



THM 4L60-E/4L65-E "UPDATE HANDBOOK"

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INTRODUCTION

THM 4L60-E/4L65-E

Since the introduction of the THM 4L60-E transmission in model year 1993, there have been many major engineering design changes to improve durability and reliability. These changes have affected nearly every part used in the THM 4L60-E. This "Update Handbook" will explain each change, the parts affected by the change, and any parts interchangeability concerns created by the change.

Beginning at the start of production for model year 2001, General Motors introduced a new transmission designated THM 4L65-E with many engineering changes. Currently this unit is found in all 2001 Cadillac Escalade and any vehicle with 6.0L engine or larger, that was previously equipped with the THM 4L60-E transmission. We will also cover the changes in the THM 4L65-E transmission in this booklet.

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Technical Service Information

THM 4L60-E TCC "PWM" SOLENOID ADDED IN 1995 AND NEW OIL PUMP ASSEMBLY FOR 1995

CHANGE: Beginning at the start of production for 1995 models, all THM 4L60-E transmissions were built with an added "PWM" solenoid on the valve body to control TCC apply feel. The new TCC PWM Solenoid ramps the torque converter clutch on and off, as in most other GM units.

REASON: Improved pleaseability of torque converter clutch apply and release.

PARTS AFFECTED:

- (1) VALVE BODY CASTING - 1995 models are now machined to accept the added TCC PWM Solenoid, as shown in Figure 1. The added TCC PWM Solenoid is exactly the same and will interchange with the 3-2 downshift solenoid (See Figure 1).
- (2) VALVE BODY SPACER PLATE - There were two holes added in the spacer plate to accommodate the added TCC PWM Solenoid as shown in Figure 2. The 1995 spacer plate can be identified with the first letter of the two digit code being either an "M" or "N", as shown in Figure 2. The first letter of the two digit code on the 1994 spacer plate will be "K" or "L". The 1993 spacer plate first letter will be "J". Refer to Figure 2 for location of the I.D. code stamped into the spacer plate
- (3) OIL PUMP BODY - There were changes in the worm track configuration on the new design pump body to accommodate the added TCC PWM solenoid. The pump body can be easily identified with "PWM" cast into the pump body, in the location shown in Figure 4. Refer to Figure 3 for the differences in the worm track area, which we have shaded for easy reference.
- (4) OIL PUMP COVER (STATOR) - There were changes in the worm track configuration on the new design pump cover to accommodate the added TCC PWM solenoid. The pump cover can be easily identified with "PWM" cast into the pump cover, in the location shown in Figure 6. Refer to Figure 5 for the differences in the worm track area, which we have shaded for easy reference.
- (5) TURBINE SHAFT BALL CAPSULE - Change in orifice sizes to accommodate the added TCC PWM solenoid, and calibrate converter release oil to the new TCC PWM solenoid.

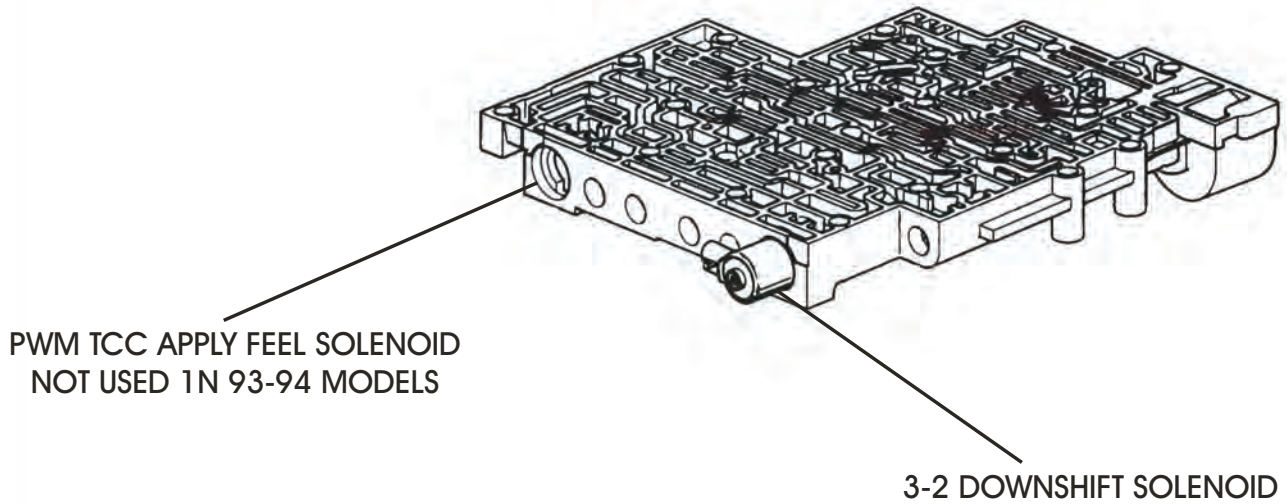
INTERCHANGEABILITY:

None of the parts listed above will interchange with one another, nor will any of these parts back service any 1993-1994 model transmissions.

SERVICE INFORMATION:

TCC PWM Solenoid (95-96 Models)	8683187
Turbine Shaft Ball Capsule (Bronze - 298mm Converter)	24201472
Turbine Shaft Ball Capsule (Silver - 245mm Converter)	8654326

**1993-1994 VALVE BODY
WITH 3-2 DOWNSHIFT SOLENOID
(REQUIRES "NON PWM" PUMP ASSEMBLY)**



**1995 VALVE BODY
WITH 3-2 DOWNSHIFT SOLENOID
AND TCC APPLY FEEL SOLENOID
(REQUIRES "PWM" PUMP ASSEMBLY)**

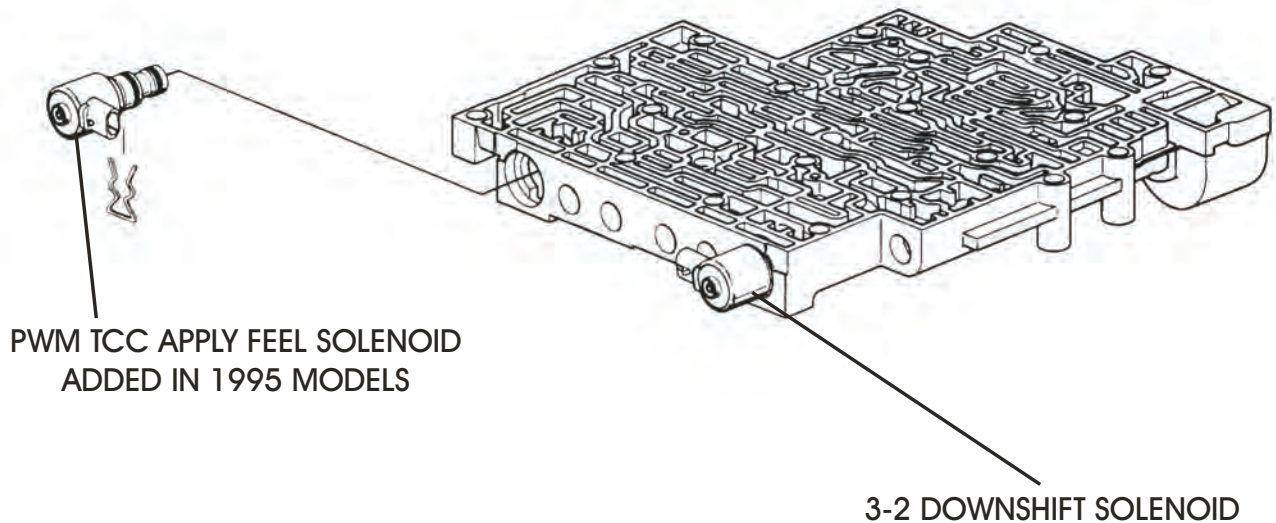


Figure 1

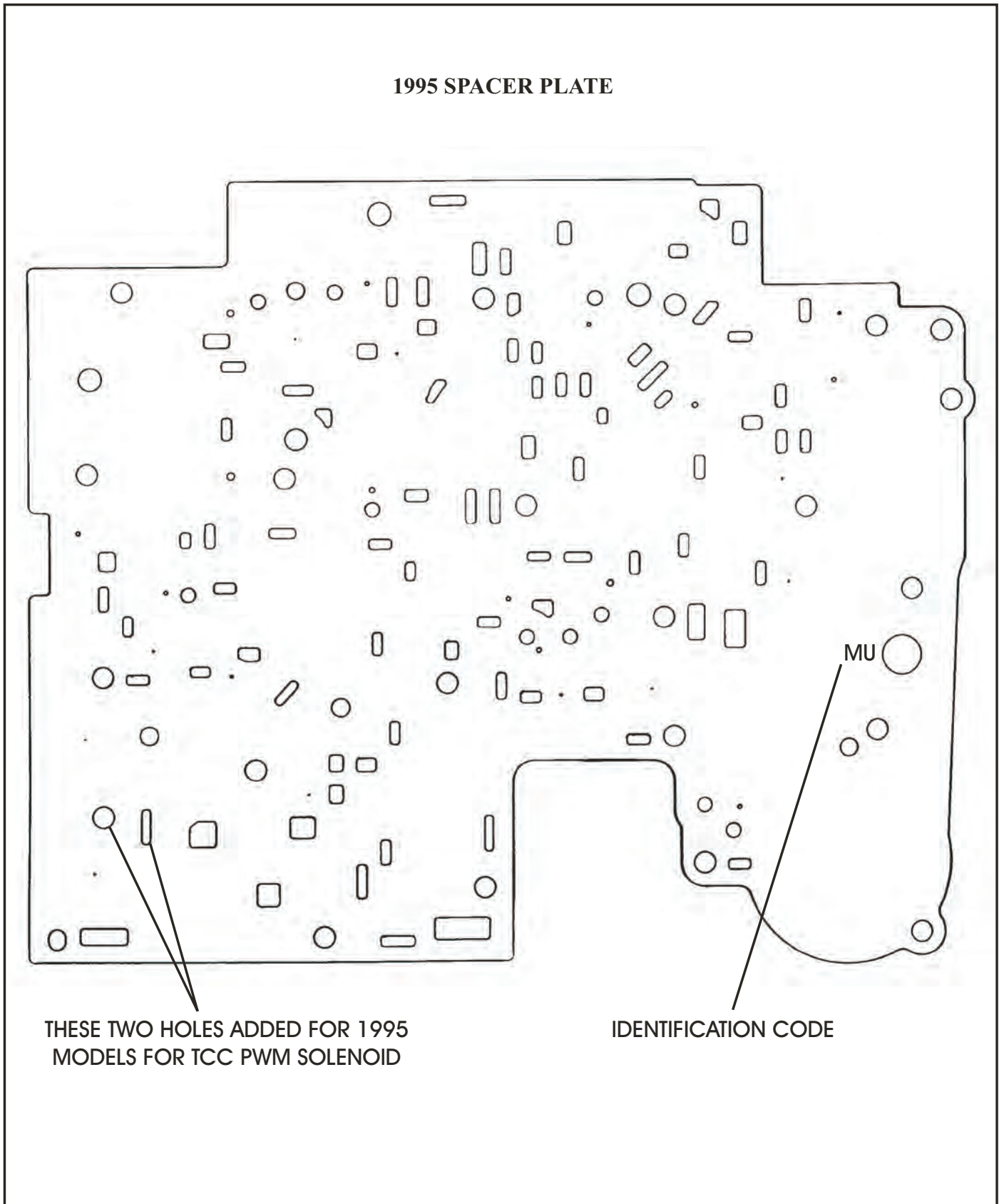


Figure 2

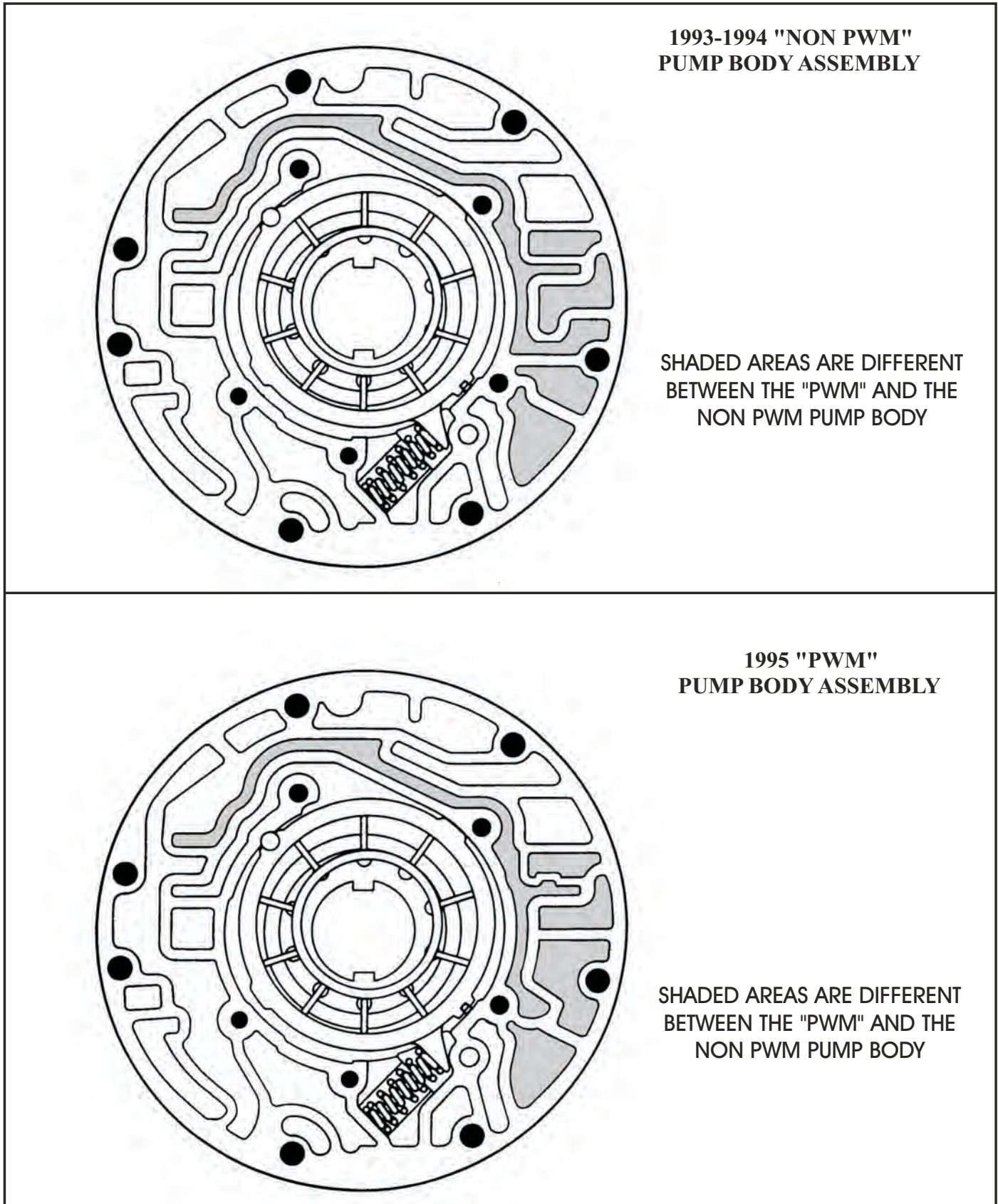


Figure 3

**1995 "PWM" PUMP BODY
IDENTIFICATION**

"PWM" IS CAST INTO
THE PUMP BODY AND
LOCATED HERE

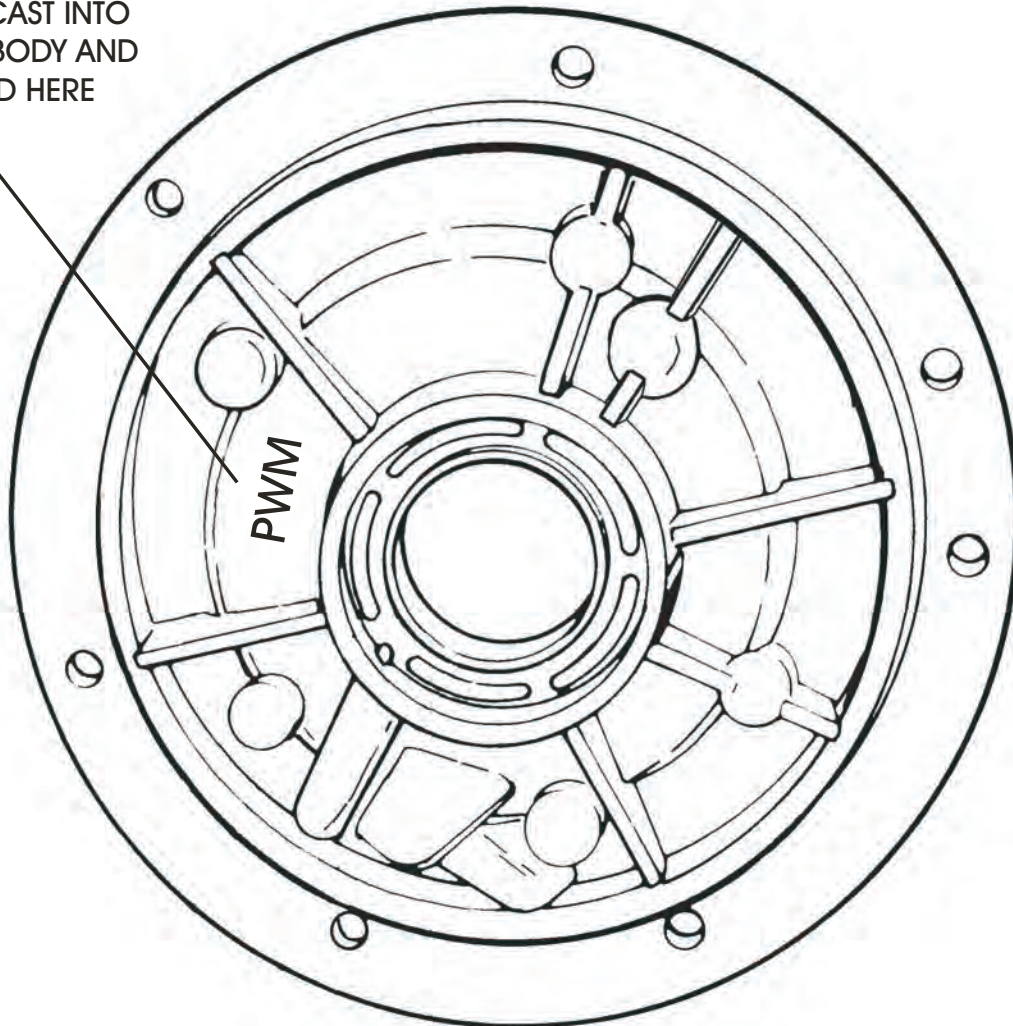


Figure 4

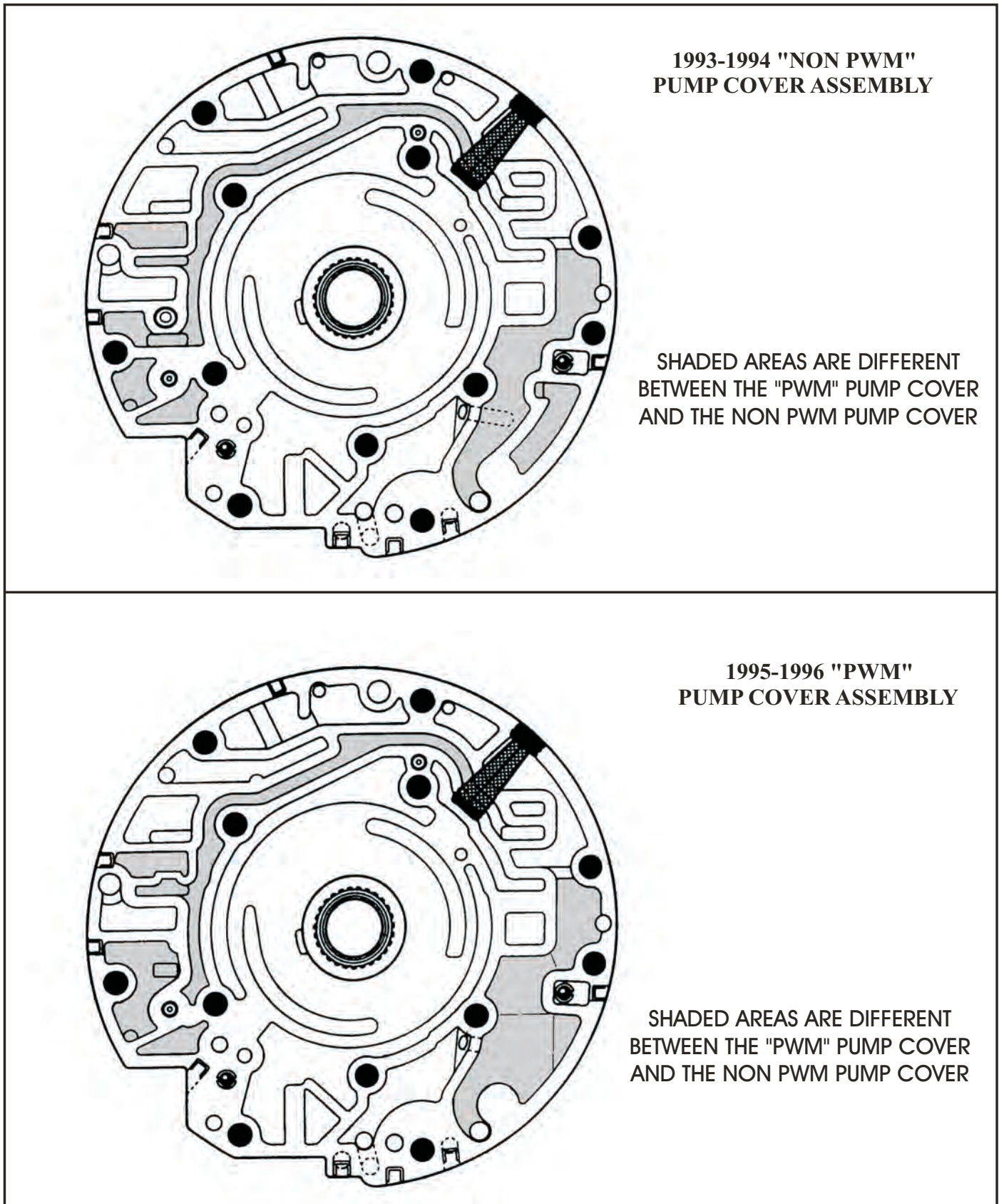


Figure 5

**1995-1996 "PWM" PUMP COVER
IDENTIFICATION**

"PWM" CAST INTO THE PUMP
COVER AND LOCATED HERE

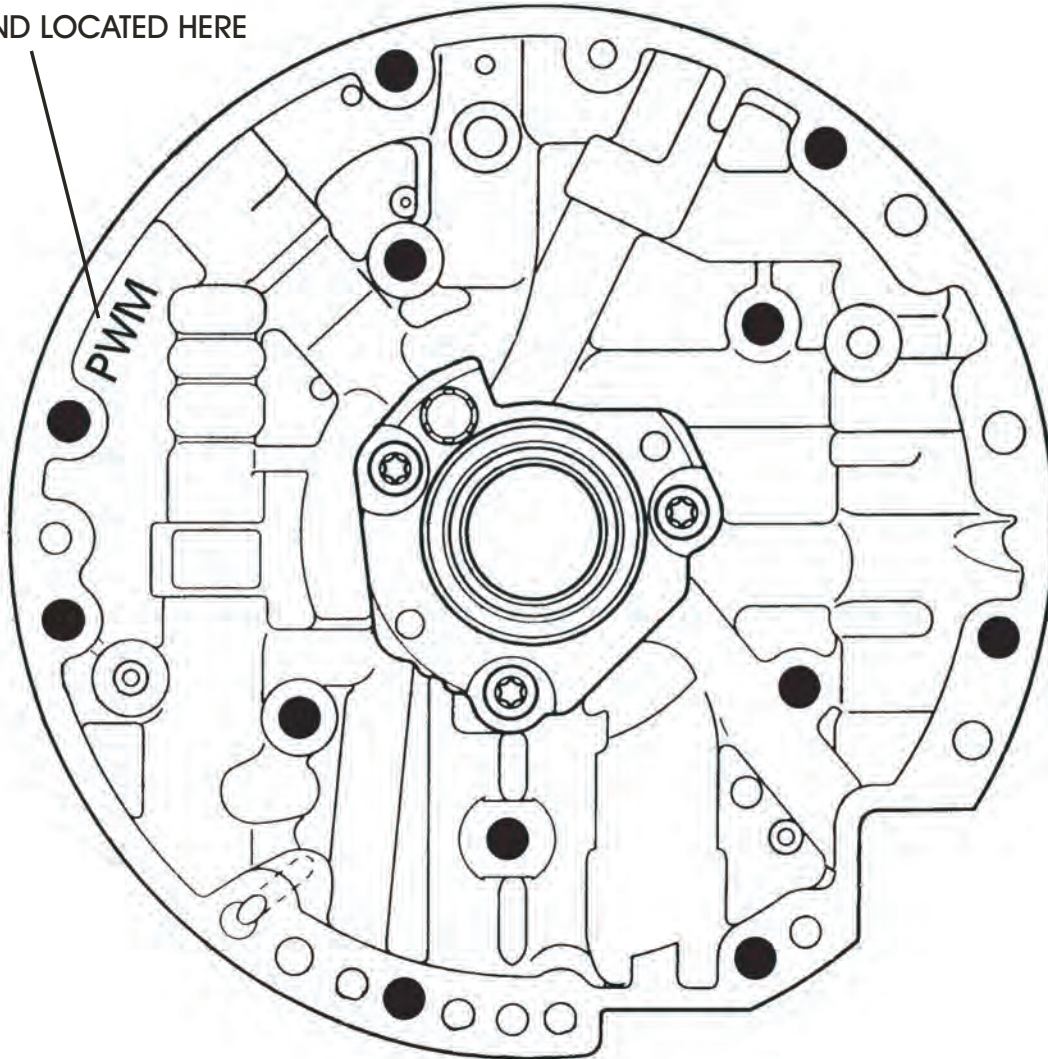


Figure 6



Technical Service Information

THM 4L60-E BOLT-ON BELLHOUSING

CHANGE: Beginning at the start of production for 1996 models, some THM 4L60-E transmissions were built with a bolt-on bellhousing. The 4.3L V6 engine is the only one to receive the bolt-on bellhousing for 1996 models, and will be expanded to most other engine sizes for 1997. Refer to Figure 1 for illustrations.

REASON: Makes the THM 4L60-E transmission much more versatile, for a wide variety of engine sizes and a wide variety of vehicles.

PARTS AFFECTED:

- (1) **BELLHOUSING** - Now bolted to the main case with eight bolts that require what appears to be a normal 50 Torx-bit to remove. *These bolts require a "TORX PLUS 50-IP" bit to remove.* The normal 50 Torx-bit will strip the head on most bellhousing bolts, if used for removal. Refer to Figure 1 for the profile of both bits.
- (2) **MAIN CASE** - Totally different casting to accommodate the bolt-on bellhousing, as shown in Figure 1. There were no changes in worm track configuration, or bolt hole locations for the bottom pan and valve body area.
- (3) **EXTENSION HOUSING** - Totally different casting to accommodate the changes in the case design, and notice the new design has six retaining bolts instead of the previous four, as shown in Figure 1.
- (4) **OIL PUMP BODY** - A machined ring has been added to the front of the pump body to accommodate and center the bolt-on bellhousing, as shown in Figure 2.

INTERCHANGEABILITY:

All of the parts listed above are unique to the 1996 model 2-piece case. However, the pump body with the added machined ring, will be found in some 1995 models, and will back service to 1995 models *only*. It cannot be used in 93-94 models because of worm track cavity differences that occurred in 1995.

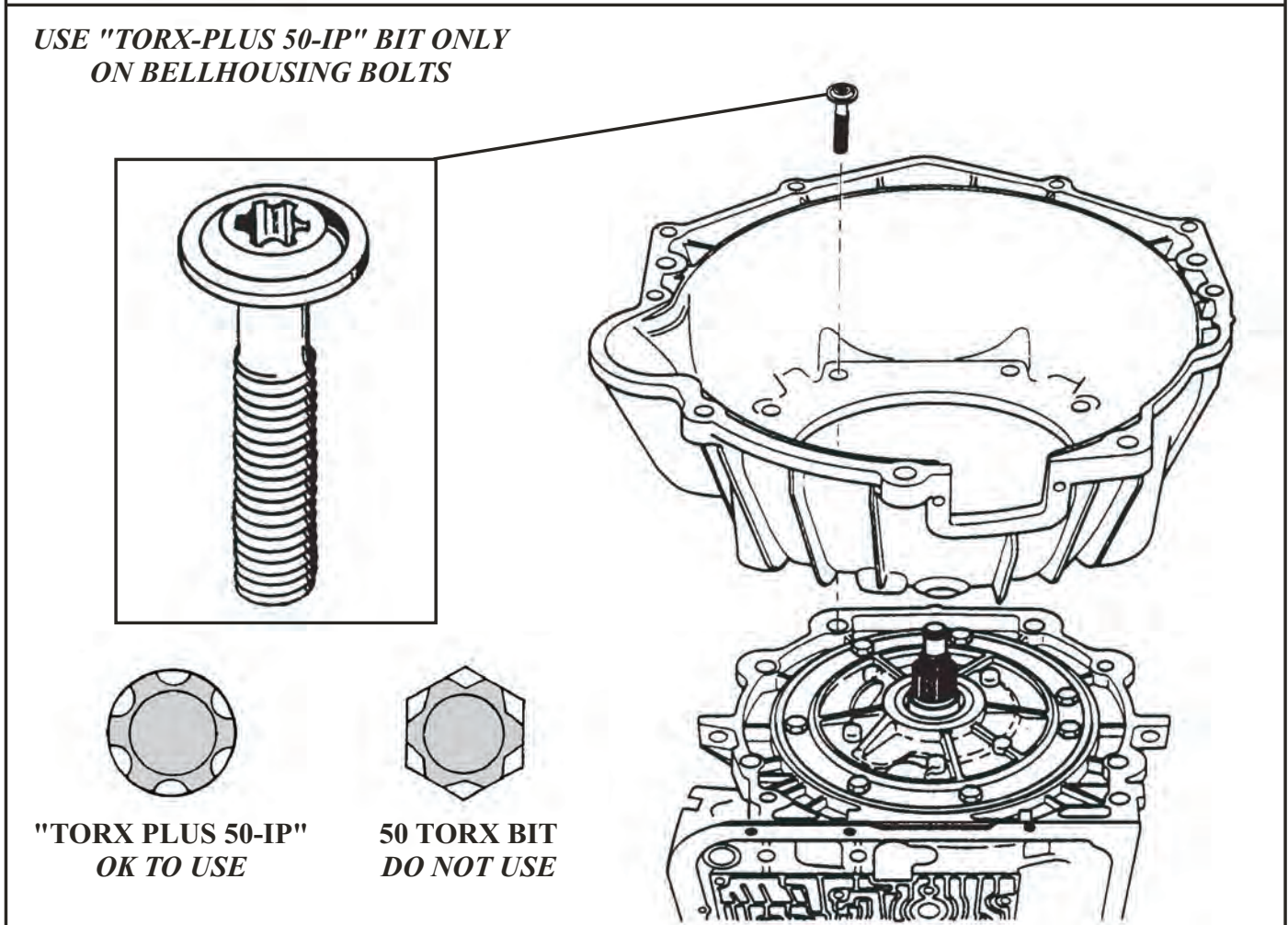
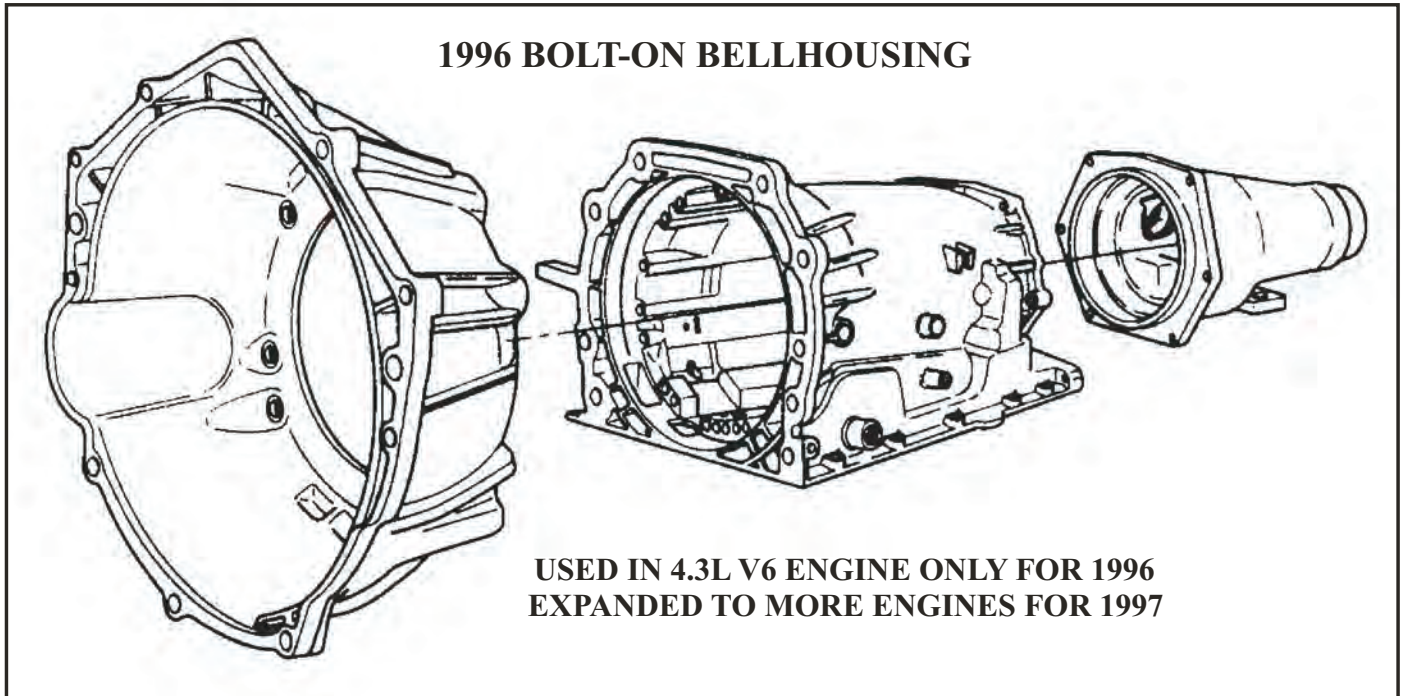
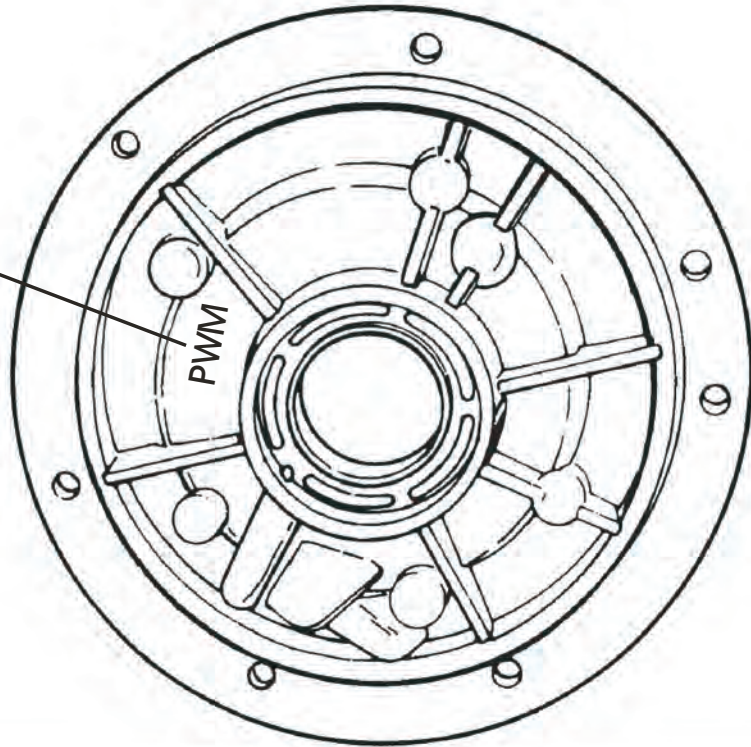


Figure 1

**1995-1996 "PWM" PUMP BODY
FOR REGULAR CASE**

"PWM" CAST INTO PUMP BODY
AND LOCATED HERE



**1996 "PWM" PUMP BODY
FOR BOLT-ON BELL HOUSING**

"PWM" CAST INTO PUMP BODY
AND LOCATED HERE

ADDED MATERIAL AND MACHINED
TO CENTER THE BELLHOUSING

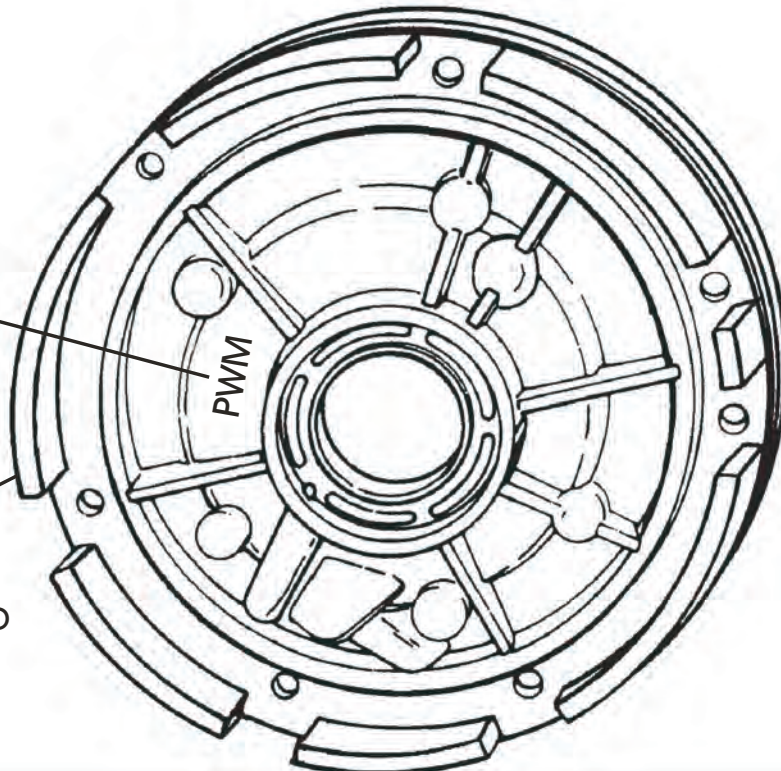


Figure 2



Technical Service Information

THM 4L60-E CHANGE IN BELLHOUSINGS FOR THE 1998 MODEL YEAR

300mm TORQUE CONVERTER (Figure 1):

The Bellhousing shown in Figure 1, is approximately 1/4" deeper than the previous "Big Bell" and is designed to accommodate a new 300mm converter that is used in the 1998 Firebird and 1999 C & K Trucks. The best identification is the added bolt hole at the top of the bellhousing. This style bellhousing and the 300mm converter also require a new design turbine shaft and stator shaft that are also about 1/4" longer.

1998 REGULAR "BIG BELL" (Figure 2):

The Bellhousing shown in Figure 2, has four added holes for an added dust shield, and can be compared with the previous model "Big Bell" that is shown in Figure 3.

1996-1997 REGULAR "BIG BELL" (Figure 3):

The Bellhousing shown in Figure 3, is the previous design "Big Bell" and included in this bulletin for comparison with the 1998 design changes.

HOLDEN "BIG BELL" (Figure 4):

The Bellhousing shown in Figure 4, is the Holden "Big Bell" that is export only and shipped mainly to Australia.

CORVETTE (Figure 5):

The Bellhousing shown in Figure 5, is for the 1997-1998 Corvette with the transmission mounted in the rear of the vehicle and is used with a torque tube.

HOLDEN "SPECIAL" S/T TRUCKS (Figure 6):

The Bellhousing shown in Figure 6, is the Holden "Special" S/T Truck bell that is export only and shipped mainly to Australia. This bell has part of the housing cast out as compared to the Regular S/T Truck bell that is shown in Figure 7.

REGULAR S/T TRUCKS (Figure 7):

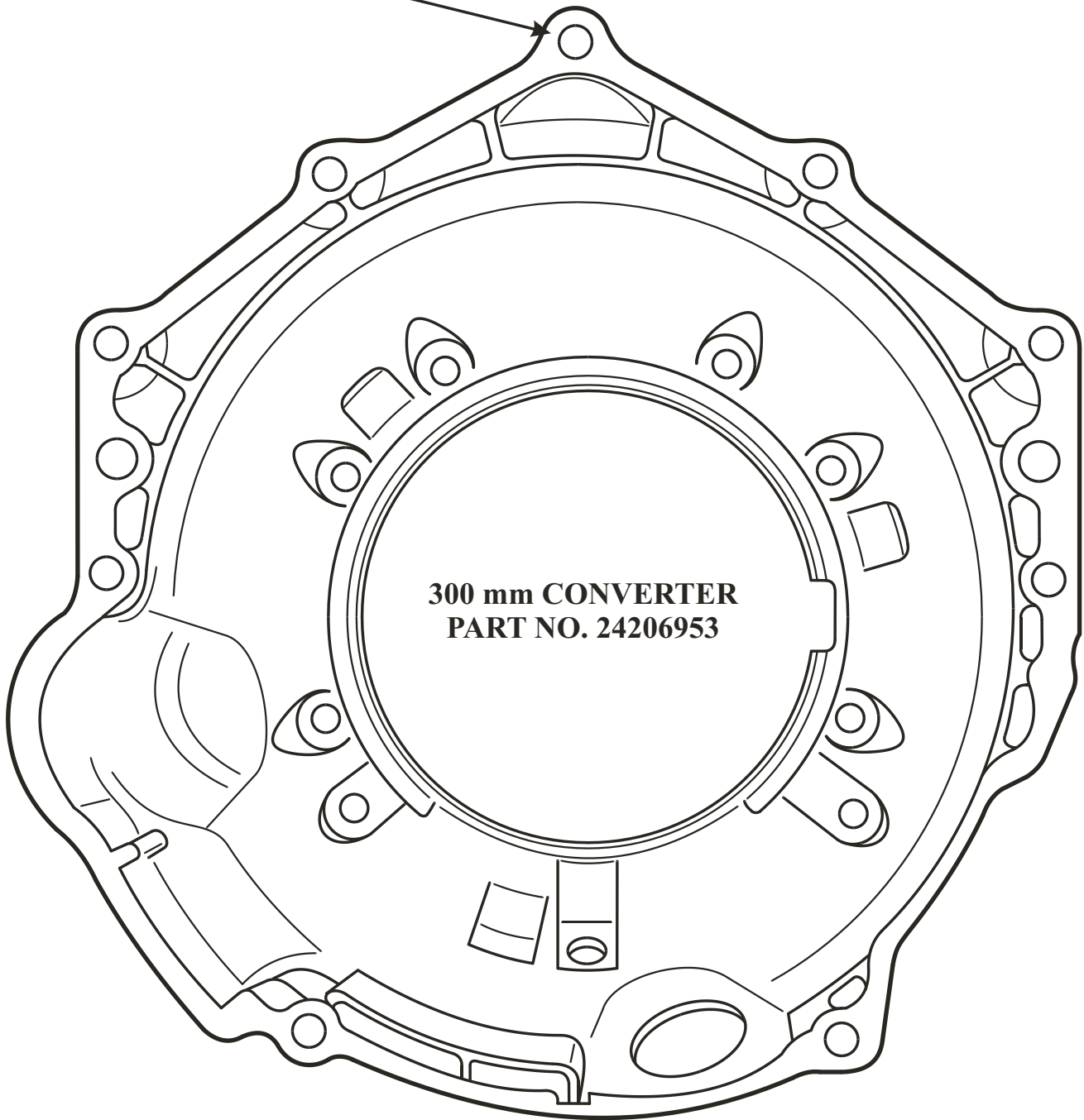
The Bellhousing shown in Figure 7, is the Regular S/T Truck bellhousing used in North America and is cast different than the export S/T Truck bellhousing shown in Figure 6.

Note: *Everything built from 1998 and on has the removable bell.*



Technical Service Information

**ADDED BOLT HOLE AND
IS APPROX. 1/4" DEEPER**



This style bellhousing and the 300mm torque converter also require a new design turbine shaft and stator shaft that are approximately 1/4" longer than other models.

