INDEX

AUTOMATIC TRANSMISSION SERVICE GROUP

SEMINARS 1989

TECHNICAL INFORMATION PACKAGE

Space age technology has fully arrived in the automotive industry. Currently most vehicles carry one on board computer. Within the next year some vehicles will have as many as six computers on board. Controlling, engine management, vehicle suspension, Interior air-temperature, Brakes, TRANSMISSION, vehicle location via satellite communication.

The seminars continue on updating computer diagnosing information along with basic transmission diagnosing. We feel it is important to you and the people that work with you in the shop to come up with a common method of diagnosing. We have a chapter in this manual that covers just that.

A thought: It might be helpful to arrange transmission problems as follows:

COMPLAINT .....or problem
CAUSE .....the part or condition creating the problem
CORRECTION ... what is needed to be done to fix the problem

Keep in mind you have the need to be able to diagnose whether the transmission problem is ELECTRICAL — HYDRAULIC — MECHANICAL if it is not the computer . . . again we welcome you.

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Technical Director

DALE ENGLAND
Field Service Consultant

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INTERCONT PRODUCTS, INC.

Professionals' Choose Intercont

REAR WHEEL DRIVE TRANSMISSION TEST MACHINE

The Intercont's Rear Wheel Drive Transmission Test Machine is a vital quality control tool for today's production rebuilder.

The motor is a rebuilt General Motors V6 motor, or equivalent.

The instrument panel is detached from the machine. The following gauges and instruments are installed: timer clock, 85 MPH speedometer, 6,000 RPM tach, 4" 300 lb. Wika pressure gauge, 2-½" 300 lb. Wika pressure gauge, two-2½" 200 lb. Wika pressure gauge, 2½" 100 lb. Wika pressure gauge.

The following standard parts and accessories are featured on Intercont's Rear Wheel Drive test machine: tool box, radiator, stand and 20-inch electrical fan, self-contained gas tank and 10 feet of fuel line, battery and marine-type battery box, vacuum pump and attachment hardware, hoses and clamps, all output adapters, pilot sleeve bushings, converter drive spools and cooling line-pressure line adapters for the following transmissions: **GM - THM 180/180C, THM 200/200C/2004R, THM 250/350/350C, THM 400, THM 700R4, CHRYSLER 727/904, FORD C-3, C-4, C-6 AOD, Jatco, Allison 500 series, and others on request,** attaching bolts, transmission attaching plates, plates and converter drive plates for transmissions listed above, heating system for self-contained reservoir for automatic transmission fluid and pump for filling transmissions.

Our Intercont machines are built with quality and craftsmanship, including heavy-duty 8" tube test frames and braking system, electric fluid heaters, aircraft-type throttle cables, and many built-in safety features.

The Intercont transmission test machine will check and isolate production line building errors, component failures, and building procedure problems, as well as having the capability of testing line pressures, shifting frequency and response, Converter lock-up, down-shifts, converter stall speed, and simulating in vehicle load conditions. Our transmission test machine allows the operator to spot fluid and pressure leaks, check hydraulic system controls, and make minor hydraulic sytem repairs on the machine.

All Intercont test machines come complete with all necessary adapters, tools and accessories for immediate setup and use. You will find our written test procedures to be simple and concise, and we are continually updating our test procedures to accommodate changes in the transmission industry. We can also update your Intercont test machine to accept new transmissions as they are introduced into the industry.

With the purchase of an Intercont transmission test machine, we offer a one-week free training course at our Springfield, Missouri manufacturing facility for complete instruction and training in the setup, maintenance and use of our transmission test machines.

INTERCONT PRODUCTS, INC.

2600 N. Westgate
Springfield, MO 65803

For price quotes, lease options and more information, call us at (417) 869-9549

1987 THM 400
CHECK BALL ADDED

CHANGE: Check ball added to case on 1987-1988 vehicles, and ONLY on vehicles with GVW of under 10,0001bs.

REASON: Softens the apply feel when the selector is moved from Park/Neutral to reverse.

PARTS AFFECTED:

(1) Transmission Case - Seventh check ball added to the case, and orificed cup plug added in the reverse servo feed bore. See Figure 1 for locations of both items.

(2) Spacer Plate - Spacer plate is revised for the additional check ball (See Figure 2).

(3) Valve Body Gaskets - Both gaskets are also revised for the additional check ball.

SERVICE INFORMATION:

Gasket, VB/Spacer Plate (87-88).....8670447
Gasket, Case/Spacer Plate (87-88).....8670458

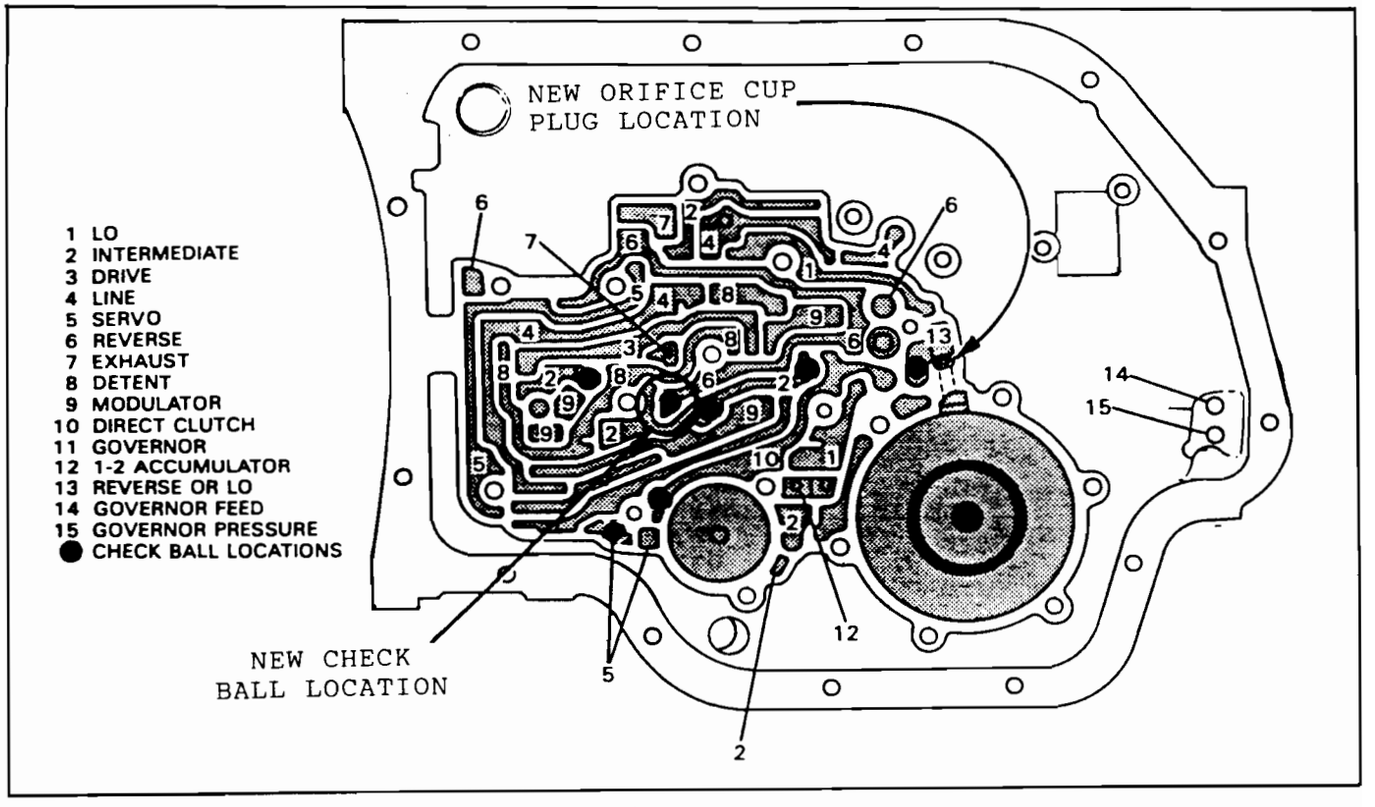


Figure 1

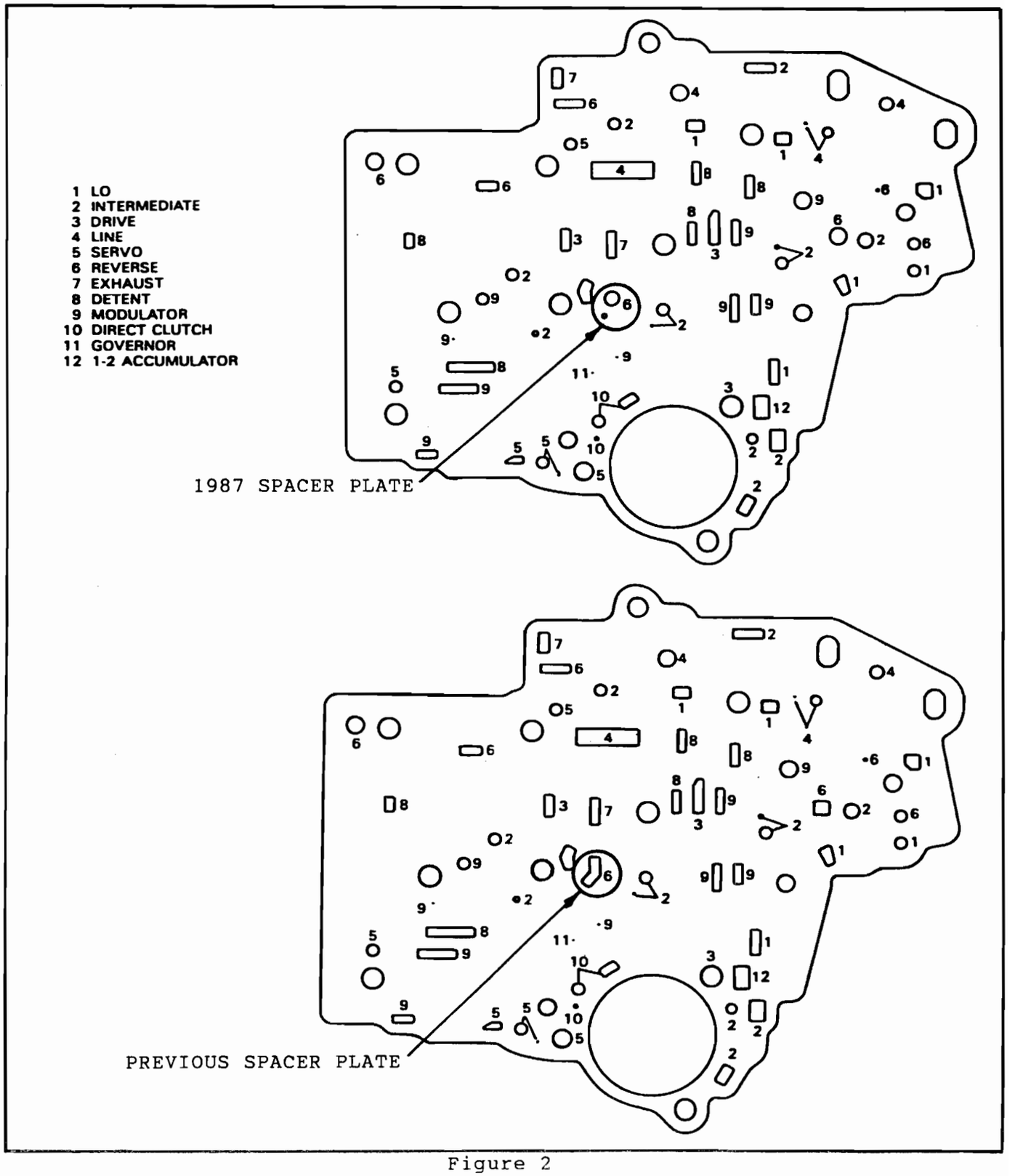
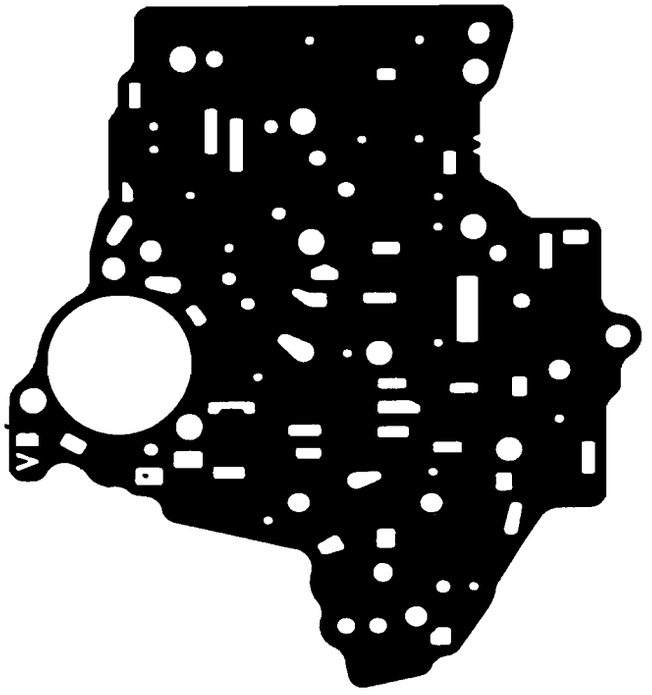

1 LO
2 INTERMEDIATE
3 DRIVE
4 LINE
5 SERVO
6 REVERSE
7 EXHAUST
8 DETENT
9 MODULATOR
10 DIRECT CLUTCH
11 GOVERNOR
12 1-2 ACCUMULATOR
1987 SPACER PLATE
PREVIOUS SPACER PLATE

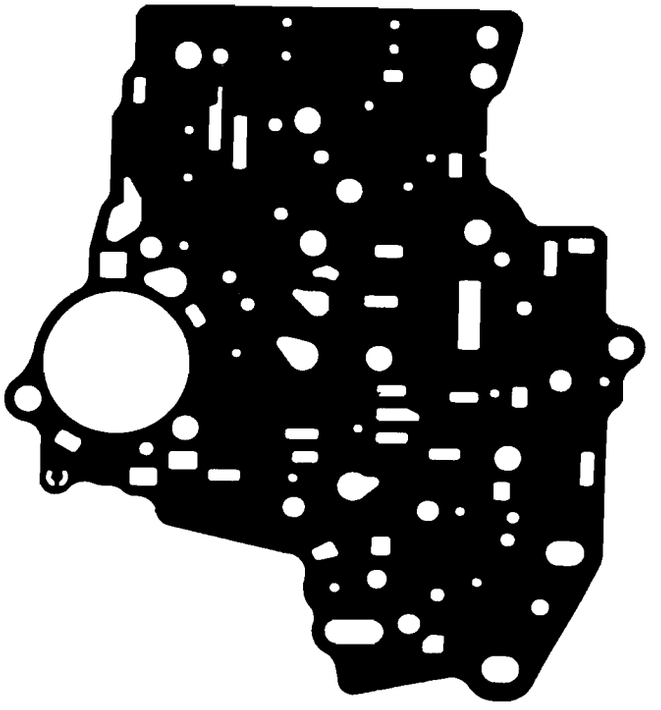
Figure 2

Thm 400 Valve Body Gasket Change

Beginning November 23, 1987, all TH400 transmissions were built with new valve body gaskets. (SEE BELOW) This change and additional changes done to the case, valve body, and separator plate, were done to relieve a harsh park/neutral to reverse engagement shift feel.



8670447



8670458

See Bulletin 88-33 for case and separator plate differences.

THM 400 PRESSURE REGULATOR

THM "375," "400" & "475" PRESSURE REGULATOR VALVE USAGE AND IDENTIFICATION

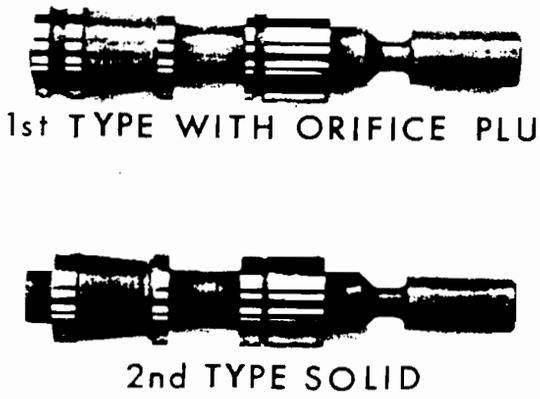


FIG. 1 PRESSURE REGULATOR VALVE

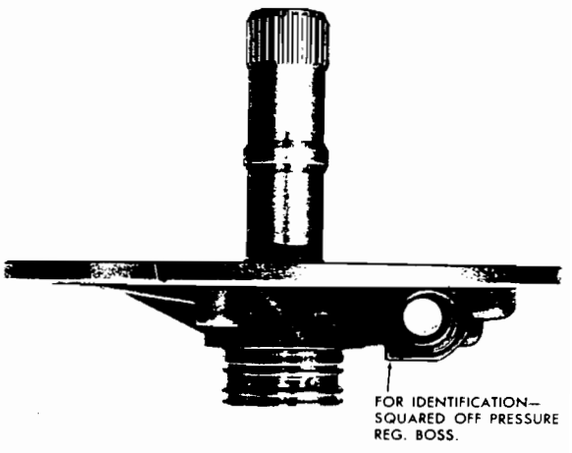


FIG. 2 PUMP COVER ASSEMBLY

NOTE: THE SOLID VALVE, 2ND TYPE, MUST ONLY BE USED IN THE PUMP COVER ASSEMBLY WITH THE SQUARED OFF PRESSURE REGULATOR BOSS (PRESSURE BOOST BUSHING END) FIG. 2. THE PRESSURE REGULATOR VALVE, 1ST TYPE, WITH OIL HOLES AND ORIFICE CUP PLUG, IS RELEASED FOR SERVICE AND CAN BE USED TO SERVICE EITHER PAST MODEL OR THE CURRENT PUMP COVER ASSEMBLY.

THM 440-T4

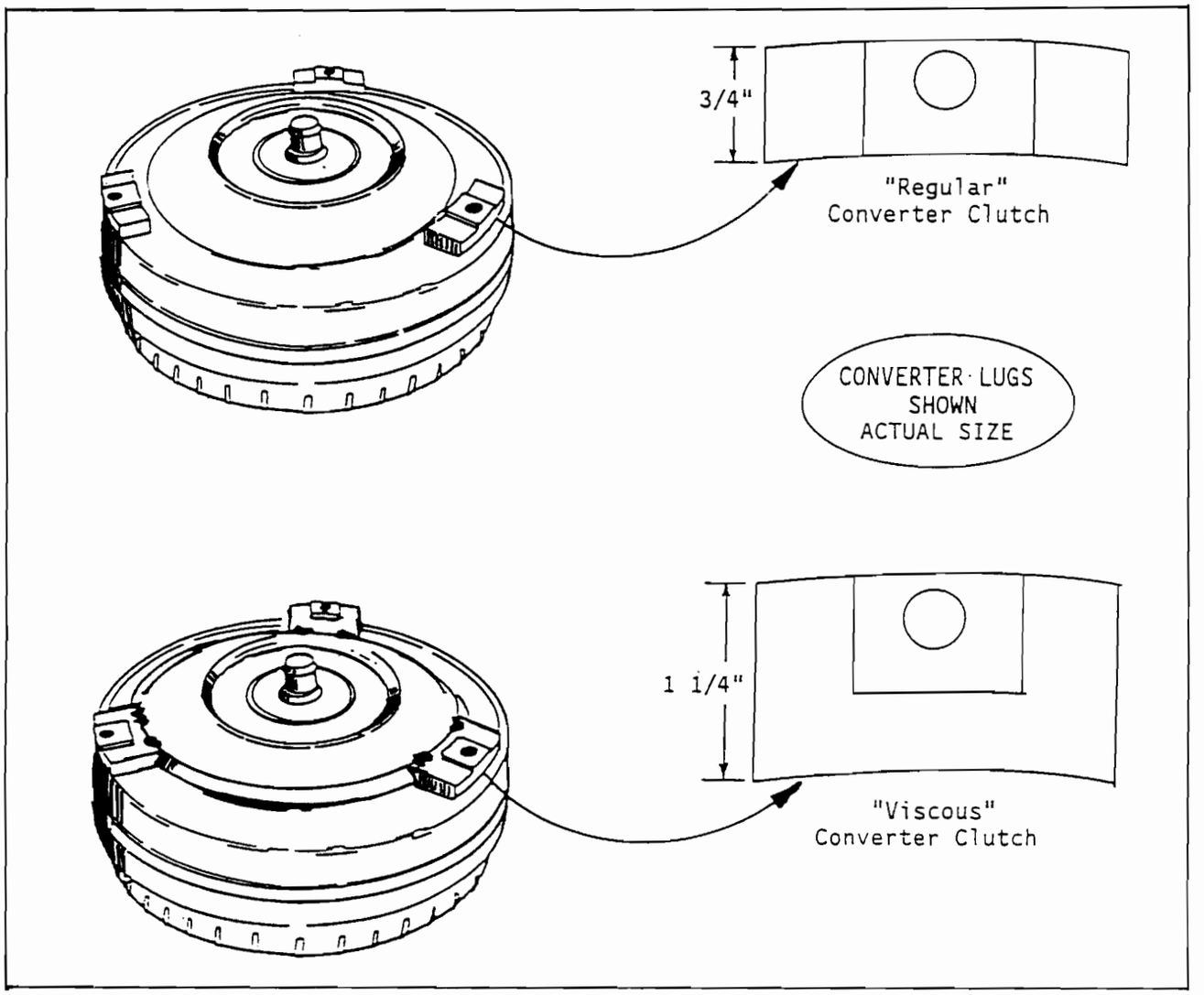


Figure 60

CONVERTER IDENTIFICATION

Identification of the "VISCOUS" converter from the "REGULAR" converter, can be done very easily externally. Notice the difference in the size of the converter drive lugs (see Figure 60). The profile of the converter covers are also different, but takes a closer look to detect, than do the drive lugs.

GM POPPET VALVE CONVERTERS

APPLICATION:

STATIC CLOSED: Diesel engine vehicles with 200C, 325-4L, 350C, 200-4R, 125C (except THM 700-R4)

STATIC OPEN: Cadillac gas: 200-4R - AA AP
325-4L - OF OM

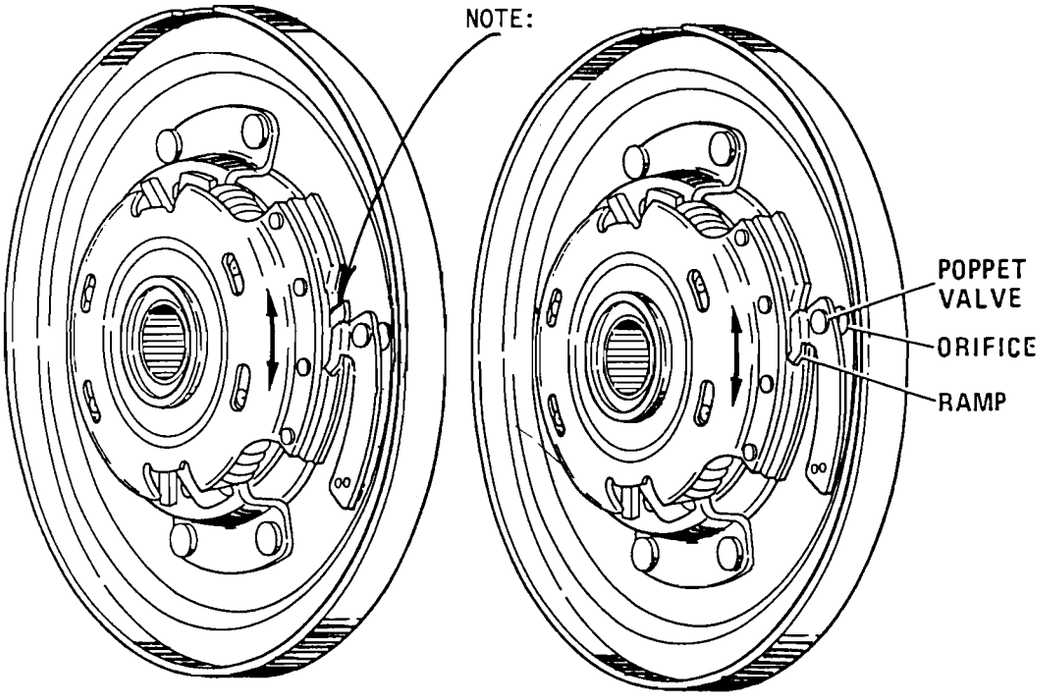


Figure 1

NOTE: In Figure 1, the static open clutch assembly, you can see the poppet valve is set on the ramp in the open position.

THM 125C NEW AUXILIARY VALVE BODY GASKET

For 1988, approximately 15% of the THM 125C transaxles require a new auxiliary valve body cover gasket. The new gasket is being used in "N" body cars(Calais, Somerset, and Grand AM) ONLY at this time.

The new gasket has a larger hole than the 1987 gasket, and a dyed area on the gasket for identification (See Figure 1).

This now makes four (4) auxiliary valve body cover gaskets for the THM 125C, and they "CANNOT" be interchanged with each other (Figure 1).

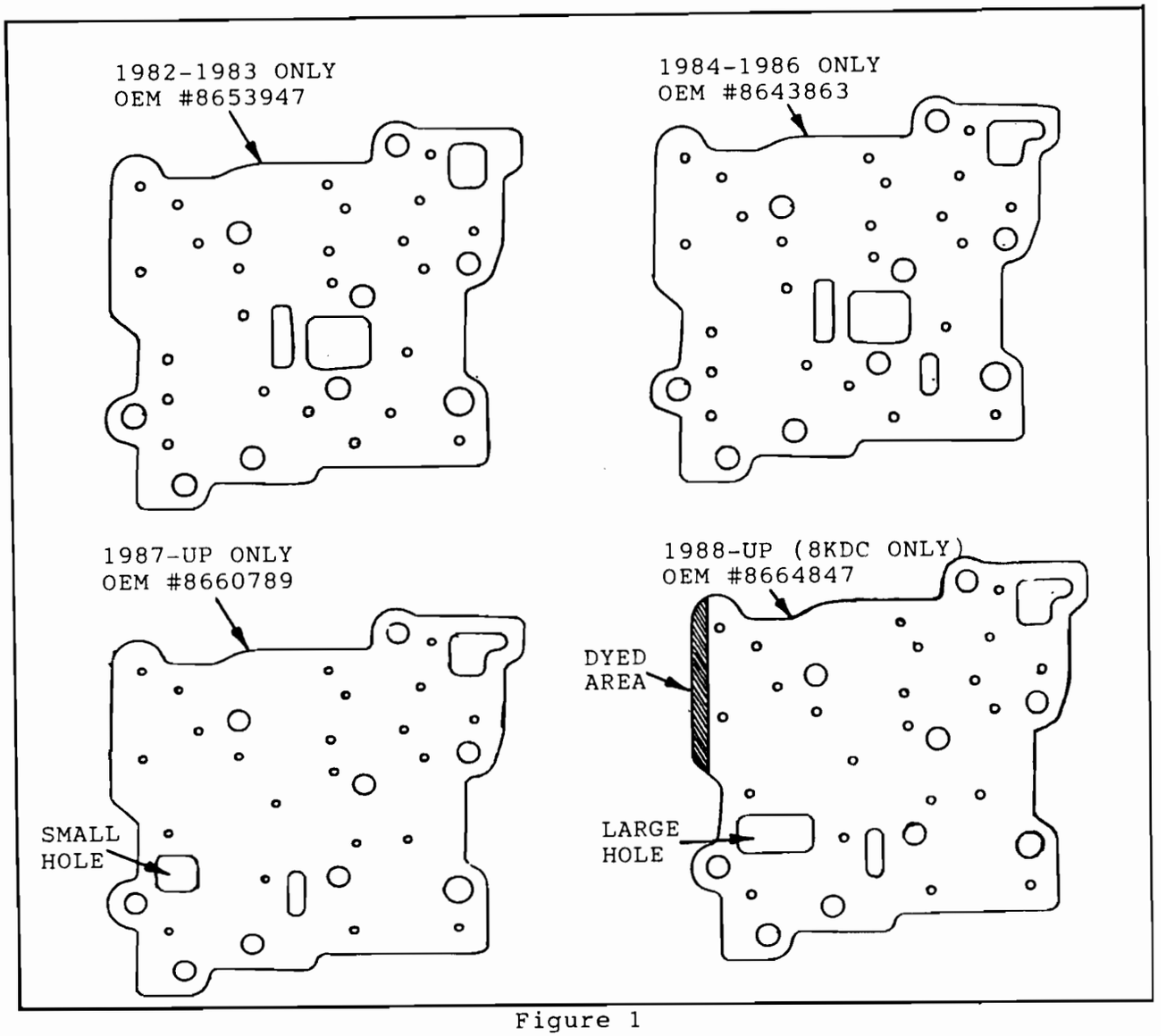


Figure 1

THM 125C TCC FILTER ADDED

A TCC filter has been added to the TCC signal passage in the auxiliary valve body, beginning in March, 1987 (See Figure 1). This will reduce the possibility of sediment entering the TCC solenoid.

If the solenoid gets contaminated with sediment, it could result in a complaint of engine stalling when selector is placed in drive or reverse.

The filter cannot be used in previous models because of a machining process needed on the auxiliary valve body.

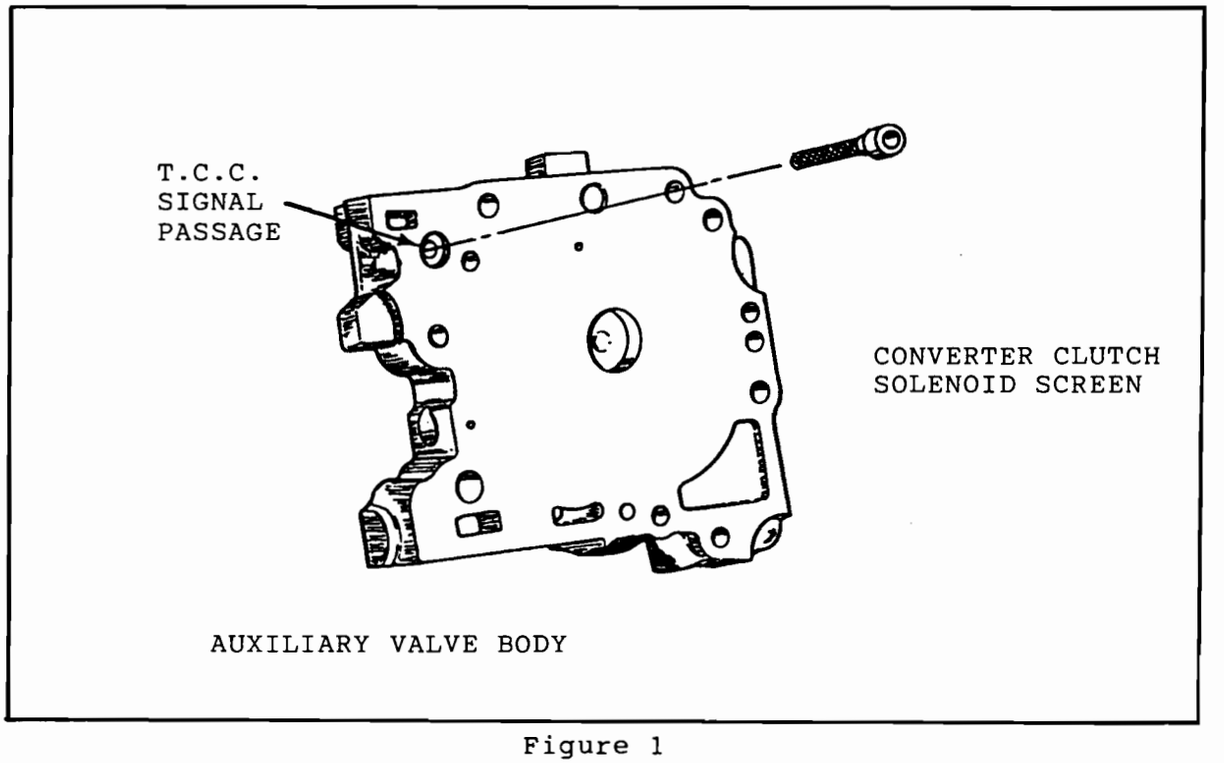


Figure 1

1984 THM 125C PARTS CHANGES

For 1984 the THM 125C has 5 L&R friction plates that are .010" thicker, and 5 L&R steel plates that are .010" thicker, for a total of .100". They had to make room for that extra .100" in the L&R clutch pack. They accomplished this by moving the final drive ring gear spacer snap ring .050" closer to the final drive and of course this requires a thiner ring gear spacer (See Figure 1). The 1983 ring gear spacer measures 1.344" and can be identified by no notch in the tab. The 1984 ring gear spacer measures 1.294" and can be identified by a "V" notch in the tab (See Figure 2).

The other .050" was handled by making the L&R piston .050" thinner. The 1983 piston measures .535" (total height) and is identified by a "round" hole in the lip seal retainer on the back of the piston. The 1984 piston measures .485" (total height) and is identified by a "square" hole in the lip seal retainer on the back of the piston (See Figure 3). Needless to say these parts cannot be interchanged.

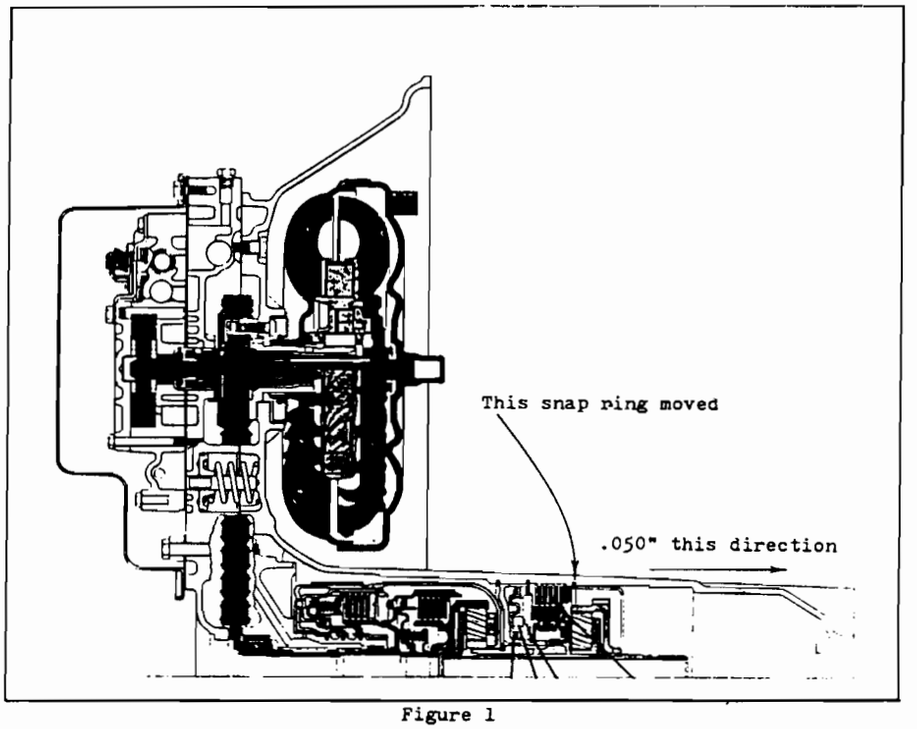


Figure 1

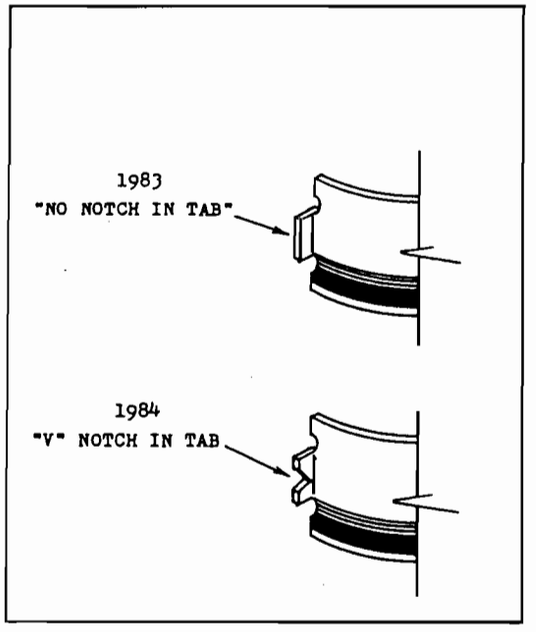


Figure 2

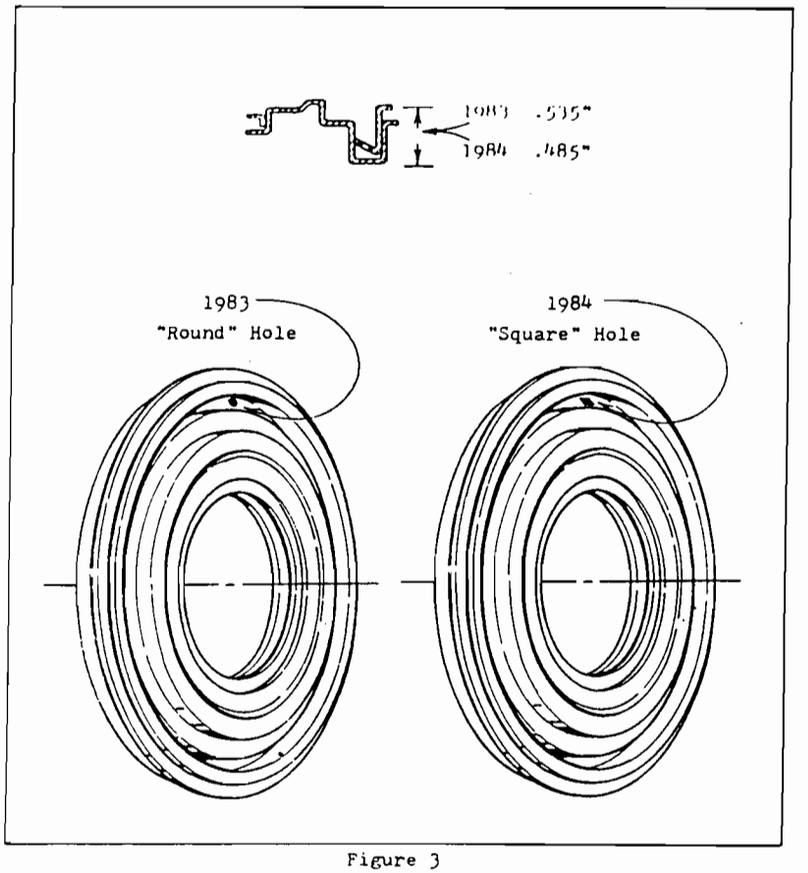


Figure 3

1987 - 1988 THM 125C
LOSS OF DRIVE AND / OR REVERSE

COMPLAINT: Loss of Drive and/or Reverse.

CAUSE: The cause may be a broken Thermo Element Retaining Clip, located "Inside" of the manual valve. This would allow the Thermo Element to move forward, allowing drive and/ or reverse oil to exhaust (See Figure 1). A retaining clip that has broken and fallen out can usually be located in the bottom pan.

CORRECTION: Install previous design manual valve, or replace retaining clip and/or thermo element as necessary.

