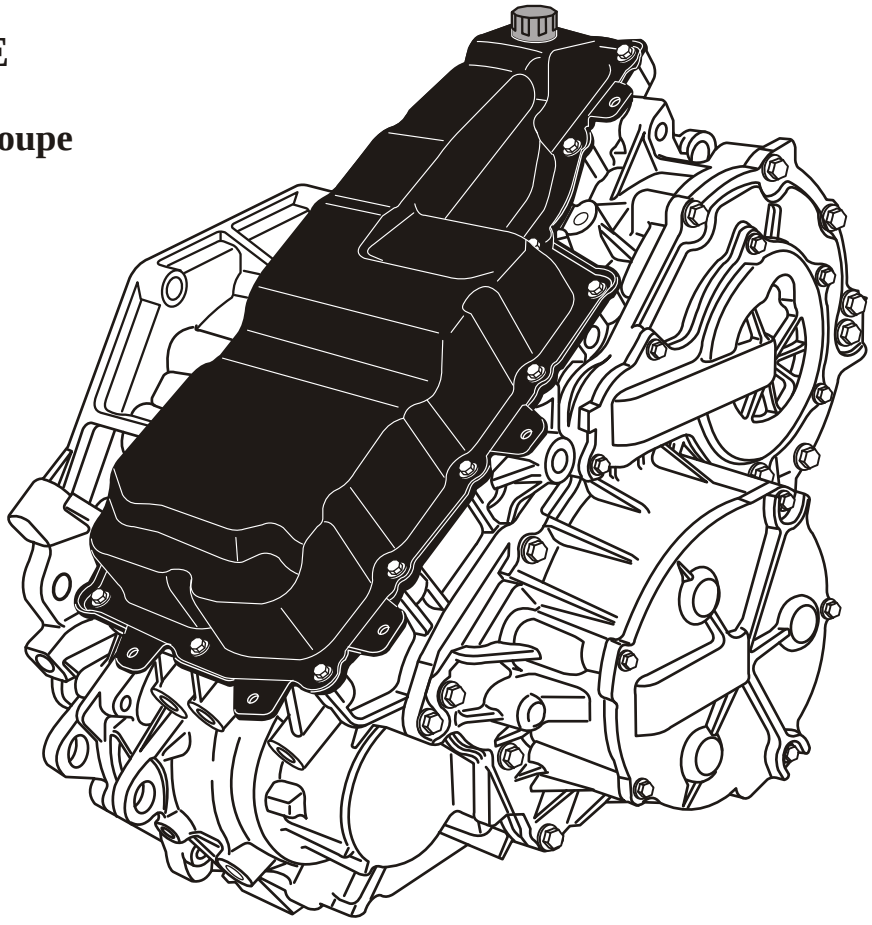
SATURN VT20/25-E
PRELIMINARY INFORMATION

This bulletin will provide you with preliminary information about the new Saturn VT20/25-E transaxle which is a continuously-variable front wheel drive unit, as shown in Figure 1. The VT20/25-E transaxle first appeared in the Saturn Vue in model year 2002 behind the 2.2L engine and in model year 2003 was expanded into Saturn Ion "Quad Coupe" equipped with the 2.2L engine.

This bulletin is intended to assist the technician during the service, diagnosis and repair of this new transaxle and should be reviewed in its entirety before attempting any diagnosis or repair. We have also provided you with an index on Page 2, because of the length of this bulletin.

SATURN'S VT20/25-E
2002 & Up 2.2L Vue
2003 & Up 2.2L ION Quad Coupe



V	T	20/25	E
NO. OF SPEEDS:	***TYPE:***	***Series Based on Relative Torque Capacity***	***MAJOR FEATURES:***
3	**T - Transverse**		**E - Electronic**
4	**L - Longitudinal**		**A - All Wheel Drive**
5	**M - Manual**		**HD - Heavy Duty**
V (Variable)			

Figure 1

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GENERAL DESCRIPTION

The VT20/25-E transaxle is a fully automatic continuously-variable front wheel drive transaxle. It consists primarily of a four element torque converter, one planetary gear set, an electronic hydraulic pressurization and control system, two variable drive pulleys, two friction clutches and a differential assembly.

The four element torque converter contains a pump, a turbine, a lined pressure plate splined to the turbine, and a stator assembly. The converter acts as a fluid coupling to smoothly transmit power from the engine to the transaxle. It also hydraulically provides additional torque multiplication when it is required. The lined pressure plate, when applied, provides a mechanical "direct drive" coupling of the engine to the transaxle for increased fuel economy.

The planetary gear set provides reverse. Changing drive ratios is fully automatic and is accomplished through the use of a Tranmission Control Module (TCM). The TCM recieves and monitors various electronic sensor signals and uses this information to control the transaxle ratios at the most optimum time.

The ratio control motor is used to change drive ratios, and feedback from the speed sensors supplies information to the TCM. The TCM then uses this information to determine when to apply the converter clutch. This allows the engine to deliver the maximum fuel efficiency without sacrificing vehicle performance.

The hydraulic system primarily consists of a vane type pump, a control valve body, a control solenoid assembly, a case and a case cover. The pump maintains the working pressures needed to stroke the clutch pistons that apply or release the friction components. These friction components consist of the forward and reverse clutches.

The hydraulic system also supplies pressurized fluid to the variable drive and driven pulley assemblies to provide accurate variable ratio controlled output torque to the differential.

RANGE DESCRIPTION

The transaxle can be operated in any one of the six different positions on the shift quadrant that is shown below.

P - Park position enables the engine to be started while preventing the vehicle from rolling either forward or backward. For safety reasons the vehicle's parking brake should be used in addtion to the "Park" position. Since the front differential carrier is mechanically locked to the case through the park pawl, variable driven pulley assembly and front differential drive pinion gear assembly, "Park" position should not be selected until the vehicle has come to a complete stop.

R - Reverse position enables the vehicle to be operated in a rearward direction.

N - Neutral position enables the engine to start and operate without driving the vehicle, but does not prevent it from rolling forward or backward.

D - Drive range should be used for all normal driving conditions. Drive range allows the transaxle to operate in the full range of variable ratios, and the converter clutch to apply.

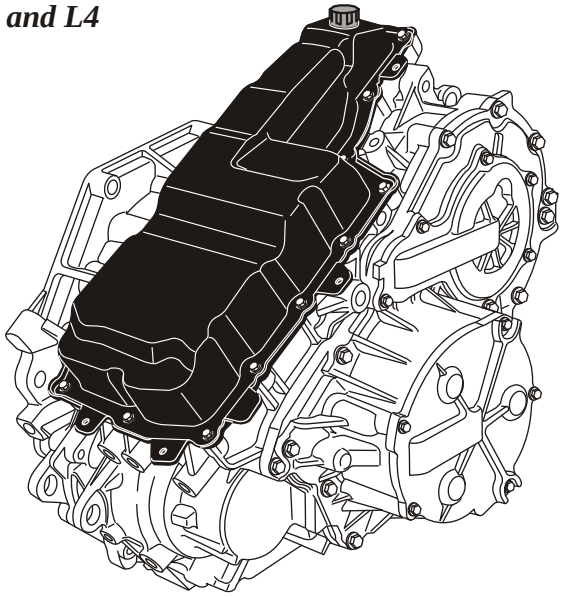
Note: The transaxle should not be operated in Drive when towing a trailer. The transaxle should be driven in a lower range selection for maximum efficiency.

I - Intermediate can be used for hilly terrain or for towing. The variable ratios are the same as in Drive range except the variable drive pulleys will not be allowed to achieve the higher ratios.

L - Low range can be selected at any vehicle speed. If the transaxle is in Drive or Intermediate, it will immediately change the ratio to low, once vehicle speed is below approximately 56 km/h (35mph). This is benificial for descending steep grades. With Low range selected, the variable drive pulleys will not be allowed to achieve the high or intermediate ratios.

Quick Reference Tek Spek Sheet

The VT20/25-E Transmission
Produced in Hungary
2004 Saturn
Vue and L4



Transmission Drive:
TRANSVERSE FRONT WHEEL DRIVE

Transmission Type:
Fully-Automatic, electronically-controlled, continuously-variable front wheel drive transaxle, with a torque converter clutch.

Transfer Design:
On-Axis
(Four axis - Input, Secondary, Transfer, Output)

Control Systems:
Electronic Control of Ratio Changing
Reverse Lockout
Input and Output Electronic Signals
Internal Control Module Assembly, with Stepper Motor
External Neutral-Start-Backup-Switch
Internal Input and Output Speed Sensors

Ratio Spread:

Forward	0.44 -2.61
Reverse	2.15
Overall	5.9

Current Engines:
1.4L to 2.2L

Maximum Engine Torque:
200 Nm (148 lb.ft.) maximum
(This is only s guide, may not be applicable under certain driving conditions)

Maximum Gross Vehicle Weight:
2,100 kg (4,360 lb)

Trailer Towing Capacity:
680 kg (1,500 lb)

Transmission Fluid Type:
DEX-CVT® and Automatic Transmission Additive

Transmission Fluid Capacity (Approximate):
8.07 Litre (8.53 qts)

Converter (Reference):
Size: 225mm
Bolt Circle Diameter: 237.00mm
Bolt Thread: M10 X 1.25
Stall Ratio: 1.70
"K" Factor Range: 196 RPM/Nm to the 1/2 power

Hydraulic Pulley/Sheave Pump:
5447 kpa (790 psi) maximum

Pulley/Sheave Material:
Forged Steel

Push Belt:
Element Material: Steel
Band Material: Maraging Steel
Number of Bands: Two Sets of 12

Case Material:
Die Cast Aluminum

Transaxle Weight Wet:

VT20-E	79.9kg (175.7lb)
VT25-E (2WD)	83.0 kg (183.0 lb)
VT25-E (4WD)	83.5 kg (184.1 lb)

