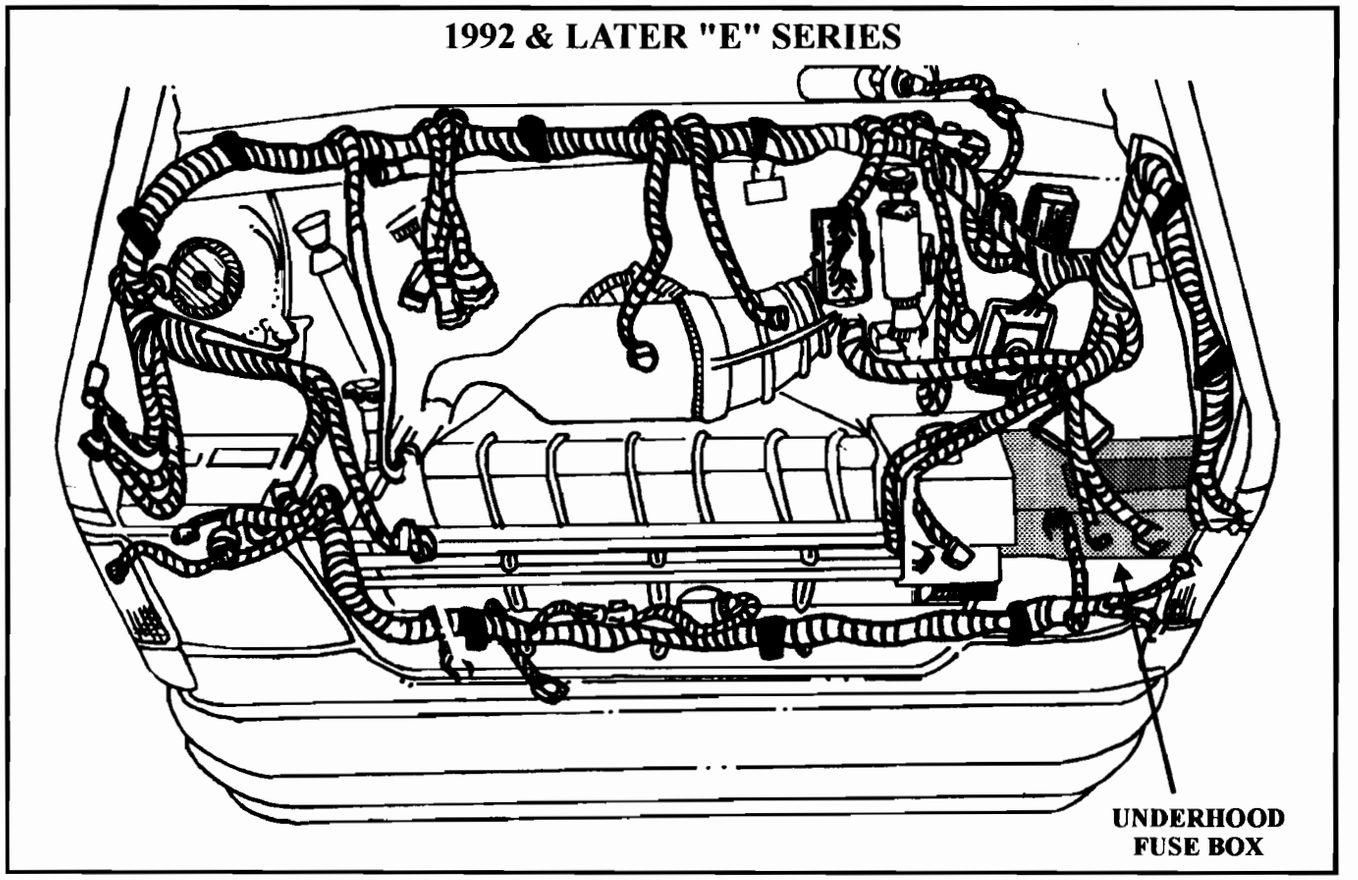

Figure 4

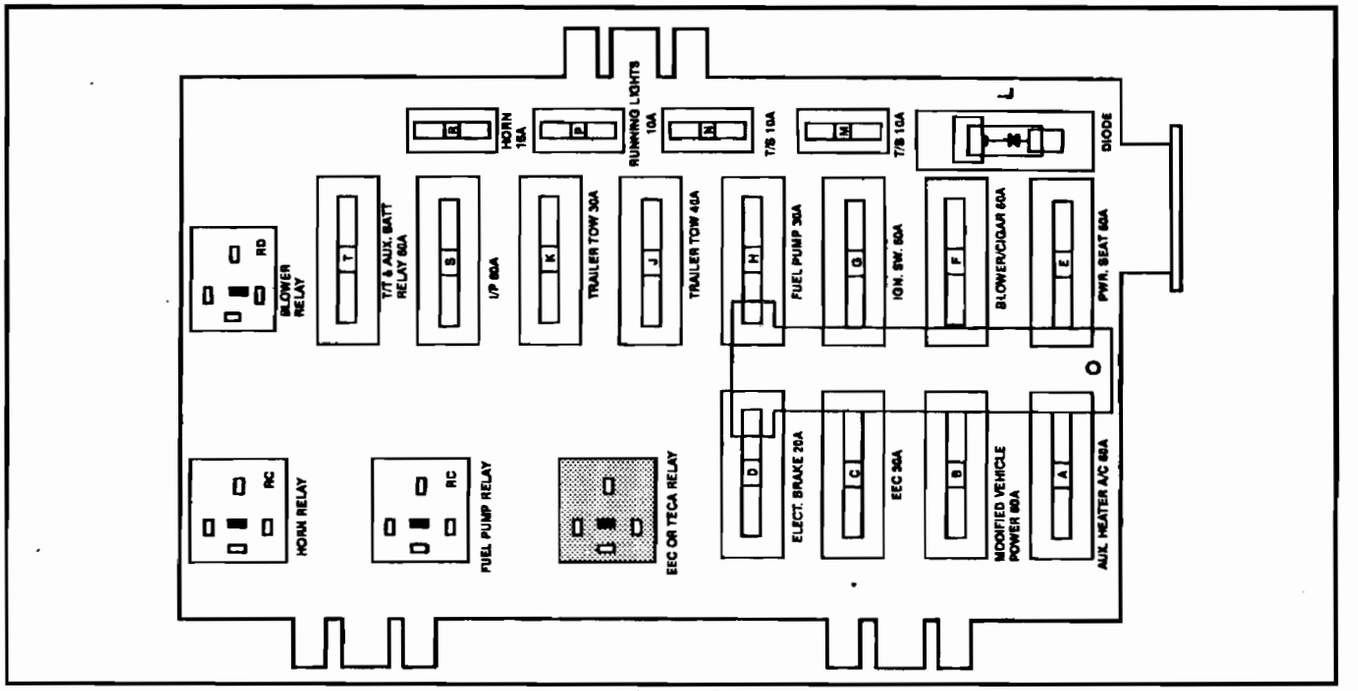

Figure 5

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

1992 & LATER "F" SERIES

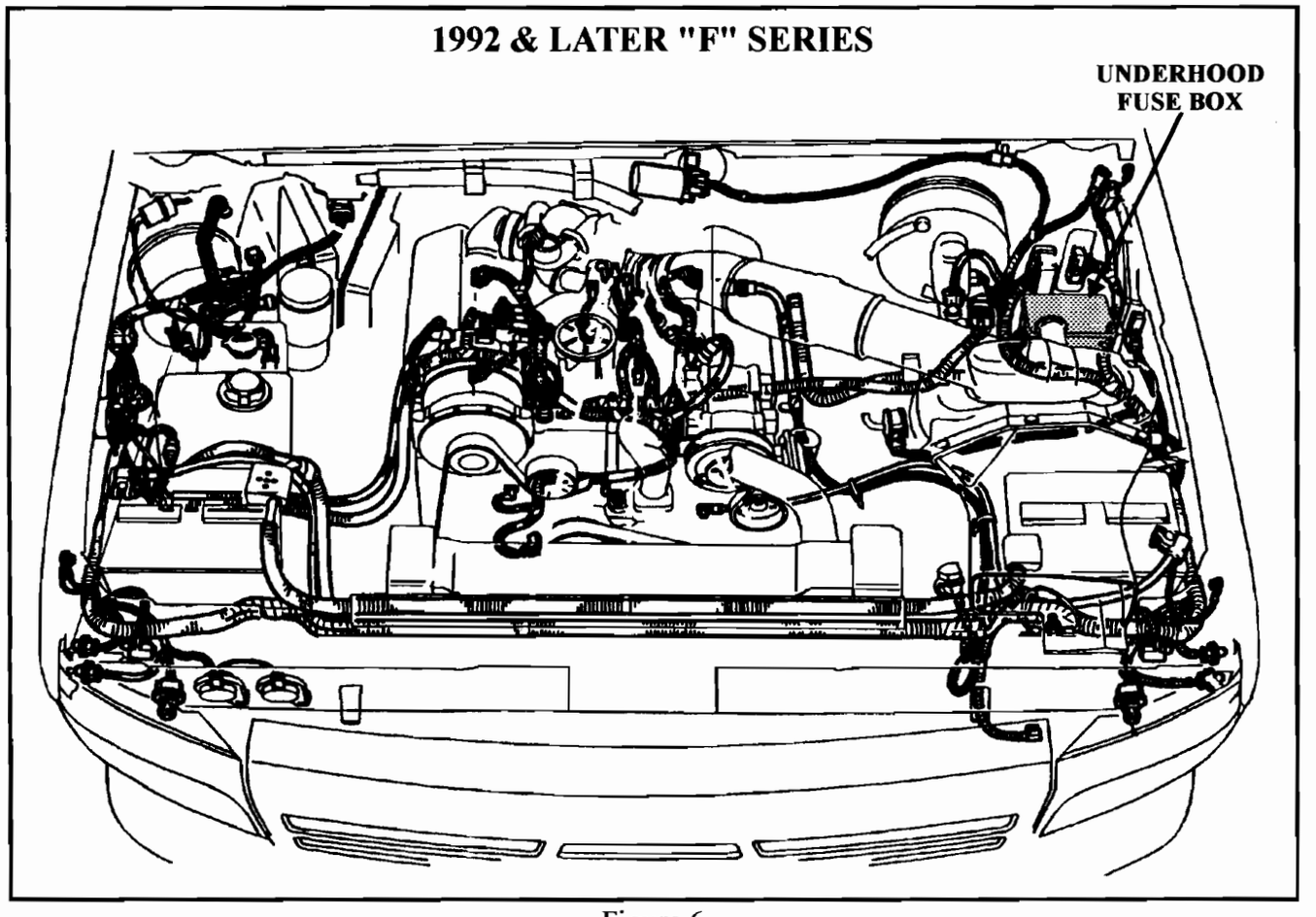

Figure 6

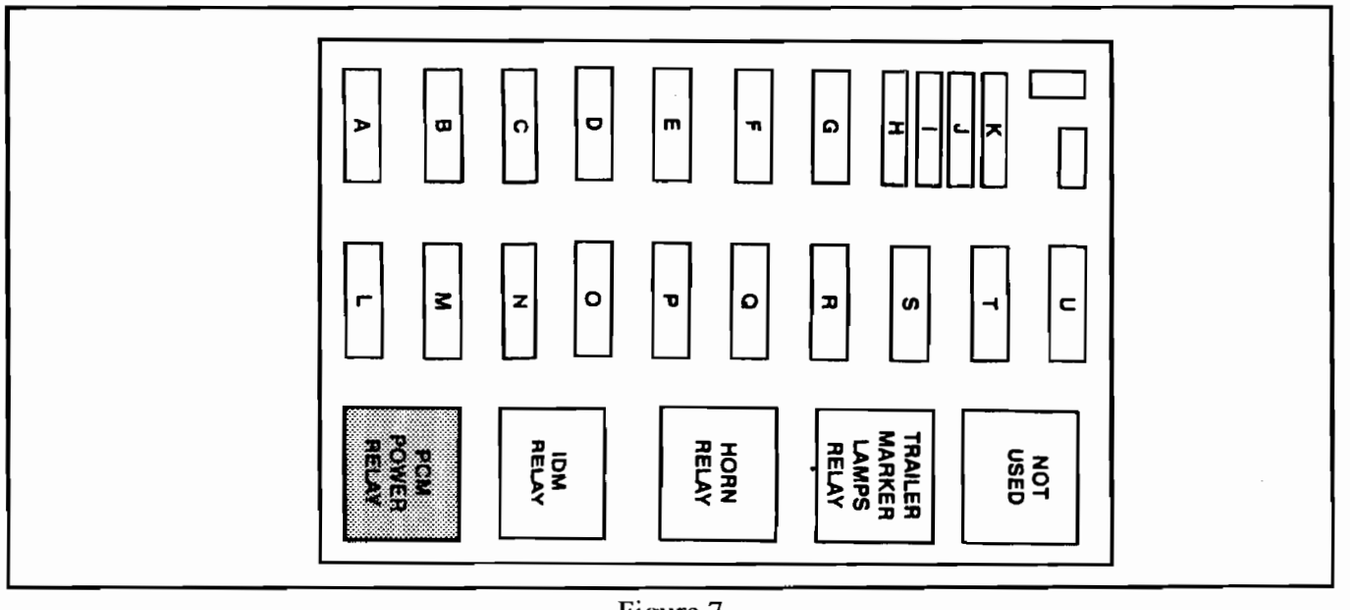

Figure 7

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STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

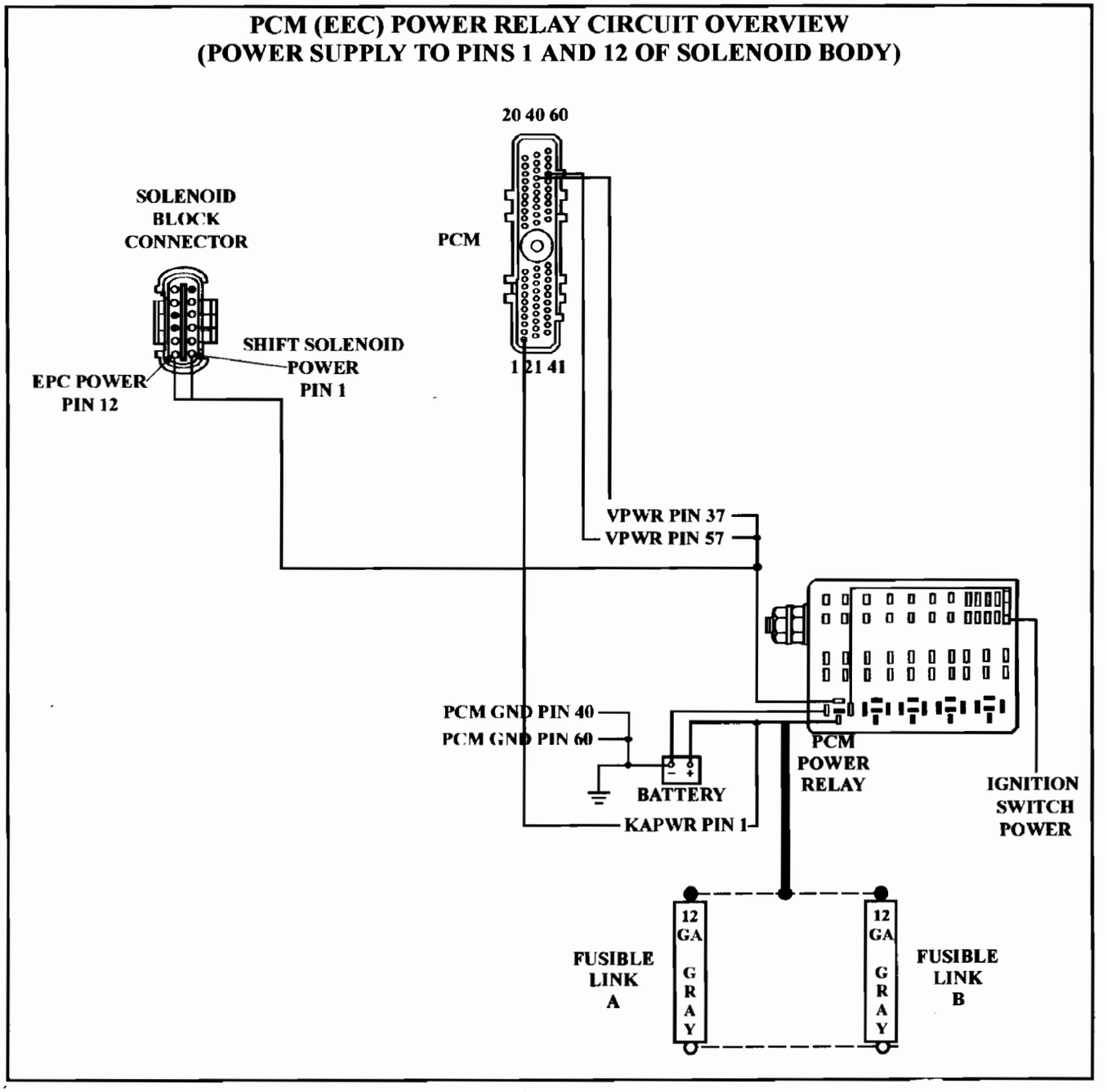

Figure 8

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FORD E4OD

STUCK IN FOURTH GEAR, HIGH LINE PRESSURE, NO CODES STORED, SELF-TESTS CANNOT RUN AND BATTERY(S) MAY RUN DOWN

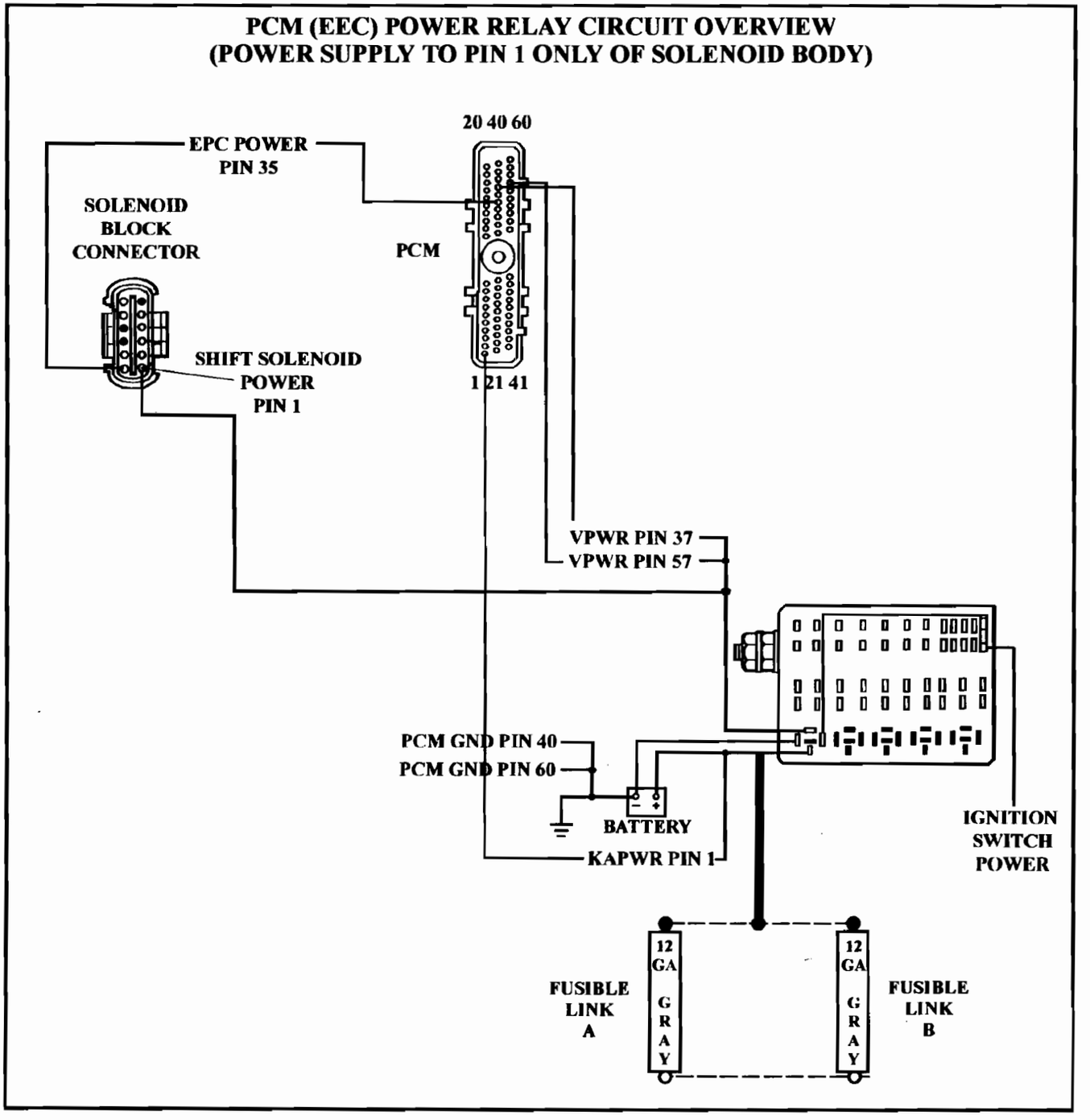

Figure 9

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Automatic Specialty Tools

TransPorter™

Made in USA

Fluid Evacuator-Injector

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REDUCE LABOR COSTS - INCREASE PROFITS

In seconds, with this simple-to-use tool, drain and fill any viscosity fluid, (even heavy gear grease). The TransPorter's patented design fits into hard to reach openings and eliminates messy drips and spills. Requires pressurized air and/or vacuum source.

SOME APPLICABLE USES:

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Overfill Transmission Fluid Removal • Differential Drain-Refill
Flush Coolant Line • Radiator–Anti-Freeze Evacuation from Underhood
BLEED CLUTCH IN ONLY 10 MINUTES

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Schaffer Shifter®

Transmission Tester

-2114

om

FORD AODE/4R70W

CASE INTERCHANGEABILITY

COMPLAINT: The case interchange area of concern for this complaint is the manual selector linkage area and the mounting of the Manual Lever Position Sensor (MLPS).
After the transmission is overhauled, one of the last things to be done is the mounting of the MLPS, at this time the technician realizes, the MLPS cannot be mounted because it does not fit, or, the geometry of manual linkage does not operate correctly. The MLPS, as a result of this may also not range correctly.

CAUSE: AODE cases are different in thickness in the pan rail area from the manual lever seal surface to the manual lever retaining pin hole.
These case differences also require different length manual selector levers and different height manual lever position sensors.
These cases, manual selector levers and manual lever position sensors are NOT interchangeable!
This may go unnoticed until the transmission is completely assembled or even after it is installed in the vehicle.

CORRECTION: The cases are classified in two categories, early and late:

The **EARLY** case, manual shift linkage and manual lever position sensor can be identified in the following way:

(1) The case has ***NO drilled and tapped bosses*** in the bell housing area on the manual shift linkage side of the case as shown in figure 1.
(2) Measure the distance of the pan rail from the manual lever seal surface to the retaining pin hole also shown in figure 1, the measurement is .844".
(3) Measure the manual lever shaft from the lever to the retaining pin groove also shown in figure 1, the measurement is .922". The early manual shift lever is ***STRAIGHT.***
(4) The Manual Lever Position Sensor that belongs with the early design has ***SHORT*** torque limiters also shown in figure 1.

The **LATE** case, manual shift linkage and manual lever position sensor can be identified in the following way:

(1) The case has ***TWO drilled and tapped bosses*** in the bell housing area on the manual shift linkage side of the case, as shown in figure 2.
(2) Measure the distance of the pan rail from the manual lever seal surface to the retaining pin hole also shown in figure 2, the measurement is .701".)
(3) Measure the manual lever shaft from the lever to the retaining pin groove also shown in figure 2, the measurement is .753". The late manual shift lever is ***OFFSET.***
(4) The Manual Lever Position Sensor that belongs with the late design has ***TALL*** torque limiters also shown in figure 2.

NOTE: **DO NOT** use the rough forge (RF) numbers on the side of the case to identify early from late, ***this is unreliable.***
Some early design cases may have ***ONE drilled and tapped boss*** in the bell housing area.

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FORD AODE/4R70W

CASE INTERCHANGEABILITY

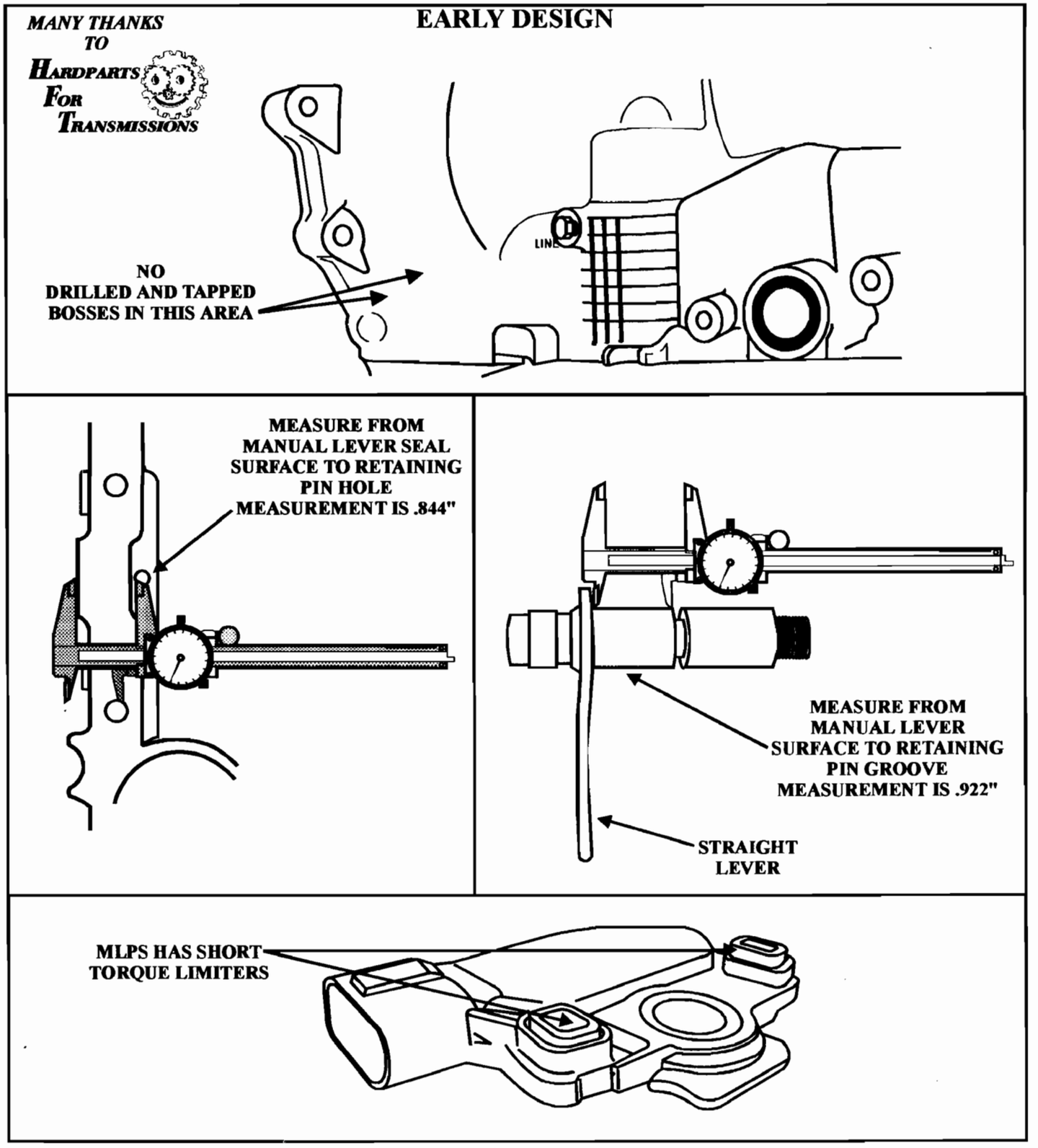

Figure 1

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FORD AODE/4R70W

CASE INTERCHANGEABILITY

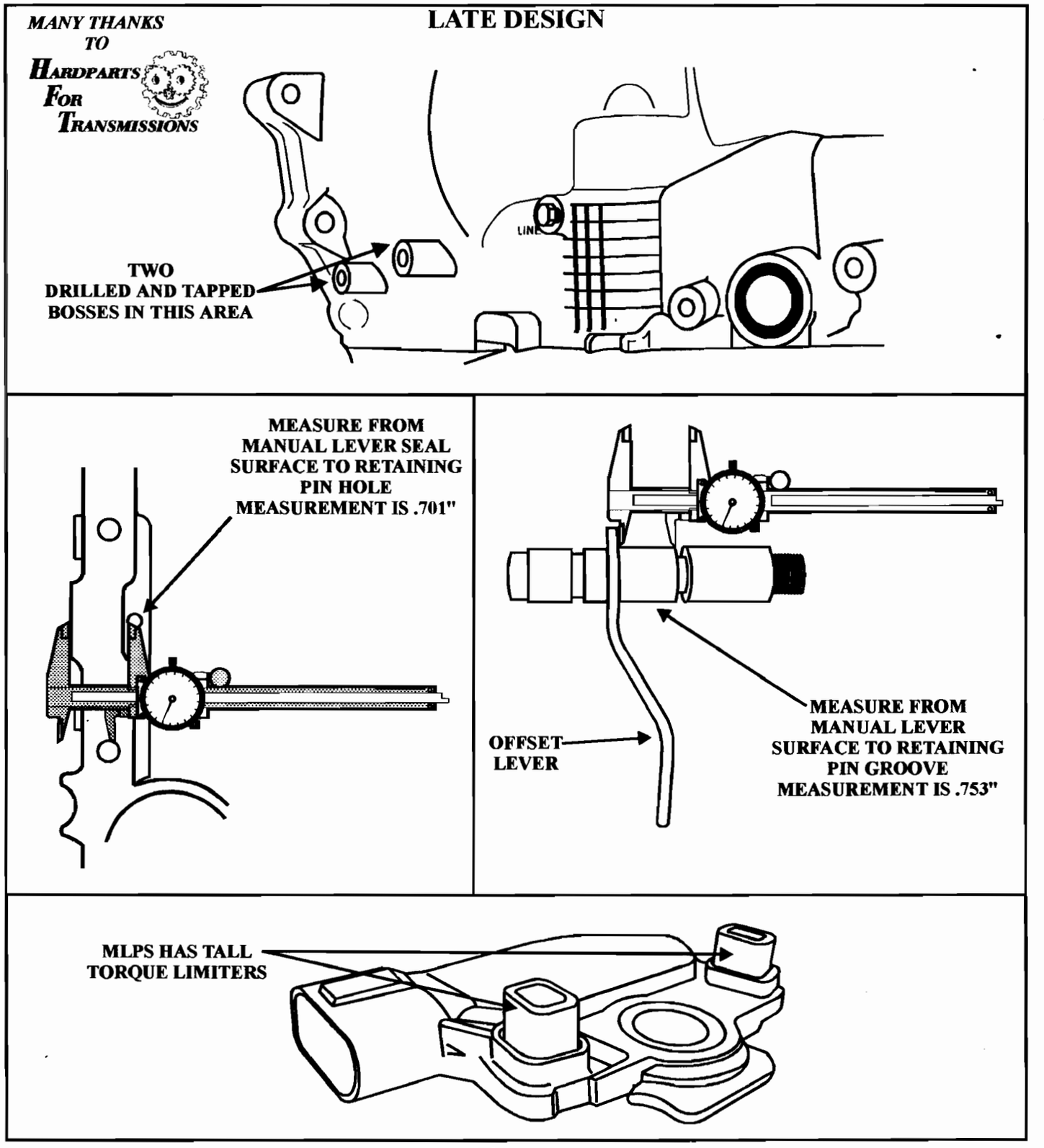

Figure 2

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FORD AX4S TRANSAXLE

SECOND GEAR STARTS

COMPLAINT: 1995 Ford Windstar Vans equipped with the AX4S Transaxle, and the EEC-V system may exhibit a second gear start. The second gear start may occur cold, or hot. A trouble code 1784 may also be stored in memory.

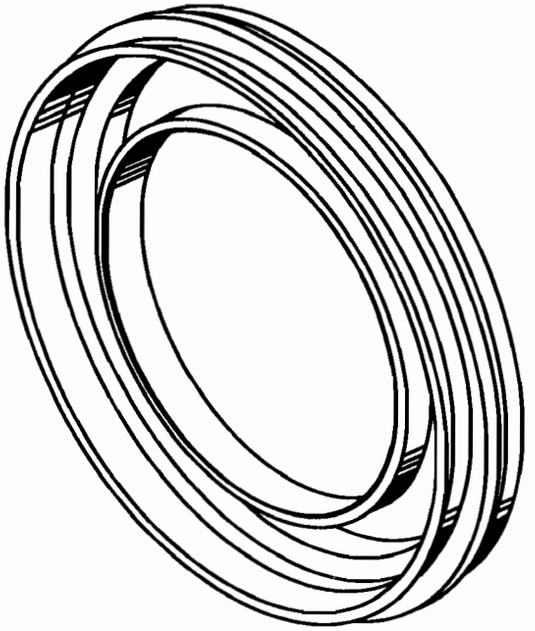
CAUSE: The cause may be a cracked Forward Clutch Piston , causing leakage of Forward Clutch pressure. A.T.S.G has found that some 1995 vehicles are still equipped with an aluminum Forward Clutch Piston.The Ford EEC-V controller has the ability to recognize slippage in this gear, and will command the Transaxle to start in second gear, as a default gear start.

CORRECTION: Replace all aluminum Forward Clutch Pistons with the updated Steel Piston as shown in Figure 1.

SERVICE INFORMATION:

Steel Forward Clutch Piston.....F4DZ-7A262-A

NEW STEEL FORWARD CLUTCH PISTON



Ford Part Number F4DZ-7A262-A

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Figure1

FORD AX4S/AX4N

TCC SOLENOID CHANGE

CHANGE: At the start of production for the 1997 model year, the Lincoln Continental equipped with the AX4N transmission received a new design Modulated TCC Solenoid.
At the start of production for the 1998 model year, the Taurus and Sable also received this new design solenoid. The new design solenoid is ***round***, like the previous design solenoid.
The new design solenoid can be identified by the ***BLUE*** connector as compared to the previous design Modulated TCC Solenoid which has a ***WHITE*** connector.

REASON: Improved converter clutch application and durability.

PARTS AFFECTED:
The new design Modulated TCC Solenoid with the ***BLUE*** connector has a resistance value of ***13-24 Ohms*** as shown in figure 1.
The EEC-V Processor for vehicles equipped with the new design higher resistance solenoid has a new design solenoid driver inside the processor which is referred to, in engineering terms as **"HIGH Z"** which will create a new design processor.
The previous design Modulated TCC Solenoid with the ***WHITE*** connector has a resistance value of ***0.98-1.6 Ohms.***
Both the EEC-IV and the EEC-V processors that operate the previous design low resistance Modulated TCC Solenoid, is referred to in engineering terms as **"LOW Z".**

INTERCHANGEABILITY:
As a result of the higher resistance in the new design Modulated TCC Solenoid and the change in the solenoid driver inside the processor, the OE Manufacturer advises ***against*** using the new design solenoid to back service any vehicles that were not equipped with this solenoid as original equipment.
Use the chart in figure 2 to check the resistance of the TCC Solenoid through the case connector in order to make certain of which solenoid is in the transmission.

SERVICE INFORMATION:
Modulated TCC Solenoid with Blue Connector.....F7OZ-7G136-AA
Modulated TCC Solenoid with White Connector.....F3DZ-7G136-AA

SOLENOID RESISTANCE...13-24 OHMS

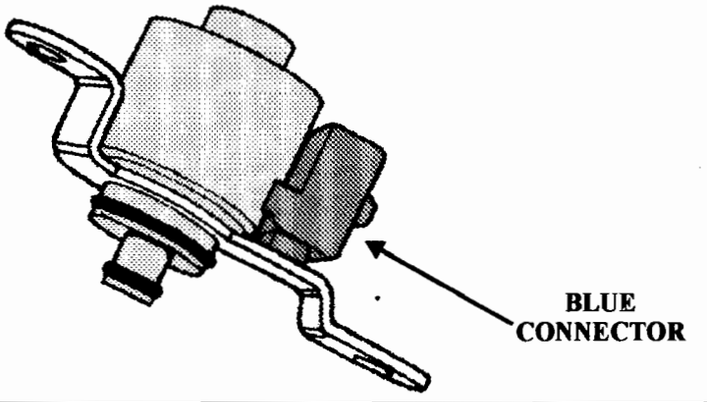

Figure 1

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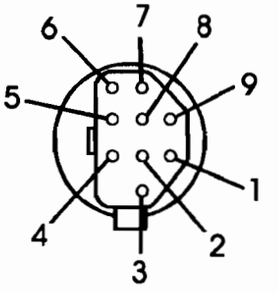
FORD AX4S/AX4N

TCC SOLENOID CHANGE RESISTANCE CHART

SOLENOID	SOLENOID RESISTANCE (OHMS)
SS1	15 - 25
SS2	15 - 25
SS3	15 - 25
EARLY MLUS	.98 - 1.6
LATE MLUS	13-24
EPC	3.23-5.50

°C	°F	TFT SENSOR (OHMS)
0-20	32-58	100k - 37k
21-40	59-104	37k - 16k
41-70	105-158	16k - 5k
71-90	159-194	5k - 2.7k
91-110	195-230	2.7k - 1.5k
111-130	231-266	1.5k - 0.8k
131-150	267-302	0.8k - 0.5k

1. EPC GROUND
2. EPC AND MLUS POWER
3. SS3 GROUND
4. MLUS GROUND
5. SHIFT SOLENOID POWER
6. SS1 GROUND
7. TFT
8. SS2 GROUND
9. TFT RETURN



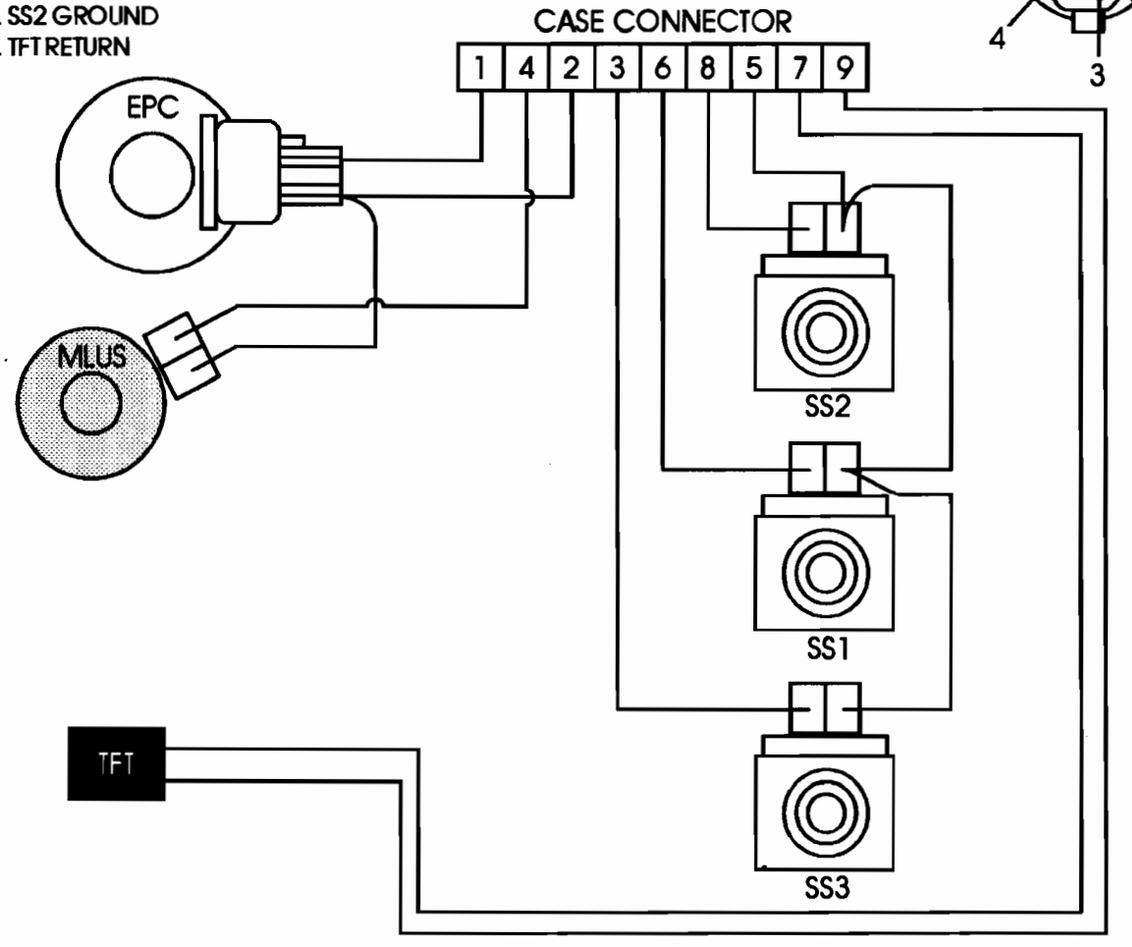


Figure 2

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FORD AX4S / AX4N
REDESIGNED PARK SYSTEM

UPDATE: The Taurus, Sable and Windstar vehicles with an AX4S transaxle built August 1999 and beyond and all 2000 Taurus, Sable and Windstar vehicles with AX4S or AX4N transaxles and 2000 Continental vehicles built October 1999 and beyond have the new redisned park system in the transaxle. **The parts are NOT interchangeable with the orignal design.**

ACTION: **When servicing a transaxle refer to the following text and illustration when servicing these late units keeping in mind that these parts are not interchangeable. The effected parts are:**

Figure 1-Parking Pawl
Figure 2-Parking Pawl Return Spring
Figure 3-Parking Pawl Shaft
Figure 4-Parking Pawl Shaft Retention Bolt(new item AX4S only)
Figure 5-Parking Pawl Apply Rod
Figure 6-Abutment Plate
Figure 7-Appy Rod Inner Lever
Figure 8-Detent Lever
Figure 9-Detent Spring
Figure 10-Manual Control Shaft
Figure 11-Transaxle case
Figure 12-Chain Cover
Figure 13-Chain Cover Gasket
Figure 14-Rear Planetary Support (AX4S only)
Figure 15-Lower Pan
Figure 16-Combined Rear Lube & Differental Lube Tube (AX4N only)
Figure 17-Pinion Shaft in Differential Case Retaining Ring
Figure 18-Manual Lever Shafts Installed
Figure 19-Park System Installed (AX4S)

The new design park system has changes to most of the parts that should prevent mixing of original and new design parts. Care must still be taken to ensure that if replacement of any part affected by this change is necessary, the correct part is installed. There are some easy ways to know if the transaxle you are servicing has the new design Park System.

1. The roll pin locations on the manual shaft have changed and the levers on the manual shaft face the opposite direction
2. The collar that the roll pin goes through on the two levers face inward on the new design.
3. The parking pawl, parking pawl return spring and the abutment plate are largr and differ in shape from the original design, Figure 19.
4. One part that may be more difficult to identify would be the rear planetary support on the AX4S transaxle only, refer to Figure 14.

For past model service (back to 1991 on AX4S and 1994 AX4N), if the transaxle case is replaced (with NEW), the transaxle will be upgraded to the new design park system. All of the parts required for this upgrade will be included with the transaxle case.