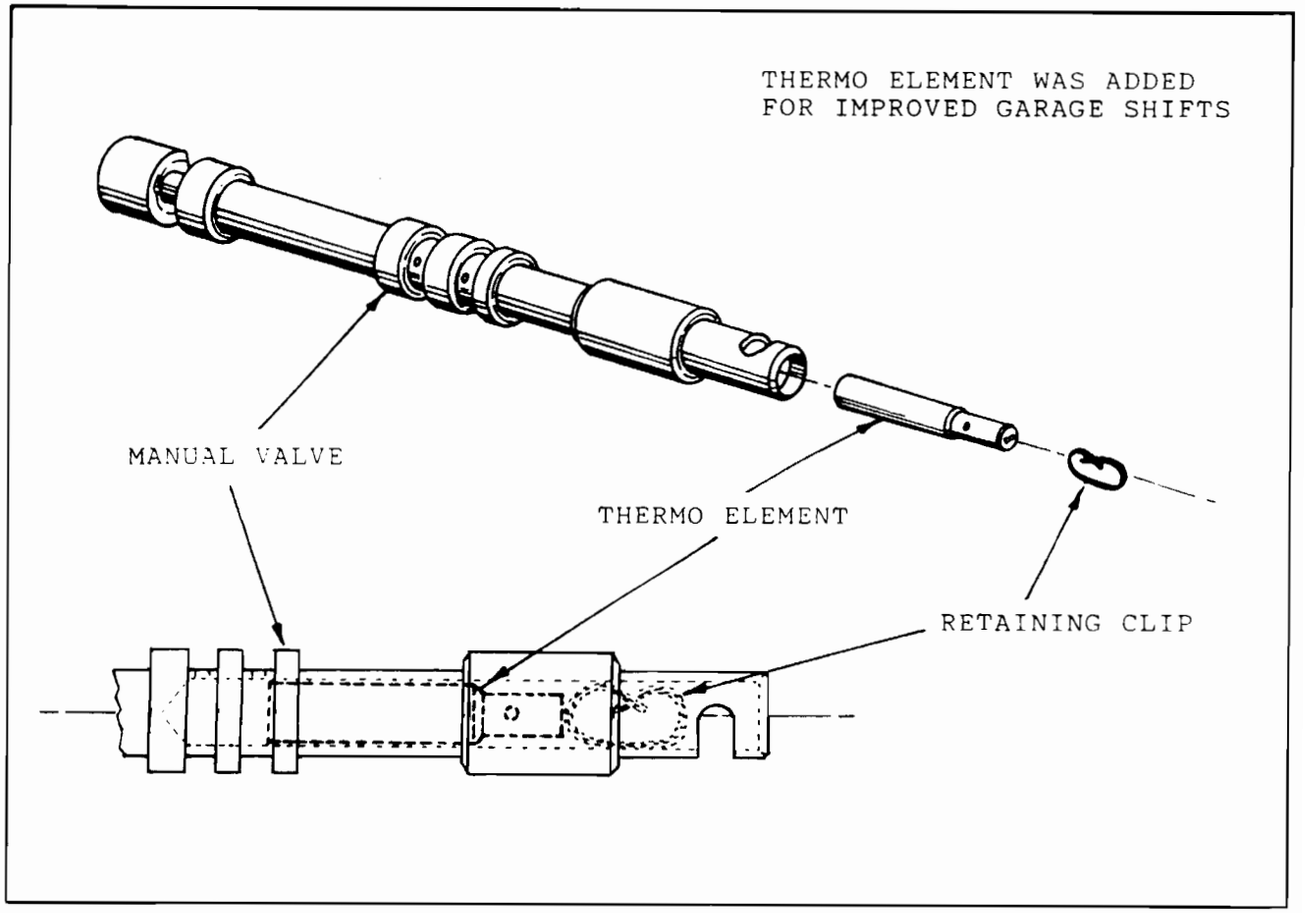


Figure 1

THM 125C
NEW LOW / REVERSE PIPE SEAL

For 84 days in 1987, (Julian Date 012 to Julian Date 096), General Motors built approximately 500,000 THM 125C transaxles using a new design Low/Reverse Oil Pump Seal (See Figure 1). In April 1987, they returned to the original design seal (See Figure 2).

The 2nd design seal is available only from the GM dealer network under OEM Part No. 8664492.

Due to the low quantities involved, the aftermarket manufacturers do not plan, at this time, to include the new seal in their kits, and at present is not included in the OE kits.

The new seal must be ordered seperately.

Low/Reverse Oil Pipe Seal (2nd Design) 8664492

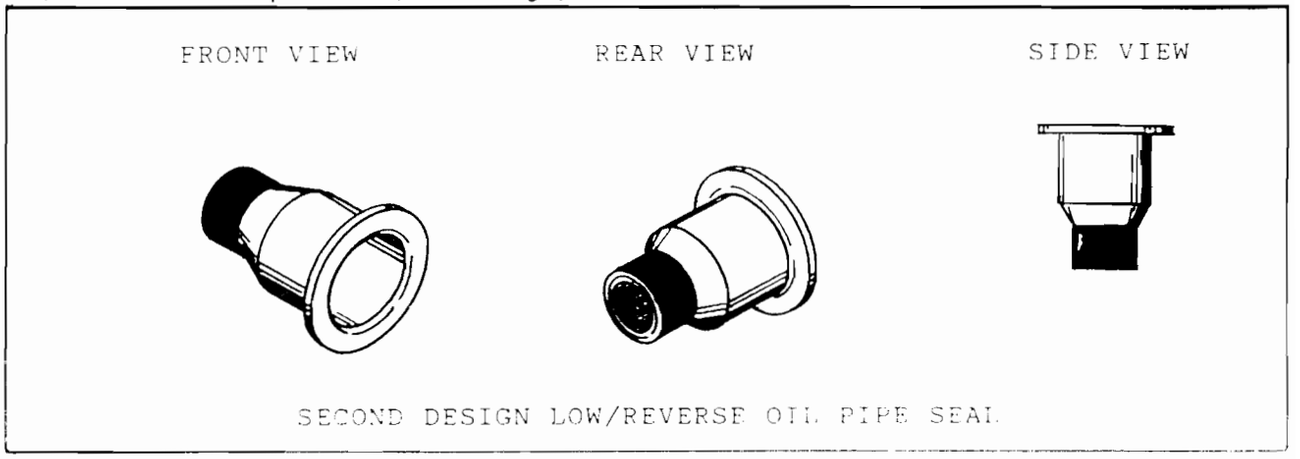


Figure 1

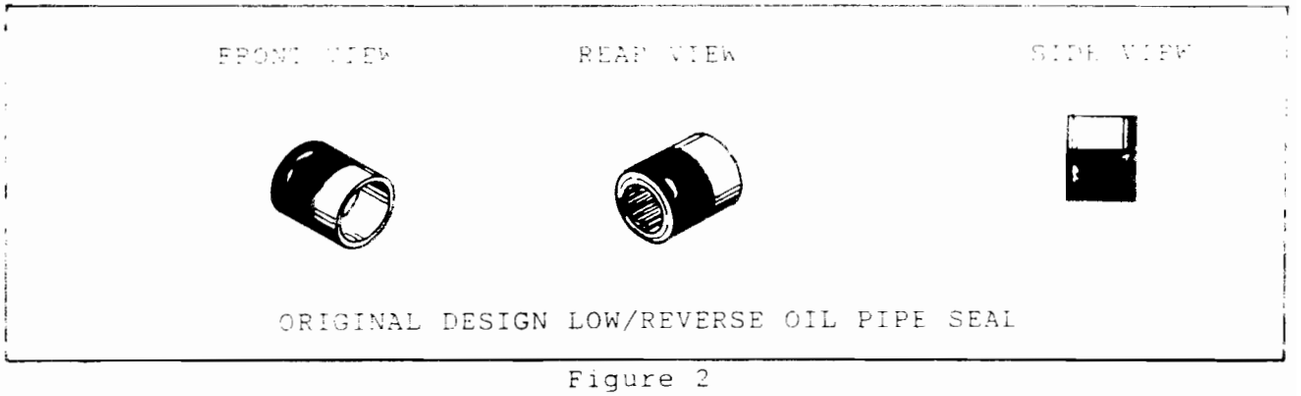


Figure 2

Thm 125C TCC Shudder

COMPLAINT:CONVERTER CLUTCH SHUDDER

CAUSE; One cause can be low converter regulator charge pressure. Figure 1. Another cause can be slow drain of converter oil in front of clutch piston.

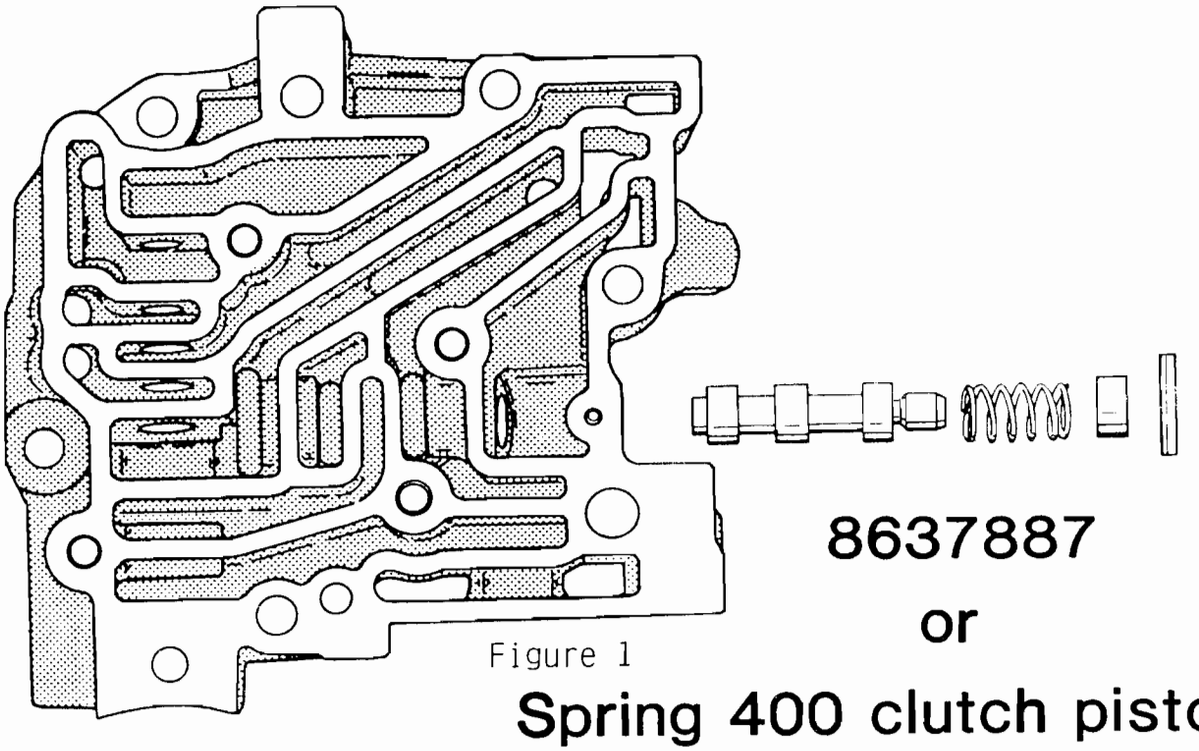


Figure 1

8637887

or

Spring 400 clutch piston

CORRECTION: Install stronger regulator valve spring 8637887 or use a spring from a Thm 400 foward or direct clutch retainer
Figure 2 Drill converter exhaust hole in separator plate to .080

THM 125C

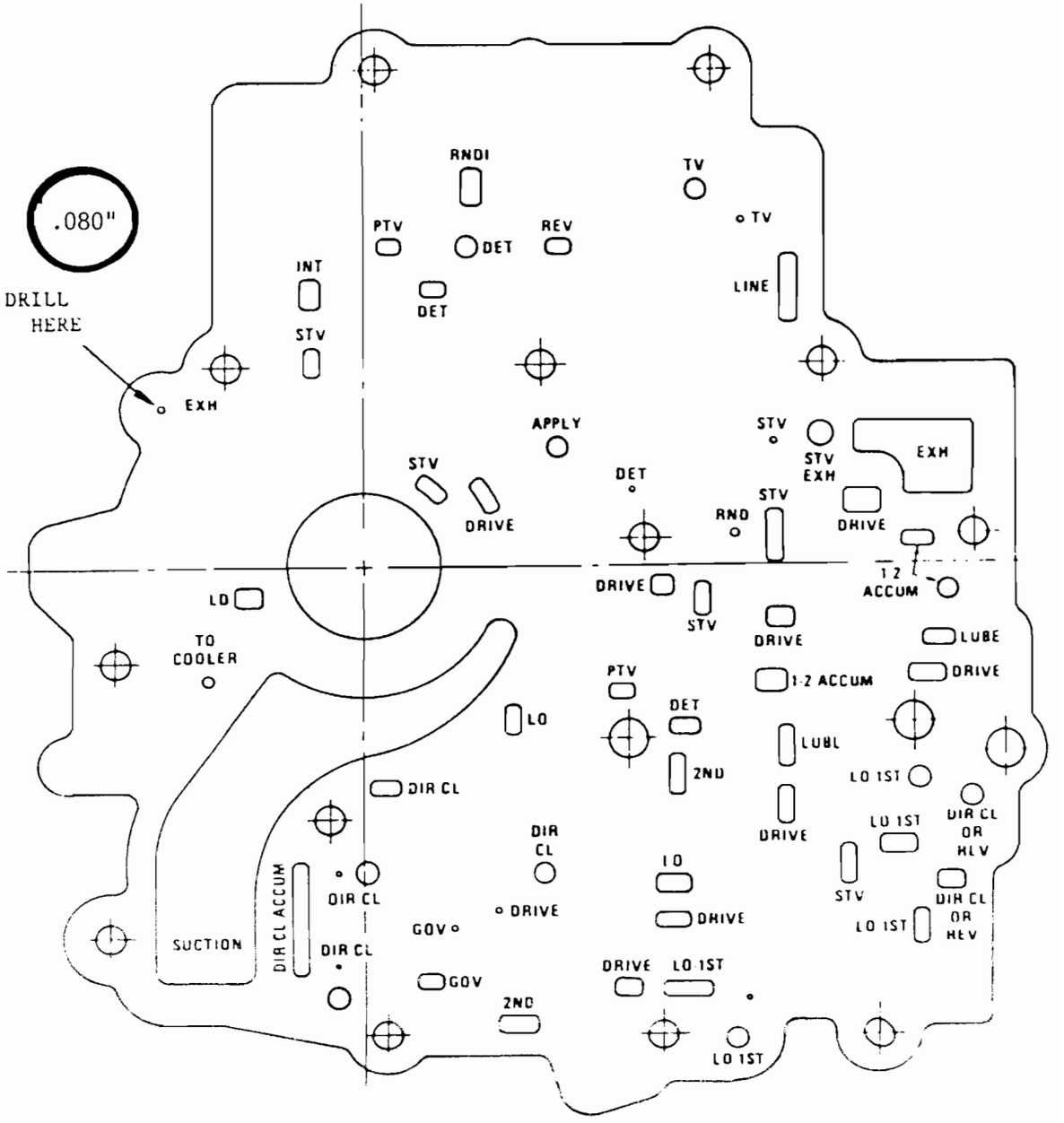


Figure 2

THM 125C
TCC FILTER ADDED

A TCC filter has been added to the TCC signal passage in the auxilary valve body, beginning in March, 1987 (See Figure 1). This will reduce the possibility of sediment entering the TCC solenoid.

If the solenoid gets contaminated with sediment, it could result in a complaint of engine stalling when selector is placed in drive or reverse.

The filter cannot be used in previous models because of a machining process needed on the auxiliary valve body.

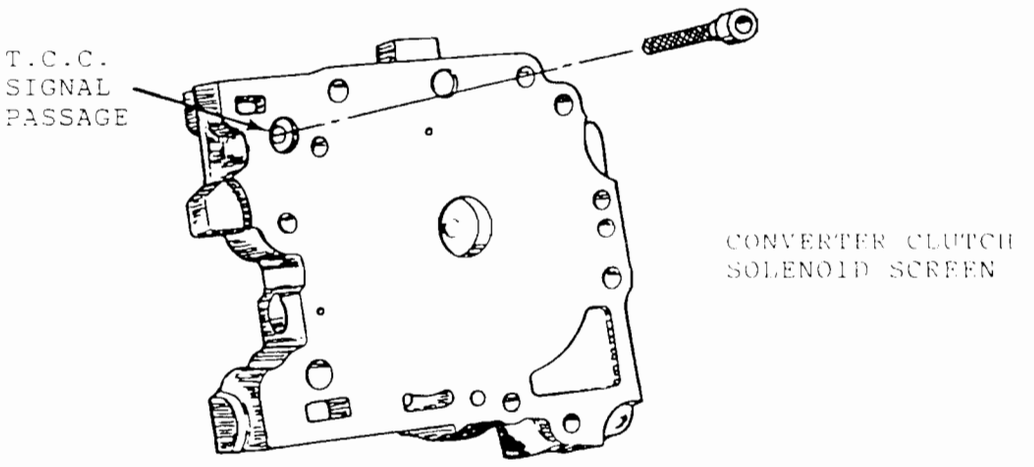


Figure 1

THM 125C
NEW GOVERNOR COVER AND BEARING

A caged needle bearing has been added to the governor cover beginning in model year 1986 (See Figure 1).

The new governor cover and bearing assembly will interchange with previous models, as an assembly.

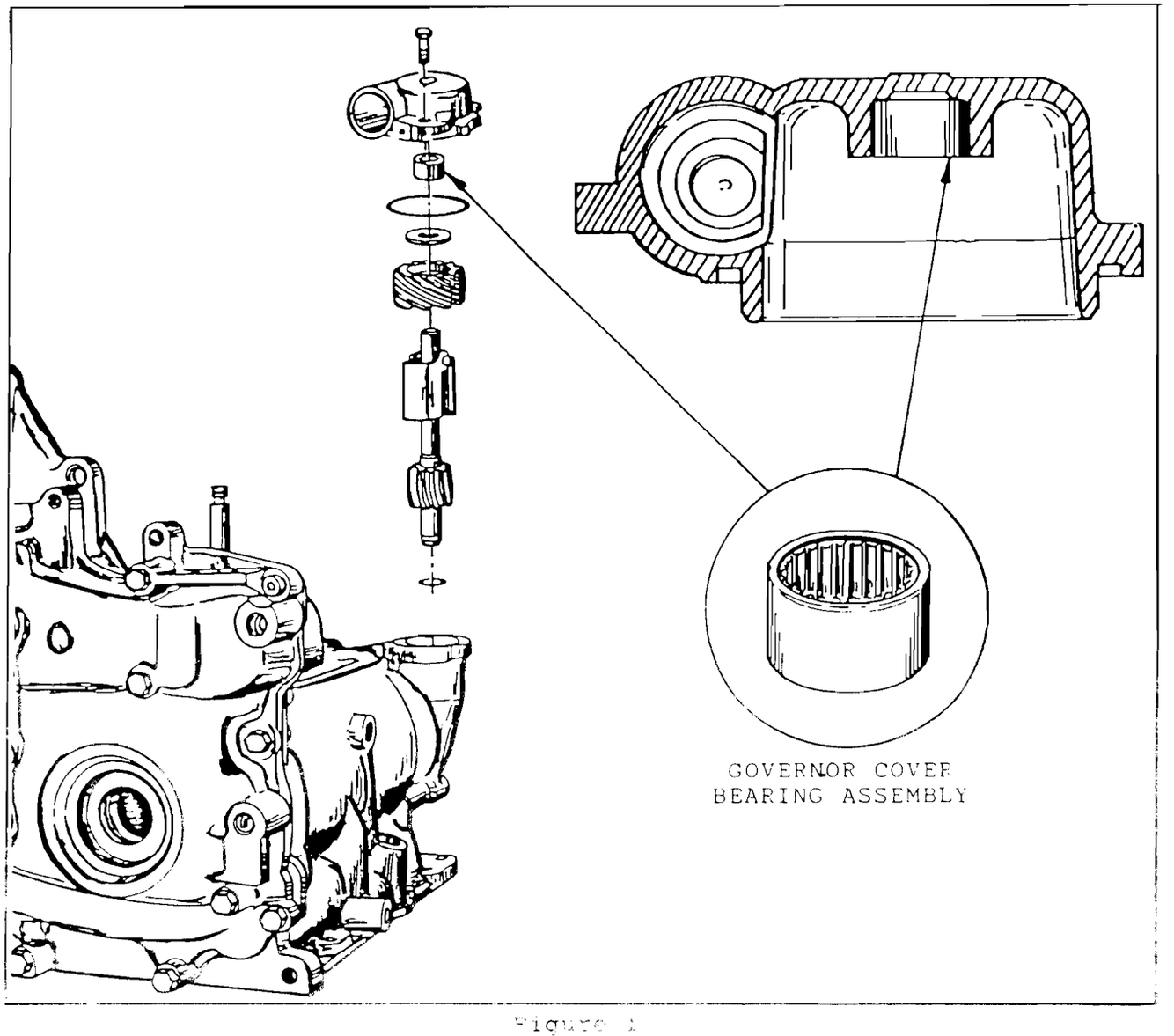


Figure 1

THM 125C
GOVERNOR SCREEN ADDED

The governor screen was added (1986 Julian Date 203) to the governor sleeve in the case, to minimize the possibility of sediment entering the governor assembly and preventing the governor balls from seating properly (See Figure 1).

A machining change was needed in the case to make room for the new governor screen, thus it will not retro-fit to previous models.

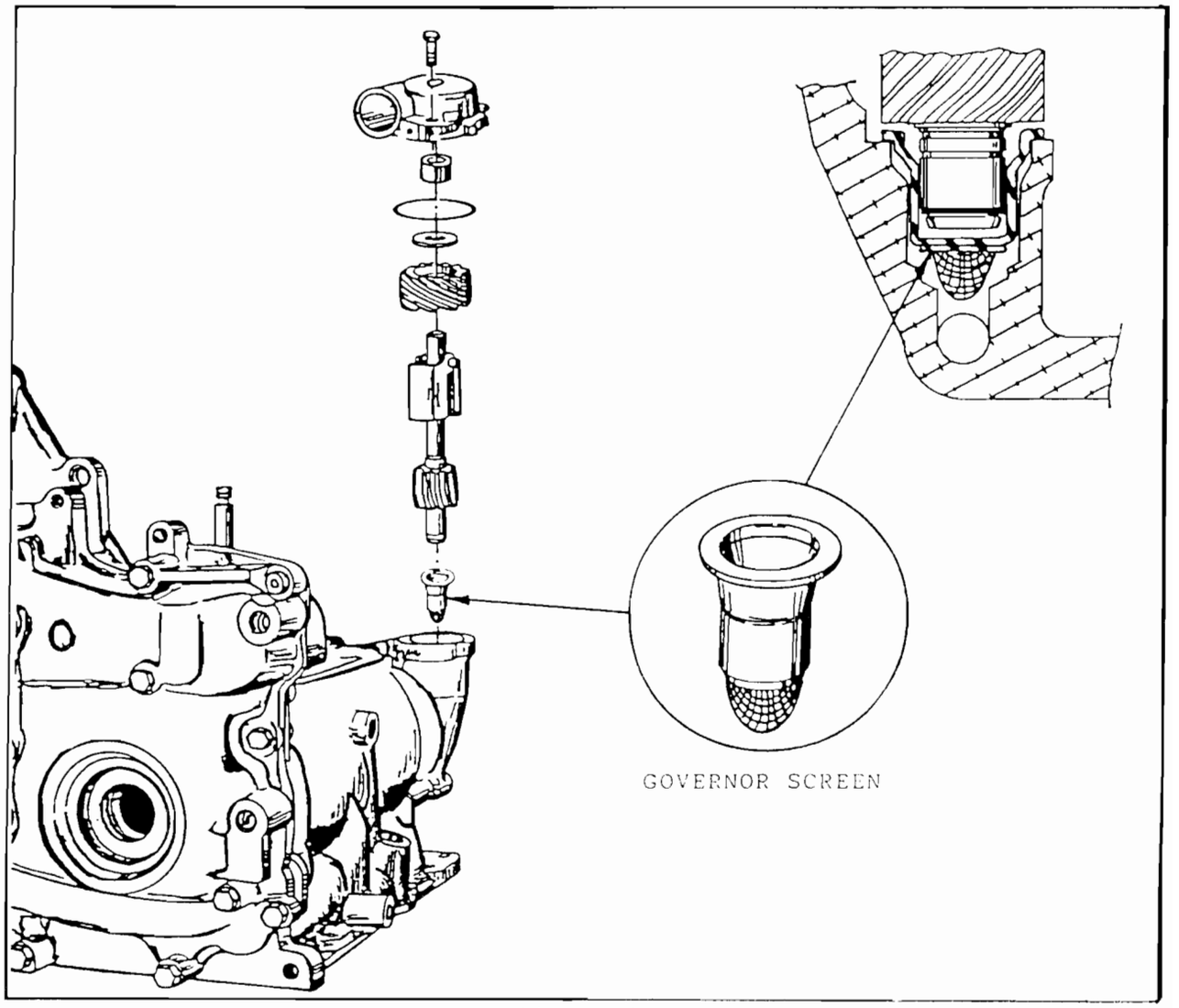


Figure 1

THM 440 T4

PUMP BODY CHANGES

1985	Identification:	Has slot in pump body (See Figure 5).
	Interchangeability:	The 1985 pump body will not work on 1985 1/2 up valve body unless spacer plate is used to eliminate slot. If used without the spacer plate result will be tie-up when transaxle shifts to 4th gear.
1985 1/2	Identification:	Slot in pump body was eliminated (See Figure 5).
	Reason:	Addition of 3-2 TV bias valve in valve body and complete revision of hydraulic circuit for improved 3-2 downshift.
	Interchangeability:	Will interchange on 85 1/2 and 1986 models only.
1986	Identification:	No way to identify from 1985 1/2. Pump pocket depth was made shallower by .0001" which created 5 new slide sizes unique to the 1986 pump. See chart on page 6.
Reason:		Improved pump capacity.
Interchangeability:		Will interchange with 85 1/2 only, as long as proper slide selection is made to correspond with depth of pump pocket.
1987	Identification:	Hole eliminated in pump body (See Fig. 5).
	Reason:	Improved 3-2 downshift. Modulator oil was fed thru the hole in pump body to stroke the 3-2 coastdown valve. Improved 3-2 downshift could be obtained by using servo release oil to stroke the valve, so hole was eliminated and the 3-2 maneuver pipe was added to carry servo release oil to the 3-2 coastdown valve in pump body (See Figure 6). This also made a change in the pump cover necessary with an additional hole and seal to accept the 3-2 maneuver pipe.
	Interchangeability	Will retro fit back to 85 1/2, and is recommended. The 3-2 maneuver pipe must be used with it. Not interchangeable unless 3-2 maneuver pipe is used.

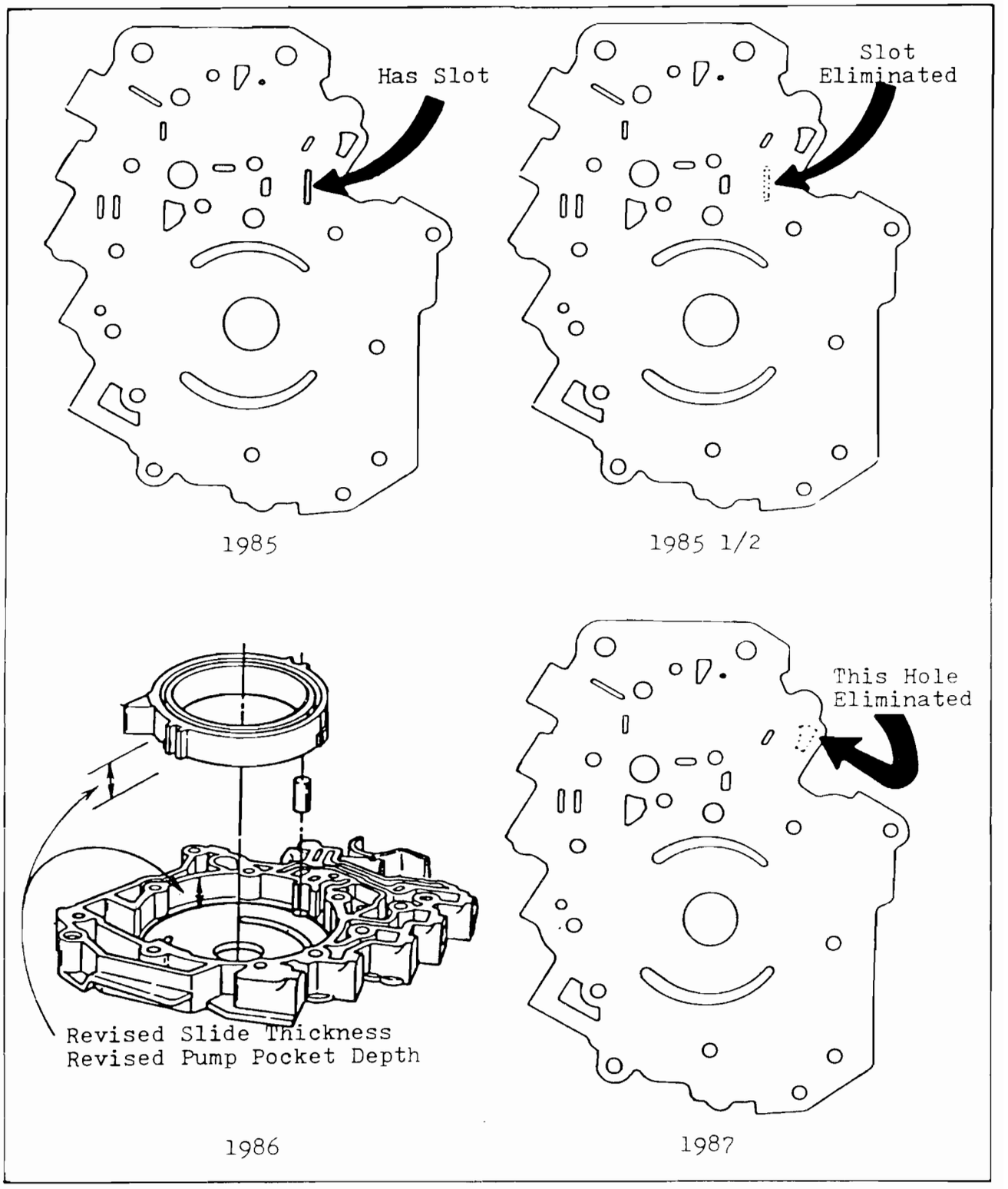

Has Slot
1985
Slot
Eliminated
1985 1/2
Revised Slide Thickness
Revised Pump Pocket Depth
1986
This Hole
Eliminated
1987

Figure 5

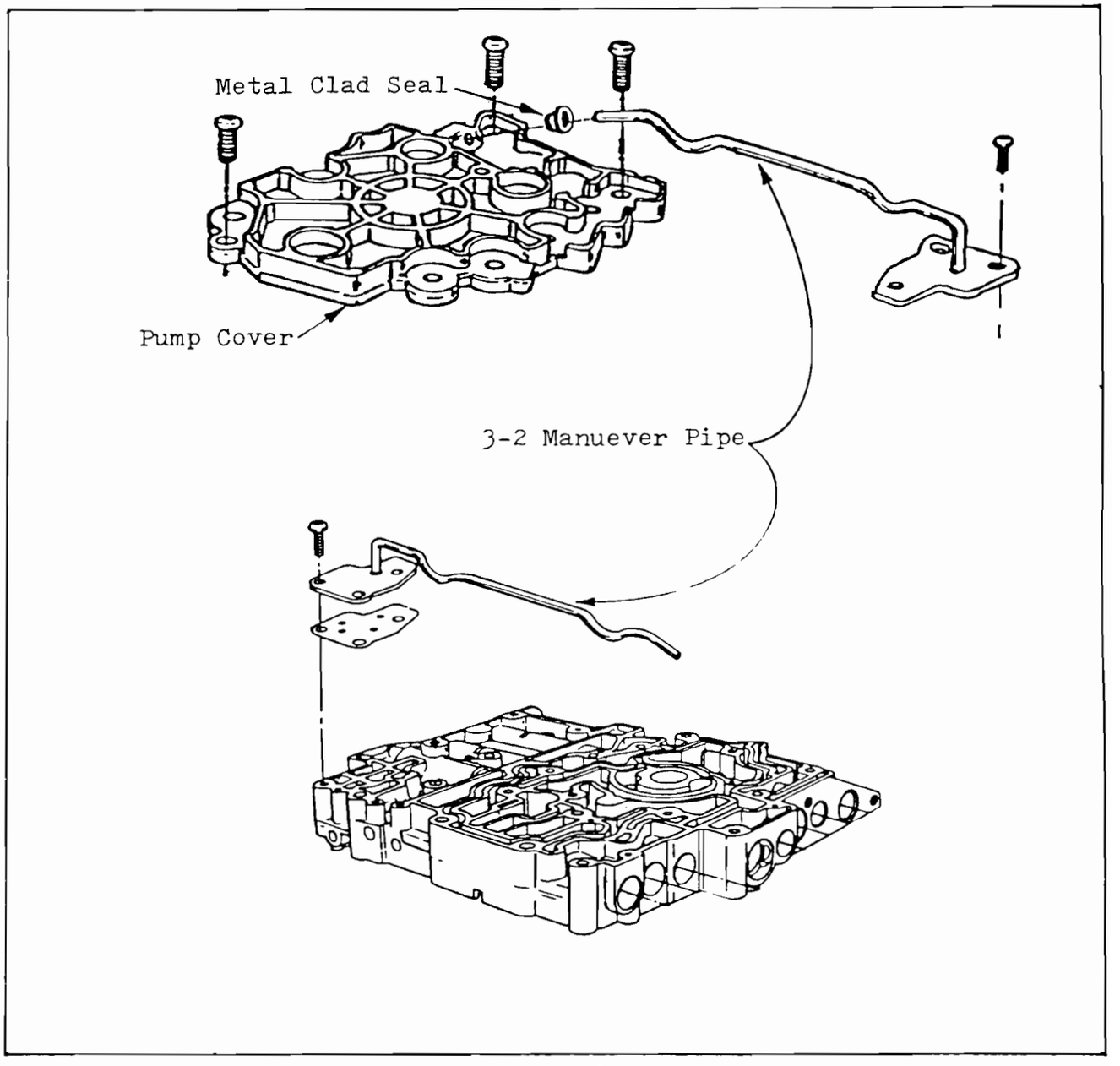


Figure 6

THM 440-T4

COMPLAINT: Premature lock-up - Sometimes described as no lock-up.

CAUSE: The cause may be a missing TCC screen and orifice (See Figure 62). If the TCC screen and orifice are left out of the 440-T4, the converter clutch will apply on the 1-2 shift because of the solenoids inability to exhaust TCC signal oil there by stroking the lock-up valve. The TCC screen and orifice must be in place, as well as the "O" ring (See Figure 62). The TCC screen "Snaps" into the spacer plate.

CORRECTION: Install the TCC screen and "O" ring into spacer plate in location shown in Figure 62. First install "O" ring on TCC screen and then "Snap" into place in the spacer plate. OEM part numbers as follows;

TCC Screen and Orifice 8658060

"O" Ring, TCC Screen 8658109

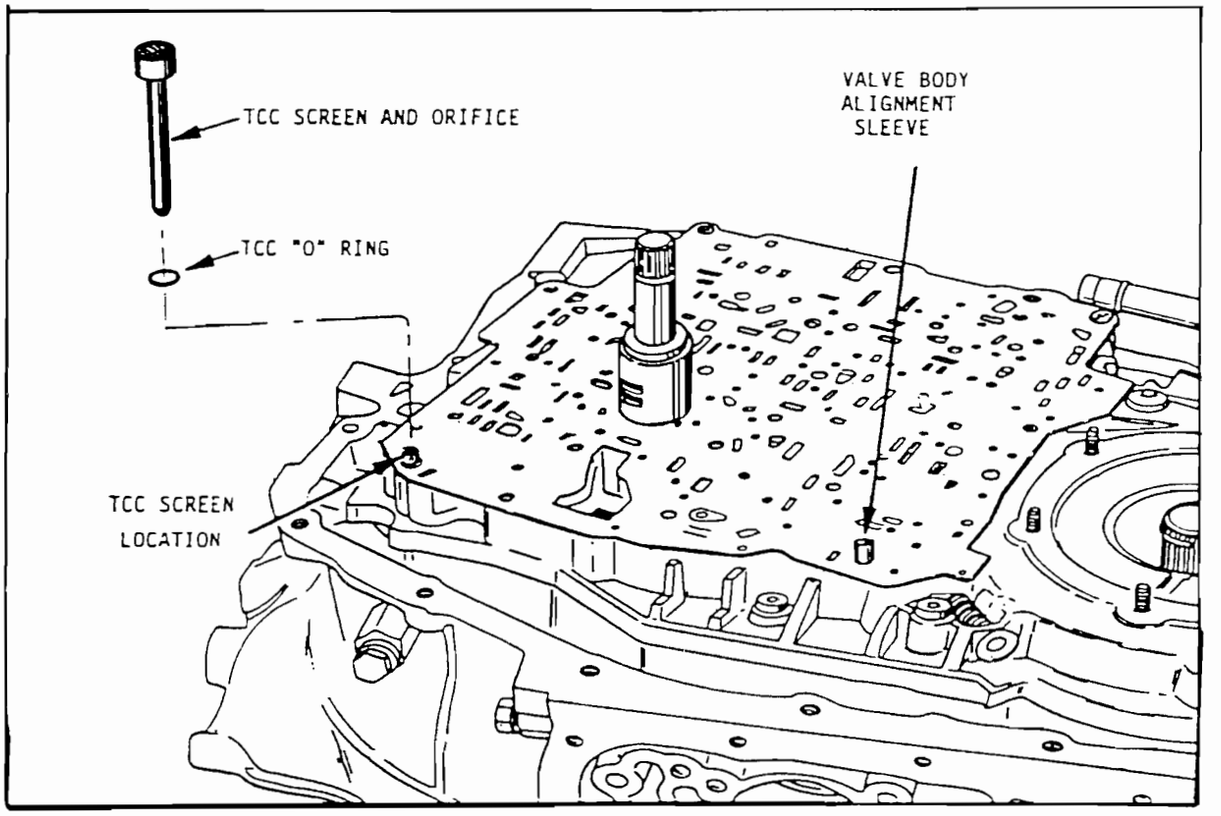


Figure 62

THM 440-T4

SLIPS IN REVERSE

COMPLAINT: Slips in reverse under light or medium throttle only - heavy throttle OK. Usually 4.1 Cadillac or 3.8 Buick engine.

CAUSE: Not enough line pressure in reverse to keep reverse band firmly applied.

CORRECTION: Remove 4 coils from the reverse boost valve spring, (385 in Figure 63). This will raise line pressure in reverse to approximately 85 PSI, which is 15 PSI higher than original and provides more holding power for the reverse band.

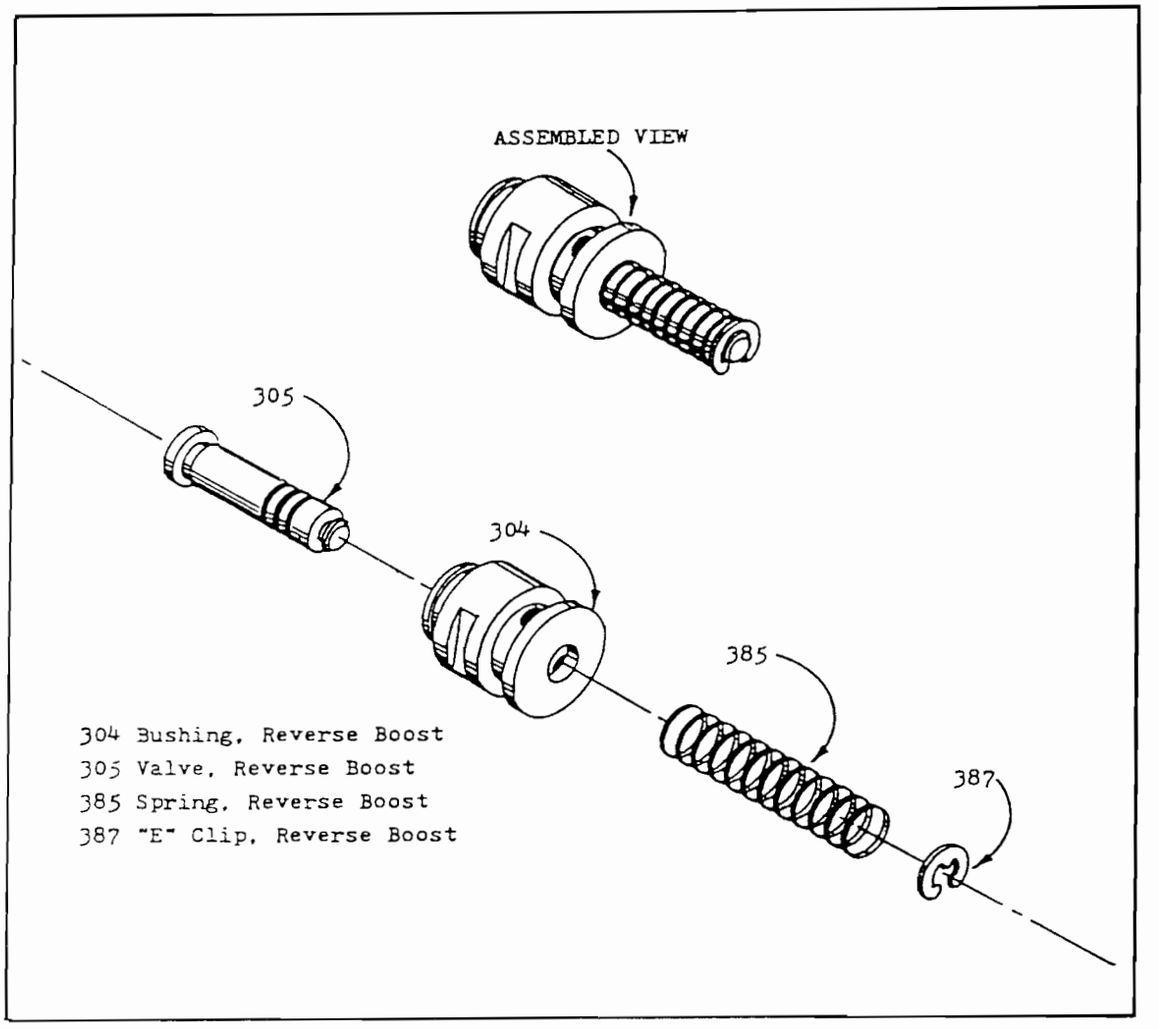


Figure 63

THM 440-T4

START OUT IN 2ND GEAR INSTEAD OF 1ST

COMPLAINT: Second Gear Starts.

