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AUTOMATIC TRANSMISSION SERVICE GROUP

INTRODUCTION

A-999 - A-904T TRANSMISSIONS

GENERAL INFORMATION

The identification markings and usage of the Load-Flite Transmissions is charted in Diagnosis and Tests.

Because of the similarity in design and in servicing the transmissions, the procedures have been combined in this Manual. Where variations in procedures occur, application is indicated (Fig. 1, 2 or 3).

Transmission operation requirements are different for each vehicle and engine combination and some internal parts will be different to provide for this. Therefore, when replacing parts, refer to the seven digit part number stamped on left side of the transmission oil pan flange.

All A-904T and A-999 transmissions are equipped with a wide-ratio planetary gear assembly. Low gear ratio is 2.74 to 1. The sun gear and front planetary gear set is unique to the wide-ratio transmission. The rear planetary gear assembly remains the same as previous models.

The transmission combines a torque converter and a fully-automatic 3-speed gear system. The torque converter housing and transmission case are an integral aluminum casting. The transmission consists of 2 multiple-disc clutches, an overrunning clutch, 2 servos and bands, and 2 planetary gear assemblies to provide 3 forward ratios and a reverse ratio. The common sun gear of the planetary gear assemblies is connected to the front clutch by a driving shell which is splined to the sun gear and engages the front clutch retainer. The hydraulic system consists of an oil pump, and a

single valve body assembly which contains all of the valves except the governor valve.

Venting of the transmission is accomplished by a passage through the upper part of the oil pump housing.

The torque converter is attached to the crankshaft through a flexible driving plate. Cooling of the torque converter is accomplished by circulating the transmission fluid through an oil-to-water type cooler, located in the radiator lower tank. The torque converter assembly is a sealed unit which cannot be disassembled. A lock-up clutch is located inside most torque converters.

The transmission fluid is filtered by an internal "Dacron Type" filter attached to the lower side of the valve body assembly.

Engine torque is transmitted to the torque converter, then, through the input shaft to the multiple-disc clutches in the transmission. The power flow depends on the application of the clutches and bands. Refer to "Elements in Use Chart" in Diagnosis and Tests section.

Lock-up Torque Converter

The A-904T (except California models) and A-999 transmissions are both equipped with **lock-up** torque converters. The A-727 transmission is **non lock-up**.

The lock-up mode is activated only in direct drive and is controlled by the engine electronics. A lock-up solenoid on the valve body transfer plate, is powered by the engine ESA module to activate torque converter lock-up.

ROBERT D. CHERRNAY
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WE THANK CHRYSLER CORPORATION
FOR THE ILLUSTRATIONS AND
INFORMATION THAT MADE THIS
BOOKLET POSSIBLE.

NOTES----NOTES----NOTES----NOTES

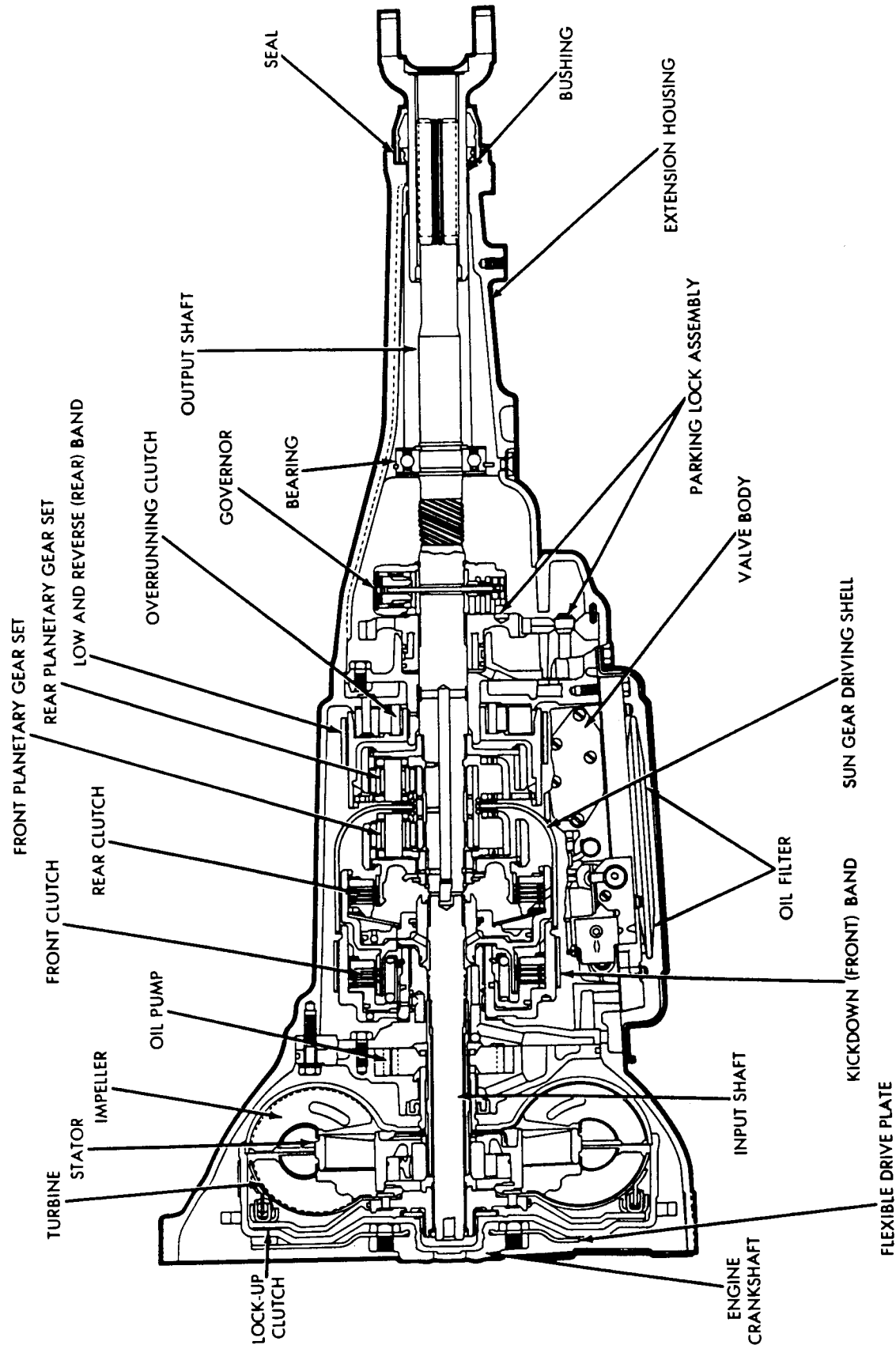


Fig. 1—LoadFlite Transmission and Torque Converter (A-904T and A-999)

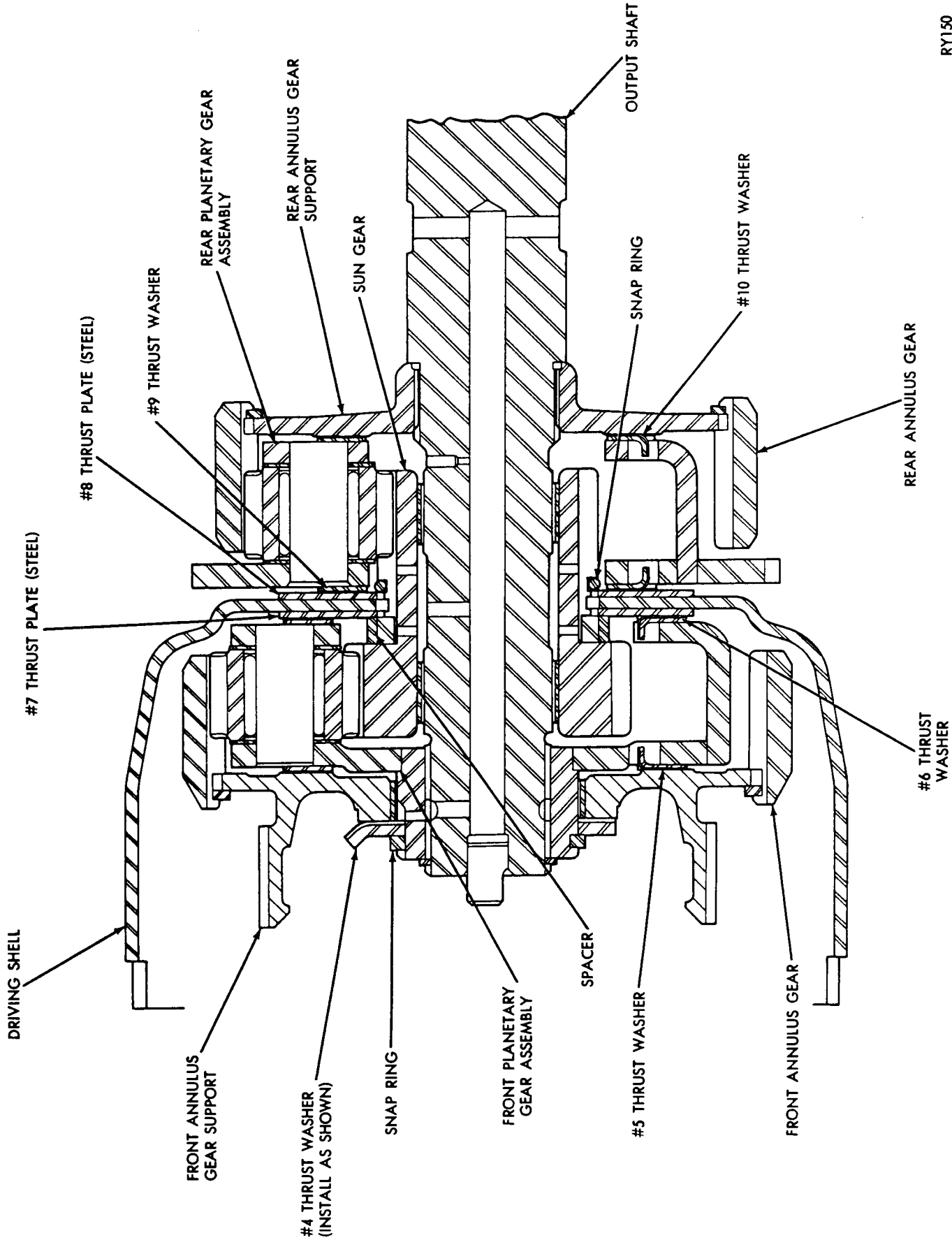


Fig. 2—Wide-Ratio Planetary Gears Assembly (A-904T and A-999)

RY150



Technical Service Information

**ELECTRONIC
LOCK-UNLOCK
COMPONENTS NEW
FOR 1986**

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

INTRODUCTION

The electronically controlled torque converter can lock up or unlock using an electrical solenoid mounted on the valve body. The operation of the solenoid is controlled by the engine computer through a relay. The computer will determine when to lock or unlock the torque converter based on information from four different sensor inputs. The four different inputs are:

1. Coolant Temperature
2. Engine Vacuum (Load)
3. Vehicle Speed
4. Closed Throttle Ground Signal

Benefits of the electronically controlled torque converter system are: precise control through sensor inputs for improved fuel economy, reduced transmission temperature and reduced engine R.P.M.

The electronic control transmission functions have been incorporated into the existing Electronic Combustion Computer program. To implement this feature the Electronic Combustion Computer and Electronic Feedback Carburetor are added to those models which previously had only electronic ignition. The system uses sensors already developed for use with the Electronic Combustion Computer to provide inputs for control of torque converter lock-up. Prior to electronic control, torque

converter lock-up was controlled only by hydraulic pressure. It occurred only in third gear above a preset speed, regardless of load. With electronic control, the hydraulic lock-up is preset to the optimum lock-up speed, but a solenoid-operated hydraulic valve is added to the transmission. This valve is controlled by the computer. It disallows torque converter lock-up by venting hydraulic pressure.

APPLICATION

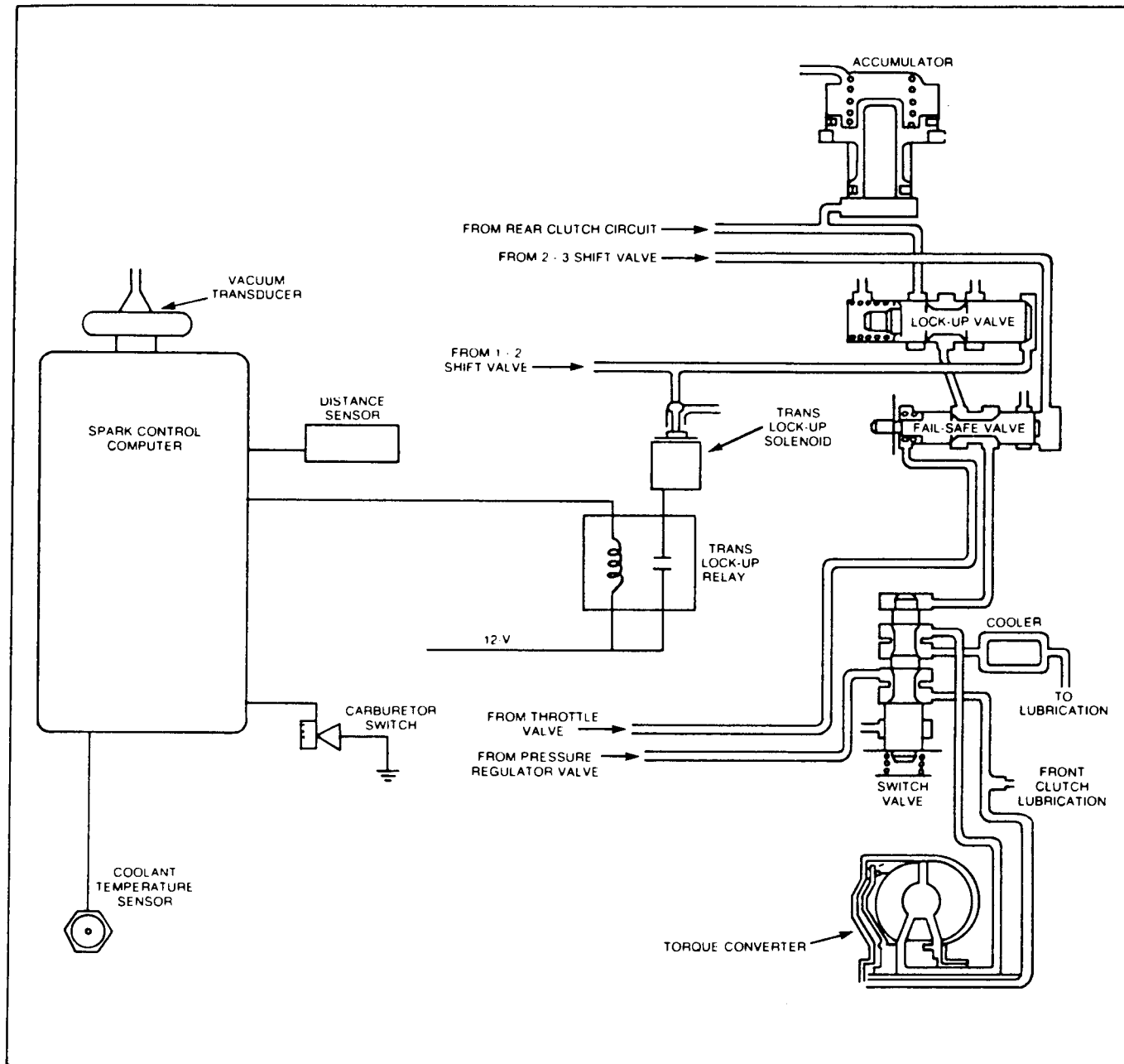
The Electronically Controlled Torque Converter system is available only in the 900 Series Torqueflite transmissions. It will be installed in vans, standard pickup and is proposed for the new down sized "N" body domestic pickup.

The exceptions will be California and heavy duty applications. These vehicles will *not* get the electronically controlled torque converter.

APPLICATION

B & D federal and high altitude 3.7 w/900 Series trans. (except California).

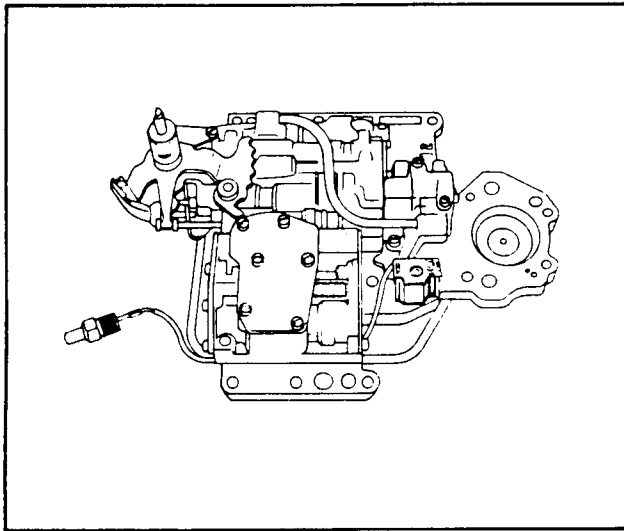
B & D federal and high altitude 5.2 w/900 Series trans. (except California).



The new components that are incorporated to facilitate operation of the electronically controlled torque converter are:

1. Valve body assy. with unlock solenoid
2. Transmission case with terminal
3. Relay
4. Computer with programming for torque converter operation.
5. Coolant sensor
6. Carb. ground switch signal
7. Speed sensor
8. Vacuum transducer

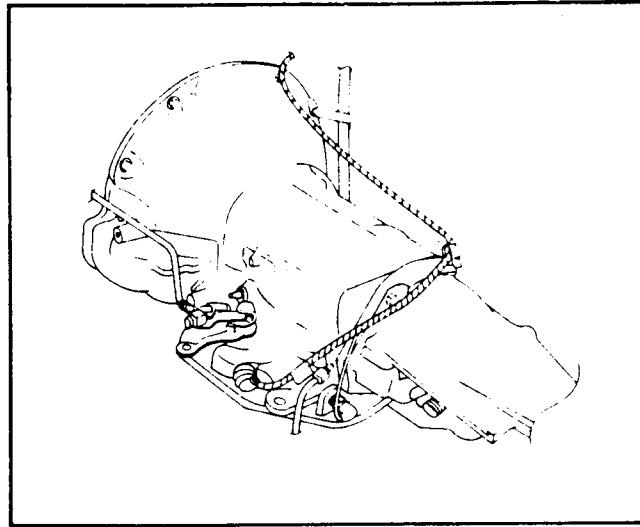
VALVE BODY ASSEMBLY WITH UNLOCK SOLENOID



The solenoid is mounted on the valve body and is controlled by the computer through a relay. The responsibility of this solenoid is to vent the line pressure used to upshift the lock-up valve and cause the torque converter to unlock.

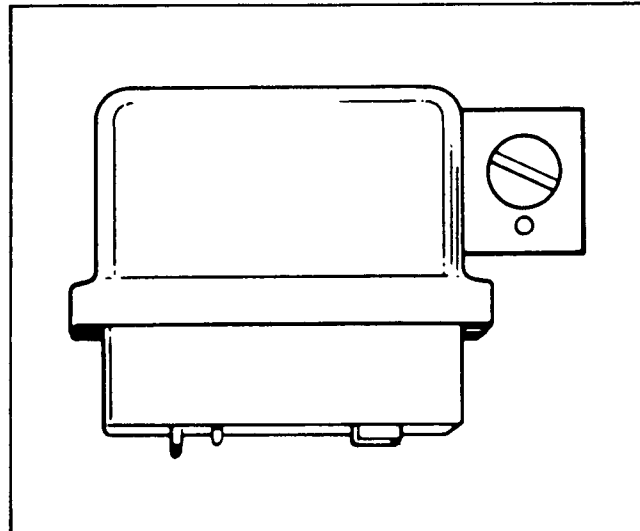
The solenoid will energize stopping the venting of line pressure and shift the lock-up valve causing the torque converter to lock-up. Lock-up will occur provided all sensor inputs meet the computer criteria.

TRANSMISSION CASE WITH TERMINAL



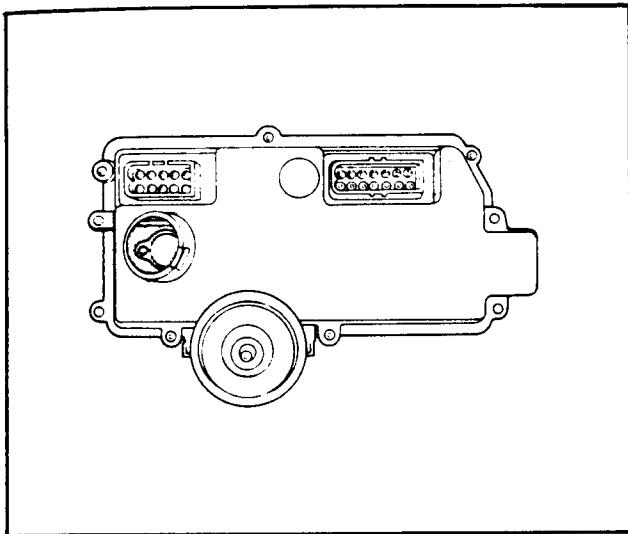
Trans. case modified to accept a thread in electrical terminal connector that supplies 12 volts to lock - unlock solenoid.

RELAY



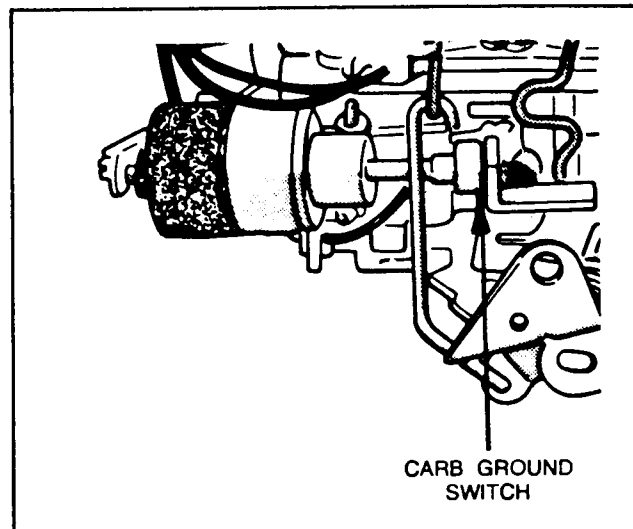
The relay is used in the unlock solenoid circuit. Between the computer and the transmission assembly.

COMPUTER



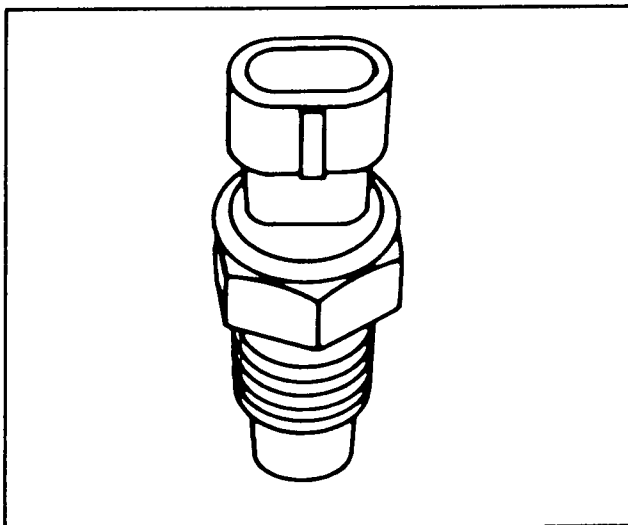
The computer mounting location is different for pickup and van and is a non repairable solid state unit.

CARBURETOR GROUND SWITCH



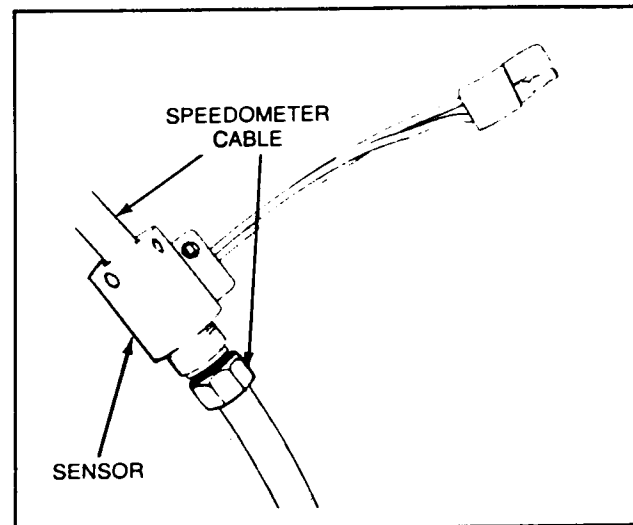
A ground signal is sent to the computer when at closed throttle to unlock the converter.

COOLANT SENSOR



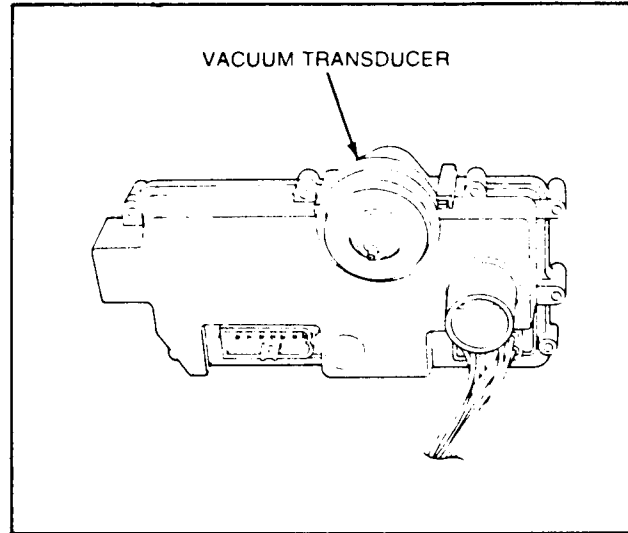
Located in the engine block and is used for gauge as well as computer input.

SPEED SENSOR



Located in series in the speedometer cable. This signal is used by the computer to calculate vehicle speed. For lock - unlock operation.

VACUUM TRANSDUCER



Located on the computer, it supplies the computer with an engine vacuum (load) signal.

SYSTEM OPERATION

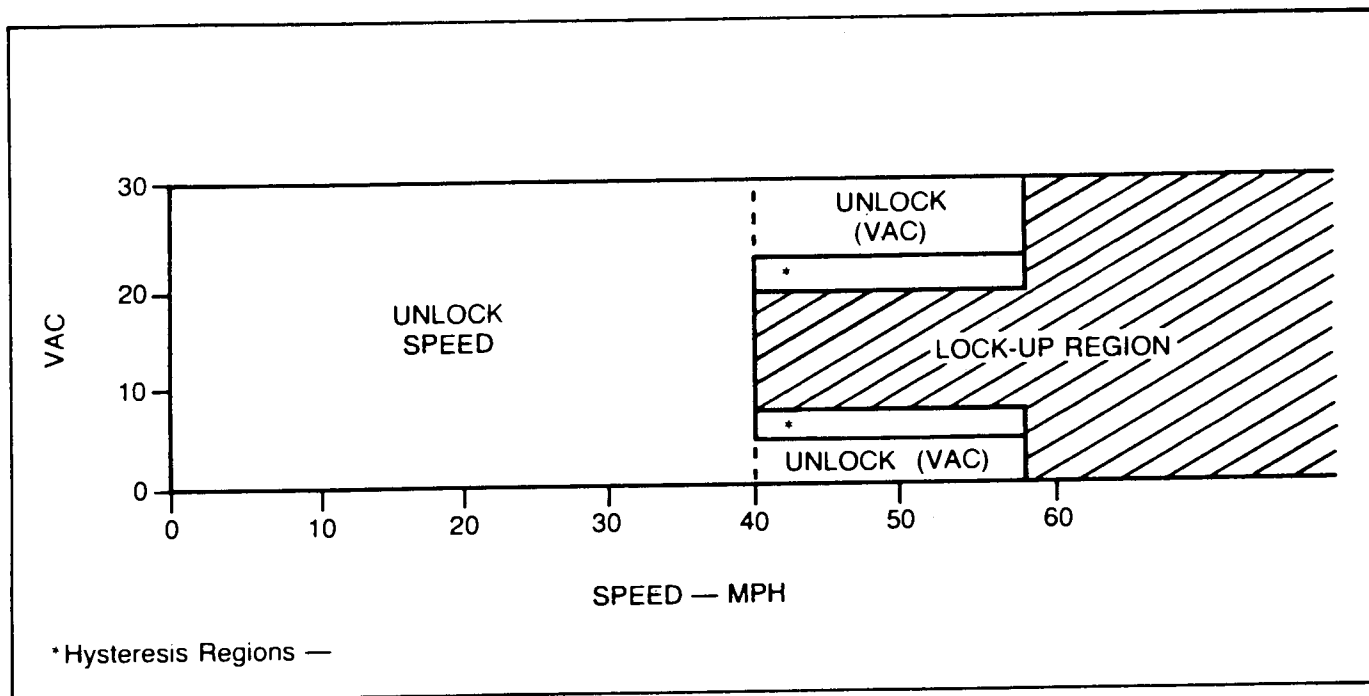
The transmission is controlled, locked or unlocked by a solenoid. First the coolant temperature is checked. If the actual temperature is below 150° F, the solenoid will remain de-energized (unlocked). Once this reference temperature is reached, MPH, vacuum and the carb. switch determine the locked or unlocked, of the transmission.

If the carb. switch is closed, the transmission will always be unlocked. The transmission will remain unlocked for a programmed period after the throttle is opened. Next, the MPH is looked at. If the actual MPH is above the low reference value entry into the lock-up region occurs. If the actual MPH is below the low

reference value, entry into the lock-up region will not occur (solenoid de-energized).

The state of the transmission, locked or unlocked, is determined by a set of vacuum versus MPH curves. Two hysteresis bands are present. Once in a lock-up (unlock) region the vacuum must fall below or rise above the unlock (lock-up) vacuum reference points in order to enter the unlock (lock-up) region. Lock-up (solenoid energized) of the transmission is delayed a programmable period of time after entry into the lock-up region occurs.

NOTE: Drop in engine R.P.M. will occur when lock-up takes place.



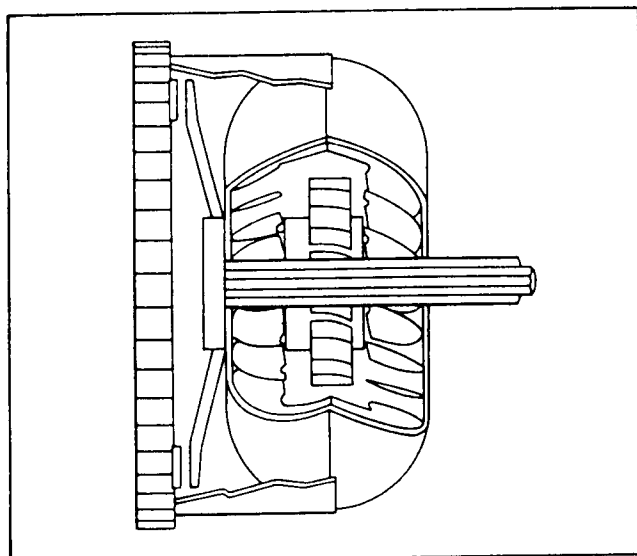


**CARRY-OVER
or
COMMON COMPONENTS
USED IN THE ELECTRONIC
LOCK-UNLOCK TRANSMISSION**

Some major components that are common to the hydraulic only lock-up, and the new electronic lock-up are:

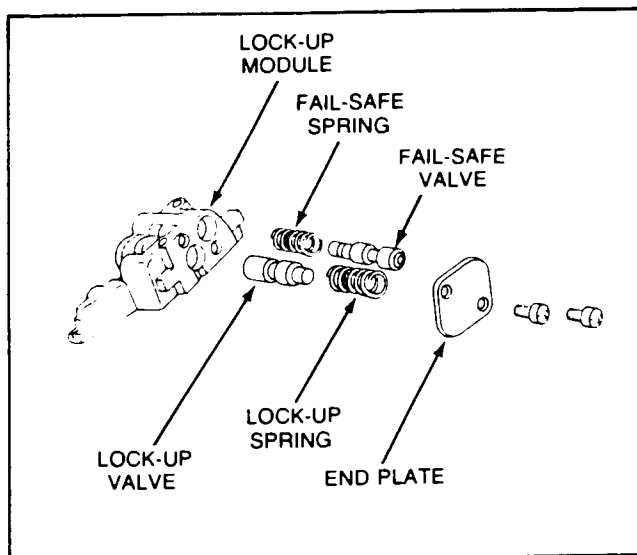
1. Torque Converter
2. Lock-up Module
3. Switch Valve
4. Trans. internal Circuitry Consisting of:
 - A - Reaction Shaft Support
 - B - Pump Housing
 - C - Input Shaft

TORQUE CONVERTER



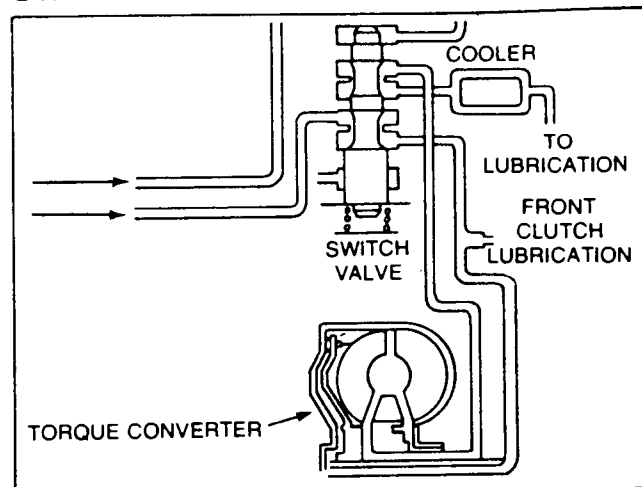
When in lock-up used as a mechanical link between the engine and transmission.

LOCK-UP MODULE



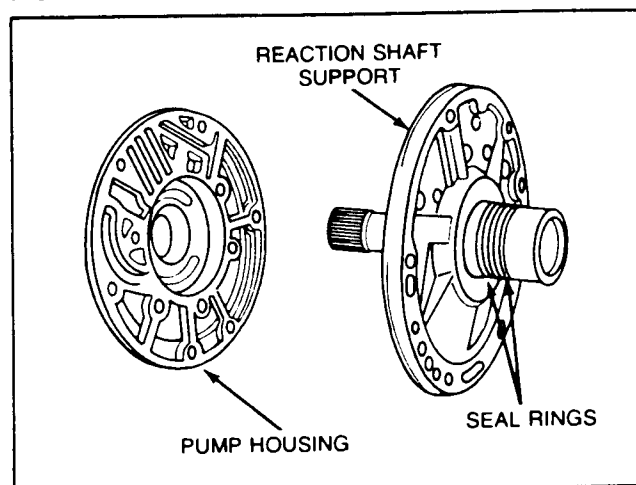
The fail-safe and lock-up valves are housed in a single valve body module.

SWITCH VALVE



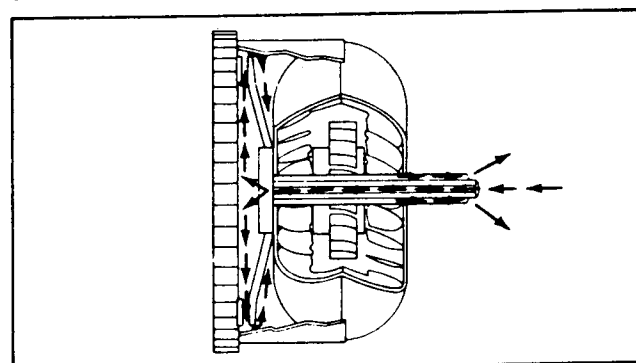
Provides both the "on" and "off" hydraulic pressure which moves the lock-up piston in the torque converter.

REACTION SHAFT SUPPORT AND PUMP ASSEMBLY



Means of supplying press and return passages for the lock-up converter.

INPUT SHAFT

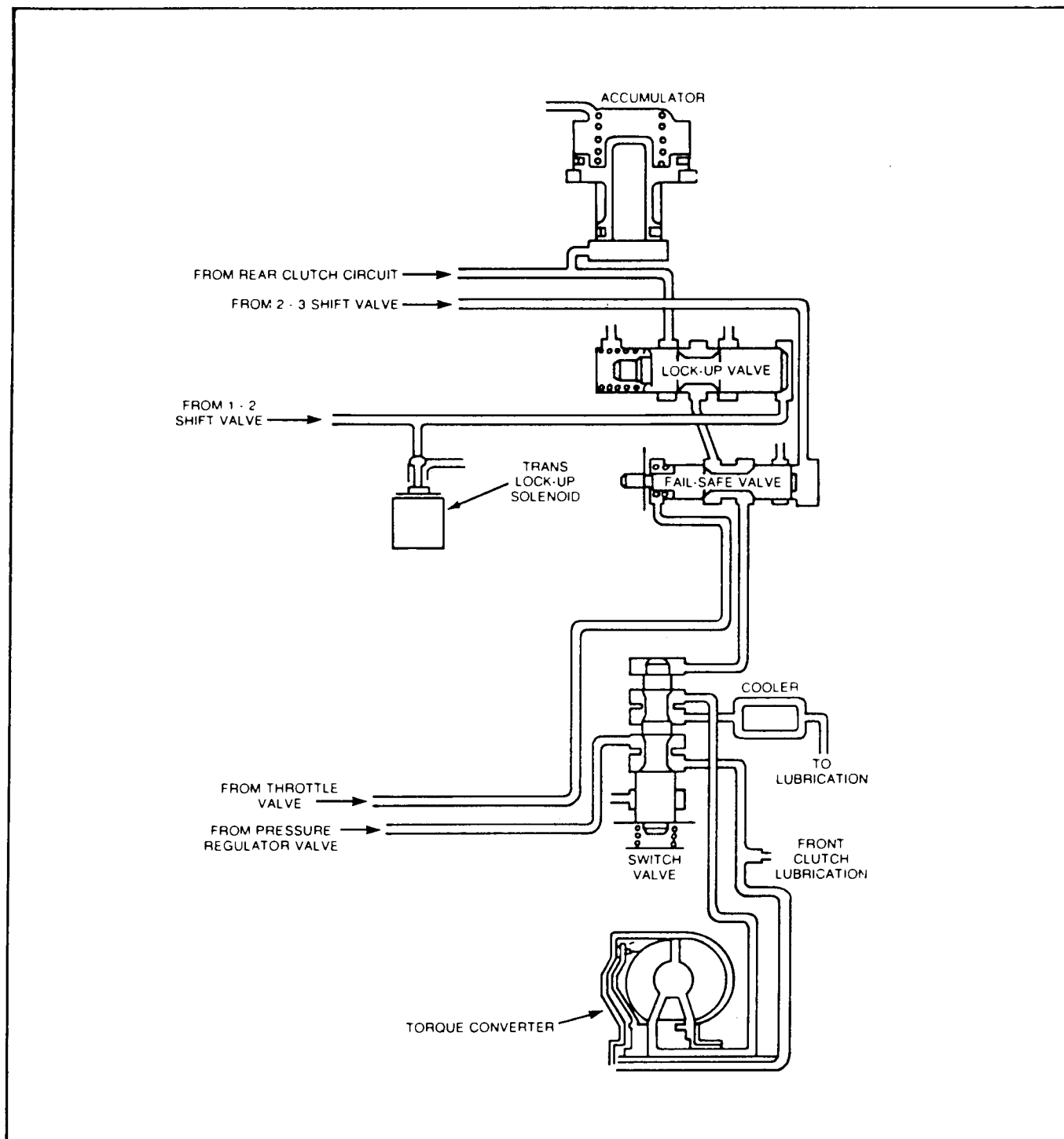


Hollow input shaft passage used to operate torque converter piston.



