TRANSMISSION - 21

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MANUAL TRANSMISSION

Speeds	five forward and reverse
Synchronizers: slip ring, cone type	1st, 2nd, 3rd and 4th gear
snap ring	5th gear
Gear type: forward	constant mesh, helical toothed
reverse	straight toothed

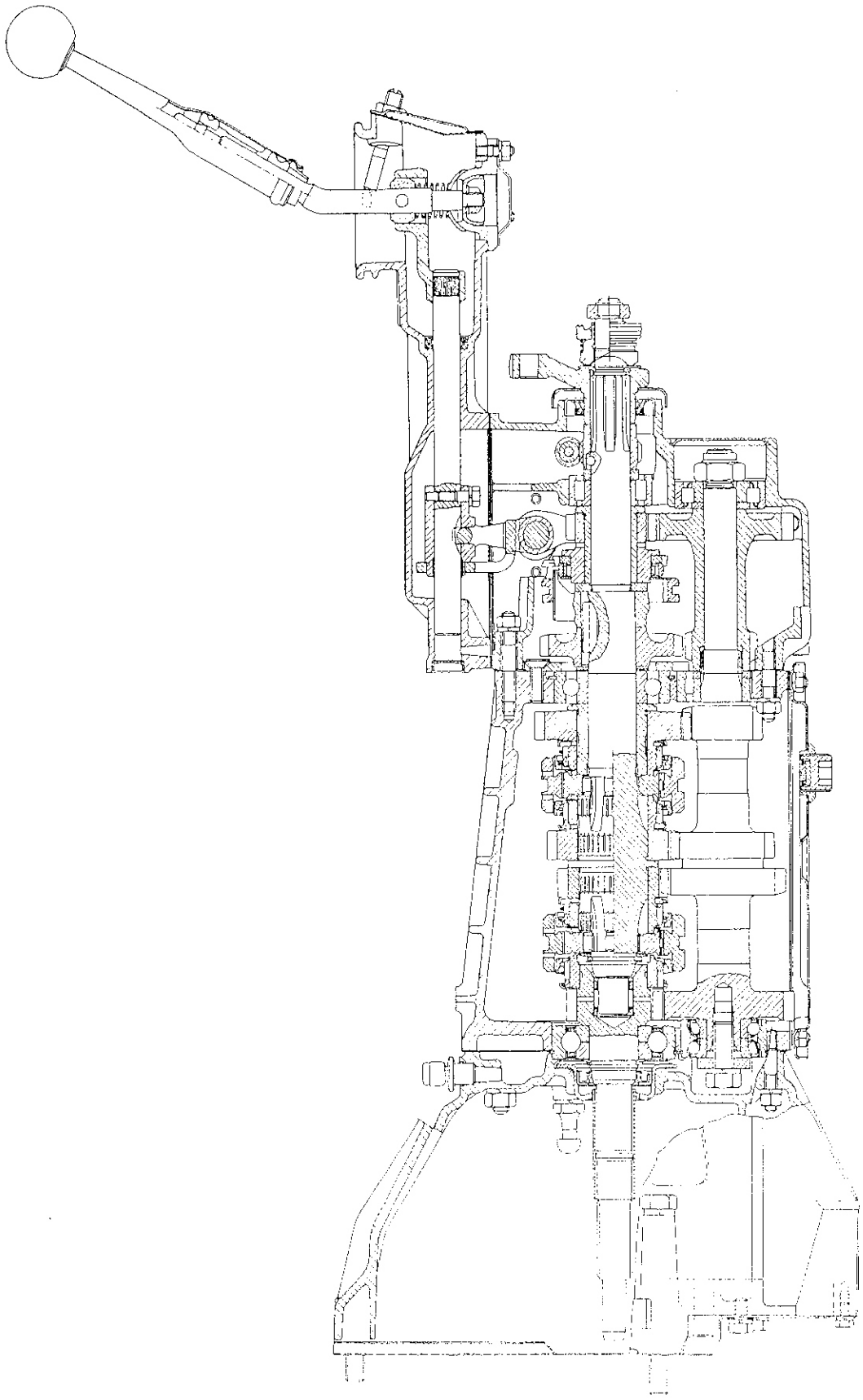
Gear ratios:	Up to 1978	1979 & 1980	1981
first	3.667	3.612	3.667
second	2.100	2.045	2.100
third	1.361	1.357	1.361
fourth	1	1	1
fifth	0.881	0.830	0.881
reverse	3.244	3.244	3.244

	in	mm
Gear lash	.004	0.10
Ball bearing radial play, max. limit	.002	0.05
Ball bearing end play, max. limit	.020	0.50
Max. allowable shaft misalignment	.002	0.05
Clearance between 1st gear and bushing and between 2nd-3rd gears and seats on mainshaft	.002 to .004	0.05 to 0.10
Clearance between reverse shaft and reverse gear bushing	.002 to .004	0.05 to 0.10

AUTOMATIC TRANSMISSION

Type G.M.S.

Speeds	three forward and reverse
Gear ratios: first	2.4 to 1
second	1.48 to 1
third	1 to 1
reverse	1.92 to 1
Location of selector lever	on tunnel
Selector lever positions:	
P = Park	transmission locked — engine starting possible
R = Reverse	back-up lights switched on
N = Neutral	engine starting possible
D = Drive	automatic engagement — 1-2-3-2-1
2 = Drive with exclusion of 3rd gear	automatic engagement of 1st and 2nd gear only
1 = 1st gear only	engagement of 1st gear only



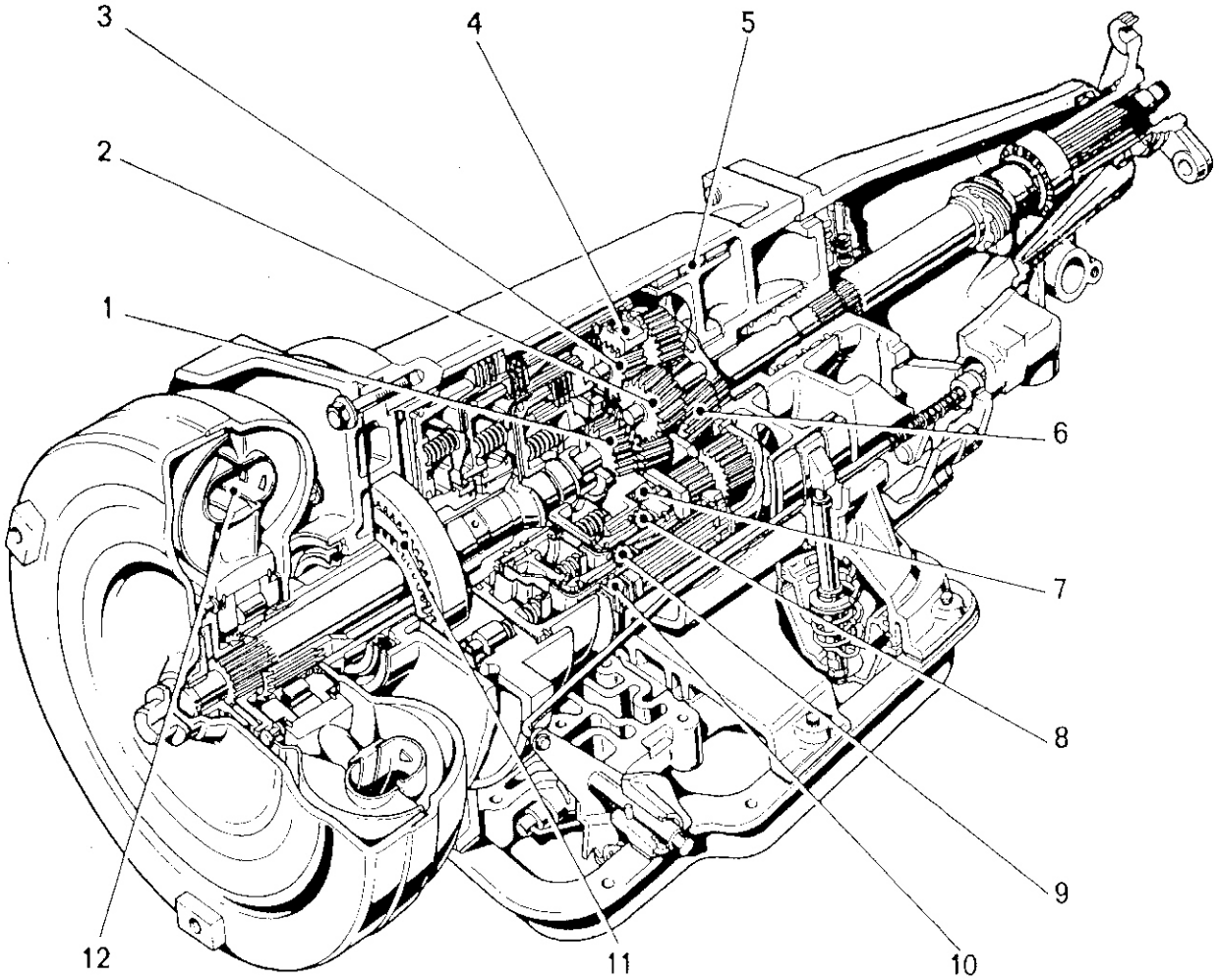
LONGITUDINAL SECTION OF MANUAL TRANSMISSION

Gear changing	Automatic, actuated by the vacuum of the engine (valve and butterfly) and the speed of the vehicle (governor body)		
KICK DOWN operation	mechanical by means of a cable		
Sprag clutch	Installed on hub of 3rd clutch – raised lip faces input sun gear		
Clutch composition	Reverse	2nd gear	3rd gear
Discs with linings	3	3	3
Steel discs	4	4	4
Cushion plate (wave washer)	1	1	1
Reaction plate	1	–	–
Torque converter			
Diameter	9.01 in (229 mm)		
Variable torque multiplication ratio	between 2.4 to 1 and 1 to 1		
Oil type	Oliofiat G I/A (dexron type)		
Oil change quantities:			
Total with transmission and converter empty	11.8 pints (5.6 litres)		
Change only	5.28 pints (2.8 litres)		

Vehicle towing

The vehicle may be towed a maximum distance of 31 miles at a maximum speed of 31 mph with the transmission in running order and the drive shaft connected.

For distances greater than 31 miles, speeds higher than 31 mph or if transmission is damaged, disconnect drive shaft or lift rear wheels.