Figure 1

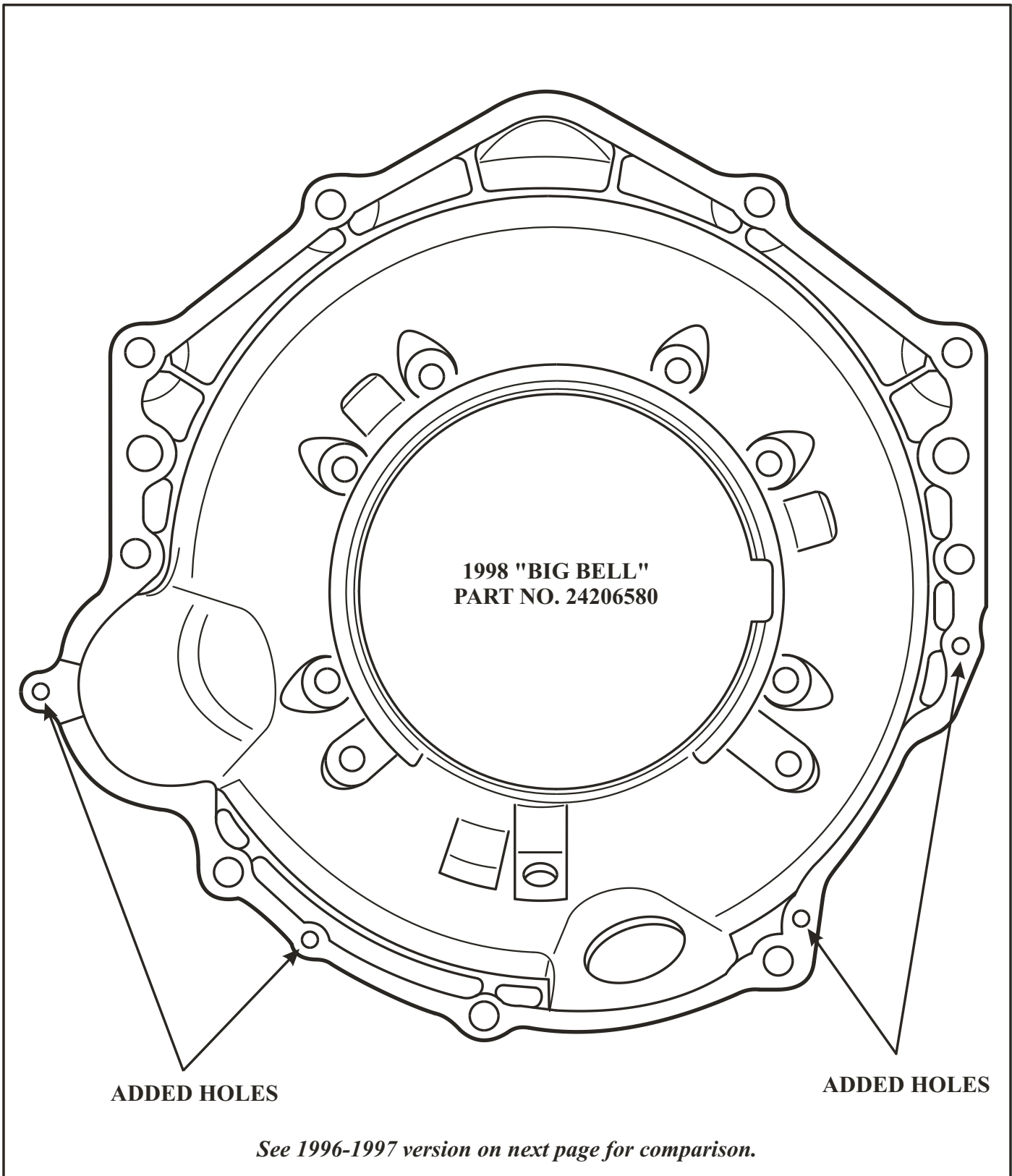


Figure 2

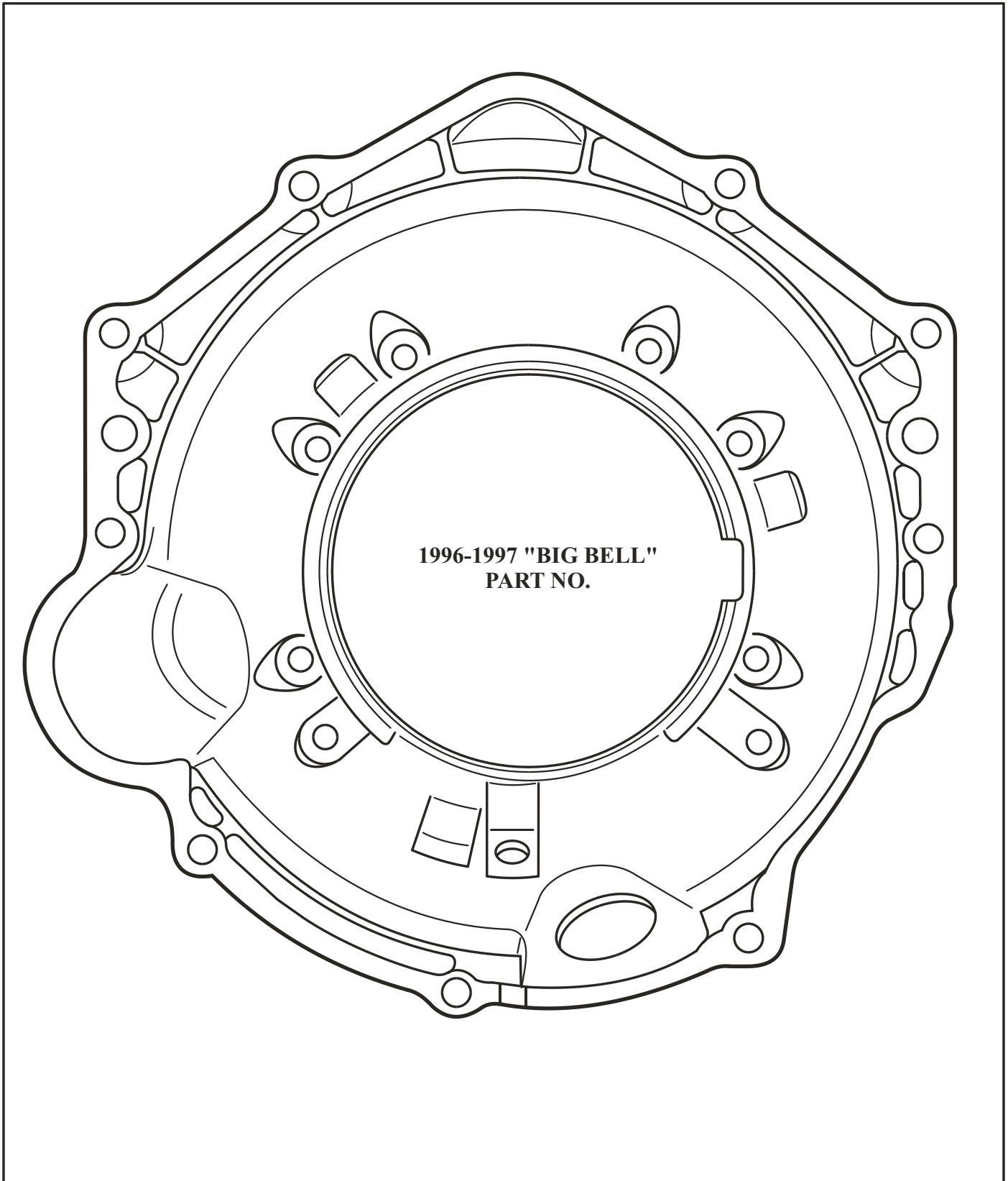


Figure 3

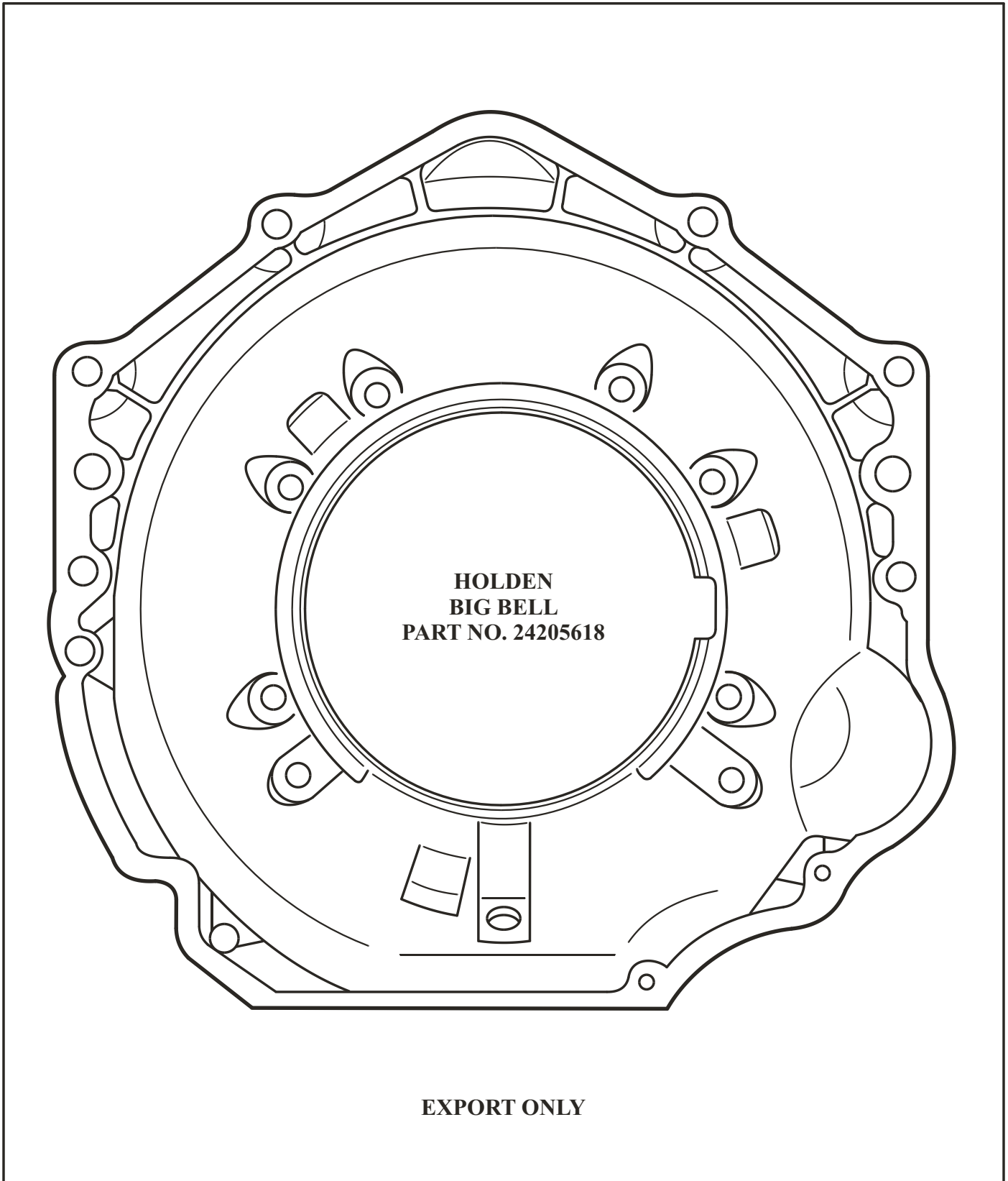


Figure 4

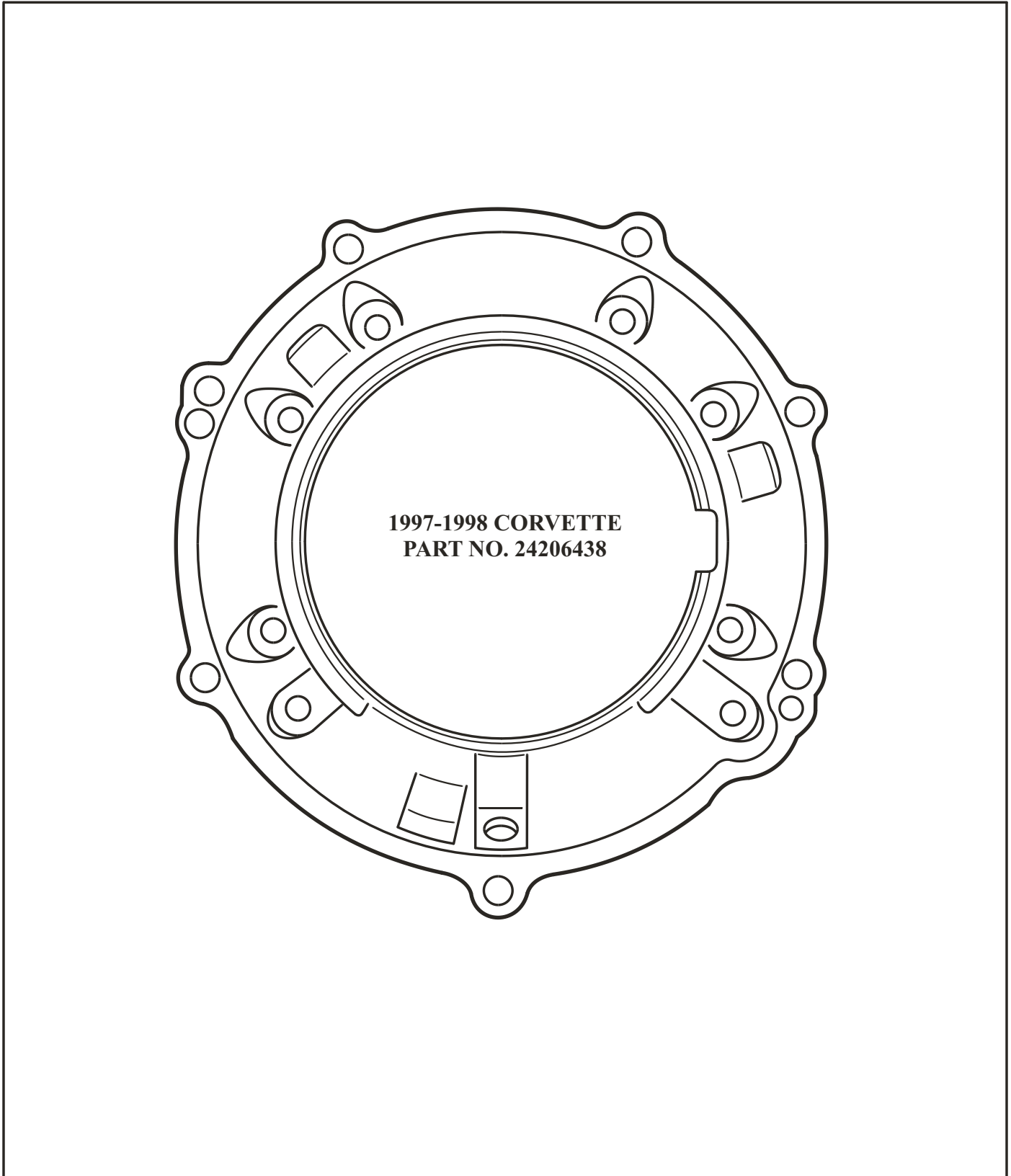
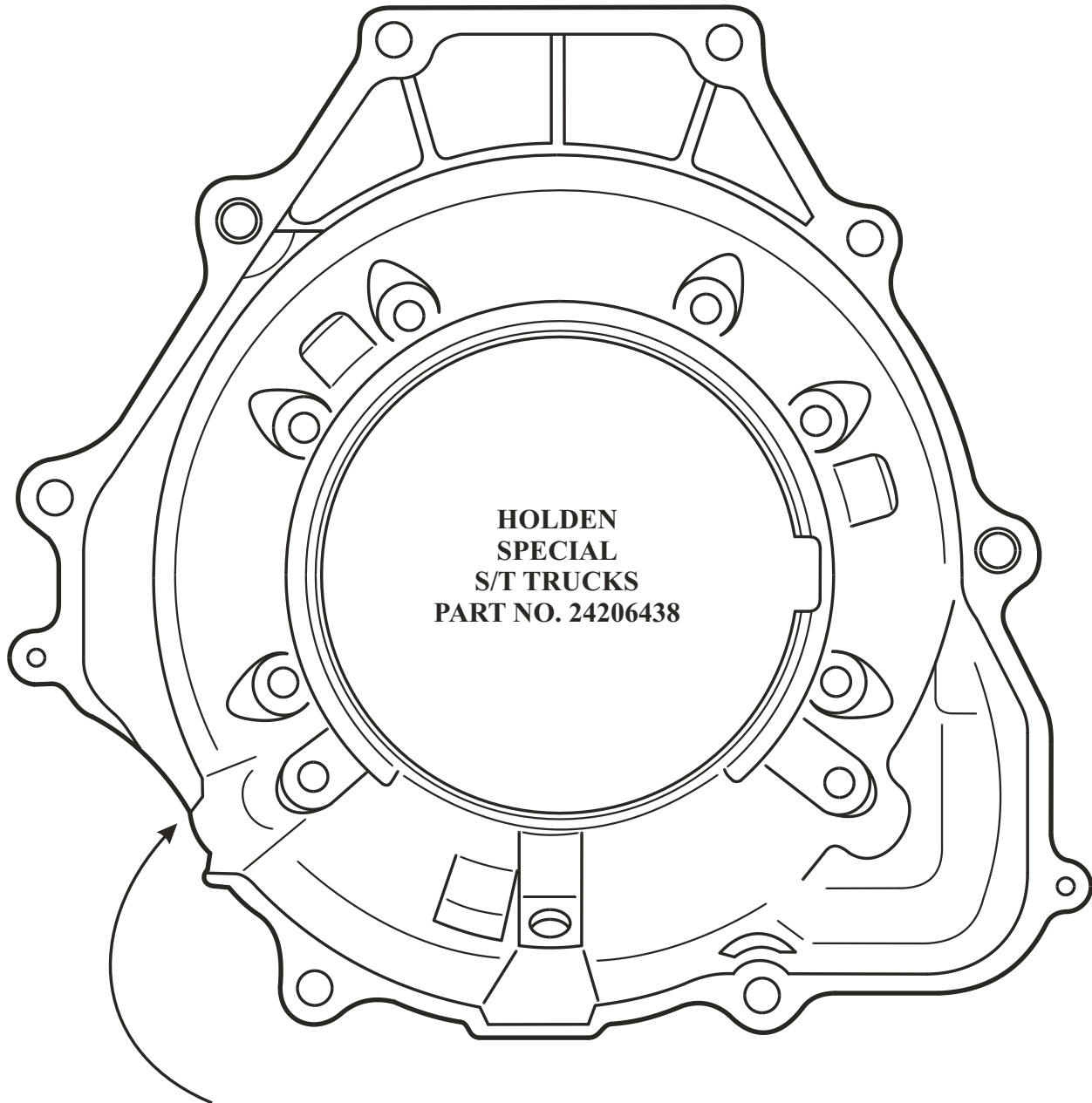


Figure 5



**SECTION CAST OUT
OF BELLHOUSING**

Compare with Regular S/T Bell on next page.

Figure 6

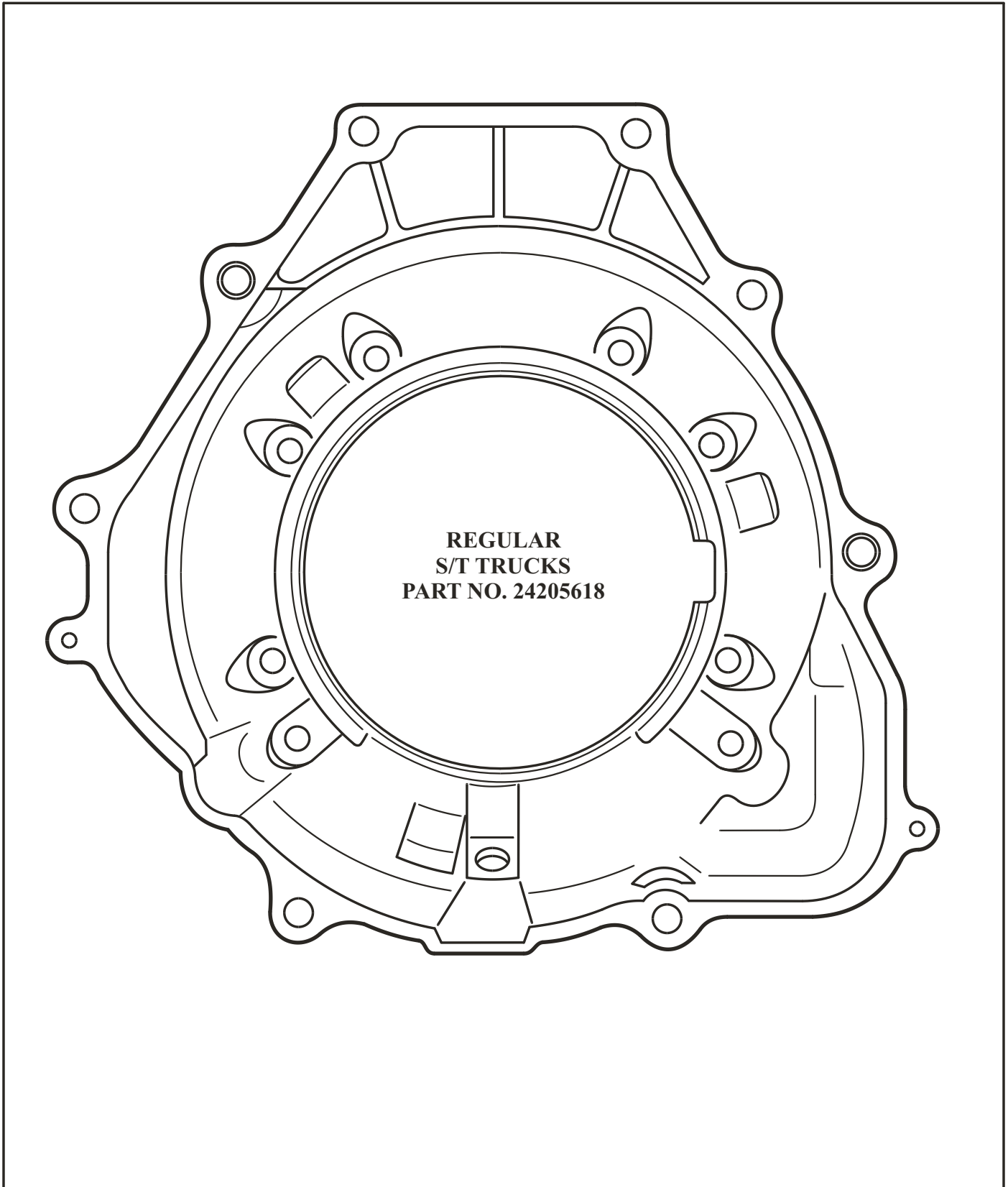


Figure 7



Technical Service Information

THM 4L60-E NEW DESIGN PUMP ROTOR AND SLIDE FOR 1997 MODELS

CHANGE: Beginning at the start of production for all 1997 models, there was a new design 13 vane pump rotor and new design pump slide installed in all THM 4L60-E transmissions (See Figure 1).

REASON: To help eliminate "Pump Whine" and pressure regulator valve ~~bu~~zing noises.

PARTS AFFECTED:

- (1) OIL PUMP ROTOR - Now has 13 vanes in the pump rotor instead of the previous 10 vanes, as shown in Figure 1.
- (2) OIL PUMP SLIDE - Now has longer porting slots on the face of the slide (See Figure 1).
- (3) ROTOR GUIDE - Now has 13 slots in the rotor guide to accommodate the added vanes.
- (4) OIL PUMP COVER - Now has different configuration on the porting slots in the pump cover to accommodate the changes in the pump slide (See Figure 2). The 13 vane pump cover can be easily identified with "13 V" cast into the back side in the location shown in Figure 3.
- (5) VANE RINGS - Material change to increase vane ring durability.

INTERCHANGEABILITY:

None of the parts listed above will retro-fit back on previous models, unless all are used as a package, and even then will only fit back to 1995. This is not recommended.

SERVICE INFORMATION:

13 Vane Rotor (17.955mm)	24205400
13 Vane Rotor (17.968mm)	24205401
13 Vane Rotor (17.981mm)	24205402
13 Vane Rotor (17.994mm)	24205403
13 Vane Rotor (18.007mm)	24205404
97 Pump Slide (17.955mm)	24205405
97 Pump Slide (17.968mm)	24205406
97 Pump Slide (17.981mm)	24205407
97 Pump Slide (17.994mm)	24205408
97 Pump Slide (18.007mm)	24205409
Plastic Rotor Guide (13 Vane)	24205410
Oil Pump Vanes (13 Required)	8631280
Pump Vane Rings (13 Vane)	24201144

Compare with Regular S/T Bell on next page.

Figure 6

**13 VANE PUMP ROTOR AND SLIDE
FOR 1997 MODELS**

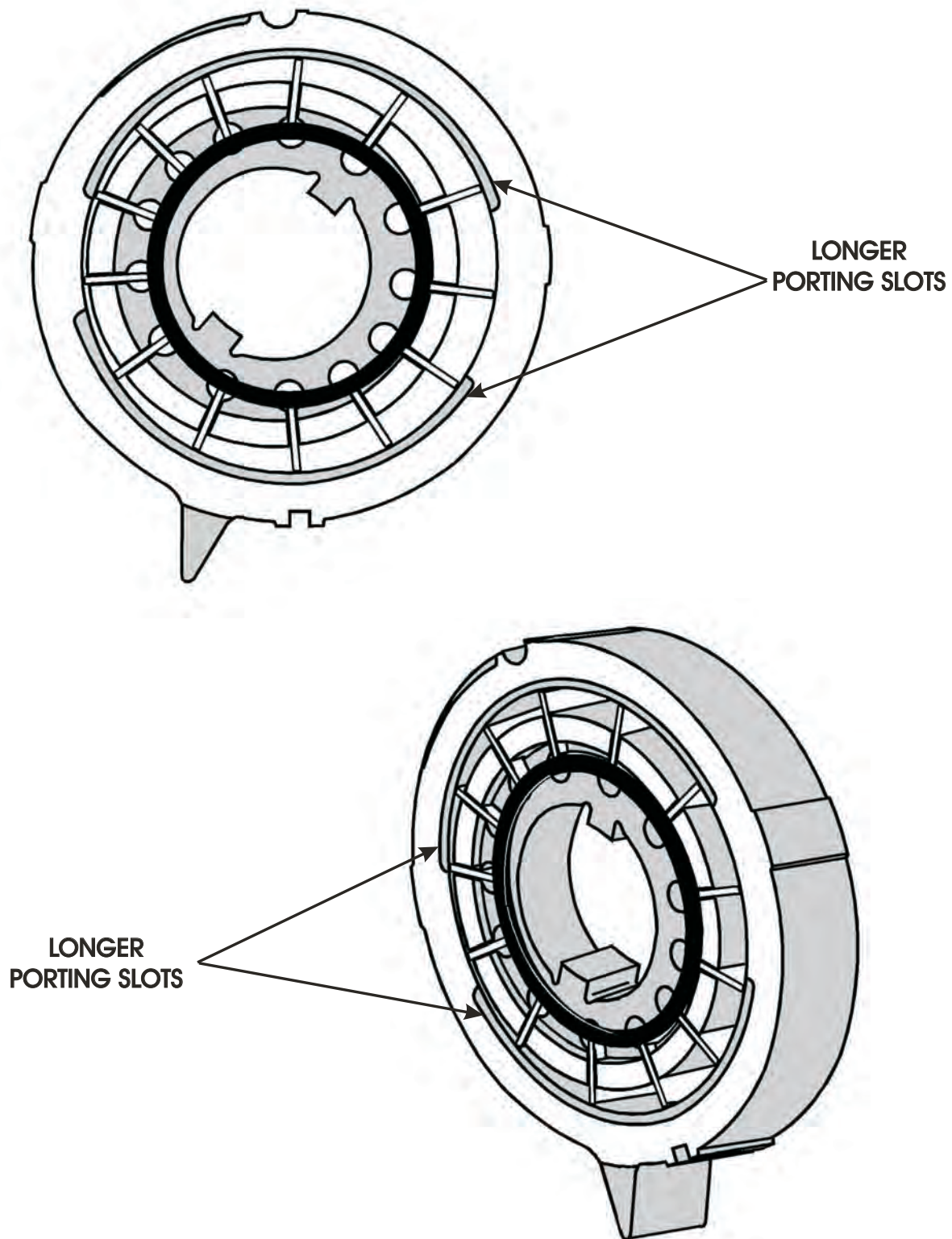
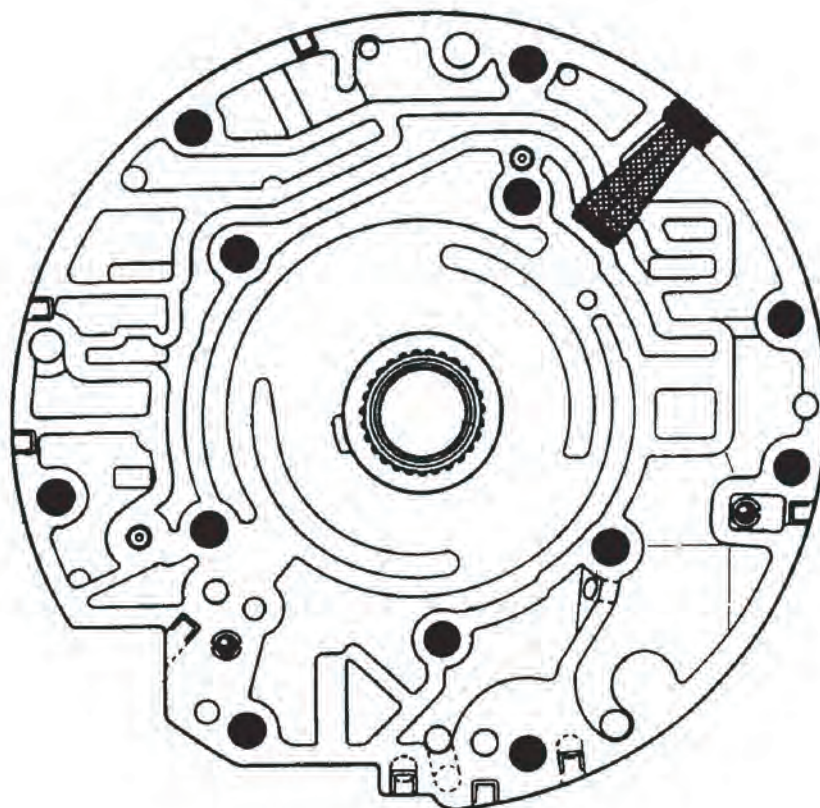


Figure 1

95-96 "PWM" PUMP COVER



1997 "13 V" PUMP COVER

"PORTING SLOTS"
ARE DIFFERENT THAN
PREVIOUS MODELS

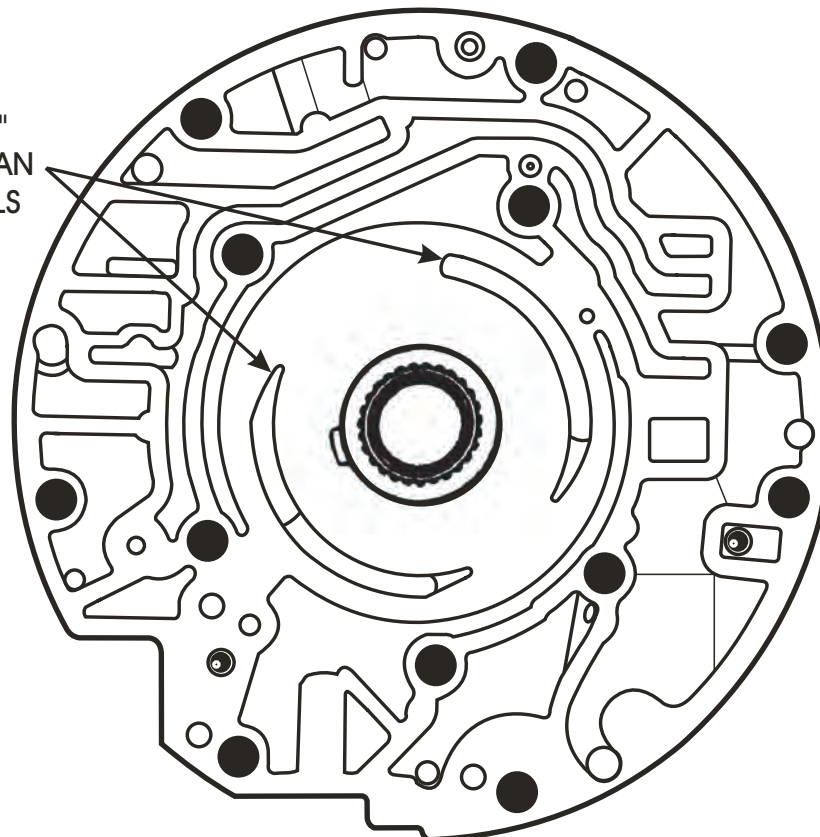
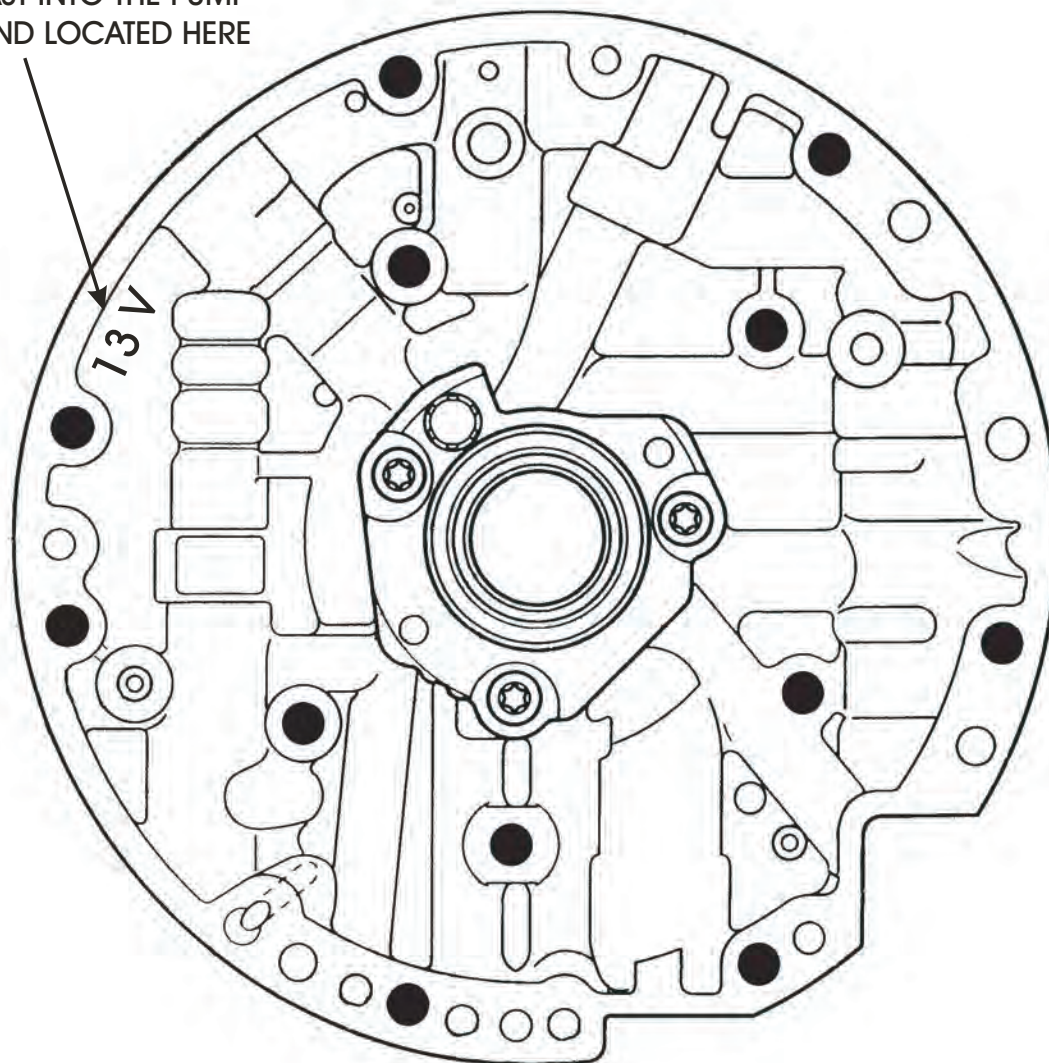


Figure 2

**1997 13-VANE PUMP COVER
IDENTIFICATION**

"13 V" CAST INTO THE PUMP
COVER AND LOCATED HERE



***THIS PUMP COVER WILL NOT INTERCHANGE WITH PREVIOUS MODELS.
IT MUST BE USED WITH THE 13 VANE ROTOR AND SLIDE.***

Figure 3



Technical Service Information

THM 4L60-E PUMP INTERCHANGE

1993 -1994 MODELS:

Pump Body - All models use the 10 Vane rotor and slide assembly, and this Pump Body has the same casting and worm track configuration as the 1985-1993 models of the 700-R4 transmission. Refer to Figure 3.

Pump Cover - All models of the 4L60-E have a larger diameter filter seal bore, as shown in Figure 1 and is the easiest way to distinguish the 93-94 4L60-E Pump Cover from the 700-R4 version. The 93-94 4L60-E worm track configuration is shown in Figure 5.

1995 -1996 MODELS:

Pump Body - All models use the 10 Vane rotor and slide assembly, but this Pump Body has a different casting and worm track configuration than the 93-94 model Pump Body and **will not** interchange. The 95-96 Pump Body is easily identified with "PWM" cast into the front side, as shown in Figure 4. The "Bolt-On" bell housing was also introduced in 1996, which required the added "Flange" to center the bell housing. Refer to Figure 4.

Pump Cover - Has a different casting and worm track configuration than the 93-94 model Pump Cover and **will not** interchange. The 95-96 Pump Cover is easily identified with "PWM" cast into the back side in the location shown in Figure 6.

1997 MODELS:

Pump Body - Has the same worm track configuration as the 95-96 "PWM" Pump Body, but a 13 Vane rotor and slide assembly was introduced, as shown in Figure 7. The 13 Vane slide has longer "Porting Slots" as shown in Figure 7. The "PWM" is still cast into the front side of the Pump Body. Refer to Figure 7.

Pump Cover - Has the same worm track configuration as the 95-96 "PWM" Pump Cover, but the "Porting Slots" are a different configuration than the 95-96 Pump Cover, to accommodate the changes in the 13 Vane rotor and slide. Refer to Figure 8. The 13 Vane Pump Cover is easily identified with "13 V" cast into the back side of the Pump Cover in the location shown in Figure 8.

INTERCHANGEABILITY:

Refer to the interchange chart shown in Figure 2.

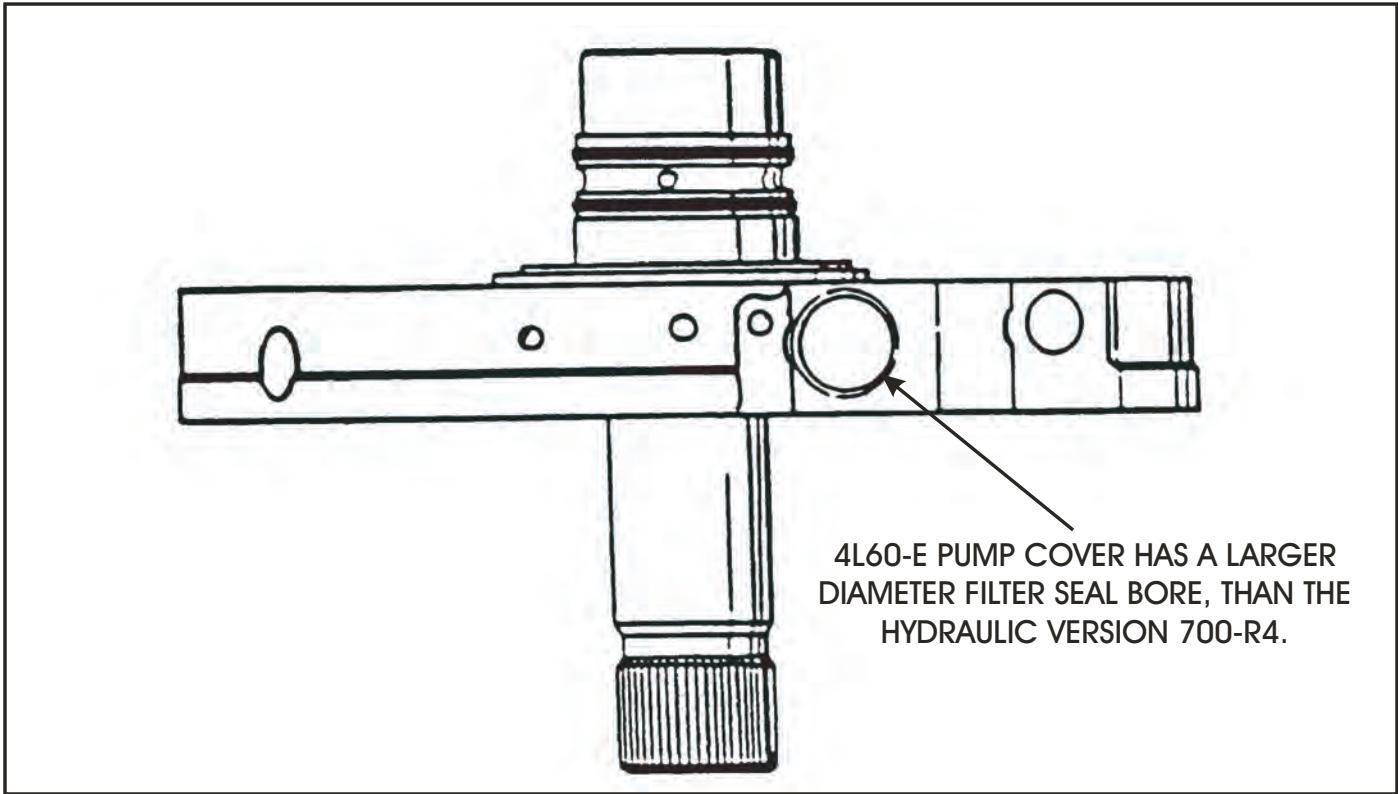


Figure 1

THM 4L60-E INTERCHANGE CHART

	93-94 COVER (Fig. 5)	95-96 COVER (Fig. 6)	13 VANE COVER (Fig. 8)
93-94 BODY (Fig. 3)	YES	NO	NO
95-96 BODY (Fig. 4)	NO	YES	NO
13 VANE BODY (Fig. 7)	NO	NO	YES
85-93 700-R4 BODY (10 V)	YES	NO	NO

