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AUTOMATIC TRANSMISSION SERVICE GROUP

REVISED EDITION

INTRODUCTION

Since the introduction of the THM 440-T4 Transaxle in April, 1984, there have been many major engineering design changes. These changes have affected nearly every part used in the THM 440-T4. This Update Handbook will explain each change, the parts affected by the change, and any parts interchangeability problems created by the change.

The engineering changes covered by this "Update Handbook" are:

1. Rotors, Vanes, and Slides
2. Pump Body Changes
3. Valve Body Changes
4. Valve Body Gasket Changes
5. Channel Plate Changes
6. Accumulator Pin Changes
7. Fourth Clutch Changes
8. Second Clutch Changes
9. Driven Sprocket Support Changes
10. Third Roller Clutch Changes
11. Plastic Lube Dam (Update)
12. Input Sprag Changes
13. Third Clutch Changes
14. Modulator Changes
15. Transaxle Case Changes
16. Governor Cover Changes

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1987 TRANSMISSION APPLICATIONS

PASSENGER CARS BY BODY TYPE

G.M. BODY TYPE	TRANSMISSIONS USED	BUICK	CADILLAC	CHEVROLET	OLDSMOBILE	PONTIAC
A	125C & 440-T4	CENTURY		CELEBRITY	CIERA CUTLESS CRUISER	6000
B	200-4R, 200C & 700-R4	LESABRE ESTATE WAGON		CAPRICE	CUSTOM CRUISER	PARISIENNE
C	440-T4	ELECTRA	DEVILLE FLEETWOOD		98 REGENCY	
D	200-4R		FLEETWOOD BROUGHAM			
E/*K	440-T4	RIVIERA	ELDORADO *SEVILLE		TORONADO	
F	700-R4			CAMARO		FIREBIRD
G**	200C & 200-4R	REGAL		MONTE CARLO	CUTLASS SUPREME	GRAND PRIX
H	440-T4	LE SABRE			DELTA 88	BONNEVILLE
J	125C	SKYHAWK	CIMARRON	CAVALIER	FIRENZA	SUNBIRD
L	125			CORSICA BERETTA		
N	125C	SKYLARK SOMERSET			CALAIS	GRAND AM
P	125C					FIERO
T	180C			CHEVETTE		T1000
V	F-7		ALLANTE			
Y	700-R4			CORVETTE		

**G BODY COMPONENTS ARE SHARED WITH THE CHEVROLET EL CAMINO AND THE GMC CABALLERO

TRUCKS AND BUSES

TRANSMISSION USED	G.M. BODY TYPE				
	C, K 2WD 4X4 STD. PICKUP	G VAN	M SMALL VAN	P FORWARD CONTROL	S, T 2WD 4X4 SMALL PICKUP
400	CHEVY & GMC-PICKUP	CHEVY-BEAUVILLE CHEVY-SPORT VAN GMC-VANDURA GMC-RALLY		CHEVY & GMC STEP VAN & SPECIAL APPLICATIONS	
700-R4	CHEVY & GMC-PICKUP CHEVY-BLAZER GMC-JIMMY CHEVY & GMC-SUBURBAN	CHEVY-BEAUVILLE CHEVY-SPORT VAN GMC-VANDURA GMC-RALLY	GMC SAFARI ASTRO		CHEVY & GMC-PICKUP CHEVY-BLAZER GMC-JIMMY

ROTORS, VANES, AND SLIDES

The THM 440-T4 uses a variable capacity vane type pump to supply the converter, bands, clutches, cooling system, and lube system with the correct oil pressure.

The 440-T4 pump has 5 selective slide sizes, 5 selective rotor sizes, and unlike any other transmission, 3 selective vane sizes. Since there are 5 selective slides, and 5 selective rotors, this obviously makes a possibility of the pump pocket depths being different from one pump body to another. Hydramatic has provided an easy method to identify which size slide and which size rotor a particular pump body was machined for. On the side of the pump body, opposite the 3rd and 4th clutch switchs, will be a two number ink stamp (Example 32). The number closest to the machined surface towards the valve body, will indicate the size of the slide, and the following number will indicate the size of the rotor (See Figure 1). In the example used, we have a No. 3 slide, and a No. 2 rotor.

Refer to the chart in Figure 3 and you will find the proper part number to order replacement parts. Notice that the slide sizes change in 1986, and create 5 new slide sizes.

It would we wise to note the slide and rotor sizes during the dis-assembly process, or scribe them on the pump body with an engraver, as the ink stamp will wash off going thru your normal cleaning process.

If your ink stamp identification is gone, all you have to do is measure the original slide and rotor thickness accurately using a micrometer. You will have to have a micrometer capable of measuring in tenths of thousands. To obtain the most accurate reading measure on flat, undamaged surfaces (See Figure 2). Using the original part measurement, order replacement parts according to the selective chart in Figure 3.

For vane selection it goes as follows:

No. 1 or No. 2 Rotor	Use No. 1 vanes
No. 3 or No. 4 Rotor	Use No. 2 vanes
No. 5 Rotor	Use No. 3 vanes

Proper vane selection is just as important as proper slide and rotor selection, even though they are only 7 tenths apart. Improper vane selection could result in oil pump damage or erratic line pressure.

Reassemble the oil pump assembly according to Figure 4, and by following the procedures outlined in the service manuals. Be sure to torque everything properly to the factory recommended specifications. This transaxle is not near as forgiving as units in the past, if you elect not to use a torque wrench.

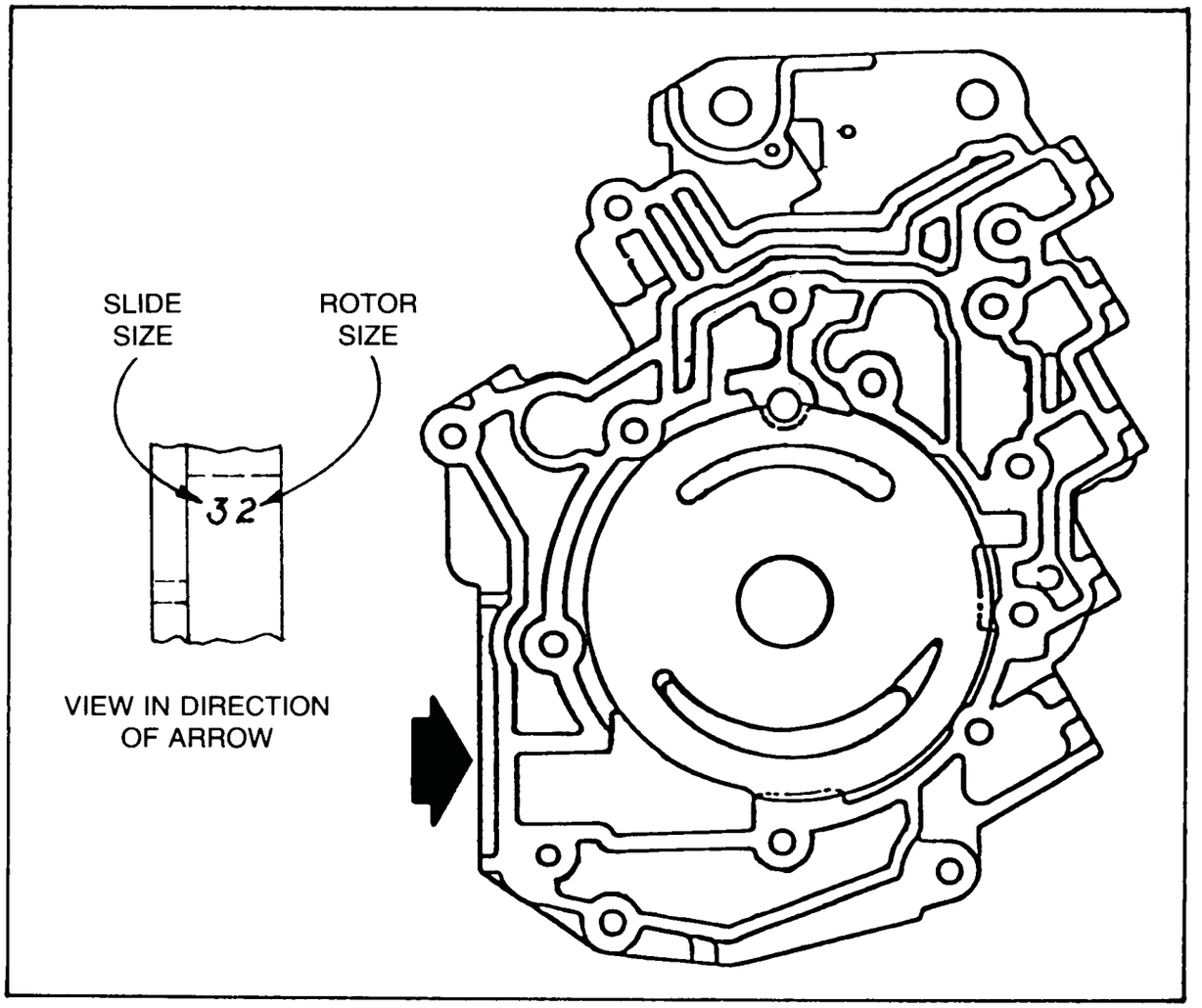


Figure 1

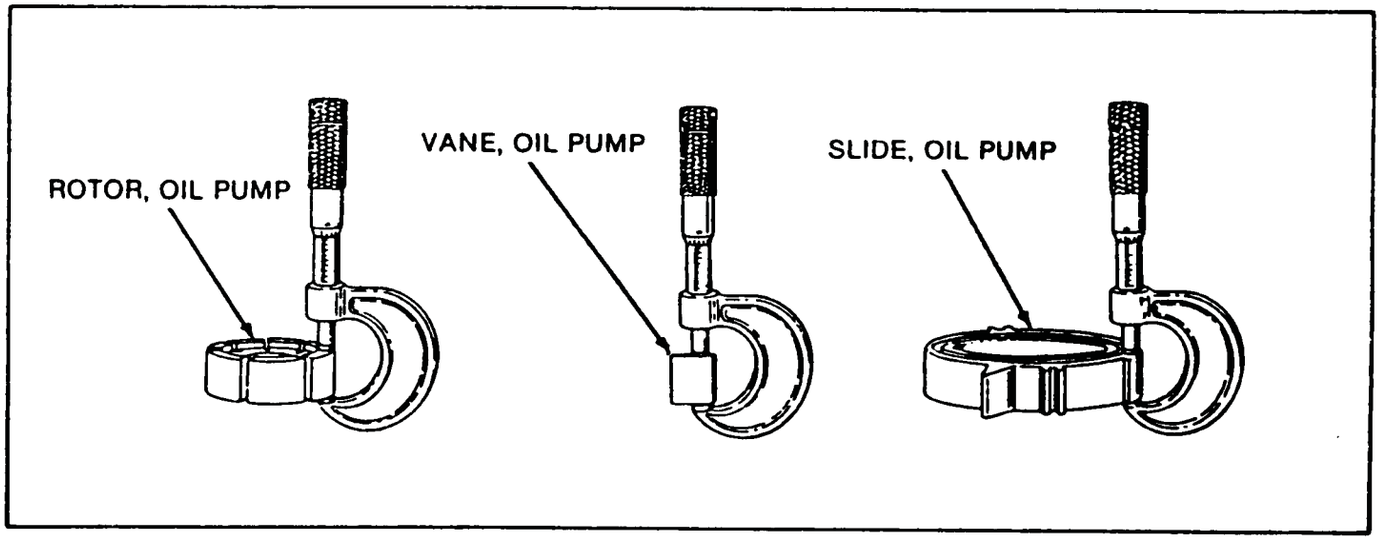


Figure 2

THM 440-T4 PUMP INFORMATION

	OEM PART NO	SIZE	
VANES	8644661	.7064"-.7071"	(Fits No-1 & No-2 Rotors)
	8644662	.7071"-.7078"	(Fits No-3 & No-4 Rotors)
	8644663	.7078"-.7085"	(Fits No-5 Rotors)
ROTORS	8656267	.7068"-.7072"	NO. 1
	8656268	.7072"-.7076"	NO. 2
	8656269	.7076"-.7080"	NO. 3
	8656270	.7080"-.7084"	NO. 4
	8656271	.7084"-.7088"	NO. 5
85-85 1/2 SLIDES	8656272	.7080"-.7084"	NO. 1
	8656273	.7084"-.7088"	NO. 2
	8656274	.7088"-.7092"	NO. 3
	8656275	.7092"-.7096"	NO. 4
	8656276	.7096"-.7100"	NO. 5
1986-1987 *SLIDES	8662133	.7069"-.7073"	NO. 1
	8662134	.7073"-.7077"	NO. 2
	8662135	.7077"-.7081"	NO. 3
	8662136	.7081"-.7085"	NO. 4
	8662137	.7085"-.7089"	NO. 5
1986-1987 **SLIDES	8662371	.7069"-.7073"	NO. 1
	8662372	.7073"-.7077"	NO. 2
	8662373	.7077"-.7081"	NO. 3
	8662374	.7081"-.7085"	NO. 4
	8662375	.7085"-.7089"	NO. 5
PUMP BODY	8658453	1985 1/2	No Thermister
	8658790	1986	No Thermister
	8662385	1987	No Thermister
PUMP BODY	8658454	1985 1/2	With Thermister
	8658789	1986	With Thermister
	8662386	1987	With Thermister

* Made in Japan

** Made in USA

Figure 3

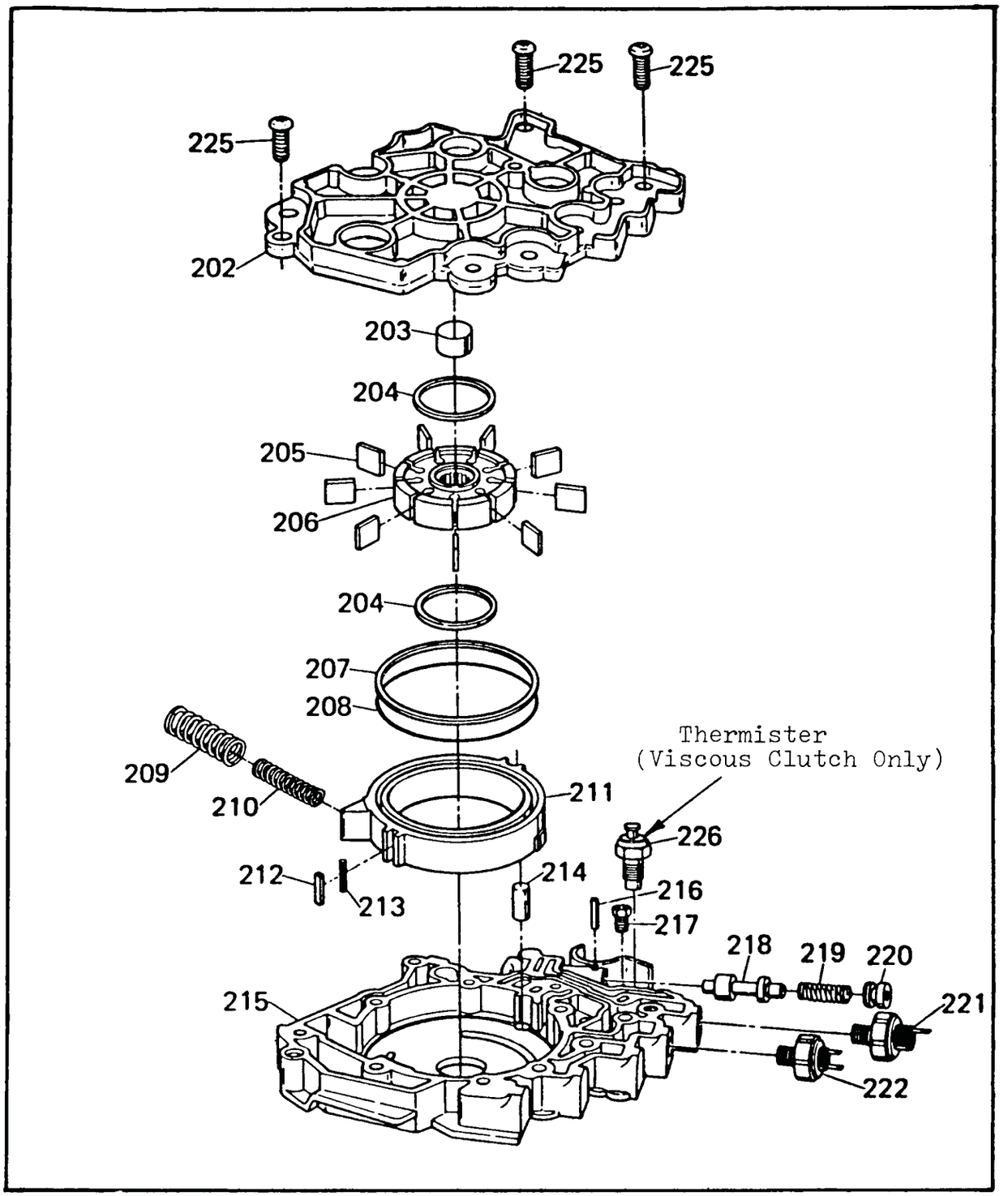


Figure 4

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 .001" 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.

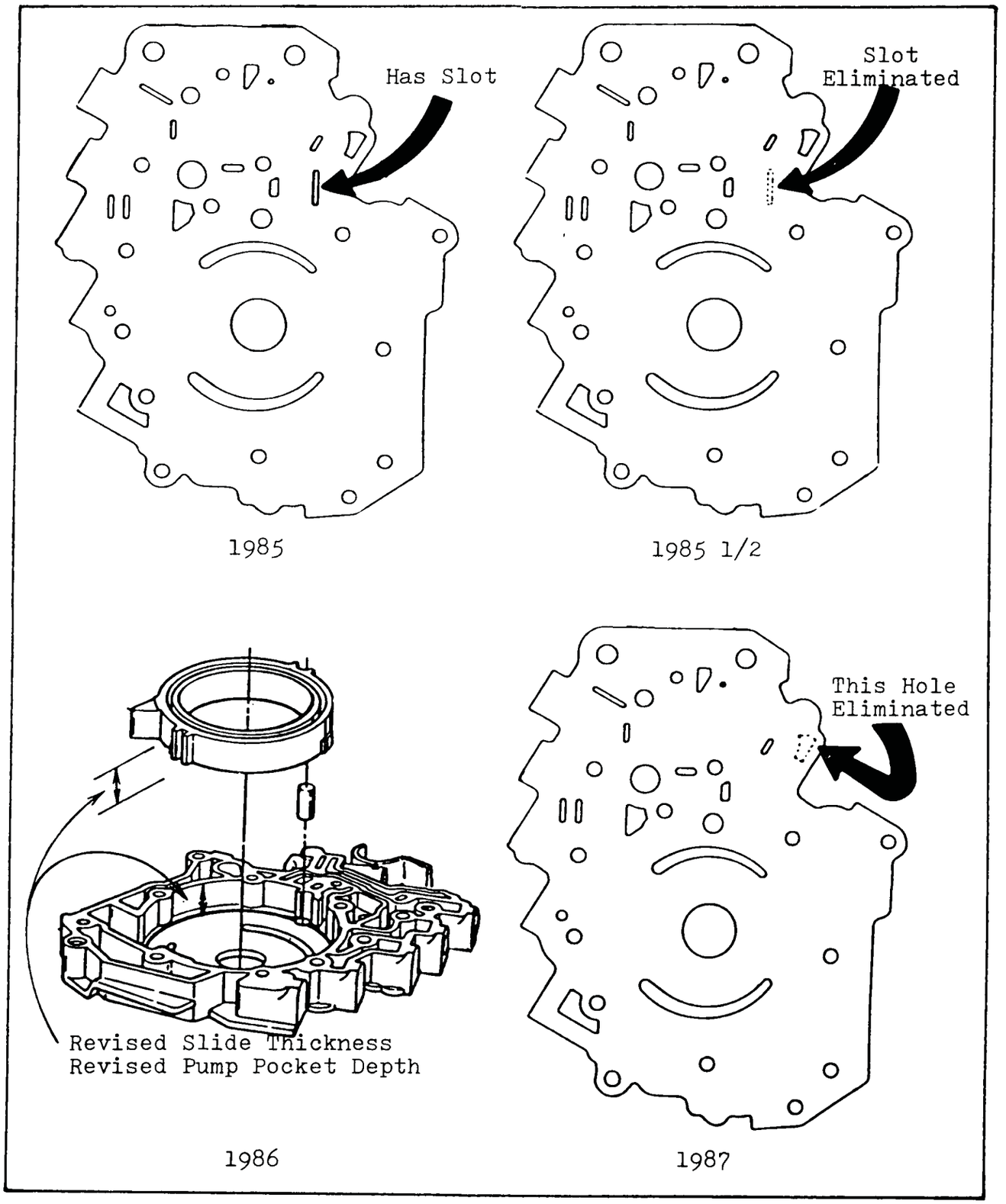


Figure 5

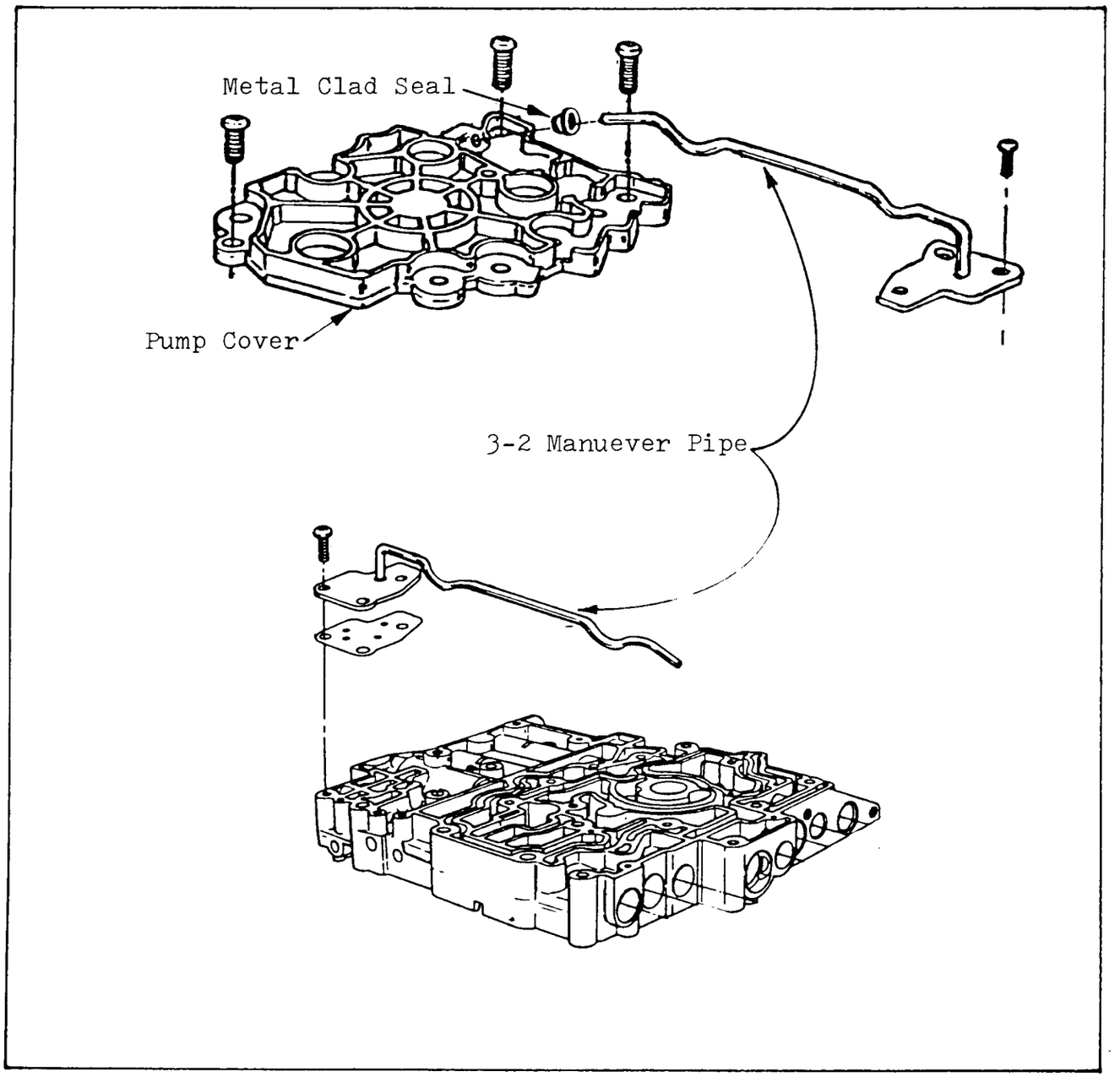


Figure 6

CAUTION – CAUTION

Some 1987 440-T4 transaxles built between November 26, 1986 (Julian Date 330) and January 12, 1987 (Julian Date 012), may exhibit a slip or no drive condition as a result of low line pressure.

This condition may be caused by the pump slide binding on excessive casting flash when the slide is in the low pressure position.

To verify the possibility of a binding pump slide, check line pressure while the vacuum signal line is installed (Minimum Pressure), and with the vacuum signal line removed and plugged (Maximum Pressure). If normal (Minimum/Maximum) pressures are recorded, proceed with the usual diagnostic steps for the cause of low line pressure.

If pressures do not vary with vacuum signal changes, inspect for pump slide bind by removing the oil pump cover and slide springs. If present, excessive flash will cause the slide to bind when the cover is on and torqued.

If flash is present you will have to replace the oil pump assembly, or use a Dremel Tool with a carbide bit and remove flash from 87 model to match contour of 86 model (See Figure 7).

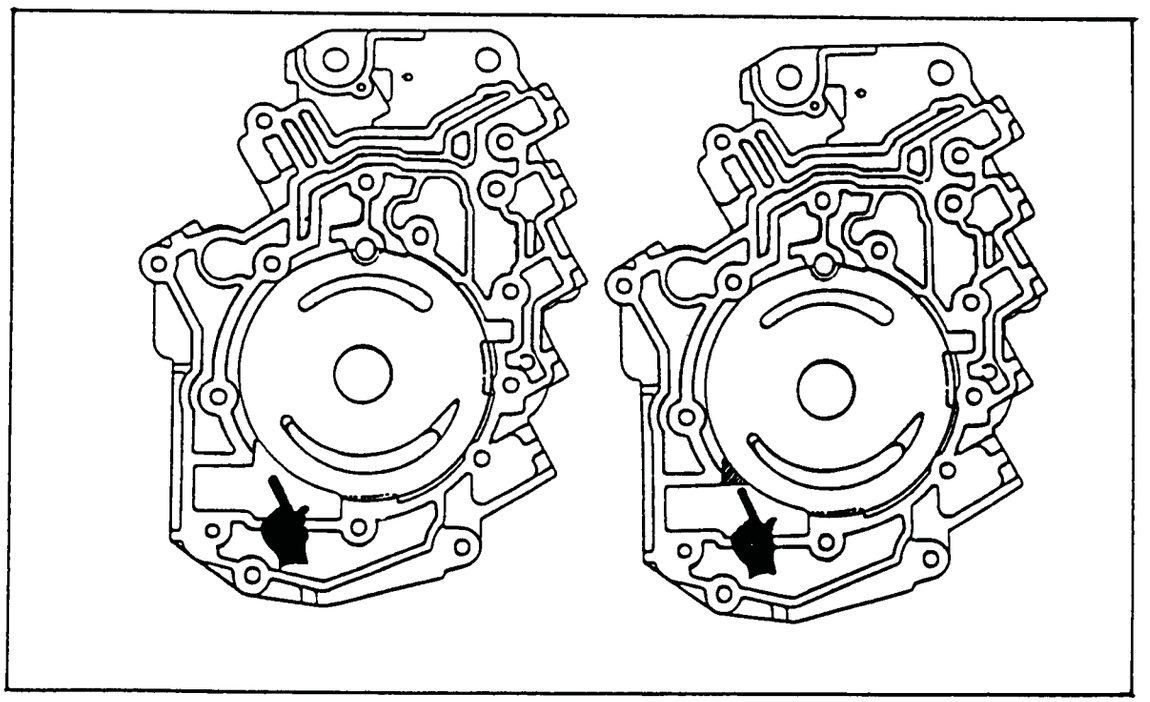


Figure 7

VALVE BODY CHANGES

1985	Identification:	Notice difference in shape of 1-2 servo release plate. Also extra bolt in valve body (See Figure 8).
	Interchangeability:	NOT INTERCHANGEABLE.
85 1/2, 86	Identification:	Notice difference in shape of 1-2 servo release plate (See Figure 8). Extra bolt eliminated in valve body to make room for the addition of 3-2 TV bias valve in valve body (See Fig. 9). Special bolt added under valve body in channel plate, and addition of tension plate (See Figure 8).
	Reason:	Improved 3-2 downshift.
	Interchangeability:	Not Compatible with 1985. Will interchange with 86 models, as long as calibration requirements are met.
1987	Identification:	Addition of 3-2 maneuver pipe (See Figure 8).
	Reason:	Further improved 3-2 downshift.
	Interchangeability:	Not compatible with 1985. Will interchange with 85 1/2 and 86 models, as long as calibration requirements are met.

CHECK BALL LOCATION CHANGE

With the complete change in valve body hydraulics from 1985 to 1985 1/2, it was also necessary to move one check ball in the valve body.

Refer to Figure 10 for 1985 locations.

Refer to Figure 11 for 1985 1/2 and up locations. Notice that the number 5 check ball moved, and at the same time became larger in diameter. 1985 1/2 and up, the No. 5 check ball is 3/8" diameter. All of the others are 1/4" diameter.

The check ball locations in the channel plate did not change. Refer to Figure 13.

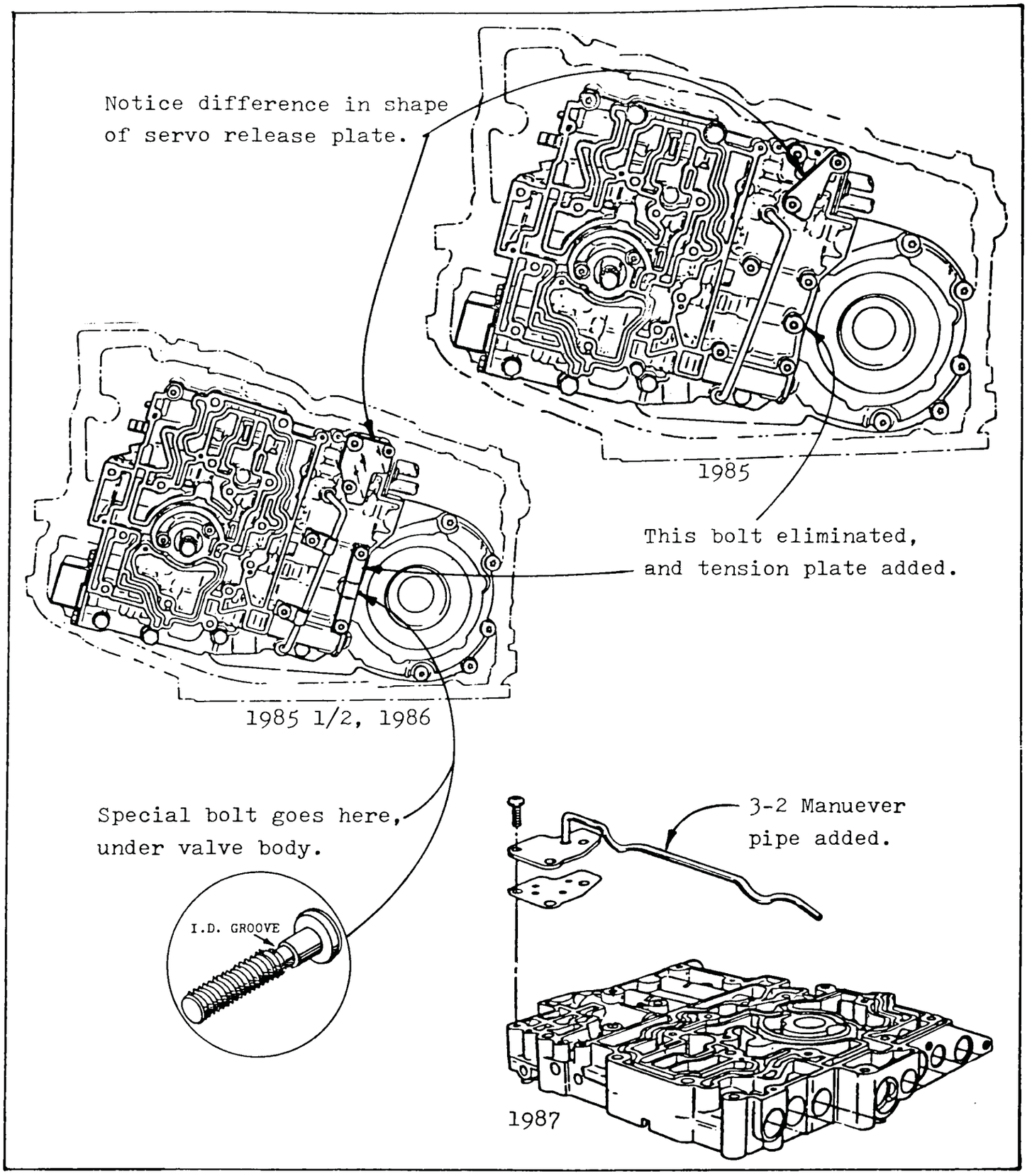
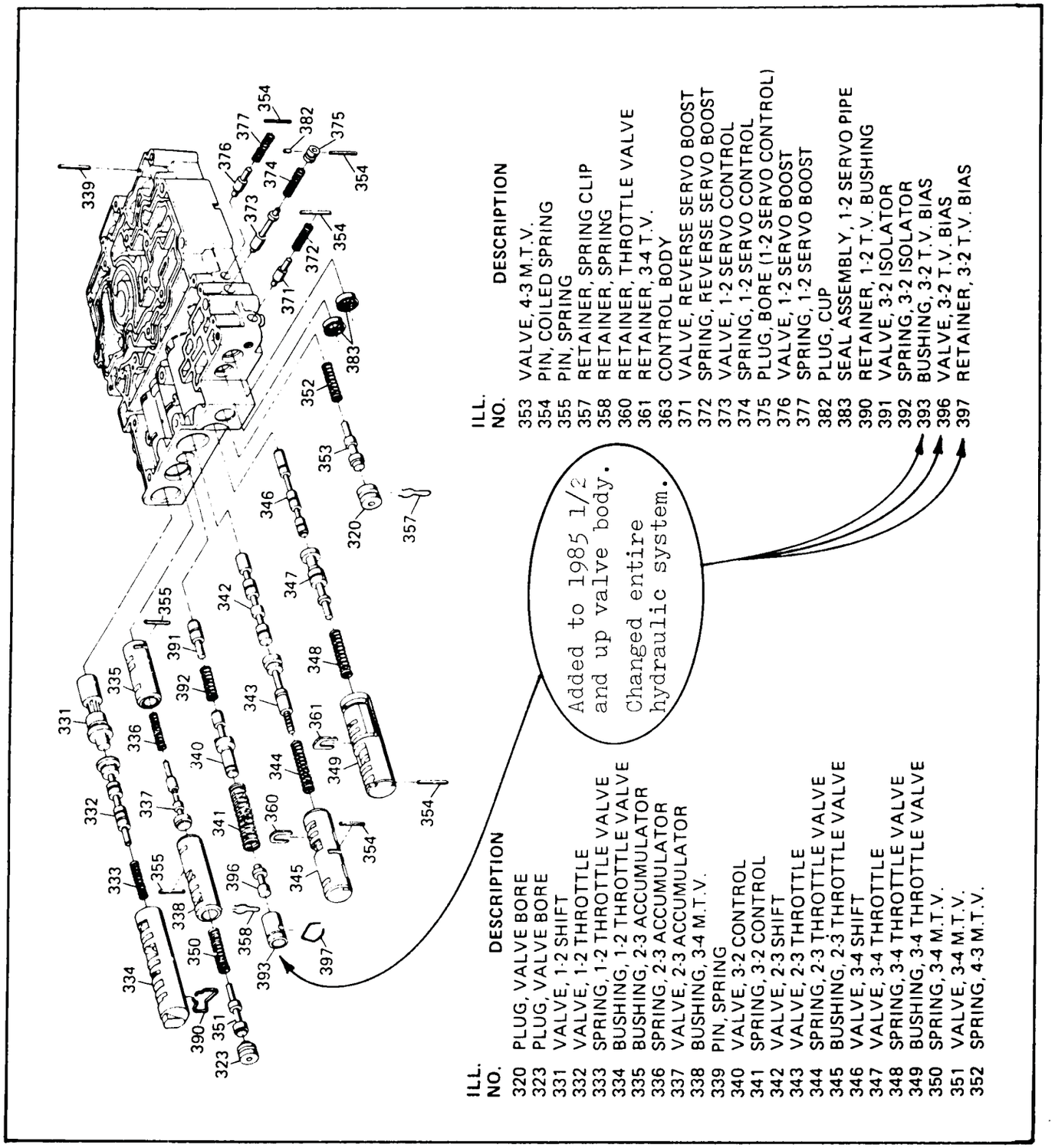


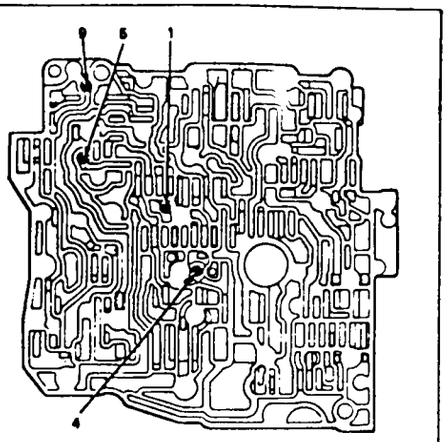
Figure 8



ILL. NO.	DESCRIPTION
320	PLUG, VALVE BORE
323	PLUG, VALVE BORE
331	VALVE, 1-2 SHIFT
332	VALVE, 1-2 THROTTLE
333	SPRING, 1-2 THROTTLE VALVE
334	BUSHING, 1-2 THROTTLE VALVE
335	BUSHING, 2-3 ACCUMULATOR
336	SPRING, 2-3 ACCUMULATOR
337	VALVE, 2-3 ACCUMULATOR
338	BUSHING, 3-4 M.T.V.
339	PIN, SPRING
340	VALVE, 3-2 CONTROL
341	SPRING, 3-2 CONTROL
342	VALVE, 2-3 SHIFT
343	VALVE, 2-3 THROTTLE
344	SPRING, 2-3 THROTTLE VALVE
345	BUSHING, 2-3 THROTTLE VALVE
346	VALVE, 3-4 SHIFT
347	VALVE, 3-4 THROTTLE
348	SPRING, 3-4 THROTTLE VALVE
349	BUSHING, 3-4 THROTTLE VALVE
350	SPRING, 3-4 M.T.V.
351	VALVE, 3-4 M.T.V.
352	SPRING, 4-3 M.T.V.

ILL. NO.	DESCRIPTION
353	VALVE, 4-3 M.T.V.
354	PIN, COILED SPRING
355	PIN, SPRING
357	RETAINER, SPRING CLIP
358	RETAINER, SPRING
360	RETAINER, THROTTLE VALVE
361	RETAINER, 3-4 T.V.
363	CONTROL BODY
371	VALVE, REVERSE SERVO BOOST
372	SPRING, REVERSE SERVO BOOST
373	VALVE, 1-2 SERVO CONTROL
374	SPRING, 1-2 SERVO CONTROL
375	PLUG, BORE (1-2 SERVO CONTROL)
376	VALVE, 1-2 SERVO BOOST
377	SPRING, 1-2 SERVO BOOST
382	PLUG, CUP
383	SEAL ASSEMBLY, 1-2 SERVO PIPE
390	RETAINER, 1-2 T.V. BUSHING
391	VALVE, 3-2 ISOLATOR
392	SPRING, 3-2 ISOLATOR
393	BUSHING, 3-2 T.V. BIAS
396	VALVE, 3-2 T.V. BIAS
397	RETAINER, 3-2 T.V. BIAS

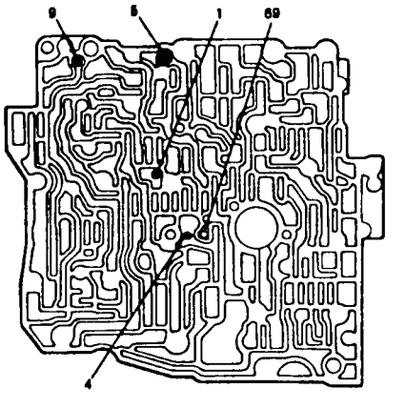
Figure 9



1 FOURTH CLUTCH CHECK BALL
4 THIRD CLUTCH CHECK BALL
5 2-3 ACCUMULATOR FEED CHECK BALL
9 REVERSE SERVO FEED CHECK BALL

NO. 7 CHECK BALL LOCATED IN A CAPSULE (137) IN CASE

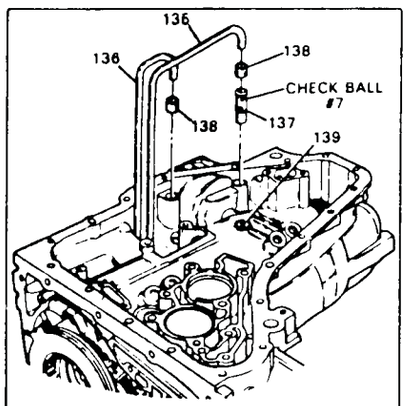
Figure 10 (1985 Only)



1 FOURTH CLUTCH CHECK BALL
4 THIRD CLUTCH CHECK BALL
5 2-3 ACCUMULATOR FEED CHECK BALL
9 REVERSE SERVO FEED CHECK BALL
69 SCREEN, 3RD CLUTCH EXHAUST

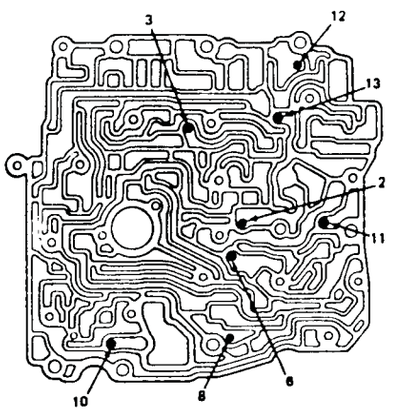
NO. 7 CHECK BALL LOCATED IN A CAPSULE (137) IN CASE

Figure 11 (1985 1/2-up)



135 PIPE, 1-2 SERVO (RELEASE OIL)
136 PIPE, 1-2 SERVO APPLY
137 CAPSULE ASSEMBLY, BALL CHECK
138 SEAL ASSEMBLY, 1-2 SERVO PIPE
139 STOP, 1-2 BAND ASSEMBLY

Figure 12

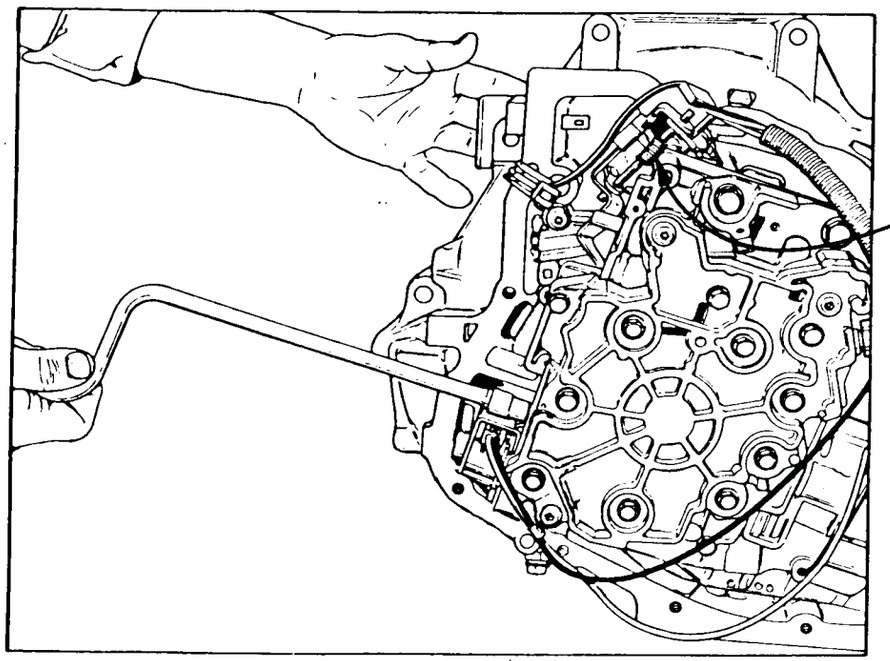


2 3-2 CONTROL CHECK BALL
3 PART THROTTLE AND DRIVE 3 CHECK BALL
6 2-3 ACCUMULATOR EXHAUST CHECK BALL
8 SECOND CLUTCH CHECK BALL
10 CONV. CLUTCH RELEASE/APPLY CHECK BALL
11 THIRD/LO-1ST CHECK BALL
12 1-2 SERVO FEED CHECK BALL
13 INPUT CLUTCH/REVERSE CHECK BALL

NO. 7 CHECK BALL LOCATED IN A CAPSULE (137) IN CASE.