Final Drive Ratio: 3.52

Transfer Gear Ratio: 1.41

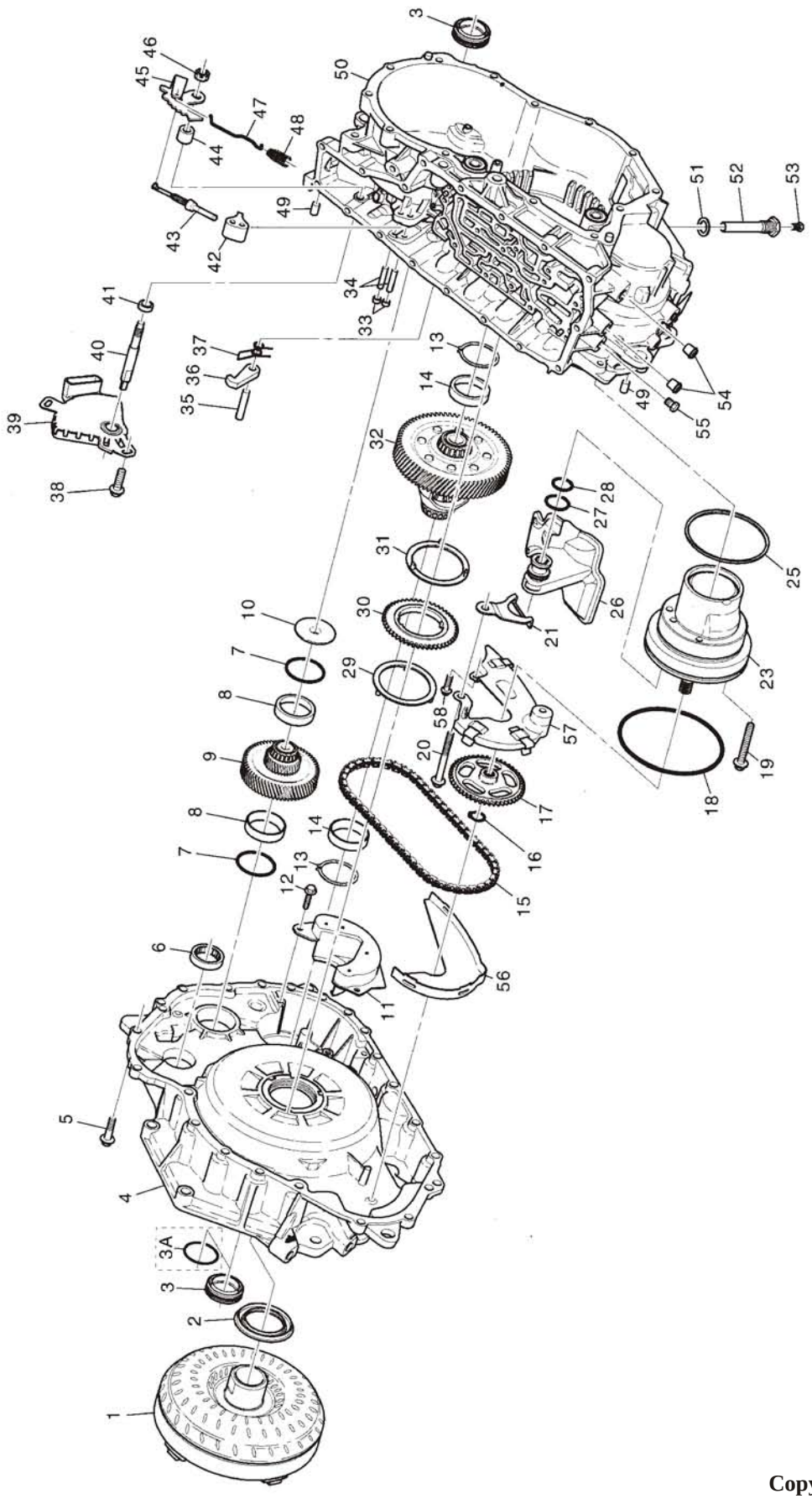
Effective Gear Ratio: 4.97

Six Position Quadrant:
(P, R, N, D, I, L)

Pressure Tap Availability:
Line Pressure

Figure 2

CASE AND COMPONENTS "FRONT SIDE" EXPLODED VIEW



Legend Found On Page 5

Figure 3

CASE AND COMPONENTS "FRONT SIDE" LEGEND

1 TORQUE CONVERTER ASSEMBLY
2 CONVERTER AND DIFFERENTIAL HOUSING SEAL ASSEMBLY
3 DRIVE SHAFT OIL SEAL ASSEMBLY (2WD)
3A DRIVE SHAFT OIL "O" RING SEAL (4WD)
4 TORQUE CONVERTER HOUSING (MODEL SENSITIVE)
5 CONVERTER HOUSING TO CASE BOLT (M8 X 1.25 X 35)
6 VARIABLE DRIVEN PULLEY BEARING ASSEMBLY
7 FRONT DIFFERENTIAL DRIVE PINION GEAR SHIM (2)
8 FRONT DIFFERENTIAL DRIVE PINION GEAR BEARING CUP (2)
9 FRONT DIFFERENTIAL DRIVE PINION GEAR ASSEMBLY
10 TRANSAXLE CASE PLUG
11 TRANSAXLE FLUID BAFFLE
12 TRANSAXLE FLUID BAFFLE BOLT (M6 X 1.0 X 17)
13 FRONT DIFFERENTIAL BEARING SHIM (2)
14 FRONT DIFFERENTIAL BEARING CUP (2)
15 DRIVE LINK ASSEMBLY
16 DRIVEN SPROCKET RETAINING SNAP RING
17 DRIVEN SPROCKET ASSEMBLY
18 TRANSAXLE OIL PUMP "O" RING SEAL
19 TRANSAXLE OIL PUMP BOLT (M6 X 1.0 X 55)
20 BOLT (M6 X 1.0 X 70)
21 TRANSAXLE FLUID FILTER RETAINER
23 TRANSAXLE OIL PUMP ASSEMBLY
25 TRANSAXLE OIL PUMP "O" RING SEAL
26 TRANSAXLE FLUID FILTER ASSEMBLY
27 TRANSAXLE FLUID FILTER "O" RING SEAL
28 TRANSAXLE FLUID FILTER "O" RING SEAL
29 DRIVE SPROCKET THRUST WASHER, CONVERTER HOUSING SIDE
30 DRIVE SPROCKET ASSEMBLY
31 DRIVE SPROCKET THRUST WASHER, CASE SIDE
32 FRONT DIFFERENTIAL CARRIER ASSEMBLY
33 PARK PAWL SHAFT HOLE PLUG
34 PARK PAWL ACTUATOR GUIDE PIN
35 PARK PAWL REACTION PIN
36 PARK PAWL
37 PARK PAWL SPRING
38 PARK/NEUTRAL SWITCH BOLT (M6 X 1.0 X 18.4)
39 PARK/NEUTRAL POSITION SWITCH ASSEMBLY
40 MANUAL SHIFT SHAFT
41 MANUAL SHIFT SHAFT SEAL ASSEMBLY
42 PARK PAWL ACTUATOR GUIDE
43 PARK PAWL ACTUATOR ACTUATOR ASSEMBLY
44 MANUAL SHIFT SHAFT RETAINER
45 MANUAL SHIFT SHAFT DETENT LEVER
46 MANUAL SHIFT SHAFT NUT
47 MANUAL VALVE LINK
48 MANUAL VALVE LINK SPRING
49 TRANSAXLE CASE LOCATOR DOWEL
50 TRANSAXLE CASE ASSEMBLY
51 TRANSAXLE FLUID FILL LOWER TUBE SEAL
52 TRANSAXLE FLUID FILL LOWER TUBE
53 TRANSAXLE FLUID FILL LOWER TUBE PLUG
54 TRANSAXLE COOLER PIPE FITTING SEALS (2)
55 TRANSAXLE LINE PRESSURE PLUG
56 TRANSAXLE FLUID TOP BAFFLE
57 TRANSAXLE FLUID BOTTOM BAFFLE
58 TRANSAXLE FLUID BAFFLE BOLT (M5 X 0.8 X 13)