Figure 2

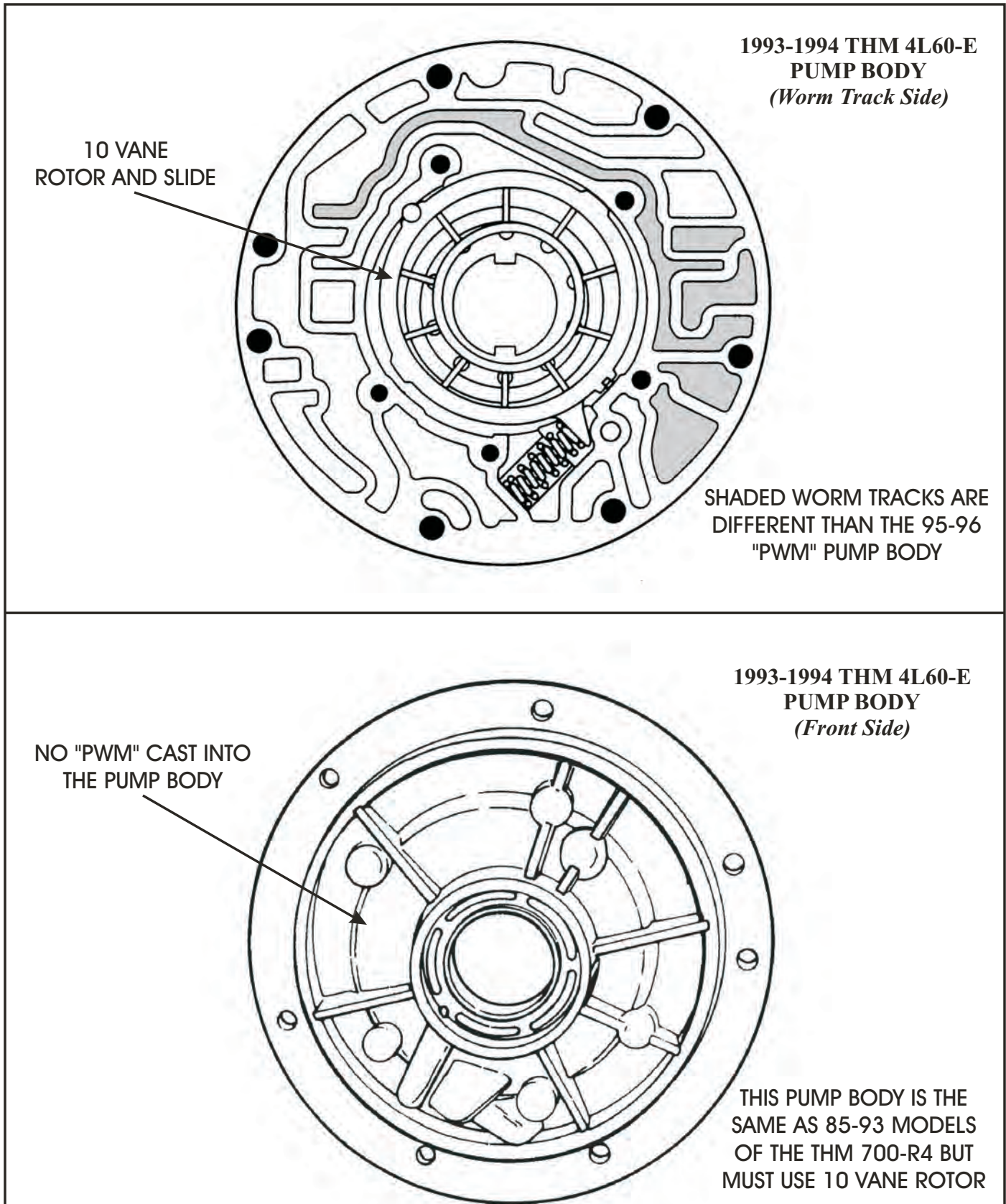


Figure 3

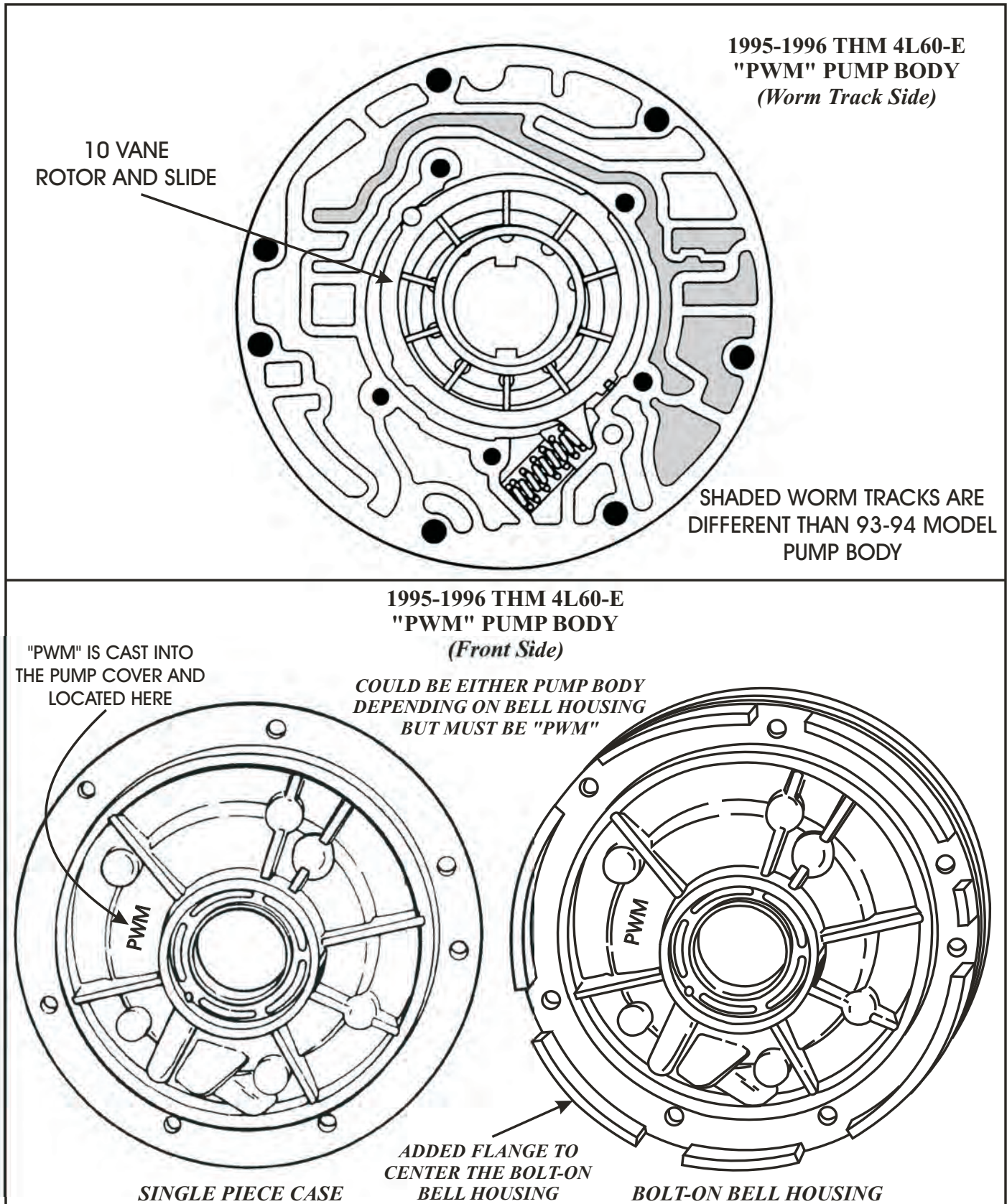


Figure 4

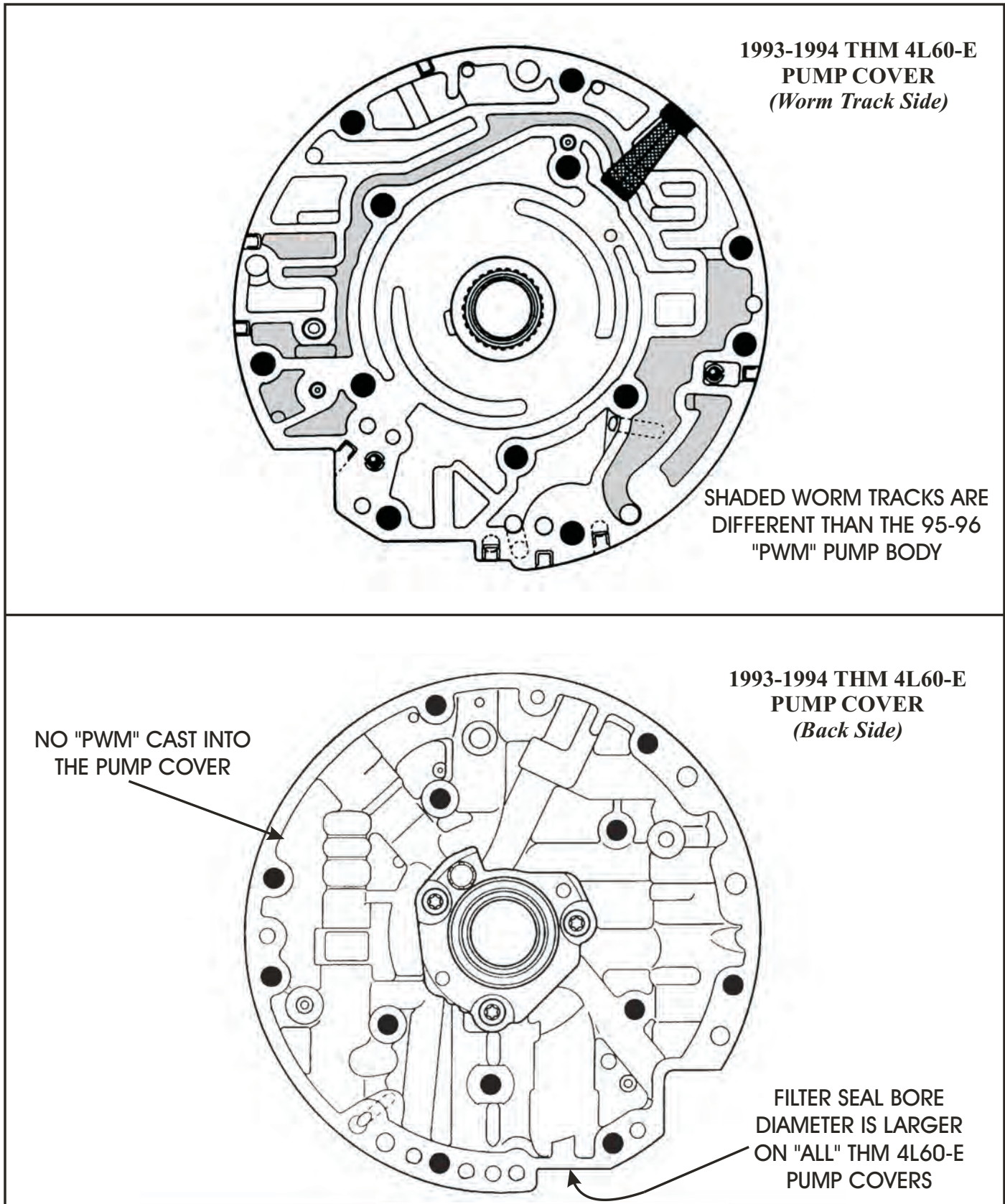


Figure 5

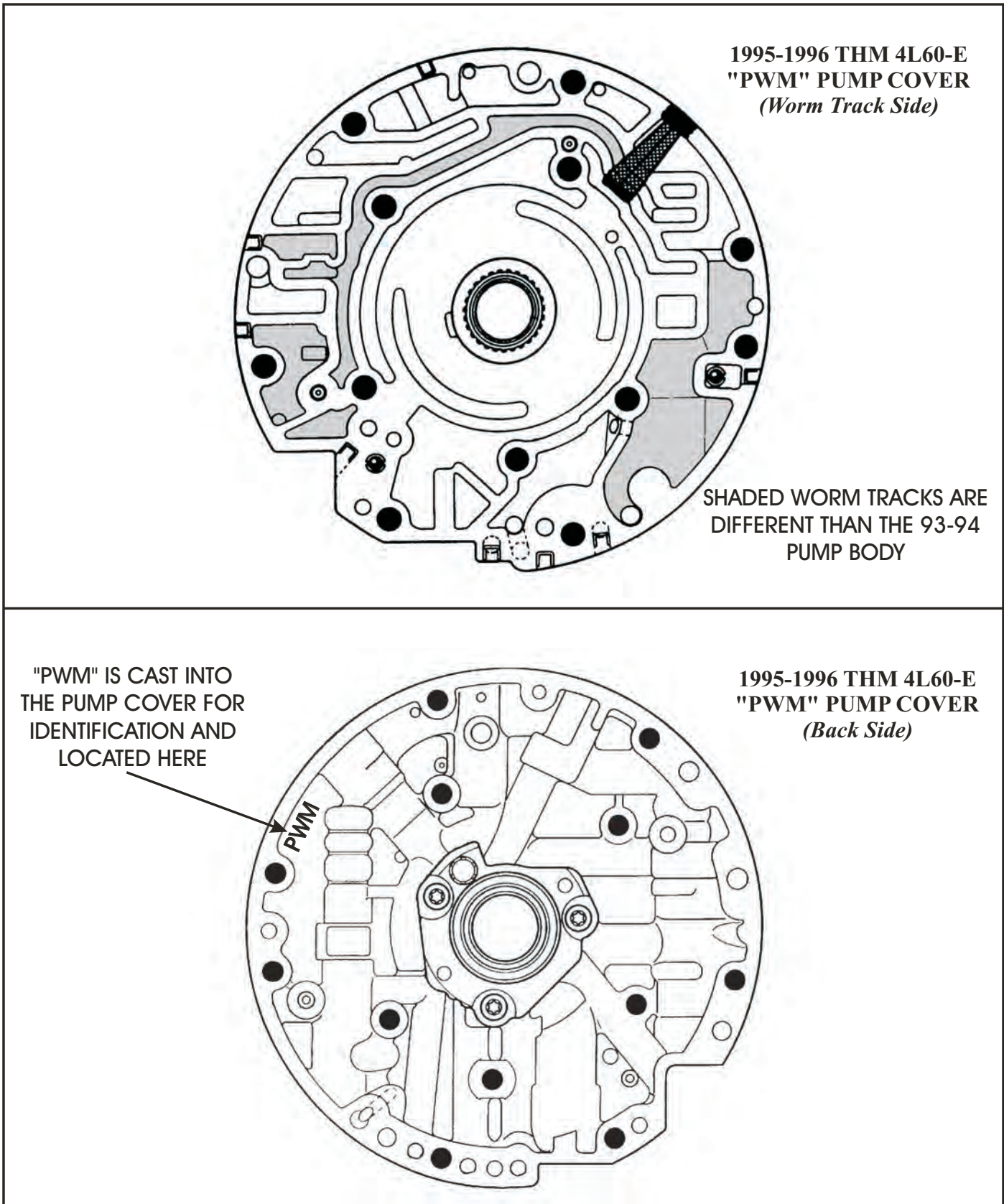


Figure 6

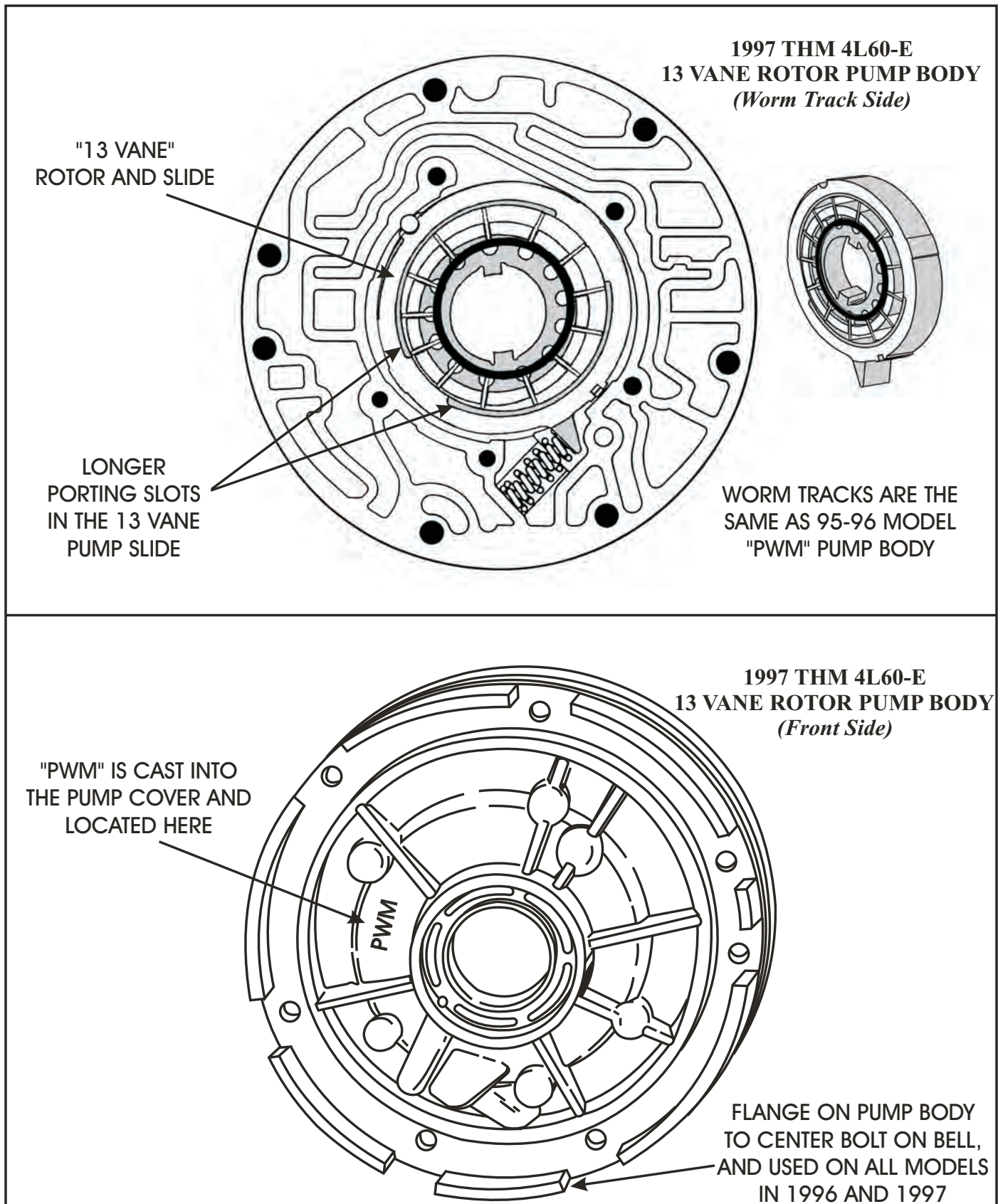


Figure 7

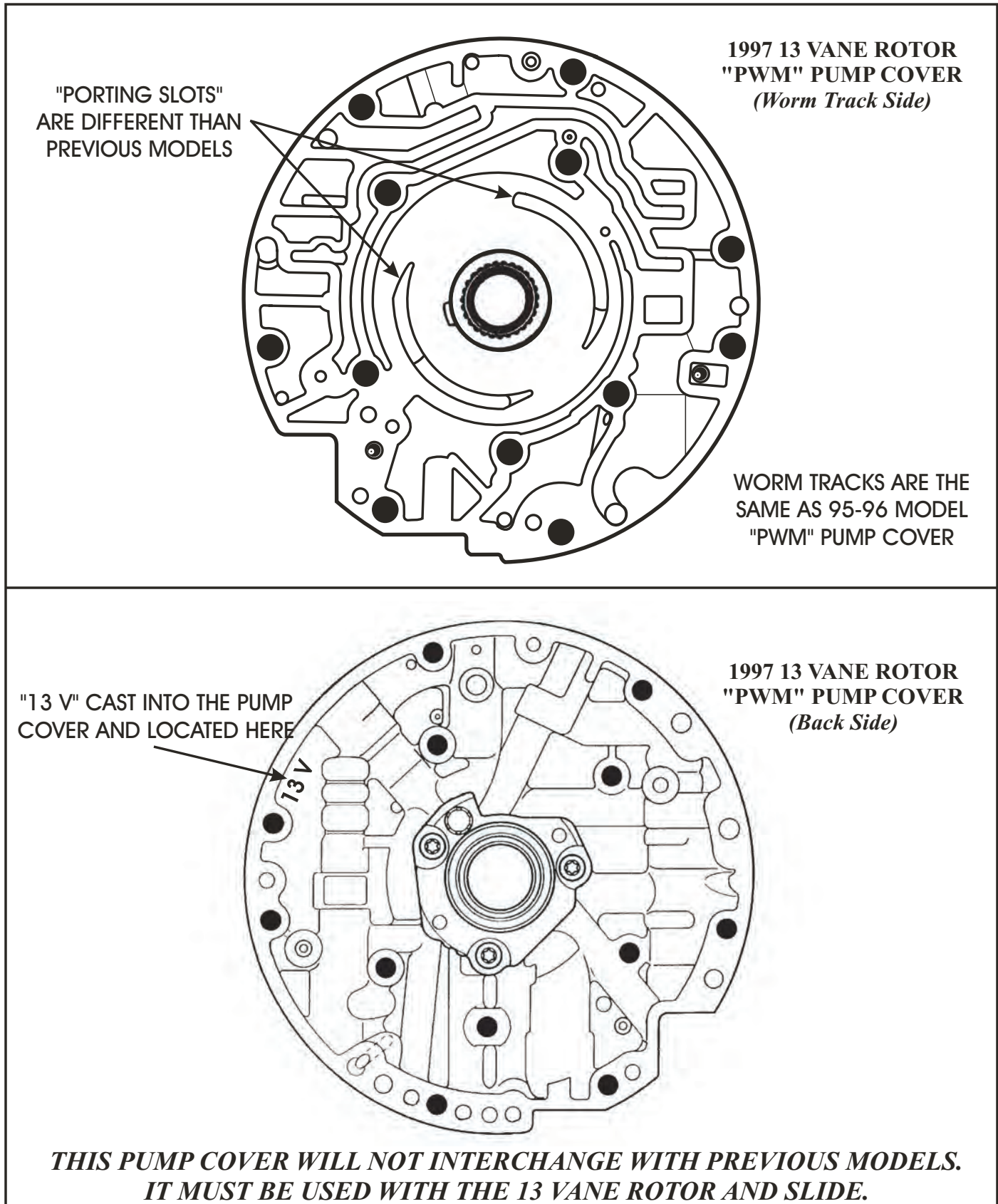


Figure 8



Technical Service Information

THM 4L60-E CHANGES IN 3-2 DOWNSHIFT VALVE AND THE 3-2 DOWNSHIFT SOLENOID

CHANGE: Beginning at the start of production for all 1996 models, the THM 4L60-E transmissions were built with a new design "On-Off" 3-2 downshift solenoid, and a new design 3-2 downshift valve line-up in the valve body.

REASON: Improved 3-2 downshift quality and 2-4 band durability.

PARTS AFFECTED:

- (1) 3-2 DOWNSHIFT SOLENOID - Changes from a Pulse Width Modulated (PWM) solenoid to a regular "On-Off" (Normally Open) solenoid, which also requires a different Powertrain Control Module (PCM). The new design "On-Off" 3-2 downshift solenoid can be identified by the case diameter, which is smaller than the previous design, and the new design solenoid also has a *plastic* stem that fits into the valve body bore, where the previous design was *metal*.
The solenoid connector was also changed to prevent the solenoids from being accidentally installed in the wrong models. Refer to Figure 1 for 1995 models, and Figure 2 for 1996 models.
- (2) 3-2 DOWNSHIFT VALVE - The entire 3-2 downshift valve line-up changes to accommodate the new design "On-Off" 3-2 downshift solenoid. Refer to Figure 1 for 1995 models, and Figure 2 for 1996 models.
- (3) VALVE BODY SPACER PLATE - There were two holes eliminated in the 1996 spacer plate, over the 3-2 downshift valve line-up, to accommodate the new design 3-2 downshift valve. The 1995 spacer plate can be identified with the first letter of the two digit code being either an "M" or "N", as shown in Figure 3. The 1996 spacer plate can be identified with the first letter of the two digit code being a "P", as shown in Figure 4.

INTERCHANGEABILITY:

None of the parts listed above will interchange with one another.

1995 parts must be used on 1995 models.

1996 parts must be used on 1996 models.

SERVICE INFORMATION:

3-2 Downshift Solenoid (PWM for 95 Models)	8683187
3-2 Downshift Solenoid (On-Off for 96 Models)	24203267



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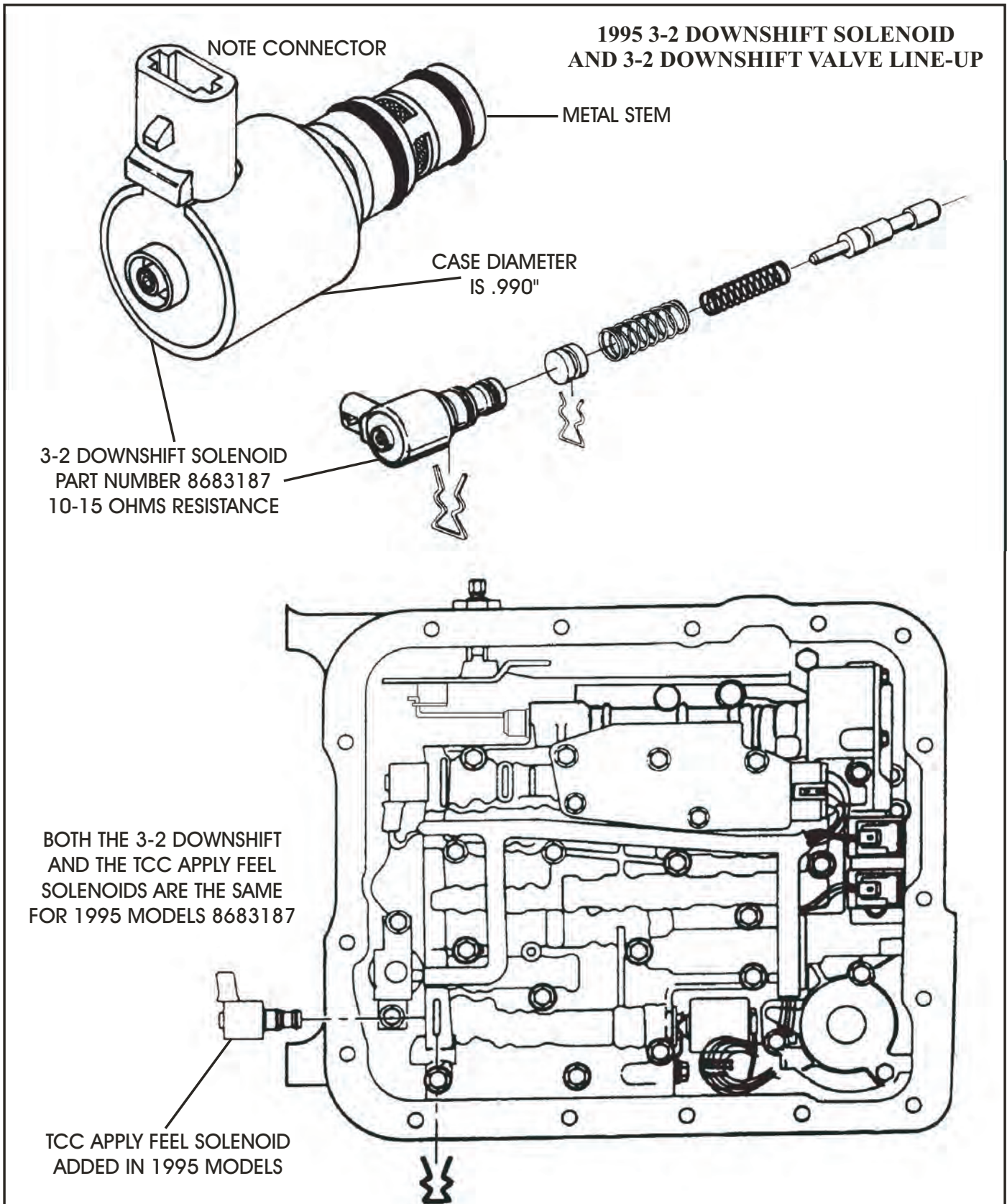


Figure 1

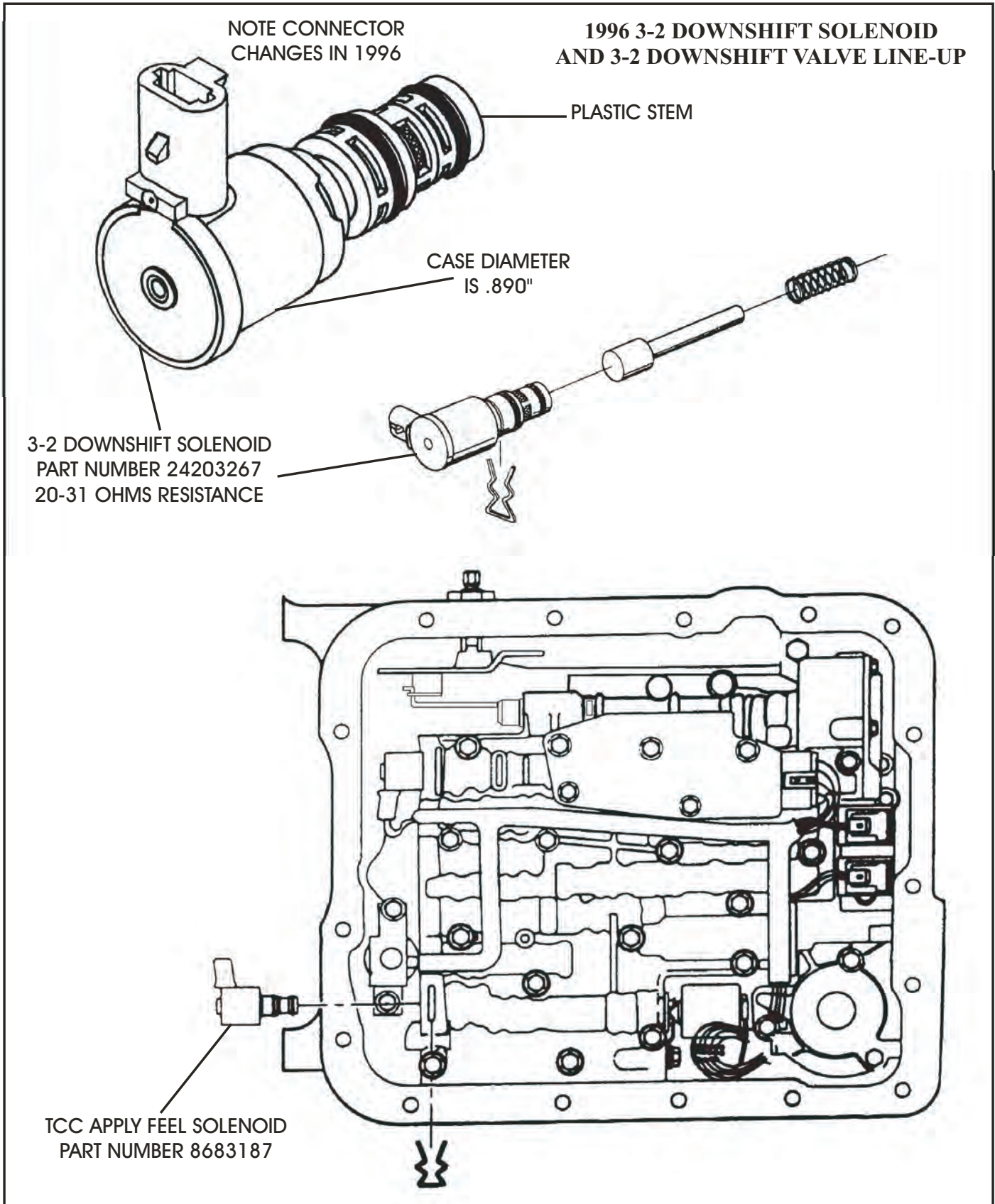


Figure 2



Technical Service Information

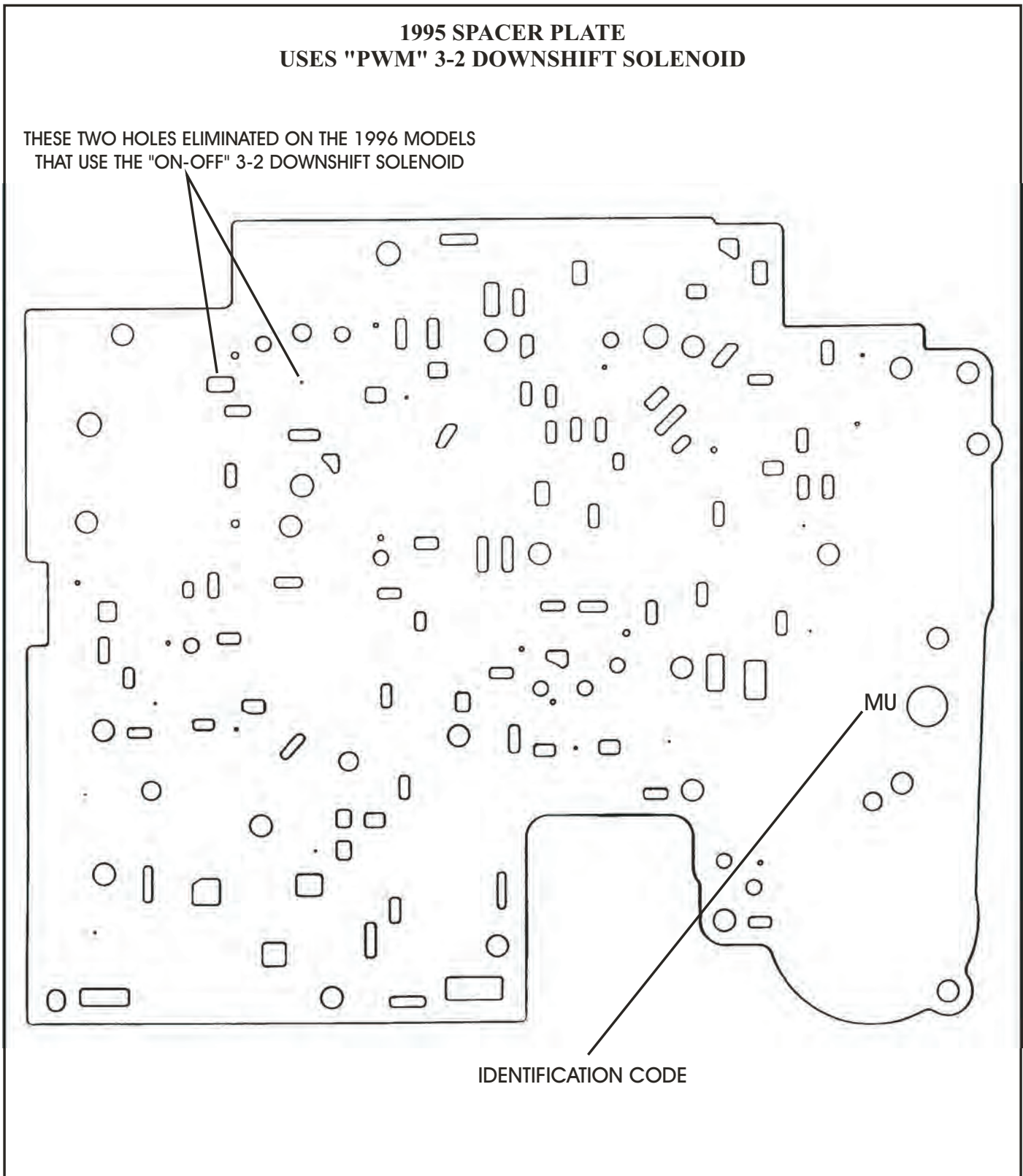


Figure 3



Technical Service Information

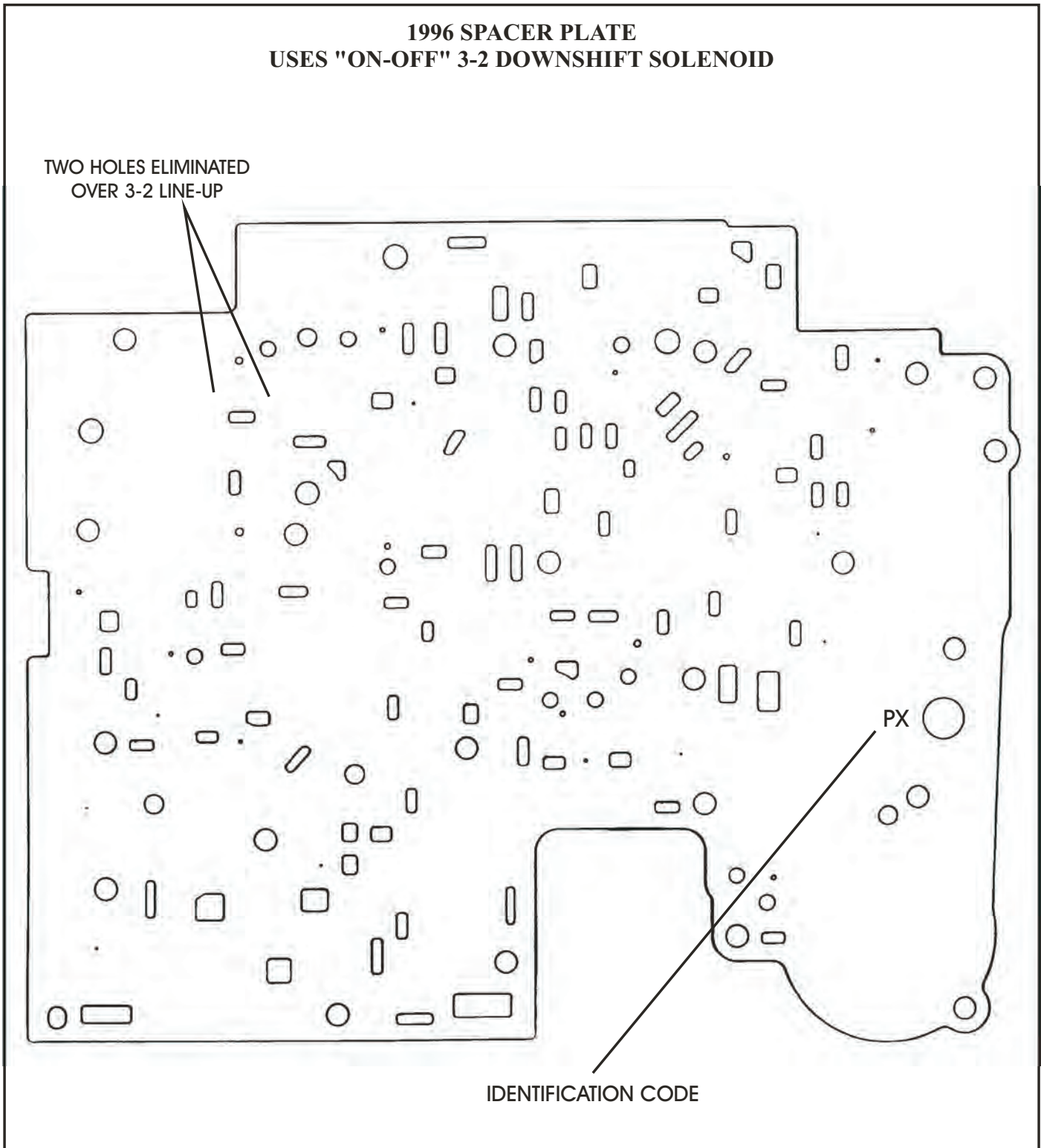


Figure 4



Technical Service Information

THM 4L60-E 1993-2003 SPACER PLATE IDENTIFICATION

The Valve Body Spacer Plate for the THM 4L60-E transmission has changed every year, since it was first introduced in 1993, and they will not interchange from year to year. The valve body casting changed once again for model year 2001 and at that time the I.D. code on the spacer plate went to 3 digits, as shown in Figure 1. The location of the I.D. code stamped in the spacer plates are also shown in Figure 1. Use the chart below that refers you to a Figure number to identify the spacer plates, which models they fit and the part number to purchase one if necessary.

Refer to Figure 2 for 1993 4L60-E spacer plate identification.
Refer to Figure 3 for 1994 4L60-E spacer plate identification.
Refer to Figure 4 for 1995 4L60-E spacer plate identification.
Refer to Figure 5 for 1996 4L60-E spacer plate identification.
Refer to Figure 6 for 1997 4L60-E spacer plate identification.
Refer to Figure 7 for 1998 4L60-E spacer plate identification.
Refer to Figure 8 for 1999 4L60-E spacer plate identification.
Refer to Figure 9 for 2000 4L60-E spacer plate identification.
Refer to Figure 10 for 2001 4L60-E spacer plate identification.
Refer to Figure 11 for 2002 4L60-E spacer plate identification.
Refer to Figure 12 for 2003 4L60-E spacer plate identification.

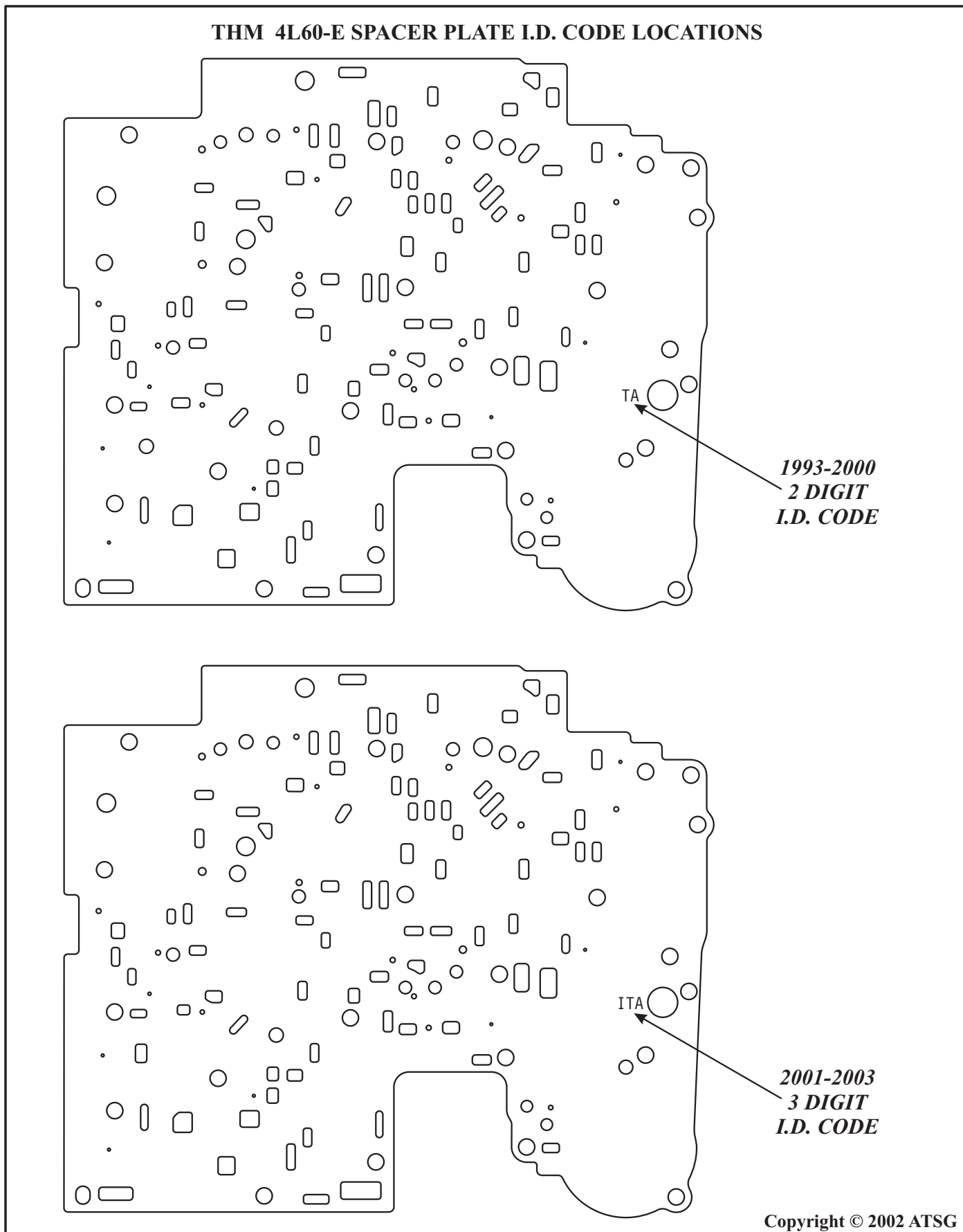


Figure 1



Technical Service Information

1993 THM 4L60-E SPACER PLATE CHART						
PART NO.	8684122	8684123	8684124	8684125	8684126	
I.D. CODE	JV	JW	JX	JY	JZ	
FITS THESE MODELS	MJD MND MSD TAD TBD MDD	SHD TLD CAD CBD KAD TWD	CCD CFD KBD	CJD CHD KCD	CKD CLD KDD	

Figure 2

1994 THM 4L60-E SPACER PLATE CHART						
PART NO.	8686011	8686012	8686013	8686037	8686038	8686039
I.D. CODE	KO	KP	KS	KT	KU	KV
FITS THESE MODELS	BBD	BWD	FDD SFD	FFD YDD	HBD	HDD
PART NO.	8686040	8686041	8686042	8686043	8686044	8686045
I.D. CODE	KW	KX	KY	KZ	LA	LB
FITS THESE MODELS	SHD TLD MJD CAD CBD KAD MND TWD	MSD TAD TBD MDD	SAD	CCD CFD KBD	CHD CJD KCD CPD	CMD CUD KPD
PART NO.	24200361	24200608	24200609			
I.D. CODE	LC	LD	LE			
FITS THESE MODELS	BFD	AHD	BCD			

Figure 3

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Technical Service Information

1995 THM 4L60-E SPACER PLATE CHART						
PART NO.	24201484	24201485	24201486	24201487	24201488	24201489
I.D. CODE	MP	MS	MT	MU	MV	MW
FITS THESE MODELS	STD	SHD TLD CAD CBD KHD CRD CSD	TAD TBD TYD TZD	CCD CDD CHD CJD CLD CND CWD KTD KWD LHD	CKD CMD KMD LUD	MSD MDD
PART NO.	24201490	24201491	24201492	24201493	24201494	24202313
I.D. CODE	MX	MY	MZ	NA	NB	NC
FITS THESE MODELS	BBD BCD	BWD	AHD	BFD	FFD YDD	HBD
PART NO.	24202314	24202813	24203084	24203918		
I.D. CODE	ND	NE	NG	NH		
FITS THESE MODELS	HDD HCD	FCD	HSD	FDD		

Figure 4



Technical Service Information

1996 THM 4L60-E SPACER PLATE CHART						
PART NO.	24203222	24204438	24203283	24203947	24203948	24203949
I.D. CODE	PA	PC	PG	PL	PM	PN
FITS THESE MODELS	SAD	CCD CFD KBD WBD	HDD HCD	BBD	BCD	BWD
PART NO.	24203950	24203951	24203952	24203953	24203946	24204435
I.D. CODE	PP	PS	PT	PU	PW	PX
FITS THESE MODELS	AHD	FBD FCD	BFD BKD	FFD YDD	CPD	SHD TLD MSD TAD TBD MDD
PART NO.	24204438	24207492	24205978	24205979		
I.D. CODE	PY	PZ	SC	SD		
FITS THESE MODELS	CAD CBD KAD	CHD CJD KCD WHD	HBD	HSD		

Figure 5



Technical Service Information

1997 THM 4L60-E SPACER PLATE CHART						
PART NO.	24203222	24203224	24203225	24203283	24203951	24203953
I.D. CODE	PA	PC	PD	PG	PS	PU
FITS THESE MODELS	SAD	CCD CFD KBD	CHD CJD KCD	HDD HCD	FBD FCD	FFD YDD
PART NO.	24204435	24204438	24205978	24205979	24207864	
I.D. CODE	PX	PY	SC	SD	SE	
FITS THESE MODELS	SHD TLD MSD TAD TBD MDD	CAD CBD KAD	HBD	HSD	HLD	

Figure 6

1998 THM 4L60-E SPACER PLATE CHART						
PART NO.	24203222	24203224	24203283	24203951	24203953	24205978
I.D. CODE	PA	PC	PG	PS	PU	SC
FITS THESE MODELS	SAD	CHD CJD CPD KCD KXD LPD	HCD HDD HFD	FBD FCD	FFD YDD	HBD
PART NO.	24205979	24207864	24209351	24210565		
I.D. CODE	SD	SE	TA	TB		
FITS THESE MODELS	HSD	HLD HND	CAD CBD KAD MSD SHD TAD	HJD		

Figure 7

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Technical Service Information

1999 THM 4L60-E SPACER PLATE CHART						
PART NO.	24203222	24203224	24203283	24203951	24203953	24205978
I.D. CODE	PA	PC	PG	PS	PU	SC
FITS THESE MODELS	SAD	CPD KBD KCD KXD LHD LPD LSD LUD	HCD HDD HFD	FBD FCD	FFD YDD	HBD
PART NO.	24205979	24207864	24209351	24210565	24210523	
I.D. CODE	SD	SE	TA	TB	TC	
FITS THESE MODELS	HSD	HLD HND	CAD CBD KAD MSD SHD TAD WBD	HJD	CCD CFD CHD CJD KBD KCD	

Figure 8

2000 THM 4L60-E SPACER PLATE CHART						
PART NO.	24203222	24203224	24203283	24203951	24203953	24205978
I.D. CODE	PA	PC	PG	PS	PU	SC
FITS THESE MODELS	SAD	KXD LHD LPD LUD	HCD HDD HFD	FBD FCD	FFD HPD YDD	HBD
PART NO.	24207864	24209351	24210565	24210523		
I.D. CODE	SE	TA	TB	TC		
FITS THESE MODELS	HND	CAD CBD KAD MSD SHD TAD WBD	HJD	CCD CFD CHD CJD KBD KCD		

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Figure 9



Technical Service Information

2001 THM 4L60-E SPACER PLATE CHART						
PART NO.	24218156	24218157	24218158	24218160	24218161	24218159
I.D. CODE	IPA	IPC	IPG	IPS	IPU	ISE
FITS THESE MODELS	SAD	LHD	HFD	FBD FCD	FFD HPD YDD	HND
PART NO.	24218162	24218163				
I.D. CODE	ITA	ITC				
FITS THESE MODELS	CAD CBD KAD MSD SHD TAD WBD	CCD CFD CHD CJD KBD KCD				

Figure 10

2002 THM 4L60-E SPACER PLATE CHART						
PART NO.	24218156	24218157	24218158	24218160	24218161	24218159
I.D. CODE	IPA	IPC	IPG	IPS	IPU	ISE
FITS THESE MODELS	SAD	LHD	HFD	FBD FCD	FFD HPD YDD	HND
PART NO.	24218162	24218163	24220200			
I.D. CODE	ITA	ITC	ITJ			
FITS THESE MODELS	CAD CBD KAD MSD SHD TAD WBD	CCD CFD CHD CJD KBD KCD	SDD TDD			

Figure 11

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Technical Service Information

2003 THM 4L60-E SPACER PLATE CHART						
PART NO.	24218156	24218158	24218161	24218159		
I.D. CODE	IPA	IPG	IPU	ISE		
FITS THESE MODELS	SAD	HFD	YDD	HND		
PART NO.	24218162	24218163	24220200			
I.D. CODE	ITA	ITC	ITJ			
FITS THESE MODELS	CAD CBD KAD MSD SHD TAD	CHD CJD KCD SCD	SDD TDD			

Figure 12



Technical Service Information

THM 4L60-E NEW DESIGN SHIFT SOLENOIDS, EPC SOLENOID AND TCC/PWM SOLENOID

CHANGE: Beginning at the start of production for all 1998 models, the THM 4L60-E transmissions were built with a new design for both Shift Solenoids, a new design EPC Solenoid, and a new design TCC/PWM Solenoid.

REASON: Improved shift quality and durability., and eliminates some mis-assembly concerns.

PARTS AFFECTED:

- (1) TCC/PWM SOLENOID - Changes from a metal stem to a "Gray Plastic" stem as shown in Figure 1, and the solenoid connector is also Gray in color to help distinguish it from the 3-2 Downshift (ON-OFF) Solenoid. These two solenoids are now manufactured identical, with the exact same dimensions, except for the difference in color of the solenoid stem and solenoid connector. The wide groove to accept the internal harness connector is also on opposite sides of the solenoid connector to prevent the solenoids from being accidentally installed in the wrong models, as shown in Figure 1.
- (2) SHIFT SOLENOIDS "A" AND "B" - One groove has been removed from the stem of the Shift Solenoids to prevent mis-assembly concerns, as the retaining clip can be installed in the previous design solenoids, which means the solenoid is not all the way into it's bore. Refer to Figure 2.
- (3) PRESSURE CONTROL SOLENOID - New design has larger micron screens in the solenoid to greatly improve cold weather operation. This will allow the colder oil through the screens easier. Refer to Figure 3.

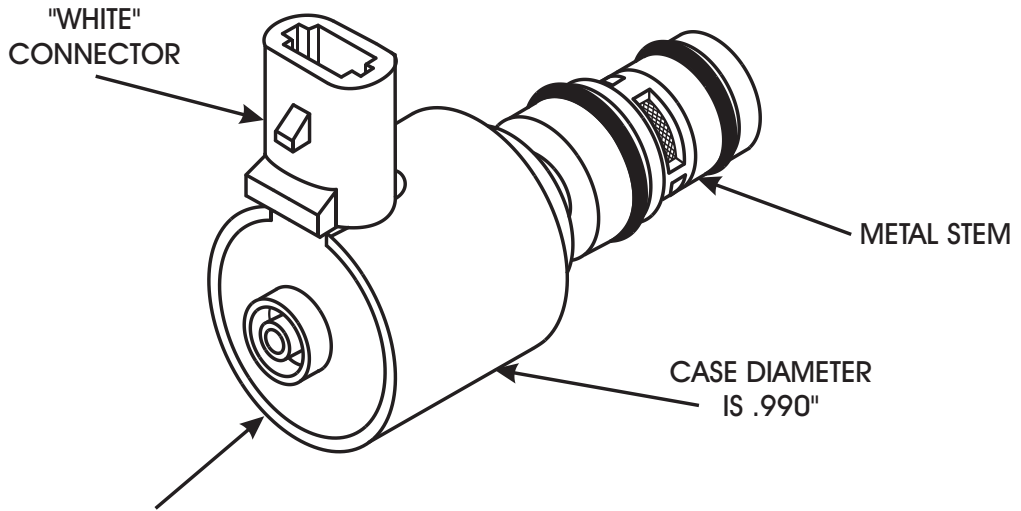
INTERCHANGEABILITY:

- (1) TCC/PWM SOLENOID - New design will retro-fit back to 1995 models.
- (2) SHIFT SOLENOIDS "A" AND "B" - New design will retro-fit back to all previous models.
- (3) PRESSURE CONTROL SOLENOID - New design will retro-fit back to all previous models.

SERVICE INFORMATION:

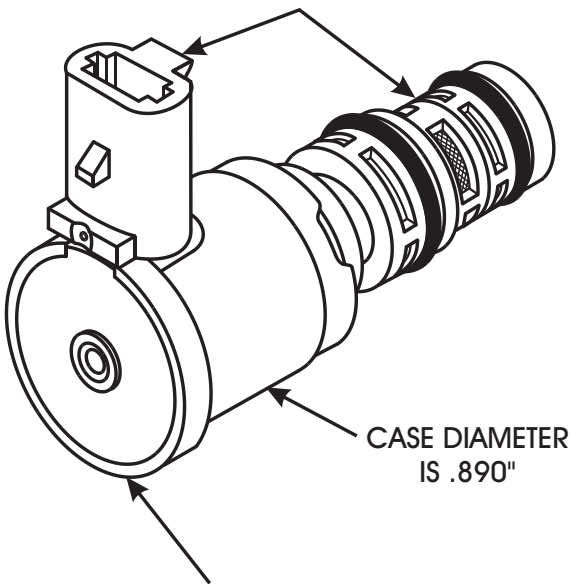
3-2 Downshift Solenoid (PWM for 95 Models)	8683187
3-2 Downshift Solenoid (On-Off for 96-97 Models).....	24209121
TCC/PWM Solenoid (For 95-97 Models)	24207054
Shift Solenoids "A" and "B" (All Models)	10478131

3-2 DOWNSHIFT SOLENOID AND TCC/PWM SOLENOID CHANGES



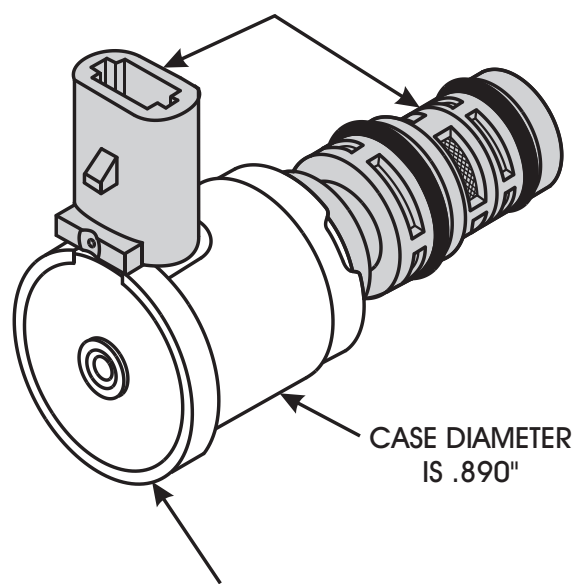
1993-1995 3-2 DOWNSHIFT (PWM) SOLENOID
AND 1995-1996 TCC/PWM SOLENOID
PART NUMBER 8683187
10-15 OHMS RESISTANCE

"WHITE PLASTIC" STEM
AND CONNECTOR



1996 AND 1997
3-2 DOWNSHIFT (ON/OFF) SOLENOID
PART NUMBER 24209121
20-31 OHMS RESISTANCE

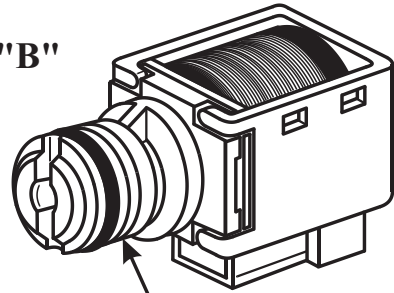
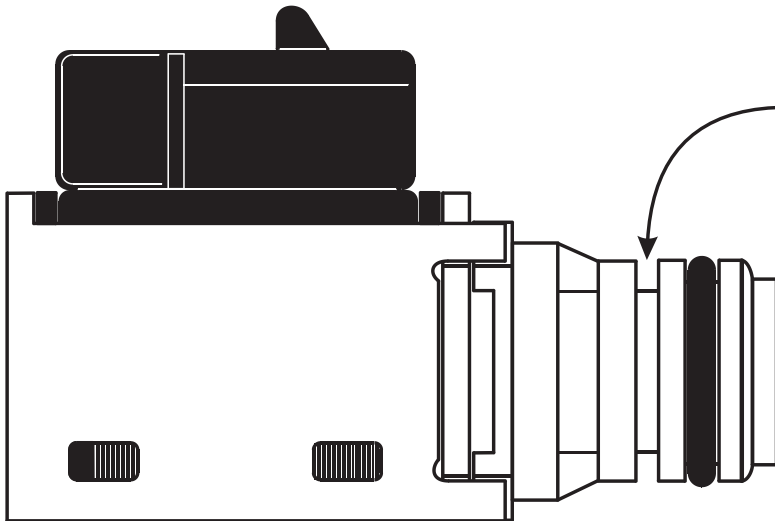
"GRAY PLASTIC" STEM
AND CONNECTOR



1997 AND LATER
TCC/PWM SOLENOID
PART NUMBER 24207054
10-15 OHMS RESISTANCE

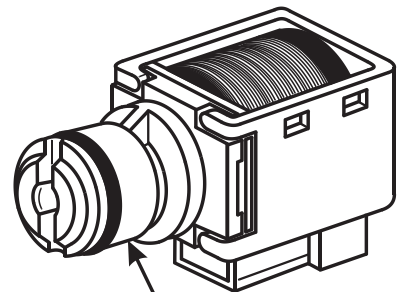
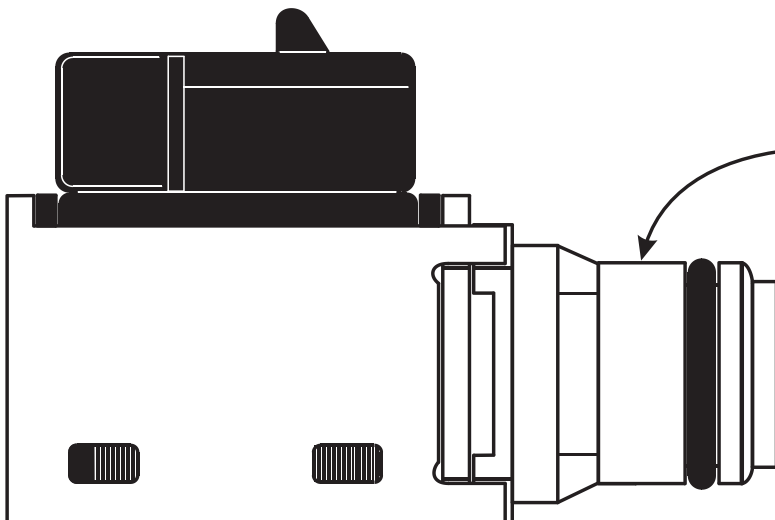
Figure 1

**THM 4L60-E
SHIFT SOLENOIDS "A" AND "B"
1993-1996 MODELS**



THIS GROOVE REMOVED
TO PREVENT MIS-ASSEMBLY,
AS RETAINING CLIP CAN BE
INSTALLED IN THIS GROOVE

**THM 4L60-E
SHIFT SOLENOIDS "A" AND "B"
1997 AND LATER MODELS
PART NO. 10478131**



GROOVE REMOVED
AND WILL RETRO-FIT
BACK TO ALL MODELS

Figure 2

**NEW ELECTRONIC PRESSURE CONTROL SOLENOID
PART NUMBER 24209276**

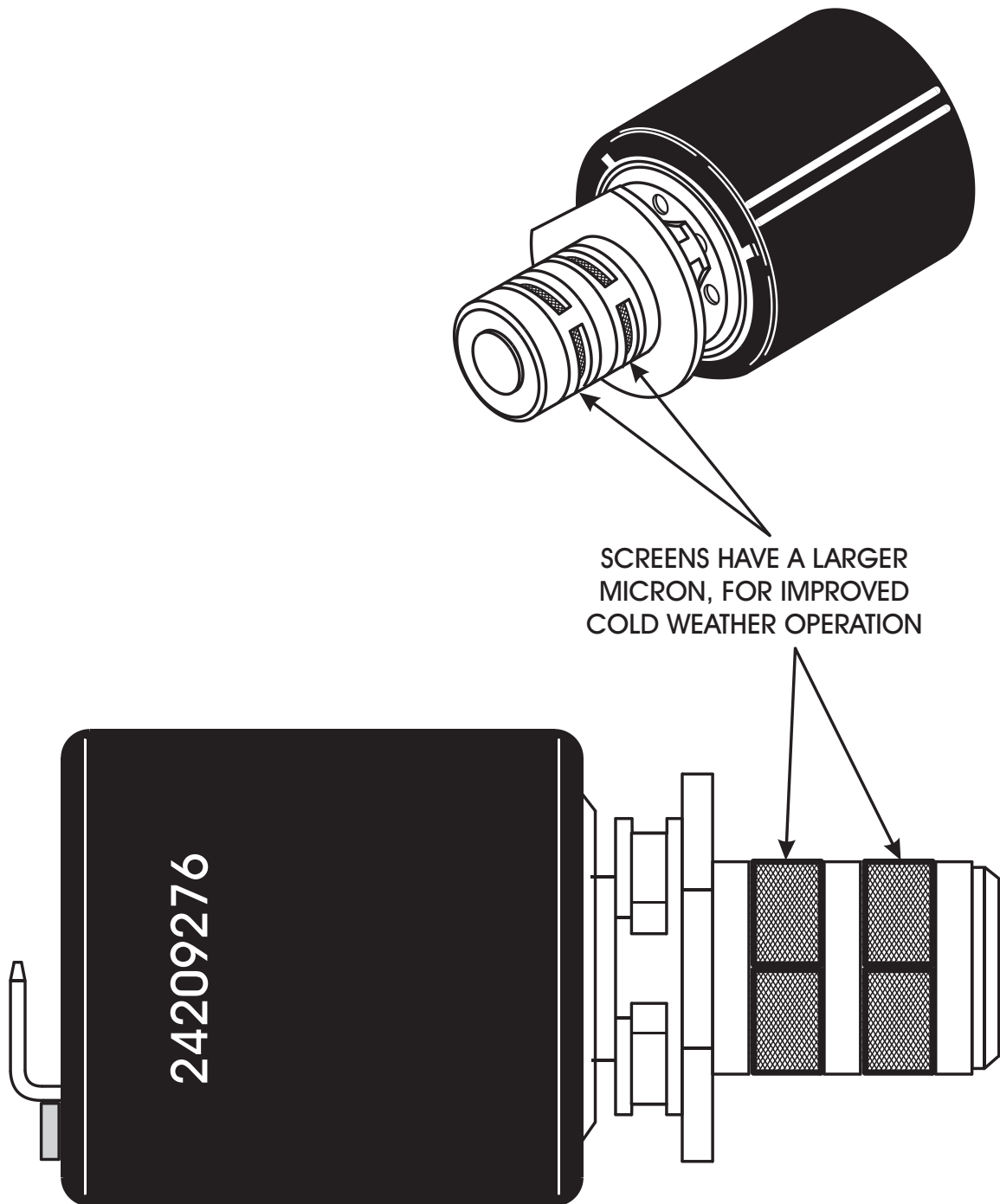


Figure 3



Technical Service Information

THM 4L60-E INTERNAL WIRE HARNESS IDENTIFICATION

1993 Models Only - Has a **"Single"** guide rail on the side of the wire harness connector that connects to the Pressure Switch Assembly, and the harness connector is **Red** in color, as shown in Figure 1.