Figure 13

NOTE: No changes in channel plate check ball locations.



NOTE: When changing from 85 to 85 1/2 hydraulics, remove this spring from TV bracket assembly. Not needed with late valve body.

Figure 14

NOTE: Location of valve body locating sleeve.

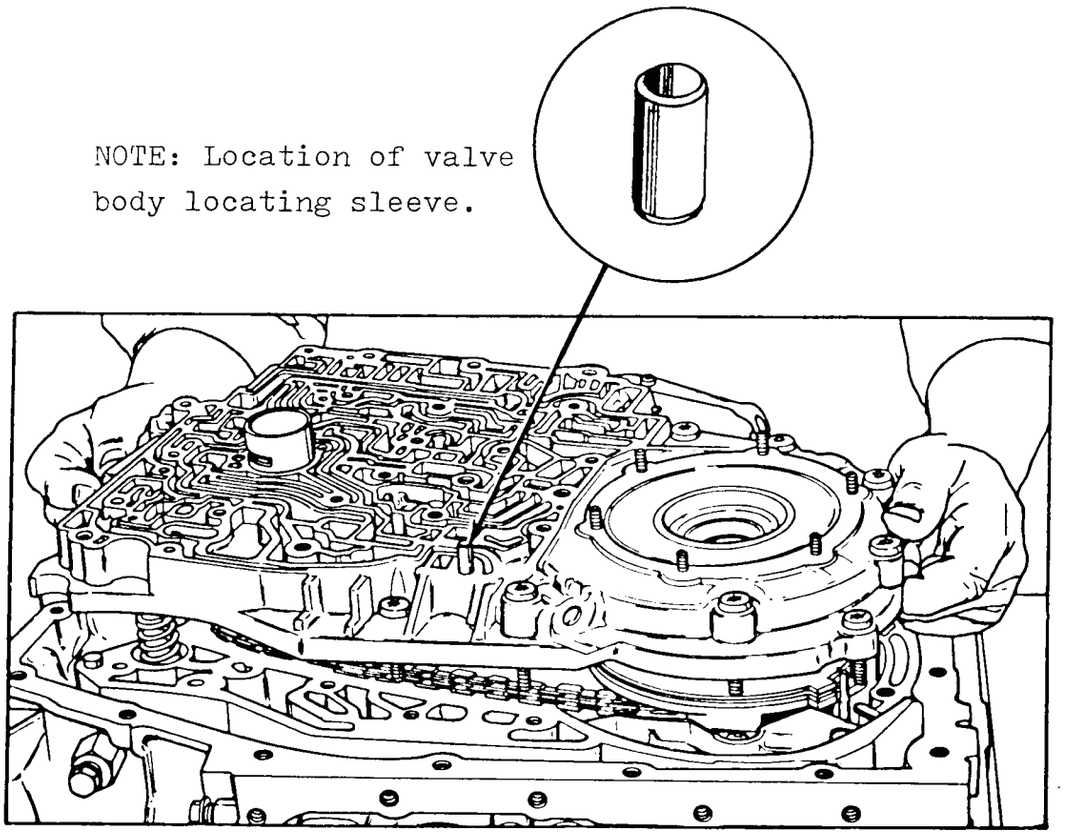


Figure 15

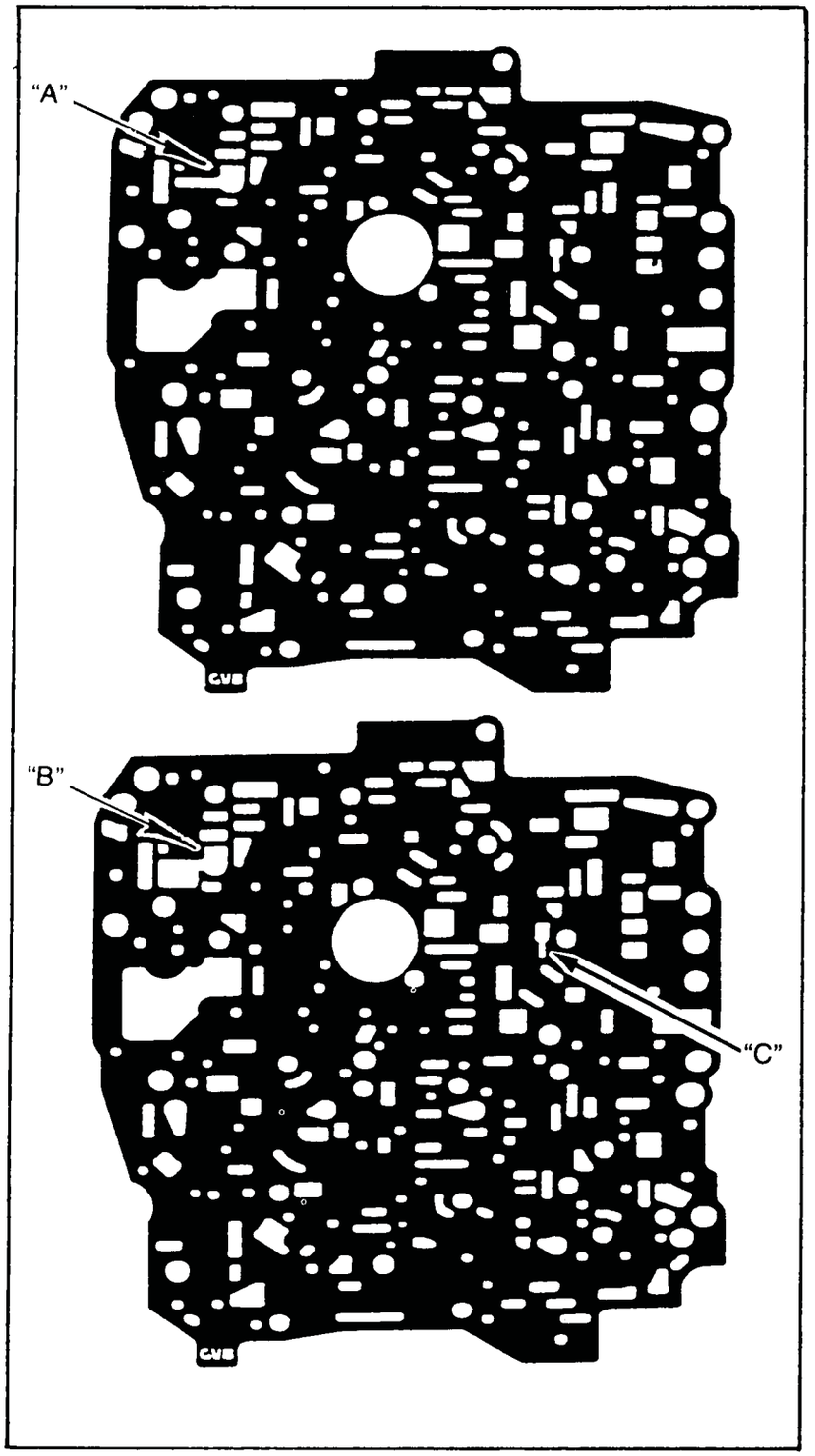


Figure 16

VALVE BODY GASKET CHANGES

Note the difference in the "Pipe Stem" between "A" and "B", Figure 16. This change occurred about Oct. 1985.

In June 1987 the "Finger" shown at "C", Figure 16 was made Approx. .020 wider.

Any of these gaskets may be used. None will have adverse affects on the operation of the transaxle.

We are including the OEM part numbers for reference.

"A"	8656812
"B"	8658882
"C"	8662848

The gaskets can be easily identified by ink stamp of the last 3 numbers of the OEM part number on the gasket.

CHANNEL PLATE CHANGES

1985

Identification: The easiest way to identify the channel plates apart is the location of the dam in the upper channel plate worm track area. (See Figure 17 and Figure 18). The dam was moved to an area directly under the upper dowel pin bore.

Reason: Complete change in hydraulic system for improved 3-2 downshift.

Interchangeability: 1985 will work with 85 hydraulics only. CANNOT MIX PUMP, VALVE BODY, OR CHANNEL PLATE.

1985 1/2, 1986, and 1987 will interchange as long as calibration requirements are met.

Parts Affected:

1) The upper channel plate gasket was changed to match movement of the dam in the channel plate (See Figure 19).

   The first design gasket has dam at both locations and will work fine with either channel plate.

   If the second design gasket (See Figure 10), is used on the 1985 channel plate (Figure 17), it allows PRN oil to enter the reverse servo feed circuit and applys the reverse band. The end result will be, that the transaxle will be in reverse and park at the same time because we also have the input clutch on in park in the 440-T4.

   Great care should be exercised to select the proper gasket for the channel plate. If in doubt, use the 1st design gasket with both dams as it will work on either channel plate.

2) The 3-2 line control valve located in the channel plate (See Figure 20 For Location), was changed from a single valve, to a two piece valve (See Figure 21). The 2 piece is connected together with a small clip that has a bad habit of breaking, and will create no 3-2 downshift.

   OEM part number on the 3-2 downshift clip is 8658678.

   Also notice (See Figure 21) that there are 2 line ups for the 85 1/2 and up models. The 2 piece 3-2 line control valve is used on 4.1 Cadillac, and 3.8 Buick engines. The "Plug" that is also shown (Figure 21), is used on 3.0 Buick, and 2.8 Chevrolet engines.

   This makes the channel plates non-interchangeable on these models. This also affects the valve body spacer plate, and makes the spacer plate non-interchangeable on these models.

3) There has also been some re-design of the manual valve, retainer clip, and manual link to assist in the assembly process (See Figure 22).

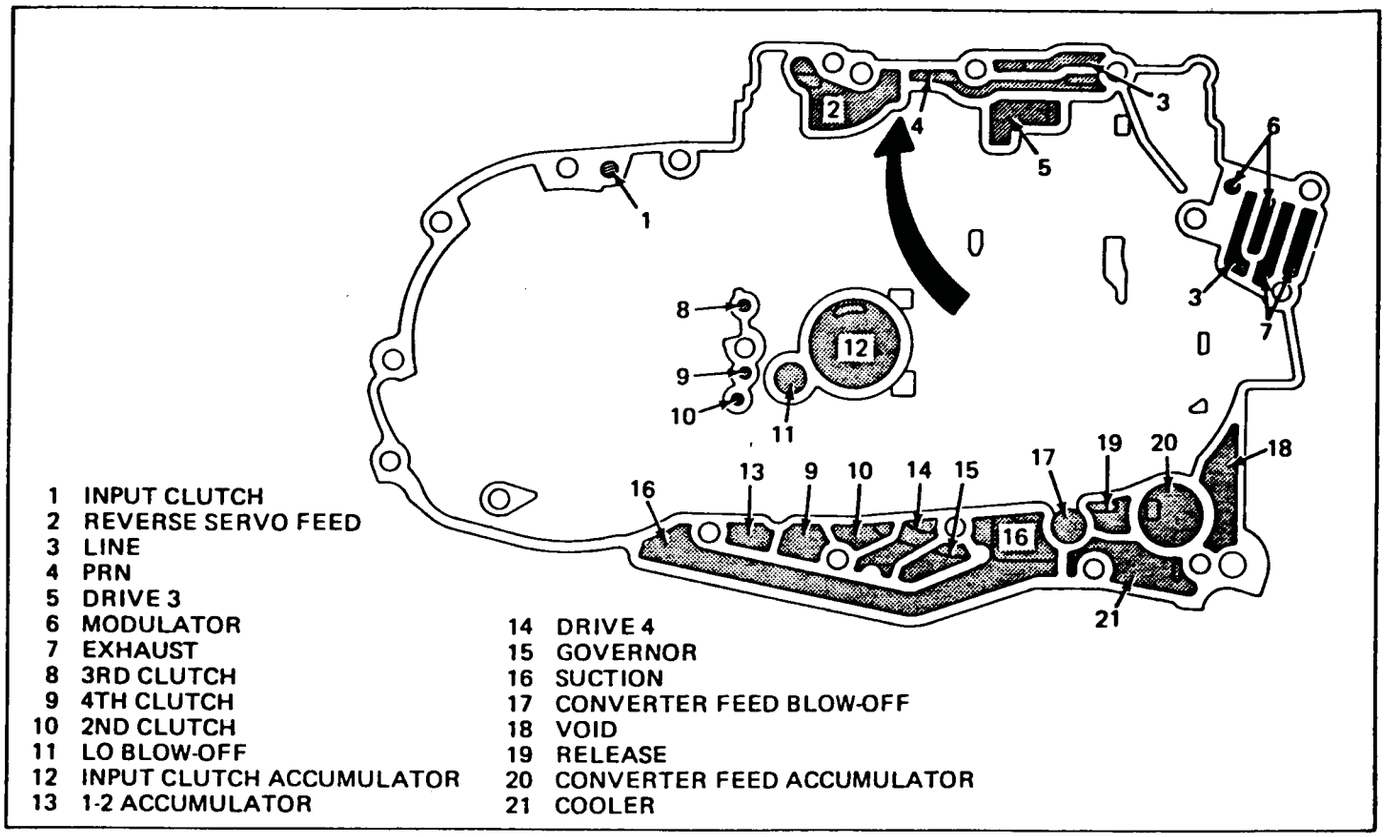


Figure 17 (1985 Only)

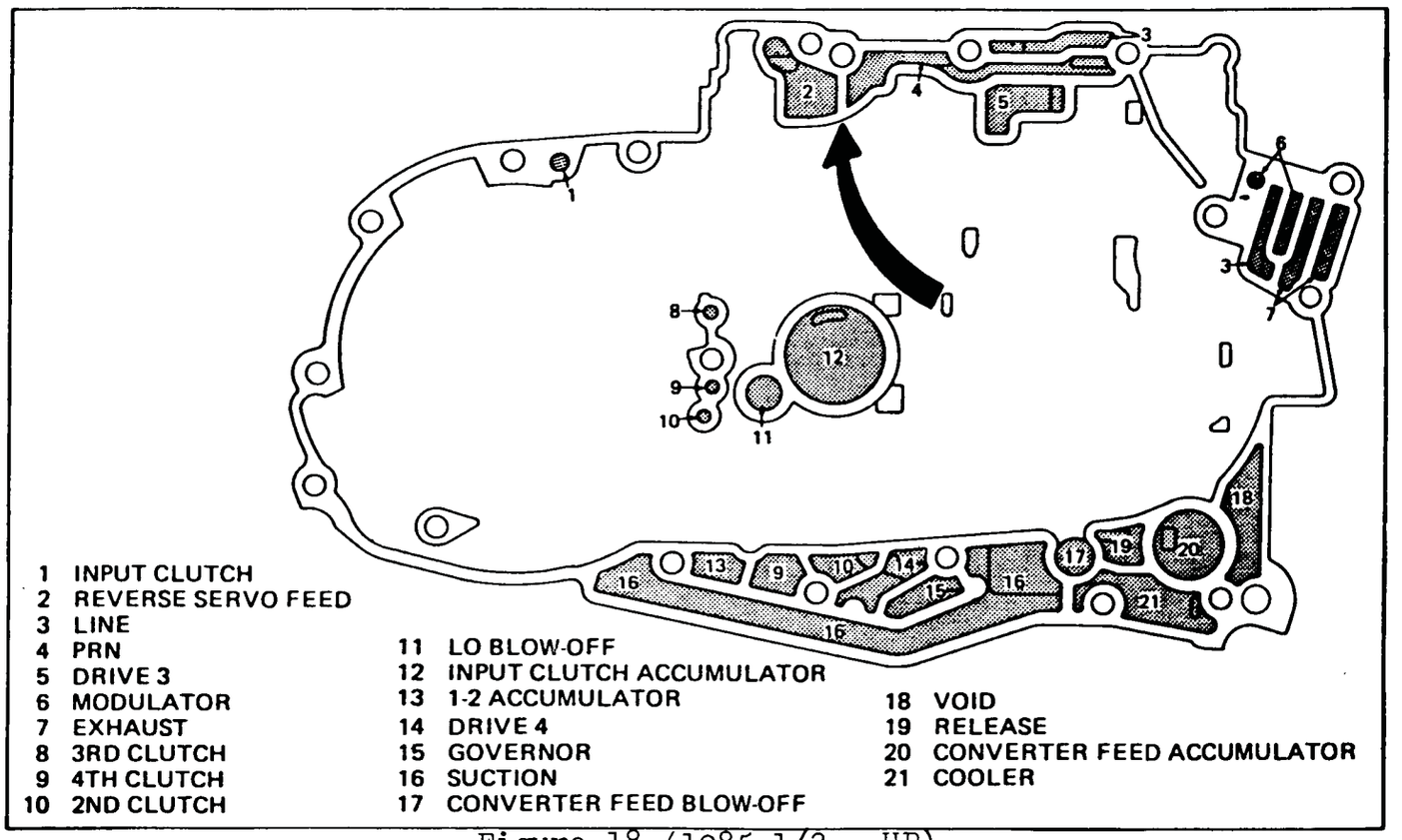
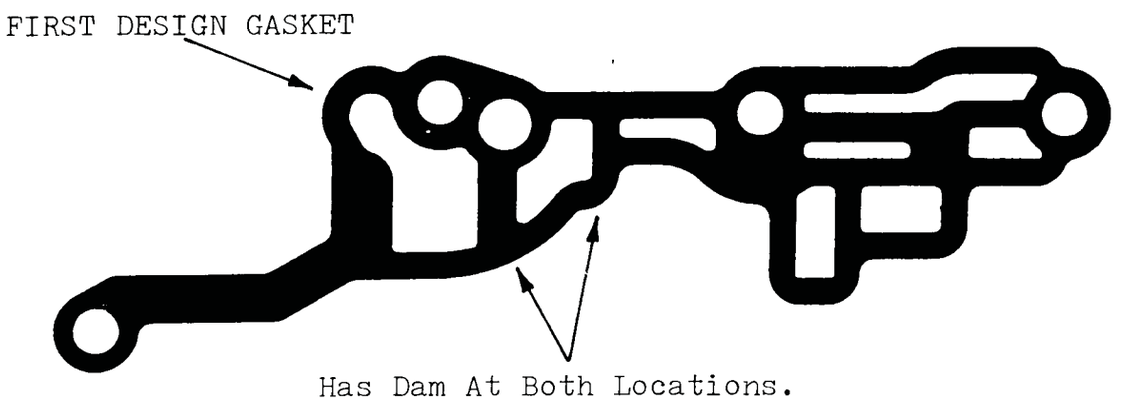
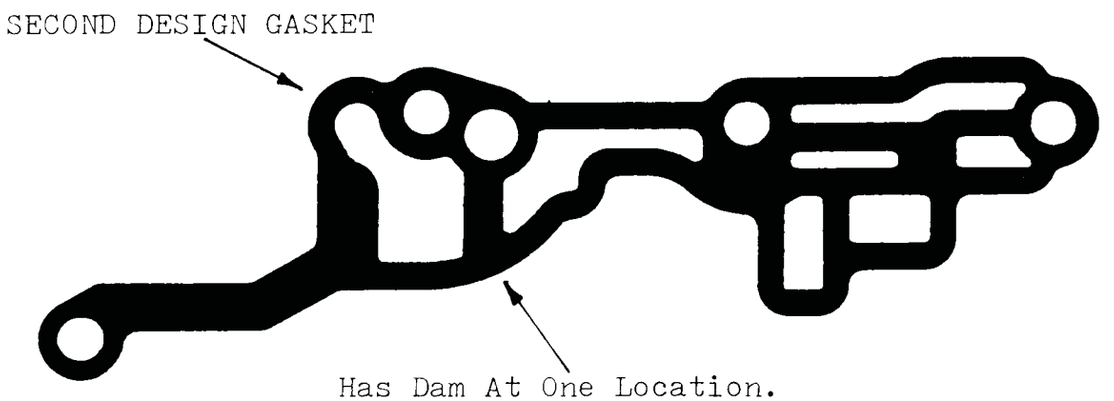


Figure 18 (1985 1/2 - UP)



Has Dam At Both Locations.
(Will Work On Either Channel Plate)



Has Dam At One Location.
(Will Work Only On 1985 1/2 And Up)

Figure 19

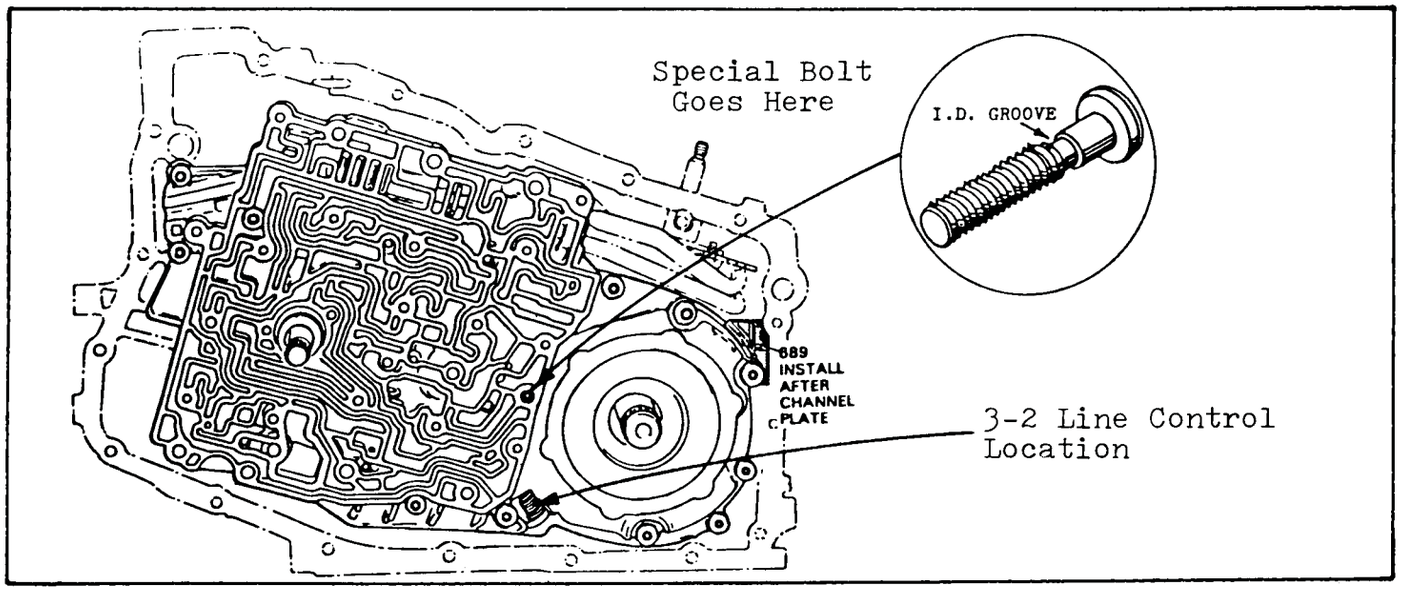


Figure 20

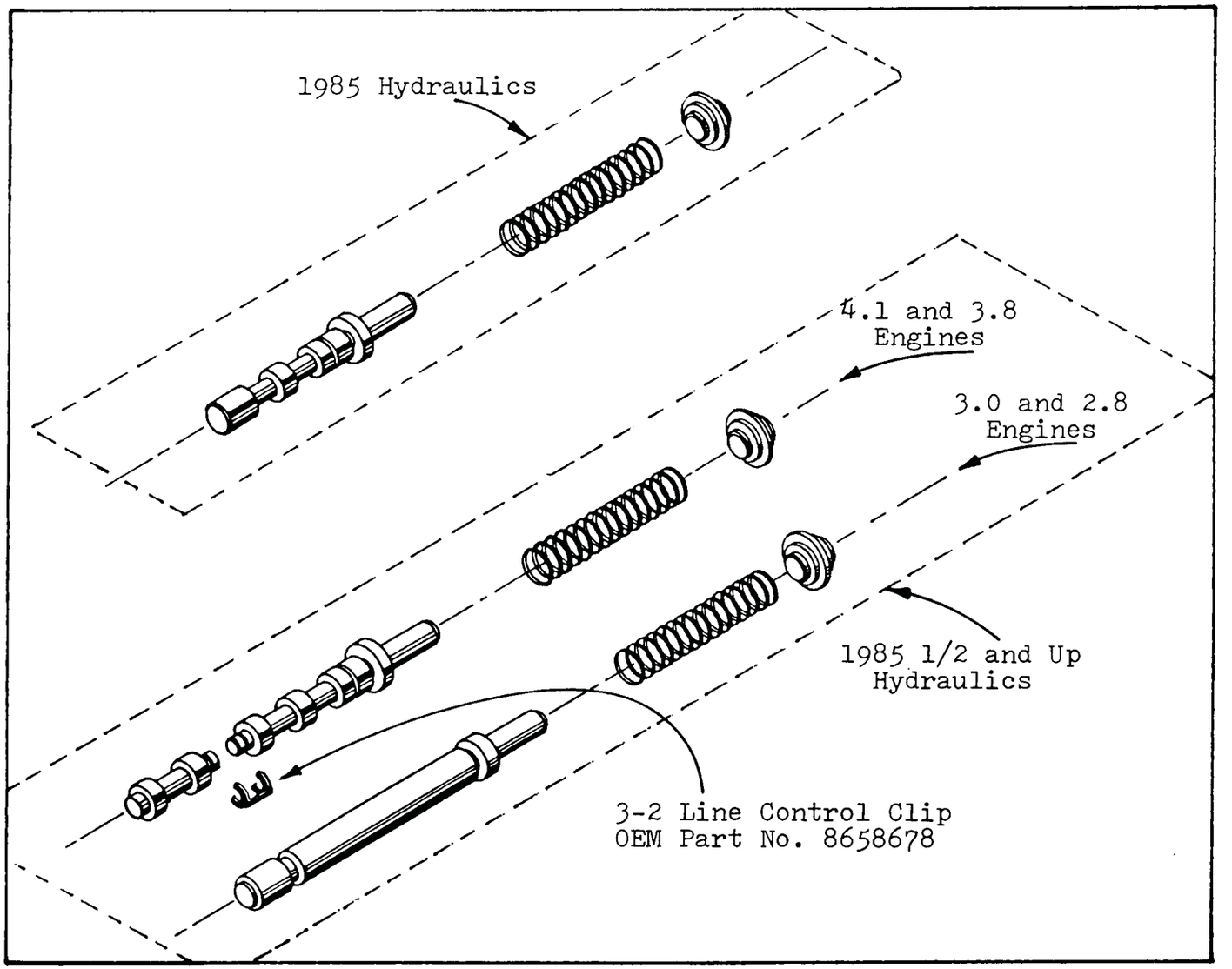


Figure 21

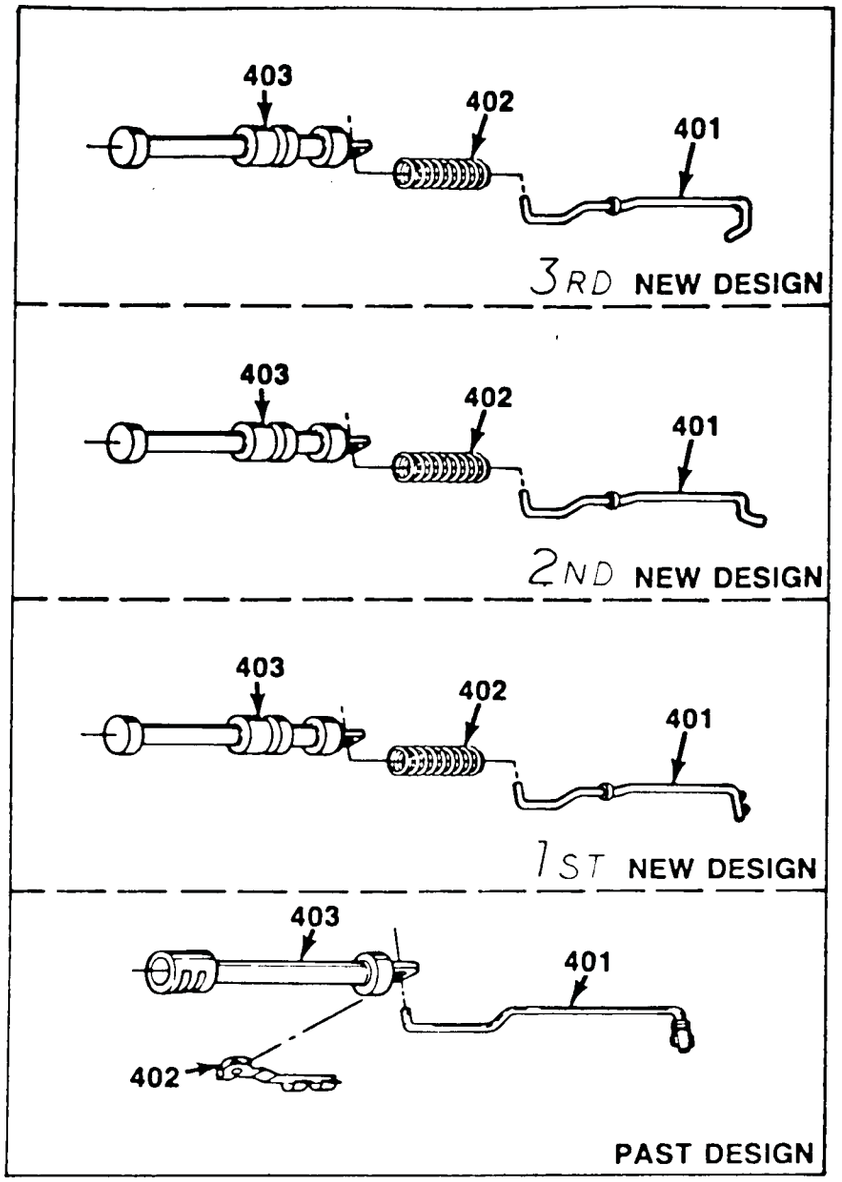


Figure 22

ACCUMULATOR PIN CHANGES

In mid 1985 the dimensions of both the TCC accumulator pin and piston, and the input accumulator pin and piston changed. We have included the dimensions of both early and late for identification purposes. (See Figure 23).

Dimension "A" (TCC Accumulator)	Dimension "B" (Input Accumulator)
EARLY .197 Inches	EARLY .309 Inches
LATE .202 Inches	LATE .314 Inches

Obviously you would not be able to install the late pin into the early piston, but you could go the other way very easily. Make sure you measure these pins and "Always" up-date to the larger 2nd design.

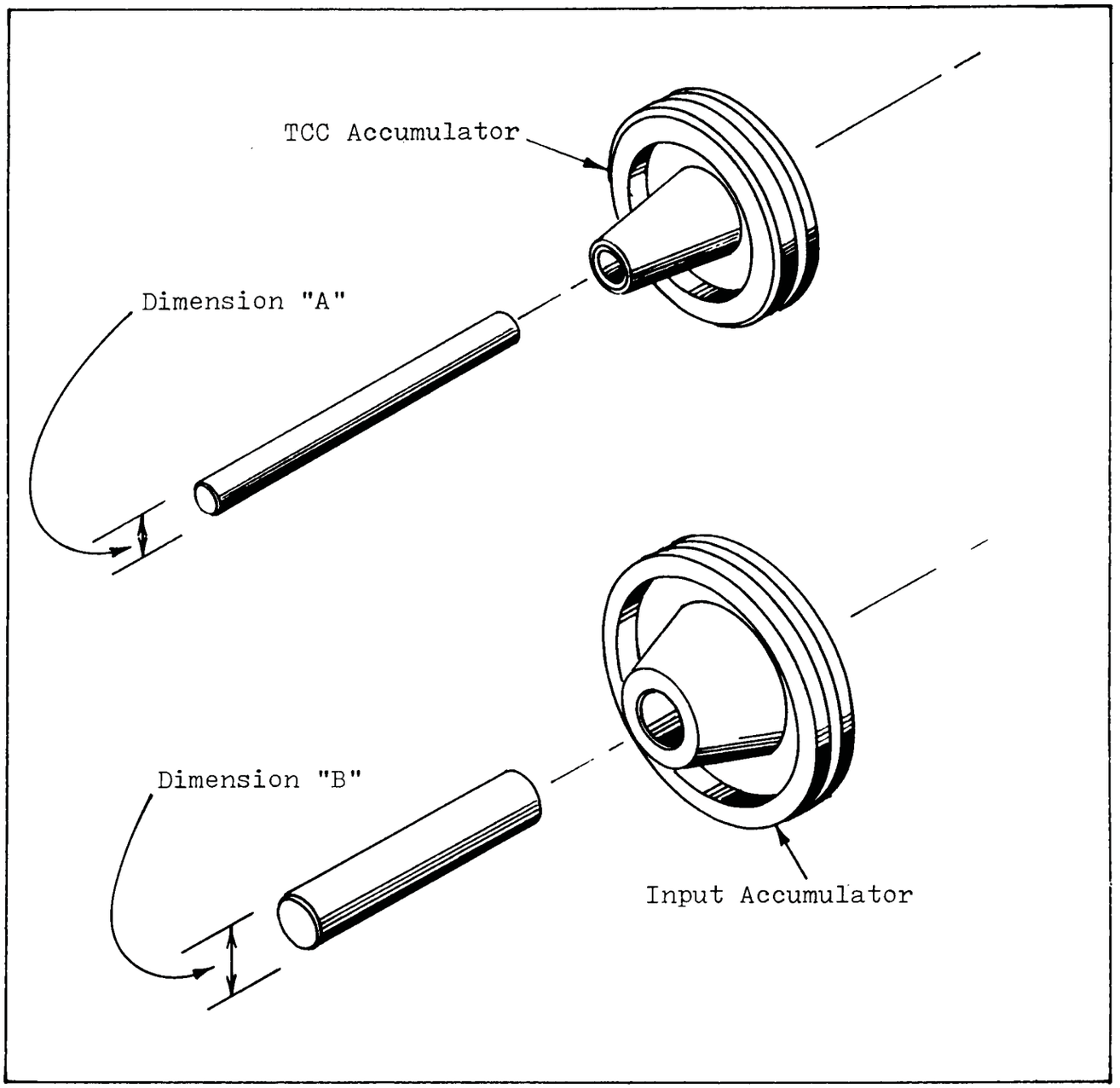


Figure 23

When the TCC accumulator pin is worn, or mismatched, TCC shudder is the result.

For more TCC shudder information see pages 24 and 25.

When the input accumulator pin is worn, or mismatched, input clutch durability is drastically reduced.

THM 440-T4

COMPLAINT: No T.C.C. apply or T.C.C. shudder.

CAUSE: Some 1984 and some early 1985 THM 440-T4 transaxles may experience a no Torque Converter Clutch (TCC) apply or TCC shudder condition, which may be due to a cut or rolled TCC accumulator piston seal (See Figure 24).

CORRECTION: Install updated service package 8646926.
Updated service package 8646926 contains the following:
1. 1-TCC ACCUMULATOR PISTON
2. 1-TCC ACCUMULATOR PISTON PIN
3. 1-TCC ACCUMULATOR PISTON SEAL

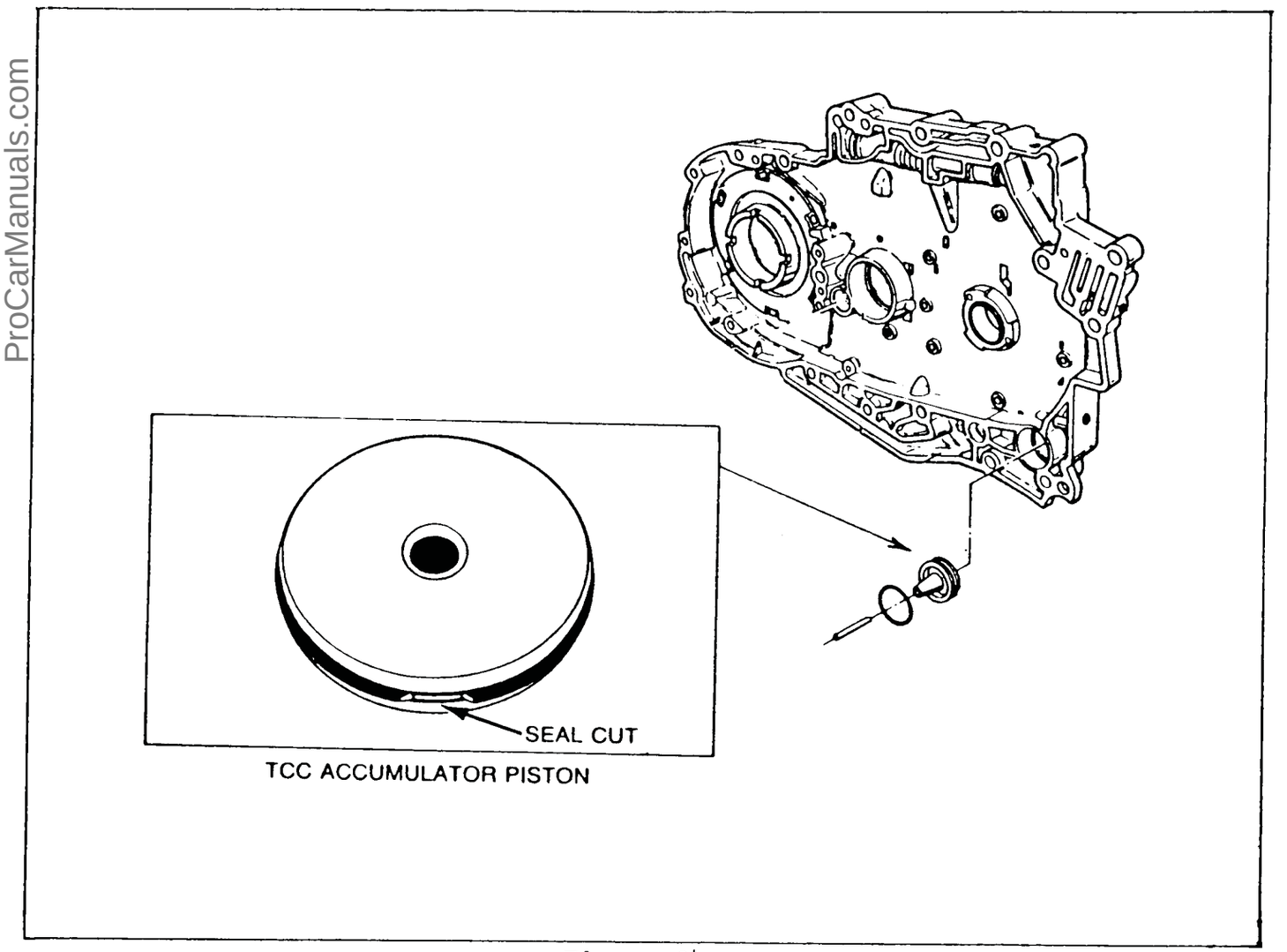


Figure 24

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 spring is available under part number SGSF-440.

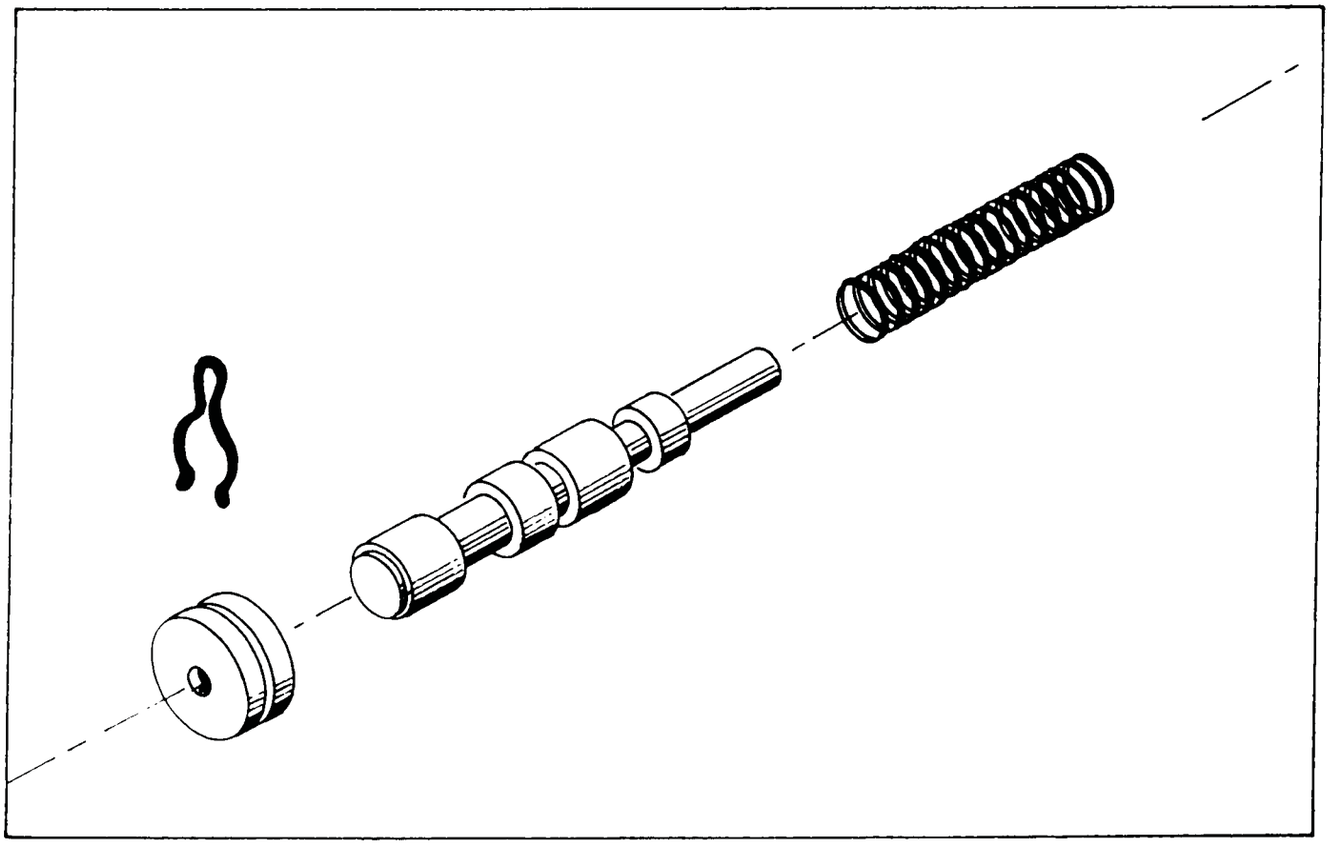


Figure 25

FOURTH CLUTCH CHANGES

In early 1984 the thickness of the 4th clutch plate was revised. The core, or metal portion, of the clutch plate was made thicker in an effort to reduce "Peening" of the 4th clutch hub and shaft.

