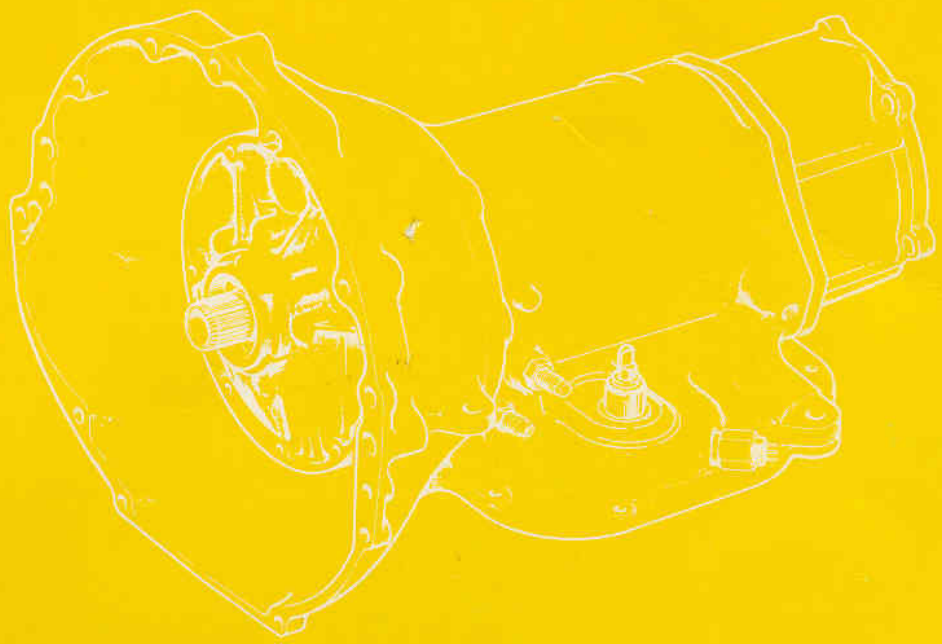
T.A. 700-900

8981 320 381 U.S.A./Canada Edition



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Service Manual

Model 700/900 Series

TRANSMISSION

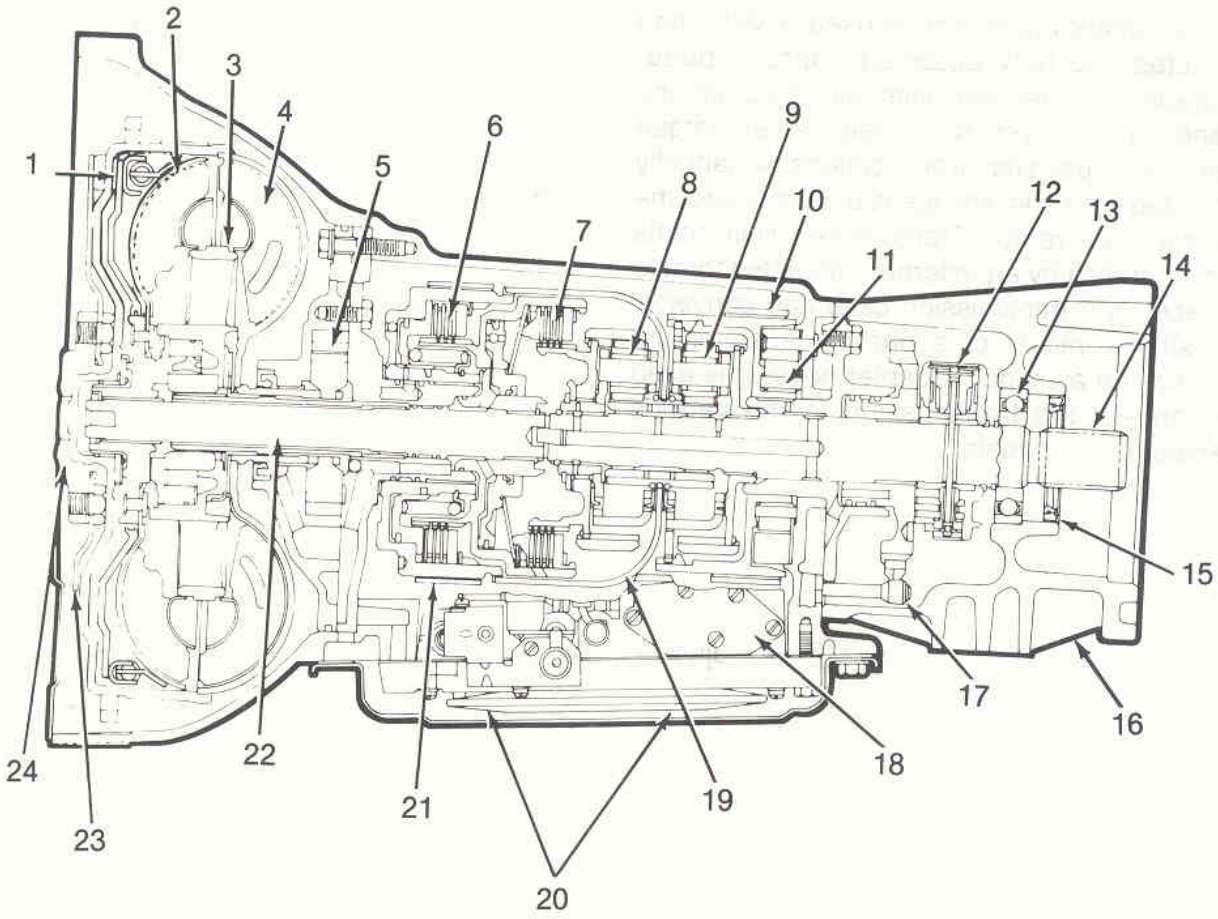
86 – 998 trans

August 1983 U.S.A./Canada Edition

8981 320 381

All information and specifications in this manual are based on the latest date available at the time of publication. American Motors Corporation reserves the right to discontinue designs or change specifications without notice or incurring obligation.

SEE I.S. NOTES



1. Lock-up Clutch
2. Turbine
3. Stator
4. Impeller
5. Oil Pump
6. Front Clutch
7. Rear Clutch
8. Front Planetary Gear Set
9. Rear Planetary Gear Set
10. Low and Reverse (Rear) Band
11. Overrunning Clutch
12. Governor
13. Bearing
14. Output Shaft
15. Seal
16. Adapter Housing
17. Parking Low Assembly
18. Valve Body
19. Sun Gear Driving Shell
20. Oil Filter
21. Kick Down (Front) Band
22. Input Shaft
23. Flexible Drive
24. Engine Crankshaft

84448

SPECIAL TOOLS

SEE I.S. NOTES

Tool Ref.	Description	Required	Recommended
J-24040-A	Input Shaft Bushing Installer (727)	■	
J-24041-A	Input Shaft Bushing Remover (727)	■	
J-24042	Front Clutch Spring Compressor and Overrunning Clutch Cam Installer (727)	■	
J-24044	Detent Ball Retainer	■	
J-24045	Pump Rotor Alignment Tool (727)	■	
J-24048	Extension Housing Bushing Remover/ Installer (727)	■	
J-24049-A	Oil Pump Bushing Remover/Installer	■	
J-24055	Oil Pump Bushing Remover/Installer (727)	■	
J-24063-01	Kickdown Band Adjustment Adapter	■	
J-24064	Front Clutch Bushing Remover/ Installer	■	
J-24108-A	Pilot Studs	■	
J-5853-B	Torque Wrench (0-250 in-lbs)		■
J-8001	Dial Indicator Set		■
J-24026	Transmission Holding Fixture		■
J-9617	Front Pump Oil Seal Installer	■	
J-3387-2	Pilot Studs	■	
J-21005-01	Front Pump Oil Seal Installer (727)	■	
J-2I232-01	Front Pump Oil Seal Remover	■	
J-22205	Front Pump Oil Seal Remover (Legs)	■	
J-23327	Front Clutch Spring Compressor	■	
J-24031	Kickdown Valve Gauge	■	

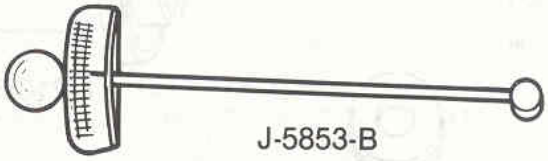
SEE I.S. NOTES

SPECIAL TOOLS continued

Tool Ref.	Description	Required	Recommended
J-24032	Reaction Shaft Bushing Installer	■	
J-24033	Pump Rotor Alignment Tools	■	
J-24036-A	Reaction Shaft Bushing Remover	■	
J-24037-A	Reaction Shaft Bushing Remover (727)	■	
J-24038	Reaction Shaft Bushing Installer (727)	■	
J-24039	Front Clutch Retainer Bushing Remover and Installer (727)	■	

SEE I.S. NOTES

J-24044



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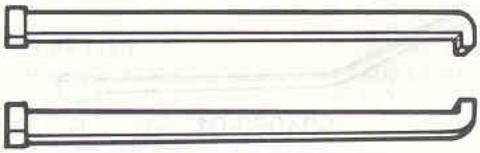

J-22205

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J-24038

J-24031

J-24045

J-24055

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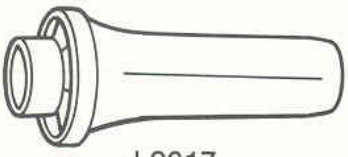
SEE I.S. NOTES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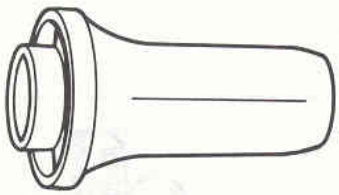
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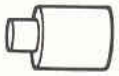
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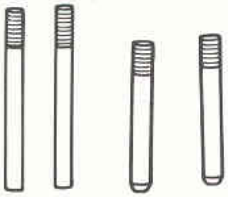
J-24049-A


J-24063-01


J-23327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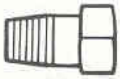
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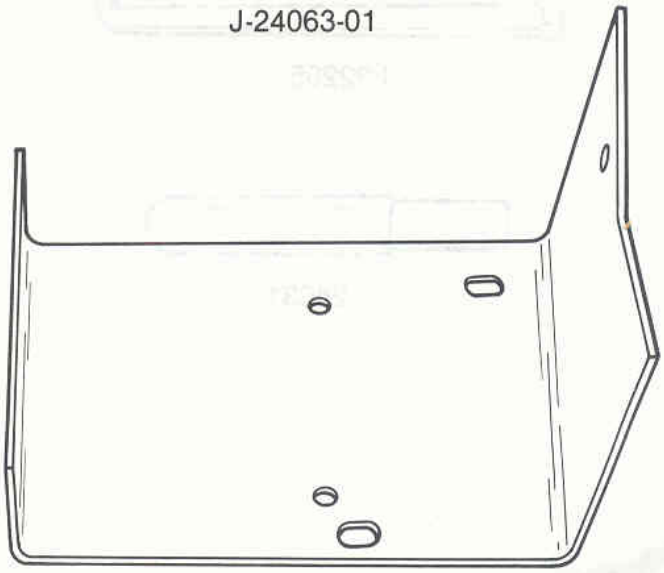
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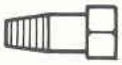
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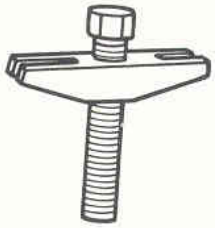
J-24042


J-24037-A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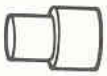
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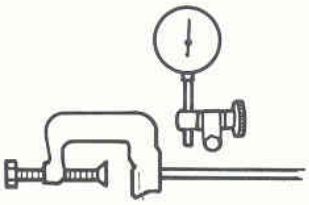
J-24048


J-24033


J-8001

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SPECIFICATIONS

SEE I.S. NOTES

Transmission Specifications

	MODEL 904 HO - 998	MODEL 999	MODEL 727
Clutch Plate Clearance			
Front Clutch	3 Disc 0.074 to 0.125 in. 4 Disc 0.067 to 0.134 in.	3 Disc 0.074 to 0.125 in. 4 Disc 0.067 to 0.134 in. 5 Disc 0.075 to 0.152 in.	3 Disc 0.070 to 0.129 in. 4 Disc 0.070 to 0.129 in.
Rear Clutch	3 and 4 Disc 0.032 to 0.55 in.	3 and 4 Disc. 0.032 to 0.55 in.	4 Disc. 0.025 to 0.045 in.
Clutch Component Thickness Tolerance			
Front Clutch			
Lined Plate	.083 to .088 in.	0.083 to 0.088 in.	0.090 to 0.095 in.
Steel Plate	.066 to 0.71 in.	0.066 to 0.071 in.	0.066 to 0.071 in.
Pressure Plate	.244 to .218 in	0.244 to 0.218 in.	0.278 to 0.282 in.
Rear Clutch			
Lined Plate	.060 to .065 in.	0.060 to 0.065 in.	0.060 to 0.065 in.
Steel Plate	.066 to .071 in.	0.066 to 0.071 in.	0.066 to 0.071 in.
Flat Pressure Plate	.214 to .218 in.	0.214 to 0.218 in.	0.278 to 0.282 in.
Formed Pressure Plate	.409 to .413 in.	0.409 to 0.413 in.	0.441 to 0.445 in.

Clutches	904 HO	998	999	727
Number of Front Clutch Plates	4	4	5	4
Number of Front Clutch Discs	4	4	5	4
Number of Rear Clutch Plates	3	3	3	3
Number of Rear Clutch Discs	4	4	4	4

	MODEL 904 HO		MODEL 998		MODEL 999		MODEL 727	
	U.S. Measure	Metric Measure	U.S. Measure	Metric Measure	U.S. Measure	Metric Measure	U.S. Measure	Metric Measure
Torque Converter Diameter	260 mm (10.2 in.)		10.75 in				10.75 in.	
Oil Capacity — Transmission and Torque Converter	15.8 pts.	7.5 ltrs.	17 pts.	7.9 ltrs.	17 pts.	7.9 ltrs	17 pts.	7.9 ltrs.
Cooling Method — All Models	Water-Heat Exhanger (In Radiator Lower Tank)							
Lubrication - All Models	Rotor Type Pump							

First	Second	Third	Reverse
2.74 to 1	1.55 to 1	1.00 to 1	2.20 to 1

Pump Clearances				
Outer Rotor to Case Bore	.004 to .008 in.	.004 to .008 in.	.004 to .008 in.	
Outer to Inner Tip	.005 to .010 in.	.006 to .010 in.	.005 to .010 in.	
End Clearance-Rotors	.001 to .003 in.	.001 to .003 in.	.001 to .003 in.	.001 to .002 in.
Gear Train End Play	.001 to .047 in.	.001 to .047 in.	.001 to .047 in.	.009 to .044 in.
Ouput Shaft End Play	.022 to .091 in.	.022 to .091 in.	.016 to .059 in.	.036 to .084 in.
Snap Rings				
Front and Rear Clutches				
Rear Snap Ring (Selective)	.060 to .062 in.	.060 to .062 in.	.060 to .062 in.	.060 to .062 in.
	.068 to .070 in.	.068 to .070 in.	.068 to .070 in.	.074 to .076 in.
	.076 to .078 in.	.076 to .078 in	.076 to .078 in.	.088 to .090 in.
Output Shaft (Forward End)	.040 to .044 in.	.040 to .044 in.	.040 to .044 in.	.048 to .052 in.
	.048 to .052 in.	.048 to .052 in.	.048 to .052 in.	.055 to .059 in.
	.059 to .065 in.	.059 to .065 in.	.059 to .065 in.	.062 to .066 in.

84451

SEE I.S. NOTES

TORQUE SPECIFICATIONS

Component	Service Set-To Torque	Service Recheck Torque
Adapter Housing-to-Transmission Case Bolt	33 N·m (24 ft-lbs)	–
Governor Body Bolt	11 N·m (100 in-lb)	–
Front Band Adjusting Screw Locknut	47 N·m (35 ft-lbs)	–
Kickdown Lever Shaft Plug	17 N·m (150 in-lb)	–
Rear Band Adjusting Screw Locknut	47 N·m (35 ft-lbs)	–
Neutral Starter Switch	33 N·m (24 ft-lbs)	–
Oil Filler Tube Bracket Bolt	17 N·m (150 in-lb)	–
Oil Pan Bolt	17 N·m (150 in-lb)	12-18 N·m (9-13 ft-lbs)
Oil Pump Housing-to-Transmission Case Bolt	20 N·m (175 in-lb)	–
Output Shaft Support Bolt	17 N·m (150 in-lb)	–
Overrunning Clutch Cam Setscrew	4 N·m (40 in-lb)	–
Pressure Test Port Plug	12 N·m (110 in-lb)	–
Reaction Shaft Support to Oil Pump Bolt	18 N·m (160 in-lb)	–
Valve Body Screw	4 N·m (35 in-lb)	–
Valve Body-to-Transmission Case Screw	11 N·m (100 in-lb)	–

Thrust Washer Chart

Thrust Washers	Thrust Washer No. and Transmission Model			
	904 HO - 998 - 999		727	
Reaction Shaft Support to Front Clutch Retainer	No. 1	.061 to .063	No.1	Selective .061 to .063 — Natural .084 to .086 — Red .102 to .104 — Yellow
Rear Clutch to Front Clutch Retainer	No. 2	.061 to .063	No. 2	.061 to .063 — Natural
Output Shaft to Input Shaft	No. 3	Selective .052 to .054 — Tin .068 to .070 — Red .083 to .085 — Green	No. 3	.062 to .064
Front Annulus Support to Rear Clutch Retainer	No. 4	.121 to .125		——
Front Annulus Support to Front Planetary Gear	No. 5	.048 to .050	No. 4	.059 to .062
Driving Shell to Front Annulus Gear		——	No. 5	.060 to .062
Front Planetary Gear to Driving Shell	No. 6	.048 to .050		——
Sun Gear and Driving Shell Front Thrust Plate	No. 7	.050 to .052	No. 6	.034 to .036
Sun Gear and Driving Shell Rear Thrust Plate	No. 8	.050 to .052		——
Rear Planetary Gear to Driving Shell	No. 9	.048 to .050	No. 7	.059 to .062
Rear Planetary to Rear Annulus Gear		——	No. 8	.034 to .036
Rear Planetary Gear to Rear Annulus Support	No. 10	.048 to .050		——

SEE I.S. NOTES

SPECIFICATIONS

Band Adjustments

Transmission Model	904 HO	998	999	727
Kickdown (Front) Turns*	2-1/2	3	2	2-1/2
Low-Reverse (Internal) Turns*	**7	4	4	2

* Backed off from 72 inch-pounds.
** Backed off from 41 inch-pounds

84452

SEE I.S. NOTES

TRANSMISSION DISASSEMBLY

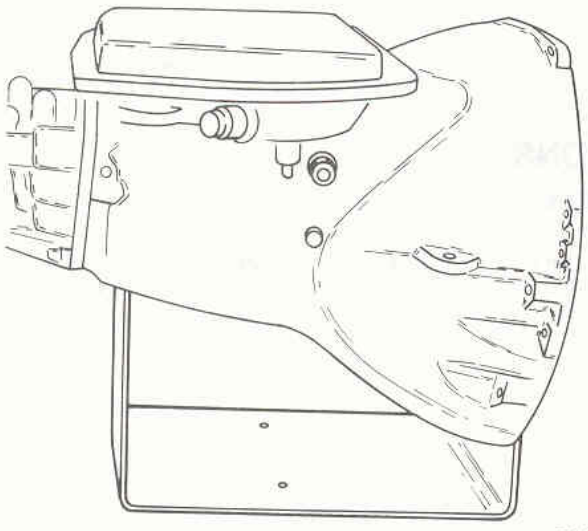
CAUTION: Cleanliness during disassembly and assembly is necessary to avoid a further malfunction after assembly. Before removing any of the transmission subassemblies, plug all openings and thoroughly clean the transmission exterior. Steam cleaning equipment is preferable for this purpose. During disassembly, clean all parts in a suitable solvent and dry each part using compressed air. Do not use cloth or paper towels to dry any parts after cleaning, use compressed air only.

End Play Measurement

NOTE: Measuring end play before disassembly will indicate whether a thrust washer change is required and save time at assembly.

Remove the transfer case from the transmission.

Mount the transmission in Holding Fixture J-24026.

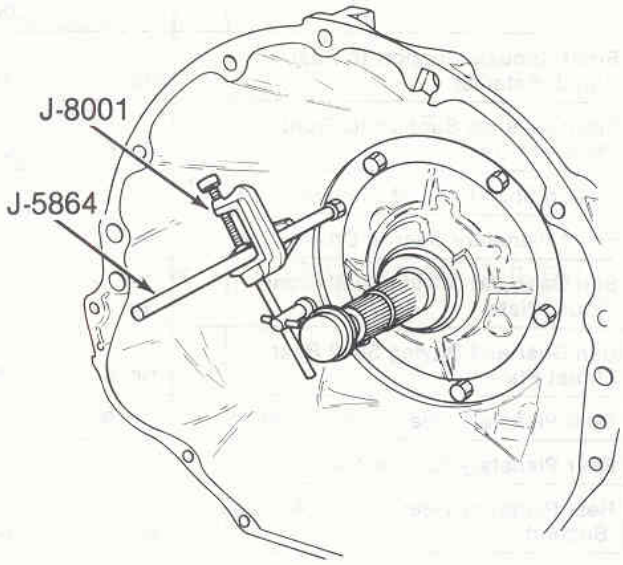


84453

Remove one pump attaching bolt and thread the Dial Indicator Support Rod J-5864 into the bolt hole.

Attach the Dial Indicator J-8001 to the rod.

Position the indicator stylus against the forward end of the input shaft.



84454

Move the input shaft rearward and set the dial indicator at zero.

Pull the input shaft forward to obtain the end play reading.

Record the reading for assembly reference.

Remove the dial indicator and rod.

Oil Pan Removal

Remove the oil pan attaching bolts and remove the oil pan and gasket. Be sure that any dirt which remained around the bolts does not fall into the transmission.

Valve Body Removal

Loosen the clamp bolts and remove the throttle and gear selector levers from the shafts.

Remove the neutral start switch.

Remove the valve body attaching screws.

Remove the valve body. Lift the valve body from the case and pull the park lock rod forward out of the case at the same time.

NOTE: If necessary, rotate the output shaft to allow the park lock rod to clear the sprag.

Accumulator Piston and Spring Removal

Remove the spring from the piston.

Identify the spring with a tag for assembly reference.

Remove the piston from the case.

Adapter Housing – Rear Bearing and Seal

Remove the housing attaching bolts and remove the housing.

Remove the bearing snap ring and remove the rear bearing from the housing.

Remove the seal from the housing.

Governor – Governor Support

Remove the E-clip (1) from the weight end of the governor valve (2).

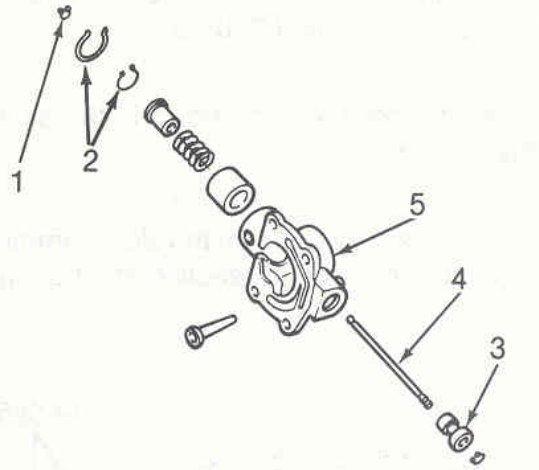
Remove the valve (3) and the shaft (4) from the governor body (5).

Rotate the output shaft until the governor weight faces downward.

Remove the snap ring located behind the governor body (6).

Remove the governor body and the park gear assembly from the output shaft (7).

SEE I.S. NOTES



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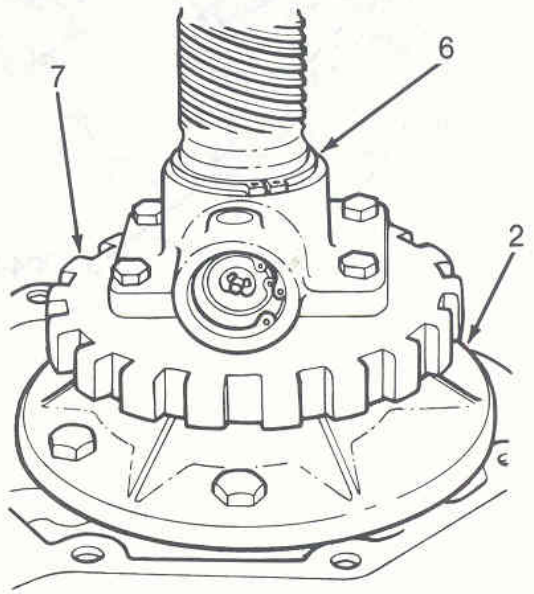


84456

SEE I.S. NOTES

Oil Pump and Reaction Shaft Support

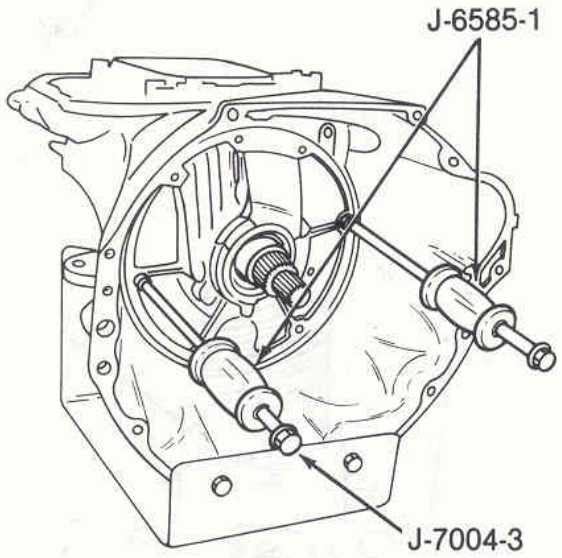
Tighten the front band adjusting screw until the band is tight around the front clutch retainer. This prevents the front clutch assembly from coming out with the pump and damaging the clutch discs.

Remove the oil pump attaching bolts.

Install Slide Hammer Tool J-6568-1 on Slide Hammer Bolts Tool J-7004-3.

Thread the bolts into the holes in the oil pump housing flange.

Bump outward evenly with the slide hammers to remove the pump and reaction shaft support.



84457

Front Band and Front Clutch

Loosen the front band adjusting screw and remove the band strut and band.

Remove the front clutch assembly.

Input Shaft and Rear Clutch

Remove the input shaft and rear clutch assembly by grasping the input shaft and pulling the assembly straight out of the case.

NOTE: Do not lose the thrust washer and thrust plate located between the rear end of the input shaft and the front end of the output shaft.

Output Shaft – Planetary Gears

Carefully remove the driving shell and output shaft assembly.

CAUTION: Be very careful to protect the machined surfaces on the output shaft during removal.

Rear Band and Drum

Pull the drum forward and out of the case.

Loosen the band adjusting screw.

Thread the 6 mm (1/4-inch) bolt into the actuating lever pivot pin.

Grip the bolt with pliers and remove pivot pin.

Remove the lever, linkage and band.

Overrunning Clutch

Carefully remove the clutch hub, rollers and springs, and store the parts where they will not be lost or damaged.

Front Servo Removal

Remove the front servo pressure port plug (1).

Compress the servo piston rod guide until it bottoms in the case bore.

Insert a No. 2 Phillips screwdriver (2) into the pressure port.

Slowly release the rod guide against the screwdriver.

Remove the servo retaining snap ring.

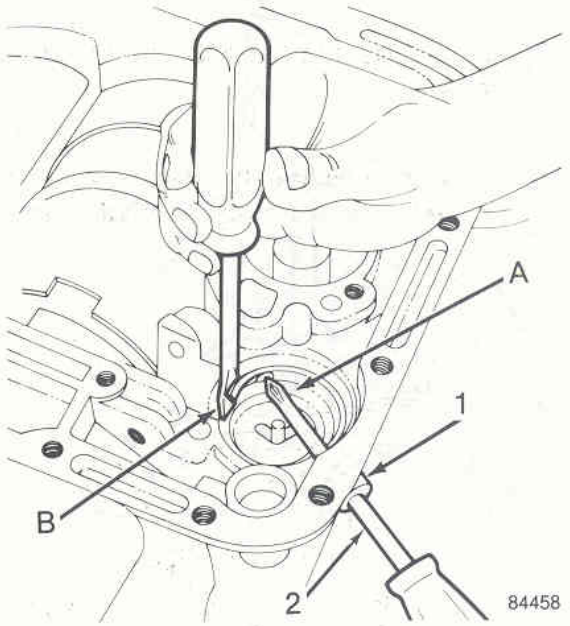
Compress the rod guide and remove the screwdriver.

Slowly release the rod guide and remove the rod guide, springs and piston rod.

CAUTION: Do not grasp the rod with pliers to remove it. If the rod sticks in the case, tap it gently to release it.

Identify the servo spring(s) with tag(s) for assembly reference.

Remove the servo piston.