HYDRAULIC OPERATION

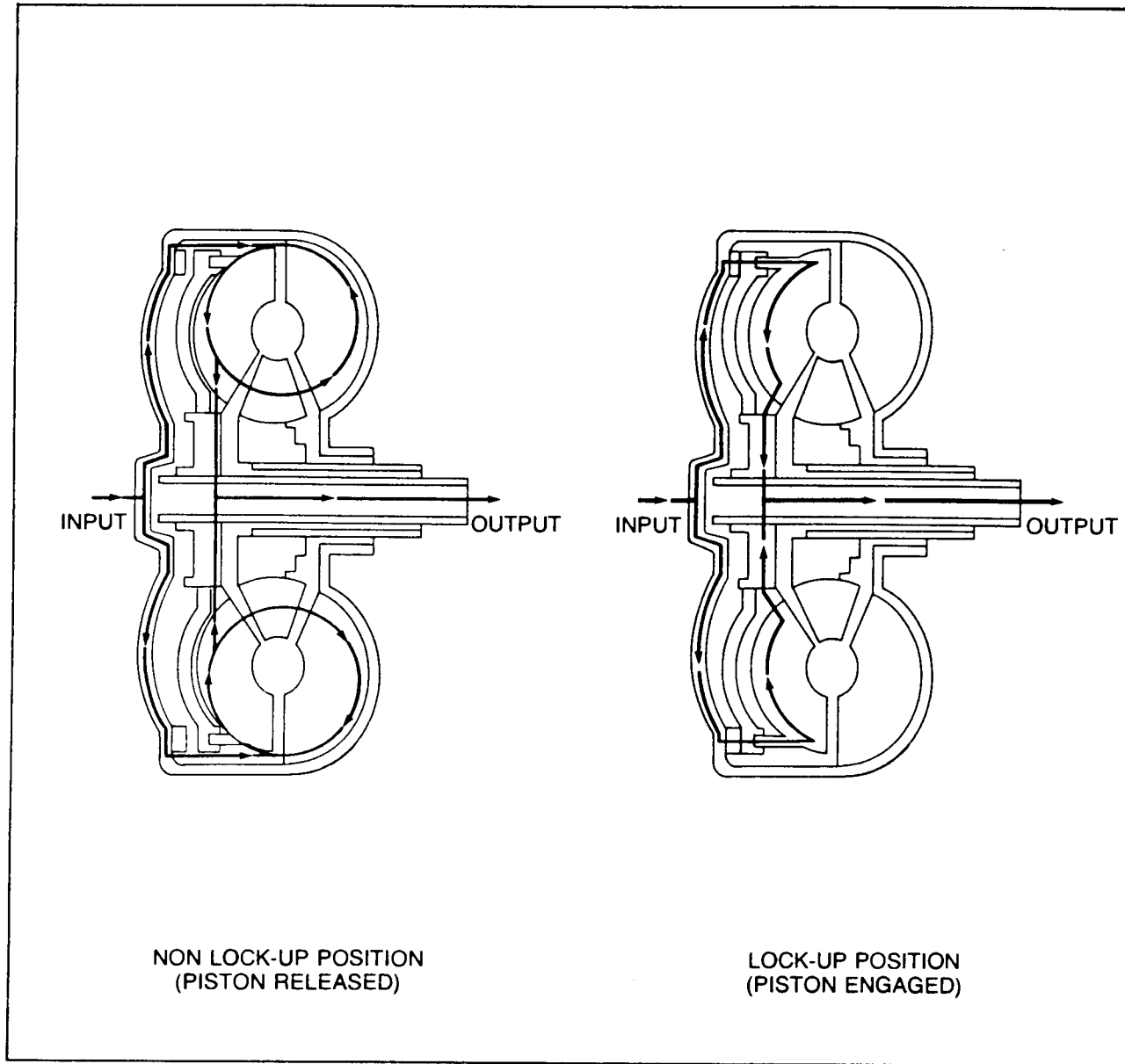
HYDRAULIC OPERATION



Some changes in the hydraulics have taken place that controls lock-up operation

for 1986 truck/van and will be covered in this section.

CONVERTER POWER FLOW SCHEMATIC

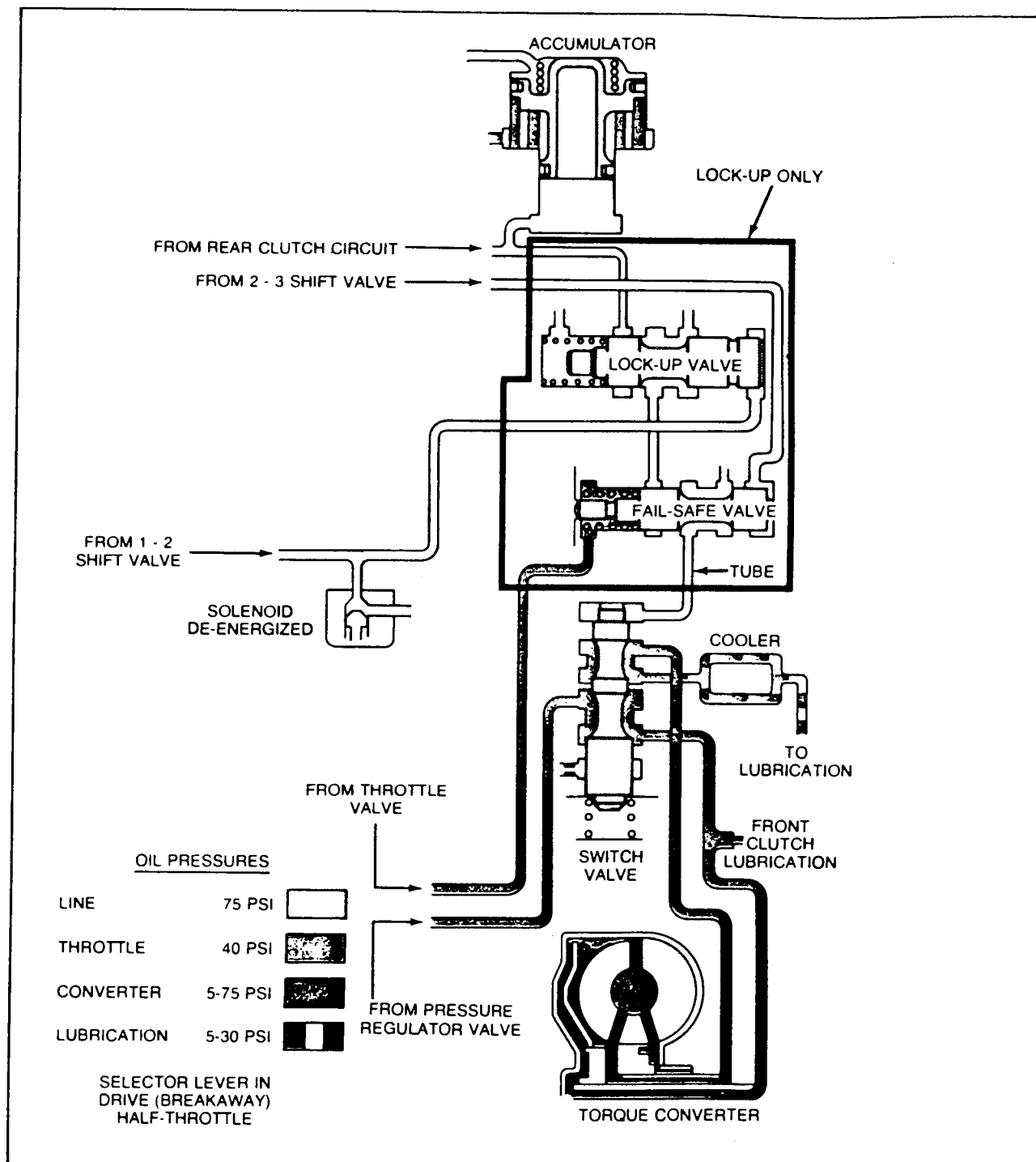


NON LOCK-UP

When the torque converter is in a non-lock-up stage of operation (any forward gear except Drive Direct), the lock-up clutch apply piston and torsional isolator springs are rotating with the turbine element of the torque converter. Normal torque converter pressure forces the piston back against the turbine.

LOCK-UP

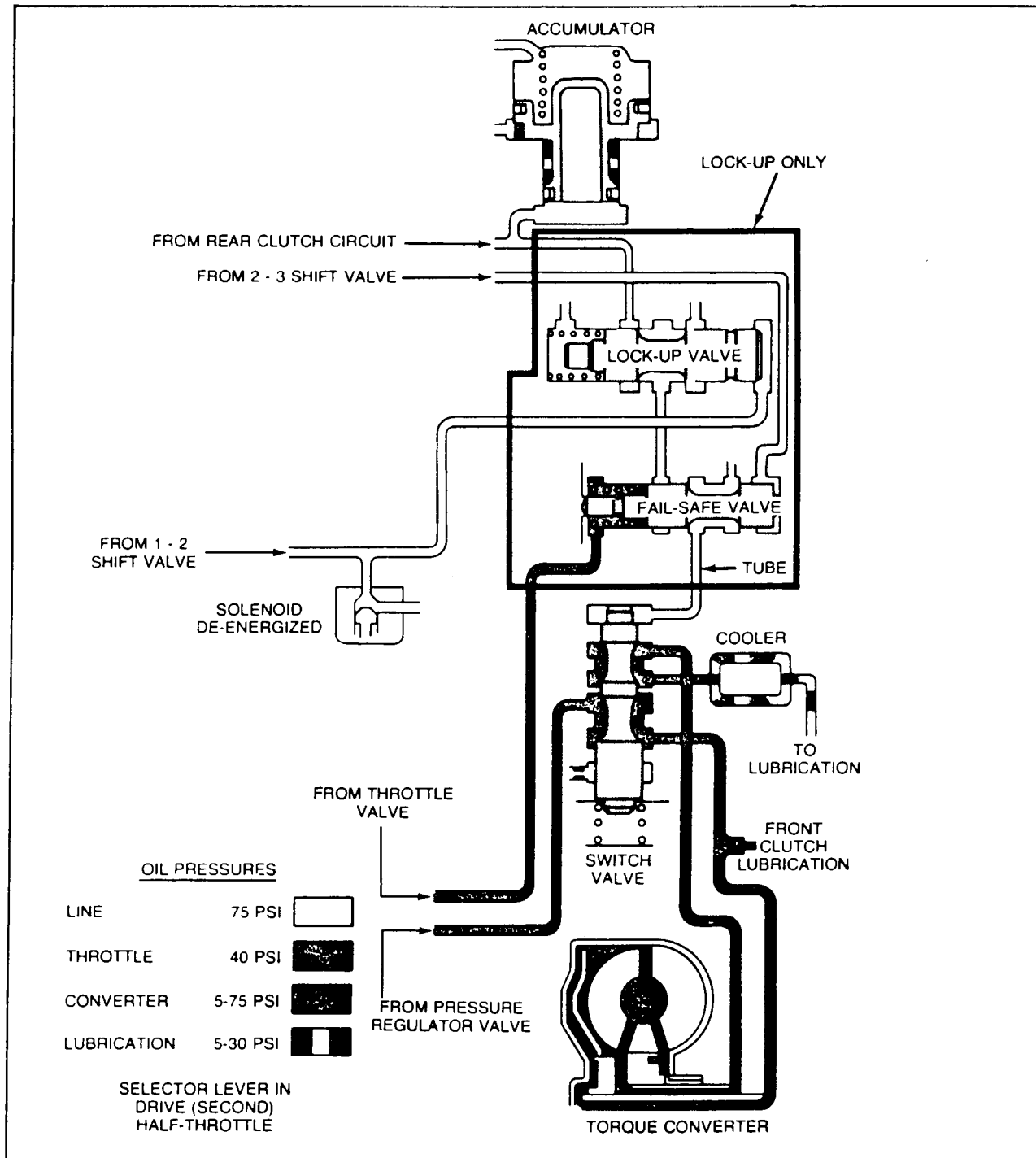
When the transmission shifts into Drive Direct, line pressure is directed in between the turbine and the lock-up clutch apply piston venting normal torque converter pressure through the input shaft. The pressure forces the piston away from the turbine until the face of the piston contacts the floating friction disc, pushing it against the torque converter cover. When the piston contacts the friction disc against the cover, the turbine, or input shaft, is locked to the impeller, or engine crankshaft.



SELECTOR LEVER IN DRIVE/BREAKAWAY

Once the vehicle is put in drive, line pressure is sent to the lock-up valve where it is stopped. At the same time pressure from the regulator valve will flow to the torque converter through the switch valve.

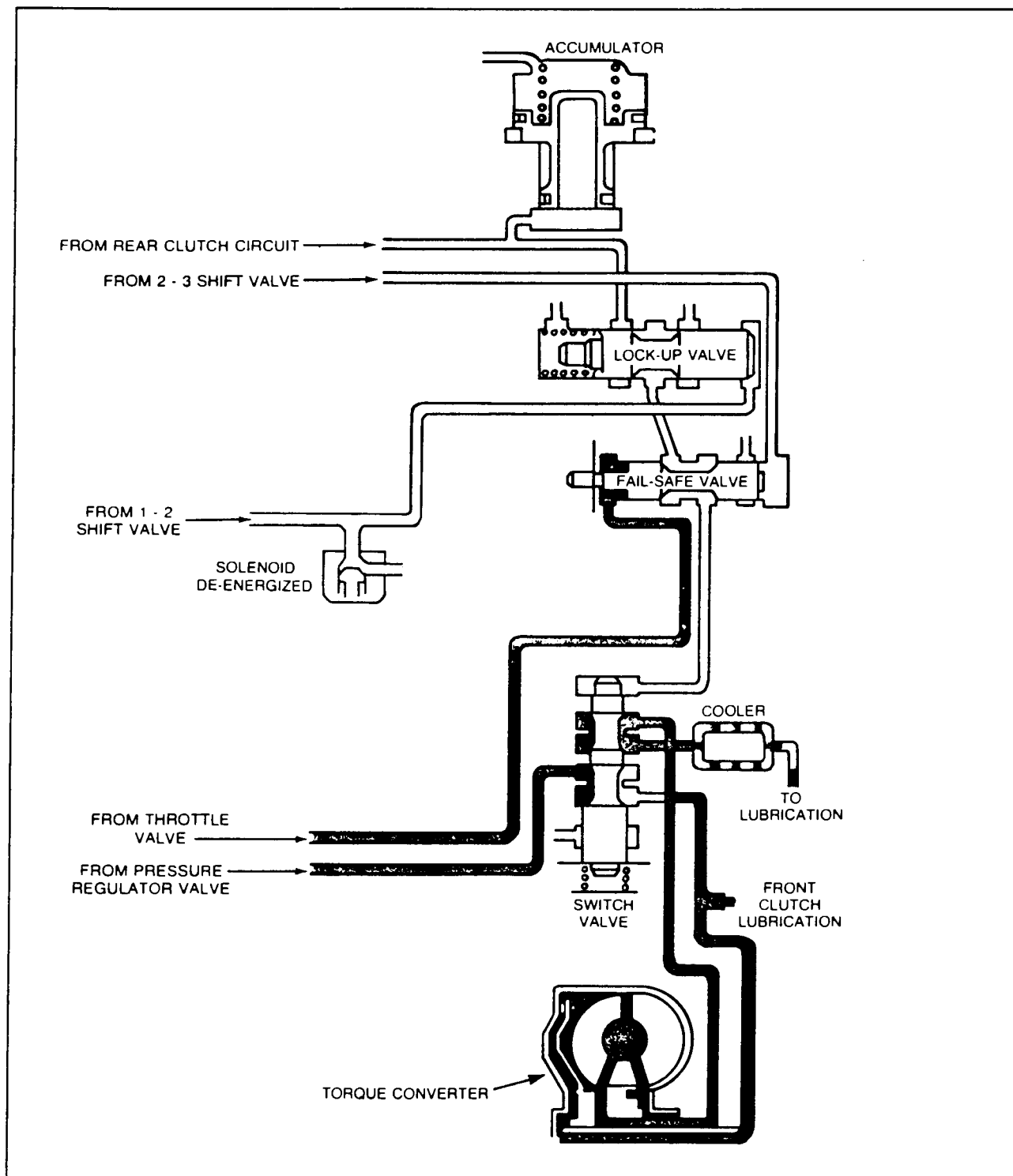
As the throttle is depressed, throttle pressure is sent to the spring end of the fail-safe valve. At this point none of the three valves mentioned, lock-up, fail-safe, or switch have moved.



SELECTOR LEVER IN DRIVE — SECOND GEAR

As the transmission shifts into second gear line pressure from the 1-2 shift valve is sent to the end (right side) of the lock-up valve. Normally this line pressure would shift this valve but what comes into play here is the lock-up solenoid. When this

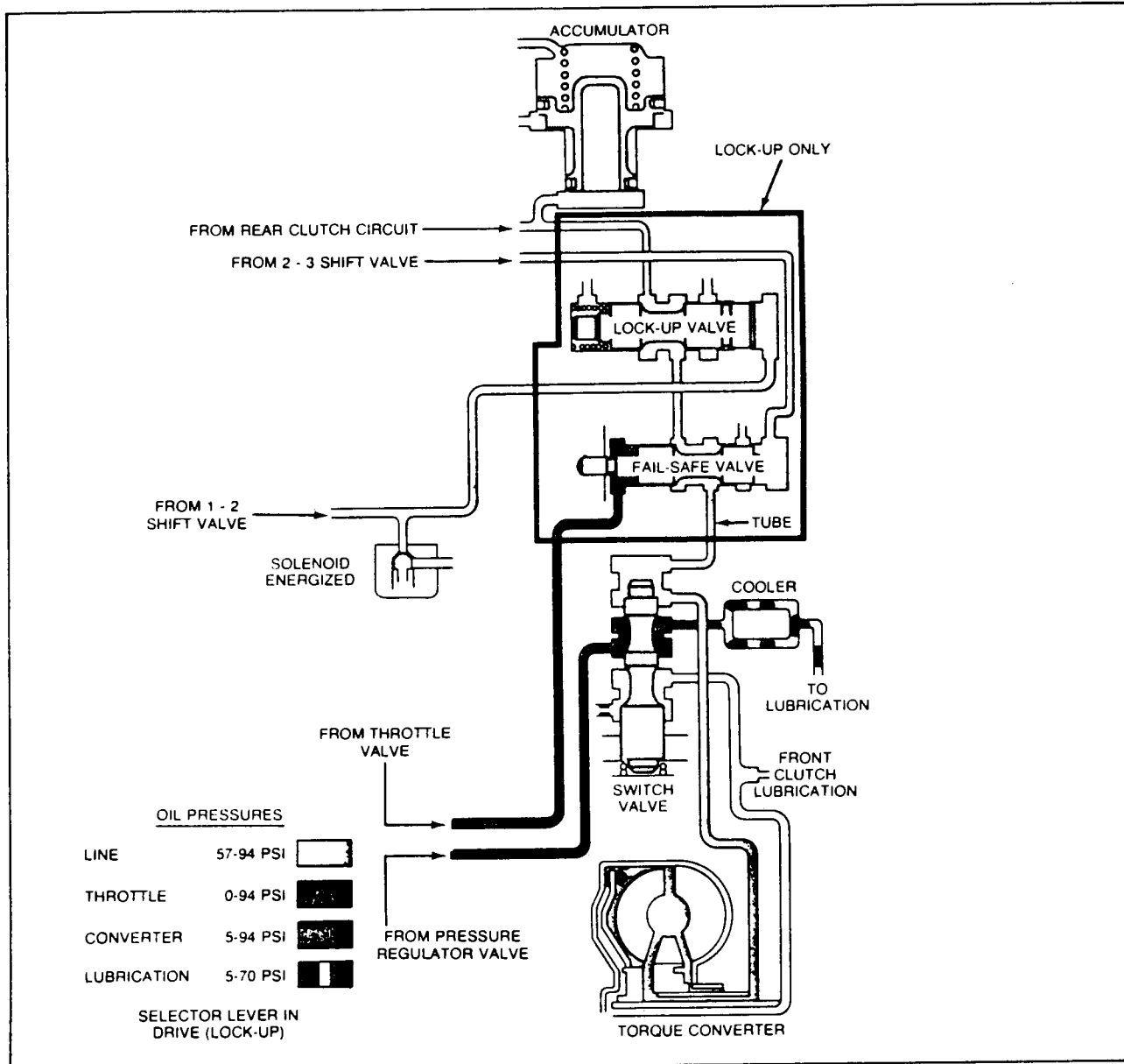
solenoid is not energized this line pressure to the lock-up valve is vented and will not shift the valve because of this. Again none of the three valves we are concerned with have moved yet.



SELECTOR LEVER IN DRIVE DIRECT — THIRD GEAR

We finally get to move a valve, the fail-safe. When the transmission shifts into third gear the fail-safe valve will be fed line pressure from the shifted 2-3 shift

valve. The fail-safe will shift but still nothing happens because the unshifted lock-up valve is blocking the line pressure needed to lock-up the torque converter.



SELECTOR LEVER IN DRIVE — DIRECT — LOCK-UP

The only thing that needs to happen at this point is for the unlock solenoid to be energized and then the torque converter will lock-up. The lock-up will occur provided the following criteria are met.

1. Engine temperature is above 150° F (coolant sensor)
2. Vehicle speed is above 40 mph (speed sensor)
3. Engine manifold vacuum above approximately 4 inches and below

approximately 19 inches of vacuum (vacuum transducer)

4. Carburetor off idle (carburetor ground switch)

When the unlock solenoid is energized line pressure from the 1-2 shift valve, that was being vented, will go to the end of the lock-up valve. When the lock-up valve shifts line pressure will flow through the fail-safe valve to the switch valve. The switch valve will move downward causing the torque converter to lock-up.



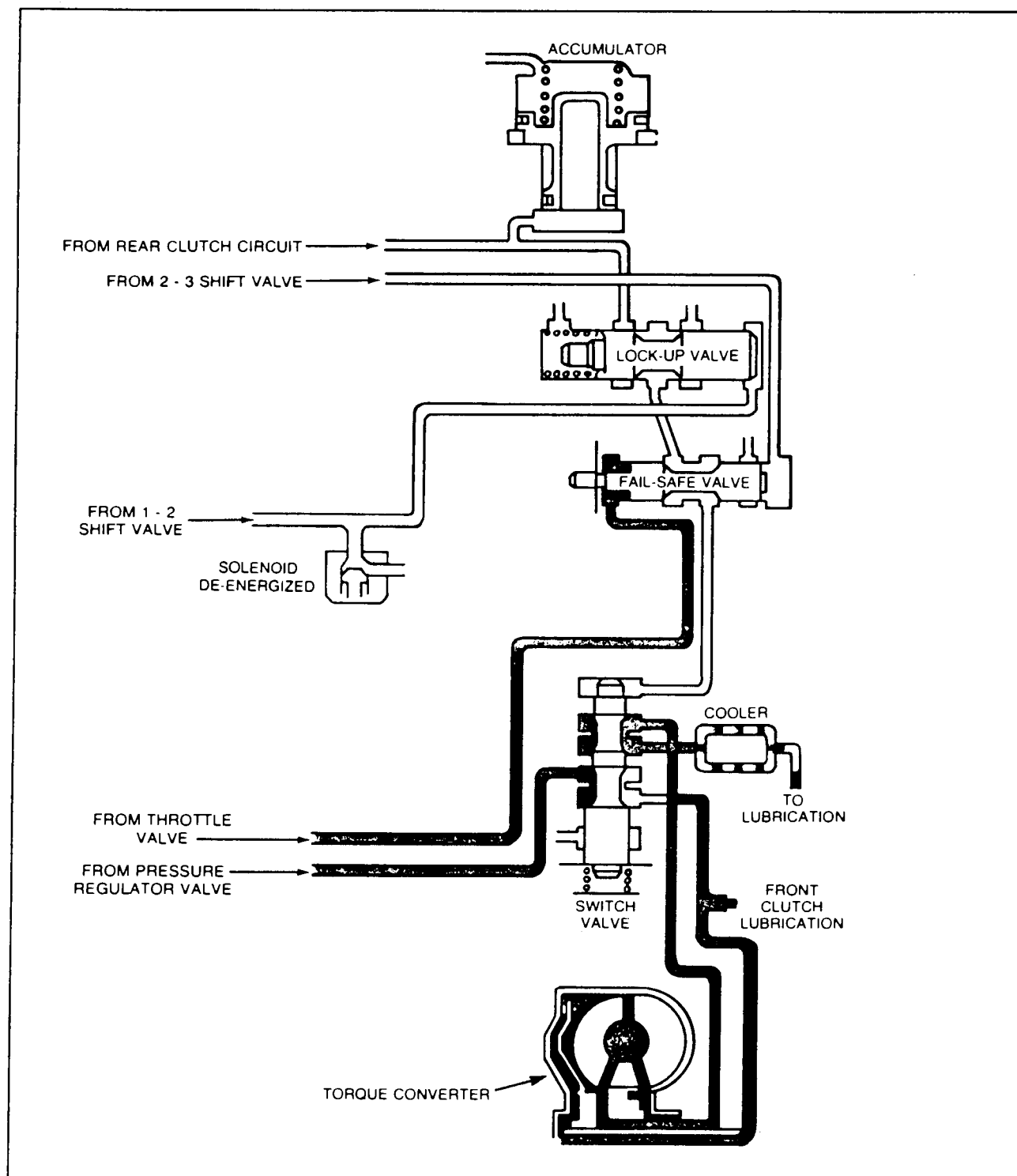
UNLOCKING THE TORQUE CONVERTER

Assuming we have met all the criteria for lock-up, that is engine above 150°F, speed above 40 mph, carburetor switch open, and vacuum within designated limits, the torque converter will lock up. To get the torque converter to unlock we must shift either the lock-up valve or the fail-safe valve to their unshifted positions. When either of these valves goes to its unshifted position it will cause the switch valve to move downward

and direct pressure to the front side of the torque converter piston to unlock it.

Three different conditions will cause the torque converter to unlock. They are:

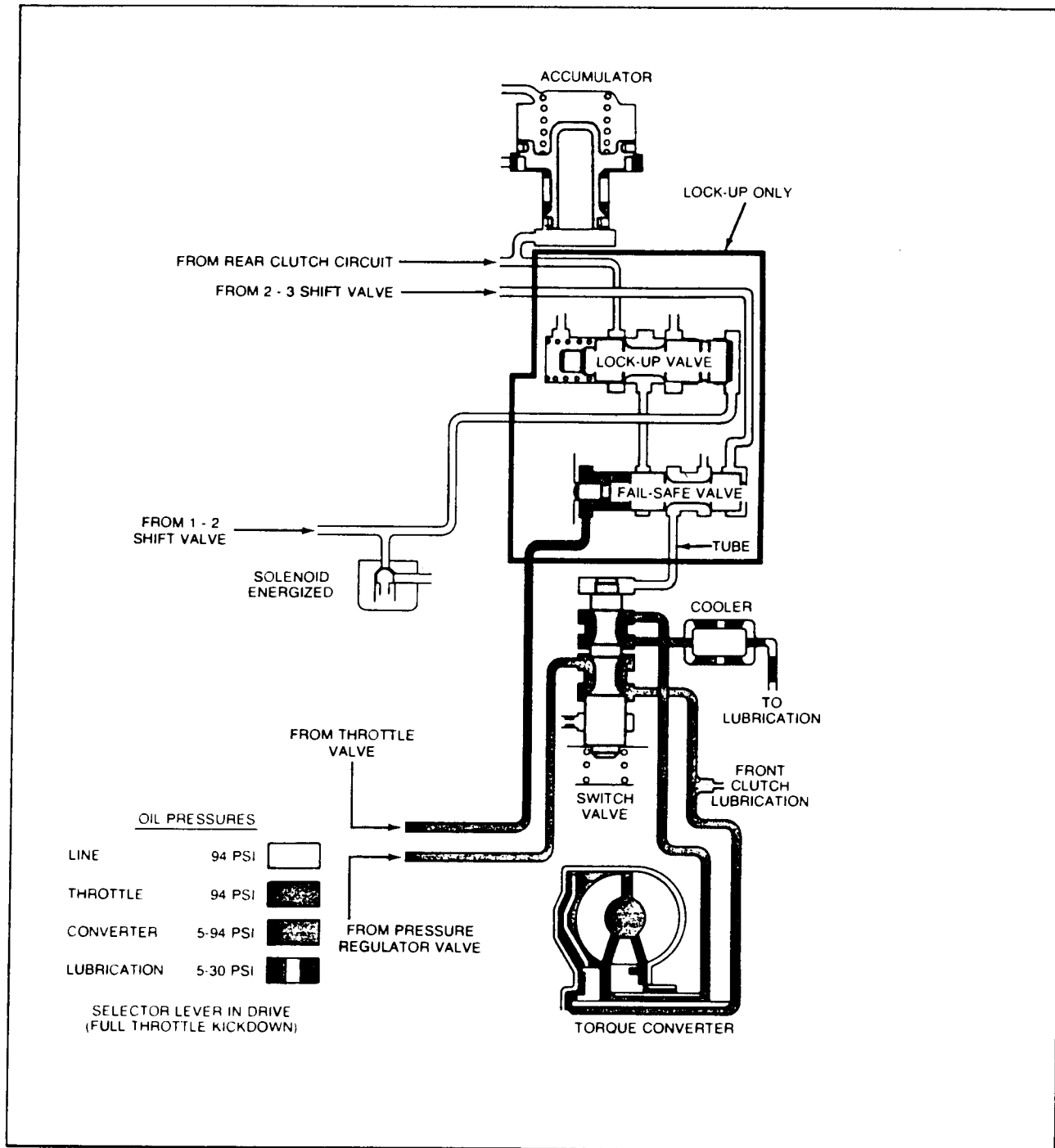
1. Part throttle unlock
2. Wide open throttle (W.O.T.) unlock
3. Closed throttle unlock



SELECTOR LEVER IN DRIVE DIRECT — THIRD GEAR

We finally get to move a valve, the fail-safe. When the transmission shifts into third gear the fail-safe valve will be fed line pressure from the shifted 2-3 shift

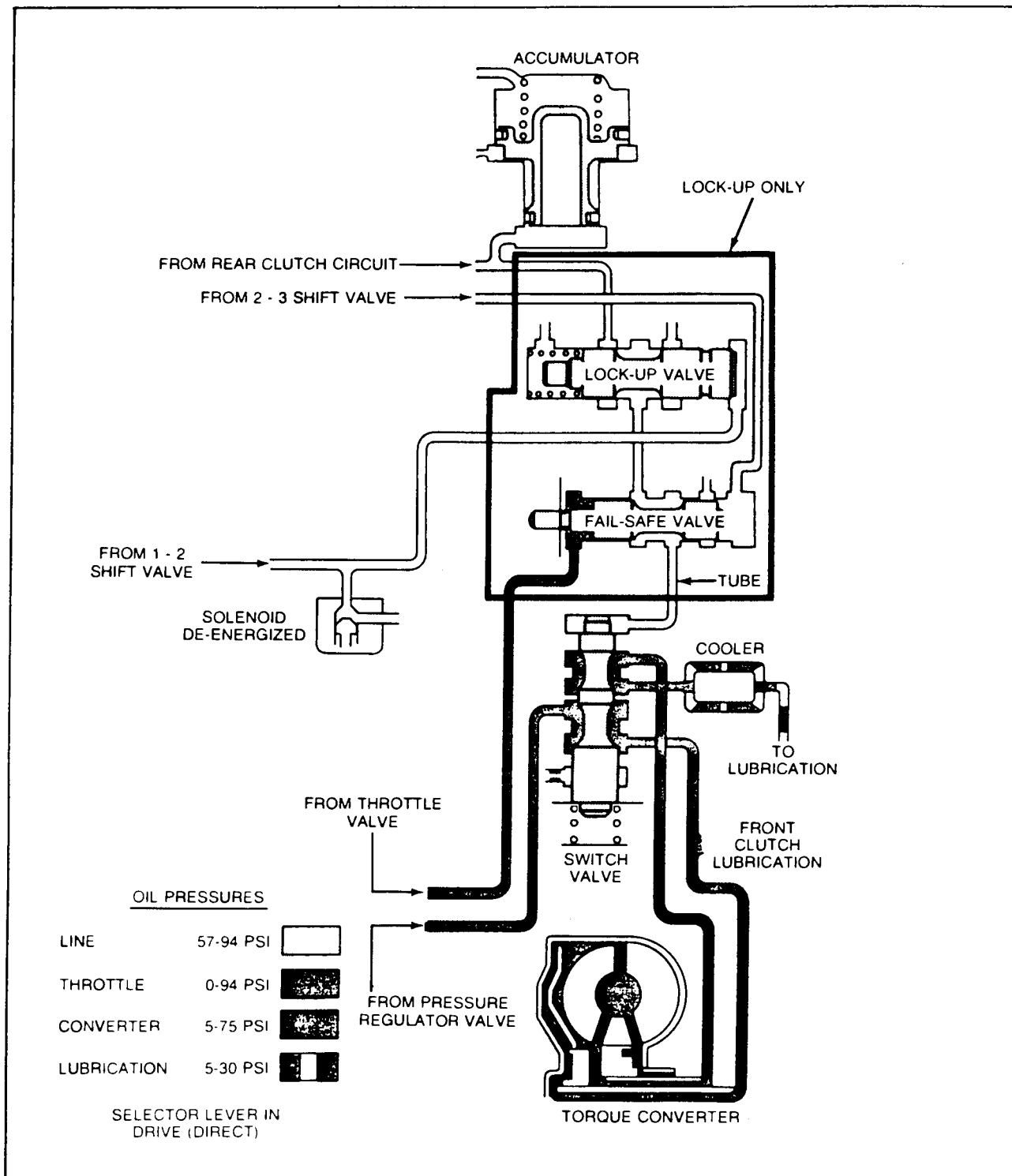
valve. The fail-safe will shift but still nothing happens because the unshifted lock-up valve is blocking the line pressure needed to lock-up the torque converter.



2. WIDE OPEN THROTTLE (W.O.T.) UNLOCK

When vehicle speed is above 55 m.p.h. unlock can be attained preceding a 3-2 downshift. Throttle pressure and spring tension on the fail-safe valve will overcome opposing line pressure on the other end of the fail-safe valve to downshift it. This will allow the switch valve to shift upward and

unlock the torque converter. This function happens just a moment before the 3-2 downshift occurs to help improve the shift quality. Line pressure from the 2-3 shift valve will not be fed to the end of the fail-safe valve after the downshift.

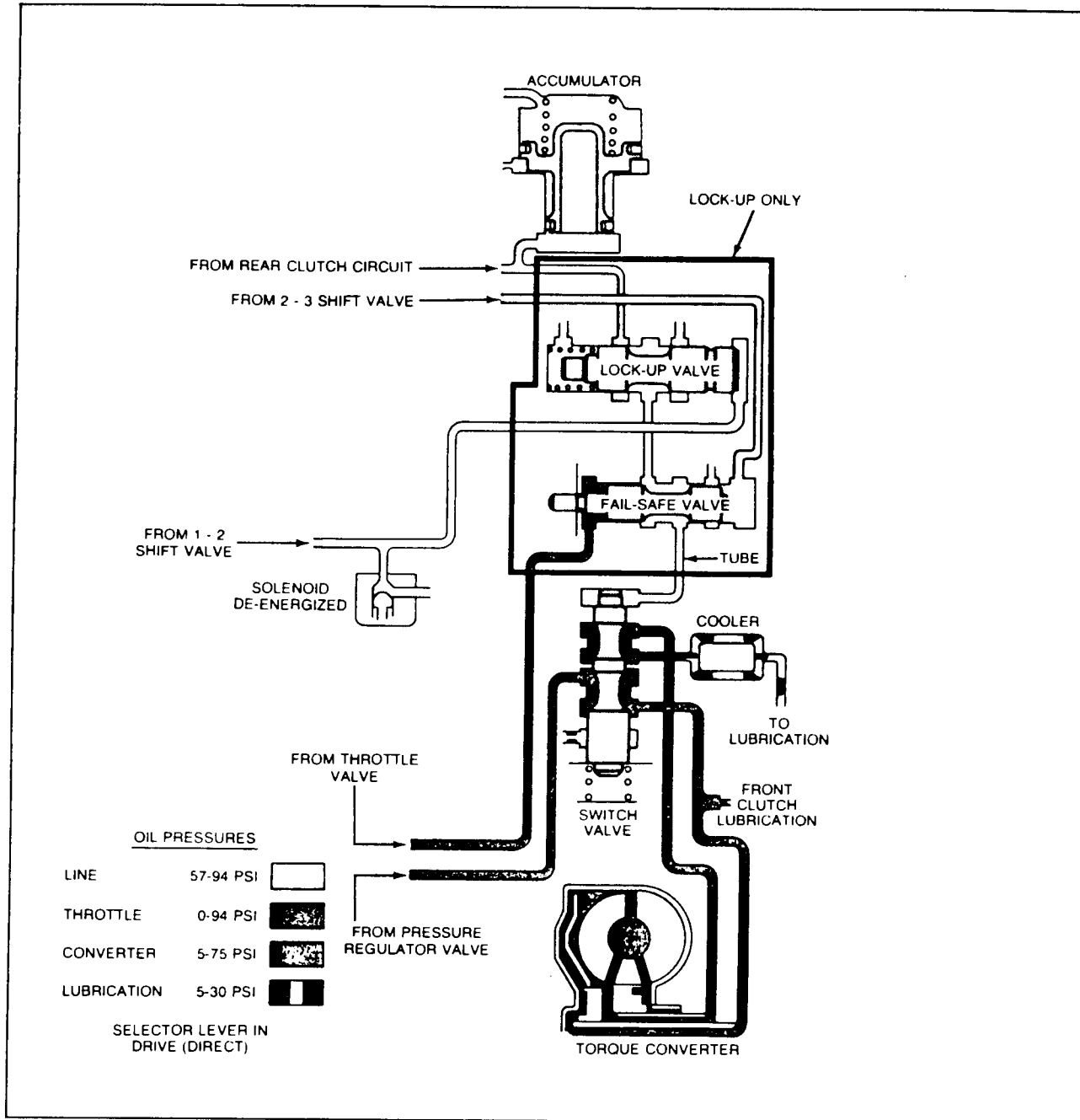


3. CLOSED THROTTLE UNLOCK

Whenever the carburetor ground switch is closed it sends a signal to the computer to de-energize the unlock solenoid, regardless of the vehicle speed.

When the unlock solenoid is de-energized

it vents 1-2 shift valve line pressure that is fed to the end of the lock-up valve. This in turn will allow the switch valve to move upward causing unlock to occur.

