G.M. 4T80-E

INDEX

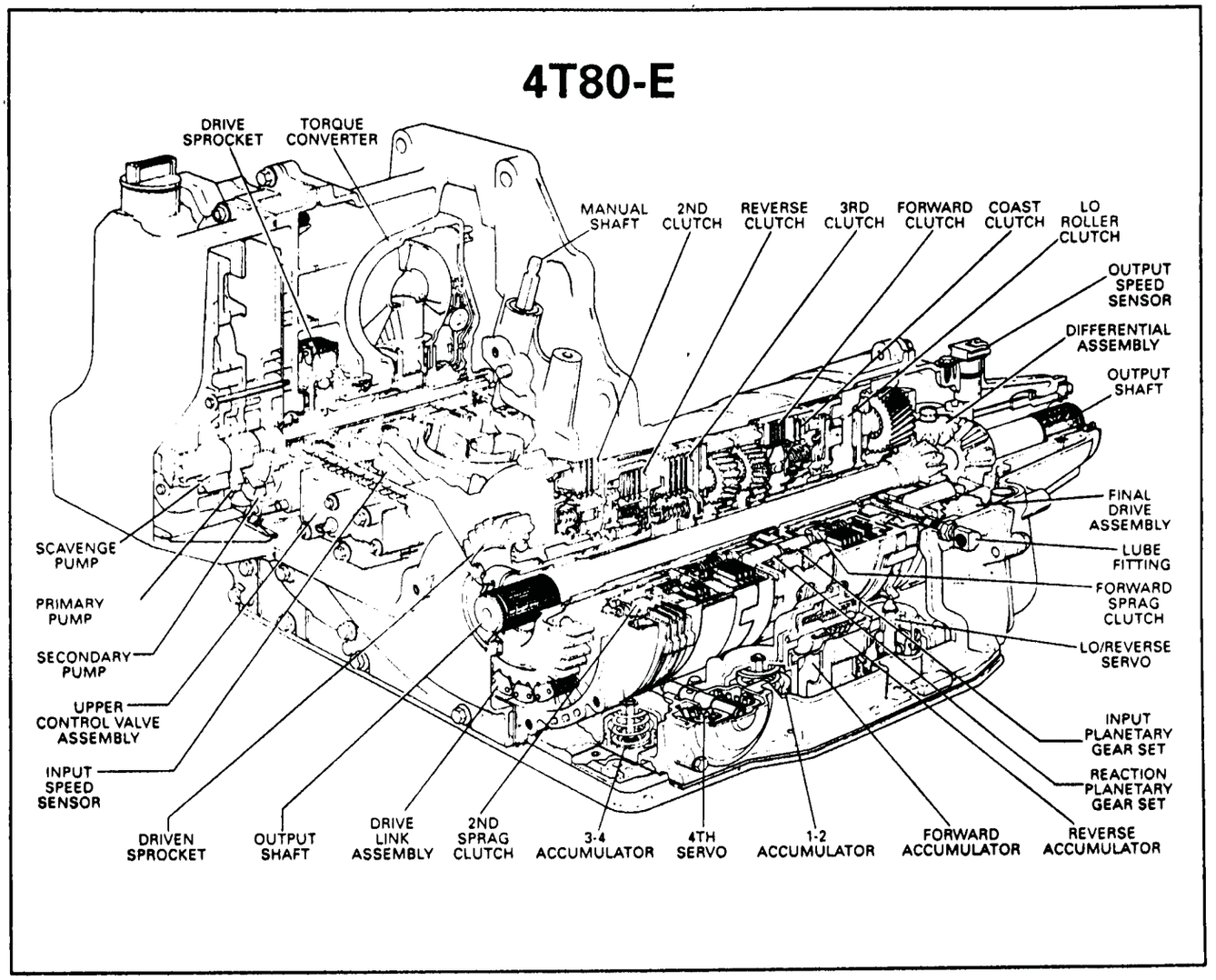
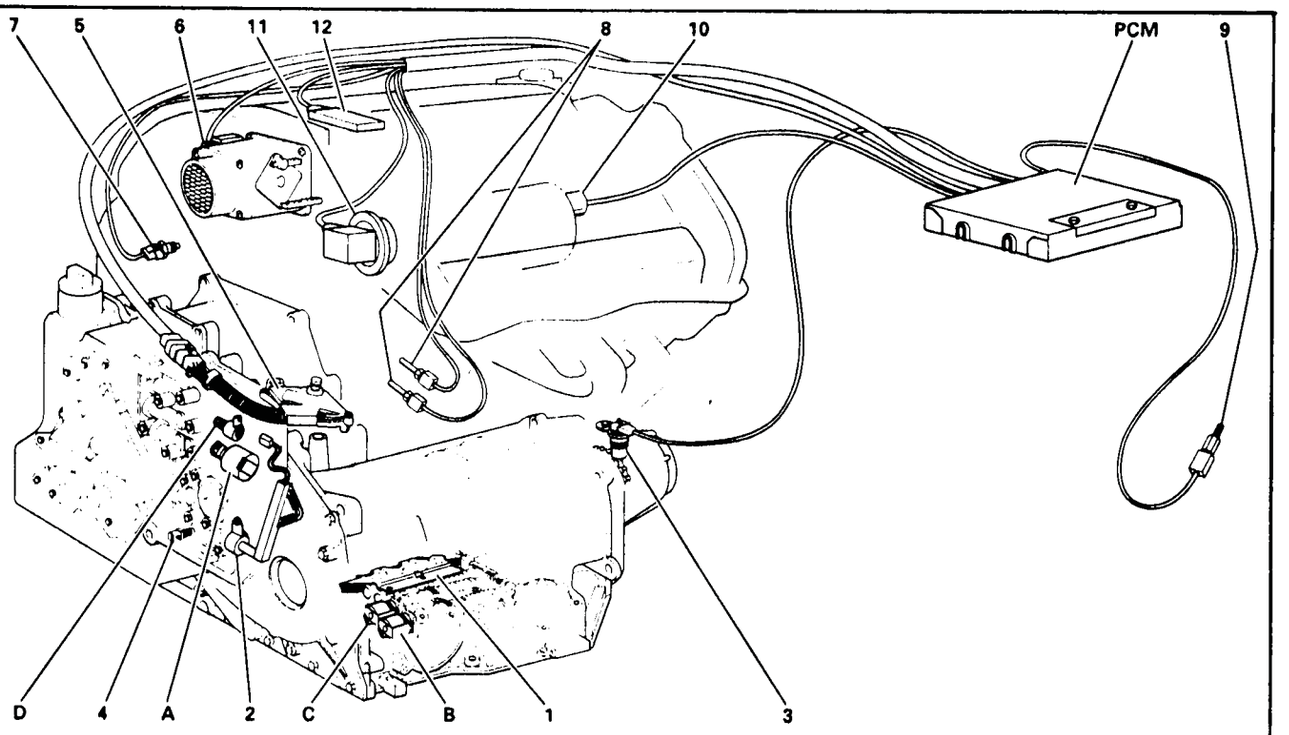

4T80-E
DRIVE SPROCKET
TORQUE CONVERTER
MANUAL SHAFT
2ND CLUTCH
REVERSE CLUTCH
3RD CLUTCH
FORWARD CLUTCH
COAST CLUTCH
LO ROLLER CLUTCH
OUTPUT SPEED SENSOR
DIFFERENTIAL ASSEMBLY
OUTPUT SHAFT
FINAL DRIVE ASSEMBLY
LUBE FITTING
FORWARD SPRAG CLUTCH
LO/REVERSE SERVO
INPUT PLANETARY GEAR SET
REACTION PLANETARY GEAR SET
REVERSE ACCUMULATOR
FORWARD ACCUMULATOR
1-2 ACCUMULATOR
4TH SERVO
3-4 ACCUMULATOR
2ND SPRAG CLUTCH
DRIVE LINK ASSEMBLY
OUTPUT SHAFT
DRIVEN SPROCKET
INPUT SPEED SENSOR
UPPER CONTROL VALVE ASSEMBLY
SECONDARY PUMP
PRIMARY PUMP
SCAVENGE PUMP