CAUSE: The cause may be the 1-2 throttle valve bushing retainer (390) pushed in too far (See Figure 69). If the retainer is pushed in too far the "Legs" of the retainer will grab hold of the 1-2 throttle valve, and the result will be 2nd gear starts.

CORRECTION: Install the retainer so that it is flush with the machined surface of the valve body (See Figure 69).

NOTE: The bushing must be installed as shown in Figure 69, with the angled surface on the end of the bushing toward the channel plate.

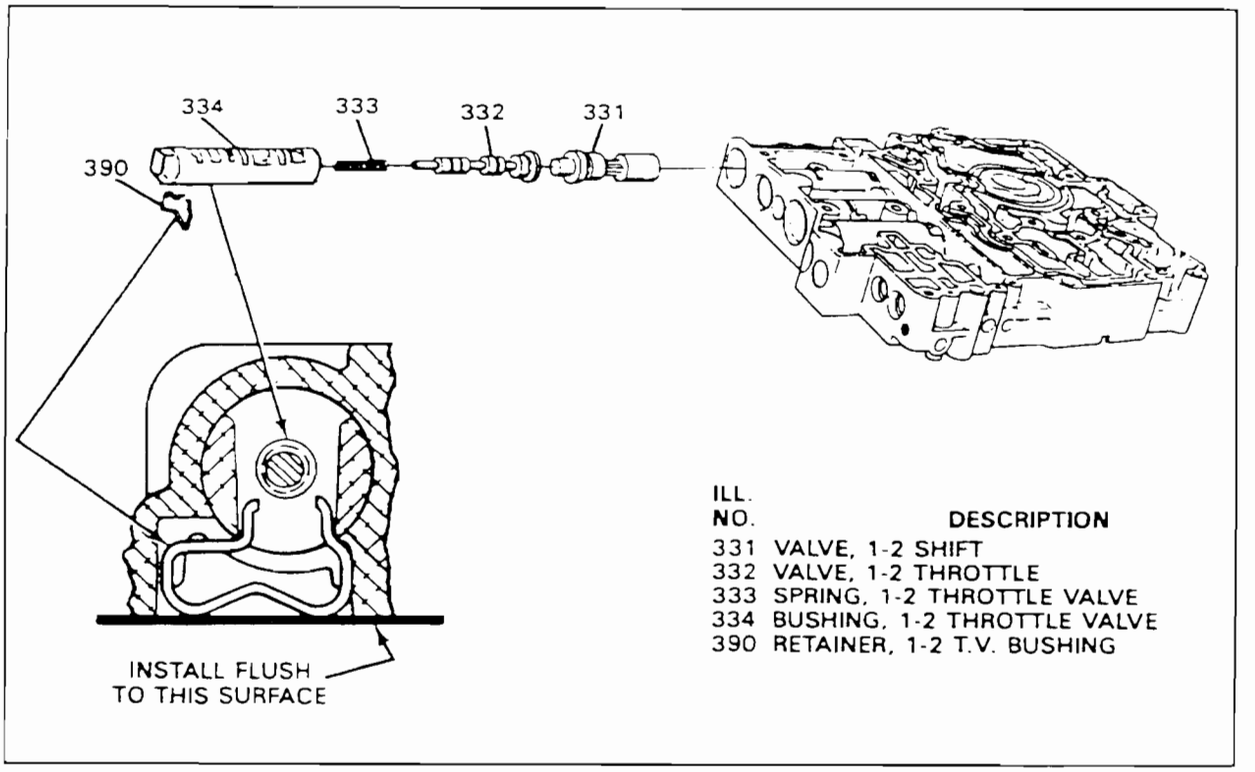


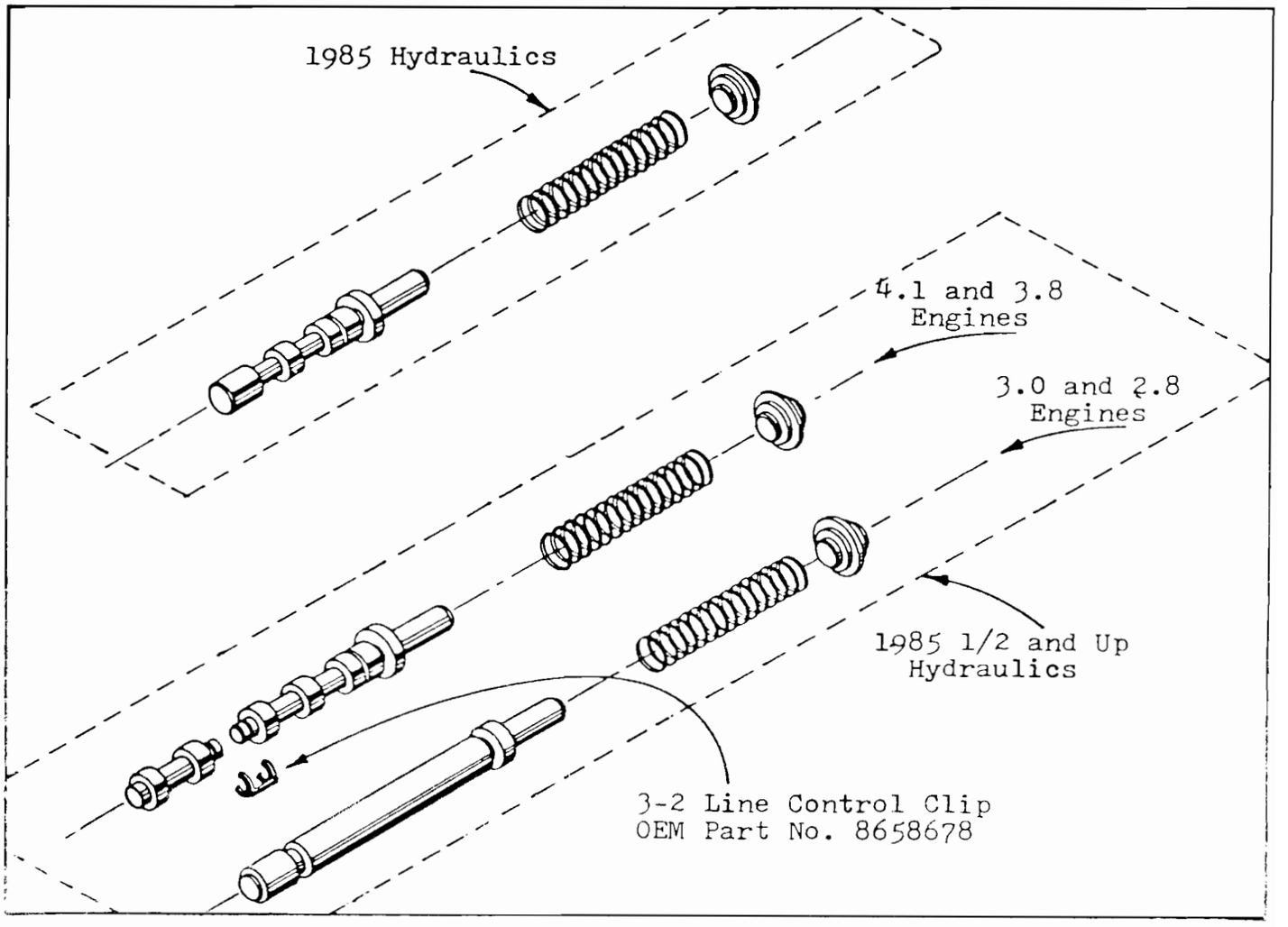
Figure 69

THM 440-T4 SPACER PLATE

Great care should be exercised when oleaning the spacer plate on any THM 440-T4, so as not to damage the thermo element that is attached to it. The spacer plates are not as interchangeable as the transmissions we have known in the past, so "Builder Beware".

The main reason, besides calibration, is the 3-2 Line Control Valve located in the channel plate directly under the spacer plate. There are currently three different line-ups on this valve (Shown Below), and this affects the number of holes that are punched into a particular model spacer plate.

The spacer plates can be identified by a three digit number that is stamped into the plate. This number is the last three numbers of the OEM part number. There are currently about 70 different spacer plates.



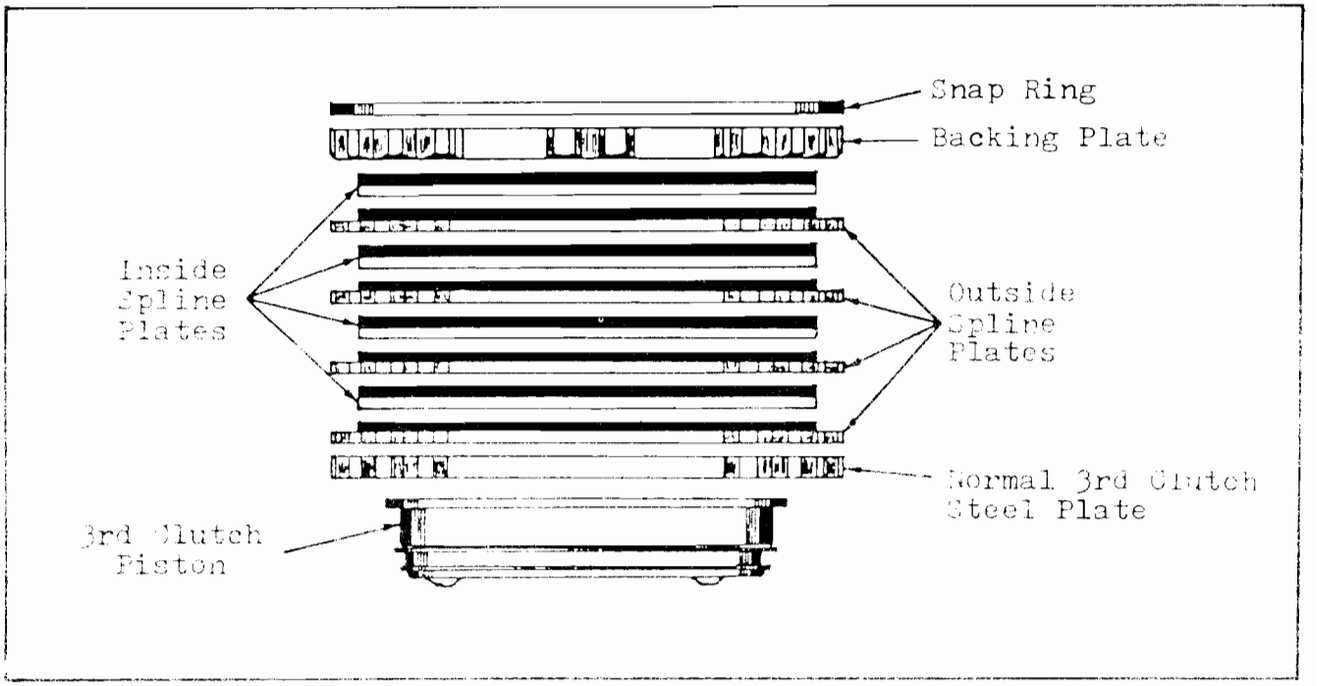
THM 440-T4 THIRD CLUTCH CHANGES

Beginning with the model year 1986, the factory started installing single sided clutch plates in the 3rd clutch on all models of the THM 440-T4. There were only two models that used single sided plates in 1985. The single sided 3rd clutch plates require a unique assembly procedure.

The single sided 3rd clutch plates will retro fit backwards and are recommended, as long as proper assembly procedures are used. The proper assembly procedures for the 3rd clutch pack on models 5CP, 5CM, and all 1986 up 440-T4 transaxles is shown in the figure below.

The 3rd clutch pack on the models mentioned above have single sided clutch plates, or clutch plates with lining on one side only. Notice that the outside spline plates, or what we normally refer to as "Steel" plates, also have lining on one side only. Notice also that the clutch pack is started with a normal 3rd clutch steel plate, and is followed with an outside spline plate with the "Lining UP". Steel against steel will not be a problem as long as they are both outside spline plates, because they cannot counter rotate against one another. Obviously if you followed the normal steel plate with an inside spline plate you would have steel counter rotating against steel, and damage to the clutch pack would result.

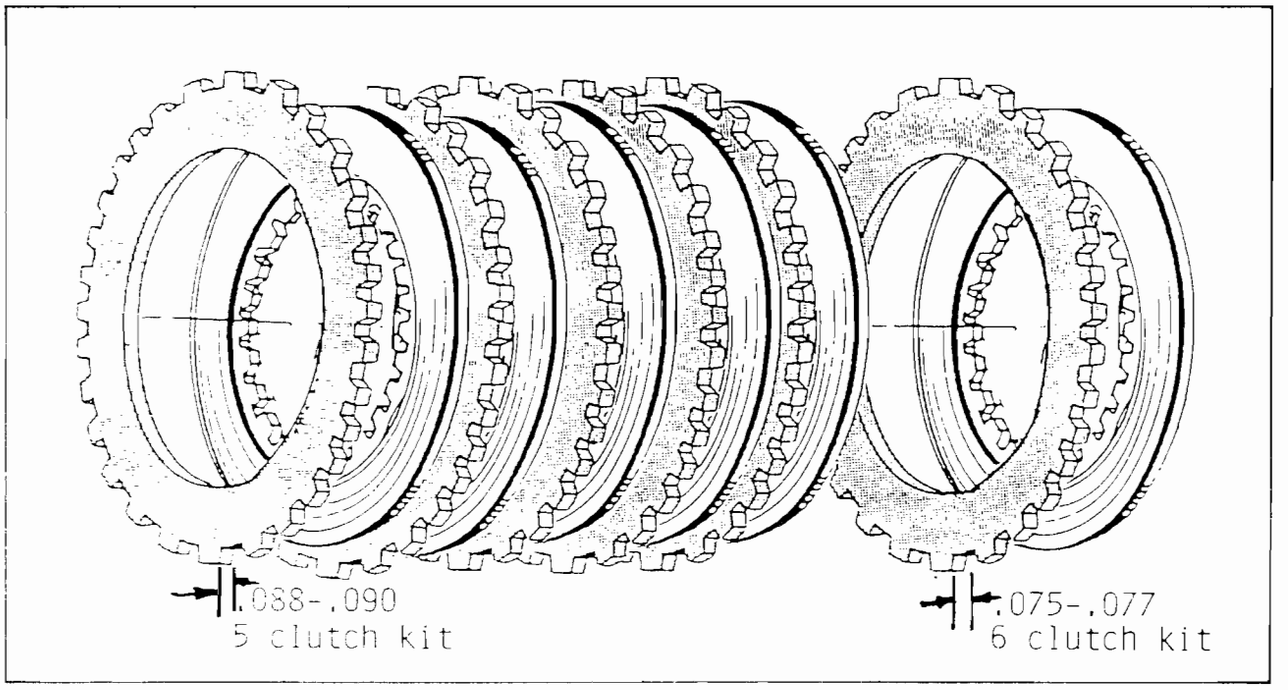
They must be assembled as shown, and you must start with a normal 3rd clutch steel plate to obtain proper clutch clearance.



THM 440 T4 1-2 Slide Shudder

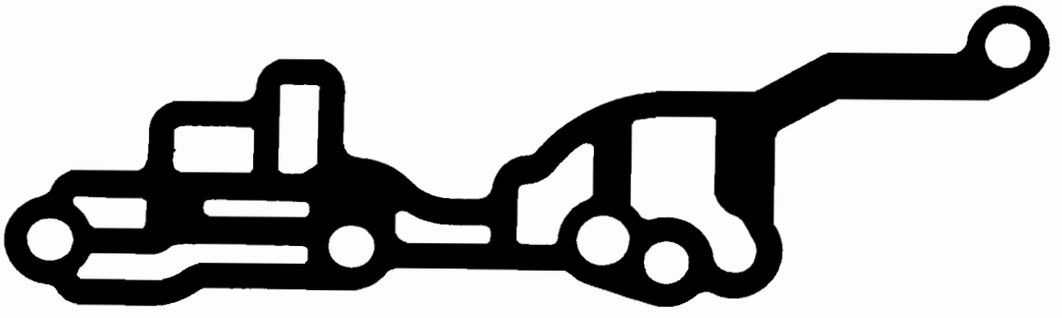
Complaint of a 1-2 slide shudder on THM 440 T4 1984-87. Can be caused by clutch lining compatability of lined plates. This can also be a problem encountered with SRTA or factory rebuilt units. To correct this problem Install kit number 8662913 for 1984 thru 1986 which comes with 5 lined plates and 5 steel (koline) plates. the koline plates in this kit are .088-.090 thick. For the 1987 units use kit number 8662914 comes with 6 lined plates and 6 steel (koline) plates. •The koline plates in this kit are .075-.077 thick.

8662913 (5) Clutch Kit 1984-86

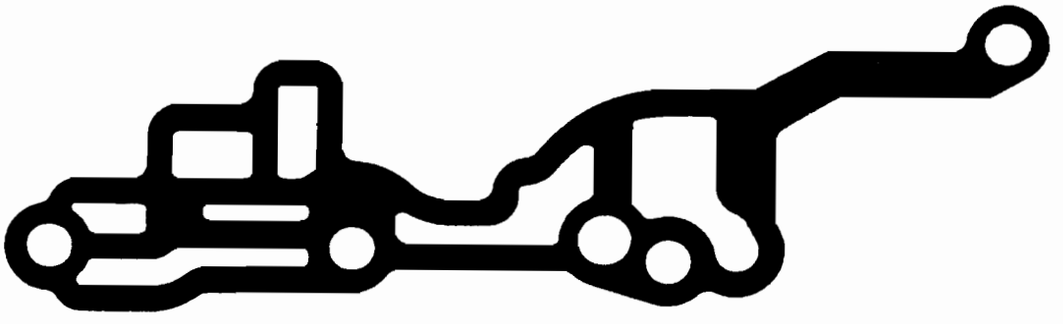


8662914 (6) Clutch Kit 1987

THM 440-T4
CASE COVER GASKET CHANGE



"Early" - 1984 and 1985 Hydraulics



"Late" - 1985½ and 1986 Hydraulics

NOTE: Early gasket will fit the late model units, but late will not fit early.

THM 440-T4
CONVERTER CLUTCH SHUDDER

COMPLAINT: Converter clutch shudder on any THM 440-T4.

CAUSE: The cause may be, not enough converter apply pressure as the factory has it calibrated at about 45 PSI.

CORRECTION: There is now available from the aftermarket suppliers a spring for the converter clutch regulator valve that raises the apply pressure to 61 PSI, and eliminates converter clutch shudder (See Figure 1).

The new spring is available under part number SGSF-440.

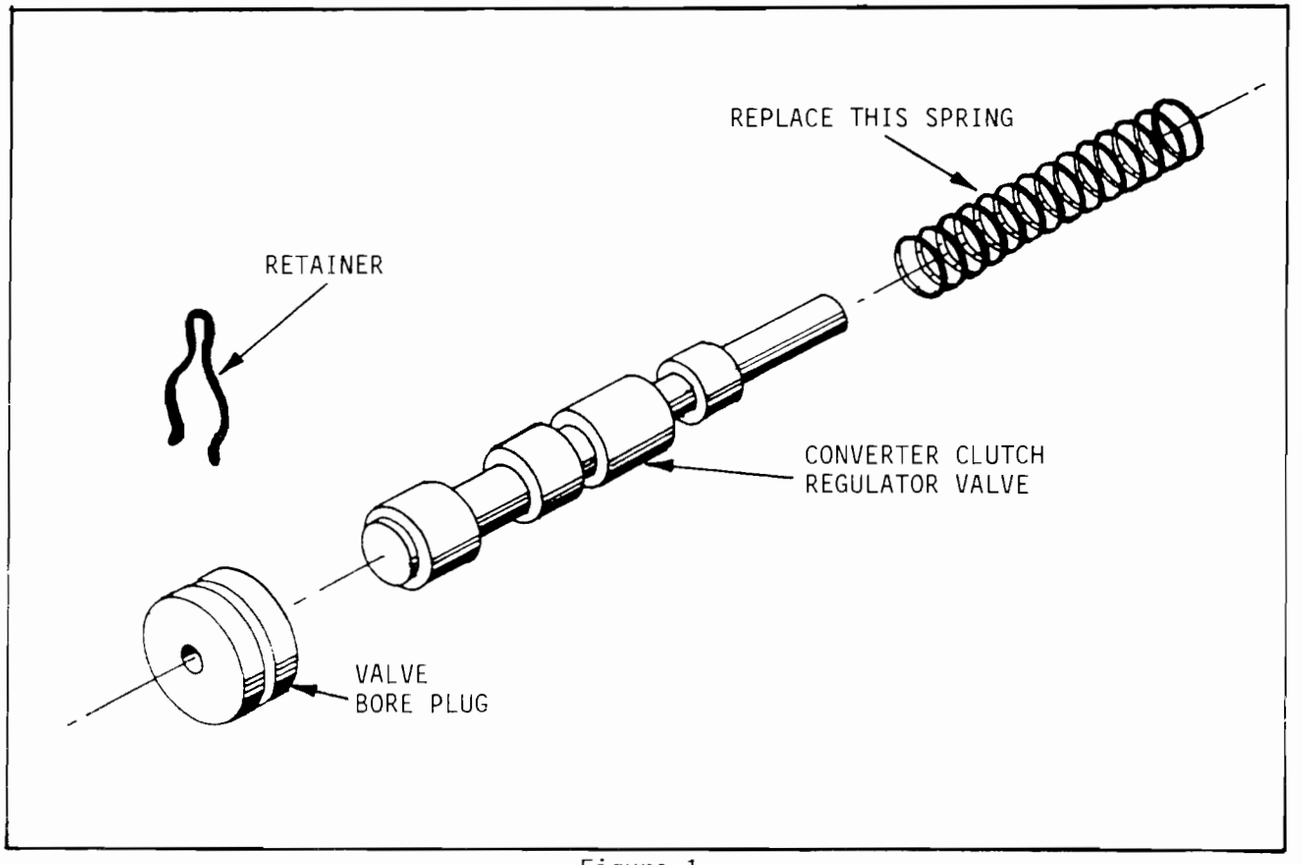


Figure 1

THM 440-T4 MODULATOR AND MODULATOR VALVE CHANGE

A new vacuum modulator assembly, and a new modulator valve were installed on all THM 440-T4 transaxles beginning in June, 1986.

The dimensions of the new vacuum modulator and the new modulator valve have changed drastically. If the previous style vacuum modulator was to be installed on top of the latest modulator valve, all boost capabilities are lost, and immeadiate damage to the transaxle would be the result.

Refer to Figure 1 for the previous design vacuum modulator and modulator valve, and Figure 2 for the latest design vacuum modulator and modulator valve.

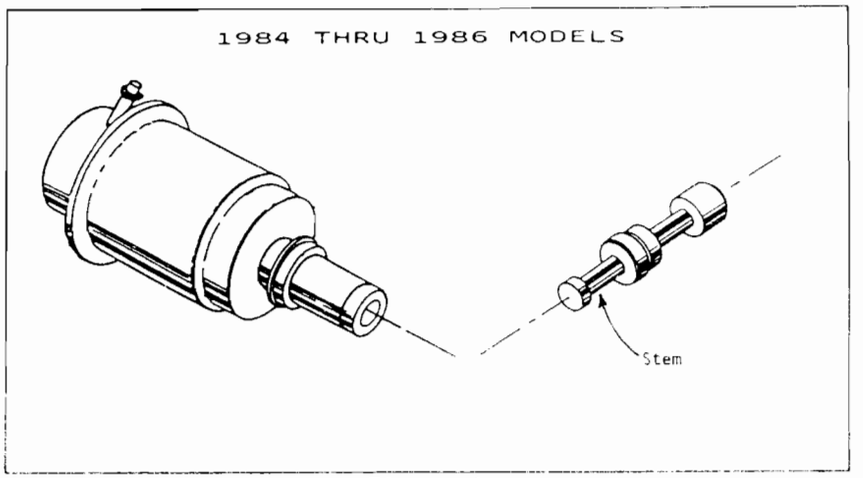


Figure 1

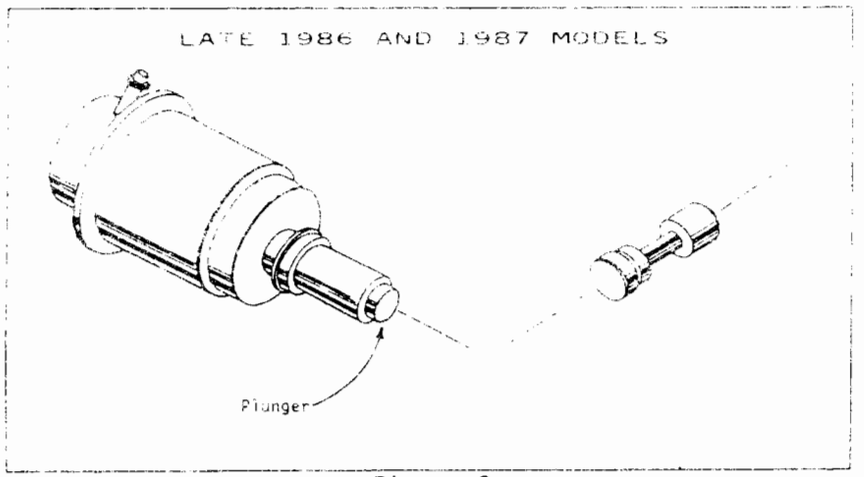


Figure 2

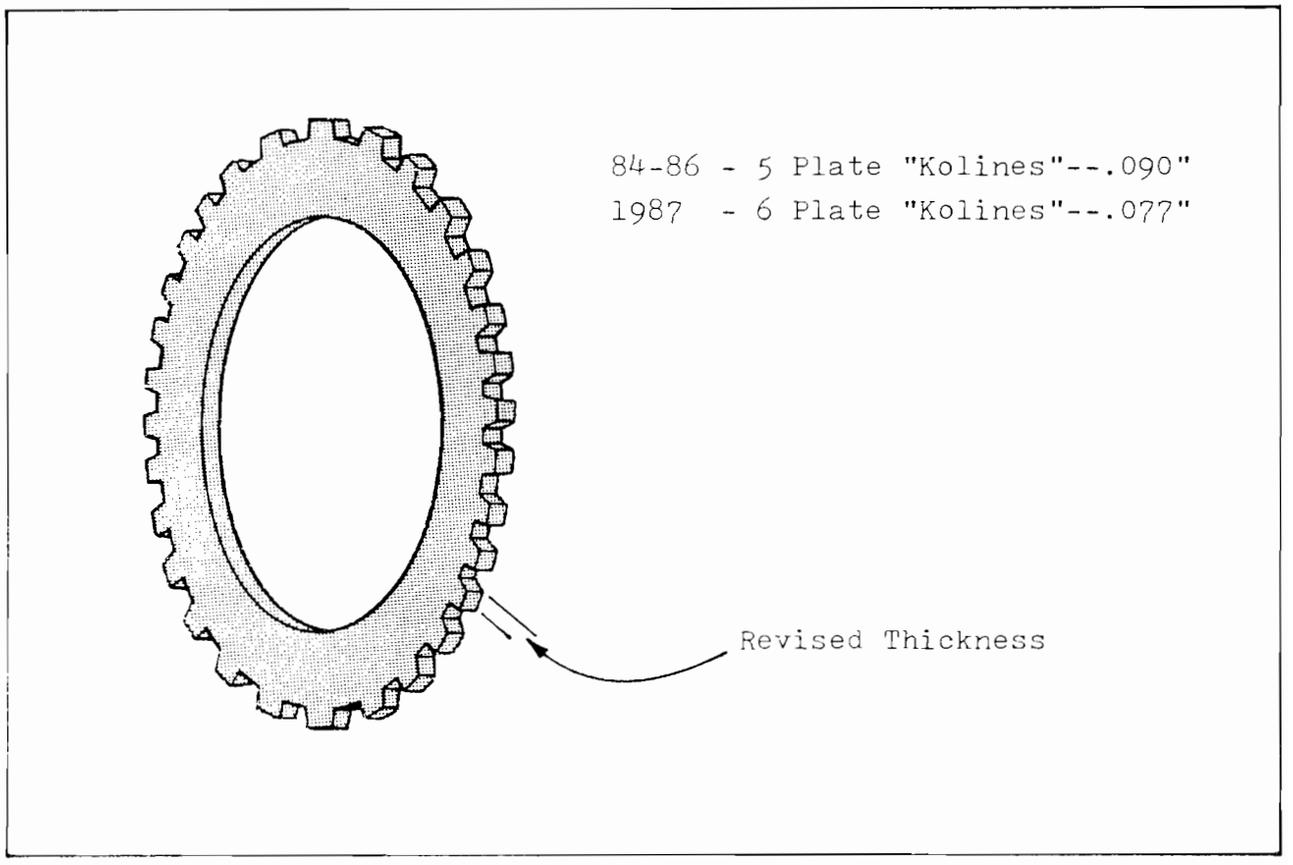


Figure 35

"Koline" Steel Plates

The steel plates in the 440-T4 2nd clutch are unique, in that they are black in color. They have a black coating on them called "Koline" plating, for shift pleasability (See Figure 35).

The 2nd clutch steel plates CANNOT be tumbled as it will remove the "Koline" plating. If the "Koline" plating is worn from the steel plates, they will have to be replaced.

The thickness of the "Koline" plates were revised for 1987, with the addition of the 6 plate 2nd clutch pack (See Figure 35).

Following are the proper OEM part numbers;

84-86 - 5 Plate "Koline" Steels .090" 8662309

1987 - 6 Plate "Koline" Steels .077" 8662006

DRIVEN SPROCKET SUPPORT (Related to 2nd Clutch)

Change: "Vespel" Sealing Rings and 4 Lobe Ring (See Figure 36).

This change, also initiated in the 1987 models, related to 2nd clutch durability and was on the driven sprocket support. The 84-86 models have large steel, hook joint, sealing rings to feed the 2nd clutch. In 1987 models the steel rings were replaced with "Vespel" (Plastic), step joint, sealing rings, that have tabs on them to prevent them from spinning in the driven sprocket support (See Figure 37). This made it necessary to machine slots in the driven sprocket support, to accept the tabs on the "Vespel" rings. There is also a special 4 lobe ring that goes in the ring groove under the "Vespel" ring, and acts as an expander for the "Vespel" sealing rings (See Figure 36).

Reason: The second design sealing rings provide a much better seal for 2nd clutch oil, and thus improved durability.

Parts Affected:

1) Driven Sprocket Support - Slots added to accept tabs on the "Vespel" sealing rings, and ring grooves machined deeper to make room for the 4 lobe ring (Expander).
2) No. (697) 4 lobe ring acts as expander for (607) "Vespel" sealing ring (See Inset, Figure 36).

Interchangeability:

Will retro fit backwards, and is recommended, as long as all parts affected are used.

Following are the OEM part numbers;

1) Driven Sprocket Support --------- 8662523
2) "Vespel" Sealing Ring ----------- 8662330
3) 4 Lobe Ring (Expander) ---------- 8662329

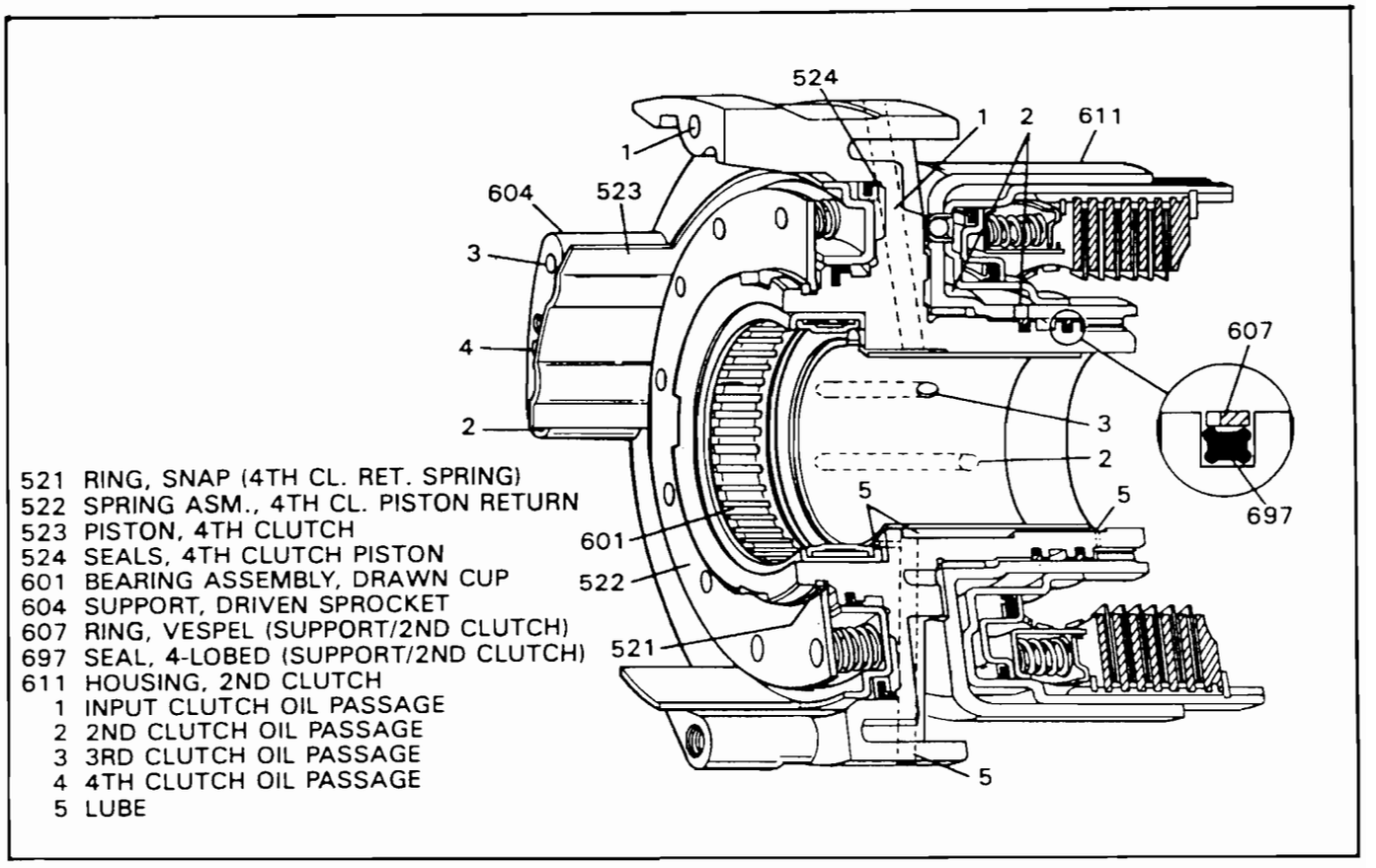


Figure 36

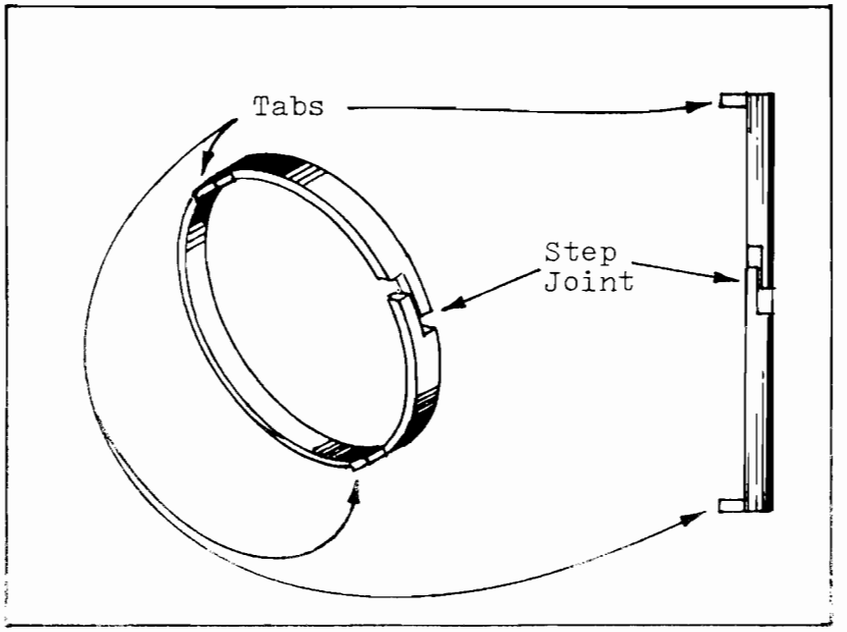


Figure 37

THM 440-T4
VALVE BODY GASKET IDENTIFICATION

1985 and 1985 1/2 model valve body and channel plate gaskets "ARE NOT" interchangeable.

Ink stamped on each gasket is a 3 digit Identification Number, in the location shown in Figure 1.

Refer to the chart in Figure 2 for proper application.

Refer to Figure 3 to identify transaxle model.

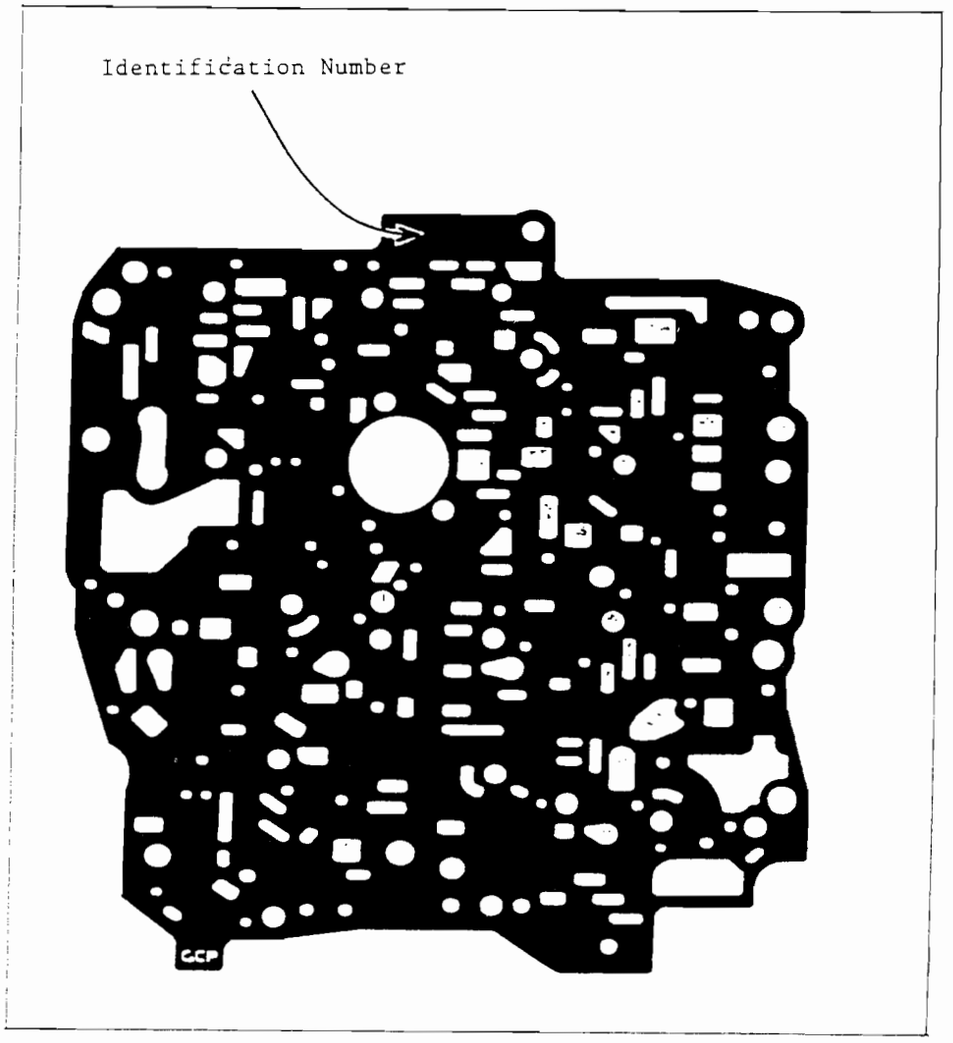


Figure 1

	1985 MODELS ONLY	1985 1/2 AND UP MODELS ONLY
(GVB) Valve Body to Spacer Plate	712	812, 882, or 848
(GCP) Channel Plate to Spacer Plate	713	813

Figure 2

1985 MODELS	1985 1/2 MODELS
5AY, 5BA, 5BC 5BN, 5BS, 5BU 5BX, 5CP, 5CW 5HA, 5HT, 50B 50Y	5AF, 5AM, 5AR 5BR, 5BV, 5BW 5CM, 5CN, 5HJ

Figure 3

THM 700-R4

COMPLAINT: Harsh downshift clunk with selector in D3 only.

