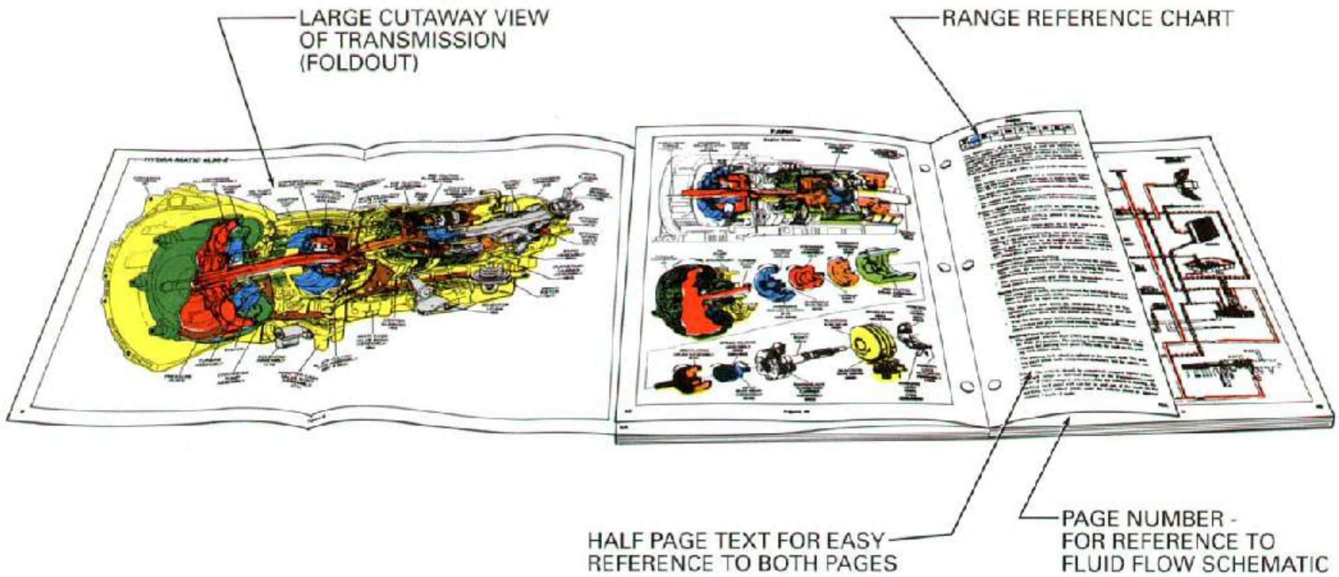

LARGE CUTAWAY VIEW
OF TRANSMISSION
(FOLDOUT)
RANGE REFERENCE CHART
HALF PAGE TEXT FOR EASY
REFERENCE TO BOTH PAGES
PAGE NUMBER -
FOR REFERENCE TO
FLUID FLOW SCHEMATIC

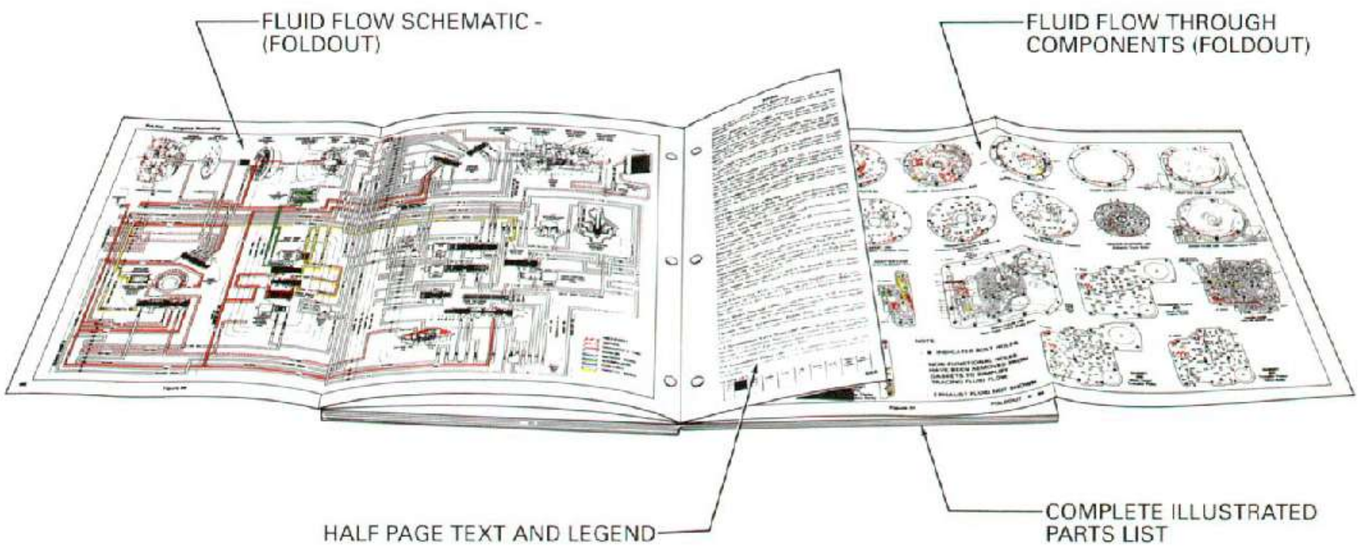

FLUID FLOW SCHEMATIC -
(FOLDOUT)
FLUID FLOW THROUGH
COMPONENTS (FOLDOUT)
HALF PAGE TEXT AND LEGEND
COMPLETE ILLUSTRATED
PARTS LIST

Figure 1

UNDERSTANDING THE GRAPHICS

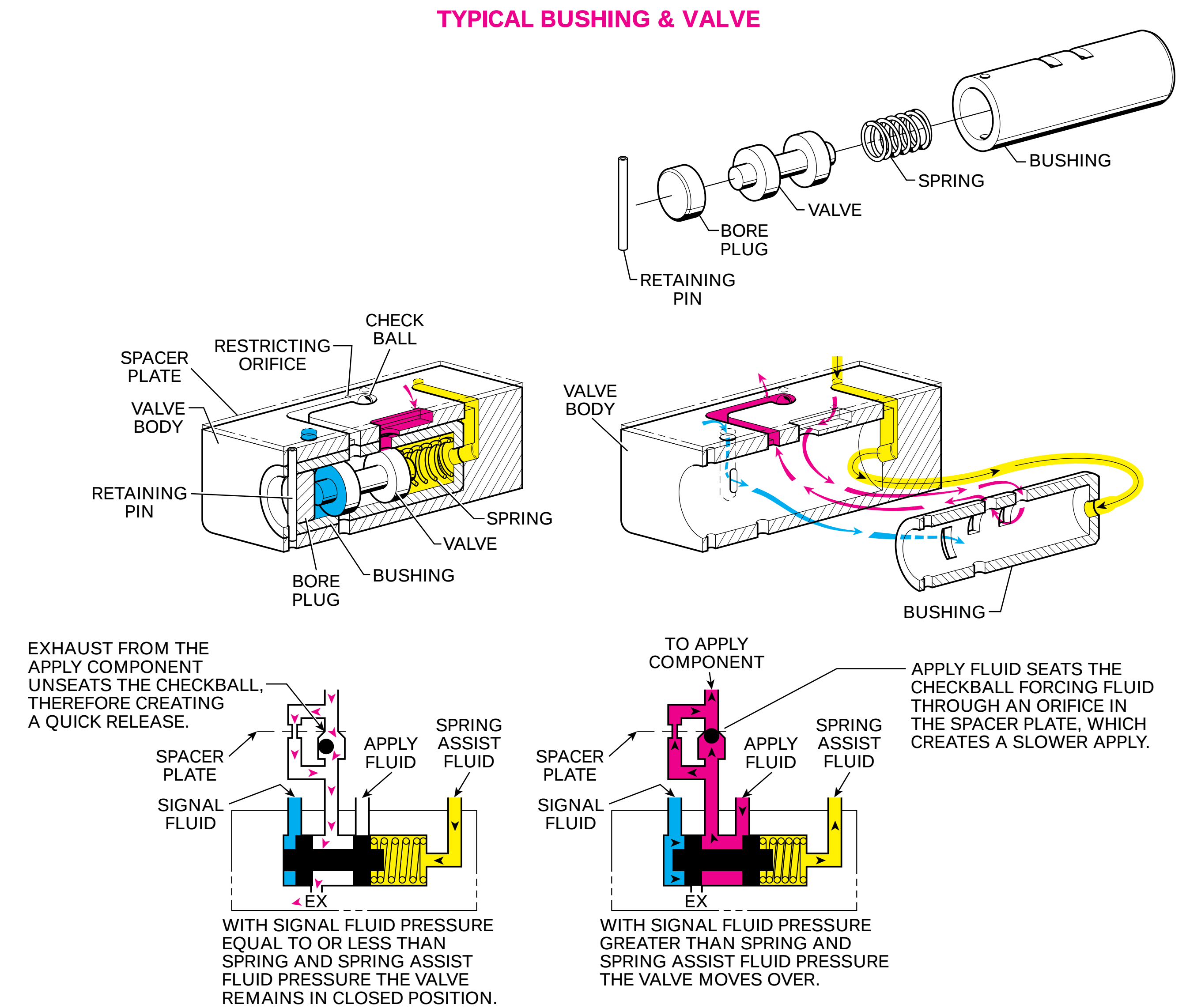
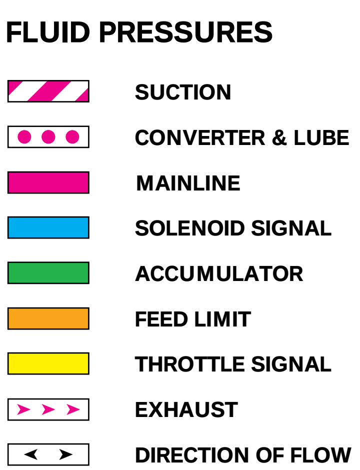
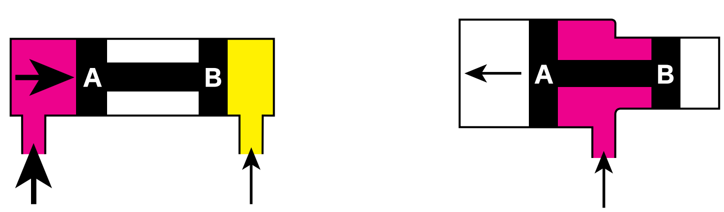


Figure 4

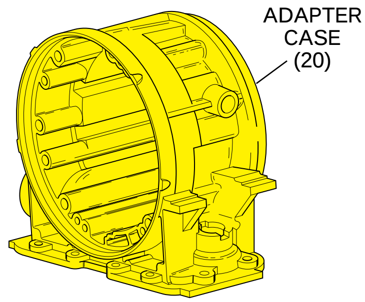




WITH EQUAL SURFACE AREAS ON EACH END OF THE VALVE, BUT FLUID PRESSURE "A" BEING GREATER THAN FLUID PRESSURE "B", THE VALVE WILL MOVE TO THE RIGHT.