Figure 1



INPUTS

INFORMATION SENSORS

1. TRANSAXLE PRESSURE SWITCH
2. TRANSAXLE INPUT SPEED SENSOR
3. TRANSAXLE VEHICLE SPEED SENSOR
4. TRANSAXLE TEMPERATURE SENSOR
5. TRANSAXLE RANGE SWITCH
6. THROTTLE POSITION (TP) SENSOR
7. ENGINE COOLANT TEMPERATURE (ECT) SENSOR
8. CRANKSHAFT POSITION SENSORS
9. TORQUE MANAGEMENT BRAKE SWITCH
10. AIR CONDITIONING (A/C) SWITCH
11. CRUISE CONTROL OPERATION
12. MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR

ELECTRONIC CONTROLLERS

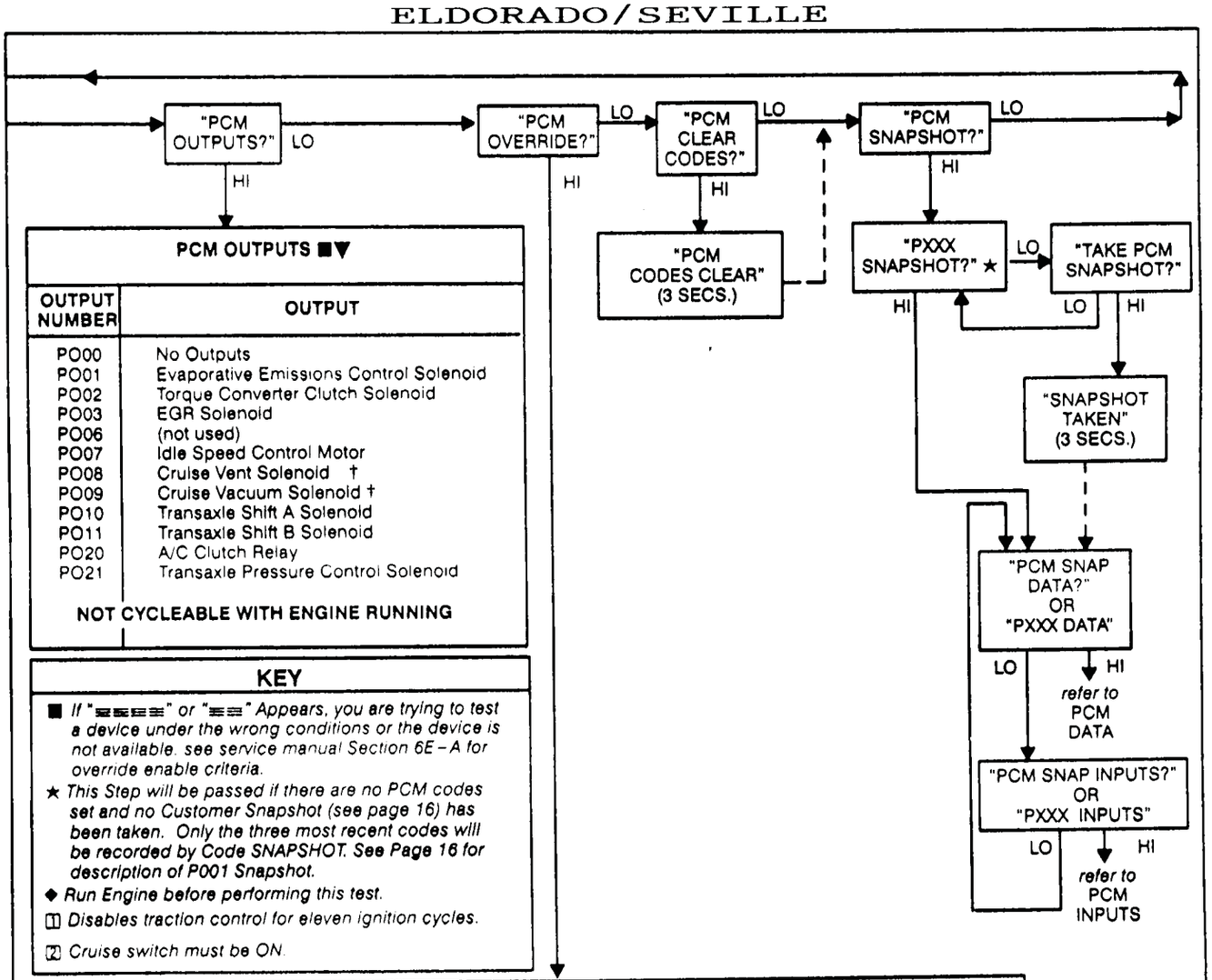
- POWERTRAIN CONTROL MODULE (PCM)

OUTPUTS

ELECTRONICALLY CONTROLLED TRANSMISSION COMPONENTS

A. PRESSURE CONTROL SOLENOID
B. SHIFT SOLENOID "A"
C. SHIFT SOLENOID "B"
D. TCC CONTROL SOLENOID

ELDORADO/SEVILLE



PCM OUTPUTS ■▼

OUTPUT NUMBER	OUTPUT
PO00	No Outputs
PO01	Evaporative Emissions Control Solenoid
PO02	Torque Converter Clutch Solenoid
PO03	EGR Solenoid
PO06	(not used)
PO07	Idle Speed Control Motor
PO08	Cruise Vent Solenoid †
PO09	Cruise Vacuum Solenoid †
PO10	Transaxle Shift A Solenoid
PO11	Transaxle Shift B Solenoid
PO20	A/C Clutch Relay
PO21	Transaxle Pressure Control Solenoid

NOT CYCLEABLE WITH ENGINE RUNNING

KEY

■ *If "≡≡≡" or "≡≡" Appears, you are trying to test a device under the wrong conditions or the device is not available. see service manual Section 6E-A for override enable criteria.*

★ *This Step will be passed if there are no PCM codes set and no Customer Snapshot (see page 16) has been taken. Only the three most recent codes will be recorded by Code SNAPSHOT. See Page 16 for description of P001 Snapshot.*

◆ *Run Engine before performing this test.*

[1] *Disables traction control for eleven ignition cycles.*

[2] *Cruise switch must be ON.*

PCM OVERRIDE ■

OUTPUT OVERRIDE NUMBER	OUTPUT OVERRIDE	OVERRIDE ACTION COOLER	OVERRIDE ACTION WARMER
PS00	No Override		
PS01	Torque Converter Clutch Solenoid	Off	On
PS02	EGR Solenoid	Decrease	Increase
PS03	ISC Motor	Retract	Extend
PS04	Injector Disable (1 thru 8)	Disable	Select
PS05	Fuel Pump Relay	Off	On
PS06	AIR Pump (not used)		
PS07	Cruise Control Servo◆ [2]	Release	Pull In
PS08	Cooling Fan Relay	Low Speed Fan Relay	High Speed Fan Relay
PS09	Temporary Spark Advance	Retard	Advance
PS10	Injector Flow	Select	Test
PS11	Transaxle Override	Upshift	Downshift
PS12	Long Term Fuel Trim Reset	Reset	No Action
PS13	TP Sensor & Idle Learn/Garage Shift Adapt Reset	Reset Learn	Reset Adapt
PS14	Transaxle Shift/Steady State Adapt Reset	Reset Shift	Reset Steady
PS15	Transaxle Oil Life	Decrease	Increase
PS20	Transaxle Pressure Control	Decrease	Increase
PS21	Knock Sensor Test	Advance	No Action
PS22	Permanent Spark Retard	Retard	Advance
PS23	Generator	Off	On
PS24	Traction Control Disable [1]	Enable	Disable

1993 HYDRA-MATIC 4T80-E LINE PRESSURE CHECK PROCEDURE

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

Gear Range	Line Pressure Range
Drive, Park or Neutral	Minimum line 50-55 psi., Maximum line 230-250 psi.
Reverse	Minimum line 90 psi., Maximum line 300 psi.

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

1. Start the engine and set parking brake.
2. Enter On-board diagnostics.
3. Check for a stored transaxle pressure control solenoid malfunction code P076, or other malfunction codes.
4. Repair vehicle if necessary.

