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"VOLUME II"

INTRODUCTION

Since the introduction of the THM 440-T4 (4T60) Transaxle in April, 1984, there have been MANY major engineering design changes. These changes have affected nearly every part used in the THM 440-T4 (4T60).

This version, "VOLUME II", of the 440-T4 "Update Handbook" begins with the engineering design changes that occurred in the 1990 model year and will explain each change, the parts affected by the change, any parts interchange problems created by the change, and will be revised as necessary.

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

1. New Driven Sprocket Support
2. Burn't or Welded 4th Clutch
3. New 3rd Clutch Plates
4. New Parking Lock System
5. New 3-2 Control Springs
6. New 2 Plate 4th Clutch
7. Broken T.V. Plunger
8. New 1-2 Band Assembly
9. New Reverse Band Assembly
10. New Output Shaft and 3rd Roller Clutch
11. New Switches and Wiring Harness
12. Input Clutch Accumulator Eliminated
13. New 1-2 Shift Valve
14. Spacer Plate Identification

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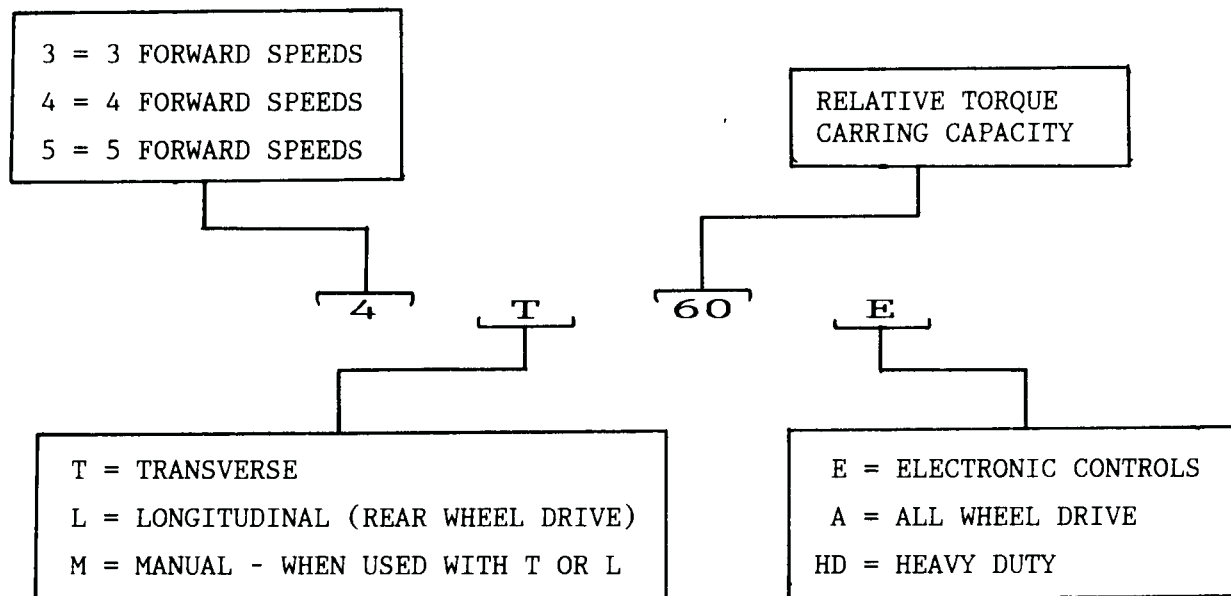
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Technical Service Information

NEW DESIGNATION SYSTEM FOR HYDRA-MATIC PRODUCTS



AUTOMATIC PRODUCTS

PREVIOUS DESIGNATION

THM 180/180C
THM R-1
THM A-1
THM 125/125C
THM 700-R4
NONE
THM 440-T4
THM F-31
THM 400
THM 475
THM R-2
NONE

NEW DESIGNATION

HYDRA-MATIC 3L30
HYDRA-MATIC 4L30-E
HYDRA-MATIC 3T40-A
HYDRA-MATIC 3T40
HYDRA-MATIC 4L60
HYDRA-MATIC 4L60-E
HYDRA-MATIC 4T60
HYDRA-MATIC 4T60-E
HYDRA-MATIC 3L80
HYDRA-MATIC 3L80-HD
HYDRA-MATIC 4L80-E
HYDRA-MATIC 4T80-E

MANUAL PRODUCTS

HM-290
HM-282

HYDRA-MATIC 5LM60
HYDRA-MATIC 5TM40

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Technical Service Information

THM 440-T4 (4T60)

1990 CHANGE

CHANGE: A new Driven Sprocket Support and Chain Scoop is now used in production on all 1990 vehicles equipped with a THM 440-T4 (4T60) transaxle. (See Figure 1).

REASON: This now makes a common casting for both the THM 440-T4 (4T60), and the new THM F-31 (4T60-E) that is scheduled for the spring of 1990.

PARTS AFFECTED:

- (1) **DRIVEN SPROCKET SUPPORT** - The new design sprocket support has an increased width of one leg on the support (See Figure 1). The wider leg on the new support will accomodate a new lube feed passage for the new THM F-31 (4T60-E) transaxle. Lube feed for the THM F-31 (4T60-E) will be thru the channel plate, instead of the pipe from the accumulator cover as on the THM 440-T4 (4T60) (See Figure 2).
- (2) **CHAIN SCOOP** - The new sprocket support requires the chain scoop, both black and white, to be about 1/3 the length of the previous chain scoop. (See Figure 1).

INTERCHANGEABILITY:

The new driven sprocket support will service all past models, but the new length (Short) chain scoop must be used with it. The previous (Long) chain scoop will not fit, but can be cut to fit the new support. Lay the previous chain scoop on the actual size drawing in Figure 3 and cut straight down, as indicated, with a hack saw. Smooth off the rough cut edge with sandpaper. The new length (Short) chain scoop must be used ONLY with the new design driven sprocket support.

SERVICE INFORMATION:

The service part number did not change from the previous to the new driven sprocket support. Either design may be available until the previous design stock is depleted, and then the new design support will be the only one available.

Driven Sprocket Support Assembly..... 8668385
White Chain Scoop (New Short Design, 35-35 Sprocket Ratio).... 8668613
Black Chain Scoop (New Short Design, 37-33 Sprocket Ratio).... 8651622

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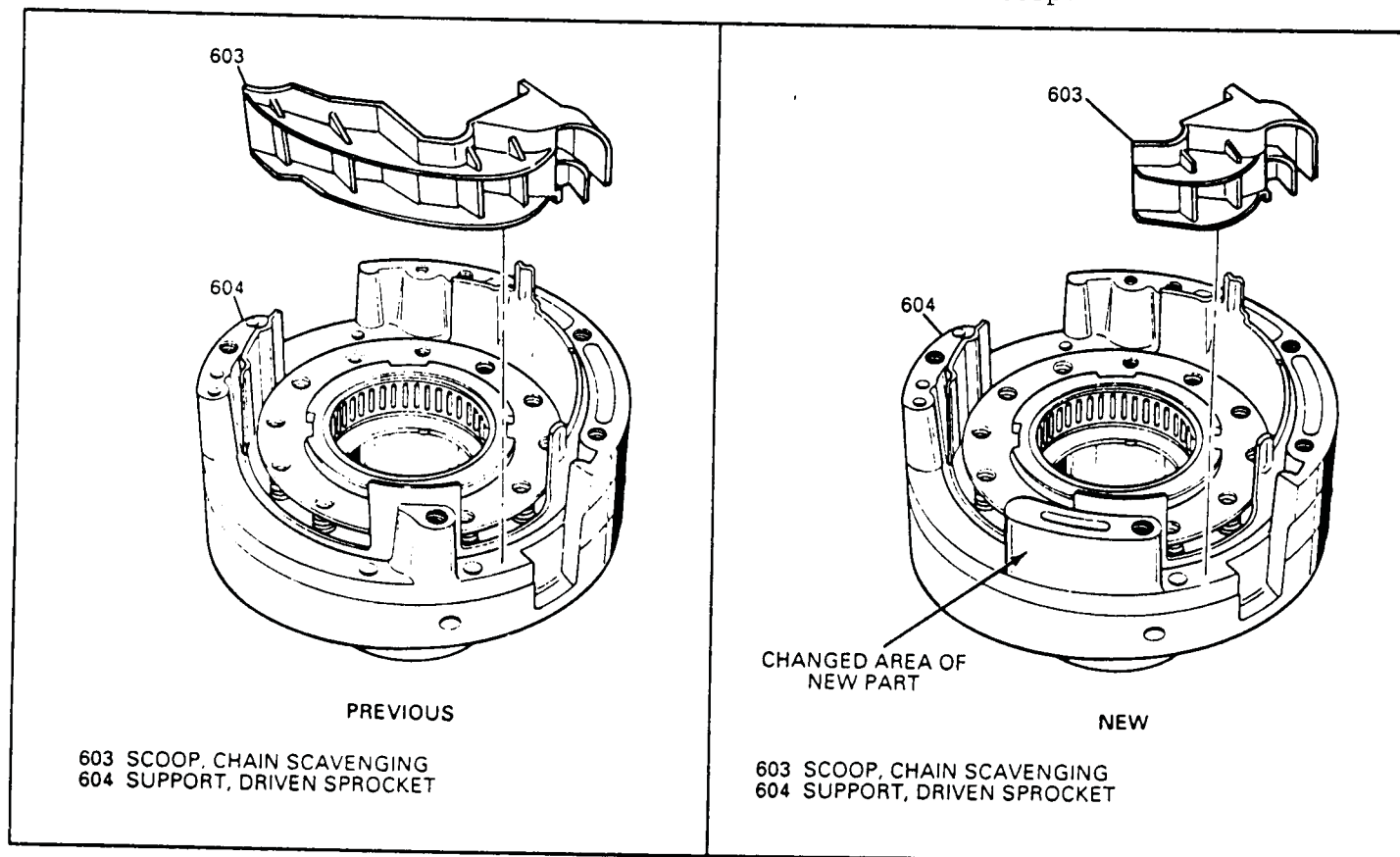


Figure 1

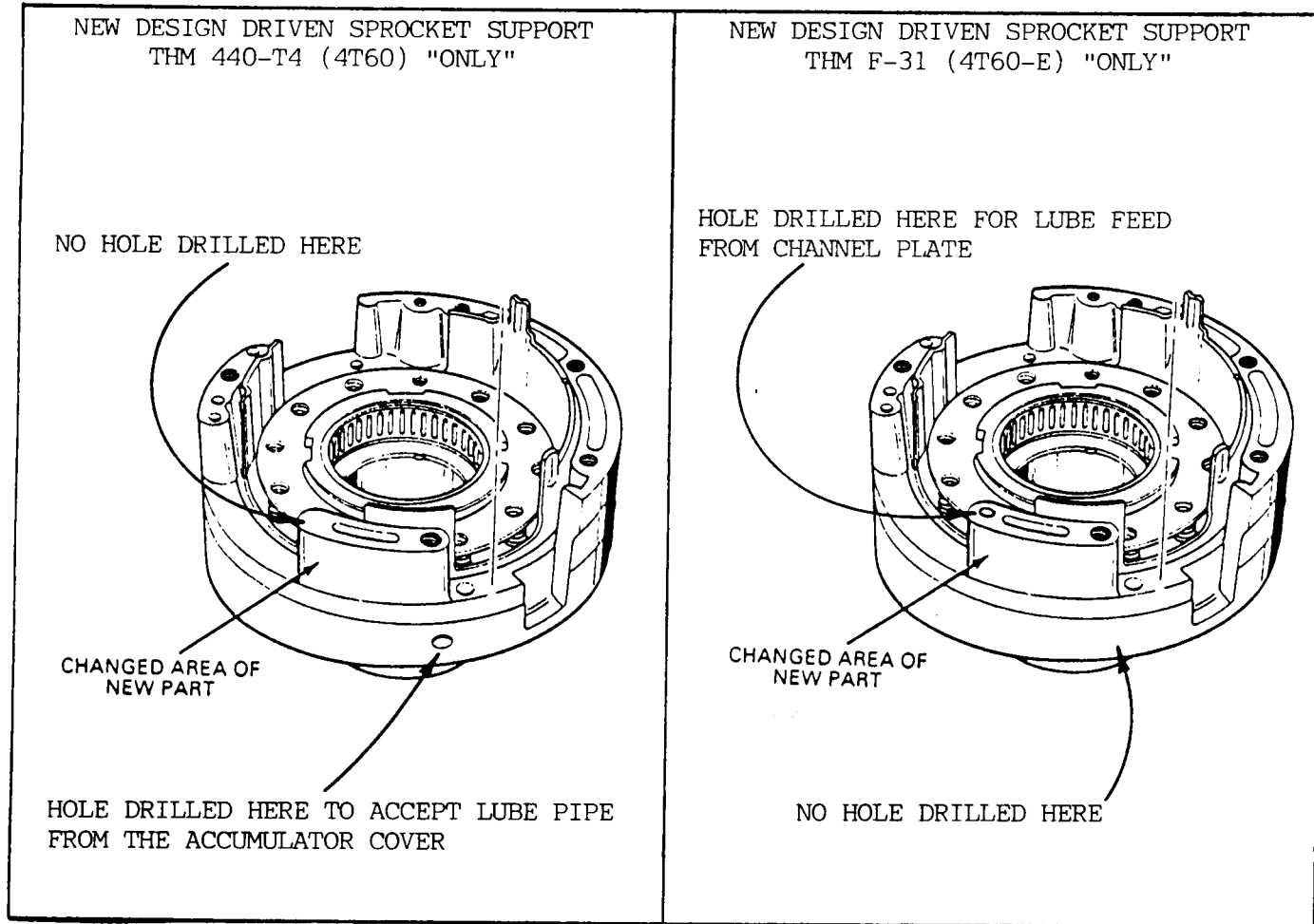


Figure 2

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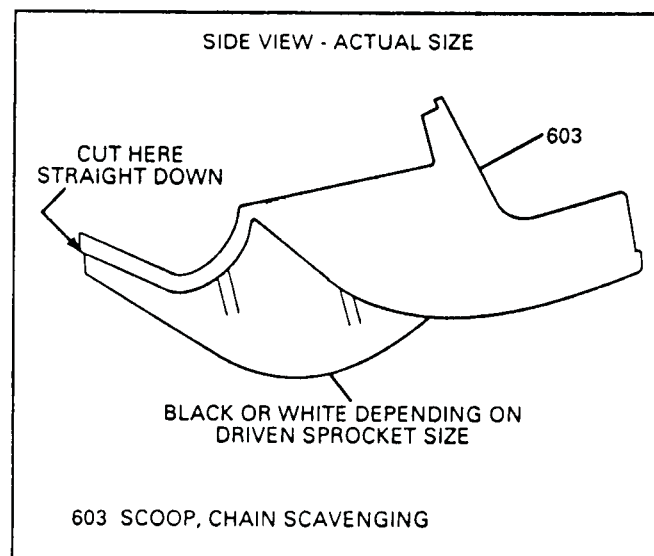


Figure 3



Technical Service Information

THM 440-T4 (4T60)

NEW REVERSE BAND ASSEMBLY

CHANGE: A 4th design Reverse Band Assembly is now in production on all THM 440-T4 transaxles.

REASON: To help eliminate a harsh reverse apply condition.

PARTS AFFECTED:

- (1) REVERSE BAND ASSEMBLY - The lining on the reverse band has once again been changed, and can be identified by the "Paper" lining on the band itself (See Figure 4).

INTERCHANGEABILITY:

It will retro-fit back to all previous models and is highly recommended, to help eliminate a harsh reverse apply condition.

SERVICE INFORMATION:

Reverse Band Assembly (4th Design)..... 8675152

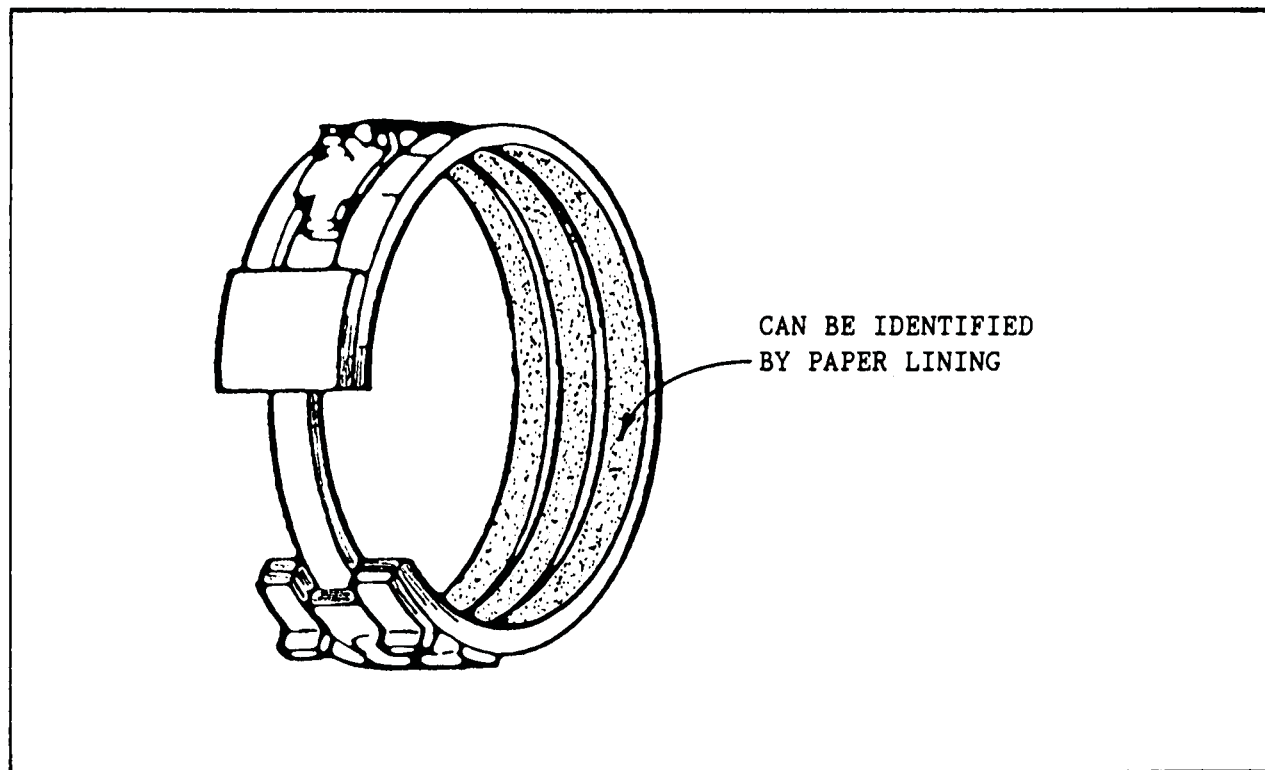


Figure 4

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Technical Service Information

THM 440-T4 (4T60)

NEW 1-2 BAND ASSEMBLY

CHANGE: A new style 1-2 Band Assembly (See Figure 26) went into production beginning on January 16, 1990 (Julian Date 016) in all THM 440-T4 transaxles.

REASON: To eliminate the possibility of a intermittent "No Drive" condition.

PARTS AFFECTED:

- (1) 1-2 BAND ASSEMBLY - The target area on the new 1-2 band, where the band apply pin engages, has been made wider and has "Wings" added to prevent the pin from ever missing the "Target" area (See Figure 5).
- (2) 1-2 BAND STOP ASSEMBLY - The 1-2 Band Stop has been eliminated as it is no longer needed (See Figure 6).

INTERCHANGEABILITY:

The new style 1-2 Band Assembly can be used to service ALL past models, but the 1-2 Band Stop MUST be removed and discarded (See Figure 6).

If the new 1-2 Band Assembly is used in a case with a 1-2 Band Stop, interference may result and band durability may be affected.

