

THE SEMINAR TO SEE IN '93

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TRANSMISSION SEMINAR 1993

This years "Seminar To See In '93" Will cover the most asked questions from the ATSG "Hotline" on the 4I60 (700-R4), 4T60 (440-T4), 4L80-E (400 Overdrive), and the Chrysler A500/518. This information will help when the same type problems arise on the vehicles coming into your shop.

The 1991 model year saw the introduction of several new fully electronic controlled transmissions. In the transaxle category was the 4T60-E, which will eventually replace the 440-T4, and we still have a 4T80-E and a 4T40-E waiting in the wings. For the rear drive vehicles, we saw the 4L80-E (400 Overdrive), and the 4L60-E (700 Electronic Control), is scheduled to be released this year in 1993

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

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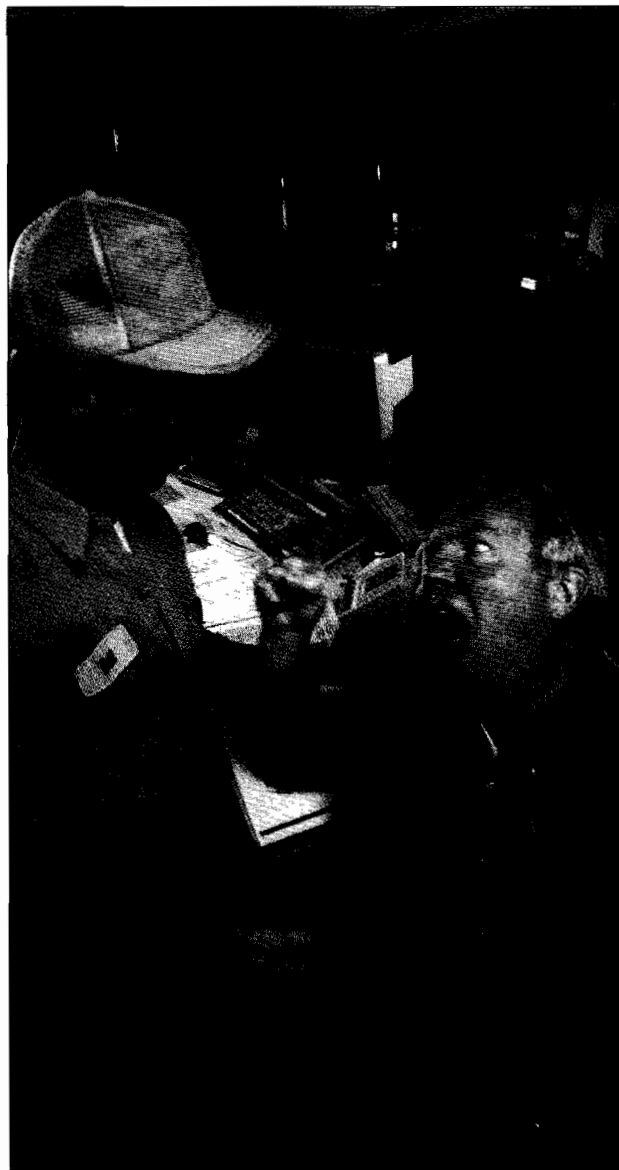
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Other clutch kits aren't the only things with low tolerance levels.

Today's consumers don't have much tolerance for poor quality, especially when it comes to automotive repairs. That's why it's important for you to know the difference between new LuK RepSet™ clutch assemblies and other clutch kits.

Most kit suppliers merely combine parts from various clutch manufacturers. Though these parts may fit together, they are not designed to match the vehicle's critical performance characteristics – the way original-quality LuK RepSets are.

Each new LuK RepSet clutch is engineered to the highest, most exact tolerances (measured in hundredths of millimeters) and performance specs for the vehicle in which it is installed.



What's more, because we cover more than 90% of all domestic and import car and light truck applications, LuK offers unsurpassed RepSet quality for virtually every clutch service application. And it's all backed by our extensive 12-month/12,000-mile warranty.



For the ultimate success in clutch service, don't tolerate anything less than the best... LuK RepSets. For more information, call 1 800 274-5001 for the name of your nearest LuK Authorized Distributor.



THM 4T80-E TRANSAXLE
CASE AND ASSOCIATED PARTS

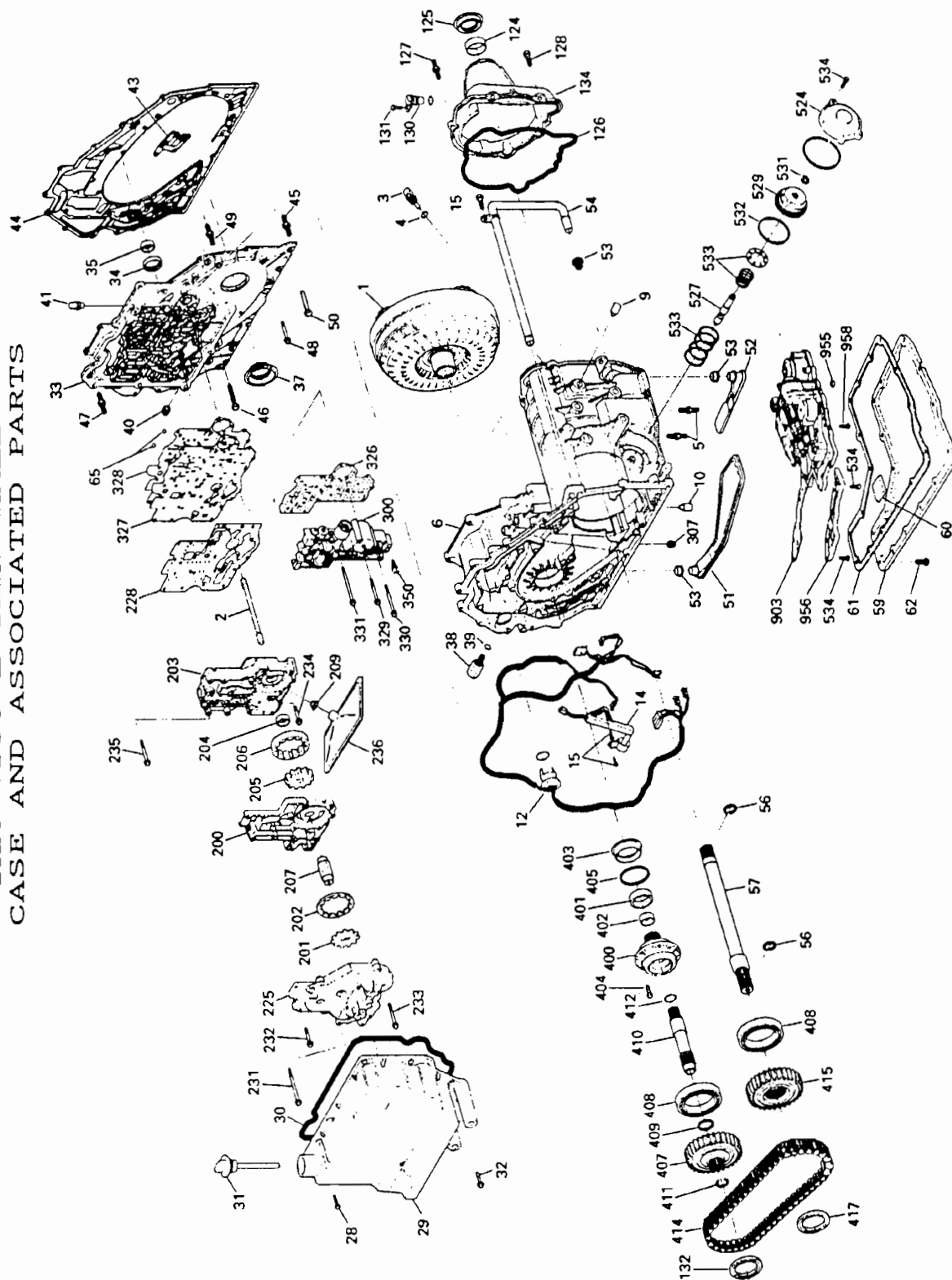


Figure 1

THM 4T80-E TRANSAXLE CASE AND ASSOCIATED PARTS

1	TORQUE CONVERTER ASSEMBLY	205	GEAR, SECONDARY PUMP DRIVE
2	SHAFT, OIL PUMP DRIVEN ASSEMBLY	206	GEAR, SECONDARY PUMP DRIVEN
3	CONNECTOR, COOLER (RETURN)	209	SEAL, FILTER
4	CONNECTOR, O-RING COOLER (RETURN)	225	BODY, SCAVENGE PUMP
5	STUD, FORWARD/COAST CLUTCH (2)	228	GASKET, SECONDARY PUMP BODY
6	CASE, TRANSAXLE	229	BOLT, PUMP TO CASE COVER
9	PIN, ANCHOR (LO AND REVERSE)	231	BOLT, PUMP ASSEMBLY/CASE
10	PIN, ANCHOR (4TH BAND)	232	BOLT, PUMP/CASE COVER
12	HARNESS, WIRING ASSEMBLY	233	BOLT, PUMP ASSEMBLY/CASE COVER
14	INPUT SPEED SENSOR ASSEMBLY	234	BOLT, SECONDARY PUMP/CASE COVER
15	BOLT, INPUT SPEED AND SCAVENGE TUBE (2)	235	BOLT, SECONDARY PUMP/CASE
28	BOLT, SIDE COVER TO CASE COVER (8)	238	FILTER, TRANSAXLE OIL
29	COVER, SIDE	300	BODY, UPPER CONTROL VALVE
30	GASKET, SIDE COVER/CASE COVER	307	PLUG, BORE
31	INDICATOR, FLUID LEVEL	326	GASKET, VALVE BODY/SPACER PLATE
32	BOLT, SIDE COVER TO CASE COVER	327	SPACER PLATE, CASE COVER ASSEMBLY
33	COVER, TRANSAXLE CASE	328	GASKET, SPACER PLATE /CASE COVER
34	SEAL, CASE COVER/DRIVE SPROCKET	329	BOLT, UPPER VALVE BODY/CASE COVER
35	SEAL, CASE COVER TO TURBINE SHAFT	330	BOLT, UPPER VALVE BODY/CASE COVER
37	SEAL, AXLE CASE COVER	331	BOLT, SECONDARY PUMP/CASE COVER
38	CONNECTOR, COOLER (SPECIAL)	300	BODY, UPPER CONTROL VALVE
39	SEAL, O-RING COOLER CONNECTOR	307	PLUG, BORE
40	PLUG, OIL TEST HOLE	326	GASKET, VALVE BODY/SPACER PLATE
41	ADAPTER, TRANSAXLE VENT	327	SPACER PLATE, CASE COVER ASSEMBLY
43	SEAL, SPROCKET SUPPORT/CASE COVER	328	GASKET, SPACER PLATE /CASE COVER
44	SEAL, CASE/CASE COVER	329	BOLT, UPPER VALVE BODY/CASE COVER
45	STUD, CASE COVER/CASE	330	BOLT, UPPER VALVE BODY/CASE COVER
48	BOLT, CASE COVER/CASE	331	BOLT, SECONDARY PUMP/CASE COVER
47	STUD, CASE COVER/CASE	350	SENSOR, TEMPERATURE
48	BOLT, CASE COVER DRIVEN/SPROCKET SUPPORT	400	SUPPORT, DRIVE SPROCKET
49	STUD, CASE COVER/CASE	401	BUSHING, CONVERTER HUB
50	BOLT, CASE COVER/CASE	402	BUSHING, STATOR SHAFT (FRONT)
51	SCREEN, SCAVENGER CASE (LEFT)	403	SEAL, CONVERTER HUB ASSEMBLY
52	SCREEN, SCAVENGER CASE (RIGHT)	404	BOLT, DRIVE SPROCKET SUPPORT/CASE (6)
53	SCREEN, SCAVENGER TUBE AND SEAL	405	SEAL, DRIVE SPROCKET SUPPORT/CASE
54	TUBE, SCAVENGE	407	SPROCKET, DRIVE
56	RING, SNAP (OUTPUT SHAFT)	408	BEARING, BALL
57	SHAFT, OUTPUT	409	RING, OIL SEAL DRIVE SPROCKET
59	PAN, TRANSAXLE OIL	410	SHAFT, TURBINE
60	MAGNET, CHIP COLLECTOR	411	RING, SNAP
61	GASKET, OIL PAN	412	SEAL, O-RING
62	SCREW, PAN TO CASE (16)	414	DRIVE LINK ASSEMBLY
65	BALL, .25 DIAMETER	415	SPROCKET, DRIVEN
124	BUSHING, CASE EXTENSION	417	BEARING, THRUST
125	SEAL, AXLE/CASE EXTENSION	524	COVER, 4TH SERVO
126	SEAL, CASE EXTENSION TO CASE	525	SEAL, SERVO COVER
127	STUD, CASE EXTENSION TO CASE (2)	527	PIN, 4TH SERVO
128	BOLT, CASE EXTENSION TO CASE	529	PISTON, 4TH SERVO
130	SENSOR, SPEED OUTPUT ASSEMBLY	531	RING, SNAP
131	BOLT, SHOULDER M6 X 1.0 X 14.0	532	SEAL, 4TH SERVO PISTON
132	BEARING, THRUST	533	SPRING AND RETAINER ASSEMBLY, 4TH SERVO
134	EXTENSION, TRANSAXLE CASE	534	BOLT, HEX FLANGE (METRIC HEAVY) (3)
200	BODY, PRIMARY PUMP	903	CHANNEL PLATE/CONTROL VALVE AND HOUSING ASSEMBLY
201	GEAR, PRIMARY PUMP DRIVE	955	NUT, LOWER VALVE BODY ASSEMBLY/STUD
202	GEAR, PRIMARY PUMP DRIVEN	956	PLATE, OIL TRANSFER
203	BODY, SECONDARY PUMP	958	BOLT, LOWER VALVE BODY/CASE
204	BUSHING, SCAVENGE PUMP		

Figure 2

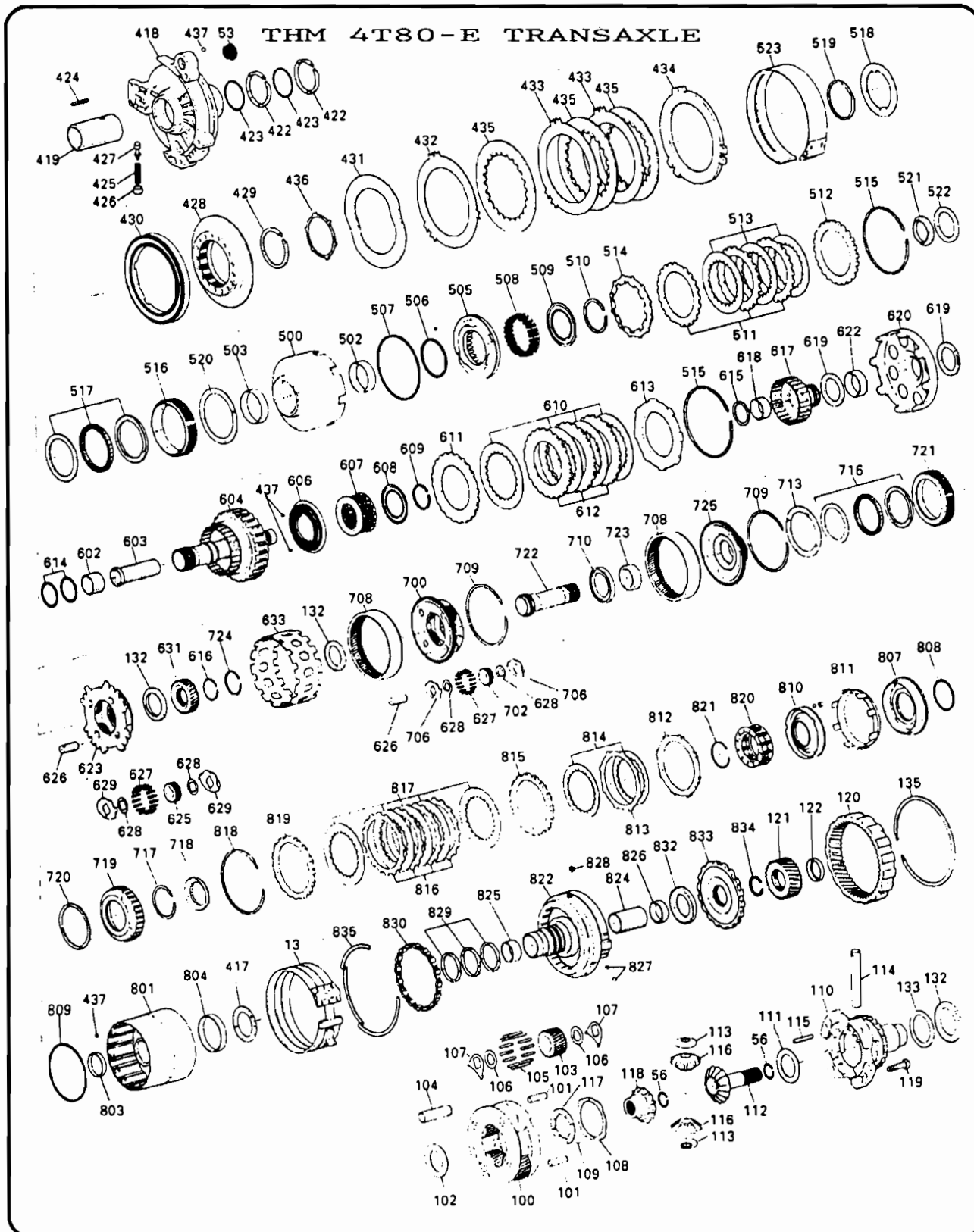
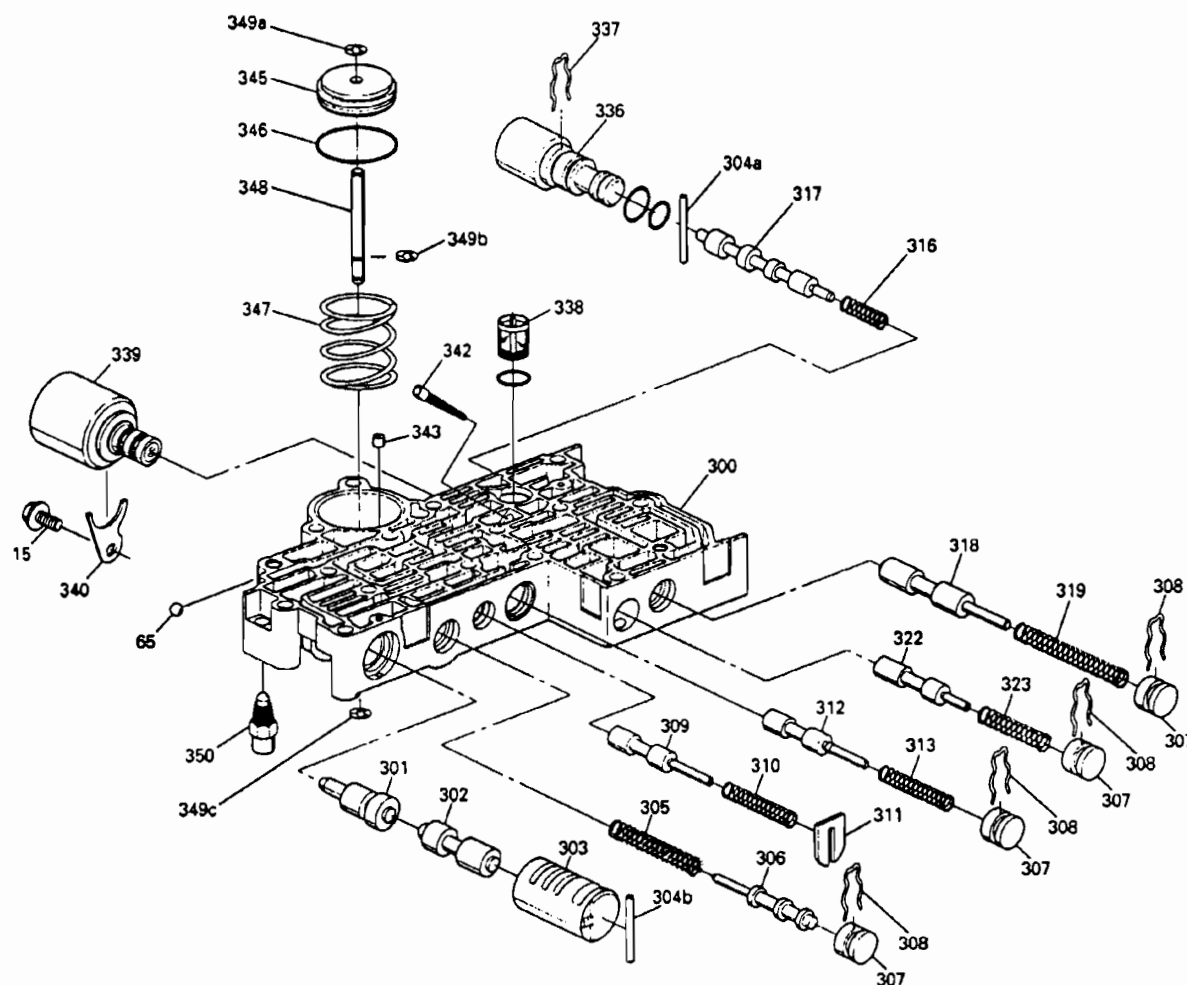


Figure 3

13	BAND, LO/REVERSE	606	PISTON ASSEMBLY, THIRD CLUTCH
53	SEAL, SCAVENGER TUBE	607	SPRING AND RETAINER ASSEMBLY
56	RING, SNAP (OUTPUT SHAFT) (3)	608	RETAINER, SNAP RING
100	CARRIER, FINAL DRIVE	609	RING, RETURN SPRING SNAP
101	DOWEL, DIFFERENTIAL CARRIER (2)	610	PLATE ASSEMBLY, THIRD CLUTCH (FIBER) (4)
102	BEARING, THRUST (SUN GEAR/CARRIER)	611	PLATE, APPLY (STEEL)
103	PINION, FINAL DRIVE PLANET (4)	612	PLATE, THIRD CLUTCH (3)
104	PIN, FINAL DRIVE PLANET PINION (4)	613	PLATE, BACKING
105	BEARINGS, NEEDLE (ROLLER) (76)	614	RING, OIL SEAL (2)
106	WASHERS, THRUST (FINAL DRIVE PINION) (8) (STEEL)	615	WASHER, THRUST (INPUT SHAFT/3RD HUB)
107	WASHERS, THRUST (FINAL DRIVE PINION) (8) (BRONZE)	616	RING, SNAP (INPUT SHAFT/INPUT SUN GEAR)
108	RETAINER	617	HUB, THIRD CLUTCH
109	PIN, ROLLED	618	BUSHING, HUB
110	CARRIER, DIFFERENTIAL	619	BEARING ASSEMBLY, THRUST
111	WASHER, THRUST (DIFFERENTIAL) (RIGHT)	620	GEAR AND SHELL ASSEMBLY, REACTION SUN
112	GEAR, DIFFERENTIAL SIDE (RIGHT)	623	CARRIER, REACTION
113	WASHER, THRUST (DIFFERENTIAL PINION) (2)	625	PINION, PLANET (4)
114	SHAFT, DIFFERENTIAL PINION	626	PIN, PLANET PINION (4)
115	PIN, DIFFERENTIAL SHAFT RETAINING	627	NEEDLE, ROLLER BEARING (68)
116	GEARS, DIFFERENTIAL PINION (2)	628	WASHER, PINION THRUST (STEEL) (8)
117	WASHER, THRUST (DIFFERENTIAL) (LEFT)	629	WASHER, PINION THRUST (BRONZE) (8)
118	GEAR, DIFFERENTIAL SIDE (LEFT)	631	GEAR, INPUT SUN
119	BOLT, DIFFERENTIAL CARRIER FINAL DRIVE (4)	633	SHELL, REACTION CARRIER
120	GEAR, FINAL DRIVE INTERNAL	640	BEARING, THRUST (INPUT SUN GEAR TO REACTION CARRIER)
121	GEAR, FINAL DRIVE SUN	700	CARRIER, INPUT
122	SEAL, FINAL DRIVE SUN GEAR	702	PINIONS, PLANET (4)
132	BEARING ASSEMBLY, THRUST	706	WASHER, THRUST (BRONZE) (8)
133	WASHER, THRUST (DIFFERENTIAL CARRIER/CASE EXTENSION) (SELECTIVE)	708	GEAR, INTERNAL GEAR (2)
135	RING, SNAP	709	RING, SNAP (2)
417	BEARING, THRUST (FWD CLUTCH SUPPORT/PARK GEAR)	710	BEARING ASSEMBLY, THRUST
418	SUPPORT, DRIVEN SPROCKET	713	WASHER, THRUST (FLANGE TO OUTER RACE)
419	SLEEVE, OIL TRANSFER	716	SPRAG ASSEMBLY, FORWARD CLUTCH
422	RING, OIL (2)	717	RING, SNAP (COAST CLUTCH HUB RETAINER)
423	RING, 4 LOBE SEAL (2)	718	BEARING, THRUST (FLANGE/FORWARD CLUTCH HOUSING)
424	PIN, SPRING	719	HUB, COAST CLUTCH
425	SPRING, 3RD CLUTCH EXHAUST VALVE	720	WASHER, THRUST (RACE/COAST CLUTCH HUB)
426	PLUG, CUP	721	RACE, FORWARD SPRAG (OUTER)
427	VALVE, 3RD CLUTCH EXHAUST	722	SHAFT, FINAL DRIVE SUN GEAR
428	2ND CLUTCH RETURN SPRING AND RETAINER ASSEMBLY	723	BUSHING, INPUT FLANGE
429	RING, SNAP (2ND CL./DRIVEN SPROCKET)	724	RING, SNAP (FINAL DRIVE SHAFT/INPUT CARRIER)
430	PISTON ASSEMBLY, 2ND CLUTCH	725	FLANGE, INPUT INTERNAL GEAR
431	PLATE, 2ND CLUTCH (WAVED)	801	HOUSING, FORWARD AND COAST CLUTCH
432	PLATE, 2ND CLUTCH (APPLY)	803	BUSHING, HOUSING (SMALL)
433	PLATE, 2ND CLUTCH (STEEL) (2)	804	BUSHING, HOUSING (LARGE)
434	PLATE, 2ND CLUTCH (BACKING)	807	PISTON, FORWARD CLUTCH
435	PLATE, 2ND CLUTCH (FIBER) (3)	808	SEAL, (INNER)
436	WASHER, THRUST (SUPPORT/REV. CLUTCH)	809	SEAL, (OUTER)
437	CHECKBALL, .1875 DIAMETER	810	PISTON ASSEMBLY, COAST CLUTCH
500	HOUSING, REVERSE CLUTCH AND RACE ASSEMBLY	811	RING, FORWARD CLUTCH (APPLY)
502	BUSHING, (SMALL)	812	PLATE, COAST CLUTCH (APPLY)
503	BUSHING, (LARGE)	813	PLATE, COAST CLUTCH (1) (STEEL)
505	PISTON ASSEMBLY, REVERSE CLUTCH	814	PLATE, COAST CLUTCH (2) (FIBER)
506	SEAL, (INNER)	815	PLATE, FORWARD AND COAST CLUTCH
507	SEAL, (OUTER)	816	PLATE, FORWARD CLUTCH (4) (STEEL)
508	SPRING AND RETAINER ASSEMBLY	817	PLATE, FORWARD CLUTCH (5) (FIBER)
509	RETAINER, SNAP RING	818	RING, SNAP (FORWARD CLUTCH BACKING PLATE)
510	RING, SNAP (RETURN SPRING)	819	PLATE, FORWARD CLUTCH BACKING
511	PLATE, REVERSE CLUTCH (STEEL) (3)	820	SPRING ASSEMBLY, FORWARD CLUTCH RELEASE
512	PLATE, REVERSE CLUTCH BACKING (SELECTIVE)	821	RING, SNAP (FORWARD RETURN SPRING ASM./HOUSING)
513	PLATE ASSEMBLY, REVERSE CLUTCH (FIBER) (3)	822	SUPPORT, FORWARD/COAST CLUTCH
514	PLATE, BELLEVILLE (APPLY)	824	SLEEVE, OIL TRANSFER
515	RING, SNAP	825	BUSHING, SUPPORT/SUN SHAFT (LEFT)
516	RACE, 2ND SPRAG (OUTER)	826	BUSHING, SUPPORT/SUN SHAFT (RIGHT)
517	CLUTCH ASSEMBLY, SECOND SPRAG	827	BALL, (OIL HOLE PLUGS)
518	RETAINER, SECOND SPRAG CLUTCH	828	SEAL, COOLER RETURN
519	RING, LOCKING	829	RING, OIL SEAL (SUPPORT/HOUSING)
520	WASHER, SECOND CLUTCH OUTER RACE	830	CLUTCH ASSEMBLY, LO ROLLER
522	WASHER, THRUST (DRIVEN SPROCKET SUPPORT) (SELECTIVE)	832	BEARING, THRUST
523	BAND, FOURTH	833	GEAR, PARKING LOCK
602	BUSHING, INPUT SHAFT	834	RING, SNAP (FINAL DRIVE SHAFT TO PARK GEAR)
603	SLEEVE, INPUT SHAFT/OIL TRANSFER	835	RING, FRETTING SUPPORT/CASE
604	HOUSING, THIRD CLUTCH		

THM 4T80-E TRANSAXLE

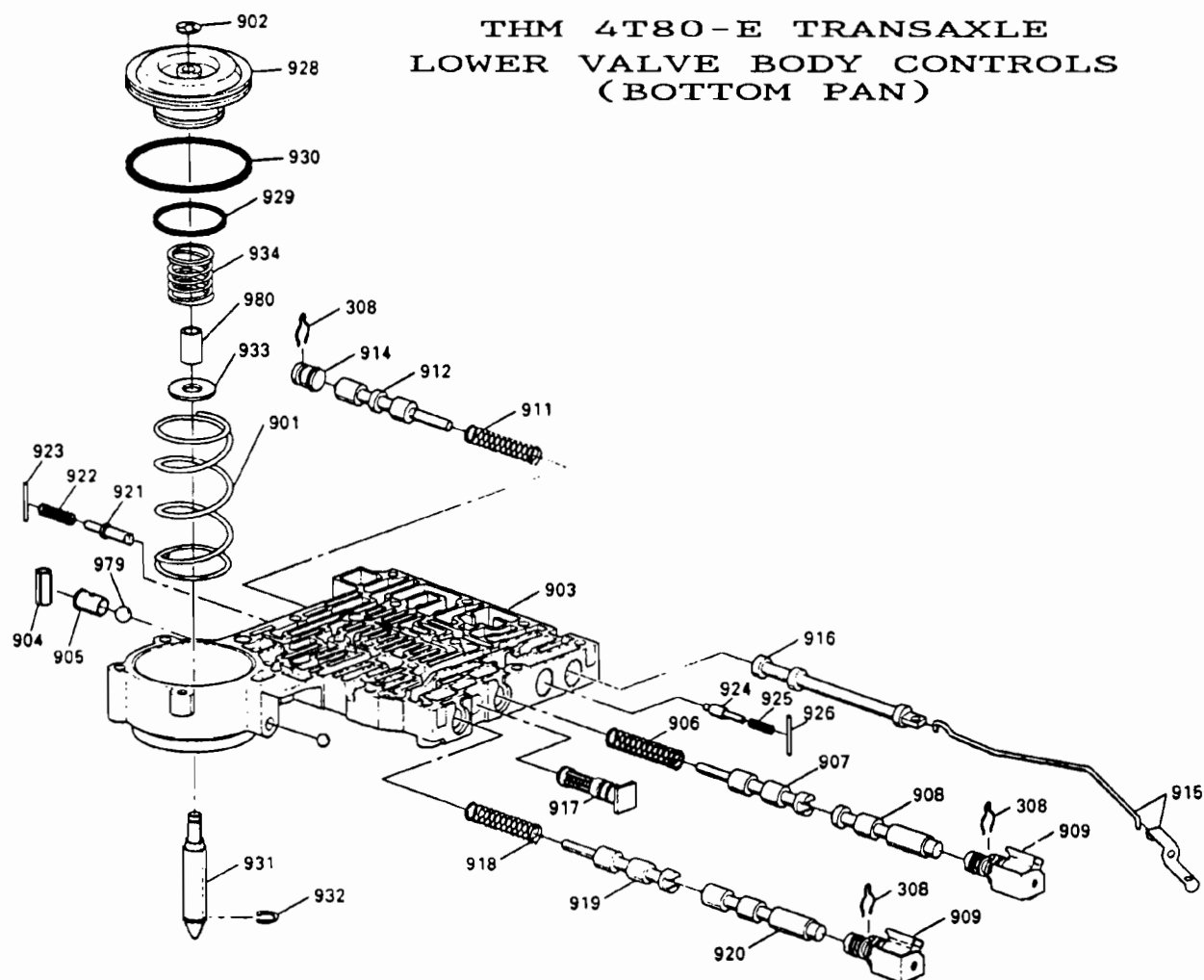
Figure 4



THM 4T80-E TRANSAXLE
UPPER VALVE BODY CONTROLS
(SIDE COVER)

- | | | | |
|-----|--------------------------------------|-----|--|
| 15 | BOLT, CLAMP | 318 | VALVE, CONVERTOR REGULATOR |
| 65 | BALL, (OIL HOLE PLUG) | 319 | SPRING, CONVERTOR CLUTCH REGULATOR |
| 300 | BODY, UPPER CONTROL VALVE | 322 | VALVE, TCC ENABLE |
| 301 | VALVE, ACCUMULATOR BOOST | 323 | SPRING, TCC ENABLE VALVE |
| 302 | VALVE, 1-2 / 3-4 ACCUMULATOR | 336 | SOLENOID, TCC PRESSURE |
| 303 | BUSHING, 1-2 / 3-4 ACCUMULATOR VALVE | 337 | CLIP, SPRING RETAINER |
| 304 | PIN, COILED SPRING (2) | 338 | FILTER AND SEAL, PRESSURE CONTROL SOLENOID |
| 305 | SPRING, 2-3 ACCUMULATOR VALVE | 339 | SOLENOID, PRESSURE CONTROL (FORCE MOTOR) |
| 306 | VALVE, 2-3 ACCUMULATOR | 340 | CLAMP, PC SOLENOID (FORCE MOTOR CLAMP) |
| 307 | PLUG, BORE (4) | 342 | SCREEN, OIL PRESSURE |
| 308 | CLIP, RETAINER (4) | 343 | PLUG, ORIFICED CUP |
| 309 | VALVE, ACTUATOR FEED LIMIT | 345 | PISTON, 2-3 ACCUMULATOR |
| 310 | SPRING, ACTUATOR FEED LIMIT | 346 | SEAL, 2-3 ACCUMULATOR PISTON |
| 311 | PLATE, SPRING RETAINER | 347 | SPRING, 2-3 ACCUMULATOR PISTON |
| 312 | VALVE, CONVERTOR FEED LIMIT | 348 | PIN, 2-3 ACCUMULATOR |
| 313 | SPRING, CONVERTOR FEED LIMIT | 349 | RING, SNAP (3) |
| 316 | SPRING, CONVERTOR CLUTCH CONTROL | 350 | SENSOR, TEMPERATURE |
| 317 | VALVE, CONVERTOR CLUTCH CONTROL | | |

Figure 5



- 308 CLIP, RETAINER (3)
- 901 SPRING, RETURN
- 902 RING, RETAINING
- 903 VALVE BODY, LOWER CONTROL
- 904 RETAINER, SPRING
- 905 CAPSULE, BALL CHECK
- 906 SPRING, 2-3 SHIFT VALVE
- 907 VALVE, SHIFT 2-3 C
- 908 VALVE, SHIFT 2-3 D
- 909 SOLENOID, SHIFT (1-2 AND 2-3)
- 911 SPRING, 3-4 SHIFT VALVE
- 912 VALVE, 3-4 SHIFT
- 914 PLUG, BORE
- 915 MANUAL LINK AND CLIP ASSEMBLY
- 916 VALVE, MANUAL
- 917 SCREEN ASSEMBLY, SOLENOID
- 918 SPRING, 1-2 SHIFT VALVE
- 919 VALVE, SHIFT 1-2 A

- 920 VALVE, SHIFT 1-2 B
- 921 VALVE, REVERSE ORIFICE BYPASS
- 922 SPRING, REVERSE ORIFICE BYPASS VALVE
- 923 PIN, COILED SPRING FLAG
- 924 VALVE, FORWARD ORIFICE BYPASS
- 925 SPRING, FORWARD ORIFICE BYPASS VALVE
- 926 PIN, COILED SPRING FLAG
- 928 PISTON, LOW/REVERSE SERVO
- 929 SEAL, LOW/REVERSE SERVO (SMALL)
- 930 SEAL, LOW/REVERSE SERVO (LARGE)
- 931 PIN, LOW/REVERSE SERVO APPLY
- 932 RING, RETAINING
- 933 WASHER, SERVO CUSHION SPRING
- 934 SPRING, SERVO CUSHION
- 979 BALL (1.375 DIA.)
- 980 SLEEVE, LO REVERSE CUSHION

Figure 6

YOU ASKED FOR PROOF!

And here are the results.

Report on the use of LUBEGARD® ATF Supplement added to General Motors Factory Fill Automatic Transmission Fluid (Reference Fluid).

Putting LUBEGARD® ATF Supplement to the test.

Wear, heat stability and frictional properties were tested at one of the two independent laboratories in the world certified by General Motors for Dexron® IIE testing. These tests represent the primary mechanical bench tests for Dexron® IIE approval.

The ATF used was General Motors Factory Fill Automatic Transmission Fluid, the reference fluid for Dexron® IIE testing. LUBEGARD® ATF Supplement was added at the recommended level of 1 fluid oz per quart.

TESTS CONDUCTED

The tests run on the ATF with and without LUBEGARD® were:

1. Vickers® Sliding Vane Pump Wear Test which measures the wear on rubbing metal parts of a pump after 100 hours of pumping hot ATF.
2. Turbo Hydra-matic Oxidation Test (THOT) which measures the condition of the ATF and a bench stand transmission after twelve and a half days of running and shifting at 325°F with air injected into the fluid.
3. High Energy Friction Coefficient and Durability Test (HEFCAD) which measures the twisting (torque) of the motionless shaft of a set of automatic transmission clutches when stopping a flywheel moving at 3600 rpm on the other shaft in less than a second. The wheel is stopped and started 3 times per minute for 100 hours.



TEST RESULTS

Test results on GM Factory Fill with LUBEGARD® were compared to GM Factory Fill without LUBEGARD®, they showed:

1. The wear on the contacting parts of the Vickers® Vane Pump was reduced **over 50%**.
2. Improvement in areas of Oxidative Stability:
 - a) **24%** less oxidative breakdown of the ATF into acids.
 - b) Less sludge formation.
 - c) **30%** less oxygen uptake.
 - d) **60%** less pentane insolubles.
 - e) No penalty to transmission seals or fluid viscosity.
3. The following frictional improvements were:
 - a) Smoother, more stable power transfer through the clutches with less shock, or torque peak, at the beginning or the end of clutch engagement.
 - b) No sign of extra slipperiness that might cause excess clutch slippage and wear.

INTERNATIONAL LUBRICANTS, INC. is committed to providing the finest quality lubricants for the transmission industry. The tests conducted and presented in this report are factual. Requests for authenticity can be provided by writing to Int'l Lubricants, Inc., P.O. Box 24743, Seattle, WA 98124.