   Inspect
   - **Fluid level**
   - **Manual linkage at transaxle**
   - **Install line pressure gage.**
5. Put gear selector in Park and set the parking brake.
6. Start engine and allow it to warm up at idle.
7. Enter diagnostics and select "PCM output override" level.
8. Access the "override" transaxle pressure control solenoid test (PS20).
9. Increase TRANSAXLE PRESSURE CONTROL SOLENOID pressure signal and read the corresponding line pressure on the pressure gage. (Allow pressure to stabilize for 5 seconds after each pressure change.)
10. Compare data to the Drive-Park-Neutral line pressure chart below.
    NOTE: This line pressure is valid for TPC Solenoid overrides with vehicle stopped at idle and in Park-Neutral.

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

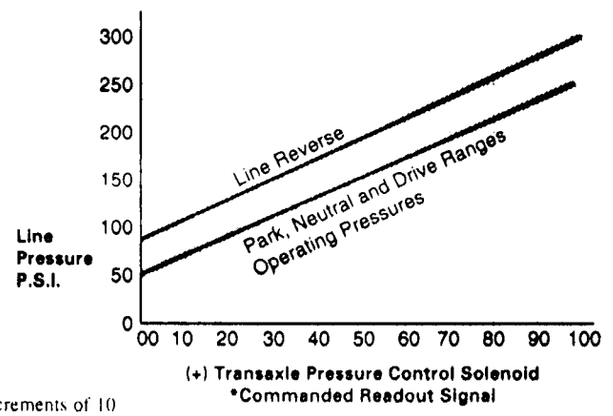
If pressure readings differ greatly from the line pressure chart, refer to the Diagnosis Charts contained in this section.

Dynamic Line Pressure Testing:

The vehicle diagnostic overrides are designed to control the transaxle pressure control solenoid in Park and Neutral with the vehicle stopped at idle and in a dynamic mode during road testing. Under dynamic testing conditions the transaxle pressure control solenoid pressure signal can be overridden to increase pressure from normal PCM commanded pressure. During road test conditions, high line pressures can be commanded to verify line pressure system response.

To verify line pressure response in the dynamic mode, access PCM output override transaxle pressure control solenoid test PS20 and drive the vehicle under normal road test conditions. While driving the vehicle, depress the warmer button to gradually increase the transaxle pressure control solenoid signal. As the transaxle pressure control solenoid signal increases transaxle upshifts should become progressively harsher. This occurs because higher than required line pressures are commanded in this test mode.

If pressure readings differ greatly from the line pressure chart, refer to the Diagnosis Charts contained in this section.



* (+) Signal time is shown in increments of 10

Cooler Flow Rates: 1500 + RPM = 7-9 Litres at Min Line, 12-14 at Max Line, Per Minute.

Figure 11

1 LEFT SCAVENGE SUCTION
2 RIGHT SCAVENGE SUCTION
3 SCAVENGE OUTLET
56 VOID

OIL PUMP PASSAGES
SCAVENGER SIDE

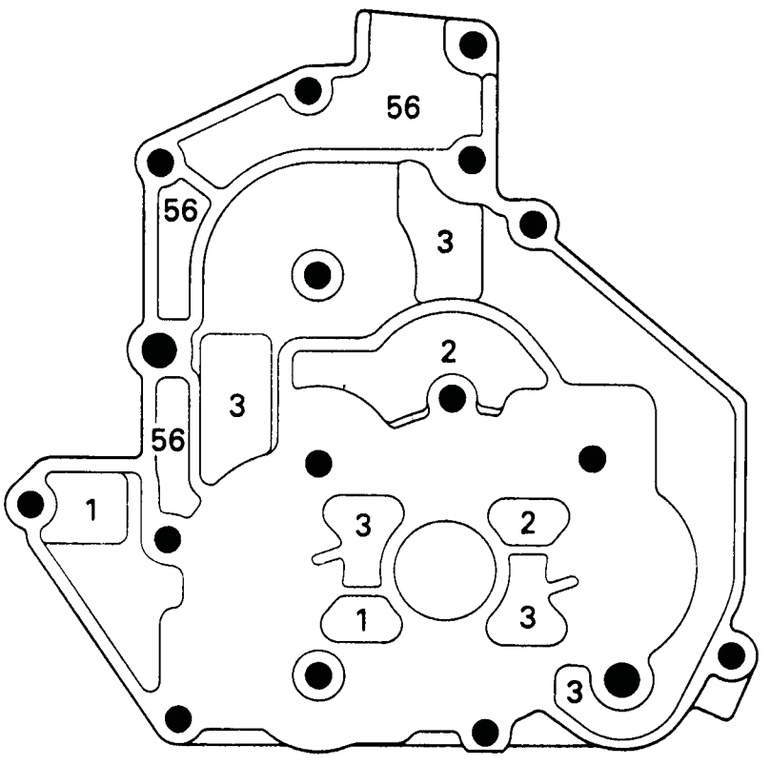


Figure 21

1 LEFT SCAVENGE SUCTION
2 RIGHT SCAVENGE SUCTION
3 SCAVENGE OUTLET
6 LINE
56 VOID

OIL PUMP PASSAGES
PRIMARY SIDE

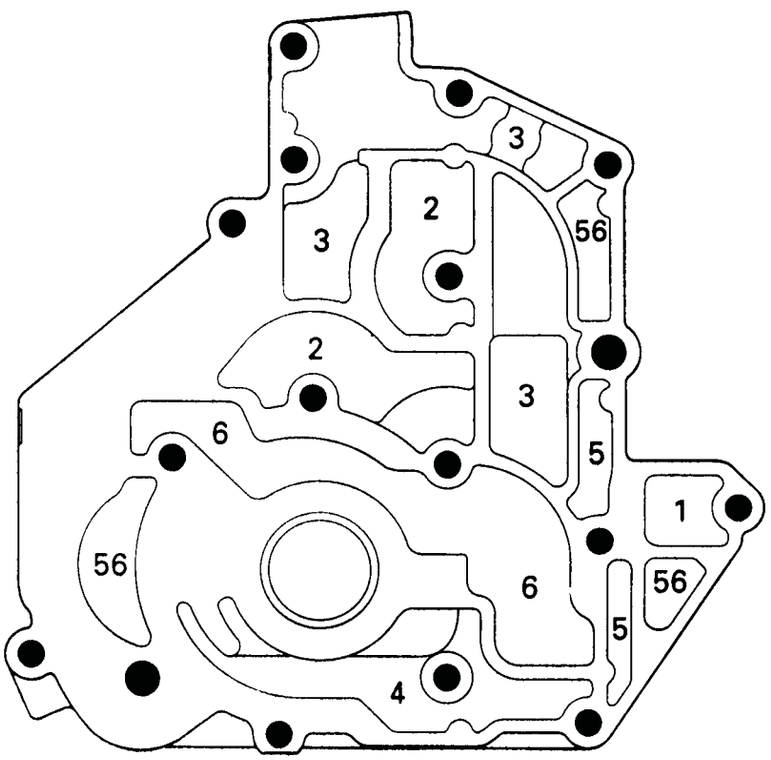
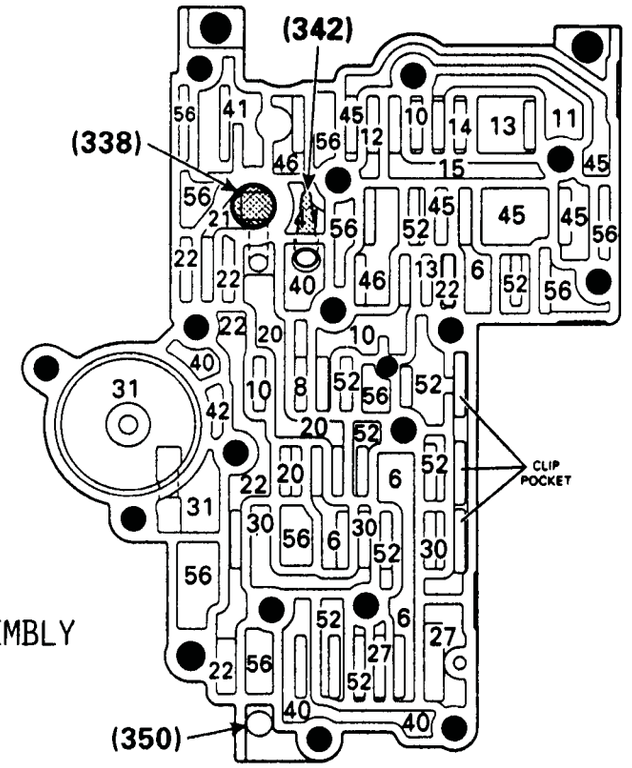