SERVICE INFORMATION:

1-2 BAND ASSEMBLY (New Style)..... 8668984

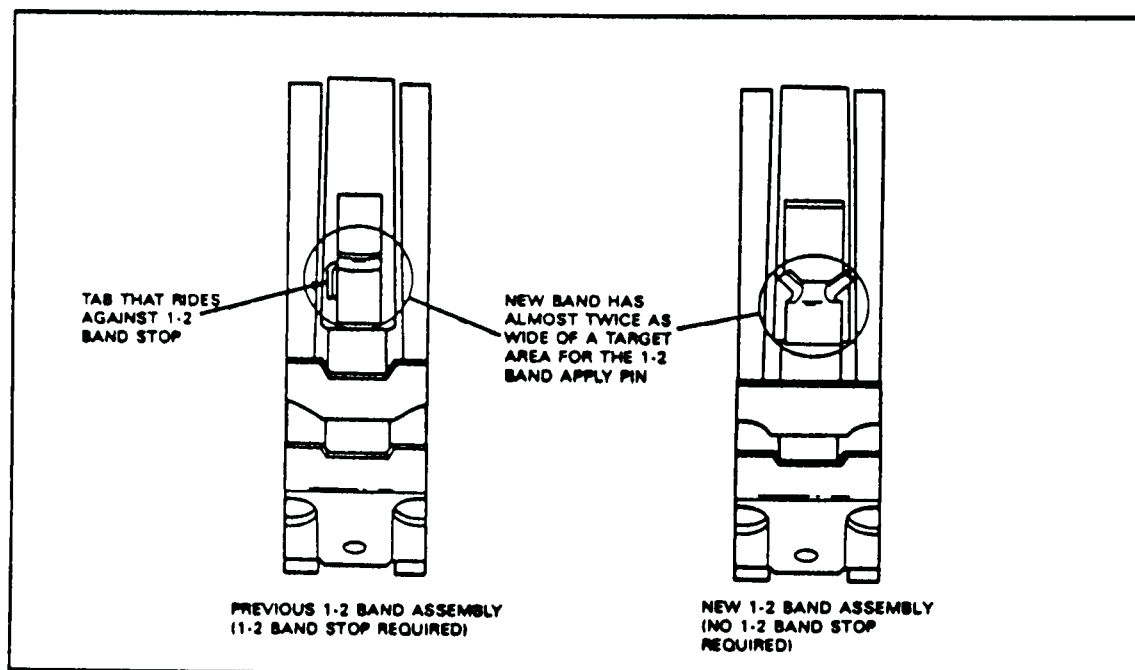


Figure 5

AUTOMATIC TRANSMISSION SERVICE GROUP

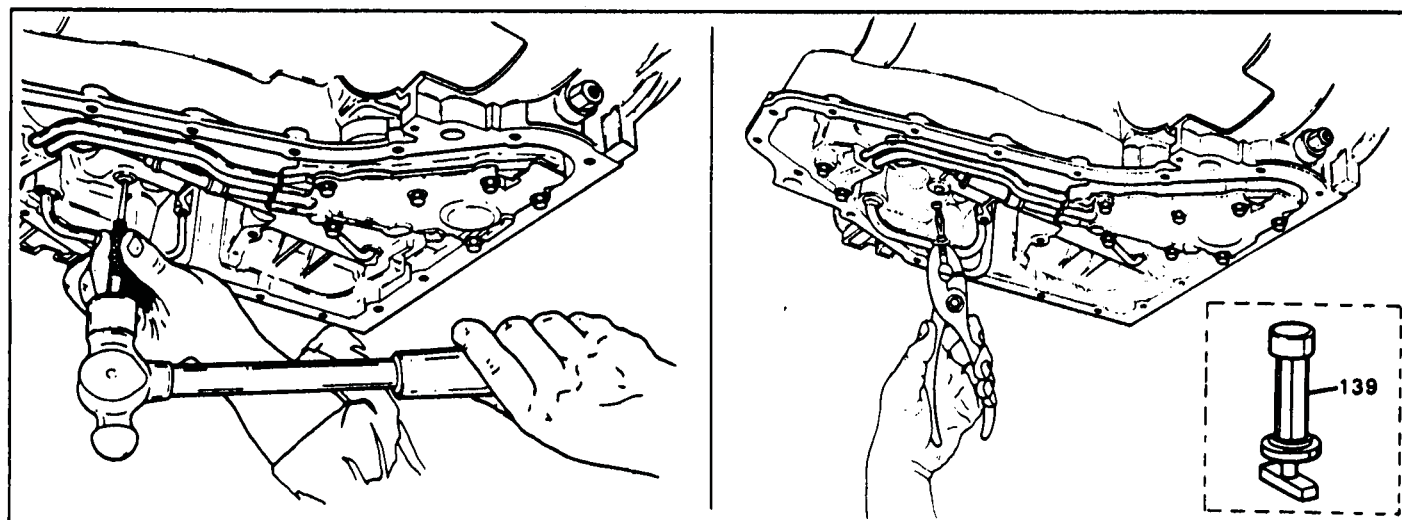


Figure 6



Technical Service Information

THM 440-T4 (4T60)

NEW PRESSURE SWITCHES AND WIRING HARNESS

CHANGE: Beginning on September 6, 1989 (Julian Date 249) SOME, 440-T4 transaxles will be built using the new pressure switches and wiring harness. By early November, 1989 ALL models should have the new pressure switches and wiring harness.

REASON: Easier assembly at the assembly plant, and to reduce the possibility of the connectors working loose.

PARTS AFFECTED:

- (1) **PRESSURE SWITCHES** - The new 2nd, 3rd, and 4th clutch pressure switches will have "Button" head wire connectors instead of the "Blade" type connectors (See Figure 7).
- (2) **WIRING HARNESS** - The new wiring harness will have different type connectors to accomodate the new "Button" head switches. Refer to Figures 8, 9, & 10 for wiring harnesses.

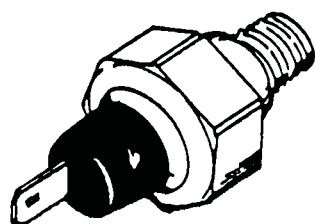
INTERCHANGEABILITY:

Will retro-fit back to previous models, but both the switches and the wiring harness must be replaced.

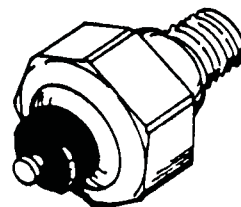
NOTE: THEY ARE MODEL SENSITIVE PARTS.

SERVICE INFORMATION:

Wiring Harness Assembly - 1990 Models: BHH, BJH, BPH, BWH, LAH,
LMH, LNH, PAH, YKH, YLH ..12096136
Wiring Harness Assembly - 1990 Models: BAH, BDH, BFH,
BMH, CDH12096137
Wiring Harness Assembly - 1990 Models: AAH, ABH, AFH, AJH,
ANH, ATH12096127
Pressure Switch Assy (2nd, 3rd, 4th, ALL Models)..... 8668707



PREVIOUS



NEW

Figure 7

AUTOMATIC TRANSMISSION SERVICE GROUP

1990
HYDRA-MATIC 4T60
MODELS: AAH, ABH, AFH,
AJH, ANH, ATH

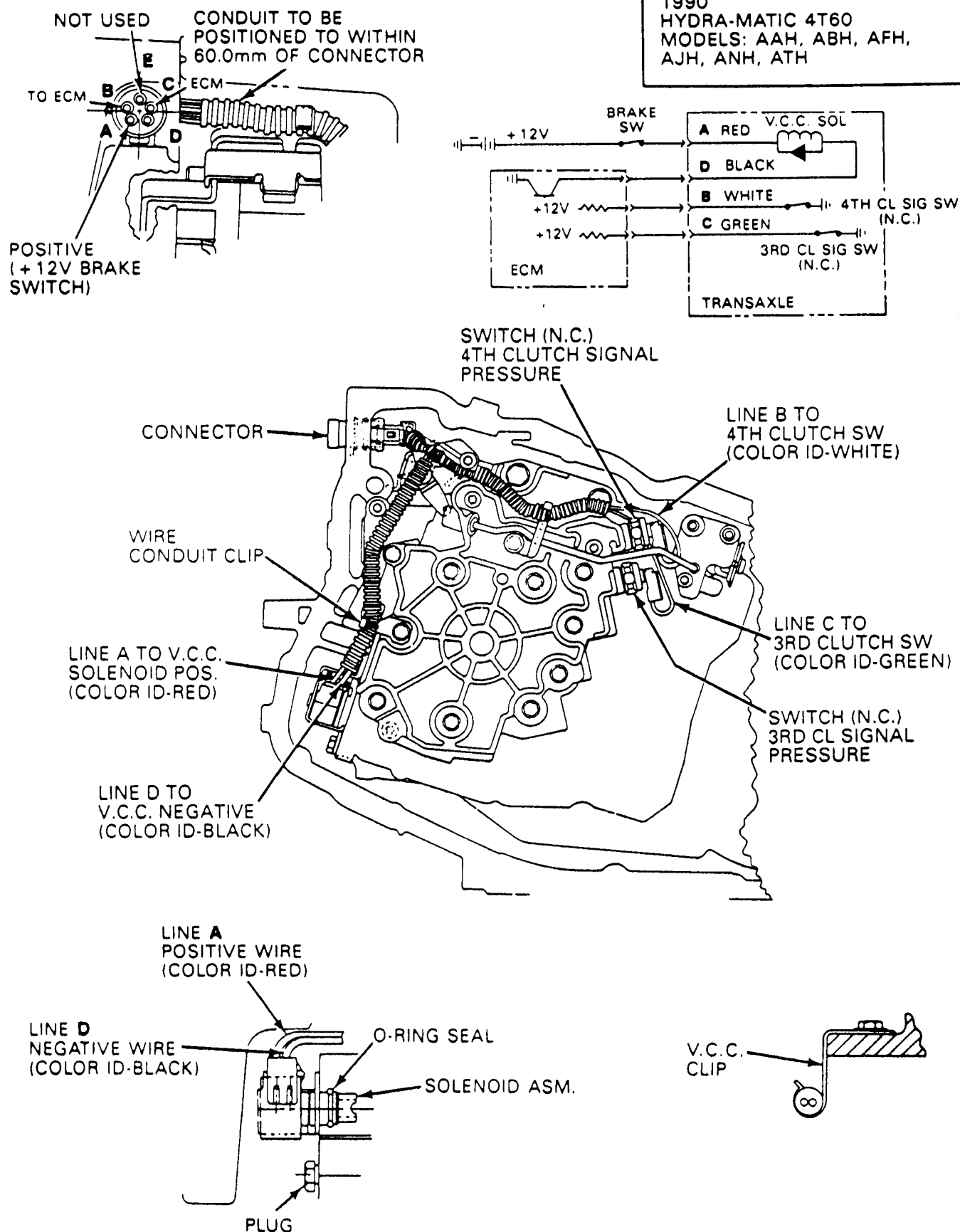


Figure 8

AUTOMATIC TRANSMISSION SERVICE GROUP

1990
HYDRA-MATIC 4T60
MODELS: BAH, BDH, BFH

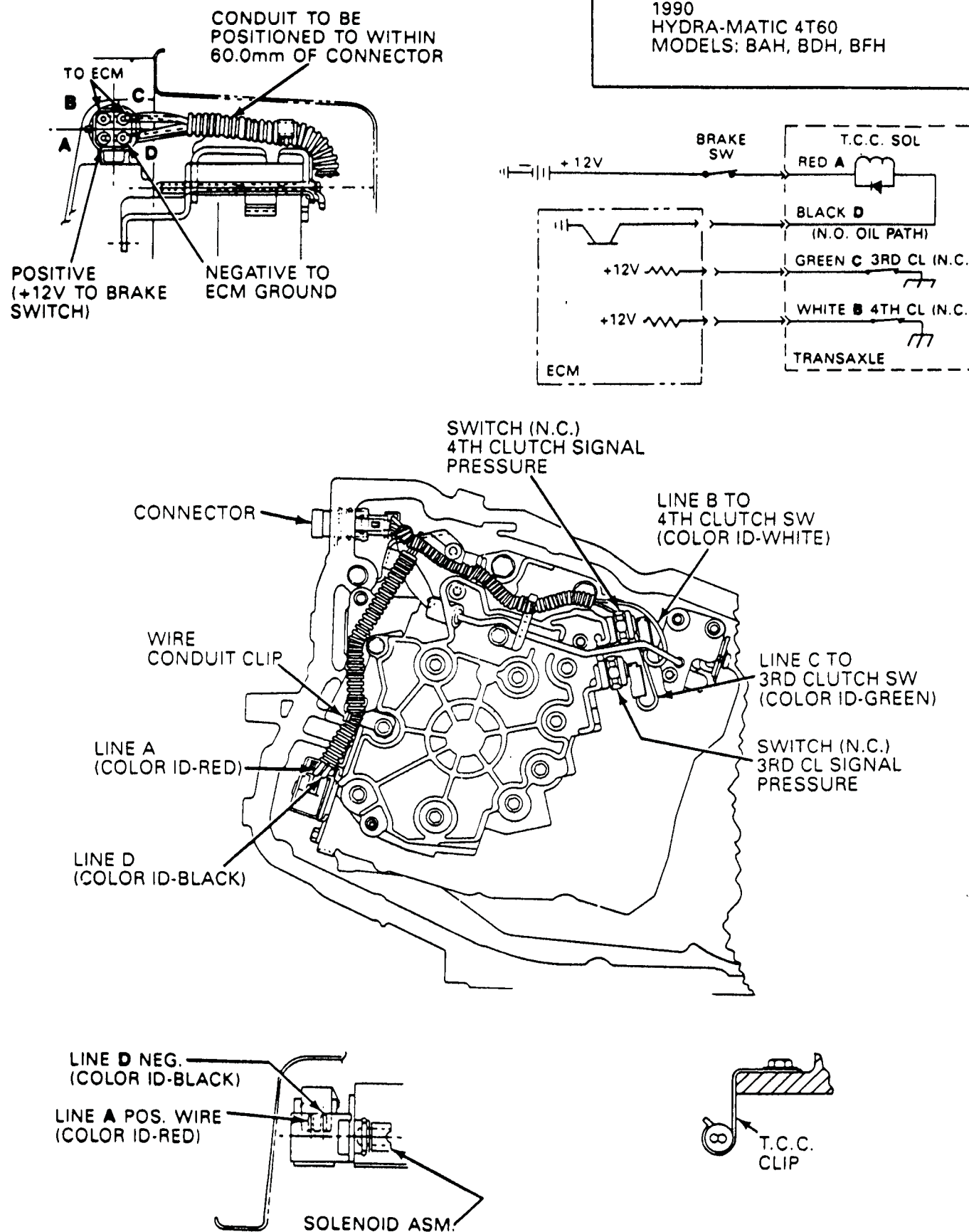


Figure 9

AUTOMATIC TRANSMISSION SERVICE GROUP

1990
HYDRA-MATIC 4T60
MODELS: BHH, BJH, BPH, BWH,
LAH, LMH, LNH, PAH

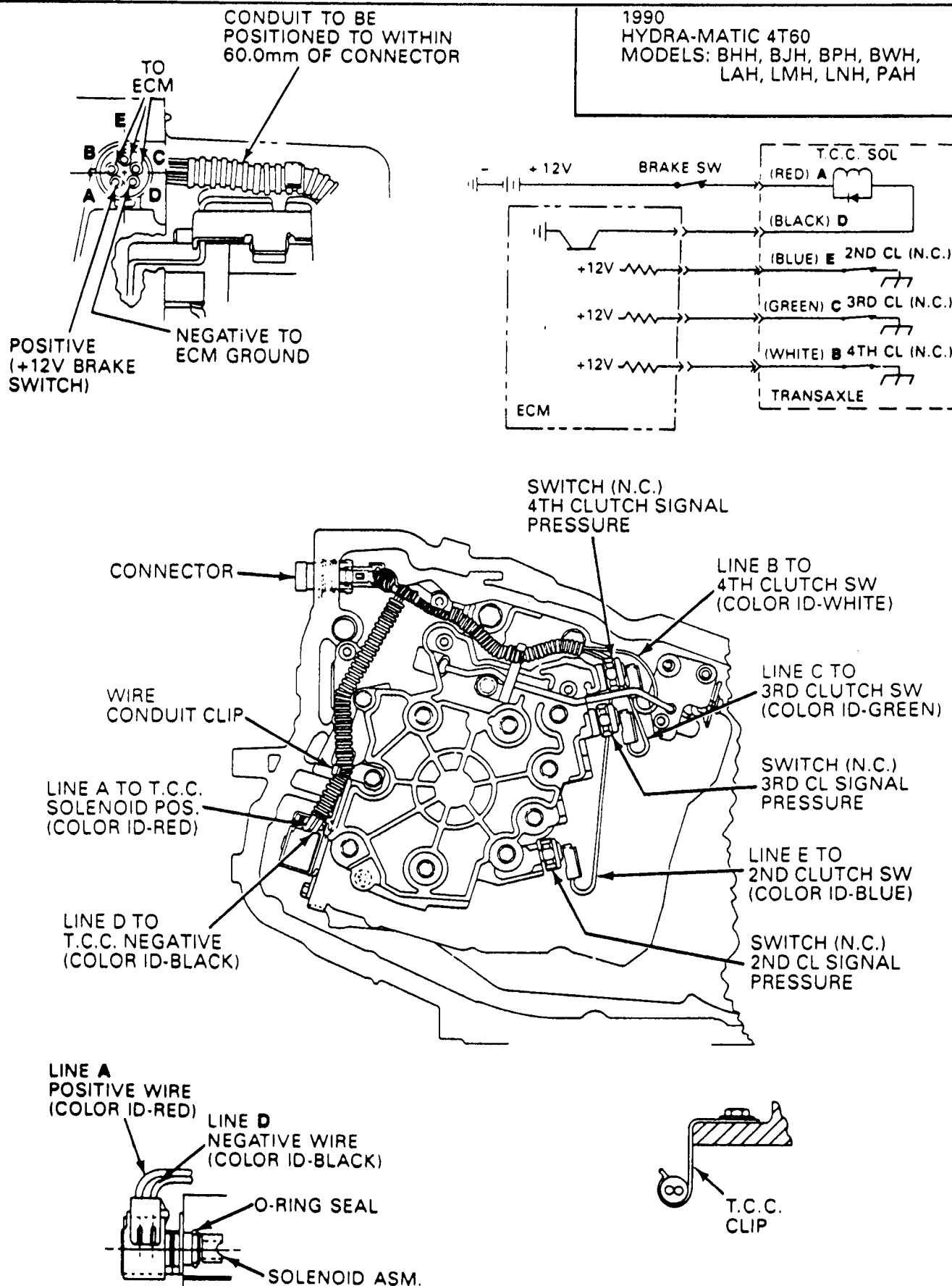


Figure 10
AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4T60)

1990 CHANGE

CHANGE: Entirely new parking lock and actuator system.

REASON: To expand model usage that would include vehicles with a heavier Gross Vehicle Weight (GVW).

PARTS AFFECTED:

- (1) TRANSAXLE CASE - Bore diameter for the actuator guide has been increased by .026", to accomodate the new actuator guide (See Figure 11).
- (2) ACTUATOR GUIDE - Outside diameter has been increased by .026" for the increased diameter of the "Bullet" on the parking rod. The plunger assembly and spring have been eliminated. The slot in the actuator guide has been eliminated (See Figure 12).
- (3) ACTUATOR GUIDE "O" RING - The "O" ring is now larger diameter to seal larger diameter actuator guide (See Figure 12).
- (4) PARKING ACTUATOR ROD - The "Bullet" on the park rod is now .070" larger in diameter, and the length increased by .543" (See Figure 13).
- (5) PARKING PAWL - The parking pawl lock-out pin has been eliminated, and the dimension (Width) of the parking pawl was reduced by .039" (See Figure 14).

NOTE: Parking pawl is an integral part of final drive ring gear.

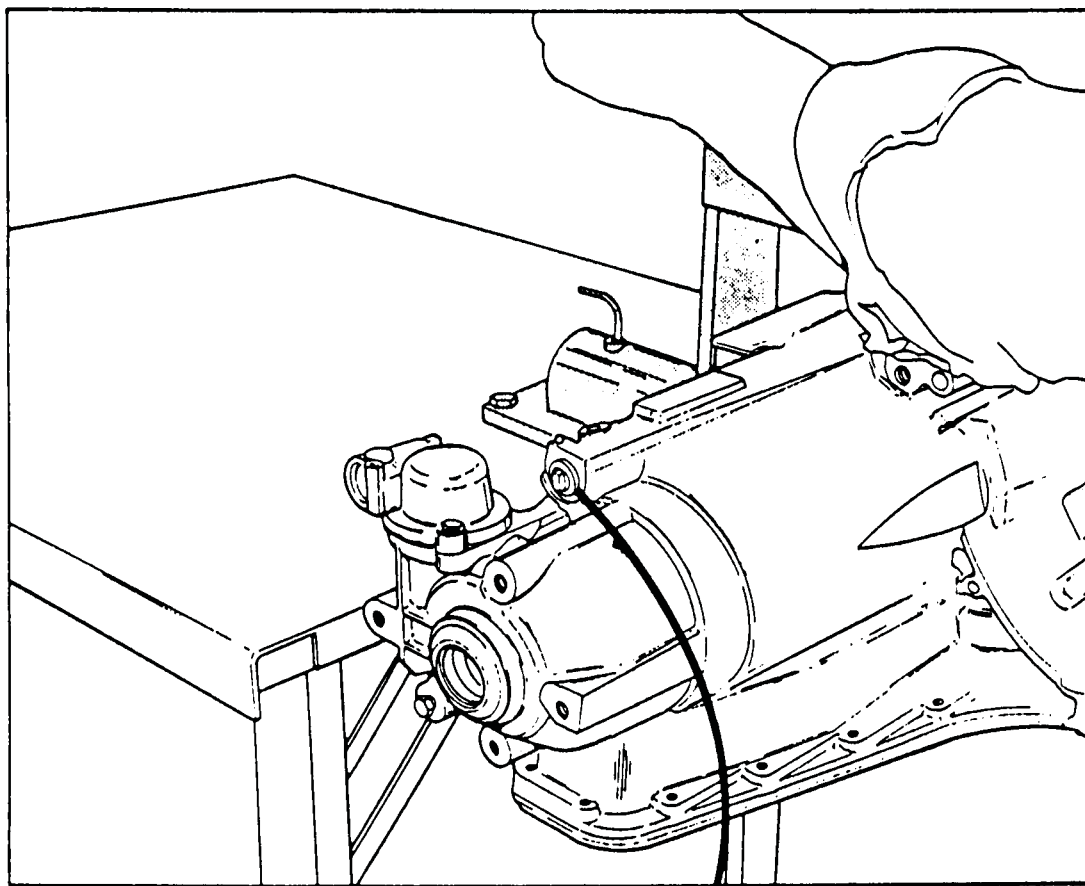
INTERCHANGEABILITY:

THE NEW PARK LOCK SYSTEM PARTS "CANNOT" BE USED TO SERVICE PAST MODELS UNLESS ALL THE COMPONENTS ARE REPLACED, INCLUDING THE TRANSAXLE CASE.