Figure 3 Legend

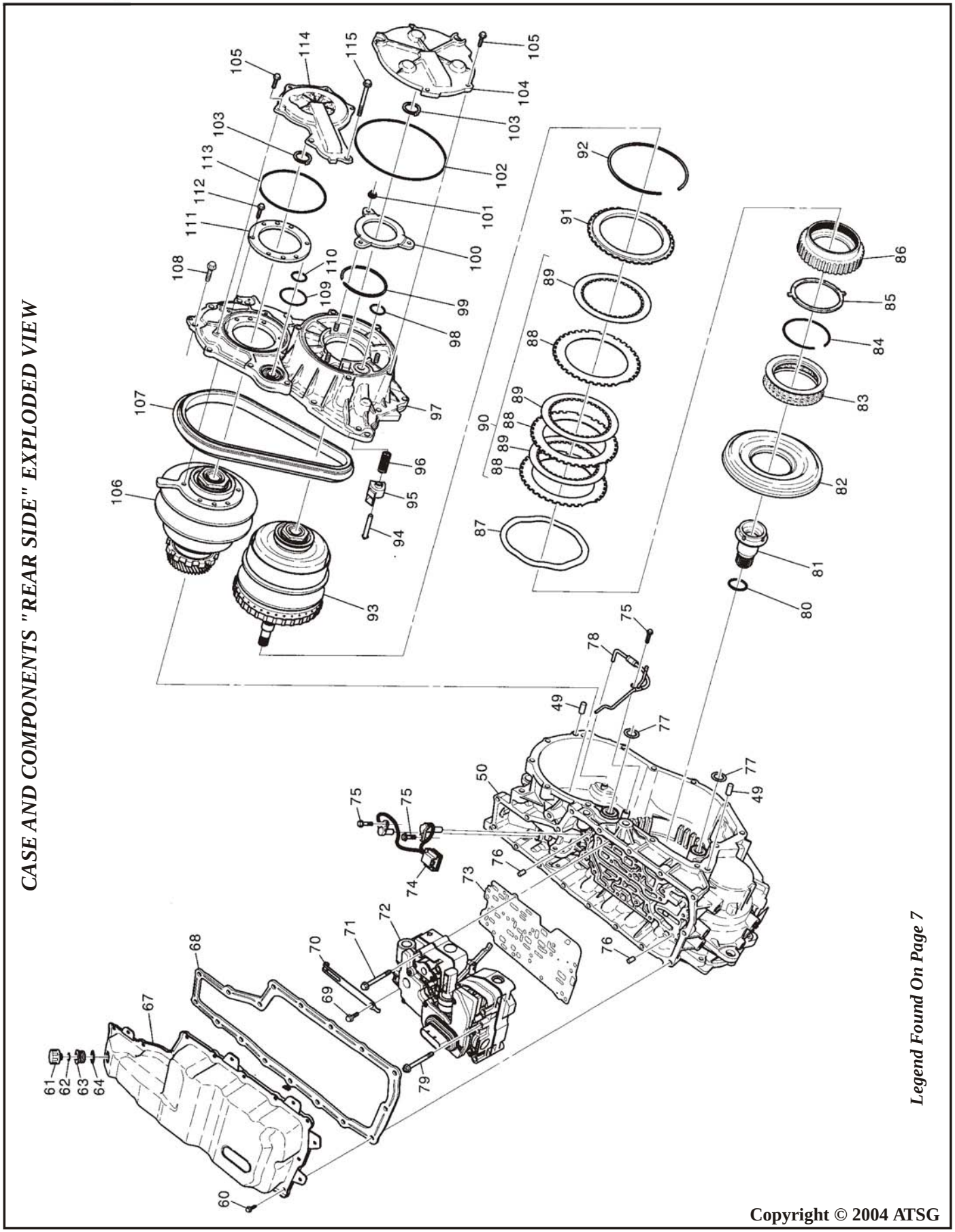


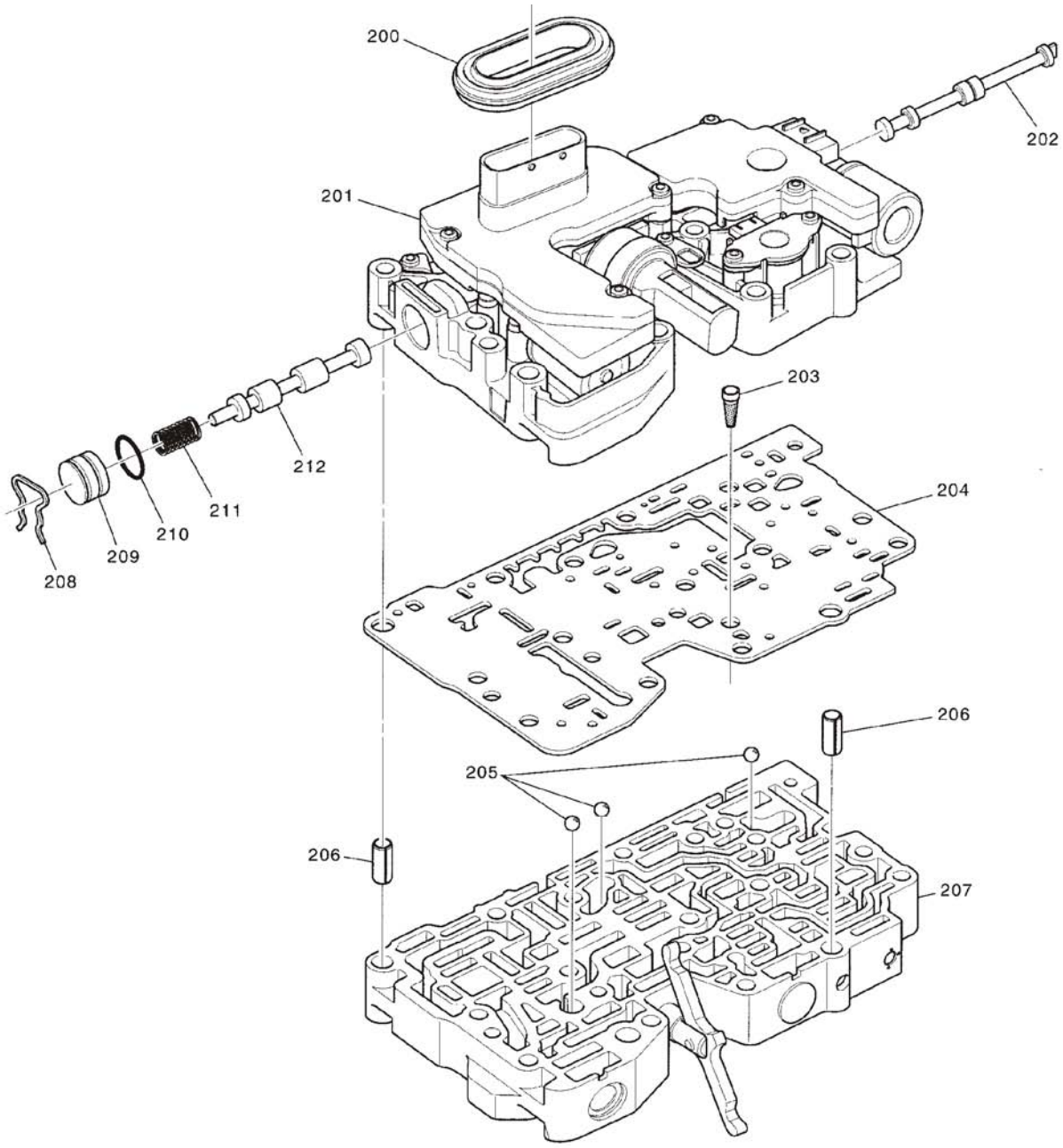
Figure 4

CASE AND COMPONENTS "REAR SIDE" LEGEND

49 TRANSAXLE CASE LOCATOR DOWEL
50 TRANSAXLE CASE ASSEMBLY
60 VALVE BODY COVER BOLT (M6 X 1.0 X 25)
61 TRANSAXLE VENT CAP
62 TRANSAXLE VENT CAP "O" RING
63 TRANSAXLE VENT CAP INSERT
64 TRANSAXLE VENT CAP INSERT "O" RING
67 VALVE BODY COVER
68 VALVE BODY COVER GASKET
69 DETENT SPRING BOLT (M6 X 1.0 X 30)
70 DETENT SPRING ASSEMBLY
71 VALVE BODY BOLT (M6 X 1.0 X 80)
72 VALVE BODY ASSEMBLY
73 VALVE BODY SPACER PLATE (MOLDED GASKET)
74 TRANSAXLE INPUT AND OUTPUT SPEED SENSOR ASSEMBLY
75 SPEED SENSOR BOLTS (M6 X 1.0 X 17)
76 VALVE BODY LOCATOR DOWEL
77 CASE COVER "O" RING SEAL (2)
78 LUBE OIL PIPE
79 VALVE BODY BOLT (M6 X 1.0 X 78)
80 STATOR SHAFT SEAL
81 STATOR SHAFT ASSEMBLY
82 REVERSE CLUTCH PISTON ASSEMBLY
83 REVERSE CLUTCH PISTON RETURN SPRING ASSEMBLY
84 REVERSE CLUTCH PISTON RETURN SPRING SNAP RING
85 REVERSE CLUTCH HUB THRUST WASHER
86 REVERSE CLUTCH HUB/INTERNAL GEAR ASSEMBLY
87 REVERSE CLUTCH "WAVED" CUSHION PLATE
88 REVERSE CLUTCH OUTSIDE SPLINED PLATES
89 REVERSE CLUTCH INSIDE SPLINED PLATES
91 REVERSE CLUTCH BACKING PLATE
92 REVERSE CLUTCH BACKING PLATE SNAP RING
93 VARIABLE DRIVE PULLEY ASSEMBLY
94 VARIABLE DRIVE PULLEY FOLLOWER PIN
95 VARIABLE DRIVE PULLEY FOLLOWER
96 VARIABLE DRIVE PULLEY FOLLOWER SPRING
97 TRANSAXLE CASE COVER ASSEMBLY
98 VARIABLE DRIVE PULLEY OPENING COVER SEAL
99 VARIABLE DRIVE PULLEY BEARING RETAINING SNAP RING
100 VARIABLE DRIVE PULLEY BEARING RETAINER
101 VARIABLE DRIVE PULLEY BEARING RETAINER NUT (M6 X 1.0)
102 VARIABLE DRIVE PULLEY OPENING COVER SEAL
103 TRANSAXLE CASE COVER SEAL
104 VARIABLE DRIVE PULLEY OPENING COVER
105 VARIABLE DRIVE PULLEY COVER BOLT (M6 X 1.0 X 25)
106 VARIABLE DRIVEN PULLEY ASSEMBLY
107 VARIABLE PULLEY DRIVE BELT ASSEMBLY
108 TRANSAXLE CASE COVER BOLT (M8 X 1.25 X 40)
109 VARIABLE DRIVEN PULLEY OPENING COVER SEAL
110 TRANSAXLE CASE COVER "O" RING SEAL
111 VARIABLE DRIVEN PULLEY BEARING RETAINER (SELECTIVE)
112 VARIABLE DRIVEN PULLEY RETAINER BOLT (M6 X 1.0 X 25)
113 VARIABLE DRIVEN PULLEY OPENING COVER SEAL
114 VARIABLE DRIVEN PULLEY OPENING COVER
115 VARIABLE DRIVEN PULLEY COVER BOLT (M8 X 1.25 X 50)

Figure 4 Legend

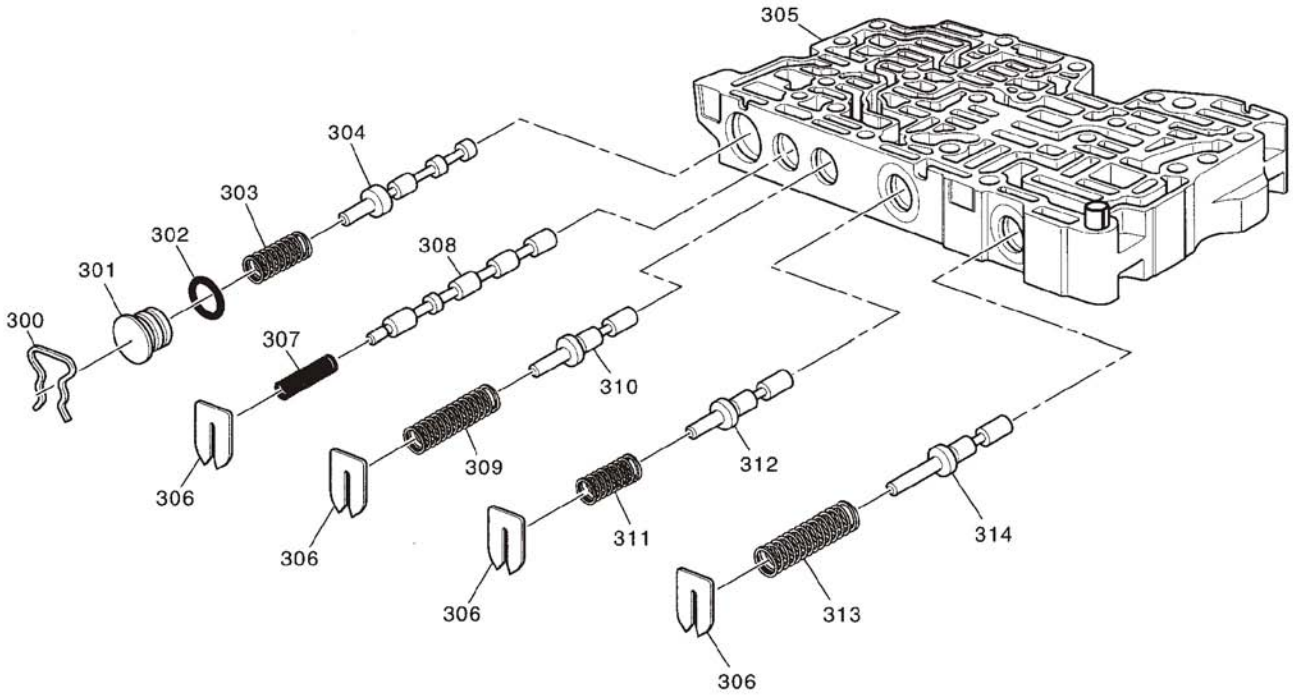
CONTROL VALVE BODY ASSEMBLY EXPLODED VIEW



200 VALVE BODY COVER WIRING CONNECTOR HOLE SEAL
201 UPPER VALVE BODY AND SOLENOID BODY ASSEMBLY
202 MANUAL VALVE
203 VALVE BODY SPACER PLATE SCREEN ASSEMBLY
204 VALVE BODY SPACER PLATE (MOLDED GASKET)
205 VALVE BODY CHECK BALLS (3)
206 VALVE BODY LOCATOR DOWELS (2)
207 LOWER VALVE BODY ASSEMBLY
208 BORE PLUG RETAINER
209 BORE PLUG
210 BORE PLUG "O" RING SEAL
211 LINE 2 PRESSURE REGULATOR VALVE SPRING
212 LINE 2 PRESSURE REGULATOR VALVE