1. Input sun gear
2. Planet short pinion
3. Planet long pinion
4. Annulus
5. Brake band
6. Output sun gear
7. Sprag wheel
8. 3rd gear clutch
9. 2nd gear clutch
10. Reverse clutch
11. Oil pump
12. Torque converter

TIGHTENING REFERENCE

DESCRIPTION	THREAD (METRIC)	TORQUE N·m	TORQUE FT. LB.	TORQUE Kgm
Manual Transmission				
Selector rod detent spring cover bolt	M8	25	2.5	18
Bell housing-to-engine upper mounting bolt	M12 x 1.25	80.5	8.3	61
Bell housing-to-engine lower mounting bolt	M12 x 1.25	80.5	8.3	61
Transmission case-to-bell housing bolt	M10 x 1.25	49	4.9	36
Transmission case-to-bell housing nut	M8	25	2.5	18
Rear cover nut	M8	25	2.5	18
Rear cover lower bolt	M8	19.6	2.0	14
Starter motor bolt	M8	19.6	2.0	14
Countershaft rear bearing nut	M18 x 1.5	116	11.8	87
Propeller shaft yoke-to-mainshaft nut	M20 x 1	145	14.7	108
Countershaft front bearing bolt	M12 x 1.25	92	9.3	69
Forked lever bolt	M6	18	1.8	14
Gear shifter and selector shaft retainer cover nut	M6	6.4	.64	3
Prong-to-selector shaft bolt	M6	18	1.8	14
Gear lever support bolt	M8	19.6	2.0	14
Inner cup-to-gear lever lower self-locking nut, type S	M8	15	1.5	11
Rear mounting pad-to-transmission extension cover nut	M8	25	2.5	18
Automatic Transmission				
Bolt, bell housing attachment to engine	M12 x 1.25	85	61.5	8.5
Bolt, converter to flywheel	3/8-16 UNC	63	47	6.5
Self-locking nut, type S, gear selection rod lever	3/8-16 UNC-2 B	20	14.5	2
Bolt, gearshift support lever	M8	15	11	1.5
Bolt, starter motor attachment	M8	20	14.5	2
Bolt, support plate to rear housing	M10	51	36	5

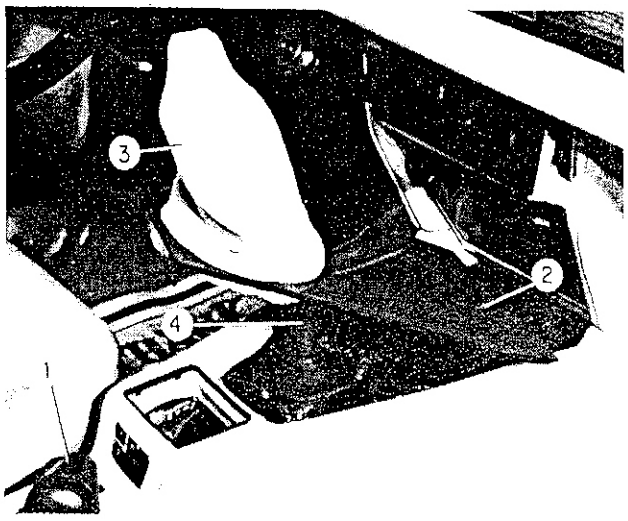
MANUAL TRANSMISSION

REMOVAL AND INSTALLATION

Disconnect battery ground cable.

Unscrew gearshift knob (1).

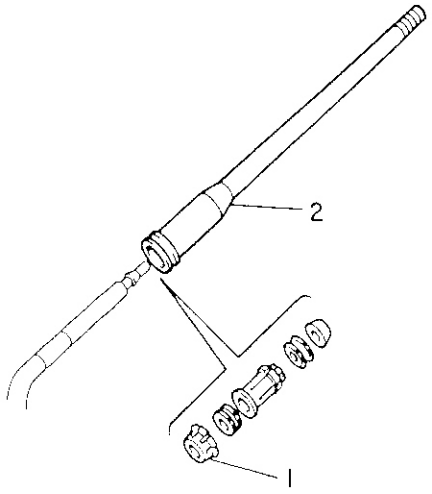
Unsnap rear of console cover (2) and lift up, along with boot (3), over gearshift lever (4) as shown.



1. Gearshift knob 2. Console cover 3. Gearshift boot 4. Gearshift lever

Unclip plastic retainer (1) at bottom of gearshift lever assembly and separate top half (2) of lever from bottom half as shown.

NOTE: To reassemble, install all retainers and bushings, including bottom retainer (1), into top half of lever in order shown. Place top half onto bottom half and tap into position with plastic mallet.



1. Plastic retainer 2. Shift lever top half

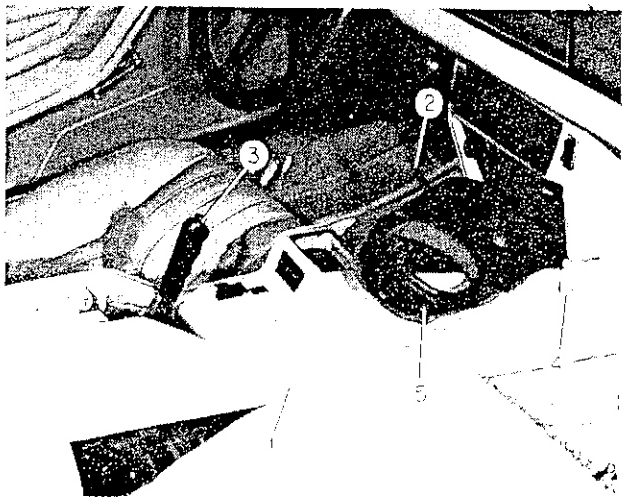
Disconnect electrical connector (4) to reverse switch.

Lift insulation to gain access to screws holding top cover (5) and remove cover.

Remove screws at front of console (1). Remove coin holder at rear of console to remove rear screw.

Lift console up slightly, and carefully pull back about 3 inches in order to obtain clearance for gearshift lever (2) when transmission is lowered.

NOTE: It may be necessary to slacken off emergency brake cable adjustment in order to raise brake handle (3) high enough for console to be moved to rear.



1. Console 2. Gearshift lever (lower half) 3. Emergency brake handle 4. Electrical connector 5. Transmission top cover

Raise vehicle on lift. Drain transmission by removing bottom plug (5).

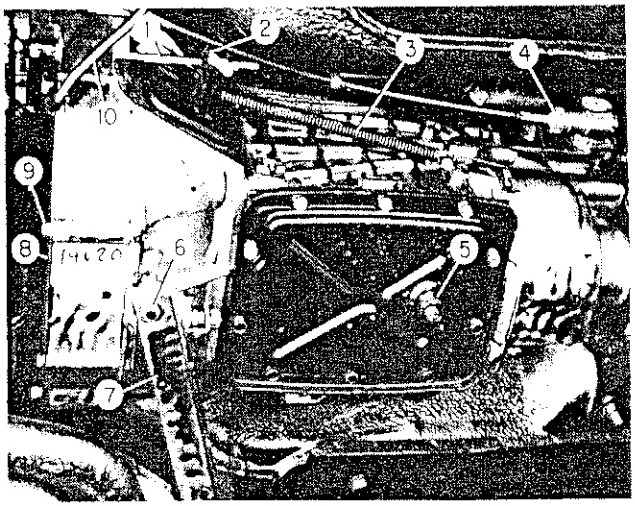
Remove clutch lever return spring (3). Disconnect clutch cable (1) from clutch lever (2). Withdraw cable through clutch housing.

Unscrew speedometer connector (4) from transmission.

Remove three bolts holding starter to clutch housing. Secure starter out of way.

Remove four bolts (8) to remove flywheel cover (9).

NOTE: Left bolt of flywheel cover also secures engine ground lead (10).

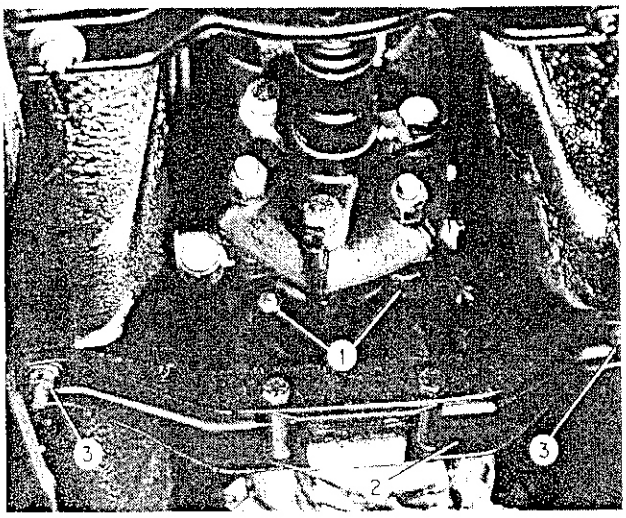


1. Clutch cable 2. Clutch lever 3. Clutch return spring
4. Speedometer connector 5. Drain plug 6. Bolt 7. Bracket
8. Bolt 9. Flywheel cover 10. Engine ground lead

Remove drive shaft assembly (refer to Drive Shaft section).

Place transmission jack under transmission.

Remove two nuts (3) holding transmission mount (2) to body. Remove two nuts (1) holding mount to transmission.



1. Nut 2. Transmission mount 3. Nut

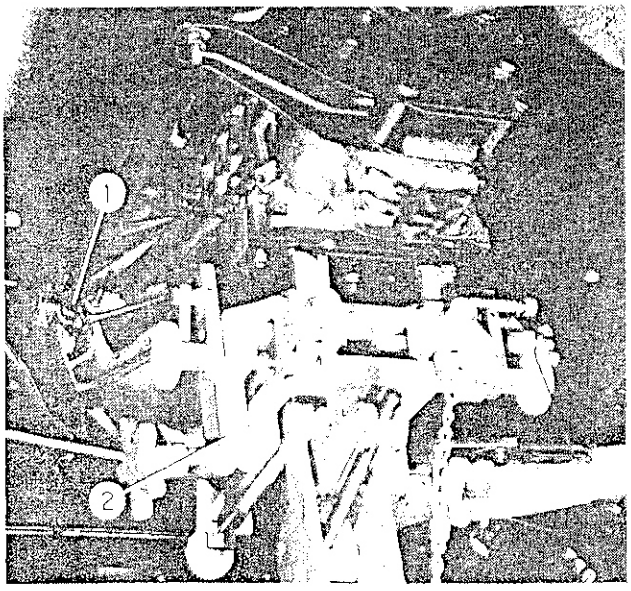
Remove four bolts (1) securing transmission to engine.

Separate transmission from engine and move it rearward. Tilt transmission to slip input shaft out of clutch. Lower transmission.

CAUTION: Be careful that transmission input shaft does not damage clutch diaphragm spring laminae.

Install in reverse order of removal.

Torque all bolts (refer to Torque Specification chart).



1. Bolt 2. Transmission jack

DISASSEMBLY

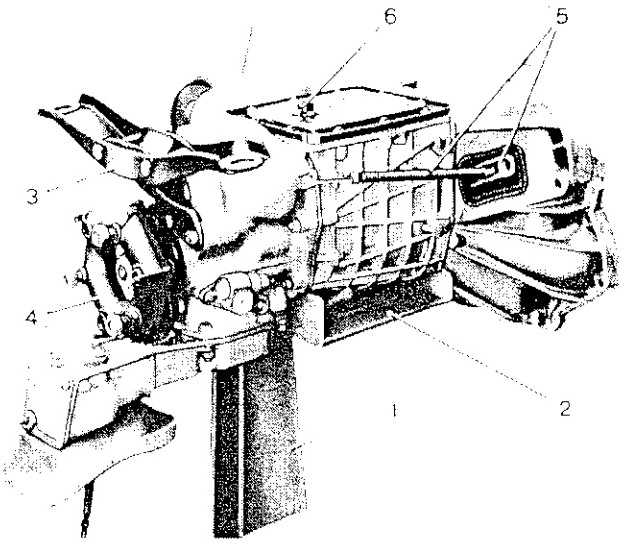
Mount transmission on support (2) A.71001/19, part of rotating stand (1).

Using tools A.50113, A.55087, and A.57051, remove oil drain plug (6), oil level plug, and rear housing oil drain plug.

Remove three self-locking nuts and bolts attaching flexible joint (4).

Remove two nuts and washers attaching rear supporting cross strut (3) to rear housing.

Remove return spring and rubber boot (5).

