

SECTION 7A

AUTOMATIC TRANSAXLE/TRANSMISSION

DIAGNOSIS AND GENERAL SERVICE

The service procedures in this section are common to all automatic transaxles and automatic transmissions. For on-car service and overhaul procedures, refer to the specific sections.

For vehicles sold in Canada and equipped with non-closed loop engines, also refer to the appropriate Canadian service manual supplement.

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DIAGNOSIS

Automatic transaxle/transmission malfunctions are caused by one, or a combination, of the following:

- Improper fluid level
- Low engine performance
- T.V. cable misadjustment
- Manual linkage misadjustment
- Internal fluid leaks
- Electrical failure
- Mechanical failure

PRELIMINARY CHECKING PROCEDURE

Figure 1

Most of the automatic transaxle/transmission problems are caused by improper external adjustments. Before attempting to service a transmission or transaxle, the fluid level and external adjustments should be checked and corrected as necessary.



Inspect

1. Warm up engine and transmission to operating temperature.
2. Fluid level. Refer to "Fluid Level Checking Procedure".
3. Engine idle speed



Important

- Do not attempt to proceed with the *Preliminary Checking Procedure* if the engine does not perform properly. Correct any engine malfunction first.
4. T.V. cable for freedom of movement and returnability at cable activating lever. Check to be sure that the T.V. cable is adjusted to the proper length.
The T.V. cable may function properly with the engine shut off and cold but may malfunction when hot. Check both cold and at operating temperature.
 5. Shift control linkage. Make sure the linkage does not bind and is properly adjusted.

6. Test drive car.

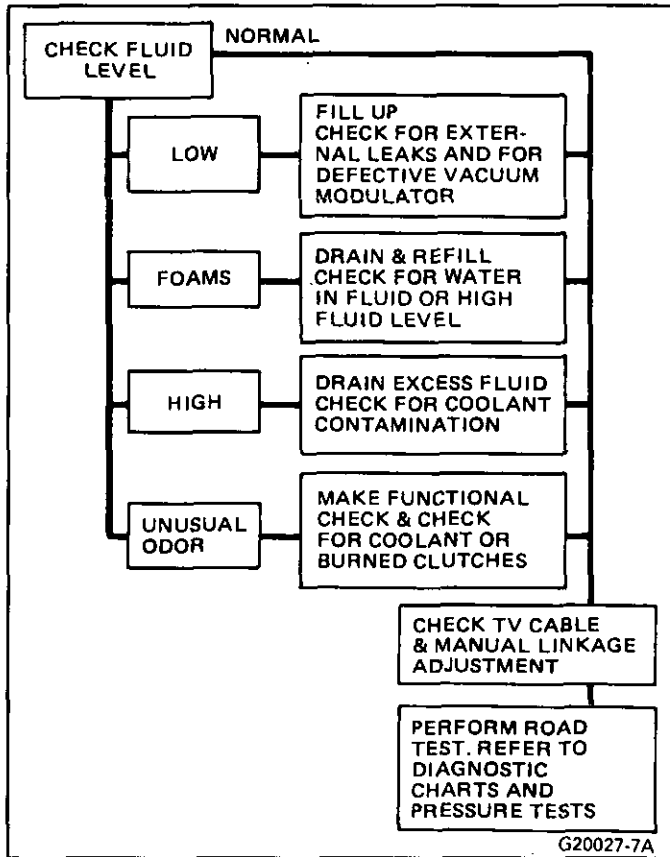


Fig. 1 Preliminary Check Procedure

ROAD TEST PROCEDURE

! Important

- Perform the road test in an organized manner. Carry out **all** steps in the sequence shown. Note the results of each step for later evaluation with the aid of the Diagnostic Charts in the Specific Automatic Transaxle/Transmission Section.

L Inspect

1. "DRIVE" range
 - a. Place gear selector into "DRIVE" (D) and accelerate car.
 - b. Observe the 1-2 and 2-3 shift. Shift points will vary with throttle pressure.
 - c. Observe Torque Converter Clutch (TCC) engagement. This should occur between 35-50 mph (57-80 km/h). Refer to "TCC Diagnosis".

! Important

- TCC will not engage if the engine is not at operating temperature.
- d. Observe 3-2 downshift
 - Part Throttle Downshift

- At a speed of 25-30 mph (40-50 km/h) quickly open throttle approximately 3/4.

- Full Throttle Downshift

- At a speed of 50 mph (80 km/h) open throttle fully.

2. "INTERMEDIATE" range (I or 2) - 3rd gear is inoperative at this setting.
 - a. Place gear selector into "2".
 - b. Accelerate car and observe 1-2 shift. The shift point will vary with the throttle opening. The 1-2 shift will be firmer than in the "D" range.
 - c. Observe 2-1 downshift.
 - Accelerate car to 20 mph (32 km/h).
 - Quickly open the throttle to wide open and observe downshift.
 - Place gear selector into "D".
 - Accelerate car to 50 mph (80 km/h).
 - Close throttle, move gear selector to "2" and observe downshift.
3. "LOW" range (L or 1) - 2nd and 3rd gear should be inoperative at this setting. Do not overspeed engine.
 - a. Observe 2-1 downshift.
 - b. Place gear selector into "2" and accelerate to 40 mph (64 km/h).
 - c. Close throttle and move gear selector into "1". The 2-1 downshift should occur between 25-45 mph (40-72 km/h).
4. "REVERSE" (R)
 - Place gear selector into "R" and observe reverse.
 - Do not place gear selector into "R" while vehicle is moving.

FLUID PRESSURE TEST PROCEDURE

1. Install pressure gage J-21867 or J-5907-A. See specific transmission section.
2. Note transmission model code and refer to the appropriate chart in the specific transmission section for the correct pressure range and engine speeds.

CAUTION: To avoid possible personal injury and/or damage to the car, brakes must be applied at all times during the test.

Causes of Low Oil Pressure

1. Low oil level
2. T.V. system (pressure low in "NEUTRAL", "DRIVE" and low to normal in "INTERMEDIATE" and "REVERSE")
 - T.V. cable misadjusted, sticking or broken. Refer to T.V. Cable Diagnosis.
 - T.V. linkage binding or incorrect cable.
 - Throttle valve stuck.
 - Shift T.V. valve stuck.
3. Oil strainer plugged or damaged.
4. Oil strainer seal leaking.
5. Control valve and pump assembly bolts loose.

6. Control Valve Assembly:
 - Check ball missing or off location.
 - Stuck or damaged valves:
 - T.V. valve and plunger.
 - Shift T.V. valve.
 - Pressure regulator valve.
 - T.V. boost valve.
 - Pressure relief valve.
 - Modulator valve.
 - 1-2 accumulator piston and/or seal leaking or missing.
 - Internal leaks.
7. ("LOW" only) Low blow off valve damaged, check ball missing or off location.
8. ("REVERSE" only) Low-Reverse clutch housing to case cup plug assembly leaking (Low-Reverse oil pipe leaking-where applicable).
9. Pump vane seals cut or missing.
10. Intermediate oil passages to pressure regulator blocked.
11. Driven sprocket support to case cover leaking.

Causes of High Oil Pressure

1. T.V. system (pressure high in "NEUTRAL" and "DRIVE" and normal to high in "INTERMEDIATE" and "REVERSE")
 - T.V. cable misadjusted, sticking or broken. Refer to T.V. Cable Diagnosis.
 - T.V. linkage binding or incorrect cable.
 - Throttle valve stuck
 - Shift T.V. valve stuck
 - T.V. lifter bent, damaged or too short
2. Control Valve and Pump Assembly:
 - T.V. valve and plunger
 - Shift T.V. valve
 - Pressure regulator valve
 - T.V. boost valve
 - Pump slide stuck
3. ("LOW" only) Low blow-off valve stuck closed
4. Internal pump or case cover leaking

On the basis of the results of the road test and the oil pressure test, consult the Diagnostic Charts for the appropriate model and determine the probable cause.



Important

- A number of sub-assemblies and systems can be repaired without removing the Automatic Transaxle/Transmission. Refer to the appropriate chart in the specific on-car service section.

FLUID LEAK DIAGNOSIS

Most fluid oil leaks are easily located and repaired by visually finding the leak and replacing or repairing the necessary parts. On some occasions a fluid leak may be difficult to locate or repair. The following procedure may help in locating and repairing most leaks.

FINDING THE LEAK

1. Identify the fluid, determine whether it is engine oil, automatic transmission fluid, power steering fluid, etc.
2. At what point is the fluid leaking from? After running the vehicle at normal operating temperature, park the vehicle over a large sheet of paper. After a few minutes, you should be able to find the approximate location of the leak by the drippings on the paper.
3. Visually check around the suspected component. Check around the suspected component. Check around all gasket mating surfaces for leaks. A mirror is useful for finding leaks in areas that are hard to reach.
4. If the leak still cannot be found, it may be necessary to clean the suspected area with a degreaser, steam or spray solvent. Clean the area well, then dry the area. Operate the vehicle for several miles at normal operating temperature and varying speeds. After operating the vehicle, visually check the suspected component. If you still cannot locate the leak, try using the powder or black light and dye method.

Powder Method

1. Clean the suspected area.
2. Apply an aerosol-type powder (such as foot powder) to the suspected area.
3. Operate the vehicle under normal operating conditions.
4. Visually inspect the suspected component. You should be able to trace the leak path over the white powder surface to the source.

Black Light and Dye Method

A dye and light kit is available for finding leaks. Refer to the manufacturers directions when using the kit.

1. Pour specified amount of dye into leaking component.
2. Operate the vehicle under normal operating conditions as directed in the kit.
3. Direct the light toward the suspected area. The dyed fluid will appear as a brightly colored path leading to the source.
 - See kit directions for the color of the fluid and dye mix.

REPAIRING THE LEAK

Once the leak has been pinpointed and traced back to its source, the cause of the leak must be determined in order for it to be repaired properly. If a gasket is replaced, but the sealing flange is bent, the new gasket will not repair the leak. The bent flange must be repaired also. Before attempting to repair a leak, check to be sure that the following conditions are correct as they may cause a leak.

Gaskets

1. Fluid level/pressure is too high.

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2. Plugged vent.
3. Improperly torqued fasteners or dirty/damaged threads.
4. Warped flanges or sealing surface.
5. Scratches, burrs or other damage to the sealing surface.
6. Damaged or worn gasket.
7. Cracking or porosity of the component.
8. Improper sealant used (where applicable).

Seals

1. Fluid level/pressure is too high.
2. Plugged vent.
3. Damaged seal bore (scratched, burred or nicked).
4. Damaged or worn seal.
5. Improper installation.
6. Cracks in component.
7. Shaft surface scratched, nicked or damaged.
8. Loose or worn bearing causing excess seal wear.

Possible Points of Oil Leak

1. **Transaxle/Transmission pan or valve body cover:**
 - Attaching bolts not correctly torqued
 - Improperly installed or damaged gasket
 - Oil pan or valve body cover mounting face not flat
2. **Case Leak:**
 - Filler pipe "multi-lip seal" damaged or missing
 - Filler pipe bracket mislocated
 - T.V. cable "multi-lip" seal missing, damaged or improperly installed
 - Governor cover and "O" rings damaged or missing
 - Speedometer driven gear/speed sensor seal damaged
 - Manual valve bore plug loose
 - Oil cooler connector fittings loose or damaged
 - Axle oil seals worn or damaged
 - Parking pawl shaft cup plug loose
 - Governor pressure pickup plug loose
 - Line pressure pickup pipe plug loose
 - Case to case cover gasket damaged
 - Porous casting
3. **Leak at converter end:**
 - Converter seal damaged
 - Seal lip cut. (Check converter hub for damage.)
 - Bushing moved forward and damaged
 - Garter spring missing from seal
 - Converter leak in weld area. (Refer to Torque Converter.)
 - Porous casting (Case or drive sprocket support)
 - Turbine shaft oil seal worn or damaged
4. **Fluid comes out vent pipe or fill tube:**
 - Over-filled
 - Water in fluid

- Case porous
- Incorrect dipstick
- Plugged vent
- Drain back holes plugged

TORQUE CONVERTER CLUTCH (TCC) DIAGNOSIS

The TCC is applied by fluid pressure which is controlled by a solenoid located inside the Automatic Transaxle/Transmission assembly. The solenoid is energized or released by making or breaking ground contact thru a combination of external switches and sensors.

TCC Diagnosis

- For electrical diagnosis of TCC, refer to the specific carline section in Section 8A, Electrical Diagnosis.
- For diagnosis of emission control related components of TCC, Refer to the specific section of 6E, Driveability and Emissions.
- For the diagnosis of TCC Hydraulic Controls, refer to the specific Transmission section.

Functional Check Procedure



Inspect

1. Install a tachometer
2. Operate the vehicle until proper operating temperature is reached
3. Drive vehicle at 50-55 mph (80-88 Km/h) with light throttle (road load)
4. Lightly touch the brake pedal and check for a slight bump when the TCC releases and a slight increase in engine RPM.
5. Release the brake and check for a re-apply of the converter clutch and a slight decrease in engine RPM.

Preliminary Checking Procedure

The purpose of the preliminary checking procedure is to isolate external (electrical) problems from internal (electrical or mechanical) ones. Refer to "General Service Procedures" for individual component test procedures.



Important

- Use only a scale type ohmmeter. High impedance type ohmmeters and those with a digital readout will not work.
- An ALCL scanner may be used to verify the ground path. Remember, a completed ground does not indicate that the circuit carries current.
- Do not bench test using an automotive type battery. Accidentally crossed wires will destroy the internal diodes of the TCC solenoid.

External Controls

Inspect

- Connect voltmeter between transmission connector and ground.
- Turn key "ON"
- If 12 volts are present at the connector, refer to the specific transmission section for TCC internal diagnosis.
- If 0 or low voltage is found, refer to Sections 6E and 8A for electrical diagnosis.

T.V. CABLE SYSTEM DIAGNOSIS

Inspect

CAUTION: To avoid possible personal injury and/or damage to the car, brakes must be applied at all times during the test.

1. Install line pressure gage.
2. Install engine tachometer.
3. Warm up engine to proper operating temperature.
4. Run engine at 1000 RPM.
5. Apply parking brake
6. Place gear selector in "PARK" and note oil pressure.
7. Place gear selector into "DRIVE". Oil Pressure should be equal or not more than 10 psi (34 kPa) higher than in "PARK".
7. Increase engine speed to 1400 RPM. If oil pressure does not increase, adjust T.V. cable. Refer to "T.V. Cable Adjustment".

SPEEDOMETER SYSTEM DIAGNOSIS

Figures 2 and 3

Refer to Figure 2 for diagnosis of speedometer complaints.

For verification of axle ratio/tire size/speedometer gear combinations, refer to Figure 3.

NOISE AND VIBRATION DIAGNOSIS

1. Vibration with the car in motion.

Inspect

- Engine and transmission mounts, damaged or loose. Refer to Sections 6A, 7A1 and 7A2.
 - Tires out of balance or unevenly worn. Snow tires, mixed sizes or mixed radial and bias ply. Refer to Section 3.
 - Drive shaft bearings worn. Refer to Section 4A.
 - Shock absorbers worn or loose. Refer to Section 3.
 - Front suspension worn, loose or misaligned. Refer to Section 3.
2. Vibration in "PARK" and "NEUTRAL". Worse at idle, tends to disappear as engine speed is increased.

Inspect

- Engine Performance
 - Spark plugs and wires
 - Timing
 - Compression. Refer to Section 6A.
- Engine/Torque Converter Balance
 - Flywheel balance weights loose or missing. Refer to Section 6A.
 - Torque converter out of balance. Refer to "On Car Service, Torque Converter Vibration Test Procedure".

GENERAL SERVICE PROCEDURES

Important

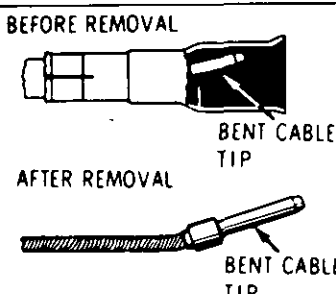
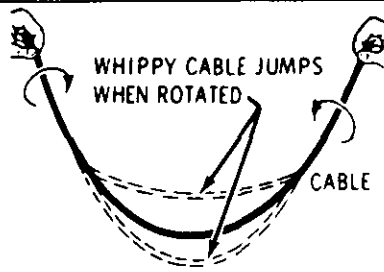
- Keep work area and tools clean.
- Always clean the exterior of the transaxle/transmission before removing any parts.
- Do not use wiping cloths or rags.
- Do not use solvent on:
 - Neoprene seals
 - Composition faced clutch plates
 - Thrust washers
- Blow out all passages with compressed air. Probe small passages with tag wire.
- Handle parts with care to avoid nicks and scratches.

Inspect

- Linkage and pivot points for wear.
- Bearing and thrust surfaces for wear and scoring.
- Broken seal rings and damaged ring lands.
- Gaskets, mating surfaces, seals and "O" rings for damage. Investigate and correct cause of damage.
- Do not remove Teflon oil seal rings unless damaged.
- Case for porosity. Refer to Case Porosity Repair Procedure.

Important

- Expand internal snap rings and compress external snap rings to assure proper seating.
- Lubricate all internal parts as they are being installed.
- When installing cap screws into aluminum parts:
 - Always use a torque wrench.
 - Always dip screw threads in transmission fluid or engine oil.
 - Stripped or damaged aluminum threads may be reconditioned with thread inserts. Refer to Section 6A.
- Replace all gaskets, seals and "O" rings.
 - Always use seal protectors.
 - Do not use gasket cement or sealers, except where noted.

DIAGNOSIS SPEEDOMETER SYSTEM			
COMPLAINT	CAUSE	PROCEDURE	
NOISY	LOOSE FERRULE AT SPEEDO HEAD.	PUSH FERRULE AGAINST SPEEDO HEAD AND RECHECK FOR NOISE.	
	BEND CABLE TIP AT SPEEDO HEAD.	 <p>BEFORE REMOVAL BENT CABLE TIP</p> <p>AFTER REMOVAL BENT CABLE TIP</p>	REPLACE CABLE. LUBRICATE LOWER TWO-THIRDS OF CABLE WITH A THIN COAT OF SPEEDOMETER CABLE LUBRICANT.
	CABLE IS "WHIPPY."	 <p>WHIPPY CABLE JUMPS WHEN ROTATED</p> <p>CABLE</p>	HOLD CABLE IN POSITION SHOWN AND ROTATE. A "WHIPPY" CABLE DOES NOT TURN SMOOTHLY, BUT JUMPS. IF THIS CONDITION EXISTS, REPLACE WITH A NEW CABLE. LUBRICATE LOWER TWO-THIRDS OF CABLE WITH A THIN COAT OF SPEEDOMETER CABLE LUBRICANT AND RECHECK FOR NOISE.
	CAUSE	PROCEDURE	
	NOT PART OF SPEEDOMETER SYSTEM.	WITH CABLE REMOVED FROM CASING, RECONNECT FERRULE AND RECHECK FOR NOISE. IF NOISE STILL EXISTS, GEARS THAT DRIVE THE CABLE AT THE TRANSMISSION MAY BE AT FAULT.	
	FAULTY DRIVEN GEAR IN TRANSMISSION	REMOVE DRIVEN GEAR FROM TRANSMISSION. CHECK FOR FREE ROTATION OF GEAR IN SLEEVE. CHECK FOR BURRS, FLASH, OR UNUSUAL WORN SPOTS. IF GEAR APPEARS FAULTY, REPLACE WITH NEW PART AND RECHECK FOR NOISE.	
	FAULTY SPEEDOMETER HEAD.	IF NOISE STILL EXISTS AFTER PERFORMING THE ABOVE PROCEDURES, REMOVE SPEEDOMETER FOR REPAIR.	
SPEEDO POINTER FLUTTERS	CABLE AND/OR CASING IS KINKED.	REFER TO NOISY CABLE AND/OR CASING KINKED.	
	CABLE IS WEAK.	IF EXAMINATION DOES NOT REVEAL A KINKED CABLE AND/OR CASING, REPLACE WITH A NEW AND PROPERLY LUBRICATED CABLE AND RECHECK FOR POINTER FLUTTER.	
STICKY SPEEDO POINTER BINDS OR HANGS UP	SPEEDO POINTER IS BENT AND RUBS.	REMOVE SPEEDOMETER CLUSTER FROM PANEL AND INSPECT FOR A RUBBING POINTER. STRAIGHTEN POINTER UNTIL IT IS FREE TO MOVE, REPLACE SPEEDOMETER CLUSTER IN PANEL AND RECHECK SPEEDO OPERATION.	
	FAULTY SPEEDOMETER.	REMOVE HEAD FOR REPAIR.	
SPEEDO DOESN'T WORK	BROKEN OR DISCONNECTED CABLE.	IF NEITHER THE SPEEDOMETER POINTER NOR ODOMETER OPERATES, CHECK TO SEE THAT CABLE IS IN PLACE AND TIGHT AT TRANSMISSION AND SPEEDOMETER. IF STILL INOPERATIVE, REPLACE CABLE.	
	FAULTY SPEEDOMETER HEAD.	IF ONLY THE ODOMETER IS INOPERATIVE, OR IF THE ABOVE PROCEDURE IS NOT SATISFACTORY, REMOVE THE SPEEDOMETER FOR REPAIR.	
INCORRECT CALIBRATION	WRONG TRANSMISSION ADAPTER, DRIVEN GEAR OR SLEEVE.	CHECK SPEEDOMETER GEAR REFERENCE CHART FOR CORRECT APPLICATION AND REPLACE IF NECESSARY.	
	OVERSIZE OR UNDERSIZE TIRES.	CHECK CALIBRATION USING CORRECT TIRE SIZE.	
	FAULTY SPEEDOMETER HEAD.	REMOVE SPEEDOMETER FOR REPAIR.	

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Fig. 2 Speedometer System Diagnosis

AXLE RATIO (RPO)	TRANSMISSION		TIRE SIZE	DRIVE GEAR REFERENCE		SPEED GEAR REFERENCE	
	TYPE (RPO)	IDENTIFICATION CODE		COLOR TEETH	NO. OF TEETH	NO. OF	COLOR
3.060	THM125 (MD9)	CD	P185/75R14 P195/70R14 P215/60R15	GREEN	10	30	BLUE
3.180	THM125 (MD9)	PF	P185/75R14 P195/70R14	GREEN	10	30	BLUE
3.350	5 spd (MT2)	ZH	P185/75R14 P195/70R14	BLUE	35	29	RED
3.610	5 spd (MG2)	ZN	P185/75R14 P195/70R14 P215/60R15	NATURAL	35	29	RED
3.650	4 spd (M17)	UA	P185/75R14 P195/70R14 P215/60R15	NATURAL	35	29	RED

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Fig. 3 Speedometer Gear Chart

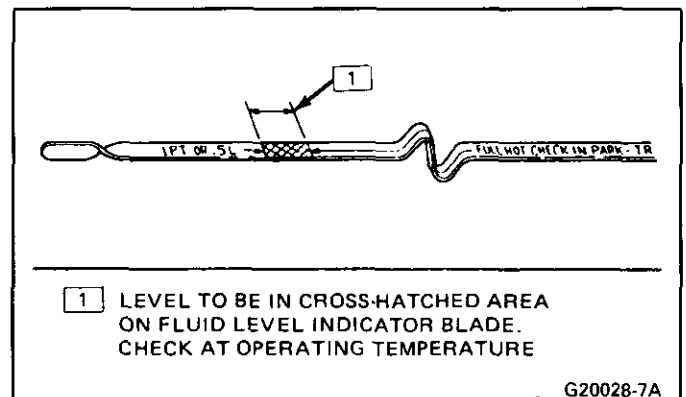
CHECKING AUTOMATIC TRANSAXLE/TRANSMISSION FLUID LEVEL

! Important

- Fluid level should be checked with the Transaxle/Transmission at operating temperature - 150-200°F (83-93°C). This temperature is reached after at least 15 miles (24 km) of highway driving.
- An accurate fluid level reading cannot be obtained if the car has recently been operated under the following conditions:
 - In high ambient temperature - above 90°F (32°C)
 - At sustained high speed
 - In heavy city traffic in hot weather
 - Pulling a trailer
 - In commercial service (taxi, police, etc.)

NOTICE: Do not overfill. Overfilling causes foaming and loss of fluid through the vent and may damage the Automatic Transaxle/ Transmission.

6. Refer to Figure 1 if unusually low or high fluid level is found, if fluid foams excessively or has an unusual odor.



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Fig. 4 Fluid Level Indicator, 125C Transaxle

Fluid Level Checking Procedure

Figure 4

1. Park car on level ground.
2. Apply parking brake.
3. Run engine at slow idle.
4. Move gear selector through all gear positions. Move selector to "PARK" and read fluid level.
5. Maintain fluid level between "ADD" and "FULL". Refer to Figure 4 for Automatic Transaxle. Low fluid level may cause slipping when cold, on a hill, when accelerating or when turning.

CHANGING FLUID AND FILTER

1. Raise vehicle and suitably support.
2. Place drain pan under Transaxle/Transmission oil pan.
3. Oil pan bolts from front and sides
4. Loosen rear oil pan bolts approximately 4 turns.
5. Pry oil pan loose with a screwdriver and allow fluid to drain.
6. Remaining oil pan bolts, pan and gasket.
7. Screen/filter and seal.

Inspect

- Oil pan and screen for foreign material:
 - Metal particles
 - Clutch facing material
 - Rubber particles
 - Engine coolant
- Determine and correct source of contamination.

Clean

- Gasket mating surfaces
- Remove all traces of old gasket
- Oil pan in solvent and blow dry.

Install or Connect

1. Screen, using a new filter and seal. Coat seal with petroleum jelly. Torque screen to specification.
2. Oil pan, using a new gasket. Torque bolts to specification.
3. Lower vehicle
4. Fill Transaxle/Transmission with the proper quantity of Dextron ® II or equivalent. Refer to specific section for quantity.
5. Place gear selector into "PARK".
6. Start engine and run at slow idle. Do not race the engine.
7. Check fluid level. Correct as required.

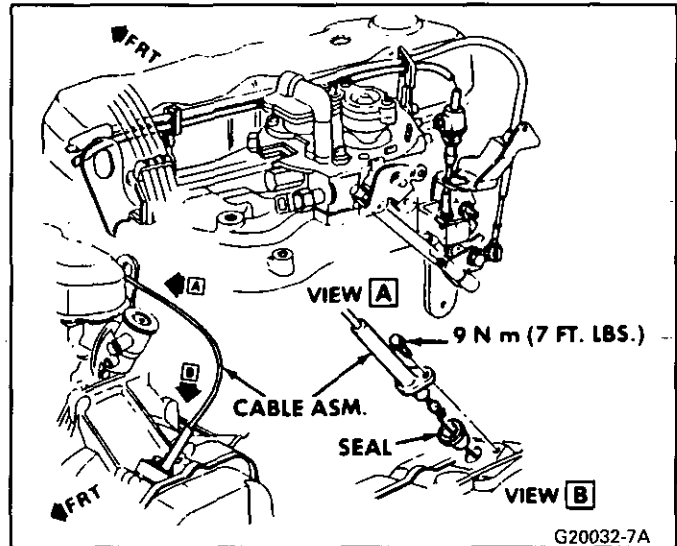


Fig. 5 T.V. Cable System

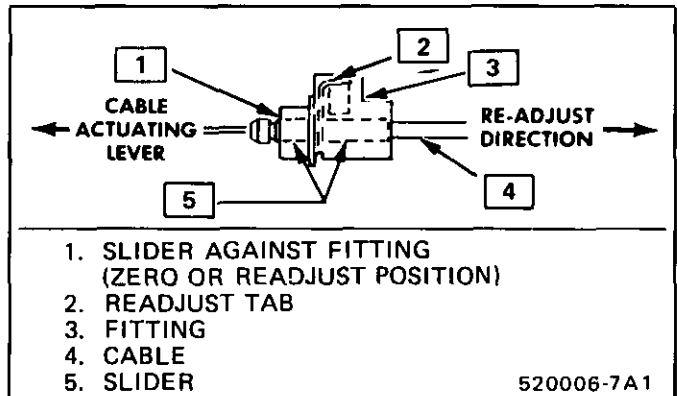


Fig. 6 T.V. Cable Adjuster

T.V. CABLE

Figures 5 and 6

Adjustment Procedure

Important

- Adjustment of the T.V. cable must be made by rotating the throttle lever at the carburetor or throttle body. Do not use the accelerator pedal to rotate the throttle lever. On Diesel engines, the throttle link assembly must be correctly adjusted **Before** making the T.V. cable adjustment.

Adjust

1. Stop engine.
2. Depress and hold down metal readjust tab at engine end of T.V. cable.
3. Move slider until it stops against the fitting.
4. Release readjustment tab.
5. Rotate the throttle lever to its "full travel position."
6. The slider must move (Ratchet) toward the lever when the lever is rotated to its "full travel position."

Inspect

- Check that cable moves freely. The cable may appear to function properly with the engine stopped and cold. Recheck after the engine is hot.
- Road Test Vehicle.

ENGINE COOLANT IN TRANSMISSION

NOTICE: Antifreeze will attack the rubber seals on the selective spacer and the glue used to bond the clutch material to the pressure plate, which may cause transmission damage.

If the transmission oil cooler has developed a leak allowing engine coolant to enter the transmission:

- Disassemble transmission and replace all rubber type seals.
- Replace composition-faced clutch plate assemblies.
- Replace all Nylon parts (washers, speedometers gears and governor gear).
- Replace the Torque Converter.
- Thoroughly clean and rebuild transmission, using new gaskets and oil filter.
- Flush the cooler lines and cooler after the transmission cooler has been properly repaired or replaced.

OIL COOLER AND COOLER LINE FLUSHING

Oil cooler and lines must be flushed if the transmission fluid has been contaminated by engine coolant or if metal, rubber or clutch facing particles have become suspended in the fluid as the result of mechanical failure.

**Clean**

1. Disconnect both cooler lines from the transmission.
2. Place a hose over the end of the cooler inlet line (from the bottom of the cooler) and insert the hose into an empty container.
3. Flush clean Oleum Solvent or equivalent through the return line (from the top of the cooler) using an oil suction gun until clean solvent comes out of the hose.
4. Remove the hose from the inlet cooler line and place it on the return line.
5. Flush clean Oleum Solvent or equivalent through the inlet line until clean solvent comes out the return line. Remove remaining solvent from cooler with compressed air applied to the return line and flush with transmission fluid.
6. Reconnect oil cooler lines and torque nuts to 17 N·m (12 ft. lbs.). Steel tubing should be double flared.

TORQUE CONVERTER CLUTCH (TCC) DIAGNOSIS

- See TCC Diagnosis in this section.

TORQUE CONVERTER STATOR

The Torque Converter Stator roller clutch can have one of two different type malfunctions:

- A. **Stator Assembly freewheels in both directions.**
- B. **Stator Assembly remains locked up at all times.**

Condition A

The car tends to have poor acceleration from a standstill. At speeds above 30-35 mph (50-55 km/h), the car may act normal. If poor acceleration is noted, it should first be determined that the exhaust system is not blocked, the engine timing is correct and the transaxle is in first (1st) gear when starting out.

If the engine freely accelerates to high r.p.m. in "NEUTRAL" (N), it can be assumed that the engine and exhaust system are normal. Driving the vehicle in "REVERSE" (R) and checking for poor performance will help determine if the stator is freewheeling at all times.

Condition B

Engine r.p.m. and car speed limited or restricted at high speeds. Performance when accelerating from a standstill is normal. Engine may over-heat. Visual examination of the converter may reveal a blue color from over-heating.

If the converter has been removed, the stator roller clutch can be checked by inserting a finger into the splined inner race of the roller clutch and trying to turn the race in both directions. The inner race should turn freely clockwise, but not turn or be very difficult to turn counterclockwise.

Do not use such items as the driven sprocket support or shafts to turn the race, as the results may be misleading.

TORQUE CONVERTER VIBRATION TEST PROCEDURE**Inspect**

1. For missing or loose converter-to-flywheel bolts. Tighten or replace as necessary.
2. Converter for damage or missing balance weights. If the converter is damaged or balance weights are missing, replace the converter.
3. Change position of converter to flywheel by 120 degrees at a time to cancel out engine and converter unbalance. Recheck in each position for improvement.
4. If the unbalance persists, leave converter in the best balanced position. Imbalance can be corrected by the use of balance weights clipped to the flexplate or install longer flywheel-to-converter bolts adding and removing washers until optimal balance is achieved.
Important! Some engine/transmission combinations cannot be balanced in this manner due to close clearances between the torque converter bolts and engine.

NOTICE: Be sure the bolts are not bottoming in the lug nuts. If bolts bottom, cover could be dented causing internal clutch facing damage. Always rotate the converter by hand after adding washers to check for clearance. See flexplate balance in Section 6A, General Engine Mechanical.

CONVERTER FLUSHING PROCEDURE

Figures 7 thru 10

Tool Required:

J-21369 Leak Tester

1. Drill a 11/32" (8.5 mm) hole in the converter between two vane extrusions and adjacent to the converter weld seam edge. Figure 7.
 - Drill the hole to approximate completion.
 - Remove the drill bit from the started hole and coat it with grease to retain any metal chips.
 - Complete drilling the hole at low speed.

NOTICE: To prevent converter damage, drill at right angles to the surface and sleeve the drill bit so it can enter no deeper than 1/4" (6.25 mm).

2. Apply grease to a 1/8 x 27 NPSF tap and thread the hole.
3. Drain fluid by propping converter in a drain pan with the drilled hole at the bottom, Figure 8. Drain approximately 15 minutes.
4. Charge converter hub with air to remove as much contaminated transmission fluid as possible. Set converter on pilot, pour in two quarts of cleaning solvent and agitate. Drain converter and to blow dry.
5. Coat a 1/8 x 27 NPTF pipe plug GM 9427802 or equivalent with Teflon pipe sealant or equivalent and install.

6. Torque to 96 in. lbs.

 **Inspect**

- For leaks at 80 psi using Tool J-21369. Put liquid soap or leak-detecting solution on the pipe plug and watch for bubbles.

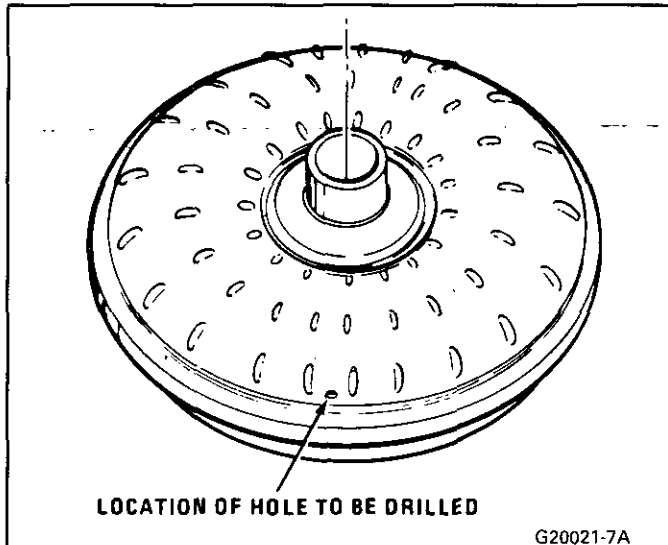


Fig. 7 Location of Hole to be Drilled



Fig. 8 Draining Torque Converter

TORQUE CONVERTER EVALUATION

Figures 9, 10 and 11

Tools Required:

J-21369-D Torque Converter Leak Test Fixture

J-21369-40 125C Leak Test Adapter

J-29060 End Play Checking Tool 200C, 200-4R

J-21371 End Play Checking Tool 325-4L

J-29830 End Play Checking Tool 125C, 440-T4

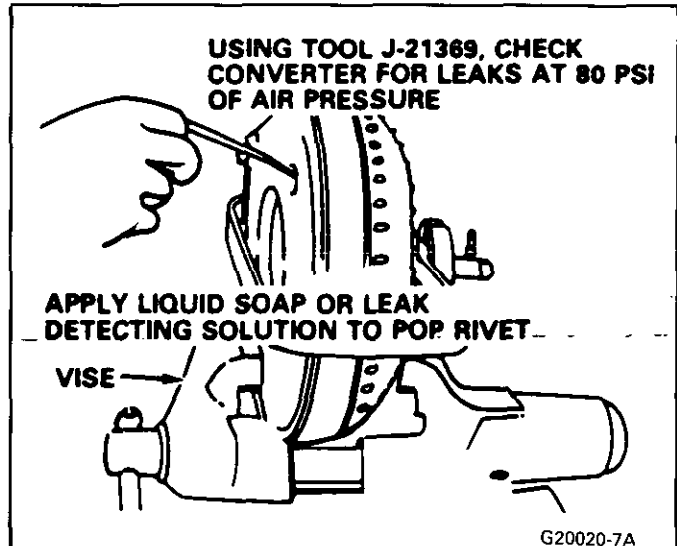


Fig. 9 Pressure Testing Torque Converter

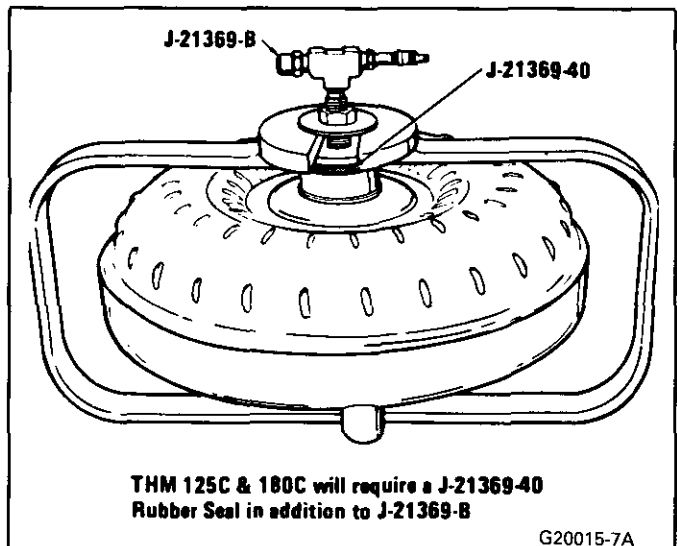


Fig. 10 Pressure Testing Torque Converter

The converter should be replaced if:

- Either the auxiliary valve body cover or pump pocket are badly scored.
- Internal converter failure, such as the stator overrun clutch not locking, thrust bearing failure, etc.. Such failures are also normally associated with "aluminized" oil in the converter.
- End play in the converter exceeds .020" to .024" (0.5mm). This measurement cannot be estimated, but must be made with tool J-29830.
- Leaks externally, such as at the hub weld area.
- Hub scored or otherwise damaged, which could cause a front seal failure or front pump bushing failure.
- A broken, damaged or illfitting converter pilot, which could cause the converter to either not fit into the crankshaft bore properly or not be correctly aligned with the crankshaft.
- If the converter has an imbalance which cannot be corrected, the converter should be replaced. Refer to Converter Vibration Test Procedure.

- Converter contaminated with engine coolant containing antifreeze.

The converter should not be replaced if:

- The oil has an odor, is discolored, and there is no evidence of metal or clutch facing particles. There is no indication that there is internal damage, nor any pump damage. Dump out as much oil as possible from the converter and replace only the oil filter in the pan.
- The threads in one or more of the three converter bolt holes are damaged. Correct with thread insert. Refer to Section 6A.

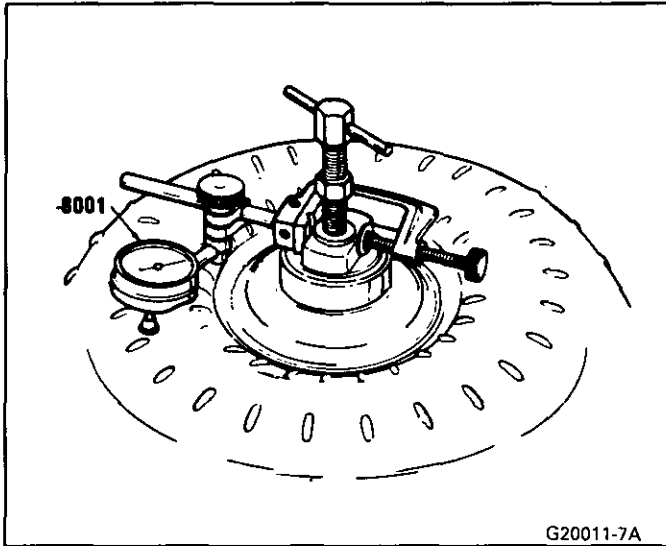


Fig. 11 Checking Torque Converter End Play

CLUTCH PLATE DIAGNOSIS

Composition Plates

 Inspect

- Dry plates and inspect for pitting, flaking, wear, glazing, cracking, charring, and chips or metal particles imbedded in lining.

If a composition plate shows any of the above conditions replacement is required.

Steel Plates

- Wipe plates dry and check for heat discoloration. If the surfaces are smooth, even if color smear is indicated, the plate should be reused. If severe heat spot discoloration or surface scuffing is indicated, the plate must be replaced.

 Important

- If there is evidence of extreme heat or burning in the area of the clutch, the springs should be replaced.

Causes of Burned Clutch Plates

Burned clutch plates can be caused by incorrect usage of clutch plates. Engine coolant in the transmission fluid can cause severe damage, such as

large pieces of composition clutch plate material peeling off.

 Inspect

1. Forward Clutch
 - Check ball in clutch housing damaged, stuck or missing
 - Clutch piston cracked, seals damaged or missing
 - Low line pressure
 - Pump cover oil seal rings missing, broken or undersize; ring groove oversize
 - Case valve body face not flat or porosity between channels
2. Intermediate Clutch or Band.
 - Intermediate clutch piston seals damaged or missing
 - Intermediate band servo piston seals damaged or missing
 - Low line pressure
 - Case valve body face not flat or porosity between channels
3. Direct Clutch
 - Clutch piston seals damaged or missing
 - Case valve body face not flat or porosity between channels
 - (Transaxles) driven sprocket support internal leakage

CASE POROSITY REPAIR PROCEDURE

External leaks caused by case porosity can be repaired with the transmission in the car:

1. Road test and bring the transmission to operating temperature, approximately 93°C. (200°F.)
2. Raise and support car with the engine running. Check for leaks in all operating positions. A mirror may be helpful in finding leaks.
3. Shut engine off and thoroughly clean area to be repaired with a cleaning solvent and air dry.
4. Using instructions of the manufacturer, mix a sufficient amount of epoxy, GM. 1360016 or equivalent to make repair.

CAUTION: EPOXY MAY IRRITATE THE SKIN AND CAUSE EYE DAMAGE. OBSERVE THE MANUFACTURER'S HANDLING INSTRUCTIONS. READ THE LABEL ON THE CONTAINER!

5. While the transmission case is still HOT apply epoxy. A clean, dry soldering acid brush can be used to clean the area and also to apply the epoxy cement. Make certain the area to be repaired is fully covered.
6. Allow epoxy cement to cure for three hours before starting engine.
7. Road test and check for leaks.

GOVERNOR

Figure 12

Refer to specific section for removal and replacement procedure.

All parts of the governor assembly, with the exception of the driven gear, are a select fit and each assembly is calibrated. The governor, including the driven gear, is serviced as a complete assembly. The driven gear can also be serviced separately.

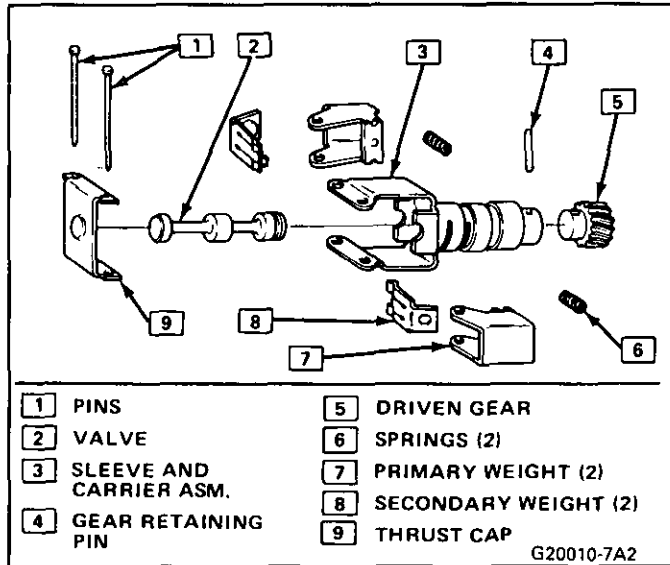


Fig. 12 Governor Assembly (Typical)

Inspect

1. The governor cover "O" ring seal for damage.
2. Governor for missing exhaust check balls.
3. Governor cover for damage or wear in its bore.
4. Speedometer drive gear and thrust washer for excessive wear.
5. Governor driven gear teeth for excessive wear or damage. If excessively worn or damaged, closely inspect the governor drive gear on the output shaft for nicks or damage.
6. The governor secondary weight may be bent and cause the governor weights to bind and not have free motion. (The secondary weight is thinner and lighter than the primary weight.) There must be more clearance between the weights. If no clearance exists, carefully place a small screwdriver between the weights at the pin and pry to create enough clearance to provide free motion of the weights. At the same time, make sure to maintain some clearance between the secondary weight and the governor shaft.
7. The primary and secondary springs must stand straight and not be mis-positioned or tilted. If improperly positioned or tilted, position it properly using a small screwdriver.

Governor Driven Gear

Figure 12

Disassemble

1. Remove retaining ring.
2. Remove washer
3. Remove gear from shaft.
 - Do not attempt to disassemble the governor any further.

Clean

- Wash governor assembly in solvent. Dry and lubricate with transmission fluid.

Assemble

1. Place gear on shaft.
2. Place washer on shaft. of hole.
3. Replace retaining ring.

DRIVE LINK ASSEMBLY (CHAIN)

When disassembling any 125/125C, inspect the drive link assembly (chain) for wear.

Inspect

1. Remove the case side cover to expose the drive link (chain)
2. Midway between the sprockets and at right angles to the chain, push the slack strand (bottom strand) of the chain until all slack is removed and mark with crayon on the bottom side of the chain link. See Figure 13.
3. Push up in the same manner and put a second mark on the case, making sure that both marks are made from the same point on the chain.

Measure

- The distance between the two marks. If the distance exceeds 27.4 mm (1 1/16 inches), replace the drive link (chain).

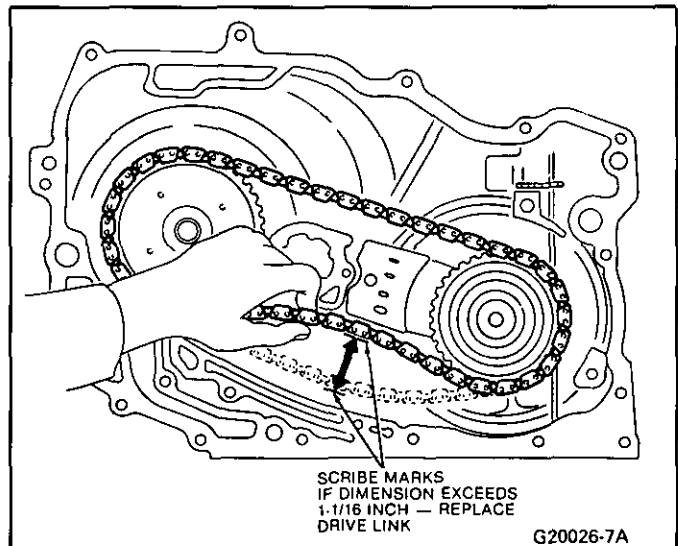


Fig. 13 Checking Drive Link (Chain) Wear

SECTION 7A1

ON-CAR SERVICE 125C AUTOMATIC TRANSAXLE

Before diagnosis of any transmission complaint is attempted, there must be understanding of oil checking procedure and what appearance the oil should have. Many times a transmission malfunction can be traced to low oil level or improper reading of dipstick. Due to the transmission fluid that is now being used, it may appear to be darker and have a stronger odor.

This is normal, and not a positive sign of required maintenance or transmission failure. Also when the dipstick is removed, it should be noted whether the oil is devoid of air bubbles or not. Oil with air bubbles gives an indication of an air leak in the suction lines, which can cause erratic operation and slippage. Water in the oil imparts a milky, pink cast to the oil and can cause spewing.

CONTENTS

General Description	7A1-1	Park Lock Cable	7A1-2
Maintenance and Adjustments	7A1-1	Neutral Safety and Backup Lamp Switch	7A1-4
Drain Intervals	7A1-1	General Service Precautions	7A1-4
Fluid Capacities	7A1-1	On-Car Service	7A1-5
Service Procedures	7A1-1	Serviceable Components	7A1-5
Shift System Cable Removal	7A1-2	Speedometer Driven Gear	7A1-5
Adjustments	7A1-2	Speedometer Drive Gear	7A1-6
Manual Linkage	7A1-2	T.V. Cable	7A1-6
Transmission Control Cable Adjustment	7A1-2	Automatic (Shift Cable)	7A1-6
Park/Lock Control Cable	7A1-2		

GENERAL DESCRIPTION

Refer to the 125C transaxle section for overhaul procedures.

MAINTENANCE AND ADJUSTMENTS

DRAIN INTERVALS

The transaxle operating temperature resulting from the type of driving conditions under which the car is used is the main consideration in establishing the proper frequency of transaxle fluid changes.

Change the transaxle fluid and replace strainer every 15,000 miles if the car is usually driven under one or more of the following severe transaxle service conditions.

- In heavy city traffic.
- Where the outside temperature regularly reaches 90°F (32°C).
- In very hilly or mountainous areas.
- Frequent trailer pulling.
- Commercial use, such as taxi, police car, or delivery service.
- Operating in dusty areas.

If you do not use your car under any of these conditions, change the fluid and replace strainer as suggested in Section 0B

NOTICE: DO NOT OVERFILL. It takes only one pint to raise level from "ADD" to "FULL"

with a hot transaxle. Overfilling can cause damage to transaxle.

FLUID CAPACITIES

- Pan removal - 3.8 liters (4 qts.)
- Overhaul - without converter drain - 5.7 liters (6 qts.)
- Overhaul - with converter drain - 8.5 liters (9 qts.)

SERVICE PROCEDURES

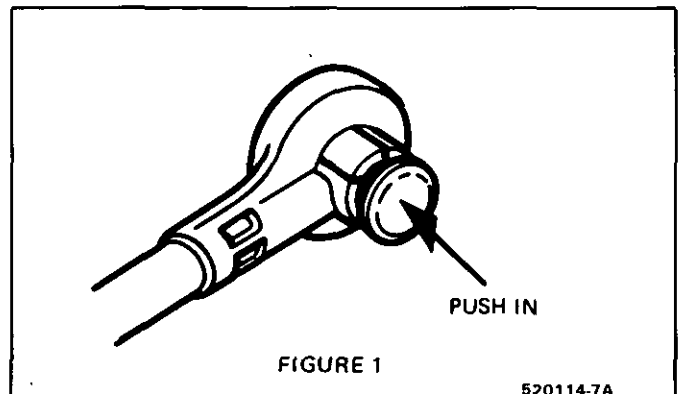


Fig. 7A1-1 Cable Removal (Plug Type)

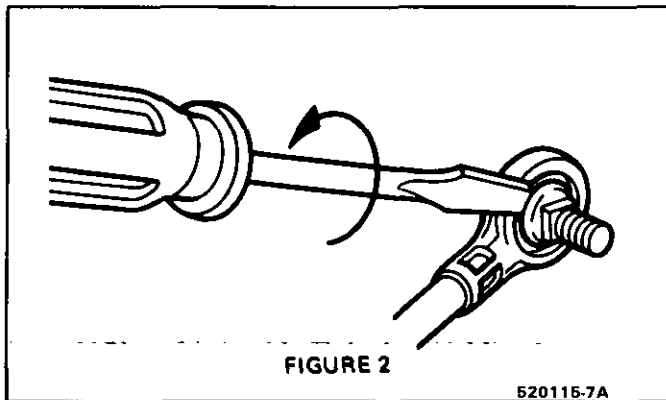


FIGURE 2

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Fig. 7A1-2 Cable Removal (Without Plug)

SHIFT SYSTEM CABLE REMOVAL

Removal procedure for automatic shift linkage cables (shift and park lock) with nylon ends.

