

1991 Chevrolet Blazer V1500

1991-92 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L80-E Overhaul

1991-92 AUTOMATIC TRANSMISSIONS

Hydra-Matic 4L80-E Overhaul

APPLICATION

1991 SERIES CODE DESIGNATIONS

Model	Designation
Blazer & Jimmy	"V" Series
Parcel Van	"P" Series
Pickup	
2WD	"C" & "R" Series
4WD	"K" & "V" Series
Suburban	
2WD	"R" Series
4WD	"V" Series
Van	"G" Series

1992 SERIES CODE DESIGNATIONS

Model	Designation
Blazer	"K" Series
Parcel Van	"P" Series
Pickup	
2WD	"C" Series
4WD	"K" Series
Sierra & Suburban	
2WD	"C" Series
4WD	"K" Series
Van	"G" Series
Yukon	"K" Series

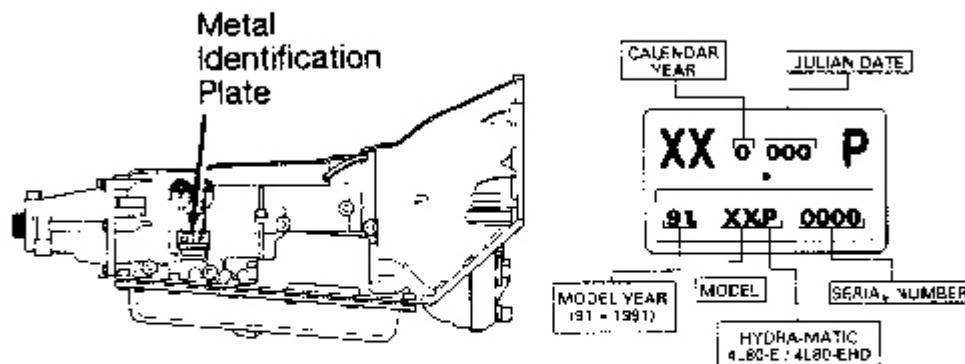
THM 4L80-E APPLICATION

Application	Engine
All Models	4.3L, 5.7L, 6.2L & 7.4L

IDENTIFICATION

NOTE: For testing and diagnostic procedures of electronic components, see HYDRA-MATIC 4L80-E OVERHAUL article.

All transaxles have a metal identification plate attached to the rear face of transaxle case. See **Fig. 1**.



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Fig. 1: Locating Transaxle Identification Information
 Courtesy of GENERAL MOTORS CORP.

DESCRIPTION

The Hydra-Matic 4L80-E transmission is a fully automatic 4-speed unit consisting primarily of a hydraulic torque converter and converter clutch. Some models have dual stators inside the torque converter. Transmission uses a gear-type pump to supply all hydraulic pressure needed for operation.

Other internal parts include the following: 5 multiple disc clutches, a roller clutch, a sprag clutch, 2 bands and 3 compound planetary gear sets.

The Hydra-Matic 4L80-E also uses 2 electronic shift valves controlled by Powertrain Control Module (PCM) or Transmission Control Module (TCM). The transmission uses 2 speed sensors instead of a governor.

LUBRICATION

See appropriate TRANSMISSION SERVICING article.

ADJUSTMENTS

See appropriate TRANSMISSION SERVICING article.

ON-VEHICLE SERVICE

The following components can be serviced without removing transmission from vehicle.

- Converter-To-Flexplate Bolts
- Filler Pipe
- Front Servo
- Rear Servo
- Rear Extension Housing
- Shift Control Cable
- Solenoids
- Speedometer Driven Gear & Seal
- Speed Sensors
- Transmission Filter
- Transmission Pan
- Valve Body
- Wiring Harness
- 3-4 Accumulator Assemblies

VALVE BODY

See **OIL PUMP & VALVE BODY** under TRANSMISSION DISASSEMBLY.

OIL COOLER FLUSHING

1. If available, fill line flusher with solution and install Oil Cooler and Line Flusher (J-35944) to top transaxle cooler line on transaxle. Follow manufacturer's instructions to flush oil cooler and cooler lines.
2. If flusher tool is not available, flush cooler and cooler lines with a mixture of clean solvent and water. Flush cooler in both directions until all old fluid and debris are removed. If necessary, replace plugged or damaged cooler and/or lines.

TROUBLE SHOOTING

NOTE: For testing/diagnostic procedures of electronic components, see **GENERAL MOTORS HYDRA-MATIC 4L80-E DIAGNOSIS** article in the **AUTOMATIC TRANSMISSIONS** section.

NOTE: See **GENERAL MOTORS TORQUE CONVERTER CLUTCH DIAGNOSIS** article for information on diagnosing torque converter clutch.

QUICK CHECK

1. Check level and condition of transmission fluid. Check PCM or TCM memory for any stored trouble codes. See **GENERAL MOTORS 4L80-E ELECTRONIC CONTROLS** article. If no trouble codes are present, go to next step. If codes are present, diagnose and repair all computer-related trouble codes. Clear

PCM or TCM trouble code memory.

2. Perform road test. See **ROAD TEST** under TESTING. During road test, record shift points. If shift point timing or shifting is incorrect, go to **GENERAL MOTORS HYDRA-MATIC 4L80-E DIAGNOSIS** article in the AUTOMATIC TRANSMISSIONS section.
3. If shift(s) is too harsh or too soft, see **HYDRAULIC PRESSURE TESTS** under TESTING.
4. For specific complaints, see appropriate condition(s) listed under **SYMPTOM DIAGNOSIS**.

SYMPTOM DIAGNOSIS

NOTE: **Models with gasoline engines use Powertrain Control Module (PCM) computer. Models with Diesel engines use Transmission Control Module (TCM) computer. These computers control TCC, force motor (hydraulic pressure) and shifting solenoids "A" and "B".**

Oil Out Of Vent Or Foaming

Transmission overfilled. Oil contaminated with antifreeze or engine overheating. Filter not seated. Cross-channel leak causing pressurize in vent area of pump cover.

Transmission Overheats

Low fluid or blocked radiator. TCC stuck in apply or release. Broken TCC valve spring. Cross channel leakage in pump cover. Pressure regulator stuck in high demand. Blocked oil cooler. Problem with converter limit valve assembly. Loss of internal lubrication oil. Problem with stator(s) or turbine seals.

Reduced Internal Lubricant

Cross channel leakage in pump cover. Pressure regulator stuck in high demand. Damaged oil pump mounting gasket. Stuck closed converter limit valve assembly (under heavy load).

High Or Low Line Pressure

Incorrect oil level. Oil pump assembly seals or gears damaged. Pump drive shaft damaged. Pressure regulator valve spring damaged, pressure regulator valve nicked or scored. Pressure relief valve spring damaged. Pump cover leaking (bolts loose). Force motor off or on all the time. Loose connection at PCM or TCM. Possible trouble Code 73.

Loss Of Drive

1. Low oil level. Low oil pressure. Manual linkage misadjusted or disconnected. Damaged torque converter. Leaking or damaged transmission case seals or gaskets. Damaged oil pump drive shaft or pump assembly. Broken bearing, pinion or carrier. Roller clutch damaged or locked.
2. Piston or seal damaged in forward clutch assembly. Forward clutch assembly clutch plates burned, clutch plates missing, or check ball capsule leaking or missing. Burned reaction plate (due to lack of lubrication), broken snap ring or worn gear teeth.
3. Rear gear set assembly pinions, internal ring gear or sun gear damaged. Main shaft damaged. Parking

pawl spring broken. Turbine shaft ball not seating.

Forward Motion In "N"

Mispositioned or stuck manual valve. Problem with forward clutch assembly.

Engine Stall

Seized forward clutch, 4th clutch or overrun clutch assembly. TCC stuck on or dragging.

No Torque In Reverse & 3rd

Broken forward clutch hub, housing or snap ring.

Locked In Park

Damaged parking pawl binding, weak spring or stretched rod.

Vehicle Moves In Park

Manual linkage damaged or disconnected. Broken park pawl spring, park pawl or park pawl gear assembly. Park actuator spring damaged.

Slips In Reverse

Low oil pressure. Reverse servo seal damaged. Reverse reaction drum splines stripped.

No Reverse

Oil pressure low. Reverse servo not correctly assembled, piston or seal damaged, or wrong apply pin. Damaged rear band. Direct clutch assembly clutch plates burned, clutch plates missing, or check ball capsule leaking or missing.

Slips In "D"

Low fluid level. Low line pressure.

No 1st Gear In "D4"

Low roller assembly not attached or race broken. Broken center support race or splines. Damaged case near center support. Center support snap rings not seated.

No 1st Gear In "D2" Or "D3"

Low roller assembly not attached or race broken. Broken center support race or splines. Damaged case near center support. Center support snap rings not seated. Stuck front band.

No 1st Gear In "D1"

Low roller assembly not attached or race broken. Broken center support race or splines. Damaged case near center support. Center support snap rings not seated. Broken housing, or mispositioned or broken rear band anchor pin. Misaligned detent lever.

No 1-2 Shift (1st Gear Only) In "D4"

Output or input speed sensor(s) reads zero. Sun gear splines damaged or missing.

1st & 2nd Gear Only

Solenoid "B" stuck off or not connected to PCM or TCM. Dirt in filter, leaking "O" ring or no supply voltage to "A" solenoid. Stuck 2-3 shift valve. Possible trouble Code 68, 81, 85 or 87.

1st & 4th Gear Only (Manual 2nd & 3rd Only)

Solenoid "A" stuck off. Dirt in filter, PCM or TCM not grounded, leaking "O" ring, no supply voltage to solenoid "A" or wire disconnected. Stuck 1-2 shift valve. Possible trouble Code 68, 82 or 85.

Late 1-2 Shift

Problem with input and/or output speed sensor(s). Faulty digital ratio adapter (2WD only). Wrong PROM calibration. Possible trouble Code 24, 28 or 85.

No Overrun Braking In "D2"

Problem with overrun clutch or reaction sun gear assemblies. Possible trouble Code 28, 68 or 85. Problem with pressure switch to PCM-to-TCM signal.

No Engine Braking

Problem with rear band assembly. Damaged main or output shafts.

No 2nd Gear

Intermediate clutch feed cup plug missing. Problem with intermediate clutch and center support assembly. Damaged intermediate sprag. Broken direct clutch housing or snap ring.

2nd Gear Only

Possible trouble Code 24, 53, 75 and 81.

No Torque In 2nd

Worn or damaged intermediate sprag.

2nd Gear Starts

Seized intermediate clutch plates. Problem with direct clutch or center support assemblies. Stuck 1-2 shift valve.

PCM- or TCM-related problem. Possible trouble Code 82.

No 2nd Gear Braking In "D2"

Problem with direct clutch housing or front band assemblies.

No Engine Braking

Problem with rear gear set assembly. Damaged main or output shafts.

No Overrun Braking In "D2"

Problem with overrun clutch or reaction sun gear assemblies.

No 1st Gear In "D3"

Low roller assembly not attached or race broken. Broken center support race or splines. Damaged case near center support. Center support snap rings not seated. Applied front band.

No 2nd Gear In "D3"

Intermediate clutch feed cup plug missing. Problem with intermediate clutch and center support assembly. Damaged intermediate sprag. Broken direct clutch housing or snap ring.

No 3rd Gear In "D3"

Direct clutch feed cup plug missing. Problem with direct clutch and center support assembly. Broken direct clutch housing or snap ring. Solenoid "B" stuck off. Dirt in filter, PCM or TCM not grounded, leaking "O" ring, no supply voltage to solenoid "B" or wire disconnected. Stuck 2-3 shift valve. PCM or TCM problem. Possible trouble Code 81, 85 or 87.

Starts In 3rd Gear

Seized forward clutch or oil holes in driving hub plugged. Damaged or seized direct clutch assembly.

No Overrun Braking In "D2"

Problem with overrun clutch or reaction sun gear assemblies.

No Engine Braking In "D3"

Damaged main shaft or main shaft bushing.

2nd & 3rd Gear Only

Possible trouble Code 68, 82 or 85. Stuck 1-2 shift valve. Failed solenoid "A" (solenoid "A" off). Dirt in filter, PCM or TCM not grounded, leaking "O" ring, no supply voltage to solenoid "A" or wire disconnected.

No 4th Gear

Problem with 4th clutch or overrun clutch related assemblies. 2-3 shift valve stuck. Failed solenoid "B" (solenoid "B" off). Dirt in filter, PCM or TCM not grounded, leaking "O" ring, no supply voltage to solenoid "B" or wire disconnected. Possible trouble Code 21, 22, 28, 68, 75 or 81.

4th Gear Starts

Solenoid "B" stuck on. Dirt in filter, PCM or TCM signal wire grounded. Possible trouble Code 86.

NOTE: Digital ratio adapter receives signals from electronic speedometer and sends them to PCM/TCM.

Wrong Shift Points

Problem related to PCM or TCM signal inputs from TPS, speed sensors or pressure switch manifold. Faulty digital ratio adapter (2WD only). Possible trouble Code 21, 22, 24, 28 or 85. Wrong tire size, axle ratio or PROM.

Harsh Shifts

High or low line pressures. Force motor stuck off. Accumulator piston seals damaged or piston springs missing. Accumulator cover bolts improperly tightened or gaskets mispositioned. Missing check balls. Wrong PROM calibration. Possible trouble Code 21, 22, 24, 28, 53, 68, 73, 75, 81 or 85.

Harsh Shifts ("D" To "R")

Blocked direct lube exhaust. Forward clutch spring not working. Direct clutch snap ring broken or not seated. Plugged direct clutch check ball.

Harsh Shifts (3-4 Shift)

Binding 4th clutch spring assembly. Plugged air bleed hole. 4th clutch case bolt blocking oil feed hole.

Harsh Shifts (4-3 Shift)

4th clutch snap ring not seated. 4th clutch spring assembly not working. Plugged 4th clutch housing cup plug. 4th clutch case bolt blocking oil feed hole. Blocked direct lube exhaust port.

Harsh Shifts ("D4"-"D3" Or "D2" Or "D1")

Overrun clutch return spring assembly not working. Plugged overrun clutch housing check ball. Snap ring not seated.

Soft Shifts

Low line pressures. Force motor stuck on. Accumulator piston seals damaged or piston springs missing. Accumulator cover bolts improperly tightened or gaskets mispositioned. PCM or TCM failure. Wrong PROM calibration. Possible trouble Code 73.

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Soft Shift (Into "R")

Plugged direct clutch oil feed. Blocked direct lube exhaust port.

Soft Shift (R To "D")

Direct clutch spring not working, large snap ring not seated or plugged check ball.

Soft Shift (2-1)

Intermediate clutch spring assembly not working. Center support snap ring not seated. Center support air bleed blocked.

Soft Shift (2-3)

Plugged direct clutch oil feed. Blocked direct lube exhaust port.

Soft Shift (3-2)

Direct clutch spring not working, small snap ring not seated or plugged check ball.

Soft Shift ("D3" To "D2")

Missing check ball. Incorrect orifice sizes.

No "D2" To "D1" Shift

Broken or disconnected rear band. Incomplete travel of detent lever.

No "D3" To "D2" Shift

Broken or disconnected front band.

No Converter Clutch Apply

Verify proper PCM or TCM operation and vehicle wiring. Damaged wiring harness or pinched wires. Brake switch not working or misadjusted. Solenoid inoperative. Oil pump valve assembly converter clutch shift valve stuck. Converter clutch apply valve stuck. Leaked solenoid "O" ring or blocked screen. Inspect torque converter for external leaks at hub weld area, or unbalanced or contaminated fluid. Turbine shaft seals damaged. Oil pump drive shaft seal damaged. Converter clutch release exhaust orifice cup plug not seated or damaged. Possible trouble Code 21, 22, 28, 37, 39, 53, 75, 81 or 83.

Converter Clutch Does Not Release

PCM- or TCM-controlled TCC solenoid stuck on or does not exhaust. Control valve assembly converter clutch apply valve stuck in apply position. Faulty PCM or TCM. Possible trouble Code 83.

Converter TCC Apply Soft Or Slipping

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Leaking turbine shaft seals. Worn oil pump body bushing. Leaking oil hole transfer cup plug. Faulty TCC solenoid. Low fluid.

Converter Clutch Apply Time Wrong

Incorrect output speed sensor, engine speed or throttle position sensor signal. Faulty PCM or TCM. Faulty pressure switch or temperature sensor. Incorrect coolant or transmission temperature (Diesel engine) signal. Possible trouble Code 14, 15, 21, 22, 24, 28, 58, 59 or 68. Problem with digital ratio adapter (2WD only).

CLUTCH & BAND APPLICATION CHART

Selector Lever Position	Solenoid Position	Elements In Use
"D" (Overdrive)		
1st Gear	"A" ON/"B" OFF	(1) Overdrive Roller Clutch, Forward Clutch, (2) Intermediate Sprag Clutch & Low Roller Clutch
2nd Gear	"A" OFF/"B" OFF	(1) Overdrive Roller Clutch, Forward Clutch, (1) Intermediate Sprag Clutch, Intermediate Clutch & (3) Low Roller Clutch
3rd Gear	"A" OFF/"B" ON	(1) Overdrive Roller Clutch, Forward Clutch, Direct Clutch, (3) Intermediate Sprag Clutch, Intermediate Clutch & (3) Low Roller Clutch
Overdrive	"A" ON/"B" ON	4th Clutch, (3) Overdrive Roller Clutch, Forward Clutch, Direct Clutch, (3) Intermediate Sprag Clutch, Intermediate Clutch & (3) Low Roller Clutch
"D" (Manual 3rd)		
1st Gear	"A" ON/"B" OFF	Overrun Clutch, (1) Overdrive Roller Clutch, Forward Clutch, (2) Intermediate Sprag Clutch & (1) Low Roller Clutch
2nd Gear	"A" OFF/"B" OFF	Overrun Clutch, (1) Overdrive Roller Clutch, Forward Clutch, (1) Intermediate Sprag Clutch, Intermediate Clutch & (3) Low Roller Clutch
3rd Gear	"A" ON/"B" OFF	Overrun Clutch, (1) Overdrive Roller Clutch, Forward Clutch,

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		Direct Clutch, ⁽³⁾ Intermediate Sprag Clutch, Intermediate Clutch & ⁽³⁾ Low Roller Clutch
"2" (Manual 2nd)		
1st Gear	"A" ON/"B" OFF	Overrun Clutch, ⁽¹⁾ Overdrive Roller Clutch, Forward Clutch, ⁽²⁾ Intermediate Sprag Clutch & ⁽¹⁾ Low Roller Clutch
2nd Gear	"A" OFF/"B" OFF	Overrun Clutch, ⁽¹⁾ Overdrive Roller Clutch, Forward Clutch, Front Band, ⁽³⁾ Intermediate Sprag Clutch, Intermediate Clutch & ⁽³⁾ Low Roller Clutch
"1" (Manual Low)		
1st Gear	"A" ON/"B" OFF	Overrun Clutch, ⁽¹⁾ Overdrive Roller Clutch, Forward Clutch, ⁽²⁾ Intermediate Sprag Clutch, ⁽¹⁾ Low Roller Clutch & Rear Band
2nd Gear	"A" OFF/"B" OFF	Overrun Clutch, ⁽¹⁾ Overdrive Roller Clutch, Forward Clutch, Front Band, ⁽³⁾ Intermediate Sprag Clutch, Intermediate Clutch & ⁽³⁾ Low Roller Clutch
"R" (Reverse)	"A" ON/"B" OFF	⁽¹⁾ Overdrive Roller Clutch, Direct Clutch & Rear Band
"N" (Neutral)	"A" ON/"B" OFF	⁽¹⁾ Overdrive Roller Clutch; All Other Clutches & Bands Released Or Ineffective
"P" (Park)	"A" ON/"B" OFF	⁽¹⁾ Overdrive Roller Clutch; All Other Clutches & Bands Released Or Ineffective
<p>(1) Holding.</p> <p>(2) Applied but not effective.</p> <p>(3) Overrunning.</p>		

ELECTRONIC SELF-DIAGNOSTICS

NOTE: Models with gasoline engines use Powertrain Control Module (PCM) computer. Models with Diesel engines use Transmission Control Module (TCM) computer. These computers control hydraulic line pressure, shift solenoids "A" and "B",

and TCC.

NOTE: For testing/diagnostic procedures of electronic components, see **GENERAL MOTORS HYDRA-MATIC 4L80-E DIAGNOSIS** article in the **AUTOMATIC TRANSMISSIONS** section.

TESTING

ROAD TEST

NOTE: Before road testing vehicle, engine and transmission must be at operating temperature. Torque converter clutch will not engage if engine coolant has not reached operating temperature.

Gear Selector Position "D" (Overdrive)

1. With gear selector in "D" (overdrive) position, steadily increase throttle pressure to accelerate vehicle. Note shift speed engagement points in 2nd gear, 3rd gear and overdrive gear. Use chart as a reference for proper shift speeds. See **Fig. 2** and **Fig. 4** . Also note when Torque Converter Clutch (TCC) engages while in 3rd gear or overdrive.

NOTE: Ensure TCC engages in 3rd gear or overdrive during the following steps. Transmission has PWM solenoid, which may make TCC engagement point hard to detect. If necessary, a Tech 1 scan tool may be used to indicate TCC and shift solenoid operation.

2. At vehicle speeds of 40-50 MPH, quickly depress accelerator to half open position (part throttle detent downshift). TCC should release, solenoid "A" turns off, and transaxle should immediately downshift to 3rd gear.
3. At vehicle speeds of 40-50 MPH, quickly depress accelerator to wide open position (full throttle detent downshift). TCC should release, solenoids "A" and "B" turn off, and transaxle should immediately downshift to 2nd gear.
4. At vehicle speeds of 40-55 MPH, release accelerator pedal while moving gear selector to the "3" (3rd gear) position. TCC should release, transaxle should downshift to 3rd gear, and engine braking should slow vehicle.
5. Move gear selector to the "D" (overdrive) position, and accelerate to 40-45 MPH. Release accelerator pedal while moving gear selector to the "2" (2nd gear) position. TCC should release, transaxle should downshift to 2nd gear immediately, and engine braking should slow vehicle.
6. Move gear selector to the "D" (overdrive) position, and accelerate to 30 MPH. Release accelerator pedal while moving gear selector to the "1" (1st gear) position. TCC should release, transaxle should downshift to 1st gear, and engine braking should slow vehicle.

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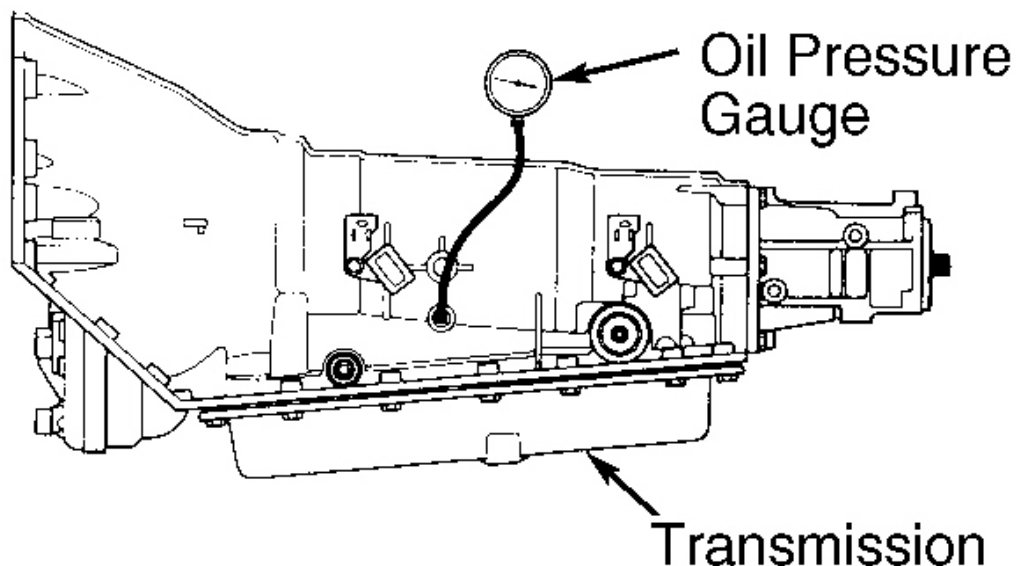
MODEL	BODY	TPS	1-2 SHIFT +/- 150 RPM					2-3 SHIFT +/- 200 RPM					3-4 SHIFT +/- 250 RPM					4-5 ±100 RPM	3-2 ±100 RPM	2-1 ±100 RPM
			10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0 - 10	0 - 10	0 - 10
ABP	P	TRANS RPM	536	682	779	974	1120	974	1218	1461	1705	1948	1705	1754	1948	2094	2289	1461	730	341
ACP, ADP	C, K	TRANS RPM	536	682	779	974	1120	974	1218	1364	1753	1948	1705	1754	1899	2240	2630	1461	730	341
BAP, BBP, BJP, BNP	C, K	TRANS RPM	512	698	837	930	1023	930	1302	1535	1674	1814	1442	1721	1953	2139	2511	1302	744	350
BAP, BBP, BJP	R, V, G, P	TRANS RPM	485	558	651	791	884	884	1070	1302	1442	1628	1442	1674	1907	2139	2372	1302	744	419
CAP, CBP, CKP	C, K, R, V, G, P	TRANS RPM	438	438	536	682	828	828	828	974	1218	1510	1266	1266	1412	1802	2192	1120	755	341
DBP, DCP, DDP, DFP, DKP, DLP, DRP	C, K, R, V, G, P	TRANS RPM	466	652	885	979	1072	979	1351	1584	1771	1957	1584	1911	2237	2470	2749	1305	652	419
DNP, DPP	P	TRANS RPM	559	699	885	979	1072	1025	1398	1584	1771	1911	1684	1957	2190	2470	2656	1305	652	419

NOTES:

1. All Speeds Given Are In Transmission Output Shaft RPM.
2. Speeds Are Based On Percent Of Throttle Position Sensor Opening.
3. Use a TECH 1 Or Other SCAN Tool To Monitor This Data.

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Fig. 2: Hydra-Matic 4L80-E Shift Speed Chart (1991)
Courtesy of GENERAL MOTORS CORP.



G92B13814

Fig. 3: Checking Line Pressure**Courtesy of GENERAL MOTORS CORP.**

7. With gear selector in the "D" (overdrive) position, accelerate vehicle to overdrive gear with TCC applied. Release accelerator pedal, and lightly apply brakes. The TCC should release. Note speeds at which vehicle downshifts. See **Fig. 2** or **Fig. 4**.

Gear Selector Position "3" (3rd Gear)

With vehicle stopped, move gear selector to the "3" (3rd gear) position. Steadily increase throttle pressure to accelerate vehicle. Note speeds at which vehicle shifts into 2nd and 3rd gears. See **Fig. 2** or **Fig. 4**. Ensure TCC engages while in 3rd gear.

Gear Selector Position "2" (2nd Gear)

With vehicle stopped, move gear selector to the "2" (2nd gear) position. Accelerate vehicle, and note speed at which vehicle shifts from 1st gear to 2nd gear. Accelerate vehicle to 35 MPH. Transaxle should not shift into 3rd gear, and TCC should not engage.

Gear Selector Position "1" (1st Gear)

With vehicle stopped, move gear selector to the "1" (1st gear) position. Accelerate vehicle to 20 MPH. Transaxle should not upshift, and TCC should not engage.

HYDRAULIC PRESSURE TESTS

CAUTION: Parking and service brakes must be applied throughout hydraulic pressure test. Factory recommends using TECH 1 scan tool to test line pressure. Total time for testing should not exceed 2 minutes.

1. Before performing hydraulic pressure tests, check fluid level and condition. Check manual control linkages for correct adjustment. See appropriate TRANSMISSION SERVICING article. Ensure engine is properly tuned.
2. Connect a tachometer to engine and an oil pressure gauge to line pressure test port. See **Fig. 3**. Compare line pressure to force motor current draw. See **FORCE MOTOR VS. LINE PRESSURE**.

NOTE: Hydraulic pressure is controlled by pump output and regulated by computer-controlled force motor. Line pressure is boosted (pressure is doubled) by force motor in the "R" selector position.