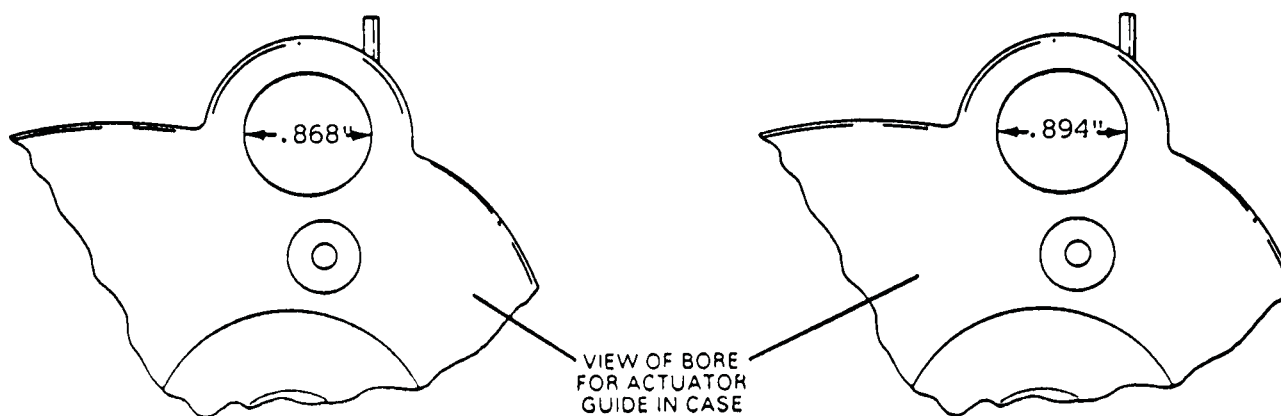
SERVICE INFORMATION:

1990 Transaxle Case (All Except OLAH).....	8668985
1990 Transaxle Case (Model OLAH).....	8668986
1990 Actuator Assembly (All).....	8675325
1990 Park Rod Assembly (All).....	8675335
1990 Final Drive Ring Gear (All).....	8675330

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TRANSAXLE CASE ACTUATOR BORE



PREVIOUS

NEW

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Figure 11

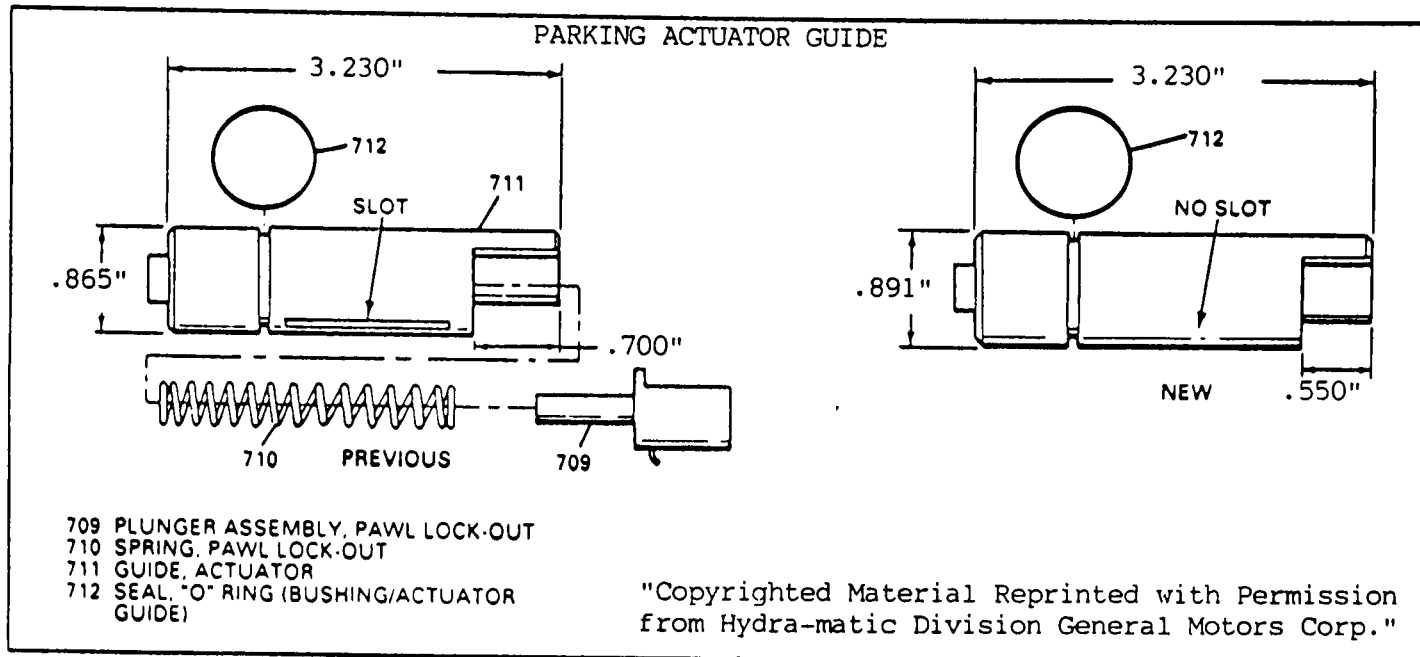


Figure 12

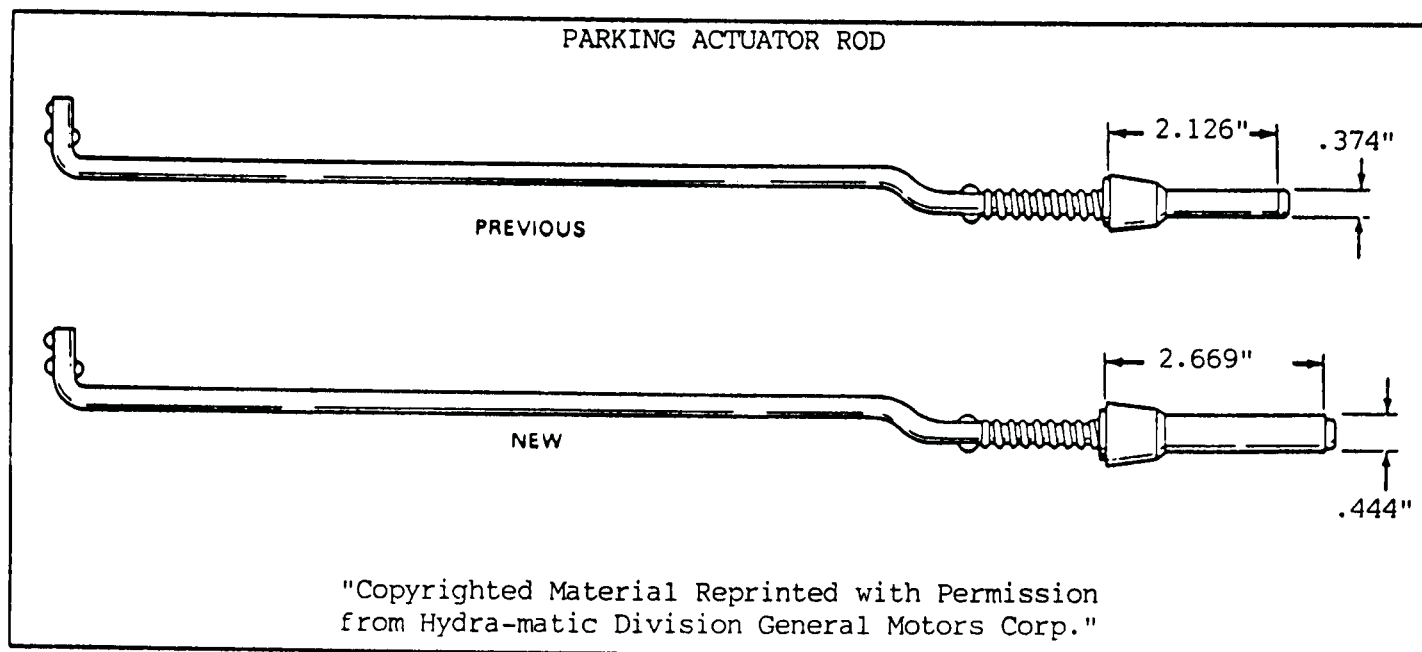


Figure 13

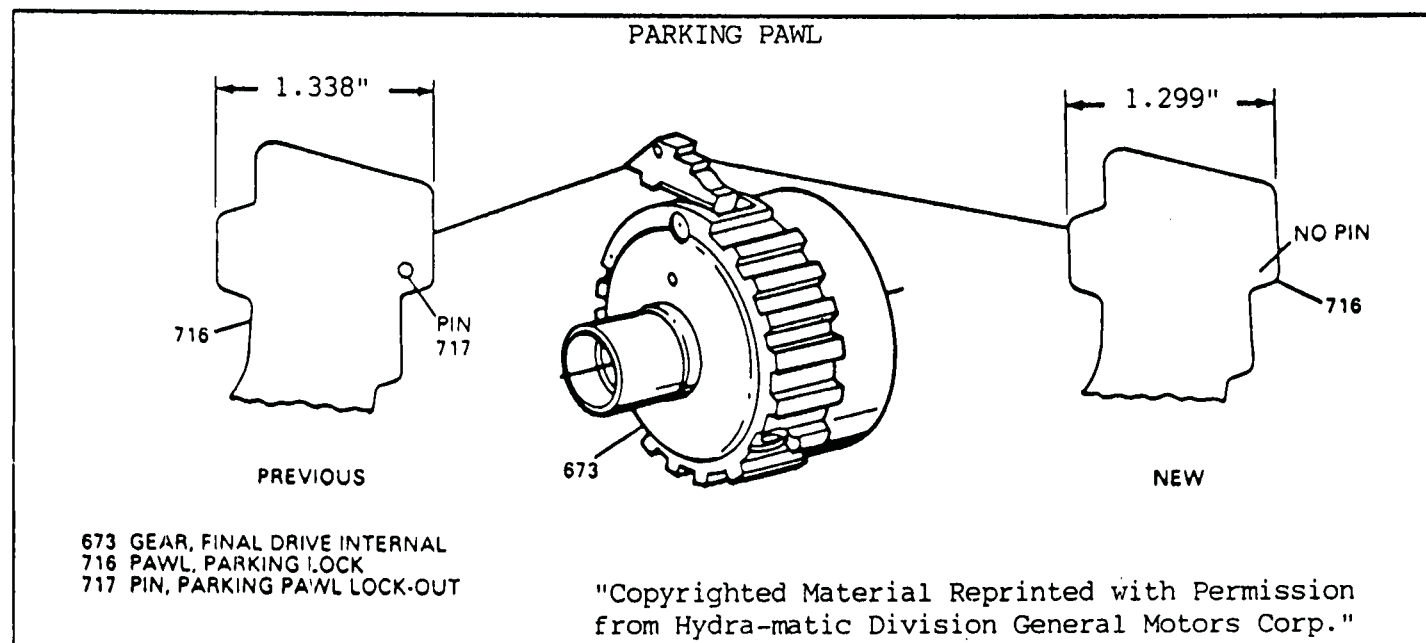


Figure 14



Technical Service Information

THM 440-T4 (4T60)

BURNT AND/OR WELDED FOURTH CLUTCH

COMPLAINT: ON 1989 AND 1990 MODELS ONLY, the fourth clutch lined and steel plates burnt to the point that it has melted the channel plate in the fourth clutch area.

POSSIBLE DRIVER COMPLAINTS:

- (1) Tie-up when transaxle shifts to 4th gear.
- (2) Will not move in drive and/or reverse (Due to 4th clutch welded to channel plate), but can be pushed with the engine off.
- (3) Leak from the left axle area (Doughnut gasket burnt from heat).

CAUSE: The cause may be the manual valve being positioned between the neutral and D4 position, which would allow the input clutch to be applied in 4th gear.

This was created by a change in the channel plate porting, in the manual valve area. The questionable channel plate can be identified by the casting number "8668423", with engineering update level "E". Refer to Figure 15 for locations. Casting number "8668423" with engineering update levels "A", "B", "C", and "D" are OK to use.

DO NOT USE CASTING NO. "8668423" WITH ENGINEERING UPDATE LEVEL OF "E" OR HIGHER - REFER TO FIGURE 15 FOR LOCATIONS.

CORRECTION: Install an earlier model channel plate that does not have the questionable casting number 8668423.

There is also a new service package available from OEM, to address this condition, and contains the following:

NEW CHANNEL PLATE - Will have porting changes for the new manual valve and new inside detent lever. The porting changes will help ensure that two ports will never be opened at once to cause burnt 4th clutch assembly. The bore for the new manual valve has been reduced by .010" to accommodate the new manual valve. This will make the previous and new parts non-interchangeable (See Figure 16).

NEW MANUAL VALVE - Will have changes to the valve lands and reduced .010" in diameter to make it compatible with the new channel plate. The previous and new manual valve are not interchangeable. The new manual valve can be identified by a ring between the first two lands as shown in Figure 17.

NEW INSIDE DETENT LEVER - Will have the manual link hole location changed to provide a different "Throw" of the manual valve, and the hole is now round instead of "Key Hole" shaped. Since the "W" car detent lever is different than all others, it will have a square identification hole punched in it. The previous and new inside detent levers will not interchange. See Figure 18 for identification.



Technical Service Information

SERVICE INFORMATION:

Channel Plate Assembly, 1989-1990 AAH, ABH, ACH, ADH, AFH,
AHH, AJH, ANH, ATH8668993

Channel Plate Assembly, 1989-1990 CLH, CPH, CZH, LMH, LNH,
YBH, YCH, YJH8668994

Channel Plate Assembly, 1989-1990 BAH, BDH, BFH, BHH, BJH,
BPH, BWH, PAH, PBH, VXH,
VYH, WBH, WCH, WLH, WRH,
WTH, WUH, WZH8668995

Channel Plate Assembly, 1989-1990 CDH, CHH, CJH, CYH, YAH,
YFH, YLH, YKH8668996

Channel Plate Assembly, 1990 LAH, YRH8668997

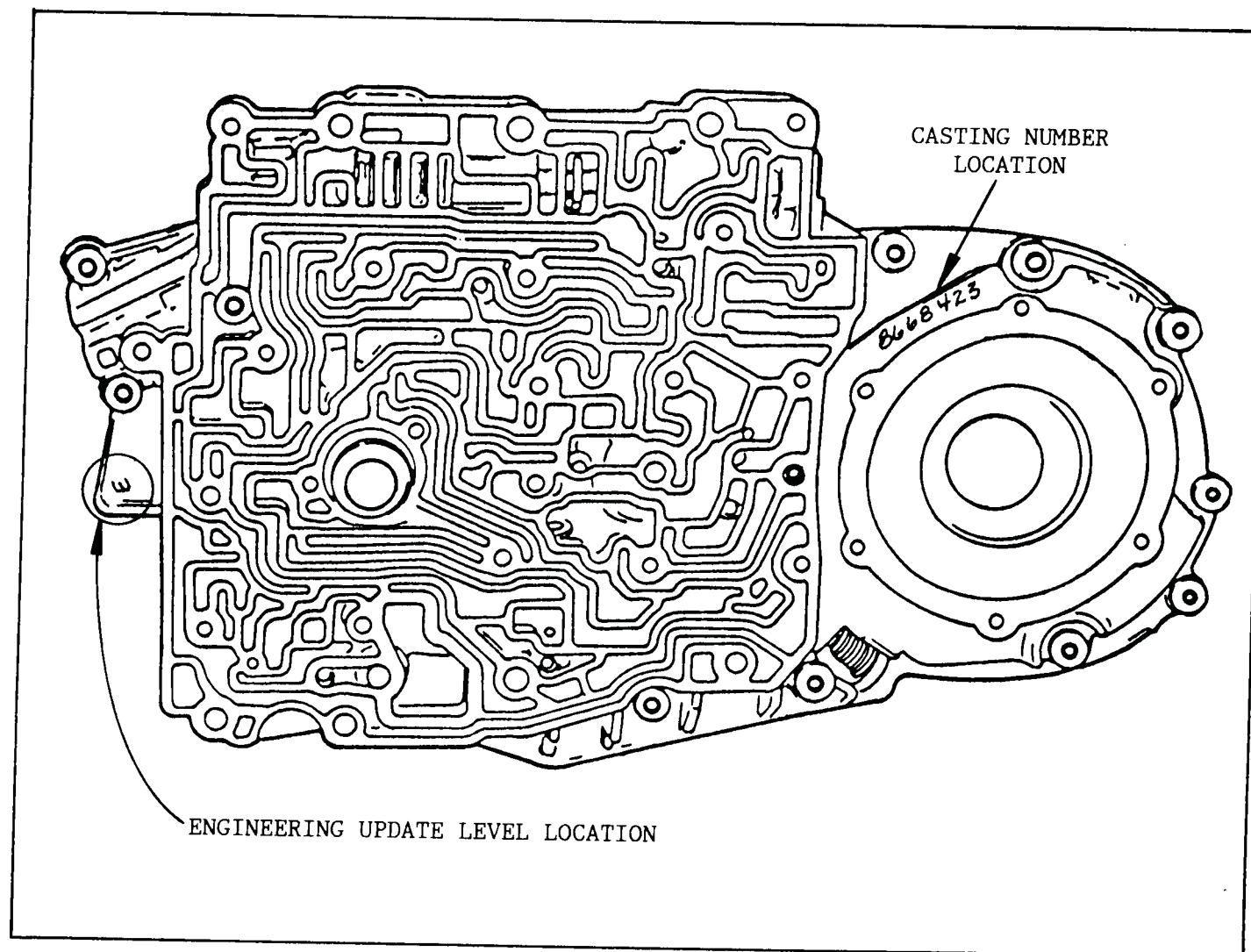


Figure 15

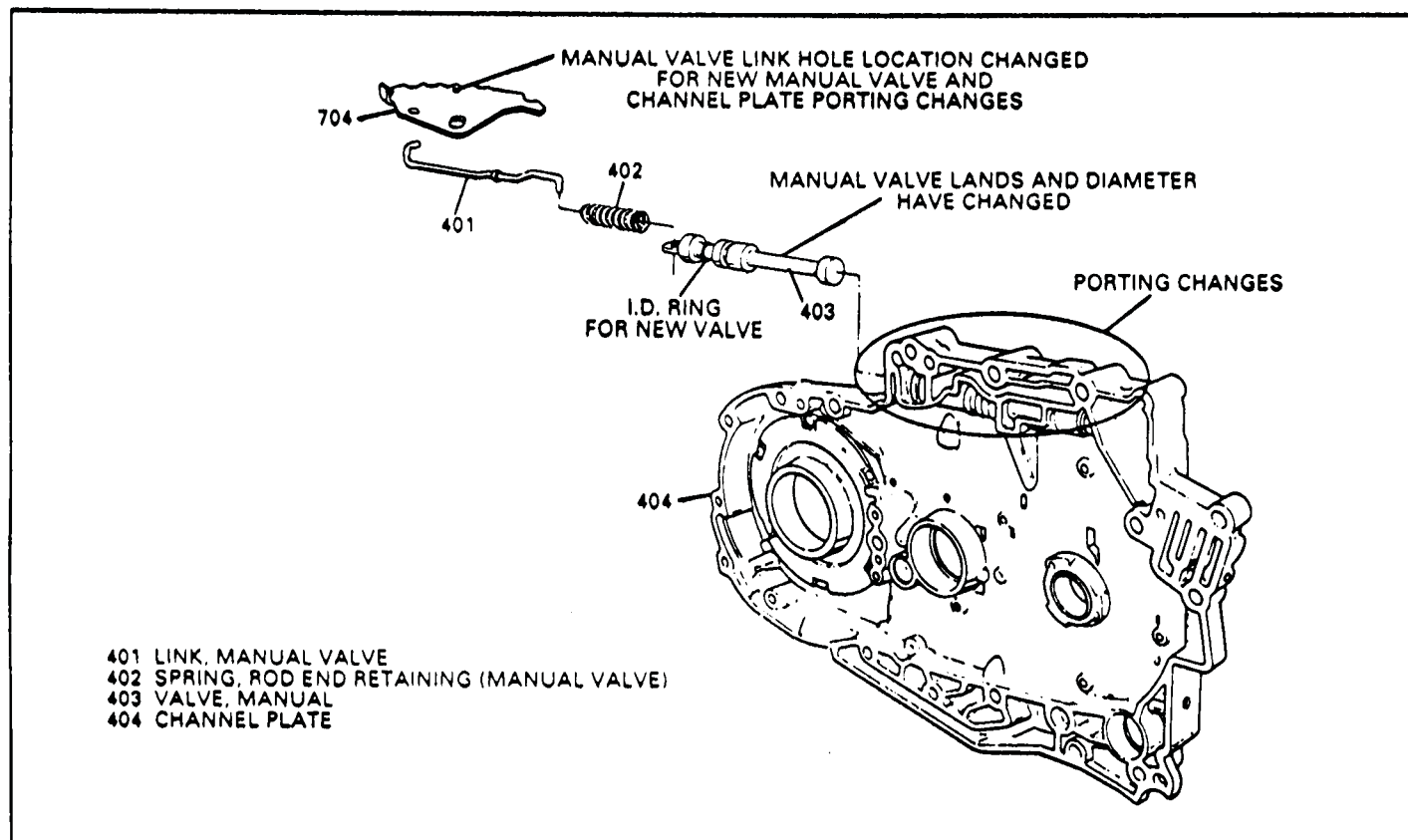


Figure 16

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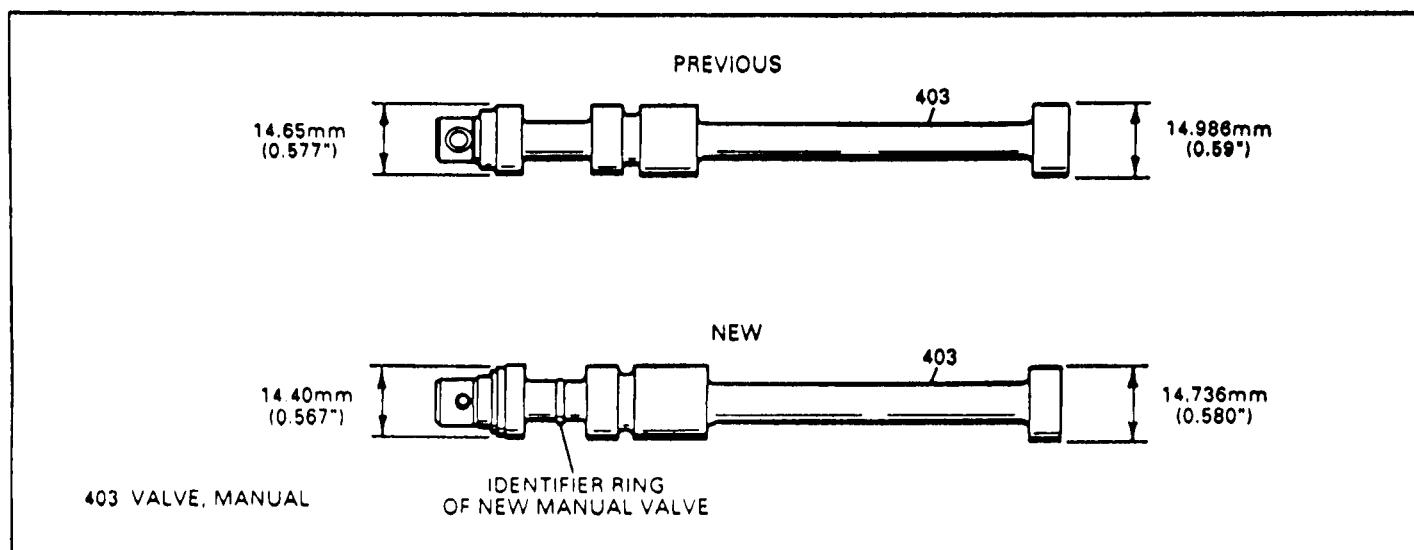