When the 4th clutch plate was made thicker, the 4th clutch piston had to be made shorter for clutch pack clearance to be correct.

It is imperative that you check the height of the 4th clutch piston on any 1984 or 1985 model THM 440-T4. You must be certain that you have the 2nd design 4th clutch piston, as the early 4th clutch plate is not available.

The only 4th clutch plate that is available Will Not work with the 1st design 4th clutch piston.

To identify, use a dial caliper set, and locked, at 1.930" and check as shown at dimension "A" in Figure 26. If dial caliper will go over the top of the piston, you have the late style piston.

If the dial caliper will not go over the top of the piston, the 4th clutch piston will have to be replaced with OEM part No. 8658388.

If not put together with compatable parts, the fourth clutch will burn immediately.

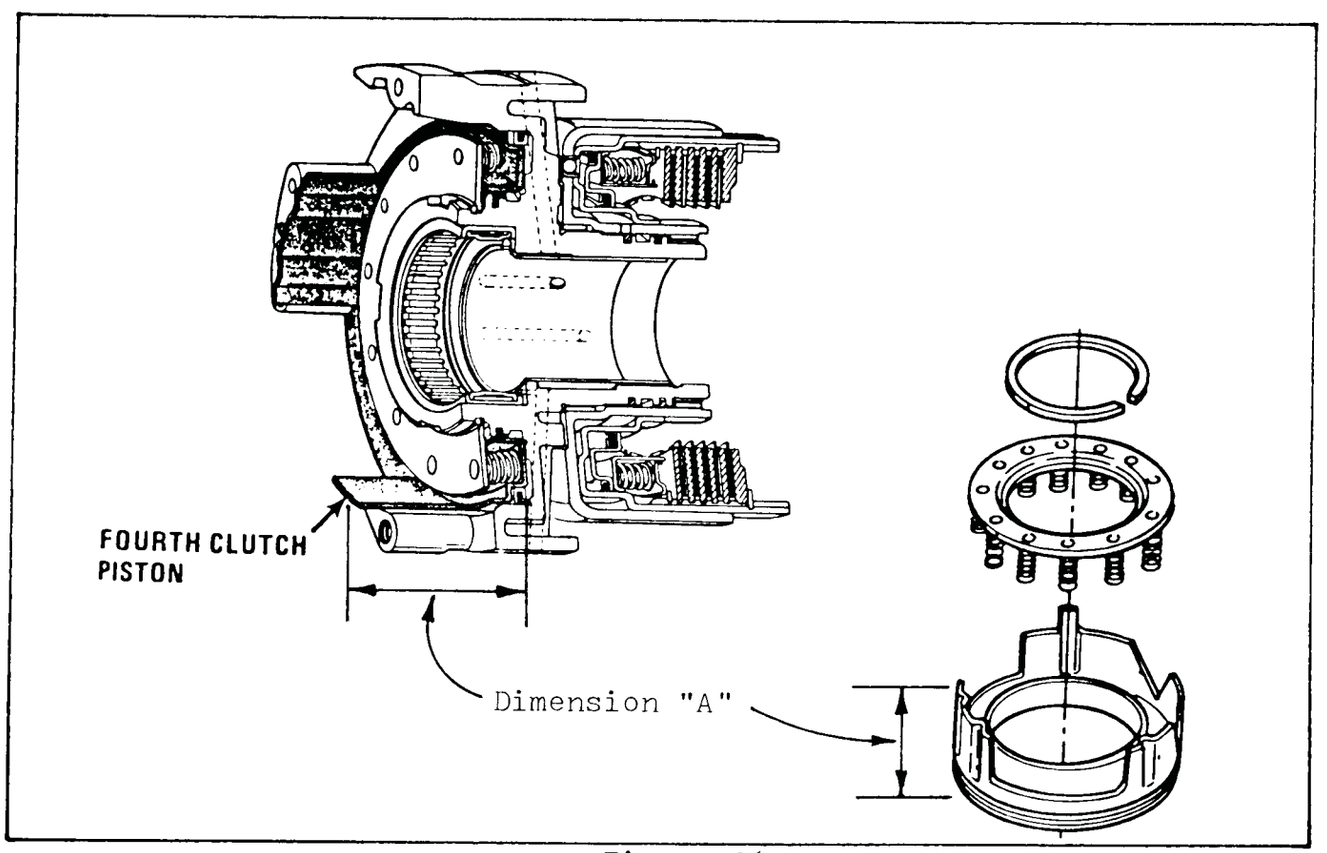


Figure 26

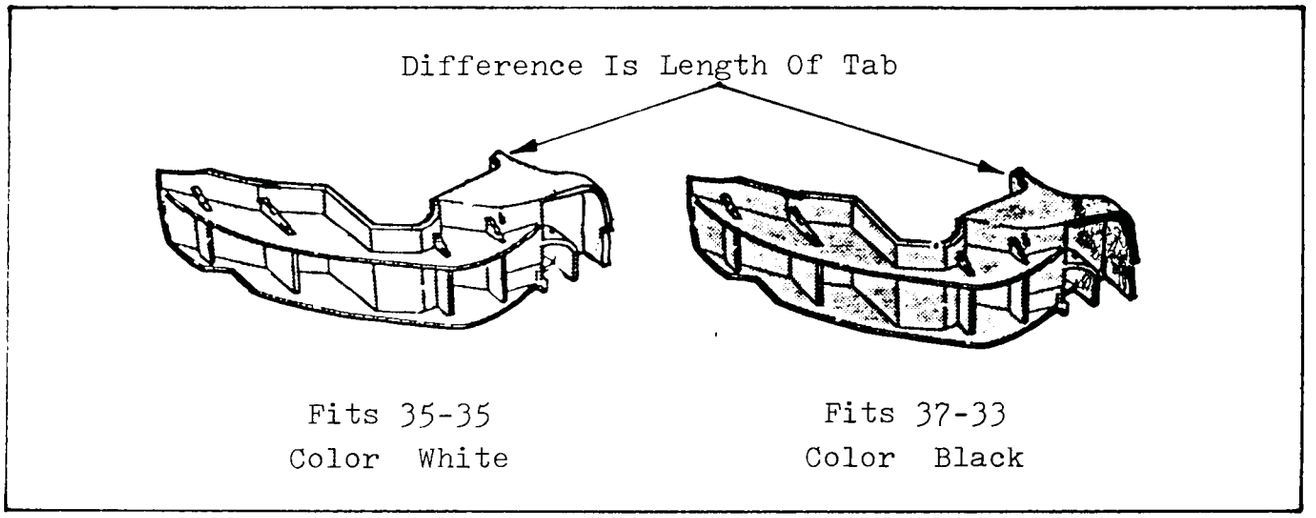


Figure 27

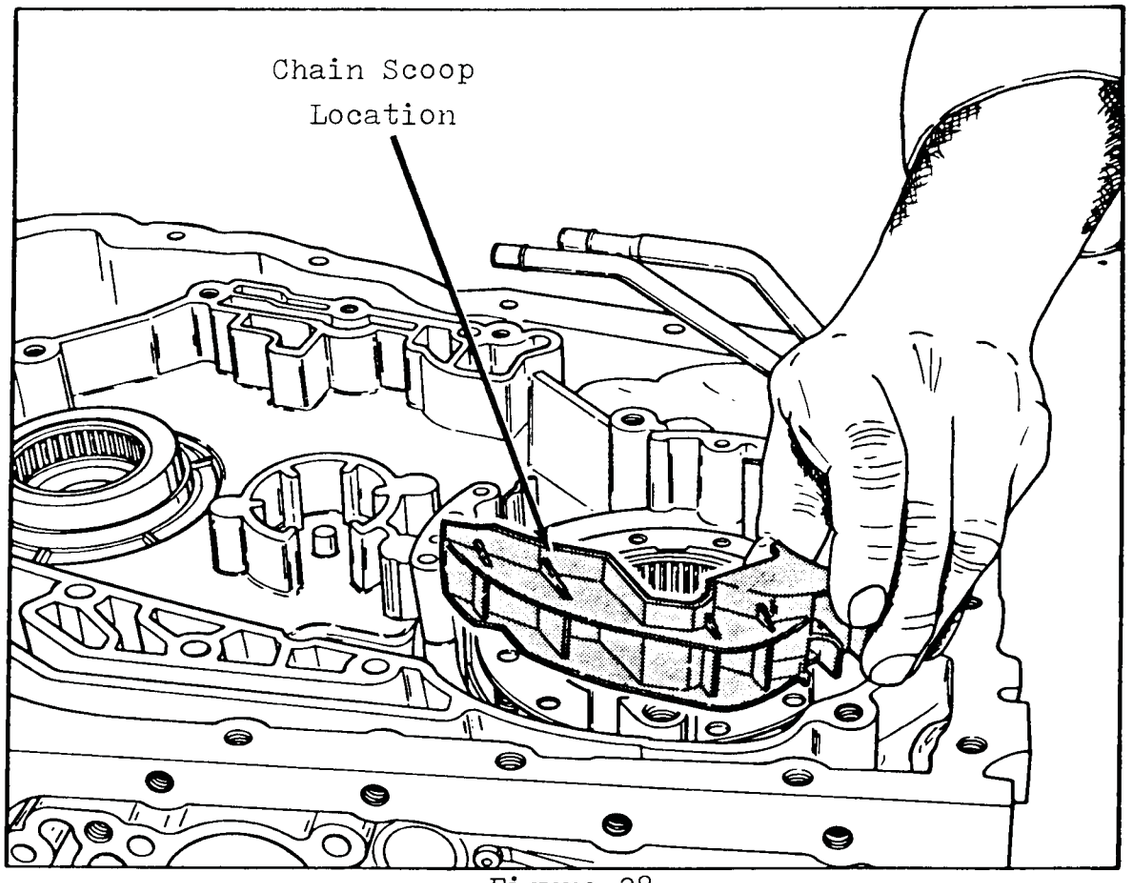


Figure 28

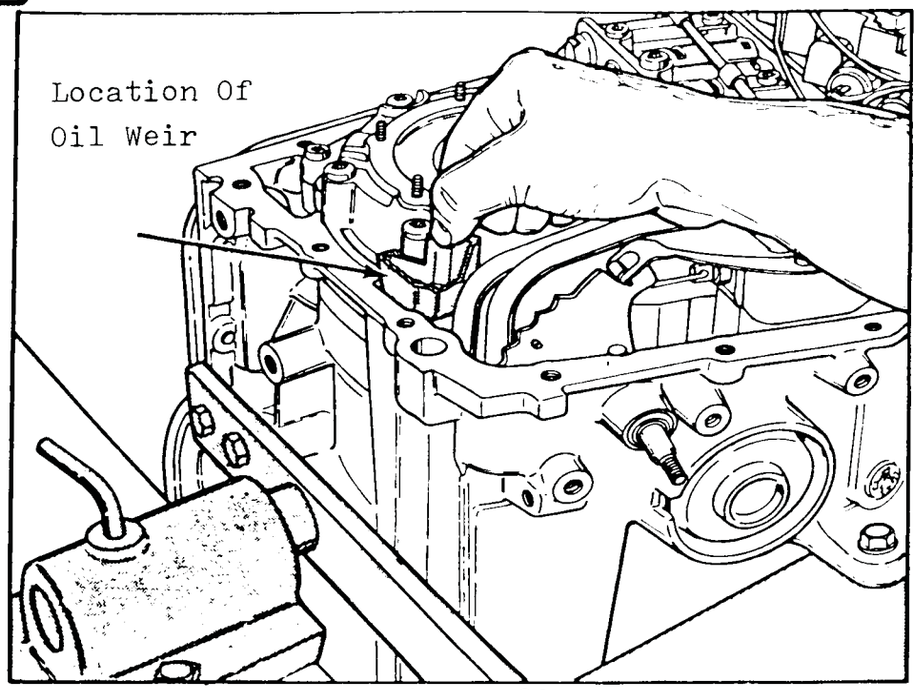


Figure 29

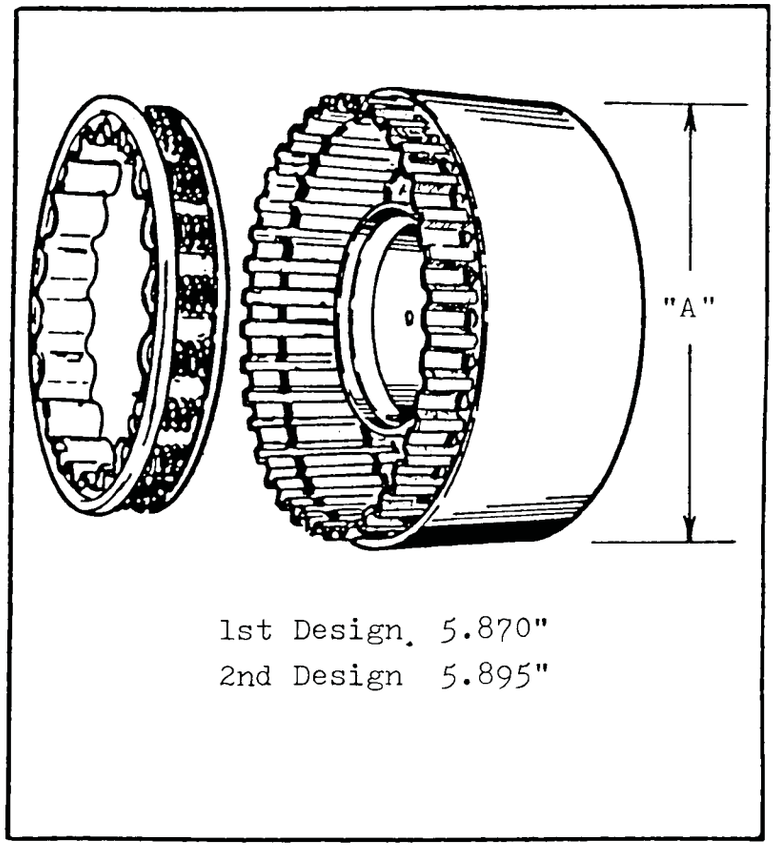


Figure 30

SECOND CLUTCH HOUSING CHANGES

1ST CHANGE (Revised Diameter)

The first change on the second clutch housing occurred in mid 1985. The outside diameter was made larger to provide more area for the reverse band to hold.

We have included the dimensions of both second clutch housings for identification purposes. See Dimension "A", Figure 30.

Reason: Improved Reverse Band Durability.

Parts Affected:

1) 2nd Clutch Housing - Revised diameter (See Figure 30).
2) Reverse Band Pin - The 3 longest selective band pins were eliminated, there are now only 6.

Interchangeability:

Interchangeable, as long as you can achieve proper reverse band pin selection. If you have a choice between both design clutch housings, always use the 2nd design (Larger) behind the 4.1 and 3.8 engines.

(Continued on Page 30)

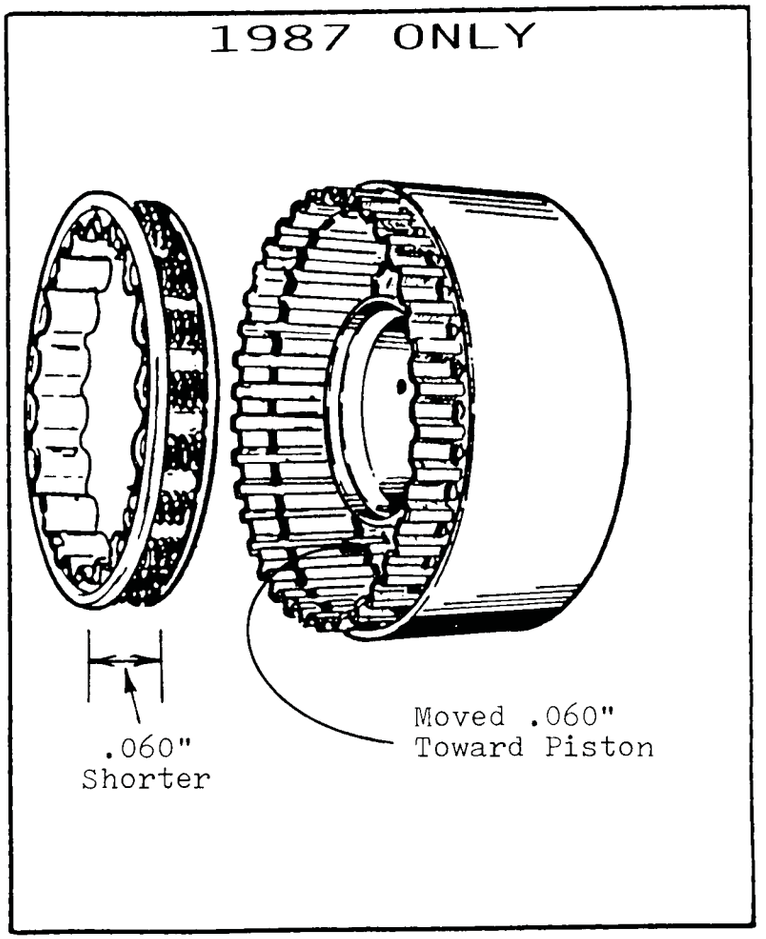


Figure 31

SECOND CLUTCH HOUSING CHANGES (Cont'd)

2ND CHANGE (Six Plate 2nd Clutch)

The second change on the second clutch housing occurred at the start of production for the 1987 models (August, 1986). They increased the capacity of the 2nd clutch by going to a 6 plate clutch pack instead of 5 (Compare in Figure 32).

84-86 - 5 Plate Clutch Pack
1987 - 6 Plate Clutch Pack

Reason: Improved Capacity For Improved Durability.

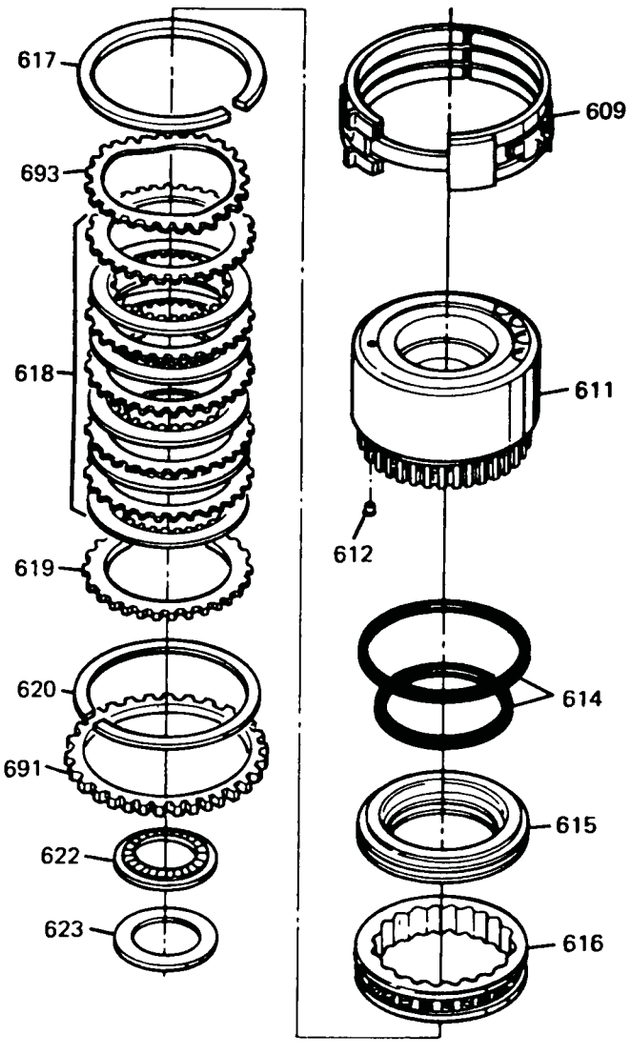
Parts Affected:

1) 2nd Clutch Housing - Bottom snap ring groove moved .060" toward the piston (See Figure 31).
2) Apply Ring And Return Spring Assy - Shortened by .060" (See Figure 31).
3) "Koline" Steel Clutch Plates - Revised thickness, (See Figure 35).
   84-86 - 5 Plate "Kolines"--.090"
   1987 - 6 Plate "Kolines"--.077"
4) Backing Plate - Redesigned to incorporate backing plate(619), support ring(691), and snap ring(620) into one assembly. (See Figure 32).
5) Reverse Reaction Plate(692) - Eliminated. If the redesigned backing plate assembly is used, you can eliminate the reverse reaction plate(692) Figure 33.
6) Input Housing - Revised balance weight location so as to eliminate interference with revised backing plate assembly (See Figure 34). Also no chamfer on bottom of 2nd clutch hub (See Figure 34).
   NOTE: There is now a new input housing available with an additional change to improve third clutch durability, that has both of the changes mentioned above already incorporated in the new housing. The new input housing is available under OEM part No. 8662670. The additional changes are covered in the 3rd clutch section of this manual.

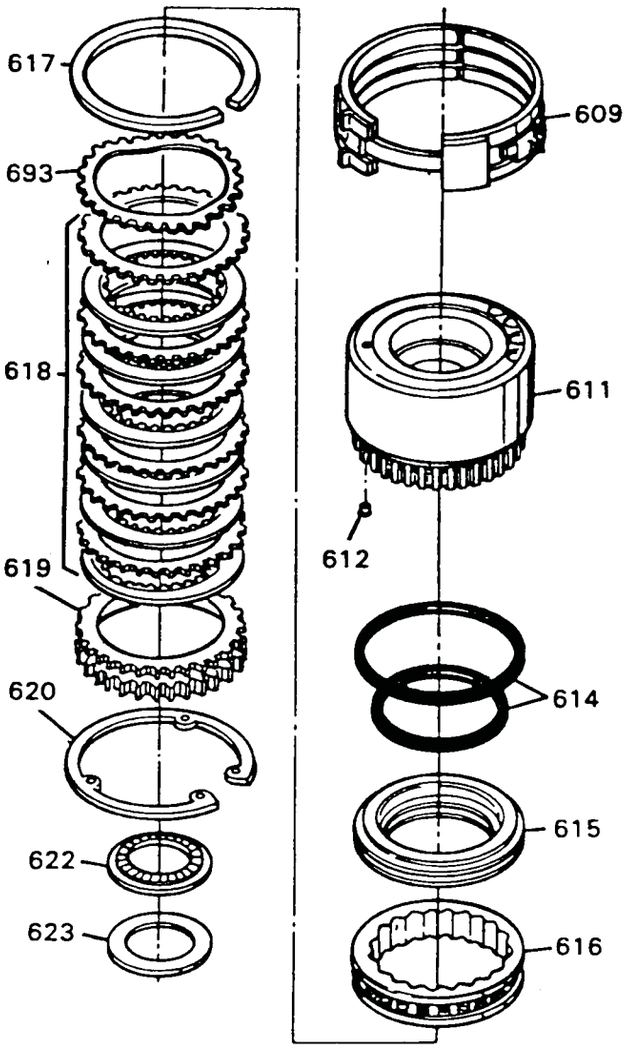
Interchangeability:

The 6 plate 2nd clutch will retro all the way back as long as you have an input housing with no balance weight, or an input housing with the balance weight down on the side (See Figure 34).

1984 - 1986
5 Plate 2nd Clutch



1987
6 Plate 2nd Clutch



609 BAND, REVERSE
611 HOUSING, 2ND CLUTCH
612 RETAINER & BALL ASSEMBLY
614 SEALS, 2ND CLUTCH PISTON
615 PISTON, 2ND CLUTCH
616 APPLY RING & SPRING RETURN
617 RING, SNAP (2ND CLUTCH HUB)
618 PLATE ASSEMBLY, 2ND CLUTCH
619 PLATE, 2ND CLUTCH BACKING
620 RING, SNAP (2ND CLUTCH BACKING)
622 BEARING, THRUST (SUPPORT/SELECTIVE THRUST WASHER)
623 WASHER, THRUST (SELECTIVE)
691 SUPPORT, 2ND CLUTCH HOUSING
693 PLATE, 2ND CLUTCH WAVED

Figure 32

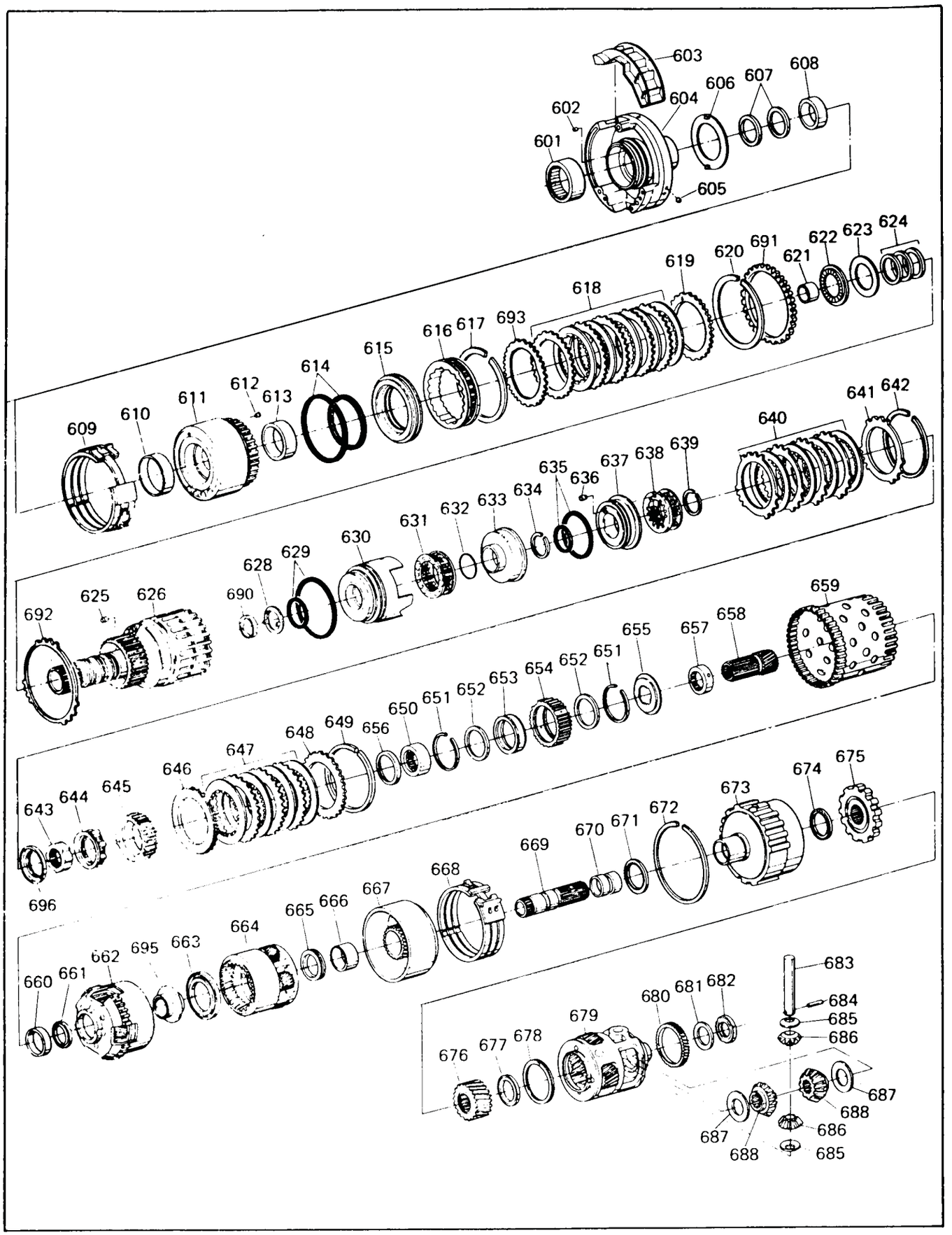


Figure 33

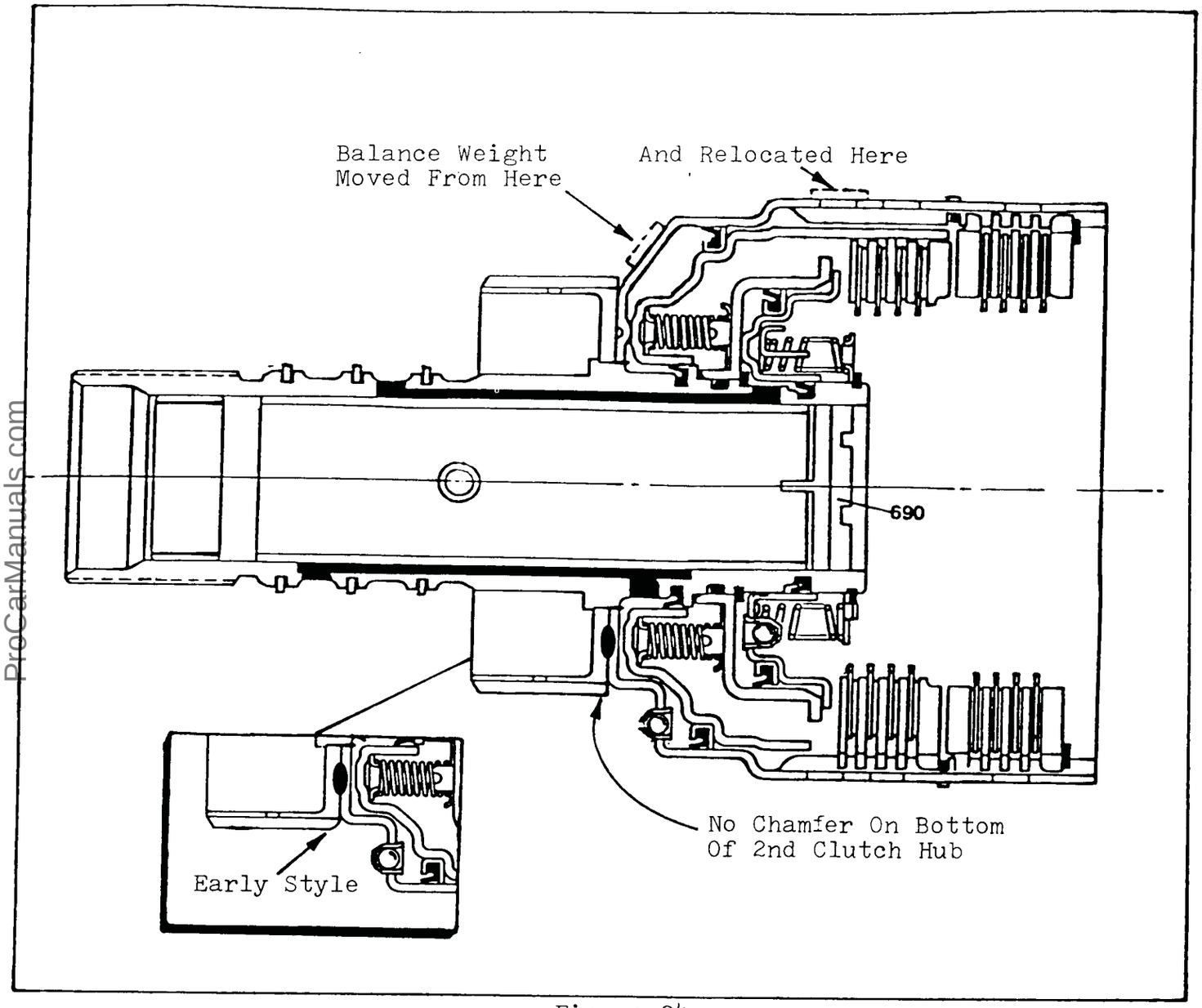


Figure 34

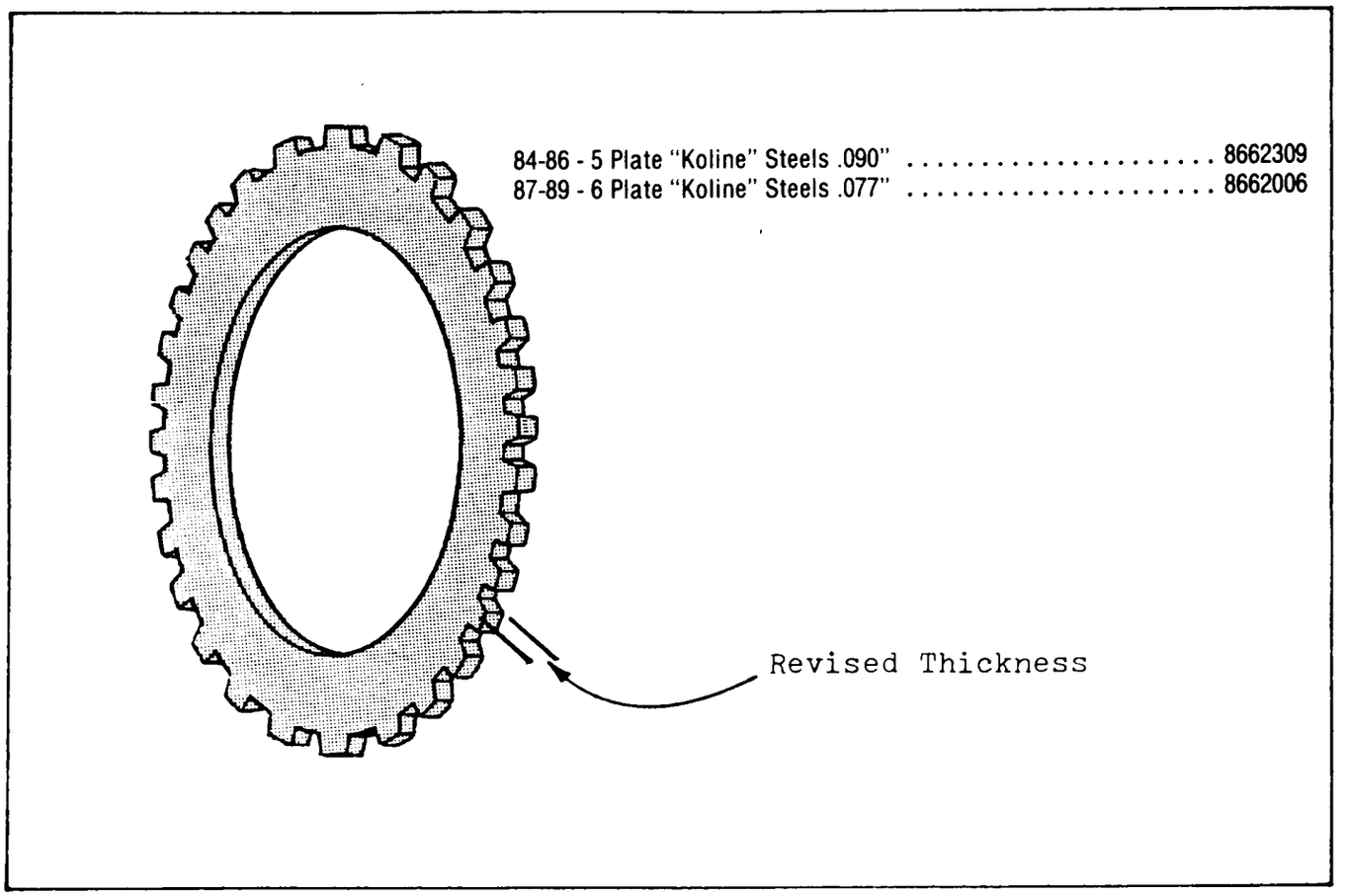


Figure 35

"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" -----8662911

1987 - 6 Plate "Koline" Steels .077" -----8662912

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:

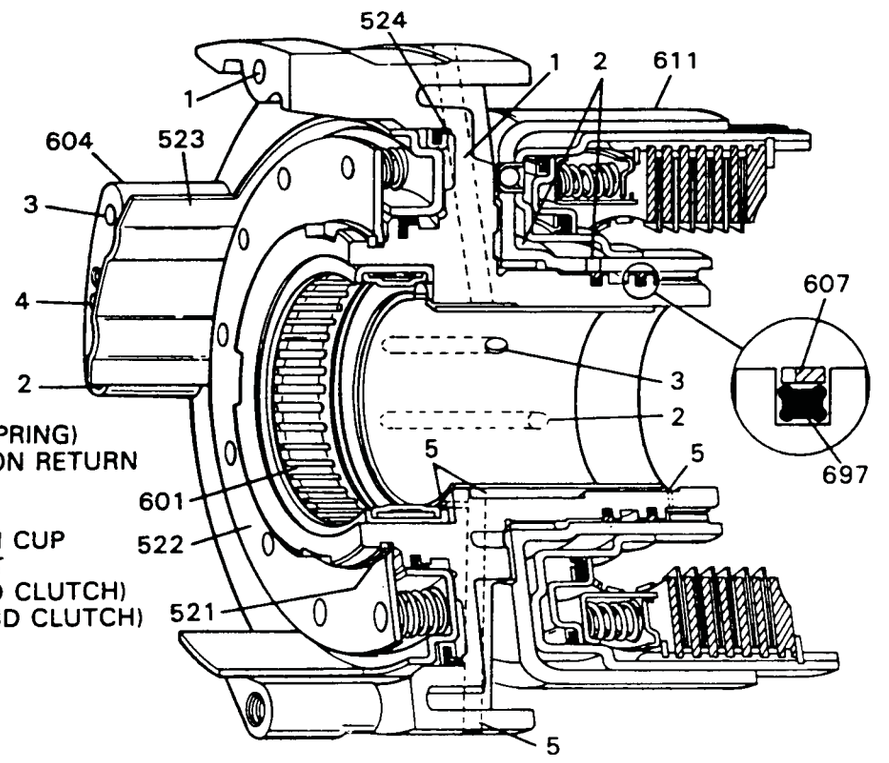
1) Driven Sprocket Support - Slots added to accept tabs on the "Vespel" sealing rings, and ring grooves machined deeper to make room for the 4 lobe ring (Expander).
2) No. (697) 4 lobe ring acts as expander for (607) "Vespel" sealing ring (See Inset, Figure 36).

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



521 RING, SNAP (4TH CL. RET. SPRING)
522 SPRING ASM., 4TH CL. PISTON RETURN
523 PISTON, 4TH CLUTCH
524 SEALS, 4TH CLUTCH PISTON
601 BEARING ASSEMBLY, DRAWN CUP
604 SUPPORT, DRIVEN SPROCKET
607 RING, VESPEL (SUPPORT/2ND CLUTCH)
697 SEAL, 4-LOBED (SUPPORT/2ND CLUTCH)
611 HOUSING, 2ND CLUTCH
1 INPUT CLUTCH OIL PASSAGE
2 2ND CLUTCH OIL PASSAGE
3 3RD CLUTCH OIL PASSAGE
4 4TH CLUTCH OIL PASSAGE
5 LUBE

Figure 36

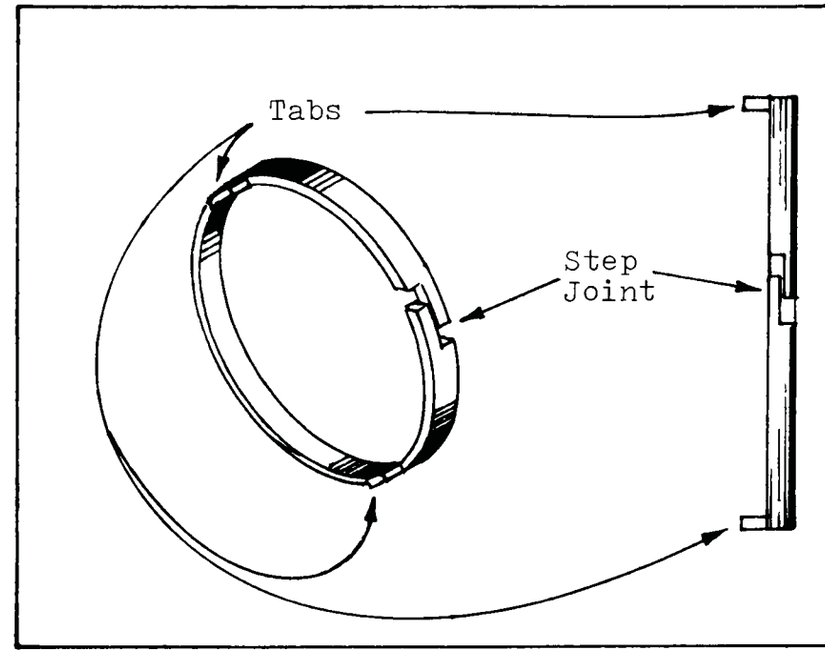
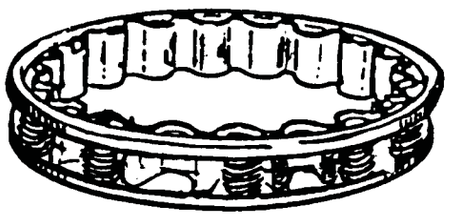


Figure 37



Remove Every Other Spring

Figure 38

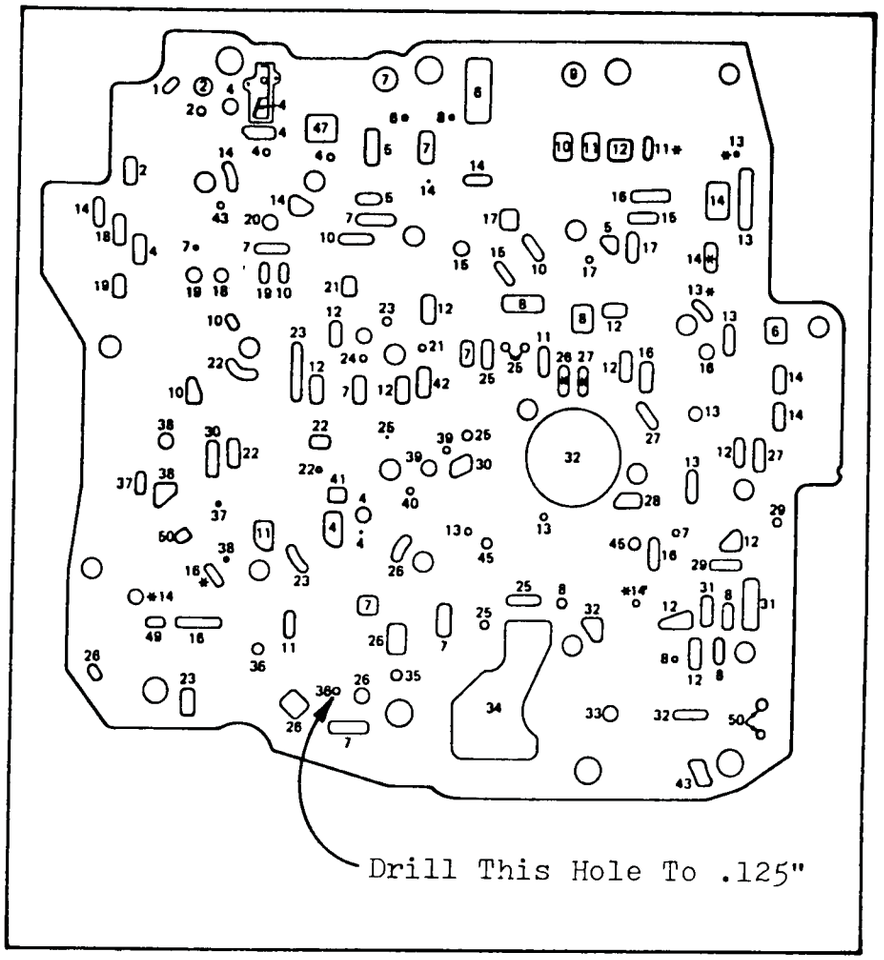


Figure 39

1-2 Slide That Won't Go Away:

Drill spacer plate at location shown, which is the 2nd clutch feed hole, to .125". That may sound like a lot but it is .097" from the factory.