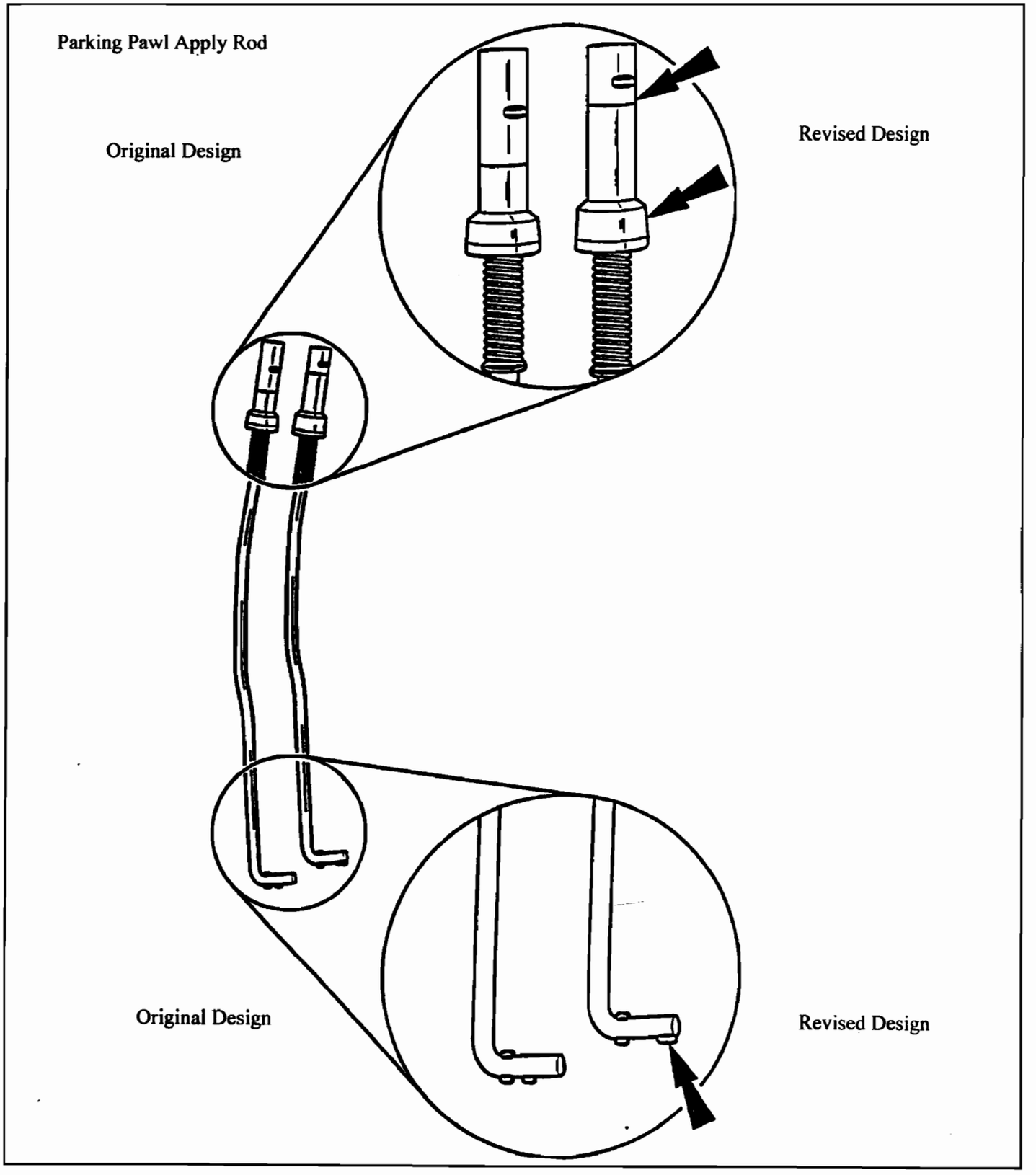

Parking Pawl Apply Rod
Original Design
Revised Design
Original Design
Revised Design

Figure 5

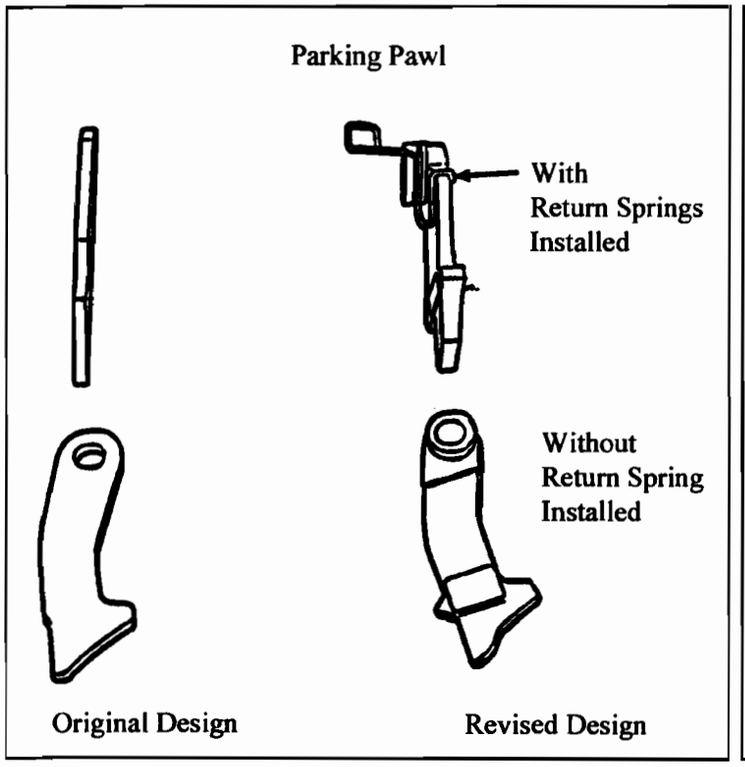


Figure 1

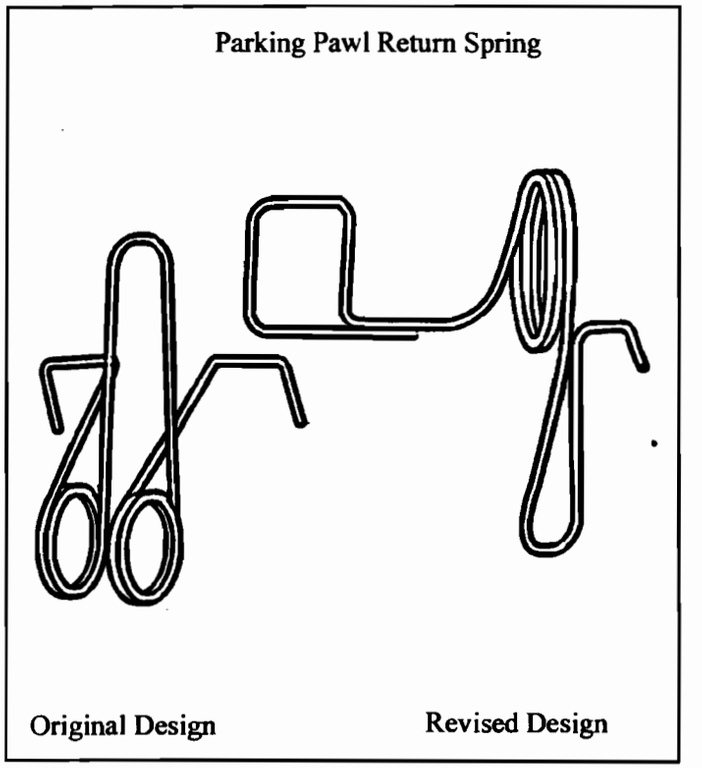


Figure 2

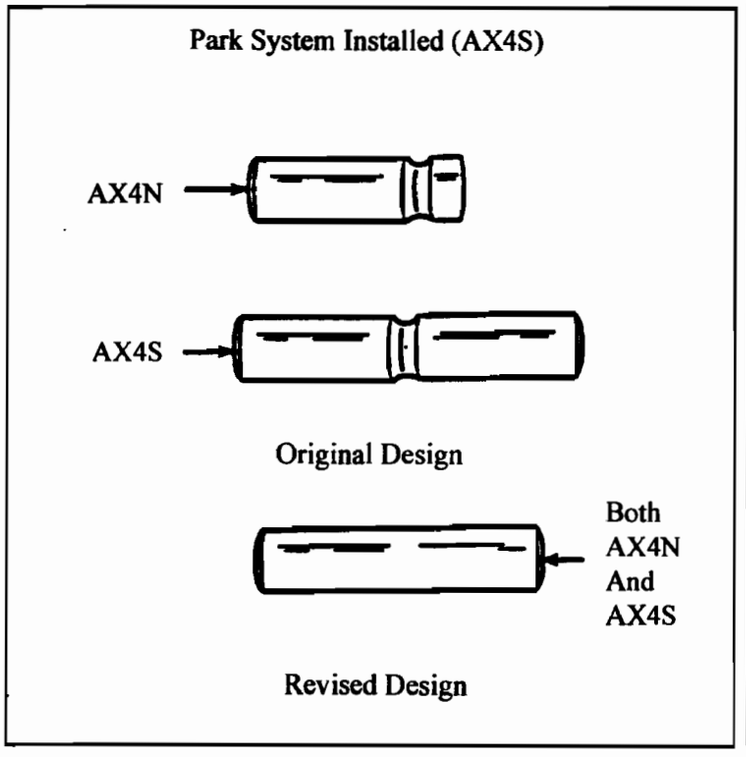


Figure 3

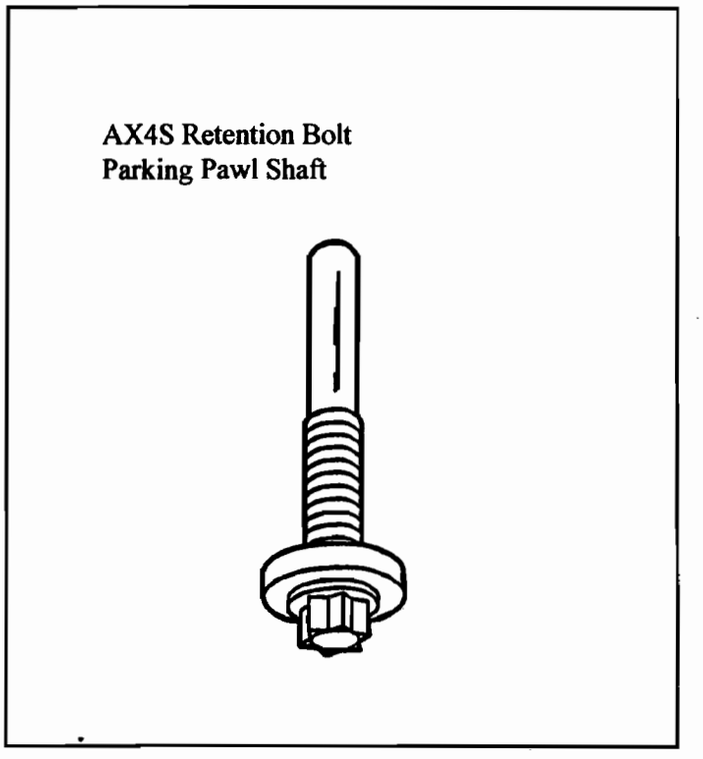


Figure 4

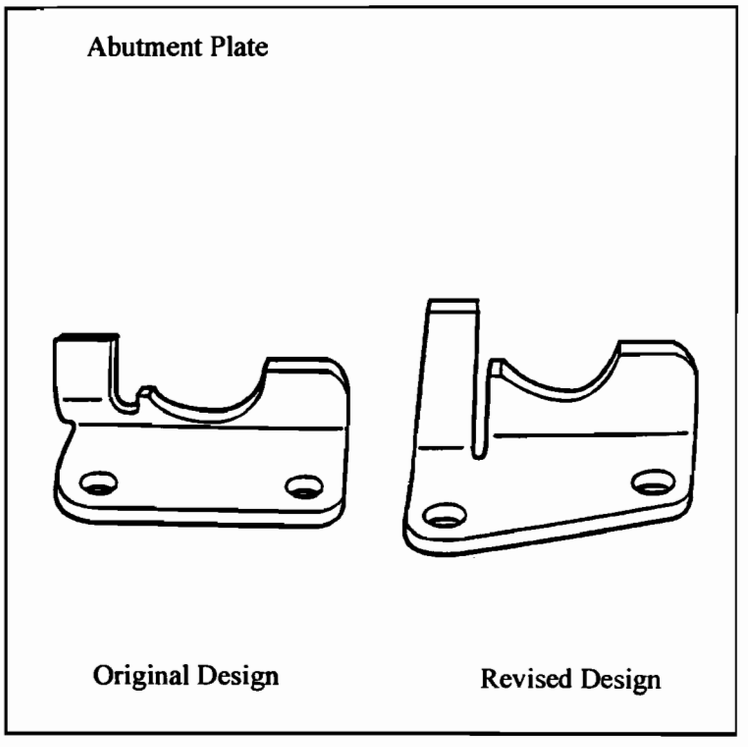


Figure 6

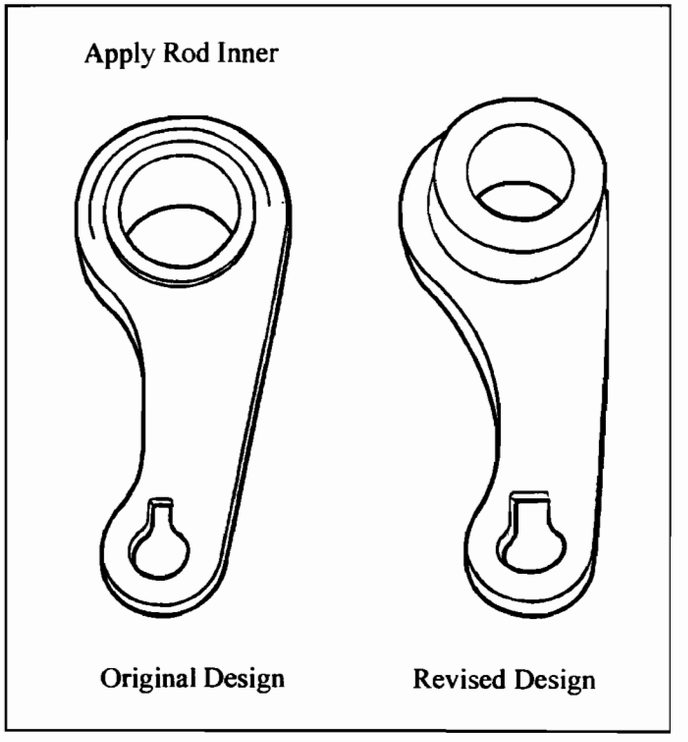


Figure 7

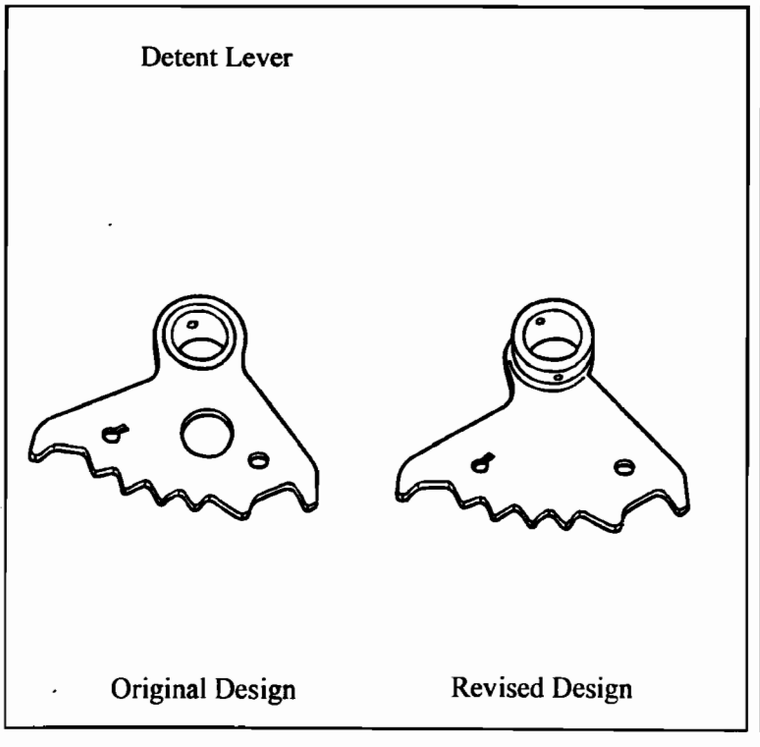


Figure 8

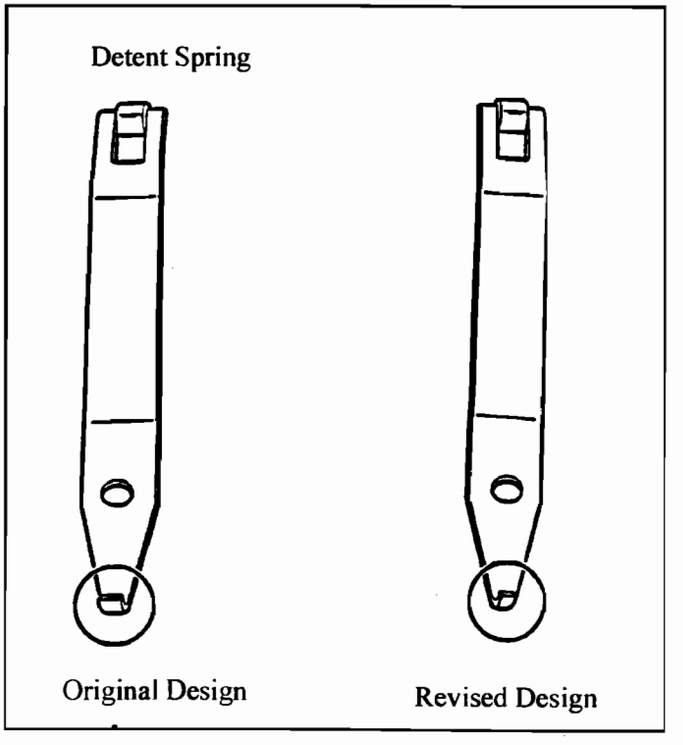


Figure 9

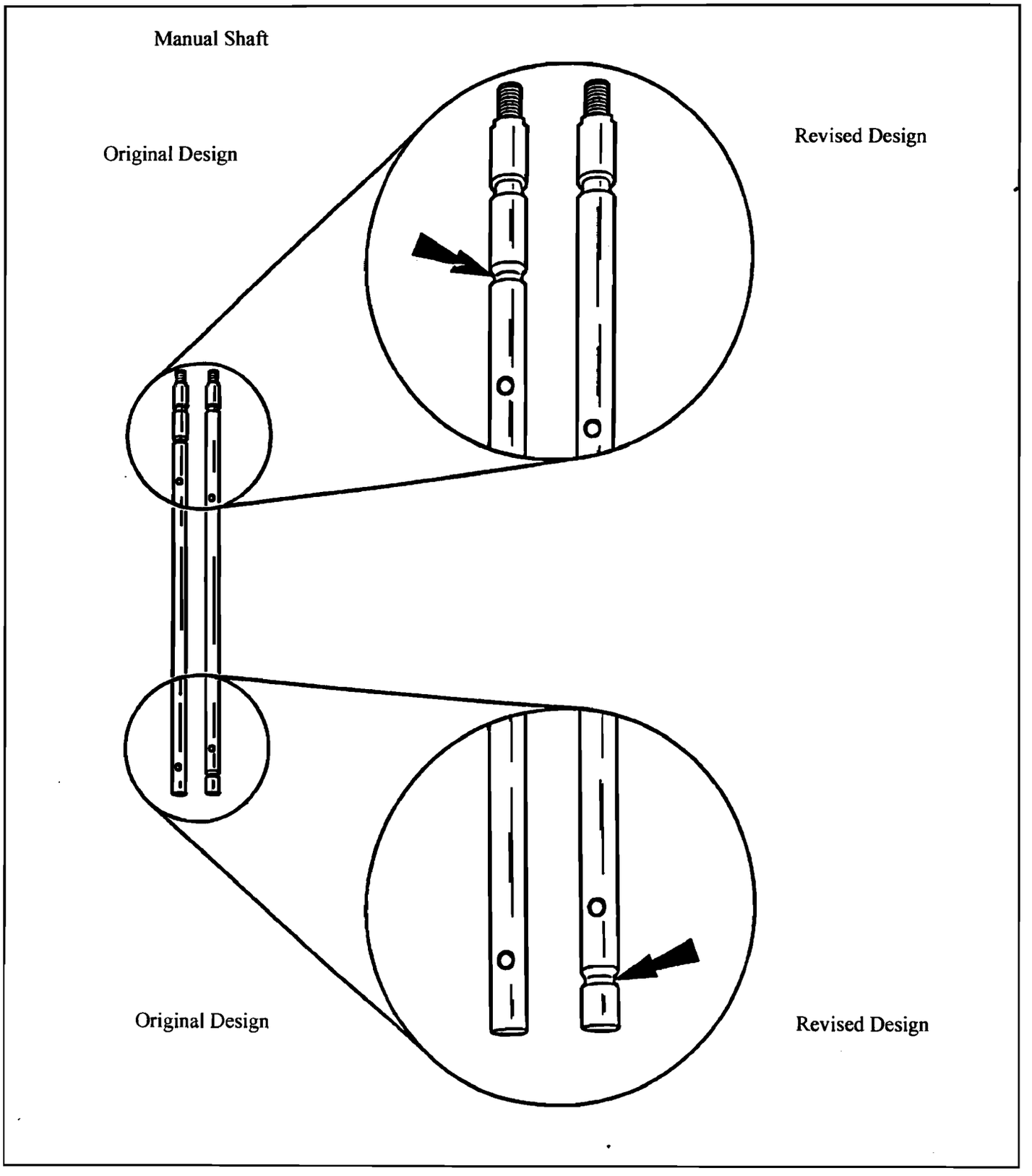

Manual Shaft
Original Design
Revised Design
Original Design
Revised Design

Figure 10

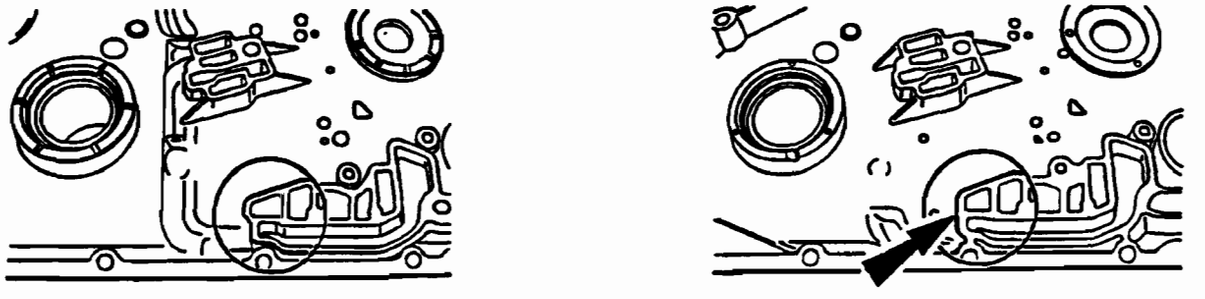
Transaxle Case

Original Design

Revised Design

Figure 11

Chain Cover

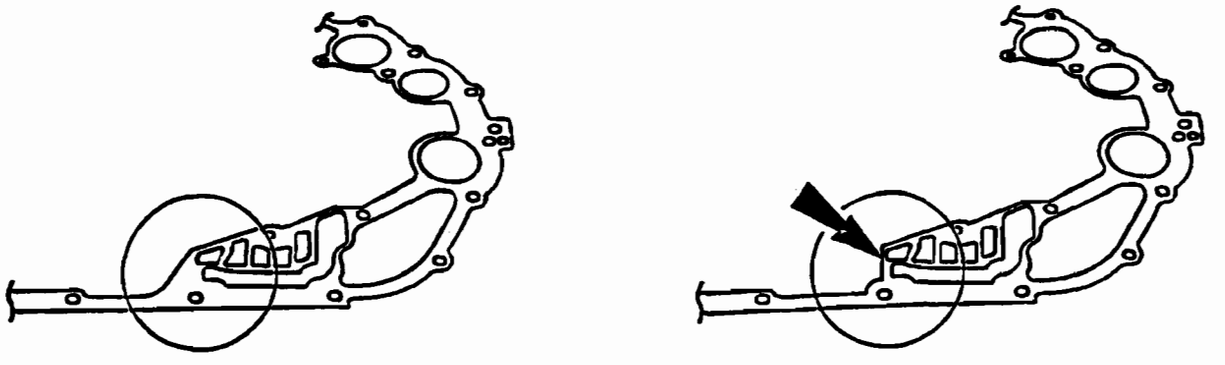


Original Design

Revised Design

Figure 12

Chain Cover Gasket



Original Design

Revised Design

Figure 13

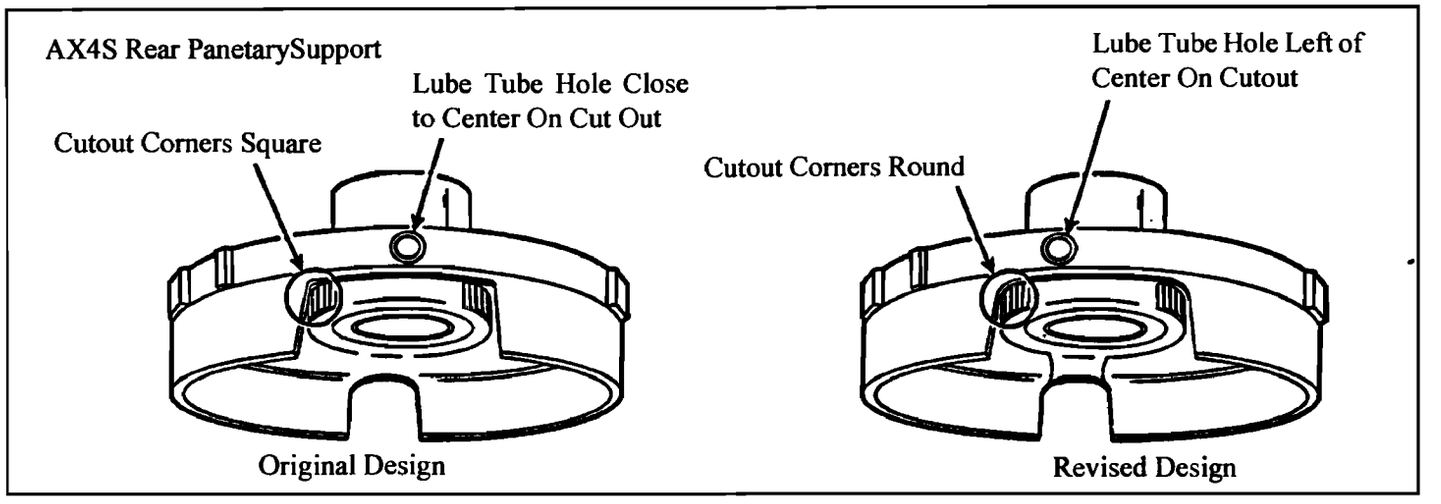


Figure 14

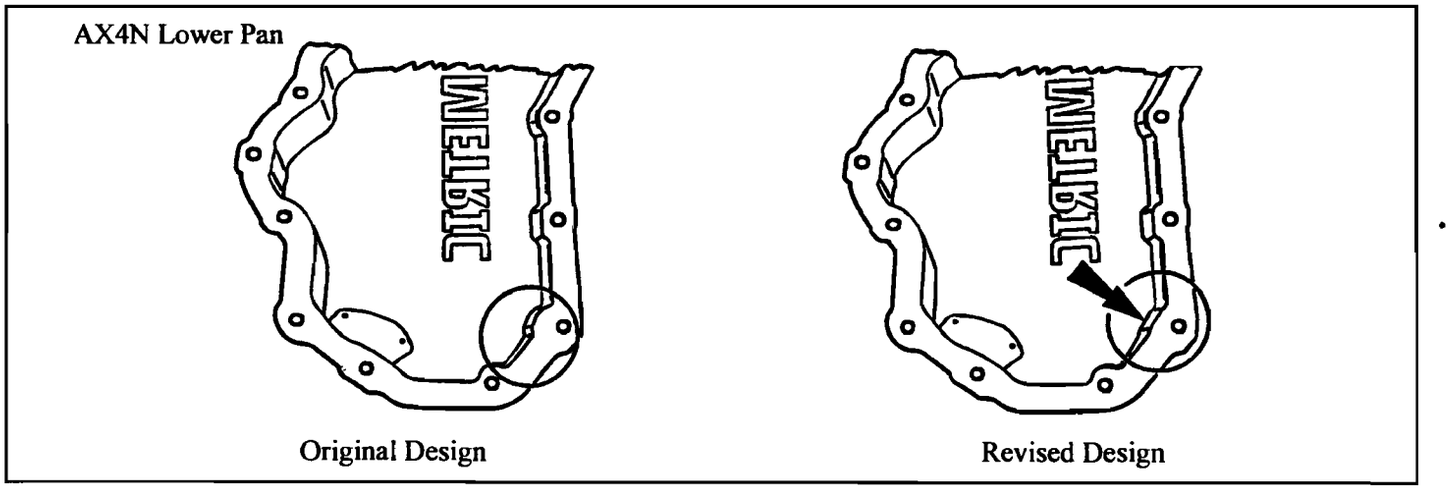


Figure 15

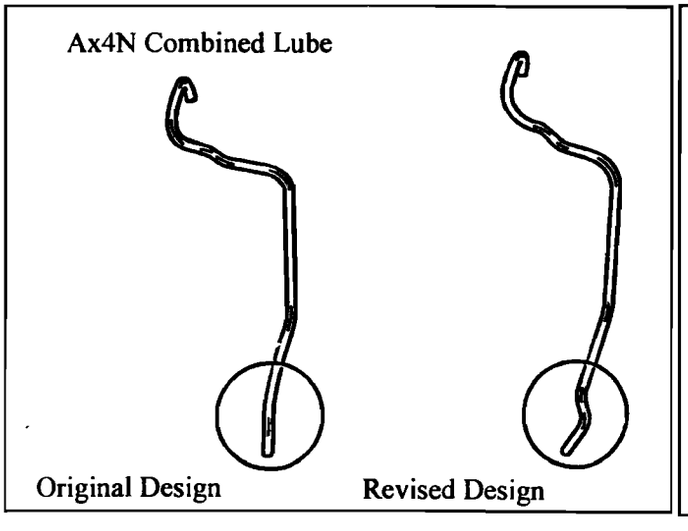


Figure 16

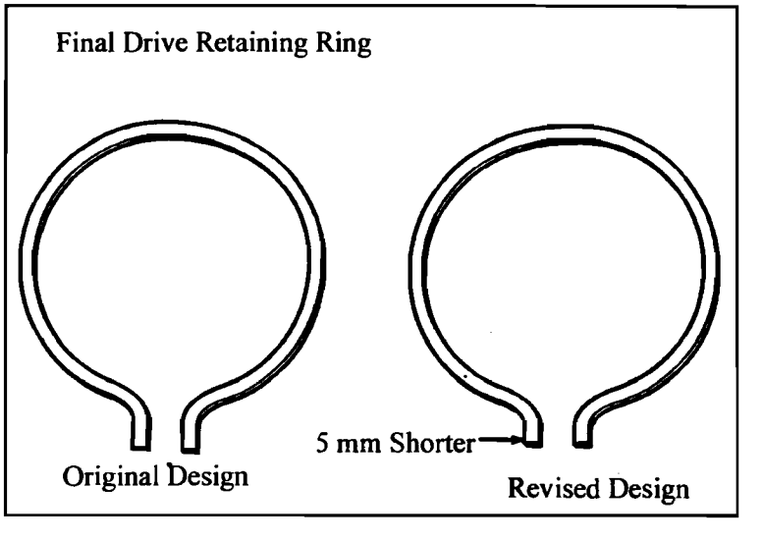
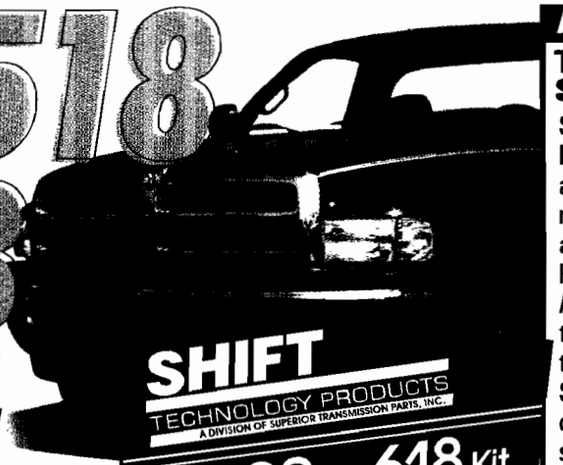


Figure 17

Introducing The New 500 Thru 618 Kit

500 518 618



Hydraulic RH *Gas/Diesel* Electronic RE *Regular/HD*

The New Superior 500-618 Kit is among the most versatile Shift Correction Packages ever introduced. This single kit works on all 500, 518 and 618 hydraulic and electronic, gas and diesel transmissions, in regular or heavy-duty applications.

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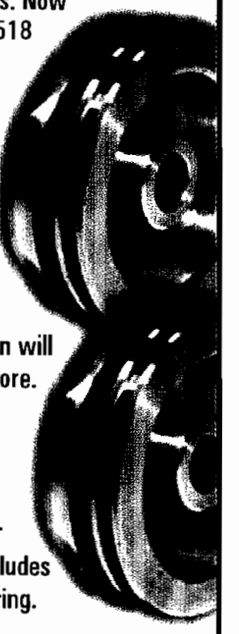
The Low & Reverse Super Servo!

Superior's new solid steel Low & Reverse Super Servos are the latest additions to our growing line of quality replacement servos. Now available for 727-518 RH/RE and 904-A500 RH/RE transmissions, the Superior Super Servos offer effective solutions to these common problems.



- Stabilized piston will not flip in the bore.
- Moves lip seal out of worn bore area — a real case saver.
- New design includes a Teflon wear ring.

THE AXOD DAM

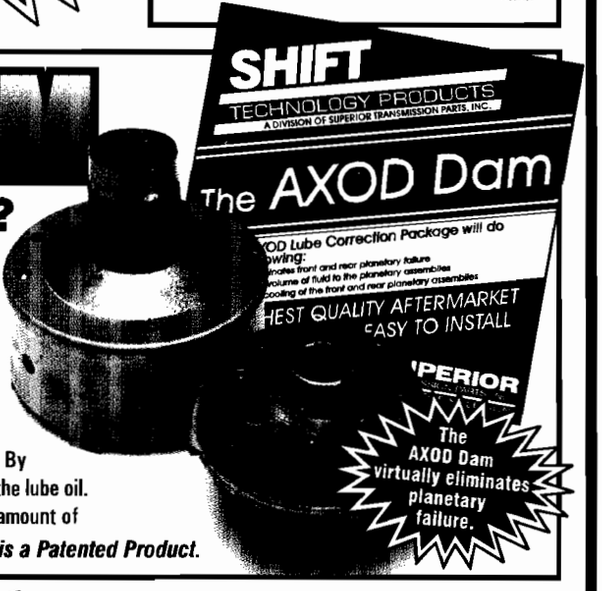
Tired of AXOD Planetary Failure?

The patented AXOD Dam is the simple solution to AXOD & AXOD-E lube problems.

Superior's patented AXOD Dam was developed to help eliminate planetary failure in the AXOD and AXOD-E transmissions. This simple, yet effective product allows AXOD planetaries to run cooler and last much, much longer.

When properly installed, the Lube Dam floods the section between the reverse cylinder and the rear planet support, where the front and rear planetary assemblies are located. By flooding this section, lube oil has adequate time for heat exchange from the pinions to the lube oil. The pinions and needle bearings run in an oil bath, ensuring total lubrication. Since the amount of lubrication is increased dramatically, better cooling is assured.

The AXOD DAM is a Patented Product.



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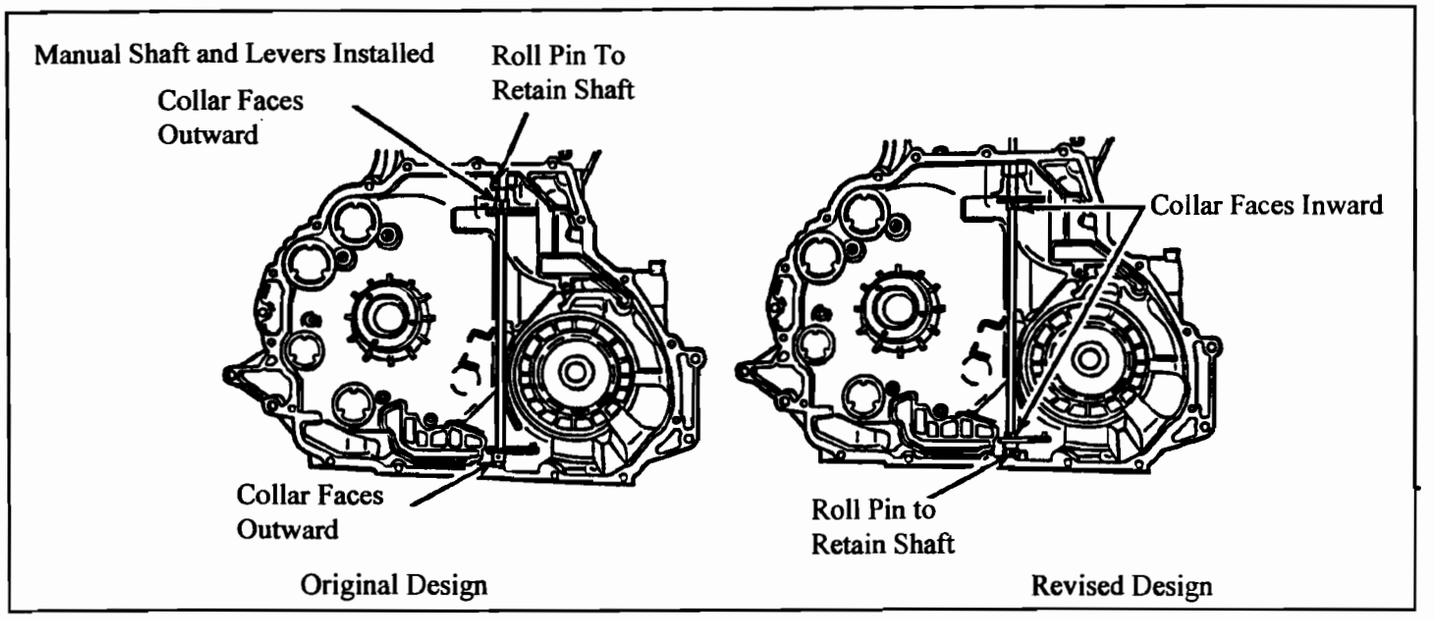

Figure 18

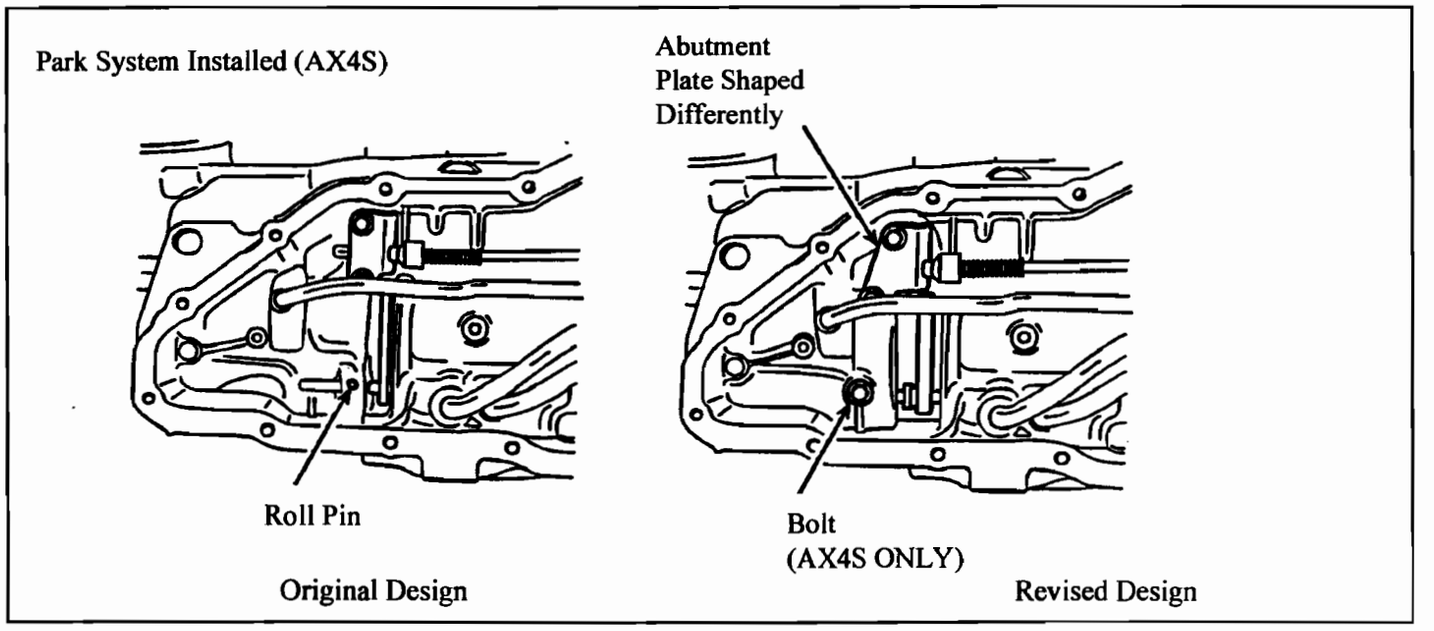

Figure 19

FORD AX4S HARSH 3-2 DOWNSHIFT WHEN COASTING AROUND A CORNER SHUDDER WHEN ACCELERATING

COMPLAINT: A harsh 3-2 downshift when coasting a corner and then accelerating away from the corner may occur on some vehicles. Another condition may be a shudder on turns if the throttle is held to accelerate through the turn.

CAUSE: Both conditions are caused by air entering the fluid filter pickup area during the turn due to a low fluid level.

CORRECTION: The fluid level in the AX4S transaxle should be set at the top end of the hatch marks on the dipstick (Figure 1) while the transaxle is at operating temperature. The vehicle must be on level ground in Park, with the engine at idle and at operating temperature to get an accurate fluid level reading. If the fluid level is not at the top of the hatch marks, add fluid until it is at the top of the hatch marks (Figure 1).

CAUTION:

Starting in 1998, All Taurus and Sable vehicles require Mercon V Transmission Fluid. 1998 Windstar vehicles built before 9/9/1997 require Mercon. Windstar vehicles built on 9/9/1997 and beyond use the new Mercon V transmission fluid. The fluids are not *INTERCHANGEABLE.* The use of incorrect fluid may cause internal transaxle damage to the friction materials

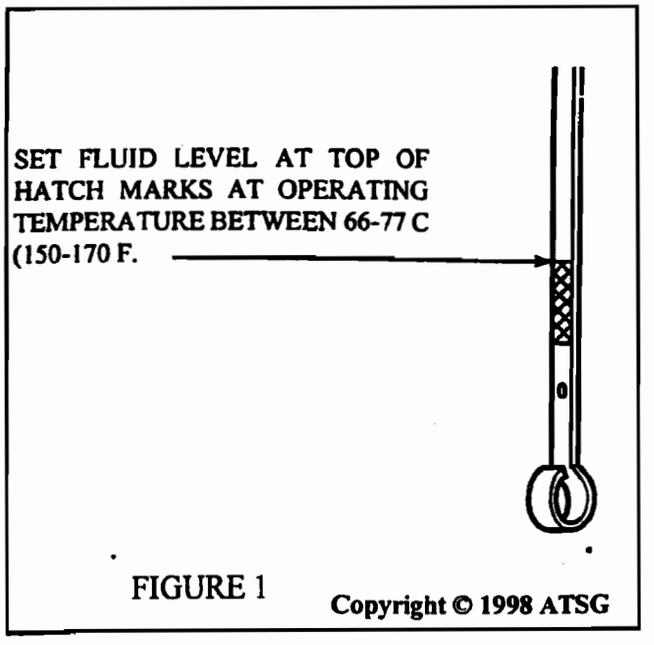

FIGURE 1

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FORD AX4N

STALLS ENGINE IN GEAR

COMPLAINT: After overhaul, the engine stalls as soon as the manual shift lever is pulled into any position except park and neutral.

CAUSE: The ***Bypass Clutch Control Plunger***, located in the bypass clutch control valve line up shown in figure 1, is shown backwards in most service manuals. When the spring and plunger are installed backwards, the plunger blocks the feed hole in the plunger sleeve, which now causes the balance of the valve to be lost. This causes the bypass clutch control valve to stroke to a position that will allow all converter clutch release oil to be exhausted, allowing the converter clutch to apply. This in turn will cause the engine to stall as soon as the manual shift lever is moved out of park or neutral as seen in figure 2.

CORRECTION: Install the sleeve, spring, plunger and valve as shown in the **CORRECT** illustration in figure 3.
DO NOT INSTALL the valve train as seen in the **INCORRECT** illustration shown in figure 4.

NOTE: The Bypass Clutch Control Sleeve should ***always*** be checked for wear during overhaul, as it is a high wear item, and can cause TCC apply and lube circuit problems.