Figure 5

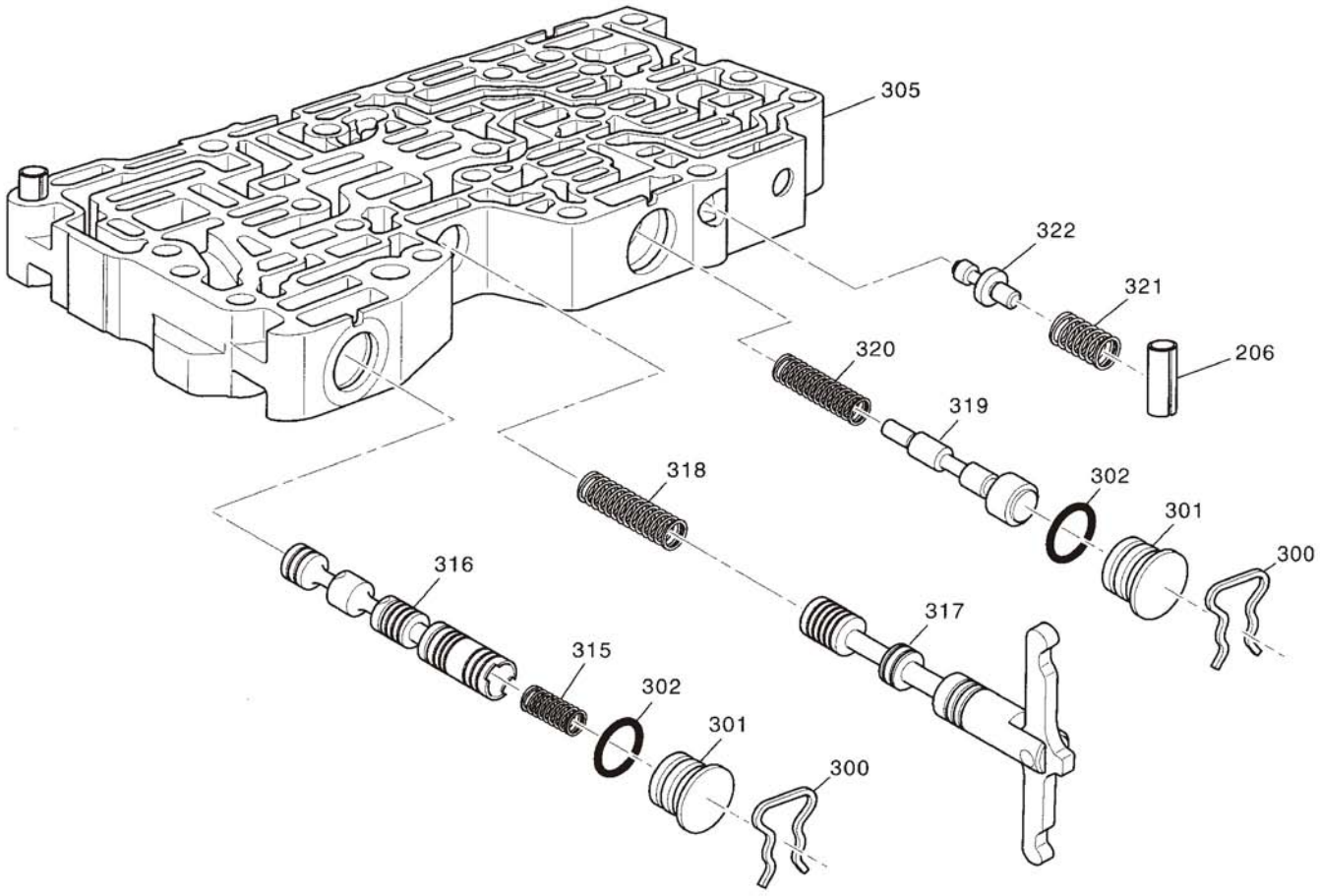
LOWER CONTROL VALVE BODY "FRONT SIDE" EXPLODED VIEW



300 BORE PLUG RETAINER
301 BORE PLUG
302 BORE PLUG "O" RING SEAL
303 FORWARD AND REVERSE CLUTCH VALVE SPRING
304 FORWARD AND REVERSE CLUTCH VALVE
305 LOWER CONTROL VALVE BODY CASTING
306 VALVE SPRING SEAT AND RETAINER
307 TCC CONTROL VALVE SPRING
308 TCC CONTROL VALVE
309 LINE LIMIT VALVE SPRING
310 LINE LIMIT VALVE
311 ACTUATOR FEED LIMIT VALVE SPRING
312 ACTUATOR FEED LIMIT VALVE
313 PRIMARY LIMIT VALVE SPRING
314 PRIMARY LIMIT VALVE

Figure 6

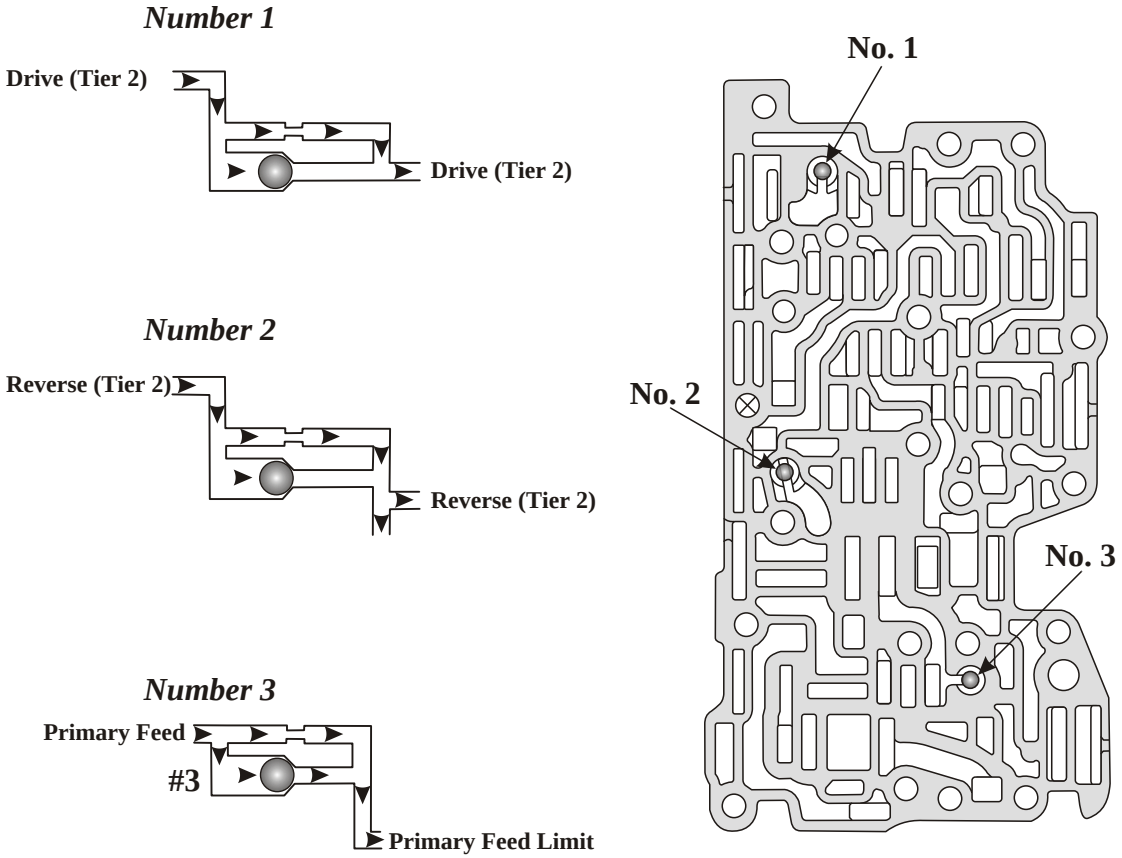
LOWER CONTROL VALVE BODY "FRONT SIDE" EXPLODED VIEW



206 VALVE BODY LOCATING DOWEL AND RETAINER
300 BORE PLUG RETAINER
301 BORE PLUG
302 BORE PLUG "O" RING SEAL
305 LOWER CONTROL VALVE BODY CASTING
315 LINE 1 PRESSURE REGUL ATOR VALVE SPRING
316 LINE 1 PRESSURE REGU LATOR VALVE
317 VARIABLE RATIO CONTROL VALVE AND LEVER ASSEMBLY
318 VARIABLE RATIO CONTROL VALVE SPRING
319 TORQUE CONVERTER CLUTCH REGULATOR VALVE
320 TORQUE CONVERTER CLUTCH REGULATOR VALVE SPRING
321 CLUTCH BOOST VALVE SPRING
322 CLUTCH BOOST VALVE

Figure 7

LOWER CONTROL VALVE BODY CHECKBALL FUNCTION



Number 1, Forward Clutch

This ball seats and forces forward clutch exhaust fluid through an orifice to control the release rate. Apply pressure pushes the ball off of its seat for a faster forward clutch apply.