Also remove every other spring from the Apply Ring and Return Spring Assy. (See Figure 38). There are a total of 20, and we are going to remove half of them.

This will make most of the 1-2 slide problems acceptable. It is not necessary on models using the 2nd design "Vespel" Sealing Rings.

3RD ROLLER CLUTCH CHANGES

Change: Addition of "Oil Dam" to 3rd roller clutch (See Figure 40).

Reason: Improved durability because of increased oil retention for lubrication.

Parts Affected:

1) 3rd Roller Clutch, Outer Race - Modified to accept the added oil dam.

2) 3rd Clutch Return Spring Assembly - Tabs removed from top of return spring assembly, because of interference with added oil dam (See Figure 41).

3) Input Housing - Snap ring groove moved .010" toward the 3rd clutch piston. This was done to move the 3rd clutch return spring assembly an additional .010" away from added oil dam for added clearance (See Figure 42).

NOTE: It has been this technicians experience that moving this snap ring was not necessary in every case.

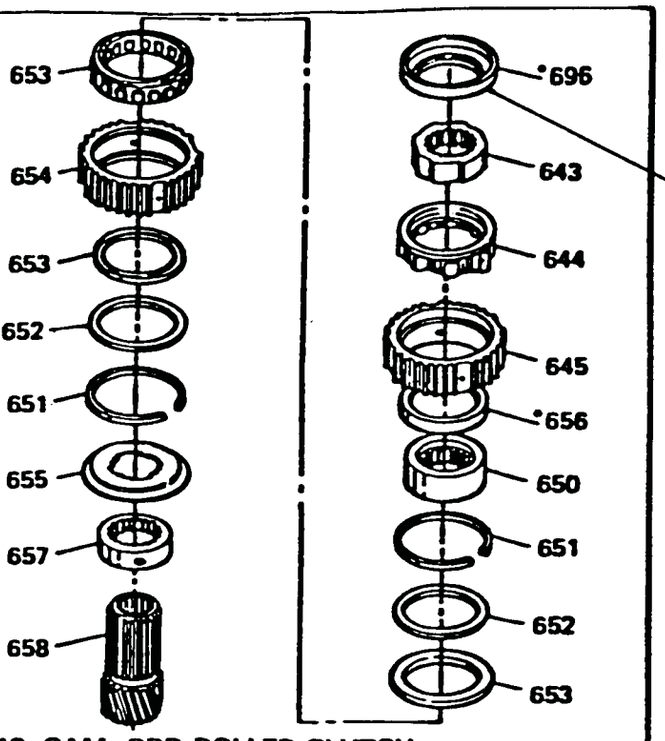
Install "Top Hat" thrust washer and check for interference by installing the 3rd roller clutch in the input housing without the 3rd clutches. If interference is present, you can add a .010 shim beneath the "Top Hat" washer (See Figure 43), and save the cost of a new input housing. In most cases all you will have to have is the 2nd design return spring assembly. This part is a must- (See Figure 41).

Interchangeability:

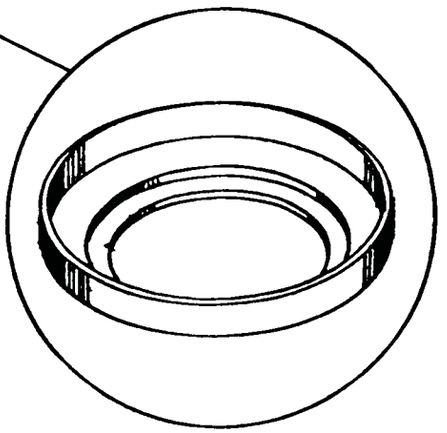
Will retro fit backwards, and is recommended, as long as compatable parts are used to eliminate any interference.

NOTE: If new input housing is purchased, be sure to remove (690) sleeve from old input housing and reinstall in the new input housing, as it does not come with the new input housing (See Inset, Figure 42).

This (690) sleeve has notches in it to accept the tangs of the "Top Hat" washer to prevent the washer from spinning in the housing (See Inset, Figure 42).



643 CAM, 3RD ROLLER CLUTCH
644 ROLLER ASSEMBLY, 3RD CLUTCH
645 RACE, 3RD ROLLER CLUTCH
650 RACE, INPUT SPRAG (INNER)
651 RING, SNAP (SPRAG)
652 WEAR PLATE, INPUT SPRAG
653 SPRAG ASSEMBLY, INPUT CLUTCH
654 RACE, INPUT SPRAG (OUTER)
655 RETAINER, INPUT SPRAG
•656 DAM, INPUT SPRAG RACE LUBE (NOT USED ON EARLY MODELS)
657 SPACER, INPUT SUN GEAR
658 GEAR, INPUT SUN
•696 DAM, 3RD ROLLER CLUTCH (NOT USED ON EARLY MODELS)



3rd Roller Clutch Oil Dam

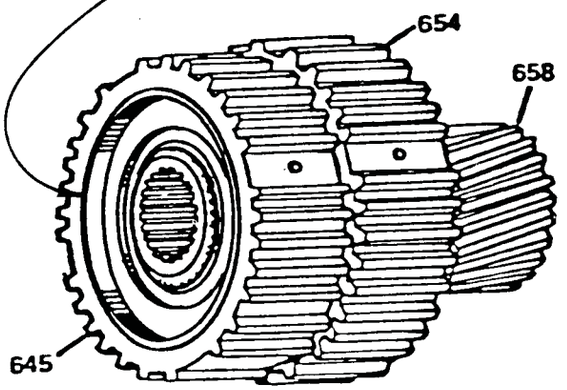


Figure 40

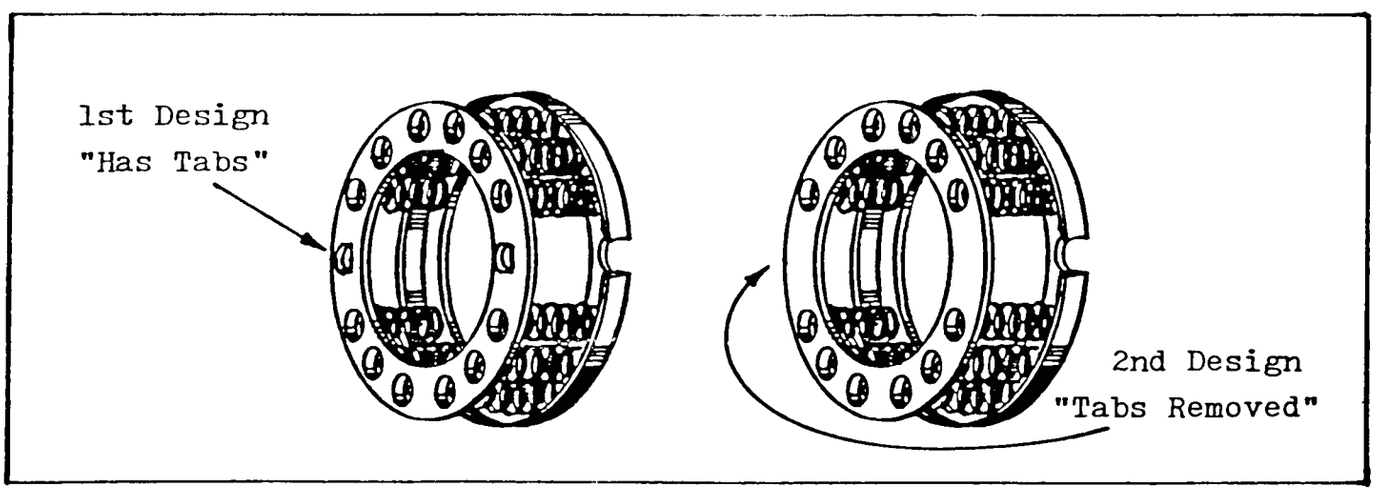


Figure 41

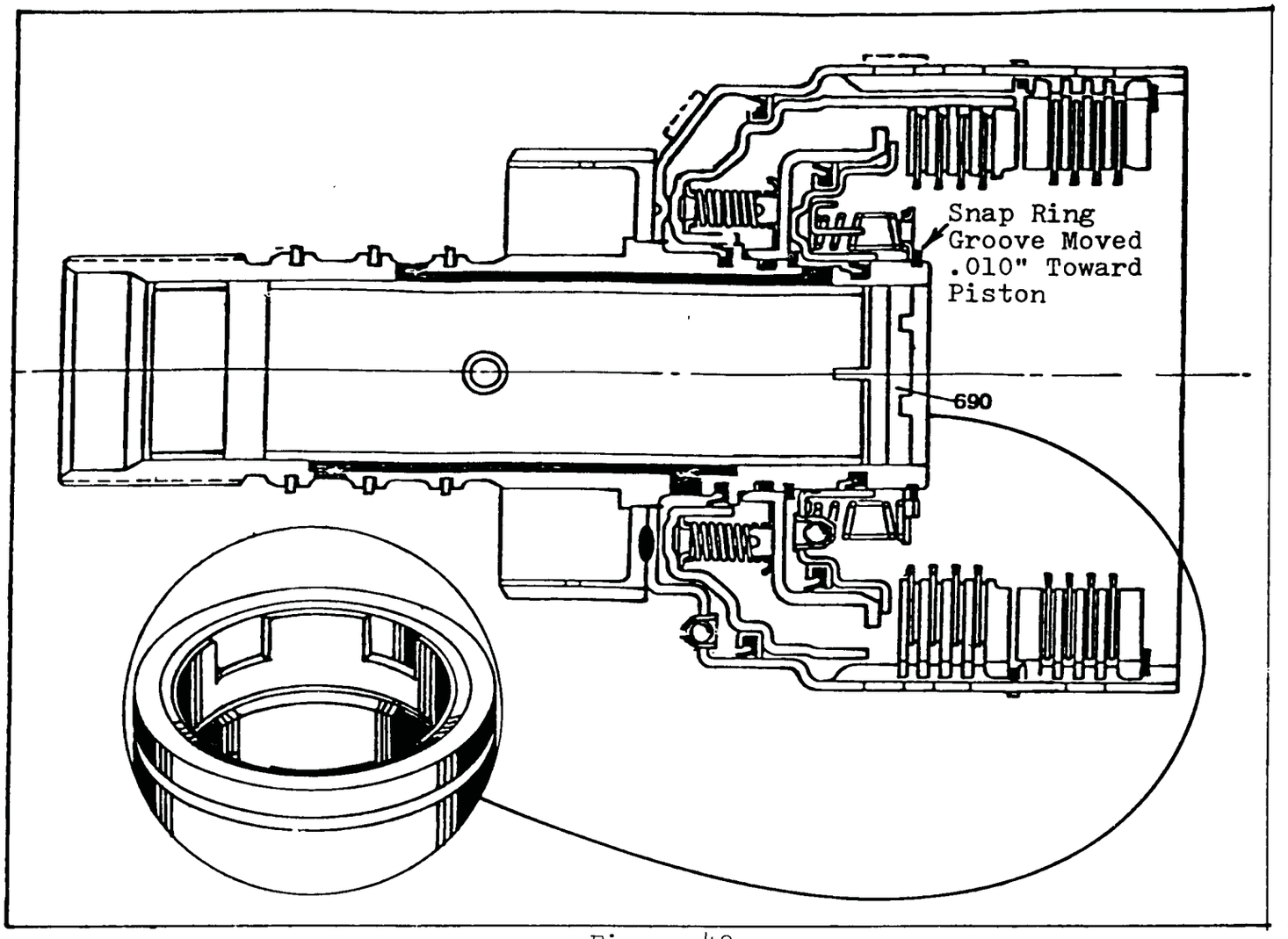


Figure 42

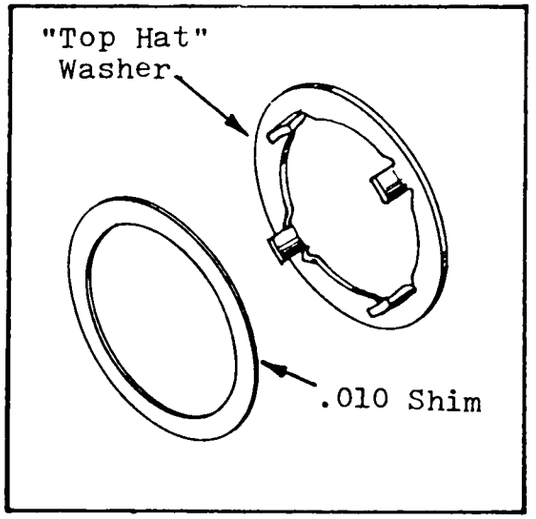


Figure 43

PLASTIC LUBE DAM (Update)

Change: Addition of plastic lube dam (695) between carriers. (See Figure 44).

Reason: Improved durability by retaining more lube oil on output shaft bearing(566) (Figure 45). This bearing rides inside of the input sun gear.

Parts Affected:

1) Input Carrier(662) (Figure 44) - Bored larger on inside diameter to accept added lube dam.
2) Output Shaft(565) (Figure 45) - Machined shoulder on output shaft to accept added lube dam (See Inset, Figure 45).
3) Final Drive Sun Gear Shaft(669) (Figure 44) - Inside diameter bored larger on one end to accept added lube dam. (See Inset, Figure 44).

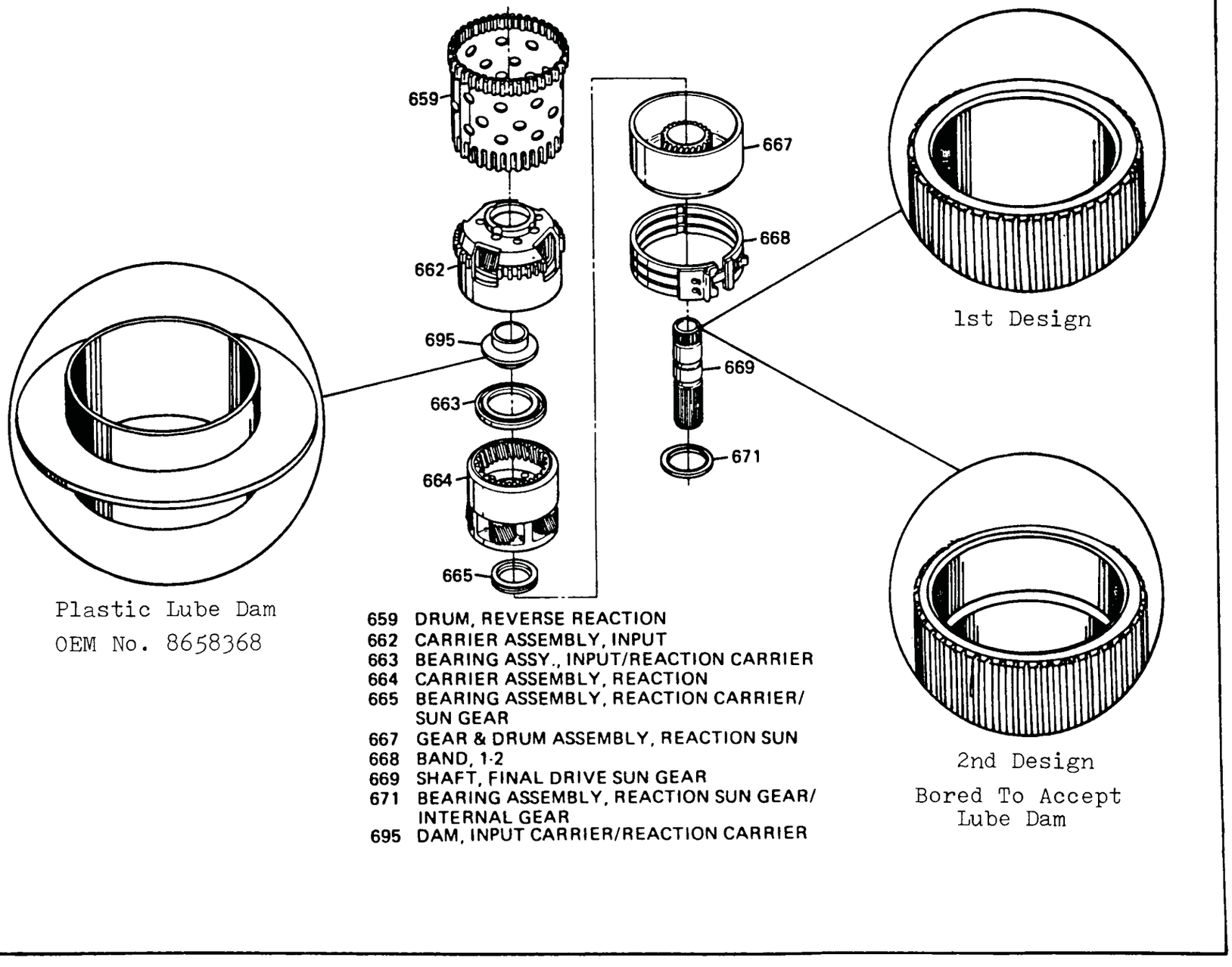
Interchangeability:

You can use input carrier, output shaft, or final drive sun gear shaft, in any configuration that you want to (Mix and Match), AS LONG AS THE INPUT CARRIER IS NOT BORED FOR THE LUBE DAM. If the input carrier is bored for the lube dam, you MUST use the lube dam. If you use the lube dam, you MUST use the 2nd design output shaft, and the 2nd design final drive sun gear shaft (See Figures 44 and 45).

NOTE: If input carrier that is bored for the lube dam is installed without the lube dam in place, the bearing on the output shaft will be destroyed in a very short period of time, along with the mating parts.

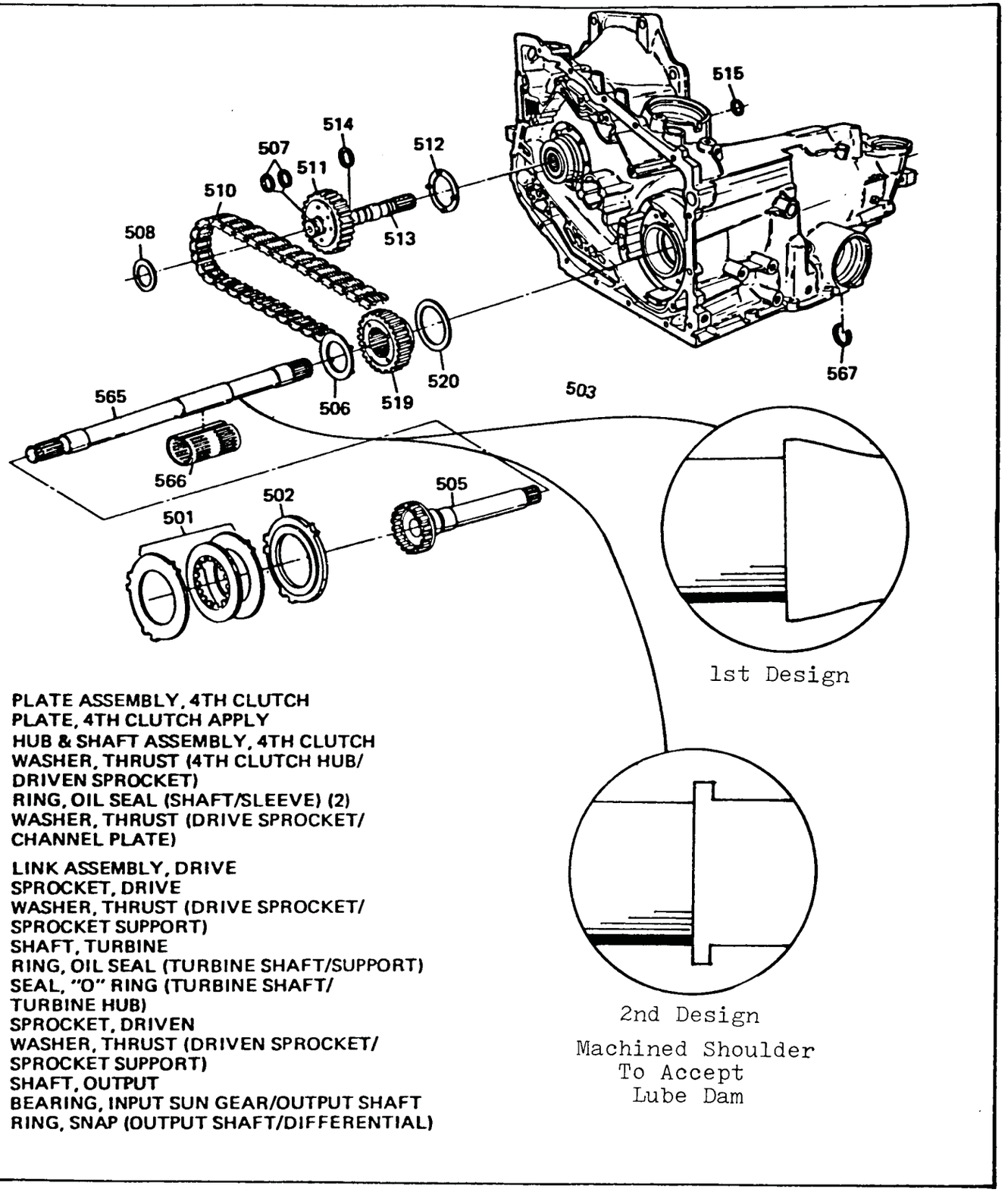
If you remove the final drive snap ring and use the output shaft as a "Tool" to remove the entire gear assemblies, you will break the lube dam if it is present.

The OEM Part NO. is 8658368.



659 DRUM, REVERSE REACTION
662 CARRIER ASSEMBLY, INPUT
663 BEARING ASSY., INPUT/REACTION CARRIER
664 CARRIER ASSEMBLY, REACTION
665 BEARING ASSEMBLY, REACTION CARRIER/ SUN GEAR
667 GEAR & DRUM ASSEMBLY, REACTION SUN
668 BAND, 1-2
669 SHAFT, FINAL DRIVE SUN GEAR
671 BEARING ASSEMBLY, REACTION SUN GEAR/ INTERNAL GEAR
695 DAM, INPUT CARRIER/REACTION CARRIER

Figure 44



501 PLATE ASSEMBLY, 4TH CLUTCH
502 PLATE, 4TH CLUTCH APPLY
505 HUB & SHAFT ASSEMBLY, 4TH CLUTCH
506 WASHER, THRUST (4TH CLUTCH HUB/ DRIVEN SPROCKET)
507 RING, OIL SEAL (SHAFT/SLEEVE) (2)
508 WASHER, THRUST (DRIVE SPROCKET/ CHANNEL PLATE)
510 LINK ASSEMBLY, DRIVE
511 SPROCKET, DRIVE
512 WASHER, THRUST (DRIVE SPROCKET/ SPROCKET SUPPORT)
513 SHAFT, TURBINE
514 RING, OIL SEAL (TURBINE SHAFT/SUPPORT)
515 SEAL, "O" RING (TURBINE SHAFT/ TURBINE HUB)
519 SPROCKET, DRIVEN
520 WASHER, THRUST (DRIVEN SPROCKET/ SPROCKET SUPPORT)
565 SHAFT, OUTPUT
566 BEARING, INPUT SUN GEAR/OUTPUT SHAFT
567 RING, SNAP (OUTPUT SHAFT/DIFFERENTIAL)

Figure 45

INPUT SPRAG CHANGES

Change: Wider Sprag - Sprags themselves increased in length by .095"

Reason: Increased capacity and vastly improved durability.

Parts Affected:

1) Input Sprag Assy(653) - Length of sprags increased by .095" and redimensioned end plates.
2) Outer Race(654) - Wider by .050".
3) Inner Race(650) - Wider by .142".
4) Retainer(655) - Shallower by .065" (See Figure 49).
5) Spacer(657) - Thinner by .142" (See Figure 49).
6) Input Carrier(622) - Shoulder machined down to shorter dimension (See Figure 46).

   CAUTION: The input carrier must be replaced or modified as per specifications in Figure 46. If not replaced or modified, an interference will result and damage to the transaxle. The lip protruding on top of the input carrier must be machined to meet the dimension shown in Figure 46. Extra care must be used in the machining process, as the torrington bearing will not come out of the input carrier.

* 7) Plastic Lube Dam(695) - Input carrier bored to accept dam.

* 8) Output Shaft(565) - Shoulder machined to accept lube dam between the carriers (See Figure 45).

* 9) Final Drive Sun Gear Shaft(669) - Bored the inside diameter to accept lube dam between the carriers (See Figure 44).

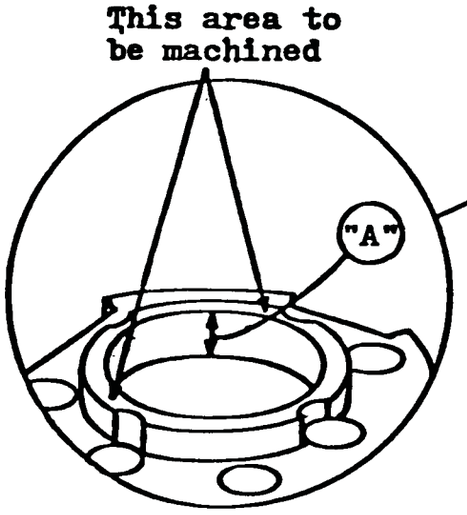
   * NOTE: If updated sprag and carrier are used, you will have to purchase these 3 parts in addition to sprag kit, if they are not included in the model you are rebuilding.

Interchangeability:

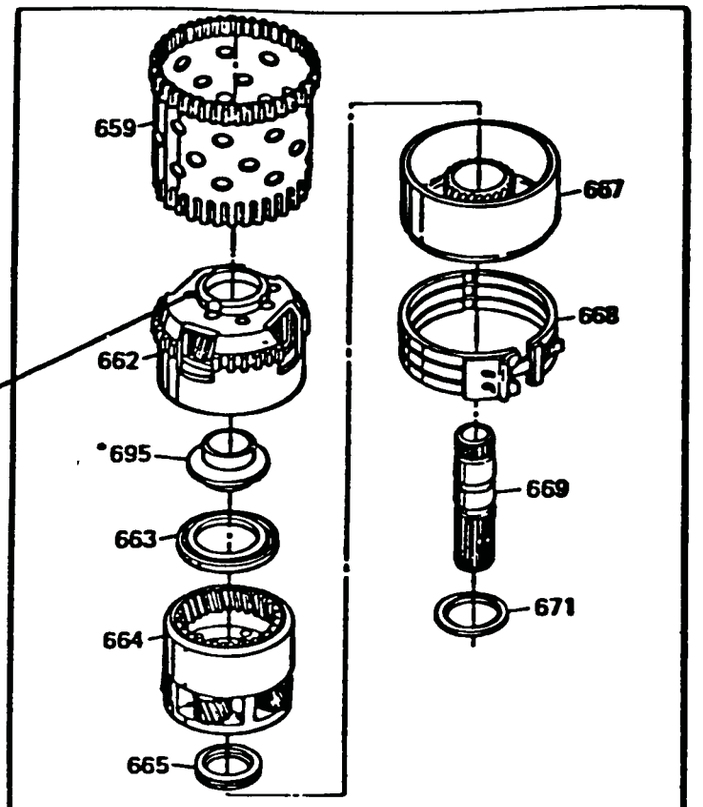
Will retro fit backwards, and is HIGHLY recommended, as long as all compatable parts are installed.

There is now available a service kit, available under OEM part No. 8662906, That will get you all of the input sprag pieces needed, plus the input carrier. The input carrier included in this kit will have the inside diameter bored for the lube dam update. This means that if you are installing this kit into a model that happened not to include the lube dam, you must also purchase the lube dam, the 2nd design output shaft, and the 2nd design final drive sun gear shaft (See Plastic Lube Dam Update portion of this manual).

All OEM Part Numbers For The Parts Above Are Listed On Page 47.

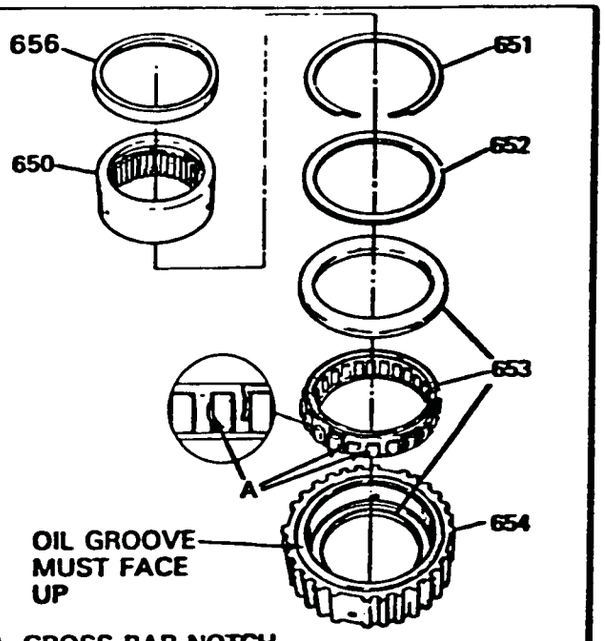


Dimension "A" should be .375" after machining



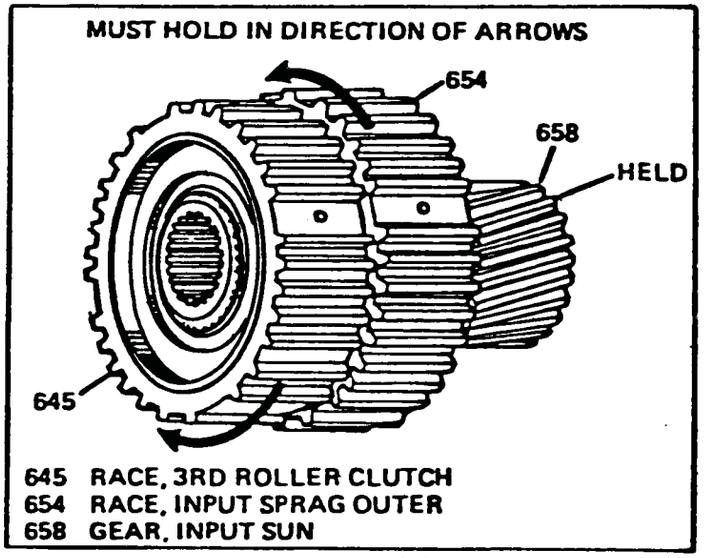
659 DRUM, REVERSE REACTION
662 CARRIER ASSEMBLY, INPUT
663 BEARING ASSY., INPUT/REACTION CARRIER
664 CARRIER ASSEMBLY, REACTION
665 BEARING ASSEMBLY, REACTION CARRIER/ SUN GEAR
667 GEAR & DRUM ASSEMBLY, REACTION SUN
668 BAND, 1-2
669 SHAFT, FINAL DRIVE SUN GEAR
671 BEARING ASSEMBLY, REACTION SUN GEAR/ INTERNAL GEAR
*695 DAM, INPUT CARRIER/REACTION CARRIER (NOT USED ON EARLY MODELS)

Figure 46



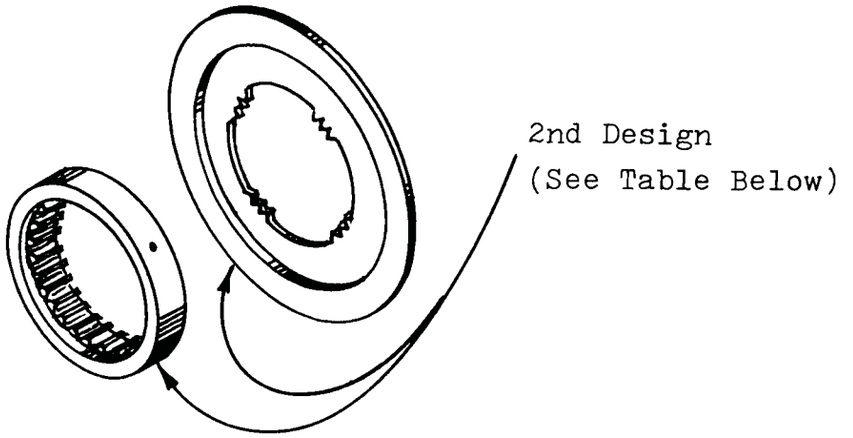
A CROSS BAR NOTCH
650 RACE, INPUT SPRAG INNER
651 RING, SNAP (SPRAG)
652 WEAR PLATE, INPUT SPRAG
653 SPRAG ASSEMBLY, INPUT CLUTCH
654 RACE, INPUT SPRAG OUTER
656 DAM, INPUT SPRAG RACE LUBE

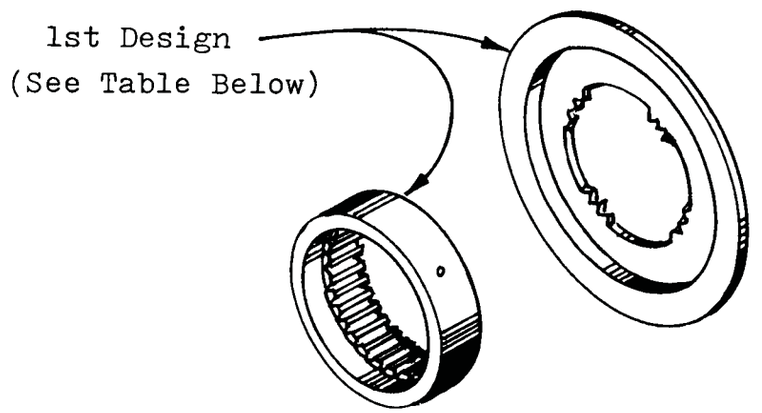
Figure 47



645 RACE, 3RD ROLLER CLUTCH
654 RACE, INPUT SPRAG OUTER
658 GEAR, INPUT SUN

Figure 48





		EARLY	LATE
Individual Sprags(653)	.095" Wider	.305"	.400"
Outer Race(654)	.050" Wider	.964"	1.014"
Inner Race(650)	.142" Wider	.790"	.932"
Retainer(655)	.065" Shallower	.140"	.075"
Spacer(657)	.142" Thinner	.495"	.353"

Figure 49

(Cont'd from Page 44)

Following are the OEM part numbers needed for the Input Sprag Update:

Input Sprag, Outer Race(654)	8658795
Snap Rings, (2 Required)(651)	8658889
Input Sprag Assembly(653)	8662031
Input Sprag, Inner Race(650)	8658834
Input Sprag Retainer(655)	8658796
Input Sprag Spacer(657)	8658797
Input Carrier(662)	8658800
Complete Kit (All Numbers Above)	8662906
Plastic Lube Dam(695)	8658368
Output Shaft(565) (2nd Design)	8658408
Final Drive Sun Gear Shaft(669) (2nd Design)	8658407

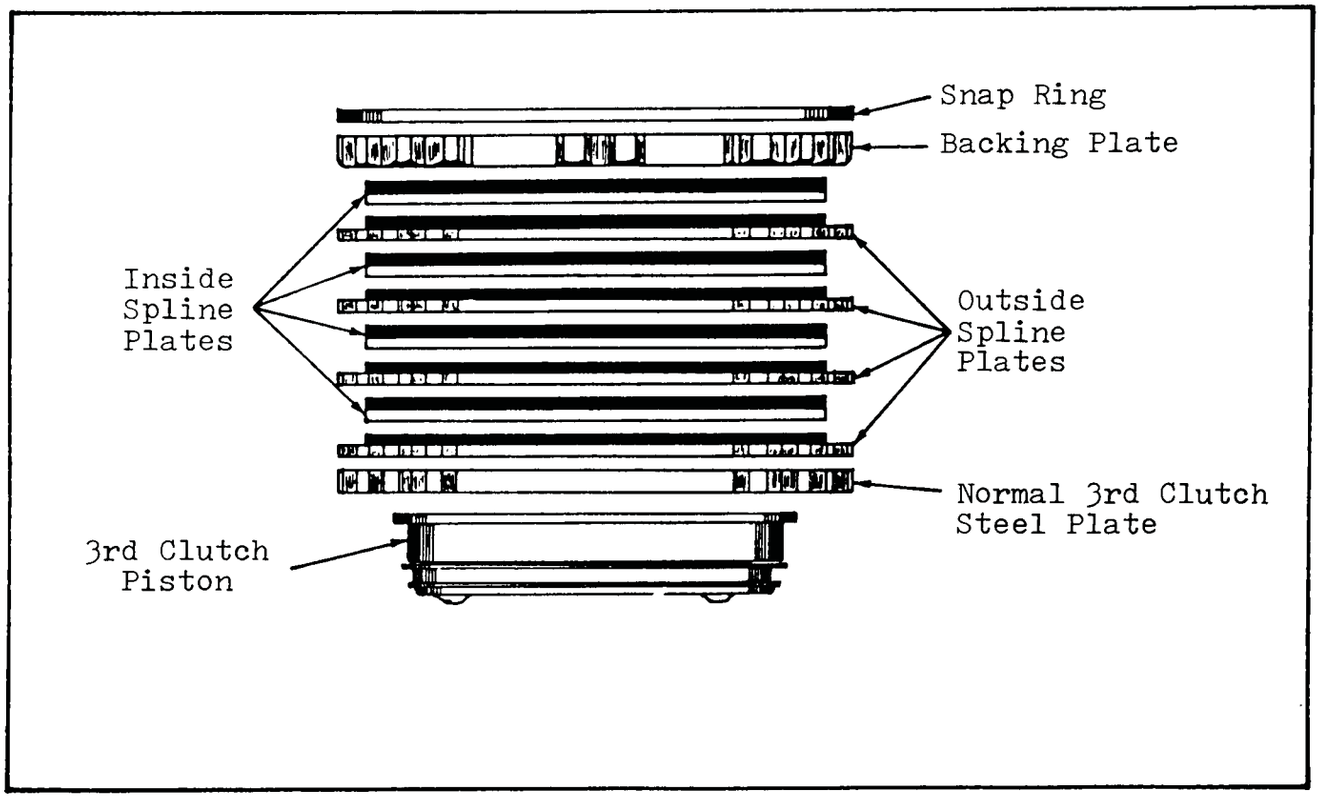


Figure 50

3RD CLUTCH CHANGES

1st Change: Single Sided 3rd Clutch Plates - Lining on one side only both inside and outside spline plates (See Figure 51).

Reason: Improved Durability

Parts Affected:

1) Third Clutch Plates - Single sided clutch plates requires new assembly procedures(See Figure 50).

Interchangeability:

Will retro fit backwards, and is 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 Figures 50 and 51.

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 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.

Refer to Figures 50 and 51.

2nd Change: 3rd Clutch Inner Lip Seal

Reason: Improved 3rd clutch durability by helping prevent the inner lip seal from rolling.

Parts Affected:

1) 3rd Clutch Inner Lip Seal - Thicker profile to help prevent seal from rolling (See Inset, Figure 52).