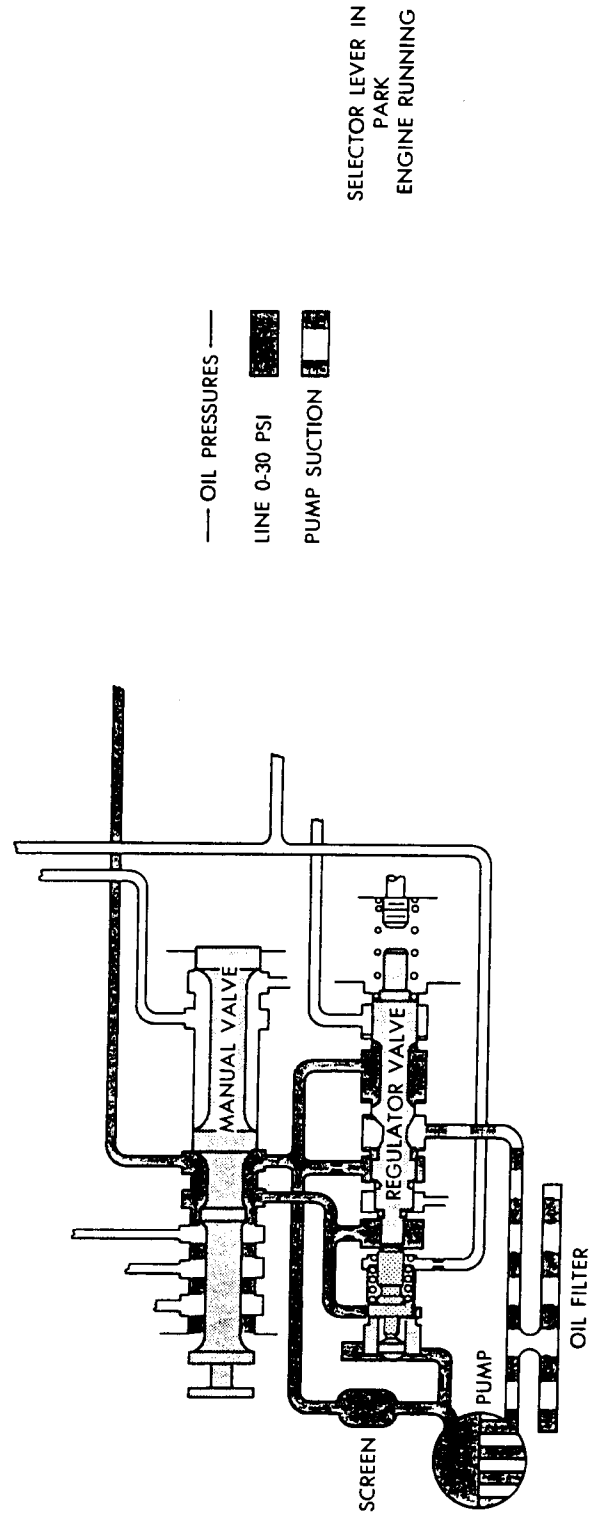
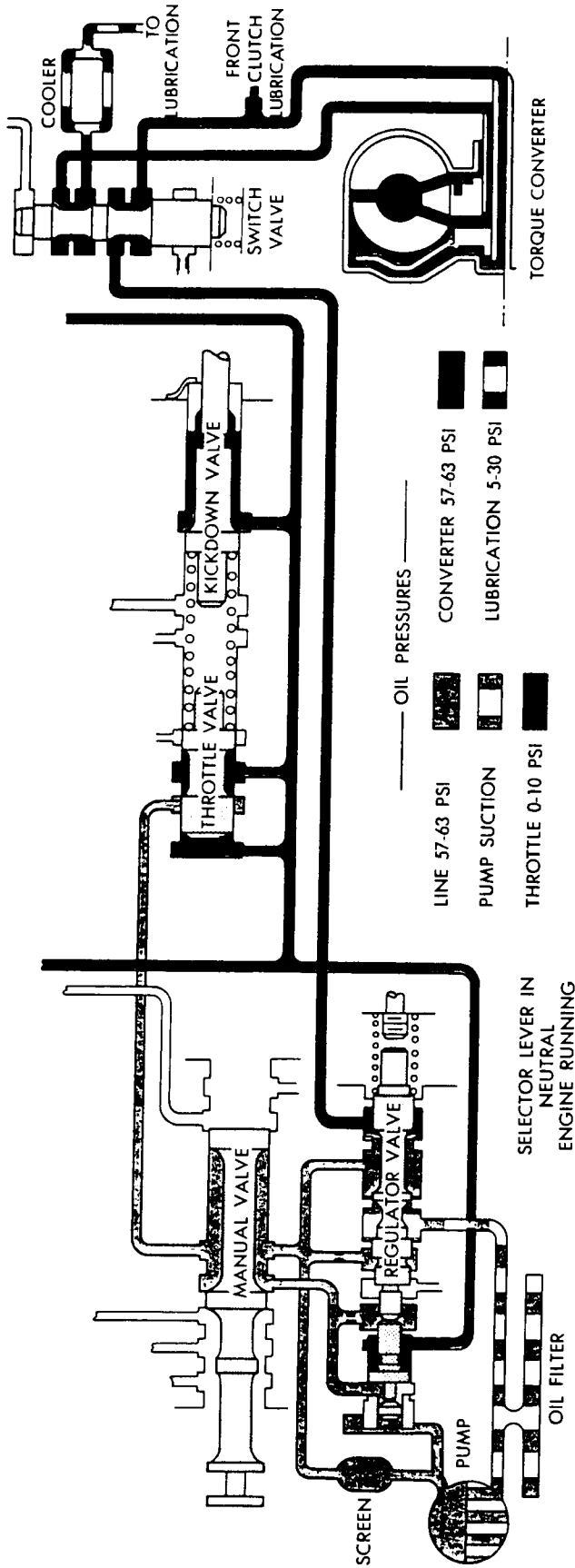


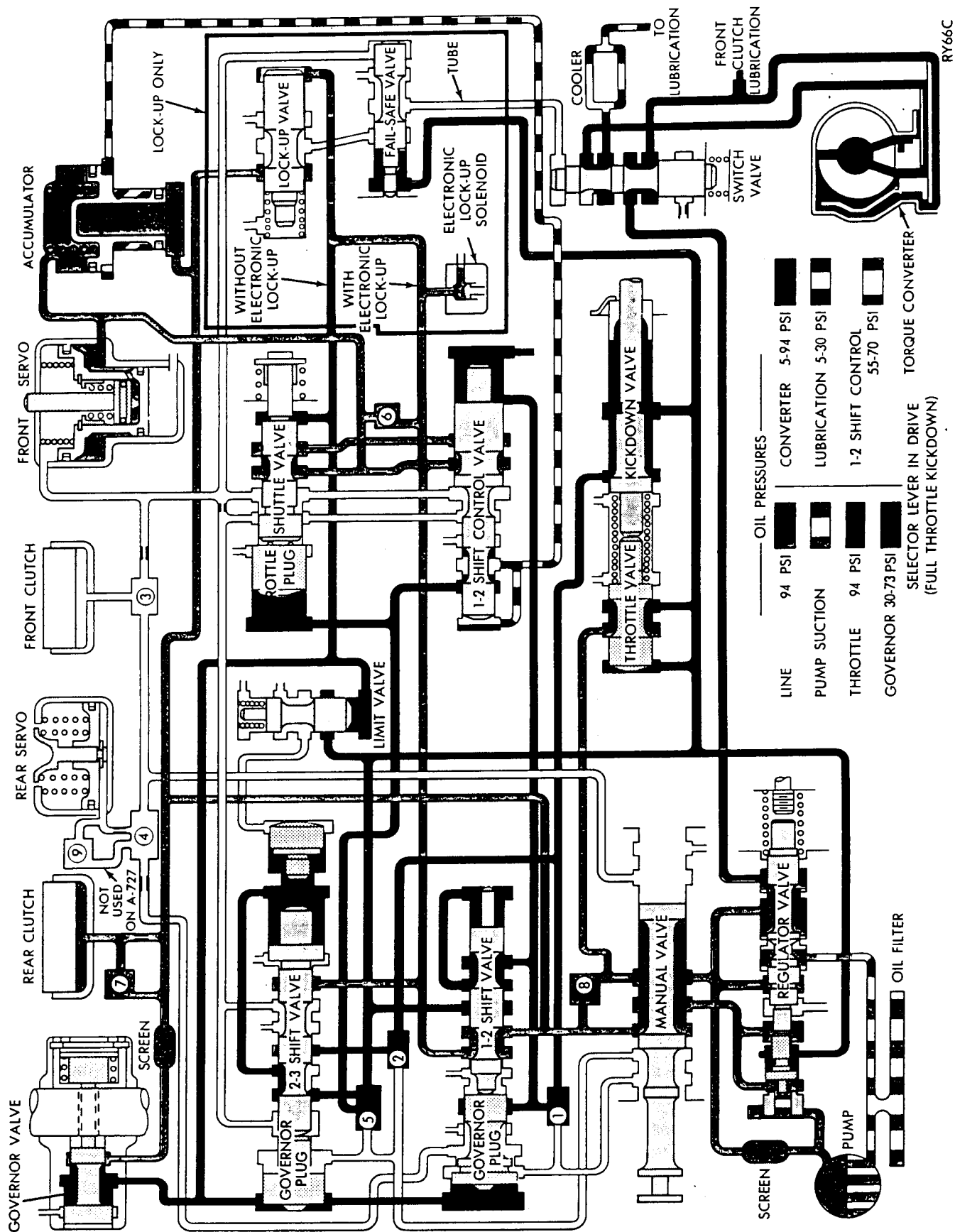
PART THROTTLE UNLOCK

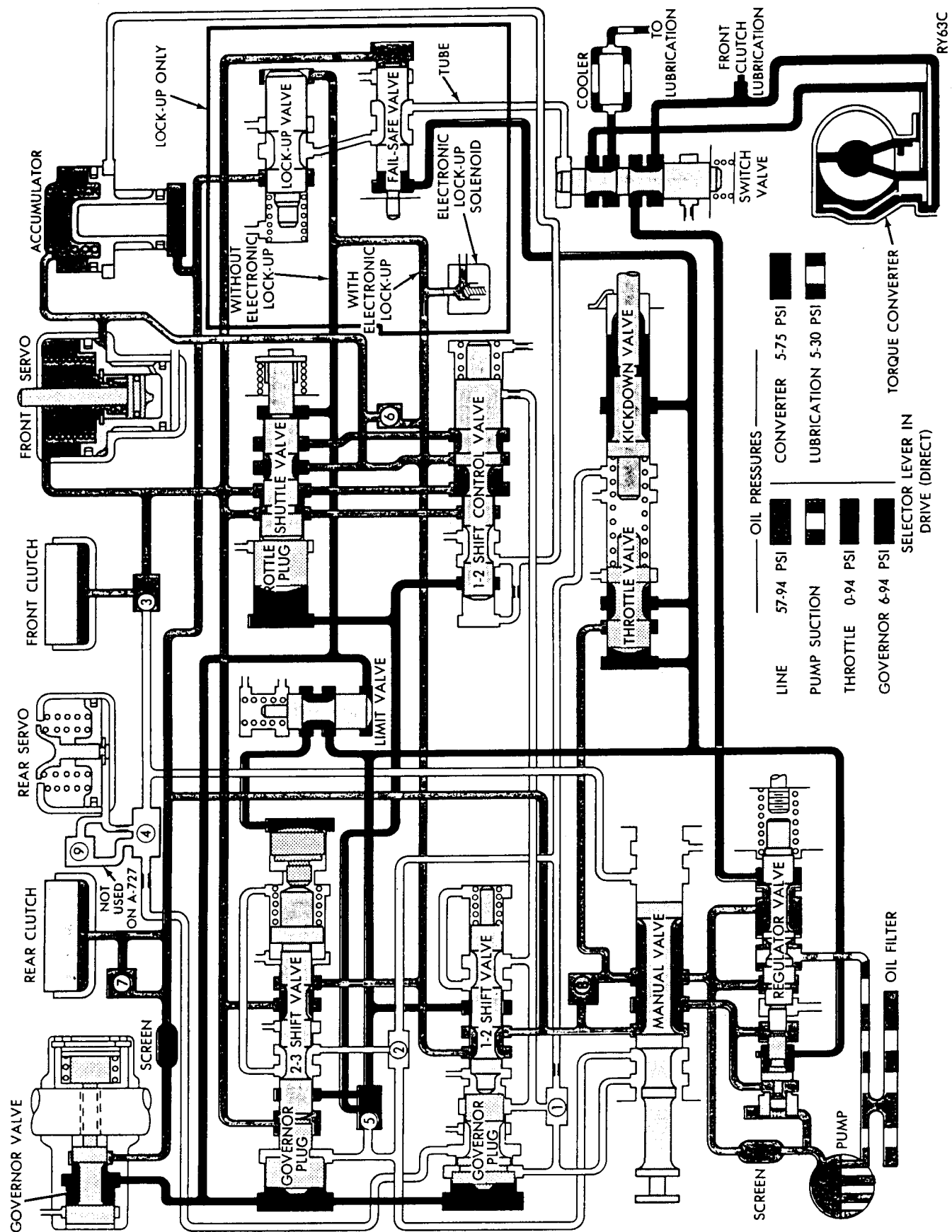
This condition will only happen between the speeds of 40 mph and 55 mph! What happens in this range is that if the manifold vacuum goes above 20 inches of vacuum or below 3 inches of vacuum the vacuum transducer will give the computer a signal to unlock the torque converter. The computer will then de-energize the unlock solenoid, which vents the line pressure going to the lock-up valve. The lock-up

valve will then go to its unshifted position and unlock will occur.

Lock-up will recur when vacuum comes back down to 18 inches or up to 5 inches of vacuum. At those points the computer will energize the unlock solenoid and line pressure will shift the lock-up valve, which in turn will move the switch valve for lock-up.









ON-BOARD DIAGNOSTIC INTRODUCTION

DIAGNOSIS FOR ELECTRONIC LOCK/UNLOCK TRANSMISSION

- Check Fluid Level
- Check Linkage Adjustment
- Visual Inspection of Wiring Connectors
 1. Computer
 2. Lock/Unlock Relay
 3. Coolant Sensor
 4. Carburetor Ground
 5. Speed Sensor
 6. Transmission Solenoid Terminal
- Install tachometer to use during road test
- Engine temperature above 150°F
- Road test vehicle at approximately 35 mph in third gear, slowly accelerate to a point above 40 mph. As lock-up occurs you should see a slight drop in engine rpm on tachometer.
- If a no lock-up condition is determined
 1. Connect miller tester (C-4805) to diagnostic connector and check for fault codes
 2. Use fault code section
 3. If no fault codes, check for transmission hydraulic problem

ON-BOARD DIAGNOSTIC INTRODUCTION

The on-board diagnostic system for 1986 carbureted engines has been expanded and improved while retaining the same basic features and procedures used in 1985. Changes for 1986 include a new and expanded fault code display.

STEP

DESCRIPTION

- | | |
|---|--|
| <ol style="list-style-type: none"> 1 — Turn the ignition key to the off position, plug the diagnostic readout box into the diagnostic connector, and set the read/hold switch on the readout box to the "read" position. 2 — Open the carburetor switch and keep the switch open throughout this procedure by placing the | <p>throttle on the fast idle cam or by placing an insulator, such as a piece of paper, between the closed contacts of the switch or by depressing the accelerator pedal and holding it down until testing is completed.</p> <ol style="list-style-type: none"> 3 — Turn the ignition key to the on position (do not crank the engine) and check for a "00" display on the readout box. This indicates that the readout box is powered up. Proceed to step 4 for diagnostic fault codes, step 6 for the switch test, or step 7 for the actuator input/output test mode. 4 — The diagnostic fault codes are displayed automatically by moving the read/hold switch to the "hold" position. As long as the read/hold switch is left in the "hold" position, fault codes will be displayed sequentially at four (4) second intervals in the following order: <ol style="list-style-type: none"> 1. Code "88" indicating the beginning of diagnostic codes. 2. All fault codes presently stored in the engine computer. (Displayed in increasing numerical order as listed at the end of these instructions) 3. Code "55" indicating the end of diagnostic codes. Any fault code from the preceding sequence can be displayed for more than 4 seconds by moving the read/hold switch to the "read" position while the fault code is being displayed in the automatic display mode. Returning the switch to the "hold" position puts the computer back into the automatic display mode starting with the next existing fault code. 5 — Code "55" will remain displayed until either the switch test mode or |
|---|--|



- the actuator test mode is entered (or if power is removed). The read/hold switch should be set to the "read" position at this time.
- 6 — To enter the switch test mode, push the actuator button for less than 1 second and release it. Code "00" is displayed while the air conditioner and defroster are off and code "88" is displayed while the air conditioner or defroster is on. The switch test mode applies only to vehicles equipped with air conditioning.
- *7 — To enter the actuator input/output test mode from the switch test mode, the fault code mode, or from power-up, push the actuator button and hold it down until the desired actuator output test is displayed and then release the button. The read/hold switch is used to change the actuator test from an output test ("read") to an input test ("hold"). There is a five (5) minute time limit for the actuator input/output test mode which is reset whenever a new actuator output test is selected. If the combined time for any one output test and its associated input test is greater than five (5) minutes, the actuator input/output test mode is terminated and a restart from step #1 is required.
- *8 — To select an actuator output test, the read/hold switch must be in the "read" position. The actuator output test selected in step 7 will toggle the selected output at a 250 millisecond rate (on and off twice a second). To select a different actuator output test, push the actuator button as before and release it when the desired test number is displayed. The test numbers will continually recycle as long as the actuator button is depressed.
- *9 — To switch from an actuator output test to an actuator input test, move the read/hold switch to the "hold" position. The display will now indicate the sensor input status as read by the computer and described in the actuator input test display code menu following these instructions. Since the actuator button is disabled during an actuator input test, the read/hold switch must be returned to the "read" position to leave an actuator input test (or let the five minute timer expire or disconnect the power). An actuator input test can only be entered from its associated actuator output test and will always return to that same output test.



DISPLAY CODES THAT AFFECT ELECTRONIC LOCK-UP

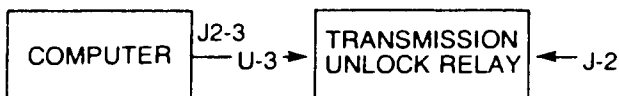
CODE

- 12 Transmission Lock/Unlock Relay Error
- 24 Vacuum Sensor Open or Shorted
- 26 Coolant Sensor Error
- 28 Vehicle Speed Switch Error

CODE 12

TRANSMISSION UNLOCK RELAY CIRCUIT (OUTPUT)

The transmission unlock output controls a relay which is used to lock-up and unlock the transmission. J2 (battery) voltage is provided to the relay and the computer provides the ground connection.



Fault code 12 is generated whenever the state of the transmission unlock relay does not match the state (actuated or non-actuated) that the computer is trying to output. Only a faulty computer, transmission unlock relay, or the associated wiring can cause this fault to occur.

ATM-92 can be used to test this output.
(ATM) Actuator Test Mode

CODE 24

VACUUM SENSOR CIRCUIT (INPUT)

The vacuum sensor circuit reads manifold vacuum from the vacuum transducer mounted in the computer housing. There is no external circuitry associated with this input.

COMPUTER — VACUUM TRANSDUCER

Fault code 24 is generated at any time the transducer wires inside the computer are open or short circuited. An intermittent condition can cause this fault. However, a disconnected vacuum line cannot create this fault.

* Actuator input test 91 can be used to test this input. (AIT-91 is initiated by moving the read/hold switch on the miller tool to the "hold" position while in ATM-91.)

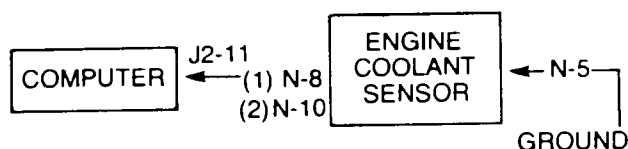
If fault code 25 and/or fault code 26 occurs in combination with fault code 24, troubleshoot fault codes 25 and 26 first. J2 (battery) voltage on the coolant sensor wiring can cause any of these three faults. If the coolant sensor circuitry is good, check for problems on all indicated faults. AIT-91 should be used in this case to determine an actual vacuum transducer fault.

*(AIT) Actuator Input Test
(ATM) Actuator Test Mode

CODE 26

ENGINE COOLANT TEMPERATURE SENSOR (INPUT)

The engine coolant temperature sensor input circuit monitors the engine coolant temperature of the dual coolant sensor in 2.2L engine applications or via the single engine coolant temperature sensor in all other engine applications. The engine coolant temperature sensor provides accurate temperature readings for engine temperature.



Fault code 26 is generated whenever the engine coolant temperature sensor does not read at least 100 degrees Fahrenheit (* 50 degrees Fahrenheit for 3.9L and 5.2L engine applications) after a period of 30 minutes from engine start-up, or if the sensor is short circuited for at least 200 seconds, or if an erratic signal is detected. (An erratic sensor reading is indicated by a 20 degree Fahrenheit temperature change in less than 100 milliseconds.)

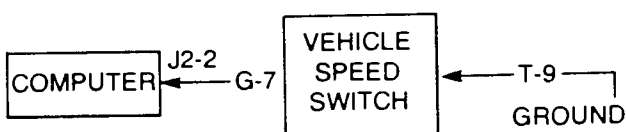
The nominal resistance ranges for the engine coolant sensor are:

-40 to 20 Deg F (cold temp)	382K - 22K ohms
50 to 100 Deg F (room temp)	36K - 3.3K ohms
140 to 245 Deg F (engine run)	3.9K - 176 ohms

CODE 28

VEHICLE SPEED/DISTANCE SWITCH (INPUT)

The vehicle speed switch input monitors the vehicle speed switch located in the speedometer cable so that the computer can determine the vehicle speed. The computer will see either an open circuit or ground.



Fault code 28 is generated if the vehicle speed switch does not indicate a valid speed between 2 and 150 mph.

ACTUATOR OUTPUT TEST DISPLAY CODES

Display
Code

Meaning

* 92 - Toggle transmission unlock relay

* ACTUATOR INPUT TEST DISPLAY CODES

Display code and read/hold switch status

"Read""Hold"

Display code meaning

91 → Vacuum transducer input reading

01 - Vacuum is between 0 and 5 inches

02 - Vacuum is between 5 and 15 inches

03 - Vacuum is greater than 15 inches

92 → Engine coolant sensor input reading

01 - Temperature is less than 50 degrees F

02 - Temperature is between 50 and 100 degrees F

03 - Temperature is greater than 100 degrees F

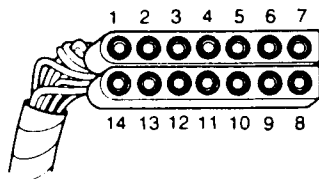
96 → Vehicle Speed switch input reading

01 - Vehicle speed switch is closed

02 - Vehicle speed switch is open

1986 COMPUTER PINOUT

(Looking into the connector)



Pin 1 — Diagnostics input

Pin 2 — Vehicle speed sensor

Pin 3 — Shift indicator light/transmission unlock

Pin 4 — Tachometer

Pin 5 — Battery

Pin 6 — Electronic throttle control solenoid

Pin 7 — Air conditioner input

Pin 8 — Exhaust gas recirculation/canister purge solenoid

Pin 9 — Charge temperature switch/fan temperature sensor

Pin 10 — Oxygen sensor

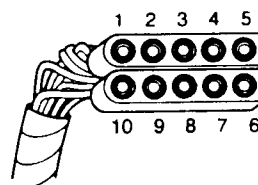
Pin 11 — Coolant temperature sensor

Pin 12 — Oxygen "fuel control" solenoid

Pin 13 — Air switching/vacuum operated secondary solenoid

Pin 14 — Diagnostics output

(Looking into the connector)



Pin 1 — Ignition coil

Pin 2 — J2

Pin 3 — Start pickup/hall B+

Pin 4 — Electric backlight

Pin 5 — Run pickup/hall pickup

Pin 6 — Knock sensor

Pin 7 — Carburetor switch

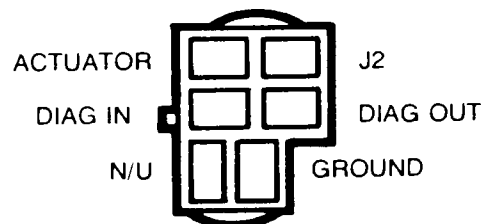
Pin 8 — Fan relay

Pin 9 — Signal ground

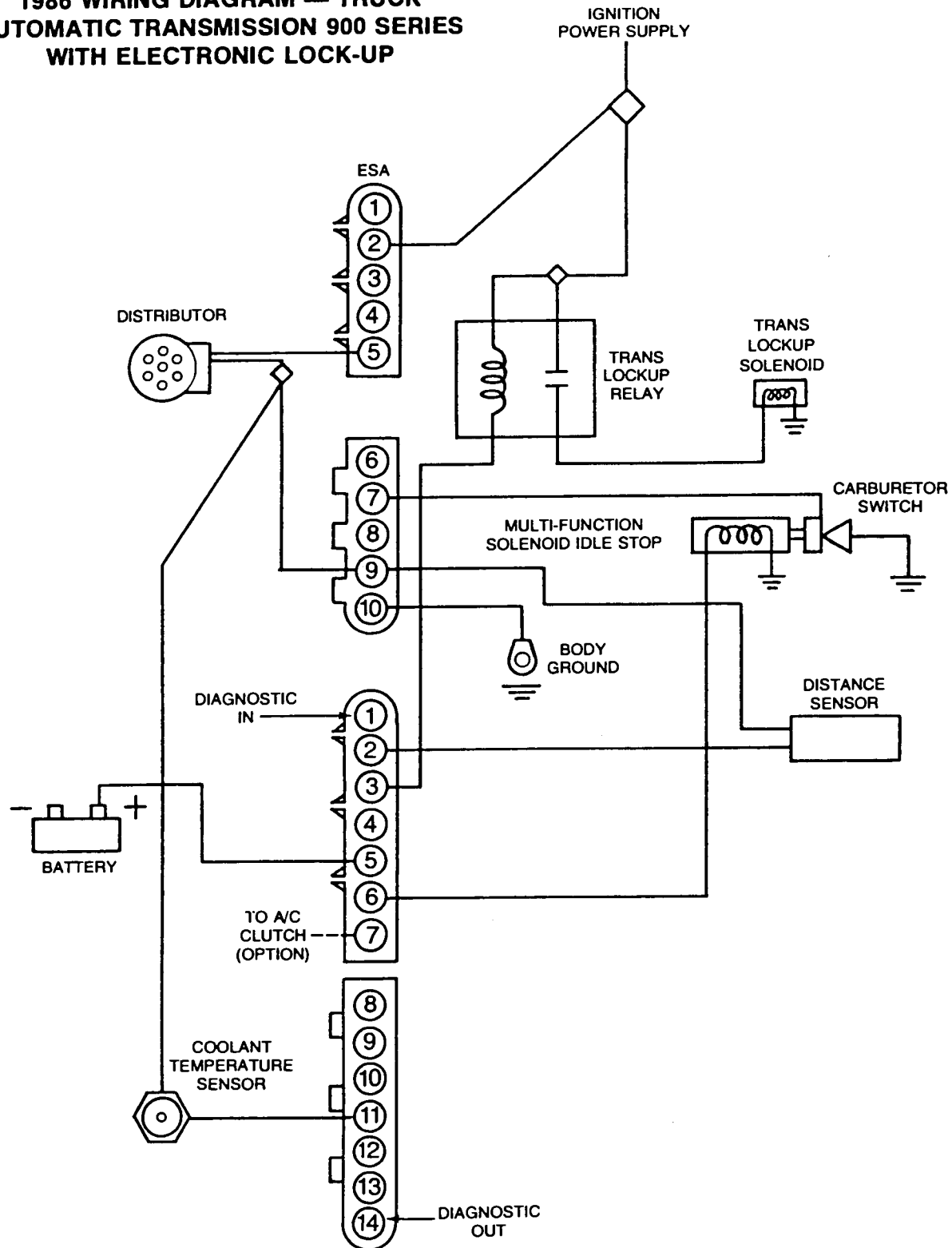
Pin 10 — Power ground

DIAGNOSTIC CONNECTOR PINOUT

(Looking into the engine wiring harness)



1986 WIRING DIAGRAM — TRUCK AUTOMATIC TRANSMISSION 900 SERIES WITH ELECTRONIC LOCK-UP



AUTOMATIC TRANSMISSION SERVICE GROUP



DIAGNOSIS CHART — LOCK-UP TORQUE CONVERTER

POSSIBLE CAUSE											
FAULTY OIL PUMP	X			X	X		X				X
FAULTY SOLENOID (VENTS PRESS)	X										
FAULTY SOLENOID (CLOSED OR PLUGGED)		X	X								
PLUGGED COOLER, LINES OR FITTINGS					X					X	X
VALVE BODY MALFUNCTION	X	X	X	X	X		X				X
STUCK SWITCH VALVE	X			X						X	
STUCK LOCK-UP VALVE	X		X								
STUCK FAIL-SAFE VALVE	X			X							
FAULTY TORQUE CONVERTER	X					X	X	X			X
OUT OF BALANCE									X		
FAILED LOCKING CLUTCH	X					X	X				X
LEAKING TURBINE HUB SEAL	X					X					
ALIGN EXHAUST SYSTEM								X			X
TUNE ENGINE							X	X			
FAULTY INPUT SHAFT OR SEAL RING	X				X						
THROTTLE LINKAGE MISADJUSTED								X			X
CONDITION											
NO LOCK-UP											
WILL NOT UNLOCK											
STAYS LOCKED UP TO TOO LOW A SPEED IN DIRECT											
LOCKS UP OR DRAGS IN LOW OR SECOND											
STALLS OR IS SLUGGISH IN REVERSE											
LOUD CHATTER DURING LOCK-UP ENGAGEMENT — (COLD)											
VIBRATION OR SHUDDER DURING LOCK-UP ENGAGEMENT											
VIBRATIONS AFTER LOCK-UP ENGAGEMENT											
VIBRATION WHEN "REVVED" IN NEUTRAL											
OVERHEATING; OIL BLOWING OUT DIPSTICK OR PUMP SEAL											
SHUDDER AFTER LOCK-UP ENGAGEMENT											



Lock-up and non lock-up torque converters and transmissions are **not** intermixable.

HYDRAULIC CONTROL SYSTEM

The hydraulic control circuit diagrams show the position of the various valves with color coded passages to indicate those under hydraulic pressure for all operations of the transmission.

The hydraulic control system makes the transmission fully automatic, and has four important functions to perform. In a general way, the components of any automatic transmission control system may be grouped into the following basic groups:

The pressure supply system, the pressure regulating valves, the flow control valves, the clutches, and band servos.

Taking each of these basic groups or systems in turn, the control system may be described as follows:

Pressure Supply System

The pressure supply system consists of an oil pump driven by the engine through the torque converter. The single front pump furnishes pressure for all the hydraulic and lubrication requirements.

Pressure Regulating Valves

The regulator valve controls line pressure dependent on throttle opening.

The governor valve controls governor pressure to the transmission (which varies with vehicle speed) to control upshift, downshift, and lock-up speeds.

The throttle valve controls throttle pressure to the transmission (which varies with throttle position) to control upshift and downshift speeds.

Flow Control Valves

The manual valve provides the different transmission drive ranges as selected by the vehicle operator.

The 1-2 shift valve automatically shifts the transmission from low to second or from second to low depending on the vehicle operation.

The 2-3 shift valve automatically shifts the transmission from second to direct or from direct to second depending on the vehicle operation.

The kickdown valve makes possible a forced downshift from direct to second, second to breakaway, or direct to breakaway (depending on vehicle speed) by depressing the accelerator pedal past the detent "feel" near wide open throttle.

The throttle pressure plug at the end of the 2-3 shift valve, provides a 3-2 downshift with varying throttle openings depending upon vehicle speed.

The 1-2 shift control valve transmits 1-2 shift control pressure to the transmission accumulator piston to control the kickdown band capacity on 1-2 upshifts and 3-2 downshifts. The limit valve determines the

maximum speed at which a 3-2 part throttle kickdown can be made. Some transmissions **do not** have the limit valve and the maximum speed for the 3-2 kickdown is at the "detent" position.

The shuttle valve has two separate functions and performs each independently of the other. The first is that of providing fast release of the kickdown band, and smooth front clutch engagement when the driver makes a "lift-foot" upshift from second to direct. The second function of the shuttle valve is to regulate the application of the kickdown servo and band when making direct to second kickdowns.

The lock-up valve automatically applies the torque converter lock-up clutch when fed with line pressure from the lock-up solenoid. The lock-up solenoid is controlled by the engine electronics through an electrical connector in the rear of the transmission case. Electronic control of the torque converter lock-up includes unlocking the torque converter at closed throttle, during engine warm-up, and during part-throttle acceleration. The non lock-up A-904T, used in California, has a threaded plug in the rear of the transmission case in place of the lock-up wiring connector.

The fail-safe valve restricts feed to the lock-up clutch if front clutch pressure drops. It permits lock-up only in direct gear and provides a fast lock-up release during a kickdown.

The switch valve directs oil to apply the lock-up clutch in one position and releases it in the other as well as directs oil to the cooling and lube circuits. The switch valve also regulates the oil pressure to the torque converter and limits the maximum oil pressure to 130 psi.

Clutches, Band Servos, and Accumulator

The front and rear clutch pistons, and both servo pistons are moved hydraulically to engage the clutches and apply the bands. The pistons are released by spring tension when hydraulic pressure is released. On the 2-3 upshift, the kickdown servo piston is released by spring tension and hydraulic pressure and the lock-up piston is applied by hydraulic pressure within the torque converter.

The accumulator controls the hydraulic pressure on the apply side of the kickdown servo during the 1-2 shift; thereby, cushioning the kickdown band application at any throttle position.

OPERATING INSTRUCTIONS

The transmission will automatically upshift and downshift at approximately the speeds shown in the "Automatic Shift Speed Chart." All shift speeds given in the "Chart" may vary somewhat due to production tolerances and rear axle ratios. The quality of the shifts is very important. All shifts should be smooth



Technical Service Information

and positive with no noticeable engine runaway. See "Diagnosis and Tests" for chart.

Gearshift and Parking Lock Controls

The transmission is controlled by a "lever type" gearshift incorporated within the steering column. The control has six selector lever positions: P (park), R (reverse), N (neutral), D (drive), 2 (second) and 1 (first). The parking lock is applied by moving the selector lever past a gate to the P (park) position.

Do not apply the parking lock until the vehicle has stopped; otherwise, a severe ratcheting noise will occur.

Starting the Engine

The engine will start with the selector lever in either the P (park) or N (neutral) positions. As a safety precaution when starting in the N (neutral) position, apply the parking or foot brake. The LoadFlite transmission will not permit starting the engine by pushing or towing.

Mountain Driving

When driving in the mountains with either heavy loads or when pulling trailers, the 2 (second) or 1 (low) position should be selected on upgrades which require heavy throttle for 1/2 mile or more. This reduces possibility of overheating the transmission and torque converter under these conditions.

Towing Vehicle

Transmission Inoperative: Tow the vehicle with a rear end pickup or remove the propeller shaft.

Transmission Operating Properly: The vehicle may be towed safely in N (neutral) with rear wheels on the ground at a speed not to exceed 30 mph (48 km/h). If the vehicle is to be towed for extended distances, it should be done with a rear end pickup or the propeller shaft removed. Because the transmission receives lubrication only when the engine is running, it is good practice to always tow a disabled vehicle with a rear end pickup or remove the propeller shaft.

DIAGNOSIS AND TESTS

Clutch and Servo Air Pressure Tests
Torque Converter Stall Test
Diagnosis Charts
Diagnosis—General

Fluid Leakage
Hydraulic Pressure Tests
Oil Cooler and Cooler Tubes Flushing

DIAGNOSIS—GENERAL

Automatic transmission malfunctions may be caused by four general conditions: poor engine performance, improper adjustments, hydraulic malfunctions, and mechanical malfunctions. Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level and condition, manual linkage adjustment, and throttle linkage adjustment. Then perform a road test to determine whether the problem has been corrected or that more diagnosis is necessary. If the problem exists after the preliminary tests and corrections are completed, hydraulic pressure tests should be performed.

Fluid Level and Condition

If a failure of any kind has contaminated the transmission fluid, the oil cooler and cooler tubes must be reverse flushed (see "Oil Cooler and Cooler Tubes Flushing.")

Before removing the dipstick, wipe all dirt off of the protective cap and top of the filler tube.

Since the torque converter fills more slowly in the "P" Park position, place the selector lever in "N" Neutral to be sure that the fluid level check is accurate. **The vehicle must be on level ground.** The

engine should be running at idle speed. **The fluid should be at normal operating temperature (approximately 175°F).** The fluid level is correct if it is between the "Full" and "Add" marks on the dipstick.

Low fluid level can cause a variety of conditions because it allows the pump to take in air along with the fluid. As in any hydraulic system, air bubbles make the fluid spongy, therefore, pressures will be low and build up slowly.

Improper filling can also raise the fluid level too high. When the transmission has too much fluid, the gears churn up foam and cause the same conditions which occur with a low fluid level.

In either case, the air bubbles can cause overheating, fluid oxidation, and varnishing, which can interfere with normal valve, clutch, and servo operation. Foaming can also result in fluid escaping from the transmission vent where it may be mistaken for a leak.

Along with the fluid level, it is important to check the condition of the fluid. When the fluid smells burned, and is contaminated with metal or friction material particles, a complete transmission overhaul is needed and because the torque converter cannot be



flushed, it should be replaced. Be sure to examine the fluid on the dipstick closely. If there is any doubt about its condition, drain out a sample for a double check.

After the fluid has been checked, seat the dipstick fully to seal out water and dirt.

OIL COOLERS AND TUBES FLUSHING

When a transmission or lock-up clutch failure has contaminated the fluid, the oil cooler(s) should be reverse flushed to insure that metal particles or sludged oil are not later transferred back into the reconditioned transmission.

- (1) Disconnect both cooler lines at radiator.
- (2) Dislodge any foreign material at the inlet side of the cooler with a small screwdriver.
- (3) Reverse flush the cooler with a combination of mineral spirits and pulsating air under pressure (shop air).
- (4) Treat the cooler lines separately and insure they are clear by flowing mineral spirits or automatic transmission fluid through them.
- (5) Remove leftover mineral spirits from cooler and cooler lines by flowing automatic transmission fluid through them.
- (6) Cooler flow should now be checked by connecting the cooler tubes and placing the rear cooler tube into a 1 quart container. Overfill the transmission by 1 quart. Watching a clock, start engine (run at curb idle) and run in neutral for exactly 20 seconds. If cooler flow is less than 1 quart in 20 seconds, replace the radiator or have the radiator bottom cooler professionally reconditioned.

Manual Linkage

Normal operation of the neutral safety switch provides a quick check to confirm proper manual linkage adjustment.

Move the selector lever slowly upward until it clicks into the "P" Park notch in the selector gate. If the starter will operate the "P" position is correct.

After checking "P" position move the selector slowly toward "N" Neutral position until the lever drops at the end of the "N" stop in the selector gate. If the starter will also operate at this point the manual linkage is properly adjusted. If adjustment is required, refer to "Gearshift Linkage Adjustment" in "Maintenance and Adjustments".

Throttle Linkage

The throttle rod adjustment is very important to proper transmission operation. This adjustment positions a valve which controls shift speed, shift quality and part throttle downshift sensitivity. If the setting is too short, early shifts and slippage between shifts may occur. If the setting is too long, shifts may be

delayed and part throttle downshifts may be very sensitive. Refer to "Throttle Rod Adjustment" in "Maintenance and Adjustments".

Road Test

Prior to performing a road test, be certain that the fluid level and condition, and control linkage adjustments have been checked and approved.

During the road test the transmission should be operated in each position to check for slipping and any variation in shifting. Note whether the shifts are harsh or spongy and check the speeds where the upshifts and downshifts occur. Approximate shift speeds for the various modes of operation are shown in the "Automatic Shift Speeds and Governor Pressure" chart.

Observe closely for slipping or engine speed flare-up. Slipping or flare-up in any gear usually indicates clutch, band, or overrunning clutch problems. If the condition is far advanced, an overhaul will probably be necessary to restore normal operation.

In most cases, the clutch or band that is slipping can be determined by noting the transmission operation in all selector positions and by comparing which internal units are applied in those positions. The "Elements in Use Chart" provides a basis for road test analysis.

By observing that the rear clutch is applied in both the "D" first gear and "1" first gear positions, but that the overrunning clutch is applied in "D" first and the low-reverse band is applied in "1" first, if the transmission slips in "D" range first gear but does not slip in "1" first gear, the overrunning clutch must be the unit that is slipping. Similarly, if the transmission slips in any two forward gears, the rear clutch is the slipping unit.

Using the same procedure, the rear clutch and front clutch are applied in "D" third gear. If the transmission slips in third gear, either the front clutch or the rear clutch is slipping. By selecting another gear which does not use one of those units, the unit which is slipping can be determined. If the transmission also slips in reverse, the front clutch is slipping. If the transmission does not slip in reverse, the rear clutch is slipping.

This process of elimination can be used to detect any unit which slips and to confirm proper operation of good units. However, although road test analysis can usually diagnose slipping units, the actual cause of the malfunction usually cannot be decided. Practically any condition can be caused by leaking hydraulic circuits or sticking valves.

Therefore, unless the condition is obvious, like no drive in "D" range first gear only, **the transmission should never be disassembled until hydraulic pressure tests have been performed.**

An engine tachometer can be used to determine if

the lock-up clutch, in the torque converter, is functioning. An instantaneous rise in engine speed of more than 150 rpm at 60 mph (97 km/h) when the throttle is opened just short of kickdown, indicates that the lock-up clutch is slipping more than normal.