WITH THE SAME FLUID PRESSURE ACTING ON BOTH SURFACE "A" AND SURFACE "B" THE VALVE WILL MOVE TO THE LEFT. THIS IS DUE TO THE LARGER SURFACE AREA OF "A" THAN "B".

Figure 5



4TH CLUTCH:

The 4th clutch assembly is located in the adapter case. The external teeth on the steel clutch plates (502) are splined to the adapter case while the internal teeth on the fiber clutch plates (503) are splined to the outside of the overrun clutch housing (510). The 4th clutch is only applied in Drive Range - Fourth Gear to provide an overdrive gear ratio through the overdrive planetary gear set.

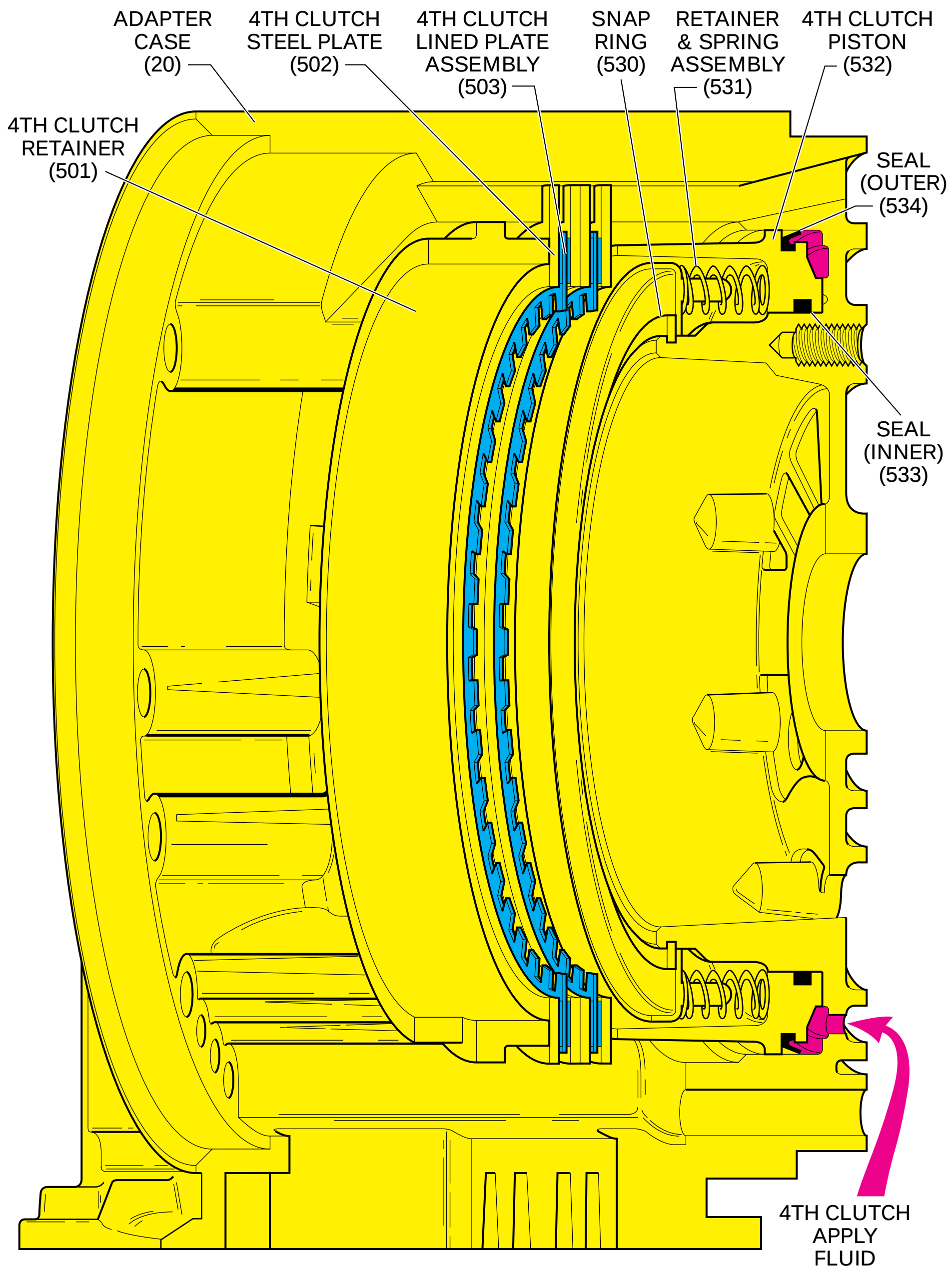
4TH CLUTCH APPLY:

To apply the 4th clutch, 4th clutch fluid is fed from the center support (30) into the adapter case behind the 4th clutch piston (532). 4th clutch fluid pressure moves the piston to compress the retainer and spring assembly (531) which cushions the clutch apply. As fluid pressure increases, the piston compresses the steel and fiber clutch plates until they are held against the 4th clutch retainer (501). The 4th clutch retainer is splined to the adapter case and held in place by the oil pump assembly (10). The retainer functions as a backing plate for the clutch pack.

When fully applied, the steel and fiber clutch plates are locked together and held stationary to the adapter case. The internal teeth on the fiber clutch plates (503) hold the overrun clutch housing (510) stationary. This prevents the overdrive sun gear (519), which is splined to the overrun clutch housing's inner hub, from rotating.

4TH CLUTCH RELEASE:

To release the 4th clutch, 4th clutch fluid exhaust from the adapter case and back through the center support (30), thereby decreasing fluid pressure at the 4th clutch piston (532). Without fluid pressure, spring force from the piston spring assembly (531) moves the 4th clutch piston away from the clutch pack. This disengages the steel and fiber clutch plates from the 4th clutch retainer (501) and allows the overrun clutch housing and overdrive sun gear to rotate freely.



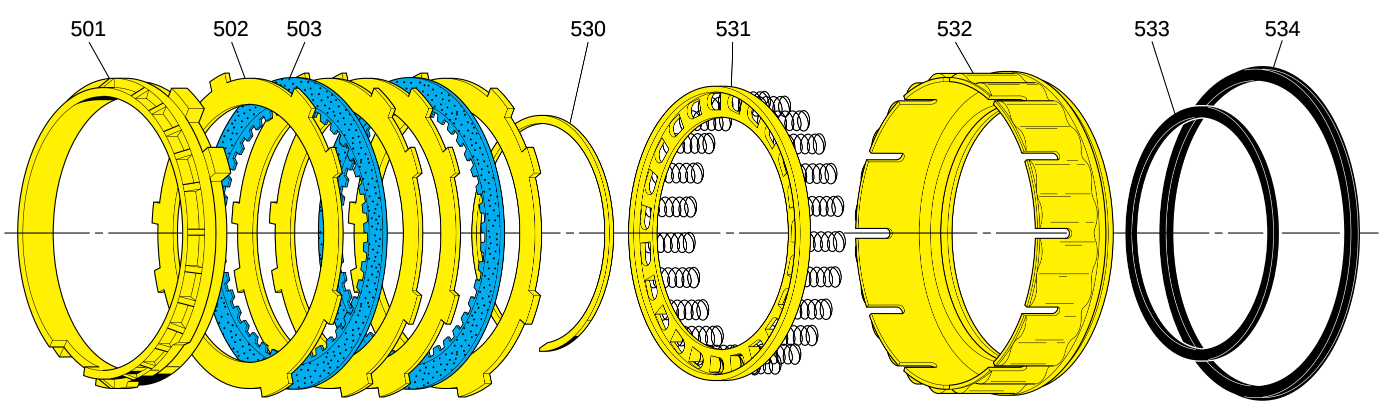


Figure 17

VALVES LOCATED IN THE CENTER SUPPORT

OVERRUN LOCKOUT VALVE (705)

This valve controls the apply and release of both the overrun clutch and the 4th clutch. *Note that these two clutches must not be applied at the same time.*

Overrun Clutch Applied

Spring force keeps the valve normally open, allowing orificed line pressure to feed the overrun clutch fluid circuit and apply the overrun clutch in Park, Reverse, Neutral, First, Second and Third gears. In this position the valve opens the 4th clutch fluid circuit to an exhaust port, thereby preventing 4th clutch apply. In Manual First and Manual Second, 1-2 fluid pressure assists spring force to prevent the overrun lockout valve from shifting into the Fourth gear position under any condition.

4th Clutch Applied

To obtain Fourth gear, 4th clutch feed 2 fluid is routed to the end of the overrun clutch valve. This fluid pressure moves the valve against spring force to; (1) block line pressure from entering the overrun clutch fluid circuit and exhaust overrun clutch fluid, thereby releasing the overrun clutch, and (2) allow 4th clutch feed 2 fluid to fill the 4th clutch fluid circuit, thereby applying the 4th clutch.

REVERSE LOCKOUT VALVE (706)

This valve prevents the reverse clutch from applying when Reverse (R) gear range is selected and the vehicle is moving forward above approximately 12 km/h (7 mph). *Reverse Lockout is not available on all applications.*

Normal Operating Conditions

When the vehicle is stationary and Reverse (R) gear range is selected, reverse fluid from the manual valve (326) is routed to the end of the reverse lockout valve. This fluid pressure moves the valve against spring force, allowing reverse fluid at the middle of the valve to enter the reverse clutch fluid circuit. Reverse clutch fluid applies the reverse clutch and Reverse (R) gear range is obtained.

Reverse Locked Out

When the vehicle is moving forward above approximately 12 km/h (7 mph) and Reverse (R) gear range is selected, the TCM energizes the TCC solenoid. With the solenoid ON, solenoid feed fluid flows through the solenoid and fills the solenoid signal fluid circuit. Solenoid signal fluid is routed to the spring end of the reverse lockout valve, thereby assisting spring force to keep the valve closed against reverse fluid pressure. This blocks reverse fluid from entering the reverse clutch fluid circuit and prevents the transmission from shifting into Reverse.