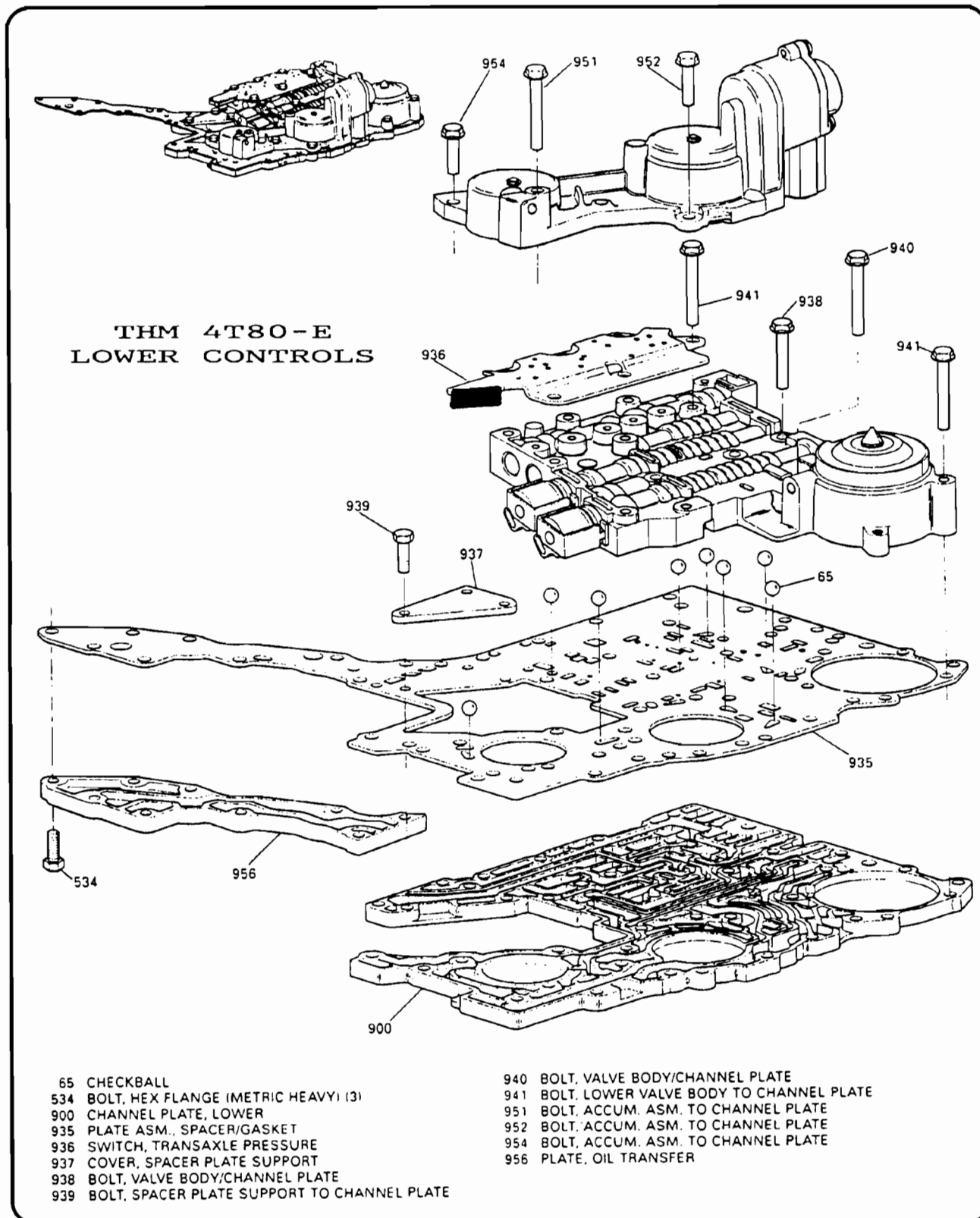
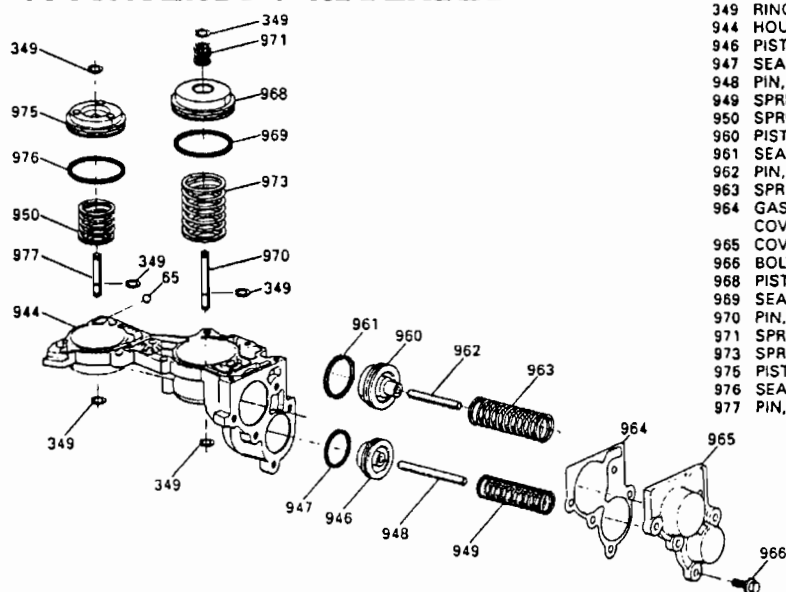


Figure 7

ACCUMULATOR ASSEMBLY



- 65 BALL, (OIL HOLE PLUG)
- 349 RING, SNAP (6)
- 944 HOUSING, ACCUMULATOR
- 946 PISTON, REVERSE ACCUMULATOR
- 947 SEAL, REVERSE ACCUMULATOR
- 948 PIN, REVERSE ACCUMULATOR
- 949 SPRING, REVERSE ACCUMULATOR
- 950 SPRING, 3-4 ACCUMULATOR
- 960 PISTON, FORWARD ACCUMULATOR
- 961 SEAL, FORWARD ACCUMULATOR
- 962 PIN, FORWARD ACCUMULATOR
- 963 SPRING, FORWARD ACCUMULATOR
- 964 GASKET, ACCUMULATOR HOUSING COVER
- 965 COVER, ACCUMULATOR HOUSING
- 966 BOLT, COVER (5)
- 968 PISTON, 1-2 ACCUMULATOR
- 969 SEAL, 1-2 ACCUMULATOR
- 970 PIN, 1-2 ACCUMULATOR
- 971 SPRING ASSEMBLY, (INNER)
- 973 SPRING, 1-2 ACCUMULATOR
- 975 PISTON, 3-4 ACCUMULATOR
- 976 SEAL, 3-4 ACCUMULATOR
- 977 PIN, 3-4 ACCUMULATOR

Figure 8

SECONDARY PUMP ASSEMBLY

- 203 BODY, SECONDARY PUMP
- 204 BUSHING, PUMP
- 205 GEAR, SECONDARY PUMP DRIVE
- 206 GEAR, SECONDARY PUMP DRIVEN
- 209 SEAL, FILTER
- 210 RETAINER, PRESSURE REGULATOR SPRING
- 211 VALVE, PRESSURE REGULATOR
- 212 SPRING, PRESSURE REGULATOR VALVE
- 213 VALVE, PRESSURE REGULATOR BOOST
- 214 SLEEVE, PRESSURE REGULATOR BOOST VALVE
- 215 CLIP, RETAINER (2)
- 216 BALL, SECONDARY PUMP CUT-OFF
- 217 BALL, PUMP SEAT

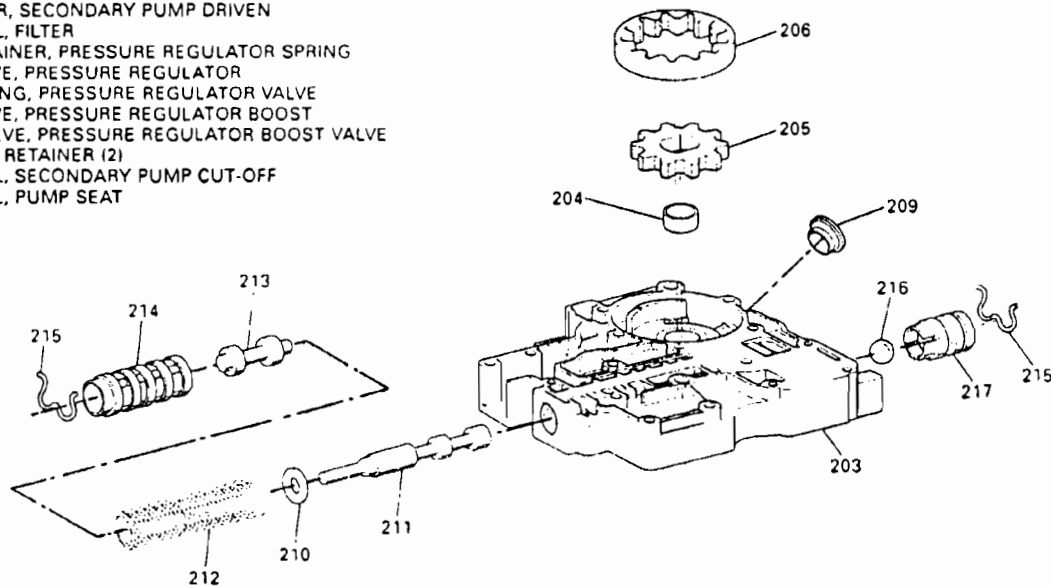
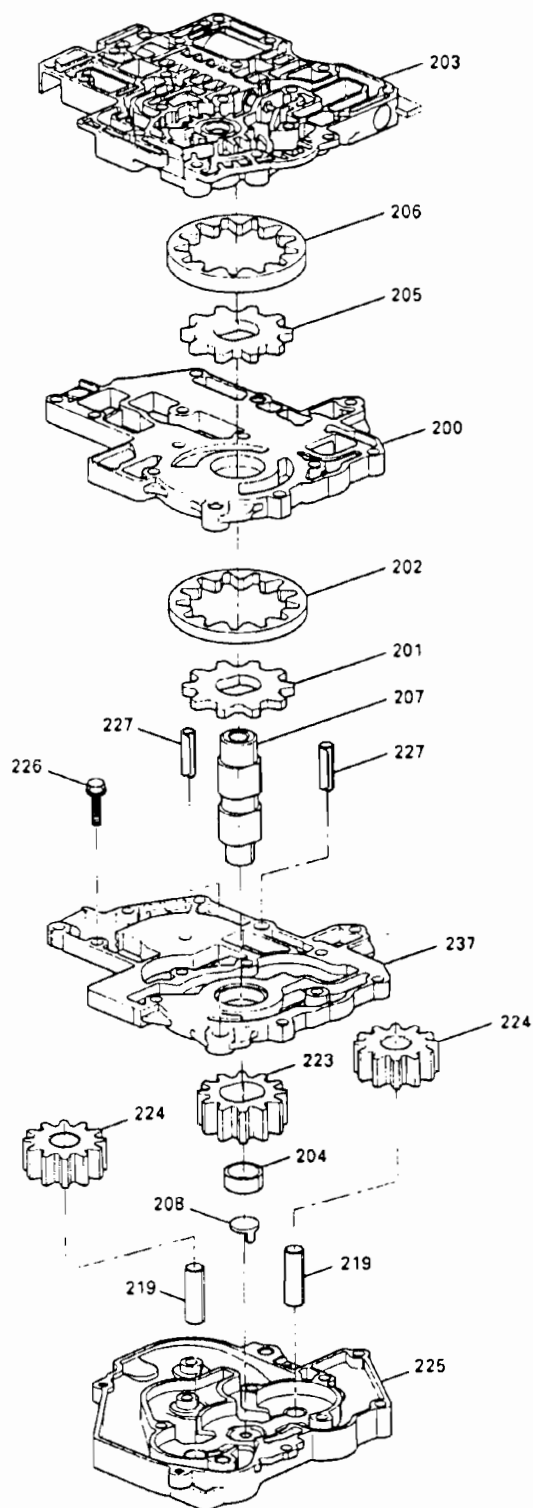


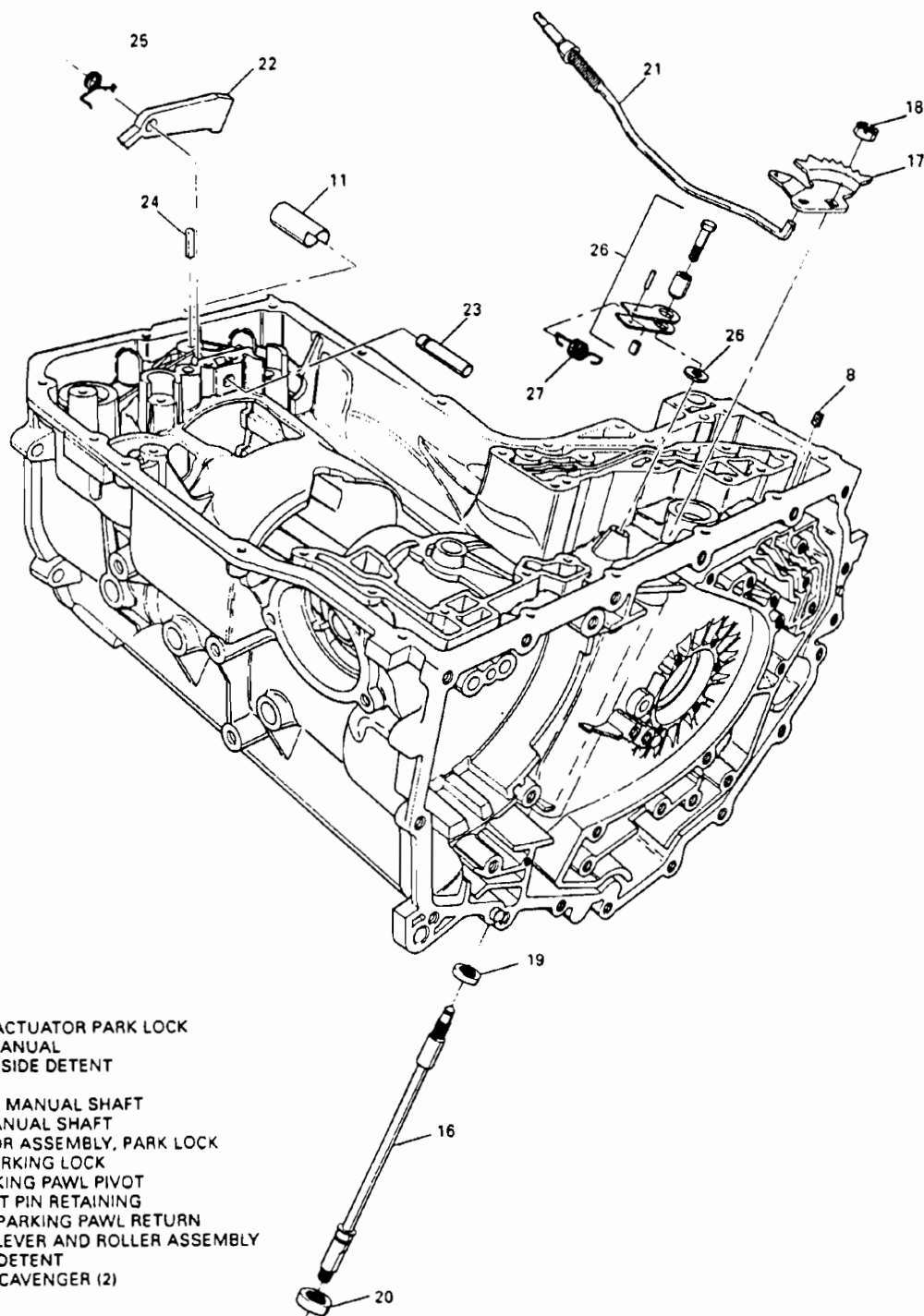
Figure 9

- 200 BODY, PRIMARY PUMP
- 201 GEAR, PRIMARY PUMP DRIVE
- 202 GEAR, PRIMARY PUMP DRIVEN
- 203 BODY, SECONDARY PUMP
- 204 BUSHING, SCAVENGE PUMP
- 205 GEAR, SECONDARY PUMP DRIVE
- 206 GEAR, SECONDARY PUMP DRIVEN
- 207 SHAFT ASSEMBLY, OIL PUMP DRIVEN
- 208 WASHER, THRUST (OIL PUMP DRIVEN SHAFT)
- 219 PIN, SCAVENGE DRIVER GEAR
- 223 GEAR, SCAVENGE PUMP DRIVE
- 224 GEAR, SCAVENGE PUMP DRIVEN (2)
- 225 BODY, SCAVENGE PUMP
- 226 BOLT, PUMP COVER TO SCAVENGER COVER (2)
- 227 BUSHINGS, DOWEL
- 237 COVER, SCAVENGE PUMP



SCAVENGER, PRIMARY AND SECONDARY PUMPS

Figure 10



CASE AND PARKING PAWL

Figure 11

HYDRA-MATIC 4L60-E MODEL CODE IDENTIFICATION

<u>MODEL</u>	<u>ENGINE</u>	<u>VEHICLE</u>
3CBD	4.3L V/6 (TBI)	C-TRUCK AND G-VAN
3CFD	5.0L V/8	C-TRUCK
3CJD	5.7L V/8	C-TRUCK AND G-VAN
3CLD	6.2L DIESEL	C-TRUCK AND G-VAN
3KAD	4.3L V/6 (TBI)	K-TRUCK
3KBD	5.0L V/8	K-TRUCK
3KCD	5.7L V/8	K-TRUCK
3KDD	6.2L DIESEL	K-TRUCK
3MJD	4.3L V/6 (TBI)	M-VAN
3MDD	4.3L V/6 (MPI) TURBO	L-TRUCK
3MND	4.3L V/6 (TBI)	L-TRUCK
3MSD	4.3L V/6 (MPI) TURBO	M-VAN
3SHD	4.3L V/6 (TBI)	S-TRUCK
3TAD	4.3L V/6 (MPI) TURBO	T-TRUCK
3TBD	4.3L V/6 (MPI) TURBO	T-TRUCK
3TLD	4.3L V/6 (TBI)	T-TRUCK

Figure 12

T.E.C.

TRANSMISSION ELECTRONIC CONTROLLER

With the T.E.C. you can operate any transmission without the automobile's computer! You can test drive the vehicle and control the transmission upshifts, downshifts, and the TCC. You can let the T.E.C computer control the shifts while you monitor the transmission. The T.E.C. allows you to determine if it is the transmission or is it the automobile's computer that is faulty and will scan the on-board computer for transmission trouble codes.

The T.E.C. is simple to program and simple to use. All you need to operate the T.E.C. is the correct adaptor cable to fit your transmission type and the correct program code found on the included laminated instruction sheet.

Follow these 5 easy steps:

1. Attach the adaptor cable to the T.E.C. and the transmission.
2. Enter the program code found on the instruction sheet. You will be given a code on the LED display that will match your instruction sheet. This will tell you if you have the right transmission. Now you are ready for your test drive.
3. Place the T.E.C. in the automatic mode and the car's computer will control the transmission while you monitor the shifts on the T.E.C..
4. Now select the manual mode and the T.E.C. controls the transmission at your command. 1st gear, 2nd gear, 3rd gear, 4th gear, then lock-up.
5. Now a test drive with the T.E.C. allows you to control the shifts on a 10 minute test drive. Is the problem the computer or is it the transmission?

As new transmissions are released from car manufacturers, all that is needed to upgrade or adapt your T.E.C. unit, is the appropriate cable and the program code on the instruction sheet. This is a very low cost way to add new transmissions to this tool. Only an inexpensive cable is required.

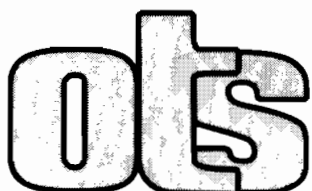


One Tool included with starter kit, evaluates these transmission models:

TH700R4 GM
TH3254L GM
TH2004R GM
TH440T4 GM
4T60E GM
4L80E GM

Other Transmission models available:

E40D Ford
AXODE Ford
A4LD Ford
All Toyota
Honda
Mitsubishi
ZF4HP22
ZF4HP18
Mazda 323/626 G4A-EL
Ford Probe 4EAT
AW7ILE
AW5040



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HYDRA-MATIC 4L60-E ELECTRICAL DIAGNOSIS

FORCE MOTOR

1. Volt/Ohmmeter set to Ohms, leads terminal to terminal on Force Motor, Ohmmeter should read 3-5 ohms resistance, at 70°F.
2. If checking from outside the transmission, Ohmmeter leads from terminal "C" to terminal "D", Ohmmeter should read 3-5 ohms (See Figure 14).

SHIFT SOLENOID "A"

1. Volt/Ohmmeter set to Ohms, leads terminal to terminal on Shift Solenoid "A", Ohmmeter should read 20-40 ohms resistance, at 70°F.
2. If checking from outside the transmission, Ohmmeter leads from terminal "E" to terminal "A", Ohmmeter should read 20-40 ohms (See Figure 14).
3. Should hear "Click" when 12V and ground are applied.

SHIFT SOLENOID "B"

1. Volt/Ohmmeter set to Ohms, leads terminal to terminal on Shift Solenoid "B", Ohmmeter should read 20-40 ohms resistance, at 70°F.
2. If checking from outside the transmission, Ohmmeter leads from terminal "E" to terminal "B", Ohmmeter should read 20-40 ohms (See Figure 14).
3. Should hear "Click" when 12V and ground are applied.

3-2 DOWNSHIFT SOLENOID

1. Volt/Ohmmeter set to Ohms, leads terminal to terminal on 3-2 Solenoid, Ohmmeter should read 10-15 ohms resistance, at 70°F.
2. If checking from outside the transmission, Ohmmeter leads from terminal "E" to terminal "S", Ohmmeter should read 10-15 ohms (See Figure 14).

OUTPUT SPEED SENSOR

1. Volt/Ohmmeter set to Ohms, leads terminal to terminal on Output Speed Sensor, Ohmmeter should read 1000-1500 ohms resistance.
2. The Output Speed Sensor generates AC voltage, the faster it turns the more AC voltage it generates. The PCM uses this voltage signal to determine how fast the vehicle is going.

SHIFT SOLENOID STATES

GEAR	SHIFT "A"	SHIFT "B"
1ST	ON	ON
2ND	OFF	ON
3RD	OFF	OFF
4TH	ON	OFF

TRANSMISSION ELECTRICAL CONNECTOR

The transmission electrical connector is a very important part of the HYDRA-MATIC 4L60-E operating system. Anything that interferes with the electrical connection can cause the transmission to set Diagnostic Trouble Codes and/or operate incorrectly.

The following items can affect the electrical connection:

- Bent pins in the connector from rough handling during connection and disconnection
- Wires backing away from the pins or coming uncrimped (in either the transmission or vehicle wiring harness)
- Dirt contamination entering the connector when it is unconnected
- Pins in the connector backing out of the connector or pushed out during connection
- Excessive transmission fluid leaking into the connector, wicking up into the vehicle wiring harness and degrading the wire insulation *
- Water/moisture intrusion in the connector
- Low pin retention from excessive connection and disconnection of the wiring harness
- Pin corrosion from contamination

* The presence of transmission fluid in the transmission connector is not harmful in itself. The fluid only affects the vehicle harness wiring insulation if the fluid wicks up that far.

Points to remember when working with the transmission electrical connector:

- To remove the connector, squeeze the two tabs towards each other and pull straight up (See illustration).
- Carefully limit twisting or wiggling the connector during removal. This can bend pins.
- DO NOT pry the connector off with a screwdriver or other tool.
- To install the connector, first orient the pins by lining up the arrows on each half of the connector. Push the connector straight down into the transmission without twisting or angling the mating parts.
- The connector should click into place with a positive feel and/or noise.
- Whenever the transmission pass-thru connector is disconnected from the vehicle harness and the engine is running, multiple Diagnostic Trouble Codes will set. Be sure to clear these codes after re-connecting the pass-thru connector.

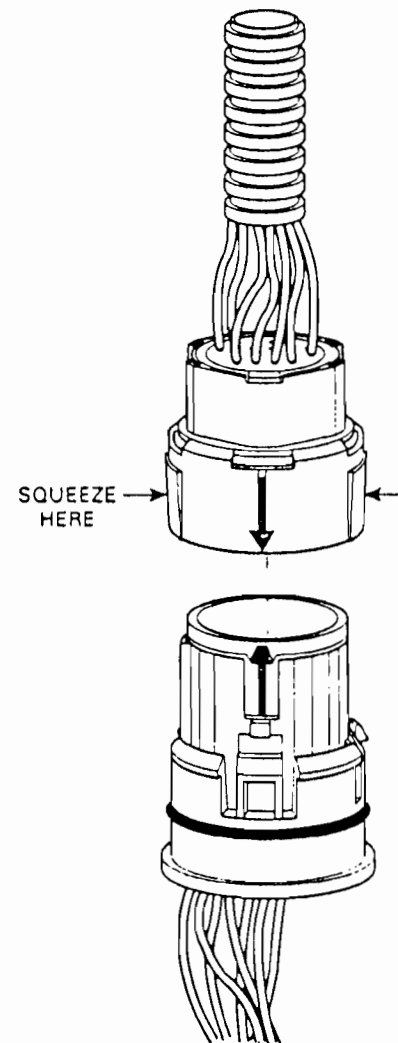
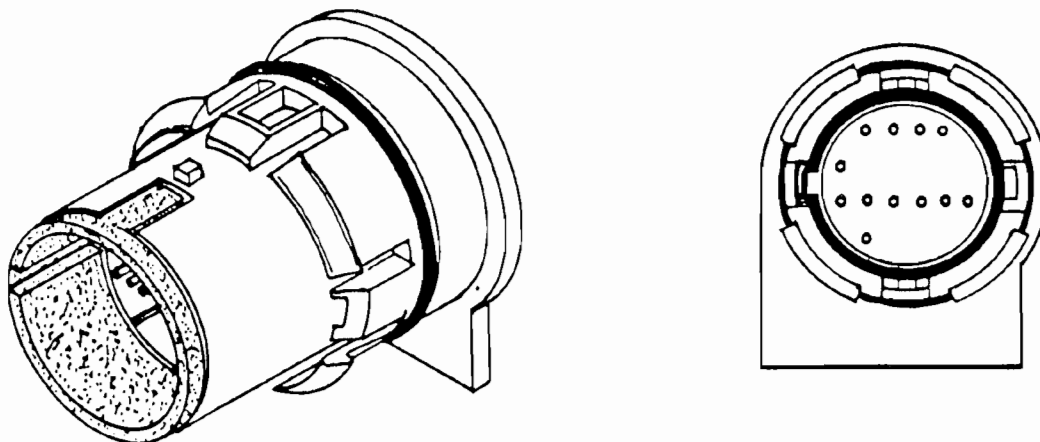


Figure 13

TRANSMISSION CASE CONNECTOR



NOTE: THE TRANSMISSION CASE CONNECTOR AND THE LOCK-UP SOLENOID ARE INTREGAL PARTS OF THE TRANSMISSION WIRING HARNESS AND MUST BE REPLACED AS AN ASSEMBLY.

VIEW LOOKING INTO TRANSMISSION CASE CONNECTOR

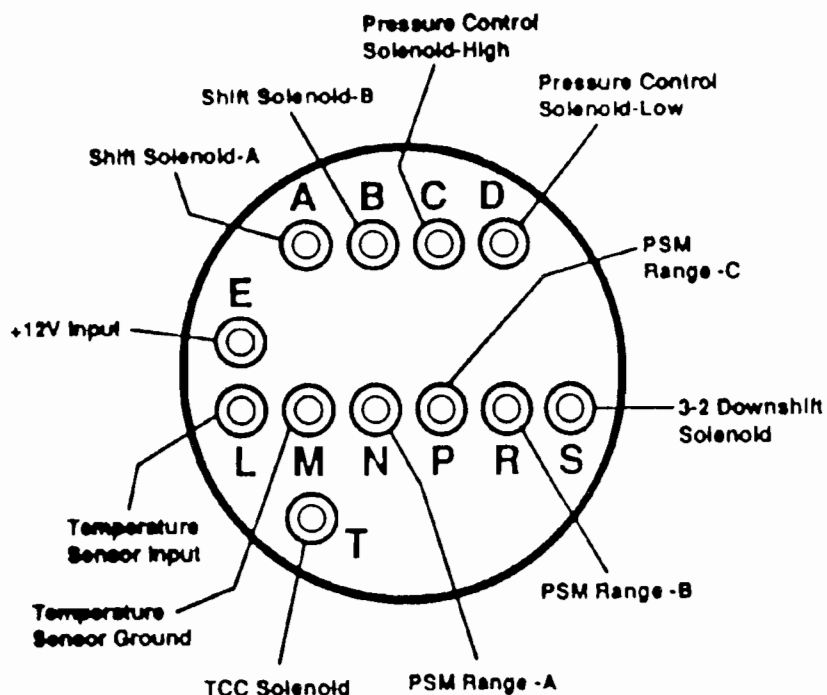


Figure 14

1993 HYDRA-MATIC 4L60-E SHIFT SPEED CHART

ENGINE	BODY	AXLE RATIO	1-2 SHIFT +/- 250 RPM					2-3 SHIFT +/- 200 RPM					3-4 SHIFT +/- 150 RPM					4-3 +/- 100 RPM	3-2 +/- 100 RPM	2-1 +/- 100 RPM	
			TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
5.7L (L05)	C10/G	3.08																			
	C20/K	3.42	465	622	738	816	894	835	1126	1282	1495	1670	1243	1554	1981	*	*	1127	699	369	
	C10/G	3.42																			
	C20/K	3.73	466	678	762	889	953	847	1228	1440	1652	1800	1270	1567	2054	*	*	1122	762	381	
	C10/G	3.73																			
	C/K	4.10	514	700	817	911	981	934	1284	1518	1705	1845	1307	1635	2101	*	*	1121	841	373	

ENGINE	BODY	AXLE RATIO	1-2 SHIFT +/- 250 RPM					2-3 SHIFT +/- 200 RPM					3-4 SHIFT +/- 150 RPM					4-3 +/- 100 RPM	3-2 +/- 100 RPM	2-1 +/- 100 RPM	
			TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
5.0L (L03)	C10/G	3.08		486	660	758	855	893	835	1146	1360	1632	1768	1243	1535	1943	2311	*	1126	699	369
	C20/K	3.42																			
	C10/G	3.42		510	744	893	978	957	851	1233	1446	1680	1808	1276	1574	1914	2297	*	1127	765	383
	C20/K	3.73																			
	G	3.73		550	793	910	1004	980	934	1237	1517	1704	1844	1307	1611	1914	2311	*	1120	840	373
	C/K	4.10																			

ENGINE	BODY	AXLE RATIO	1-2 SHIFT +/- 250 RPM					2-3 SHIFT +/- 200 RPM					3-4 SHIFT +/- 150 RPM					4-3 +/- 100 RPM	3-2 +/- 100 RPM	2-1 +/- 100 RPM	
			TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
6.2L DIESEL (LH6)	C	3.08																			
	C20/K	3.42	369	369	505	582	757	757	757	893	1184	1437	1359	1359	1359	*	*	1223	679	330	
	C10	3.42																			
	C20/K	3.73	361	382	489	595	744	744	744	872	1170	1425	1340	1340	1340	*	*	1212	680	319	
	C10	3.73																			
	C/K	4.10	373	373	467	607	747	747	747	887	1190	1424	1354	1354	1354	*	*	1214	677	326	
	G	3.08																			
		3.42	352	389	519	556	723	723	723	871	1057	1317	1298	1298	1298	*	*	1168	649	315	
		3.73	349	369	472	513	719	719	719	863	1058	1315	1294	1294	1294	*	*	1171	657	308	
		359	381	516	561	718	718	718	853	1077	1324	1302	1302	1302	*	*	1167	651	314		

ENGINE	BODY	AXLE RATIO	1-2 SHIFT +/- 250 RPM					2-3 SHIFT +/- 200 RPM					3-4 SHIFT +/- 150 RPM					4-3 +/- 100 RPM	3-2 +/- 100 RPM	2-1 +/- 100 RPM	
			TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
4.3L (L35)	M/L	3.42/3.73		566	784	928	893	915	981	1482	1656	1765	1787	1395	1918	3488	*	*	1242	588	348
	S/T	3.08/3.42		545	784	828	893	915	981	1460	1656	1765	1787	1438	2005	3488	*	*	1242	588	348
4.3L (LB4)	M/L	3.23/3.42		392	545	588	675	784	784	1111	1242	1417	1613	1395	1700	1918	*	*	1242	632	348
		3.73		479	719	937	1002	1046	850	1308	1526	1787	1940	1395	1765	1983	*	*	1242	654	348
	G	3.42/3.73		479	741	937	1002	1046	850	1329	1569	1787	1940	1395	1787	2005	*	*	1242	654	348
	S/T	3.08/3.42		436	545	588	675	784	784	1090	1220	1417	1613	1395	1678	1918	*	*	1242	654	348
	C10	3.08/3.42		479	588	654	741	784	850	1177	1308	1460	1613	1395	1678	1918	*	*	1242	654	348
		3.73/4.10		501	654	719	763	784	915	1242	1373	1526	1613	1395	1678	1918	*	*	1242	654	348

* SHIFT NOT AVAILABLE AT THIS TPS

1. ALL SPEEDS ARE GIVEN IN TRANSMISSION OUTPUT SHAFT RPM
2. SPEEDS ARE BASED ON PERCENT THROTTLE POSITION SENSOR (TPS) DATA
3. USE A TECH 1 OR OTHER SCAN TOOL TO MONITOR THIS DATA
4. ALL SHIFT SPEEDS ARE APPROXIMATE

Figure 15

HYDRA-MATIC 4L60-E LINE PRESSURE CHECK PROCEDURE

Line pressures are calibrated for two sets of gear ranges – Drive-Park-Neutral and Reverse. This allows the transmission line pressure to be appropriate for different pressure needs in different gear ranges:

<u>Gear Range</u>	<u>Line Pressure Range</u>
Drive, Park or Neutral	55 - 189 PSI
Reverse	64 - 324 PSI

Before performing a line pressure check, verify that the pressure control solenoid is receiving the correct electrical signal from the PCM:

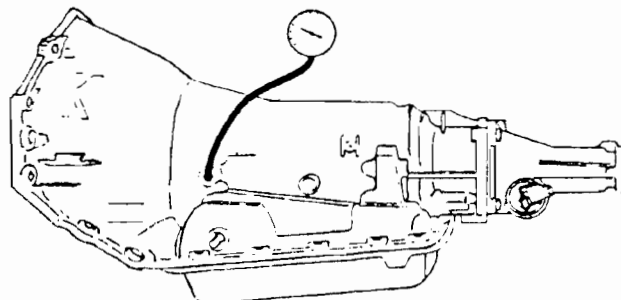
1. Install a scan tool.
2. Start the engine and set parking brake.
3. Check for a stored pressure control solenoid diagnostic trouble code, and other diagnostic trouble codes.
4. Repair vehicle if necessary.

Inspect

- Fluid level
- Manual linkage

Install or Connect

- TECH 1 Scan tool
- Oil pressure gage at line pressure tap



5. Put gear selector in Park and set the parking brake.
6. Start engine and allow it to warm up at idle.
7. Access the "PCS Control" test on the TECH 1 scan tool.
8. Increase DESIRED PCS in 0.1 Amp increments and read the corresponding line pressure on the pressure gage. (Allow pressure to stabilize for 5 seconds after each current change.)
9. Compare data to the Drive-Park-Neutral line pressure chart below.

*NOTICE

Total test running time should not exceed 2 minutes, or transmission damage could occur.

CAUTION

Brakes must be applied at all times to prevent unexpected vehicle motion.

If pressure readings differ greatly from the line pressure chart, refer to the Diagnosis Charts

The TECH 1 scan tool is only able to control the pressure control solenoid in Park and Neutral with the vehicle stopped. This protects the clutches from extremely high or low pressures in Drive or Reverse ranges.

Pressure Control Solenoid Current (Amp)	Line Pressure (PSI)
0.02	170 - 190
0.10	165 - 185
0.20	160 - 180
0.30	155 - 175
0.40	148 - 168
0.50	140 - 160
0.60	130 - 145
0.70	110 - 130
0.80	90 - 115
0.90	65 - 90
0.98	55 - 65

Pressures at 1500 RPM and 66°C (150°F). Line pressure drops as temperature increases.

Figure 16

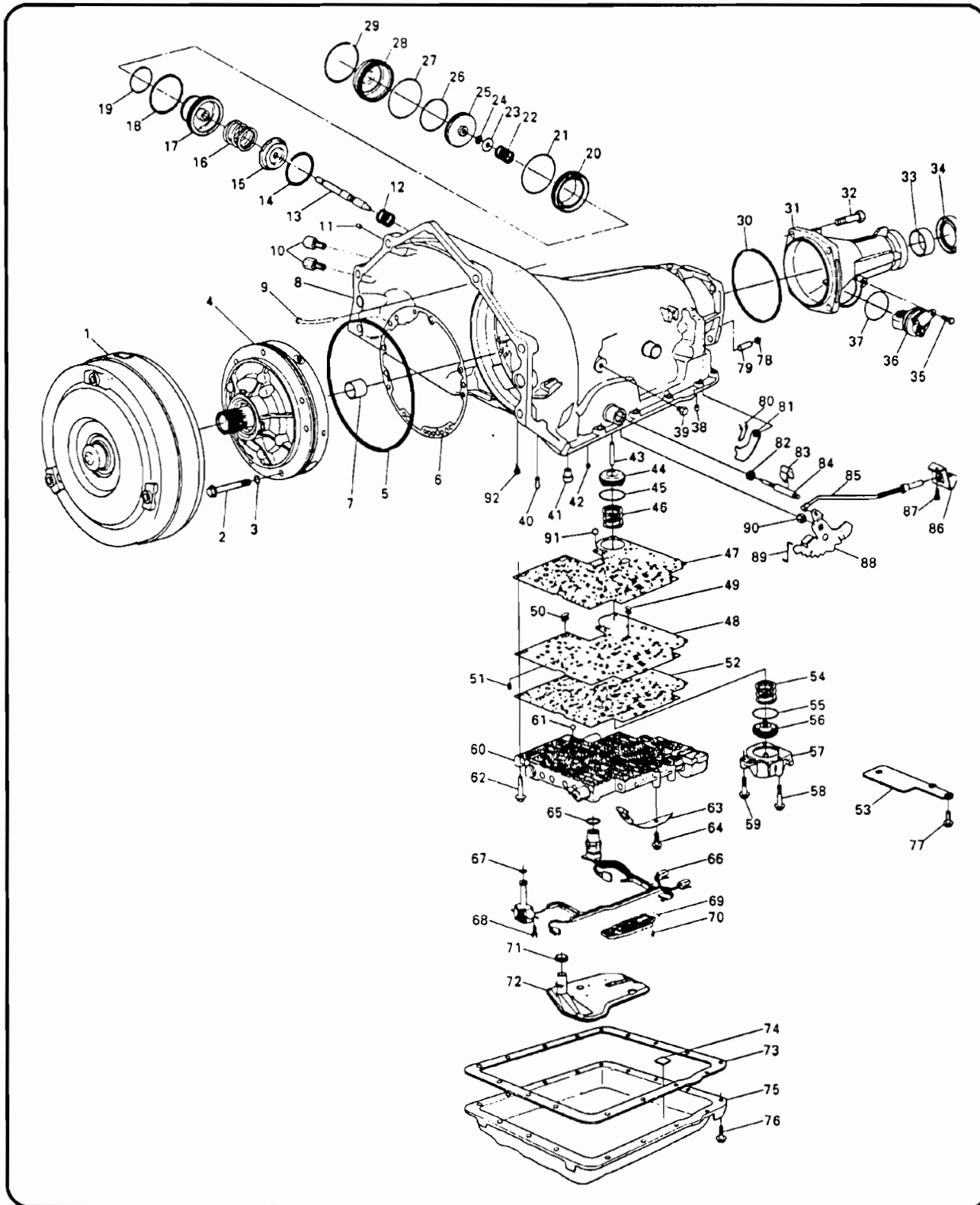


Figure 17

ILL. NO.	DESCRIPTION	ILL. NO.	DESCRIPTION
1	TORQUE CONVERTER ASSEMBLY	48	PLATE, VALVE BODY SPACER
2	BOLT, PUMP TO CASE	49	SCREEN, SHIFT SOLENOIDS
3	O-RING, PUMP TO CASE BOLT	50	SCREEN, PRESSURE CONTROL SOLENOID
4	PUMP ASSEMBLY, OIL	51	SCREEN, 3-2 CONTROL SOLENOID
5	SEAL, OIL (PUMP TO CASE)	52	GASKET, SPACER PLATE TO VALVE BODY
6	GASKET, PUMP COVER TO CASE	53	PLATE, SPACER PLATE SUPPORT
7	BUSHING, CASE	54	SPRING, 1-2 ACCUMULATOR
8	CASE, TRANSMISSION	55	RING, OIL SEAL (1-2 ACCUMULATOR)
9	VENT ASSEMBLY, TRANSMISSION	56	PISTON, 1-2 ACCUMULATOR
10	CONNECTOR, OIL COOLER PIPE	57	COVER AND PIN ASSEMBLY, 1-2 ACCUMULATOR
11	PLUG, CASE SERVO	58	BOLT, ACCUMULATOR COVER
12	SPRING, SERVO RETURN	59	BOLT, ACCUMULATOR COVER
13	PIN, 2ND APPLY PISTON	60	VALVE ASSEMBLY, CONTROL BODY
14	RING, RETAINER (2ND APPLY PISTON)	61	CHECKBALL
15	RETAINER, SERVO CUSHION SPRING	62	BOLT, VALVE BODY
16	SPRING, SERVO CUSHION	63	SPRING ASSEMBLY, MANUAL DETENT
17	PISTON, 2ND APPLY	64	BOLT, MANUAL DETENT SPRING
18	RING, OIL SEAL (2ND APPLY PISTON - OUTER)	65	SEAL, WIRING HARNESS PASS-THRU CONNECTOR O-RING
19	RING, OIL SEAL (2ND APPLY PISTON - INNER)	66	SOLENOID ASSEMBLY, WIRING HARNESS
20	HOUSING, SERVO PISTON (INNER)	67	SEAL, O-RING (SOLENOID)
21	SEAL, O-RING	68	BOLT, HEX WASHER HEAD (SOLENOID)
22	SPRING, SERVO APPLY PIN	69	SWITCH ASSEMBLY, TRANSMISSION PRESSURE
23	WASHER, SERVO APPLY PIN	70	BOLT, PRESSURE SWITCH ASSEMBLY
24	RING, RETAINER (APPLY PIN)	71	SEAL, FILTER
25	PISTON, 4TH APPLY	72	FILTER ASSEMBLY, TRANSMISSION OIL
26	RING, OIL SEAL (4TH APPLY PISTON - OUTER)	73	GASKET, TRANSMISSION OIL PAN
27	SEAL, O-RING (2-4 SERVO COVER)	74	MAGNET, CHIP COLLECTOR
28	COVER, 2-4 SERVO	75	PAN, TRANSMISSION OIL
29	RING, SERVO COVER RETAINING	76	SCREW, TRANSMISSION OIL PAN
30	SEAL, CASE EXTENSION TO CASE	77	BOLT, SPACER PLATE SUPPORT
31	EXTENSION, CASE	78	PLUG, STEEL CUP
32	BOLT, CASE EXTENSION TO CASE	79	SHAFT, PARKING BRAKE PAWL
33	BUSHING, CASE EXTENSION	80	SPRING, PARKING PAWL RETURN
34	SEAL ASSEMBLY, CASE EXTENSION OIL	81	PAWL, PARKING BRAKE
35	BOLT, SPEED SENSOR RETAINING	82	SEAL, MANUAL SHAFT
36	SPEED SENSOR, INTERNAL TRANSMISSION	83	RETAINER, MANUAL SHAFT
37	SEAL, O-RING (ITSS TO CASE EXTENSION)	84	SHAFT, MANUAL
38	PLUG, TRANSMISSION CASE (ACCUM. BLEED)	85	ACTUATOR ASSEMBLY, PARKING LOCK
39	PLUG, PRESSURE	86	BRACKET, PARKING LOCK
40	RETAINER AND BALL ASSEMBLY, 3RD ACCUM.	87	BOLT, PARKING LOCK BRACKET
41	PIN, BAND ANCHOR	88	LEVER, INSIDE DETENT
42	RETAINER AND BALL ASM. (DOUBLE ORIFICE)	89	LINK, MANUAL VALVE
43	PIN, ACCUMULATOR PISTON	90	NUT, HEX HEAD
44	PISTON, 3-4 ACCUMULATOR	91	NO. 10 CHECKBALL
45	RING, OIL SEAL (3-4 ACCUMULATOR PISTON)	92	SCREEN, TCC
46	SPRING, 3-4 ACCUMULATOR		
47	GASKET, SPACER PLATE TO CASE		