HYDRAULIC PRESSURE TESTS

Pressure testing is a very important step in the diagnostic procedure. These tests usually reveal the cause of most transmission problems.

Before performing pressure tests, be certain that the fluid level and condition, and control linkage

adjustments have been checked and approved. Fluid must be at operating temperature (150 to 200 degrees F.).

Install an engine tachometer, raise vehicle on hoist which allows rear wheels to turn, and position the tachometer so it can be read under the vehicle.

Disconnect throttle rod and shift rod from transmission levers so they can be controlled under the vehicle.

Attach 100 psi gauges (C-3292) to ports required for test being conducted. A 300 psi gauge (C-3293) is required for "reverse" pressure test at rear servo.

Test port locations are shown in (Figs. 1 and 2).

ELEMENTS IN USE AT EACH POSITION OF THE SELECTOR LEVER

Lever Position	Standard Ratio	Wide Ratio	Start Safety	Parking Sprag	Clutches				Bands	
					Front	Rear	Over-running	Lock-up	(Kickdown) Front	(Low-Rev.) Rear
P—PARK			X	X						
R—REVERSE	2.21	2.21			X					X
N—NEUTRAL			X							
D—DRIVE:										
First	2.45	2.74				X	X		X	
Second	1.45	1.54				X				
Direct	1.00	1.00			X	X		X		
2—SECOND:										
First	2.45	2.74				X	X		X	
Second	1.45	1.54				X				
1—LOW (First)	2.45	2.74				X				X

Test One (Selector in "1")

- (1) Attach gauges to "line" and "rear servo" ports.
- (2) Operate engine at 1000 rpm for test.
- (3) Move selector lever on transmission all the way forward ("1" position).
- (4) Read pressures on both gauges as throttle lever on transmission is moved from full forward position to full rearward position.

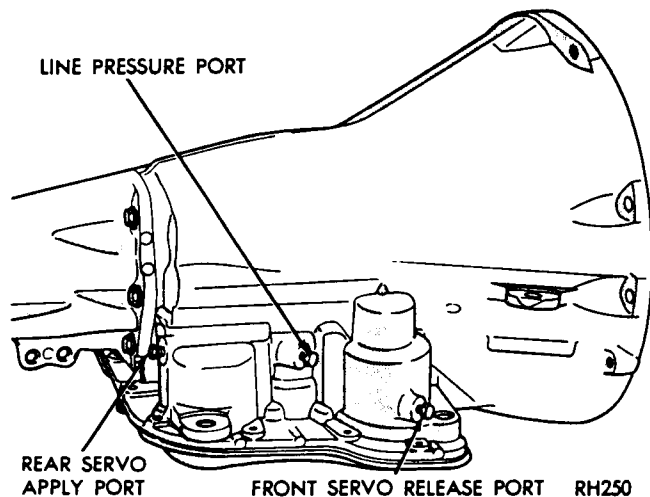


Fig. 1—Pressure Test Locations

- (5) Line pressure should read 54 to 60 psi (372 to 414 kPa) with throttle lever forward and gradually increase, as lever is moved rearward, to 90 to 96 psi (621 to 662 kPa).

- (6) Rear servo pressure should read the same as line pressure within 3 psi.

- (7) This tests pump output, pressure regulation, and condition of rear clutch and rear servo hydraulic circuits.

Test Two (Selector in "2")

- (1) Attach gauge to "line pressure" port and "tee"

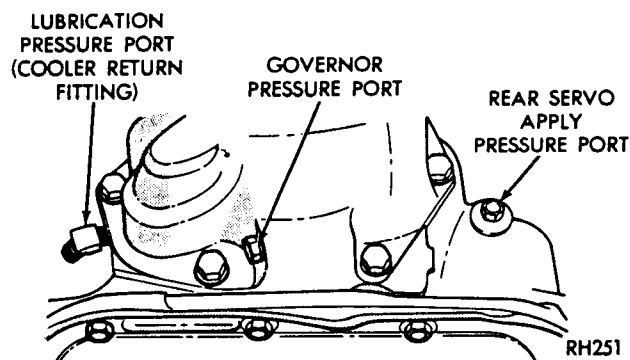


Fig. 2—Pressure Test Locations



Technical Service Information

into rear cooler line fitting to read "lubrication" pressure.

(2) Operate engine at 1000 rpm for test.

(3) Move selector lever on transmission one "detent" rearward from full forward position. This is selector "2" position.

(4) Read pressures on both gauges as throttle lever on transmission is moved from full forward position to full rearward position.

(5) Line pressure should read 54 to 60 psi (372 to 414 kPa) with throttle lever forward and gradually increase, as lever is moved rearward, to 90 to 96 psi (621 to 662 kPa).

(6) Lubrication pressure should be 5 to 15 psi (34 to 103 kPa) with lever forward and 10 to 30 psi (68 to 204 kPa) with lever rearward.

(7) This tests pump output, pressure regulation, and condition of the rear clutch and lubrication hydraulic circuits.

Test Three (Selector in "D")

(1) Attach gauges to "line" and "front servo release" ports.

(2) Operate engine at 1600 rpm for tests.

(3) Move the selector lever on transmission two "detents" rearward from full forward position. This is selector "D" position.

(4) Read pressures on both gauges as throttle lever on transmission is moved from full forward position to full rearward position.

(5) Line pressures should read 54 to 60 psi (372 to 414 kPa) with the throttle lever forward and gradually increase, as the lever is moved rearward.

(6) Front servo release is pressurized only in direct drive and should be same as line pressure within 3 psi (32 kPa), up to downshift point.

(7) This tests pump output, pressure regulation, and condition of rear clutch, front clutch, and lock-up clutch hydraulic circuits.

Test Four (Selector in Reverse)

(1) Attach 300 psi gauge to "rear servo apply" port.

(2) Operate engine at 1600 rpm for test.

(3) Move the selector lever on transmission four "detents" rearward from full forward position. This is selector "R" position.

(4) Rear servo pressure should read 145 to 175 psi with throttle lever forward and increase gradually to 230-280 psi as throttle lever is moved rearward.

AUTOMATIC SHIFT SPEEDS AND GOVERNOR PRESSURE CHART

(APPROXIMATE MILES PER HOUR AT ROAD LOAD)
(Km/h = Kilometers Per Hour)

Engine (C.I.D.)	225		318/360			
Model	150	250	150	150	250	350
Axle Ratio	3.21	3.54	2.71	2.94	3.21	3.54
Tire Size	P195/75R15	P235/75R15XL	P195/75R15	P195/75R15	P235/75R15XL	8.75x16.5-E
Throttle Closed	mph . . km/h	mph . . km/h	mph . . km/h	mph . . km/h	mph . . km/h	mph . . km/h
1-2 Upshift ...	8-10 13-16	8-10 13-16	10-12 16-19	9-11 14-19	9-11 14-19	8-11 13-18
2-3 Upshift ...	11-14 18-23	11-14 18-23	13-17 21-27	12-15 19-24	12-16 19-26	12-16 19-26
3-1 Downshift .	8-10 13-16	8-10 13-16	10-12 16-19	9-11 14-19	9-11 14-19	8-11 13-18
Throttle Wide Open						
1-2 Upshift ...	29-36 46-57	29-36 46-57	34-42 55-68	31-39 50-63	36-43 58-69	34-41 55-66
2-3 Upshift ...	55-61 89-98	55-61 89-98	65-73 105-118	60-67 97-108	63-70 101-113	60-67 97-108
Kickdown Range						
3-2 Downshift .	50-57 80-92	50-57 80-92	60-68 97-109	55-63 89-101	58-65 93-101	55-62 89-100
3-1 Downshift .	25-27 40-43	25-27 40-43	30-32 48-52	28-30 45-48	27-35 43-56	26-33 42-53
Governor Pressure*						
15 psi	16-18 26-29	16-18 26-29	19-21 31-34	17-19 27-31	17-20 27-32	16-19 26-31
50 psi	36-41 58-66	36-41 58-66	43-49 69-79	40-45 64-72	43-49 69-79	41-47 66-76
75 psi	54-59 87-95	54-59 87-95	64-70 103-113	59-65 95-105	62-68 100-110	59-65 95-105

*Governor pressure should be from zero to 1.5 psi at standstill or downshift may not occur.

NOTE: Figures given are typical for the axle ratio and tire size combination. Changes in tire size or axle ratio will cause shift points occur at correspondingly higher or lower vehicle speeds.

(5) This tests pump output, pressure regulation, and condition of the front clutch and rear servo hydraulic circuits.

(6) Move selector lever on transmission to "D" position to check that rear servo pressure drops to zero.

(7) This tests for leakage into rear servo, due to case porosity, which can cause reverse band burn out.

Test Result Indications

(1) If proper line pressure, minimum to maximum, is found in any one test, the pump and pressure regulator are working properly.

(2) Low pressure in "D, 1, and 2" but correct pressure in "R" indicates rear clutch circuit leakage.

(3) Low pressure in "D and R" but correct pressure in "1" indicates front clutch circuit leakage.

(4) Low pressure in "R and 1" but correct pressure in "2" indicates rear servo circuit leakage.

(5) Low line pressure in all positions indicates a defective pump, a clogged transmission oil filter, or a stuck pressure regulator valve.

Governor Pressure

Test only if transmission shifts at wrong vehicle speeds when throttle rod is correctly adjusted.

(1) Connect a 0-100 psi pressure gauge, to governor pressure take-off point, located at lower left side of extension near the mounting flange (Fig. 2).

(2) Operate transmission in third gear to read pressures and compare speeds shown in chart.

If governor pressures are incorrect at the given vehicle speeds, the governor valve and/or weights are probably sticking. The governor pressure should respond smoothly to changes in mph and should return to 0 to 1-1/2 psi (10 kPa) when vehicle is stopped. High pressure at standstill (above 2 psi) will prevent the transmission from downshifting.

Throttle Pressure

No gauge port is provided for throttle pressure. Incorrect throttle pressure should only be suspected if part-throttle upshift speeds are either delayed or occur too early in relation to vehicle speeds. Engine runaway on either upshifts or downshifts can also be an indicator of incorrect (low) throttle pressure setting.

In no case should throttle pressure be adjusted until the transmission throttle linkage adjustment has been verified to be correct.

TORQUE CONVERTER STALL TEST

WARNING: DO NOT LET ANYONE STAND IN FRONT OF VEHICLE DURING TEST

The stall test consists of determining the engine speed obtained at full throttle in "D" position only. This test checks the torque converter stator clutch operation, and the holding ability of the transmission clutches. The transmission oil level should be checked and the engine brought to normal operating temperature before stall operation. **Both the parking and service brakes must be fully applied and front wheels blocked while making this test.**

Do not hold the throttle open any longer than is necessary to obtain a maximum engine speed reading, and never longer than five seconds at a time. If more than one stall check is required, operate the engine at approximately 1,000 rpm in neutral for 20 seconds to cool the transmission fluid between runs. If engine speed exceeds the maximum limits shown, release the accelerator immediately since transmission clutch slippage is indicated.

Stall Speed Above Specification

If stall speed exceeds the maximum specified in chart by more than 200 rpm, transmission clutch slippage is indicated. Follow the transmission oil pressure and air pressure checks outlined in this section to determine the cause of slippage.

Stall Speed Below Specification

Low stall speeds with a properly tuned engine indicate torque converter stator clutch problems. A road test will be necessary to identify the exact problem.

If stall speeds are 250-350 rpm below specification, and the vehicle operates properly at highway speeds, but has poor through-gear acceleration, the stator overrunning clutch is slipping (lock-up and non lock-up torque converters).

If stall speed and acceleration are normal, but abnormally high throttle opening is required to maintain highway speeds, the stator clutch has seized (non lock-up torque converter only).

Both of these stator defects require replacement of the torque converter.

Noise

A whining or siren-like noise due to fluid flow is

LOADFLITE TRANSMISSION STALL SPEED CHART

Engine C.I.D.	Carburetor BBLs	Torque Converter Diameter	Engine Stall Speed rpm
225	1	10-3/4 inch	1800-2100
318	2	10-3/4 inch	1700-2000
360	4	10-3/4 inch	1700-2000

normal during stall operation with some torque converters; however, loud metallic noises from loose parts or interference within the assembly indicate a defective torque converter. To confirm that the noise originates within the torque converter, operate the vehicle at light throttle in D and N on a hoist and listen under the transmission bell housing.

CLUTCH AND SERVO AIR PRESSURE TESTS

A "NO DRIVE" condition might exist even with correct fluid pressure, because of inoperative clutches or bands. The inoperative units, clutches, bands, and servos can be located through a series of tests by substituting air pressure for fluid pressure (Fig. 3).

The front and rear clutches, kickdown servo, and low-reverse servo may be tested by applying air pressure to their respective passages after the valve body assembly has been removed. To make air pressure tests, proceed as follows:

Compressed air supply must be free of all dirt or moisture. Use a pressure of 30 psi.

Front Clutch

Apply air pressure to front clutch "apply" passage and listen for a dull "thud" which indicates that front clutch is operating. Hold air pressure on for a few seconds and inspect system for excessive oil leaks.

Rear Clutch

Apply air pressure to rear clutch "apply" passage and listen for a dull "thud" which indicates that rear clutch is operating. Also inspect for excessive oil leaks. If a dull "thud" cannot be heard in the clutches, place finger tips on clutch housing and again apply air

pressure. Movement of piston can be felt as the clutch is applied.

Kickdown Servo (Front)

Direct air pressure into front servo "apply" passage. Operation of servo is indicated by a tightening of front band. Spring tension on servo piston should release the band.

Low and Reverse Servo (Rear)

Direct air pressure into rear servo "apply" passage. Operation of servo is indicated by a tightening of rear band. Spring tension on servo piston should release the band.

If clutches and servos operate properly, no upshift or erratic shift conditions indicate that malfunctions exist in the valve body.

FLUID LEAKAGE—TRANSMISSION TORQUE CONVERTER HOUSING AREA

(1) Check for Source of Leakage.

Since fluid leakage at or around the torque converter area may originate from an engine oil leak, the area should be examined closely. Factory fill fluid is dyed red and, therefore, can be distinguished from engine oil.

(2) Prior to removing the transmission, perform the following checks:

When leakage is determined to originate from the transmission, check fluid level prior to removal of the transmission and torque converter.

High oil level can result in oil leakage out the vent located at the top of the front pump housing. If the fluid level is high, adjust to proper level.

After performing this operation, inspect for leakage. If a leak persists, perform the following operation on the vehicle to determine if it is the torque converter or transmission that is leaking.

Leakage Test Probe

(1) Remove torque converter housing dust shield.

(2) Position vehicle with front lower than back so that accumulated fluid in torque converter housing will drain out. Wipe inside of torque converter housing as dry as possible. A solvent spray followed by compressed air drying is recommended.

(3) Fabricate and fasten test probe (Fig. 4) securely to convenient dust shield bolt hole. Make certain torque converter is cleared by test probe. Tool must be clean and dry.

(4) Run engine at approximately 2,500 rpm with transmission in neutral, for about 2 minutes. Transmission must be at operating temperature.

(5) Stop engine and carefully remove tool.

(6) If upper surface of test probe is dry, there is no torque converter leak. A path of fluid across probe

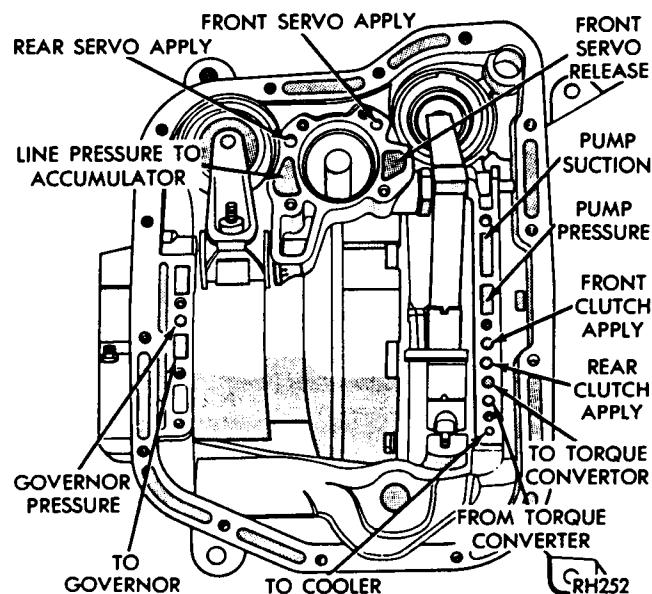


Fig. 3—Air Pressure Tests

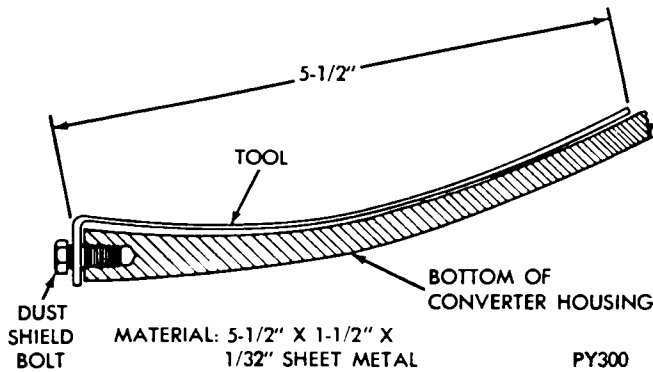


Fig. 4—Leak Locating Test Probe Tool

indicates a torque converter leak. Oil leaking under the probe is coming from the pump housing area (Fig. 5).

(7) Remove transmission and torque converter assembly from vehicle for further investigation. The fluid should be drained from the transmission. Reinstall oil pan (with new gasket) at specified torque.

Possible sources of transmission pump housing area fluid leakage shown in (Fig. 5) are:

- (1) Torque converter hub seal.
 - (a) Seal lip cut; check torque converter hub finish.
 - (b) Bushing moved and/or worn.
 - (c) Oil return hole in front pump housing plugged or omitted.
 - (d) Seal worn out (high mileage vehicles).
- (2) Fluid leakage at the outside diameter from pump housing "O" ring seal.
- (3) Fluid leakage at the front pump to case bolts.
- (4) Fluid leakage due to case or front pump housing porosity.
- (5) Oil leakage out the vent.
- (6) Kickdown lever shaft access plug.

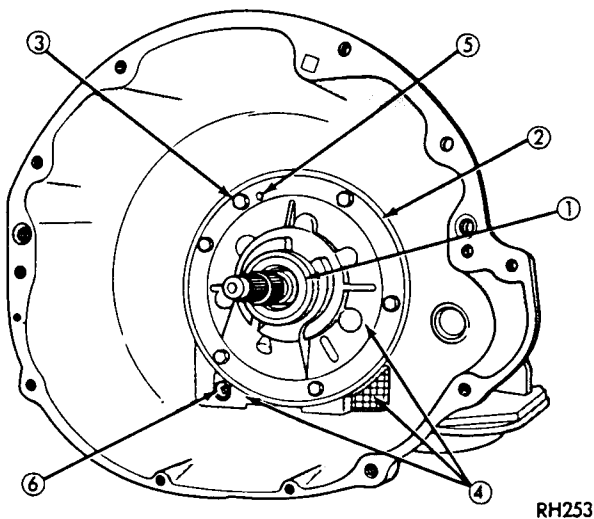


Fig. 5—Pump Housing Area

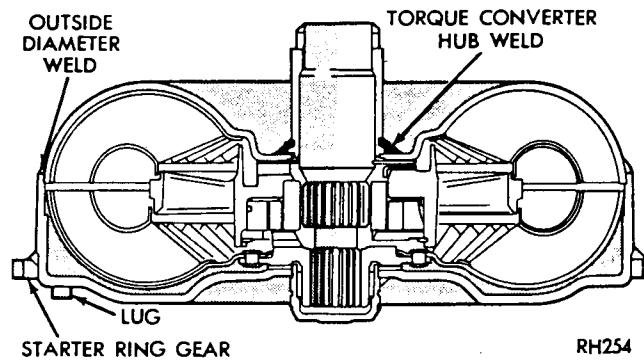


Fig. 6—Torque Converter (Non Lock-Up)

Torque Converter Leakage (Fig. 6)

Possible sources of torque converter leakage are:

- (a) Torque converter weld leaks at the outside diameter (peripheral) weld.
- (b) Torque converter hub weld.

Air Pressure Test of Transmission

Fabricate equipment needed for test as shown in Figures 7 through 11.

The transmission should be prepared for pressure test as follows, after removal of the torque converter:

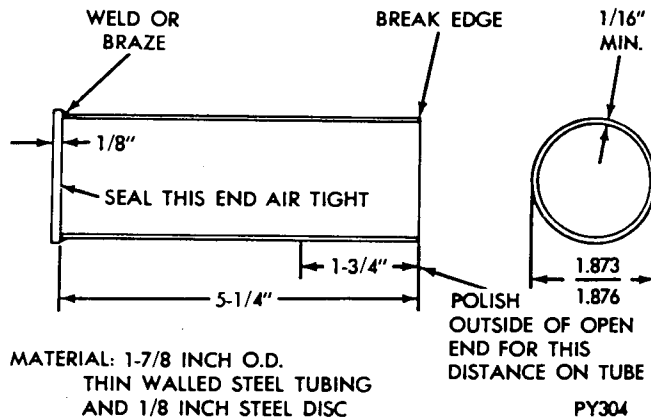


Fig. 7—A-727 Hub Seal Cup

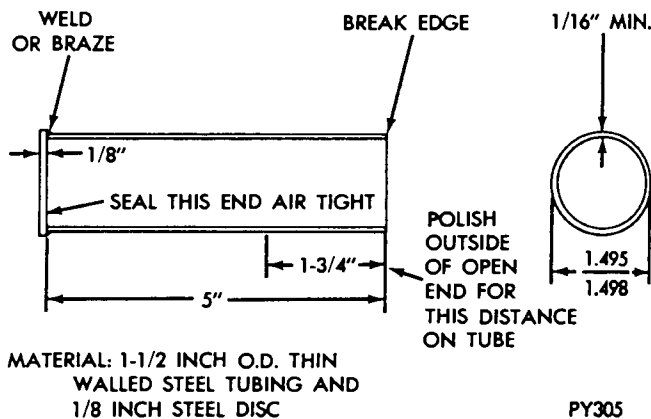


Fig. 8—A-904T and A-999 Torque Converter Hub Seal Cup

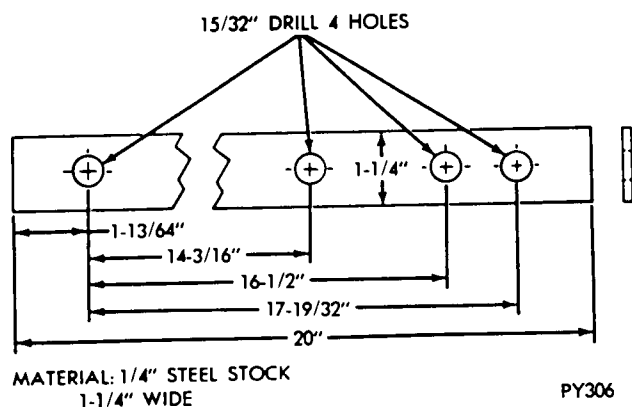


Fig. 9—Hub Seal Cup Retaining Strap

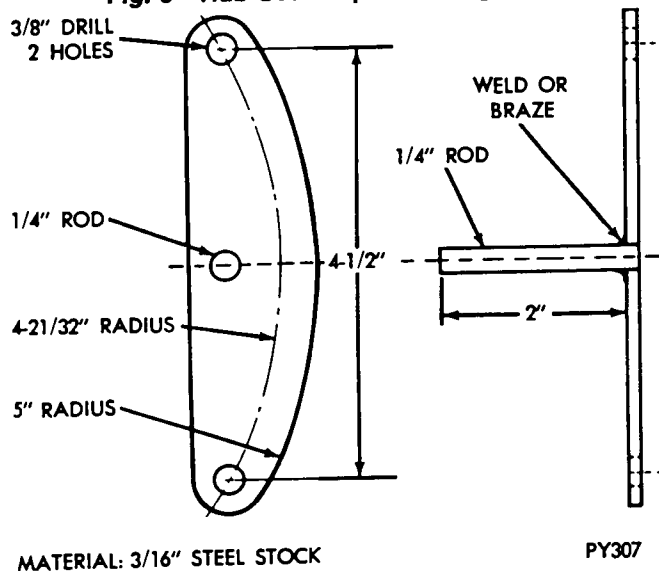


Fig. 10—A-727 Vent Plug Retainer

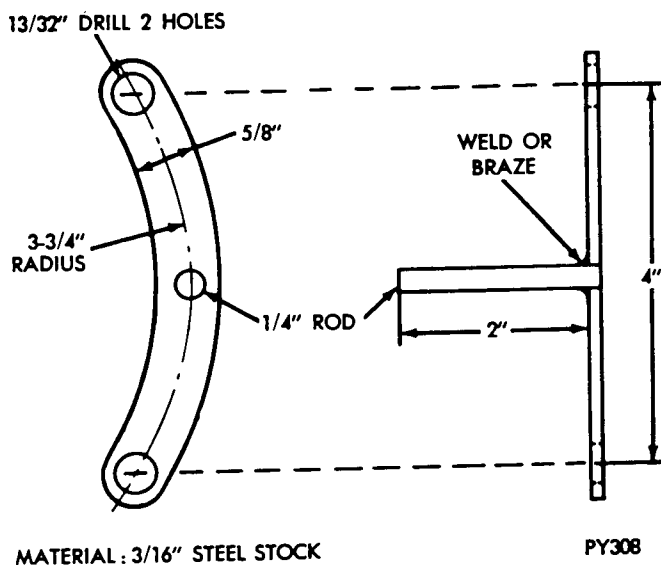


Fig. 11—A-904T and A-999 Vent Plug Retainer

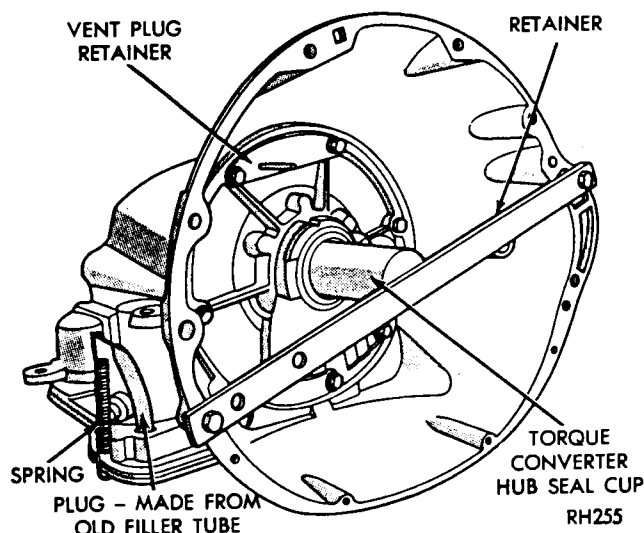


Fig. 12—Transmission Prepared for Test

(1) Install filler tube bore plug, propeller shaft yoke (tie in with cord or wire), flared tube fitting cap (on front cooler line fitting), and a short piece of tubing, flared at one end, on the rear cooler line fitting (Figs. 12 and 13).

(2) Remove necessary front pump housing bolts. Install vent plug (rubber stopper), and vent plug retainer preferably using longer bolts than those removed.

(3) With rotary motion, install torque converter hub seal cup over input shaft, and through the torque converter hub seal until the cup bottoms against the pump rotor lugs. Secure with cup retainer strap (Fig. 9), using torque converter housing to engine block retaining bolts.

(4) Attach and clamp hose from the nozzle of Tool C-4080 to tubing which is on the rear cooler line fitting (Fig. 13).

(5) Pressurize the transmission using Tool C-4080 until the pressure gauge reads 8 psi. Position transmission so that pump housing and case front may be covered with soapy solution or water. Leaks are some-

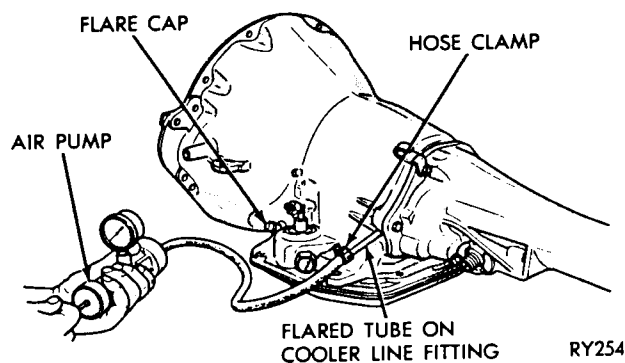


Fig. 13—Pressurizing Transmission



Technical Service Information

DIAGNOSIS GUIDE — VEHICLE WILL NOT MOVE

CHECK THE TRANSMISSION FLUID LEVEL BEFORE STARTING THE ENGINE. IF NO FLUID IS VISIBLE ON THE DIP STICK, ADD FLUID TO THE "L" MARK BEFORE STARTING THE ENGINE. THEN START THE ENGINE WITH THE TRANSMISSION IN NEUTRAL AND LISTEN FOR NOISE.

NO ABNORMAL NOISE.
MOVE THE SELECTOR TO A FORWARD DRIVE RANGE AND OBSERVE THE PROPELLER SHAFT FOR TURNING.

ABNORMAL NOISE.
STOP ENGINE IMMEDIATELY.
REMOVE TRANSMISSION AND CONVERTER AS AN ASSEMBLY; DISASSEMBLE, CLEAN AND INSPECT ALL PARTS; CLEAN THE VALVE BODY, INSTALL ALL NEW SEALS, RINGS, AND GASKETS; REPLACE WORN OR DEFECTIVE PARTS.

PROPELLER SHAFT TURNS
BUT REAR WHEELS
DO NOT TURN, INSPECT
FOR BROKEN REAR
AXLE PARTS.

**PROPELLER SHAFT DOES
NOT TURN.**
REMOVE THE
TRANSMISSION OIL PAN.
INSPECT FOR DEBRIS.

NO DEBRIS
REMOVE VALVE BODY.
DISASSEMBLE, CLEAN AND
INSPECT ALL PARTS.
REASSEMBLE, INSTALL AND
CHECK PRESSURES AND
OPERATION.

DEBRIS IS PRESENT.
REMOVE THE TRANSMISSION AND
CONVERTER AS AN ASSEMBLY.
DISASSEMBLE, CLEAN AND INSPECT
ALL PARTS. CLEAN VALVE BODY;
INSTALL ALL NEW SEALS, RINGS
AND GASKETS; REPLACE WORN OR
DEFECTIVE PARTS.

PU567

DIAGNOSIS GUIDE — FLUID LEAKS

VISUALLY INSPECT FOR SOURCE OF LEAK. IF THE SOURCE OF LEAK CANNOT BE READILY DETERMINED, CLEAN THE EXTERIOR OF THE TRANSMISSION. CHECK TRANSMISSION FLUID LEVEL. CORRECT IF NECESSARY.

THE FOLLOWING LEAKS MAY BE CORRECTED WITHOUT REMOVING THE TRANSMISSION:

MANUAL LEVER SHAFT OIL SEAL
FILLER TUBE 'O' RING
PRESSURE GAUGE PLUG
NEUTRAL START SWITCH
PAN GASKET
OIL COOLER FITTINGS
EXTENSION HOUSING TO CASE GASKET
EXTENSION HOUSING TO CASE BOLTS
EXTENSION HOUSING YOKE SEAL
SPEEDOMETER ADAPTER 'O' RING
FRONT BAND ADJUSTING SCREW

THE FOLLOWING LEAKS
REQUIRE REMOVAL OF THE TRANSMISSION
AND TORQUE CONVERTER FOR
CORRECTION.

TRANSMISSION FLUID LEAKING FROM THE LOWER
EDGE OF THE CONVERTER HOUSING; CAUSED BY
FRONT PUMP SEAL, PUMP TO CASE SEAL, OR TORQUE
CONVERTER WELD.
CRACKED OR
POROUS TRANSMISSION CASE.

PU568

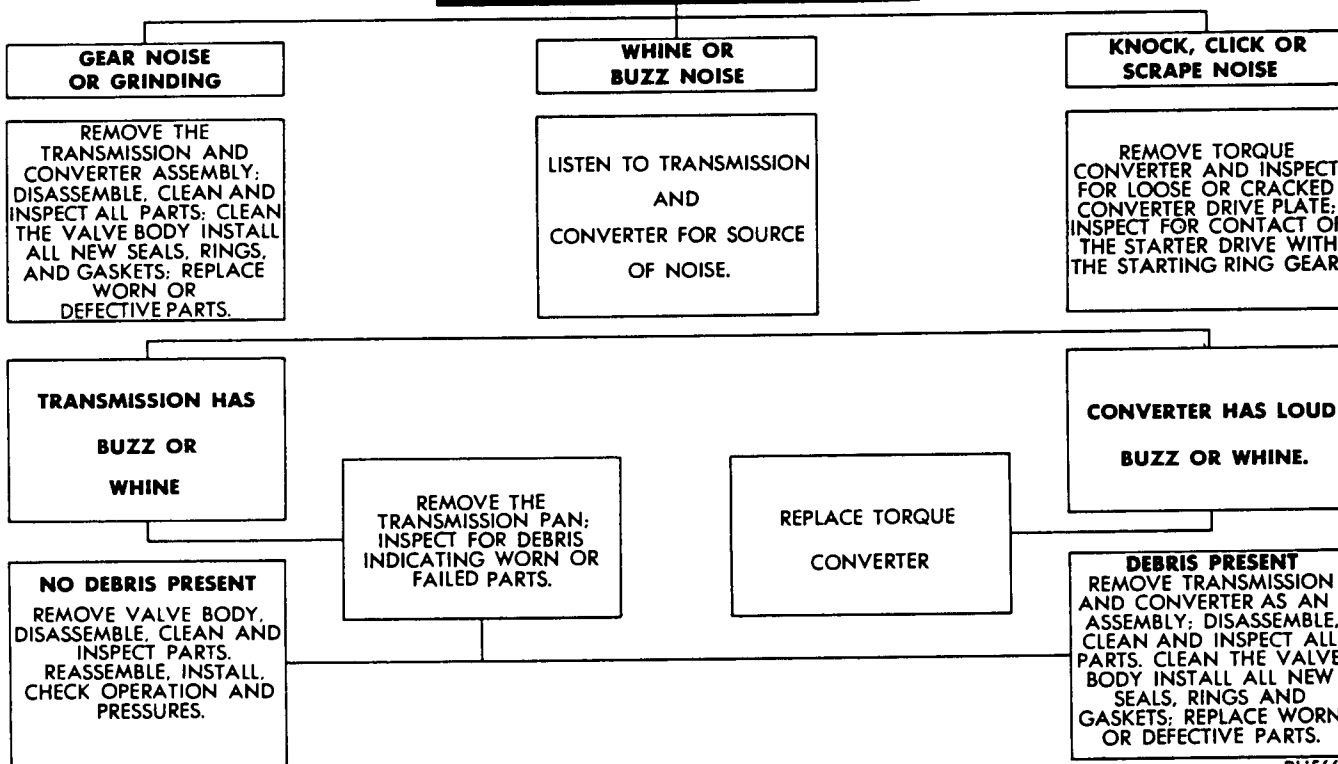
AUTOMATIC TRANSMISSION SERVICE GROUP

times caused by porosity in the case of pump housing.
CAUTION: Do not, under any circumstances, pressurize a transmission to more than 10 psi.

If a leak source is located, that part and all associated seals and gaskets should be replaced with new parts.

DIAGNOSIS GUIDE – ABNORMAL NOISE

INSPECT AND CORRECT THE TRANSMISSION FLUID LEVEL, ROAD TEST TO VERIFY THAT AN ABNORMAL NOISE EXISTS, IDENTIFY THE TYPE OF NOISE, DRIVING RANGES, AND CONDITIONS WHEN THE NOISE OCCURS.



PU566

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

LOADFLITE DIAGNOSIS CHART—GENERAL

POSSIBLE CAUSE

Faulty lock-up clutch.
Overrunning clutch inner race damaged.
Overrunning clutch worn, broken or seized.
Planetary gear sets broken or seized.
Rear clutch dragging.
Worn or faulty rear clutch.
Insufficient clutch plate clearance.
Faulty cooling system.
Kickdown band adjustment too tight.
Hydraulic pressure too high.
Breather clogged.
High fluid level.
Worn or faulty front clutch.
Kickdown servo band or linkage malfunction.
Governor malfunction.
Worn or broken reaction shaft support seal rings.
Governor support seal rings broken or worn.
Output shaft bearing and/or bushing damaged.
Overrunning clutch not holding.
Kickdown band out of adjustment.
Incorrect throttle linkage adjustment.
Engine idle speed too low.
Aerated fluid.
Worn or broken input shaft seal rings.
Faulty oil pump.
Oil Filter clogged.
Incorrect gearshift control linkage adjustment.
Low fluid level.
Low-reverse servo, band or linkage malfunction.
Valve Body malfunction or leakage.
Low-reverse band out of adjustment.
Hydraulic pressure too low.
Engine idle speed too high.
Stuck lock-up valve.
Stuck switch valve.

CONDITION																																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
HARSH ENGAGEMENT FROM NEUTRAL TO D OR R	X					X																														
DELAYED ENGAGEMENT FROM NEUTRAL TO D OR R			X			X	X	X	X	X	X	X	X	X					X							X										
RUNAWAY UPSHIFT			X			X							X																							
NO UPSHIFT			X			X	X	X	X					X																						
3-2 KICKDOWN RUNAWAY			X			X	X							X	X	X			X																	
NO KICKDOWN OR NORMAL DOWNSHIFT						X								X																						
SHIFTS ERRATIC																																				
SLIPS IN FORWARD DRIVE POSITIONS			X			X	X	X	X	X	X	X	X	X	X			X	X	X	X															
SLIPS IN REVERSE ONLY			X	X		X	X	X	X	X	X	X	X	X																					X	
SLIPS IN ALL POSITIONS			X			X	X	X	X	X	X	X	X																							
NO DRIVE IN ANY POSITION			X			X	X	X	X	X																									X	
NO DRIVE IN FORWARD DRIVE POSITIONS			X			X	X	X			X						X															X	X	X		
NO DRIVE IN REVERSE			X	X		X	X	X											X													X				
DRIVES IN NEUTRAL						X			X																							X	X	X		
DRAGS OR LOCKS											X																									
GRATING, SCRAPING GROWLING NOISE		X																								X								X	X	
BUZZING NOISE						X																														
HARD TO FILL, OIL BLOWS OUT FILLER TUBE							X																													X
TRANSMISSION OVERHEATS	X		X	X						X																										
HARSH UPSHIFT				X																																
DELAYED UPSHIFT																																				
SLIPS IN REVERSE OR MANUAL LOW																																				



DIAGNOSIS CHART—LOCK-UP TORQUE CONVERTER

POSSIBLE CAUSE

FAULTY OIL PUMP	X			X	X		X				X
STICKING GOVERNOR VALVE	X	X	X								
PLUGGED COOLER, LINES OR FITTINGS					X					X	X
VALVE BODY MALFUNCTION	X	X	X	X	X		X				X
STUCK SWITCH VALVE	X	X	X	X	X					X	
STUCK LOCK-UP VALVE	X	X	X								
STUCK FAIL-SAFE VALVE	X	X	X	X							
STUCK LOCK-UP SOLENOID	X		X								
SOLENOID WIRING DISCONNECTED	X										
FAILED LOCK-UP SOLENOID	X										
FAILED LOCK-UP RELAY	X		X								
FAULTY TORQUE CONVERTER:	X					X	X	X			X
OUT OF BALANCE									X		
FAILED LOCKING CLUTCH	X					X					X
LEAKING TURBINE HUB SEAL	X					X					
ALIGN EXHAUST SYSTEM								X			X
TUNE ENGINE							X	X			X
FAULTY INPUT SHAFT OR SEAL RING	X				X						
THROTTLE LINKAGE MISADJUSTED								X			X
CONDITION	NO LOCK-UP	WILL NOT UNLOCK	STAYS LOCKED UP TO TOO LOW A SPEED IN DIRECT	LOCK UP OR DRAGS IN LOW OR SECOND	STALLS OR IS SLUGGISH IN REVERSE	LOUD CHATTER DURING LOCK-UP ENGAGEMENT—(COLD)	VIBRATION OR SHUDDER DURING LOCK-UP ENGAGEMENT	VIBRATIONS AFTER LOCK-UP ENGAGEMENT	VIBRATION WHEN "REVED" IN NEUTRAL	OVERHEATING; OIL BLOWING OUT DIPSTICK OR PUMP SEAL	SHUDDER AFTER LOCK-UP ENGAGEMENT

MAINTENANCE AND ADJUSTMENTS

Band Adjustments
 Gearshift Linkage Adjustments
 Hydraulic Control Pressure Adjustments

Lubrication
 Throttle Rod Adjustment

LUBRICATION

Inspect fluid level on dipstick every six months with engine idling and transmission in neutral position and vehicle on **level** ground. A properly filled transmission will read near the "add" mark when fluid temperature is 70 degree fahrenheit (21 degrees Celsius) and near (but not over) the "full" mark at 180 degrees fahrenheit (82 degrees Celsius) (average operating temperature).