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4.3L ENGINES			1-2 SHIFT +/-150 RPM					2-3 SHIFT +/-200 RPM					3-4 SHIFT +/-250 RPM					4-3 +/-100 RPM	3-2 +/-100 RPM	2-1 +/-100 RPM
MODEL	BODY	TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
ABP	P	TRAN RPM	580	672	769	950	1096	974	1159	1432	1739	1948	1705	1729	1924	2118	2313	1461	609	292
ABP, ACP	C, K	TRAN RPM	580	672	769	950	1096	1032	1242	1432	1739	1948	1705	1729	1924	2318	2630	1461	609	390
AFP, AJP	G	TRAN RPM	580	672	769	950	1096	974	1159	1432	1739	1948	2143	2143	2143	2289	2435	1705	609	438

5.7L ENGINES			1-2 SHIFT +/-150 RPM					2-3 SHIFT +/-200 RPM					3-4 SHIFT +/-250 RPM					4-3 +/-100 RPM	3-2 +/-100 RPM	2-1 +/-100 RPM
MODEL	BODY	TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
BAP, BJP, MKP	C, K	TRAN RPM	521	674	842	925	1023	939	1269	1511	1674	1814	1442	1693	2027	2288	2511	1302	744	419
BAP, BMP, BNP, MBP, MKP	G, P	TRAN RPM	465	577	618	800	884	884	1070	1274	1442	1628	1442	1632	1874	2148	2372	1302	744	395

6.2L ENGINES			1-2 SHIFT +/-150 RPM					2-3 SHIFT +/-200 RPM					3-4 SHIFT +/-250 RPM					4-3 +/-100 RPM	3-2 +/-100 RPM	2-1 +/-100 RPM
MODEL	BODY	TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
BAP, BJP, BMP, MBP, MKP	C, G, K, P	TRAN RPM	438	438	497	648	828	852	852	930	1213	1510	1266	1266	1403	1753	2167	1120	755	341

6.5L ENGINES			1-2 SHIFT +/-150 RPM					2-3 SHIFT +/-200 RPM					3-4 SHIFT +/-250 RPM					4-3 +/-100 RPM	3-2 +/-100 RPM	2-1 +/-100 RPM
MODEL	BODY	TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
LAP, LFP, LLP, LRP	C, K	TRAN RPM	487	487	506	648	828	852	852	930	1213	1510	1266	1266	1403	1753	2167	1120	755	438

7.4L ENGINES			1-2 SHIFT +/-150 RPM					2-3 SHIFT +/-200 RPM					3-4 SHIFT +/-250 RPM					4-3 +/-100 RPM	3-2 +/-100 RPM	2-1 +/-100 RPM
MODEL	BODY	TPS	10	20	30	40	50	10	20	30	40	50	10	20	30	40	50	0-10	0-10	0-10
DCP, DLP, DRP, TSP, TWP	C, G, K, P<12K	TRAN RPM	484	651	865	995	1070	990	1335	1576	1790	1930	1600	1897	2213	2497	2744	1302	651	419
DNP, DPP	P>12K	TRAN RPM	553	660	865	995	1070	1083	1311	1590	1776	1907	1600	1897	2158	2427	2674	1302	651	419
HTP	C 5.6K	TRAN RPM	520	737	980	1212	1288	1000	1470	1894	2212	2348	1510	2081	2565	3040	3409	1313	732	404

NOTES:

1. All Speeds Given Are In Transmission Output Shaft RPM.
2. Speeds Are Based On Percent Of Throttle Position Sensor Opening.
3. Use a TECH 1 Or Other SCAN Tool To Monitor This Data.

92A13813

Fig. 4: Hydra-Matic 4L80-E Shift Speed Chart (1992)
Courtesy of GENERAL MOTORS CORP.

Line Pressure Check

Start engine, and access OVERRIDE FORCE MOTOR on Tech 1 scan tool. Increase force motor current in .1-amp increments. Record line pressure readings and compare to specifications. See FORCE MOTOR VS. LINE PRESSURE table. If pressure recorded is incorrect, see **HIGH OR LOW LINE PRESSURE** under SYMPTOM DIAGNOSIS.

FORCE MOTOR VS. LINE PRESSURE

Force Motor: Applied Current (Amps)	Line Pressure: psi (kPa)
0.02	157-177 (1082-1220)
0.10	151-176 (1040-1213)
0.20	140-172 (965-1186)
0.30	137-162 (944-1117)
0.40	121-147 (834-1013)
0.50	102-131 (703-903)
0.60	88-113 (606-780)
0.70	63-93 (434-640)
0.80	43-73 (296-503)
0.90	37-61 (255-420)
0.98	35-55 (241-380)

REMOVAL & INSTALLATION

See appropriate REMOVAL & INSTALLATION article.

TORQUE CONVERTER

NOTE: See **GM TORQUE CONVERTER CLUTCH DIAGNOSIS** article.

TORQUE CONVERTER INSPECTION

Torque converter must be replaced for any of the following reasons:

- Damage To Pump Assembly
- Metal Particles Present In Oil
- Leaks In Hub Weld Area
- Crankshaft Pilot Broken Or Damaged
- Hub Scored Or Damaged
- Stator Failure
- Torque Converter Imbalance
- Engine Coolant Contamination
- Excessive End Play

TORQUE CONVERTER END PLAY CHECK

Mount Torque Converter End Play Fixture (J-35138) and Dial Gauge (J-8001) on stand to check end play. End play should be 0-.024" (0-0.60 mm). See **Fig. 5**.

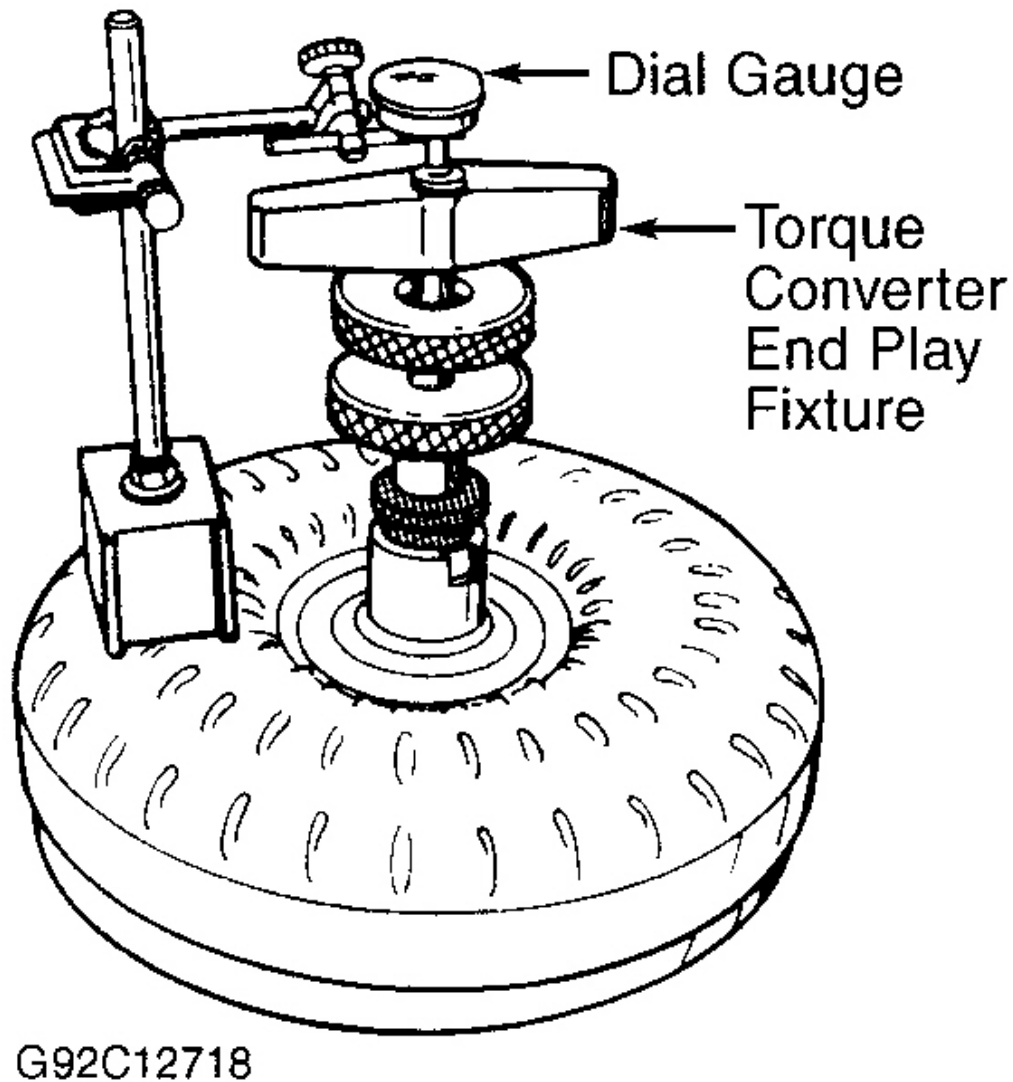


Fig. 5: Measuring Torque Converter End Play
Courtesy of GENERAL MOTORS CORP.

TRANSMISSION DISASSEMBLY

SPEED SENSORS/REAR HOUSING

Thoroughly clean transaxle exterior. Drain fluid, and remove torque converter. Place transaxle in holding fixture. Remove rear extension housing. Remove speed sensors.

LOWER TRANSMISSION ASSEMBLY

Remove oil pan and oil filter. Remove accumulator assembly. See **Fig. 45**. Remove valve body assembly. See **Fig. 46**. Remove check balls from case. See **Fig. 59**. Remove wiring harness. See **Fig. 61**. Remove parking pawl and manual linkage. See **Fig. 6**.

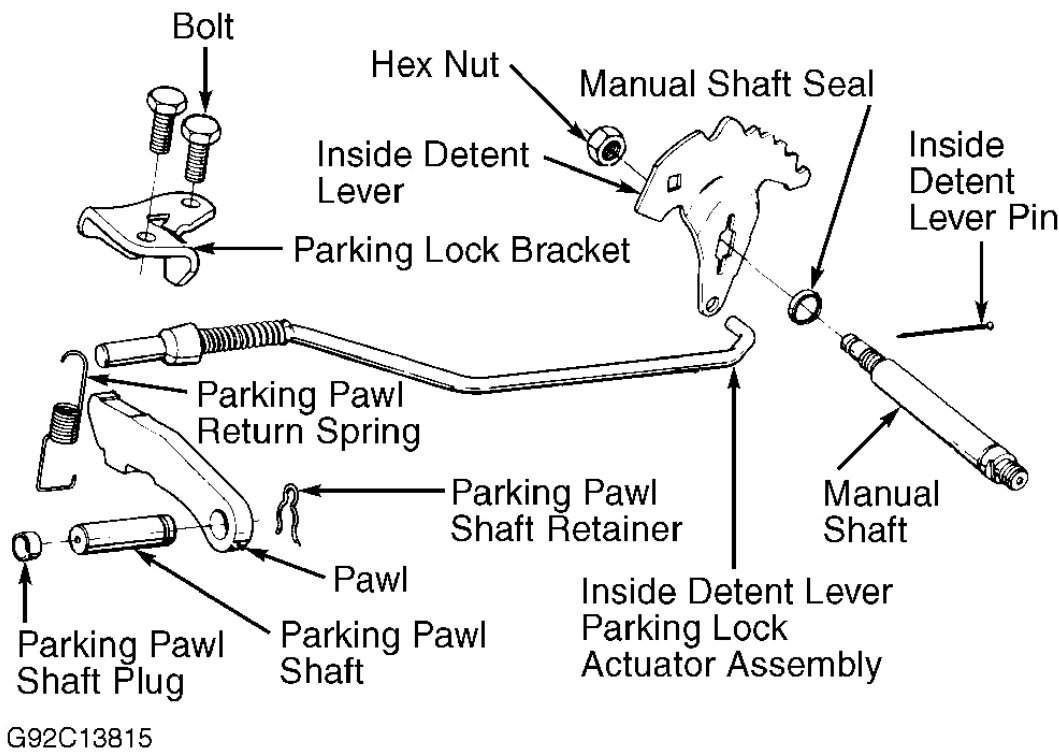


Fig. 6: Exploded View of Manual Linkage
Courtesy of GENERAL MOTORS CORP.

SERVO ASSEMBLIES

Remove servo covers and assemblies. See **Fig. 44** and **Fig. 58**.

Rear Band Apply Pin Selection

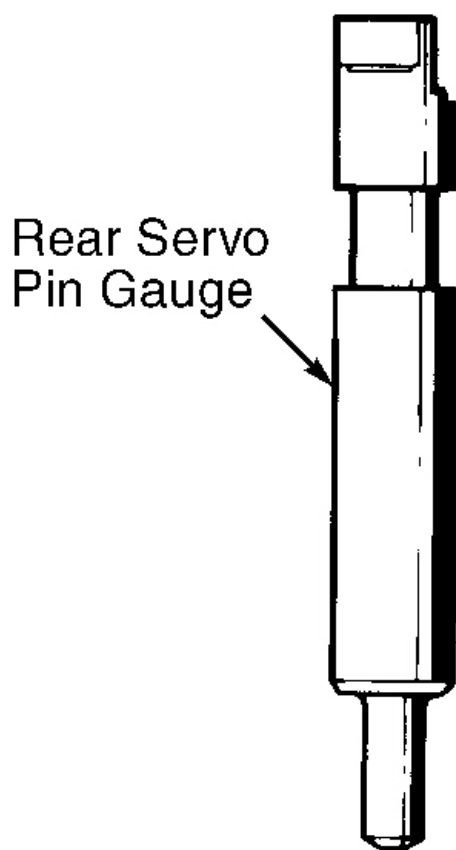
1. Install Band Apply Selector Pin (J-21370-10) into servo bore. See **Fig. 7**. Mount Band Apply Pin Selector Gauge (J-38737) and selector pin on transmission. See **Fig. 8**. Apply 25 ft. lbs. (34 N.m) of torque to hex

nut on gauge.

2. Note which step on selector pin lines up with top edge of apply pin gauge; use this information to determine pin length. See **Fig. 7** and **Fig. 9**. Record length for reassembly. Pins are available in various lengths. See **Fig. 9**.



TOP VIEW



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Fig. 7: Identifying Band Apply Pin Gauge
Courtesy of GENERAL MOTORS CORP.

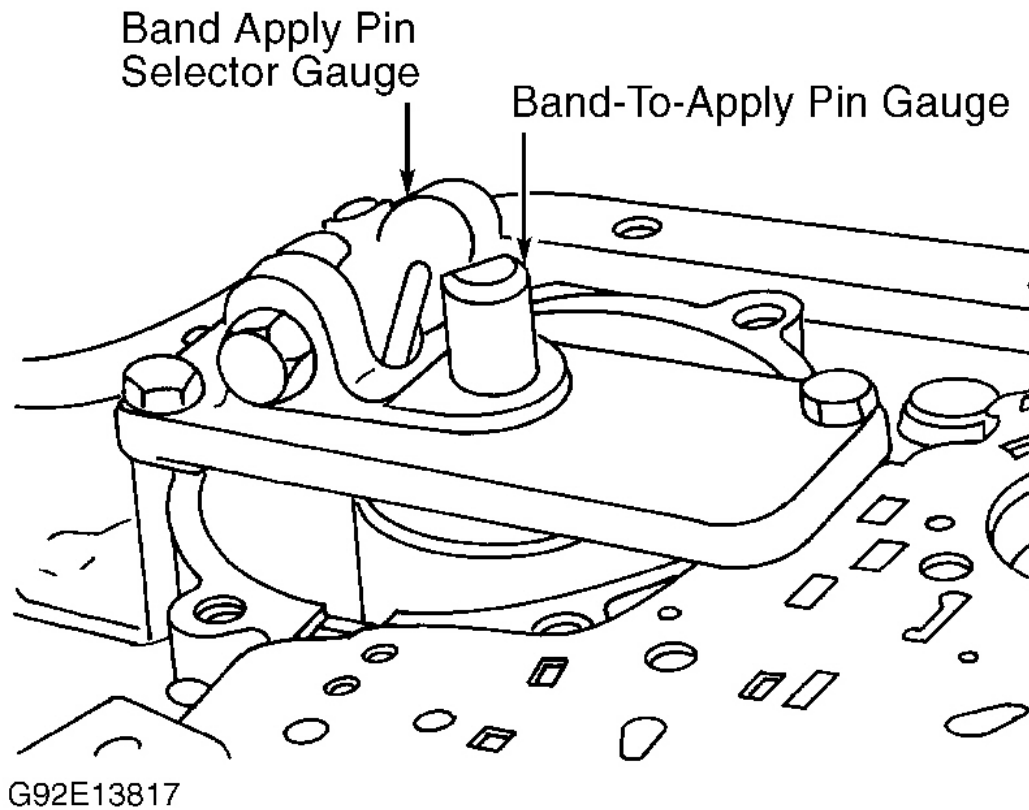


Fig. 8: Checking Band Apply Pin Length
Courtesy of GENERAL MOTORS CORP.

	7	PIN LENGTH	PIN IDENTIFICATION
		3.468-3.474" (88.08-88.23 mm)	
	6	3.440-3.446" (87.37-87.52 mm)	
	5	3.412-3.418" (86.66-86.81 mm)	
	4	3.384-3.390" (85.95-86.10 mm)	
	3	3.356-3.362" (85.24-85.39 mm)	
	2	3.328-3.334" (84.53-84.68 mm)	
	1	3.300-3.306" (83.82-83.97 mm)	

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Fig. 9: Band Apply Selection Chart

Courtesy of GENERAL MOTORS CORP.

END PLAY CHECKS

Using Dial Indicator (J-8001), check front and rear unit end play. See **Fig. 10** and **Fig. 11**. Front unit end play should be .004-.022" (.10-.56 mm). Rear unit end play should be .005-.025" (.13-.63 mm). Record measurements for reassembly.

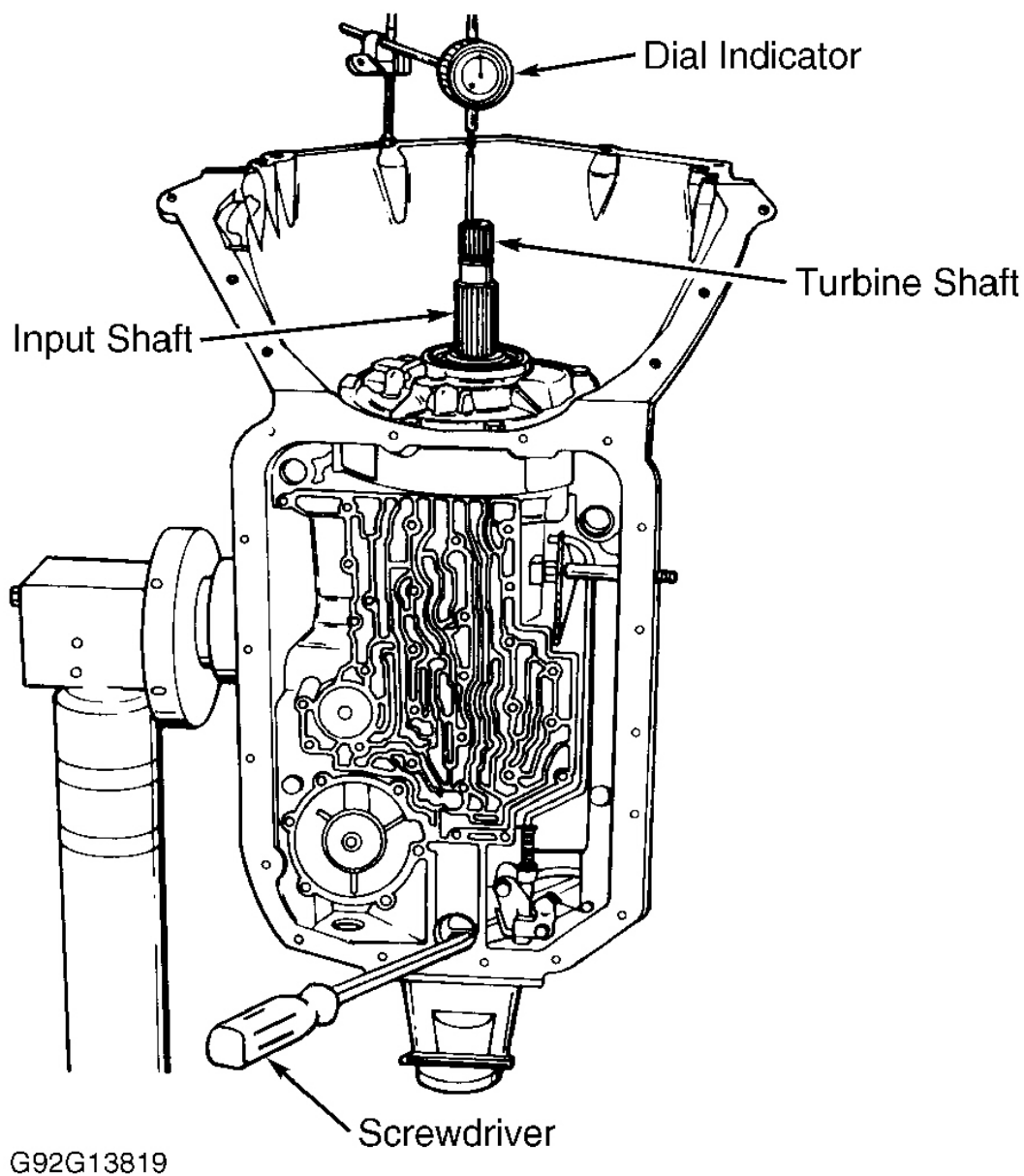


Fig. 10: Checking Front Unit End Play
Courtesy of GENERAL MOTORS CORP.

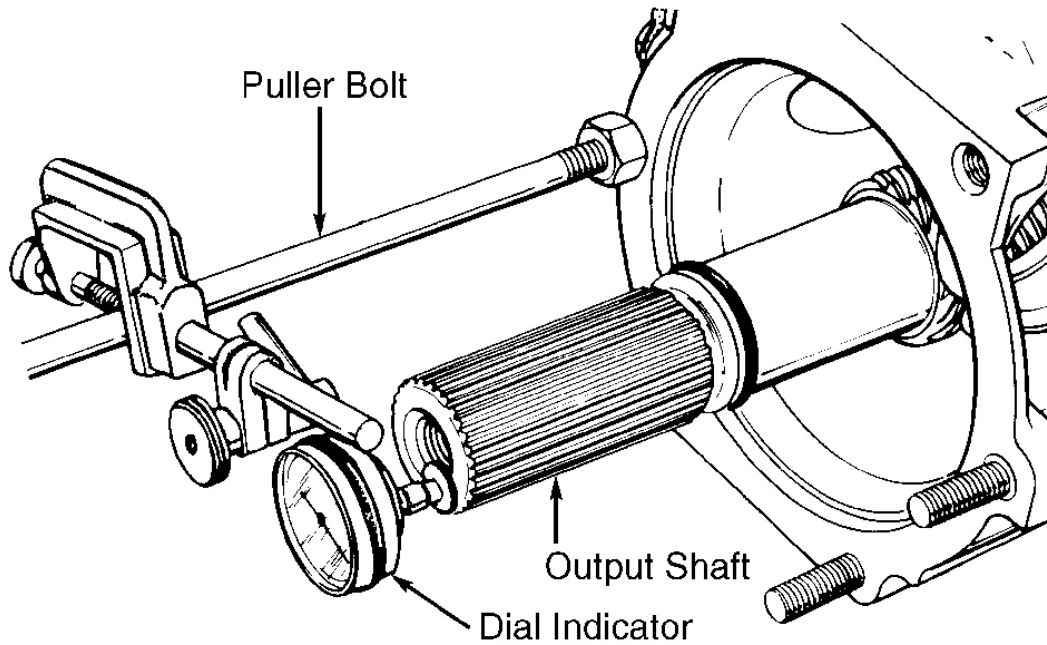


Fig. 11: Checking Rear Unit End Play
Courtesy of GENERAL MOTORS CORP.

OIL PUMP & VALVE BODY

Remove oil pump assembly cover bolts. Remove oil pump assembly, gasket and shims. See [Fig. 57](#). Remove valve body assembly. See [Fig. 46](#).

OVERDRIVE ASSEMBLY & 4TH CLUTCH

Remove turbine shaft and overdrive assembly. See [Fig. 33](#). Using 40T Torx wrench, remove 4th clutch support bolt and discard. See [Fig. 49](#). Remove 4th clutch snap ring and assembly. See [Fig. 55](#).

FORWARD & DIRECT CLUTCH

Using Clutch Remover (J-38358-A), remove forward clutch assembly. See [Fig. 52](#). Using Clutch Remover (J-38733), remove direct clutch assembly. See [Fig. 51](#).

INTERMEDIATE CLUTCH

Remove snap ring. Remove intermediate clutch plates and front band. See [Fig. 50](#).

CENTER SUPPORT & REAR GEAR UNIT

1. Remove center support bolt and discard. See **Fig. 49**. Using Gear Assembly Remover/Installer (J-38868), Adapter (J-21364-A) and Slide Hammer Handle (J-6125-B), remove gear assembly. See **Fig. 48**.
2. Remove rear case snap ring. See **Fig. 12**. Remove rear band and thrust washer. If necessary, select proper selective thrust washer based on end play measurements. See **END PLAY CHECKS** under TRANSMISSION DISASSEMBLY. Set thrust washer aside for reassembly.

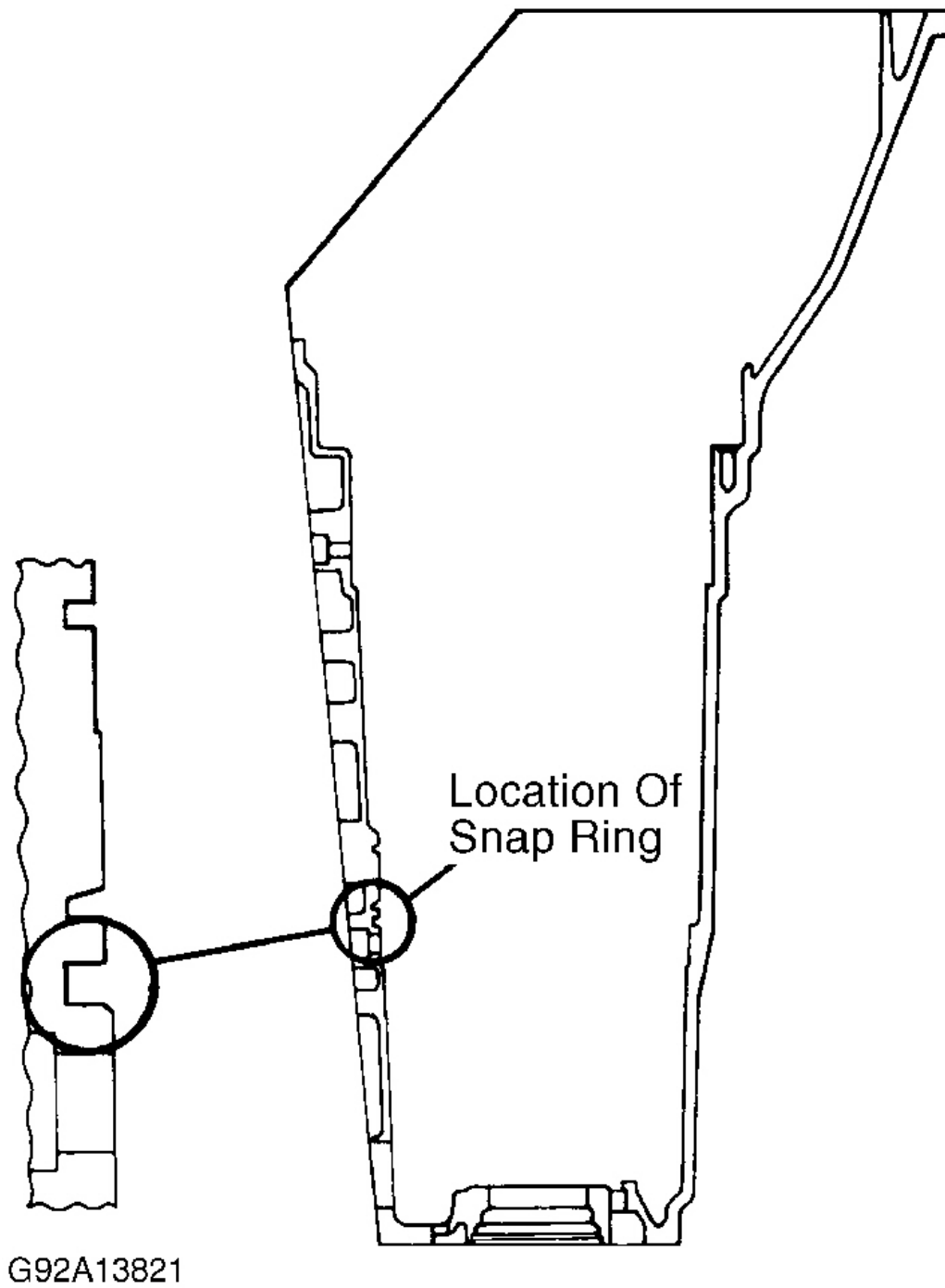


Fig. 12: Locating Rear Case Snap Ring
Courtesy of GENERAL MOTORS CORP.

COMPONENT DISASSEMBLY & REASSEMBLY

TRANSMISSION CASE

Cleaning & Inspection

Thoroughly clean transaxle case with solvent and then air dry. Inspect transaxle case for damage to band lugs, snap ring grooves, drive sprocket bearings, interconnected or damaged oil passages and servo bores. Inspect case for stripped threads in bolt holes or casting porosity. Repair or replace case if necessary.