Figure 18

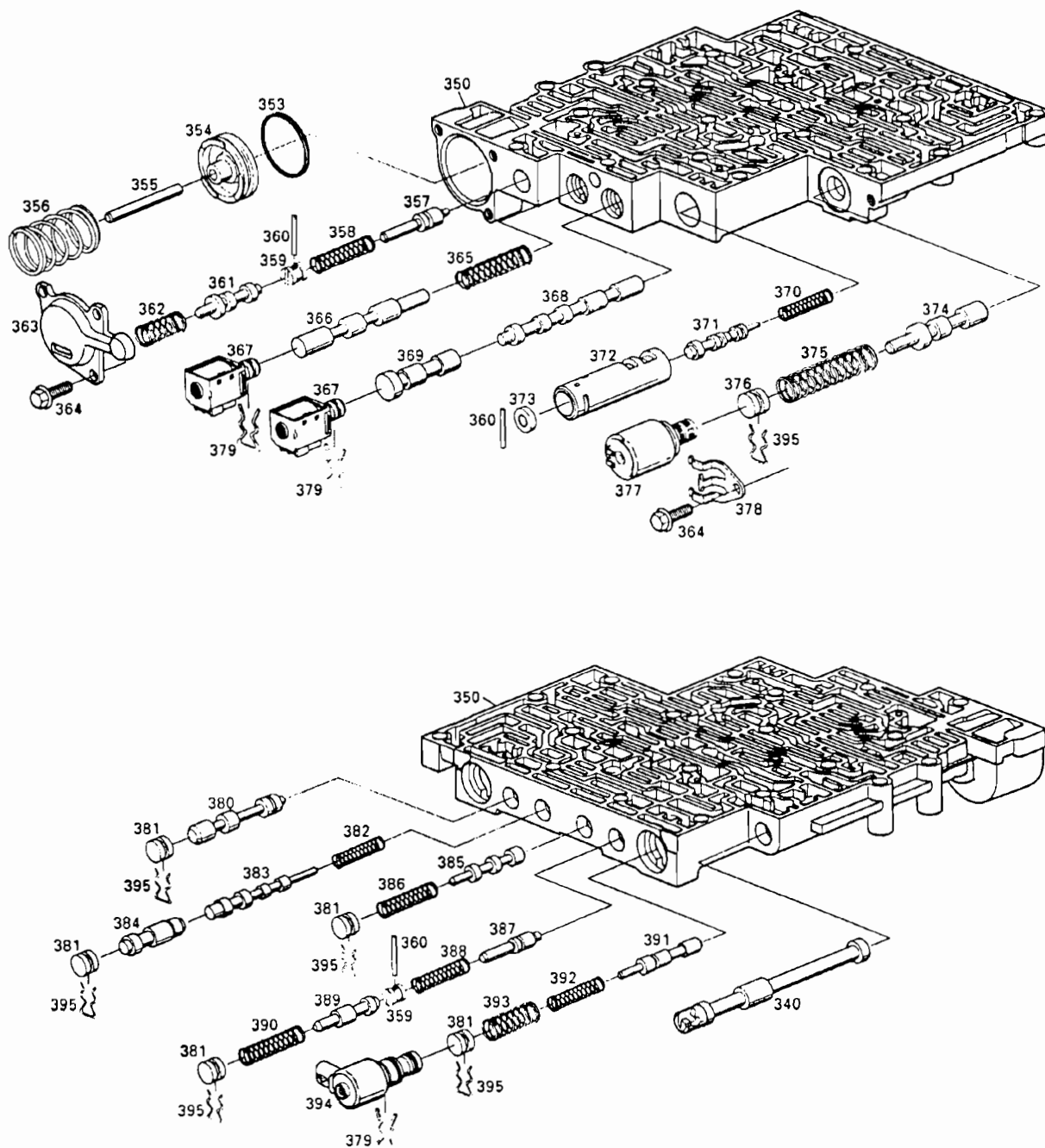


Figure 19

340 VALVE, MANUAL
 350 VALVE ASSEMBLY, CONTROL BODY
 353 SEAL, FORWARD ACCUMULATOR OIL
 354 PISTON, FORWARD ACCUMULATOR
 355 PIN, FORWARD ACCUMULATOR
 356 SPRING, FORWARD ACCUMULATOR
 357 VALVE, FORWARD ABUSE
 358 SPRING, FORWARD ABUSE VALVE
 359 PLUG, BORE
 360 PIN, COILED SPRING
 361 VALVE, LOW OVERRUN
 362 SPRING, LOW OVERRUN VALVE
 363 COVER, FORWARD ACCUMULATOR
 364 BOLT, FORWARD ACCUMULATOR COVER
 365 SPRING, 1-2 SHIFT VALVE
 366 VALVE, 1-2 SHIFT
 367A 1-2 SHIFT SOLENOID (A)
 367B 2-3 SHIFT SOLENOID (B)
 368 VALVE, 2-3 SHIFT
 369 VALVE, 2-3 SHUTTLE
 370 SPRING, 1-2 ACCUMULATOR VALVE
 371 VALVE, 1-2 ACCUMULATOR
 372 SLEEVE, 1-2 ACCUMULATOR VALVE
 373 PLUG, BORE
 374 VALVE, ACTUATOR FEED LIMIT
 375 SPRING, ACTUATOR FEED LIMIT VALVE
 376 PLUG, BORE
 377 PRESSURE CONTROL SOLENOID
 378 RETAINER, PRESSURE CONTROL SOLENOID
 379 RETAINER, SOLENOID
 380 VALVE, CONVERTER CLUTCH SIGNAL
 381 PLUG, BORE
 382 SPRING, 4-3 SEQUENCE VALVE
 383 VALVE, 4-3 SEQUENCE
 384 VALVE, 3-4 RELAY
 385 VALVE, 3-4 SHIFT
 386 SPRING, 3-4 SHIFT VALVE
 387 VALVE, REVERSE ABUSE
 388 SPRING, REVERSE ABUSE VALVE
 389 VALVE, 3-2 DOWNSHIFT
 390 SPRING, 3-2 DOWNSHIFT VALVE
 391 VALVE, 3-2 CONTROL
 392 SPRING, 3-2 CONTROL VALVE
 393 SPRING, BORE PLUG
 394 3-2 CONTROL SOLENOID
 395 RETAINER, BORE PLUG

Figure 20

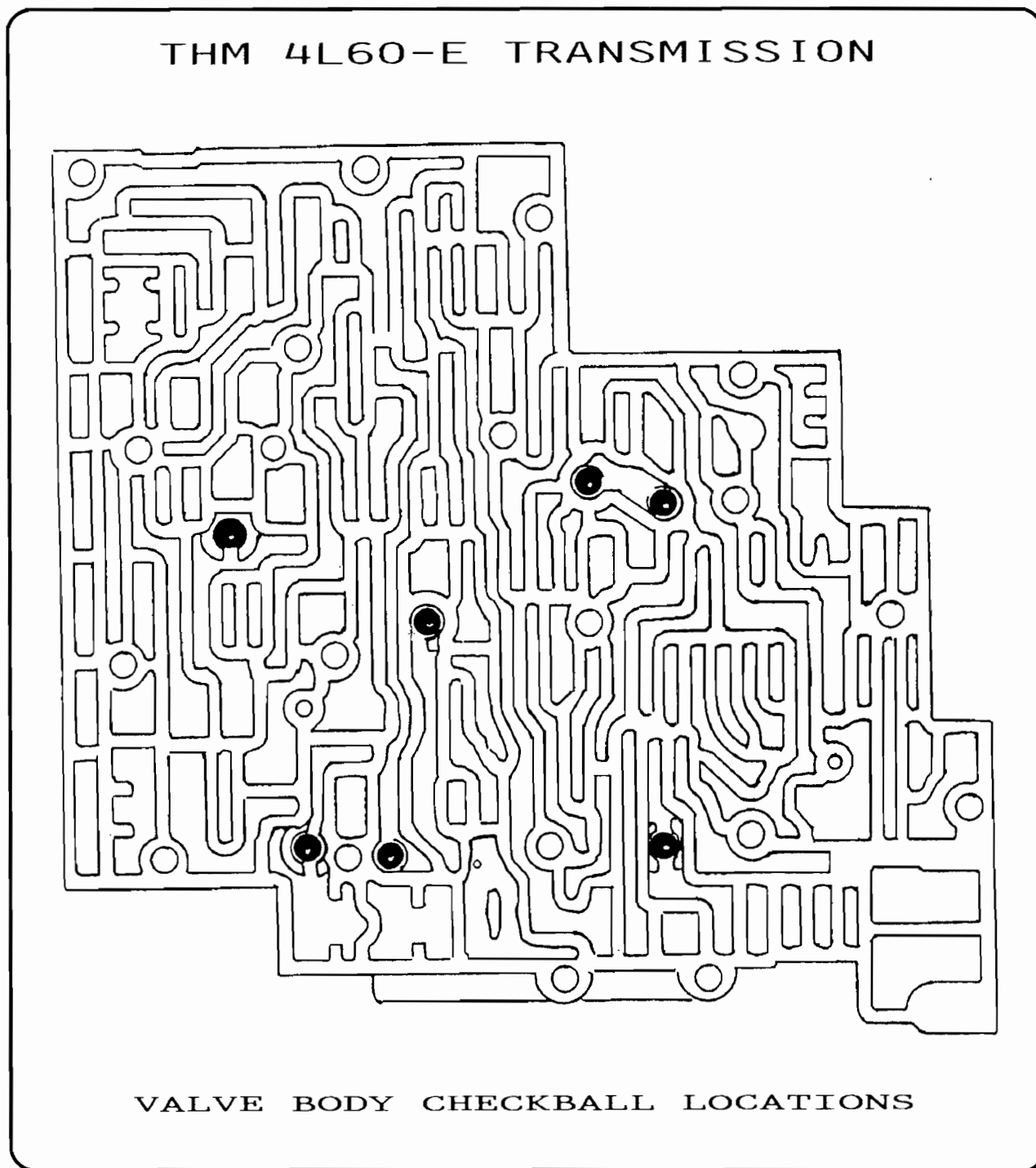
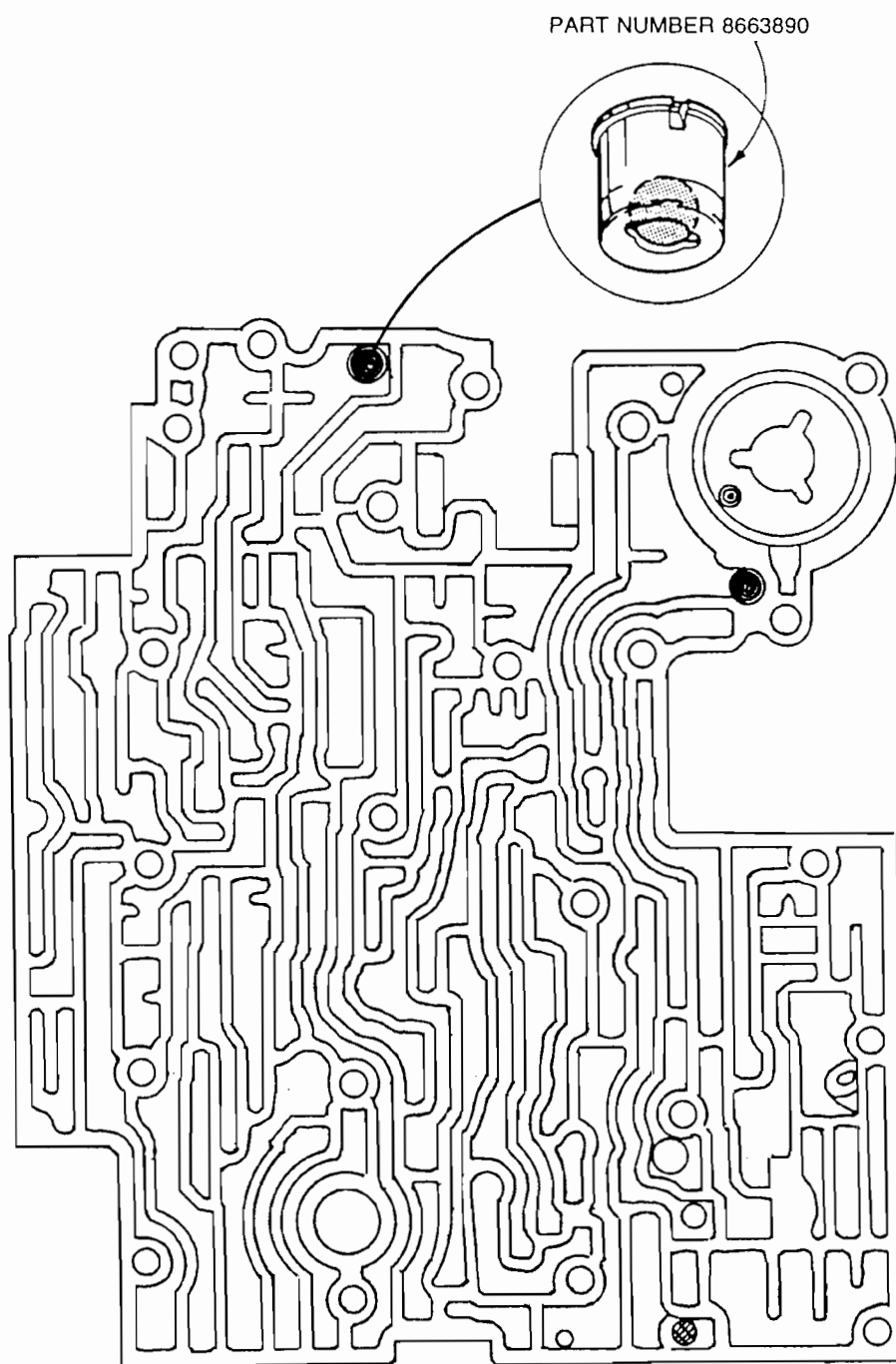


Figure 21

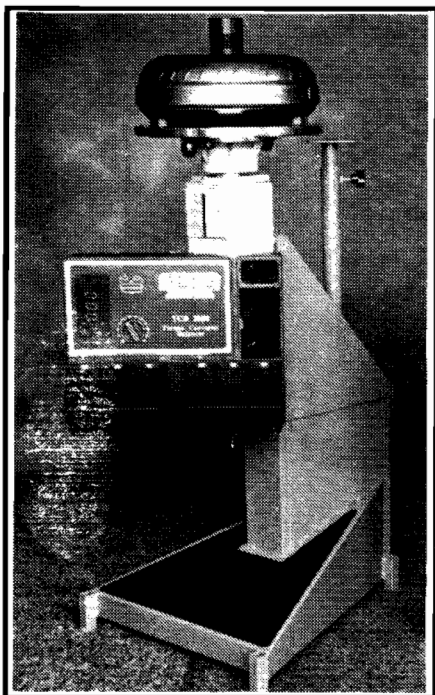
THM 4L60-E TRANSMISSION



CASE CHECKBALL LOCATION

Figure 22

...Dedicated To Keeping You On The Leading Edge Of Technology!



TCRS

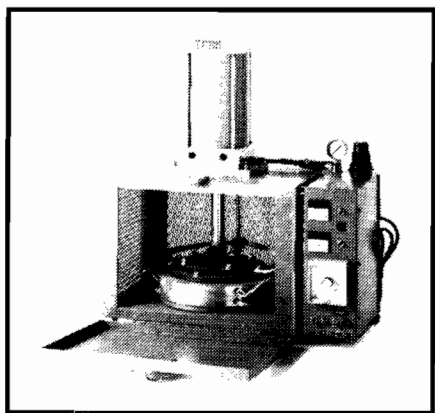
THE LATEST IN TORQUE CONVERTER REBUILDING TECHNOLOGY

AWA-2001+ MASTER AUTO-WELD ALIGNER

- Solid Cast Steel 1-Piece Casting
- Precision Line Bored
- Automatic Shut Off
- Set Clearance Easily
- No Bolting Necessary
- TCW-2001+ Does All Torque Converters, Better Than OEM Quality
- .0005 Tolerances Pilot To Hub
- NC Controlled
- Will Weld New Finish Ground Hub On Impeller
- No More Ring Savers The Master Aligner Is Capable Of Bowl Build-Up. Save \$
- Automatic Hold Down Precision Air Operated Collet Closes For Superior Alignment Accuracy Than Any Scroll Type Chuck

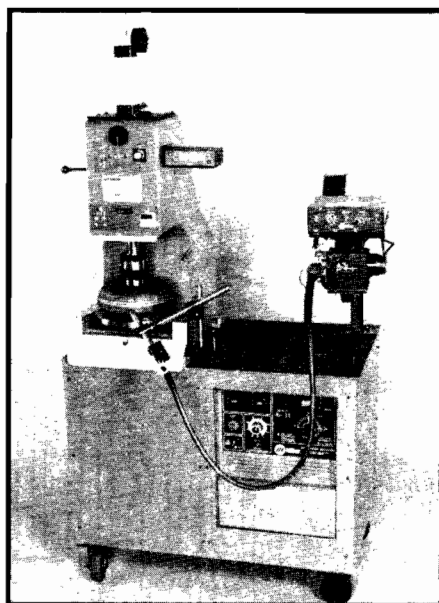
TCB-2000 COMPUTERIZED BALANCER

- Easy To Operate - Rotating At Only 90 RPM
- No More Shakers
- Tells You If Internal Components Are Out Of Balance
- American & Foreign Tooling (13 Pieces)
- Affordably Priced



PB-2002 PISTON BONDER

- Easy To Use 1-2-3
- Bonds A Piston Every Two Minutes
- Adjustable Heat & Timer Controls
- Aluminum Bonder Dies Provide Even Heat Distribution
- Compact & Efficient
- No Wait - No Freight
- Comes With 16 Die Sets American & Foreign

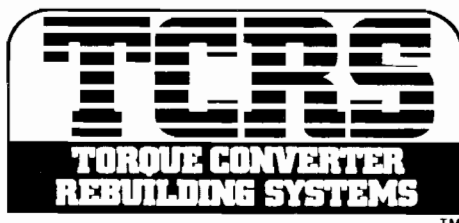


TCRS FB-4000 MICROPROCESSOR MOTORIZED FLUID OR DRY BALANCER

- Easy Operator Service
- Only Ten Seconds To Balance
- Rugged Motor Drive System
- 110v
- Push button Calibration
- Automatic True Zero
- Fast, Accurate, Easy To Use
- No Bolting Necessary
- Fluid Or Dry Balance
- Add Life To Your Shelf Converters
- No Rust Build-Up
- No Special Tooling Is Necessary For Indexing The FB-4000 Automatically Indexes Internal Balancing as Well As Bowl Balance On Most Converters
- Computer Touch Key Pad For Entering Torque Converter Diameter

OTHER EQUIPMENT AVAILABLE FROM TCRS

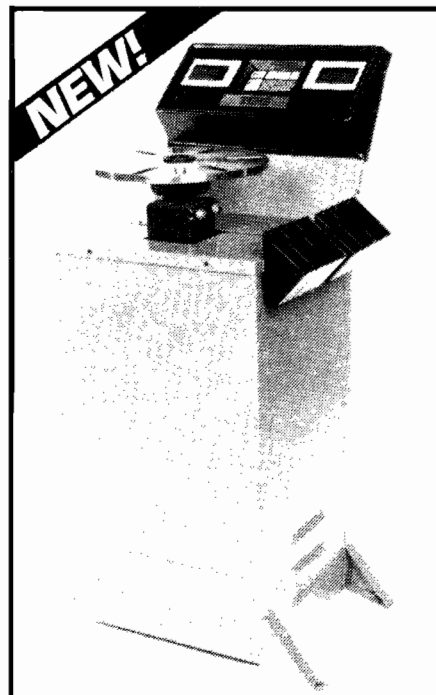
- SPECIAL APPLICATION LATHE
- RETROFITTED TURRET LATHE
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THM 4L60 (700-R4)

REVERSE INPUT HOUSING AND CHECKBALL CHANGES FOR 1993

CHANGE: The Reverse Input Housing for ALL 1993 model THM 4L60 transmissions has the oil feed hole enlarged (Large Square Hole), from the previous .095" round feed hole (See Figure 23).

REASON: To make a "Common" Reverse Input Housing for both the THM 4L60 and the THM 4L60-E transmissions for the 1993 model year.

PARTS AFFECTED:

- (1) REVERSE INPUT HOUSING - Feed hole has been enlarged from .095" round hole to large square hole, and this is the ONLY identification as they both require the aluminum piston (See Figure 23).
- (2) VALVE BODY CASTING - Changed with the addition of checkball in the location shown in Figure . (NOT IN BATHTUB). This checkball was added to orifice feed oil to the reverse input clutch (See Figure 24).
- (3) VALVE BODY SPACER PLATE - Orifice for the new checkball added in location shown in Figure , which is now the orifice for feed oil to the reverse input clutch. The 1993 spacer plate is identified with a two digit code stamped into the spacer plate as shown in Figure 25. However, the 1993 code letter can be prefixed with an "E", "G", or "H". Refer to the chart in Figure 26. Some 1992 spacer plates were also prefixed with an "E", so compare the chart in Figure 26, with the chart in Figure 27, so as not to get the wrong spacer plate.
- (4) VALVE BODY GASKETS - Both gaskets now have a "Tear-Drop" hole at checkball and orifice location in spacer plate, instead of the round hole found in the previous gaskets (See Figure 28).
- (5) PUMP COVER SEALING RINGS - Will now be solid Teflon seals for use with the new reverse input housing with the large square feed hole, and does require a new installation and re-sizing tool (See Figure 29).

INTERCHANGEABILITY:

- (1) REVERSE INPUT HOUSING - 1993 Reverse Input Housing CANNOT be used on any 1987 thru 1992 model transmission, but CAN be used to service any 1982 thru 1986 model transmission. Previous model Reverse Input Housings CANNOT be used on any 1993 models.
- (2) VALVE BODY CASTING - Can be used on previous models back thru 1988 models, as long as checkball is not installed in the new pocket. Previous model valve body CANNOT be used on any 1993 model, as there is no dam to retain new checkball in the proper location.
- (3) VALVE BODY SPACER PLATE - Not recommended to be used on any previous models, and 1992 plates WILL NOT work on 1993 models unless the reverse input clutch orifice hole is drilled into the plate.
- (4) VALVE BODY GASKETS - New gaskets can be used on previous models back thru 1987. The previous gaskets CANNOT be used on any 1993 models, as they will block the reverse input clutch feed orifice in the spacer plate.

(Continued on next Page)

(5) PUMP COVER SEAL RINGS - Will retro-fit back on ALL previous models, but will require installation and re-sizing tools.

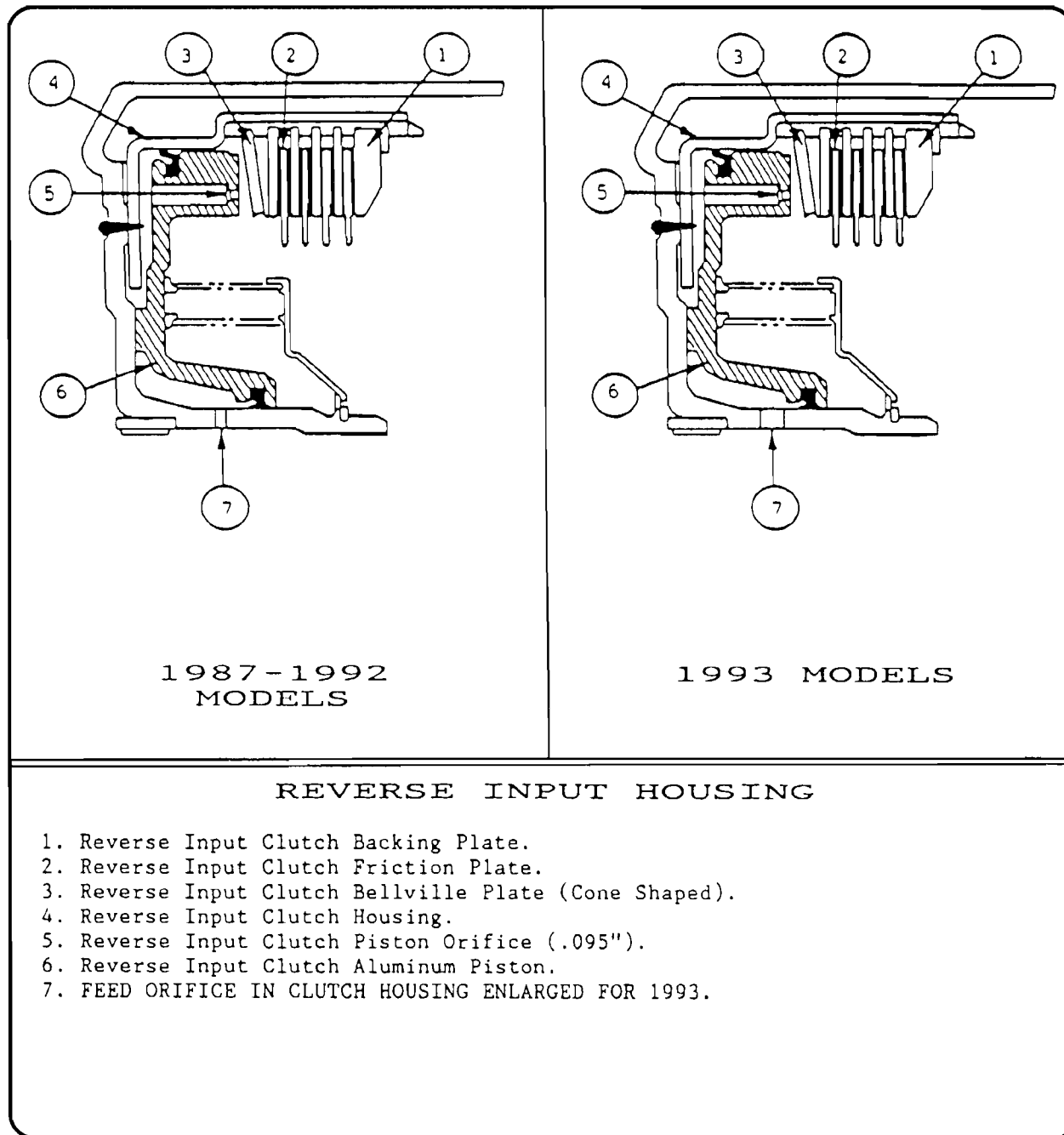


Figure 23

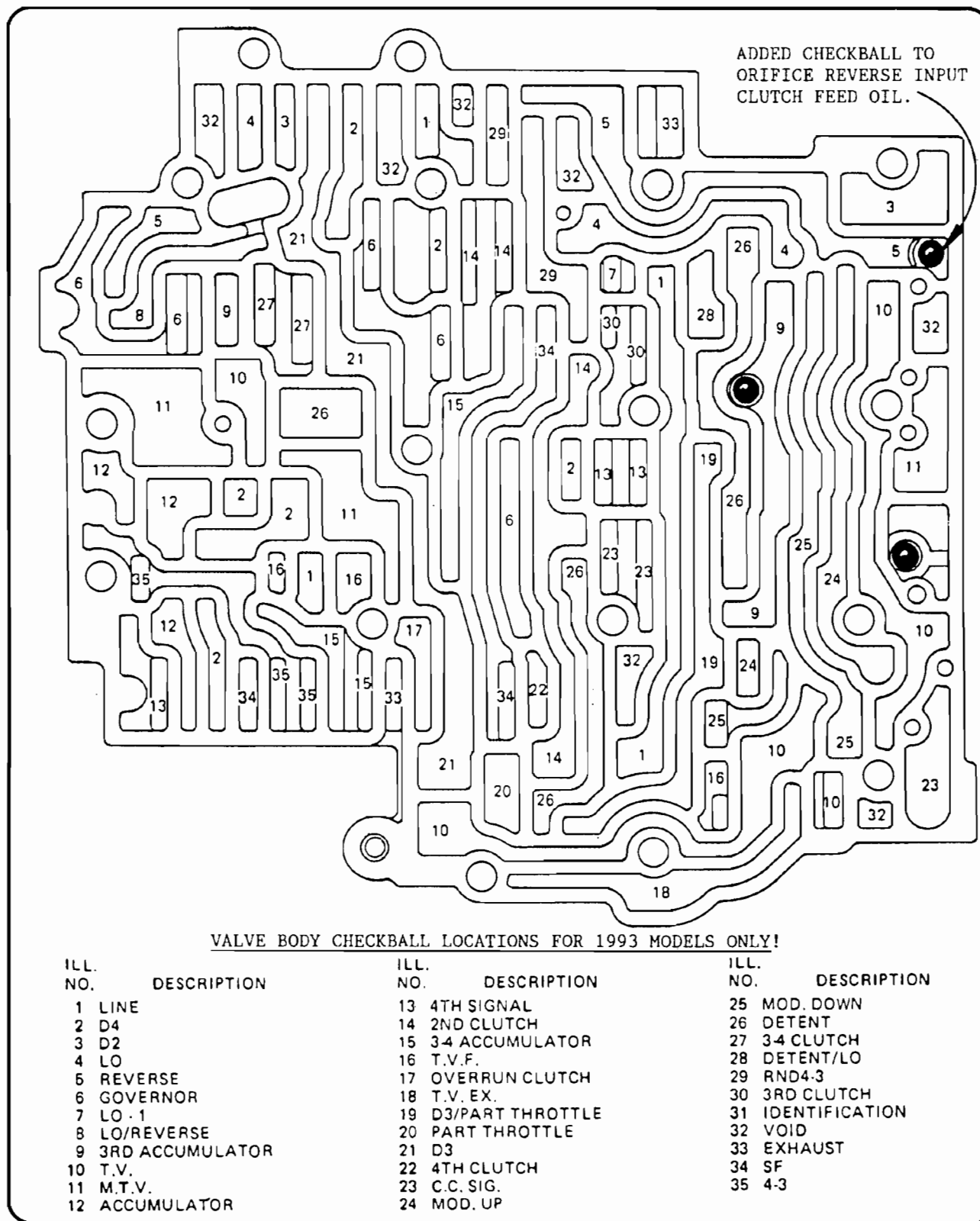


Figure 24

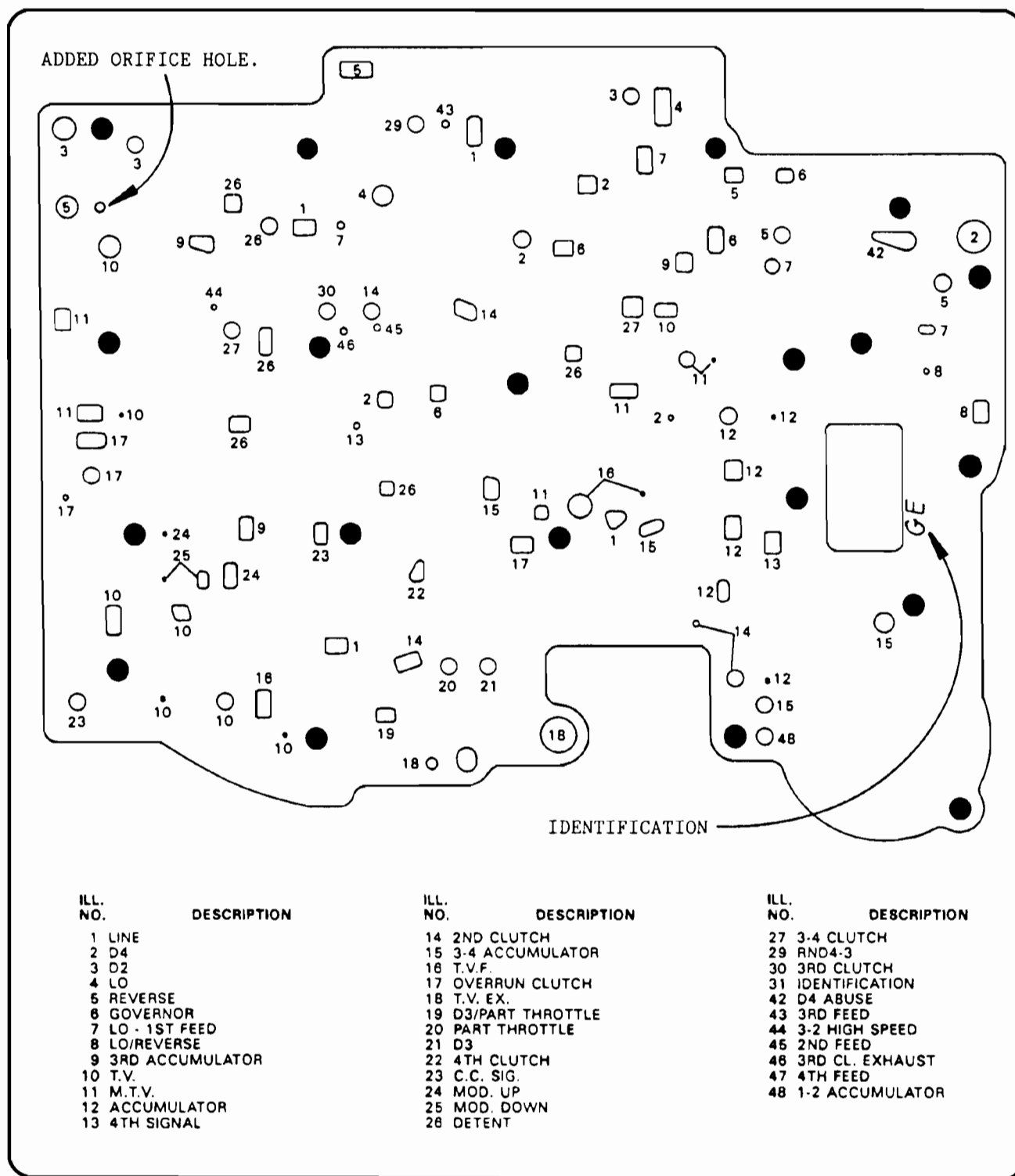


Figure 25

1993 SPACER PLATE CHART (ALL MODELS)

PART NO.	8681262	8681263	8681264	8681265	8681266	8681267
I.D. CODE	EP	ES	ET	EU	EV	EW
FITS THESE MODELS	AAM	BWM	ADM AFM	FAM FDM	HBM	HDM
PART NO.	8681268	8681269	8681270			
I.D. CODE	EX	EY	EZ			
FITS THESE MODELS	FFM	FMM	HJM			
PART NO.	8681271	8681272	8681273	8681274	8681275	8681276
I.D. CODE	GA	GB	GC	GD	GE	GG
FITS THESE MODELS	HLM	YAM YCM	YDM	BAM	BBM BHM	BCM
PART NO.	8681277	8681278	8681280	8681285	8681289	8681259
I.D. CODE	GH	GJ	GL	GS	GW	GX
FITS THESE MODELS	BFM	SAM	CPM	LHM	SFM	BRM
PART NO.	8684466					
I.D. CODE	HA					
FITS THESE MODELS	ASM					

Figure 26

1993 SEMINAR INFORMATION

1991-1992 SPACER PLATE CHART (PREFIX "E" ONLY)

PART NO.	8680144	8680371	8680678	8680677	8680502	8680503
I.D. CODE	EA	EB	EC	ED	EE	EG
FITS THESE MODELS	1CNM 1CYM 1KWM 1RCM 1RDM 2CJM 2CHM 2KJM 2WCM	1AMM 1APM	YAM YCM	YDM	BAM	BWM
PART NO.	8680770	8680828	8681061			
I.D. CODE	EH	EJ	EK			
FITS THESE MODELS	ADM AKM	MMM MSM	CPM			

Figure 27

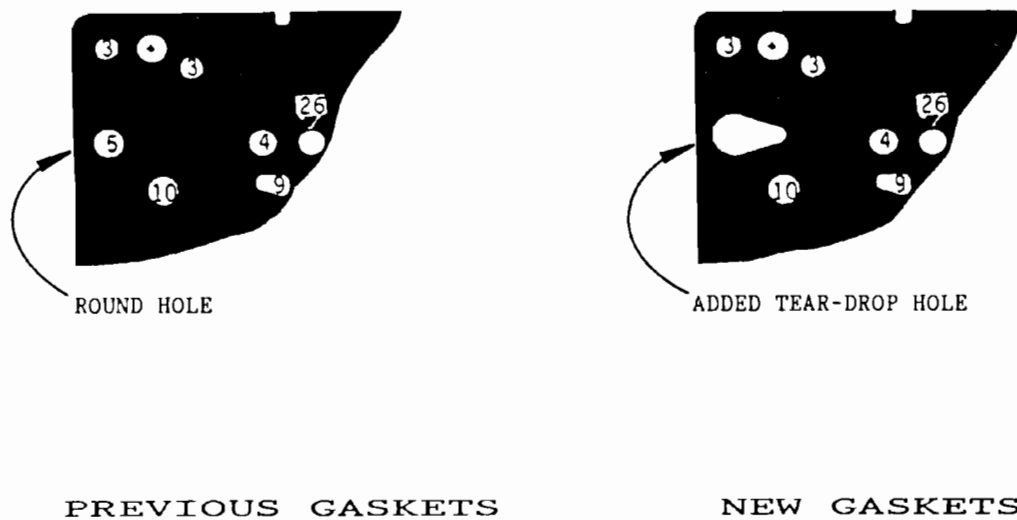


Figure 28

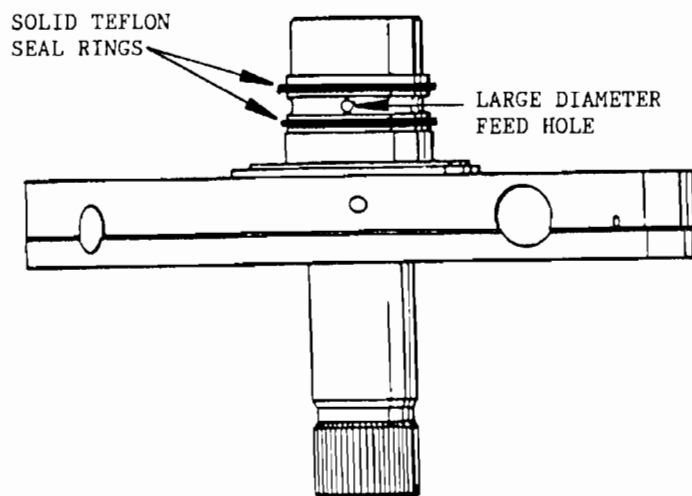
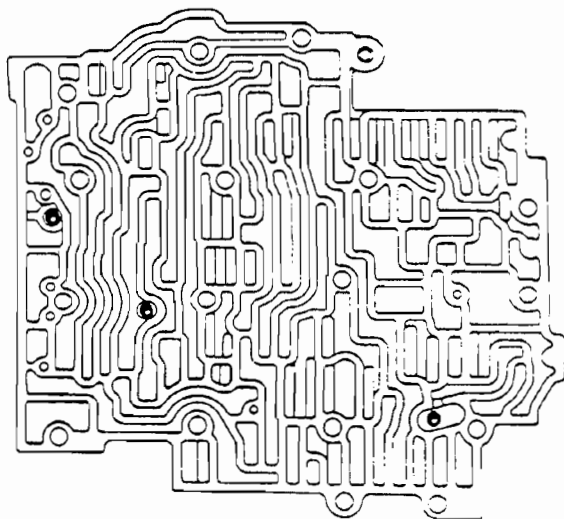
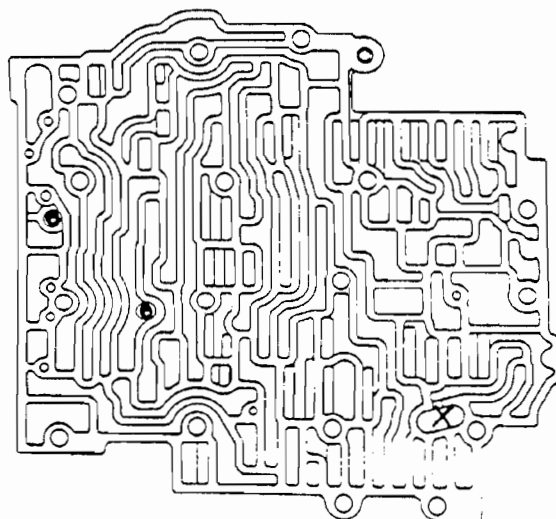


Figure 29

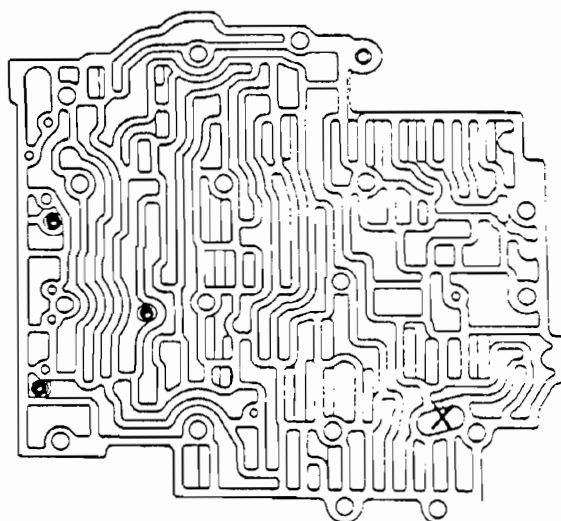
THM 4L60 (700-R4) CHECKBALL LOCATIONS - ALL MODELS



1982 THRU EARLY 1987
VALVE BODY CHECKBALL LOCATIONS
(WITHOUT AUXILIARY VALVE BODY)



LATE 1987 THRU 1992
VALVE BODY CHECKBALL LOCATIONS
(WITH AUXILIARY VALVE BODY)



1993 MODELS ONLY
VALVE BODY CHECKBALL LOCATIONS
(WITH AUXILIARY VALVE BODY)

Figure 30

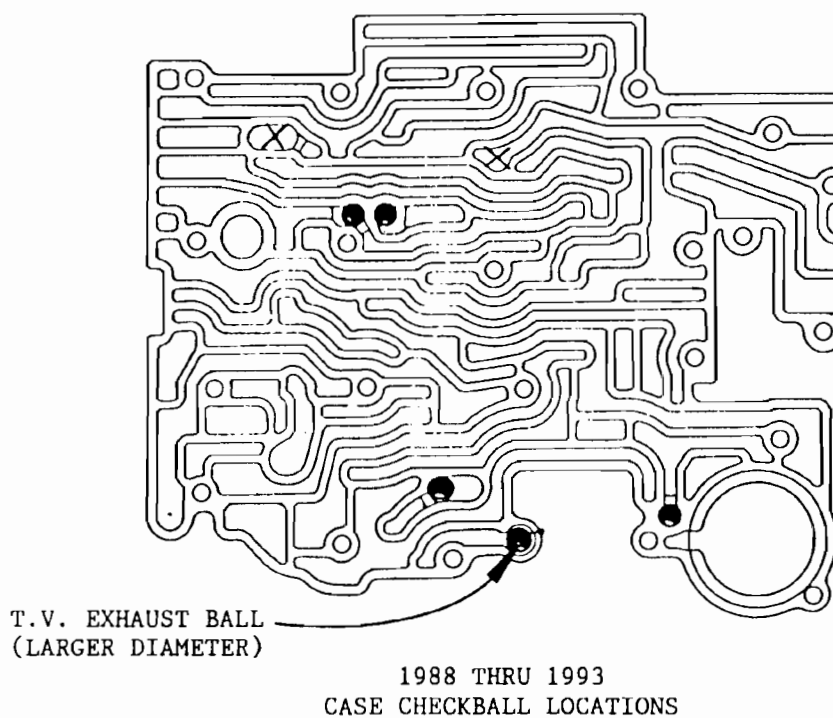
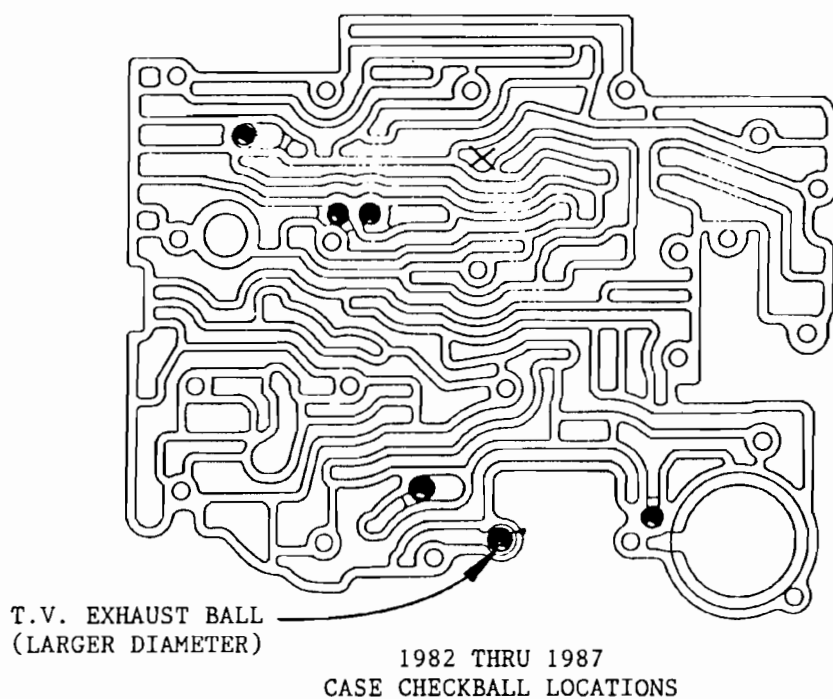


Figure 31



1993 SEMINAR INFORMATION

THM 4L60 (700-R4) NEW LOW/REVERSE CLUTCH PISTON AND NEW LOW/REVERSE CLUTCH SUPPORT FOR ALL 1993 MODELS

CHANGE: At the start of production for all 1993 model THM 4L60 (700-R4) transmissions there is a new (.040" Longer) Low/Reverse Clutch Piston and a new (.040" Thinner) Low/Reverse Clutch Support.