1994 Models Only - Has **"Two"** guide rails on the top of the wire harness connector that connects to the Pressure Switch Assembly, and the harness connector is **White** in color, as shown in Figure 2.

1995 Models Only - Has an added **"TCC/PWM Solenoid"** on the valve body which requires an added connector to the internal wire harness assembly. Both the added TCC/PWM Solenoid and the 3-2 PWM Solenoid are the same part number and their harness connectors are **Blue** in color as shown in Figure 3. 1995 Models use the White harness connector for the Pressure Switch Assembly, as shown in Figure 3.

1996 Models Only - The **"3-2/PWM" Downshift Solenoid** was changed to an **"On-Off" 3-2 Downshift Solenoid**, which changes the solenoid's part number, and the connector for the new design solenoid. The TCC/PWM Solenoid internal harness connector remains **Blue** in color, with the "Fat" tab on the left side as shown in Figure 4. The new design 3-2 "On-Off" Downshift Solenoid harness connector is **Gray** in color, with the "Fat" tab on the right side as shown in Figure 4.

SERVICE INFORMATION:

Internal Wire Harness (1993 Only)	12121299
Internal Wire Harness (1994 Only)	12143279
Internal Wire Harness (1995 Only)	12163009
Internal Wire Harness (1996 Only)	12163408
Transmission Fluid Switch Assembly (93 Only) Not Available.....	8678450
Transmission Fluid Switch Assembly (For 93 models with 94 wiring harness and for 94-99 Models)..	8686147
3-2 "PWM Solenoid (93-95 Only)	8683187
3-2 "On-Off" Solenoid (1996 Only)	24203267
Shift Solenoid "A" and "B" (All Models)	10478120
TCC/PWM Solenoid (95-96 Only)	8683187
EPC Solenoid (1993 Only)	8683434
EPC Solenoid (94-96 Only)	24203101
Output Shaft Speed Sensor (93-95 Only)	8673299
Output Shaft Speed Sensor (1996 Models - "Except Corvette")	10456194
Output Shaft Speed Sensor (1996 Corvette)	8673299

Note: *The 1993 wiring harness is no longer available. The 1994 wiring harness replaces the 1993 wiring and must be used with the 94 and up Transmission Fluid Switch Assembly.*

WIRE HARNESS AND CONNECTORS FOR 1993 MODELS ONLY
INTERNAL WIRE HARNESS PART NUMBER 12121299

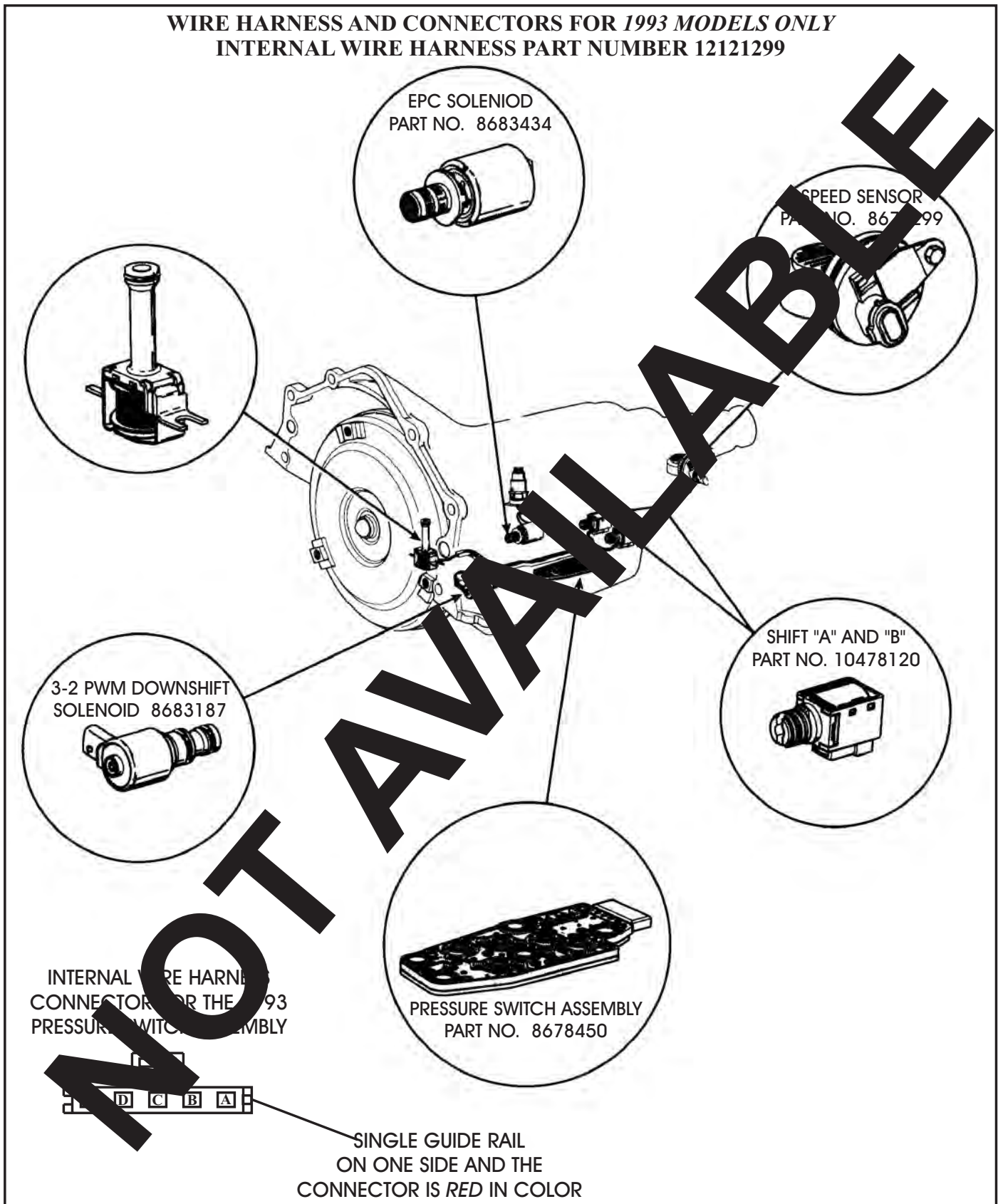


Figure1

WIRE HARNESS AND CONNECTORS FOR 1994 MODELS ONLY
INTERNAL WIRE HARNESS PART NUMBER 12143279

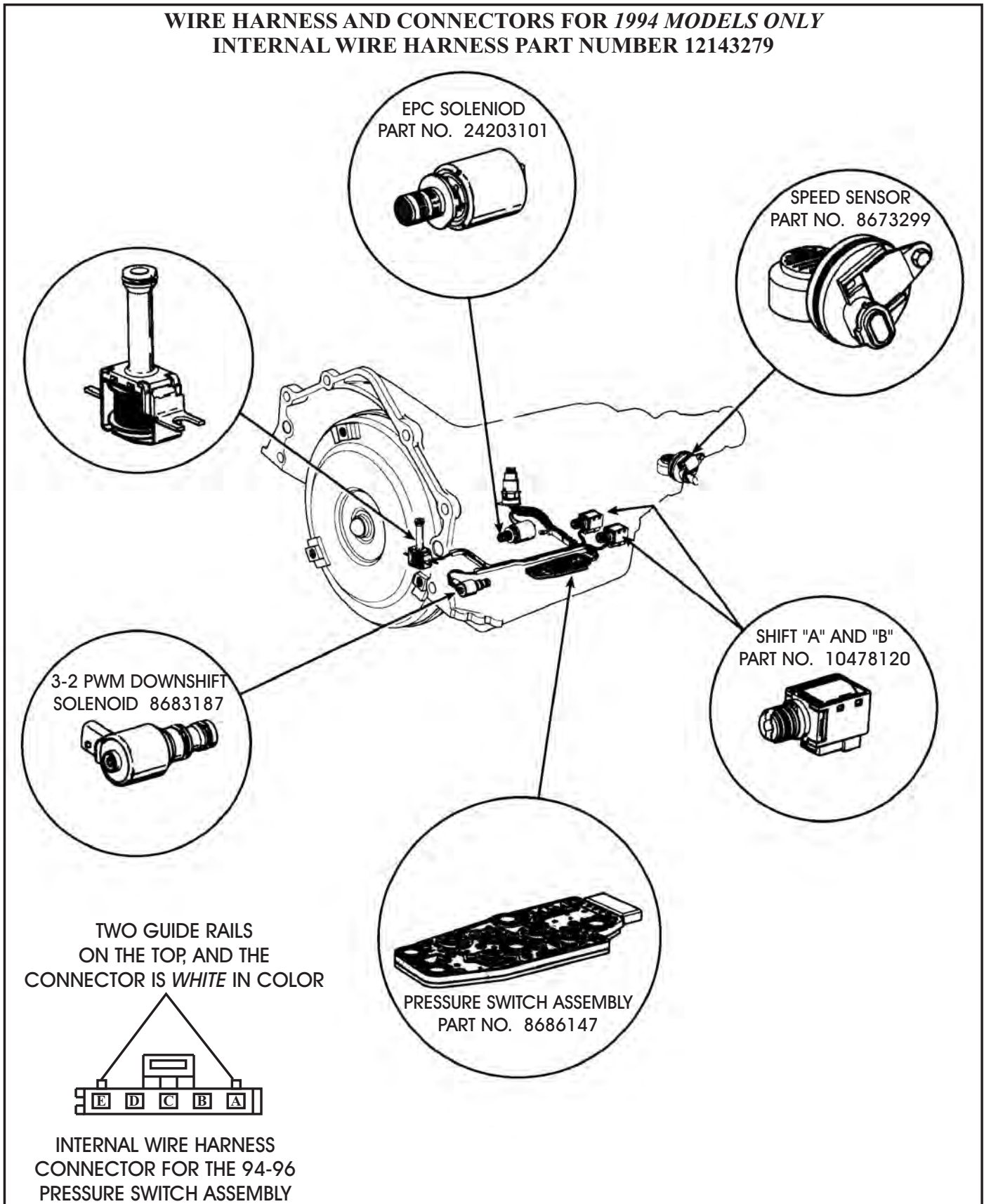


Figure 2

WIRE HARNESS AND CONNECTORS FOR 1995 MODELS ONLY
INTERNAL WIRE HARNESS PART NUMBER 12163009

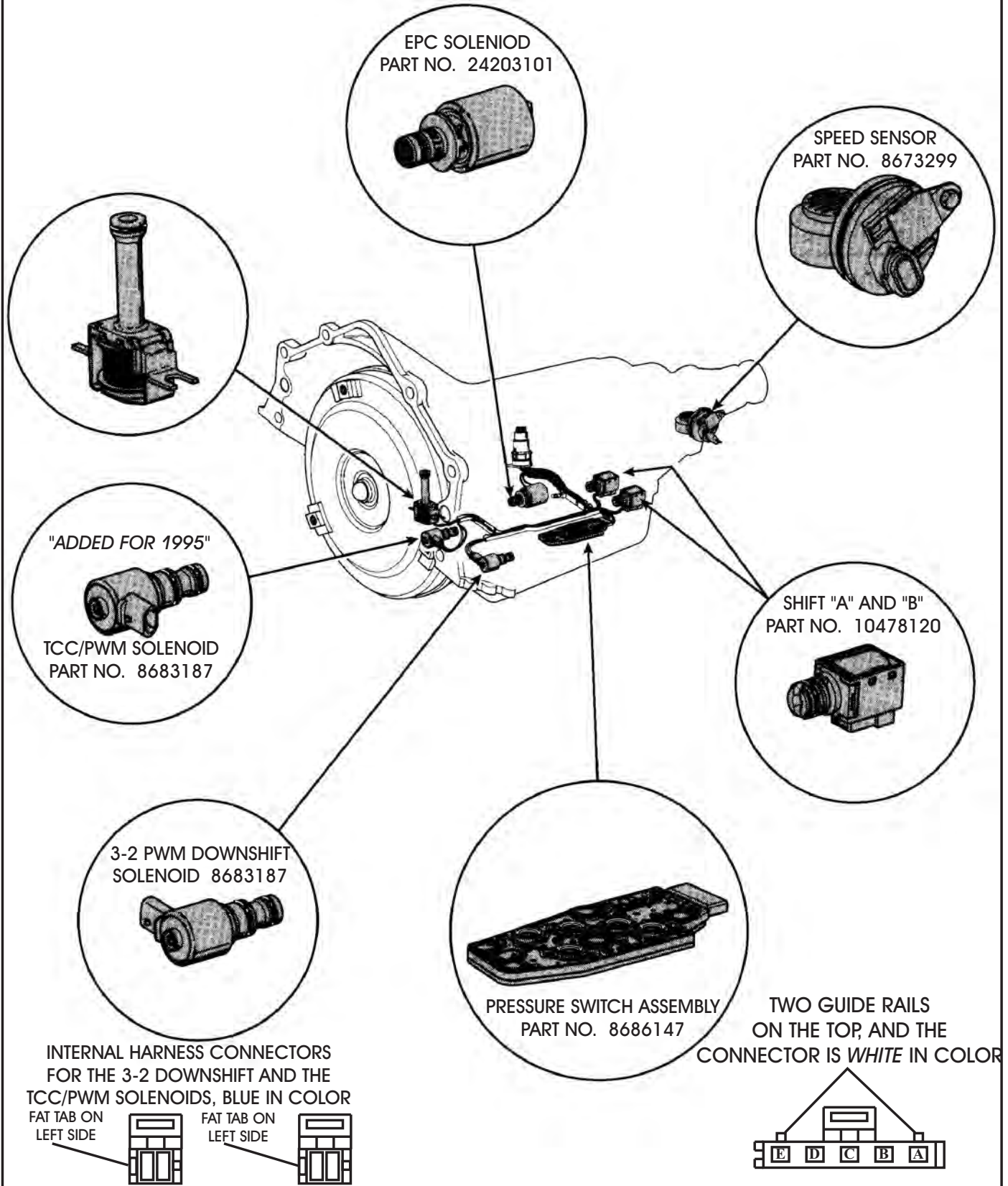


Figure 3

WIRE HARNESS AND CONNECTORS FOR 1996 MODELS ONLY INTERNAL WIRE HARNESS PART NUMBER 12163408

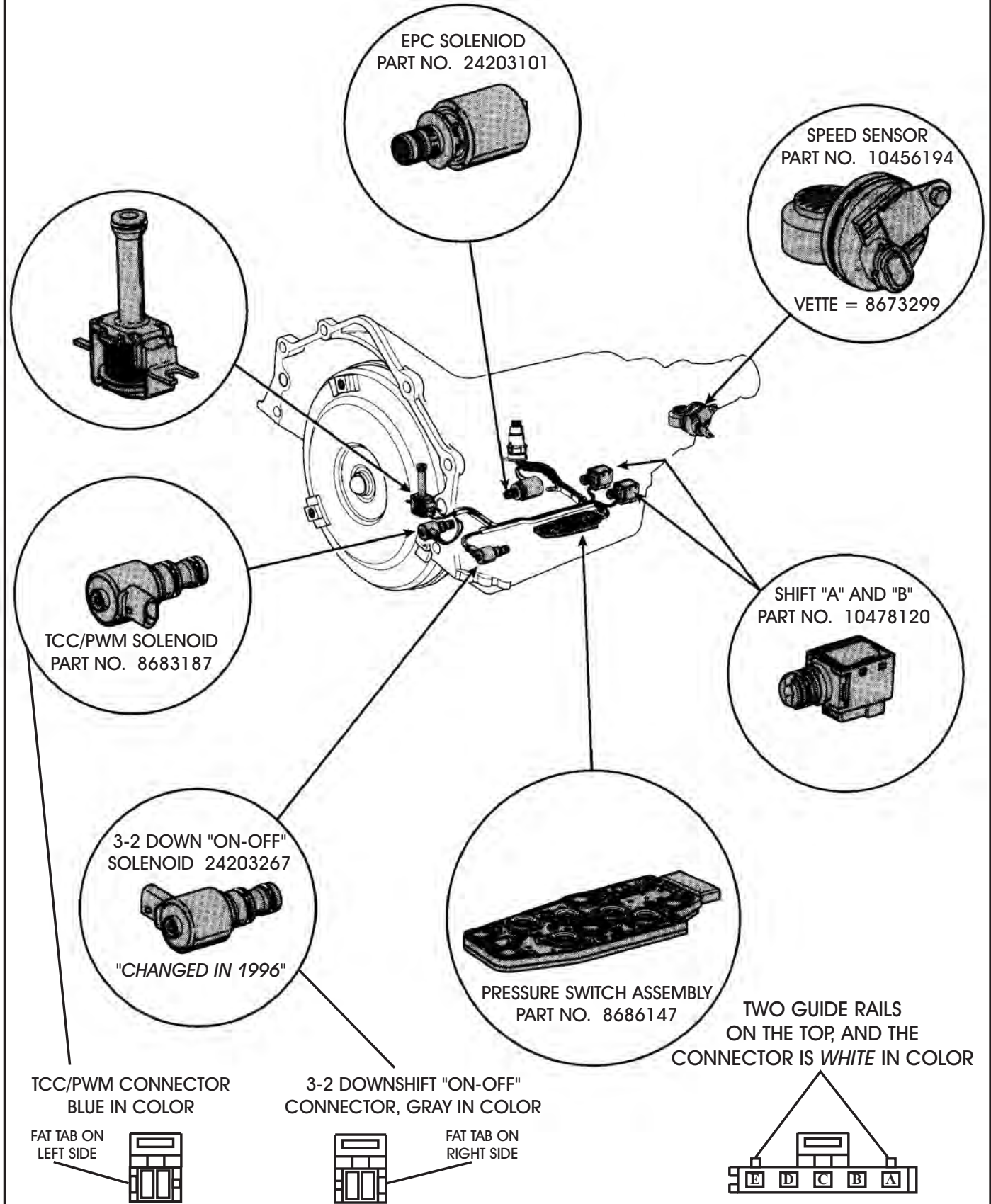


Figure 4



Technical Service Information

THM 4L60-E PREMATURE LOW/REVERSE CLUTCH FAILURE (1993-1995 MODELS ONLY)

COMPLAINT: Premature and/or repeat failure of the Low/Reverse Clutch pack, on 1993-1995 models only, and may occur in as little as 5000 miles.

CAUSE: The cause may be, the Low/Reverse Clutch not totally exhausting the apply oil when the shift lever is moved from Park to the Drive position. On 1993-1995 models, the exhaust path for L/R apply oil is not large enough.

CORRECTION: STEP 1: Drill a .030" hole through the Low/Reverse Piston, in the tapered area between the outer seal and the center seal, as shown in Figure 1. This will provide an immediate exhaust path for PR apply oil when the selector lever is placed into the Drive position.

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

STEP 3: *If you have a "T" Truck*, which is the small "S" type truck with 4 wheel drive, *remove and discard the brace from transmission bell to the transfer case*, as shown in Figure 3. This will require a shorter bolt at the bell housing.

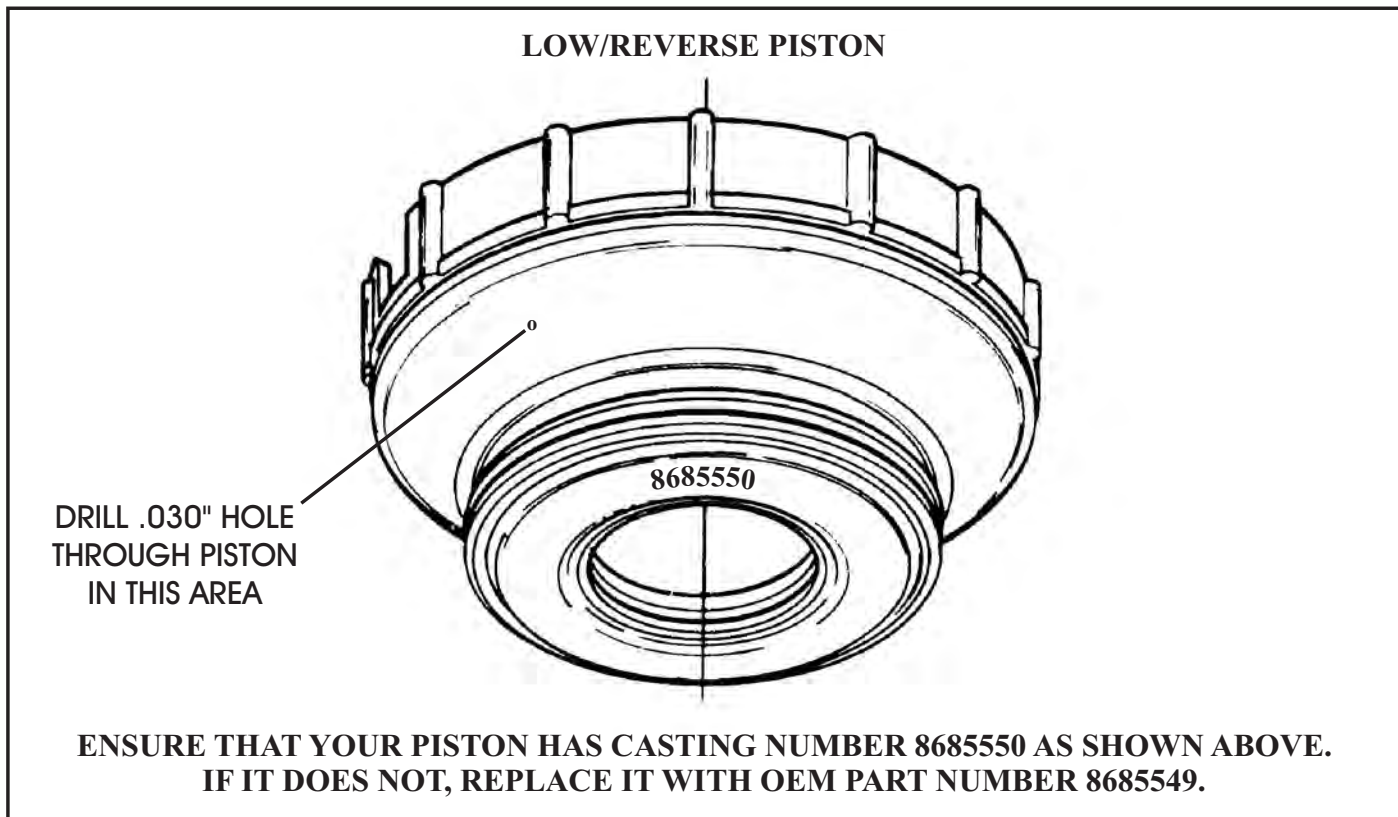


Figure 1

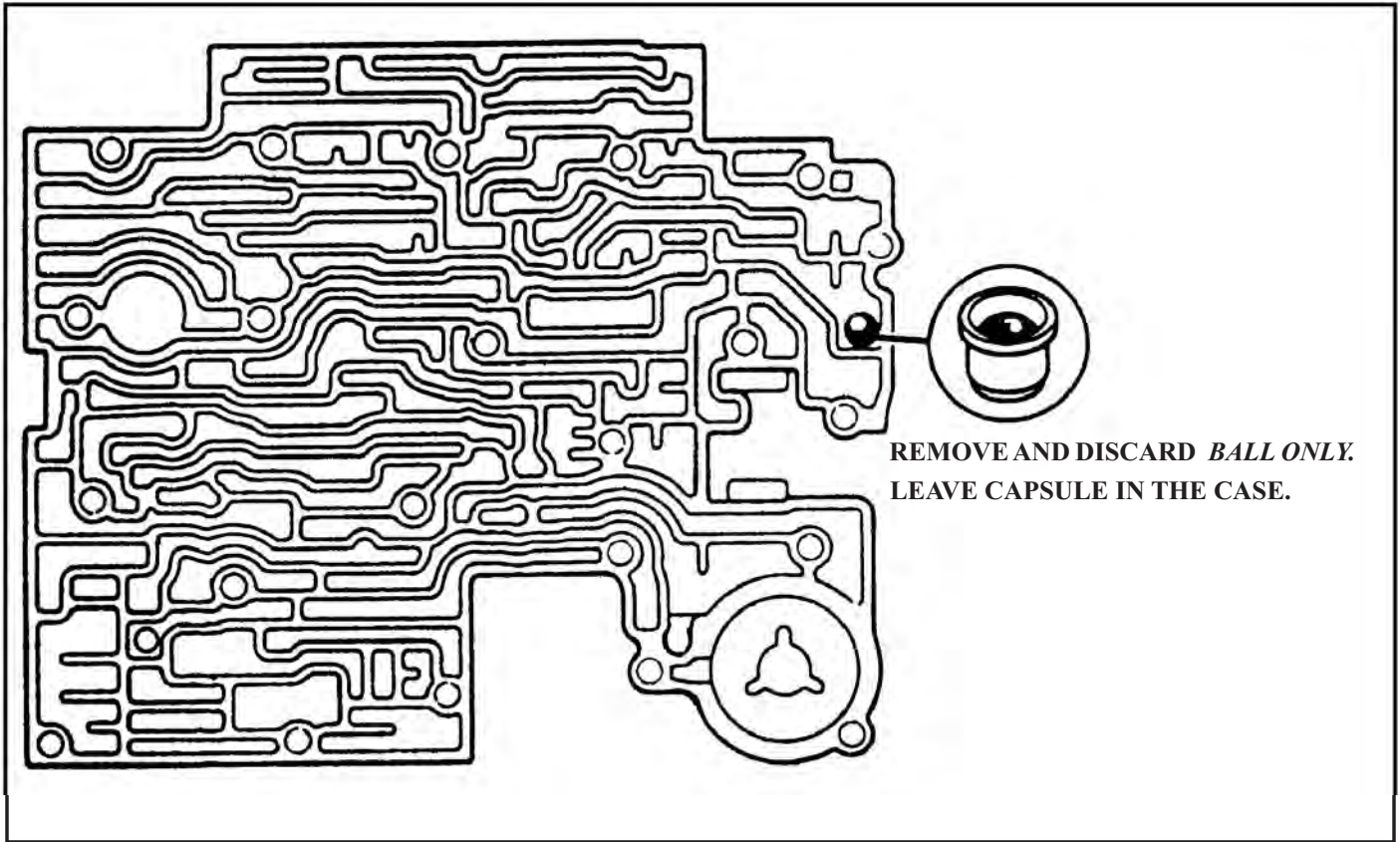


Figure 2

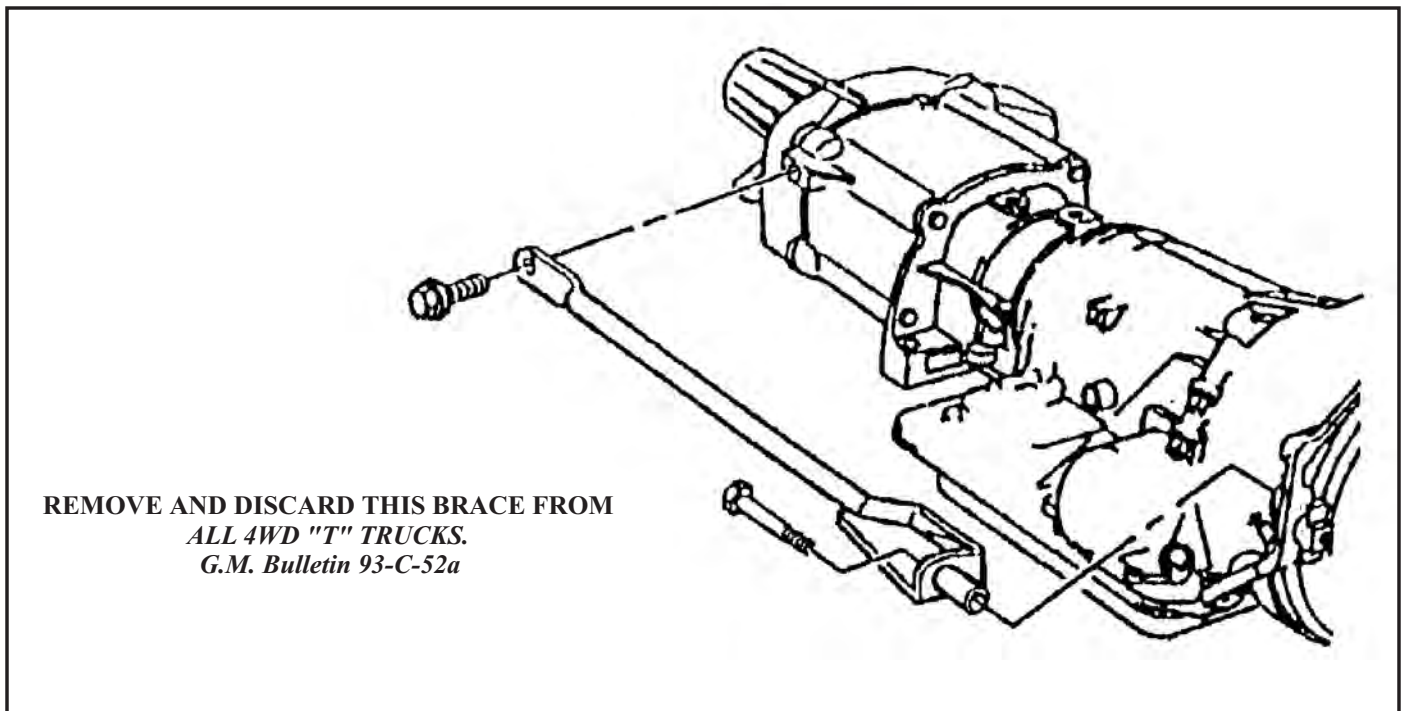


Figure 3



Technical Service Information

THM 4L60-E NEW MANUAL VALVE AND VALVE BODY CASTING FOR 1996

CHANGE: Beginning at the start of production for all 1996 models, the THM 4L60-E transmissions were built with a new design Manual Valve, and a new design Valve Body Casting. Refer to Figures 1 and 2.

REASON: Improved exhaust path for Lo/Reverse clutch oil, when the selector lever is in the Drive position, which greatly improves Lo/Reverse clutch durability.

PARTS AFFECTED:

- (1) **VALVE BODY CASTING** - Added exhaust hole through the valve body casting in the manual valve bore, to exhaust Lo/Reverse clutch oil at a faster rate when the manual valve is in the Drive position. Refer to Figure 1 for 1995 models, and to Figure 2 for 1996 models.
- (2) **MANUAL VALVE** - Totally different design to accommodate the added exhaust hole in the valve body casting. Refer to Figure 1 for 1995 models, and to Figure 2 for 1996 models.

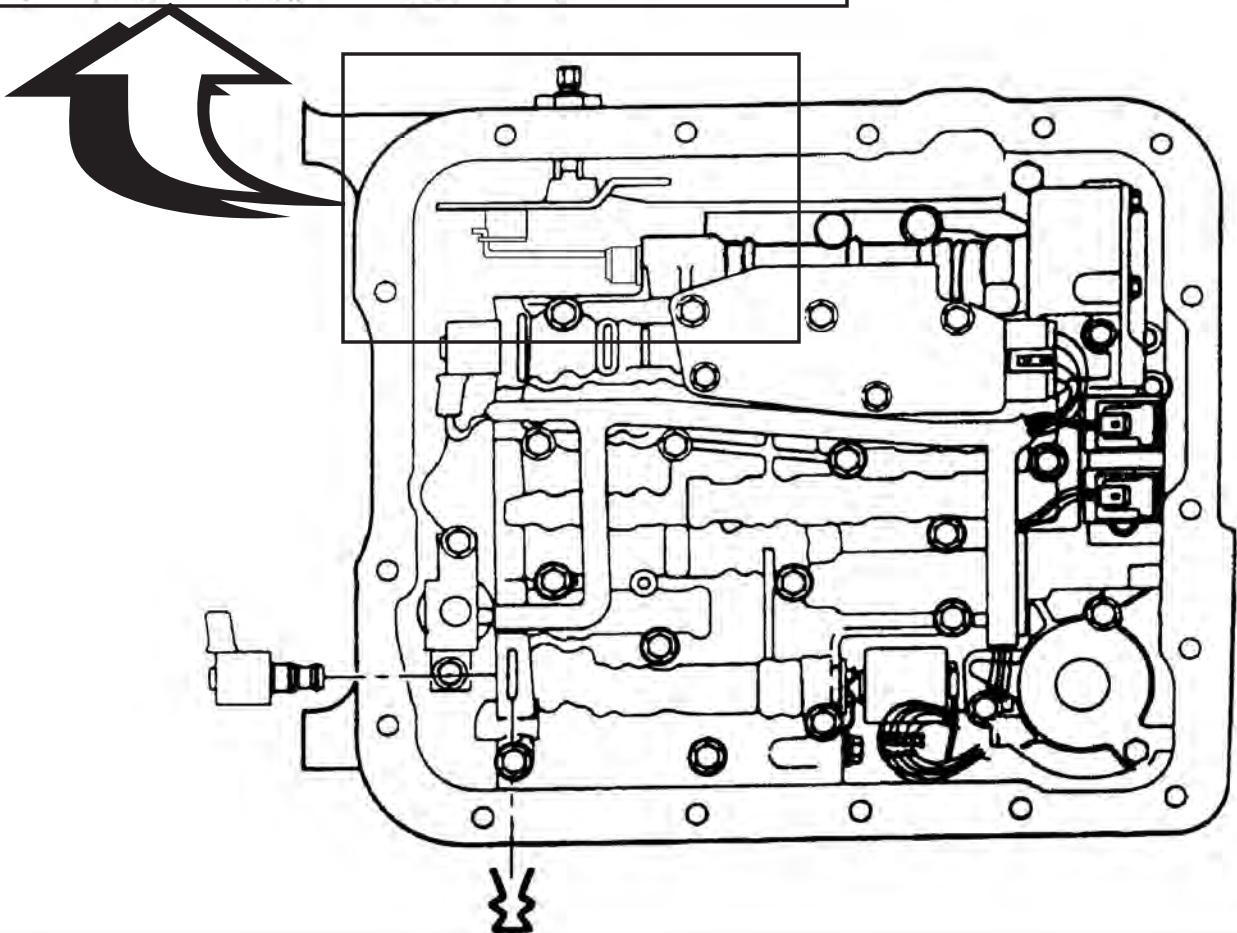
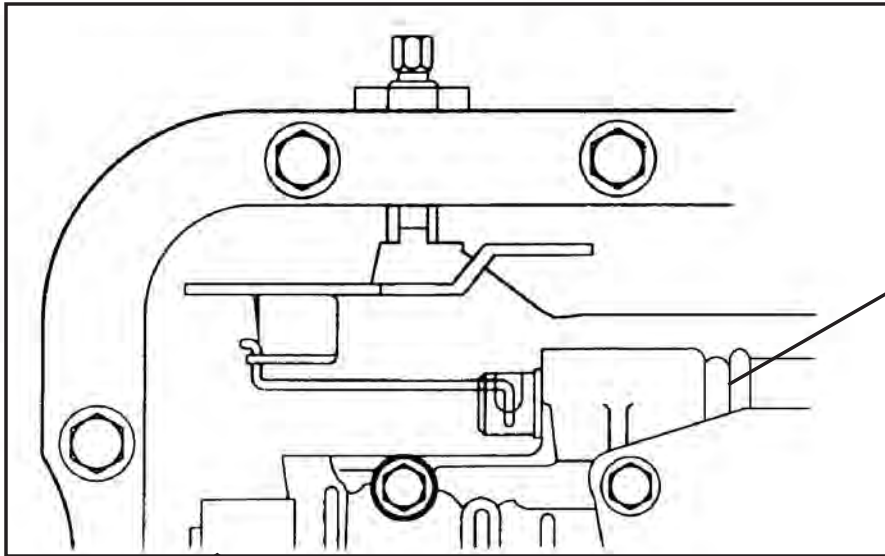
INTERCHANGEABILITY:

None of the parts listed above are interchangeable with one another. The 1996 valve body and manual valve cannot be used on 1995 models because of other changes that occurred in the 3-2 downshift valve line up, and the 3-2 downshift solenoid.

1995 parts must be used on 1995 models.

1996 parts must be used on 1996 models.

1995 MANUAL VALVE AND VALVE BODY CASTING



1996 MANUAL VALVE AND VALVE BODY CASTING

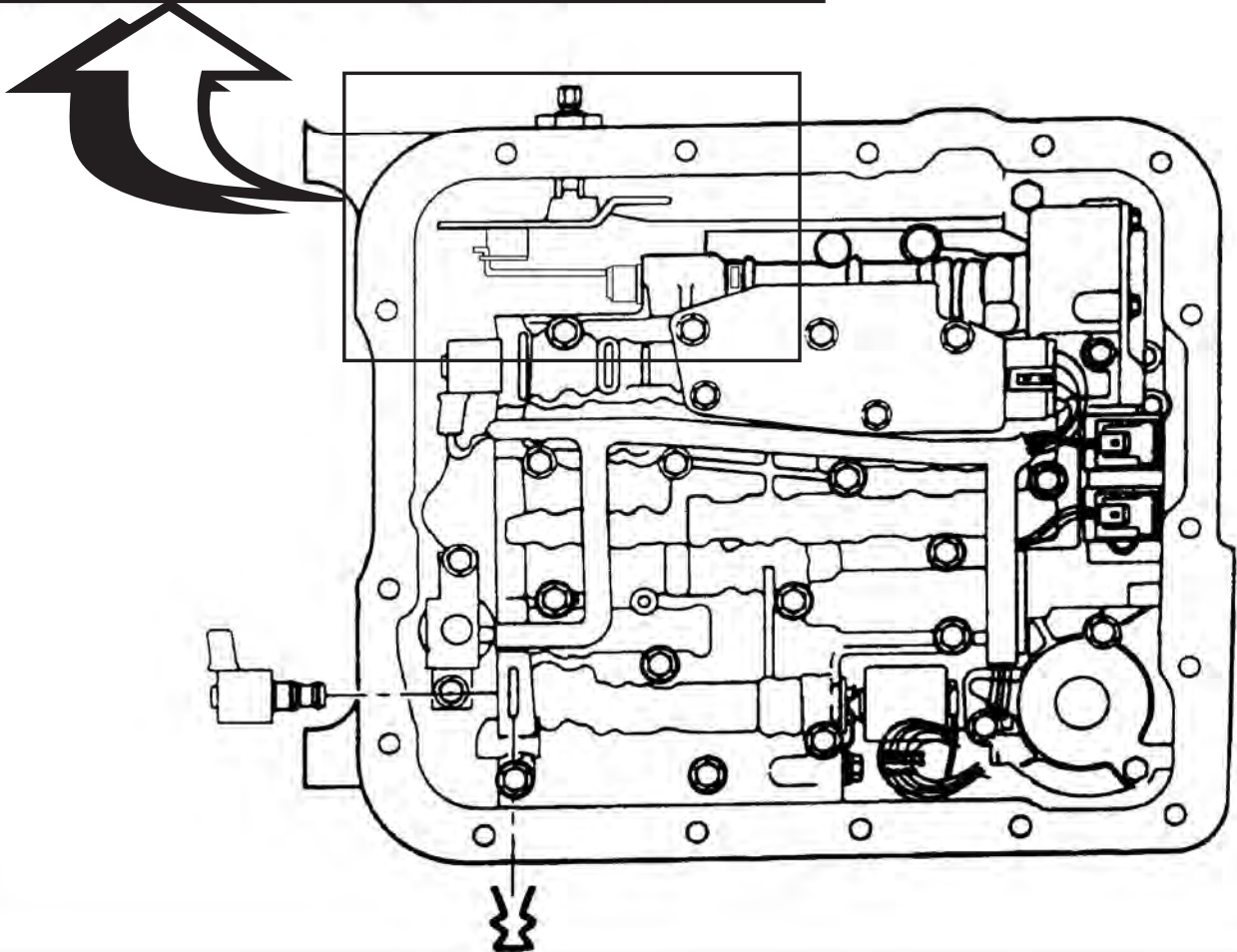
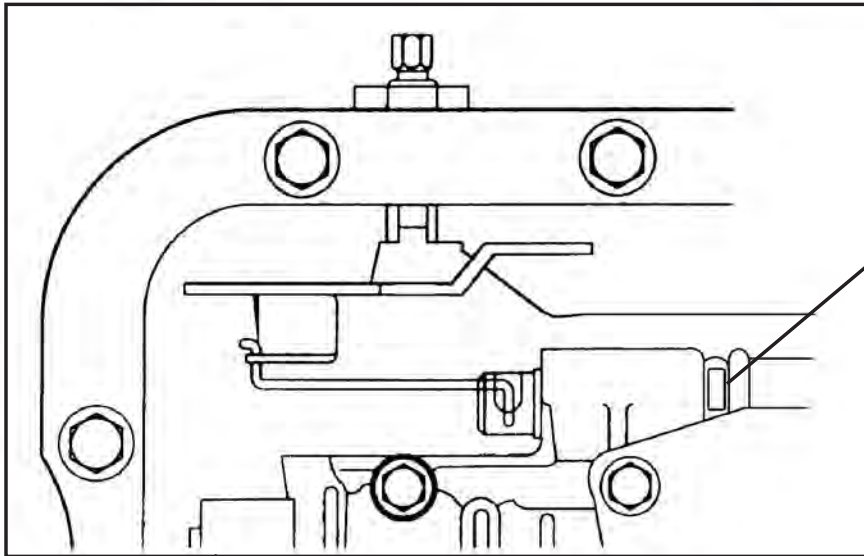


Figure 2

THM 4L60-E SOFT 1-2 UPSHIFT

COMPLAINT: Some 1994 model vehicles, equipped with the THM 4L60-E transmission may exhibit a soft 1-2 upshift condition.

CAUSE: The cause may be, calibration of the 1-2 accumulator valve in the valve body.

CORRECTION: There is now available a new calibration service package consisting of a 1-2 accumulator valve, valve spring, and 1-2 accumulator valve bushing for the valve body. These are items 370, 371, and 372, as shown in Figure 1 below. This new service package is available under OEM part number 24202698.

SERVICE INFORMATION:

1-2 Accumulator Valve Service Package 24202698

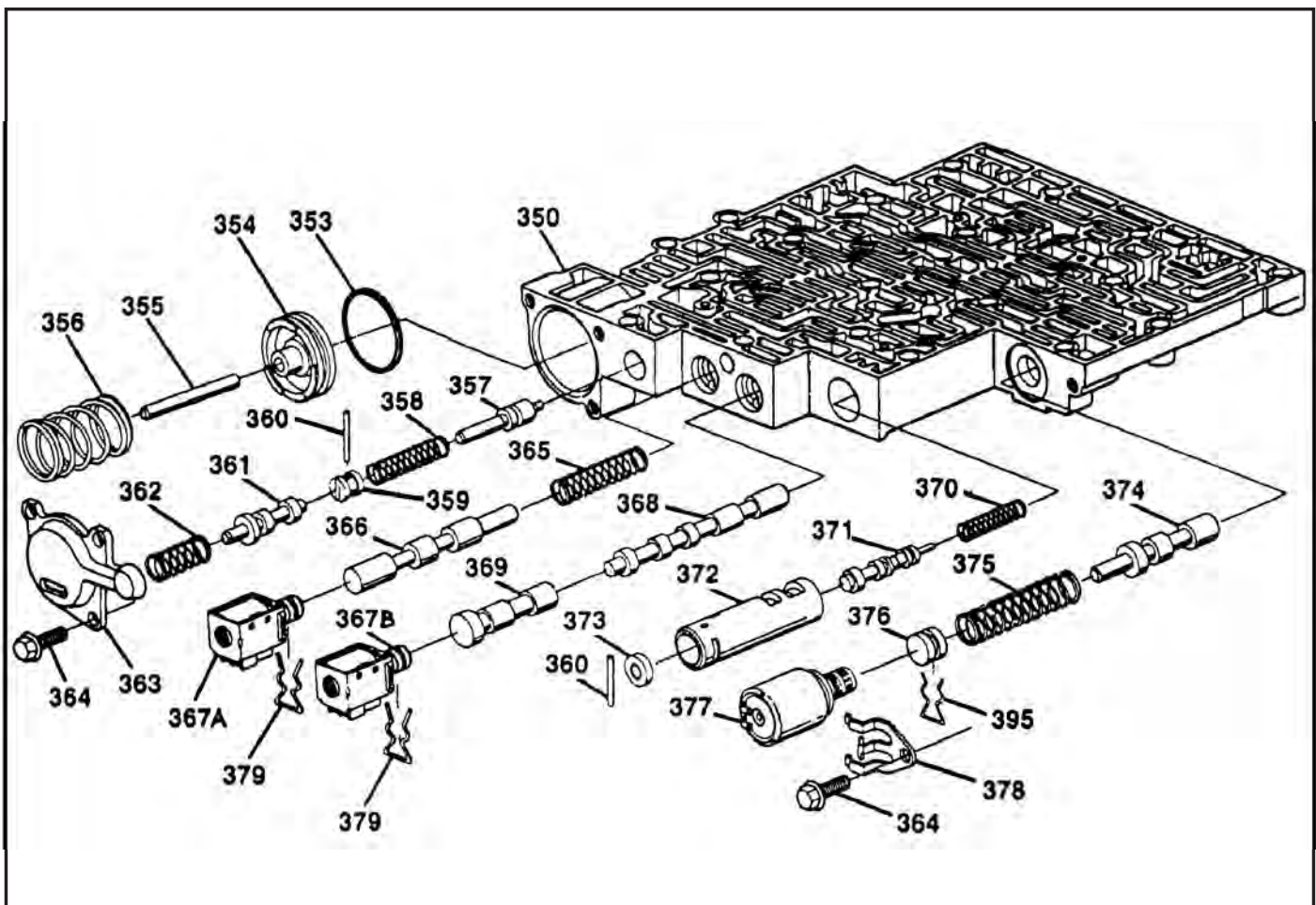


Figure 1



Technical Service Information

THM 4L60-E ACCUMULATOR PISTON WEAR

COMPLAINT: When the accumulator piston wears with an "Egg-Shaped" hole where the accumulator piston strokes, it can create a delayed engagement to drive, slipping condition in forward gears, slipping 1-2 shift, slipping 3-4 shift, depending on which accumulator piston is worn, and how bad it is worn.