FRONT & REAR BANDS

Inspection

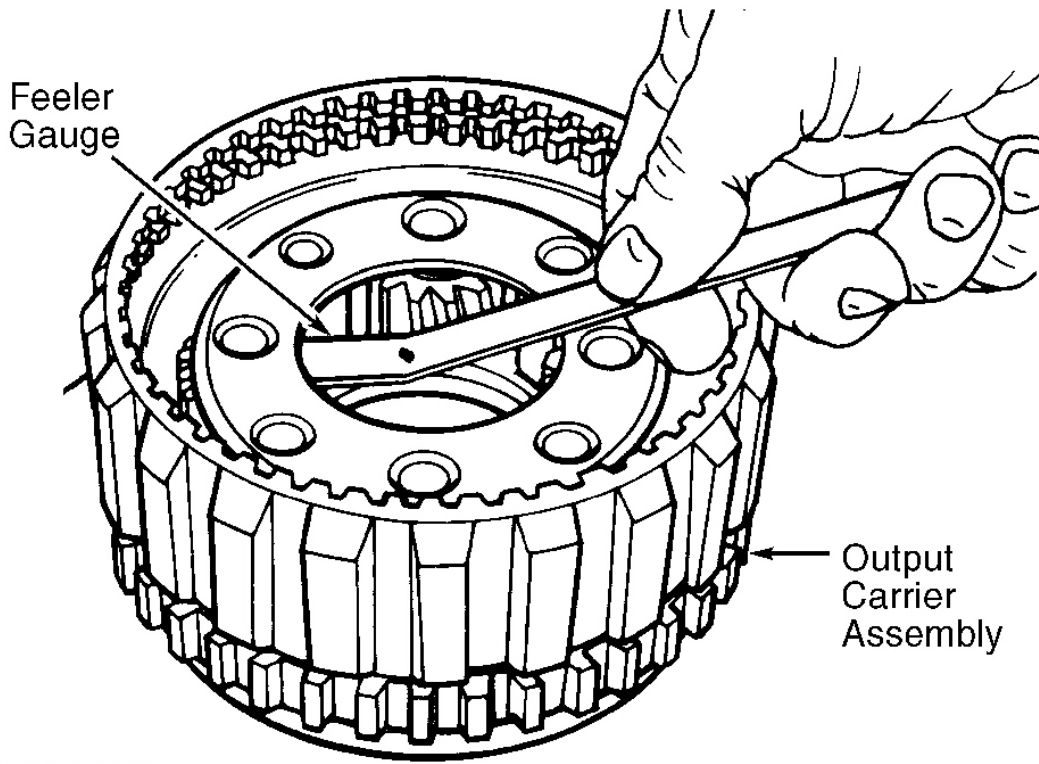
DO NOT wash bands in solvent. Inspect each band assembly for heat damage, lining cracks and separation. Check band stop for damage and replace if necessary. If rear band is replaced, recheck apply pin. See **SERVO ASSEMBLIES** under TRANSMISSION DISASSEMBLY.

CENTER SUPPORT & REAR GEAR UNIT

Disassembly

Remove snap rings. Separate center support, output carrier, reaction carrier and parts of rear gear unit. See **Fig. 14**.

Using Clutch Compressor (J-23327) and Adapter (J-38734), compress intermediate clutch springs, and remove snap ring. Separate center support from intermediate clutch assembly. See **Fig. 16**.



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Fig. 13: Checking Pinion Clearance of Output Carrier
Courtesy of GENERAL MOTORS CORP.

Cleaning & Inspection

1. Inspect output carrier, reaction carrier and reaction drum for damaged teeth, scoring or warpage. Check thrust bearing for damage. Using a feeler gauge, check output carrier and reaction carrier pinion gear end play. See [Fig. 13](#) and [Fig. 15](#).
2. End play should be .009-.024" (.23-.61 mm). Check for damage to reaction carrier internal gear. Ensure center support cup plug bleed hole opening is about .020" (.51 mm). See [Fig. 17](#).

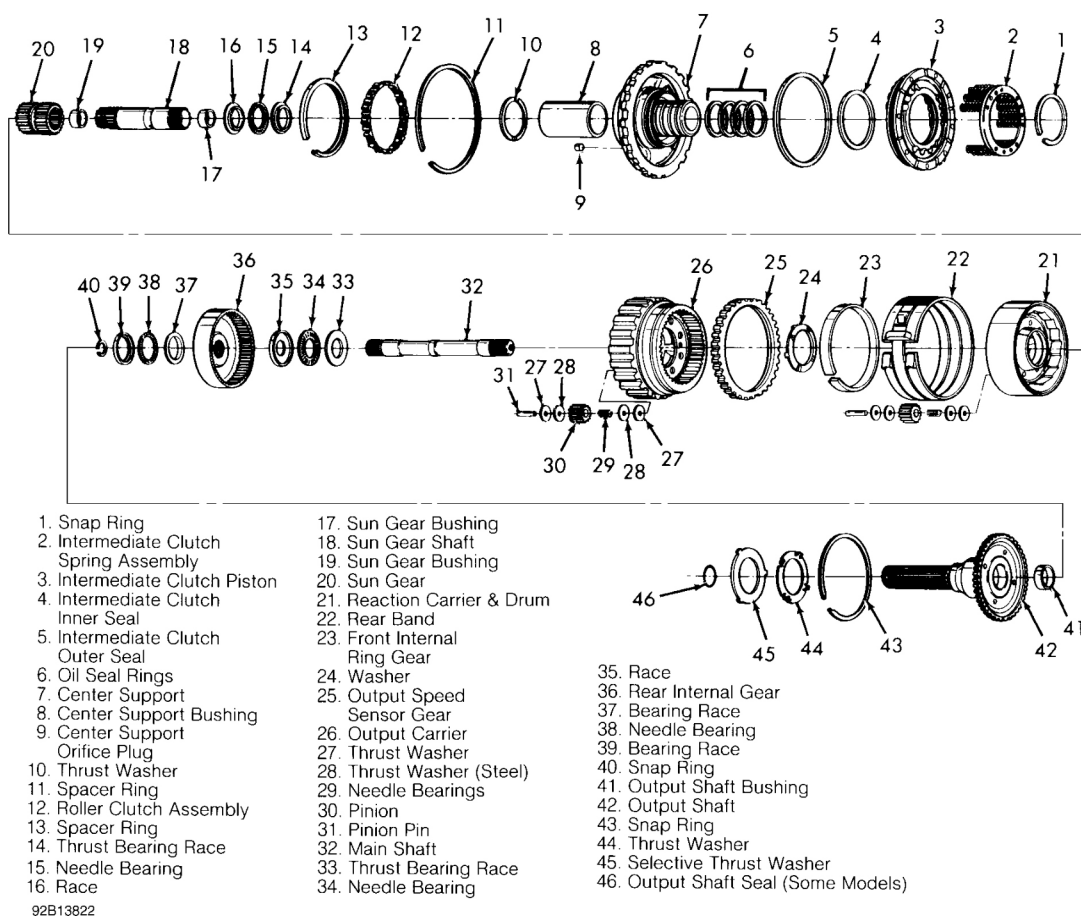
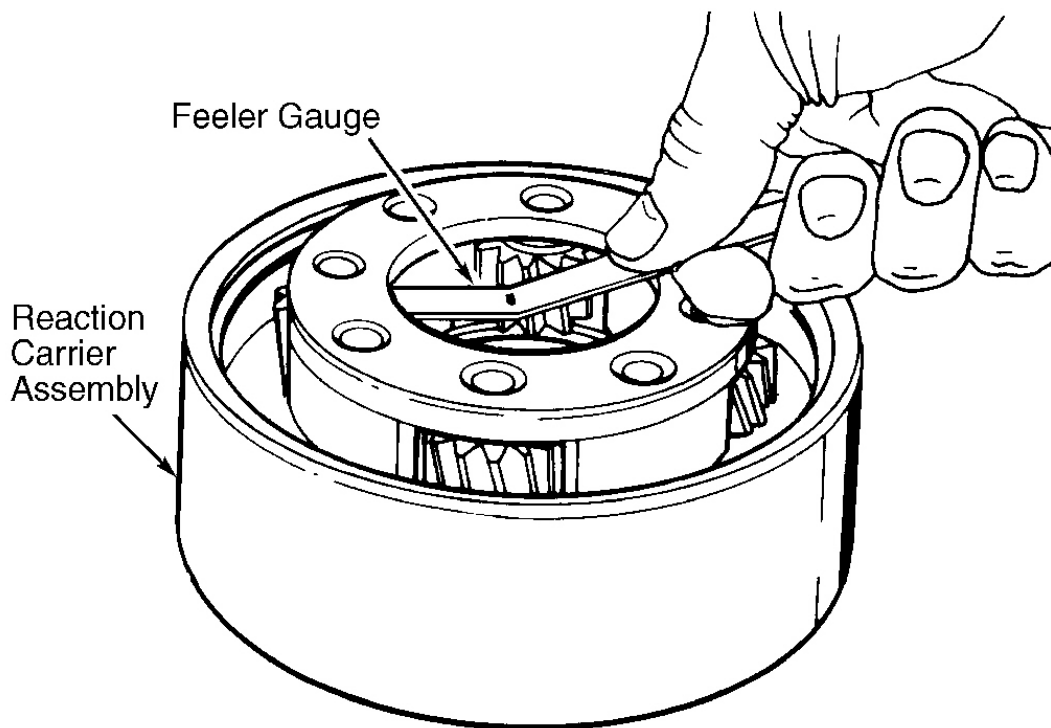
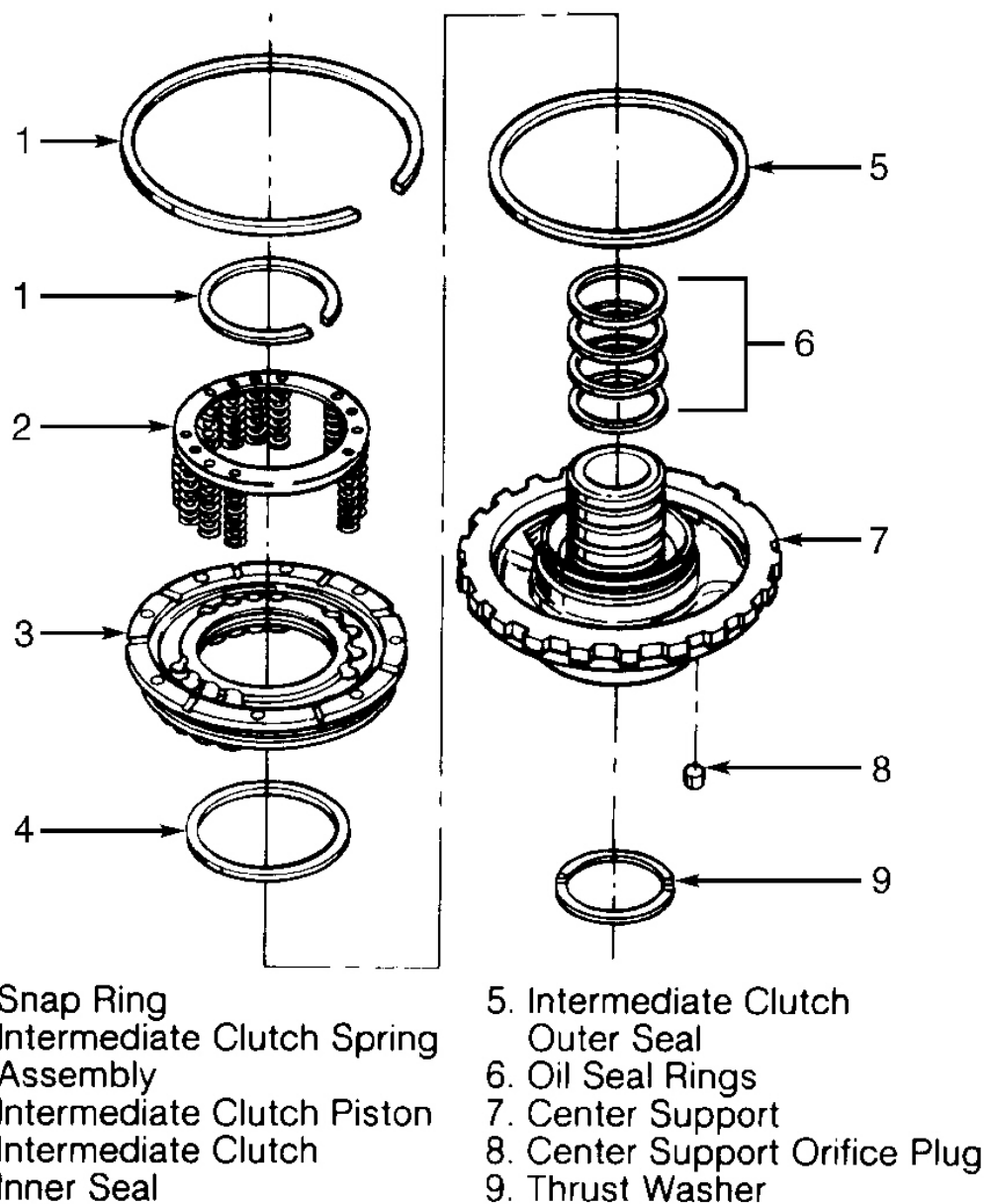


Fig. 14: Exploded View of Center Support & Rear Gear Unit
Courtesy of GENERAL MOTORS CORP.



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Fig. 15: Checking Pinion Clearance of Reaction Carrier
Courtesy of GENERAL MOTORS CORP.



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Fig. 16: Exploded View of Intermediate Clutch & Piston
Courtesy of GENERAL MOTORS CORP.

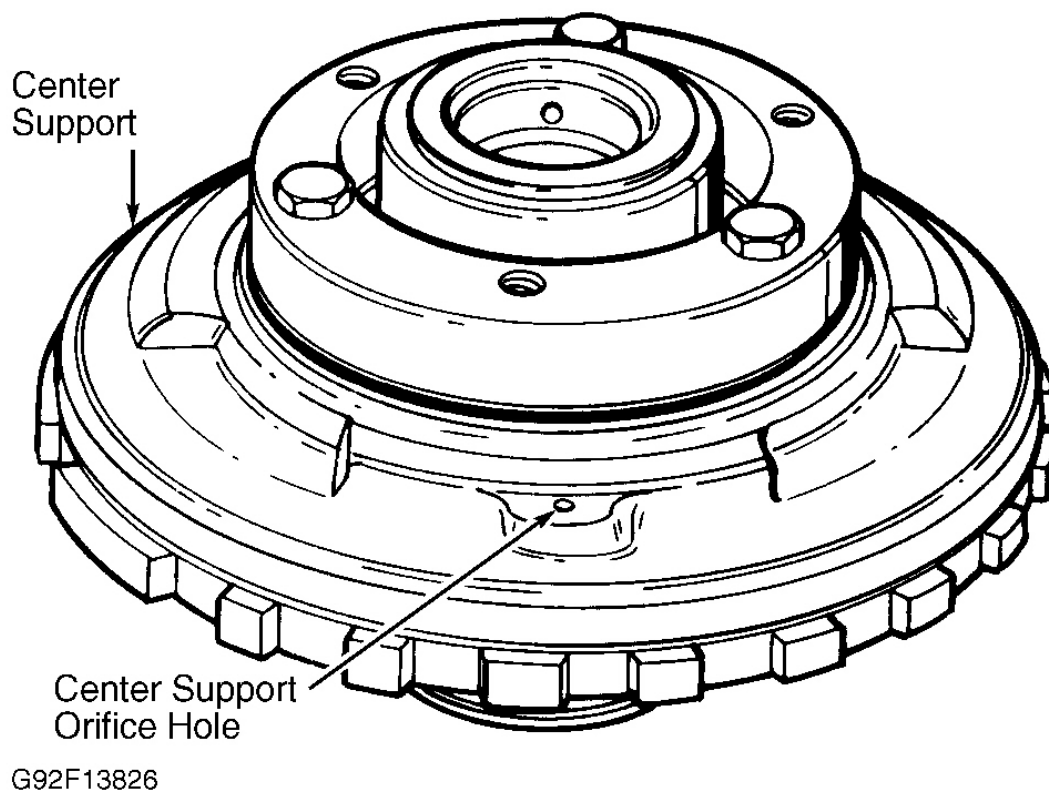
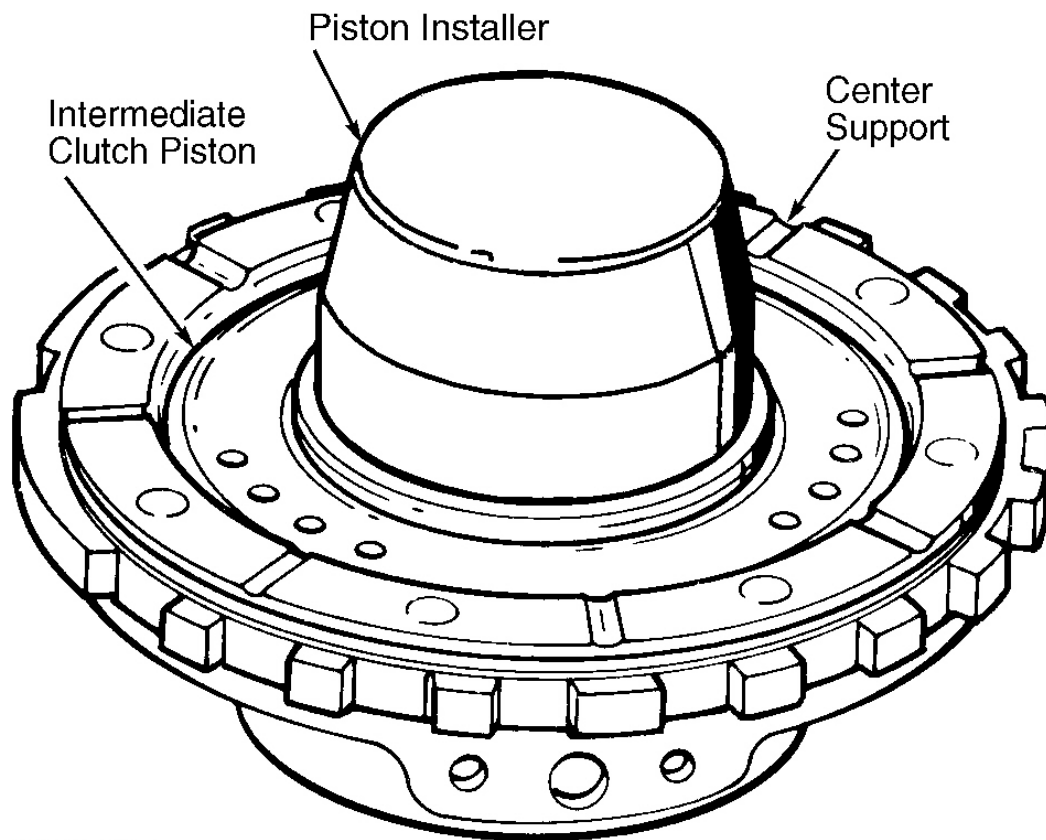


Fig. 17: Checking Center Support Cup Plug Bleed Hole
Courtesy of GENERAL MOTORS CORP.

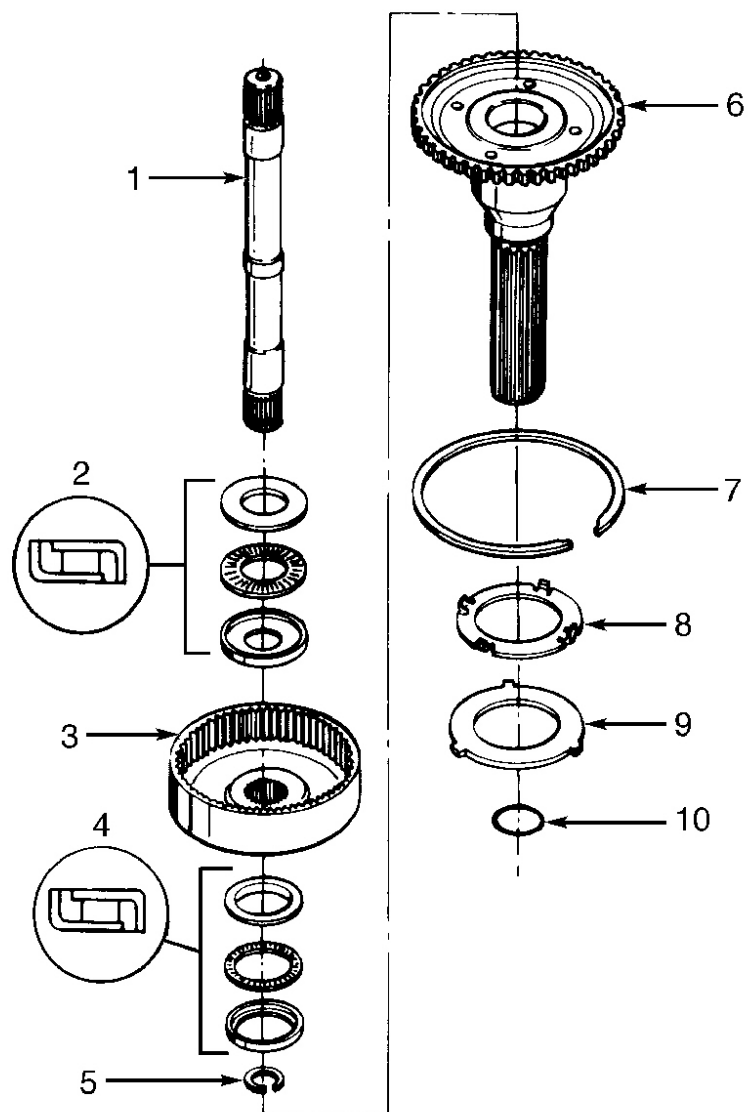
Reassembly

Using Piston Installer (J-21362), install intermediate piston to center support. See **Fig. 18**. Reassemble center support and rear gear unit. See **Fig. 19-Fig. 22**. Install new oil seal rings to center support.



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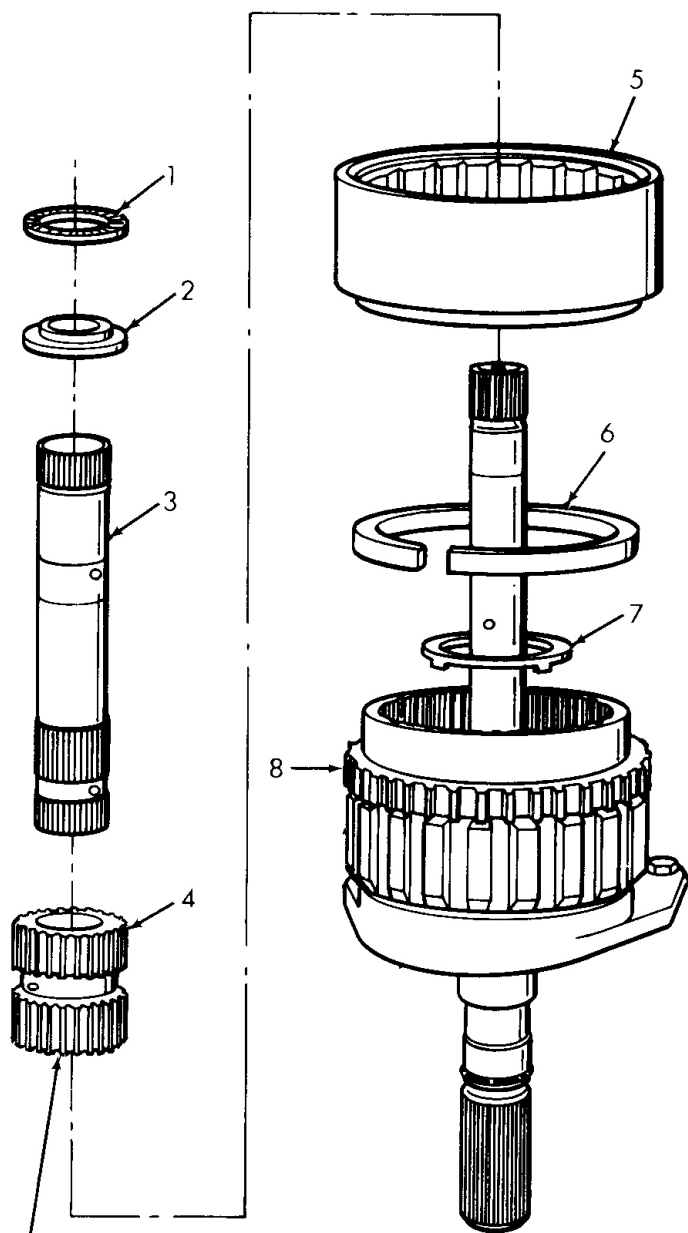
Fig. 18: Installing Intermediate Clutch Piston
Courtesy of GENERAL MOTORS CORP.



- | | |
|-----------------------------------|-------------------------------------|
| 1. Main Shaft | 6. Output Shaft |
| 2. Thrust Needle Bearing Assembly | 7. Snap Ring |
| 3. Rear Internal Gear | 8. Thrust Washer |
| 4. Needle Bearing Assembly | 9. Selective Thrust Washer |
| 5. Snap Ring | 10. Output Shaft Seal (Some Models) |

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Fig. 19: Input Sprag & 3rd Roller Clutch Assemblies (1 of 4)
 Courtesy of GENERAL MOTORS CORP.



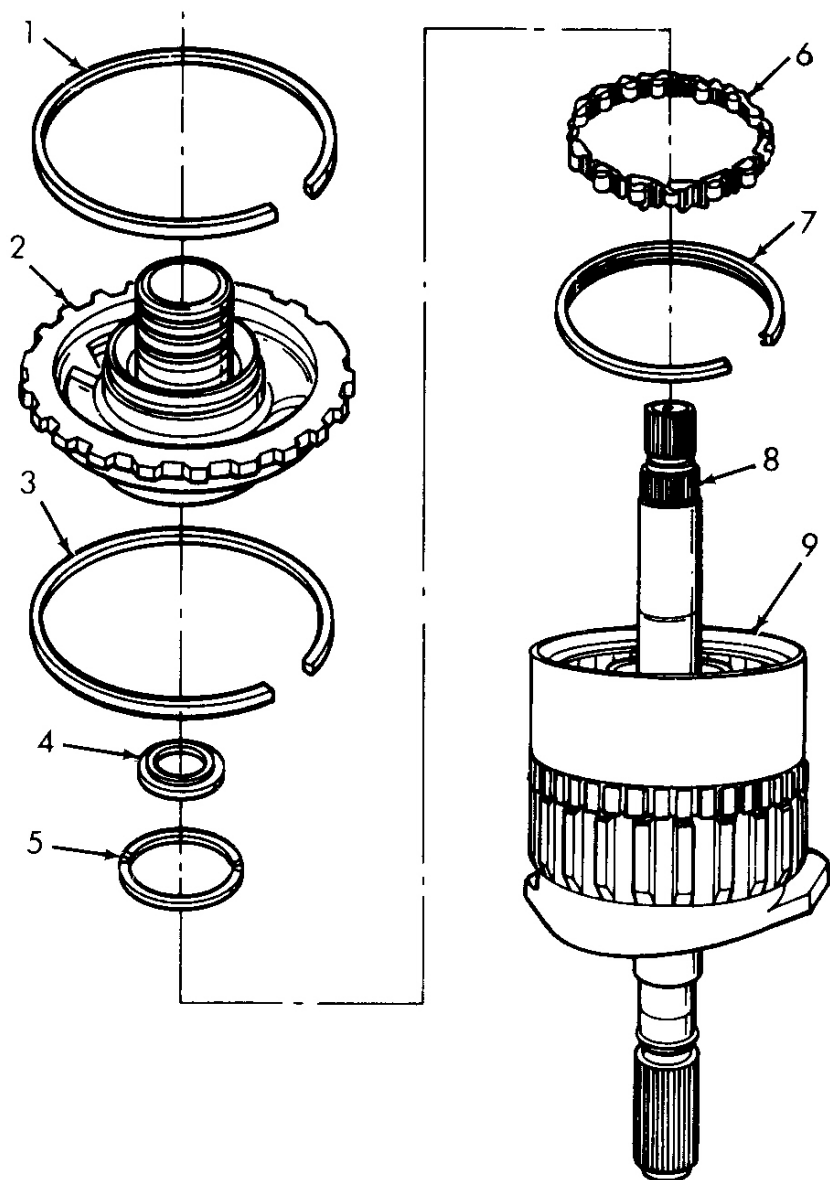
Note: Chamfered Side

1. Needle Bearing
2. Needle Bearing Race
3. Sun Gear Shaft
4. Sun Gear

5. Reaction Drum & Carrier Assembly
6. Front Internal Gear Ring
7. Washer
8. Output Carrier & Output Speed Sensor Ring

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Fig. 20: Input Sprag & 3rd Roller Clutch Assemblies (2 of 4)
 Courtesy of GENERAL MOTORS CORP.



- | | |
|------------------------|---|
| 1. Snap Ring | 6. Roller Clutch Assembly |
| 2. Center Support | 7. Snap Ring/Spacer |
| 3. Snap Ring | 8. Sun Gear Shaft |
| 4. Thrust Bearing Race | 9. Output Carrier &
Output Speed Sensor Ring |
| 5. Thrust Washer | |
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Fig. 21: Input Sprag & 3rd Roller Clutch Assemblies (3 of 4)
Courtesy of GENERAL MOTORS CORP.