REASON: To move the Low/Reverse Clutch Plates towards the support and eliminate any interference between the wave plate and the reaction ring gear.

PARTS AFFECTED:

- (1) LOW/REVERSE CLUTCH PISTON - Now .040" longer than the previous piston and is easy to identify by the casting number 8681725. The previous piston casting number is 8663888 (see figure 32).
- (2) LOW/REVERSE CLUTCH SUPPORT - Now .040" thinner than the previous support. The ONLY way to identify the new Low/Reverse Clutch Support is to measure its thickness with a micrometer (see figure 33).

INTERCHANGEABILITY:

The new (Longer) Low/Reverse Clutch Piston and the new (Thinner) Low Reverse Clutch Support MUST be used together. When used together they will retro-fit back to 1987 models as long as you have proper clutch pack clearance.

Neither one of them are compatible with any previous model parts.

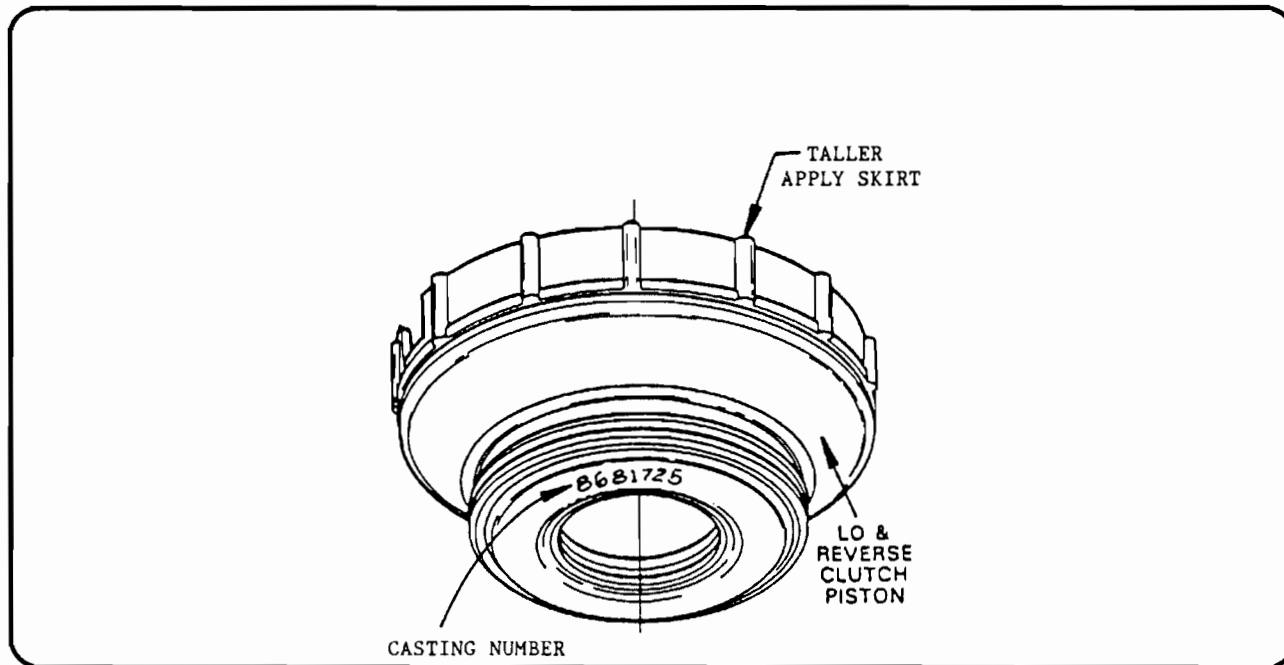


Figure 32

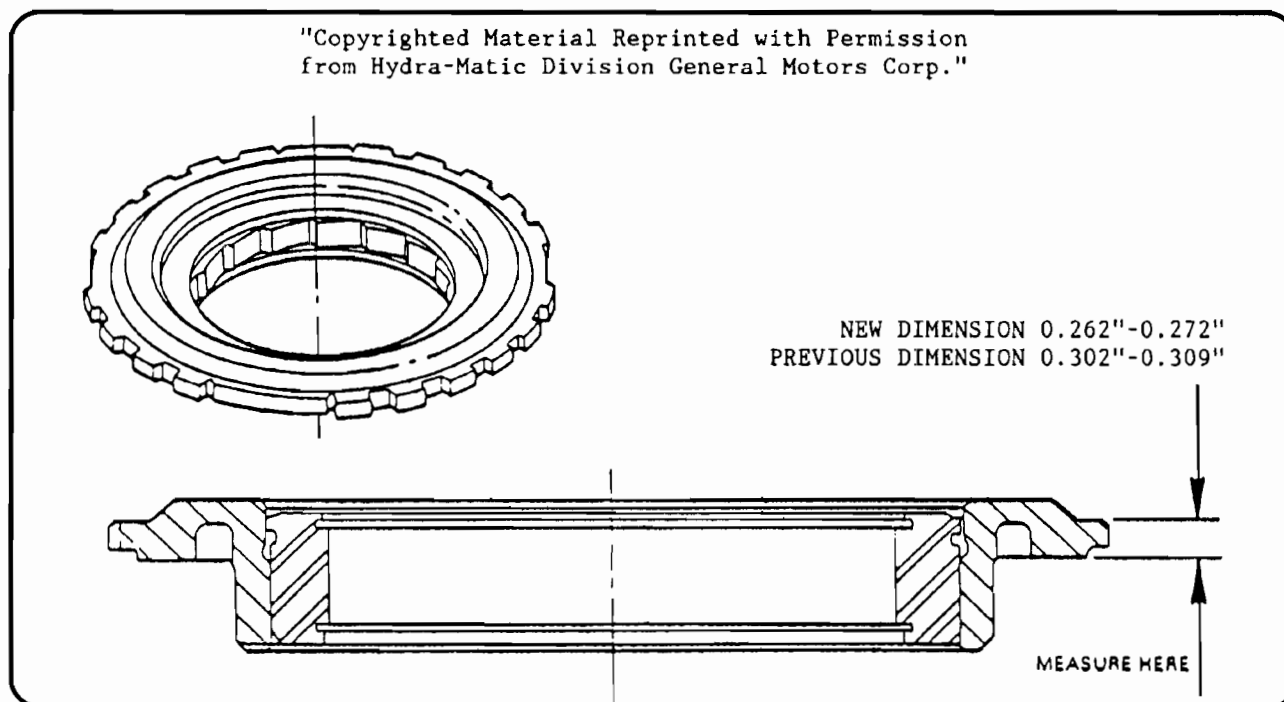


Figure 33

THM 4L60 (700-R4) REVISED ACCUMULATOR ASSEMBLY FOR SOME 1993 MODELS

Beginning with the Start of Production for 1993, SOME MODELS of the THM 4L60 (700-R4) transmissions were built with a new calibration that eliminates the 3-4 accumulator spring, and INVERTS the 1-2 accumulator piston and spring (see figure 34).

The models affected are as follows:

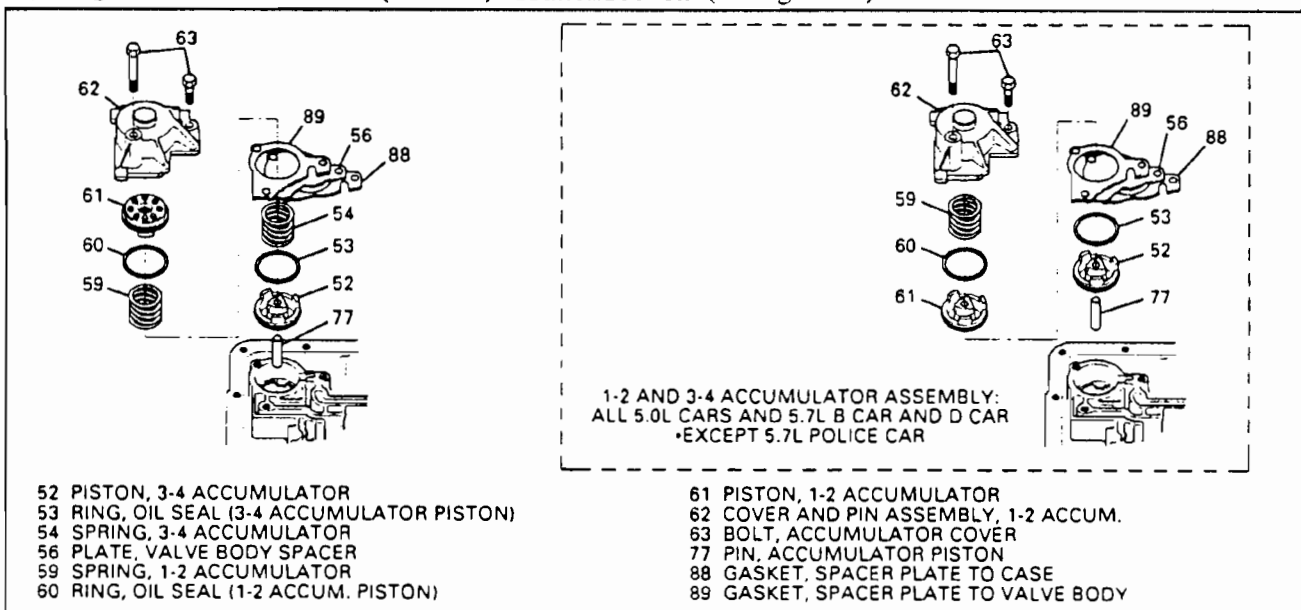
3AAM, 3ADM, 3AFM, 3ASM, 3BBM, 3BCM, 3BHM, 3BRM, 3BWM.

1. This affects ALL vehicles equipped with the 5.0L engine, and 5.7L in the "B" Car, EXCEPT 5.7L POLICE CAR.

"B" Car = Chevrolet Caprice, Chevrolet Classic, Chevrolet Wagon,
Buick Roadmaster Sedan, Buick Roadmaster Wagon.

2. This affects ALL Cadillac vehicles equipped with the THM 4L60 (700-R4).

We have also provided you with the accumulator spring color code chart for ALL 1993 models of the THM 4L60 (700-R4) transmission (see figure 34).



1993 MODELS	BCM, BWM	AAM, ADM, AFM, ASM, BBM, BHM, BRM	SAM	SFM	HBM, HLM	HJM	HDM	YAM, YCM, YDM, FFM, FMM	FAM, FOM	BFM, LHM	BAM, CPM
1-2 ACCUMULATOR SPRING COLOR	DARK GREEN	YELLOW	YELLOW	NO PAINT	DARK GREEN	VIOLET	DARK GREEN	YELLOW	YELLOW	NO PAINT	NO PAINT
3-4 ACCUMULATOR SPRING COLOR	NOT USED	NOT USED	RED	DARK GREEN	YELLOW	YELLOW	VIOLET	NO PAINT	VIOLET	NO PAINT	VIOLET

Figure 34

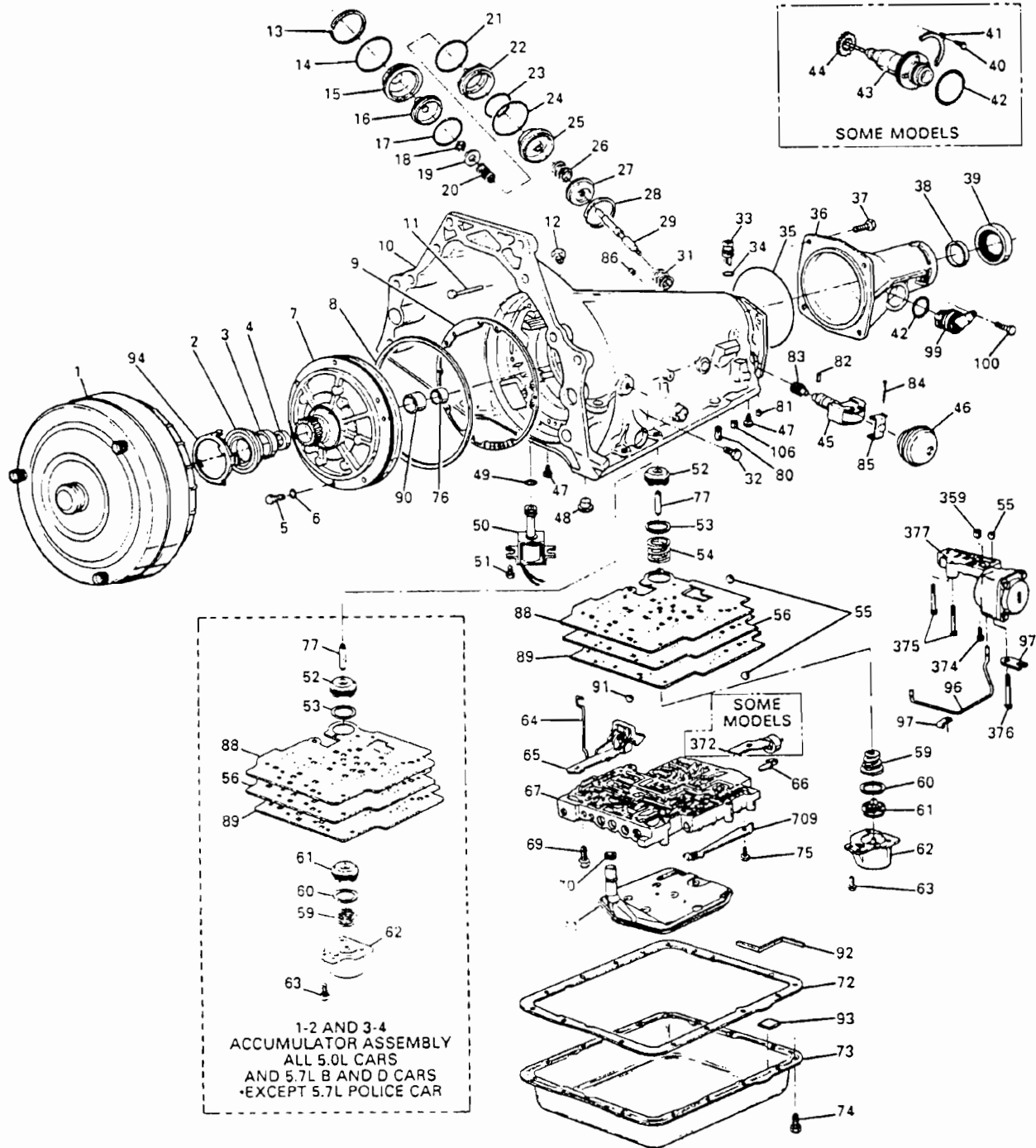


Figure 35

• clutch plates • steel plates • high performance clutches •

• clutch plates • steel plates • high performance clutches •

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THM 4L60 (700-R4)

NO REVERSE OR DELAYED REVERSE COLD

COMPLAINT: Some 1989-1991 THM 4L60 (700-R4) transmissions may exhibit a no reverse or delayed reverse condition, especially when the outside temperatures drop near 20° Farenheit.

CAUSE: The cause may be a "Short Lip" design seal installed on the reverse input clutch piston outer seal (See Figure 36).

CORRECTION: Install the "Long Lip" design seal on the reverse input clutch piston outer seal (see figure 36). NEVER install the short lip design seal, as the manufacturer has now gone back to the long lip design on all models.

SERVICE INFORMATION:

Overhaul Seal and Gasket Package 8683958

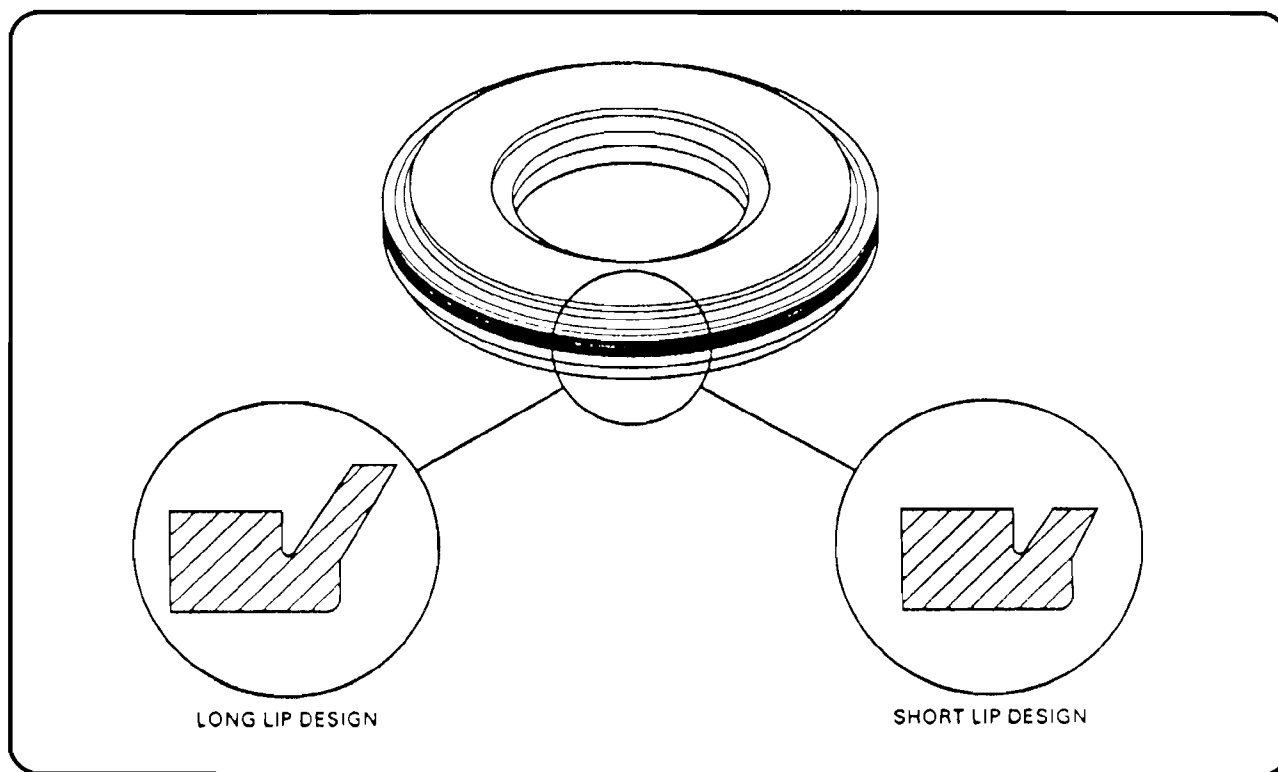


Figure 36

THM 4T60 (440-T4) HARSH 3-2 AND/OR 4-2 DOWNSHIFTS NEW CALIBRATION

COMPLAINT: A harsh 3-2 and/or 4-2 forced downshift condition at either full and/or part throttle, may occur at high altitude (Above 4000 Feet) or at low altitude (Below 4000 Feet).

CAUSE: Original calibrations may need to be updated with a service 3-2 control valve spring per customer's requirements.

CORRECTION: Replace the 3-2 control valve spring with the appropriate service part number as it is model sensitive.
Part numbers are as follows:

SERVICE INFORMATION:

HARSH 3-2 SHIFT - HIGH ALTITUDE ONLY.

<u>TRANSAXLE MODEL</u>	<u>PART NUMBER</u>
2WWH	8646979
2YBH, 2YCH, 2YKH	8646980
2WFH	8646982
1WWH, 1WSH, 1WXH, 1PAH	8646979
1YDH, 1CHH, 1YHH, 1CJH,	
1YSH, 1CAH, 1YTH, 1CBH	8646980
1WMH, 1BHH	8646981
1WFH, 1BDH, 1BAH, 1WDH,	
1WJH, 1BJH, 1WPH, 1BWH	8646982
0PAH, 0WXH	8646979
0AAH, 0KCH, 0ABH, 0KDH, 0AFH,	
0KPH, 0ANH, 0KRH, 0ATH, 0KLH,	
0BFH, 0WHH,	8646980
0BHH, 0WMH	8646981
0BAH, 0WDH, 0BDH, 0WFH, 0BWH,	
0WPH, 0BJH, 0WJH, 0CJH, 0CHH	8646982
0LMH, 0YSH, 0LNH, 0YTH,	
0YKH, 0YDH, 0YLH, 0YHH	8646993
0AJH, 0KHH, 0BPH, 0WNH	8662932
9AAH, 9ABH, 9AFH, 9ANH,	
9ATH, 9AJH	8646953
9BPH, 9WRH	8646980
9BHH, 9PAH, 9WBH, 9WCH	8646981
9BAH, 9BDH, 9BJH, 9BWH, 9YCH,	
9YAH, 9YBH, 9YJH, 9YFH	8646982
9BFH, 9BMH, 9WUH, 9WZH, 9VYH	8646993
9CDH, 9CLH, 9CPH, 9CYH, 9CZH	8646994
9PBH, 9WLH, 9WKH	8662932
9ACH, 9ADH, 9AHH	8675936

High Altitude Continued on next Page.

1993 SEMINAR INFORMATION

SERVICE INFORMATION:

HARSH 3-2 SHIFT - HIGH ALTITUDE ONLY (Continued).

<u>TRANSAXLE MODEL</u>	<u>PART NUMBER</u>
8FCH	8646979
8BKH, 8FBH	8646982
8BJH, 8BRH, 8BTH, 8BYH, 8FJH	8646993
7FCH, 7FZH	8646979
7FBH, 7FKH	8646982
7FJH, 7FNH, 7FRH, 7FTH	8646993
6BCH, 6BDH, 6BMH, 6BZH,	
6FCH, 6FZH	8646979
6BAH,	8646980
6ACH, 6AWH	8646981
6AAH, 6AMH, 6AFH, 6APH, 6ASH,	
6AYH, 6BBH, 6BHH, 6FBH	8646982
6CMH, 6CNH, 6CFH	8646983
6BLH, 6BTH, 6BYH	8646992
6FTH, 6FYH	8646993
5BX	8646979
5AC, 5AY, 5BW	8646981
5AM	8646982
5CM, 5CN	8646983
5BR, 5CP, 5CW	8646993
5BV	8646994

HARSH 3-2 SHIFT - LOW ALTITUDE ONLY

<u>TRANSAXLE MODEL</u>	<u>PART NUMBER</u>
2YBH, 2YCH, 2YKH	8646979
2WFH	8646993
2WWH	8662907
1YDH, 1CHH, 1YHH, 1CJH, 1YSH,	
1CAH, 1YTH, 1CBH	8646979
1WMH, 1BHH	8646980
1WFH, 1BDH, 1WDH, 1BAH, 1WJH,	
1BJH, 1WPH, 1BWH	8646993
1WWH, 1WSH, 1BZH, 1WXH, 1PAH	8662907
OYKH, OYDH, OYLH, OYHH, OBFH, OWHH	8646979
OWMH, OAAH, OKCH, OABH, OKDH,	
OAFH, OKPH, OANH, OKRH, OATH,	
OKLH, OBHH,	8646980
OCHH, OCJH	8646981
OBAH, OBDH, OBWH, OBJH,	
OWDH, OWFH, OWPH, OWJH	8646993
OPAH, OWXH	8662907
OAJH, OKHH	8662932
OBPH, OWNH	8675962
OLMH, OLNH, OYSH, OYTH	8675963

Low Altitude Continued on next Page.

SERVICE INFORMATION:

HARSH 3-2 SHIFT - LOW ALTITUDE ONLY (Continued).

<u>TRANSAXLE MODEL</u>	<u>PART NUMBER</u>
9AAH, 9ABH, 9AFH, 9AJH,	
9ANH, 9ATH, 9WTH	8646953
9BFH, 9BMH, 9WUH, 9WZH, 9VYH	8646980
9BAH, 9BDH, 9BJH, 9BWH, 9YAH,	
9YBH, 9YJH, 9YFH, 9YCH	8646981
9BCH, 9BHH, 9PAH, 9WBH	8646993
9BPH, 9WRH	8662932
9ACH, 9ADH, 9AHH	8675936
8FJH, 8BJH, 8BTH, 8BYH	8646979
8BRH	8646980
8FBH, 8BKH	8646993
8FCH	8662932
7FJH, 7FNH, 7FRH, 7FTH	8646979
7FBH, 7FKH	8646993
7FCH, 7FZH	8662932
6BAH, 6BLH, 6BTH, 6BYH,	
6FTH, 6FYH	8646979
6BBH	8646981
6BHH	8646982
6FBH	8646993
6CNH, 6CMH, 6CFH	8646994
6BCH, 6BDH, 6BMH, 6BZH	8662907
6CFH, 6FZH	8662932

4T60 / 4T60E

BLOWN CHANNEL PLATE GASKETS

COMPLAINT: Channel plate gaskets upper and/or lower blown after rebuild.

CAUSE: No. 1 Using gaskets that do not have ribs manufactured into the gasket.

No. 2 Improper torque on channel plate bolts and valve body bolts.

No. 3 Out of flat mating surfaces

CORRECTION: No. 1 Use ribbed gaskets.

No. 2 Torque all bolts to proper specifications.

No. 3 Check all surfaces and replace where necessary.

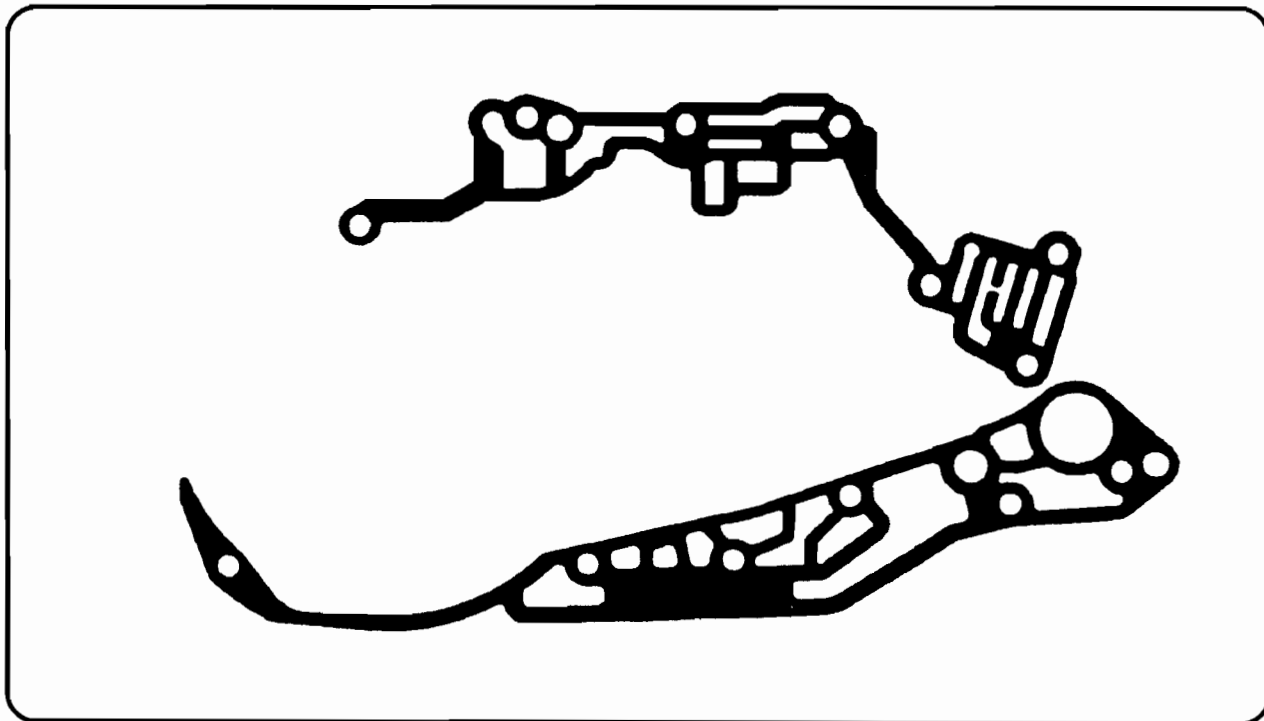


Figure 37

4T60 - (440-T4)

SECOND GEAR STARTS

- COMPLAINT:** Vehicle starts in 2nd gear after a upshift sequence, but will usually take manual low.
- CAUSE:**
- No. 1- Line pressure too high.
 - No. 2- Double gaskets or damaged gaskets on the 1-2 and 3-4 accumulator spacer plate (see figure 38).
 - No. 3- The 1-2 shift valve sticking in the upshifted position (see figure 39). 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:**
- No. 1- A) Check for proper vacuum to the modulator and correct if wrong
B) Check for a stuck modulator valve or stuck pressure regulator valve
 - No. 2- Use only one gasket on each side of the plate and replace gasket as necessary
 - No. 3- A) Modify the original 1-2 shift valve as shown in figure 40. 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.

B) The 1-2 shift valve, throttle valve or spring may be pushed in too far. The retainer should be installed flush with the machined surface of the valve body (see figure 41).

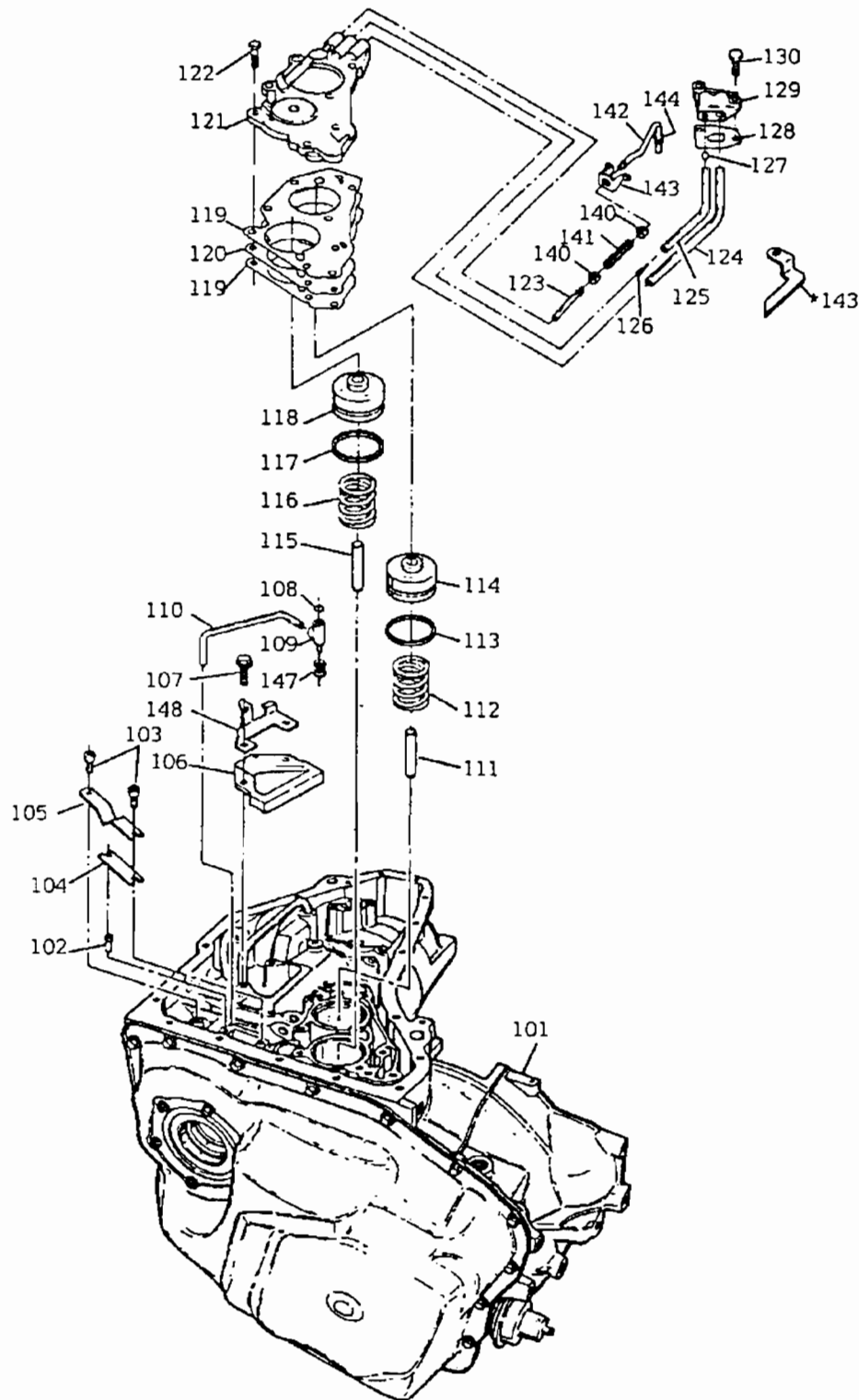
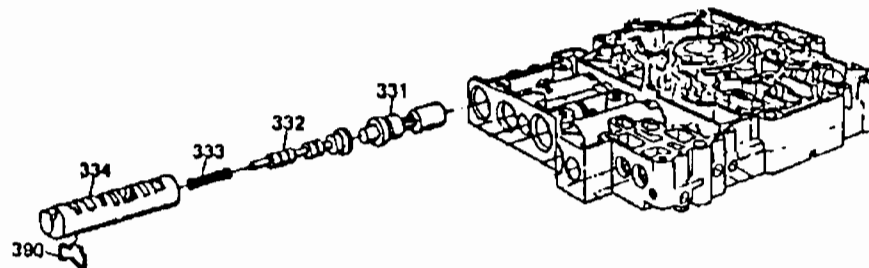


Figure 38

ILL. NO.	DESCRIPTION	ILL. NO.	DESCRIPTION
101	CASE ASSEMBLY, TRANSMISSION	125	PIPE, GOVERNOR FEED
102	PIN, THERMAL ELEMENT	126	SCREEN ASSEMBLY, GOVERNOR
103	PIN & WASHER ASM., THERMO ELEMENT (2)	127	PLUG, ORIFICED CUP (GOVERNOR OIL PIPES RETAINER)
104	PLATE ELEMENT	128	GASKET, GOV. OIL PIPE RETAINER
105	THERMO ELEMENT	129	RETAINER, GOVERNOR OIL PIPE
106	OIL SCOOP, SCAVANGER BOTTOM PAN	130	BOLT, GOVERNOR PIPE RET. (HEX) (2)
107	BOLT, (OIL SCOOP/CASE) (HEX) (2)	132	BOLT, SERVO PIPE RETAINER (TORX.)
108	SEAL, SQ. CUT (LUBE OIL PIPE RET./CASE)	133	BRACKET, SERVO PIPE RETAINER
109	RETAINER, LUBE OIL PIPE	135	PIPE, 1-2 SERVO (REL. OIL)
110	PIPE, LUBE OIL (RETAINER TO DRIVE SPROCKET SUPPORT)	136	PIPE, 1-2 SERVO APPLY
111	PIN, ACCUMULATOR	137	CAPSULE ASSEMBLY, BALL CHECK
112	SPRING, 3-4 ACCUMULATOR	138	SEAL ASSEMBLY, 1-2 SERVO PIPE
113	RING, OIL SEAL ACCUM. PISTON (3-4)	139	STOP, 1-2 BAND ASSEMBLY
114	PISTON, ACCUMULATOR (3-4)	140	CLAMP, HOSE
115	PIN, ACCUMULATOR	141	HOSE, LUBE OIL
116	SPRING, 1-2 ACCUMULATOR	142	PIPE, LUBE OIL
117	RING, OIL SEAL ACCUM. PISTON (1-2)	143	RETAINER, F.D. PIPE LUBE OIL
118	PISTON, ACCUMULATOR (1-2)	*143	RETAINER, F.D. PIPE LUBE OIL (USED ON EARLY MODELS)
119	GASKET, ACCUMULATOR COVER (2)	144	WASHER, F.D. PIPE LUBE OIL RETAINER
120	PLATE, ACCUMULATOR SPACER	147	SPRING, LUBE OIL PIPE RETAINER
121	COVER, ACCUMULATOR	148	BRACKET, 1-2 SERVO PIPES RETAINER
122	BOLT, ACCUMULATOR COVER/CASE (7)		
123	PIPE, LUBE OIL (ACCUMULATOR COVER/ F.D. INTERNAL GEAR)		
124	PIPE, GOVERNOR RETURN		

Figure 38 Legend

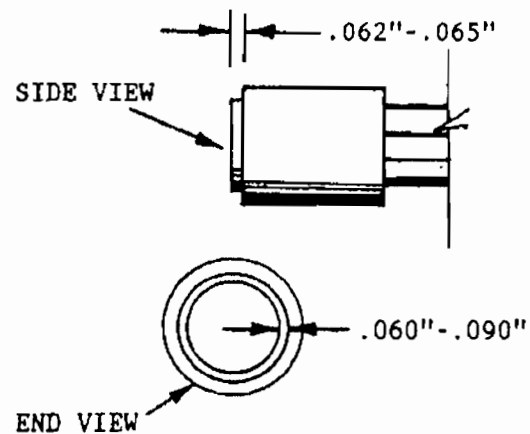
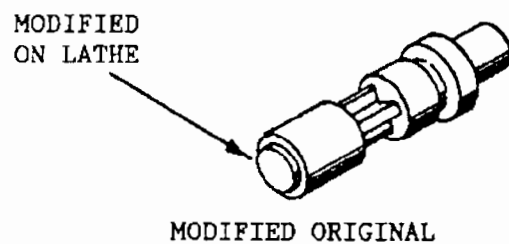
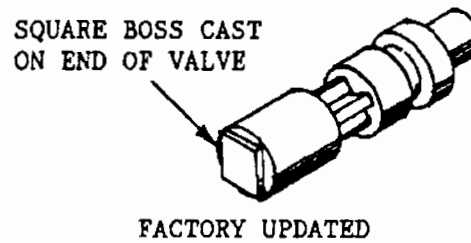
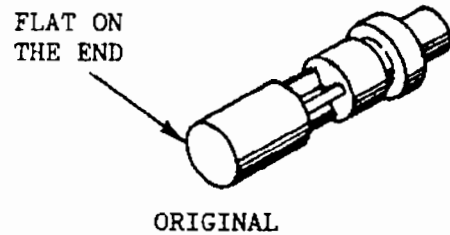
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- 331 1-2 SHIFT VALVE
- 332 1-2 THROTTLE VALVE
- 333 1-2 THROTTLE VALVE SPRING
- 334 1-2 THROTTLE VALVE BUSHING
- 390 1-2 THROTTLE VALVE BUSHING RETAINER

Figure 39

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 40

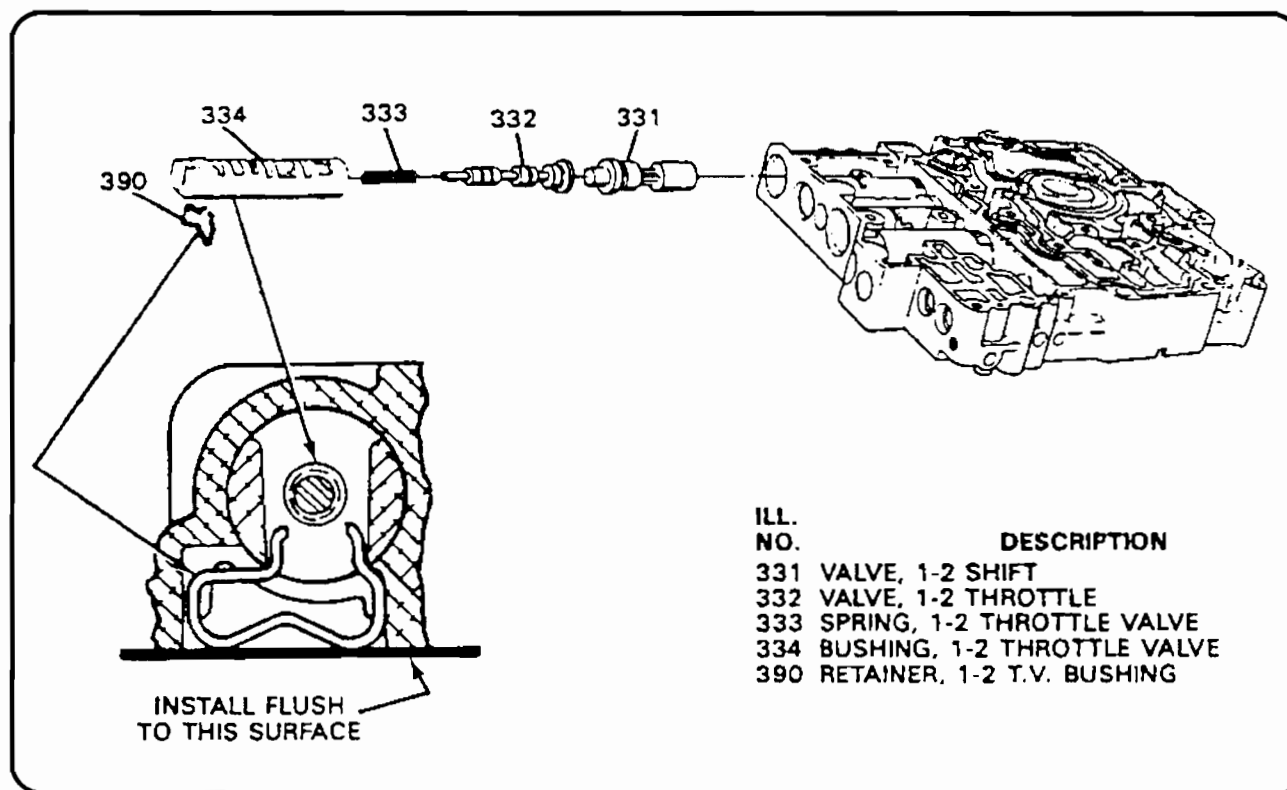
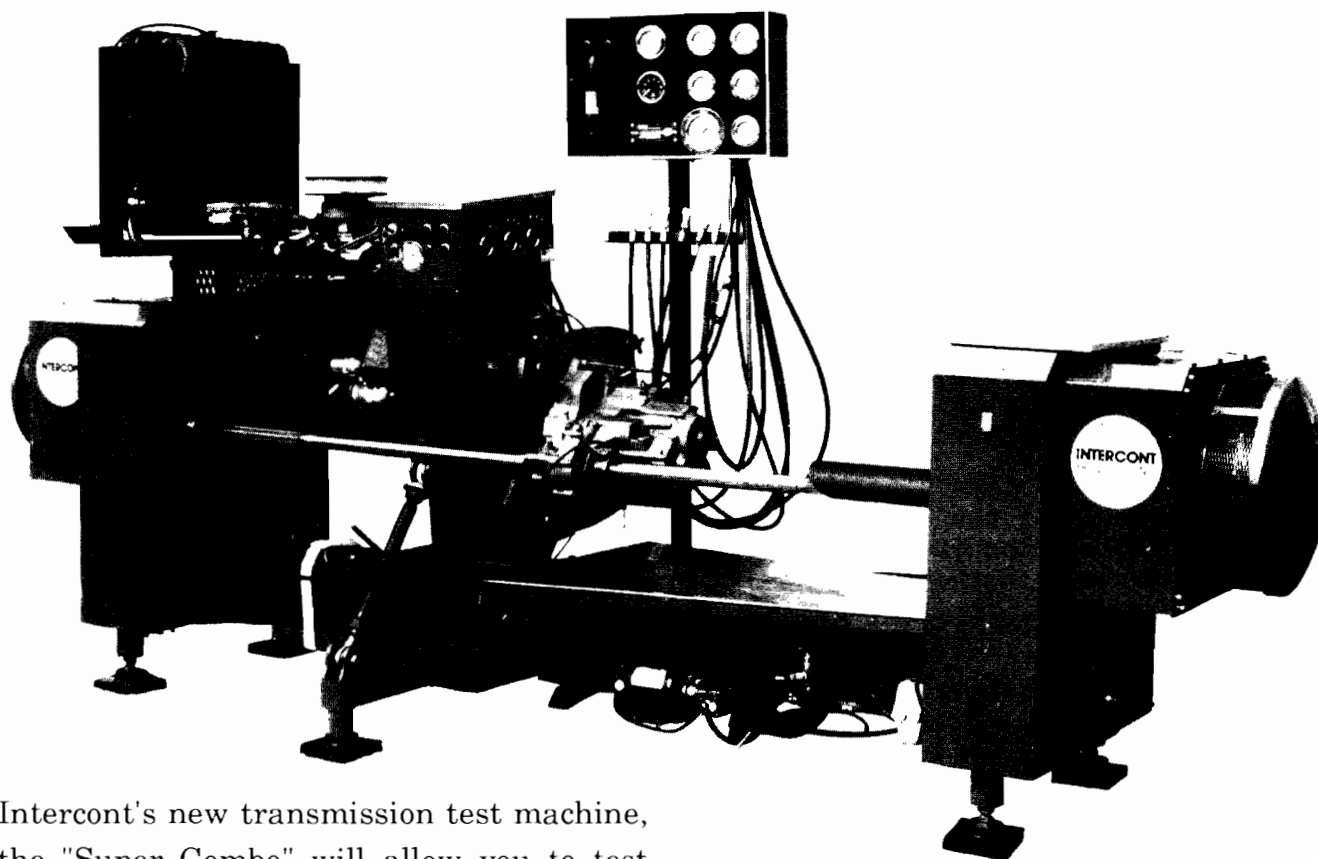


Figure 41

TEST YOURSELF

with Intercont's new Super Combination Transmission Test Machine



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THM 4T60-E

COMPLETE HYDRAULICS CHANGE FOR 1993

CHANGE: A new design converter clutch regulator valve line-up, and a new design for the accumulator bushings in the valve body, changes the hydraulics beginning at the start of production for all 1993 model THM 4T60-E transaxles.