- If cable end has a plug (reference Figure 1), push on plug to spread tangs then remove cable end from lever pin (shifter, transmission, etc.).
- If cable end does not have a plug, use a screwdriver or flat tool as shown in Figure 2.
 - Insert tool between lever and nylon end at the pin center line. Rotate tool and cable end will snap off pin.

ADJUSTMENTS

MANUAL LINKAGE

The transaxle manual linkage must be adjusted so that the indicator quadrant and stops correspond with the transaxle detent. If the linkage is not adjusted properly, an internal leak could occur which could cause a clutch or band to slip.

CAUTION: If a manual linkage adjustment is made with the selector lever in the "PARK" position, the parking pawl should freely engage the reaction internal gear to prevent the car from rolling. Transmission, vehicle or personal injury may occur if not properly adjusted.

TRANSMISSION CONTROL CABLE



Adjust

Figure 7A1-4 and 7A1-6

1. Place shift lever in "N" (neutral) position.
2. Place transmission lever in "neutral" position. Obtain "neutral" position by rotating transmission lever clockwise from "park" thru "R" into "N" (neutral).
3. Insert threaded pin (part of shift cable asm) upward through slotted hole in lever and hand start nut. Lever must be held out of park when torquing nut. Impact type tools must not be used.

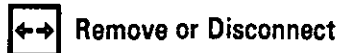


Tighten

Nut to 20-34 N·m (15-25 lb.ft.)

PARK/LOCK CONTROL CABLE

Park Lock Cable



Remove or Disconnect

Figure 7A1-4 and 7A1-5

Remove console covers, hush panel and lower steering column as necessary for access to park lock cable.

1. Negative (-) battery cable.
2. Shift lever in "park" position.
3. Ignition key to "run" position.
4. Cable from inhibitor.

NOTICE: To release cable from inhibitor insert screwdriver blade into inhibitor slot, depress cable latch and pull cable from inhibitor.

5. Cable from park lock lever pin.
6. Cable from shifter base.
7. Cable.



Install or Connect

1. Shift lever in "park" position.
2. Snap cable connector lock button to up position.
3. Snap cable connector to base.
4. Ignition key to "OFF" position.
5. Snap cable into inhibitor housing.
6. Ignition key to "lock" position.
7. Snap cable to park lock lever pin.
8. Push cable connector nose forward toward connector to remove slack.
9. With no load applied to nose, snap cable connector lock button down.



Tighten

1. Shift lever in "park" position.
2. Ignition key to "lock" position.
3. Shift lever should not be able to move to another position. Ignition key should be removable from column.
4. Ignition key to "run" position.
5. With shift lever in "Neutral", ignition key should not be removable from column.

NOTICE: If the above functional checks were met adjustment is complete. If key can be removed in "Neutral" snap connector lock button to up position and repeat Steps 8 and 9. If key cannot be removed in "Park" position, snap connector lock button to up position and move cable connector nose rearward until key can be removed from ignition. Snap connector lock button down.

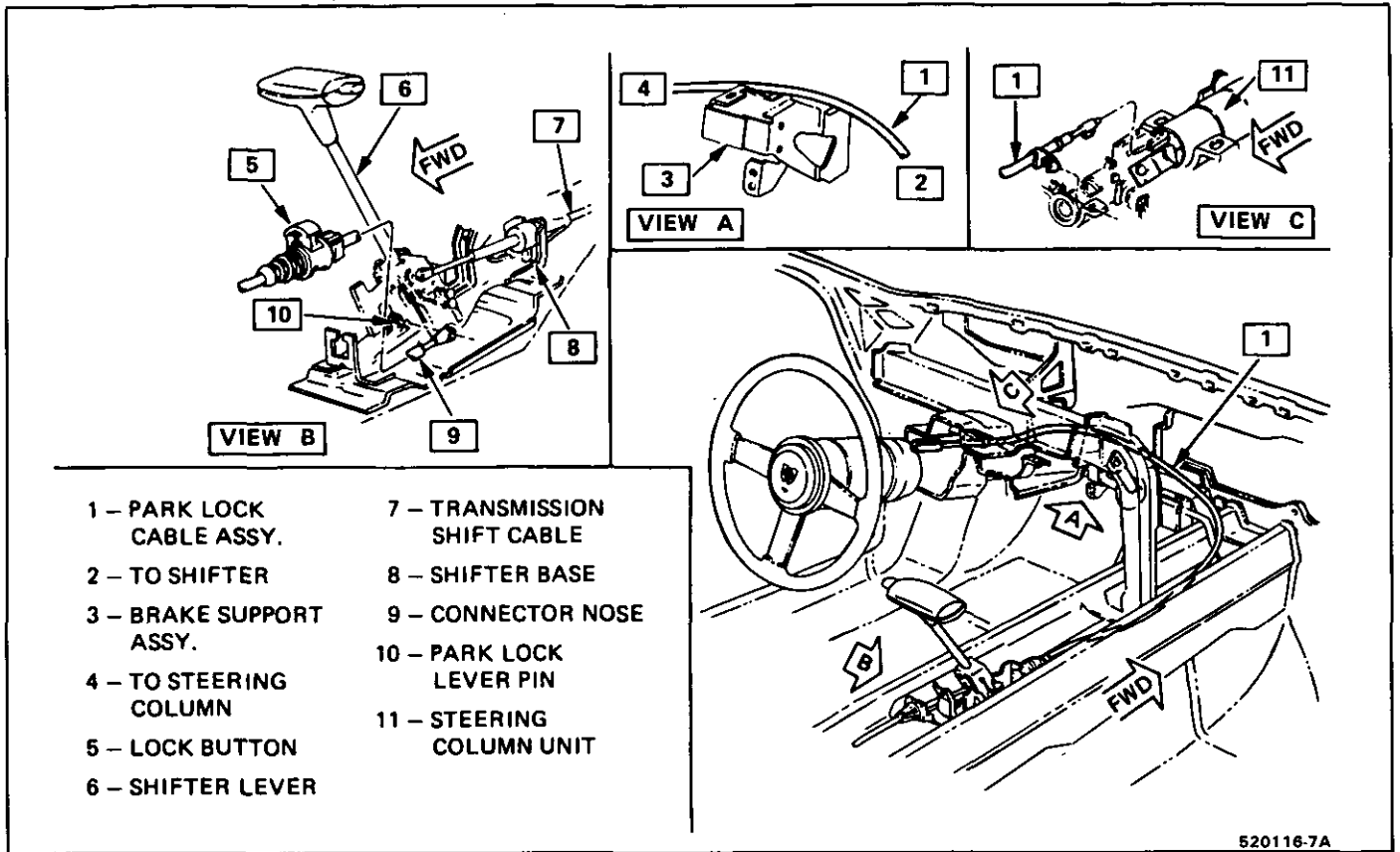


Fig. 7A1-3 Park Lock Cable Routing

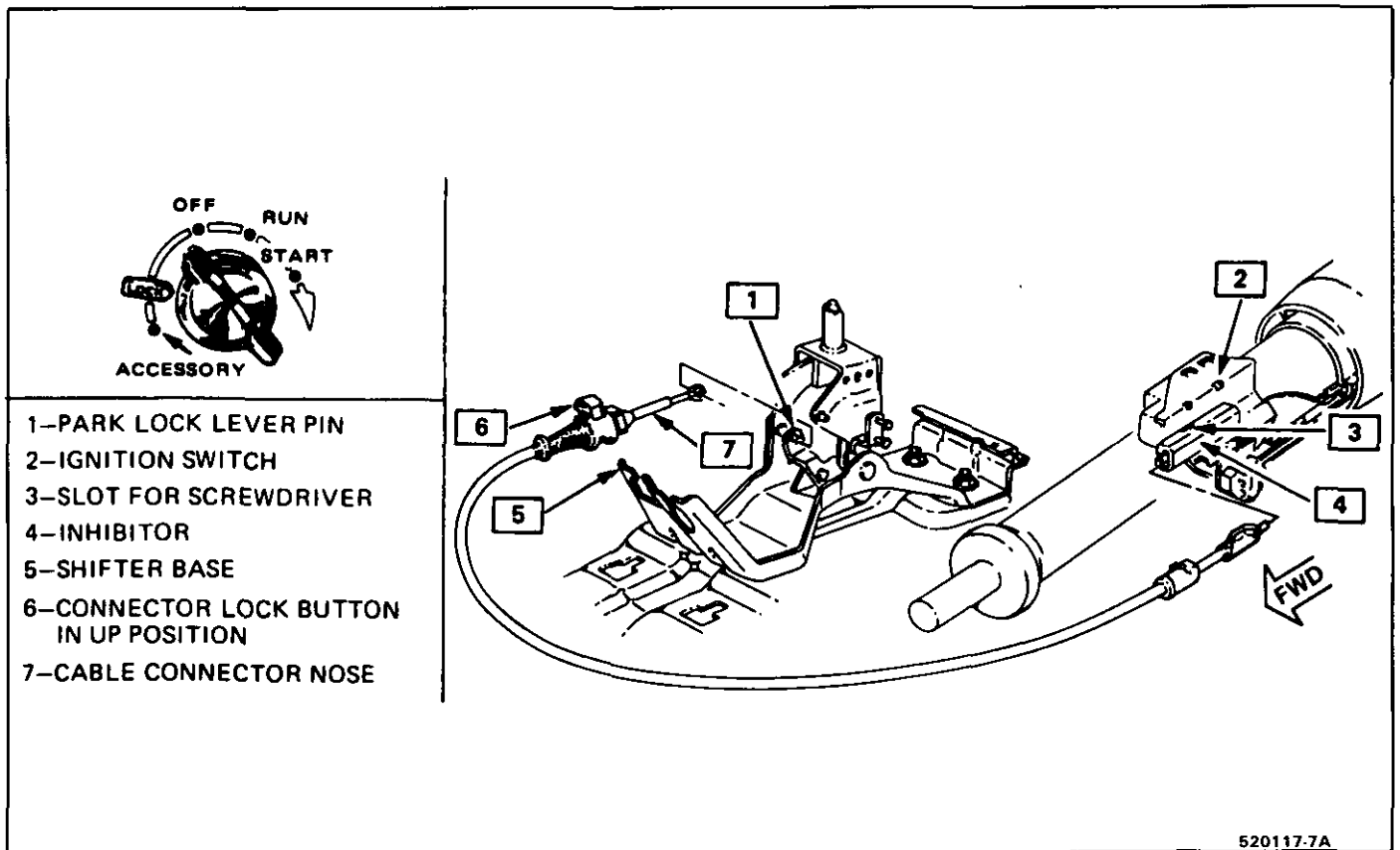


Fig. 7A1-4 Park Lock Cable Adjustment Illustration

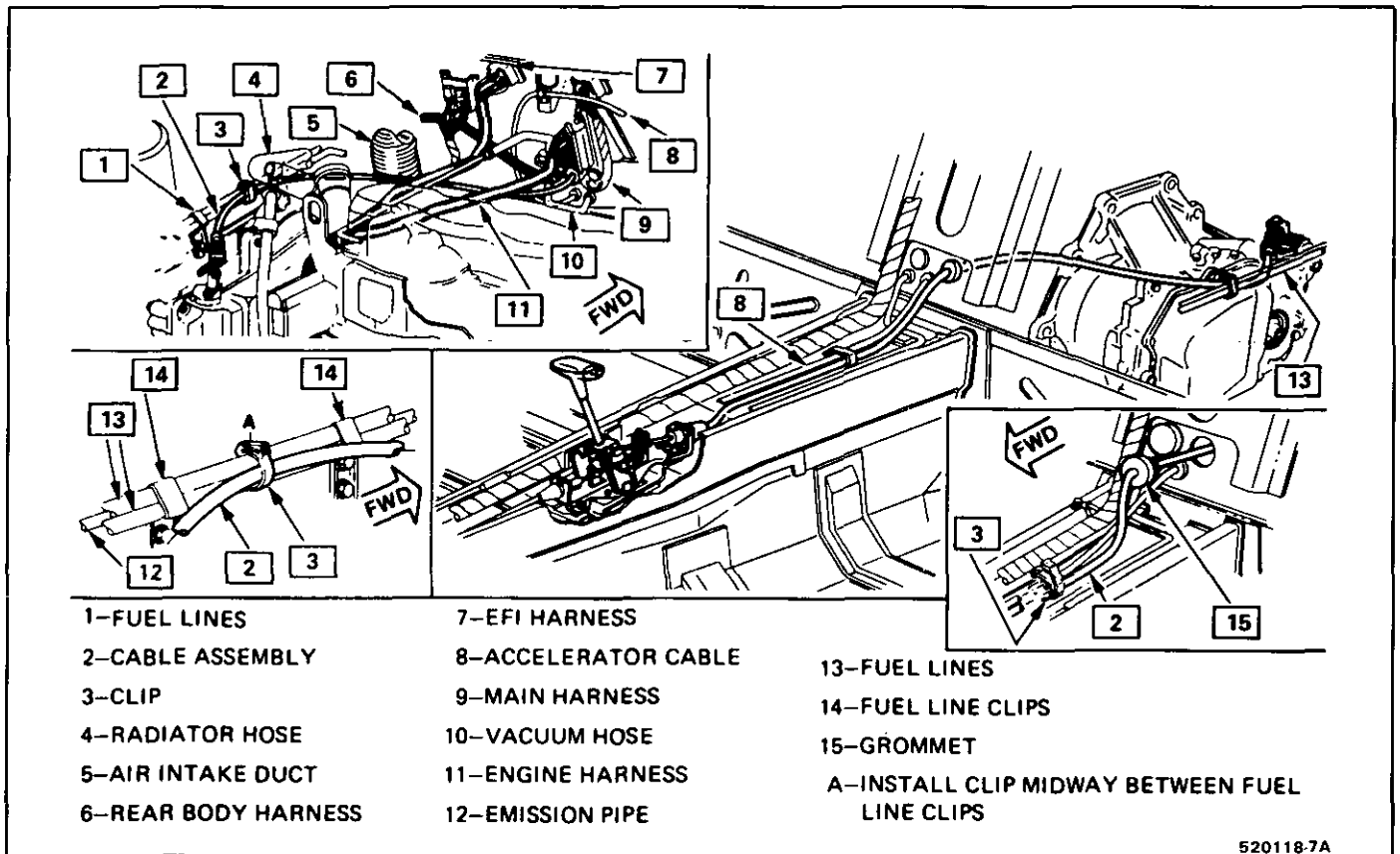


Fig. 7A1-5 Transaxle Control Cable Routing

Neutral Safety and Backup Lamp Switch



Adjust

Figure 7A1-6

1. Place transmission shaft in "NEUTRAL" position.
2. Align flats in switch insert with flats on transmission shaft and push switch over shaft.
3. Loosely assemble bolts to transmission case.
4. Insert 2.34 dia. gage pin (or rounded shank end and a 3/32 inch drill bit) into service adjustment hole. Rotate the switch until the gage pin drops to a depth of 9mm.
5. Tighten attaching bolts to recommended torque.
6. Remove gage pin.

GENERAL SERVICE PRECAUTIONS

- When servicing the transaxle, it is recommended that upon disassembly of a unit, all parts should be cleaned and inspected.
- The unit should be reassembled before disassembly of other units to avoid confusion and interchanging of parts.
- Before disassembly of the unit, thoroughly clean the exterior.
- Disassembly and reassembly of the unit and the subassemblies must be made on a clean work bench. As in repairing any hydraulically operated unit, cleanliness is of the utmost importance;

therefore, the bench tools, and parts must be kept clean at all times.

- Before installing cap screws into aluminum parts, **ALWAYS DIP SCREWS INTO TRANSMISSION OIL** to prevent cap screws from galling the aluminum threads and also to prevent the screws from seizing.
- Always use a torque wrench when installing cap screws into aluminum parts to prevent the possibility of stripping the threads.
- If tapped threads in aluminum parts are stripped or damaged, the part can be made serviceable by the use of Heli-coils or equivalent.
- Seal-protecting tools must be used when assembling the units to prevent damage to the seals. The slightest flaw in the sealing surface of the seal can cause an oil leak.
- The aluminum castings and the valve parts are very susceptible to nicks, burrs, etc., and care should be exercised when handling them.
- The internal snap rings should be expanded and the external snap rings compressed if they are to be reused. This will ensure proper seating when installed.
- Replace all "O" rings, gaskets and oil seals that are removed. Teflon oil seal rings should not be removed unless damaged.
- During assembly of each unit, all internal parts must be lubricated with oil.

ON-CAR SERVICE

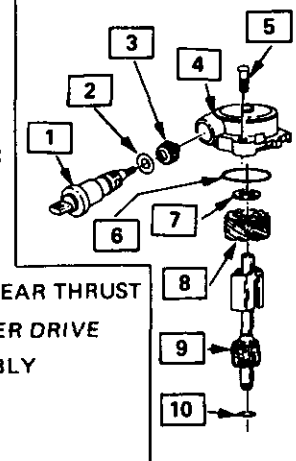
SERVICEABLE COMPONENTS

The following parts can be serviced with the transaxle in the car. For part removal and installation procedures not listed in this section, refer to the disassembly and reassembly sections.

1. Throttle valve control cable and/or sleeve seal.
2. Filler pipe and/or sleeve seal.
3. Governor assembly and speedometer gear assembly.
4. Intermediate servo assembly and direct clutch accumulator check valve.
5. Valve body assembly, spacer plate, gaskets, throttle lever and bracket assembly, pump shaft, valve body cover and gasket, TCC solenoid, switch and wiring.
6. Converter to flexplate bolts.
7. Oil pan and/or gasket, strainer assembly and "O" ring.
8. Lo and Reverse pipe, "O" ring seal and oil seal.
9. Dip-stick stop bracket, parking pawl and return spring.
10. Output shaft, axle joint retaining ring, snap ring (shaft) and axle oil seals.
11. Cooler fittings, manual valve, and electrical connector. spring and seal, thermostatic element assembly, manual detent spring and roller assembly, sprockets, drive link and thrust washers.
12. 3rd clutch pressure switch, solenoid, auxiliary valve body, cover and gasket.
13. Park/Neutral and back-up lamp switch.

Speedometer Driven Gear

- 1 - SENSOR ASSEMBLY
- 2 - SEAL, 'O' RING
- 3 - SPEEDOMETER DRIVEN GEAR
- 4 - COVER, GOVERNOR
- 5 - SCREW, GOVERNOR COVER TO CASE
- 6 - SEAL, 'O' RING
- 7 - WASHER, SPEEDO GEAR THRUST
- 8 - GEAR, SPEEDOMETER DRIVE
- 9 - GOVERNOR ASSEMBLY
- 10 - RING OIL SEAL
- 11 - RETAINER



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Fig. 7A1-7 Governor and Speedometer Sensor Assembly


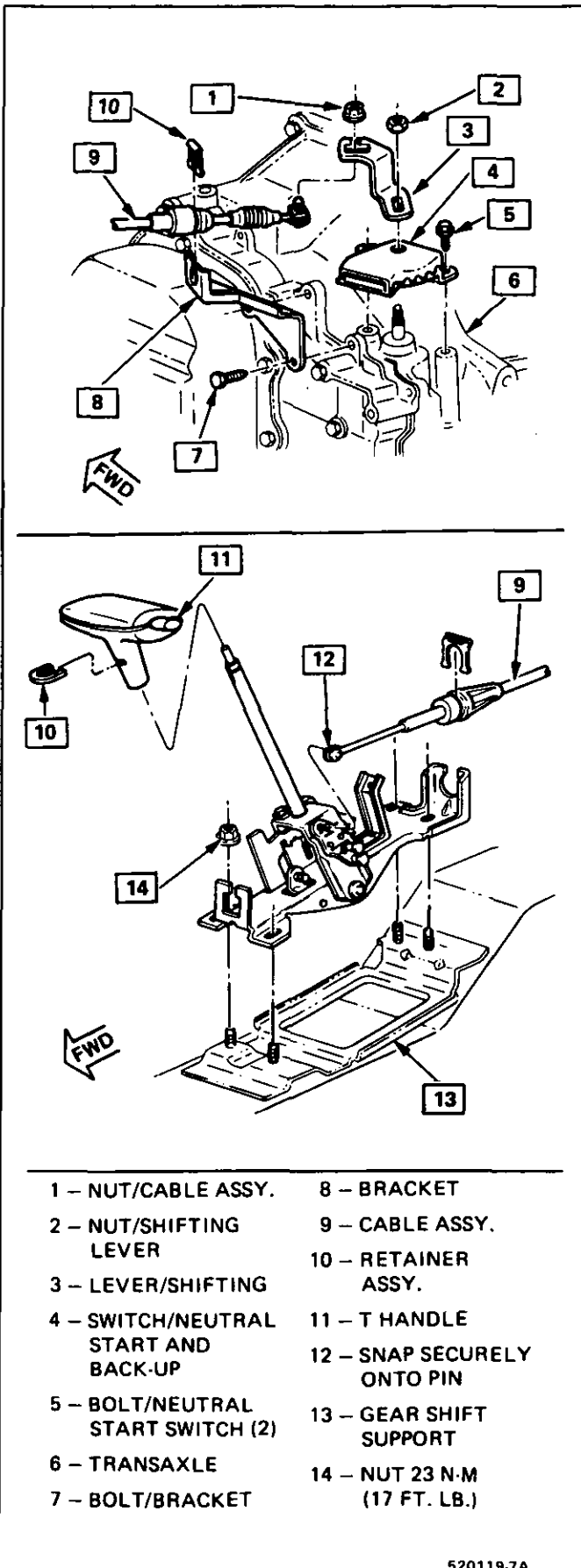
 Remove or Disconnect

Figure 7A-8

1. Negative (-) battery cable.



- | | |
|--------------------------------------|------------------------------|
| 1 - NUT/CABLE ASSY. | 8 - BRACKET |
| 2 - NUT/SHIFTING LEVER | 9 - CABLE ASSY. |
| 3 - LEVER/SHIFTING | 10 - RETAINER ASSY. |
| 4 - SWITCH/NEUTRAL START AND BACK-UP | 11 - T HANDLE |
| 5 - BOLT/NEUTRAL START SWITCH (2) | 12 - SNAP SECURELY ONTO PIN |
| 6 - TRANSAXLE | 13 - GEAR SHIFT SUPPORT |
| 7 - BOLT/BRACKET | 14 - NUT 23 N·M (17 FT. LB.) |

520119-7A

Fig. 7A1-6 Transaxle Controls, Cable Attachment and Neutral Start Switch

2. Electrical connector at sensor assembly.
3. Sensor assembly retainer.
4. Sensor assembly.
5. Speedometer drive gear from sensor assembly.

 **Important**

Reassemble using new O-rings.

 **Install or Connect**

1. Speedometer drive gear to sensor.
2. Sensor assembly.
3. Sensor assembly retainer.
4. Electrical connector at sensor assembly.
5. Negative (-) battery cable.

 **Inspect**

Speedometer for proper operation.

SPEEDOMETER DRIVE GEAR


 **Remove or Disconnect**

Figure 7A1-7

1. Negative (-) battery cable.
2. Electrical connection at sensor.
3. Sensor assembly retainer.
4. Sensor assembly and gear.
5. Governor cover screw.
6. Governor cover.
7. O-ring.
8. Speedometer thrust washer.
9. Speedometer drive gear.

 **Important**

Reassemble using new O-rings.


 **Install or Connect**

1. Speedometer drive gear.
2. Speedometer thrust washer.
3. O-ring.
4. Governor cover.
5. Governor cover screw.
6. Sensor assembly and gear.
7. Sensor assembly retainer.
8. Electrical connection at sensor.
9. Negative (-) battery cable.

 **Inspect**

Speedometer for proper operation.

T.V. CABLE

 **Remove or Disconnect**


1. Air cleaner assembly.
2. T.V. cable at injector.
3. Bolt securing T.V. cable at transaxle.

 **Important**

Pull up on cable cover at transaxle until cable is seen. Disconnect cable from transaxle rod.

 **Remove or Disconnect**

1. Clip securing T.V. cable at valve cover.

 **Install or Connect**

1. T.V. cable at transaxle.

 **Tighten**

Torque T.V. cable bolt to 7-10 N·m (6-7 lb. ft.).

 **Install or Connect**

1. T.V. cable at injector.
2. Clip securing T.V. cable to valve cover.
3. Air cleaner assembly.

 **Adjust**

Make all necessary adjustments to T.V. cable as outlined above.

AUTOMATIC (SHIFT CABLE)

 **Remove or Disconnect**

1. Negative (-) battery cable.
2. Front trim plate and shift knob.
3. Shift trim plate rear console pad assembly and front pad assembly.
4. E.C.M. electrical connection.
5. E.C.M.
6. Front carrier to I.P. reinforcement.
7. Carrier reinforcement.
8. Carpet clips and rivets at console.
9. Heater control.
10. Radio.
11. Carrier.
12. Shift cable from shifter control assembly.
13. Cable from shift lever at transaxle.
14. Yoke clip securing shift cable to transaxle mounting bracket.
15. Pull cable through body into the passenger compartment.

 **Install or Connect**

1. Pilot cable from passenger side through body into engine compartment.
2. Clip cable to transaxle mounting bracket.
3. Snap cable to shift lever.
4. Clip cable in place at, fuel line.
5. Cable to shifter bracket.
6. Cable end to shift lever pin.
7. Carrier assembly, console.
8. Radio.
9. Heater control.
10. Carpet clips and rivets at console.

11. Carrier reinforcements.
12. E.C.M.
13. E.C.M. Electrical connections.
14. Front pad assembly.
15. Front pad trim plate.
16. Rear console pad assembly.
17. Shift trim plate, and shift knob.
18. Negative (-) battery cable.

SECTION 125C

AUTOMATIC TRANSAXLE DIAGNOSIS AND UNIT REPAIR

CONTENTS

GENERAL DESCRIPTION 125C-1 DIAGNOSIS Road Test Procedure 125C-1 Cause of Burned Clutch Plates 125C-3 Component Illustrations 125C-6 Systematic Trouble Shooting Charts 125C-13	UNIT REPAIR Transaxle Disassembly 125C-21 Torque Specifications Chart 125C-62 Required Special Tools 125C-63 Thrust Washer & Bearing Locations..... 125C-61
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GENERAL DESCRIPTION

The 125C automatic transaxle is a fully automatic unit consisting primarily of a 4-element hydraulic torque converter, compound planetary gear set and dual sprocket and drive link assembly. In addition, this transaxle incorporates a differential and final drive gear set.

The 4-element torque converter contains a pump, a turbine, a pressure plate splined to the turbine, and a stator assembly. The pressure plate, when applied, provides a mechanical direct drive coupling of the engine to the planetary gears.

Three multiple-disc clutches, a roller clutch and a band provide the friction elements required to obtain the desired function of the planetary gear sets.

A hydraulic system pressurized by a vane type pump provides the working pressure required to operate the friction elements and automatic controls.

DIAGNOSIS

ROAD TEST PROCEDURE

Drive Range:

Position the selector lever in **DRIVE RANGE** and accelerate the vehicle. A 1-2 and 2-3 shift should occur at these throttle openings. (The shift points will vary with the throttle openings). Check the part throttle 3-2 downshift at 30 m.p.h. (50 km/h) by quickly opening the throttle approximately three-fourths. At 50 m.p.h. (80 km/h) the transmission should downshift 3-2 by depressing the accelerator fully.

Intermediate Range:

Position the selector lever in **INTERMEDIATE RANGE** and accelerate the vehicle. A 1-2 shift should occur

at all the throttle openings. (No 2-3 shift can be obtained in this range.) The 1-2 shift point will vary with the throttle opening. Check the detent 2-1 downshift at 20 m.p.h. (32 km/h). The transaxle should downshift 2-1. The 1-2 shift in **INTERMEDIATE RANGE** is somewhat firmer than in **DRIVE RANGE**. This is normal.

Position the selector lever in **DRIVE RANGE**. With the vehicle speed at approximately 50 m.p.h. (80 km/h) and closed or 0 throttle, move the selector lever to **INTERMEDIATE RANGE**. The transaxle should downshift into 2nd. An increase in engine r.p.m. and an engine braking effect should be noticed.

Lo Range:

Position the selector lever in **LO RANGE** and accelerate the vehicle. No upshift should occur in this range.

At 40 m.p.h. (64 km/h), with throttle closed, move the selector lever to Lo. A 2-1 downshift should occur in the speed range of approximately 45 to 25 m.p.h. (72 to 40 km/h), depending on valve body calibration. The 2-1 downshift at closed throttle will be accompanied by increased engine r.p.m. and an engine braking effect should be noticed. Stop vehicle.

Reverse Range:

Position the selector lever in **REVERSE POSITION** and check for reverse operation.

Converter Clutch

Install an engine tachometer. **Engine must be at normal operating temperature.**

Position the selector lever in drive range. With vehicle speed between 40-45 mph (64-72 km/h), in third gear, the converter clutch will apply. Observe the tachometer. A drop of about 200 rpm's will occur.

PRELIMINARY CHECK PROCEDURE

CHECK TRANSMISSION OIL LEVEL • CHECK AND ADJUST T.V. CABLE
 CHECK OUTSIDE MANUAL LINKAGE AND CORRECT • CHECK ENGINE TUNE
 INSTALL OIL PRESSURE GAGE* • CONNECT TACHOMETER TO ENGINE
 CHECK OIL PRESSURES IN THE FOLLOWING MANNER:

Minimum T.V. Line Pressure Check

Set the T.V. cable to specification; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m.'s indicated in the chart below.

Full T.V. Line Pressure Check

Full T.V. line pressure readings are obtained by tying or holding the T.V. cable to the full extent of its travel; and with the brakes applied, take the line pressure readings in the ranges and at the engine r.p.m.'s indicated in the chart below.

*For line pressure tap location see Fig. A-10, Item 405.

CAUTION Brakes must be applied at all times.

NOTICE Total running time for this combination not to exceed 2 minutes.

MODEL	RANGE	MINIMUM T.V.		MAXIMUM T.V.	
		kPa	P.S.I.	kPa	P.S.I.
BA,BC,BD,BP,CA,CJ,PD,CB,CC,JS,CM,PH,JP,PF,PR,PK,PN,PW,HX,PA CD, CF, CH, CK, CL, CT, CU, CX, HL, HN, HS, HU JB, JD, JF, JJ, JK, JM, JN, JR, JW, RD	Park @ 1000 RPM	455-510 510-585 395-440	65-75 75-85 55-65	No T.V. pressure in Park. Line pressure is the same as Park at Minimum T.V.	
JD, JM JF, JK JN JW JR JJ RD JB PA JP BA, BC, BD, BP, CA, CB, CC, CM, JS, PH, PK, PN, PW CJ HX PD, PF CD CT, CX CF, CK, CL, CU, HL, HN, HS, HU	Reverse @ 1000 RPM	690-765 690-765 690-765 760-840 760-840 760-840 760-840 760-840 780-860 805-890 805-890 805-890 805-890 895-1020 895-1020 895-1020	100-112 100-112 100-112 110-122 110-122 110-122 110-122 110-122 113-125 117-130 117-130 117-130 117-130 130-148 130-148 130-148	1400-1590 1600-1785 1185-1320 1510-1720 1510-1680 1635-1815 1635-1815 1760-1955 1810-2057 1487-1655 1510-1710 1630-1850 1715-1910 1750-1985 1692-1912 1720-1980 1840-2115	203-230 230-260 170-190 220-250 220-245 235-265 235-265 255-285 262-300 215-240 220-248 235-270 250-277 255-290 245-277 250-287 267-307
JB, JF, JK JD, JM JN JR JJ, RD JW JP BA, BC, BD, BP, CA, CC, CB, CM, JS, PH, PR, PK, PN, PW CJ HX PD, PF PA CD CX, CT CF, CK, CL, CU, HL, HN, HS, HU	Neutral/ Drive @ 1000 RPM	395-437 395-437 395-437 395-437 395-437 459-507 459-507 459-507 459-507 459-507 459-507 510-582 510-582 510-582	55-65 55-65 55-65 55-65 55-65 67-74 67-74 67-74 67-74 67-74 67-74 74-85 74-85 74-85	915-1020 800-906 675-753 785-875 850-950 863-981 849-944 863-977 930-1055 979-1090 998-1133 1065-1211 966-1091 982-1130 1050-1208	132-148 116-132 98-110 114-127 125-138 125-143 123-137 125-142 135-153 142-158 145-165 155-176 140-158 142-164 152-175
JD, JF, JK, JM, JN, JW BA,BC,BD,BP,CA,CB,CC,CM,CJ,HX,JP,JS,PD,PF,PH,PR,PK,PN,PW JB, JJ, JR, RD CD, CF, CK, CL, CT, CU, CX, HL, HN, HS, HU PA	Intermediate/ LO @ 1000 RPM	680-750 787-870 826-910 877-998 957-1057	99-109 114-126 120-132 127-145 139-154	No T.V. pressure in Intermediate or Lo. Line pressure is the same as Intermediate/ Lo at Minimum T.V.	

Line pressure is basically controlled by pump output and the pressure regulator valve. In addition, line pressure is boosted in Reverse, Intermediate and Lo by the reverse boost valve.

Also, in the Neutral, Drive and Reverse positions of the selector lever, the line pressure should increase with throttle opening because of the T.V. system. The T.V. system is controlled by the T.V. cable, the throttle lever and bracket assembly and the T.V. link, as well as the control valve pump assembly.

Figure A-1 Preliminary Checking Procedure

CAUSES OF BURNED CLUTCH PLATES OR BAND

A burned clutch or band is generally caused by some condition such as low pressure and/or leaks that prevent proper application. During diagnosis or inspection, this cause must be found.

A cut or damaged seal may be the cause of a clutch problem or may be the result of a burned clutch. If a clutch is burned, excessive piston travel may result and allow one or more of the piston seals to come out of the bore and become cut or folded. When looking for the cause of the problem, the condition of the piston seals should be considered; but further inspection should be made to determine if some other area is the cause of the problem, to prevent a repeat problem.

EXAMPLE: A leak at an intermediate servo piston seal may be the cause of a burned direct clutch and/or intermediate band because the oil pressure that applies the direct clutch also releases the servo piston.

In All Cases of Burned Clutch Plates or Band - Check for

1. The Driven Sprocket Support
 - a. The drive sprocket support seal rings may be leaking.
 - b. The case cover gaskets are not sealing. Case cover gasket leaking.
 - c. The driven sprocket support sleeve may be loose or mispositioned.
 - d. Loose attaching bolts. Torque to 24 N·m (18 ft. lbs.)
2. The Case Cover and Case
 - a. Blocked or interconnected oil channels.
 - b. The sealing surfaces may be damaged or leaking.
 - c. The check balls may be missing or out of location.
 - d. Porosity.
3. The Control Valve Pump Assembly
 - a. The control valve pump assembly to case cover bolts may be loose.
 - b. The sealing surfaces on the control valve pump assembly, spacer plate, and/or gaskets are damaged or leaking.
 - c. The valves may be leaking, binding, or sticking.
 - d. The channels may be blocked or interconnected.

If low line pressure is present, refer to the possible causes.

NOTICE: Burned clutch plates can be caused by incorrect usage of clutch plates. Engine coolant in the transmission fluid can cause severe damage to clutch plate material and result in pieces of composition material peeling off.

Burned Direct Clutch Only*

1. The Direct Clutch Assembly
 - a. The seals may be cut, missing or rolled out of groove.
 - b. The exhaust ball capsule in the housing may be damaged and not sealing.
 - c. The piston or the housing may be damaged, leaking.
 - d. The snap ring may not be fully seated.
2. The Intermediate Servo Assembly
 - a. The wrong servo pin - check selectivity.

- b. The seals may be missing or damaged.
 - c. The servo bore is scored or damaged.
 - d. The servo orifice bleed plug may be missing.
 - e. The band apply pin could be tight in the case bore.
3. The Case Cover and Case
 - a. The #5 check ball missing or off location may be the case cover.
 - b. The accumulator exhaust check valve may be missing or not sealing in the case.

Burned Forward Clutch Only*

1. The Forward Clutch Assembly
 - a. The seal rings on the input shaft could be damaged or missing.
 - b. The Input shaft feed passage or the orifice are restricted.
 - c. Holes not drilled in piston or waved steel clutch plate not installed next to piston.
 - d. The selective backing plate or snap ring may be incorrectly installed, or incorrect selective backing plate.
 - e. The piston seals may be missing or damaged.
 - f. The piston insert may be missing.
 - g. The piston, housing, or shaft could be damaged, leaking.
2. The Control Valve Pump Assembly
 - a. The valve body pipe is loose or leaking.
 - b. Pressure regulator valve roll pin damaged or worn.

Burned Lo and Reverse Clutch Only*

1. The Lo and Reverse Clutch Assembly
 - a. The housing seals are damaged.
 - b. The piston or seals are damaged.
 - c. Wrong number of clutch plates.
2. The Control Valve Pump Assembly
 - a. The reverse boost valve is sticking.
3. The Case Cover and Case
 - a. The #4 or #5 check ball is missing or off location in the case cover.
 - b. The Lo and Reverse pipe is leaking in the case bore.
 - c. The Lo and Reverse clutch housing to case cup plug assembly is restricted, damaged, or not seated properly.
 - d. The Lo and Reverse pipe to case "O" ring and/or seal backup ring is damaged or missing.

Burned Intermediate Band Only*

1. The Intermediate Band
 - a. The band is not properly installed and aligned in the case.
 - b. The apply pin is not engaged.
2. The Intermediate Servo Assembly
 - a. The wrong servo pin - check the selectivity.
 - b. The seals are missing or damaged.
 - c. The servo bore is scored or damaged.
 - d. The band apply pin is tight or undersize in the case bore.
3. The Case Cover and the Case
 - a. The accumulator check valve and/or spring is missing or not sealing properly.
 - b. The direct clutch accumulator cup plug is missing.

- c. The #1 or #2 check balls are missing or off location.
- d. The 1-2 accumulator piston is missing or the seal is leaking.
- 4. The Control Valve Pump Assembly
 - a. The 1-2 accumulator valve is sticking.
* See also above section labeled "IN ALL CASES OF BURNED CLUTCH PLATES OR BAND."
- 5) The pressure relief valve.
- c. The 1-2 accumulator piston and/or seal is leaking or missing.
- d. Internal leaks.
- 7. (Lo only) The Lo blow off valve is damaged, #4 check ball is missing or off location.
- 8. (Reverse only) The Lo-Reverse clutch housing to case cup plug assembly is leaking.
- 9. The pump vane seals are cut or missing.
- 10. The intermediate oil passages to pressure regulator is blocked.
- 11. The driven sprocket support to case cover is leaking.

THE CAUSES OF LOW OIL PRESSURE

- 1. Low oil level.
- 2. The T.V. system (the pressure is low in Neutral, Drive, and low to normal in Intermediate and Reverse.)
 - a. The T.V. cable is misadjusted or sticking.
 - b. The T.V. linkage may be binding, incorrect cable.
 - c. The throttle valve may be stuck in the bore.
 - d. The shift T.V. valve is stuck.
- 3. The oil strainer is plugged.
- 4. The oil strainer "O" ring seal is leaking or damaged.
- 5. The control valve and pump assembly bolts are loose.
- 6. The control Valve Assembly.
 - a. The #5 or #6 check ball is missing or off location.
 - b. The below listed valves may be stuck or damaged.
 - 1) The T.V. valve and plunger.
 - 2) The Shift T.V. valve.
 - 3) The pressure regulator valve.
 - 4) The T.V. boost valve.

CAUSES OF HIGH OIL PRESSURE

- 1. The T.V. system (the pressure is high in the Neutral, Drive and normal to high in intermediate and Reverse).
 - a. The T.V. cable is misadjusted, sticking or broken.
 - b. The T.V. linkage is binding or incorrect cable.
 - c. The throttle valve is stuck.
 - d. The shift T.V. valve is stuck.
 - e. The T.V. lifter is bent, damaged or too short.
- 2. The control Valve and Pump Assembly valves may be sticking or damaged.
 - a. The T.V. valve and plunger.
 - b. The shift T.V. valve.
 - c. The pressure regulator valve.
 - d. The T.V. boost valve.
 - e. The pump slide stuck.
- 3. (Lo only) The Lo blow off valve may be stuck closed.
- 4. The internal pump or case cover may be leaking.

RANGE REFERENCE CHART						
RANGE	GEAR	DIRECT CLUTCH	INTERMEDIATE BAND	FORWARD CLUTCH	ROLLER CLUTCH	LO - REVERSE CLUTCH
PARK - NEUT.						
DRIVE	FIRST SECOND THIRD	APPLIED	APPLIED	APPLIED APPLIED APPLIED	HOLDING	
INTERMEDIATE	FIRST SECOND		APPLIED	APPLIED APPLIED	HOLDING	
LO	FIRST			APPLIED	HOLDING	APPLIED
REVERSE		APPLIED				APPLIED

Figure A-2 Range Reference Chart

PARK

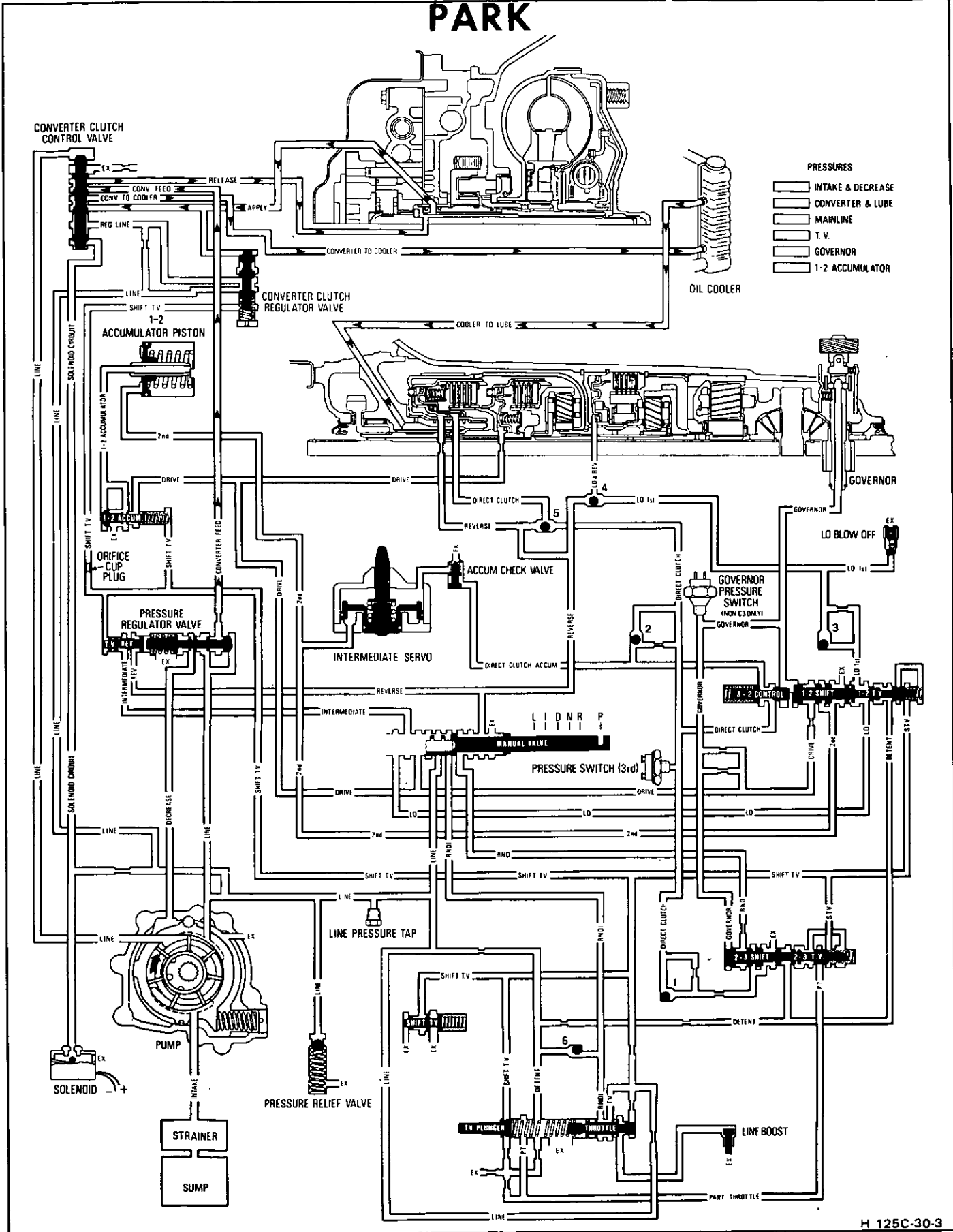


Figure A-3 Hydraulic Oil Circuit

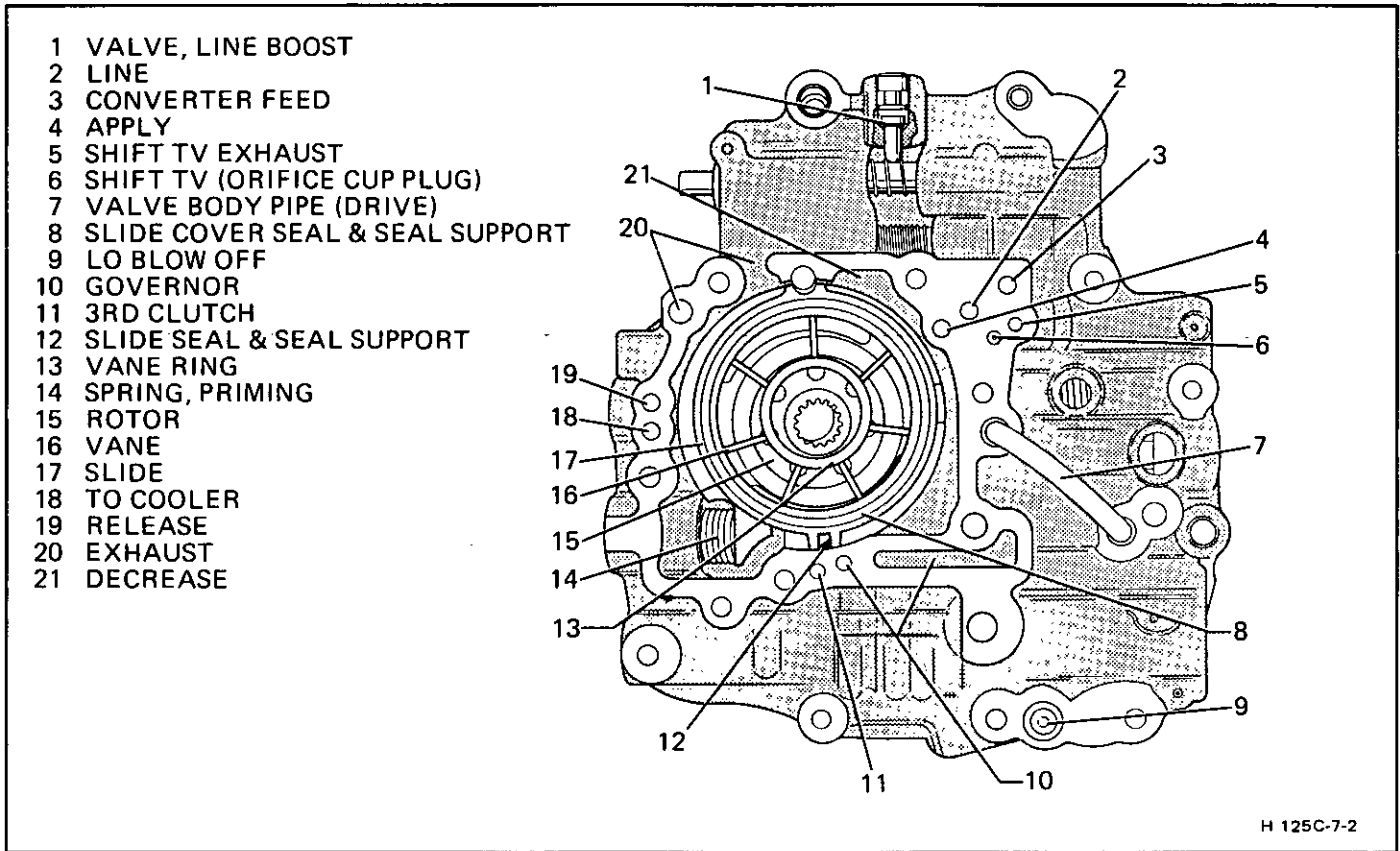


Figure A-4 Variable Capacity Vane Oil Pump

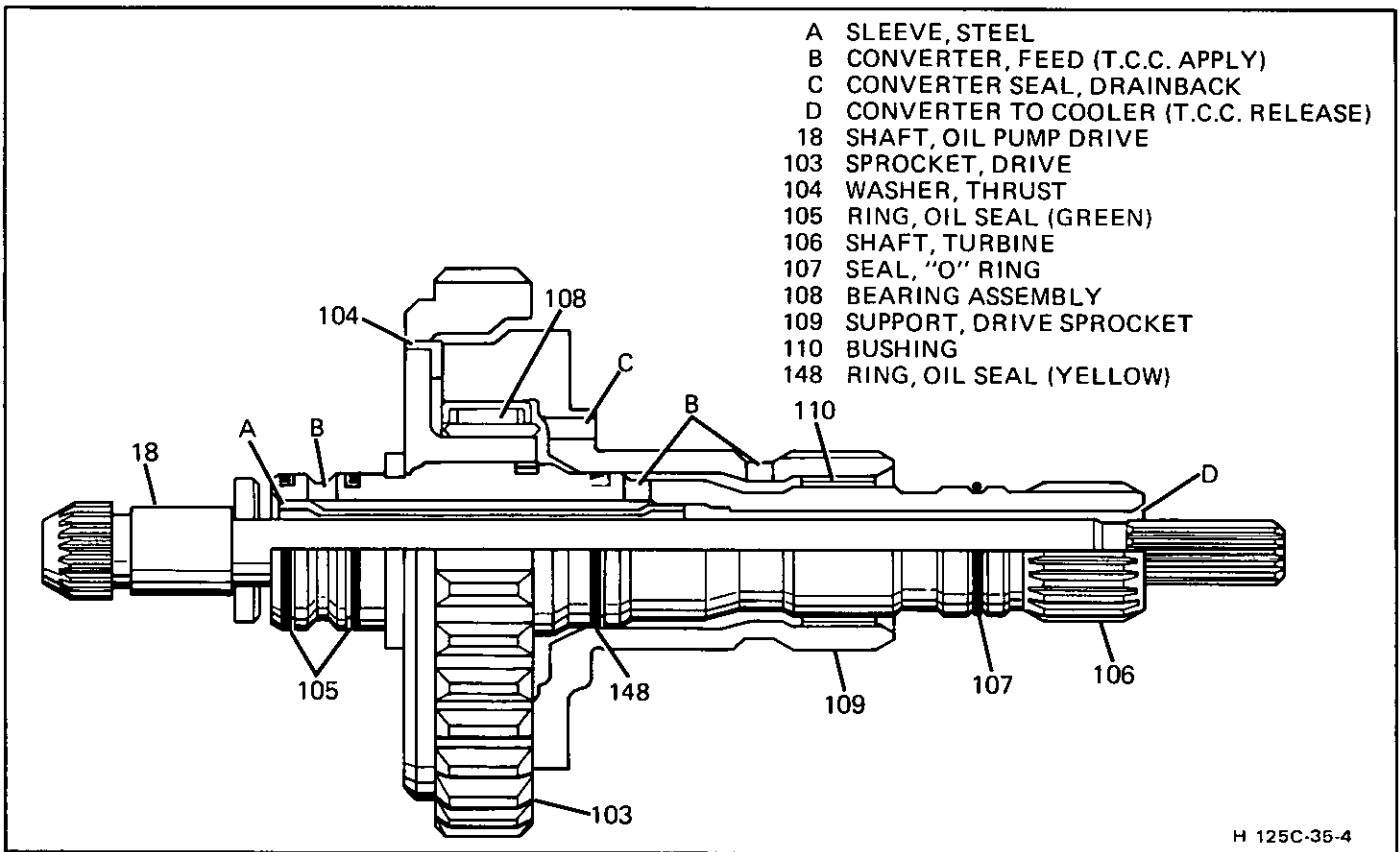
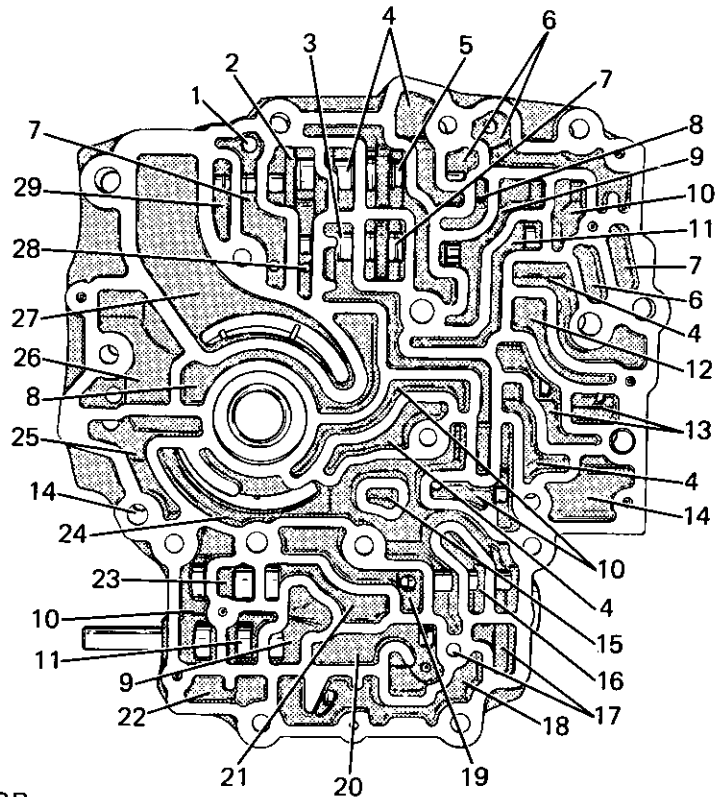