CAUSE: The cause could be the 2nd apply piston.

CORRECTION: Modify the 2nd apply piston by machining the inner hub and remove .125" (See Figure 1).

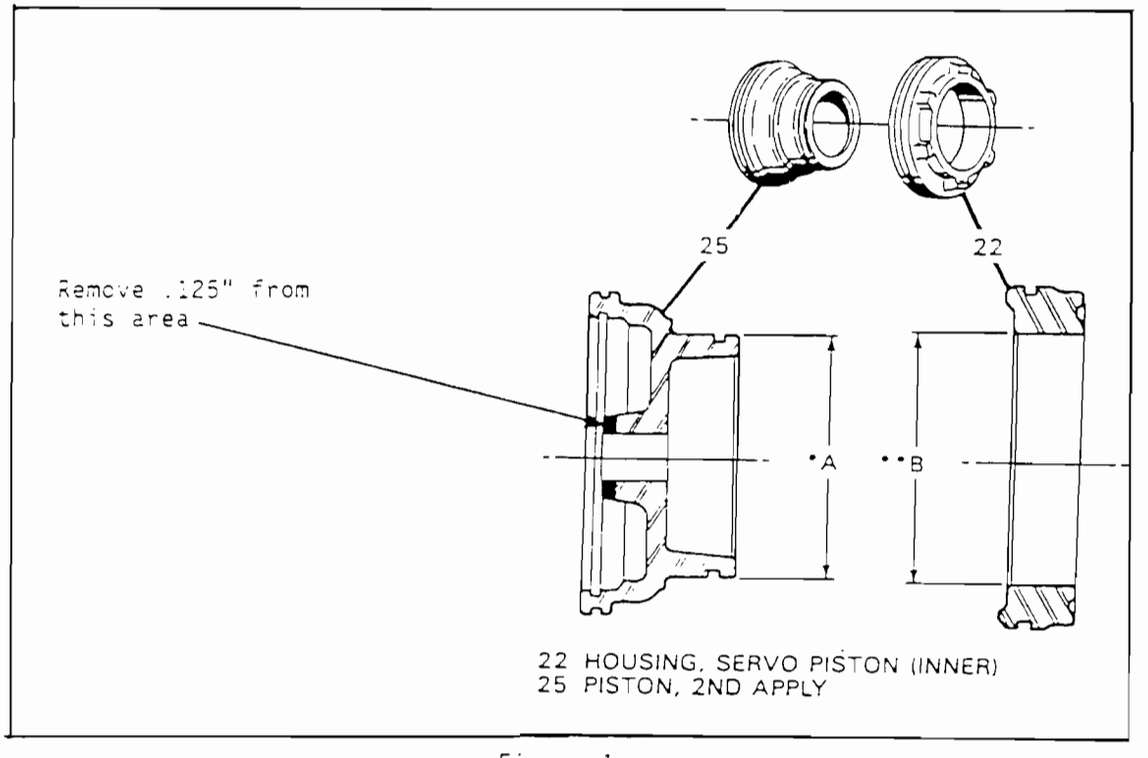


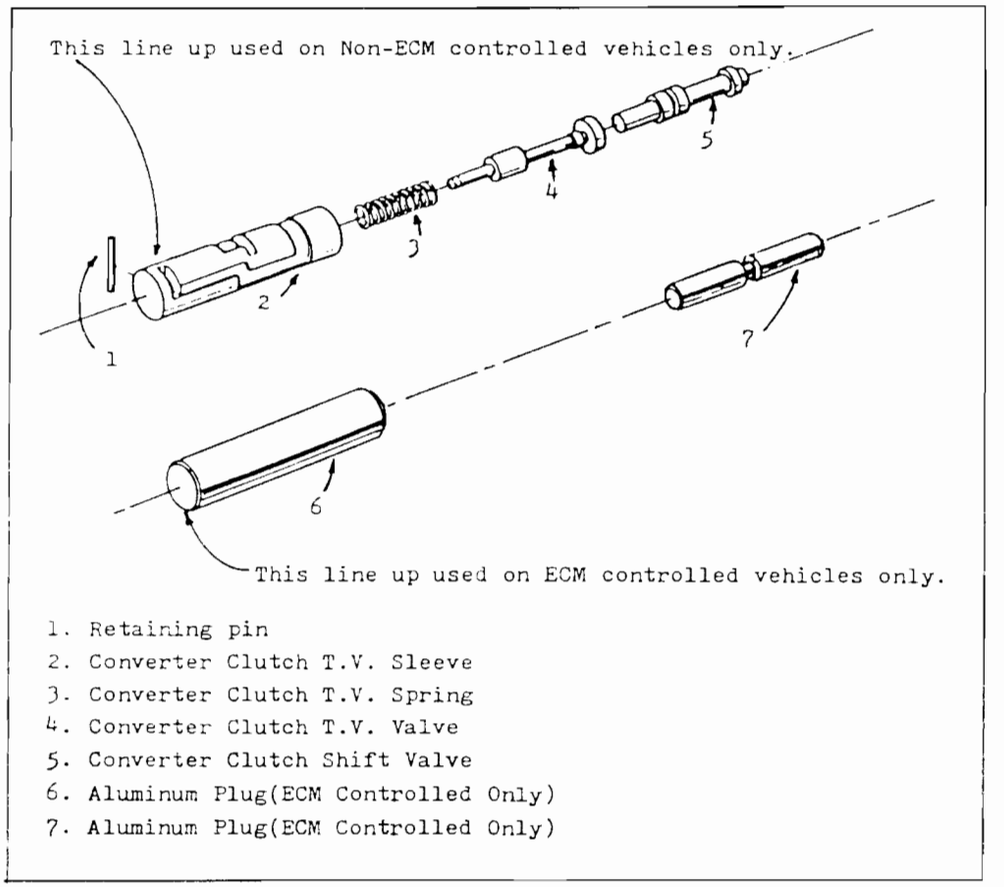
Figure 1

AUTOMATIC TRANSMISSION SERVICE GROUP

THM 700-R4
8642970 KIT IN THE ECM CONTROLLED MODELS

We all know that the factory installed an aluminum plug in the valve body, where the converter clutch T.V. sleeve normally goes. This was to block off the oil channels since TCC was no longer controlled by oil pressure, but controlled instead by the ECM. What some of us do not know, is that they installed "TWO" aluminum plugs. One to replace the converter clutch T.V. sleeve, and one to replace the converter clutch shift valve (See Figure 1). You will have to remove "TWO" aluminum plugs from the valve body and in addition you will have to come up with a converter clutch shift valve from an old valve body, as it is not available from OEM sources.

With both aluminum plugs removed, install the "Aquired" converter clutch shift valve first and then your 8642970 kit. Be sure to clip one coil off of the spring that comes in the kit.



1. Retaining pin
2. Converter Clutch T.V. Sleeve
3. Converter Clutch T.V. Spring
4. Converter Clutch T.V. Valve
5. Converter Clutch Shift Valve
6. Aluminum Plug(ECM Controlled Only)
7. Aluminum Plug(ECM Controlled Only)

Figure 1

CHANGE: Forward Sprag Assembly

REASON: Vastly Improved Torque Carrying Capacity

PARTS AFFECTED:

1. Sprag Outer Race(644) – Larger inside diameter (See Figure 8).
2. Sprag Inner Race(641) – Larger outside diameter and longer lip on the retainer on the sprag inner race.
3. Forward Sprag Assembly(642) – Increased diameter and addition of 2 sprag elements (this increased elements from 26 to 28. See Figure 8.
4. Solid Steel End Bearings(643) – See Figure 8.
5. Sprag Assembly wear Plate(640) – Eliminated (See Figure 8).
6. Input Carrier Thrust Washer(660) – Eliminated (See Fig. 8).

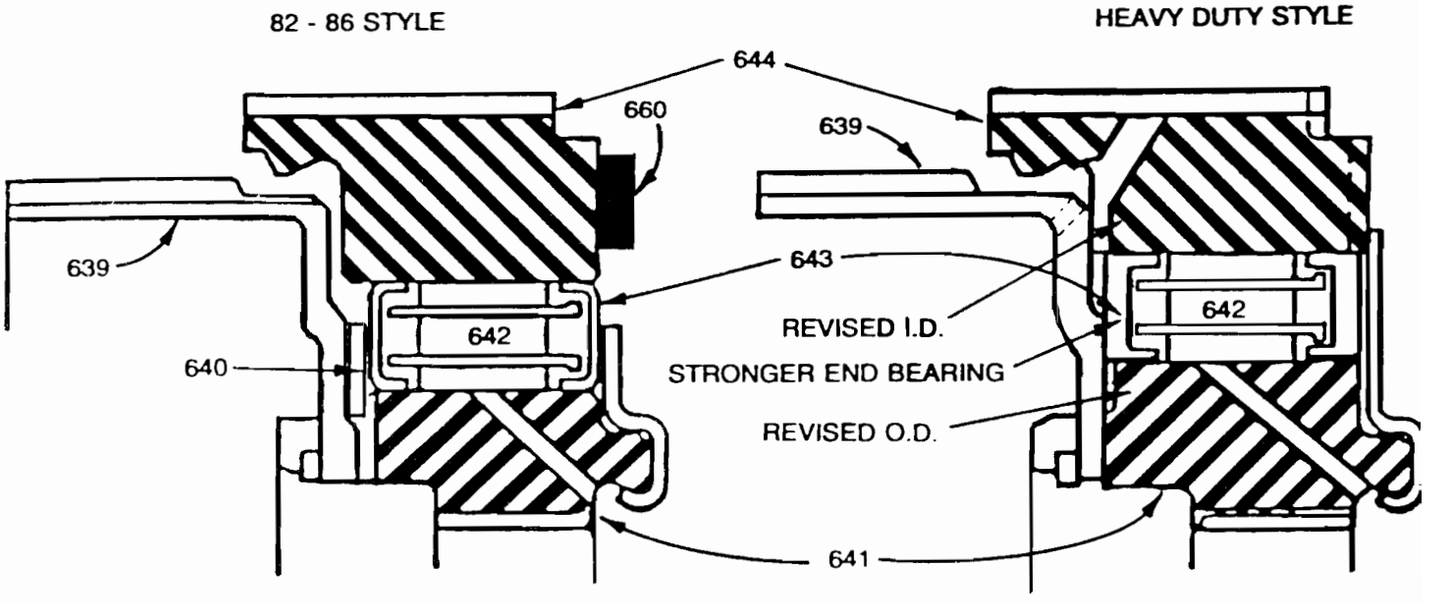
INTERCHANGEABILITY:

1. The new design Forward Sprag Assembly is highly recommended, and will retro fit back on all previous models, by replacing the "Entire Assembly".
2. Individual components are "Not" interchangeable.
3. The Input Carrier Thrust Washer and Wear Plate are not required with the new design sprag. Use of the Input Thrust Washer(660) with the new design sprag will create a misbuild as correct end play cannot be obtained (See Figure 8).

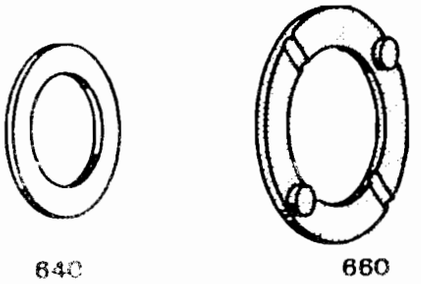
SERVICE INFORMATION:

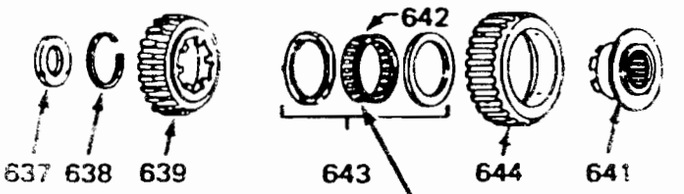
The new design Forward Sprag Assembly includes the new design Overrun Clutch Hub (Figure 7), and is available under OEM Part Number 8657928.

CUT-AWAY VIEW
FORWARD SPRAG CLUTCH



IMPORTANT: THESE PARTS ARE NOT REQUIRED WITH THE NEW LARGER DIAMETER DESIGN SPRAG.





THE NOTCHES ABOVE EACH SPRAG MUST POINT UP AS SHOWN WHEN ASSEMBLED INTO THE OUTER RACE

ILL. NO.	DESCRIPTION
637	BEARING ASSEMBLY, INPUT SUN GEAR
638	SNAP RING, OVERRUN CLUTCH HUB RET.
639	HUB, OVERRUN CLUTCH
641	RETAINER & RACE ASSEMBLY, SPRAG
642	FORWARD SPRAG ASSEMBLY
643	RETAINER RINGS, SPRAG ASSEMBLY
644	RACE, FORWARD CLUTCH — OUTER

Figure 1

THM 700-R4 PREMATURE REVERSE INPUT CLUTCH FAILURE

COMPLAINT: Premature reverse input clutch failure on 1987 or 1988 models only.

CAUSE: The cause may be the orifice hole in the new aluminum piston, drilled too large (Original was .116").

CORRECTION: Plug the original hole from the back side of piston with an allen head set screw, flush or below. Retain the set screw with Loc-tite (See Figure 32, Inset "A").
180 degrees from original orifice hole you will find a hole started but not drilled through. Drill through here with a 1/16" drill bit, from the front side of piston. Turn the piston over and from the back side of piston, drill about half way through with a 1/8" drill bit. (See Figure 32, Inset "B").

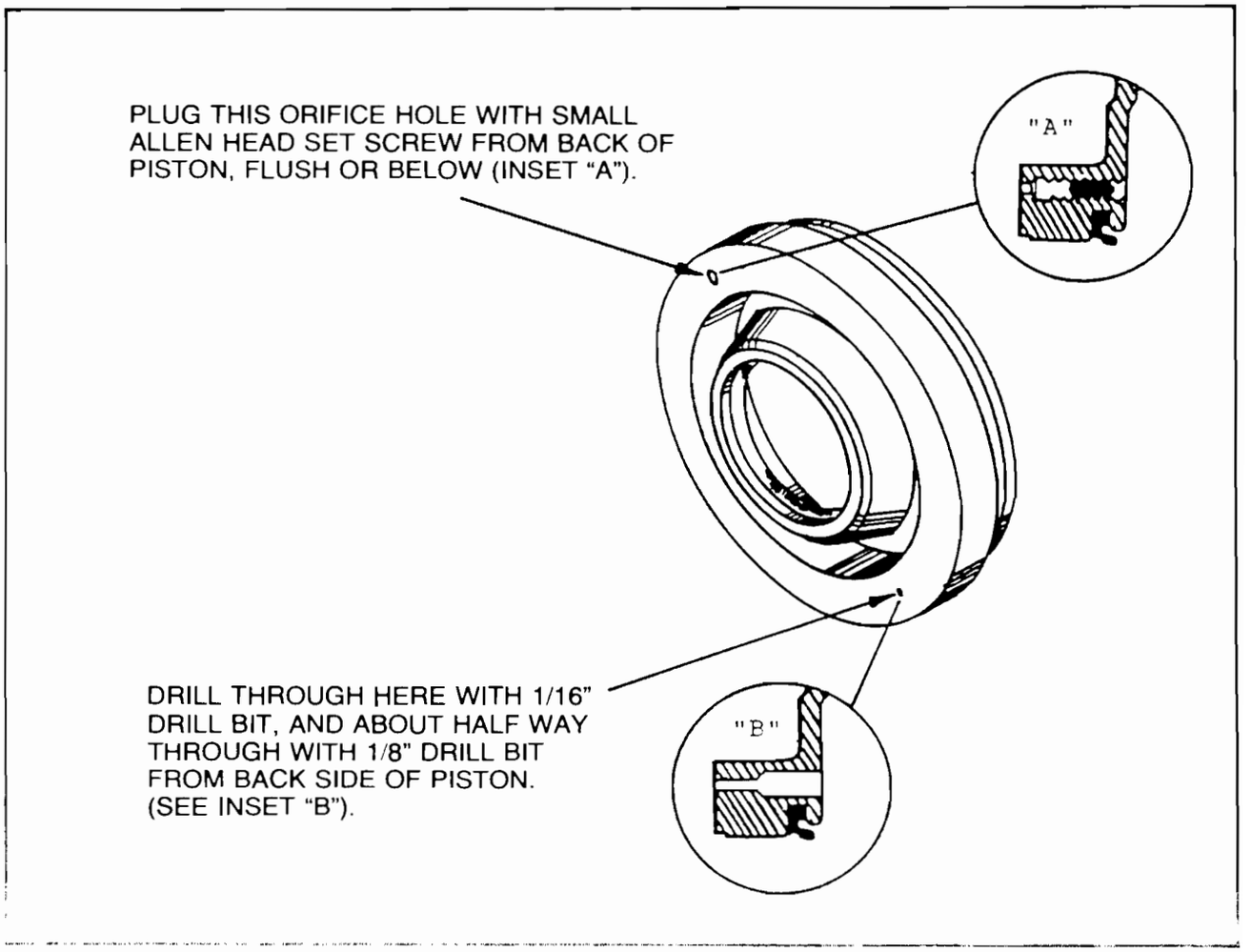


Figure 32

THM 700-R4
NO 3-4 SHIFT

COMPLAINT: No 3-4 shift on any THM 700-R4 transmission.

CAUSE: The cause may be that you have installed the 3-4 relay valve in backwards. The 3-4 relay valve is located in front of the 4-3 sequence valve in the valve body (See Figure 1).

CORRECTION: Install the 3-4 relay valve correctly (See Figure 1).

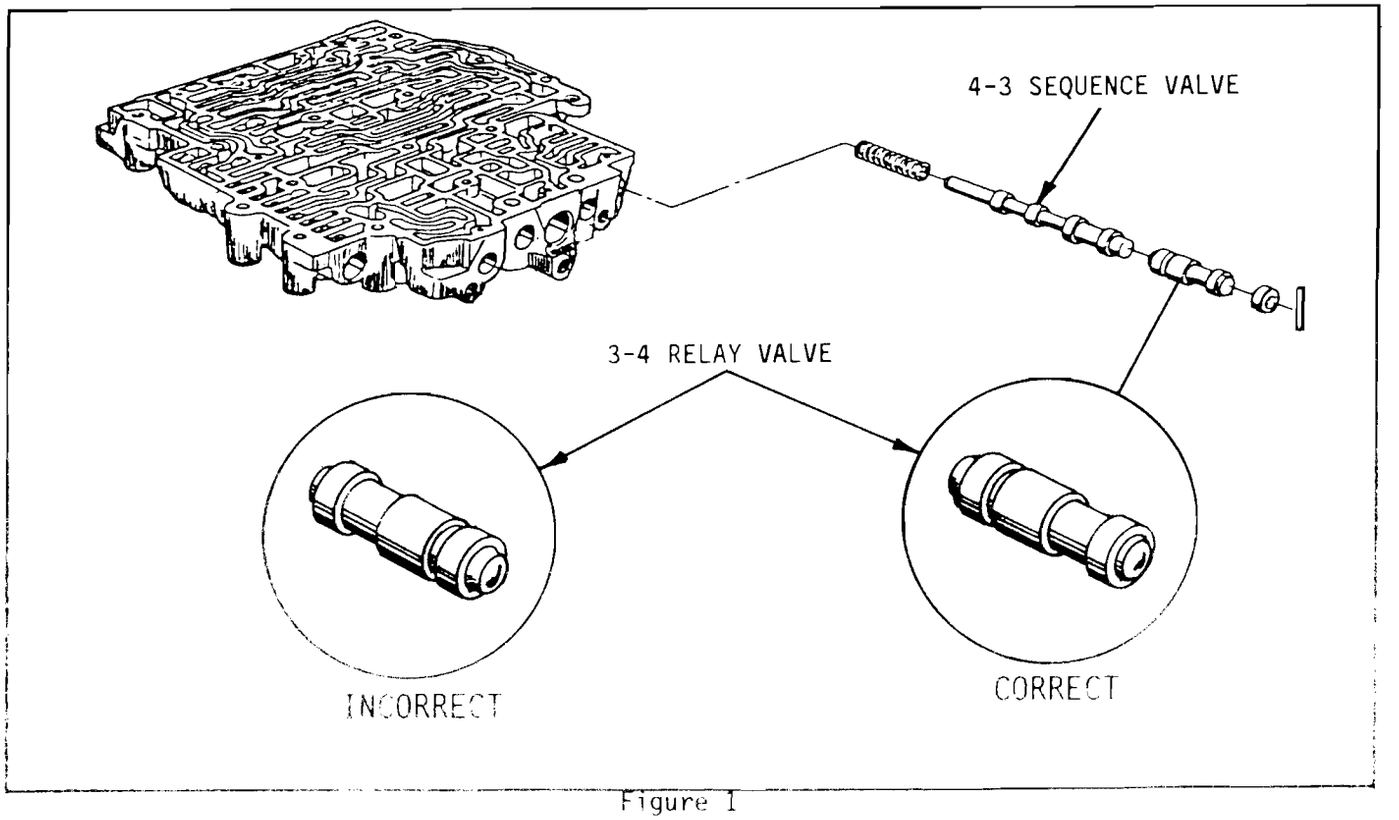


Figure 1

CHANGE: Oil Filter and Filter Seal - Beginning July 6, 1987 (Julian Date 187).

REASON: Eliminates the potential for transmission noise caused by air suction through the filter seal or filter neck.

PARTS AFFECTED:

(1) Oil Filter - The new design filter is wider, has a felt element in place of the screen, and is bottom suction instead of top suction (See Figure 48).

(2) Oil Filter Seal - Best description of the new seal is "It looks like "O" rings moulded together" (See Figure 48).

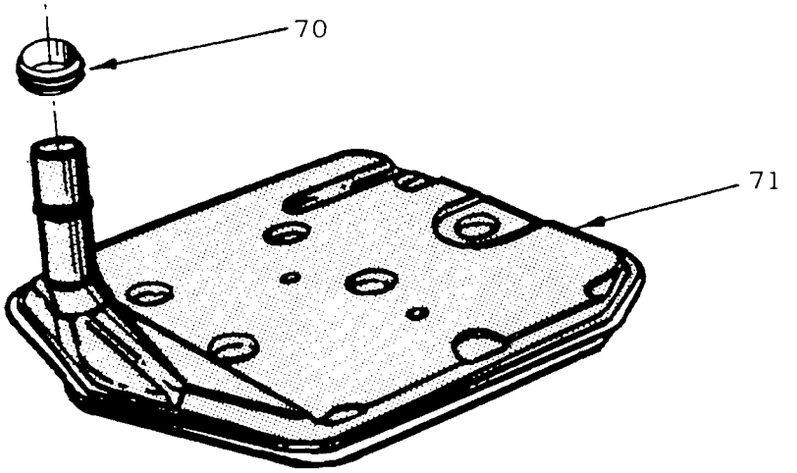
INTERCHANGEABILITY:

The new design filter and filter seal can be used on any 1982-1988 THM 700-R4 transmission. The filter retaining clip is not needed with the new design filter, and should be discarded.

SERVICE INFORMATION:

Seal, Oil Filter 8657767
Service Package, Filter, Filter Seal, Gasket 8657926

70 Seal, Oil Filter
71 Filter Assembly, Oil



SPECIAL NOTE: Late filter will retro fit in MOST CASES. To be sure make the following check. Install pan without gasket. If the pan rocks, or is not flush with the pan rail on the case, then install the early filter or the late model deep pan.

Figure 48

CHANGE: New design accumulator piston, seal, and spring (See Figure 2).

REASON: Improved shift consistency and smoothness.

PARTS AFFECTED:

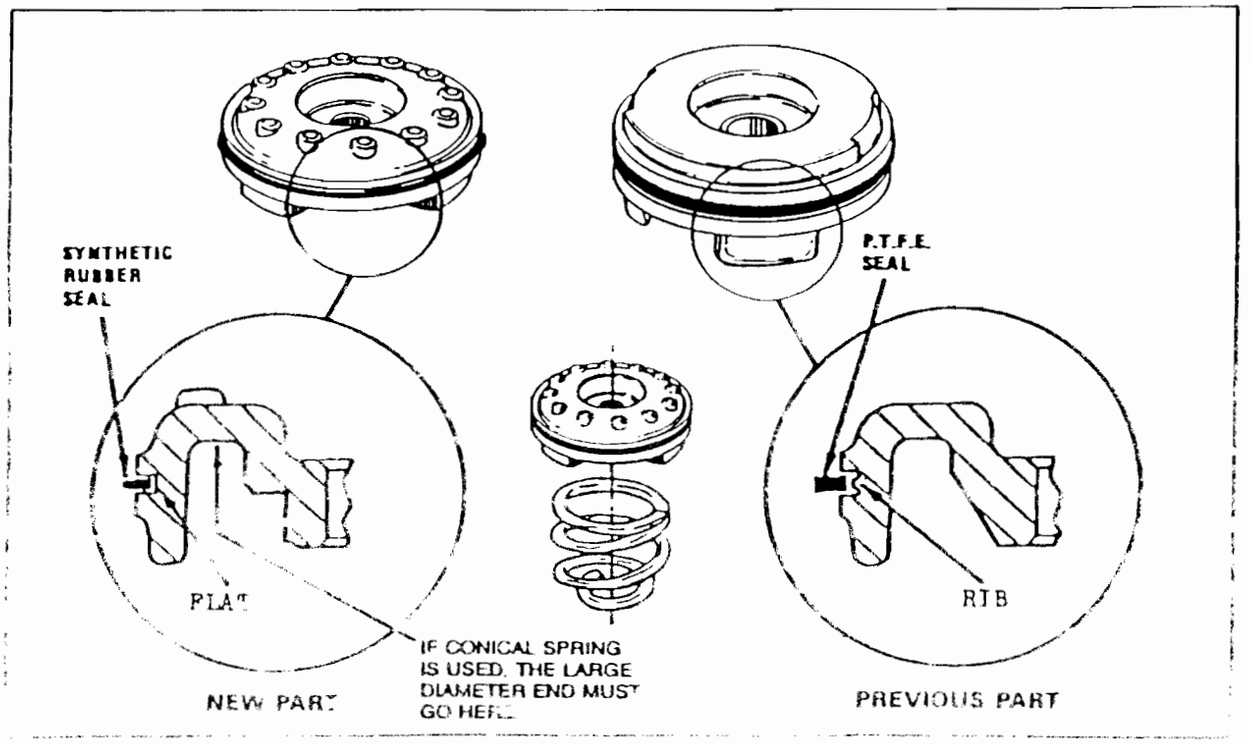
1. Accumulator piston (See Figure 2).
2. Accumulator piston rubber seal.
3. Accumulator piston conical spring for some models (See Figure 2).

INTERCHANGEABILITY:

1. The new accumulator piston and rubber seal will retro fit, and is highly recommended, on all previous model THM 700-R4.
2. This new piston and seal is used in the 1-2, 3-4, and forward clutch accumulator (Located in Aux. valve body) on all 1987 model THM 700-R4 transmissions.
3. The new conical accumulator piston spring (Some Models), must be assembled with the large end into the piston (See Fig. 2).

SERVICE INFORMATION:

1. This change went into production on June 18, 1986 (Julien 169).
2. Piston and seal package part number 8648998
3. Seal package part number 8635568



CHANGE: Revised 1-2 shift valve line-up in the main valve body, and a revised 3-4 throttle valve (See Figure 41).

REASON: This change reduces internal leakage, thus improving consistency for the 1-2 and 3-4 shifts, and allows engine braking at a higher speed during a manual 2-1 downshift.

PARTS AFFECTED:

(1) 1-2 Shift Valve Line-up – The 1-2 shift valve line-up changes from 4 valves and 2 sleeves, to 2 valves and 1 sleeve. The Lo Range Downshift Valve(321), Lo Range Control Sleeve(320), and the 1-2 Lo Range Upshift Valve(353) have been eliminated from the 1988 models (See Figure 41).

(2) 3-4 Throttle Valve – The 3-4 throttle valve and sleeve have been revised (See Figure 41).

(3) Spacer Plate – Spacer plate has been revised to be compatable with the new valve body, as have both valve body gaskets. There is now a "Two" letter code on all 87-88 spacer plates and can be identified as follows:
1987 – First letter will always be "A" (See Figure 19).
1988 – First letter will always be "B" (See Figure 42).

(4) Number 9 Checkball – The number 9 checkball, located in the case, has been eliminated on all 1988 models (See Figure 43). The spacer plate has been modified, with a rectangular hole, on some models so that even if the technician installs the checkball in a 1988 model, it will be ineffective. (See Figure 42).
NOTE: INSTALLING THE NO. 9 CHECKBALL IN A 1988 MODEL CASE WITHOUT A MODIFIED SPACER PLATE WILL BURN THE LOW REVERSE CLUTCH.

INTERCHANGEABILITY:

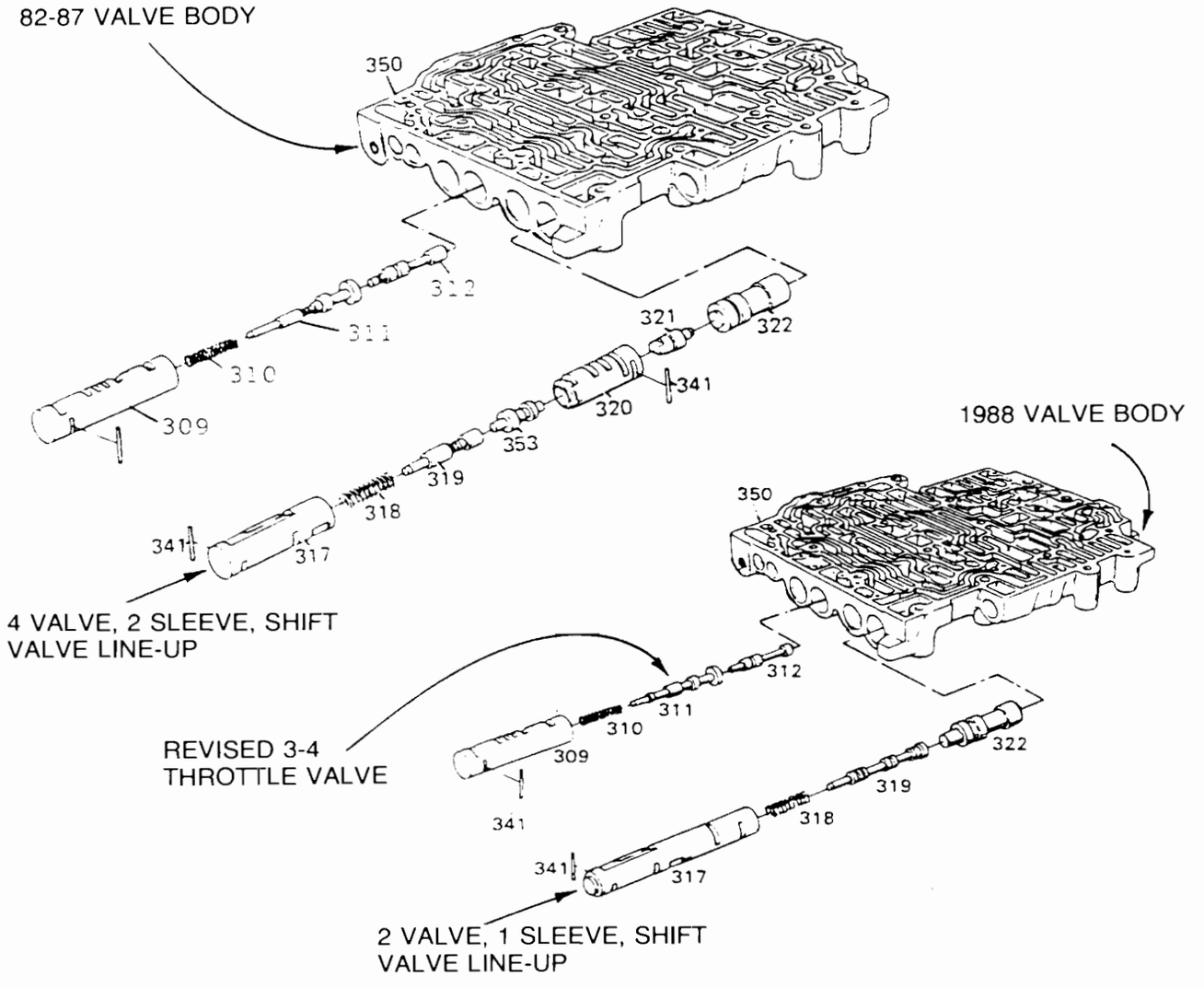
(1) The 1988 valve body assembly cannot be used on any previous model THM 700-R4.

(2) The spacer plate and gaskets are unique to 1988 models and will not retro fit to previous models.

(3) DO NOT install the number 9 checkball in any 1988 model.

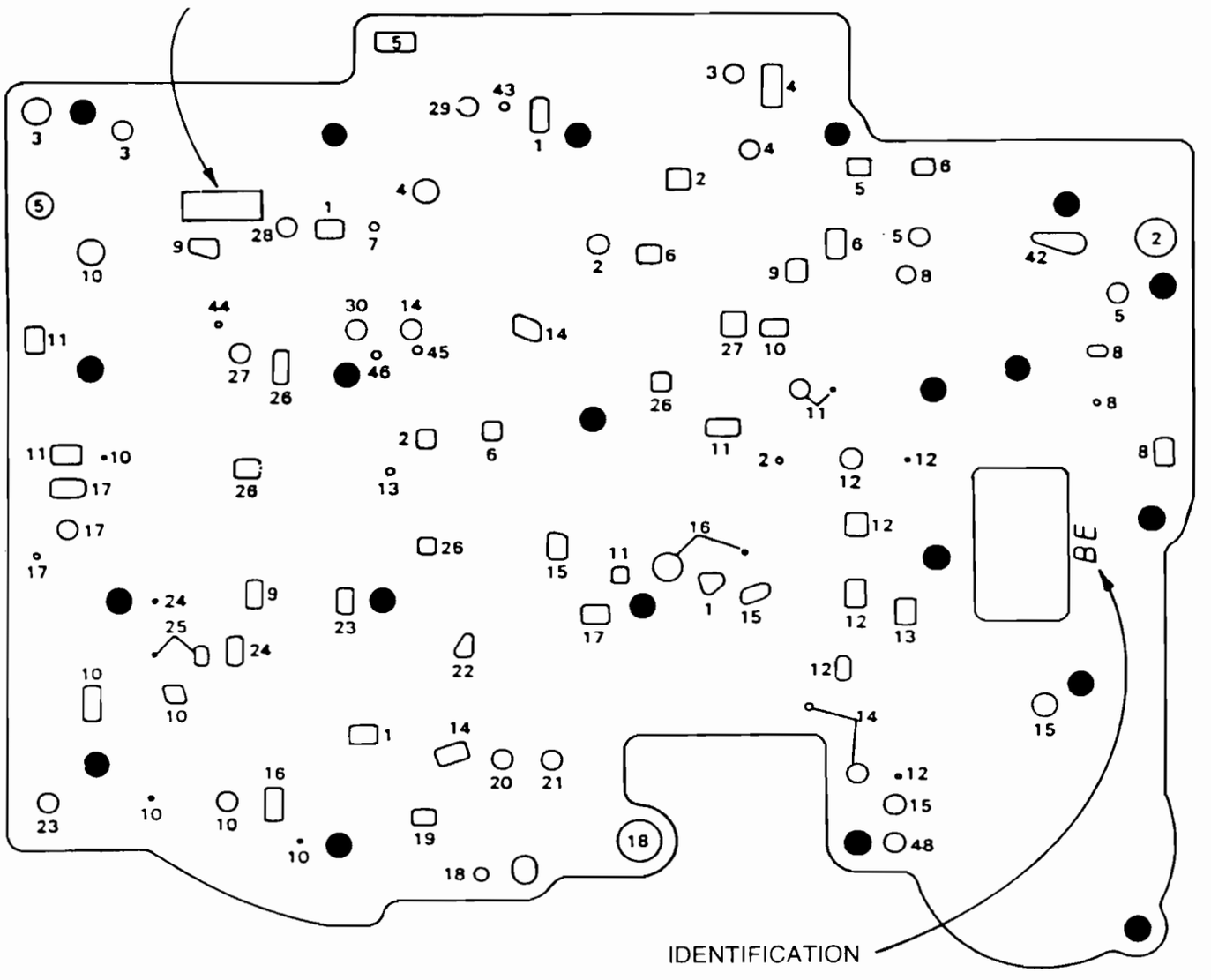
SERVICE INFORMATION:

For Spacer Plate Part Numbers and Application;
1987 Models – See Figure 44
1988 Models – See Figure 45



309 SLEEVE, 3-4 THROTTLE VALVE
310 SPRING, 3-4 THROTTLE VALVE
311 VALVE, 3-4 THROTTLE
312 VALVE, 3-4 SHIFT
317 SLEEVE, 1-2 THROTTLE VALVE
318 SPRING, 1-2 THROTTLE VALVE
319 VALVE, 1-2 THROTTLE
320 SLEEVE, LO RANGE DOWNSHIFT
321 VALVE, LO RANGE DOWNSHIFT
322 VALVE, 1-2 SHIFT
341 PIN, COILED RETAINING
350 BODY, CONTROL VALVE
353 VALVE, LO RANGE UPSHIFT

Figure 41



1 LINE
2 D4
3 D2
4 LO
5 REVERSE
6 GOVERNOR
7 LO - 1ST FEED
8 LO/REVERSE
9 3RD ACCUMULATOR
10 T.V.
11 M.T.V.
12 ACCUMULATOR
13 4TH SIGNAL
14 2ND CLUTCH
15 3-4 ACCUMULATOR
16 T.V.F.
17 OVERRUN CLUTCH
18 T.V. EX.
19 D3/PART THROTTLE
20 PART THROTTLE
21 D3
22 4TH CLUTCH
23 C.C. SIG.
24 MOD. UP
25 MOD. DOWN
26 DETENT
27 3-4 CLUTCH
28 DETENT/LO
29 RND4-3
30 3RD CLUTCH
31 IDENTIFICATION
42 D4 ABUSE
43 3RD FEED
44 3-2 HIGH SPEED
45 2ND FEED
46 3RD CL. EXHAUST
47 4TH FEED
48 1-2 ACCUMULATOR

Figure 42

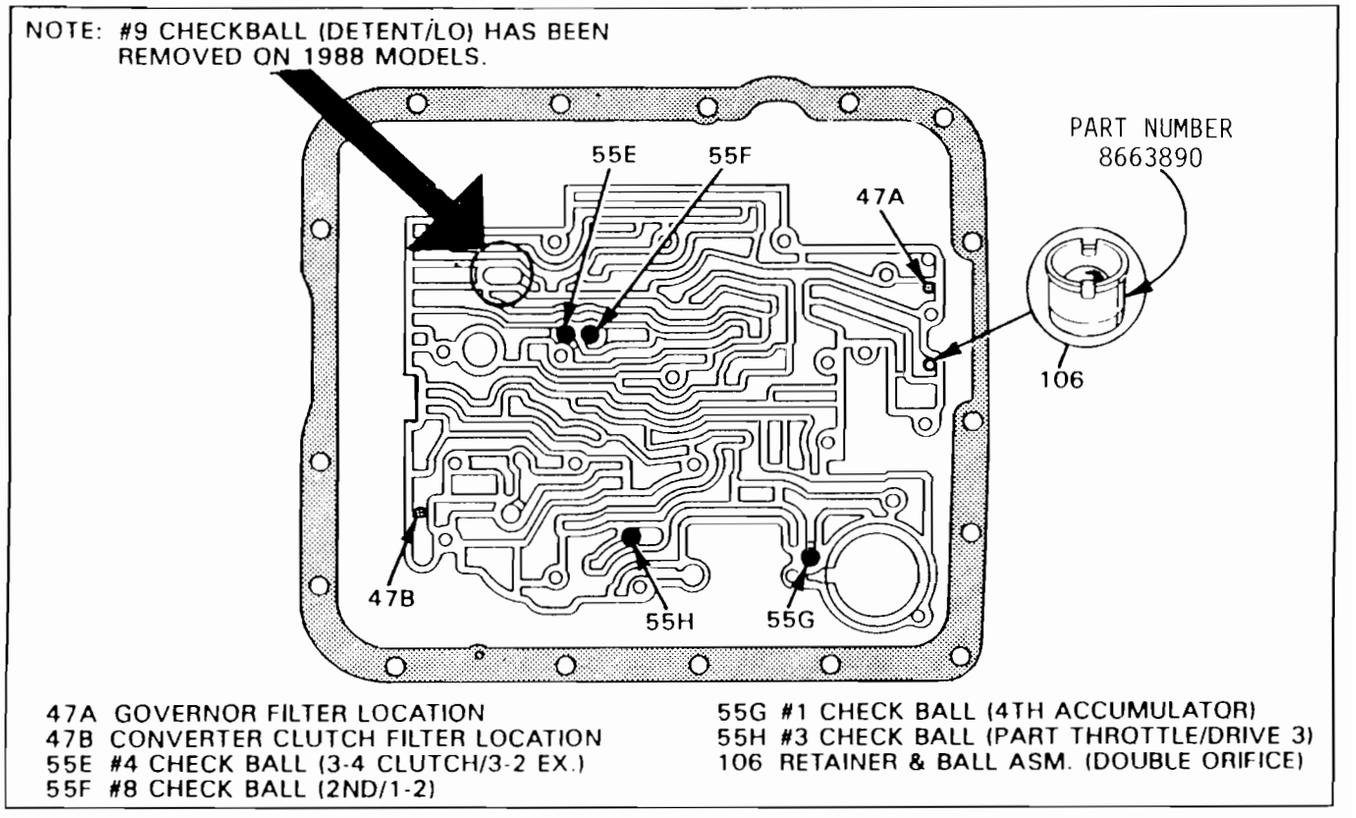

NOTE: #9 CHECKBALL (DETENT/LO) HAS BEEN REMOVED ON 1988 MODELS.
55E
55F
47A
PART NUMBER 8663890
106
47B
55H
55G
47A GOVERNOR FILTER LOCATION
47B CONVERTER CLUTCH FILTER LOCATION
55E #4 CHECK BALL (3-4 CLUTCH/3-2 EX.)
55F #8 CHECK BALL (2ND/1-2)
55G #1 CHECK BALL (4TH ACCUMULATOR)
55H #3 CHECK BALL (PART THROTTLE/DRIVE 3)
106 RETAINER & BALL ASM. (DOUBLE ORIFICE)

Figure 43

THM 700-R4
3RD & 4TH CLUTCH SWITCHES

EXTERNAL 3RD CLUTCH SWITCH:

Some transmissions used with four cylinder engines may have a third clutch switch installed in the third clutch pressure tap on the side of the transmission case (see Figure 1). The purpose of this switch is to cycle off the air conditioner compressor during a forced downshift.