Figure 17

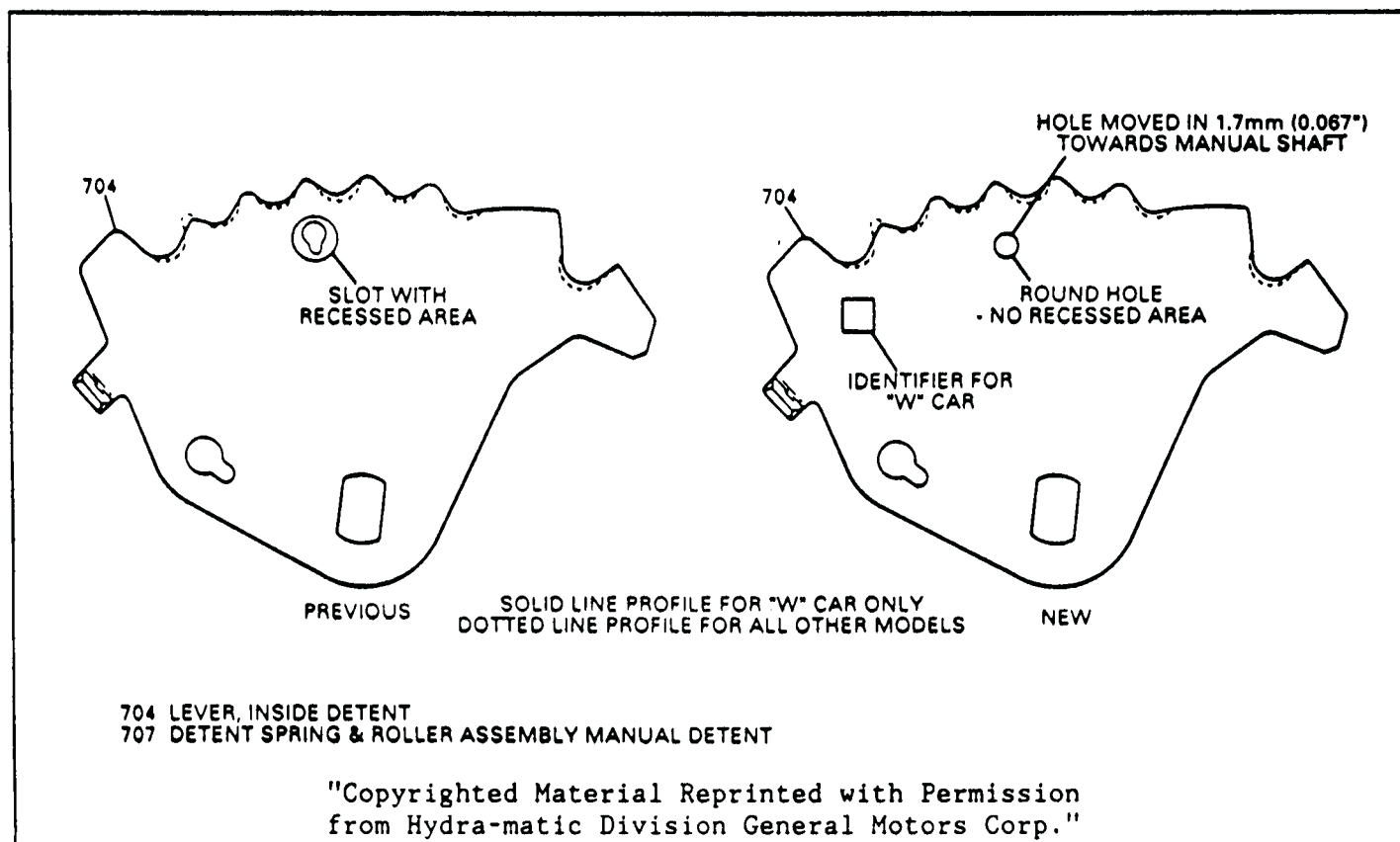


Figure 18



Technical Service Information

THM 440-T4 (4T60) INPUT CLUTCH ACCUMULATOR ELIMINATED

CHANGE: The Input Clutch Accumulator has been eliminated from the channel plate (See Figure 19).

REASON: A "Wave" plate was added to the Input Clutch Pack.

PARTS AFFECTED:

- (1) CHANNEL PLATE - The input clutch accumulator piston, piston pin, and accumulator spring have been eliminated from the channel plate, which of course changes the channel plate casting (See Figure 19).
- (2) INPUT HOUSING - Top snap ring groove moves .060" closer to the top of the input housing, to accomodate the added wave plate (See Figure 20).
- (3) INPUT CLUTCH STEEL PLATES - The steel plates are .027" thinner to help accomodate the added wave plate (See Figure 21). The new steel plates are .049" thick, and the old steel plates are .076" thick (Figure 21).
- (4) INPUT CLUTCH "STACK-UP" - The input clutch stack has also been revised to accomodate the new changes. Refer to Figure 21 for proper assembly of the new input clutches.

NOTE: BOTH PRESSURE PLATES AND FOUR LINED PLATES REMAIN THE SAME
AS PREVIOUS MODELS WITH NO DIMENSIONAL CHANGES.

INTERCHANGEABILITY:

NOT RECOMMENDED TO INTERCHANGE WITH PREVIOUS MODELS.

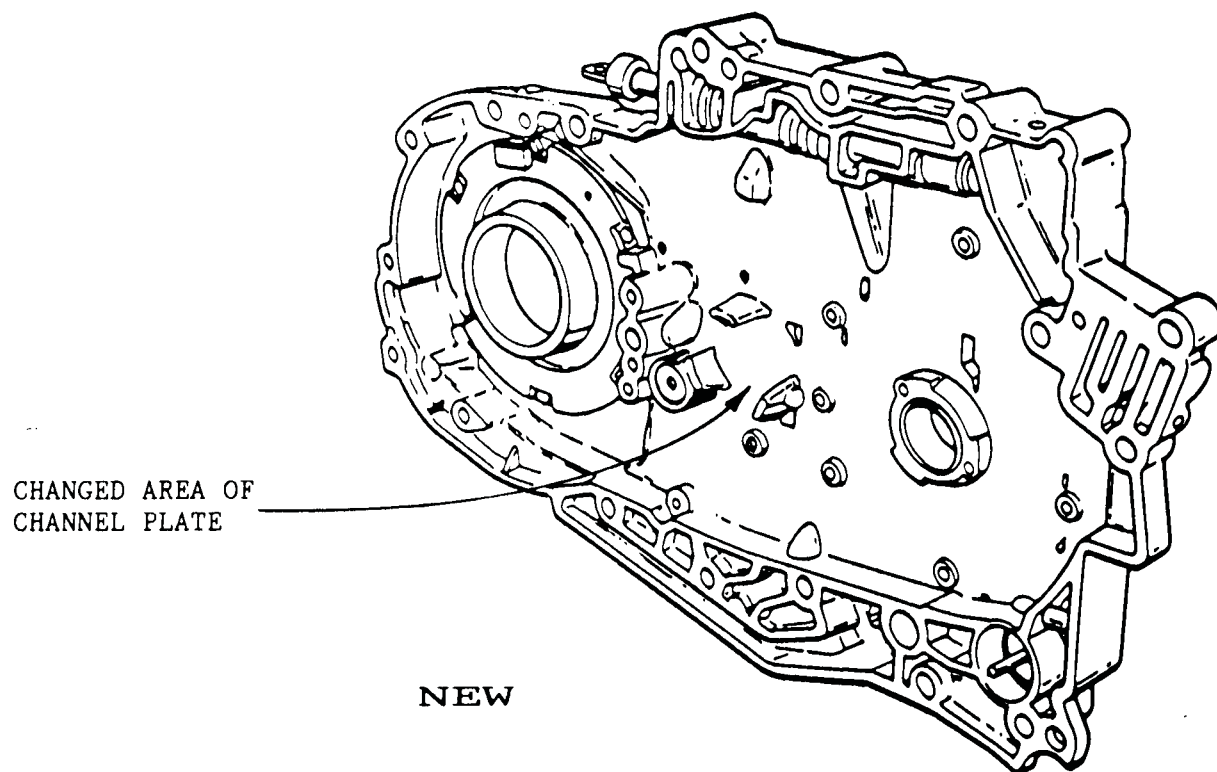
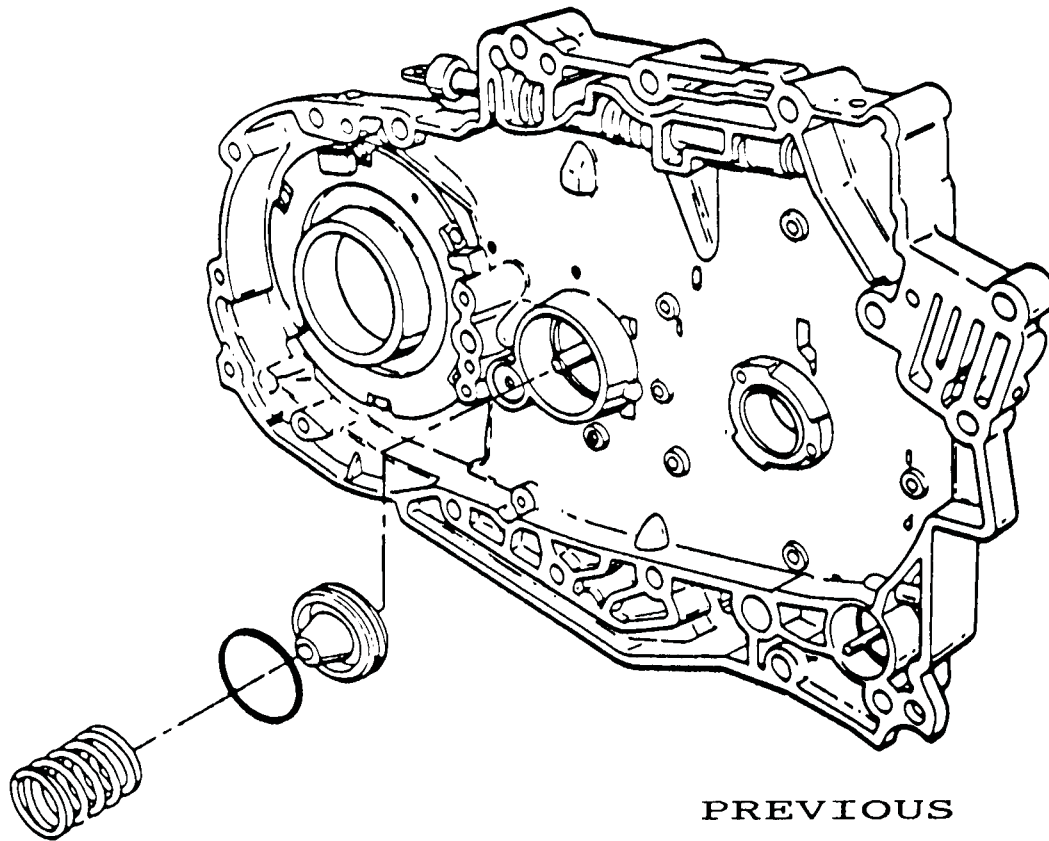


Figure 19

AUTOMATIC TRANSMISSION SERVICE GROUP

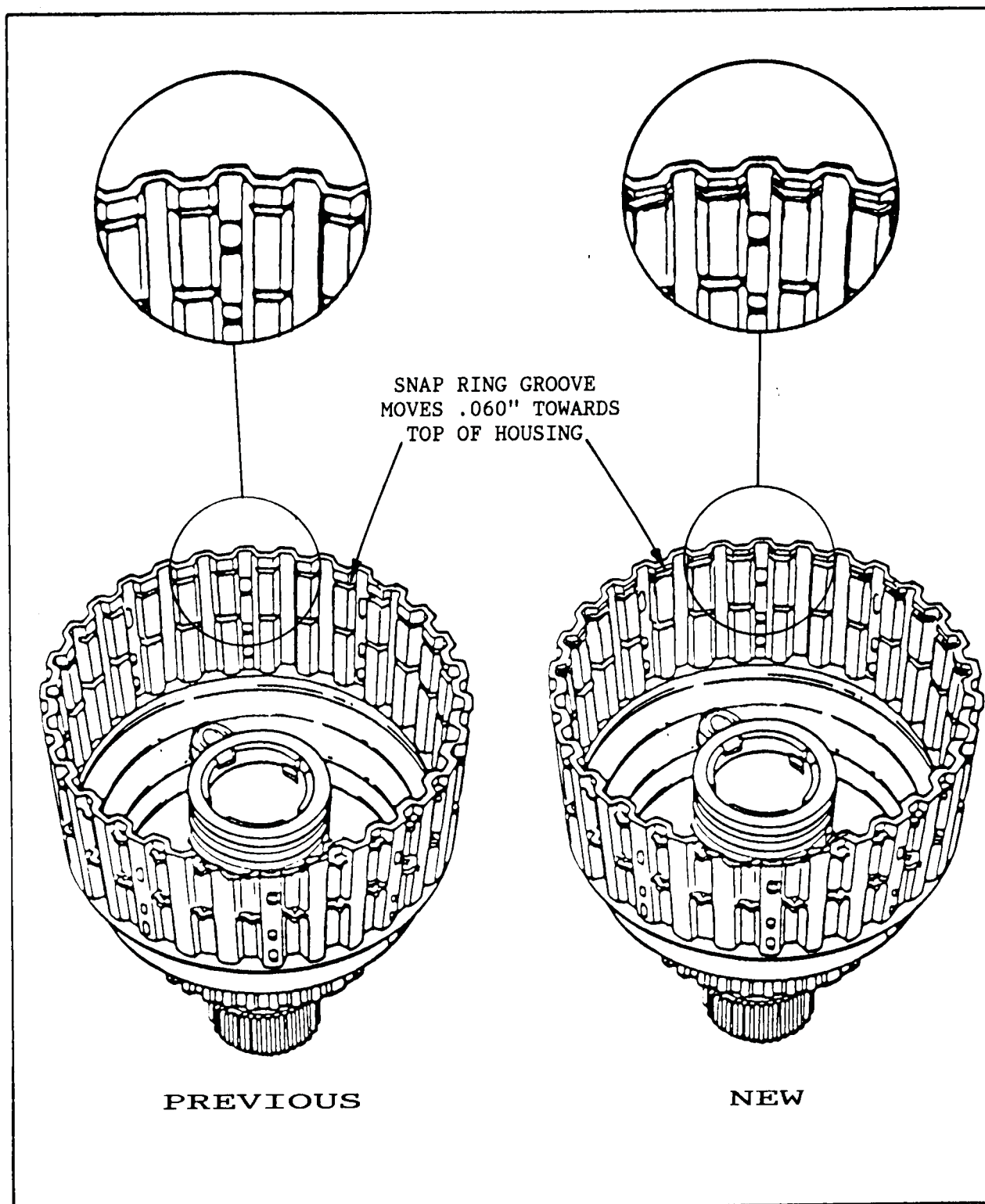


Figure 20

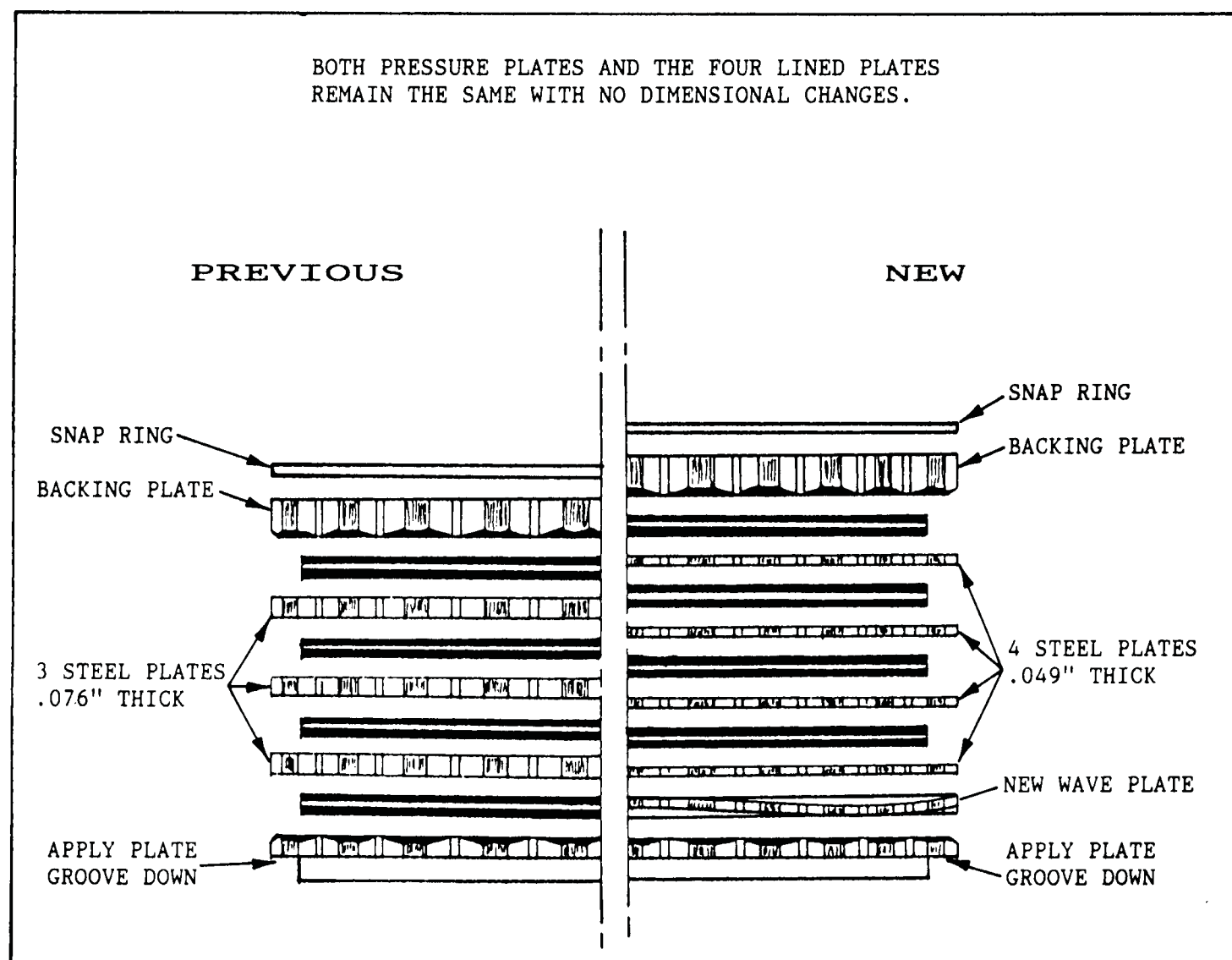


Figure 21

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4T60)

NEW OUTPUT SHAFT/BEARING & 3RD ROLLER CLUTCH

CHANGE: There is now a new Output Shaft/Bearing Assembly, and a new style (5th Design) 3rd Roller Clutch Assembly (See Figures 22 and 23). Beginning on December 11, 1989 (Julian Date 345) all 1990 model 440-T4 transaxles were built with the new 3rd Roller Clutch Assembly, and the new Output Shaft/Bearing Assembly went into production on January 25, 1990 (Julian Date 025).

REASON: Improved lube oil flow to the 3rd roller clutch and input sprag.

PARTS AFFECTED:

- (1) OUTPUT SHAFT/BEARING - The new bearing has a single row of needle bearings instead of a double row, and the output shaft is machined different to accomodate the new bearing (See Figure 22). This change will improve lube oil flow to the 3rd roller clutch and input sprag.
- (2) 3RD ROLLER CLUTCH ASSEMBLY - The new 3rd roller clutch outer race has four (4) less lube holes than previous models. The four lube oil holes are in line with the very end of the rollers (See Figure 23). Elimination of these four holes helps keep the rollers from "Skewing" (Running at an Angle), thus generating less heat.

INTERCHANGEABILITY:

The new Output Shaft/Bearing Assembly will retro-fit back to 1988 models ONLY, because the longer output shaft was required for the up-dated final drive assembly that had the larger side gears.
IT WILL NOT FIT INTO 84-87 MODEL TRANSAXLES.

The new 3rd Roller Clutch Assembly will service all models that are equipped with the Input Housing Thrust Bearing Assembly.
IT WILL NOT FIT TRANSAXLES WITH THE "TOP-HAT" THRUST WASHER.