Number 2, Reverse Clutch

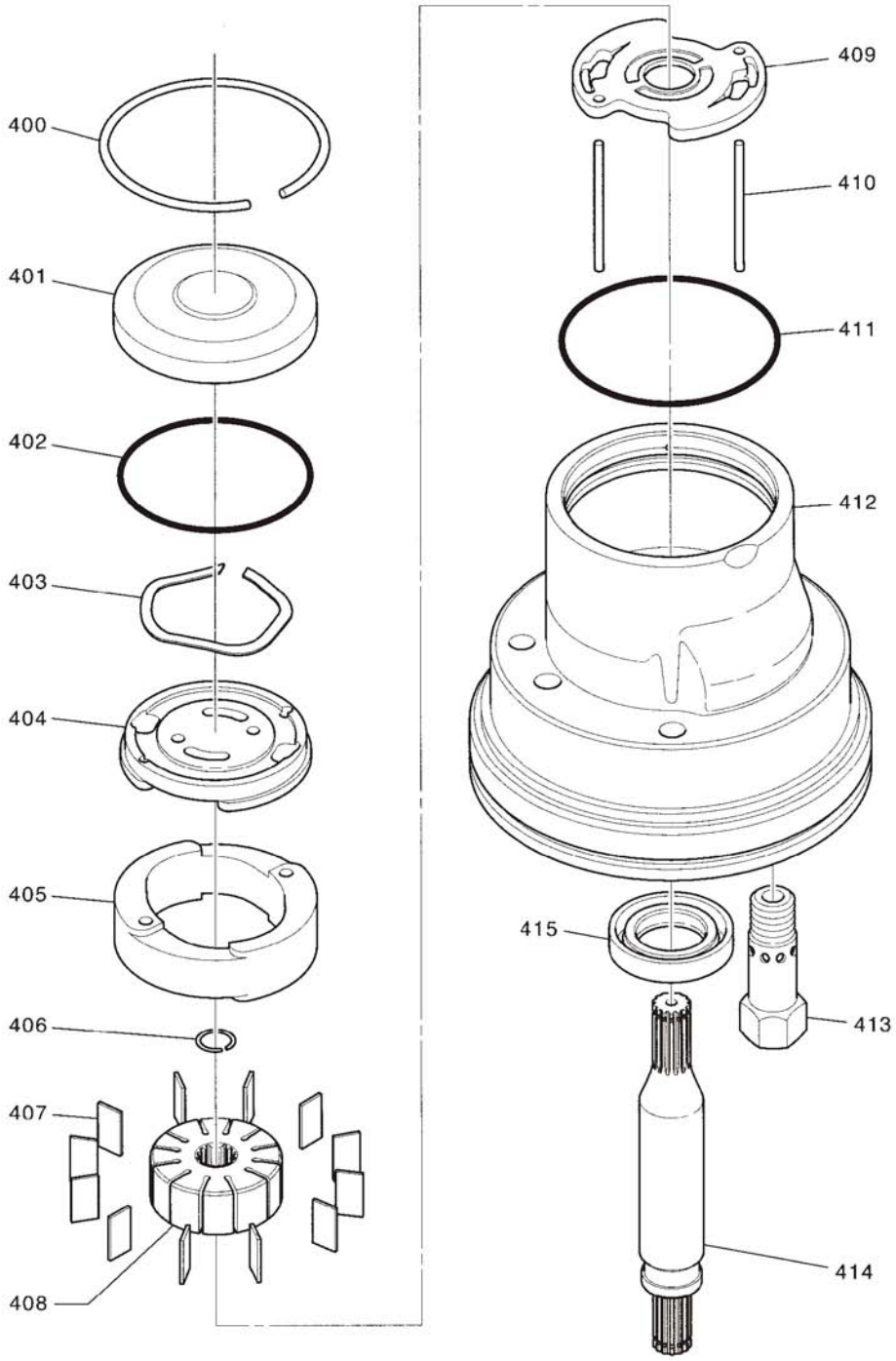
This ball seats and forces reverse clutch exhaust fluid through an orifice to control the release rate. Apply pressure pushes the ball off of its seat for a faster reverse clutch apply.

Number 3, Primary Feed Limit

This ball seats to force the primary feed pressure through an orifice and into the primary feed limit circuit, in order to help control the apply rate of the variable drive pulley. When this pully is released, the ball is forced off of its seat for a faster exhaust.

Figure 8

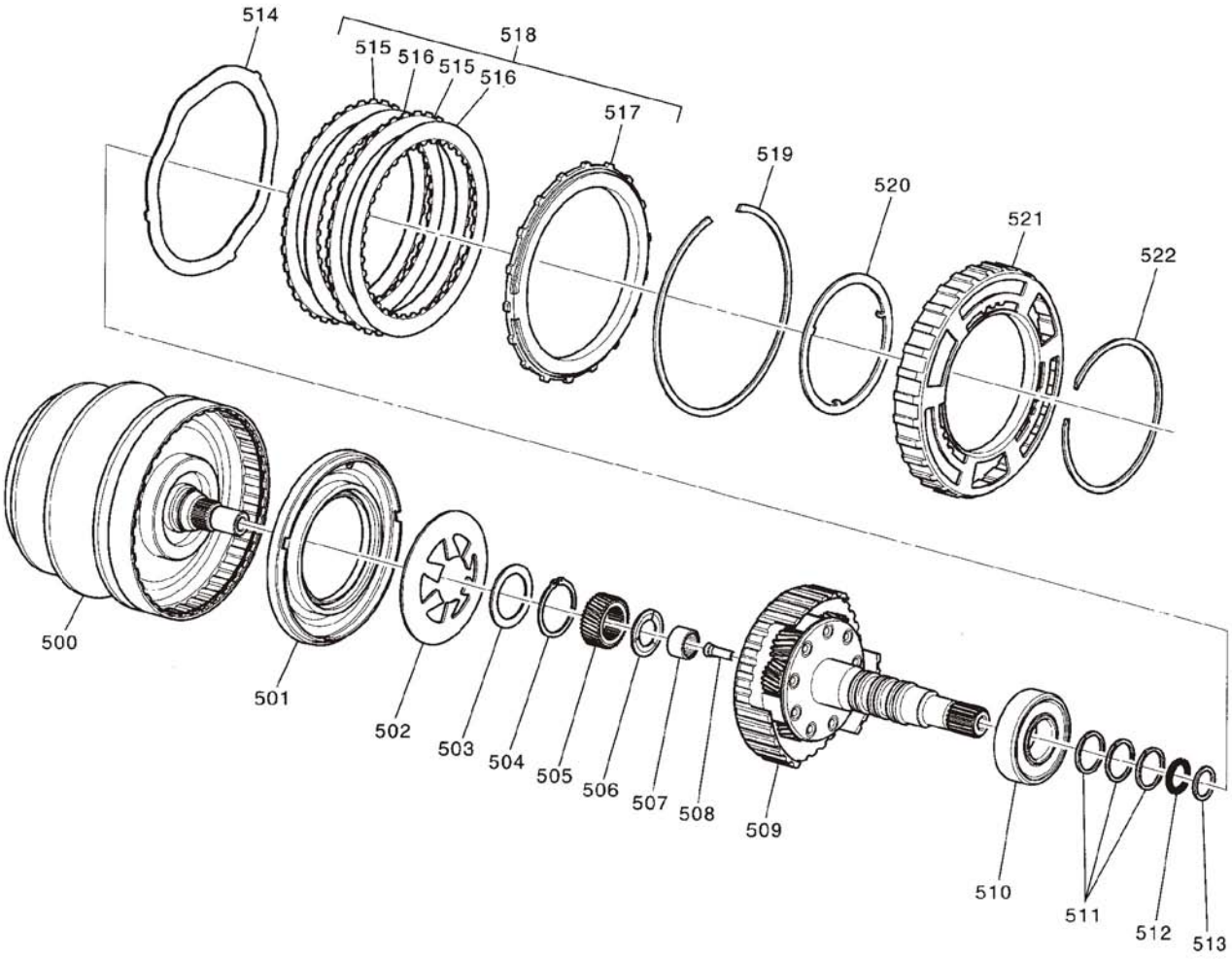
OIL PUMP ASSEMBLY EXPLODED VIEW



400 OIL PUMP END COVER RETAINING RING
401 OIL PUMP END COVER
402 OIL PUMP END COVER "O" RING SEAL
403 OIL PUMP PRESSURE PLATE SPRING
404 OIL PUMP PRESSURE PLATE
405 OIL PUMP CAM RING
406 OIL PUMP DRIVE SHAFT RETAINING SNAP RING
407 OIL PUMP ROTOR VANES (12)
408 OIL PUMP ROTOR
409 OIL PUMP THRUST PLATE
410 OIL PUMP CAM RING DOWEL PINS (2)
411 OIL PUMP INNER "O" RING SEAL
412 OIL PUMP HOUSING
413 OIL PUMP PRESSURE RELIEF VALVE ASSEMBLY
414 OIL PUMP DRIVE SHAFT
415 OIL PUMP DRIVE SHAFT SEAL

Figure 9

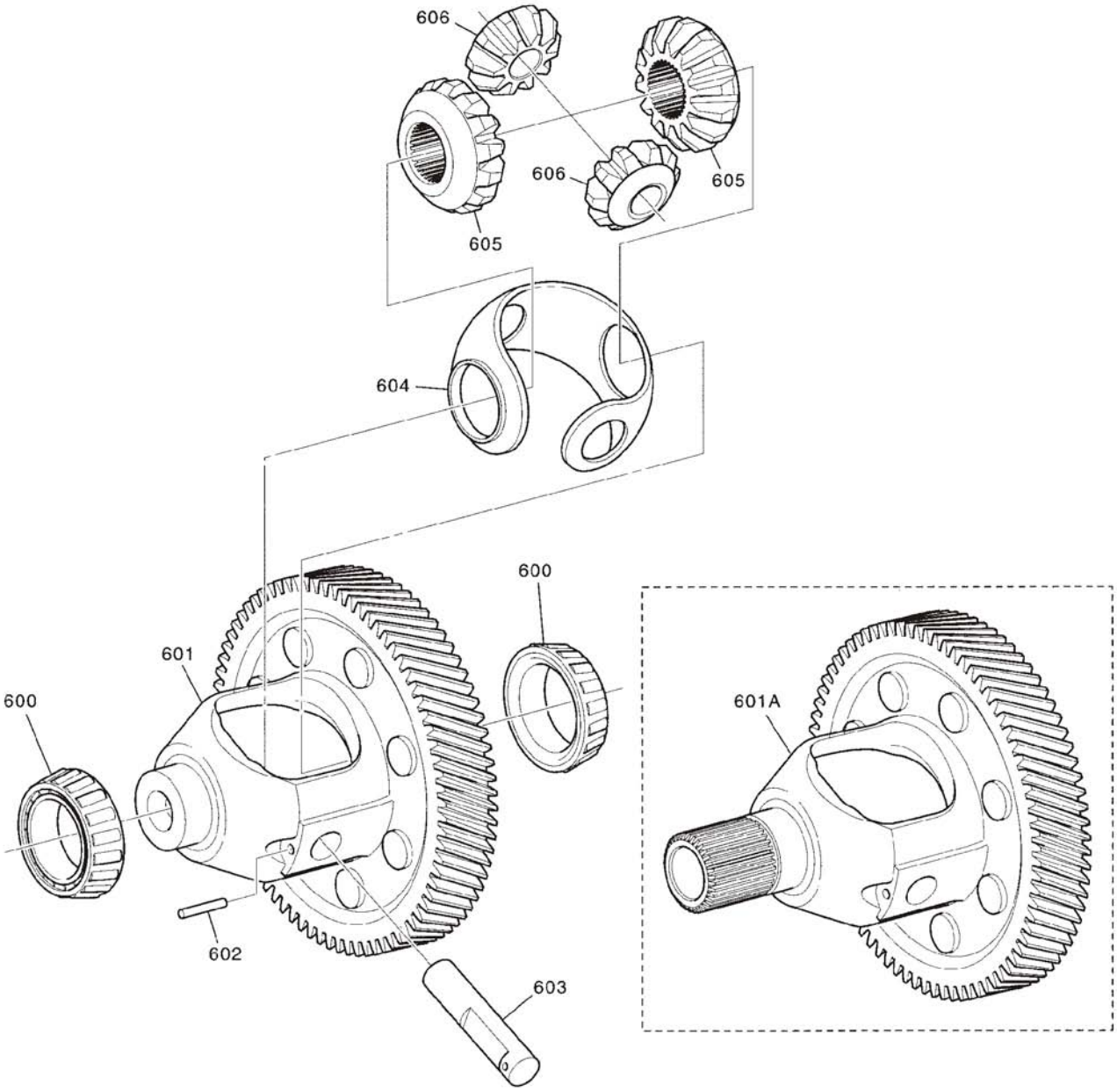
INPUT SHAFT AND FORWARD CLUTCH ASSEMBLY EXPLODED VIEW