Continued on Page 50

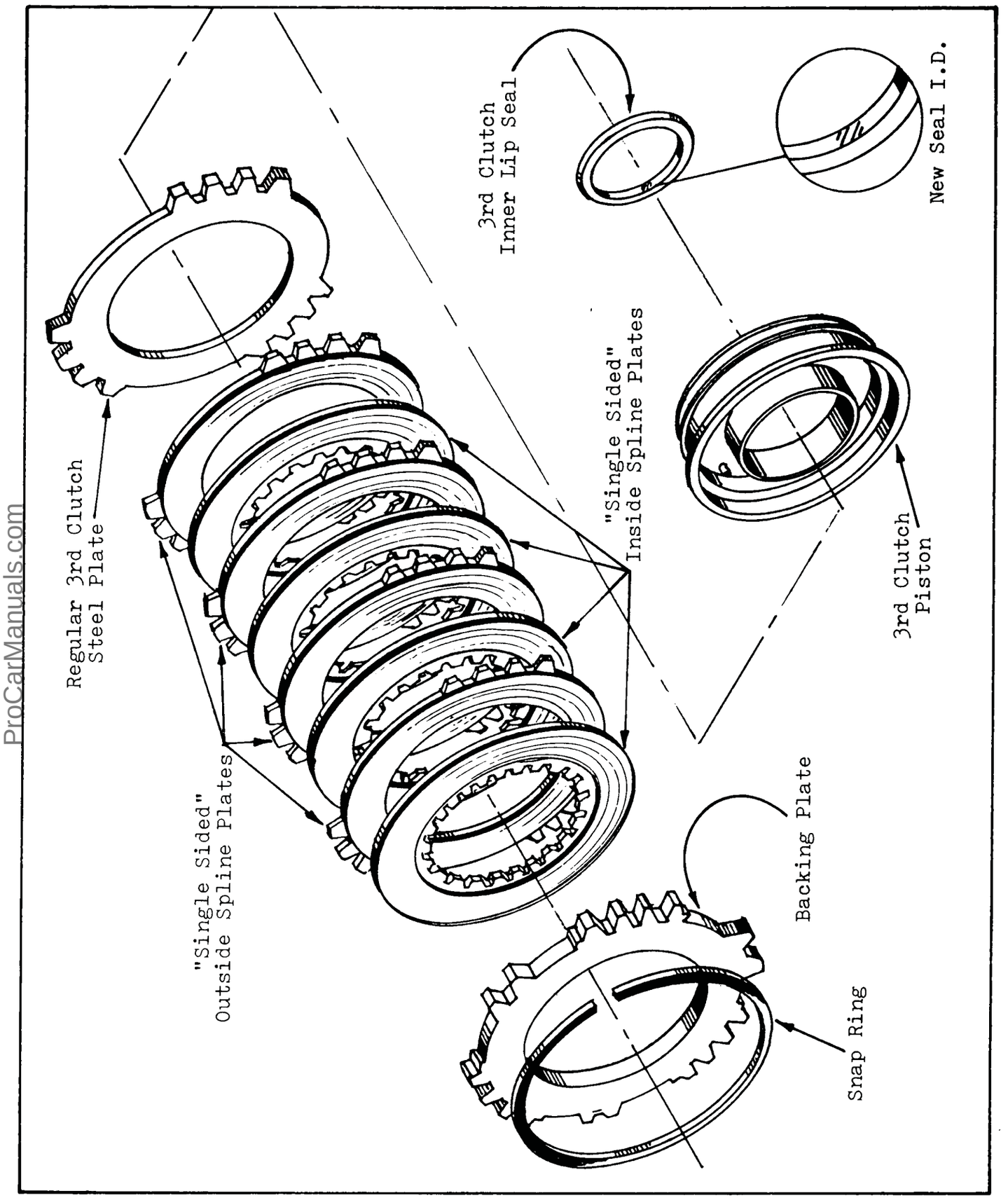


Figure 51

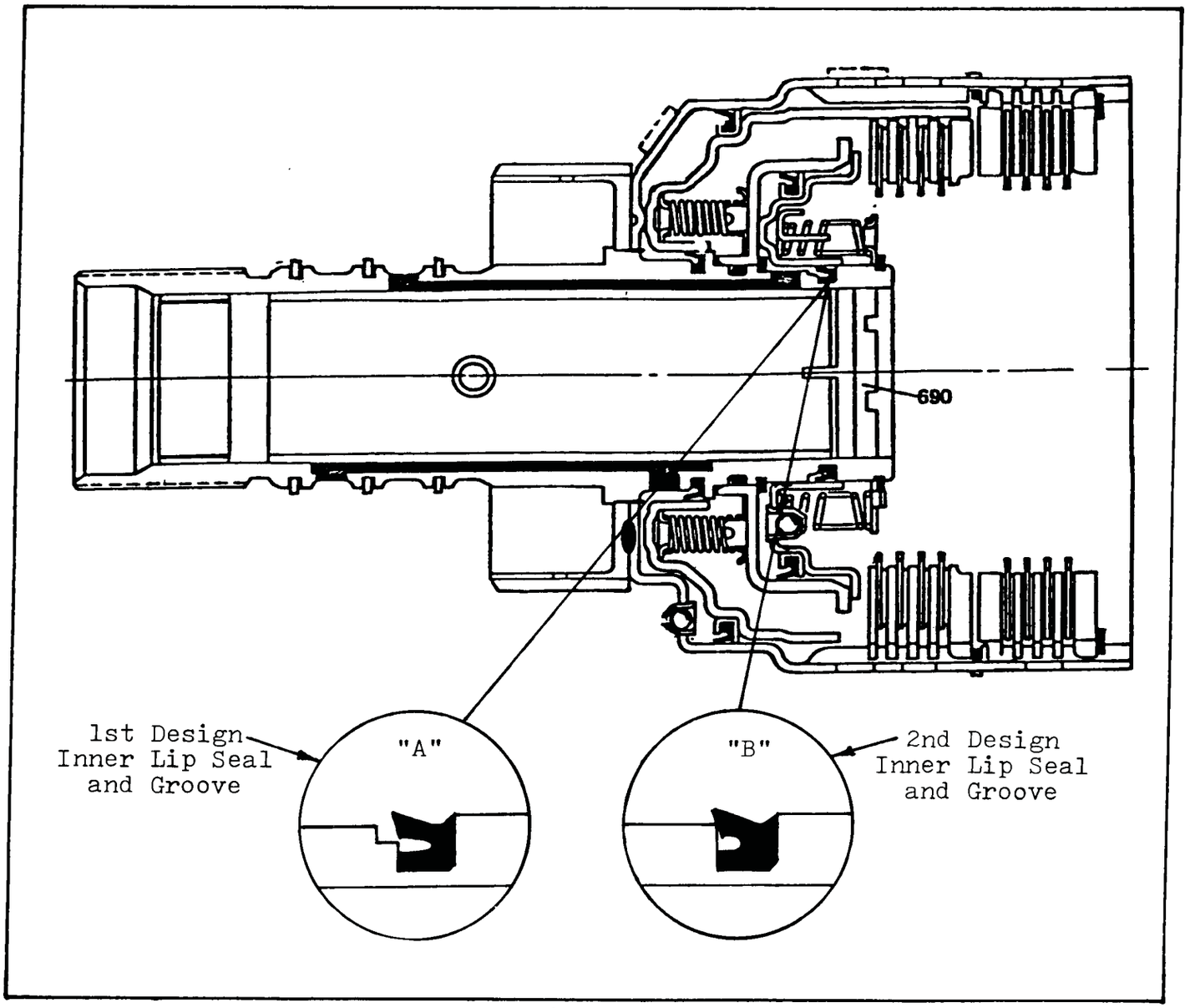


Figure 52

Cont'd from Page 48

Interchangeability:

Will retro fit backwards, and is recommended. New OEM Part No. is 8662673 on the new 3rd clutch lip seal. For positive identification of the new seal, check for hash marks on inside diameter of lip seal (See Inset, Figure 51). For difference in profile compare Inset "A" and "B" in Figure 52.

Continued on Page 51

3RD CLUTCH CHANGES (Cont'd)

3rd Change: Input/3rd Clutch Housing - Revised 3rd Clutch Inner Lip Seal Groove (See Figure 52)

Reason: Improved Durability of 3rd clutch inner lip seal.

Parts Affected:

1) Input/3rd Clutch Housing - One machining process eliminated in groove for the 3rd clutch inner lip seal, which provided more support for the lip seal to prevent it from rolling.

(Compare Inset "A" and "B", Figure 52).

Interchangeability:

Will retro fit backwards, and is recommended. The 2nd design Input/3rd Clutch Housing is available under OEM part No. 8662670.

If 2nd design housing is purchased, be sure to remove Sleeve(690) from old input housing and re-install in the new input housing. (See Inset, Figure 42).

This Sleeve(690) has notches in it to accept the tangs of the "Top Hat" washer to prevent the washer from spinning in the housing. (See Inset, Figure 42).

Following are the OEM part numbers needed for 3rd Clutch changes:

Inside Spline, Single Sided 3rd Clutch ------- 8658042
Outside Spline, Single Sided 3rd Clutch ------ 8658043
Normal Steel Plate, 3rd Clutch --------------- 8656313
Inner Lip Seal (2nd Design) ------------------ 8662673
Input/3rd Clutch Housing (2nd Design) -------- 8662670

MODULATOR CHANGES

Change: Modulator redesigned on the end that goes into transaxle. (Compare Figures 54 and 55). Occured Approx. July, 1986.

Reason: Improved shift feel at all altitudes.

Parts Affected:

1) Vacuum Modulator - Late design has plunger sticking out of modulator (See Figures 54 and 55).

2) Modulator Valve - Redesigned to be compatable with "Plunger" style modulator. (Stem Removed--See Figures 54 and 55).

3) Channel Plate - Orificed cup plug added to channel plate to stabilize modulator valve action (See Figure 53).

Interchangeability:

Will retro fit backwards, but not necessary in this technicians opinion.

CAUTION: Be certain, if changing modulators, that you have compatable parts together. You cannot install the late style modulator on top of the early style valve, but you can go the other way very easily.

If you install the early style modulator on top of the late style valve, you lose all modulator boost, and clutch damage will occur in about 15 minutes of normal vehicle operation.

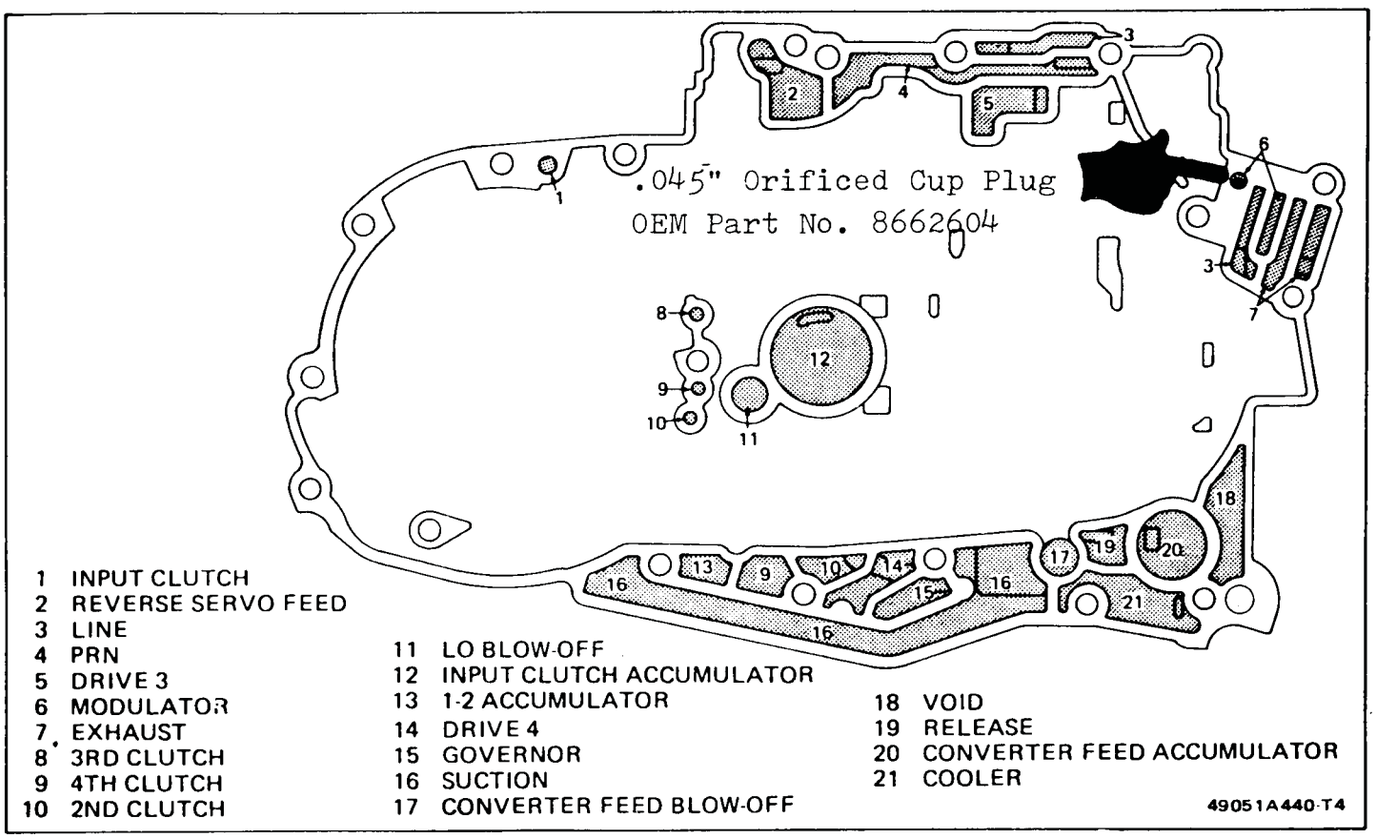


Figure 53

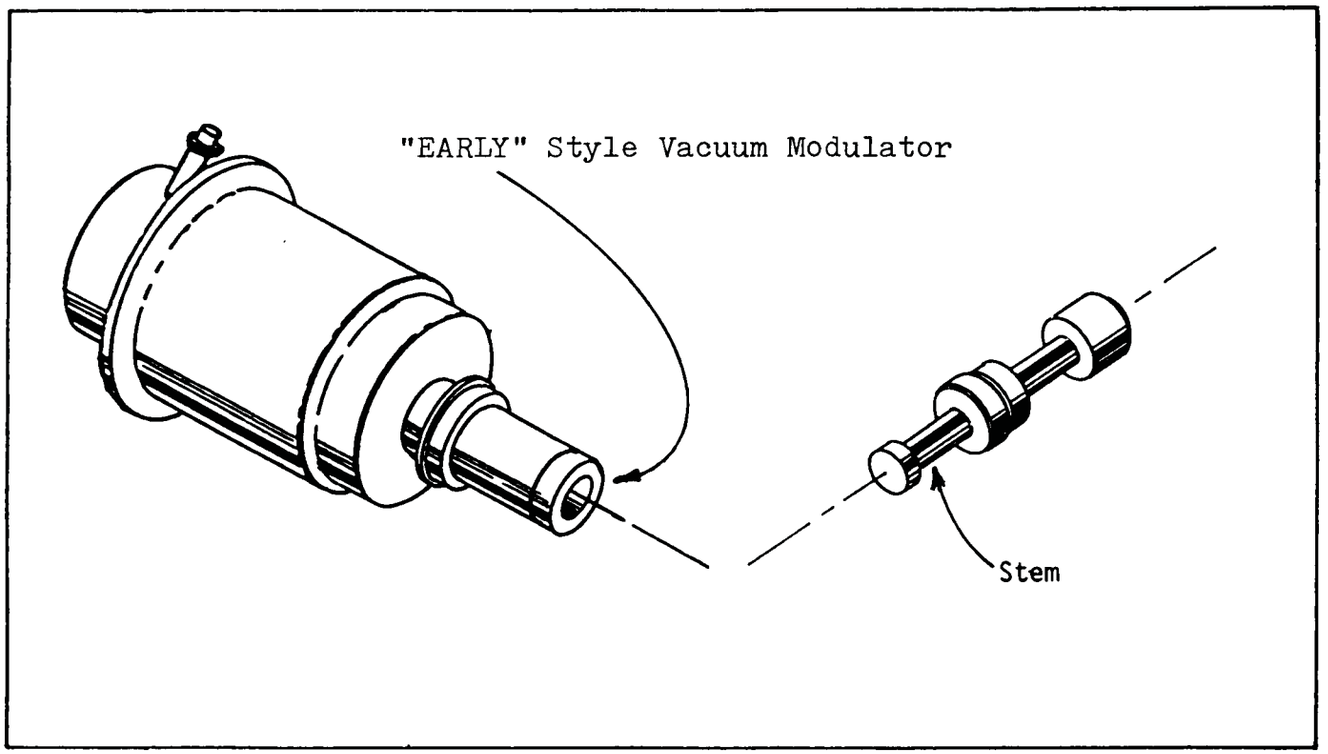


Figure 54

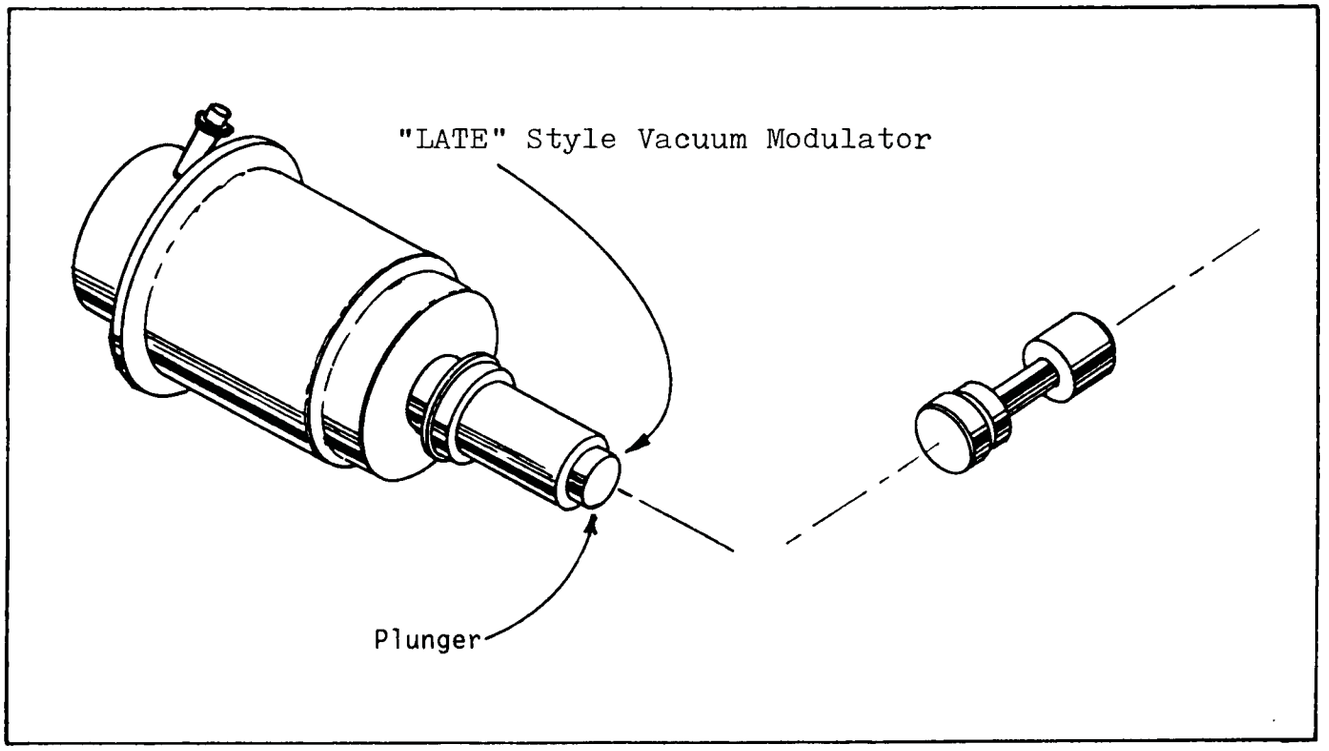


Figure 55

TRANSAXLE CASE CHANGES (1986 Up Models)

Change: Transaxle Case Assembly - 3 bosses added to transaxle case assembly (See Figures 56 and 57).

Reason: Addition of the THM 440-T4 to Toronado, Riviera, El Dorado (All "E" Bodies), and Cadillac Seville ("K" Body).

Parts Affected:

1) Transaxle Case - 3 bosses added to the case assembly (See Figures 56 and 57). The larger bosses on top of the case are for mounting purposes in the "E" and "K" bodies only. The smaller boss is for fuel line bracket in the "E" and "K" bodies only (See Figure 56). We can immediately see why it is called the E/K case.

2) Manual Shaft - The manual shaft is 1/4" longer on the E/K cars only.

Interchangeability:

Will retro fit backwards, but would not be smart to waste an E/K case on a non E/K vehicle, as they are in short supply.

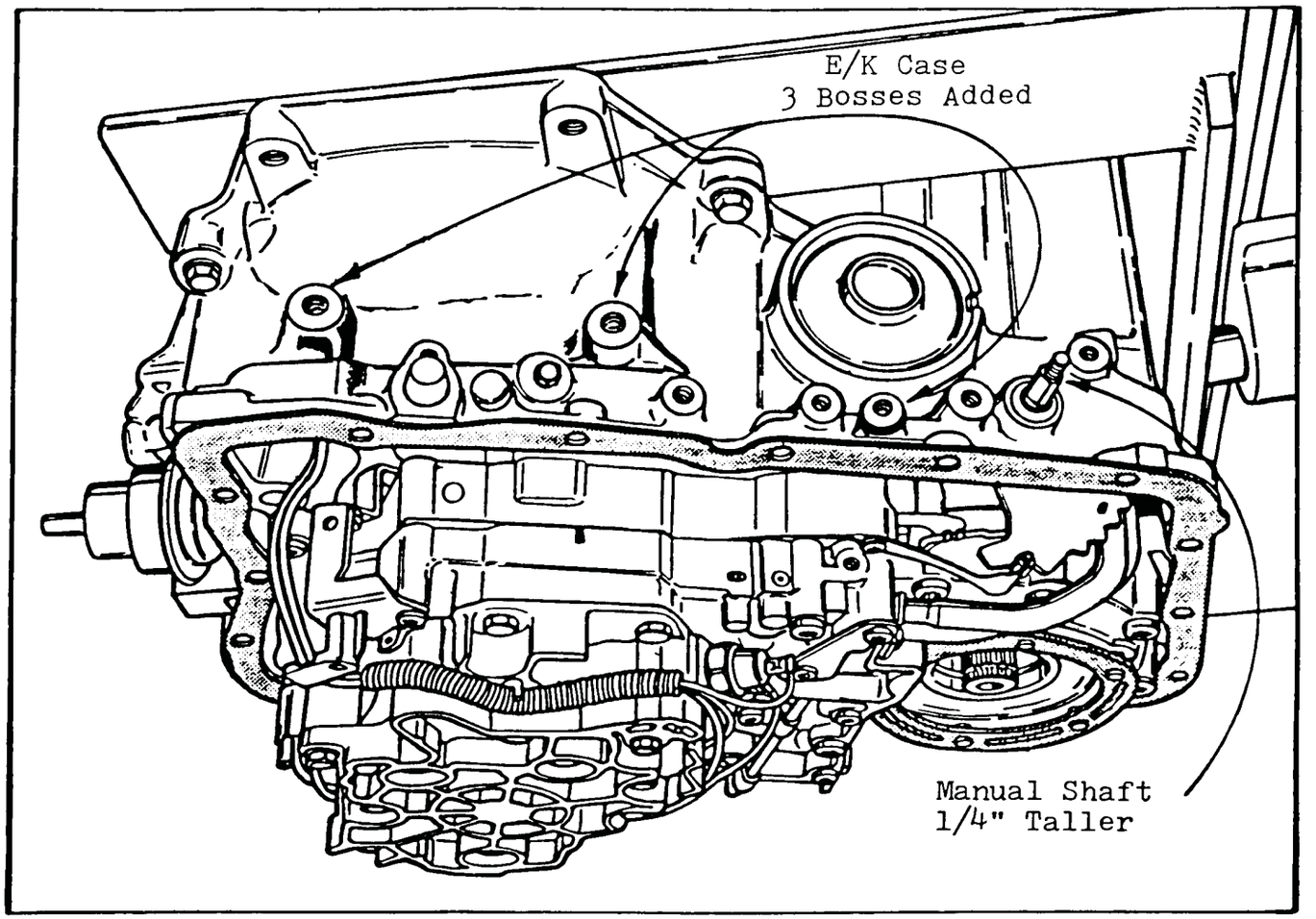


Figure 56

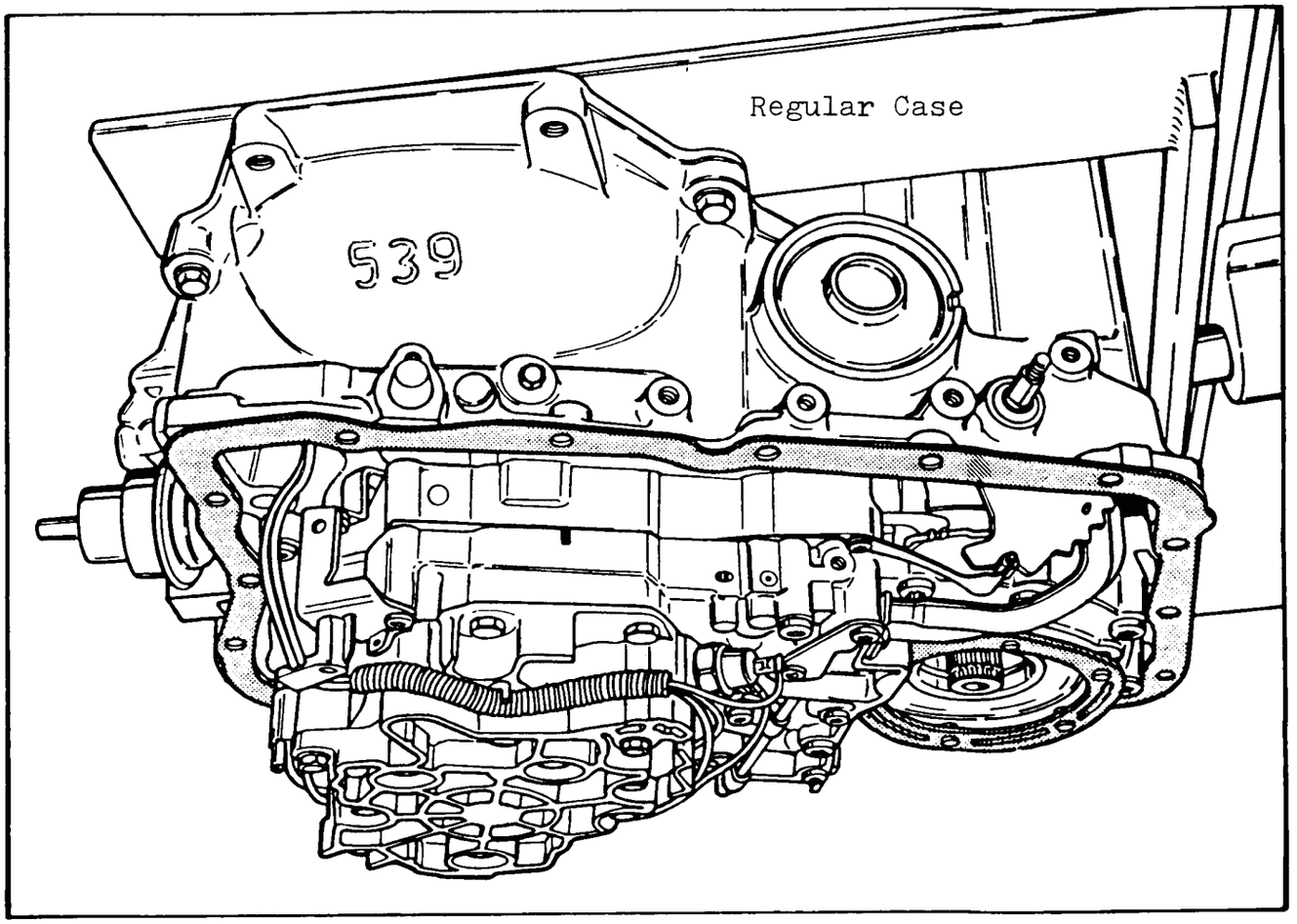


Figure 57

GOVERNOR COVER CHANGES (1987)

Change: Speed Sensor added to governor cover (Some Models)

Reason: The speed sensor is used by the ECM to provide anti-skid braking (Some Models)

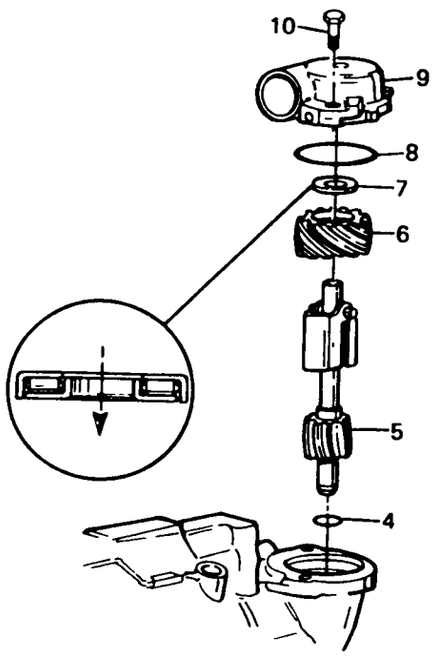
Parts Affected:

1) Governor Cover - Redesigned and speed sensor added to governor cover (See Figures 58 and 59).

2) Speedometer Gear - Replaced by 14 tooth rotor (11 Tooth on Allante) That is pressed on governor shaft (See Figure 59).

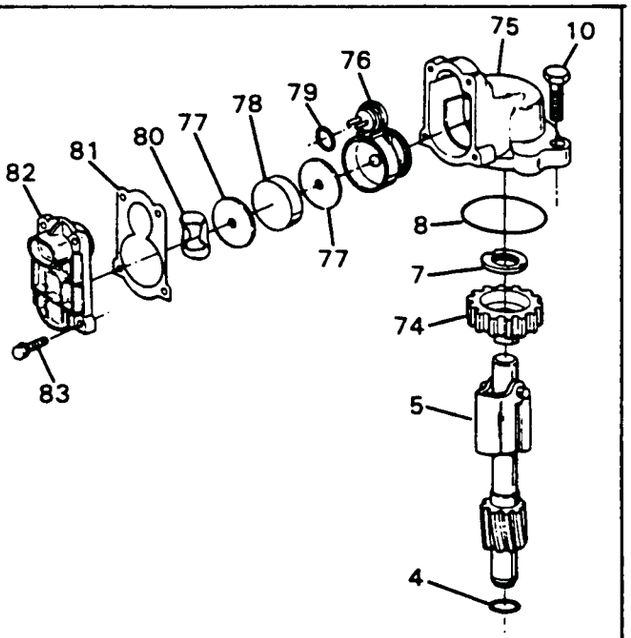
Interchangeability:

Not Interchangeable.



4 RING, OIL SEAL (GOVERNOR SHAFT)
5 GOVERNOR ASSEMBLY
6 GEAR, SPEEDOMETER DRIVE
7 BEARING ASM., THRUST (SPEEDO GEAR)
8 SEAL, "O" RING (GOVERNOR COVER)
9 COVER, GOVERNOR
10 SCREW, GOVERNOR COVER/CASE

Figure 58



4 RING, OIL SEAL (GOVERNOR SHAFT)
5 GOVERNOR ASSEMBLY
7 BEARING ASM., THRUST (SPEEDO GEAR)
8 SEAL, "O" RING (GOVERNOR COVER)
10 SCREW, GOVERNOR COVER/CASE
74 ROTOR, SPEED SENSOR
75 HOUSING, SPEED SENSOR
76 COIL ASSEMBLY
77 WASHER
78 MAGNET
79 SEAL, "O" RING
80 WASHER, WAVE SPRING
81 GASKET, COVER
82 COVER, HOUSING
83 BOLT

Figure 59

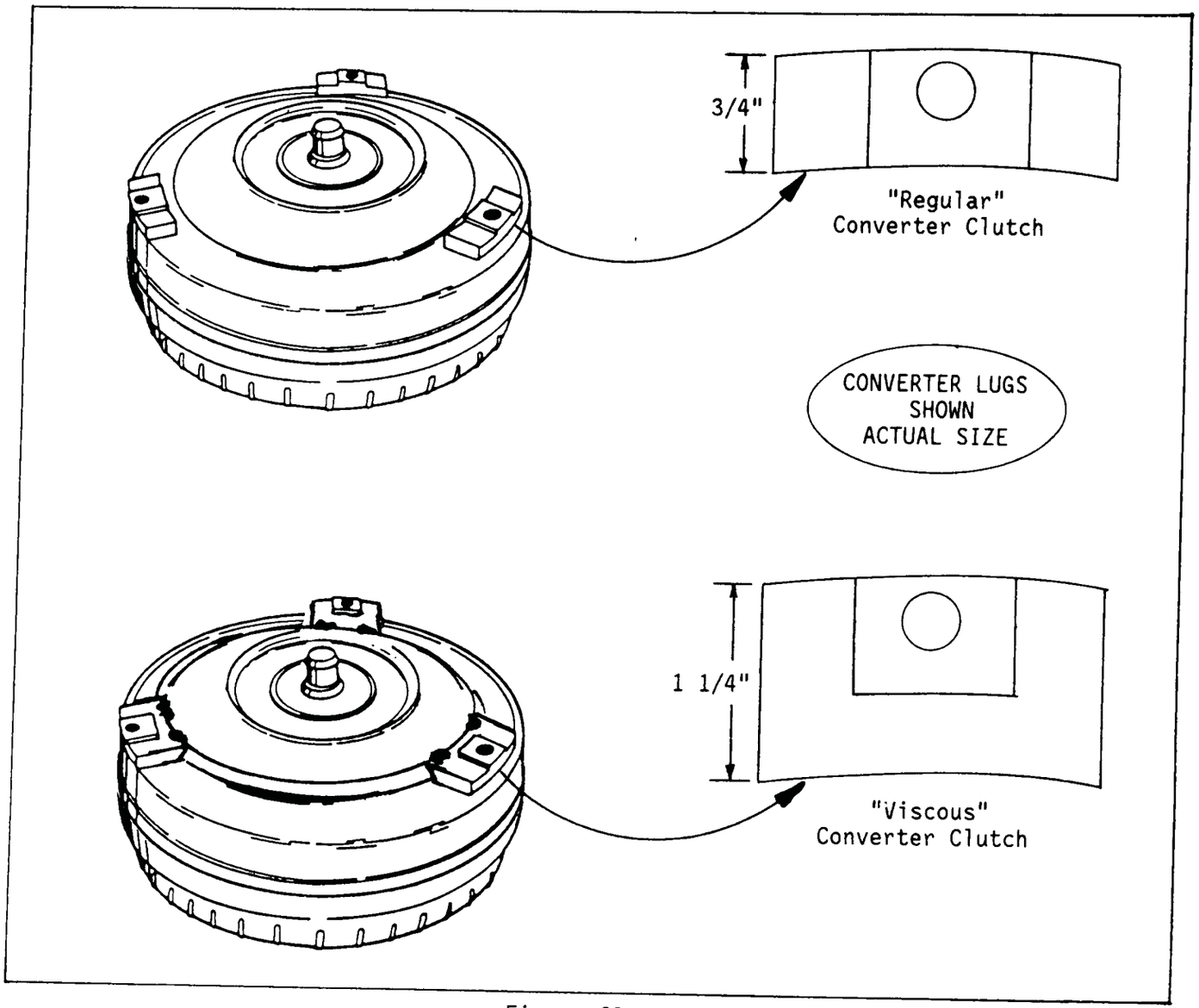


Figure 60

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.

1985, 1985½ THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
*CM	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.06	35-35	2.14	1,2,3,4
*CN	A	V6 2.8L Chevrolet	FD6B	2095	3.06	35-35	2.14	1,2,3,4
CP	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.06	35-35	2.14	1,2,3,4
CW	A	V6 2.8L Chevrolet	FD6B	2095	3.06	35-35	2.14	1,2,3,4
HA	A	V6 2.8L Chev Canada	FD6B	2095	3.06	35-35	2.14	1,2,3,4,6
*HJ	A	V6 2.8L Chev Canada	FD6B	2095	3.06	35-35	2.14	1,2,3,4,6
HT	A	V6 2.8L Chev Canada	FD6B	2095	3.06	35-35	2.14	1,2,3,4,6
*AF	C&LIMO	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
*AM	C&LIMO	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
*AR	C (Exp)	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
AY	C&LIMO	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
BS	C	V6 3.0L Buick	FE4B	1865	3.06	35-35	2.14	3,4
BU	C	V6 3.0L Buick	FE4B	1865	3.06	35-35	2.14	3,4
BN	C	V6 3.0L Buick	FE4B	1865	3.06	35-35	2.14	3,4
*BV	C	V6 3.0L Buick	FE4B	1865	3.06	35-35	2.14	3,4
OB	C	V6 4.3L Olds Diesel	FY7B	1525	3.06	35-35	2.14	3,4
OY	C	V6 4.3L Olds Diesel	FY7B	1525	3.06	35-35	2.14	3,4
BA	A,C	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	1,2,3,4
BC	A,C	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	1,2,3,4
BX	A,C	V6 3.8L Buick	FM4B	1895	2.84	35-35	1.98	1,2,3,4
*BR	A,C	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	1,2,3,4
*BW	A,C	V6 3.8L Buick	FM4B	1895	2.84	35-35	1.98	1,2,3,4

* Denotes 1985 1/2 Models

1 - Chevrolet
2 - Pontiac
3 - Oldsmobile
4 - Buick
5 - Cadillac
6 - Canada

MODEL	FINAL DRIVE RATIO	1-2 MIN. THROT	2-3 MIN. THROT	3-4 MIN. THROT	1-2 W.O.T.	2-3 W.O.T.	4-3 PART THROT	3-2 PART THROT	2-1 PART THROT	3-2 DET	2-1 DET	4-3 ZERO THROT	3-2 ZERO THROT	2-1 ZERO THROT
AA-AC AF-AM	3.33	11-14	21-24	38-49	36-41	70-75	52-65	46-53	8-12	61-68	30-37	34-46	18-21	9-12
AR	3.33	11-14	21-24	38-49	36-41	70-75	52-65	44-52	8-12	60-67	30-37	34-46	18-21	9-12
BA-BD BM	2.84	13-15	20-22	42-49	45-49	74-78	55-70	48-55	9-13	64-71	40-45	38-47	16-19	10-13
BB	3.06	13-15	20-22	42-50	45-50	76-81	57-72	49-56	9-13	67-73	40-46	38-47	16-19	10-13
BC	2.84	12-14	19-21	42-49	42-47	70-75	55-68	46-52	9-13	61-67	38-43	39-47	15-18	10-13
BH	3.06	11-13	20-22	42-50	43-48	74-78	79-92	44-52	6-11	63-70	37-43	37-47	16-19	8-12
BL	3.06	12-14	19-21	40-47	42-47	70-74	53-66	46-52	9-13	61-67	38-43	36-44	15-18	10-13
BT	3.33	11-14	19-21	42-49	42-47	72-77	55-69	45-53	8-12	63-69	37-43	38-47	15-18	9-12
BZ	2.84	12-14	19-21	42-50	43-47	71-76	55-69	46-53	9-13	62-68	38-44	39-47	15-18	10-13
CF	3.33	13-16	22-25	44-54	41-46	69-75	80-92	56-64	10-14	60-68	36-42	41-52	19-22	11-14
CH	3.33	14-16	20-22	44-49	46-51	70-76	64-77	47-55	11-14	60-68	41-47	40-46	15-19	12-14
CM	3.06	12-15	21-23	40-46	41-46	68-73	69-78	52-59	9-13	59-65	36-42	36-43	17-20	10-13
CN	3.06	13-15	18-20	41-45	42-47	65-70	59-70	43-51	10-13	55-62	38-43	37-42	14-17	11-13
HJ	3.06	13-15	20-22	42-48	42-47	66-71	60-72	46-52	10-13	57-64	38-43	39-45	16-19	11-13

1986 THM "440-T4" SHIFT SPEED CHART

1986 THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
CNH	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.06	35-35	2.14	1,2,3,4
CFH	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.06	35-35	2.14	1,2,3,4
CMH	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.06	35-35	2.14	1,2,3,4
HJH	A	V6 2.8L Chev Canada	FD6B	2095	3.06	35-35	2.14	1,2,3,4,6
HBH	A	V6 2.8L Chev Venz.	FD6B	2095	3.33	37-33	2.07	1,2,3,4,5,6
BFH	A	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	3,4
BCH	A	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	3,4
BDH	A	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	3,4
CTH	A	V6 2.8L Chev H/O Alt.	FD6B	2095	3.33	35-35	2.33	1,2,3,4,5
BPH	A,C	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	1,2,3,4
BAH	C	V6 3.8L Buick	FM4B	1895	2.84	35-35	1.98	1,2,3,4
BLH	C	V6 3.8L Buick	FL4B	1895	3.06	35-35	2.14	1,2,3,4
BGH	C	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	1,2,3,4
ACH	C	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
AMH	C	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
AFH	C	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
AJH	C	V8 4.1L Cad Alt. (Visc)	FM8C	1525	3.33	37-33	2.07	5,
ARH	C	V8 4.1L Cadillac Export	FM8C	1525	3.33	37-33	2.07	
ADH	C	V8 4.1L Cadillac Export	FM8C	1525	3.33	37-33	2.07	
BMH	E	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	3,4
BSH	E	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	3,4
BZH	E	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	3,4
BTH	E	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	3,4
BYH	E	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	3,4
BQH	E	V6 3.8L Buick Altitude	FL4B	1895	2.84	35-35	1.98	3,4

1986 THM 440-T4 MODELS (Continued)

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
AAH	E,K	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
ABH	E,K	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
AYH	E,K	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	5,
BBH	H	V6 3.8L Buick	FI4B	1895	3.06	37-33	1.90	3,4
BCH	H	V6 3.8L Buick	FI4B	1895	2.84	35-35	1.98	3,4
BDH	H	V6 3.8L Buick	FI4B	1895	2.84	35-35	1.98	3,4
BHH	H	V6 3.8L Buick	FI4B	1895	3.06	35-35	2.14	3,4

1 - Chevrolet
2 - Pontiac
3 - Oldsmobile
4 - Buick
5 - Cadillac
6 - Canada

1987 THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
CAH	A	V6 2.8L Chevrolet H/O	FD6B	2095	3.33	35-35	2.33	**
CBH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
FCH	A	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	**
FLH	A	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	**
ACH	C	V8 4.1L Cadillac (Visc)	FL8C	1525	3.33	35-35	2.33	**
ADH	C	V8 4.1L Cadillac Export	FM8C	1525	3.33	37-33	2.07	**
ARH	C	V8 4.1L Cadillac Export	FM8C	1525	3.33	37-33	2.07	**
ALH	C & LIMO	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	**
AFH	C & LIMO	V8 4.1L Cadillac (Visc)	FM8C	1525	3.33	37-33	2.07	**
FTH	C	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
FNH	C,H	V6 3.8L Buick	FL4B	1895	2.84	37-33	1.77	**
FBH	H	V6 3.8L Buick	FY4B	1895	3.06	37-33	1.90	**
FKH	H	V6 3.8L Buick	FY4B	1895	3.06	37-33	1.90	**
FSH	H	V6 3.8L Buick Export	FL4B	1895	2.84	35-35	1.98	**
HAH	H	V6 3.8L Buick Canada	FY4B	1895	3.06	37-33	1.90	**
HCH	H	V6 3.8L Buick Canada	FL4B	1895	3.33	37-33	2.07	**
AHH	E,K	V8 4.1L Cadillac (Visc)	FL8C	1525	3.33	37-33	2.07	**
FRH	E	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
FZH	E	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	**

** Not available at the time of this printing.

1988 THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
AAH	C	V8 4.1L Cadillac	FM8C	1525	3.33	37-33	2.07	**
ABH	E/K	V8 4.1L Cadillac	FM8C	1525	3.33	37-33	2.07	**
AFH	C Limo	V8 4.1L Cadillac	FM8C	1525	3.33	37-33	2.07	**
ANH	C	V8 4.5L Cadillac (Exp)	FM8C	1825	3.33	37-33	2.07	**
ATH	E/K	V8 4.5L Cadillac (Exp)	FM8C	1825	3.33	37-33	2.07	**
BJH	H	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
BKH	C	V6 3.8L Bucik	FY4B	1895	3.06	37-33	1.90	**
BRH	E	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
BTH	C	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
BYH	E	V6 3.8L Bucik	FL4B	1895	2.84	35-35	1.98	**
CFH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
CMH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
CRH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
CTH	W	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
CWH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
CXH	A	V6 2.8L Chevrolet	FD6B	2095	3.33	35-35	2.33	**
FBH	H	V6 3.8L Buick	FY4B	1895	3.06	37-33	1.90	**
FCH	A	V6 3.8L Buick	FL4B	1895	2.84	35-35	1.98	**
FJH	H	V6 3.8L Buick	FL4B	1895	3.33	37-33	2.07	**
FSH	C & H	V6 3.8L Buick (Exp)	FL4B	1895	2.84	35-35	1.98	**

** Not available at time of this printing.

1989 THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
AAH	C	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
ABH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
AFH	C Limo	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
AJH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	35-35	2.33	**
ANH	C	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
ATH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
BAH	A	V6 3300 Buick	FY9B	1895	3.06	37-33	1.90	**
BDH	A	V6 3300 Buick	FY9B	1895	3.06	37-33	1.90	**
BFH	A	V6 3300 Buick	FL9B	1895	3.06	35-35	2.14	**
BHH	C,H	V6 3800 Buick	FY9B	1895	2.84	35-35	1.98	**
BJH	H	V6 3800 Buick	FL9B	1895	3.33	37-33	2.07	**
BMH	A	V6 3800 Buick	FL9B	1895	3.06	35-35	2.14	**
BPH	E	V6 3800 Buick	FL9B	1895	2.84	35-35	1.98	**
BWH	E,Z	V6 3800 Buick	FL9B	1895	3.33	37-33	2.07	**
PAH	H	V6 3800 Buick	FL9B	1895	3.33	35-35	2.33	**
CDH	W	V6 2.8L Chevrolet	FJ9B	2060	3.33	35-35	2.33	**
CLH	A	V6 2.8L Chevrolet	FJ9B	2060	3.33	35-35	2.33	**
CPH	A	V6 2.8L Chevrolet	FJ9B	2060	3.33	35-35	2.33	**
CYH	W	V6 2.8L Chevrolet	FJ9B	2060	3.33	35-35	2.33	**
CZH	A	V6 2.8L Chevrolet	FJ9B	2060	3.33	35-35	2.33	**

** Not available at time of this printing

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

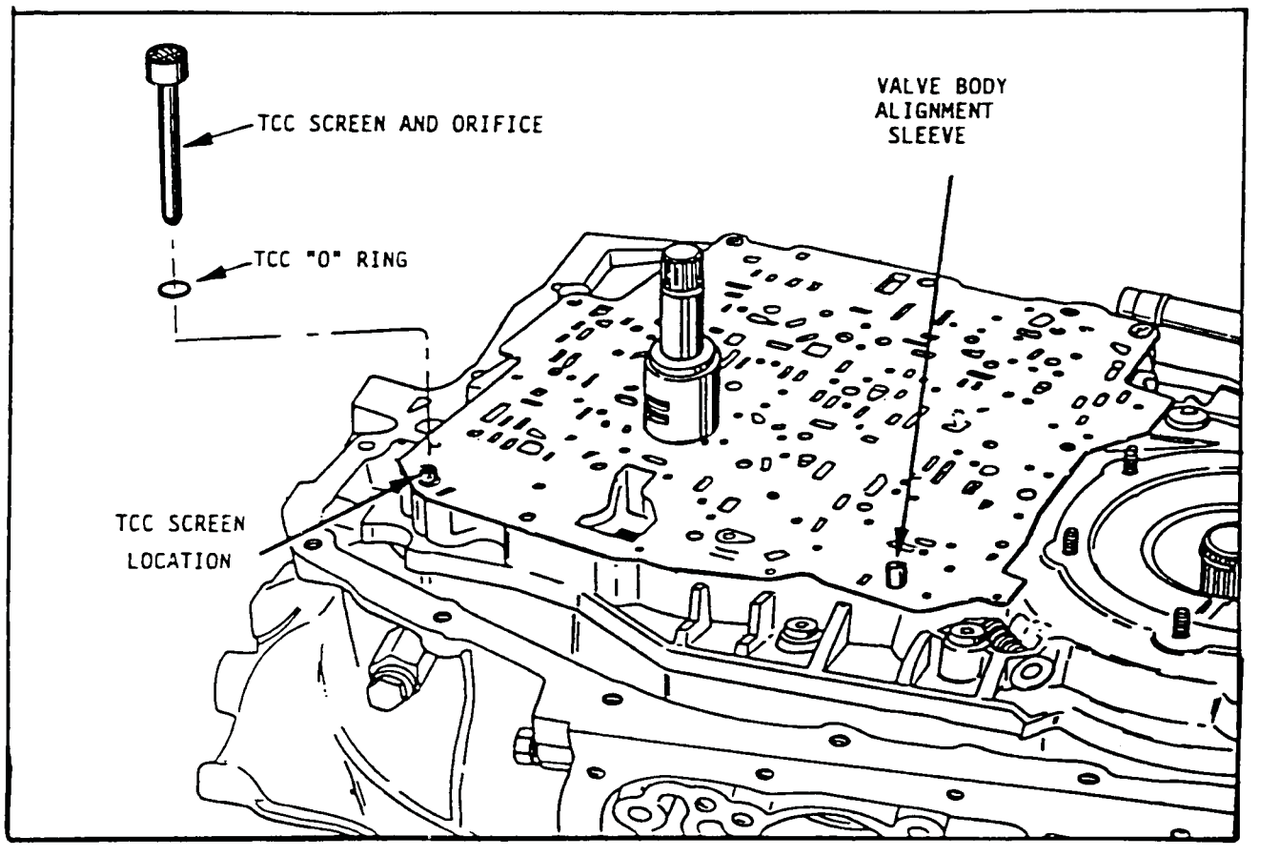


Figure 62

THM 440-T4

VALVE BODY GASKET IDENTIFICATION

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

Ink stamped on each gasket is a 3 digit identification number, in the location shown in Figure 64.