Figure A-5 Converter Oil Passages - Parts Cut-Away View

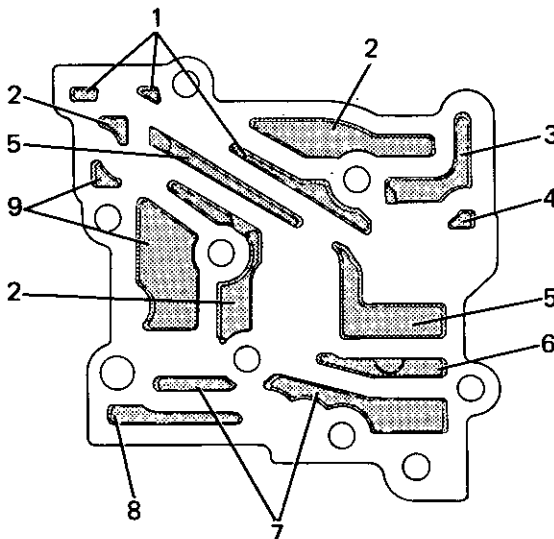
- 1 #1 CHECK BALL
- 2 GOVERNOR
- 3 RND
- 4 DRIVE
- 5 2ND
- 6 LO - 1ST
- 7 DIRECT CLUTCH (3RD)
- 8 LO
- 9 DETENT
- 10 SHIFT TV
- 11 PART THROTTLE
- 12 LUBE
- 13 1-2 ACCUMULATOR
- 14 EXHAUST
- 15 APPLY
- 16 CONVERTER FEED
- 17 TV
- 18 TV EXHAUST
- 19 DECREASE
- 20 RNDI
- 21 REVERSE
- 22 VOID
- 23 INTERMEDIATE
- 24 LINE
- 25 RELEASE
- 26 TO COOLER
- 27 INTAKE
- 28 DRILLED HOLE
- 29 DIRECT CLUTCH ACCUMULATOR



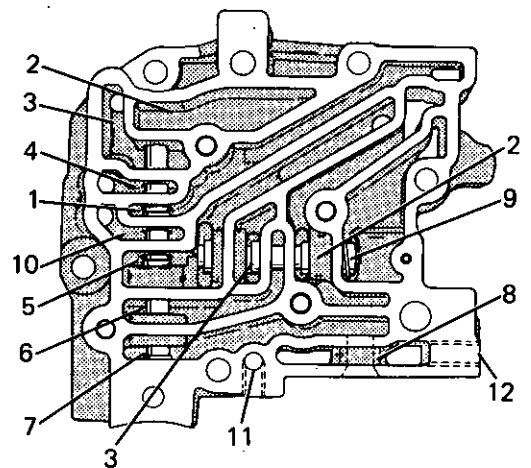
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Figure A-6 Valve Body Passages

- 1 CONVERTER FEED
- 2 LINE
- 3 EXHAUST
- 4 RELEASE
- 5 APPLY
- 6 REGULATED LINE
- 7 SOLENOID CIRCUIT
- 8 GOVERNOR
- 9 SHIFT TV
- 10 TO COOLER
- 11 3RD CLUTCH
- 12 DRILLED & TAPPED HOLE (NON C3 ONLY)



AUXILIARY VALVE BODY COVER



AUXILIARY VALVE BODY

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Figure A-7 Auxiliary Valve Body and Cover

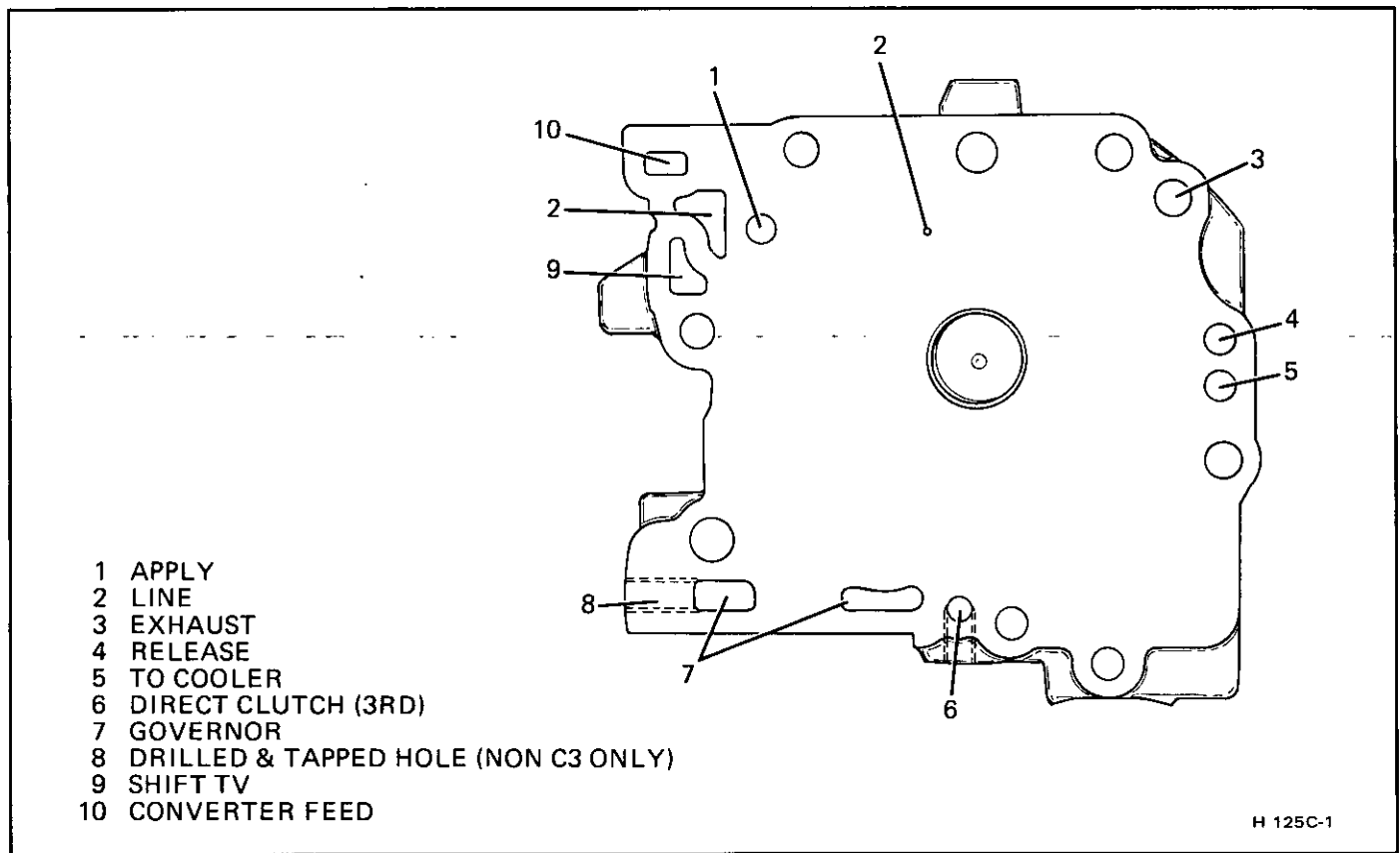


Figure A-8 Auxiliary Valve Body - Pump Side

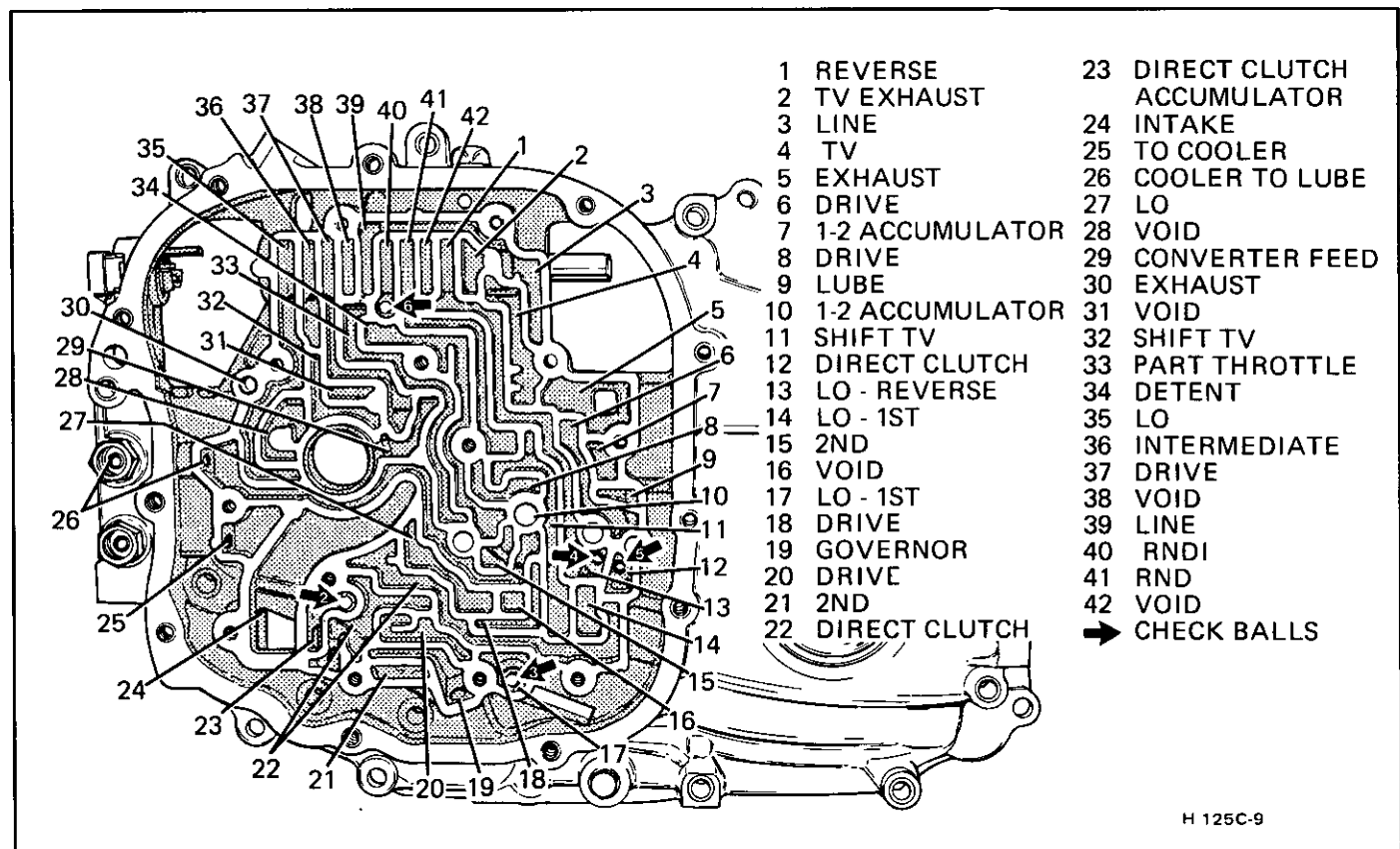


Figure A-9 Case Cover - Valve Body Side

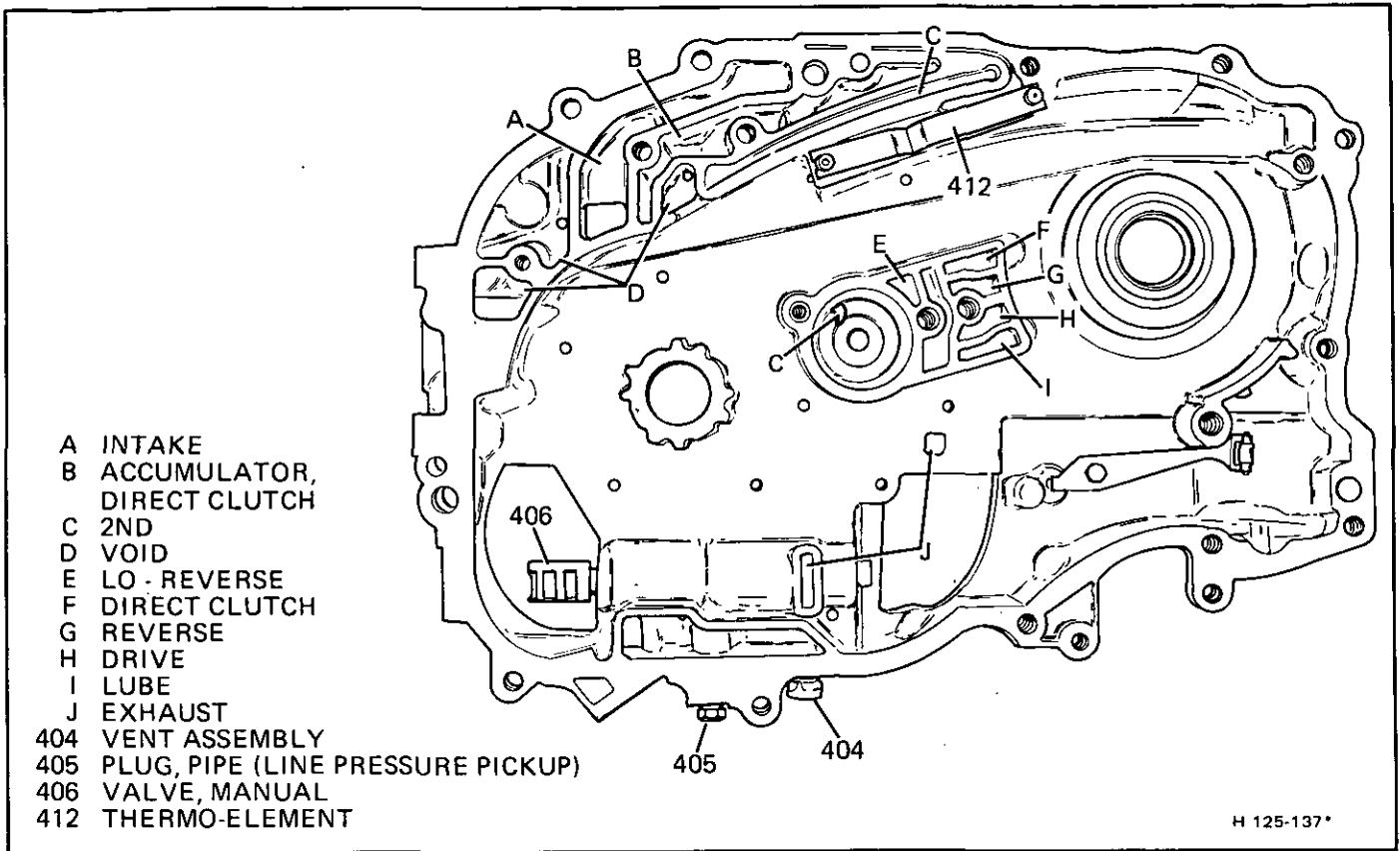


Figure A-10 Case Cover - Case Side

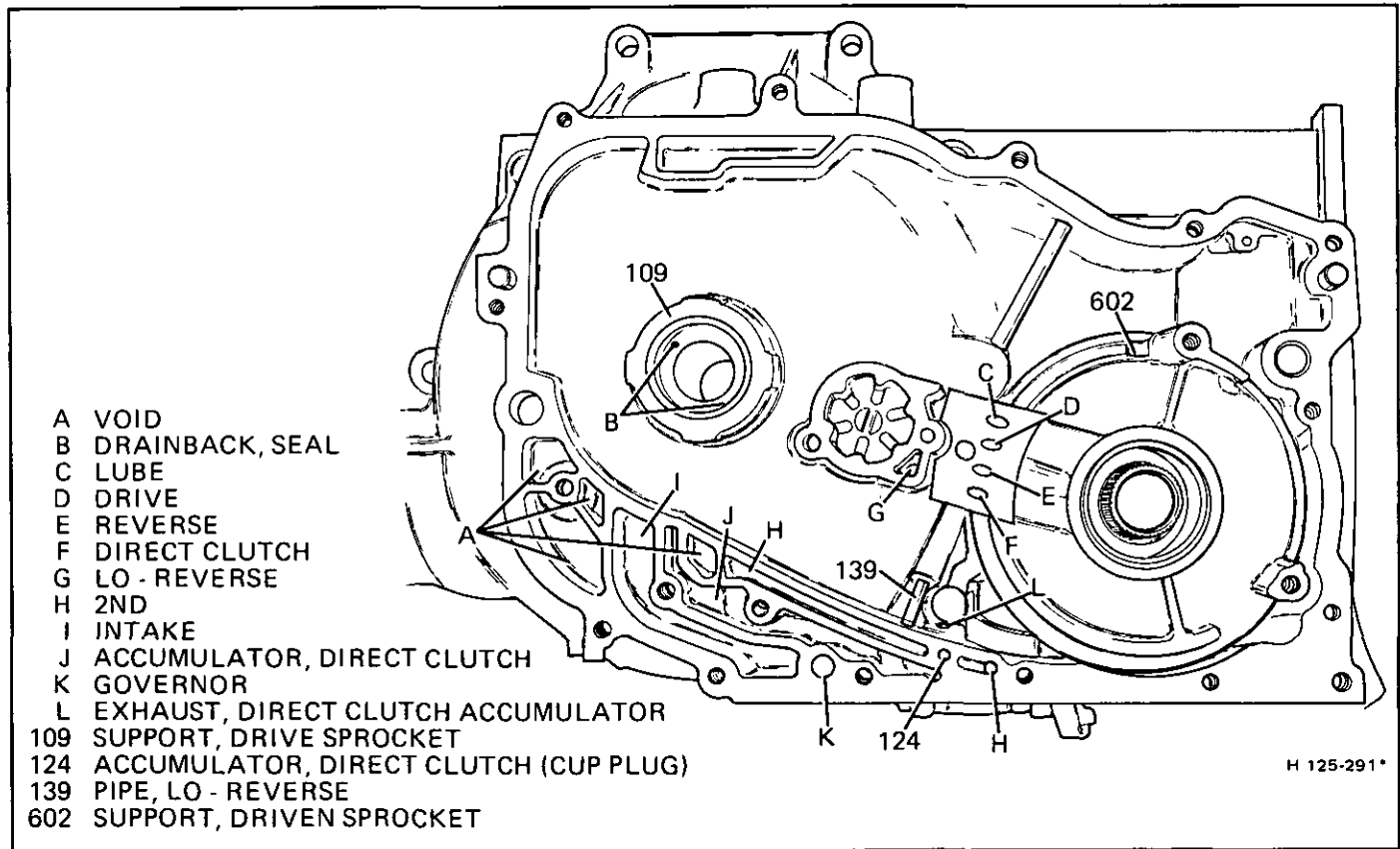


Figure A-11 Case - Case Cover Side

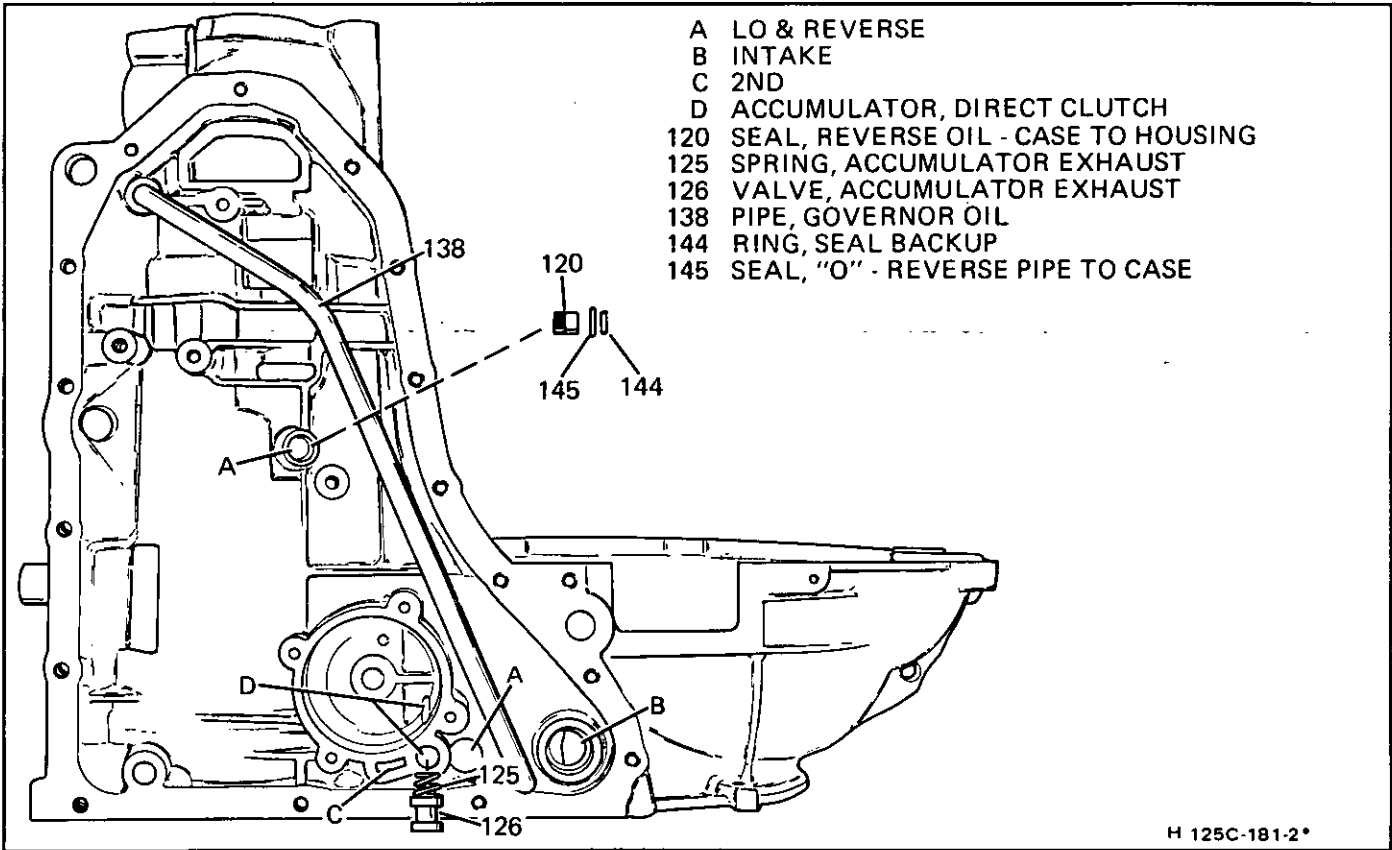


Figure A-12 Case - Oil Pan Side

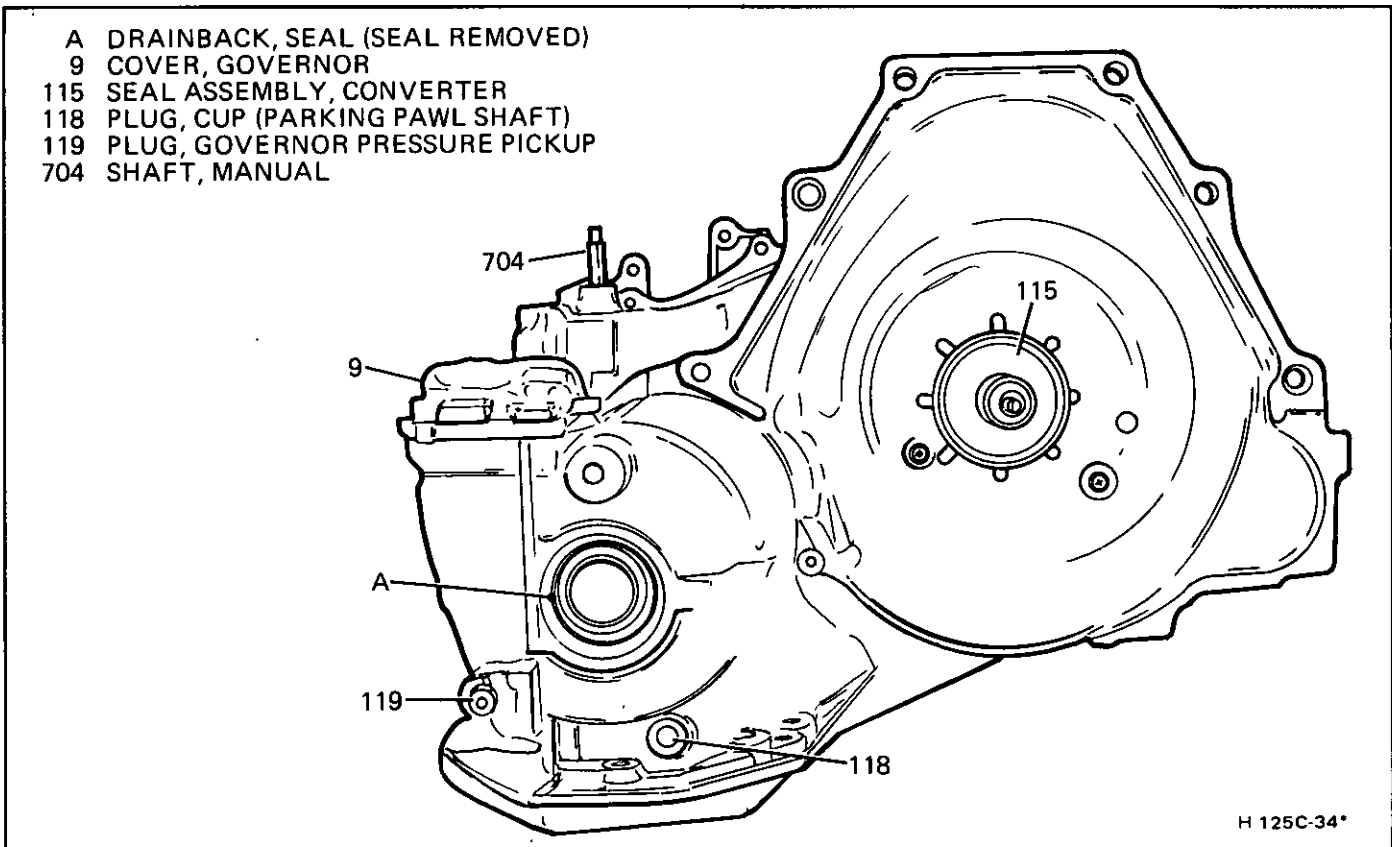


Figure A-13 Case - Right Hand Axle End

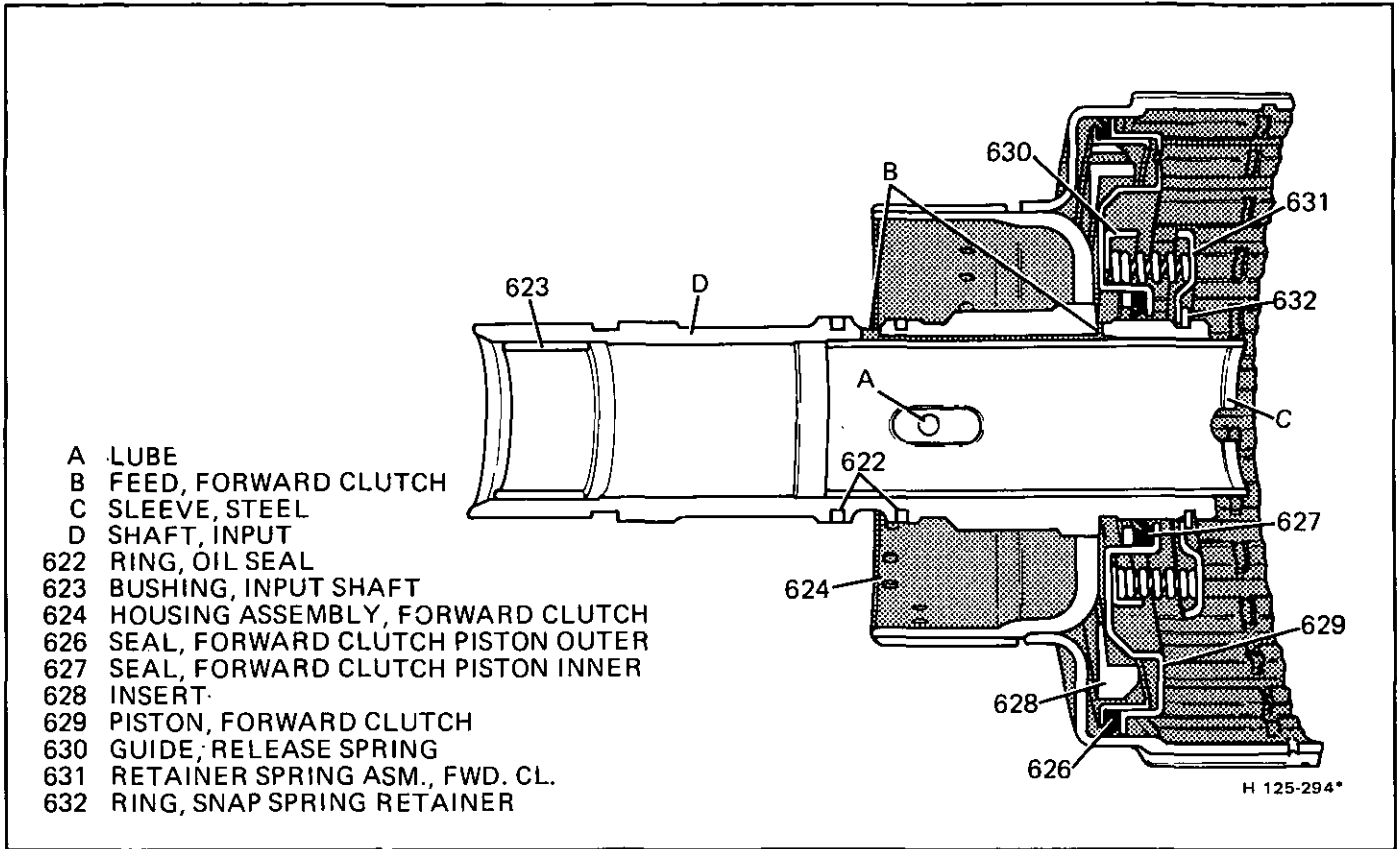


Figure A-14 Forward Clutch Assembly - Cut-Away View

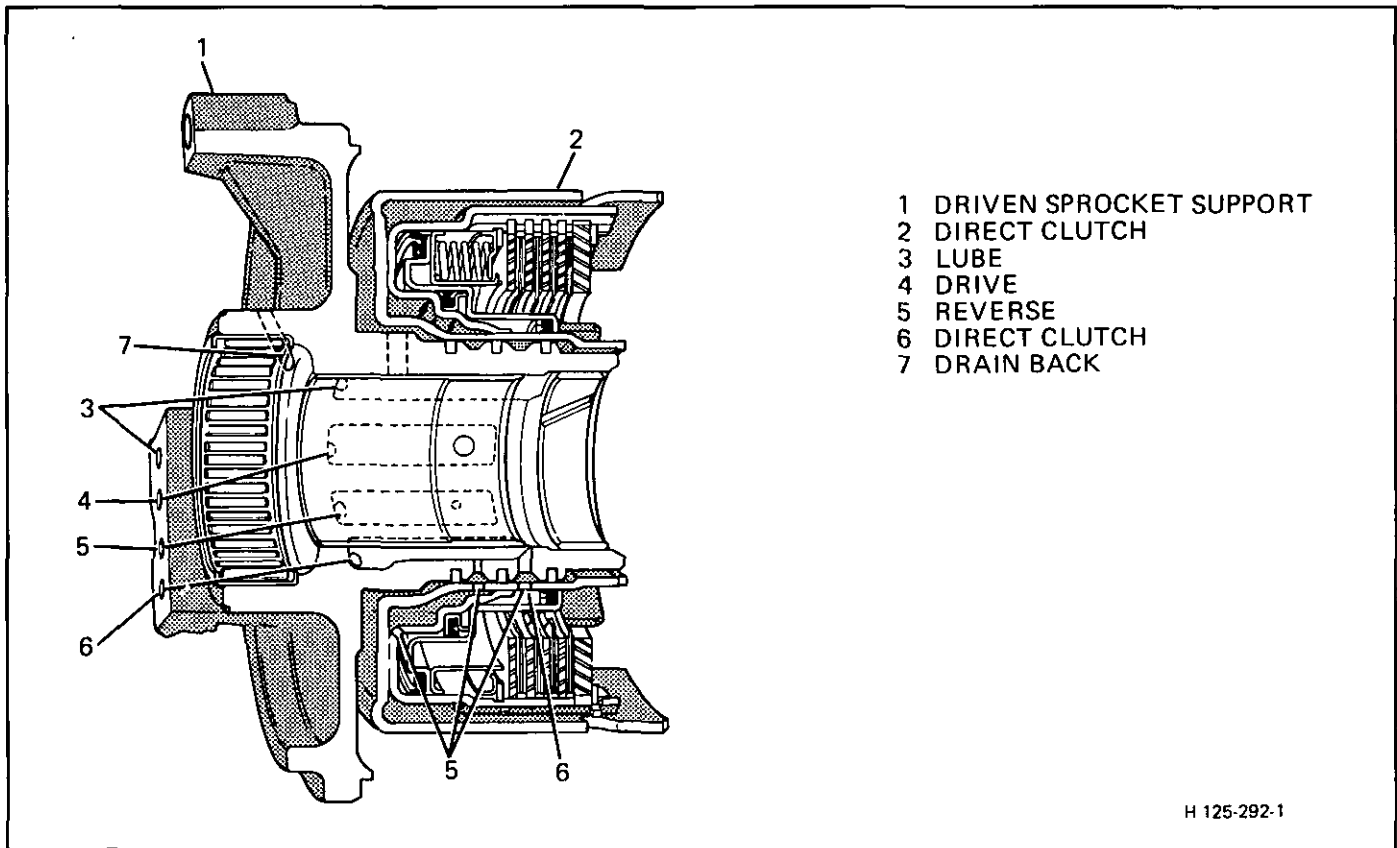
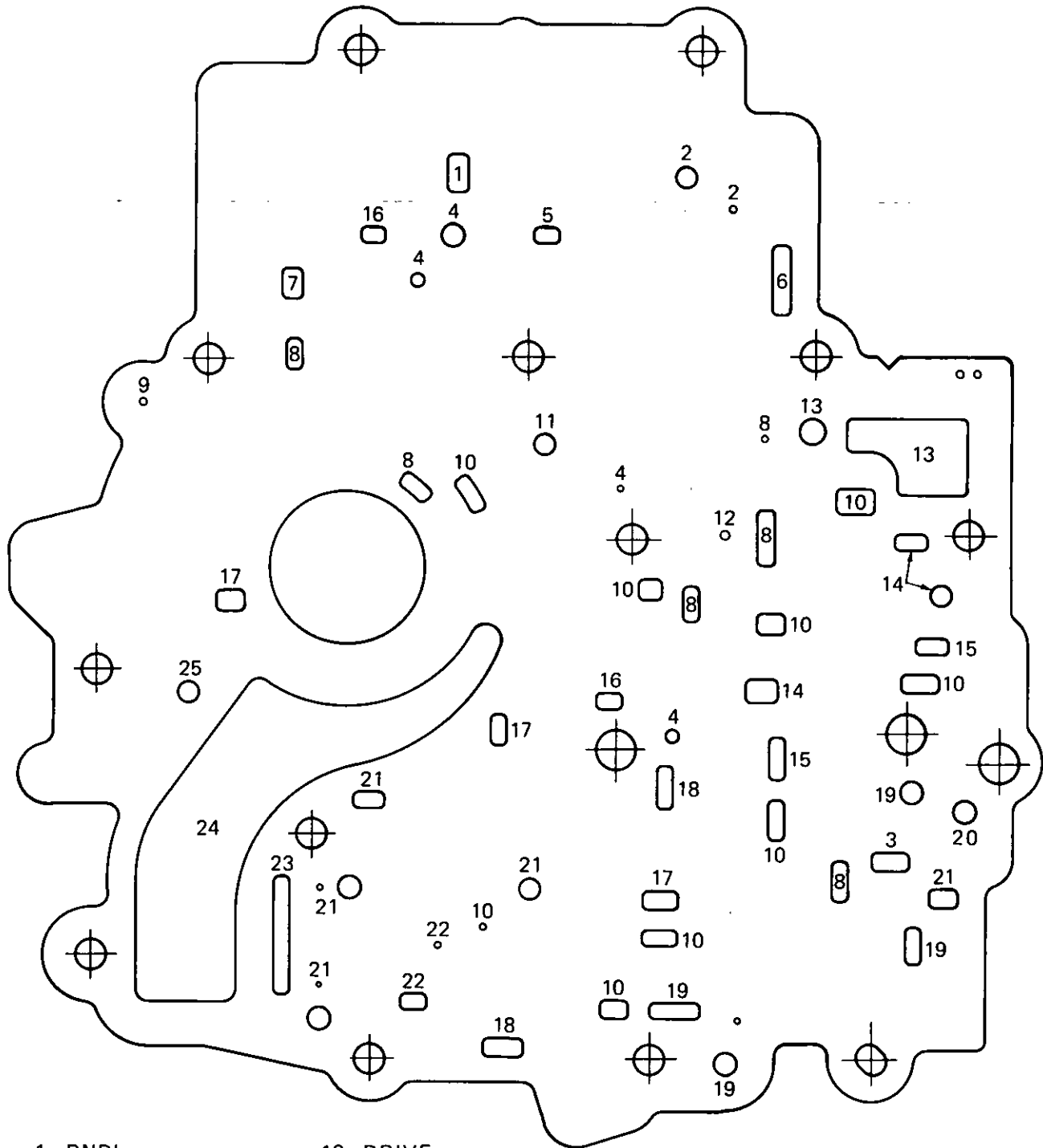


Figure A-15 Driven Sprocket Support - Cut-Away View



- | | | |
|------------------|-----------------|-----------------------------|
| 1 RNDI | 10 DRIVE | 19 LO - 1ST OR REV. |
| 2 T.V. | 11 T.C.C. APPLY | 20 3RD CL. (DIRECT) OR REV. |
| 3 LO - 1ST | 12 RND | 21 3RD CL. (DIRECT) |
| 4 DETENT | 13 S.T.V. EXH. | 22 GOVERNOR |
| 5 REVERSE | 14 1-2 ACCUM. | 23 3RD CL. (DIRECT) ACCUM. |
| 6 LINE | 15 LUBE | 24 SUCTION |
| 7 INTERMEDIATE | 16 P.T.V. | 25 TO COOLER |
| 8 S.T.V. | 17 LO | |
| 9 T.C.C. EXHAUST | 18 2ND | |