500 VARIABLE DRIVE PULLEY ASSEMBLY
501 FORWARD CLUTCH PISTON ASSEMBLY
502 FORWARD CLUTCH PISTON RETURN "BELLVILLE" SPRING
503 FORWARD CLUTCH RETURN SPRING WASHER
504 FORWARD CLUTCH RETURN SPRING SNAP RING
505 PL ANETARY SUN GEAR
506 PL ANETARY SUN GEAR THRUST WASHER
507 INPUT SHAFT CAGED NEEDLE BEARING ASSEMBLY
508 INPUT SHAFT FLUID PASSAGE SLEEVE
509 INPUT SHAFT AND PL ANETARY ASSEMBLY
510 INPUT SHAFT BEARING ASSEMBLY
511 INPUT SHAFT SEALING RING S (3)
512 INPUT SHAFT "O" RING SEAL
513 INPUT SHAFT SPLIT SPIRAL RING
514 FORWARD CLUTCH "WAVED" CUSHION PLATE
515 FORWARD CLUTCH OUTSIDE SPLINED PLATES
516 FORWARD CLUTCH INSIDE SPLINED PLATES
517 FORWARD CLUTCH BACKING PLATE
519 FORWARD CLUTCH BACKING PLATE SNAP RING
520 INPUT INTERNAL RING GEAR THRUST WASHER
521 INPUT SHAFT SPEED SENSOR R ELUCTOR RING
522 INPUT SHAFT SPEED SENSOR R ELUCTOR RING SNAP RING

Figure 10

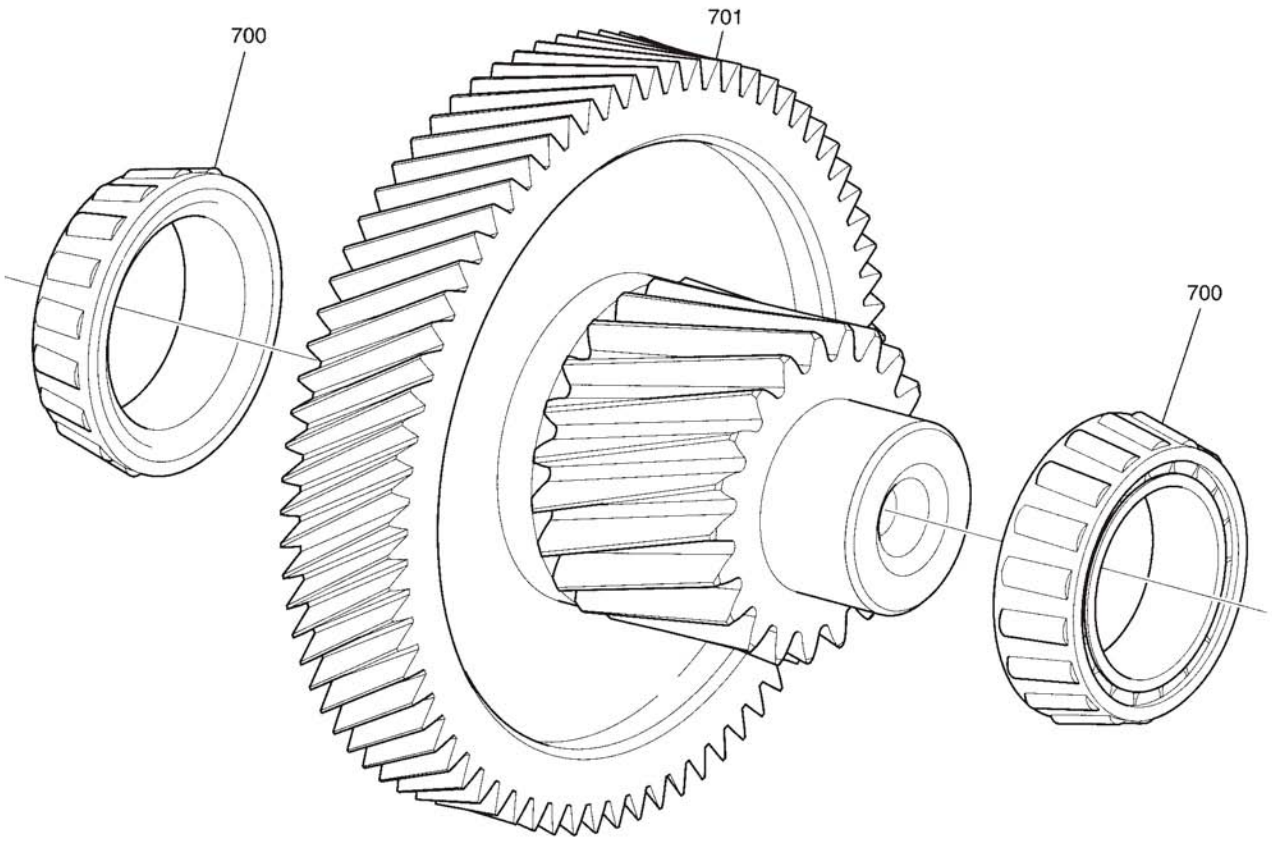
FRONT DIFFERENTIAL CARRIER ASSEMBLY EXPLODED VIEW



600 FRONT DIFFERENTIAL CARRIER ROLLER BEARINGS (2)
601 FRONT DIFFERENTIAL CARRIER ASSEMBLY (2WD)
601A FRONT DIFFERENTIAL CARRIER ASSEMBLY (4WD)
602 FRONT DIFFERENTIAL PINION GEAR SHAFT ROLL PIN
603 FRONT DIFFERENTIAL PINION GEAR SHAFT
604 FRONT DIFFERENTIAL CARRIER THRUST WASHER
605 FRONT DIFFERENTIAL SIDE GEARS (2)
606 FRONT DIFFERENTIAL PINION GEARS (2)

Figure 11

FRONT DIFFERENTIAL TRANSFER GEAR ASSEMBLY EXPLODED VIEW

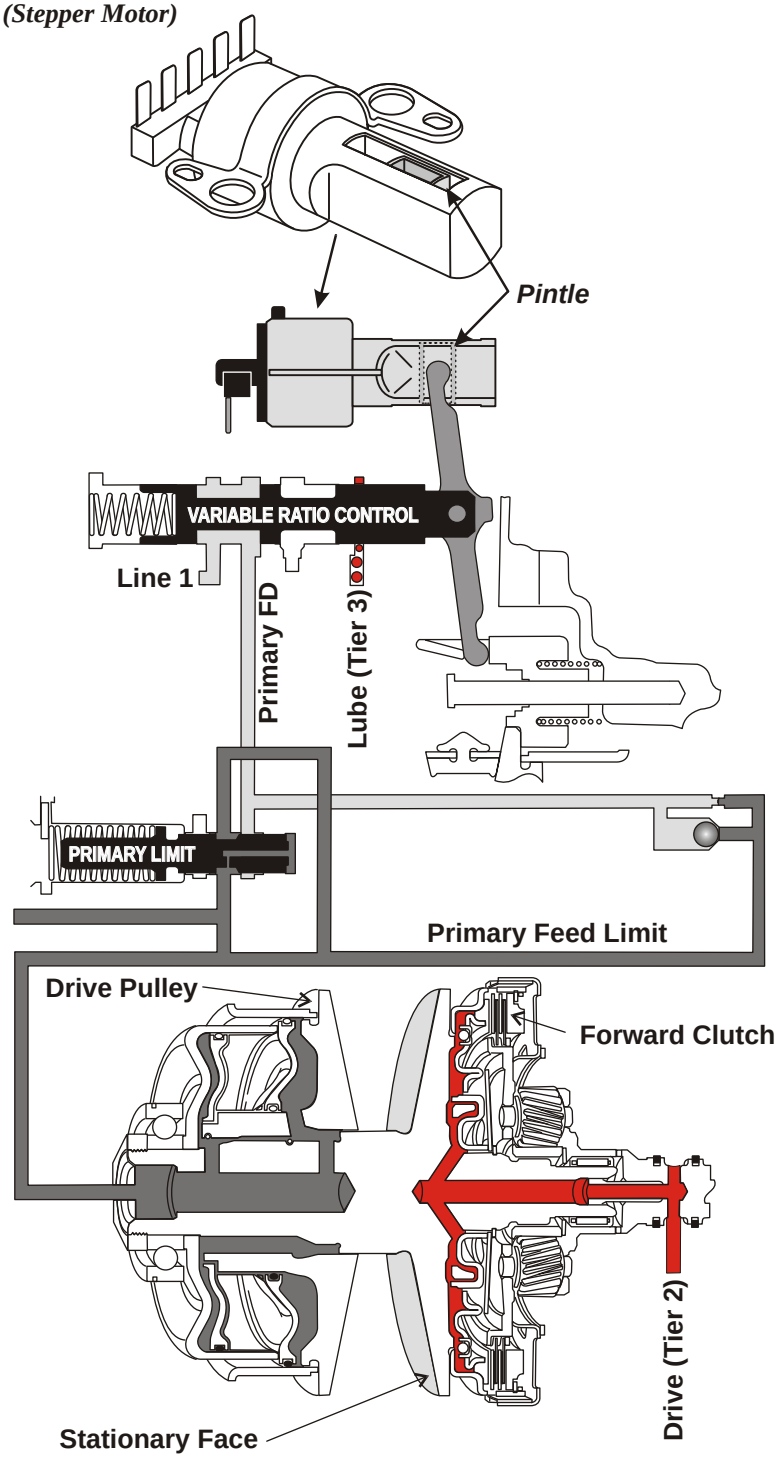


700 FRONT DIFFERENTIAL DRIVE PINI ON GEAR ROLLER BEARINGS (2)
701 FRONT DIFFERENTIAL DRIVE PINION GEAR AND TRANSFER GEAR ASSEMBLY

Figure 12

RATIO CONTROL MOTOR DESCRIPTION AND OPERATION

Ratio Control Motor (RCM)
(Stepper Motor)



Ratio Control Motor (RCM)

The ratio control motor (RCM) is a linear position device, which changes transmission ratio by accurately controlling the position of the variable ratio control valve in order to regulate primary feed fluid flow. The RCM has a total nominal travel of 22.0 mm.

The transmission control module (TCM) controls the sheave ratio by adjusting the position of the RCM pintle. Movement of the pintle changes the position of the variable ratio control valve, which regulates the primary feed fluid flow and directly changes the sheave ratio. The RCM is a bi-directional motor driven by two coils. The TCM supplies a ground to apply current to the RCM in steps (counts) to extend or retract the pintle. An increase in counts will result in a larger speed ratio (smaller sheave ratio) and a decrease in counts will result in a smaller speed ratio (larger sheave ratio).