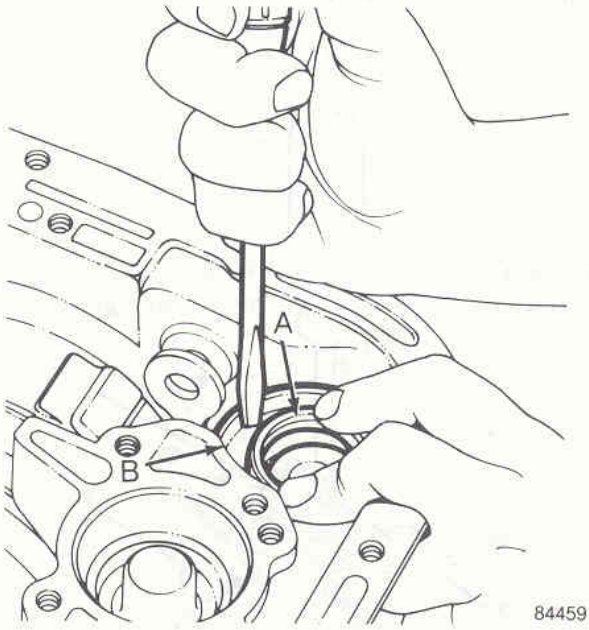
SEE I.S. NOTES

SEE I.S. NOTES

Rear Servo Removal

Compress piston spring (A) and remove snap ring (B).

Remove the spring retainer, spring, piston and plug assembly. Identify the spring with a tag for assembly reference.



84459

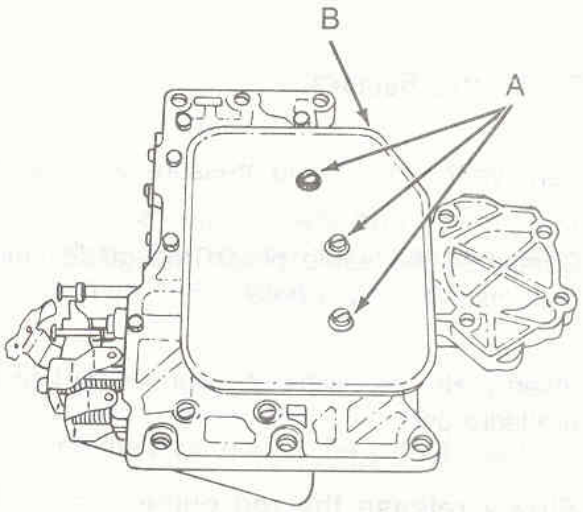
SUBASSEMBLY OVERHAUL

Valve Body With Lock-Up

Disassembly

CAUTION: Do not clamp any part of the valve body or transfer plate in a vise. Any slight distortion of the body or plate will cause sticking valves or excessive leakage or both. When removing and installing valves or plugs, slide them in or out very carefully. Do not use force to remove or install valves.

NOTE: When disassembling the valve body, identify all valve springs with a tag for assembly reference.



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Remove the oil filter attaching screws (A) and the oil filter (B).

NOTE: Oil filter screws are longer than transfer plate screws.

Remove the screws attaching the lockup module housing to the valve body.

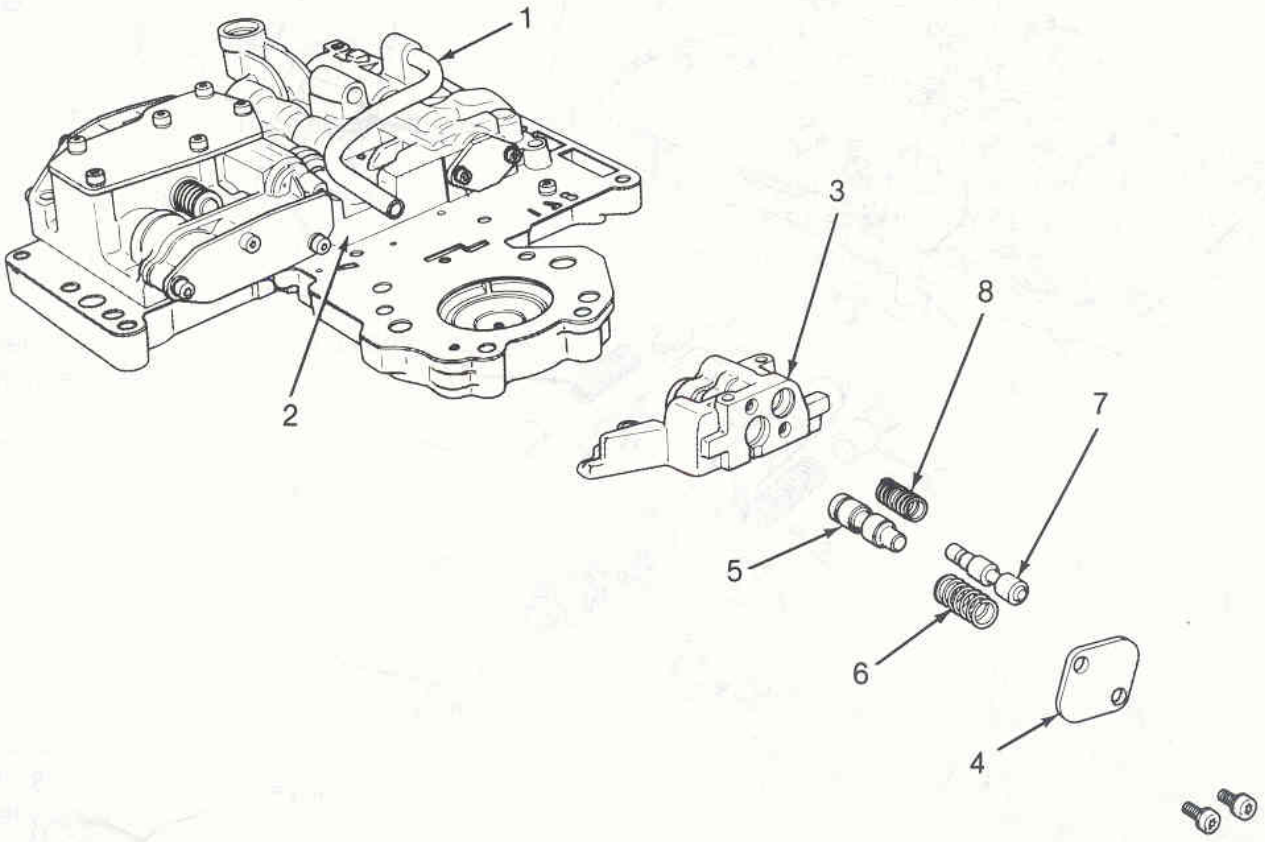
Slide the lockup module oil tube (1) out of valve body (2) and remove the tube and module (3) as an assembly.

Remove the end plate from the module (4).

Remove the lockup valve (5) and the spring (6).

Remove the fail-safe valve (7) and the spring (8).

SEE I.S. NOTES



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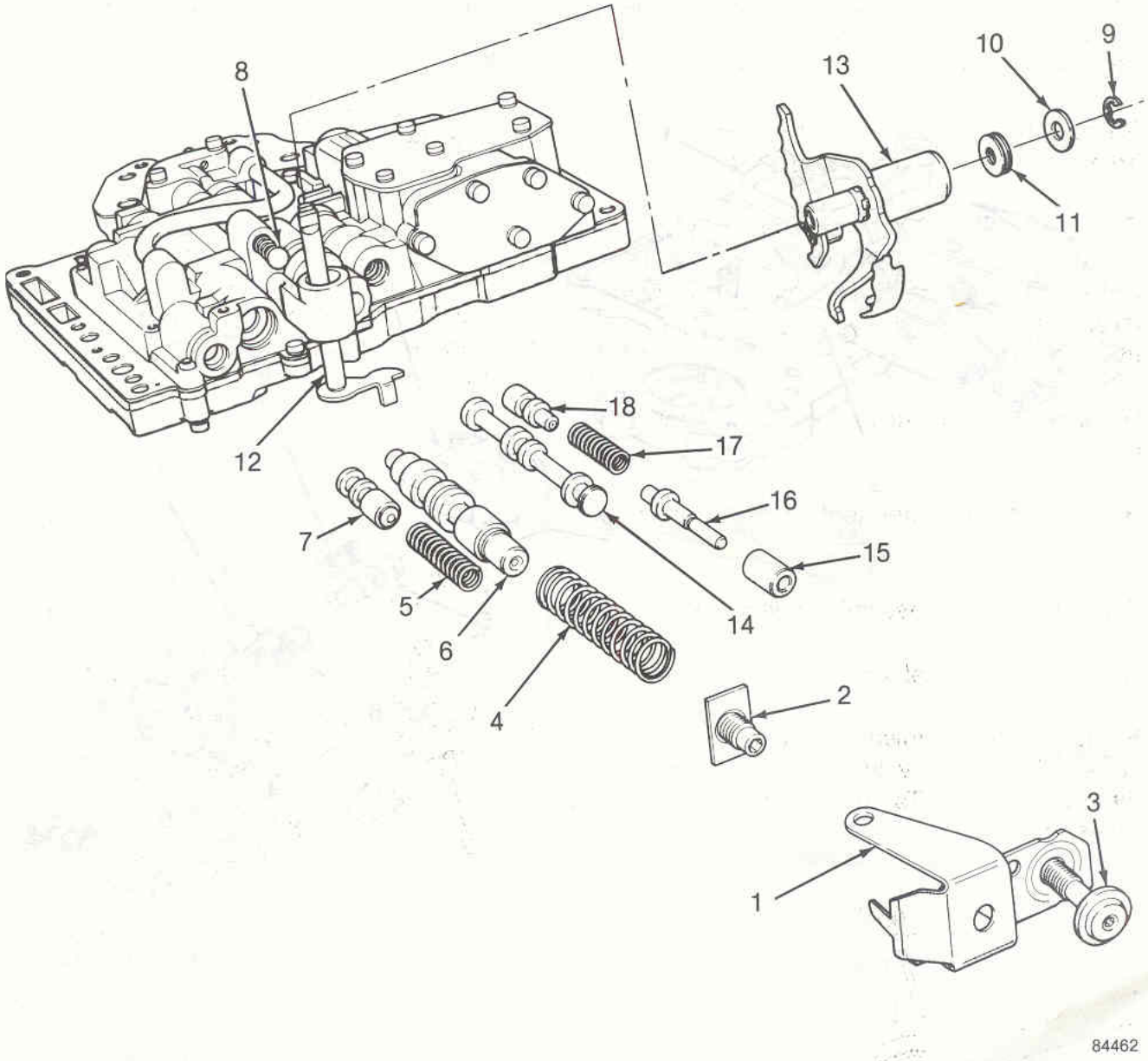
SEE I.S. NOTES



NOTE: Tag the springs and valves for reassembly reference.

Remove the upper and lower screws from the spring retainer and adjustment screw bracket (1). Hold the spring retainer firmly against the spring force while removing the last screw.

Remove the spring retainer line (2) and the throttle pressure adjusting screws (3). Do not disturb the screw settings. Remove the line pressure (4) and torque converter valve regulator springs (5). Tag the springs for assembly reference.

Remove the line pressure regulator (6) and torque converter control valves (7).

Install Detent Ball Retainer Tool J-24044 around detent ball casing (8).

CAUTION: The detent ball retainer tool is holding the ball under spring pressure. Shield the ball casing area with one hand before removing the retainer tool and detent ball.

Remove E-clip (9), washer (10), and seal (11) from the throttle valve lever shaft (12).

Remove the burrs on the shaft with crocus cloth.

Slide the manual lever assembly (13) off the throttle lever shaft and remove the throttle lever assembly.

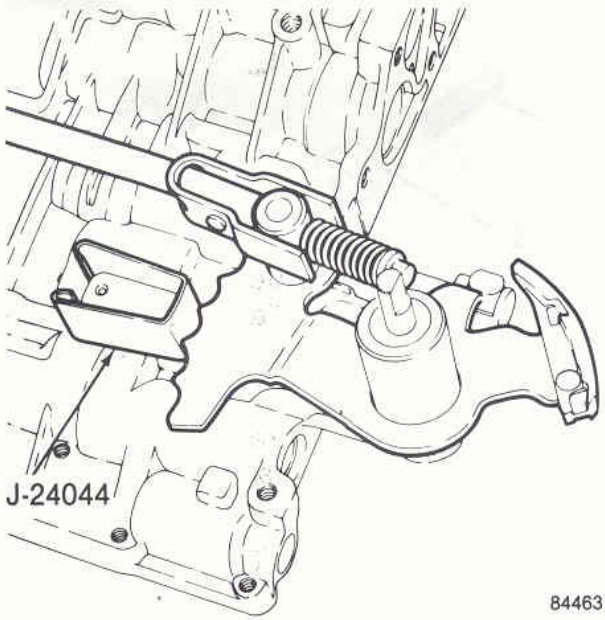
Remove the E-clip and park control rod from the manual lever.

Remove the retainer tool, detent ball, and spring.

Tag the spring for assembly reference.

Remove the manual valve (14).

Remove the kickdown detent (I5), kickdown valve (16), throttle valve spring (17), and the throttle valve (18). Tag the spring for assembly reference.

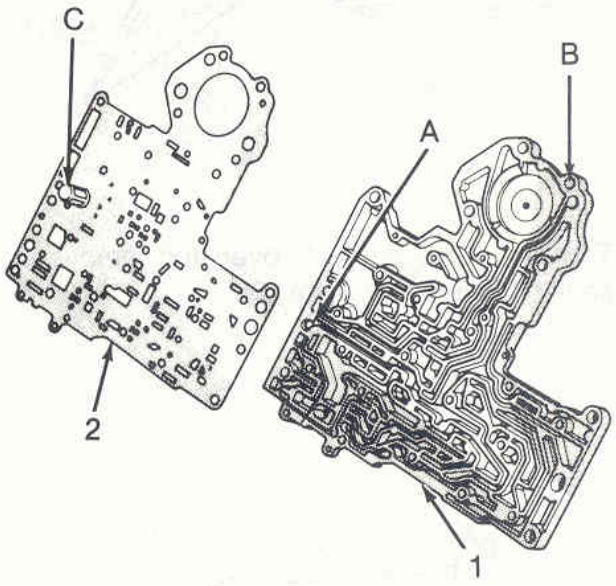


84463

Remove the transfer plate assembly retaining screws and remove the transfer plate (1) assembly.

Remove the screws attaching the separator plate (2) to the transfer plate and separate these parts.

Remove the rear clutch check ball (A) from the transfer plate and the rear servo apply check ball (B) on 900 series transmissions and remove the pressure regulator valve screen (C) from the separator plate.

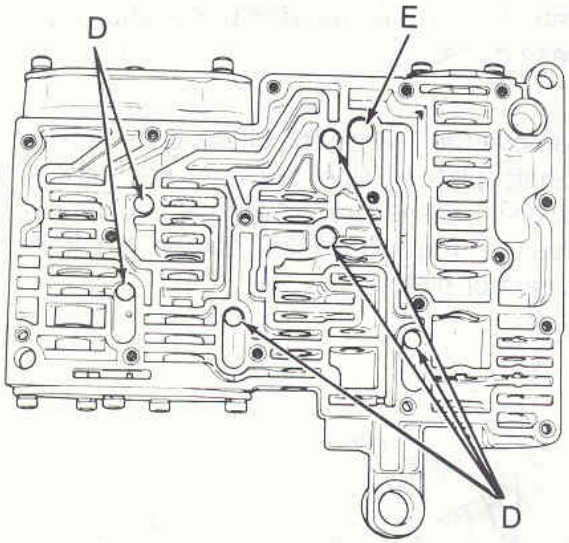


84464

SEE I.S. NOTES

SEE I.S. NOTES

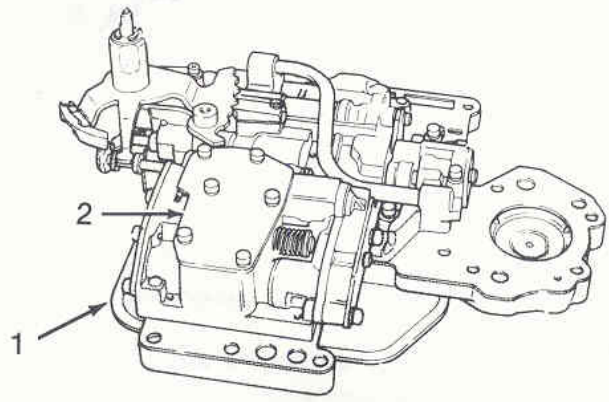
Remove the check balls from the valve body.



Check Ball Size Chart
A = 11/32 Inch Diameter
B = 1/4 Inch Diameter

84465

Turn the valve body (1) over and remove the shuttle valve cover plate (2).

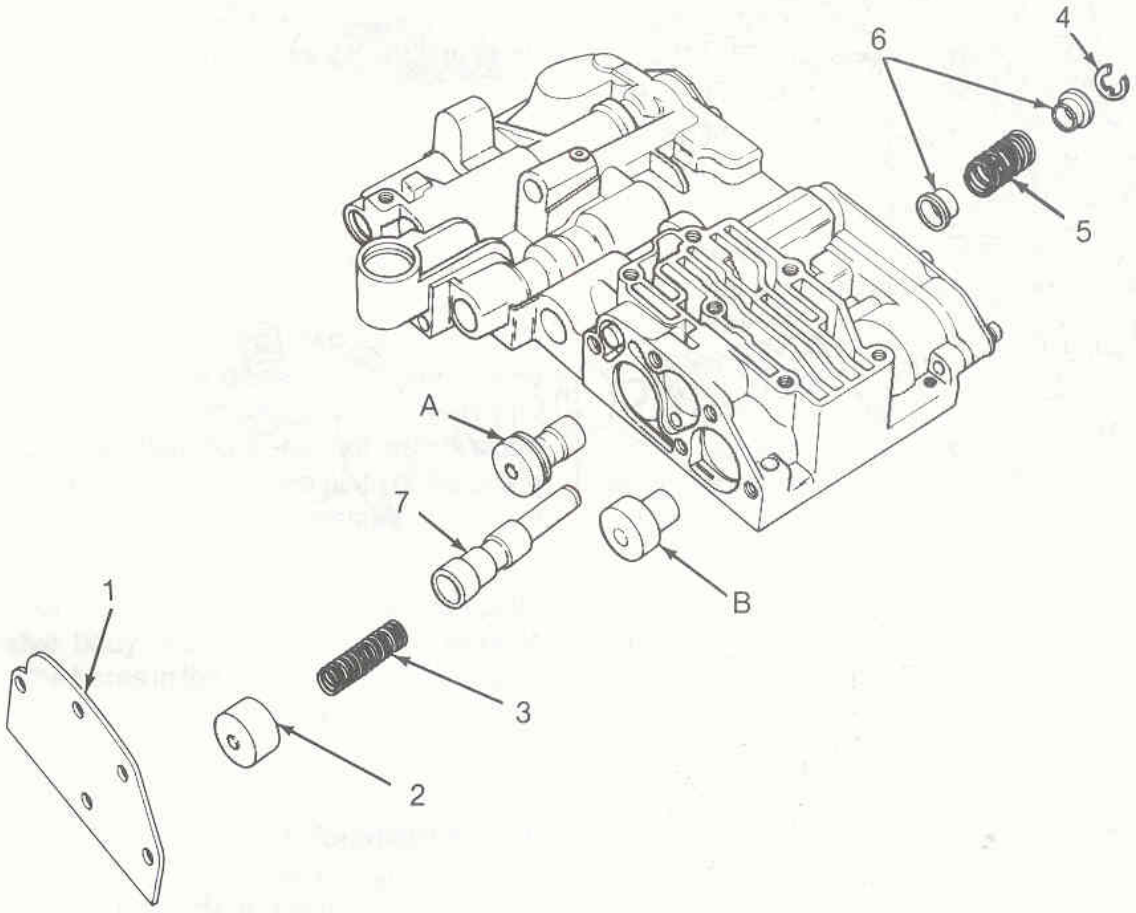


84466

Remove the governor plug end plate (1), shuttle valve throttle plug (2) and spring (3), and the 1-2 (A) and 2-3 (B) shift valve governor plugs.

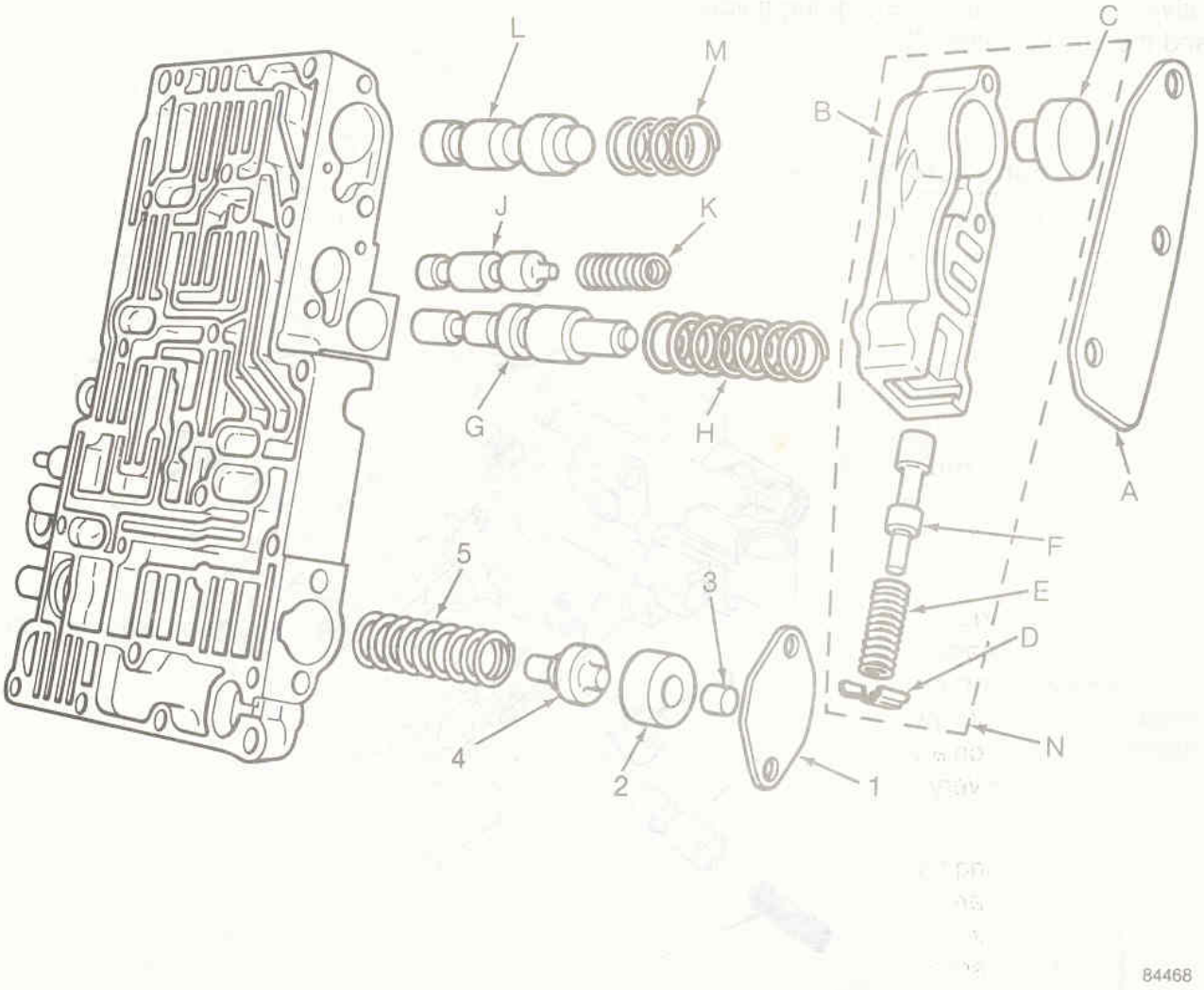
Remove the shuttle valve E-clip (4), shuttle valve secondary spring (5), spring guides (6), and the shuttle valve (7).

SEE I.S. NOTES



84467

SEE I.S. NOTES



Remove the line pressure regulator valve end plate (1).

Remove the sleeve (2), line pressure regulator valve plug (3), and the throttle pressure regulator valve plug (4), and spring (5).

Remove the downshift valve housing end plate (A).

Remove downshift valve housing (B), remove throttle plug (C) and downshift valve retainer (D), and remove spring (E), and limit valve from the housing (F). Tag spring for assembly reference.

Remove 1-2 shift control valve (G) and spring (H), 1-2 shift valve (J) and spring (K), and 2-3 shift valve (L) and spring (M). Tag all springs for assembly reference.

Cleaning and Inspection

Thoroughly wash and air dry all parts.

Do not use any type of caustic cleaning solution. Be sure all passages are clean and free from obstructions.

Clean the regulator filter in solvent and air dry. Replace the filter, if damaged.

Inspect the manual and throttle valve levers and shafts for being bent, worn or excessively loose. If a lever is loose on a shaft, replace the lever and shaft assembly. If a lever or shaft is bent, replace the assembly.

Inspect all mating surfaces for burrs, nicks and scratches. Remove minor irregularities using crocus cloth applying very light pressure.

Use a straightedge and inspect all mating surfaces for warpage or distortion. Very slight warpage or distortion may be corrected by abrading the surface on a sheet of crocus cloth. Position the cloth on a surface plate or flat piece of glass and use very light pressure.

Be sure all metering holes in the separator plate and valve body are open. Use a penlight to inspect the bores in the valve body for corrosion, scores, burrs, scratches, pits, and other irregularities.

Inspect all valve springs for distortion or collapsed coils.

Inspect all valves and plugs for burrs, nicks, and scores. Remove slight irregularities using crocus cloth but do not round off the sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between the valve and the body bore.

Inspect all valves and plugs for freedom of operation in the valve body bores. When the bores, valves, and plugs are clean and dry, the valves and plugs fall freely in the bores. Make sure the orifice in the 1-2 shift control bore in the valve body is open. Verify this by inserting a .79 mm (1/32-inch) diameter drill through the orifice and into the 1-2 shift control bore.

NOTE: A valve body that functioned properly when the vehicle was new will operate correctly after cleaning, reconditioning, assembly, and adjustment if:

(a) all mating surfaces are flat.
(b) bores, plugs, and valves are smooth.
(c) metering holes are open.
(d) springs are not damaged.
(e) valves and plugs slide freely in their bores.

There is no need to replace a valve body unless it is damaged in handling.

SEE I.S. NOTES

SEE I.S. NOTES

Assembly

Install the 1-2 and 2-3 shift valves (L) (J) and springs (M) (K), and the 1-2 shift control valve (G) and spring in valve body (H).

Assemble and install the downshift housing assembly in the following sequence:

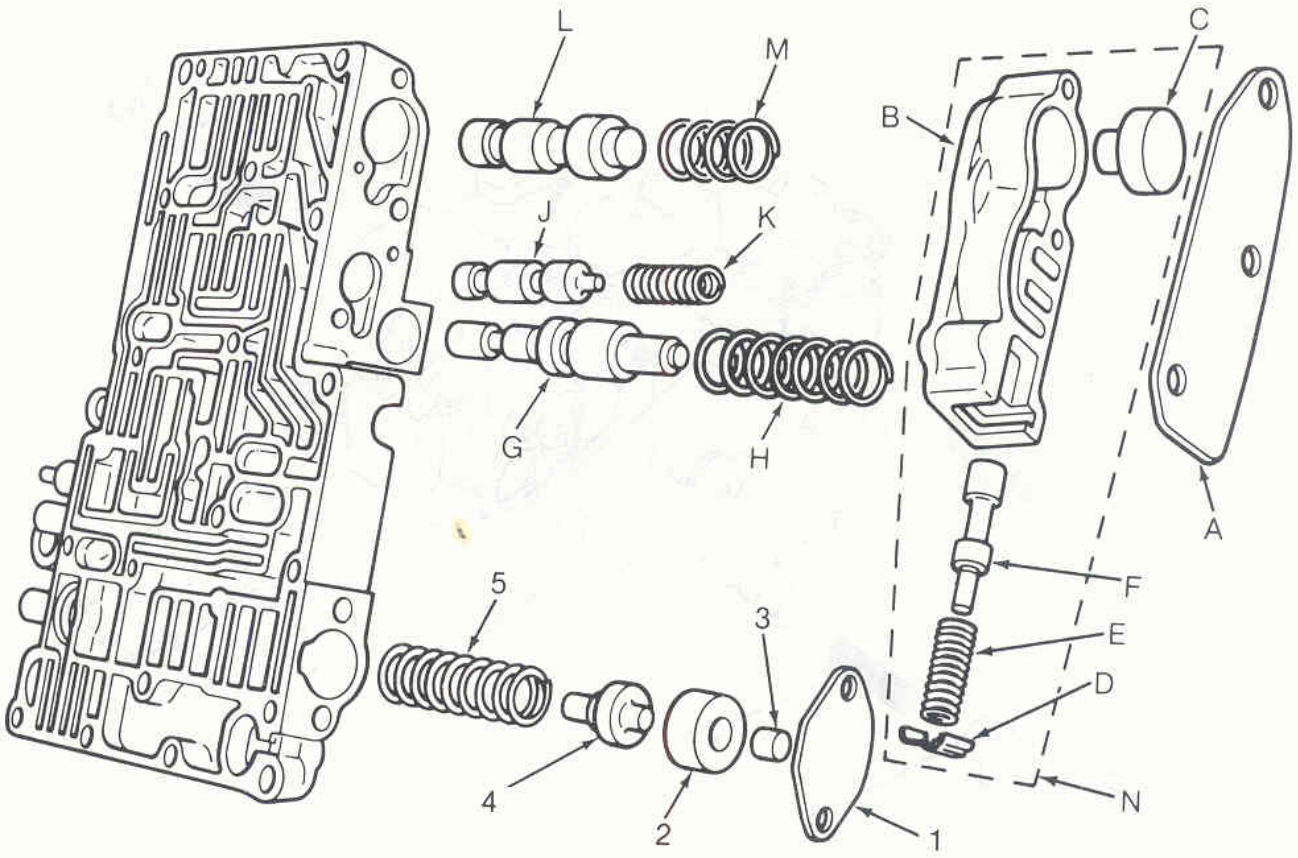
(a) Install the limit valve (F) and spring (E).
(b) Slide the spring retainer into groove.
(c) Insert the throttle plug (C) into the bore.
(d) Position the downshift housing end plate (A) on the housing and insert the retaining screws.
(e) Position the downshift housing assembly (N) against the shift valve springs. Be sure all the springs are in proper alignment. Install and tighten the retaining screws to 4 N·m (35 in-lbs) torque.