Figure A-16 Valve Body Spacer Plate - Typical

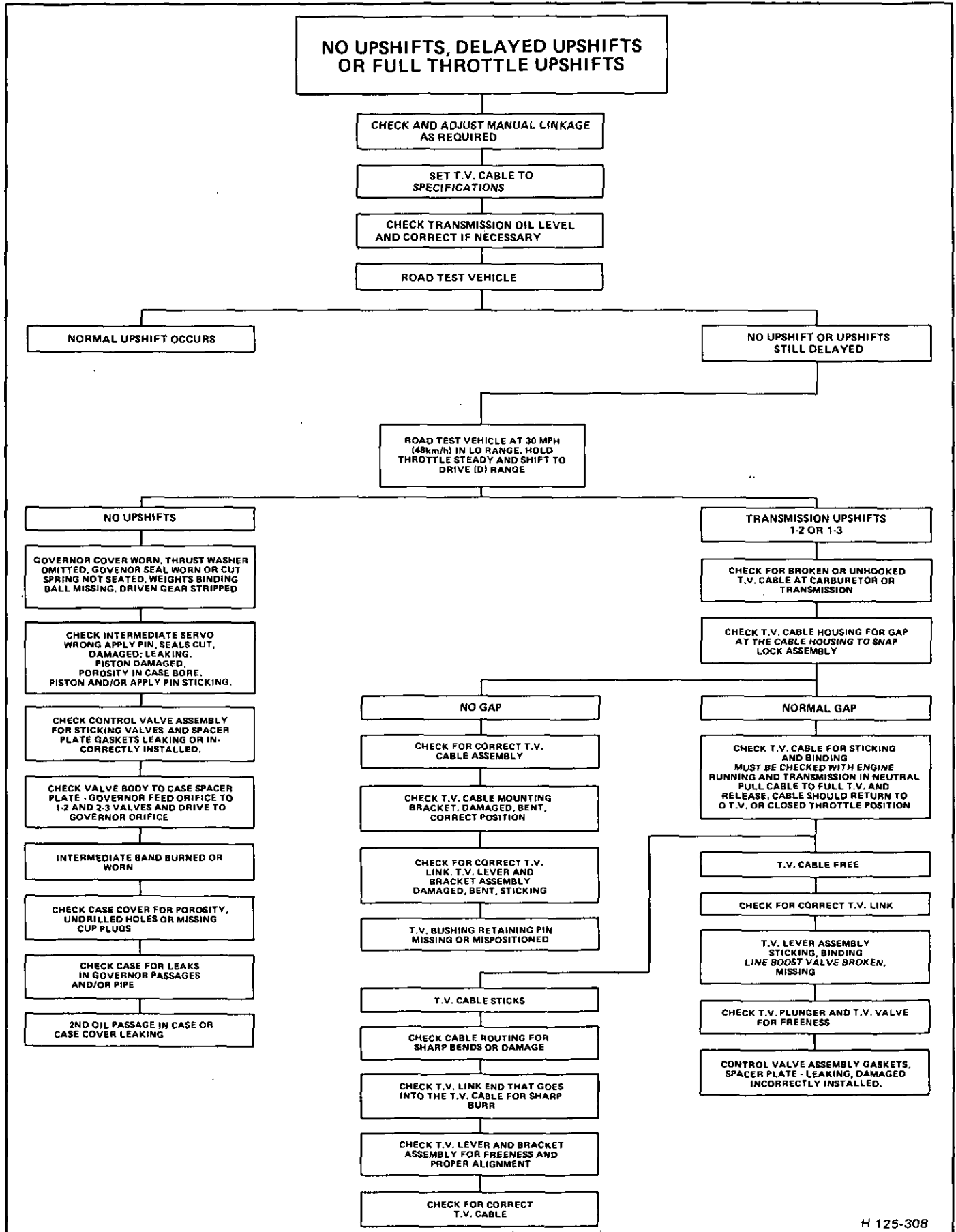


Figure A-17 Upshift Complaint

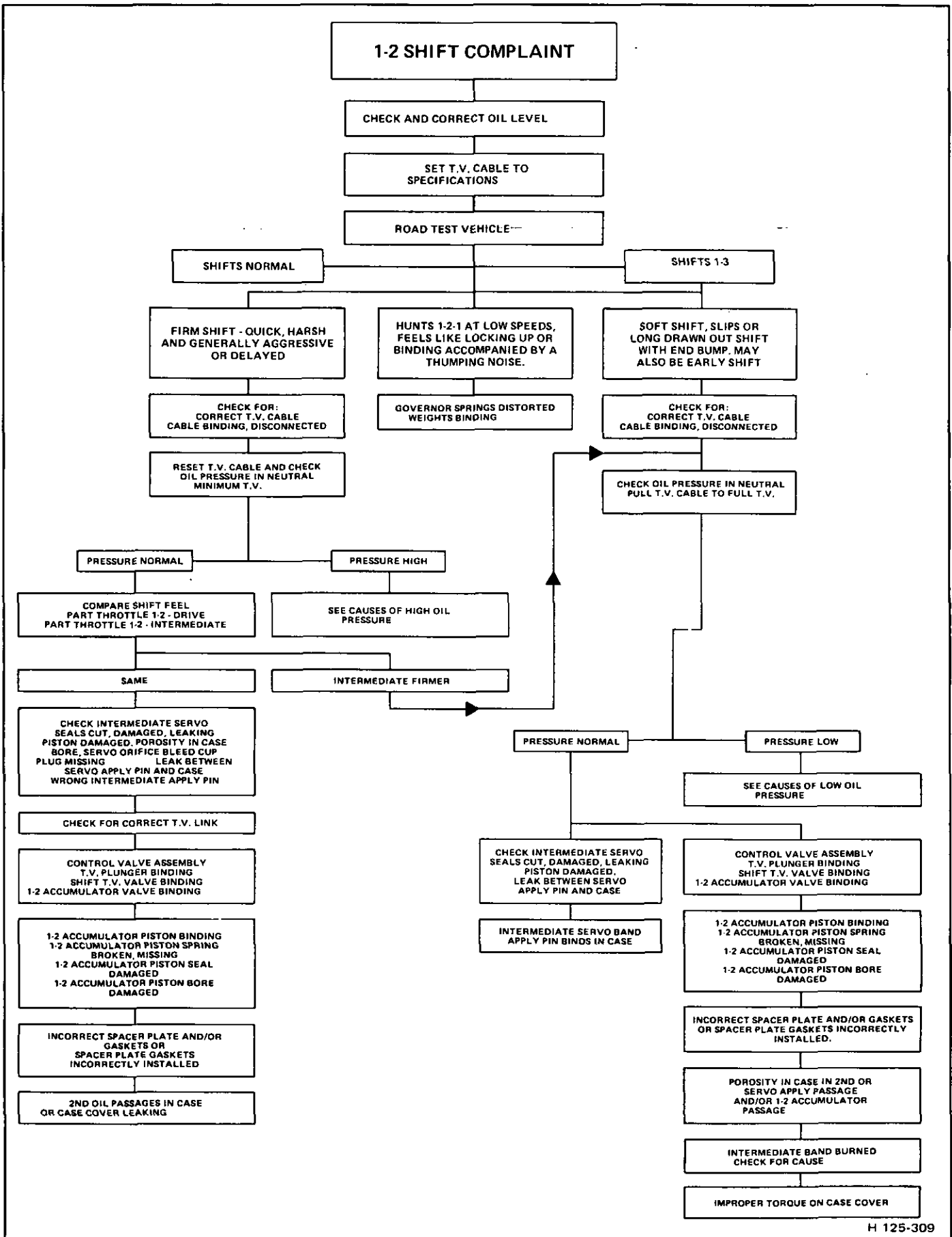


Figure A-18 1-2 Shift Complaint

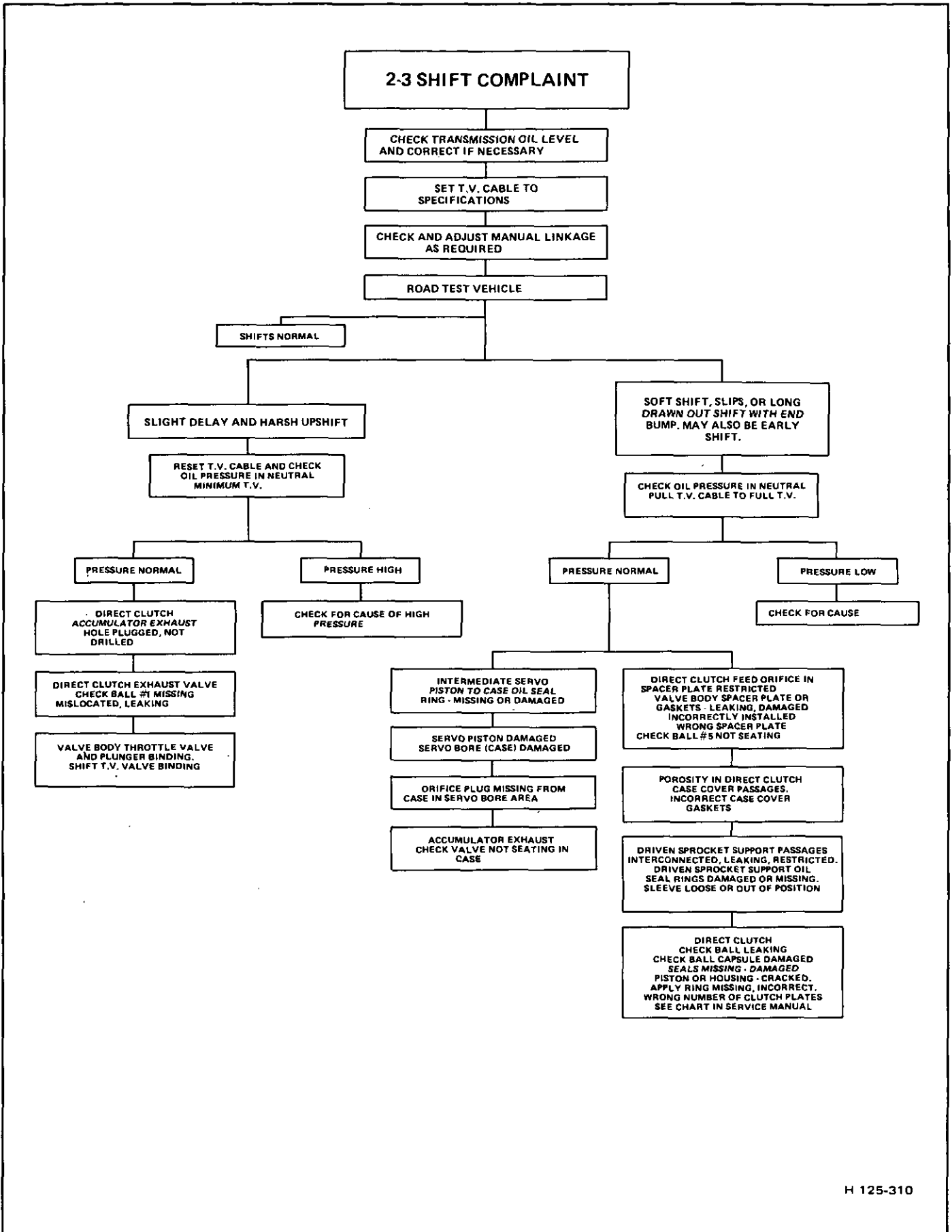


Figure A-19 2-3 Shift Complaint

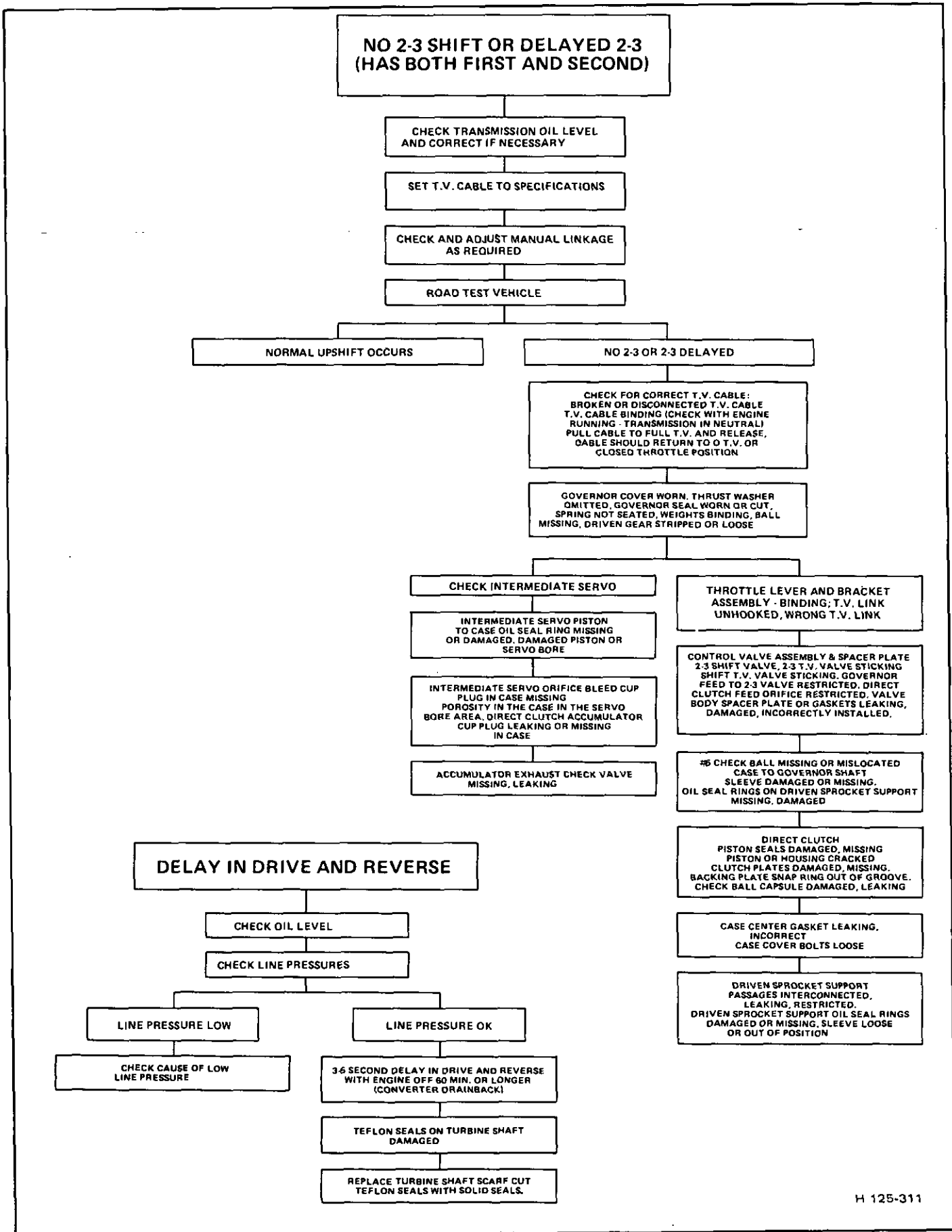


Figure A-20 No 2-3 or Delayed 2-3

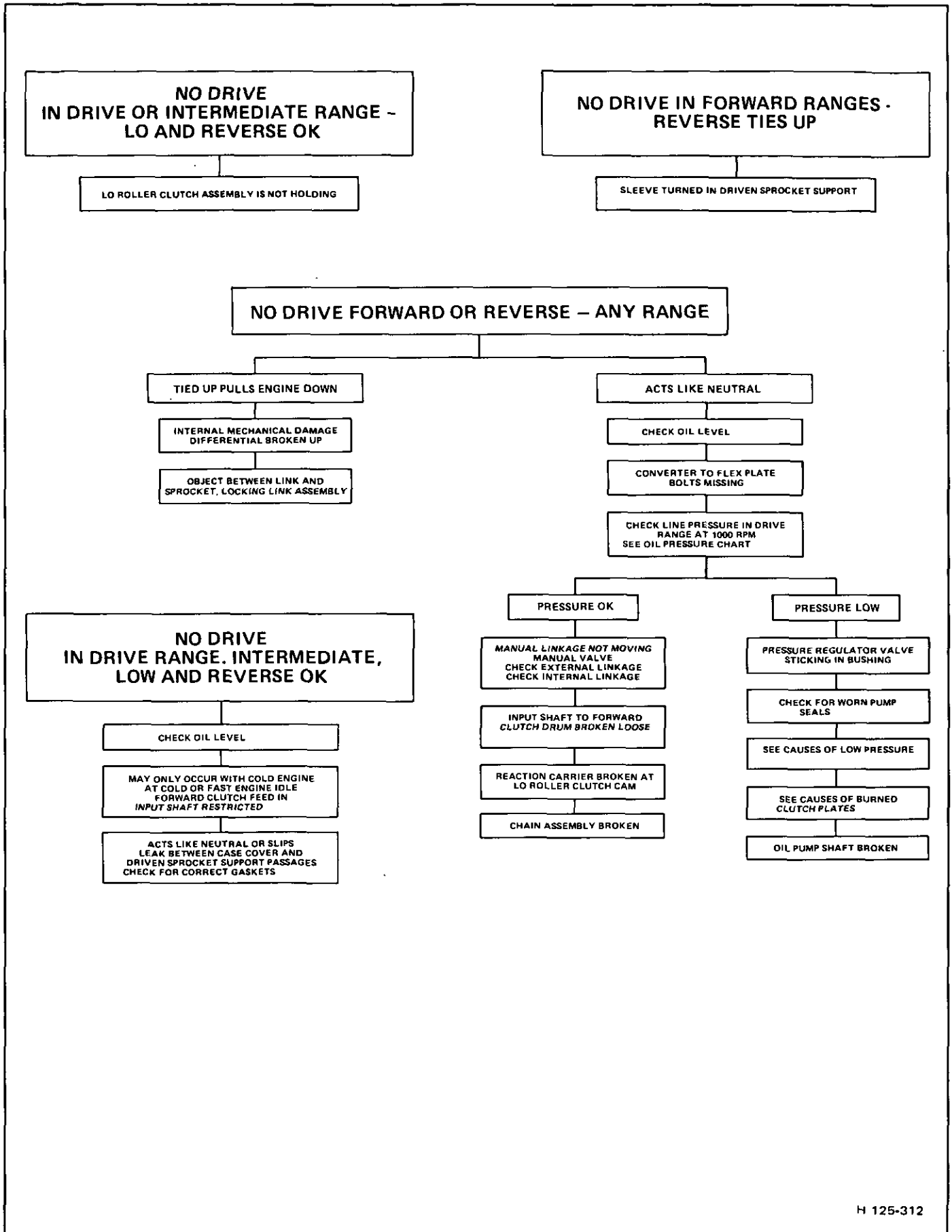
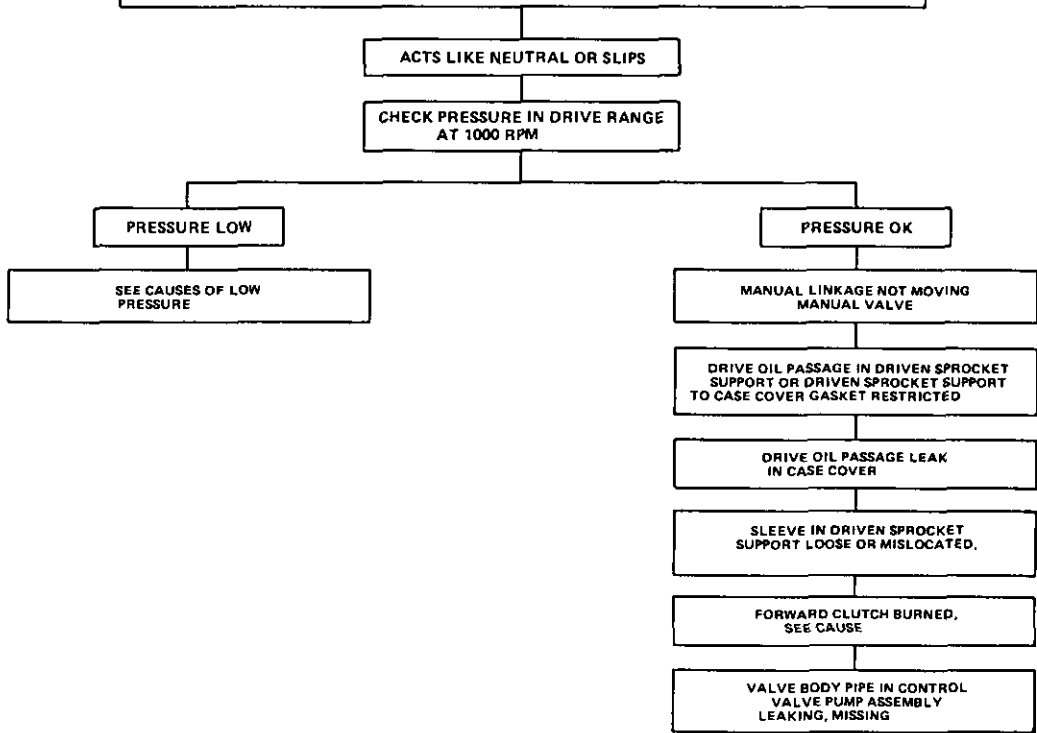
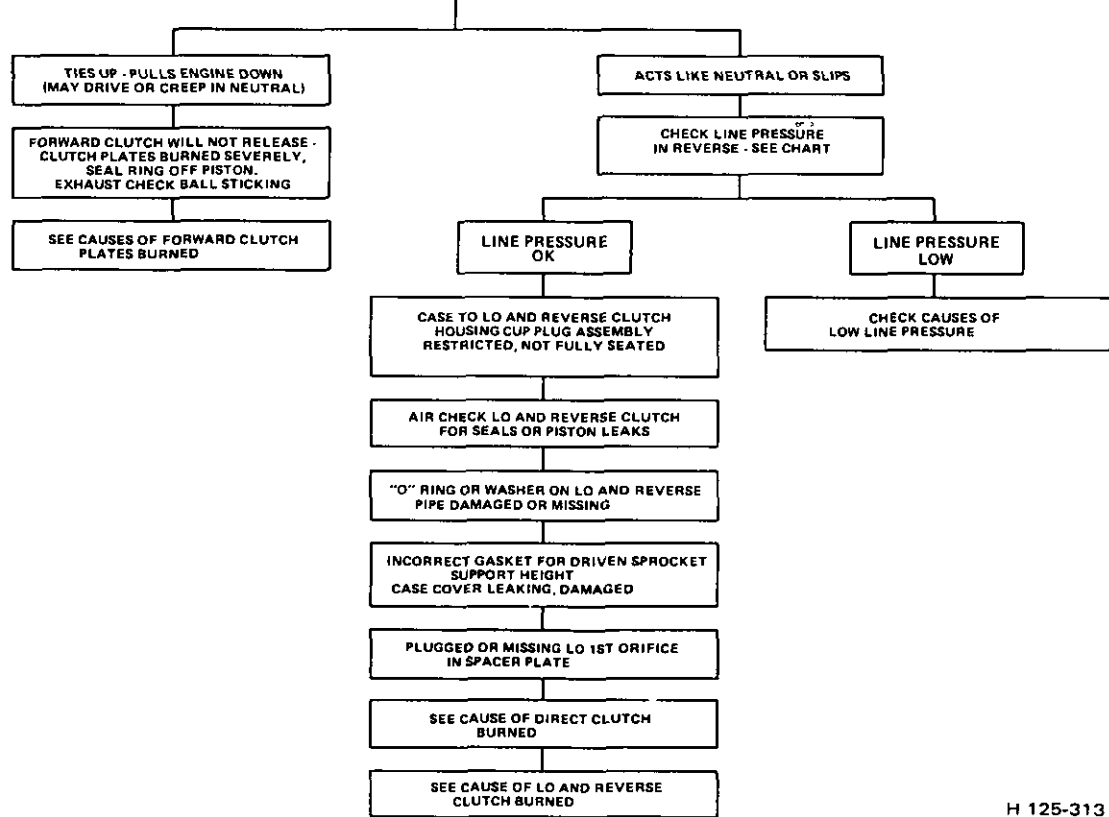


Figure A-21 No Drive

NO DRIVE IN ANY FORWARD RANGE – REVERSE OK



NO REVERSE – ALL FORWARD RANGES OK



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Figure A-22 No Reverse

SECOND SPEED START - MISSES 1ST AT TIMES

- GOVERNOR
SPRINGS DISTORTED OR OUT OF PLACE.
WEIGHTS BINDING
- 1-2 SHIFT VALVE OR 1-2 THROTTLE VALVE
STICKING IN UPSHIFTED POSITION

SHIFTS 3-1 AT HIGH SPEEDS FOR PASSING GEAR (DETENT DOWNSHIFTS)

- INSPECT GOVERNOR
- INTERMEDIATE SERVO STICKING.
- DIRECT CLUTCH ORIFICE CONTROLLED BY #2
CHECK BALL RESTRICTED
- 1-2 ACCUMULATOR PISTON MISSING;
SEAL LEAKING

SLIPS - CHATTERS IN 1ST

- CHECK OIL LEVEL,
- T.V. CABLE
NOT ADJUSTED, WRONG CABLE.
- CHECK OIL PRESSURE
- PRESSURE NORMAL**
 - RESTRICTED FEED TO FORWARD CLUTCH
 - BURNED FORWARD CLUTCH -
SEE CAUSES OF BURNED CLUTCH PLATES
 - ROUGH MACHINE SURFACE
ON DRIVEN SPROCKET SUPPORT
INCORRECT CASE COVER GASKETS,
- PRESSURE LOW**
 - CHECK CAUSE OF LOW PRESSURE

SHIFTS 1-3 (MISSES 2ND)

- INTERMEDIATE SERVO STICKING,
LEAKING OR DAMAGED, ACCUMULATOR
EXHAUST CHECK VALVE STICKING,
NOT SEATING
- 1-2 VALVE STICKING IN CONTROL
VALVE PUMP ASSEMBLY
- SPACER PLATE
GASKETS INCORRECTLY INSTALLED
GOVERNOR FEED TO THE 1-2 VALVE BLOCKED.
INTERMEDIATE BAND APPLY FEED ORIFICE BLOCKED.
WRONG SPACER PLATE
- INTERMEDIATE SERVO APPLY PASSAGE (2ND OIL)
IN CASE OR CASE COVER BLOCKED
- INTERMEDIATE BAND IMPROPERLY INSTALLED,
BURNED OR BROKEN. SEE CAUSES OF
BURNED BAND

NO FULL THROTTLE (DETENT) DOWNSHIFT 3-2

- T.V. CABLE IMPROPERLY ADJUSTED
BINDING T.V. LINKAGE OR CABLE.
WRONG T.V. CABLE OR LINK.
- ACCELERATOR PEDAL AND/OR LINKAGE
WILL NOT OPEN CARBURETOR TO
WIDE OPEN THROTTLE
- CONTROL VALVE PUMP ASSEMBLY
SHIFT T.V. VALVE OR
THROTTLE VALVE BINDING
- SPACER PLATE HOLES PLUGGED
GASKETS MISPOSITIONED OR DAMAGED.

Figure A-23 Shift Complaint

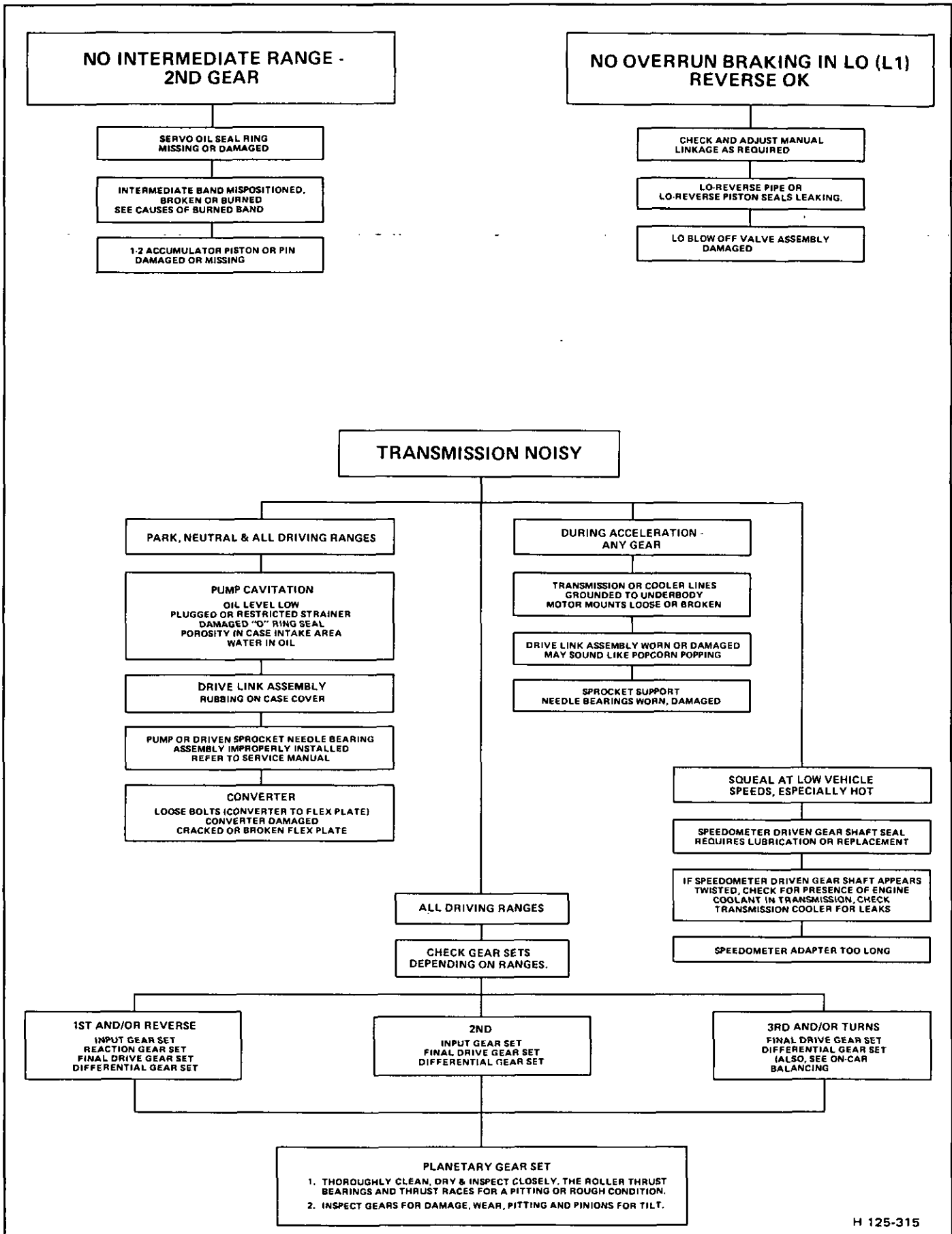


Figure A-24 Transmission Noisy

DISASSEMBLY

←→ Remove or Disconnect

1. J-21366 Converter holding strap
2. Converter (1)

→← Install or Connect (Figure 1)

Tools Required:

- J-28664 - Transaxle Holding Fixture
- J-3289-20 - Fixture Base

CAUTION: To reduce the possibility of personal injury or transaxle damage, make sure, when doing the next step, that all the bolts for the support fixture J-28664 are installed as shown and torqued to 11 N·m (8 ft.-lbs.).

1. J-28664 fixture
2. Fixture into J-3289-20 base
3. Drain the transmission fluid.

Governor Assembly

←→ Remove or Disconnect (Figure 2)

1. Bolt (14 and retainer (13)
2. Speedo sleeve (12) and gear (10)
3. Screws (8)
4. Governor cover (9) and "O" ring (7)
5. Bearing (6)
6. Gear (5)
7. Governor assembly (4)

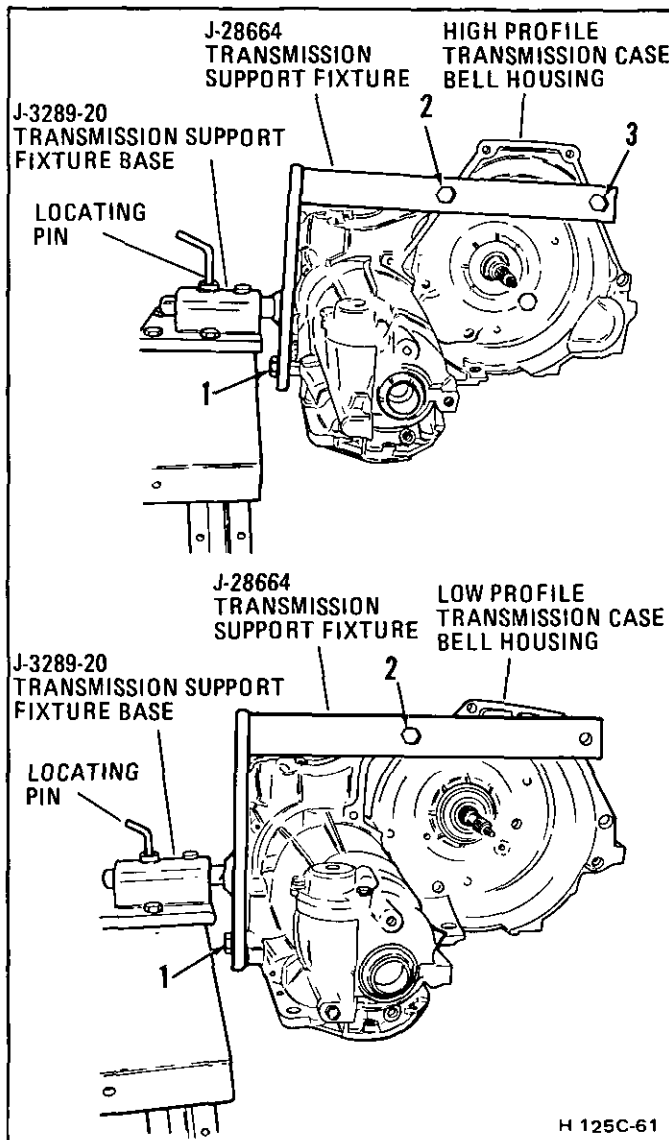


Figure 1 Transaxle in Holding Fixture

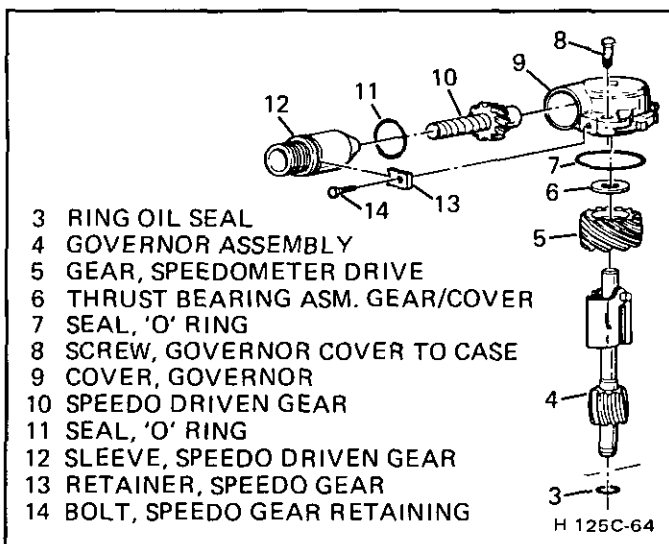
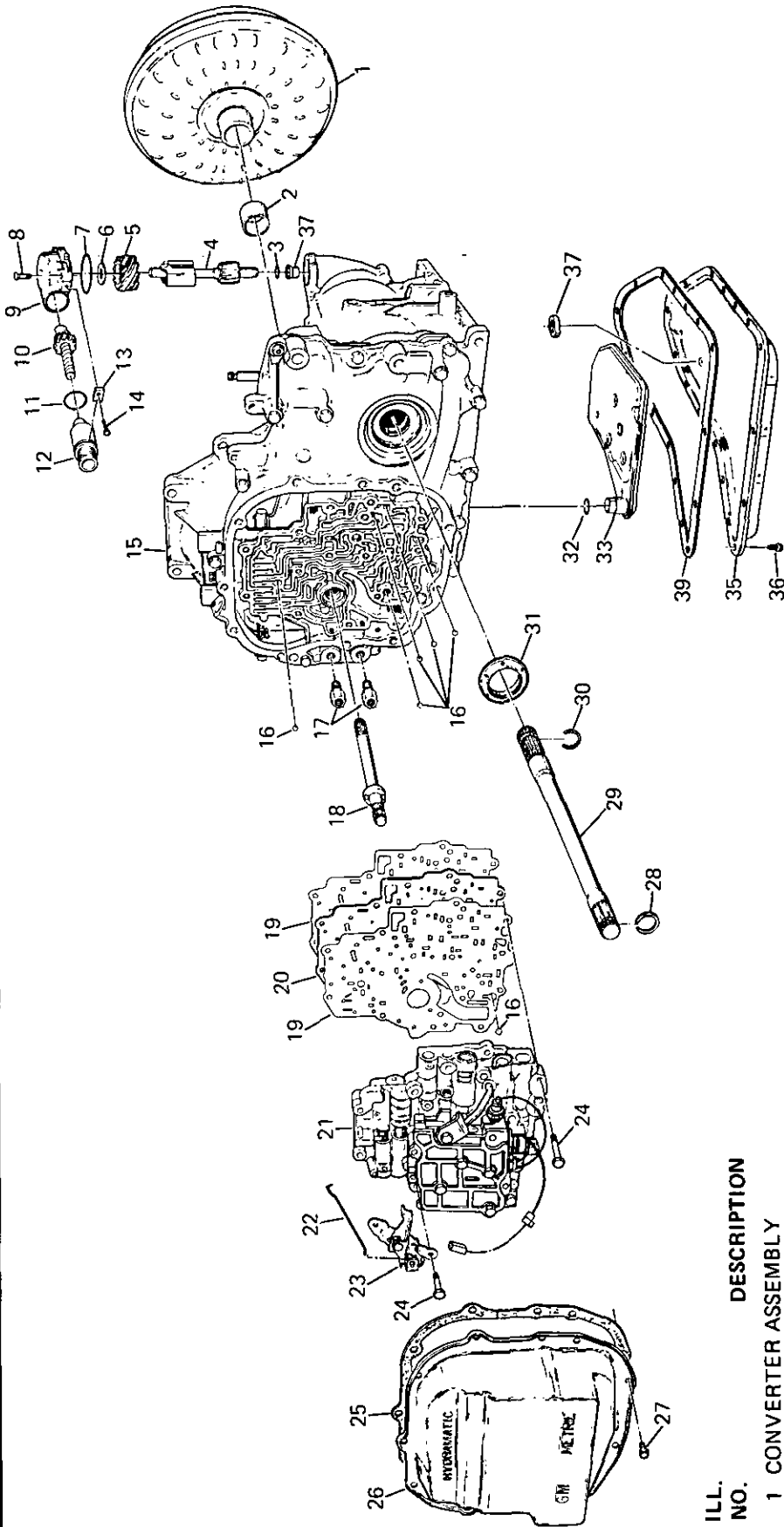
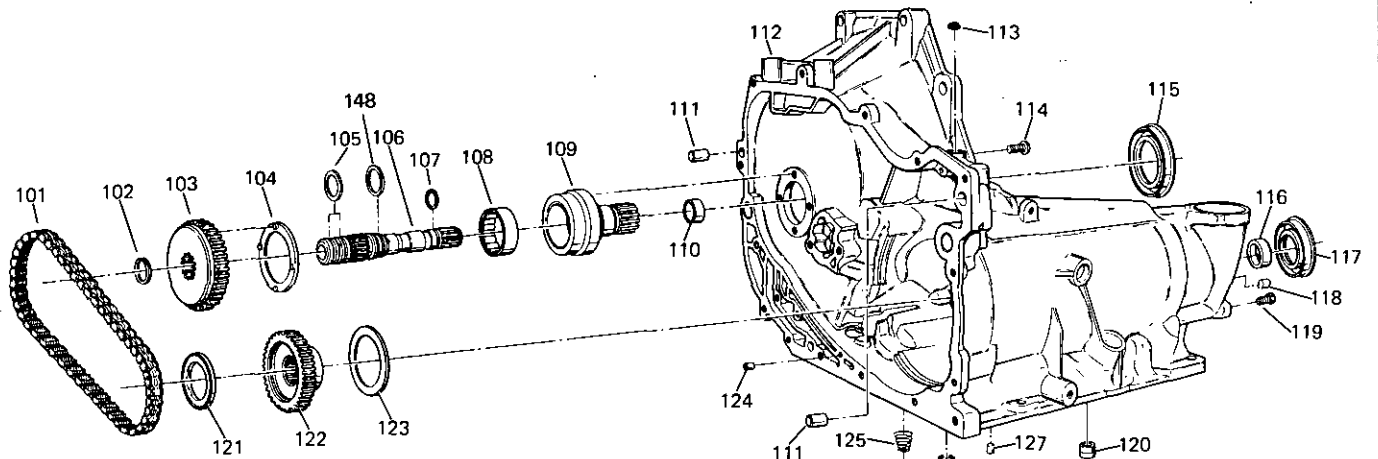


Figure 2 Governor Assembly



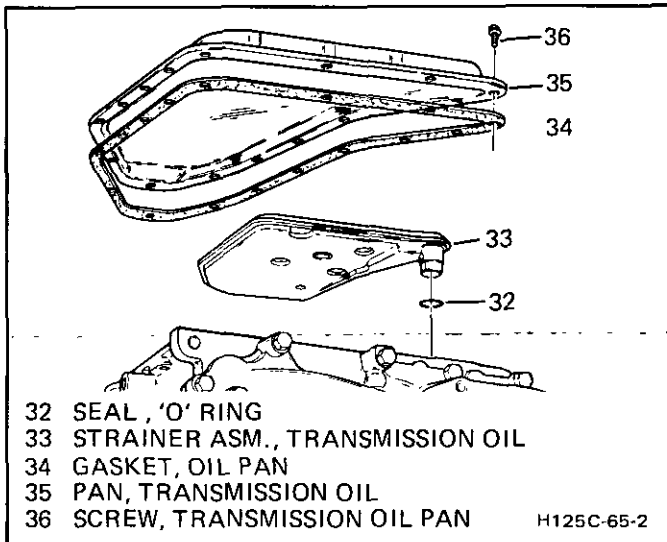
- | ILL. NO. | DESCRIPTION |
|----------|-------------------------------------|
| 1 | CONVERTER ASSEMBLY |
| 2 | BUSHING, CONVERTER PUMP |
| 3 | RING, OIL SEAL |
| 4 | GOVERNOR ASSEMBLY, COMPLETE |
| 5 | GEAR, SPEEDOMETER DRIVE |
| 6 | THRUST BEARING ASSEMBLY, GEAR/COVER |
| 7 | SEAL, "O" RING |
| 8 | SCREW, GOVERNOR COVER TO CASE |
| 9 | COVER, GOVERNOR |
| 10 | SPEEDO DRIVEN GEAR |
| 11 | SEAL, "O" RING |
| 12 | SLEEVE SPEEDO DRIVEN GEAR |
| 13 | RETAINER, SPEEDO GEAR |
| 14 | BOLT, SPEEDO GEAR RETAINING |
| 15 | CASE, ASSEMBLY |
| 16 | BALL (6.3 DIA.) |
| 17 | CONNECTOR, COOLER FITTING |
| 18 | SHAFT, OIL PUMP DRIVE |
| 19 | GASKET, SPACER PLATE |
| 20 | PLATE, VALVE BODY SPACER |
| 21 | CONTROL VALVE & OIL PUMP ASSEMBLY |
| 22 | LINK, THROTTLE LEVER TO CABLE |
| 23 | LEVER & BRACKET ASSEMBLY, THROTTLE |
| 24 | BOLT, VALVE BODY/CASE |
| 25 | GASKET, VALVE BODY COVER |
| 26 | COVER, VALVE BODY |
| 27 | SCREW, VALVE BODY COVER |
| 28 | RING, RETAINING - AXLE JOINT |
| 29 | SHAFT, OUTPUT |
| 30 | RING, SNAP |
| 31 | SEAL ASSEMBLY, AXLE OIL |
| 32 | SEAL, "O" RING |
| 33 | STRAINER ASSEMBLY, TRANSMISSION OIL |
| 35 | PAN, TRANSMISSION OIL |
| 36 | SCREW, TRANSMISSION OIL PAN |
| 37 | MAGNET, CHIP COLLECTOR |

Figure 3 External Components



- | ILL. NO. | DESCRIPTION |
|----------|---------------------------------------|
| 101 | LINK ASSEMBLY, DRIVE |
| 102 | RING, SNAP |
| 103 | SPROCKET, DRIVE |
| 104 | WASHER, CASE COVER TO DR. SKT. THRUST |
| 105 | RING, OIL SEAL TURBINE SHAFT (GREEN) |
| 106 | SHAFT, TURBINE |
| 107 | SEAL, "O" RING TURBINE SHAFT |
| 108 | BEARING ASSEMBLY |
| 109 | SUPPORT, DRIVE SPROCKET |
| 110 | BUSHING, DRIVE SPROCKET SUPPORT |
| 111 | PIN, DOWEL-CASE COVER TO CASE |
| 112 | CASE TRANSMISSION |
| 113 | SEAL ASSEMBLY, MANUAL SHAFT |
| 114 | SCREW, SOCKET BUTTON HEAD |
| 115 | SEAL ASSEMBLY, (CONVERTER) |
| 116 | BUSHING, CASE |
| 117 | SEAL ASSEMBLY, (AXLE) |
| 118 | PLUG, CUP (PARKING PAWL SHAFT) |
| 119 | PLUG, (GOVERNOR PRESSURE PICKUP) |
| 120 | REVERSE OIL SEAL - CASE TO HOUSING |
| 121 | BEARING ASM., DRIVEN SPROCKET THRUST |
| 122 | SPROCKET, DRIVEN |
| 123 | WASHER, DR. SKT./SUPPORT THRUST |
| 124 | PLUG, CUP (3RD OIL) |
| 125 | SPRING, ACCUMULATOR EXHAUST |
| 126 | VALVE, ACCUMULATOR EXHAUST |
| 127 | PLUG, ORIFICE |
| 128 | RING, OIL SEAL INTER. BAND APPLY PIN |
| 129 | PIN, INTERMEDIATE BAND APPLY |
| 130 | RETAINER, INTERMEDIATE SERVO SPRING |
| 131 | SPRING, INTERMEDIATE SERVO CUSHION |
| 132 | RING, OIL SEAL OUTER, INT. SERVO |
| 133 | PISTON, INTERMEDIATE SERVO |
| 134 | RING, OIL SEAL - INNER INT. SERVO |
| 135 | RING, SNAP |
| 136 | GASKET, INTERMEDIATE SERVO COVER |
| 137 | COVER, INTERMEDIATE SERVO |
| 138 | PIPE, GOVERNOR OIL |
| 139 | PIPE, REVERSE OIL |
| 140 | RETAINER, REVERSE OIL PIPE |
| 141 | BOLT, INTERMEDIATE SERVO COVER |
| 142 | BOLT, PIPE RETAINER/CASE |
| 143 | RETAINER, GOVERNOR & REVERSE OIL PIPE |
| 144 | RING - SEAL BACKUP |
| 145 | SEAL, "O" REVERSE PIPE TO CASE |
| 146 | RETAINER, OIL WEIR |
| 147 | OIL WEIR |
| 148 | RING, OIL SEAL TURBINE SHAFT (YELLOW) |

Figure 4 Drive Link Assembly, Servo, Oil Pipes



- 32 SEAL, 'O' RING
 - 33 STRAINER ASM., TRANSMISSION OIL
 - 34 GASKET, OIL PAN
 - 35 PAN, TRANSMISSION OIL
 - 36 SCREW, TRANSMISSION OIL PAN
- H125C-65-2

Figure 5 Bottom Pan & Oil Strainer

Bottom Pan, Oil Strainer, Oil Pipes

←→ Remove or Disconnect (Figures 3 and 5)

1. Bolts (36)
2. Pan (35) — Leave two bolts in place finger tight — tap with a rubber mallet to break the R.T.V. sealant bead or gasket set.
3. Strainer (33) and "O" ring (32)

←→ Remove or Disconnect (Figures 4 and 6)

1. Bolts (141) and (142)
2. Brackets (140) and retainers (143)
3. Servo cover (137) and gasket (136)
4. Servo assembly (129 - 135)
5. "E" ring (135) from pin (129)
6. Pin (129) from piston (133)

📏 Measure (Figures 7 and 8)

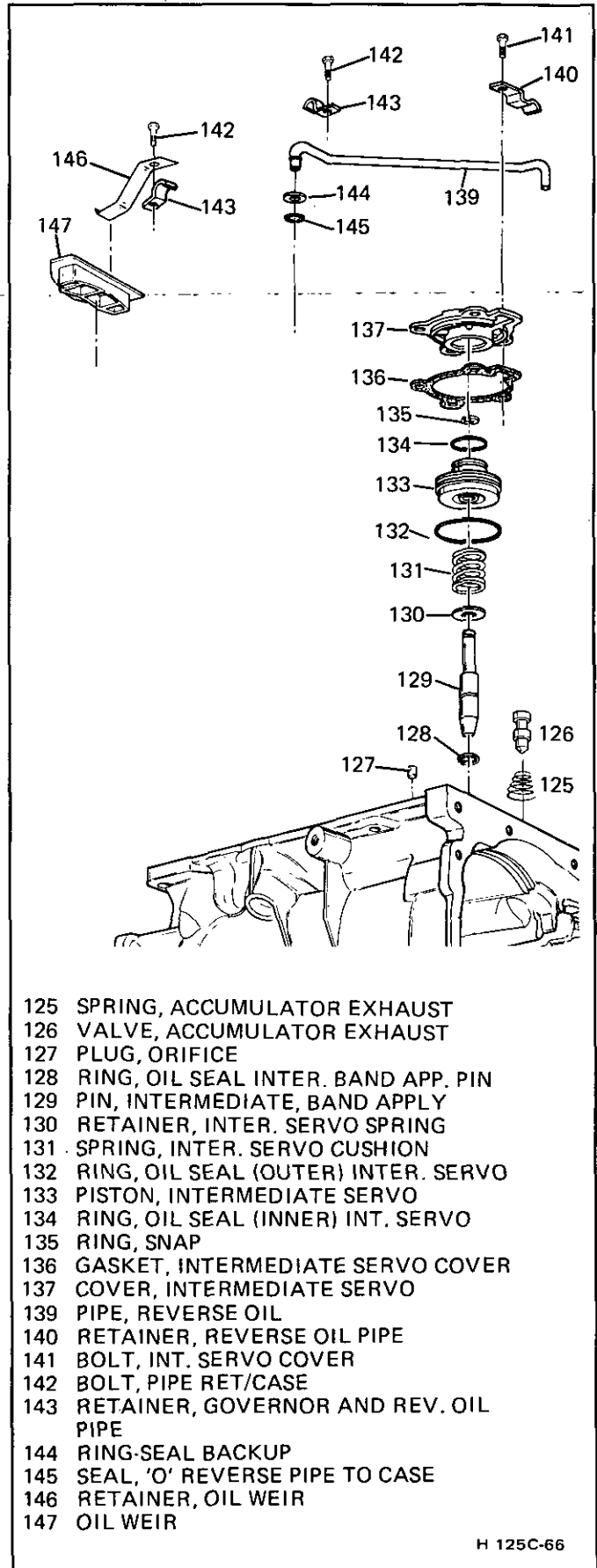
Tool Required:

J-28535 Intermediate band apply pin gage

1. Install J-28535 on case (112) and pin (129) into the gage.
2. With a torque wrench apply 11.2 N·m (100 inch pounds) of torque.
3. If the white line appears in the window the pin length is correct.
 - If the white line does not appear, select another length pin. (Figure 6) Repeat procedure.
4. Remove pin gage.

←→ Remove or Disconnect (Figures 9 & 10)

1. Bolt (712)
2. Stop bracket (711)
3. Bracket (710)
4. Bolts (146)
5. Weir (147)
6. Check valve (126) and spring (125)
7. Pipe (139), backup ring (144) and "O" Ring (145)



- 125 SPRING, ACCUMULATOR EXHAUST
- 126 VALVE, ACCUMULATOR EXHAUST
- 127 PLUG, ORIFICE
- 128 RING, OIL SEAL INTER. BAND APP. PIN
- 129 PIN, INTERMEDIATE, BAND APPLY
- 130 RETAINER, INTER. SERVO SPRING
- 131 SPRING, INTER. SERVO CUSHION
- 132 RING, OIL SEAL (OUTER) INTER. SERVO
- 133 PISTON, INTERMEDIATE SERVO
- 134 RING, OIL SEAL (INNER) INT. SERVO
- 135 RING, SNAP
- 136 GASKET, INTERMEDIATE SERVO COVER
- 137 COVER, INTERMEDIATE SERVO
- 139 PIPE, REVERSE OIL
- 140 RETAINER, REVERSE OIL PIPE
- 141 BOLT, INT. SERVO COVER
- 142 BOLT, PIPE RET/CASE
- 143 RETAINER, GOVERNOR AND REV. OIL PIPE
- 144 RING-SEAL BACKUP
- 145 SEAL, 'O' REVERSE PIPE TO CASE
- 146 RETAINER, OIL WEIR
- 147 OIL WEIR

H 125C-66

Figure 6 Oil Pipes & Servo Assembly

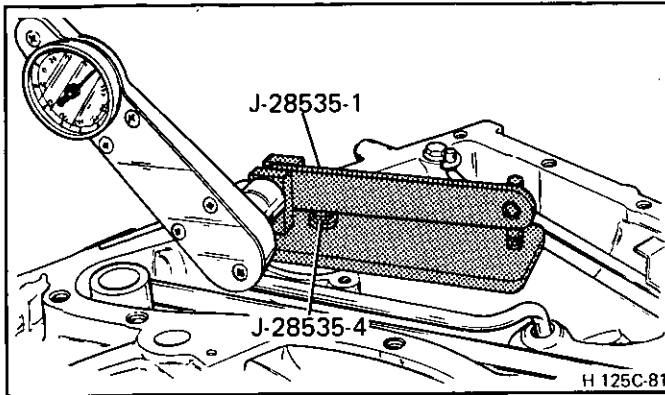


Figure 7 Checking for Proper Apply Pin

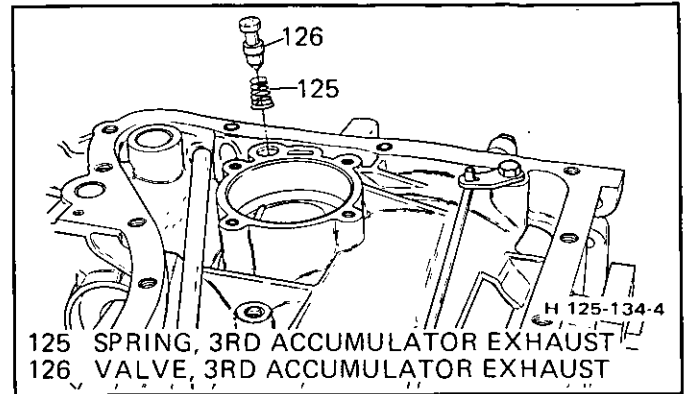


Figure 10 3rd Accumulator Exhaust Valve & Spring

INTERMEDIATE BAND APPLY PIN	
LENGTH	IDENTIFICATION
Short	2 Grooves
Medium	1 Groove
Long	No Grooves

H 125-317

Figure 8 Apply Pin Chart

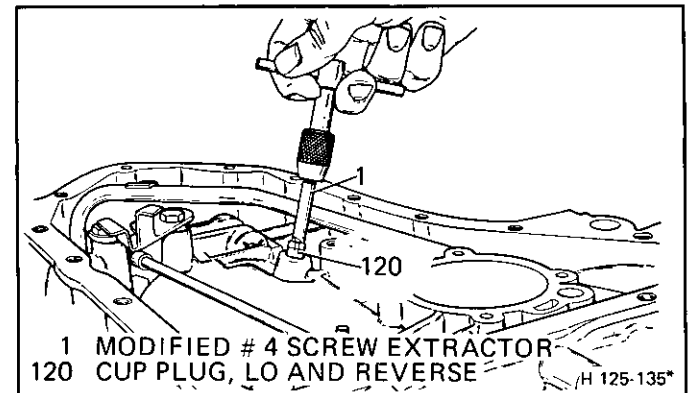


Figure 11 Lo & Reverse Cup Plug

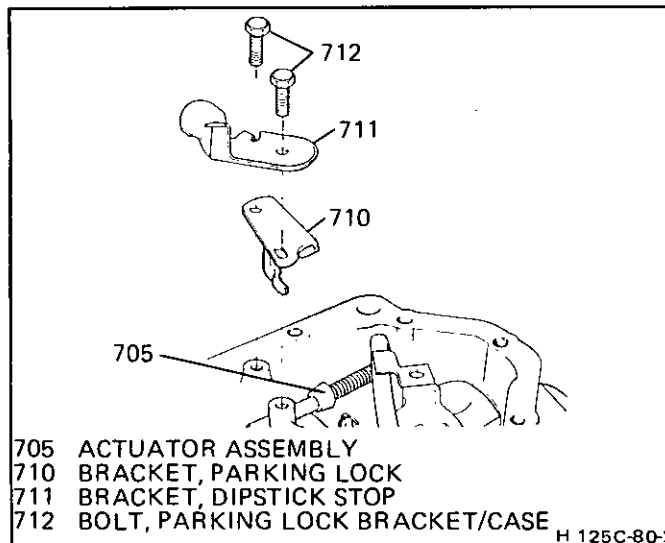


Figure 9 Dip Stick Stop & Brackets

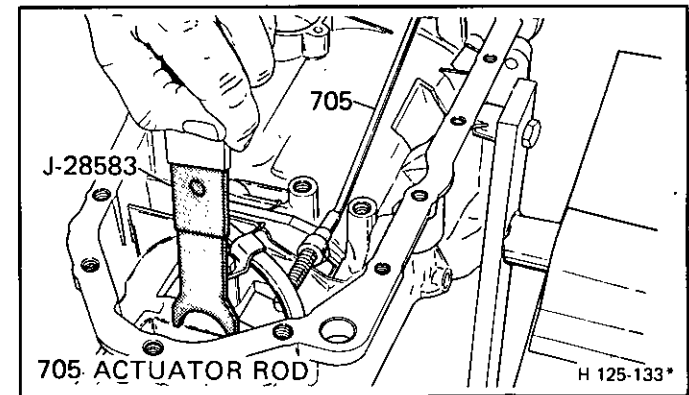


Figure 12 Expanding "C" Ring

LOW AND REVERSE SEAL AND OUTPUT SHAFT

↔ Remove or Disconnect (Figure 11 & 12)

Tool Required:

J-28583 - "C" ring remover, output shaft
Modified No. 4 screw extractor

1. Lo and reverse seal (120)
 - Use a modified No. 4 screw extractor
2. Output shaft "C" ring (30) with J-28583
 - Push ring with remover - rotate shaft (29) - pull the ring with needle nose pliers
3. Output shaft (29) from case

SIDE COVER AND CONTROL VALVE PUMP ASSEMBLY

↔ Remove or Disconnect (Figures 13 and 14)

1. Screws (27) (Leave two screws finger tight - tap the cover (26) with rubber mallet.)
2. Cover (26)
3. Bolts (24) - Do not remove the screw marked "A" (Figure 14)
4. Bracket assembly (23) and T.V. cable link (22)
5. Valve body (21) - Do not place the machined side on the bench
6. Number one check ball (16)
7. Pump shaft (18)
8. Spacer plate (20) and gaskets (19)
9. Five check balls (Figure 15)

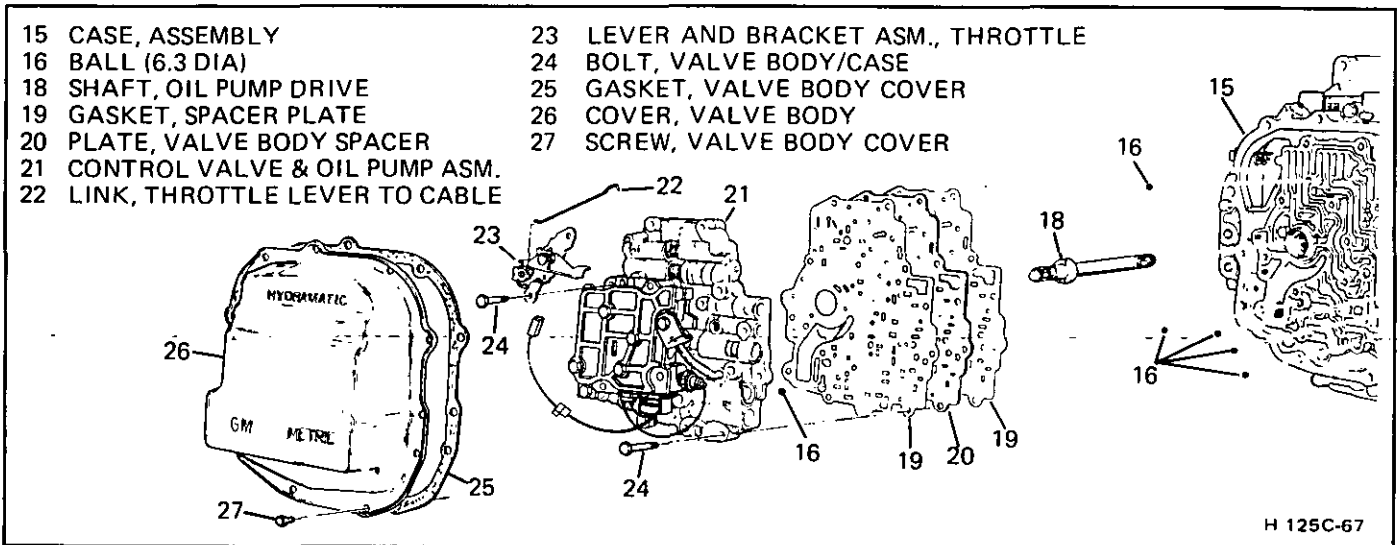


Figure 13 Side Cover & the Control Valve, Pump Assembly

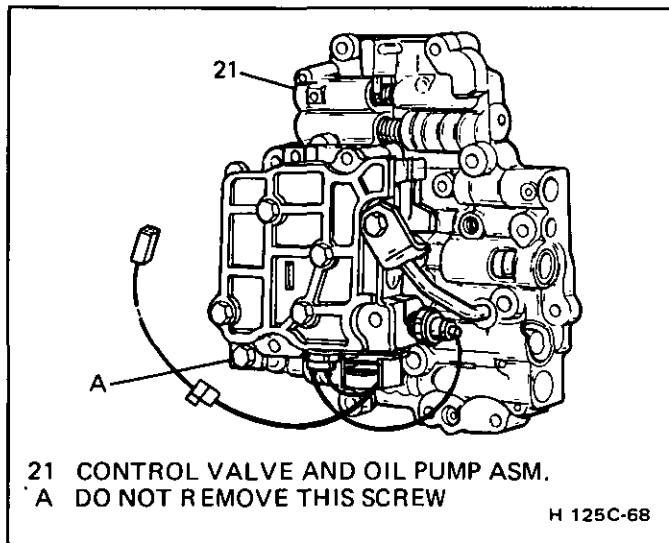


Figure 14 Control Valve/Pump Assembly

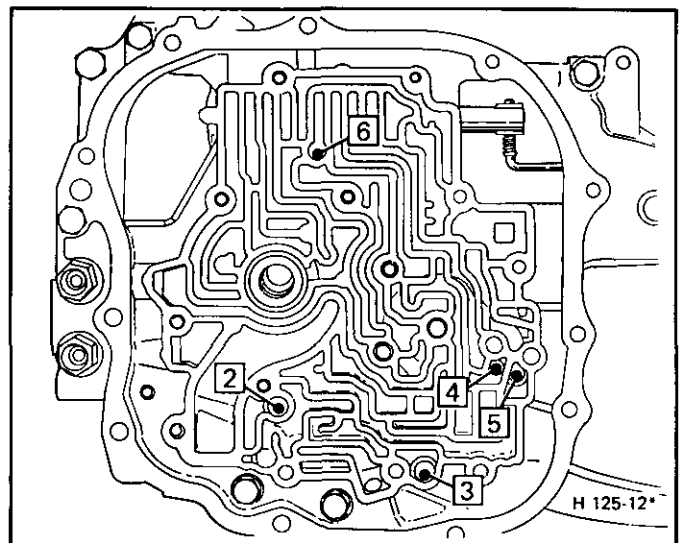


Figure 15 Check Ball Locations

Input Shaft to Case Cover Selective Snap Ring End Play Check

 Measure (Figures 16, 17 and 18)

Tools required:

- J-26958-10 Adapter Plug
- J-26958 Loading tool
- J-26958-11 Bracket
- J-28544 Input shaft lifter
- J-25025-7 Dial indicator post
(J-26900-12 or 58001 (M) dial indicator)

1. Install the adapter plug J-26958-10, loading tool J-26958 and bracket J-26958-11.
Tighten the loading tool knob until tight.
2. Install the dial indicator set and lifter.
3. Push the lifter down then zero the dial indicator.
4. Pull the lifter up.
5. Reading should be 0.10-0.84 mm (.004"-0.33"). See Figure 18. For choice of selective snap rings for proper end play ranges - record the reading.
6. Remove the dial indicator set and the lifter.