Figure 22

6 LINE
8 CONVERTER FEED
10 TCC FEED LIMIT
11 CONVERTER RELEASE
12 CONVERTER APPLY
13 TCC EXHAUST ENABLE
15 TO COOLER
20 ACTUATOR FEED
21 FILTERED ACTUATOR FEED
22 TORQUE SIGNAL
27 PRIMARY ACCUMULATOR
30 SECONDARY 2-3 ACCUMULATOR
31 2-3 ACCUMULATOR
40 3RD CLUTCH
41 FILTERED 3RD CLUTCH
45 REGULATED APPLY
46 TCC CONTROL
52 EXHAUST
56 VOID



UPPER CONTROL VALVE ASSEMBLY

Figure 31

1 LEFT SCAVENGE SUCTION
2 RIGHT SCAVENGE SUTION
5 SUMP
6 LINE
9 LUBE 2
16 LUBE
20 ACTUATOR FEED
27 PRIMARY ACCUMULATOR
29 1-2 ACCUMULATOR
32 REVERSE
33 REVERSE CLUTCH
39 2ND CLUTCH
40 3RD CLUTCH
42 ORIFICED 3RD CLUTCH
52 EXHAUST
54 DRAIN
55 OVERFLOW
56 VOID

CASE PASSAGES - SIDE

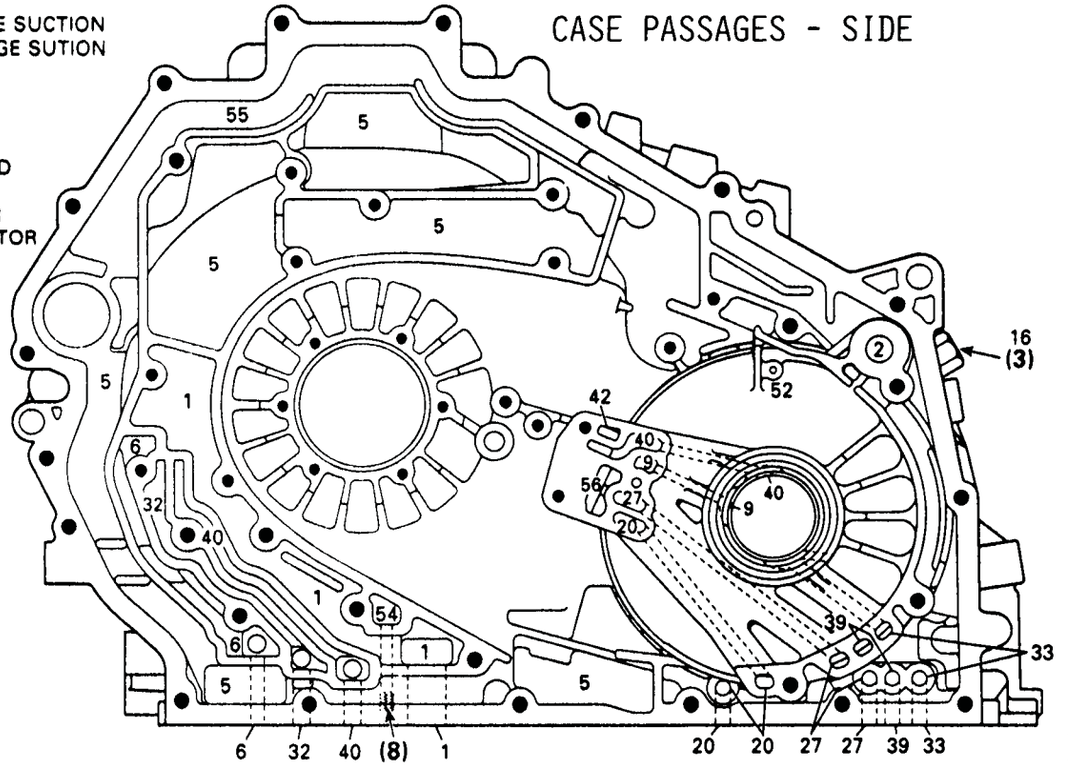


Figure 32

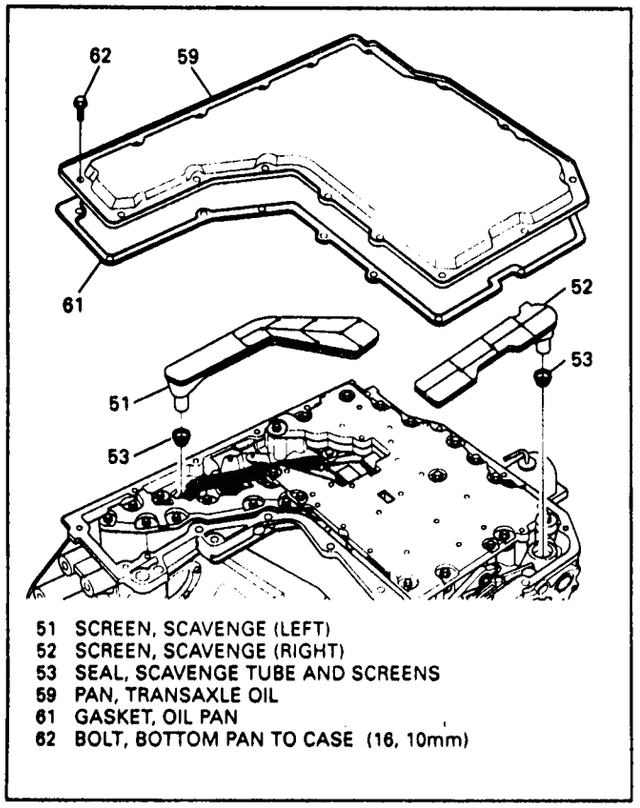


Figure 45

BOTTOM PAN, GASKET AND SCAVENGE SCREENS

1. Remove 16 bottom pan bolts using a 10mm socket (See Figure 45).
2. Remove bottom pan, and discard gasket.
3. Remove left scavenge screen and seal as shown in Figure 45.
4. Remove right scavenge screen and seal as shown in Figure 45.
5. A small screwdriver may be used to pry seals from the case using care not to damage the case bores.
6. Use a small screwdriver to disconnect shift solenoids A and B and transaxle pressure switch connectors by prying back small tabs, shown in Figure 46.
7. Remove nine 10mm bolts from the oil transfer plate (See Figure 47).
8. Remove oil transfer plate.
9. Remove manual valve linkage clip using a small screwdriver as shown in Figure 46.
10. Remove two 10mm bolts(958) and two 10mm nuts(955) from lower valve body assembly as shown in Figure 47