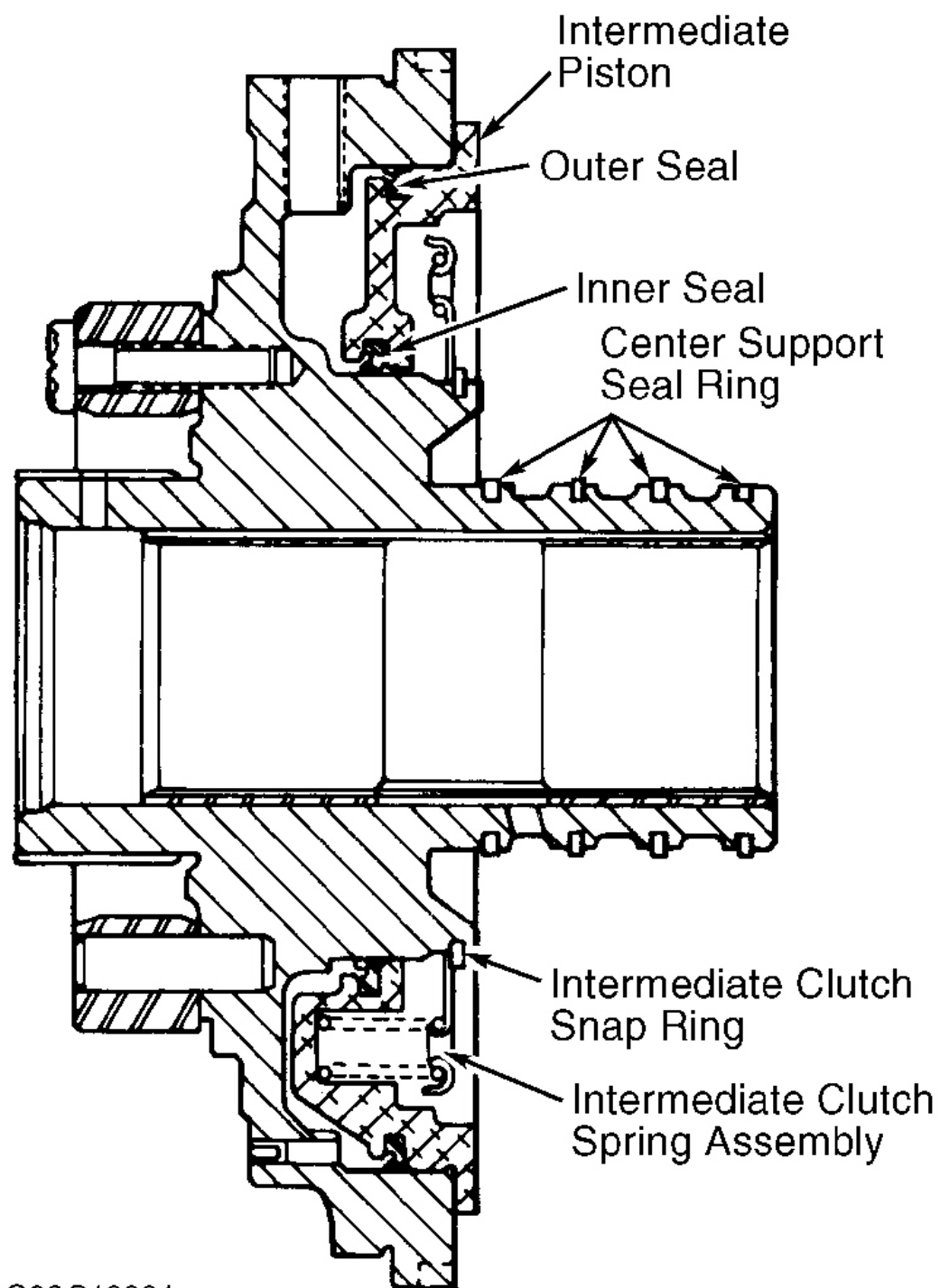
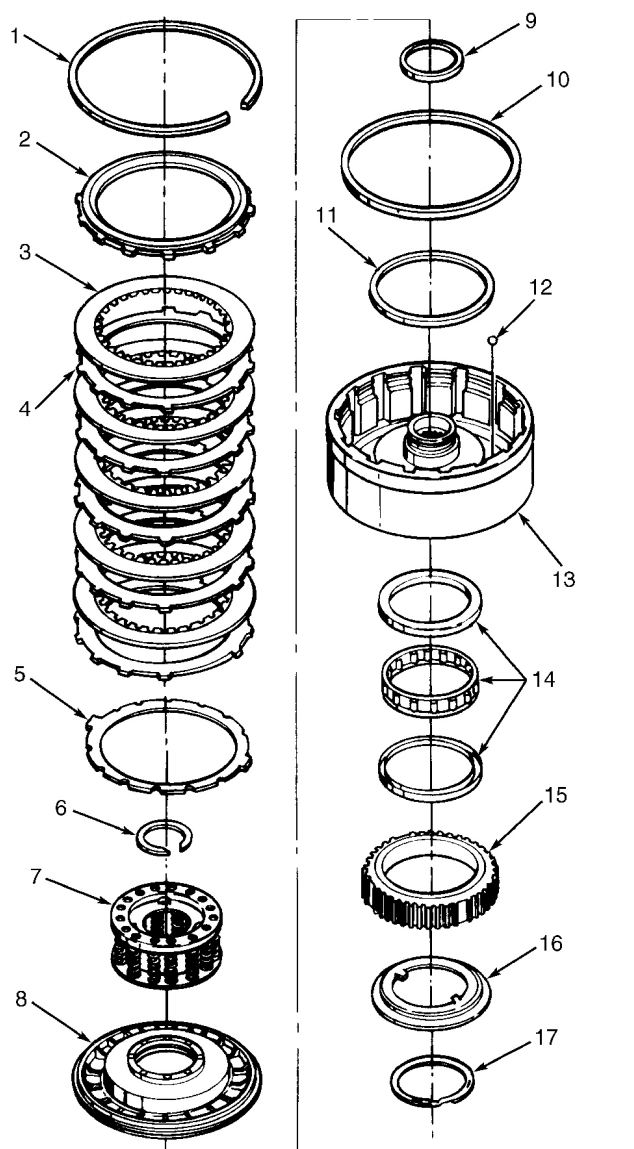


Fig. 22: Input Sprag & 3rd Roller Clutch Assemblies (4 of 4)
 Courtesy of GENERAL MOTORS CORP.

DIRECT CLUTCH ASSEMBLY**Disassembly**

Disassemble intermediate sprag clutch assembly. Discard the spiral snap ring. Remove the direct clutch pack. See **Fig. 23**. Using Clutch Compressor (J-23327) and Adapter (J-25018-A), compress intermediate clutch springs, and remove snap ring.



1. Snap Ring
2. Direct Clutch Backing Plate
3. Direct Clutch Composition Plates
4. Direct Clutch Steel Plates
5. Dished Plate
6. Snap Ring
7. Direct Clutch Spring Assembly
8. Direct Clutch Piston
9. Inner Seal

10. Outer Seal
11. Center Seal
12. Check Ball (Inspect)
13. Direct Clutch Housing
14. Intermediate Sprag Assembly
15. Intermediate Clutch Race
16. Intermediate Clutch Retainer
17. Locking Ring

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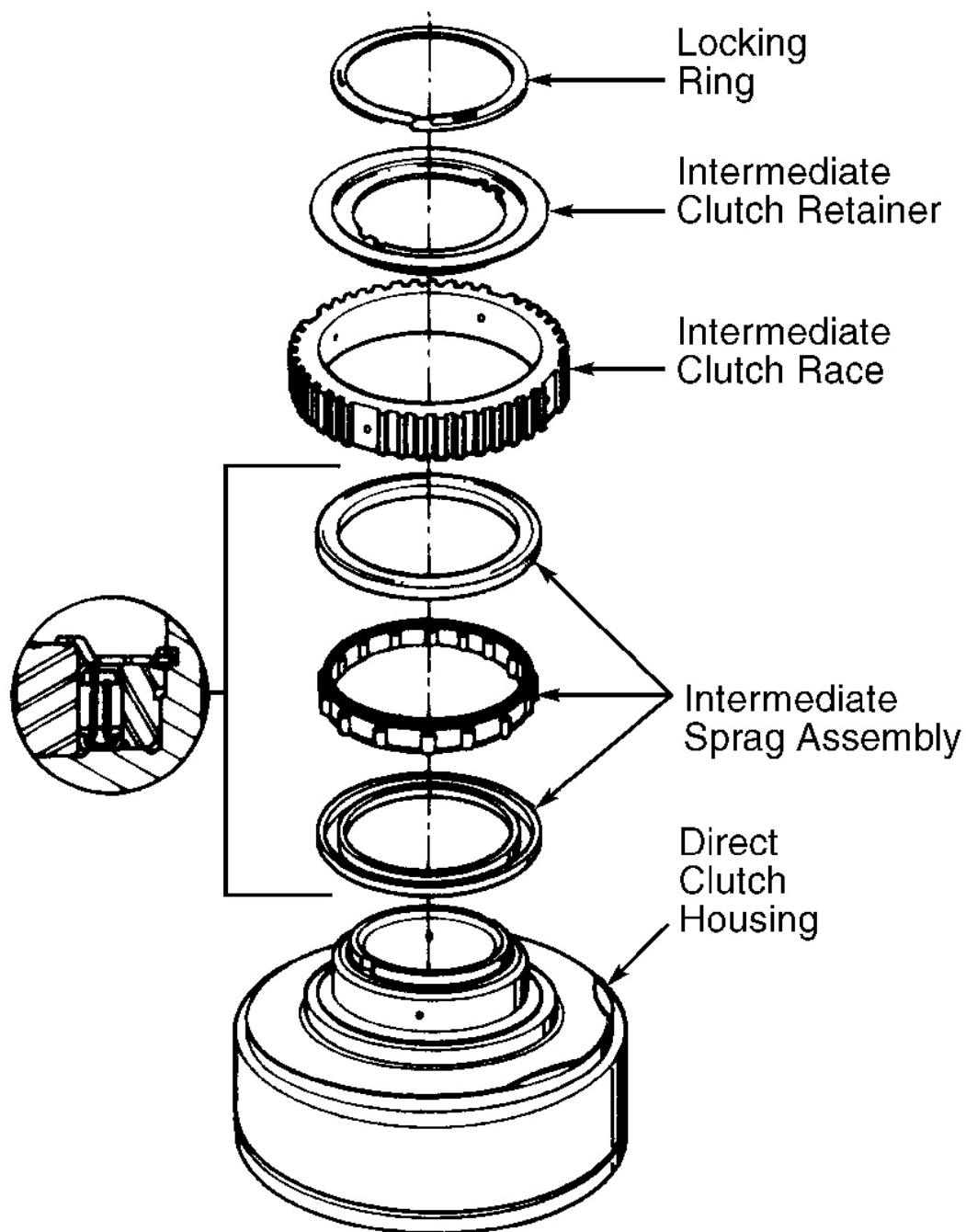
Fig. 23: Identifying Direct Clutch & Intermediate Sprag Clutch
Courtesy of GENERAL MOTORS CORP.

Inspection

Inspect all parts for wear, cracks, burned plates and scoring; replace if necessary.

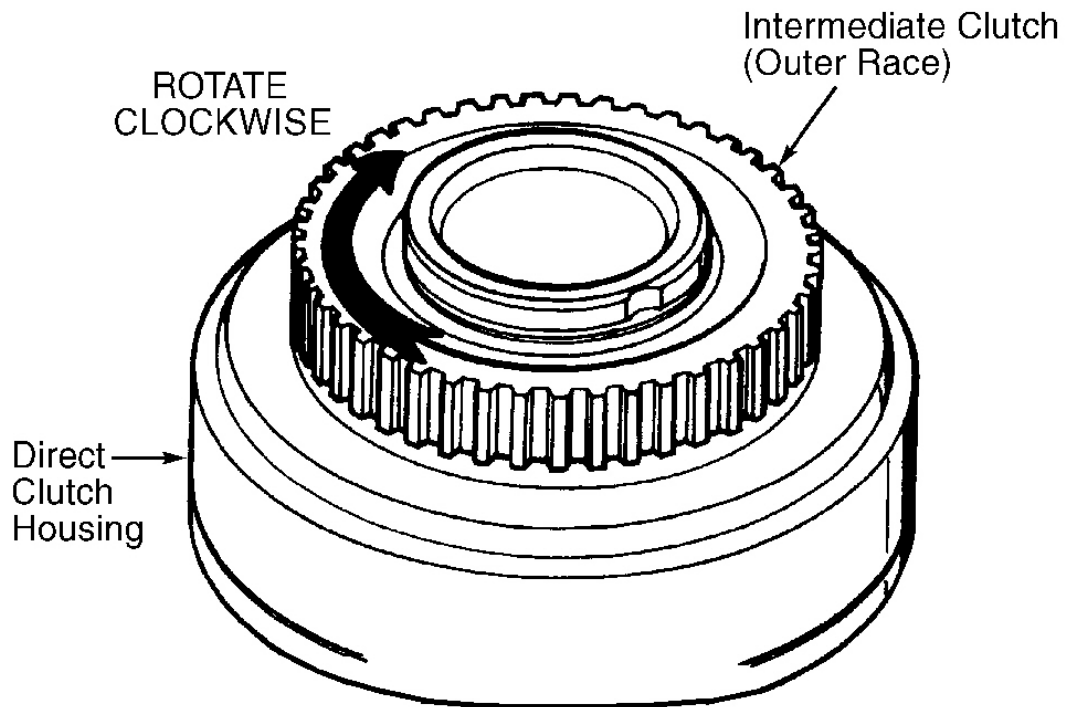
Reassembly

1. Reassemble intermediate sprag clutch. See **Fig. 24**. Install new spiral snap ring. Ensure intermediate sprag rotates clockwise only. See **Fig. 25**.
2. Using Clutch Piston Installers (J-21362 and J-38732), install piston into direct clutch housing. Reassemble direct clutch. Direct clutch uses 5 steel plates, 5 composition plates and one dished plate. See **Fig. 23** and **Fig. 26**.
3. Apply 80 psi (550 kPa) of air to reverse port. Air should bleed through direct port. Apply air pressure to direct port. Ensure piston seals do not leak. Direct clutch piston should move .121-.186" (3.07-4.72 mm). See **Fig. 27**.



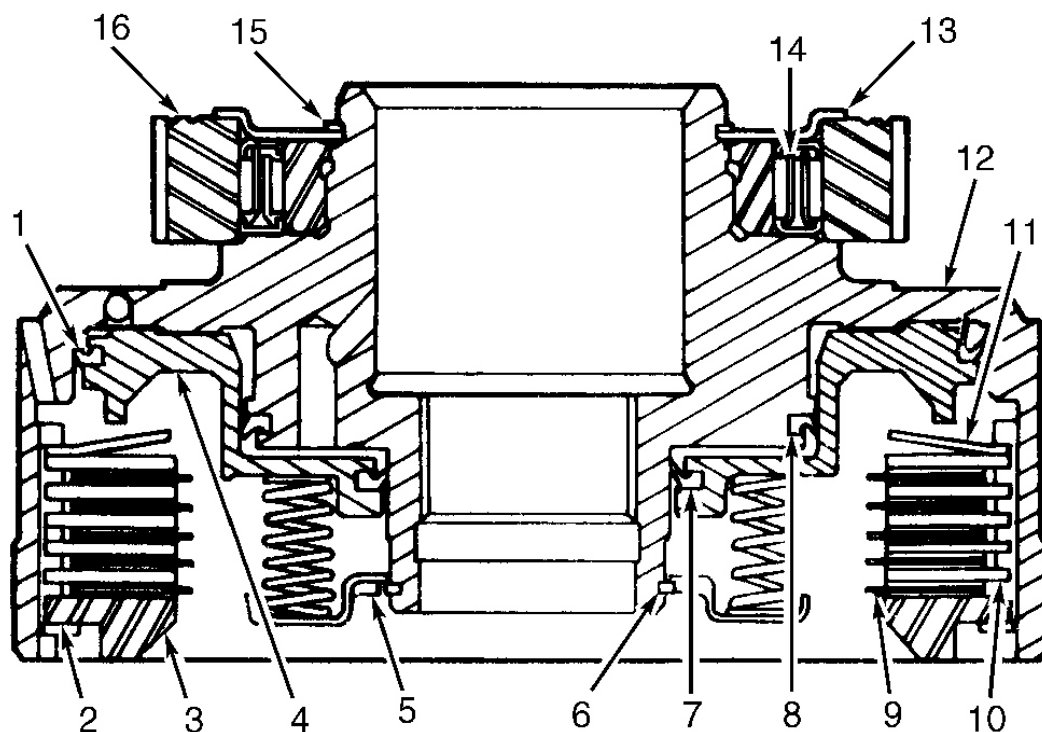
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Fig. 24: Assembling Intermediate Sprag Clutch
Courtesy of GENERAL MOTORS CORP.



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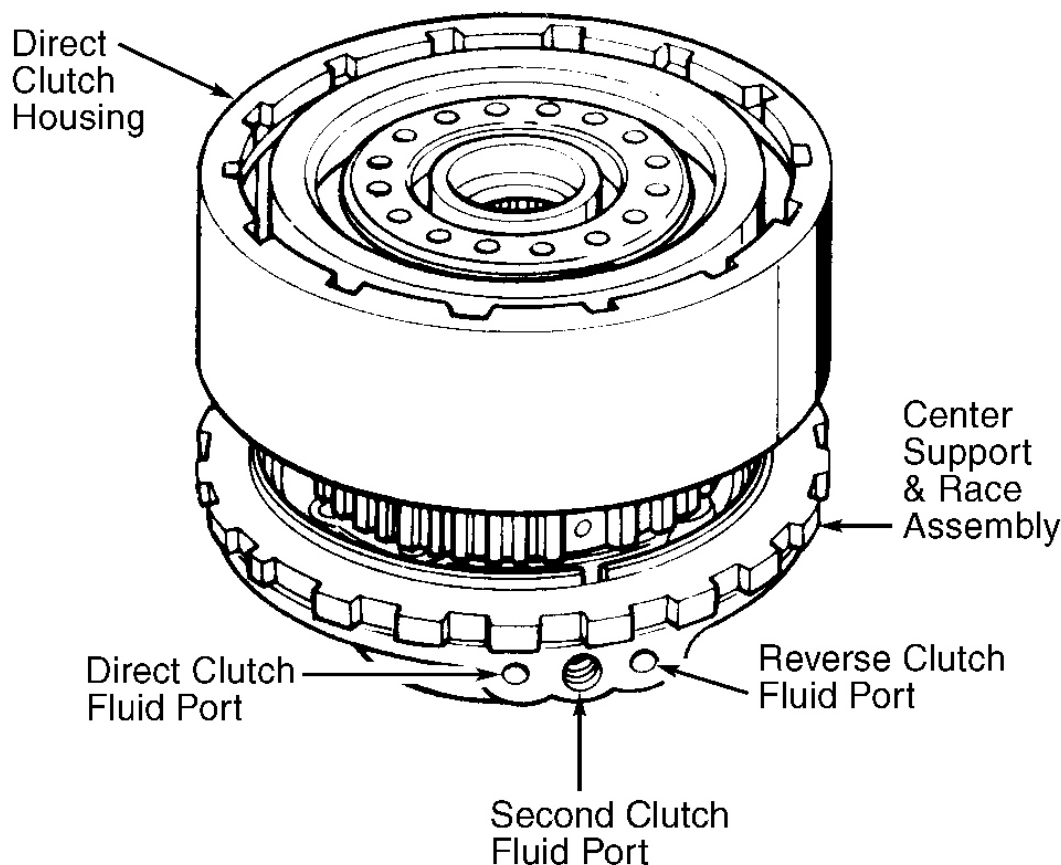
Fig. 25: Identifying Rotation of Intermediate Sprag Clutch
Courtesy of GENERAL MOTORS CORP.



- | | |
|--------------------------------|----------------------------------|
| 1. Outer Clutch Seal | 9. Composition Plate |
| 2. Snap Ring | 10. Steel Plate |
| 3. Direct Clutch Backing Plate | 11. Dished Plate |
| 4. Direct Clutch Piston | 12. Direct Clutch Housing |
| 5. Spring Retainer Assembly | 13. Intermediate Clutch Retainer |
| 6. Snap Ring | 14. Intermediate Sprag Assembly |
| 7. Inner Clutch Seal | 15. External Locking Ring |
| 8. Center Clutch Seal | 16. Intermediate Clutch Race |

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Fig. 26: View of Direct Clutch & Intermediate Sprag Clutch
 Courtesy of GENERAL MOTORS CORP.



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Fig. 27: Checking Direct Clutch

Courtesy of GENERAL MOTORS CORP.

FORWARD CLUTCH

Disassembly

Disassemble forward clutch assembly. See **Fig. 28**. Using Clutch Spring Compressor (J-23327-1), compress and remove spring retainer. See **Fig. 29**. Remove clutch piston and seals from piston.

Inspection

Inspect all clutch plates for cracks, wear, lining separation, pits or other signs of damage. Ensure forward clutch housing check ball is working. Inspect thrust washer for damage. Inspect clutch housing for damaged clutch hub, worn bushings or damaged oil seal rings.

Reassembly

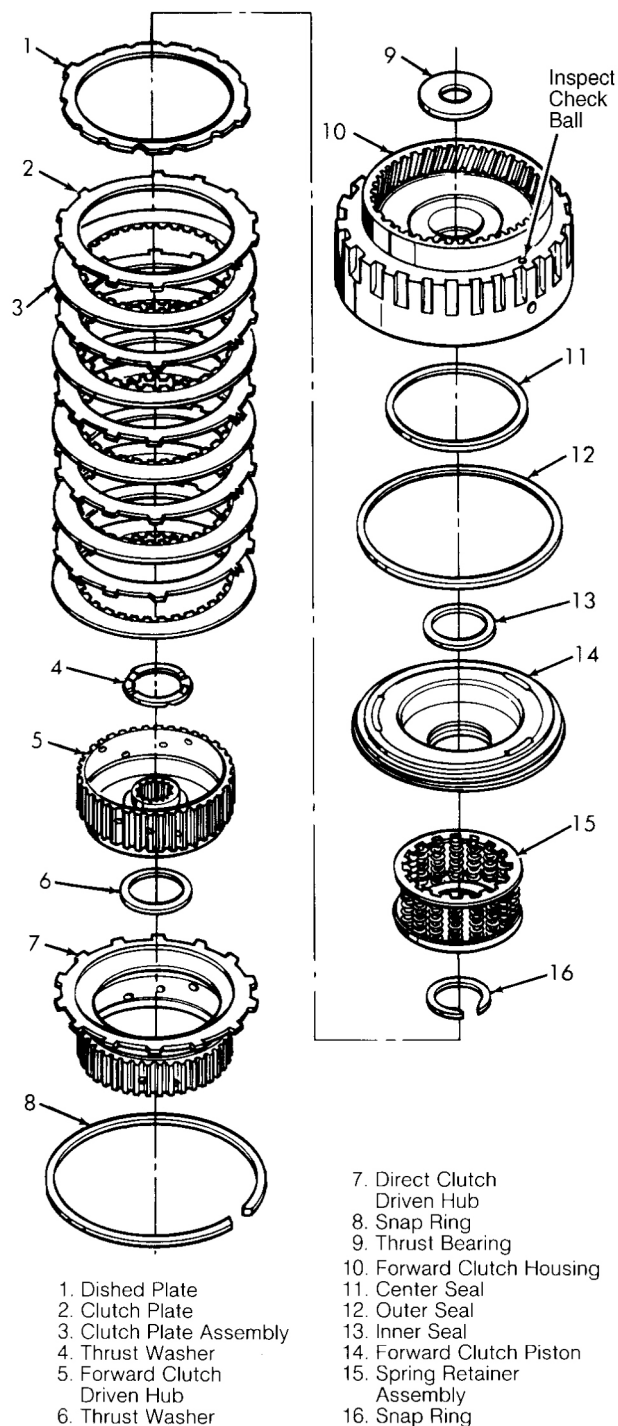
1991 Chevrolet Blazer V1500

1991-92 AUTOMATIC TRANSMISSIONS Hydra-Matic 4L80-E Overhaul

1. Using Clutch Piston Installers (J-21362 and J-38732), install piston into forward clutch housing. Reassemble forward clutch. See **Fig. 28**. Install correct number of clutch plates. See **FORWARD CLUTCH PLATE APPLICATION**.
2. Apply 80 psi (550 kPa) of air to turbine shaft air port. See **Fig. 30**. Ensure piston seals do not leak. Check forward clutch piston movement. Forward clutch piston should move .121-.186" (3.07-4.72 mm) on all except model ZBP. On model ZBP, forward clutch piston should move .087-.110" (2.21-2.81 mm).

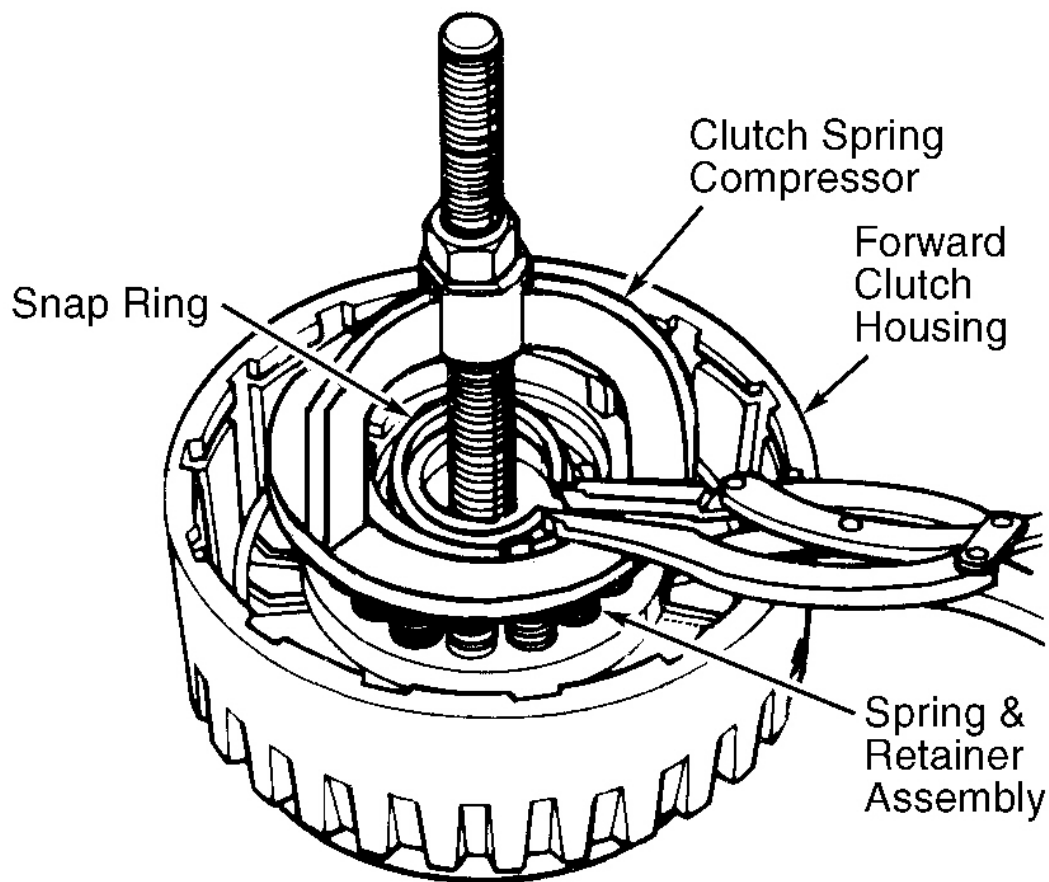
FORWARD CLUTCH PLATE APPLICATION

Application	Quantity
Model ZBP	
Flat Steel Plate	4
Composition Plate	5
Waved Steel Plate	1
Except Model ZBP	
Flat Steel Plate	5
Composition Plate	5
Dished Steel Plate	1



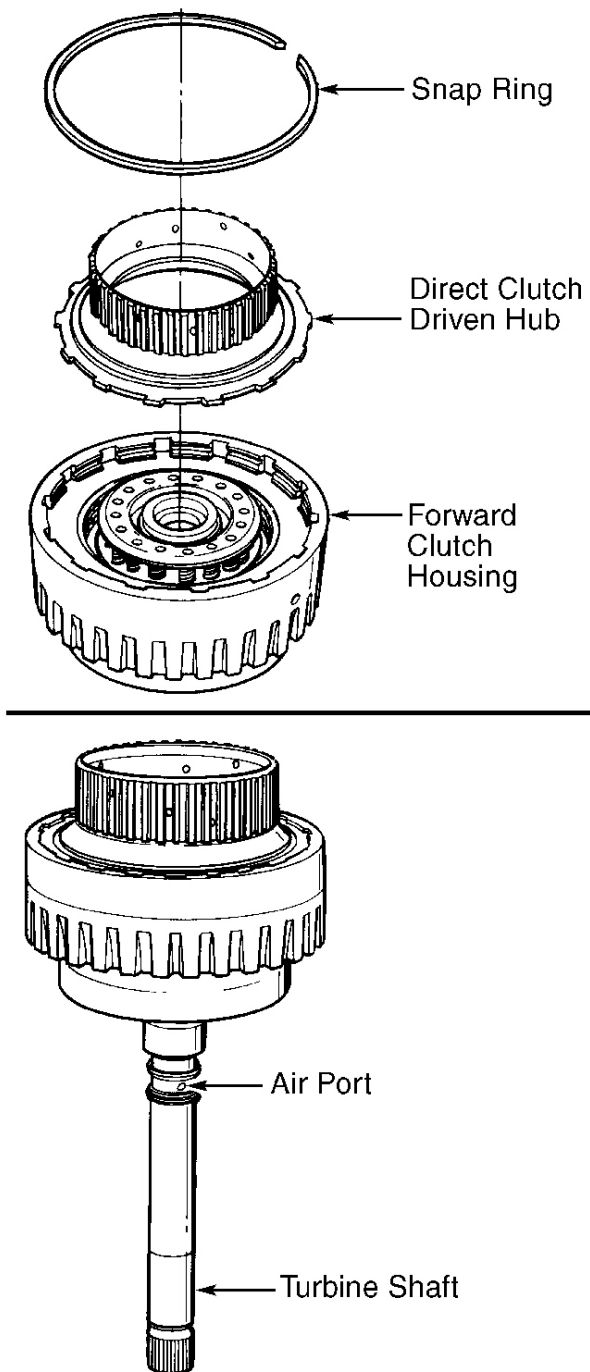
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Fig. 28: Exploded View Of Forward Clutch Assembly
Courtesy of GENERAL MOTORS CORP.