SERVICE INFORMATION:

Output Shaft and Bearing Assembly (New Style)	8668990
Needle Bearing Only (new Style)	8675032
3rd Roller Clutch Assembly (5th Design)	8677016

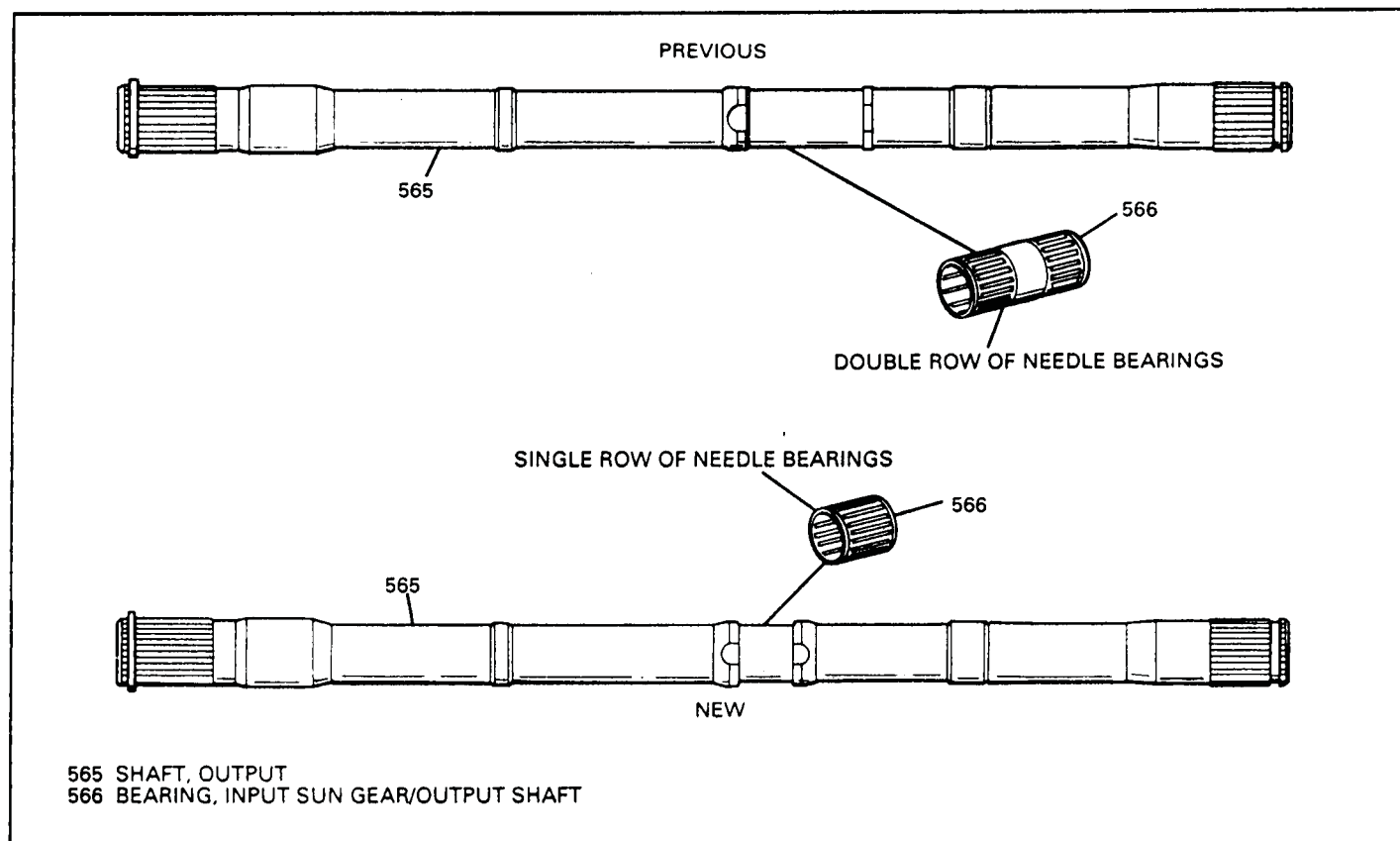


Figure 22

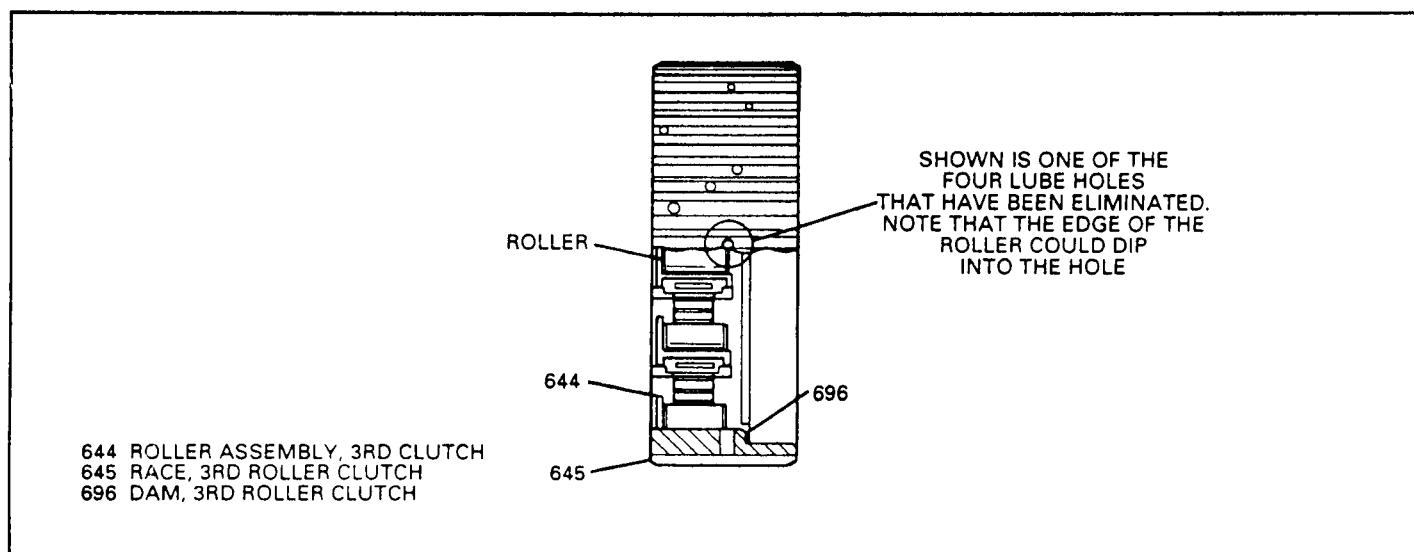


Figure 23



THM 440-T4 (4T60) SPACER PLATE IDENTIFICATION

Proper spacer plate identification and selection is a MUST on the THM 440-T4. There are 2 different line-ups for the 3-2 line control valve, located in the channel plate, on all 1985 1/2 and later hydraulics. The 2 piece 3-2 line control valve is used on 4.1L and 4.5L Cadillac Engines, 3.8L Buick Engines, 3.3L Buick Engines, and 3.1L Turbocharged Engines (See Figures 24 and 25). The "Plug" that is also shown, is used on 3.1L Pontiac Engines, 3.0L Buick Engines, and 2.8L Chevrolet Engines (See Figures 24 and 25).

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

Refer to Figure 25 for the specific holes in the spacer plate to identify which valve line-up the spacer plate is compatible with.

THESE SPACER PLATES WILL NOT INTERCHANGE

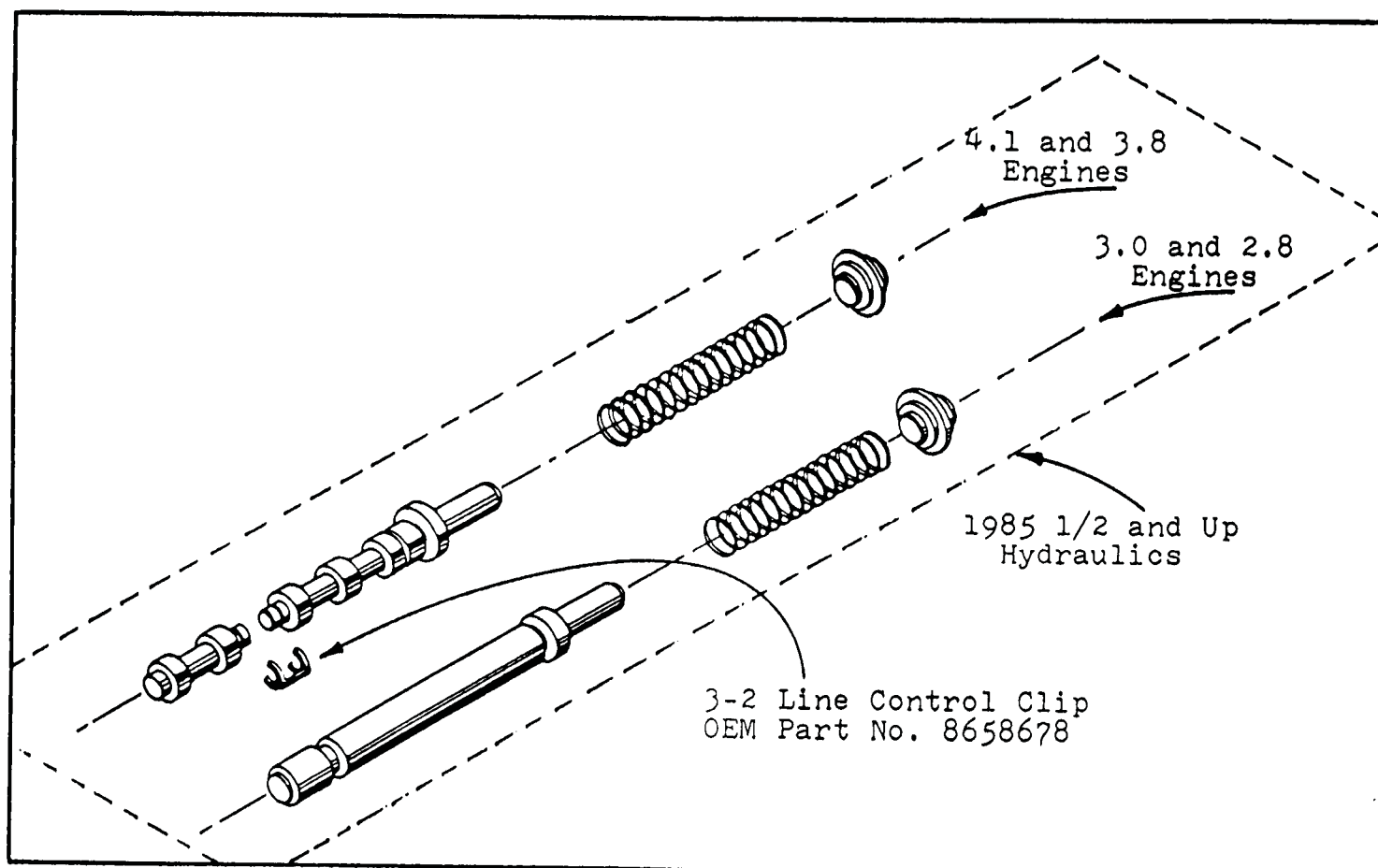


Figure 24

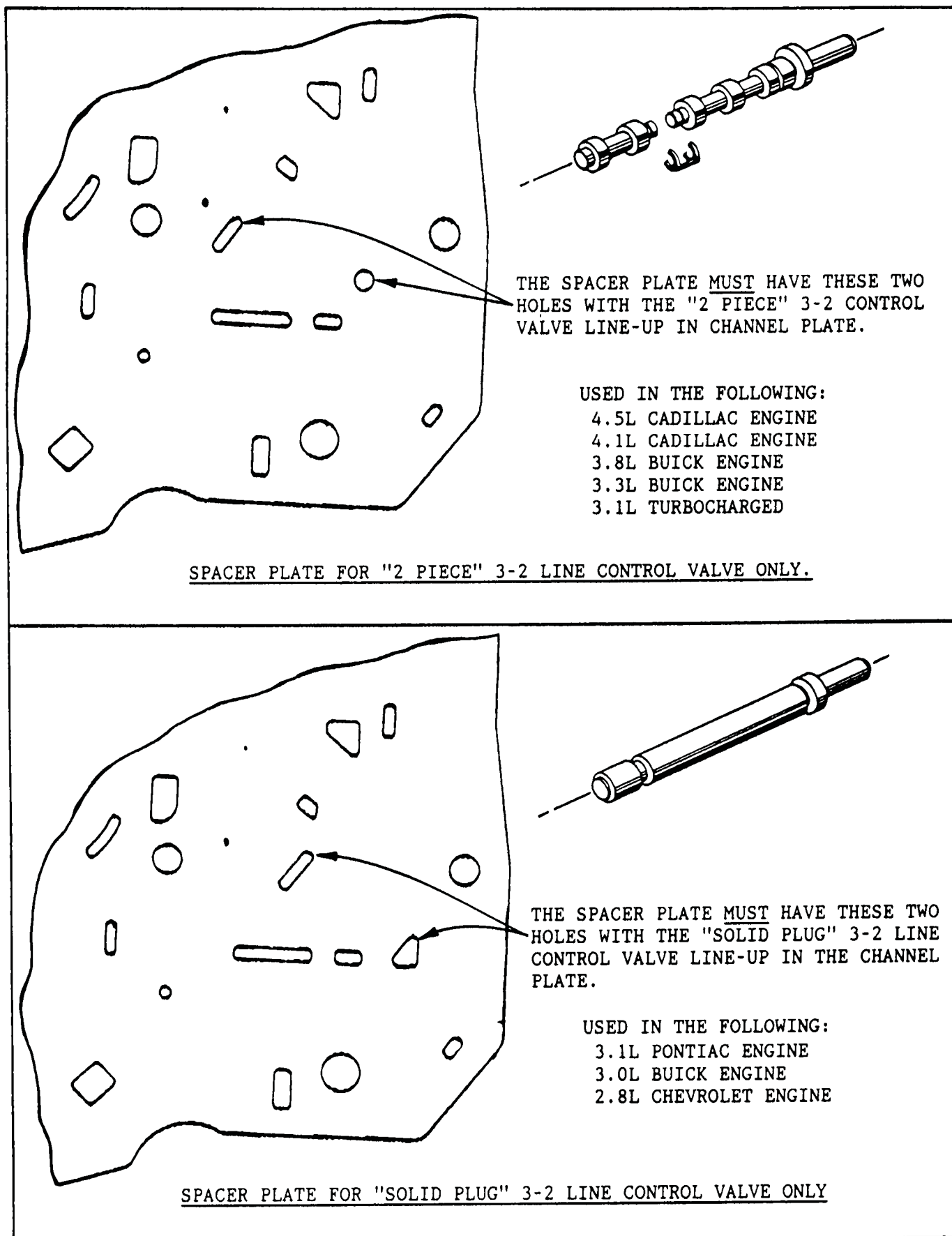


Figure 25

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4T60)

CHANGE ON 3RD CLUTCH PLATES

CHANGE: A change of the fiber material on the 3rd clutch plates requires that all 1989 and 1990 model THM 440-T4 transaxle models built after March 17, 1989 (Julian Date 076) have "New Calibrations" and new two letter model codes.

REASON: Change of factory supplier.

PARTS AFFECTED:

- (1) 3RD CLUTCH PLATES - Change of Fiber Material on the 3rd clutch plates, and can be identified by four (4) black stripes and/or "Notch" cut in one of the teeth, and/or NO identification at all (See Figure 26).
- (2) NEW MODEL CODES - Were assigned when the fiber material change on the 3rd clutch plates was put into production (See Figure 27).
- (3) SPACER PLATE - Was changed on some models. To identify the new spacer plate, see Figure 28 for numbers.
- (4) VALVE BODY CALIBRATION - Goes as follows: (Refer to Figure 29)
 - A. 2-3 accumulator valve spring (Most Models).
 - B. 3-2 control valve spring (All Models).
 - C. 1-2 accumulator valve spring (CPH Models Only).

NOTE: The updated valve body assembly will have an update level "Laser Etched" into the casting by the servo pipes. Refer to Figure 28 for the identification numbers.
- (5) 1-2 SERVO CUSHION SPRING - New 1-2 servo cushion spring can be identified by light blue and orange paint (See Figure 30).
- (6) 1-2 ACCUMULATOR SPRING - New spring on the CPH model only (See Figure 31).

INTERCHANGEABILITY:

The new 3rd clutch fiber plates (Black Stripe) WILL NOT service previous models, UNLESS, a Calibration Update Kit" is installed at the same time. When the new 3rd clutch plates and Calibration Update Kit are installed, a new model tag must be installed with adhesive, that reflects the "New" model code. This is supplied in the Calibration Update Kit. Refer to Figure 32 for location of I.D. tag.

NOTE: THE FOLLOWING CONDITIONS COULD OCCUR IF PARTS ARE MIXED.

- (1) Harsh shifts and possibly a tie-up condition (Worse at Altitudes) on 2-3 and 3-2 shifts if the PREVIOUS 3rd clutch plates are installed into a transaxle built after March 17, 1989 (New Model Codes).
- (2) A slide-bump on 2-3 and 3-2 shifts if the NEW 3rd clutch plates (Black Stripe) are installed into a transaxle built before March 17, 1989 (Old Model Codes) without installing one of the "Calibration Update Kits". Refer to Page 31 of this manual for OEM part numbers under Service Information.

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

SERVICE INFORMATION:

<u>DESCRIPTION</u>	<u>MODELS</u>	<u>PART NO.</u>
1989 Calibration Update Kit	9AAH, 9ABH, 9AFH	8675936
1989 Calibration Update Kit	9BAH, 9BDH	8675937
1989 Calibration Update Kit	9BFH, 9BMH	8675938
1989 Calibration Update Kit	9BHH	8675939
1989 Calibration Update Kit	9BJH	8675940
1989 Calibration Update Kit	9BPH	8675941
1989 Calibration Update Kit	9BWH, 9VXH	8675942
1989 Calibration Update Kit	9CDH, 9CLH, 9CZH	8675943
1989 Calibration Update Kit	9PAH'	8675945
1989 Calibration Update Kit	9CPH, 9CYH	8675946
1989 Calibration Update Kit	0CHH	8675947
1989 Calibration Update Kit	0CJH	8675948
3rd Clutch Plate Package (New Black Stripe)		8662990
3rd Clutch Plate Package (Previous Models)		8662954

=====

3RD CLUTCH PACK PART NUMBERS

1984-1988	3RD CLUTCH PACKAGE	8646938
	CONTAINS THE FOLLOWING:	
	4 Single Sided Inside Spline Plates (Green Stripes)	
	4 Single Sided Outside Spline Plates (Green Stripes)	
	1 Normal 3rd Clutch Steel Plate	
1989-1990	3RD CLUTCH PACKAGE	8662954
	CONTAINS THE FOLLOWING:	
	5 Single Sided Inside Spline Plates (No Stripes)	
	5 Single Sided Outside Spline Plates (No Stripes)	
	1 3rd Clutch Wave Plate	
1989-1990	3RD CLUTCH PACKAGE	8662990
	CONTAINS THE FOLLOWING:	
	5 Single Sided Inside Spline Plates (Black Stripes)	
	5 Single Sided Outside Spline Plates (Black Stripes)	
	1 3rd Clutch Wave Plate	
	REQUIRES CALIBRATION UPDATE KIT IF USED IN PREVIOUS MODELS.	

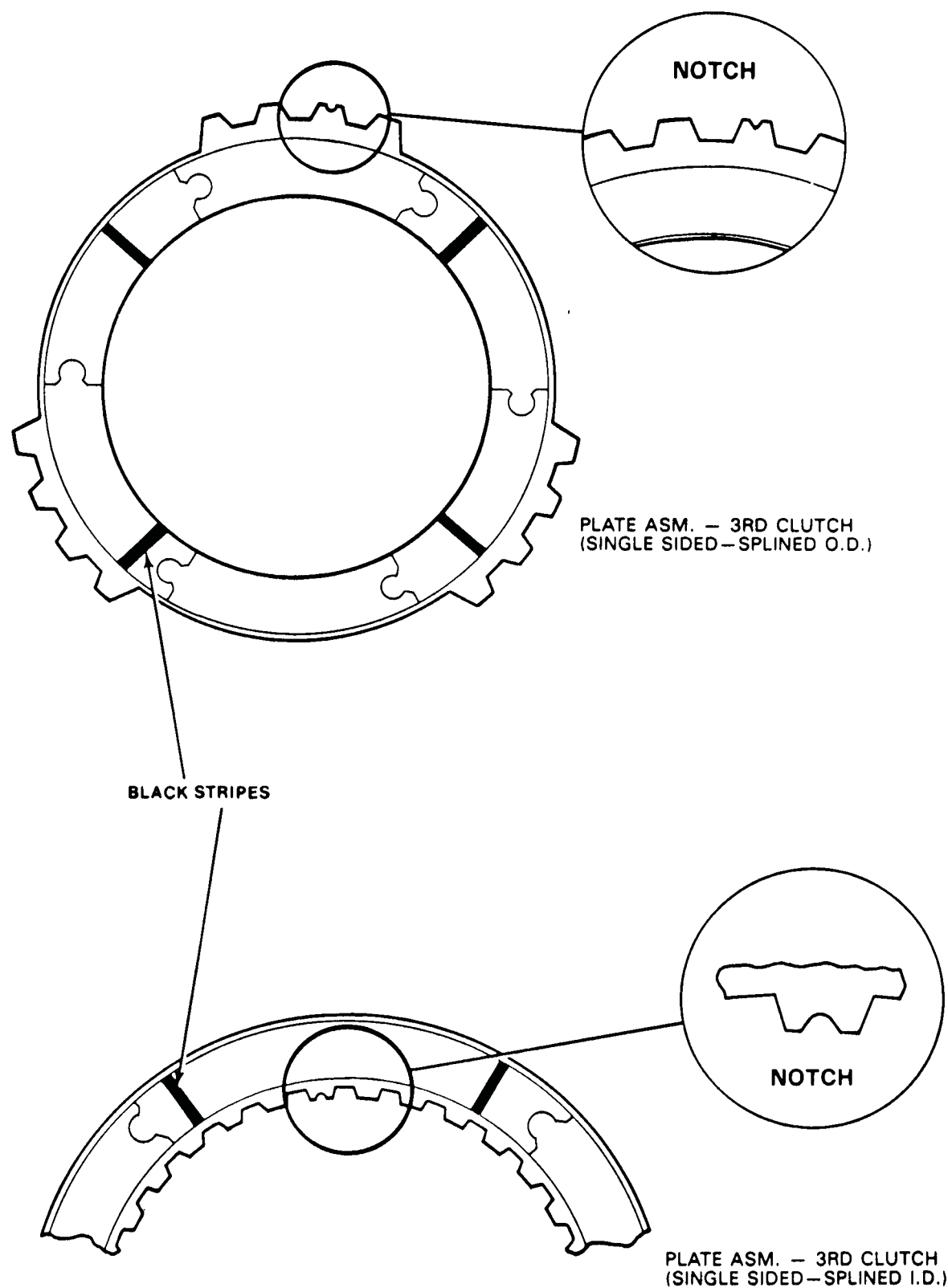
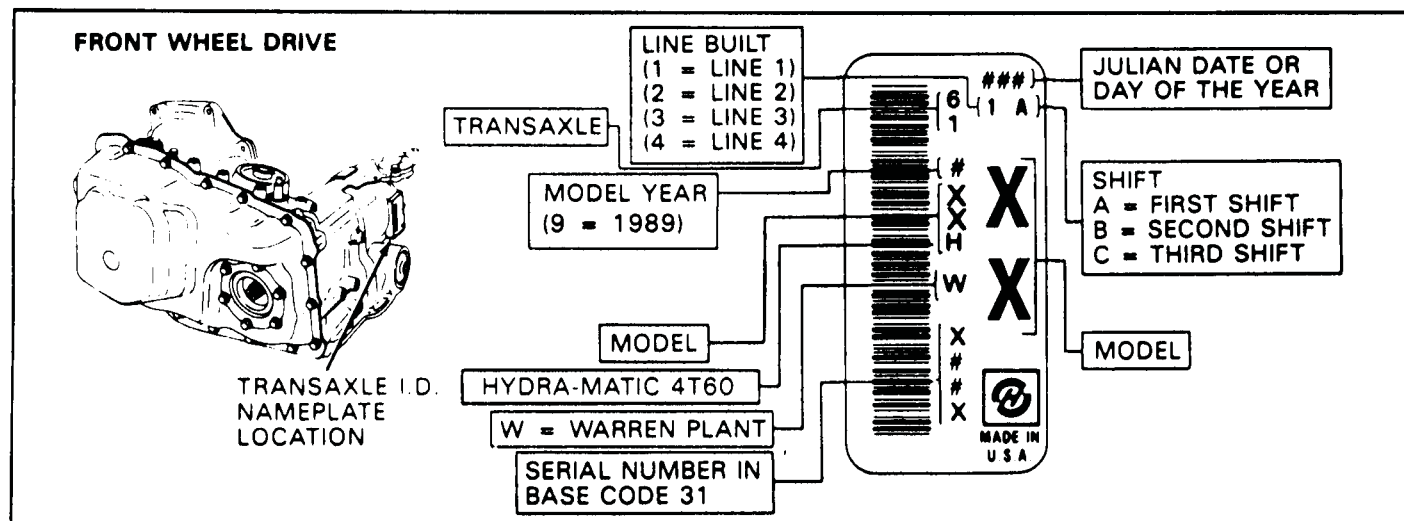