Install the throttle pressure regulator valve spring (5) and plug (4).

Install the line pressure regulator valve sleeve (2) and plug (3).

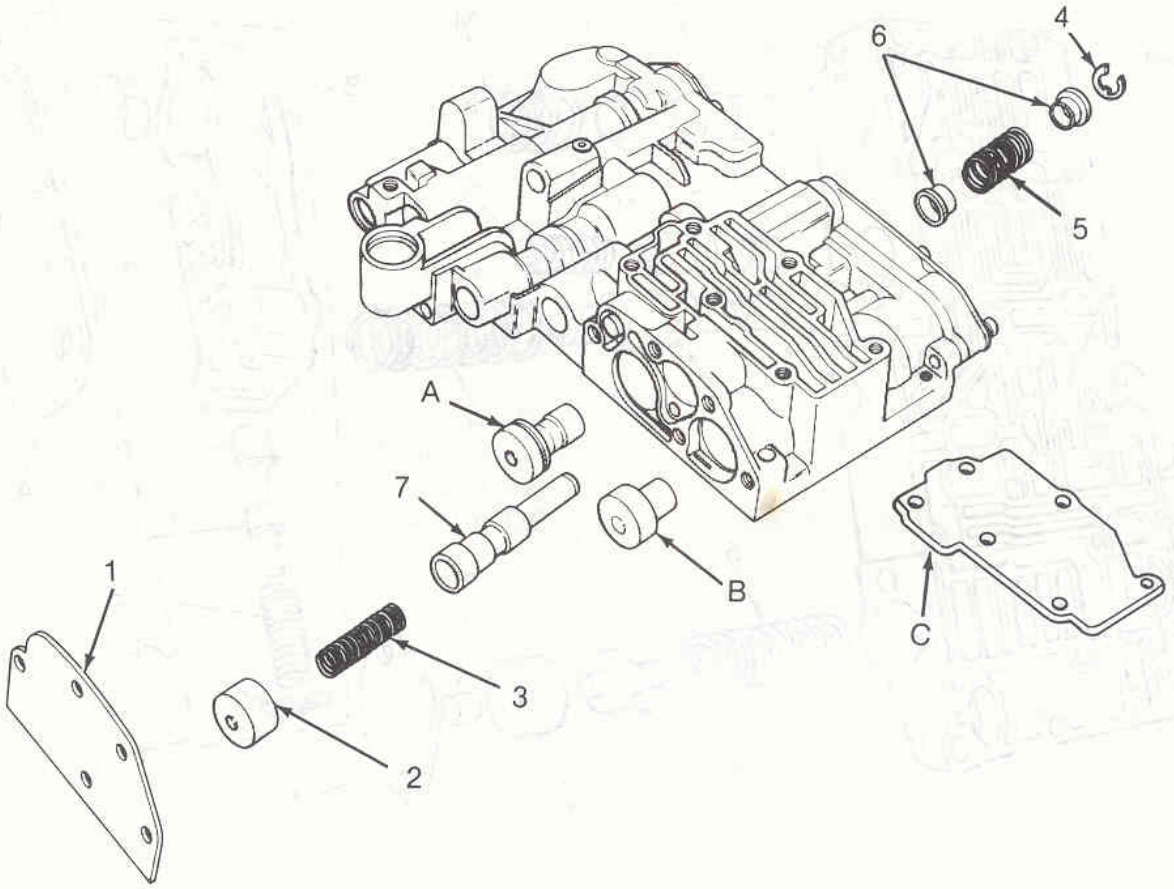
Install the line pressure regulator valve end plate (1).

SEE I.S. NOTES



84469

SEE I.S. NOTES



84470

Install the 1-2 and 2-3 shift valve governor plugs (A) (B).

Install the shuttle valve (7), primary spring (3) and the throttle plug (2).

Install the governor plug end plate (1) and tighten the screws to 4 N·m (35 in-lbs) torque.

Install the spring guides (6), shuttle valve secondary spring (5), and the E-clip (4).

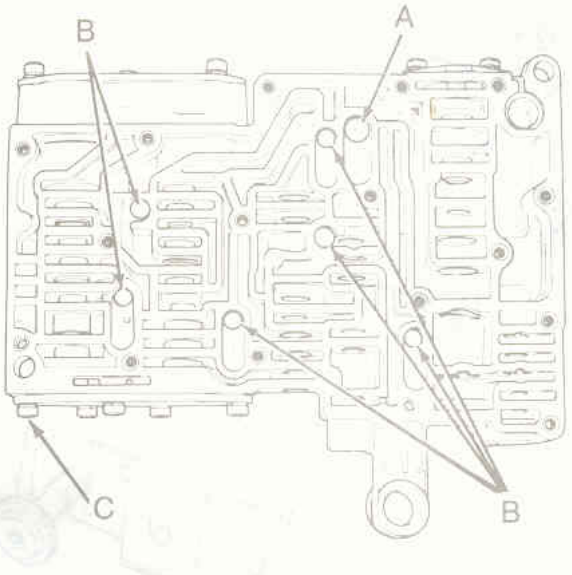
Install the shuttle valve cover plate (C) and tighten the screws to 4 N·m (35 in-lbs) torque.

Install the check balls (A) (B) in the valve body (C).

Install the rear clutch check ball (D) in the transfer plate and the rear servo apply check ball (E) on all 900 series transmissions.

Install the pressure regulator valve screen (F) in the separator plate (G).

Position the separator plate on the transfer plate (4).

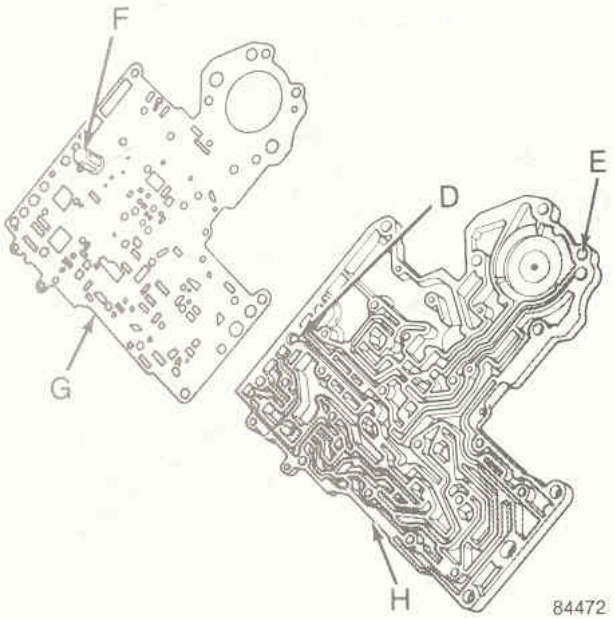


84471

Position the transfer plate assembly on the valve body and install the retaining screws finger-tight.

NOTE: Before tightening the retaining screws be sure the pressure regulator filter screen and 10 mm (3/8-inch) diameter check ball are properly aligned.

Starting at the center and working outward, tighten the transfer plate assembly retaining screws to 4 N·m (35 in-lbs) torque.



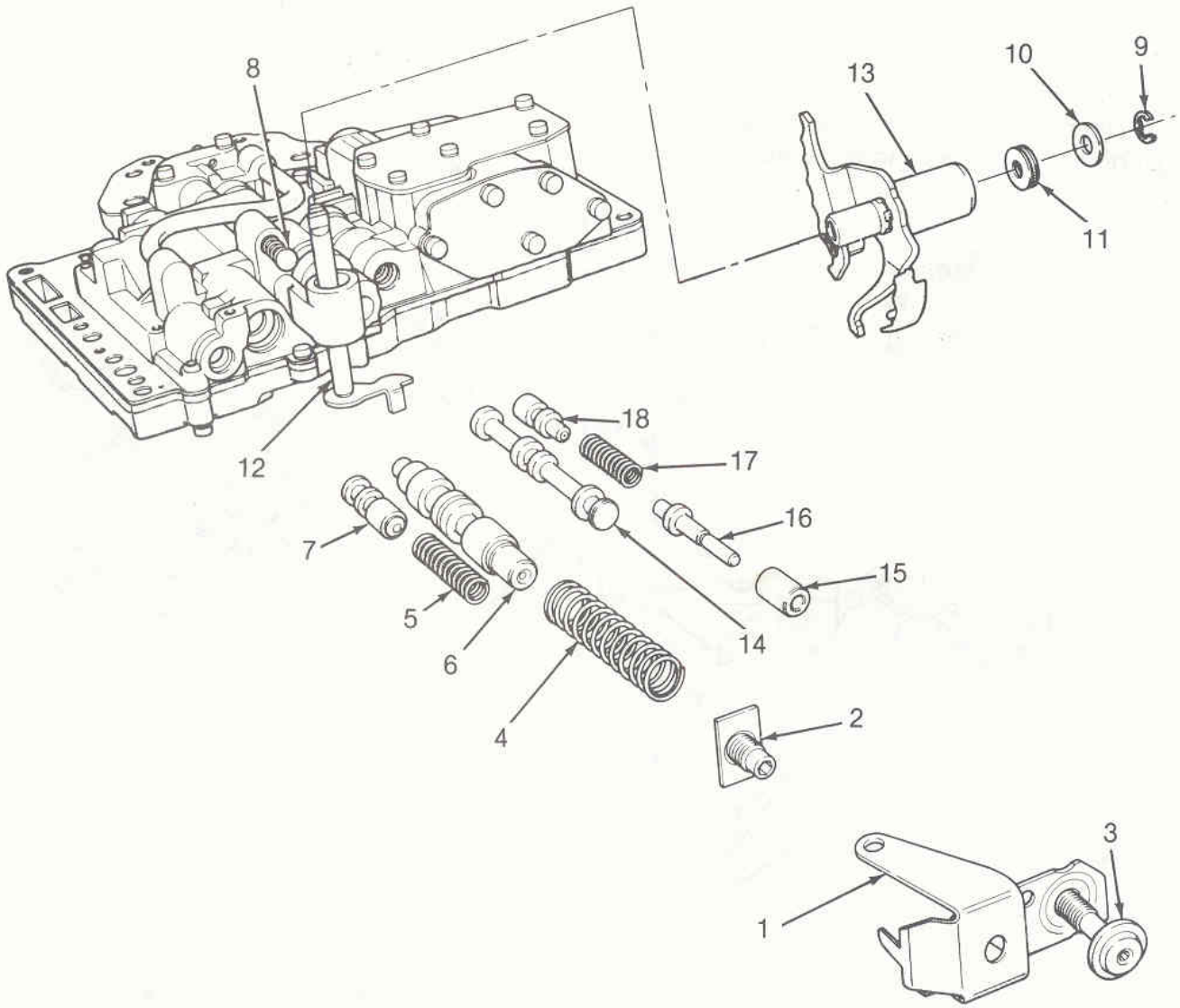
84472

Check Ball Size Chart
A = 11/32 Inch Diameter
B = 1/4 Inch Diameter

84473

SEE I.S. NOTES

SEE I.S. NOTES



Install the throttle valve (18), valve spring (17), kickdown valve (16) and the detent (15).

Install the manual valve (14).

Insert the detent ball and spring (8) in the valve body. Install the Retainer Tool J-24044 around the detent ball casing to retain the ball and spring.

Install the throttle lever assembly (12).

Install the manual lever assembly (13) on the throttle lever shaft. Position the manual lever assembly so it engages the manual valve (14) and detent ball.

Install the seal (11), washer (10), and E-clip (9) on the throttle lever shaft.

Remove the detent ball retainer tool.

Install the line pressure and torque converter control valves.

Install the torque converter and line pressure regulator valve springs (4) (5).

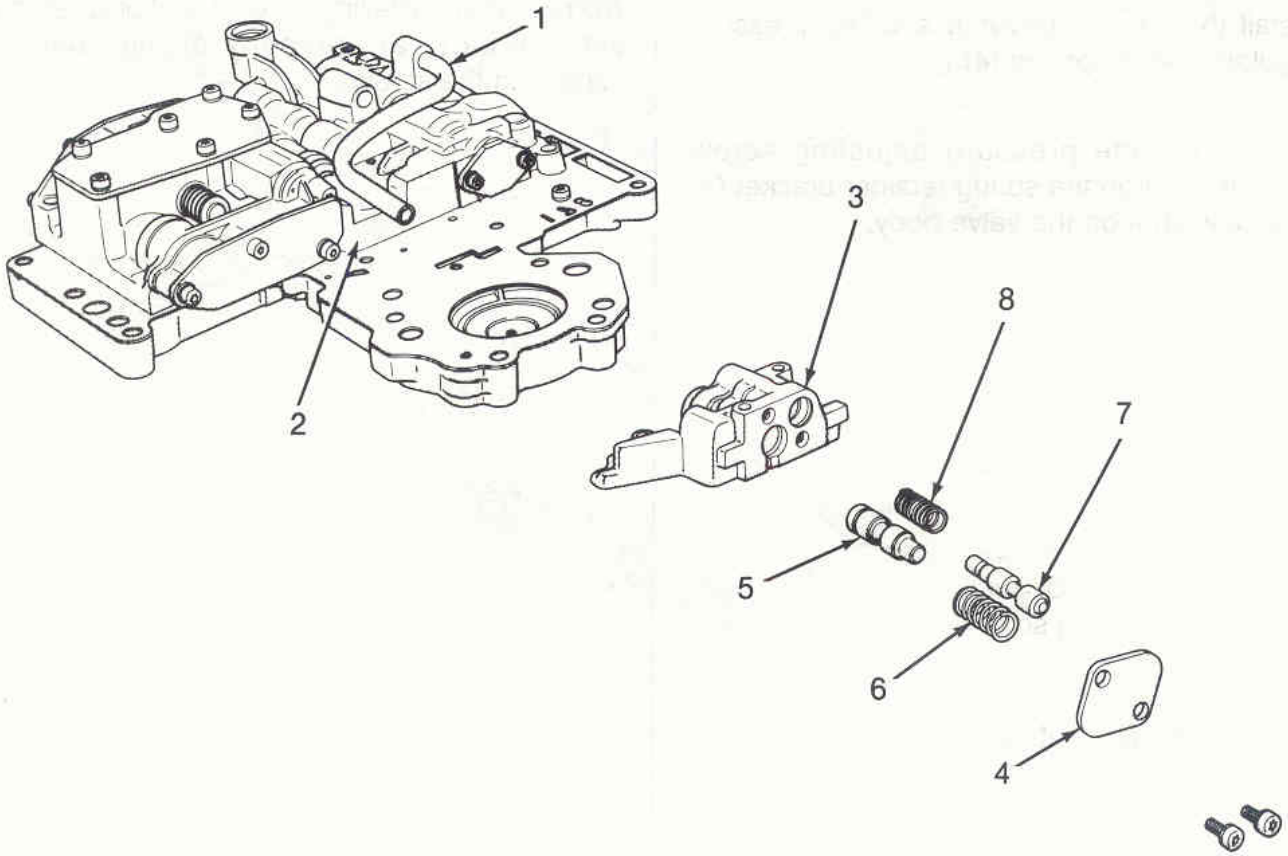
Install the line pressure adjusting screw assembly (2) on the spring retainer bracket (1) and position it on the valve body.

Attach the bracket to the side of the valve body and tighten the retaining screws only after starting both the top and bottom bracket screws. Tighten the screws to 4 N·m (35 in-lbs) torque.

NOTE: When installing retainer and bracket, be sure all parts are properly aligned before tightening the screws.

SEE I.S. NOTES

SEE I.S. NOTES



84475

Install the fail-safe valve (7) and spring (8) into the housing.

Install the lockup valve (5) and spring (6) into the housing.

Install the end plate and attaching screws (4).

Install lockup module housing (3) and oil tube (1) to the valve body (2).

Install attaching screws.

Install the oil filter.

Measure the throttle and line pressure settings.

NOTE: If pressures were satisfactory before disassembly, do not change the line or throttle pressure adjusting screw settings.

Valve Body Without Lock-Up

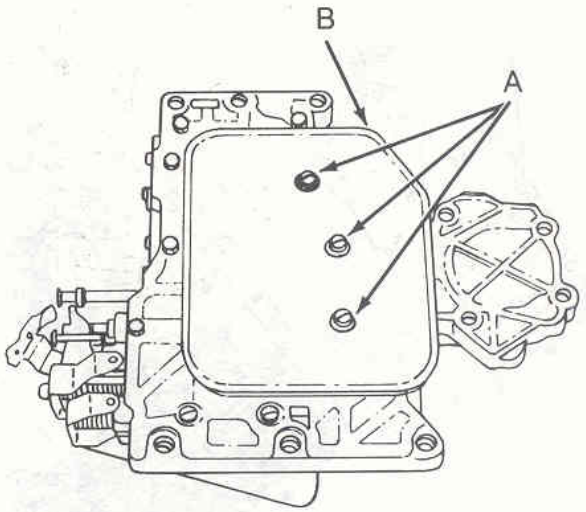
Disassembly

CAUTION: Do not clamp any part of the valve body or transfer plate in a vise. Any slight distortion of the body or plate will cause sticking valves or excessive leakage or both. When removing and installing valves or plugs, slide them in or out very carefully. Do not use force to remove or install valves.

NOTE: When disassembling the valve body, identify all valve springs with a tag for assembly reference.

Remove the oil filter attaching screws (A) and oil filter (B).

NOTE: The oil filter screws are longer than the transfer plate screws.



84476

Remove the transfer plate assembly retaining screws and remove the transfer plate assembly (1).

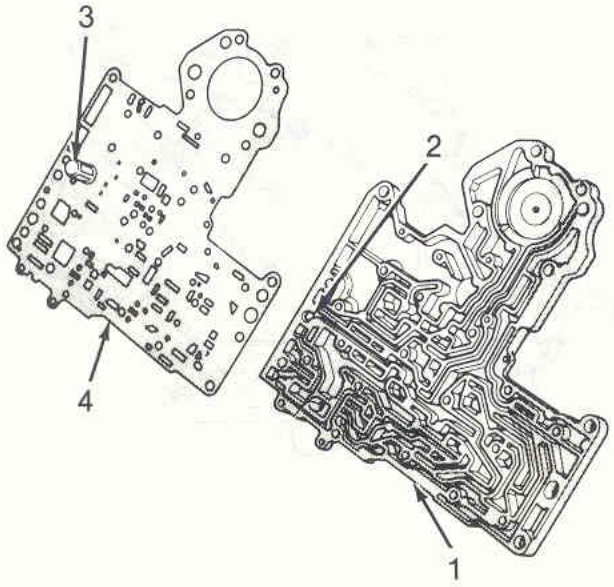
Remove the screws attaching the stiffener and separator plates to the transfer plate and separate these parts.

SEE I.S. NOTES

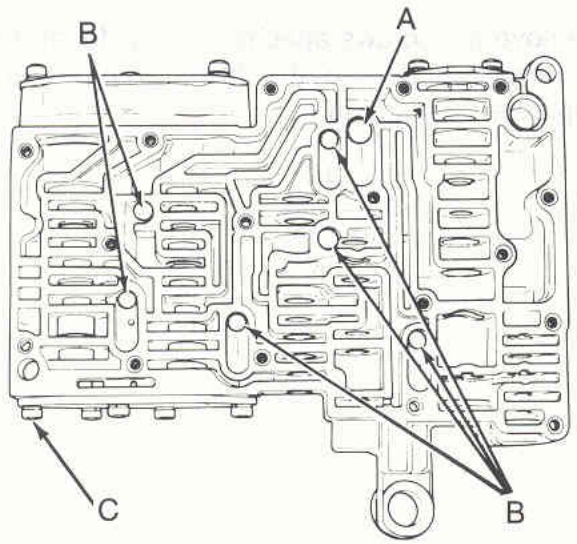
SEE I.S. NOTES

Remove the rear clutch check ball (2) from the transfer plate and remove the pressure regulator valve screen (3) from the separator plate (4).

Remove check balls (A) and (B) from the valve body.



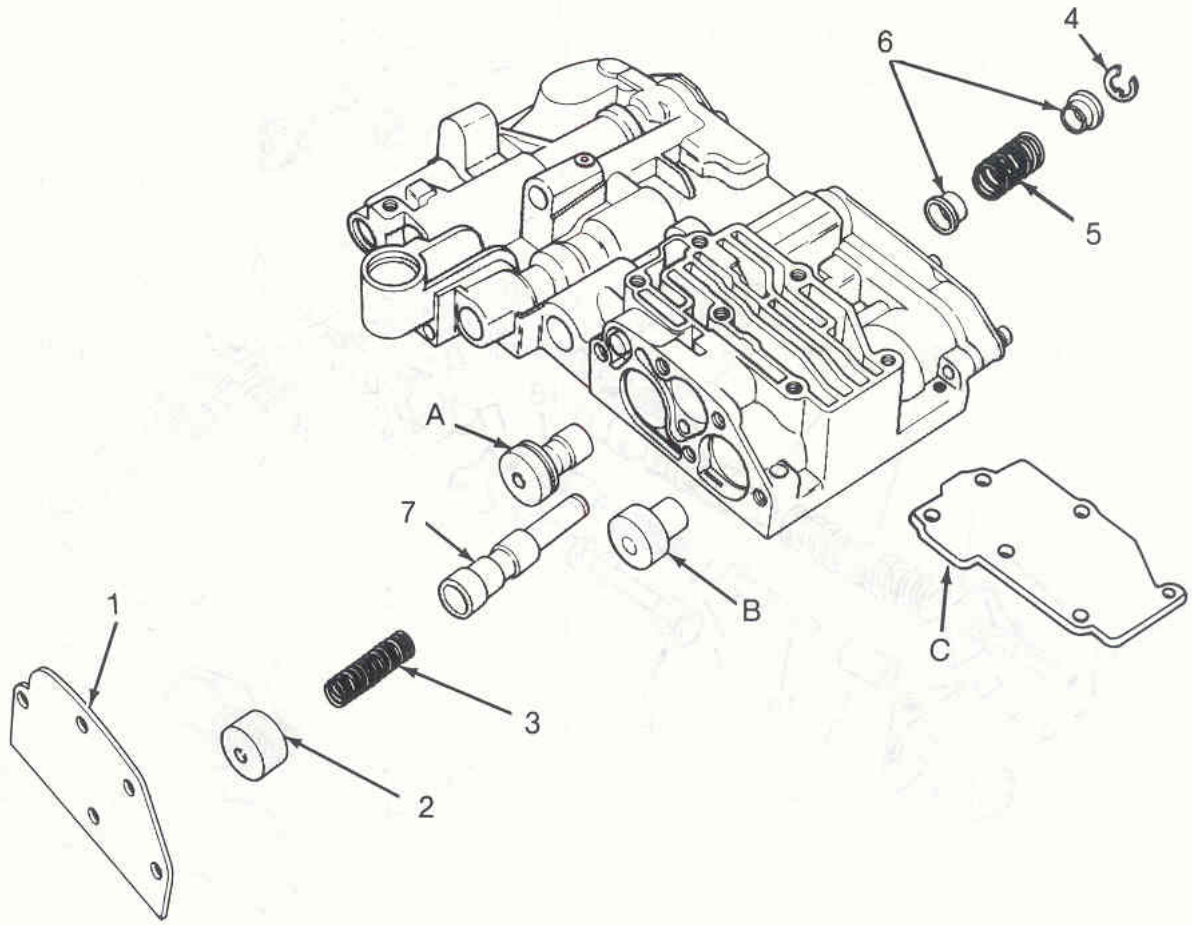
84477



Check Ball Size Chart
A = 11/32 Inch Diameter
B = 1/4 Inch Diameter

84478

SEE I.S. NOTES



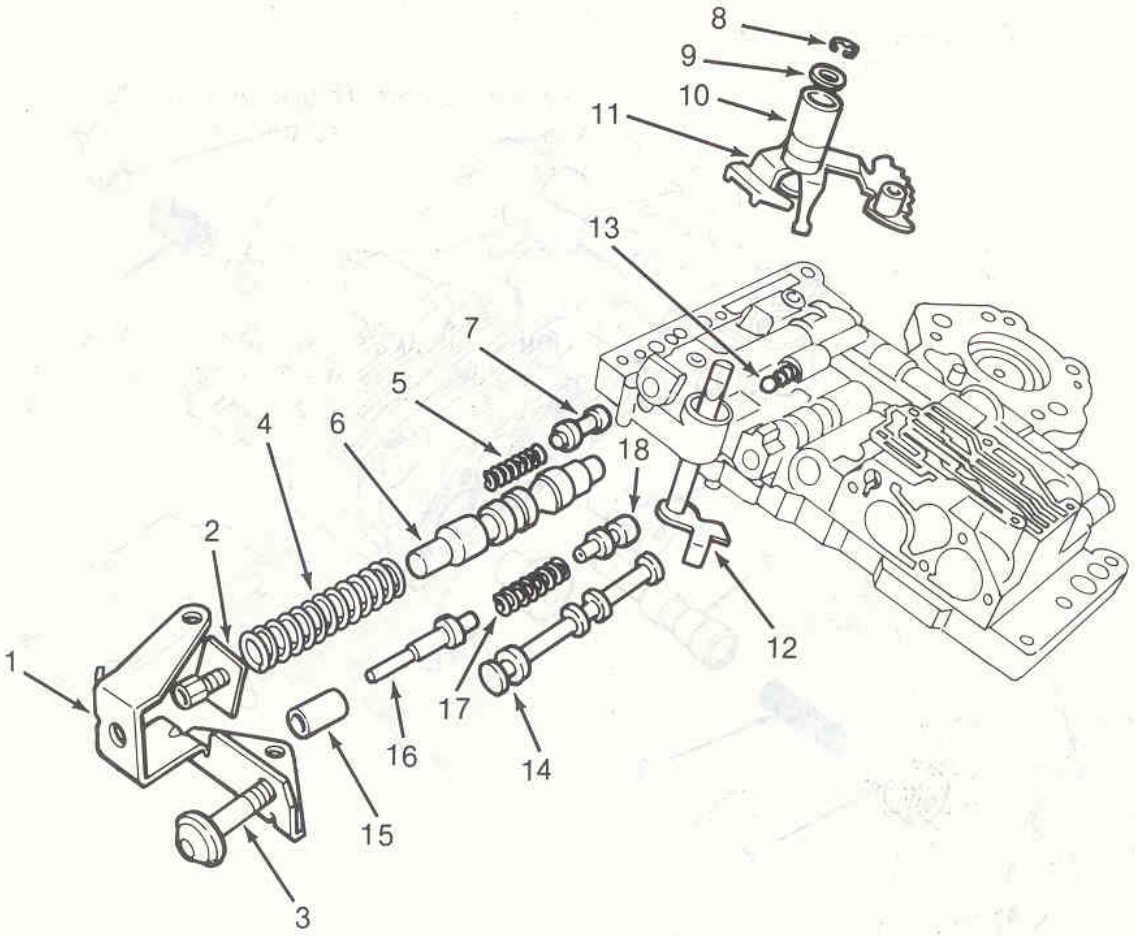
84479

Turn the valve body over and remove the shuttle valve cover plate.

Remove the governor plug end plate (1), shuttle valve throttle plug (2) and spring (3), and 1-2 (A) and 2-3 (B) shift valve governor plugs.

Remove the shuttle valve E-clip (4), shuttle valve secondary spring (5), spring guides (6), and shuttle valve (7).

SEE I.S. NOTES



84480

Remove the screws attaching the line pressure adjusting screw bracket and retainer (l) to the valve body and remove the bracket, screw, and retainer. Hold the spring retainer firmly against the spring force while removing the last screw.

Release the pressure applied to the spring retainer and remove the spring retainer and line pressure adjusting screw assembly (2) and throttle pressure adjusting screw (3). Do not disturb the screw settings. Remove the line pressure (4) and torque converter valve regulator springs (5). Tag the springs for assembly reference.

Remove the line pressure regulator (6) and torque converter control (7) valves.

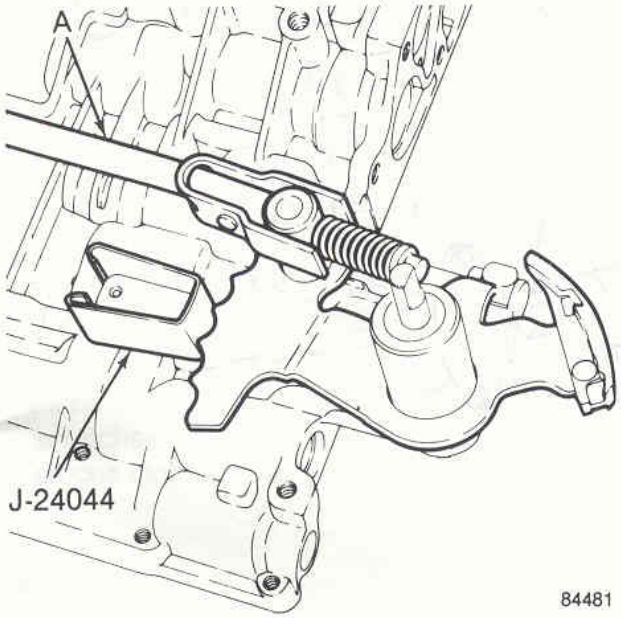
Install the Detent Ball Retainer Tool J-24044 around the detent ball casing.