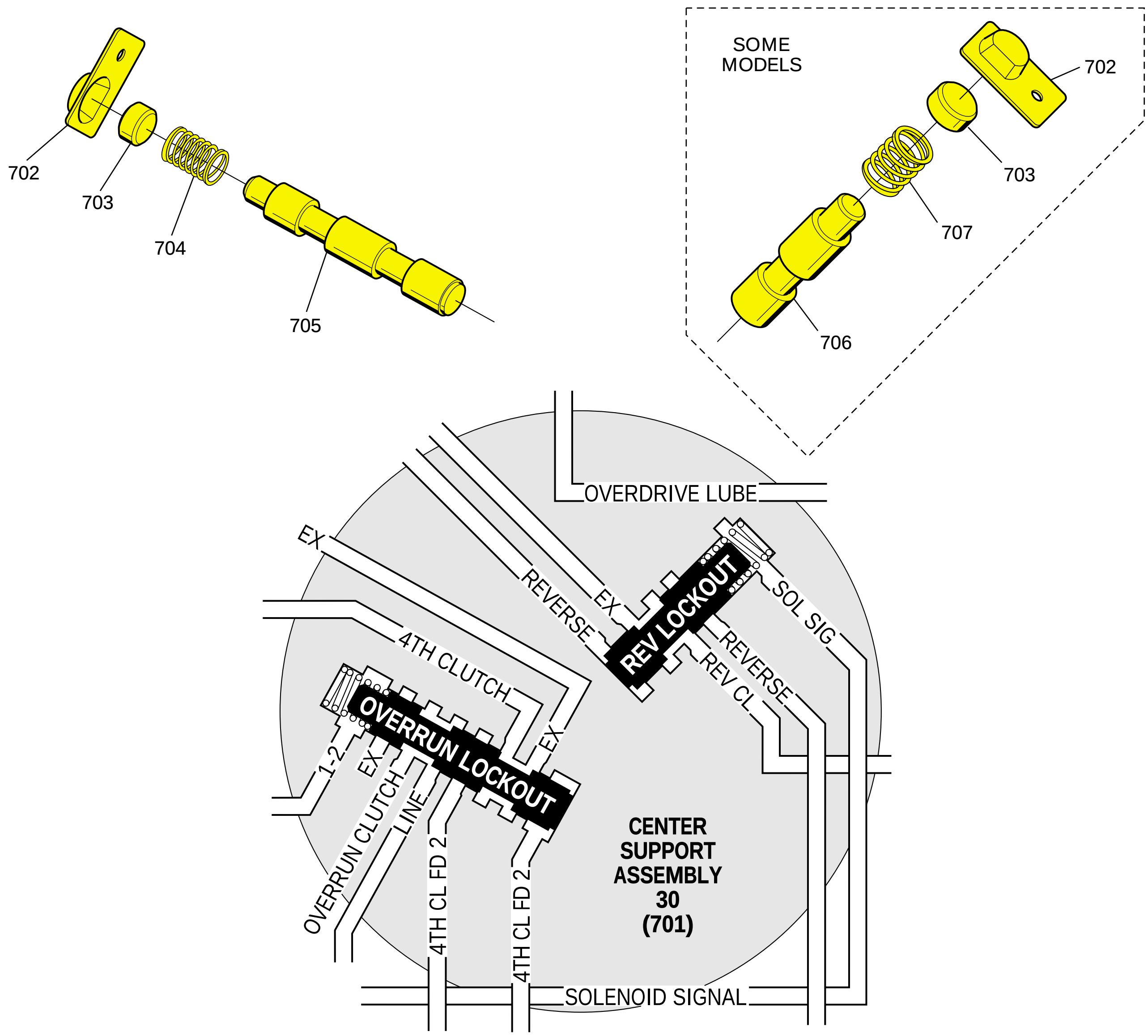


Figure 30

DRIVE RANGE - THIRD GEAR

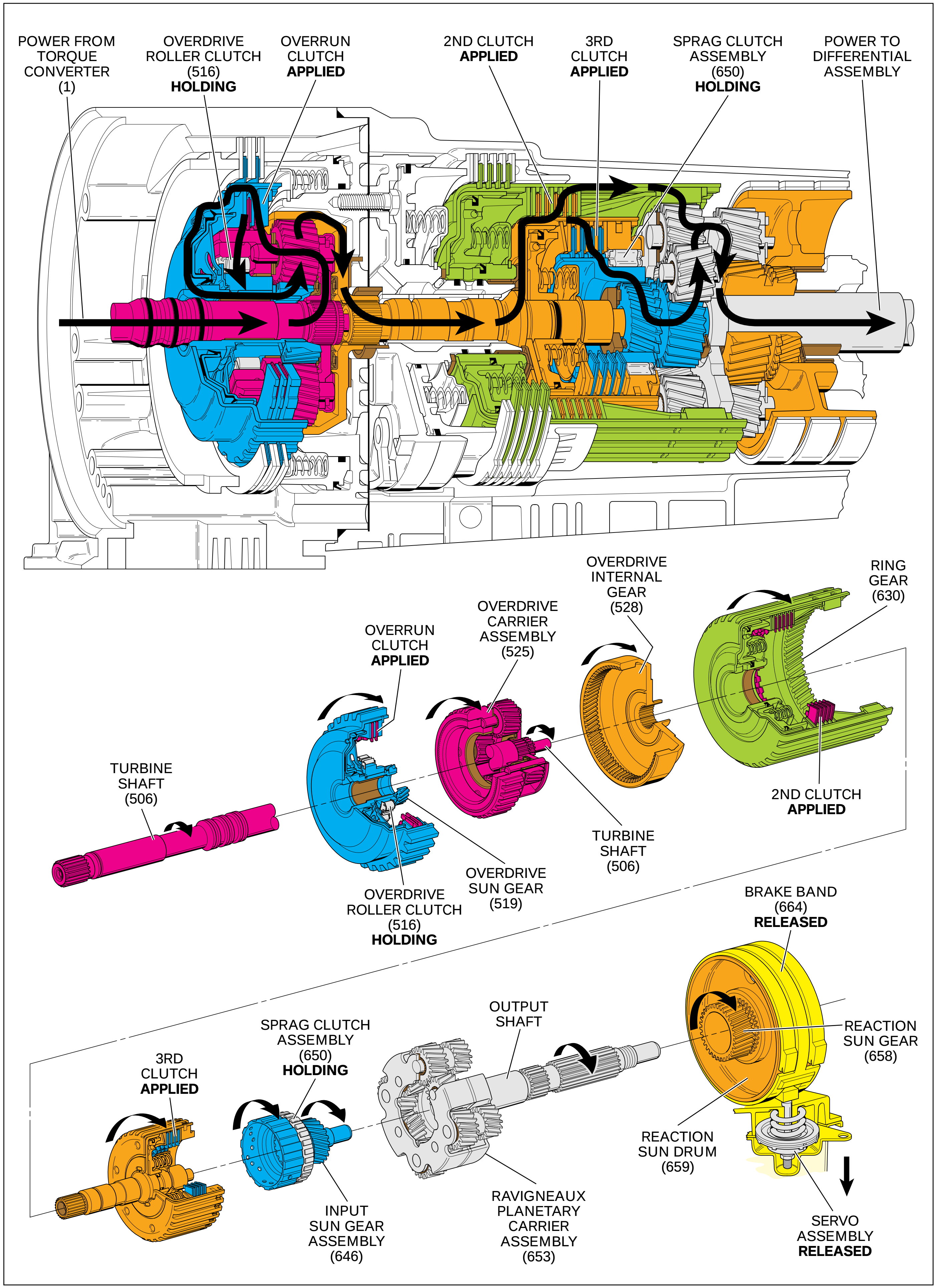


Figure 50

DRIVE RANGE - THIRD GEAR

1-2 / 3-4 SOL N.C.	2-3 SOL N.O.	OVERDRIVE ROLLER CLUTCH	OVERRUN CLUTCH	FOURTH CLUTCH	THIRD CLUTCH	REVERSE CLUTCH	SECOND CLUTCH	PRINCIPLE SPRAG ASSEMBLY	BAND ASSEMBLY
ON	OFF	LD	APPLIED		APPLIED		APPLIED	NE	

LD = LOCKED IN DRIVE FW = FREEWHEELING NE = NOT EFFECTIVE

As vehicle speed increases further, the TCM processes the input signals from the VSS, TPS and other vehicle sensors to determine the precise moment to shift the transmission into Third gear. In Third gear, both planetary gear sets rotate at the same speed, thereby providing a 1:1 direct drive gear ratio between the converter turbine and output shaft.

- Engine torque is transmitted to the 3rd clutch drum assembly (634) from the converter turbine in the same manner as First and Second Gears: The overrun clutch plates (520-522) are applied, the overdrive roller clutch (516) is holding and there is a 1:1 direct drive ratio through the overdrive gear set.

3rd Clutch Applied

- The 3rd clutch plates (641-643) are applied and transfer engine torque from the 3rd clutch drum to the input sun gear assembly (646).

Sprag Clutch Holding

- The sprag clutch (650) is locked in drive as in Park, Reverse, Neutral and First gear. However, the 3rd clutch plates function as the primary holding force to transfer engine torque to the input sun gear.
- The 2nd clutch plates (625-627) remain applied as in Second gear. Engine torque is also transferred from the 3rd clutch drum to the 2nd clutch drum (618) and ring gear (630).
- With both the input sun gear and ring gear rotating at converter turbine speed, the short and long pinions are locked together and do not rotate on their pins. The pinion gears act as wedges and rotate at converter turbine speed with the input sun gear and ring gear. This drives the Ravigneaux carrier and output shaft assembly (653) at converter turbine speed.

Brake Band Released

- The brake band (664) is released and the long pinions drive the reaction sun gear (658) and reaction sun drum (659). However, these components do not affect power flow in Third gear.
- Therefore, a 1:1 direct drive gear ratio is obtained between the converter turbine and output shaft.
- The torque converter clutch (TCC) may be applied in Third gear. When the TCC is applied, converter turbine speed equals engine speed (see torque converter, page 12).

Coast Conditions

- With the 3rd clutch plates applied, the 3rd clutch drum and input sun gear assembly are locked together. As a result, the input sun gear assembly cannot overrun the sprag clutch (650) during coast conditions (throttle released) as in Drive Range - First Gear. Similar to Second gear, without an element to overrun during deceleration, engine compression provides braking to slow the vehicle when the throttle is released.

As vehicle speed increases, less torque multiplication is required to operate the vehicle efficiently. Therefore, it is desirable to shift the transmission to an overdrive gear ratio, or Fourth gear.