Figure 26
AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information



HYDRA-MATIC 4T60 IDENTIFICATION INFORMATION

OLD MODEL	NEW MODEL	CODES	CODE INFORMATION
AAH	ACH		(*) = NO CHANGES (NO NEW 3RD CLUTCH PLATES)
ABH	ADH		
AFH	AHH		(O) = EARLY 1990 MODEL
(AJH)	(AJH)	(*)	
(ANH)	(ANH)	(*)	
(ATH)	(ATH)	(*)	
(OLAH)	(OLAH)	(*) (O)	
(OLCH)	(OLCH)	(*)	
PAH	PBH		
VXH	VYH		
BAH	WBH		
BDH	WCH		
BFH	WLH		
BMH	WKH		
BHH	WRH		
BJH	WZH		
BPH	WTH		
BWH	WUH		
CDH	YAH		
CLH	YBH		
CPH	YCH		
CYH	YFH		
CZH	YJH		
OCHH	OYKH	(O)	
OCJH	OYLH	(O)	

NOTE: IF THE MODEL CODES CHANGED THEN THE 3RD CLUTCH PLATE ASSEMBLY AND CALIBRATIONS DID ALSO.

Figure 27

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

MODELS	VALVE BODY I.D.	MODELS	SPACER PLATE LAST FOUR NUMBERS
AJH	8S-1	AJH	8394
ACH, ADH, AHH	9A-3	ACH, ADH, AHH	5213
ANH, ATH	9B-2	ANH, ATH	8415
WBH, WCH	9D-2	WBH, WCH	5103
WLH, WKH	9E-3	WLH, WKH	5091
WRH	9G-3	WRH	5091
WZH, WUH	9H-3	WZH	5099
		WUH	5097
WTH	9J-3	WTH	5091
YAH, YBH, YJH	9M-2	YAH, YBH, YJH	5089
YCH	9P-2	YCH	5093
PBH	9U-2	PBH	5101
OYKH	OY-1	OYKH	5201
OYLH	OW-1	OYLH	5203
OLAH	OZ-1	OLAH	8874
YFH	9C-0	YFH	8273
The last number of the valve body I.D. can be the same as indicated or higher. The higher number means that it was updated.			

Figure 28

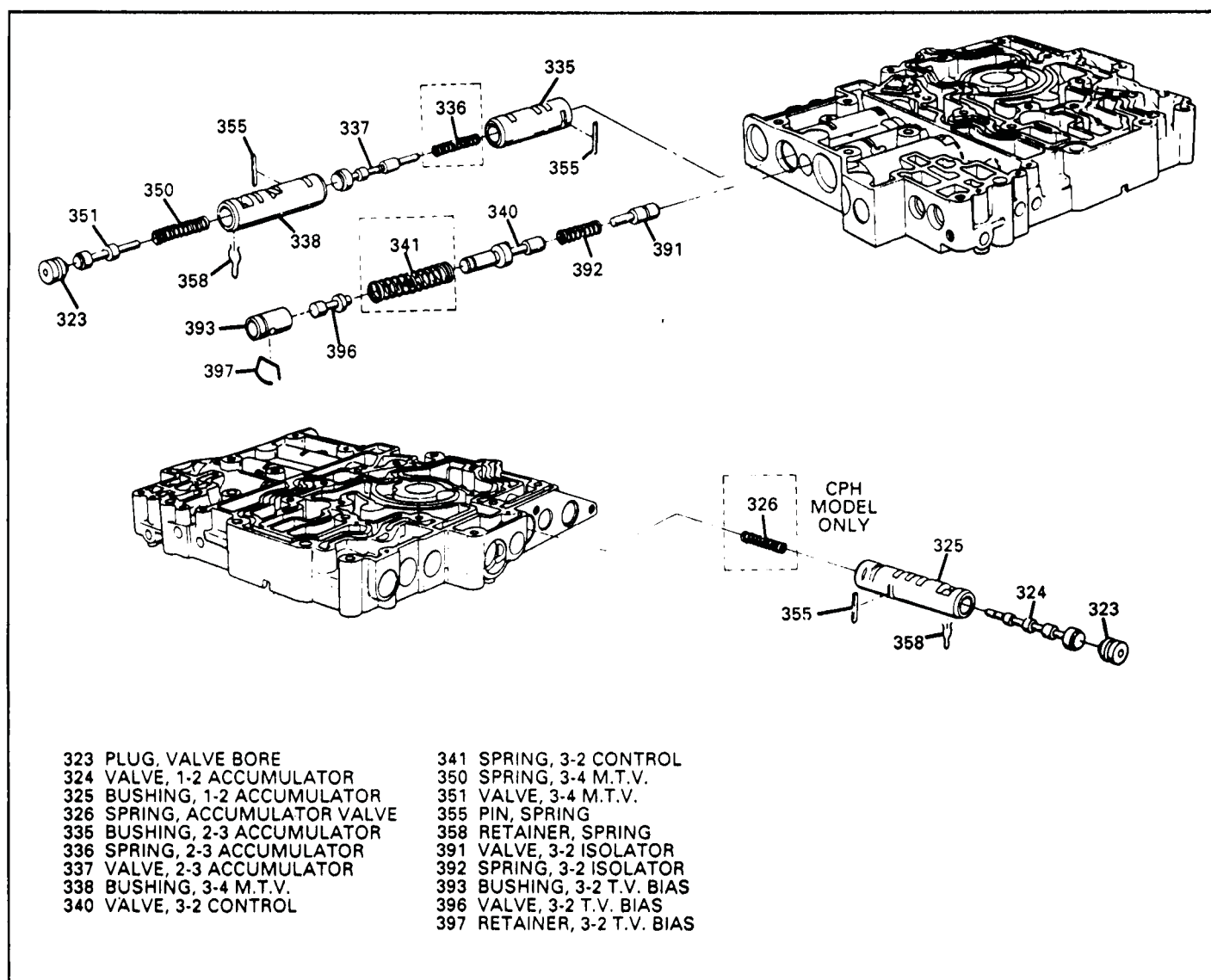


Figure 29

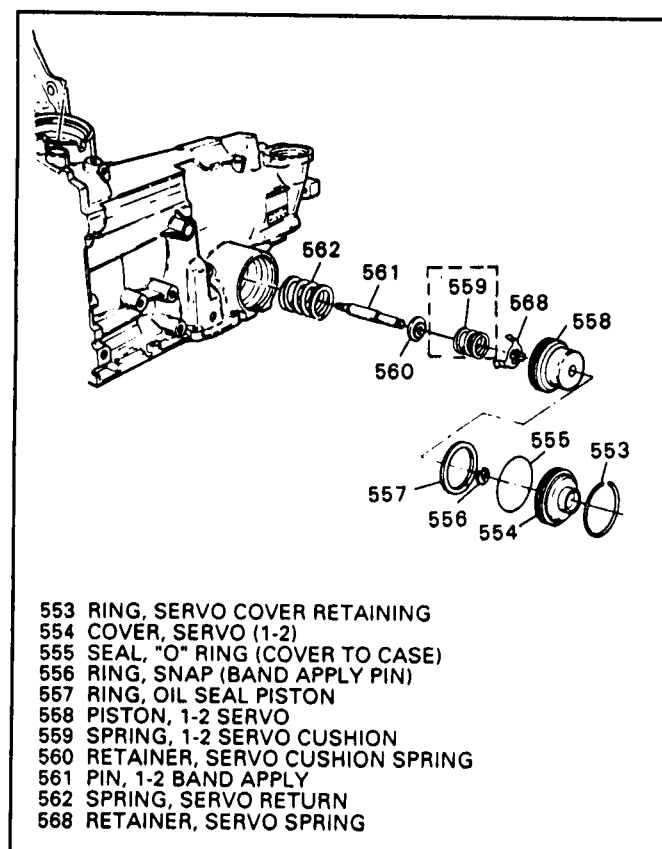


Figure 30

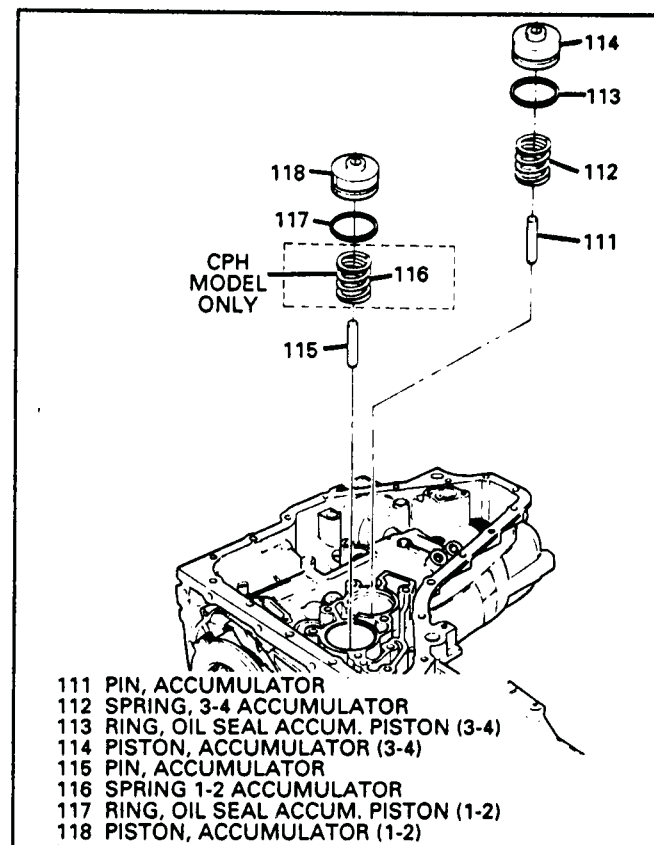
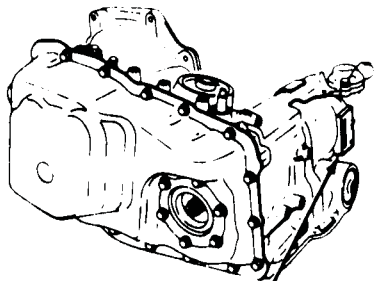



Figure 31

FRONT WHEEL DRIVE



TRANSAXLE I.D. NAMEPLATE LOCATION



6 1
X X H W X # # X

MADE IN U.S.A.

1 A

X

X

JULIAN DATE

CLEAN AREA/PLACE
NEW ADHESIVE
MODEL TAG HERE

SHOWN	CHANGE TO	SHOWN	CHANGE TO
AAH	ACH	CLH	YBH
ABH	ADH	CPH	YCH
AFH	AHH	CYH	YFH
PAH	PBH	CZH	YJH
VXH	VYH	CHH	YKH
BAH	WBH	CJH	YLH
BDH	WCH		
BFH	WLH		
BMH	WKH		
BHH	WRH		
BJH	WZH		
BPH	WTH		
BWH	WUH		
CDH	YAH		

Figure 32



Technical Service Information

THM 440-T4 (4T60)

NEW "TWO PLATE" 4TH CLUTCH (SOME MODELS ONLY)

CHANGE: A new "Two Plate" 4th clutch assembly was used to replace the Single Plate 4th clutch assembly for SOME MODELS ONLY on the 1990 THM 440-T4 transaxles (See Figure 33).

REASON: Higher torque engine applications (Some Models Only).

PARTS AFFECTED:

- (1) 4TH CLUTCH LINED PLATES - Were made thinner by .020" than the previous lined plate, and can be identified by the four WHITE stripes, while the single plate lined plate has four GREEN stripes (See Figure 33). The Single Plate 4th Clutch is .090" thick, and the new "Two Plate" 4th Clutch plates are .070" thick.
- (2) 4TH CLUTCH STEEL PLATES - Were made thinner by .004" than the previous plates, and can be identified by a "Notch" cut into one of the tabs (See Figure 33). The single plate 4th clutch steels are .078" thick, and the new "Two Plate" steels are .074" thick.
- (3) 4TH CLUTCH APPLY PLATE - Was machined thinner than the previous apply plate, and the step was removed. Refer to Figure 33.

INTERCHANGEABILITY:

Will not interchange without calibration changes. May create harsh shifts if the Two Plate type is installed where the Single type was, or soft shift if the Single type is installed where the Two Plate type belongs.

SERVICE INFORMATION:

4th Clutch Lined Plates (Two Plate Type)	18017246
4th Clutch Steel Plates (Two Plate Type)	8661006
4th Clutch Apply Plate (Two Plate Type)	8661004

AUTOMATIC TRANSMISSION SERVICE GROUP

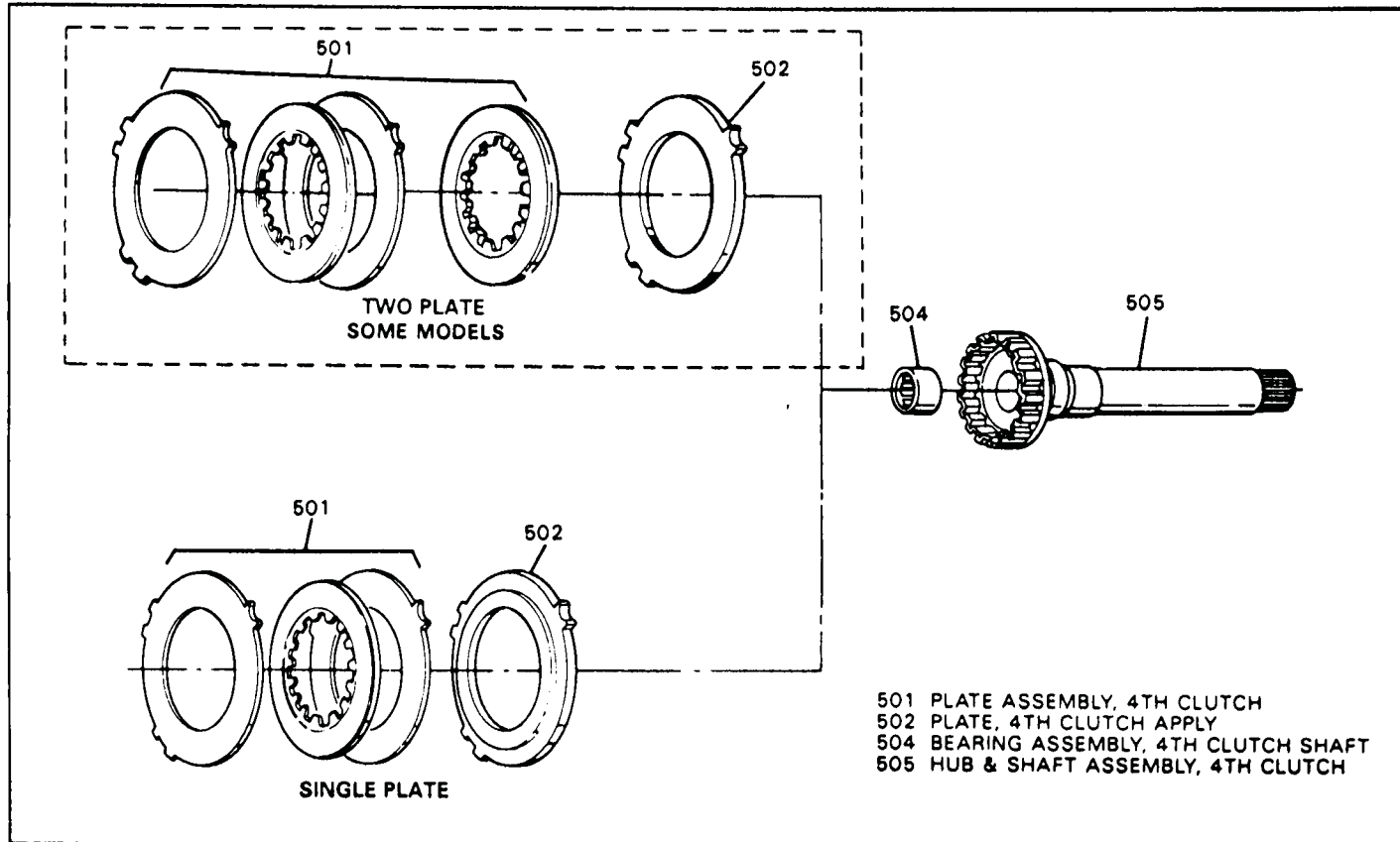


Figure 34

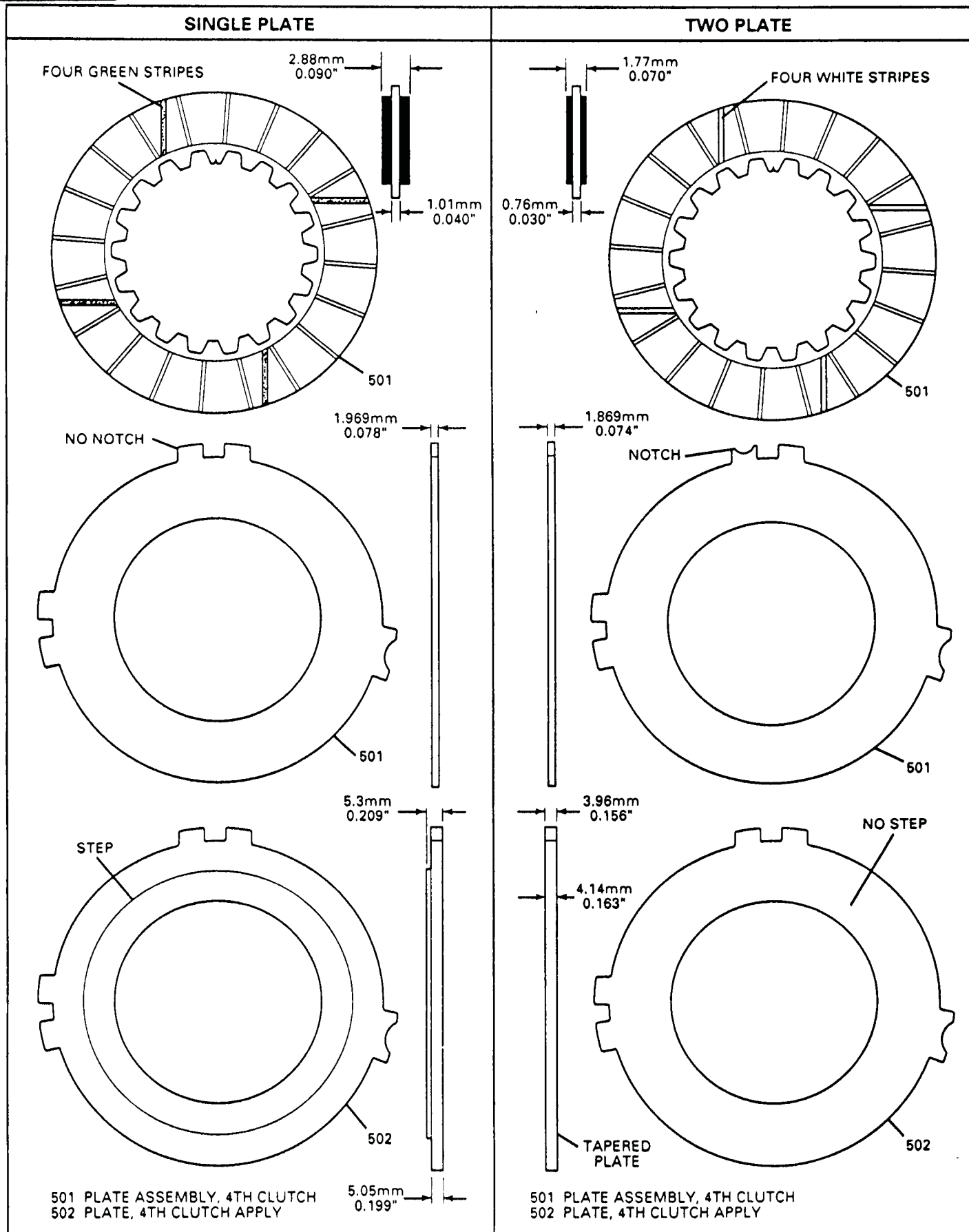


Figure 33

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4L60)

BROKEN T.V. PLUNGER

The T.V. Plunger and Bushing Assembly are now available from OEM in a service package, so that buying a valve body is no longer necessary when the TV plunger is broken or cracked (See Figure 35). Refer to the following OEM part numbers as it IS a model sensitive part.