REASON: Improved shift feel and durability.

PARTS AFFECTED:

- (1) **VALVE BODY CASTING** - The aluminum plug and retainer clip for the converter clutch regulator valve were eliminated and replaced with a new bushing and a new style retainer. This makes it much easier to remove this line-up out of its valve body bore (See Figure 42).
The 1-2 accumulator valve bushing (Both Primary and Secondary), the 2-3 accumulator valve bushing, and the 3-4 accumulator valve bushing were also re-designed for improved shift feel.
These changes required changes in the worm tracks in the valve body casting and the easiest way to identify the 1993 valve body is the diameter of the TCC regulator bore as shown in Figure 43.
- (2) **VALVE BODY SPACER PLATE** - Different hole spacing to accommodate the valve body and channel plate casting changes. Also the 91-92 hydraulics spacer plate has the TCC solenoid orifice in the spacer plate, and the 1993 hydraulics requires the screen and orifice assembly, with the "O" ring, that we seen in the THM 440-T4 transaxle (See Figures 44 & 45).
- (3) **VALVE BODY GASKETS** - Both the valve body to spacer plate and spacer plate to channel plate gaskets change to accommodate the new hydraulics. They are easily identified by the part number ink stamped on each gasket. See the gasket chart in Figure 46 for proper identification.
- (4) **CHANNEL PLATE CASTING** - Casting changes in the worm track area to accommodate the valve body changes, and can be easily identified by the casting number. See Figure 47 for casting number location. The casting number on 91-92 hydraulics is 8667284, and the casting number on 1993 hydraulics is 8682217.

INTERCHANGEABILITY:

NONE of the parts listed above will interchange with one another. If you change one piece, you must change them ALL.

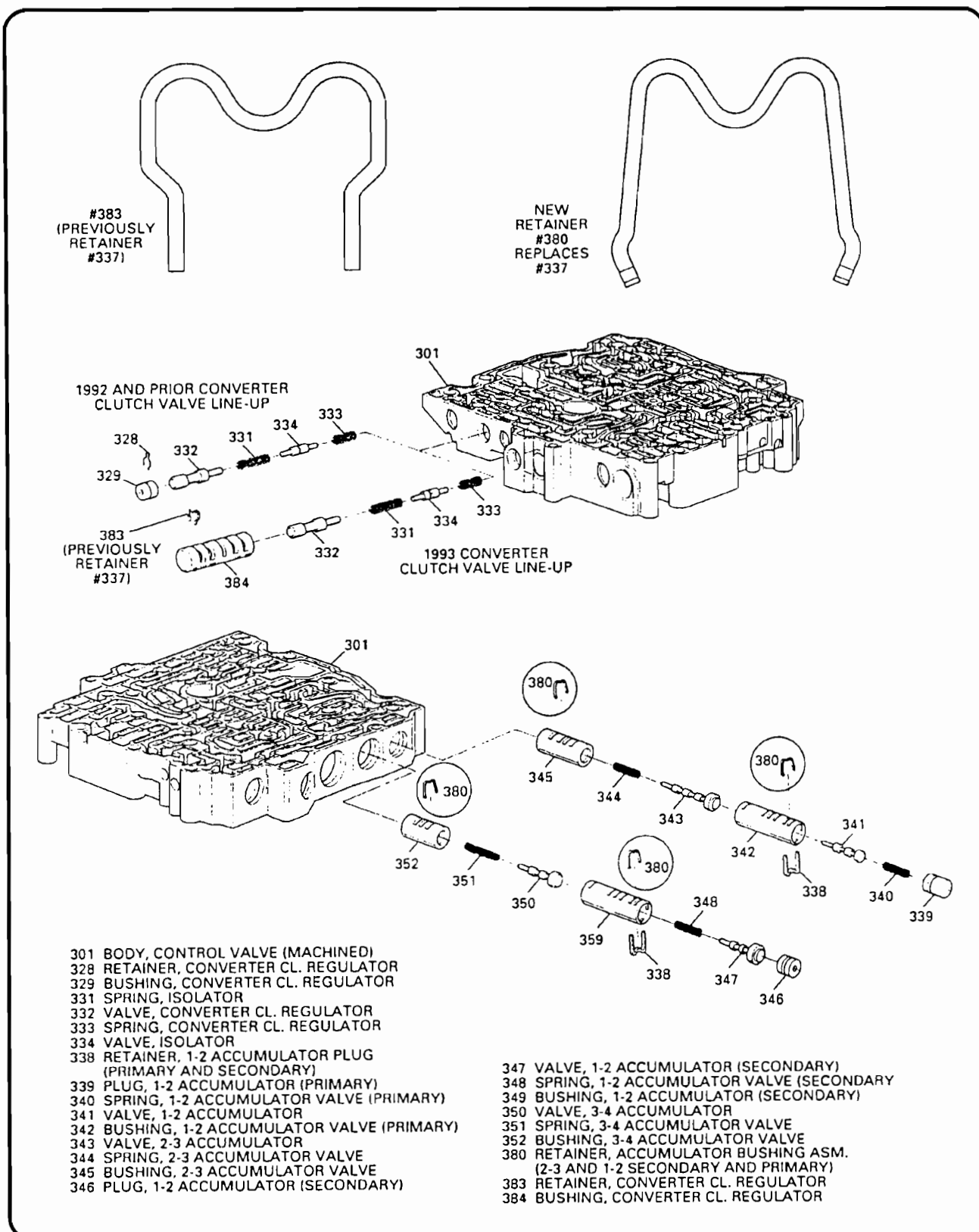


Figure 42

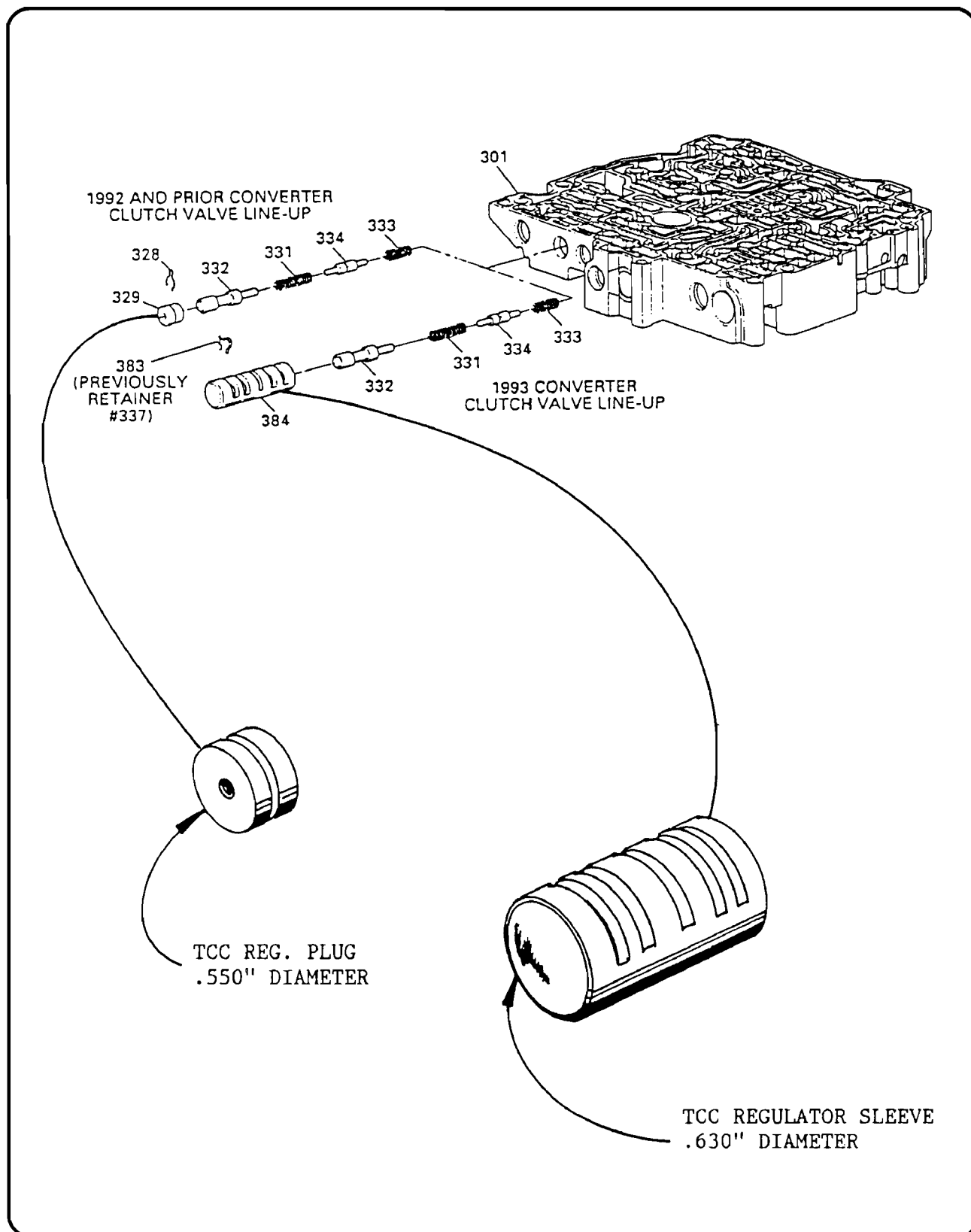
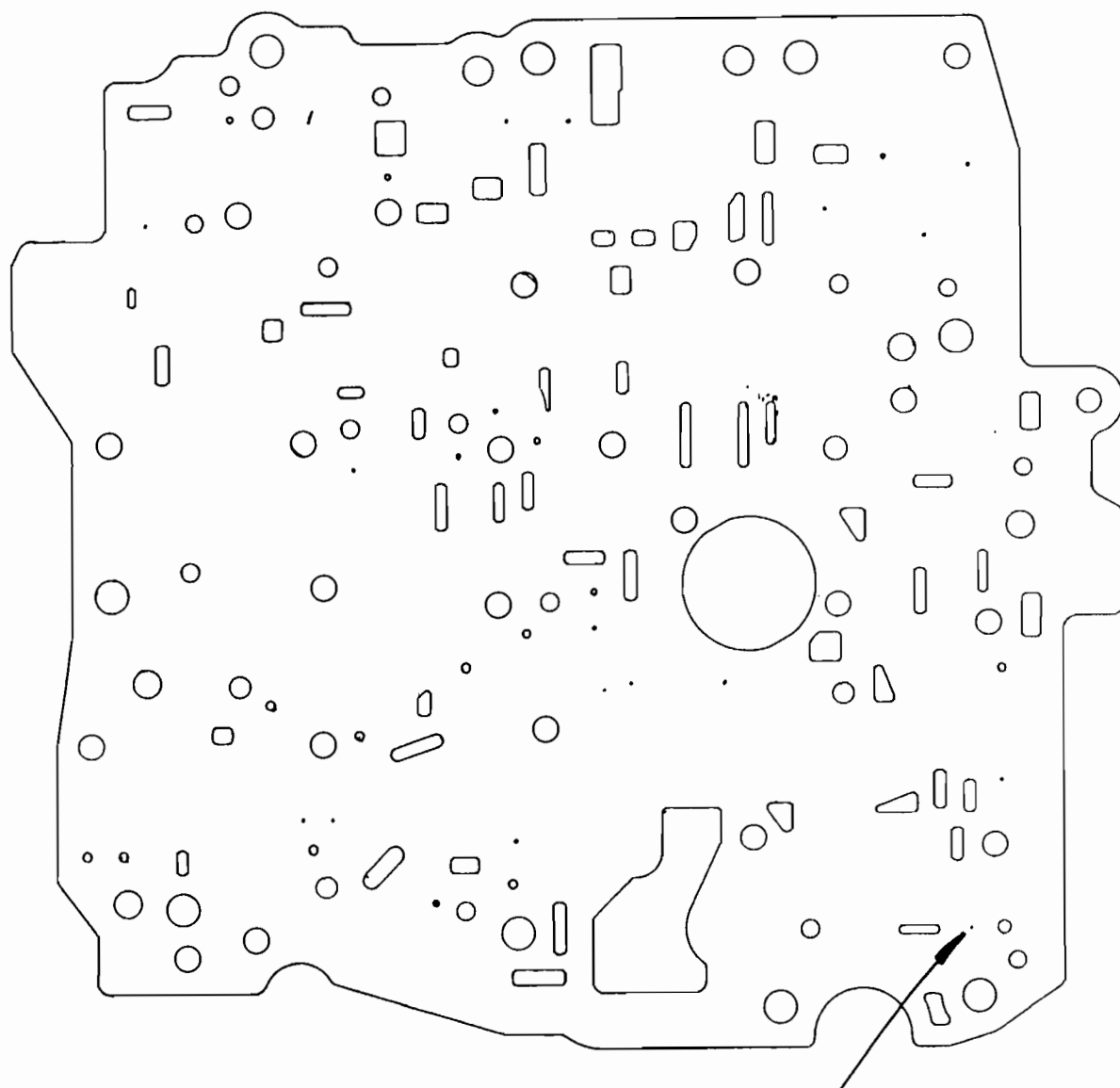


Figure 43

91-92 SPACER PLATE



TCC SOLENOID ORIFICE

Figure 44

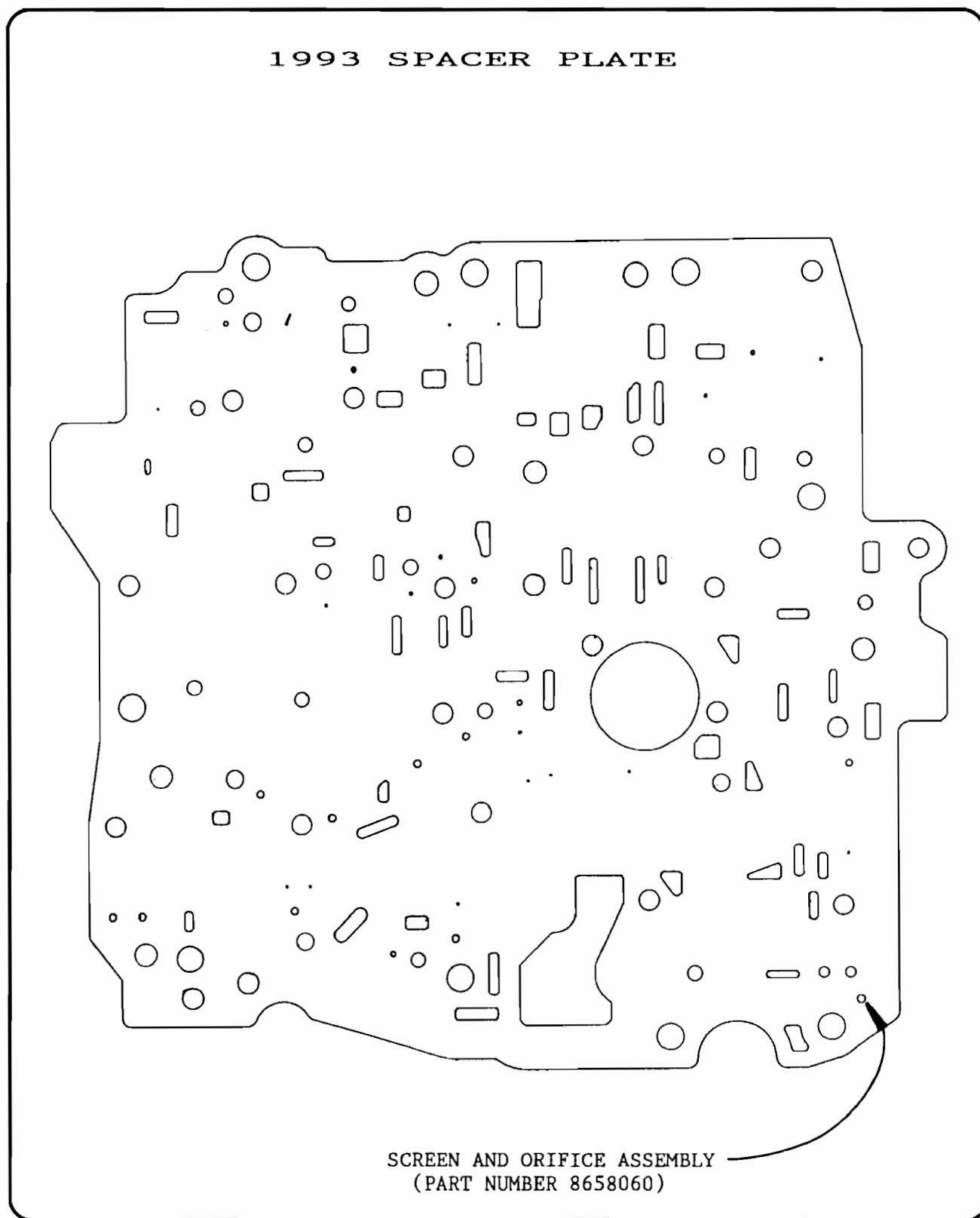


Figure 45

	91-92 HYDRAULICS	1993 HYDRAULICS
VALVE BODY TO SPACER PLATE GASKET	8678762	8682281
SPACER PLATE TO CHANNEL PLATE GASKET	8678761	8682280

Figure 46

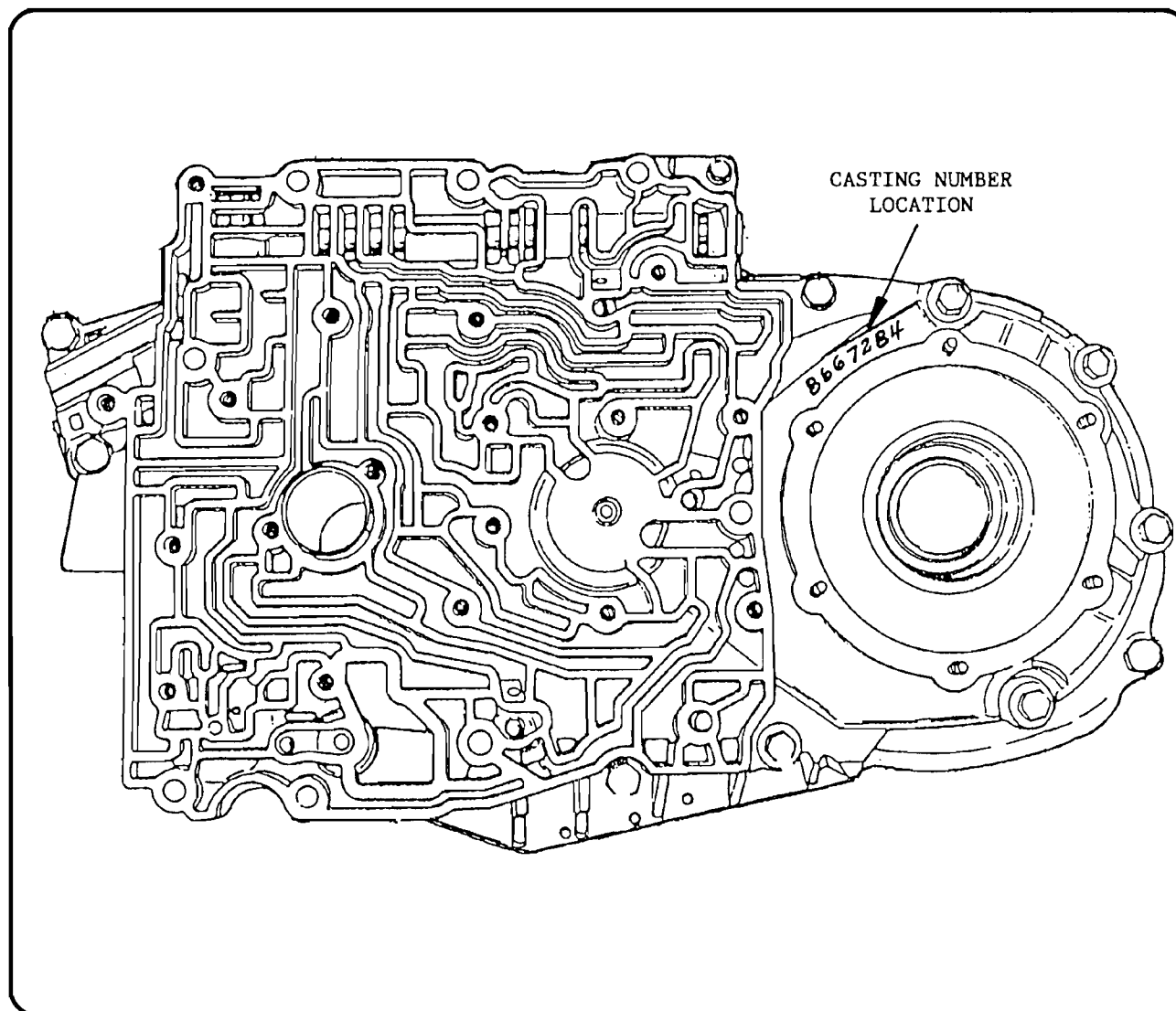


Figure 47

THM 3T40 (125C) NO REVERSE AND/OR PREMATURE LOW/REVERSE CLUTCH FAILURE

- COMPLAINT:** A no reverse condition and/or low/reverse clutches badly burnt at a very low mileage.
- CAUSE:** The cause may be the Low/Reverse fluid not completely exhausting, so that the Low/Reverse clutch remains partially applied while moving in all forward gears. All reverse fluid must exhaust through the thermo element, located in the manual valve, on a reverse to drive garage shift.
- CORRECTION:** Remove and discard the thermo-element and the retaining clip, located inside the manual valve, on all vehicles so equipped (See Figure This should be done as standard procedure during ALL rebuilds.

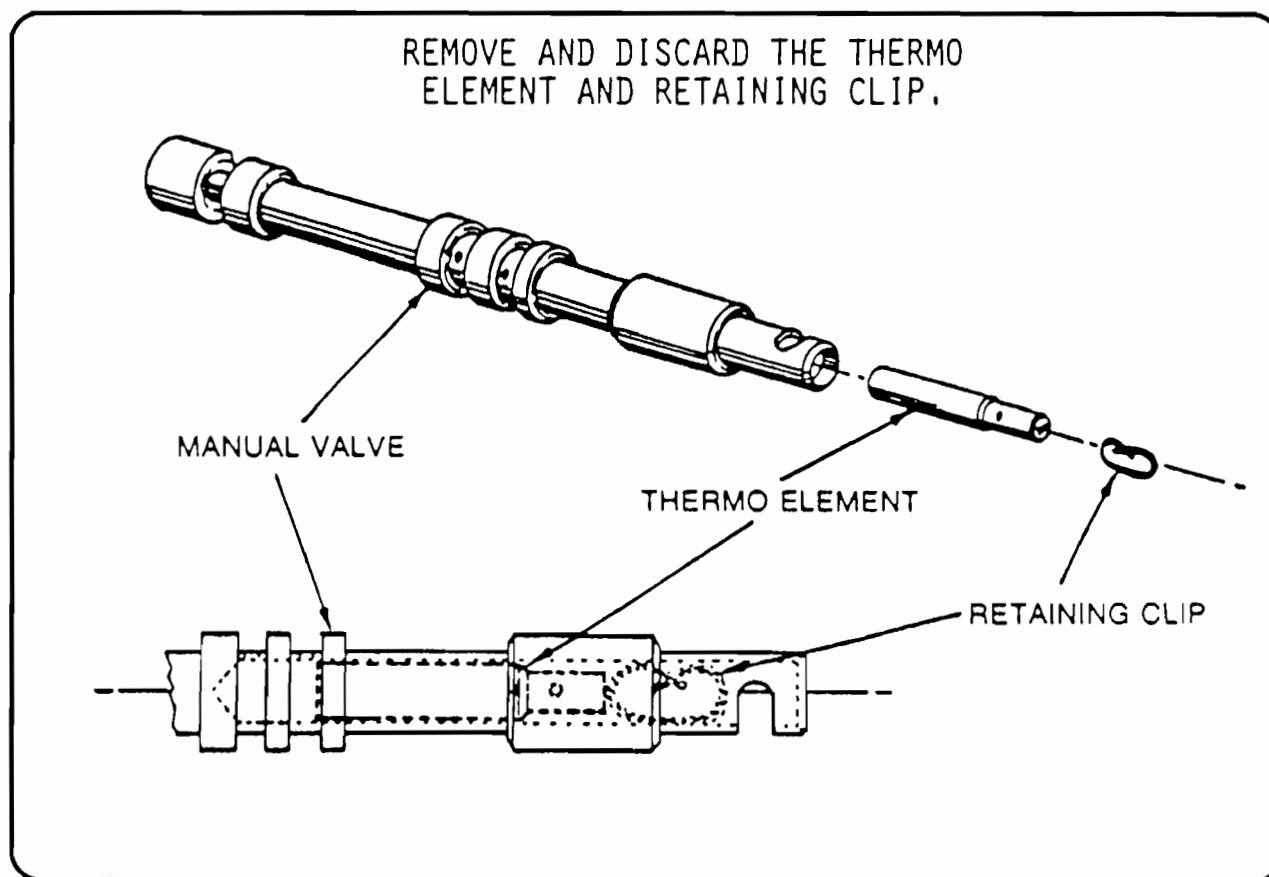


Figure 48

THM 3T40 (125C) NEW LOW/REVERSE CLUTCH RETURN SPRING AND SPIRAL RETAINING RING

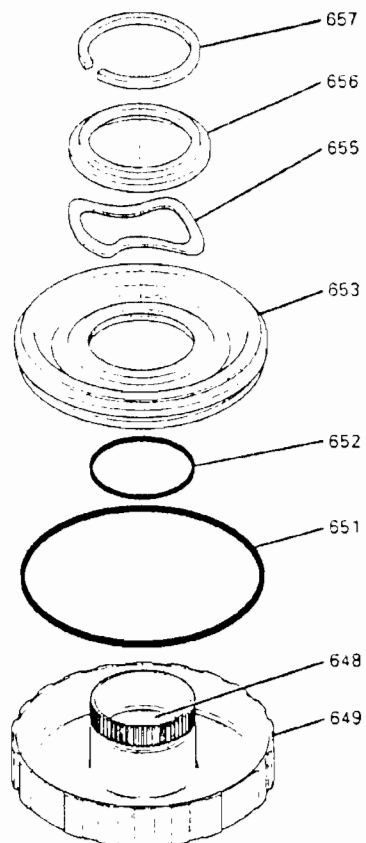
CHANGE: Beginning in 1993 models, there is a new "Belleville" return spring and spiral retaining ring found in the low/reverse clutch housing.
(See Figure 49).

REASON: The current return spring rate may not be great enough to keep the piston from partially applying while in drive range.

PARTS AFFECTED:

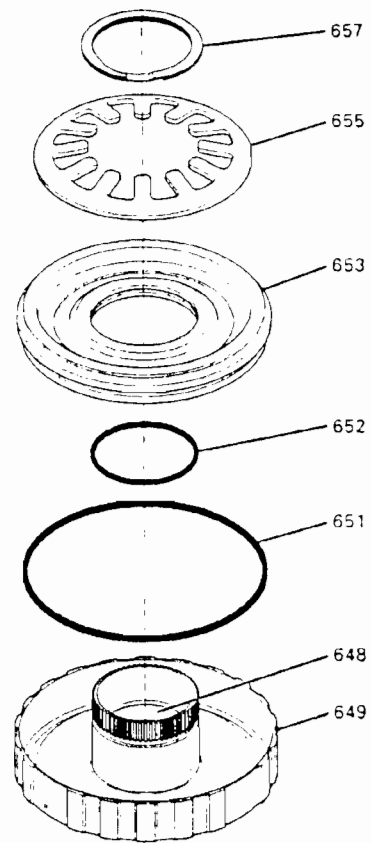
- (1) LOW/REVERSE RETURN SPRING - Changed to the "Belleville" design instead of the previous "Wave" design, and the spring retainer is eliminated.
(See Figure 49).
- (2) LOW/REVERSE RETAINING RING - Changed to a spiral retaining ring instead of the previous snap ring (See Figure 49).

NOTE: NO CHANGES WERE MADE TO THE HOUSING OR PISTON.



- 648 BUSHING, REACTION CARRIER
- 649 HOUSING ASSEMBLY, LO AND REVERSE CLUTCH
- 651 SEAL, LIP LO AND REVERSE PISTON (OUTER)
- 652 SEAL, LIP LO AND REVERSE PISTON (INNER)
- 653 PISTON, LO AND REVERSE CLUTCH
- 655 SPRING, LO AND REVERSE CLUTCH RELEASE
- 656 RETAINER, LO AND REVERSE CLUTCH SPRING
- 657 RING, SNAP LO AND REVERSE PISTON

PREVIOUS DESIGN



- 648 BUSHING, LO AND REVERSE CLUTCH HOUSING
- 649 HOUSING ASSEMBLY, LO AND REVERSE CLUTCH
- 651 SEAL, LIP LO AND REVERSE PISTON (OUTER)
- 652 SEAL, LIP LO AND REVERSE PISTON (INNER)
- 653 PISTON, LO AND REVERSE CLUTCH
- 655 SPRING, BELLEVILLE RETAINER LO AND REVERSE CLUTCH
- 657 RING, SNAP LO AND REVERSE PISTON

NEW DESIGN

Figure 49

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THM 3T40 (125C) CONVERTER CLUTCH SHUDDER 1982 - 1986 MODELS ONLY

COMPLAINT: Converter clutch shudders during application.

CAUSE: One cause may be low converter charge pressure. Another cause may be slow drain of converter release oil from the front side of the converter clutch piston.

CORRECTION: Install a stronger converter clutch regulator valve spring, OEM part number 8637887, or use a return spring from a 700 reverse input housing return spring assembly. Also drill the converter clutch exhaust hole in the spacer plate to .080"
Refer to Figures 50 & 51

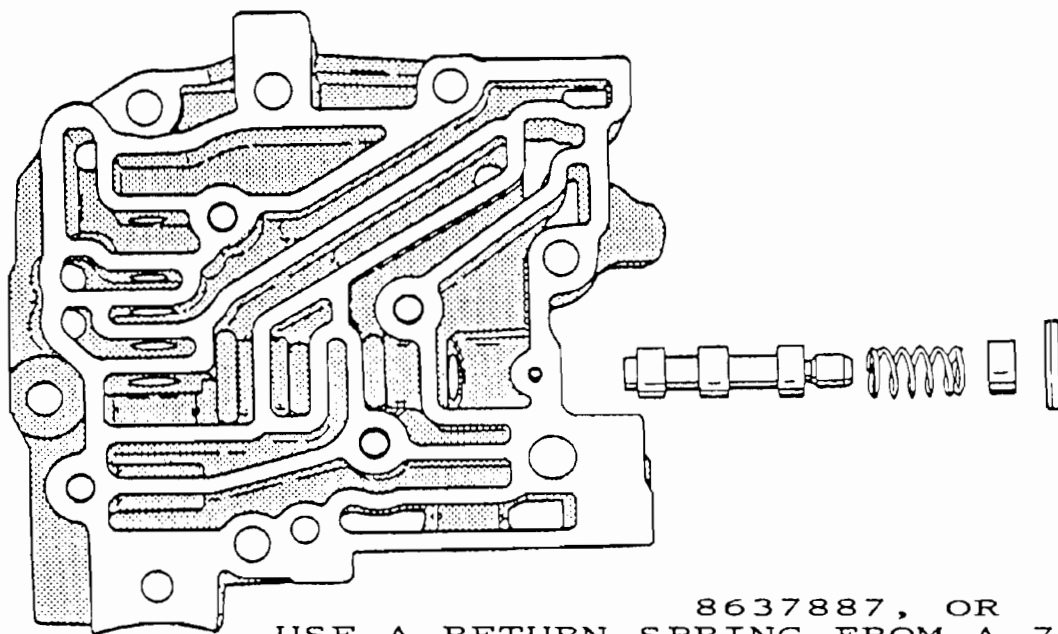


Figure 50

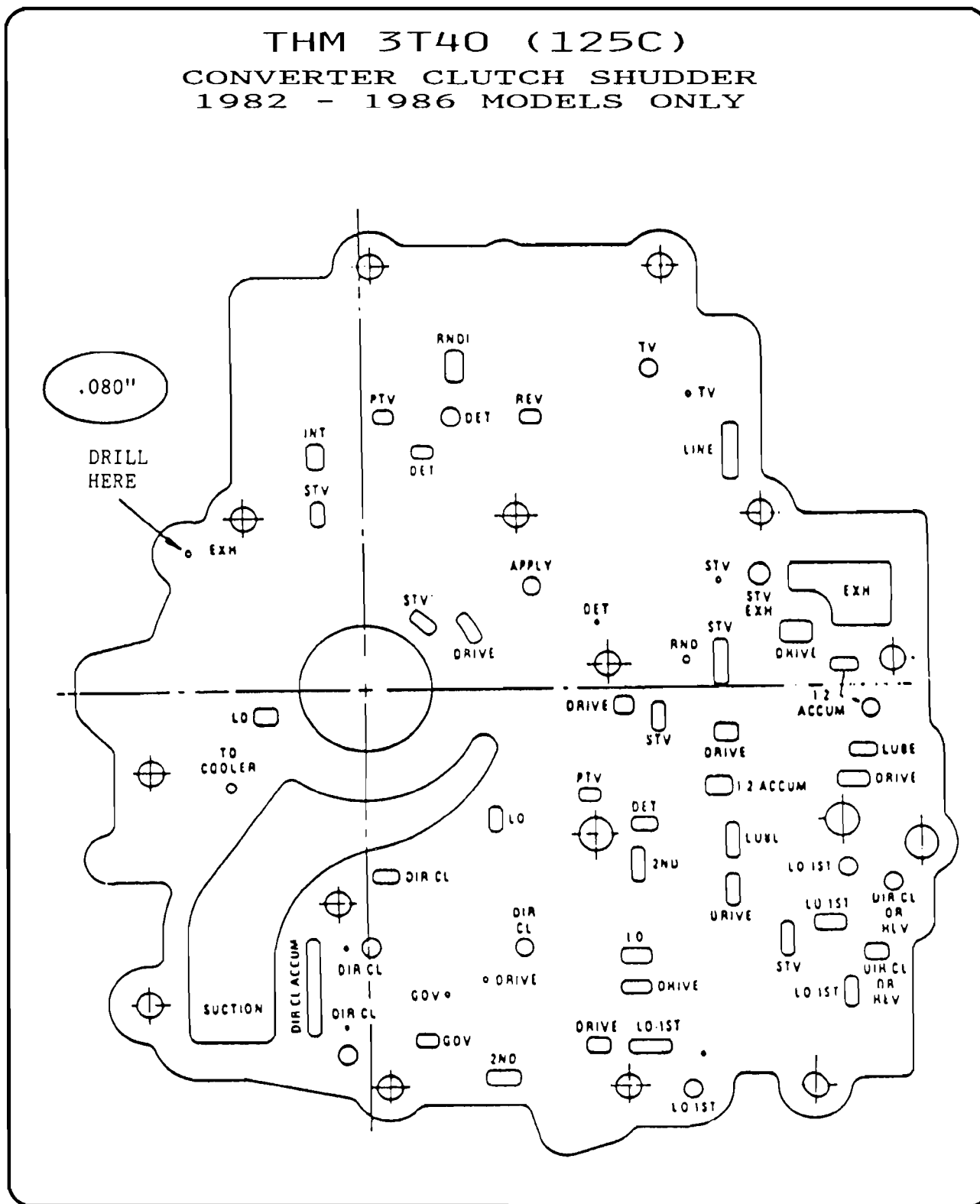


Figure 51

THM 3T40 (125C) CONVERTER CLUTCH SHUDDER 1987 AND LATER ONLY

COMPLAINT: Converter clutch apply shudder, ONLY on 1987 and later model THM 3T40 (125C) transaxles.

CAUSE: Not enough converter clutch apply oil.

CORRECTION: Install the auxiliary valve body cover gasket with the large hole (see figure 52), or modify the gasket with the small hole by cutting on the dotted line to make a large hole gasket out of the small hole gasket (see figure 52).