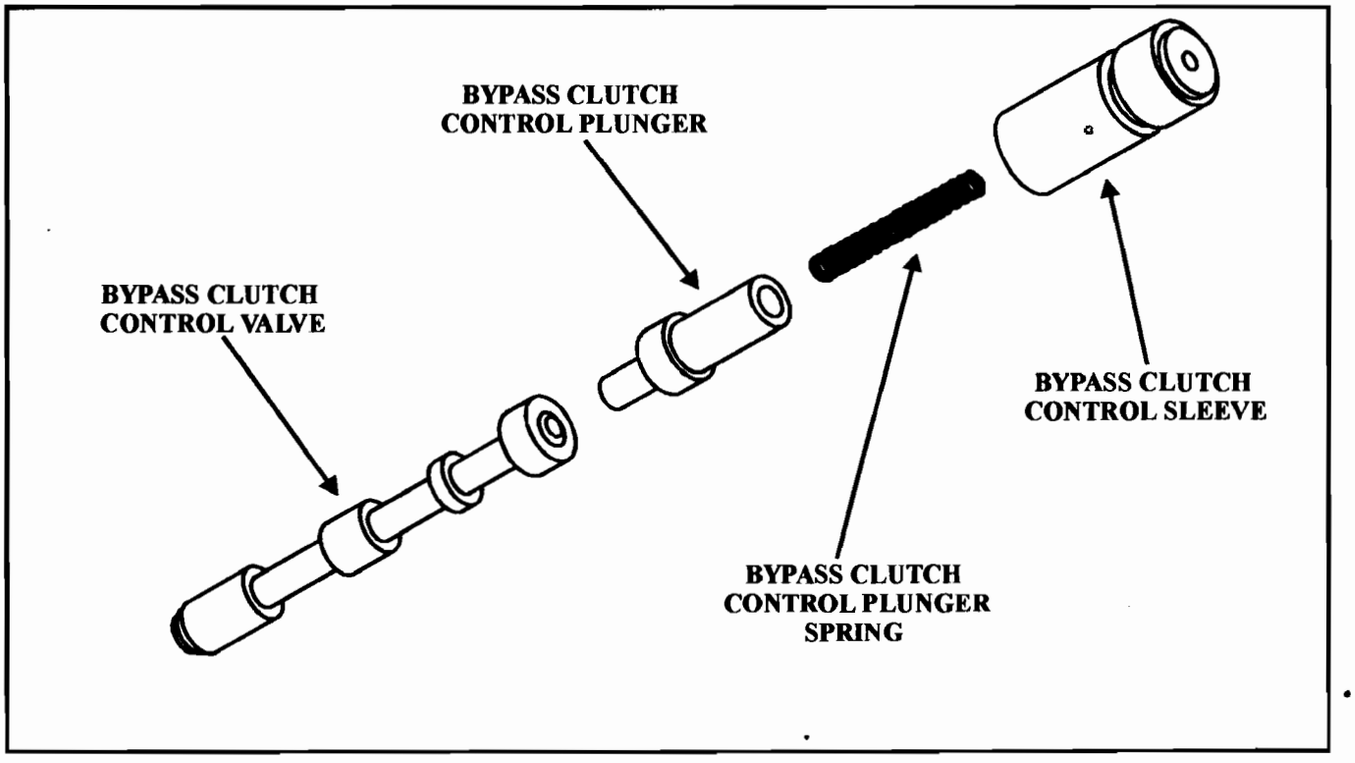

Figure 1

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FORD AX4N

STALLS ENGINE IN GEAR

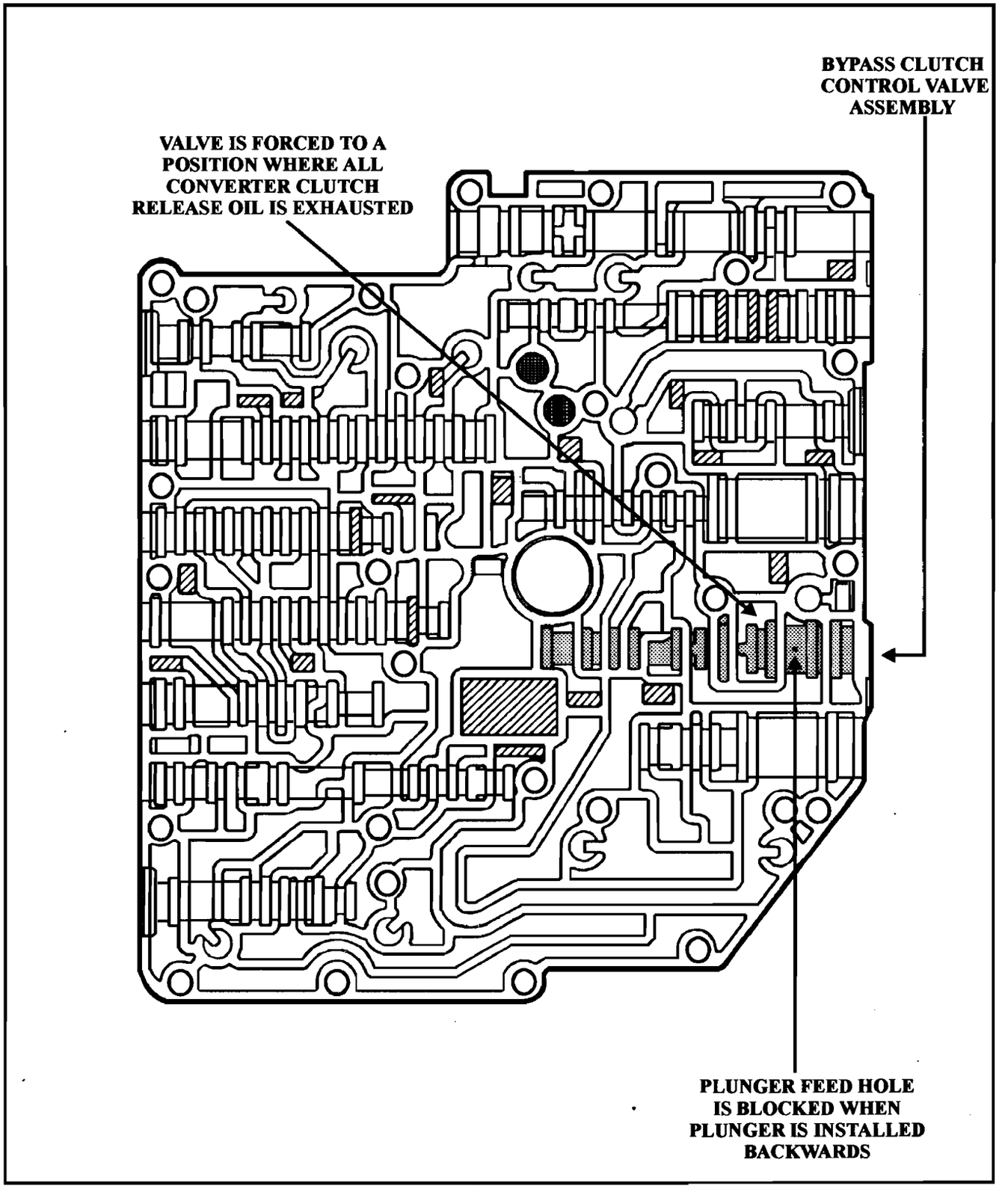

Figure 2

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FORD AX4N

STALLS ENGINE IN GEAR

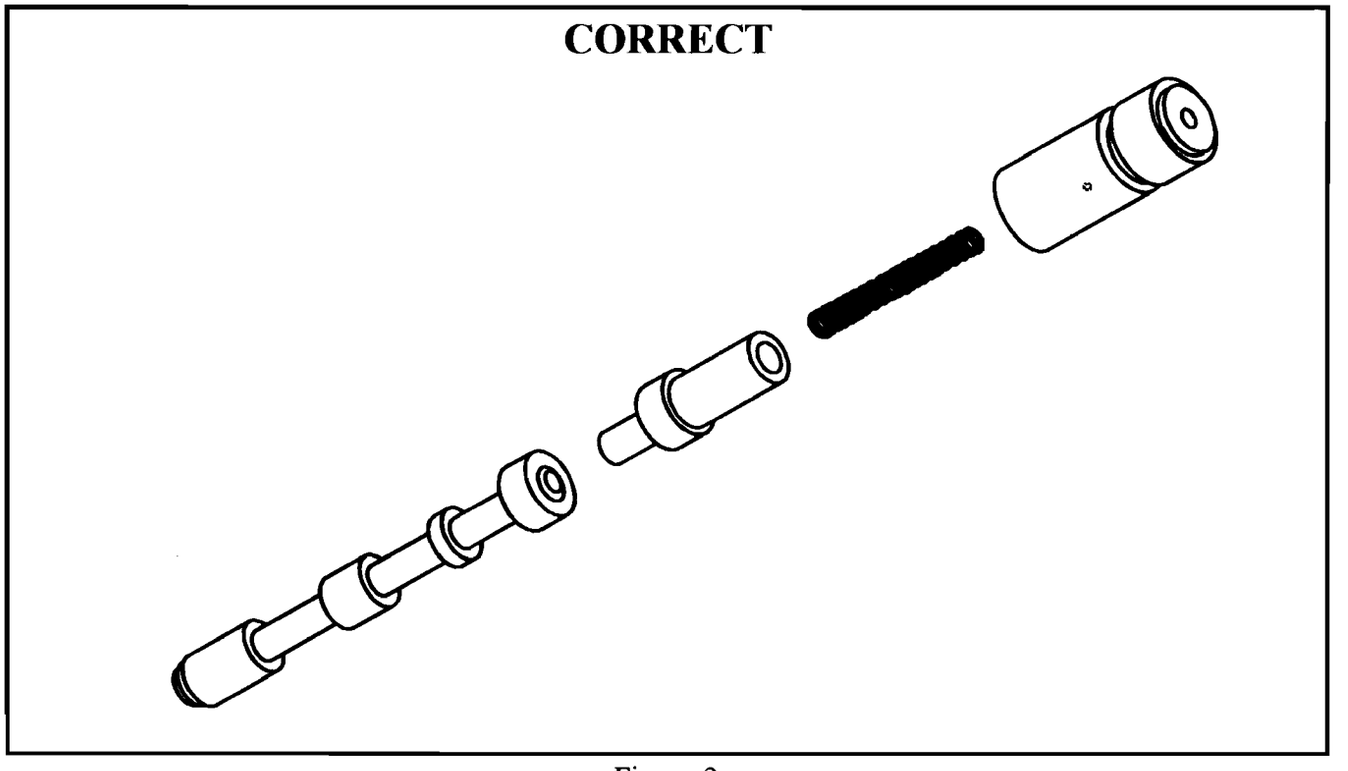

Figure 3

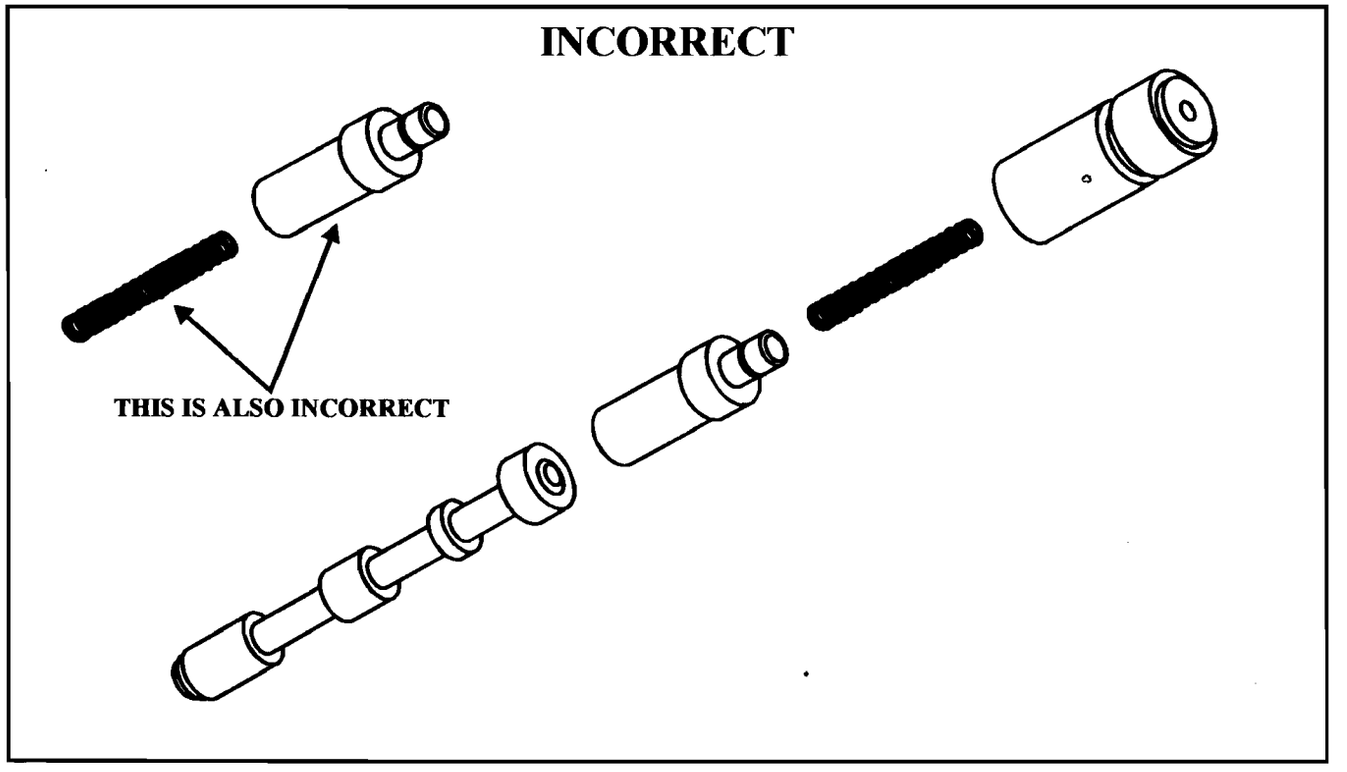

Figure 4

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FORD AX4N
NEW PUMP SPACER PLATE TO VALVE BODY GASKET

CHANGE: A new design pump spacer plate to valve body gasket was implemented during the 1998 model year for all models of the AX4N transaxle.

REASON: To eliminate the possibility of unsupported gasket material breaking off and sticking valves in the valve body. The valve most commonly stuck has been the by-pass clutch control valve causing no converter clutch engagement.

PARTS AFFECTED:

(1) A large portion of the previous design gasket has been removed to prevent unsupported gasket material from breaking off and entering the valve body, as shown in Figures 1 and 2.

SERVICE INFORMATION:

Pump Spacer Plate To Valve Body Gasket (New Design) F8DZ-7A136-AB

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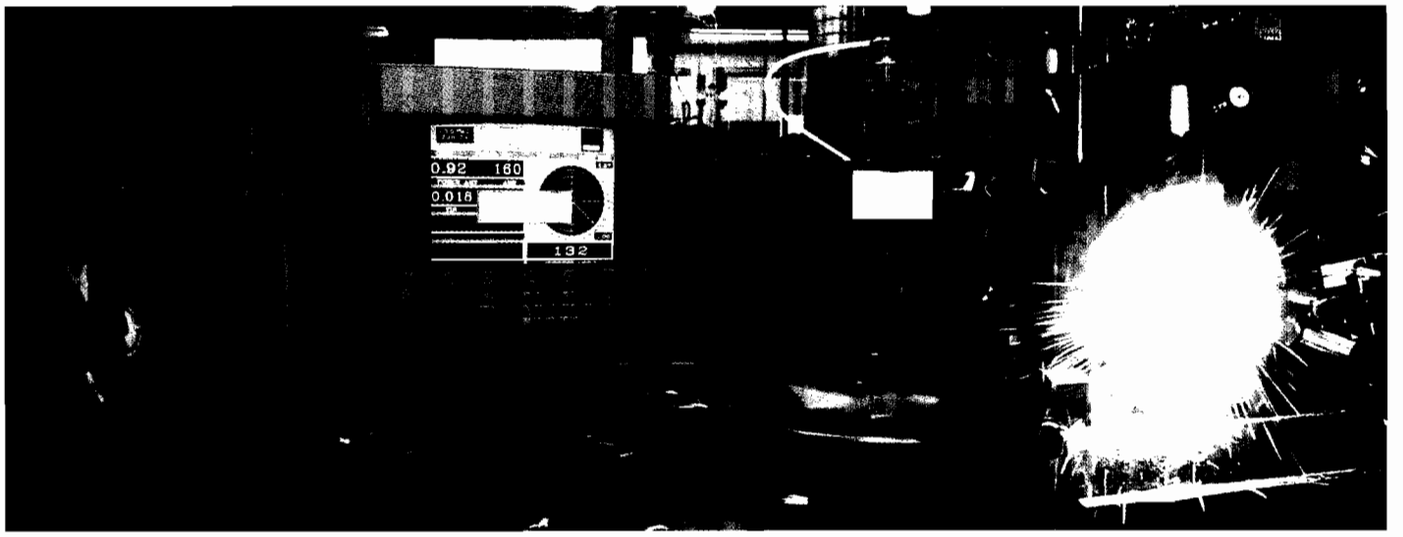

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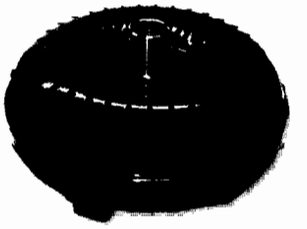

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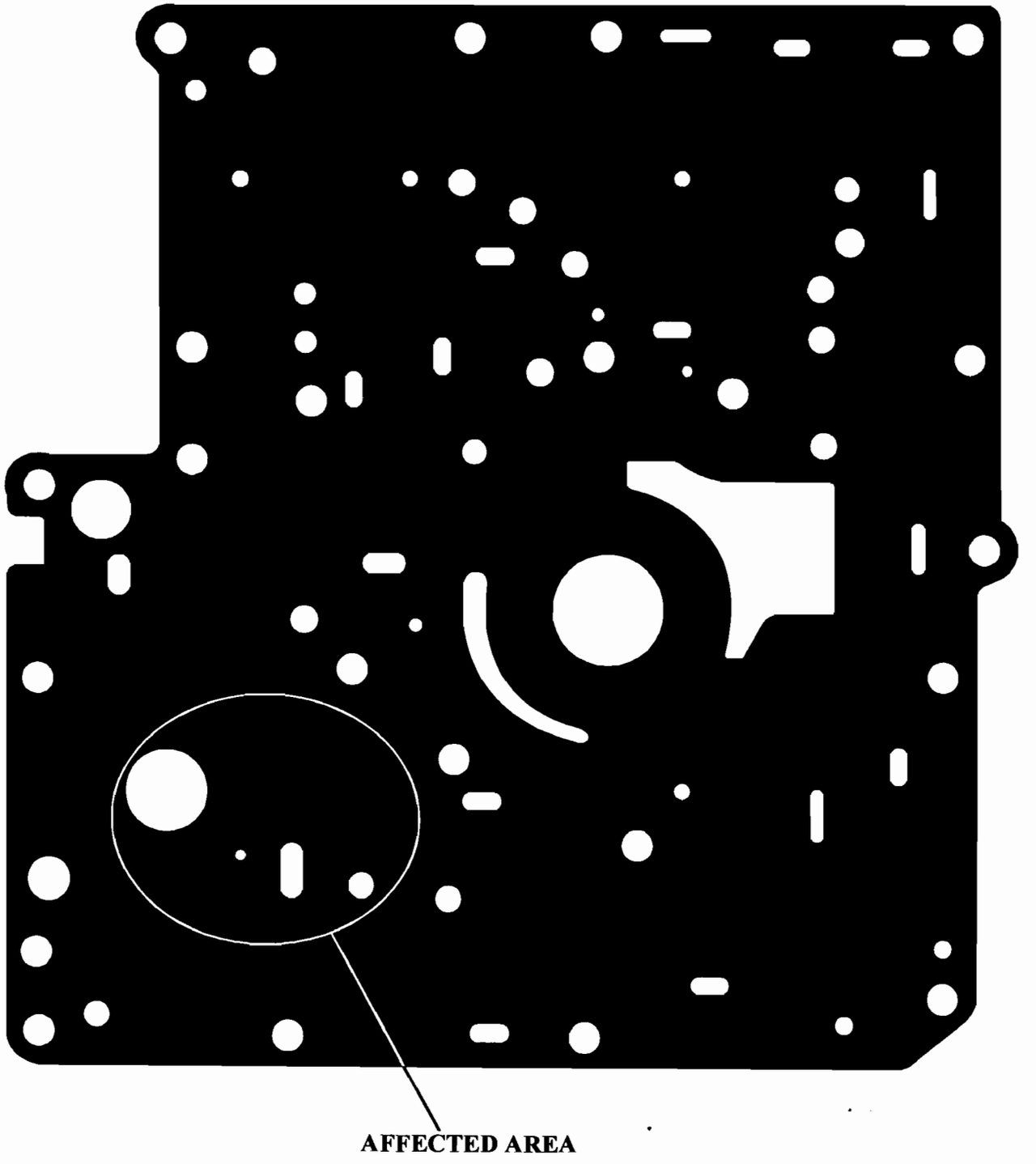

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Figure 1

NEW DESIGN LEVEL PUMP SPACER PLATE TO VALVE BODY GASKET PART NUMBER F8DZ-7A136-AB

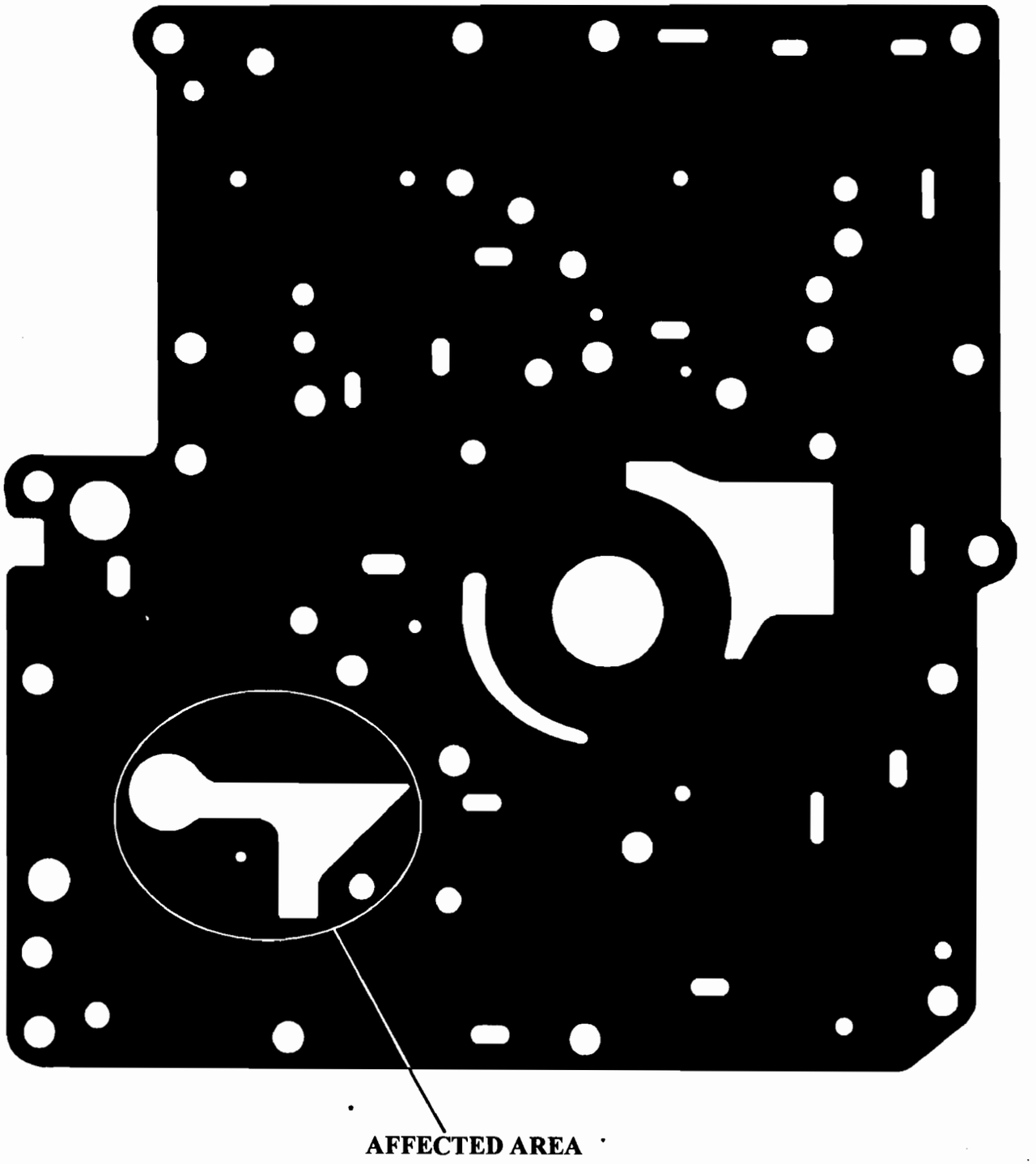

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Figure 2

AX4S/AX4N
ERRATIC SHIFTING

COMPLAINT: Vehicles equipped with either the AX4S or AX4N transaxles may exhibit erratic undescribable shifts after the vehicle's processor has been changed. The same complaint may also occur immediately after the original processor has been flashed by a local Ford dealership. This condition may also produce a TCIL code 623 or P1779 on vehicles equipped with the AX4N transaxle..

CAUSE: The shift solenoid sequence is different between the AX4S and the AX4N transaxle (See Figure 1). If the incorrect processor is installed, or the processor has been flashed incorrectly, the wrong shift pattern will be supplied to the transaxle.

Vehicles with the AX4N have a shift quadrant of OD, D and L. This eliminates the need for an OD cancel button. Vehicles with the AX4S transaxle have a shift quadrant of OD, 2 and 1 with an OD cancel button (See Figure 2). TIP: Should a processor programmed to operate an AX4S transaxle be installed into a vehicle with and AX4N, a code 623 or P1779 will be produced as it is looking for the OD cancel button.

CORRECTION: Install the correct processor or have the processor re-flashed for the transaxle installed.

NOTE: The solenoid shift command may be viewed via a scanner or LED lights and compared to the chart below (Figure 1). The command viewed can then be compared to the style of transmission that is in the vehicle. This will help to verify that the above complaint is due to an incorrectly installed or flashed processor.

AXODE/AX4S *Solenoid Shift Pattern*			
GEAR	**SS1**	**SS2**	**SS3**
First	OFF	ON	OFF
Second	ON	ON	OFF
Third	OFF	OFF	ON
Fourth	ON	OFF	ON

AX4N *Solenoid Shift Pattern*			
GEAR	**SS1**	**SS2**	**SS3**
First	OFF	ON	OFF
Second	OFF	OFF	OFF
Third	ON	OFF	ON
Fourth	ON	ON	ON

Figure 1

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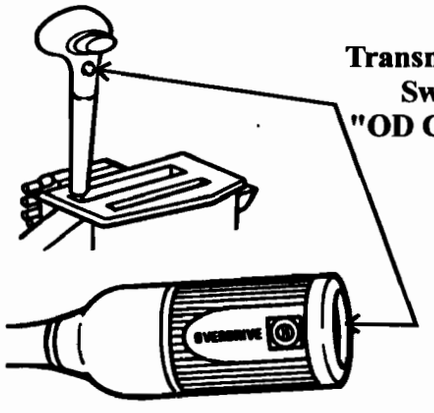
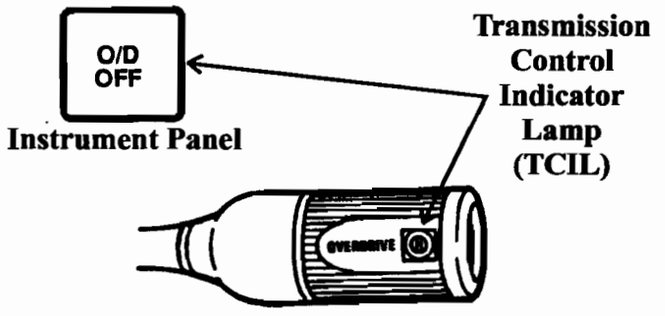
AXODE/AX4S *Shift Quadrant*	AX4N *Shift Quadrant*
Park **Reverse** **Neutral** **Overdrive** **2** **1**	**Park** **Reverse** **Neutral** **Overdrive** **Drive** **Low**
	There is not a Transmission Control Switch (TCS) on AX4N vehicles as the selector lever provides this operation. The Check engine light is used as the Malfunction Indicator Lamp (MIL) as a warning that a code or codes have been generated. It also may be used to display codes as well.
	

Figure 2

FORD AX4S/AX4N

VEHICLE SPEED SENSOR CHANGES

CHANGE: The gear driven vehicle speed sensor that has been in use in the AX4S and the AX4N since their inception will be replaced, as a running change during the 1999 model year beginning with the AX4S and at the start of production for the 2000 model year for the AX4N, with a permanent magnet speed sensor. The PM Generator will be mounted in the barrel of the case and will be using the park gear teeth as an exciter wheel.

REASON: The possibility of the VSS drive or driven gear "apple coring" will be eliminated as well as the intermittent loss of vehicle speed signal due to the speed sensor sub harness damage that would occur as a result of exhaust system heat transferral.

PARTS AFFECTED:

The case has changed to accommodate the speed sensor and a new design final drive planetary support with a ***"cut out"*** for the speed sensor to look through at the park gear as shown in figure 1.

INTERCHANGEABILITY:

The PM Generator type of speed sensor being new to the vehicle line, would prevent them from being used in any earlier vehicles not designed with this type of system.
The vehicle speed sensor for the AX4S is illustrated in figure 2 and the vehicle speed sensor for the AX4N is shown in figure 3.

SERVICE INFORMATION:

AX4S Vehicle Speed Sensor ***XF2Z-7H103-AA***
AX4N Vehicle Speed Sensor ***YF1Z-7H103-AA***

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FORD AX4S/AX4N

VEHICLE SPEED SENSOR CHANGES

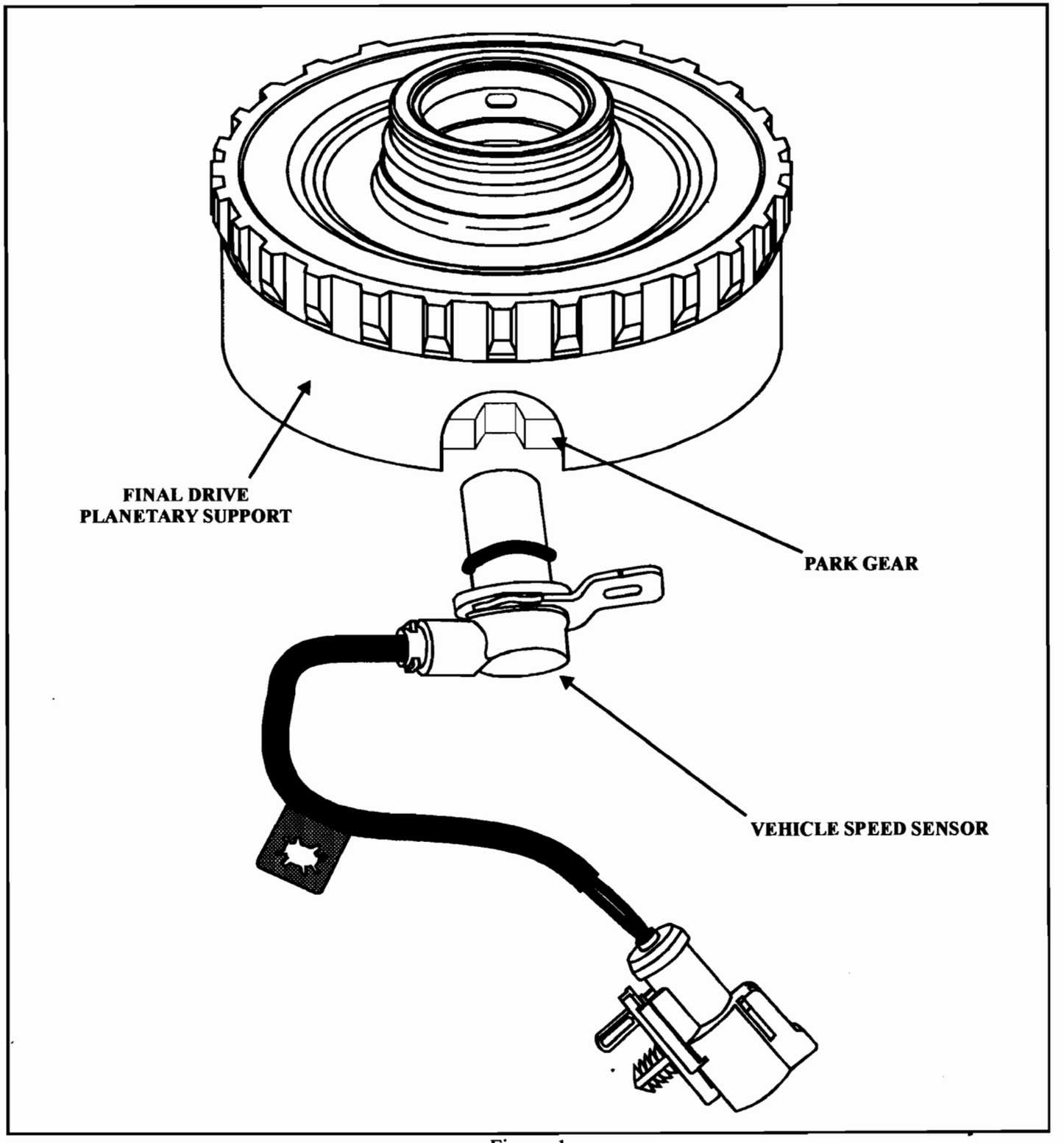

Figure 1

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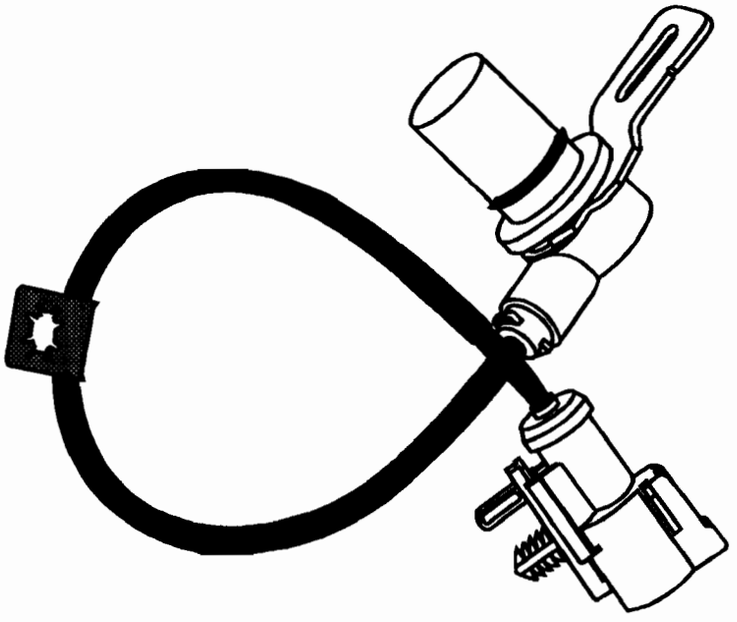
FORD AX4S/AX4N

VEHICLE SPEED SENSOR CHANGES

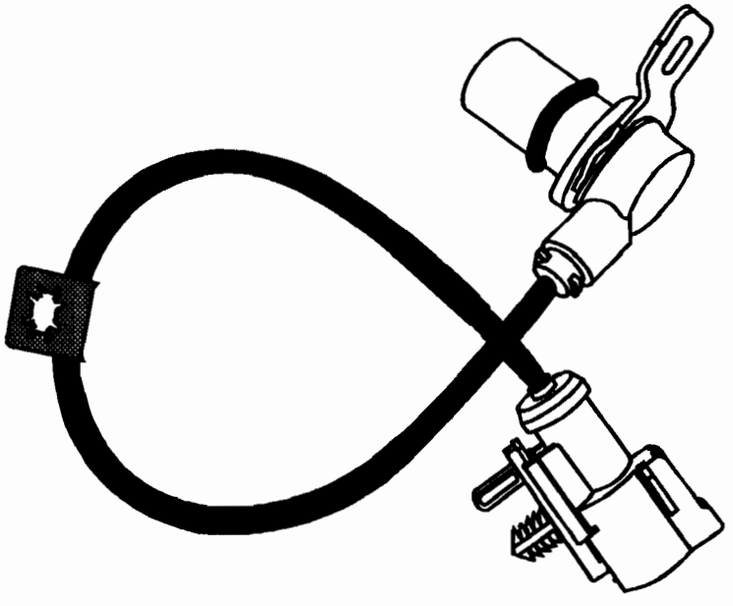
AX4S VEHICLE SPEED SENSOR



XF2Z-7H103-AA

Figure 2

AX4N VEHICLE SPEED SENSOR



YF1Z-7H103-AA

Figure 3

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FORD CD4E
PREMATURE REVERSE DRUM BUSHING FAILURE

COMPLAINT: After overhaul, a vehicle equipped with a CD4E transaxle exhibits premature failure of the top bushing in the reverse input housing (See Figure 1), and apparently due to lack of lubrication. Because of the bushing failure, the ring area in the reverse input housing may be grooved, and the sealing rings on the forward/coast/direct housing may be worn.

CAUSE: The cause may be, mis-assembly of the reverse input clutch hub onto the splines of the forward/coast/direct clutch housing. The reverse input clutch hub has 2 slots machined 180 degrees apart on the bottom of the hub, as shown in Figure 2. These slots ***must*** be indexed over the two lubrication holes 180 degrees apart in the splines of the forward clutch housing, as shown in Figure 2. If the slots are not lined up with the lube holes in the splines, premature failure of the reverse input housing bushing will be the result.

CORRECTION: Identify and locate the slots in the reverse input clutch hub and ensure that the slots are aligned with the lubrication holes in the splines of the forward/coast/direct clutch drum during the assembly process. Refer to Figure 2 for correct assembly.

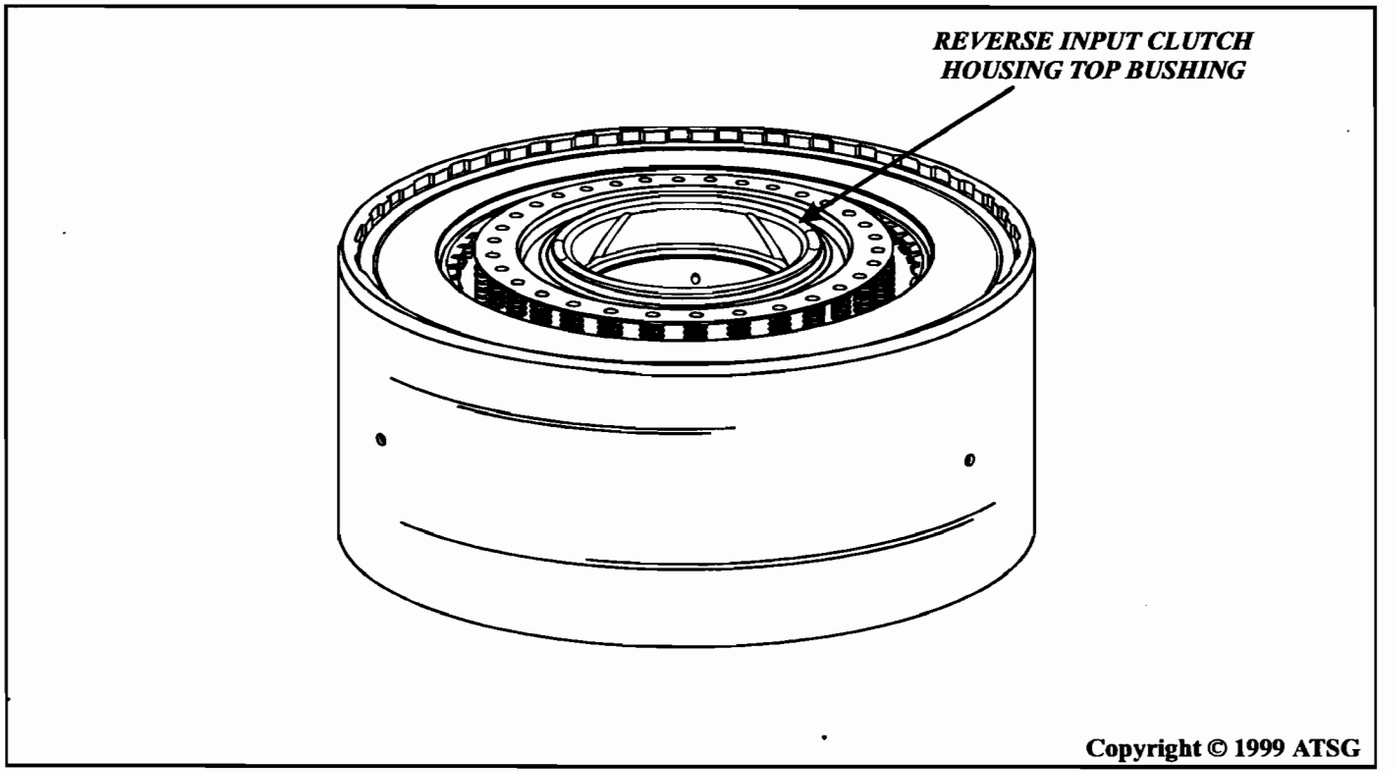

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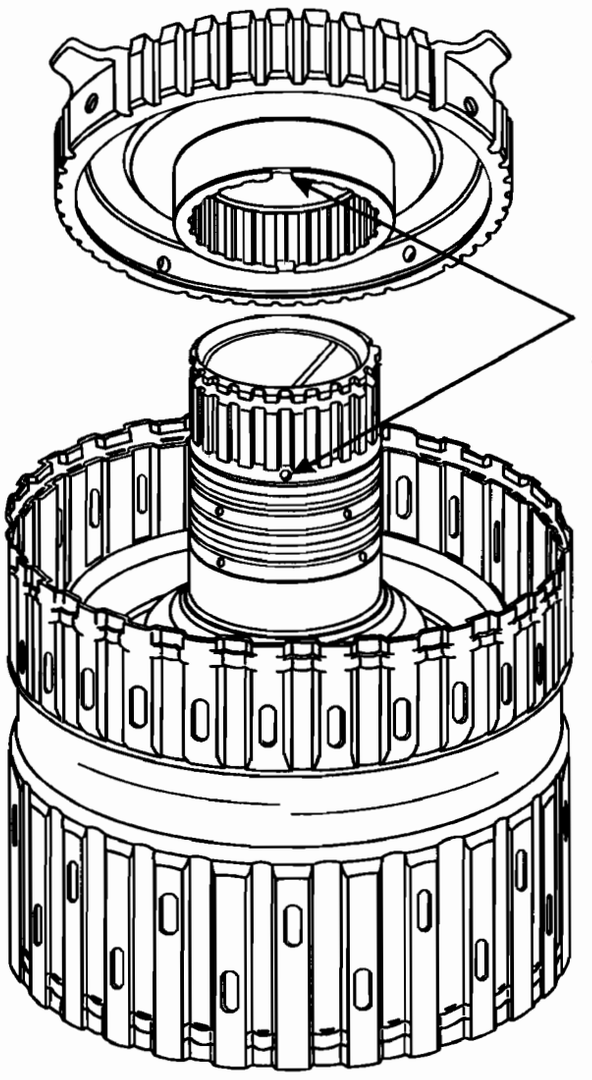
Figure 1



The notches in this hub MUST be indexed with the holes in the splines.

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Figure 2

FORD CD4E

CONTINUOUS FRONT SEAL LEAK

COMPLAINT: Some vehicles equipped with the CD4E transaxle may exhibit a front seal leak after overhaul.

CAUSE: One cause may be, the incorrect converter was installed in the vehicle.

CORRECTION: Remove transaxle and ensure that the proper converter has been installed for the vehicle. Refer to Figures 1 & 2 for proper converter identification.

NOTE: THE PART NUMBERS LISTED ARE DACCO PART NUMBERS.