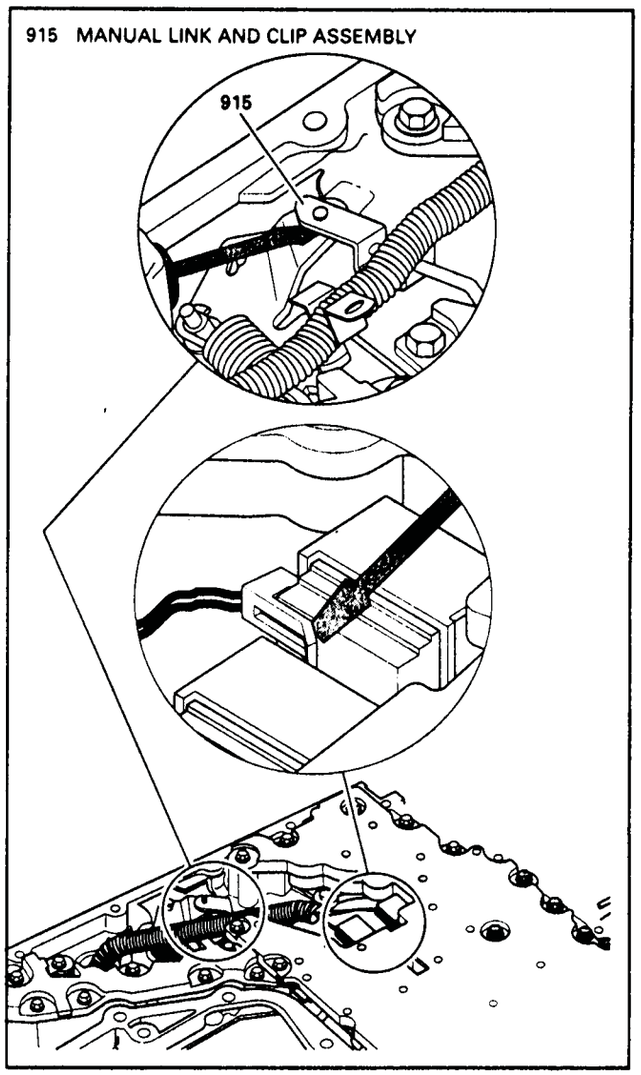
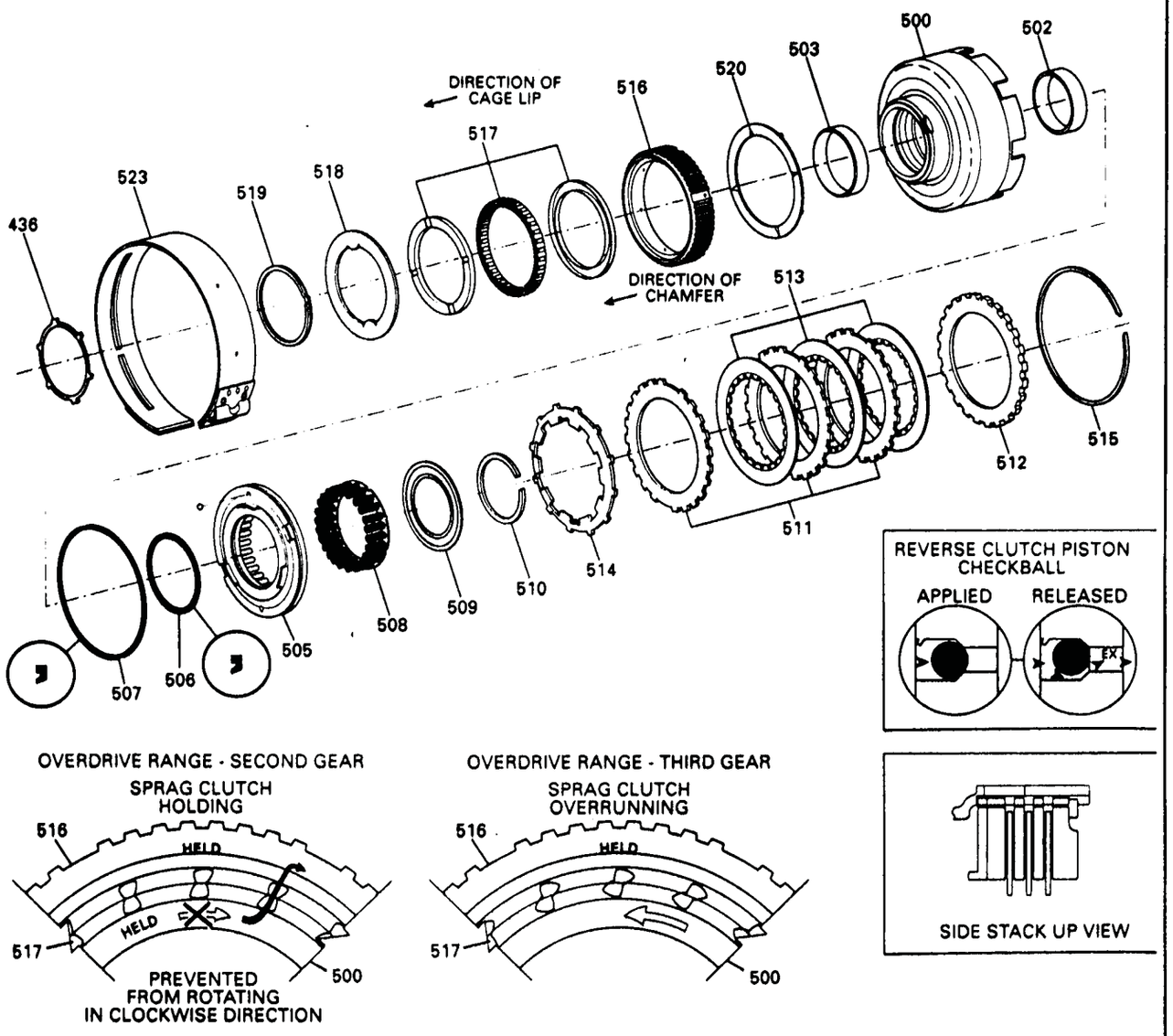


Figure 46

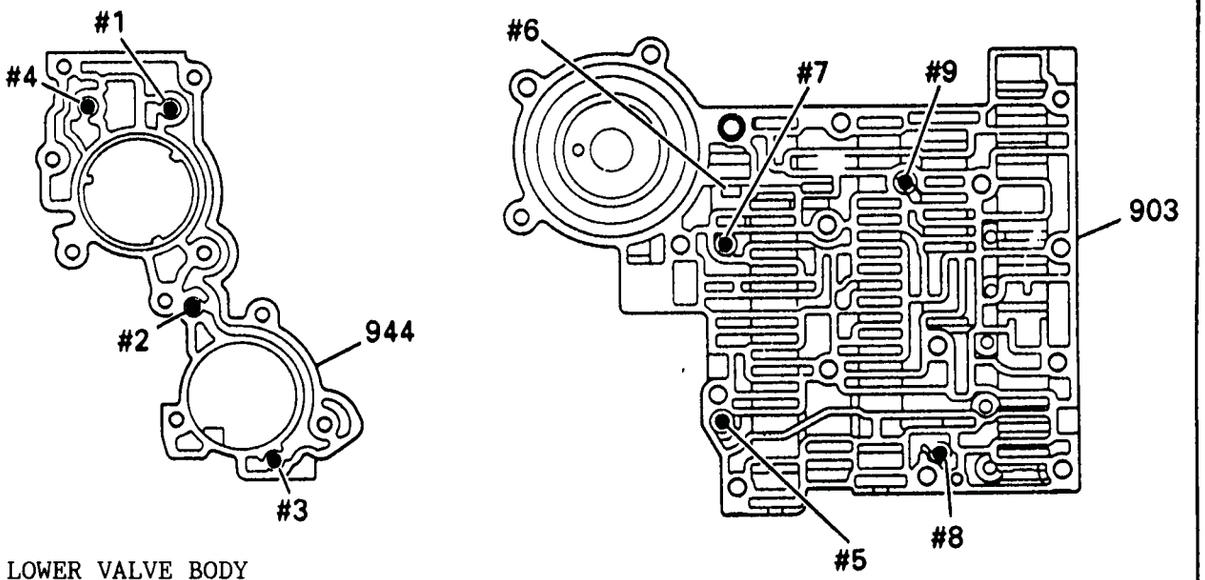
11. Remove nine 10mm bolts from lower valve body assembly as shown in Figure 47.
12. DO NOT remove the four bolts indicated in Figure 47 at this time.
13. Lift lower channel plate, valve body assembly and accumulator assembly from case as a single unit and set aside. (See Figure 47).