The RCM frequency is calculated in a 25 ms loop and used throughout the 25 ms time. The RCM counts are spaced equally for each 25 ms loop. This is accomplished by looking at how many counts are requested for this period. If all of them can be done in less than the maximum frequency, then the slower frequency is used.

When there is a change in direction, the RCM must pause for a minimum time. If there is a change in frequency, then there is the same minimum pause time. The ratio control motor control algorithm incorporates a feature that will delay the count command for a calibratable amount of time when a change in direction of rotation of the ratio control motor shaft is detected. This feature is necessary because a significant amount of "lost' counts can occur due to overshoot of the rotor. The time delay allows the rotor to stabilize before beginning the rotation in the opposite direction.

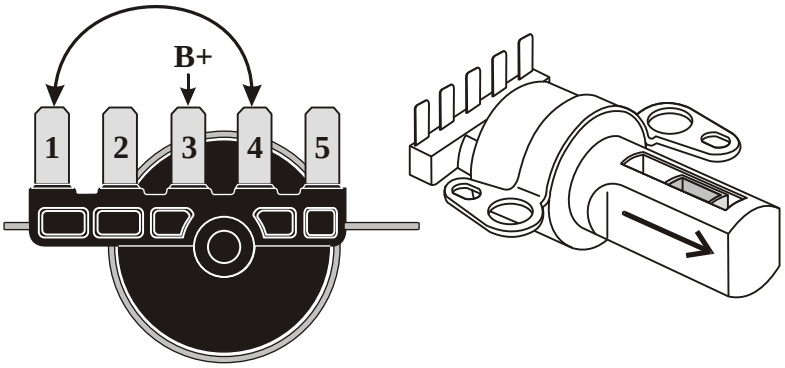
Figure 13

TESTING THE RATIO CONTROL MOTOR

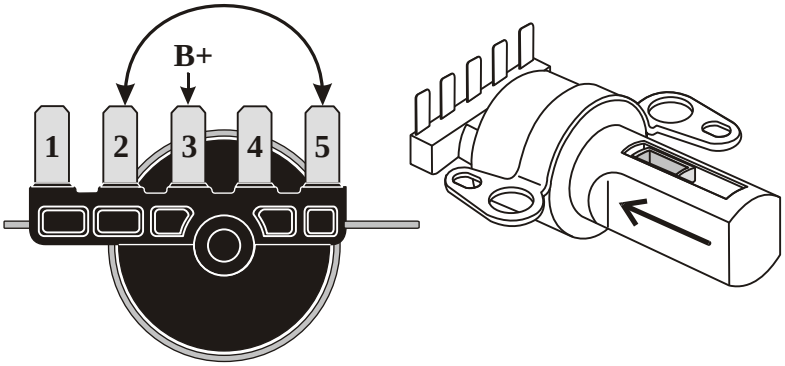
Ratio Control Motor (RCM)

Performing a Dynamic Test

To perform a dynamic test of the RCM (Stepper Motor), supply battery voltage to the center terminal marked 3.
Alternate a ground repeatedly between terminals 1 and 4 and watch the pintle move away from the coil.
NOTE: Pintle will move approximatey .89 mm (.035") for every 10 pulses.



Keeping a battery supply to the center terminal marked 3, alternate a ground repeatedly between terminals 2 and 5 and watch the pintle move towards the coil.
CAUTION: Do not leave current flowing through the stepper for great lengths of time or damage may occur.



To perform a resistance check on RCM, place the positive lead to center terminal marked 3, as shown.
With the negative lead, make individual contact with terminals 1, 2, 4 and 5. Each of the terminals should have approximately 25 ohms resistance.

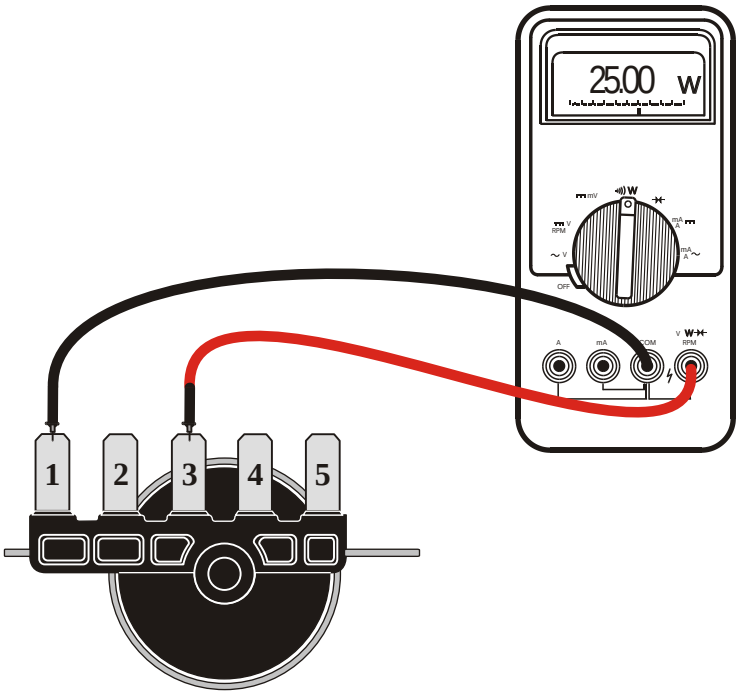
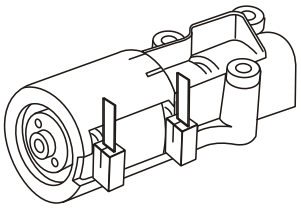


Figure 14

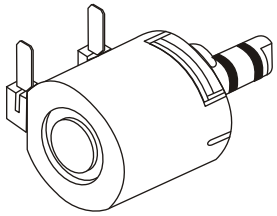
ADDITIONAL ELECTRONIC COMPONENT IDENTIFICATION

Line Pressure Control Solenoid



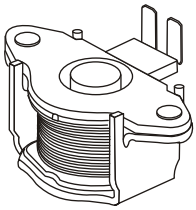
The Line Pressure Control Solenoid is a normally high, 2 port linear pressure control solenoid. The TCM controls the solenoid on a positive duty cycle at a fixed frequency of 292.5 Hz.
0.1 amps = Maximum line and 1.1 amps = Minimum line.
Resistance should measure between 3.5 and 4.1 ohms at 68° F.

Neutral Idle/ TCC Control Solenoid



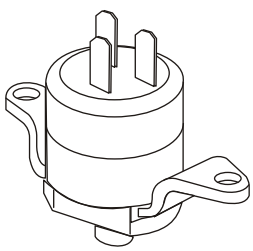
The Neutral Idle/TCC Control Solenoid is a normally low, 3 port linear pressure control solenoid. This solenoid controls the fluid pressure used to apply the forward and reverse clutches, as well as the TCC apply feel.
Resistance should measure between 3.5 and 4.1 ohms at 68° F.

Neutral Idle/ TCC ON/OFF Solenoid



The Neutral Idle/TCC ON/OFF Solenoid is a normally closed, 3 port ON/OFF solenoid. This solenoid is used to hydraulically select which fluid pressure; clutch control or regulated apply, that will be directed to the Neutral Idle/TCC Control Solenoid.
Resistance should measure between 20 and 24 ohms at 68° F.

Pressure Sensor

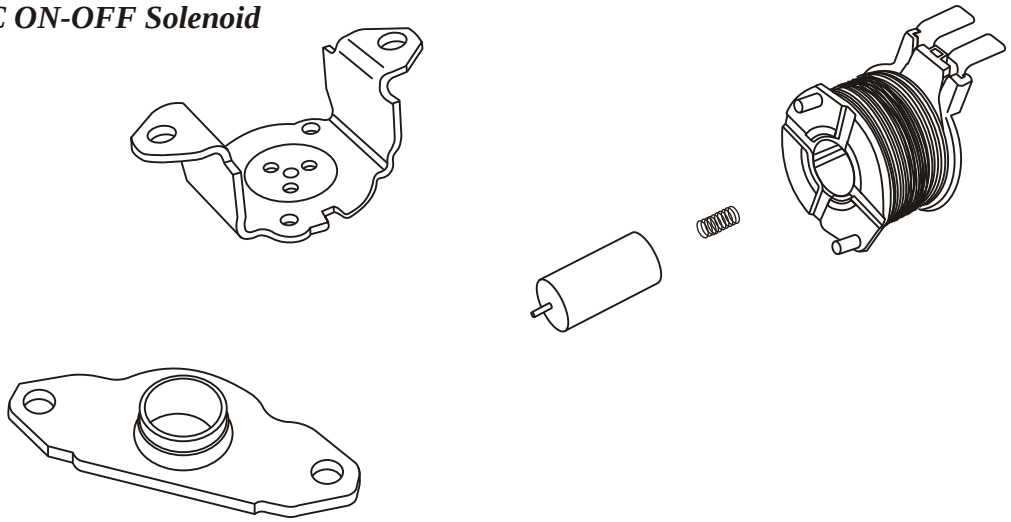


The Pressure Sensor is used to monitor line pressure and provide this information to the TCM. The Pressure Sensor uses an analog signal of 0 to 5 volts. The Pressure Sensor is fed with Tier 2 feed fluid pressure which normally ranges from 70 psi to 850 psi.

Figure 15

SOLENOID ASSEMBLY TIP

Neutral Idle/
TCC ON-OFF Solenoid



WARNING:
The Neutral Idle/TCC ON-OFF Solenoid brackets, coil, plunger and spring will seperate when the retaining bolts are removed. The metering ball remains in the valve body casting under a disc with the word "UP" stamped on the surface facing the solenoid. Extra care must be used so as not to lose any of these parts. The ball diameter is approximately .156".