PART NUMBER	F-67	F-69
DIAMETER	10.50"	11"
HEIGHT	3.710"	4.125"
STAMP	A	C
MODEL	PROBE 626 MX6 CONTOUR MYSTIQUE	CONTOUR MYSTIQUE
ENGINE SIZE	2.0L	2.5L

Figure 1

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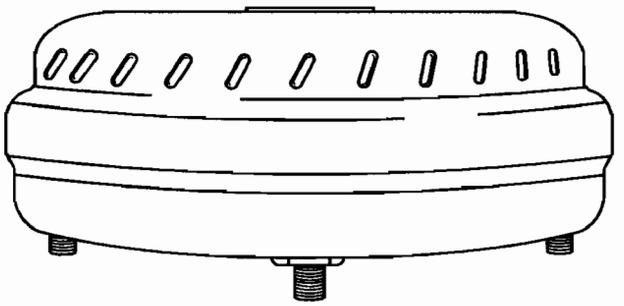
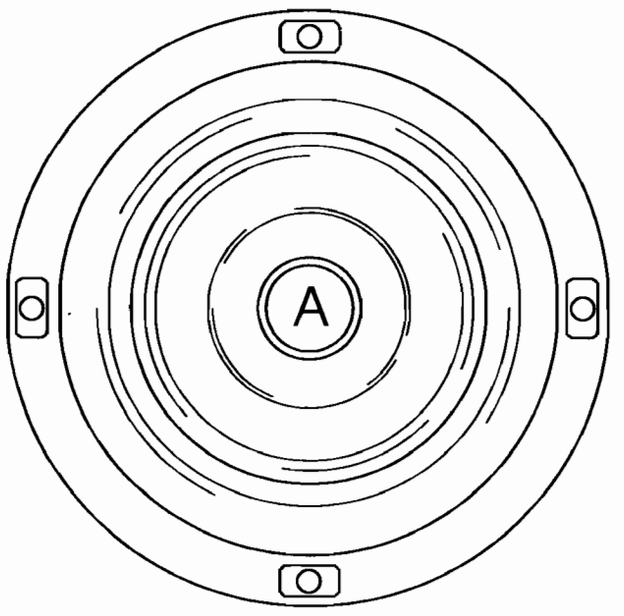
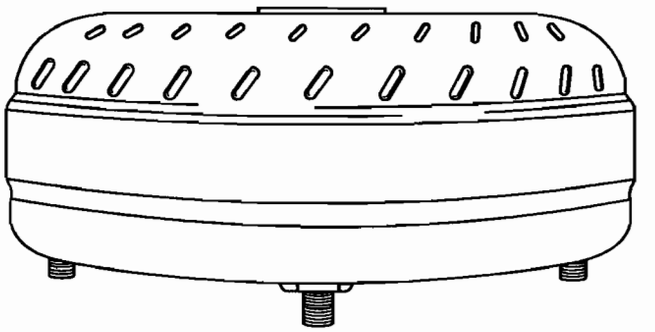
F-67





F-69



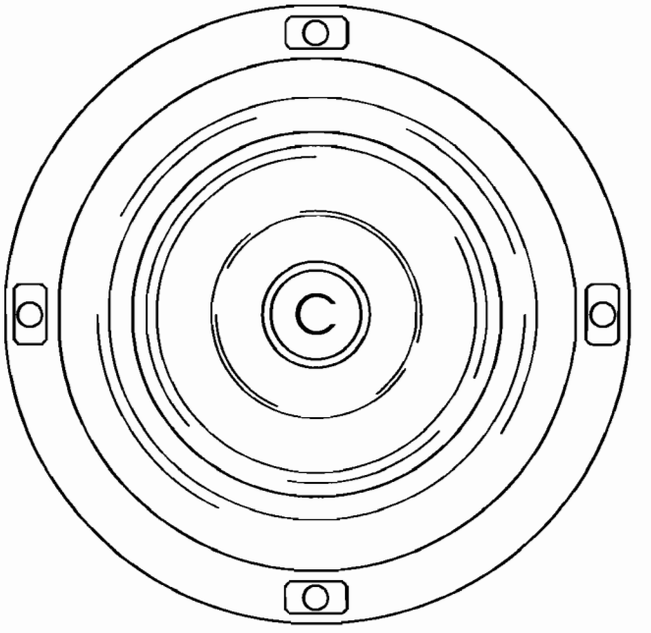


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Figure 2

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- Trouble code charts for each year of production
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Service Engineering

FORD TRANSMISSION INFORMATION FROM FORD ENGINEERS

E4OD

- Covers '89 - '93
- 248 photos
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- 446 total pages

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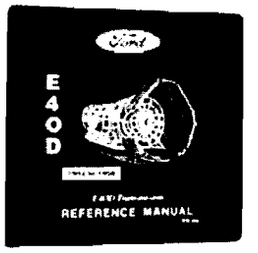
- Covers '99 - '00
- 274 photos
- 8 fold out pages of color oil flows
- 470 total pages

ORDER ITEM #3

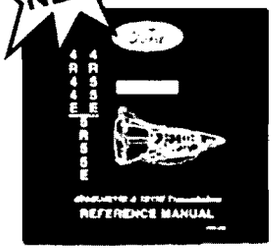


E4OD UPDATED

- Covers '94 - '98
- 378 photos
- 18 pages of color oil flows
- 474 total pages

ORDER ITEM #2

NEW



4R/5RE

- Covers '95 - '00
- 395 photos
- 17 pages of color oil flows
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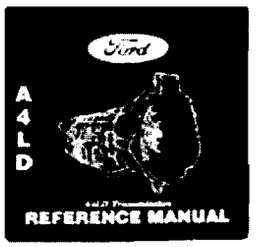

A4LD

- Covers '85 - '93
- 232 photos
- 14 pages of color hydraulic fluid circuits
- 453 total pages

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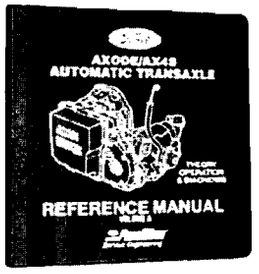


AXODE/AX4S

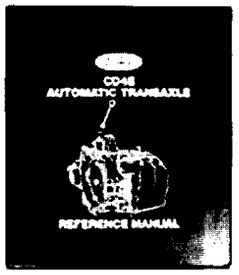
- Covers '91 - '97
- Two binders
- 357 color photos
- 8 pages of color hydraulic fluid circuits
- 460 total pages

ORDER ITEM #21

AX4N

- Covers '94 - '97
- Two binders
- 332 photos
- 9 pages of color hydraulic fluid circuits
- 575 total pages

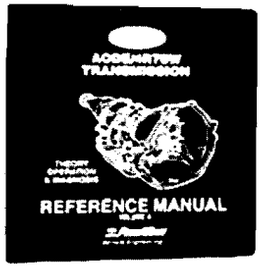
ORDER ITEM #12



CD4E

- Two binders
- 363 photos
- 16 pages of color hydraulic fluid circuits
- All full color pages
- 413 total pages

ORDER ITEM #9



AODE/4R70W

- Covers '92 - '96
- Two binders
- 219 color photos
- 18 pages of color hydraulic fluid circuits
- 413 total pages

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- Diagnosis
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Written by

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Service Engineers

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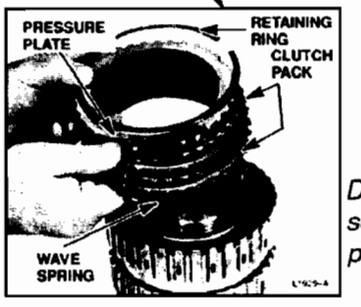
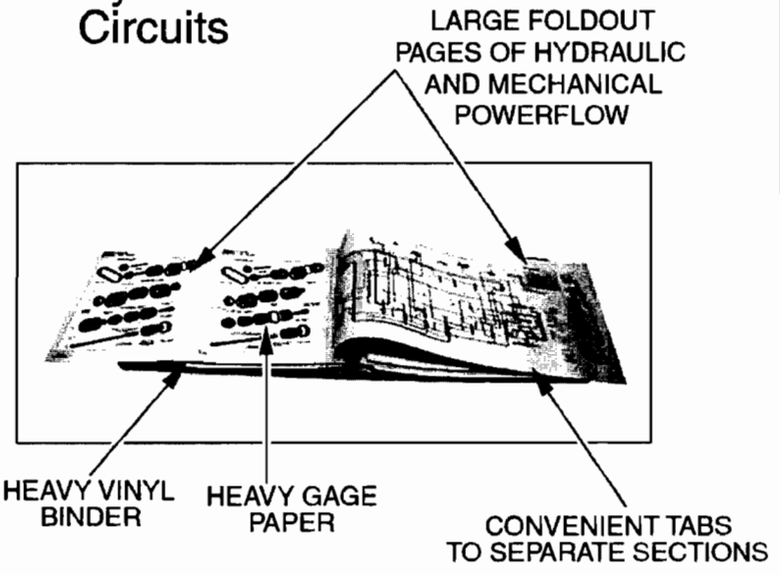


Disassembly/Reassembly sections use real photographs.



These reference manuals feature much more information than the shop manual. Reference manuals are designed to inform the beginner as well as the advanced technician on:

- Hydraulic and electrical theory
- Diagnositc routines
- Diagnostic concerns and their causes
- Mechanical power flow
- Complete disassembly and reassembly
- Torque converter operation

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Livonia, MI 48150
ICBA form questions call: (734) 523-5809

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Ford PowerTrain™

Service Engineering

99C

TECHNICAL PUBLICATIONS ORDER FORM 1999C

Item#	Description	Price Each	Qty	Extended Price
1	**E4OD** Reference Manual Binder 1989-1993 PTB 201	69.95		
2	**E4OD** Reference Manual Binder 1994-1998 PTB 802	69.95		
3	**4R100** Reference Manual Binder 1999-2000 PTB 904	69.95		
4	**4R/5RE** Reference Manual Binder 1995-2000 PTB 905	69.95		
9	**CD4E** Reference Manual Binder PTB 306	69.95		
11	**A4LD** Reference Manual Binder PTB 304	69.95		
12	**AX4N** Reference Manual Binder PTB 407	69.95		
13	Powertrain Product Guides POB 001	5.00		
20	**AODE/4R70W** Reference Manual Binder PTB 606	69.95		
21	**AXODE/AX4S** Reference Manual Binder PTB 605	69.95		
			Total	
			U.S. Orders only, add 10% Shipping/Handling (minimum $5.00)	
			(Orders outside U.S. see Ordering Instructions)	
			Total	

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FORD POWERTRAIN PUBLICATIONS
101 UNION STREET
PLYMOUTH, MI 48170

SHIP TO (No PO Boxes)

Attention _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone ( ) _____

Check No. _____

or

Visa/MC# _____

Expiration Date ___/___/___

Signature _____

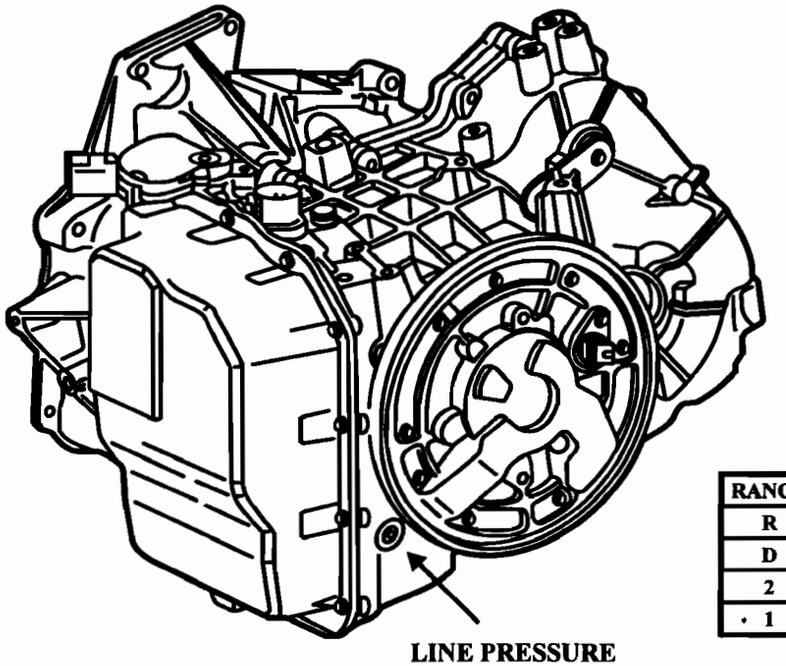
FORD CD4E/MAZDA LA4A-EL

HIGH LINE PRESSURE

COMPLAINT: Line pressure is high and there may or may not be gear ratio error codes stored. Transmission slip may or may not be experienced.
A **FALSE** code 452 for loss of vehicle speed signal may also be stored.

CAUSE: When the forward one-way clutch or forward clutch slips and the computer sees this slip take place, the computer will go to **Failure Mode Effects Management (FMEM).**
Even though a gear ratio code has not been stored, line pressure will be high.
The reason for this is, the computer has to see a slip three (3) times in order to store a slip code, but it only needs to see the slip occur once to go to FMEM.
This is why you may have high line pressure and no gear ratio error codes.
When the engine RPMs rise as a result of the slip, the computer does not see vehicle speed also rise and will therefore think the vehicle speed sensor has failed and will store a false VSS code.

CORRECTION: First scan the computer for gear ratio error or slip codes such as a code 645. Next verify line pressure using the information in figure 1.
Next check the condition of the forward one-way clutch for wear as indicated in figure 2. It is actually a good practice to replace this sprag as they are notorious for looking good but being bad.
Finally check the condition of the forward clutch. Remember that the forward clutch drum is also notorious for cracking which can cause forward clutch failure as well as direct clutch failure. (Refer to figure 3)



LINE PRESSURE
SERVICE PORT

RANGE	TAP	PSI AT IDLE	PSI AT STALL
R	Line	64-76	259-294
D	Line	45-63	168-184
2	Line	45-63	168-184
1	Line	45-63	168-184

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Figure 1

FORD CD4E/MAZDA LA4A-EL

HIGH LINE PRESSURE

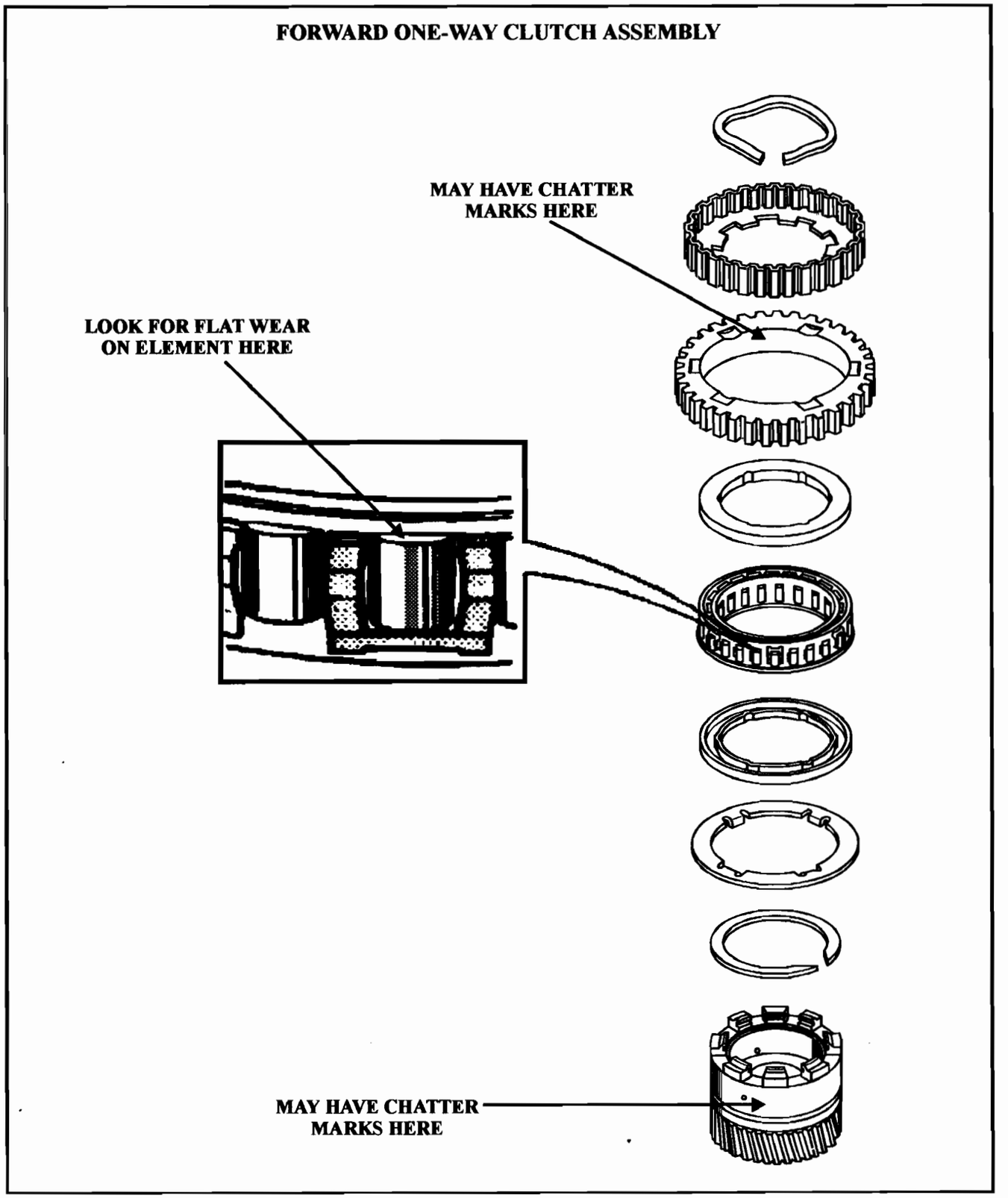

Figure 2

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FORD CD4E/MAZDA LA4A-EL

HIGH LINE PRESSURE

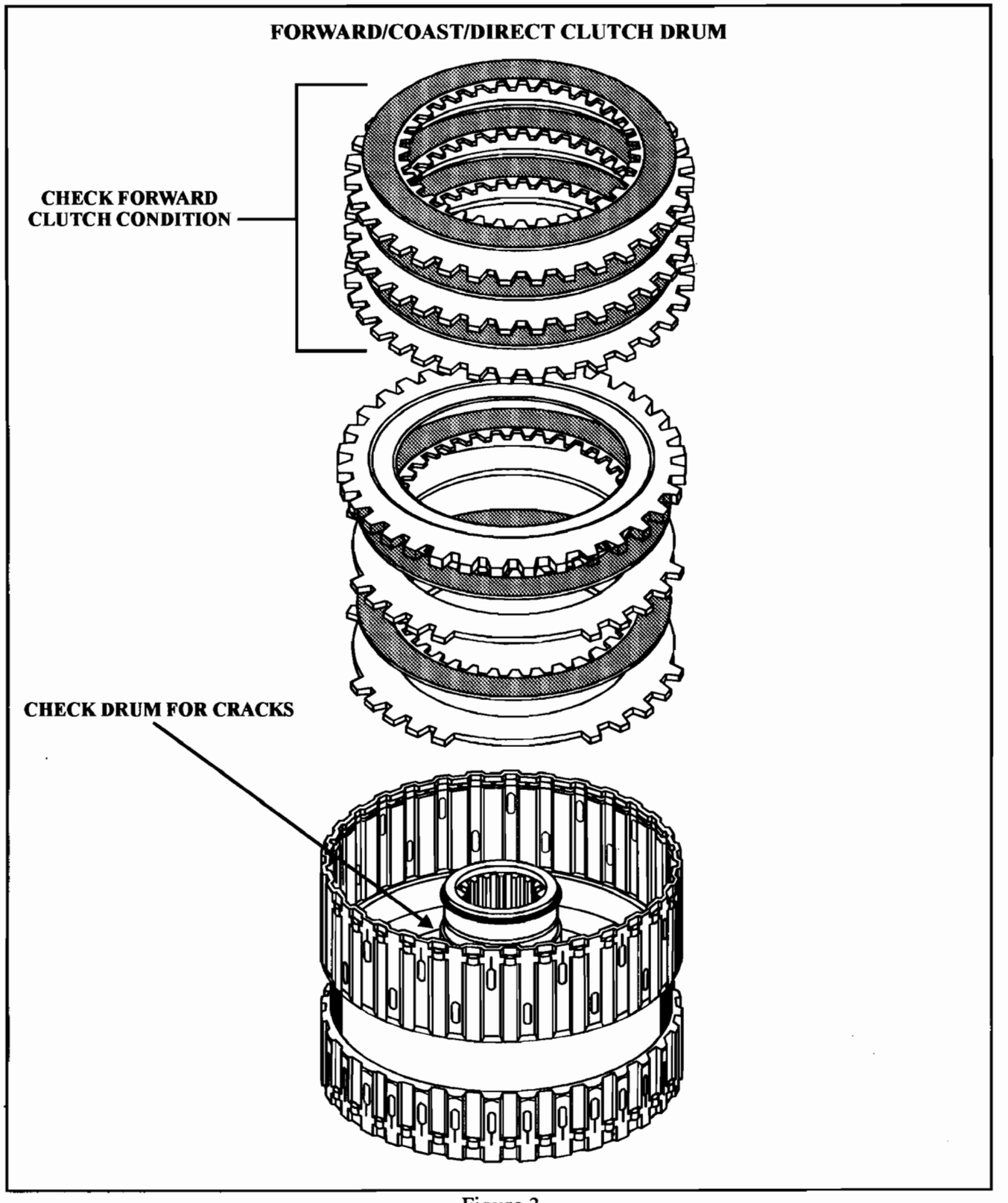

Figure 3

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ESCORT/TRACER
WRONG GEAR STARTS

COMPLAINT: It is noticed through a scanner that the speed sensor registers a mile per hour reading sometimes as high as 15 mph when the vehicle is stopped. This places the transaxle into a wrong gear start condition. Upon further investigation, it is found that the heater core is seeping coolant into the processor. With the processor replaced, the problem persists.

CAUSE: One cause may be the C203 connector located under the processor has been filled with coolant from the heater core. The C203 connector is white 4 pin connector (See Figure 1). A dark blue and a dark green wire can be found in this connector on 1.8L vehicles. A dark blue and a white wire with a black tracer can be found in this connector on 1.9L vehicles.

CORRECTION: Unplug and dry out both ends of the C203 connector.

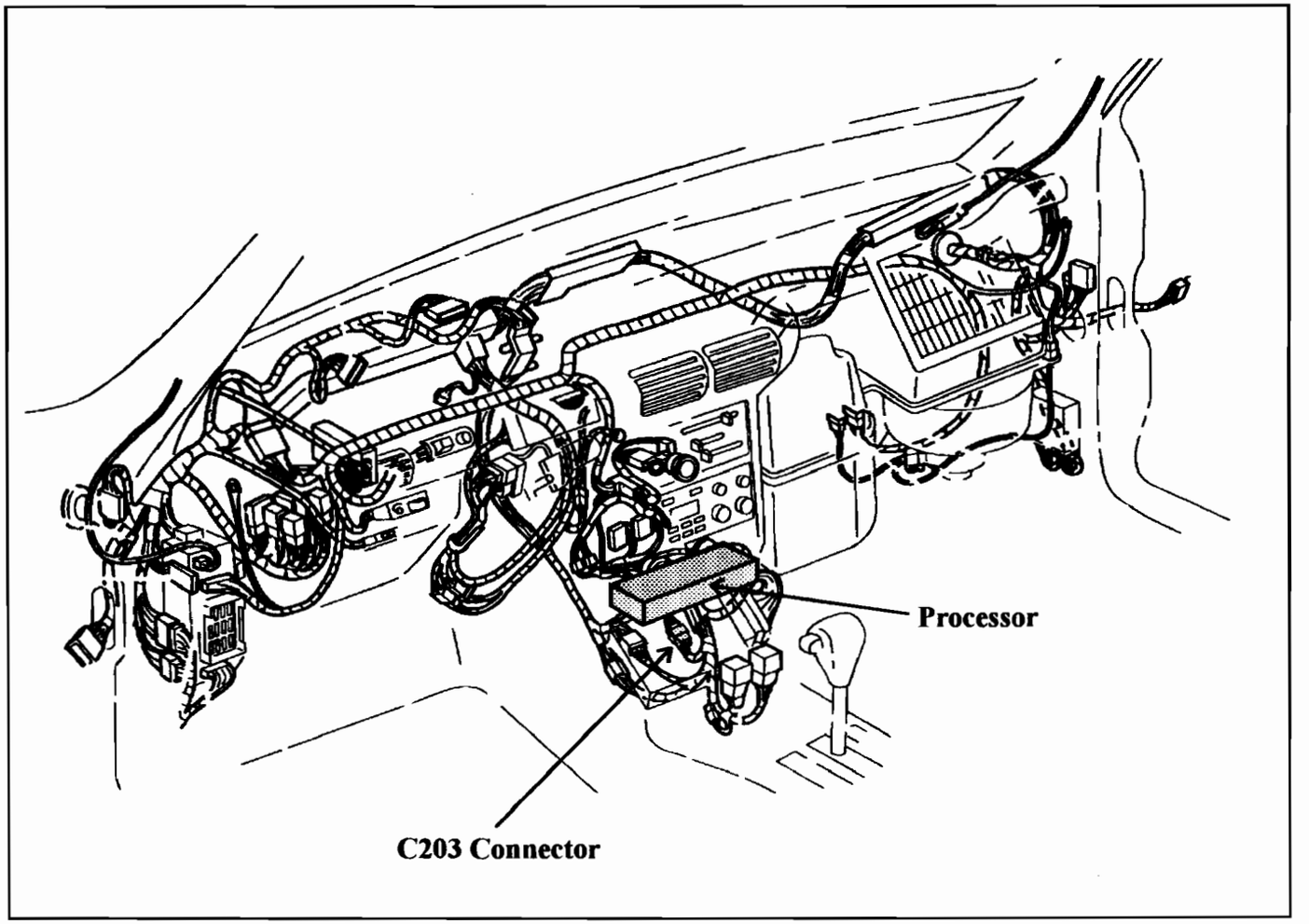

Figure 1

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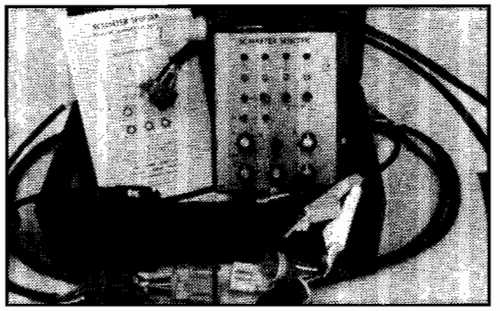
NEED HELP WITH DIAGNOSTICS?



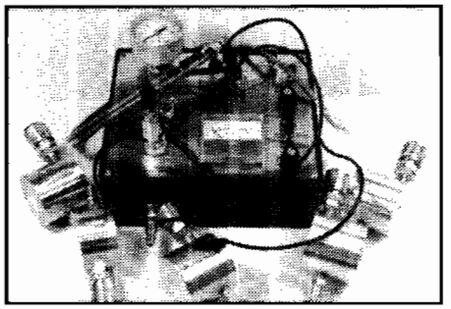
SCHAFFER SHIFTER® Transmission Tester

- Color-coded adapters serve as breakouts
- Highest Quality
- No Computer Knowledge Necessary
- Largest Connector Coverage on the Market
- Fastest and Simplest to Operate
- Most Complete Standard Package
- Automatic Short Detections

THESE PRODUCTS CAN SIMPLIFY YOUR JOB!

3-IN-1 SOLENOID TESTER

***SOLENOID REGULATION* - In or Out of Vehicle**

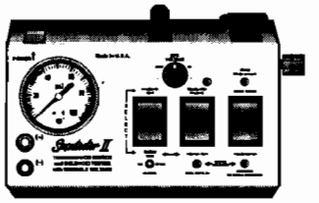


- Bench Test All Automatic Transmission Solenoid Types - Simple, Modulated, and Variable Force
- Simulated In - Car Operational Tests

SMARTESTER II™

Solenoid & Switch Bench Tester

Now with variable voltage for domestic EPC Control.

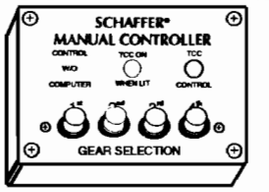


Checks pressure switches and simple solenoids under simulated operating conditions.

High Performance TRANSMISSION CONTROLLERS

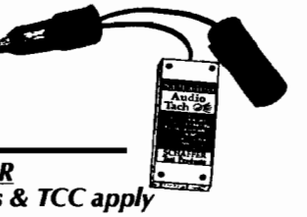
For Electronic Shifted Transmissions with or without factory computer

- Take full manual control
- Detachable from harness and wiring - theft deterrent

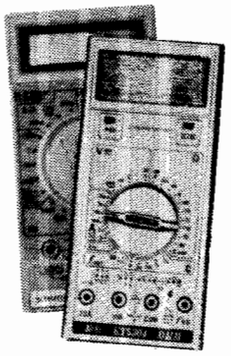


SHIFT-A-LIZER

Audio Tach



Now you can HEAR transmission shifts & TCC apply



DIGITAL MULTI-METERS

VOLTS - OHMS - AMPS
CAPACITANCE-
FREQUENCY
LARGE READOUT

•

No frills model, under $100

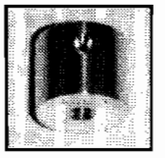
•

All the frills, under $200

•

Also with PC Interface

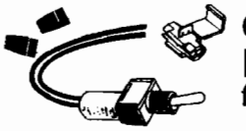
A4LD TEST SPOOL



4 ft. DMM TEST LEADS

with insulation piercing probes!

allows testing during operation - ***set of 2***



OVERDRIVE LOCKOUT for Ford Trucks

- Choice of full-time or switchable
- Allows full-time coast clutch operation

Coming soon for Chrysler & GM Trucks

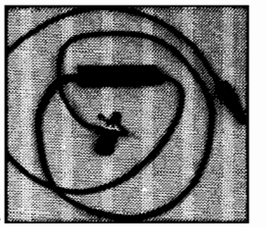
SAFE JUMP™

The Limiter *"takes the heat"*

Allows only 1.5 amps through it.

•

Safe operation & testing of all solenoids.

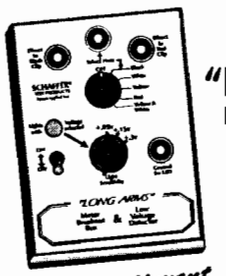


BACK PROBE KIT

Includes 2 - 4 ft. leads with large and small probes.

E40D SOLENOID PACK BENCH TEST MANIFOLD

- Mounted pressure regulator and gauge.
- Individual passages to identify which solenoid is being tested.
- EPC valve check by cycling the solenoid through the operating ranges.



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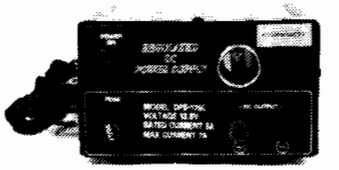
DMM Breakout Box

Electronic Test Light and Monitor

- Multi-Meter Breakout Box
- True Electronic Test Light
- Works as a signal monitor

The only equipment of it's kind in the World!

6 Amp Regulated Bench POWER SUPPLY



Multiple hook-ups allow versatility –cigar lighter, screw posts and banana jacks.

SCHAFFER® TEST PRODUCTS, INC.

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SOLENOID TESTING (PART II)

SOLENOID FAILURE WHEN HOT

COMPLAINT: In many cases a solenoid is checked for electrical and mechanical ability during overhaul and if the solenoid passes these tests, the solenoid is considered good and is reused in the newly overhauled transmission.
When repairs have been completed the vehicle is given the final road test after which, if all is well, the vehicle is delivered.
What may happen next is a phone call from the owner of that newly rebuilt transmission that some failure has occurred.
When the vehicle returns, a preliminary diagnosis indicates that one or more of those reused solenoids has failed!

CAUSE: This is an all to common occurrence due to the fact that a reused solenoid can fail when it gets hot, even though it checked good cold.
A variety of problems can arise such as falling out of gear, harsh or soft shifts, TCC problems or burnt frictions, depending which solenoid has failed.

CORRECTION: There is a new solenoid tester that is available from the ***Answermatic® division of Zoom Technology*** known as the ***Sol-X®***(Refer to Figure 1) which, among many other features, does check solenoids hot.
Some of the testers features are:

1. Interchangeable solenoid adaptors and a 6 channel manifold which can check an individual solenoid or a solenoid pack.
2. Pressure gauges to measure solenoid input and output pressure.
3. An oil heater which allows solenoids to be checked hot.
4. Digital display of oil temperature and solenoid flow
5. A solenoid demagnetizer which will allow complete flushing of the solenoid.
6. A multi-mode controller which provides 4 separate modes of operation such as:
   - **A.** Manual mode which provides manual control of the solenoid on/off cycle.
   - **B.** Cycle 1 mode which provides automatic on/off operation of the solenoid.
   - **C.** Cycle 2 mode which provides an aggressive continuous flush cycling of the solenoid being tested.
   - **D.** Flush mode combines the features of cycle 2 mode operation with a built in timer and a "cycle completed" audible alarm.
7. A multimeter to electrically evaluate the solenoid being tested.
8. Solenoid drive which provides 8 separate driver channels to allow continuity checks of solenoid packs and harnessed solenoids.
9. Solenoid power drivers that can be set to operate the ground side or positive side of the solenoid being tested.
10. On/off and duty cycling controls which allow on/off testing or pulse width modulation testing. Pulse width duties are set digitally to within 1% and are stable and repetitive.
11. Frequency control which provides 5 different operating frequencies for testing variable force solenoids.

For further information on the ***Sol-X®*** solenoid tester, contact Zoom Technology at 1-800-322-0806 or E-Mail to Answermatic@Info80e.net.

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SOLENOID TESTING (PART II)

SOLENOID FAILURE WHEN HOT

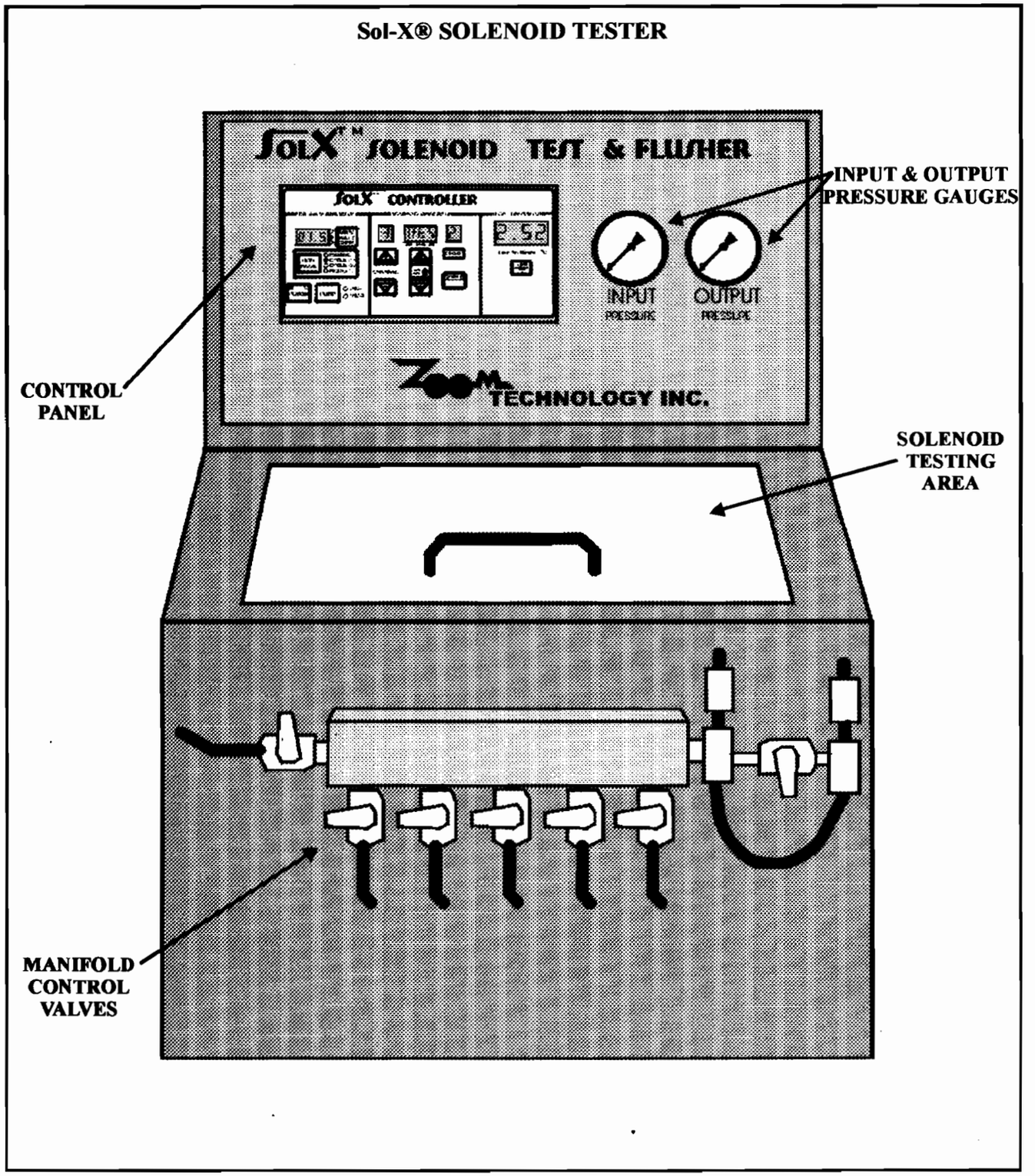

Figure 1

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SONNAFLOW
A NEW DIAGNOSTIC AID

The new ***Sonnaflow*** ™ tester by ***Sonnax*** provides a method whereby the technician can now monitor cooler flow effectively. Typically in the past and at present good cooler flow rate is determined by observing 1 quart per 20 seconds being delivered from the return cooling line. The equivalent reading that would be observed using the ***Sonnaflow*** ™ tester would be 0.7 to 0.8 Gallons Per Minute. Should the flow rate drop to 0.5 GPM or less a low flow warning lamp lights up catching the technicians attention (See Figure 1).

Although this new flow meter will aid the technician in locating cooler flow problems guarding against repeated planetary failure (which in itself is a reason to have this meter), it also provides other diagnostic capabilities. There is an optional diagnostic lead available which allows the technician to attach the flow meter to most DVOM's or Digital Lab Scopes. It may also be attached to Snap-On's Vantage which is a digital graphing multi-meter.

Sonnaflow ™ ***and the Vantage***
In Figure 2, the Vantage is set up as a Multi-Meter from the Main Menu to graph frequency in the range of 0 to 500 Hertz and is best viewed in one second time frames. When set in this configuration, the hertz level will be proportional to flow. As flow increases hertz increases. The one second interval allows the graph to move across the screen at a higher resolution permitting the observance of intermittent flow fluctuation.

Figure 3 - An example graph
Figure 3 is an example graph displaying an assortment of generic flow possibilities. The first half of the graph is an example of a weak pump. The cooler flow at idle is at a low 0.5 gpm. Only when the engine idle has increased that the proper flow rate of 0.7 to 0.8 gpm is reached. Another revealing factor of a weak pump is a significant drop in flow (0.4 gpm = 40-60Hz) when moving the selector from one position to the next (All have an average drop of 0.1 gpm = 10-20Hz).

The second half of the graph shows how flow begins to increase as the engine RPM's increase on acceleration. The shifts can be observed as the flow dips between shifts. Notice that when in gear cooler flow remains steady at an approximate 1.3 to 1.5 gpm.

The end of the graph reveals how converter clutch application may also be observed. When converter clutch applies, cooler flow will either increase or decrease in flow. This change in flow rate reveals that the converter clutch operation did in fact take place. Also notice that when the clutch is applied, cooler flow will either increase or decrease. The majority of lock up systems will increase in flow from 1.7 gpm to as high as 1.9 gpm. Few lock up systems will drop cooler flow as low as 0.8 gpm.

Figure 4 - A604 TCC vs No TCC Code 38
A no Converter Clutch apply produces a code 38 with A604/606 transaxles. A no converter clutch apply may be the result of several different possibilities. Figure 4 displays two graphs. The lower graph is a 604 transaxle producing a code 38. It is noticed that there are three blips which occurred over a period of 1 mile prior to the code being set. Once the code is set the blips do not occur again until the ignition has been cycled. This observance reveals the controllers attempt at applying the converter clutch verifying the computer systems integrity. With this information it is obvious that an internal problem had occurred. Upon inspection, the converter clutch switch valve was found to be stuck. The above chart reveals converter clutch apply after the switch valve was freed by changing it with Sonnax's Converter Apply Pressure Regulator Valve Kit 92835-01K.

SONNAFLOW
A NEW DIAGNOSTIC AID

Figure 5 - A defective cooler
The lower graph has been taken from a Dodge Pickup with a 47RE transmission experiencing repeated planetary failure. Notice that the cooler flow never achieves a flow rate much higher than 0.6 gpm. Also noticed that the converter clutch never applied. This low cooler flow had effected the operation of the 4 spool switch valve which this particular valve body had, not allowing the correct hydraulic move of the valve to occur. The above graph is what occurred after the cooler was replaced.

Figure 6 - A weak pump
Figure 6 is a graph of a transmission with a weak pump. In the past, different methods were employed to determine weak pumps. A flow meter is the single most easiest method which can be employed for all automatic transmissions.

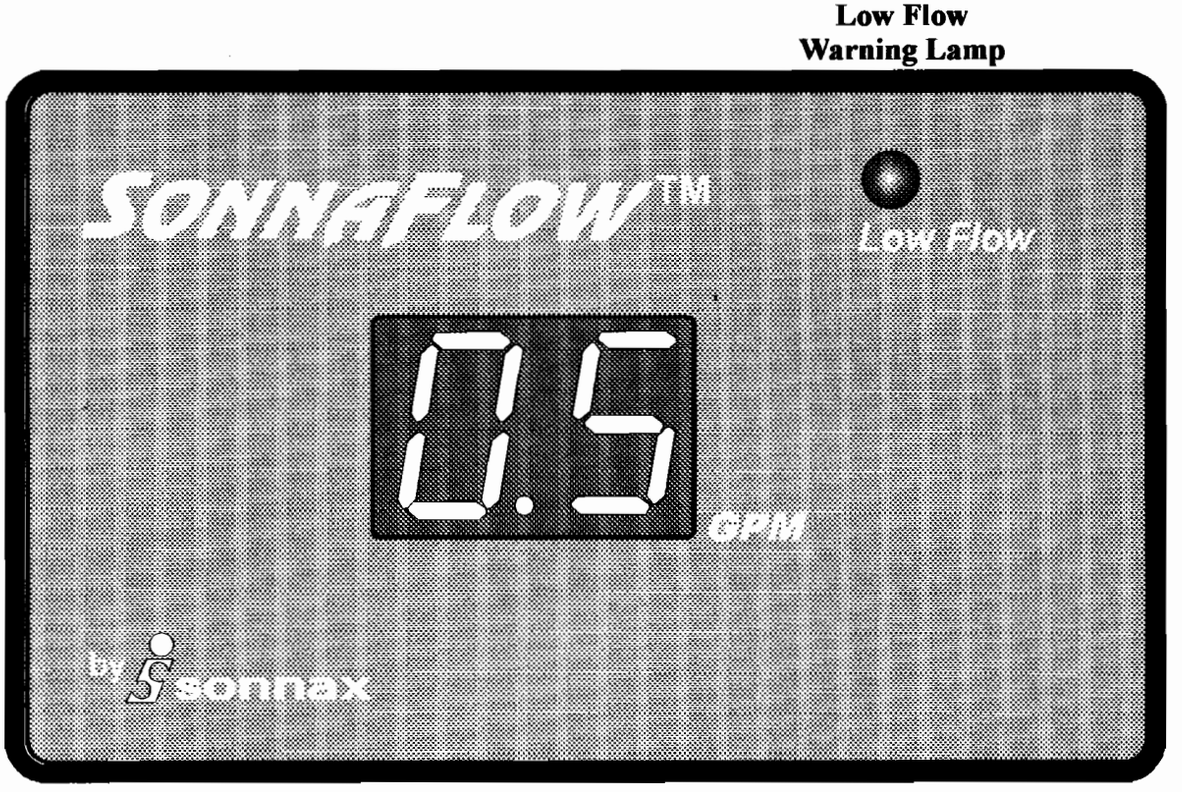
Figure 7 - High line low or no cooler flow
Some technicians may have had the unfortunate experience of placing a C3 modulator into a C4 transmission only to find themselves with a vehicle that has a no move condition. This scenario caused the pressure regulator valve to be in such a high line pressure condition, converter fill and lube flow was cut off. When the correct modulator is installed, converter fill and cooler flow is restored and the no move condition is cured. This situation serves as an example as to what could happen to converter fill and lube flow for most transmissions should high line pressure occur. Drilling from a line pressure circuit into a lube circuit has become common place in most shops as an insurance method of providing constant lube should high line pressure take place. The example in Figure 7 is from a Ford Taurus with an AXODE transmission. This transmission did not have the updated cross over pipes nor was line to lube drilled. As soon as a code was stored whereby the processor went into "Failure Mode Effect Management" (FMEM), line pressure went up and cooler flow dropped to 0.

Figure 8 - Will the real cause please stand up
The cause of a sudden flare into Neutral while driving 60 mph in a Ford Taurus is usually found to be a defective Manual Lever Position Sensors (MLPS). In this case all electronics have been replaced, i.e. solenoids and sensors. The graph indicates that cooler flow was dropping simultaneously with the neutralizing. Line pressure was not spiking during this condition either. The evidence provided by the flow meter via the graph indicated a loss of hydraulic stability placing the transmission into neutral. With this information the next step is to go into the valve body to check the pump shaft, sealing rings etc.. Only a worn TCC bypass valve and sticking lube relief valves were found and repaired to correct this condition.

Figure 9 - Pump cavitation
The ***Sonnaflow*** ™ sensor uses a little paddled wheel to sense flow. When a pump sucks to much air into the system it is said to have cavitation. Spurts of air rushing past the wheel spins the wheel faster making the readings spike. The graph in figure 9 displays this as an irregular wave form reaching heights as high as 3.0 gpm and better.

All and all, this tool provides a new method of diagnosing. Consistent use of the tool will not only safeguard against repeated planetary failure, it will also provide a new set of eyes in diagnosing pump and pressure regulation concerns.

SONNAFLOW
A NEW DIAGNOSTIC AID



Sonnax's Digital User Interface Display

Figure 1

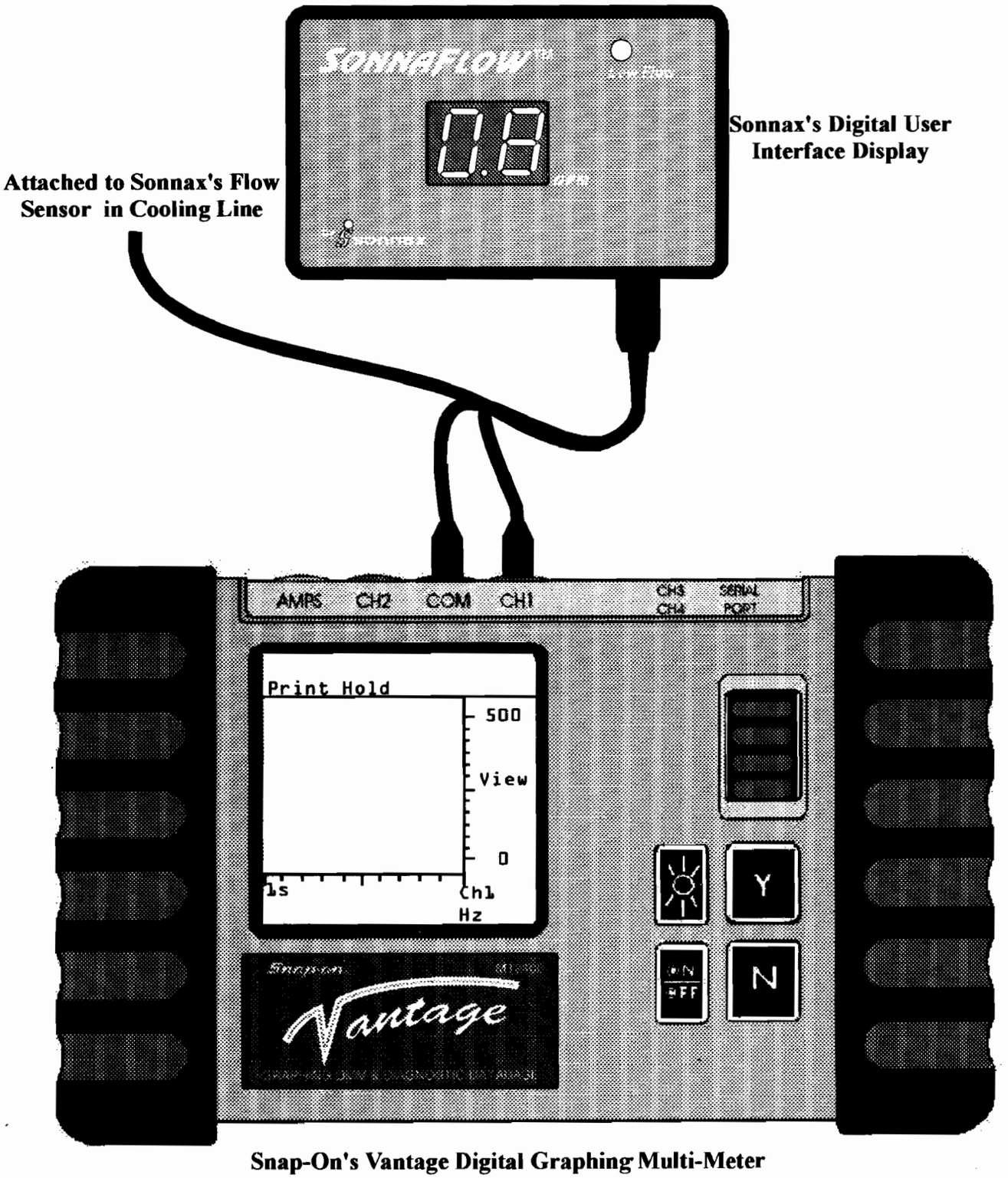
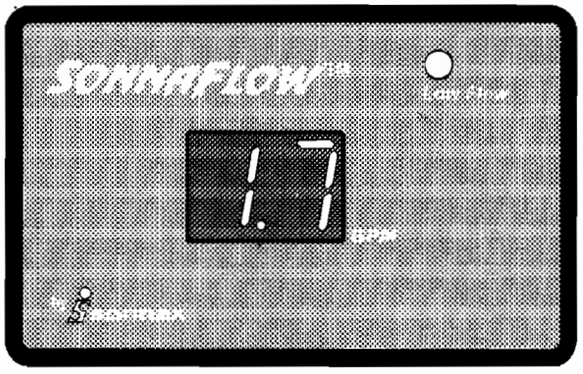

SONNAFLOW
0.8
Sonnax's Digital User Interface Display
Attached to Sonnax's Flow Sensor in Cooling Line
AMPS
CH2
COM
CH1
CH3
CH4
SERIAL PORT
Print Hold
500
View
0
1s
Ch1
Hz
Y
N
ON
OFF
Snap-on
Vantage
Snap-On's Vantage Digital Graphing Multi-Meter

Figure 2

The traditional flow check of 1 quart in 20 seconds corresponds to a flow rate of 0.7 to 0.8 GPM.