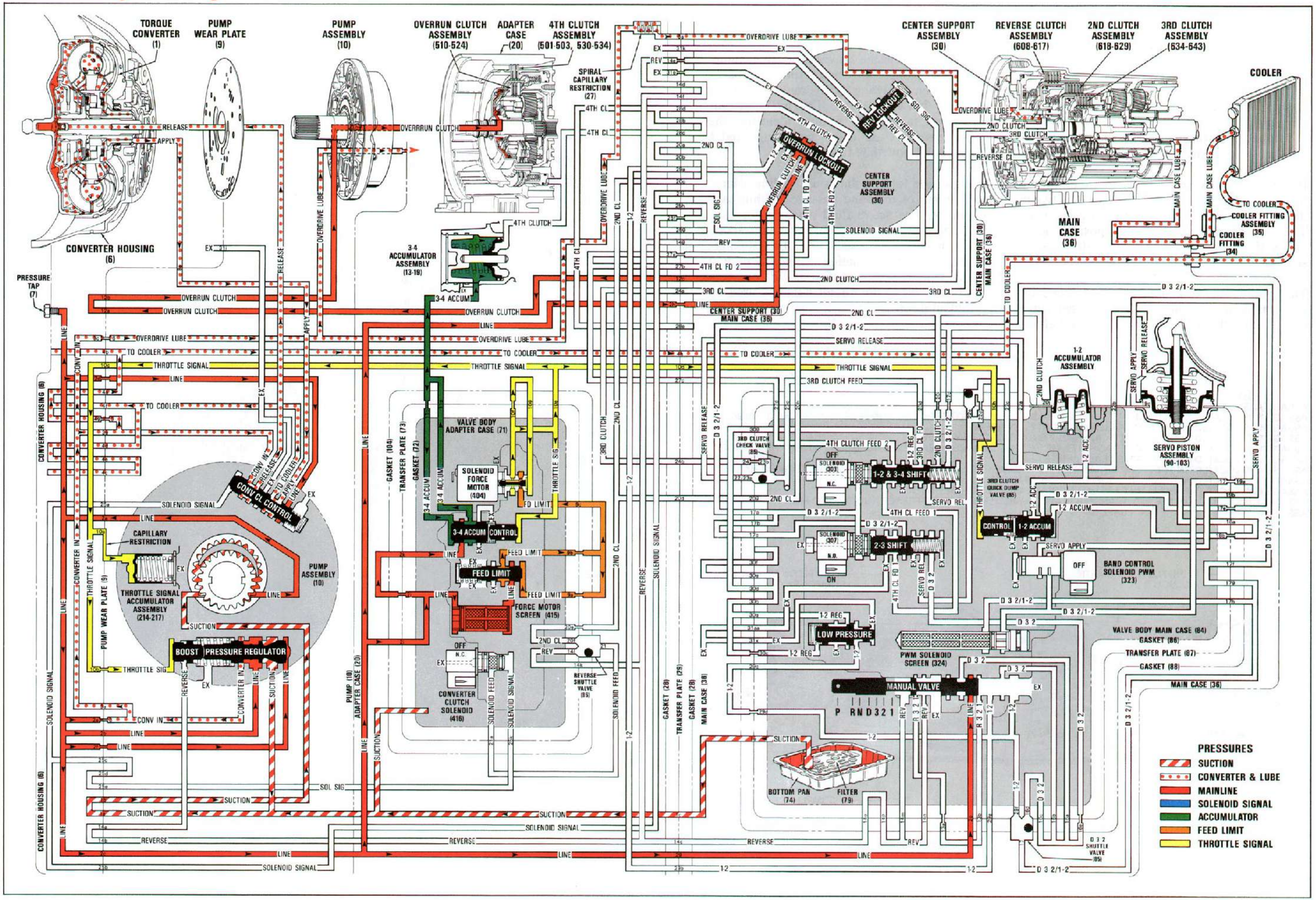
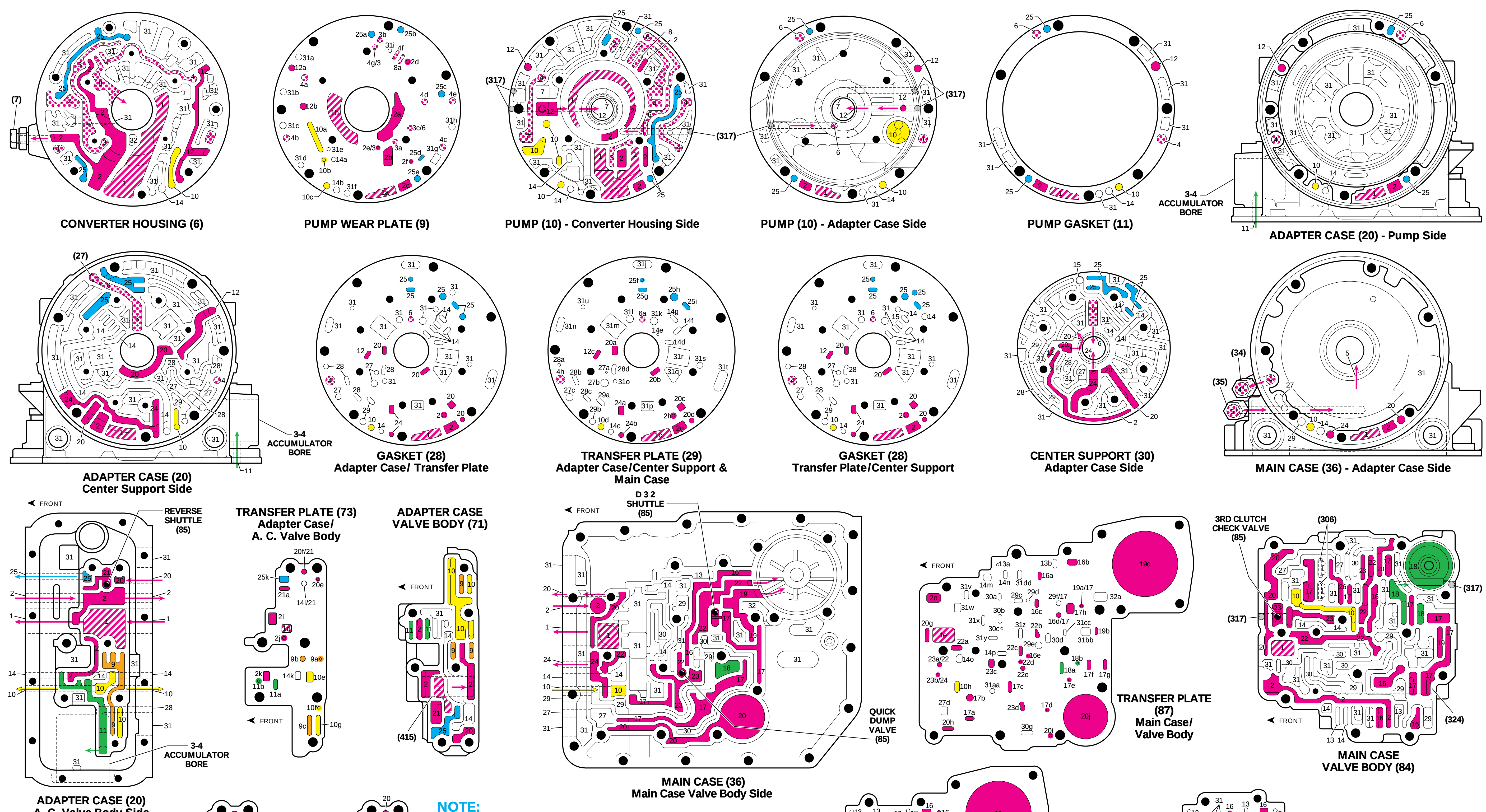
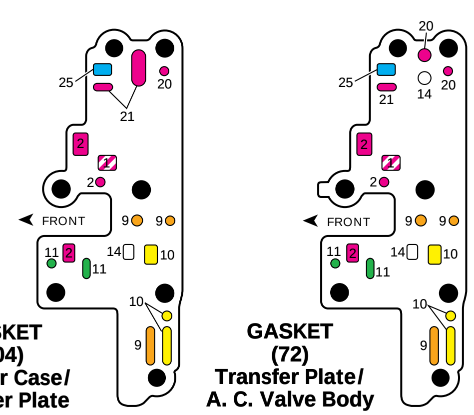

TORQUE CONVERTER (1)
PUMP WEAR PLATE (9)
PUMP ASSEMBLY (10)
OVERRUN CLUTCH ASSEMBLY (510-524)
ADAPTER CASE (20)
4TH CLUTCH ASSEMBLY (501-503, 530-534)
SPIRAL CAPILLARY RESTRICTION (27)
CENTER SUPPORT ASSEMBLY (30)
REVERSE CLUTCH ASSEMBLY (608-617)
2ND CLUTCH ASSEMBLY (618-629)
3RD CLUTCH ASSEMBLY (634-643)
COOLER
CONVERTER HOUSING (6)
PRESSURE TAP (7)
3-4 ACCUMULATOR ASSEMBLY (13-19)
MAIN CASE (36)
COOLER FITTING ASSEMBLY (35)
COOLER FITTING (34)
1-2 ACCUMULATOR ASSEMBLY
SERVO PISTON ASSEMBLY (90-103)
VALVE BODY ADAPTER CASE (71)
SOLENOID FORCE MOTOR (404)
3-4 ACCUM CONTROL
FEED LIMIT
FORCE MOTOR SCREEN (415)
CONVERTER CLUTCH SOLENOID (416)
CONV CL CONTROL
CAPILLARY RESTRICTION
THROTTLE SIGNAL ACCUMULATOR ASSEMBLY (214-217)
BOOST
PRESSURE REGULATOR
REVERSE SHUTTLE VALVE (85)
3RD CLUTCH CHECK VALVE (85)
1-2 & 3-4 SHIFT
2-3 SHIFT
3RD CLUTCH QUICK DUMP VALVE (85)
CONTROL
1-2 ACCUM
BAND CONTROL SOLENOID PWM (323)
LOW PRESSURE
PWM SOLENOID SCREEN (324)
MANUAL VALVE
P R N D 3 2 1
BOTTOM PAN (74)
FILTER (79)
D 3 2 SHUTTLE VALVE (85)
VALVE BODY MAIN CASE (84)
GASKET (86)
TRANSFER PLATE (87)
GASKET (88)
MAIN CASE (36)
REV LOCKOUT
OVERRUN LOCKOUT
OVERDRIVE LUBE
OVERRUN CLUTCH
THROTTLE SIGNAL
LINE
TO COOLER
SOLENOID SIGNAL
SUCTION
REVERSE
PRESSURES
SUCTION
CONVERTER & LUBE
MAINLINE
SOLENOID SIGNAL
ACCUMULATOR
FEED LIMIT
THROTTLE SIGNAL

Figure 65

DRIVE RANGE - THIRD GEAR (Torque Converter Clutch Applied)





NOTE:

- ● INDICATES BOLT HOLES
- NON-FUNCTIONAL HOLES HAVE BEEN REMOVED FROM GASKETS TO SIMPLIFY TRACING FLUID FLOW.
- EXHAUST FLUID NOT SHOWN
- CONFIGURATION OF SOME COMPONENTS MAY BE DIFFERENT FOR VARIOUS APPLICATIONS. REFER TO APPROPRIATE SERVICE INFORMATION FOR SPECIFIC APPLICATION INFORMATION.