436 WASHER, THRUST (SUPPORT/REV. CLUTCH)
500 HOUSING, REVERSE CLUTCH AND RACE ASSEMBLY
502 BUSHING, (SMALL)
503 BUSHING, (LARGE)
505 PISTON ASSEMBLY, REVERSE CLUTCH
506 SEAL, (INNER)
507 SEAL, (OUTER)
508 SPRING AND RETAINER ASSEMBLY
509 RETAINER, SNAP RING
510 RING, SNAP (RETURN SPRING)
511 PLATE, REVERSE CLUTCH (STEEL) (3)
512 PLATE, REVERSE CLUTCH BACKING
513 PLATE ASSEMBLY, REVERSE CLUTCH (FIBER) (3)
514 PLATE, BELLEVILLE (APPLY)
515 RING, SNAP
516 RACE, 2ND SPRAG (OUTER)
517 CLUTCH ASSEMBLY, SECOND SPRAG
518 RETAINER, SECOND SPRAG CLUTCH
519 RING, LOCKING
520 WASHER, SECOND CLUTCH OUTER RACE
523 BAND, FOURTH

REVERSE CLUTCH AND 2ND SPRAG ASSEMBLY

Figure 66



903 LOWER VALVE BODY
944 ACCUMULATOR BODY

CHECKBALL LOCATIONS FOR
ACCUMULATOR BODY AND LOWER VALVE BODY

Figure 83

LOWER VALVE BODY ASSEMBLY AND ACCUMULATOR ASSEMBLY, SPACER PLATE/ SPACER GASKET, AND LOWER CHANNEL PLATE

1. Insert pins J-39630-1 into the lower channel plate, as illustrated in Figure 84. Turn lower channel plate over and rest on pin heads.
2. Install guide pins J-39630-2 (Total 6) into channel plate, as shown in Figure 85.
3. Install Spacer Plate/Gaskets.
   NOTE: THE GASKETS ARE MADE ONTO THE SPACER PLATE. IF GASKETS ARE DAMAGED THE ENTIRE SPACER PLATE MUST BE REPLACED.
4. Install four lower valve body check balls in the locations shown Figure 83, and retain with TransJel.
   NOTE: An alternative way is to place them on the spacer plate in locations shown in Figure 79 on Page 63.
5. Install lower valve body over guide pins (See Figure 86).
6. Install valve body bolts, other than bolts for pressure switch assembly, and hand tighten.
   NOTE: Refer to Figures 139 & 140 for bolt identification and lengths
7. Install tension plate and the three retaining bolts (See Figure 79).
   NOTE: Refer to Figures 139 & 140 for bolt identification and lengths.
8. Remove the guide pins.
9. Install transaxle pressure switch onto lower valve body and install bolts. (See Figure 79).
10. Install remaining valve body bolts, including bolt (534) on channel plate side (See Figures 79 & 84).
11. Torque all lower valve body bolts to 6-10 ft.lbs.
12. Install four checkballs in accumulator housing in the locations shown Figure 83, and retain with TransJel.
    NOTE: An alternative method is to place checkballs on spacer plate in locations shown in Figure 79.
13. Install guide pins J-39630-2 in channel plate for accumulator housing (See Figure 87).
14. Install spring (971) onto the channel plate with washer side down, as shown in Figure 79.
15. Install the pre-assembled accumulator housing assembly to lower channel plate and hand tighten (See Figure 79).
16. Remove guide pins and install remaining bolts, including three bolts on channel plate side (See Figure 79).
    NOTE: Refer to Figures 139 & 140 for bolt identification and lengths.