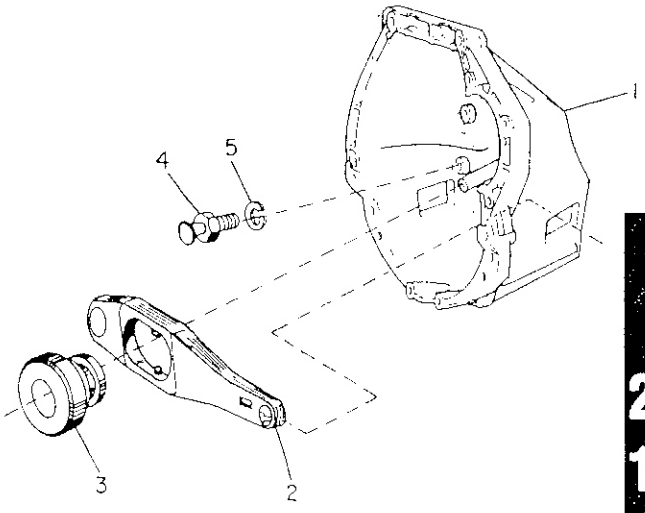


1. Rotating stand 2. Support 3. Rear supporting cross strut
4. Flexible joint 5. Spring and rubber boot 6. Oil drain plug

Unhook yoke (2) from pivot (4) by sliding yoke toward return spring end.

When unhooked, guide yoke and throwout bearing (3) off input shaft.

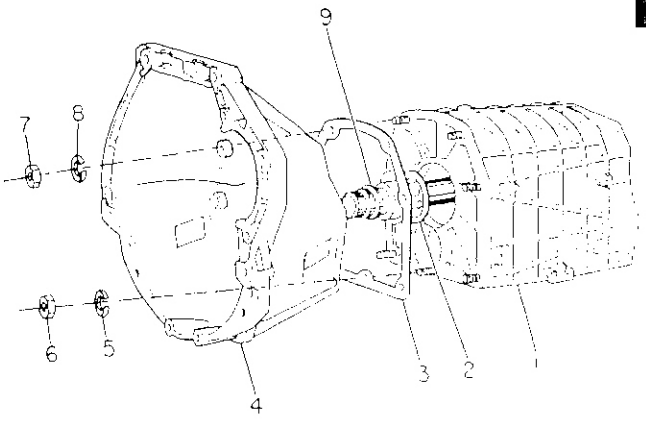
Remove pivot (4) and lockwasher (5) from bellhousing (1) only if damaged.



1. Bellhousing 2. Yoke 3. Throwout bearing 4. Pivot
5. Lockwasher

Remove six nuts (7), lockwashers (8), and one nut (6) and lockwasher (5) attaching bellhousing (4) to case (1).

Remove gasket (3) and spring washer (2). Remove seal (9) from the bellhousing (4) only if seal will be replaced.

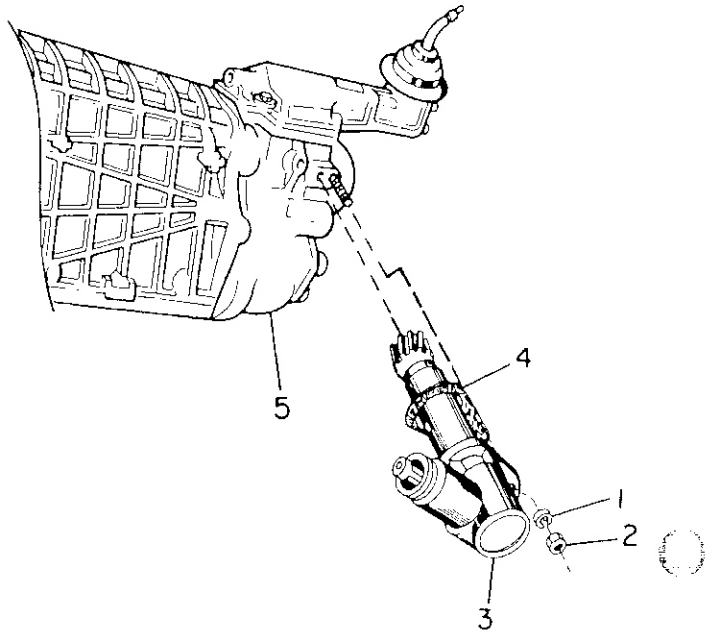


1. Case 2. Spring washer 3. Gasket 4. Bellhousing 5. Lockwasher
6. Nut 7. Nut 8. Lockwasher 9. Seal

Remove nut (2) and lockwasher (1) attaching speedometer drive (3) to rear housing (5).

Remove speedometer drive (3) and gasket (4).

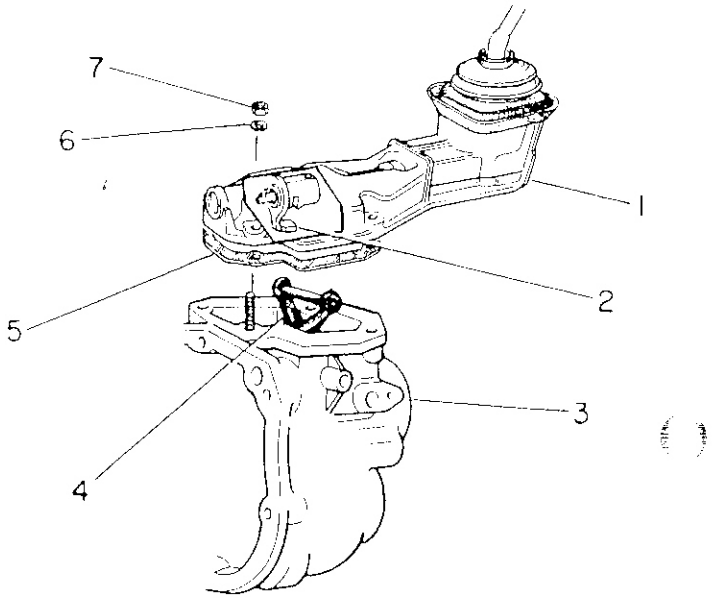
1. Lockwasher 2. Nut 3. Speedometer drive 4. Gasket
5. Rear housing



Remove four nuts (7) and lockwashers (6).

Remove entire shift tower assembly (1) by lifting, then pushing shift lever forward until tab on dog (2) clears engaging lever (4) in rear housing (3). Remove gasket (5).

1. Shift tower assembly 2. Dog 3. Rear housing 4. Engaging lever
5. Gasket 6. Lockwasher 7. Nut



NOTE: Disassemble shift tower assembly only to the extent to replace defective components.

Remove boot (15).

Remove four nuts and lockwashers (14), cover (17), and gasket (16). Do not remove reverse lockout screw (18) and locknut (19) unless damaged.

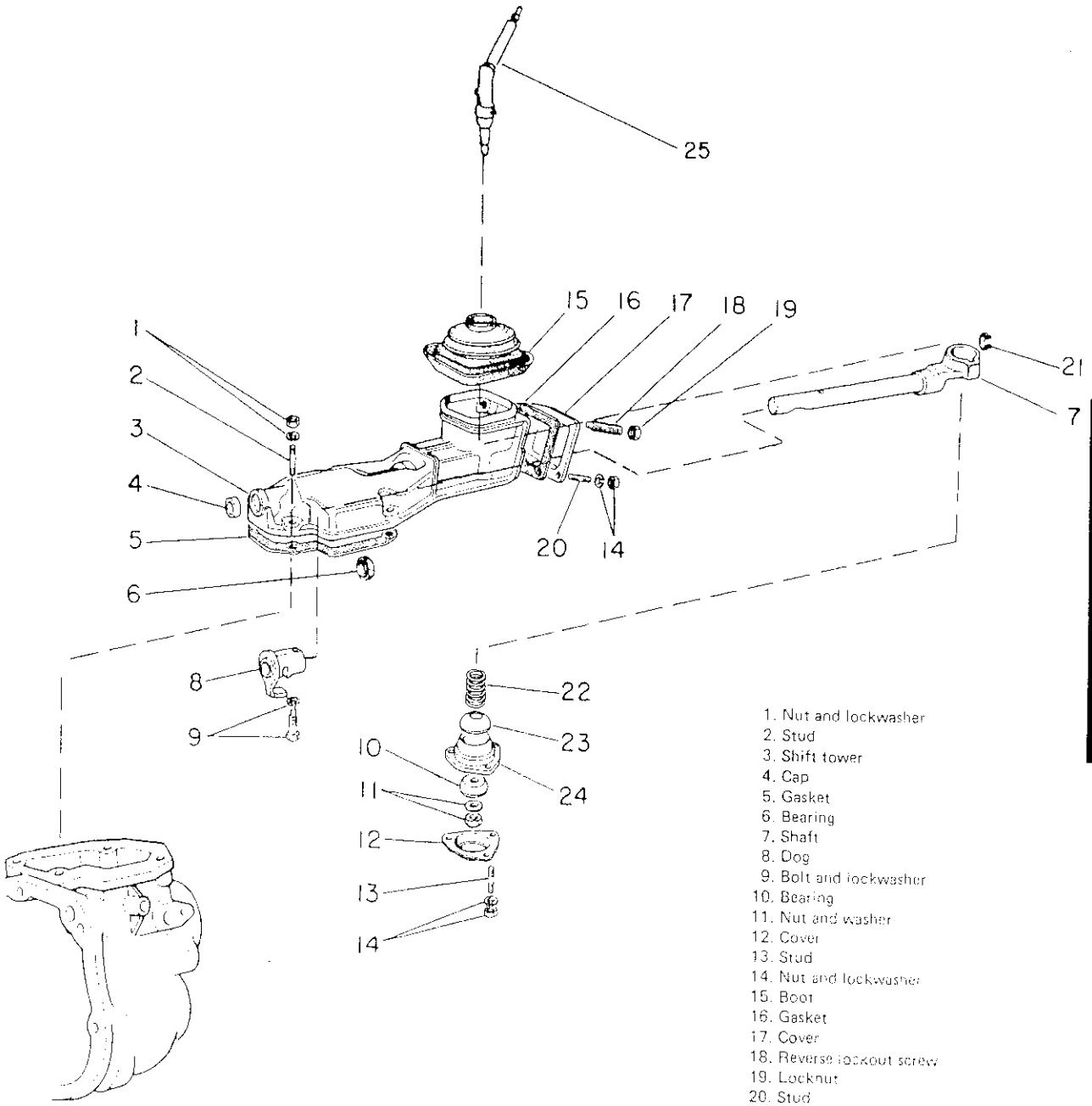
Remove three nuts and lockwashers (14), and cover (12).

Remove nut and washer (11), bearings (10), socket (24), cover (23), and spring (22).

Lift shift lever (25) from shift tower. Remove spring clip (21).

Remove bolt and lockwasher (9). Slide shaft out shift tower rear, then remove dog (8).

Remove cap (4), bearing (6), and studs (2, 13, and 20) only if damaged



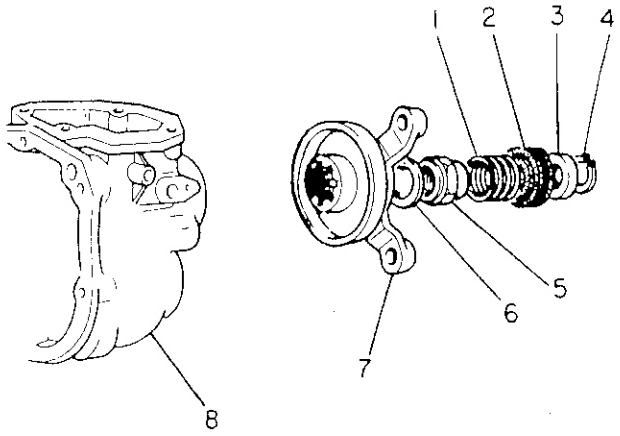
1. Nut and lockwasher
2. Stud
3. Shift tower
4. Cap
5. Gasket
6. Bearing
7. Shaft
8. Dog
9. Bolt and lockwasher
10. Bearing
11. Nut and washer
12. Cover
13. Stud
14. Nut and lockwasher
15. Boot
16. Gasket
17. Cover
18. Reverse lockout screw
19. Locknut
20. Stud
21. Spring
22. Spring
23. Cover
24. Socket
25. Shift lever

Remove snap ring (4), spacer (3), seal (2), and spring (1) from output shaft.