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Fig. 29: Compressing Forward Clutch Spring Retainer
Courtesy of GENERAL MOTORS CORP.



G92A13839

Fig. 30: Checking Forward Clutch
Courtesy of GENERAL MOTORS CORP.

4TH CLUTCH

Disassembly

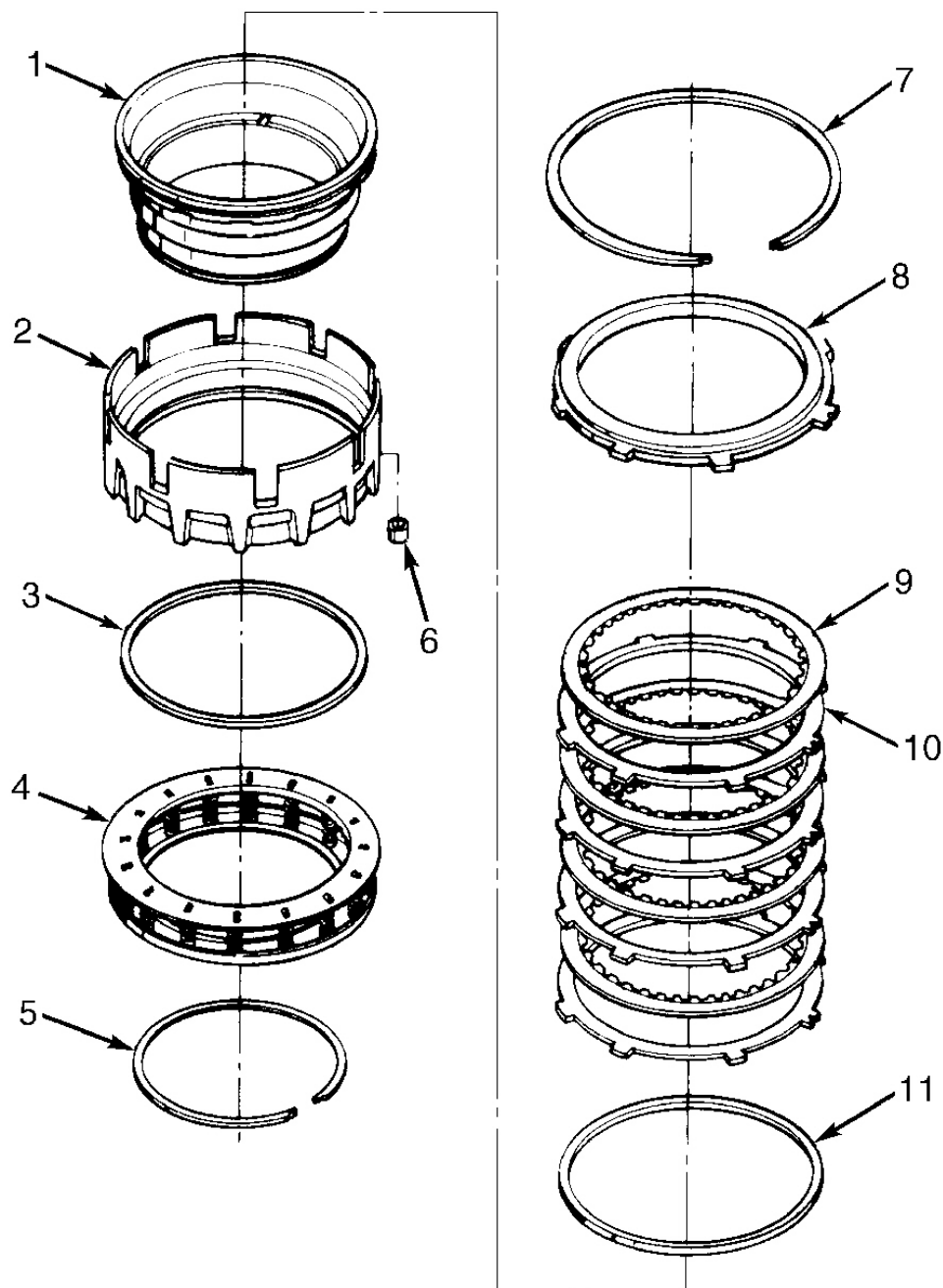
Remove snap ring and backing plate. See **Fig. 31**. Remove clutch plates. Using Clutch Spring Compressors (J-23327-1 and J-38882), compress and remove spring retainer. Remove clutch piston and seals from piston.

Cleaning & Inspection

Inspect housing and clutch plates for damaged teeth, scoring or warpage. Ensure 4th clutch housing cup plug bleed hole opening is about .020" (.51 mm).

Reassembly

1. Using Piston Seal Protectors (J-38731-1, J-38731-2 and J-38731-3), install piston into 4th clutch housing. Reassemble 4th clutch assembly. See **Fig. 31**.
2. Install snap ring. Install 4 steel and 4 composition plates. Ensure steel plate notches are indexed opposite 4th clutch bolt hole. Ensure clearance between backing plate and snap ring is .040-.100" (1.01-2.54 mm). See **Fig. 32**.

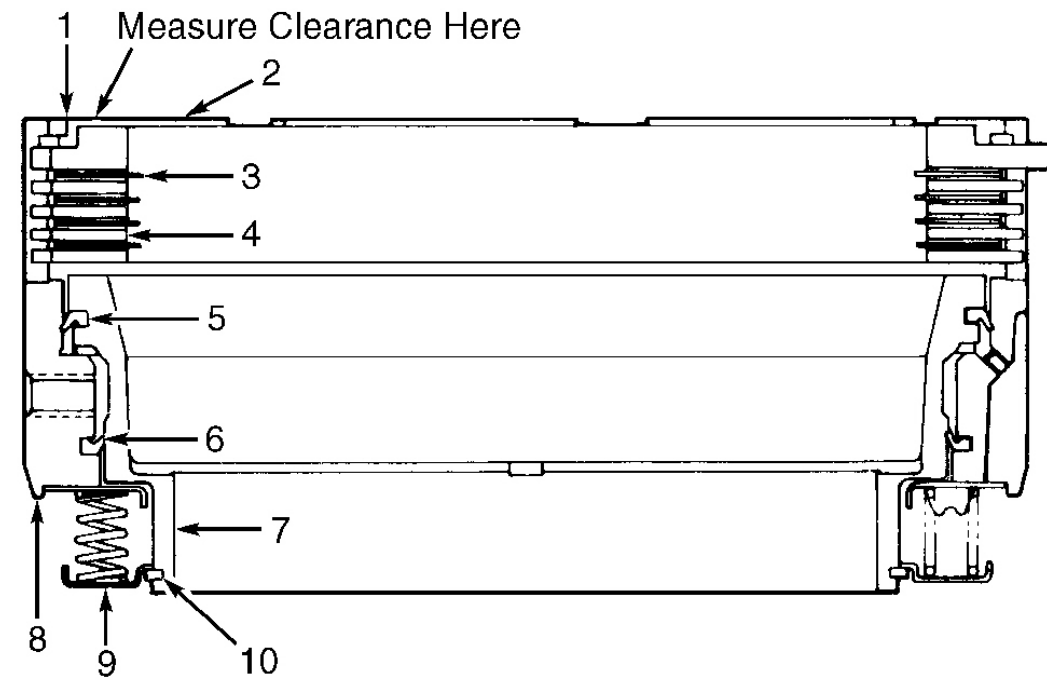


1. 4th Clutch Piston
2. 4th Clutch Housing
3. 4th Clutch Inner Seal
4. 4th Clutch Spring Retainer
5. Snap Ring

6. Orifice Plug
7. 4th Clutch Snap Ring
8. 4th Clutch Backing Plate
9. 4th Clutch Composition Plate
10. 4th Clutch Steel Plate
11. 4th Clutch Outer Seal

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Fig. 31: Exploded View Of 4th Clutch Assembly
Courtesy of GENERAL MOTORS CORP.



- | | |
|--|---------------------------------|
| 1. Snap Ring | 6. 4th Clutch Inner Seal |
| 2. 4th Clutch Backing Plate | 7. 4th Clutch Piston |
| 3. 4th Clutch Composition Plate Assembly | 8. 4th Clutch Housing |
| 4. 4th Clutch Steel Plate | 9. 4th Clutch Spring & Retainer |
| 5. 4th Clutch Outer Seal | 10. 4th Clutch Snap Ring |

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Fig. 32: Checking 4th Clutch Clearance
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE ASSEMBLY

Disassembly

1. Remove overrun clutch housing from overdrive assembly. See **Fig. 33**. Disassemble overrun clutch. See **Fig. 34** and **Fig. 41**. Using Clutch Spring Compressor (J-23327) and Adapter (J-38734), compress spring retainer, and remove clutch piston. See **Fig. 34**.
2. Disassemble overdrive assembly. See **Fig. 41**. If necessary, disassemble overdrive carrier assembly. See **Fig. 39**.

Inspection

Inspect housing and clutch plates for damaged teeth, scoring or warpage. Inspect spring and spring retainer for damage. Inspect overdrive carrier assembly and turbine shaft for wear or damage. Replace if necessary. Ensure end play of overdrive carrier pinions is .009-.024" (.23-.61 mm). See **Fig. 36**.

Turbine Shaft Seal Replacement

1. Remove oil seal rings from turbine shaft. Inspect seal ring grooves for nicks or burrs. Lubricate each oil seal ring. Place Seal Protector/Installer Kit (J-38736) on turbine shaft.
2. Quickly slide each seal into ring groove when protector is in position. Use seal driver from Kit (J-38736) to push ring over seal protector. Size seal with seal sizer from Kit (J-38736); gently twist seal sizer over each seal. Leave sizer in place.

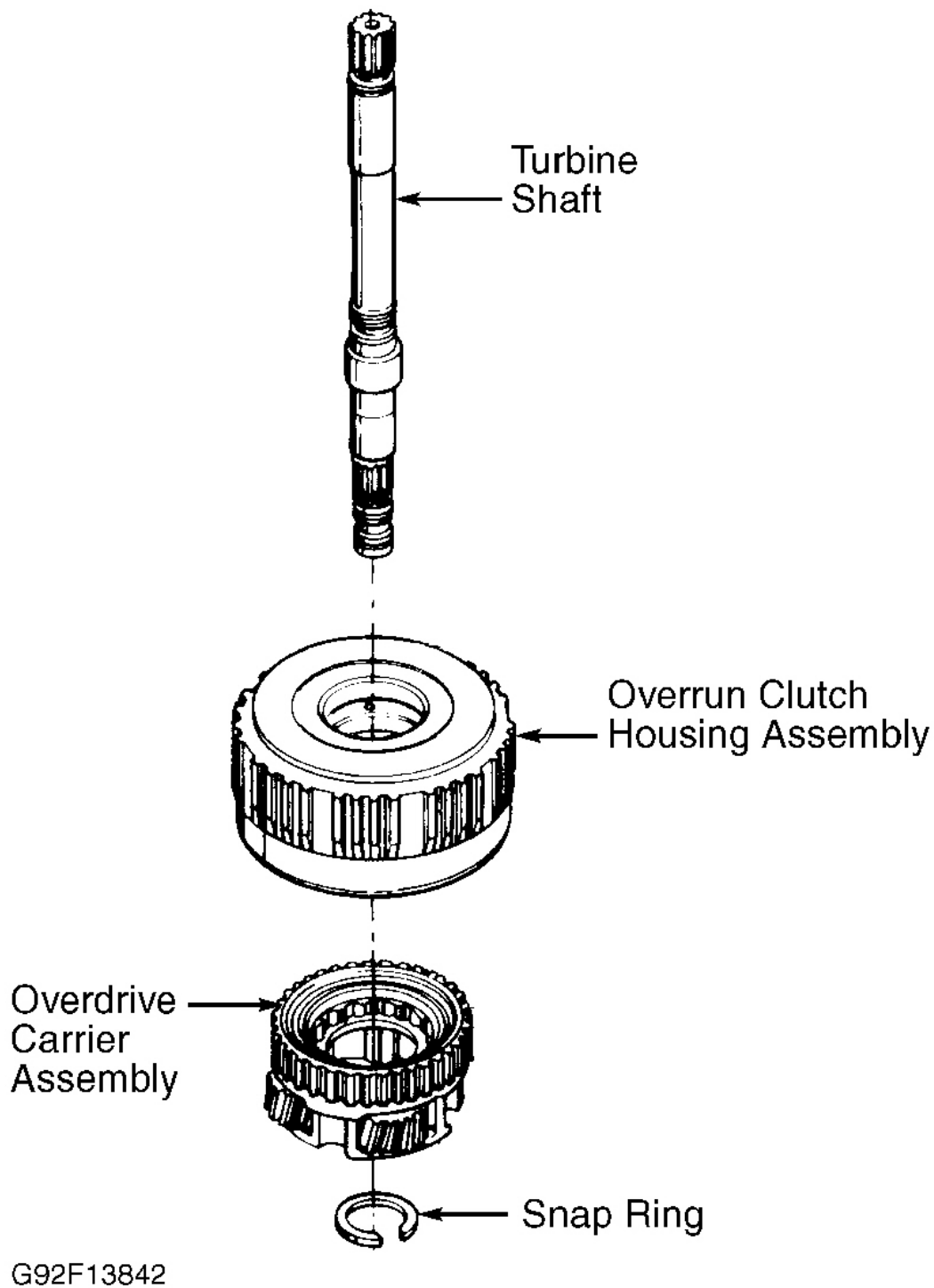
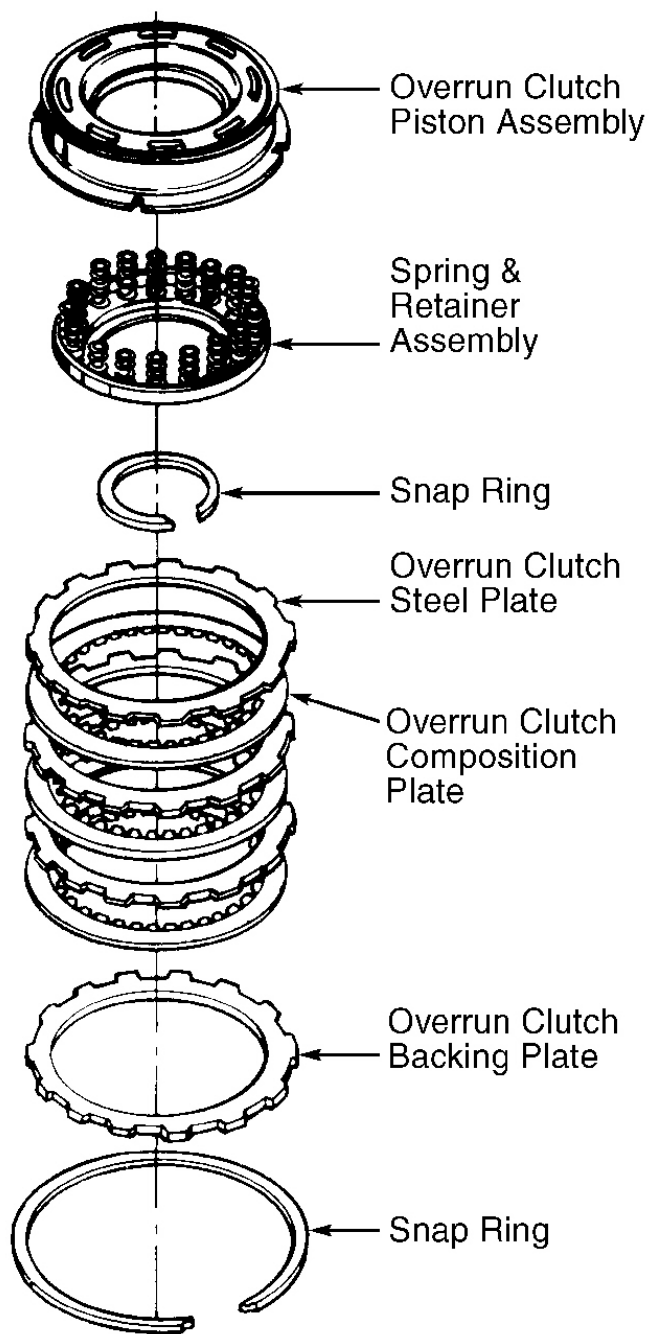


Fig. 33: Exploded View Of Overdrive Assembly
Courtesy of GENERAL MOTORS CORP.



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Fig. 34: Exploded View Of Overrun Clutch Assembly
Courtesy of GENERAL MOTORS CORP.

Reassembly

1. Using Piston Seal Protector (J-38729), install piston into overrun clutch housing. See **Fig. 35**. Reassemble overrun clutch assembly. See **Fig. 34**.
2. Install snap ring. Install 3 steel and 3 composition plates. Ensure clearance between backing plate and snap ring is .040-.100" (1.02-2.54 mm). See **Fig. 37**.
3. If necessary, reassemble overdrive carrier. See **Fig. 38**, **Fig. 39** and **Fig. 41** . Install thrust washer to overdrive carrier. See **Fig. 38**. To complete reassembly, install turbine shaft and overdrive carrier to overrun clutch. See **Fig. 33** and **Fig. 41** .

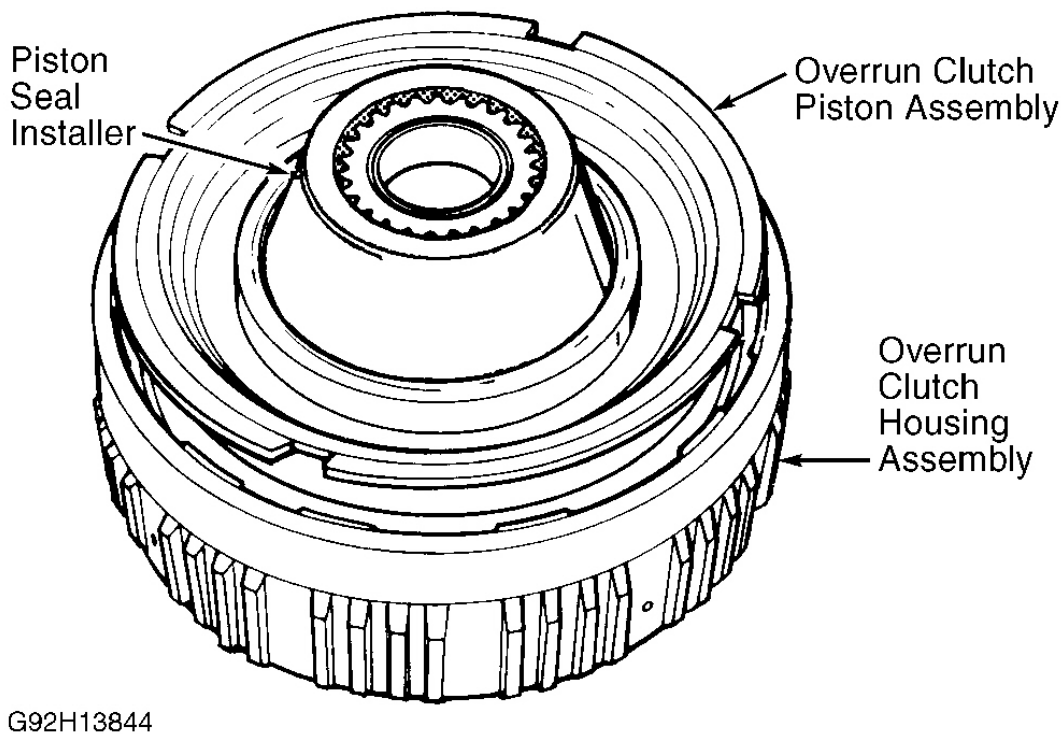
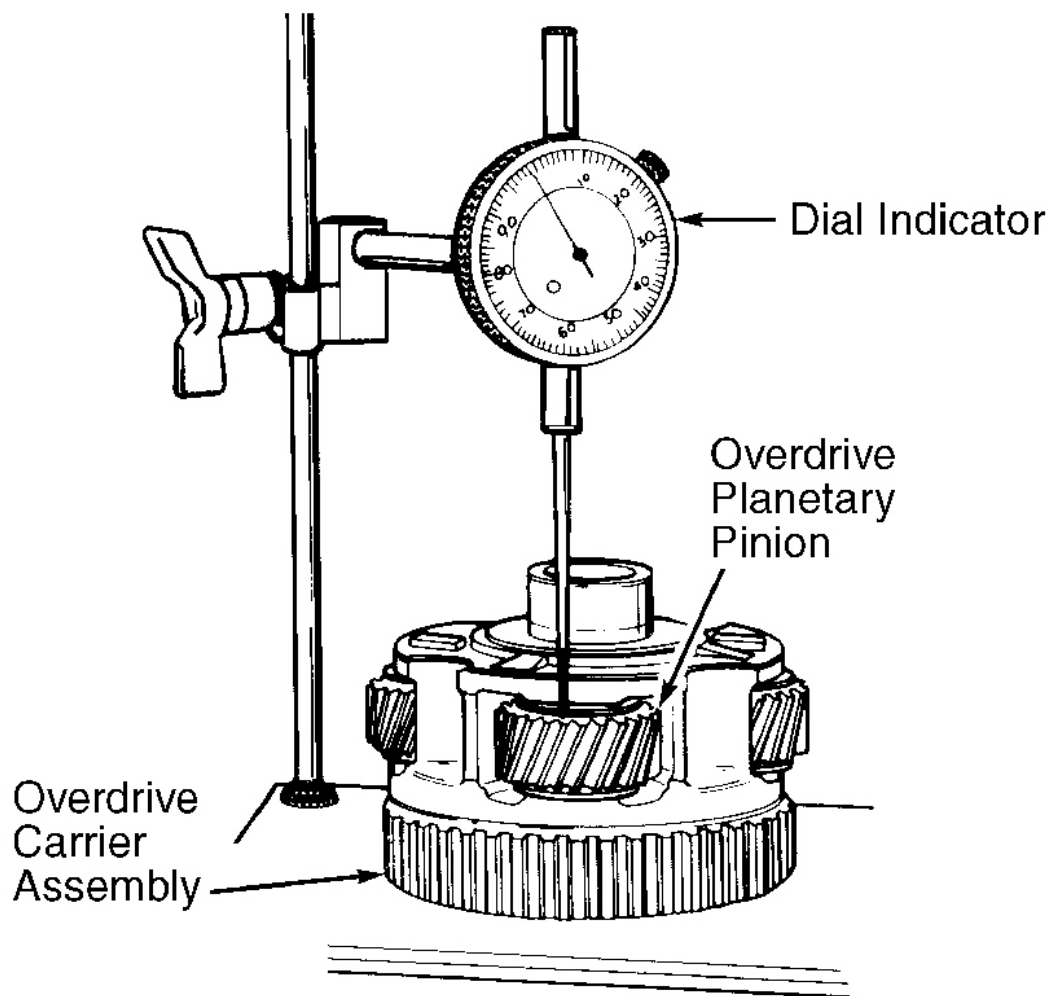


Fig. 35: Installing Overrun Clutch Piston
Courtesy of GENERAL MOTORS CORP.



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Fig. 36: Checking Overdrive Carrier Pinion End Play
Courtesy of GENERAL MOTORS CORP.

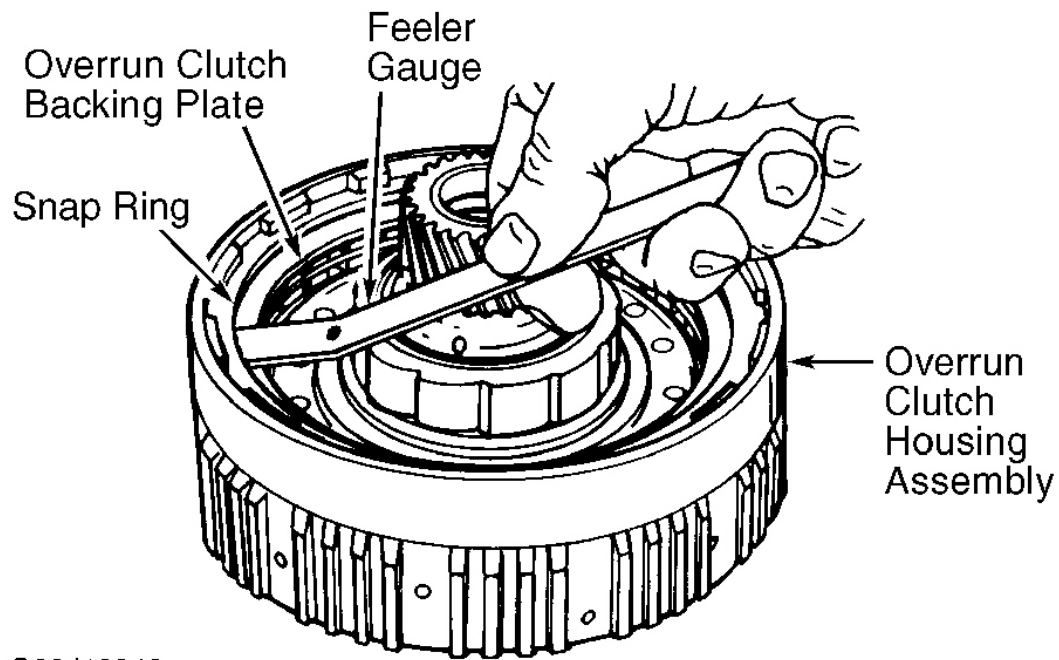
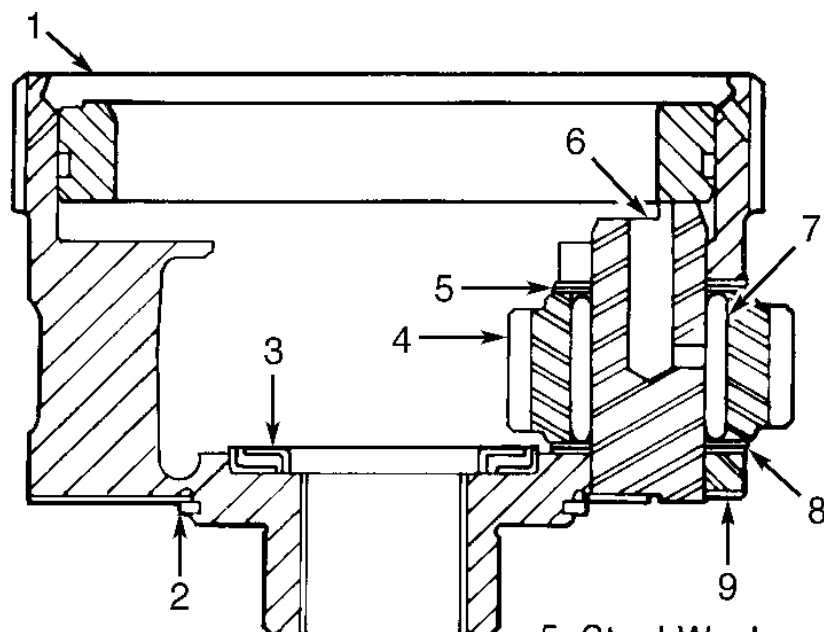


Fig. 37: Checking Overrun Clutch Clearance
Courtesy of GENERAL MOTORS CORP.



- 1. Overdrive Carrier Assembly
- 2. Snap Ring
- 3. Thrust Bearing
- 4. Overdrive Planetary Pinion

- 5. Steel Washer
- 6. Pinion Pin
- 7. Needle Roller Bearing
- 8. Pinion Thrust Washer
- 9. Retainer

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Fig. 38: Locating Overdrive Assembly Washers
 Courtesy of GENERAL MOTORS CORP.