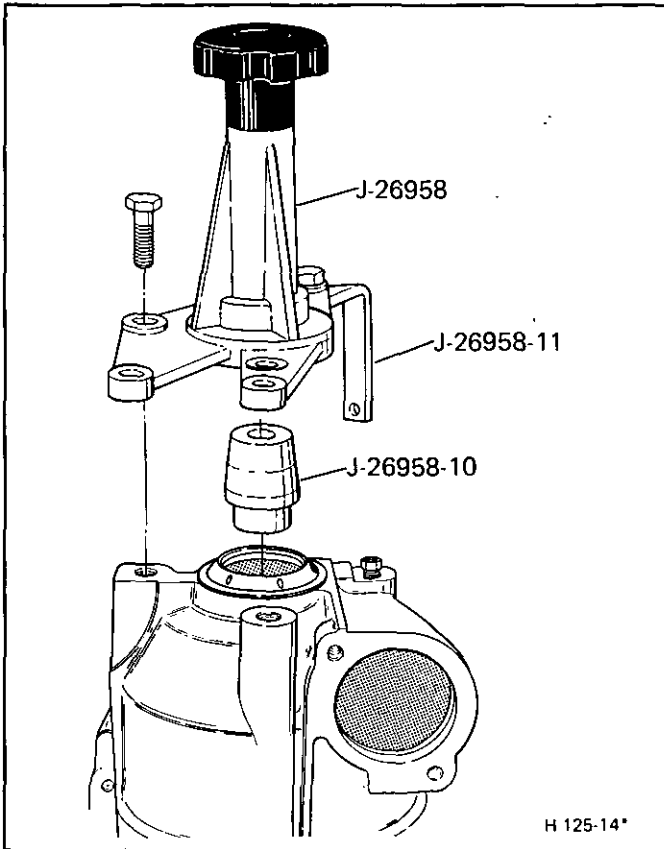


Figure 16 Output Shaft Loading Tool

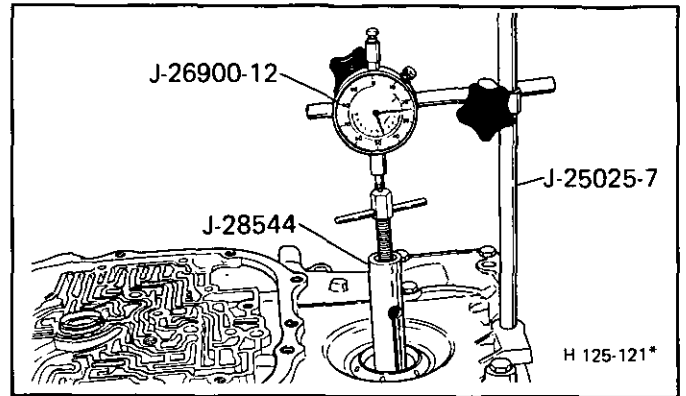


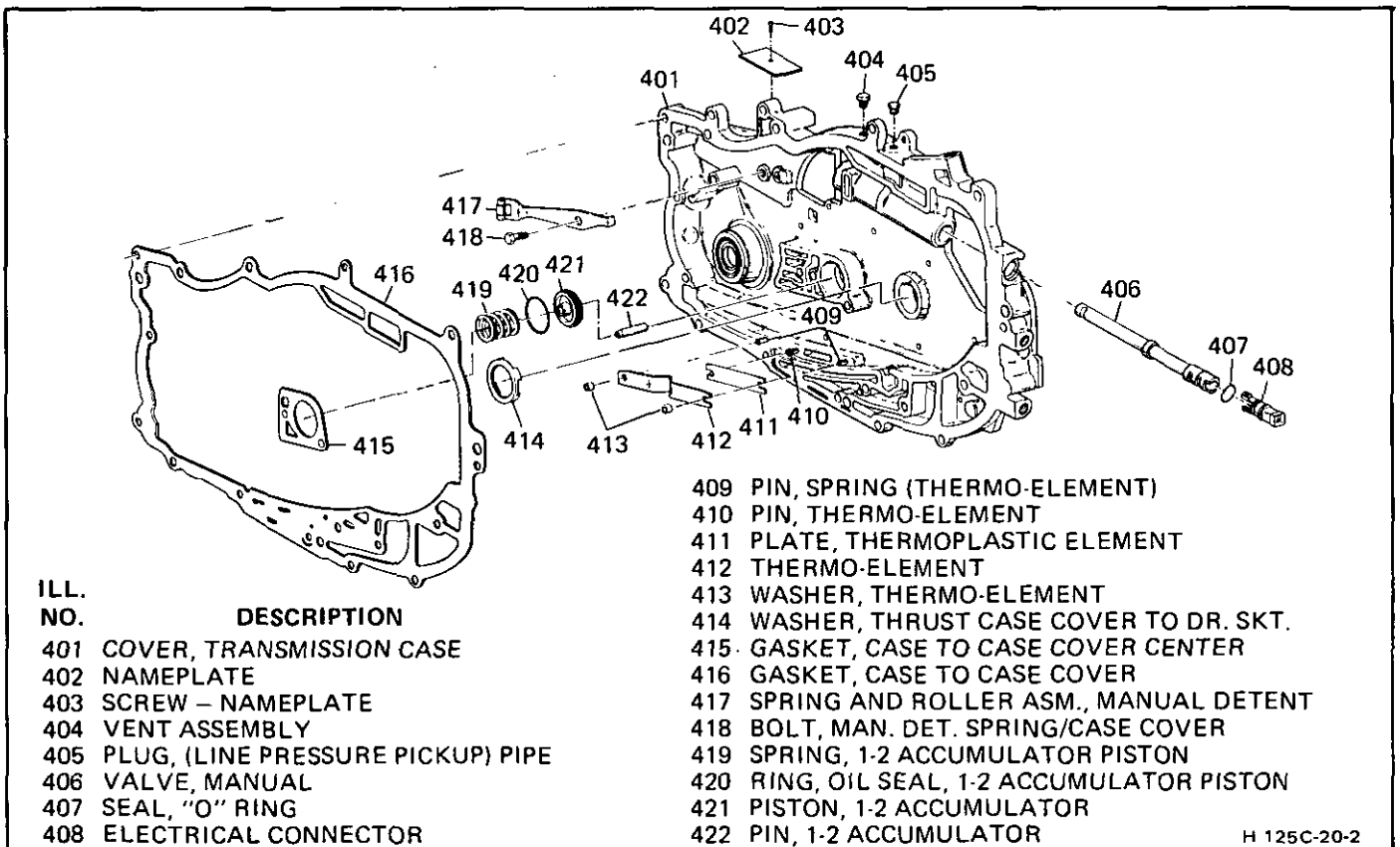
Figure 17 Input Shaft to Case Cover End Play

INPUT SHAFT SELECTIVE SNAP RING (621)

Thickness	Identification/Color
1.83 - 1.93mm (0.071" - 0.076")	White
2.03 - 2.13mm (0.078" - 0.084")	Blue
2.23 - 2.33mm (0.088" - 0.092")	Brown
2.43 - 2.53mm (0.095" - 0.099")	Yellow
2.63 - 2.73mm (0.103" - 0.107")	Green

H 125-318

Figure 18 Selective Snap Ring Chart



ILL. NO.

DESCRIPTION

- 401 COVER, TRANSMISSION CASE
- 402 NAMEPLATE
- 403 SCREW - NAMEPLATE
- 404 VENT ASSEMBLY
- 405 PLUG, (LINE PRESSURE PICKUP) PIPE
- 406 VALVE, MANUAL
- 407 SEAL, "O" RING
- 408 ELECTRICAL CONNECTOR

- 409 PIN, SPRING (THERMO-ELEMENT)
- 410 PIN, THERMO-ELEMENT
- 411 PLATE, THERMOPLASTIC ELEMENT
- 412 THERMO-ELEMENT
- 413 WASHER, THERMO-ELEMENT
- 414 WASHER, THRUST CASE COVER TO DR. SKT.
- 415 GASKET, CASE TO CASE COVER CENTER
- 416 GASKET, CASE TO CASE COVER
- 417 SPRING AND ROLLER ASM., MANUAL DETENT
- 418 BOLT, MAN. DET. SPRING/CASE COVER
- 419 SPRING, 1-2 ACCUMULATOR PISTON
- 420 RING, OIL SEAL, 1-2 ACCUMULATOR PISTON
- 421 PISTON, 1-2 ACCUMULATOR
- 422 PIN, 1-2 ACCUMULATOR

H 125C-20-2

Figure 19 Case Cover - Case Side

Case Cover

↔ Remove or Disconnect (Figures 19, 20, 21, and 22)

Tools Required:

Two M12 bolts 50 mm (2" long)

1. Rod (70) from manual valve (406)
 2. All case cover attaching bolts including 2 TORX ® head bolts
 - Install two (2) M12 bolts 50 mm (2") long into dowel pin holes. Bolts will: self tap, bottom and separate the case (112) and the cover(401). Alternate tightening of the bolts.
- DO NOT PRY CASE COVER (401).**

- Place the case cover (401) on the bench, 1-2 accumulator side up.
3. Accumulator spring (419)
 4. Piston (421)
 5. Gasket (415)
 6. Drive sprocket thrust washer (414)
 7. Driven sprocket thrust washer (121)
 8. Turbine shaft "O" ring (Figure 21)
 9. Link assembly (101), drive and driven sprockets (103) (122)
 10. Drive sprocket support thrust washer (104)
 11. Driven sprocket support thrust washer (123)

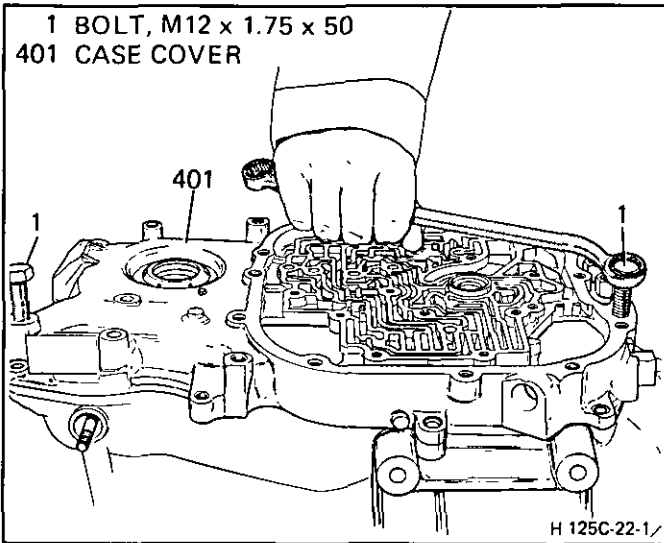


Figure 20 Case Cover Removal

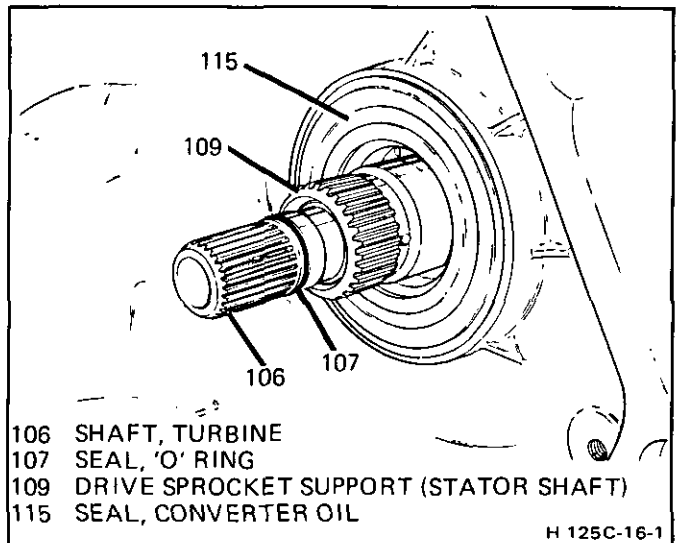


Figure 21 Turbine Shaft "O" Ring Seal

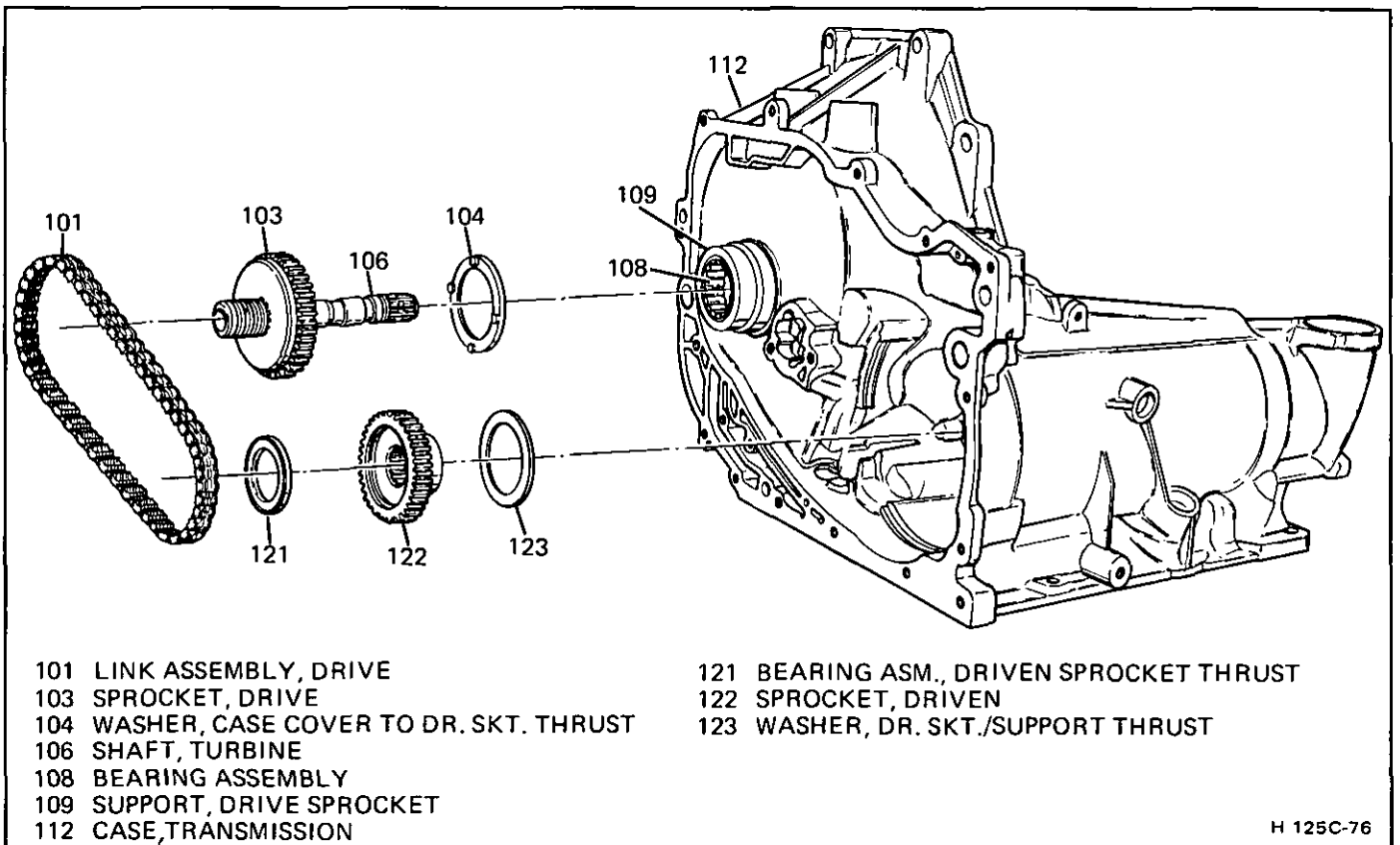
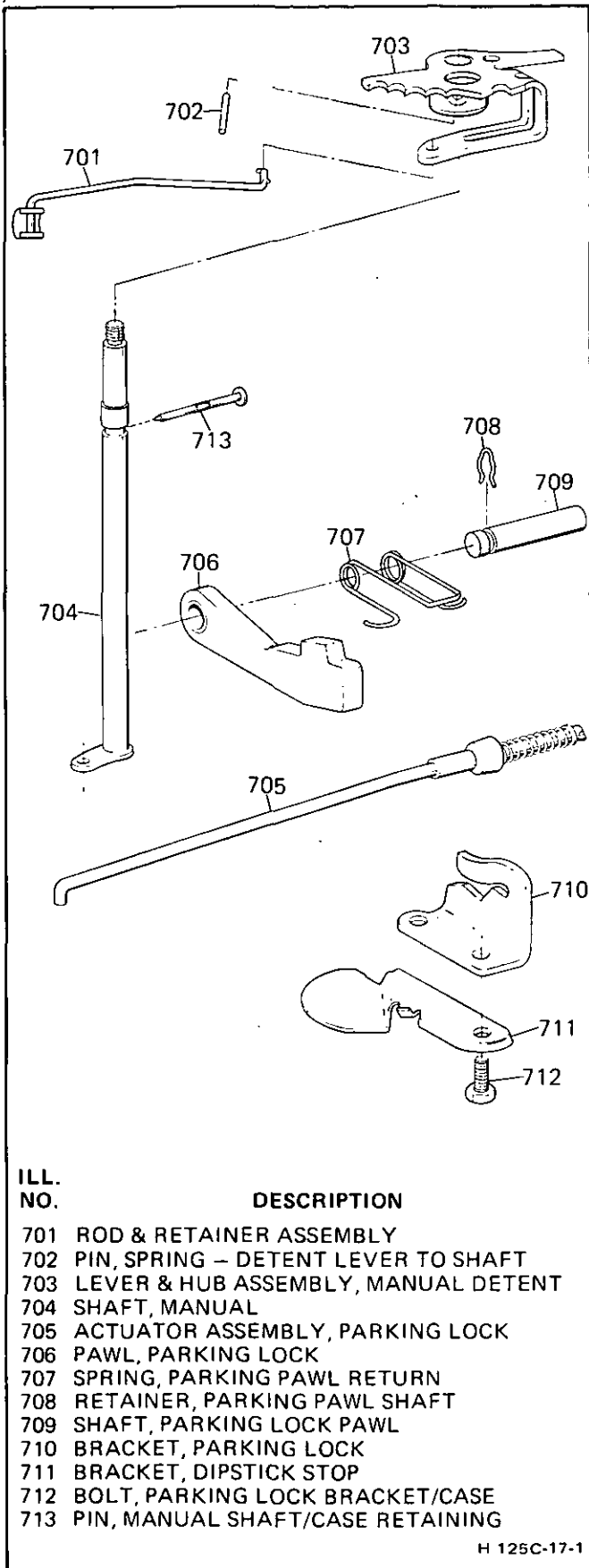


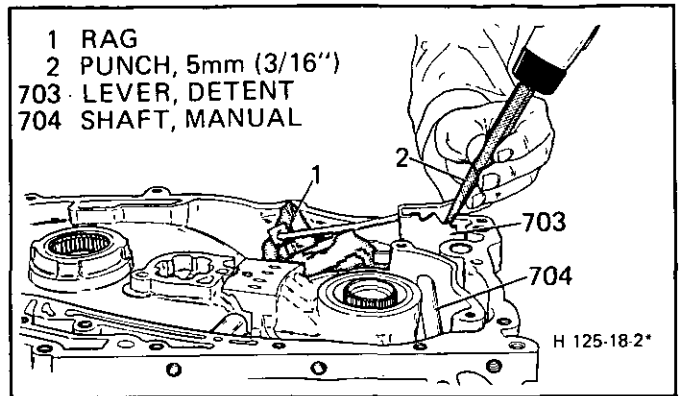
Figure 22 Drive Link Assembly



ILL. NO.	DESCRIPTION
701	ROD & RETAINER ASSEMBLY
702	PIN, SPRING - DETENT LEVER TO SHAFT
703	LEVER & HUB ASSEMBLY, MANUAL DETENT
704	SHAFT, MANUAL
705	ACTUATOR ASSEMBLY, PARKING LOCK
706	PAWL, PARKING LOCK
707	SPRING, PARKING PAWL RETURN
708	RETAINER, PARKING PAWL SHAFT
709	SHAFT, PARKING LOCK PAWL
710	BRACKET, PARKING LOCK
711	BRACKET, DIPSTICK STOP
712	BOLT, PARKING LOCK BRACKET/CASE
713	PIN, MANUAL SHAFT/CASE RETAINING

H 125C-17-1

Figure 23 Manual Linkage



- 1 RAG
- 2 PUNCH, 5mm (3/16")
- 703 LEVER, DETENT
- 704 SHAFT, MANUAL

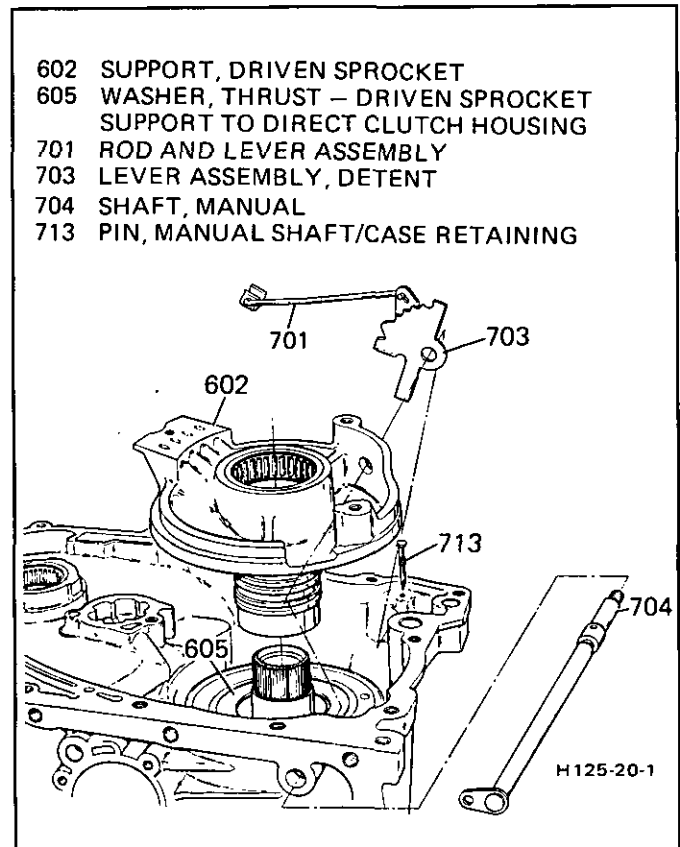
H 125-18-2*

Figure 24 Retaining Pin Removal

INPUT UNIT PARTS

←→ Remove or Disconnect (Figures 23, 24, 25, 26, 27, and 28)

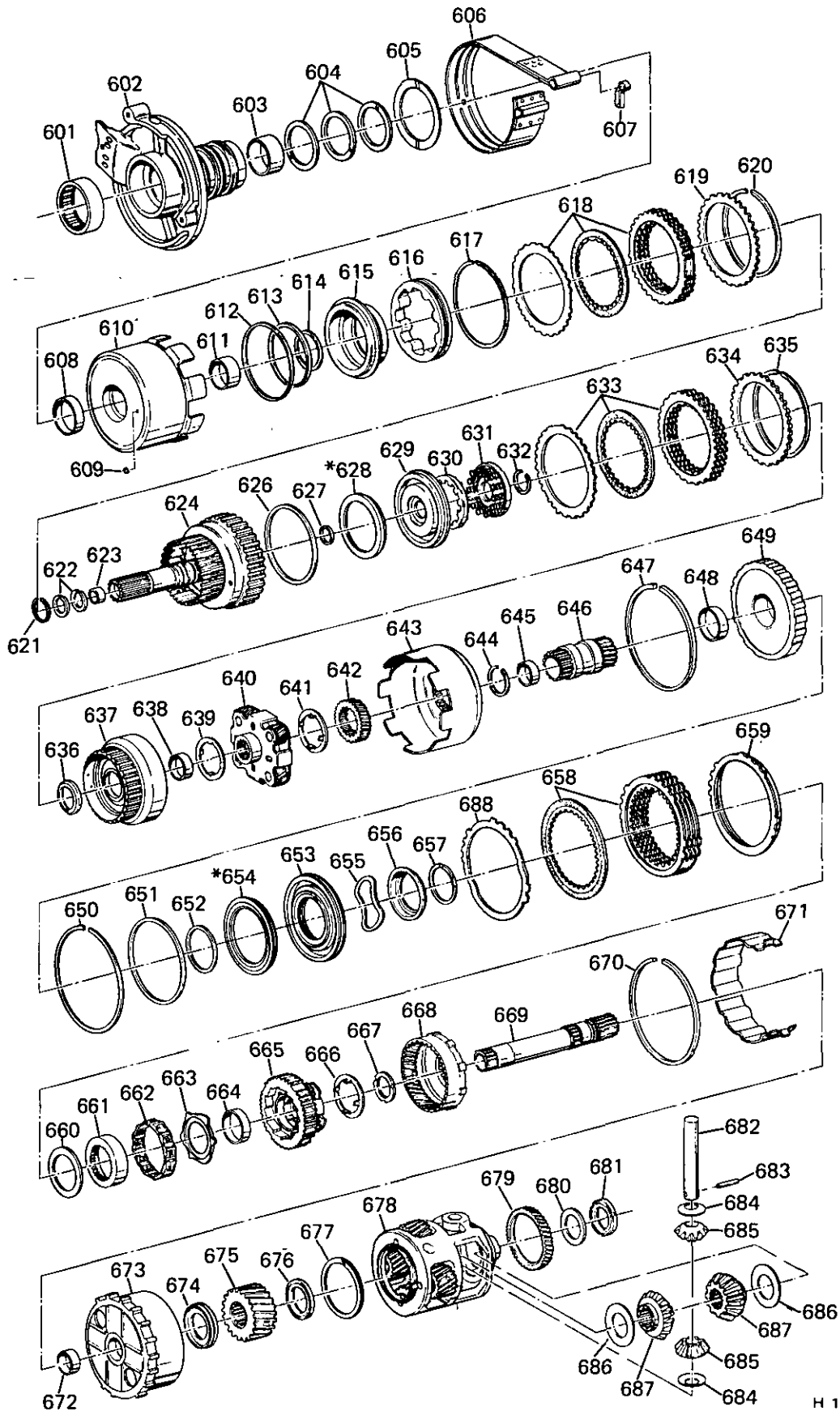
1.
 - Pin (702)
 - Pin (713)
 - Detent lever (703)
 - Manual shaft (704)
 - Actuator rod (705)
2.
 - Driven sprocket support (602)
 - Thrust washer (605) (from direct clutch side)
3.
 - Plug (607) (Figure 27)
 - Band (606)



- 602 SUPPORT, DRIVEN SPROCKET
- 605 WASHER, THRUST - DRIVEN SPROCKET SUPPORT TO DIRECT CLUTCH HOUSING
- 701 ROD AND LEVER ASSEMBLY
- 703 LEVER ASSEMBLY, DETENT
- 704 SHAFT, MANUAL
- 713 PIN, MANUAL SHAFT/CASE RETAINING

H125-20-1

Figure 25 Removing Manual Linkage



*NOT REQUIRED WITH CAST ALUMINUM PISTON

H 125-143-2

Figure 26 Internal Components

ILL. NO.	DESCRIPTION	
601	BEARING ASSEMBLY	645 BUSHING, REACTION SUN GEAR
602	SUPPORT ASSEMBLY, DRIVEN SPROCKET	646 GEAR, REACTION SUN
603	BUSHING, DRIVEN SPROCKET SUPPORT	647 RING, SNAP
604	RING, OIL SEAL	648 BUSHING, LO & REVERSE CLUTCH HOUSING
605	WASHER, THRUST	649 HOUSING, LO AND REVERSE
606	BAND ASSEMBLY, INTERMEDIATE	650 RING, SNAP
607	PLUG, BAND ANCHOR HOLE	651 SEAL, LO & REVERSE PISTON OUTER
608	BUSHING, DIRECT CLUTCH	652 SEAL, LO & REVERSE PISTON INNER
609	RETAINER & BALL ASM., CHECK VALVE	653 PISTON, LO AND REVERSE CLUTCH
610	HOUSING & DRUM ASM., DIRECT CLUTCH	*654 INSERT, LO & REVERSE CLUTCH PISTON
611	BUSHING, DIRECT CLUTCH DRUM	655 SPRING, LO & REVERSE CLUTCH RELEASE
612	SEAL, DIRECT CLUTCH PISTON OUTER	656 RETAINER, LO & REVERSE CLUTCH SPRING
613	SEAL, DIRECT CLUTCH CENTER	657 RING, SNAP
614	SEAL, DIRECT CLUTCH PISTON INNER	658 PLATE, LO & REVERSE CLUTCH
615	PISTON, DIRECT CLUTCH	659 PLATE, LO & REVERSE CLUTCH BACKING
616	APPLY RING & RELEASE SPRING ASM.	660 SPACER, REV. HOUSING/LO RACE SELECTIVE
617	RING, SNAP	661 RACE, LO ROLLER CLUTCH
618	PLATE, DIRECT CLUTCH	662 ROLLER ASSEMBLY, LO CLUTCH
619	PLATE, CLUTCH BACKING, DIRECT	663 WASHER, REACTION CARR./INT. GR. THRUST
620	RING, SNAP	664 BUSHING, REACTION CARRIER
621	SNAP RING, SELECTIVE	665 CARRIER ASSEMBLY, REACTION
622	RING, OIL SEAL	666 WASHER, REACTION CARR./INT. GR. THRUST
623	BUSHING, INPUT SHAFT	667 BEARING, REACTION SUN/INT. GR. THRUST
624	HOUSING ASSEMBLY, FORWARD CLUTCH	668 GEAR, REACTION INTERNAL
626	SEAL, FORWARD CLUTCH PISTON OUTER	669 SHAFT, FINAL DRIVE SUN GEAR
627	SEAL, FORWARD CLUTCH PISTON INNER	670 RING, SNAP
*628	INSERT	671 SPACER, FINAL DRIVE INTERNAL GEAR
629	PISTON, FORWARD CLUTCH	672 BUSHING, FINAL DRIVE INTERNAL GEAR
630	GUIDE, RELEASE SPRING	673 GEAR, FINAL DRIVE INTERNAL
631	RETAINER & SPRING ASM., FWD. CL.	674 BEARING, THRUST SUN GEAR/INT. GEAR
632	RING, SNAP SPRING RETAINER	675 GEAR, FINAL DRIVE SUN
633	PLATE, FORWARD CLUTCH	676 BEARING, THRUST SUN GEAR/CARRIER
634	PLATE, CLUTCH BACKING, FORWARD	677 RING, SPIRAL RETAINING
635	RING, SNAP	678 DIFFERENTIAL, CARRIER
636	WASHER, INPUT SHAFT THRUST	679 GEAR, GOVERNOR DRIVE
637	GEAR, AND INPUT INTERNAL	680 WASHER, DIFF. CARR./CASE SEL. THRUST
638	BUSHING, INPUT INTERNAL GEAR	681 BEARING ASM., DIFF. CARR./CASE THRUST
639	WASHER, INPUT CARR./IP. INT. GR. THRUST	682 SHAFT, DIFFERENTIAL PINION
640	CARRIER ASSEMBLY, INPUT	683 PIN, DIFF. PINION SHAFT RETAINING
641	WASHER, INPUT CARR./IP. SUN GR. THRUST	684 WASHER, PINION THRUST
642	GEAR, INPUT SUN	685 PINION, DIFFERENTIAL
643	DRUM, INPUT	686 WASHER, DIFF. SIDE GEAR THRUST
644	RING, SNAP SELECT. INPUT DRUM/SUN GEAR	687 GEAR, DIFFERENTIAL SIDE
		688 PLATE, LO & REVERSE CLUTCH WAVED
		*NOT REQUIRED WITH CAST ALUMINUM PISTON

LEGEND
H 125-143-2L

Figure 27L Legend

- Direct and forward clutch assemblies (610 - 624) by lifting input shaft
- 4. Thrust washer (636)
- 5.
 - Internal gear (637)
 - Carrier (640) thrust washer (641)
 - Input sun gear (642)
 - Input drum (643)

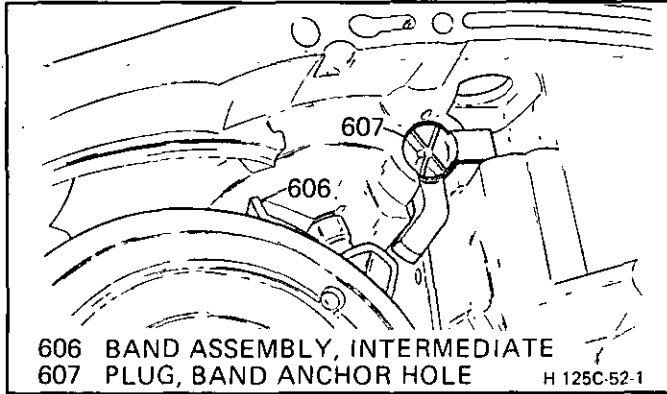


Figure 28 Band Anchor Hole Plug

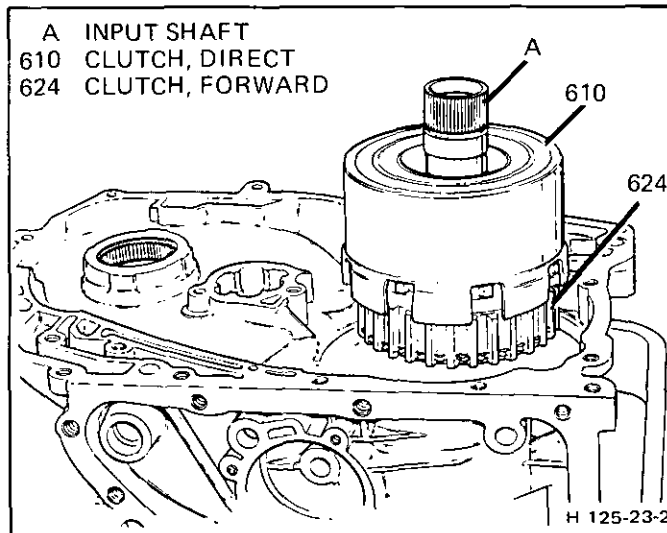


Figure 29 Removing Forward & Direct Clutches

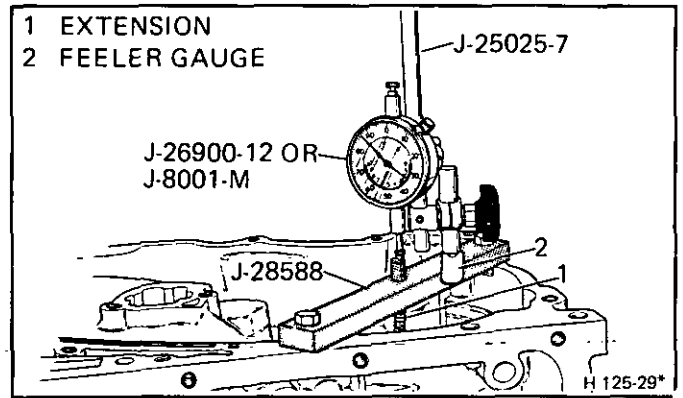


Figure 30 Selective Snap Ring End Play

REACTION SUN GEAR TO INPUT DRUM SELECTIVE SNAP RING (644)

Thickness	Identification/Color
2.27 - 2.37mm (0.089" - 0.093")	Pink
2.44 - 2.54mm (0.096" - 0.100")	Brown
2.61 - 2.71mm (0.103" - 0.107")	Lt. Blue
2.78 - 2.88mm (0.109" - 0.113")	White
2.95 - 3.05mm (0.116" - 0.120")	Yellow
3.12 - 3.22mm (0.123" - 0.127")	Lt. Green
3.29 - 3.39mm (0.129" - 0.133")	Orange
3.46 - 3.56mm (0.136" - 0.140")	No Color

H 125-319-2

Figure 31 Selective Snap Ring Chart

Reaction Sun Gear to Input Drum End Play

Measure (Figure 30 & 31)

Tools Required:

- J-26958 Loading tool
- J-26958-11 Bracket
- J-26958-10 Adapter plug
- J-28588 Gauge
- J-25025-7 Post
- J-26900-12 or J-8001M Dial indicator

1. Install tools as shown.
 - The loading tool should already be in place.
 2. Position the gage extension between open ends of the snap ring (644). (Reaction sun gear (646) must be properly positioned.)
 3. Swing the gage under the extension shoulder.
 4. Zero the dial indicator.
 5. Position the snap ring (644) under the extension.
 6. Remove the gage from under the shoulder.
 7. The dial indicator should read 0.33 to 0.13 mm (0.013" to 0.005"). - record the reading.
- For correct snap ring selection, See Figure 31. Measure washer thickness (new or old) with a micrometer.

Lo Roller Clutch Race Selective Spacer End Play

Measure (Figures 32 and 33)

1. Use tools from "Selective Snap Ring End Play Check".
2. Pry up on internal gear (668) with J-28585 – Do not pry against the spacer (671).
3. The dial indicator reading should be 0.08-1.17 mm (0.003"-0.046"). Record reading. For correct washer selection see Figure 33.
4. Remove the dial indicator set and J-28588 gage.

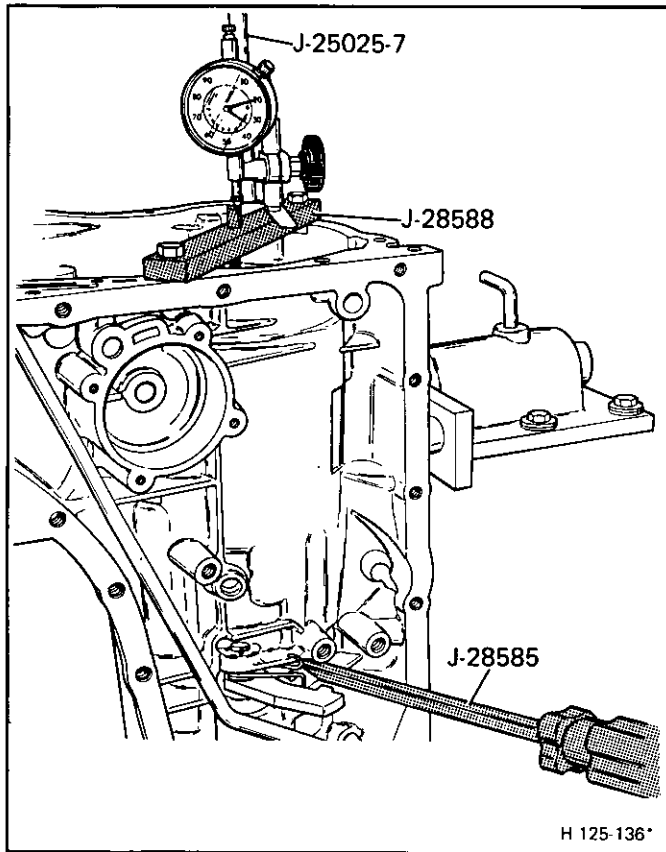


Figure 32 Lo Roller Clutch Race Selective Thrust Spacer

REVERSE CLUTCH HOUSING TO LO RACE SELECTIVE SPACER (660)

Thickness	Identification
1.00 - 2.20mm (0.039" - 0.043")	1
1.42 - 1.52mm (0.056" - 0.060")	2
1.84 - 1.94mm (0.072" - 0.076")	3
2.26 - 2.36mm (0.089" - 0.093")	4
2.68 - 2.78mm (0.105" - 0.109")	5
3.10 - 3.20mm (0.122" - 0.126")	6

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Figure 33 Lo Race Selective Spacer Chart

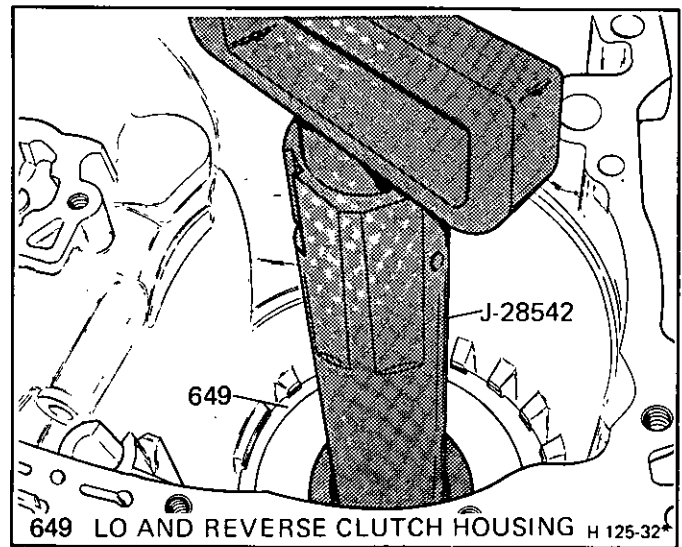


Figure 34 Removing the Lo & Reverse Clutch Housing

REACTION UNIT PARTS

Remove or Disconnect (Figures 25, 33, 34, 35 and 36)

Tool Required:
J-28542 Lo-Reverse Clutch Unit Remover and Installer

1. Sun gear (646)
2. Snap ring (644) – ring is 2.36 mm (0.092") thick
3. Lo reverse clutch housing (649) with J-28542
4. Snap ring (650)
5. Output carrier and roller clutch assemblies and lo reverse clutch plates (658 thru 668) by lifting shaft (669) (Figure 35).

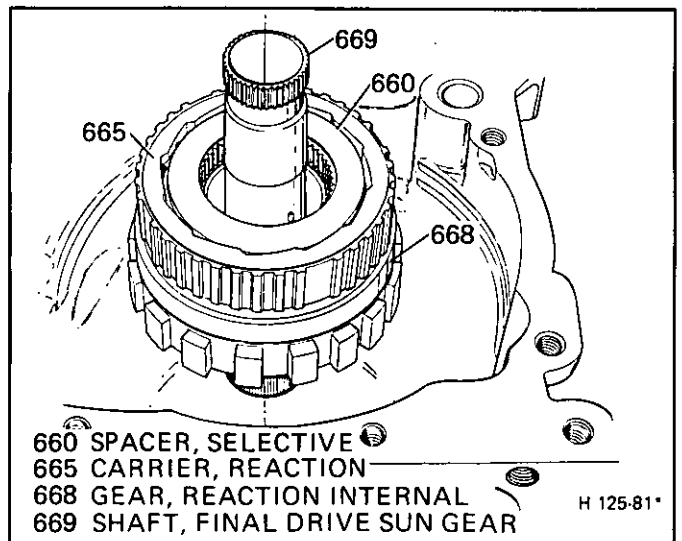


Figure 35 Removing Reaction Components

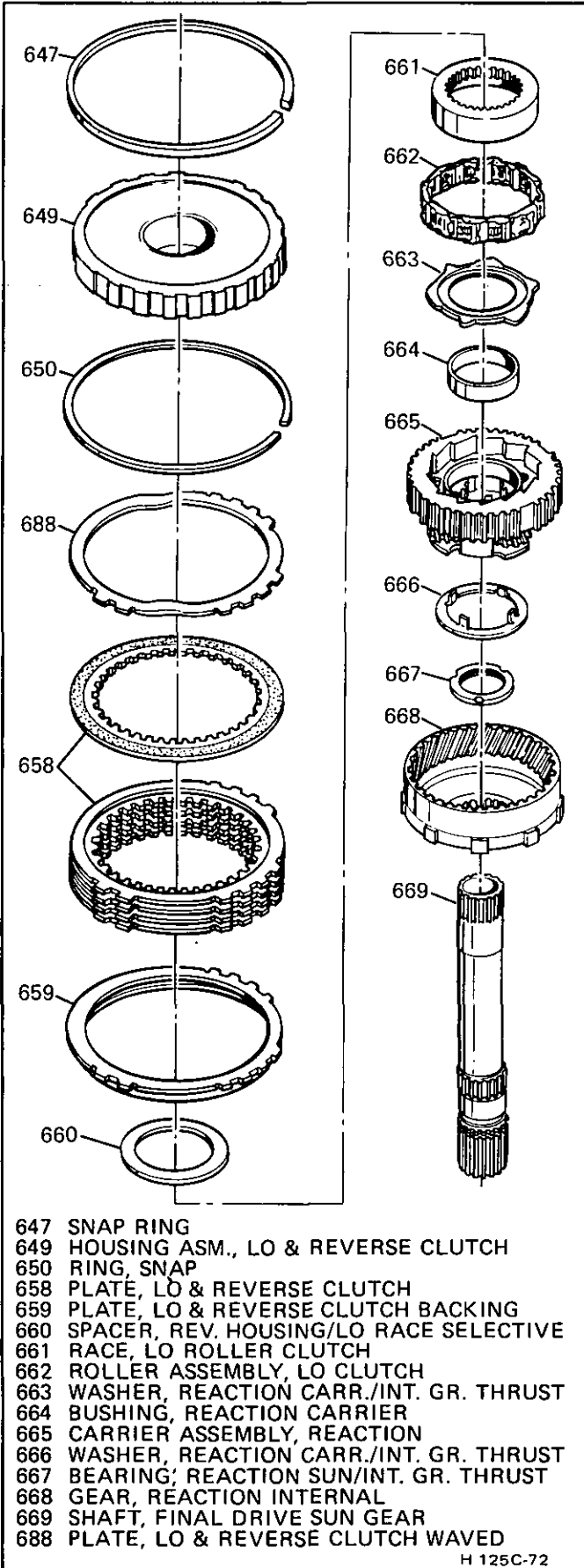


Figure 36 Reaction Components Disassembly



Disassemble (Figure 26 and 36)

- Clutch plates (658) & Backing plate (658)
- Roller clutch assembly (665)
- Internal gear (668)
- Shaft (669)

FINAL DRIVE ASSEMBLY



Measure (Figures 37, 38, 39 and 40)

Tools Required:

- J-26958-10 Adapter
- J-25025-7 Post
- J-26900-12 or J-8001M Dial indicator
- J-28585 Snap ring remover

1. Remove J-26958 and J-26958-11. Leave J-26958-10 adapter in place.
2. Install the dial indicator set so that stem contacts the adapter.

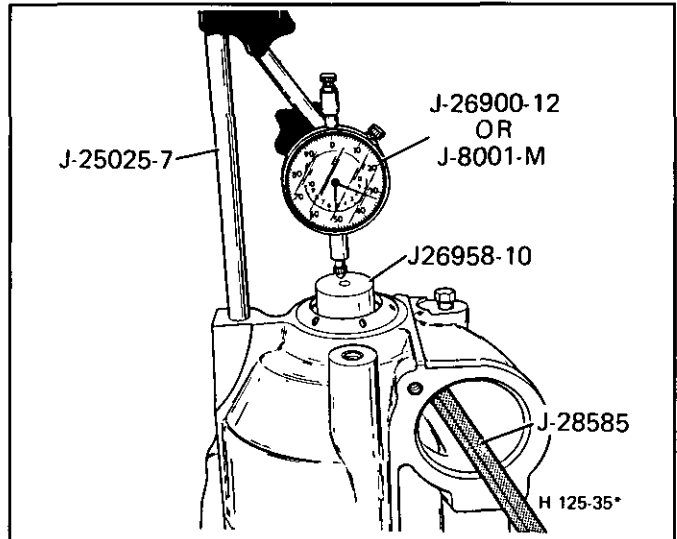


Figure 37 Final Drive End Play Selective Thrust Washer Measurement (680)

**FINAL DRIVE TO CASE END PLAY
 SELECTIVE THRUST WASHER (680)**

THICKNESS	IDENTIFICATION NO./COLOR
1.40 - 1.50mm (0.055" - 0.059")	0/Orange
1.50 - 1.60mm (0.059" - 0.062")	1/White
1.60 - 1.70mm (0.062" - 0.066")	2/Blue
1.70 - 1.80mm (0.066" - 0.070")	3/Pink
1.80 - 1.90mm (0.070" - 0.074")	4/Brown
1.90 - 2.00mm (0.074" - 0.078")	5/Green
2.00 - 2.10mm (0.078" - 0.082")	6/Black
2.10 - 2.20mm (0.082" - 0.086")	7/Purple
2.20 - 2.30mm (0.086" - 0.091")	8/Purple & White
2.30 - 2.40mm (0.091" - 0.095")	9/Purple & Blue

H 125-321-2

Figure 38 Final Drive End Play Chart

3. Lift up on the governor drive gear (679) with J-28585.
4. Reading on the dial indicator should be 0.12-0.82 mm (0.005"-0.032") - Record reading.
For correct washer selection see Figure 37.
5. Remove the dial indicator set and the adapter.