Refer to the chart in Figure 65 for proper application.

Refer to the chart in Figure 66 to identify transaxle model, or pages 8 thru 19 to identify hydraulic system.

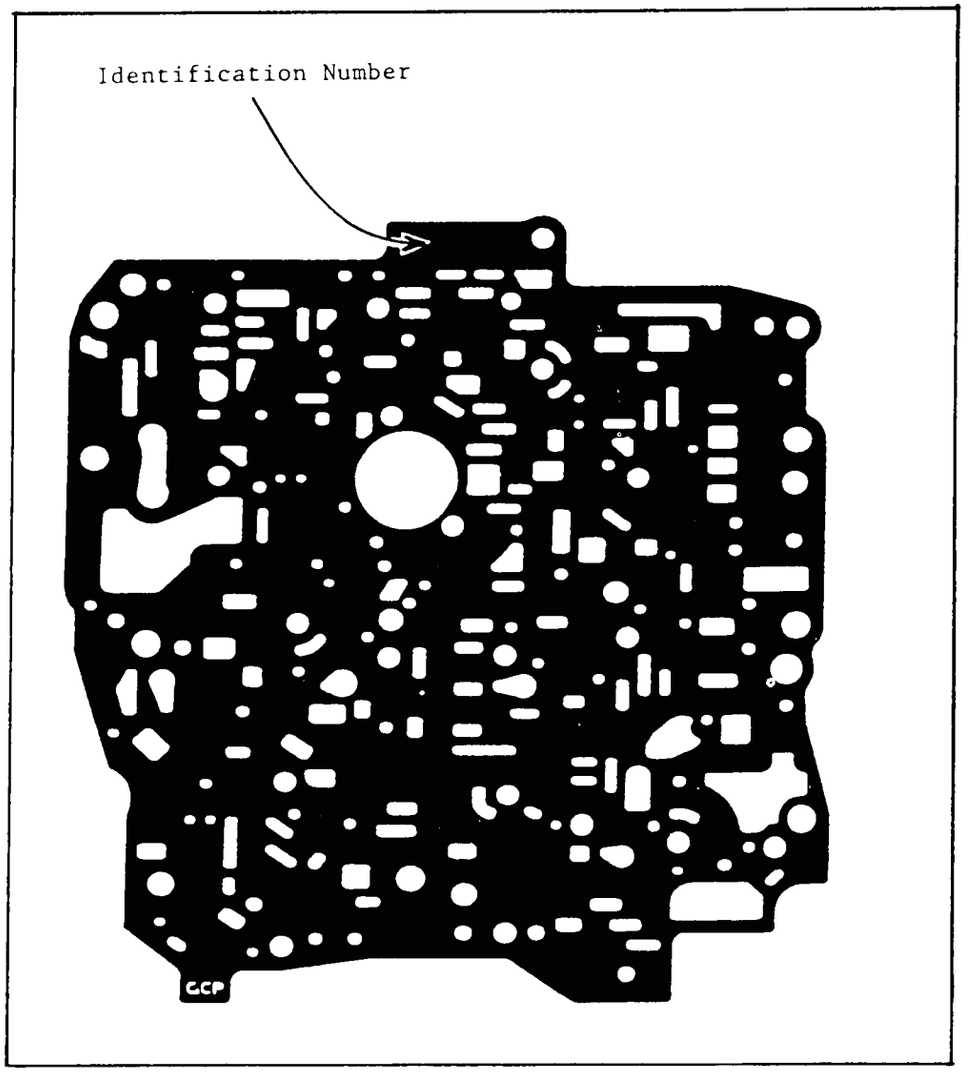


Figure 64

	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 65

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

Figure 66

THM 440-T4

TCC SHUDDER OR NO CONVERTER CLUTCH

Some models of the THM 440-T4, usually with the 3.8L engine, may exibit a TCC shudder condition or no torque converter clutch, because of a rivet head popping off that retains the damper assembly to the pressure plate (See Figure 67).

Great care must be exercised in the diagnosis procedure before making any modifications to cure TCC shudder. The check ball behind the TCC regulator valve will not fix a vehicle with this condition.

A torque converter checking fixture should be used on all 3.8L converters to verify converter clutch operation before installation.

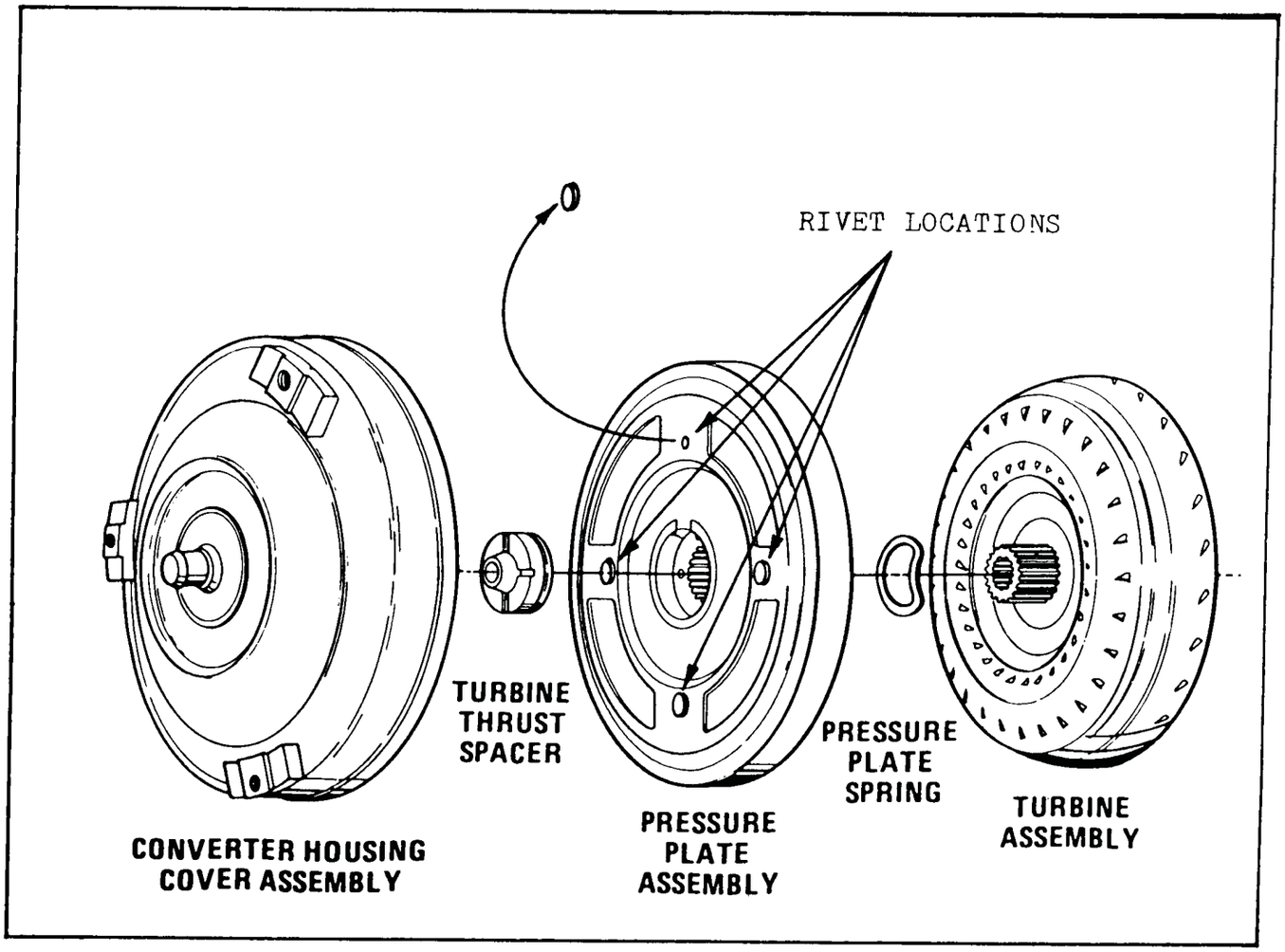


Figure 67

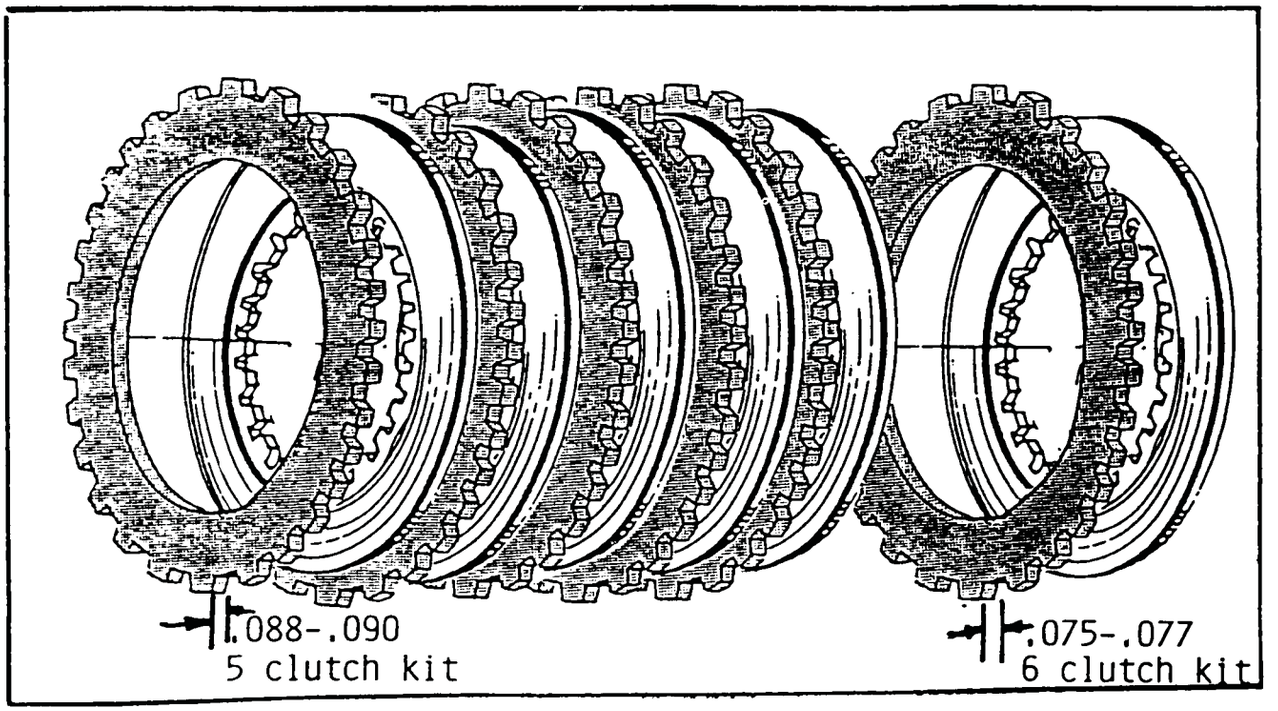
THM 440-T4
1-2 SLIDE SHUDDER

COMPLAINT: 1-2 slide shudder on THM 440-T4, 1984-87.

CAUSE: Can be caused by clutch lining compatability of lined plates. This can also be a problem encountered with SRTA or factory rebuilt units.

CORRECTION: Install kit number 8662913 for 1984 thru 1986, which comes with five (5) lined plates and five (5) steel (koline) plates. The koline plates in this kit are .088-.090 thick. For the 1987 units, use kit number 8662914, which comes with six (6) lined plates and six (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

CHANGE: Oil Filter Assembly - Added baffles to oil filter and revised inlet (See Figure 68).

REASON: Engine flare, pump whine, or transaxle slip during sharp vehicle turns.

PARTS AFFECTED:

(1) Oil Filter Assembly in bottom pan.
Additional baffles were installed on the new design filter and the inlet was revised (See Figure 68). Starting April 6, 1987 (Julien Date 096), all THM 440-T4 transaxles were built using the new design filter with the new inlet and baffle design.

INTERCHANGEABILITY:

The new design filter assembly will retro fit back to all previous models.

SERVICE INFORMATION:

1. Oil Filter Service Package 8646902
   Includes; Oil Pan Gasket
   New Design Oil Filter Assy
   Seal, Oil Filter to Case
2. Filter, Oil (New Design) 8662853
3. Seal, Oil Filter to Case 8656613

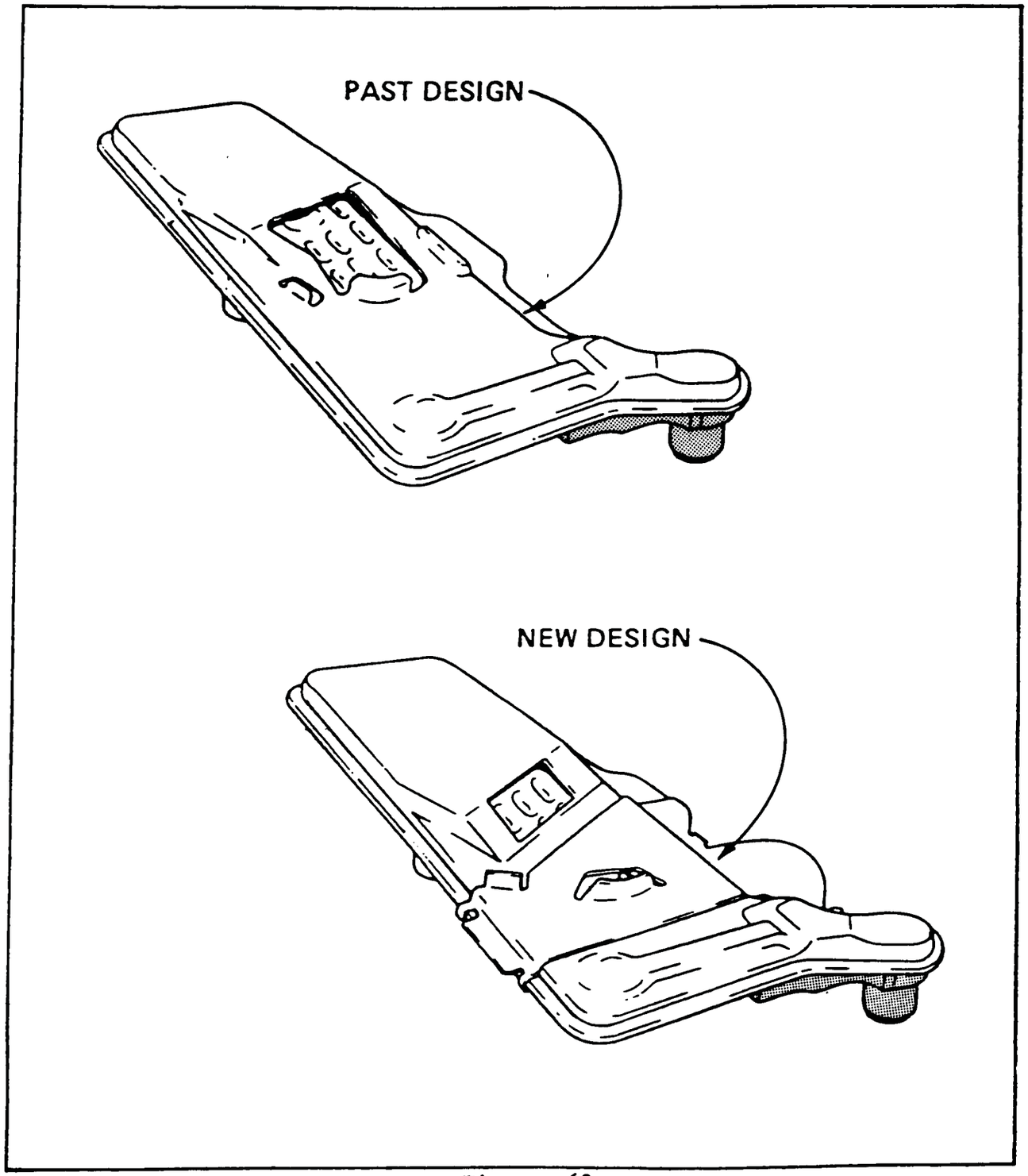


Figure 68

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.

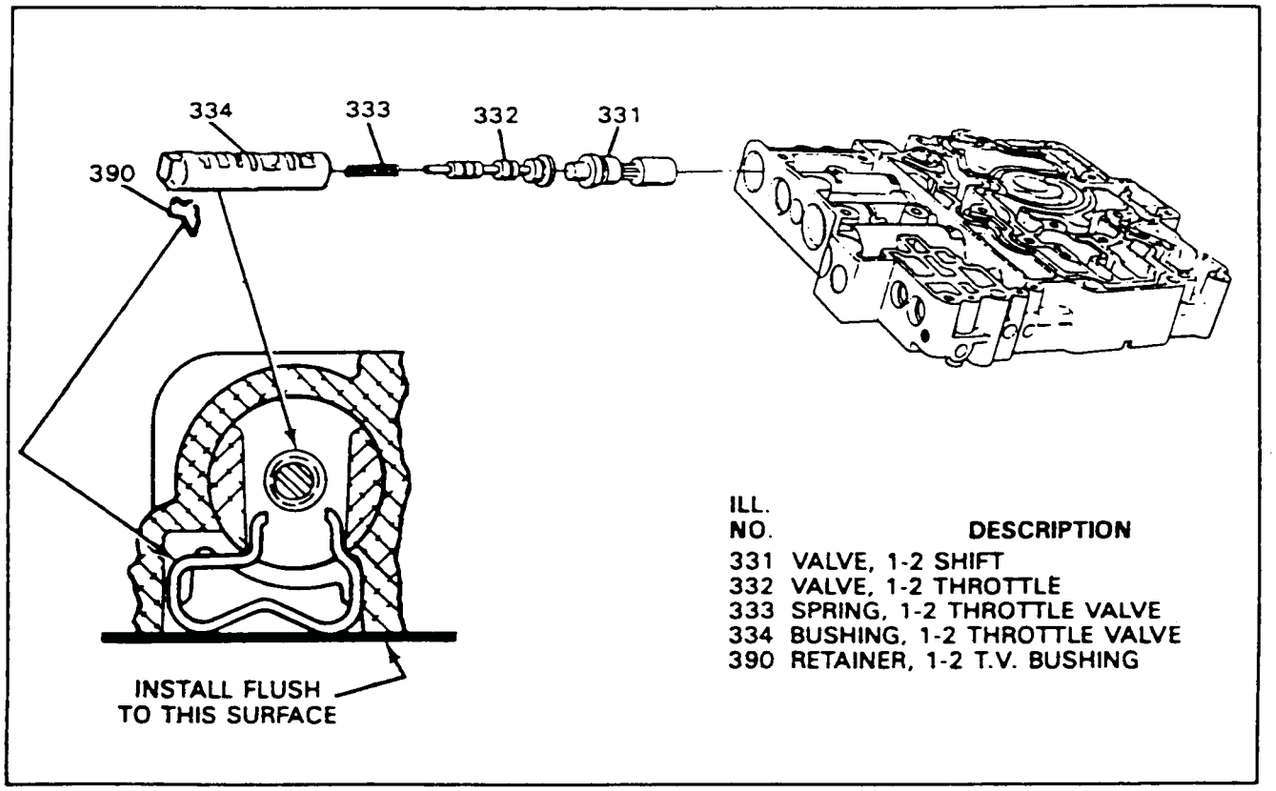


Figure 69

THM 440-T4

COMPLAINT: Consistently harsh 1-2 shift condition at any throttle angle and any altitude.

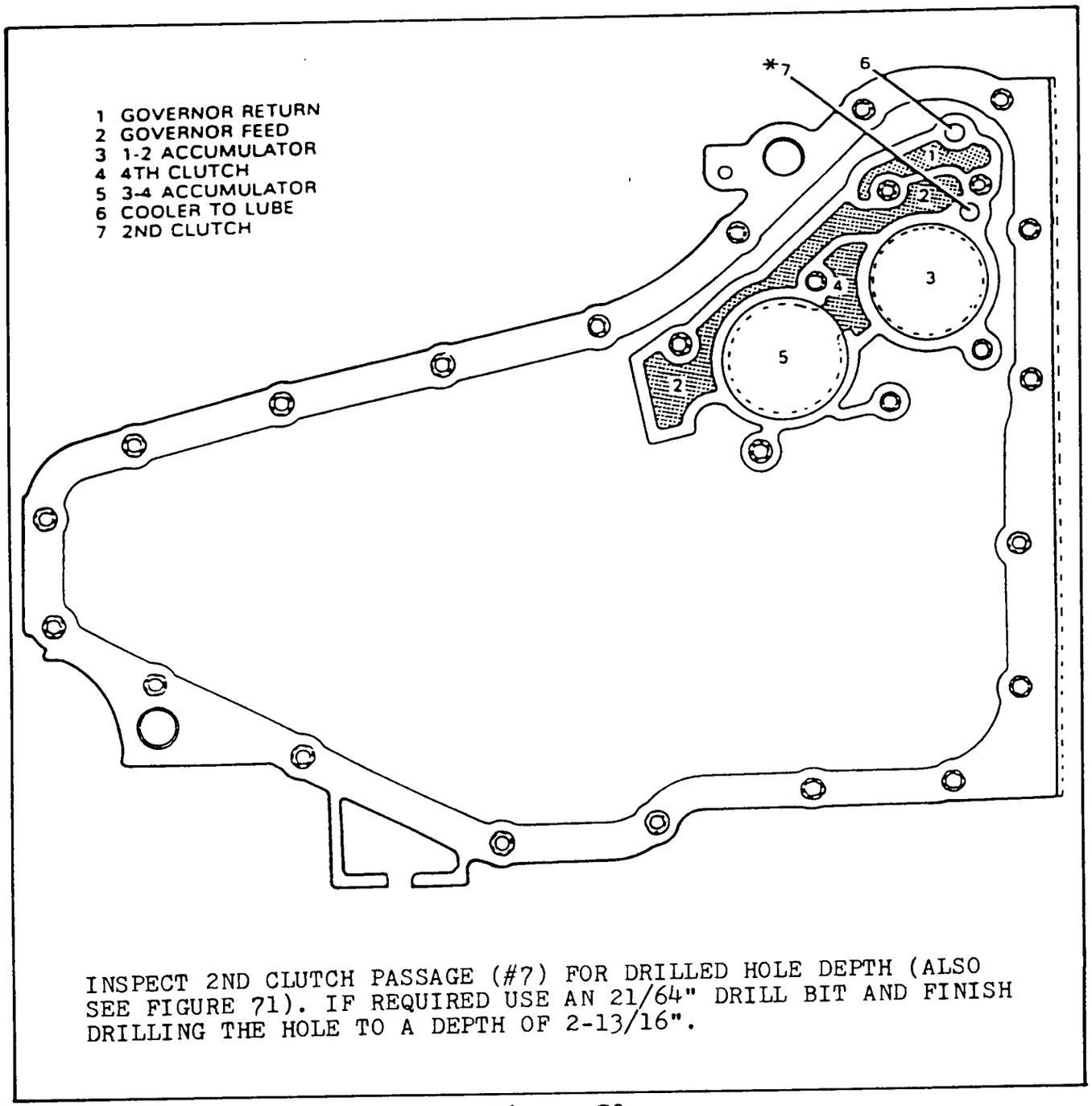
CAUSE: This harsh shift condition may be caused by a blocked, or partially drilled 2nd clutch feed passage in the case.

CORRECTION: To repair this condition inspect the 2nd feed passage, #7 in Figure 70, for blockage or incomplete drilling operation. To perform this inspection, remove the transaxle oil pan, filter, accumulator cover (With feed pipes and retainer), accumulator cover spacer plate and gaskets. Inspect the 2nd clutch passage by measuring the depth of the hole, which should be a minimum of 2-13/16" as shown in Figures 70 and 71.

If the passage is not properly drilled:

1. Remove the transaxle from the vehicle and disassemble components up to and including the channel plate.
2. Mark a 21/64" drill bit at 2-13/16" from the end using a drill stop or tape. From the oil pan side of the case, finish drilling the 2nd clutch passage to the proper depth as marked on the drill bit.

   NOTE: DRILLING TOO DEEP INTO THE 2ND CLUTCH PASSAGE WILL RESULT IN DAMAGE TO THE CASE.
3. Remove metal chips caused by drilling and thoroughly flush the repaired case passages with clean solvent.
4. Reassemble the transaxle.



INSPECT 2ND CLUTCH PASSAGE (#7) FOR DRILLED HOLE DEPTH (ALSO SEE FIGURE 71). IF REQUIRED USE AN 21/64" DRILL BIT AND FINISH DRILLING THE HOLE TO A DEPTH OF 2-13/16".

Figure 70

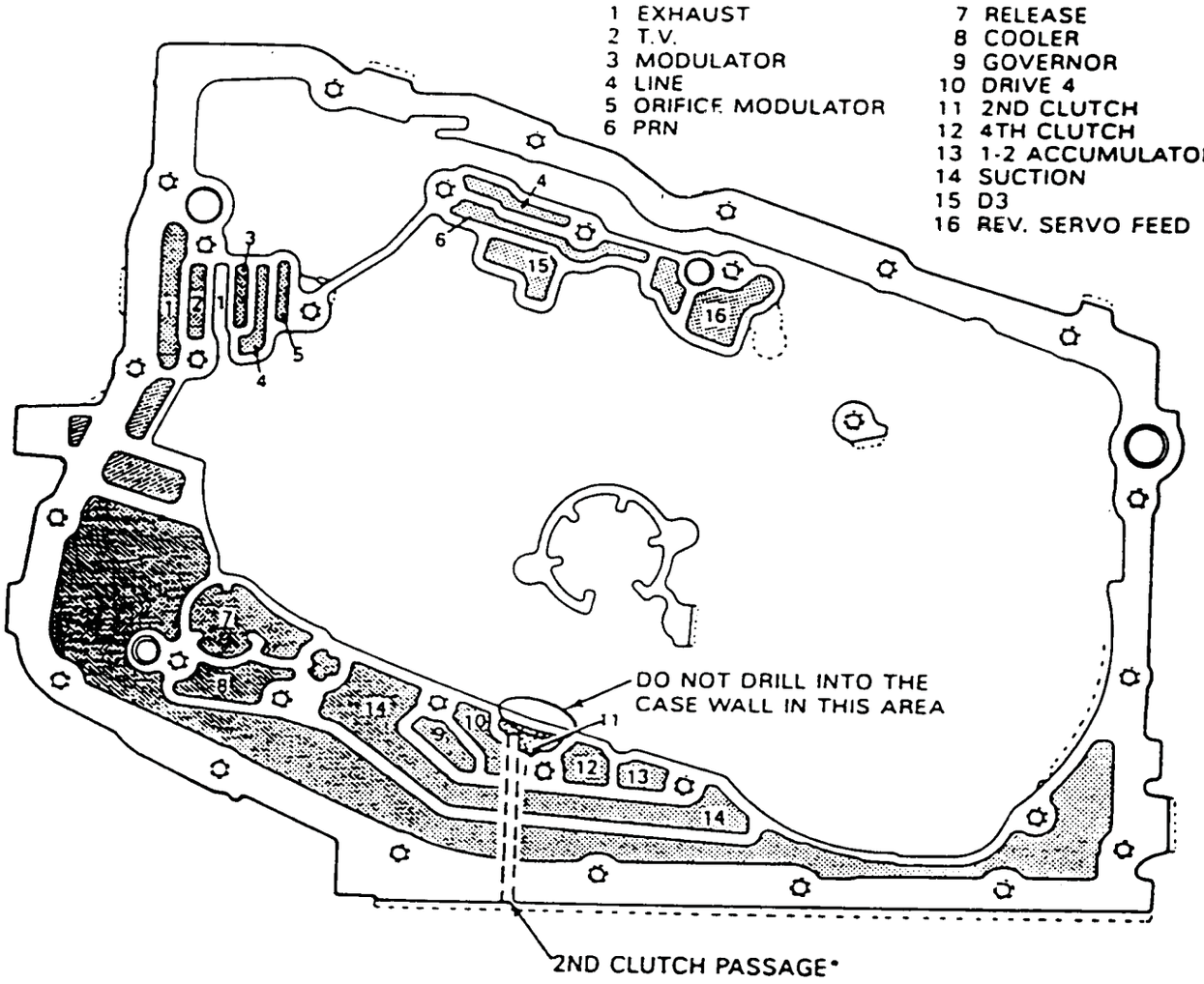


Figure 71

1988 THM 440-T4 CHANGES

CHANGE: Thermister located in oil pump housing moved into cooler line (See Figures 72 & 74). Temperature switch in channel plate was also eliminated (See Figure 73).

REASON: Much more accurate temperature reading for ECM, and Viscous Clutch cut off at 315 degrees now function of ECM.

PARTS AFFECTED:

(1) Thermister - Removed from pump housing (See Figure 72).

(2) Temperature Switch - Eliminated (See Figure 73).

(3) Cooler Line - Temperature Sensor added (See Figure 74).

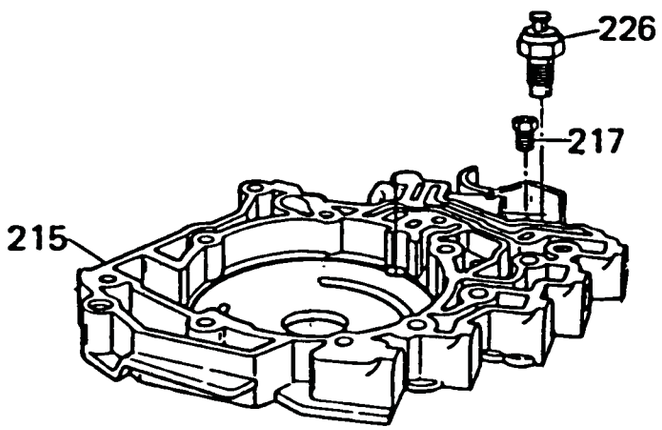
(4) Case Connector - "E" terminal that normally carried the thermister wire is now empty (See Figure 75).

(5) Vehicle Wiring Harness.

INTERCHANGEABILITY: Not Interchangeable.

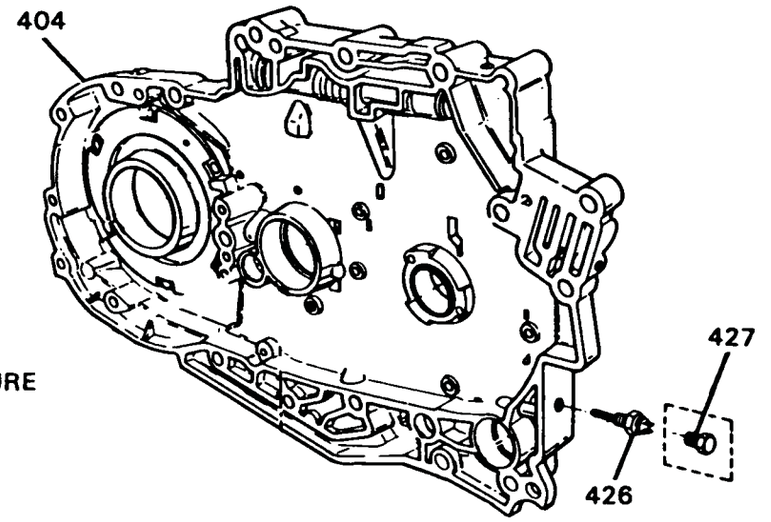
SERVICE INFORMATION:

NOTE: SOME EARLY 1988 CADILLAC MODELS MAY HAVE "NO" COOLER FLOW CREATED BY NEW TEMPERATURE SENSOR IN COOLER LINE. CHECK COOLER FLOW ON "ALL" 1988 CADILLAC MODELS AND REPLACE COOLER LINE ASSEMBLY WITH OEM PART NUMBER 25036979 IF NECESSARY.



215 Body, Oil Pump
217 Plug, Orificed (Decrease Oil)
226 Thermister, (Cadillac Only)

Figure 72



404 PLATE, CHANNEL
426 SWITCH ASSEMBLY, TEMPERATURE (VISCOUS ONLY)
427 PLUG, PIPE

Figure 73

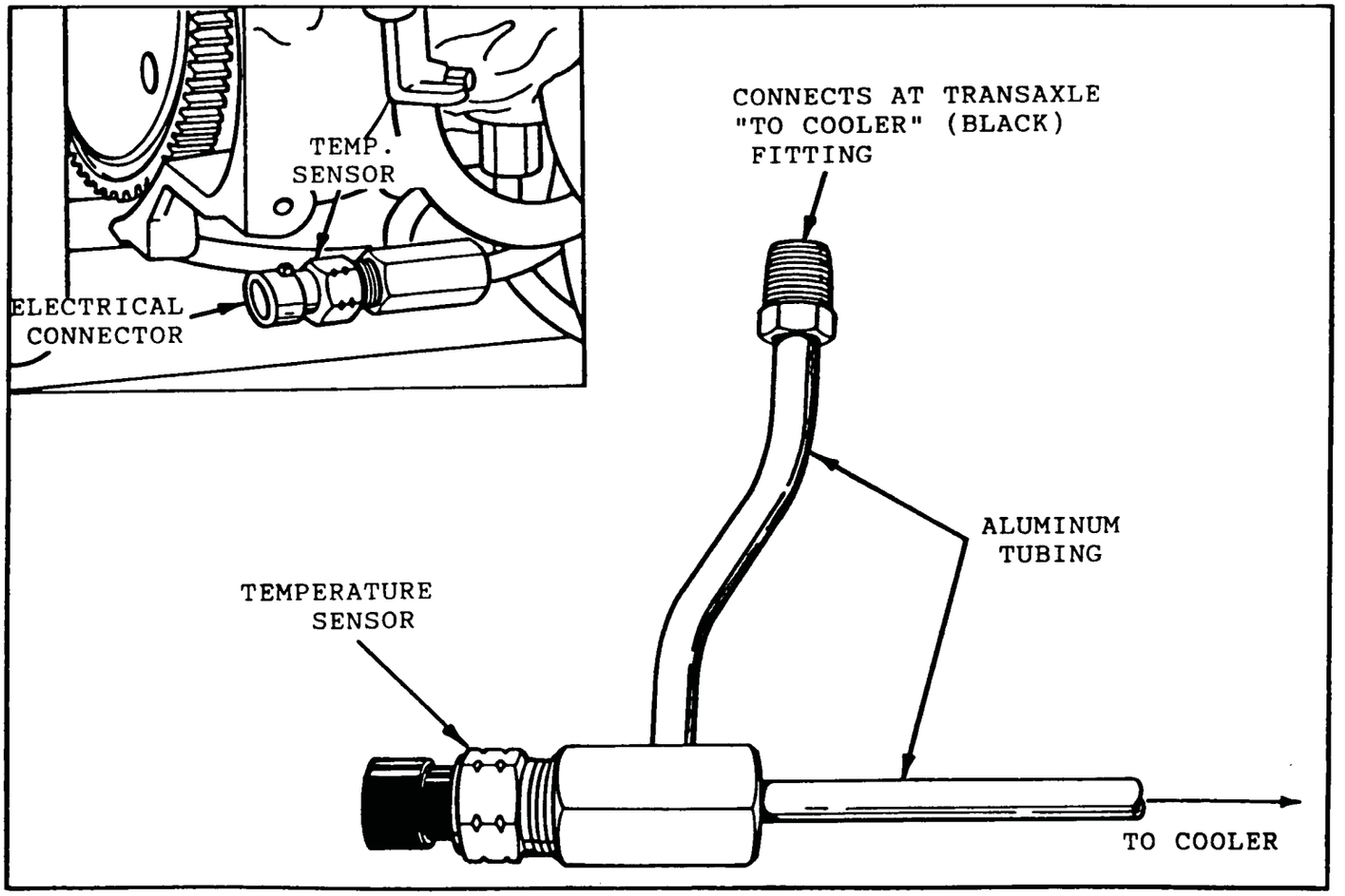


Figure 74

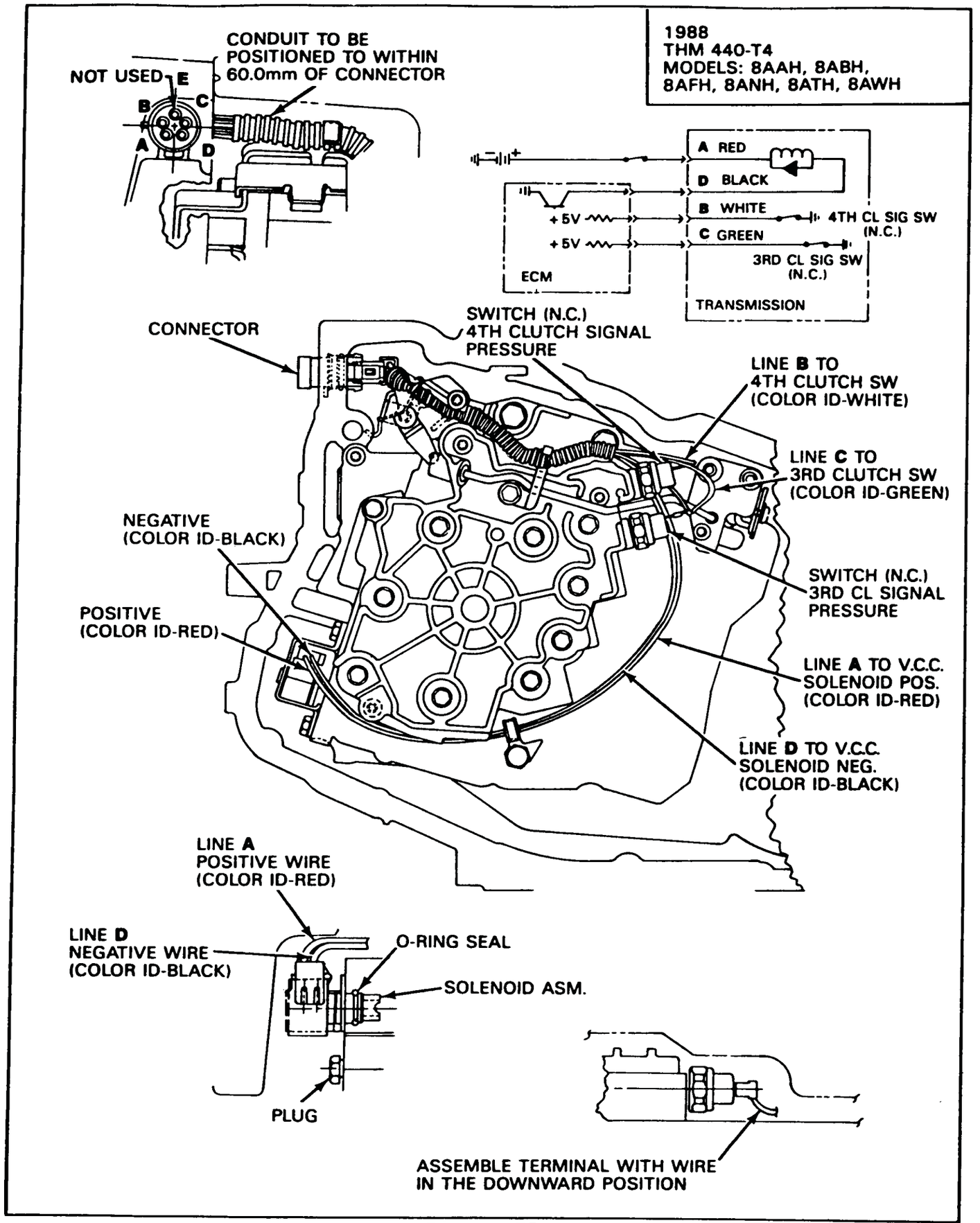


Figure 75

CHANGE: 2nd clutch switch added on pump housing (Some Models).

REASON: 2nd clutch signal needed for added "Engine Torque Management" function to ECM.