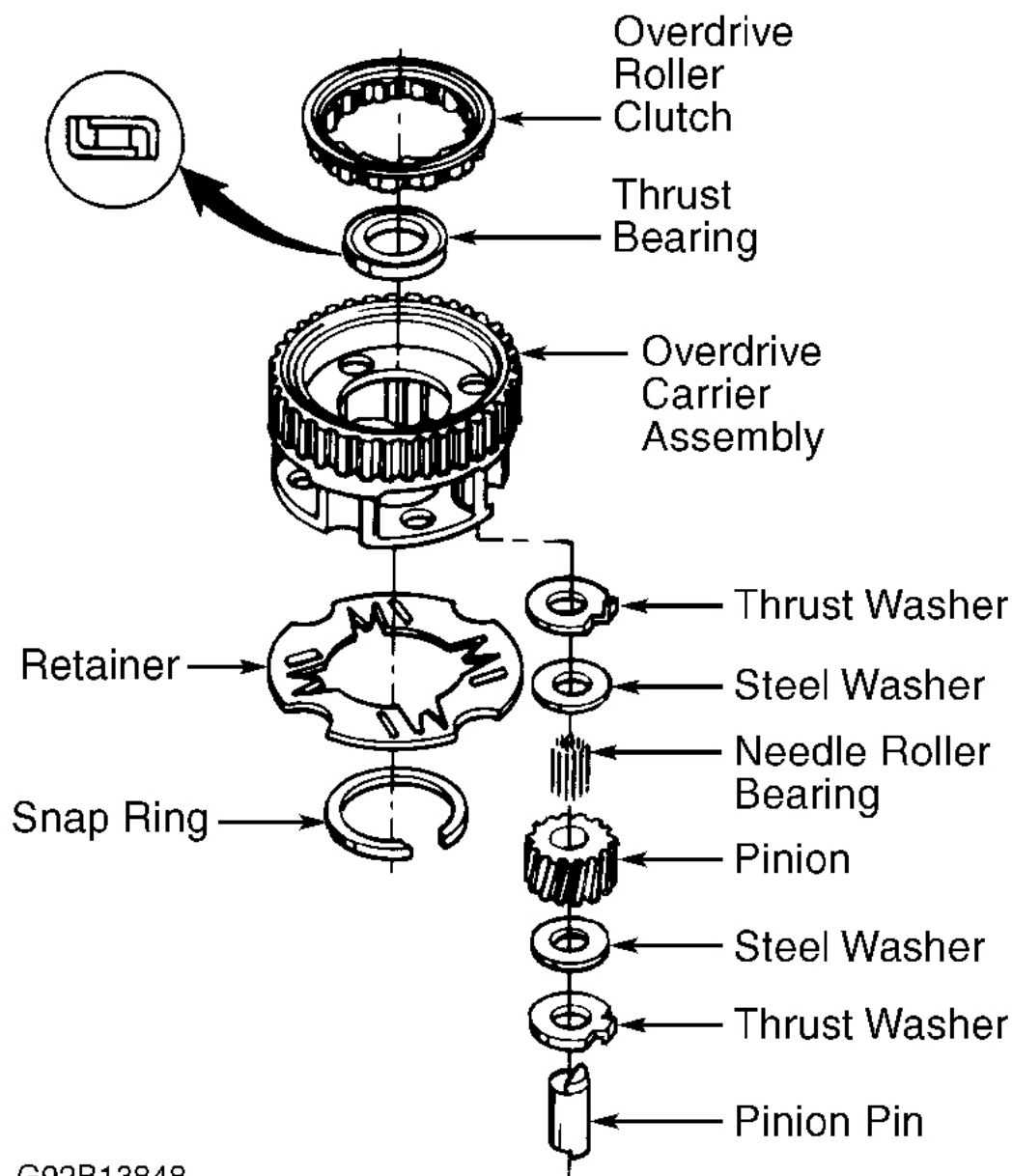
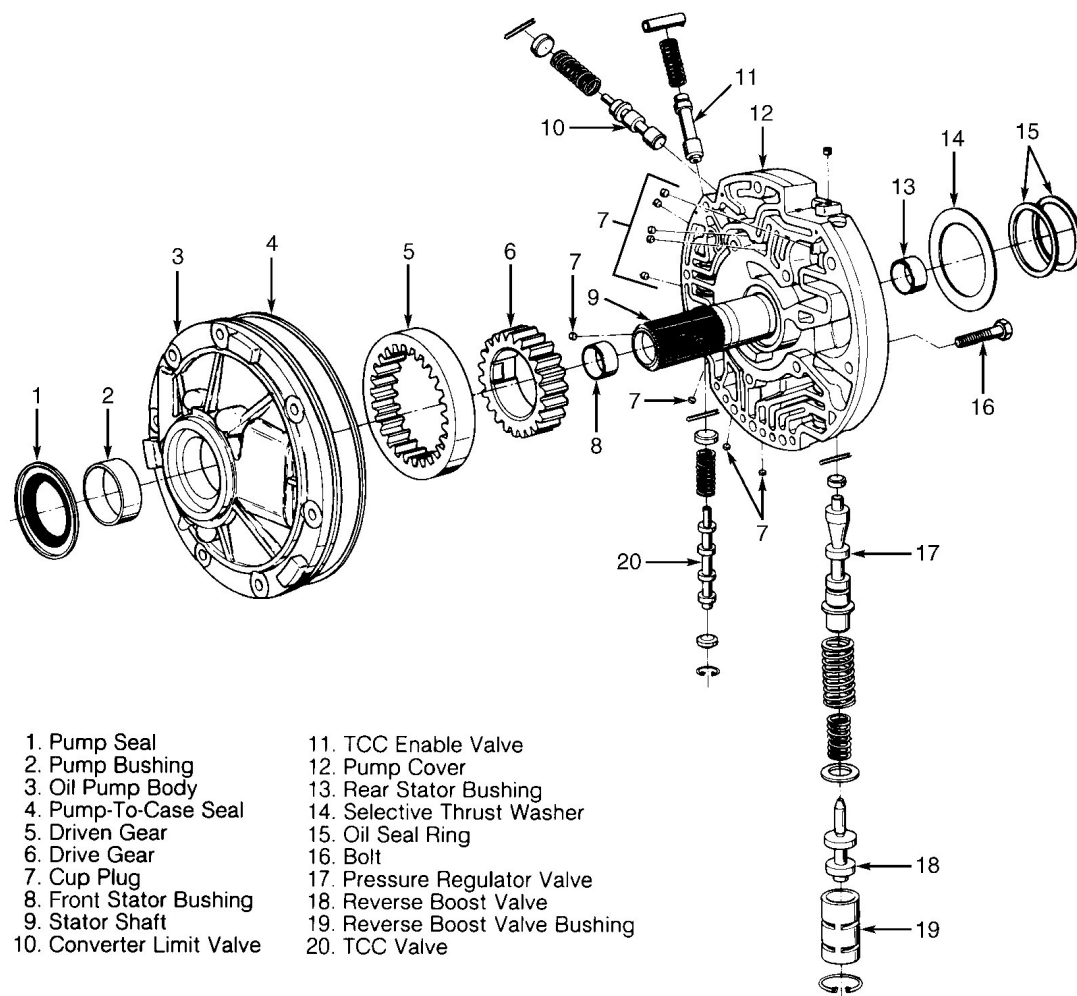


Fig. 39: Exploded View Of Overdrive Carrier Assembly
 Courtesy of GENERAL MOTORS CORP.



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Fig. 40: Exploded View Of Oil Pump Assembly
Courtesy of GENERAL MOTORS CORP.

OIL PUMP ASSEMBLY

Disassembly

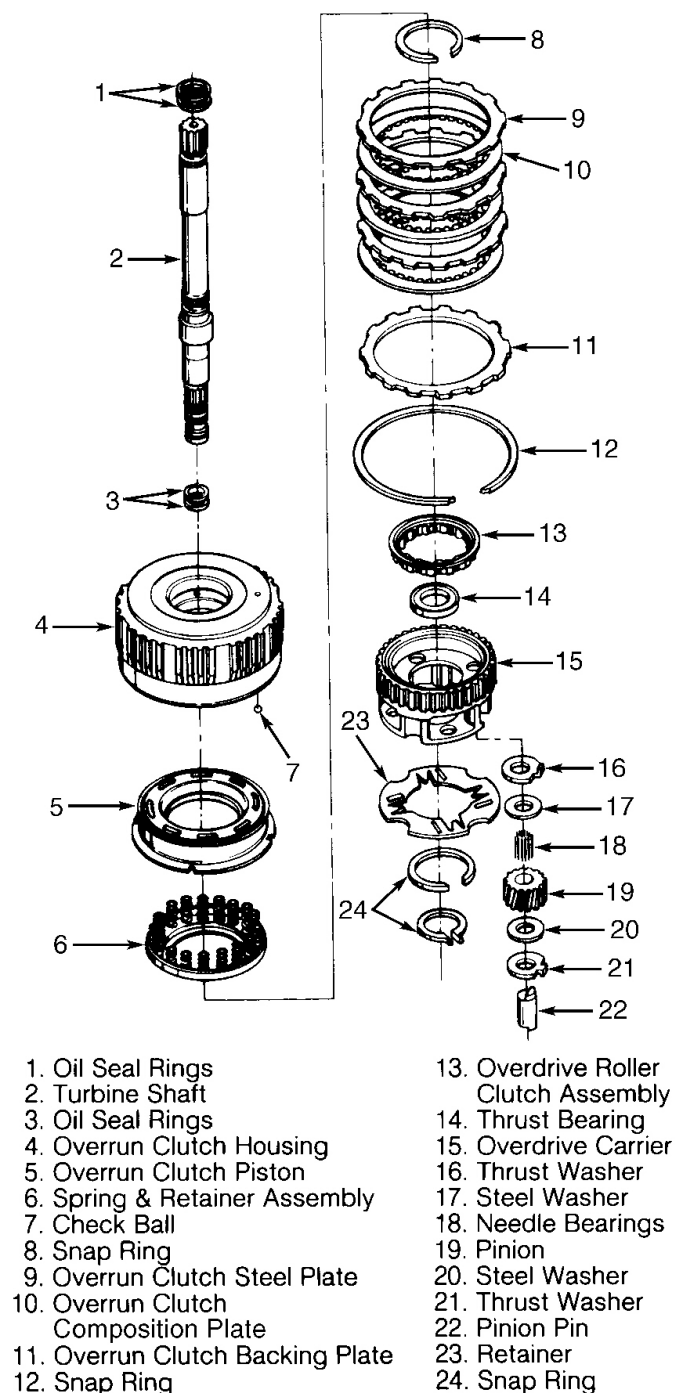
Clean and air dry oil pump. Disassemble oil pump. See **Fig. 40** for exploded view of pump assembly.

Cleaning & Inspection

1. Inspect pump body for porosity, interconnected oil passages, damaged inner pump area surface or damaged machine facing. Check gears and bushings for damage.
2. Measure gear clearance between oil pump gears and pump body. Clearance should be .0007-.0028" (.017-.071 mm). Ensure pump body mating surface is flat.

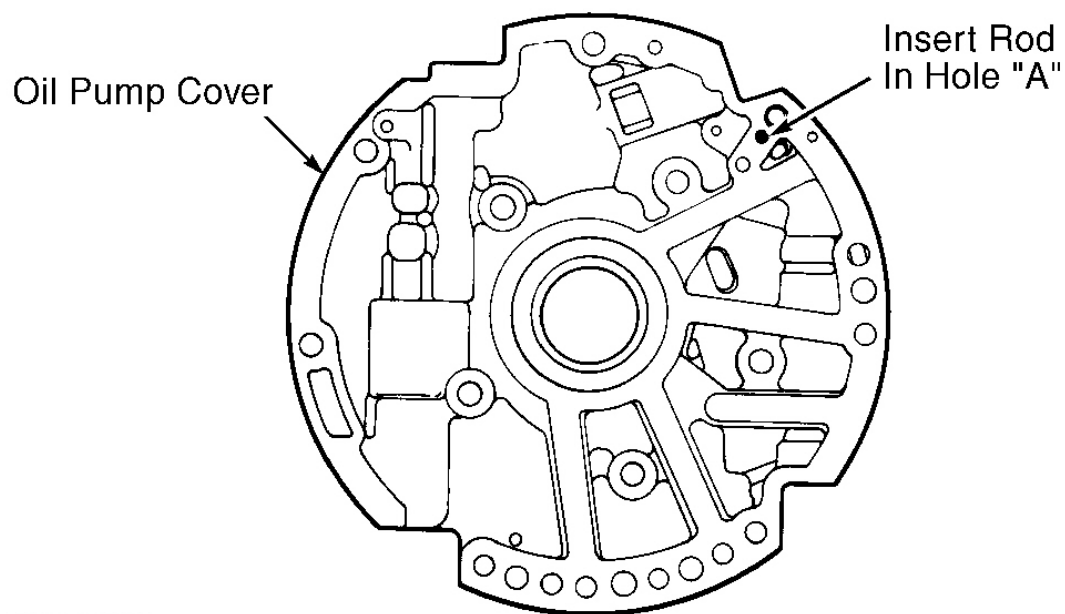
Reassembly

1. Reassemble oil pump. See **Fig. 40**. To install TCC enable valve, compress spring into oil pump body, and insert a small rod into hole "A". See **Fig. 42**. Install spring retainer, and remove small rod.
2. Install pump cover onto body. Install cover bolts and hand tighten them. Install Alignment Pin (J-25025-1) into pump. Install and tighten oil pump Alignment Band (J-21368). See **Fig. 43**. Tighten oil pump attaching bolts.



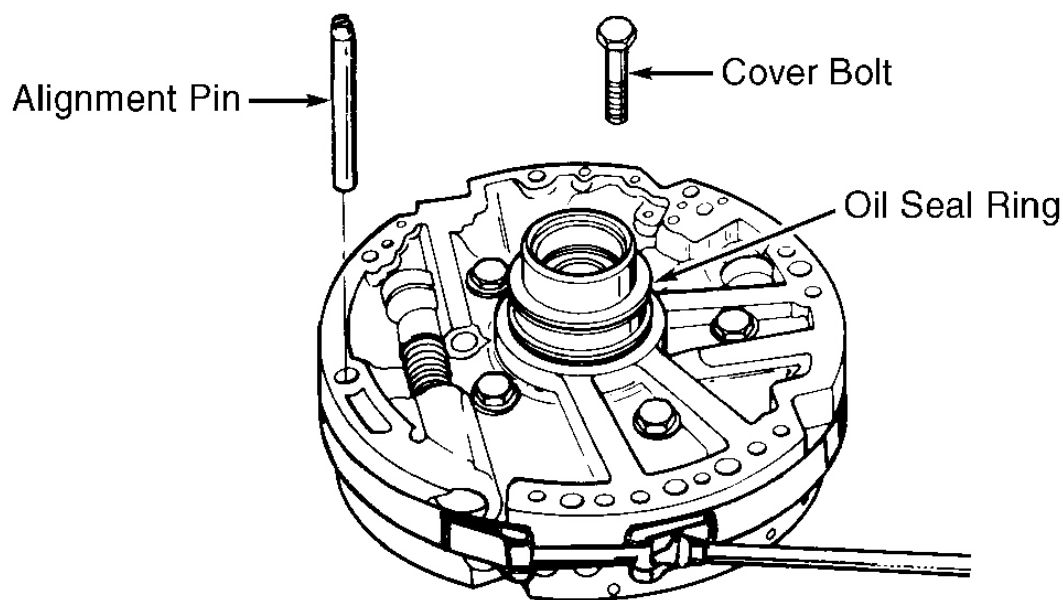
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Fig. 41: Exploded View of Overdrive/Overrun Assembly
 Courtesy of GENERAL MOTORS CORP.



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Fig. 42: Locating TCC Enable Valve Spring Temporary Holder Hole
Courtesy of GENERAL MOTORS CORP.



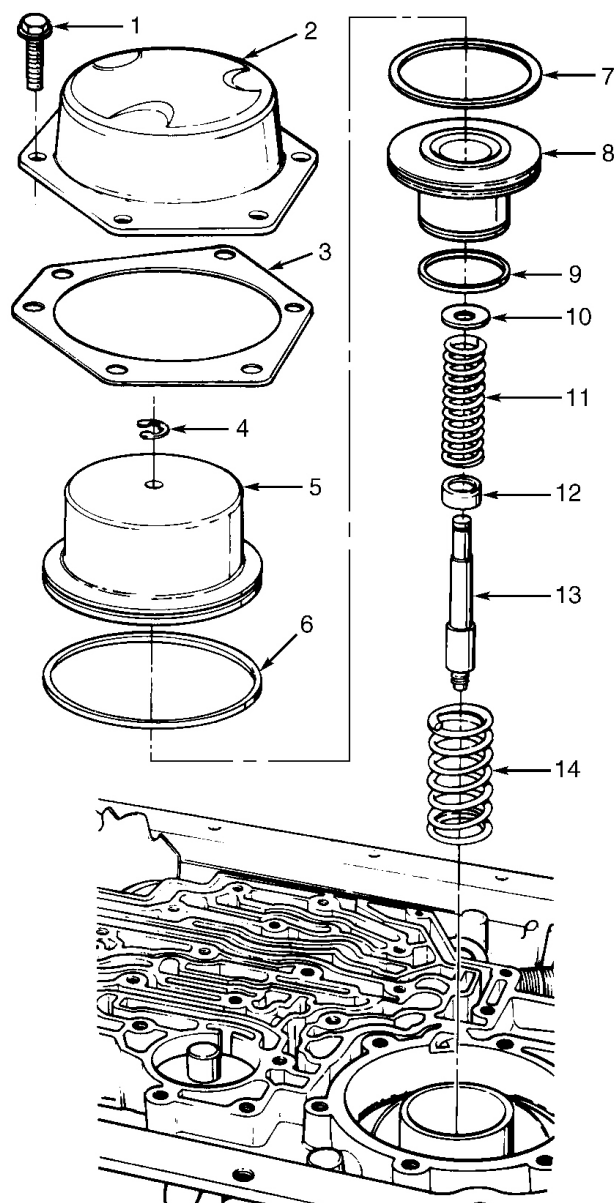
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Fig. 43: Aligning Oil Pump Cover To Body
Courtesy of GENERAL MOTORS CORP.

FRONT & REAR SERVOS

Inspection & Reassembly

Inspect servo pistons and seals for damage or cracks. **DO NOT** remove seals unless replacement is required. Inspect springs for damaged coils. Replace all damaged parts, and reassemble servos. See **Fig. 44** and **Fig. 58**.



- | | |
|----------------------|----------------------------|
| 1. Bolt | 8. Rear Accumulator Piston |
| 2. Rear Servo Cover | 9. Piston Seal |
| 3. Gasket | 10. Washer |
| 4. Clip | 11. Rear Servo Spring |
| 5. Rear Servo Piston | 12. Spring Retainer |
| 6. Outer Seal | 13. Rear Band Apply Pin |
| 7. Inner Seal | 14. Accumulator Spring |

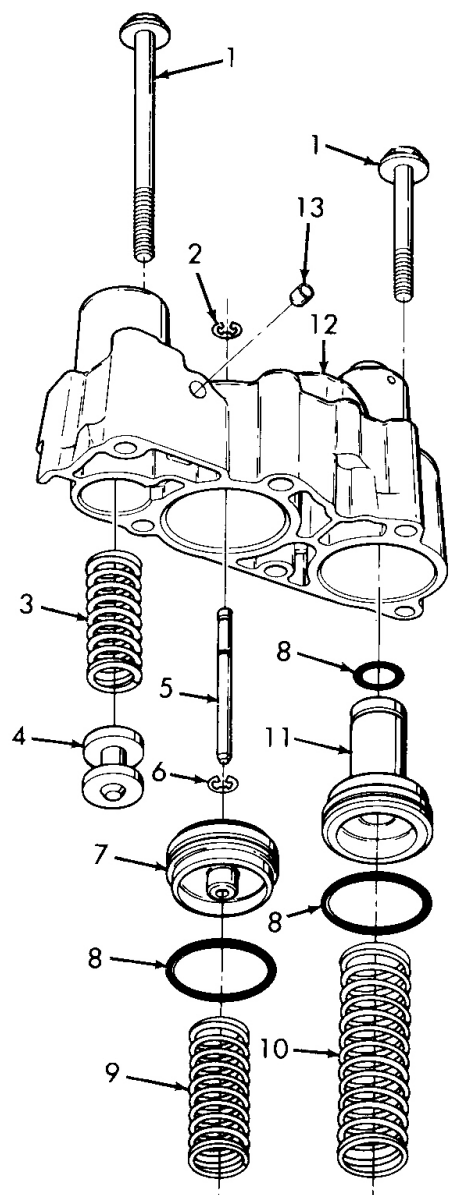
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Fig. 44: Exploded View of Rear Servo Assembly
 Courtesy of GENERAL MOTORS CORP.

ACCUMULATOR ASSEMBLY

Inspection

Inspect accumulator pistons and seals for damage or cracks. **DO NOT** remove seals unless replacement is required. Inspect springs for damaged coils. Replace all damaged parts, and reassemble accumulators. See **Fig. 45.**



- | | |
|-------------------------|------------------------------|
| 1. Bolt | 7. 4th Clutch Accum. Piston |
| 2. Clip | 8. Seal (Square Cut) |
| 3. Torque Signal Spring | 9. 4th Clutch Accum. Spring |
| 4. Torque Signal Valve | 10. 3rd Clutch Accum. Spring |
| 5. 4th Clutch Pin | 11. 3rd Clutch Accum. Piston |
| 6. Clip | 12. Accum. Housing |
| | 13. Cup Plug |

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Fig. 45: Exploded View of Accumulator Assembly
Courtesy of GENERAL MOTORS CORP.

VALVE BODY

Disassembly

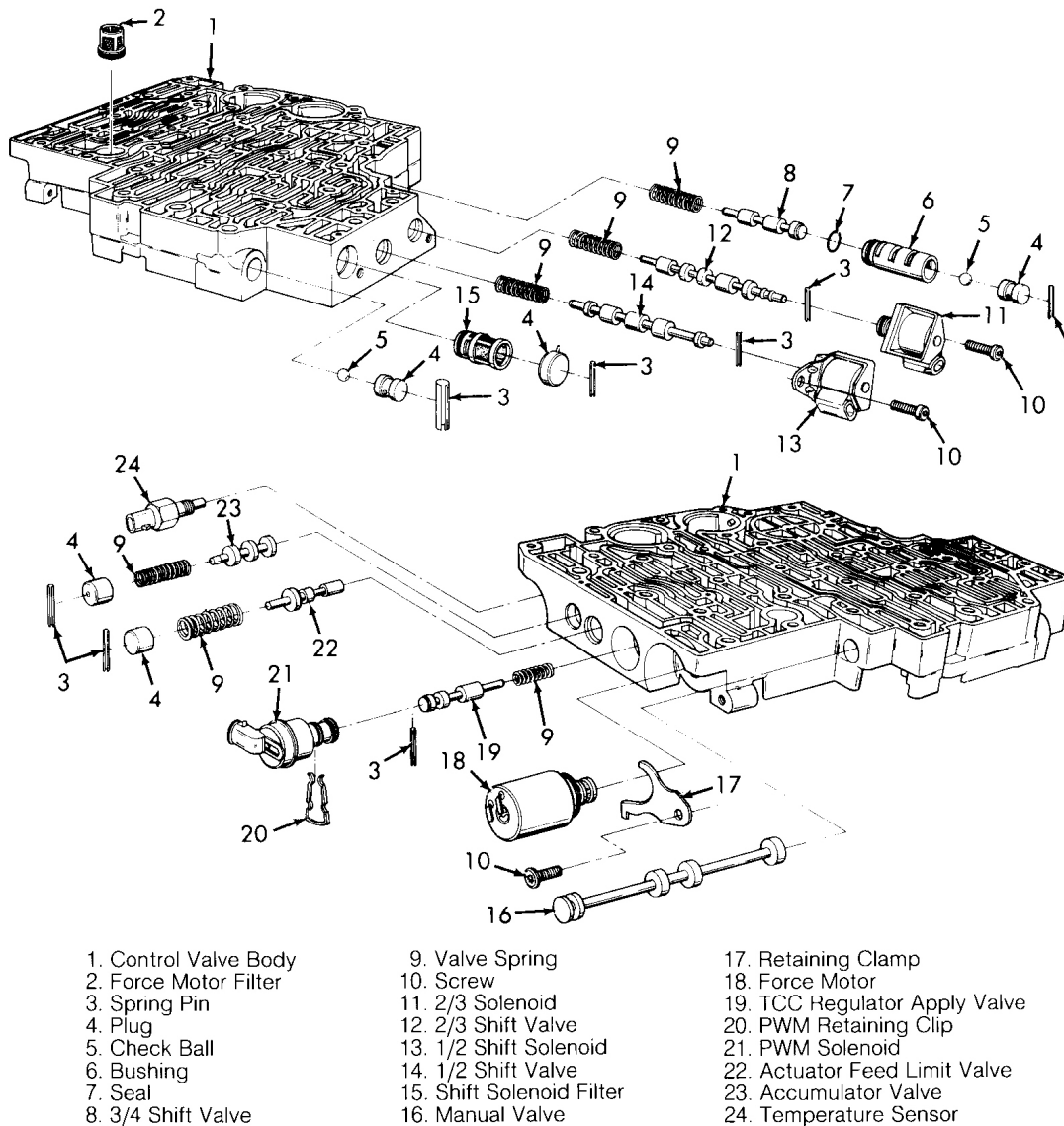
1. Thoroughly clean and air dry valve body. Remove each valve train. Cover bores when removing roll pins because some valves are under pressure. Remove control solenoids.
2. Remove blind hole roll pins with a modified drill bit. Lay valves, springs and bushings on a clean surface in removed order. Remove servo pipe lip seals. Clean valves, springs and bushings in solvent. NEVER use shop rags to clean valve body components.

Cleaning & Inspection

Inspect valves and bushings for scoring, nicks and scratches. Inspect springs for damaged or distorted coils. Inspect valve body casting for porosity, interconnected oil passages and damaged machined surfaces.

Reassembly

Reassemble valve body assembly. See **Fig. 46**.



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Fig. 46: Exploded View of Hydra-Matic 4L80-E Valve Body Assembly
Courtesy of GENERAL MOTORS CORP.

TRANSMISSION REASSEMBLY

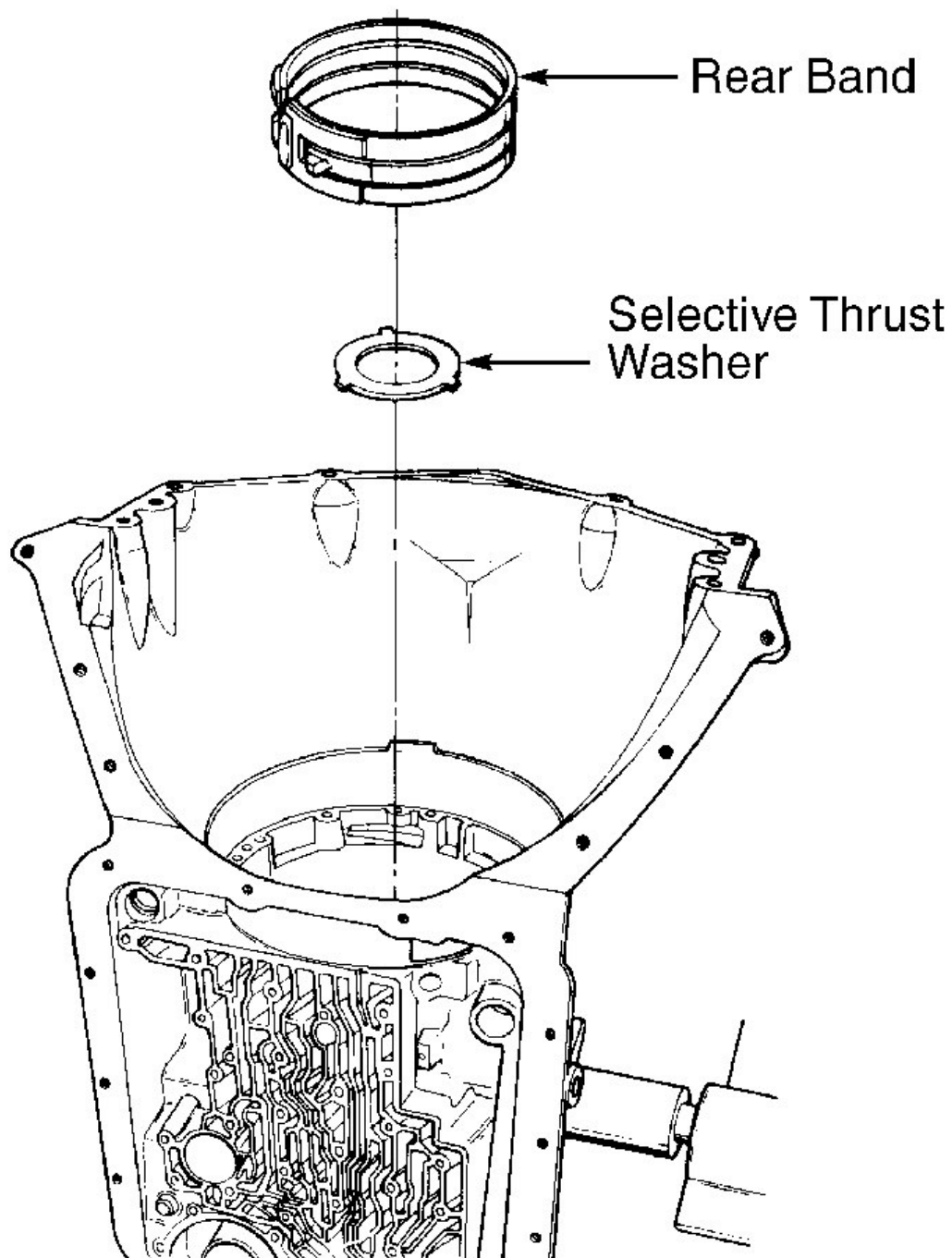
NOTE: All selective thrust washer measurements taken during disassembly must be rechecked at appropriate reassembly stage.

CENTER SUPPORT & REAR GEAR UNIT

1. Install rear band and thrust washer. Ensure band anchor pins engage band, and band assembly stop is in place. Install proper selective thrust washer. See **Fig. 47**. Install rear case snap ring. Install snap ring

groove into case, with snap ring opening at 3 o'clock position. See **Fig. 12**.