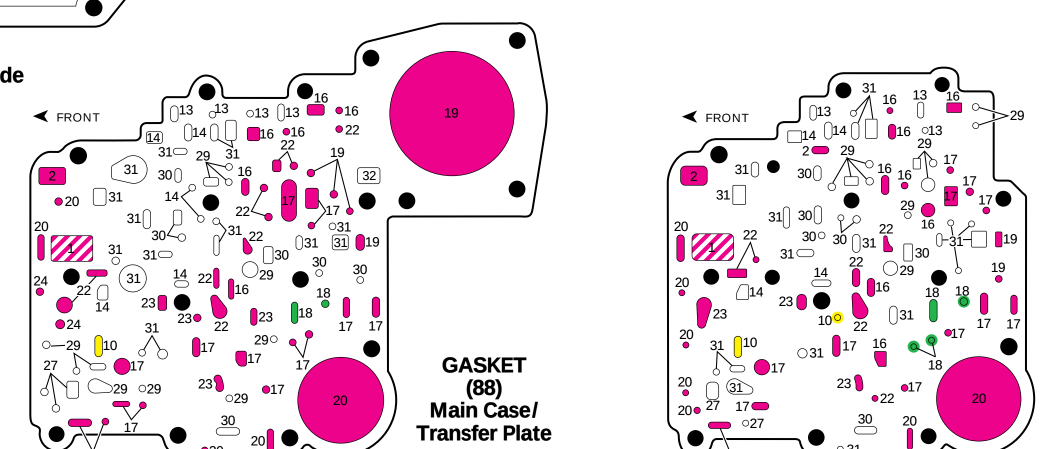
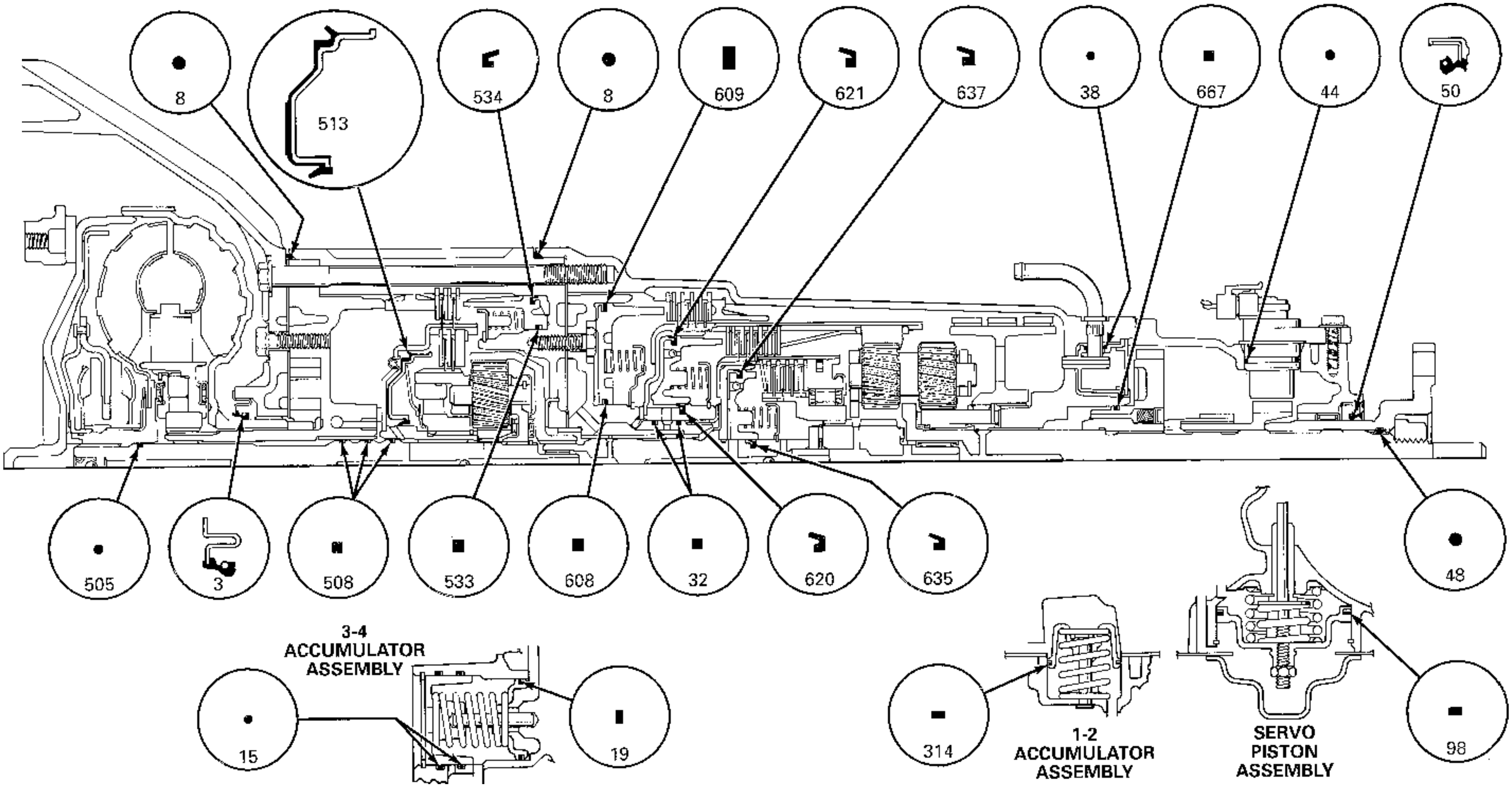


Figure 76

SEAL LOCATIONS



3 SEAL RING ASSEMBLY, CONVERTER HOUSING
8 SEAL, O-RING
15 SEAL, O-RING 3-4 ACCUMULATOR
19 RING, 3-4 ACCUMULATOR PISTON
32 RING, OIL SEAL
38 SEAL, O-RING/BREATHER ASSEMBLY
44 SEAL, O-RING/SPEED SENSOR
48 SEAL, O-RING/DRIVE FLANGE
50 SEAL, EXTENSION ASSEMBLY
98 SEAL, RING/SERVO PISTON
314 RING, 1-2 ACCUMULATOR PISTON
505 SEAL, O-RING/TURBINE SHAFT
508 RING, OIL SEAL/TURBINE SHAFT
513 PISTON, OVERRUN CLUTCH
533 SEAL, 4TH CLUTCH PISTON (INNER)
534 SEAL, 4TH CLUTCH PISTON (OUTER)
608 SEAL, REVERSE CLUTCH PISTON (INNER)
609 SEAL, REVERSE CLUTCH PISTON (OUTER)
620 SEAL, 2ND CLUTCH PISTON (INNER)
621 SEAL, 2ND CLUTCH PISTON (OUTER)
635 SEAL, 3RD CLUTCH PISTON (INNER)
637 SEAL, 3RD CLUTCH PISTON (OUTER)
667 SEAL, RING/GOVERNOR HUB

Figure 89

BASIC SPECIFICATIONS

Transmission Drive
Rear Wheel Drive

Transmission Type
4L30-E = 4: Four Speed
L: Longitudinal Mount
30: Product Series
E: Electronically Controlled

Automatic Overdrive with
Torque Converter Clutch Assembly

Current Engine Range
1.6L to 4.3L Gasoline

Control Systems
Shift Pattern –
(2) 3-Way On/Off Solenoids
Shift Quality –
(1) Force Motor
(1) "High Flow" Pulse Width Modulated Solenoid (for 3-2 Downshifts Only)
Torque Converter Clutch –
(1) 2-Way On/Off Solenoid

Additional transmission and engine sensors are provided depending on transmission/powertrain application.

Gear Ratios	**Base**	**Optional**
1st	2.400	2.860
2nd	1.479	1.620
3rd	1.000	1.000
4th	0.723	0.723
Rev	2.000	2.000

Maximum Engine Torque
350 Nm (258 LB-FT, 36 Kg-M)

Maximum Gearbox Torque
597 Nm (440 LB-FT, 61 Kg-M)

The maximum torque limits are only to be used as a guide and may not be applicable under certain conditions.

Maximum Shift Speed

	245mm Converter	**260mm Converter**
1-2	6,500 RPM	7,000 RPM
2-3	6,500 RPM	7,000RPM
3-4	6,500 RPM	7,000RPM

The maximum shift speed allowed in each engine application must be calculated.

Maximum Gross Vehicle Weight (Estimate)
3,500 Kg (7,716 LB)

Transmission Fluid Type
Dexron® IIE

Converter Sizes Available
245 mm and 260 mm (Reference)

Converter Bolt Circle Diameters
For 245 mm Converter – 228.0 mm to 247.7 mm
For 260 mm Converter – 227.0 mm to 247.7 mm

Converter Stall Torque Ratio Range
For 245 mm Converter – 1.63 to 2.70
For 260 mm Converter – 1.70 to 2.57

Converter "K" Factor Range
For 245 mm Converter – 122 to 240
For 260 mm Converter – 129 to 187

Not all "K" Factors are applicable across the entire range of Converter Stall Torque Ratios.

Transmission Fluid Capacities (Approximate)
Dry: 6.4L (7 QT) with 245 mm Converter
Dry: 7.8L (8 QT) with 260 mm Converter

Transmission Weight

For 245 mm Converter	**For 260 mm Converter**
Dry: 69.1 Kg (152.33 LB)	Dry: 72.4 Kg (159.06 LB)
Wet: 76.0 Kg (167.55 LB)	Wet: 80.5 Kg (177.47 LB)

Transmission Packaging Information*
Overall Length**
725.14 mm to 793.64 mm (245 mm Converter)
733.39 mm to 801.89 mm (260 mm Converter)

Main Case (Reference)**
430.4 mm

Converter Housing
142.75 mm minimum with 245 mm Converter
152.0 mm minimum with 260 mm Converter

Extension Housing**
219.6 mm minimum with Slip Yoke Design
115.0 mm minimum with Fixed Yoke Design
70.0 mm minimum with 4-wheel Drive

* All dimensions shown are nominal.
** Determined by customer requirements.

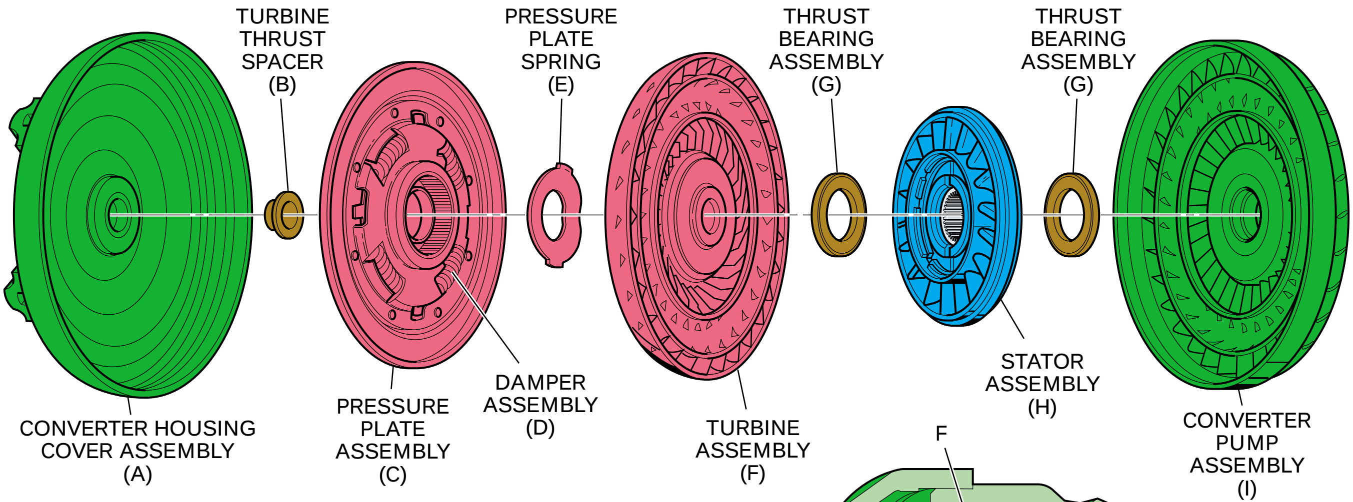
7 Position Quadrant
(P, R, N, D, 3, 2, 1)

Pressure Taps Available
Line Pressure

Manufacturing Location
Strasbourg, France

Information may vary with application. All information, illustrations and specifications contained in this brochure are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

TORQUE CONVERTER



TORQUE CONVERTER:
The torque converter (1) is the primary component for transmittal of power between the engine and the transmission. It is bolted to the engine flywheel (also known as the flexplate) so that it will rotate at engine speed. Some of the major functions of the torque converter are:

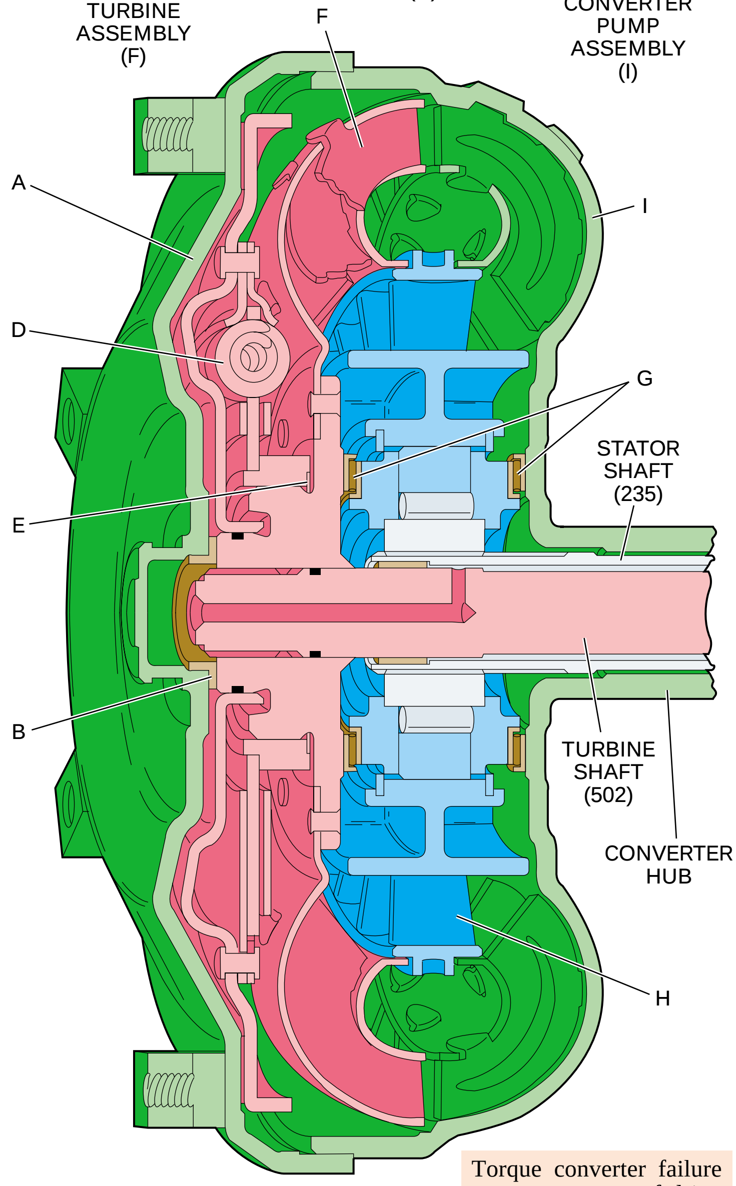
- to provide for a smooth conversion of torque from the engine to the mechanical components of the transmission.
- to multiply torque from the engine that enables the vehicle to achieve additional performance when required.
- to mechanically operate the transmission oil pump (4) through the converter hub.
- to provide a mechanical link, or direct drive, from the engine to the transmission through the use of a torque converter clutch (TCC).

The torque converter assembly is made up of the following five main sub-assemblies:

- a converter housing cover assembly (A) which is welded to the converter pump assembly (I).
- a converter pump assembly (I) which is the driving member.
- a turbine assembly (F) which is the driven or output member.
- a stator assembly (G) which is the reaction member located between the converter pump and turbine assemblies.
- a pressure plate assembly (C) splined to the turbine assembly to enable direct mechanical drive when appropriate.

CONVERTER PUMP ASSEMBLY AND TURBINE ASSEMBLY
When the engine is running the converter pump assembly acts as a centrifugal pump by picking up fluid at its center and discharging it at its rim between the blades (see Figure 12). The force of this fluid then hits the turbine blades and causes the turbine to rotate. As the engine and converter pump increase in RPM, so does the turbine.

PRESSURE PLATE, DAMPER AND CONVERTER HOUSING ASSEMBLIES
The pressure plate is splined to the turbine hub and applies (engages) with the converter cover to provide a mechanical coupling of the engine to the transmission. When the pressure plate assembly is applied, the amount of slippage that occurs through a fluid coupling is reduced (but not eliminated), thereby providing a more efficient transfer of engine torque to the drive wheels.

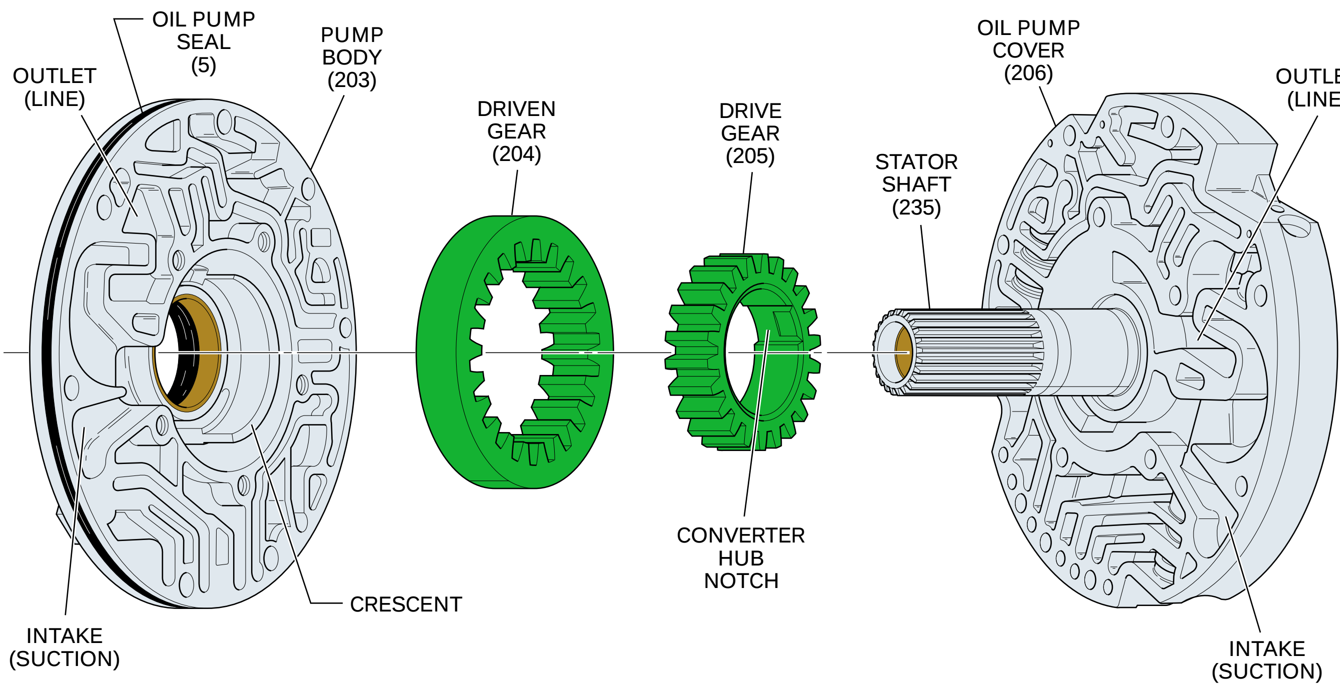


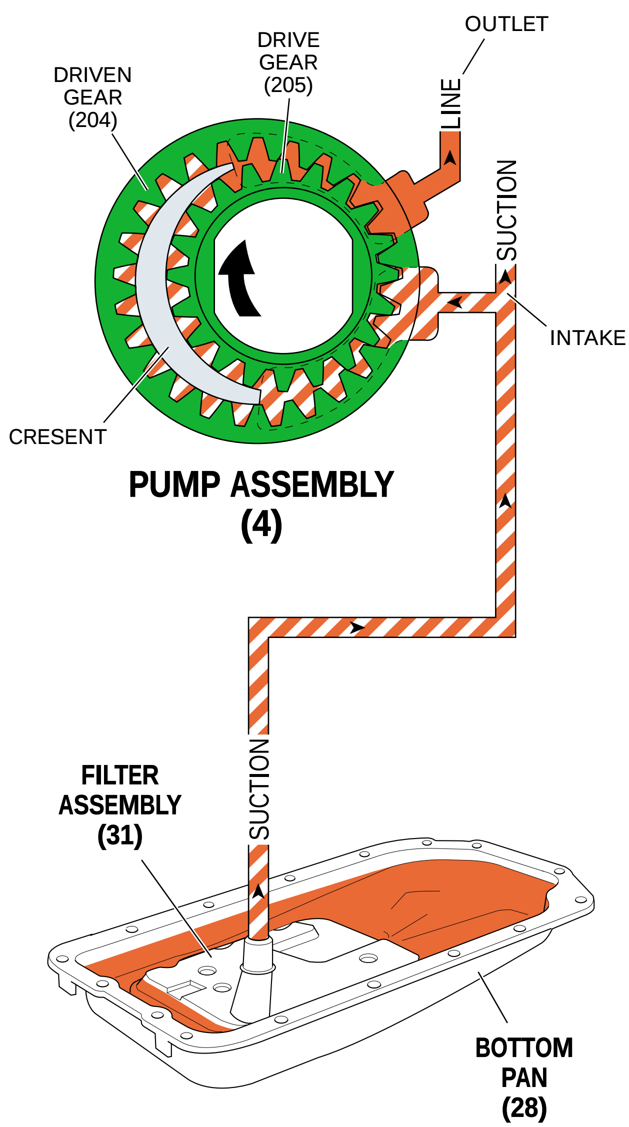
Torque converter failure could cause loss of drive and or loss of power.

To reduce torsional shock during the apply of the pressure plate to the converter cover, a spring loaded damper assembly (D) is used. The pressure plate is attached to the pivoting mechanism of the damper assembly which allows the pressure plate to rotate independently of the damper assembly up to approximately 45 degrees. During engagement, the springs in the damper assembly cushion the pressure plate engagement and also reduce irregular torque pulses from the engine or road surface.

Figure 11

OIL PUMP ASSEMBLY





The oil pump assembly (204) contains a positive displacement internal-external gear type pump located in the oil pump body (203). This spur gear type pump assembly consists of a pump drive gear (205) that has gear teeth in constant mesh with the teeth on one side of the pump driven gear. On the opposite side of the mesh point, the pump gears are separated by a crescent section of the pump body. Whenever the engine is cranking or running, the pump drive gear, keyed into the torque converter pump hub, is driven by the hub and rotates at engine speed.

As the gears rotate towards the wide portion of the crescent, volume is positively displaced, thereby creating a vacuum (low atmospheric pressure) at the pump intake port. This vacuum allows the higher atmospheric pressure acting on the fluid in the bottom pan (28) to force fluid through the filter assembly (31) and into the suction side of the pump. Through the rotation of the gears, the gear teeth carry the transmission fluid beyond the crescent to the pressure side of the pump. In this area the volume between the gear teeth decreases. As the gear teeth come together, fluid is forced through the pump outlet into the line fluid passage. Line fluid is then directed to the pressure regulator valve which creates the line pressure required to maintain the supply of fluid to the various hydraulic circuits and apply components throughout the transmission.