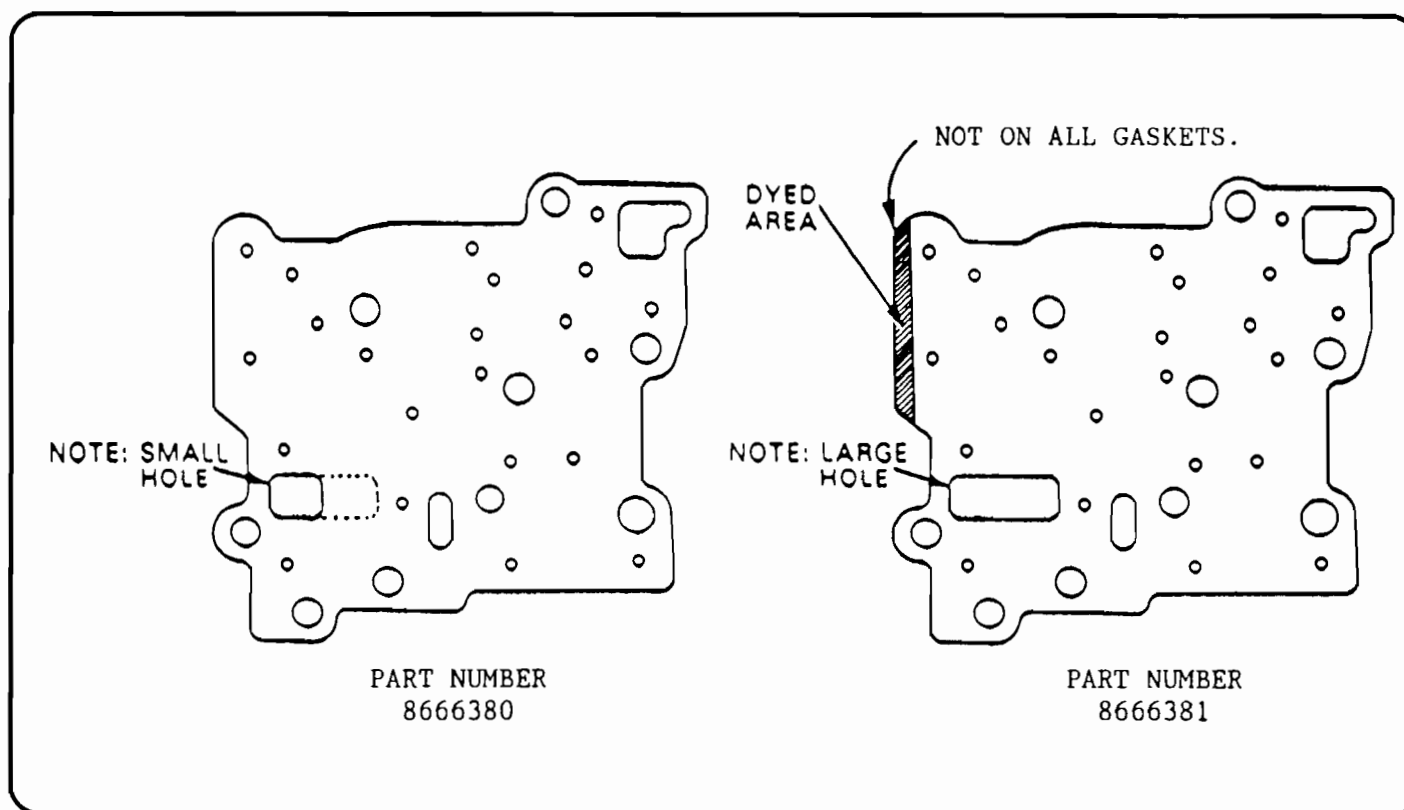


Figure 52

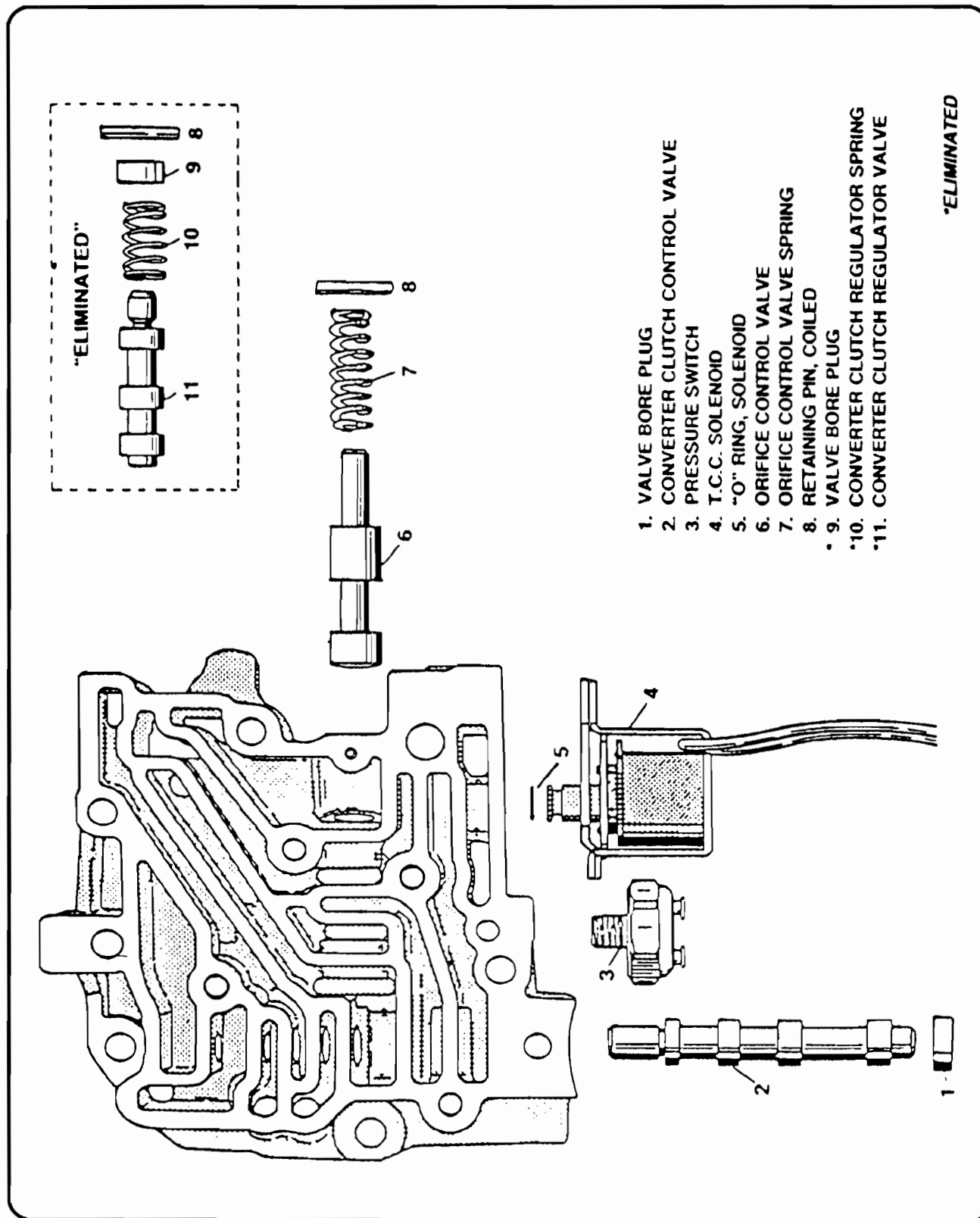


Figure 53



1993 SEMINAR INFORMATION

THM 4L80-E/4L80-EHD

NEW CASE, SPACER PLATE, AND GASKETS

CHANGE: Beginning August 21, 1991 (Julian Date 233) all THM 4L80-E/4L80-EHD transmissions were built using a new case assembly, new valve body spacer plate, and new spacer plate gaskets.

REASON: To correct high line pressure instability, and improve durability.

PARTS AFFECTED:

- (1) TRANSMISSION CASE - Oil dam was added to the worm track area in the torque signal oil circuit, as shown in Figure 54
- (2) SPACER PLATE - Slot removed and an orifice added to the torque signal oil circuit, to correct the line pressure instability.
- (3) SPACER PLATE GASKETS - Hole configuration changed to accomodate the added orifice in the spacer plate.

INTERCHANGEABILITY:

The new case assembly, new spacer plates and gaskets, **MUST** be used together to correct the line pressure instability concerns.

The new spacer plates and gaskets can be used with the previous case (No Dam) and will function, but **WILL NOT CORRECT** line pressure instability. To correct line pressure instability concerns on units built prior to Julian Date 233, refer to ATSG Bulletin 92-34.

SERVICE INFORMATION:

Case Assembly (2WD)	1991 ABP, ADP, BAP, BBP, BMP, BNP, CAP, CBP, CRP, DCP, DDP, DNP, DPP, DRP, DSP, 1992 ABP, BAP, BMP, BNP, DCP, DRP, DNP, DPP, HTP, LLP, JDP, 8683974
Case Assembly (4WD)	1991 ACP, BJP, CKP, DLP, 1992 ACP, BJP, DLP, LFP, 8683975
Case Assembly(LUG CUT)	1992 AFP, AJP, MBP, MKP, MPP, TSP, TWP, MHP, LAP, 8683976
Spacer Plate	1991 BAP, BBP, BJP, BMP, BNP, 8680654
Spacer Plate	1991 ADP, 8680584
Spacer Plate	1992 ABP, ACP, AFP, AJP, 8680584
Spacer Plate	1991 CAP, ABP, CKP, CRP, 1992 BAP, BJP, BMP, BNP, JDP, LAP, LFP, LLP, MBP, MKP, MPP, 8680585
Spacer Plate	1991 DNP, DPP, 1992 DNP, DPP, 8680586
Spacer Plate	1991 DCP, DDP, DLP, DRP, 1992 DCP, DLP, DRP, TSP, TWP, 8680587
Spacer Plate	1991 DSP, 1992 HTP, 8680588
Gasket, V.B./S.P.	ALL 1991 and 1992 Models 8680583
Gasket, Case/S.P.	ALL 1991 and 1992 Models 8680593

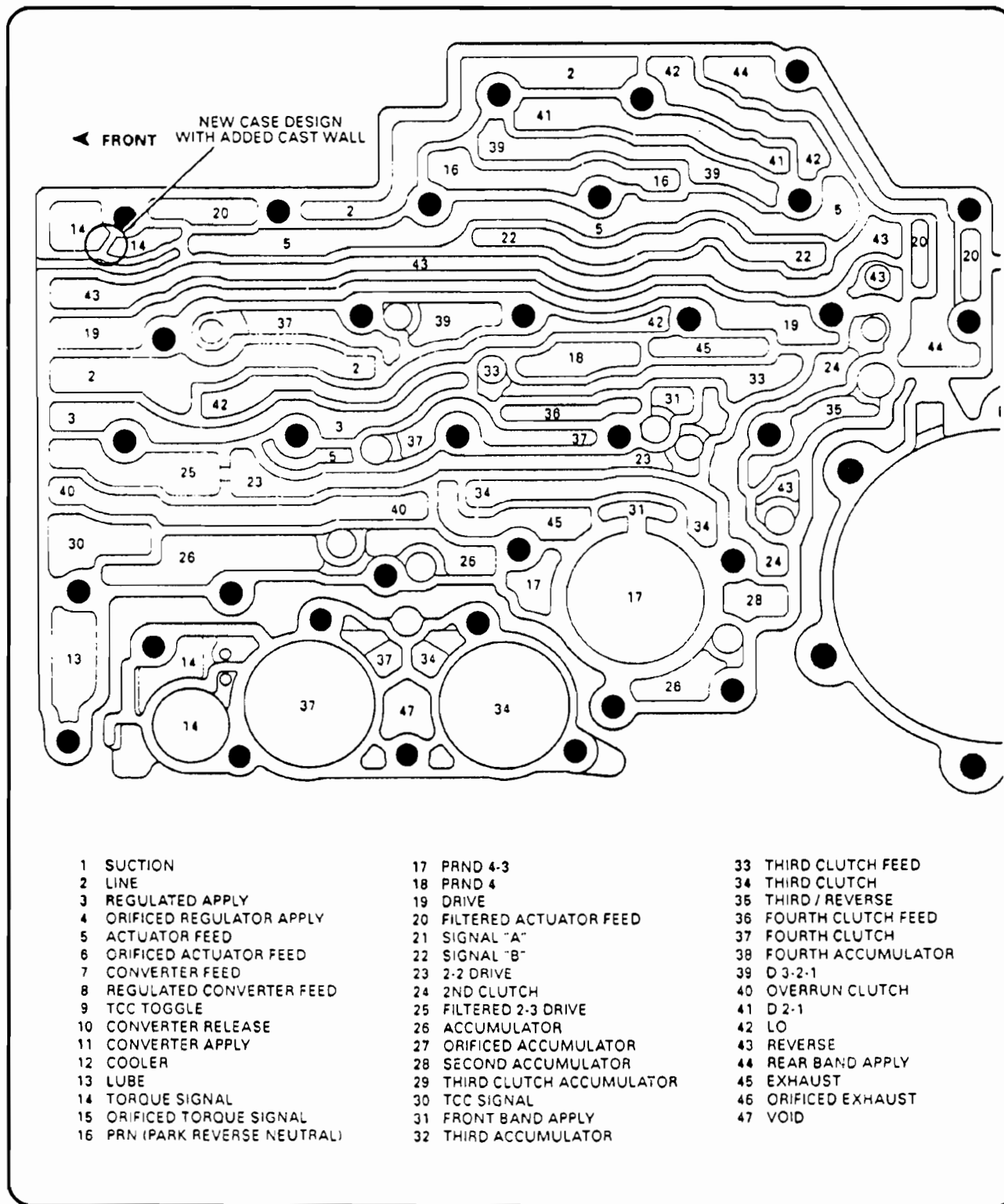


Figure 54

HYDRA-MATIC 4L80-E

BUZZING NOISE IN PARK AND/OR NEUTRAL

COMPLAINT: Some Hydra-matic 4L80-E/4L80-EHD transmissions may exhibit a buzzing or vibration noise while the selector lever is in the park or neutral position.

CAUSE: The cause may be, line pressure instability in the pressure regulator valve line-up located in the pump cover.

CORRECTION: The correction requires two steps:

STEP 1. There is now available from OEM, a new service package that includes an "Added" isolater spring, inside of the current pressure regulator spring (See Figure 30).

The new service package is available under OEM part number 8682998. Refer to Figure 30 for proper assembly.

NOTE: Ensure that the snap ring is installed with the flat side facing away from the boost sleeve.

STEP 2. Install a 9/32" diameter cup plug, with a .075" orifice hole drilled in the center of the cup plug, into the torque signal passage of the pump cover (see figure 55).

SERVICE INFORMATION:

Pressure Regulator Service Package 8682998
9/32" Cup Plug, (Local Hardware Item)

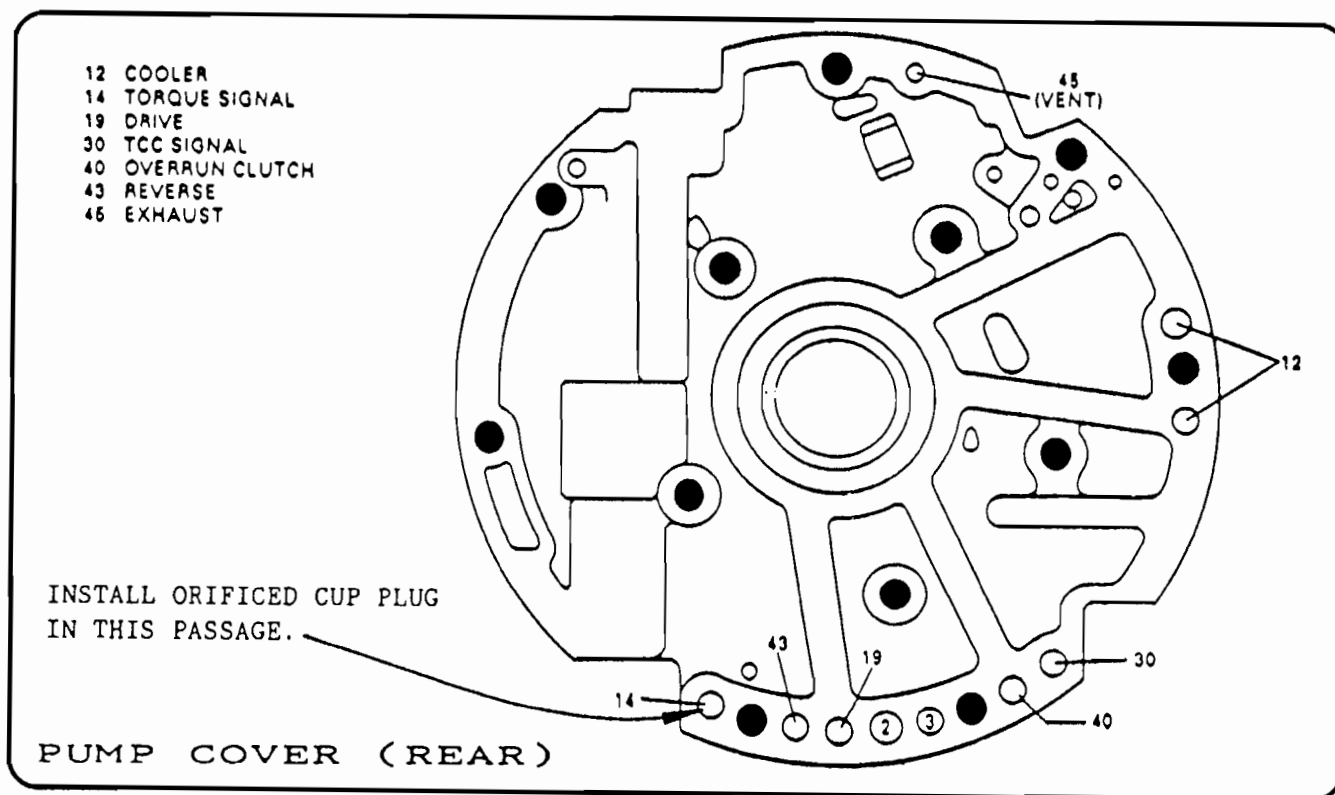
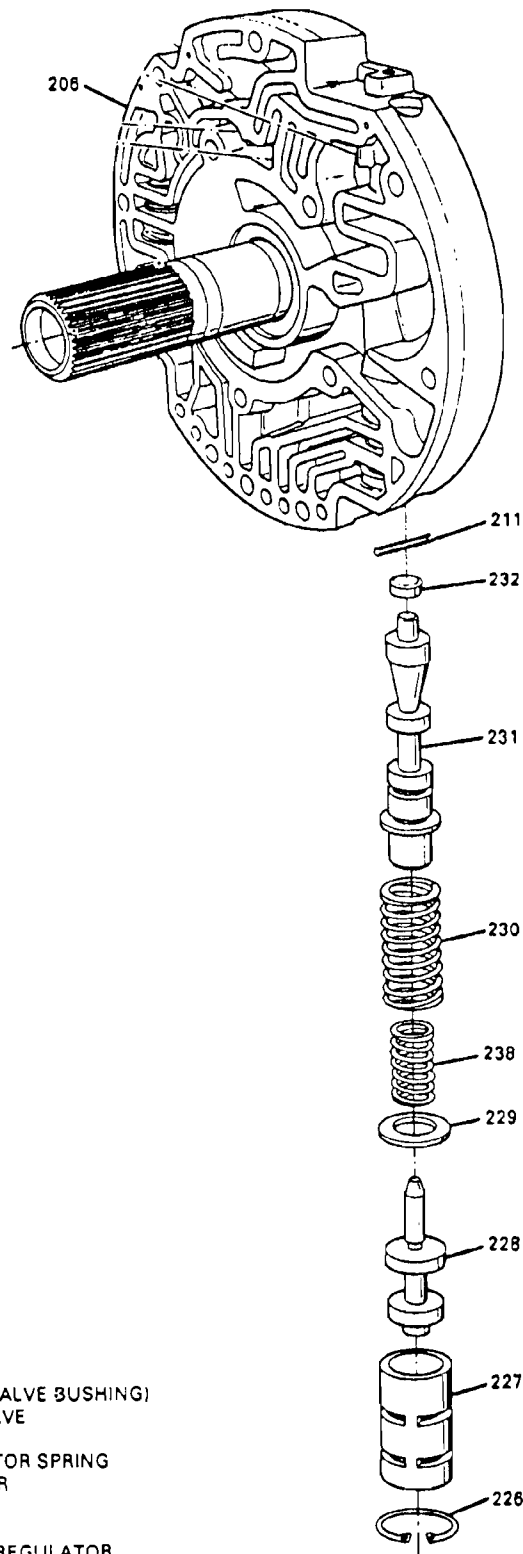


Figure 55

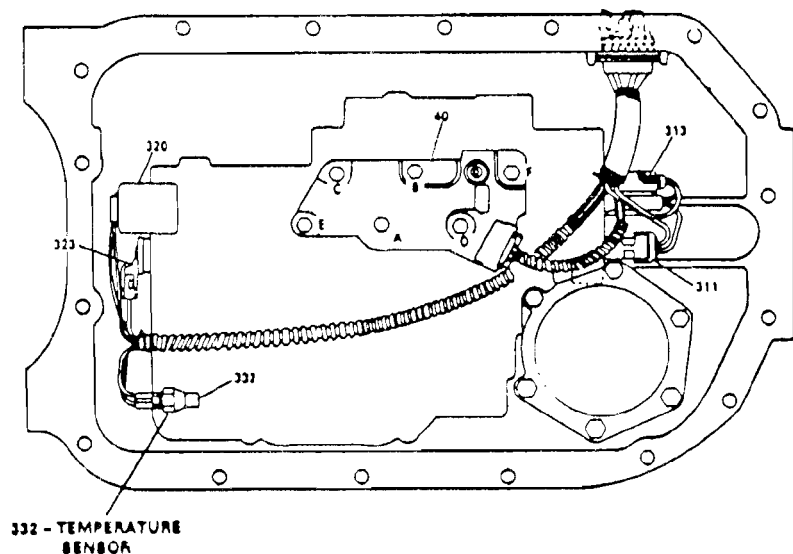


- 208 COVER, PUMP
- 211 PIN, COILED SPRING (3)
- 226 RING, RETAINER (REV. BOOST VALVE BUSHING)
- 227 BUSHING, REVERSE BOOST VALVE
- 228 VALVE, REVERSE BOOST
- 229 RETAINER, PRESSURE REGULATOR SPRING
- 230 SPRING, PRESSURE REGULATOR
- 231 VALVE, PRESSURE REGULATOR
- 232 PLUG, PRESSURE REGULATOR
- 238 SPRING, ISOLATOR PRESSURE REGULATOR

Figure 56

THM 4L80-E/4L80-EHD NEW TEMPERATURE SENSOR

Some 1992 model THM 4L80-E/4L80-EHD transmissions are now equipped with a new Transmission Oil Temperature (TOT) sensor incorporated within the transmission wiring harness as shown in figure below and replaces the TOT sensor that screwed into the valve body on previous models.



1991 AND SOME 1992 MODELS

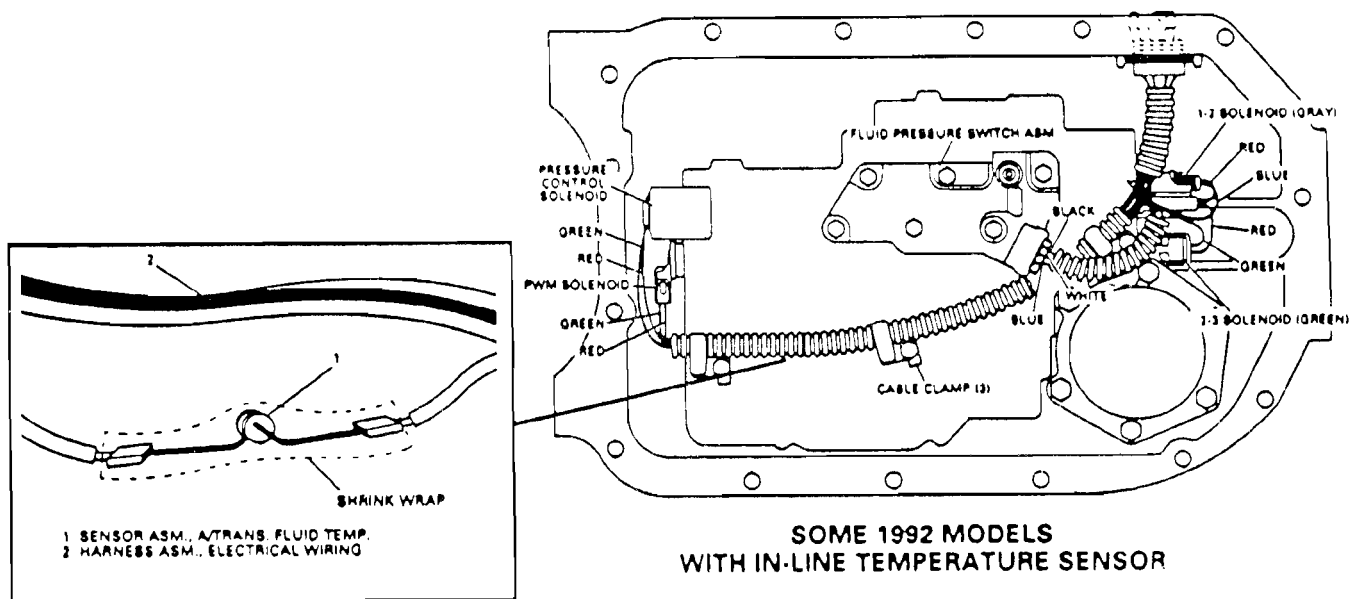


Figure 57

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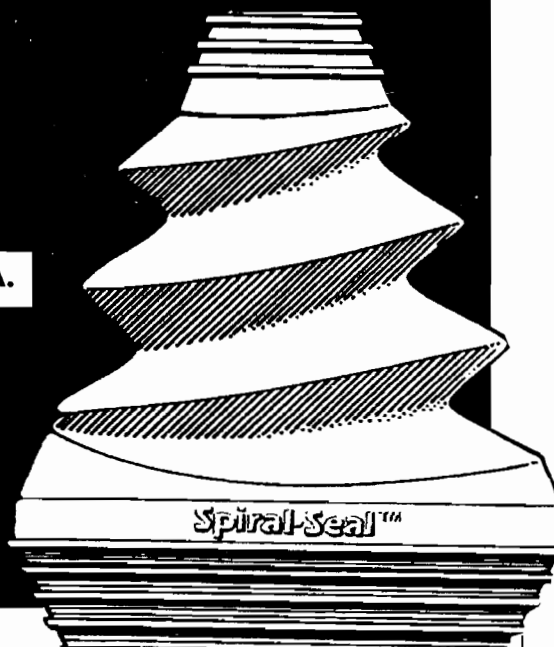
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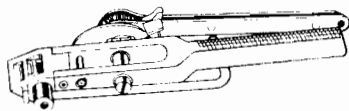
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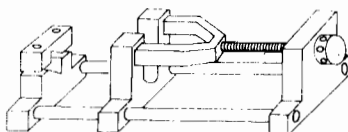


BAND STRAP DELUXE TOOL
(W/RACHET AND CUTTER)



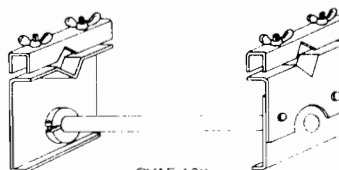
CVBT-120

C.V. JOINT PULLER



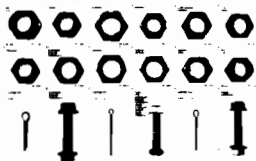
CVJP-200

C.V. ASSEMBLY FIXTURE



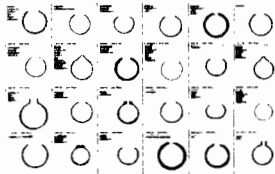
CVAF-100

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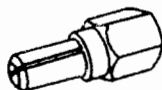
CVH-700K

HARDWARE KIT - CLIPS



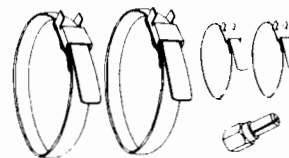
CVH-800K

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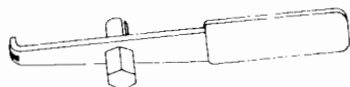
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BAND STRAP CLAMP KIT
INCLUDES: 2 STAINLESS STEEL (19") &
2 (10") CLAMPS AND THROW-AWAY-TOOL™



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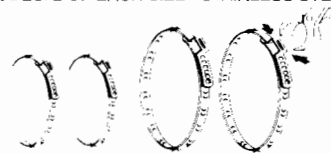
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THM 4L80-E/4L80-EHD NO REVERSE AND/OR BROKEN CASE

- COMPLAINT:** Some THM 4L80-E/4L80-E transmissions may experience a no reverse condition and/or a broken case assembly in the area of the rear band anchor pins.
- CAUSE:** This is caused by the lugs on the rear band assembly not holding on the case anchor pins, causing the reaction drum not to hold.
- CORRECTION:** Beginning on April 11, 1992 (Julian Date 101) all THM 4L80-E/4L80-EHD transmissions were built with a revised reverse band assembly which is wider in the band lug area (See Figure 59) , and should be used during all rebuilds.
All 1992 model THM 4L80-E/4L80-EHD transmissions were built with a new case assembly with "Added Ribs" in the anchor pin area (See Figure 60)

SERVICE INFORMATION:

Reverse Band Assembly (New Design) 8681620

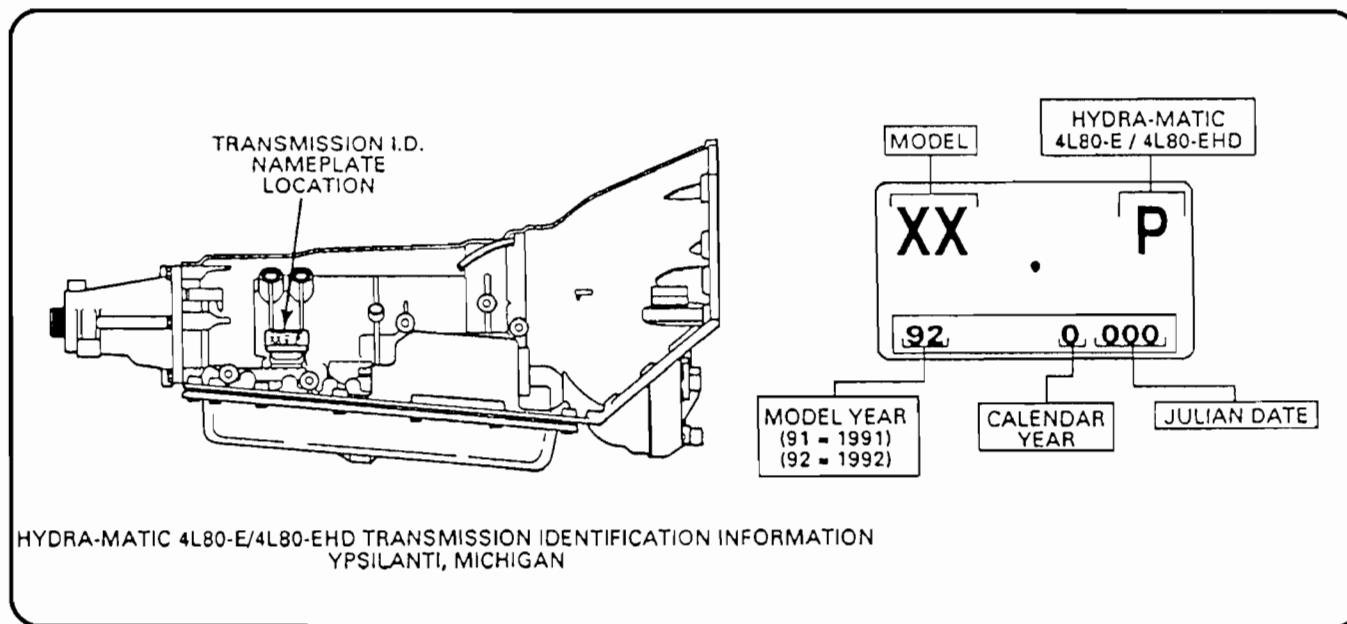


Figure 58

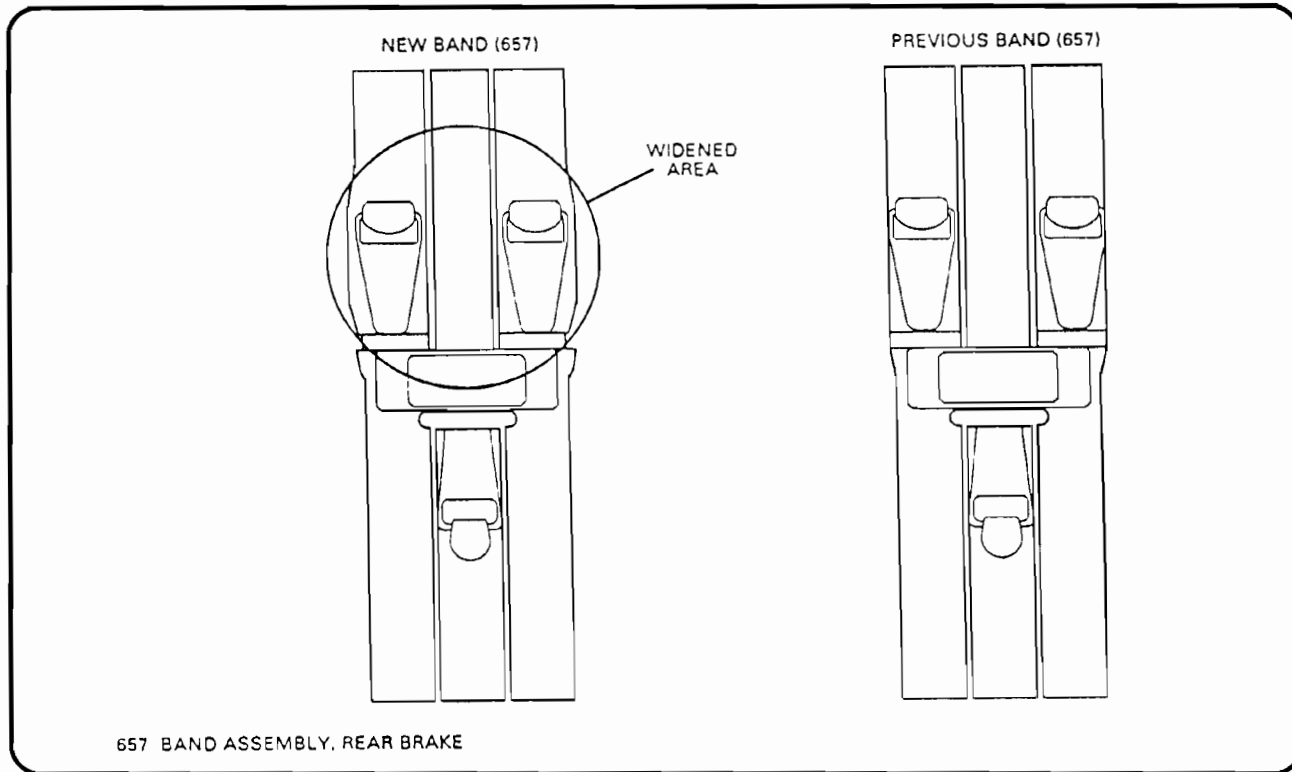


Figure 59

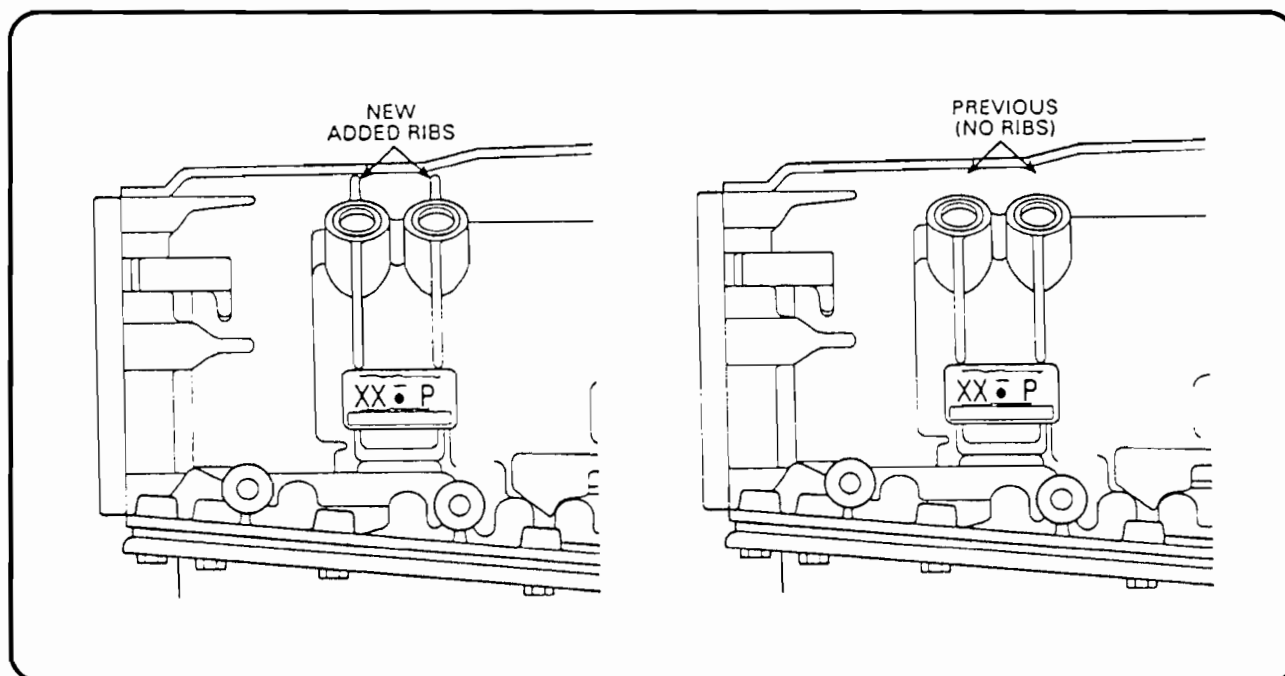


Figure 60



1993 SEMINAR INFORMATION

THM 4L80-E / 4L80-EHD

STARTS IN THIRD, BINDS IN LOW, AND/OR DIRECT CLUTCH FAILURE.

COMPLAINT: Transmissions coming to the shop with complaints of wrong gear starts may have a direct clutch problem. If the PCM/ TCM does not have a code set, remove the pan and check for signs of abnormal wear or damage.

CAUSE: If abnormal wear is detected, the dished cushion plate for the direct clutch may be broken. When this plate breaks, it can jam the direct clutch and cause clutch failure.

CORRECTION: Inspect the direct clutch drum and the direct clutch drum piston for nicks, gouges, or cracks which have occurred as a result of the broken dished plate. Any burrs in the drum must be removed so that a new cushion plate will slide freely. If the piston is damaged, replace it with a new one - Part # **8675511**. Install a new dished cushion plate - Part # **8680816**.

NEW SHIFT SOLENOID ASSEMBLIES

CHANGE: Beginning on February 17, 1992 (Julian Date 048) all THM 4L80-E/4L80-EHD transmissions were built with revised shift solenoid assemblies

REASON: Improved shift solenoid durability and manufacturing process.

**PARTS
AFFECTED:** (1) SHIFT SOLENOID "A"- Revised to incorporate reversible diaphragm, increased coil wire size, and inlet filter screen within the solenoid. Shift Solenoid "A" is now GREY in color, instead of the previous Blue.
(2) SHIFT SOLENOID "B"- Revised to incorporate reversible diaphragm, increased coil wire size, and inlet filter screen within the solenoid. Shift Solenoid "A" is now GREEN in color, instead of the previous Red.

The new Shift Solenoids will retro fit back to ALL previous models of the THM 4L80-E/4L80-EHD transmissions.

SERVICE SHIFT SOLENOID "A" (GREY).....8683081
INFORMATION: SHIFT SOLENOID "B" (GREEN).....8683082

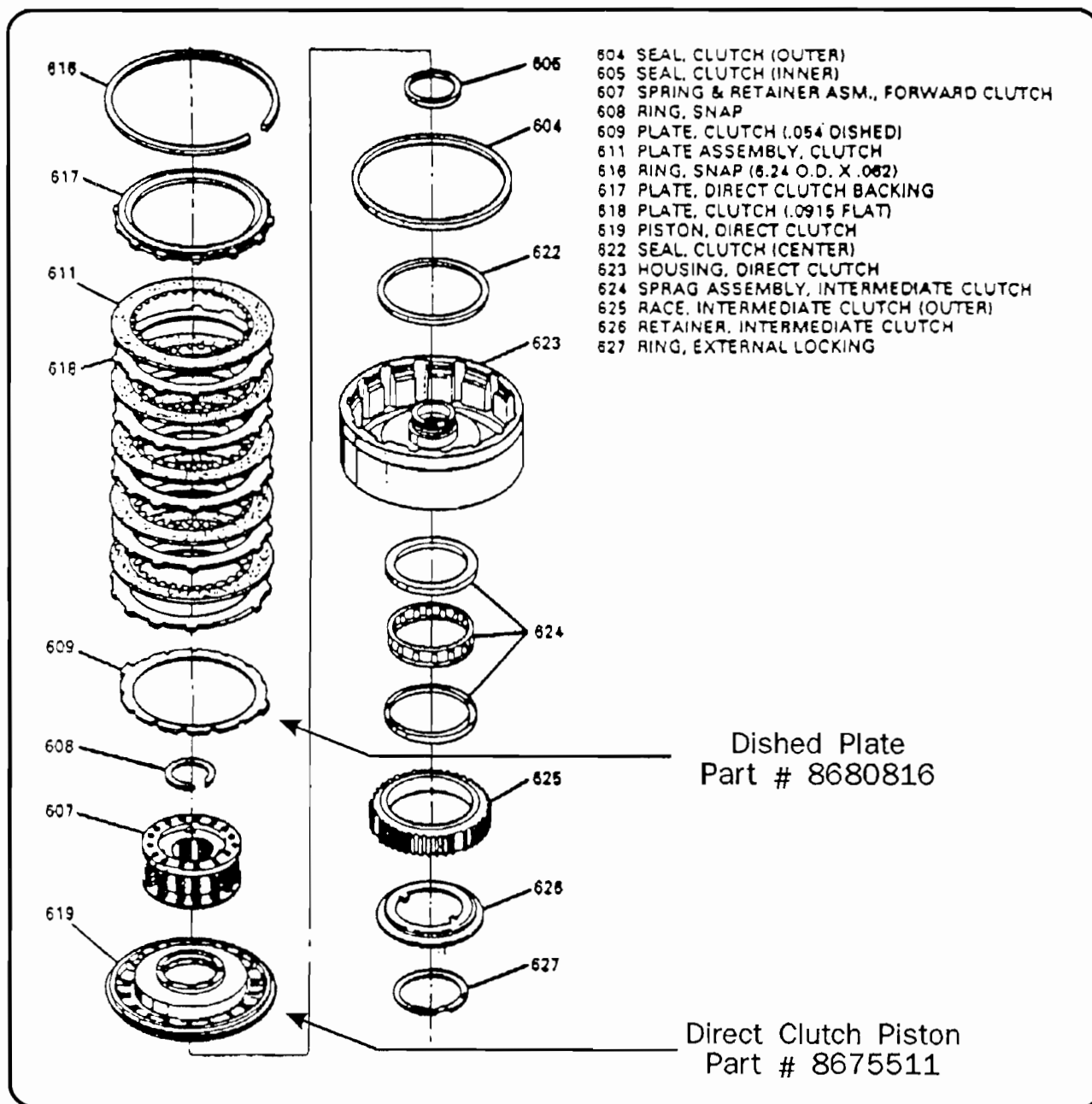


Figure 61

CHRYSLER A500 - 518 OVERDRIVE/DIRECT CLUTCH DRUM

COMPLAINT: Cannot adjust overdrive piston shim correctly, no reverse after overhaul, or bind up on 3-4 shift.