↔ Remove or Disconnect (Figures 26, 38, 39 and 48)

Tool Required:

J-28545 Final Drive Unit Remover and Installer

1. Snap ring (670) - Ring is 2.36 mm (0.092") thick.
2. Spacer (671)
3. Final drive assembly (673-688) with J-28545
4. Thrust bearing (681)
5. Selective washer (680)

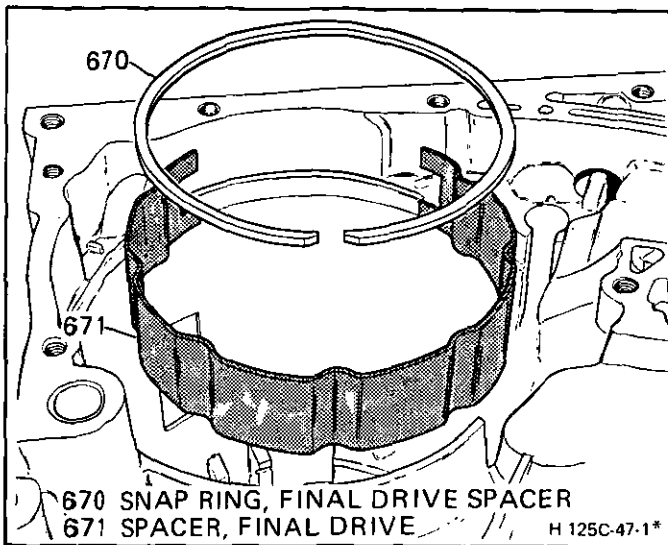


Figure 39 Final Drive Spacer & Snap Ring

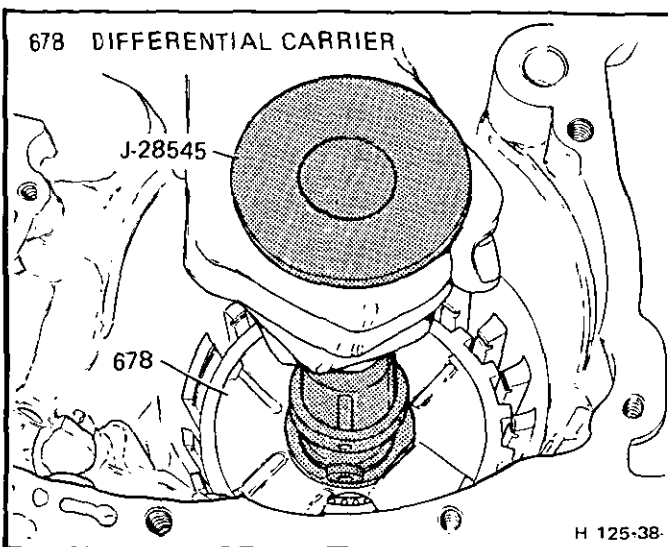


Figure 40 Removing Final Drive Assembly

CASE ASSEMBLY



Clean

- Case (112) thoroughly with solvent and air dry.



Inspect (Figure 40)

- Case - see Section 7A for Case Repair
 - Lug damage
 - Snap ring groove damage
 - Oil passage damage
 - Servo bore damage
 - Casting porosity
 - Stripped threads
- Case bushing (116) - for scoring
- Converter seal (115) - see drive sprocket support inspection replace
- Axle seal (117) - for damage

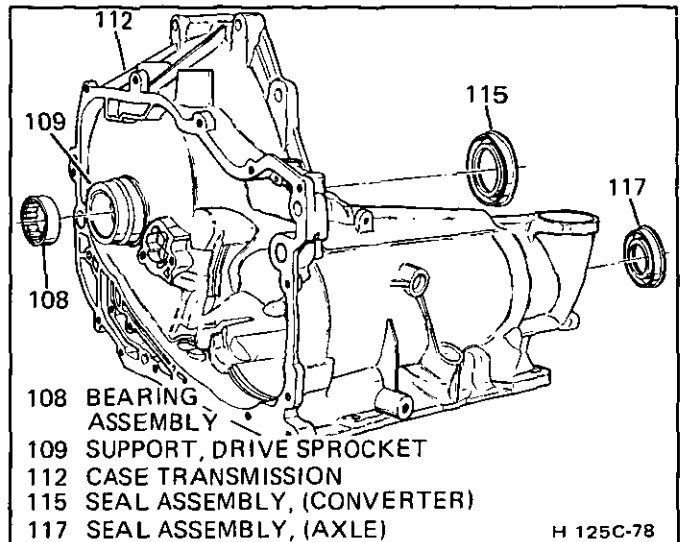


Figure 41 Axle Seals & Sprocket Bearing

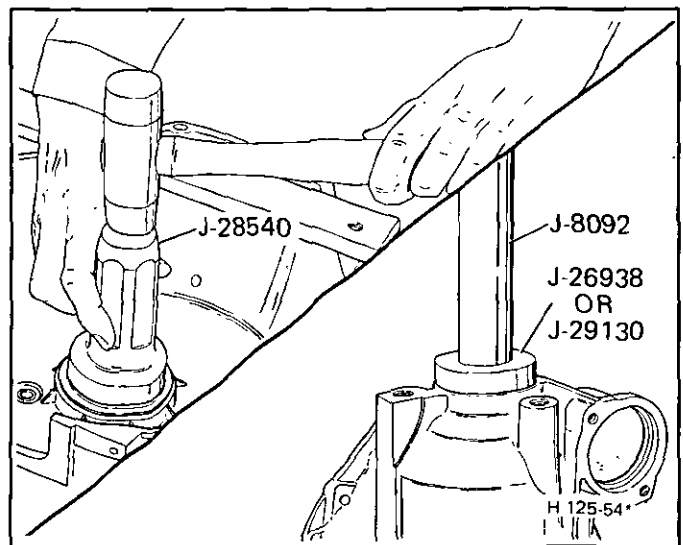


Figure 42 Converter Seal and Axle Seal Installation

Seal Replacement Procedure

↔ Remove or Disconnect (Figure 41)

- Seal (115) or (117) – pry out

↔ Install or Connect (Figure 42)

Tools Required:

- J-26938 or J-29130 Axle Seal Installer
- J-28540 Converter Seal Installer

- Seal (115) with J-28540
- Seal (117) with J-26938 or J-29130

🔍 Inspect (Figure 41)

- Drive sprocket support bearing (108)
If new bearing is required be sure to inspect drive sprocket (106) race for damage or wear

Bearing Replacement Procedure

↔ Remove or Disconnect (Figure 43)

Tools Required:

- J-26941 Bearing puller
- J-6125-1 or J-2619-01 Slide hammer
- J-6471-8 Adapter

- Bearing (108) with J tools

↔ Install or Connect (Figure 44)

Tools Required:

- J-28677 Bearing Installer
- J-8092 Handle

- Bearing (108) identification side up with J-28677 and J-8092

🔍 Inspect

- Drive sprocket support (109) for scoring

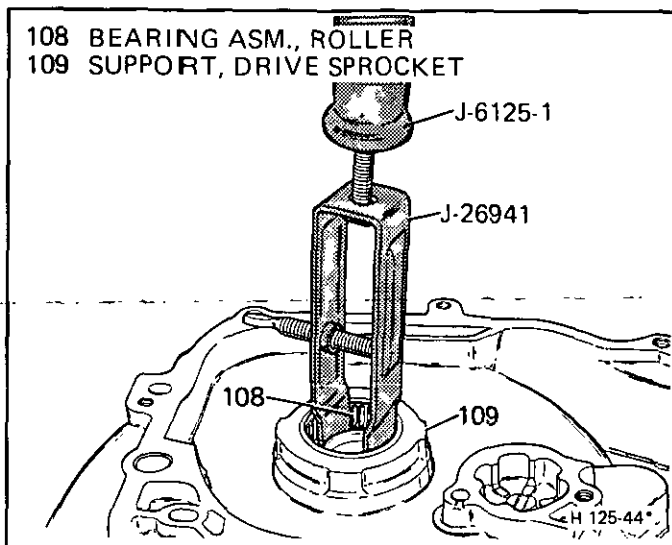


Figure 43 Removing Bearing

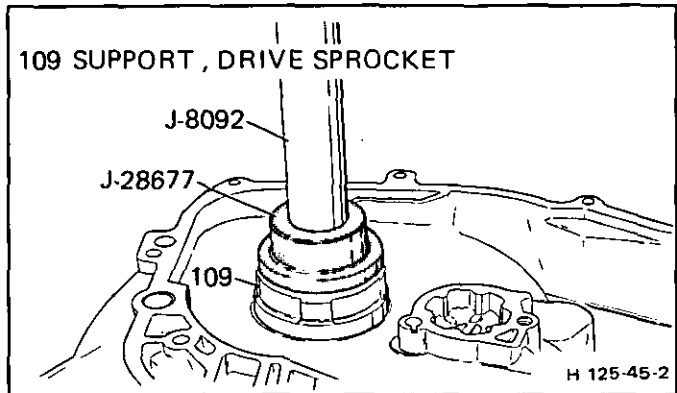


Figure 44 Installing Bearing

Support Replacement Procedure

↔ Remove or Disconnect (Figure 45)

Tool Required:

- J-25359-5 #40 Torx bit or equivalent

1. Converter oil seal (115)
2. Screws (114) with J-25359-5
3. Support (109) from case

↔ Install or Connect (Figure 45)

1. Support (109) into case
2. Screws (114) – use thread locking compound

🔧 Tighten

Tools Required:

- J-25259 #40 Torx bit or equivalent

- Screws (114) to 24 N·m (18 ft. lbs.) with J-25359-5

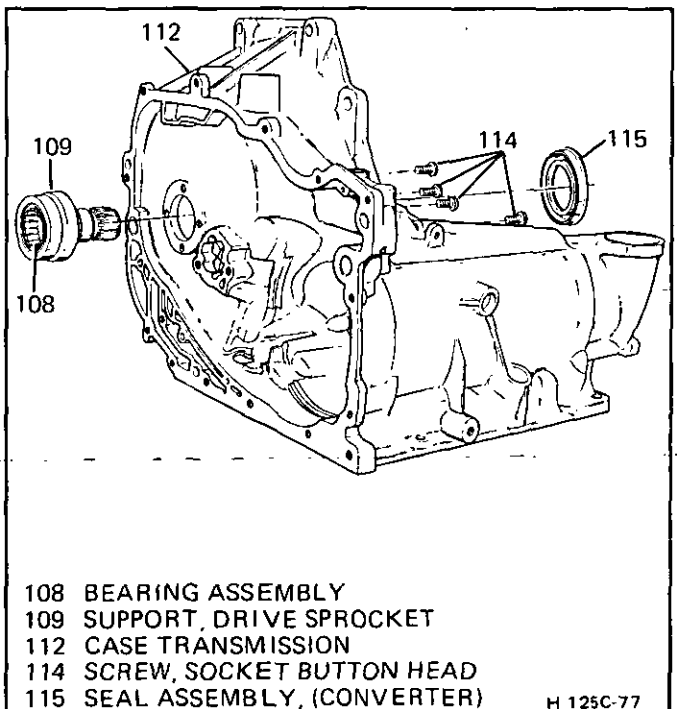


Figure 45 Sprocket Support Replacement

Inspect

- Parking pawl (706) for damage

Parking Pawl Replacement Procedure

Remove or Disconnect (Figure 46)

1. Cup plug with a screw extractor
2. Retainer (708)
3. Shaft (709)
4. Return spring (707)
5. Pawl (706)

Install or Connect

1. Return spring (707)
2. Pawl (706)
3. Shaft (709)
4. Retainer (708)
5. Cup Plug with a 9 mm (3/8") rod

Inspect

- Governor pipe (138) for damage or cracks

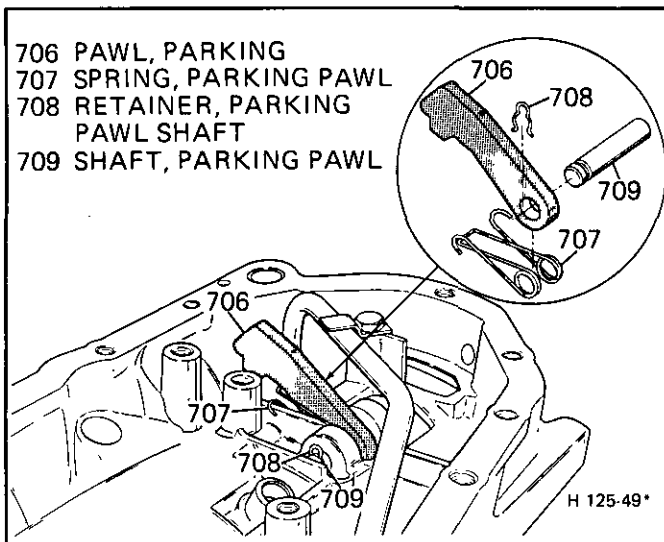


Figure 46 Parking Pawl

3. Retainer (143) and bolt (142) torque to 24 N·m (18 ft. lbs.)

Inspect

- 3rd oil cup plug (127) for cracks or loose fit

3rd Oil Cup Plug Replacement Procedure

Remove or Disconnect (Figure 48)

- Plug (127) – use #3 screw extractor with 13 mm (1/2") ground off.

Install or Connect

- Plug (127) tap until seated in case – use a 6 mm (1/4") rod.

Inspect

- Manual Shaft oil seal (113) for damage

Manual Shaft Replacement Procedure

Remove or Disconnect

- Seal (113) – pry out – check bore for burrs. Smooth with fine stone if necessary.

Install or Connect

- Seal (113) lip side up use 13 mm or 9/16" socket – tap with mallet until seated.

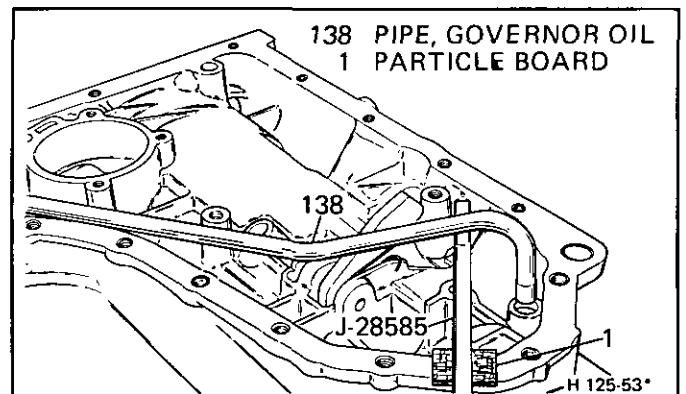


Figure 47 Governor Pipe Replacement

Governor Pipe Replacement Procedure

Remove or Disconnect (Figure 47)

Tool Required:

J-28585 Snap Ring Remover

- Pipe (138) with J-28585, pry out. Use particle board to protect case. Pipe is sealed in place.

Install or Connect

1. Coat both ends of the pipe (138) with loctite ® or equivalent.
2. Pipe (138) into case (112), tap gently with a soft mallet.

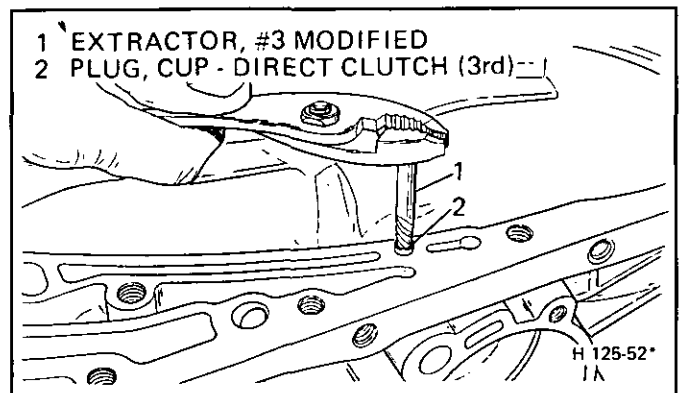


Figure 48 Cup Plug Removal

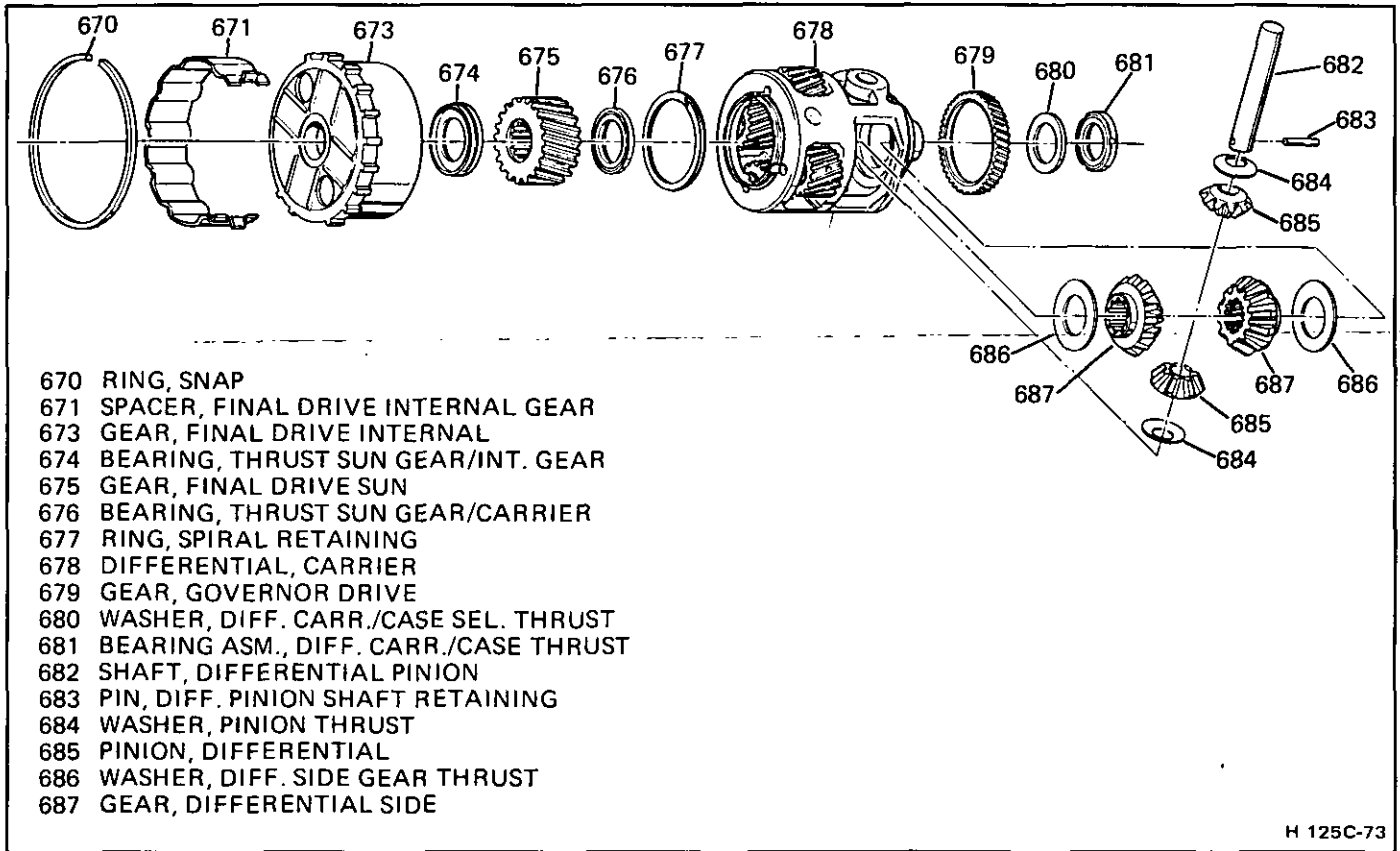


Figure 49 Final Drive Assembly

DIFFERENTIAL AND FINAL DRIVE

Disassemble (Figure 49)

1. Internal gear (673)
2. Thrust bearing (674)
3. Sun gear (675)
4. Thrust bearing (676)

End play range - 0.24 - 0.63 mm (0.009"-0.025")

- Internal gear (673) for damaged teeth or bearing surface
- Thrust bearing (674) for damage
- Sun gear (675) for damaged teeth or bearing surfaces
- Thrust bearing (676) for damage
- Governor drive gear (679) for wear

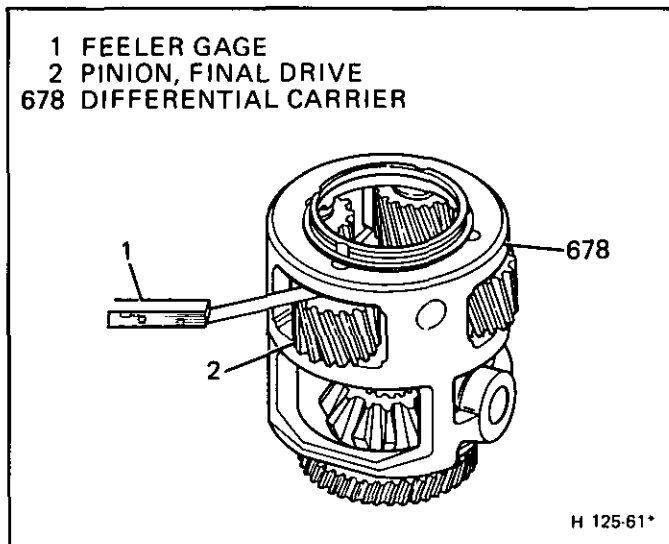


Figure 50 Final Drive Pinion End Play

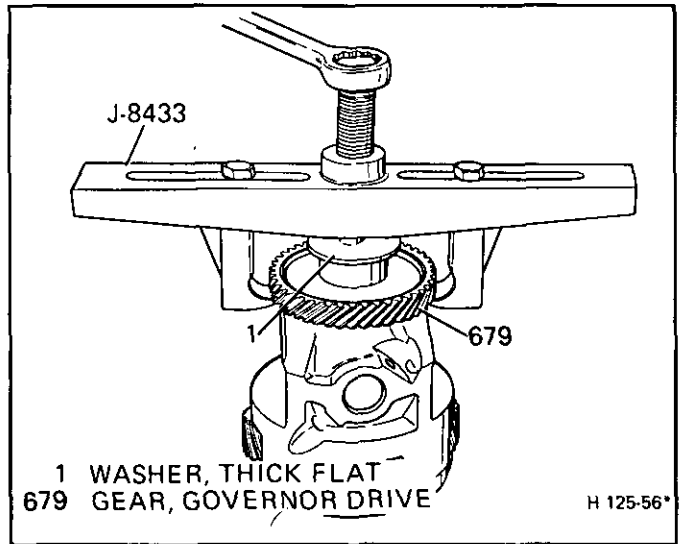


Figure 51 Governor Drive Gear Replacement

Inspect (Figure 50)

- Final drive pinions (678) for damage
 - Excessive end play - with a feeler gage

Governor Drive Gear Replacement

Remove or Disconnect (Figure 51)

Tool Required:

J-8433 Puller

- Governor drive gear (678) with J-8433 – place a thick flat washer or other protection on the hub to avoid damage



Install or Connect

- Drive gear – tap into position with a soft mallet.



Inspect (Figure 49)

- Pinions (685) and side gears (687) for damaged teeth

Pinion Gear Replacement Procedure



Disassemble (Figures 49 and 52)

- Retaining pin (683) use a pin punch as shown
- Pinion shaft (682)
- Pinions (685), side gears (687) and washers (684 and 686)



Inspect (Figure 49)

- Washers (684 and 686) and carrier for damage



Assemble (Figure 49)

1. Side gears (687) and washer (686) into carrier
2. Pinion thrust washer (684) to pinions (685), retain with petrolatum
3. Pinions and thrust washers into carrier
4. Pinion shaft (682), slide through both pinions for alignment, then remove.
5. Rotate pinions into position, then replace shaft (682)
6. Retaining pin (683)



Assemble (Figure 49)

1. Thrust bearing (676) into carrier
2. Sun gear (675) stepped side facing up
3. Thrust bearing (674) outside race to internal gear
4. Internal gear (673) onto carrier

678 DIFFERENTIAL CARRIER
683 PIN, RETAINING
1 PUNCH, 5mm (3/16)

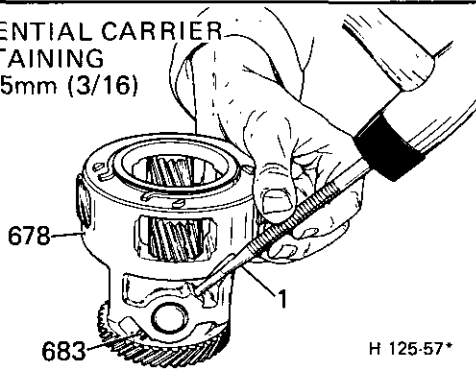


Figure 52 Pinion Shaft Retaining Pin



Install or Connect (Figure 52)

Tool Required:

J-28545 Final Drive Remover and Installer

1. Thrust washer (680) onto carrier assembly, retain with petrolatum

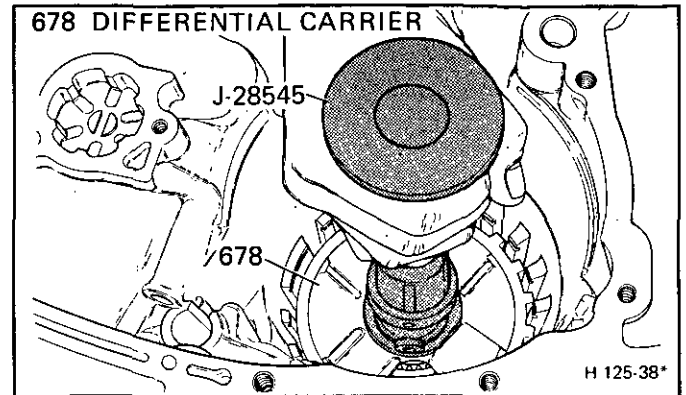


Figure 53 Installing the Final Drive Assembly

2. Thrust bearing (681) onto carrier assembly, inner race toward carrier, retain with petrolatum
3. Carrier assembly into case with J-28545



Inspect

- Spacer (671) for damage
- Snap ring (670) for damage



Install or Connect (Figure 49)

1. Spacer (671) into the transmission case



Important

The spacer (671) must fit into the case so that the parking pawl operates freely.

2. Snap ring into the snap ring groove.

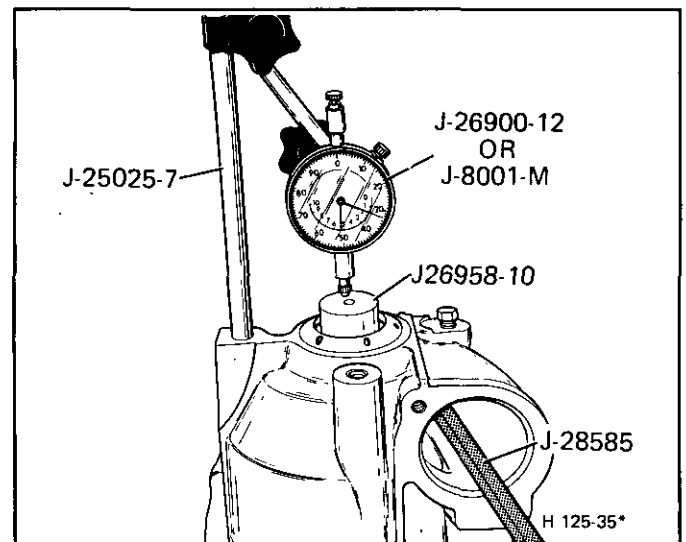


Figure 54 Final Drive End Play Selective Thrust Washer Measurement (680)

Final Drive to Case End Play



Measure (Figures 54 and 55)

Tools Required:

J-26958-10 Adapter

J-25025-7 Post

J-26900-12 or J-800/M Dial indicator

J-28585 Snap ring remover

1. Install the dial indicator set so that stem contacts the adapter.
2. With J-28585 through the governor bore, lift up on the governor drive gear (679).

**FINAL DRIVE TO CASE END PLAY
SELECTIVE THRUST WASHER (680)**

THICKNESS	IDENTIFICATION NO./COLOR
1.40 - 1.50mm (0.055" - 0.059")	0/Orange
1.50 - 1.60mm (0.059" - 0.062")	1/White
1.60 - 1.70mm (0.062" - 0.066")	2/Blue
1.70 - 1.80mm (0.066" - 0.070")	3/Pink
1.80 - 1.90mm (0.070" - 0.074")	4/Brown
1.90 - 2.00mm (0.074" - 0.078")	5/Green
2.00 - 2.10mm (0.078" - 0.082")	6/Black
2.10 - 2.20mm (0.082" - 0.086")	7/Purple
2.20 - 2.30mm (0.086" - 0.091")	8/Purple & White
2.30 - 2.40mm (0.091" - 0.095")	9/Purple & Blue

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Figure 55 Final Drive End Play Chart

3. Reading on the dial indicator should be 0.12-0.82 mm (0.005"-0.032") For correct washer selection, see Figure 54.
4. Remove the dial indicator set and the adapter. Leave the adapter in place.
5. Install J-26958 and J-26958-11 – turn knob until it bottoms.

REACTION CARRIER ASSEMBLY

Inspect (Figure 56 and Figure 26)

- Sun gear shaft (669) for damage or wear
- Internal gear (668) for damage or wear
- Thrust bearing (667) for damage or wear

Assemble

1. Internal gear (668) onto sun gear shaft (669)
2. Thrust bearing (667) – inner race against internal gear (668)

LO ROLLER CLUTCH ASSEMBLY

Disassemble (Figure 56)

1. Selective washer (660)
2. Race (661)
3. Clutch assembly (662)
4. Lo race thrust washer (663)
5. Reaction carrier thrust washer (666)

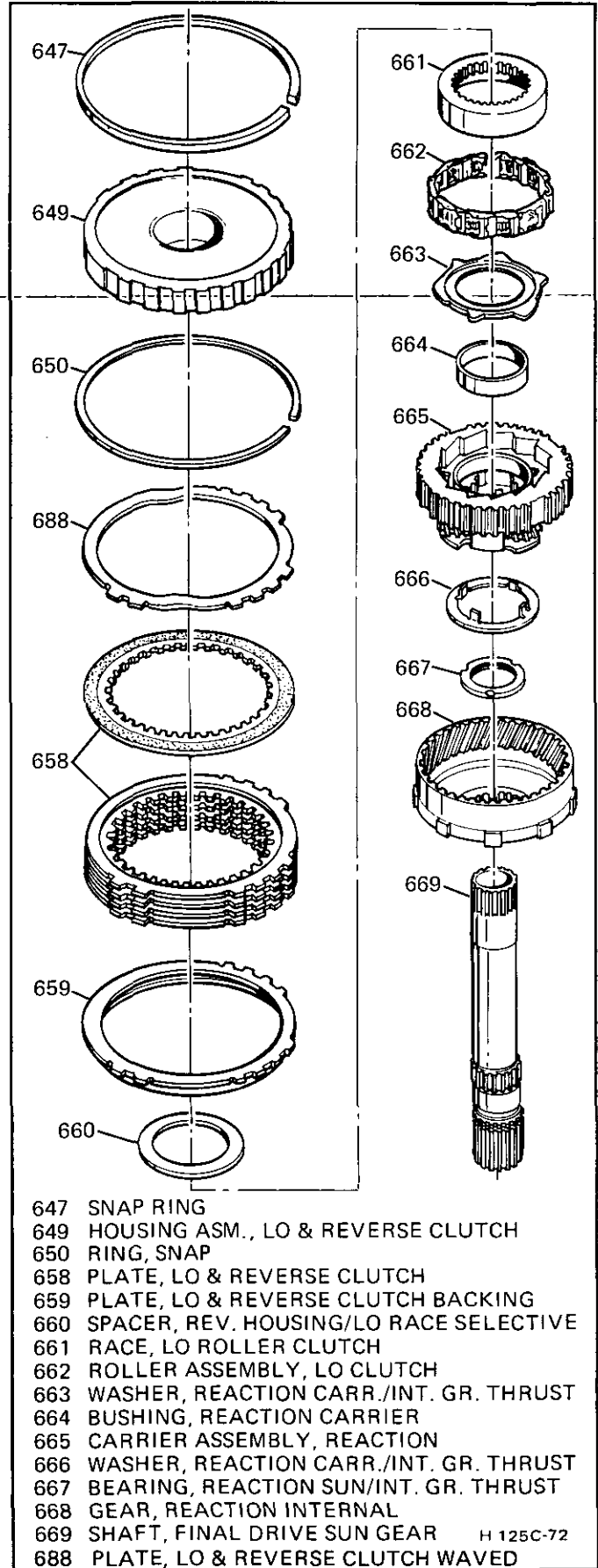
Inspect

- Selective spacer (660) for damage
- Lo roller clutch cam (665)
- Carrier bushing (664) for damage
- Reaction carrier pinions (665) for damage, rough bearings or tilt

Measure

- Pinions (665 – end play with feeler gage – end play range 0.24-0.69 mm (0.009"-0.027").

Inspect (Figure 56 and Figure 26)



- 647 SNAP RING
- 649 HOUSING ASM., LO & REVERSE CLUTCH
- 650 RING, SNAP
- 658 PLATE, LO & REVERSE CLUTCH
- 659 PLATE, LO & REVERSE CLUTCH BACKING
- 660 SPACER, REV. HOUSING/LO RACE SELECTIVE
- 661 RACE, LO ROLLER CLUTCH
- 662 ROLLER ASSEMBLY, LO CLUTCH
- 663 WASHER, REACTION CARR./INT. GR. THRUST
- 664 BUSHING, REACTION CARRIER
- 665 CARRIER ASSEMBLY, REACTION
- 666 WASHER, REACTION CARR./INT. GR. THRUST
- 667 BEARING, REACTION SUN/INT. GR. THRUST
- 668 GEAR, REACTION INTERNAL
- 669 SHAFT, FINAL DRIVE SUN GEAR
- 688 PLATE, LO & REVERSE CLUTCH WAVED

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Figure 56 Reaction Components

- Clutch race (661) for damage, cracks or wear

- Rollers, springs and cage (662) for damage or wear
- Carrier (4 tanged) thrust washer (665) for scoring or distortion

Assemble (Figure 56 and Figure 26)

1. Thrust washer (663) into carrier assembly (665)
2. Rollers, into cage (662)
3. Clutch assembly (662)
4. Clutch race (661) – rotate into place.
5. Tanged thrust washer (666) – use petrolatum to hold in position.
6. Carrier (665) and clutch assembly into internal gear (668)
7. Selective spacer (660)
8. Reaction gear set (660-669) into case
Make sure gear set does not contact spacer (671).

LO AND REVERSE CLUTCH PLATES

Inspect (Figure 56)

- Backing plate (659) for damage or cracks
- Lo and reverse clutch composition and steel plates (658) for wear or burning

Install or Connect (Figure 56 and Figure 70)

1. Backing plate (659) stepped side down into case
2. Lubricant on composition plates (658) before installation
3. Alternate composition plate first, then steel plate (See Figure 70)
4. Waved steel plate
5. Spacer ring (650) – ring is 1.07 mm (0.042") thick

LO AND REVERSE CLUTCH HOUSING

Disassemble (Figure 57)

1. Snap ring (656) – push down on spring retainer (657).
2. Waved spring (655)
3. Clutch piston (653)
4. Inner (652) and outer (651) seals from piston (653)

Inspect (Figure 57)

- Waved spring (655) for damage
- Inner (652) and outer (651) seals for nicks or rolling
- Clutch housing (649) for damage or plugged feed hole
- Clutch housing bushing for damage, cracks or scoring
- Clutch piston (653) for distortion, cracks or damage

Assemble (Figures 57, 58 and 59)

1. Seals (651 and 652) onto piston (653)
2. Piston (653) – with J-26744-A inner seal (652) first, then outer seal
3. Waved spring (655)
4. Retainer (656) – cupped side down
5. Snap ring (657) – push down on spring retainer (656).

FUNCTIONAL CHECK

Apply air (max 90 psi) to feed hole. Piston must apply and release when pressure is removed.

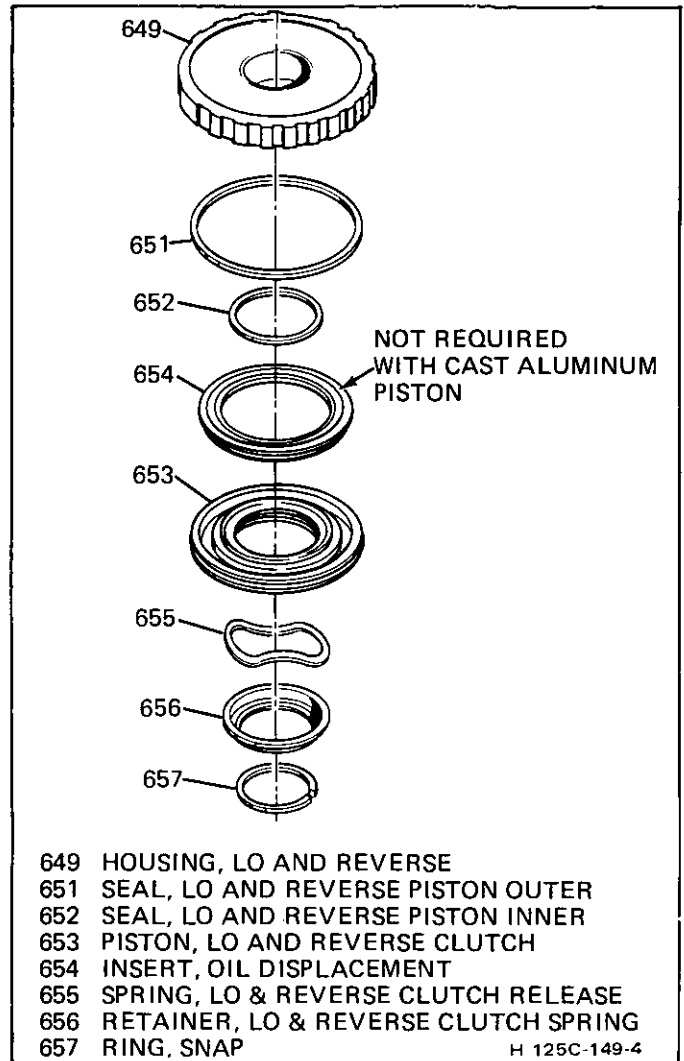


Figure 57 Lo & Reverse Clutch Assembly

Install or Connect (Figure 61)

1. Lo and reverse clutch housing (649) with J-28542 into case
 - Align the clutch housing oil feed hole with the case feed hole.
 If housing (649) does not go past snap ring groove – remove J-28542 and install sun gear (646). Rotate sun gear back and forth until the housing is properly positioned. Loosen J-26958 as needed.
2. Snap ring (647) – ring is 2.36 mm (0.092") thick.

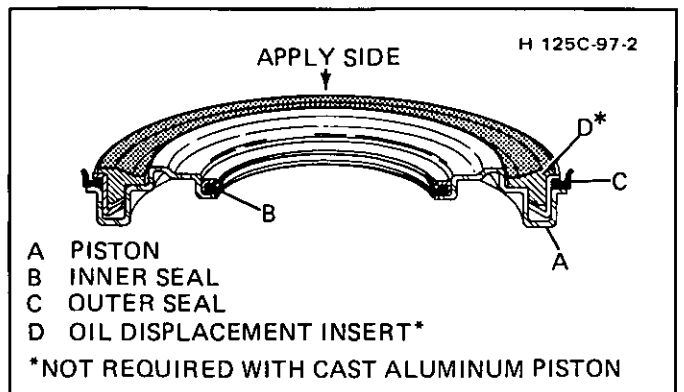


Figure 58 Typical Lo & Rev. Clutch Apply Piston

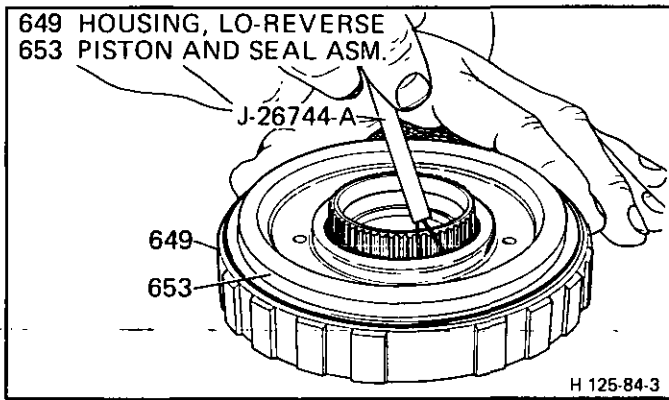


Figure 59 Installing the Lo & Reverse Piston

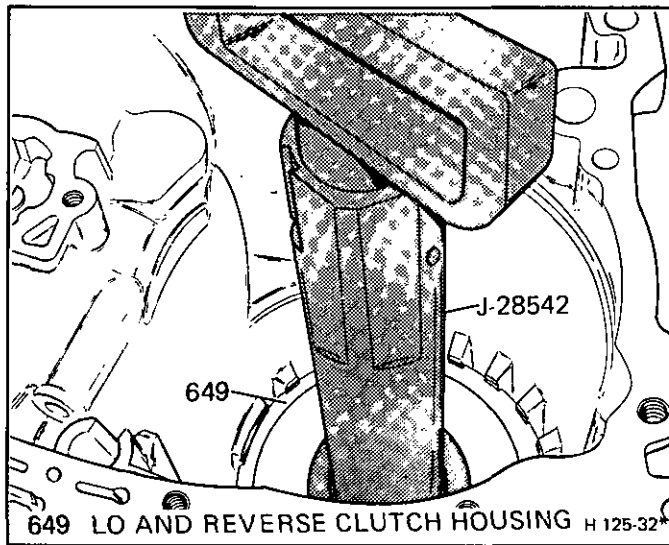


Figure 60 Installing the Lo & Reverse Clutch

REACTION SUN GEAR

Inspect (Figure 65)

- Reaction sun gear (646) for cracks, splits, damaged splines, worn gear or journal and plugged lubrication holes.

Install or Connect

- Sun gear (646) and selective snap ring (644).

Selective Snap Ring End Play

Measure (Figures 61 and 62)

Tools Required:

- J-26958 Loading tool
- J-26958-11 Bracket
- J-26958-10 Adapter plug
- J-28588 Gage
- J-25025-7 Post
- J-26900-12 or J-8001M Dial indicator

1. Install the tools as shown.
 - The loading tool should still be in place.
2. Seat sun gear (646).
3. Position the gage extension between open ends of snap ring (644).
4. Swing the gage under the extension shoulder.
5. Set the dial indicator at zero.
6. Position the snap ring (644) under extension shoulder.
7. Remove the gage from under the shoulder.
8. The dial indicator should read 0.33 to 0.13 mm (0.013" to 0.005"). If not within tolerances, for correct selection see Figure-62 (Measure-washer thickness (new or used) with micrometer).

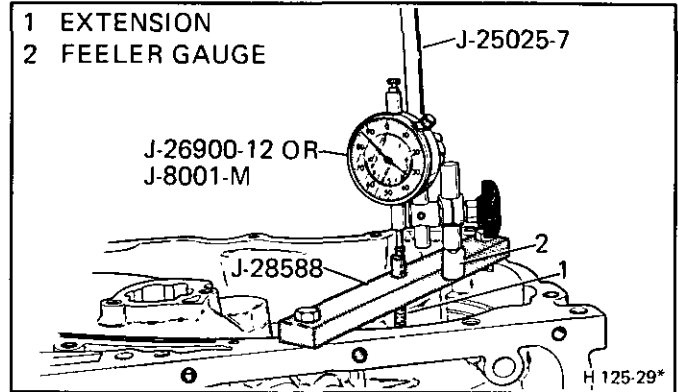


Figure 61 Selective Snap Ring End Play (Sun Gear/Input Drum)

REACTION SUN GEAR TO INPUT DRUM SELECTIVE SNAP RING (644)	
Thickness	Identification/Color
2.27 - 2.37mm (0.089" - 0.093")	Pink
2.44 - 2.54mm (0.096" - 0.100")	Brown
2.61 - 2.71mm (0.103" - 0.107")	Lt. Blue
2.78 - 2.88mm (0.109" - 0.113")	White
2.95 - 3.05mm (0.116" - 0.120")	Yellow
3.12 - 3.22mm (0.123" - 0.127")	Lt. Green
3.29 - 3.39mm (0.129" - 0.133")	Orange
3.46 - 3.56mm (0.136" - 0.140")	No Color

Figure 62 Selective Snap Ring Chart

Lo Roller Clutch Race Selective Spacer End Play

Measure (Figures 63 and 64)

Tools Required:

- Tools from previous measurement check
- J-28585 Snap Ring Remover

1. Leave tools from "Selective Snap Ring End Play Check" in place.
2. Pry up on internal gear (668) with J-28585 - Do not pry against spacer (671).

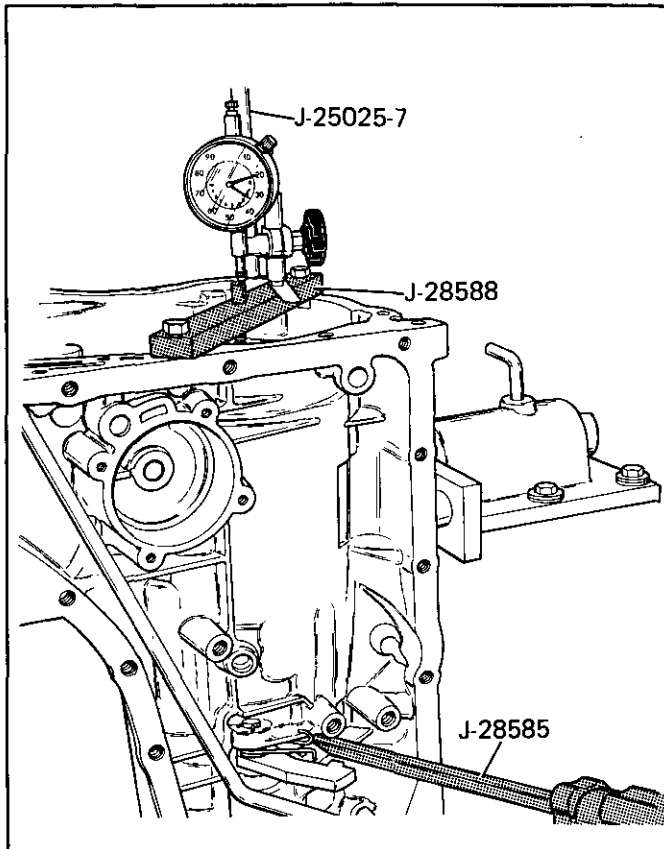
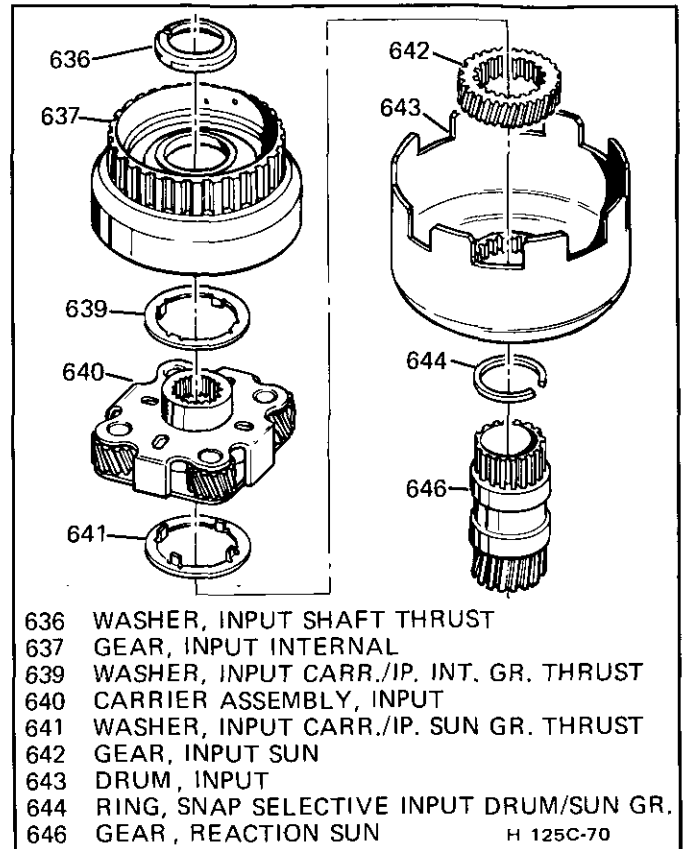


Figure 63 Lo Roller Clutch Race Selective Spacer



- 636 WASHER, INPUT SHAFT THRUST
- 637 GEAR, INPUT INTERNAL
- 639 WASHER, INPUT CARR./IP. INT. GR. THRUST
- 640 CARRIER ASSEMBLY, INPUT
- 641 WASHER, INPUT CARR./IP. SUN GR. THRUST
- 642 GEAR, INPUT SUN
- 643 DRUM, INPUT
- 644 RING, SNAP SELECTIVE INPUT DRUM/SUN GR.
- 646 GEAR, REACTION SUN

H 125C-70

Figure 65 Input Components

**REVERSE CLUTCH HOUSING
TO LO RACE SELECTIVE SPACER
(660)**

Thickness	Identification
1.00 - 2.20mm (0.039" - 0.043")	1
1.42 - 1.52mm (0.056" - 0.060")	2
1.84 - 1.94mm (0.072" - 0.076")	3
2.26 - 2.36mm (0.089" - 0.093")	4
2.68 - 2.78mm (0.105" - 0.109")	5
3.10 - 3.20mm (0.122" - 0.126")	6

H 125-320

Figure 64 Lo Race Selective Spacer Chart

3. Dial indicator reading should be 0.08-1.17 mm (0.003"-0.046"). For correct washer selection see Figure 64.
4. Remove the dial indicator set and J-28588.