Fluid and Filter Changes

Refer to "Lubrication and Maintenance" Group "0". Severe usage as defined below, requires that fluid and filter be changed and bands adjusted every 12,000 miles (19 000 kilometers).

(1) More than one half operation in heavy city traffic during hot weather (above 90°F.) (32°C.).

(2) Police, Taxi, Limousine, Commercial Type Operation, and Trailer Tow.

NOTES:

(1) When the factory fill fluid is changed as recommended above, MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176 should be used. A band adjustment and filter change should be made at the time of the oil change.

(2) If the transmission is disassembled for any reason, the fluid and filter should be changed, and the bands adjusted.

Drain and Refill

(1) Raise vehicle on a hoist. Place a drain container, with a large opening, under transmission oil pan.

(2) Loosen pan bolts and tap the pan at one corner to break it loose allowing fluid to drain, then remove the oil pan.

(3) If necessary, adjust the reverse band.

(4) Install a new filter on bottom of the valve body, and tighten retaining screws to 35 in. lbs. (4 N·m).

(5) Clean the oil pan, make sure the round magnet is located over the bump in the front, right hand corner of the oil pan. Install oil pan using a new gasket. Tighten oil pan bolts to 150 in. lbs. (17 N·m).

(6) Pour four quarts of **Mopar ATF Plus** Automatic Transmission Fluid) Type 7176 through the filler tube.

(7) Start engine and allow to idle for at least two minutes. Then, with parking brake applied, move

selector lever momentarily to each position, ending in the neutral position.

(8) Add sufficient fluid to bring level to the "ADD" mark.

Recheck fluid level after transmission is at **normal operating temperature**. The level should be between the "FULL" mark and "ADD" mark with vehicle on **level** ground.

To prevent dirt from entering transmission, make certain that dipstick cap is fully seated onto the filler tube.

GEARSHIFT LINKAGE ADJUSTMENT (Column Shift) (Fig. 1)

When it is necessary to disassemble linkage rods from levers which use plastic grommets as retainers, the grommets should be replaced with new grommets. Use a prying tool to force rod from grommet in lever, (pry only where grommet and rod attach; not on the rod itself). Then cut away old grommet. Use pliers to snap new grommet into lever and rod into grommet.

(1) To insure proper adjustment, make sure adjustable swivel block is free to turn on shift rod. Disassemble and clean or repair parts to assure free action, if necessary.

(2) Place gearshift lever in "P" (park) position.

(3) With all linkage assembled and the adjustable

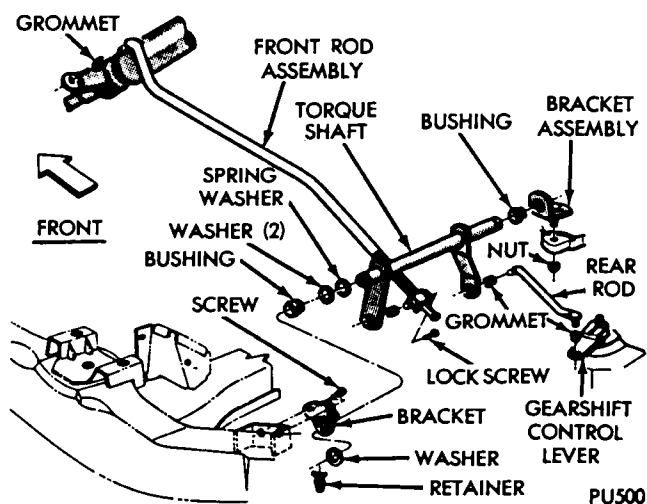
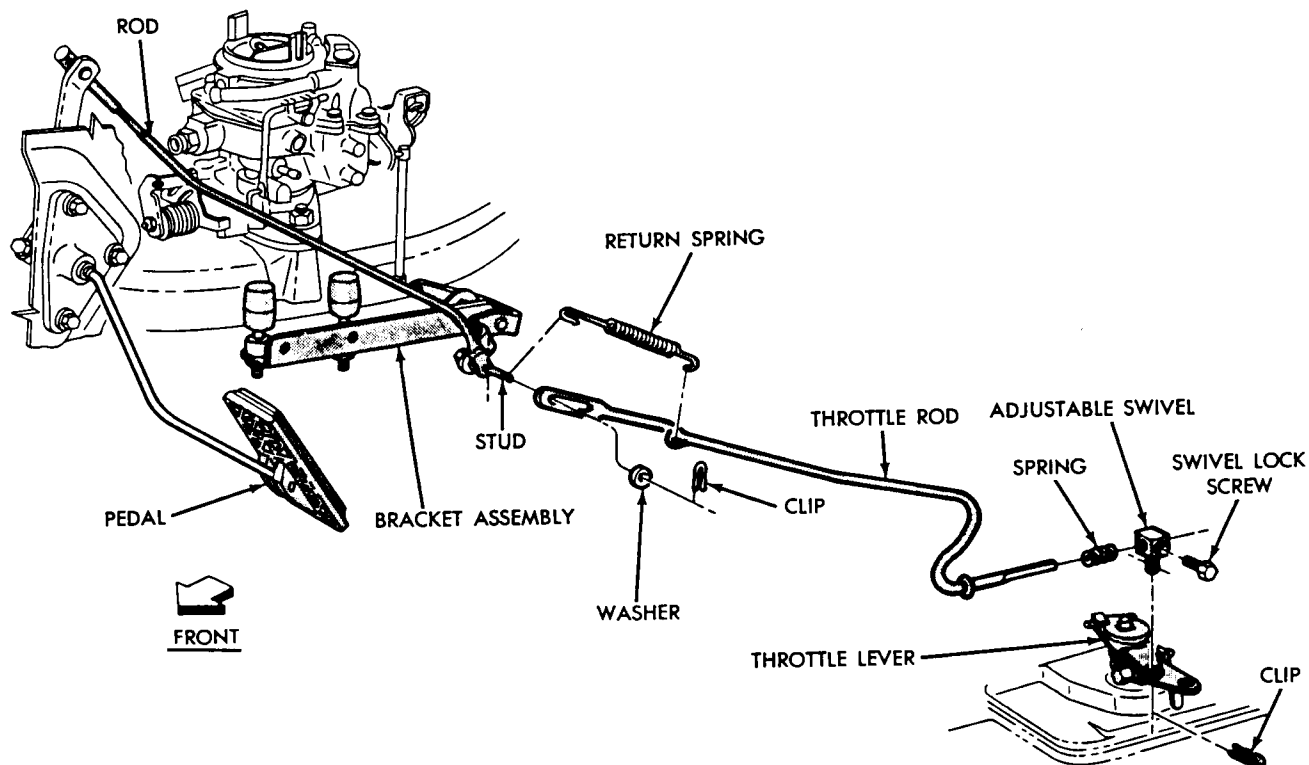
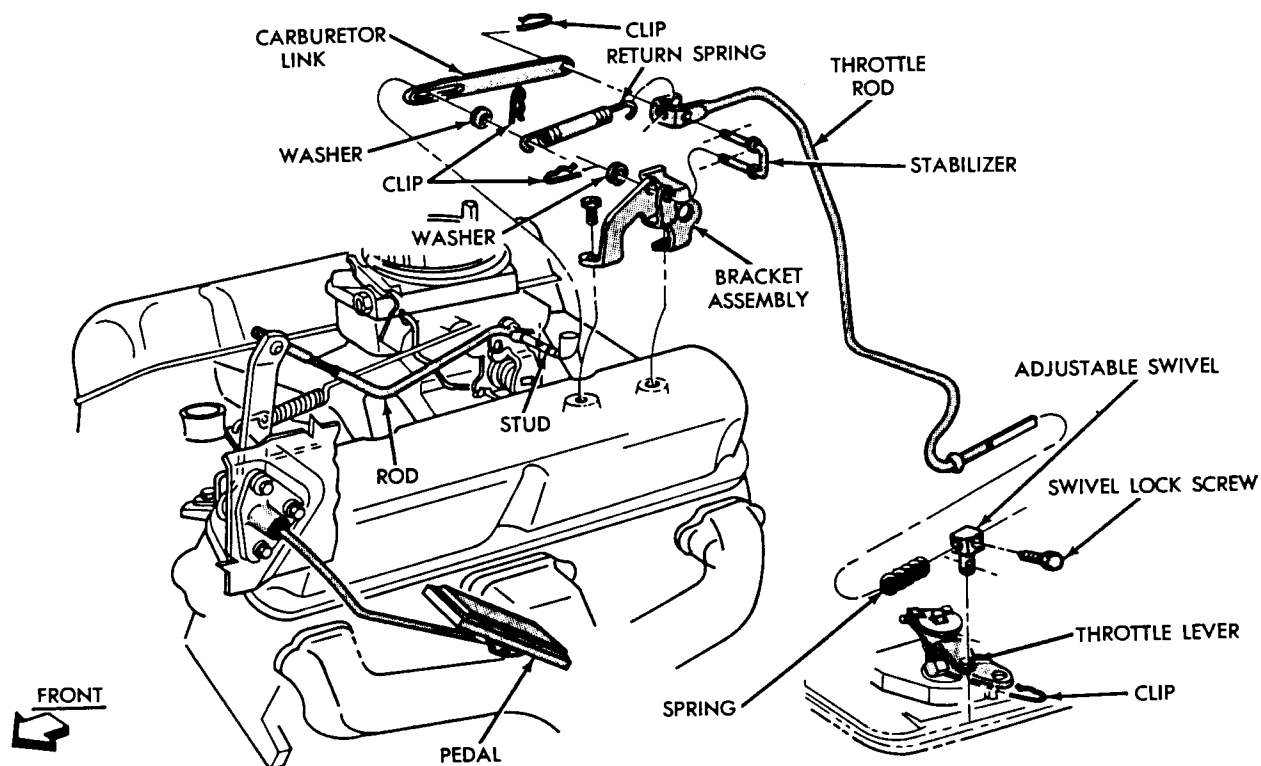


Fig. 1—Column Gearshift Linkage Adjustment



PU488

Fig. 2—Throttle Rod Adjustment (6 Cylinder Models)



PU490

Fig. 3—Throttle Rod Adjustment (8 Cylinder Models)

swivel lock bolt loose, move the shift lever on transmission all the way to the rear detent position (park).

(4) Tighten adjustment swivel lock screw to 90 in. lbs. (10 N·m).

(5) Check adjustment as follows:

(a) Detent position for neutral and drive should be within limits of hand lever gate stops.

(b) Key start must occur only when shift lever is in "park" or "neutral" positions.

THROTTLE ROD ADJUSTMENT

With engine at operating temperature and carburetor off fast idle cam, adjust idle speed of engine using a tachometer. Refer to "Fuel System" Group 14, for idle speed Specifications and carburetor linkage adjustment.

Adjustment Procedure—All (Figs. 2 or 3)

(1) Perform transmission throttle rod adjustment while engine is at normal operating temperature, otherwise make sure carburetor is not on fast idle cam.

(2) Raise vehicle on hoist to make adjustment at transmission throttle lever.

(3) Loosen adjustment swivel lock screw.

(4) To insure proper adjustment, swivel must be free to slide along flat end of throttle rod so that preload spring action is not restricted. Disassemble and clean or repair parts to assure free action, if necessary.

(5) Hold transmission lever firmly forward against its internal stop and tighten swivel lock screw to 100 in. lbs. (11 N·m).

(6) The adjustment is finished and linkage backlash was automatically removed by the preload spring.

(7) If lubrication is required see "Lubrication", Group 0.

(8) Lower vehicle, reconnect choke if disconnected, and test linkage freedom of operation by moving the throttle rod rearward, slowly releasing it to confirm it will return fully forward.

BAND ADJUSTMENTS

Kickdown Band (Front)

The kickdown band adjusting screw is located on left side of the transmission case (Fig. 4).

(1) Loosen lock nut and back off lock nut approximately five turns. Test adjusting screw for free turning in the transmission case.

(2) Using wrench, Tool C-3380-A with adapter C-3705, tighten band adjusting screw 47 to 50 in. lbs. (5 N·m). If adapter C-3705 is not used, tighten adjusting screws to 72 in. lbs. (8 N·m) which is the true torque.

(3) Back off adjusting screw the number of turns

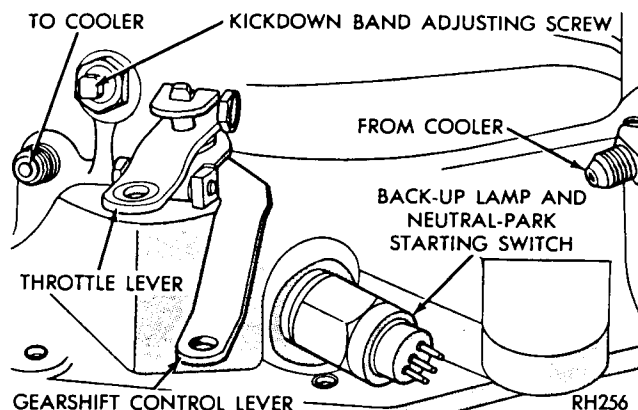


Fig. 4—External Control and Adjustments

listed in "Specifications". Hold adjusting screw in this position and tighten lock nut to 30 ft. lbs. (41 N·m).

Low-Reverse Band (Rear)

(1) Raise vehicle, drain transmission fluid from loosened oil pan and remove oil pan.

(2) Loosen adjusting screw lock nut and back off lock nut approximately five turns (Fig. 5). Test adjusting screw for free turning in the lever.

(3) Using wrench, Tool C-3380-A, tighten band adjusting screw to 72 in. lbs. (8 N·m).

(4) Back off adjusting screw the number of turns listed in "Specifications". Hold adjusting screw in this position and tighten lock nut to 25 ft. lbs. (34 N·m).

(5) Reinstall oil pan using a new gasket. Tighten oil pan bolts to 150 in. lbs. (17 N·m).

(6) Fill transmission with "MOPAR ATF PLUS" (Automatic Transmission Fluid) type 7176.

HYDRAULIC CONTROL PRESSURE ADJUSTMENTS

Line Pressure

An incorrect throttle pressure setting will cause incorrect line pressure readings even though line pressure adjustment is correct. Always inspect and

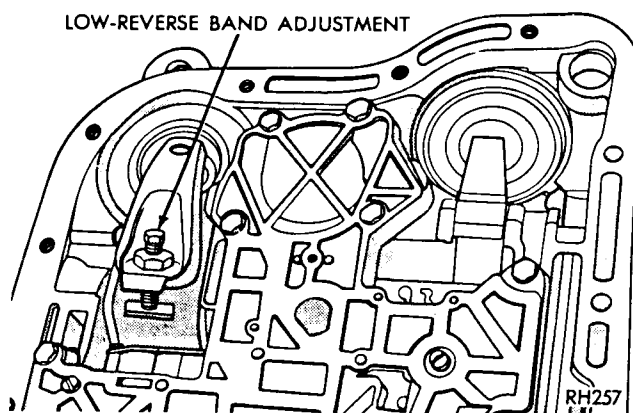


Fig. 5—Low-Reverse Band Adjustment

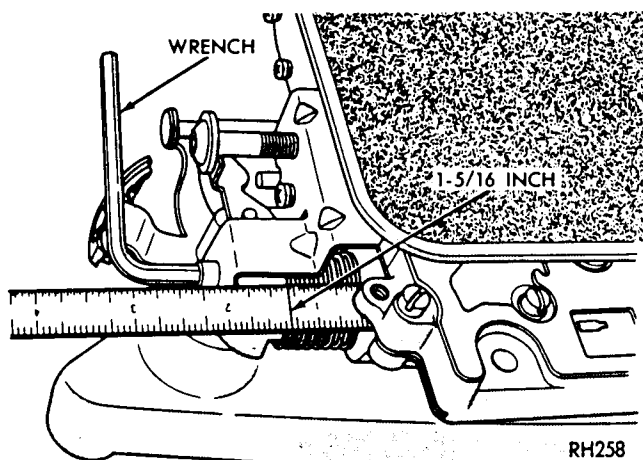


Fig. 6—Line Pressure Adjustment

correct throttle pressure adjustment before adjusting the line pressure.

The approximate adjustment is 1 5/16 inches, measured from valve body to inner edge of adjusting nut (Fig. 6). However, due to manufacturing tolerances, the adjustment can be varied to obtain specified line pressure.

The adjusting screw may be turned with an Allen wrench. One complete turn of adjusting screw changes closed throttle line pressure approximately 1 2/3 psi. Turning adjusting screw counterclockwise increases pressure, and clockwise decreases pressure.

Throttle Pressure

Throttle pressures cannot be tested accurately;

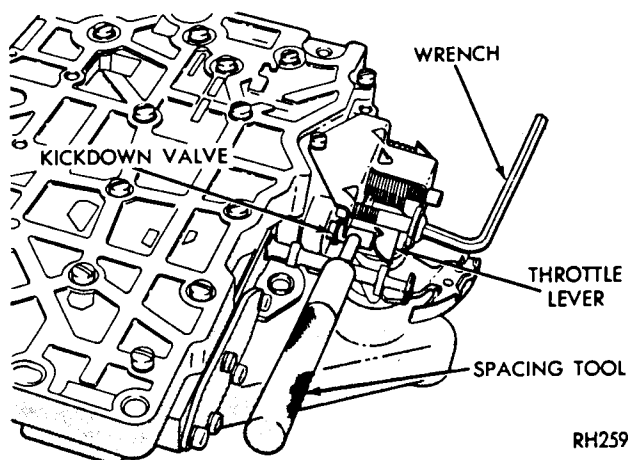


Fig. 7—Throttle Pressure Adjustment

therefore, the adjustment should be measured if a malfunction is evident.

(1) Insert gauge pin of Tool C-3763 between the throttle lever cam and kickdown valve (Fig. 7).

(2) By pushing in on tool, compress kickdown valve against its spring so that throttle valve is completely bottomed inside the valve body.

(3) As force is being exerted to compress spring, turn throttle lever stop screw with allen wrench until head of screw touches the throttle lever tang with throttle lever cam touching tool and the throttle valve bottomed. Be sure adjustment is made with spring fully compressed and valve bottomed in the valve body.

SERVICE IN VEHICLE

Aluminum Thread Repair
Extension Housing Bushing and Output Shaft
Bearing
Extension Housing Yoke Seal
Governor and Parking Gear
Manual Lever Shaft Seal
Neutral Starting and Back-up Lamp Switch

GENERAL INFORMATION

Various transmission components can be removed for repairs without removing the transmission from the vehicle. The removal, reconditioning, and installation procedures for these components are covered here.

SPEEDOMETER PINION GEAR

Any time the speedometer pinion adapter is removed, a NEW "O" ring (black in color) must be

Parking Lock Components
Speedometer Pinion Gear
Valve Body and Accumulator Piston Installation ..
Valve Body and Accumulator Piston Removal
Valve Body Disassembly
Valve Body Reassembly

installed on the outside diameter of the adapter.

Removal and Installation

Rear axle gear ratio and tire size determines pinion gear requirements.

- (1) Place drain pan under speedometer adapter.
- (2) Remove bolt and retainer securing speedometer pinion adapter in the extension housing (Fig. 1).
- (3) With cable housing connected, carefully work adapter and pinion out of the extension housing.
- (4) If transmission fluid is found in cable housing, replace seal in the adapter (Fig. 2). Start seal and

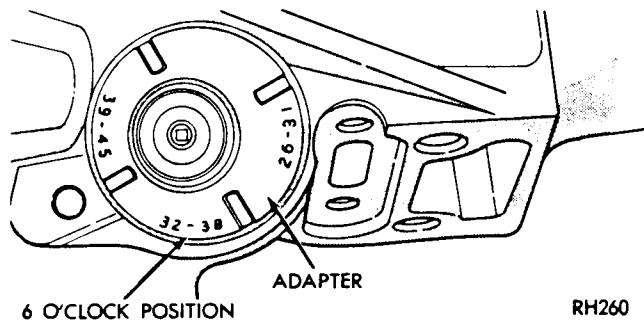


Fig. 1—Speedometer Pinion and Adapter

retainer ring in the adapter, then push them into adapter with Tool C-4004 until tool bottoms (Fig. 3).

Before installing pinion and adapter assembly make sure adapter flange and its mating area on extension housing are perfectly clean. Dirt or sand will cause misalignment resulting in speedometer pinion gear noise.

(5) Note number of gear teeth and install speedometer pinion gear into adapter.

(6) Rotate the speedometer pinion gear and adapter assembly so that the number of teeth on the gear, is in the 6 o'clock position as assembly is installed (Fig. 1).

(7) Install retainer and bolt, with retainer tangs in adapter positioning slots. Tap adapter firmly into the extension housing and tighten retainer bolt to 100 in. lbs. (11 N·m). Refill transmission.

NEUTRAL STARTING AND BACK-UP LAMP SWITCH (Fig. 4)

Replacement and Test

The neutral starting switch is the center terminal of the 3-terminal switch. It provides ground for the starter solenoid circuit through the selector lever in only **Park** and **Neutral** positions.

(1) To test switch, remove wiring connector from switch and test for continuity between center pin of switch and transmission case. Continuity should exist only when transmission is in **Park** or **Neutral**.

(2) Check the gearshift linkage adjustment before replacing a switch that tests bad.

(3) Unscrew switch from transmission case allowing fluid to drain into a container. Move selector lever to

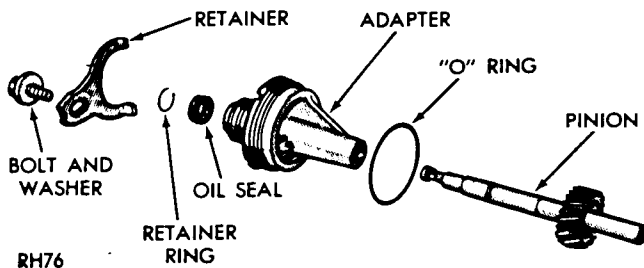


Fig. 2—Speedometer Drive

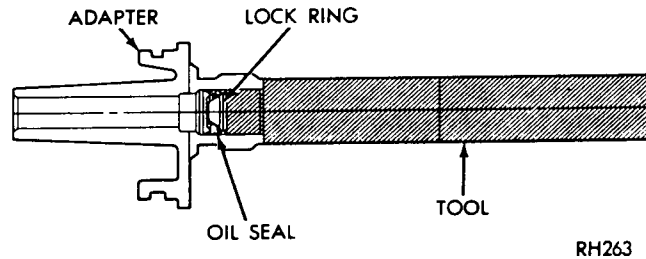


Fig. 3—Installing Speedometer Pinion Seal

Park and then to **Neutral** positions, and inspect to see that the switch operating lever fingers are centered in switch opening in the case.

(4) Screw switch with a new seal into transmission case and tighten to 25 ft. lbs. (34 N·m). Retest switch with the test lamp.

(5) Add fluid to transmission to bring up to proper level.

(6) The back-up lamp switch circuit is through the two outside terminals of the 3-terminal switch.

(7) To test switch, remove wiring connector from switch and test for continuity between the two outside pins.

(8) Continuity should exist only with transmission in **Reverse** position.

(9) No continuity should exist from either pin to the case.

EXTENSION HOUSING YOKE SEAL

Replacement

(1) Mark parts for reassembly then disconnect the propeller shaft at rear universal joint. Carefully pull shaft yoke out of the transmission extension housing.

Be careful not to scratch or nick ground surface on sliding spline yoke during removal and installation of the shaft assembly.

(2) Remove oil seal with Tool C-3985 (Fig. 5).

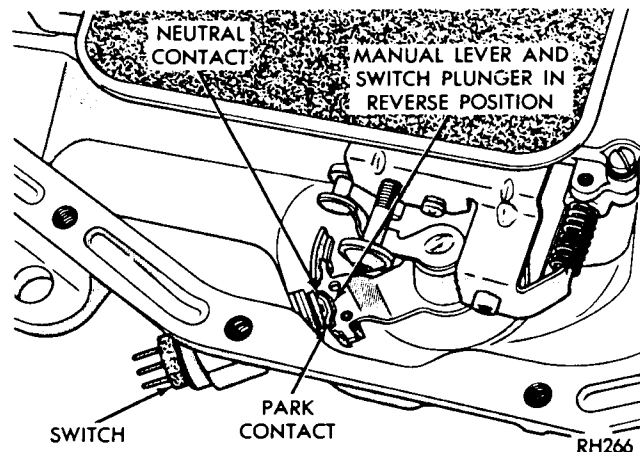


Fig. 4—Start and Back-Up Lamp Switch

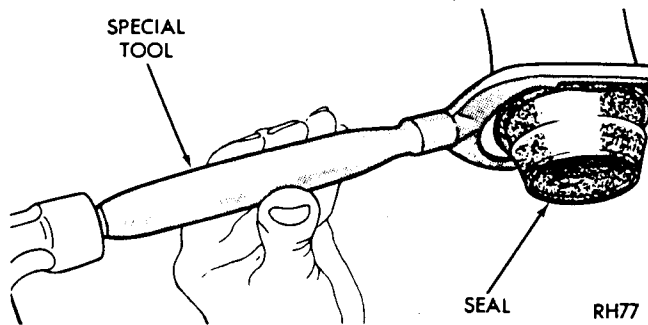


Fig. 5—Remove Extension Housing Yoke Seal

(3) To install a new seal, position seal in opening of extension housing and drive it into the housing with Tool C-3995 or C-3972 (Fig. 6).

(4) Carefully guide front universal joint yoke into extension housing and on the mainshaft splines. Align marks made at removal and connect propeller shaft to rear axle pinion shaft yoke.

EXTENSION HOUSING BUSHING AND OUTPUT SHAFT BEARING

Extension Removal

(1) Mark parts for reassembly then disconnect propeller shaft at rear universal joint. Carefully pull shaft assembly out of the extension housing.

(2) Remove speedometer pinion and adapter assembly (Fig. 1). Drain approximately 2 quarts of fluid from the transmission.

(3) Remove bolts securing extension housing to the crossmember. Raise transmission slightly with service jack, then remove center crossmember and support assembly.

(4) Remove extension housing to transmission bolts. When removing or installing extension housing (step 6), the gearshift lever must be in "1" (low) position. This positions parking lock control rod rearward so it can be disengaged or engaged with the parking lock sprag.

(5) Remove screws, plate, and the gasket from bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing (Fig. 7).

With snap ring spread as far as possible, carefully tap extension housing off output shaft bearing. Carefully pull extension housing rearward, to remove

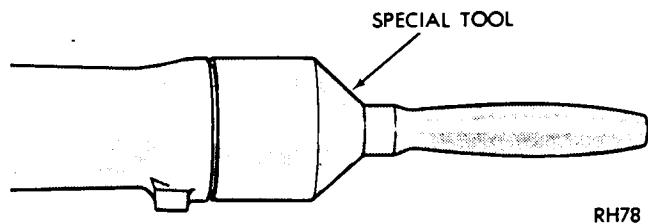


Fig. 6—Install Extension Housing Yoke Seal

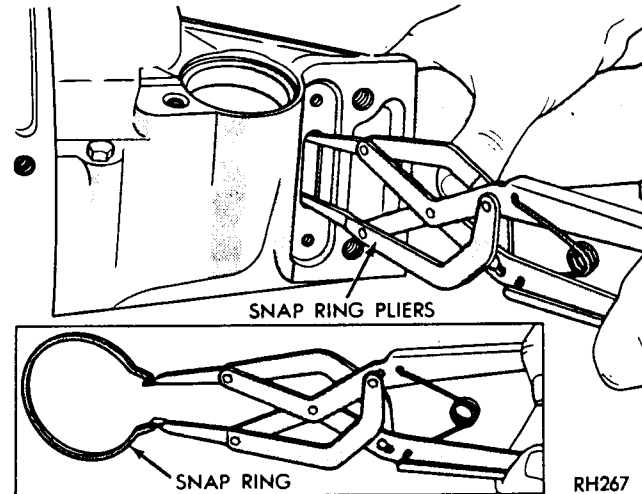


Fig. 7—Remove or Install Extension Housing

parking lock control rod knob past the parking sprag, then remove the housing.

Bearing Replacement

(1) Using heavy-duty snap ring pliers, remove output shaft bearing rear snap ring and remove bearing from the shaft (Fig. 8).

(2) Install a new bearing on shaft with outer race ring groove toward front, then install rear snap ring. A-727 has a snap ring in front of bearing; A-904T and A-999 do not.

Bushing Replacement

(1) Remove oil seal with Tool C-3985 (Fig. 5).

(2) **A-904T and A-999:** Press or drive out bushing with Tool C-3996 (Fig. 9).

A-727: Remove bushing in the same manner with Tool C-3974.

(3) **A-904T and A-999:** Slide a new bushing on installing end of Tool C-3996. Align oil hole in bushing with oil slot in the housing, then press or drive bushing into place (Fig. 9).

A-727: Using Tool C-3974, install a new bushing in same manner.

(4) **A-904T and A-999:** Drive a new oil seal into housing with Tool C-3995 (Fig. 6).

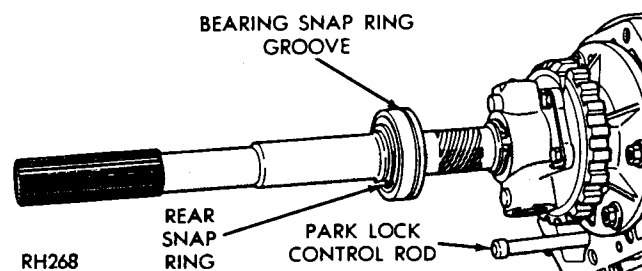


Fig. 8—Output Shaft Bearing

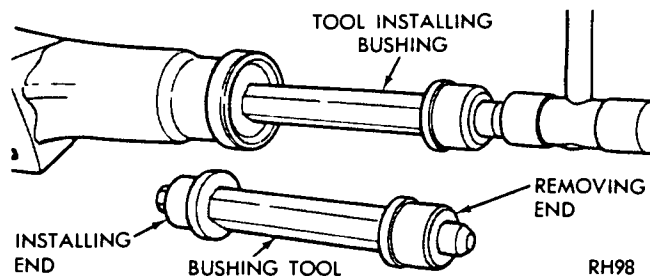


Fig. 9—Replacing Extension Housing Bushing

A-727: Using Tool C-3972, install a new oil seal in same manner.

Extension Installation

(1) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in extension housing. Slide extension housing on output shaft guiding the parking lock control rod knob past the parking sprag. While spreading large snap ring in housing (Fig. 7), carefully tap housing into place, then release the snap ring. Make sure snap ring is fully seated in bearing outer race ring groove.

(2) Install and tighten extension housing bolts to 32 ft. lbs. (43 N·m).

(3) Install gasket, plate and screws on bottom of the extension housing mounting pad.

(4) Install the center crossmember and rear mount assembly, tighten retaining bolts. Lower transmission to install extension housing to support bolts and tighten to 50 ft. lbs. (68 N·m).

(5) Install the speedometer pinion and adapter.

(6) Carefully guide front universal joint yoke into extension housing and on the output shaft splines. Align marks made at removal and connect propeller shaft to rear axle pinion shaft yoke.

(7) Add fluid to transmission to bring up to proper level.

GOVERNOR AND PARKING GEAR

Removal

(1) Remove extension housing and output shaft bearing as previously described.

(2) Carefully pry snap ring from weight end of governor valve shaft (Fig. 10). Slide valve and shaft assembly out of governor body.

(3) Remove large snap ring from weight end of governor body, lift out governor weight assembly.

(4) Remove snap ring from inside governor weight, remove inner weight and spring from the outer weight. Figure 11 shows a disassembled view of the governor assembly.

(5) Remove snap ring from behind governor body, then slide governor and support assembly off the output shaft. Remove the 4 bolts and separate gover-

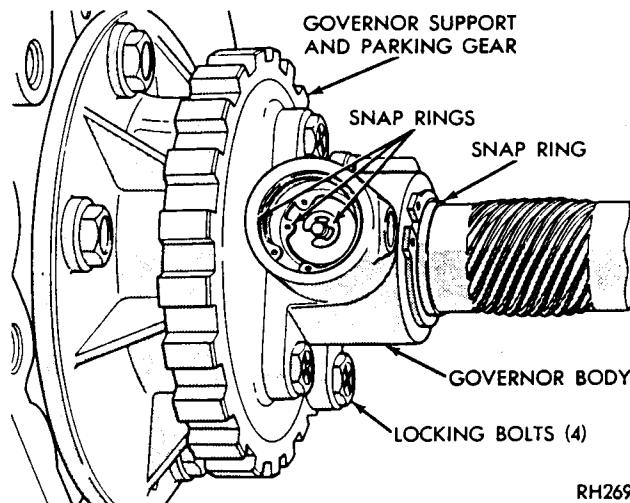


Fig. 10—Governor Snap Rings

nor body and screen from the parking gear.

Cleaning and Inspection

Figure 11 shows a disassembled view of the governor assembly.

Inspect all parts for burrs and wear. Inspect inner weight for free movement in outer weight, and outer weight for free movement in governor body. Inspect valve for free movement in governor body. The weights and valve should fall freely in the bores when clean and dry. Rough surfaces may be removed with crocus cloth. Wash governor screen. Inspect governor seal rings for wear on sides and outside diameter.

Inspect governor weight spring for distortion. Inspect lugs on support gear for broken edges or other damage. Thoroughly clean all governor parts in clean solvent and test for free movement before assembly.

Installation

(1) Assemble the governor body and screen to the support and tighten bolts finger tight. Make sure oil passage of governor body aligns with passage in the support.

(2) Position support and governor assembly on the

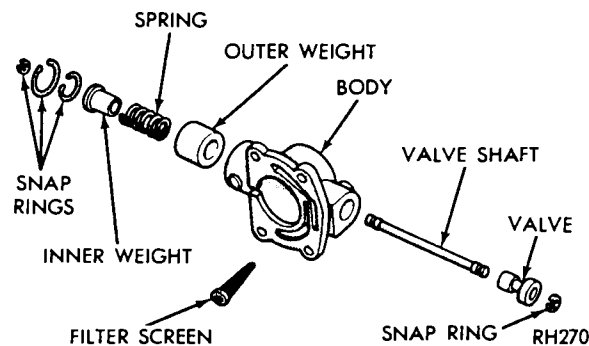


Fig. 11—Governor Assembly

output shaft. Align assembly so valve shaft hole in governor body aligns with hole in the output shaft, then slide assembly into place. Install snap ring behind governor body (Fig. 10). Tighten the body to support bolts to 95 in. lbs. (11 N-m). The support bolts have a self-locking nylon patch and can be re-used.

(3) Assemble governor weights and spring, and secure with snap ring inside of large governor weight. Place weight assembly in governor body and install snap ring.

(4) Place governor valve on the valve shaft, insert assembly into the body and through governor weights. Install valve shaft retaining snap ring. Inspect valve and weight assembly for free movement after installation.

(5) Install output shaft bearing and extension housing as previously described.

PARKING LOCK COMPONENTS

Removal

(1) Remove the extension housing as previously described.

(2) Slide shaft out of extension housing to remove the parking sprag and spring (Fig. 12). Remove snap ring and slide the reaction plug and pin assembly out of the housing.

(3) To replace the parking lock control rod, refer to "Valve Body—Removal and Installation."

Inspection

Inspect sprag shaft for scores and free movement in the housing and sprag. Inspect sprag and control rod springs for distortion and tension. Inspect square lug on sprag for broken edges, also lugs on parking gear for damage. Inspect knob on end of control rod for nicks, burrs, and free turning.

Assembly

(1) Install reaction plug and pin assembly in the housing and secure with snap ring (Fig. 12).

(2) Position sprag and spring in housing and insert the shaft. Make sure square lug on sprag is toward

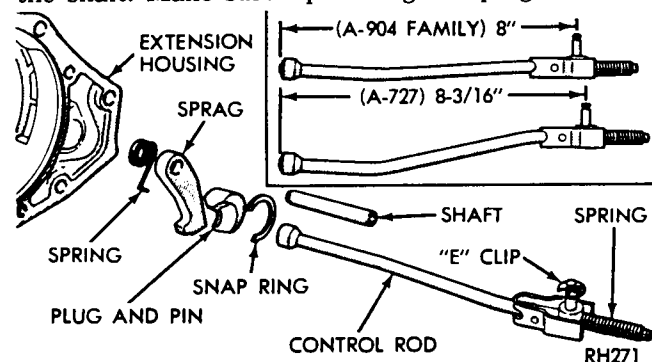


Fig. 12—Parking Lock Components

parking gear, and spring is positioned so it moves sprag away from the gear.

(3) Install extension housing.

VALVE BODY AND ACCUMULATOR PISTON REMOVAL

(1) Raise vehicle on a hoist.

(2) Loosen oil pan bolts, tap the pan to break it loose allowing fluid to drain, then remove oil pan.

(3) Loosen clamp bolts and remove throttle and shift levers from transmission.

(4) Pull wire connector from combination back-up lamp/neutral start switch.

(5) Unscrew and remove switch from transmission case (Fig. 4).

(6) Disconnect electronic lock-up solenoid wire from inside of wiring connector at rear of transmission case, if so equipped.

(7) Place a drain pan under transmission. Remove the 10 hex-head valve body to transmission case bolts. Hold valve body in position while removing the bolts.

(8) While lowering valve body down out of transmission case, pull it forward out of the case. If necessary, rotate propeller shaft to align parking gear and sprag to permit knob on end of parking control rod to pass the sprag.

(9) Remove accumulator piston and spring from transmission case. Inspect piston for nicks, scores, and wear. Inspect spring for distortion. Inspect rings for freedom in piston grooves and wear or breakage. Replace parts as required.

Manual Lever Shaft Seal

(1) If valve body manual lever shaft oil seal requires replacement, drive it out of the case with a punch.

(2) Drive a new seal into the case with a 15/16 inch socket and hammer (Fig. 13).

This seal can be replaced without removing the valve body from transmission by using a small screwdriver to pry seal out of its bore. Be careful not to scratch manual lever shaft or the seal bore in transmission.

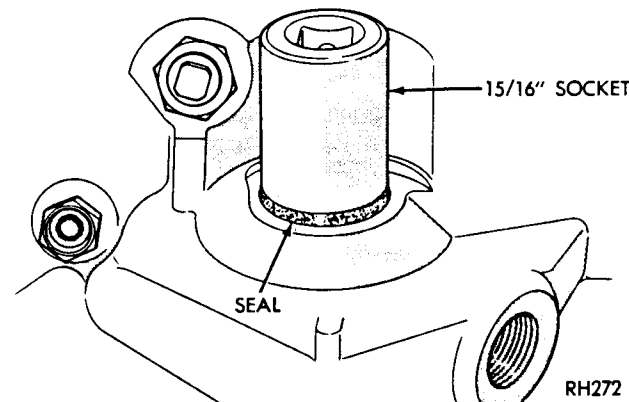


Fig. 13—Installing Manual Lever Shaft Oil Seal

VALVE BODY DISASSEMBLY

Tag all springs as they are removed for reassembly identification.

Do not clamp any portion of valve body or transfer plate in a vise. Any slight distortion of the aluminum body or transfer plate will result in sticking valves, excessive leakage or both. **When removing or installing valves or plugs, slide them in or out carefully. Do not use force.**

Remove "E" clip and park control rod from manual lever.