CAUSE: The cause may be, a worn accumulator piston pin bore (See Figure 1).

CORRECTION: Replace the accumulator piston with the proper part number from "Service Information" as shown below.

SERVICE INFORMATION:

1-2 Accumulator Piston (Package of 2)	8684429
3-4 Accumulator Piston (Package of 2)	8682096
Forward Clutch Accumulator Piston	8679738

Service Note:

The THM 4L60-E, 3-4 accumulator piston is same as 700-R4.

The THM 4L60-E, 1-2 accumulator piston has a smaller pin diameter.

The THM 4L60-E, forward accumulator piston is a smaller outside diameter.

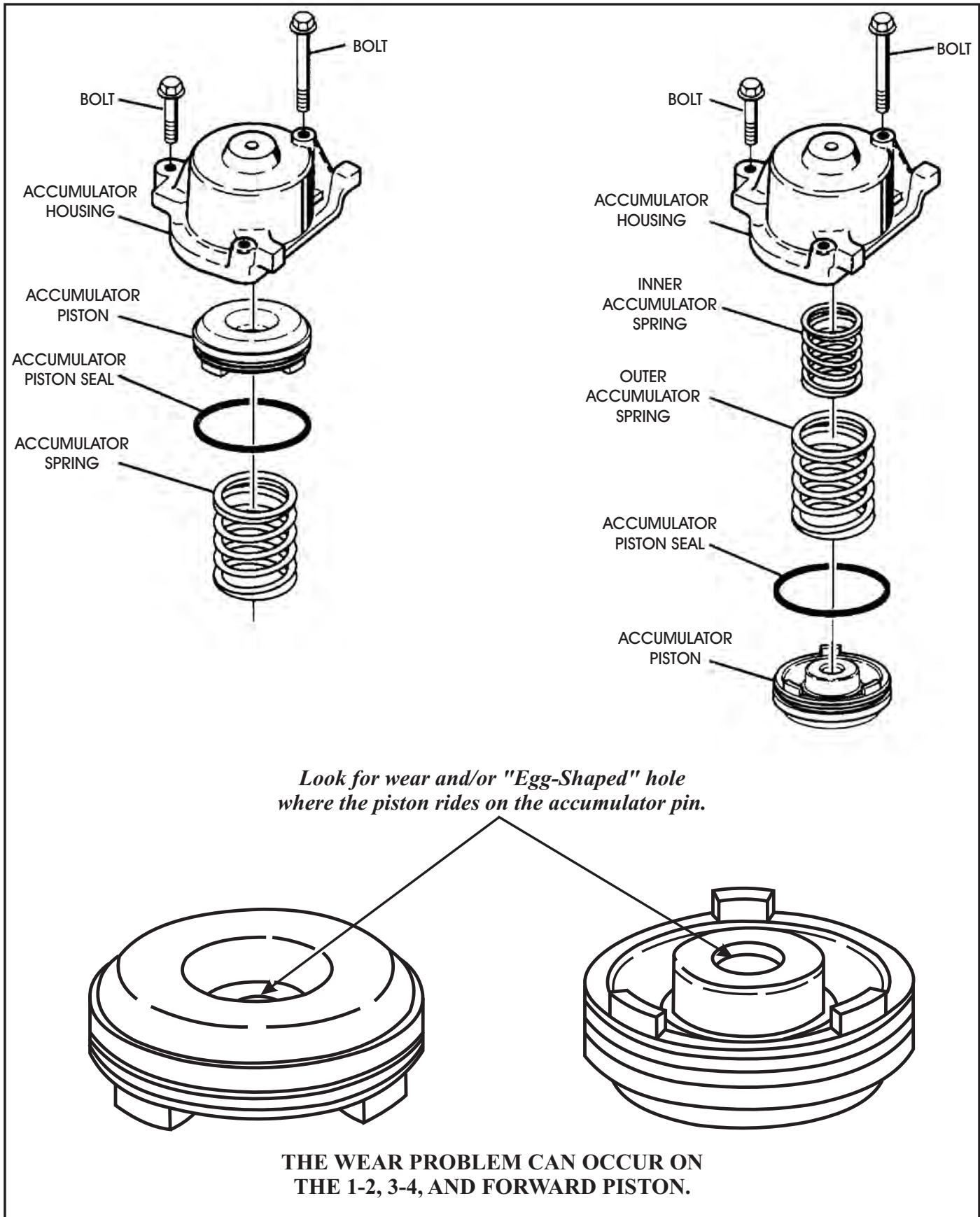


Figure 1



Technical Service Information

THM 4L60-E NEW DESIGN 1-2 ACCUMULATOR PISTON

CHANGE: Beginning on May 11, 1998 (Julian Date 131) all THM 4L60-E transmissions were built with a new design plastic 1-2 Accumulator Piston, and an ovate (oval) wire outer accumulator spring, to replace the previous design aluminum piston and round wire outer accumulator spring, as shown in Figure 1.

REASON: More cost effective than the aluminum piston.

PARTS AFFECTED:

- (1) 1-2 ACCUMULATOR PISTON - Now manufactured out of plastic instead of the previous aluminum, which necessitated a dimensional change, as the plastic piston is thicker as shown in Figure 1.
- (2) 1-2 ACCUMULATOR OUTER SPRING - Now manufactured out of an ovate (oval) wire instead of the previous design round wire, to eliminate coil bind as shown in Figure 1.

INTERCHANGEABILITY:

The different 1-2 Accumulator Pistons and Outer Springs are not interchangeable. When replacing these parts you must remove the 1-2 Accumulator Assembly and inspect for the presence of either the aluminum or plastic 1-2 accumulator piston.

The plastic piston must use the ovate wire outer spring, and the aluminum piston must use the round wire outer spring to ensure against coil bind and spring breakage.

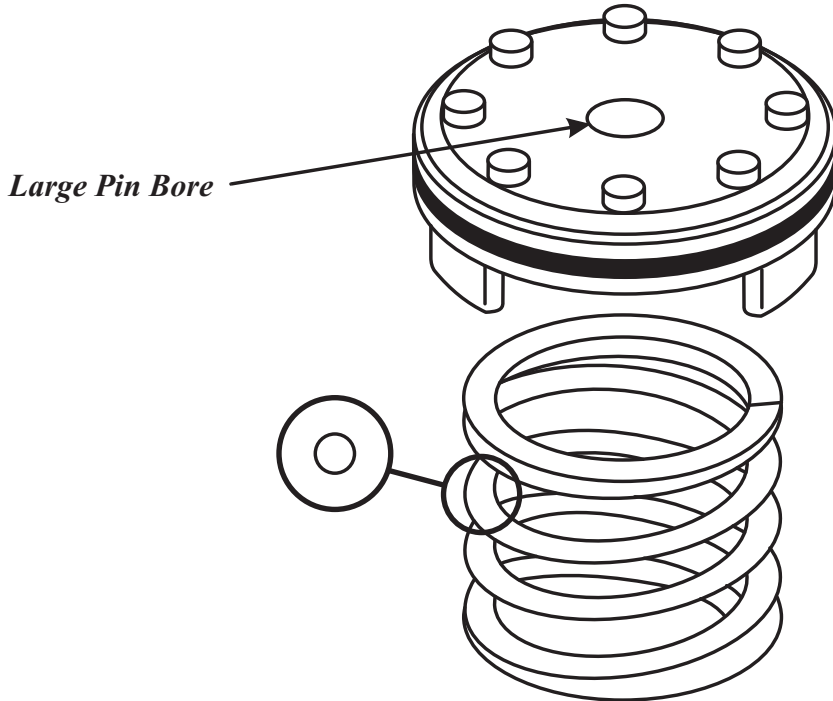
Refer to "Service Information" below for the proper service package part numbers if replacement is necessary.

SERVICE INFORMATION:

1-2 Accum. Piston Service Package, 4L60, (1982-1993 Aluminum)	24204495
1-2 Accum. Piston Service Package, 4L60-E, (1994-1997 Aluminum).....	24204496
1-2 Accum. Piston Service Package, 4L60-E, (1998-1999 Plastic)	24214343

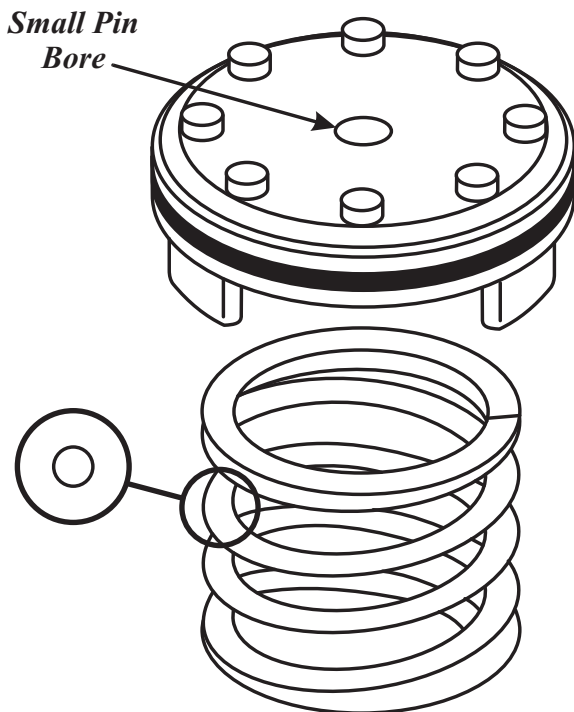
Note: All service packages include the proper outer spring.

*Aluminum 1-2 Accumulator Piston
"Round Wire" Outer Spring
1982-1993 Only
Part Number 24204495*



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*Aluminum 1-2 Accumulator Piston
"Round Wire" Outer Spring
1984-1997 Only
Part Number 24204496*



*Aluminum 1-2 Accumulator Piston
"Round Wire" Outer Spring
1998-1999 Only
Part Number 24214343*

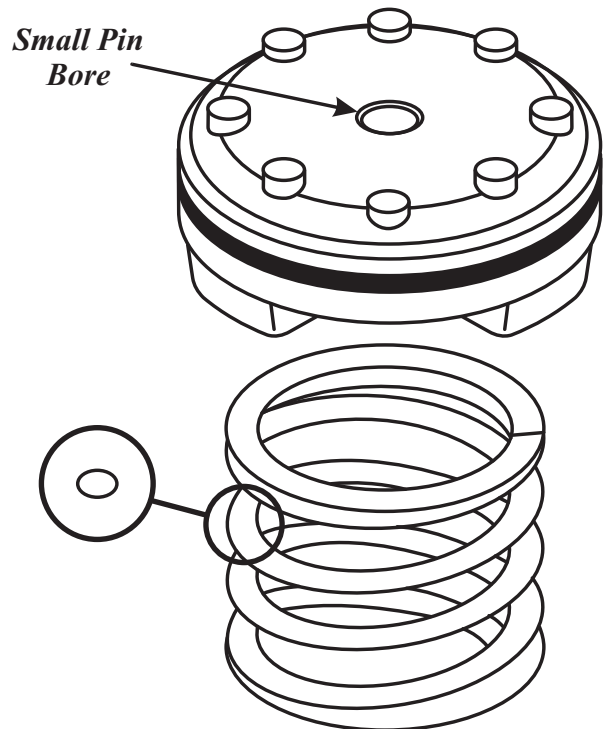


Figure 1



Technical Service Information

THM 4L60-E TRANSMISSION AND ENGINE OVERHEATS 1994-1996 CHEVROLET CAPRICE

COMPLAINT: Some models of 1994-1996 Chevrolet Caprice may exhibit a engine and/or transmission overheating condition, and usually occurs in heavy duty operation, such as Police and Taxi use.

CAUSE: The Primary Cooling Fan Relay may overheat and fail, rendering the cooling fan inoperative and resulting in the overheat condition. The Secondary fan may operate, but will not provide enough cooling air to prevent the overheat condition.

CORRECTION: A new service package is available under OEM part number 12167644, that moves the Primary Cooling Fan Relay to a new location and upgrades the terminal ends. No instructions are provided in the service package, so you will need this bulletin for installation instructions. Contents of the service package are shown in Figure 1.

- (1) Disconnect the Negative battery cable.
- (2) Locate the underhood Electrical Center, located at the top rear of the right front wheel housing, and remove the cover.
- (3) Remove the Electrical Center from the casing, by releasing the tabs using a small screwdriver, as shown in Figure 2.
- (4) Remove the current Primary Cooling Fan Relay and the 40 Amp, number 12 Maxi-fuse, as shown in Figure 2.
- (5) From the back of the Electrical Center, as shown in Figure 3:
 - (A) Remove the 10 gauge "Red" jumper wire and terminals from cavities "K2" and "C4", and discard this jumper wire.
 - (B) Remove the 10 gauge "Blue" wire and terminal from cavity "B6". Cut off the terminal end and discard, and tape the wire end.
 - (C) Remove the 22 gauge "Brown" wire and terminal from cavity "B4", and the 22 gauge "Green" wire and terminal from cavity "C6". These wires will be reused in step seven.
- (6) Locate connector number "C103", located just in front of the Electrical Center, as shown in Figure 4. Unplug the connector and remove the "Blue" 10 gauge wire and terminal from cavity "A". Cut off the terminal end and discard, and tape the bare end of the wire.

Continued on Next Page.



Technical Service Information

Installation procedure continued.

- (7) Locate the new cooling fan relay and harness assembly from the service package, and insert the "Red" wire and terminal into cavity "K2" of the Electrical Center, as shown in Figure 5. Cut the old terminal ends from the "Brown" and "Green" wires that were previously removed from the Electrical Center in Step 5, and discard. Using the crimp connectors from the service package, connect the "Brown" wire from the new harness assembly to the "Brown" wire removed from terminal "B4", as shown in Figure 5. Using the remaining crimp connector from the service package, connect the "Green" wire from the new harness assembly to the "Green" wire removed from terminal "C6", as shown in Figure 5. Heat shrink the connections to insure a water tight seal, and reinstall the Electrical Center into the case.
- (8) Reinstall the 40 Amp, number 12 Maxi-fuse.
- (9) At connector number "C103", install the "Blue" wire and terminal from the new harness assembly into cavity "A", as shown in Figure 6, and plug the connector back together.
- (10) Remove the hex nut that secures the hood ground strap to the cowl, as shown in Figure 7. Install the new cooling fan relay bracket on top of the ground strap, leaving the ground strap in place, and reinstall the hex nut. Refer to Figure 7.
- (11) Secure the new harness into position, making sure there are no rub or pinch points, reconnect the Negative battery cable, and verify the operation of the cooling fan.

ADDITIONAL "IMPORTANT" INFORMATION

It has come to our attention that some models have the external transmission cooler mounted directly behind the front bumper, and greatly restricted from the air flow. Make sure you check the mounting in the vehicle that you are working on, and if in this location, it would be advisable to "remount" the external transmission cooler so that it is higher, and in the direct air flow from the front of vehicle.



Technical Service Information

CONTENTS OF SERVICE PACKAGE PART NUMBER 12167644

NEW DESIGN
RELAY ASSEMBLY

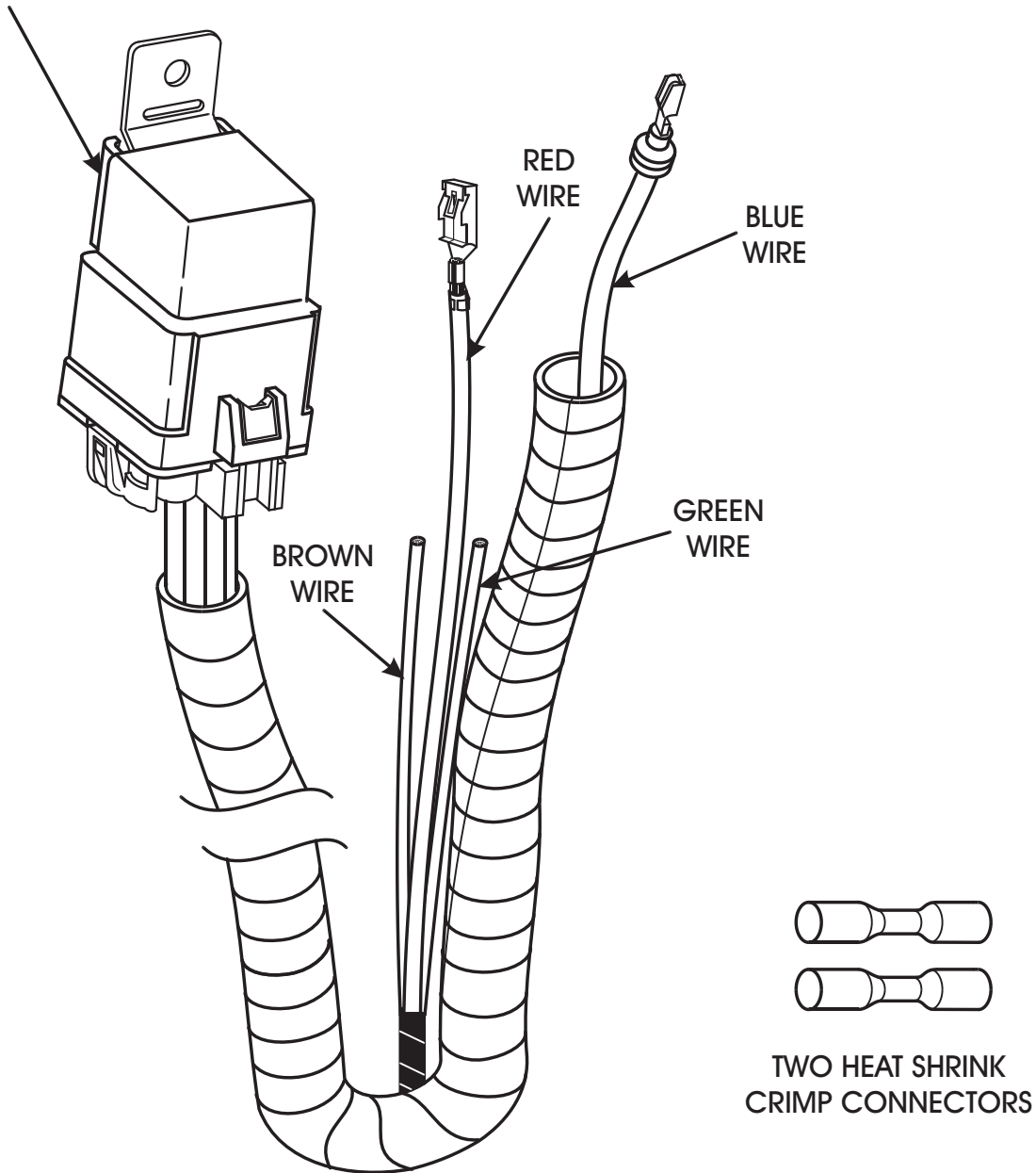


Figure 1



Technical Service Information

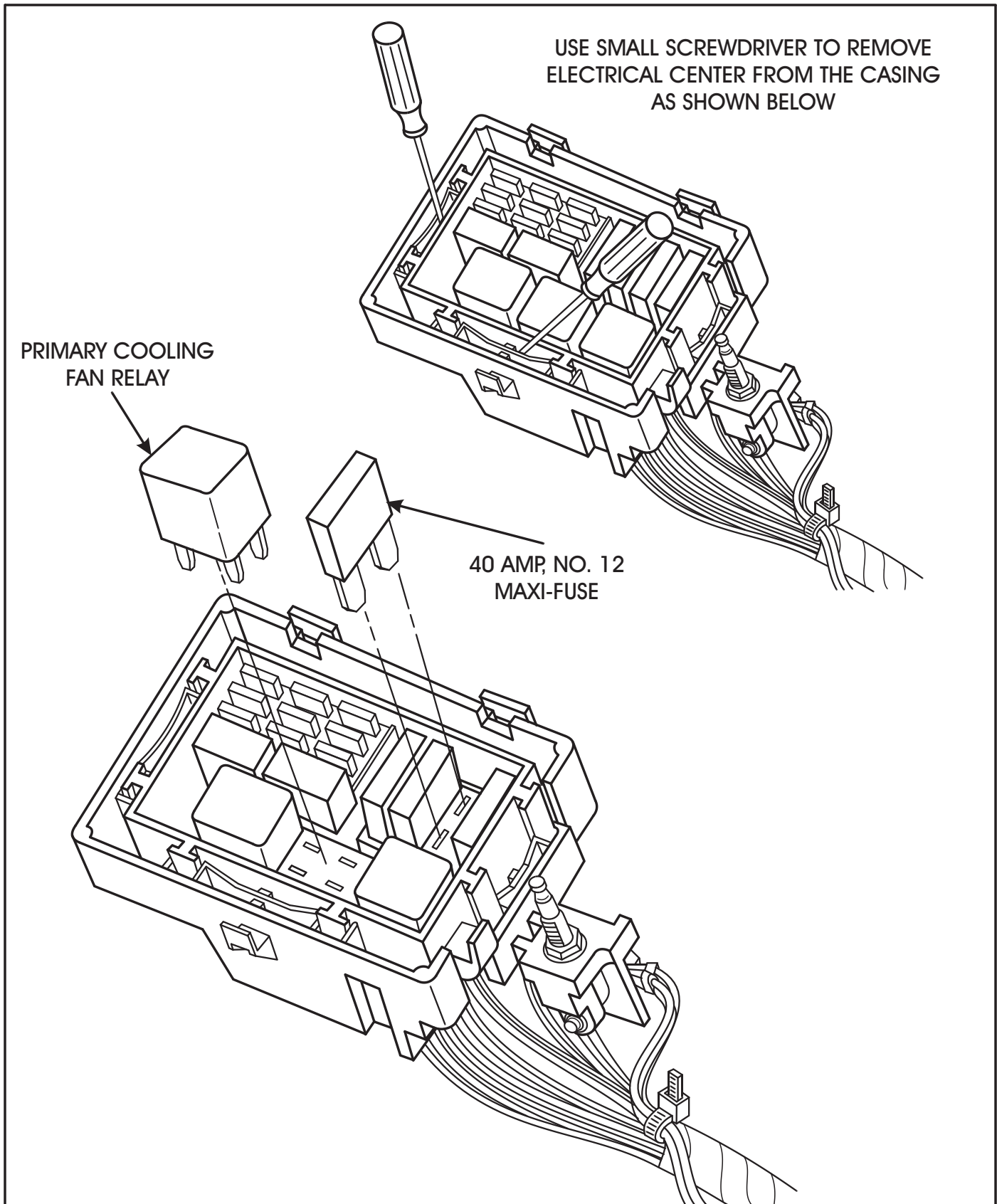


Figure 2

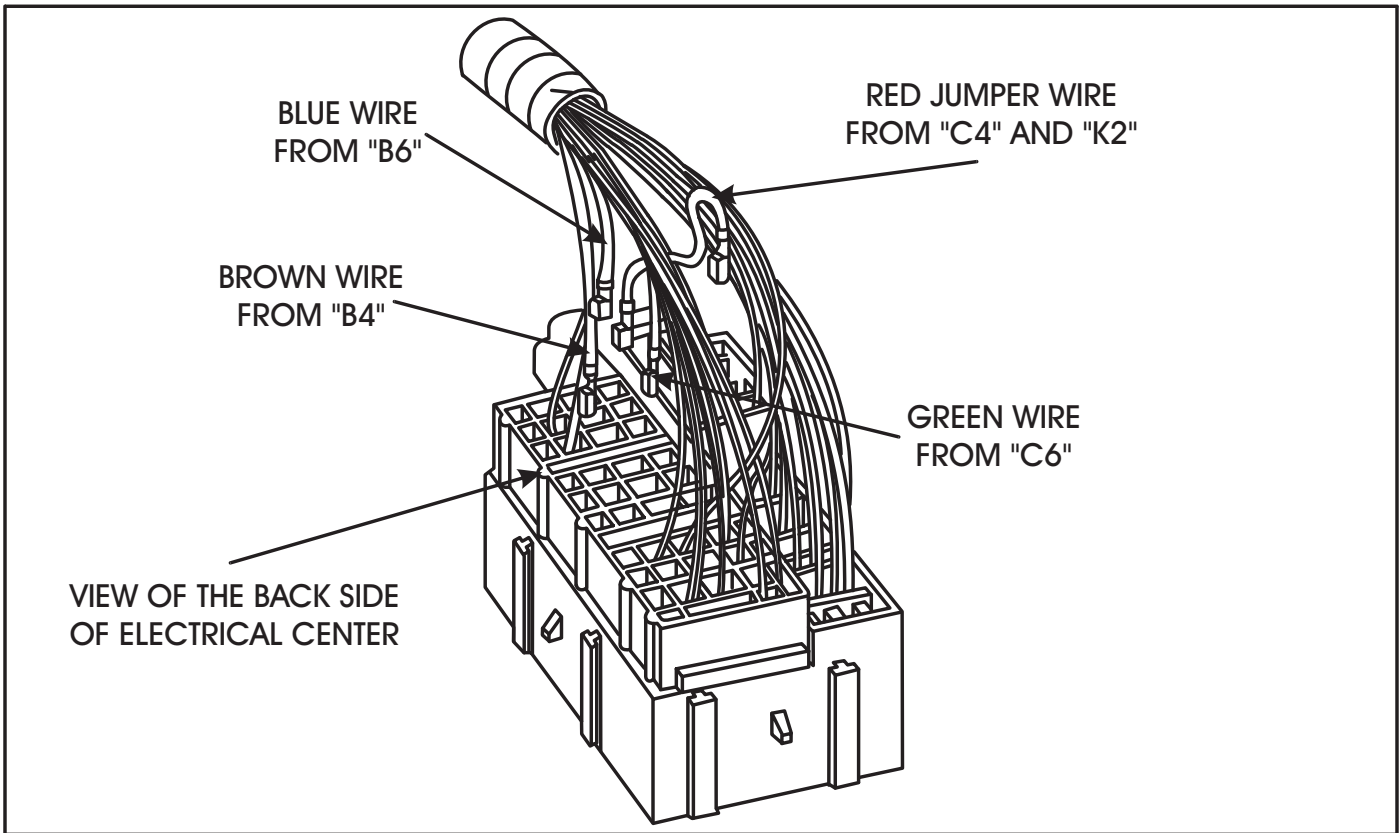


Figure 3

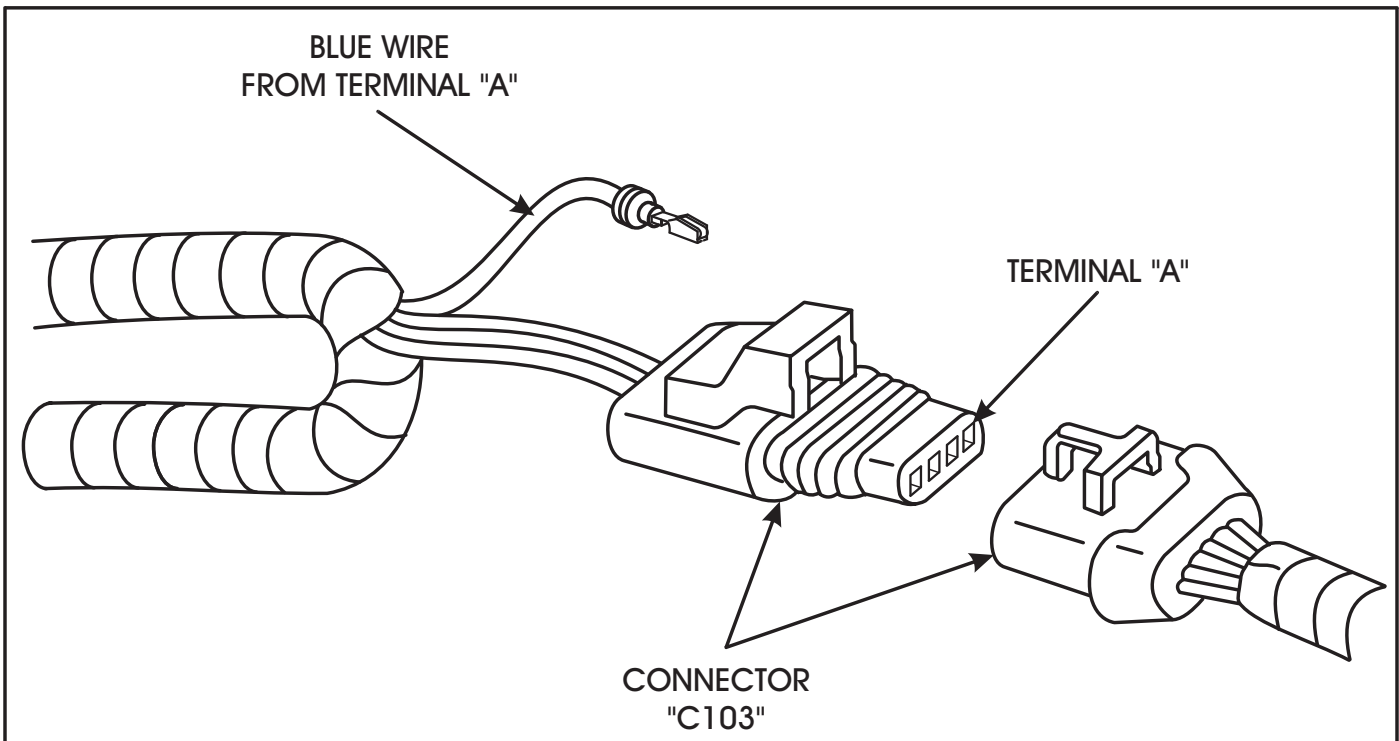


Figure 4

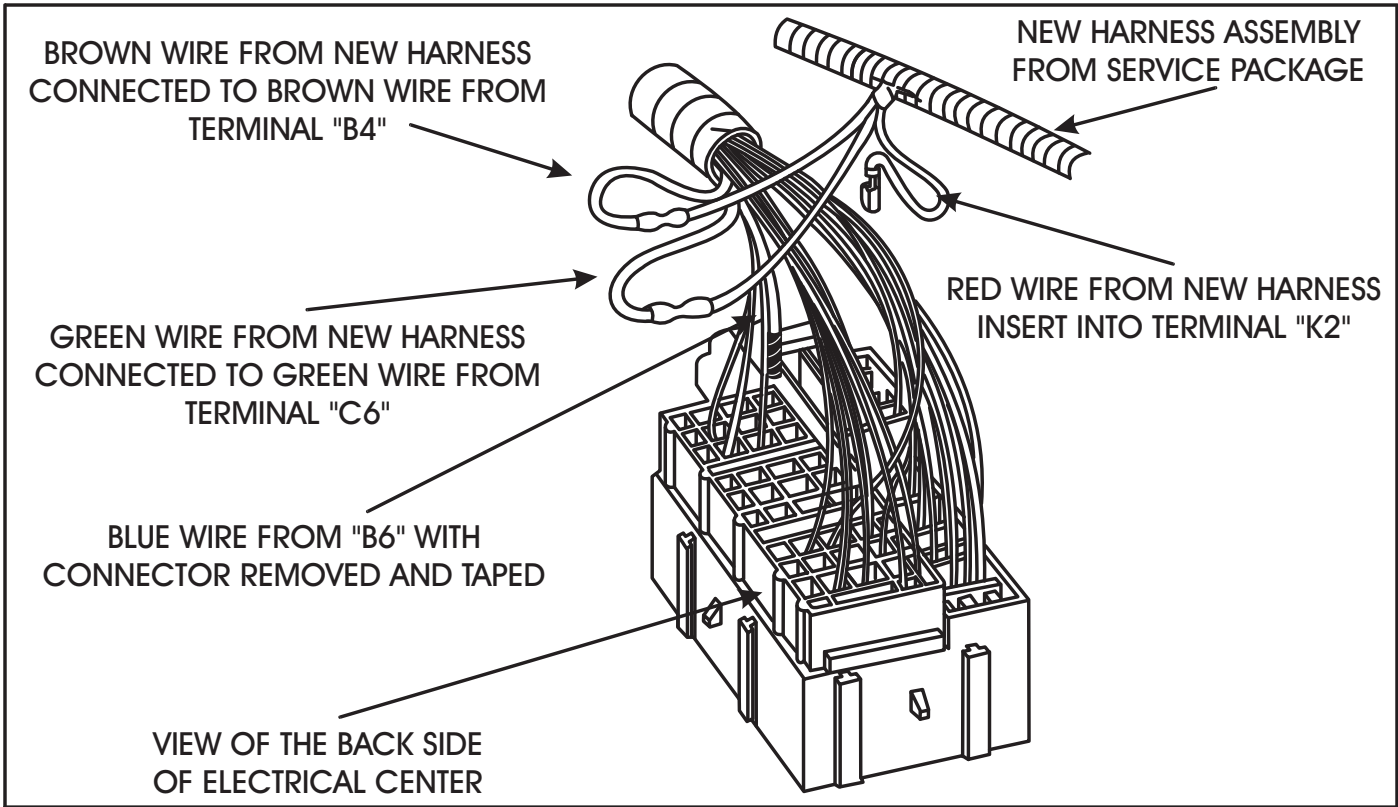


Figure 5

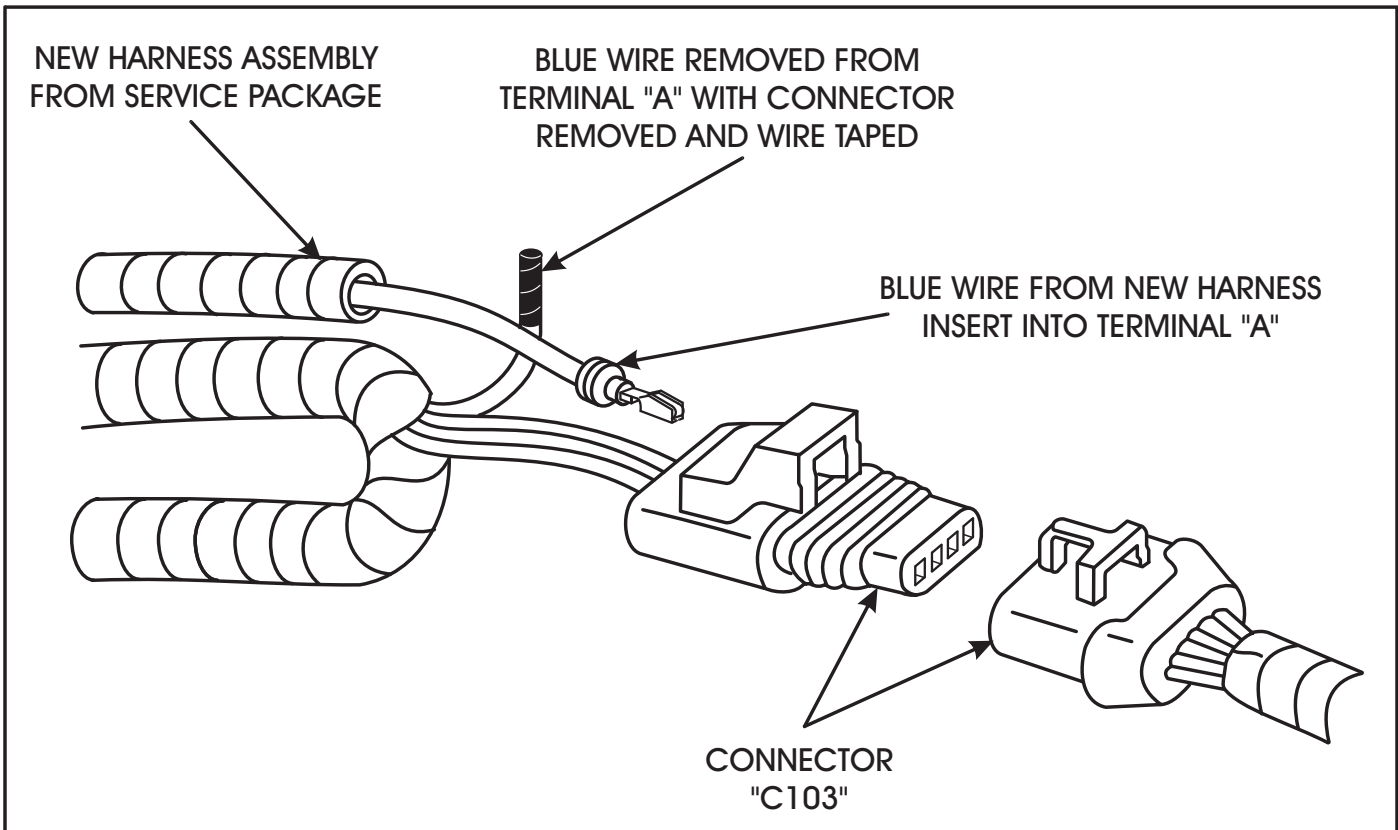


Figure 6

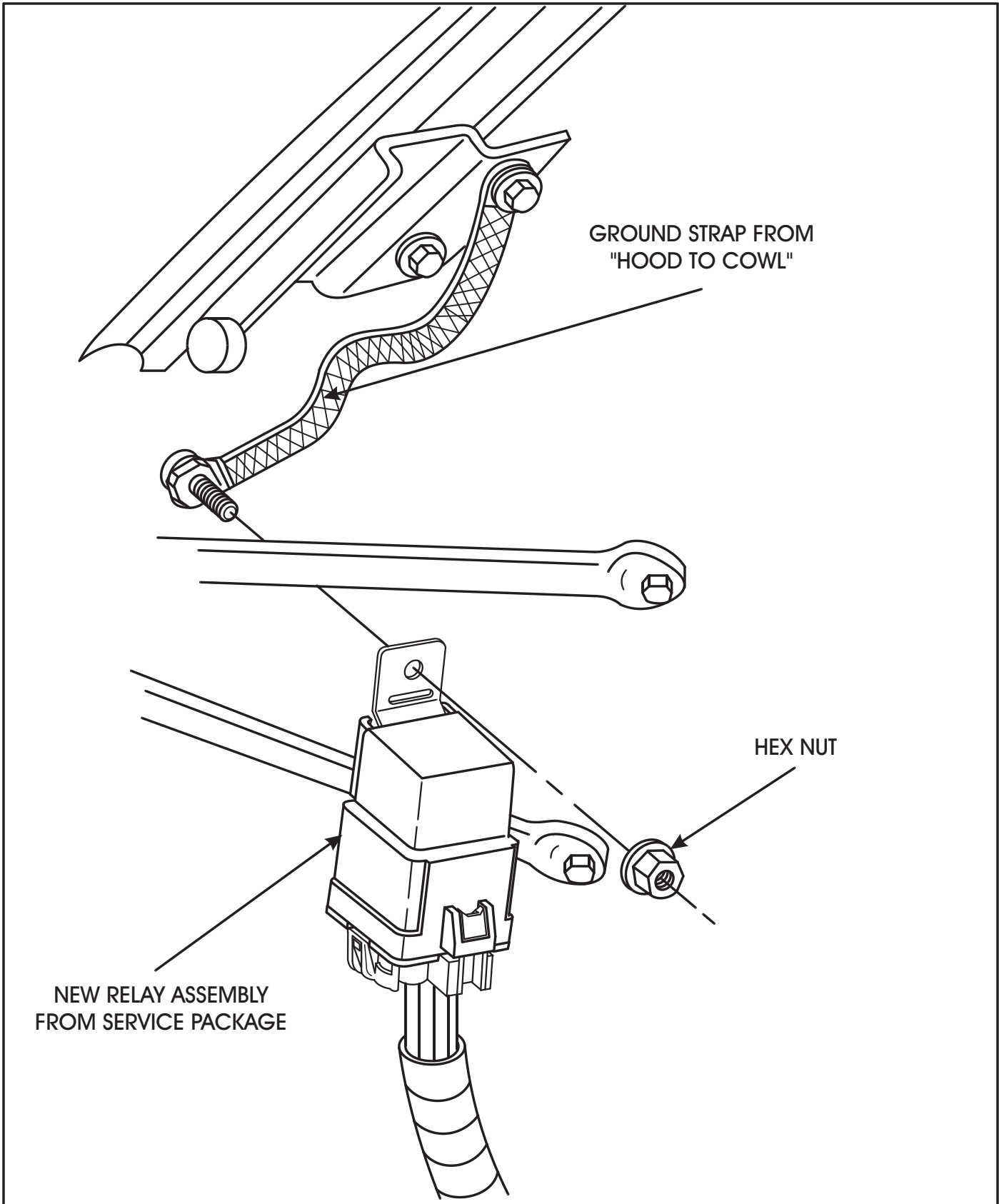


Figure 7



Technical Service Information

THM 4L60-E PUSH-IN COOLER LINE FITTINGS FOR TRUCK AND VANS

CHANGE: Beginning at the start of production for 1996 models, all "C" and "K" Trucks and "G" Vans were built with a new design "Push-In" cooler line fittings for the transmission, as shown in Figure 21.

REASON: Ease of installation at the Truck Assembly Plants.

PARTS AFFECTED:

VEHICLE COOLER LINES - Modified oil cooler lines to accommodate the new design "Push-In" transmission cooler line fittings.

NOTE: General Motors recommends that the retaining "Clip" in the new design cooler line fittings be replaced every time that the cooler line is removed.

SERVICE INFORMATION:

Cooler Line Fitting (5/16" Lines)	8637742
Cooler Line Fitting (3/8" Lines)	8651654
Cooler Line Fitting (Push-In)	24205102
Cooler Line Fitting Retaining Clip (Push-In).....	24205103

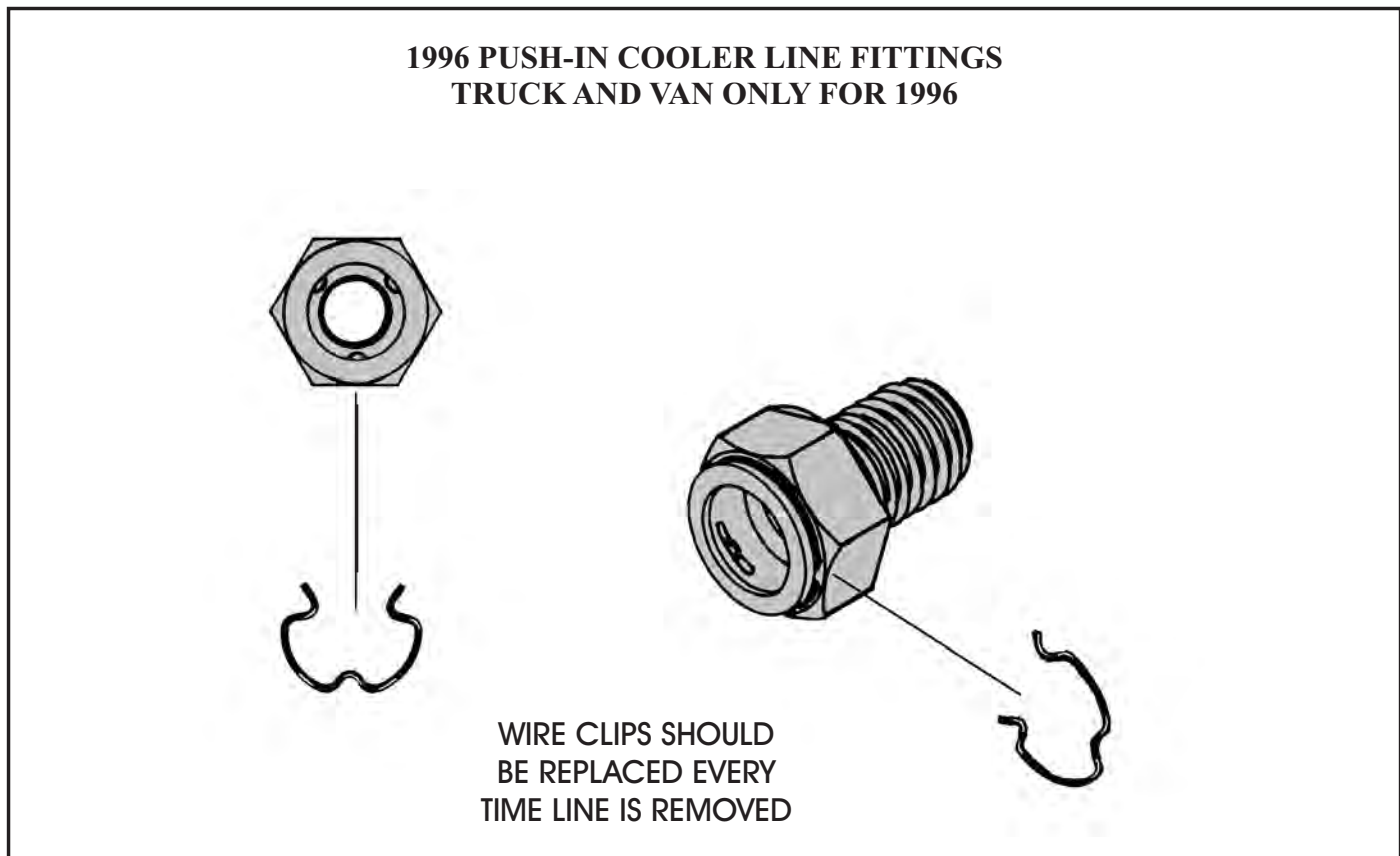


Figure 1



Technical Service Information

THM 4L60-E INTERMITTENT PRESSURE RISE ON 1996 MODELS ONLY

COMPLAINT: Beginning at the start of production for all 1996 model vehicles equipped with the THM 4L60-E transmission, there was a VCM (Vehicle Control Module) installed on the vehicles with an internal ground wire that connects the two printed circuit boards together. Some vehicles with the VCM will display very erratic and unstable line pressure rise in the transmission, and in some instances, premature failure of the transmission.

CAUSE: Bad ground connection from one printed circuit board to the other.

CORRECTION: There is now available from OEM parts sources, a new service repair kit with an instruction sheet, to repair 1996 vehicles with this condition, and is available under OEM part number 12167310.

Step Number One:

Remove the wire and terminal from location 18 in the "Clear" connector, and install one end of the jumper wire that is included in the service kit into location 18 in the "Clear" connector, and reinstall the clear connector, as shown in Figure 1.

Step Number Two:

Install the wire and terminal that was removed from cavity location 18 in the clear connector, into empty cavity location 23 of the "Blue" connector, as shown in Figure 1.

Step Number Three:

Install the other end of the included jumper wire that was previously installed in cavity 18 of the clear connector, into empty cavity location 26 of the "Red" connector, as shown in Figure 1.

SERVICE INFORMATION:

Service Repair Kit 12167310

VEHICLE CONTROL MODULE

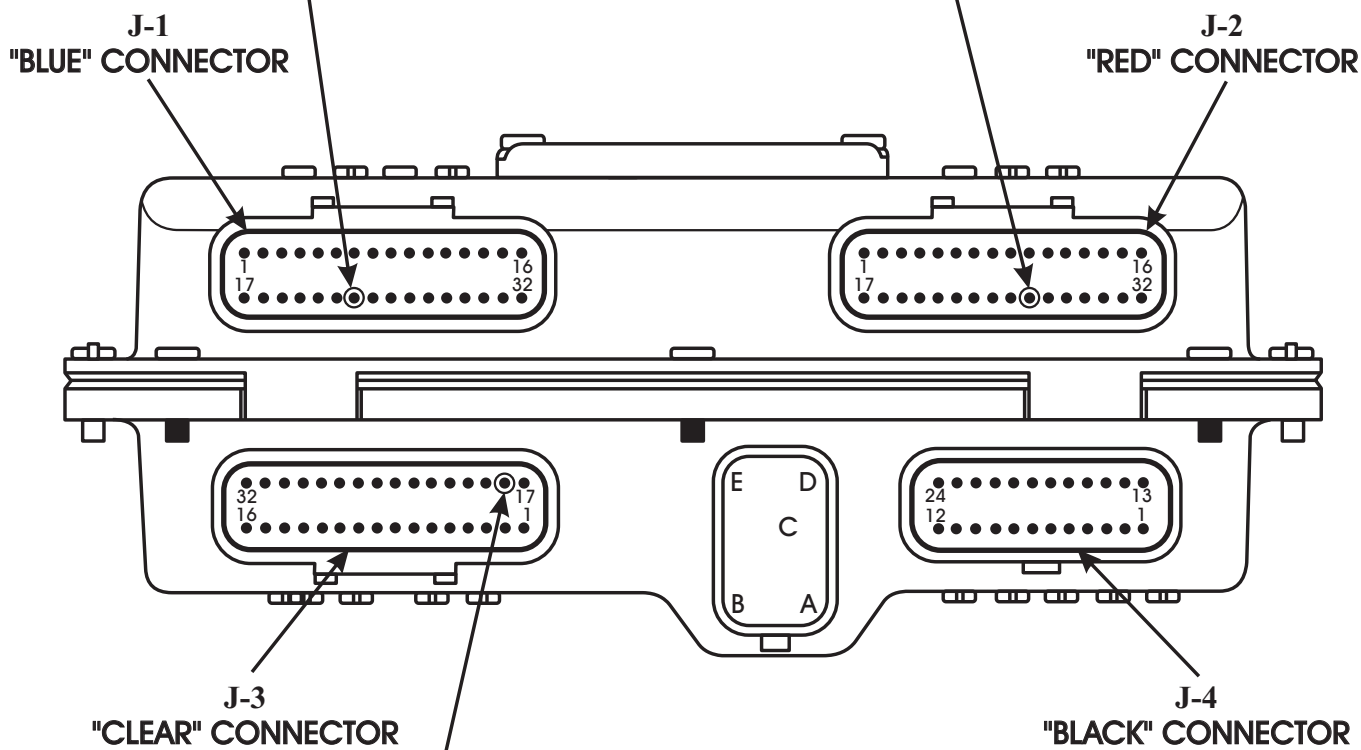
*OEM Harness Repair Kit
Part Number 12167310*

Step Number Two

INSTALL THE WIRE AND TERMINAL THAT WAS REMOVED FROM LOCATION 18 IN THE CLEAR CONNECTOR, INTO CAVITY LOCATION 23 OF THE BLUE CONNECTOR.