YEAR	TRANSAXLE MODELS	PART NO.
1984	4BC	8649730
1985	5OB, 5OY	8649317
	5BA, 5BC, 5BR, 5BW, 5BX	8649730
	5CM, 5CP	8646435
	5AF, 5AM	8649641
1986	6AAH, 6ACH, 6ADH, 6AFH, 6AMH, 6ANH, 6APH, 6ARH, 6ASH, 6ATH, 6AWH, 6AYH	8649641
	6BAH, 6BBH, 6BCH, 6BDH, 6BLH, 6BMH, 6BSH, 6BTH, 6BYH	8658704
	6BHH, 6BZH	8649730
	6CFH, 6CMH	8646435
1987	7ACH, 7ADH, 7AHH, 7ALH, 7ARH, 7HAH, 7HCH	8649641
	7CAH, 7CBH	8646435
	7FBH, 7FCH, 7FJH, 7FKH, 7FLH, 7FNH, 7FRH, 7FSH, 7FTH, 7FUH, 7FZH	8658704
1988	8AAH, 8ABH, 8AFH, 8AJH, 8ANH, 8ATH	8649641
	8BJH, 8BKH, 8BRH, 8BTH, 8BYH, 8FBH, 8FCH, 8FJH, 8FSH, 8VXH	8658704
	8CFH, 8CMH, 8CRH, 8CTH, 8CWH, 8CXH	8646435
1989	9AAH, 9ABH, 9ACH, 9ADH, 9AFH, 9AHH, 9AJH, 9ANH, 9ATH	8649641
	9BAH, 9BDH, 9BFH, 9BHH, 9BJH, 9BMH, 9BPH, 9PAH, 9PBH, 9VXH, 9VYH, 9WBH, 9WCH, 9WKH, 9WLH, 9WRH, 9WTH, 9WUH, 9WZH,	8658704
	9CDH, 9CLH, 9CPH, 9CYH, 9CZH, 9YAH, 9YBH, 9YCH, 9YFH, 9YJH	8646435
1990	0AAH, 0ABH, 0AFH, 0AJH, 0ANH, 0ATH	8649641
	0BAH, 0BDH, 0BFH, 0BHH, 0BJH, 0BMH, 0BPH, 0BWH, 0PAH	8658704
	0CHH, 0CJH, 0LAH, 0LMH, 0LNH, 0YKH, 0YLH	8646435

AUTOMATIC TRANSMISSION SERVICE GROUP

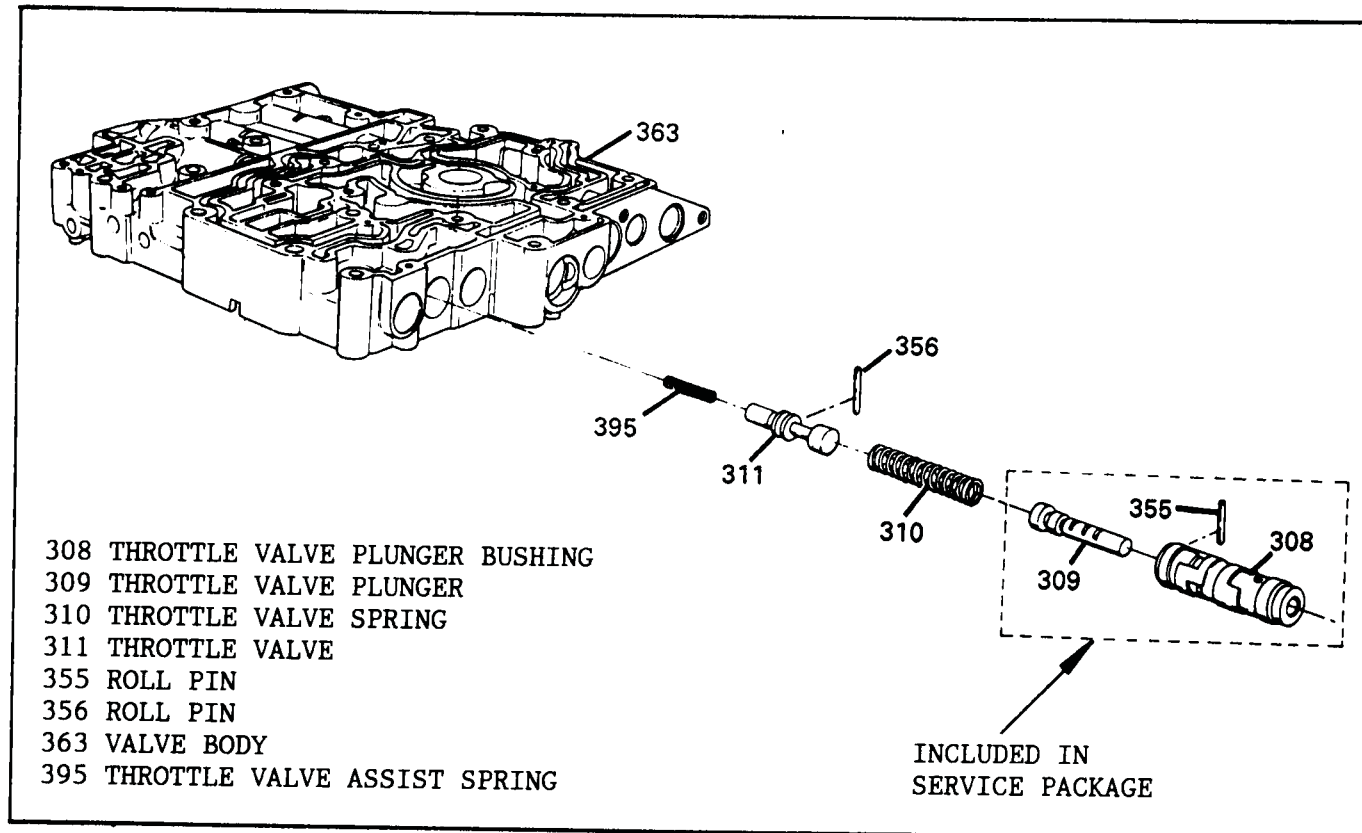


Figure 35



THM 440-T4 (4T60) HARSH 3-2 DOWNSHIFT

COMPLAINT: Harsh 3-2 part throttle, and/or full throttle downshifts.

CAUSE: Improper timing for release of the third clutch and reapplication of the 1-2 band.

CORRECTION: Install a new 3-2 Control Valve Spring, now available in a service package from OEM. See "Service Information" on pages 43 and 44 for proper OEM part numbers. Refer to Figure 36 for proper installation. This IS a model sensitive part.

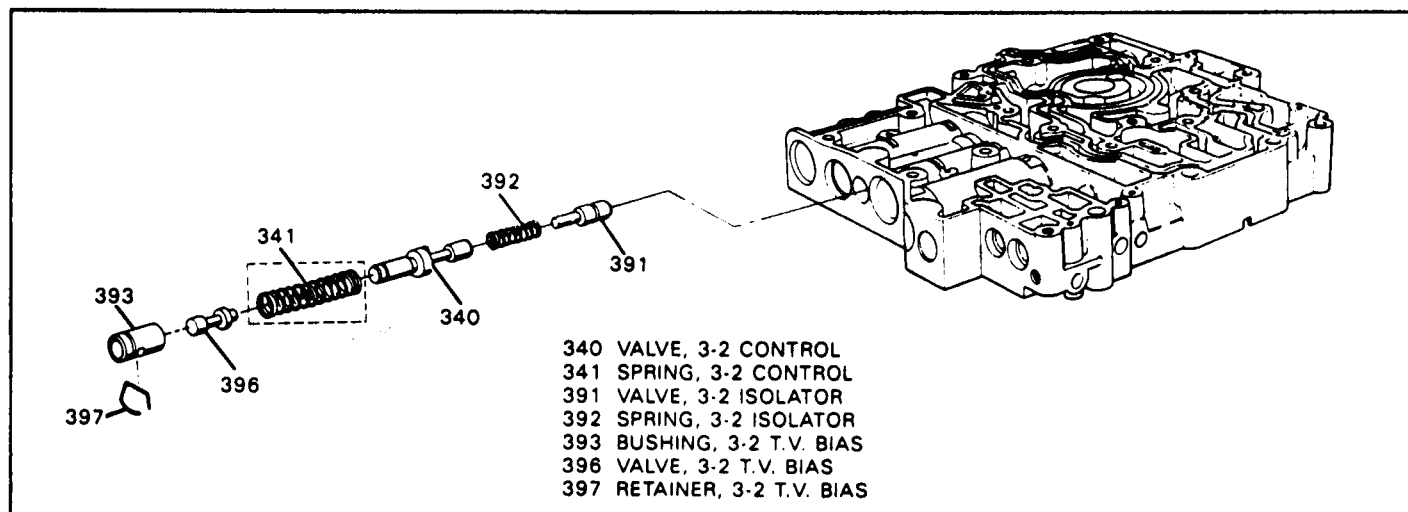


Figure 36



Technical Service Information

SERVICE INFORMATION:

HIGH ALTITUDE ONLY;

5AC, 5AY, 5BW	8646981
5BR, 5CP, 5CW	8646993
5BX	8646979
5BV	8646994
5CN, 5CN	8646983

6AAH, 6AMH, 6AFH, 6APH, 6ASH, 6AYH, 6BBH, 6BHH, 6FBH	8646982
6ACH, 6AWH	8646981
6BAH	8646980
6BCH, 6BDH, 6BMH, 6BZH, 6FCH, 6FZH	8646979
6BLH, 6BTH, 6BYH	8646992
6CMH, 6CNH, 6CFH	8646983
6FTH, 6FYH	8646993

7FBH, 7FKH	8646982
7FCH, 7FZH	8646979
7FJH, 7FNH, 7FRH, 7FTH	8646993

8BJH, 8BRH, 8BTH, 8BYH, 8FJH	8646993
8BKH, 8FBH	8646982
8FCH	8646979

9AAH, 9ABH, 9AFH, 9ANH, 9ATH, 9AJH	8646953
9ACH, 9ADH, 9AHH	8675936
9BAH, 9BDH, 9BJH, 9BWH	8646982
9BFH, 9BMH	8646993
9BHH, 9PAH, 9WBH, 9WCH	8646981
9BPH, 9WRH	8646980
9CDH, 9CLH, 9CPH, 9CYH, 9CZH	8646994
9PBH, 9WLH, 9WKH	8662932
9WUH, 9WZH, 9VYH	8646993
9YAH, 9YBH, 9YJH, 9YCH, 9YFH	8646982

0AAH, 0ABH, 0AFH, 0ANH, 0ATH	8646980
0AJH	8662932
0LMH, 0LNH	8646993
0BAH, 0BDH, 0BWH, 0BJH	8646982
0BHH	8646981
0BFH	8646980
0BPH	8662932
0PAH	8646979
0YKH, 0YLH	8646993
0CHH, 0CJH	8646982

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

SERVICE INFORMATION: (Cont'd)

LOW ALTITUDE ONLY;

6FCH, 6FZH	8662932
6FBH	8646993
6CFH, 6CMH, 6CNH	8646994
6BHH	8646982
6BBH	8646981
6BCH, 6BDH, 6BMH, 6BZH	8662907
6BAH, 6BLH, 6BTH, 6BYH, 6FTH, 6FYH	8646979
=====	
7FCH, 7FZH	8662932
7FBH, 7FKH	8646993
7FJH, 7FNH, 7FRH, 7FTH	8646979
=====	
8FCH	8662932
8BRH	8646980
8FBH, 8BKH	8646993
8BJH, 8BTH, 8BYH, 8FJH	8646979
=====	
9AAH, 9ABH, 9AFH, 9AJH, 9ANH, 9ATH	8646953
9ACH, 9ADH, 9AHH	8675936
9BAH, 9BDH, 9BJH, 9BWH, 9YAH,	
9YBH, 9YJH, 9YFH, 9YCH	8646981
9BCH, 9BHH, 9WBH, 9PAH	8646993
9BFH, 9BMH, 9WUH, 9WZH, 9VYH	8646980
9BPH, 9WRH	8662932
9WTH	8646953
=====	
0AAH, 0ABH, 0AFH, 0ANH, 0ATH	8646980
0AJH	8662932
0LMH, 0LNH	8675963
0BFH	8646979
0BAH, 0BDH, 0BJH, 0BWH	8646993
0BHH	8646980
0BPH	8675962
0PAH	8662907
0YKH, 0YLH	8646979
0CHH, 0CJH	8646981
=====	

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4T60) PLASTIC LUBE DAM BROKEN

COMPLAINT: Plastic Lube Dam located between the carriers, in two pieces, appearing as if it had been machined. Sometimes not machined all the way through.

CAUSE: Final drive sun gear shaft is too long, and cuts or machines plastic lube dam in half.

CORRECTION: Machine or grind the final drive sun gear shaft, ON THE SHORT SPLINED END ONLY, to the dimension shown in Figure 37. Finished dimension should be 4.435" - 4.440". Non-machined final drive sun gear shaft will measure 4.480" - 4.490".

NOTE: MEASURE ALL FINAL DRIVE SUN GEAR SHAFTS TO INSURE PROPER LENGTH.

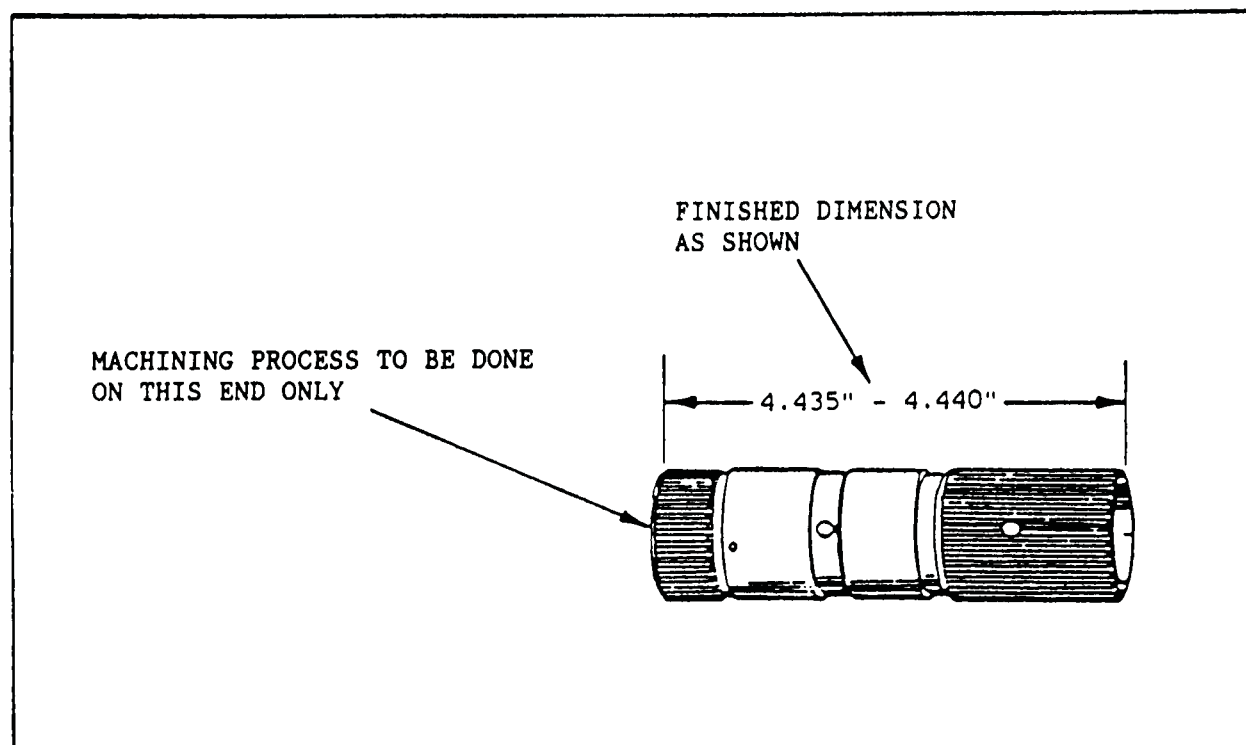


Figure 37

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

THM 440-T4 (4T60)

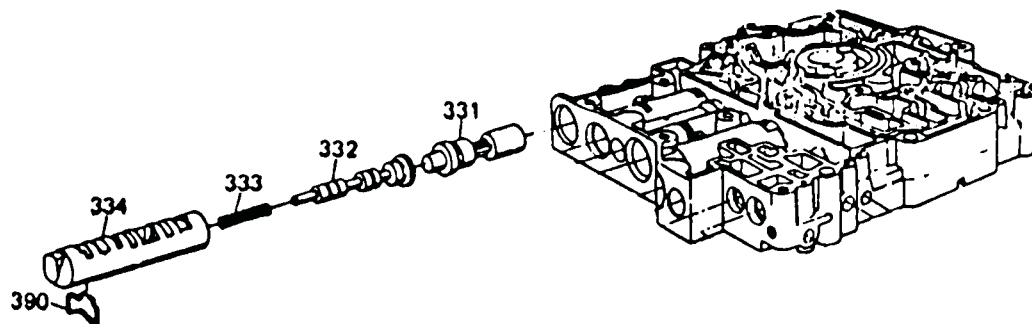
SECOND GEAR STARTS

COMPLAINT: Vehicle starts in 2nd gear after a upshift sequence, but will usually take manual low.

CAUSE: The cause may be the 1-2 shift valve sticking in the upshifted position (See Figure 38). The 1-2 shift valve is aluminum and might have a tendency to "Mushroom", caused by hitting the valve body casting in the bottom of the bore.

CORRECTION: Modify the original 1-2 shift valve as shown in Figure 39. This is a very simple machining operation on a lathe. The factory has upgraded the 1-2 shift valve with a "Boss" cast on the end of the valve (See Figure 39).

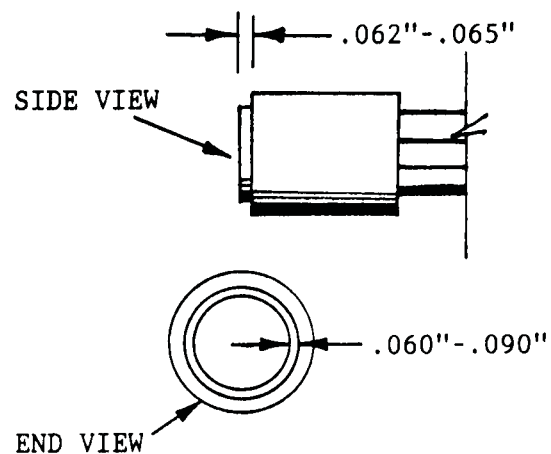
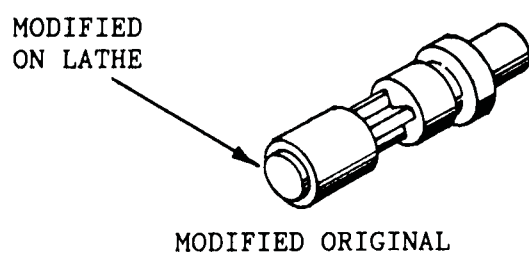
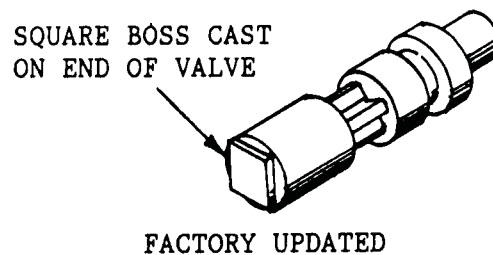
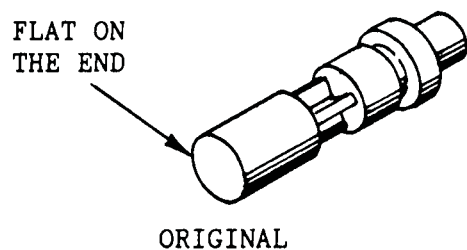
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- 331 1-2 SHIFT VALVE
- 332 1-2 THROTTLE VALVE
- 333 1-2 THROTTLE VALVE SPRING
- 334 1-2 THROTTLE VALVE BUSHING
- 390 1-2 THROTTLE VALVE BUSHING RETAINER

Figure 38

440-T4 1-2 SHIFT VALVE



THIS MODIFICATION KEEPS THE END OF THE SHIFT VALVE FROM "FLARING OUT" WHEN IT BOTTOMS IN THE BORE.

Figure 39



Technical Service Information

THM 440-T4 (4T60)

2ND CLUTCH DURABILITY

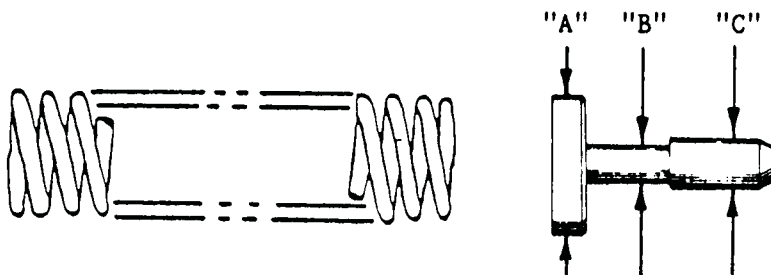
COMPLAINT: 2nd clutch pack with a very short life span, usually associated with a 1-2 slip, or a 1-2 slide bump.