Remove the E-clip (8), washer (9), and seal (10) from the throttle valve lever shaft.

Remove any burrs on the shaft with crocus cloth.

Slide the manual lever assembly (11) off the throttle lever shaft and remove the throttle lever assembly (12).

Remove the E-clip and park control rod from the manual lever (A).



CAUTION: The detent ball retainer tool is holding the ball against spring pressure. Shield the ball casing area with one hand before removing the retainer tool and detent ball.

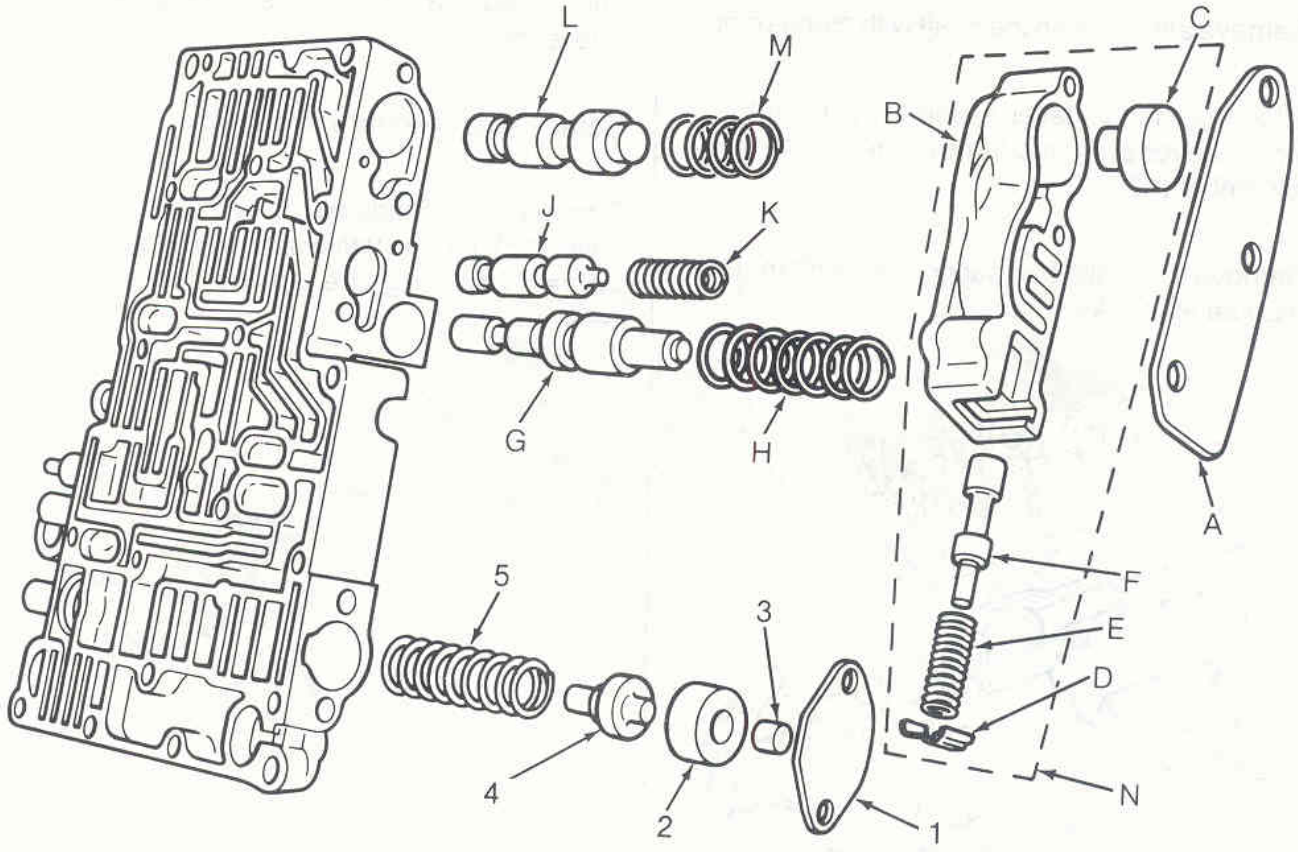
Remove the detent ball retainer tool, detent ball, and spring (13). Tag the spring for assembly reference.

Remove the manual valve (14).

Remove the kickdown detent (15), kickdown valve (16), throttle valve spring (17), and throttle valve (18). Tag the spring for assembly reference.

SEE I.S. NOTES

SEE I.S. NOTES



84482

Remove the line pressure regulator valve end plate (1).

Remove the sleeve (2), line pressure regulator valve plug (3), and throttle pressure regulator valve plug (4), and spring (5).

Remove the downshift valve housing end plate (A).

Remove the downshift valve housing (B), throttle plug (C) and downshift valve retainer (D), spring (E) and limit valve (F), from housing.

Tag the spring for assembly reference.

Remove the 1-2 shift control valve (G) spring (H), 1-2 shift valve (J) spring (K), 2-3 shift valve (L) and spring (M).

Tag all the springs for assembly reference.

Cleaning and Inspection

Thoroughly wash and air dry all parts.

Do not use any type of caustic cleaning solution. Be sure all passages are clean and free from obstructions.

Clean the regulator filter in solvent and air dry. Replace the filter, if damaged.

Inspect the manual and throttle valve levers and shafts for being bent, worn or excessively loose. If a lever is loose on a shaft, replace the lever and shaft assembly. If a lever or shaft is bent, replace the assembly.

Inspect all mating surfaces for burrs, nicks and scratches. Remove minor irregularities using crocus cloth and very light pressure.

Use a straightedge and inspect all mating surfaces for warpage or distortion. Very slight warpage or distortion may be corrected by abrading the surface on a sheet of crocus cloth. Position the cloth on a surface plate or flat piece of glass and use very light pressure.

Be sure all metering holes in the separator plate and valve body are open. Use a penlight to inspect the bores in the valve body for corrosion, scores, burrs, scratches, pits, and other irregularities.

Inspect all valve springs for distortion or collapsed coils.

Inspect all valves and plugs for burrs, nicks, and scores. Remove slight irregularities using crocus cloth but do not round off the sharp edges. The sharpness of these edges is vitally important because it prevents foreign matter from lodging between the valve and the body bore.

Inspect all valves and plugs for freedom of operation in the valve body bores. When the bores, valves, and plugs are clean and dry, the valves and plugs fall freely in the bores. Make sure the orifice in the 1-2 shift control bore in the valve body is open. Verify this by inserting a .79 mm (1/32-inch) diameter drill through the orifice and into the 1-2 shift control bore.

SEE I.S. NOTES

SEE I.S. NOTES

NOTE: A valve body that functioned properly when the vehicle was new will operate correctly after cleaning, reconditioning, assembly, and adjustment if:

(a) all mating surfaces are flat.
(b) bores, plugs, and valves are smooth.
(c) metering holes are open.
(d) springs are not damaged.
(e) valves and plugs slide freely in their bores.

There is no need to replace a valve body unless it is damaged in handling.

Assembly

Install the 1-2 and 2-3 shift valves (J) (L) and springs (K) (M), and the 1-2 shift control valve (G) and spring (N) into the valve body.

Assemble and install the downshift housing assembly in the following sequence:

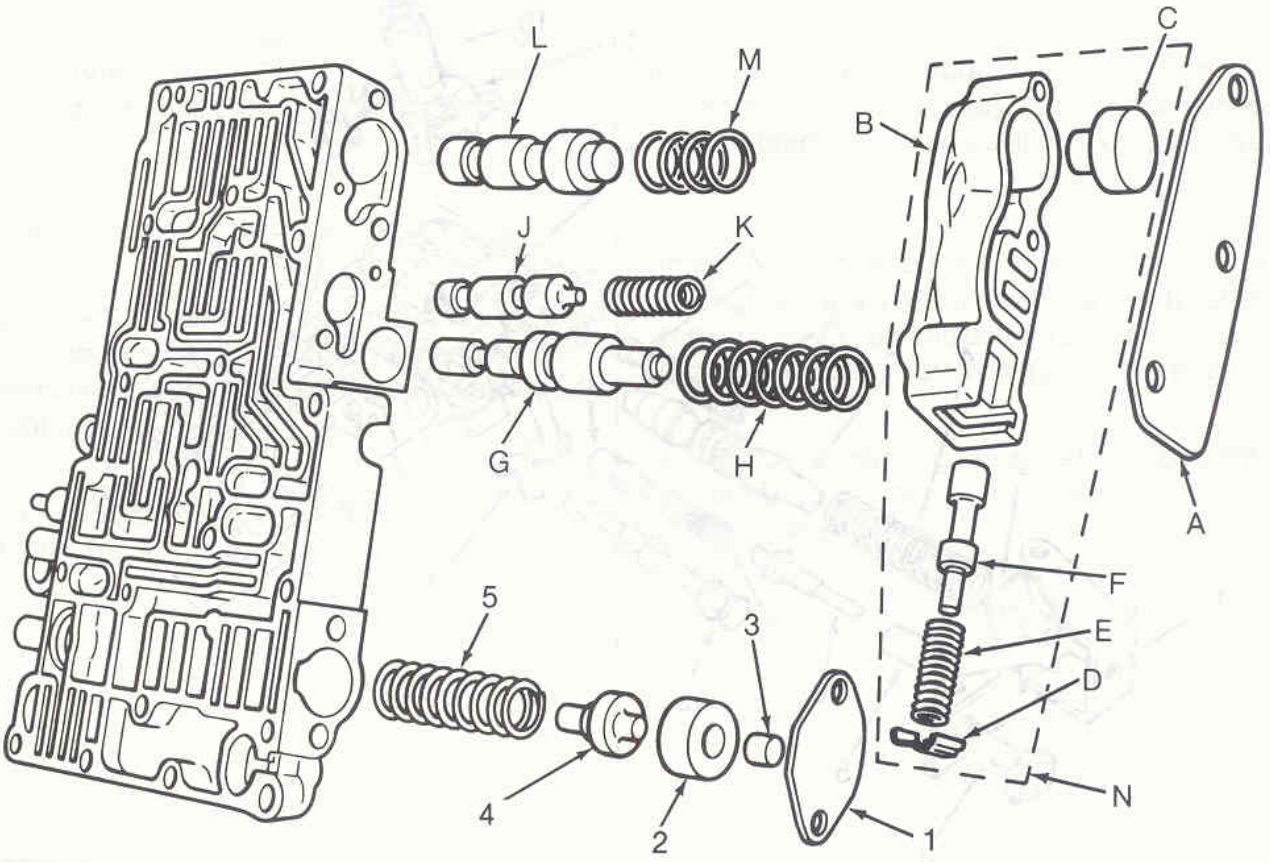
(a) Install the limit valve (F) and spring (E).
(b) Slide the spring retainer (D) into the groove.
(c) Insert the throttle plug (C) into the bore.
(d) Position the downshift housing end plate (A) into the housing (B) and insert the retaining screws.
(e) Position the downshift housing assembly against the shift valve springs. Be sure all the springs are in proper alignment. Install and tighten the retaining screws to 4 N·m (35 in-lbs) torque.

Install the throttle pressure regulator valve spring (5) and plug (4).

Install the line pressure regulator valve plug (3) and sleeve (2).

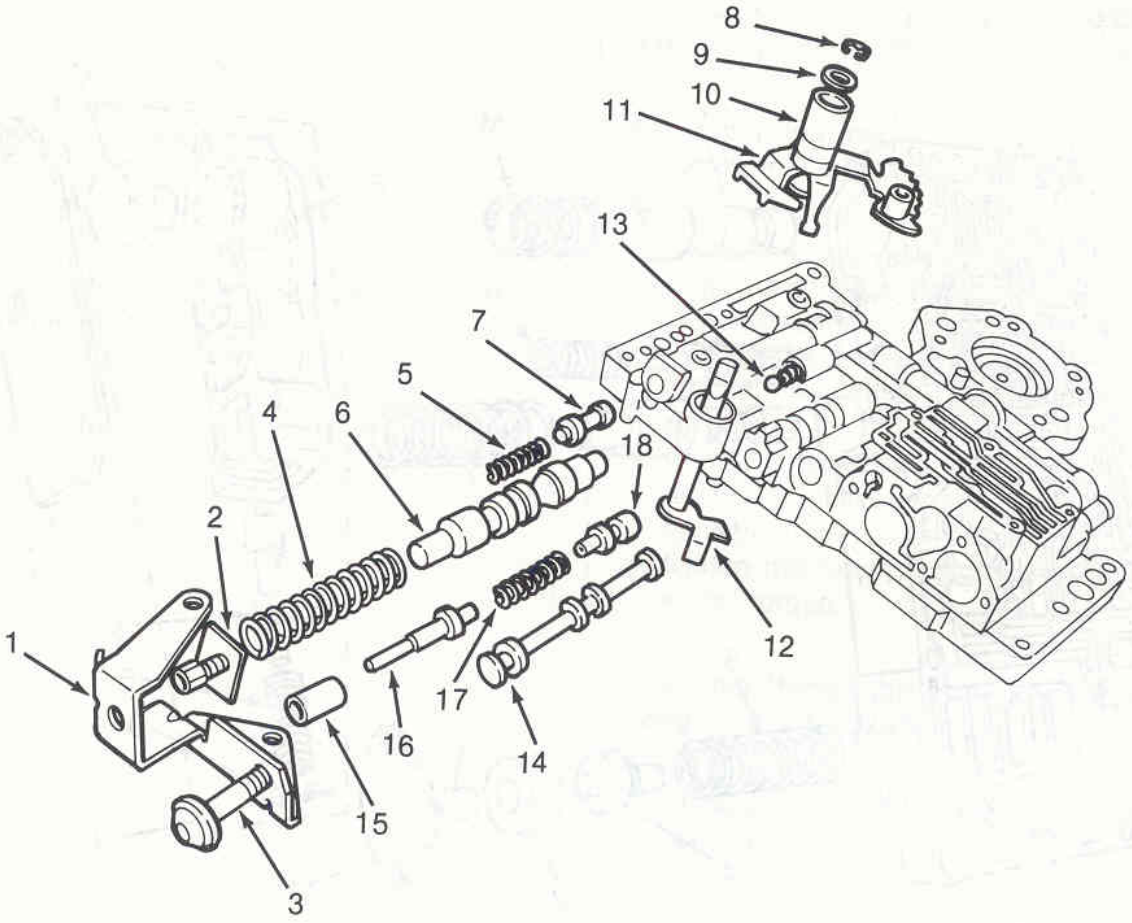
Install the line pressure regulator valve end plate (1).

SEE I.S. NOTES



84482

SEE I.S. NOTES



84483

Install the throttle valve (18), valve spring (17), kickdown valve (16) and detent (15).

Install the manual valve (14).

Insert the detent ball and spring (13) into the valve body. Install Retainer Tool J-24044 around detent ball casing to retain the ball and spring.

Install the throttle lever assembly (12).

Install the manual lever assembly (11) on the throttle lever shaft. Position the manual lever assembly so it engages the manual valve and detent ball.

Install the seal (10), washer (9) and E-clip (8) on the throttle lever shaft.

Remove the detent ball retainer tool.

Install the line pressure regulator valve (6) and spring (4) and install the converter control valve (7) and spring (5).

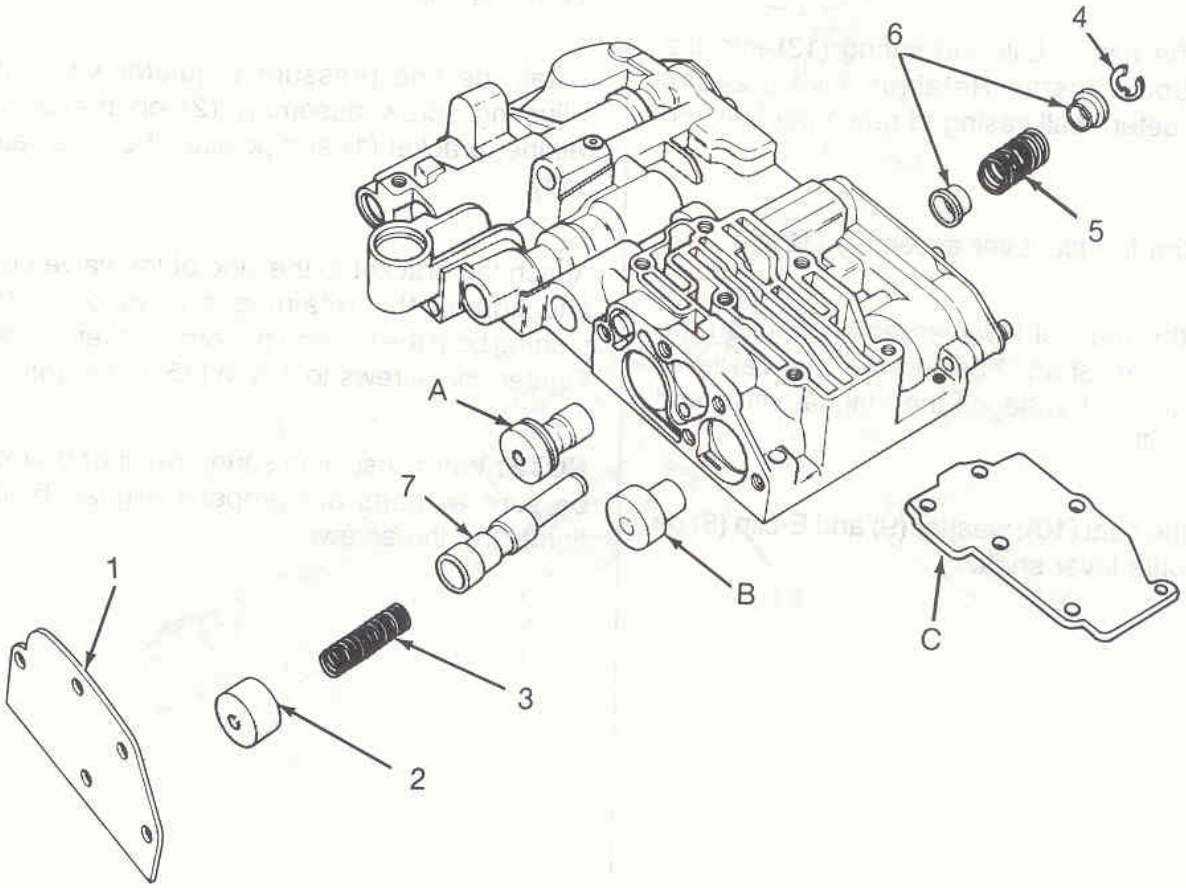
Install the line pressure regulator valve (3) adjusting screw assembly (2) on the spring retainer bracket (1) and position it on the valve body.

Attach the bracket to the side of the valve body and tighten the retaining screws only after starting both the top and bottom bracket screws. Tighten the screws to 4 N·m (35 in-lbs) torque.

NOTE: When installing spring retainer bracket, be sure all parts are properly aligned before tightening the screws.

SEE I.S. NOTES

SEE I.S. NOTES



84484

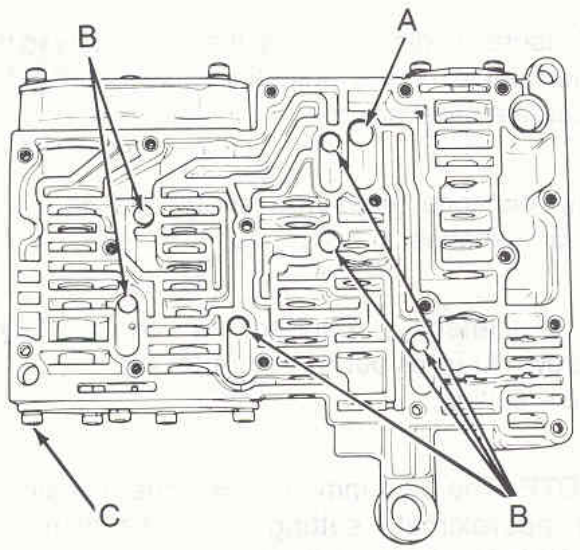
Install the 1-2 (A) and 2-3 (B) shift valve governor plugs.

Install the shuttle valve (7), primary spring (3) and the throttle plug (2).

Install the governor plug end plate (1) and tighten the screws to 4 N·m (35 in-lbs) torque.

Install the spring guides (6), shuttle valve secondary spring (5) and E-clip (4).

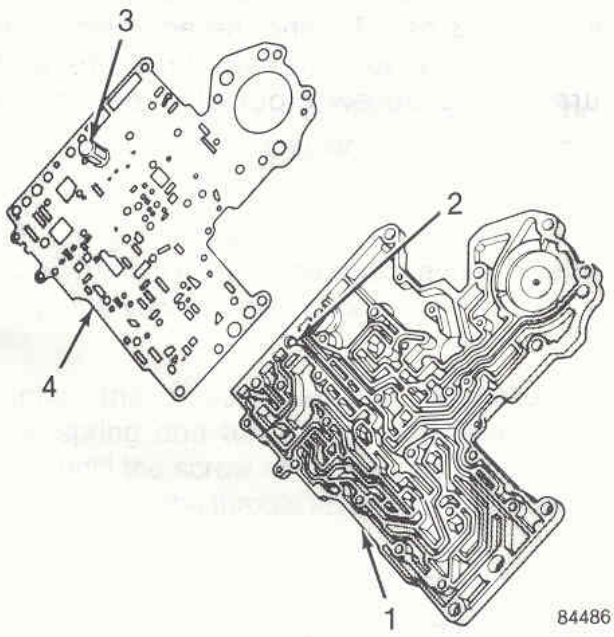
Install the shuttle valve cover plate (C) and tighten the screws to 4 N·m (35 in-lbs) torque.



Check Ball Size Chart
A = 11/32 Inch Diameter
B = 1/4 Inch Diameter

84485

SEE I.S. NOTES



84486

Install the check balls (A) (B) in the valve body.

Install the pressure regulator valve screen (3) in the separator plate (4) and rear clutch check ball (2).

Position the separator plate (4) on the transfer plate (1) and the stiffener plate on the separator plate.

Install the stiffener and separator plate-to-transfer plate retaining screws. Tighten the screws to 4 N·m (35 in-lbs) torque.

Position the transfer plate assembly on the valve body and install the retaining screws finger-tight.

NOTE: Before tightening the retaining screws be sure the pressure regulator filter screen is properly aligned.

Starting at the center and working outward, tighten the transfer plate assembly retaining screws to 4 N·m (35 in-lbs) torque.

Install the E-clip and park control rod on the manual lever assembly.

Install the oil filter.

Check and adjust the throttle and line pressure settings if necessary.

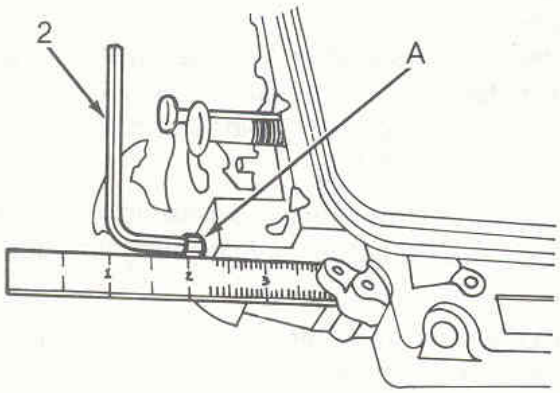
NOTE: If pressures were satisfactory before disassembly, do not change the line or throttle pressure adjusting screw settings.

SEE I.S. NOTES

Valve Body Hydraulic Control Pressure Adjustments

There are two hydraulic control pressure adjustments that can be performed on the valve body, they are: Line pressure and throttle pressure adjustment.

Because line and throttle pressure are interdependent (each affects shift quality and timing), both adjustments must be performed properly and in the correct sequence which is; line pressure adjustment first – throttle pressure adjustment last.



84487

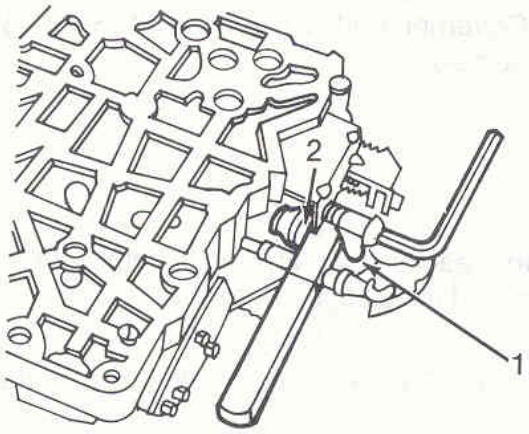
Line Pressure Adjustment

Measure the distance from the valve body to the inner edge of the adjusting screw using the accurate steel scale.

The distance measured should be 33.4 mm (1-5/16 inches).

If adjustment is required, turn the adjusting screw (A) in or out to obtain 33.4 mm (1-5/16 inch) setting.

NOTE: The 33.4 mm (1-5/16 inches) setting is an approximate setting. Because of manufacturing tolerances, it may be necessary to vary from this dimension to obtain the desired pressure. One complete turn of the adjusting screw changes line pressure approximately 9kPa (1-2/3 psi). Turning the adjusting screw counterclockwise increases pressure while turning the screw clockwise decreases pressure.



84488

Throttle Pressure Adjustment

Insert the Gauge Tool J-24031 between the throttle lever cam (1) and kickdown valve (2).

Push the gauge tool inward to compress the kickdown valve against the spring and to bottom the throttle valve in valve body.

Maintain the pressure against the kickdown valve spring and turn the throttle lever stop screw until the screw head touches the throttle lever tang and the throttle lever cam touches the gauge tool.

NOTE: The kickdown valve spring must be fully compressed and the kickdown valve completely bottomed in the valve body to obtain a correct adjustment.

Accumulator Piston and Spring – Inspection

Inspect the piston for nicks, burrs, scores and wear. Be sure the rings turn freely in the piston grooves. Inspect the case bore for scores or other damage.

Inspect the spring for cracks or distortion. Replace damaged or worn parts.

Adapter Housing Bearing and Seal Replacement

Remove the seal from extension housing using a screwdriver or punch.

Remove the snap rings and remove the bearing from the housing.

Install the replacement bearing in the housing and install the snap rings.

Install the replacement seal in the housing. Seat the seal flush with the edge of the seal bore in the housing.

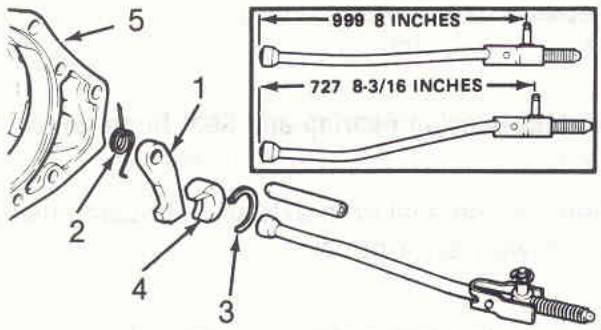
SEE I.S. NOTES

SEE I.S. NOTES

Park Lock Sprag

Disassembly

Remove the pivot shaft from adapter housing.



Transmission	A	B
727		208 mm (8-3/16)
900	203.6 mm (8 in.)	

84489

Remove the park sprag (1) and the spring (2).

Remove the snap ring (3) and reaction plug and the pin assembly (4) from the housing (5).

Inspection

Inspect the pivot shaft for scores and free movement in the housing and sprag. Inspect the control rod and sprag springs for distortion and loss of tension. Inspect the sprag and gear for cracks and broken edges on the engagement lugs. Inspect the knob at the end of the control rod for excessive wear, nicks, burrs, and free turning.

If necessary, replace the park gear as outlined under Governor and Support – Disassembly and Assembly.

Assembly

Install the reaction plug and pin assembly (4) in housing and install snap ring (3).

Install the sprag (1) and spring (2) in the housing.

NOTE: The square lug on the sprag must face the park gear.

Position the spring so it moves the sprag away from the gear.

Install the pivot pin.

Governor

Disassembly

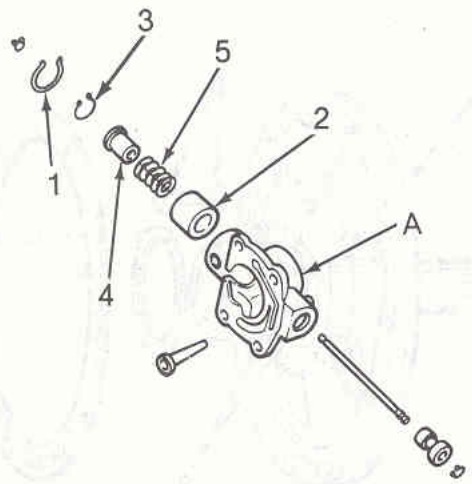
Remove the large snap ring (1) from the weight end of the governor body (A).

Remove the weight assembly (2).

Remove the snap ring (3) from the governor weight assembly.

Separate the inner weight (4), spring (5), and outer weight (2).

NOTE: If the park gear or governor body are to be replaced, straighten the lock tabs and remove the four attaching bolts.



84490

Inspection

Thoroughly clean and dry all governor parts and check for free movement. Do not use a caustic cleaning solution.

The weights and valve should fall freely in their bores when clean and dry. Rough surfaces and burrs may be polished with crocus cloth.

Inspect the governor weight spring for distortion.