Step Number Three

INSTALL THE OTHER END OF THE INCLUDED JUMPER WIRE THAT WAS PREVIOUSLY INSTALLED INTO THE CLEAR CONNECTOR, INTO CAVITY LOCATION 26 OF THE RED CONNECTOR.



Step Number One

REMOVE THE WIRE AND TERMINAL FROM LOCATION 18 ON THE CLEAR CONNECTOR, AND INSTALL ONE END OF THE INCLUDED JUMPER WIRE INTO LOCATION 18 ON THE CLEAR CONNECTOR.

"REFERENCE COLORS NOT VISIBLE UNTIL CONNECTOR IS REMOVED"

Figure 1



Technical Service Information

THM 4L60 AND 4L60-E PREMATURE 3-4 CLUTCH FAILURE

COMPLAINT: After rebuild, the vehicle exhibits premature 3-4 clutch failure, sometimes in as little as 2000 miles of use. Usually associated with Police, Taxi, or heavy duty use.

CAUSE: The cause may be, not using the high energy clutch plates, and the thick (.106") steel plates, or not enough line pressure rise with throttle opening.

CORRECTION NUMBER 1:

Install the latest design 3-4 clutch pack from General Motors that allows the use of the thickest (.106") steel plates, and requires the following parts:

1. New design 3-4 Apply Ring with shorter legs.
2. New design one piece 3-4 Apply Plate.
3. New Design .106" thick 3-4 Steel Plates, 5 required (See Figure 1).
4. New design high energy 3-4 Friction Plates, 6 required (See Figure 1).
5. New design 3-4 Selective Backing Plate, as they are thinner.
6. Re-install the 3-4 Load Release Springs in the late design stack-up (See Figure 2).
7. Ensure that you have .050"-.070" clutch clearance.

CORRECTION NUMBER 2:

There is available from Trans-Go® a new Vacuum Modulator Kit, that *does solve* the line pressure rise with throttle opening concerns that are associated with the 4L60-E unit. This new kit replaces the EPC Solenoid with a vacuum modulator and includes all necessary parts for the installation.

SERVICE INFORMATION:

3-4 Clutch Apply Ring (New Design)	8685043
3-4 Clutch Apply Plate (New Design)	8685044
3-4 Clutch Steel Plates (.106" Thick)	8685045
3-4 Clutch Backing Plate (Selective .227", Stamped "A")	8685046
3-4 Clutch Backing Plate (Selective .192", Stamped "B")	8685047
3-4 Clutch Backing Plate (Selective .157", Stamped "C")	8685048
3-4 Load Release Springs	8667424
3-4 Clutch Friction Plates (High Energy)	24207605
3-4 Clutch Service Package (1987-1998)	
Includes the parts listed above, plus the 7605 friction plates	8690923

SPECIAL NOTE:

The 2050 high energy friction plates normally associated with the above kit have been replaced with the 7605 high energy friction plates for increased durability. Refer to Figure 1. The 2050 high energy friction plates have been discontinued.

3-4 CLUTCH LINED AND STEEL PLATES

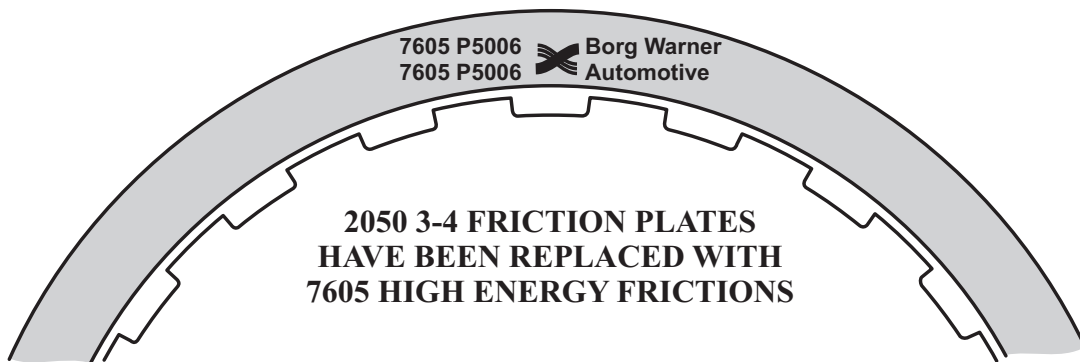
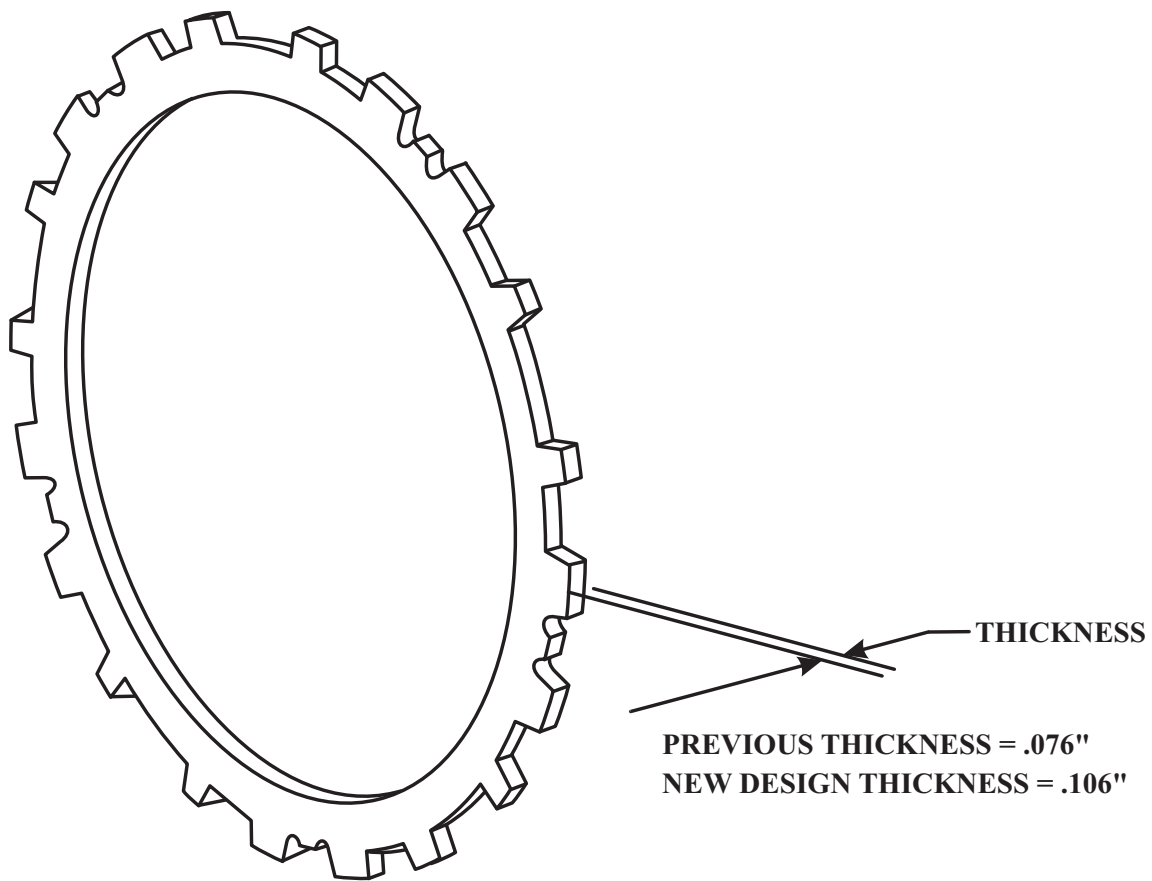


Figure 1

RE-USE THE 3-4 LOAD RELEASE SPRINGS IN THE NEW DESIGN CLUTCH PACK ONLY

Re-install the 3-4 load release springs when you are using the .106" thick steel plates, 7605 high energy lined plates, new design 3-4 apply ring, new design one piece apply plate and new design backing plate.

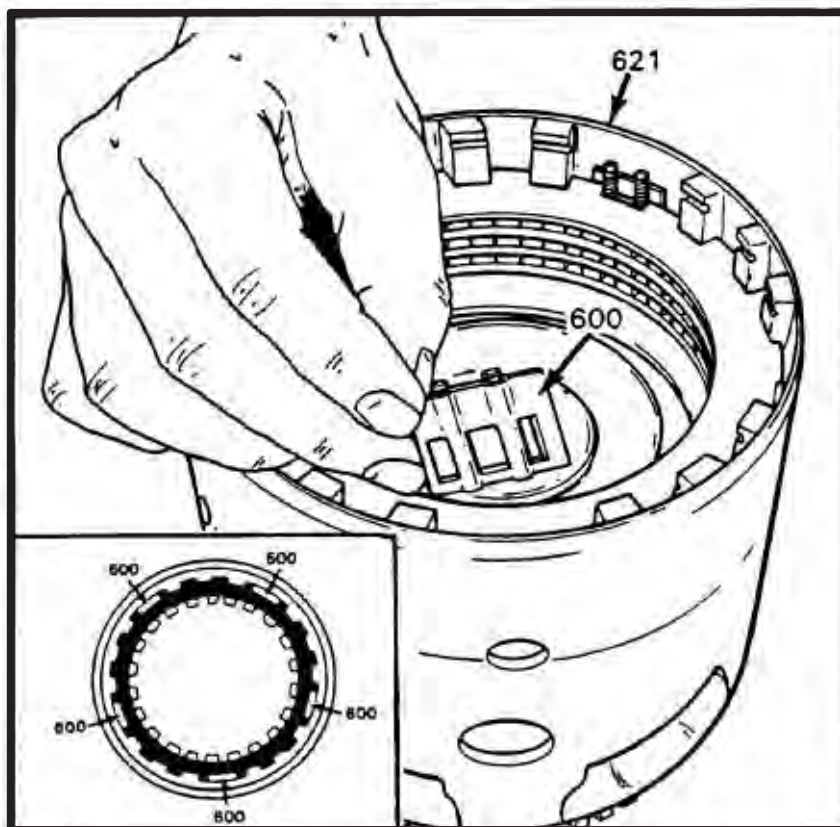


Figure 2

THM 4L60-E

2ND GEAR START, 2-3 SHIFT ONLY OR LACK OF LINE PRESSURE RISE

COMPLAINT: Before and/or after rebuild the vehicle exhibits a 2nd gear start with only a 2-3 shift and possibly a lack of proper line pressure rise with throttle opening.

CAUSE: The cause may be, one or both of the screens in the spacer plate collapsed shut, and restricting solenoid feed oil or actuator feed oil to the Pressure Control Solenoid.

CORRECTION: Replace both screens in the spacer plate as shown in Figure 1, with the part numbers listed below. These *new part numbers* are screens with a larger micron screen that will pass more oil easier.

SERVICE INFORMATION:

Electronic Pressure Control Solenoid Screen	24209145
Shift Solenoid Screen	24209144

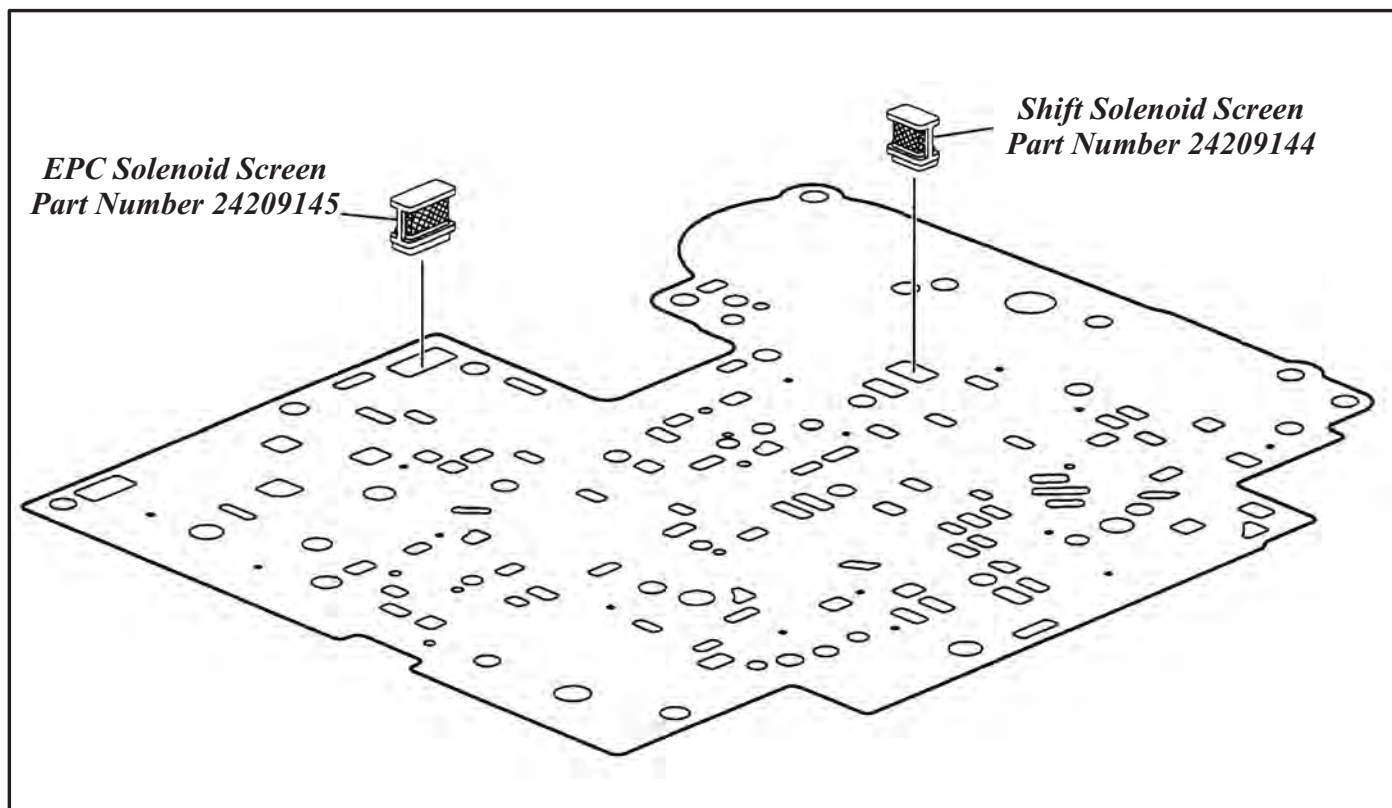


Figure 1



Technical Service Information

THM 4L60-E NEW DESIGN OUTPUT SHAFT SPEED SENSOR

CHANGE: Beginning at the start of production for 1996 models, some THM 4L60-E transmissions were built with a new design Output Shaft Speed Sensor, as shown in Figure 1. Corvette models will be the only vehicle that will continue to use the previous design speed sensor, as shown in Figure 1.

REASON: Ease of assembly and cost savings.

PARTS AFFECTED:

- (1) EXTENSION HOUSING - New casting with smaller speed sensor bore diameter, to accept the new design Output Shaft Speed Sensor, as shown in Figure 1.

SERVICE INFORMATION:

Output Shaft Speed Sensor (Previous Design)	8673299
Output Shaft Speed Sensor (1996 New Design)	10456194

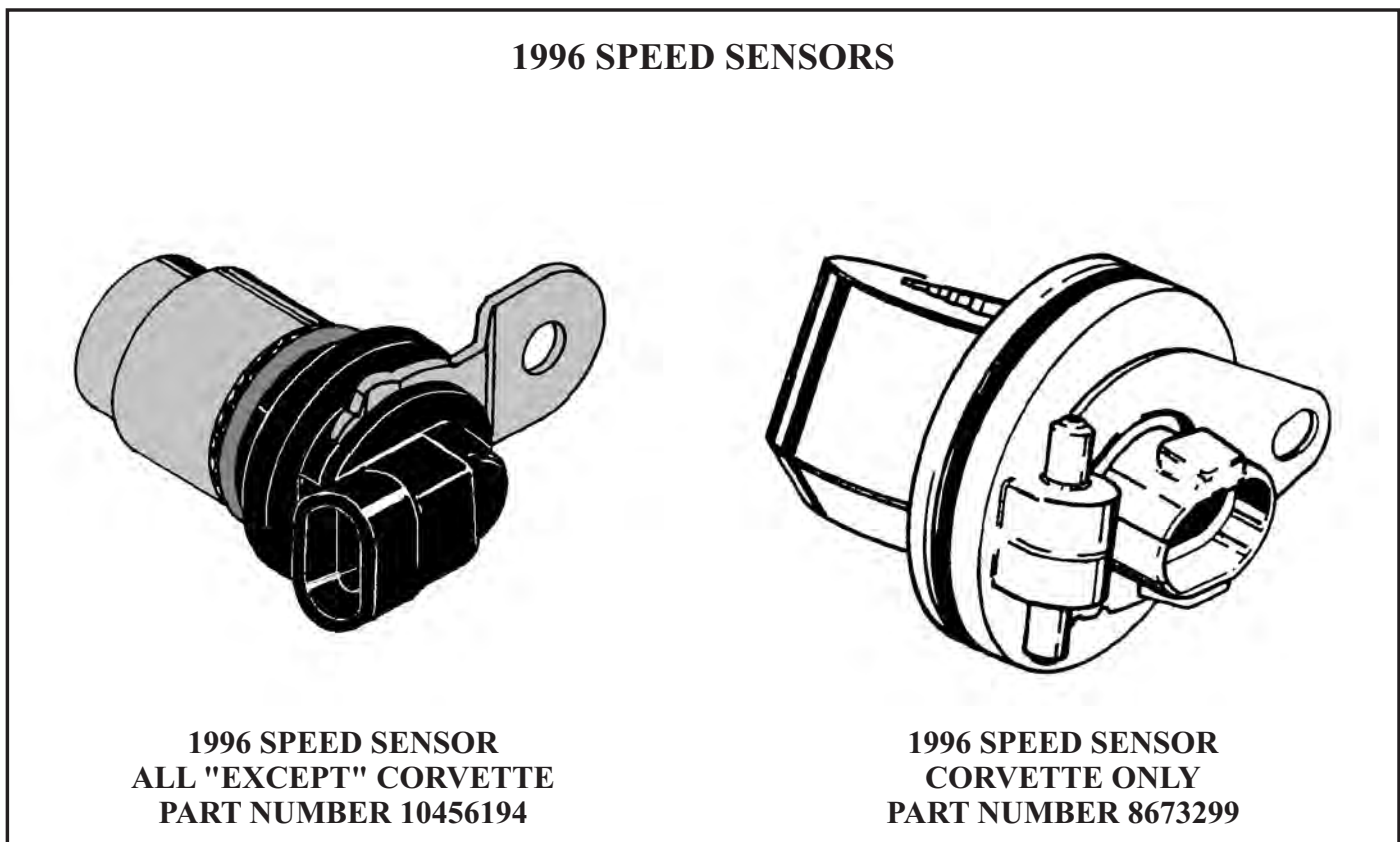


Figure 1



Technical Service Information

THM 4L60-E STAMPED STEEL, MOULDED RUBBER, FORWARD AND OVERRUN PISTONS ADDED FOR 1997

CHANGE: Beginning at the start of production for 1997 models, all THM 4L60-E transmissions will be built with stamped steel, moulded rubber seals for both forward and overrun clutch pistons, as shown in Figure 1. The 3-4 clutch stamped steel piston was introduced in 1993.

REASON: Cost savings and increased durability.

PARTS AFFECTED:

- (1) FORWARD CLUTCH PISTON - Now manufactured of stamped steel with moulded rubber inner and outer seals, for increased durability against cracking (See Figure 1).
- (2) OVERRUN CLUTCH PISTON - Now manufactured of stamped steel with moulded rubber inner and outer seals, for increased durability and cost savings (See Figure 1).
- (3) 3-4 CLUTCH PISTON - Now manufactured of stamped steel with moulded rubber inner and outer seals, for increased durability and cost savings (See Figure 1).

INTERCHANGEABILITY:

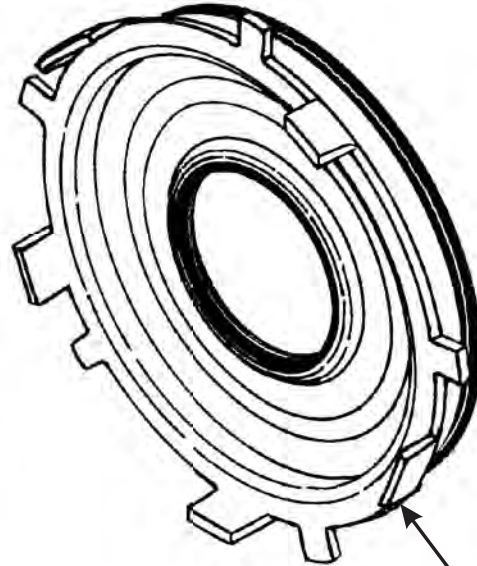
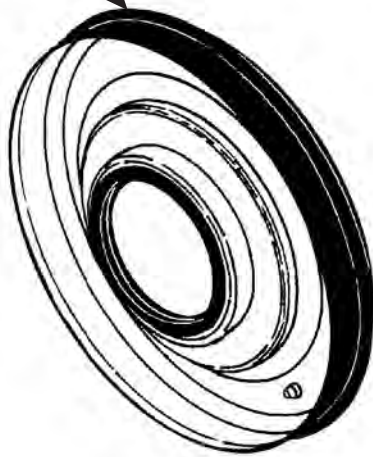
All of the pistons listed above, the Forward Clutch Piston, the Overrun Clutch Piston, and the 3-4 Clutch Piston will retro-fit back on all previous models, including the THM 700-R4 transmission.

SERVICE INFORMATION:

Forward Clutch Piston (Stamped Steel, Moulded Rubber)	24205272
Overrun Clutch Piston (Stamped Steel, Moulded Rubber)	24205273
3-4 Clutch Piston (Stamped Steel, Moulded Rubber)	24200290

**ALL PISTONS IN THE INPUT HOUSING ARE NOW
STAMPED STEEL, WITH MOULDED RUBBER SEALS**

**OVERRUN CLUTCH PISTON
PART NO. 24205273**



**FORWARD CLUTCH PISTON
PART NO. 24205272**

**FORWARD CLUTCH PISTON
PART NO. 24200290**

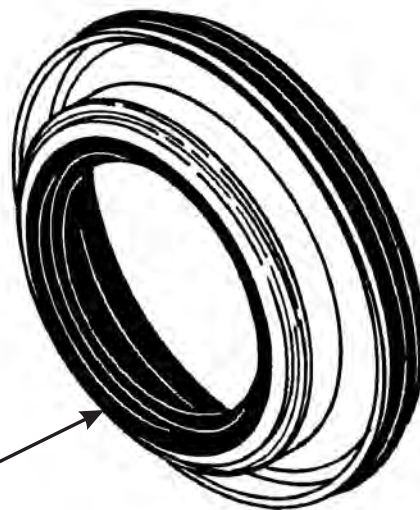


Figure 1



Technical Service Information

THM 4L60-E NEW "DEEP" BOTTOM PAN AND FILTER FOR 1998

CHANGE: Beginning at the start of production for 1998 model vehicles, there was a new design bottom pan introduced on all "C" Trucks, "K" Trucks and "G" Vans. All other models use the regular pan, except the Corvette. The Corvette has its own pan since 1997. The new design bottom pan is approximately 17mm deeper and requires a new design filter.

REASON: Improved fluid temperature control.

PARTS AFFECTED:

- (1) **BOTTOM PAN** - New design is approximately 17mm deeper than the regular pan, and all three bottom pans used in 1998 models are illustrated in Figure 3 for identification purposes.
- (2) **BOTTOM PAN FILTER** - There are now three different filters for the 1998 model year. The bottom profile of the filters are all the same as shown in Figure 1. The side profiles however are different as the "Deep" pan requires the filter with the longer neck, the "Regular" pan requires the filter with the shorter neck, and the 97-up Corvette requires the filter with the added extension on the bottom. Refer to Figure 2.

INTERCHANGEABILITY:

Bottom pan filters must be used with the correct design level bottom pans and must be used on the models that they were intended for, as shown in Figures 1, 2, and 3.

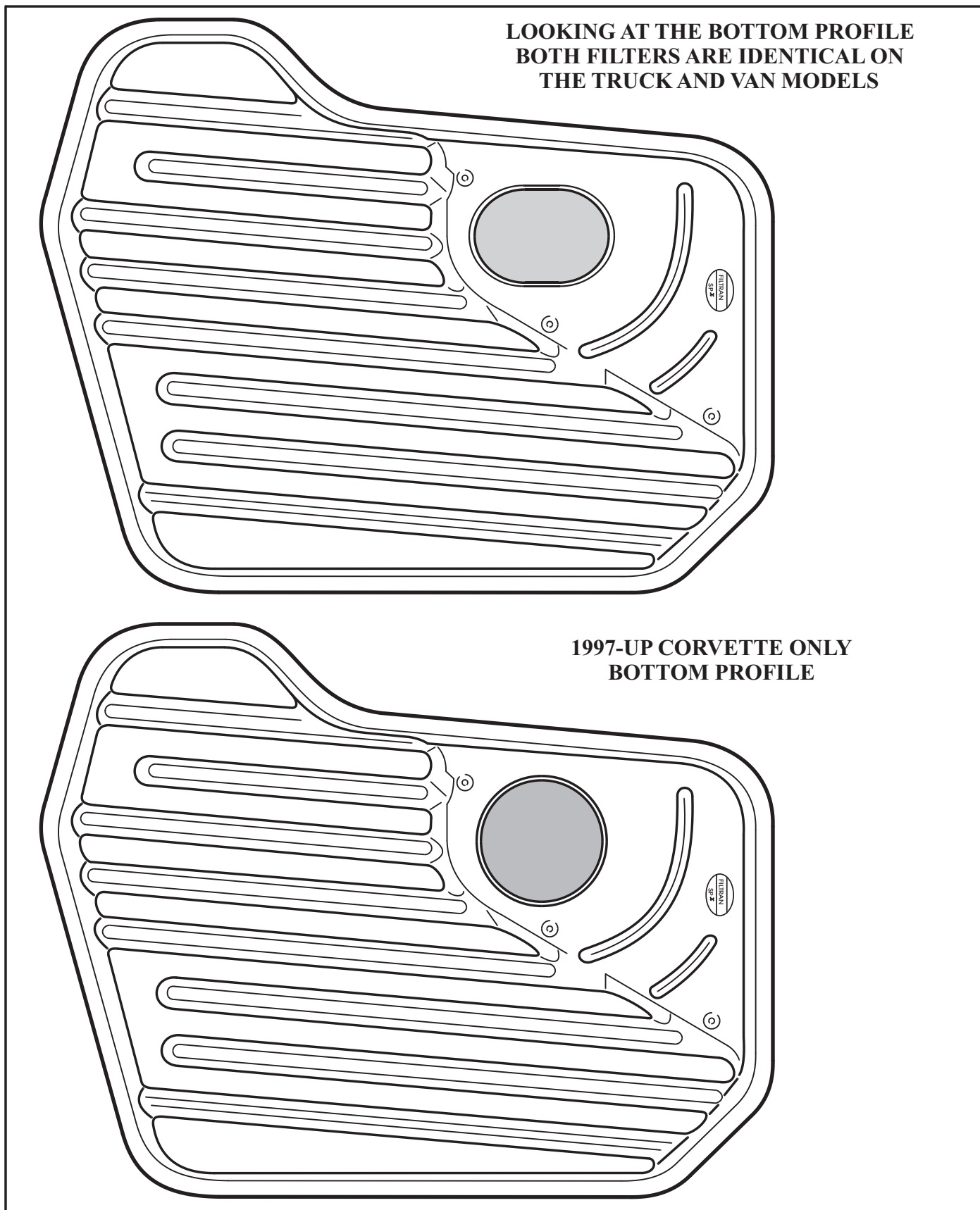


Figure 1

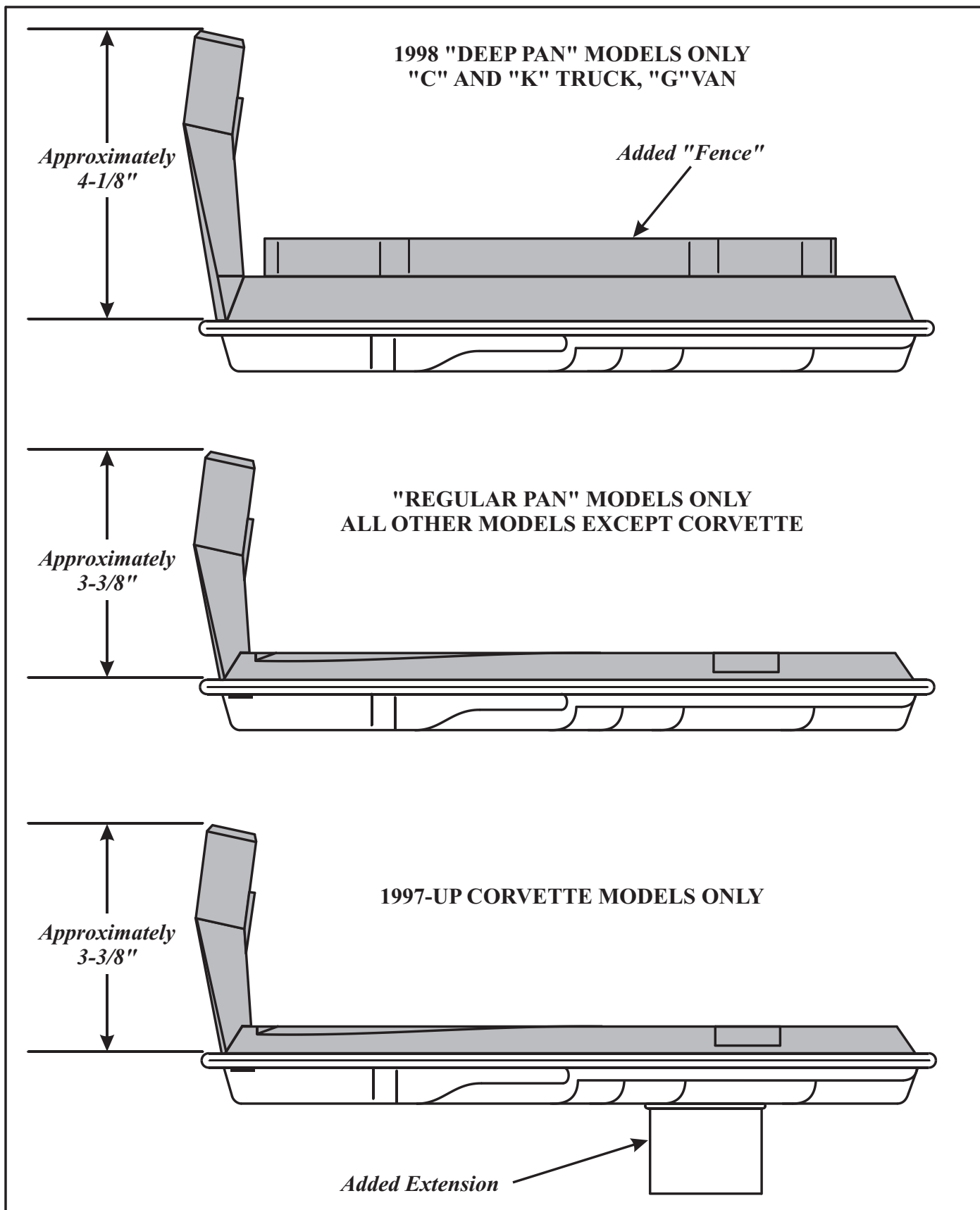


Figure 2

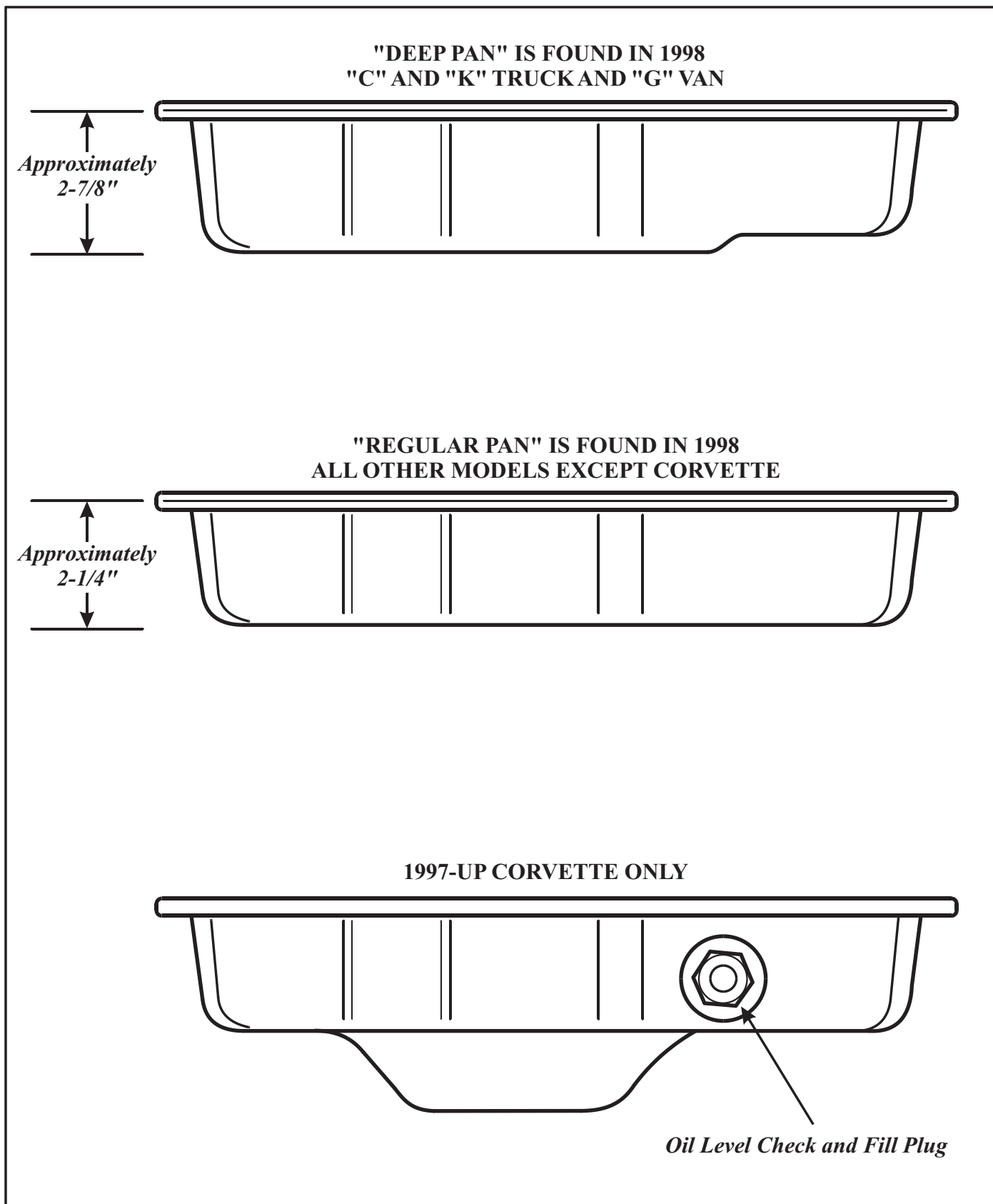


Figure 3



Technical Service Information

THM 4L60-E NEW "DIPSTICK STOP BRACKET"

CHANGE: Beginning at the start of production for 1998 model vehicles, new design Dipstick Stop Brackets have been introduced bringing the total number of available brackets up to 3.

REASON: There was a new design bottom pan introduced on all "C" Trucks, "K" Trucks and "G" Vans. All other models use the regular pan, except the Corvette. The Corvette has its own pan since 1997. The new design bottom pan is approximately 17mm deeper and requires a new design filter and dipstick stop bracket (See Figure 1 for dipstick bracket location).

PARTS AFFECTED:

- (1) **BOTTOM PAN** - The 1998 new design pan is 17mm deeper than the regular pan.
- (2) **VALVE BODY** - The 1998 Valve body now has an added chamfer made to the casting making room for the design change to the dipstick stop bracket (See Figure 2).
- (3) **DIPSTICK STOP BRACKET** - There is a new dipstick stop bracket for regular pans with chamfered valve bodies and one specifically designed for deep pans with chamfered valve bodies (See Figure 3).

INTERCHANGEABILITY:

Dipstick stop bracket # 1 is to be used **only** with regular pans on valve bodies **without** the additional chamfer (See Figure 2 and 3).

Dipstick stop bracket # 2 is to be used **only** with regular pans on valve bodies **with** the additional chamfer (See Figure 2 and 3).

Dipstick stop bracket # 3 is to be used **only** with deep pans on valve bodies **with** the additional chamfer (See Figure 2 and 3).

THM 4L60-E DIPSTICK STOP BRACKET LOCATION

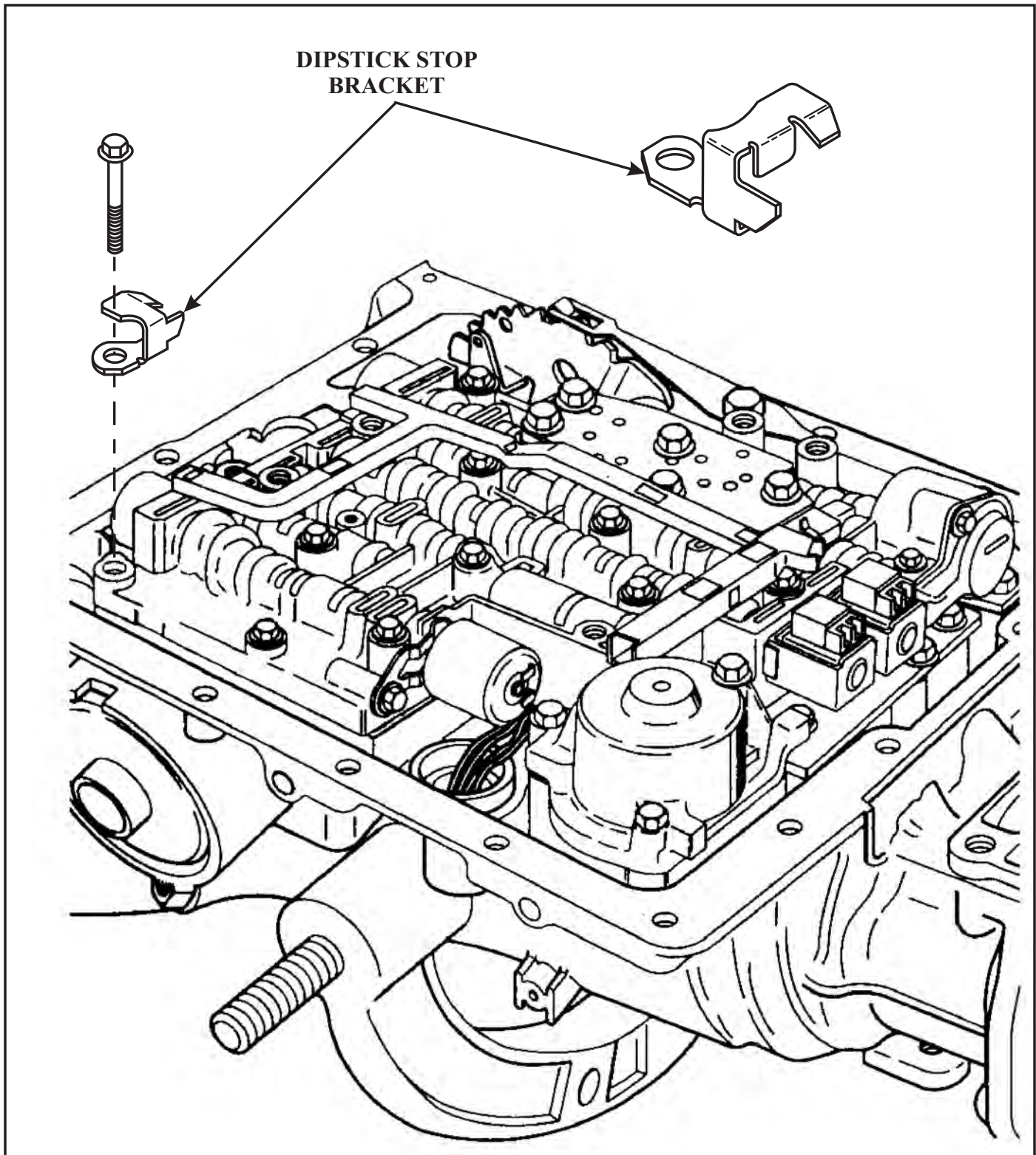


Figure 2

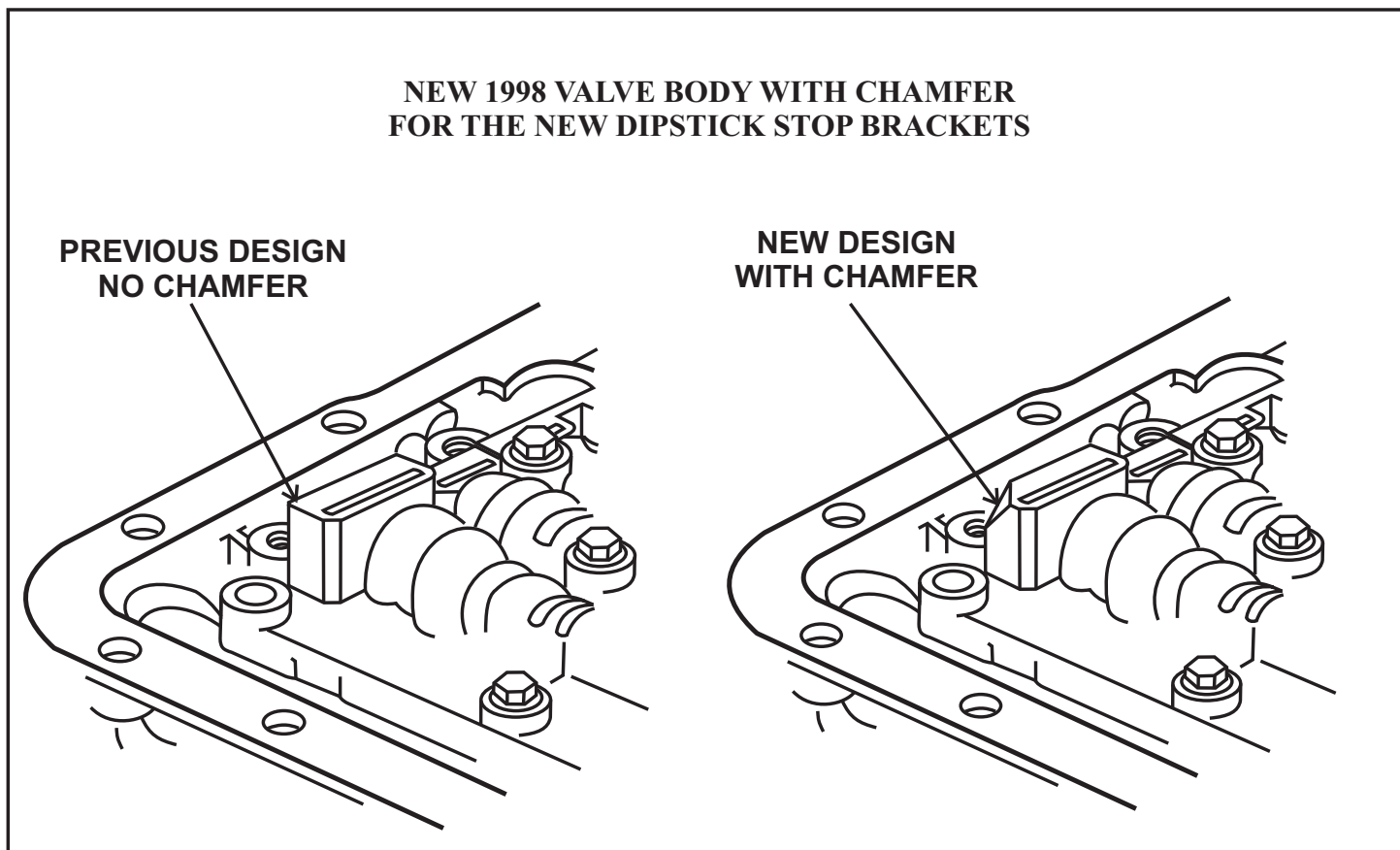


Figure 2

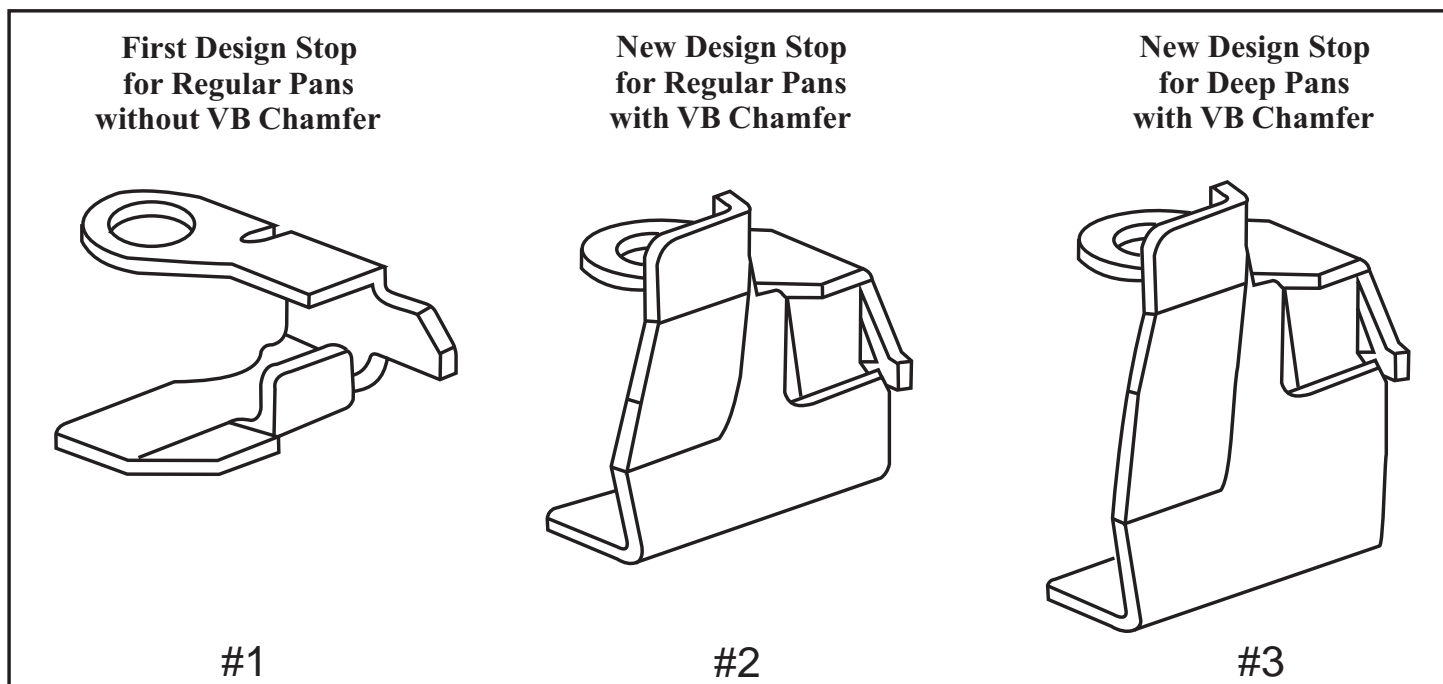


Figure 3



Technical Service Information

THM 4L60-E BIND-UP IN MANUAL LOW AND REVERSE 2ND GEAR START AND BIND ON 2-3 SHIFT

COMPLAINT: After overhaul, the vehicle exhibits a bind up in manual low and reverse. It takes off in second gear in the OD position and binds up going into third gear.

CAUSE: There are different length valve body bolts which can be easily mis-positioned (See Figure 1). A *common* error is placing a 54.4 millimeter length bolt into a location designed for a 47.5 millimeter length bolt (See Figure 2). The mis-located bolt will extend into the barrel of the case and into the sun shell. The bolt now being screwed into the sun shell inhibits the rotation of the shell causing the above complaint.

CORRECTION: Relocate the necessary valve body bolts to their proper location. Use figure 3 to locate the proper positions for the 47.5 and 54.4 millimeter bolt lengths. In severe cases, it may be necessary to remove the transmission in order to replace the damaged sun shell.