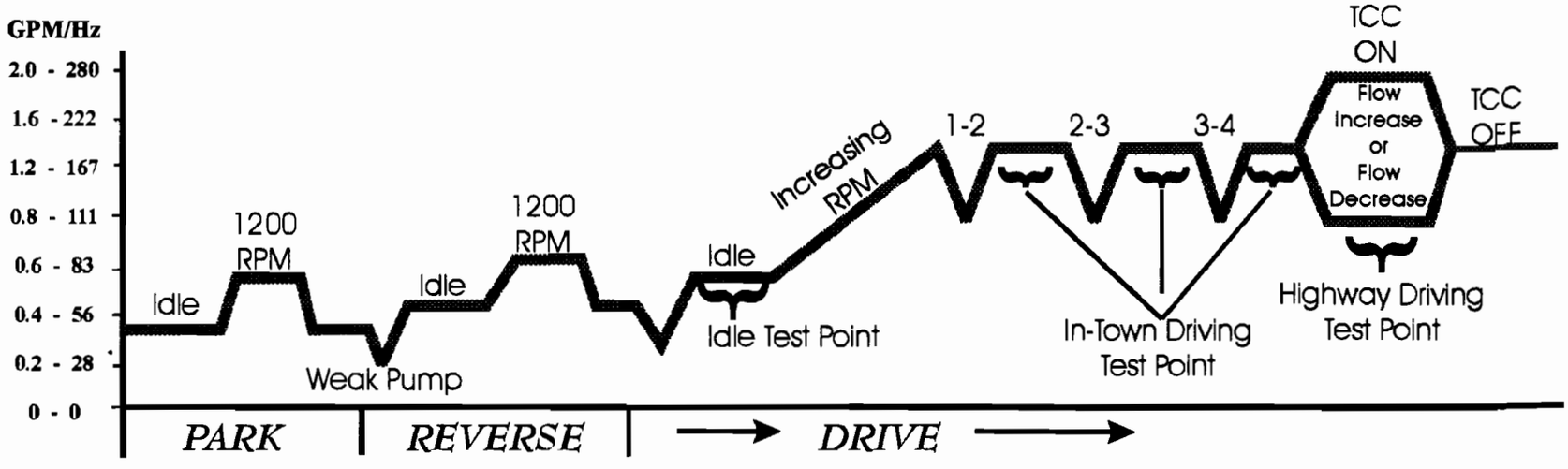


Figure 3

A604 TCC vs No TCC Code 38

A sticking or stuck TCC Control valve
produces code 38.
Replaced TCC control valve with
Sonnax Switch Valve Regulating Assembly
92835-01K

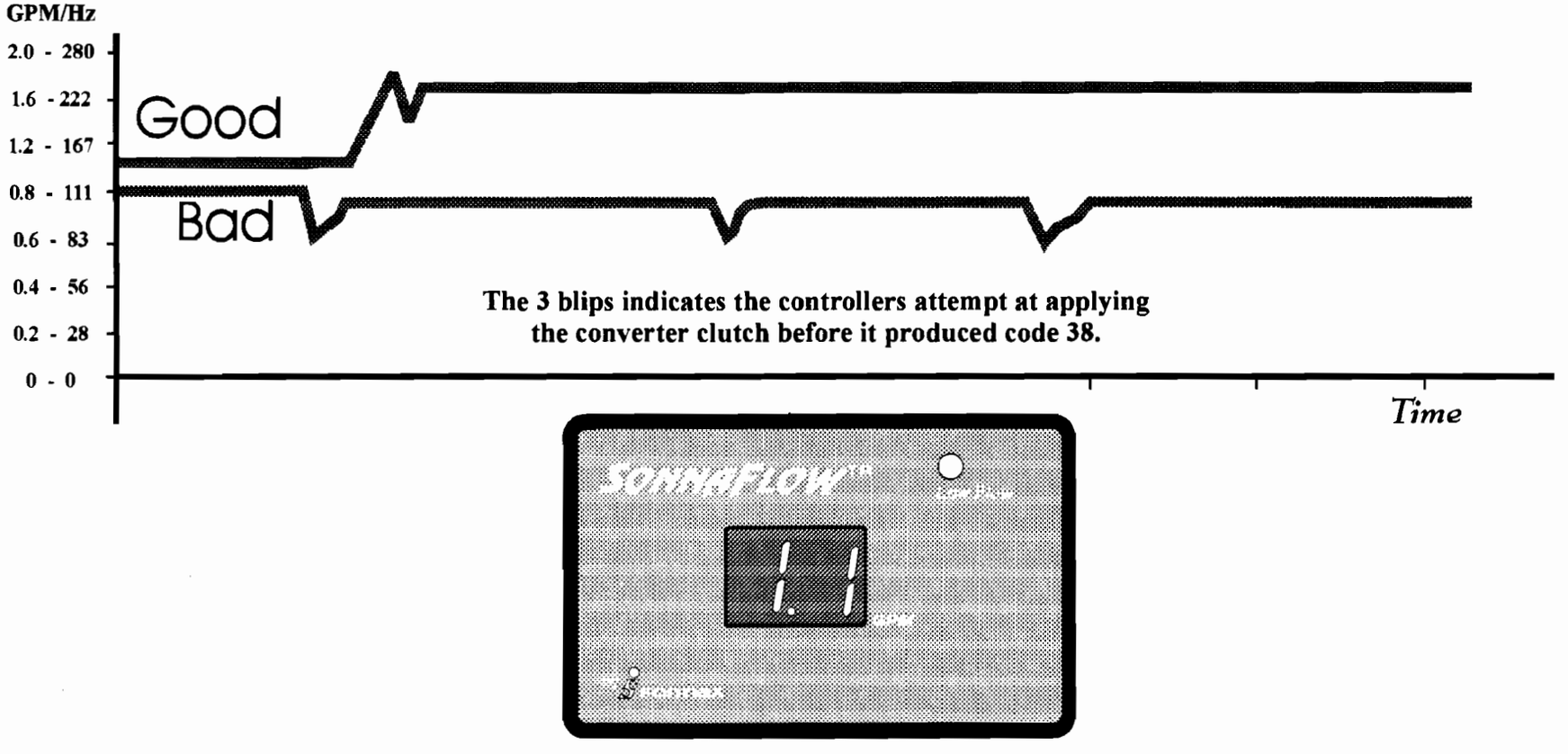


Figure 4

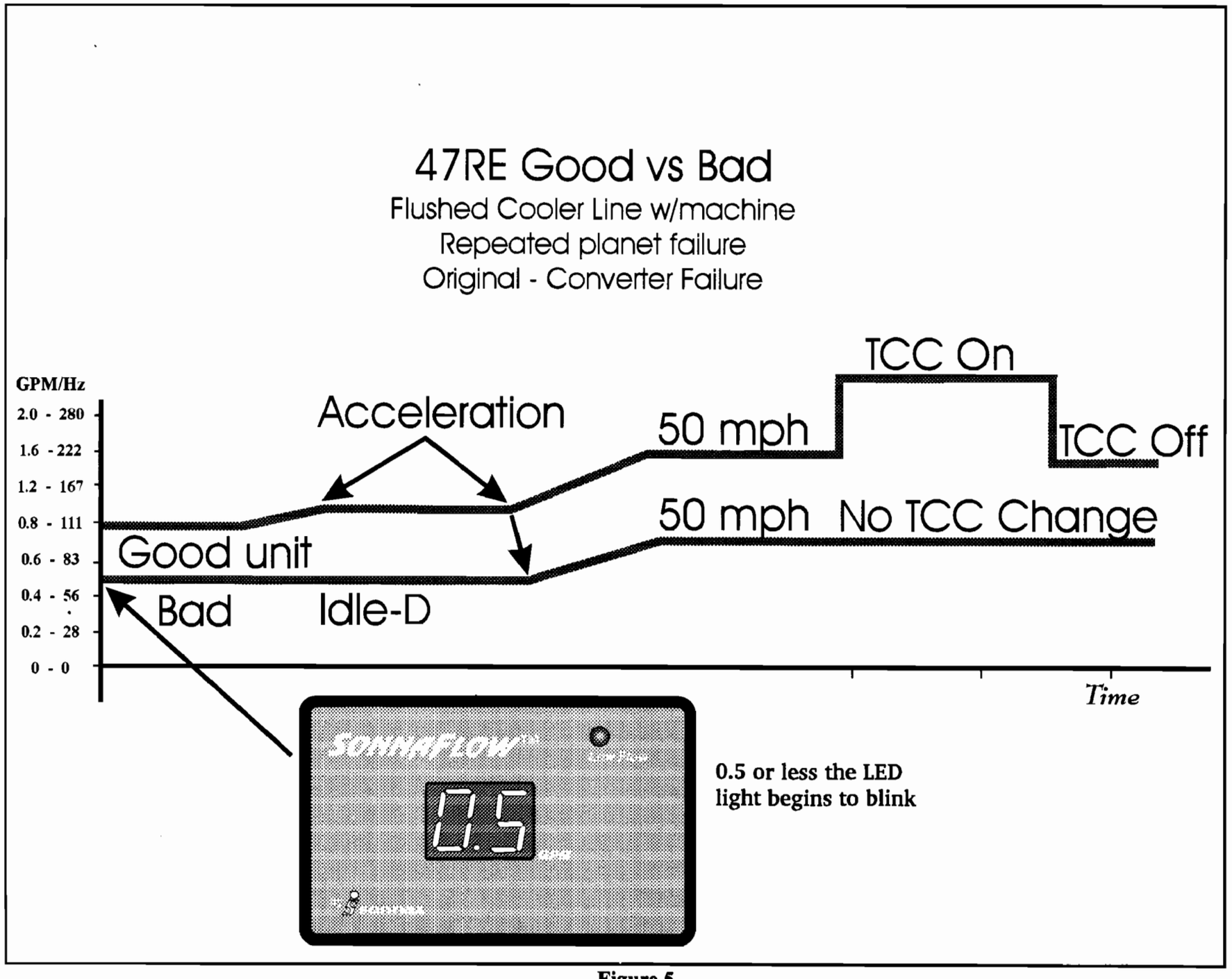

47RE Good vs Bad
Flushed Cooler Line w/machine
Repeated planet failure
Original - Converter Failure
GPM/Hz
2.0 - 280
1.6 - 222
1.2 - 167
0.8 - 111
0.6 - 83
0.4 - 56
0.2 - 28
0 - 0
Acceleration
TCC On
50 mph
TCC Off
50 mph No TCC Change
Good unit
Bad
Idle-D
Time
0.5 or less the LED
light begins to blink

Figure 5

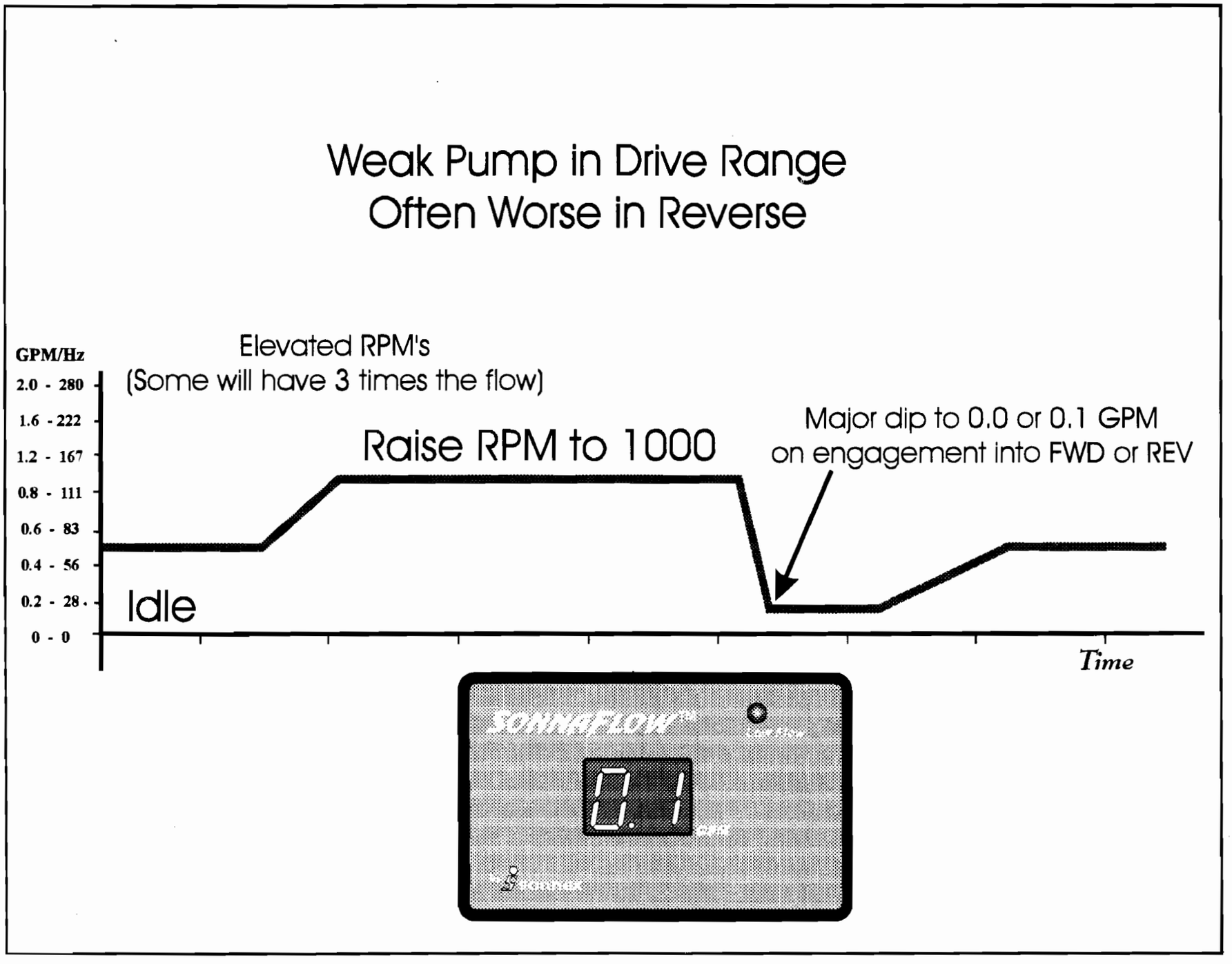

Weak Pump in Drive Range
Often Worse in Reverse
GPM/Hz
2.0 - 280
1.6 - 222
1.2 - 167
0.8 - 111
0.6 - 83
0.4 - 56
0.2 - 28
0 - 0
Elevated RPM's
(Some will have 3 times the flow)
Raise RPM to 1000
Major dip to 0.0 or 0.1 GPM
on engagement into FWD or REV
Idle
Time
SONNAFLOW™
0.1
GPM

Figure 6

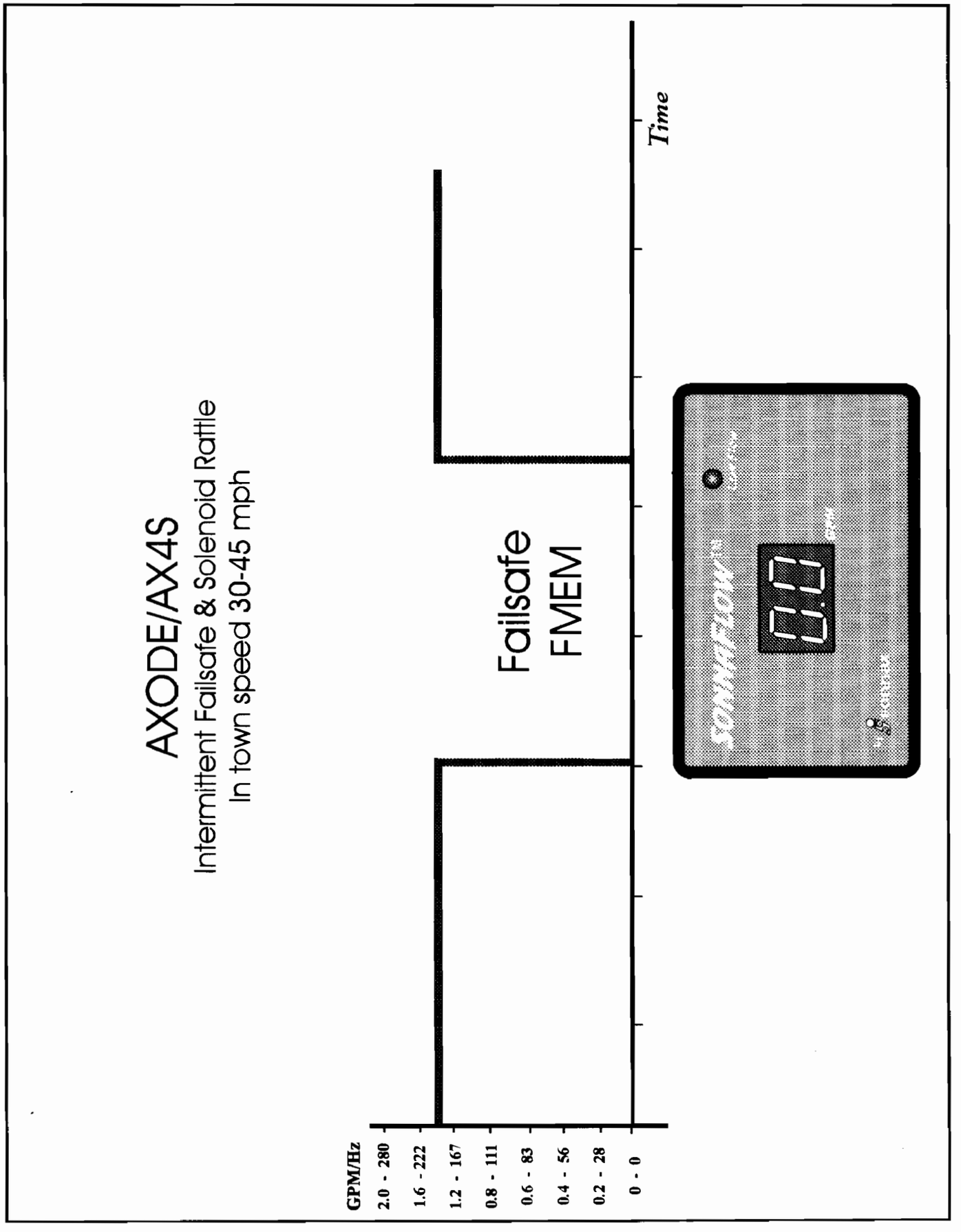

AXODE/AX4S
Intermittent Failsafe & Solenoid Rattle
In town speed 30-45 mph
Failsafe
FMEM
GPM/Hz
2.0 - 280
1.6 - 222
1.2 - 167
0.8 - 111
0.6 - 83
0.4 - 56
0.2 - 28
0 - 0
Time

Figure 7

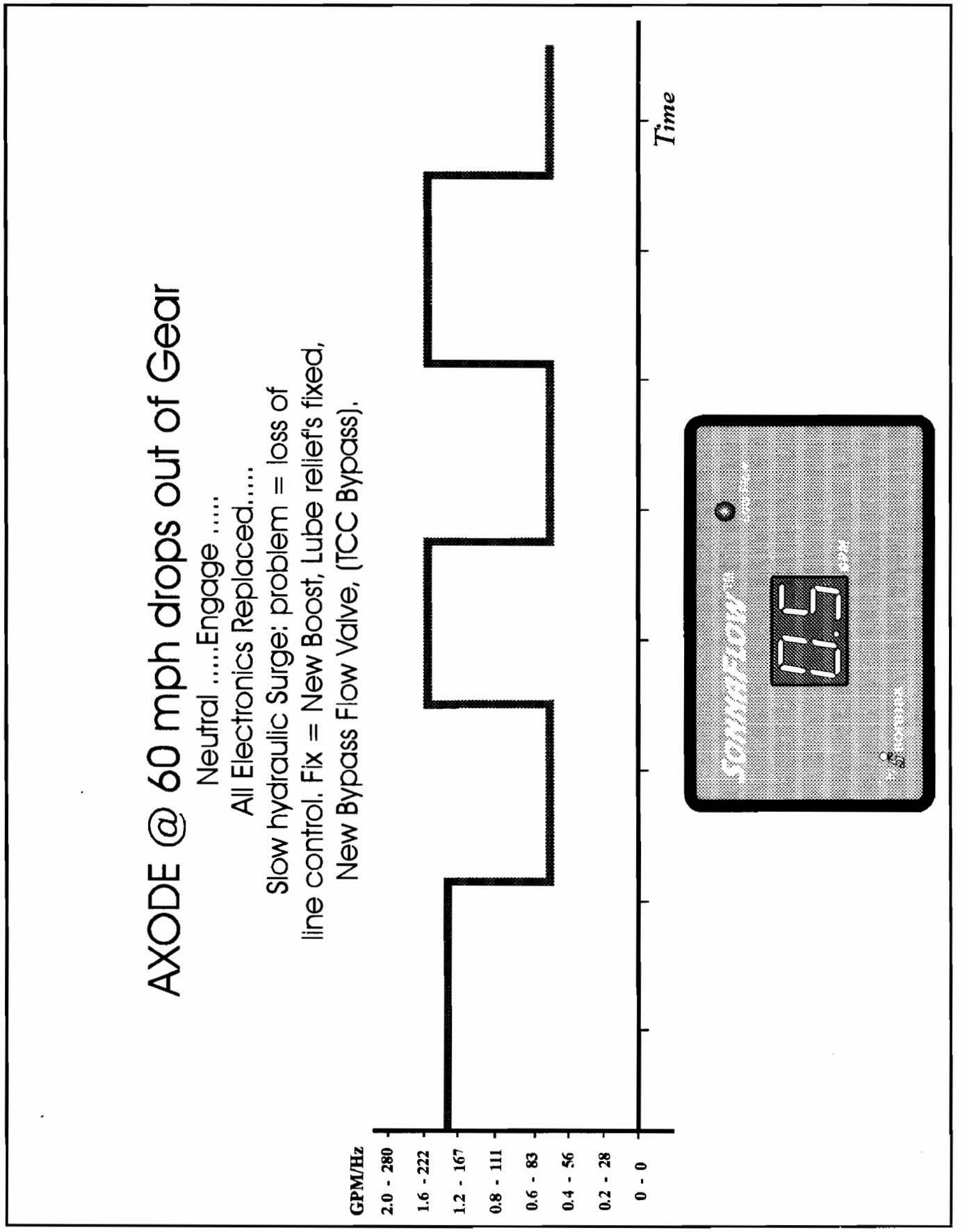

AXODE @ 60 mph drops out of Gear
Neutral .....Engage .....
All Electronics Replaced.....
Slow hydraulic Surge; problem = loss of
line control. Fix = New Boost, Lube relief's fixed,
New Bypass Flow Valve, (TCC Bypass).
GPM/Hz
2.0 - 280
1.6 - 222
1.2 - 167
0.8 - 111
0.6 - 83
0.4 - 56
0.2 - 28
0 - 0
Time
SONNAFLOW

Figure 8

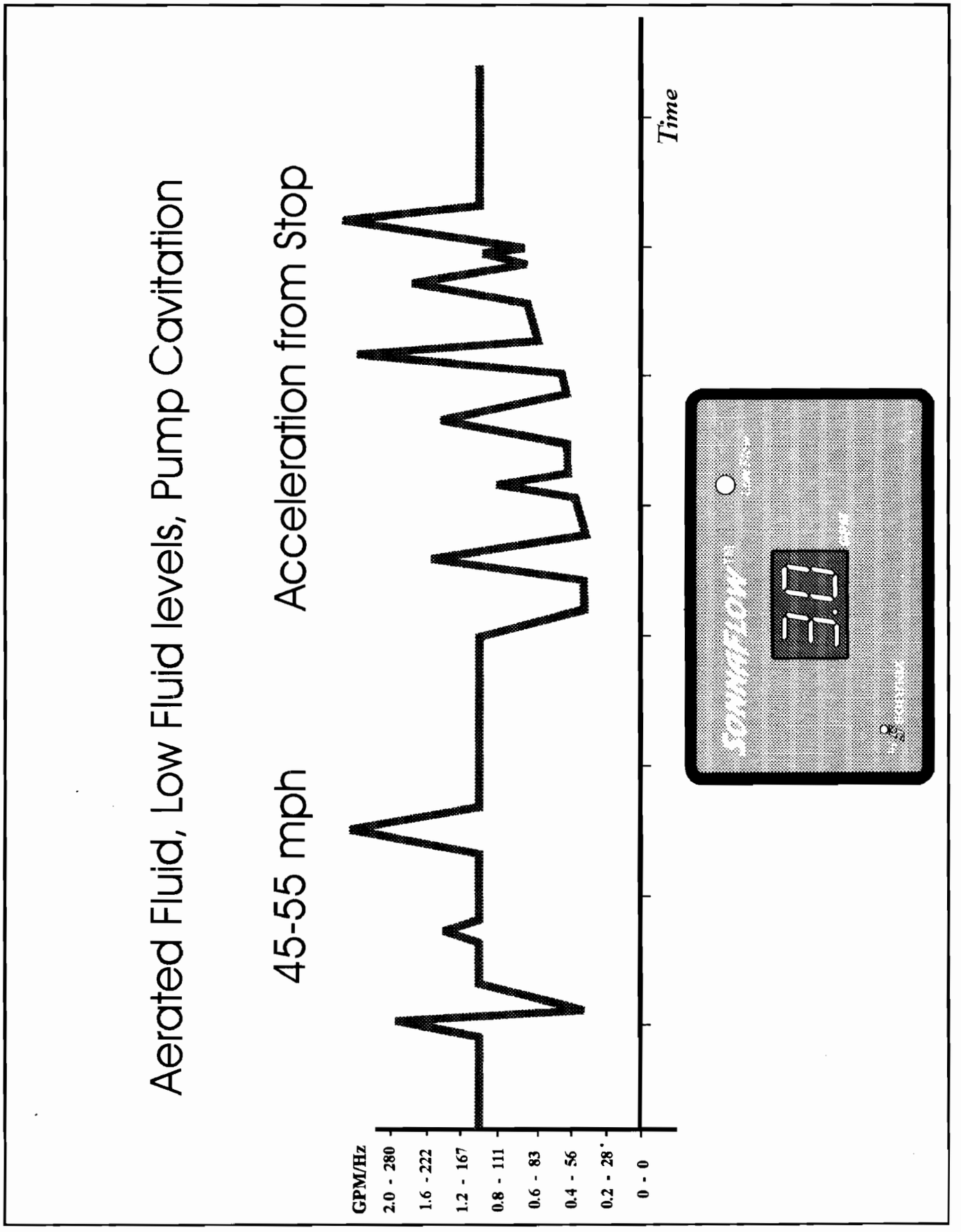

Aerated Fluid, Low Fluid levels, Pump Cavitation
45-55 mph
Acceleration from Stop
GPM/Hz
2.0 - 280
1.6 - 222
1.2 - 167
0.8 - 111
0.6 - 83
0.4 - 56
0.2 - 28
0 - 0
Time
SONNAFLOW

Figure 9

CHRYSLER 45RFE

SNAP RING IDENTIFICATION FOR THE INPUT HOUSING AND LOW/REVERSE HOUSING

The Input Housing on the new Chrysler 45RFE rear drive transmission is very similar to the A604 input housing, except that it is much larger in diameter and length. This is going to change all of the snap ring dimensions in the input housing and can create some confusion. To eliminate this confusion we have provided you with the exploded view of all of the internal parts in the input housing, as well as all of the snap ring dimensions. There is also a drain back check valve assembly incorporated in the input shaft that has not been seen before and we have provided you with location and parts involved. Refer to the Figure numbers below for this information.

The Low/Reverse Clutch Housing is also fairly complex in the snap ring department, and the assembly of this housing which incorporates the Low/Reverse roller clutch can be confusing. To eliminate this confusion we have also provided you with snap ring dimensions and locations for the Low/Reverse Housing and the assembly process for the same. Refer to the Figure numbers below for this information.

Refer to Figures 1 and 2 for the exploded view of the parts in the Input Housing.

Refer to Figure 3 for the snap ring dimensions and locations for the Input Housing.

Refer to Figure 4 for the new drain back valve assembly location and parts.

Refer to Figure 6 for the exploded view of the parts in the Low/Reverse Clutch Housing.

Refer to Figures 7 and 8 for the assembly process for Low/Reverse Clutch Housing.

Refer to Figure 9 for the snap ring dimensions and locations for the Low/Reverse Clutch Housing.

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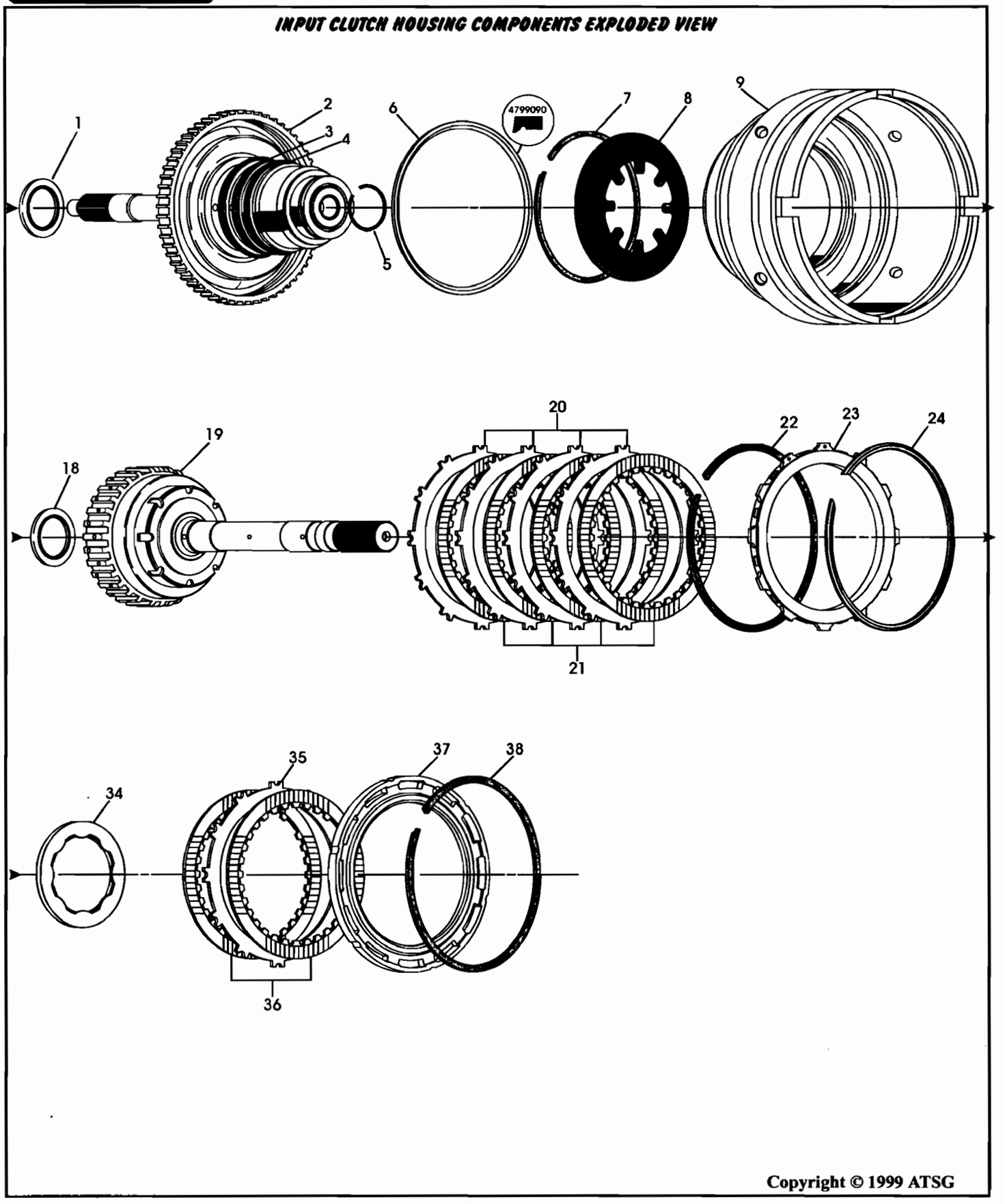
INPUT CLUTCH HOUSING COMPONENTS EXPLODED VIEW
1
2
3
4
5
6
4799090
7
8
9
18
19
20
21
22
23
24
34
35
36
37
38
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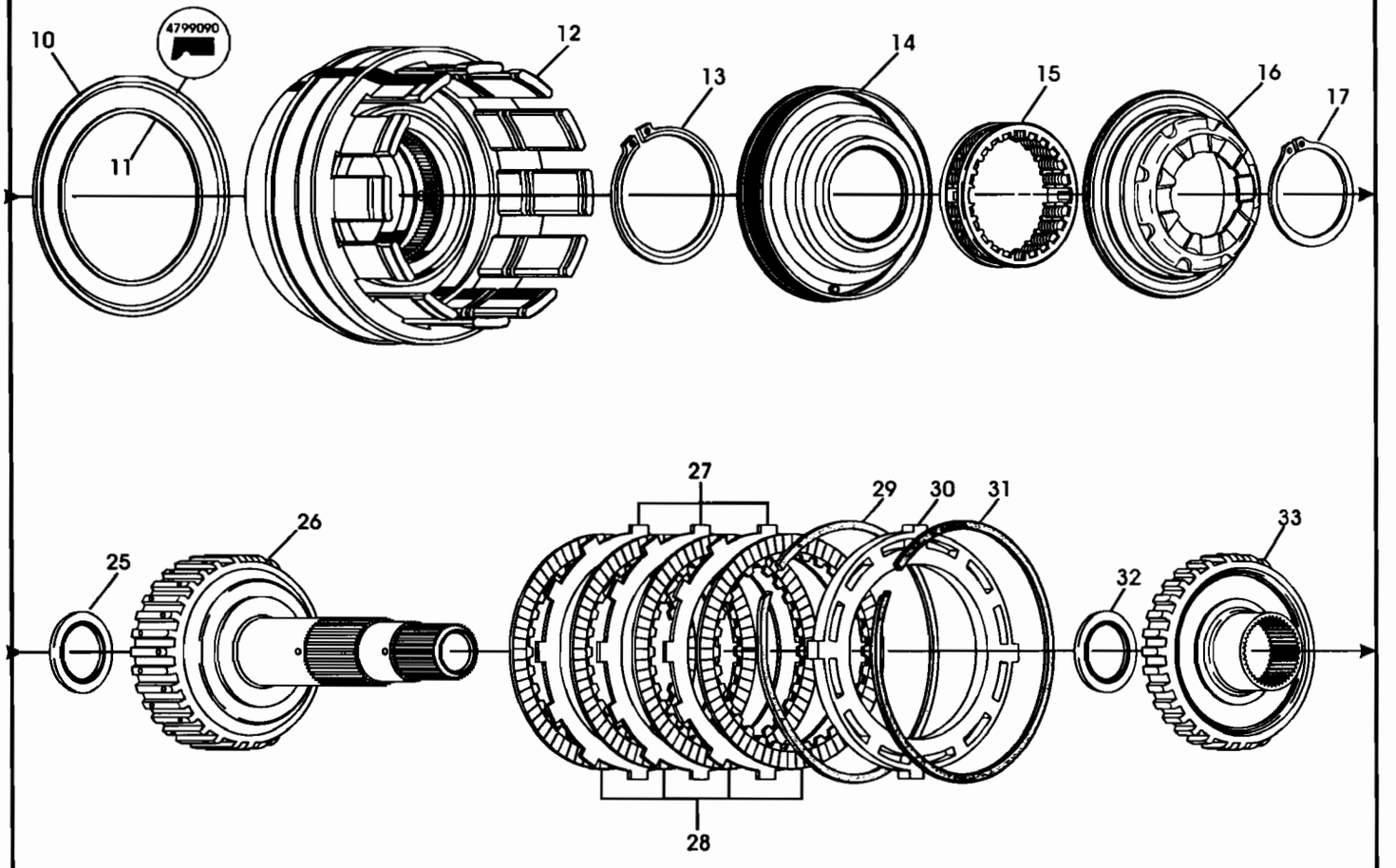
Figure 1

INPUT CLUTCH HOUSING COMPONENTS EXPLODED VIEW



1. NUMBER 1 THRUST BEARING.
2. INPUT CLUTCH HUB.
3. GREEN COLORED "O" RING.
4. RED COLORED "O" RING.
5. INPUT SHAFT RETAINING CIR-CLIP.
6. REVERSE OUTER LIP SEAL (INSIDE LIP).
7. OVERDRIVE/REVERSE PISTON BELLVILLE SNAP RING.
8. OVERDRIVE/REVERSE PISTON BELLVILLE PLATE.
9. OVERDRIVE/REVERSE PISTON ASSEMBLY.
10. OVERDRIVE OUTER LIP SEAL (INSIDE LIP).
11. OVERDRIVE/REVERSE INNER "O" RING.
12. INPUT CLUTCH RETAINER.
13. "BEVELED" SNAP RING (INSIDE BEVEL).
14. UNDERDRIVE CLUTCH PISTON ASSEMBLY.
15. UNDERDRIVE CLUTCH RETURN SPRING ASSEMBLY.
16. SPRING RETAINER AND BALANCE PISTON ASSEMBLY.
17. "FLAT" SNAP RING.
18. NUMBER 2 THRUST BEARING.
20. UNDERDRIVE CLUTCH STEEL PLATES .067" THICK (4 REQUIRED).
21. UNDERDRIVE CLUTCH LINED PLATES .078" THICK (4 REQUIRED).
22. UNDERDRIVE/OVERDRIVE REACTION PLATE "FLAT" SNAP RING.
23. UNDERDRIVE/OVERDRIVE REACTION PLATE.
24. UNDERDRIVE/OD REACTION PLATE "TAPERED" SNAP RING.
25. NUMBER 3 THRUST BEARING.
26. OVERDRIVE CLUTCH HUB AND SHAFT ASSEMBLY.
27. OVERDRIVE CLUTCH STEEL PLATES .086" THICK (3 REQUIRED).
28. OVERDRIVE CLUTCH LINED PLATES .090" THICK (4 REQUIRED).
29. OVERDRIVE/REVERSE REACTION PLATE "WAVE" SNAP RING.
30. OVERDRIVE/REVERSE REACTION PLATE.
31. OVERDRIVE/REVERSE REACTION PLATE "FLAT" SNAP RING.
32. NUMBER 4 THRUST BEARING.
33. REVERSE CLUTCH HUB ASSEMBLY.
34. NUMBER 5 "SELECTIVE" THRUST BEARING ASSEMBLY.
35. REVERSE CLUTCH STEEL PLATE .067" THICK (1 REQUIRED).
36. REVERSE CLUTCH LINED PLATES .080" THICK (2 REQUIRED).
37. REVERSE CLUTCH BACKING PLATE.
38. REVERSE CLUTCH BACKING PLATE "FLAT" SNAP RING.