When engine speed (RPM) increases, the volume of fluid being supplied to the hydraulic system also increases because of the faster rotation of the pump gears. At a specified calibrated pressure, (which varies with transmission model) the pressure regulator valve will move down far enough against spring force to allow excess fluid to return to the suction side of the pump gears. The result is a control of the pump's delivery rate of fluid to the hydraulic system.

Pump Related Diagnostic Tips

- Transmission Overheating
- Loss of drive
- High or low line pressure
- Oil out the vent tube

Figure 29

MECHANICAL POWERFLOW FROM THE TORQUE CONVERTER TO THE TURBINE SHAFT

(Engine Running)

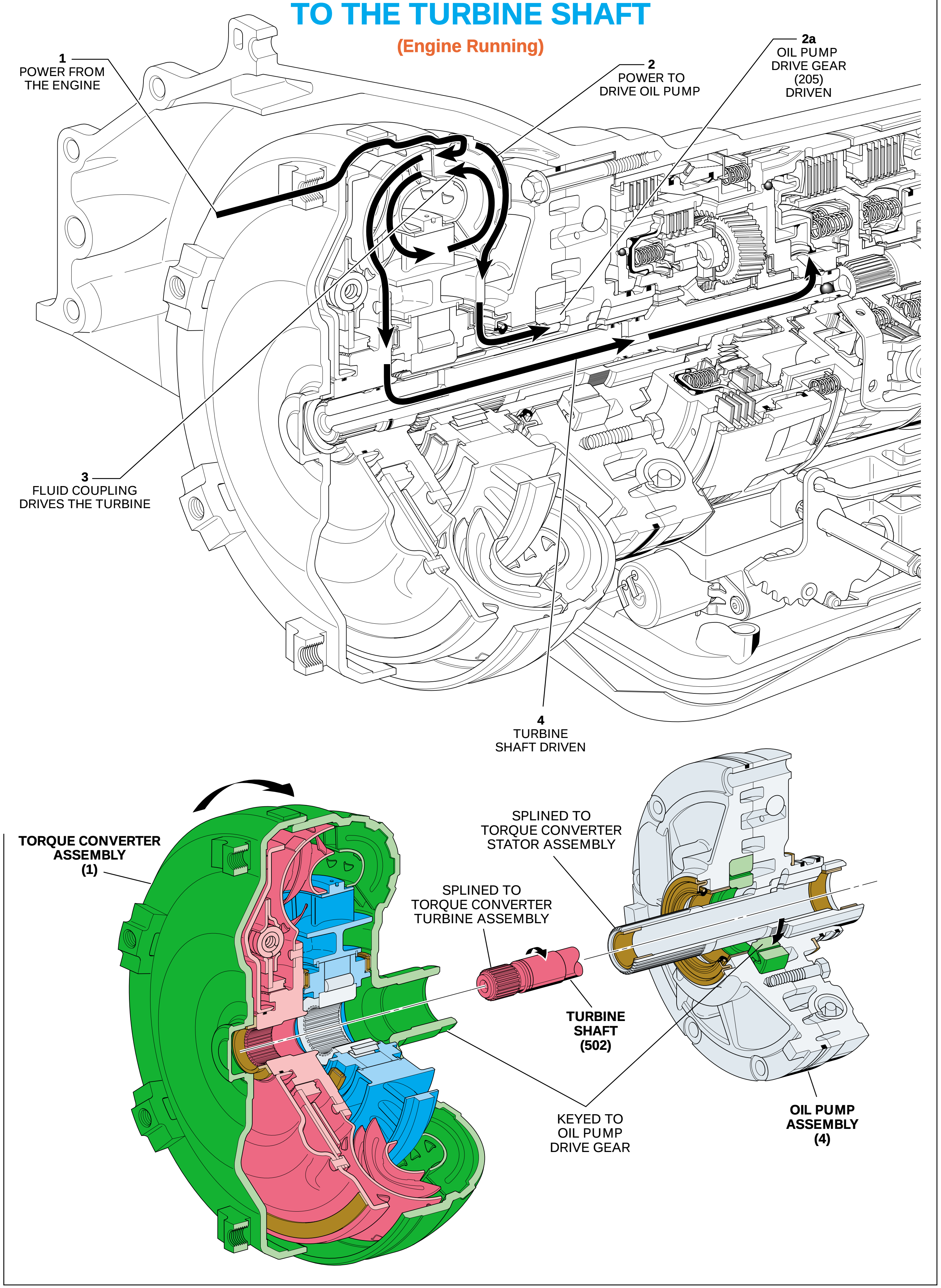


Figure 44

MECHANICAL POWERFLOW FROM THE TORQUE CONVERTER TO THE TURBINE SHAFT

(Engine Running)

The mechanical power flow in the Hydra-matic 4L80-E transmission begins at the point of connection between the torque converter and the engine flywheel. When the engine is running, the torque converter cover (pump) is forced to rotate at engine speed. As the torque converter rotates it multiplies engine torque and transmits it to the turbine shaft (502). The turbine shaft provides the primary link to the mechanical operation of the transmission.

The Hydra-matic 4L80-E automatic transmission requires a constant supply of pressurized fluid to cool and lubricate all of the components throughout the unit. It also requires a holding force to be applied to the bands and clutches during the various gear range operations. The oil pump assembly (4) and control valve body assembly (44) provide for the pressurization and distribution of fluid throughout the transmission.

1 Power from the Engine
Torque from the engine is transferred to the transmission through the engine flywheel which is bolted to the engine crankshaft.

2 Power to Drive the Oil Pump
The oil pump drive gear (205) is keyed to the torque converter hub. Therefore, the oil pump drive gear also rotates at engine speed.

3 Fluid Coupling Drives the Turbine
Transmission fluid inside the torque converter (1) creates a fluid coupling which in turn drives the torque converter turbine.

4 Turbine Shaft Driven
As the torque converter turbine rotates, the turbine shaft (502), which is splined to the torque converter turbine, is also forced to rotate at turbine speed.

NOTE: To minimize the amount of repetitive text, the remaining mechanical power flow descriptions will begin with the turbine shaft (502). The transfer of torque from the engine through the torque converter to the turbine shaft is identical in all gear ranges.

MANUAL FIRST – FIRST GEAR

(from Manual Second – Second Gear)

SOLENOID 1-2	SOLENOID 2-3	FOURTH CLUTCH	OVERRUN CLUTCH	OVERDRIVE ROLLER CLUTCH	FORWARD CLUTCH	DIRECT CLUTCH	MANUAL 2-1 BAND	INTER. SPRAG CLUTCH	INTER. CLUTCH	LOW ROLLER CLUTCH	LOW & REV BAND
ON	OFF		APPLIED	HOLDING	APPLIED			*		HOLDING	APPLIED

* HOLDING BUT NOT EFFECTIVE.

NOTE: DESCRIPTIONS ABOVE EXPLAIN COMPONENT FUNCTION DURING ACCELERATION.

Manual First (1) may be selected at any time while the vehicle is being operated in a forward gear range. However, the downshift to First gear is controlled electronically by the PCM which will not energize the 1-2 shift solenoid (SS) valve (First gear state) until the vehicle speed is below approximately 56 km/h (35 mph). Above this speed, the transmission will operate in a Manual First - Second Gear condition until vehicle speed slows sufficiently. Note that this speed varies depending on vehicle application.

When the gear selector lever is moved to Manual First, the manual valve also moves. With vehicle speed low enough, the following hydraulic and electrical changes occur to achieve Manual First - First Gear:

LOW AND REVERSE BAND ASSEMBLY APPLIES

1a Manual Valve:
Line pressure enters the lo fluid circuit at the manual valve.

1b TFP Manual Valve Position Switch:
Lo fluid is directed to the TFP manual valve position switch to signal the PCM that the transmission is in Manual First.

1c 1-2 Shift Solenoid (SS) Valve:
The PCM engergizes the 1-2 SS valve, thereby creating high 1-2 signal fluid pressure which moves the 1-2 shift valve to the downshifted position.

1d #7 Ball Check Valve:
Lo fluid from the manual valve is also routed to the #7 ball check valve, and seats the #7 ball check valve against the reverse circuit and enters the Rear Band Apply (RBA) fluid circuit.

1e Low And Reverse Band Servo:
RBA fluid pressure overcomes the force from 2nd accumulator fluid pressure and spring force to move the low and reverse servo piston and low and reverse band apply pin. This applies the low and reverse band assembly.

2 INTERMEDIATE CLUTCH AND MANUAL 2-1 BAND RELEASE:

2a 1-2 Shift Valve:
The 2-3 drive circuit is opened to an exhaust port at the 1-2 shift valve. Because 2-3 drive fluid supplies the Front Band Apply (FBA), 2nd clutch and filtered 2-3 drive circuits, these circuits are also open to exhaust.

2b Manual 2-1 Band Servo:
FBA fluid exhausts from the manual 2-1 band servo, allowing spring force to move the piston and manual 2-1 band servo pin and release the manual 2-1 band assembly. When exhausting, FBA fluid unseats the #3 ball check valve.

2c Intermediate Clutch Assembly:
2nd clutch fluid exhausts from the intermediate clutch piston and low and reverse servo assembly, thereby releasing the intermediate clutch plates.

3 SHIFT ACCUMULATION

3a Accumulator Valve:
Lo fluid is also directed to the accumulator valve to keep the valve fully compressed against spring force and orificed accumulator fluid pressure. This allows drive fluid to flow directly into the accumulator fluid circuit without being regulated, thereby increasing accumulator fluid pressure to equal line fluid pressure.

- The increase in accumulator fluid pressure in Manual First is needed at the low and reverse servo assembly to keep the low and reverse band released in a Manual First - Second Gear condition. In Second gear, the PCM keeps the 1-2 SS valve de-energized and 2nd clutch fluid pressure is present (see inset in Figure 69). If this happens with 2nd accumulator fluid pressure not equal to line fluid pressure, RBA fluid pressure will move the low and reverse servo piston to apply the low and reverse band. In this situation, both bands (manual 2-1 and low and reverse) would be applied and a tie up condition would occur.

As in Manual Third and Manual Second, the PCM output signal to the pressure control (PC) solenoid valve increases torque signal fluid pressure further for the added torque requirements during engine compression braking or maximum engine torque transfer.