INPUT UNIT PARTS

Inspect (Figure 65)

- Drum (643) for damage
- Thrust washer (641) for damage
- Carrier assembly (640) for
 - Pinion damage
 - Pinion tilt
 - Pinion end play - use the feeler gages - end play range 0.24-0.69 mm (0.009"-0.027")
- Thrust washer (639) for damage

- Internal gear (637) for gear tooth damage, clutch hub damage or scored bearing surfaces
- Sun gear (642) for damaged teeth or bearing surface

Assemble (Figure 65)

1. Drum (643) onto the reaction sun gear (646) in the case
2. Input sun gear (642) I.D. groove facing up onto the reaction sun gear (646)
3. Tanged thrust washer (641) onto the carrier assembly (640) - retain with petrolatum.
4. Carrier assembly (640) onto the sun gear (642) - sun gear must engage the pinions.
5. Thrust washer (639)
6. Internal gear (637)

FORWARD CLUTCH ASSEMBLY

Disassemble (Figures 66 and 67)

Tools Required:
Arbor Press or J-23456 Clutch Pack Compressor

1. Snap ring (635) from clutch housing (624)
2. Backing plate (634)
3. Steel and composition clutch plates (633)
4. Snap ring (632) - use an arbor press or J-23456.
5. Retainer and spring assembly (631) and guide (630)
6. Piston (629)
7. Insert (628)
8. Piston seals (626 and 627)

Inspect (Figure 66)

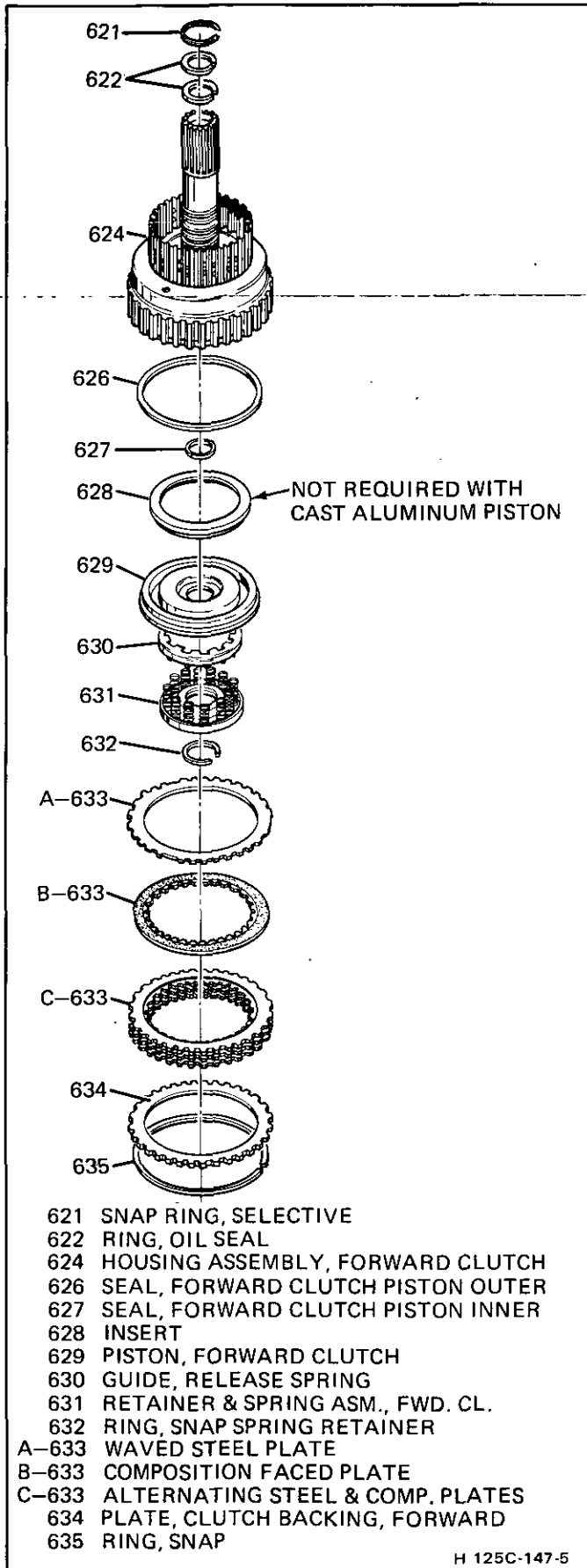


Figure 66 Forward Clutch Assembly

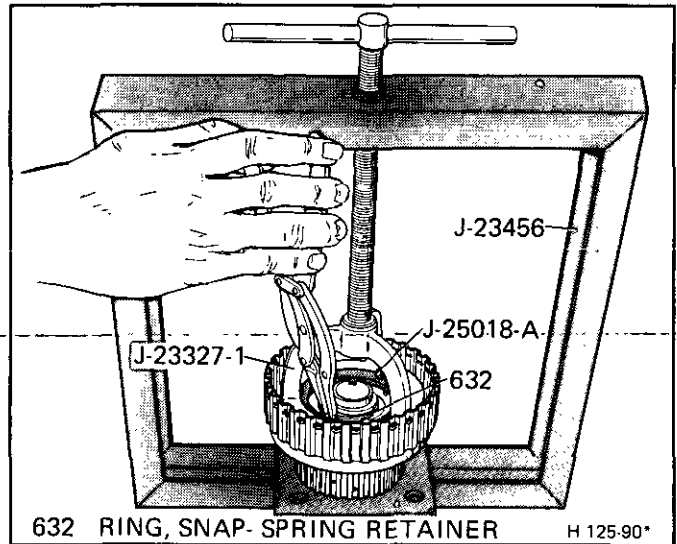


Figure 67 Forward Clutch Disassembly

- Forward clutch housing (624) for cracks, broken welds
- Input shaft (A) splines and journals for damage
- Input sleeve for damage, alignment and tightness – sleeve must not turn and slot must line up with input shaft hole.
- Seal rings (622) for damage – do not remove unless replacing.
- Piston (629) for damage or cracks
- Snap ring (621) for damage
- Insert (628) for damage
- Spring guide (630) for damage or distortion
- Retainer and spring assembly (631) for collapsed springs or bent retainer
- Composition and steel plates for wear or burning
- Waved steel plate (633) for wear or burning - flatness
- Backing plate (634) for damage or cracks

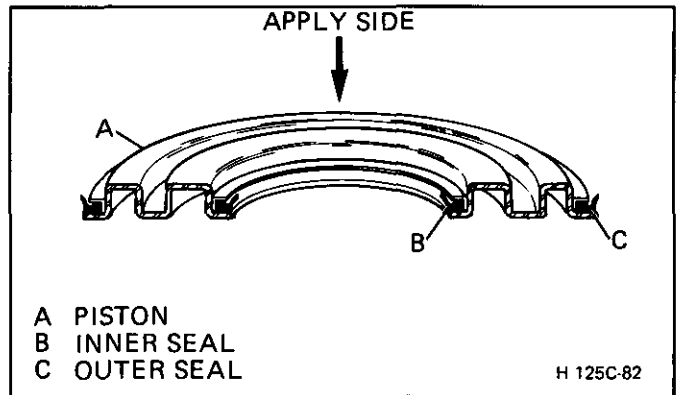


Figure 68 Typical Apply Piston



Assemble (Figures 66, 67, 68, 69, and 70)

Tools Required:

J-26744-A Seal Installer

J-23456 Clutch Pack Compressor

J-25018-A Adapter Forward Spring Compressor

1. Inner (627) and outer (626) seals – lips facing housing (624) (Figure 68)
2. Insert (628)

3. Piston assembly (629) with J-26744-A. Start inner seal (627) first.
Do not cut the seals on the snap ring groove.
4. Spring guide (630)
5. Spring and retainer assembly (631)
6. Snap ring (632) – Use arbor press or J-23456 and J-25018-A.
7. Wave plate (633).
8. Lubricate composition plates (633).
9. Alternately composition and steel plates (633)
10. Backing plate (633) I.D. side up
11. Snap ring (632)
12. New seal rings (622) if required

Measure

- Snap ring (635) to backing plate (634) – end play range with a feeler gage must be 1.0-1.5 mm (.040"-.060"). For correct backing plate selection see Figure 69.

A INPUT SHAFT
 1 FEELER GAGE 1.0-1.5mm (.04"-.06")
 624 HOUSING ASSEMBLY, FORWARD CLUTCH
 634 PLATE, FORWARD CLUTCH BACKING
 635 RING, SNAP

BACKING PLATE THICKNESS		IDENTIFICATION CODE
MM	Inches	
6.1 - 6.0	0.24 - 0.23	1
5.4 - 5.3	0.21 - 0.20	2
4.7 - 4.6	0.19 - 0.18	3

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Figure 69 Forward Clutch Backing Plate Selection

DIRECT CLUTCH ASSEMBLY

Disassemble (Figure 70)

1. Snap ring (620)
2. Backing plate (619)
3. Composition and steel clutch plates (618)
4. Snap ring (617)
5. Apply ring and release spring assembly (616).
6. Piston (615)
 - Inner (614) and outer (612) seals
 - Center seal (613) from housing

125C CLUTCH PLATE AND APPLY RING USAGE CHART

CLUTCH	FLAT STEEL PLATE		COMP. FACED PLATE	WAVED PLATE		APPLY RING	
	No.	Thick-ness	No.	No.	Thick-ness	I.D.	Thick-ness
DIRECT CJ, CT, CD, CX, CF, PJ, PA, CU	5	2.3mm (0.09")	5	—	—	7	19.0mm (0.74")
ALL OTHERS	4	2.3mm (0.09")	4	—	—	1	23.1mm (0.90")
FORWARD ALL	3	1.9mm (0.08")	4	1	1.25mm (0.06")	—	—
LO & REVERSE ALL	4	2.2mm (.085")	5	1	1.94mm (0.08")	—	—

The direct and forward clutch flat steel clutch plates and the forward clutch waved steel plate should be identified by their thickness.

The direct and forward production installed composition-faced clutch plates must not be interchanged. For service, direct and forward clutch use the same compositioned-faced plates.

The forward clutch backing plate is selective. Refer to the Forward Clutch End Play Chart.

Measure the width of the clutch apply ring for positive identification.

H 125C-48-8

Figure 70 Clutch Plate Usage Chart

Inspect

- Housing (610) for
 - Bad welding
 - Band scoring
 - Heat damage
- Housing bushings for cracks, damage or scoring
- Piston (615) for damage or cracks
- Inner (614), outer (612) and center (613) seals for burrs, nicks or brittleness
- Apply ring and release spring assembly (616) for damage and collapsed springs
- Clutch plates (618) for wear or burning
- Backing plate (619) for damage, cracks or burning
- Snap rings (620), (617) for damage
- Check ball capsule for free operation

Check Ball Capsule Replacement Procedure

Remove or Disconnect

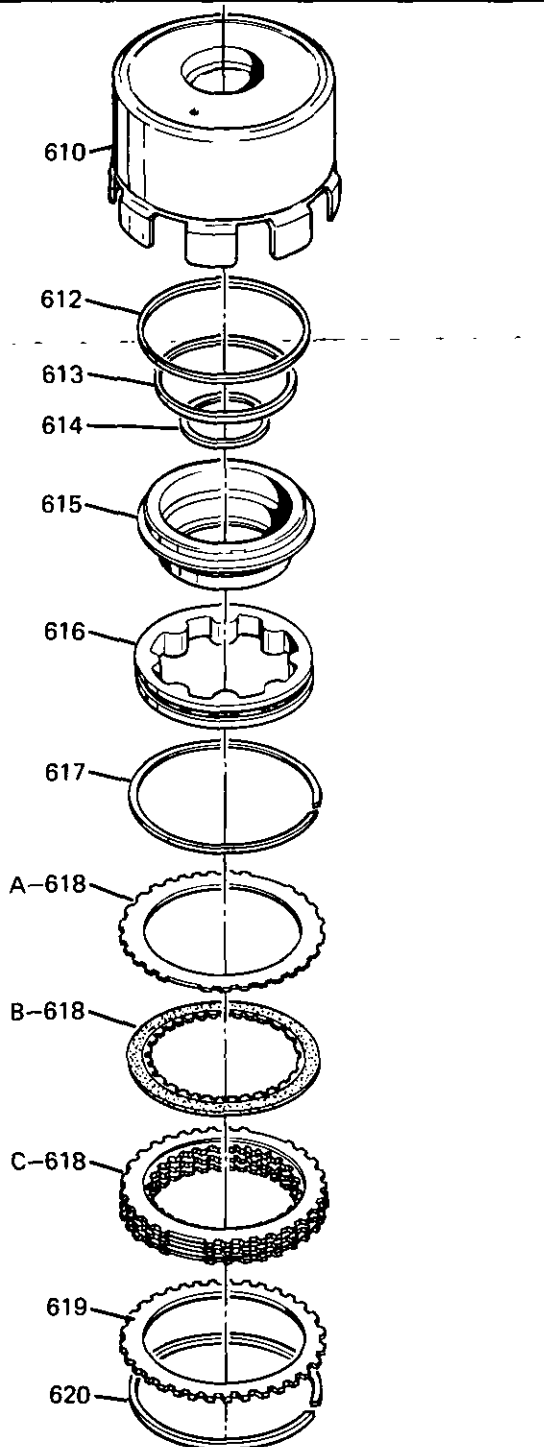
- Use a 9.5 mm (3/8") drift to drive out the ball capsule assembly.

Install or Connect

- Seat the new capsule with the 9.5 mm (3/8") drift.

Assemble (Figures 70, 71 and A-15)

1. Center seal (613) – lips facing away from capsule
2. Inner seal (614) – lips facing capsule
3. Outer seal (612) – lips facing capsule
4. Piston (615)



- 610 HOUSING & DRUM ASM., DIRECT CLUTCH
- 612 SEAL, DIRECT CLUTCH PISTON OUTER
- 613 SEAL, DIRECT CLUTCH CENTER
- 614 SEAL, DIRECT CLUTCH PISTON INNER
- 615 PISTON, DIRECT CLUTCH
- 616 APPLY RING & RELEASE SPRING ASM.
- 617 RING, SNAP
- A-618 STEEL CLUTCH PLATE
- B-618 COMPOSITION FACED PLATE
- C-618 ALTERNATING STEEL & COMP. PLATES
- 619 PLATE, CLUTCH BACKING, DIRECT
- 620 RING, SNAP

H 125-146-3

Figure 71 Direct Clutch Assembly

5. Apply ring and release spring assembly (616)
6. Snap ring (617)
7. Lubricate composition plates (618)
8. Alternatel steel and composition plates (618)
9. Backing plate (619) (chamfered or highly polished side against composition plate)
10. Snap ring (620)

- 610 HOUSING, DIRECT CLUTCH
- 624 HOUSING, FORWARD CLUTCH
- 636 WASHER, THRUST (STEPPED SIDE OUT)

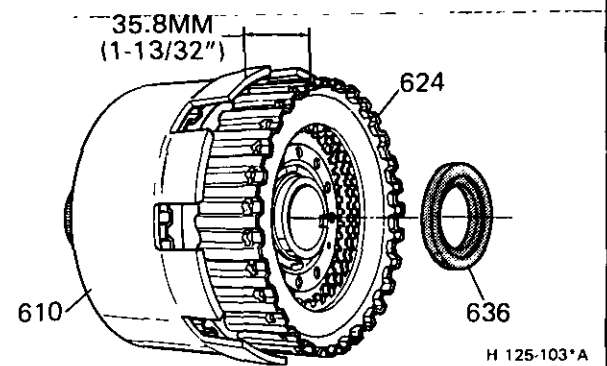


Figure 72 Assembled Height of Clutch Assemblies

FORWARD AND DIRECT CLUTCH

- Assemble (Figures 72, 73 and 74)**
 - Direct clutch assembly onto the forward clutch assembly. Rotate the direct clutch so that all clutch plates engage the clutch hub.
 - Thrust washer stepped side out (636) - use petrolatum

- Measure (Figure 72)**
 - Assembled height 31 mm (1-7/32")

- Install or Connect (Figures 73 and 74)**
 - Forward and direct clutch assemblies into case

- Measure (Figure 74)**
 - Case face to housing - 42 mm (1-11/16")

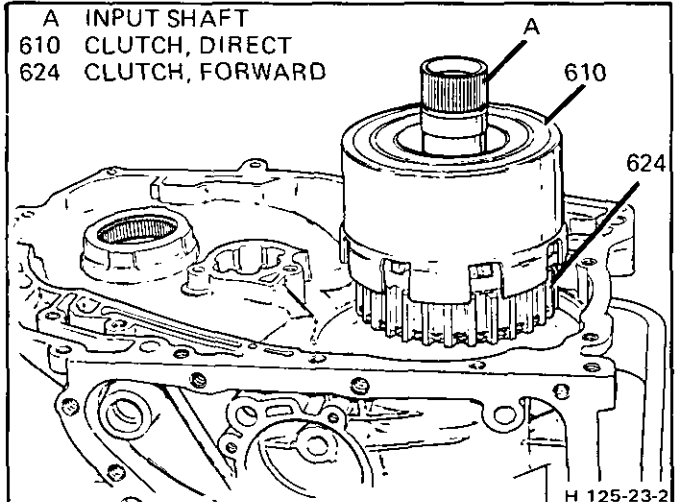


Figure 73 Installing the Clutch Assemblies

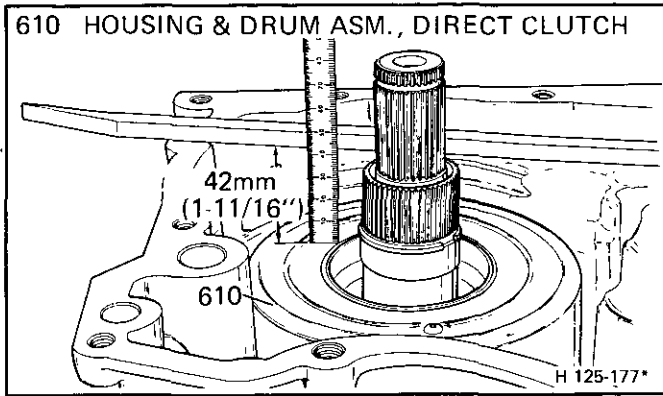


Figure 74 Proper Clutch Installation

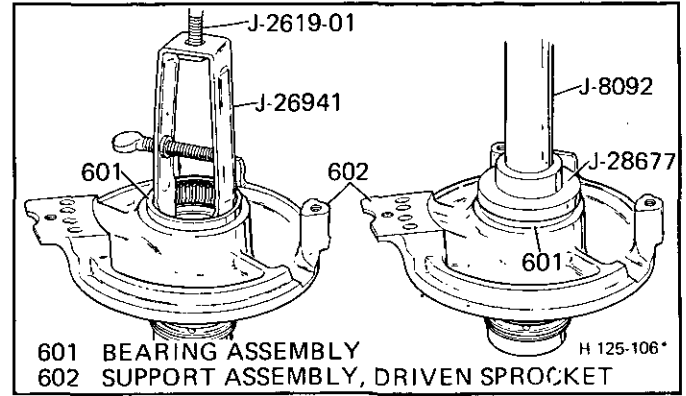


Figure 76 Bearing Replacement

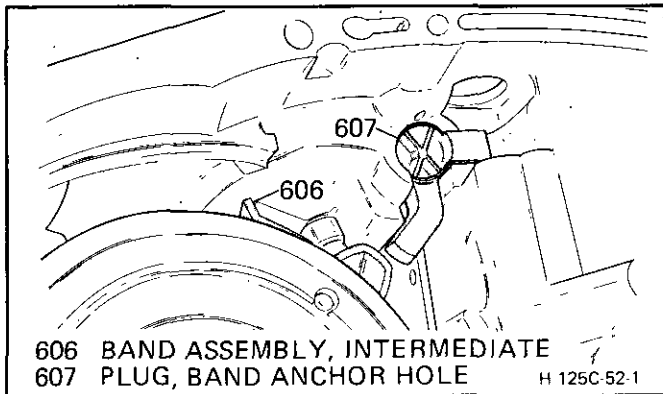


Figure 75 Intermediate Band Anchor Hole Plug

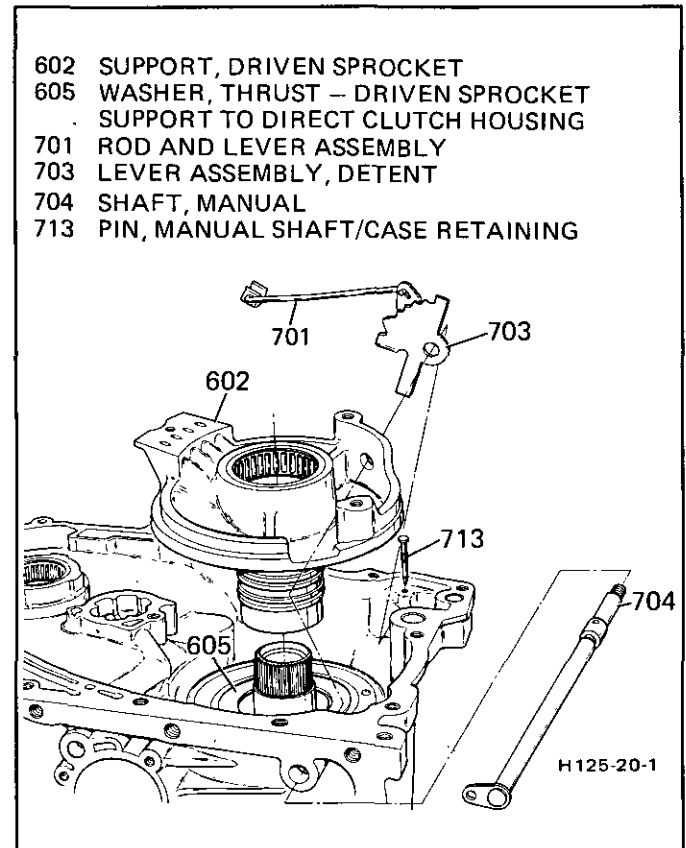


Figure 77 Driven Sprocket Support & Manual Linkage

INTERMEDIATE BAND ASSEMBLY



Inspect

- Band (606) for burns, flaking or damage



Install or Connect (Figure 75)

1. Band (606) – must engage the case lug
2. Plug (607)

DRIVEN SPROCKET SUPPORT



Inspect (Figure 76 and 26)

- Support (602) for cracks, burrs or damage – oil passage surface must be flat and smooth
- Bushing (603) for damage
- Thrust washer (605) for damage
- Oil seal rings (604) for nicks, cuts or damage

Bearing Replacement Procedure



Remove or Disconnect (Figure 76)

Tools Required:

J-26941 Transmission Case Bearing Cup Remover

J-6125-1 Slide Hammer

- Bearing assembly (601) – use J-26941 and J-6125-1
- Inspect race for damage



Install or Connect

- New bearing – manufacturing identification faces up



Assemble (Figure 77 and Figure 26)

- Thrust washer (605) – retain with petrolatum.
- Support assembly (602) into the case. (Do not allow the direct clutch bushing to cut the oil seals.)

MANUAL SHAFT



Inspect (Figure 77)

- Rod and retainer assembly (701) for distortion or damage

125C-48 AUTOMATIC TRANSAXLE

- Detent lever (703) for damage
- Manual shaft (704) for damaged threads, raised edges on flats
- Parking lock actuator assembly (705) for damage or broken retainer lugs

Assemble

1. Actuator (705) to manual shaft (704)
2. Detent lever (703) into case
3. Slide the manual shaft (704) into the case and engage the detent lever (703).
4. Tap the roll pin (702) into the detent lever with a 5 mm (3/16") drift.
5. Tap nail (703) into place.

DRIVE LINK ASSEMBLY

Inspect (Figure 78)

- Drive and driven sprockets (103) (122) teeth and splines for nicks, burrs, scoring or wear.
- Shaft (106) for damage, wear
- Seals (105) for damage
- Thrust washer (104) for damage or wear
- Link assembly (101) for damage or loose links

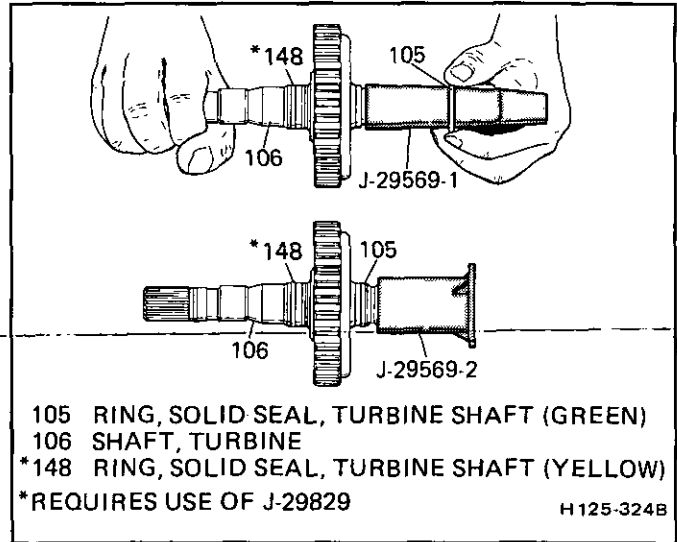


Figure 79 Turbine Shaft Seal Replacement

- Thrust bearing (121) for damage or wear
- Driven support thrust washer (123) for damage or wear

See drive link inspection in Section 7A.

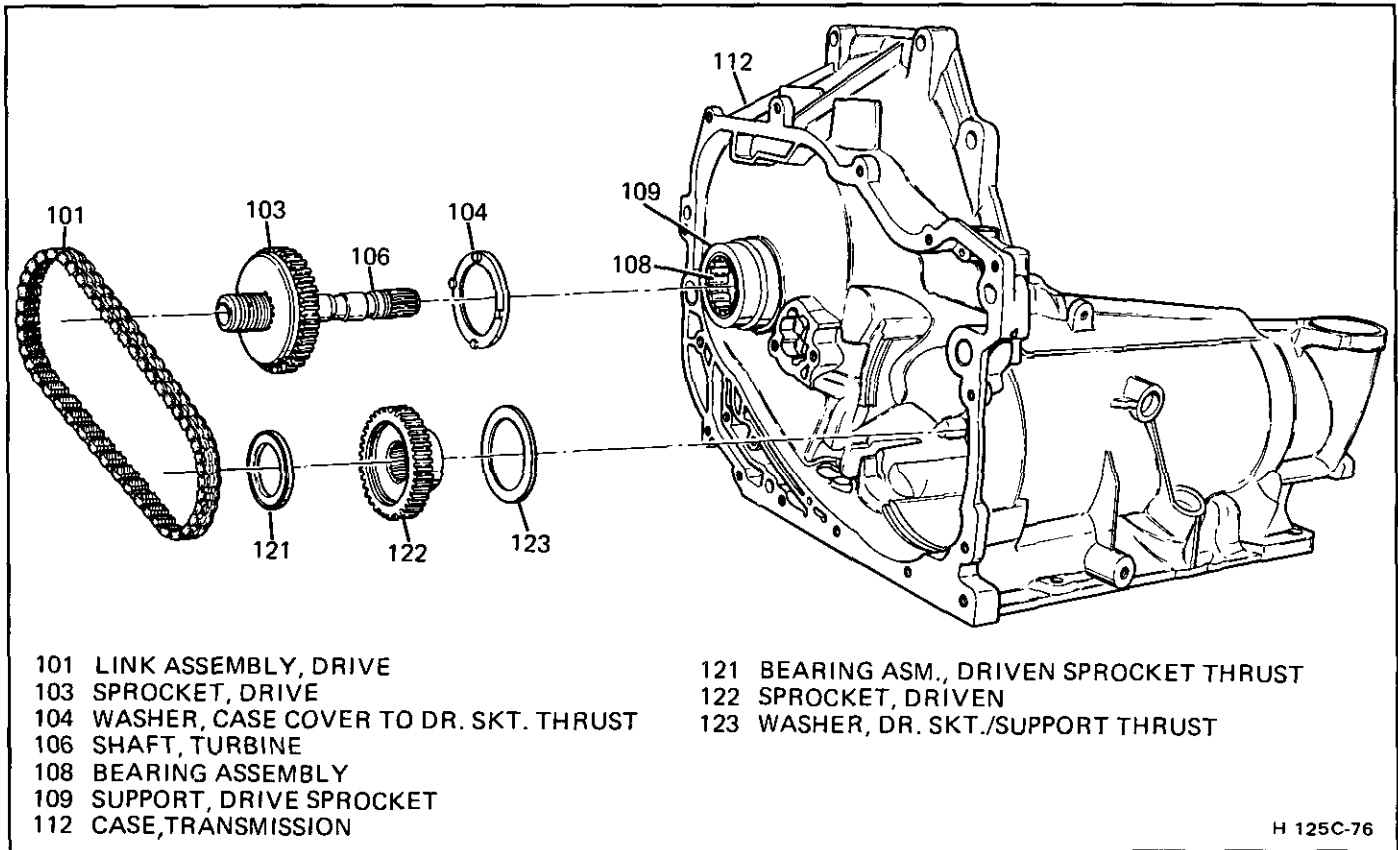


Figure 78 Drive Link Assembly

Turbine Shaft Seal and Drive Sprocket Replacement Procedure

↔ Remove or Disconnect (Figure 4 and 79)

- Seals (105) from turbine shaft (cut with a knife)
- Snap ring (102) from turbine shaft
- Drive sprocket (103) from turbine shaft

↔ Install or Connect (Figure 79)

Tools Required:

- J-29569 Turbine Shaft Seal Installer
- J-29829 Turbine Shaft Seal Installer

- Drive sprocket (103) onto turbine shaft
- Snap ring (102) onto turbine shaft
- Slide installer J-29569-1 over the turbine shaft and coat with petrolatum
- Guide new seals (105) over tool into seal ring grooves
- Size the seals with sizing tool J-29569-2
- Slide installer J-29829-1 over opposite end of turbine shaft and coat with petrolatum.
- Guide new seal (148) over tool into seal ring groove.
- Size the seal with sizing tool J-29829-2.

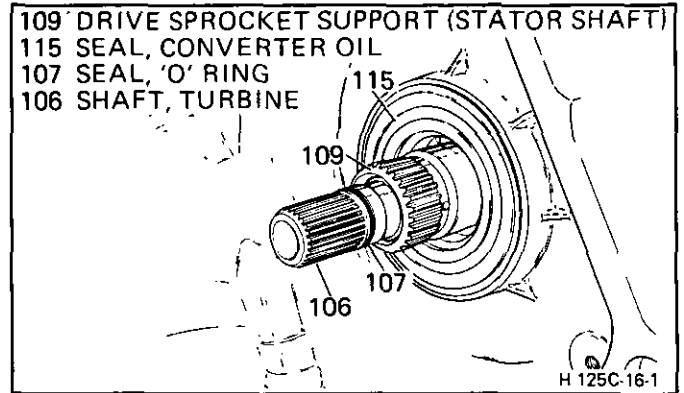


Figure 80 Turbine Shaft "O" Ring Seal

↔ Install or Connect (Figures 78 and 80)

1. Thrust washer (123) onto sprocket (122) and retain with petrolatum
2. Thrust washer (104) onto sprocket (103) and retain with petrolatum
3. Drive (103) and driven (122) sprockets into link assembly (101) - colored guide link up
4. Link assembly (101) and sprockets (103) and (122) into case (112)
5. New "O" ring (107) onto the turbine shaft from the converter side of case (Figure 80)
6. Thrust bearing (121) onto sprocket (122)

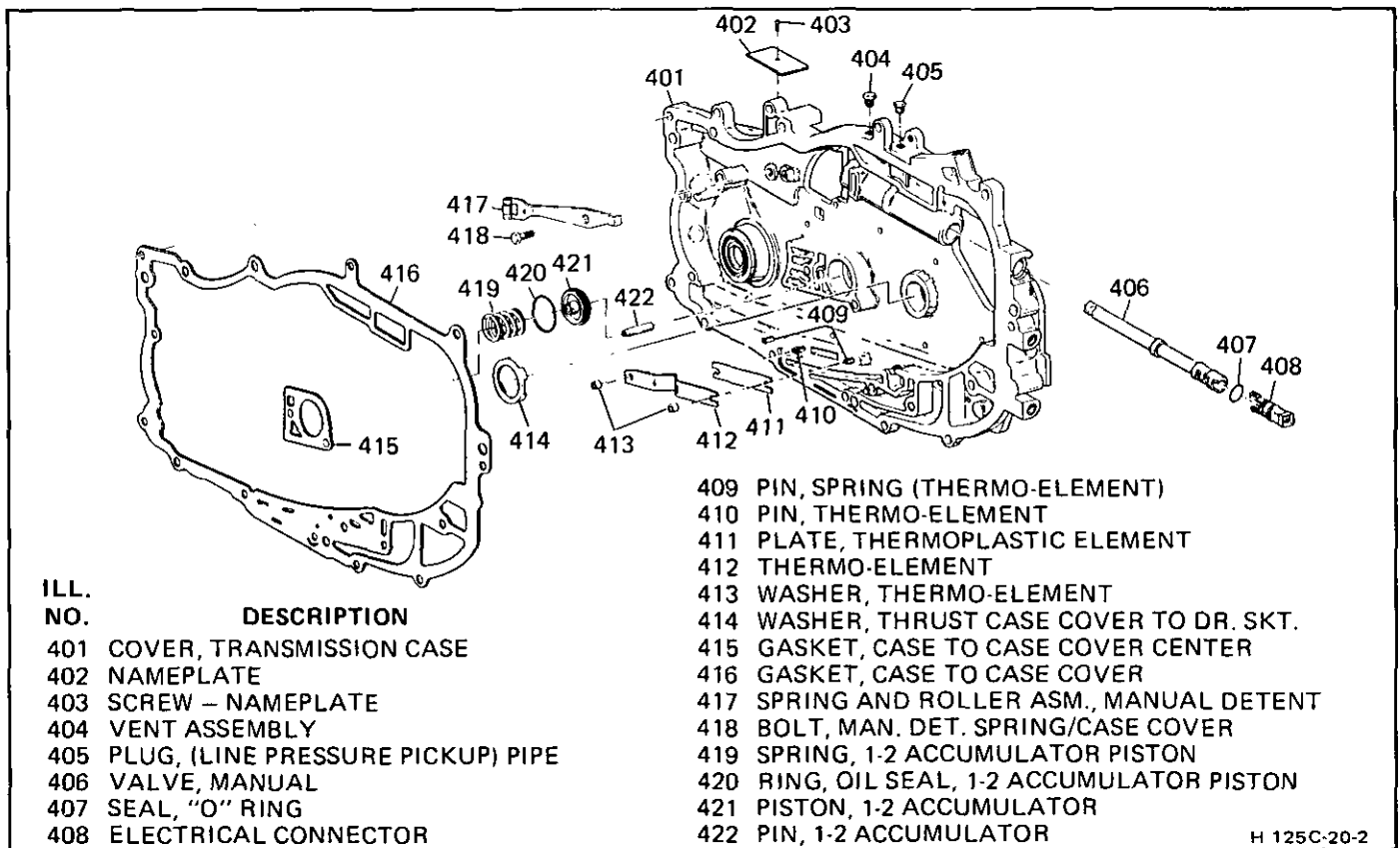


Figure 81 Case Cover - Case Side

CASE COVER ASSEMBLY



Clean (Figures 81 and 84)

- Apply gasket remover, then scrape the case cover gasket surface with a plastic scraper



Inspect

- Case cover (401) – see Section 7A for case cover repair
 - Casting porosity
 - Oil passage damage
 - 1-2 accumulator bore damage
- 1-2 accumulator piston (421), seal (420) and spring (419)
 - Cracked or damaged piston
 - Cut or nicked seal
 - Distorted spring
- Vent assembly (404) for damage

Vent Assembly Replacement Procedure



Remove or Disconnect

- Vent assembly with pliers



Install or Connect

- Apply thread sealant to the vent (404) vent.
- Tap the vent (404) into case cover with a soft mallet.



Inspect (Figure 81 and 84)

- Detent spring and roller (417) for damage – replace as necessary.
- Cooler fittings (17) for thread damage

Cooler Fitting Replacement Procedure



Disassemble (Figure 84)

- Cooler fittings (17) from case cover



Assemble

- Apply thread sealer to cooler fittings
- Cooler fittings (17) into case cover – 38 N·m (23 ft. lbs.)



Inspect

- Electrical connector (408) for damage
- Case cover sleeve – for feed hole alignment
- Manual valve (406) for damage – must slide freely in the bore
- Thrust washer (414) for damage
- Thermostatic element (409-413) for damage

Thermostatic Element Replacement Procedure



Disassemble (Figure 82)

Tool Required:
J-29023

- Washers (413)

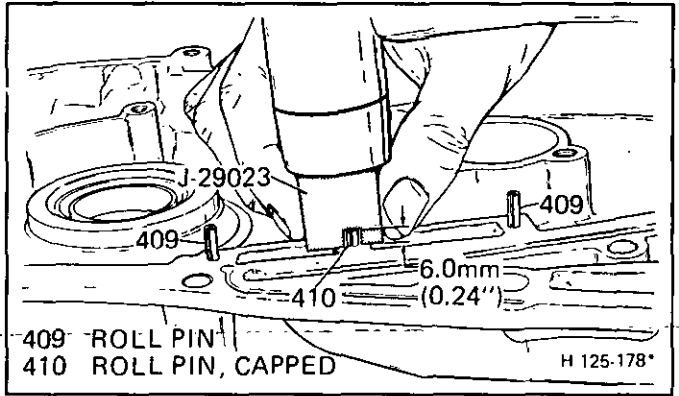


Figure 82 Setting Center Roll Pin Height

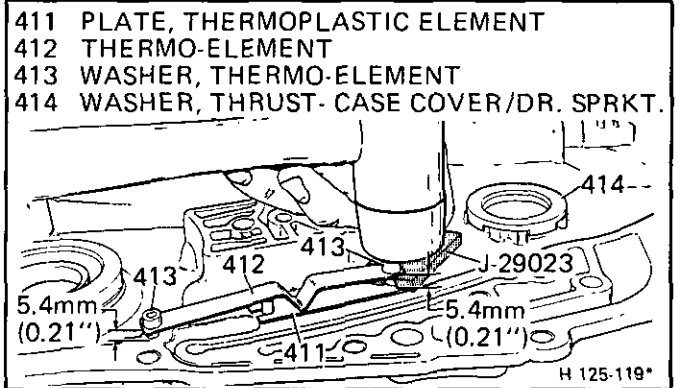


Figure 83 Setting Element Height

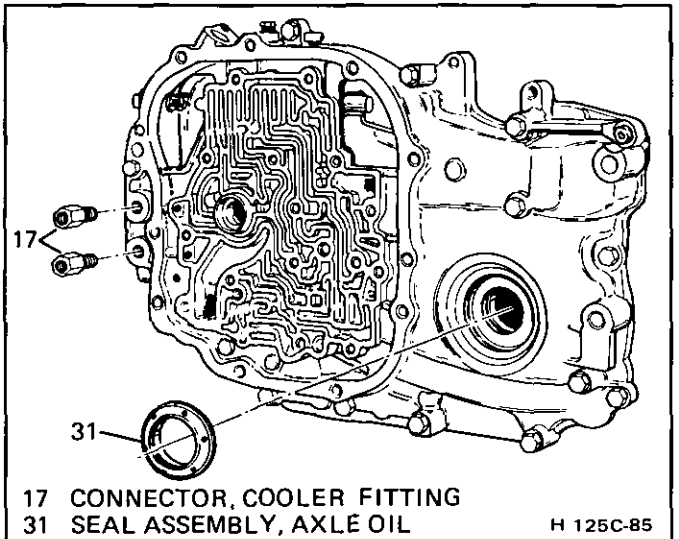


Figure 84 Left Hand Axle Seal & Cooler Fittings

- Element (412)
- Element plate (411)



Assemble (Figure 82 and 83)

- Set thermo pin height with J-29023
- Install the element plate (411)
- Install the element (412)
- Install the washers (413) – use J-29023 to set the washer height.



Inspect (Figure 84)

- Left hand axle seal (31) for damage

Seal Replacement Procedure

Remove or Disconnect

- Seal (31)

Install or Connect

- Seal (31) use J-26938 or J-29130

Assemble (Figure 81)

1. Case cover
2. Thrust washer (414) – use petrolatum to hold in place.
3. Pin (422), chamfered end first
4. Piston (421)
5. Spring (419)
6. Gasket (415) – use petrolatum to hold in place.

Install or Connect

- Loctite ® 515 or equivalent on both sides of gasket (416)
- Gasket (416) to case cover
- Case cover (401) to case
- Coat bolt (A) with thread sealer (Figure 84A).
- Retainer (701) to manual valve (406) (Figure 85)

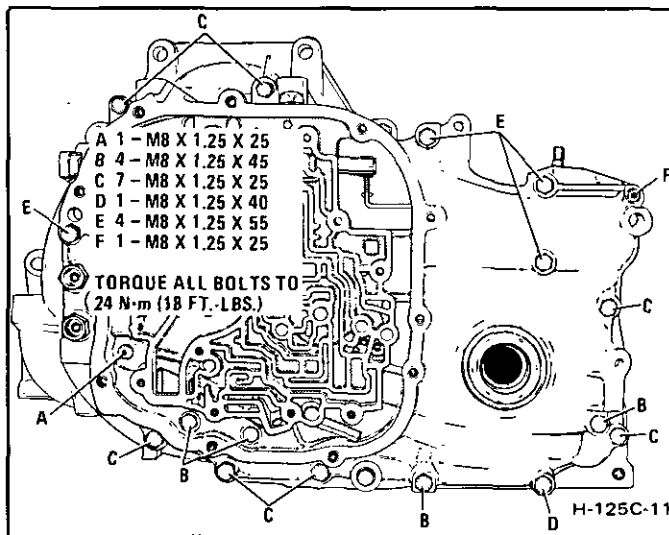


Figure 84A

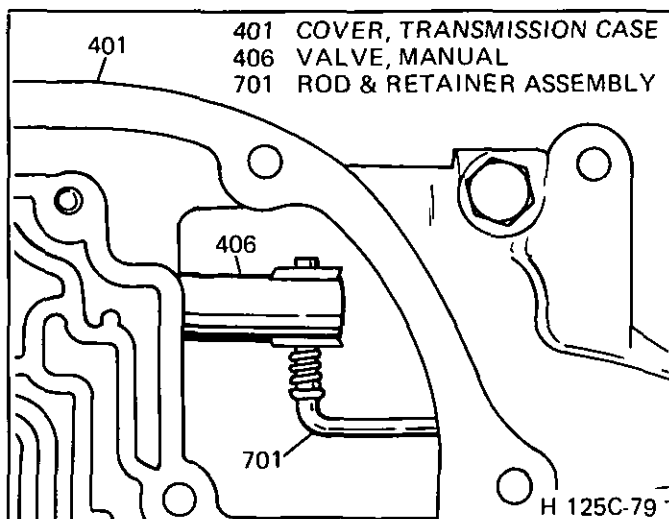


Figure 85 Manual Valve

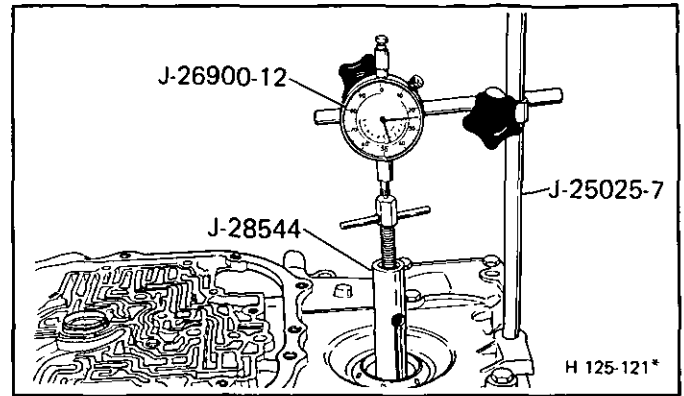


Figure 86 Input Shaft to Case Cover End Play

INPUT SHAFT TO CASE COVER SELECTIVE SNAP RING (621)

Thickness	Identification/Color
1.83 - 1.93mm (0.071" - 0.076")	White
2.03 - 2.13mm (0.078" - 0.084")	Blue
2.23 - 2.33mm (0.088" - 0.092")	Brown
2.43 - 2.53mm (0.095" - 0.099")	Yellow
2.63 - 2.73mm (0.103" - 0.107")	Green

H 125-318-2

Figure 87 Selective Snap Ring Chart

Input Shaft End Play

Measure (Figures 86 and 87)

Tools required:

- J-26958-10 Adapter plug
- J-26958 Loading tool and J-26958-11 bracket
- J-28544 Input shaft lifter
- J-25025-7 Dial indicator post
- J-26900-12 or J-8001 Dial indicator

1. Install essential tools
2. Push the lifter down and zero the dial indicator.
3. Pull the lifter up.
4. Dial indicator reading should be 0.10-0.84 mm (.004-.033").
See (Figure 87) for snap ring selection – correct as necessary.
5. Remove tools.

CONTROL VALVE AND OIL PUMP ASSEMBLY

Disassemble (Figures 88, 89, and 90L)

- Control Valve Assembly

Important

- Valves and springs are **not** interchangeable. Keep them in the order shown.
- Position as shown.
- Start at the upper left and remove each valve train. Lay out the valve train as shown.

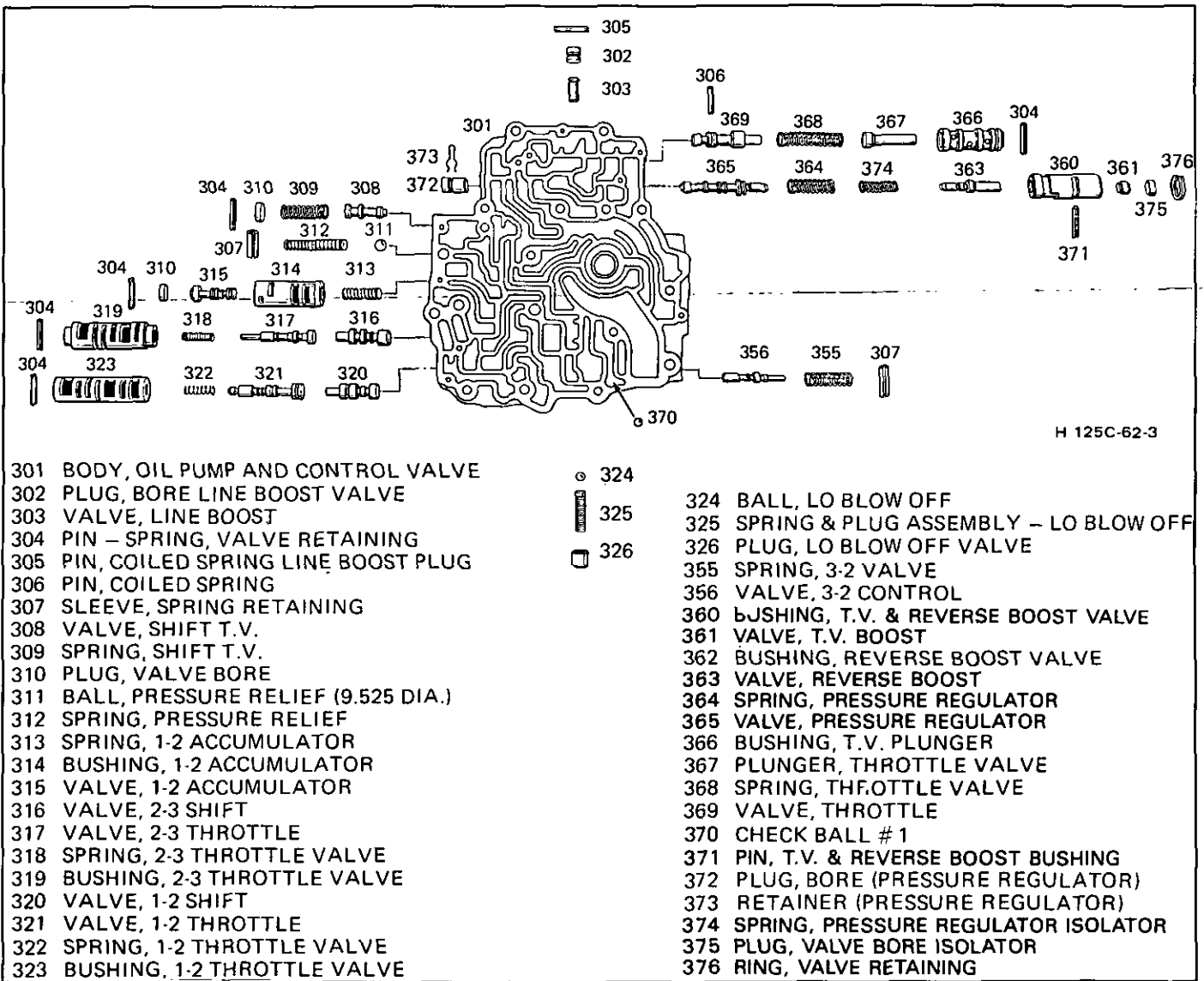




Figure 88 Control Valve - Pump Assembly

- Roll pins (307) – they are under pressure. Cover the bore when the pin is removed.
- Blind hole pins must be removed with a #49 drill bit (1.85 mm or .073"). Grind the taper off the bit.
- Oil pump and auxiliary valve body assembly
 1. Screw (327)
 2. Cover (330) and gasket (331)
 3. Screw (334), solenoid assembly (333) and "O" ring seal (337)
 4. Switches (335 & 338)
 5. Auxiliary valve body (343)
 - Converter clutch regulator valve, pin, bore plug and spring (306, 340, 41, 4.)
 6. C.C. Control valve (332) and plug (310)
 7. Pin (345) and slide (348)
 8. Vanes (352) and rotor (353)
 9. Pump vane ring (351)
- All valves, bushings and springs with solvent, air dry
-  **Inspect**
 - Valve body (301) and auxiliary valve body (343)
 - Oil passage damage
 - Casting porosity
 - Machine face damage
 - Scored valve bores
 - Pump pocket for damage
 - Auxiliary valve body sleeve for damage
 - Valves, bushings and springs
 - Scored or cracked valves
 - Scored or cracked bushings
 - Collapsed springs
 - Pump rotor and vanes
 - Rotor damage (353)
 - Vane damage (352)
 - Vane rings for damage (351)
 - Slide seals (350)
 - Slide "O" rings seals (346 & 347)
 - Pump shaft bearing (354) for damage
-  **Clean**
 - Valve body (301) and auxiliary valve body (340) with solvent – air dry. Lo blow off assembly – 326, 325, 324 must be replaced.