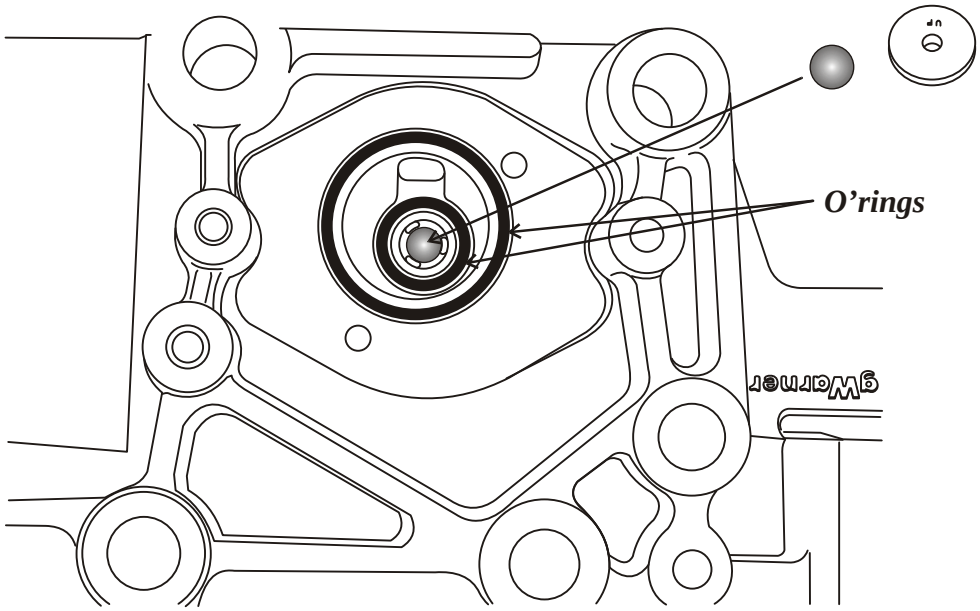
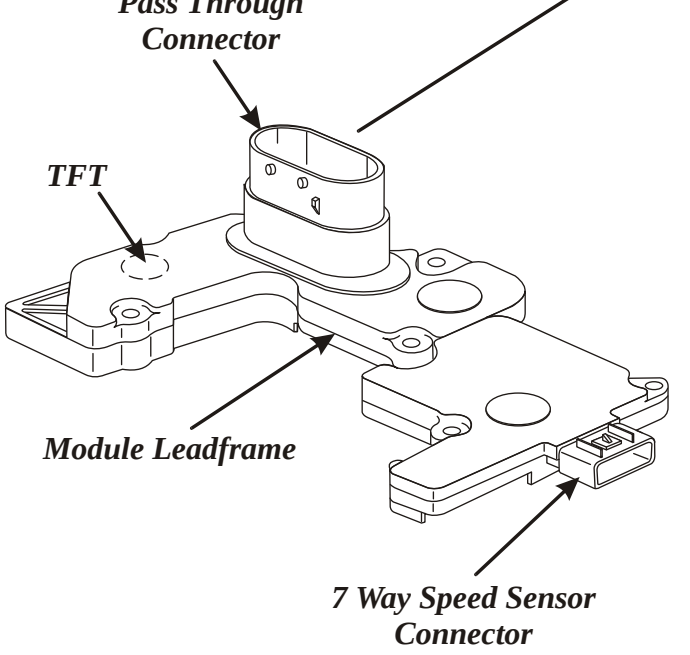
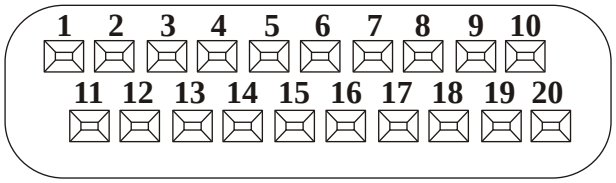


Figure 16

ADDITIONAL ELECTRONIC COMPONENT IDENTIFICATION



Pass Through Connector Terminal Identification

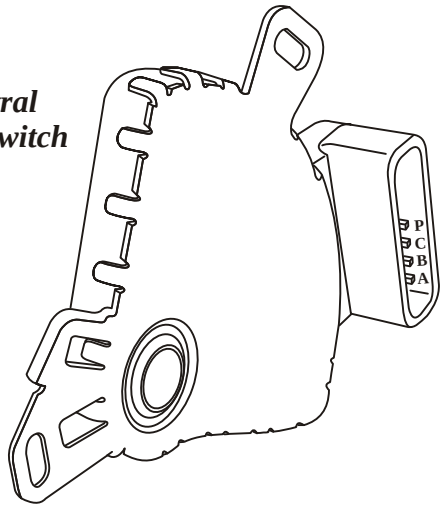


Pin	Function
1	Pressure Sensor Ground
2	Transmission Input Speed Sensor High
3	Transmission Input Speed Sensor Low
4	Transmission Output Speed Sensor High
5	Transmission Output Speed Sensor Low
6	NI/TCC Clutch Control Solenoid Valve Low
7	NI/TCC Clutch Control Solenoid Valve High
8	NI/TCC On-Off Solenoid Valve High
9	NI/TCC On-Off Solenoid Valve Low
10	Ratio Control Motor Phase B Terminal E
11	Pressure Sensor Power
12	Pressure Sensor Output
13	Transmission Fluid Temperature Sensor Low
14	Transmission Fluid Temperature Sensor High
15	Line Pressure Control Solenoid Valve High
16	Line Pressure Control Solenoid Valve Low
17	Ratio Control Motor Phase A Terminal A
18	Ratio Control Motor Phase B Terminal B
19	Ratio Control Motor Power (Common)
20	Ratio Control Motor Phase A Terminal D

Figure 17

ADDITIONAL ELECTRONIC COMPONENT IDENTIFICATION

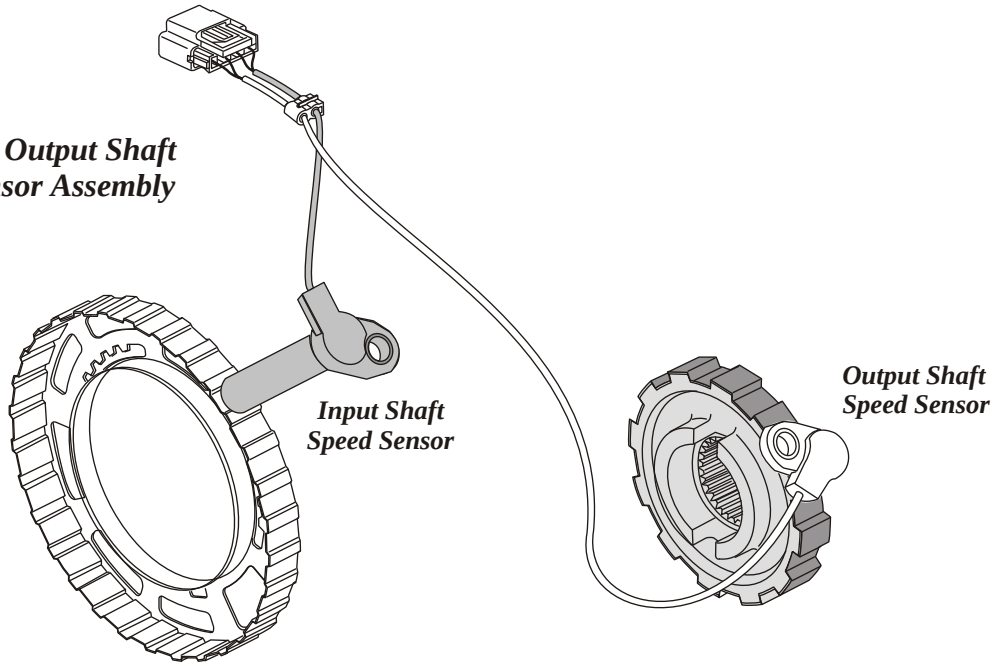
Park/Neutral Position Switch Assembly



Range Indicator	Circuit			
	A	B	C	P
Park	1	0	0	1
Reverse	1	1	0	0
Neutral	0	1	0	1
Drive	0	1	1	0
Intermediate	1	1	1	1
Low	1	0	1	0

1 = Closed (Resistance less than 50 ohms)
0 = Open (Resitance greater than 50k Ohms)

Input and Output Shaft Speed Sensor Assembly



Speed Sensor resistance should measure between 1300 - 1950 ohms at 68° F. Output voltage will vary with vehicle speed from a minimum of 0.5 volts AC @ 100 RPM, to more than 100 volts AC @ 8,000 RPM

Figure 18

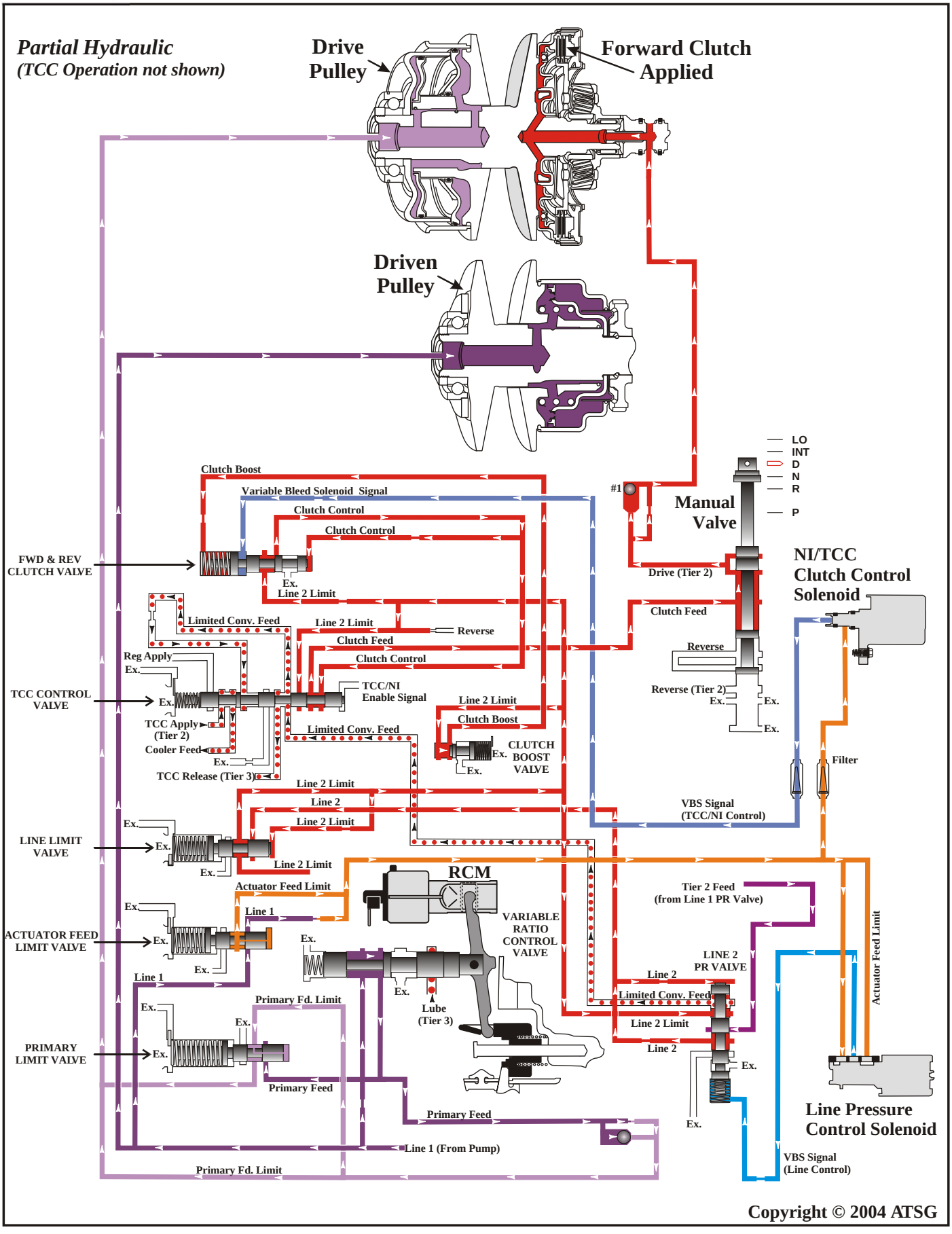


Figure 19