CAUSE: Incorrect number of clutches in the overdrive/direct drum.

CORRECTION: Use the chart and illustration below to determine the correct number of clutches in the overdrive/direct drum. See bulletin 92-37 for correct drum stack up.

TRANSMISSION	LINED	STEEL	MEASUREMENT
A500 (40RH) 3.9L	5	4	Approx. .430 in.
A500 (42RH) 5.2L	6	5	Approx. .300 in.
A518 (46RH)	8	7	Approx. .150 in.

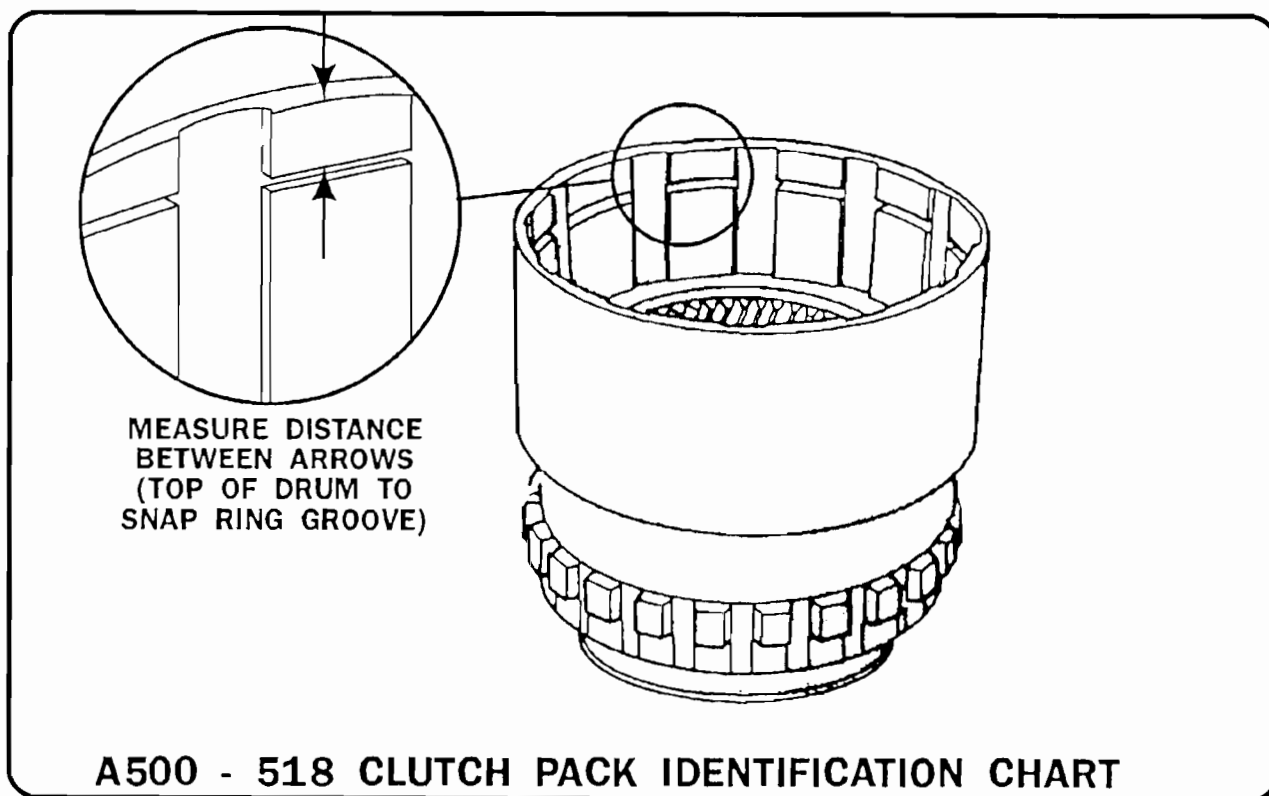


Figure 62

CHRYSLER A-500/518

PROPER DIRECT AND O.D. CLUTCH ASSEMBLY

1. Install direct clutch pressure plate on sliding hub with INSIDE LIP DOWN,
2. Install direct clutch plates beginning with a friction plate
The number of direct clutch friction and steel plates depends on the engine size. See chart below.

	FRICION	STEEL
A-500 3.9L ENGINE	5	4
A-500 5.2L ENGINE	6	5
A-518 ALL MODELS	8	7

3. Install direct clutch reaction plate in direct clutch housing with OUTSIDE LIP UP,
4. Install direct clutch "Waved" snap ring which is the smallest diameter of the two waved snap rings.
NOTE: THE SLIDING HUB AND 800 POUND SPRING MUST BE COMPRESSED IN A BEARING PRESS TO INSTALL THIS SNAP RING. ALSO INSTALL THE SAFETY RETAINING RING ON THE SUN GEAR WHILE SPRING IS COMPRESSED.
5. Install the FLAT overdrive clutch snap ring into the groove in extension housing,
6. Install the WAVED overdrive clutch snap ring in the same groove on top of the flat snap ring
7. Install overdrive clutch reaction plate (Thinnest) on top of the snap rings,
8. Install overdrive clutch plates beginning with a friction plate, and alternate with steel plate, Overdrive clutch requires 3 friction and 2 steel plates on all models.
9. Install overdrive clutch pressure plate (Thickest) on top of the overdrive plates
10. Install the ROUND wire retaining ring in groove in the extension housing to retain the overdrive pack in position for assembly

SEE FIGURE 63

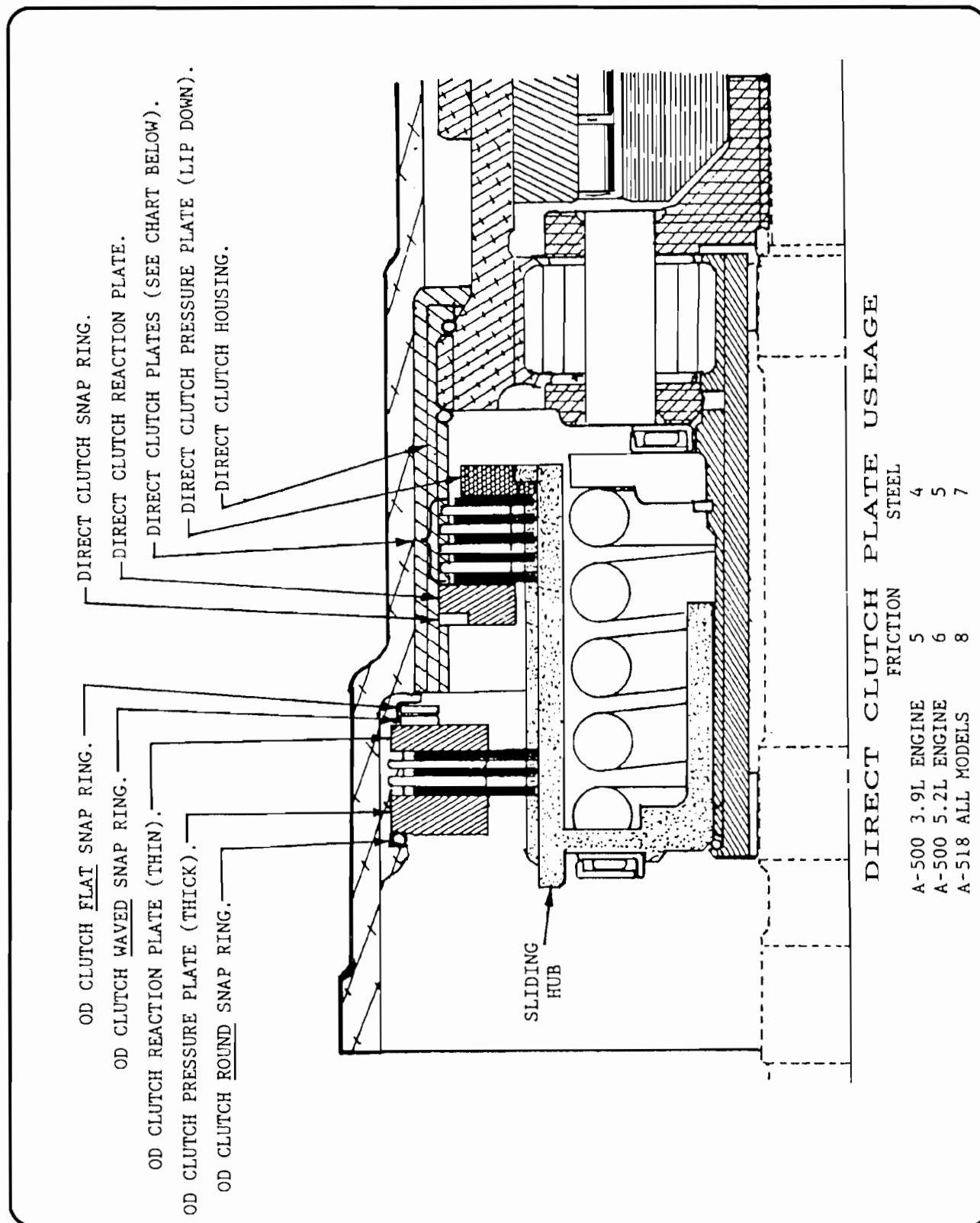


FIGURE 63

CHRYSLER A500/518 ELECTRICAL DIAGNOSIS

The A500 and A518 are both found in 1988 and up Ram Vans, Wagons, Pickups, Ramchargers and Dakota Trucks. The 3.9 liter engines were equipped with the A500 transmission. The 5.2 liters shared both the A500 and the A518 transmissions while the 5.9 liters had only the A518. Both the A500 and the A518 are rear wheel overdrive transmissions. The A500 has been equipped with a locking torque converter clutch since 1988 while the A518 transmission did not use a locking torque converter clutch until the start of 1992. Fourth gear and lock-up are both electronically controlled and hydraulically activated. The Single Module Engine Controller (SMEC) uses the following inputs to allow the shift to fourth gear and lock up in the torque converter to take place:

1. Coolant temperature sensor signal
2. Engine speed sensor signal
3. Vehicle speed sensor signal
4. Throttle position sensor signal
5. Map sensor signal

Both the lock up and overdrive solenoids share a common 12 volt supply which originates from the ignition switch. Once the SMEC receives the necessary information from the 5 inputs listed above, it makes a ground to complete the circuit for either the lock up or overdrive solenoid (Chrysler service manuals call the overdrive solenoid an overdrive lock-out solenoid and the lock up solenoid a part throttle unlock solenoid).

Figure 64 identifies the three terminals located in the case connector near the rear cooler fitting.

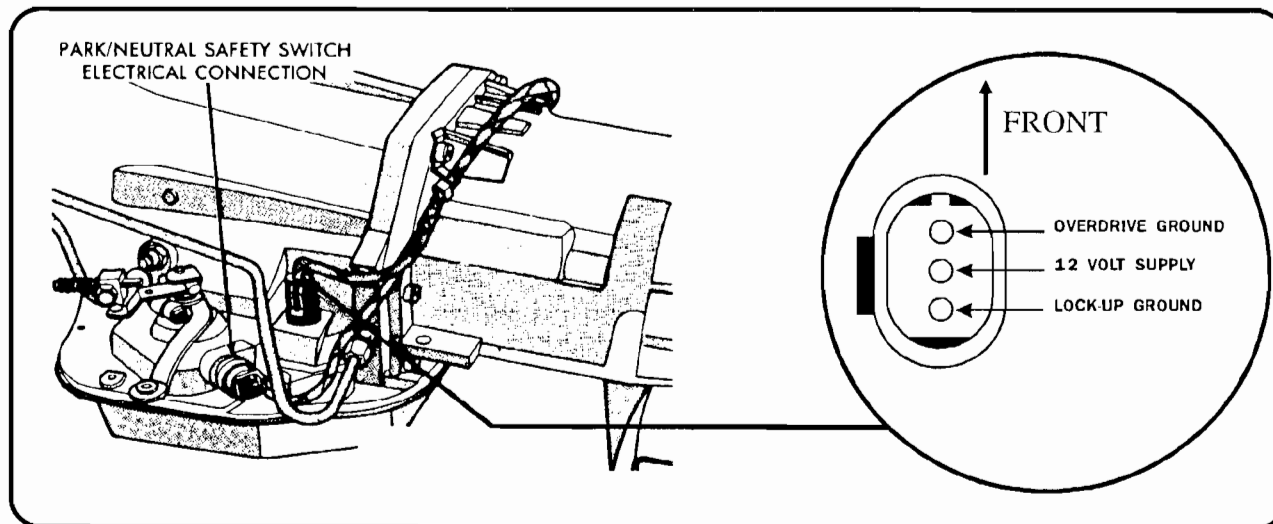


Figure 64

A quick check that can be made when the vehicle has lost lock up and overdrive is to supply your own 12 volts to the middle pin. When the vehicle is in third gear, ground the front pin. A shift to overdrive should be felt. When the rear pin is grounded, lock up should come on. If one or both operations has failed with this test, the problem is an internal one and will require a solenoid check. Both solenoids are normally open to exhaust and closes when energized and should have 25 to 35 ohms resistance at room temperature. When this check has been completed and the solenoids are in good working order, there is a non-electrical fault in the transmission causing the no overdrive or no lock up condition.

If the quick test shifted the transmission into overdrive and lock up came on, then an external electrical problem exists. A scanner will interface with the SMEC to retrieve fault codes. Figure 65 shows the location of the diagnostic connector and the SMEC with its 60 way and 14 way connectors.

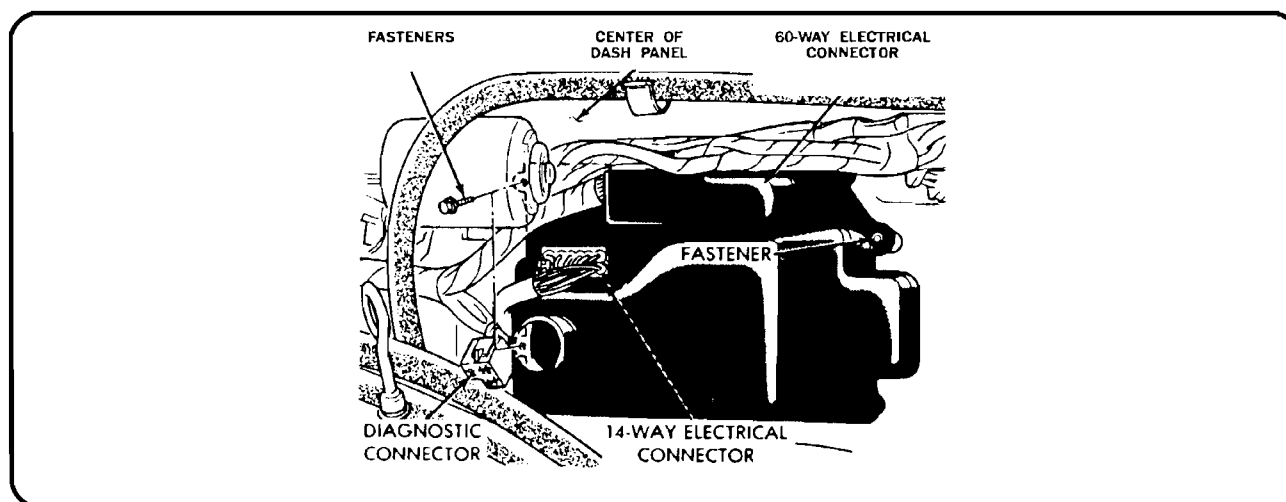


Figure 65

If a scanner is not available the SMEC may show fault codes by flashing a check engine lamp on the instrument cluster. To activate this function turn the ignition key on. The check engine lamp will come on for two seconds as a bulb check. Immediately following this it will display a fault code by flashing on and off. There is a short pause between flashes and a longer pause between digits.

An example of two codes is as follows:

1. Lamp on for two seconds, then turns off.
2. Lamp flashes four (4) times pauses, and then flashes once (1).
3. Lamp pauses for four seconds, flashes four (4) times, pauses and then flashes seven (7) times.

The two codes shown in this example is 41 and 47. The following chart is a list of the fault codes that can be stored in the memory of the SMEC.

1993 SEMINAR INFORMATION

FAULT CODE	SCANNER DISPLAY	DESCRIPTION OF FAULT CODE
11	IGN Reference Signal	No distributor reference signal detected during engine cranking
12	No. of Key-ons since last fault or since faults were erased.	Direct battery input to controller disconnected within the last 50-100 ignition key-ons.
13 +**	MAP Pneumatic Signal or MAP Pneumatic Change	No variation in MAP sensor signal is detected. No difference is recognized between the engine MAP reading and the stored barometric pressure reading. MAP sensor input below minimum acceptable voltage.
14+**	MAP voltage too low or MAP voltage too low	MAP sensor input above maximum acceptable voltage.
15**	Vehicle Speed Sensor	No distance sensor signal detected during road load conditions.
16+**	Battery Input Sense	Battery voltage sense input not detected during engine running.
17	Low Engine Temp.	Engine coolant temperature remains below normal operating temperatures during vehicle travel (thermostat).
21**	Oxygen Sensor Signal	Neither rich or lean condition is detected from the oxygen sensor input.
22+**	Coolant voltage low or Coolant voltage high	Coolant temperature sensor input below minimum acceptable voltage. Coolant temperature sensor input above maximum acceptable voltage.
23	T/B temp. voltage low or T/B temp. voltage high.	Throttle body temperature sensor input below the minimum acceptable voltage (5.2L and 5.9L only). Throttle body temperature sensor input above the maximum acceptable voltage (5.2L and 5.9L only).
24+**	TPS voltage low or TPS voltage high	Throttle position sensor input below the minimum acceptable voltage. Throttle position sensor input above the maximum acceptable voltage.
25**	ISC motor circuits	A shorted condition detected in one or more of the ISC control circuits.
26	INJ1 peak current or INJ2 peak current	High resistance condition detected in the INJ1 injector output circuit. High resistance condition detected in the INJ2 injector output circuit.
27	INJ1 control circuit or INJ2 control circuit	INJ1 injector output driver stage does not respond properly to control signal INJ2 injector output driver stage does not respond properly to control signal

1993 SEMINAR INFORMATION

FAULT CODE	SCANNER DISPLAY	DESCRIPTION OF FAULT CODE
31**	Purge solenoid circuit	An open or shorted condition detected in purge solenoid circuit.
32**	EGR solenoid circuit or EGR system failure	An open or shorted condition detected in ERG solenoid circuit. (California emissions only). Required change in fuel/air ratio not detected during diagnostig test (California only).
33	A/C clutch relay circuit	An open or shorted condition detected in the A/C clutch relay circuit.
34	S/C servo solenoid	An open or shorted condition detected in the speed control vacuum or vent solenoid circuit.
35	Idle switch shorted or Idle switch opened	Idle contact switch input circuit shorted to ground. Idle contact switch input circuit opened.
36	Air switch solenoid	An open or shorted condition detected in the air switching solenoid circuit.
37	PTU solenoid circuit	An open or shorted condition detected in the torque converter part throttle unlock solenoid circuit.
41	Charging system circuit	Output driver stage for alternator field does not respond properly to the voltage regulator control system.
42	ASD relay circuit or Z1 voltage sense	An open or shorted condition detected in the auto shutdown relay circuit. No Z1 voltage sensed when the auto shutdown relay is energized.
43	Ignition control circuit	Output driver stage for ignition coil does not respond properly to the dwell control signal.
44	FJ2 voltage sense	No FJ2 voltage present at the logic board during controller operation.
45	Overdrive solenoid	An open or shorted condition detected in the overdrive solenoid circuit.
46**	Battery voltage high	Battery voltage sense input above target charging voltage during engine operation.
47	Battery voltage low	Battery voltage sense input below target charging voltage during engine operation.
51**	Air fuel at limit	Oxygen sensor signal input indicates lean fuel/air ratio condition during engine operation.
52**	Air fuel at limit or Excessive leaning	Oxygen sensor signal input indicates rich fuel/air ratio condition during engine operation. Adaptive fule value leaned excessively due to a sustained rich condition
53	Internal self-test	Internal engine controller fault condition detected, complea-

1993 SEMINAR INFORMATION

FAULT CODE	SCANNER DISPLAY	DESCRIPTION OF FAULT CODE
62	EMR mileage accum	Unsuccessful attempt to update EMR mileage in the controller EEPROM.
63	EEPROM write denied	Unsuccessful attempt to write to an EEPROM location by the controller.
	Fault code error	An unrecognized fault ID recieved by DRB II.

+ CHECK ENGINE LAMP ON

** CHECK ENGINE LAMP ON (CALIFORNIA ONLY)

Once a fault code or codes have been retrieved, the necessary repair or repairs can then be made. But if shorted circuits or open circuits have occurred, the replacement of sensors or switches will not correct the problem. To aid the technician in locating open and shorted circuits, figure 66 shows the 60 way connector viewed from the wire end as it plugs into the SMEC. Each terminal has been numbered for pin identification. The following chart provides information on the terminals that are transmission related only. Figure 67 is a wiring diagram of these terminals for further assistance to the technician.

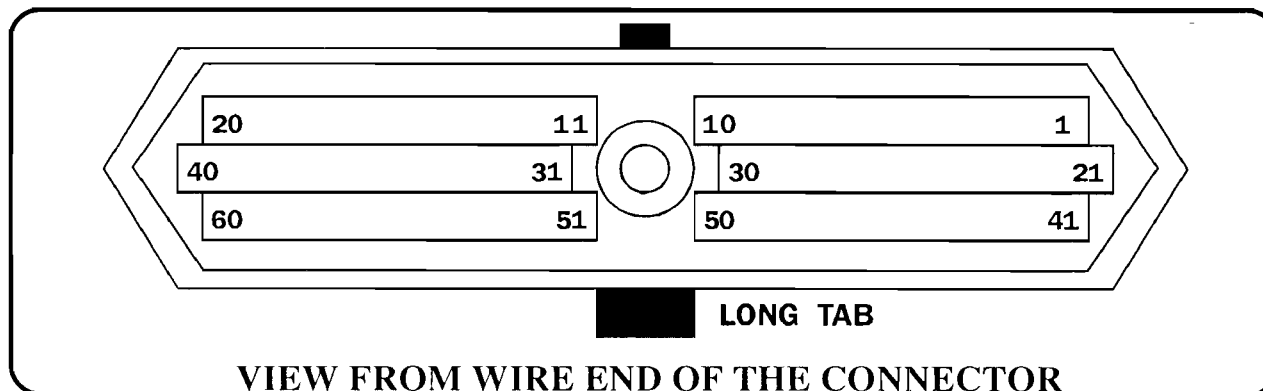


Figure 66

TERMINAL #	CIRCUIT NAME	WIRE COLOR
1	K4	Dark Blue With Red Tracer
3	K10	Tan With White Tracer
4	N5	Black With Light Blue Tracer
13	K8	Violet With White Tracer
22	K7	Orange With Dark Blue Tracer
30	S4	Brown With Yellow Tracer
38	U4	Orange With White Tracer
41	J11	Red
47	N7	Gray With Black Tracer
48	G7	White With Orange Tracer
55	U3	Orange With Black Tracer

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QUALITY WORKMANSHIP

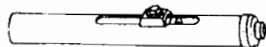
ALL OF OUR TOOLS ARE
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NEW

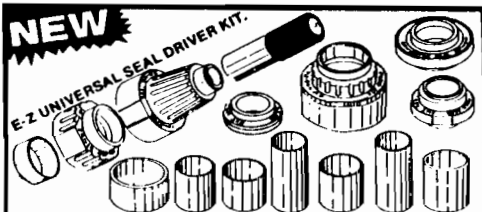
E-Z UNIVERSAL SPEEDOMETER GEAR INSTALLER



BIG 3 FRONT PUMP PULLER

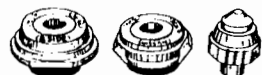


NEW



NISSAN RL4F02A

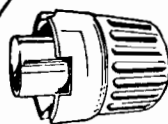
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#350

BUSHING DRIVERS BY
TRANSMISSION TYPE

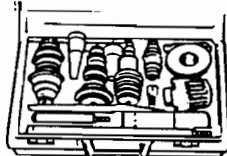
BEARING CUP & CONE SERVICE TOOLS

PATENT# U.S. PATENT NO. 4339865

CHRYSLER



CLUTCH SPRING
COMPRESSOR KIT
#2987



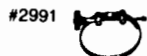
UNIVERSAL BUSHING
DRIVER SET
#1001



P.R. VALVE SNAP
RING INSTALLER
#2993



#280
SEAL PULLER



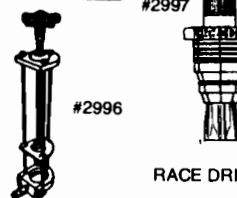
#2991



NISSAN



#2997



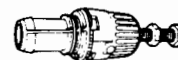
GEAR & PUMP PULLER



TUFFY
#2994



LO/REV. CLUTCH TOOLS
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EXT. HOUSING BUSHING
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BUSHING EXTRACTORS



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TERMINAL 1- This is the MAP sensor signal to the SMEC.

TERMINAL 3- This is the engine coolant sensor ground signal.

TERMINAL 4- This is the engine coolant sensor ground return. With the connector unplugged, 7K to 13K ohms can be seen here between terminals 3 and 4 when the engine coolant sensor is at approximately room temperature (70° F). With the engine at operating temperature (200° F), 700 to 1,000 ohms should be seen.

TERMINAL 13- This is a 5 volt supply from the SMEC to both the MAP sensor and the Throttle Position Sensor. 5 volts should be seen here.

TERMINAL 22- This is the Throttle Position Sensor signal to the SMEC. At closed throttle approximately .10 volts can be seen. As the accelerator is depressed the voltage should rise smoothly to 4.5 to 5 volts at wide open throttle.

TERMINAL 30- This is a ground signal circuit for the SMEC from the middle terminal on the safety neutral switch. With the connector unplugged, there will be continuity at this terminal in Park and Neutral only.

TERMINAL 38- This is the ground circuit for the overdrive solenoid. With the connector unplugged, 25 to 35 ohms can be seen at this terminal when the solenoid are a room temperature.

TERMINAL 41- This is the direct battery feed for the computer. 12 volts should be seen here.

TERMINAL 47- This is a reference signal from the distributor providing engine speed input.

TERMINAL 48- This is a vehicle speed input from the distance sensor (speedometer) on the transmission.

TERMINAL 55- This is the ground circuit for the lock up solenoid. With the connector unplugged, 25 to 35 ohms can be seen at this terminal when the solenoid is at room temperature.

On the dash panel there is an overdrive cancel button. When the vehicle has been started, the overdrive light is on and a shift into overdrive will take place when the vehicle reaches operating temperature. If the driver chooses to cancel the overdrive operation, the button is simply pressed and the light goes out and overdrive is prohibited. This button cancels overdrive by opening the ground circuit that the SMEC provides for the overdrive solenoid through an overdrive control module. On some vehicles this module is built into the switch and on others it is mounted on the right side of the brake support bracket (figure 68).

The switch or control module can malfunction in one or two ways. It could allow the transmission to shift into overdrive with no cancel abilities, or prevent overdrive from ever occurring. Figure 69 shows the wiring circuit for the button and module with each terminal numbered for reference.

With the overdrive button on allowing overdrive to take place, continuity should be seen with an ohm meter between terminals 8 and 9. When the overdrive button is in the canceled position, the ohm meter should read open between these two terminals. If terminals 8 and 9 always show continuity, there will be no ability to cancel overdrive. If terminals 8 and 9 always reads open, overdrive will not occur.

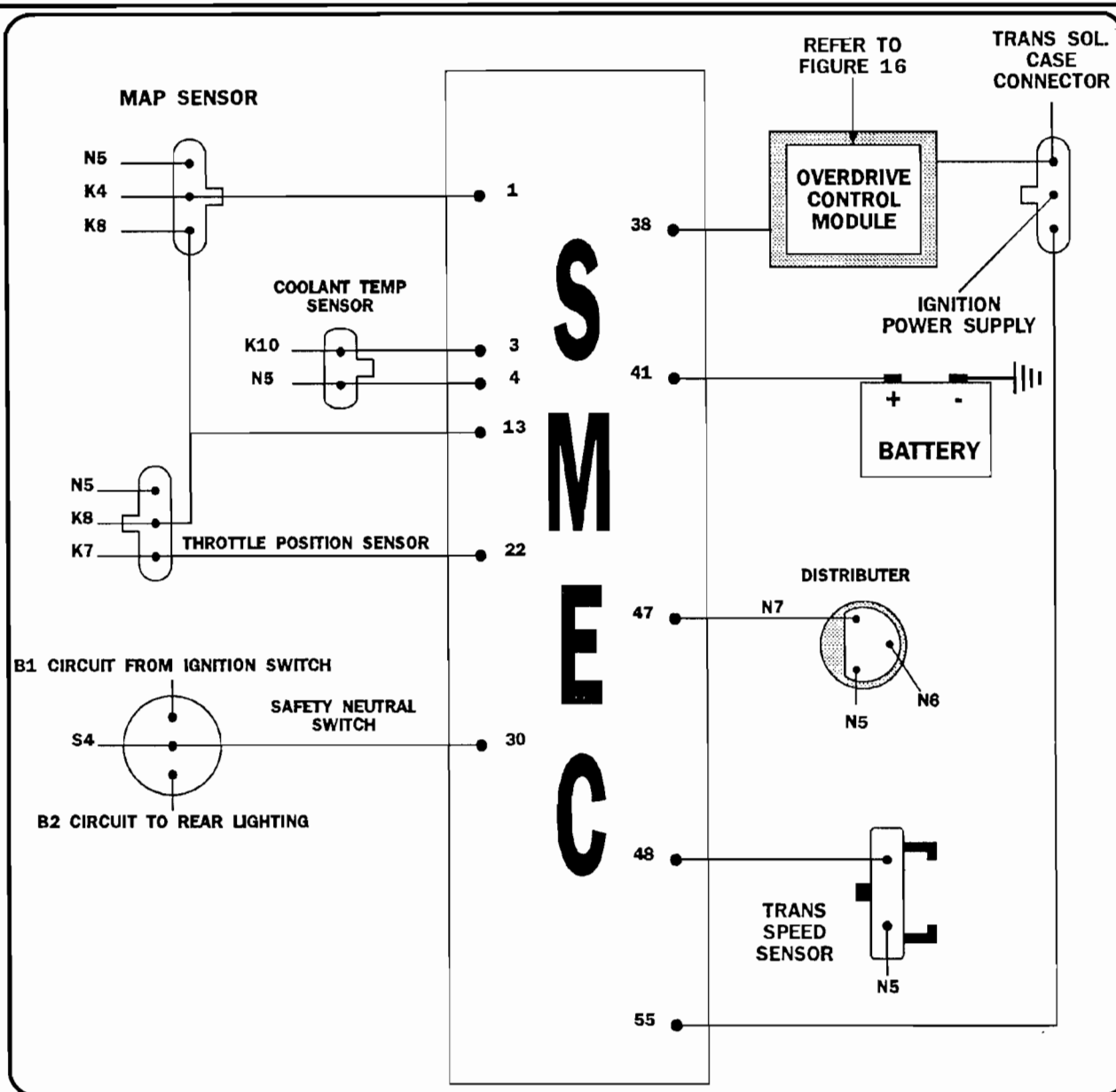


Figure 67

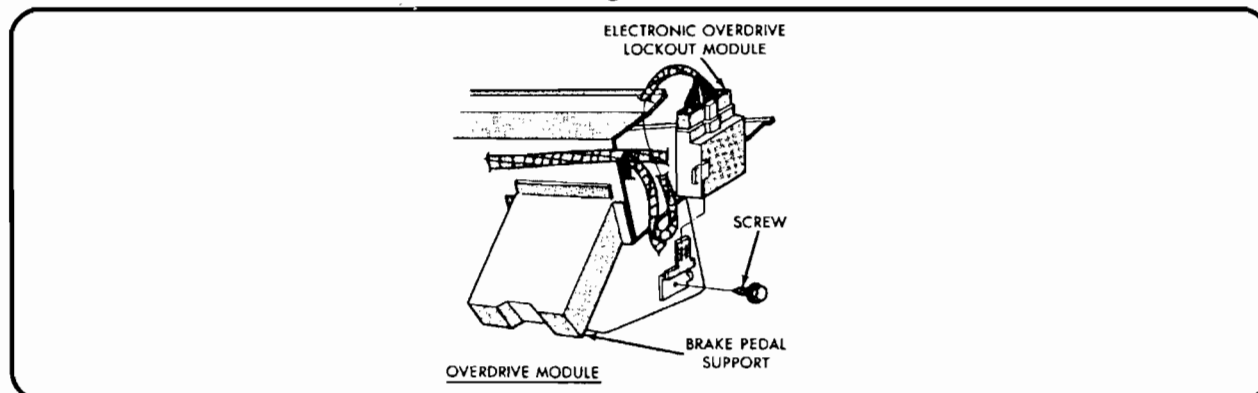


Figure 68

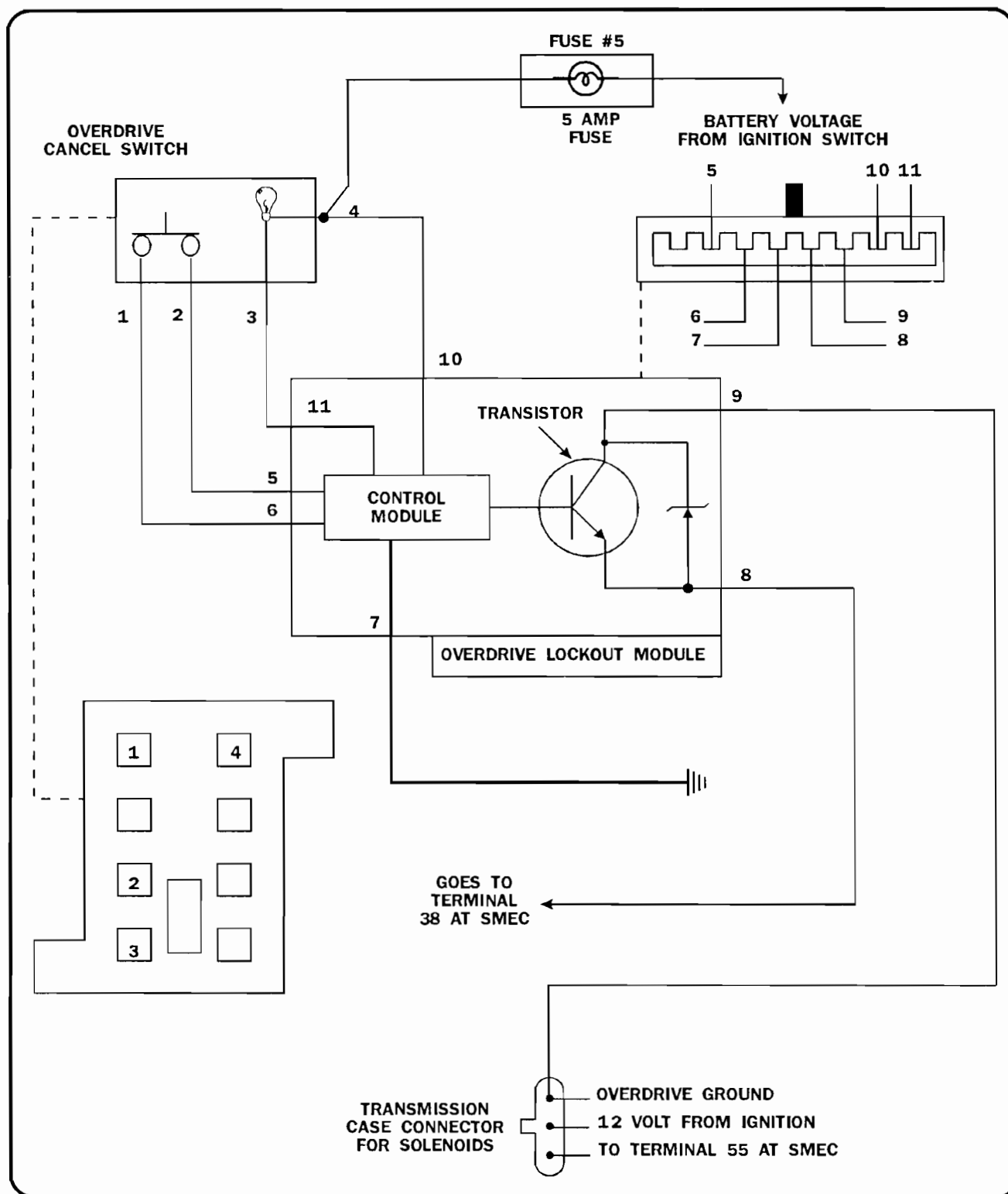


Figure 69



1993 SEMINAR INFORMATION

CHRYSLER PART NUMBERS

CHRYSLER A500/518

UPDATED THRUST PLATE	4461125
UPDATED THRUST BEARING	4461126
UPDATED (WAVED) OVERDRIVE PLATES	4461181
A500 OVERDRIVE/DIRECT CLUTCH HOUSING (6 LINED PLATES)	4461040
A518 OVERDRIVE/DIRECT CLUTCH HOUSING (8 LINED PLATES)	4461089

A500 / 518

OVERDRIVE PISTON SHIM

The gauging bar that Chrysler uses to check for proper thickness of the O.D. piston shim is a 1/2" thick bar. Refer to Figure 70. The chart (see figure 71) includes this 1/2" (.500") in its measurements. If a different thickness bar is used, you will not get the right measurements to fall within the specifications given in the chart below. Be sure to adjust your calculation if you do use a different thickness bar. Example: If you use a bar that is a 1/4" thick (.250"), you will need to add another .250" to your measurement to be within specifications. Figure 72 shows the dimensions of the bar Chrysler uses if you want to make your own

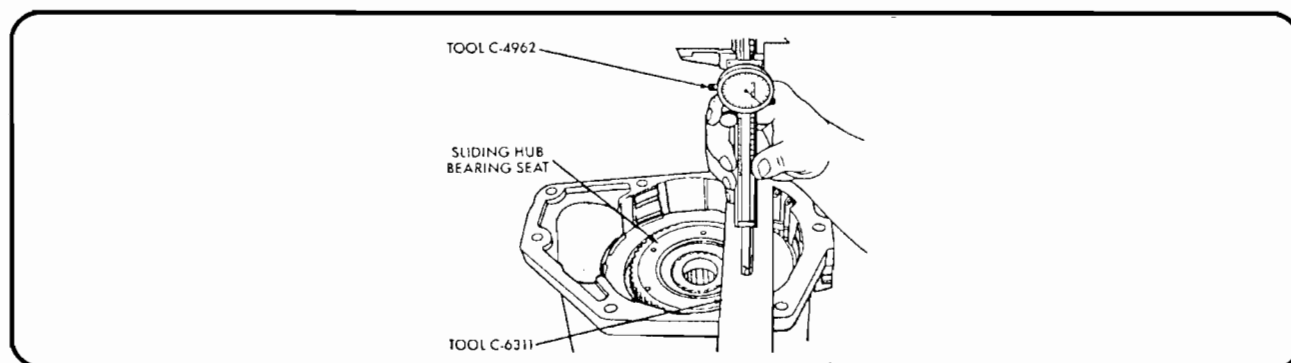


Figure 70

Overdrive Piston Shim Chart

Measurement (Inches)	Spacer Part Number	Spacer Thickness (Inches)
1.7500-1.7649	4431730	.108-.110
1.7650-1.7799	4431585	.123-.125
1.7800-1.7949	4431731	.138-.140
1.7950-1.8099	4431586	.153-.155
1.8100-1.8249	4431732	.168-.170
1.8250-1.8399	4431587	.183-.185
1.8400-1.8549	4431733	.198-.200
1.8550-1.8699	4431588	.213-.215
1.8700-1.8849	4431734	.228-.230
1.8850-1.8999	4431590	.243-.245

Figure 71

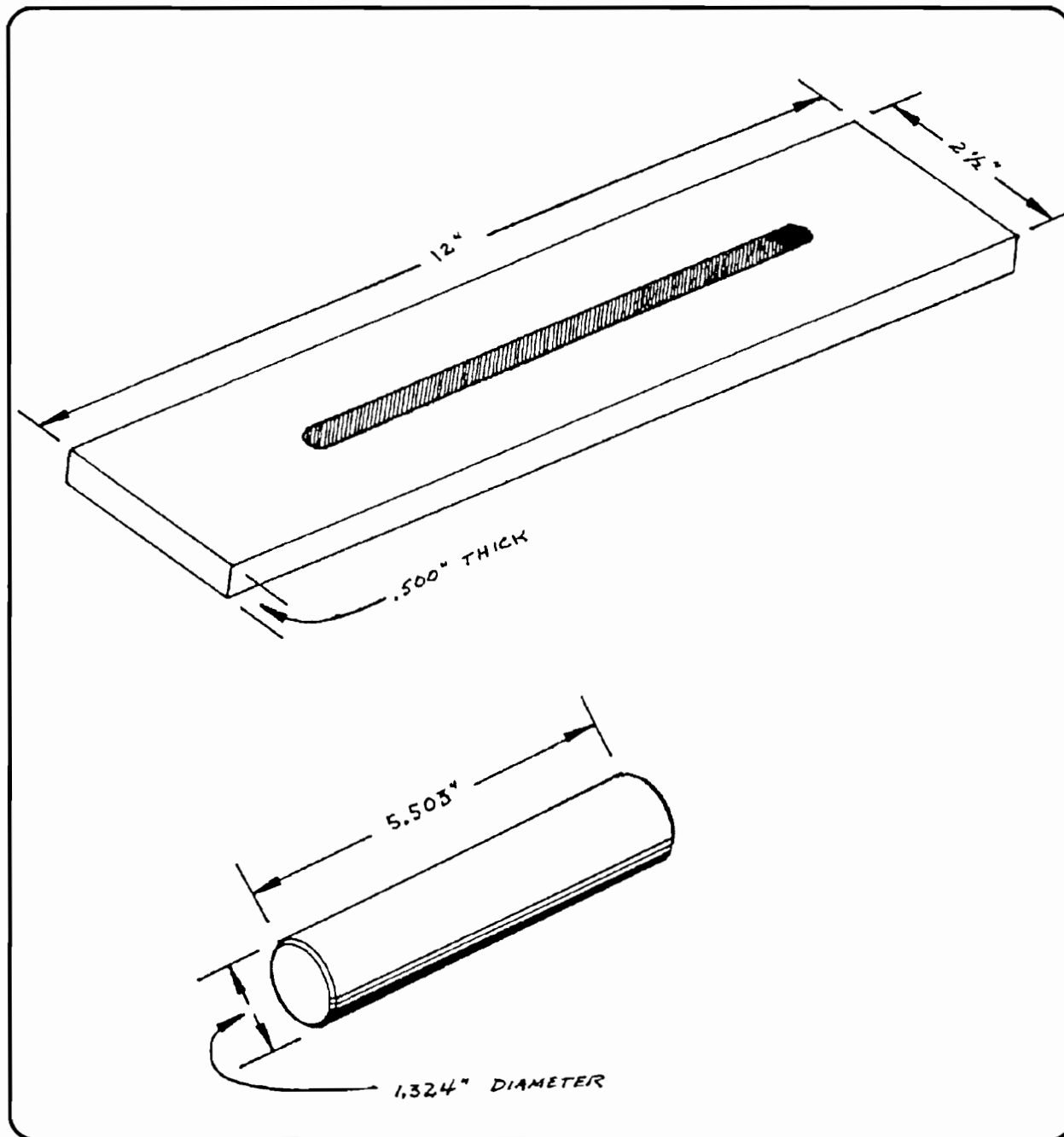


Figure 72

A500 / 518

RATTLE ON 3-4 AND 4-3 SHIFTS

- COMPLAINT: The transmission may exhibit a "rattling" sound when the 3-4 and/or 4-3 shifts occur.
- CAUSE: The clearance in the O.D. clutch pack causes a rattling condition during the apply and release.
- CORRECTION: Install new waved overdrive plates part # 4461181