CAUSE: The cause may be a lack of line pressure rise to sufficiently apply the second clutch pack. We also recommend OEM "Koline" steel plates in this pack, and "Vespel" sealing rings on the driven sprocket support.

CORRECTION: Shorten the modulator boost valve spring by 1/4" or approximately 1 to 1 1/2 coils. The modulator boost valve spring is located in the pressure regulator line-up, which is directly next to the T.V. plunger in the valve body (See Figure 40). This will allow line pressure to rise at less of a throttle opening and greatly increase 2nd clutch durability. This modification should be done on "ALL" THM 440-T4 transaxles during the rebuilding process.

SPECIAL NOTE:

There are currently 3 different diameters of modulator boost valves, and 3 different spring calibrations (See Below). This equation will work on all 3 calibrations.



	SPRING COLOR	DIMENSION "A"	DIMENSION "B"	DIMENSION "C"
CALIBRATION NO. 1	BLUE	.568"	.170"	.200"
CALIBRATION NO. 2	GREEN	.568"	.166"	.276"
CALIBRATION NO. 3	ORG/YELLOW	.547"	.168"	.200"

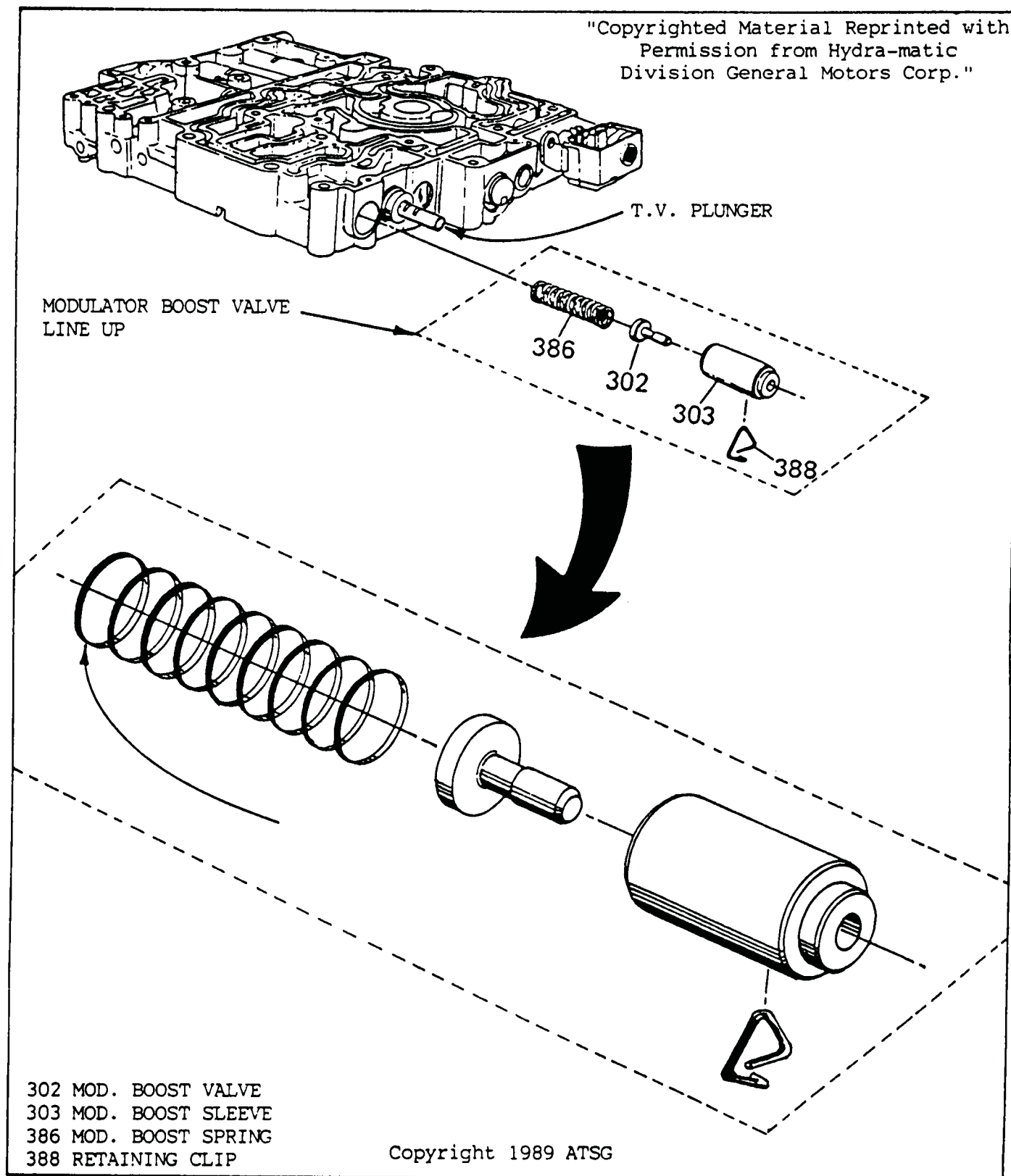


Figure 40



Technical Service Information

1990 THM 440-T4 MODELS

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
AAH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
ABH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
AFH	C Limo	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
AJH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	35-35	2.33	**
ANH	E/K	V8 4.5L Cadillac	FM8C	1825	2.84	37-33	1.77	**
ATH	E/K	V8 4.5L Cadillac	FM8C	1825	2.84	37-33	1.77	**
BAH	A	V6 3.3L Buick	FY9B	1420	3.33	37-33	2.07	**
BDH	A	V6 3.3L Buick	FY9B	1420	3.06	35-35	2.14	**
BFH	A	V6 3.3L Buick	FL9B	1895	3.06	35-35	2.14	**
BHH	C, H	V6 3.8L Buick	FY9B	1420	2.84	35-35	1.98	**
BJH	H	V6 3.8L Buick	FL9B	1895	3.33	37-33	2.07	**
BPH	E	V6 3.8L Buick	FL9B	1895	2.84	35-35	1.98	**
BWH	E, Z	V6 3.8L Buick	FL9B	1895	3.33	37-33	2.07	**
CHH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
CJH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
KDH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
KHH	E/K	V8 4.5L Cadillac	FM8C	1825	3.33	35-35	2.33	**
KLH	E/K	V8 4.5L Cadillac	FM8C	1825	2.84	37-33	1.77	**
KPH	C Limo	V8 4.5L Cadillac	FM8C	1825	3.33	37-33	2.07	**
LAH	W	V6 3.1L Turbocharged	FL9B	1895	3.33	35-35	2.33	**
LMH	A	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
LNH	A	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
PAH	H	V6 3.8L Buick	FL9B	1895	3.33	35-35	2.33	**
WDH	A	V6 3.3L Buick	FY9B	1420	3.33	37-33	2.07	**
WFH	A	V6 3.3L Buick	FY9B	1420	3.06	35-35	2.14	**
WHH	A	V6 3.3L Buick	FL9B	1895	3.06	35-35	2.14	**



Technical Service Information

1990 THM 440-T4 MODELS (Continued)

MODEL	CAR LINE	ENGINE	CONV CODE	STALL SPEED	FINAL DRIVE	SPROCKETS DRIVE-DRIVEN	OVERALL RATIO	USED BY
WJH	H	V6 3.8L Buick	FL9B	1895	3.33	37-33	2.07	**
WMH	C, H	V6 3.8L Buick	FY9B	1420	2.84	35-35	1.98	**
WNH	E	V6 3.8L Buick	FL9B	1895	2.84	35-35	1.98	**
WPH	E, Z	V6 3.8L Buick	FL9B	1895	3.33	37-33	2.07	**
WXH	H	V6 3.8L Buick	FL9B	1895	3.33	35-35	2.33	**
YAH	W	V6 3.1L Turbocharged	FL9B	1895	3.33	35-35	2.33	**
YDH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
YHH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
YKH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
YLH	W	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
YRH	W	V6 3.1L Turbocharged	FL9B	1895	3.33	35-35	2.33	**
YSH	A	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**
YTH	A	V6 3.1L Pontiac	FJ9B	2060	3.33	35-35	2.33	**

** Not available at the time of this printing.



Technical Service Information

THM 440-T4 (4T60)

NEW MODULATOR AND PRESSURE RELIEF VALVE

CHANGE: There is now a new Vacuum Modulator, with a Pressure Relief Valve installed between the modulator and the vacuum line to the engine. (See Figure 41).

REASON: Introduction of a 3.1L Turbocharged Engine.

PARTS AFFECTED:

- (1) VACUUM MODULATOR - Special non-aneroid modulator that is compatible with the 3.1L Turbocharged Engine ONLY. The transmission model codes are OLAH, and OYRH, and found in the "W" car.
- (2) PRESSURE RELIEF VALVE - To protect the diaphragm in the modulator from turbo boost pressure in the intake manifold. This is a "One-Way" valve and must be installed as shown in Figure 41.

INTERCHANGEABILITY:

NOT INTERCHANGEABLE - FITS TURBOCHARGED MODELS ONLY.

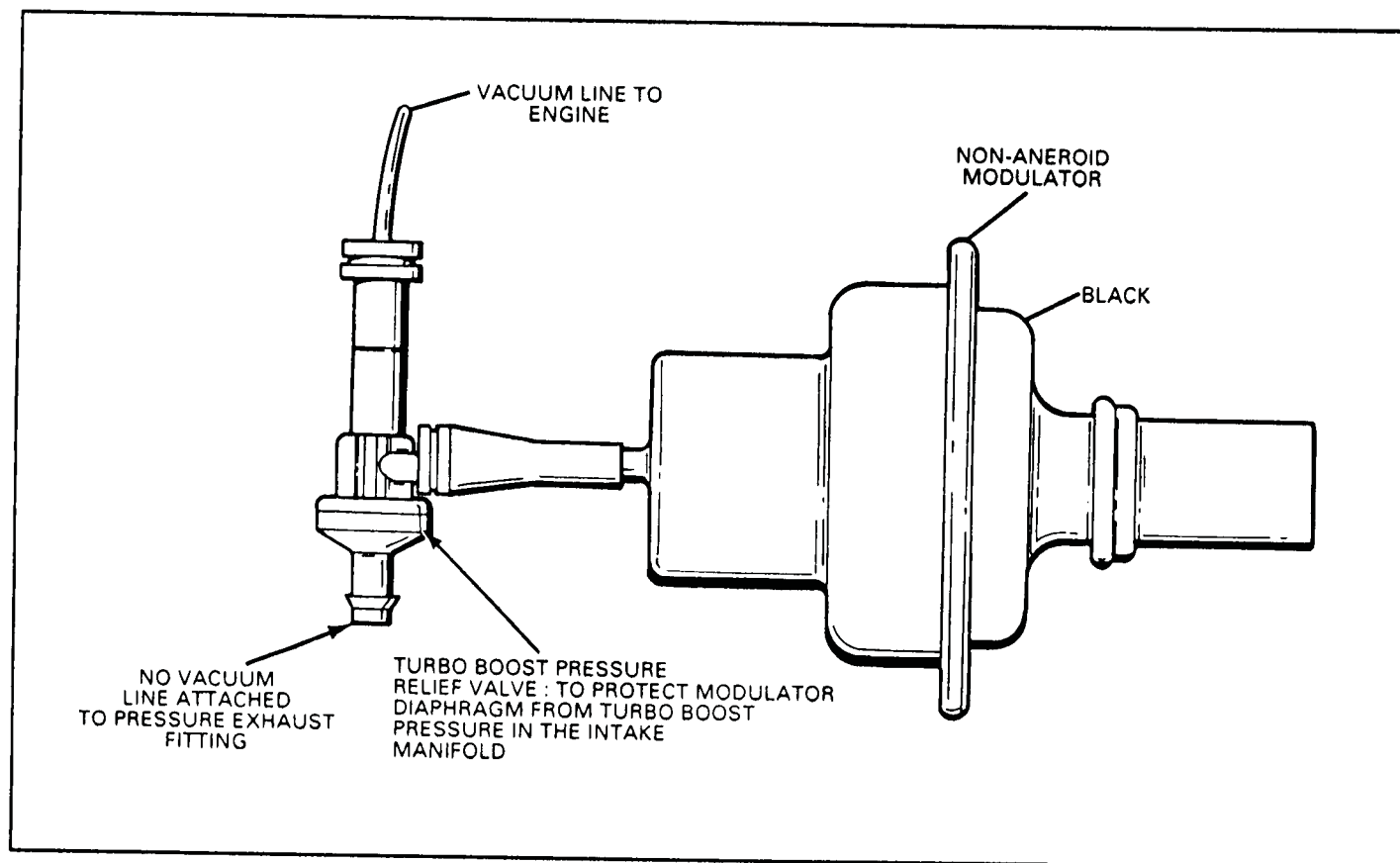


Figure 41



Technical Service Information

PRELIMINARY INFORMATION ON THE NEW 4T60-E (ELECTRONIC CONTROL SHIFT PATTERN)

The next four pages have some preliminary information on the new Hydra-matic 4T60-E transaxle, that has already begun replacing the THM 440-T4 (4T60), in the 1991 Buick Park Avenue ("C" Body) cars. The 4T60-E is also, already scheduled for some Chevrolet models.

The THM 4T60-E is a fully automatic, electronic controlled, front wheel drive transaxle. It provides park, reverse, neutral, and four forward speeds with 4th gear being overdrive. Refer to Page 54 for powerflow chart, and shift solenoid pattern.

THE MAJOR COMPONENTS OF THIS UNIT ARE:

- * THREE BAND ASSEMBLIES
 - (1) Forward Band (Was 1-2 Band)
 - (2) 1-2 Manual Band (Added)
 - (3) Reverse Band
- * FOUR MULTIPLE DISC CLUTCH ASSEMBLIES
 - (1) Input Clutch
 - (2) 2nd Clutch
 - (3) 3rd Clutch
 - (4) 4th Clutch
- * THREE OVER-RUNNING CLUTCHES
 - (1) Input Sprag
 - (2) 1-2 Roller Clutch (Added)
 - (3) 3rd Roller Clutch
- * COMPOUND PLANETARY GEAR SET
- * DIFFERENTIAL AND FINAL DRIVE ASSEMBLY

The shift pattern is controlled electronically with solenoids that receive a ground signal from the PCM (Powertrain Control Module). The PCM will vary shift points, as it is constantly interpreting numerous electronic signals from various operational sensors located on the vehicle. The PCM also controls application of the converter clutch and TCC apply feel electronically with solenoids. Refer to Figure 42 for wiring schematic, solenoid location, and wiring color codes.

Line pressure and shift feel are controlled by the Vacuum Modulator System.



Technical Service Information

4T60-E (F-31) POWER FLOW CHART

	INPUT CLUTCH	SECOND CLUTCH	THIRD CLUTCH	FOURTH CLUTCH	FORWARD BAND	D-2 BAND	REVERSE BAND	INPUT SPRAG	1-2 ROLLER	3RD ROLLER
PARK	*							*		
D4/1ST	ON				ON			HOLD	HOLD	
D4/2ND	ON	ON			ON			O/R	HOLD	
D4/3RD		ON	ON		ON				O/R	HOLD
D4/4TH		ON	ON	ON	ON					O/R
D3/1ST	ON				ON			HOLD	HOLD	
D3/2ND	ON	ON			ON			O/R	HOLD	
D3/3RD	ON	ON	ON		ON				O/R	HOLD
D2/1ST	ON				ON	ON		HOLD	HOLD	
D2/2ND	ON	ON			ON	ON		O/R	HOLD	
LO/1ST	ON		ON		ON	ON		HOLD	HOLD	HOLD
REVERSE	ON						ON	HOLD		

* APPLIED BUT NOT EFFECTIVE

4T60-E (F-31) SOLENOID PATTERN

SHIFT SOLENOID

"A"

1ST GEAR	ON
2ND GEAR	OFF
3RD GEAR	OFF
4TH GEAR	ON

SHIFT SOLENOID

"B"

ON
ON
OFF
OFF

TCC APPLY SOLENOID

THIS SOLENOID CONTROLS THE POSITION OF THE
CONVERTER CLUTCH APPLY VALVE

TCC PWM SOLENOID

THIS SOLENOID CONTROLS
CONVERTER CLUTCH APPLY FEEL

AUTOMATIC TRANSMISSION SERVICE GROUP

4T60-E BUICK

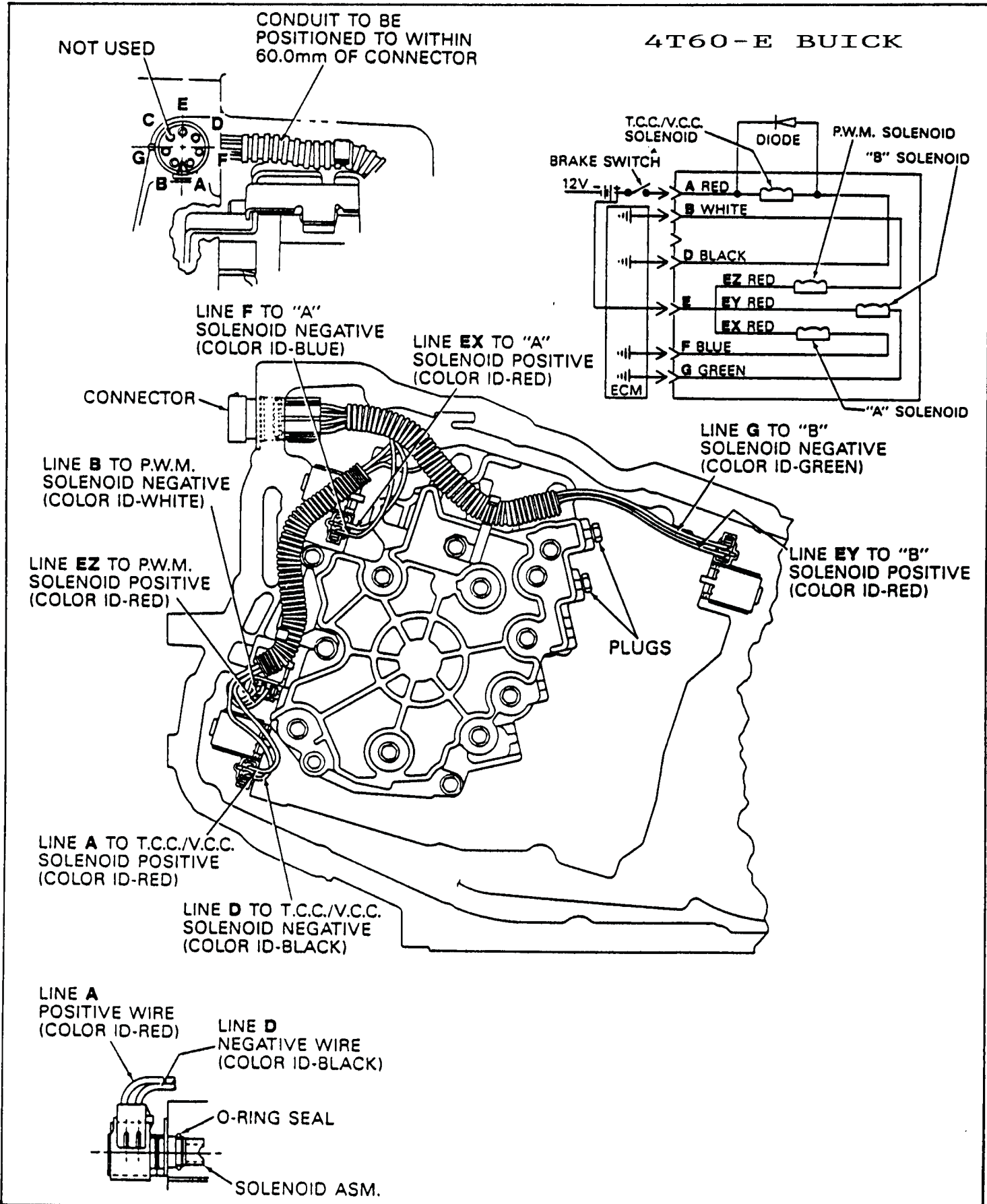


Figure 42



Technical Service Information

4T60 AND 4T60-E COMPARISON

<u>4T60 (440-T4)</u>	<u>4T60-E (F-31)</u>
VACUUM MODULATOR SYSTEM (CONTROLS LINE PRESSURE)	VACUUM MODULATOR SYSTEM (CONTROLS LINE PRESSURE)
T.V. CABLE SYSTEM	ELIMINATED
GOVERNOR SYSTEM	ELIMINATED
28 VALVES IN VALVE BODY	14 VALVES IN VALVE BODY
1 SOLENOID	4 SOLENOIDS
3 PRESSURE SWITCHES	2 PRESSURE SWITCHES
1 ROLLER CLUTCH 1. 3RD ROLLER CLUTCH	2 ROLLER CLUTCHES 1. 3RD ROLLER CLUTCH 2. 1-2 ROLLER CLUTCH
1 OVERRUNING SPRAG (INPUT)	1 OVERRUNING SPRAG (INPUT)
4 CLUTCH PACKS 1. INPUT CLUTCH 2. SECOND CLUTCH 3. THIRD CLUTCH 4. FOURTH CLUTCH	4 CLUTCH PACKS 1. INPUT CLUTCH 2. SECOND CLUTCH 3. THIRD CLUTCH 4. FOURTH CLUTCH
1-2 BAND	FORWARD BAND
REVERSE BAND	REVERSE BAND
NONE	MANUAL 1-2 BAND
NONE	MANUAL 1-2 SERVO
1 PIECE TRANSAXLE CASE	2 PIECE TRANSAXLE CASE
MACHINED IN CASE ACCUMULATORS (BOTTOM PAN)	BOLT ON ACCUMULATORS (BOTTOM PAN)
INPUT CLUTCH ACCUMULATOR IN CHANNEL PLATE	ELIMINATED (IT IS NOW THE 3-4 ACCUMULATOR)
8 OIL PIPES	4 OIL PIPES