Inspect the park gear and governor support for chipped or worn gear teeth and damaged ring grooves.

Clean the filter in solvent and air dry. Replace it if damaged or defective.

Assembly

If the governor body was separated from park gear, assemble the parts and install the attaching bolts finger-tight.

NOTE: The bolts must not be tightened to specified torque until the assembly is installed on the output shaft.

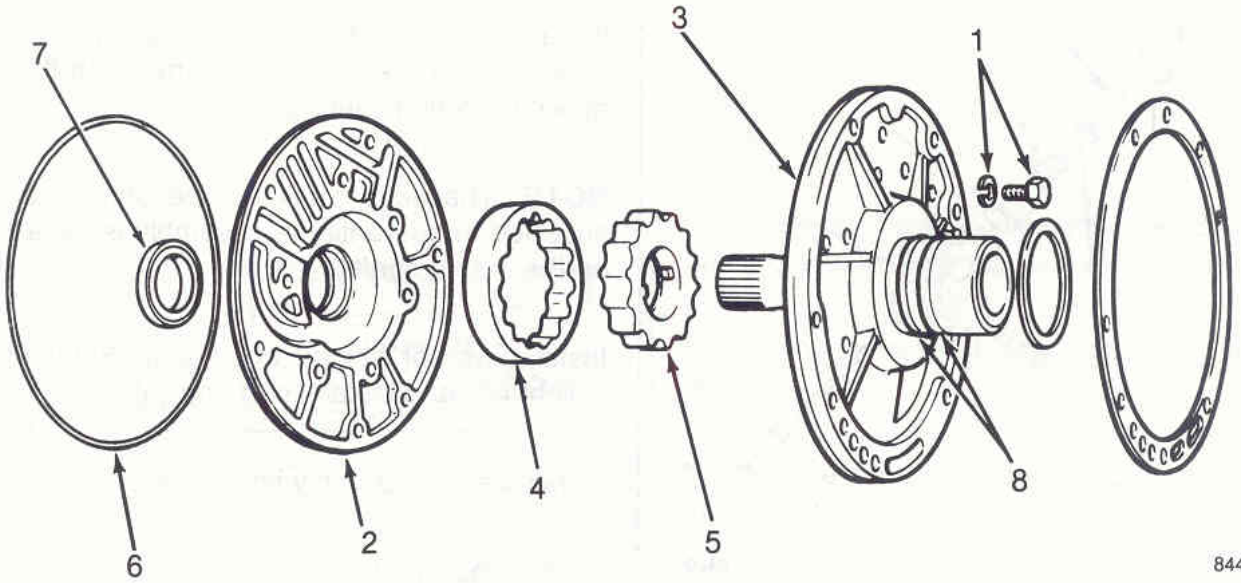
Install governor weights and spring (5) in outer weight (2), and install snap ring (3).

Install weight assembly into body.

Install snap ring (1).

SEE I.S. NOTES

SEE I.S. NOTES



Oil Pump and Reaction Shaft Support – 900 Series

Disassembly

Remove the bolts (1) attaching the pump (2) to the support (3) and remove the support.

Mark the pump rotors (4) (5) for assembly reference.

Remove the rotors.

Remove the O-ring (6), seal (7) using a blunt punch.

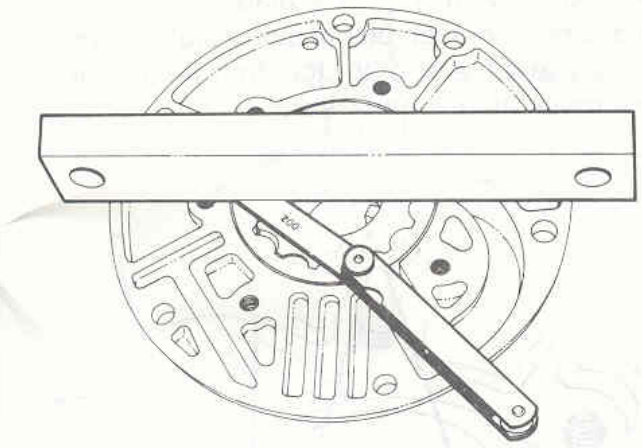
Remove the front clutch seal rings (8) from the support.

SEE I.S. NOTES

Inspection

Inspect the front clutch seal ring grooves for burrs, nicks, or cracked edges. Inspect the front clutch retainer-to-reaction shaft support thrust washer for wear. The washer should be 1.09 to 1.14 mm (0.043 to 0.045 in) thick. Inspect all machined surfaces on the pump housing and support for nicks and burrs. Inspect the pump body and reaction shaft support bushings for wear and scores. Inspect the pump rotors for scores or pits.

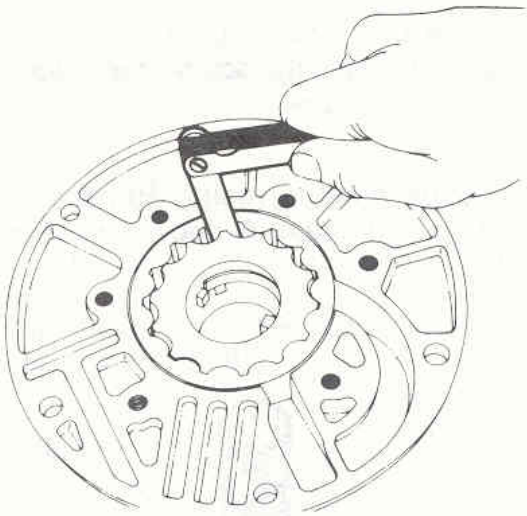
Install the pump rotors in the pump body. Place straightedge across the rotor faces and pump body. Using a feeler gauge, measure the clearance between the straightedge and pump rotors. Clearance limits are 0.02 to 0.07 mm (0.001 to 0.003 in).



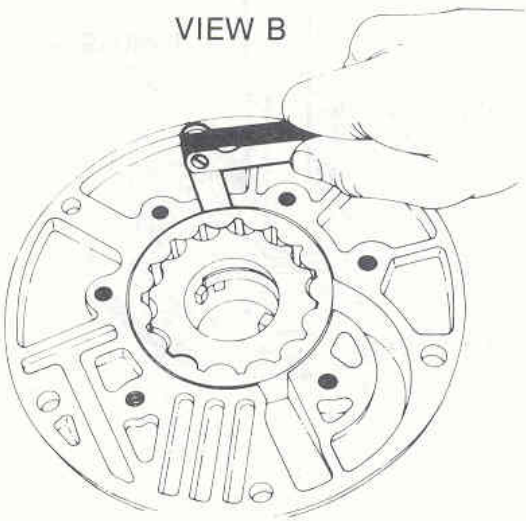
84492

Position the inner and outer rotors so that the center of one tooth on each rotor is aligned. Measure the clearance between the tips of the teeth. Make four measurements. Rotate the inner rotor approximately 1/4 turn (90°) between measurements. Rotor tip clearance should be 0.13 to 0.25 mm (0.005 to 0.010 in) (View A).

VIEW A



VIEW B



84493

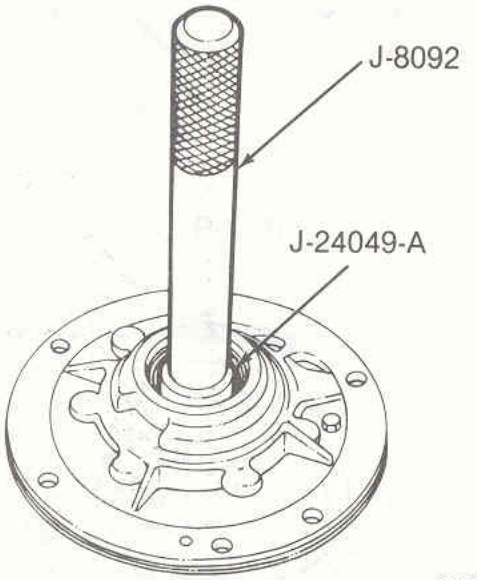
Measure the clearance between the outer surface of the outer rotor and the pump bore. The clearance should be 0.10 to 0.20 mm (0.004 to 0.008 in) (View B).

SEE I.S. NOTES

Pump Bushing Replacement

Position the pump housing, with the reaction shaft support mating surface facing downward, on a flat, level surface.

Remove the bushing using Remover and Installer Tool J-24049-A and Driver Handle J-8092.

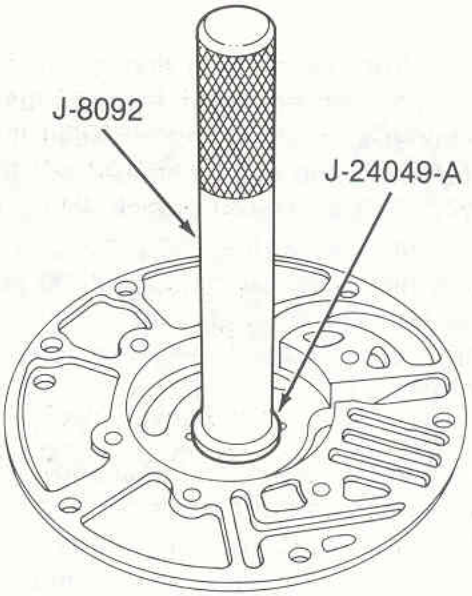


84494

NOTE: Be careful to keep the tool straight in the bore during removal.

Position replacement bushing on Installer Tool J-24049-A.

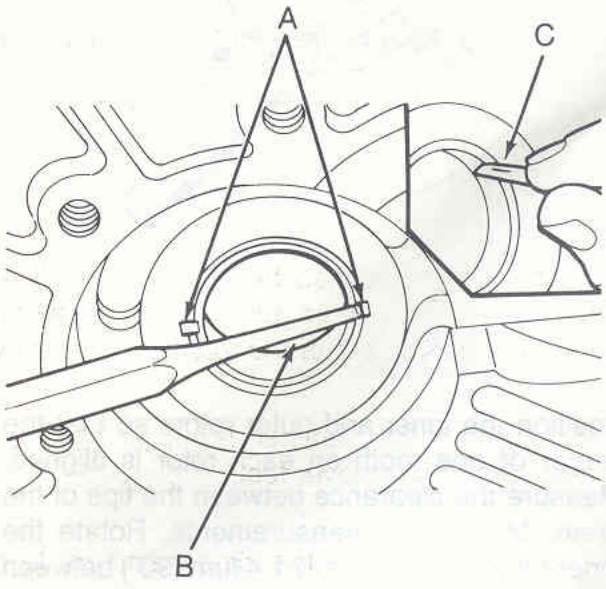
Turn the pump housing over and install the bushing straight into the housing until the edge of bushing is flush with the bore.



84495

Stake the bushing in two places (A) (to retain it) using a blunt punch (B).

Use a knife, with a narrow blade (C) only, to remove burrs or high points at the stake points. Do not use a file or other tool that will remove more metal than is necessary.



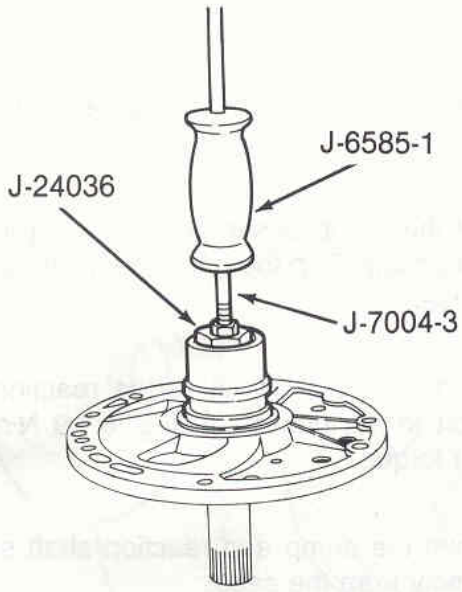
84496

Reaction Shaft Bushing Replacement

NOTE: If the reaction shaft bushing requires replacement, be sure to inspect the support for wear at the input shaft and rear clutch retainer seal ring lands. If the lands are worn or grooved, replace the entire support assembly.

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

Thread the Bushing Remover Tool J-24036 straight into the bushing as far as possible by hand.



84497

Using a wrench, thread the remover tool into the bushing three or four additional turns to fully engage the threads of the tool in the bushing.

Install the Slide Hammer Tools J-7004-3 and J-6585-1 into remover tool.

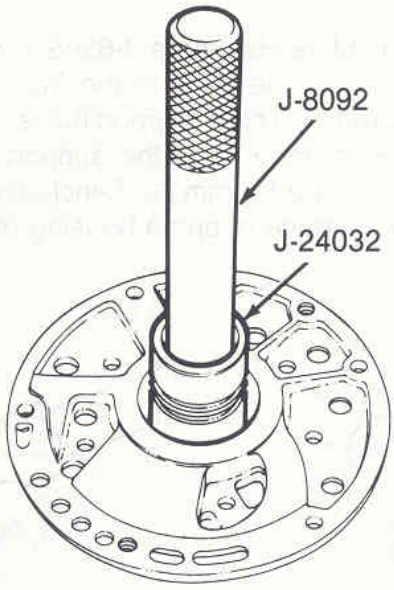
Bump outward with the slide hammers to remove the bushing.

Clean the chips from the reaction shaft support assembly.

Grip the old bushing with pliers and remove it from Tool J-24036.

CAUTION: Be sure to protect the remover tool threads when using the tool.

Thread Bushing Installer Tool J-24032 onto the Driver Handle J-8092.



84498

Position the replacement bushing on the installer tool and install the bushing straight into the shaft bore until the tool bottoms.

Clean the reaction shaft support thoroughly after bushing installation.

SEE I.S. NOTES

SEE I.S. NOTES

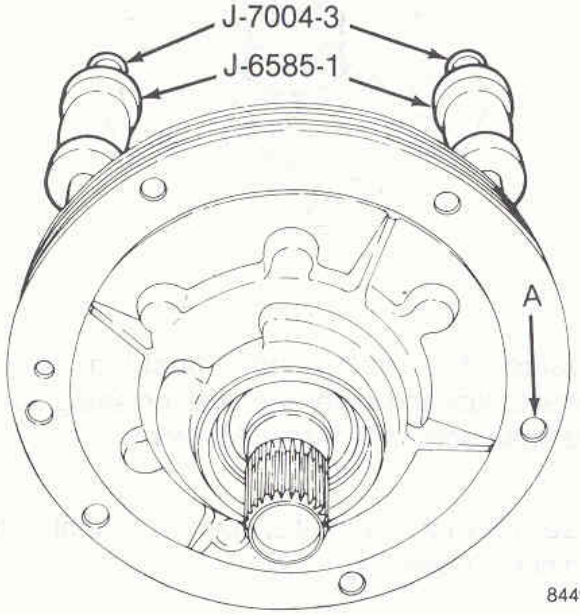
Assembly

Position the pump housing on a smooth flat surface and install the pump rotors.

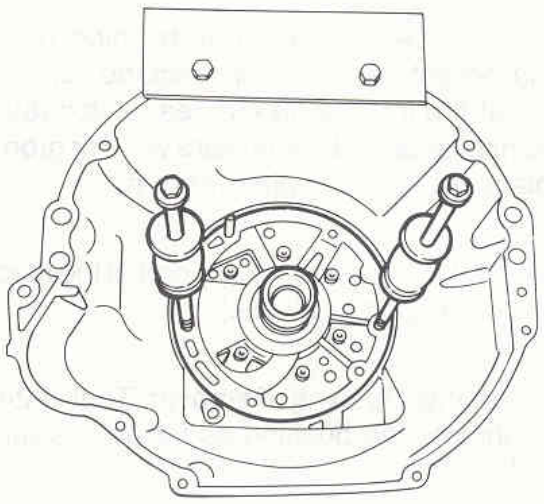
NOTE: New rotors may be installed with either face up. Used rotors must be installed as removed. Refer to reference marks made during disassembly.

Align and install the reaction shaft support on the pump housing and finger-tighten the attaching bolt.

Insert two Slide Hammers J-6585-1 and Bolts J-7004-3, from the back to the front, into the threaded reaction shaft support holes. The bolts should be threaded into the support until the ends of bolts are 1.6 mm (1/16-inch) below front machined surface of pump housing (A).



84499


84500

Install one Pilot Stud Tool J-3387-2 into the case pump opening.

Install the pump assembly backward into the case opening. Tap the pump gently to seat it in the case.

Tighten the bolts attaching the reaction shaft support to the pump housing to 19 N·m (160 in-lbs) torque.

Remove the pump and reaction shaft support assembly from the case.

Remove the slide hammer tools from the pump.

Position the oil seal in the pump housing with the seal lip facing inward.

Install the seal using Installer Tool J-9617. Install the seal into the housing until the tool bottoms.

Oil Pump and Reaction Shaft Support – Model 727

Disassembly

Remove the pump-to-support attaching bolts (1) and remove the support (2) from pump (3).

Mark the rotors for assembly alignment reference.

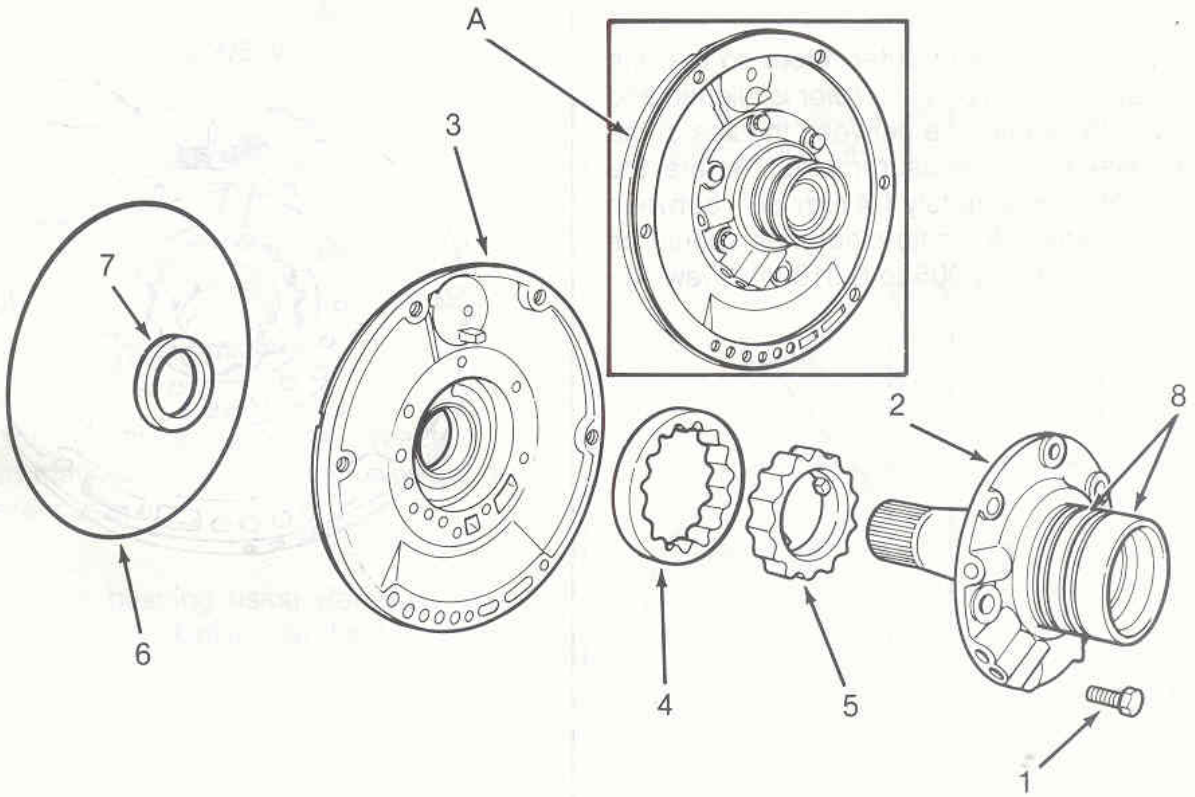
Remove the rotors (4) (5).

Remove the O-ring seal (6) from the pump body flange (A).

Remove the front oil seal (7) using a blunt punch.

Remove the front clutch seal rings (8) from the support.

SEE I.S. NOTES



84501

SEE I.S. NOTES

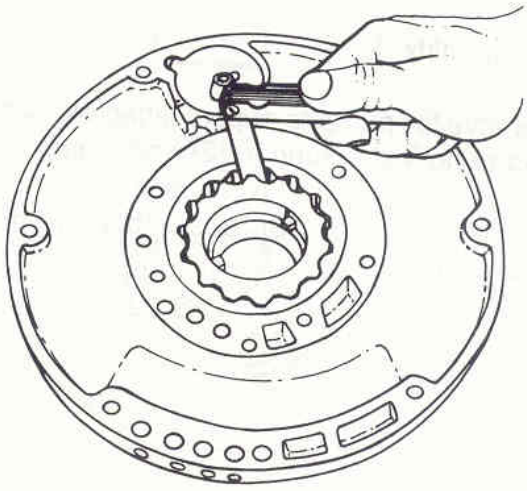
Inspection

Inspect the front clutch seal ring grooves for burrs, nicks, or cracked edges. Inspect all machined surfaces on the pump housing for nicks and burrs. Inspect the pump body and reaction shaft support bushings for wear and scores. Inspect the pump rotors for scores and pits.

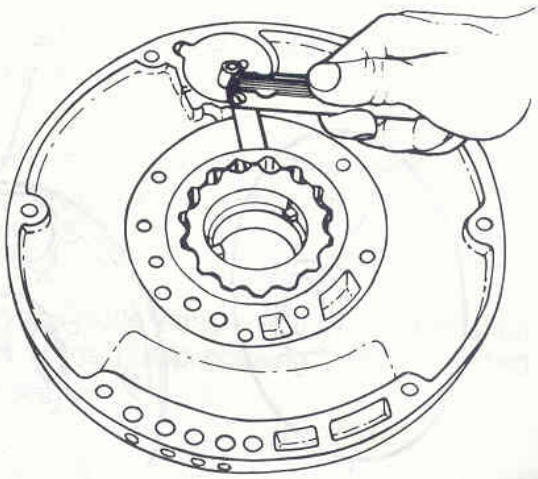
Install the pump rotors in the pump body. Position a straightedge (A) across the rotor faces and pump body and use a feeler gauge (B) to measure the clearance between the straightedge and rotors. Clearance limits are 0.02 to 0.07 mm (0.001 to 0.003 in).

Position the inner and outer rotors so that the center of one tooth on each rotor is aligned and measure the clearance between the tips of the teeth. Make four measurements. Rotate the inner rotor approximately 1/4 turn (90°) between measurements. Rotor tip clearance should be 0.13 to 0.20 mm (0.005 to 0.010 in) (View A).

VIEW A

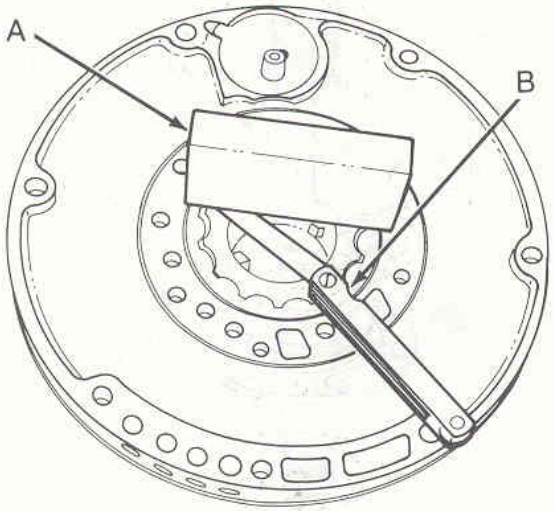


VIEW B



84503

Measure the clearance between the outer surface of the outer rotor and the pump bore. Clearance should be 0.10 to 0.20 mm (0.004 to 0.008 in) (View B).

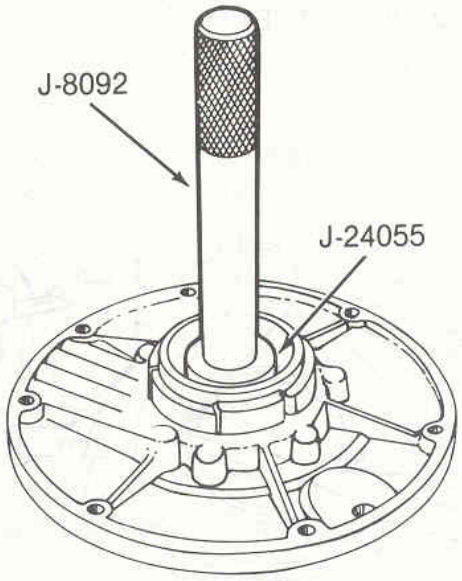


84502

Pump Bushing Replacement

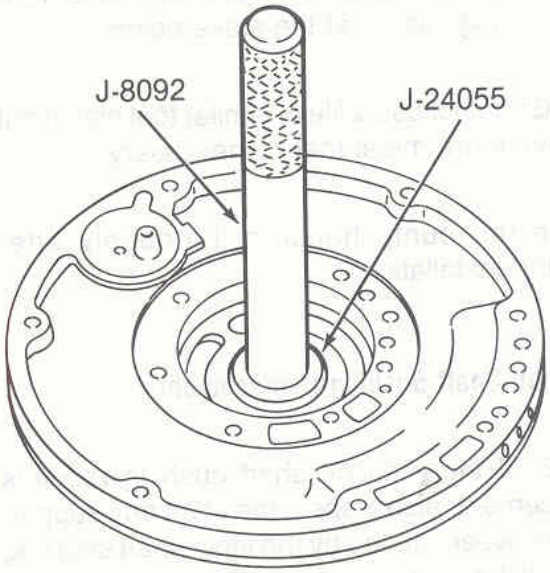
Place the pump housing, with the reaction shaft support mating surface facing downward, on a flat, level surface.

Remove the bushing using Remover/Installer Tool J-24055 and Driver Handle J-8092.



84504

Install the replacement bushing on Remover/ Installer Tool J-24055.



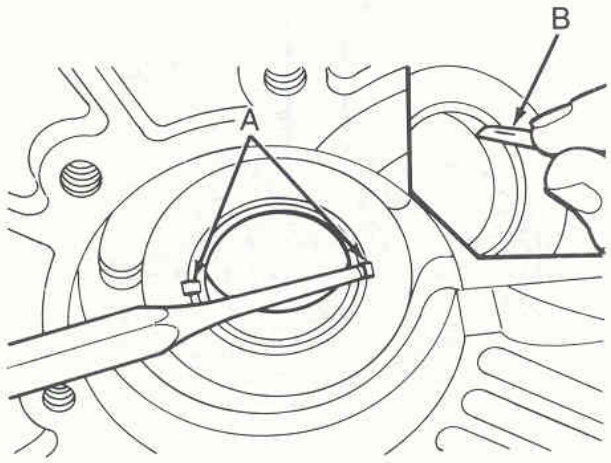
84505

Turn the pump housing over and install the bushing straight into the housing until the edge of the bushing is flush with the bore.

SEE I.S. NOTES

SEE I.S. NOTES

Stake the bushing (A) in two places to retain it using a blunt punch (B).



84506

Use a knife, with a narrow blade only, to remove burrs or high spots at the stake points.

NOTE: Do not use a file or similar tool that might remove more metal than is necessary.

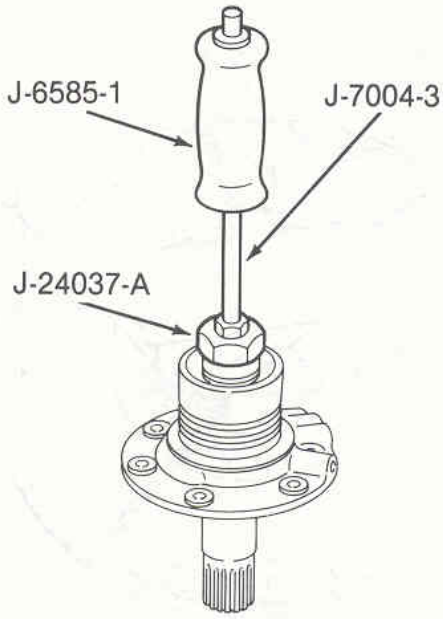
Clean the pump housing thoroughly after bushing installation.

Reaction Shaft Bushing Replacement

NOTE: If the reaction shaft bushing requires replacement, also inspect the shaft and support bore for wear caused by the input shaft seal ring lands. If the bore is worn or grooved, replace the entire support assembly.

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

Thread Bushing Remover Tool J-24037-A to the bushing as far as possible by hand.



84507

Using a wrench, thread the remover tool into the bushing three to four additional turns to fully engage the threads of the tool into the bushing.

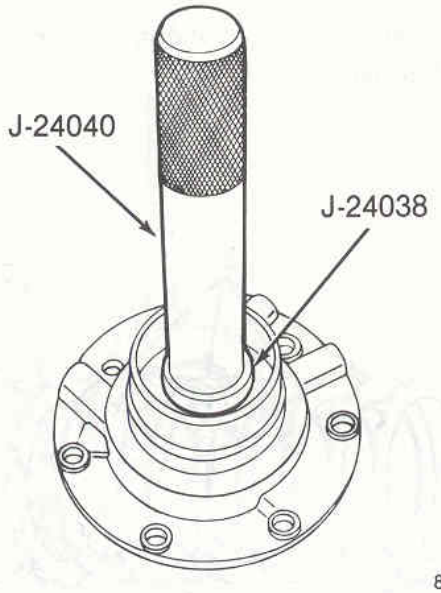
Install Slide Hammer Bolts Tool J-7004-3 and J-6585-1 into the remover tool. Bump outward with the slide hammers to remove bushing.