PARTS AFFECTED:

(1) Pump Body - Drilled and tapped for 2nd clutch switch. (See Figure 76).

(2) Valve Body - Extra hole drilled in valve body to carry 2nd clutch oil to pump body.

(3) Case Connector - Now round black connector (Same as Cadillac), and "E" terminal now carries 2nd clutch signal wire (See Figure 77).

(4) Transaxle Wiring Harness - Extra wire in harness for 2nd clutch signal to ECM (See Figure 77).

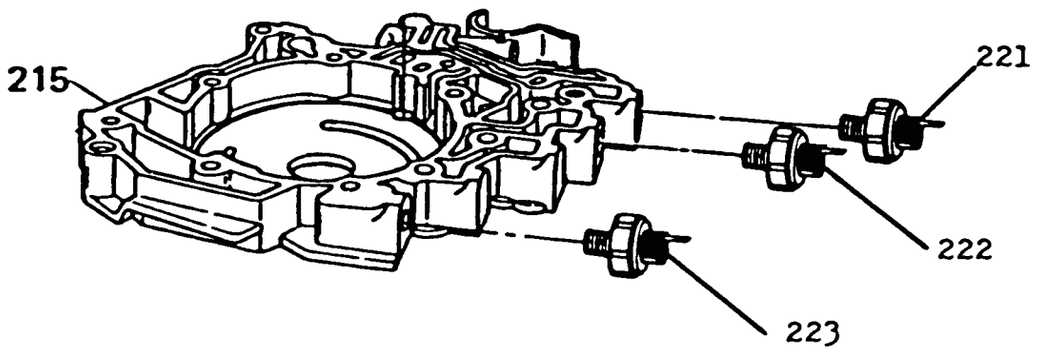
(5) Vehicle Wiring Harness

INTERCHANGEABILITY: Not Interchangeable

SERVICE INFORMATION:

Models affected are as follows; 8BJH, 8BKH, 8BRH, 8BTH, 8BYH.

The same switch is used in all three locations, OEM Part No. 8658040, and is a N.C. single prong switch.



215 Body, Oil Pump
221 Switch, 4th Clutch
222 Switch, 3rd Clutch
223 Switch, 2nd Clutch

Figure 76

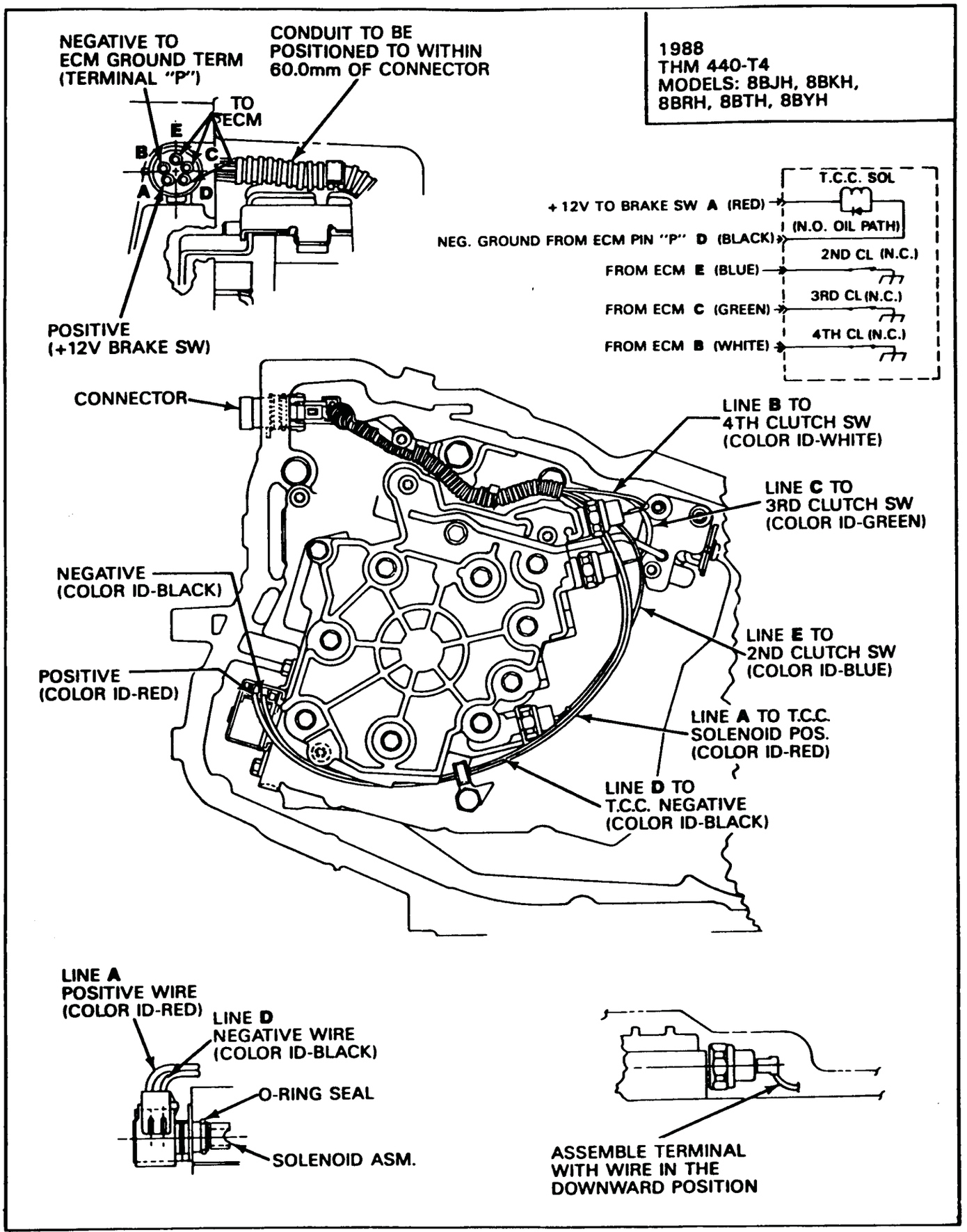


Figure 77

CHANGE: Detent Roller and Spring Assembly, and Inside Detent Lever. (Some Models)

REASON: Increased driver comfort, by decreasing the effort required for shift lever movement.

PARTS AFFECTED:

(1) Detent Roller and Spring Assembly - Different profile. (See Figure 78)

(2) Inside Detent Lever - Different profile on the detents only. 2nd design can be identified by "GM-10" stamped into detent lever as shown in Figure 78.

INTERCHANGEABILITY:

Will retro fit back on all models but, 2nd design Inside Detent Lever "MUST" be used with the 2nd design Detent Roller and Spring Assembly (See Figure 78).
DO NOT MIX THESE PARTS.

SERVICE INFORMATION:

Spring and Roller, Detent (2nd Design).....8662737

Lever, Inside Detent (2nd Design).....8662736

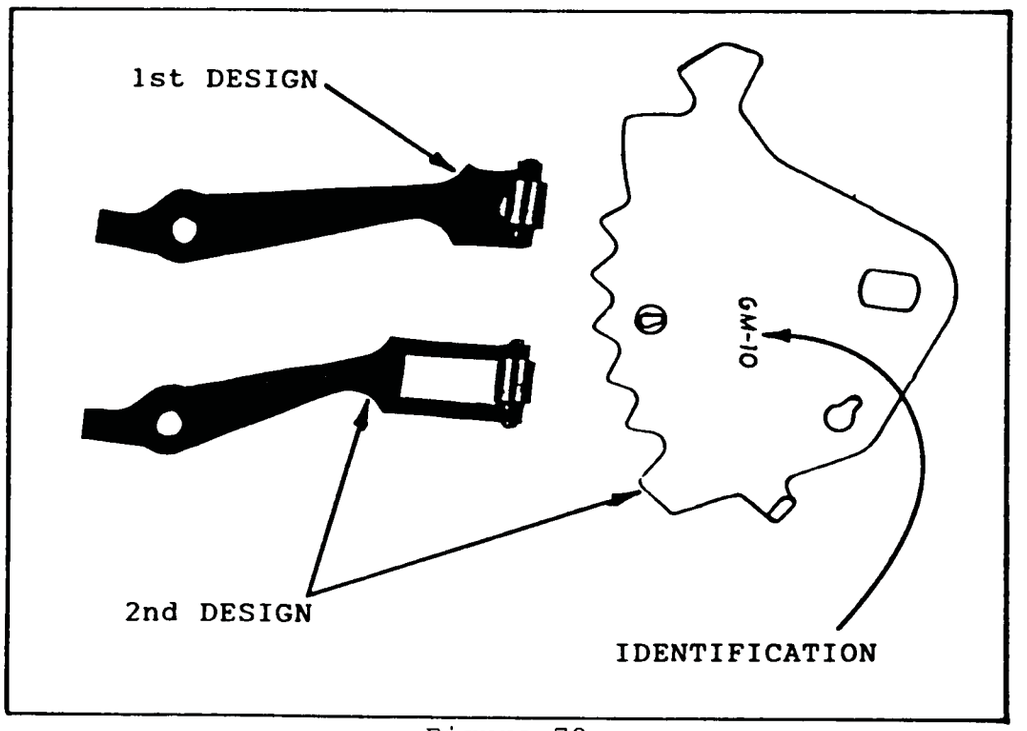


Figure 78

CHANGE: Revised dimensions on Side Gears, Pinion Gears, Thrust Washers, Cross Shaft, in the Final Drive.

REASON: Stronger side gears and pinion gears needed with the addition of 4.5L engine in the Cadillac for 1988.

PARTS AFFECTED:

(1) Differential Side Gears - Revised dimension (Thicker), and they have 16 teeth instead of previous 15.

(2) Differential Pinion Gears - Revised dimension, and have 10 teeth instead of previous 11.

(3) Side Gear Thrust Washers - Revised dimension.

(4) Pinion Gear Thrust Washers - Revised dimension.

(5) Differential Housing - Revised dimensions(Internal), to accept new side gears and new pinion gears.

(6) Differential Pinion Shaft - Black in color to identify the new design final drive assembly (See Figure 79). Also is a smaller diameter.

(7) Output Shaft - Longer (.028"), so that it will extend through the thicker side gears, to get "C" clip installed. The longer output shaft can be identified by green paint on the end of the shaft opposite the "C" clip end (See Figure 80).

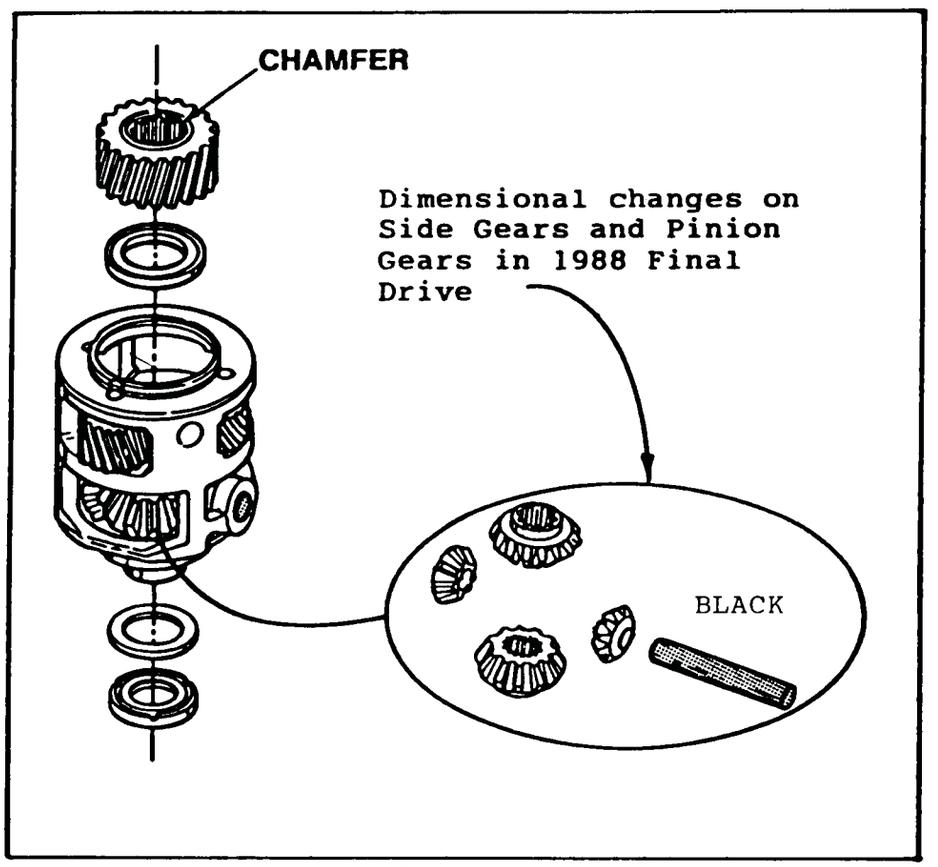


Figure 79

INTERCHANGEABILITY:

(1) Will retro fit back to all previous models, as long as, you use the longer output shaft. The entire assembly must be changed as a unit.

(2) The side gears and pinion gears "ARE NOT" interchangeable from the new design final drive, too the previous design final drive.

SERVICE INFORMATION:

Final Drive Assembly, 3.33 Ratio (2nd Design).....8662777

Output Shaft (2nd Design).....8661039

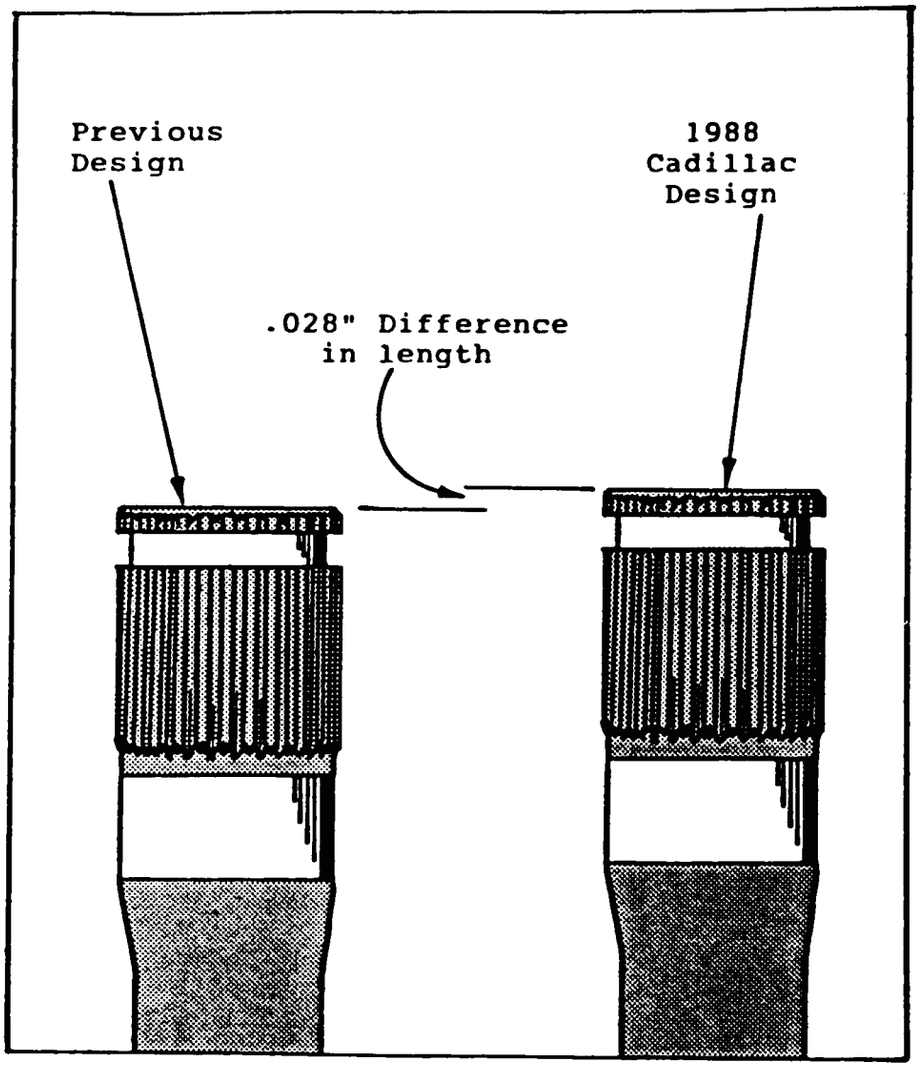


Figure 80

1989 THM 440-T4 CHANGES

CHANGE: The single sided 3rd clutch plates were "Increased" from the 8 plate clutch pack to a 10 plate clutch pack for all 1989 model THM 440-T4 transaxles (See Figure 81).

REASON: The two extra plates were added for greater clutch capacity, because of the new higher torque engine applications. "SEE SPECIAL NOTE"

PARTS AFFECTED:

(1) Single Sided 3rd Clutch Plates - Both inside and outside spline plates are .006" thinner for 89, to make room for the two additional plates (See Figure 82).

(2) 3rd Clutch Piston Housing - Was decreased in overall size for calibration considerations (See Figure 83).

(3) 3rd Clutch Piston - The 3rd clutch piston outer seal is now moulded to the 3rd clutch piston (See Figure 84).

(4) Input Clutch Piston - The cutouts in the piston for the 3rd clutch plates are .250" deeper to accomodate the additional two clutch plates in the 3rd clutch pack (See Figure 85).

(5) 3rd Roller Clutch Outer Race - The outer race was made wider by .033" to accomodate the two extra plates. The rollers have not changed in width (See Figure 86).

(6) 3rd Clutch Return Spring Assembly - The cutout in the retainer is .045" deeper to accomodate the relocated ball capsule in the new (Smaller Diameter) 3rd clutch piston and seal Assy. (See Figure 87).

INTERCHANGEABILITY:

Not interchangeable because of calibration differences. Input Clutch Piston, and 3rd Clutch Return Spring Assembly are the only parts that will retro fit back to 1984. See Service Information.

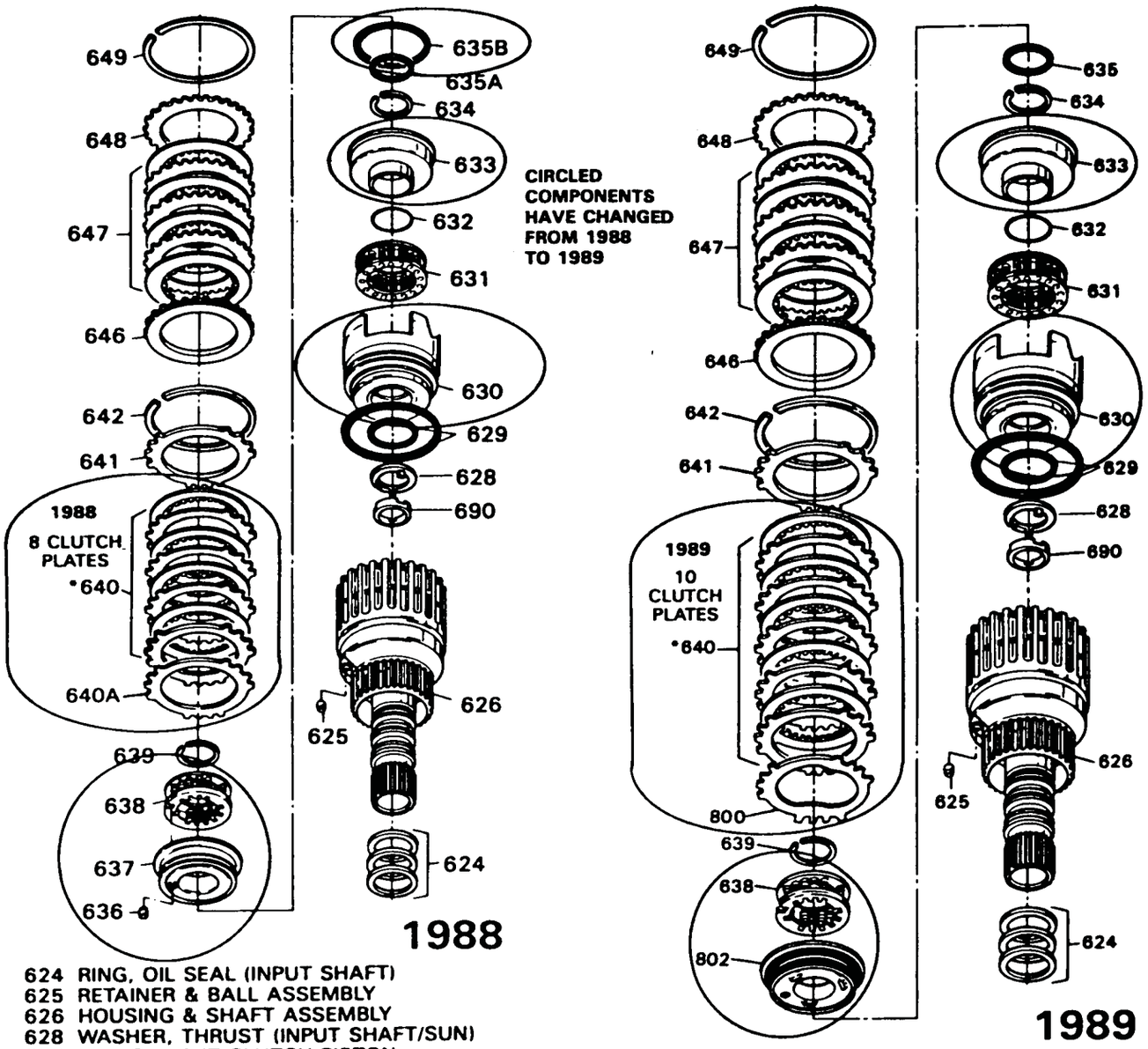
SERVICE INFORMATION:

10 Plate 3rd Clutch Pack, W/Wave (1989).....8662954
Input Clutch Piston Assy (1984-1989).....8668295
3rd Clutch Piston Housing (1989).....8668359
3rd Clutch Piston with Moulded Seal (1989).....8668453
3rd Clutch Return Spring Assy (1984-1989).....8668071
3rd Roller Clutch Complete (1989).....8668367

SPECIAL NOTE:

On page 48 of this manual you are told to start the 3rd clutch stack with a normal (Flat) 3rd clutch steel plate. Beginning in 1988 there is a "Wave" plate in this location on some models. Beginning in 1989 the "Wave" plate is standard on all models. You must start the 3rd clutch pack in 1988, with either the flat plate, or the wave plate.

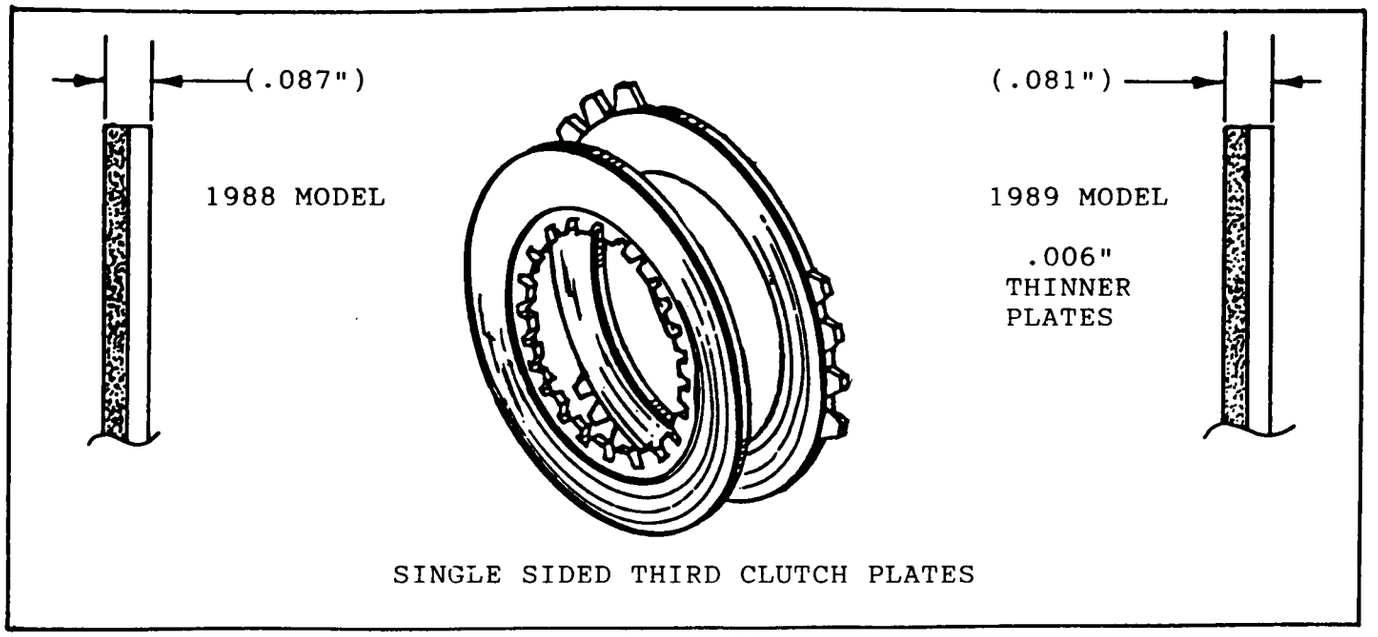
"DO NOT USE BOTH IN THE SAME PACK"



624 RING, OIL SEAL (INPUT SHAFT)
625 RETAINER & BALL ASSEMBLY
626 HOUSING & SHAFT ASSEMBLY
628 WASHER, THRUST (INPUT SHAFT/SUN)
629 SEALS, INPUT CLUTCH PISTON
630 PISTON, INPUT CLUTCH APPLY
631 SPRING & RETAINER ASSEMBLY, INPUT
632 SEAL, "O" RING (SHAFT/3RD CL. HSG.)
633 HOUSING, 3RD CLUTCH PISTON
634 RING, SNAP (SHAFT/3RD CLUTCH HOUSING)
635A SEAL, 3RD CLUTCH PISTON (INNER)
635B SEAL, 3RD CLUTCH PISTON (OUTER)
636 RETAINER & BALL ASSEMBLY
637 PISTON, 3RD CLUTCH
638 SPRING RETAINER & GUIDE ASM., 3RD CL.
639 RING, SNAP
*640 PLATES, 3RD CL. (FIBER ONE SIDE FACING UP)
640A PLATE, 3RD CL. (STEEL)
(FLAT — 3.8L ENGINES)
(WAVED — 2.8L, 4.1L, 4.5L ENGINES)
641 PLATE, 3RD CLUTCH BACKING
642 RING, SNAP (3RD CL. BACKING PLATE)
646 PLATE, INPUT CLUTCH APPLY
647 PLATES, INPUT CLUTCH
648 PLATE, INPUT CLUTCH BACKING
649 RING, SNAP (INPUT CL. BACKING PLATE)
690 SLEEVE, LOCK UP

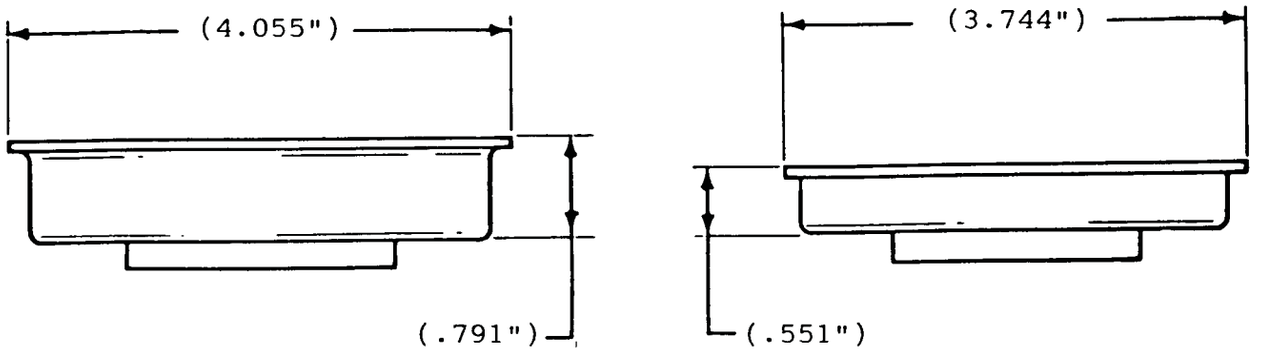
624 RING, OIL SEAL (INPUT SHAFT)
625 RETAINER & BALL ASSEMBLY
626 HOUSING & SHAFT ASSEMBLY
628 WASHER, THRUST (INPUT SHAFT/SUN)
629 SEALS, INPUT CLUTCH PISTON
630 PISTON, INPUT CLUTCH APPLY
631 SPRING & RETAINER ASSEMBLY, INPUT
632 SEAL, "O" RING (SHAFT/3RD CL. HSG.)
633 HOUSING, 3RD CLUTCH PISTON
634 RING, SNAP (SHAFT/3RD CLUTCH HOUSING)
635 SEAL, 3RD CLUTCH PISTON (INNER)
638 SPRING RETAINER & GUIDE ASM., 3RD CL.
639 RING, SNAP
*640 PLATES, 3RD CL. (FIBER ONE SIDE FACING UP)
641 PLATE, 3RD CLUTCH BACKING
642 RING, SNAP (3RD CL. BACKING PLATE)
646 PLATE, INPUT CLUTCH APPLY
647 PLATES, INPUT CLUTCH
648 PLATE, INPUT CLUTCH BACKING
649 RING, SNAP (INPUT CL. BACKING PLATE)
690 SLEEVE, LOCK UP
800 PLATE, 3RD CLUTCH (WAVED)
802 SEAL ASM. AND RETAINER & BALL ASM., 3RD CLUTCH PISTON

Figure 81



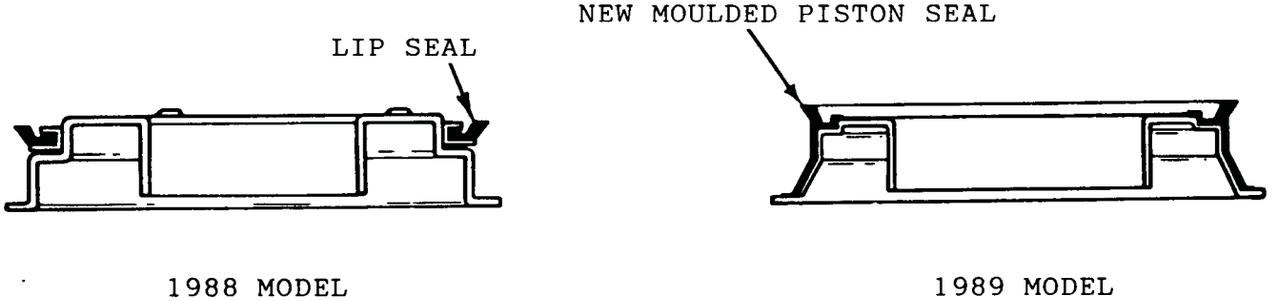
SINGLE SIDED THIRD CLUTCH PLATES

Figure 82



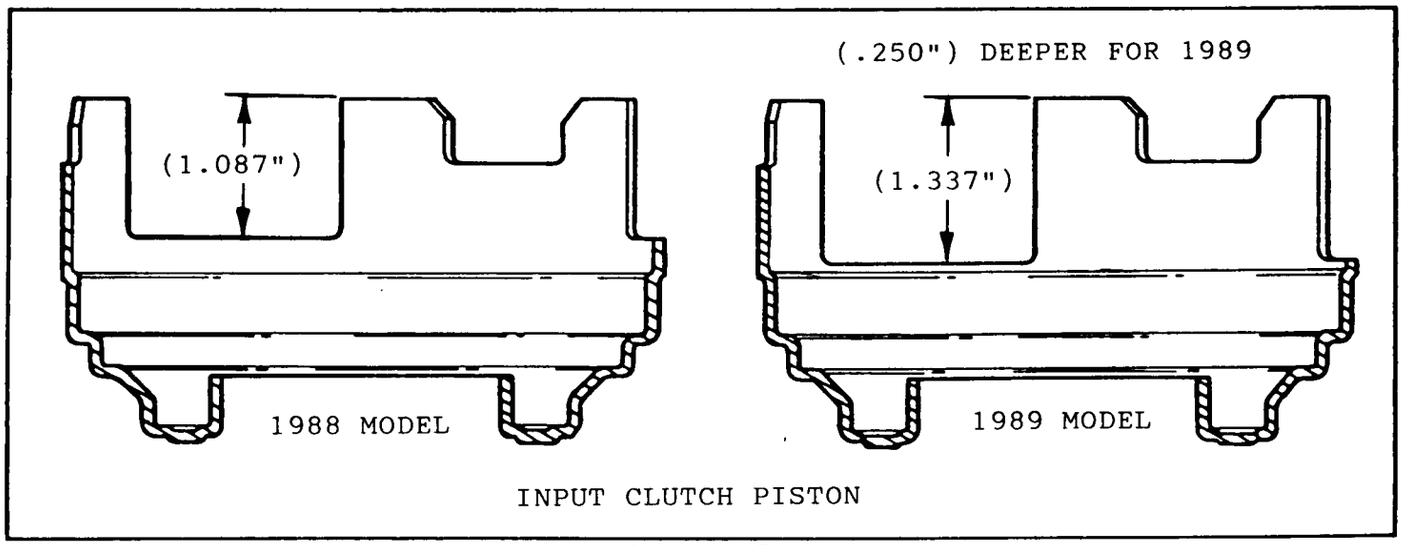
3RD CLUTCH PISTON HOUSING

Figure 83



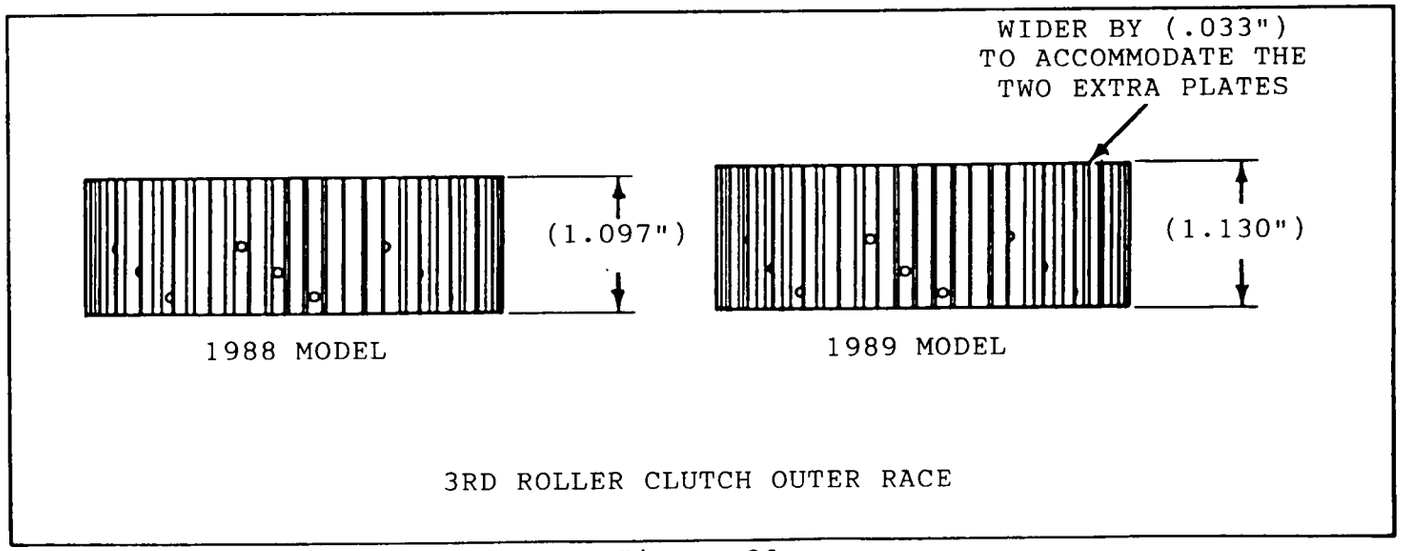
3RD CLUTCH PISTON AND SEAL ASSEMBLY

Figure 84



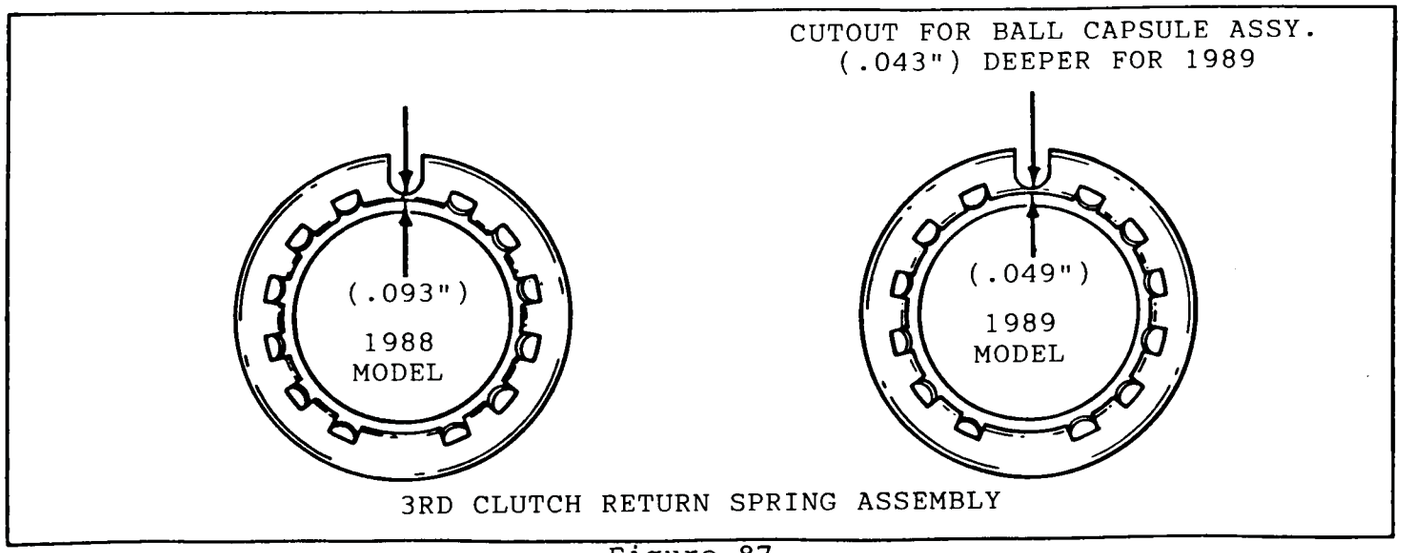
INPUT CLUTCH PISTON

Figure 85



3RD ROLLER CLUTCH OUTER RACE

Figure 86



3RD CLUTCH RETURN SPRING ASSEMBLY

Figure 87

CHANGE: 2nd Clutch Backing Plate was redesigned (See Figure 88).

REASON: 1987 and 1988 design backing plate was prone to warping in the area of the "Windows", which were there to accommodate the snap ring.

PARTS AFFECTED:

(1) 2nd Clutch Backing Plate - "Windows" in backing plate are eliminated which makes the backing plate less prone to warpage. Also notice (See Figure 88) that the support ring has been eliminated from the backing plate and is no longer used, because "Engine Torque Management" was added as an ECM function. This was one of the reasons for the addition of the 2nd clutch switch in 1988.

(2) 2nd Clutch Backing Plate Snap Ring - The new snap ring is only half as wide as the previous models and must be used with the third design backing plate.

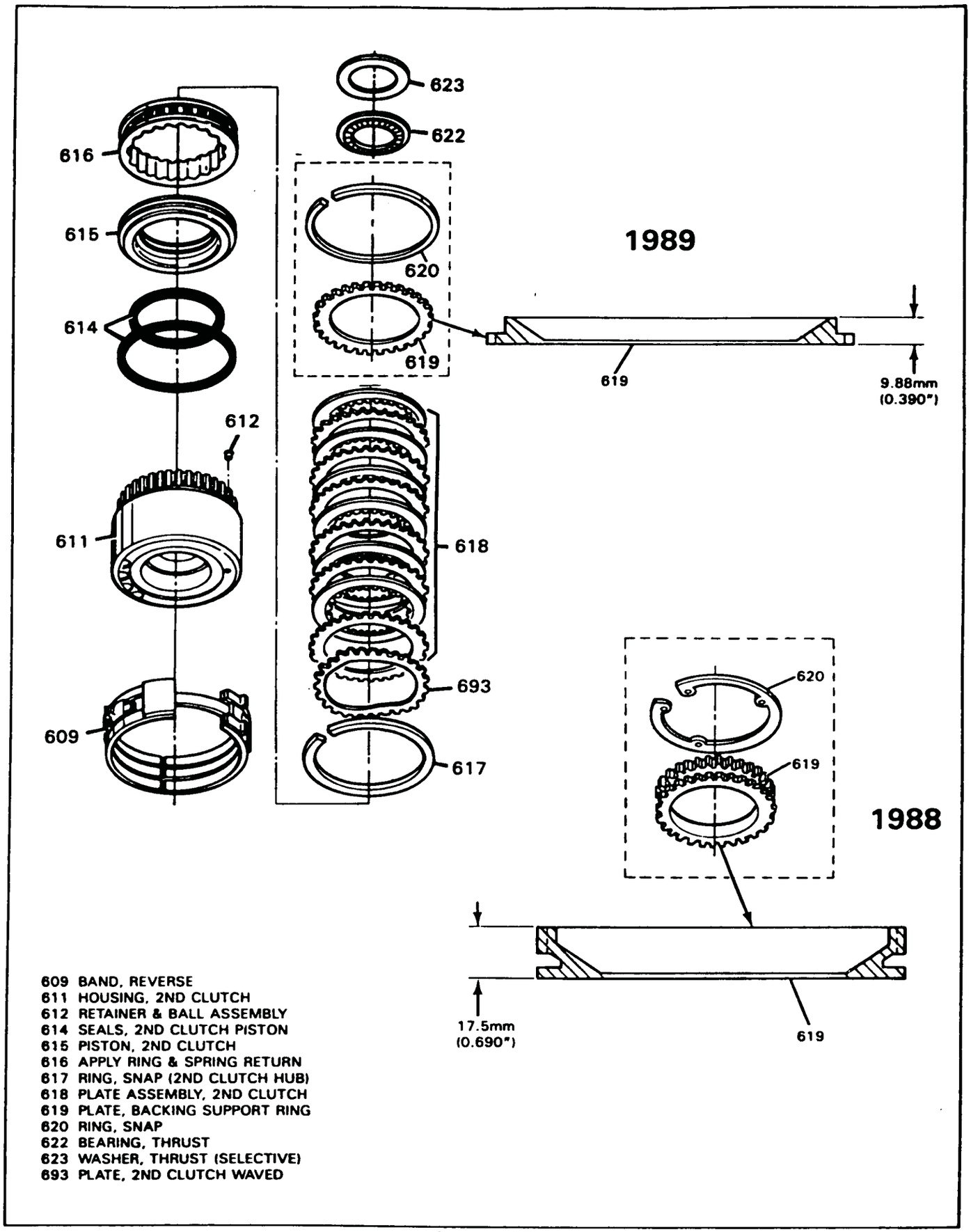
INTERCHANGEABILITY:

Can not be used in a vehicle without "Engine Torque Management" which is a function of the ECM beginning in 1989. If used on a previous model you may cave in the 2nd clutch drum where it splines into the reverse reaction drum because of excess torque load, and lack of the support ring.