Using adapter A.55130 on yoke (7), remove nut (5) and washer (6).

Using a puller, remove yoke (7).

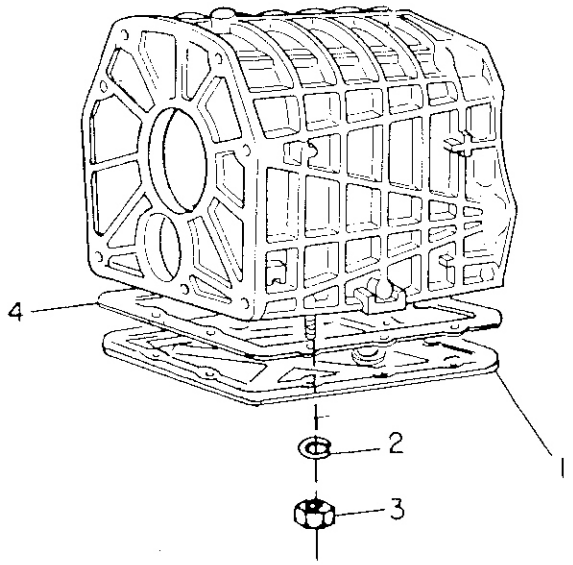
1. Spring 2. Seal 3. Spacer 4. Snap ring 5. Nut 6. Washer 7. Yoke 8. Rear housing



Remove ten nuts (3) and lockwashers (2).

Remove cover (1) and gasket (4).

1. Cover 2. Lockwasher 3. Nut 4. Gasket



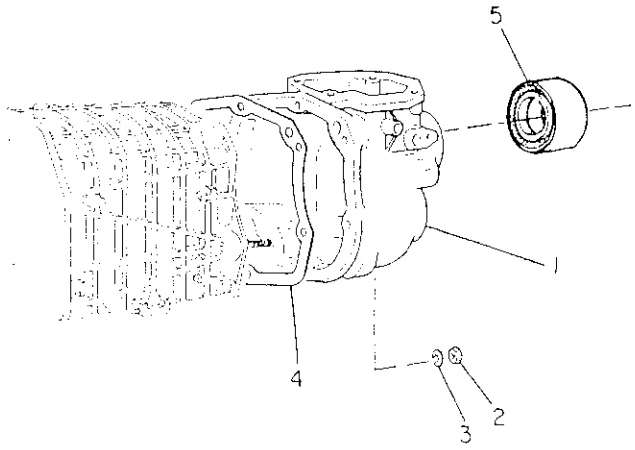
Remove six nuts (2) and lockwashers (3) attaching rear housing (1) to case. (One nut is located inside the case.)

Carefully remove rear housing (1) from case. As housing is removed, guide gear selection and engaging lever out of fork shafts.

Remove gasket (4).

Remove seal (5) from rear housing (1) only if the seal will be replaced.

1. Rear housing 2. Nut 3. Lockwasher 4. Gasket 5. Seal



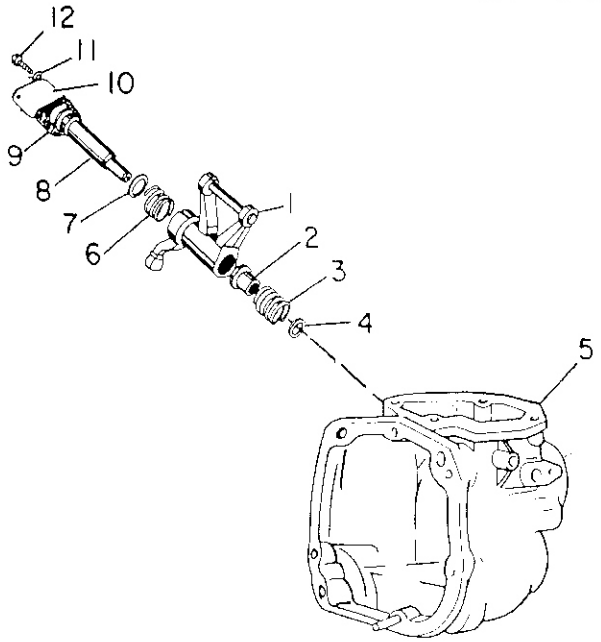
NOTE: Disassemble gear selection and engaging lever only if damaged.

Remove two bolts (12) and two lockwashers (11) attaching cover (10) to rear housing (5).

Remove cover (10) and gasket (9).

Slowly slide gear selection and engaging lever rod (8) out side of rear housing (5). As rod is withdrawn, remove spring (3), spring retainer (2), gear selection and engaging lever (1), spring (6), and thrust washer (7).

Remove thrust washer (4) from rear housing (5).



1. Engaging lever 2. Spring retainer 3. Spring 4. Thrust washer
5. Rear housing 6. Spring 7. Thrust washer 8. Engaging lever rod
9. Gasket 10. Cover 11. Lockwasher 12. Bolt

Remove bolt (3) and lockwasher (2) attaching fifth and reverse shift fork to fifth and reverse fork shaft (1).

Slowly remove fork shaft. As fork shaft is removed, detent ball (8) will release.

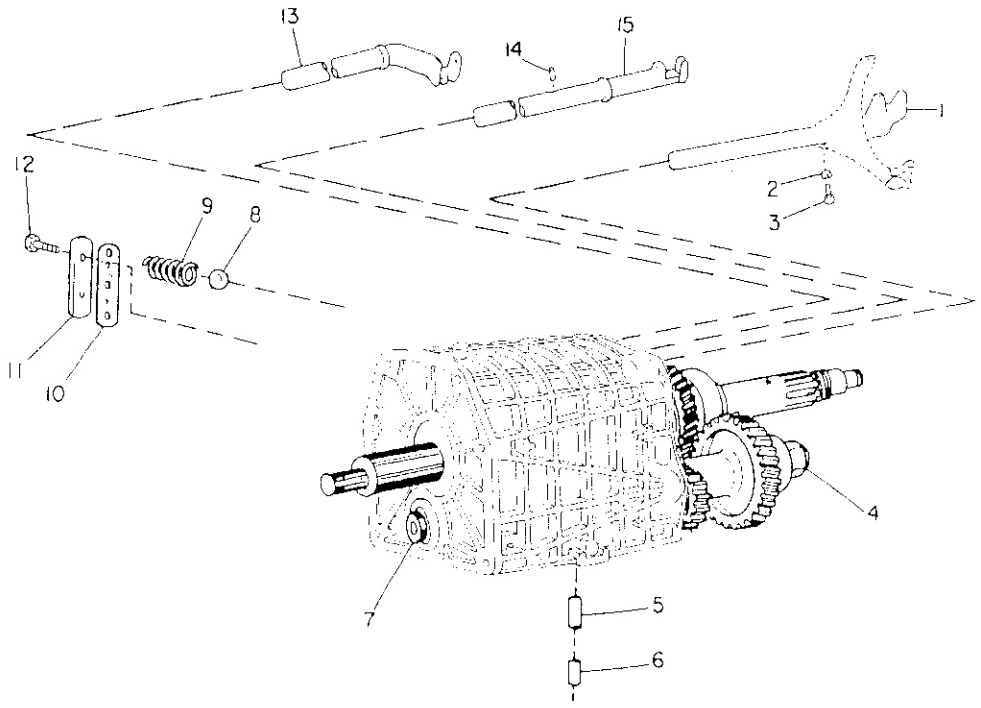
Engage two gears to lock the transmission. Loosen, but do not remove, 27-mm nut (4) and 19-mm bolt (7) on ends of countershaft. Disengage the two gears.

Remove two bolts (12) attaching cover (11) to case. Remove gasket (10), three springs (9), three detent balls (8), and short detent dowel (6).

Remove second bolt (3) and lockwasher (2) attaching third and fourth shift fork to third and fourth fork shaft (15).

Slowly remove third and fourth fork shaft. While removing fork shaft, remove detent pin (14) from fork shaft. Using a magnet, remove long detent dowel (5).

Remove third bolt (3) and lockwasher (2) attaching first and second shift fork to first and second fork shaft (13). Remove fork shaft.

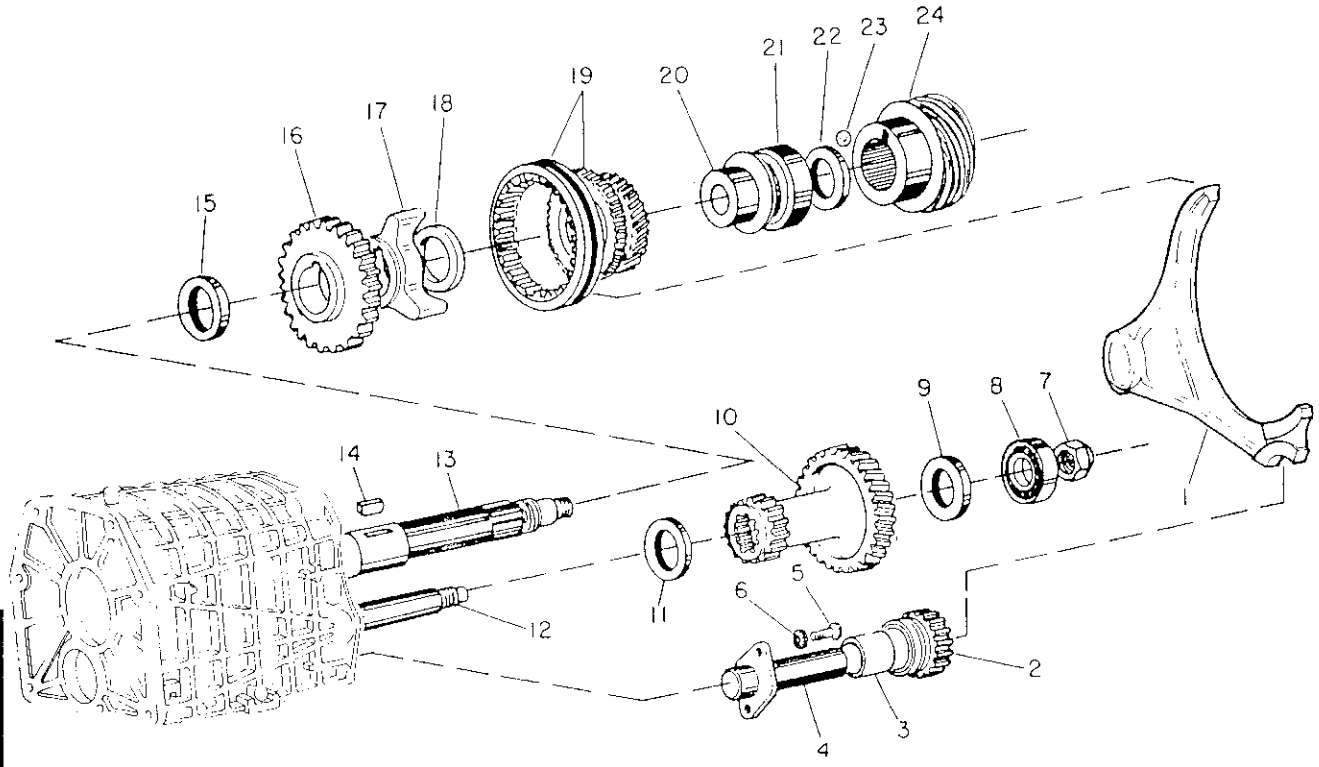


1. Fifth and reverse fork shaft
2. Lockwasher
3. Bolt
4. 27-mm nut
5. Long detent dowel
6. Short detent dowel
7. 19-mm bolt
8. Detent ball
9. Spring
10. Gasket
11. Cover
12. Bolt
13. First and second fork shaft
14. Detent pin
15. Third and fourth fork shaft

Remove speedometer drive gear (24), ball (23), spacer (22), and bearing (21). Remove 27-mm nut (7), bearing (8), and spacer (9).