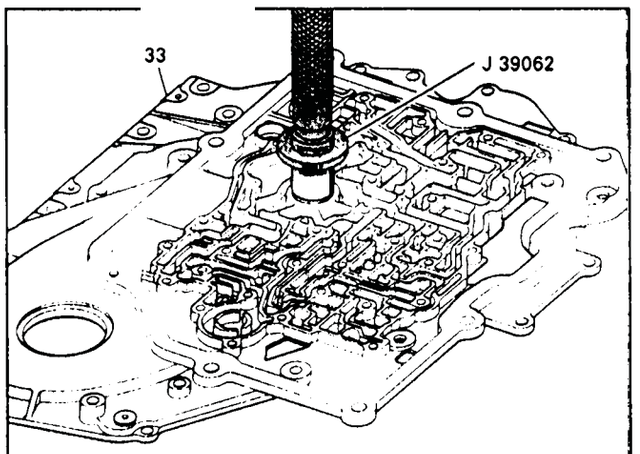


Figure 105

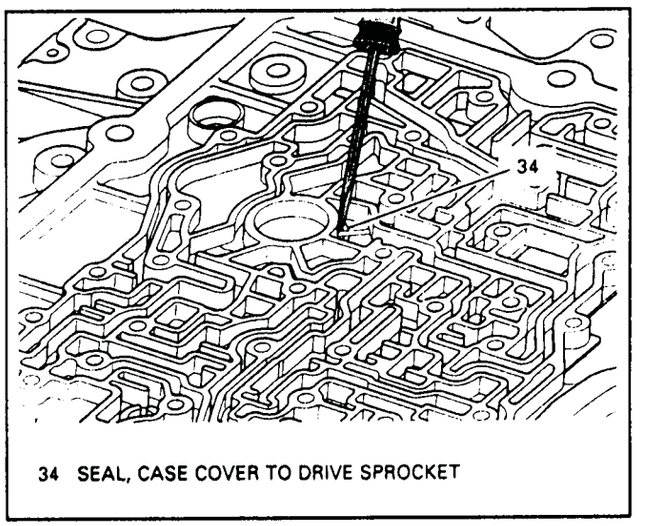


Figure 107

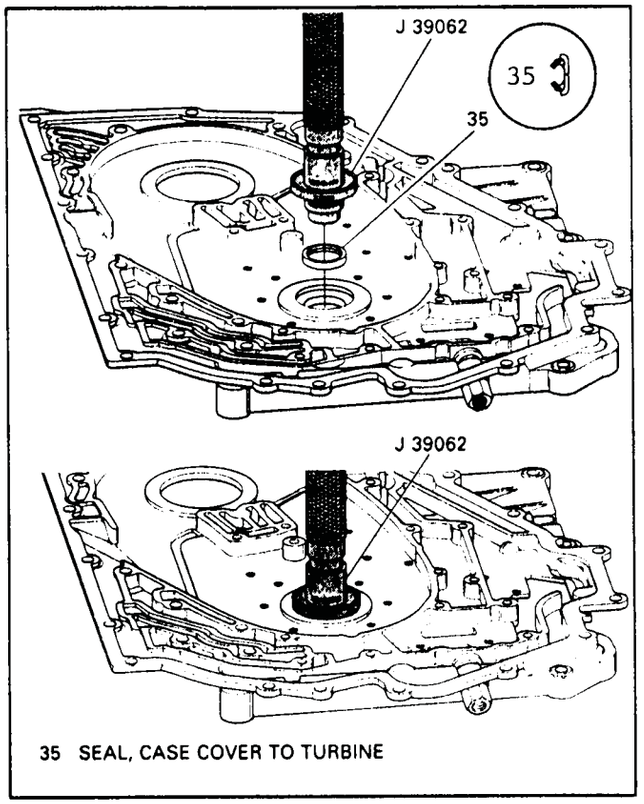


Figure 106

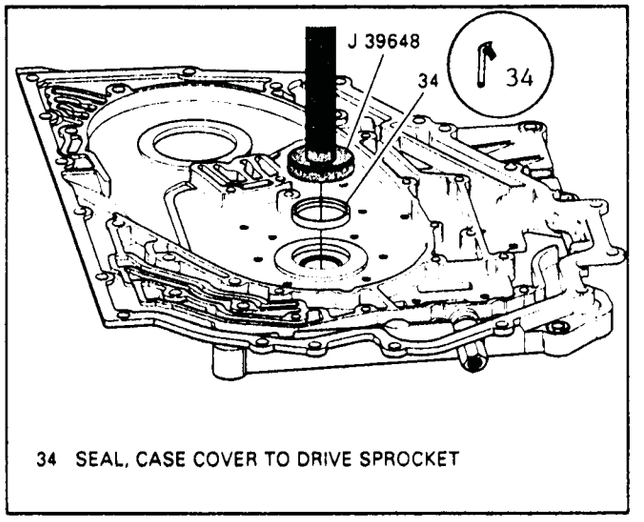
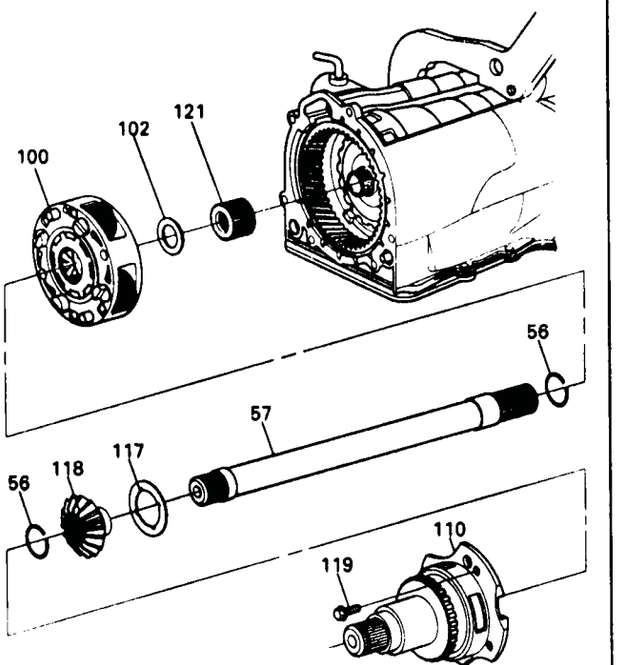
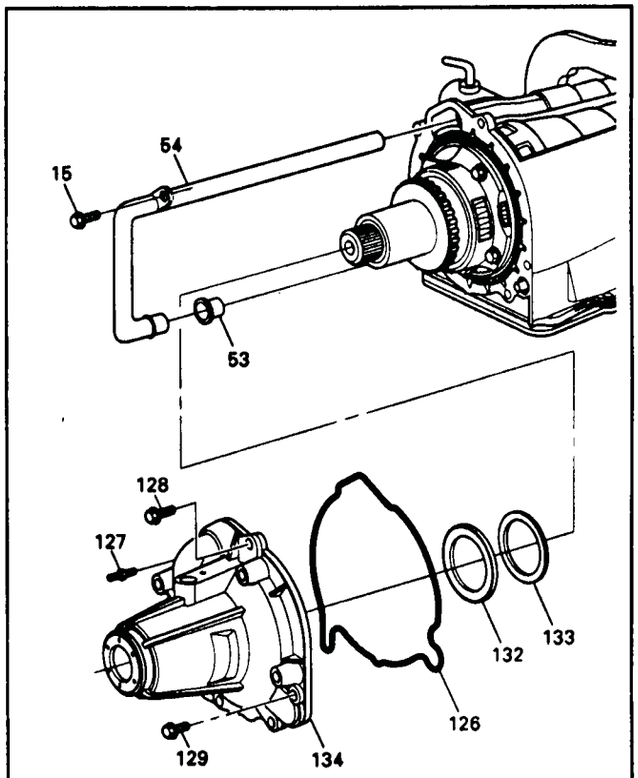


Figure 108



56 RING, SNAP (OUTPUT SHAFT)
57 SHAFT, OUTPUT
100 CARRIER, FINAL DRIVE
102 BEARING, THRUST (SUNGEAR/CARRIER)
110 CARRIER, DIFFERENTIAL
117 WASHER, THRUST (DIFFERENTIAL) (LEFT)
118 GEAR, DIFFERENTIAL SIDE (LEFT)
119 BOLT, DIFFERENTIAL CARRIER FINAL DRIVE (4)
121 GEAR, FINAL DRIVE SUN

Figure 121

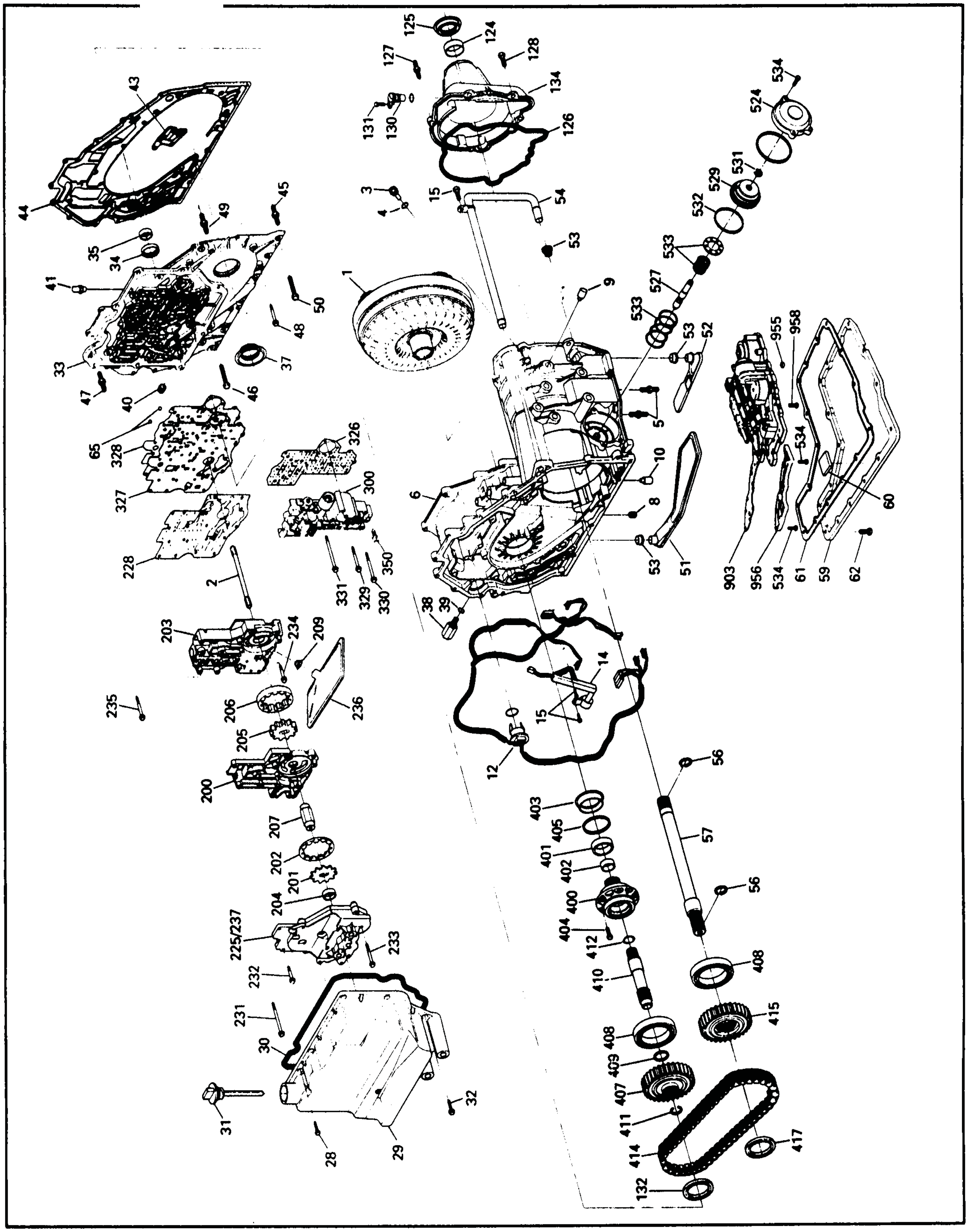


15 BOLT, SCAVENGE TUBE (2, 8mm)
53 SEAL, SCAVENGE TUBE AND SCREENS
54 TUBE, SCAVENGE
126 SEAL, CASE EXTENSION TO CASE
127 STUD, CASE EXTENSION TO CASE (1, 15mm)
128 BOLT, CASE EXTENSION TO CASE (4, 13mm)
129 BOLT, CASE EXTENSION TO CASE (1, 10mm)
132 BEARING, THRUST
133 WASHER, THRUST (DIFFERENTIAL CARRIER/CASE EXTENSION) (SELECTIVE)
134 EXTENSION, TRANSAXLE CASE

Figure 122

SCAVENGE TUBE ASSEMBLY AND
CASE EXTENSION

1. Install new scavenge tube seal (53) into the case (See Figure 122).
2. Install scavenge tube (54) into case, by tapping lightly using a plastic mallet to ensure fit in both seals. (See Figure 122). There is one seal in the case and one in the driven sprocket support.
3. The rib on the pipe will remain exposed. This is normal condition.
4. Install scavenge tube retaining bolt and torque to 6-10 ft.lbs. (See Figure 122).
5. Install selective washer and thrust bearing on to differential output shaft (See Figure 122).
6. Install new case extension axle seal into extension housing.
7. Install new case extension seal (126) into extension housing (Figure 122).
8. Install case extension onto the case and install stud and retaining bolts. (See Figure 122).
9. The stud goes in 11 o'clock position, as shown in Figure 122.
10. HAND TIGHTEN THE BOLTS UNTIL YOU HAVE VERIFIED THE FINAL DRIVE END PLAY ON NEXT PAGE.