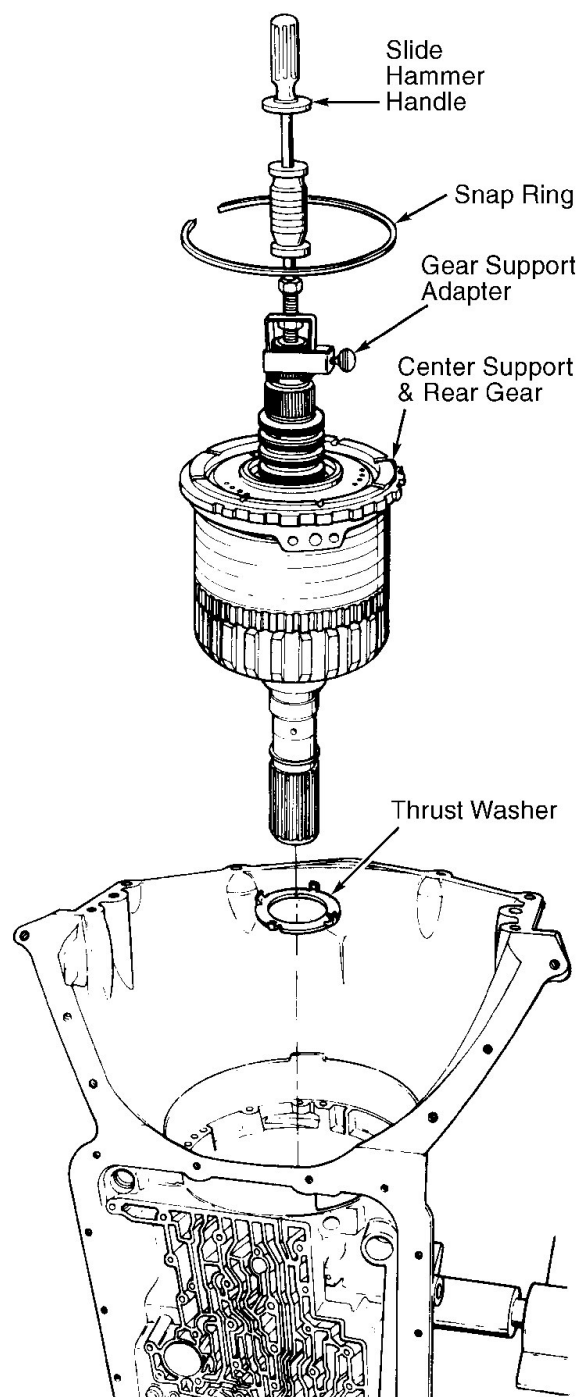
2. Using Gear Assembly Remover/Installer (J-38868), Adapter (J-21364-A) and Slide Hammer Handle (J-6125-B), install gear assembly. See **Fig. 48**.



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Fig. 47: Installing Rear Band & Selective Washer

Courtesy of GENERAL MOTORS CORP.



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Fig. 48: Installing Center Support & Gear Unit
Courtesy of GENERAL MOTORS CORP.

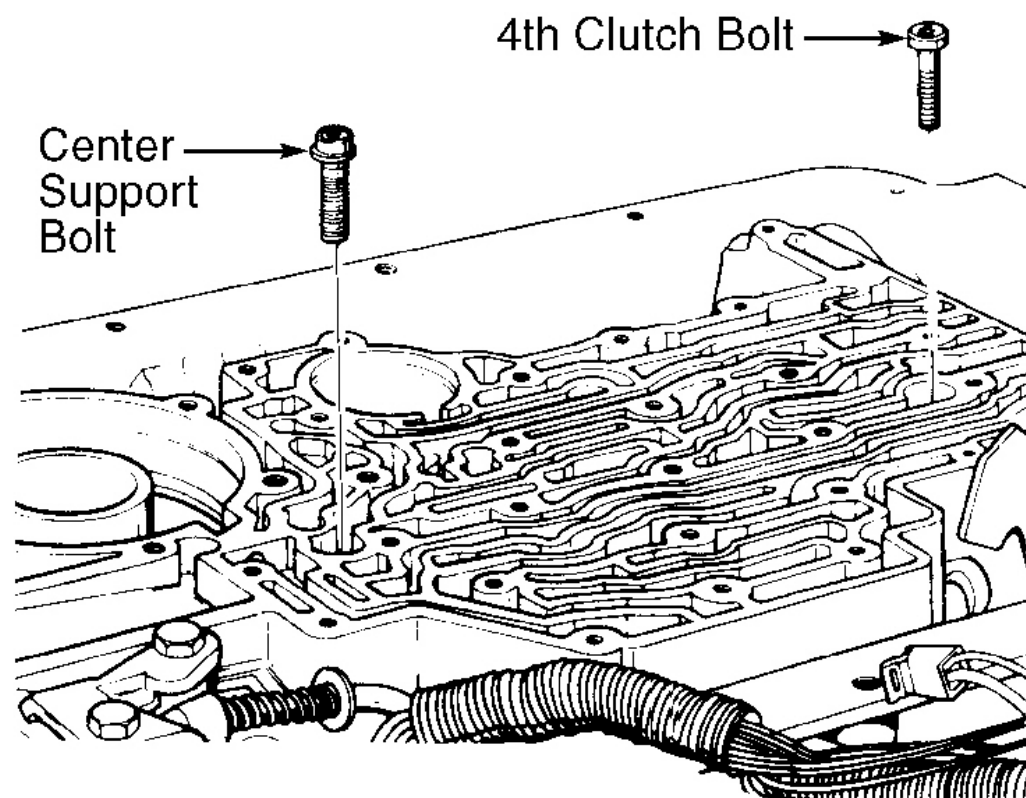
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3. Install upper center support snap ring with flat side down and opening at 3 o'clock position. Using Dial Indicator (J-8001), check rear unit end play. See **Fig. 11**. Rear unit end play should be .005-.025" (.13-.63 mm).
4. If rear unit end play is not correct, select proper size thrust washer. See **REAR END PLAY THRUST WASHER**. If necessary, remove center support and rear unit to change selective thrust washer.
5. Using Center Support Aligner (J-23093), push center support splines against case splines (away from rear servo). Align center support with bolt hole. Using new bolt, install center support bolt. See **Fig. 49**. Tighten bolt to 32 ft. lbs. (43 N.m).

REAR END PLAY THRUST WASHER

Identification	Thickness
No. 1	.074-.078" (1.88-1.98 mm)
No. 2 (Side Of Tab)	.082-.086" (2.08-2.18 mm)
No. 3 (Side Of Tab)	.090-.094" (2.29-2.39 mm)
No. 4 (End Of Tab)	.098-.102" (2.49-2.59 mm)
No. 5 (End Of Tab)	.106-.110" (2.69-2.79 mm)
No. 6 (End Of Tab)	.114-.118" (2.89-3.00 mm)

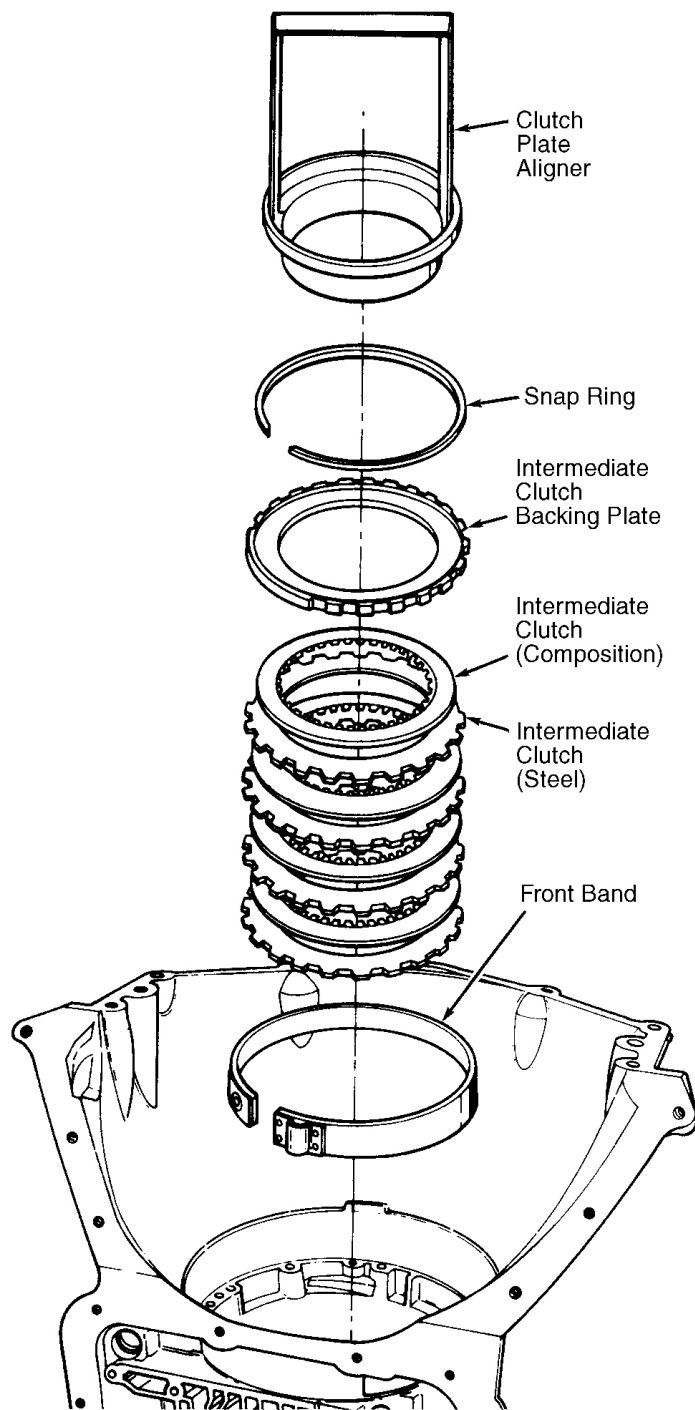


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Fig. 49: Installing Center Support & 4th Clutch Bolts
Courtesy of GENERAL MOTORS CORP.

INTERMEDIATE CLUTCH

Install intermediate clutch plates (4 steel and 4 composition). See **Fig. 50**. Install backing plate and snap ring. Ensure clearance between clutch plates and backing plate is .040-.107" (1.02-2.72 mm). Using Clutch Plate Aligner (J-24396), align intermediate clutch assembly.



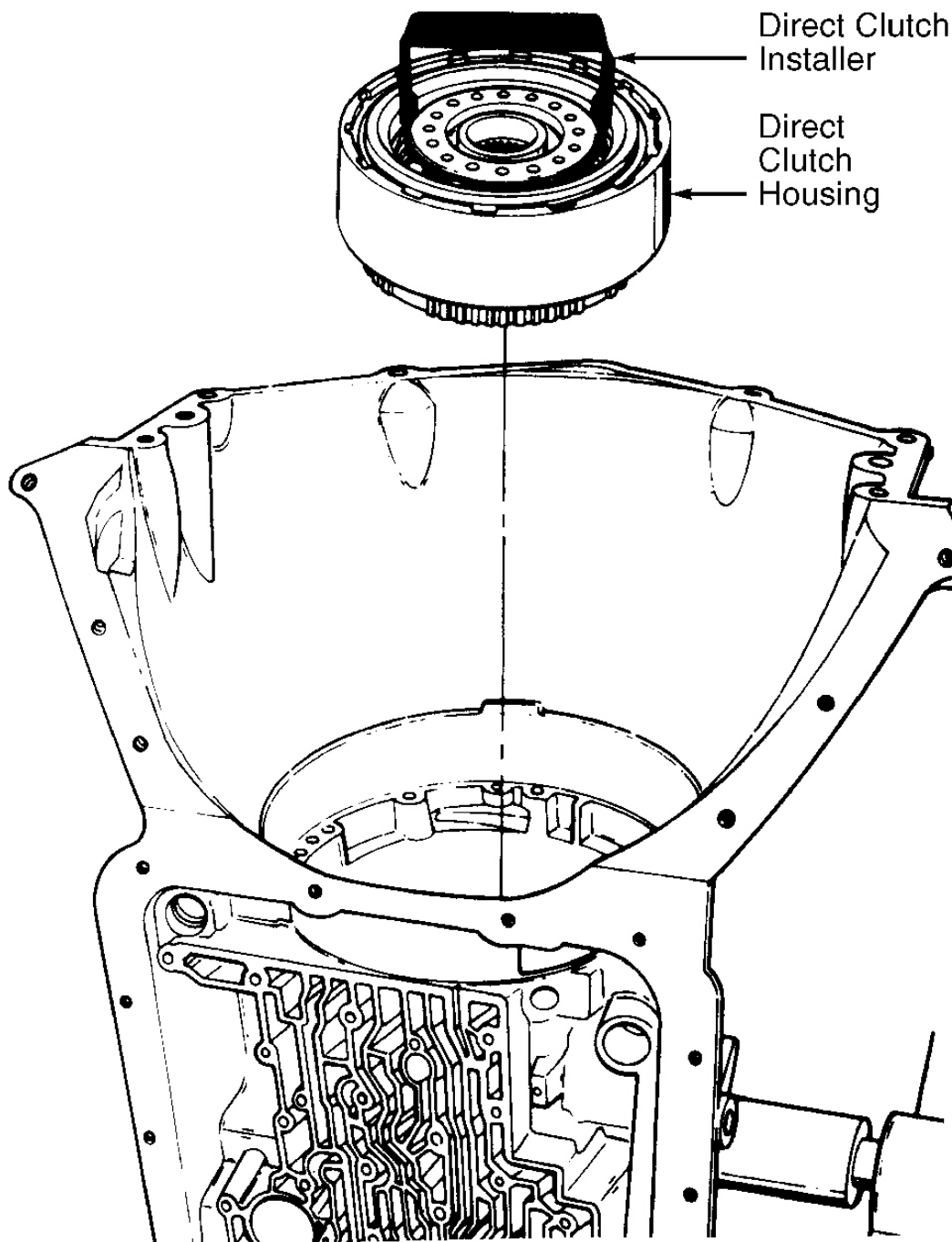
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Fig. 50: Installing Intermediate Clutch Plates & Front Band
Courtesy of GENERAL MOTORS CORP.

FORWARD & DIRECT CLUTCH

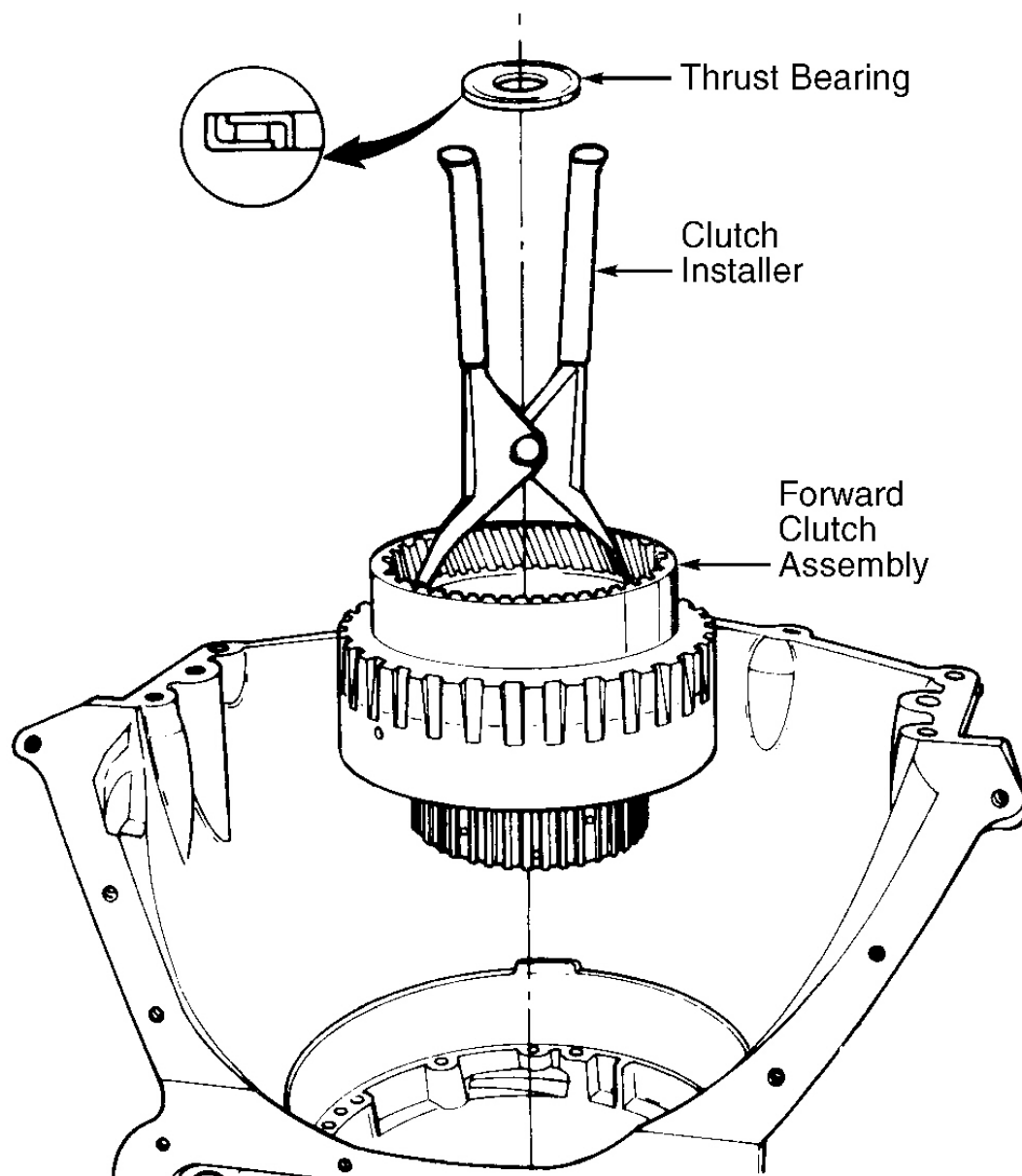
Apply air pressure into center support hole to hold intermediate clutch plates in place. Using Clutch Installer (J-38733), install direct clutch assembly and front band. See **Fig. 50** and **Fig. 51** . Using Clutch Installer (J-38358-A), install forward clutch assembly and thrust bearing. See **Fig. 52** and **Fig. 62** .

NOTE: Check installed height of speed sensor ring (on forward clutch housing). Top of speed sensor ring to oil pump gasket surface height should be 3.85-3.89" (98-99 mm).



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Fig. 51: Installing Direct Clutch
Courtesy of GENERAL MOTORS CORP.



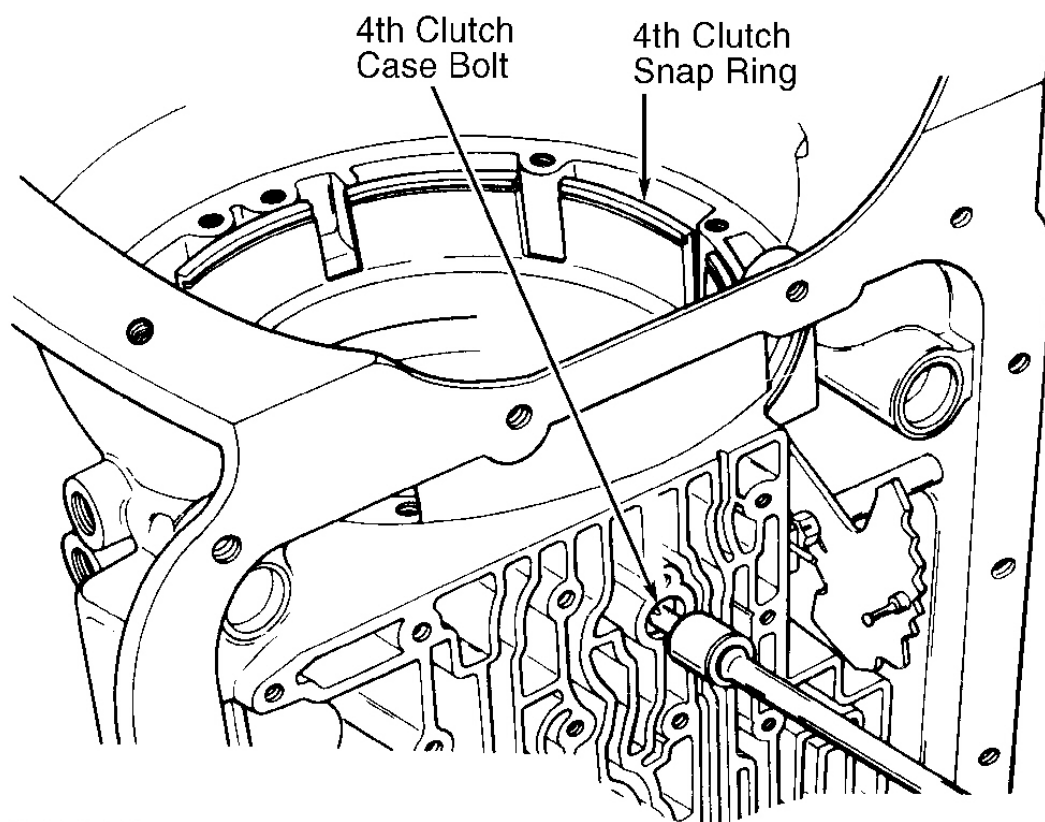
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Fig. 52: Installing Forward Clutch
Courtesy of GENERAL MOTORS CORP.

OVERDRIVE ASSEMBLY & 4TH CLUTCH

1. Install 4th clutch support (without clutch plates) into transmission case. Using 40T Torx wrench, install new 4th clutch support bolt. See **Fig. 53**. Tighten bolt to 12 ft. lbs. (16 N.m).
2. Remove turbine seal sizer from turbine shaft. Install turbine shaft and overdrive assembly. See **Fig. 33**.

Ensure assembly is fully seated. Install 4th clutch plates (4 steel and 4 composition). See **Fig. 54**. Install backing plate and snap ring. See **Fig. 55**.



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Fig. 53: Installing 4th Clutch Support Bolt
Courtesy of GENERAL MOTORS CORP.

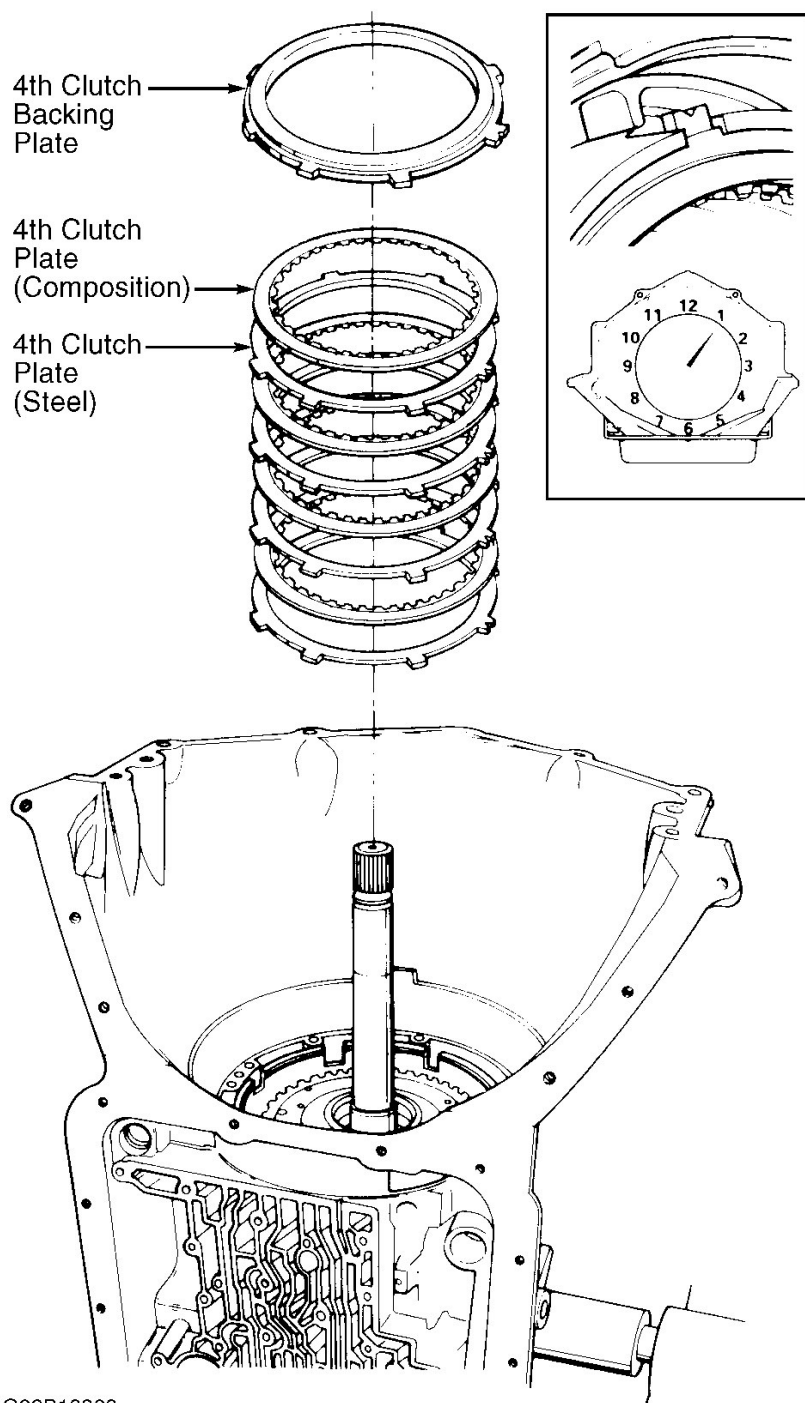
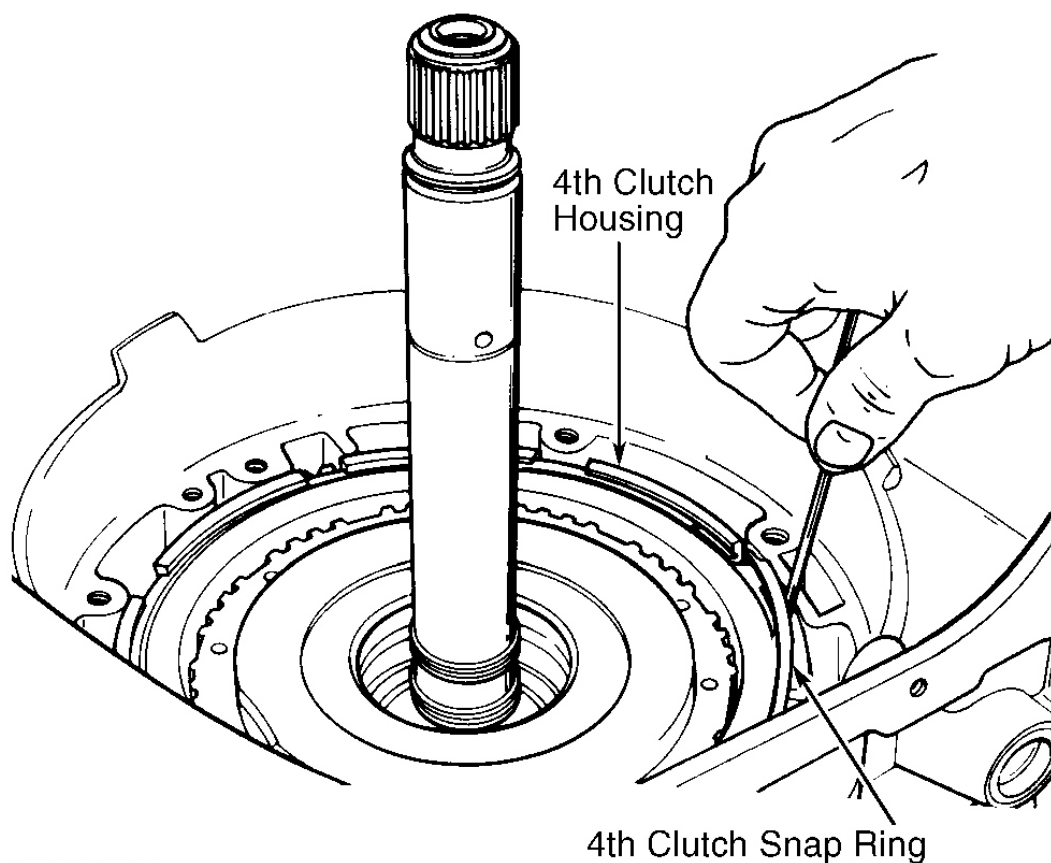


Fig. 54: Installing 4th Clutch
 Courtesy of GENERAL MOTORS CORP.



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Fig. 55: Installing 4th Clutch Snap Ring
Courtesy of GENERAL MOTORS CORP.

OIL PUMP

1. Using Locating Pin (J-25025-1), install oil pump gasket. See **Fig. 56**. Install selective washer. Using Handle (J-37789), install oil pump assembly. See **Fig. 57**. Ensure turbine shaft spins free. Tighten oil pump mounting bolts.
2. Using Dial Indicator (J-8001), check front unit end play. See **Fig. 10**. Front unit end play should be .004-.022" (.10-.56 mm).
3. If front unit end play is not correct, select proper size thrust washer. See **FRONT END PLAY THRUST WASHER**. If necessary, remove oil pump assembly to change selective thrust washer.