Carefully tap fifth and reverse gear (10) off until its internal splines are disengaged. As fifth and reverse gear is removed from countershaft (12), remove reverse sliding gear (2), fifth and reverse gear (10), spacer (11), bushing (20), fifth and reverse gear shift fork (1), and fifth gear assembly (19). Disassemble fifth gear assembly as specified in Fifth Gear Assembly.

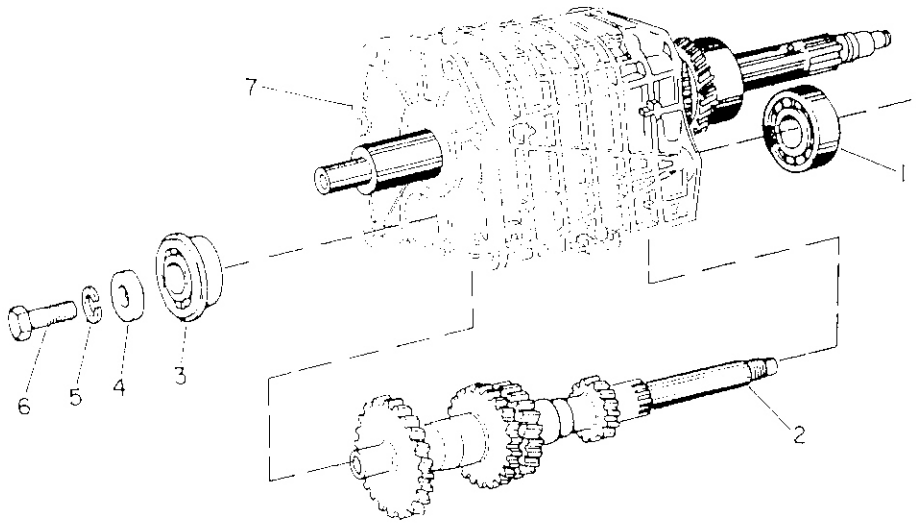
Remove spacer (18), hub (17), and reverse gear (16). Remove bushing (3) and shaft (4) attached with screws (5) and lockwasher (6) only if damaged.



1. Fifth and reverse shift fork
2. Reverse sliding gear
3. Bushing
4. Shaft
5. Screw
6. Lockwasher
7. 17-mm nut
8. Bearing
9. Spacer
10. Fifth and reverse gear
11. Spacer
12. Countershaft
13. Main shaft
14. Key
15. Spacer
16. Reverse gear
17. Hub
18. Spacer
19. Fifth gear assembly
20. Bushing
21. Bearing
22. Spacer
23. Ball
24. Speedometer drive gear

Remove bolt (6), lockwasher (5), and washer (4). Using a soft mallet, tap on output end of countershaft (2) until bearing (3) can be removed from case (7).

Carefully tap on bearing (1) outer race to remove from case (7). Remove countershaft (2) from case.



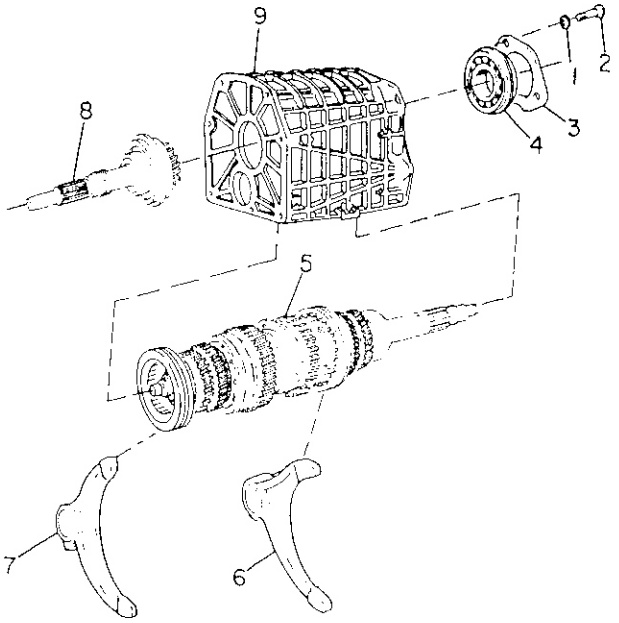
1. Bearing
2. Countershaft
3. Bearing
4. Washer
5. Lockwasher
6. Bolt
7. Case

Remove third and fourth shift fork (7), first and second shift fork (6). Although both forks are the same, do not mix to maintain wear.

Using an impact driver, remove three screws (2) and lockwashers (1). Remove bearing retainer (3) and bearing (4).

Carefully work to slip input shaft assembly (8) out of case (9). Disassemble as specified in Input Shaft Disassembly.

Carefully move main shaft assembly (5) rearward, then remove from case (9). Disassemble as specified in Main Shaft Assembly.



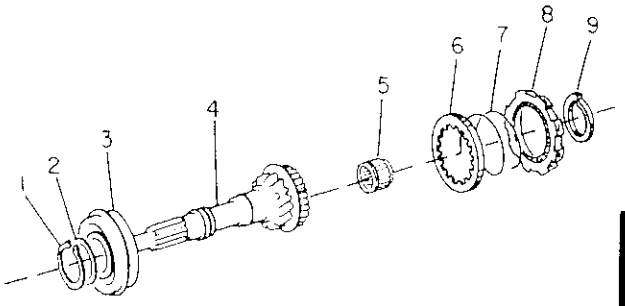
1. Lockwasher 2. Screw 3. Bearing retainer 4. Bearing 5. Main shaft assembly 6. First and second shift fork 7. Third and fourth shift fork 8. Input shaft assembly 9. Case

Input Shaft Disassembly

Use a press and tool A.70350 to compress spring washer (2). Unsnap snap ring (1) from its groove, then remove from press.

Remove snap ring (1), spring washer (2), and bearing (3) from input shaft (4). Remove bearing (5) from inside input shaft.

Remove snap ring (9) holding synchro (8) to input shaft. Remove synchro (8), spring (7), and spring retainer (6).

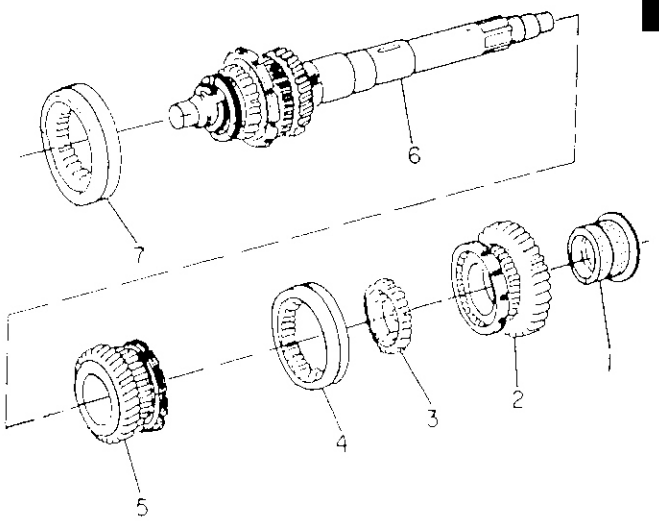


1. Snap ring 2. Spring washer 3. Bearing 4. Input shaft 5. Bearing 6. Spring retainer 7. Spring 8. Syncro 9. Snap ring

Main Shaft Disassembly

Remove sleeve (7). Remove bushing (1), first gear assembly (2), hub (3), sleeve (4) and second gear assembly (5) from main shaft and third gear subassembly (6).

Disassemble main shaft and third gear subassembly (6) as specified in Main Shaft and Third Gear Subassembly. Disassemble first and second gear assemblies (2 and 5) as specified in First, Second, and Third Gear Assemblies.

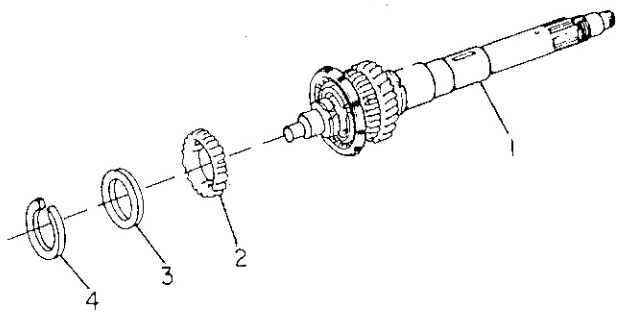


1. Bushing 2. First gear assembly 3. Hub 4. Sleeve 5. Second gear assembly 6. Main shaft and third gear subassembly 7. Sleeve

Main Shaft and Third Gear Subassembly Disassembly

Place subassembly in press. Do not support subassembly on gear, but on shoulder of main shaft. Use press and tool A.70159 to compress spring washer (3). Unsnap snap ring (4) from its groove, then remove from press.

Remove snap ring (4), spring washer (3) and hub (2) from main shaft and third gear (1). Disassemble main shaft and third gear (1) as specified in First, Second, and Third Gear Assemblies.



1. Main shaft and third gear 2. Hub 3. Spring washer 4. Snap ring

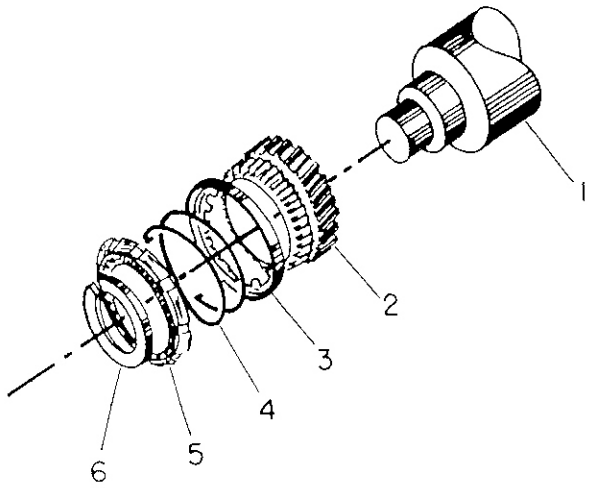
First, Second, and Third Gear Disassembly

NOTE: Although different in size, first, second, and third gear assemblies are similar in assembly. Also, third gear assembly is assembled on the main shaft.

Using tool A.70159, remove snap ring (6).

Remove synchro (5), spring (4) and spring retainer (3) from gear (2).

Remove third gear assembly from main shaft (1).



1. Main shaft (third gear only) 2. First, second, or third gear 3. Spring retainer 4. Spring 5. Synchro 6. Snap ring

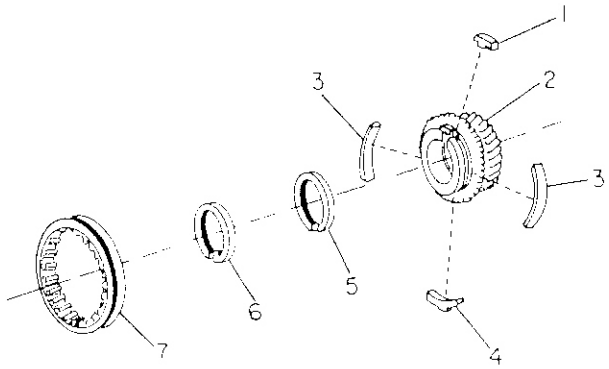
Fifth Gear Disassembly

Remove sleeve (7).