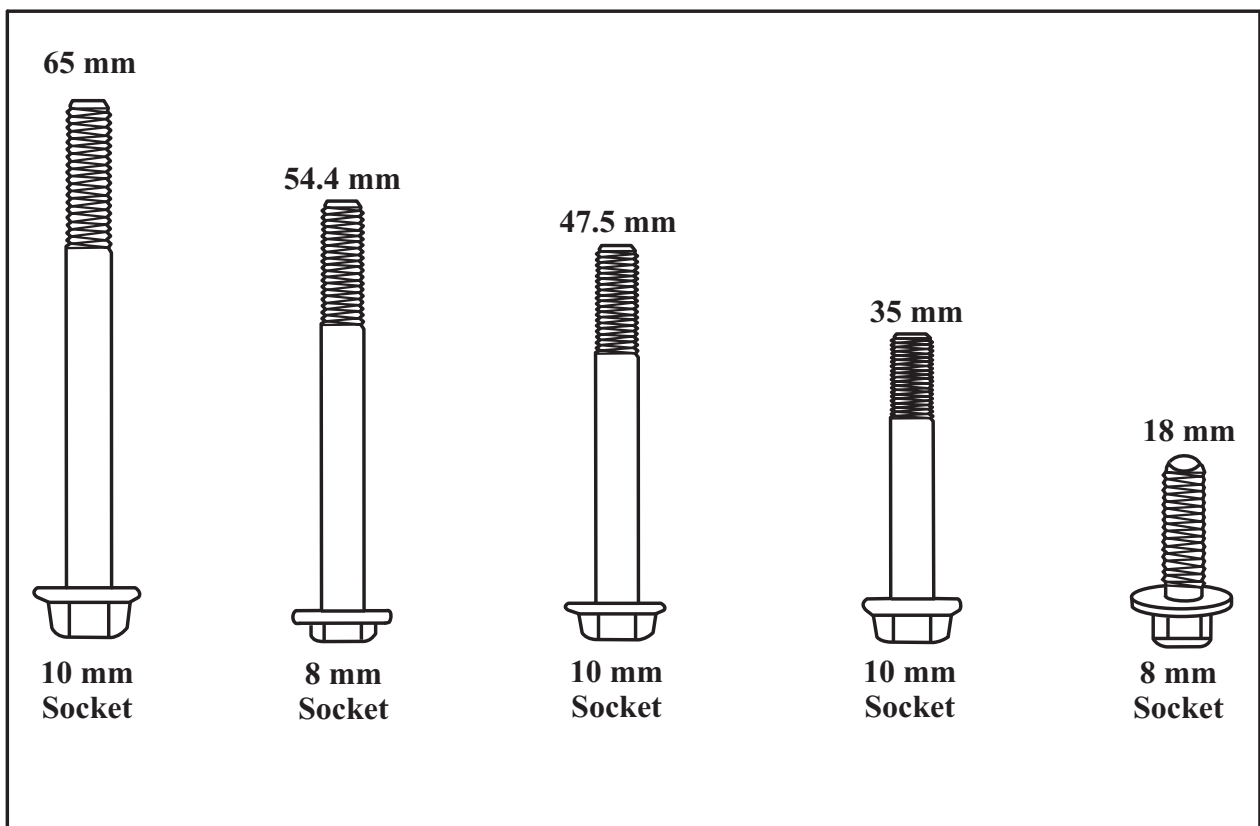


Figure 1

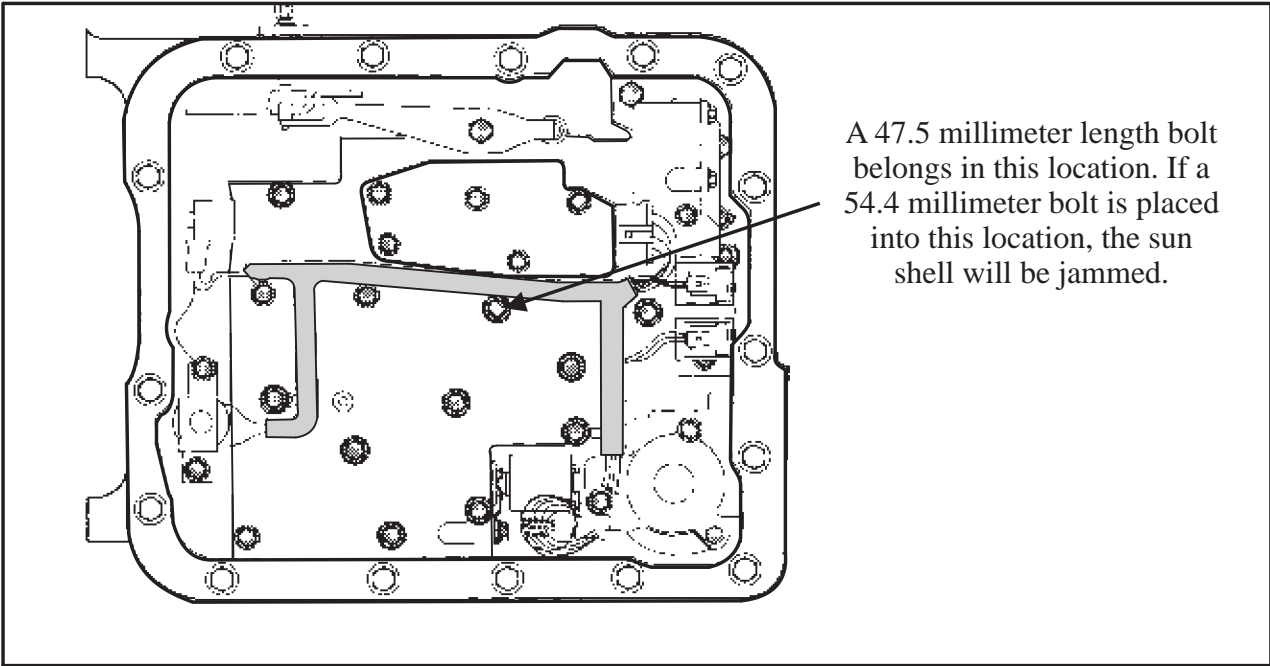


Figure 2

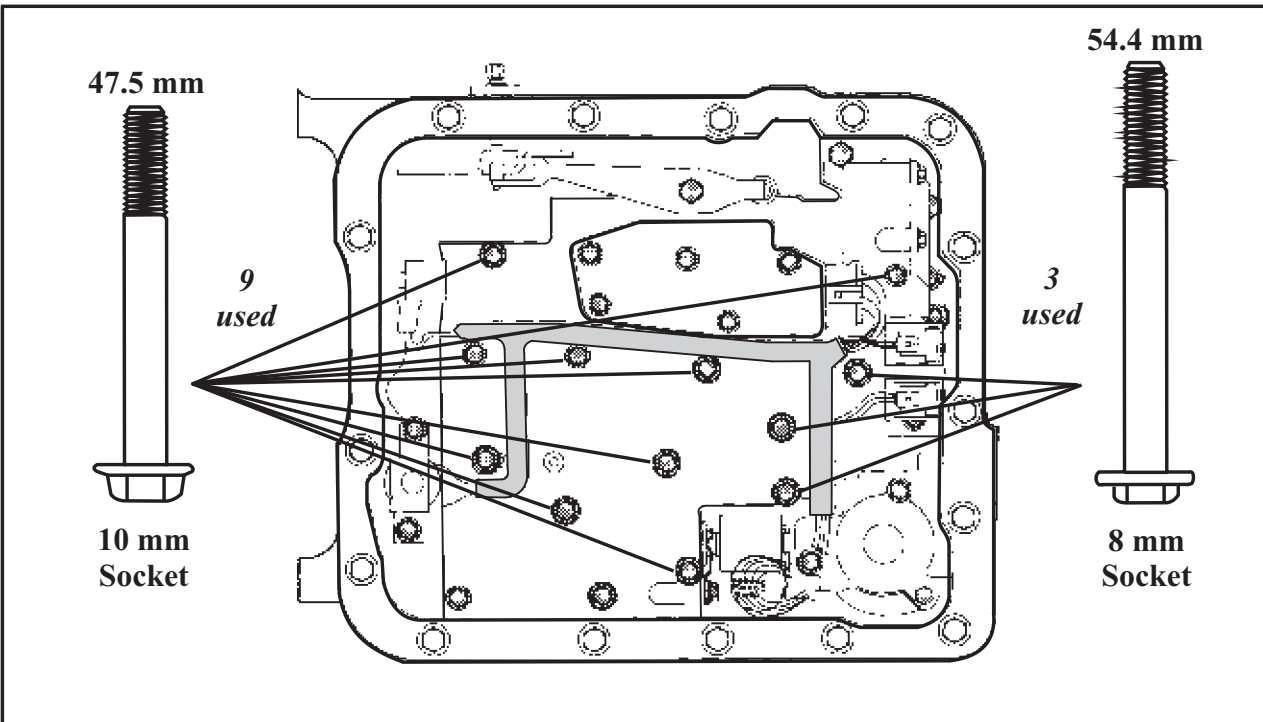


Figure 3



Technical Service Information

THM 4L60-E

PARK/NEUTRAL POSITION SWITCH CONNECTOR CANNOT BE REMOVED

COMPLAINT: Technicians may experience difficulty in removing the connector from the Park/Neutral Position Switch, on some 1995-1998 model trucks and vans, usually when trying to remove the switch during transmission service. In rare cases the customer may report switch related electrical problems, such as improper or no shift indication on the dash indicator, or no back-up light operation.

CAUSE: The cause may be high ambient heat causing the sealing compound in the switch to melt and flow into the connectors, sealing the connectors to the switch. This normally causes no customer concerns, but may cause an open electrical circuit in rare cases.

CORRECTION: If the switch is being removed as part of transmission service, *and there are no switch related concerns*, the switch can be removed without removing the connectors, and left hanging until time to be re-installed. However, some models have a mounting bolt directly behind the switch connectors, which requires removing the connectors, and the switch *will be damaged* in the process (See Figure 3).

There is now available from OEM sources, service repair connectors for both the 7-way and the 4-way connectors under part numbers 15305887 and 15305925 (See Figure 3).

Note: The service connector pigtailed use wires that are all the same color. Use the old connector as a pattern to ensure that the new wires are connected to the vehicle harness correctly. This switch is in a wet area, and it is imperative that the wires be soldered and heat-shrink tubing be used to insure water-tight connections. Refer to Figure 1 for the location of the Park/Neutral Position Switch. Refer to Figure 2 for a full wiring schematic of the Park/Neutral Position Switch circuit for diagnostic purposes.

SERVICE INFORMATION:

Park/Neutral Position Switch (All Models)	12450016
7-Way Repair Connector Assembly (Includes Heat-Shrink Connectors)	15305887
4-Way Repair Connector Assembly (Includes Heat-Shrink Connectors)	15305925

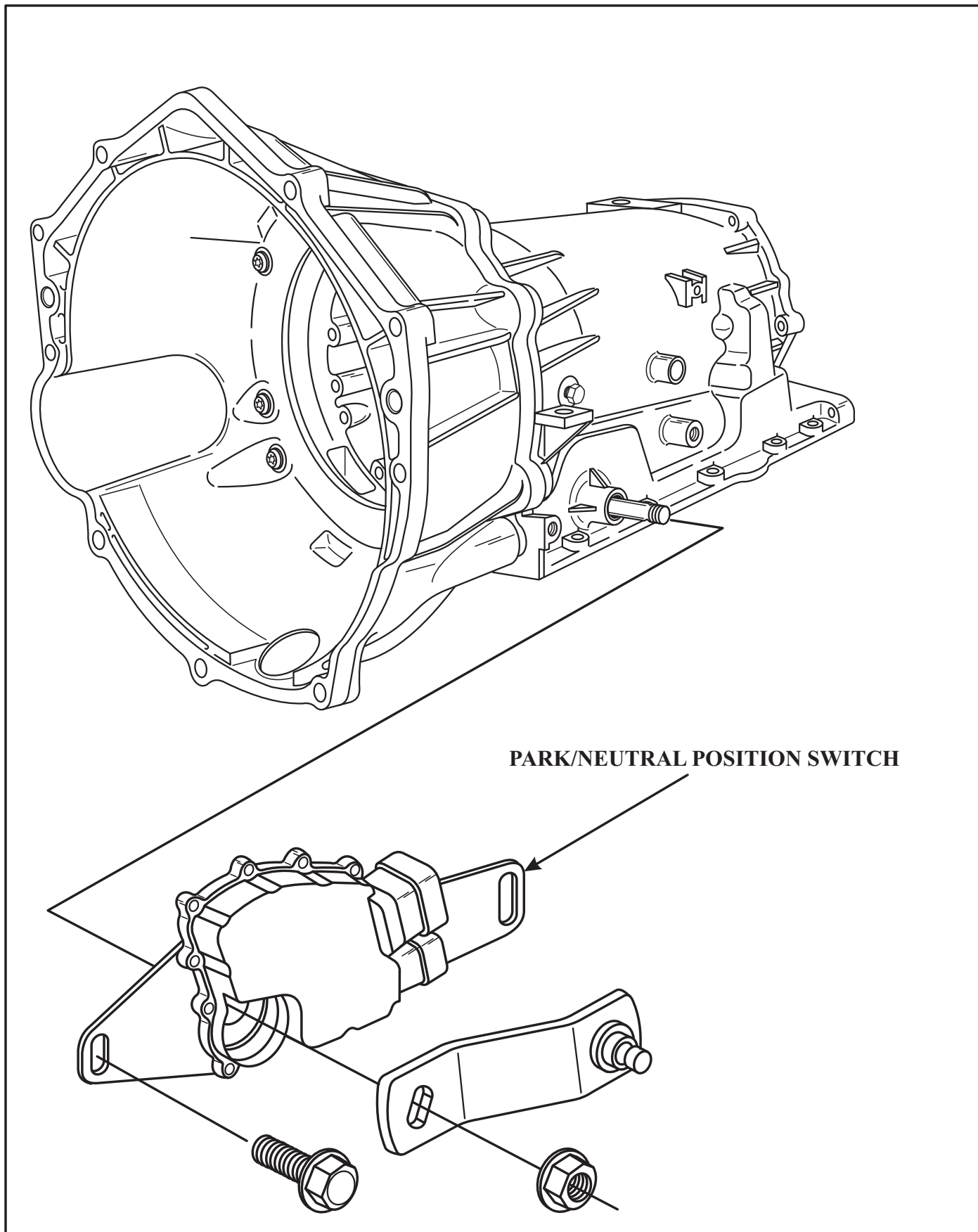


Figure 1

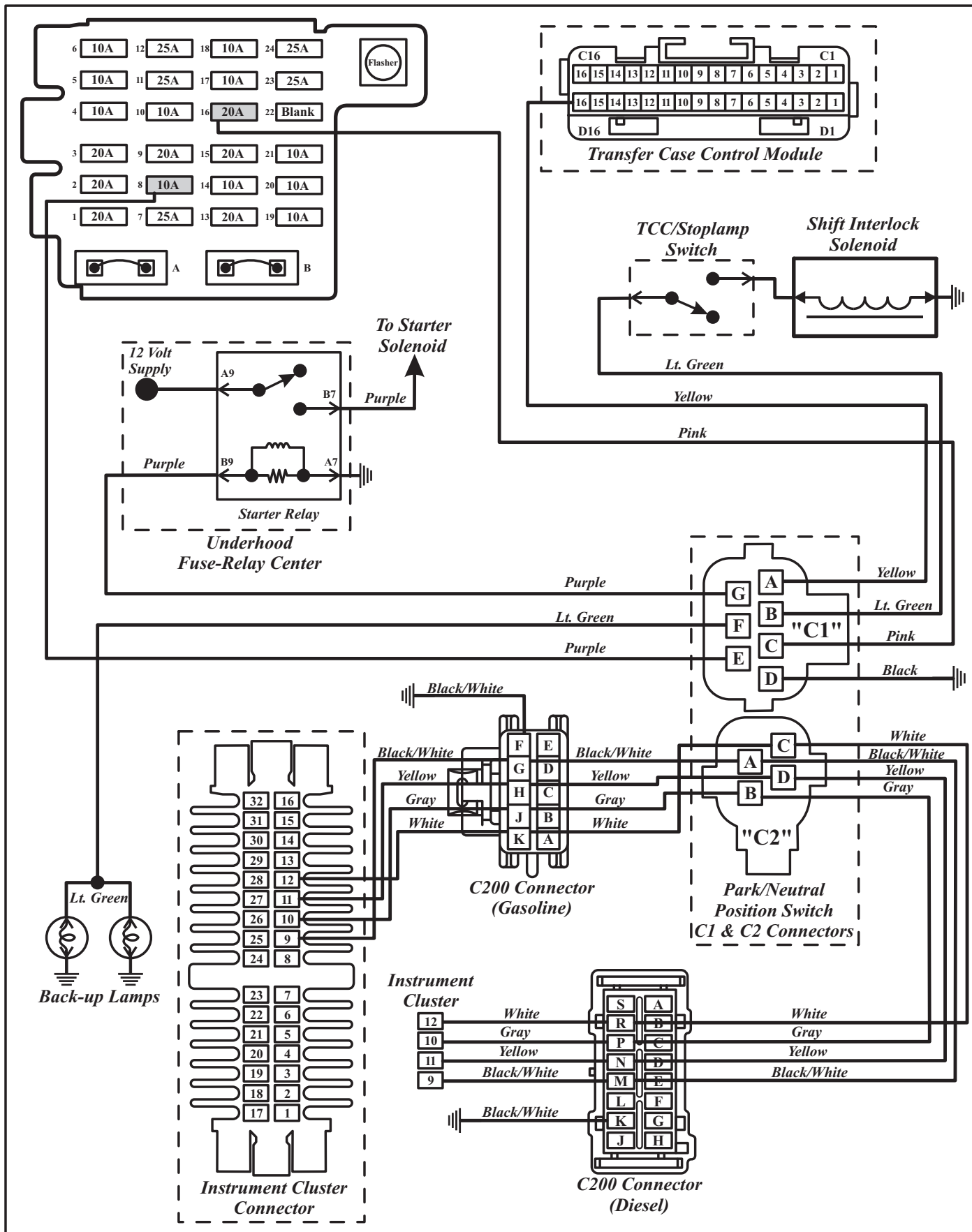


Figure 2

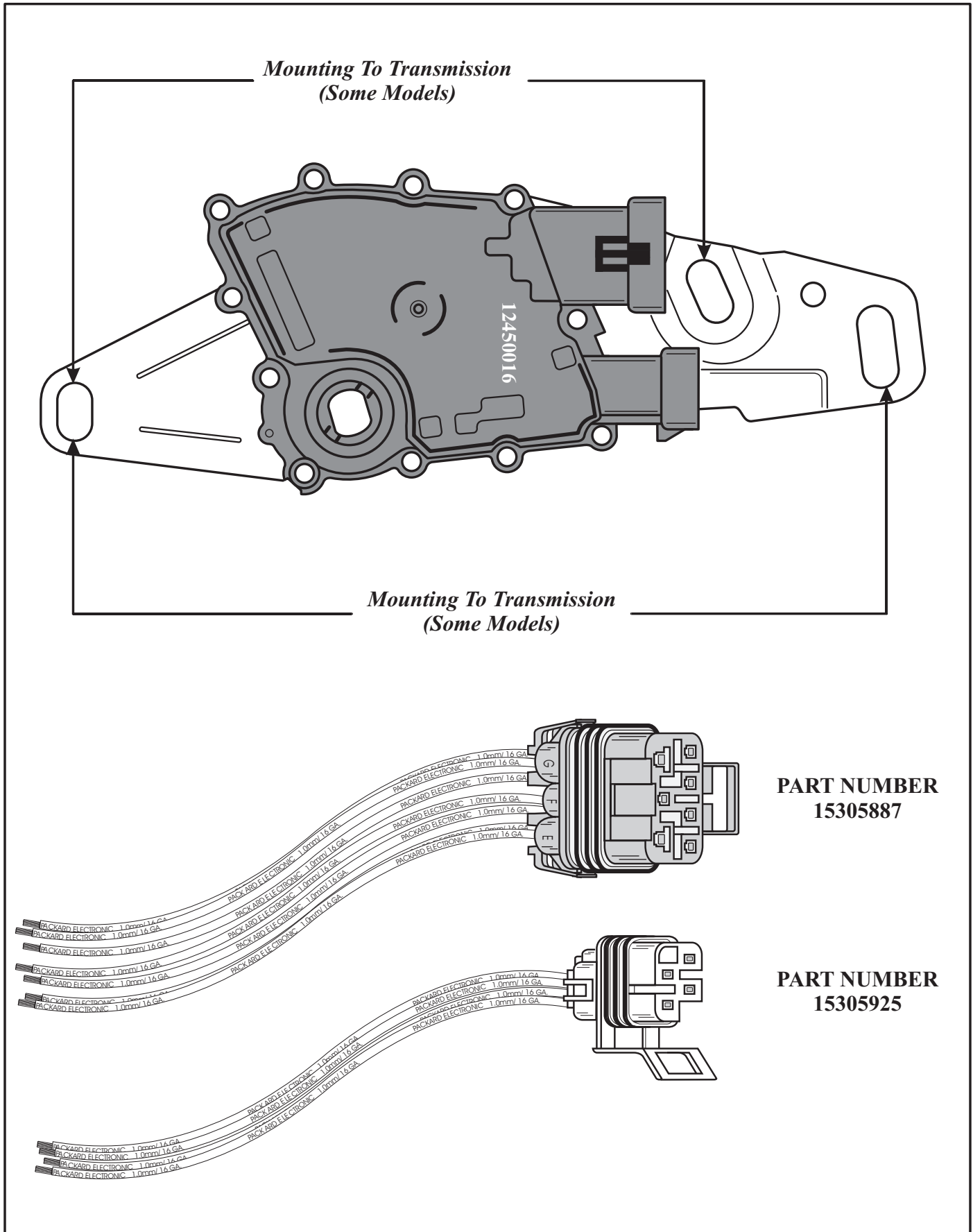


Figure 3



THM 4L60-E "SKF" SINGLE CAGE FORWARD SPRAG DURABILITY

This bulletin is being reprinted to help eliminate some confusion as several technicians are not aware that the "SKF" sprag is okay to use, as long as "second" design mating parts are used with it.

CHANGE: Beginning in January 1995, all THM 4L60-E transmissions were built with dimensional changes on the Forward Sprag Inner Race and the Overrun Clutch Hub.

REASON: Greatly improved durability of the 29 element "SKF" Forward Sprag Assembly.

PARTS AFFECTED:

- (1) FORWARD SPRAG INNER RACE - Dimensional changes on the new design inner race, with the removal of the chamfer, and now fully supports the sprag end bearing, on the end bearing inside diameter. Compare the previous cutaway illustration in Figure 2, with the current cutaway illustration in Figure 3.
- (2) OVERRUN CLUTCH HUB - Dimensional changes on the new design clutch hub, with the elimination of the raised tabs on the teeth. The back side of the clutch hub is now flat, to keep the end bearing inside diameter fully on the inner race. Compare the previous clutch hub illustration in Figure 2, with the current clutch hub illustration in Figure 3.

INTERCHANGEABILITY:

The "SKF" single cage sprag is OK to use, *as long as*, the new design inner race and the new design overrun clutch hub are used with it as a service package (See Figure 1). The complete Forward Sprag Assembly is available under OEM part number 8657928.

The 29 element single cage "SKF" sprag and cage is available from Raybestos.

The 29 element dual cage sprag is available from Borg Warner.

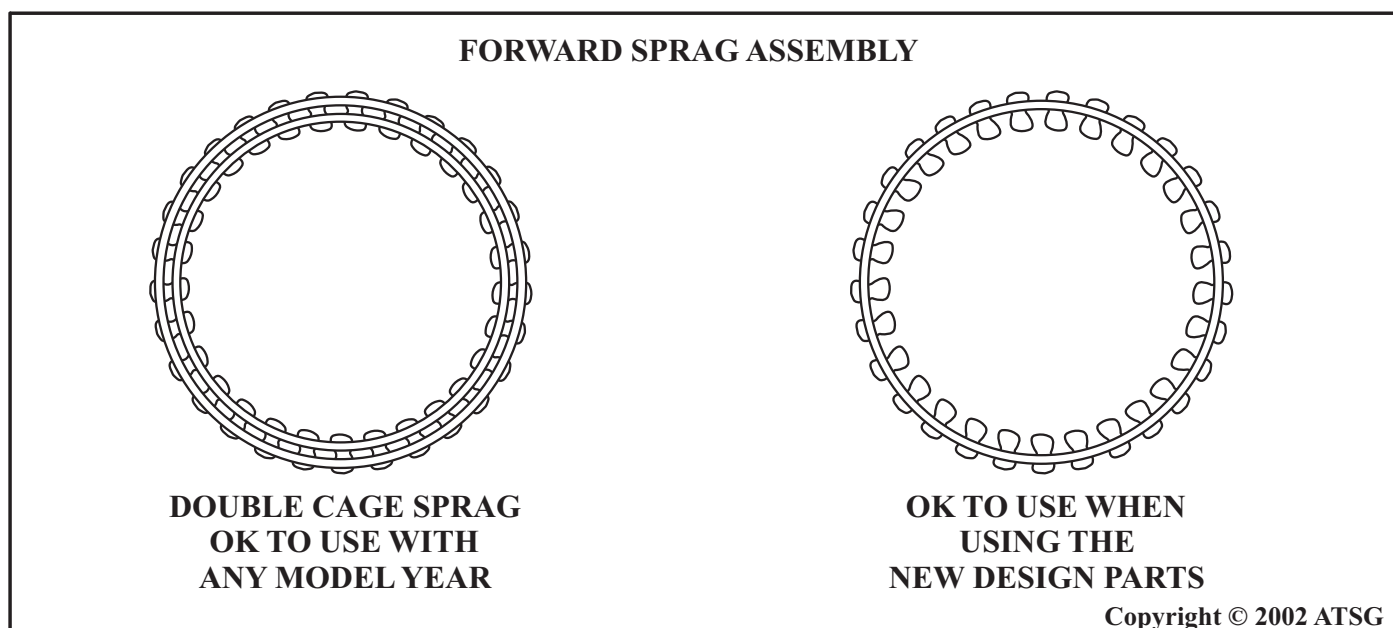


Figure 1

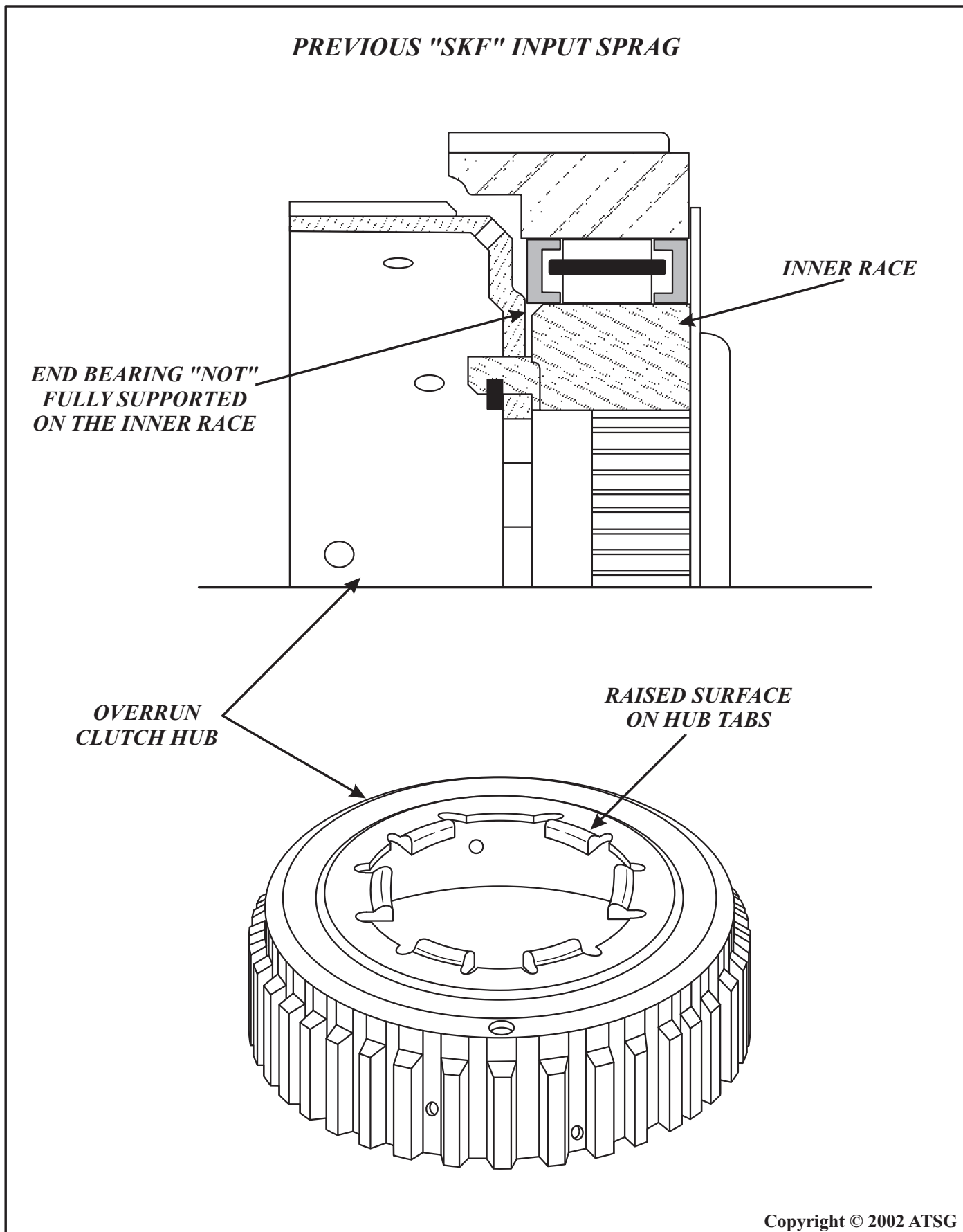
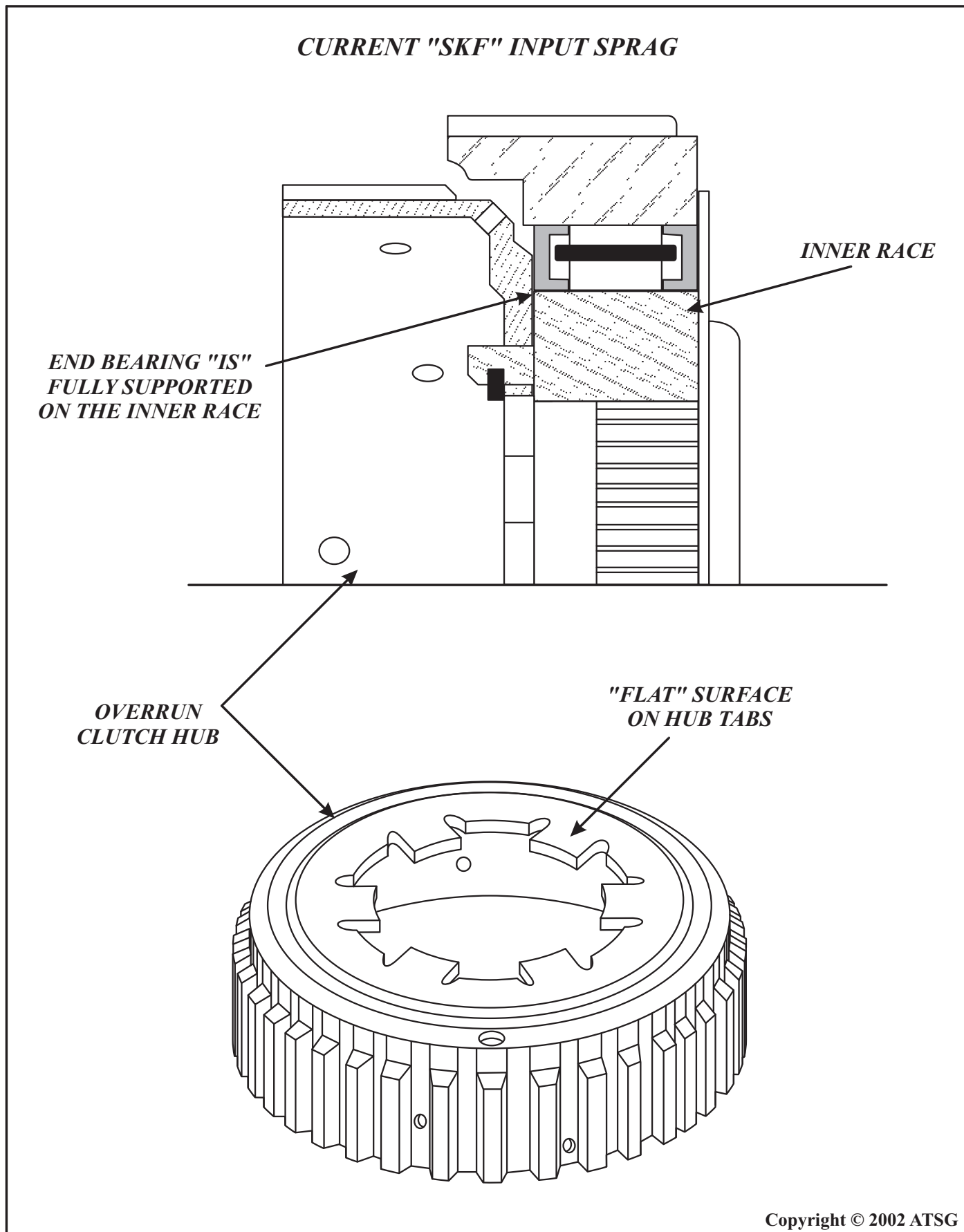


Figure 2



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Figure 3



Technical Service Information

THM 4L60-E/4L65-E NEW SUN SHELL AND THRUST BEARING

CHANGE: Beginning at the start of production for model year 2001, General Motors introduced a new transmission designated THM 4L60-EHD with many engineering changes. Currently this unit is found in all 2001 Cadillac Escalade and any vehicle with 6.0L engine or larger, that was previously equipped with the THM 4L60-E transmission. One of the changes includes a new design sun gear shell and thrust bearing to replace the previous design washer, as shown in Figures 1 and 2.

REASON: Increased durability and reliability.

PARTS AFFECTED:

- (1) SUN GEAR SHELL - The holes in the sun shell for the previous thrust washer have been eliminated, as shown in Figures 1 and 2, to accommodate the new thrust bearing.
- (2) REACTION CARRIER SHAFT - Modified on the rear surface to accommodate the added thrust bearing, as shown in Figures 3 and 4.
- (3) THRUST BEARING - Added for increased durability, as shown in Figures 3 and 4.

INTERCHANGEABILITY:

Will Not interchange with any previous design parts, but *Will* retro-fit back on any previous model 4L60-E transmission, **when used as a service package.**

SERVICE INFORMATION:

Sun Gear Shell (New Design)	24217145
Reaction Carrier Shaft (New Design)	24217157
Sun Shell Thrust Bearing (New Design)	24217328

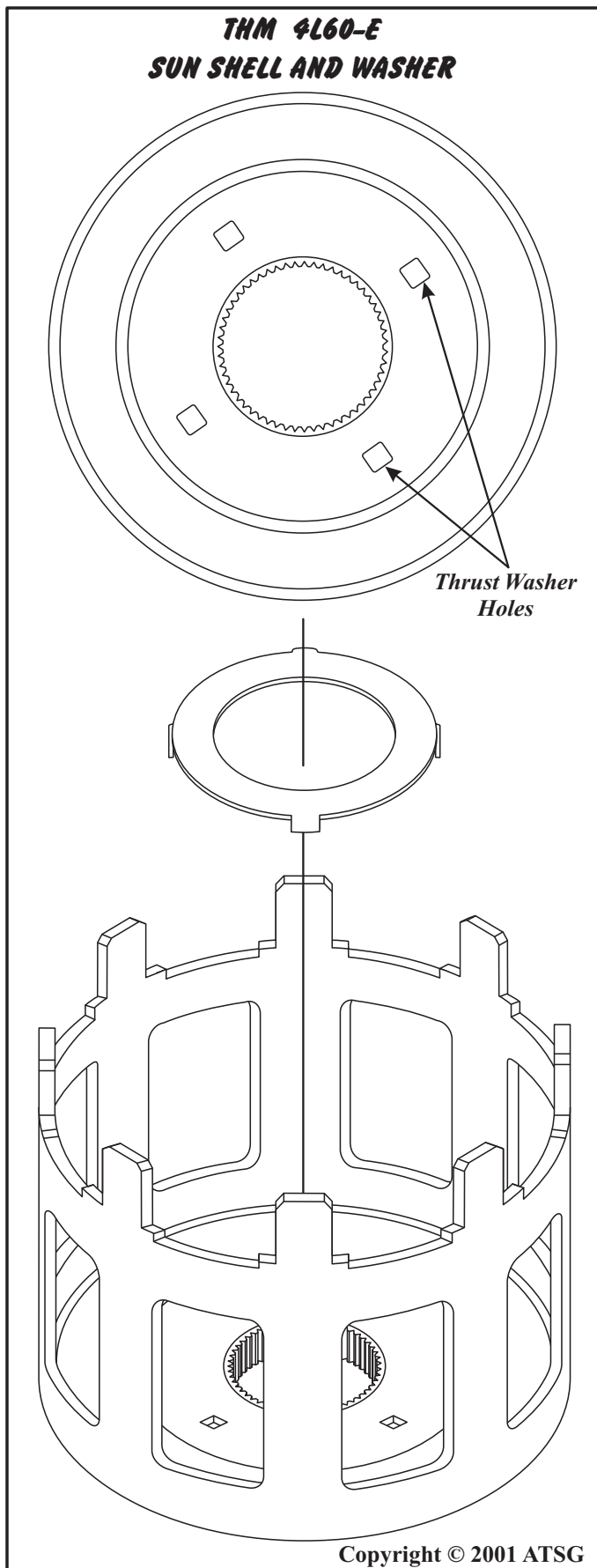


Figure 1

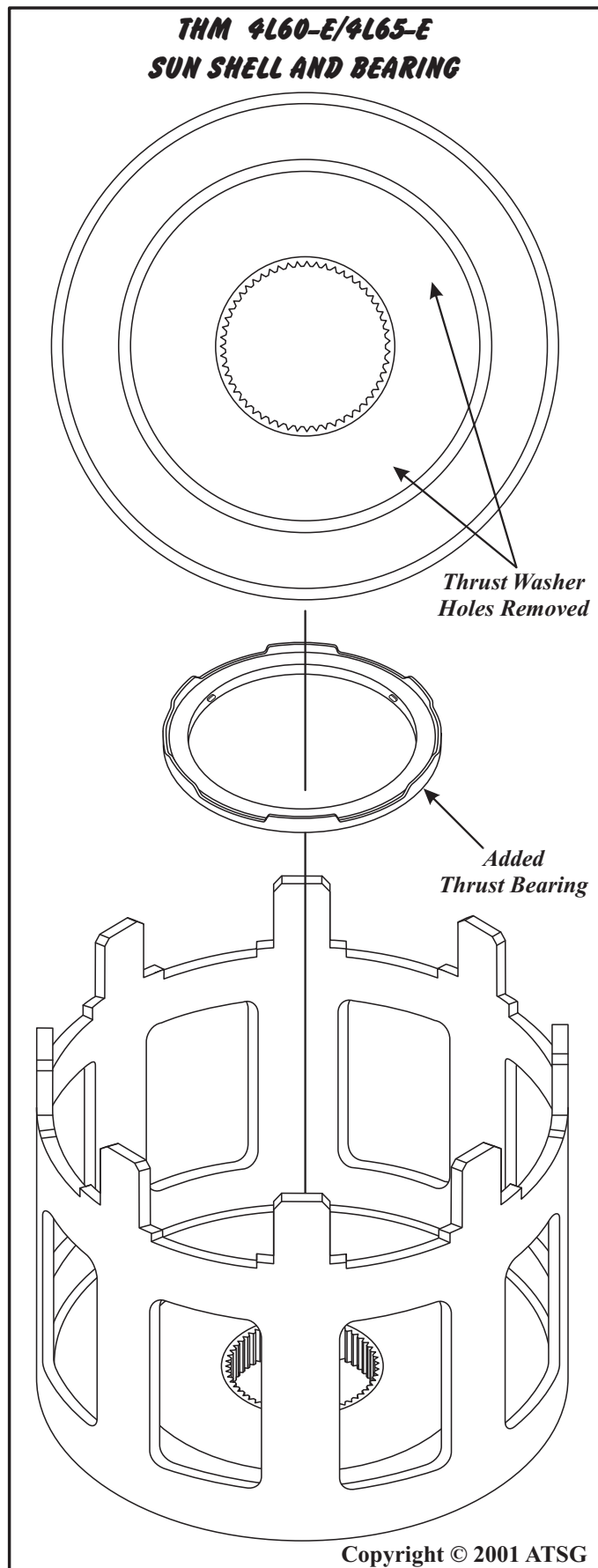


Figure 2

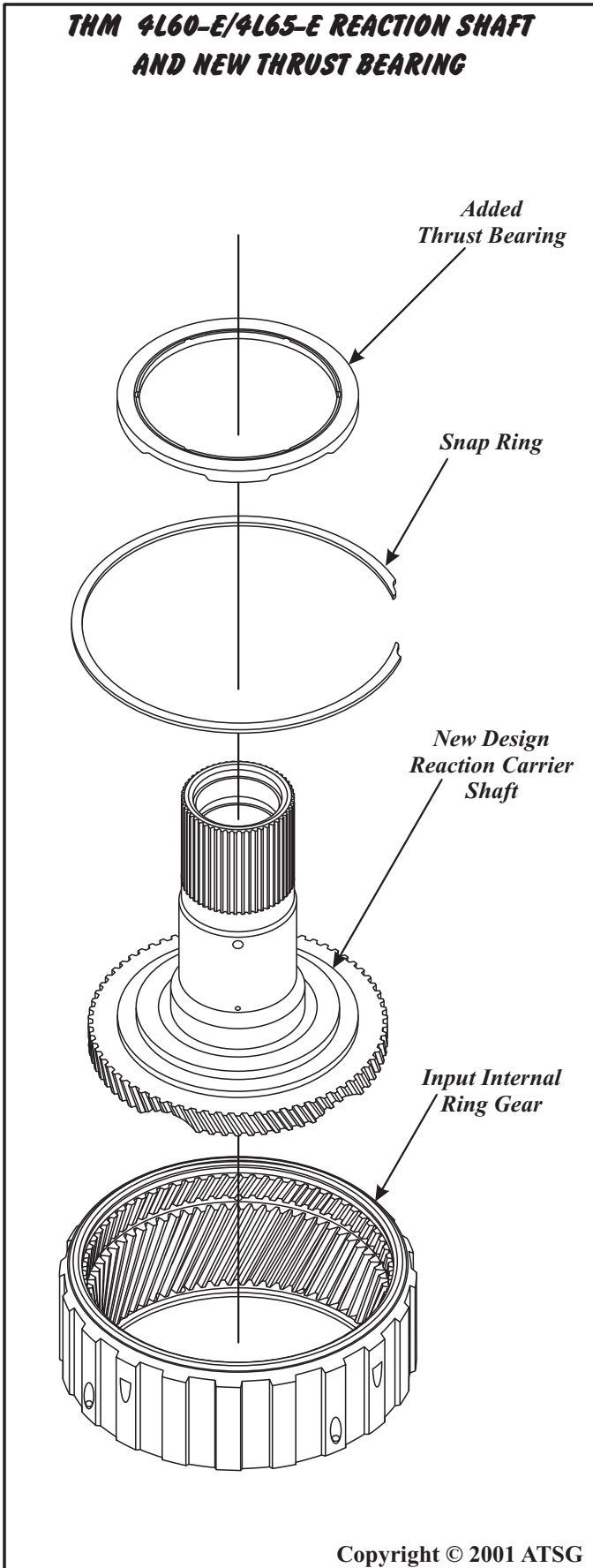


Figure 3

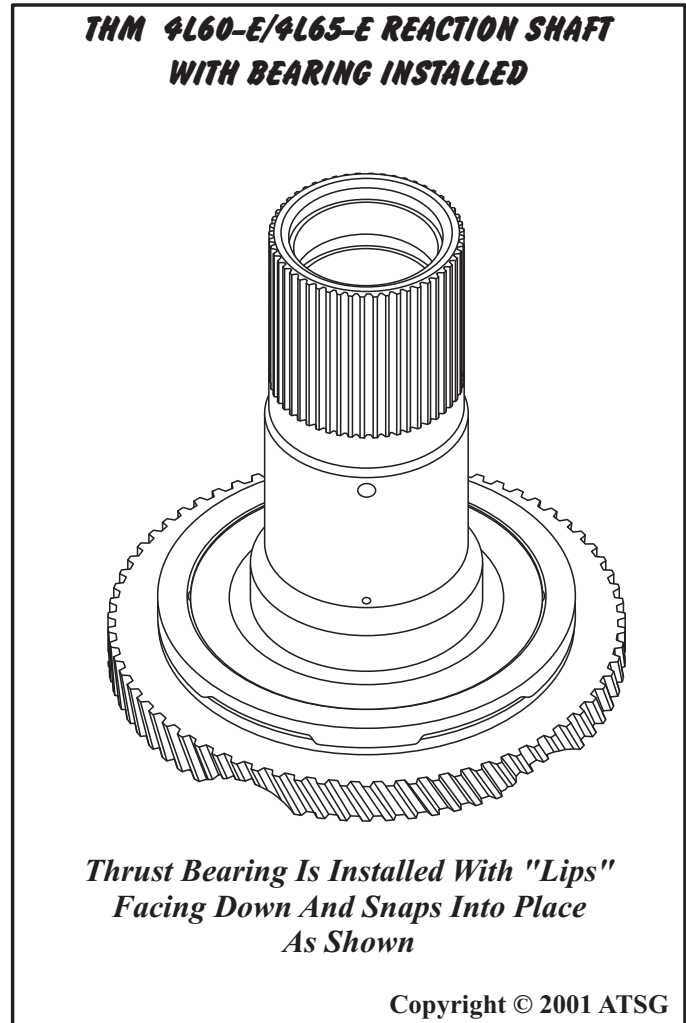


Figure 4



Technical Service Information

THM 4L65-E (M32) SEVEN CLUTCH 3-4 PACK

CHANGE: Beginning at the start of production for model year 2001, General Motors introduced a new transmission designated THM 4L65-E (M32) with many engineering changes. Currently this unit is found in all 2001 Cadillac Escalade and any vehicle with 6.0L engine or larger, that was previously equipped with the THM 4L60-E transmission. One of the changes includes adding a seventh lined plate to the 3-4 clutch pack, as shown in Figure 1, with no dimensional changes to the input housing. There is a "Kitted" Service Package available from OEM under part number 24220129, as shown in Figure 2.

REASON: New generation of higher horsepower engines and increased durability and reliability.

PARTS AFFECTED:

- (1) 3-4 CLUTCH APPLY PLATE - Required dimensional changes to accommodate the added friction and steel plate. The new design level is .218" thick and the previous design level thickness is .224", as shown in Figure 3.
- (2) 3-4 CLUTCH BACKING PLATE - Required dimensional changes to accommodate the added friction and steel plate, and to achieve the proper 3-4 clutch clearance. There are four new thickness backing plates and one of the previous backing plates, to ensure proper 3-4 clutch clearance, as shown in Figure 4.
- (3) 3-4 CLUTCH FRICTION PLATE - Required dimensional changes to accommodate the added friction and steel plate. The new design level friction plate is .065" thick and the previous design level thickness is .082", as shown in Figure 5.
- (4) 3-4 CLUTCH STEEL PLATE - Required dimensional changes to accommodate the added friction and steel plate. The new design level steel plate is .097" thick and the previous design level thickness is .106", as shown in Figure 5.

INTERCHANGEABILITY:

All of the new design parts listed above *will retro-fit back* to 1993 models, when used as a service package.