MANUAL FIRST – FIRST GEAR

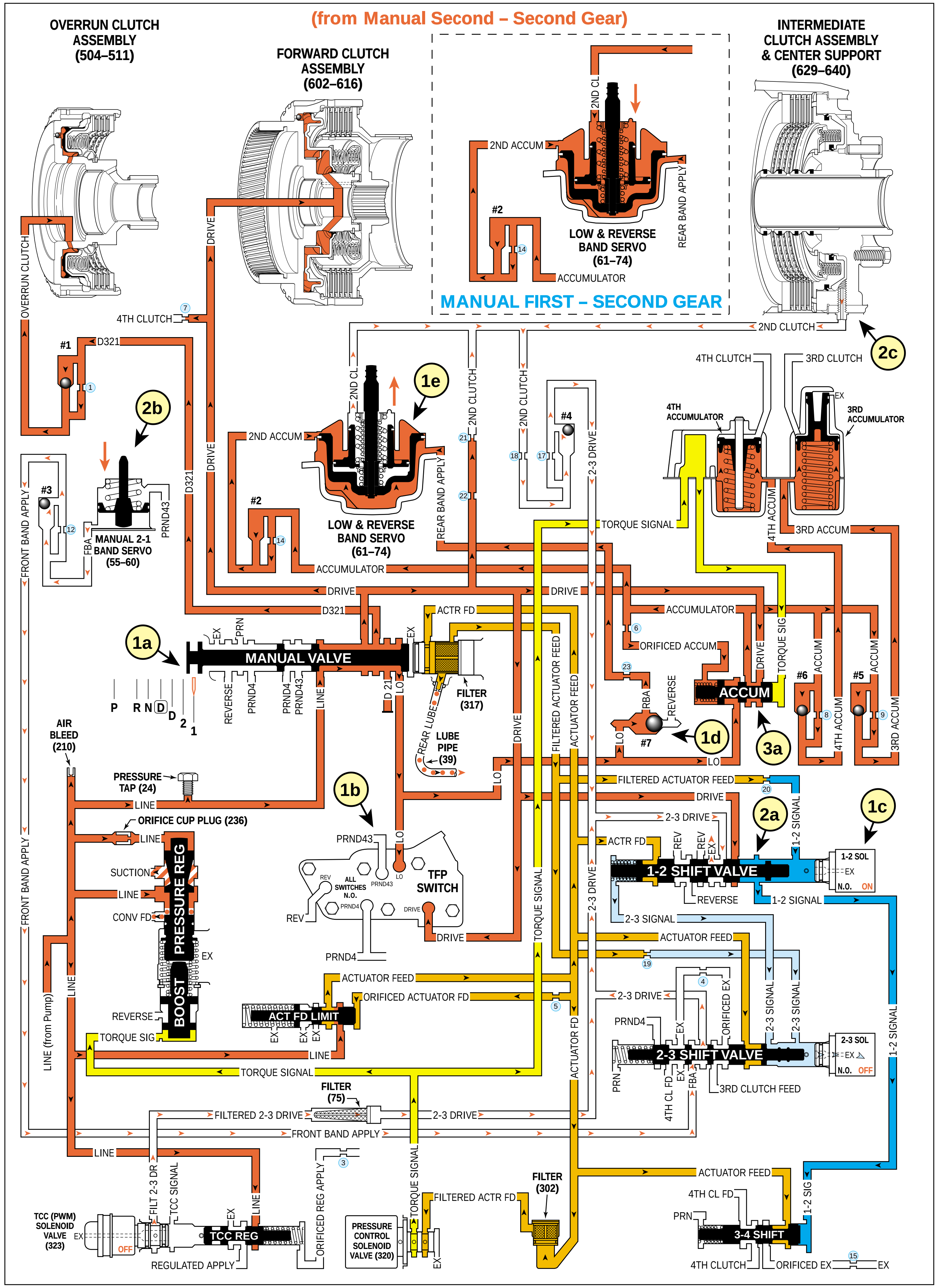


Figure 69

OVERDRIVE RANGE – FIRST GEAR

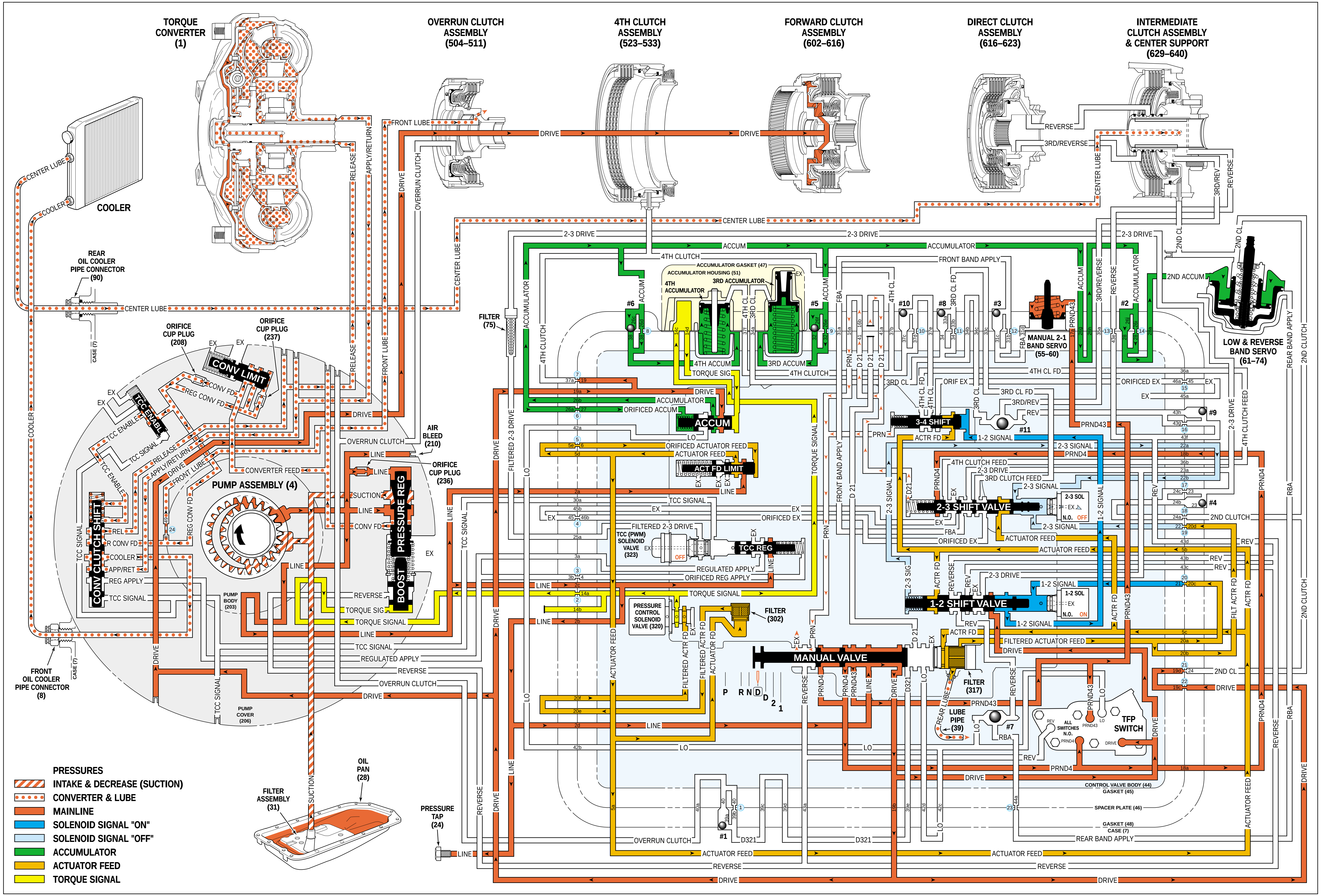


Figure 78

OVERDRIVE RANGE – FOURTH GEAR (Torque Converter Clutch Applied)

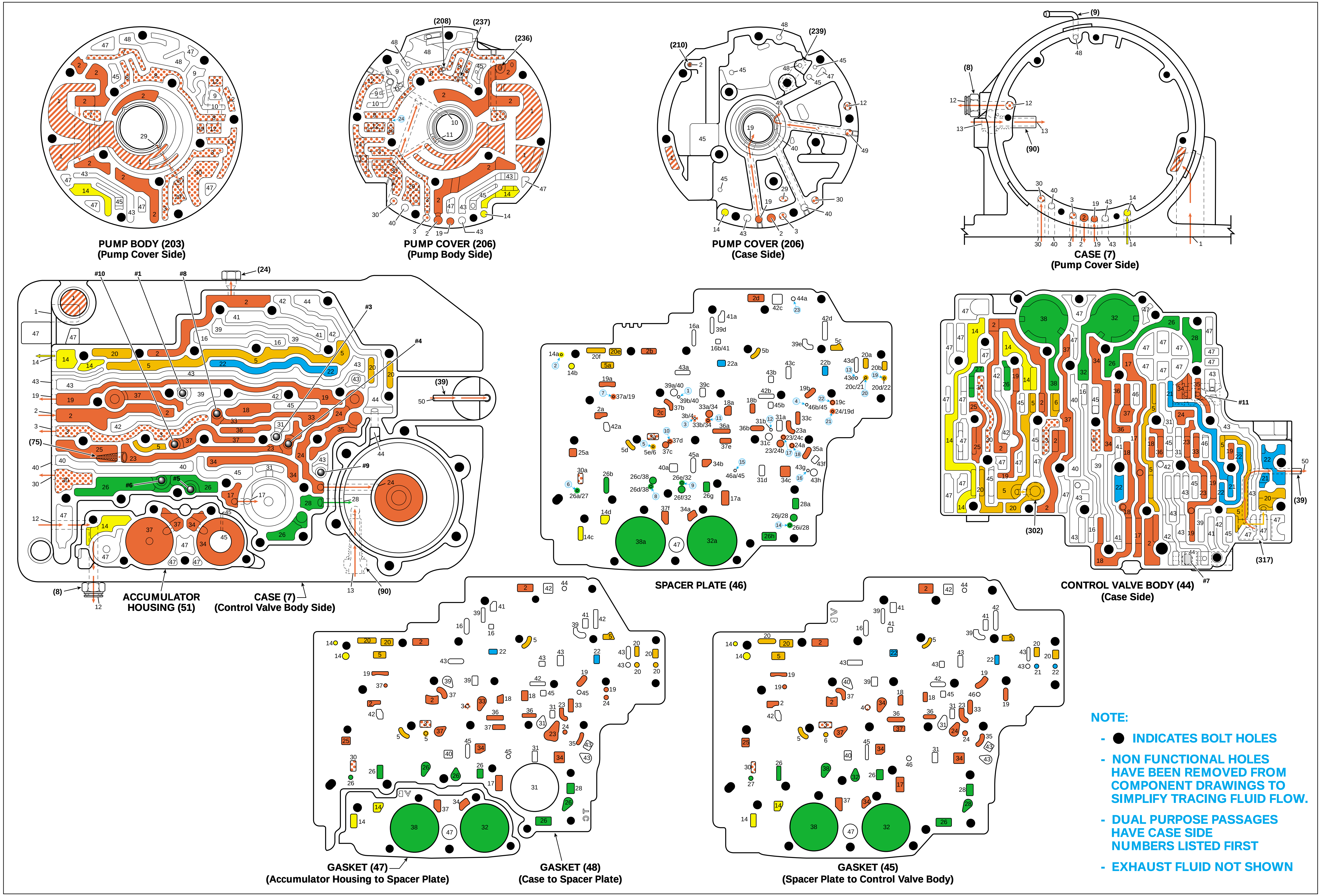


Figure 87