Remove synchromesh parts snap ring (6). Discard snap ring.

Using tool A.70166, remove synchromesh ring (5).

Remove spring (3), lock (1), and stop (4) from fifth gear (2).



1. Lock 2. Gear 3. Spring 4. Stop 5. Synchromesh ring 6. Synchromesh parts snap ring 7. Sleeve

INSPECTION AND REPAIR

Cleaning

Clean all parts with a suitable cleaning solvent to remove oil traces.

Carefully scrape or brush away deposits from holes and grooves.

Carefully remove gaskets from mating surfaces.

Dry with compressed air.

CAUTION: Do not spin dry bearings as damage may result.

Inspect and repair each part as described. If there is doubt as to a part's serviceability, replace the part.

Bearings

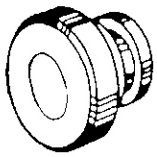
a. Roller or ball
   1. Check that bearing rollers and balls are free to turn in their cages, or that there is no galling, scratches, or cracks. Replace bearing if damaged.
   2. Check that surfaces of inner and outer races are free from galling, scratches, or cracks. Replace bearing if damaged.
   3. Check that radial play is not greater than 0.002 inch and end play is not greater than 0.020 inch. Replace worn bearings.

b. Throwout bearing. Check throwout bearing for wear. Replace if worn.

c. Nonroller bearings. Check for wear. For minor scratches, clean with fine emery or stone. Replace if worn, cracked, or broken.

Roller or Ball Bearing

Throwout Bearing



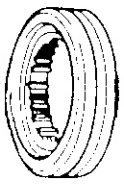
Nonroller Bearings

Hubs and Sleeves

Check that bearing surfaces are free from burrs, nicks, or galling. For nicks or burrs, use a fine stone or emery. Replace if galled.

Check that there is no excessive play between a hub or sleeve and its mating surface.

Check that teeth are not chipped, broken, galled, or worn. Replace if damaged.



Sleeves

Hubs

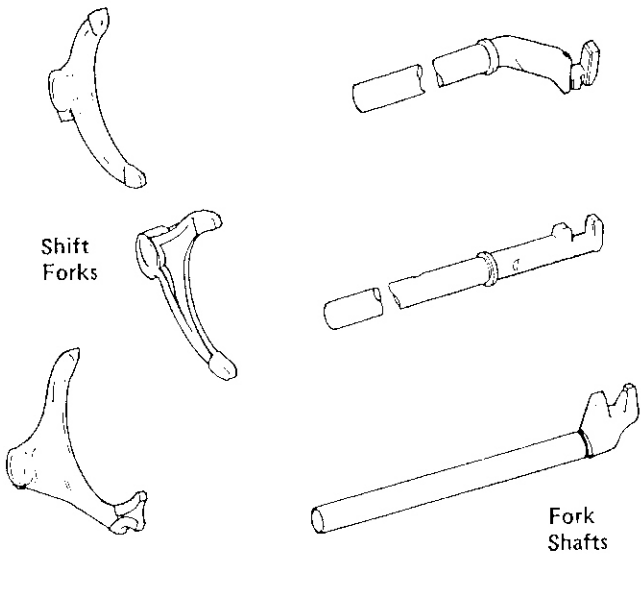
Shift Forks and Fork Shafts

NOTE: Although the first and second shift fork is the same as the third and fourth shift fork, do not interchange.

Check that threads in bolt holes are clean and free from damaged threads. Use a tap to clean holes. Replace shaft if threads are stripped.

Check sliding surfaces for excessive wear. Replace if worn.

Check that fork shafts are not bent, and that grooves for detent balls are not scored. Replace if bent or worn.

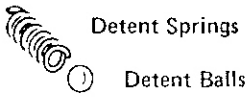


Detent Balls, Dowels, and Pin

Check for free travel of detent pin in third and fourth fork shaft. Replace pin if worn. Use fine emery for minor scratches.

Check detent ball and dowels for galling. Replace if damaged.

Check detent springs for tension. Replace if weak.




Detent Dowels and Pin

21

Input Shaft, Main Shaft, Countershaft, Reverse Sliding Gear Shaft, and Engaging Lever Rod

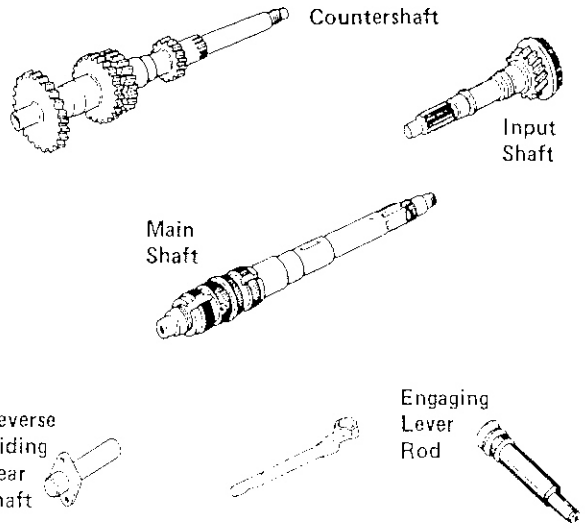
Check all shafts for straightness by placing between points. Maximum runout shall be not greater than 0.002 inch. Some shafts can be straightened with a press. If not, replace.

Check splines for damage. Use a fine file, emery, or stone to remove burrs or nicks.

Check that threads on main shaft and countershaft are not damaged. Replace shaft if threads are stripped.

Check that bearing surfaces are free from burrs, nicks or galling. Use a fine stone or emery to clean.

Check engaging lever rod for straightness and wear. Replace if worn or bent.



Gears

Check that teeth on all gears are not chipped, broken, or galled. Replace if damaged.

Check that synchro crown teeth are flat and not rounded. Rounded teeth indicates worn gear. Replace. Also replace mating gear.

Check that wear pattern is even. Replace if worn.

Check that bearing surfaces are free from burrs, nicks or galling. Use fine emery to clean.

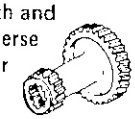
Check that clearance between reverse sliding gear bushing and reverse shaft is 0.002 to 0.004 inch. Replace bushing if worn.

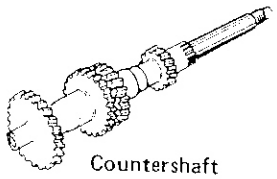
Check that clearance between first gear and its bushing is 0.002 to 0.004 inch. Replace if worn.

Check that clearance between second and third gears and seats on main shaft is 0.002 to 0.004 inch. Replace if worn.

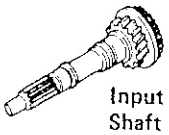
First, Second, and Third Gears

Fifth and Reverse Gear





Countershaft



Input Shaft

Synchros

Check that synchro is not cracked. Replace if cracked.

Check that teeth are not broken. Replace if broken.

Check bearing surfaces for excessive wear. Replace if worn.

Synchros

Springs

Check all springs for tension. Replace weak springs.

Check detent springs for wear on axial surface. Replace if worn.

Snap Rings

Check that snap rings are not deformed and maintain a good grip in their grooves. Replace if worn. Discard the synchromesh parts snap ring used on fifth gear assembly.

Spacers, Thrust and Spring Washers

Check all thrust washers for wear. Replace if worn.

Check that spacer and spring washers are not deformed. Replace if deformed.

Springs

Snap Ring

Spring Washers

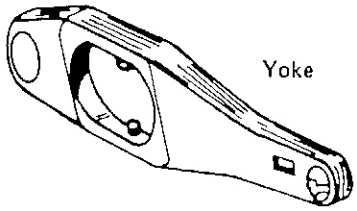
Pivot and Yoke

Check that pivot and yoke for throwout bearing are not worn. Replace if worn.

Check that hole for return spring on yoke is not worn. A steel washer can be welded to restore hole.

Check that yoke is not bent. Replace if bent.

Pivot

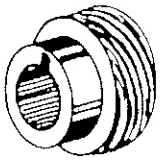


Yoke

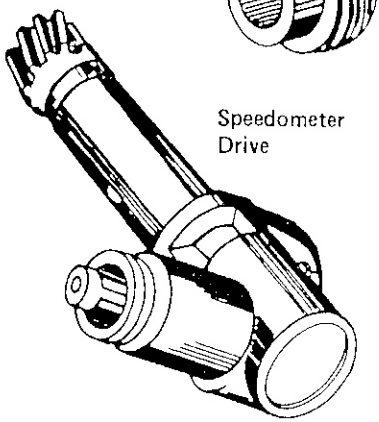
Speedometer Drive

Check that teeth on speedometer drive are not chipped, broken or galled. Replace if damaged. Also replace speedometer drive gear.

Check that shafts turn easily without excessive play. Replace if worn.



Speedometer Drive Gear



Speedometer Drive

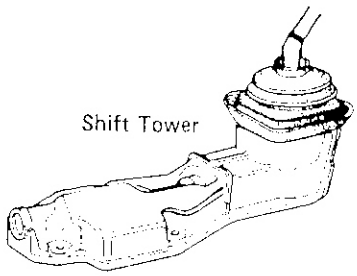
Shift Tower and Gear Selection and Engaging Lever

If not disassembled, check for free movement without binding or excessive play. Disassemble for binding.

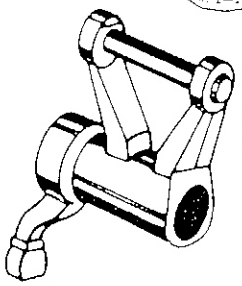
If disassembled, check that all bearing surfaces are free from excessive wear. Replace worn parts.

Check that shafts are not bent. Replace bent parts.

Check that dog is not damaged. Replace if damaged.



Shift Tower

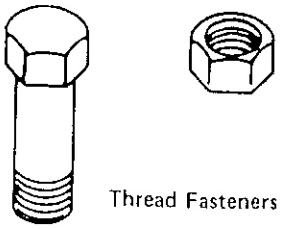


Gear Selection and Engaging Lever

Thread Fasteners

Check that threads on all threaded fasteners are not stripped or cross-threaded. Replace if damaged.

Replace all self-locking nuts.



Thread Fasteners

Case, Rearhousing, Bell Housing, Covers

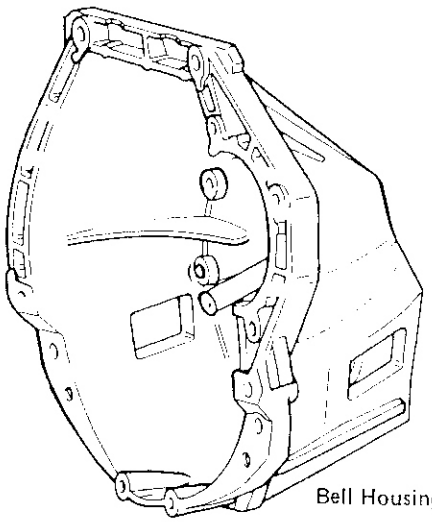
Check that all structured parts are not cracked, broken, or damaged. Replace if damage is in a bearing or structural area. Cracks or holes in any nondimensional or structural area may be repaired by welding.

Check that all threaded holes are not stripped or cross-threaded. Repair by retreading oversize or using helical inserts.

Check that covers are not bent or cracked. Repair by straightening or welding.

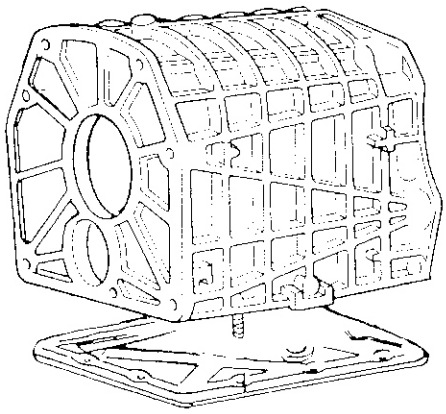
Check that bores for detent balls and dowels are not worn. Replace steel sleeve if worn.