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Figure 2

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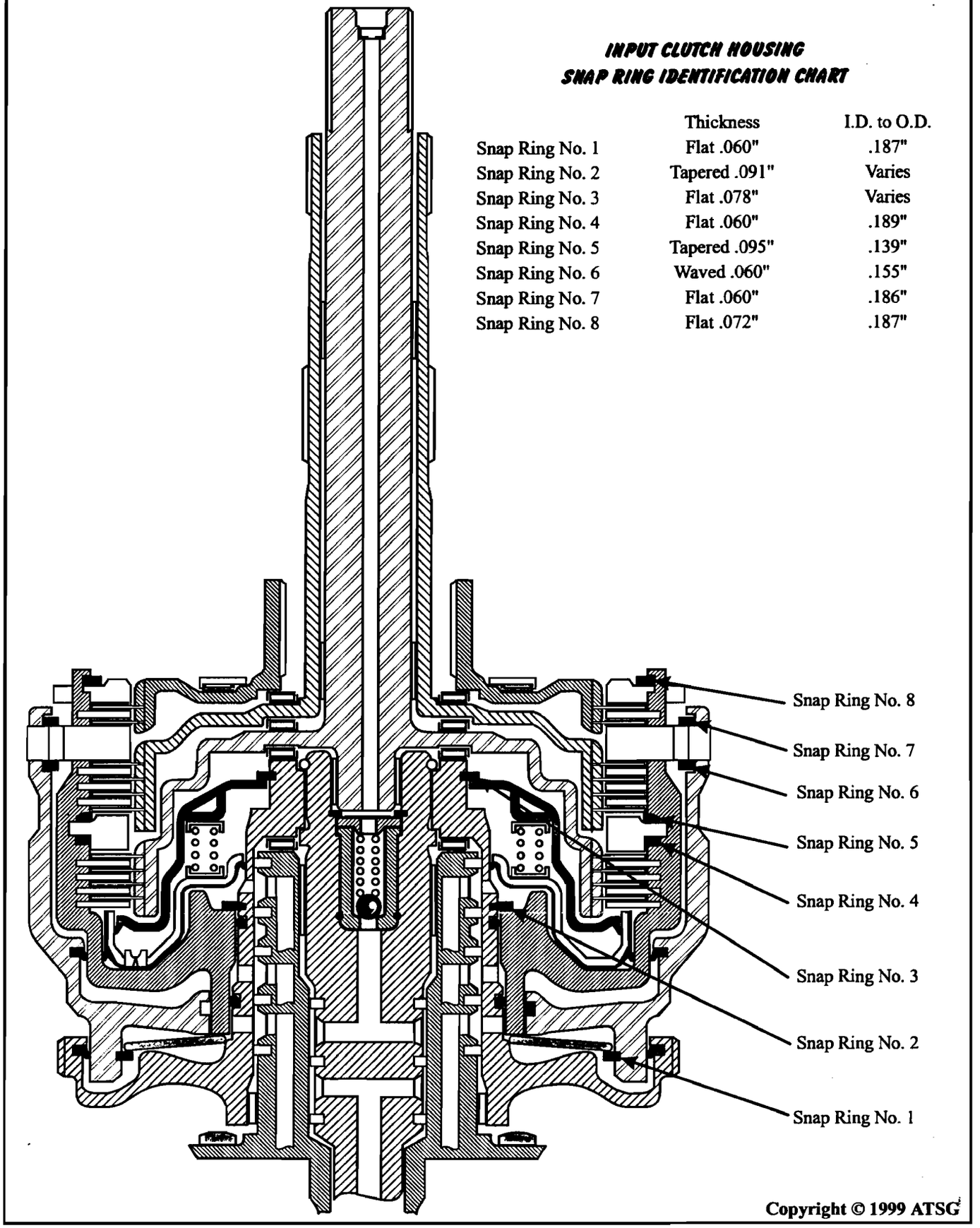
INPUT CLUTCH HOUSING
SNAP RING IDENTIFICATION CHART
Thickness
I.D. to O.D.
Snap Ring No. 1 Flat .060" .187"
Snap Ring No. 2 Tapered .091" Varies
Snap Ring No. 3 Flat .078" Varies
Snap Ring No. 4 Flat .060" .189"
Snap Ring No. 5 Tapered .095" .139"
Snap Ring No. 6 Waved .060" .155"
Snap Ring No. 7 Flat .060" .186"
Snap Ring No. 8 Flat .072" .187"
Snap Ring No. 8
Snap Ring No. 7
Snap Ring No. 6
Snap Ring No. 5
Snap Ring No. 4
Snap Ring No. 3
Snap Ring No. 2
Snap Ring No. 1
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Figure 3

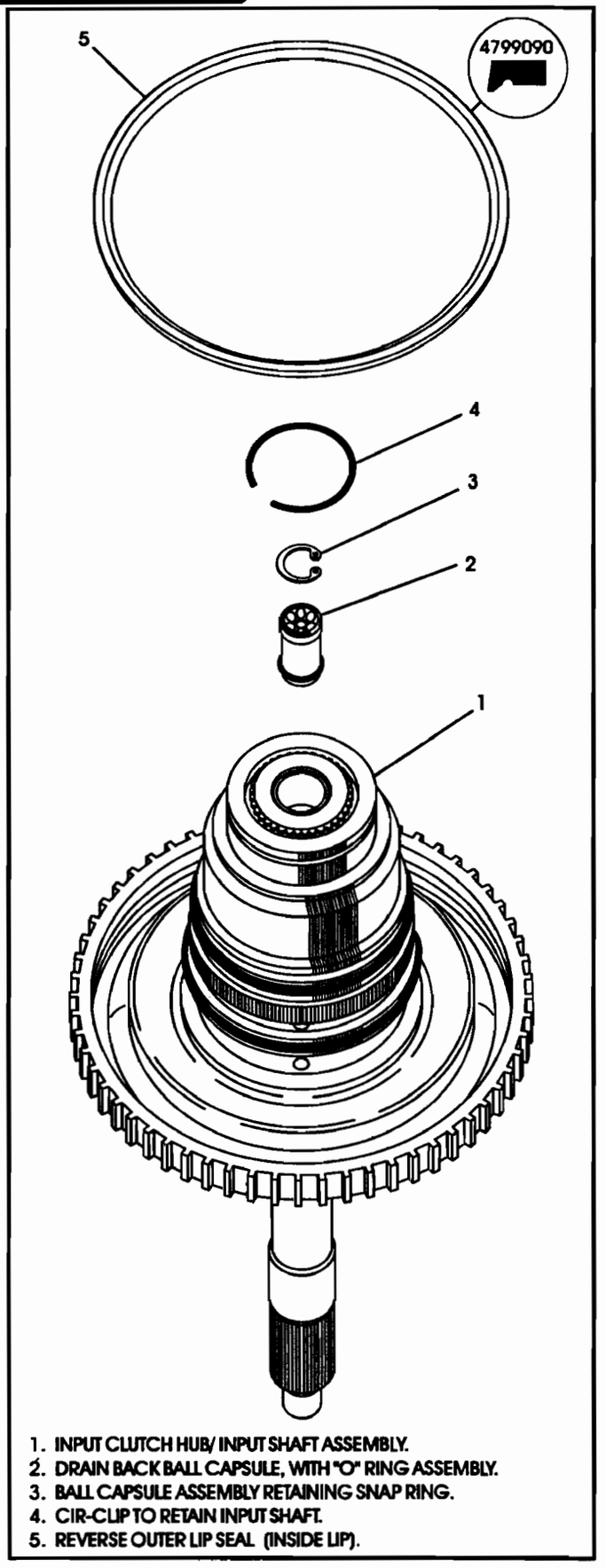


Figure 4

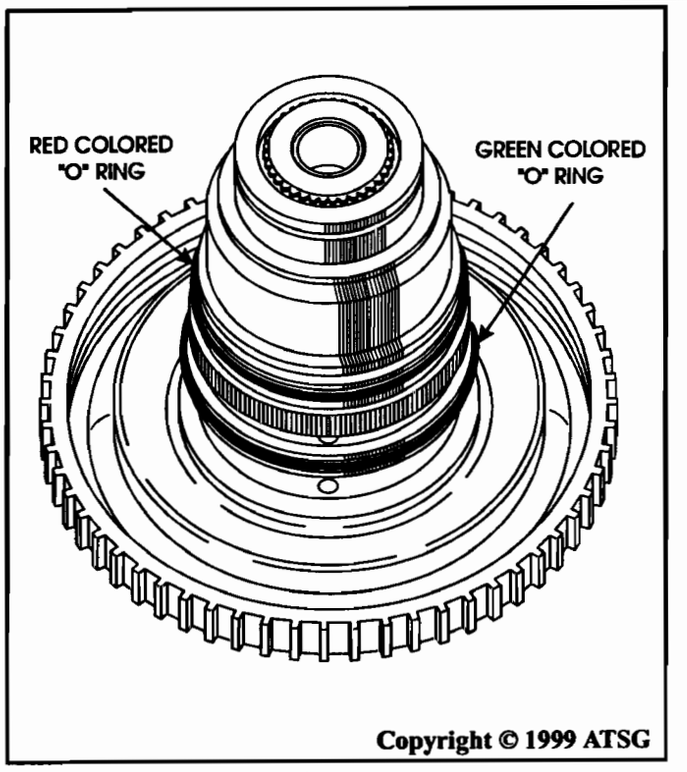
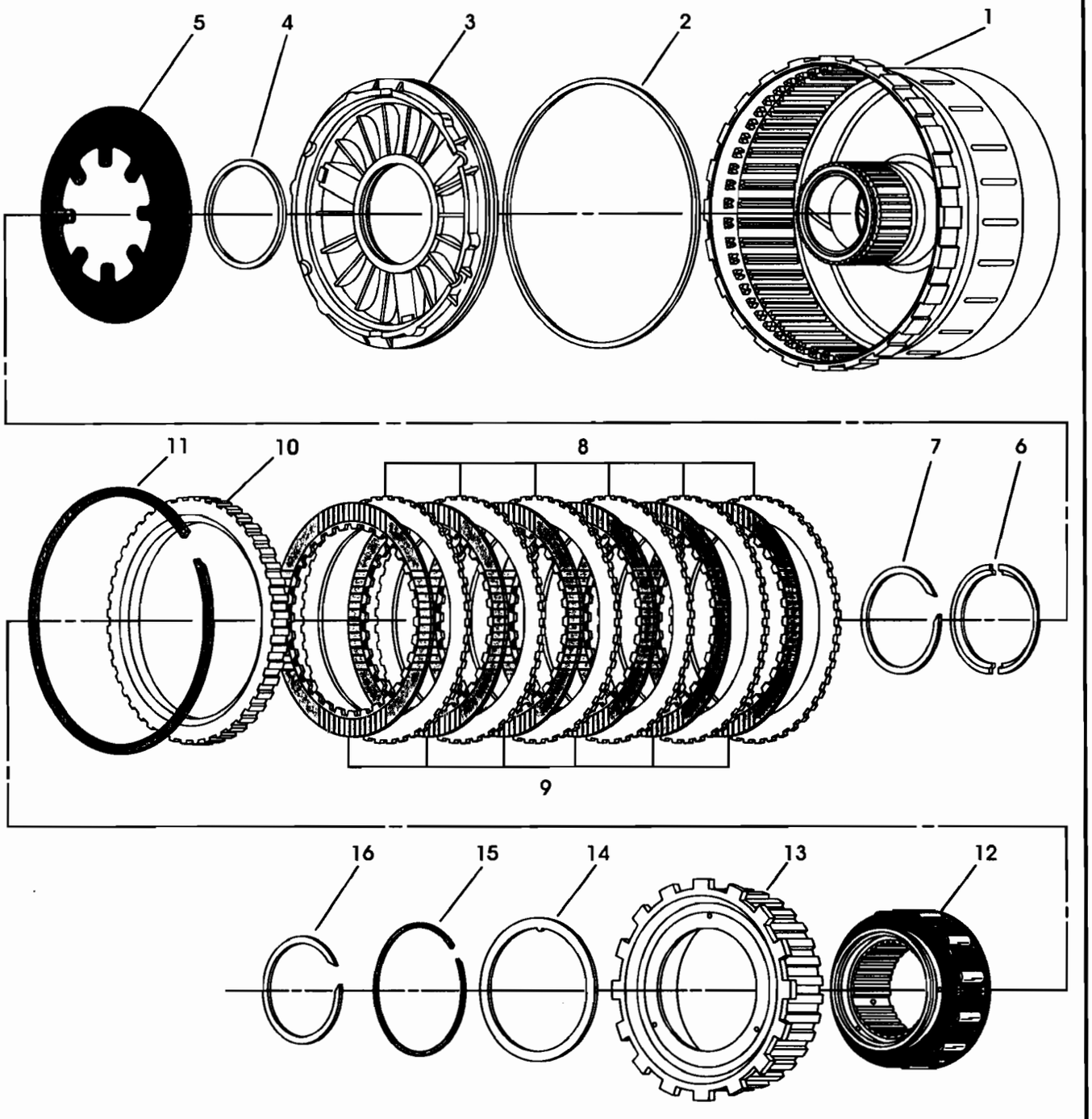


Figure 5

LOW/REVERSE CLUTCH HOUSING EXPLODED VIEW



1. LOW/REVERSE CLUTCH HOUSING
2. LOW/REVERSE CLUTCH PISTON OUTER "D" RING
3. LOW/REVERSE CLUTCH PISTON
4. LOW/REVERSE CLUTCH PISTON INNER "D" RING
5. LOW/REVERSE CLUTCH BELLVILLE PLATE
6. LOW/REVERSE BELLVILLE PLATE "SPLIT" RETAINING RING
7. LOW ROLLER CLUTCH LOWER SNAP RING
8. LOW/REVERSE CLUTCH STEEL PLATES (6 REQUIRED)
9. LOW/REVERSE CLUTCH FRICTION PLATES (6 REQUIRED)
10. LOW/REVERSE CLUTCH BACKING PLATE
11. LOW/REVERSE CLUTCH BACKING PLATE SNAP RING
12. LOW ROLLER CLUTCH AND INNER RACE ASSEMBLY
13. LOW ROLLER CLUTCH OUTER RACE
14. SPACER WASHER
15. LOW ROLLER INNER RACE RETAINING SNAP RING
16. LOW ROLLER CLUTCH UPPER SNAP RING

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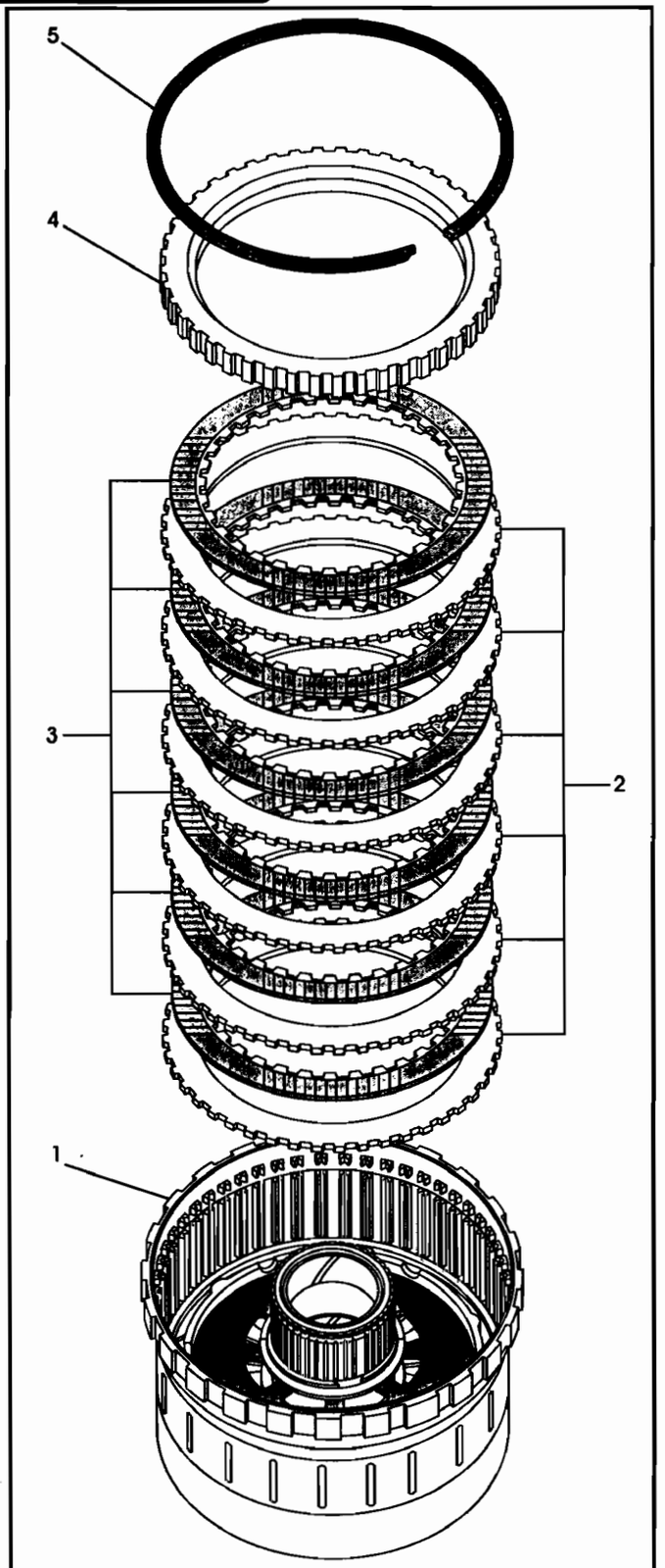
Figure 6



1. LOW/REVERSE CLUTCH HOUSING.
2. LOW/REVERSE STEEL PLATES (6 REQUIRED).
3. LOW/REVERSE FRICTION PLATES (6 REQUIRED).
4. LOW/REVERSE BACKING PLATE.

Figure 7

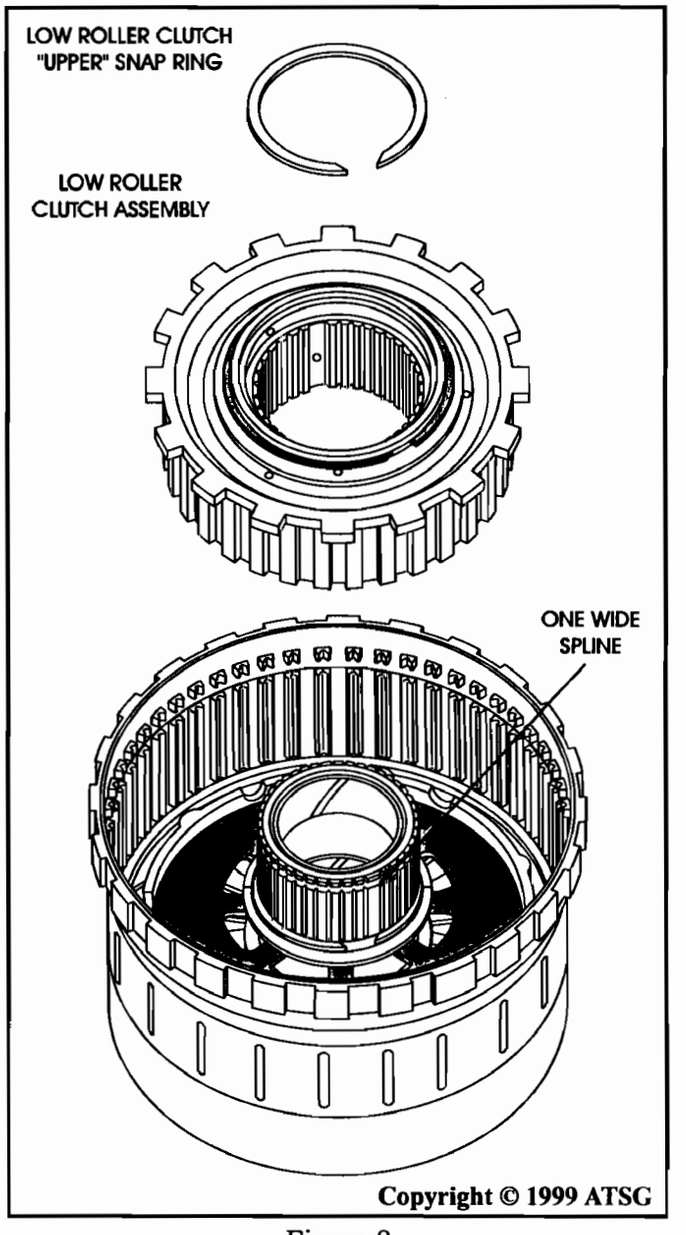


Figure 8

LOW/REVERSE CLUTCH HOUSING SNAP RING IDENTIFICATION

	Thickness	I.D. to O.D.	Notes:
Snap Ring No. 1	"Split" Ring		
Snap Ring No. 2	Flat .061"	.154"	
Snap Ring No. 3	Flat .061"	.154"	Same as Ring No. 2.
Snap Ring No. 4	Flat .038"	.187"	
Snap Ring No. 5	Flat .080"	.186"	
Snap Ring No. 6	Tapered .080"	.188"	Retains the housing in case.

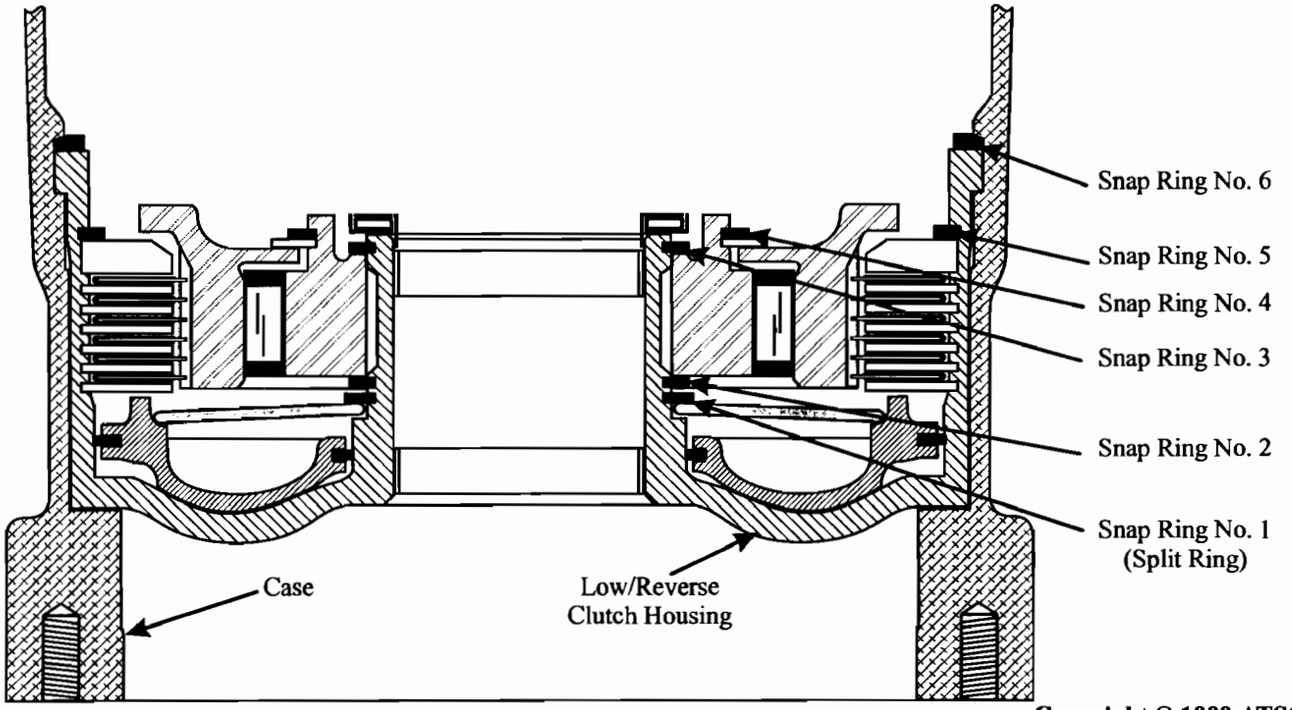


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Figure 9

COMPLETED LOW/REVERSE CLUTCH HOUSING

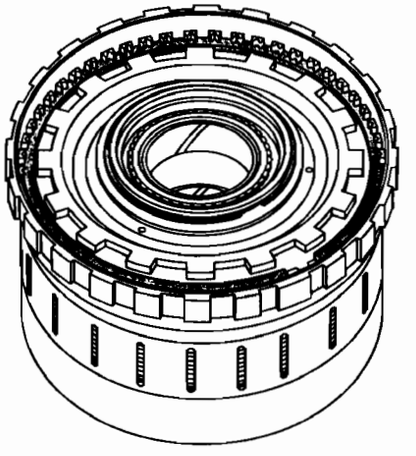

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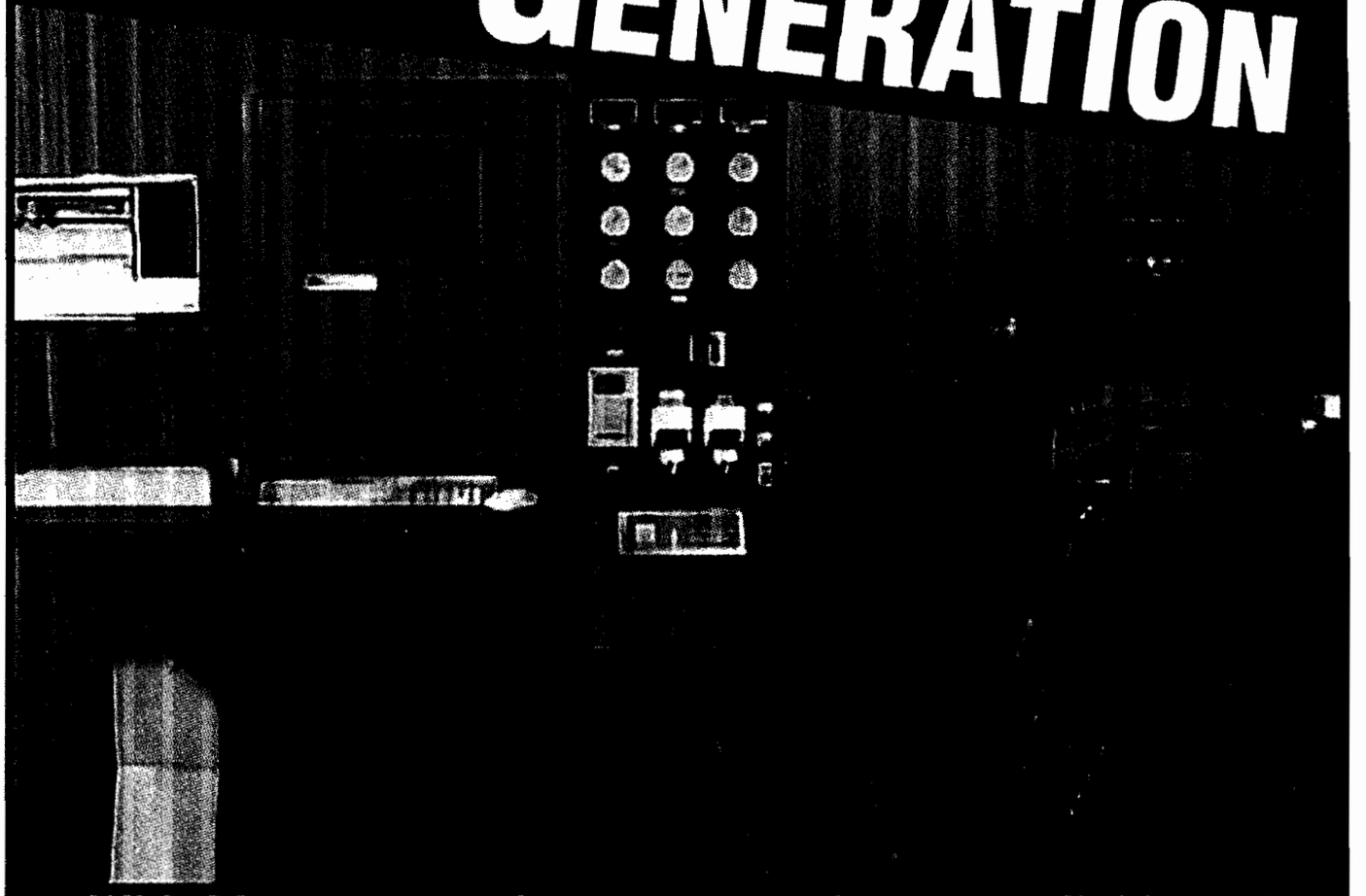
Figure 10

THE NEW GENERATION



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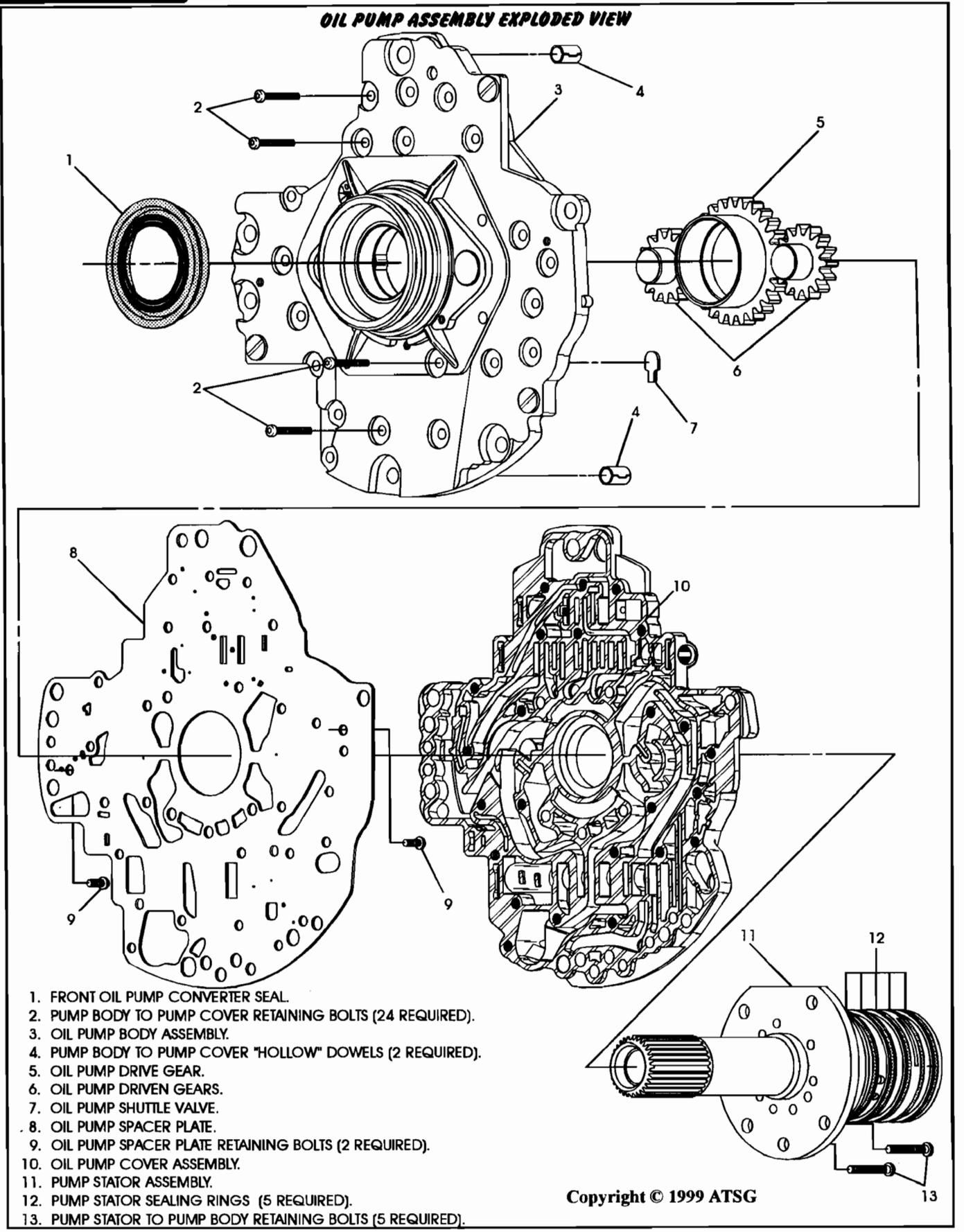
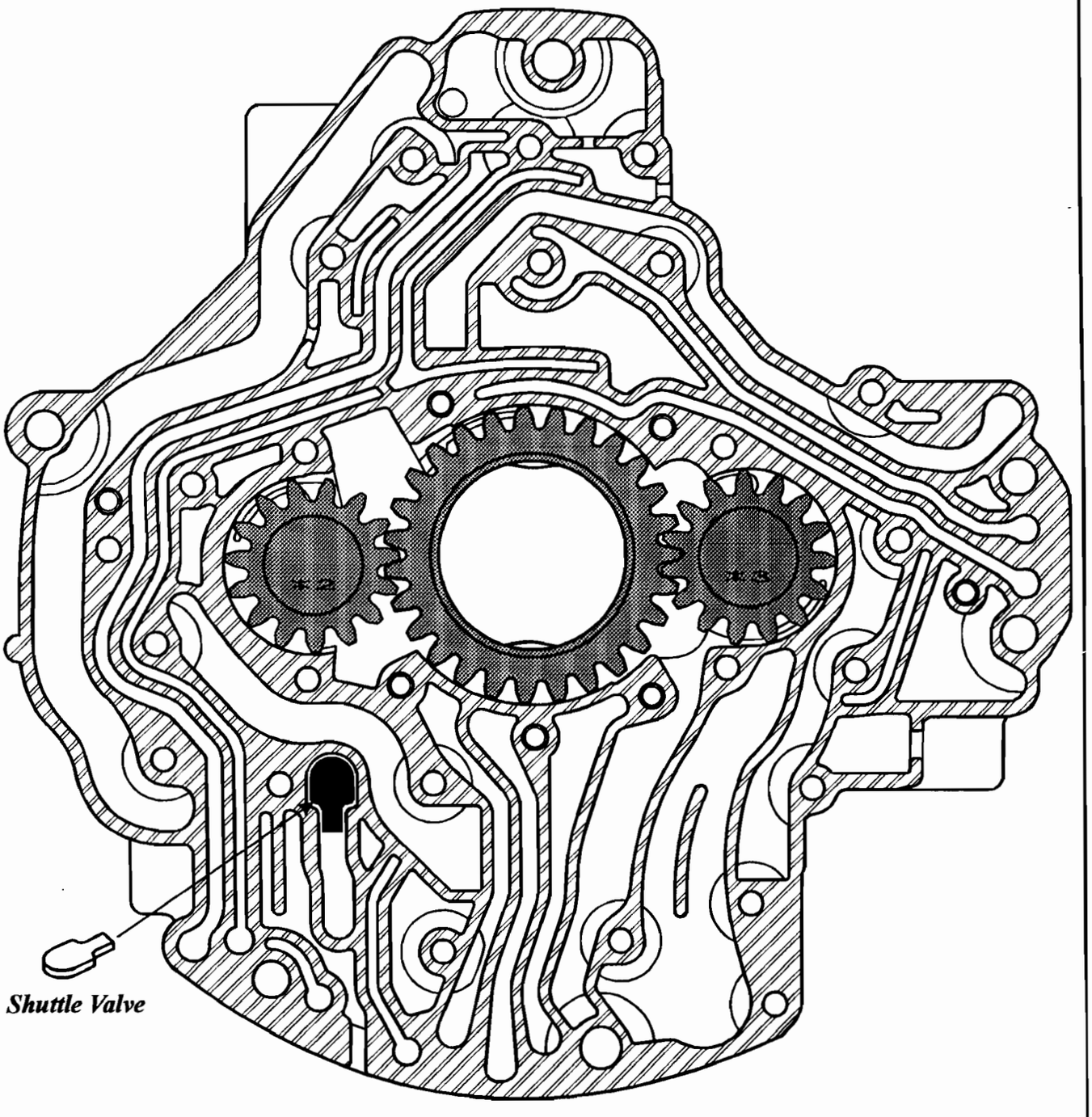


Figure 1

45RFE OIL PUMP BODY AND GEARS



A dual stage oil pump is also new for the 45RFE. The pump has three gears, one drive gear and two driven gears as shown above. Both stages of the pump supply fluid during idle and at low engine speeds. Under these conditions there is not enough pressure from the primary stage to close the shuttle valve. As engine speed increases, so does the output from the primary stage. Once the pressure from the primary stage builds up, the shuttle valve is forced closed and in this condition the secondary stage has no effect and the primary side supplies all of the pressure needed for proper transmission operation.

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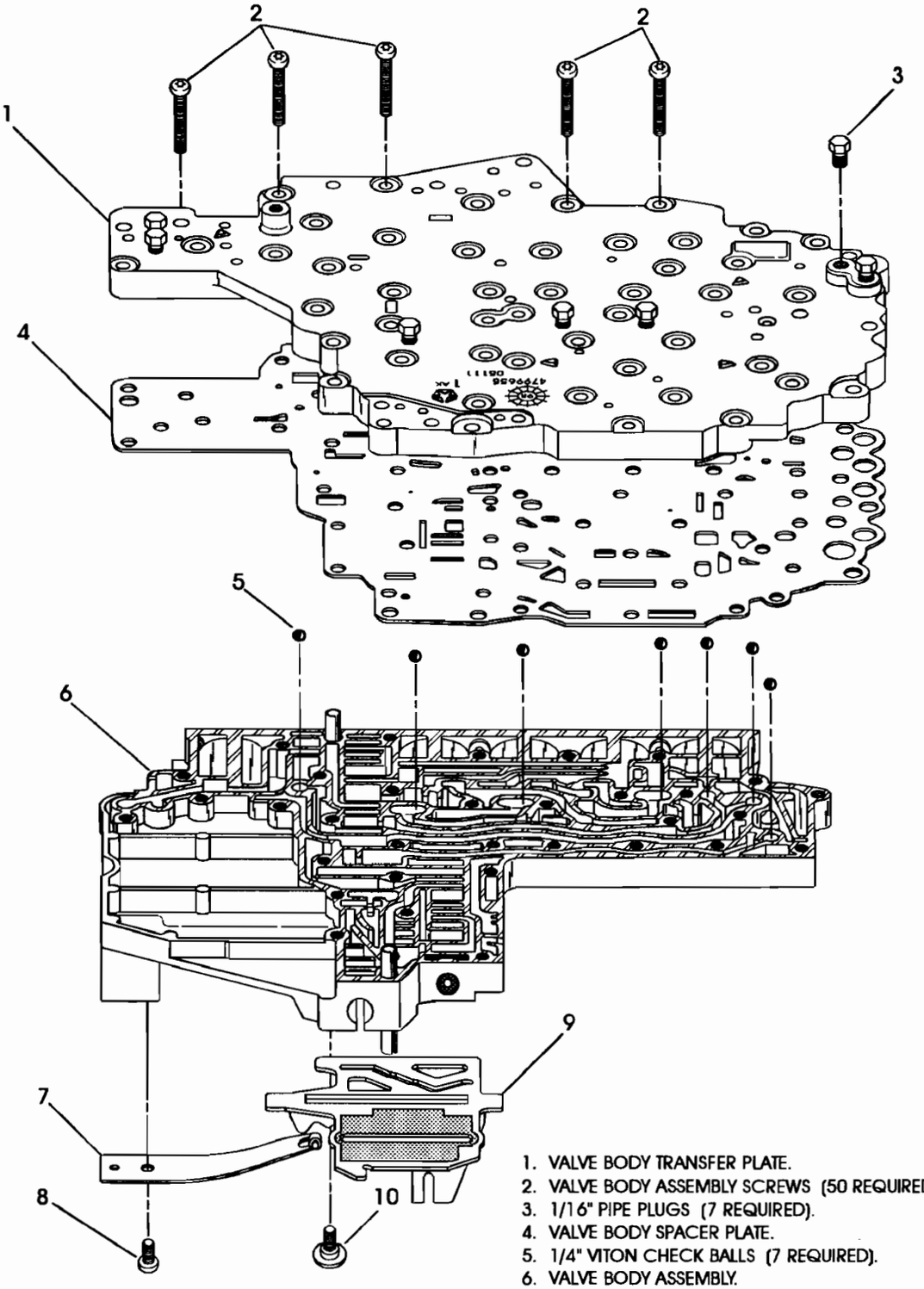
Figure 2

VALVE BODY ASSEMBLY EXPLODED VIEW



1. VALVE BODY TRANSFER PLATE.
2. VALVE BODY ASSEMBLY SCREWS (50 REQUIRED).
3. 1/16" PIPE PLUGS (7 REQUIRED).
4. VALVE BODY SPACER PLATE.
5. 1/4" VITON CHECK BALLS (7 REQUIRED).
6. VALVE BODY ASSEMBLY.
7. MANUAL VALVE DETENT SPRING.
8. MANUAL VALVE DETENT SPRING RETAINING BOLT.
9. TRANSMISSION RANGE SENSOR SELECTOR PLATE.
10. TRS SELECTOR PLATE "SHOULDERED" RETAINING BOLT.

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Figure 1

MAIN VALVE BODY EXPLODED VIEW

1. MAIN VALVE BODY CASTING.
2. 1/4" VITON CHECKBALLS (7 REQUIRED).
3. SOLENOID SWITCH VALVE LINE-UP.
4. SOLENOID SWITCH VALVE LINE-UP PLASTIC RETAINING CLIP.
5. MANUAL VALVE.
6. OVERDRIVE CLUTCH ACCUMULATOR PISTON AND SEALS.
7. OVERDRIVE CLUTCH ACCUMULATOR SPRING (SINGLE).
8. UNDERDRIVE CLUTCH ACCUMULATOR PISTON AND SEALS.
9. UNDERDRIVE CLUTCH ACCUMULATOR SPRINGS (DOUBLE).
10. 4TH CLUTCH ACCUMULATOR PISTON AND SEALS.
11. 4TH CLUTCH ACCUMULATOR SPRINGS (DOUBLE).
12. 2ND CLUTCH ACCUMULATOR PISTON AND SEALS.
13. 2ND CLUTCH ACCUMULATOR SPRINGS (DOUBLE.
14. LOW/REVERSE SWITCH VALVE.
15. LOW/REVERSE SWITCH VALVE BORE PLUG.
16. LOW/REVERSE ACCUMULATOR PISTON AND SEALS.
17. LOW/REVERSE ACCUMULATOR SPRINGS (DOUBLE).
18. ACCUMULATOR COVER PLATE.
19. ACCUMULATOR COVER PLATE SCREWS (7 REQUIRED).

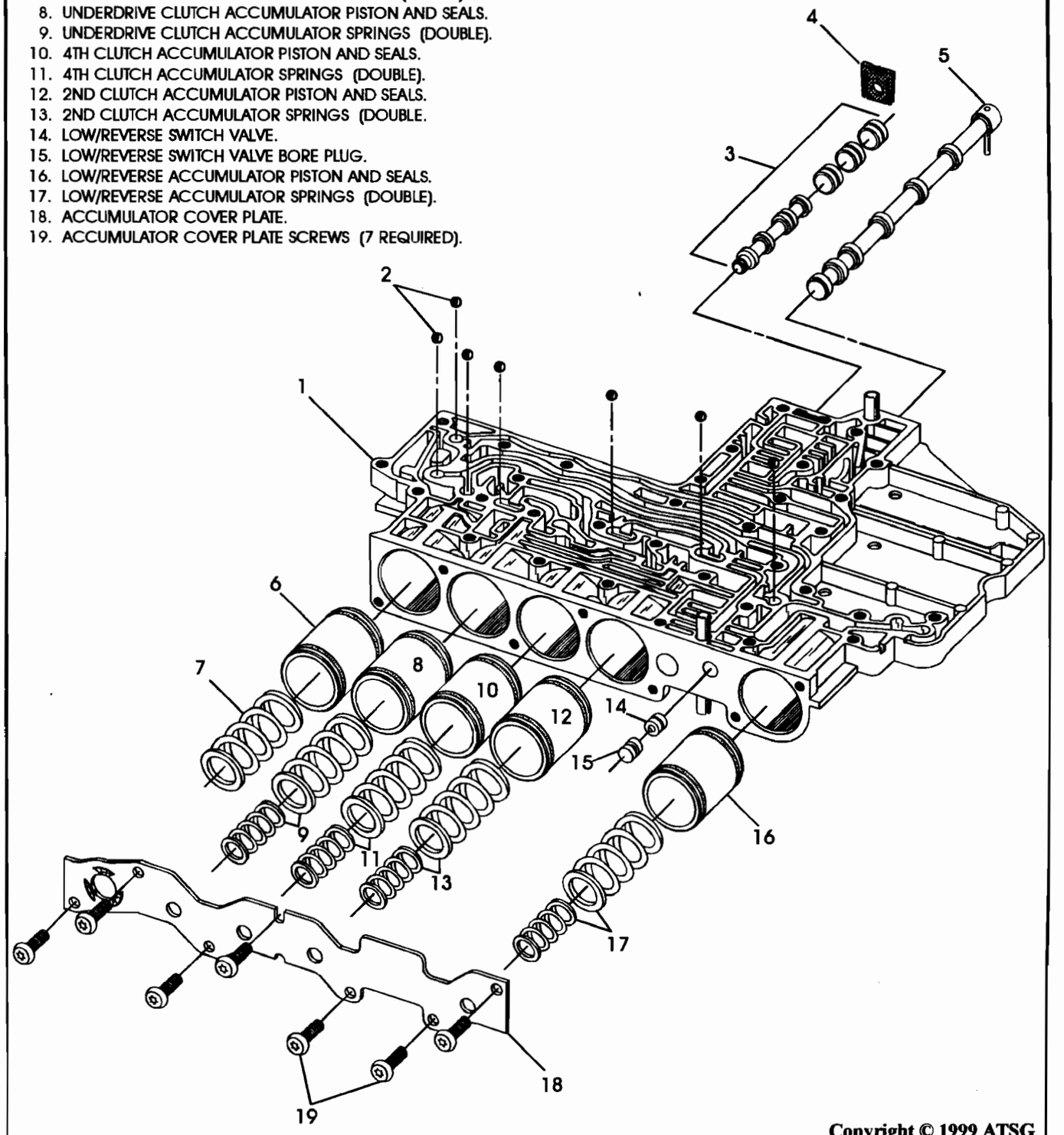

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Figure 2

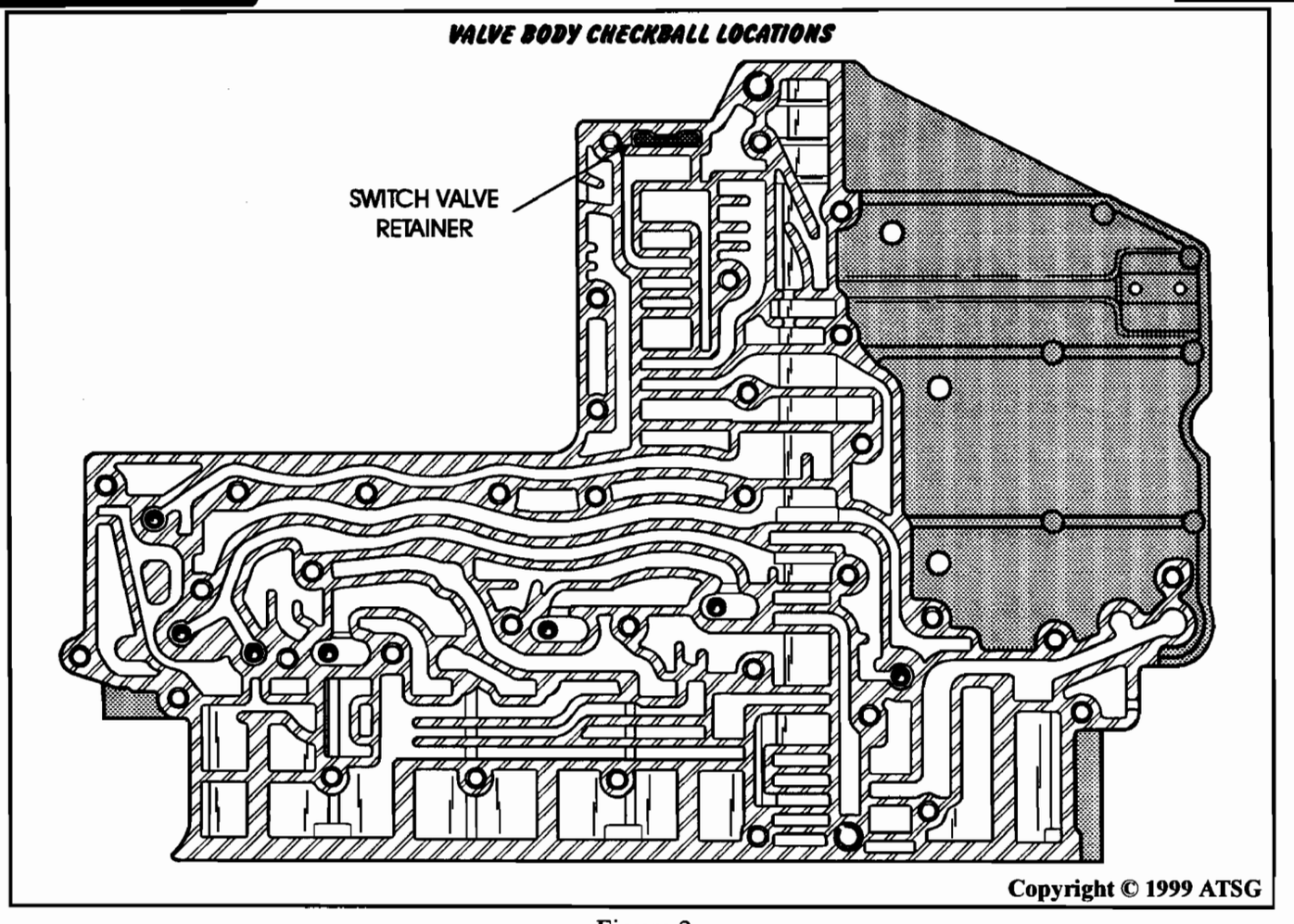
VALVE BODY CHECKBALL LOCATIONS
SWITCH VALVE
RETAINER
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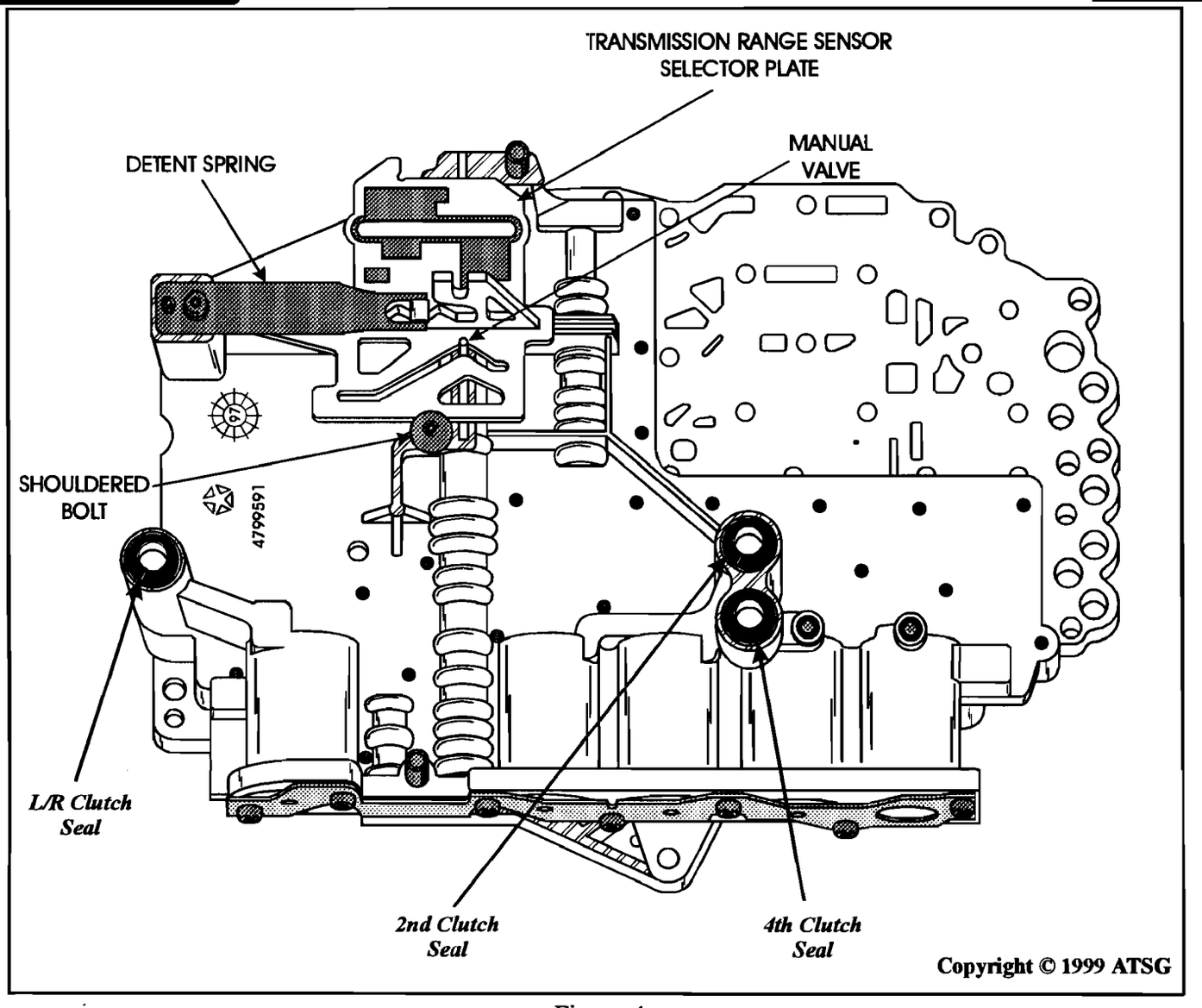
Figure 3