Filter, Transfer Plate, and Pressure Regulators

(1) Place valve body assembly on repair stand Tool C-3749 (Fig. 1). Remove 3 screws from fluid filter and lift off the filter.

(2) Remove top and bottom screws from spring retainer and adjustment screw bracket.

(3) Hold spring retainer firmly against spring force while removing last retaining screw from side of valve body.

(4) Remove spring retainer, with line and throttle pressure adjusting screws (do not disturb setting) and the line pressure and switch valve regulator springs.

(5) Slide switch valve and regulator valve out of their bores.

(6) Remove screws from lock-up module (or stiffener plate) and carefully remove tube and lock-up module (or stiffener plate). Disassemble lock-up module, tagging springs. **Non lock-up A-904T, for California models, use an empty lock-up body instead of a stiffener plate.**

(7) Remove transfer plate retaining screws and lift off transfer plate and separator plate assembly.

(8) Remove lock-up solenoid retaining screw and

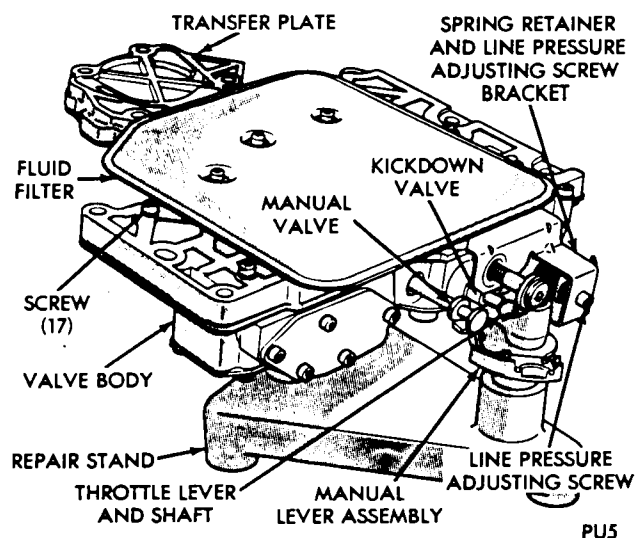


Fig. 1—Valve Body Assembly

pull solenoid from its bore in transfer plate, if so equipped.

(9) Remove 3 screws from separator plate and separate parts for cleaning (Fig. 4).

(10) Remove rear clutch ball check, reverse servo ball check, and line pressure regulator valve screen from separator plate for cleaning (Fig. 4).

(11) Remove the 7 balls from valve body as shown in Figure 5.

LOCK-UP MODULE (Fig. 3)

(1) Remove end cover.

(2) Remove lock-up spring and valve.

(3) Remove fail-safe valve and spring.

Tag springs as they are removed, for reassembly identification.

Shuttle Valve and Governor Plugs (Fig. 6)

(1) Turn valve body over and remove shuttle valve cover plate.

(2) Remove governor plug end plate (Fig. 6) and slide out the shuttle valve throttle plug and spring, the 1-2 shift valve governor plug and the 2-3 shift valve governor plug.

(3) Remove shuttle valve "E" clip and slide shuttle valve out of its bore. Also, remove the secondary spring and guides which were retained by "E" clip.

Manual Lever and Throttle Lever

(1) Remove "E" clip and washer from throttle lever shaft (Fig. 2). Remove any burrs from shaft, then while holding manual lever detent ball and spring in their bore with Tool C-3765 or similar tool, slide manual lever off the throttle shaft. Remove the detent ball and spring.

(2) Slide manual valve out of its bore.

(3) Slide out the kickdown detent sleeve, kickdown valve, throttle valve spring, and the throttle valve.

Shift Valves and Regulator Valve Pressure Sensing Plugs.

(1) Remove the line pressure regulator valve end plate (Fig. 7) and slide out the regulator valve sleeve, line pressure plug, throttle pressure plug, and spring.

(2) Remove end plate and limit valve housing assembly.

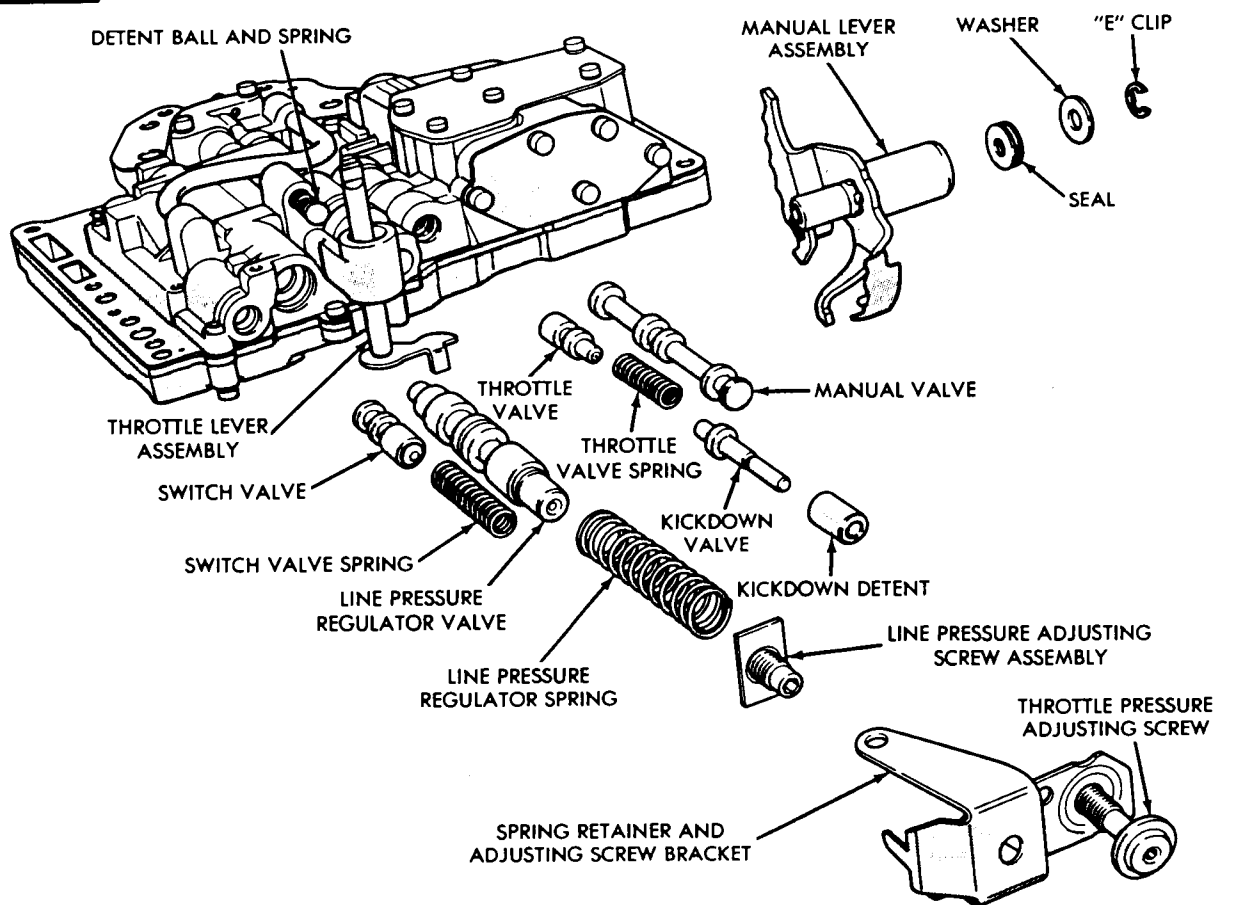
(3) Remove throttle plug from housing.

(4) Slide retainer from housing and remove limit valve and spring.

(5) Remove the 3 springs and shift valves from the valve body.

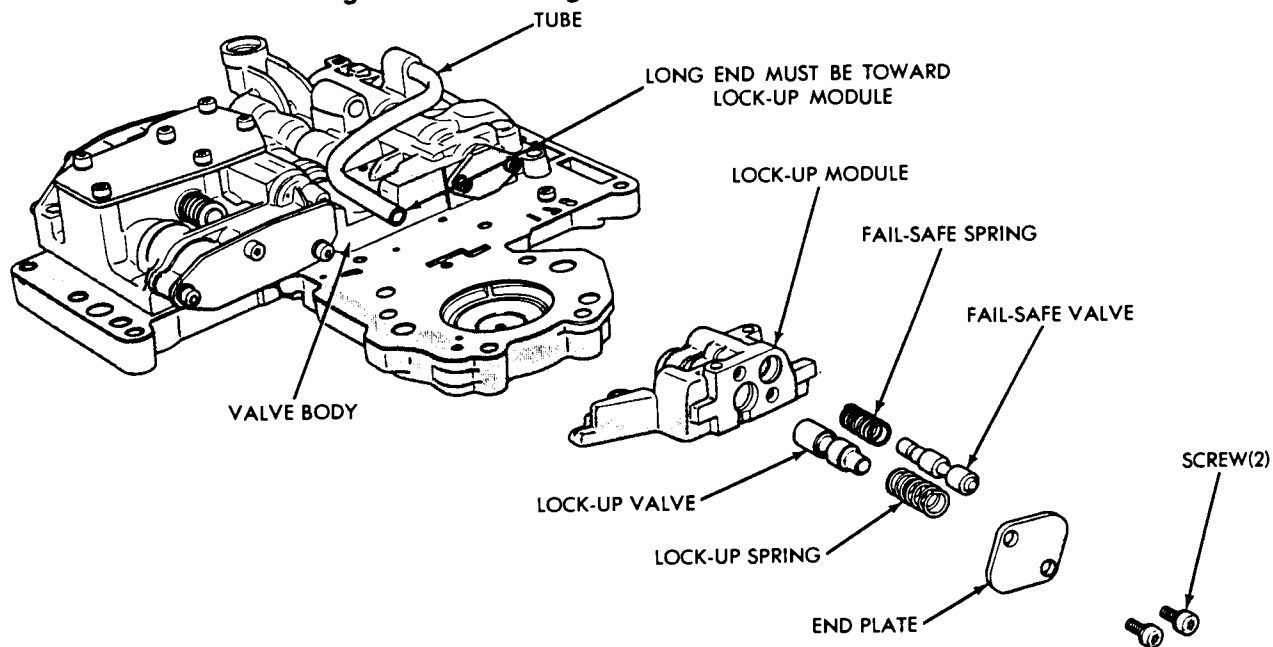
Cleaning and Inspection

Allow all parts to soak a few minutes in a suitable clean solvent. Wash thoroughly and blow dry with compressed air. Make sure all passages are clean and free from obstructions.



PU8A

Fig. 2—Pressure Regulators and Manual Control



PU9B

Fig. 3—Lock-Up Module

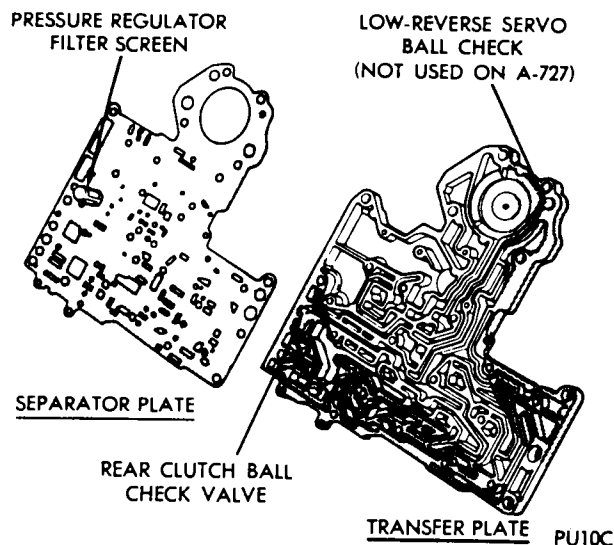


Fig. 4—Transfer Plate and Separator Plate

Inspect manual and throttle valve operating levers and shafts for being bent, worn or loose. If a lever is loose on its shaft, the lever and shaft assembly should be replaced. **Do not attempt to straighten bent levers.**

Inspect lock-up solenoid assembly for cut or broken wire, melted or distorted coil, cut or nicked O-ring, etc. Shake solenoid to verify that plunger is free to travel. Replace solenoid if plunger is stuck. Check orifice in solenoid nozzle and drilled crosshole at solenoid bore in transfer plate for dirt or foreign material. To check solenoid operation, hold solenoid with nozzle pointing up and apply 12 volts between solenoid wire and solenoid frame at screw hole. Plunger should travel up and down when 12 volts power is turned on and off.

Inspect all mating surfaces for burrs, nicks and

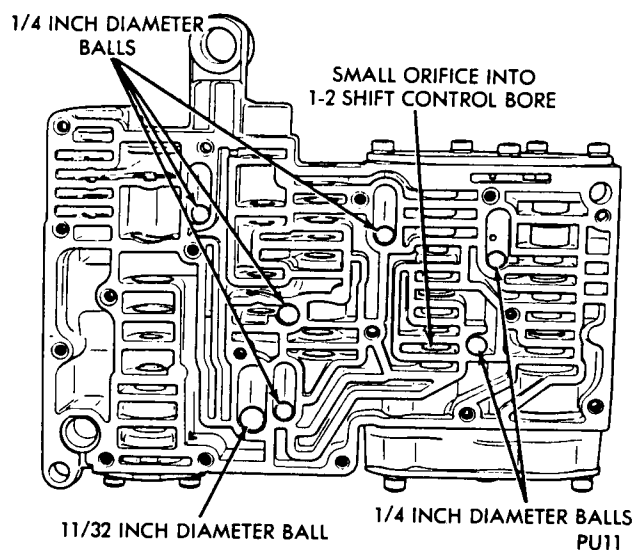


Fig. 5—Steel Ball Locations

scratches. Minor blemishes may be removed with crocus cloth, using only a very light pressure. Using a straightedge, inspect all mating surfaces for warpage or distortion. Slight distortion may be corrected, using a surface plate. Make sure all metering holes in steel plate and valve body are open. Using a pen light, inspect bores in valve body for scores, scratches, pits and irregularities.

Make sure orifice referred to in (Fig. 6) is open by inserting a 1/32 inch diameter drill through it into the 1-2 shift control valve bore.

Inspect all valve springs for distortion and collapsed coils. Inspect all valves and plugs for burrs, nicks, and scores. Small nicks and scores may be removed with crocus cloth, providing extreme care is taken not to round off sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between valve and valve body, reducing the possibility of sticking. Inspect all valves and plugs for freedom of operation in valve body bores.

When bores, valves, and plugs are clean and dry, the valves and plugs should fall freely in the bores. The valve body bores do not change dimensionally with use. Therefore, a valve body assembly that was functioning properly when vehicle was new, will operate correctly if properly and thoroughly cleaned. There is no need to replace valve body assembly unless it is damaged in handling.

VALVE BODY REASSEMBLY (Tighten all valve body screws to 35 inch-pounds) (4 Newton-meters)

Shift Valves and Regulator Valve Pressure Sensing Plugs (Fig. 7)

(1) Slide shift valves and springs into proper valve body bores.

(2) Subassemble the 3-2 limit valve housing assembly as follows:

- Insert limit valve and spring into housing.
- Slide spring retainer into groove in housing.
- Insert throttle plug in housing bore. Position assembly against the shift valve springs.

Omit Step (2) when no 3-2 limit valve housing assembly is used.

(3) Install end plate and tighten screws.

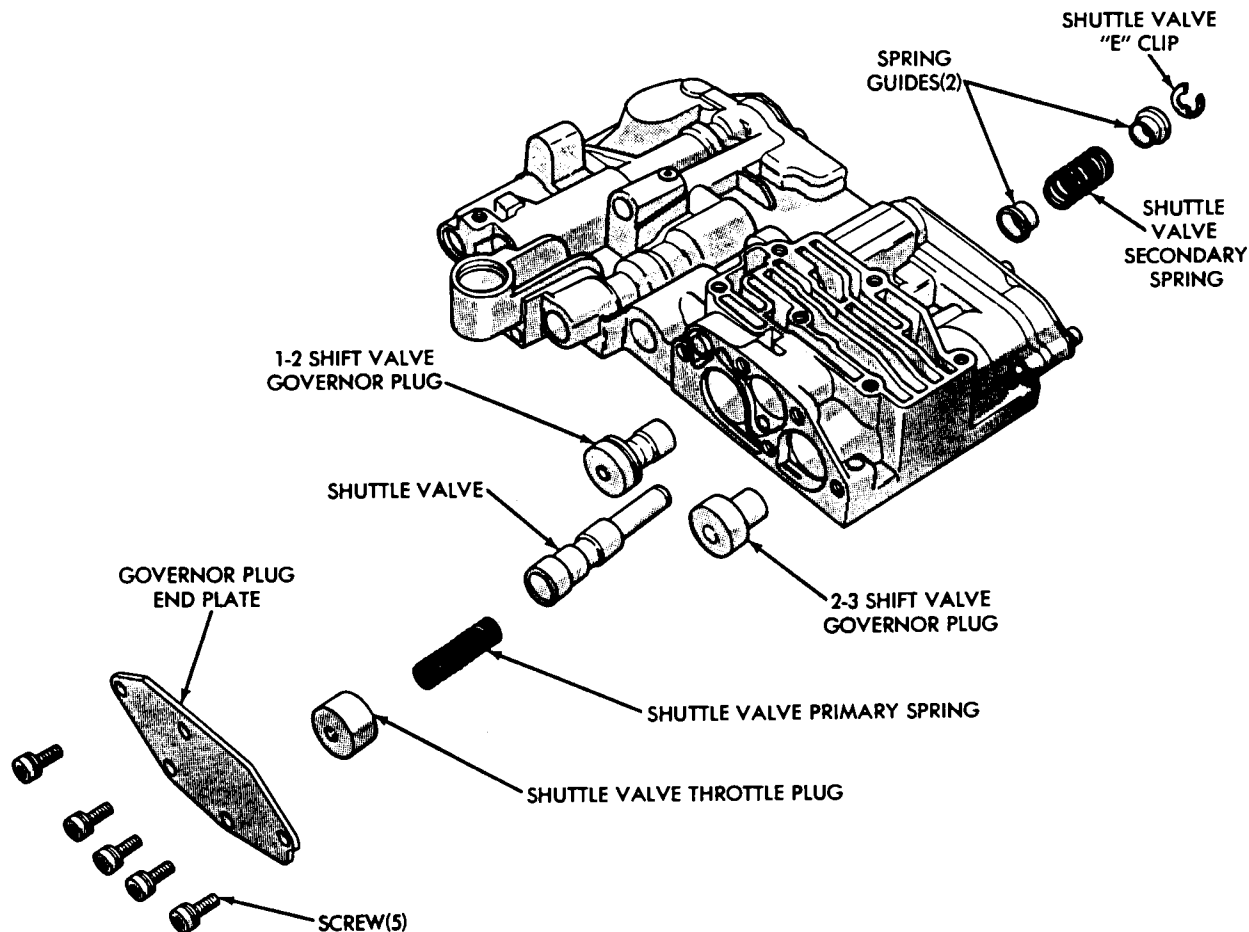
(4) Install throttle pressure spring and plug, line pressure plug and sleeve, then fasten end plate to valve body.

Shuttle Valve and Governor Plugs (Fig. 6)

(1) Place 1-2 and 2-3 shift valve governor plugs in their respective bores.

(2) Install shuttle valve and hold it in the bore with index finger while installing the secondary spring with guides and retaining "E" clip.

(3) Install primary shuttle valve spring and throttle



PU12

Fig. 6—Shuttle Valve and Governor Plugs

plug.

(4) Install governor plug end plate and tighten the retaining screws.

(5) Install shuttle valve cover plate and tighten the retaining screws.

Manual Lever and Throttle Lever (Fig. 2)

(1) Install throttle valve, throttle valve spring, kick-down valve, and kickdown detent sleeve.

(2) Slide manual valve into its bore.

(3) Install throttle lever and shaft on valve body. Insert detent spring and ball in its bore in valve body. Depress ball and spring with Tool C-3765 (Fig. 8) or similar tool and slide manual lever over throttle shaft so that it engages manual valve and detent ball. Install seal, retaining washer, and E-clip on throttle shaft.

Filter, Transfer Plate, Lock-up Solenoid, and Pressure Regulators

(1) Install the 7 balls in valve body as shown in Figure 5.

(2) Install rear clutch ball check and low-reverse

servo ball check (Fig. 4) in transfer plate and regulator valve screen in separator plate (Fig. 4).

The low-reverse servo ball check is used ONLY with A-904T and A-999 transmissions.

(3) Install 3 screws in separator plate.

(4) Place transfer plate assembly on valve body. Be careful to align filter screen as the 17 shorter screws are installed finger tight (3 longer screws are for oil filter).

(5) Starting at the center and working outward, tighten screws to 35 in. lbs. (4 N.m).

(6) Slide switch valve and line pressure valves and springs into their bores (Fig. 2).

(7) Install pressure adjusting screw and bracket assembly on the springs and fasten with 1 screw for now. Use screw which goes into side of valve body. This screw is to be tightened first, after starting the top and bottom screws.

(8) Install oil filter and tighten screws to 35 in. lbs. (4 N.m).

(9) Install lock-up valve and spring, then install fail-safe spring and valve into lock-up module (Fig. 3). Install lock-up module to transfer and separator plate

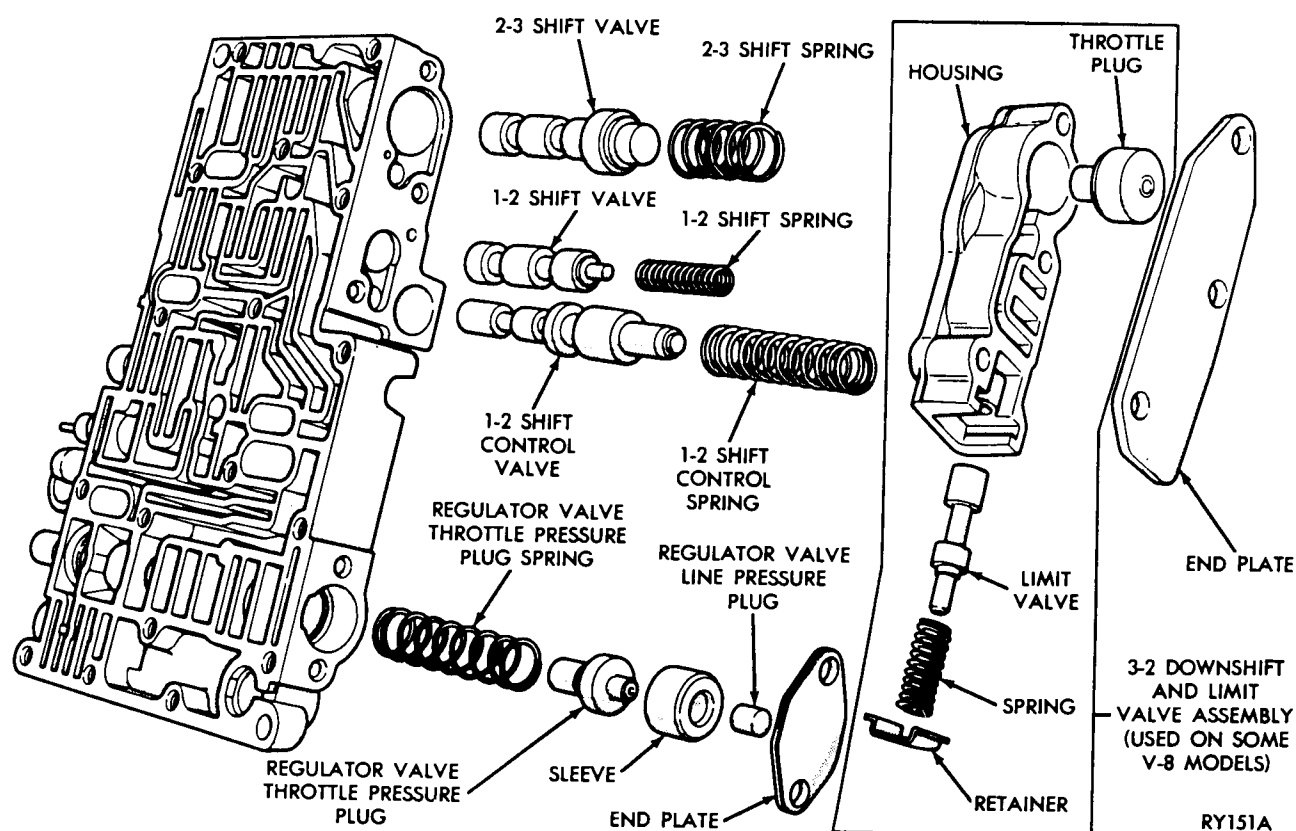


Fig. 7—Shift Valve and Pressure Regulator Valve Plugs

assembly with 3 screws. (Install stiffener plate on non lock-up valve body).

(10) Insert lock-up solenoid nozzle (with O-ring) into bore in transfer plate and install retaining screw. Route lock-up solenoid wire between solenoid and limit valve housing cover, and underneath edge of oil filter. **Correct wire routing is VERY IMPORTANT.** The wire must be routed away from the low-reverse band lever.

(11) After valve body has been serviced and completely assembled, measure throttle and line pressure adjustments (see "Maintenance and Adjustments"). However, if pressures were satisfactory prior to disassembly, use original settings.

(12) Install parking lock rod and "E" clip retainer to manual lever.

VALVE BODY AND ACCUMULATOR PISTON INSTALLATION

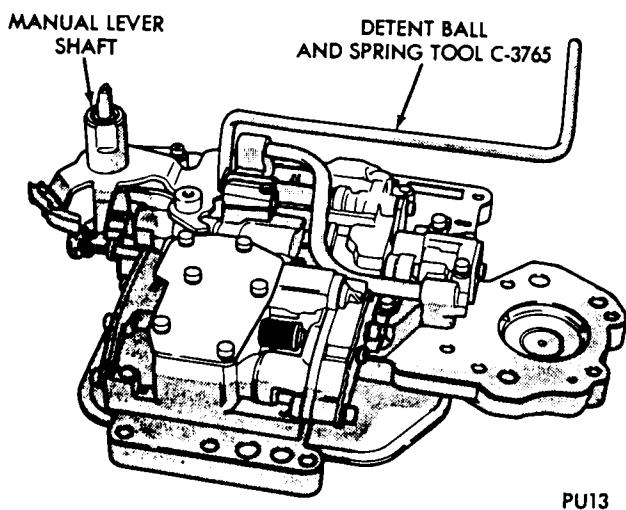


Fig. 8—Installing Detent Ball and Spring

(1) Make sure combination back-up lamp/neutral start switch is **not** installed in transmission case.

(2) Place valve body manual lever in "1" position to move parking rod to rear position.

(3) Use a screwdriver to push the parking sprag into engagement with parking gear, turning output shaft to verify engagement. This will allow "knob" on end of parking rod to move past the sprag as valve body is installed.

(4) Install accumulator piston in the transmission case.

(5) Position accumulator spring between piston and valve body.

(6) Place valve body in position, working park rod through opening and past sprag. Install retaining bolts finger tight.

(7) With neutral starting switch installed, place



Technical Service Information

manual lever in the neutral position. Shift valve body if necessary, to center neutral finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 105 in. lbs. (12 N·m).

(8) Connect lock-up solenoid wire to wiring connector pin at rear of transmission case.

(9) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and realign.

(10) Make sure throttle shaft seal is in place, then install flat washer and throttle lever and tighten the clamp bolt. Connect throttle and gearshift linkage and adjust as required.

(11) Install oil pan, with a new gasket. Add transmission fluid to bring it up to proper level.

ALUMINUM THREAD REPAIR

Damaged or worn threads in the aluminum transmission case and valve body can be repaired by the use of Heli-Coils, or equivalent. Essentially, this repair consists of drilling out the worn or damaged threads, tapping the hole with a special Heli-Coil, or equivalent tap, and installing a Heli-Coil, or equivalent insert into the tapped hole. This brings the hole back to its original thread size.

Heli-Coil, or equivalent, tools and inserts are readily available from most automotive parts suppliers.

SERVICE OUT OF VEHICLE

Assembly—Subassembly Installation
Disassembly—Subassembly Removal
Installation—Transmission, Torque Converter,
and Drive Plate
Pump Oil Seal
Recondition Subassemblies
Front Clutch—A-904T/A-999

Kickdown Servo and Band
Low-Reverse Servo and Band
Oil Pump and Reaction Shaft Support—
A-904T/A-999

Overrunning Clutch
Planetary Gear train—A-904T/A-999

Rear Clutch—A-904T/A-999

Removal—Transmission and Torque Converter ..
Special Service Tools
Specifications
Starter Ring Gear—Replace
Tightening Reference

TRANSMISSION AND TORQUE CONVERTER REMOVAL

(1) The transmission and torque converter must be removed as an assembly; otherwise, the torque converter drive plate, pump bushing, or oil seal may be damaged. The drive plate will not support a load; therefore, none of the weight of the transmission should be allowed to rest on the plate during removal.

(2) Disconnect the negative (ground) cable from the battery for safety.

(3) Some models require that the exhaust system be dropped for clearance, (see Group 11).

(4) Remove engine to transmission struts, if so equipped.

(5) Remove cooler lines at Transmission.

(6) Remove starter motor and cooler line bracket.

(7) Remove torque converter access cover.

(8) Loosen oil pan bolts and tap the pan to break it loose allowing fluid to drain.

(9) Reinstall pan.

(10) Mark torque converter and drive plate to aid in reassembly. The crankshaft flange bolt circle, inner and outer circle of holes in the drive plate, and the 4 tapped holes in front face of the torque converter all have one hole offset so these parts will be installed in

the original position. This maintains balance of the engine and torque converter.

(11) Rotate engine clockwise with socket wrench on vibration dampener bolt to position the bolts attaching torque converter to drive plate, and remove bolts.

(12) Mark parts for reassembly then disconnect propeller shaft at rear universal joint. Carefully pull shaft assembly out of the extension housing.

(13) Disconnect wire from the back-up lamp and neutral starting switch, and lock-up solenoid wiring connector, if so equipped.

(14) Disconnect gearshift rod and torque shaft assembly from transmission.

When it is necessary to disassemble linkage rods from levers that use plastic grommets as retainers, the grommets should be replaced with new ones. Use a prying tool to force rod from grommet in lever, then cut away old grommet. Use pliers to snap new grommet into lever and rod into grommet.

(15) Disconnect throttle rod from lever at the left side of transmission. Remove linkage bellcrank from transmission if so equipped.

(16) Remove oil filler tube and speedometer cable.

(17) Install engine support fixture Tool C-3487-A with frame hooks or a suitable substitute, that will support rear of the engine (Fig. 1).

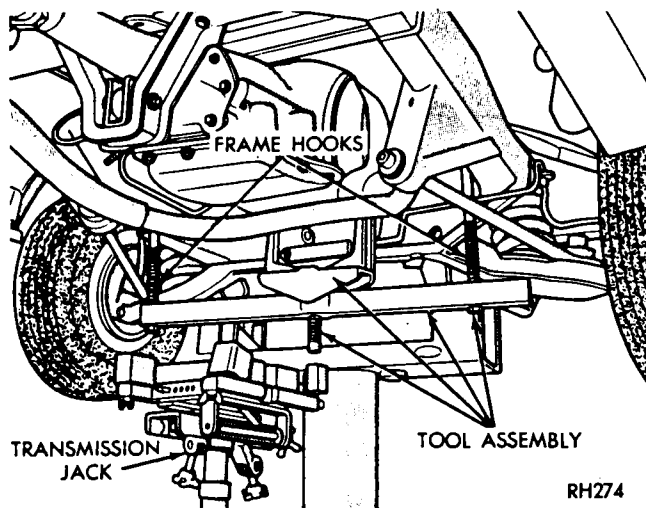


Fig. 1—Engine Support Fixture (Typical)

(18) Raise transmission slightly with service jack to relieve load on the supports.

(19) Remove bolts securing transmission mount to crossmember and crossmember to frame, then remove crossmember.

(20) Remove all bell housing bolts.

(21) Carefully work transmission and torque converter assembly rearward off the engine block dowels and disengage torque converter hub from end of crankshaft. **Attach a small "C" clamp to edge of bell housing to hold torque converter in place during transmission removal.**

(22) Lower transmission and remove assembly from under the vehicle.

(23) To remove torque converter, remove "C" clamp from edge of bell housing, then carefully slide torque converter out of the transmission.

STARTER RING GEAR REPLACEMENT

NOTE 1: All lock-up torque converters, with starter ring gears that require replacement, **should be replaced** with a torque converter assembly. This is to prevent lock-up friction material damage while welding new ring gear in place.

NOTE 2: All non lock-up torque converters, with starter ring gears that require replacement can have the gear changed as per instructions below.

The starter ring gear is mounted directly on outer diameter of the torque converter front cover. With torque converter removed from vehicle, replacement of the gear is as follows:

Removal

(1) Cut through weld material at rear side of ring gear with a hack saw or grinding wheel (Fig. 2). Be careful not to cut or grind into front cover stamping.

(2) Scribe a heavy line on front cover next to front face of ring gear to aid in locating the new gear.

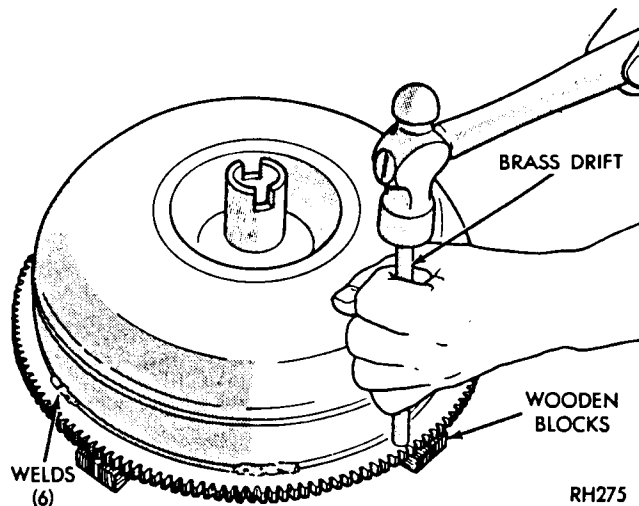


Fig. 2—Removing Starter Ring Gear (Non Lock-Up Only)

(3) Support torque converter on front cover, adjacent to the lugs with blocks of wood to prevent altering lug position. The torque converter must **not** rest on the front cover hub during this operation. Using a blunt chisel or drift and a hammer, tap downward on ring gear near welded areas to break any remaining weld material (Fig. 2). Tap around ring gear until it comes off the torque converter.

(4) Smooth off weld areas on the cover with a file.

Installation

Any of the following methods may be used to heat and expand starter ring gear for installation on the torque converter:

Oven: Place ring gear in Oven and set temperature at 200 degrees F. (93 degress Celsius). Allow ring gear to remain in oven for 15 to 20 minutes.

Boiling Water: Place ring gear in a shallow container, add water, and heat for approximately eight minutes after water has come to a boil.

Steam: Place ring gear on a flat surface and direct a steam flow around gear for approximately 2 minutes.

Flame: Place ring gear squarely on a flat surface. Using a medium size tip, direct a slow flame evenly around inner rim of the gear. **Do not apply flame to the gear teeth.** Place a few drops of water on face of gear at intervals during heating process. When gear is hot enough to just boil the water, installation of gear on the torque converter can be made.

(1) After ring gear is expanded by heating, place the gear in position on torque converter front cover. Tap gear on the cover evenly with a plastic or rawhide mallet until face of gear is even with scribe line (made during removal) on the front cover. **Make sure gear is even with scribed line around full circumference of the front cover.**

(2) Reweld ring gear to torque converter front cover, being careful to place, as nearly as possible, same amount of weld material in exactly same location as was used in original weld. This is necessary in order to maintain proper balance of the unit. Place welds alternately on opposite sides of torque converter to minimize distortion.

(3) The following suggestions are offered as an aid in making the weld:

(a) **Do not gas weld.**

(b) Use a D.C. welder that is set at straight polarity or an A.C. welder if the proper electrode is available.

(c) Use a 1/8 inch diameter welding rod, and a welding current of 80 to 125 amps.

(d) Direct the arc at intersection of the gear and front cover from an angle of 45 degrees from rear face of the gear.

(4) Inspect gear teeth and remove all nicks where metal is raised, weld metal splatter, etc., in order to ensure quiet starter operation.

OIL COOLER AND TUBES FLUSHING (See "Diagnosis and Tests")

PUMP OIL SEAL

Replacement

The pump oil seal can be replaced without removing pump and reaction shaft support assembly from the transmission case.

(1) **A-904T and A-999:** Screw seal remover Tool C-3981 into seal (Fig. 3), then tighten screw portion of tool to withdraw the seal.

A-727: Using Tool C-3861, remove seal in the same manner.

(2) **A-904T and A-999:** To install a new seal, place seal in opening of the pump housing (lip side facing inward). Using Tool C-4193 and Handle Tool C-4171, drive seal into housing until tool bottoms (Fig. 4).

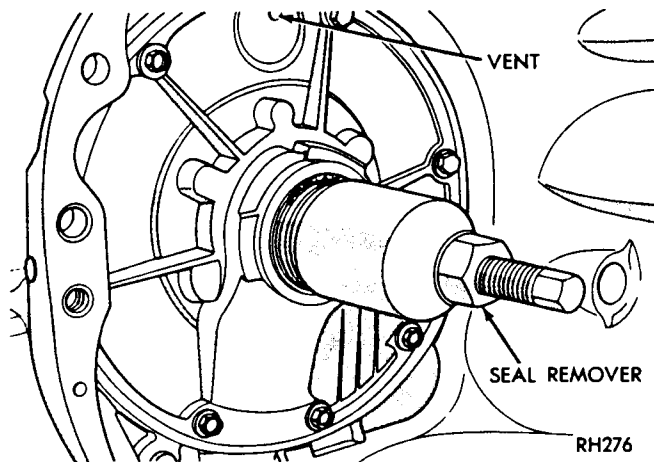


Fig. 3—Remove Pump Oil Seal

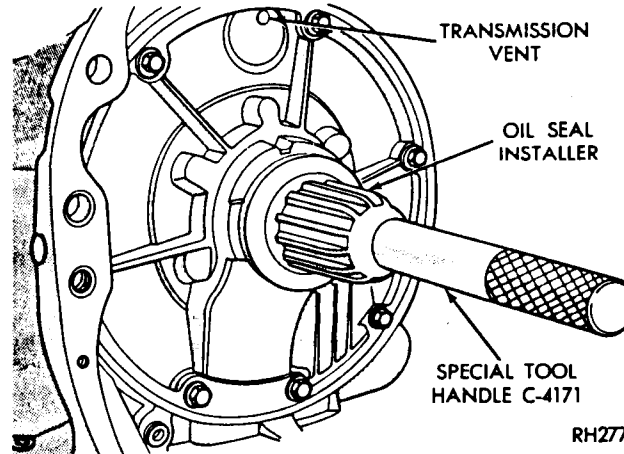


Fig. 4—Install Pump Oil Seal

A-727: Using Tool C-3860-A and Handle Tool C-4171, install new seal in the same manner.

DISASSEMBLY—SUBASSEMBLY REMOVAL

Prior to removing any transmission subassemblies, plug all openings and thoroughly clean exterior of the unit, preferably by steam. Cleanliness through entire disassembly and assembly cannot be overemphasized. When disassembling, each part should be washed in a suitable solvent, then dried by compressed air. **Do not wipe parts with shop towels.** All mating surfaces in the transmission are accurately machined; therefore, careful handling of parts must be exercised to avoid nicks or burrs.

Input Shaft End Play

Measuring input shaft end play before disassembly will usually indicate when a thrust washer change is required, (except when major parts are replaced). The thrust washer is located between reaction shaft support and front clutch retainer on A-727 transmissions. The thrust washer is located between input and output shafts on A-904T and A-999 transmissions.

(1) Attach a dial indicator to transmission bell housing with its plunger seated against end of input shaft (Fig. 5).

(2) Move input shaft in and out to obtain end play reading. End play specifications are .022 to .091 inch for A-904T and A-999 transmission, and .034 to .084 inch for A-727 transmissions.