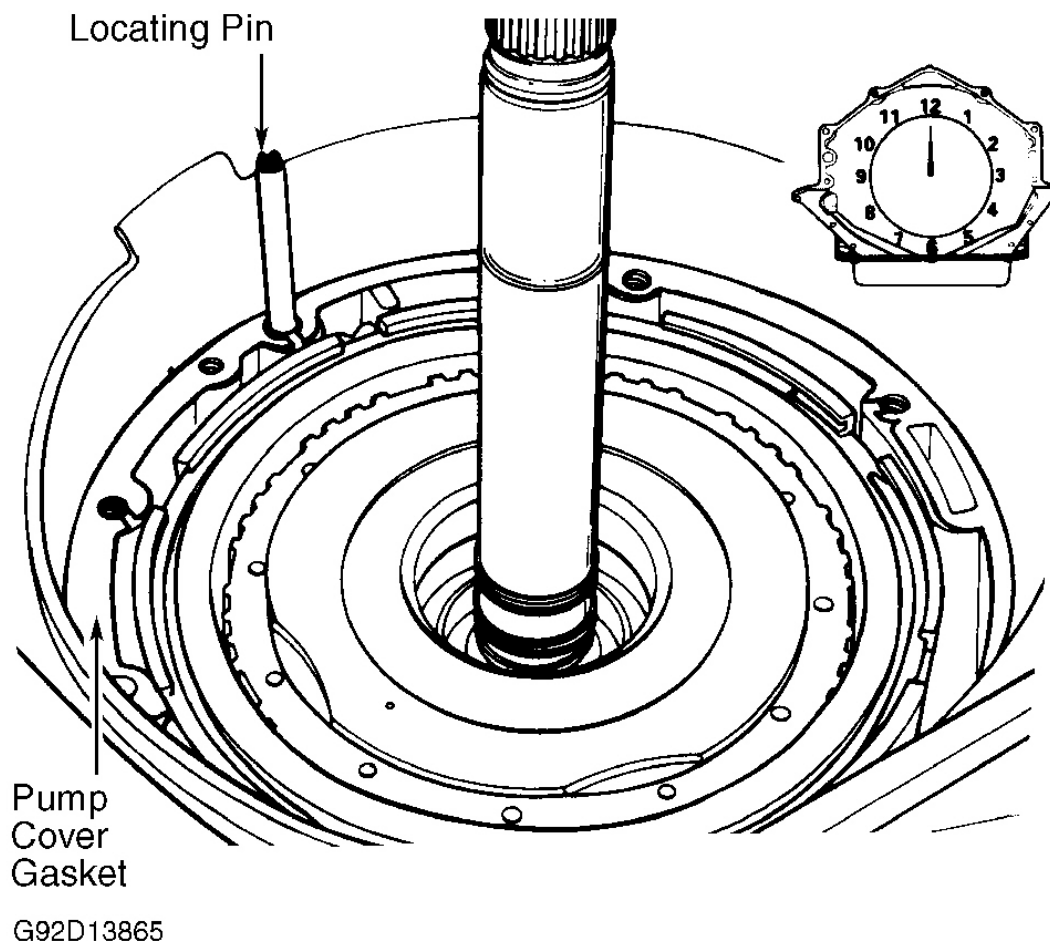
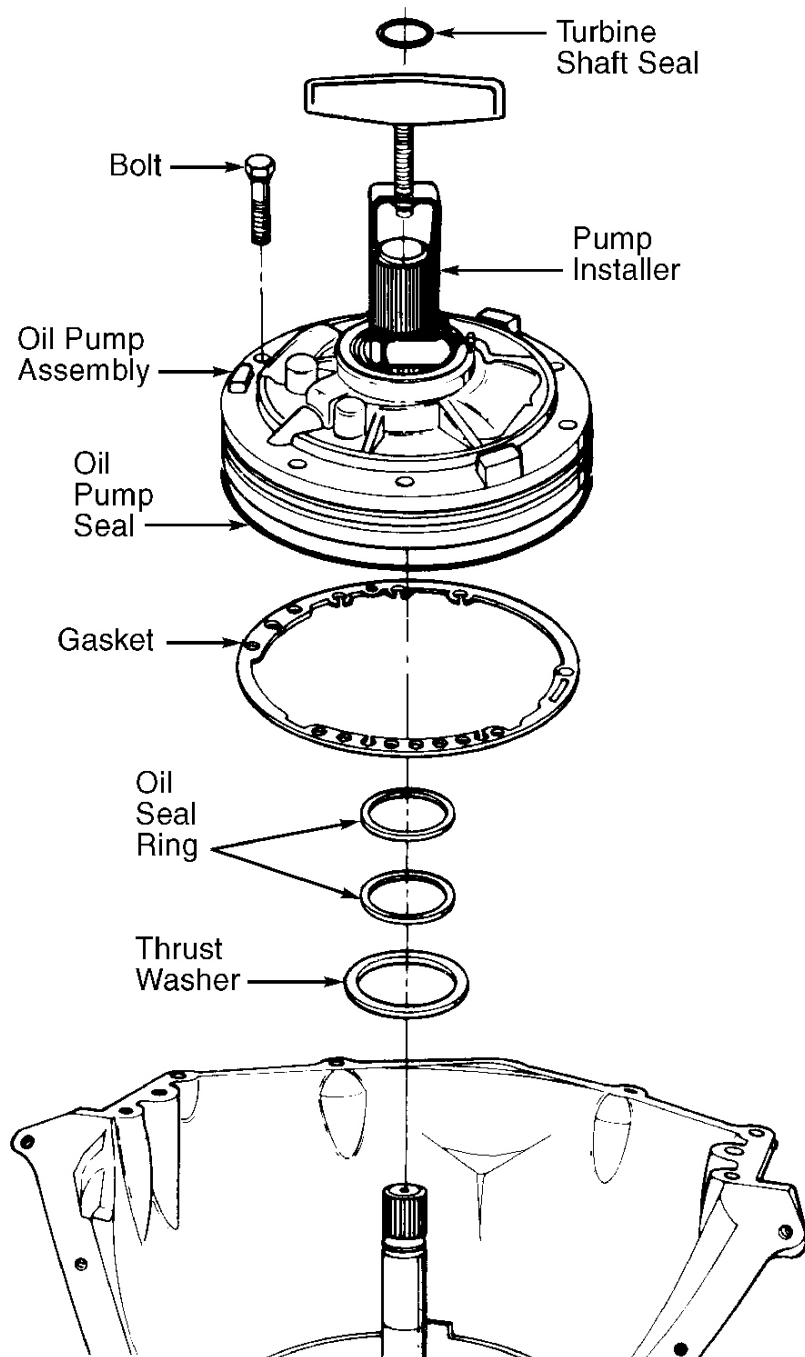


Fig. 56: Installing Oil Pump Gasket
Courtesy of GENERAL MOTORS CORP.



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Fig. 57: Installing Oil Pump & Washers
Courtesy of GENERAL MOTORS CORP.

FRONT END PLAY THRUST WASHER

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Identification	Thickness
Blue	.057-.061" (1.45-1.55 mm)
Red	.073-.077" (1.85-1.96 mm)
Brown	.089-.093" (2.26-2.36 mm)
Green	.105-.109" (2.67-2.77 mm)
Plain	.121-.125" (3.07-3.18 mm)

SERVO ASSEMBLIES

Install selected rear band apply pin. If necessary, check rear band apply pin using Band Apply Selector Pin (J-21370-10) and Band Apply Pin Gauge (J-38737). See SERVO ASSEMBLIES under **TRANSMISSION DISASSEMBLY**. Install front and rear servo assemblies. See **Fig. 44** and **Fig. 58**.

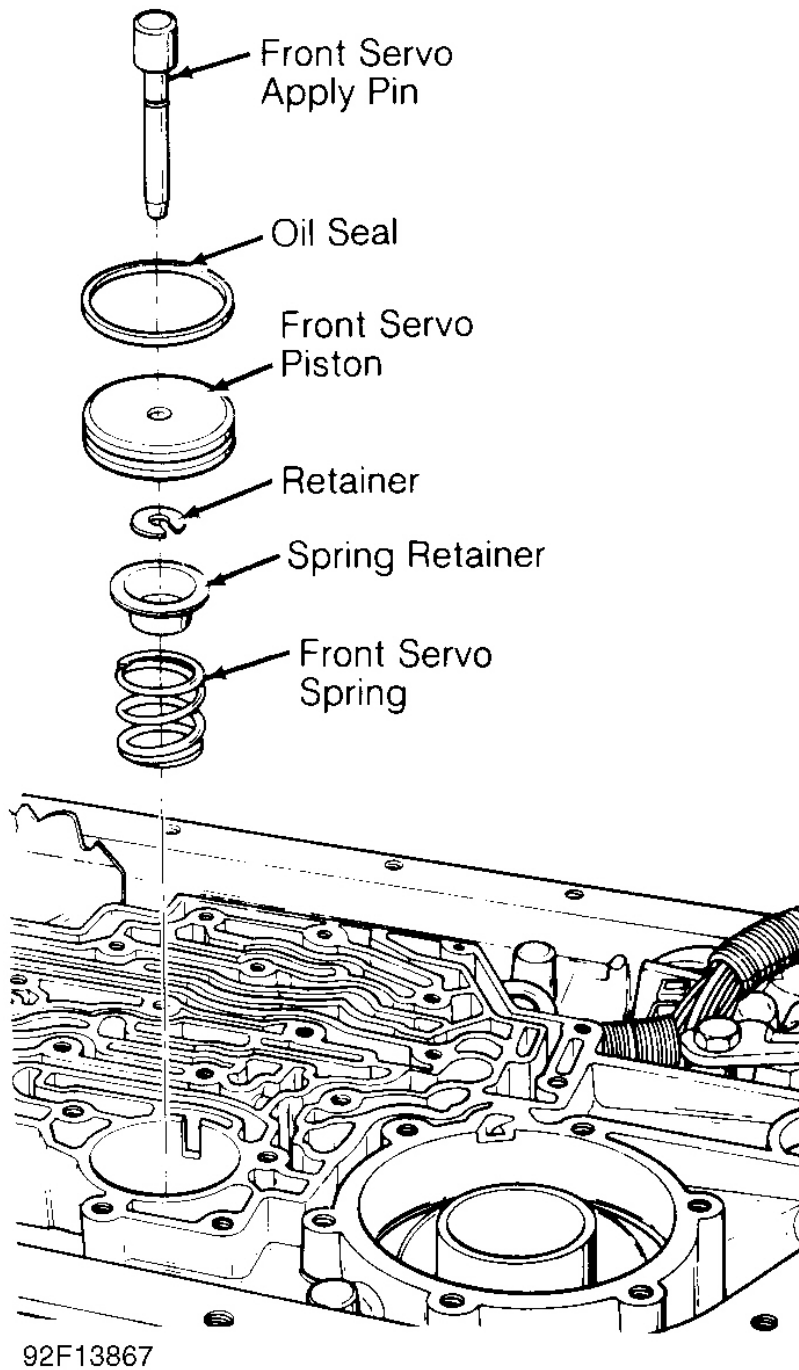
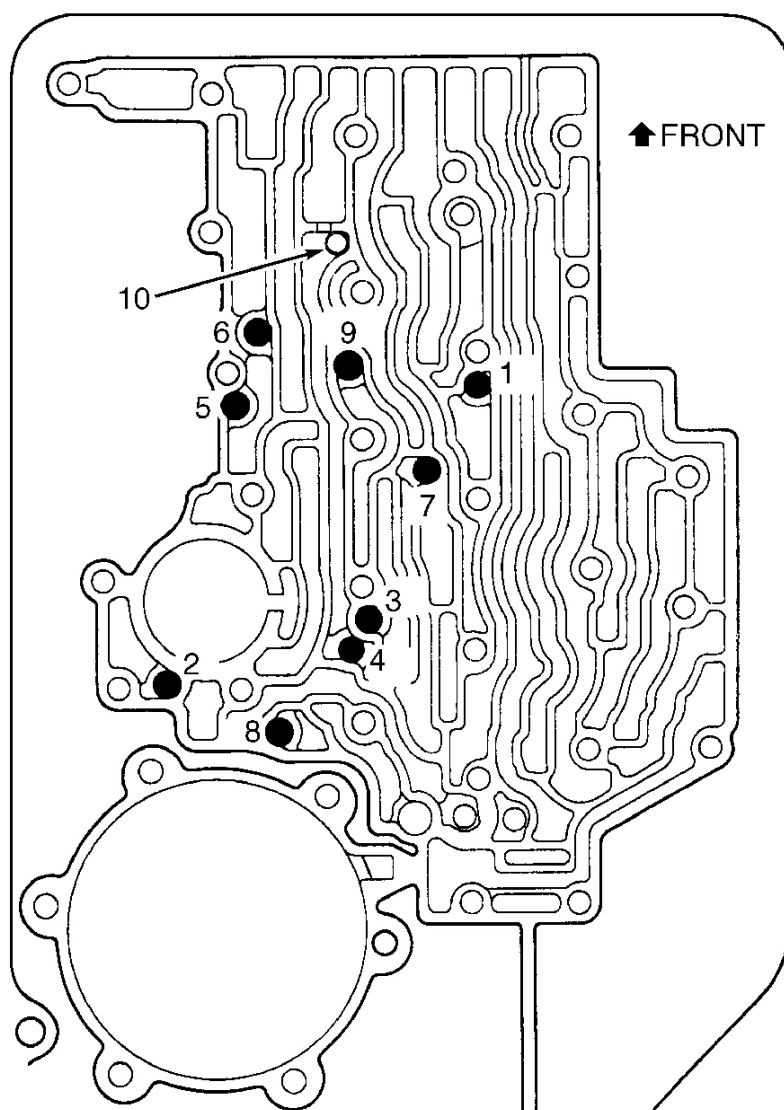


Fig. 58: Installing Front Servo
Courtesy of GENERAL MOTORS CORP.

LOWER TRANSMISSION ASSEMBLY

Install parking pawl and manual linkage. See **Fig. 6**. Install check balls in case. See **Fig. 59**. Assemble and install accumulator assembly. See **Fig. 45**. Tighten accumulator assembly bolts in sequence. See **Fig. 60**. Install valve body assembly. See **Fig. 46**. Install lube pipe and wiring harness. See **Fig. 61**. Install oil pan and oil filter.



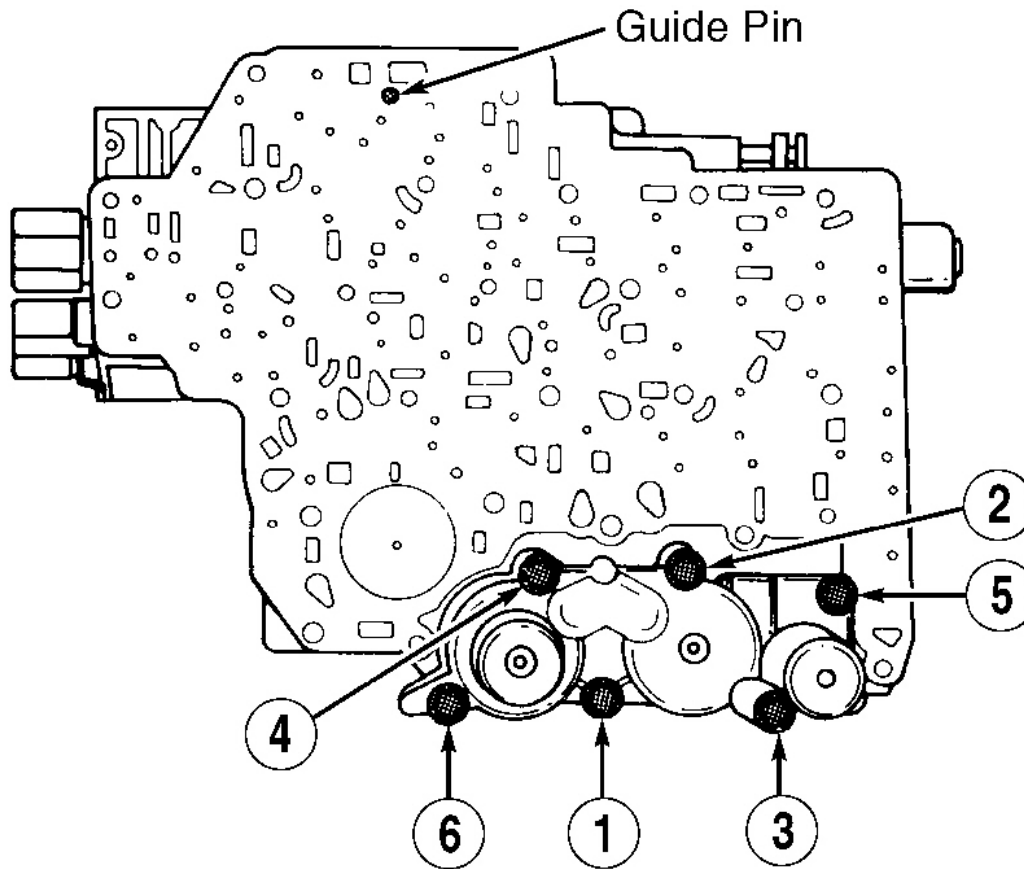
- | | |
|-------------------------------------|-------------------------|
| 1. Overrun Clutch | 6. 4th Accumulator |
| 2. 2nd Accumulator
(Some Models) | 7. 3rd Clutch |
| 3. Front Band Apply | 8. Reverse |
| 4. 2nd Clutch | 9. 4th Clutch |
| 5. 3rd Accumulator | 10. PWM Solenoid Screen |

NOTE: Identifying check balls located at numbers 1-9.

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Fig. 59: Locating Check Balls

Courtesy of GENERAL MOTORS CORP.



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Fig. 60: Installing Accumulator Assembly
Courtesy of GENERAL MOTORS CORP.

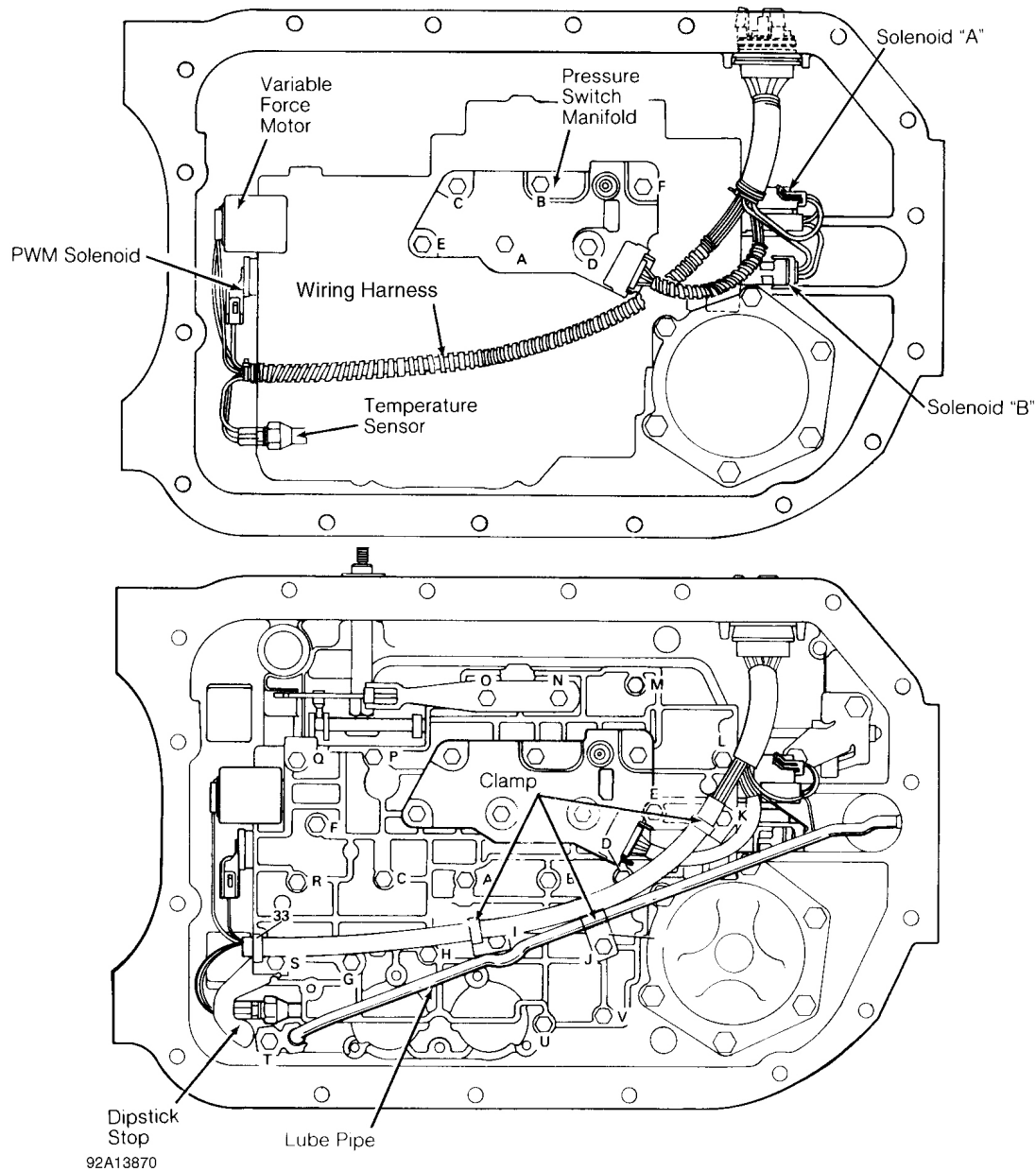


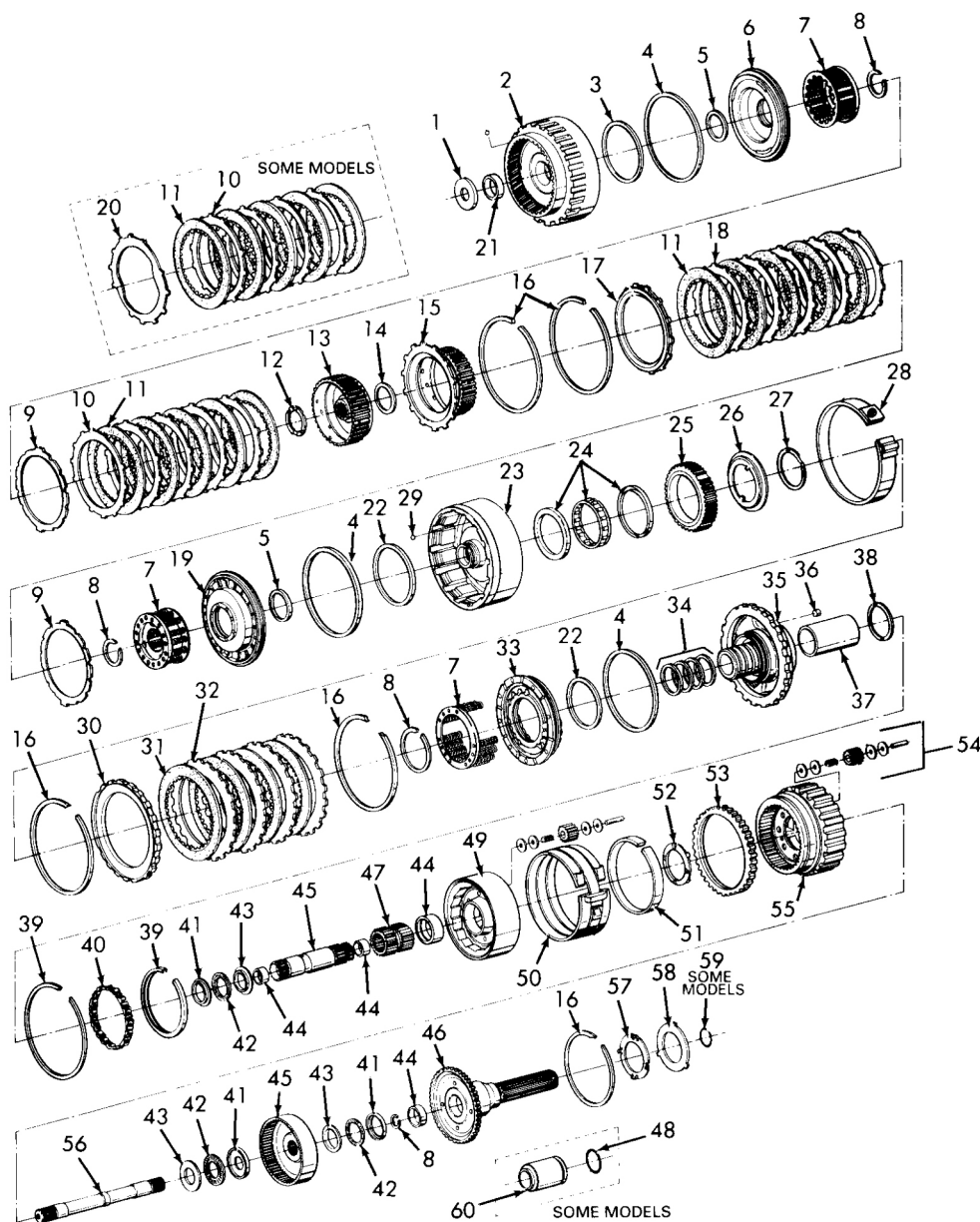
Fig. 61: Removing & Installing Lube Pipe & Wiring Harness
 Courtesy of GENERAL MOTORS CORP.

SPEED SENSORS/REAR HOUSING

Install and secure torque converter. Install rear extension housing. Install speed sensors.

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- | | | |
|----------------------------------|--|------------------------------|
| 1. Forward Clutch Thrust Bearing | 21. Bushing | 41. Thrust Bearing Race |
| 2. Forward Clutch Housing | 22. Center Clutch Seal | 42. Needle Bearing |
| 3. Center Clutch Seal | 23. Direct Clutch Housing | 43. Thrust Bearing Race |
| 4. Outer Clutch Seal | 24. Intermediate Sprag Assembly | 44. Sun Gear Bushing |
| 5. Inner Clutch Seal | 25. Intermediate Clutch Outer Race | 45. Sun Gear Shaft |
| 6. Forward Clutch Piston | 26. Intermediate Clutch Retainer | 46. Output Shaft |
| 7. Spring Retainer | 27. External Locking Ring | 47. Sun Gear |
| 8. Snap Ring | 28. Front Band | 48. Output Shaft Seal |
| 9. Dished Clutch Plate | 29. Check Ball | 49. Reaction Drum & Carrier |
| 10. Clutch Plate | 30. Intermediate Clutch Backing Plate | 50. Rear Brake Band |
| 11. Clutch Plate Assembly | 31. Intermediate Clutch Plate Assembly | 51. Front Internal Gear Ring |
| 12. Thrust Washer | 32. Intermediate Clutch Plate | 52. Reaction Carrier Washer |
| 13. Forward Clutch Hub | 33. Intermediate Clutch Piston | 53. Output Speed Sensor Ring |
| 14. Forward Clutch Thrust Washer | 34. Oil Seal Ring | 54. Pinion Assembly |
| 15. Direct Clutch Driven Hub | 35. Center Support Assembly | 55. Output Carrier Assembly |
| 16. Snap Ring | 36. Orifice Plug | 56. Main Shaft |
| 17. Direct Clutch Backing Plate | 37. Bushing | 57. Thrust Washer |
| 18. Clutch Plate | 38. Reaction Drum Thrust Washer | 58. Selective Thrust Washer |
| 19. Direct Clutch Piston | 39. Spacer | 59. Output Shaft Seal |
| 20. Waved Clutch Plate | 40. Roller Clutch Assembly | 60. Yoke Seal |

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Fig. 62: Exploded View of Hydra-Matic 4L80-E
 Courtesy of GENERAL MOTORS CORP.

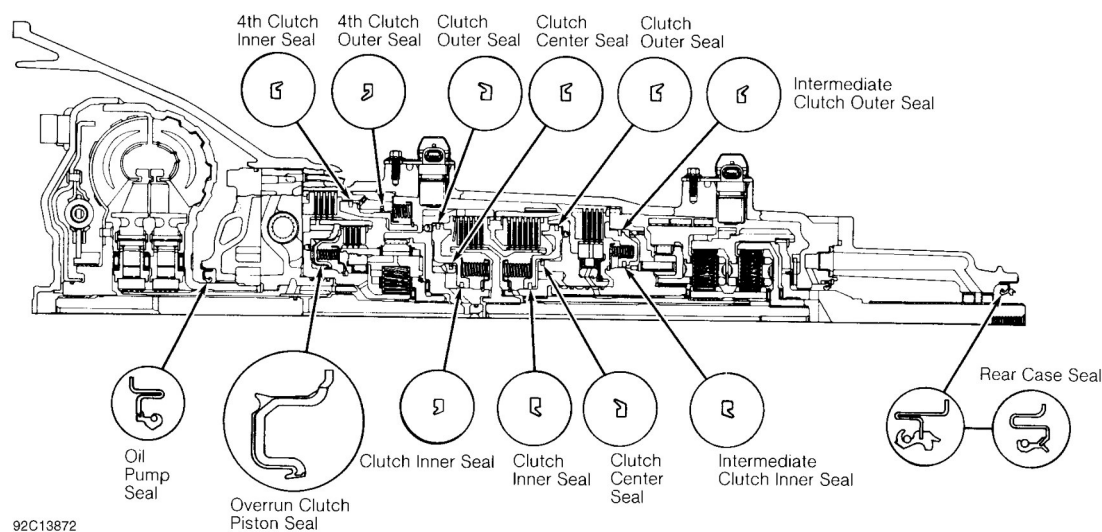


Fig. 63: Identifying Hydra-Matic 4L80-E Lip Seals
 Courtesy of GENERAL MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Center Support Screw	29 (39)
Connector Cooler Fitting Bolts	29 (39)
Converter-To-Flexplate Bolts	32 (43)
Extension Housing-To-Case	25 (34)
Manual Shaft-To-Detent Lever Nut	18 (24)
Oil Pan Bolts	18 (24)
Parking Pawl Bracket	18 (24)
Pump Body-To-Case Bolts	18 (24)
Pump Cover-To-Pump Body Bolts	18 (24)
Rear Servo Cover	18 (24)
Rear Transmission Mount	32 (43)
Rear Transmission Support Bracket	32 (43)
Transmission-To-Engine	32 (43)
4th Clutch	12 (16)
INCH Lbs. (N.m)	
Accumulator Cover-To-Case Bolts	98 (11)
Force Motor Bracket	71 (8)

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Lube Pipe	98 (11)
Pipe Plug	98 (11)
Speed Sensor	98 (11)
Solenoid-To-Valve Body Bolts	71 (8)
Temperature Sensor	35 (4)
Valve Body-To-Case Bolts	98 (11)

WIRING DIAGRAMS

NOTE: See HYDRA-MATIC 4L80-E DIAGNOSIS article.