Thoroughly clean the reaction shaft support assembly after bushing removal.

Grip the old bushing with the pliers and remove it from the Tool J-24037-A.

NOTE: Be sure to protect the threads on the remover tool when using the tool.

Thread the Bushing Installer Tool J-24038 onto Driver Handle J-8092.



Position the replacement bushing on the installer tool and install the bushing straight into the shaft bore until the tool bottoms.

Assembly

Install the pump rotors in the housing.

Install the reaction shaft support and tighten the attaching bolts to 18 N·m (160 in-lbs) torque.

Install the O-ring seal around the pump housing flange.

Install the oil seal pump housing with the seal lip facing inward.

Install the oil seal on Installer Tool J-21005.

Install the seal straight into the housing until the tool bottoms.

Thoroughly clean the reaction shaft support assembly.

SEE I.S. NOTES

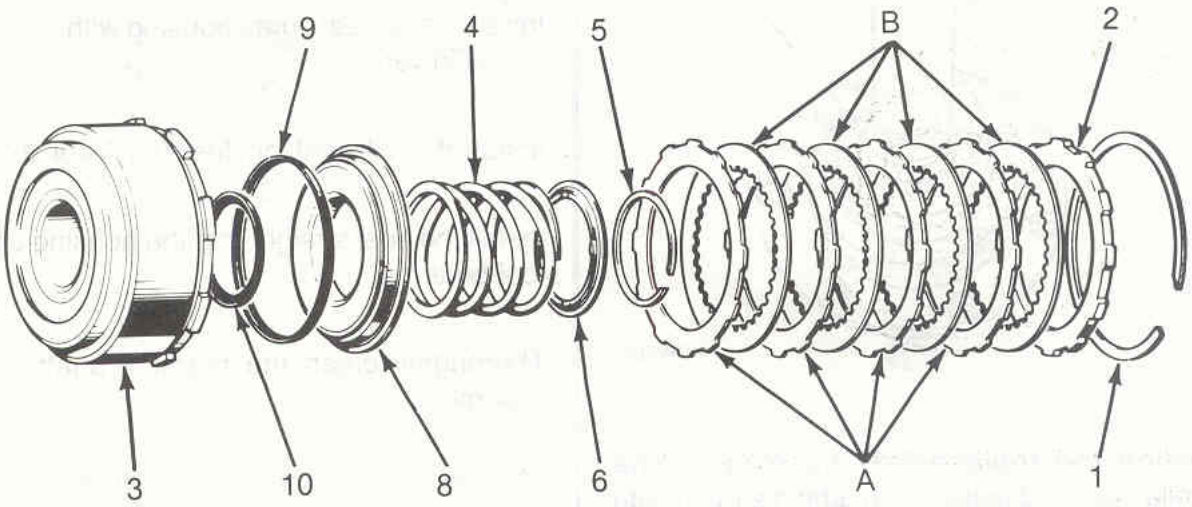
SEE I.S. NOTES

Front Clutch – 900 Series

Disassembly

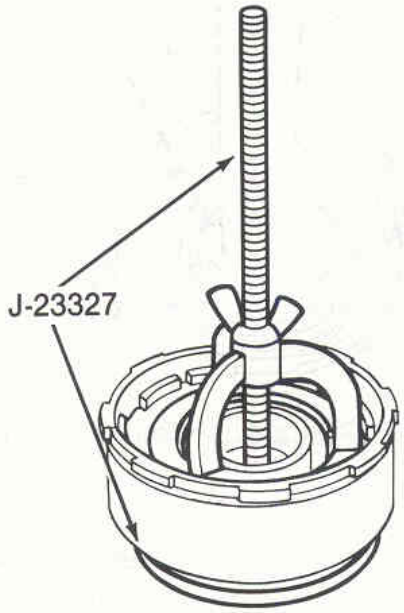
Remove the large waved snap ring (1) which secures the pressure plate (2) in the clutch retainer (3).

Remove the steel plates (A) and the clutch plates (B).



84509

Install the Spring Compressor Tool J-23327 over piston spring retainer.



Compress the piston springs (4) and remove the snap ring (5).

Release the compressor tool slowly until the spring retainer is free of the hub.

NOTE: When releasing the compressor tool, do not allow the spring retainer to stick or bind in the snap ring groove.

Remove the tool, retainer (6) and piston spring.

Turn clutch retainer over and bump on the wood block to dislodge and remove the piston.

Remove the seal rings (9) (10) from the piston and clutch retainer hub.

Inspection

Inspect the friction material on all driving discs. Replace discs that are charred, glazed, heavily pitted, flaking or if the friction material can be scraped off easily.

Inspect the steel plates and pressure plate surfaces for overheating, scoring, warping and for damaged driving lugs. Replace any worn, damaged parts.

Inspect the steel plate lug grooves in the clutch retainer for smooth surfaces. The plates must slide freely in the grooves.

Inspect the band application surface on the clutch retainer for nicks and scores. Light scratches and nicks can be removed with crocus cloth.

Inspect the ball check in the clutch retainer. The ball should move freely in its cage.

Inspect the seal ring surfaces inside the clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing of the rings. Inspect the clutch retainer bushing for scores and wear and inspect the inner bore surface for wear from the reaction shaft support seal rings and lands.

Inspect the inside of the piston bore for score marks. Remove light scores with crocus cloth. Inspect the seal ring grooves for nicks and burrs. Inspect the piston spring, retainer, and snap ring for distortion.

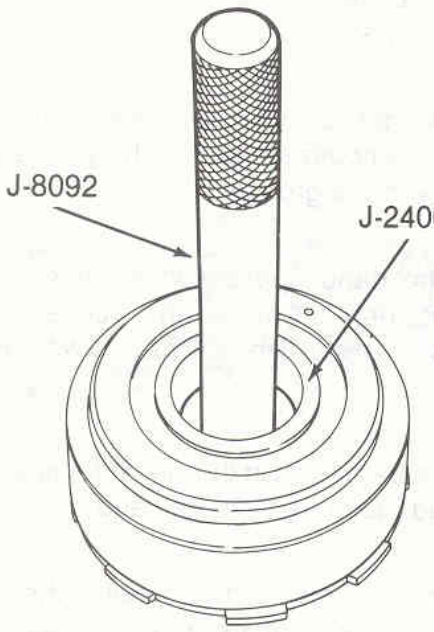
SEE I.S. NOTES

SEE I.S. NOTES

Retainer Bushing Replacement

Place the clutch retainer, with the open end facing down, on a clean, smooth surface.

Insert the Bushing Remover/Installer Tool J-24064 in bushing.

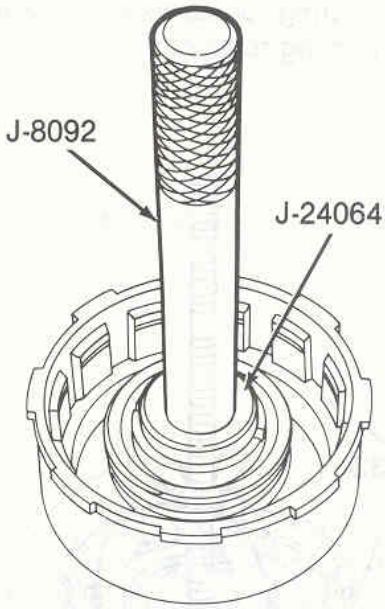


84511

Install Driver Handle J-8092 into the remover tool and drive the bushing straight down and out of the retainer bore.

Position the clutch retainer so the open end faces upward.

Install the replacement bushing on the tool and install the bushing straight into the retainer bore until the bushing is flush with the base of the bore chamfer.



84512

Assembly

Lubricate the inner seal with petroleum jelly and install the seal on hub of clutch retainer.

NOTE: Be sure the seal lip is facing into the piston bore and that the seal is properly seated in the retainer groove.

Lubricate the outer seal with petroleum jelly and install it on the clutch piston so the seal lip faces into the piston bore.

Install the piston assembly in the retainer using a twisting motion to seat the piston at the bottom of the bore.

Install the spring on piston hub and spring retainer.

Install the snap ring over the spring.

Install Spring Compressor Tool J-23327 over retainer assembly.

Compress the spring and seat the snap ring in the clutch hub groove.

Remove the compressor tool.

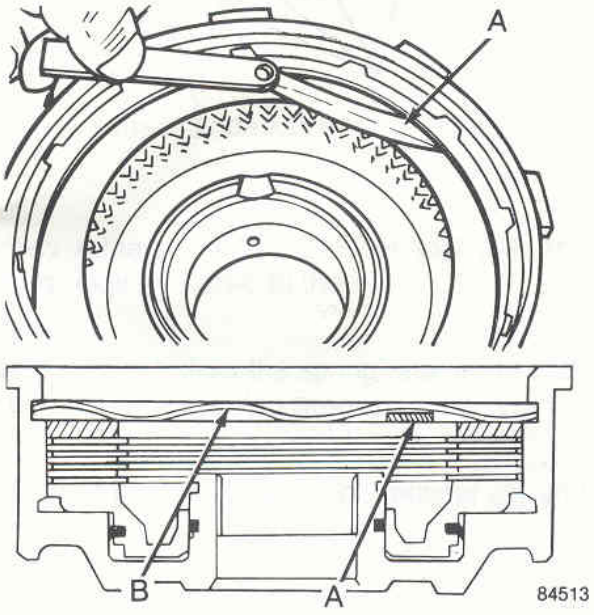
Lubricate the clutch plates and discs with transmission fluid.

Install one steel plate followed by a lined plate until the proper number of plates are installed.

Install the pressure plate and the waved snap ring.

NOTE: Be sure snap ring is completely seated in groove.

Measure the clutch pack clearance using feeler gauge (A).



Insert the gauge between the pressure plate and snap ring. Refer to the Clutch Plate Clearance in the Specifications for tolerances.

If the clutch plate clearance is not within specifications, disassemble the clutch pack and measure the thickness of the line plate, steel plates and pressure plate. The thickness should be as follows:

Lined Plate ..... 2.11 to 2.24 mm
(0.083 to 0.088 in)

Steel Plate ..... 1.68 to 1.80 mm
(0.066 to 0.071 in)

Pressure Plate ..... 5.44 to 5.54 mm
(0.2l4 to 0.218 in)

Any component not meeting the listed thickness specification must be replaced in order to obtain the correct clutch park clearance.

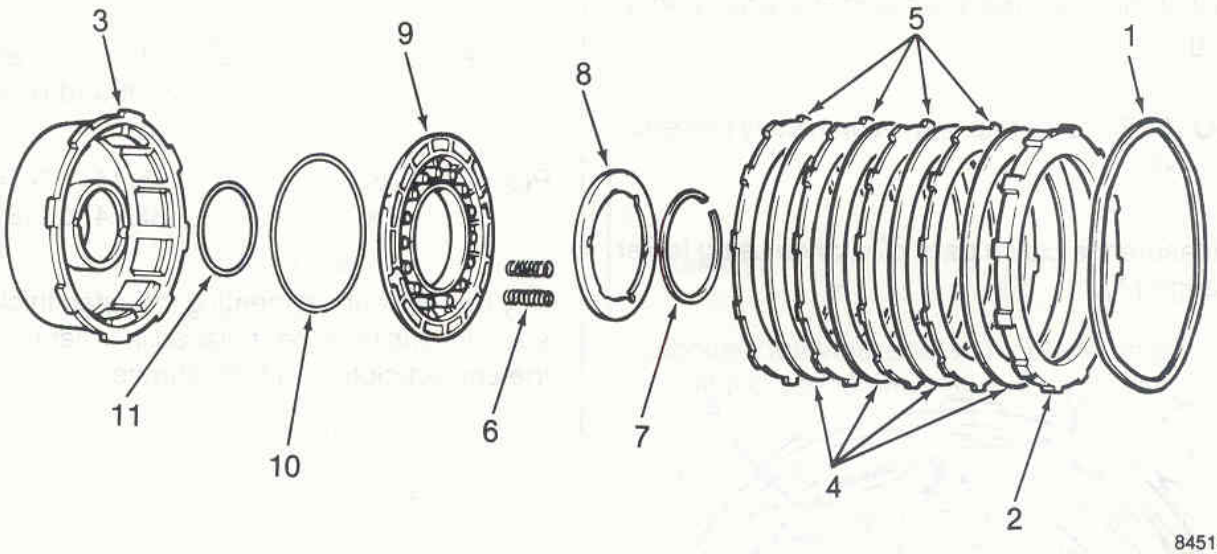
SEE I.S. NOTES

SEE I.S. NOTES

Front Clutch – Model 727

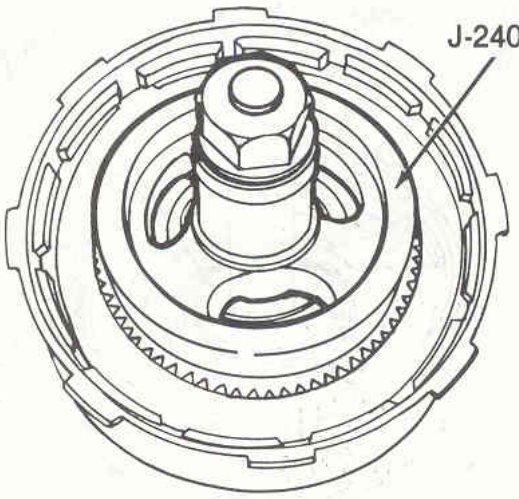
Disassembly

Remove the large waved snap ring (1) that retains the pressure plate (2) in the clutch piston retainer (3).



Remove the pressure plate (4) and clutch plates (5).

Install the Compressor Tool J-24042 over the piston spring retainer.



84515

Compress the springs and remove the snap ring (7).

Slowly release the compressor tool until the spring retainer is free of the hub.

NOTE: Do not allow the spring retainer to stick or bind in the snap ring groove.

Remove the compressor tool, retainer (8) and springs (6).

Turn the clutch retainer over and bump on the wooden block to dislodge and remove the piston (9).

Remove the seals from the piston (10) and retainer hub (11).

Inspection

Inspect the friction material on all driving discs. Replace discs that are charred, glazed, heavily pitted, flaking, or if the friction material can be scraped off easily. Inspect internal splines for wear or other damage.

Inspect the steel plates and pressure plate surfaces for overheating, scoring, warping and damaged driving lugs and replace as necessary.

Inspect the steel plate lug grooves in the clutch retainer for smooth surfaces. The plates must slide freely in the grooves.

Inspect the band application surface on the clutch retainer for nicks and scores. Remove light scratches and nicks with crocus cloth.

Inspect the check ball in the clutch retainer. The ball should move freely in its cage.

Inspect the seal ring surface inside the clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing of the rings. Inspect the clutch retainer bushing for scores and wear from the reaction shaft support sealing rings and lands.

Inspect the inner bore of the piston for score marks. Remove light scores with crocus cloth. Inspect the seal ring grooves for nicks and burrs. Inspect the piston springs, retainer, and snap ring for distortion.

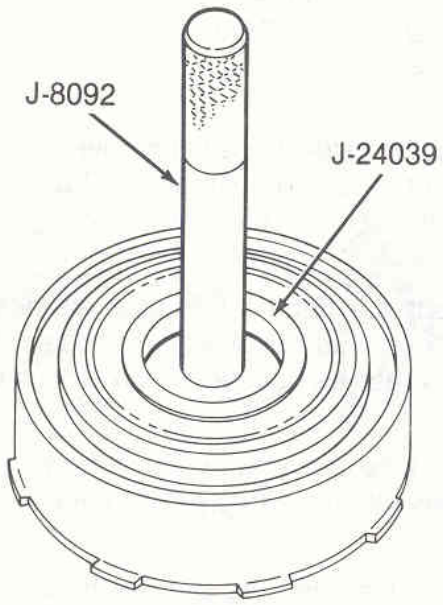
SEE I.S. NOTES

SEE I.S. NOTES

Retainer Bushing Replacement – Model 727

Place the clutch retainer, with the open end facing downward, on a clean, smooth surface.

Insert the Bushing Remover/Installer Tool J-24039 in the bushing.

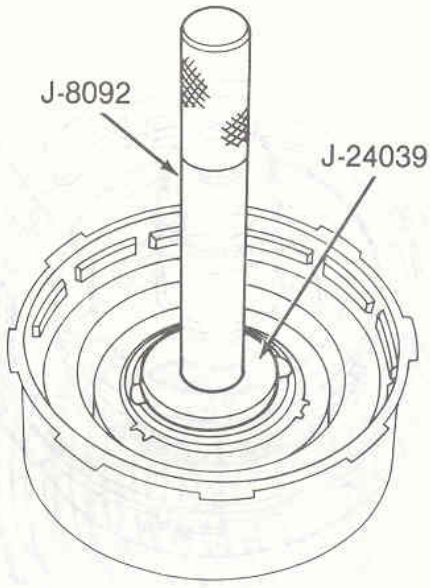


84516

Install the Drive Handle J-8092 in the tool and tap the bushing straight down and out of the bore.

Position the clutch retainer so the open end faces upward.

Install the replacement bushing on the Tool J-24039 and install the bushing straight into the retainer bore until the bushing is flush with the base of the bore chamfer.



84517

Assembly

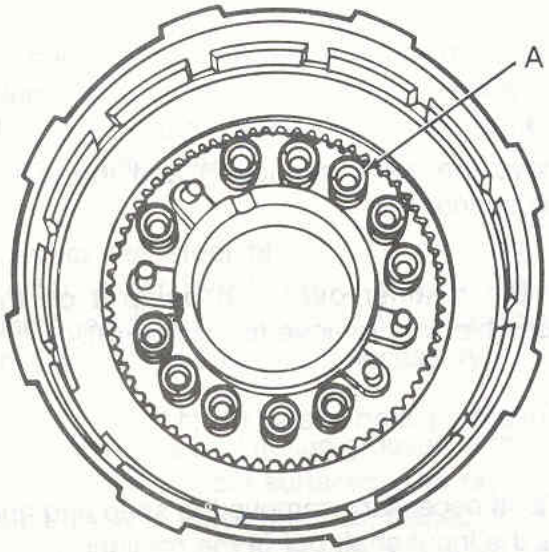
Lubricate the inner seal with petroleum jelly and install it on hub of clutch retainer.

NOTE: Be sure the seal lip faces into the piston bore and is properly seated in the seal groove.

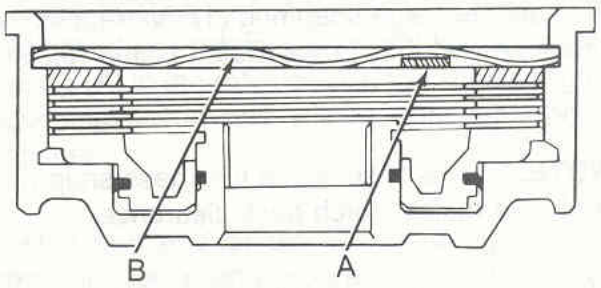
Lubricate the outer seal with petroleum jelly and install it on the clutch piston with the seal lip facing into piston bore.

Install the piston assembly in the retainer and carefully seat the piston at the bottom of the retainer bore.

Install the clutch piston springs (A) on the piston.



84518



84519

SEE I.S. NOTES

Install the nine or eleven springs in the clutch (according to original number in clutch).

Install the spring retainer and snap ring over the springs.

Install the Compressor Tool J-24042 over the retainer assembly.

Compress the springs and seat snap ring in the hub groove.

Remove the compressor tool.

Lubricate the clutch plates with transmission fluid.

Install one steel plate followed by one lined plate until the correct number of plates are installed.

Install the pressure plate and waved snap ring. Measure the clutch pack clearance using the feeler gauge.

Refer to the clutch plate clearance in the Specifications section for tolerances.

If the clutch pack clearance is not within specifications, disassemble the clutch pack and measure the thickness of the lined plates, steel plates, and pressure plate. The thickness should be as follows:

Lined Plate ..... 2.29 to 2.41 mm
(0.090 to 0.095 in)

Steel Plate ..... 1.52 to 1.80 mm
(0.060 to 0.071 in)

Pressure Plate ..... 7.06 to 7.16 mm
(0.278 to 0.282 in)

Any component not meeting the listed thickness specification must be replaced in order to obtain the correct clutch pack clearance.

Rear Clutch – 900 Series

SEE I.S. NOTES

Disassembly

Remove the large snap ring (1) that retains the pressure plate (2) in the clutch piston retainer (3).

NOTE: This is a selective thickness snap ring and determines clutch pack clearance.

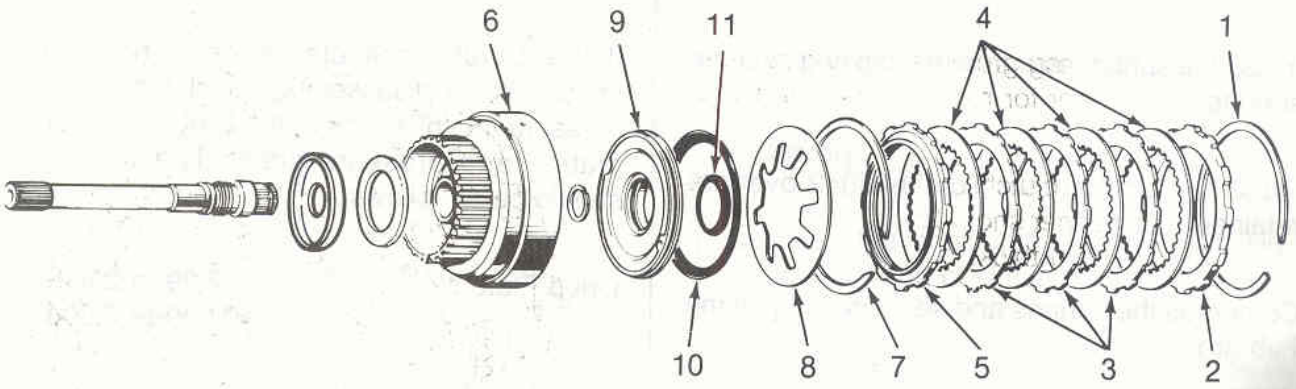
Lift the pressure plate (2), clutch plates (3) (4), and inner pressure plate (5) out of the retainer (6).

Remove the wave spring (7) and the clutch piston spring (8).

Turn the retainer over and bump it on the wooden block to remove the piston (9).

Remove the piston seals (10) (11).

NOTE: If necessary, remove the snap ring and press the input shaft out of the retainer.



84551

Inspection

Inspect the friction material on the driving discs. Replace discs that are charred, heavily pitted, flaking or if the driving disc inner splines are worn or damaged.

Inspect the steel plates and pressure plate surfaces for overheating, scoring, and for damaged drive lugs. Inspect all discs and plates for flatness and replace if necessary.

Inspect the steel plate lug grooves in the clutch retainer for smooth surfaces. The plates must slide freely in these grooves. Inspect the clutch piston ball check. The ball should move freely in its cage. Inspect the seal ring surfaces in the clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing. Inspect the piston spring and wave spring for distortion or breakage.

Inspect the seal ring grooves in the input shaft and piston retainer for nicks, burrs, and wear.

Inspect the rear clutch to front clutch thrust washer. The washer should be 1.09 to 1.14 mm (0.043 to 0.045 in) thick.

Assembly

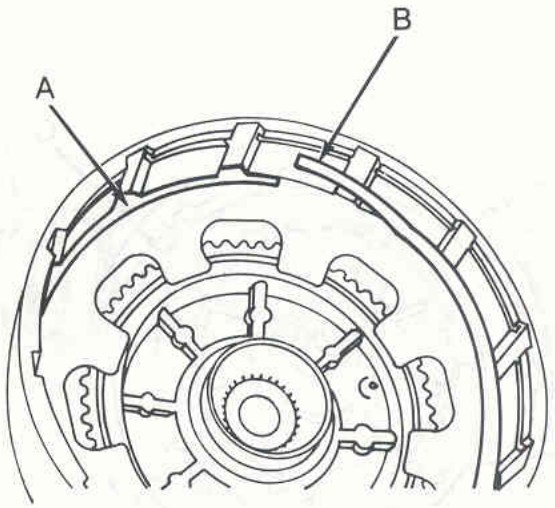
Press the input shaft into the piston retainer (if removed) and install the snap ring.

Lubricate and install the inner and outer seal rings on the clutch piston.

NOTE: Be sure that the lips of the seals face into the retainer bore and that the seals are properly seated in the piston grooves.

Install the piston assembly into the retainer using a twisting motion to seat the piston at the bottom of the retainer bore. Install the piston spring (A) in the retainer with the spring fingers touching piston and with spring centered in retainer.

Install one end of the wave spring (B) into retainer groove and progressively push or tap the spring into place until completely seated. If necessary, lightly tap the piston spring to keep it centered.



84520

SEE I.S. NOTES

SEE I.S. NOTES

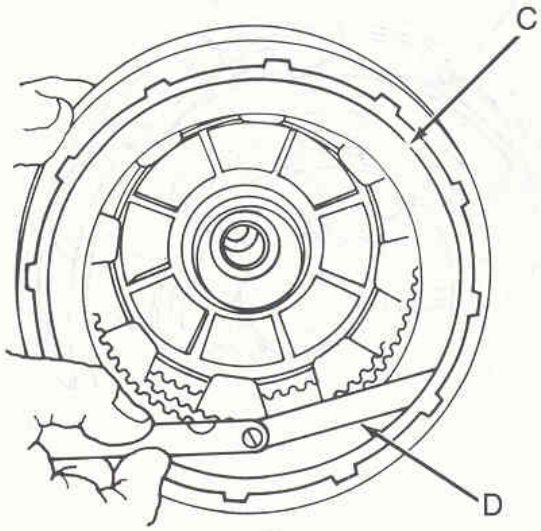
Install the inner pressure plate. The raised side of plate should rest on the piston spring and the flat surface should face the open end of the retainer.

Lubricate the clutch plates with transmission fluid.

Install a lined plate first and follow with a steel plate and then a lined plate until the correct number of plates are installed.

Install the outer pressure plate and the selective thickness snap ring (C).

Measure the rear clutch pack clearance. Press down firmly on the outer pressure plate and insert the feeler gauge (D) between the pressure plate and selective snap ring.



84521

If necessary, adjust the clearance using one of the following selective thickness outer snap rings. Snap rings are available in 1.52, 1.93 and 2.49 mm (0.060, 0.076 and 0.098 in.) thicknesses. Low limit clearance is desirable.

NOTE: Rear clutch pack clearance is very important in obtaining the proper clutch engagement and shift quality.

Rear Clutch – Model 727

Disassembly

Remove the large snap ring (1) that retains the pressure plate (2) in the clutch piston retainer (3).

NOTE: This is a selective thickness snap ring and determines clutch pack clearance.

Remove the pressure plate (2), clutch plates (4) (5), and inner pressure plate (6).

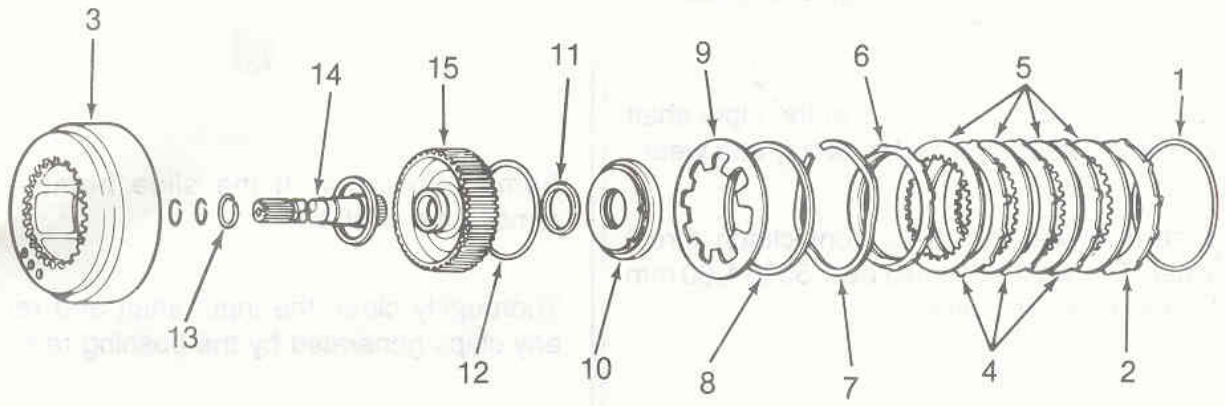
Remove the wave spring (7), spacer ring (8), and clutch piston spring (9).

Turn the retainer over and bump on a wooden block to remove the piston (10).

Remove the piston inner (11) and outer seals (12).

Remove the input shaft snap ring (13) and press the input shaft (14) out of the retainer (15) if necessary.

SEE I.S. NOTES



84522

SEE I.S. NOTES

Inspection

Inspect the friction material on driving discs. Replace all discs that are charred, glazed, heavily pitted, flaking or if the friction material can be scraped off easily. Inspect the driving disc inner splines for wear or other damage.

Inspect the steel plates and pressure plate surfaces for over heating, scoring, and damaged driving lugs. Inspect all discs and plates for distortion. Replace warped or coned discs or plates.

Inspect the steel plate lug grooves in the retainer for smooth surfaces. The plates must slide freely in these grooves. Inspect the clutch piston ball check. The ball should move freely in its cage. Inspect the seal ring surfaces in the clutch retainer for nicks or deep scratches. Light scratches will not interfere with sealing. Inspect the piston spring, wave spring, and spacer for distortion or breakage.

Inspect the seal ring grooves in the input shaft and piston retainer for nicks, burrs, and wear.