SERVICE INFORMATION:

3-4 Clutch Plates, "Kitted" (New Design)	24220129
3-4 Clutch Backing Plate (.144" Thick)	24217450
3-4 Clutch Backing Plate (.165" Thick)	24217453
3-4 Clutch Backing Plate (.194" Thick)	24212460
3-4 Clutch Backing Plate (.219" Thick)	24217516
3-4 Clutch Backing Plate (.241" Thick)	24217517

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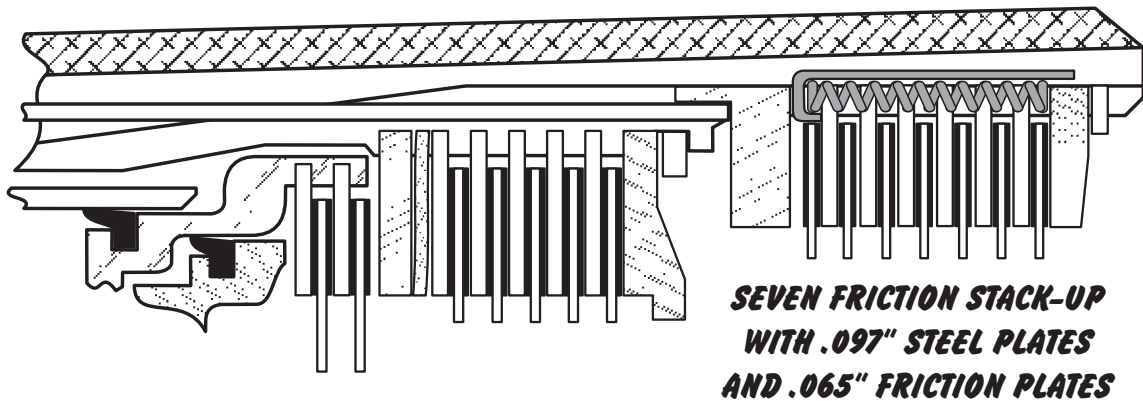
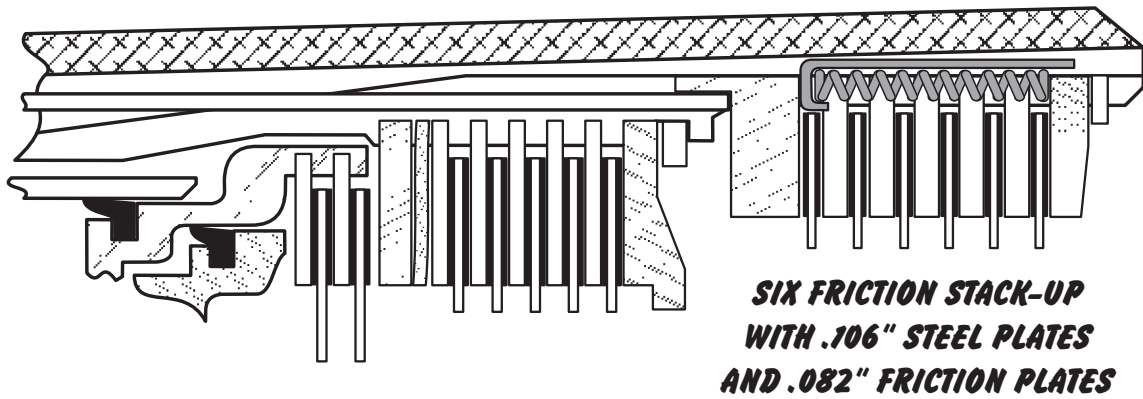
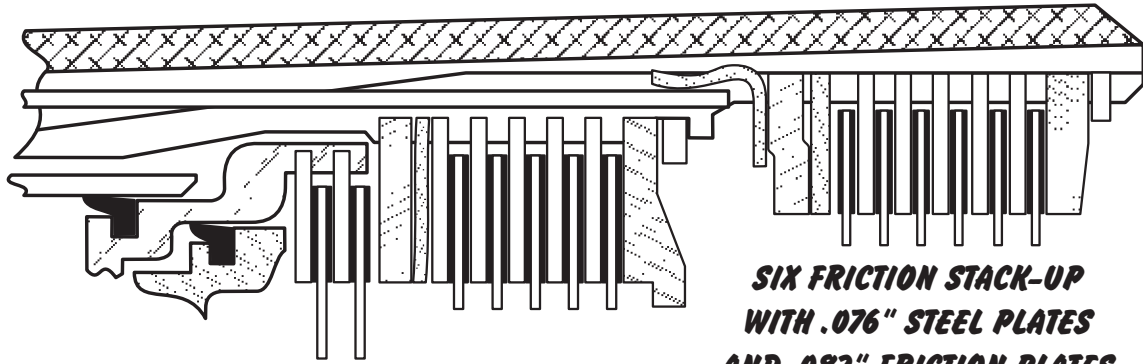
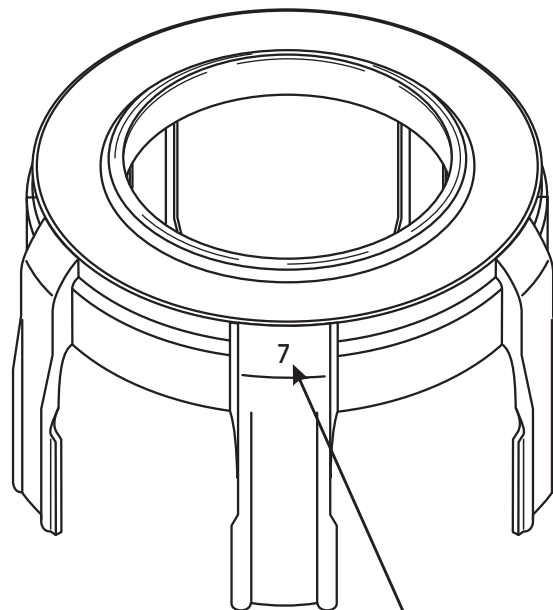
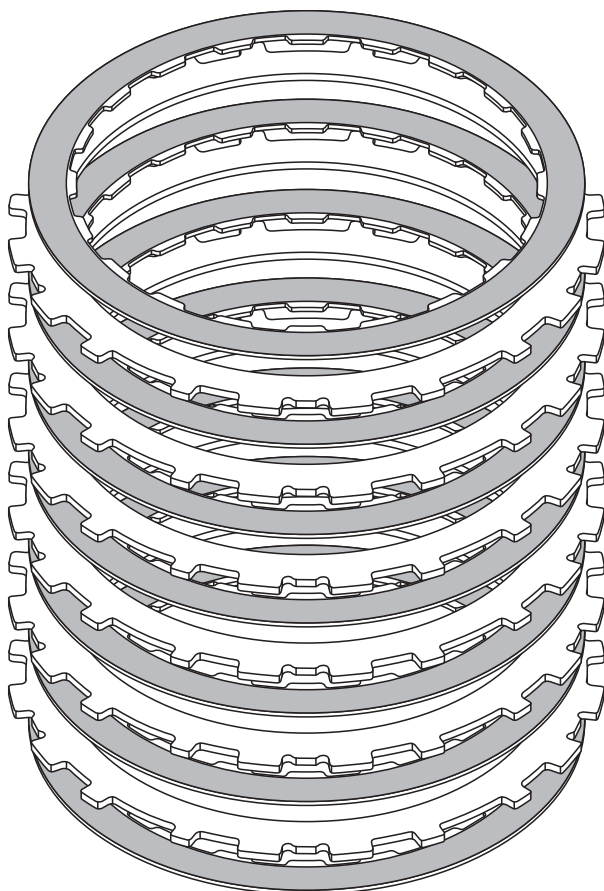
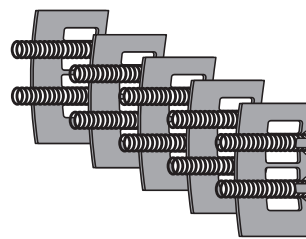


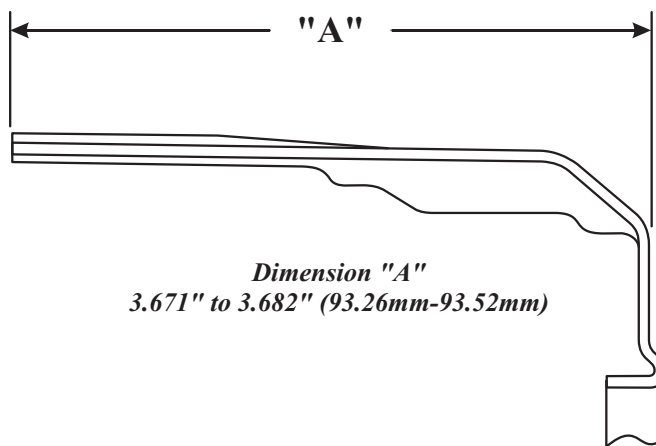
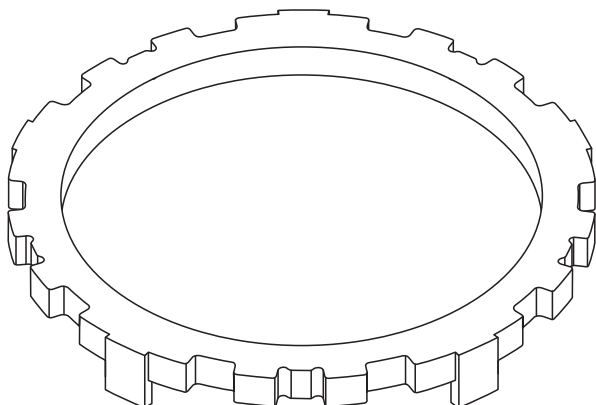
Figure 1

CONTENTS OF SERVICE PACKAGE
PART NUMBER 24220129

- 7 .065" Thick High Energy Friction Plates
- 6 .097" Thick Steel Plates
- 1 .218" Thick 3-4 Apply Plate
- 1 3-4 Apply Ring (Same As Previous, Stamped "7")
- 5 3-4 Load Release Springs (Same As Previous)



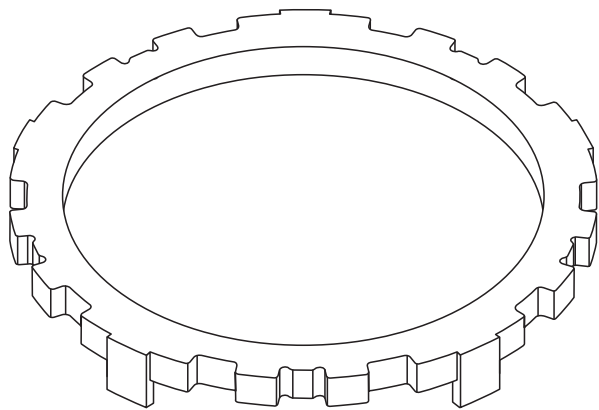
Identification, Stamped "7"



Dimension "A"
 3.671" to 3.682" (93.26mm-93.52mm)

Figure 2

3-4 CLUTCH APPLY PLATE

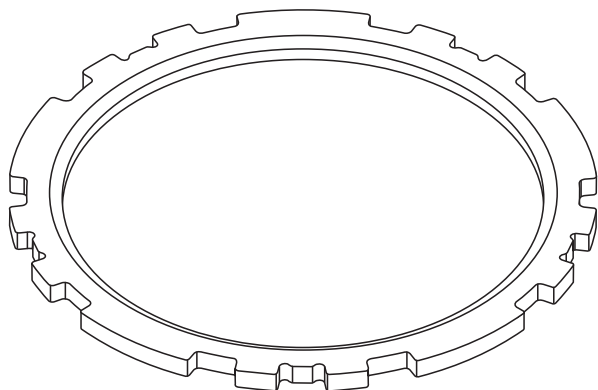


Thickness For Six Friction Plates = .224"
Thickness For Seven Friction Plates = .218"

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Figure 3

NEW 3-4 CLUTCH BACKING PLATES

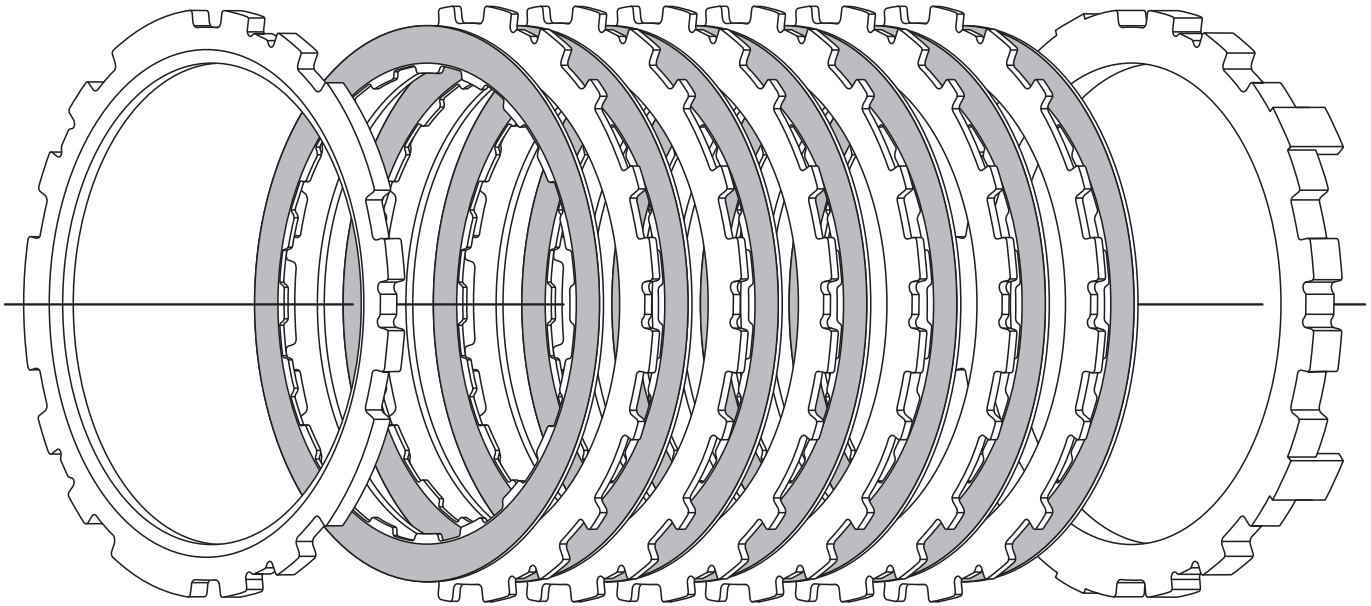


24217450 = .144" Thick (New)
24217453 = .165" Thick (New)
24212460 = .194" Thick (Same As Previous)
24217516 = .219" Thick (New)
24217517 = .241" Thick (New)

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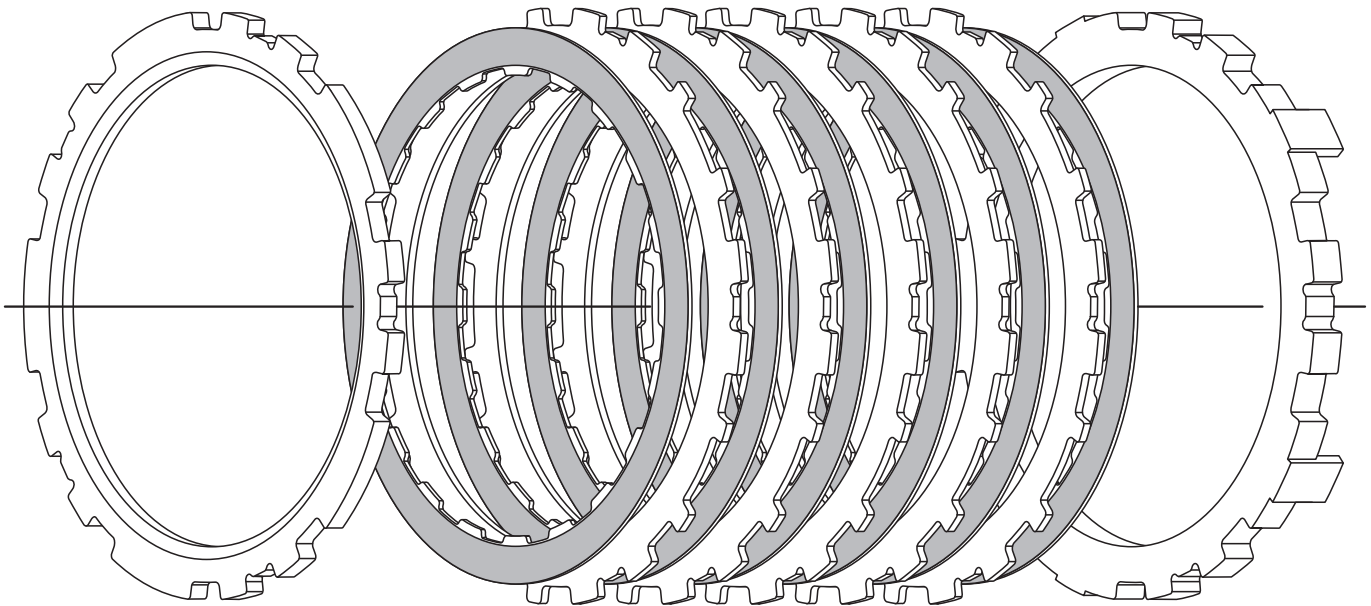
Figure 4

**THM 4L65-E (M32) 3-4 CLUTCH
SEVEN FRICTION STACK-UP**



*Friction Plates = .065" Thick, 7 Required
Steel Plates = .097" Thick, 6 Required*

**THM 4L60-E (M30) 3-4 CLUTCH
SIX FRICTION STACK-UP**



*Friction Plates = .082" Thick, 6 Required
Steel Plates = .106" Thick, 5 Required*

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Figure 5



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Technical Service Information

THM 4L65-E 5 PINION FRONT AND REAR PLANETARY CARRIERS

CHANGE: Beginning at the start of production for model year 2001, General Motors introduced a new transmission designated THM 4L65-E with many engineering changes. Currently this unit is found in all 2001 Cadillac Escalade and any vehicle with 6.0L engine or larger, that was previously equipped with the THM 4L60-E transmission. One of the changes includes adding a 5 pinion reaction(rear) planetary carrier and a 5 pinion input (front) planetary carrier, as shown in Figures 1 and 2, with no dimensional changes to the related parts.

REASON: Increased durability and reliability.

PARTS AFFECTED:

- (1) REACTION (Rear) PLANETARY CARRIER - Now equipped with 5 planetary pinion gears, as shown in Figure 1.
- (2) INPUT (Front) PLANETARY CARRIER - Now equipped with 5 planetary pinion gears, as shown in Figure 2.

INTERCHANGEABILITY:

Both Input and Reaction 5 pinion planetary carriers can be used in any previous model 4L60-E transmission for increased durability.

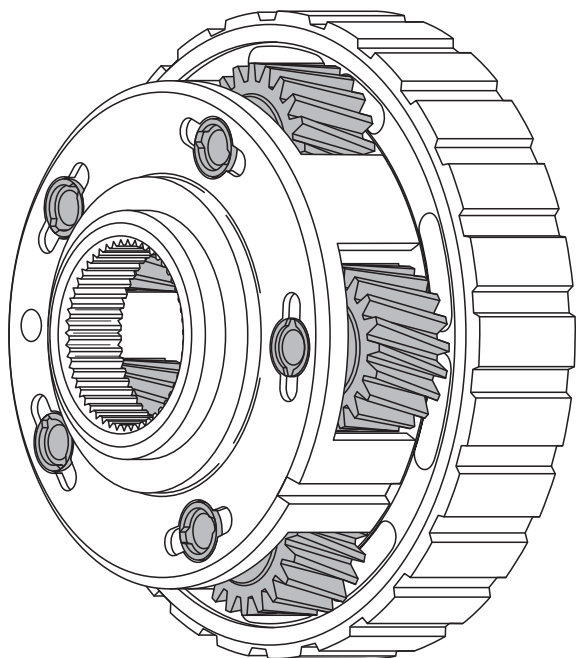
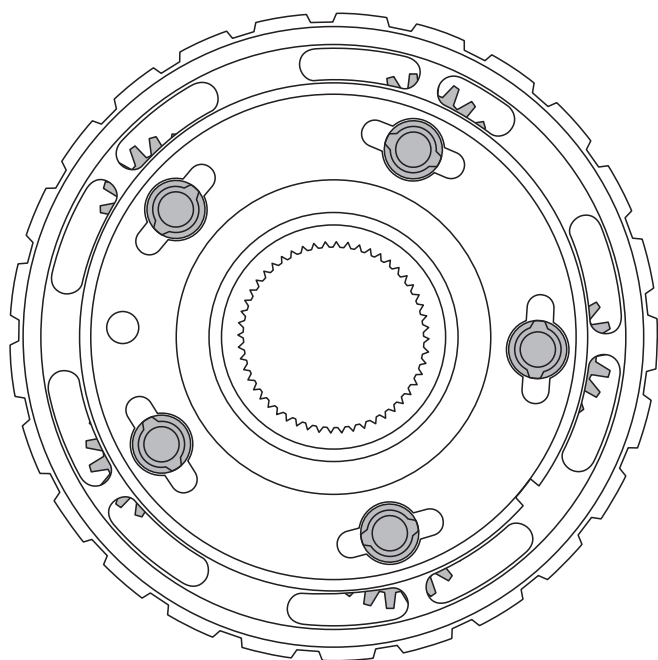
SERVICE INFORMATION:

Input Planetary Carrier Assembly, 5 Pinion	24218063
Reaction Planetary Carrier Assembly, 5 Pinion	24218069

Special Note:

ATSG has recieved several calls on these units with the reaction (rear) ring gear broken. Since the part number changed but the dimensions did not, it would be logical to assume that the manufacturing process changed in some manner. Our recommended procedure, at this time, is to replace it with a reaction ring gear from a THM 4L60-E transmission and available under OEM part number 8667055.

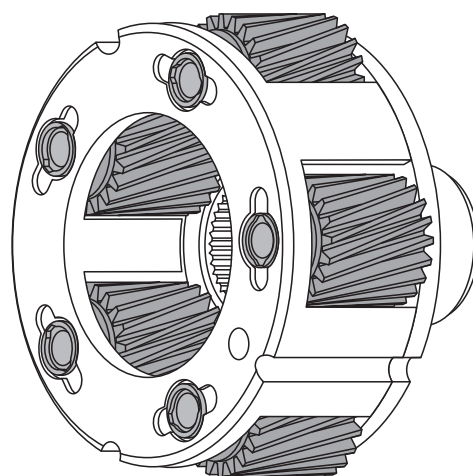
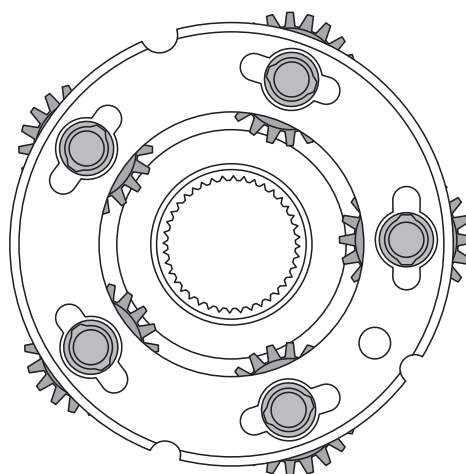
**THM 4L65-E
5 PINION REAR CARRIER**



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Figure 1

**THM 4L65-E
5 PINION FRONT CARRIER**



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Figure 2



Technical Service Information

THM 4L60-E NEW DESIGN VALVE BODY AND SPACER PLATE FOR 2001

CHANGE: Beginning at the start of production for 2001, all 4L60-E transmissions were produced with a new design converter clutch regulator valve line-up located in the valve body, in the location shown in Figure 1.

REASON: Reduced bore wear and improved performance for apply and release of the converter clutch.

PARTS AFFECTED:

- (1) **TCC REGULATOR AND ISOLATOR VALVES** - This line-up now has re-designed aluminum TCC Regulator Valve and Isolator Valves, instead of the previous steel, as shown in Figure 1.
- (2) **VALVE BODY CASTING** - Has changed in the worm track areas that are identified inside the circles, as shown in Figure 2, to accommodate the new design converter clutch regulator and isolator valves.
- (3) **SPACER PLATE** - There are two holes in the spacer plate that have been revised, as shown in Figure 3, to accommodate the new design converter clutch regulator and isolator valves.

INTERCHANGEABILITY:

None of the parts listed above will interchange with the previous design level parts. However, when new design valve body and spacer plate are used as a service package, they will back service to 1998 models.

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CONVERTER CLUTCH REGULATOR VALVE LINE-UP

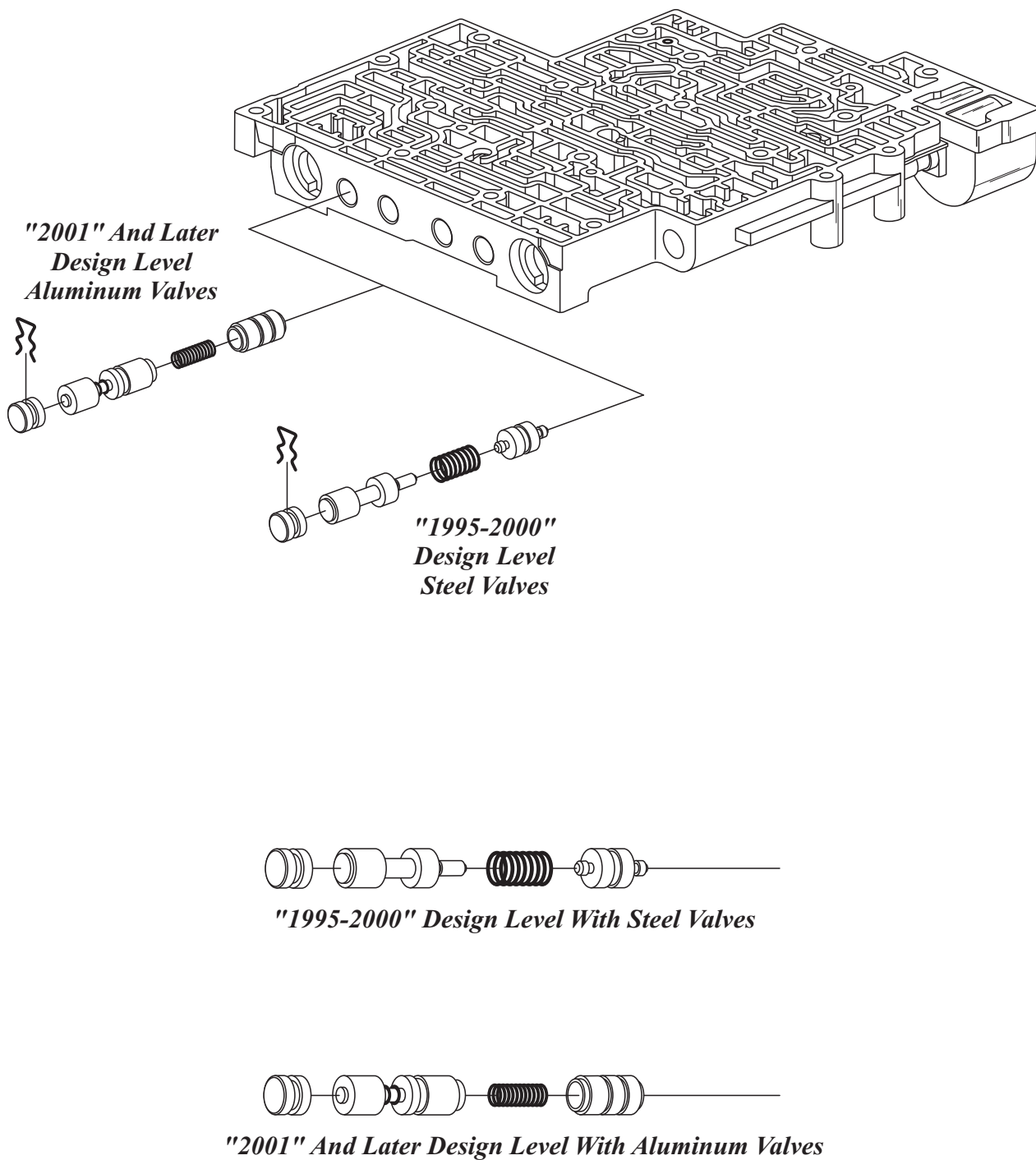


Figure 1

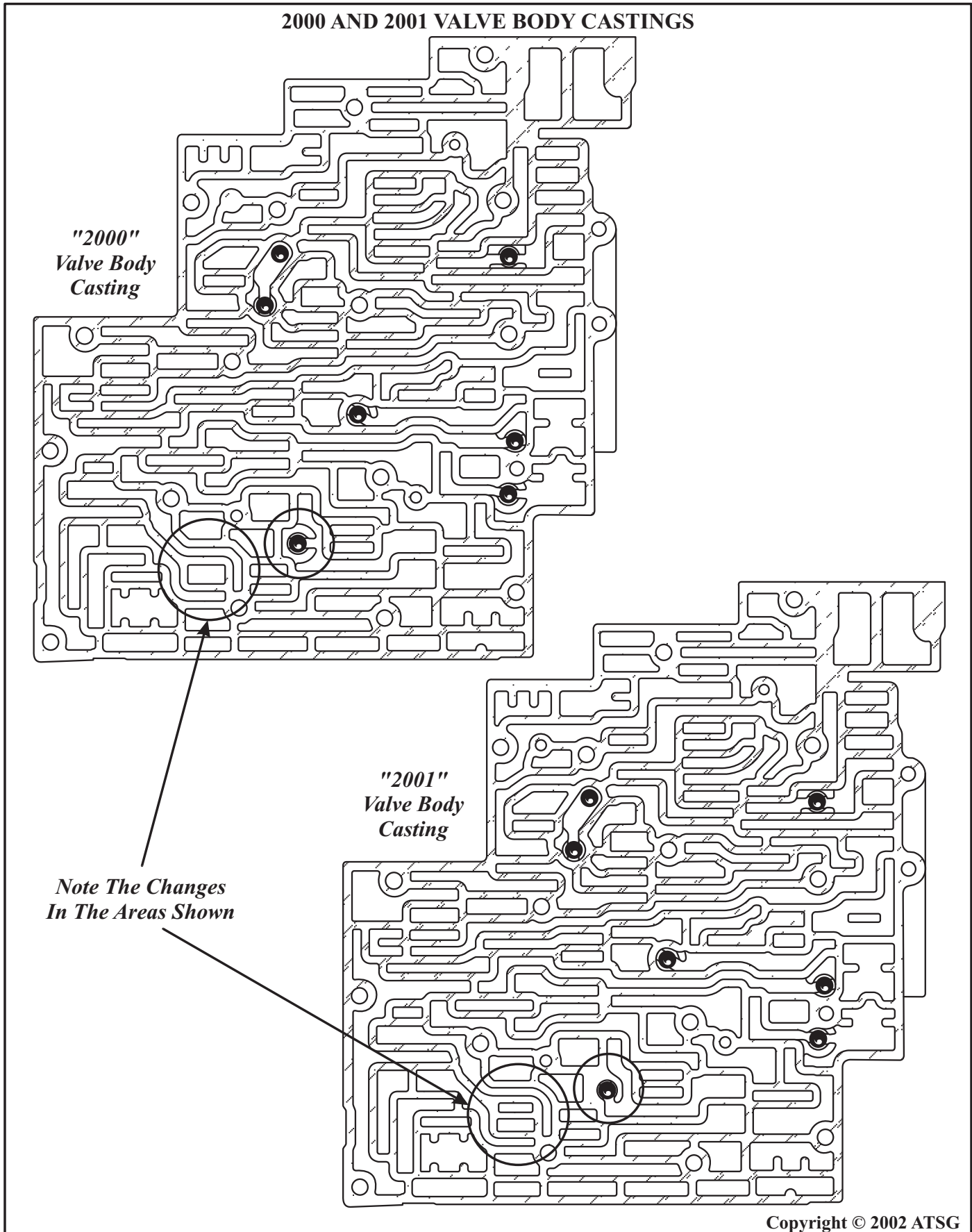


Figure 2

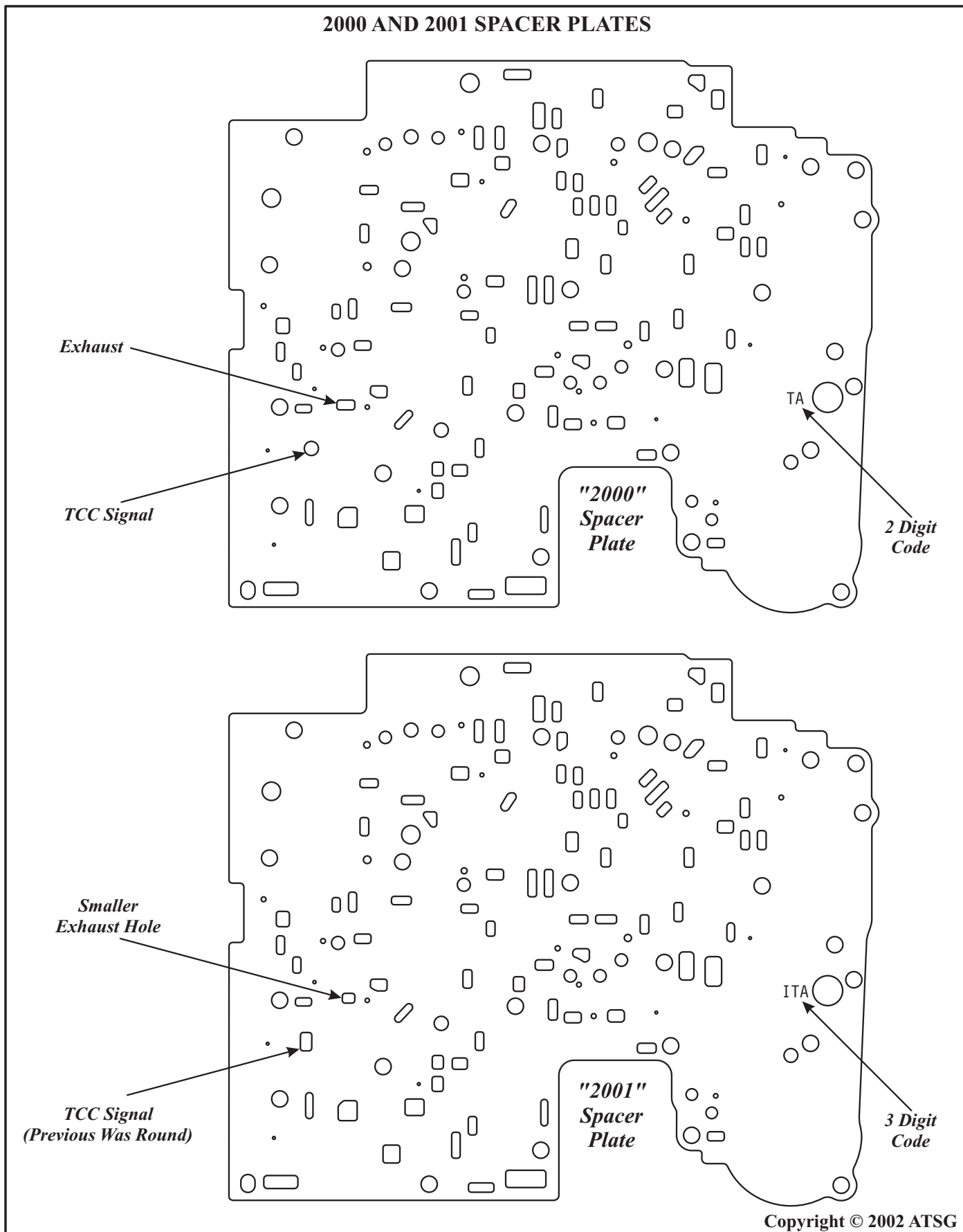


Figure 3



Technical Service Information

THM 4L60-E

TROUBLE CODE P1870

COMPLAINT: Some vehicles may consistently return, before and/or after rebuild, with "Check Engine" lamp illuminated and trouble code P1870, (Internal Component Slipping), stored in memory.

CAUSE: The cause is usually Torque Converter Clutch slippage, created by a badly worn valve body casting in the Converter Clutch Regulator Valve bore.

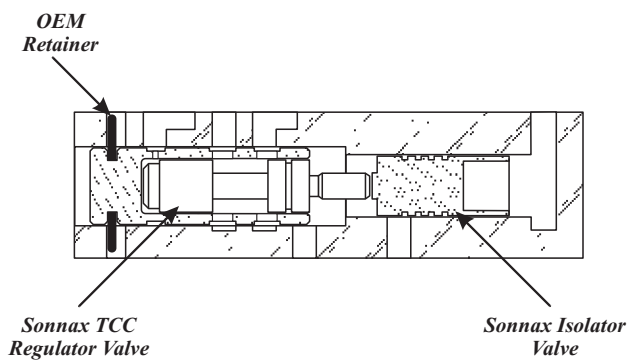
CORRECTION: Sonnax manufactures two different kits to repair the current valve body castings, both of which require a reamer, also available from Sonnax. One of the kits, Sonnax part number 77754-03K, fits 1993 thru 1997 model transmissions, but they require different assembly processes. Refer to Figure 1 for the 1994-1994 models and Figure 2 for the 1995-1997 models, for the proper assembly. The other kit, Sonnax part number 77754-04K, fits only the 1998 and later ECCC models, as it is a different calibration. Refer to Figure 3 for proper assembly of the 1998 and later models. The reamer required is the same for either kit and is available under Sonnax part number 77754-R2.

Special Note: The difference between the kits are as follows;

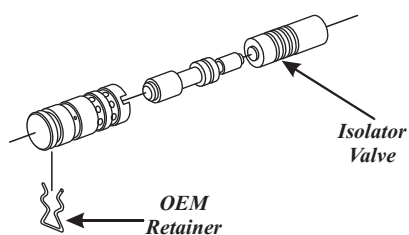
1993-1997 Models, The TCC Regulator Valve is .398" in diameter, which is .042" smaller than the Isolater Valve, for improved rate of apply.

1998-Up Models, The TCC Regulator Valve is .440" in diameter, which is the same diameter as the Isolater Valve, and is ***not recommended*** for the earlier models.

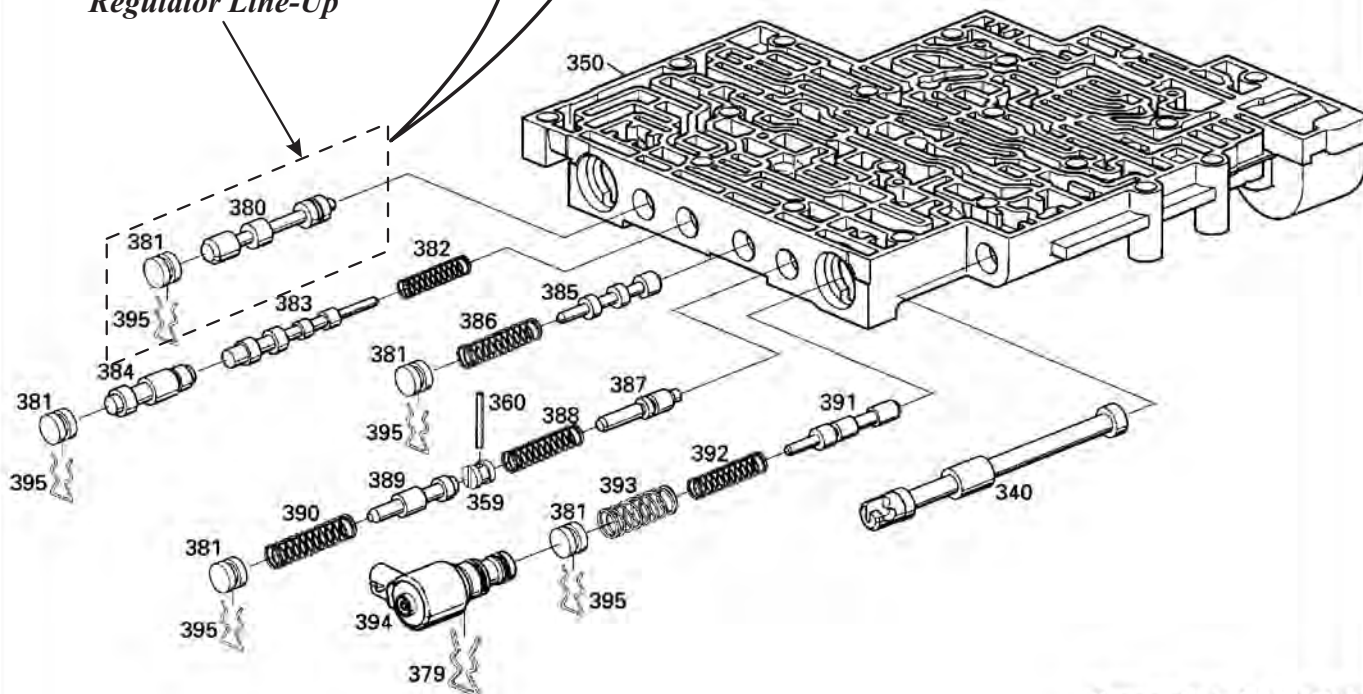
1993-1994 NON-PWM MODELS ONLY ASSEMBLY PROCEDURE



**Sonnax kit for 93-94 NON-PWM Models:
Install Isolator Valve as shown below
and use OEM retaining clip.**



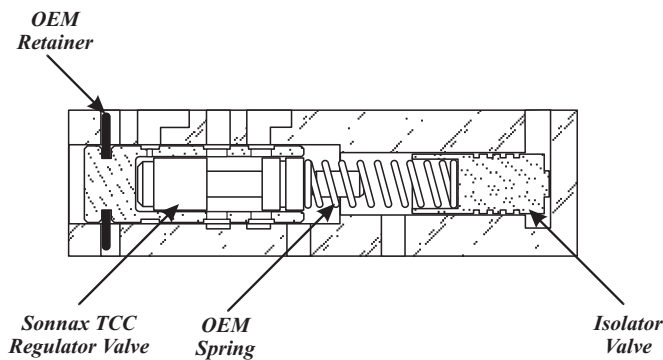
*Converter Clutch
Regulator Line-Up*



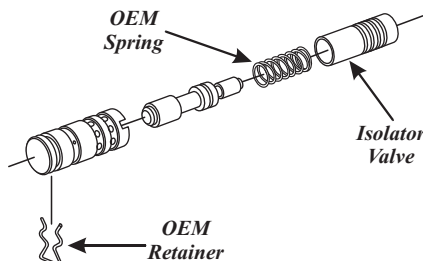
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Figure 1

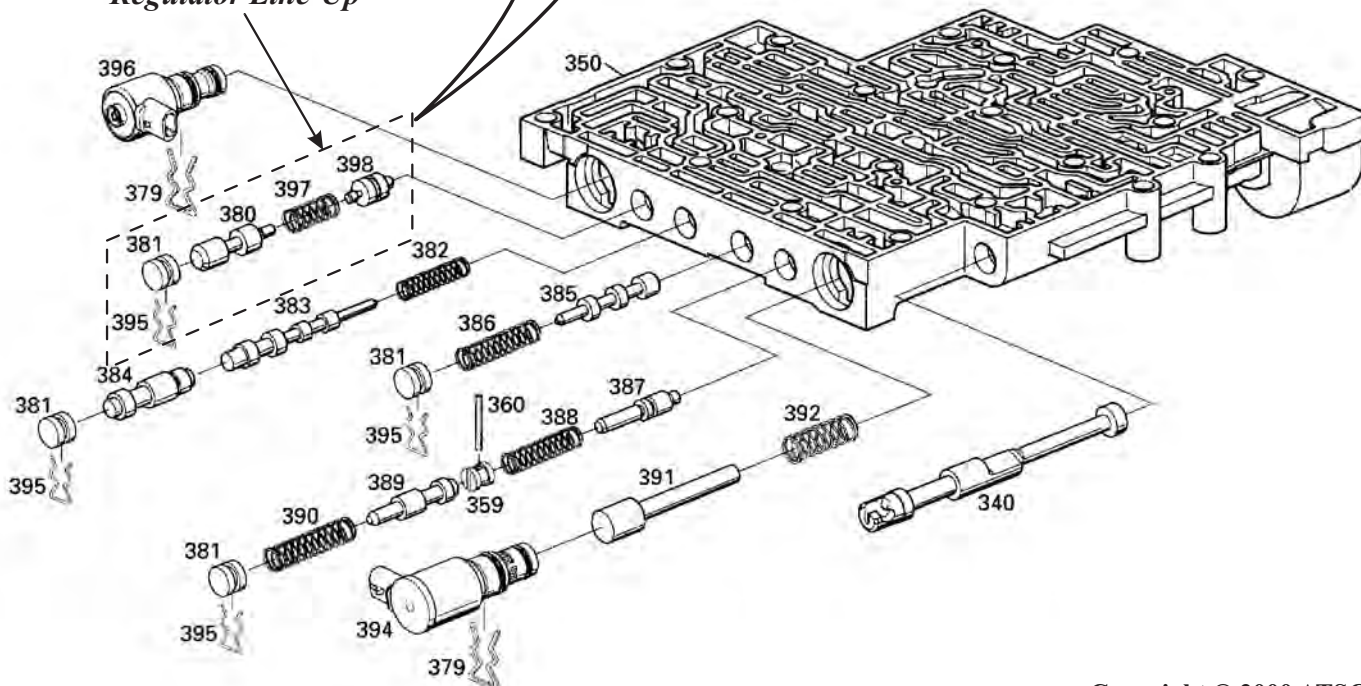
1995-1997 PWM MODELS ONLY ASSEMBLY PROCEDURE



**Sonnax kit for 1995-1997 PWM Models:
Install Isolator Valve as shown below
and use OEM spring and clip.**



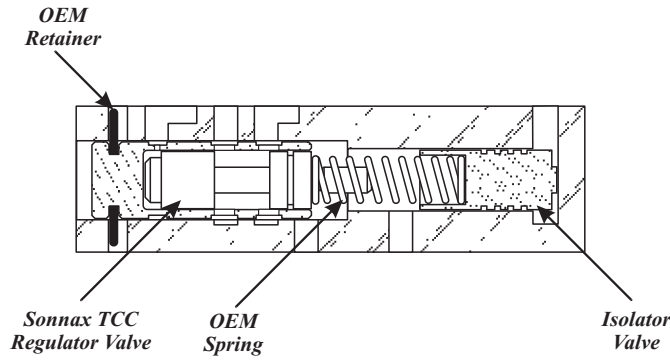
Converter Clutch Regulator Line-Up



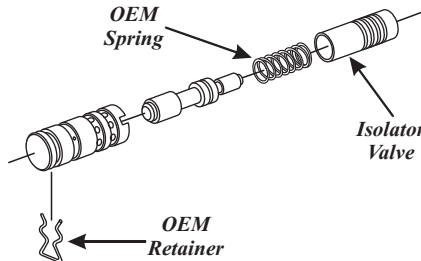
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Figure 2

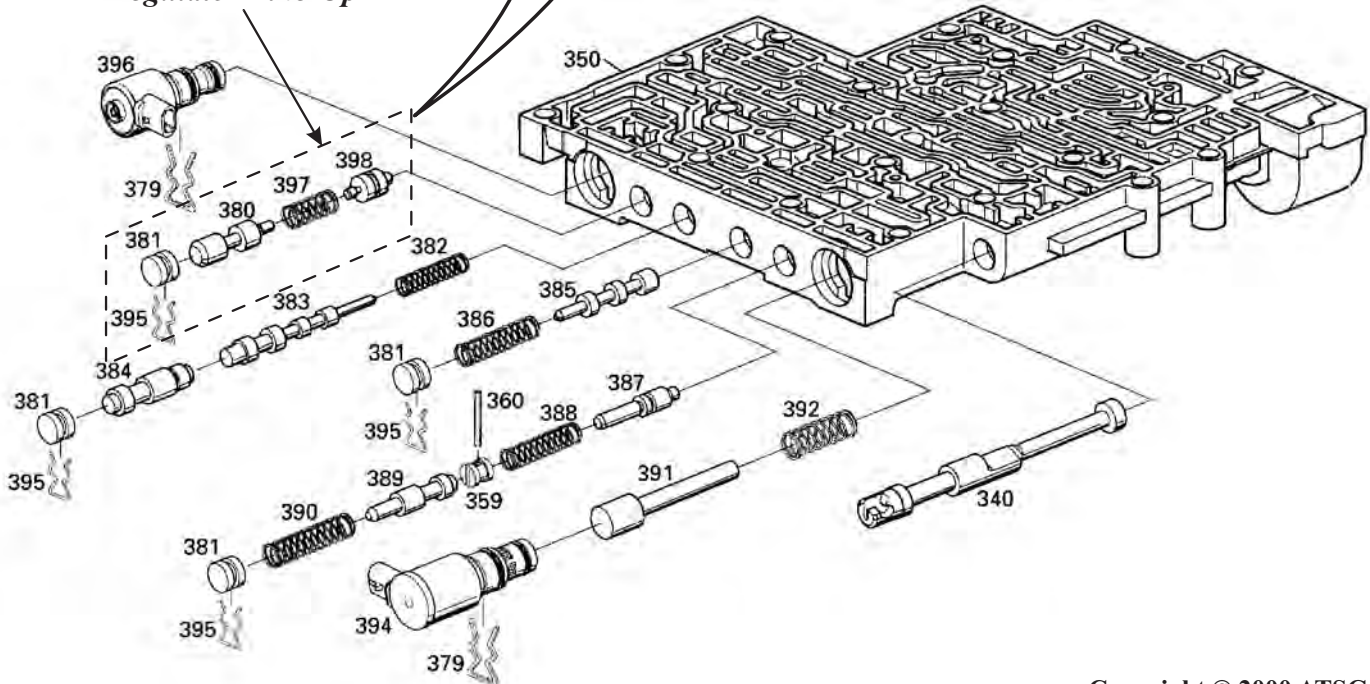
1998-UP ECCC MODELS ONLY ASSEMBLY PROCEDURE



**Sonnax kit for 1998-UP ECCC Models:
Install Isolator Valve as shown below
and use OEM spring and clip.**



Converter Clutch Regulator Line-Up



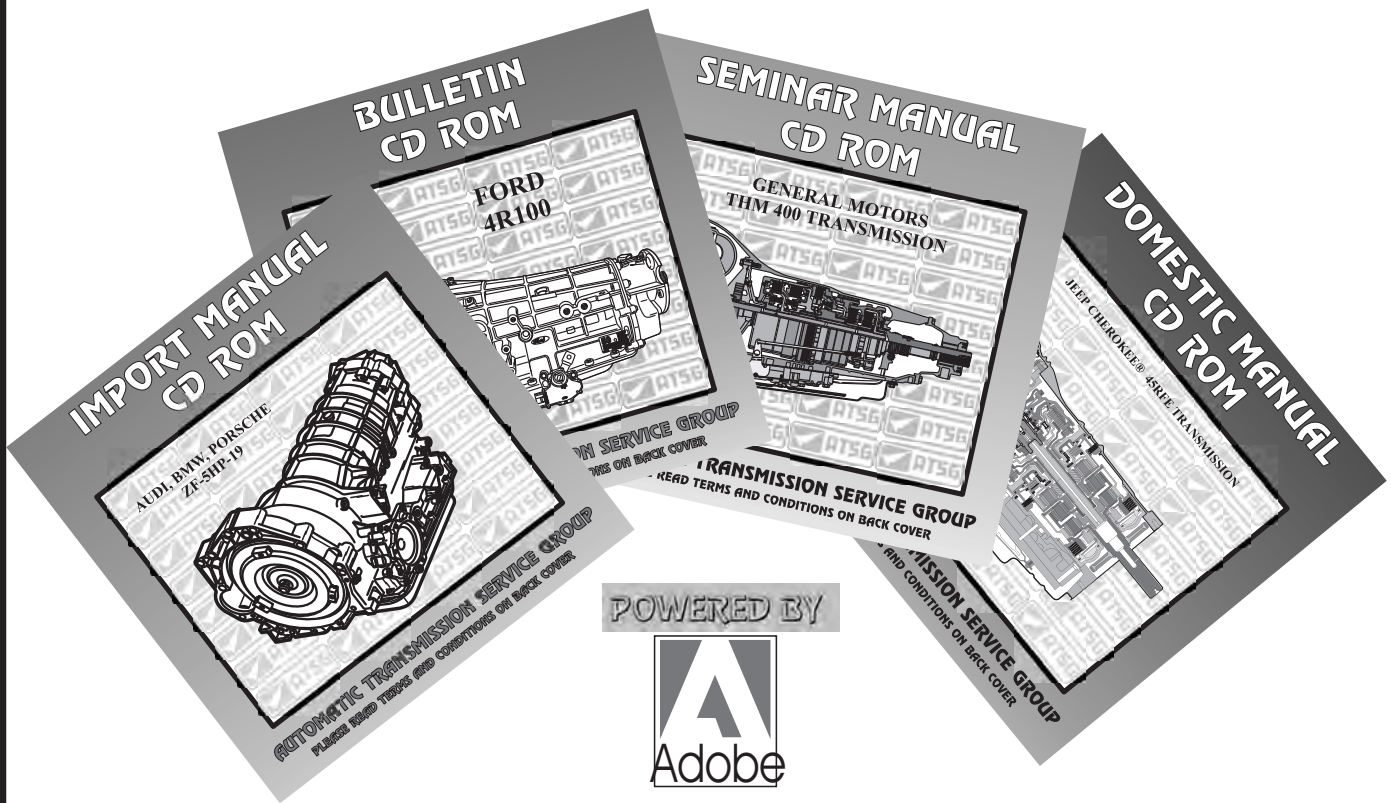
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Figure 3



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