EXTERNAL 4TH CLUTCH SWITCHES (California Only):

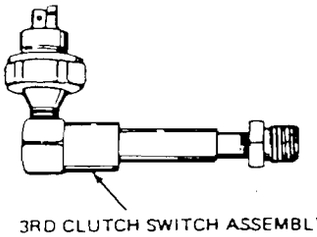
Some transmissions used with California 4 wheel drive trucks may have a 4th clutch switch installed in the external 4th clutch pressure tap on the side of the transmission case. The purpose of this switch is to control E.G.R. bleed and it is only used in 1984 model vehicles (see Figure 2). Some of these switches are normally open, and some are normally closed depending on vehicle.

SERVICE INFORMATION

Switch, External 3rd Clutch (N.O.).....14036254

Switch, External 4th Clutch (N.O.) (California Only)....15599014

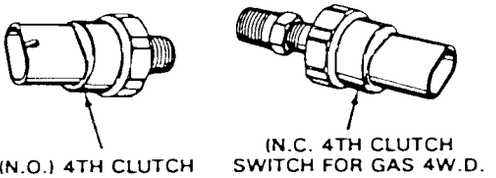
Switch, External 4th Clutch (N.C.) (California Only)....15598409



3RD CLUTCH SWITCH ASSEMBLY

This switch is installed in the external 3rd clutch tap on transmissions used with L 4 engines. The function of this switch is to release the air conditioner compressor during full throttle downshifts.

Figure 1



(N.O.) 4TH CLUTCH SWITCH FOR DIESEL 4W.D. TRUCK. (SWITCH CLOSES AT 26 P.S.I.)

(N.C. 4TH CLUTCH SWITCH FOR GAS 4W.D. TRUCK. (SWITCH OPENS AT 42 P.S.I.)

4th Clutch Switches used in California 4 wheel drive trucks. These switches are installed in the external 4th clutch pressure tap. The function of these switches is to bleed E.G.R. in 4th gear and they are only used in 1984.

Figure 2

AXOD - FLARE ON 2-3 SHIFT

COMPLAINT: Flare or slip on 2-3 shift, or premature failure of direct clutches.

CAUSE: The cause may be a cracked direct clutch piston. For procedure to check the piston, see Figure 1.

CORRECTION: Replace the direct clutch piston.

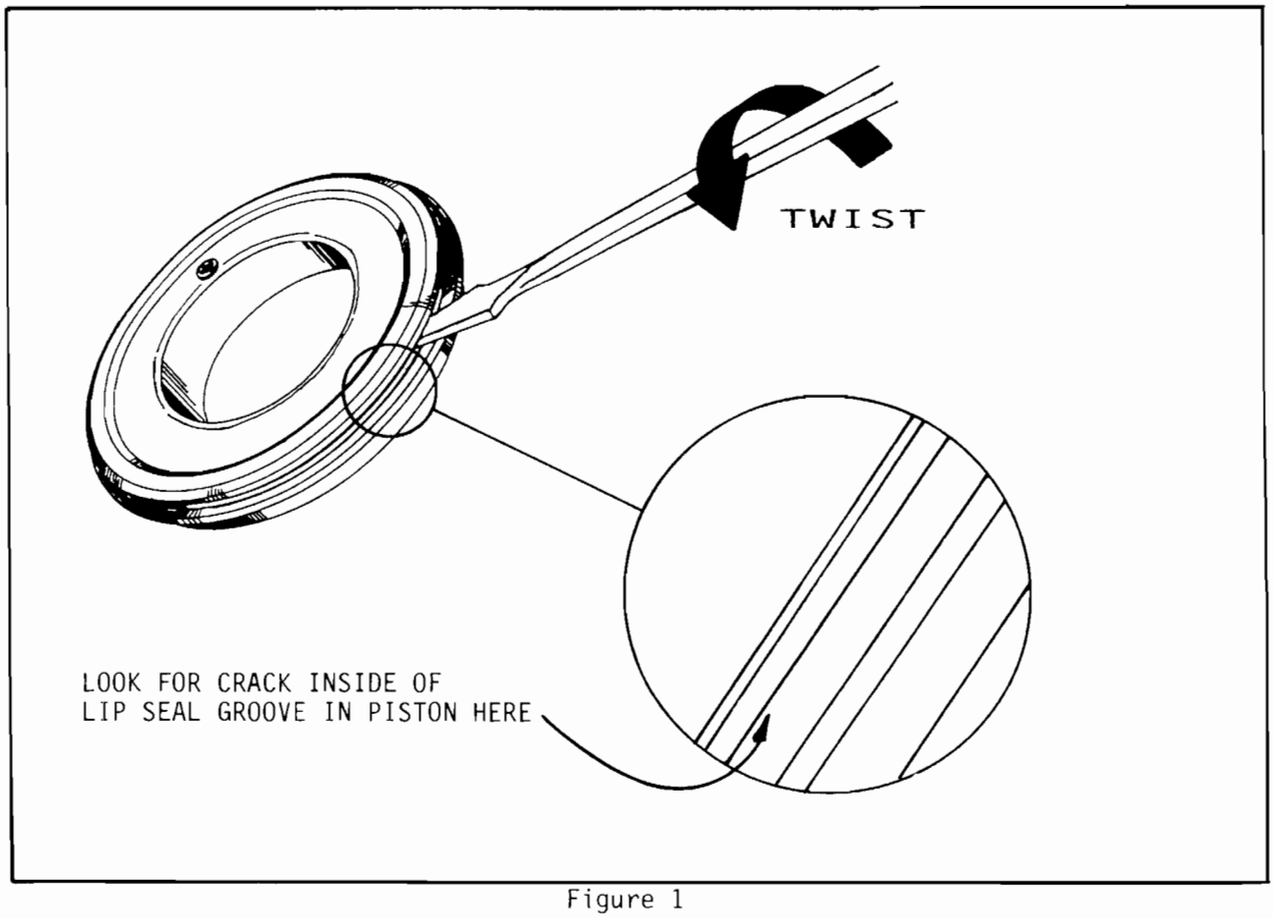


Figure 1

AXOD CHECK BALL LOCATIONS

Valve Body Ball Checks

The following information describes the function of the valve body ball checks. The location of the different ball checks is shown in figure 1.

Ball Checks:

B1: Forces reverse clutch feed oil through the A orifice and thermal element while allowing the clutch to exhaust without restriction.

B2: Separates reverse clutch and forward clutch circuits feeding the forward clutch.

B3: Separates manual low relief and TVLM passages to the main regulator boost valve

B4: Separates manual low relief and direct clutch circuits to the direct clutch.

B5: Connects low/intermediate servo release and direct clutch passages during pressurization of these circuits while forcing low/intermediate servo release to be exhausted through the L orifice and the 3-2 control valve.

B6: (2 required) Forces forward clutch feed oil through the K orifice for the 4-3 downshift while bypassing the orifice for a drive engagement.

B7: Allows forward clutch to exhaust freely on the 3-4 upshift but forces forward clutch apply through the K orifice for the 4-3 downshift

B8: Separates low and kickdown circuits to the 2-3 shift valve.

B9: Forces the direct clutch to exhaust through the M orifice on a 3-2 downshift while bypassing the orifice for the 3-1 downshift.

B10: Exhausts low/intermediate servo apply directly through the manual valve on a drive-neutral or a drive-reverse engagement, bypassing the B orifice.

B11: Not used.

B12: Not used.

B13: Forces direct clutch feed through the E and F orifices bypassing the M orifice.

B14: Forces overdrive servo apply feed through the H and G orifices while bypassing the orifices for exhaust.

B15: Applies forward clutch through the PP orifice as well as the K orifice for a manual 3 pull in.

B16: Separates the low and backout circuits to the backout valve.

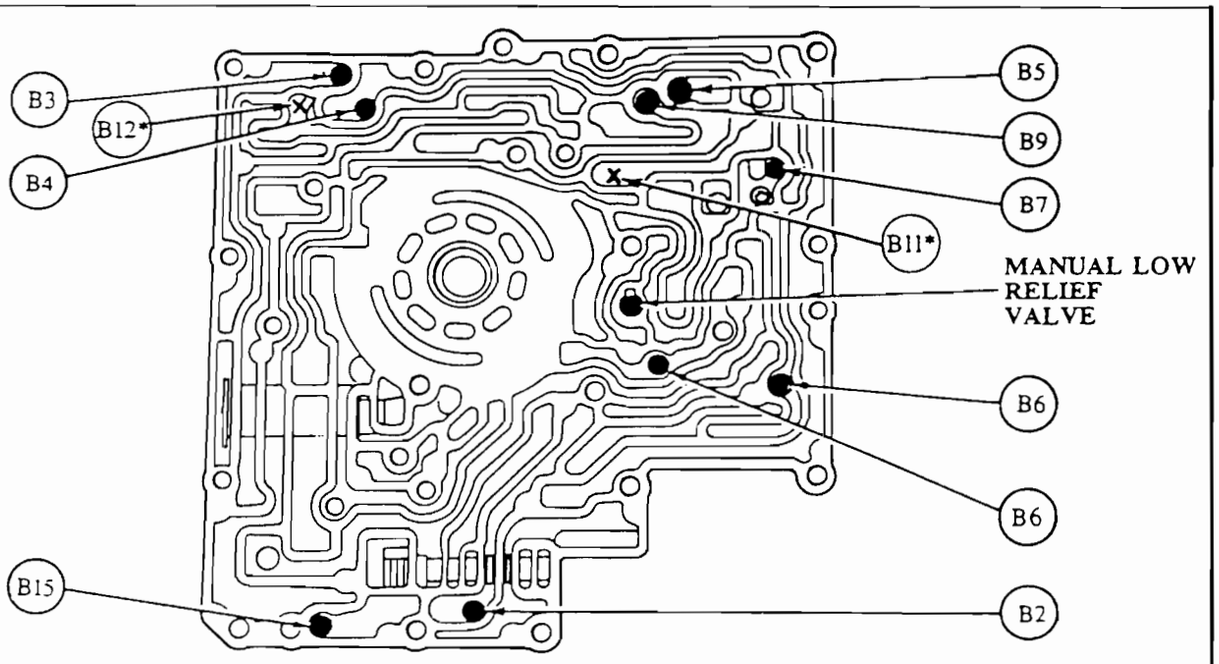
B17: Not used

B18: Feeds the N-D accumulator through the RR and SS orifices in parallel and exhausts N-D accumulator through the RR and SS orifices in series

Relief and Drainback Valves

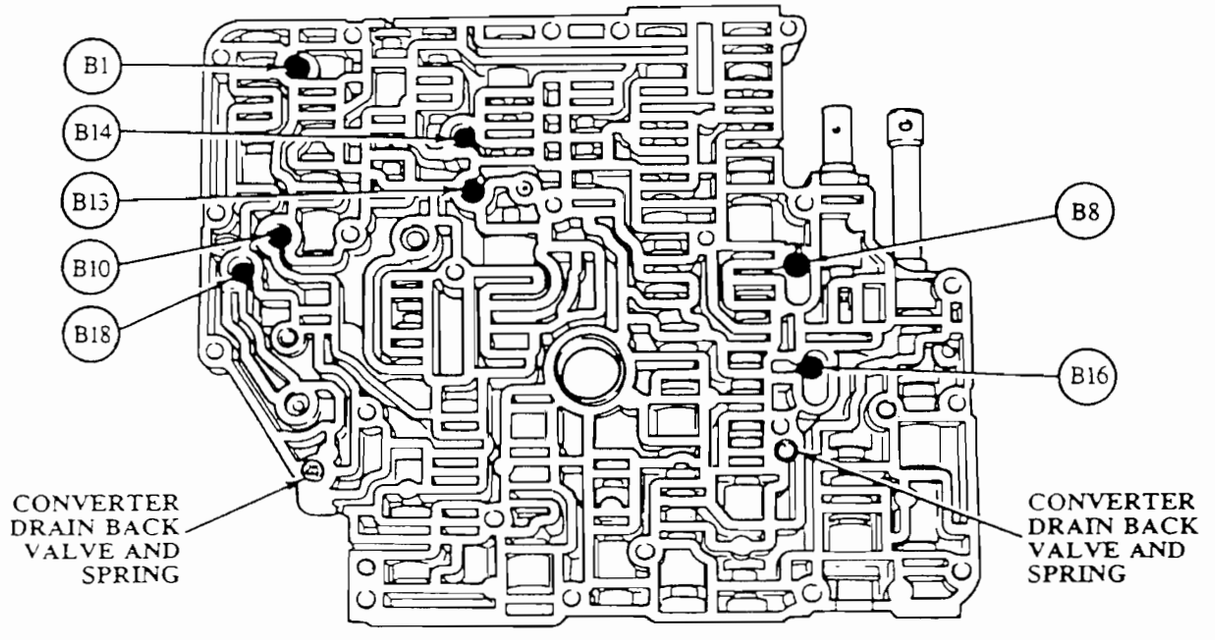
MANUAL LOW RELIEF — Controls direct clutch pressure to 53 psi during a manual low pull-in. Also acts to boost line pressure at low TV pressure during the manual low pull-in.

CONVERTER DRAINBACK — Prevents the converter from draining when the vehicle is not running.



OIL PUMP

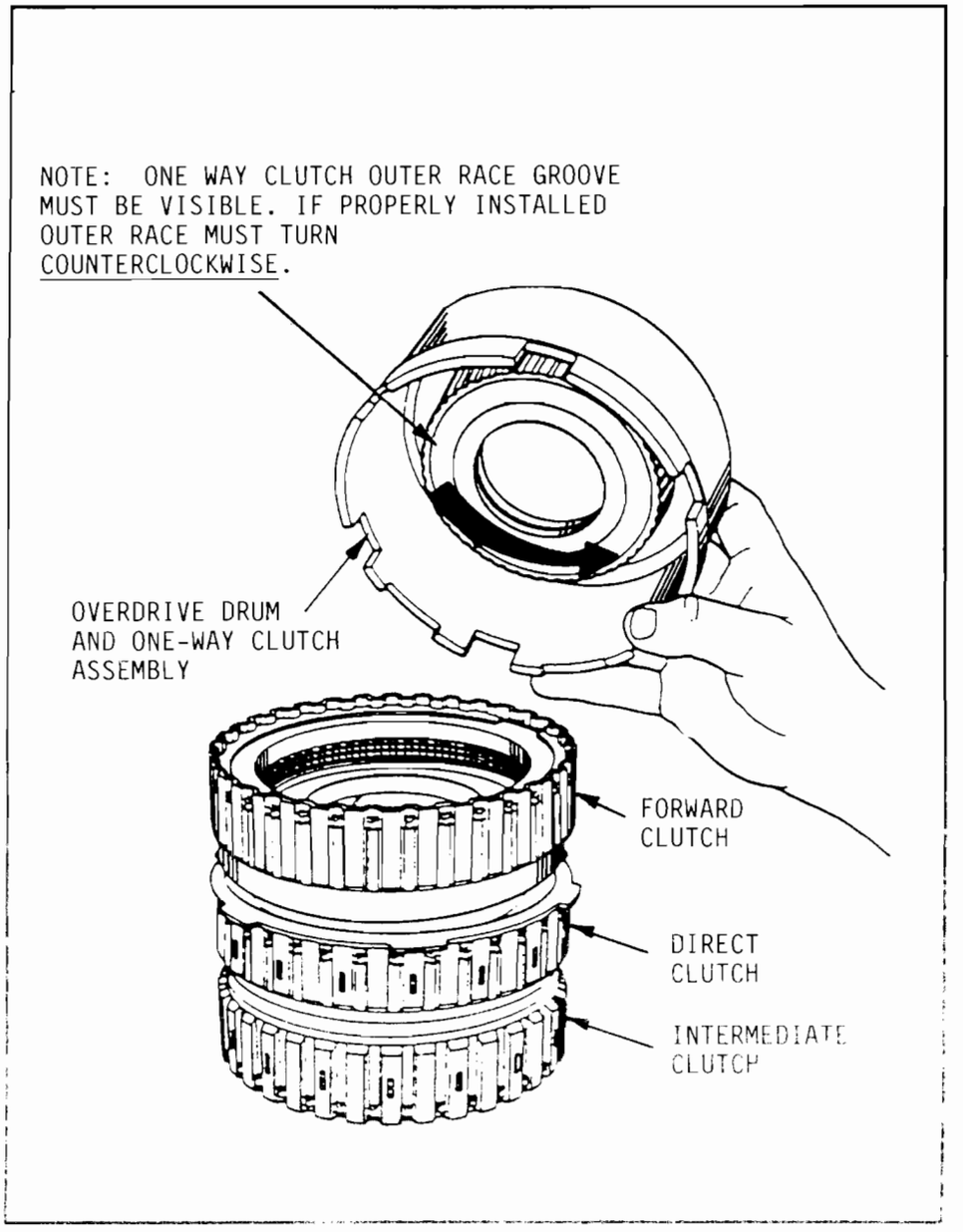
*Do not install ball check



VALVE BODY

Figure 1

AXOD


NOTE: ONE WAY CLUTCH OUTER RACE GROOVE MUST BE VISIBLE. IF PROPERLY INSTALLED OUTER RACE MUST TURN COUNTERCLOCKWISE.
OVERDRIVE DRUM AND ONE-WAY CLUTCH ASSEMBLY
FORWARD CLUTCH
DIRECT CLUTCH
INTERMEDIATE CLUTCH

AXOD Accumulator Spring Color Codes

The illustration below, Figure 1, shows the correct location of the accumulator springs according to color.

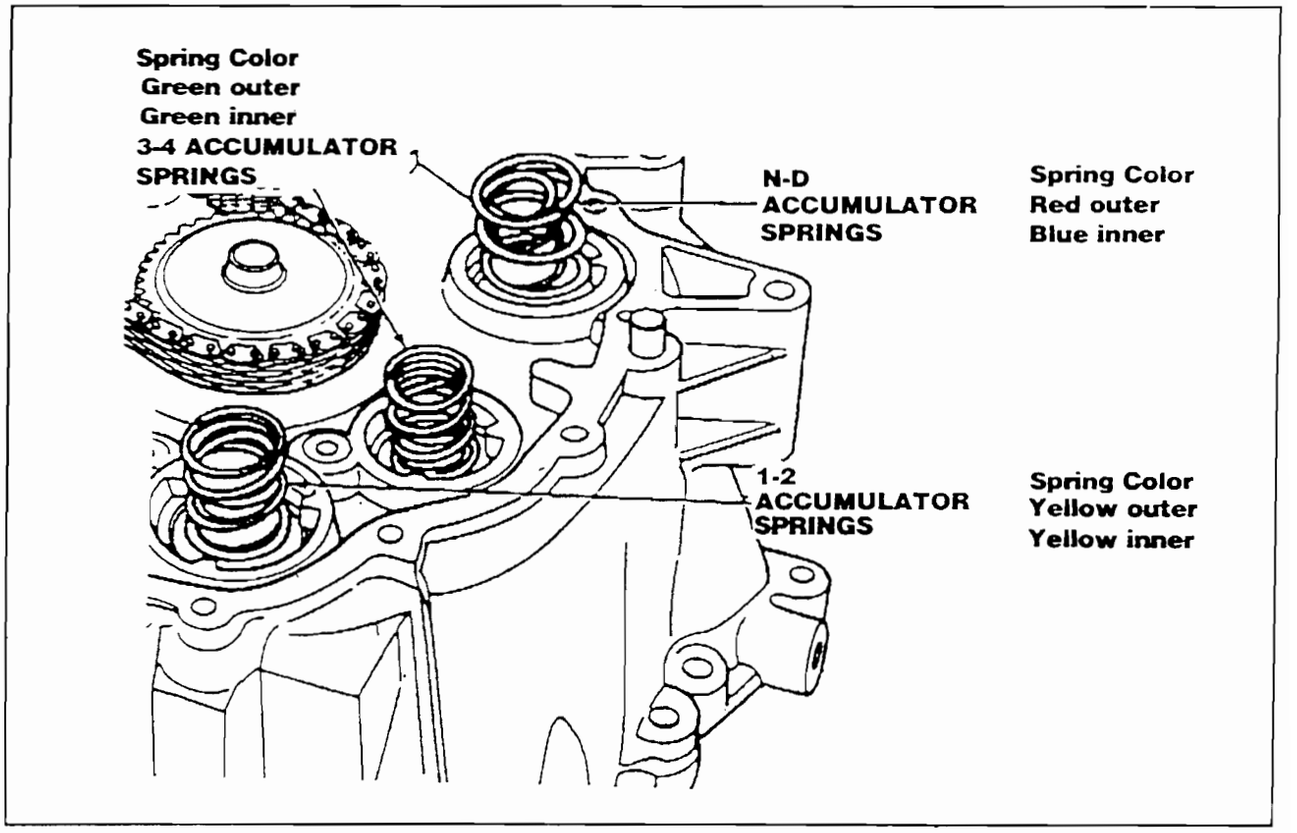


FIGURE 1

FORD

TRANSMISSION — AUTOMATIC — A4LD — ENGINE STALLS WHEN SHIFTING INTO FORWARD OR REVERSE

A4LD

LIGHT TRUCK
1985 RANGER, BRONCO II

An engine stall condition may be experienced in the subject vehicles equipped with A4LD automatic overdrive transmissions. This condition occurs after engine start up and when shifting the transmission into any forward gear or reverse.

A possible cause of this condition is a broken converter clutch shuttle valve spring. This will allow the shuttle valve to remain in the bottom on its bore thereby continuously applying the piston plate clutch in the torque converter. This provides a mechanical connection between the engine and wheels thus resulting in engine stall when the transmission is engaged.

Prior to taking any action, verify that engine speeds are set to specification as shown on the Engine Emission Decal.

Disassemble the valve body from the transmission assembly and remove the separator plate. Follow the valve body removal procedure in Section 17-08 of the 1985 Ranger/Bronco II Shop Manual.

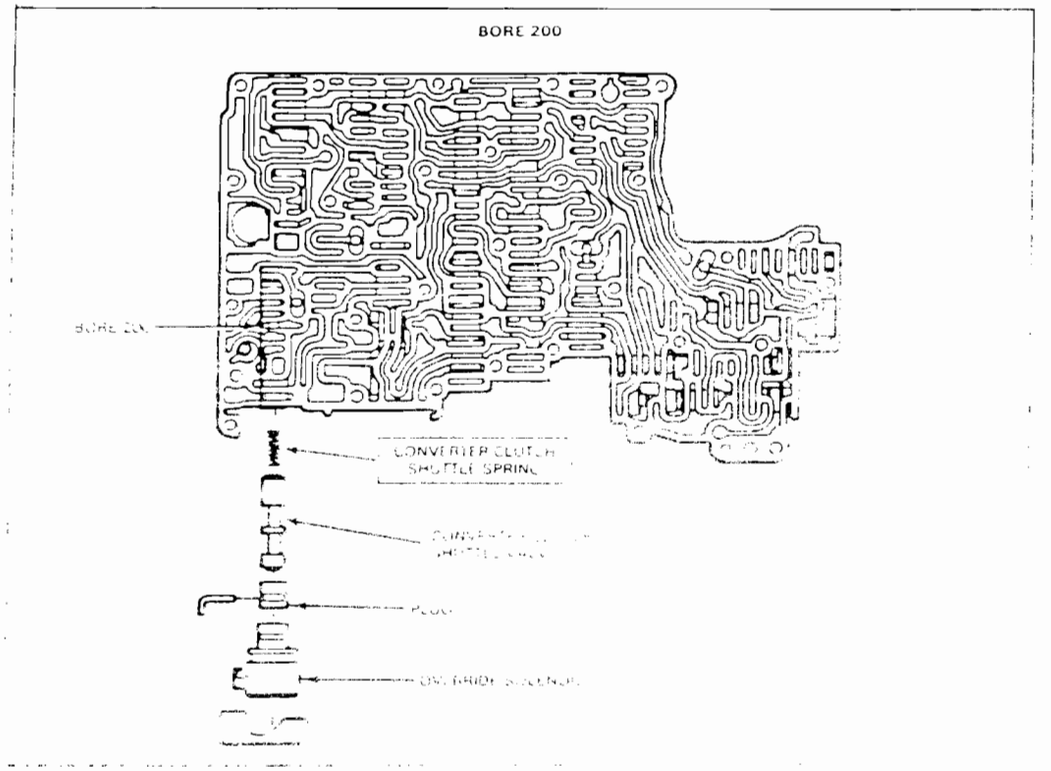
Refer to the valve body identification illustration in Section 17-08 of the Shop Manual or Figure 21, for the shuttle valve bore location (bore reference number 200). Locate the converter clutch shuttle valve spring. See Figure 21.

Remove the retainer plate, override solenoid, plug, valve and spring. Remove any foreign material from the bore. Do not dislodge the shuttle balls.

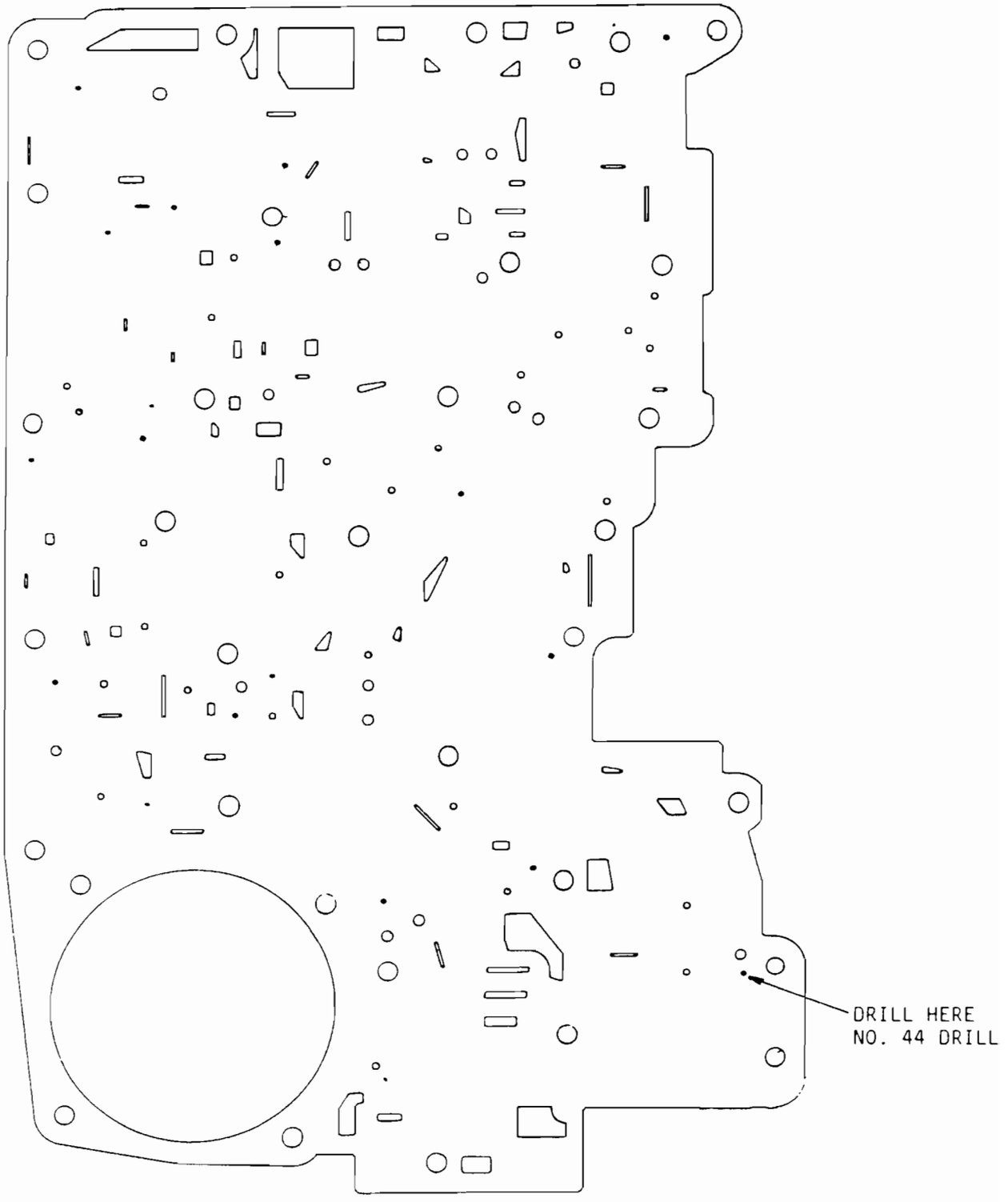
Install a new shuttle valve spring (part number E5TZ-7L490-A, color code dark green). Reinstall the other components in reverse order. Make sure the shuttle valve moves freely.

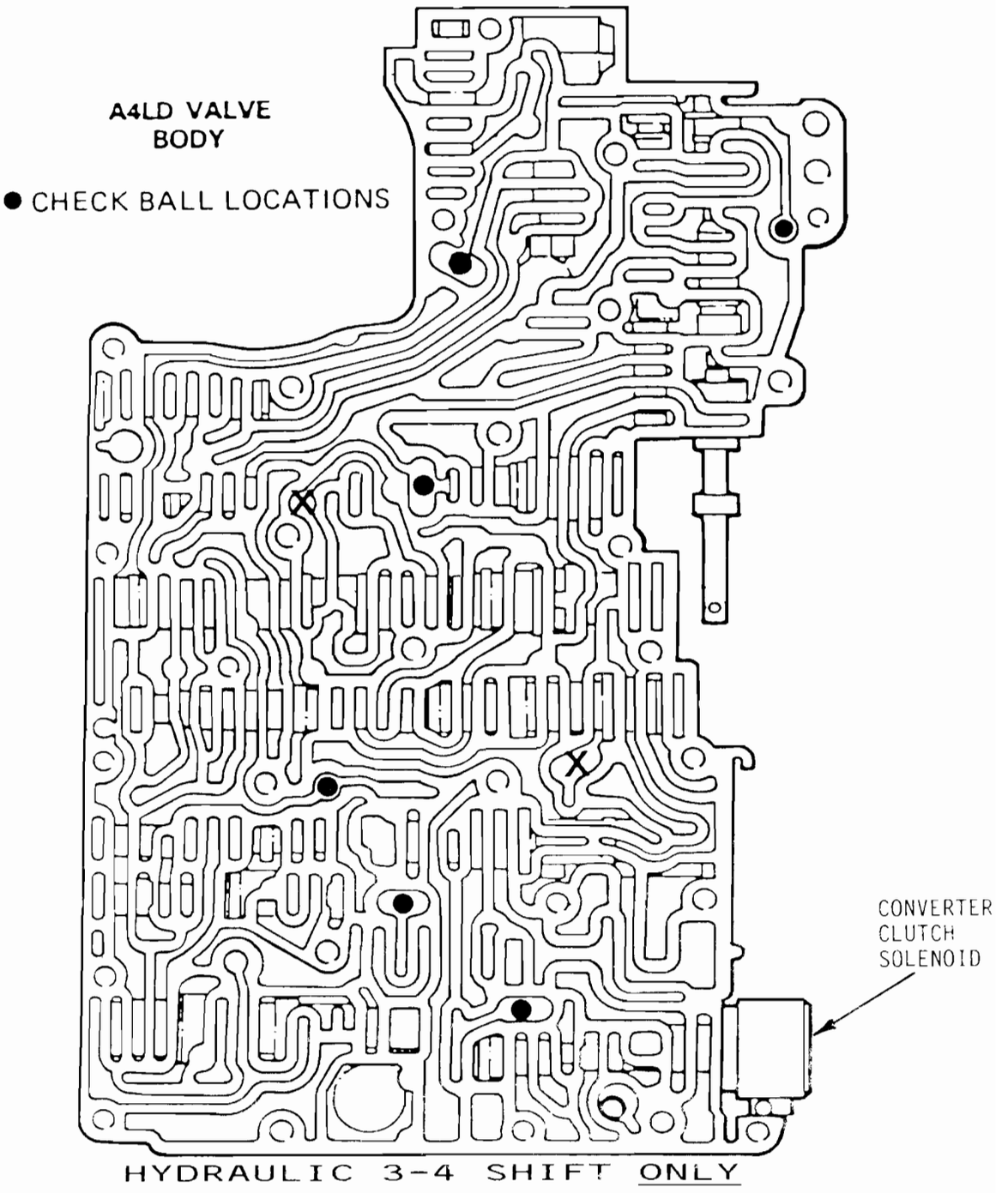
Install the separator plate and assemble the valve body into the transmission assembly per the procedure in Section 17-08 of the Shop Manual.

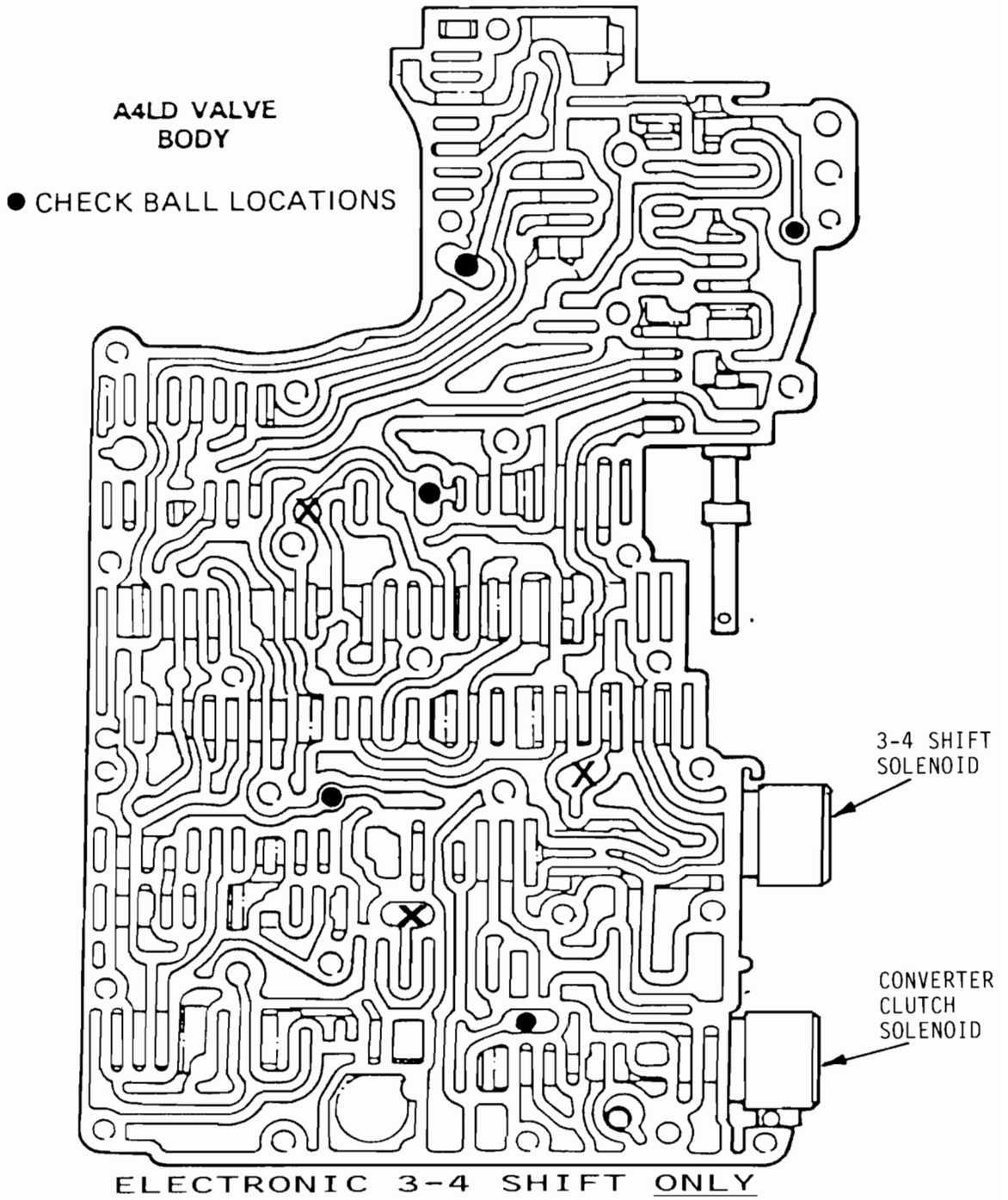
PART NUMBER	PART NAME
E5TZ-7L490-A	Spring — Shuttle Valve



A4LD - DELAYED REVERSE




A4LD VALVE
BODY
● CHECK BALL LOCATIONS
CONVERTER
CLUTCH
SOLENOID
HYDRAULIC 3-4 SHIFT ONLY

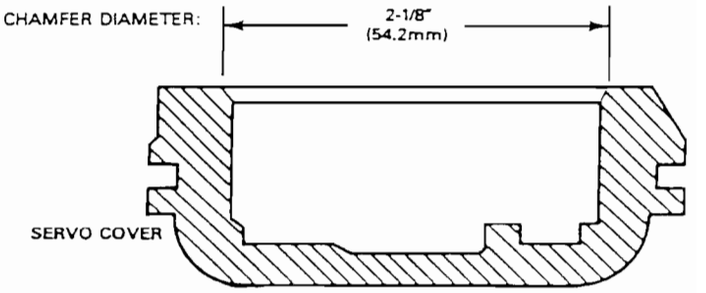

A4LD VALVE
BODY
● CHECK BALL LOCATIONS
3-4 SHIFT
SOLENOID
CONVERTER
CLUTCH
SOLENOID
ELECTRONIC 3-4 SHIFT ONLY

FORD A4LD
SERVO COVERS

SERVO COMPONENTS
OVERDRIVE SERVO

Engine	Vehicle	Servo Cover①	Servo Piston	Servo Spring	Servo Lever
2.3L EFI	Ranger	84DT-7D027-AA	78DT-7E221-AA	80DT-7D028-AA ②	84GT-7D396-GA
2.9L EFI	Ranger Bronco II	84DT-7D027-AA	78DT-7E221-AA	80DT-7D028-AA ②	84GT-7D396-GA

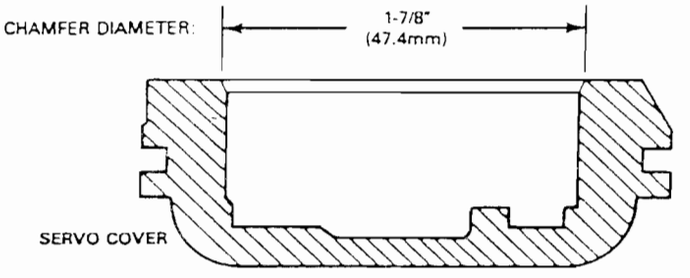
①Part No. cast in cover
②Color Code Blue



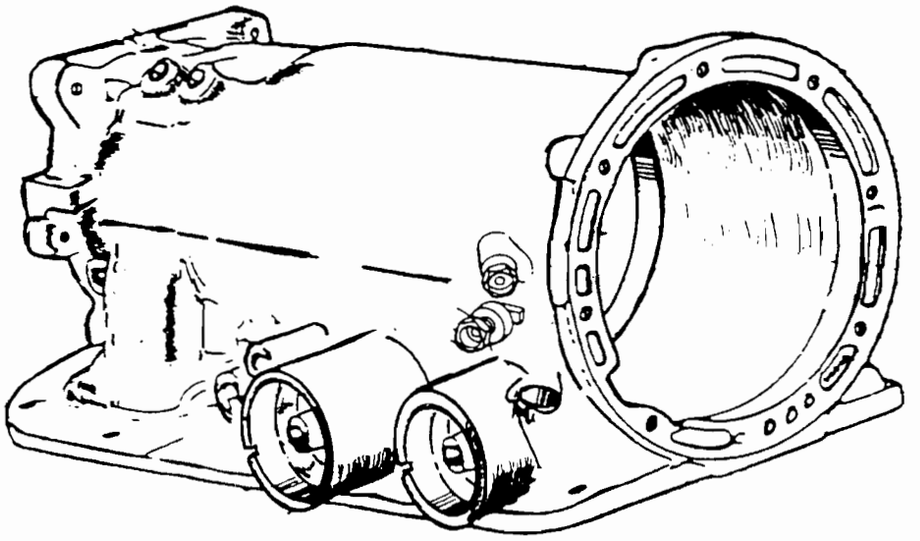
INTERMEDIATE SERVO

Engine	Vehicle	Servo Cover③	Servo Piston	Servo Spring	Servo Lever
2.3L EFI	Ranger	84DT-7D027-CA	83DT-7E221-CA	80DT-7D028-AA ④	74DT-7D396-GB
2.9L EFI	Ranger Bronco II	84DT-7D027-CA	83DT-7E221-CA	80DT-7D028-AA ④	74DT-7D396-GB

③Part No. cast in cover
④Color Code Blue



A4LD CASE CHANGE

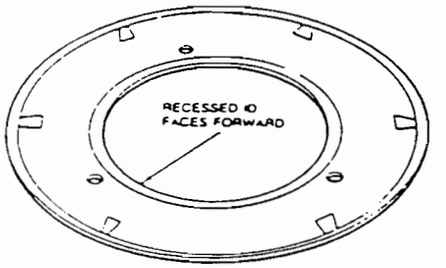


IN THE EVENT THAT A CASE CHANGE IS WARRANTED DUE TO EXCESSIVE RING WEAR IN THE GOVERNOR SUPPORT BORE, ROLLER CLUTCH INNER RACE WEAR OR ANY OTHER REASON, A NEW CASE ASSEMBLY IS AVAILABLE AT A GREATLY REDUCED PRICE. USE THE OEM PART NUMBER BELOW.