Inspect the rear clutch to front clutch thrust washer. The washer should be 1.55 to 1.60 mm (0.061 to 0.063 in) thick.

Input Shaft Bushing Replacement – Model 727

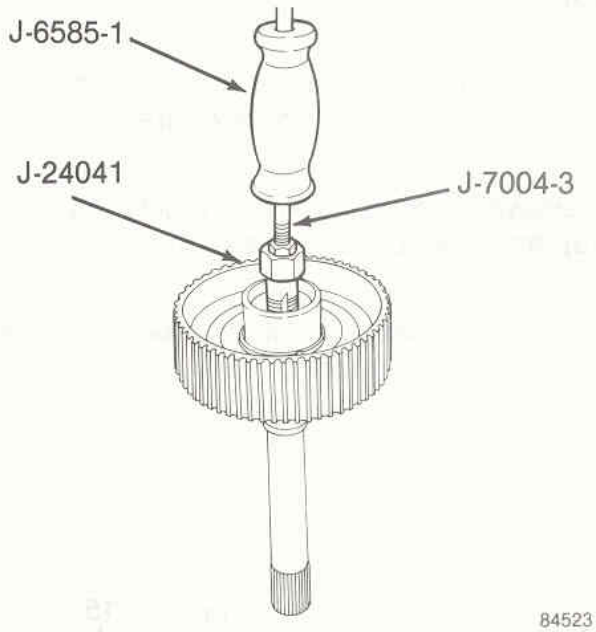
Clamp the input shaft in a vise using brass protective jaws.

CAUTION: Do not clamp the seal ring land or bearing journal.

Thread Bushing Remover Tool J-24041 straight into the bushing as far as possible by hand.

Using a wrench, thread the puller into the bushing three to four additional turns to fully engage the puller threads into the bushing.

Thread Slide Hammer Bolts Tool J-7004-3 into the puller.



Bump outward with the slide hammers to remove the bushing.

Thoroughly clean the input shaft and remove any chips generated by the bushing removal.

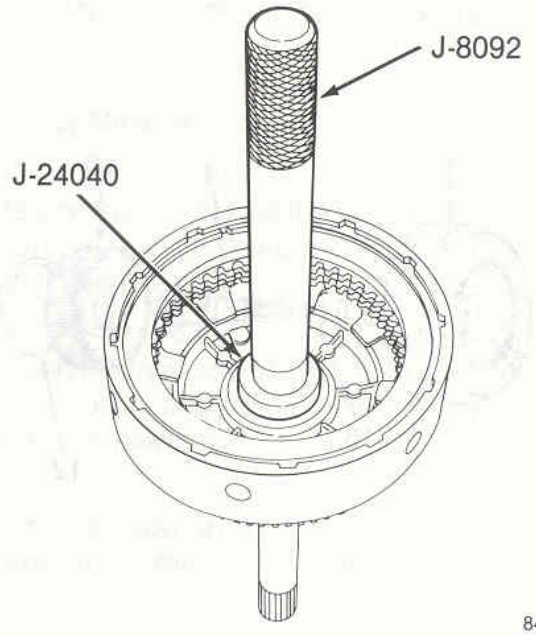
Grip the old bushing with pliers and remove it from the tool.

NOTE: Be careful to protect the remover tool threads when using the tool.

Thread Bushing Installer Tool J-24040 onto Driver Handle J-8092.

Position the replacement bushing on the installer tool and install the bushing straight into the shaft until the tool bottoms.

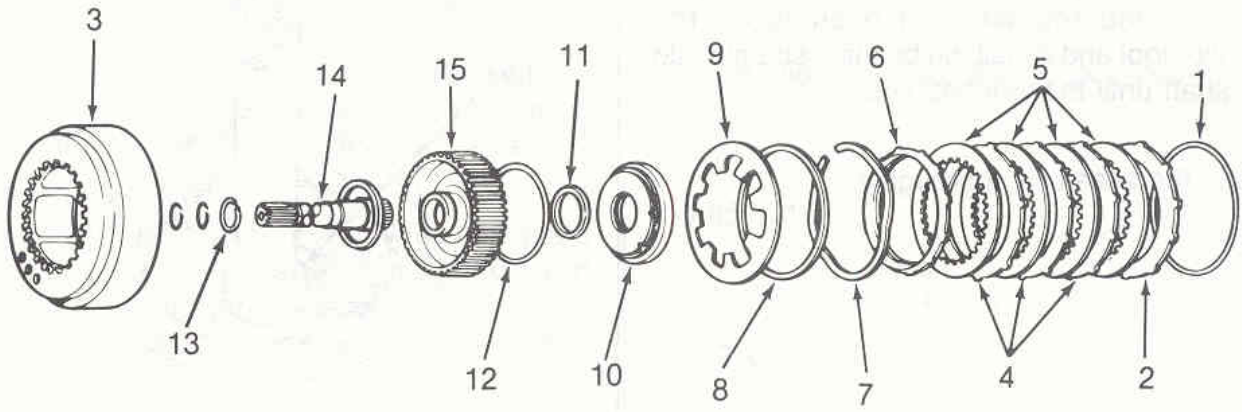
Clean the assembly thoroughly.



84524

SEE I.S. NOTES

SEE I.S. NOTES



84522

Assembly

Press the input shaft (14) into the piston retainer (15) and install the snap ring (18), if removed.

Lubricate the inner and outer sealing rings (11) (12) with petroleum jelly and install them on the clutch piston (10).

NOTE: Be sure that the lips of the seals face into the retainer bore and that seals are properly seated in piston grooves.

Install the piston assembly in the clutch retainer (3).

Seat the piston at the bottom of the retainer bore using a twisting motion.

Position the clutch retainer over the piston retainer splines. Support the assembly to maintain the position of the clutch retainer.

Install the piston spring (9) in the clutch retainer with the spring fingers touching the piston.

Install the spacer ring (8). Be sure piston spring and ring are centered in the retainer recess.

Install one end of the wave spring (7) in the retainer groove. Progressively push or tap the spring into the plate until it is completely seated.

NOTE: If necessary, gently tap the piston spring and spacer to keep them centered.

Install the inner pressure plate (6) in the retainer. The raised side of the plate should rest on the piston spring and the flat surface should face outward.

Lubricate the remaining clutch plates (5) with transmission fluid and install them in the retainer. Alternately install the lined plate (5) followed by the steel plate (4) until the correct number of lined and steel plates have been installed.

Install the outer pressure plate (2) and the selective thickness snap ring (1).

Install the outer pressure plate (2) and the selective thickness snap ring (1).

Measure the clutch pack clearance. Press down firmly on the outer pressure plate and insert a feeler gauge between the pressure plate and selective outer snap ring.

If necessary, adjust the clearance using one of the following selective thickness snap rings. Snap rings are available in 1.52, 1.88 and 2.70 (0.060, 0.074, 0.088 and 0.106 in) thicknesses.

NOTE: Rear clutch pack clearance is very important in obtaining proper clutch engagement and shift quality.

Planetary Gear Assembly – 900 Series

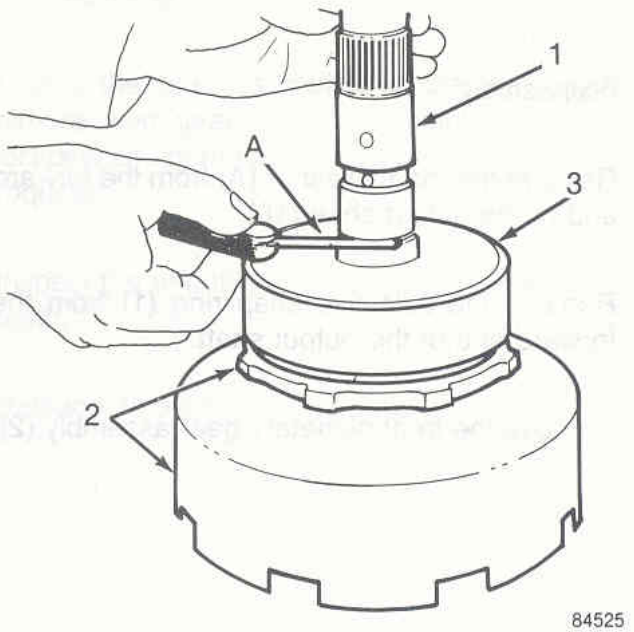
SEE I.S. NOTES

End Play Measurement

Measure the end play of the planetary assembly before removing component parts from the output shaft.

Support the front end of the output shaft (1) on a wooden block and position the assembly (2) in an upright position.

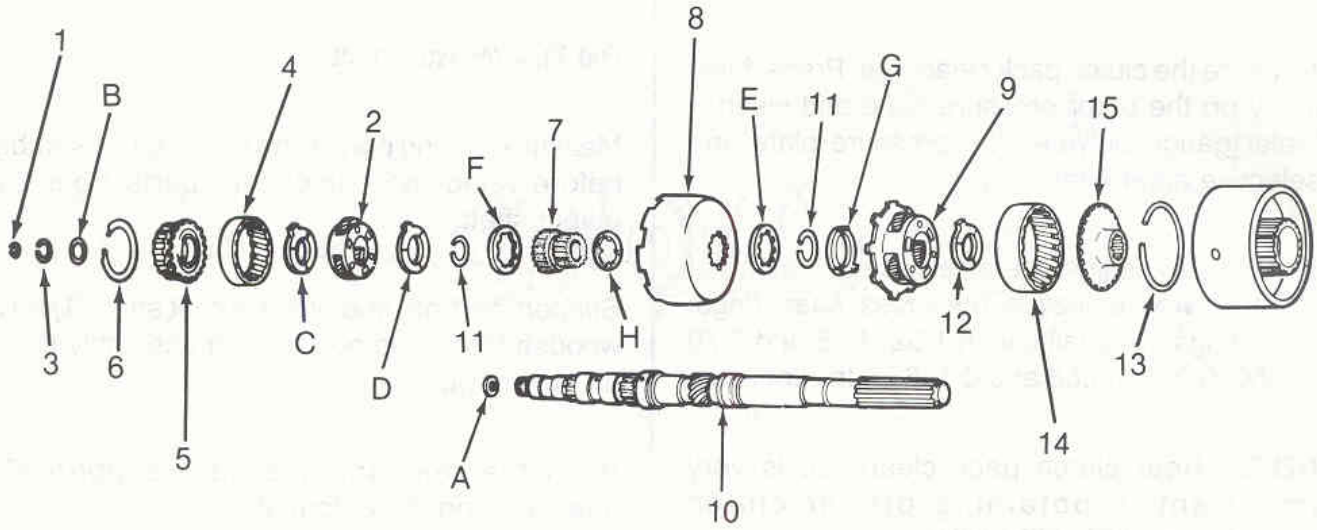
Push the rear annulus gear support (3) downward on the output shaft.



84525

Insert a feeler gauge (A) between the rear annulus support and the shoulder on the output shaft. Clearance should be 0.02 to 1.19 mm (0.001 to 0.047 in). If the clearance is not within specifications, replace the thrust washers, any worn parts, and the selective thickness snap ring at assembly.

SEE I.S. NOTES



84526

Disassembly

Remove the thrust washer (A) from the forward end of the output shaft (10).

Remove the selective snap ring (1) from the forward end of the output shaft.

Remove the front planetary gear assembly (2).

Remove the snap ring and the thrust washer (8) from the forward hub of the front planetary assembly.

Remove the front annulus gear (4) and the support (5) from the planetary gear assembly. If necessary, remove the large snap ring (6) from the front annulus gear and separate the support from the gear.

Remove the C and D thrust washers from the planetary gear assembly.

Remove the sun gear (7), driving shell (8), and the rear planetary assembly (9) from the output shaft (10).

Separate the sun gear and driving shell from the rear planetary assembly.

Remove the rear snap ring (11) and steel thrust plate (E) from the sun gear.

Remove the remaining snap ring and steel thrust plate (F) from the sun gear.

Remove the thrust washer (G) from the forward side of the rear planetary assembly.

Remove the planetary gear assembly and thrust washer (12).

If necessary, remove the large snap ring (13) from the rear of annulus gear (14) to separate the support (15) from the gear.

Inspection

Inspect the bearing surfaces on the output shaft for nicks, burrs, scores or other damage. Light scratches, nicks or burrs can be removed with crocus cloth. Be sure all oil passages in the shaft are open and clean. Inspect the speedometer drive gear. Remove nicks and burrs with an oilstone.

Inspect the sun gear bushings for wear or scores. Replace the sun gear if the bushings are damaged.

Inspect all the thrust washers and plates. Replace all the thrust washers and plates that are damaged or worn below thickness specifications.

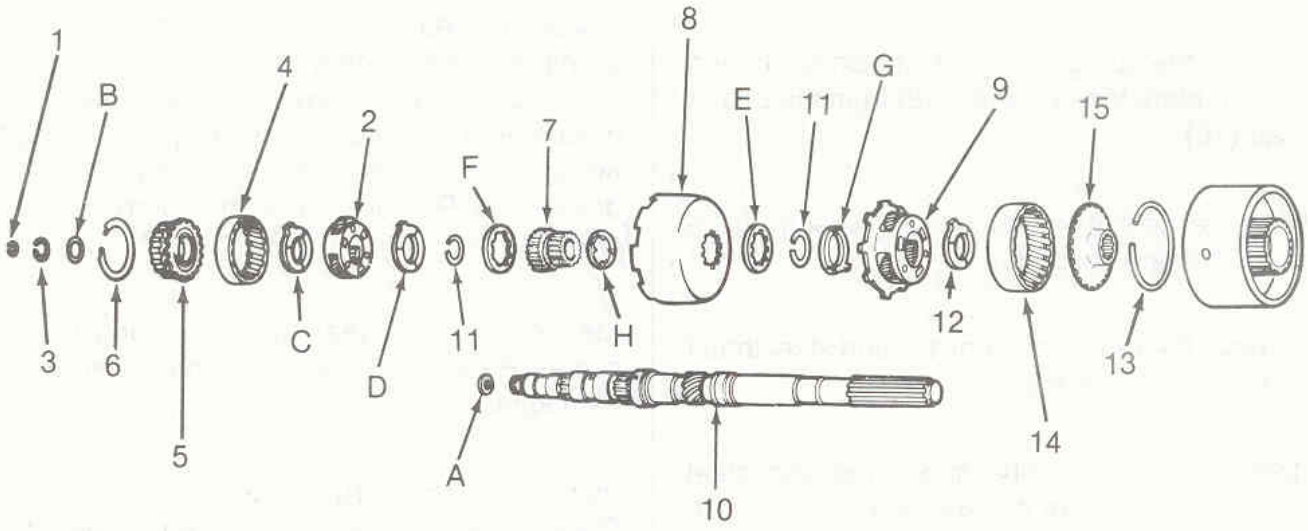
Inspect the gear assemblies for cracks, broken pinions, worn gear teeth, broken pinion shafts or lockpins and damaged thrust faces. Replace as required.

Inspect the annulus gears for cracks and worn teeth.

Replace all distorted snap rings.

SEE I.S. NOTES

SEE I.S. NOTES



84526

Assembly

Install the rear annulus gear support (15) in the annulus gear (14) and install the snap ring (13).

Install the rear annulus gear assembly on the output shaft (10).

Install the thrust washer (12) on the output shaft.

Position the rear planetary gear assembly (9) in the rear annulus gear. Install the thrust washer (G) on the front side of the gear assembly.

Install the steel thrust plate (F) and snap ring (11) on the opposite end of sun gear (7).

Insert the sun gear through the front side of the driving shell (8), and install the steel thrust plate (E) and the snap ring (11) on one end of the sun gear.

Install the driving shell and sun gear onto the output shaft (2), and engage the sun gear teeth with the rear planetary pinions.

Install the front annulus gear support (5) in annulus gear (4) and install the large snap ring (6).

Install thrust washer (C) at the forward end of the front planetary gear assembly (2), and insert assembly into front annulus gear (4).

Position the thrust washer (D) on the rear side of the front planetary gear assembly (2).

Carefully work the front planetary and annulus gear assembly onto the output shaft and mesh the planetary pinions with the sun gear.

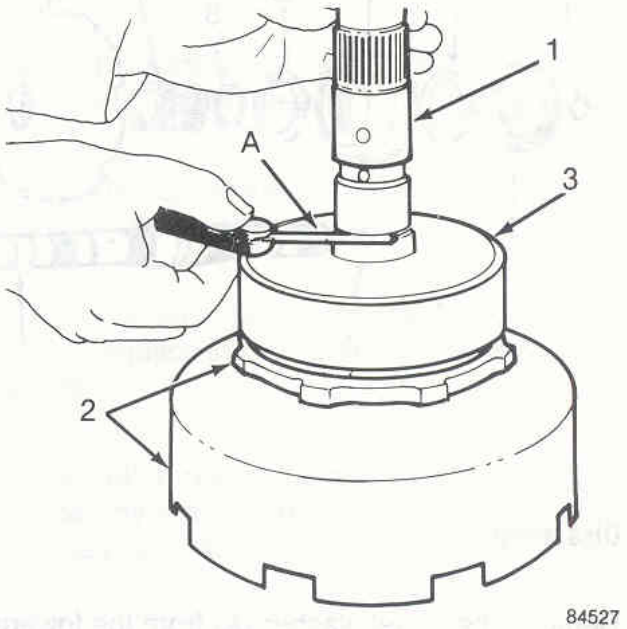
Install the thrust washer (A) on the output shaft.

Install the selective snap ring (1) and measure the assembly end play.

NOTE: If necessary, adjust the clearance by using selective thickness snap rings. Snap rings are available in 1.06, 1.63 and 2.13 mm (0.042, 0.064 and 0.084-inch) thicknesses.

Planetary Gear Assembly – Model 727

End Play Measurement



Measure the planetary assembly end play before removing component parts from the output shaft (1).

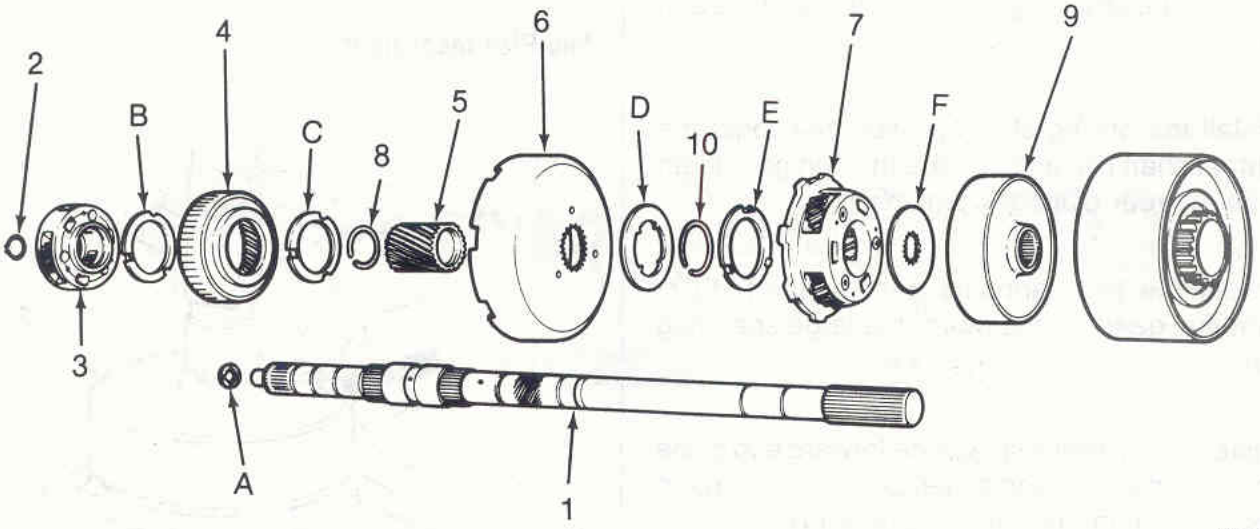
Support the front end of output shaft on a wooden block and place the assembly (2) in the upright position.

Push the rear annulus gear support (3) downward on the output shaft.

Insert the feeler gauge (A) between the rear annulus support (3) and shoulder on the output shaft. Clearance should be 0.22 to 1.12 mm (0.009 to 0.044-inch). If the clearance is not within the specifications, replac the thrust washers, any worn parts and the selective thickness snap ring at assembly.

SEE I.S. NOTES

SEE I.S. NOTES



84528

Disassembly

Remove the thrust washer (A) from the foward end of the output shaft (1).

Remove the snap ring (2) and front planetary assembly (3) from the output shaft.

Remove the front annulus gear (4) from the planetary assembly.

Remove the thrust washer (B) from the rear side of planetary gears.

Remove the sun gear (5), driving shell (6) and the rear planetary assembly (7) from the output shaft.

Separate the sun gear and the driving shell from the rear planetary assembly.

Remove thrust washer (C) from the inside of the driving shell.

Remove the rear snap ring (8) and steel thrust plate (D) from the sun gear.

Remove the sun gear from the driving shell.

Remove the remaining snap ring (9) from the sun gear, if necessary.

NOTE: The forward end of the sun gear is longer than the rear.

Remove the thrust washer (E) from the foward side of the rear planetary assembly (6).

Remove the gear assembly and the thrust plate (F) from the rear annulus gear.

Inspection

Inspect the bearing surfaces on the output shaft for nicks, burrs, scores, and other damage. Light scratches, nicks, or burrs can be removed with crocus cloth.

NOTE: Be sure all oil passages in the output shaft are open and clean.

Inspect the speedometer drive gear. Remove nicks and burrs with an oilstone.

Inspect the sun gear bushings for wear and scores. Replace the sun gear if the bushings are damaged.

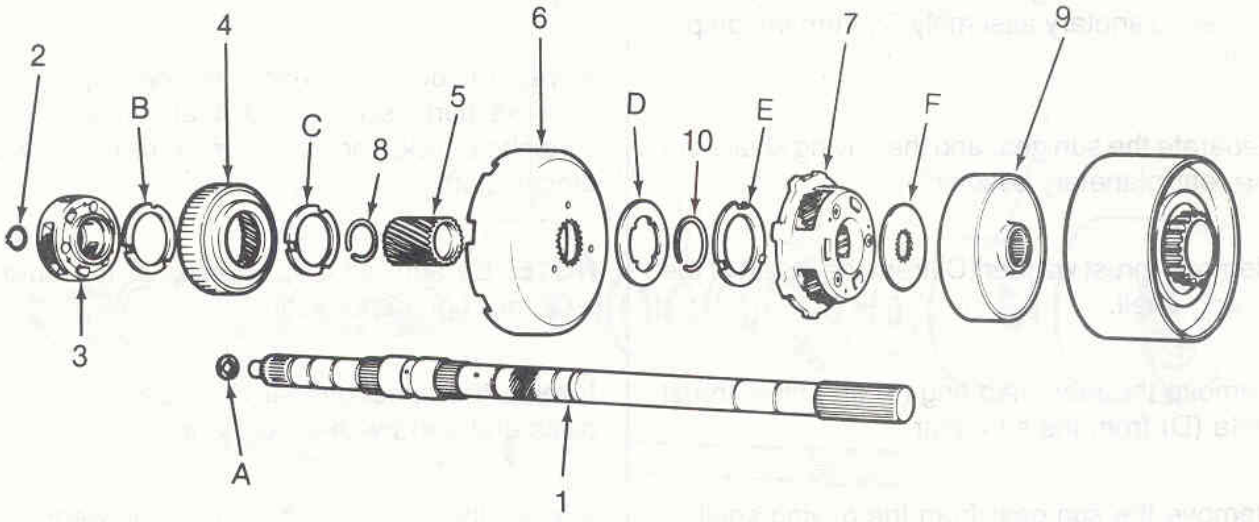
Inspect all thrust washers and plates and replace any that are damaged or worn below thickness specifications.

Inspect the gear assemblies for cracks, broken pinions, worn gear teeth, broken pinion shafts or lockpins, or damaged thrust faces. Replace components as necessary.

Inspect the annulus gears for cracks and worn teeth. Replace any distorted snap rings.

SEE I.S. NOTES

SEE I.S. NOTES



84528

Assembly

Install the rear annulus gear (9) on the output shaft (1).

Apply a thin coat of petroleum jelly on the thrust plate (F).

Position the plate (F) on the output shaft (1) and in the rear annulus gear.

NOTE: Be sure the teeth are engaged with the output shaft splines.

Position the rear planetary gear assembly (7) in the rear annulus gear and install the thrust washer (E) on the forward side of the gear assembly.

Insert the sun gear through the forward side of the driving shell (6) and install the steel thrust plate (D) and snap ring (1) on the rear side of the sun gear (5).

Install the snap ring in the forward groove of the sun gear. Install the thrust washer (C) in the driving shell (6) over the sun gear (5).

Install the driving shell and sun gear assembly on the output shaft and engage the sun gear teeth with the rear planetary pinions.

Position the thrust washer (B) on the rear hub of the front planetary gear (3) and engage the planetary gear with the front annulus gear (4).

Install the front planetary and annulus gear assembly (3) (4) onto the output shaft and mesh the planetary pinions with sun gear.

Install the selective snap ring (2) and measure assembly end play.

NOTE: If necessary, the clearance should be adjusted by using selective thickness snap rings. Snap rings are available in 1.22, 1.40 and 1.57 mm (0.048, 0.055 and 0.062-inch) thicknesses.

Overrunning Clutch

Inspection

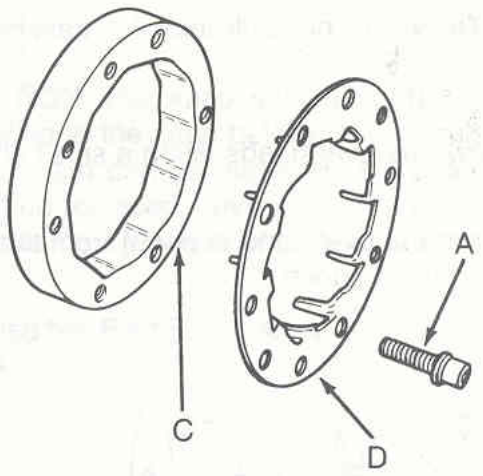
Inspect the clutch rollers for smooth, round surfaces. They must be free of flat spots and chipped teeth.

Inspect the roller contact surfaces in the cam and race for brinelling and inspect the springs for distortion, wear or other damage.

NOTE: On the model 727 transmission only, inspect the cam setscrew for tightness. If loose, tighten the setscrew and restake the case around the screw.

Cam Replacement – 900 Series

If the overrunning clutch cam or spring retainer are damaged, they can be replaced with a service replacement cam, spring retainer and retaining screw.

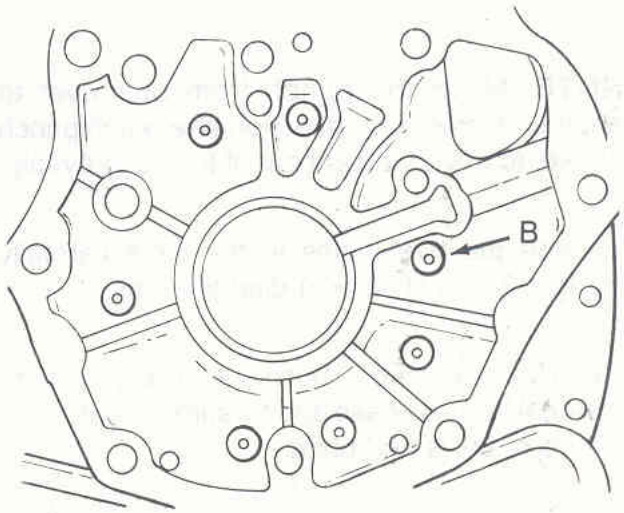


84529

Remove the bolts (A) attaching the output shaft support to the rear of the case.

Remove the support from the rear of the case using a wooden block and hammer.

Centerpunch the rivets (B) exactly in the center of each rivet head.



84530

SEE I.S. NOTES

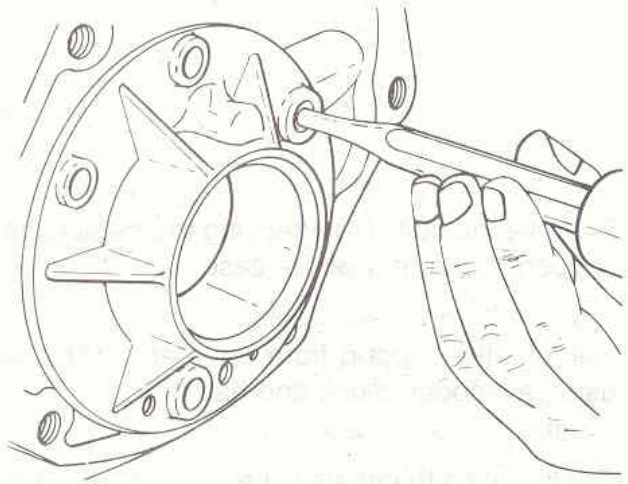
SEE I.S. NOTES

Drill through each rivet head using a 10 mm (3/8-inch) diameter drill.

CAUTION: Do not drill into the transmission case.

Remove the rivet heads using a small chisel.

Remove the rivets and cam (C) from the case using a blunt punch.



84531

NOTE: Move the punch from one rivet to another in clockwise direction after each punch stroke, to drive the cam out of the case evenly.

Enlarge the rivet holes in the case carefully using a 7 mm (17/64-in) diameter drill.

Remove the chips, burrs, and any foreign material from the case and be sure the cam area is free of burrs and chips.

Install the replacement cam and spring retainer in the case with the bolt holes in the cam and retainer aligned with the holes in the case.