Check gasket surfaces for nicks, scratches, or breaks that may cause leaks. Clean with fine emery. Gasket surface can be repaired by welding and machining. Otherwise replace part.

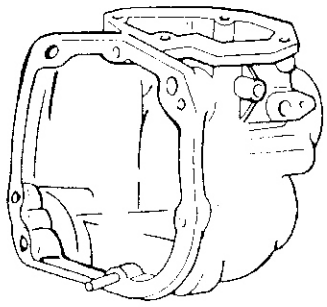


Bell Housing

Case



Cover



Rear Housing

Oil Seals

Check that oil seals are not worn, chipped, torn, brittle, or cracked. Replace if damaged.

Check that seal springs are not deformed and in place. Restore spring to its position if seal is not otherwise damaged.

Oil Seal

REASSEMBLY

Reassembly is reverse of disassembly and observing the following instructions.

Fifth Gear Reassembly

Lightly coat parts with oil.

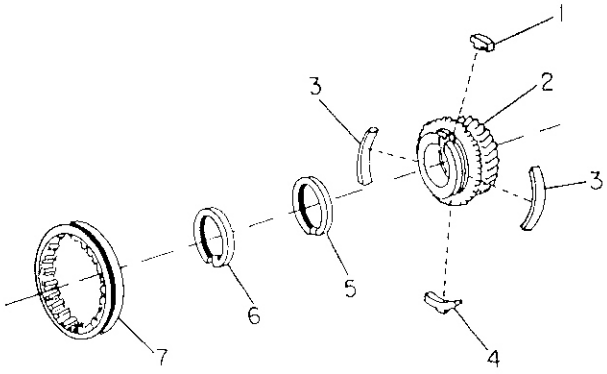
With gear (2) laying flat (gear side down), assemble lock (1) into slot of gear (2).

Assemble stop (4) and two springs (3).

Carefully spread synchro ring (5) and place around assembled parts (1, 3, and 4) so open end is over stop (4).

Using tool A.70166, assemble new synchromesh parts snap ring (6) with dog end in slot on gear (2).

Assemble sleeve (7).



1. Lock 2. Gear 3. Spring 4. Stop 5. Synchromesh ring
6. Synchromesh parts snap ring 7. Sleeve

First, Second, and Third Gear Reassembly

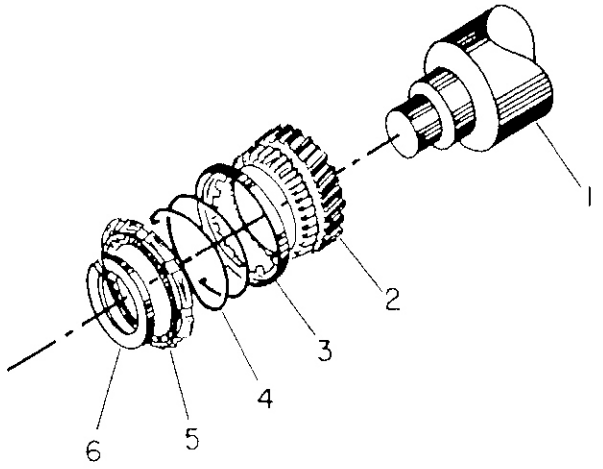
Lightly coat parts with oil.

For third gear only, assemble third gear (2) on main shaft (1).

With cup side away from gear (2), assemble spring retainer (3) on gear (2). Assemble spring (4).

With small end of synchro (5) away from gear (2), assemble synchro (5) and snap ring (6) on gear (2). Use tool A.70159 to assemble snap ring (6).

When assembled, check that synchro (5) can be moved along gear (2), and springs back when released.



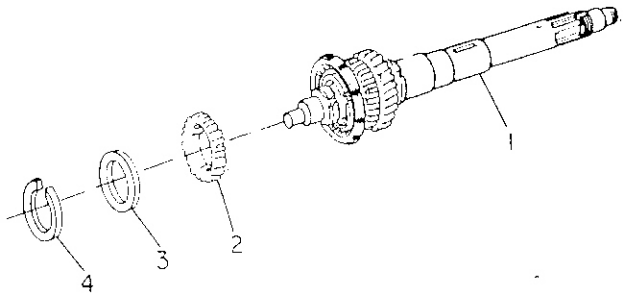
1. Main shaft (third gear only) 2. First, second, or third gear
3. Spring retainer 4. Spring 5. Synchro 6. Snap ring

Main Shaft and Third Gear Reassembly

Lightly coat parts with oil, then place main shaft and third gear (1) in a press. Do not support on third gear, but on shoulder of main shaft.

Onto main shaft and third gear (1) input end, assemble hub (2), spring washer (3), snap ring (4), and tool A.70159.

Use press to compress spring washer (3), then seat snap ring (4) in its groove. Remove subassembly from press.



1. Main shaft and third gear 2. Hub 3. Spring washer 4. Snap ring

Main Shaft Reassembly

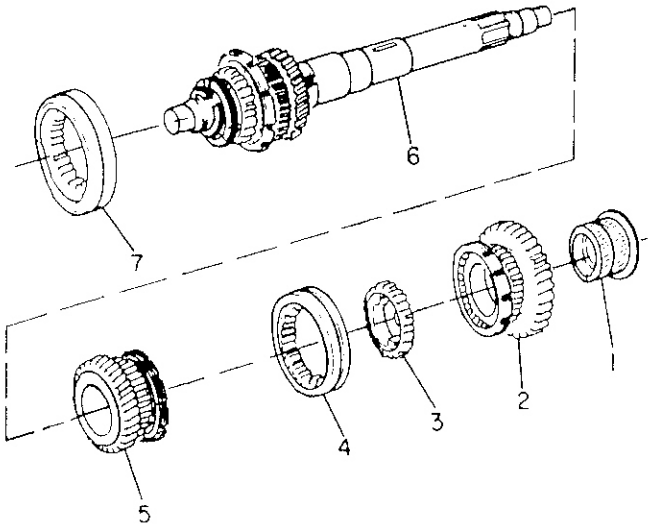
Lightly coat parts with oil.

Onto output end of main shaft and third gear assembly (6), assemble second gear assembly (5), sleeve (4), hub (3), first gear assembly (2), and bushing (1).

Carefully mate all parts. When assembled, sleeve (4) should straddle the synchros on second and first gear assemblies, and the gears should go from small to large, input end to output end.

Assemble sleeve (7) on input end.

1. Bushing 2. First gear assembly 3. Hub 4. Sleeve 5. Second gear assembly 6. Main shaft and third gear subassembly 7. Sleeve



Input Shaft Reassembly

Lightly coat parts with oil. Place input shaft (4) in press. Support on gear end.

Onto input shaft (4) input end, assemble bearing (3) with retaining ring away from gear, spring washer (2), snap ring (1), and tool A.70350.

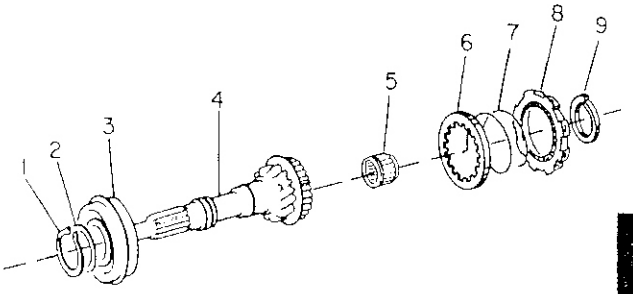
Use press to compress spring washer (2), then seat snap ring (1) in its groove. Remove from press.

Coat bearing (7) with heavy grease. Install bearing (5) inside input shaft.

Assemble spring retainer (6), spring (7), and synchro (8) on input shaft. Assemble snap ring (9) in its groove on input shaft.

Lay input shaft on its side so bearing (5) does not come out.

1. Snap ring 2. Spring washer 3. Bearing 4. Input shaft 5. Bearing 6. Spring retainer 7. Spring 8. Synchro 9. Snap ring



Input and Main Shaft Assemblies Installation

Lightly coat all bearing bores, bores for fork shafts, and bores for detent balls and dowels. Also coat each part as it is installed.

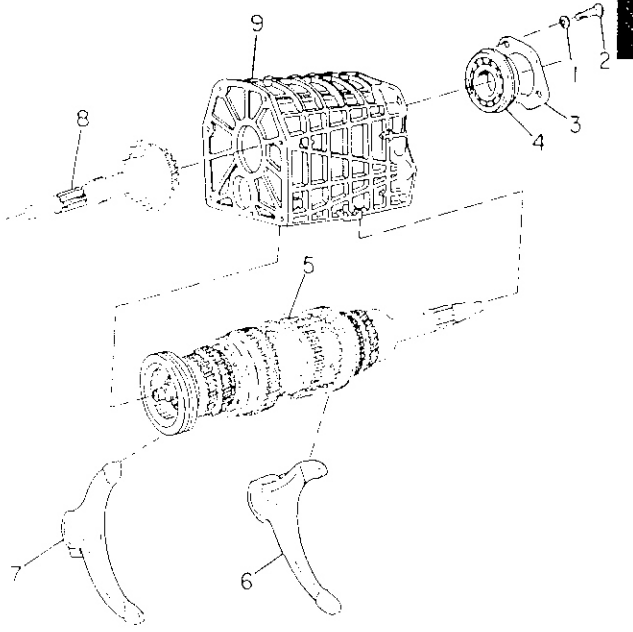
While keeping main shaft assembly (5) fully compressed, carefully insert output end into its bore in case (9), then insert input end. Check for bearing in input shaft assembly (8), then carefully work input shaft assembly into its bore in case (9).

Assemble bearing (4), bearing retainer (3), washers (1) and screws (2). Tighten screws with an impact driver.

Check that input and main shaft assemblies (8 and 5) are easily turned. Check that sleeves on main shaft assembly can be moved axially.

Install first and second shift fork (6) and third and fourth shift fork (7) in their respective sleeves on main shaft assembly (5). Make sure thread holes face cover end of case (9).

1. Lockwasher 2. Screw 3. Bearing retainer 4. Bearing 5. Main shaft assembly 6. First and second shift fork 7. Third and fourth shift fork 8. Input shaft assembly 9. Case



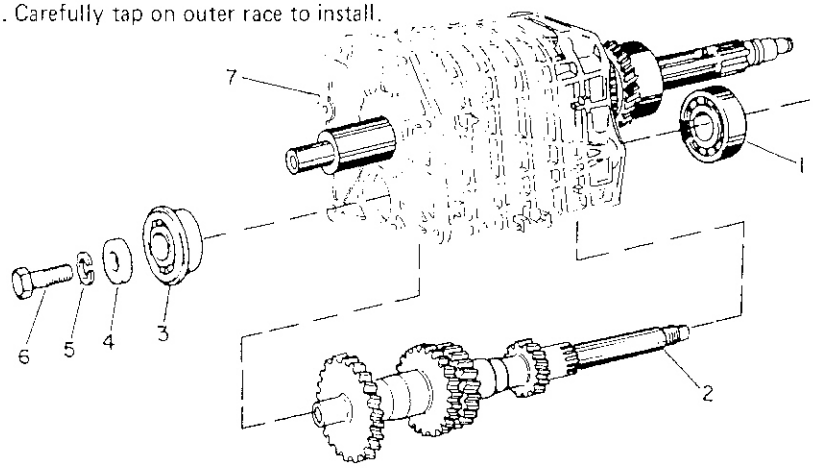
Countershaft Installation

Insert output end of countershaft (2) into its bore in case (7), then insert input end.