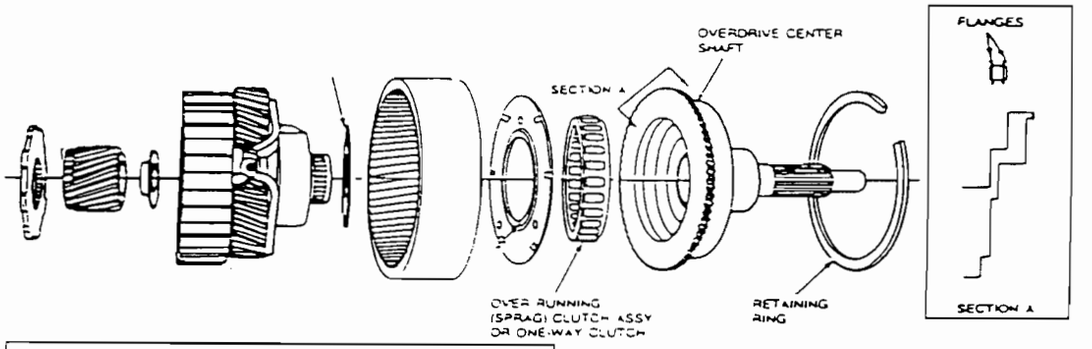
E7TZ-7005-N

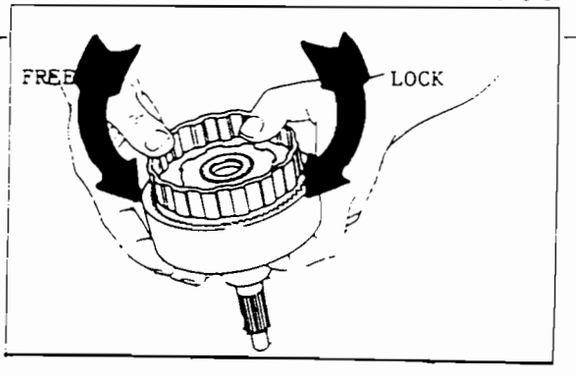
FORD A4LD
PROPER SPRAG INSTALLATION

In addition, the overdrive clutch washer, that is positioned between the overdrive planet carrier and center shaft must be installed in such a way that the "recessed ID" faces forward (not against sprag clutch).



NOTE: The one-way clutch assembly MUST be installed into the center shaft in such a way that the flanges of the inner and outer cages are toward the overdrive planet assembly which is toward the front of the transmission.





NOTE: SPRAG ROTATION

HOLD RING GEAR IN LEFT HAND, PLANETARY IN **RIGHT HAND.**
PLANETARY FREEWHEELS COUNTER CLOCKWISE AND LOCKS CLOCKWISE.

FORD A4LD
3-4/4-3 SHIFT PROBLEM

COMPLAINT: Erratic or no 3-4 upshift or 4-3 downshift.

CAUSE: May be caused by normal levels of contamination in the transmission fluid. This causes the 3-4 shift solenoid to stick in the open or closed position. The 3-4 shift solenoid is external of the transmission filter which makes it sensitive to normal levels of transmission fluid contamination.

CORRECTION: To correct this, install a new 3-4 shift solenoid and sleeve/screen assembly. The sleeve/screen assembly will protect the new 3-4 shift solenoid from contamination. Both components are contained in service kit E8TZ-7M107-A.

NOTE: Always install the sleeve/screen assembly provided in the service kit whenever replacing the 3-4 shift solenoid. Failure to do this may cause a repeat repair.

PART NUMBER	PART NAME
E8TZ-7M107-A	Service Kit 3-4 Solenoid and Sleeve/Screen Assembly

TRANSMISSION — AUTOMATIC — A0D — NO FORWARD DRIVE AFTER COAST DOWN FROM FOURTH GEAR

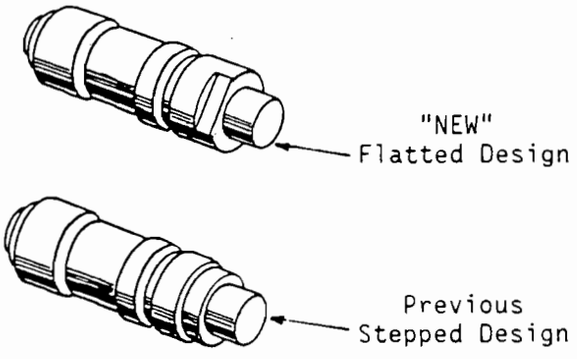
FORD
1983-1985 FORD, THUNDERBIRD, LTD, MUSTANG

LINCOLN-MERCURY
1983-85 MERCURY COUGAR, MARQUIS, CAPRI, LINCOLN, MARK, CONTINENTAL

LIGHT TRUCK
1983-85 E & F SERIES

Some AOD-equipped vehicles with transmissions built between March, 1983 and April 19, 1985 may exhibit a no forward drive condition after coast down from fourth gear. This condition may occur if a small particle of contamination causes the 3-4 shift valve to stick in the forward clutch exhaust position.

To service this condition, install a new 3-4 shift valve that has a design with flats on the valve. This will allow contamination to pass and be trapped in the main control filter assembly. The new valve was incorporated in production April 19, 1985. Refer to Figure 1 for visual differences between 3-4 shift valve design levels.



PART NUMBER	PART NAME
E5AZ-7F259-A	3-4 Shift Valve

Figure 1

TRANSMISSION — AUTOMATIC — AOD — MAIN CONTROL VALVE BODY GASKETS

FORD
1980-86 FORD, THUNDERBIRD, LTD, MUSTANG

LINCOLN-MERCURY
1980-83 MARK VI; 1980-86 MERCURY, COUGAR, MARQUIS, CAPRI, LINCOLN, CONTINENTAL
1984-86 MARK VII

LIGHT TRUCK
1981-86 E-SERIES, F-SERIES, BRONCO

New upper and lower main control valve body gaskets have been released for service. The new gasket has an additional slot, which reduces the chance for contamination of the 3-4 shift valve (refer to Figures 11 and 12). The new gaskets can be used on all AOD main control valve bodies produced for the 1980-86 model years.

Old upper and lower main control valve body gaskets (E0AZ-7D100-B and E0AZ-7C155-A) may still be used on certain applications. To identify the correct application, the middle letter of the main control valve body's three-letter I.D. code is necessary. Refer to the following service usage chart for the correct gasket applications.

SERVICE USAGE CHART FOR AOD MAIN CONTROL VALVE BODY GASKETS

AOD Valve Body I.D. Codes (Middle Letter)	Old Gaskets E0AZ-7D100-B E0AZ-7C155-A	New Gaskets E6AZ-7D100-A E6AZ-7C155-A
A, B, C, D, E T, U, V, W, X, Y, Z	Acceptable	Acceptable
All other than above (For example: main controls with middle letter I.D. code F, G, H, Q, R, S)	Must NOT Use	Must Use

(Continued on next page)

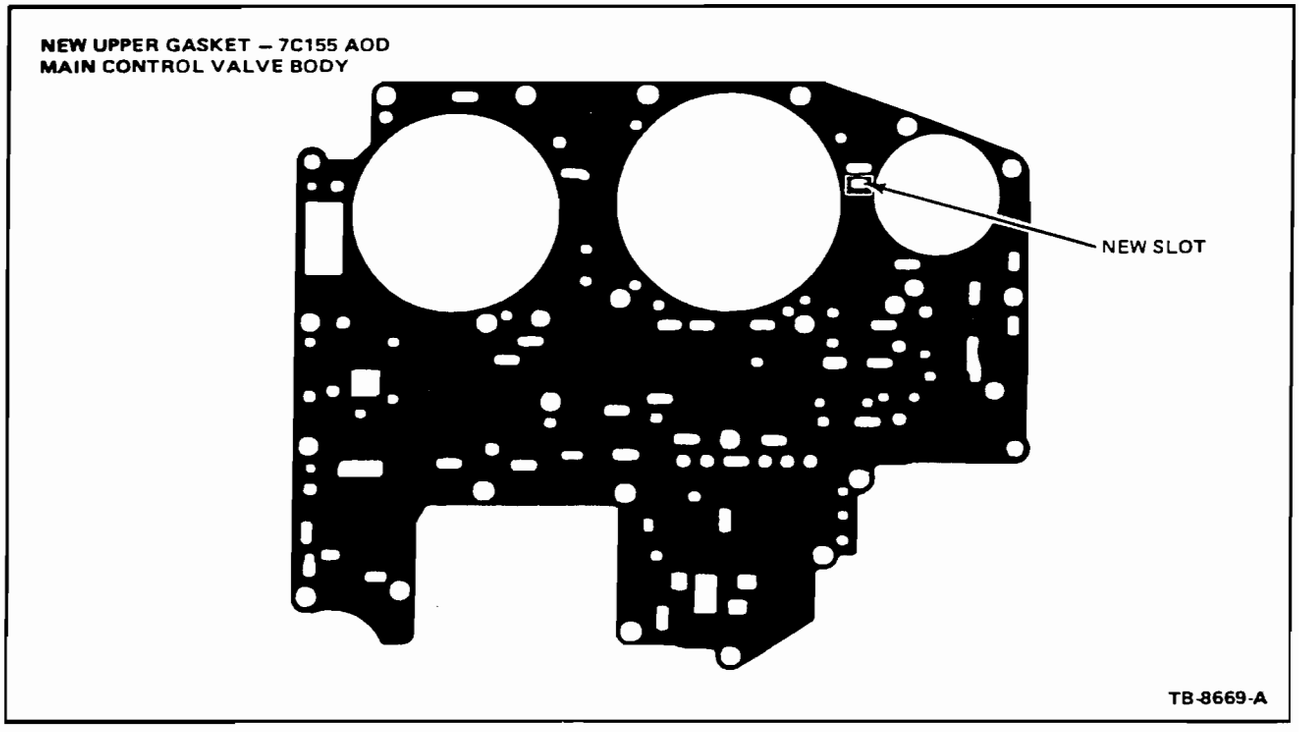


Figure 11

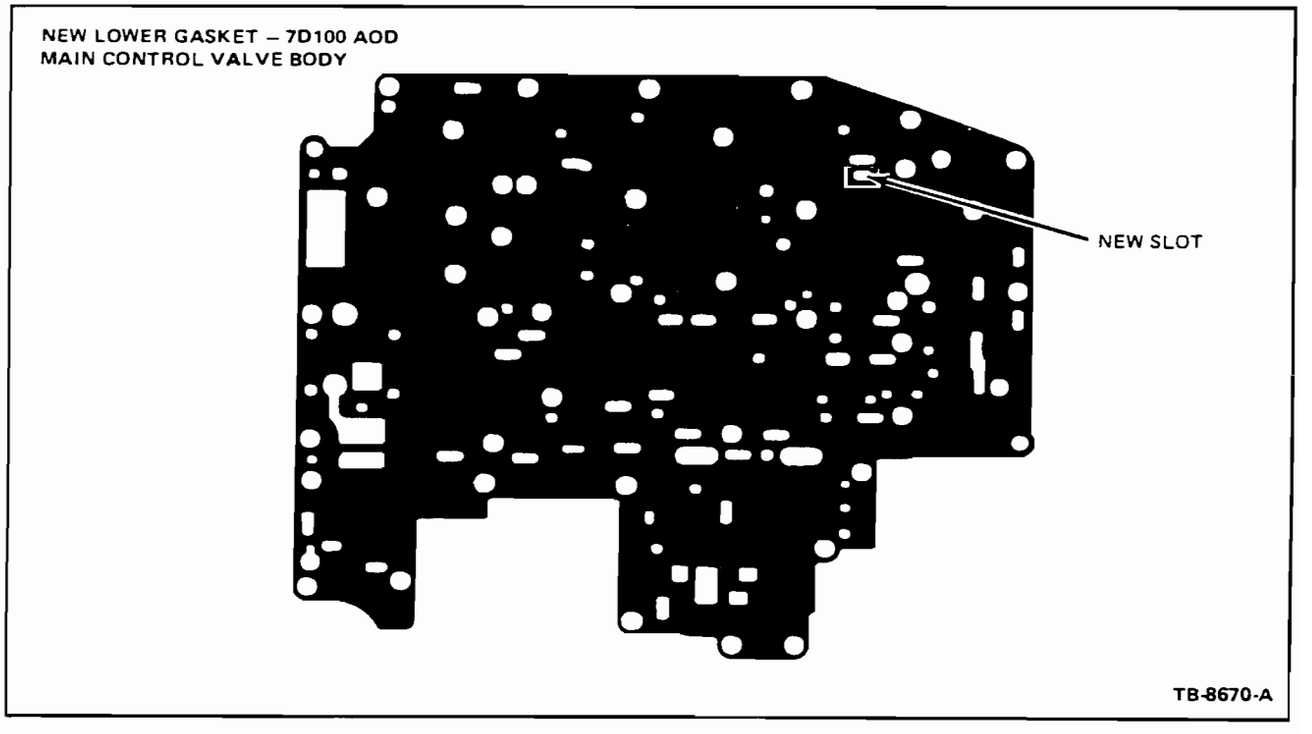


Figure 12

AOD - NO 4TH GEAR

COMPLAINT: Very late 4th gear, or NO 4th gear.

CAUSE: Valve Body and/or Case cross leaks.

CORRECTION: Drill a vent hole through valve body casting, in the 3-4 T.V. modulator circuit, using a .020" drill bit. See Figure 1 for the location. The smaller drill bits can usually be obtained at the local hobby shop.

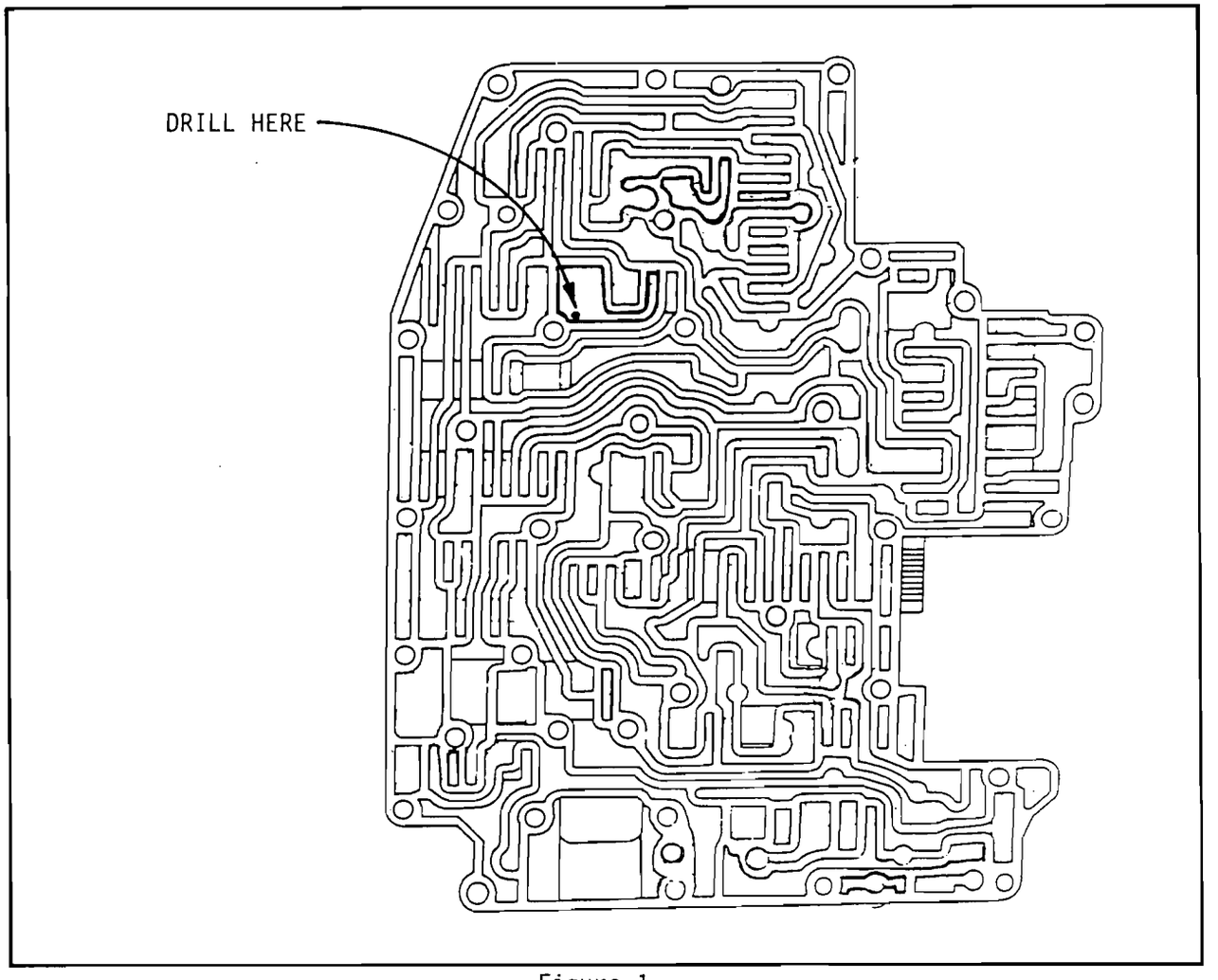


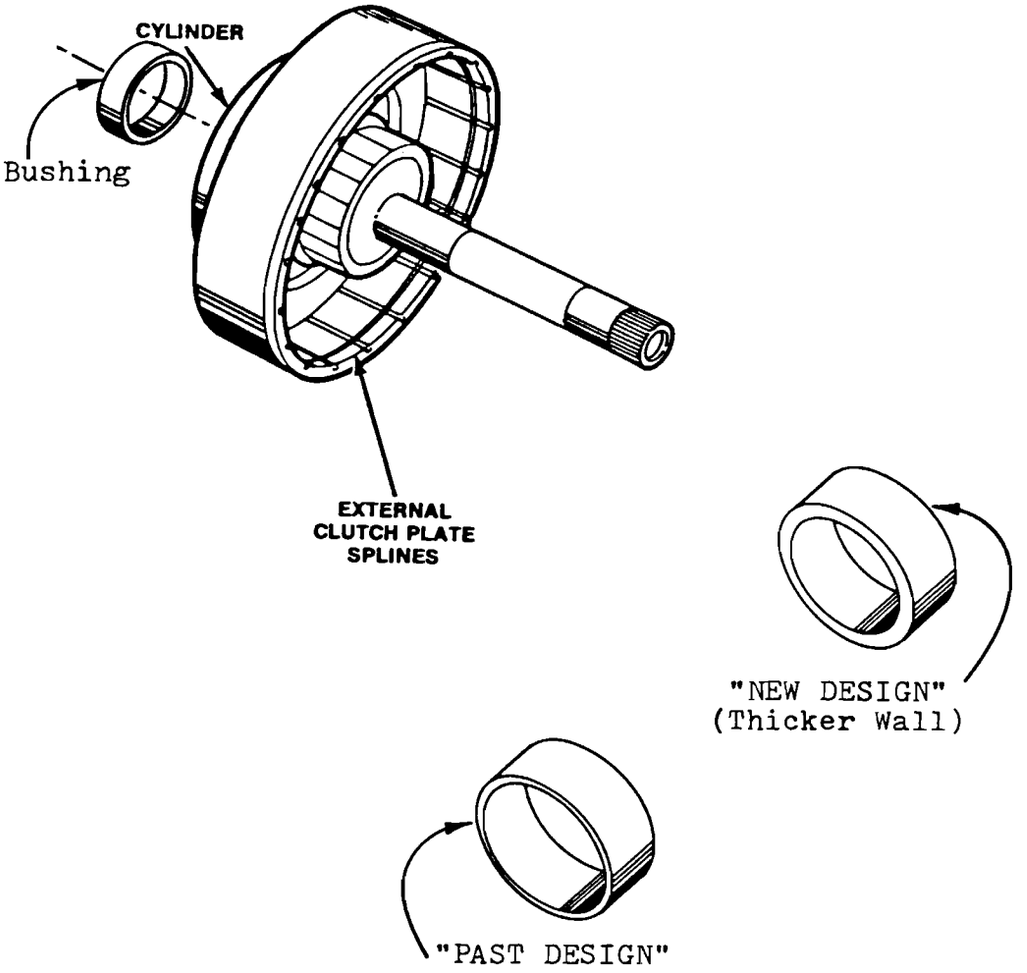
Figure 1

FORD ATX 2-3 SLIP

There is now available an aftermarket bushing for the direct drum on the ATX (Location shown below), that has a thicker wall thickness (See Below), and provides a closer tolerance where the direct drum sets on the intermediate drum.

This provides a much better support for the direct clutch sealing rings and a much improved 2-3 shift.

The new bushing is available under Aftermarket part No. 57010E.

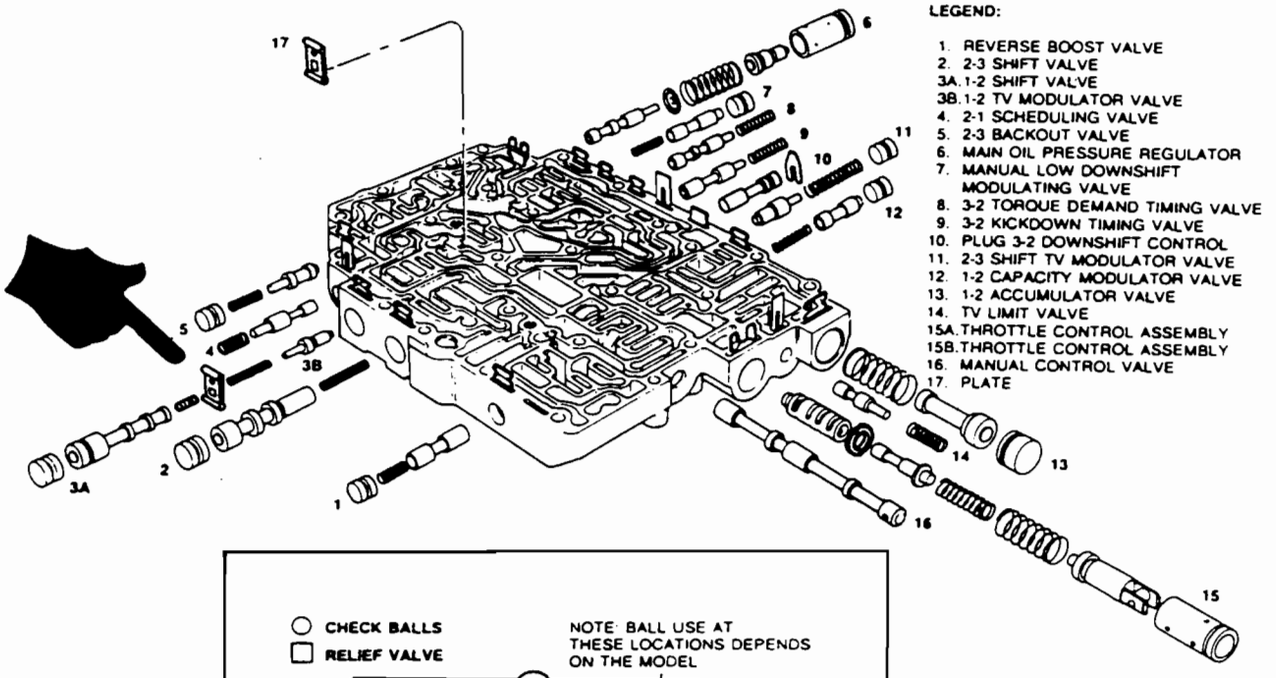


FLC-ATX

SECOND GEAR STARTS - This can be caused by a mis-positioned retainer clip (17) in the 1-2 valve line-up

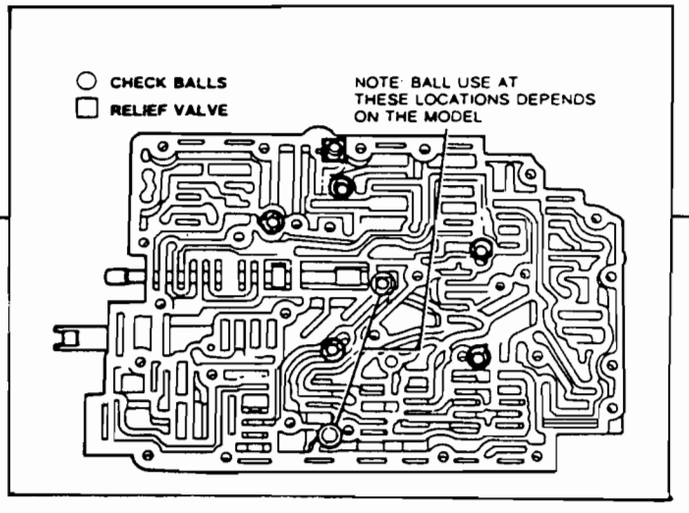
The following illustration shows the position and components for each of the valve assemblies in the valve body.

NOTE: Do not turn the throttle valve adjusting screw. The adjustment is set during manufacture and must not be altered.



LEGEND:

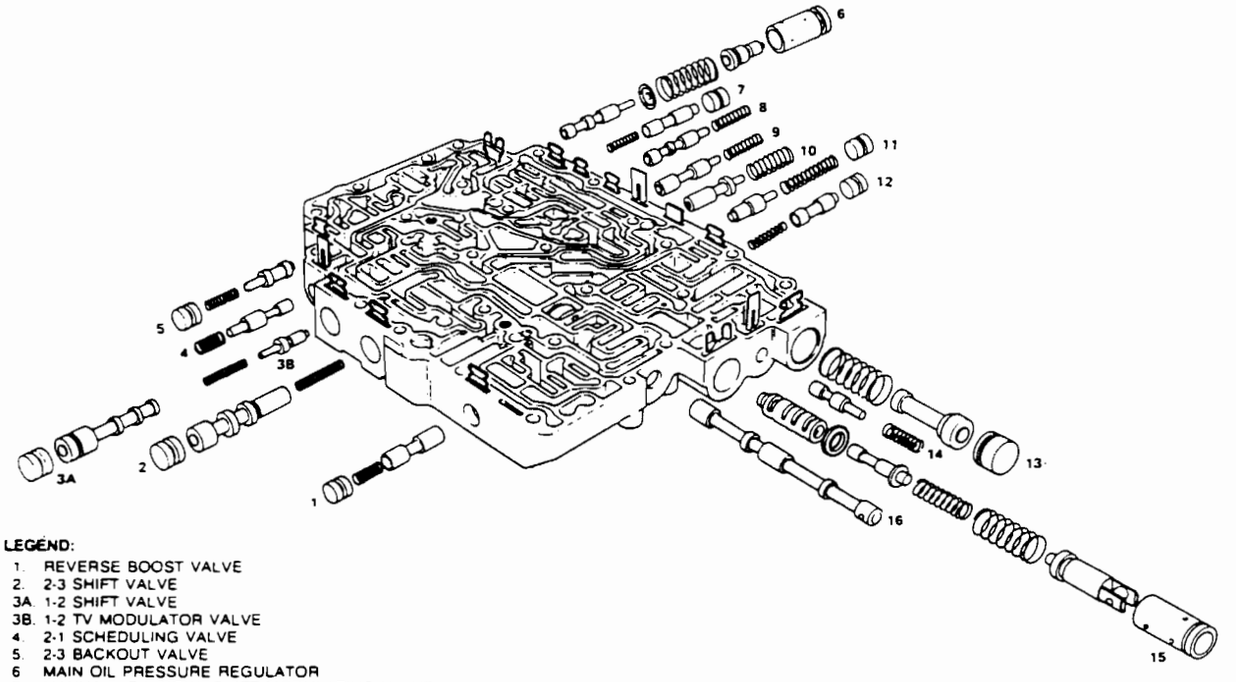
1. REVERSE BOOST VALVE
2. 2-3 SHIFT VALVE
3A. 1-2 SHIFT VALVE
3B. 1-2 TV MODULATOR VALVE
4. 2-1 SCHEDULING VALVE
5. 2-3 BACKOUT VALVE
6. MAIN OIL PRESSURE REGULATOR
7. MANUAL LOW DOWNSHIFT MODULATING VALVE
8. 3-2 TORQUE DEMAND TIMING VALVE
9. 3-2 KICKDOWN TIMING VALVE
10. PLUG 3-2 DOWNSHIFT CONTROL
11. 2-3 SHIFT TV MODULATOR VALVE
12. 1-2 CAPACITY MODULATOR VALVE
13. 1-2 ACCUMULATOR VALVE
14. TV LIMIT VALVE
15A. THROTTLE CONTROL ASSEMBLY
15B. THROTTLE CONTROL ASSEMBLY
16. MANUAL CONTROL VALVE
17. PLATE



CLC-ATX

The following illustration shows the position and components for each of the valve assemblies in the valve body.

NOTE: Do not turn the throttle valve adjusting screw. The adjustment is set during manufacture and must not be altered.

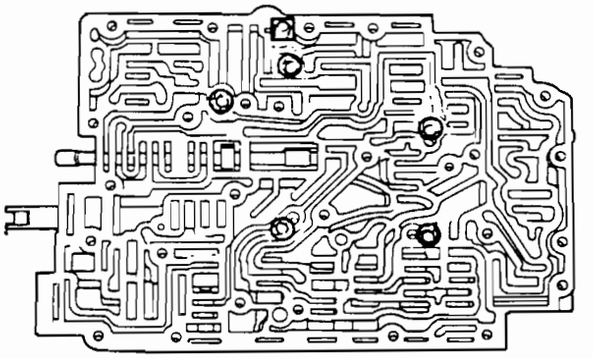


LEGEND:

1. REVERSE BOOST VALVE
2. 2-3 SHIFT VALVE
3A. 1-2 SHIFT VALVE
3B. 1-2 TV MODULATOR VALVE
4. 2-1 SCHEDULING VALVE
5. 2-3 BACKOUT VALVE
6. MAIN OIL PRESSURE REGULATOR
7. MANUAL LOW DOWNSHIFT MODULATING VALVE
8. 3-2 TORQUE DEMAND TIMING VALVE
9. 3-2 KICKDOWN TIMING VALVE
10. 3-2 CONTROL VALVE
11. 2-3 SHIFT TV MODULATOR VALVE
12. 1-2 CAPACITY MODULATOR VALVE
13. 1-2 ACCUMULATOR VALVE
14. TV LIMIT VALVE
15A. THROTTLE CONTROL ASSEMBLY
15B. THROTTLE CONTROL ASSEMBLY
16. MANUAL CONTROL VALVE

Install check balls and relief valve.

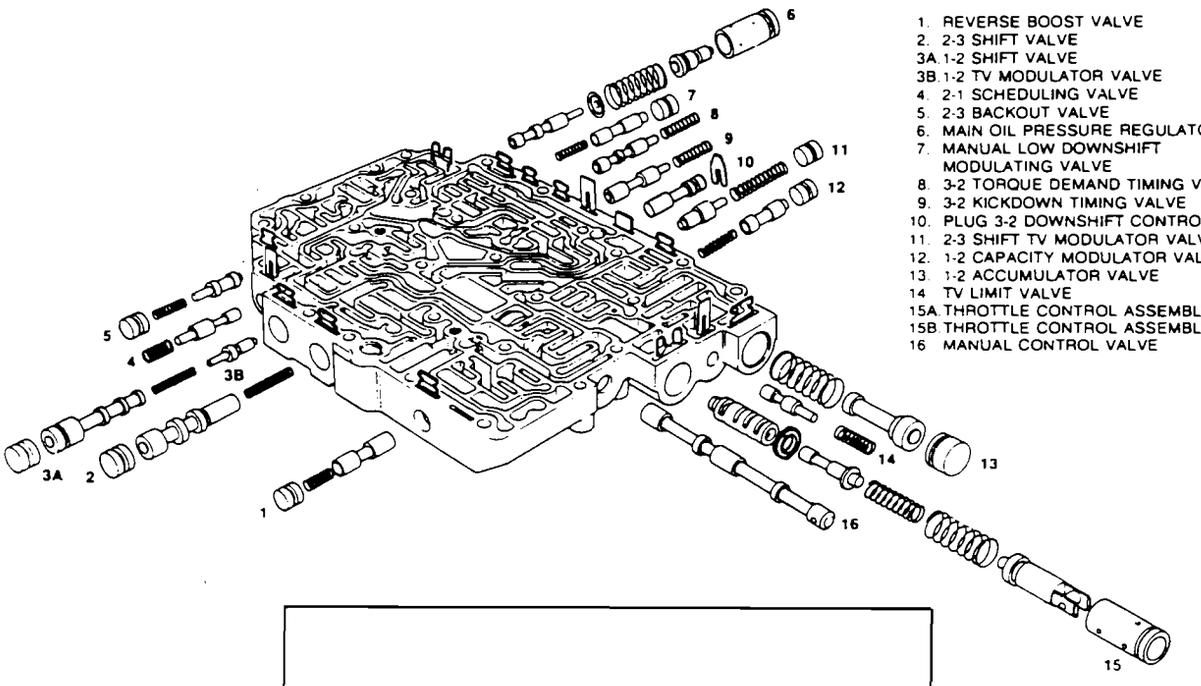
○ CHECK BALLS
□ RELIEF VALVE



ATX

The following illustration shows the position and components for each of the valve assemblies in the valve body.

NOTE: Do not turn the throttle valve adjusting screw. The adjustment is set during manufacture and must not be altered.

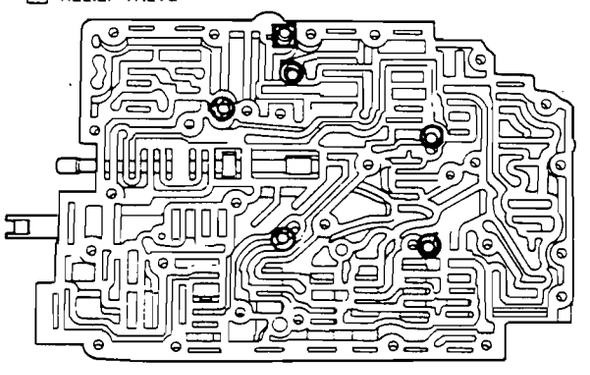


LEGEND:

1. REVERSE BOOST VALVE
2. 2-3 SHIFT VALVE
3A. 1-2 SHIFT VALVE
3B. 1-2 TV MODULATOR VALVE
4. 2-1 SCHEDULING VALVE
5. 2-3 BACKOUT VALVE
6. MAIN OIL PRESSURE REGULATOR
7. MANUAL LOW DOWNSHIFT MODULATING VALVE
8. 3-2 TORQUE DEMAND TIMING VALVE
9. 3-2 KICKDOWN TIMING VALVE
10. PLUG 3-2 DOWNSHIFT CONTROL
11. 2-3 SHIFT TV MODULATOR VALVE
12. 1-2 CAPACITY MODULATOR VALVE
13. 1-2 ACCUMULATOR VALVE
14. TV LIMIT VALVE
15A. THROTTLE CONTROL ASSEMBLY
15B. THROTTLE CONTROL ASSEMBLY
16. MANUAL CONTROL VALVE

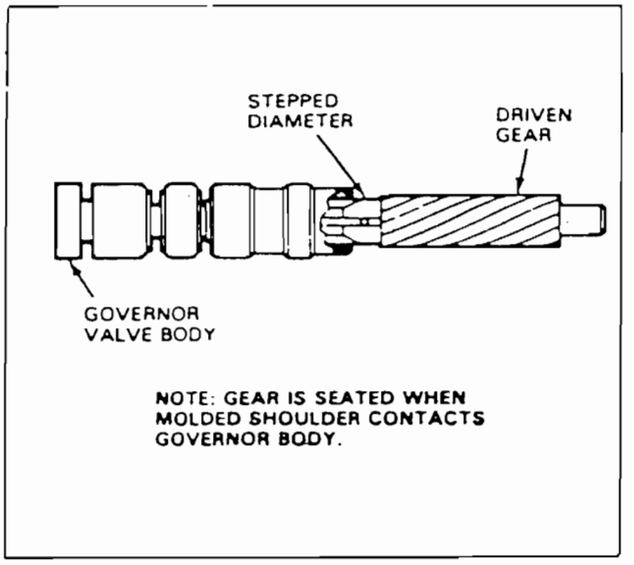
Install check balls and relief valve.