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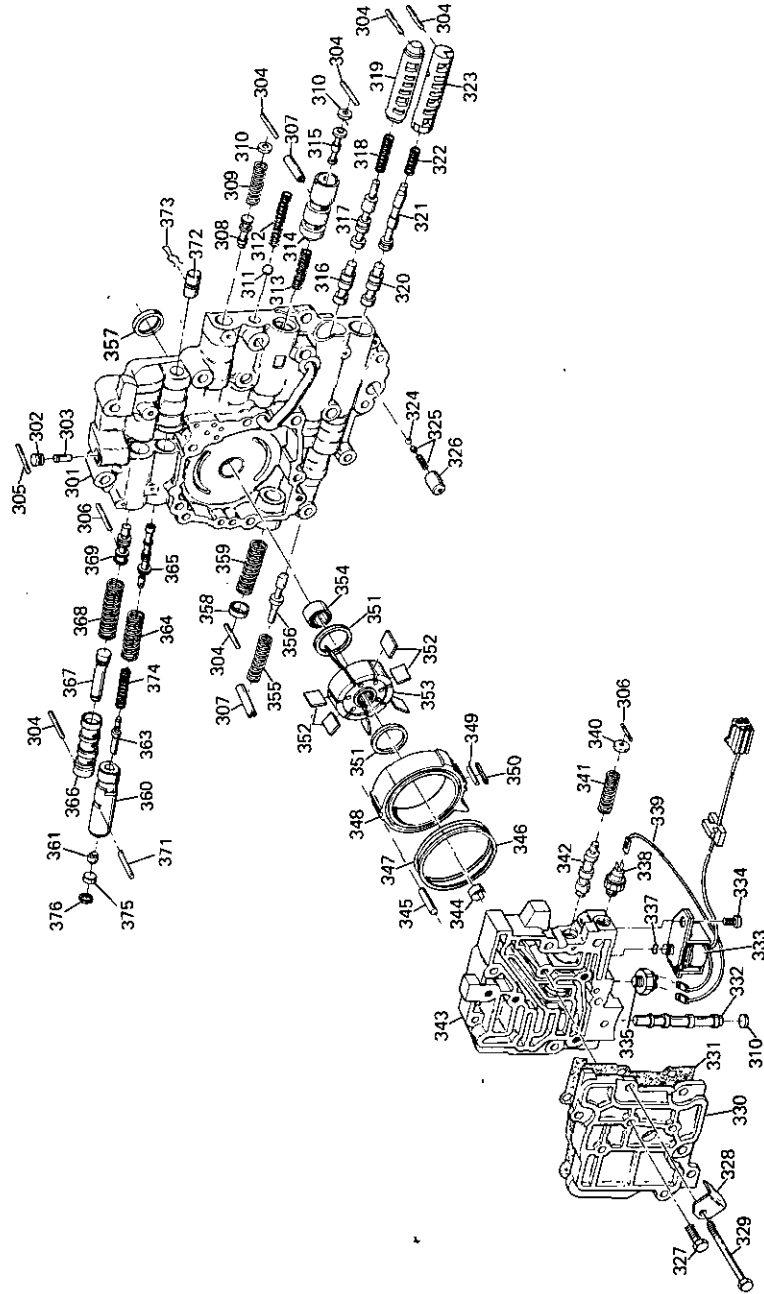


Figure 89 Control Valve & Oil Pump Assembly

- | | |
|--|--|
| <p>301 BODY, OIL PUMP & CONTROL VALVE
 302 PLUG, BORE LINE BOOST VALVE
 303 VALVE, LINE BOOST
 304 PIN, VALVE RETAINING SPRING
 305 PIN, COILED SPRING LINE BOOST PLUG
 306 PIN, COILED SPRING
 307 SLEEVE, SPRING RETAINING
 308 VALVE, SHIFT T.V.
 309 SPRING, SHIFT T.V.
 310 PLUG, VALVE BORE
 311 BALL, PRESSURE RELIEF (9.525 DIA.)
 312 SPRING, PRESSURE RELIEF
 313 SPRING, 1-2 ACCUMULATOR
 314 BUSHING, 1-2 ACCUMULATOR
 315 VALVE, 1-2 ACCUMULATOR
 316 VALVE, 2-3 SHIFT
 317 VALVE, 2-3 THROTTLE
 318 SPRING, 2-3 THROTTLE VALVE
 319 BUSHING, 2-3 THROTTLE VALVE
 320 VALVE, 1-2 SHIFT
 321 VALVE, 1-2 THROTTLE
 322 SPRING, 1-2 THROTTLE VALVE
 323 BUSHING, 1-2 THROTTLE VALVE
 324 BALL, LO BLOW OFF
 325 SPRING & PLUG ASSEMBLY, LO BLOW OFF
 326 PLUG, LO BLOW OFF VALVE
 327 BOLT, AUXILIARY V.B./VALVE BODY
 328 RETAINER, VALVE BODY PIPE
 329 BOLT, AUXILIARY VALVE BODY TO CASE
 330 COVER, AUXILIARY VALVE BODY
 331 GASKET, AUXILIARY VALVE BODY COVER
 332 VALVE, CONVERTER CLUTCH CONTROL
 333 SOLENOID ASSEMBLY
 334 BOLT, SOLENOID
 335 SWITCH, PRESSURE
 337 SEAL, "O" RING
 338 SWITCH, GOVERNOR PRESSURE (DIESEL ONLY)
 339 HARNESS, SOLENOID WIRE
 340 PLUG, VALVE BORE</p> | <p>341 SPRING, CONVERTER CLUTCH REGULATOR
 342 VALVE, CONVERTER CLUTCH REGULATOR
 343 BODY, AUXILIARY VALVE
 344 SLEEVE, AUXILIARY VALVE BODY
 345 PIN, SLIDE PIVOT
 346 RING, OIL SEAL (SLIDE TO COVER)
 347 SEAL, "O" RING (SLIDE)
 348 SLIDE, PUMP
 349 SUPPORT, PUMP SLIDE SEAL
 350 SEAL, PUMP SLIDE
 351 RING, PUMP VANE
 352 VANE, PUMP
 353 ROTOR, OIL PUMP
 354 BEARING ASSEMBLY, ROLLER PUMP SHAFT
 355 SPRING, 3-2 VALVE
 356 VALVE, 3-2 CONTROL
 357 SEAL, PUMP SHAFT
 358 PLUG, SPRING RETAINING
 359 SPRING, PUMP PRIMING
 360 BUSHING, T.V. & REVERSE BOOST VALVE
 361 VALVE, T.V. BOOST
 363 VALVE, REVERSE BOOST
 364 SPRING, PRESSURE REGULATOR
 365 VALVE, PRESSURE REGULATOR
 366 BUSHING, T.V. PLUNGER
 367 PLUNGER, THROTTLE VALVE
 368 SPRING, THROTTLE VALVE
 369 VALVE, THROTTLE
 371 PIN, T.V. & REVERSE BOOST BUSHING
 372 PLUG, BORE (PRESSURE REGULATOR)
 373 RETAINER, PRESSURE REGULATOR
 374 SPRING, PRESSURE REGULATOR ISOLATOR
 375 PLUG, VALVE BORE ISOLATOR
 376 RING, VALVE RETAINING</p> |
|--|--|

LEGEND
H 125C-21-3

Figure 90L Control Valve and Oil Pump Ass'y. Legend

Oil Pump Rotor and Slide Replacement



Measure (Figure 91)

Tool Required:

- One Inch Micrometer
- Oil Pump Rotor (353) Thickness
- Oil Pump Slide (348) Thickness



Important

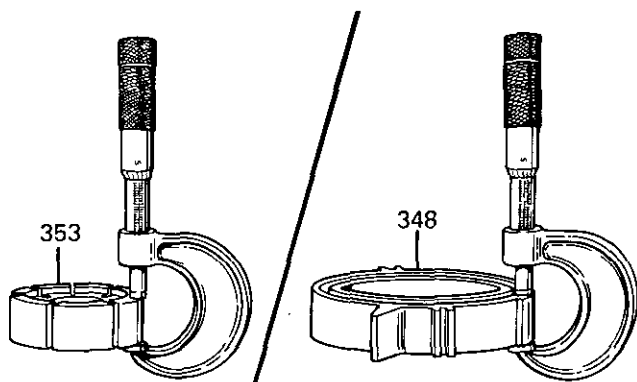
Measurement of rotor/slide must be made on undamaged surfaces. Select similar size replacements. (Figure 91) Lightly hone both sides of replacement rotor or slide to remove any nicks or burrs.

OIL PUMP ROTOR SELECTION CHART

THICKNESS (mm)	THICKNESS (in.)
17.917 - 17.929	0.7055 - 0.7059
17.930 - 17.942	0.7060 - 0.7064
17.943 - 17.955	0.7065 - 0.7069
17.956 - 17.968	0.7070 - 0.7074
17.969 - 17.981	0.7075 - 0.7079

OIL PUMP SLIDE SELECTION CHART

THICKNESS (mm)	THICKNESS (in.)
17.955 - 17.967	0.7070 - 0.7074
17.968 - 17.980	0.7075 - 0.7079
17.981 - 17.993	0.7080 - 0.7084
17.994 - 18.006	0.7085 - 0.7089
18.007 - 18.020	0.7090 - 0.7094



348 OIL PUMP SLIDE
353 OIL PUMP ROTOR

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Figure 91 Oil Pump Rotor and Slide Selection

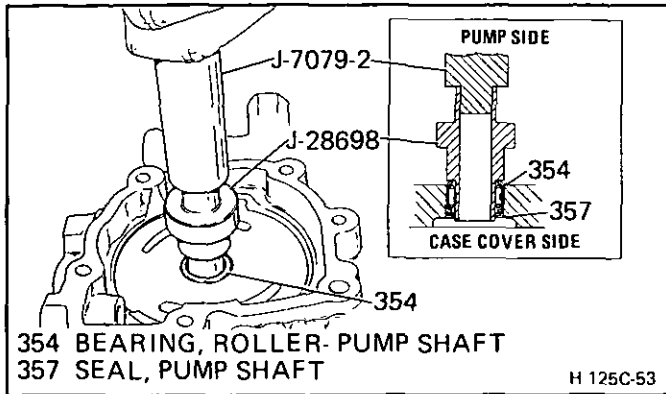


Figure 92 Pump Bearing Installation

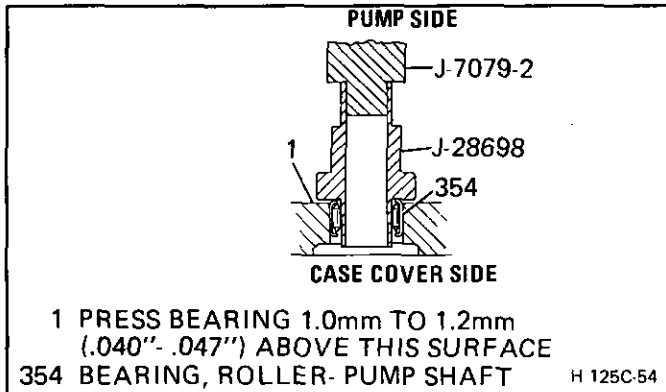


Figure 93 Bearing Dimension

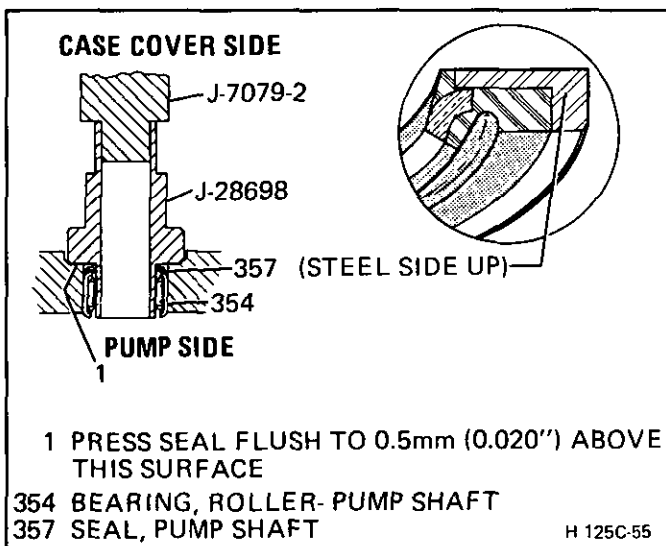


Figure 94 Bearing Seal Dimension

Pump Shaft Bearing Replacement

Remove or Disconnect

Tools Required:

J-28698 Pump Bearing Remover and Installer

J-7079-2 Driver Handle

- Bearing with J-28698 and J-7079-2 (Drive toward pump pocket)

Install or Connect (Figures 92, 93, and 94)

Tools Required:

J-28698 Pump Bearing Remover and Installer

J-7079-2 Driver Handle

- New bearing, use J-28698 and J-7-79-2 – install from pump pocket side – bearing cup must be 0.45 - 0.15 mm (0.017\"-0.005\") below pump pocket

Assemble (Figures 88 and 89)

- Oil pump assembly
 1. Pump slide (348) into pump pocket
 2. Slide seal support (349) and seal (350) into slide (348)
 3. Align side with pivot hole, then install pin (345)
 4. Vane ring (351) into pump pocket (1 of 2 rings)
 5. Vanes (352) and rotor (353) pocket
 6. Vane ring (351) top of rotor
 7. "O" ring seal (349) on top of rotor
 8. "O" ring seal (346) (slide to cover)
- Auxiliary valve body
 - Converter clutch regulator valve (342), spring (341), bore plug (340) and roll pin (306)
 - Control valve (332) and plug (310)
 - Switches (335 & 338)
 - Solenoid (333) with oil seal (337) and bolt (334)
 - attach leads
- Auxiliary valve body to valve body
 - Position as shown.
 - Install gasket (331) and cover (330).

Tighten

Torque the bolts (327) to 11 N·m (8 ft. lbs.)

Assemble (Figures 88, 89, and 90L)

- Control valve assembly
- All valves, springs, bushings, bore plugs and roll pins as shown

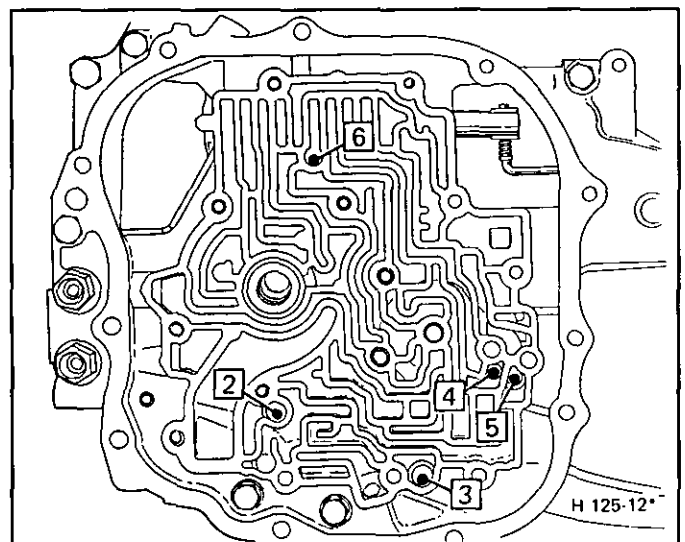


Figure 95 Check Ball Locations

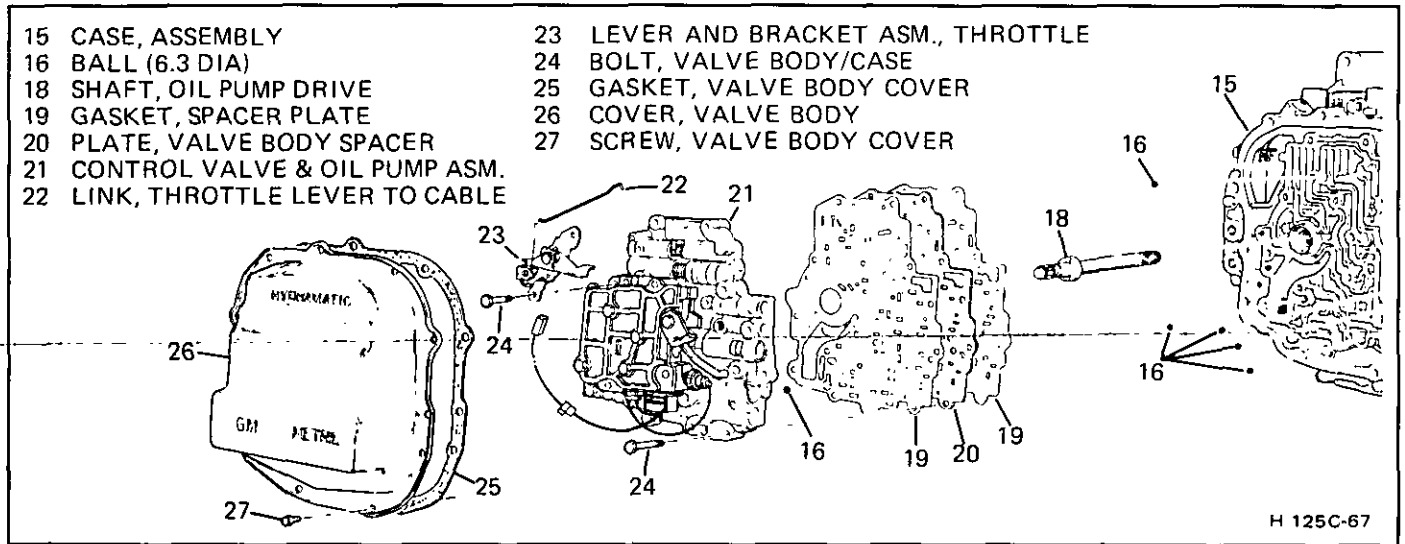


Figure 96 Control Valve Pump Assembly, Oil Pump Shaft

CONTROL VALVE AND OIL PUMP ASSEMBLY

Install or Connect (Figures 95, 96, 97, 98, 99 and 100)

1. Check balls (16), numbers 2, 3, 4 and 5
2. Gasket (19)
3. Plate (20)
4. Gasket (19)
5. Check ball (16) number one – on spacer plate
6. Shaft (18) – through case cover
7. 6 mm guide pins
8. Body assembly (21) – onto case cover
9. Retainer (328)
10. Bolts (327). Refer to Figure 98.
11. Coat bolt "F" Figure 98 with thread sealer.
12. Wiring harness.
13. Link (22)
14. Bracket assembly (23) – engage link (22)
15. Remove 6 mm guide pins.
16. Remaining bolts (327)

Tighten

- Torque the bolts (327):
M6 - 11 N·m (8 ft. lbs.).
M8 - 24 N·m (18 ft. lbs.).

- A 9 – M6 X 1.0 X 45
- B 2 – M6 X 1.0 X 65
- C 4 – M6 X 1.0 X 25
- D 1 – M8 X 1.25 X 65
- E 1 – M8 X 1.25 X 85
- F 1 – M8 X 1.25 X 130
- G 3 – M6 X 1.0 X 90
- H 1 – M6 X 1.0 X 16
- I 1 – PIPE RETAINER

TORQUE ALL M6 BOLTS TO 11 N·m (8 FT.-LBS.)
TORQUE ALL M8 BOLTS TO 24 N·m (18 FT.-LBS.)

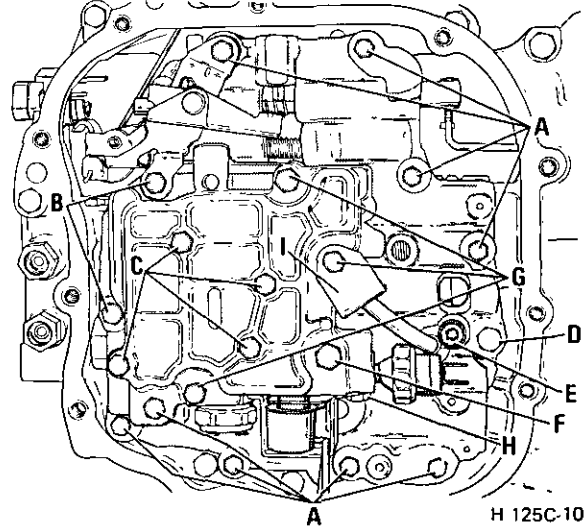


Figure 98 Valve Body Bolt Location

2. Cover (26)
3. Screws (27)

Tighten

- Torque the screws (27) to 11 N·m (8 ft. lbs.).

Install or Connect (Figure 101)

1. Shaft (29) into case
2. "C" ring (30) position with needle nose pliers.
3. With J-28583 push on "C" ring (30)

- 1 PINS, 6mm GUIDE
- 18 SHAFT, PUMP DRIVE
- 19 & 20 SPACER PLATE & GASKETS
- 370 CHECK BALL, #1

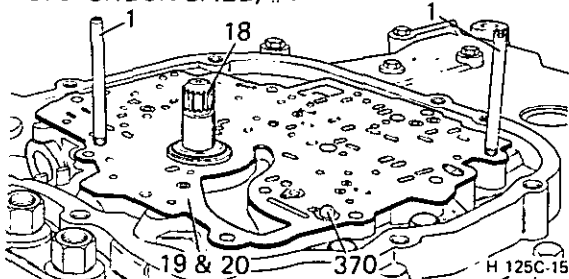


Figure 97 Spacer Plate & Gaskets

Install or Connect

1. Gasket (25) or apply R.T.V. silicon sealant

MODEL USAGE — BA, BC, BD, BP, CA, CB, CC, CD, CF, CJ, CK, CL, CM, CT, CU, CX, HL, HU, PA, PD, PF, PH, PJ, PK, PN, PR, PW

- 1 CLIP IN CASE COVER PRONGS
- 2 RED
- 3 WHITE
- 4 BLACK

- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 408 CONNECTOR, ELECTRICAL

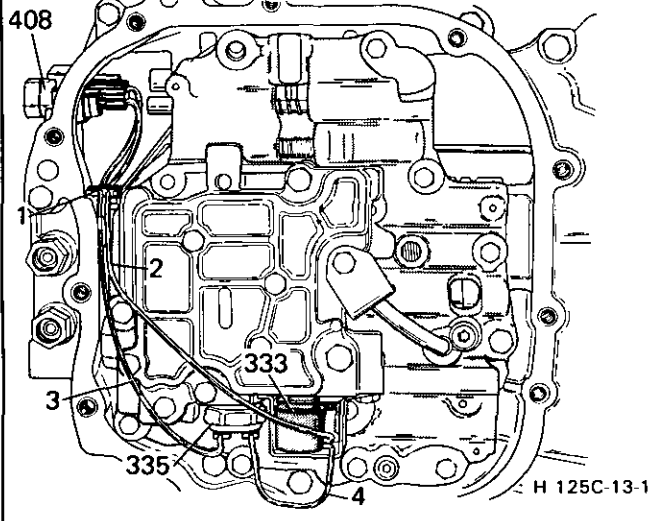
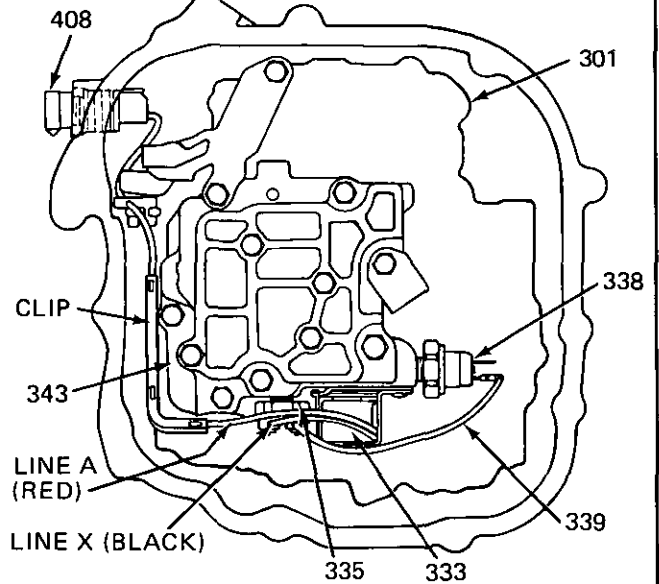


Figure 99 T.C.C. Wiring Diagram

MODEL HS

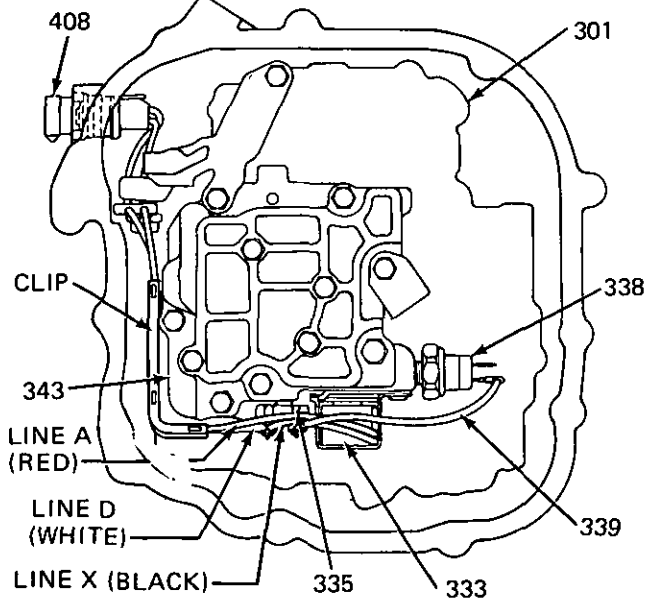


- 301 BODY, OIL PUMP AND CONTROL VALVE
- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 338 SWITCH, GOV. PRESSURE (N.O.)
- 339 WIRE ASSEMBLY (WHITE)
- 343 BODY, AUXILIARY VALVE
- 408 ELECTRICAL CONNECTOR

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Figure 100A T.C.C. Wiring Diagram

MODELS JD, JM, JN, JS, JW



- 301 BODY, OIL PUMP AND CONTROL VALVE
- 333 SOLENOID ASSEMBLY
- 335 SWITCH, 3RD CLUTCH PRESSURE (N.O.)
- 338 SWITCH, GOV. PRESSURE (N.O.)
- 339 WIRE ASSEMBLY (WHITE)
- 343 BODY, AUXILIARY VALVE
- 408 ELECTRICAL CONNECTOR

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Figure 100 T.C.C. Wiring Diagram

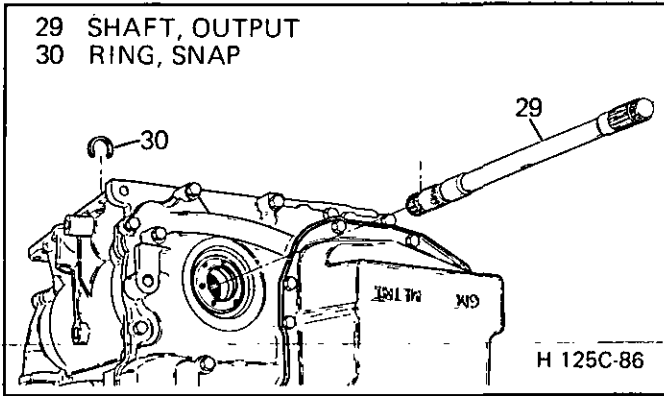


Figure 101 Output Shaft & "C" Ring

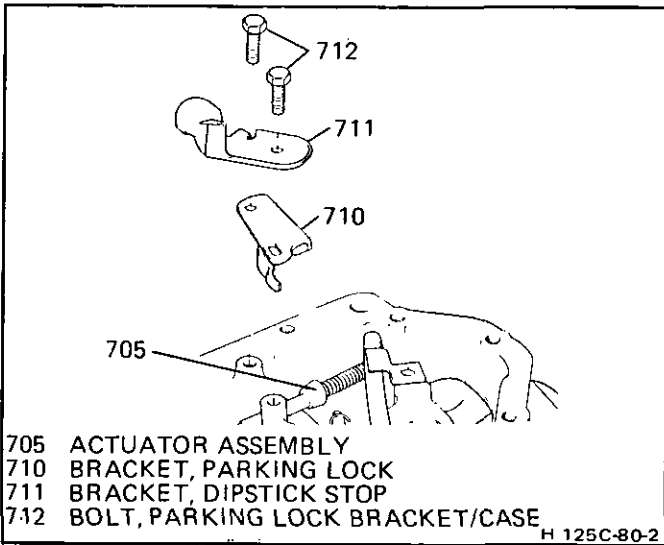


Figure 102 Dipstick Stop & Parking Lock

Reverse Pipe and Parking Bracket

Install or Connect (Figures 102 and 103)

1. Weir (147)
2. Bracket (143)
3. Retainer (143)
4. Screw (142)
5. Bracket (710)
6. Stop (711)
7. Screw (712)

Inspect

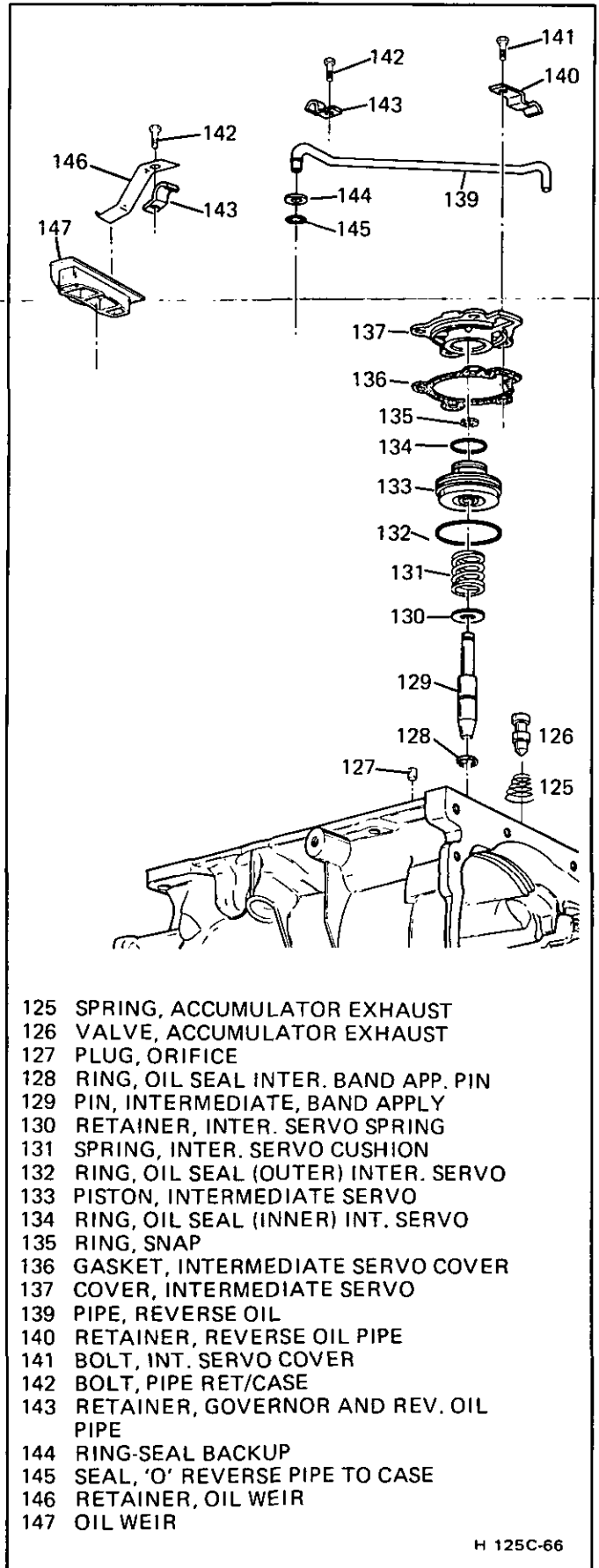
- Actuator Assembly (705) for proper action

Install or Connect (Figure 104)

- Cup plug (120) – use 9.5 mm (3/8") drift

Assemble (Figure 103)

1. Washer (144) onto pipe (139)
2. "O" ring (145) – retain with petrolatum
3. Pipe assembly (139)
4. Bracket (143)
5. Screw (142)



- 125 SPRING, ACCUMULATOR EXHAUST
- 126 VALVE, ACCUMULATOR EXHAUST
- 127 PLUG, ORIFICE
- 128 RING, OIL SEAL INTER. BAND APP. PIN
- 129 PIN, INTERMEDIATE, BAND APPLY
- 130 RETAINER, INTER. SERVO SPRING
- 131 SPRING, INTER. SERVO CUSHION
- 132 RING, OIL SEAL (OUTER) INTER. SERVO
- 133 PISTON, INTERMEDIATE SERVO
- 134 RING, OIL SEAL (INNER) INT. SERVO
- 135 RING, SNAP
- 136 GASKET, INTERMEDIATE SERVO COVER
- 137 COVER, INTERMEDIATE SERVO
- 139 PIPE, REVERSE OIL
- 140 RETAINER, REVERSE OIL PIPE
- 141 BOLT, INT. SERVO COVER
- 142 BOLT, PIPE RET/CASE
- 143 RETAINER, GOVERNOR AND REV. OIL PIPE
- 144 RING-SEAL BACKUP
- 145 SEAL, 'O' REVERSE PIPE TO CASE
- 146 RETAINER, OIL WEIR
- 147 OIL WEIR

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Figure 103 Oil Pipe & Servo

Tighten

- Torque the screws (142, 712, 142) to 24 N·m (18 ft. lbs.).

INTERMEDIATE SERVO

Disassemble (Figure 103)

1. "E" ring (135) from pin (129)
2. Piston (133) from pin (129)
3. Spring (131)
4. Retainer (130)

Inspect

- Pin (129) for damage
- Seals (134 and 132) for cuts or nicks – proper scarf cut alignment.
Do not remove seals (132 and 134) unless replacement is necessary.
- Spring (131) for damage
- Retainer (130) for damage
- Cover (137) for damage, cracks, porosity
- Piston (133) for cracks, seal groove damage

Measure (Figures 105 and 106)

Tools Required:

J-28535 Intermediate Band apply pin gage

1. Install J-28535 on the case (112) and the pin (129) into the gage.
2. With a torque wrench apply 11.2 N·m (100 inch pounds of torque).

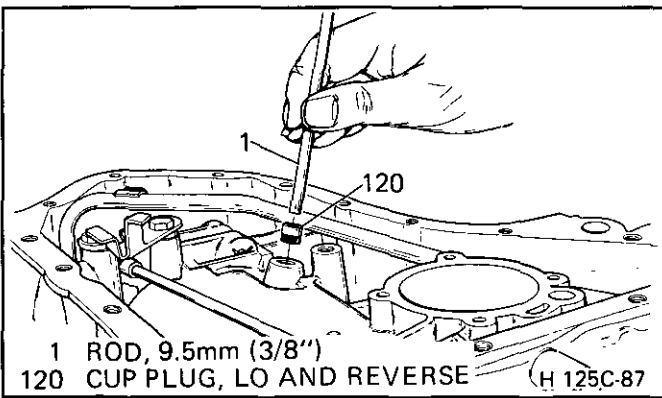


Figure 104 Lo & Reverse Cup Plug

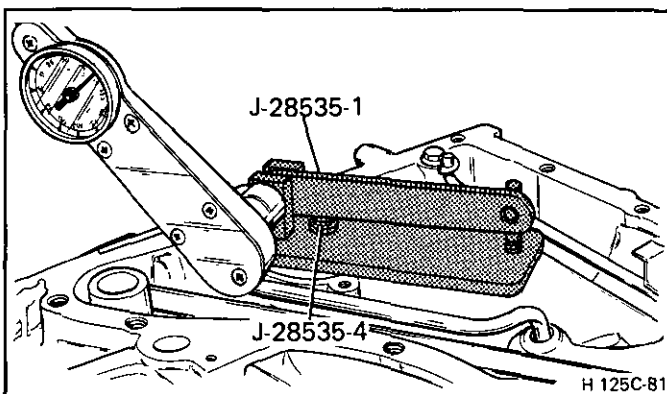


Figure 105 Checking for Proper Apply Pin

**INTERMEDIATE BAND
APPLY PIN**

LENGTH	IDENTIFICATION
Short2 Grooves
Medium	1 Groove
Long	No Grooves

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Figure 106 Apply Pin Chart

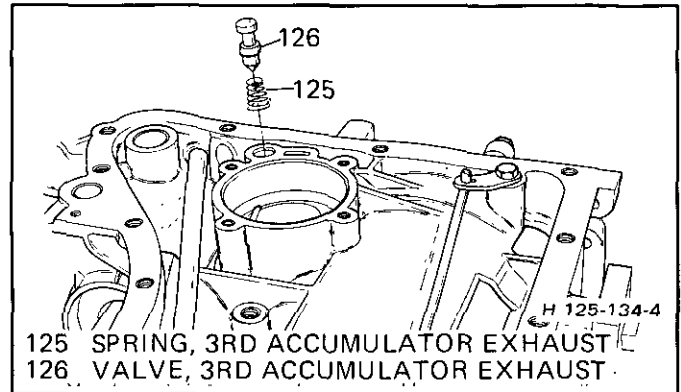


Figure 107 3rd Accumulator Exhaust Valve & Spring

3. If the white line appears in window the pin length is correct.
- If the white line does not appear, select another length pin – Figure 106. Repeat procedure.
4. Remove pin gage.

Assemble (Figure 103)

1. Retainer (130) onto pin (129)
2. Spring (131) against spacer (13)
3. Piston (133) onto pin
4. "E" ring (135) onto pin

Install or Connect (Figures 107 and 103)

1. Spring (125) into bore
2. Check valve (126) into bore

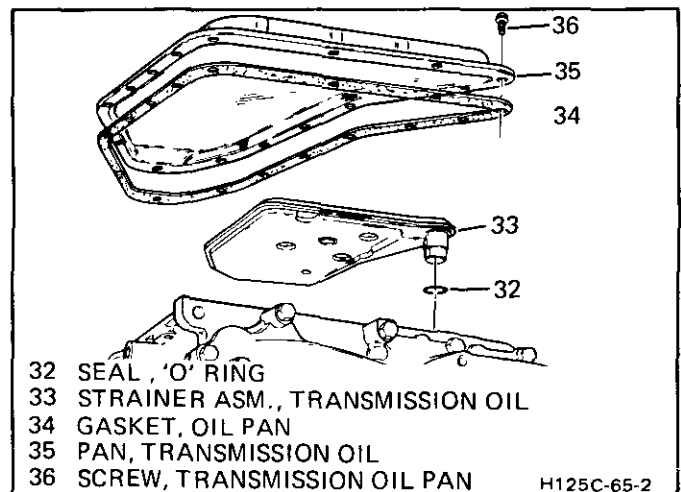


Figure 108 Bottom Pan & Oil Strainer

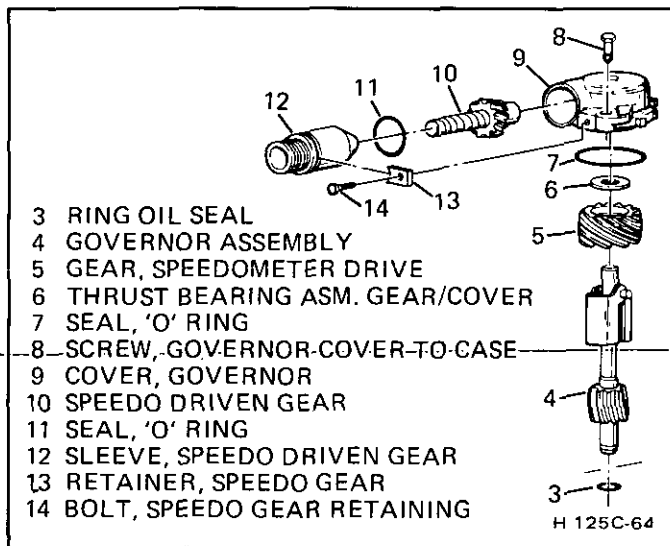


Figure 109 Governor Assembly

- 3. Servo assembly (133) into servo bore
- 4. Gasket (136)
- 5. Cover (137)
- 6. Bracket (140)
- 7. Screws (141)

Tighten

- Torque the screws (141) to 11 N·m (8 ft. lbs.).

OIL PAN AND STRAINER

Install or Connect (Figure 108)

1. "O" ring (32) onto the strainer tube
2. Strainer (33) into the case
3. Gasket (34) or apply R.T.V. silicon sealant.
4. Pan (35) onto the case
5. Bolts (36)

Tighten

- Torque the pan bolts (36) to 11 N·m (8 ft. lbs.).

GOVERNOR AND SPEEDOMETER GEAR ASSEMBLY

Clean

- Governor assembly (4)

Inspect (Figure 109)

- Governor
 - Oil passage blocked
 - Damaged springs
 - Missing check balls
 - Seal (3) damage
 - Binding weights

Seal Replacement Procedure

Remove or Disconnect

- Seal (3) – cut off

Install or Connect

- Seal (3) – use petrolatum

Inspect

- Gear (5) for wear
- Bearing (6) for damage
- Cover (9) for porosity or cracks
- Gear (10) for wear
- "O" ring (11) for nicks or cuts
- Sleeve (12) for scoring

Install or Connect (Figure 109)

1. Governor (4) assembly into case
2. Gear (5) onto governor
3. Bearing (6) onto gear
4. New "O" ring (7) into cover (9)
5. Cover (9)
 - Make sure shaft (4) is piloted into cover.
6. Screw (8)

Tighten

- Torque the screw (8) to 11 N·m (8 ft. lbs.)

Assemble (Figure 109)

- "O" ring (11) onto sleeve (12)
- Gear (10) into sleeve (12)

Install or Connect

1. Sleeve (12) into cover (9)
2. Retainer (13)
3. Screw (14)

Tighten

- Torque the screw (14) to 9 N·m (75 inch pounds)

Install or Connect

- Transaxle into transmission jack

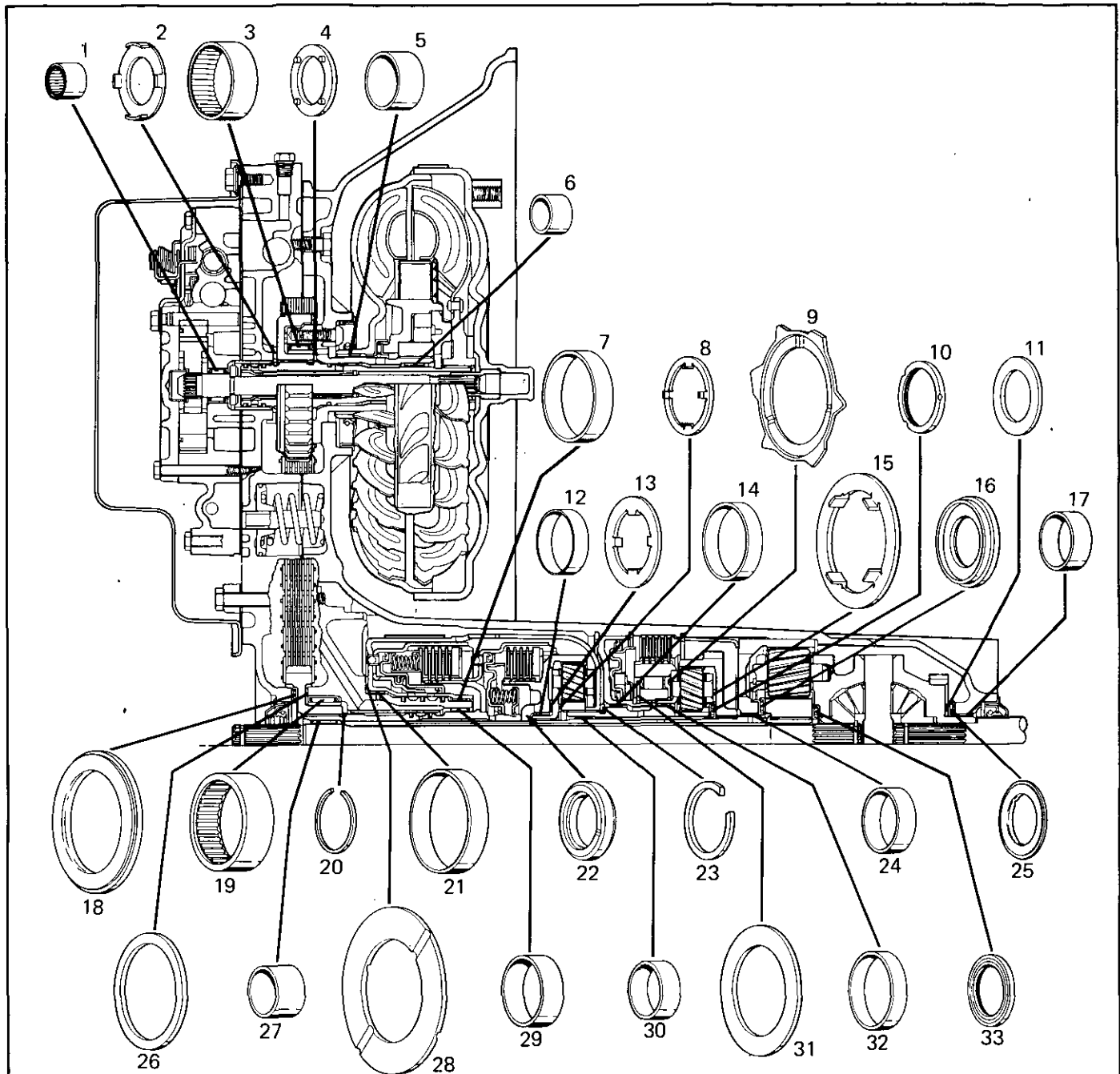
Remove or Disconnect

- J-28664

Install or Connect

Tool Required:
J-21366 Converter Holding Strap

1. Converter (1)
2. J-21366 Converter retaining strap



- | | |
|---|--|
| 1. Pump Shaft Roller Bearing Assy. Group 4.226 | 18. Driven Sprocket Thrust Bearing Assembly Group 4.131 |
| 2. Case Cover To Driven Sprocket Thrust Washer Group 4.131 | 19. Bearing Assembly Group 4.131 |
| 3. Bearing Assembly Group 4.131 | 20. Selective Snap Ring Group 4.169 |
| 4. Case Cover To Drive Sprocket Thrust Washer Group 4.131 | 21. Direct Clutch Bushing Group 4.169 |
| 5. Converter Bushing Group 4.115 | 22. Input Shaft Thrust Washer Group 4.158 |
| 6. Drive Sprocket Support Bushing Group 4.226 | 23. Selective Snap Ring Group 4.216 |
| 7. Direct Clutch Drum Bushing Group 4.169 | 24. Final Drive Internal Gear Bushing Group 4.319 |
| 8. Input Carrier To Input Sun Gear Thrust Washer Group 4.159 | 25. Differential Carrier To Case Thrust Brg. Assy. Group 4.176 |
| 9. Reaction Carrier To Lo Race Thrust Washer Group 4.180 | 26. Driven Sprocket Support Thrust Washer Group 4.131 |
| 10. Reaction Sun To Internal Gear Thrust Bearing Group 4.159 | 27. Input Shaft Bushing Group 4.158 |
| 11. Differential Carrier To Case Sel. Thrust Washer Group 4.176 | 28. Thrust Washer Group 4.169 |
| 12. Input Internal Gear Bushing Group 4.158 | 29. Driven Sprocket Support Bushing Group 4.226 |
| 13. Input Carrier To Input Int. Gear Thrust Washer Group 4.159 | 30. Reaction Sun Gear Bushing Group 4.159 |
| 14. Lo And Reverse Clutch Housing Bushing Group 4.159 | 31. Reverse Housing To Lo Race Selective Washer Group 4.180 |
| 15. Reaction Carrier To Int. Gear Thrust Washer Group 4.180 | 32. Reaction Carrier Bushing Group 4.159 |
| 16. Sun Gear To Internal Gear Thrust Bearing Group 4.178 | 33. Sun Gear To Carrier Thrust Bearing Group 4.159 |
| 17. Case Bushing Group 4.319 | |

Figure 110 Bushing & Thrust Washer Locations

TORQUE SPECIFICATIONS

DESCRIPTION OF USAGE	QUANTITY	SIZE	TORQUE ASSEMBLY
Valve Body to Case Cover	2	M6 x 1.0 x 65.0	11 N·m (8 ft.-lbs.)
Pump Cover to Case Cover	1	M8 x 1.25 x 130.00	24 N·m (18 ft.-lbs.)
Pump Cover to Valve Body	4	M6 x 1.0 x 20.0	11 N·m (8 ft.-lbs.)
Pump Cover to Valve Body	3	M6 x 1.0 x 90	11 N·m (8 ft.-lbs.)
Solenoid to Valve Body	1	M6 x 1.0 x 16	11 N·m (8 ft.-lbs.)
Valve Body to Case Cover	9	M6 x 1.0 x 45.0	11 N·m (8 ft.-lbs.)
Valve Body to Case	1	M8 x 1.25 x 85.0	24 N·m (18 ft.-lbs.)
Valve Body to Driven Sprocket Support	1	M8 x 1.25 x 65.0	24 N·m (18 ft.-lbs.)
Case Cover to Case	4	M8 x 1.25 x 45.0	24 N·m (18 ft.-lbs.)
Case Cover to Case	4	M8 x 1.25 x 55.0	24 N·m (18 ft.-lbs.)
Case Cover to Case	1	M8 x 1.25 x 40.0	24 N·m (18 ft.-lbs.)
Case Cover to Case	7	M8 x 1.25 x 25.0	24 N·m (18 ft.-lbs.)
Case Cover to Case	2	M8 x 1.25 x 25.0	24 N·m (18 ft.-lbs.)
Case to Drive Sprocket Support	4	M8 x 1.25 x 23.5	24 N·m (18 ft.-lbs.)
Oil Pan and Valve Body Cover	27	M8 x 1.25 x 16.0	11 N·m (8 ft.-lbs.)
Manual Detent Spring Assembly to Case	1	M6 x 1.0 x 10.0	11 N·m (8 ft.-lbs.)
Cooler Connector	2	1/4 - 18 NPSF	38 N·m (23 ft.-lbs.)
Line Pressure Take-Off	1	1/8 - 27 NPTF	11 N·m (8 ft.-lbs.)
Intermediate Servo Cover	4	M6 x 1.0 x 20.0	11 N·m (8 ft.-lbs.)
Parking Lock Bracket to Case	2	M8 x 1.25 x 20.0	24 N·m (18 ft.-lbs.)
Pipe Retainer to Case	2	M8 x 1.25 x 14.0	24 N·m (18 ft.-lbs.)
Governor Cover to Case	2	M6 x 1.0 x 25.0	11 N·m (8 ft.-lbs.)
Speedometer Driven Gear to Governor Cover	1	M6 x 1.0 x 16.0	9 N·m (75 in.-lbs.)
T.V. Cable to Case	1	M6 x 1.0 x 16.0	9 N·m (75 in.-lbs.)
Pressure Switch	2	1/8 - 27 NPTF	11 N·m (8 ft.-lbs.)

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Figure 111 Torque Specifications

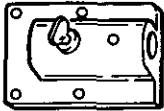
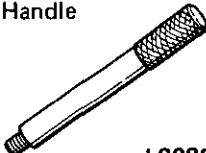
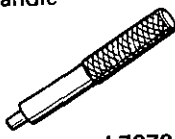
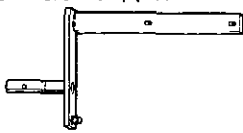
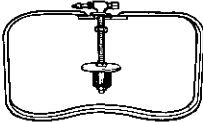

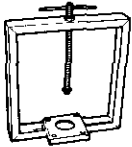
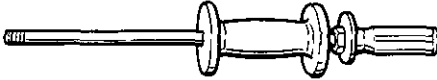
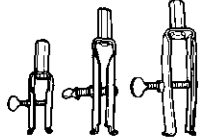
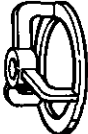

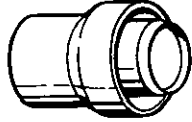

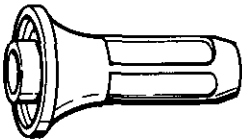
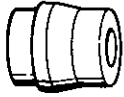
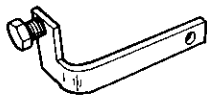
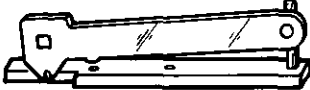
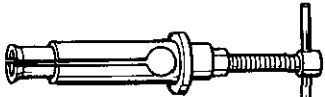
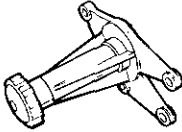
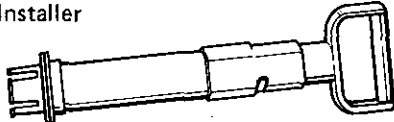
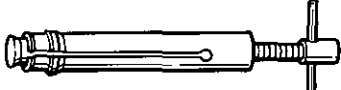


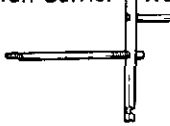
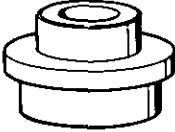
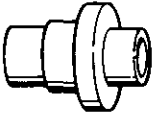




<p>Transmission Support Fixture Base</p>  <p>J-3289-20</p>	<p>Handle</p>  <p>J-8092</p>	<p>Handle</p>  <p>J-7079-2</p>	
<p>Transmission Support Fixture</p>  <p>J-28664</p>	<p>Torque Converter Pressurization Kit</p>  <p>J-21369-B</p>		<p>Dial Indicator Stand and Guide Pin Set</p>  <p>J-25025-A</p>
<p>Compressor Screw and Frame</p>  <p>J-23456</p>	<p>Universal Remover</p>  <p>J-23907</p>		<p>Universal Bushing Remover Set</p>  <p>J-29369</p>
<p>Forward Clutch Spring Compressor</p>  <p>J-23327-1</p>	<p>#40 Torx Bit or Equivalent</p>  <p>J-25359-5</p>		<p>Axle Seal Installer</p>  <p>J-29130</p>
<p>Adapter - Forward Clutch Spring Compressor</p>  <p>J-25018-A</p>			<p>Converter Seal Installer</p>  <p>J-28540</p>
<p>Adapter Plug</p>  <p>J-26958-10</p>	<p>Adapter Bracket</p>  <p>J-26958-11</p>	<p>Intermediate Band Apply Pin Gauge</p>  <p>J-28535</p>	<p>Torque Converter End-Play Fixture</p>  <p>J-28538</p>
<p>Output Shaft Aligning and Loading Tool</p>  <p>J-26958</p>	<p>Lo-Reverse Clutch Housing Remover and Installer</p>  <p>J-28542</p>		<p>Input Shaft Lifter</p>  <p>J-28544</p>
<p>Final Drive Unit Remover and Installer</p>  <p>J-28545</p>	<p>"C" Ring Remover - Output Shaft</p>  <p>J-28583</p>		<p>Gauge - Reaction Sun Gear Snap Ring and Reaction Carrier Washer Selection</p>  <p>J-28588</p>
<p>Bearing Installer - Sprocket Supports</p>  <p>J-28677</p>	<p>Pump Bearing - Installer and Remover</p>  <p>J-28698</p>		<p>Thermo - Element Height Gauge</p>  <p>J-29023</p>
<p>Universal Bushing Installer Set</p>  <p>J-29369</p>	<p>Turbine Shaft Seal Installer and Sizer (2 Seals)</p>  <p>J-29569</p>		<p>Turbine Shaft Seal Installer and Sizer (1 Seal)</p>  <p>J-29829</p>

Figure 112 Tool List