(3) Record indicator reading for reference when reassembling the transmission.

Oil Pan

(1) Place transmission assembly in repair stand, Tool C-3750-A (Fig. 6).

(2) Unscrew oil pan bolts and remove oil pan and gasket.

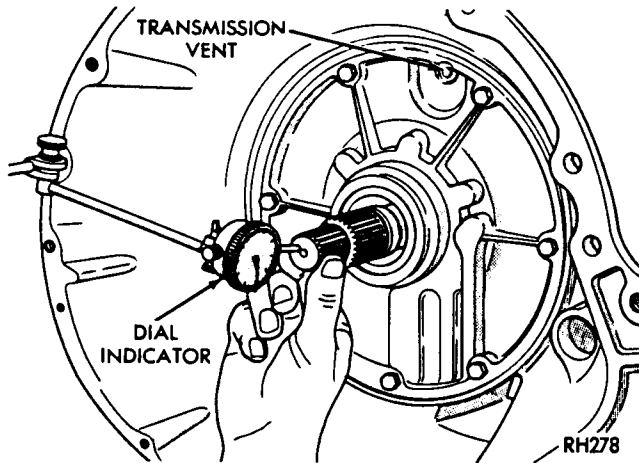


Fig. 5—Measure Input Shaft End Play

Valve Body Assembly

- (1) Loosen clamp bolts and remove throttle and gearshift levers from the transmissions.
- (2) Remove back-up lamp and neutral start switch.
- (3) Disconnect lock-up solenoid wire from wiring connector at rear of transmission case, if so equipped.
- (4) Remove the 10 hex-head valve body to transmission bolts. Remove "E" clip securing parking lock rod to the valve body manual lever.
- (5) While lifting valve body upward out of transmission case, disconnect parking lock rod from the lever.

Accumulator Piston and Spring

- (1) Lift spring off accumulator piston and withdraw piston from the case.

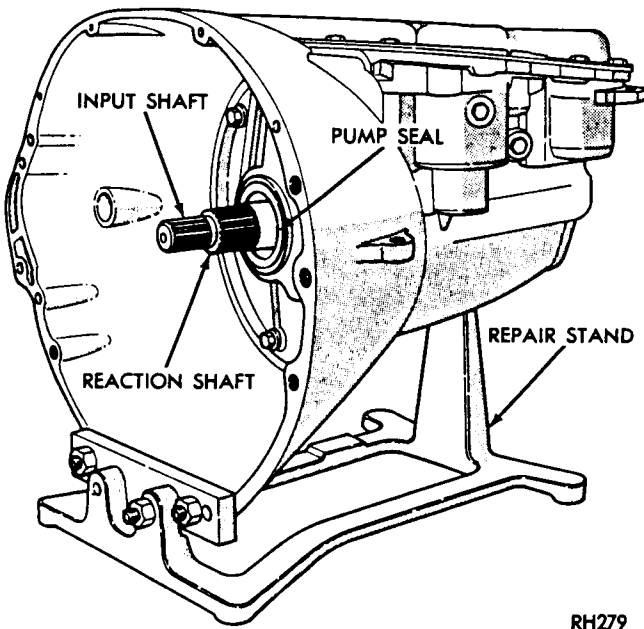


Fig. 6—Transmission in Repair Stand

Extension Housing

Before removing extension housing, pull parking lock rod forward out of the case. Rotate output shaft, if necessary, to align parking gear and sprag to permit knob on end of control rod to pass the sprag.

- (1) Remove speedometer pinion and adapter assembly.
- (2) Remove extension housing to transmission bolts.
- (3) Remove 2 screws, plate, and gasket from the bottom of extension housing mounting pad. Spread large snap ring from output shaft bearing. With snap ring spread as far as possible, carefully tap extension housing off the output shaft and bearing.
- (4) Using heavy-duty snap ring pliers, remove output shaft bearing rear snap ring. Remove bearing from shaft, then remove front snap ring (A-727). The A-904T and A-999 transmissions have no front snap ring.

Governor and Support

- (1) Carefully pry snap ring from the weight end of governor valve shaft. Slide valve and shaft assembly out of the governor body.
- (2) Remove snap ring from behind governor body, then slide governor body and support assembly off the output shaft.

Oil Pump and Reaction Shaft Support

- (1) Tighten front band adjusting screw until band is tight on front clutch retainer. This prevents clutch retainer from coming out with pump which might cause unnecessary damage to the clutches.
- (2) Remove oil pump housing retaining bolts.
- (3) Attach Tool C-3752 to pump housing flange, (Fig. 7), in threaded holes in the flange.
- (4) Bump outward evenly with the 2 "knocker weights" to withdraw pump and reaction shaft support.

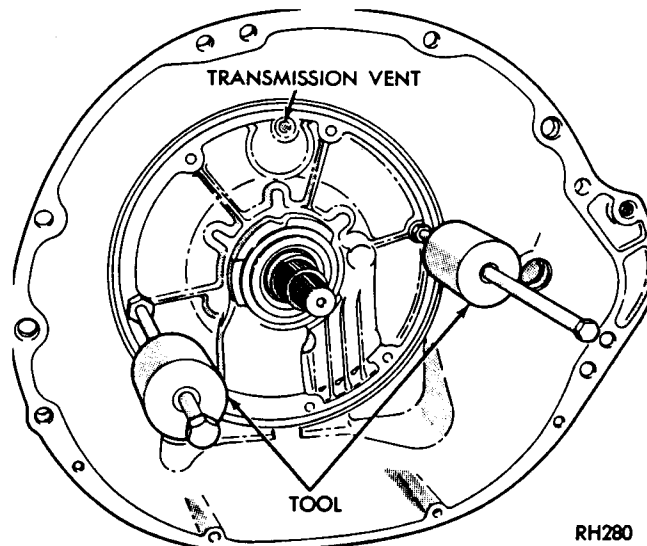


Fig. 7—Remove Oil Pump

port assembly from the case.

Front Band and Front Clutch

- (1) Loosen front band adjuster, remove band strut (and A-727 anchor) and slide band out of the case.
- (2) Slide front clutch assembly out of the case.

Input Shaft and Rear Clutch

- (1) Grasp input shaft, and slide input shaft and rear clutch assembly out of the case.
- Be careful not to lose thrust washer located between rear end of input shaft and forward end of the output shaft.

Planetary Gear Assemblies, Sun Gear, and Driving Shell

- (1) While supporting output shaft and driving shell, carefully slide assembly forward and out through the case.

Be very careful not to damage ground surfaces on output shaft during removal.

Rear Band and Low-Reverse Drum

- (1) Remove low-reverse drum, then loosen rear band adjuster, remove band strut and link, then remove band from the case.
- Double-Wrap Band:** Loosen band adjusting screw, then remove band and low-reverse drum.

Overrunning Clutch

- (1) Note position of overrunning clutch rollers and springs before disassembly to assist in reassembly.
- (2) Carefully slide out clutch hub and remove rollers and springs.

Kickdown Servo (Front)

- (1) Compress kickdown servo spring by using the engine valve spring compressor Tool C-3422A, then remove snap ring (Fig. 8).
- (2) Remove rod guide, spring and piston assembly from the case. Be careful not to damage piston rod or guide during removal.
- (3) Withdraw piston from the transmission case.

Low-Reverse Servo (Rear)

- (1) Compress low-reverse servo piston spring by using engine valve spring compressor Tool C-3422A, then remove the snap ring.
- (2) Remove spring retainer, spring, and servo piston and plug assembly from the case.

RECONDITION SUBASSEMBLIES

The following procedures cover disassembly, inspection, repair, and assembly of each subassembly as removed from the transmission.

Heli-Coil inserts are recommended for repairing

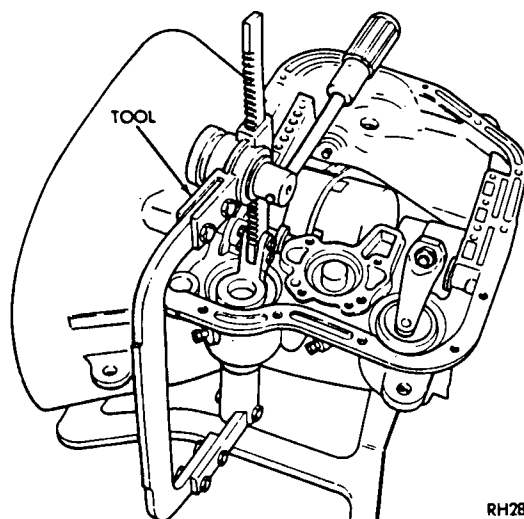


Fig. 8—Compress Kickdown Servo Spring

damaged, stripped or worn threads in aluminum parts.

Pre-sized service bushings are available for replacement for most all bushings in the LoadFlite transmission. The two bushings in sun gear are not serviced because of the low cost of the sun gear assembly. If bushings are found worn or scored, they should be replaced as outlined in the following reconditioning procedures.

The bushing replacement tools listed by "SP" numbers are part of Tool Kit C-3887B.

The use of crocus cloth is permissible where necessary, providing it is used carefully. When used on valves, use extreme care to avoid rounding off the sharp edges. The sharp edge is vitally important to this type of valve. Sharp edges prevent dirt and foreign matter from getting between the valve and body, thus reducing possibility of sticking. When it becomes necessary to recondition transmission, and vehicle has accumulated considerable mileage, install new seal rings on parts requiring their usage. Coat each part with MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176 during assembly.

OIL PUMP AND REACTION SHAFT SUPPORT—A-904T AND A-999

Due to the lock-up torque converter, it is important that the oil pump be within the clearance limits as specified. Also, note that the oil pump bushing should be replaced in any overhaul.

Disassembly

Figure 9 shows the oil pump and reaction shaft support disassembled.

- (1) Remove bolts from rear side of reaction shaft support and lift support off the pump.

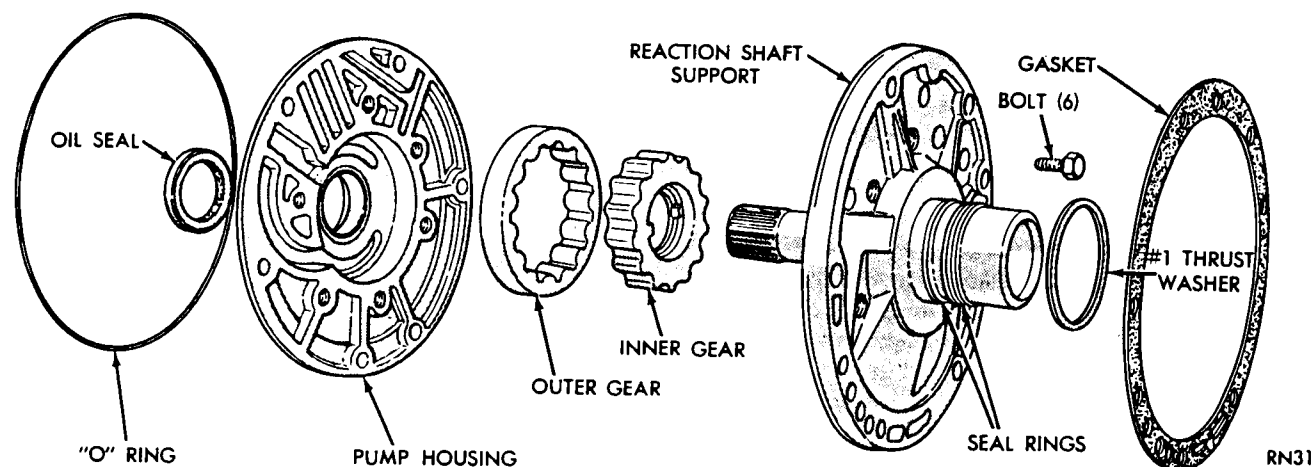


Fig. 9—Oil Pump and Reaction Shaft Support (A-904T and A-999)

(2) Remove rubber seal ring from pump body flange.

(3) Drive out seal with a blunt punch.

Inspection

Inspect interlocking seal rings (Fig. 9) on reaction shaft support for wear or broken locks, make sure they turn freely in the grooves. Seal rings have to be removed to allow clearance for #1 thrust washer removal or installation. Inspect front clutch piston retainer to reaction shaft support thrust washer for wear. Washer thickness should be .061 to .063 inch, replace if necessary. Inspect machined surfaces on pump body and reaction shaft support for nicks and burrs. Inspect pump body and reaction shaft support bushings for wear or scores. Inspect pump gears for scoring or pitting. With gears cleaned and installed in pump body, place a straightedge across face of gears and pump body. Use a feeler gauge to measure clearance between straightedge and face of gears. Clearance limits are from .001 to .0025 inch. Also, measure gear tip clearance between inner and outer gear teeth. Clearance limits are from .0045 to .0095 inch. Clearance between outer gear and its bore in oil pump body should be .0035 to .0075 inch.

Pump Bushing Replacement—A-904T and A-999

(1) Place pump housing (seal face down) on a smooth, firm surface.

(2) Place removing head, Tool SP-3551 in bushing and install handle Tool C-4171 in removing head (Fig. 10).

(3) Drive bushing straight down and out of pump housing bore. Be careful not to cock tool in the bore.

(4) Position new bushing on installing head Tool SP-5117.

(5) With pump housing on a smooth, clean surface, start bushing and installing head in the bushing bore. Install handle in the installing head (Fig. 10).

(6) Drive bushing into housing until tool bottoms in the pump cavity. Be careful not to cock tool during installation.

(7) Stake bushing in place by using a blunt punch or similar tool (Fig. 11). A gentle tap at each stake slot location will suffice.

(8) Using a narrow-bladed knife or similar tool, remove high points or burrs around staked area (Fig. 11). Do not use a file or similar tool that will remove more metal than is necessary.

Reaction Shaft Bushing Replacement—A-904T and A-999

The lock-up reaction shaft support has 3 steel balls in the support at outside diameter of reaction shaft and the non lock-up has 2 steel balls.

In case of a reaction shaft bushing failure, always

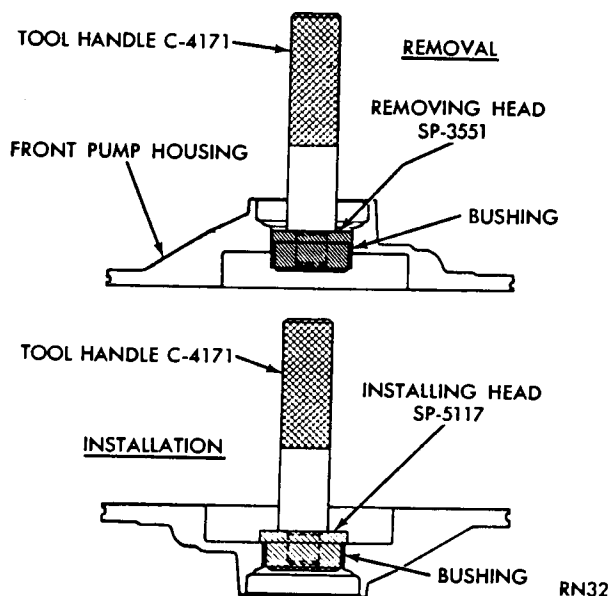


Fig. 10—Replace Pump Bushing (A-904T and A-999)

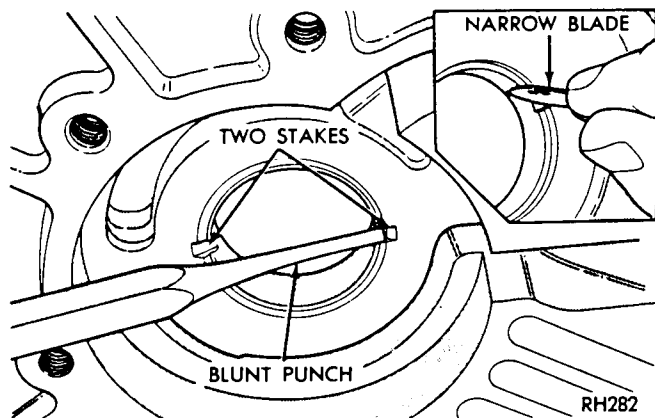


Fig. 11—Stake Pump Bushing (A-904T and A-999)

inspect the support for wear from the input shaft seal ring lands. If worn or grooved, replace support assembly.

(1) Assemble the remover Tool SP-5324, cup Tool SP-3633, and hex-nut Tool SP-1191 (Fig. 12).

Do not clamp any part of reaction shaft or support in a vise.

(2) With cup held firmly against reaction shaft, thread remover into bushing as far as possible by hand.

(3) Using a wrench, screw remover into bushing 3 to 4 additional turns to firmly engage threads in the bushing.

(4) Turn hex nut down against cup to pull bushing from reaction shaft. Thoroughly clean reaction shaft to remove chips made by remover threads.

(5) Lightly grip bushing in a vise or with pliers and back tool out of the bushing. Be careful not to damage threads on bushing remover.

(6) Slide a new bushing on installing head Tool SP-5325, and start them in the bore of reaction shaft (Fig. 12).

(7) Support reaction shaft upright on a clean,

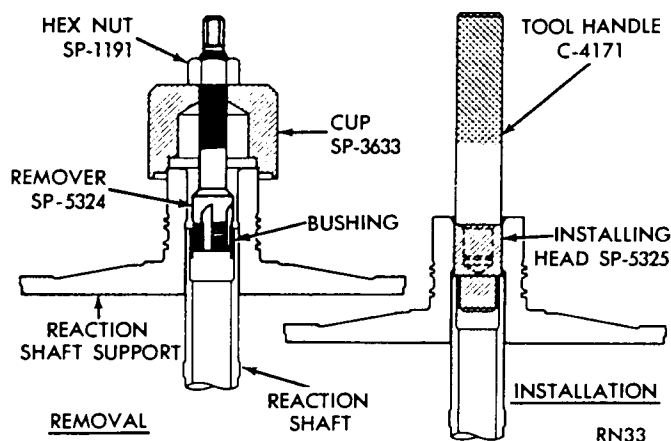


Fig. 12—Replace Reaction Shaft Bushing (A-904T and A-999)

smooth surface and install handle Tool C-4171 in installing head. Drive bushing into the shaft until tool bottoms.

(8) Thoroughly clean reaction shaft support assembly before installation.

Assembly

(1) Place reaction shaft support in assembling Tool C-3759, with hub of support and tool resting on a smooth, flat surface bench (Fig. 13). Screw 2 pilot studs, Tool C-3283-A, into threaded holes of reaction shaft support flange.

(2) Assemble and place gears in the center of the support.

(3) Lower pump body over the pilot studs, insert Tool C-3756 through pump body and engage pump inner gear. Rotate the gears with tool to center gears in pump body, then with pump body firm against reaction shaft support, tighten clamping tool securely.

(4) Invert pump and reaction shaft support assembly with clamping tool intact. Install support to pump body bolts and tighten to 175 in. lbs. (20 N-m). Remove clamping tool, pilot studs, and gear alignment tool.

(5) Place a new oil seal in opening of pump housing (lip of seal facing inward). Using Tool C-4193 and Handle Tool C-4171, drive seal into housing until tool bottoms.

FRONT CLUTCH—A-904T AND A-999

Disassembly

Figure 18 shows a disassembled view of the front clutch assembly.

(1) Remove large waved snap ring that secures pressure plate in the clutch piston retainer. Lift pressure plate and clutch plates out of the retainer.

(2) Install compressor, Tool C-3575-A, over piston spring retainer (Fig. 19). Compress spring and remove snap ring, then slowly release tool until spring retainer is free of the hub. Remove tool, retainer, and spring.

(3) Invert clutch retainer assembly and bump it on a wooden block to remove the piston. Remove seals from the piston and clutch retainer hub.

Inspection

Inspect plates and discs for flatness. They must not be warped or cone shaped.

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should also be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure

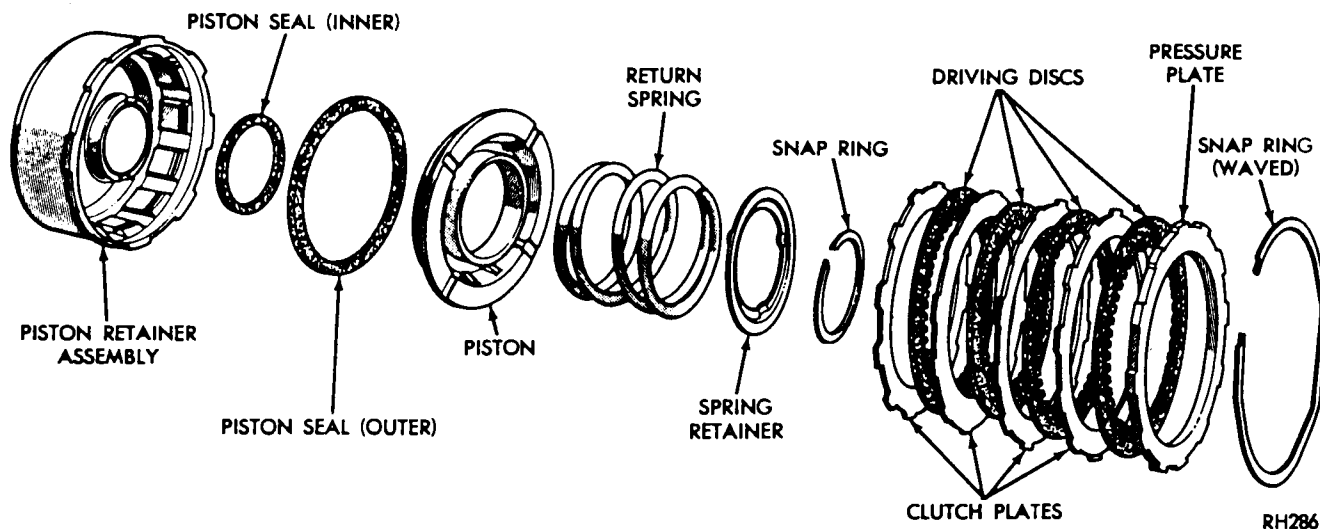


Fig. 18—Front Clutch (A-904T and A-999)

plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces; plates must travel freely in grooves. Inspect band contacting surface on clutch retainer for scores, the contact surface should be protected from damage during disassembly and handling. Note ball check in clutch retainer, make sure ball moves freely. Inspect piston seal surfaces in clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing of seals. Inspect clutch retainer inner bore surface for wear from reaction shaft support seal rings. Inspect clutch retainer bushing for wear or scores.

Inspect inside bore of piston for score marks, if light, remove with crocus cloth. Inspect seal grooves for nicks and burrs. Inspect seals for deterioration, wear, and hardness. Inspect piston spring, retainer, and snap ring for distortion.

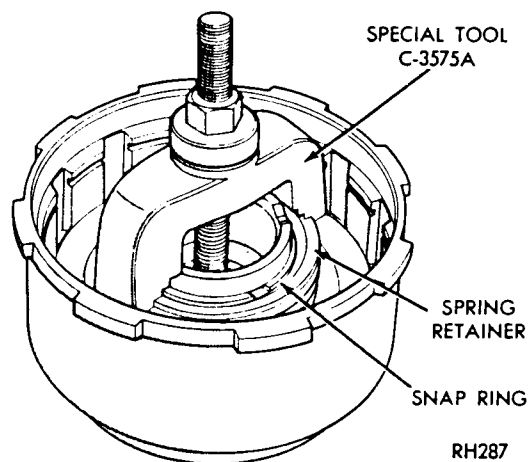


Fig. 19—Front Clutch Spring Retainer Snap Ring (A-904T and A-999)

Front Clutch Retainer Bushing Replacement—A-904T and A-999

(1) Lay clutch retainer (open end down) on a clean, smooth surface and place removing head Tool SP-3627 in the bushing (Fig. 20). Install handle Tool C-4171 in removing head.

(2) Drive bushing straight down and out of clutch retainer bore. Be careful not to cock tool in the bore.

(3) Lay clutch retainer (open end up) on a clean, smooth surface. Slide a new bushing on installing head Tool SP-3626, and start them in clutch retainer bore.

(4) Install handle in installing head. Drive bushing into clutch retainer until tool bottoms.

(5) Thoroughly clean clutch retainer before assembly and installation.

Assembly

(1) Lubricate and install inner seal on hub of clutch retainer. Make sure lip of seal faces down and seal is properly seated in the groove (Fig. 18).

(2) Install outer seal on the clutch piston, with lip of

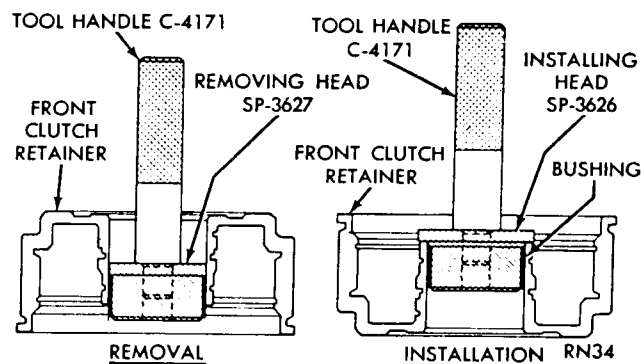


Fig. 20—Replace Front Clutch Retainer Bushing (A-904T and A-999)

seal toward bottom of clutch retainer. Apply a coating of wax type lubricant, or Door Ease, to outer edge of seals and press seal to bottom of its groove around piston diameter for easier installation of piston assembly. Place piston assembly in retainer and carefully seat piston in bottom of retainer.

(3) Place spring on piston hub and position spring retainer and snap ring on the spring. Compress spring with Tool C-3575-A (Fig. 19), and seat snap ring in hub groove. Remove compressor tool.

(4) Lubricate all clutch plates, install one steel plate followed by a lined plate (disc) until the number given in specifications is installed. Install pressure plate and snap ring. Make sure snap ring is properly seated.

(5) Insert a feeler gauge between pressure plate and waved snap ring, where snap ring is waved away from pressure plate, to measure maximum clearance (Fig. 21). See "Specifications" for allowed clearance.

Assembly

(1) If removed, press input shaft into piston retainer and install snap ring.

(2) Lubricate and install inner and outer seals on clutch piston. Make sure seal lips face toward input shaft, and seals are properly seated in piston grooves (Fig. 27).

(3) Place piston assembly in retainer and, with a twisting motion, seat piston in bottom of retainer.

(4) Place clutch piston spring on top of piston in clutch retainer. Start one end of wave spring in retainer groove (Fig. 28), then progressively push or tap spring into place making sure it is fully seated in the groove.

(5) Install inner pressure plate in clutch retainer with raised portion of plate resting on the spring.

(6) Lubricate all clutch plates, install one lined disc followed by a steel plate until all plates are installed. Install outer pressure plate and selective snap ring.

(7) Measure rear clutch plate clearance by having an assistant press down firmly on outer pressure plate, then insert a feeler gauge between the plate and snap ring (Fig. 29).

See "Specifications" for allowed clearance. If necessary, install a new snap ring of proper thickness to obtain specified clearance. Low limit clearance is desirable. Rear clutch plate clearance is very important in obtaining proper clutch operation. Clearance can be adjusted by the use of various thickness outer snap rings. Snap rings are available in .060, .076, and .098 inch thickness.

(8) Grease cupped side of #3 thrust plate and install cupped side over input shaft.

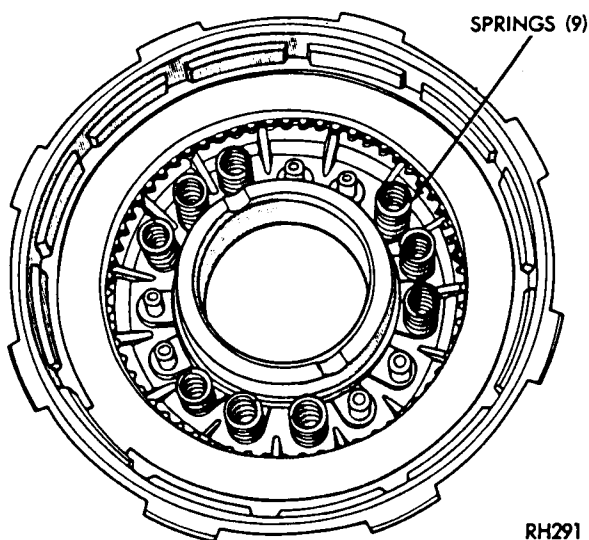


Fig. 25—Front Clutch Spring Location (9 Springs)
REAR CLUTCH—A-904T AND A-999

Disassembly

Figure 27 shows a disassembled view of the rear clutch assembly.

(1) Remove large selective snap ring that secures pressure plate in clutch piston retainer. Lift pressure plate, clutch plates, and inner pressure plate out of the retainer.

(2) Carefully pry one end of wave spring out of its groove in clutch retainer, then remove wave spring, and clutch piston ring.

(3) Invert clutch piston retainer assembly and bump it on a wooden block to remove piston. Remove seals from piston.

(4) If necessary, remove snap ring and press input shaft from piston retainer.

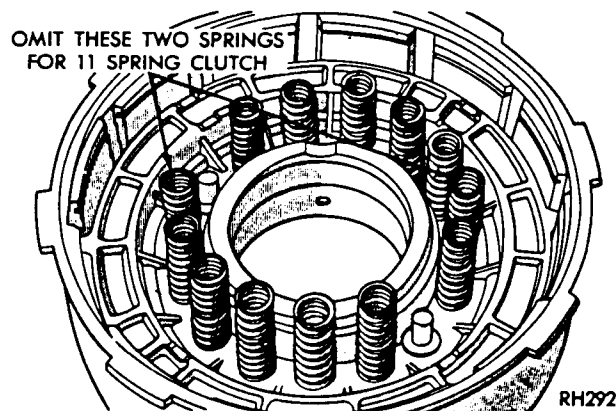


Fig. 26—Front Clutch Spring Location
(11 and 13 Springs)

Inspection

Inspect facing material on all driving discs. Replace discs that are charred, glazed or heavily pitted. Discs should be replaced if they show evidence of material flaking off or if facing material can be scraped off easily. Inspect driving disc splines for wear or other damage. Inspect steel plate and pressure plate surfaces for burning, scoring or damaged driving lugs. Replace if necessary. Inspect plates and discs for flatness, they must not be warped or cone-shaped.

Inspect steel plate lug grooves in clutch retainer for smooth surfaces; plates must travel freely in the grooves. Note ball check in clutch retainer, make sure ball moves freely. Inspect seal rings surfaces in clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing of the seals. Inspect neoprene seal rings for deterioration, wear, and hardness. Inspect piston spring and wave spring for distortion or breakage.

Inspect teflon and/or cast iron seal rings on input shaft for wear (Fig. 27). If required, replacement rings

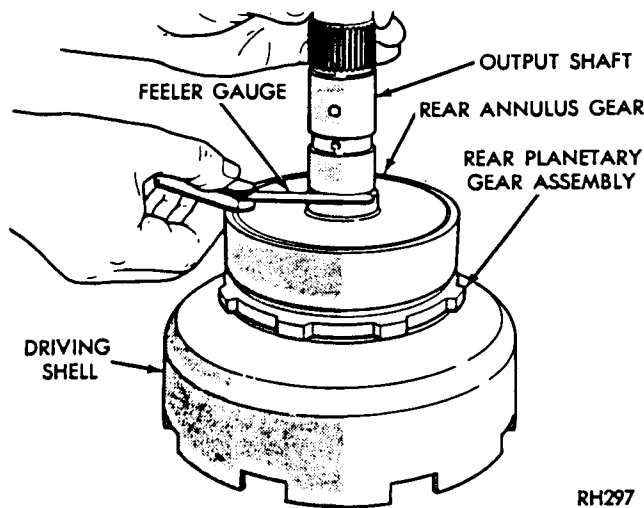


Fig. 32—Measure End Play of Planetary Gear Train

assembly. Remove snap ring and #8 thrust plate from sun gear (rear side of driving shell). Slide sun gear out of driving shell, and remove spacer (Fig. 33), and #7 thrust plate from opposite end of sun gear, if necessary.

Remove #9 thrust washer from forward side of rear planetary assembly and remove planetary gear assembly from rear annulus gear. Remove #10 thrust washer from rear side of planetary assembly. If necessary, remove snap ring from rear of annulus gear to separate support from annulus gear.

Inspection

Inspect bearing surfaces on output shaft for nicks, burrs, scores or other damage. Light scratches, small nicks or burrs can be removed with crocus cloth or a fine stone. Inspect speedometer drive gear for any nicks or burrs, and remove with a sharp-edged stone. Make sure all oil passages in shaft are open and clean.

Inspect bushings in sun gear for wear or scores, replace sun gear assembly if bushings are damaged. Inspect all thrust washers for wear and scores, replace if damaged or worn below specifications. Inspect thrust faces of planetary gear carriers for wear, scores or other damage, replace as required. Inspect planetary gear carrier for cracks and pinions for broken or worn gear teeth, and for broken pinion shaft welds. Inspect annulus gear and driving gear teeth for damage. Replace distorted lock rings.

Assembly

Refer to Figure 33 for parts reference.

(1) Place rear annulus gear support in annulus gear and install snap ring.

(2) Position #10 thrust washer on rear side of rear planetary gear assembly and install in rear annulus gear. Install #9 thrust washer on front side of rear planetary gear assembly.

(3) Insert output shaft in rear opening of rear annulus gear. Carefully work shaft through annulus gear support and planetary gear assembly. Make sure shaft splines are fully engaged in splines of annulus gear support.

(4) Install #7 thrust plate and spacer (Fig. 33) on one end of sun gear. Insert sun gear through front side of driving shell, install #8 thrust plate and snap ring.

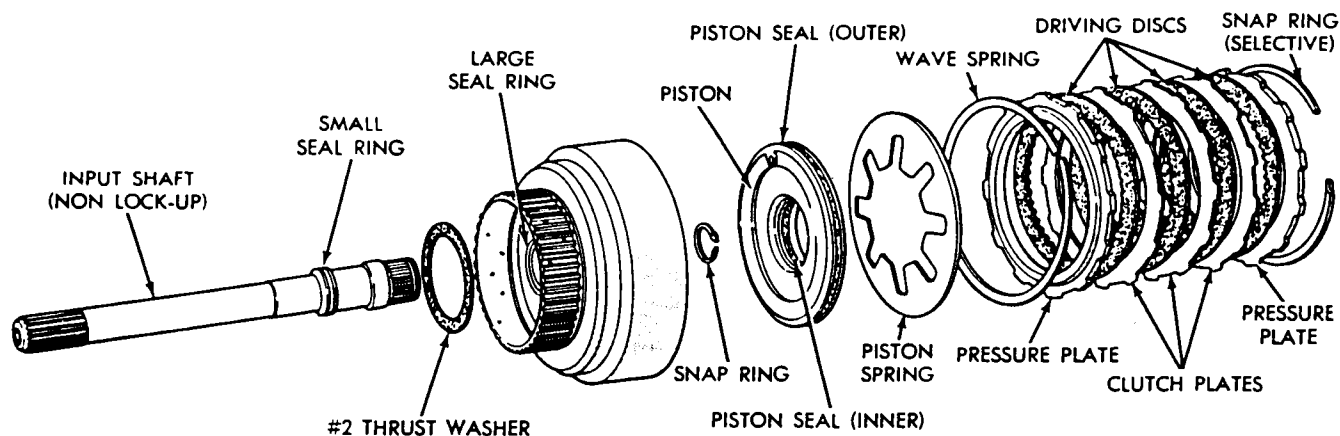
(5) Carefully slide driving shell and sun gear assembly on the output shaft, engaging sun gear teeth with rear planetary pinion teeth.

(6) Place front annulus gear support in the annulus gear and install snap ring.

(7) Position #5 thrust washer on front side of front planetary gear assembly. Position front planetary gear assembly in front annulus gear, place #4 thrust washer over planetary gear assembly hub and install snap ring. Position #6 thrust washer on rear side of planetary gear assembly.

(8) Carefully work front planetary and annulus gear assembly on output shaft, meshing planetary pinions with sun gear teeth.

(9) With all components properly positioned, install selective snap ring on front end of output shaft. Remeasure end play of the assembly. The clearance can be adjusted by the use of various thickness snap rings. Snap rings are available in .042, .064, and .084 inch thickness.



RH293

Fig. 27—Rear Clutch (A-904T and A-999 Non Lock-Up)

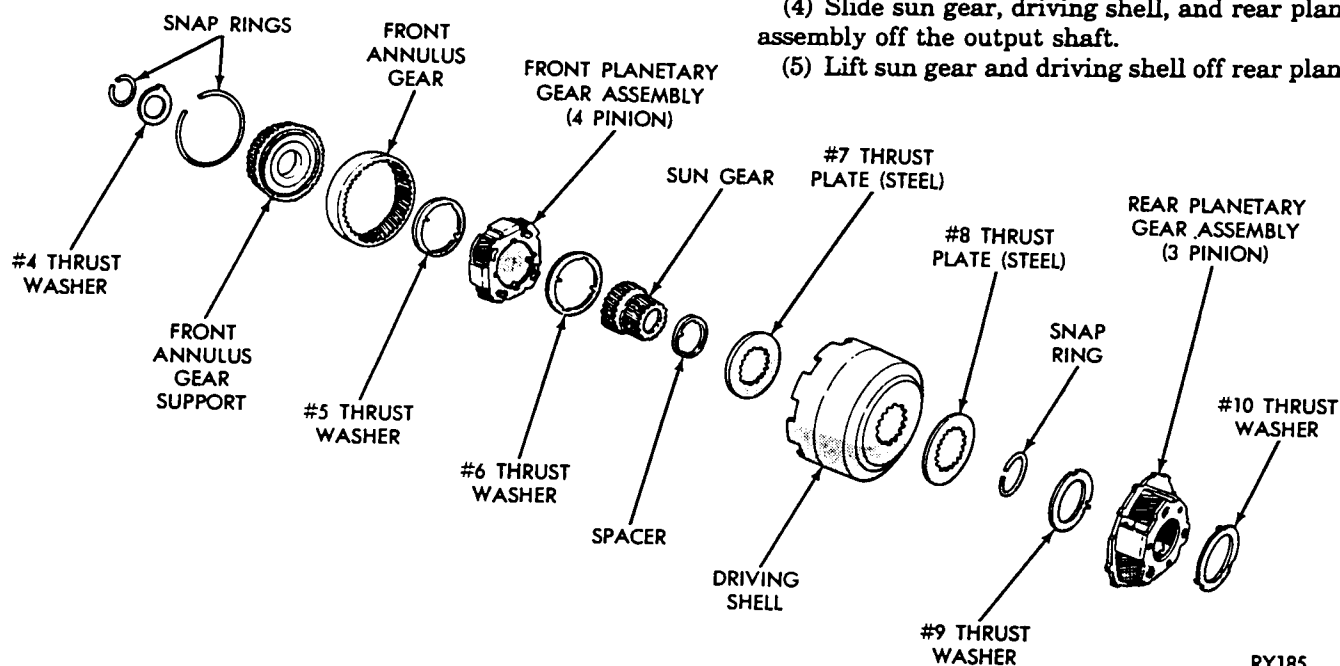
Planetary Gear Train—A-904T and A-999

End Play

Measure end play of planetary gear assemblies, sun gear, and driving shell before removing these parts from output shaft. Stand assembly upright with forward end of output shaft on a wooden block so that all parts will move forward against selective snap ring at front of shaft. Insert a feeler gauge between rear annulus gear support hub and shoulder on output shaft. (Fig. 32). The clearance should be .005 to .048 inch. If clearance exceeds specifications, replace thrust washers and/or necessary parts.

Disassembly (Fig. 33)

- (1) Remove selective #3 thrust washer from forward end of output shaft.
- (2) Remove selective snap ring from forward end of output shaft, then slide front planetary assembly off the shaft.
- (3) Remove snap ring and #4 thrust washer from forward hub of front planetary gear assembly, slide front annulus gear and support off planetary gear assembly. Remove #5 thrust washer from front side of planetary gear assembly. Remove #6 thrust washer from rear side of planetary gear assembly. If necessary, remove snap ring from front of annulus gear to separate support from annulus gear.
- (4) Slide sun gear, driving shell, and rear planetary assembly off the output shaft.
- (5) Lift sun gear and driving shell off rear planetary



RY185

Fig. 33—Wide-Ratio Planetary Gear Train

Overrunning Clutch Cam Replacement — A-904T and A-999

If overrunning clutch cam or spring retainer are found damaged, they can be replaced with a service replacement cam, spring retainer, and retaining bolts (Fig. 35).