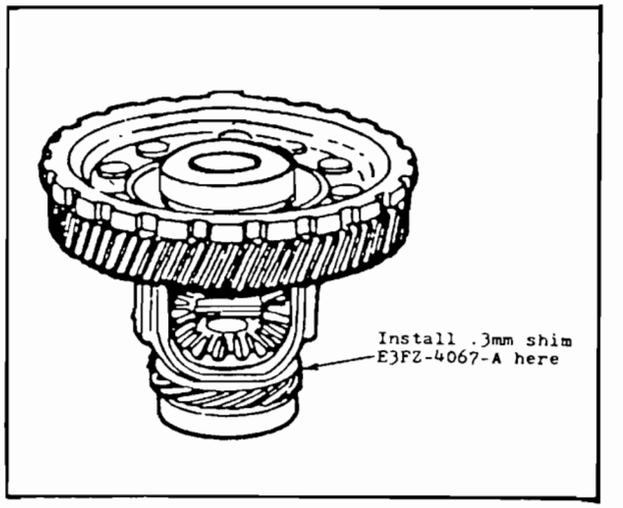
○ CHECK BALLS
□ RELIEF VALVE



ATX - SPEEDOMETER DRIVE/DRIVEN AND GOVERNOR GEAR DAMAGE WITH BALL BEARING DIFFERENTIAL

Loss of speedometer, speed control, and/or transaxle governor operation or function may be caused from the speedometer drive gear wearing against the differential housing causing gear wear and looseness. This condition will cause speedometer driven gear wear, and a "Hourglass" wear pattern of the governor gear. To service this condition replace the speedometer drive gear on the differential housing (OEM Part No E3FZ-17285-B). Prior to installing the drive gear, install a .3mm shim (E3FZ-4067-A) between the differential and the speedometer drive gear to eliminate repeat repairs. Replace speedometer driven gear and governor gear as required. Refer to ATSG Techtran Manual, Page 92, for differential removal without removing entire transaxle.





PART NUMBER	PART NAME
E3FZ-17285-B	Speedometer Drive Gear
E3FZ-4067-A	Shim
E2FZ-7F419-A	ATX Governor Drive Gear

CONVERTER REBUILDERS
1987-88 FORD ATX FLC

1987-88 Tempo Topaz only use a converter adapter sleeve, Part Number E7FZ-7A878-A. This sleeve has two internal splines and one external spline. (See Figure 1) Since this is a slip on adapter, it can stay engaged in the torque converter turbine hub upon removal of the converter from the transmission. If this adapter IS NOT reinstalled on the transmission (turbine and intermediate shafts), a NO DRIVE CONDITION WILL BE THE COMPLAINT AFTER INSTALLATION. (See Figure 2)

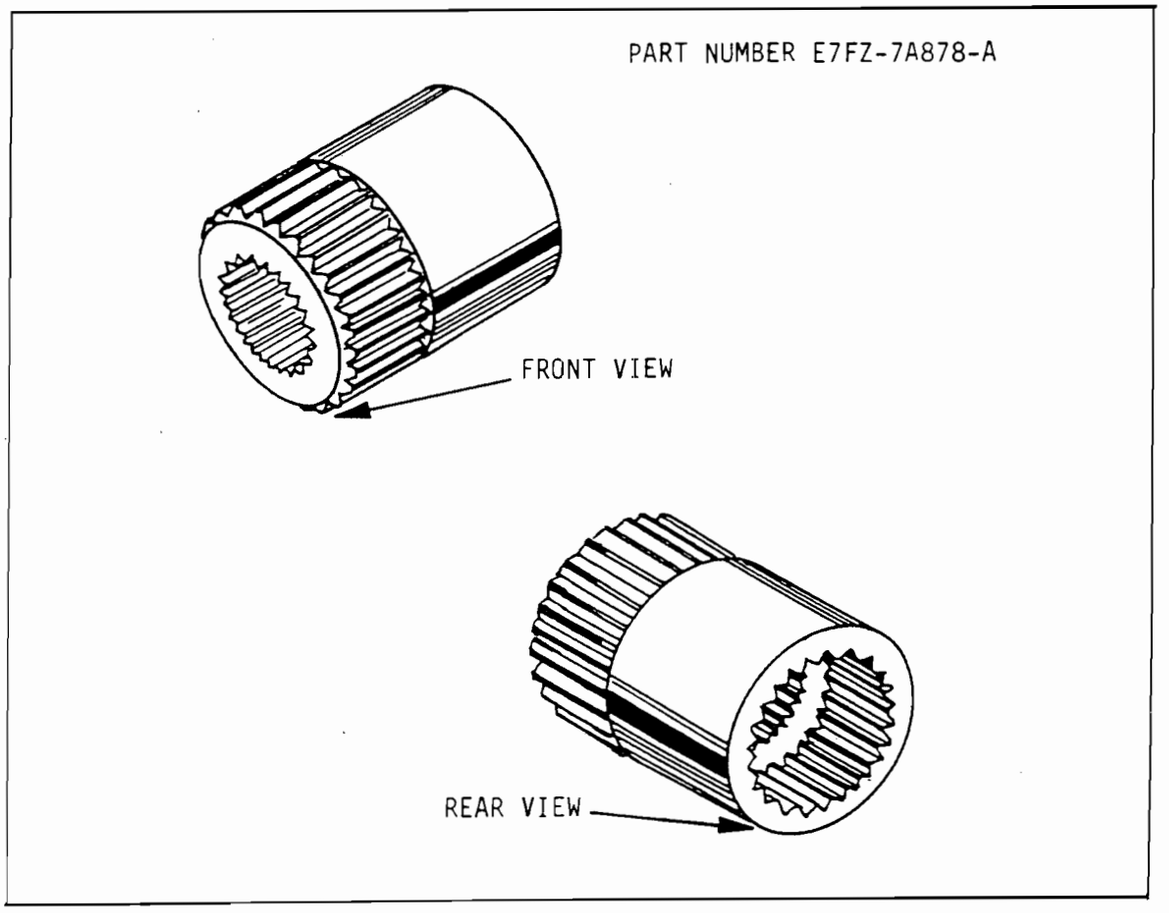


Figure 1

Remove Converter Turbine Sleeve.

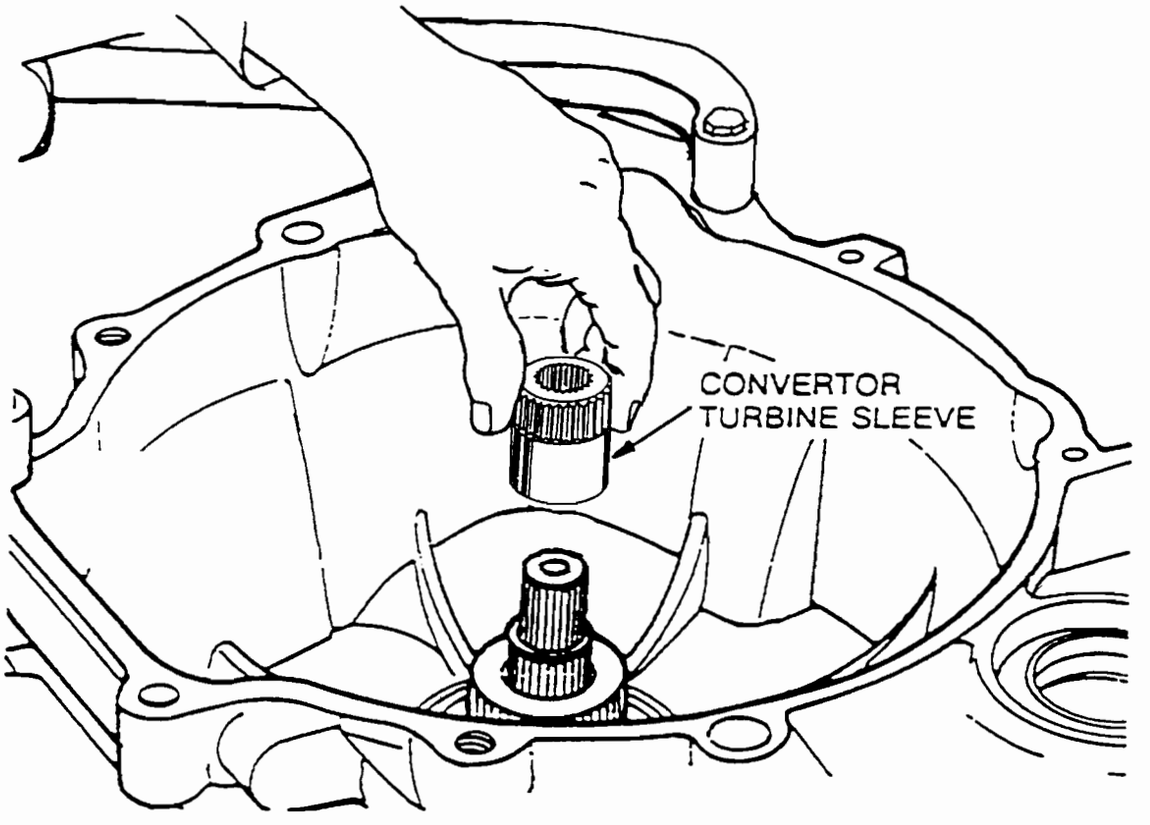


Figure 2

ATX

TRANSMISSION – AUTOMATIC TRANSAXLE – SENSITIVE 3-2 DOWNSHIFT, 3-2, 2-3 "HUNTING"

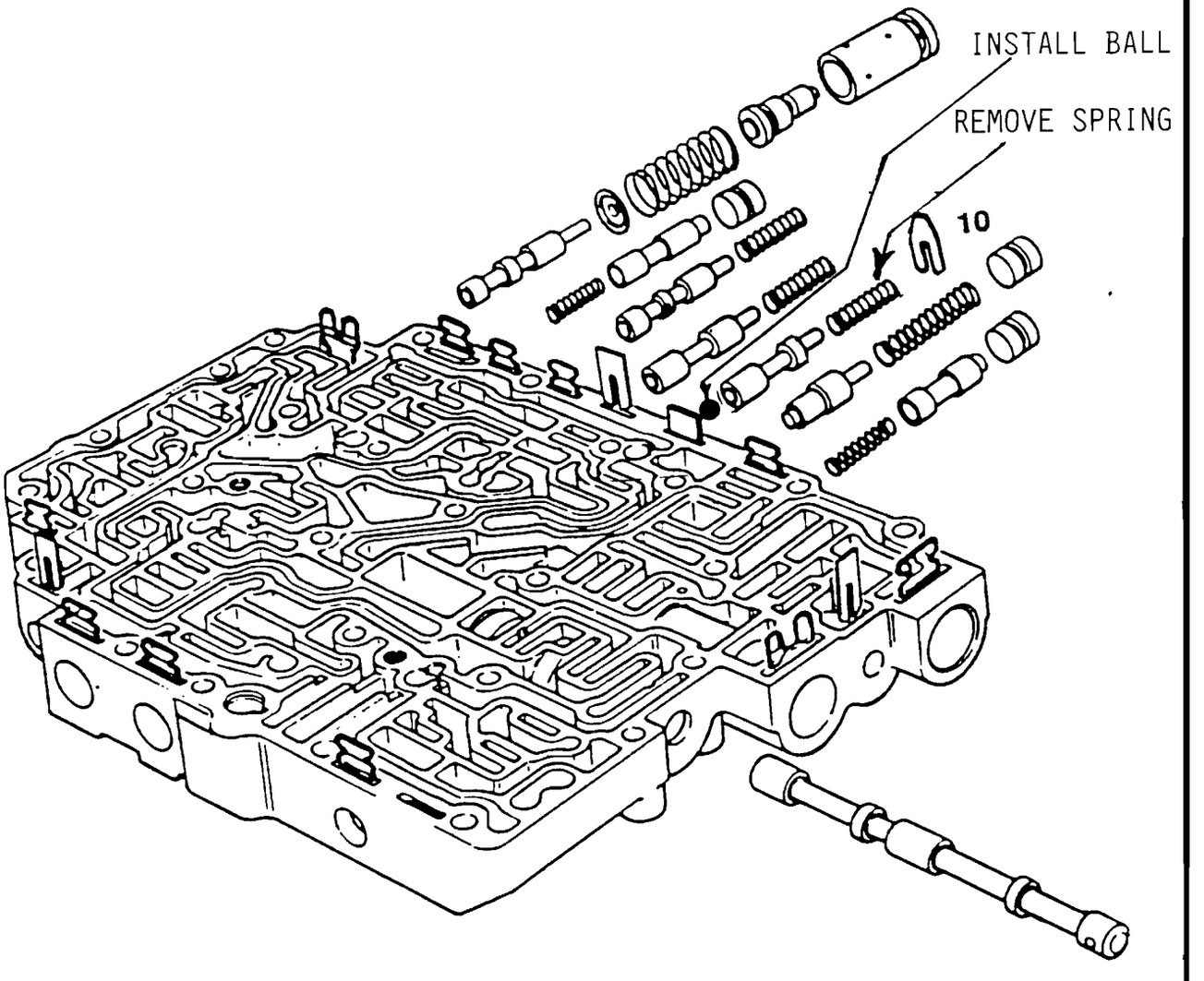
This article revises, supersedes and cancels the service procedure in TSB 83-19-11 for customer concerns of 3-2 torque demand sensitivity and 3-2, 2-3 shift "hunting".

Main control assembly (7A100) removal, disassembly/assembly, as well as location of 3-2 Control Valve with procedural steps for the removal of the individual valve components are described in Section 17-25 of the Tempo/Topaz Car Shop Manual.

Revised assembly of the 3-2 control valve is as follows:

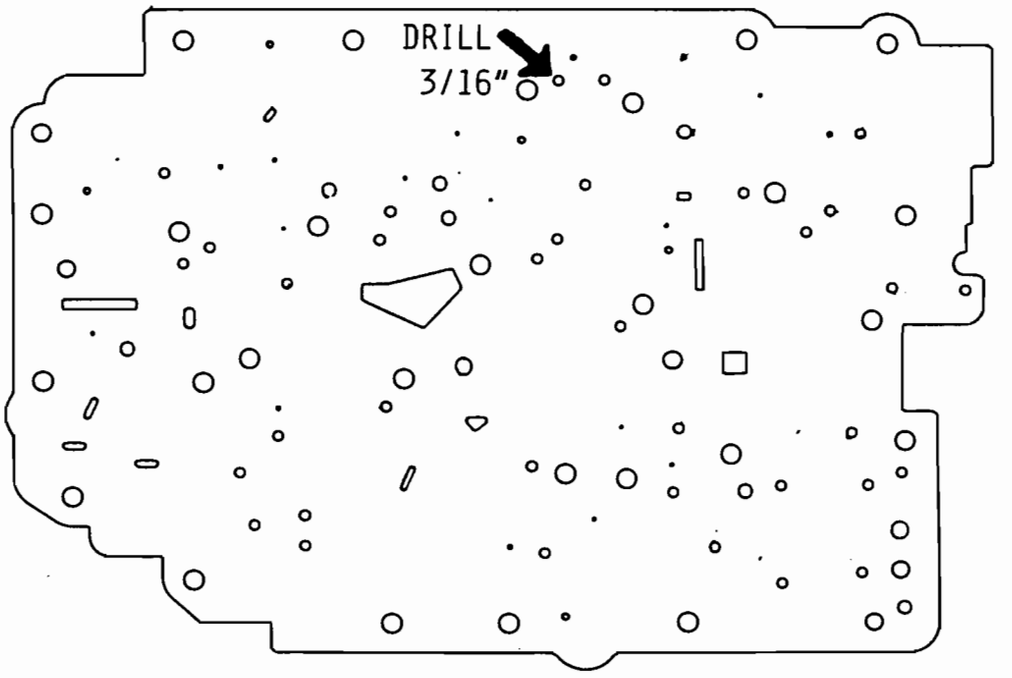
1. Remove main control assembly and disassemble.
2. Locate and remove 3-2 control valve components (Ref: Car Shop Manual, Section 17-25, Page 92).
3. Discard spring (Yellow or Purple).
4. Install check ball E0AZ-7E195-B at bottom of bore.
5. Replace 3-2 control valve with main control (DO NOT INSTALL SPRING) and install retainer.
6. Assemble and install main control assembly.

PART NUMBER	PART NAME
E0AZ-7E195 B	Check Ball



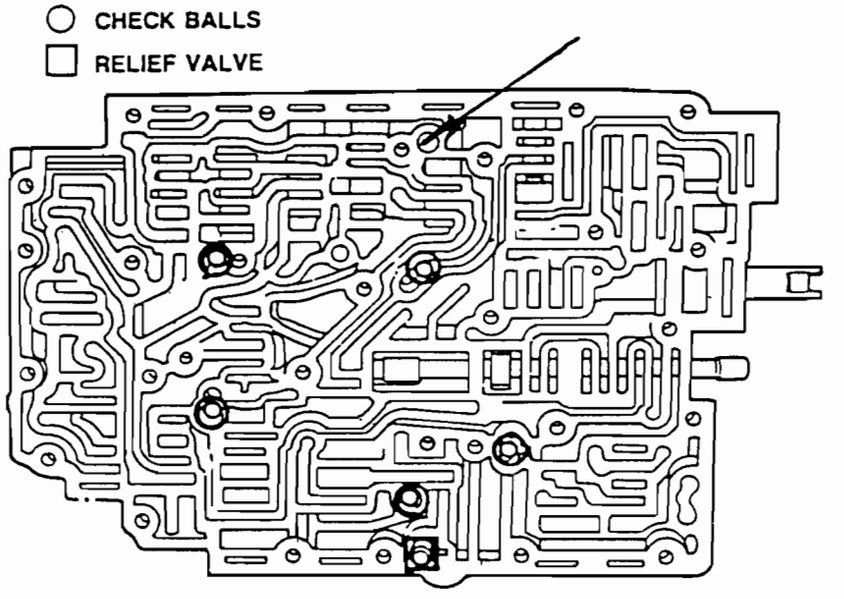
10-3-2 CONTROL VALVE

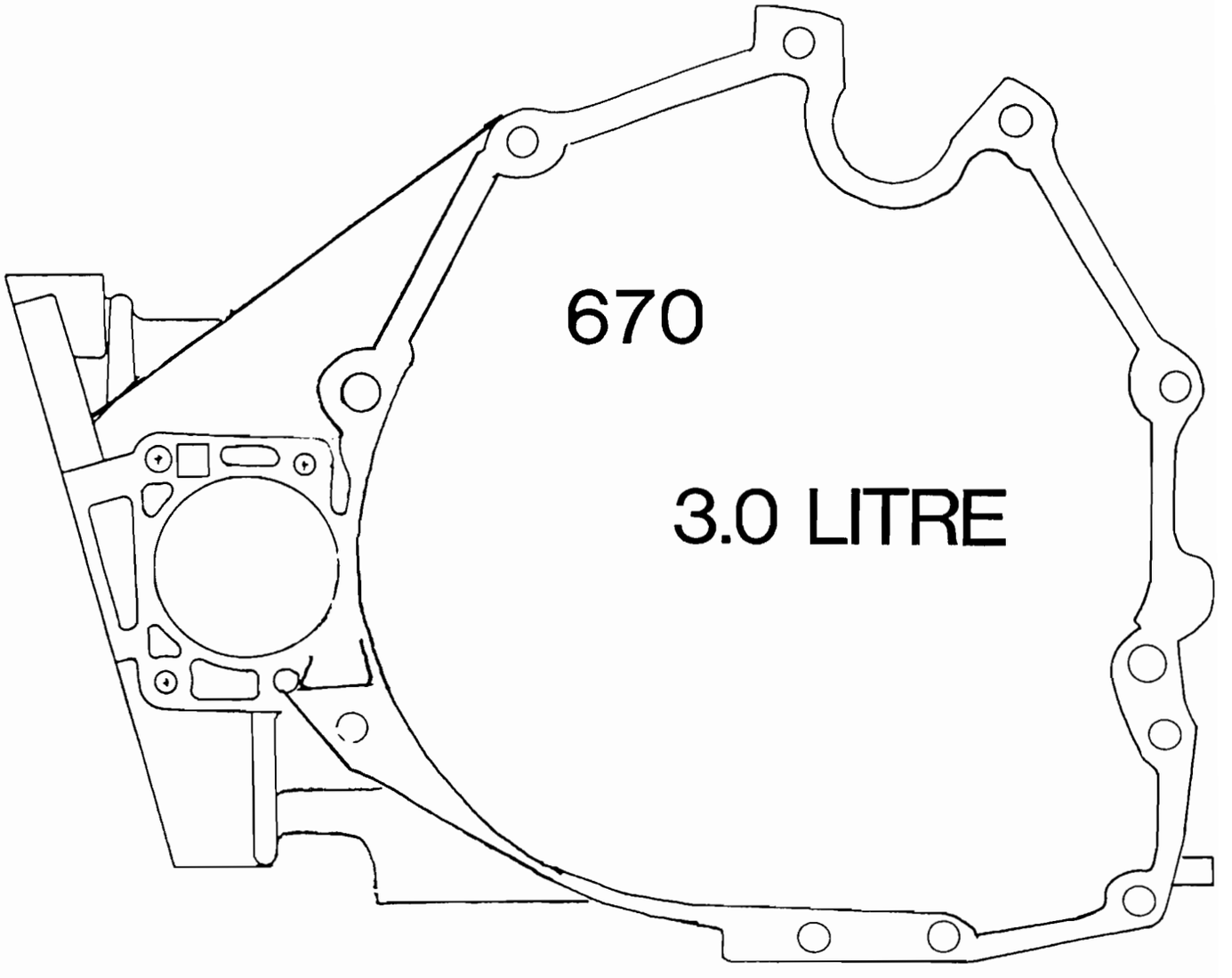
ATX



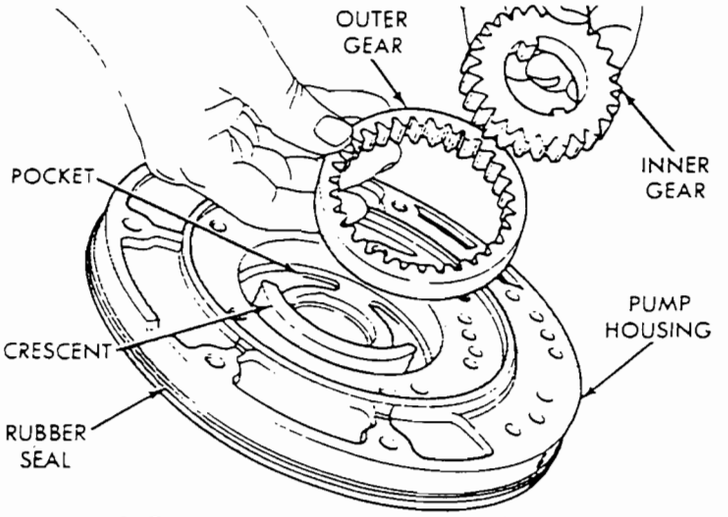
Assembly

check balls and relief valve.

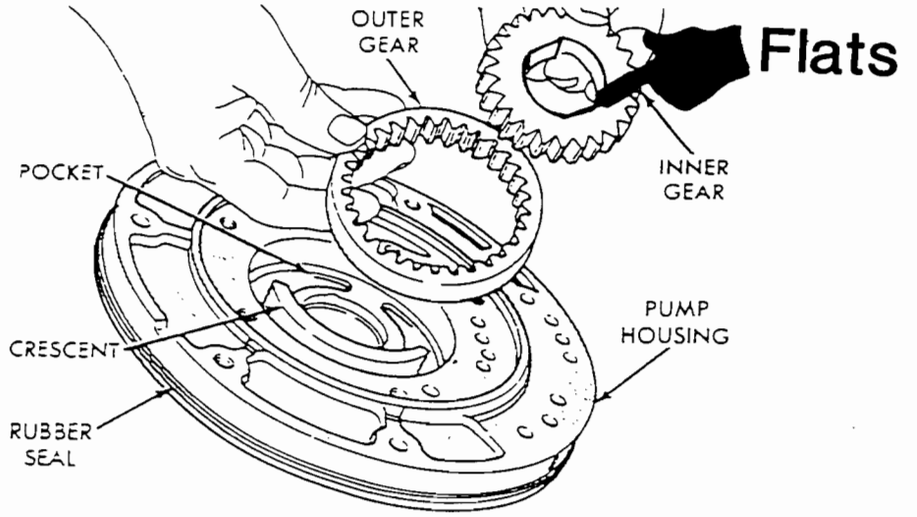



670
3.0 LITRE

PUMP CHANGE



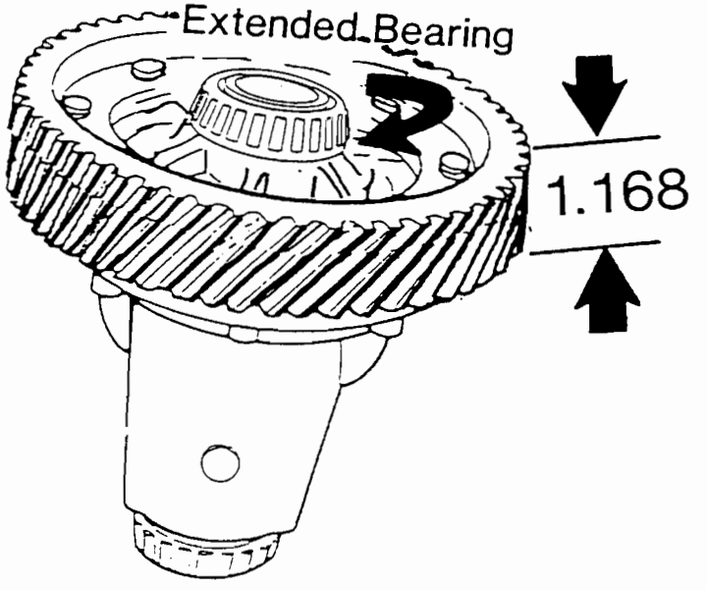
1978–85 Lug Type



1986–88 Flats Type

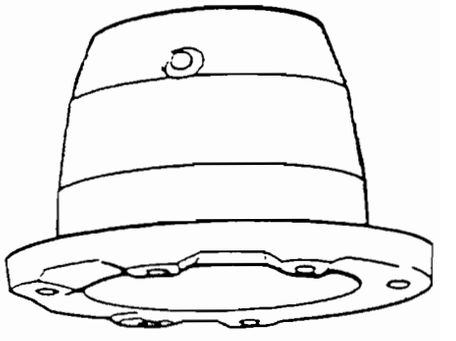
Converter Change–Slot to Flats

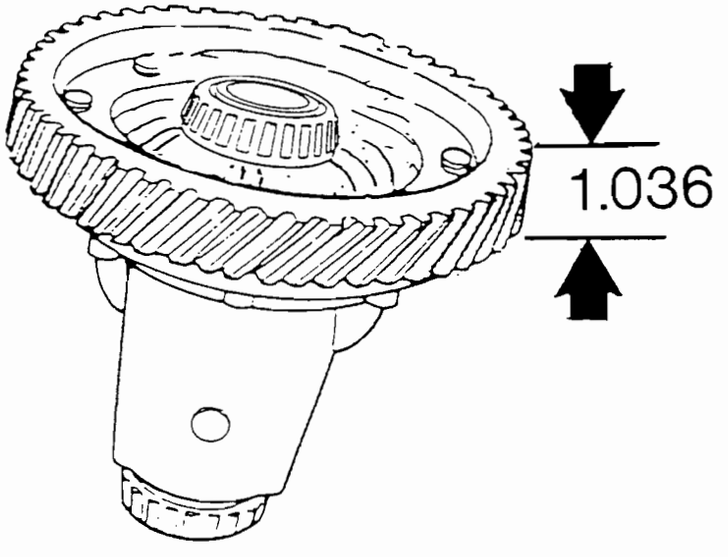
Final Drive & Bearing Support



1987–88

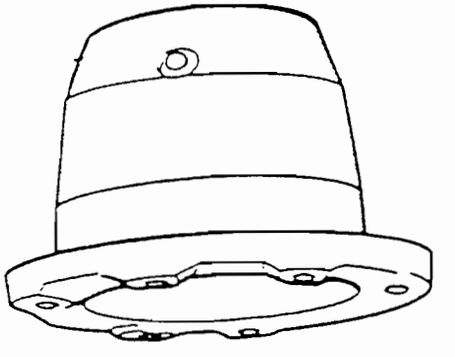
Late–Shorter



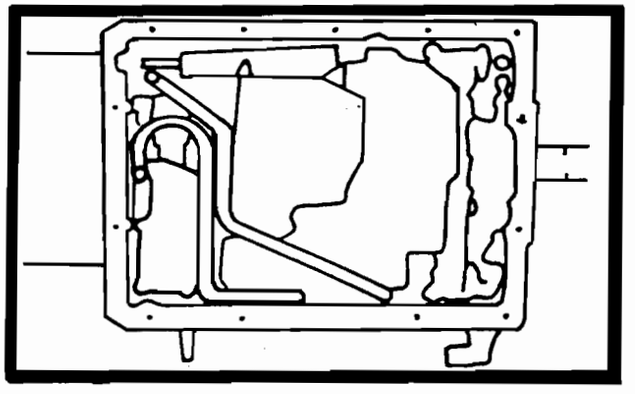


1983–86

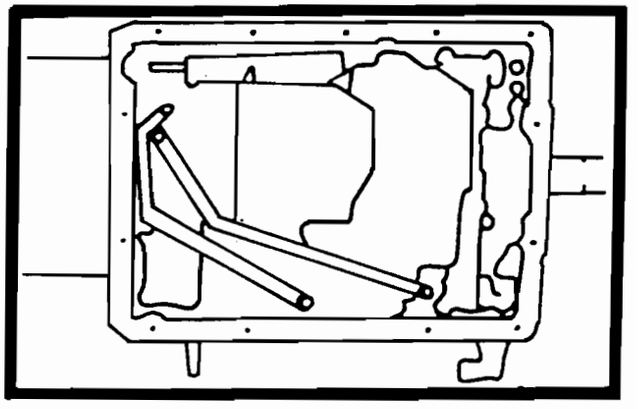
Early–Taller



A40D SERIES IDENTIFICATION

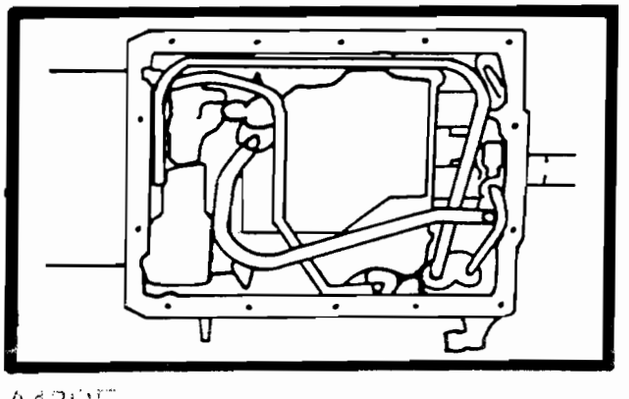


A43DL

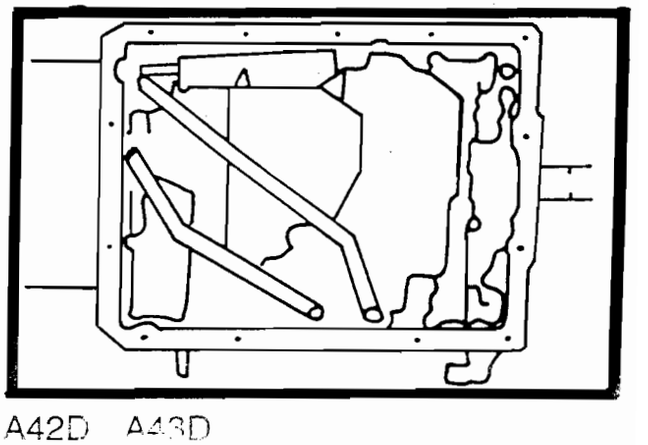


A40D

ID NUMBER	TRANSMISSION
03-50	A40D
03-51	A40D
03-55	A40
03-56	A40
03-60	A40D
03-70	A42D
03-71	A43D
03-71L	A43DL
03-71LE	A43DE



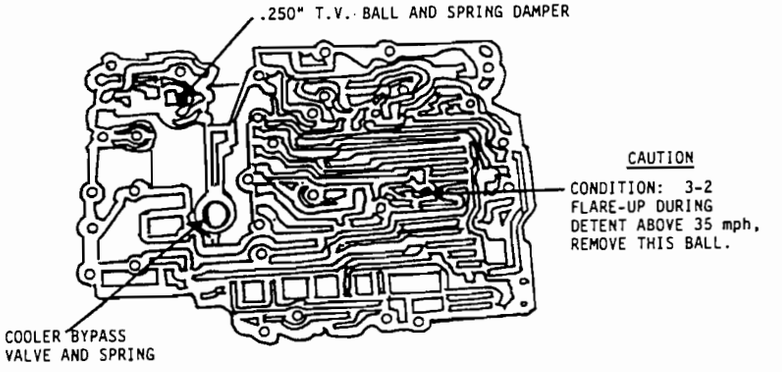
A43DE



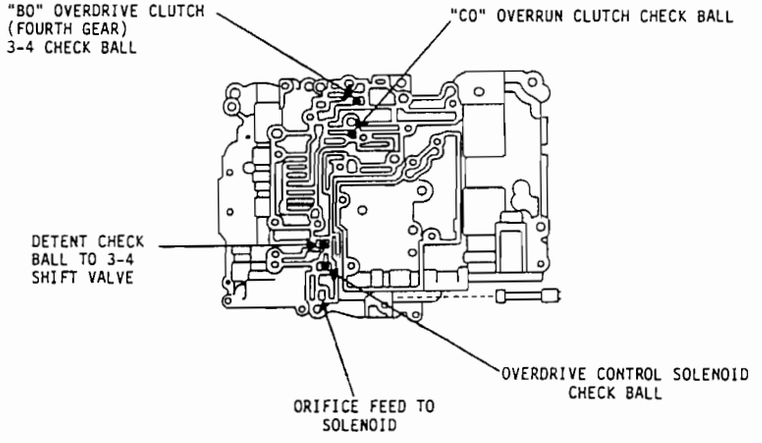
A42D A43D

A40D TOYOTA REAR DRIVE VALVE BODY

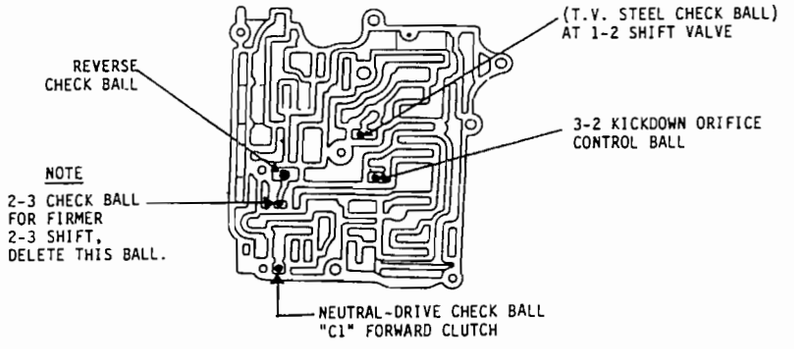
LOWER VALVE BODY
(Top view)



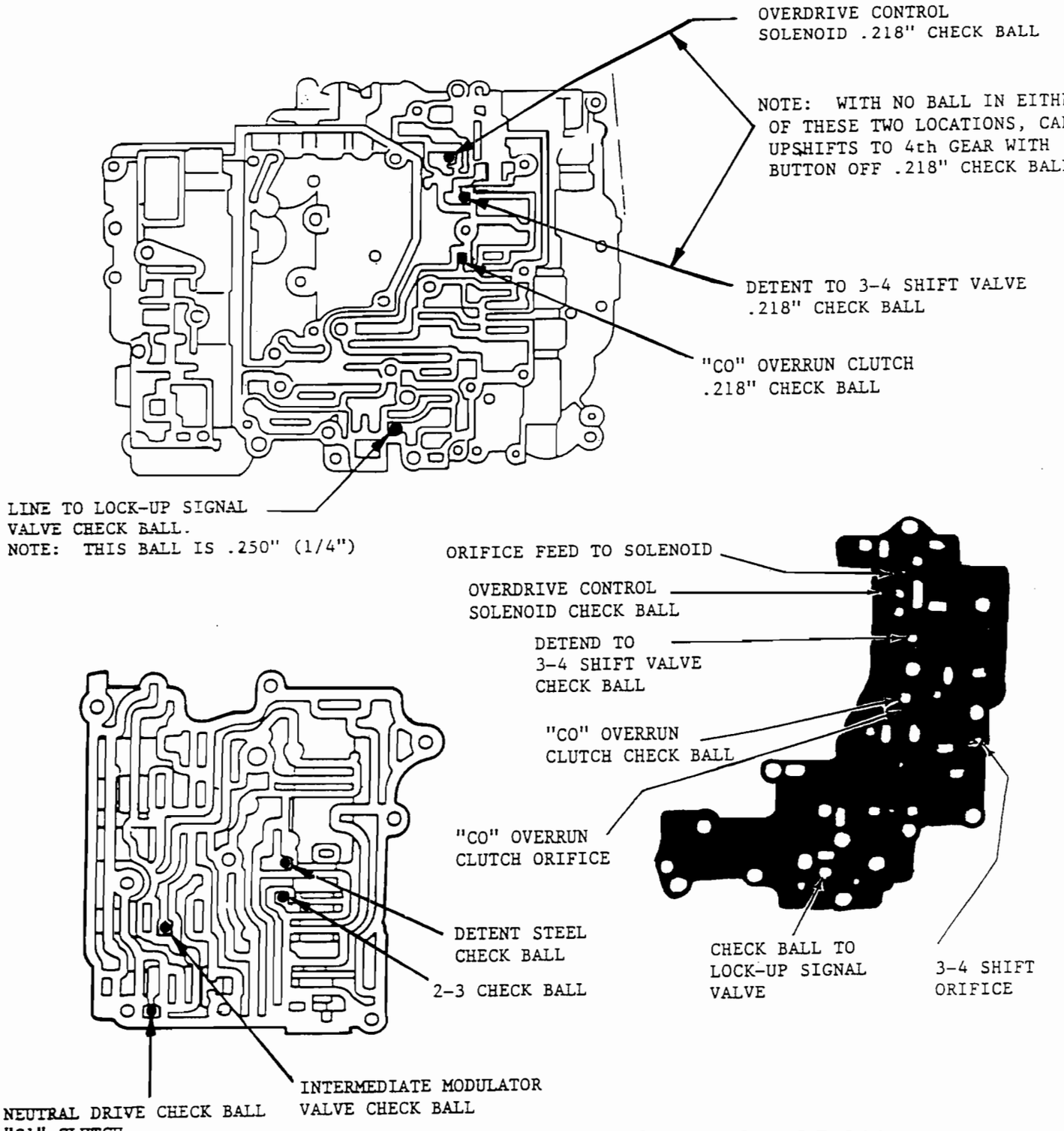
LOWER VALVE BODY
(Bottom view)



REAR UPPER VALVE BODY



A43DL AND A44DL VALVE BODY

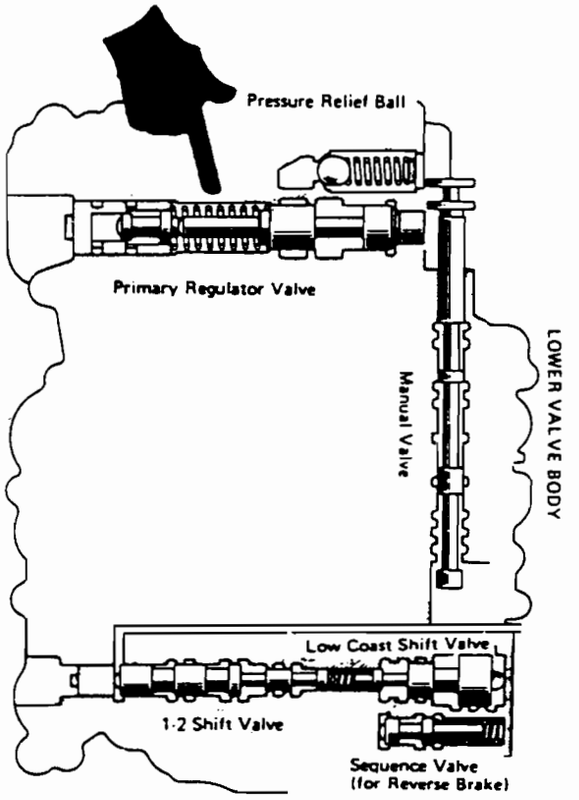


A43D/A43DE
HARSH 1-2 SHIFT

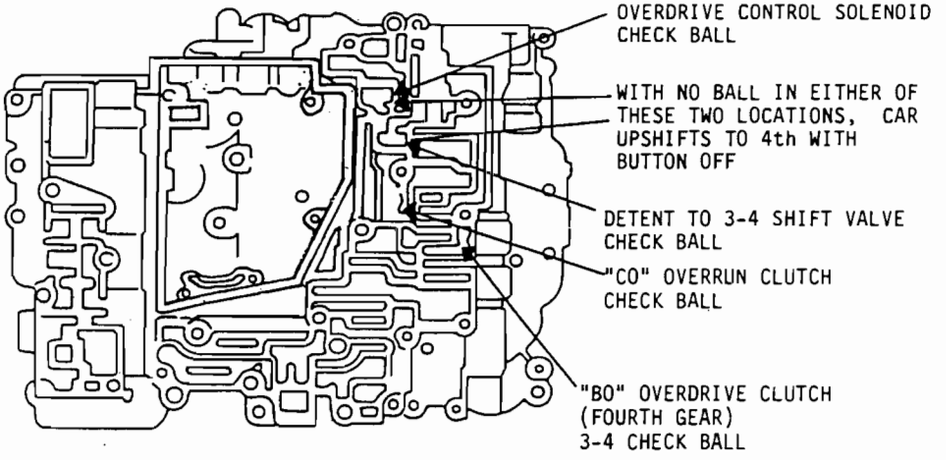
COMPLAINT: Harsh 1-2 shift.