SERVICE INFORMATION:

2nd Clutch Backing Plate (3rd Design).....8668566

2nd Clutch Snap Ring (3rd Design).....8668567



609 BAND, REVERSE
611 HOUSING, 2ND CLUTCH
612 RETAINER & BALL ASSEMBLY
614 SEALS, 2ND CLUTCH PISTON
615 PISTON, 2ND CLUTCH
616 APPLY RING & SPRING RETURN
617 RING, SNAP (2ND CLUTCH HUB)
618 PLATE ASSEMBLY, 2ND CLUTCH
619 PLATE, BACKING SUPPORT RING
620 RING, SNAP
622 BEARING, THRUST
623 WASHER, THRUST (SELECTIVE)
693 PLATE, 2ND CLUTCH WAVED

Figure 88

CHANGE: A new Thrust Bearing Assembly replaces the "Top Hat" Thrust Washer and Lock Up Sleeve in the input housing. (See Figure 89). The new bearing and related parts went into production on all 1989 models on November 28, 1988 (Julian Date 333).

REASON: To minimize friction and the potential of excess heat that would melt the plastic in the 3rd roller clutch assembly.

PARTS AFFECTED:

(1) Input Housing - Surface on the input housing where the new bearing assembly rides, has been reduced by .035" to accommodate the increased thickness of the new bearing (See Figure 90).

(2) "Top Hat" Thrust Washer - Eliminated (See Figure 90).

(3) Lock Up Sleeve - The lock up sleeve is no longer needed and has been eliminated (See Figure 90).

(4) 3rd Roller Clutch Lube Dam - The inside diameter has been increased by .256" to accommodate the larger diameter new bearing, and the lip on the lube dam eliminated for increased lube flow to the 3rd roller assembly (See Figure 91).

(5) 3rd Roller Clutch Inner Race - Has been machined .040" thinner to accommodate the increased thickness of the new bearing assembly (See Figure 91).

INTERCHANGEABILITY:

Will retro fit back to all previous models, as long as, all parts affected are used. You "Cannot" mix parts in this location as you will not be able to obtain proper end play.

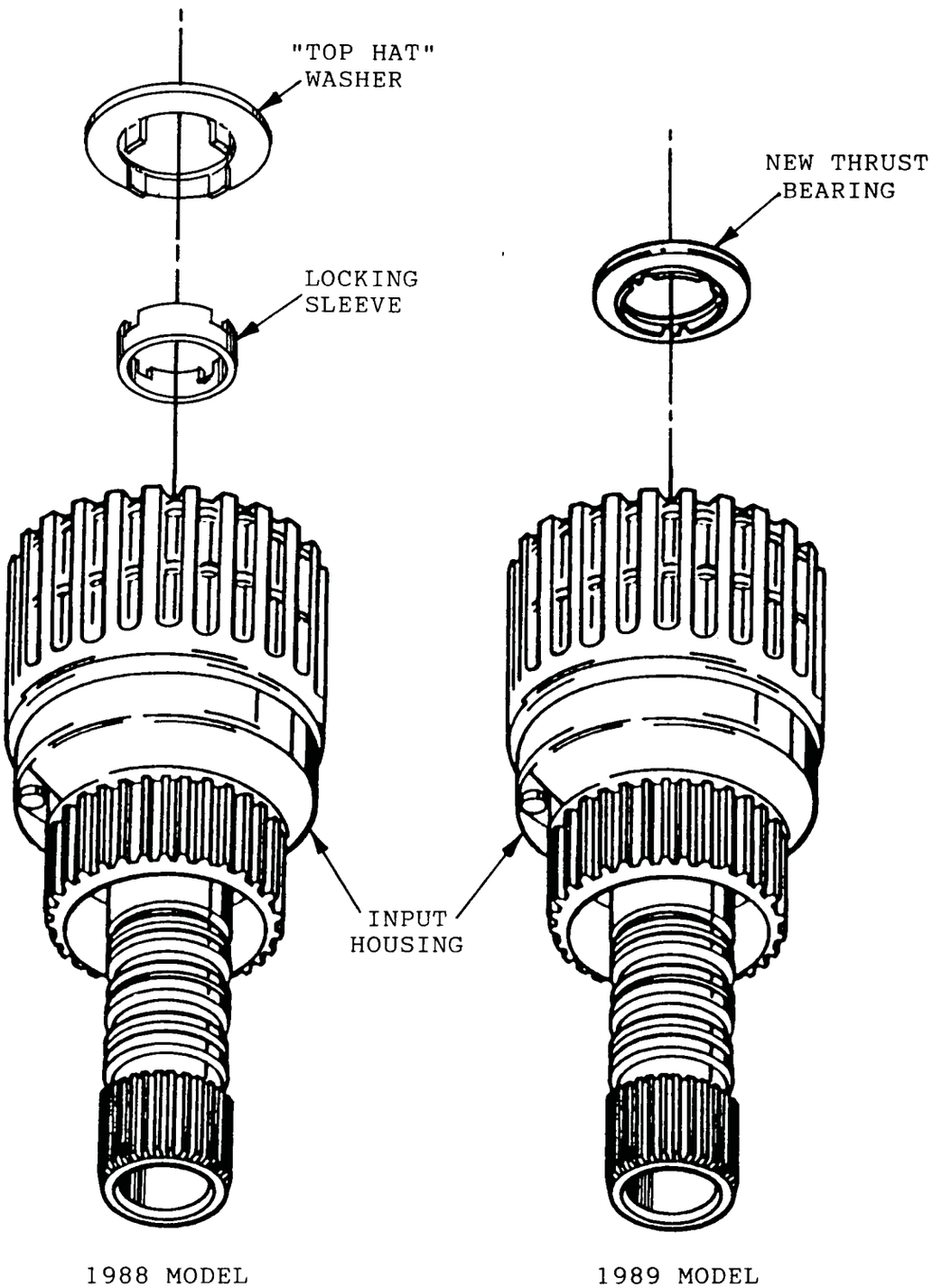
You can purchase the new Thrust Bearing Assembly and the new design 3rd Roller Clutch Complete, and have .030" machined from your input housing, to retro back to all models. Make sure you check end play. This will save the cost of buying a new input housing.

SERVICE INFORMATION:

Thrust Bearing Assembly (New Design).....8668422

3rd Roller Clutch Complete (New Design).....8657046

Service Package.....8662970
Contains the following;
1. New design Input Housing.
2. New design Thrust Bearing Assembly.
3. New design 3rd Roller Clutch Complete.
4. Instruction Sheet.



INPUT/THIRD CLUTCH HOUSING

Figure 89

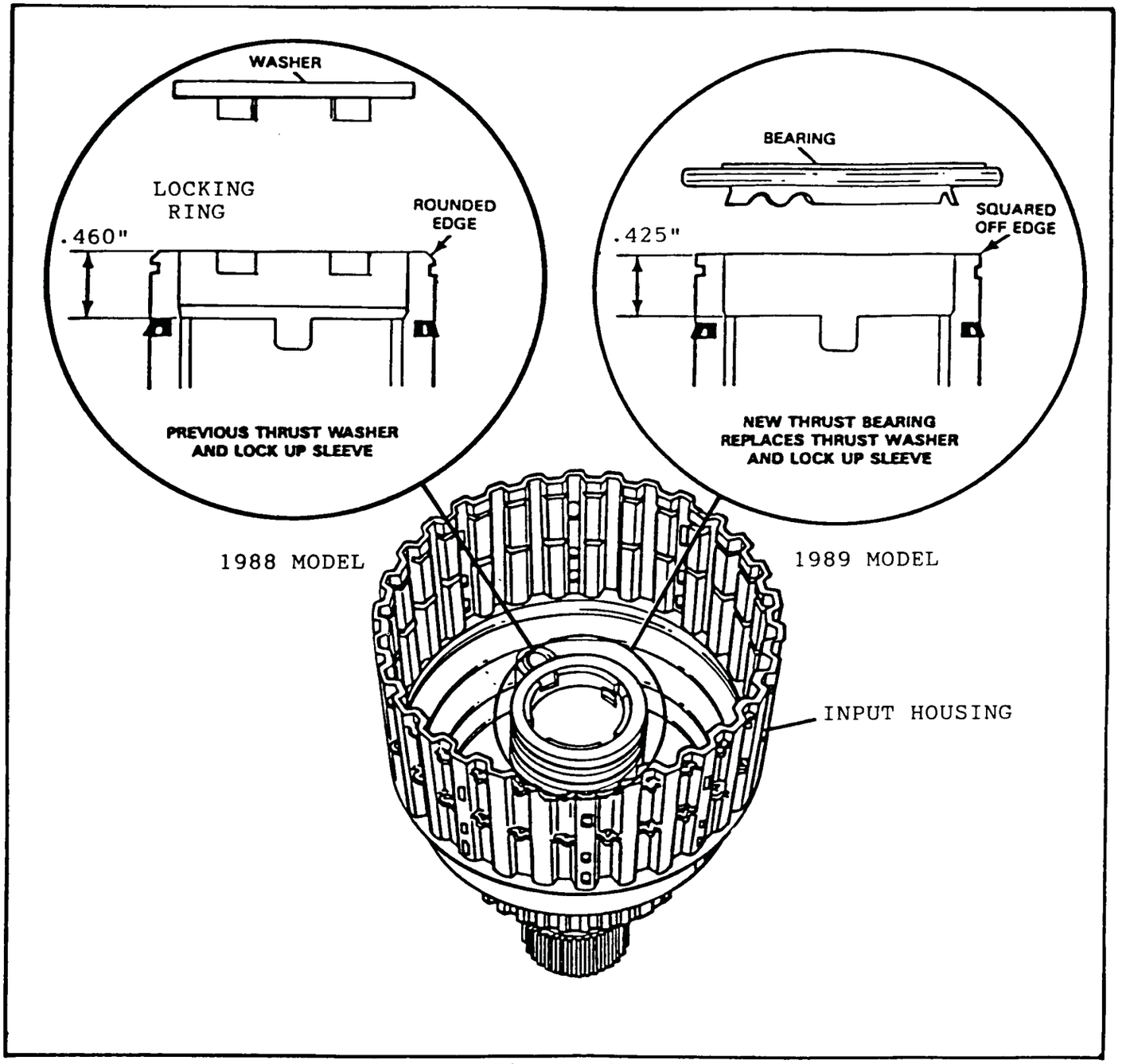


Figure 90

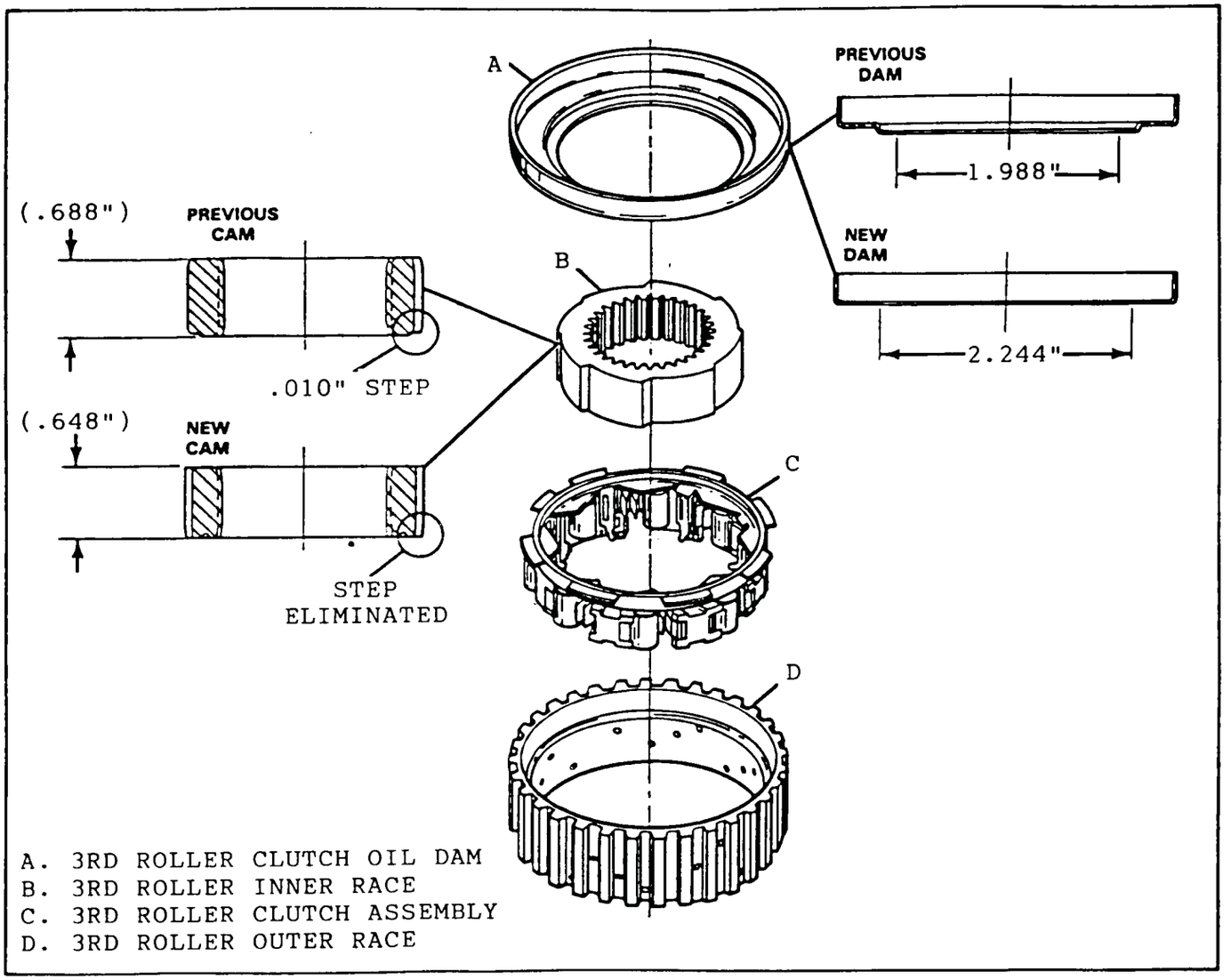


Figure 91

THM 440-T4

3RD ROLLER CLUTCH AND INPUT SPRAG FAILURE

COMPLAINT: Repeated failure of the 3rd Roller Clutch and/or the Input Sprag Assembly.

CAUSE: Lack of lube oil to 3rd Roller Clutch and Input Sprag.

CORRECTION: Modification as follows, of the parts indicated, will increase lube flow to both the 3rd Roller Clutch and the Input Sprag.

1. MODIFY OUTPUT SHAFT:
   Grind four (4) flats on the Output Shaft at the front of the bearing in the locations shown in Figure 92.
2. MODIFY OUTPUT SHAFT BEARING:
   Remove individual needle bearings as shown in Figure 93 in three equally spaced locations around the bearing, to provide three "Troughs" for additional lube oil to flow. Removing the needles does not impair the durability of the bearing assembly.
3. MODIFY ASSEMBLY PROCEDURE:
   When installing the Sprag Assembly onto the Input Sun Gear, align one of the three lube oil holes in the inner race, with one of the two lube oil holes in the Input Sun Gear, as shown in Figure 94.

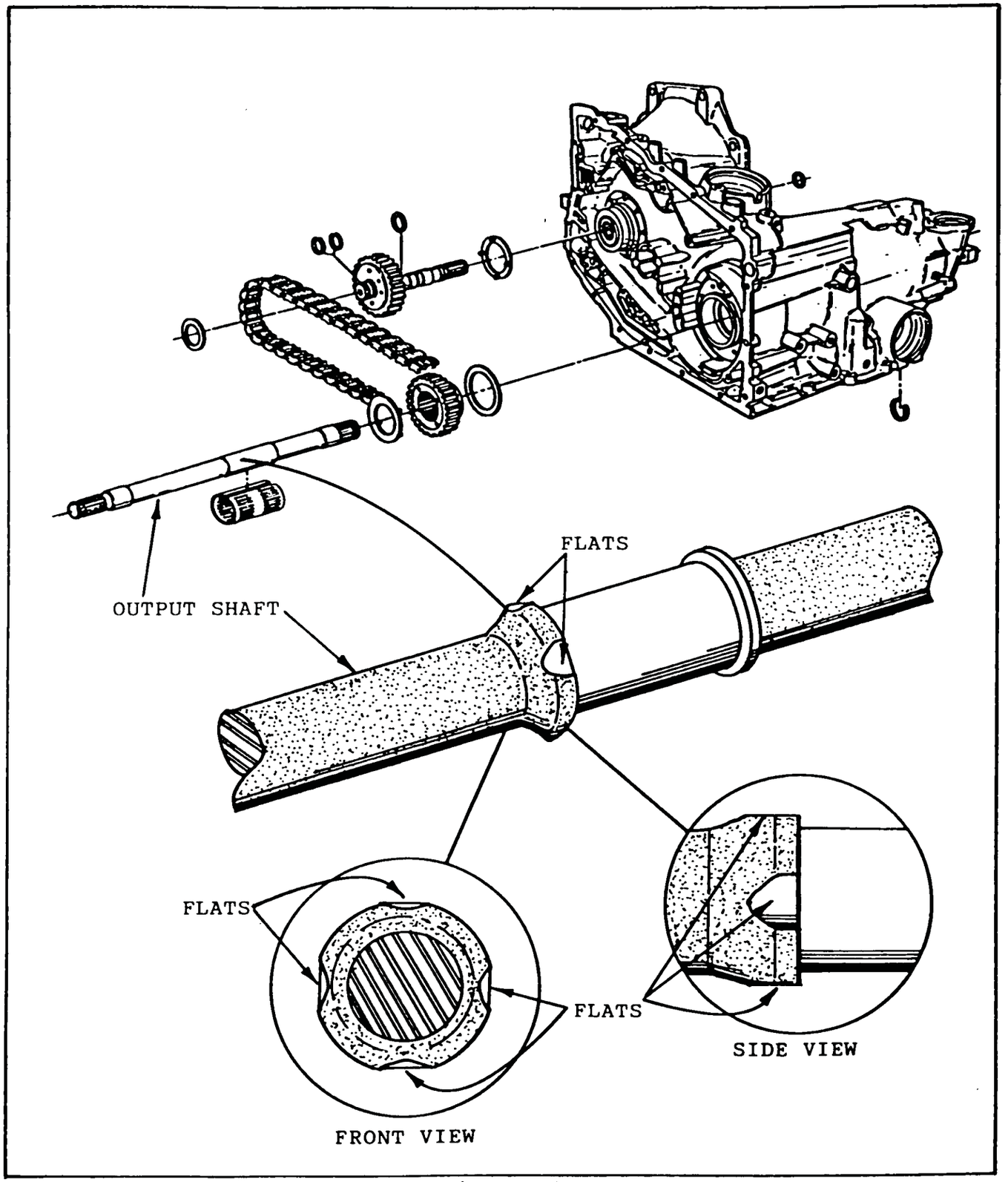
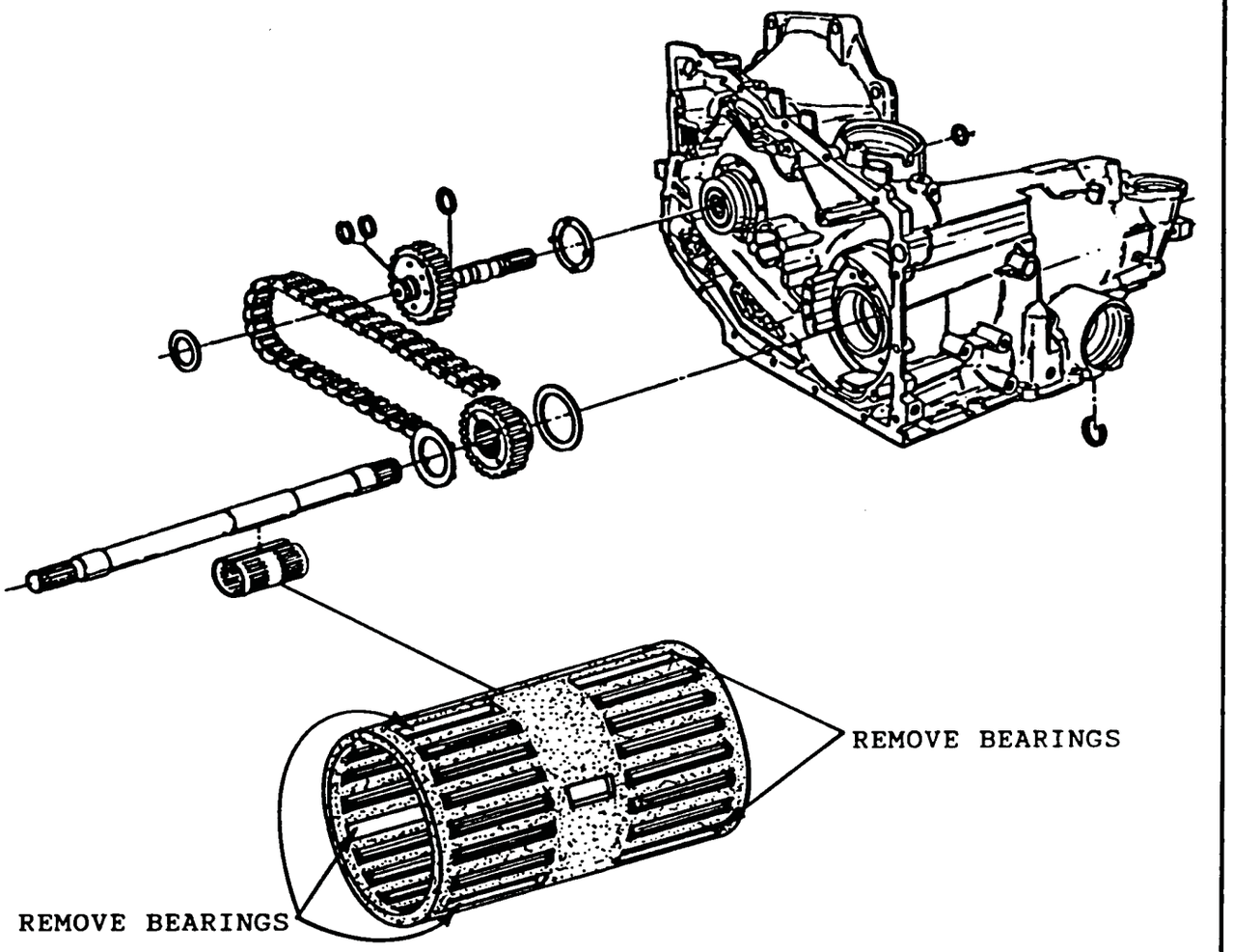


Figure 92



REMOVE INDIVIDUAL NEEDLE BEARINGS IN THREE EQUALLY SPACED LOCATIONS AROUND THE BEARING TO PROVIDE THREE "TROUGHS" FOR ADDITIONAL LUBE OIL TO FLOW.

Figure 93

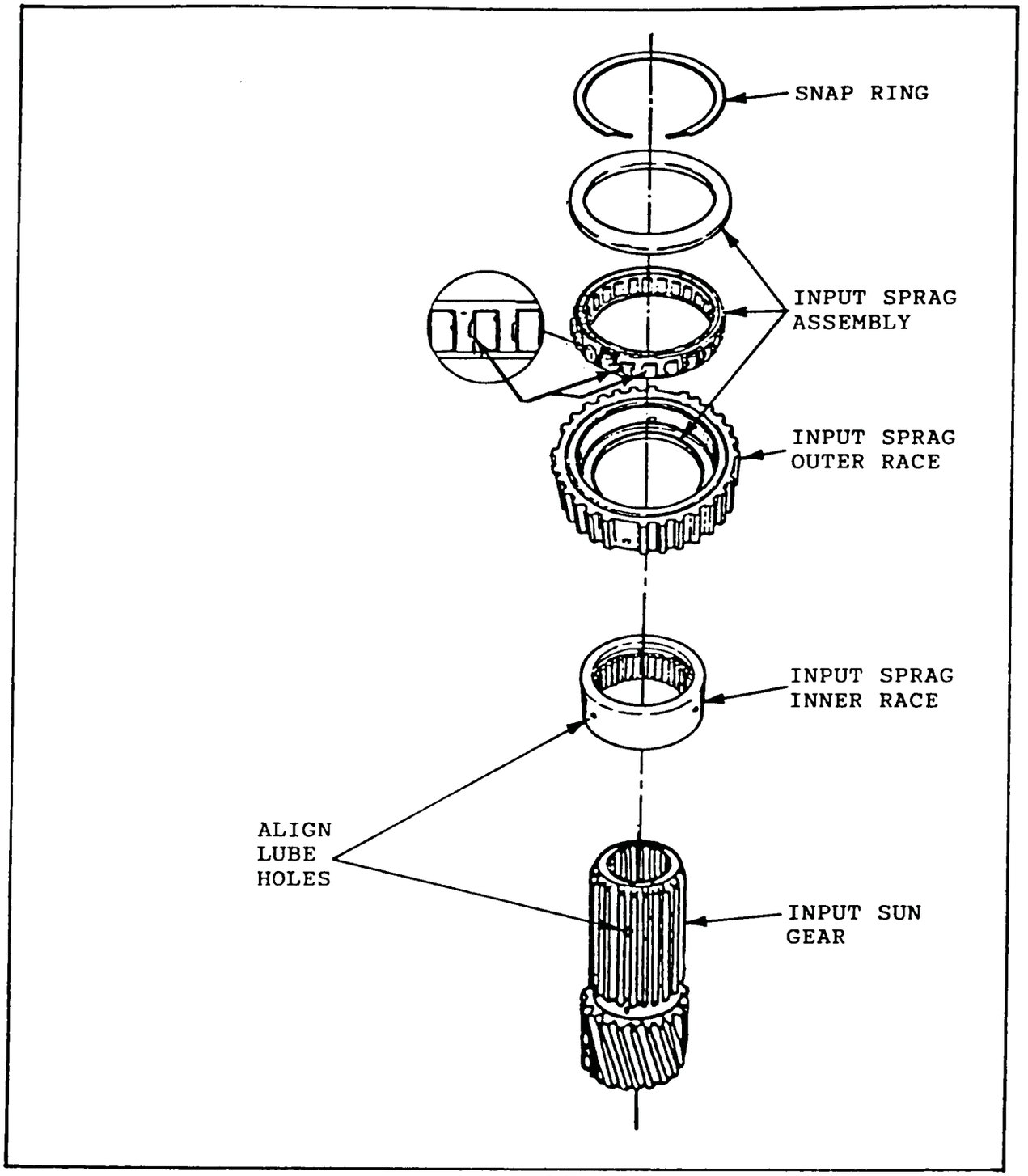


Figure 94

CHANGE: Upper Channel Plate Gasket (See Figure 95).

REASON: To help prevent mis-assembly of the gaskets during the assembly process.

PARTS AFFECTED:

(1) Upper Channel Plate Gasket - The Upper Channel Plate Gasket and Modulator Port Gasket are now connected together as one gasket (See Figure 95).

INTERCHANGEABILITY:

The new Upper Channel Plate Gasket will retro fit back to 85 1/2 hydraulics only. The new gasket "CANNOT" be used on 1985 hydraulics. The previous design gaskets may still be used on all models.

SERVICE INFORMATION:

The new design Upper Channel Plate Gasket will most likely "Not Appear" in aftermarket gasket sets, as the previous design gaskets will work fine.

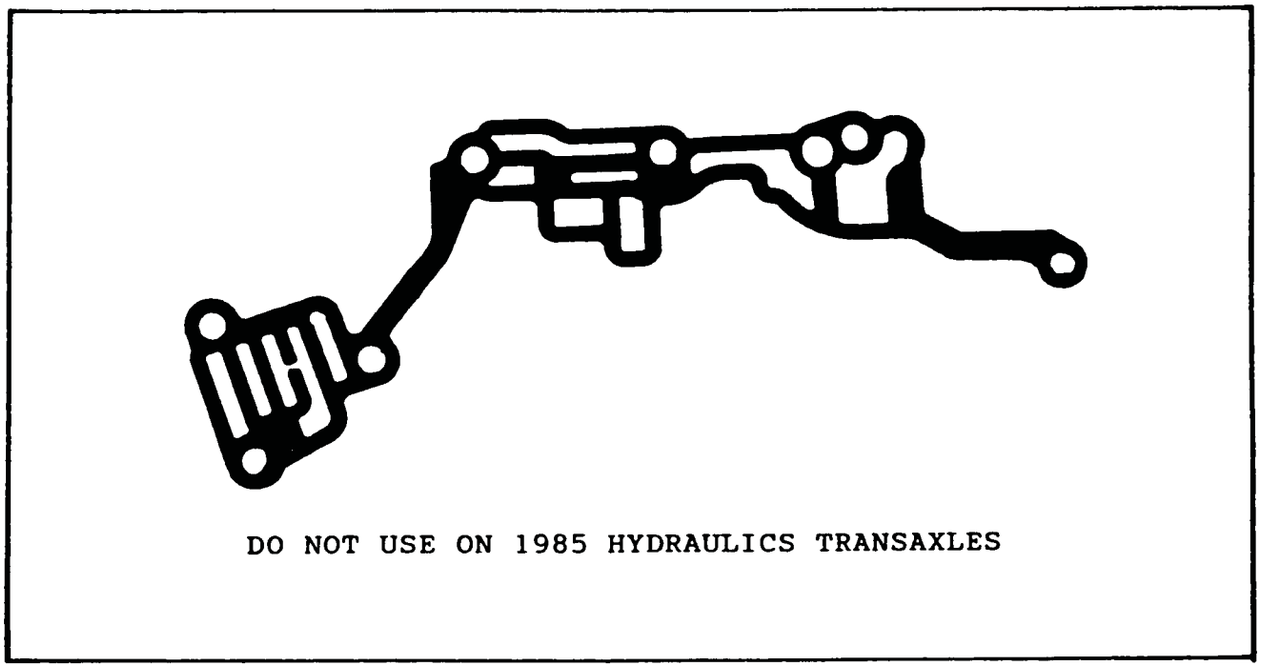


Figure 95

The governor screen was added in 1989 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 96).

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

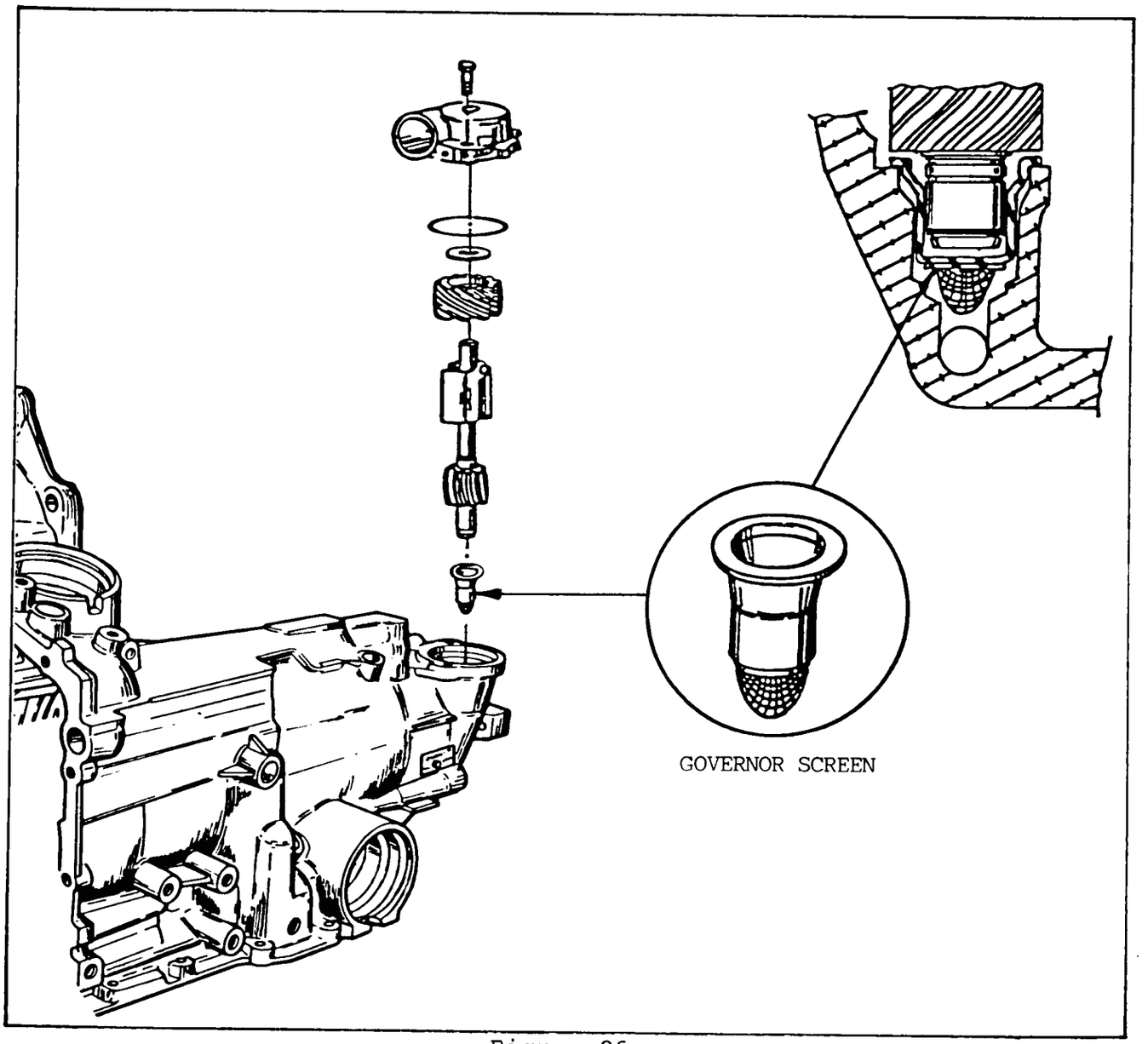


Figure 96

THM 440-T4
HARSH REVERSE

COMPLAINT: Harsh Garage Shift From Park/Neutral To Reverse.

CAUSE: The cause may be:
1. Low vacuum supply to the vacuum modulator.
2. Stuck modulator valve in case.
3. No. 9 checkball missing or off location.

CORRECTION: AFTER ALL OF THE ABOVE ARE ELIMINATED:
There is now available a new Reverse Servo Cushion Spring, and a new Reverse Servo Return Spring. Replacing these springs should correct the harsh reverse condition. The reverse servo return spring should only be replaced on the 2.8L engines.

Spring, Reverse Servo Cushion (All).....8668121
Spring, Reverse Servo Return (2.8L Only)...8668127

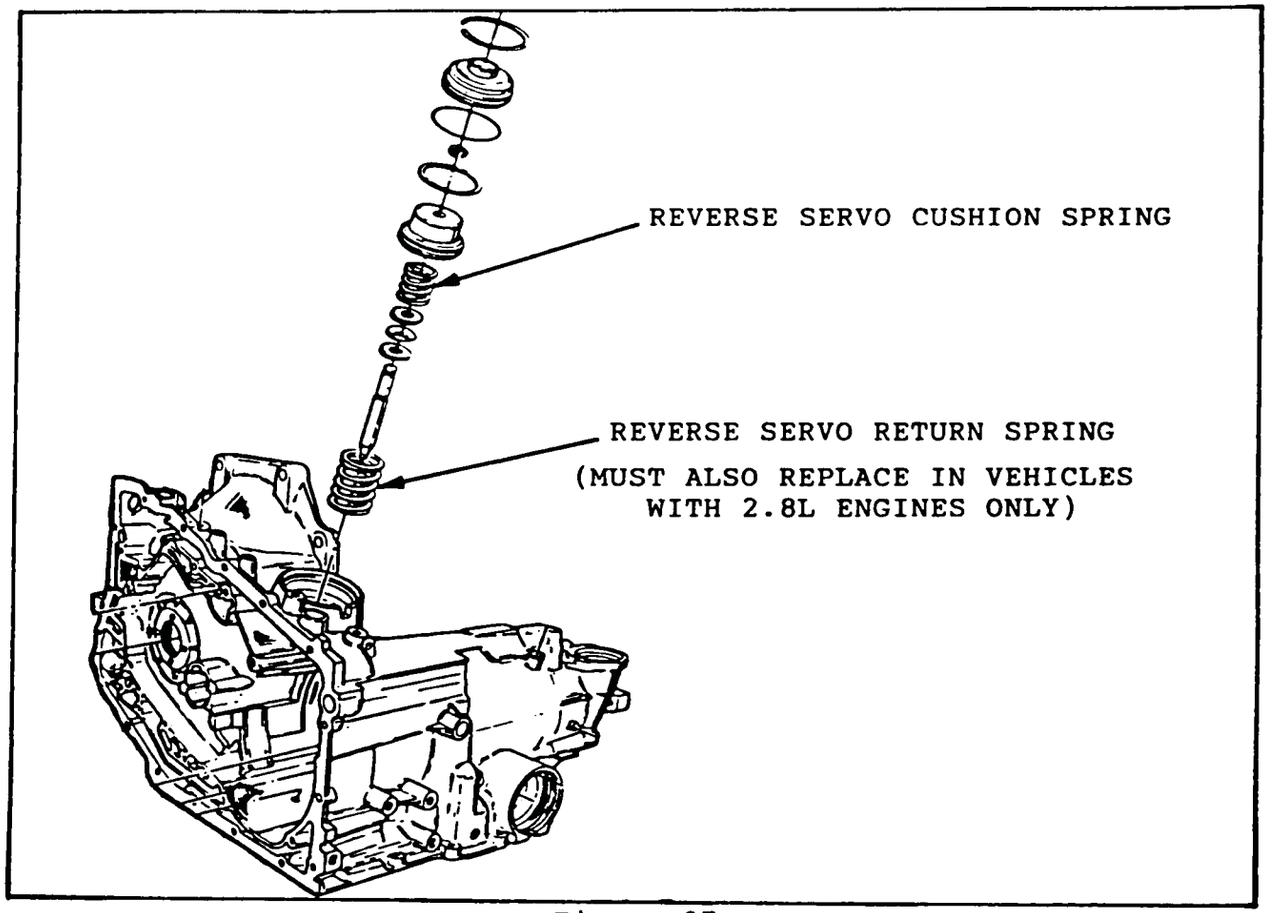


Figure 97

THM 440-T4
HARSH DRIVE ENGAGEMENT

COMPLAINT: Harsh garage shift from Park/Neutral to Drive.

CAUSE: The cause may be:
1. Low vacuum supply to vacuum modulator.
2. Stuck modulator valve in case.
3. No. 12 checkball missing or off location.

CORRECTION: AFTER ALL OF THE ABOVE ARE ELIMINATED:
There is now available a new 1-2 Servo Cushion Spring. Replacing this spring should correct the harsh drive condition (See Figure 1).

Spring, 1-2 Servo Cushion (A11).....8668123

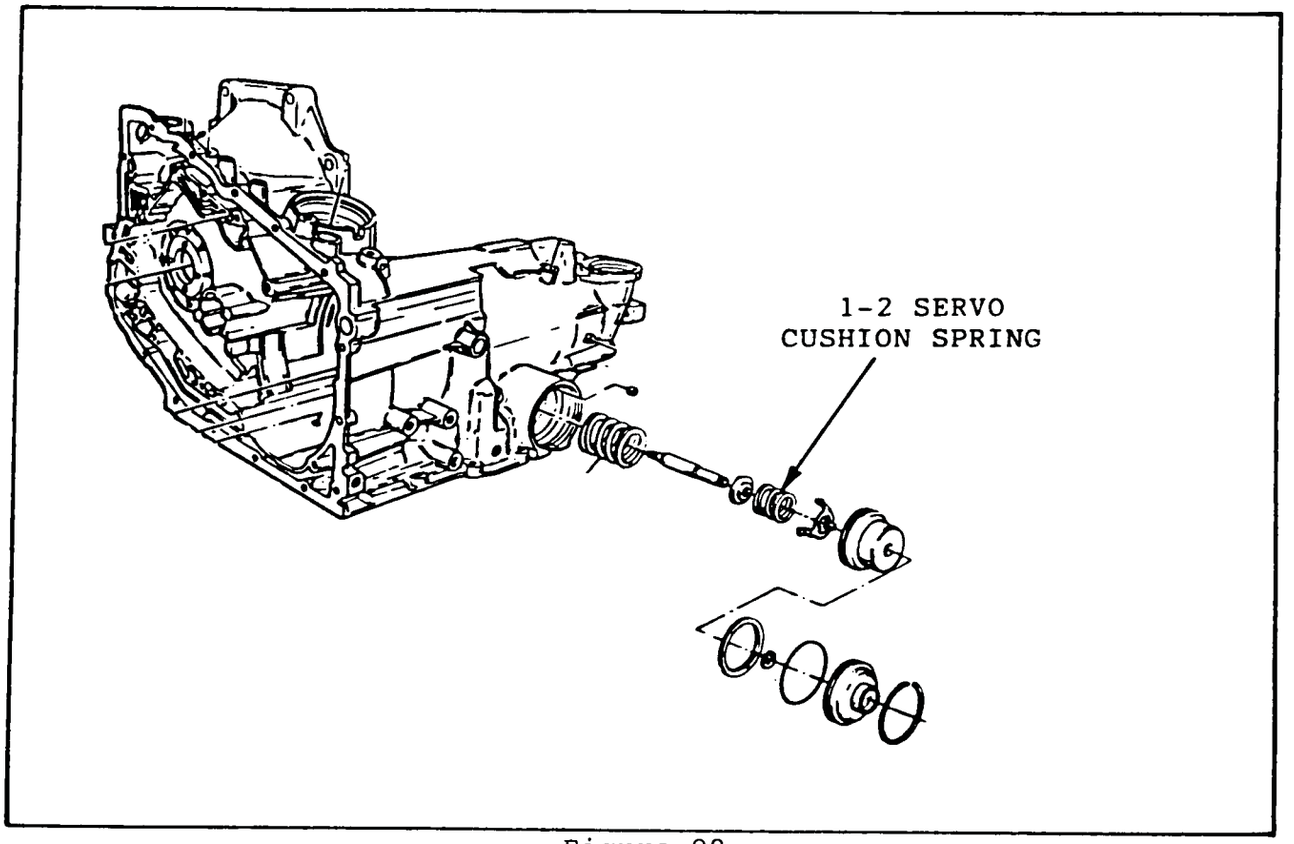


Figure 98

1989 PASSENGER CARS BY BODY TYPE

BODY TYPE	TRANSMISSIONS USED	BUICK	CADILLAC	CHEVROLET	OLDSMOBILE	PONTIAC
A	125C & 440-T4	CENTURY		CELEBRITY	CUTLASS CRUIS CIERA	6000
B	200-4R & 700-R4	LE SABRE WAGON		CAPRICE	CUSTOM CRUISER	SAFARI
C	440-T4	ELECTRA	DEVILLE FLEETWOOD		OLDS 98	
D	200-4R		BROUGHAM			
E/*K	440-T4	RIVERIA	ELDORADO *SEVILLE		TORONADO	
F	700-R4			CAMARO		FIREBIRD
H	440-T4	LE SABRE			DELTA 88	BONNEVILLE
J	125C	SKYHAWK		CAVALIER		SUNBIRD
L	125C			CORSICA BERETTA		
N	125C	SKYLARK			CALAIS	GRAND AM
V	F-7		ALLANTE			
W	440-T4	REGAL		LUMINA	CUTLASS SUPREME	GRAND PRIX
Y	700-R4			CORVETTE		
Z	440-T4	REATTA				

Figure 99