TRANSMISSION RANGE SENSOR
SELECTOR PLATE
DETENT SPRING
MANUAL
VALVE
SHOULDERED
BOLT
4799591
L/R Clutch
Seal
2nd Clutch
Seal
4th Clutch
Seal
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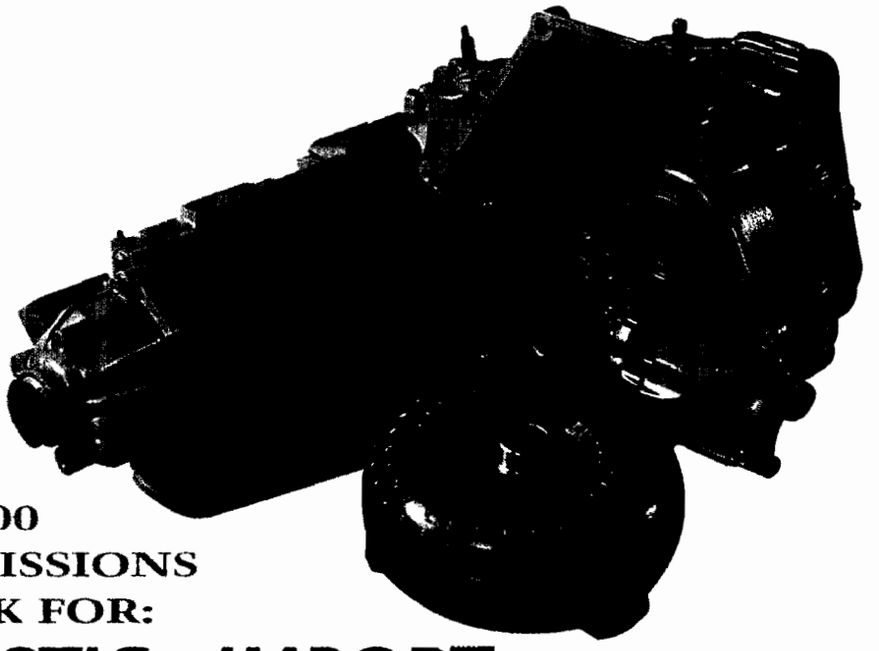

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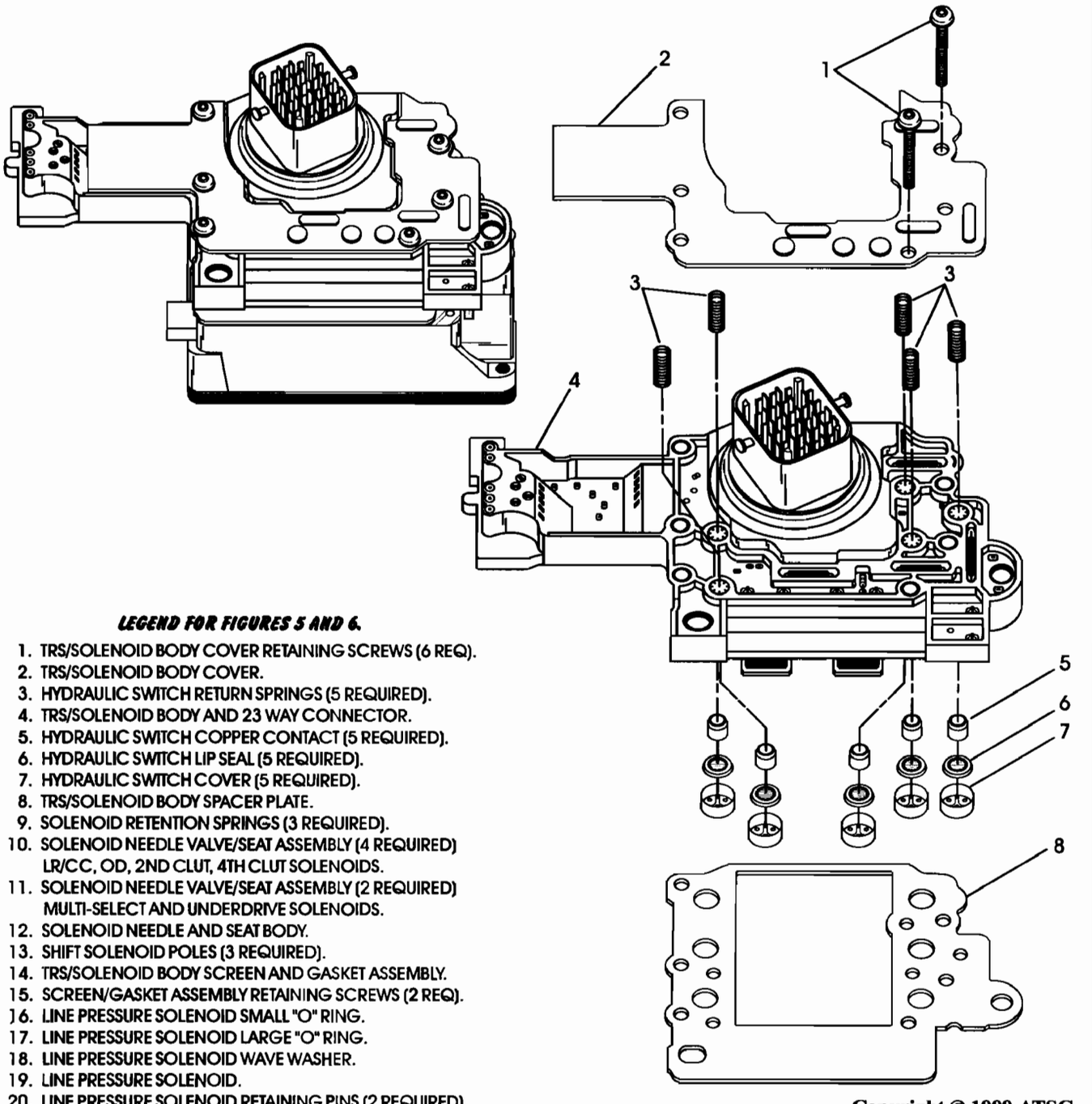
TRS/SOLENOID PACK

1. The TRS/Solenoid Pack is serviced ***only*** as a complete assembly, which is why we told you not to remove the screws on top that retain the cover plate.
2. However, if someone has not listened, we have provided you with an exploded view of the TRS/Solenoid Pack in Figures 5 and 6.

The illustrations in Figures 5 and 6 have been provided as information only. We recommend that the TRS/Solenoid Pack NOT be disassembled as none of the internal parts are serviced seperately.

TRANSMISSION RANGE SENSOR EXPLODED VIEW



LEGEND FOR FIGURES 5 AND 6.

1. TRS/SOLENOID BODY COVER RETAINING SCREWS (6 REQ).
2. TRS/SOLENOID BODY COVER.
3. HYDRAULIC SWITCH RETURN SPRINGS (5 REQUIRED).
4. TRS/SOLENOID BODY AND 23 WAY CONNECTOR.
5. HYDRAULIC SWITCH COPPER CONTACT (5 REQUIRED).
6. HYDRAULIC SWITCH LIP SEAL (5 REQUIRED).
7. HYDRAULIC SWITCH COVER (5 REQUIRED).
8. TRS/SOLENOID BODY SPACER PLATE.
9. SOLENOID RETENTION SPRINGS (3 REQUIRED).
10. SOLENOID NEEDLE VALVE/SEAT ASSEMBLY (4 REQUIRED) LR/CC, OD, 2ND CLUT, 4TH CLUT SOLENOIDS.
11. SOLENOID NEEDLE VALVE/SEAT ASSEMBLY (2 REQUIRED) MULTI-SELECT AND UNDERDRIVE SOLENOIDS.
12. SOLENOID NEEDLE AND SEAT BODY.
13. SHIFT SOLENOID POLES (3 REQUIRED).
14. TRS/SOLENOID BODY SCREEN AND GASKET ASSEMBLY.
15. SCREEN/GASKET ASSEMBLY RETAINING SCREWS (2 REQ).
16. LINE PRESSURE SOLENOID SMALL "O" RING.
17. LINE PRESSURE SOLENOID LARGE "O" RING.
18. LINE PRESSURE SOLENOID WAVE WASHER.
19. LINE PRESSURE SOLENOID.
20. LINE PRESSURE SOLENOID RETAINING PINS (2 REQUIRED).

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Figure 5

TRANSMISSION RANGE SENSOR EXPLODED VIEW

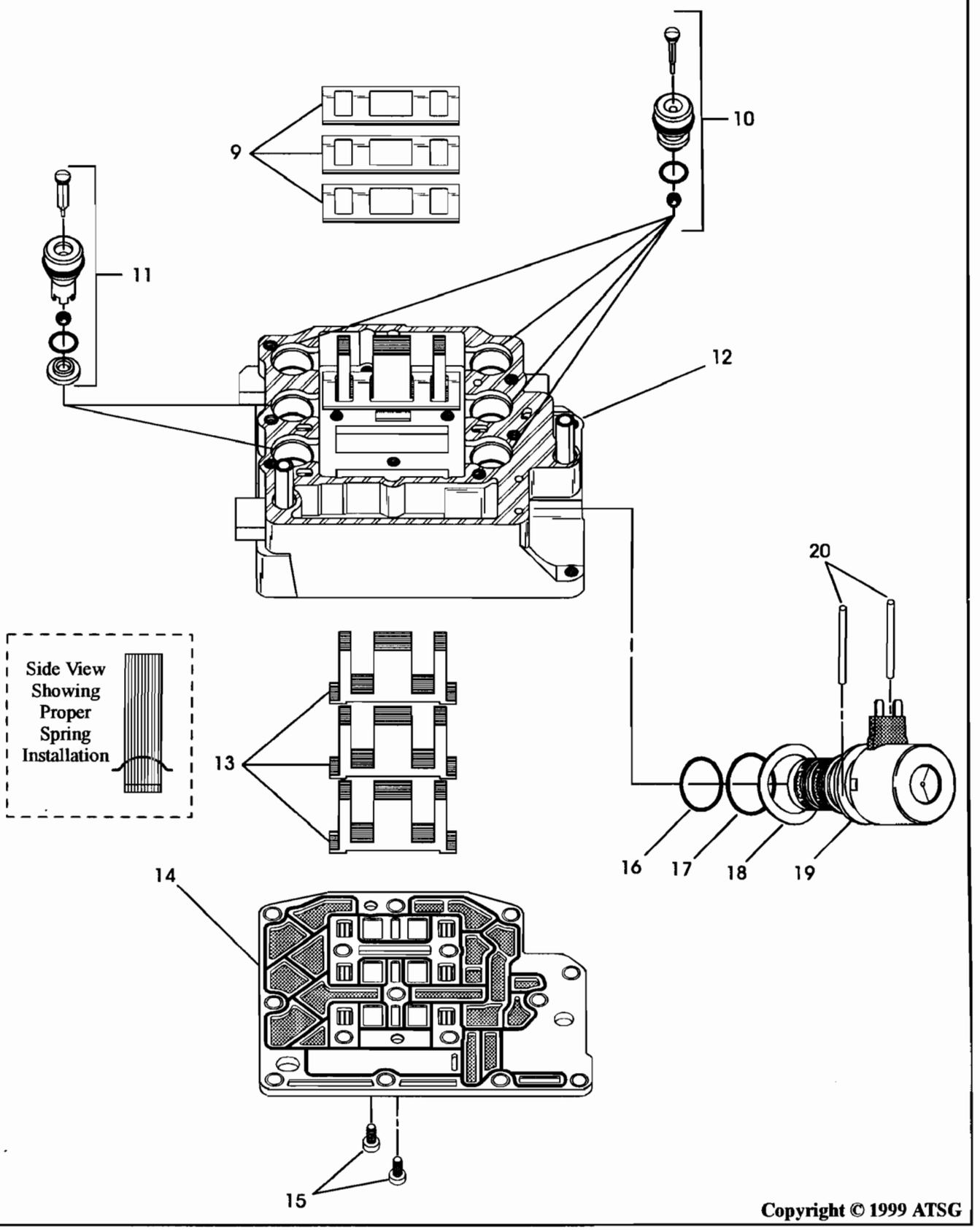

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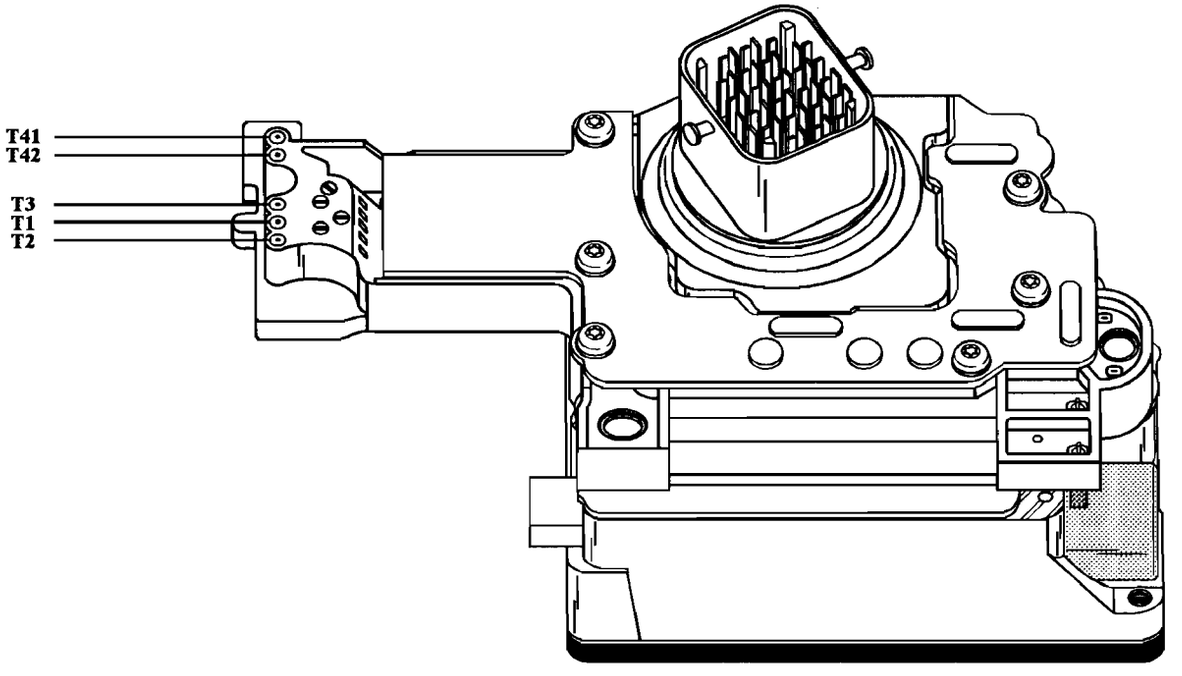
Figure 6

TRS/SOLENOID BODY TESTS



TRANSMISSION RANGE SENSOR CHART							
CIRCUIT	METER	P	R	N	OD	2	1
T41	T41 & GRD OR CONNECTOR PIN 4 & GRD	C	O	C	O	O	O
T42	T42 & GRD OR CONNECTOR PIN 5 & GRD	C	C	C	O	O	O
T3	T3 & GRD OR CONNECTOR PIN 8 & GRD	O	O	C	C	O	C
T1	T1 & GRD OR CONNECTOR PIN 9 & GRD	O	O	O	C	C	O
T2	T2 & GRD OR CONNECTOR PIN 13 & GRD	C	O	O	O	C	C
		C = Closed O = Open					

SOLENOID RESISTANCE CHART		
SOLENOID	CONNECTOR PINS	RESISTANCE
LR/TCC	10 AND 2	1.9 Ω @ 72°F
OVERDRIVE	10 AND 7	1.9 Ω @ 72°F
UNDERDRIVE	10 AND 17	1.9 Ω @ 72°F
2ND CLUTCH	10 AND 20	1.9 Ω @ 72°F
4TH CLUTCH	10 AND 19	1.9 Ω @ 72°F
MULTI-SELECT	10 AND 21	1.9 Ω @ 72°F
LINE PRESSURE	10 AND 12	4.3 Ω @ 72°F
TOT SENSOR	22 AND 23	9.37k Ω @ 72°F

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Figure 7

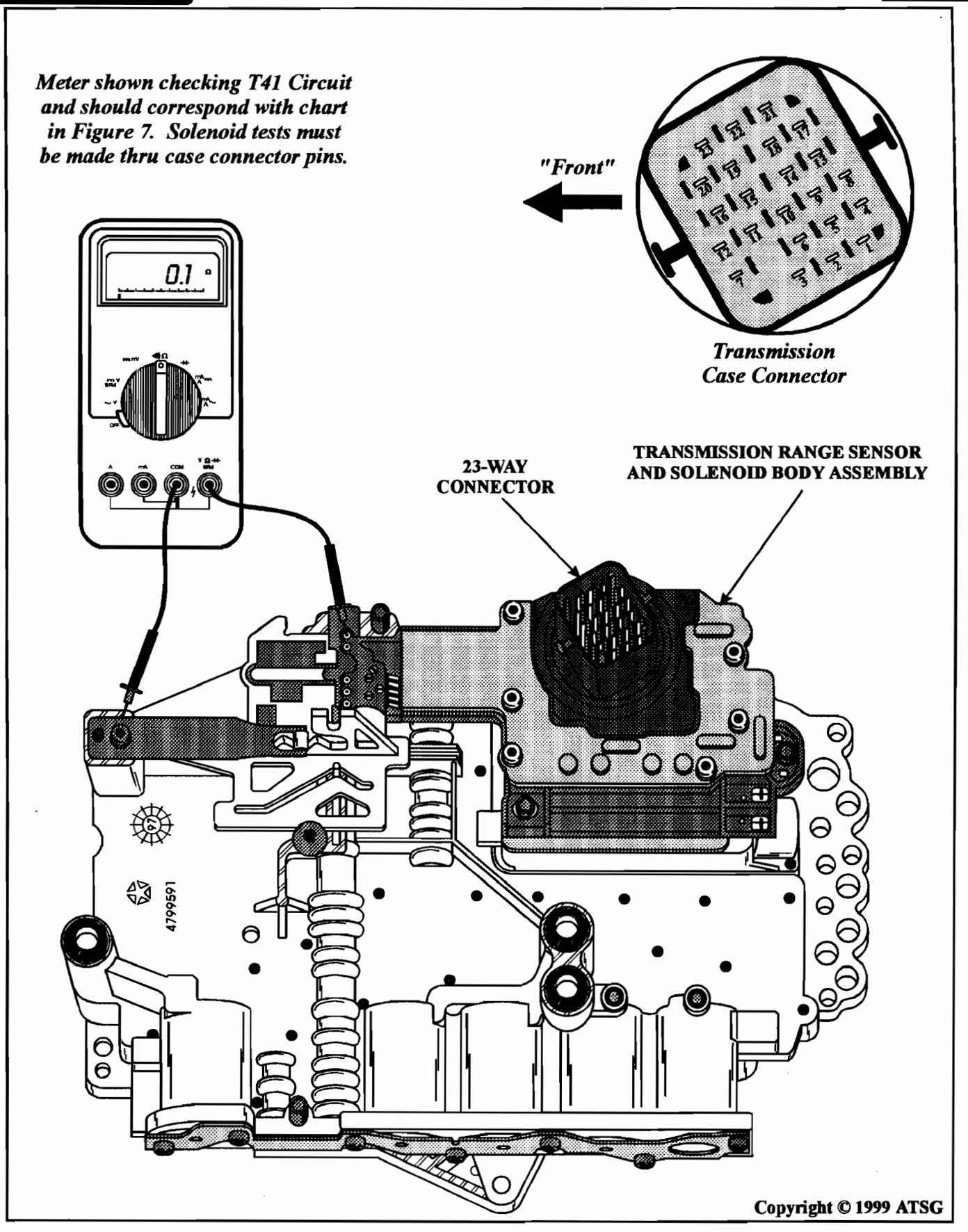
Meter shown checking T41 Circuit and should correspond with chart in Figure 7. Solenoid tests must be made thru case connector pins.
"Front"
Transmission Case Connector
23-WAY CONNECTOR
TRANSMISSION RANGE SENSOR AND SOLENOID BODY ASSEMBLY
4799591
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Figure 8

CHRYSLER 41TE
OVERDRIVE / UNDERDRIVE REACTION PLATE CHANGE

CHANGE: Some time in 1999, two of the previous Overdrive/Underdrive Reaction Plate selectives became "Plate Packages," including the Overdrive/Reverse reaction plate and a .075" Overdrive/Underdrive Reaction Plate Tapered Snap Ring as shown in Figure 1.

SERVICE INFORMATION:

Part No. 4723682 (.253"-.257" OD/UD thickness).....Now Part No. 05017179AA
Part No. 4723683 (.234"-.238" OD/UD thickness).....Now Part No. 05017514AA

NOTE: These two selective OD/UD Reaction Plates can only be purchased in this package including the Tapered Snap Ring and OD/Reverse Reaction Plate

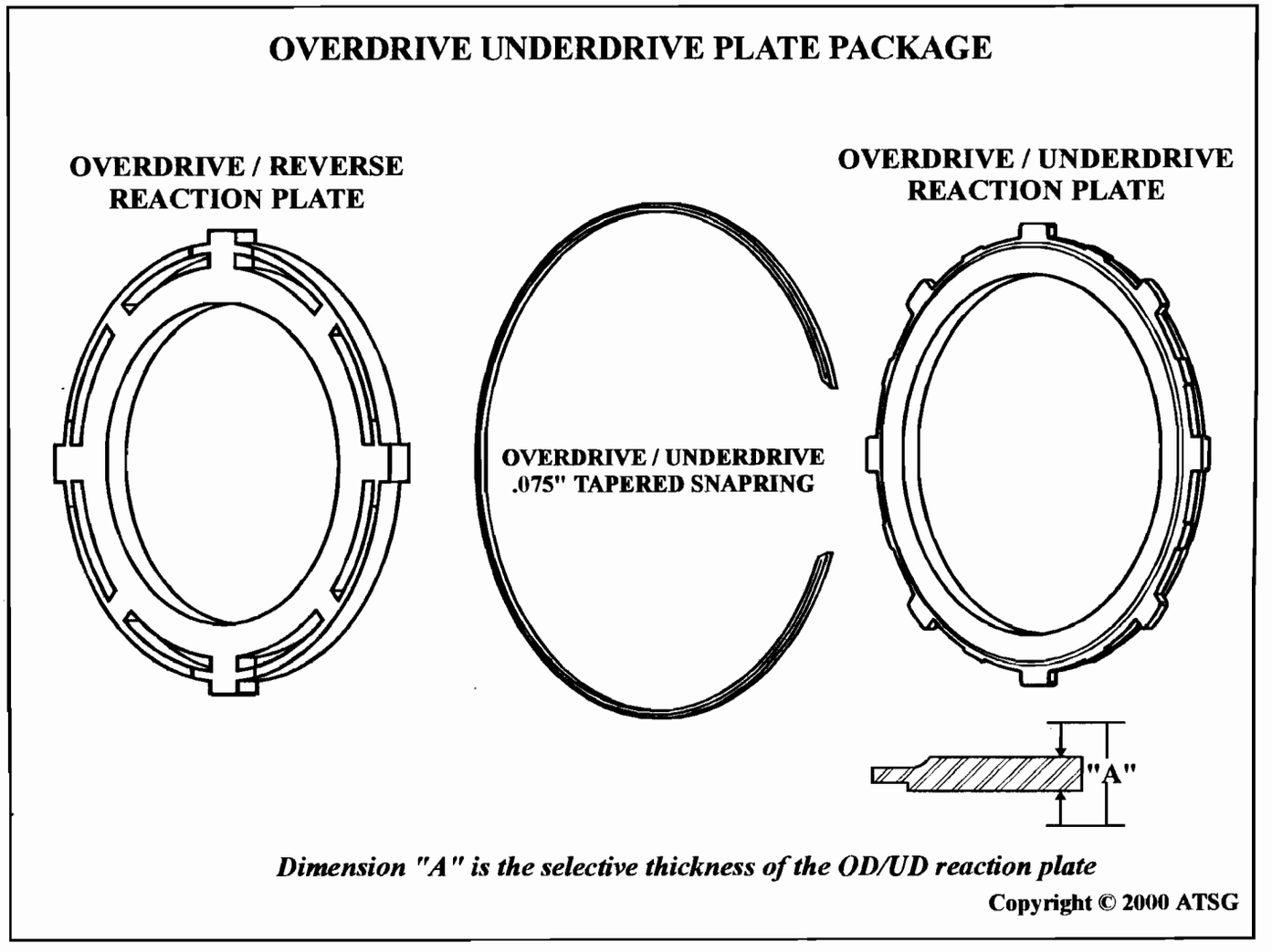


Figure 1

CHRYSLER 41TE
2-4 / LOW REVERSE
REACTION PLATE CHANGE

CHANGE: Some time in 1999, four of the previous 2-4/Low Reverse Reaction Plate selectives were changed to acommodate a new Tapered Snap Ring as shown in Figure 1.

REASON: For increased durability of the Tapered Snap Ring.

PARTS AFFECTED:

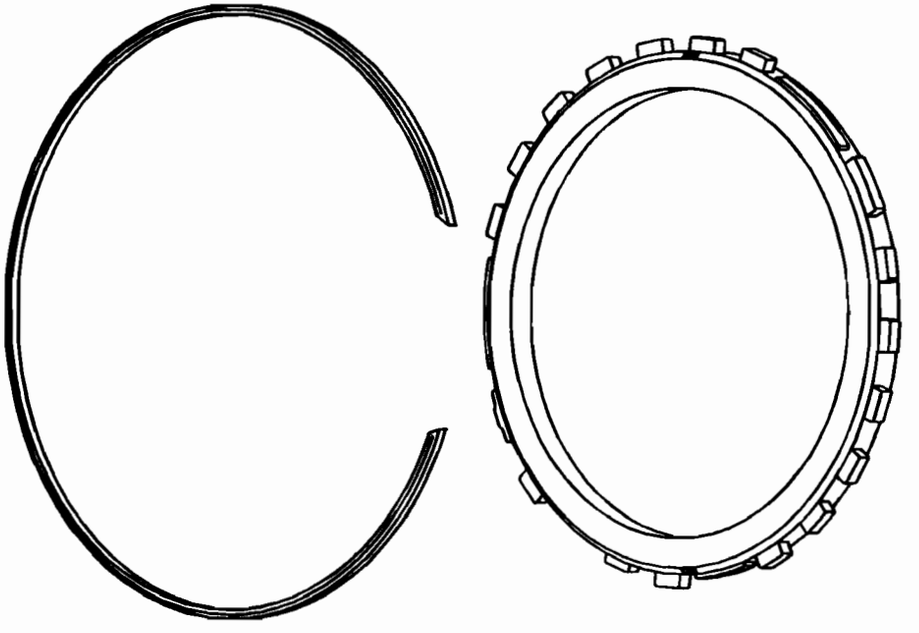
(1)The 2-4/Low Reverse Reaction Plate: was machined to accept a new Tapered Snap Ring.
(2)The Tapered Snap Ring: was made .010 " thicker to avoid breakage.

SERVICE INFORMATION:

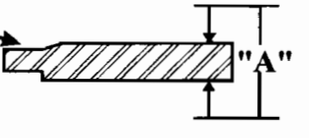
Part No. 4377149 (.262" thickness).....Now Part No. 4897455AA
Part No. 4377148 (.252" thickness).....Now Part No. 4897454AA
Part No. 4412268 (.242" thickness).....Now Part No. 4897453AA
Part No. 4412267 (.232" thickness).....Now Part No. 4897452AA

NOTE: The thicker tapered snap ring is included in the new 2-4/Low Reverse Reaction Plate package when the Part Number ends with "AA."

2-4/LOW REVERSE REACTION PLATE AND TAPERED SNAP RING



The 2-4/L.R. reaction plate was machined to accept the new thicker Tapered snap ring



Dimension "A" is the selective thickness of the 2-4/L.R. reaction plate

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Figure 1

CHRYSLER 41TE
HARSH ENGAGEMENT IN DRIVE RANGES AND / OR HARSH 4-3 DOWNSHIFT

COMPLAINT: After overhaul, 95 and up vehicles equipped with 41TE transaxles, may exhibit a harsh engagement into the Drive range and or a harsh 4-3 downshift.

CAUSE: The cause may be, the Overdrive Clutch Accumulator springs were placed into the Underdrive Clutch Accumulator piston.

CORRECTION: Refer to Figure 1 for the correct Accumulator Piston and Spring I.D.

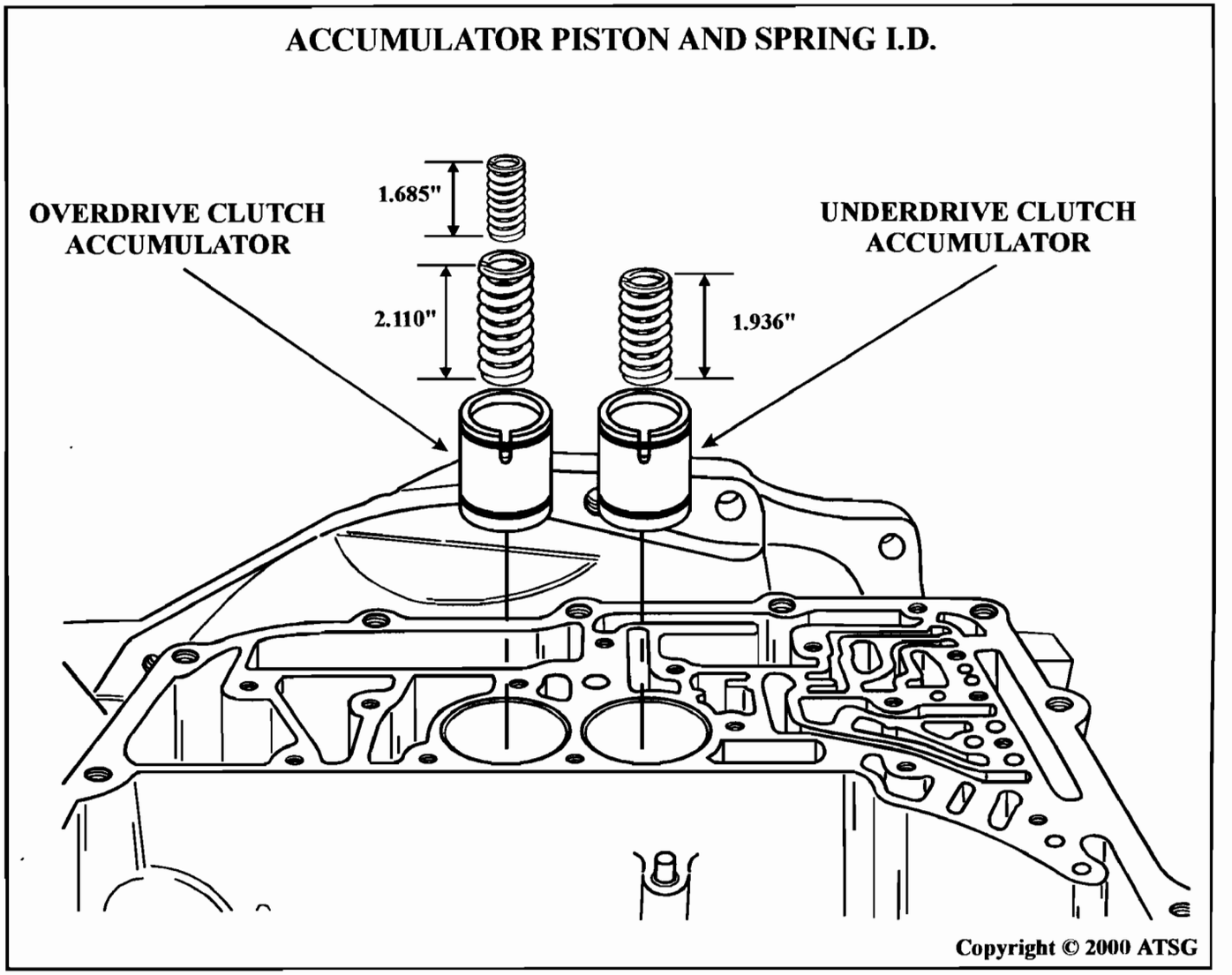


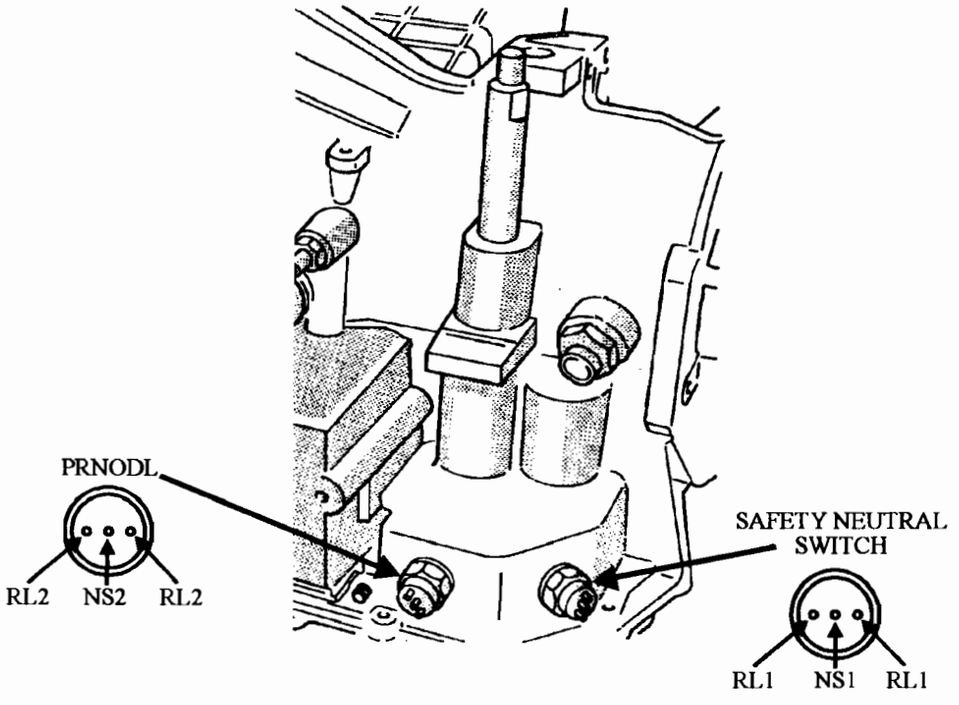
Figure 1

41TE (A604)
3-4 UP SHIFT IN THE D3 RANGE

COMPLAINT: Only 41TE transaxels that have PRNODL and NEUTRAL switches may exhibit a shift in manual low, a 3-4 upshift in D3, works fine in D4, starts in Park but not in Neautral after rebuild. When the open, closed status of the NS and RL circuits are viewed through a scanner, it is noticed that the sequence is incorrect. The switches are replaced and the problem remains (See Figure 1).

CAUSE: The switches have been cross connected.

CORRECTION: Unplug and swap switch connectors.



Circuit	P	R	N	OD	D	L
NS1	Closed	Open	Closed	Open	Open	Open
RL1	Open	Closed	Open	Closed	Open	Open
NS2	Closed	Open	Open	Open	Open	Closed
RL2	Open	Closed	Closed*	Open	Closed	Open

*RL2 can also be open

Proper open/closed status of the NS and RL circuits as seen in a scanner.

Figure 1

CHRYSLER 42RE
"BUZZING" NOISE IN REVERSE

COMPLAINT: Some vehicles equipped with the 42RE transmission may exhibit a "buzzing" noise while the manual selector lever is in the Reverse position.

CAUSE: The cause may be, the Pressure Regulator Valve buzzing because of a partially clogged main filter, or may be the PR valve itself.

CORRECTION: First install a brass "Screen" in place of the felt media filter in the bottom pan, as shown in Figure 1. If this does not cure the condition, replace the aluminum PR valve in the valve body with the previous design steel PR valve (See Figure 2), available under OEM part number 4130169

SERVICE INFORMATION:

Pressure Regulator Valve (Steel) 4130169
Brass Screen (Aftermarket ATC) 12010D

INSTALL BRASS "SCREEN" INSTEAD OF FELT MEDIA FILTER

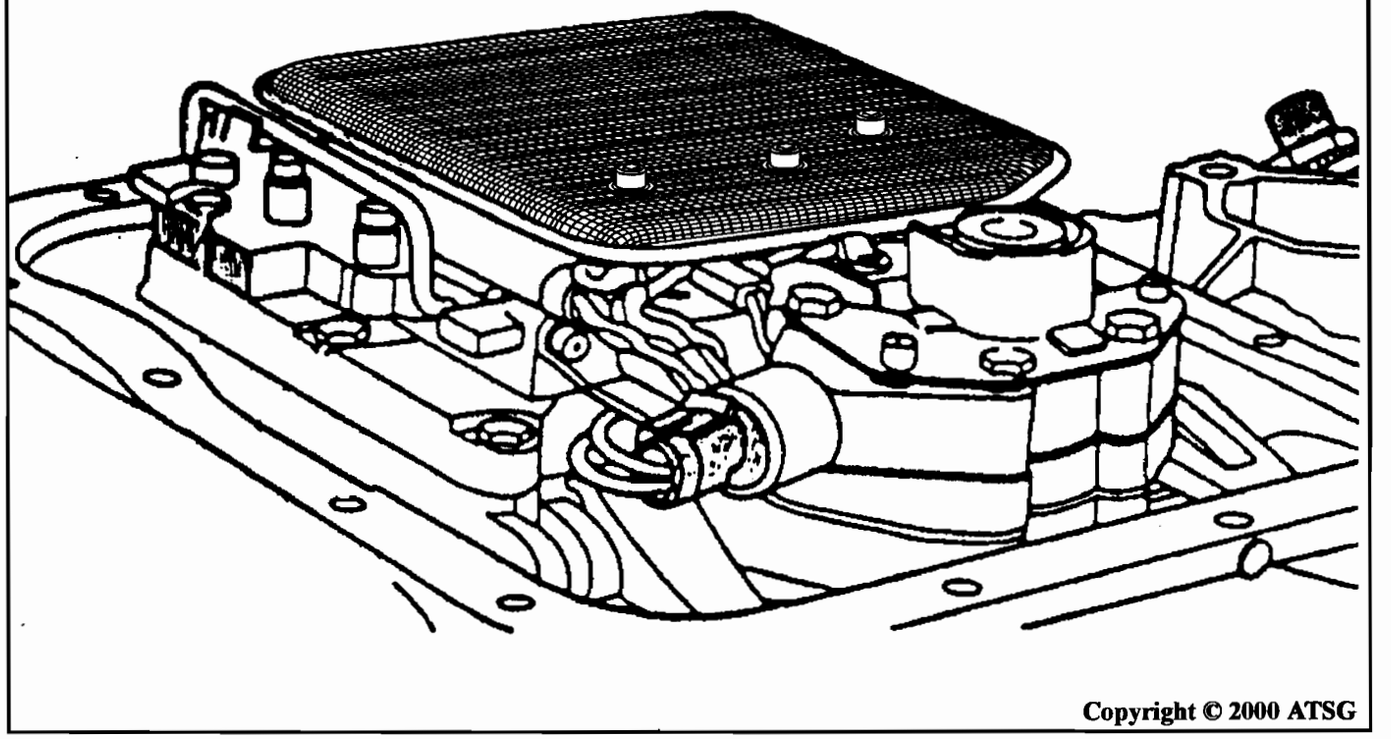


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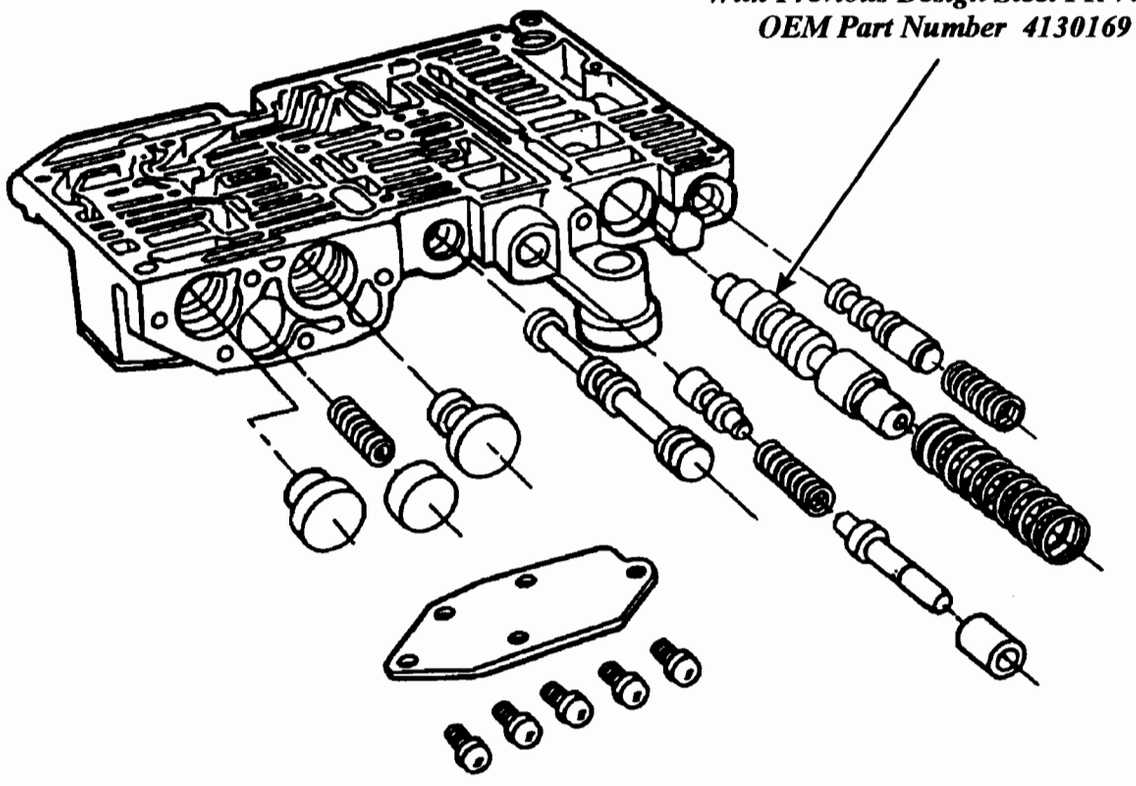
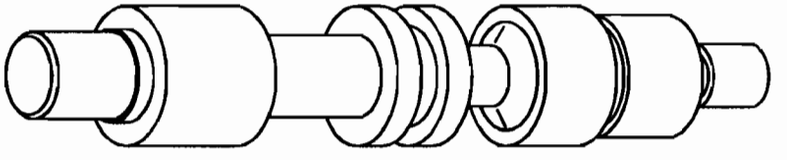
Figure 1





PREVIOUS DESIGN STEEL
PRESSURE REGULATOR VALVE
PART NUMBER 4130169

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Figure 2

CHRYSLER 42RE
1-2 SHIFT SHUTTLE AFTER REBUILD

COMPLAINT: After rebuild, some vehicles may exhibit a 1-2 upshift shuttle condition that may lead you into thinking it is governor pressure or valve body related.