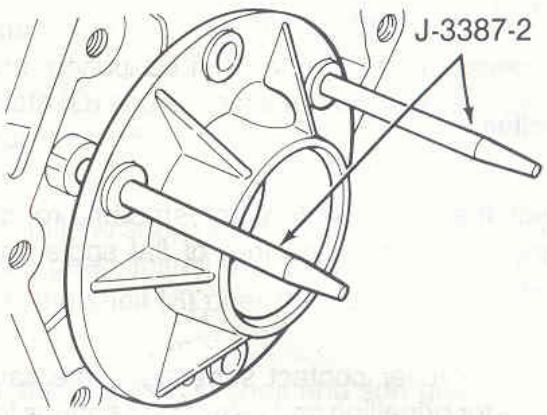
Thread the retaining screws and washers into the cam.

NOTE: Install the washers on the screws so that the inner diameter of the washer contacts the screw head.

Install the cam in the case using brass hammer.

Alternately and evenly tighten the retaining screws to 11 N·m (100 in-lbs) torque.

Thread two Pilot Studs Tool J-3387-2 into the case.



84532

Position an illuminated light bulb next to the case to heat the case.

CAUTION: Do not use an open flame to heat the case.

Chill the support with ice (preferably dry ice).

Remove the light, position the support (1) over the pilot studs and install the support in the case using a wooden block and hammer.

Install and tighten the support attaching bolts to 17 N·m (150 in-lbs) torque.

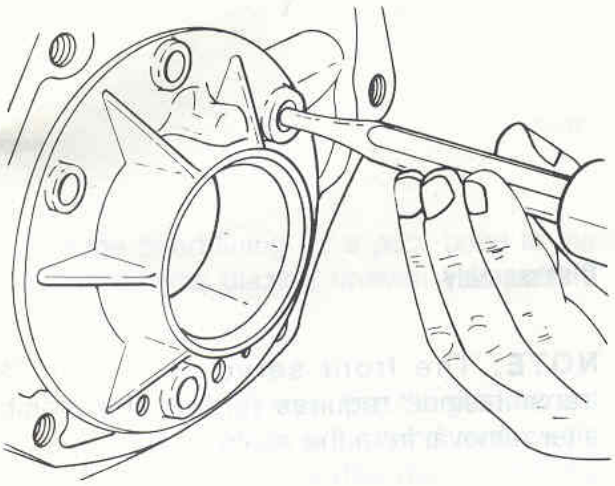
Cam Replacement – Model 727

The overrunning clutch cam and spring retainer should be removed only if replacement is necessary.

Remove the setscrew from the case.

Remove the bolts attaching the output shaft support to the rear of the case.

Insert a punch through the bolt holes and drive the cam (A) out of the case.

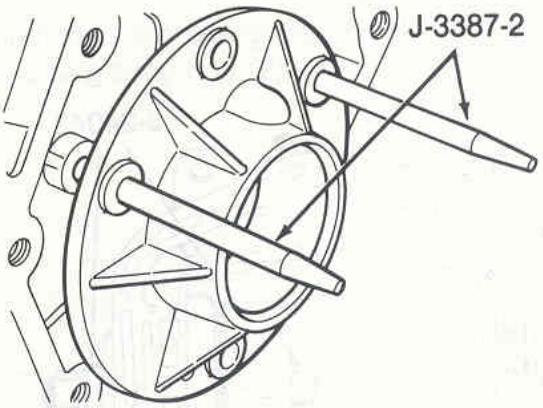


84533

NOTE: Move the punch from one bolt hole to another in a clockwise direction after each punch stroke to drive the cam out of the case evenly.

CAUTION: The output shaft support must be installed in the case before the overrunning clutch cam can be installed. If the support must be replaced, drive it out the rear of the case using a wooden block and hammer.

Thread two Pilot Stud Tools J-3387-2 into the case.



84534

SEE I.S. NOTES

SEE I.S. NOTES

Install the support in the case using a wooden block and hammer.

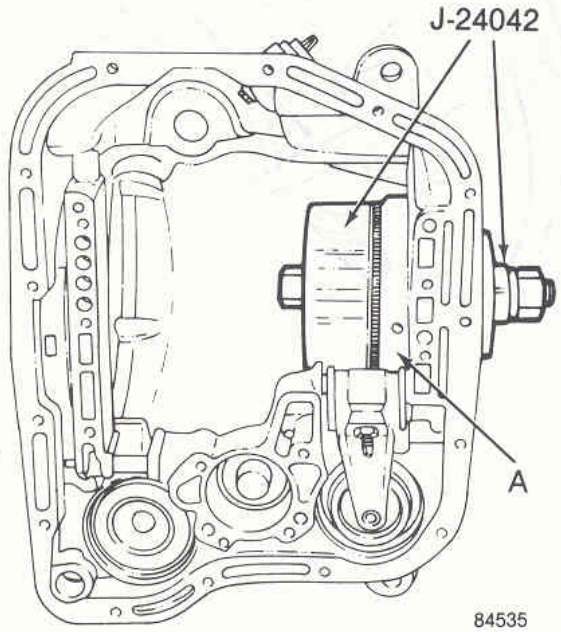
Clean all burrs, chips, and foreign material from the cam (A) area in the case.

Position the spring retainer on the cam. Be sure the retainer lugs snap firmly into the cam notch.

Align the cam serrations with those in the case.

Install the cam evenly into the case as far as possible using a brass hammer.

Install Tool J-24042.



Tighten the tool nut to seat the cam in the case. Be sure the cam is completely seated.

Install the cam retaining setscrew and stake the case around the setscrew.

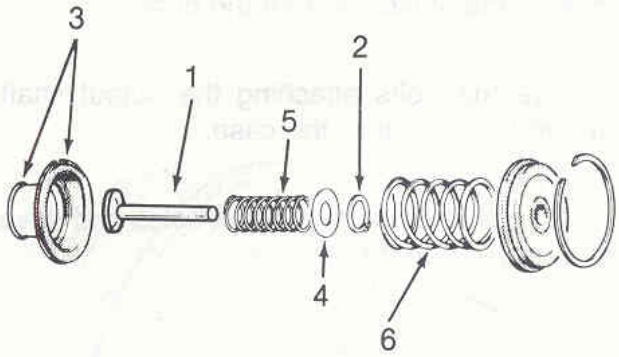
Remove Tool J-24042.

Install and tighten the support retaining bolts to 17 N·m (15 in-lbs) torque.

Stake the case around the cam in twelve places using a blunt chisel.

Front Servo

Two front servo designs are used.



Disassembly

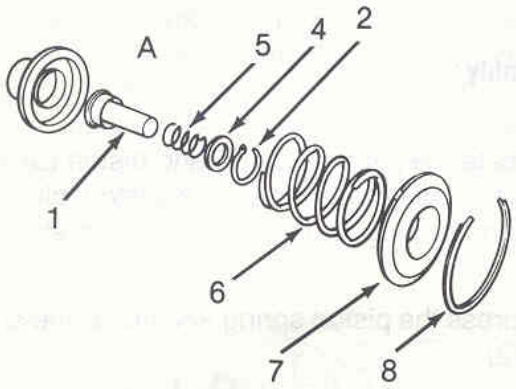
NOTE: The front servo in model 727 transmissions requires further disassembly after removal from the servo bore.

Remove the piston rod (1) retaining snap ring (2) from the servo piston (3).

Remove the washer (4), inner piston rod spring (5), outer spring (6), and piston rod from the servo piston.

Inspection

Inspect the piston for nicks, burrs, scores, and wear. Be sure the ring grooves are not damaged. Inspect the fit of the guide on the piston rod. Inspect the piston bore in the case for scores or other damage. Inspect the piston spring(s) for distortion. On model 727 transmissions, inspect the bore in the piston and the piston rod 0-ring.



84537

Inspect the band lining for a poor bond to the band, burn marks, glazing, uneven wear pattern and flaking.

If the lining is so badly worn that the grooves are not visible at any portion of the band, replace the band. Inspect the band for distortion or cracked ends. Replace as necessary.

Assembly

CAUTION: Do not use force to assemble any of the servo components. If they do not assemble easily, investigate and correct the cause before proceeding with the assembly.

Apply petroleum jelly to the piston rod O-ring (A) and install the piston rod (1) in the servo piston (3) bore.

Install the piston rod spring (5) on the piston rod.

Install the washer (4).

Compress the spring and install the piston rod retaining snap ring (2).

SEE I.S. NOTES

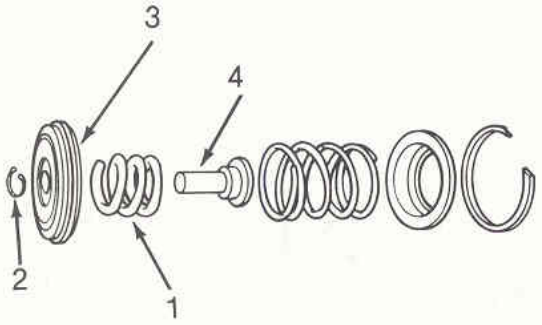
SEE I.S. NOTES

Rear Servo

Disassembly

Compress the piston plug spring (1) and remove the snap ring (2).

Remove the piston (3), piston plug (4), and plug spring.



84538

Inspection

Inspect the piston and piston plug for nicks, burrs, scores, and wear. The plug must move freely in the piston. Inspect the piston bore in the case for scores or other damage. Inspect the springs for distortion.

Inspect the band lining for poor bonding to the band and for excessive wear. If the lining is so excessively worn that the grooves are not visible at any portion of the band, replace the band. Inspect the band for distortion or cracks and replace as necessary.

Assembly

Lubricate the piston plug (4) and piston (3) with petroleum jelly and insert the piston plug (4) through the plug spring and into the piston.

Compress the piston spring and install the snap ring (2).

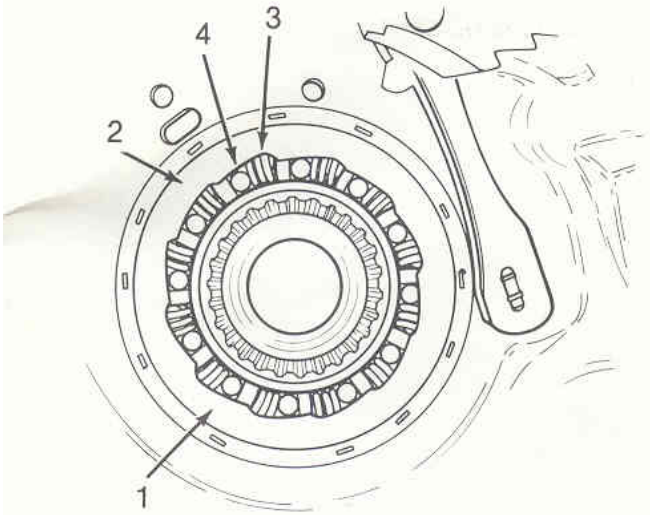
TRANSMISSION ASSEMBLY

NOTE: Use only automatic transmission fluid or petroleum jelly to lubricate the transmission components during assembly.

Overrunning Clutch

Place the transmission case in the upright position and install the clutch cam (1) and spring retainer (2).

Install the clutch spring (3) and rollers (4) so the springs rest against the retainer post and the rollers rest against the spring and with both springs and rollers installed on the counterclockwise side of the spring retainer posts.



84539

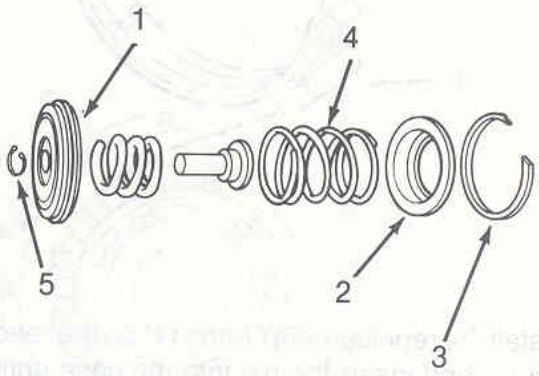
Rear Servo

Servo

Install the servo piston (1) assembly in the case bore with a twisting motion.

Place the spring retainer (2) and snap ring (3) over the piston.

Compress the piston spring (4) by hand and install the snap ring (5).



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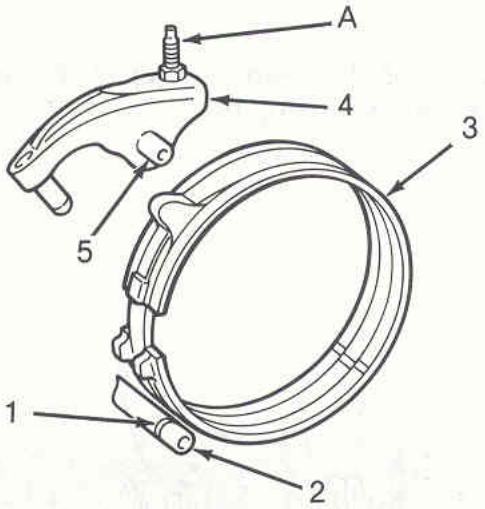
SEE I.S. NOTES

SEE I.S. NOTES

Rear Band – 900 Series

NOTE: The model 900 series transmission has a double wrap band supported at two points by a reaction pin mounted in the case. It is actuated at one point by the rear servo adjusting screw (A).



84541

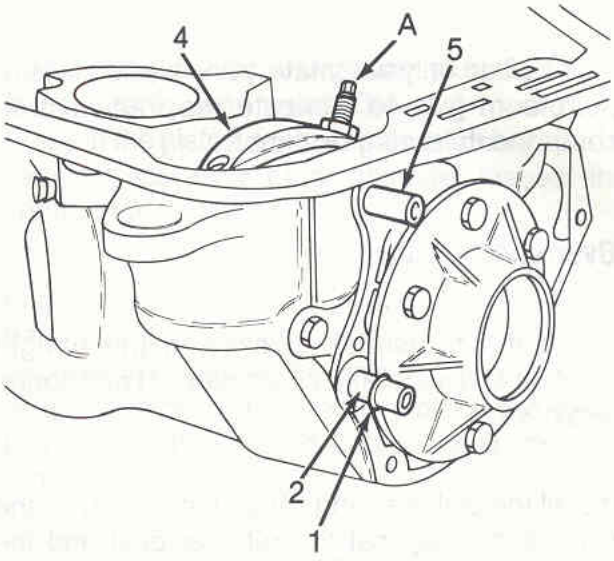
Install the replacement O-ring (1) on the reaction pin (2) and insert the pin into the case until the pin is flush with the gasket surface.

Position the band (3) in the case so both band lugs rest against the reaction pin.

Install the low-reverse drum in the overrunning clutch hub and into the rear band.

Install the band operating lever (4) and pivot pin.

NOTE: When installed, the lever adjusting screw (A) should touch the center lug of the band and the pivot pin should be flush with the case.



84542

Rear Band – Model 727

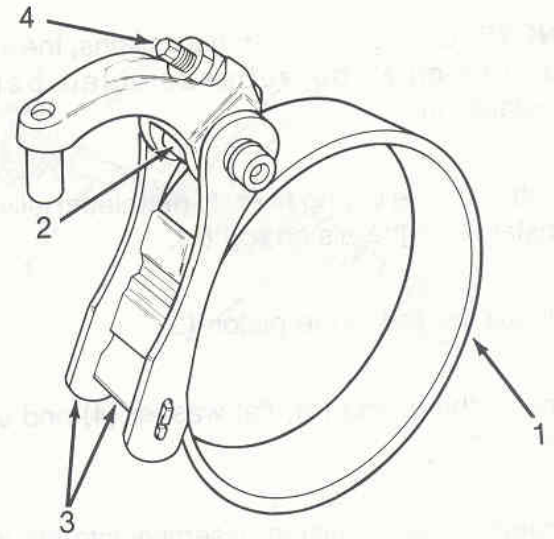
Install the rear band (1) in the case.

Install the short strut (2), and connect the long link and anchor (3) in the band.

Thread the band adjusting screw (4) inward just enough to hold the band strut in place.

Be sure the long link and anchor assembly are installed as shown to provide clearance for the rear band and drum.

Install the low-reverse drum in the overrunning clutch hub and rear band.



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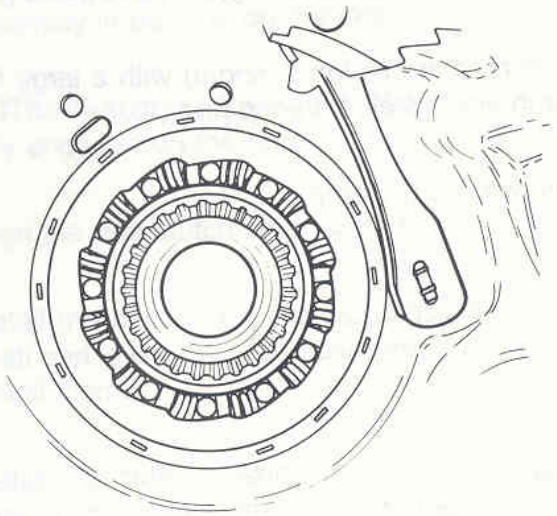


84544

SEE I.S. NOTES

SEE I.S. NOTES

Front Servo

NOTE: On model 727 transmissions, the servo piston must be subassembled before installation.

Lubricate the O-ring (A) with petroleum jelly and install it on the piston rod (1).

Install the rod in the piston (3).

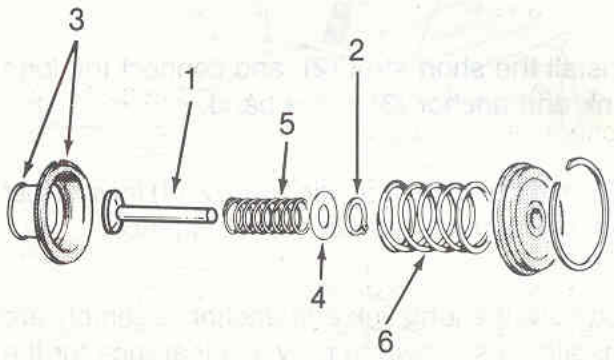
Install the spring (5), flat washer (4) and snap ring (2).

Insert the servo piston assembly into the case bore.

Install the piston rod, spring(s)(6) and guide (7).

Compress the piston spring(s) with a large C-clamp and install the snap ring (8).

Remove the C-clamp.



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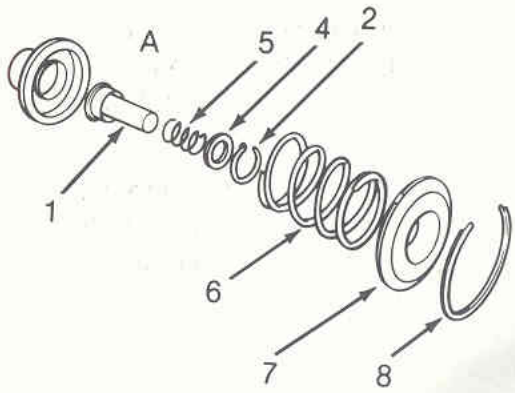


84537

SEE I.S. NOTES

Planetary Gear Assembly and Output Shaft

CAUTION: Protect all machined surfaces on the output shaft during installation.

Position and support the gear and output shaft assembly in the case and insert the output shaft through the rear support.

Carefully work the gear and shaft assembly rearward and engage the rear planetary carrier lugs in the low reverse drum slots.

Front and Rear Clutch Assemblies

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

Cut a 9 cm (3½ inch) diameter hole in a workbench. In the end of a small oil drum or a large wooden box strong enough to support the transmission. Cut or file notches at the edge of the hole to accommodate the output shaft.

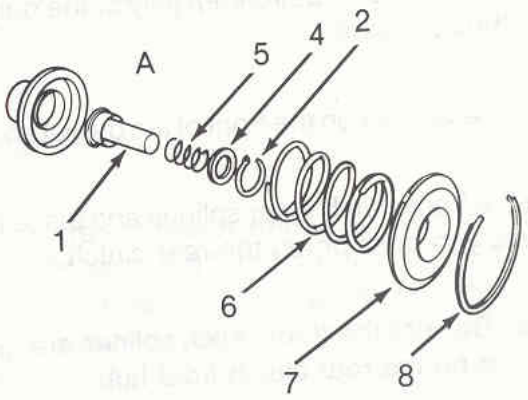
Carefully insert the ouput shaft into the hole and support the transmission in an upright position on the output shaft support flange.

900 Series

Apply a thin coat of petroleum jelly to the selective thrust washer.

Install the washer on the front end of the output shaft.

If the transmission end play was not within specifications (0.056 to 2.31 mm or 0.022 to 0.091 in) when measured at disassembly, replace the thrust washer with one that will provide proper end play.



83545

Align the front clutch inner splines and place the assembly in position on the rear clutch.

NOTE: Be sure the front clutch plate splines are fully engaged on the rear clutch front hub.

Align the rear clutch inner splines.

Install the clutch assemblies. Grasp the input shaft and lower the assemblies into the case to install them.

Install the clutch assemblies using a twisting motion and engage the rear clutch splines over the splines of the front annulus gear.

NOTE: Be sure the front clutch drive lugs are fully engaged in the driving shell slots.

SEE I.S. NOTES

Model 727

Apply a thin coat of petroleum jelly to the output shaft thrust washer.

Install the washer on the front of the output shaft.

Align the front clutch inner splines and place the assembly in position on the rear clutch.

NOTE: Be sure the front clutch splines are fully engaged on the rear clutch front hub.

Align the rear clutch inner splines.

Install the clutch assemblies. Grasp the input shaft and lower the clutch assemblies into the case to install them.

Install clutch assemblies using a twisting motion to engage the rear clutch splines over the splines of front annulus gear.

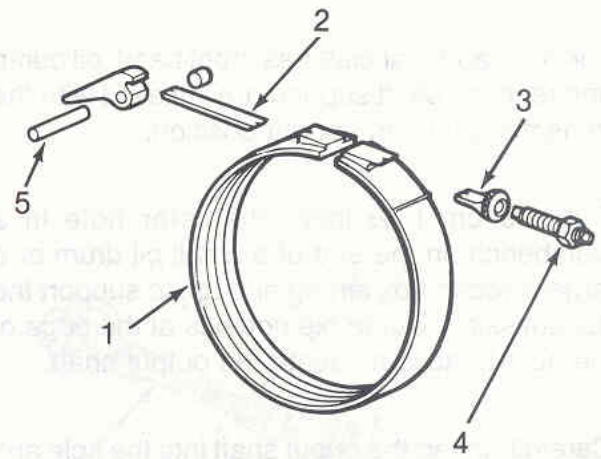
NOTE: Be sure the front clutch drive lugs are fully engaged in the driving shell slots.

Front Band

Slide the band (1) over the front clutch assembly.

Install the band strut (2). Also install the band anchor (3) on model 727.

Tighten the band adjusting screw (4) enough to hold the band and linkage in place (5).



83546

Oil Pump and Reaction Shaft Support

If difficulty was encountered in removing the pump assembly due to an exceptionally tight fit in the case, it may be necessary to heat and expand the case in order to install the pump. If necessary, heat the pump area for a few minutes, using a heat lamp, before installing the pump and support assembly.

900 Series

Install the thrust washer on the reaction shaft support hub.

Thread two Pilot Studs J-3387-2 into the case pump opening.

Install the gasket over the studs.

Install the rubber seal ring in the groove in the outer flange of the pump housing. Be sure the seal is not twisted.

Coat the seal ring with petroleum jelly.

Install the pump assembly in the case. If necessary, tap the pump assembly lightly with a rawhide mallet to install.

Install the four pump attaching bolts finger-tight.

Remove the pilot studs and install the remaining pump attaching bolts finger-tight.

Rotate the input and output shafts to see if any binding exists.

If the shafts rotate freely, tighten all the pump attaching bolts to 20 N·m (175 in-lbs) torque.

Recheck the shafts for a bind-free rotation. If a bind exists, loosen the bolts and tighten the bolts alternately and evenly to 20 N·m (175 in-lbs) torque.

Model 727

If the transmission end play was not within specifications 0.91 to 2.13 mm (0.036 to 0.084 in) when measured at disassembly, replace the thrust washer on the reaction shaft support hub with one that will provide the correct end play.

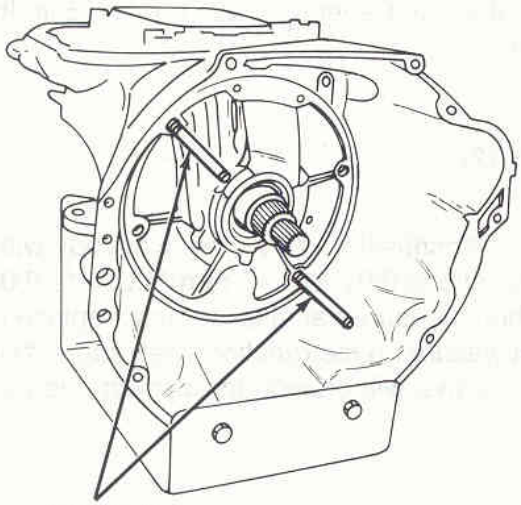
SEE I.S. NOTES

Thrust Washer Chart — Model 727

Thickness (Inch)	Color
0.061 - 0.063	Natural (Brown)
0.084 - 0.086	Red
0.102 - 0.104	Yellow

83548

SEE I.S. NOTES



J-3387-2

83547

Thread two Pilot Studs Tool J-3387-2 into the case pump opening.

Install the gasket over the studs.

Install the rubber seal ring in the groove in the outer flange of the pump housing. Be sure the seal is not twisted.

Coat the seal ring with petroleum jelly.

Install the pump assembly in the case. If necessary, tap the pump assembly lightly with a rawhide mallet to install.

Position the deflector, if equipped, over the vent opening and install the four pump attaching bolts finger-tight.

Remove the pilot studs and install the remaining pump attaching bolts finger-tight.

Rotate the input and output shafts to see if any binding exists.

If the shafts rotate freely, tighten all the pump attaching bolts to 20 N·m (175 in-lbs) torque.

Recheck shafts for free rotation. If a bind exists, loosen the bolts and tighten the bolts alternately and evenly to 20 N·m (175 in-lbs) torque.

Governor and Park Gear

Install the gear and governor body assembly on the output shaft.

Align the assembly so the governor valve shaft hole in the governor body is aligned with the hole in the output shaft.

Slide the assembly into place and install the snap ring behind the governor body.

Tighten the governor body-to-gear attaching bolts to 11 N·m (100 in-lbs) torque.

Bend the end of the lock tabs against the shoulders of the bolt heads.

Install the governor valve on the valve shaft.

Insert the assembly into the body and through the governor weights.

Install the valve shaft retaining E-clip.

Output Shaft Bearing and Adapter Housing

Install the bearing in the adapter housing if not installed previously.

Install the seal in the housing.

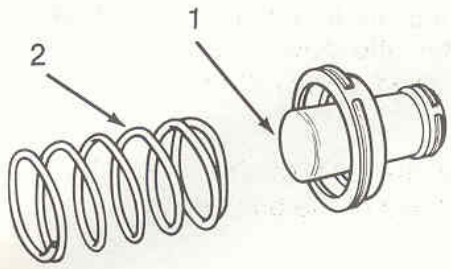
Install the bearing snap rings.

Valve Body and Accumulator Piston

Before installing the valve body, check the operation of the clutches and bands using the air pressure test procedure to confirm proper operation.

Clean all the mating surfaces and remove any burrs from the transmission case or valve body steel plate mating surfaces.

Install the accumulator piston assembly (1) in the case bore and install the piston spring (2) on the piston.



83549

Insert the park lock rod through the opening in the rear of the case.

Position the knob of the lock rod against the reaction plug and sprag.

Move the front end of the rod toward the centerline of the transmission while exerting rearward pressure on the rod to force it past the sprag. Rotate the output shaft, if necessary.

NOTE: Before installing the valve body, be sure the neutral start switch has not yet been installed.

Place the valve body manual lever in the Drive position.

Place the valve body assembly in its approximate position in the case.

Align the valve body in the case and install the attaching screws finger-tight.

Install the neutral start switch.

Shift the valve body manual lever to the Neutral position.

Relocate the valve body if necessary to align the manual lever neutral finger over the neutral start switch plunger ball.

Tighten the valve body attaching screws to 11 N·m (100 in-lbs) torque.

Install the gearshift control lever on the manual lever shaft and tighten the clamp bolt.

Check the lever shaft for binding in the case by moving the lever through all the detent positions.

NOTE: If binding exists, loosen the valve body attaching screws and align the valve body.

Install the flat washer and throttle lever and tighten the throttle lever clamp bolt.

SEE I.S. NOTES

SEE I.S. NOTES

Rear Band Adjustment

Loosen the locknut and back the nut off five turns.

Tighten the band adjusting screw to the specified torque.

CAUTION: If Adapter Tool J-24063 is used to adjust the band, tighten the adjusting screw to one half the specified torque only.

Back off the adjusting screw to specifications.

Hold the adjusting screw in position and tighten the locknut to the specified torque.

Install the oil pan and gasket.

Front Band Adjustment

Loosen the locknut and back the nut off five turns.

Be sure the band adjusting screw turns freely in the case. Lubricate the screw, if necessary.

Tighten the band adjusting screw to the specified torque using Torque Wrench J-5853 and an 8 mm (5/16 in) square socket.

CAUTION: If Adapter Tool 2-24063 is used to adjust the band, tighten the adjusting screw to one half the specified torque only.

Back off the adjusting screw to specifications.

Hold the adjusting screw in position and tighten the locknut to the specified torque.

Parts & Service Division

American Motors