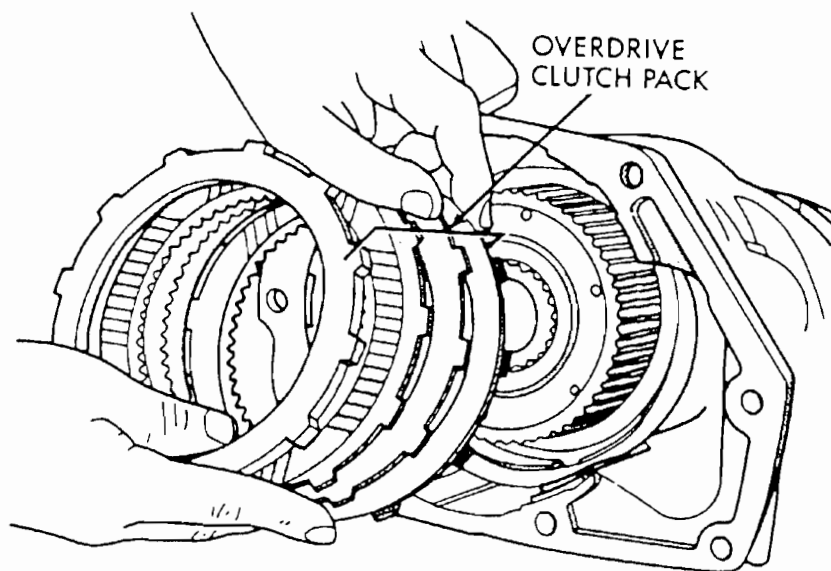


Figure 73

A500 / 518

NEW SUNGEAR AND THRUST PLATE

A new bearing and thrust plate has been designed for better lube to this area. this will retro fit back to all models and is highly recommended

UPDATED THRUST PLATE.....4461125
UPDATED THRUST BEARING.....4461126

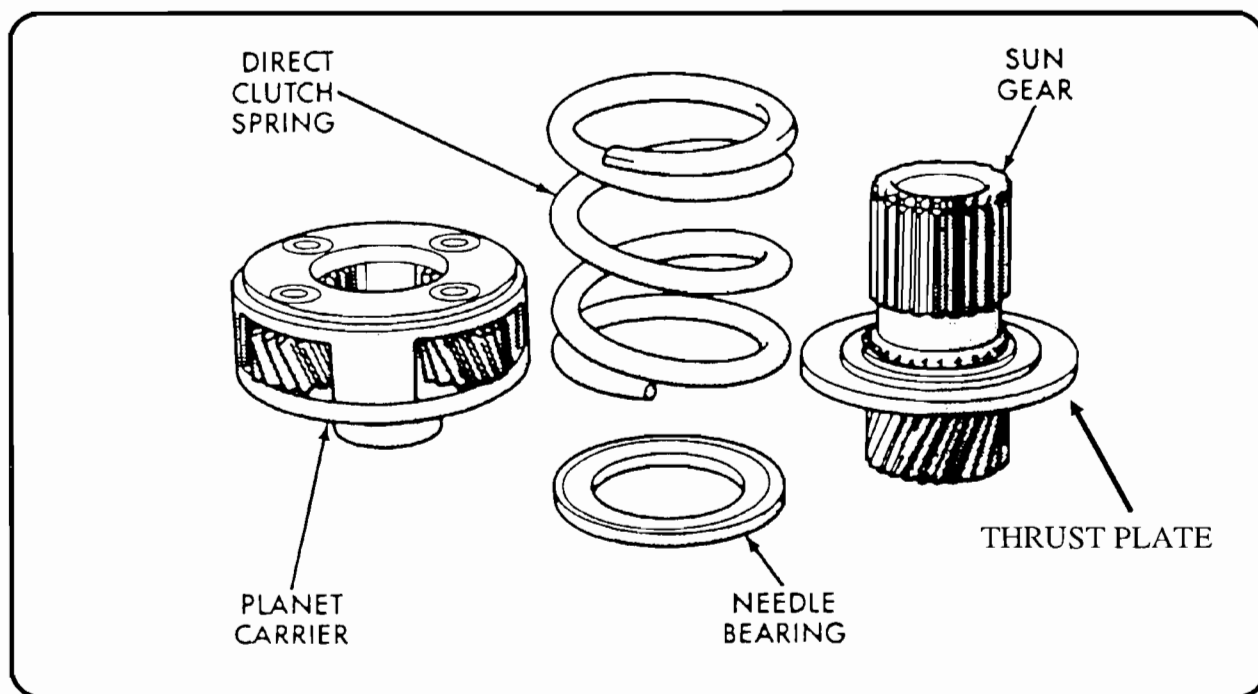


Figure 74

• THE A604 ULTRIDRIVE TRANSAXLE ELECTRICAL DIAGNOSIS

The A604 ultradrive transaxle controller is able to detect malfunctions with the electrical system as well as some of the hydraulic and mechanical malfunctions. When the controller detects a malfunction, it will cause the transaxle to automatically shift to second gear and stay there. This is known as the default or limp-in mode. When this function occurs, the controller will memorize a two digit fault code which can only be retrieved with a hand held scanner. A DRB II from Chrysler, a MONITOR 4000 E from OTC, or a SNAP-ON MT 2500 are a few of the scanners that can interface with the transaxle controller when the appropriate cartridge or card is used. Refer to figure 75 for the different diagnostic connector locations to ensure the proper hook-up of your scanner.

Location:

On the C body, this connector is located inside the vehicle, under the dash, just to the right of the steering column.

On the Y body, this connector is located inside the vehicle, under the dash, to the left of the steering column.

On the A, G, J, P and S bodies, the connector is located inside the vehicle, under the dash, on the extreme left, behind the fuse access panel.

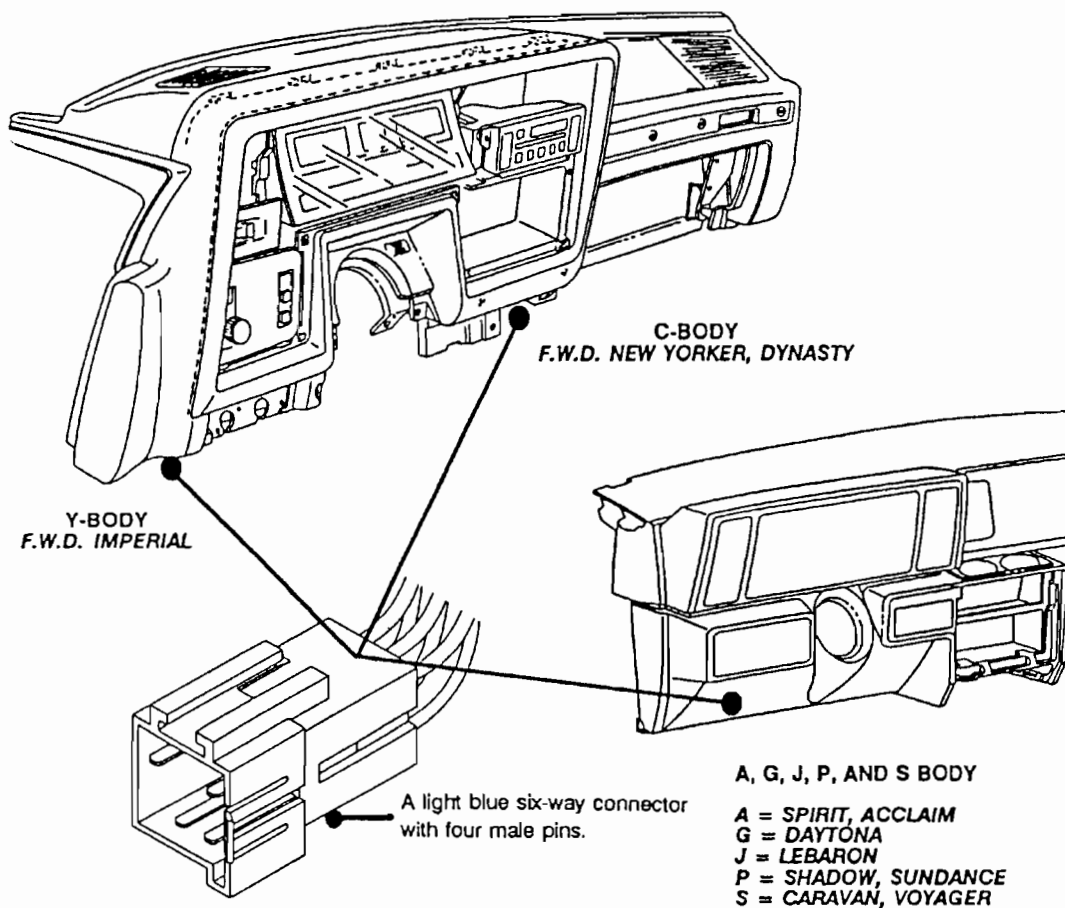


Figure 75

1993 SEMINAR INFORMATION

The solenoid assembly on this transaxle contains 4 solenoids, 3 pressure switches, and 3 resistors. These all can be and should be tested during overhaul. Care must be taken when removing the three 10mm bolts that hold the solenoid body to the case. These bolts have had their threads coated with lock-tite from the factory. Rapid removal of these bolts with an impact could result in broken bolts or stripped holes in the case.

Once the body has been removed, the eight thimble screens that filter the oil into the body can be viewed across the bottom of the assembly. If they are deteriorated, no further testing is required, you need a new solenoid body. If they have not deteriorated, then perform the following electrical diagnosis using a digital ohmmeter.

SOLENOID CHECK - All four solenoids should have 1.5 ohms resistance. Refer to figure 76 for pin locations.

SOLENOID NO. 1 - Connect ohmmeter leads to pins 4 and 5.

SOLENOID NO. 2 - Connect ohmmeter leads to pins 4 and 6.

SOLENOID NO. 3 - Connect ohmmeter leads to pins 4 and 7.

SOLENOID NO. 4 - Connect ohmmeter leads to pins 4 and 8.

RESISTOR CHECK - All three resistors should have 270 - 330 ohms of resistance. Refer to figure 76 for pin locations.

O.D. RESISTOR - Connect ohmmeter leads to pins 4 and 3.

L/R RESISTOR - Connect ohmmeter leads to pins 4 and 2.

2-4 RESISTOR - Connect ohmmeter leads to pins 4 and 1.

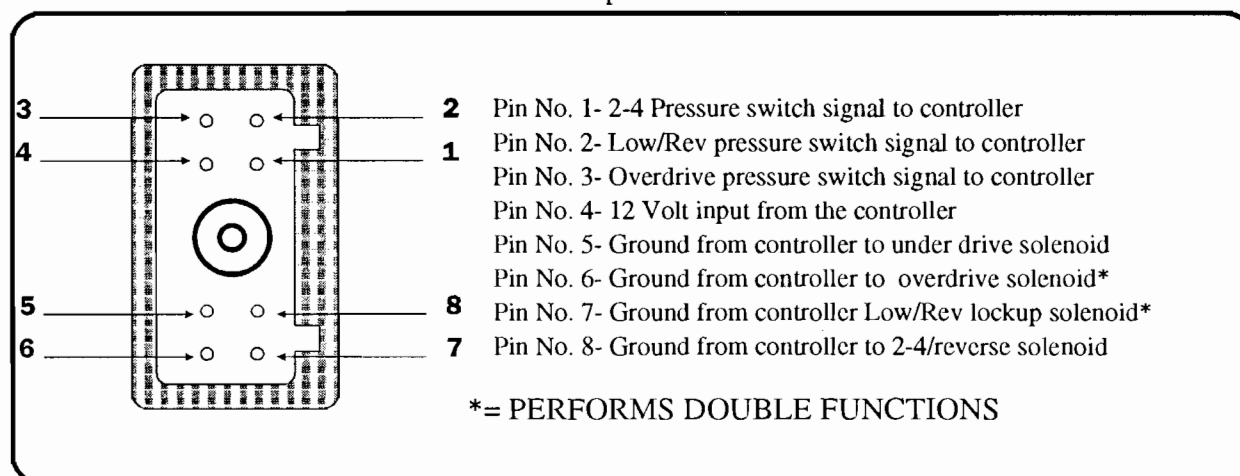


Figure 76

PRESSURE SWITCHES - All three pressure switches are tested with 50 psi of air through the passages show in figure 77. With no air applied to the switch, the ohmmeter should read no continuity. With the air applied, the ohmmeter should read 0 ohms.

O.D. SWITCH - Connect ohmmeter to pin 3 and ground.

L/R SWITCH - Connect ohmmeter to pin 2 and ground.

2-4 SWITCH - Connect ohmmeter to pin 1 and ground.

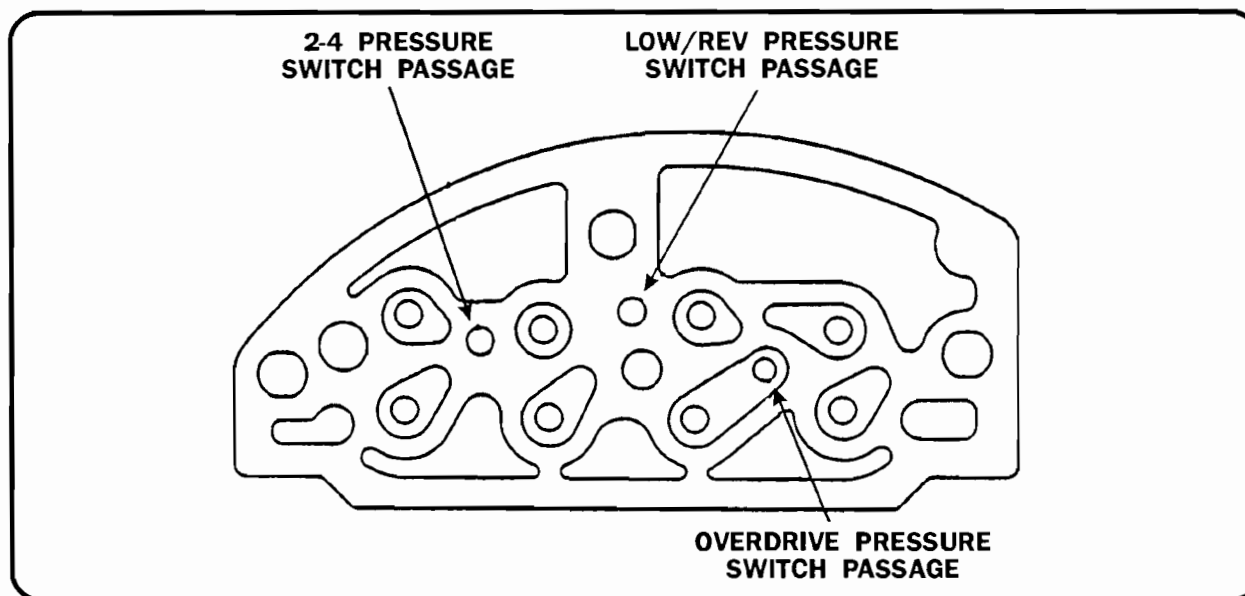


Figure 77

Another check that can be made quickly and easily are the plug connectors. There is an 8 way connector for the solenoid body, a 60 way connector for the transaxle controller (they only use 40 pins), and two 3 way connectors for the PRNDL and safety neutral switch. Check for drag in each pin cavity of the connectors for proper sizing by using the shank of an appropriate size drill bit. This way you can ensure tight connections of each terminal.

1. To check the 8 way connector, use the shank of a #43 drill bit or a .0890 guage. See figure 78.
2. To check the 60 pin connector for the transaxle controller, use the shank of a #53 drill bit or a .0595 guage. See figure 79.
3. To check both 3 way connector for PRNDL and safety nuetral switch, use a #42 drill bit or a .0935 guage. See figure 80.

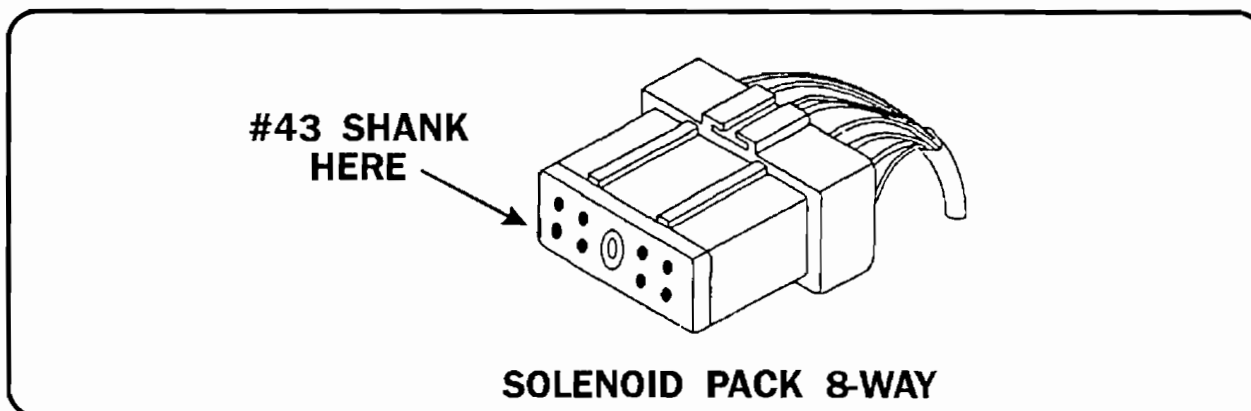


Figure 78

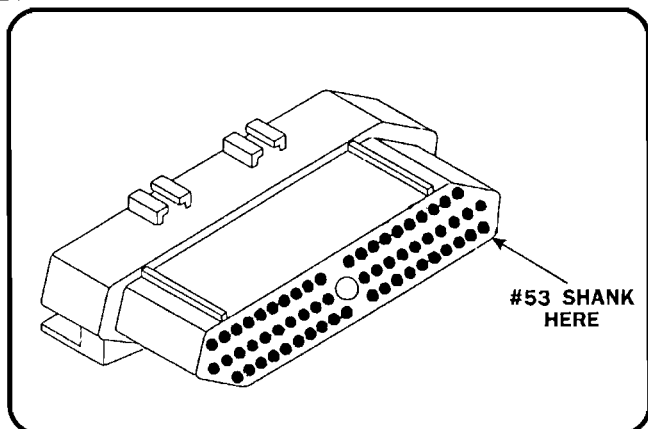


Figure 79

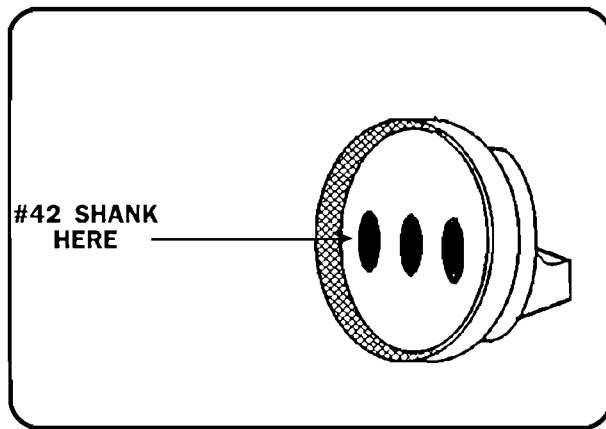


Figure 80

The transaxle controller receives direct input information from sensors and input information over the C2D bus system. The C2D bus system is a pair of twisted wires that relays information the engine control module uses with the transaxle controller and other vehicle controllers if so equipped. As shown in figure 81, some of the direct inputs to the transaxle controller is the throttle position sensor, battery feed, cranking signal, ignition run signal, engine speed, output speed sensor, input speed sensor, neutral safety switch, PRNDL switch, and the three pressure switches in the solenoid body. All the other inputs such as the coolant sensor, ambient sensor, brake switch, map sensor etc., come into the controller over the C2D link. (C2D=CEE SQUARED "D" = which also can be written as CCD)

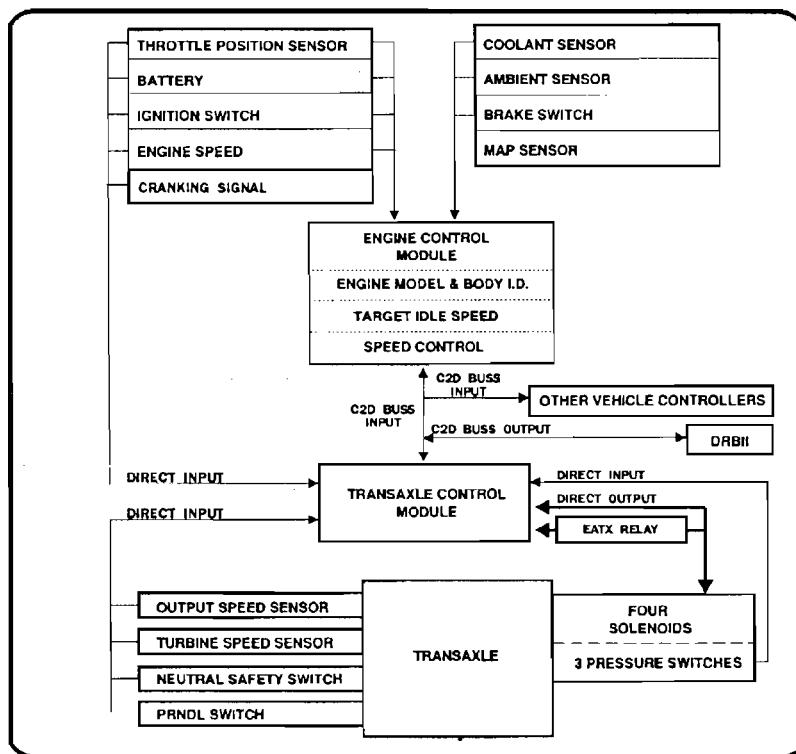


Figure 81

1993 SEMINAR INFORMATION

Once the controller receives this input, it then processes this information through logic circuits and sends output signals to control shift timing and shift feel of the transaxle. Similar to the input signals it has two output signals. A direct output signal is sent to the EATX relay and the solenoid body. The purpose of this relay is to make operating voltage available to the solenoid and switches located in the solenoid pack. The controller is constantly monitoring the system and if it recognizes a problem it opens the relay taking the voltage away from the solenoid body. This puts the transaxle in a limp-in mode. In figure 82 we show you where the EATX relay is located. The second output signal is over the C2D bus system where a hand held scanner can access the system for diagnostic purposes. In 1992 this link has been changed. Any previous year cartridge used in your scanner is unable to interface with this system, a specific 1992 and up cartridge is required.

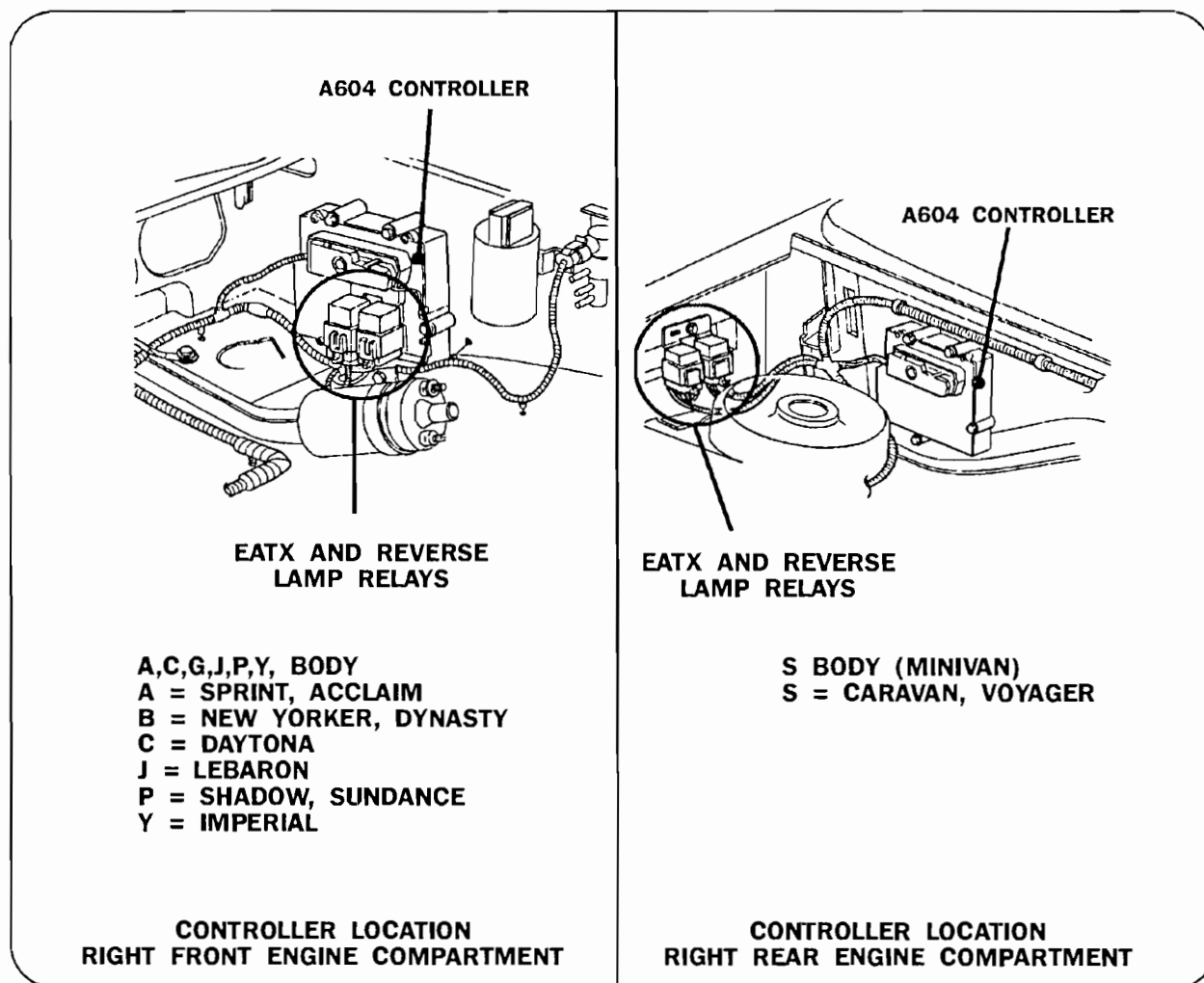


Figure 82

NOTE: Since the EATX and the reverse lamp relay connectors could be installed in either position, you must use the wire colors in the connectors to identify the correct relay.

- (1) The EATX relay has a red and a green wire in its connector.
- (2) The reverse lamp relay has a white and a violet wire in its connector.

CHRYSLER A-604 TRANSAXLE CONTROLLERS

1989-1991 MODEL CONTROLLERS

PART NUMBER: 5234623, 5234649, 5234678.

These are all early 1989 controllers, used on all models, and would allow only a 3-1 closed throttle downshift.

PART NUMBER: 4557120.

This controller was introduced as a running change during 1989 model year. It featured sequential downshifts (3-2-1) instead of 3-1 downshifts as the previous controllers. Another improvement incorporated is less 3-4 shift business under load at highway speeds, or with the cruise control engaged. This controller will replace all previous controllers.

PART NUMBER: 4557585.

This controller was introduced as a running change during 1990 model year. It has further refinements of the logic to eliminate the 3-4 shift business under load at highway speeds, or with the cruise control engaged. It also allowed the converter clutch to release in 4th gear for more available engine torque when it was required. This controller will replace all previous model controllers.

PART NUMBER: 4672104.

This controller was introduced for the 1991 model year with further refinement of the logic. This controller will replace all previous controllers.

PART NUMBER: 4672002.

This controller was introduced as a running change during 1991 model year. This controller will replace all previous model controllers.

PART NUMBER: 4672105.

This is the latest controller available and is preferred over all other controllers for 1989 thru 1991 model years ONLY. It WILL NOT work on 1992 model vehicles as there was a different C2D Bus system on 1992 models.

1992 MODEL CONTROLLERS

PART NUMBER: 4672203.

This controller fits all 1992 models EXCEPT, New Yorker, 5th Avenue, and Imperial. This controller WILL NOT replace ANY previous models. It fits 1992 models ONLY.

PART NUMBER: 4672216.

This controller fits all 1992 New Yorker, 5th Avenue, and Imperial ONLY. It will not work on any other 1992 models. This controller WILL NOT replace ANY previous models. It fits 1992 models ONLY.

CHRYSLER A604

1991 UPDATES

1. If the case is cast for the new cooler bypass valve (bump between fittings), and not bored for the valve, the pump cover micro finish is bad where the turbine shaft rings ride, and the pump cover should be replaced.
2. If the case is cast for the new cooler bypass valve (bump between fittings), and the cooler bypass valve is installed (in case under pump), the pump cover micro finish is ok to use.
3. Chatter on the 1-2 shift, change the 2-4 lined clutch plates to borg-warner plates, oem part number 4567212.
4. Clunk on the 2-1 downshift and/or double bump engagement feel, change the low/reverse clutch piston retainer to oem part number 4431648.
5. If unit is overfilled by 1/2 quart, foaming will result because of gear train spinning in the transmission fluid, and possible burn-up could result.
6. If fluid foaming is detected on the dipstick, use foaming agent part number 659, and correct fluid level.
7. PRNDL and neutral safety switch insulators should be black in color, "do not" use switches that have brown insulators.
8. Differential bolts that are stamped "E" are defective, do not use them. Also roll pins walk out frequently, lock-tite them in place.
9. Transaxle shim kit, oem part number 5241065, contains shims for all selectives. (about 10 of each selective shim and costs \$124.00.)
10. If the weld on input sun gear/2-4 hub assembly shows bubbles, replace it with oem part number 4431622.
11. Wire harness by air-conditioning compressor bracket wears through the insulation and creates all kinds of different problems.
12. Use 7176 Chrysler oil when experiencing clutch chatter or squawks on shifts and/or when the converter clutch shudders as well.
13. Input shaft speed sensor part #4412878
14. Output shaft speed sensor part #4412879.

CHRYSLER A-604 (41TE) NO SHIFT AFTER FLUID CHANGE

- COMPLAINT:** After a routine maintenance service, including fluid and a new filter, some A-604 transaxles will go to the limp mode after the first shift. Second gear will be the only forward gear possible.
- CAUSE:** If air is introduced into the hydraulic system, the A-604 controller may momentarily record no line pressure and enter the limp mode. This is especially true if the engine is restarted before adding sufficient fluid.
- CORRECTION:** If the transaxle enters the limp mode after a service, shutting the engine off and restarting it will usually solve the problem. If the controller continues to receive a no pressure reading for a period of time, it may set multiple codes. If shutting off and restarting the engine does not solve the problem, then it will be necessary to disconnect the battery or use a scanner tool to clear the codes.
- NOTE:** Always replace the filter "O" ring and pre-fill the filter with clean fluid. (see figure 83).

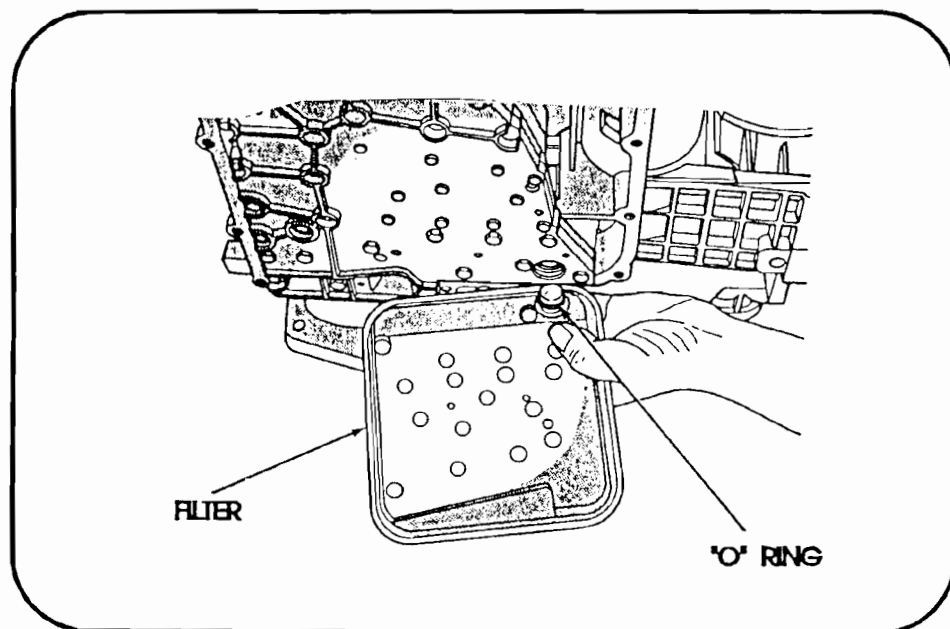


Figure 83

CHRYSLER A604

PREMATURE FAILURE OF O.D. AND REVERSE CLUTCHES

COMPLAINT: Premature failure of the overdrive and the reverse clutch plates, and all lip seals and "O" rings are good.

CAUSE: The cause may be an orifice and screen assembly blown out of the overdrive/reverse piston (see figure 84).

CORRECTION: Replace the Orifice/Screen Assembly with a new one, available under OEM part number 4531903, and stake the new assembly in place (See figure 85). They were not all staked in place at the factory.

SERVICE INFORMATION:

Overdrive/Reverse Piston Orifice/Screen Assy 4531903

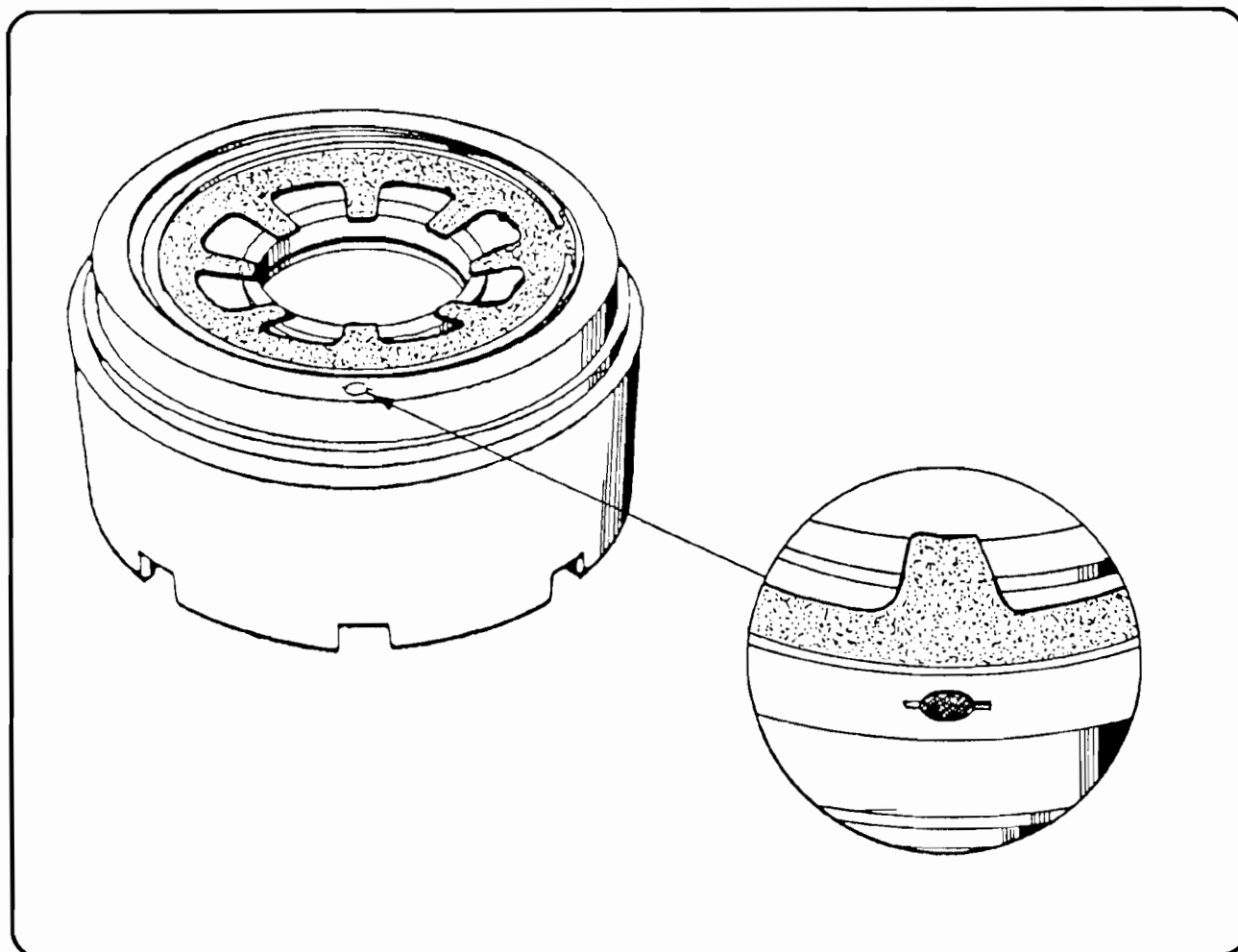


Figure 84

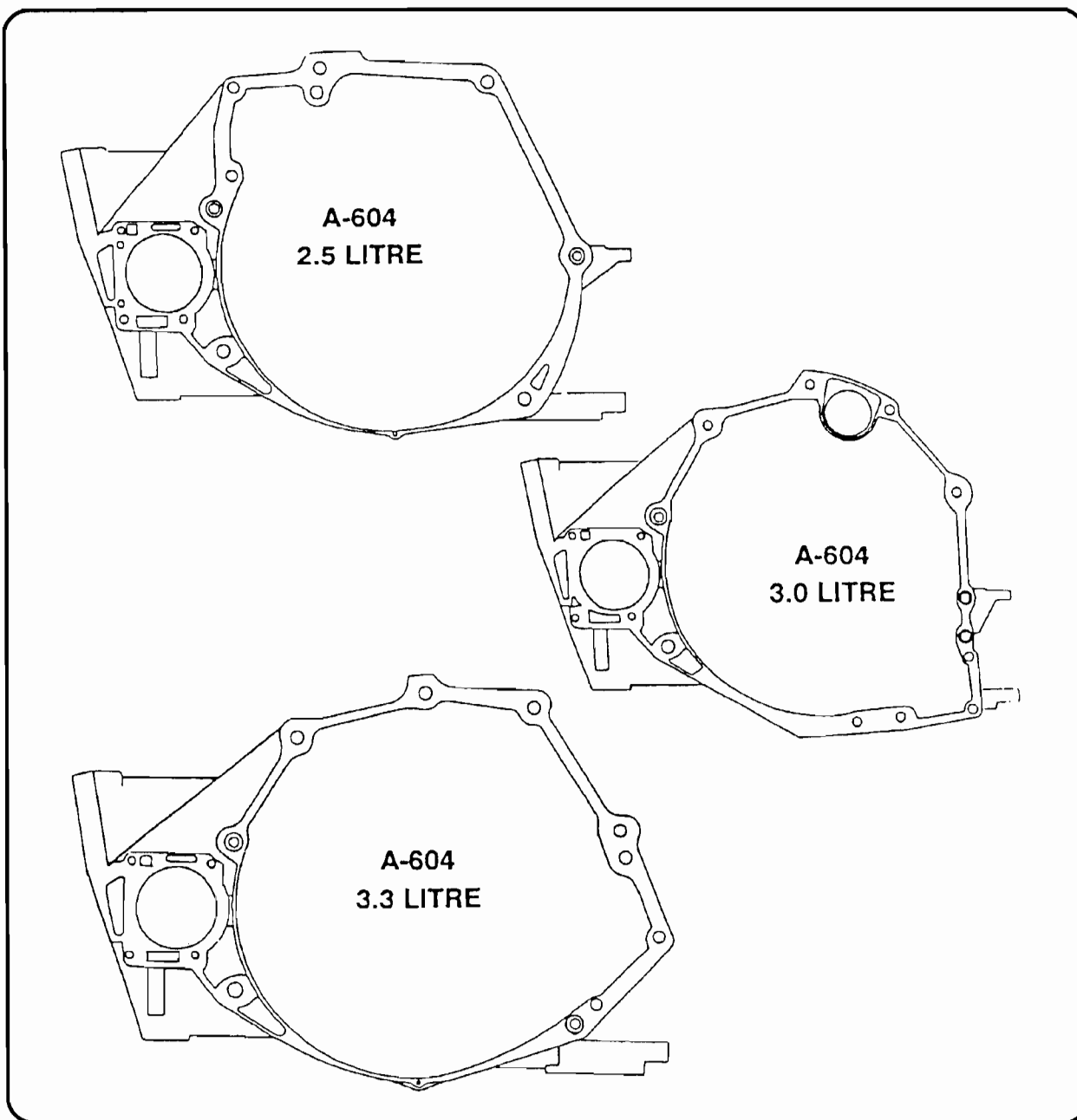


Figure 85