CAUSE: The cause may be, that you have adjusted the intermediate band incorrectly, or the seal rings on the 1-2 accumulator piston are leaking.

CORRECTION: We have gotten into the habit of adjusting the intermediate band with a visual adjustment during the rebuild process, before we install the bottom pan. This is a grave mistake on the 42RE transmission. You ***must*** tighten the adjusting screw to 72 inch pounds, and then back the adjusting screw off ***exactly*** 3-5/8 turns, as shown in Figure 1. In some cases we have also had to install the previous design 1-2 accumulator piston with steel seal rings as shown in Figure 2.

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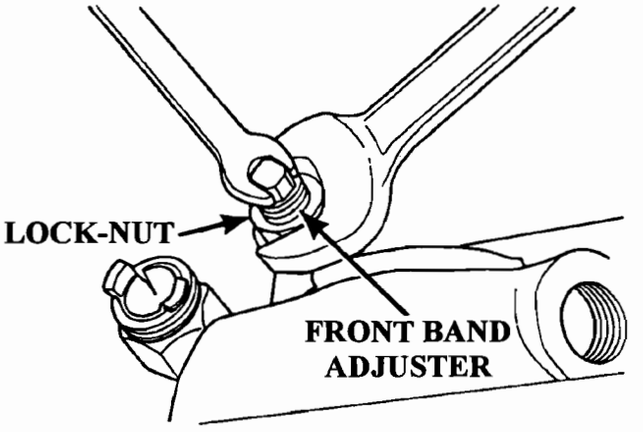
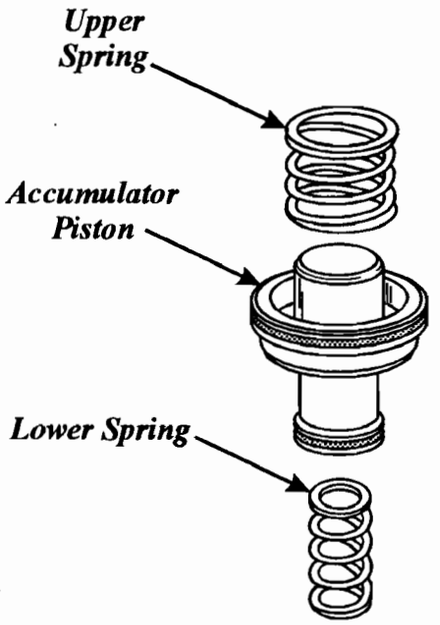
BAND ADJUSTMENT FOR 42RE INTERMEDIATE BAND



Tighten band adjuster to 72 inch pounds, and back off "Excatly" 3-5/8 turns.

Figure 1



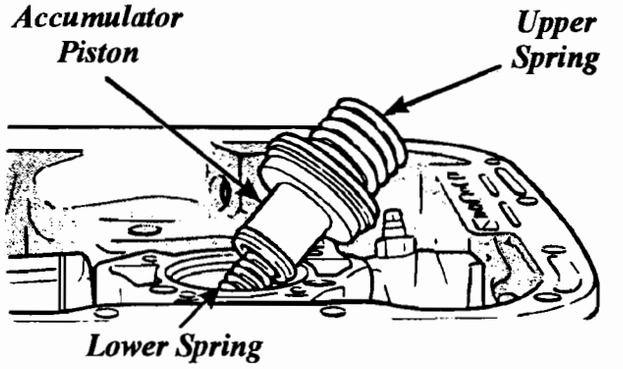


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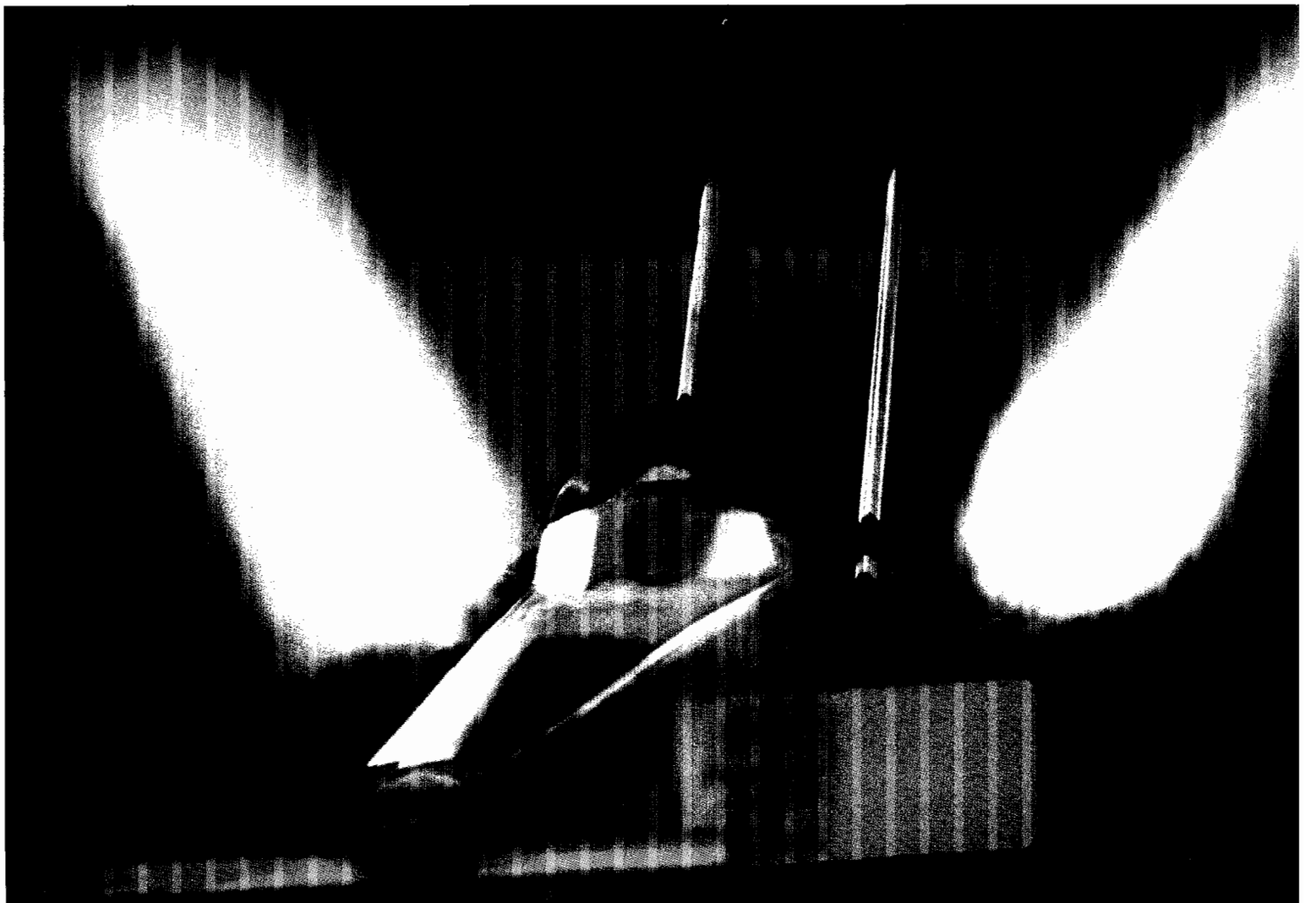
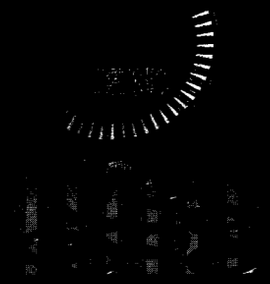
Figure 2



Winners Know How To Make Every Second Count.



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CHRYSLER A518
OVERDRIVE SECTION PLANETARY CHANGES

CHANGE: Beginning in model year 1995 Chrysler introduced a new design Overdrive Planetary Gear Set with 15 degree helical cut gears, to replace the previous design straight cut (spur) gears. The straight cut gears were found in the Turbo Diesel engine models equipped with the 47RH. The 46RH used a 4 pinion 22 1/2 degree helical cut overdrive gear set. This change has created a service concern for transmission technicians, as you now have two different angles of helical cut overdrive gear sets for the A518 transmission.

REASON: Reduction of noise concerns from the straight cut spur gears.

PARTS AFFECTED:

(1) OVERDRIVE SUN GEAR - Now has a 15 degree helical cut gear and is easy to identify by the I.D. groove cut into the sun gear, to distinguish it from the 22 1/2 degree helical cut sun gear. Refer to Figure 1 for illustrations and identification of all three overdrive sun gears.

(2) OVERDRIVE INTERNAL RING GEAR - Now has a 15 degree helical cut gear and is easy to identify by the I.D. groove cut into the ring gear, to distinguish it from the 22 1/2 degree helical cut ring gear. Refer to Figure 2 for illustrations and identification of all three overdrive internal ring gears.

(3) OVERDRIVE PLANETARY CARRIER - Now has 15 degree helical cut pinion gears and the 22 1/2 degree helical cut gears are also still used. There are not any identification marks on the carriers to distinguish between the two, but they will not assemble if the wrong components are used. Refer to Figure 3 for illustration of the 4 pinion carriers.
Refer to Figure 4 for illustration of the 5 pinion straight cut (spur) gear and is easy to identify because of the straight cut gears.
Refer to Figure 5 for illustration of the 5 pinion, 15 degree helical cut pinion gears, that was used to replace the straight cut design to reduce noise in the unit. The 5 pinion, 15 degree helical cut planetary must be used in the Turbo Diesel and the V-10 models.

INTERCHANGEABILITY:

The new design 5 pinion, 15 degree helical cut overdrive carrier will replace the straight cut design when used with the 15 degree sun gear and the 15 degree internal ring gear, and is highly recommended. The 5 pinion design ***must*** be used in the Turbo Diesel and the V-10 models, and is recommended for any heavy duty application.
The 4 pinion, 22 1/2 degree helical cut set-up is used in the 46RH models, but could be upgraded to the 5 pinion, 15 degree set-up, for heavy duty applications as necessary.

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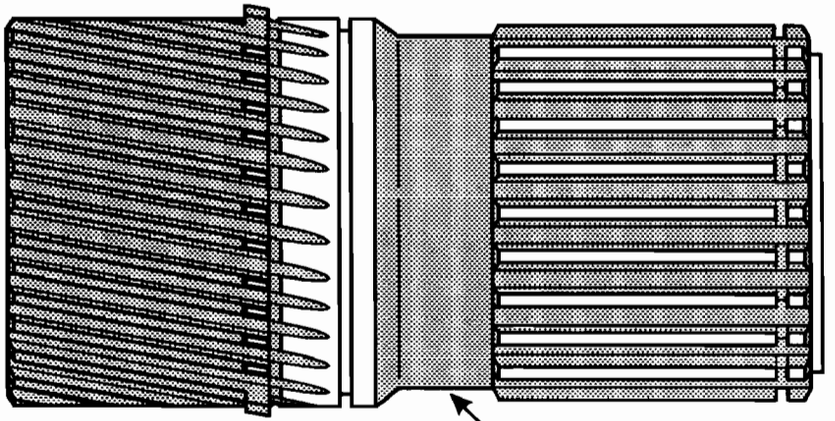
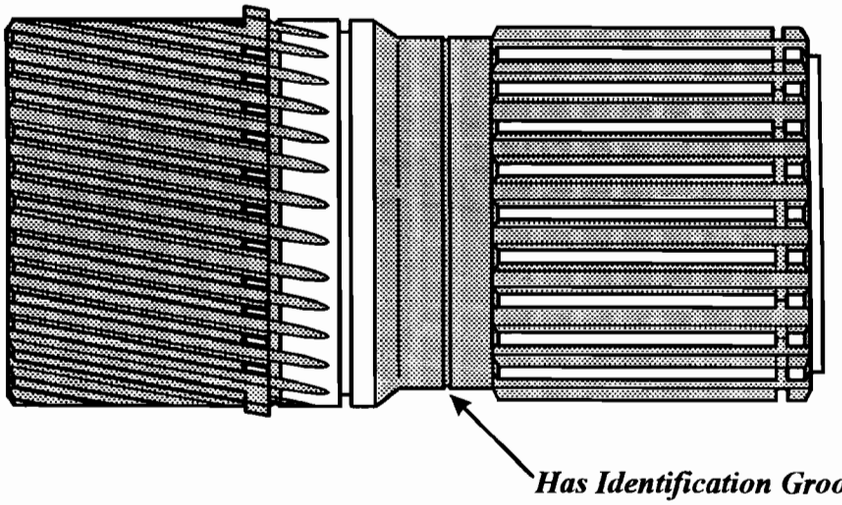
22 1/2 DEGREE OVERDRIVE SUN GEAR



15 DEGREE OVERDRIVE SUN GEAR



STRAIGHT CUT (SPUR) OVERDRIVE SUN GEAR

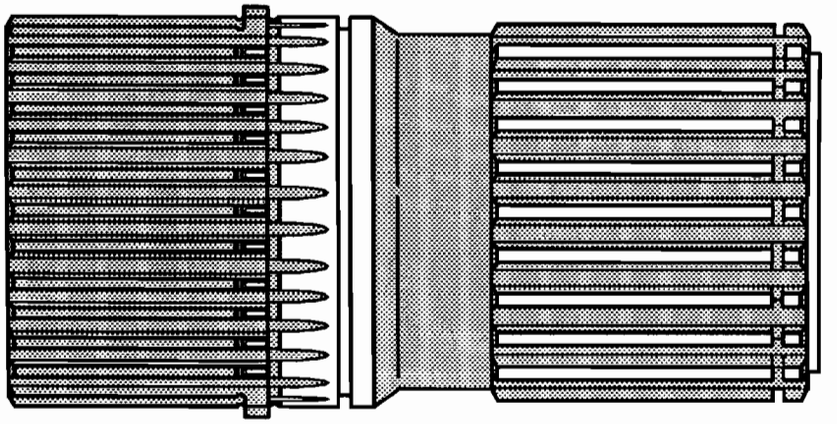


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Figure 1

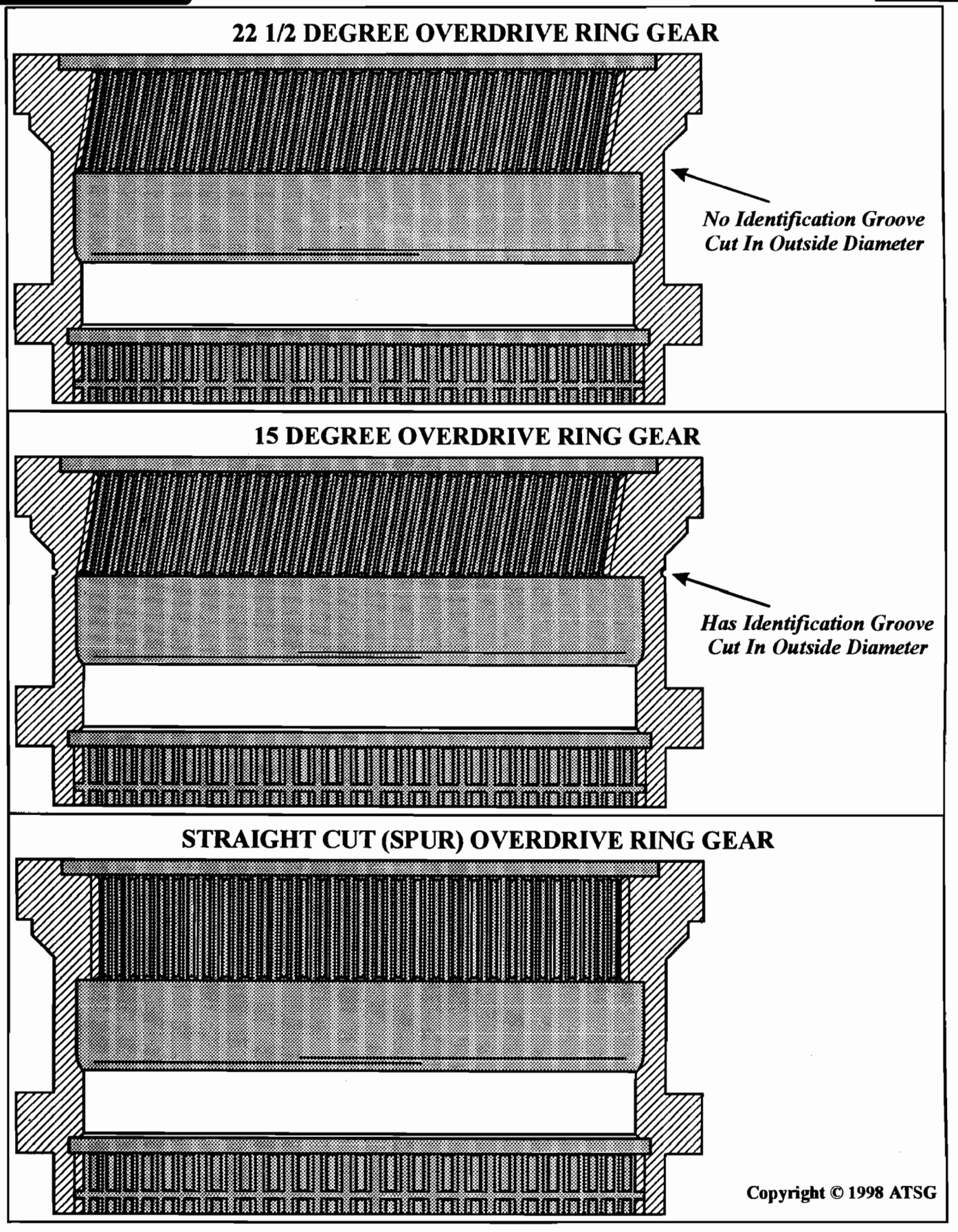
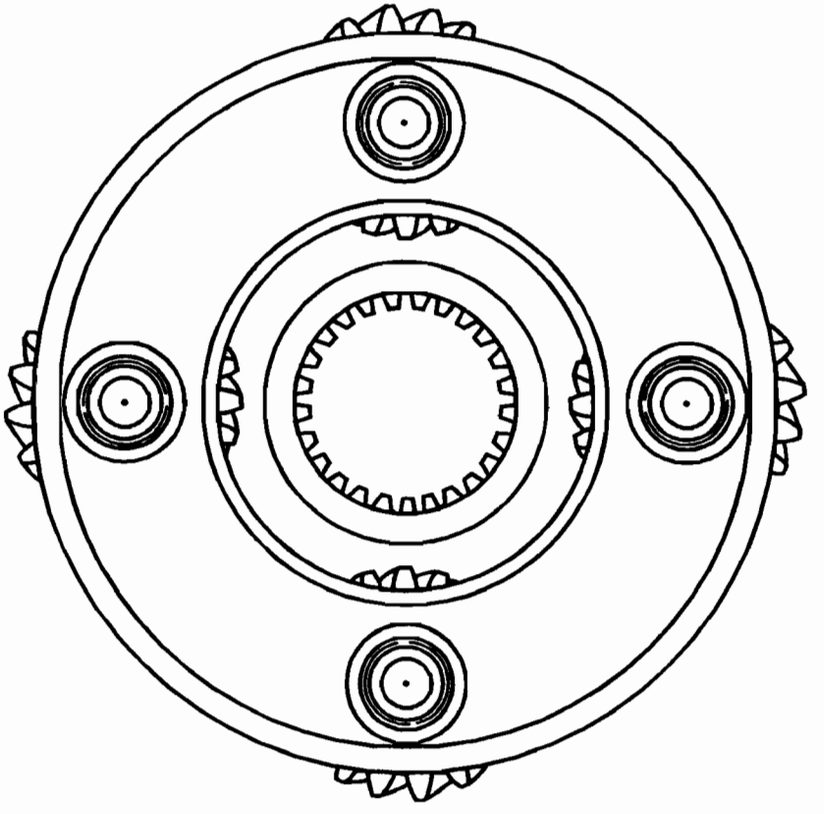


Figure 2

Automatic Transmission Service Group

4 PINION OVERDRIVE PLANETARY CARRIER

MANUFACTURED IN BOTH 15 DEGREE AND 22 1/2 DEGREE HELICAL CUT GEARS



NO POSITIVE IDENTIFICATION BUT
WILL NOT ASSEMBLE WITH WRONG COMPONENTS

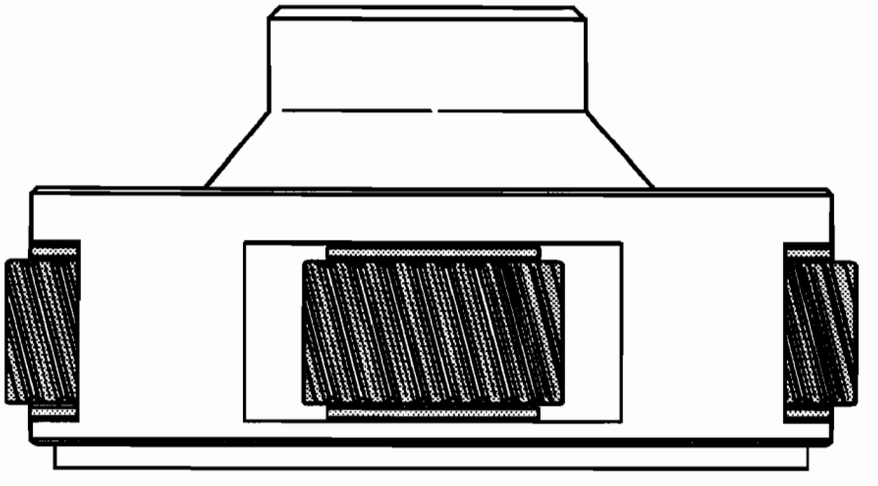


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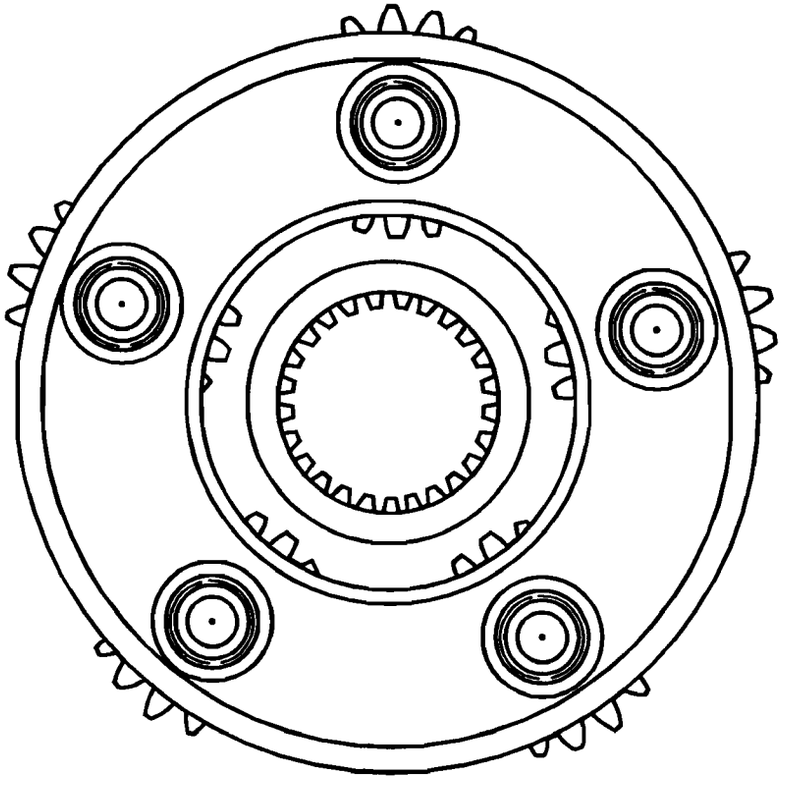
Figure 3

5 PINION STRAIGHT CUT OVERDRIVE PLANETARY CARRIER

FIRST INTRODUCED INTO THE TURBO DIESEL MODELS FOR STRENGTH



REPLACED WITH 15 DEGREE HELICAL CUT GEARS IN 1995 TO REDUCE NOISE

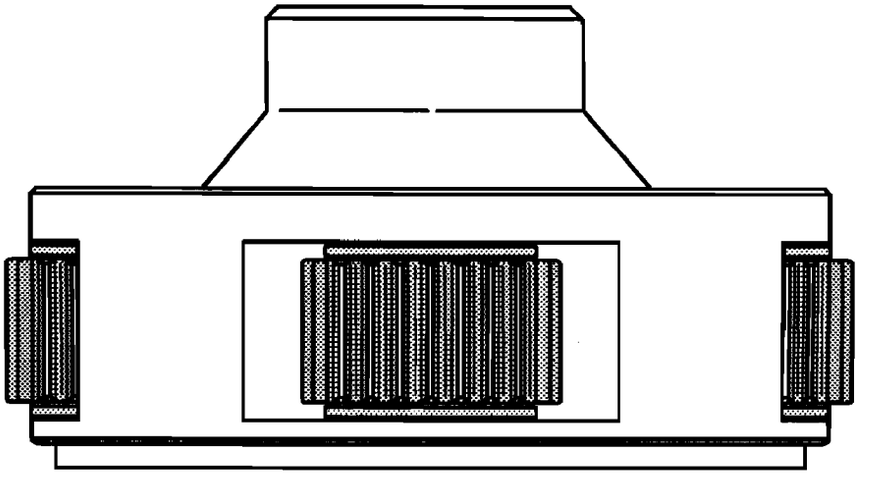


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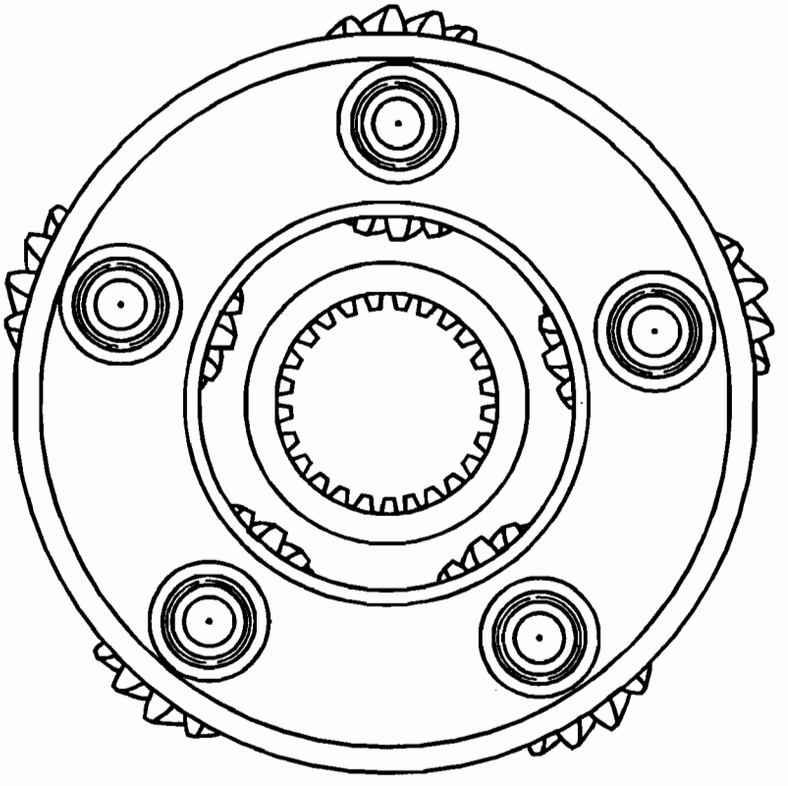
Figure 4

5 PINION 15 DEGREE HELICAL CUT OVERDRIVE PLANETARY CARRIER

INTRODUCED IN 1995 FOR TURBO DIESEL AND V-10 MODELS TO REDUCE NOISE



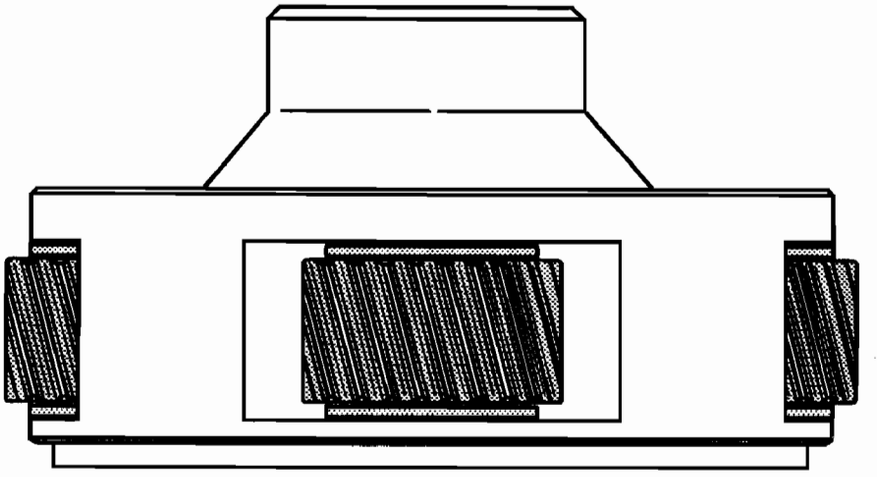


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Figure 5

CHRYSLER A518 (46RH) AND 46RE
BROKEN FRONT PLANETARY

COMPLAINT: Before and/or after rebuild the vehicle returns with the front planetary carrier broken, and will occur with a lot more frequency if it is equipped with the Diesel engine.

CAUSE: Not enough torque carrying capacity with previous design aluminum, 4 pinion carrier.

CORRECTION: There is now available under OEM part number 4617998, a new design 5 pinion, steel front planetary carrier, as shown in Figure 1. The 5 pinion, steel front carrier also requires a plastic bushing, OEM part number 4617951, that fits between the new carrier and the previous ring gear as shown in Figure 1, and a 5 tang thrust washer for the back side of the carrier, OEM part number 4539129, as shown in Figure 2. These parts should be installed in all Diesel engine equipped vehicles, and any vehicle carrying heavy loads.

SERVICE INFORMATION:

Front Planetary Carrier, 5 Pinion, Steel	4617998
Thrust Washer, 5 Tang	4539129
Plastic Front Carrier Bushing	4617951

5 PINION STEEL FRONT CARRIER OEM PART NUMBER 4617998

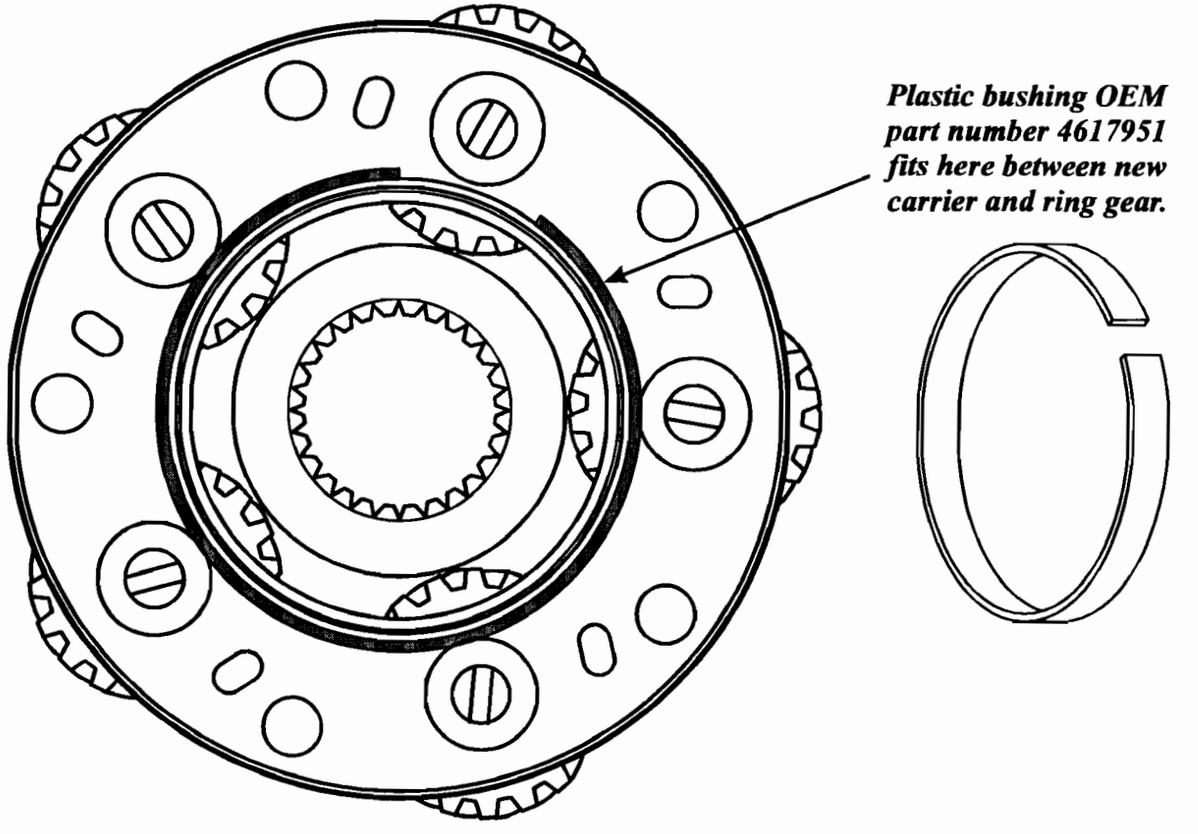

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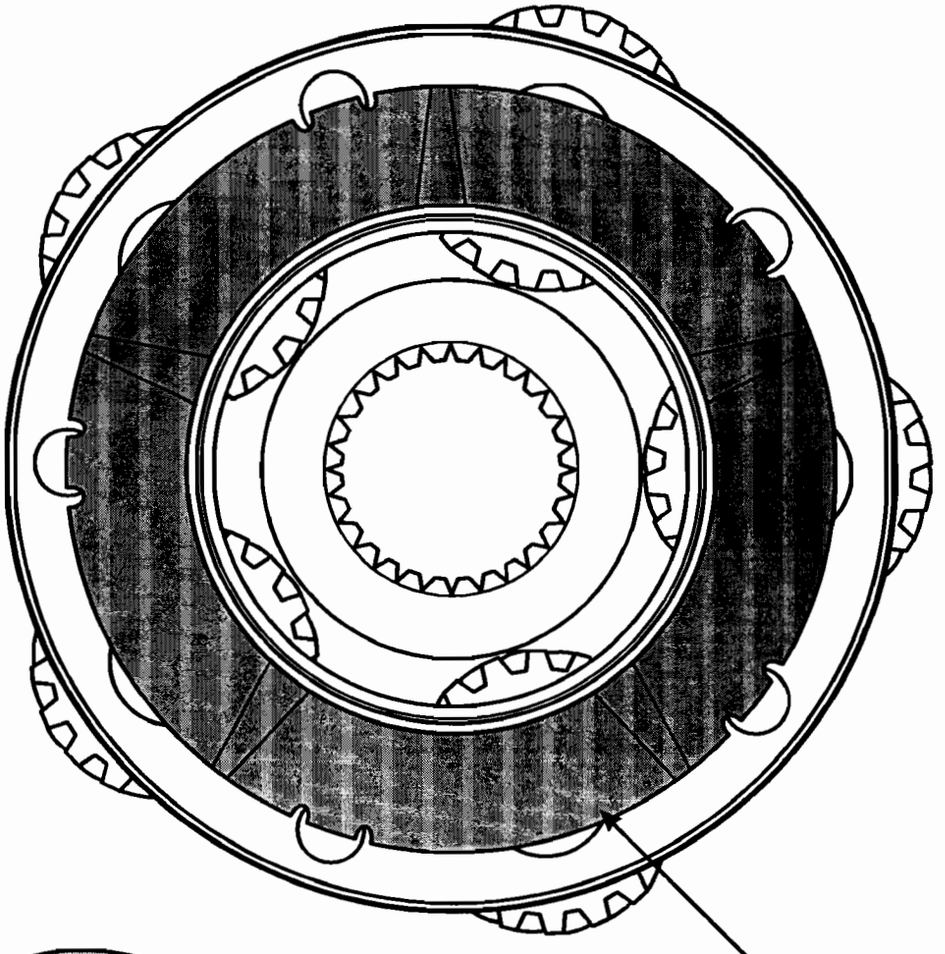
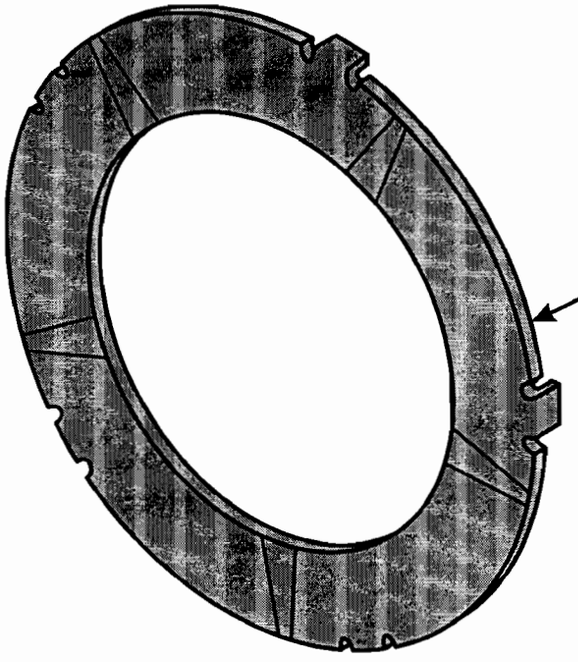
Figure 1

View looking at back side of carrier with 5 tang thrust washer in place.





5 Tang Thrust Washer 4539129 Required with 5 pinion Carrier.

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Figure 2

CHRYSLER REAR DRIVE
PREMATURE PLANETARY FAILURE

COMPLAINT: Before or after overhaul, some 94 and later Chrysler or Jeep vehicles equipped with rear wheel or 4 wheel drive transmissions may exhibit premature planetary failure.

CAUSE: The cause may be, the one-way ball and spring located in the return cooler hose as shown in Figure 1, may be sticking and inhibiting cooler flow to the return cooler fitting which is the rear cooler fitting on the transmission.

CORRECTION: Locate the return hose which is near the radiator as shown in Figure 2. The threaded fitting will have an arrow and the word ***flow*** identifing the one-way ball and spring. Remove and discard the hose shown in Figure 1 and reconnect the existing lines with a suitable hose. After making the repair ensure that there is a minimum of 1 quart of fluid flow in 20 seconds when the rear cooler line is placed into a container and the transmission selector is in Neutral.

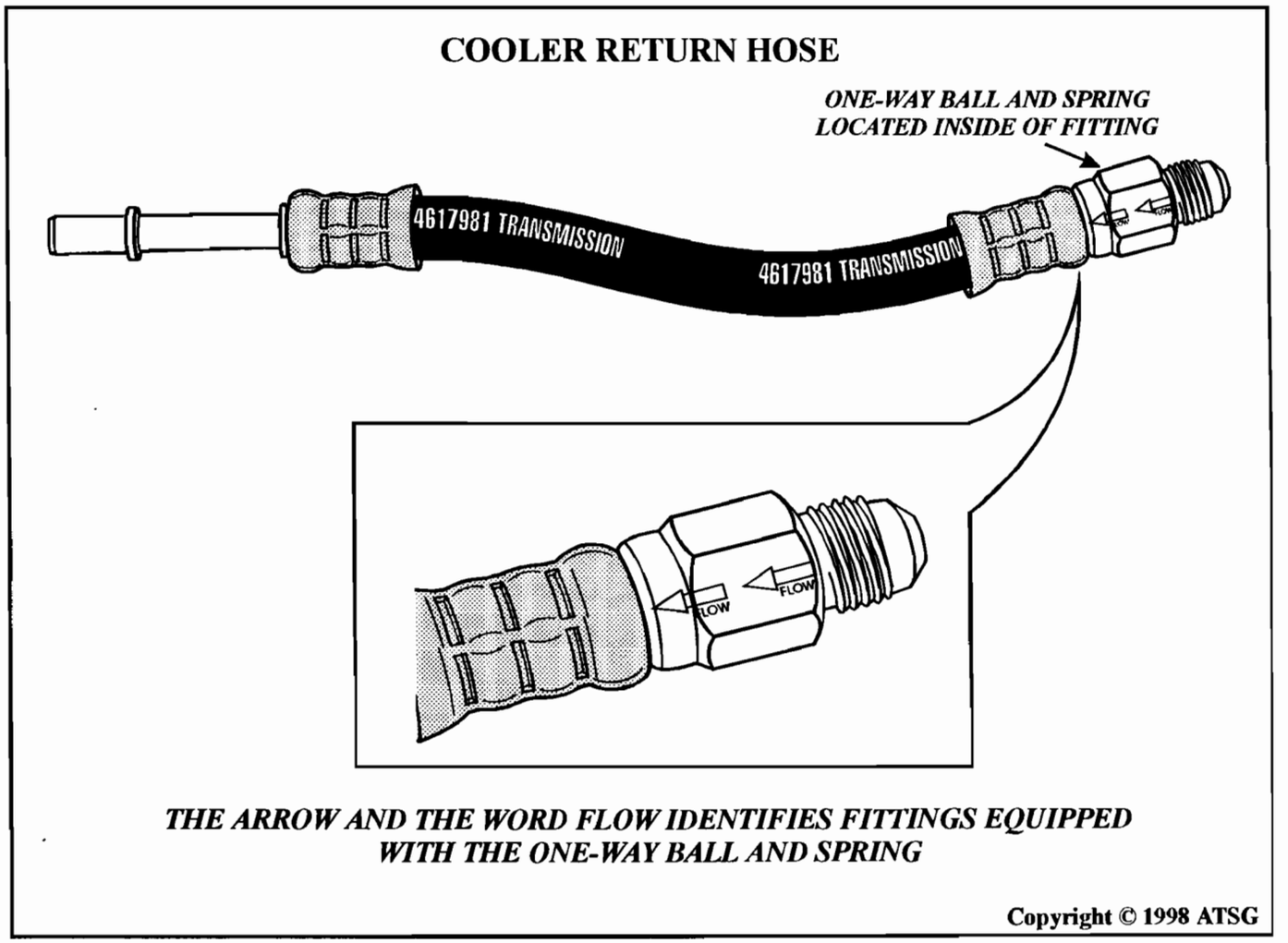

Figure 1

COOLER RETURN HOSE LOCATION

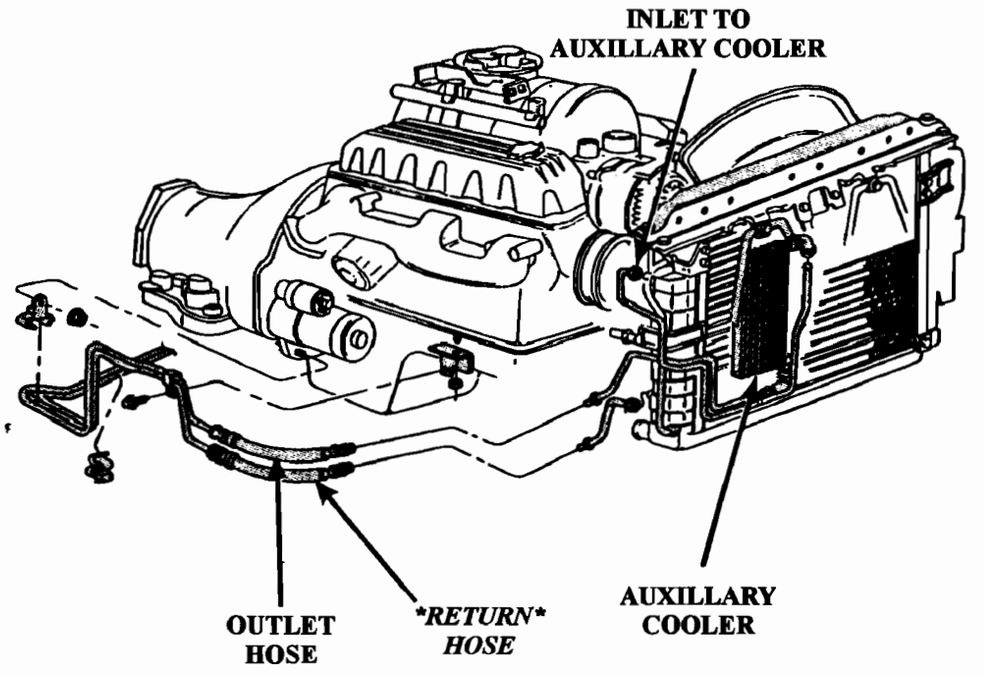

Figure 2