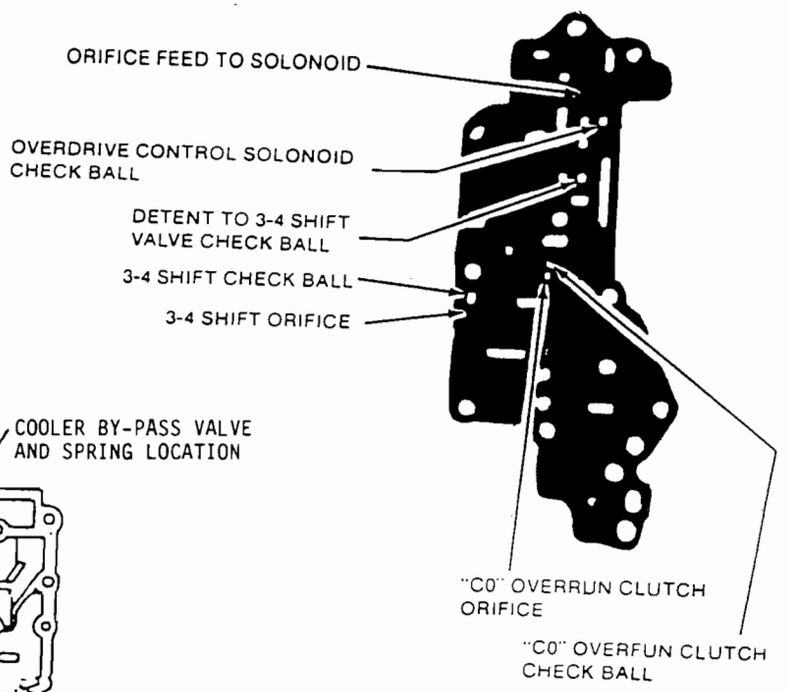
CAUSE: Missing or mis-positioned check ball. High line pressure.

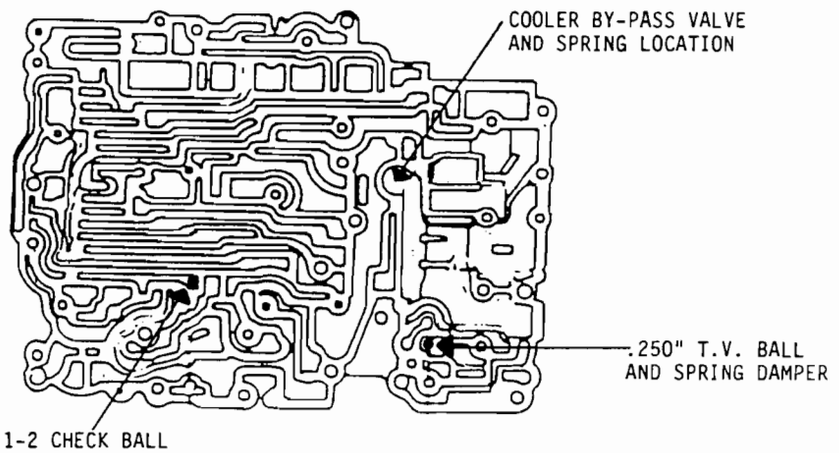
CORRECTION: Install check-ball in proper location or replace Primary Valve Spring with a new spring, part # 90501-18028.



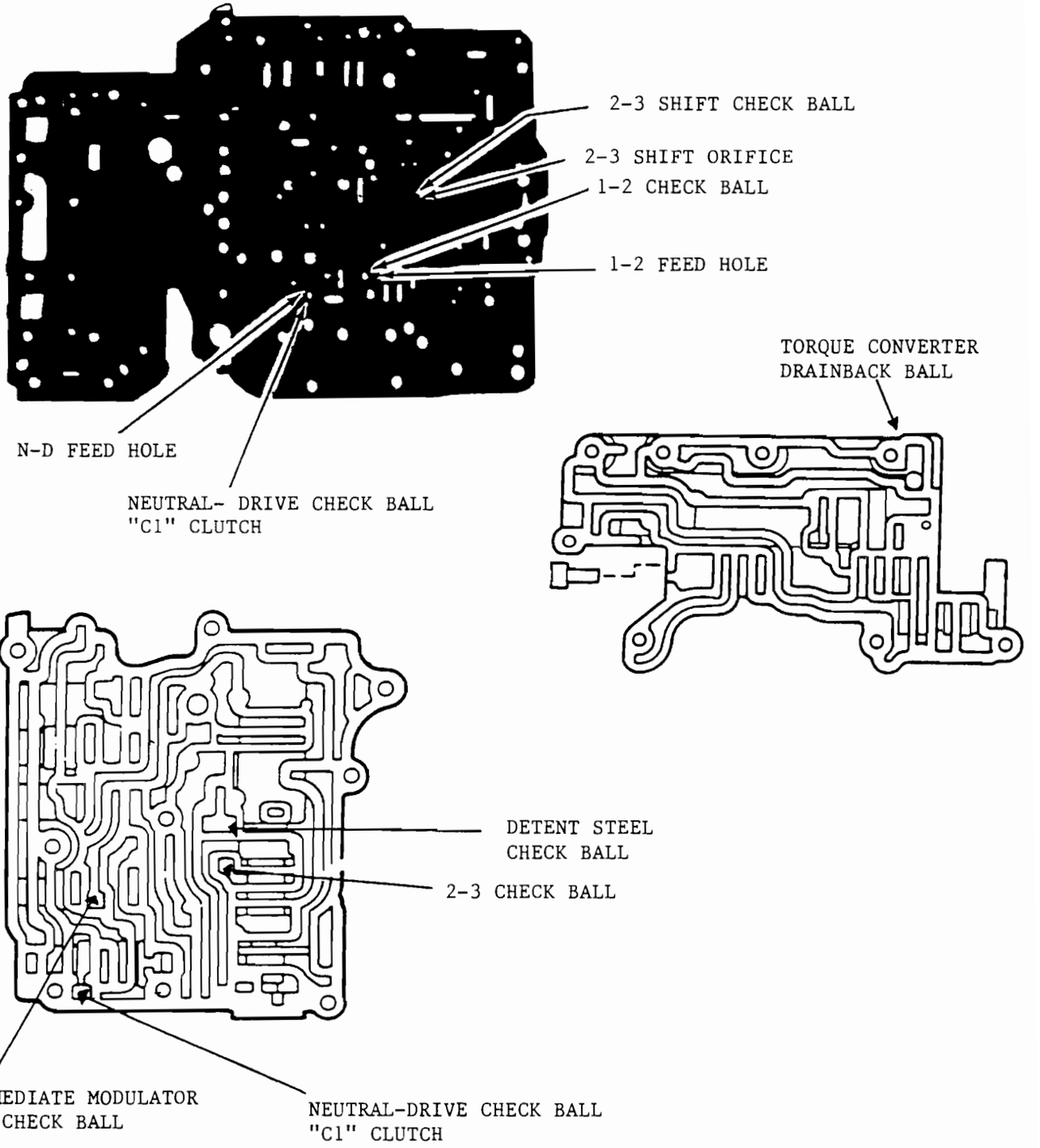
A43D REAR DRIVE
A42D VALVE BODY





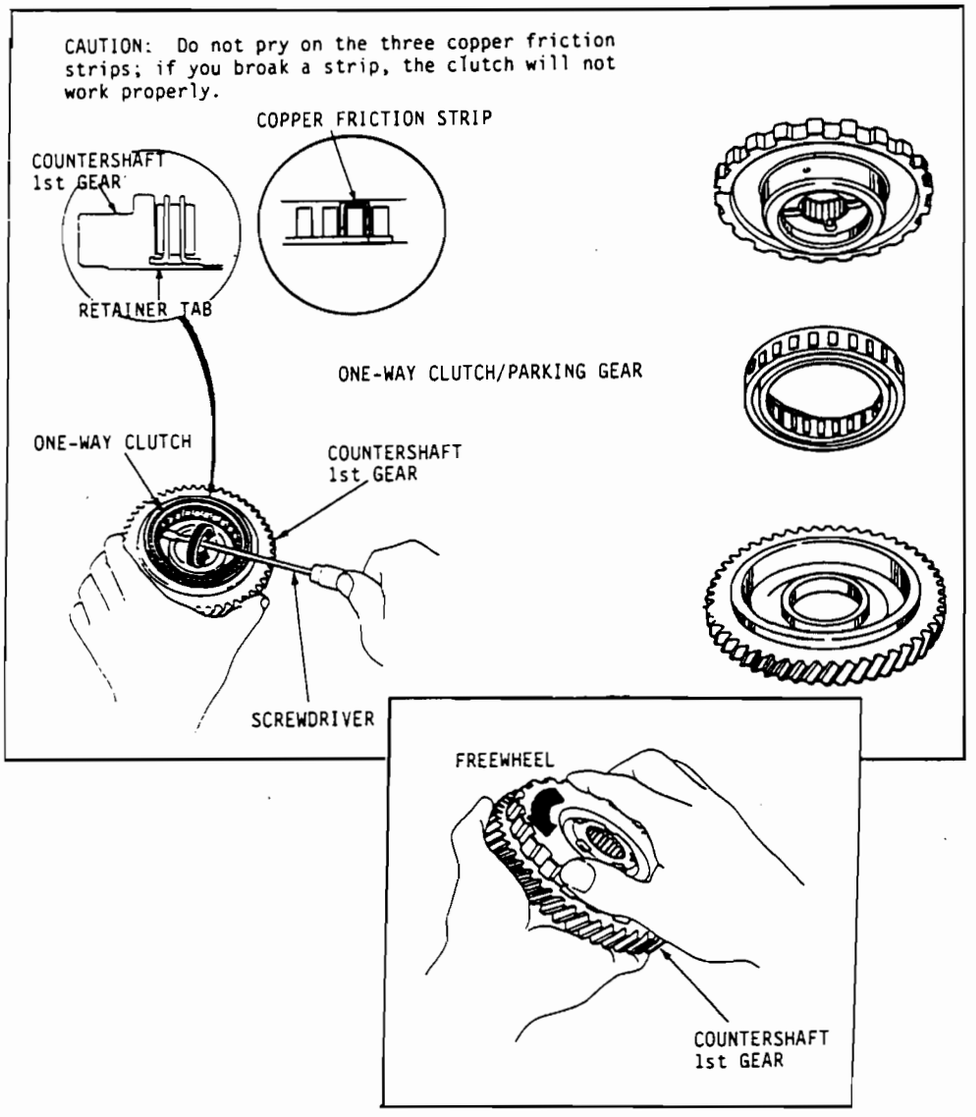


A43D REAR DRIVE
A42D VALVE BODY

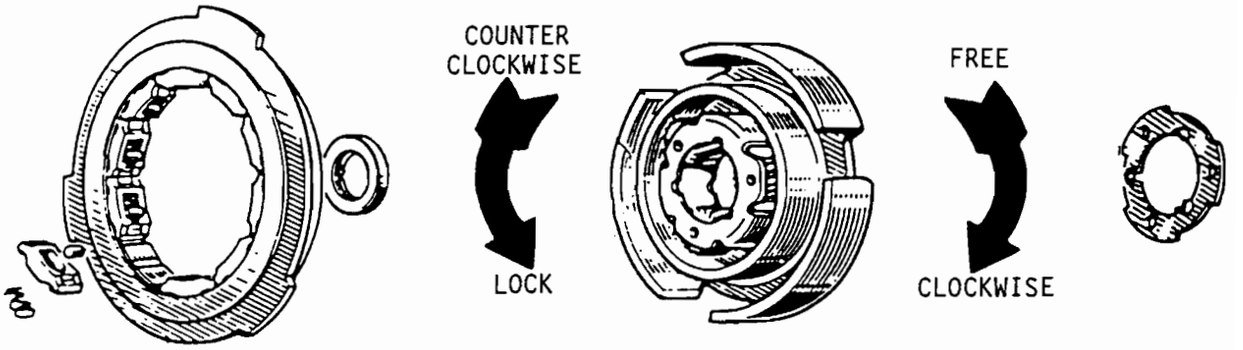


HONDA FOUR SPEED
PROPER SPRAG INSTALLATION

This bulletin purpose is to show the technician the proper sprag installation. Figure 1 shows freewheel counter clockwise, locks clockwise.

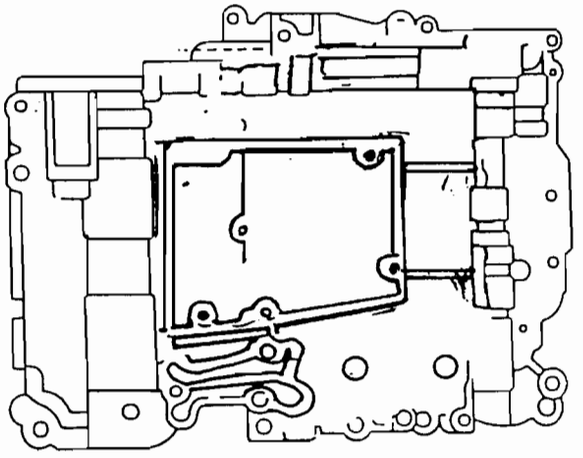


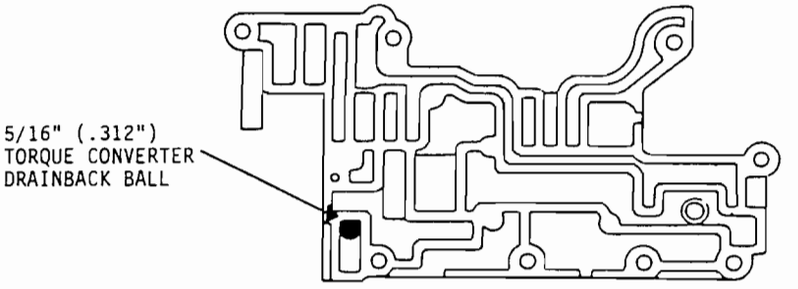
MB1-MJ3
SPRAG ROTATION

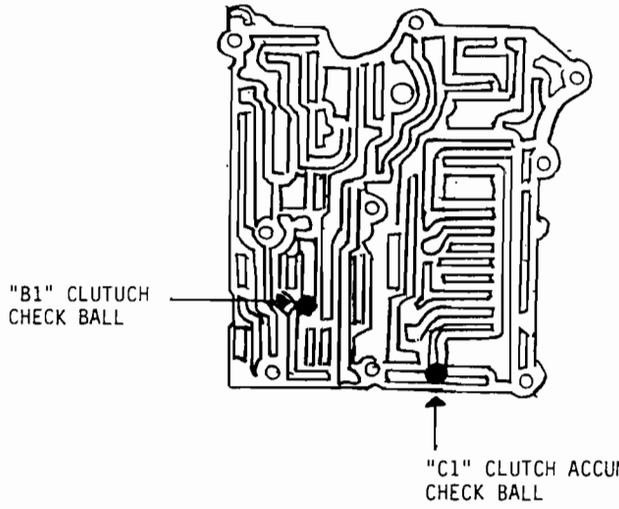


For proper sprag rotation, it should lock counter clockwise and freewheel clockwise.

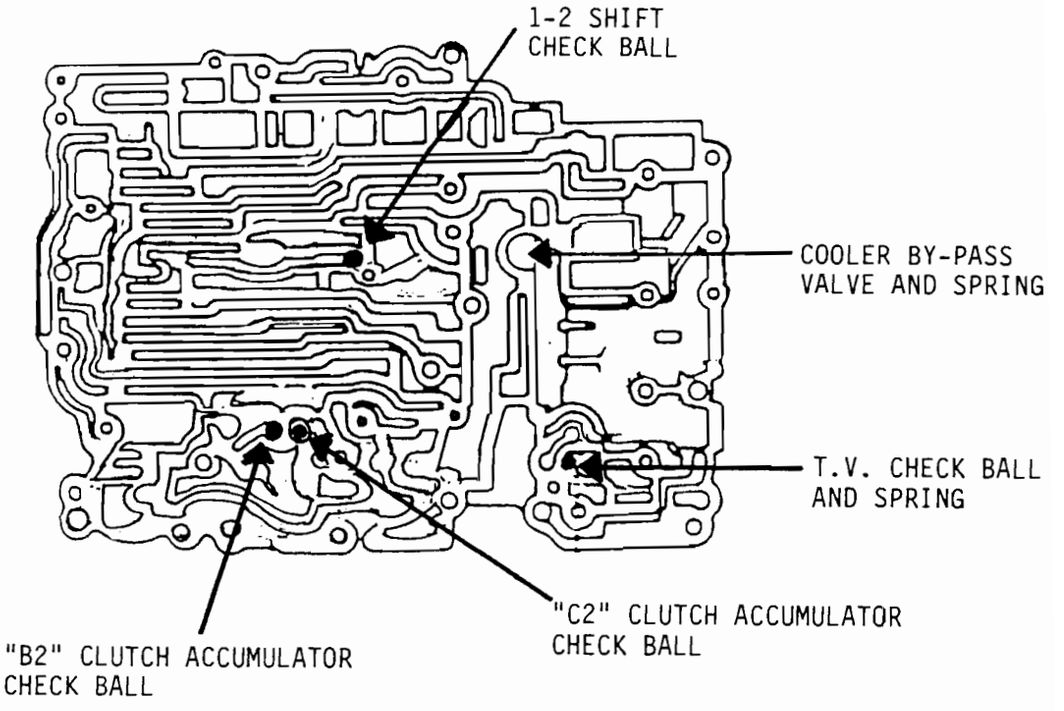
BW55 REAR DRIVE VALVE BODY

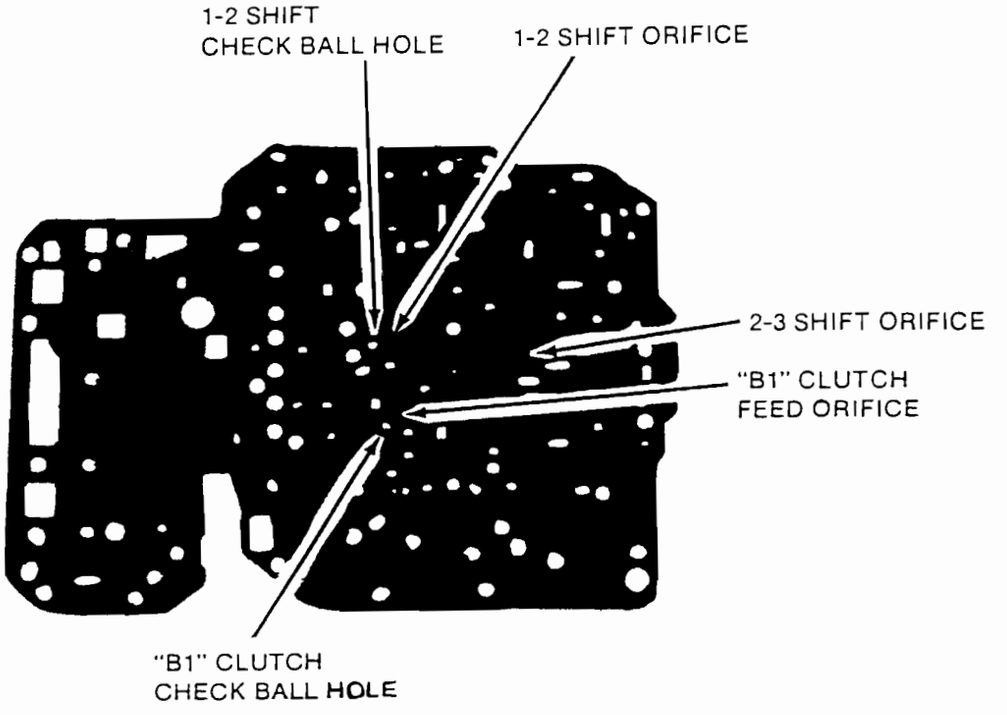






BW55 REAR DRIVE VALVE BODY





TOYOTA A130/A140
PROPER SPRAG INSTALLATION

The Toyota A130 has two sprags: No. 1 (Figure 1) and No. 2 (Figure 2). The Toyota A140 has three sprags. No. 1 and No. 2 are the same as the A130. The overdrive sprag, Figure 3, is found in the A140.

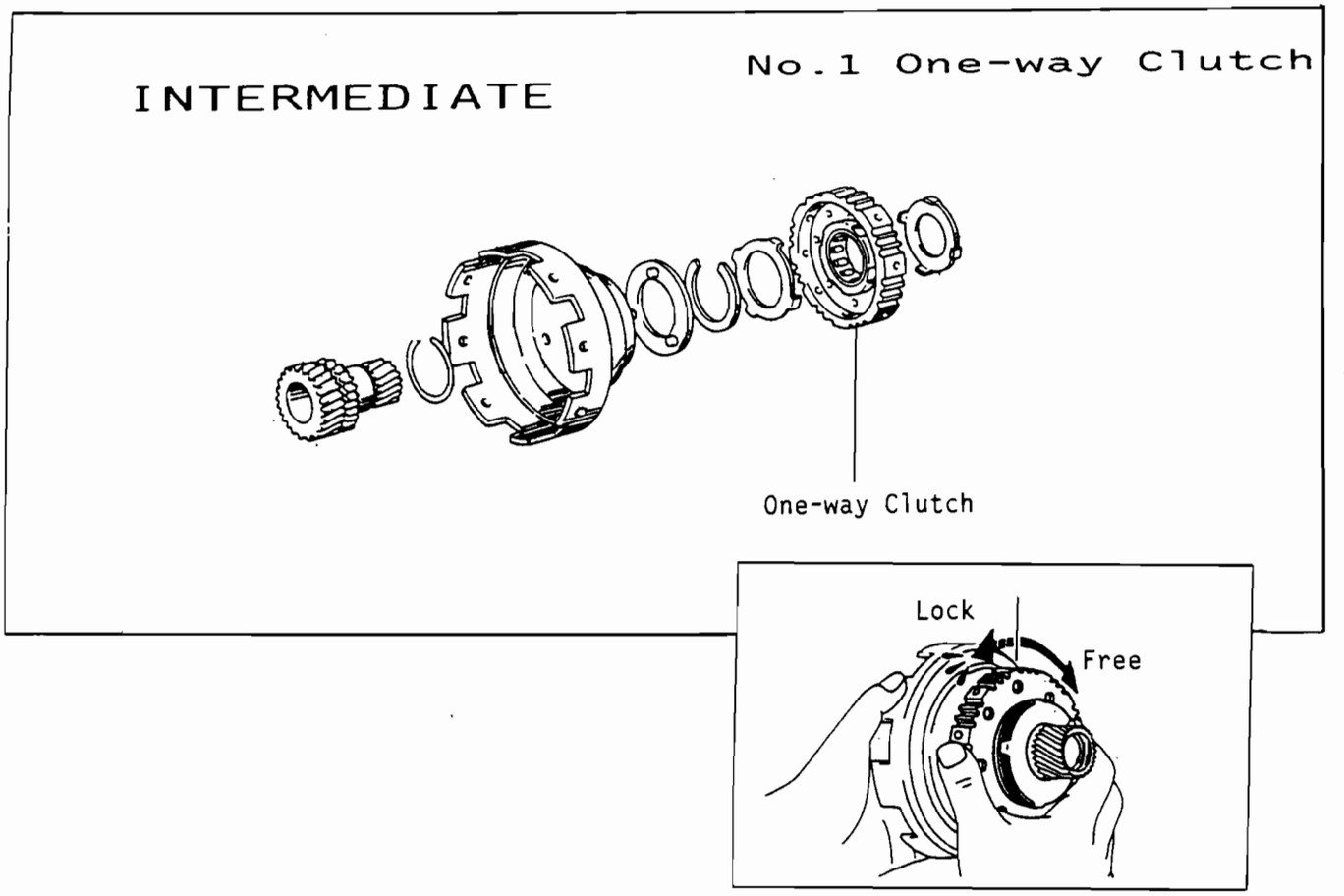
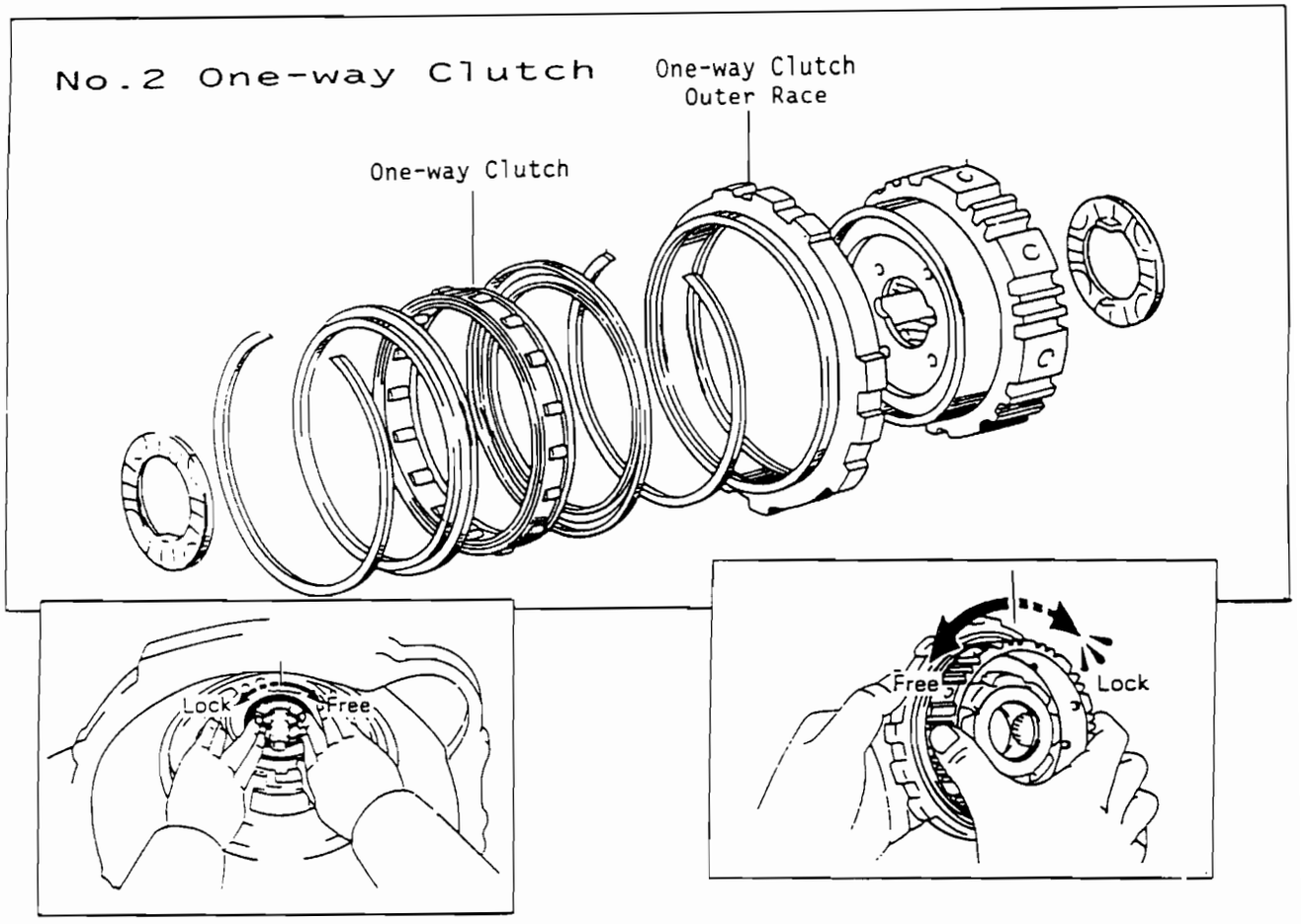


FIGURE 1

TOYOTA A130/A140
PROPER SPRAG INSTALLATION



Install No.2 One-way clutch into case with shiny side upward.

FIGURE 2

TOYOTA A140 O.D. SPRAG

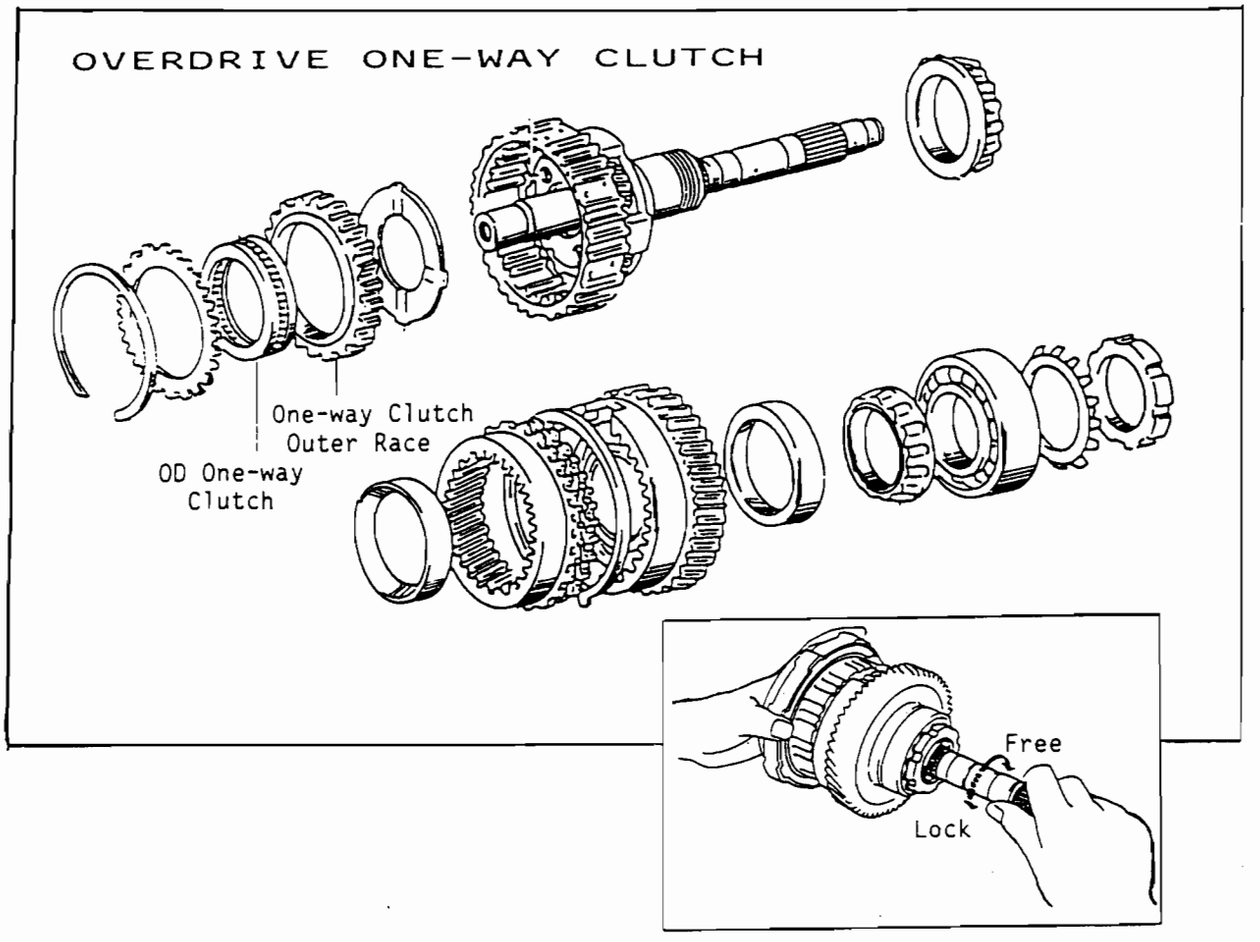
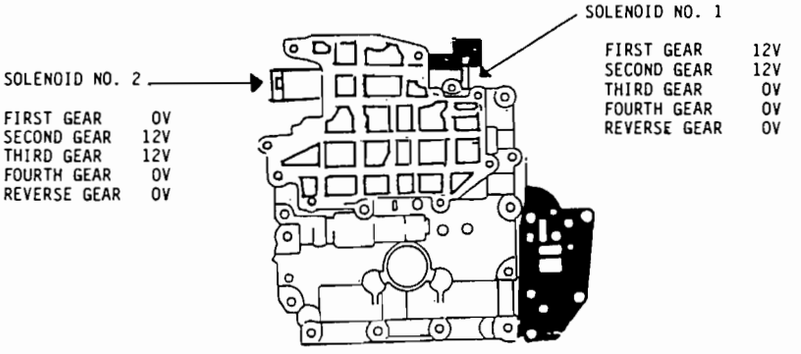


FIGURE 3

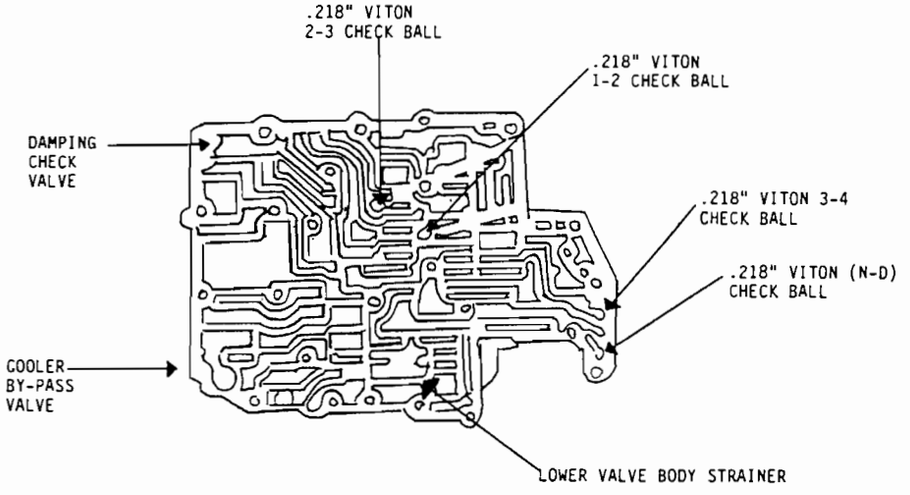
TOYOTA FRONT WHEEL DRIVE VALVE BODY

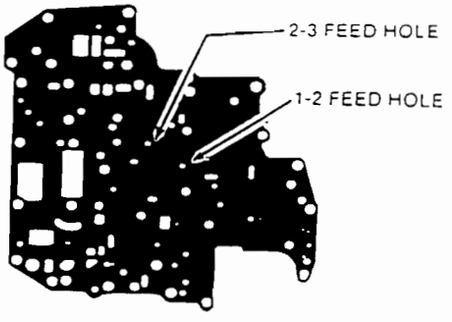
A130, A131 w/o SOLENOIDS
A140, A141 w/o SOLENOIDS



CAUTION: WHEN AIR CHECKING SOLENOIDS, THEY MUST HOLD 70 PSI WITH NO VOLTAGE.

LOWER VALVE BODY CHANNEL CASTING CHECK BALL LOCATIONS



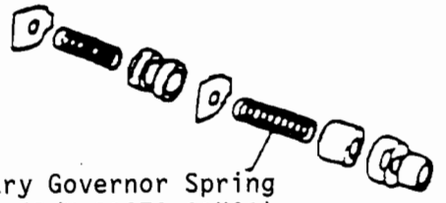


MAIN SEPARATOR PLATE

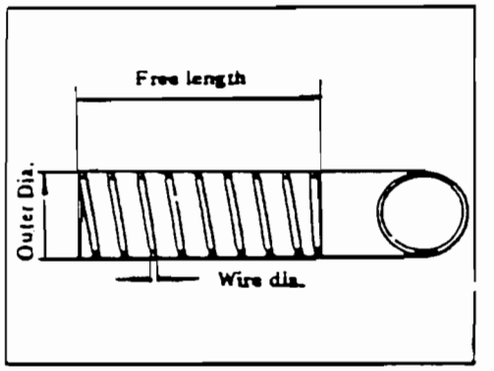
RL3F01A
STANZA MODELS

COMPLAINT: Stanza models exhibit a 3-2 down shift clunk.

CORRECTION: Install new Secondary Governor Spring, part # 31873-01X01



Secondary Governor Spring
(P/N 31873-01X01)



Governor valve spring chart

SPRING P/N	FREE LENGTH MM (IN)	WIRE DIA. MM (IN)	OUTER COIL DIA. MM (IN)
Former-31873-01X00	38.2 (1.504)	0.8 (0.031)	10.8 (0.425)
New -31873-01X01	41.0 (1.614)	0.8 (0.031)	10.8 (0.425)

RL3F01A
1982-1983 STANZA/SENTRA

COMPLAINT: Engine flare on 1-2 and 2-3 shifts with the transmission in the drive range.

CAUSE: A broken back-up valve retaining plate.

CORRECTION: Install a new plate, part # 31748-01X01

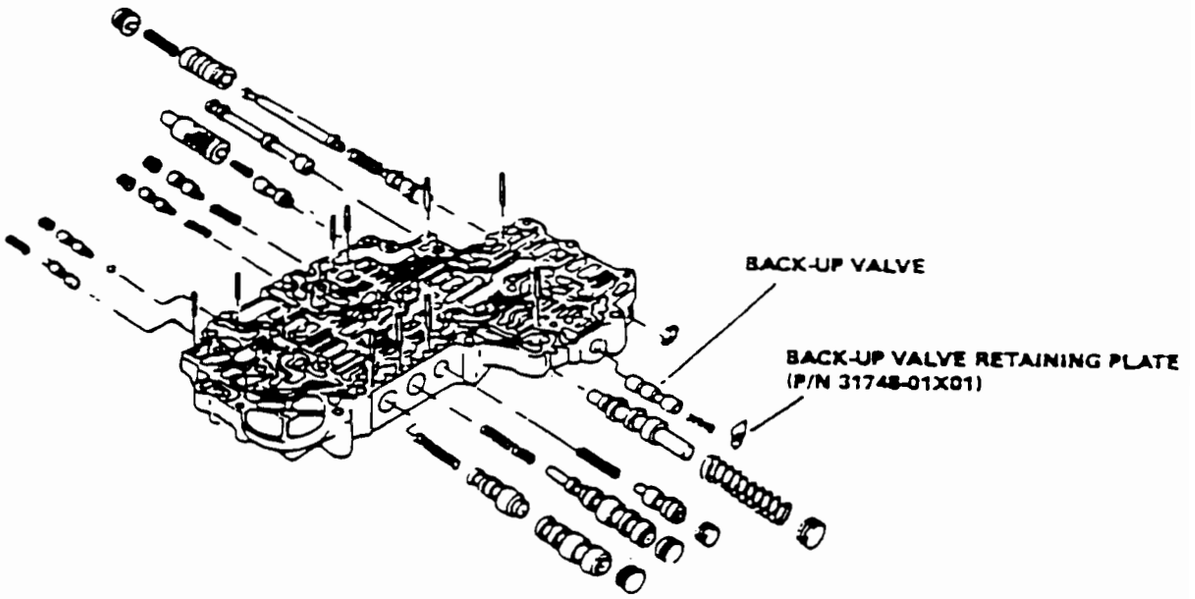


FIGURE 1

Part Name	Part Number	
	New	Former
Back-up valve retaining plate	31748-01X01	31748-01X00

– NOTES –