The service parts are retained in the case with bolts instead of rivets. To install, proceed as follows:

(1) Remove four bolts securing output shaft support to rear of the transmission case. Tap support rearward out of the case with a soft-faced hammer.

(2) Center punch the rivets exactly in center of each rivet head (Fig. 36).

(3) Drill through each rivet head with a 3/8 inch drill. Be careful not to drill into the transmission case. Chip off rivet heads with a small chisel, then drive rivets and cam from the case with a blunt punch of

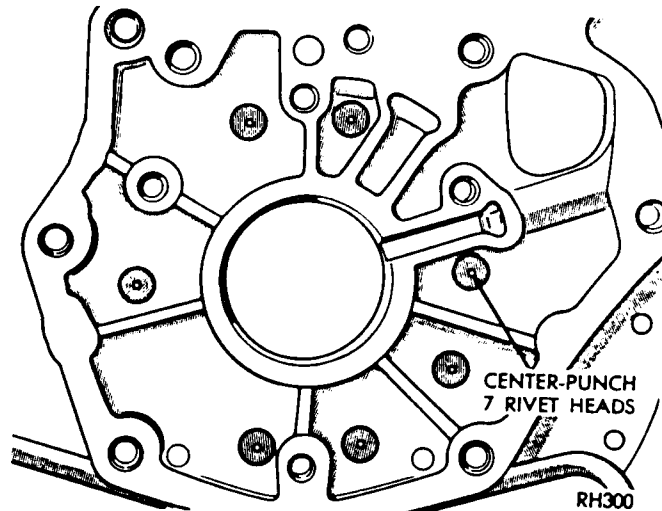


Fig. 36—Center Punch Rivet Heads
(A-904T and A-999)

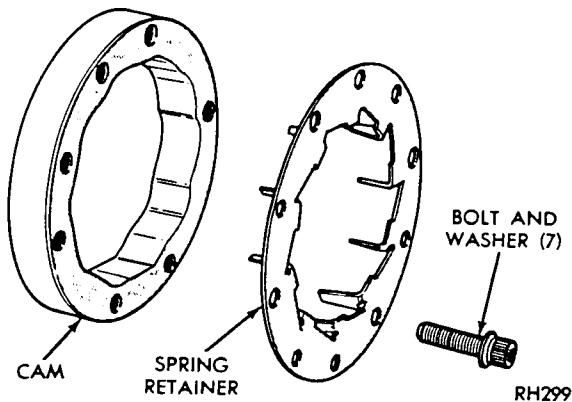


Fig. 35—Overrunning Clutch Service Replacement
Cam (A-904T and A-999)

proper size.

(4) Carefully enlarge rivet holes in the case with a 17/64 inch drill. Remove all chips and foreign matter from the case, make sure cam area is free of chips and burrs.

(5) To install, position cam and roller spring retainer in the case. Align cam bolt holes with holes in the case, then thread all seven retaining bolt and washer assemblies into cam a few turns. The cone washers must be installed so inner diameter is coned toward the bolt head (Fig. 37).

(6) Tap cam firmly into the case if necessary. Draw retaining bolts down evenly, then tighten to 100 in. lbs. (11 N·m)

(7) Screw 2 pilot studs, Tool C-3288-B into the case (Fig. 38). Position support over the pilot studs, and tap it firmly into the case with a soft-faced hammer.

(8) Remove pilot studs, install bolts and tighten to 150 in. lbs. (17 N·m).

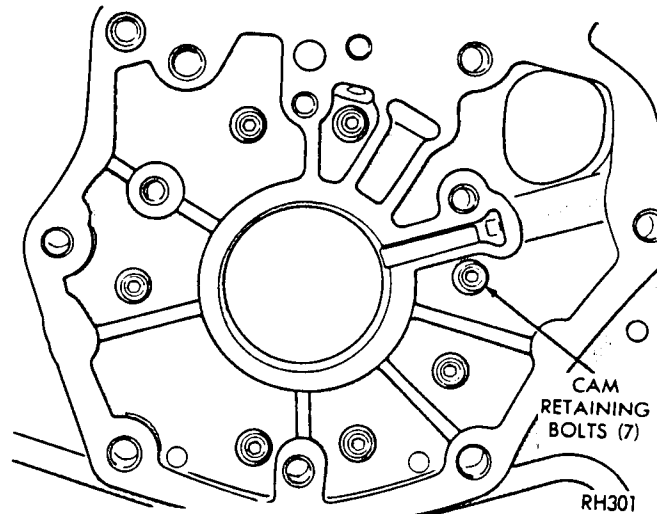


Fig. 37—Cam Retaining Bolts
(A-904T and A-999)

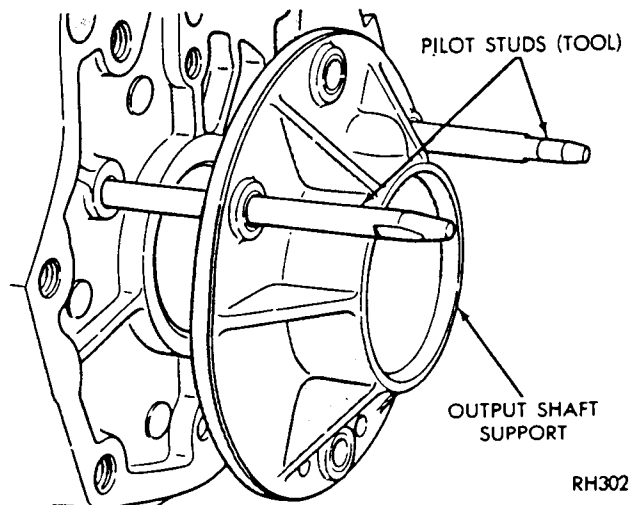


Fig. 38—Installing Output Shaft Support
(A-904T and A-999)

Double-wrap Low-Reverse Band — A-904T and A-999 (Figs. 46 and 47)

- (1) Push band reaction pin (with new "O" ring) into case flush with gasket surface.
- (2) Place band into case resting two lugs against band reaction pin.
- (3) Install low-reverse drum into overrunning clutch and band.
- (4) Install operating lever with pivot pin flush in case and adjusting screw touching center lug on band.

Kickdown Servo (Fig. 43)

- (1) Carefully push servo piston assembly into the case bore. Install spring, guide, and snap ring.
- (2) Compress kickdown servo springs by using engine valve spring compressor Tool C-3422A, then install snap ring.

Planetary Gear Assemblies, Sun Gear, and Driving Shell

- (1) While supporting assembly in the case, insert output shaft through rear support. Carefully work assembly rearward engaging rear planetary carrier lugs into low-reverse drum slots.

Be very careful not to damage ground surfaces on output shaft during installation.

Front and Rear Clutch Assemblies

The front and rear clutches, front band, oil pump and reaction shaft support are more easily installed with transmission in an upright position.

One method to support transmission, is outlined in Steps 1 and 2.

- (1) Cut a 3 1/2 inch (89mm) diameter hole in a

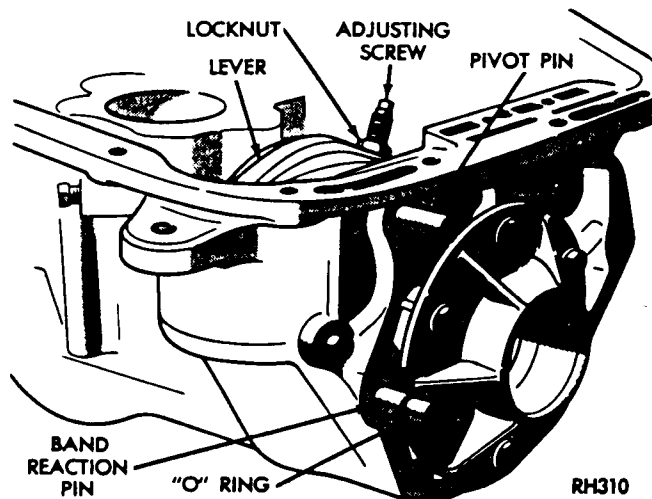


Fig. 46—Double-Wrap Band Linkage (A-904T and A-999)

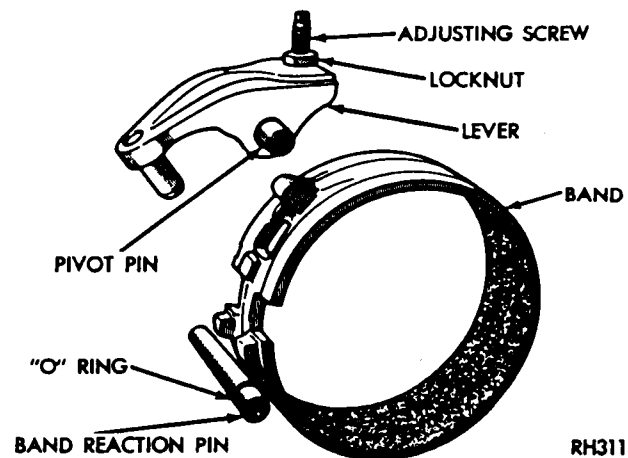


Fig. 47—Double-Wrap Band and Linkage (A-904T and A-999)

bench, in the end of a small oil drum, or a large wooden box strong enough to support transmission. Cut or file notches at edge of the 3 1/2 inch (89mm) hole so output shaft support will fit and lay flat in the hole.

- (2) Carefully insert output shaft into hole to support the transmission upright, with its weight resting on flange of the output shaft support.

(3) **A-904T and A-999:** Apply a light coat of grease to selective thrust washer and install washer on front end of the output shaft. Apply a light coat of grease to input shaft thrust plate and install over input shaft. If input shaft end play was not within specifications (.022 to .091 inch), when tested before disassembly, replace thrust washer with one of proper thickness. Refer to thrust washer number 3 in "Specifications" for sizes available.

A-727: Apply a coat of grease on the input to output shaft thrust plate Number 3 (Fig. 34), and install plate on front end of the output shaft. Apply a light coat of grease to the 3-tab thrust washer and install in rear clutch piston retainer.

- (4) Align front clutch plate inner splines, and place assembly in position on the rear clutch. Make sure front clutch plate splines are fully engaged on rear clutch splines.

(5) Align rear clutch plate inner splines, grasp input shaft and lower the two clutch assemblies into the transmission case.

(6) Carefully work clutch assemblies in a circular motion to engage rear clutch splines over splines of front annulus gear. Make sure front clutch drive lugs are fully engaged in slots in the driving shell.

Kickdown Band (Fig. 48)

- (1) Slide band over front clutch assembly.
- (2) Install band strut, screw in adjuster just enough to hold strut and anchor in place.

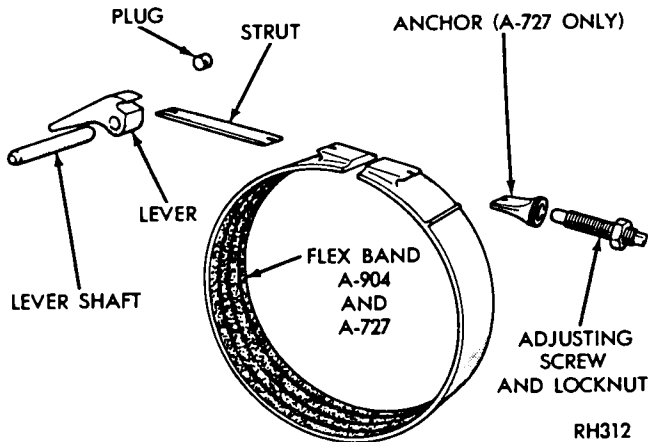


Fig. 48—Kickdown Band and Linkage

Oil Pump and Reaction Shaft Support

If difficulty was encountered in removing the pump assembly due to an exceptionally tight fit in the case, it may be necessary to expand the case with heat during pump installation. Using a suitable heat lamp, heat the case in area of pump for a few minutes prior to installing pump and reaction shaft support assembly.

A-904T and A-999: Install number one thrust washer on reaction shaft support hub (Fig. 9).

A-727: If input shaft end play was not within specifications (.034 to .084 inch) when measured before disassembly, replace thrust washer on reaction shaft support hub with one of proper thickness (Fig. 14). Refer to thrust washer number 1 in "Specifications" for sizes available.

(1) Screw two pilot studs, Tool C-3288-B in pump opening in the case (Fig. 49). Install a new gasket over the pilot studs.

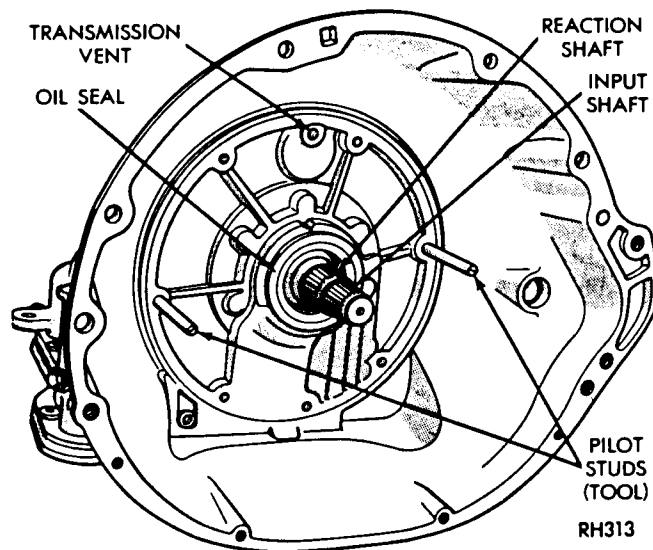


Fig. 49—Installing Oil Pump

(2) Place a new rubber seal ring in the groove on the outer flange of pump housing. Make sure seal ring is not twisted. Coat seal ring with grease for easy installation.

(3) Install pump assembly in the case; tap it lightly with a soft-faced mallet, if necessary. Remove pilot studs, install bolts and snug down evenly.

Rotate input and output shafts to see if any binding exists, then tighten bolts to 175 in. lbs. (20 N-m). Check shafts again for free rotation.

(4) Adjust both bands as described in "Maintenance and Adjustments" Section.

Governor and Support

(1) Position support and governor body assembly on the output shaft. Align assembly so governor valve shaft hole in governor body aligns with hole in output shaft, then slide assembly into place. Install snap ring behind the governor body. Tighten body to support self-locking bolts to 95 in. lbs. (11 N-m).

(2) Place governor valve on valve shaft, insert the assembly into body and through governor weights. Install valve shaft retaining snap ring.

Output Shaft Bearing and Extension Housing

(1) Install a snap ring in the front groove (A-727 only) on output shaft. Install bearing on shaft with its outer race ring groove toward front. Press or tap bearing tight against front snap ring (or shoulder on A-904T and A-999) then install rear snap ring.

(2) Place a new extension housing gasket on the transmission case. Position output shaft bearing retaining snap ring in the extension housing. Spread snap ring as far as possible then carefully tap extension housing into place. Make sure snap ring is fully seated in the bearing groove.

(3) Install and tighten extension housing bolts to 32 ft. lbs. (43 N-m).

(4) Install gasket, plate, and 2 screws on bottom of extension housing mounting pad.

Measure input shaft end play as described under "Disassembly—Subassembly Removal." Correct if necessary (Fig. 5).

Valve Body Assembly and Accumulator Piston

(1) Make sure combination back-up lamp/neutral start switch is not installed in transmission case.

(2) Place valve body manual lever in "low" position to move parking rod to rear position.

(3) Use screwdriver to push park sprag into engagement with parking gear, turning output shaft to verify engagement. This will allow "knob" on end of parking rod to move past the sprag as valve body is installed.

(4) Install accumulator piston in the transmission case (Fig. 50).

(5) Position accumulator spring between piston and valve body.

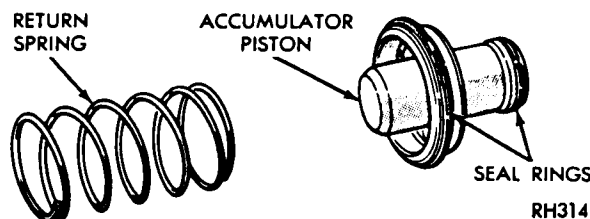


Fig. 50—Accumulator Piston and Spring

(6) Place valve body in position, working park rod through opening and past sprag. Install retaining bolts finger tight.

(7) With neutral starting switch installed, place manual lever in the neutral position. Shift valve body, if necessary, to center neutral Finger over the neutral switch plunger. Snug bolts down evenly, then tighten to 105 in. lbs. (12 N·m).

(8) Connect lock-up solenoid wire to wiring connector pin at rear of transmission case, if so equipped.

(9) Install gearshift lever and tighten clamp bolt. Check lever shaft for binding in the case by moving lever through all detent positions. If binding exists, loosen valve body bolts and realign.

(10) Make sure throttle shaft seal is in place, then install flat washer and throttle lever and tighten the clamp bolt.

(11) Position the round magnet over the bump in the front, right hand corner of the oil pan.

(12) Install oil pan, and a new gasket.

TRANSMISSION, TORQUE CONVERTER, AND DRIVE PLATE INSTALLATION

The transmission and torque converter must be installed as an assembly; otherwise, the torque converter drive plate, pump bushing, and oil seal will be damaged. The drive plate will not support a load; therefore, none of the weight of transmission should be allowed to rest on the plate during installation.

(1) Rotate pump gears with Tool C-3756 (A-904T and A-999) or Tool C-3881 (A-727) until the two small holes in handle are vertical (Fig. 51).

(2) Carefully slide torque converter assembly over input shaft and reaction shaft. Make sure torque converter hub slots are also vertical and fully engage pump inner gear lugs.

Test for full engagement by placing a straightedge on face of the case (Fig. 52). The surface of torque converter front cover lug should be at least 1/2 inch to rear of straightedge when torque converter is pushed all the way into transmission.

(3) Attach a small "C" clamp to edge of torque converter housing to hold torque converter in place during transmission installation.

(4) Inspect torque converter drive plate for distortion or cracks and replace if necessary. Torque the

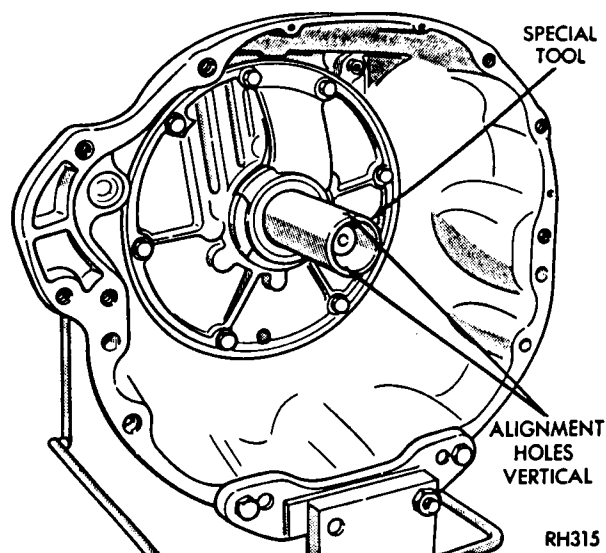


Fig. 51—Align Pump Inner Gear Lugs

drive plate to crankshaft bolts to 55 ft. lbs. (75 N·m). When drive plate replacement has been necessary, make sure both transmission dowel pins are in engine block and they are protruding far enough to hold transmission in alignment.

(5) Coat the torque converter hub hole in crankshaft with Multipurpose grease. Place transmission and torque converter assembly on a service jack and position assembly under vehicle for installation. Raise or tilt as necessary until transmission is aligned with engine.

(6) Rotate torque converter so mark on torque converter (made during removal) will align with mark on drive plate. The offset holes in plate are located next to 1/8 inch hole in the inner circle of plate. Carefully work transmission assembly forward over engine

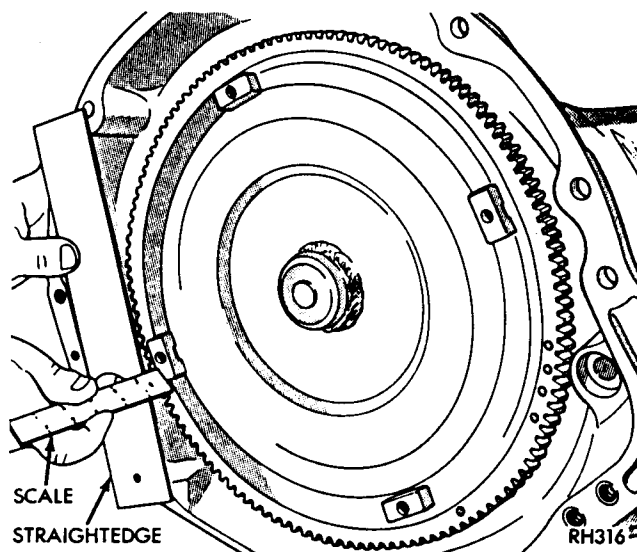


Fig. 52—Measuring Torque Converter for Full Engagement into Transmission

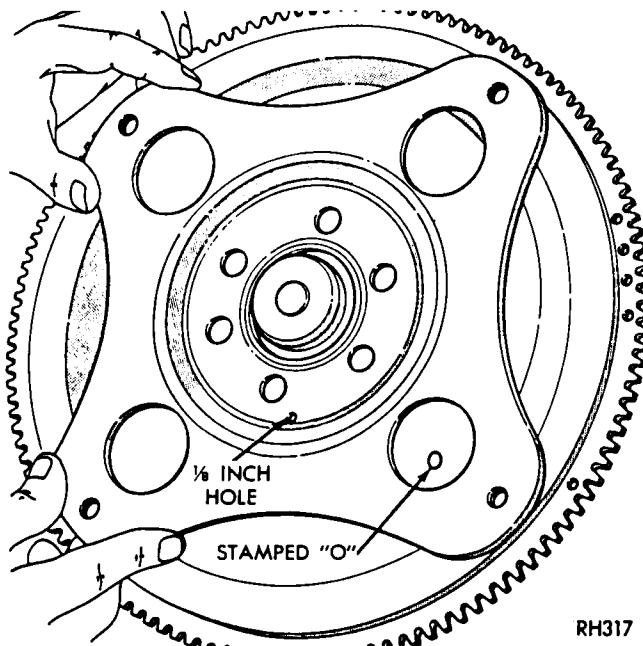


Fig. 53—Torque Converter and Drive Plate Markings

block dowels with torque converter hub entering the crankshaft opening.

(7) After transmission is in position, install bell housing bolts and tighten to 30 ft. lbs. (41 N·m).

(8) Install crossmember to frame and lower transmission to install mount on extension to the crossmember. Tighten all bolts.

(9) The engine support fixture (Fig. 1), may now be removed.

(10) Install oil filler tube and speedometer cable.

(11) Connect throttle rod to transmission lever.

(12) Connect gearshift rod and torque shaft assembly to transmission lever and frame.

When it is necessary to disassemble linkage rods from levers which use plastic grommets as retainers, the grommets should be replaced with new ones. Use a prying tool to force rod from grommet in lever, then cut away old grommet. Use pliers to snap new grommet into lever and rod into grommet.

(13) Place wire connector on the combination back-up lamp and neutral/park starter switch.

(14) Connect wiring to lock-up solenoid wiring connector at rear of transmission case, if so equipped.

(15) Rotate engine clockwise with socket wrench on vibration dampener bolt, as needed to install torque converter to drive plate bolts, matching marks made at removal. Tighten to 270 in. lbs. (31 N·m).

(16) Install torque converter access cover.

(17) Install starter motor and cooler line bracket.

(18) Tighten cooler lines to transmission fittings.

(19) Install engine to transmission struts, if so equipped.

Tighten bolts holding strut to transmission before strut to engine bolts.

(20) Replace exhaust system if it was disturbed for clearance.

(21) Carefully guide sliding yoke into extension housing and on the output shaft splines. Align marks made at removal then connect propeller shaft to axle pinion shaft yoke.

(22) Adjust shift and throttle linkage.

(23) Refill transmission with MOPAR ATF PLUS (Automatic Transmission Fluid) Type 7176.



Technical Service Information

SPECIFICATIONS

Transmission Models	A904T/A-999
SNAP RINGS	
Rear Clutch Snap Ring (Selective)060 to .062 inch .068 to .070 inch .076 to .078 inch .098 to .100 inch
Output Shaft (Forward End)040 to .044 inch .062 to .066 inch .082 to .086 inch
CLUTCH PLATE CLEARANCE	
Front Clutch	4 Disc. .067 to .134 inch 5 Disc. .075 to .152 inch
Rear Clutch	4 Disc. .032 to .055 inch

	A-904T	A-999
	Wide Ratio	Wide Ratio
CLUTCHES—Engine Cu. In.	225	318
Number of Front Clutch Plates	4	5
Number of Front Clutch Discs	4	5
Number of Rear Clutch Plates	3	3
Number of Rear Clutch Discs	4	4
Number of Front Clutch Springs	1	1
BAND ADJUSTMENTS		
Kickdown (Front) Turns*	2-1/2	2-1/2
Low-Reverse (Internal) Turns*	4	4

*Backed off from 72 inch-pounds (5 N-m)

THRUST WASHERS	A-904T/A-999
Engine	225/318 CID
Reaction Shaft Support Thrust Washer	#1 .061 to .063 inch
Rear Clutch Retainer Thrust Washer	#2 .061 to .063 inch
Input Shaft Thrust Plate024 to .026 inch
Output Shaft Thrust Washer	#3 Selective .052 to .054 inch (Tin) .068 to .070 inch (Red) .083 to .085 inch (Green)
Output Shaft Thrust Plate	—
Front Annulus Thrust Washer	#4 .121 to .125 inch
Front Carrier (To Annulus) Thrust Washer ..	#5 .048 to .050 inch
Drive Shell (To Front Annulus) Thrust Washer	—

(continued)



Technical Service Information

THRUST WASHERS (continued)

A-904T/A-999

Front Carrier (To Drive Shell) Thrust Washer	#6 .048 to .050 inch
Sun Gear Drive Shell Thrust Plate	#7 .050 to .052 inch
	#8 .050 to .052 inch
Rear Carrier (To Drive Shell) Thrust Washer	#9 .048 to .050 inch
Rear Carrier (To Annulus) Thrust Plate	—
Rear Carrier (To Annulus) Thrust Washer	#10 .048 to .050 inch

TIGHTENING REFERENCE

Manual "Overdrive-4" 4 Speed					
	Ft. Lbs.	(N·m)		Ft. Lbs.	(N·m)
Back-Up Lamp Switch	15	20	Shift Lever Nuts	18	24
Drive Pinion Bearing			Transmission to Clutch		
Retainer Bolts	30	41	Housing Bolts	50	68
Extension Housing to Case Bolts .	50	68	Transmission Drain Plug	25	34
Gearshift to Mounting Plate	24	33			
Gearshift Mounting Plate to					
Extension	12	16			
Automatic (LoadFlite)					
Location	A-904T/A-999/A-727	Ft. Lbs.	N·m	Ft. Lbs.	N·m
Cooler Line Fitting	155*	18	Neutral Starter Switch	25	34
Cooler Line Nut	85*	10	Oil Pan Bolt	150*	17
Converter Drive Plate			Oil Pump Housing to		
To Crankshaft Bolt	55	75	Transmission Case Bolt	175*	20
Converter Drive Plate to Torque			Output Shaft Support Bolt	150*	17
Converter Bolt	270*	31	Overrunning Clutch Cam Set Screw .	40*	5
Extension Housing to			Pressure Test Take-Off Plug	120*	14
Transmission Case Bolt	32	43	Reaction Shaft Support to Oil		
Extension Housing to Insulator			Pump Bolt	175*	20
Mounting Bolt	50	68	Reverse Band Adjusting		
Governor Body to Support Bolt ..	95*	11	Screw Lock Nut	25	34
Kickdown Band Adjusting			Speedometer Drive Clamp Screw .	100*	11
Screw Lock Nut	30	41	Transmission to Engine Bolt	30	41
Kickdown Lever Shaft Plug	150*	17	Valve Body Screw	35*	4
Lock-up Solenoid Wiring			Valve Body to Transmission		
Connector	150*	17	Case Bolt	105*	12
		*Inch Pounds			*Inch Pounds

AUTOMATIC TRANSMISSION SERVICE GROUP



TRANSMISSION CHANGES FOR 1986

AUTOMATIC TRANSMISSION SERVICE GROUP



ALL 1978-1986 EQUIPPED WITH AUTOMATIC TRANSMISSION & LOCK-UP TORQUE CONVERTER

A new automatic transmission fluid Type 7176, (PN 4318077 — quart and 4318079 — 55 gallon) has been released for all vehicles equipped with automatic transmission and lock-up torque converter.

Aftermarket fluids can vary in terms of their friction characteristics and this in turn can affect the performance of the lock-up clutch, causing shudder and/or excessive slippage. Use of the new fluid will help to insure that the lock-up clutch will perform satisfactorily after the fluid has been replaced.

Type 7176 fluid should be used any time it is necessary to replace the fluid in a lock-up torque converter equipped transmission.

If a lock-up shudder condition is encountered, check all linkage adjustments and drain and refill the transmission with Type 7176 fluid prior to attempting any other repairs, especially if the fluid has been changed previously.

ALL 1978-1986 DOMESTIC CARS & TRUCKS EQUIPPED WITH AUTOMATIC TRANSMISSION/TRANSAXLE

The drainless torque converter, introduced in February, 1977, prevents the ability to completely flush the converter. To eliminate the possibility of a repeat transmission failure, it is necessary that the torque converter be replaced if any of the following conditions exist when the transmission is being replaced or repaired:

- There is a heavy accumulation of dirt or contamination in the bottom of the oil pan.
- The transmission oil is burnt or black.
- Small particles can be seen suspended in the oil.
- Excessive torque converter hub damage has occurred.
- The problem is directly related to the torque converter.

In addition to the above conditions, the transmission cooler lines should be flushed thoroughly to clean the transmission's hydraulic system. (Refer to the appropriate service manual for the recommended procedure.)



Technical Service Information

1986 MODEL YEAR — R.W.D. CHRYSLER PASSENGER CAR TRANSMISSIONS

<u>1986 Assy. No.</u>	<u>1985 Assy. No.</u>	<u>Engine Cu/In</u>	<u>Type Trans.</u>	<u>Other Information</u>
*4348703	4058398	318	A999	Lock-up
4412001	4295887	318	A999	Lock-up
4412002	4329436	318	A999	Lock-up — Fleet
*4348792	4269932	1.6L	A904	MMC Non Lock-up
*4348793	4269933	2.0L	A904	MMC Non Lock-up
*4348797	4269934	2.6L	A904	MMC Non Lock-up

TRUCK TRANSMISSIONS

*4348798	4202898	2.6L	A904	MMC 4×4 Non Lock-up
4329633	4058383	225	A904T	Part Throttle Unlock
4348782	—	225	A904T	Non Lock-up
4348715	4058398	318	A999	Part Throttle Unlock
4329632	—	318	A999	Part Throttle Unlock, HD Extension
—	4058384	225	A727	Lock-up — Long Extension
—	4295941	225	A727	Non Lock-up — Long Extension
*4348718	4329482	318/360	A727	Non Lock-up — Short Extension
*4377823	4377821	318	A727	Non Lock-up — Long Extension
*4348768	4329438	318	A727	Non Lock-up — H.D. Long Extension
*4348783	4329458	318	A727	Non Lock-up — 4×4
*4348785	4329468	318/360	A727	Non Lock-up — H.D. Long Extension
*4377824	4377822	318/360	A727	Non Lock-up — H.D. Long Extension
*4348786	4329488	360	A727	Non Lock-up — 4×4

MARINE AND INDUSTRIAL TRANSMISSIONS

4142312	4142312	225	A727	Non Lock-up — Short Extension
4142313	4142313	225	A727	Non Lock-up — Medium Extension
4142321	4142321	318/360	A727	Non Lock-up — Medium Extension
4142362	4142362	Diesel	A727	Non Lock-up — Short Extension
4142363	4142363	Diesel	A727	Non Lock-up — Medium Extension
4142364	4142364	Diesel	A727	Non Lock-up — Long Extension
4142901	4142901	258/360 AMC	A727	Non Lock-up — Medium Extension

Note: 1986 Transmissions marked thus "*" can be used to service 1985 units.

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

AMERICAN MOTORS TRANSMISSIONS				
1986 Assy. No.	1985 Assy. No.	Engine Cu/In	Type Trans.	Other Information
—	8953001334	2.1L Diesel	A904	4×4 XJ Non Lock-up
*8953001672	8953002430	2.46/2.8L	A904	4×2 XJ Lock-up
*8953002097	8953001141	2.46/2.8L	A904	4×4 XJ Lock-up
—	8933000916	258	A998	4×4 Eagle Lock-up
8933002366	8933002366	258	A998	4×4 Eagle Non Lock-up
—	8933000913	258	A999	4×4 Jeep Lock-up
8933000917	8933000917	258	A999	4×4 Jeep Non Lock-up
8953003074	—	4.2L	A999	4×4 YJ Non Lock-up
8953001836	8953001836	4.2/5.9L	A727	4×4 SJ Non Lock-up
8993000026	8993000026	Diesel	A727	AM International Non Lock-up

Note: Transmissions marked thus "*" can be used to service 1985 units.

AM GENERAL TRANSMISSIONS

—	5995621	2.46L	A904	1/4 Ton Postal Non Lock-up
—	5995949	258	A999	1/2 Ton Postal Non Lock-up

OTHER TRANSMISSIONS

4025739	4025739	—	A727	Aston Martin — Lock-up
4058387	4058387	—	A727	Karrier Motors — Non Lock-up
4348990	4348990	Diesel	A727	MMC Medium — Non Lock-up
3836023	3836023	—	A727	Land Rover — Non Lock-up
3836024	3836024	Diesel	A727	Iveco Short — Non Lock-up
3836040	3836040	—	A727	Maserati — Lock-up
3836054	3836054	318	A727	Stonefield — Non Lock-up
3836061	3836061	Diesel	A727	Matbro Short — Non Lock-up
3836063	3836063	Diesel	A727	Sirmac Short — Non Lock-up
3836064	3836064	Diesel	A727	Boss Motor — Non Lock-up

AUTOMATIC TRANSMISSION SERVICE GROUP



Technical Service Information

1986 MODEL YEAR CHANGES — R.W.D.

PART THROTTLE UNLOCK (A904)

Part throttle unlock feature was incorporated in all 318 (A999) and 225 (A904T) truck transmissions with lock-up. Performance is improved by unlocking the torque converter with application of heavy throttle at speeds up to 50 mph. Lock-up and unlock points are computer controlled by sensing road speed, engine vacuum and engine temperature.

Addition of a solenoid in the valve body assembly required changes to the valve body, steel plate, transfer plate, throttle pressure adjusting bracket, case and reverse band lever. Following is a description of the parts that changed.

CASE — Threaded hole added in rear face for solenoid connector. Casting revision in accumulator bore area to provide clearance for solenoid. The new cases can be used to service prior models by plugging connector hole with P/N 6028873 plug.

	<u>New P/N</u>	<u>Old P/N</u>	
Case Assy.	4202767	4130977	318 Engine
Case Assy.	4202768	4202047	225 Engine

TRANSFER PLATE — Hydraulic passages revised and bore added for the solenoid. Tapped hole for attaching solenoid also added. New part used only with part throttle unlock assemblies.

STEEL PLATES — Orifice added and provisions added for P/T unlock solenoid. Used only with P/T unlock.

TP ADJUSTING BRACKET —

Redesigned for added strength. Can be used in prior model valve body assemblies except those used in MMC transmissions.

<u>New P/N</u>	<u>Old P/N</u>
4348882	3743840

VALVE BODY — Hydraulic passages revised to provide control circuit to P/T unlock solenoid. New valve body is not interchangeable with old part. However, in conjunction with new steel plates, it will be used in regular lock-up and non lock-up valve bodies for production and service.

<u>New V/ Body Assys.</u>	<u>Old V/ Body Assys.</u>	
4348757	—	P/T Unlock (225)
4348760	—	P/T Unlock (318)
4348762	—	Non Lock-up
4348759	4202634	Regular Lock-up
4348765	4269125	Non Lock-up
4348964	4295888	Regular Lock-up
4412488	—	Regular Lock-up
4348763	4202633	Non Lock-up
4348764	4295863	Regular Lock-up
4348965	4202631	Non Lock-up
4348961	4202578	Regular Lock-up
4348962	4202876	Regular Lock-up
4348774	4269151	MMC Non Lock-up
4348963	4202636	Regular Lock-up
4348940	4295894	Non Lock-up
4348773	4202875	Regular Lock-up
4348772	4202632	Regular Lock-up

SOLENOID ASSEMBLY — New part added. P/N 4348719

SOLENOID CONNECTOR — New part added. P/N 4348945

LOCK-UP BODY — Hydraulic passages revised. New body will be used with regular lock-up and past model service.

LOCK-UP SPRING — New 4.0# spring for P/T unlock only.

REVERSE BAND LEVER — Cast and machining changes to provide clearance for solenoid. New lever will service prior models.

<u>New P/N</u>	<u>Old P/N</u>	
4202764	2801815	Lever Assembly



Technical Service Information

HEAVY DUTY EXTENSION (A999 & A904T)

New extension was released for use in long wheelbase trucks. The bearing access hole was rotated 90°, flange thickness increased, and ribs added to increase strength. The new heavy duty part can be used in place of regular extension in trucks.

	<u>New P/N</u>	<u>Old P/N</u>
Extension	4329883	3681600
Est. Assembly	4329882	3681599

TRANSMISSION ASSEMBLY (A904T)

As the A727 transmission will not be used with 225 6-cylinder truck engine in 1986, a new non lock-up transmission was released for California usage. Valve body assembly requires a new steel plate P/N 4348702, and uses lock-up body (without valves) P/N 4348863 as a stiffener instead of flat plate P/N 3410380.

"XJ" JEEP CASE (A904)

Case modified by adding a cast slot and two reamed holes for attaching Renix timing probe. The new case will be used to service prior models.

	<u>New P/N</u>	<u>Old P/N</u>
Case	4348603	4269738
Case Assembly	4348840	4295866

"YJ" JEEP TRANSMISSION (A999)

New transmission for "YJ" Jeep usage with 258 (4.2L) engine. Same as used with "CJ" and "SJ" Jeep except for Eagle adapter P/N 4269952.

CASE (A727)

Depth of three 7/16-14 holes at bottom of A-engine bell increased to permit use of longer strut bolts. New case will service prior models.

	<u>New P/N</u>	<u>Old P/N</u>
Case	4377912	4130190
Case Assembly	4377913	4130379

318 PASSENGER CAR TRANSMISSION (A999)

Lock-up speed decreased in units used with 2.2 axle ratio in passenger cars. New valve body assembly P/N 4412488 to replace P/N 4295888 for this application. Transmission and valve bodies are not interchangeable.

CHRYSLER CORPORATION TRANSAXLES 1986 MODEL YEAR

<u>1986 Assy. No.</u>	<u>1985 Assy. No.</u>	<u>Engine</u>	<u>Type</u>	<u>Overall Ratio</u>	<u>Other Information</u>
4377906	4207905	2.2	A413	2.78	Standard
4377902	4329506	1.8-2.2-2.5	A413	3.02	Standard
4377903	4329546	2.2-2.5	A413	3.22	Heavy Duty
4377904	4329542	2.2	A413	3.50	Mexican — Heavy Duty
4377907	4329538	2.2	A413	3.02	(Turbo — Heavy Duty (Police-Taxi)
—	4329541	2.2	A413	3.22	Mexican Turbo
4377899	—	2.2	A413	3.50	Mexican Turbo
—	4329547	2.6	A470	3.02	Standard
—	4329564	2.6	A470	3.02	Heavy Duty
4377911	4329565	2.6	A470	3.22	Heavy Duty
4377973	4329401	1.4	A415	3.50	Talbot (Simca)
4377974	4329402	1.6	A415	3.73	Talbot (Simca)