125
124
127
128
134
131
130
126
534
524
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48
37
47
40
46
3
4
15
54
53
1
9
533
527
529
531
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955
958
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328
327
326
300
228
2
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350
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10
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51
903
956
534
61
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62
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203
234
209
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206
236
15
205
12
200
56
403
405
57
207
202
401
402
201
204
400
56
404
412
225/237
233
232
410
408
231
30
415
408
409
407
31
32
411
28
29
414
417
132

Figure 129

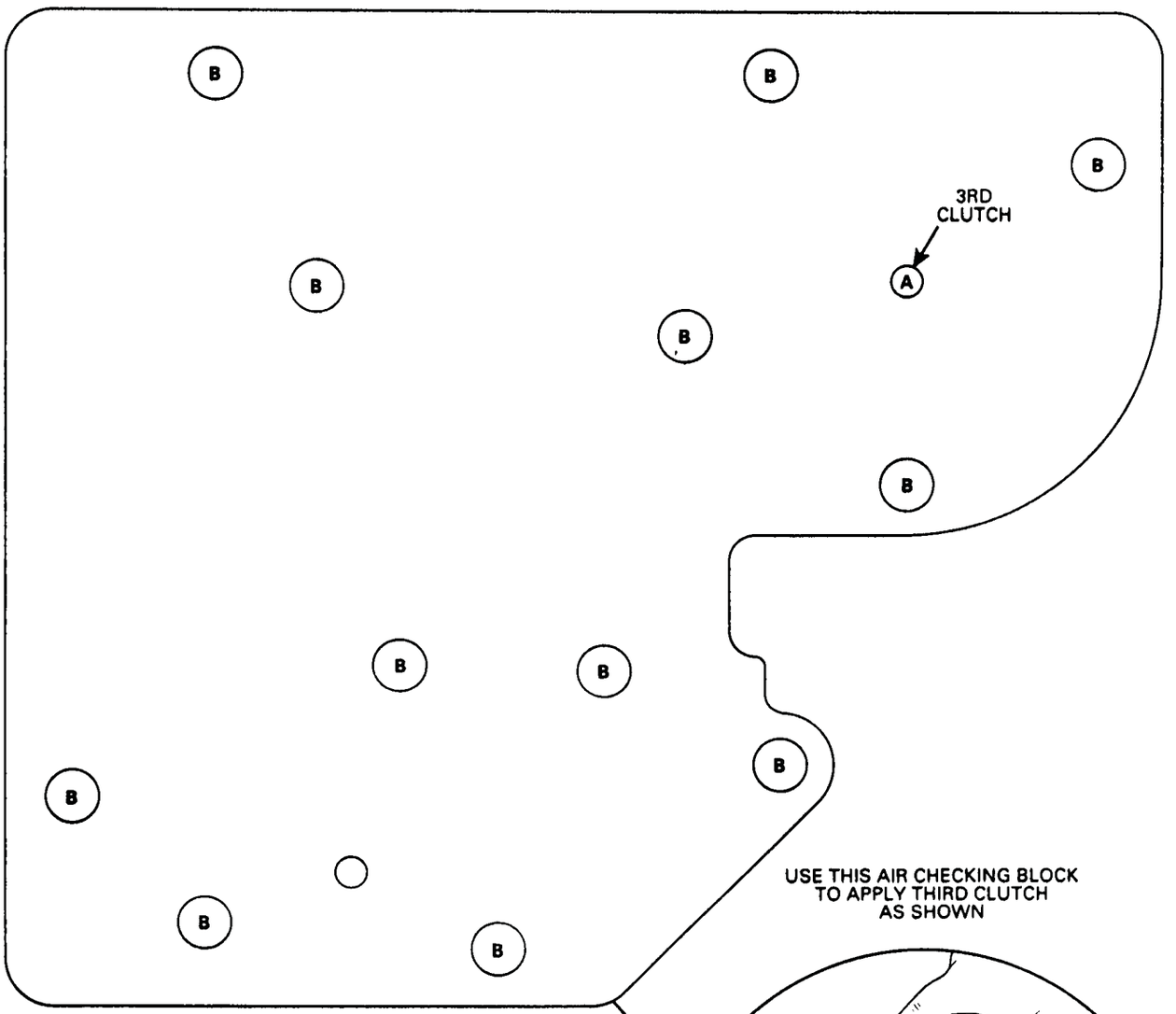
BOLT LOCATIONS (Continued)

Ill. No.	Description	Qty Size	Specified Torque
SIDE COVER			
28	BOLT, SIDE COVER TO CASE COVER	(8, 15mm)	50-55 N•m
32	BOLT, SIDE COVER TO CASE COVER	(1, 13mm)	20-27 N•m
BOTTOM PAN			
62	BOLT, BOTTOM PAN TO CASE	(16, 10mm)	10-12 N•m
CASE EXTENSION and FINAL DRIVE			
127	STUD, CASE EXTENSION TO CASE	(1, 15mm)	50-55 N•m
128	BOLT, CASE EXTENSION TO CASE	(4, 13mm)	50-55 N•m
129	BOLT, CASE EXTENSION TO CASE	(1, 10mm)	20-27 N•m
119	BOLT, DIFFERENTIAL TO FINAL DRIVE CARRIER	(4, 15mm)	70-76 N•m
MISCELLANEOUS			
3	COOLER CONNECTOR, RETURN (CASE)	(1, 19mm)	25-29 N•m
5	STUD, CASE TO FORWARD CLUTCH SUPPORT	(2, 13mm)	25-27 N•m
8	PLUG, OIL DRAIN - BOTTOM PAN TO CASE COVER		8-14 N•m
15	BOLT, SCAVENGE TUBE TO CASE	(1, 8mm)	8-14 N•m
15	BOLT, INPUT SPEED SENSOR TO CASE	(2, 8mm)	11-13 N•m
18	NUT, MANUAL SHAFT TO DETENT LEVER	(1, 15mm)	27-34 N•m
26	BOLT, DETENT LEVER AND ROLLER ASSEMBLY	(1, 13mm)	8-14 N•m
38	COOLER CONNECTOR (TO COOLER) (CASE COVER)	(1, 19mm)	20-27 N•m
40	PLUG, OIL TEST - #40 TORX (CASE COVER)		18-26 N•m
131	BOLT, SPEED SENSOR TO CASE EXTENSION	(1, 10mm)	8-14 N•m
404	BOLT, DRIVE SPROCKET SUPPORT TO CASE	(6, 8mm)	11-13 N•m
534	BOLT, SERVO COVER TO CASE	(3, 10mm)	8-14 N•m

ENGLISH CONVERSIONS

8-14	N•m	-	6-10	lb. ft.
10-12	N•m	-	8-9	lb. ft.
11-13	N•m	-	8-9.5	lb. ft.
20-27	N•m	-	15-20	lb. ft.
25-27	N•m	-	19-20	lb. ft.
25-29	N•m	-	19-21	lb. ft.
27-31	N•m	-	20-23	lb. ft.
27-34	N•m	-	20-25	lb. ft.
50-55	N•m	-	37-40	lb. ft.
70-76	N•m	-	52-56	lb. ft.

Figure 136



Air Checking Block Dimensions:

1. Using plastic or aluminum stock 10-12 mm (0.3937-0.4724 in) thick, trace the pattern as shown.
2. Cut out the pattern and drill holes in the exact locations shown on the pattern. Holes marked "B" indicate where bolts will anchor the air checking block to the case; use a 7 mm drill bit. Holes marked "A" indicate where air will be applied; use a 4 mm drill bit.
3. When using the air checking block, do not score or damage the case and/or use any material which could leave foreign particles or debris in the unit.

Figure 143