Assemble bearing (3) with retaining ring away from case (7), washer (4), lockwasher (5), and bolt (6). Finger tighten bolt.

Install bearing (1) with inner race going on first. Carefully tap on outer race to install.

1. Bearing
2. Countershaft
3. Bearing
4. Washer
5. Lockwasher
6. Bolt
7. Case



Fifth and Reverse Gears Installation

If removed, install bushing (3) in reverse sliding gear (2). Attach shaft (4), lockwasher (6), and screws (5). Tighten screws with impact driver.

Assemble spacer (15) and key (14) on main shaft (13). Assemble reverse gear (16), hub (17), and spacer (18). Assemble spacer (11) on countershaft (12).

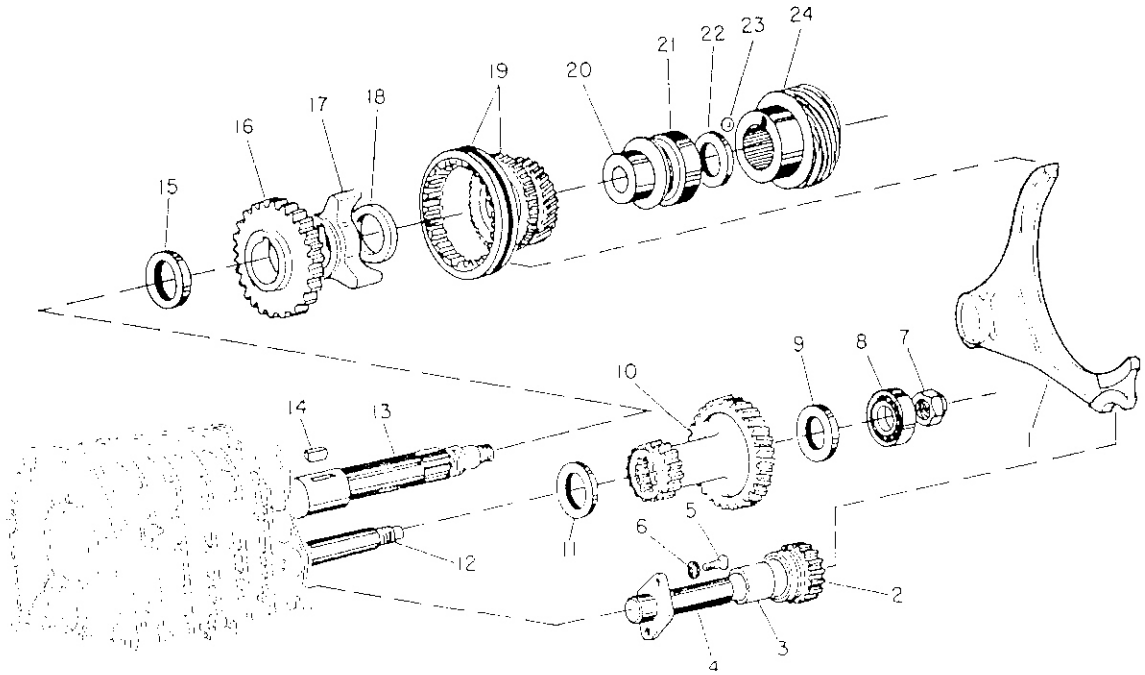
Partially assemble fifth and reverse gear (10) on countershaft (12), and fifth gear assembly (19) on main shaft (13).

Assemble fifth and reverse shift fork (1) on reverse sliding gear (2) and fifth gear assembly (19). Carefully slide partially assembled parts on their respective shafts until they can be released.

Carefully tap on fifth and reverse gear (10) until it is fully seated on countershaft (12).

Assemble spacer (9), bearing (8), and nut (7). Finger tighten nut.

Assemble bushing (20), bearing (21), spacer (22), ball (23), and speedometer drive gear (24).



1. Fifth and reverse shift fork
2. Reverse sliding gear
3. Bushing
4. Shaft
5. Screw
6. Lockwasher
7. 27-mm nut
8. Bearing
9. Spacer
10. Fifth and reverse gear
11. Spacer
12. Countershaft
13. Main shaft
14. Key
15. Spacer
16. Reverse gear
17. Hub
18. Spacer
19. Fifth gear assembly
20. Bushing
21. Bearing
22. Spacer
23. Ball
24. Speedometer drive gear

Fork Shafts Installation

Install first and second fork shaft (13) in fork shaft hole furthest away from case cover. As fork shaft is installed, insert into first and second shift fork.

Assemble washer (2) and bolt (3). Tighten to 14 ft lb torque.

Install long detent dowel (5).

Install third and fourth fork shaft (15) in center fork shaft holes. As fork shaft is installed, insert into third and fourth shift fork. Also install detent pin (14) into fork shaft (15).

Assemble washer (2) and bolt (3). Tighten to 14 ft lb torque.

Temporarily install two detent balls (8) and two springs (9) for installed fork shafts. Assemble cover (11) and two bolts (12).

Engage two gears to lock the transmission.

Tighten 27-mm nut (4) to 87 ft lb and 19-mm bolt to 69 ft lb torque. Disengage two gears.

Check that both countershaft and main shaft can be easily turned. If countershaft cannot be turned, its rear bearing may be installed backwards. Also engage each gear and check for free turning.

Using staking pliers A.74140/1 and staking heads A.74140/4, stake nut (4).

Install short detent dowel (6).

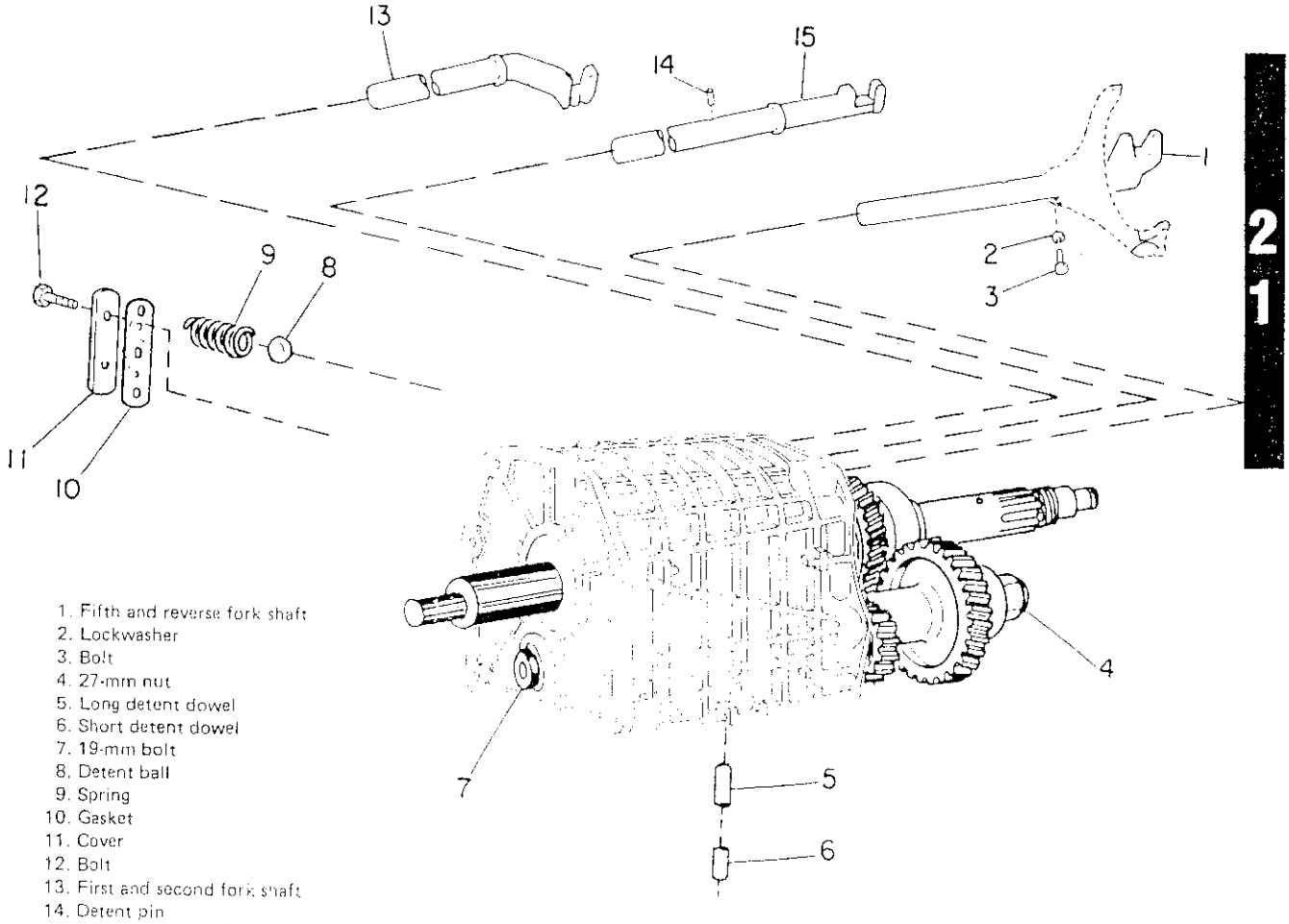
Install fifth and reverse fork shaft (1) into fifth and reverse shift fork, and into remaining fork shaft hole.

Assemble washer (2) and bolt (3). Tighten to 14 ft lb torque.

Remove bolt (12) and cover (11). Install third detent ball (8) and spring (9).

Install new gasket (10) (sealant is not recommended), cover (11), and two bolts (12). Tighten bolts to 18 ft lb torque.

Engage a gear. Check that a second gear cannot be engaged at the same time.



1. Fifth and reverse fork shaft
2. Lockwasher
3. Bolt
4. 27-mm nut
5. Long detent dowel
6. Short detent dowel
7. 19-mm bolt
8. Detent ball
9. Spring
10. Gasket
11. Cover
12. Bolt
13. First and second fork shaft
14. Detent pin
15. Third and fourth fork shaft

Engaging Lever Installation

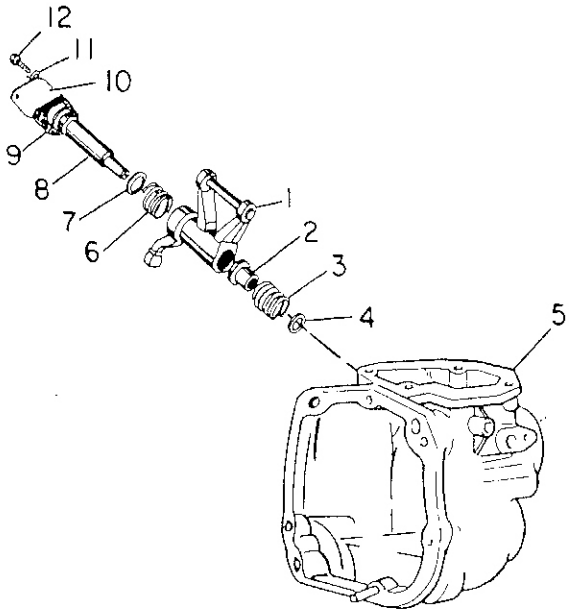
If disassembled, install thrust washer (4) in rear housing (5).

Slowly install engaging lever rod (8) into rear housing (5). As rod is installed, assemble thrust washer (7), spring (6), gear selection and engaging lever (1), spring retainer (2), and spring (3).

Install new gasket (9) (sealant is not recommended), cover (10), lockwasher (11), and bolt (12). Tighten bolt to 14 ft lb torque.

Check for free side-to-side travel of gear selection and engaging lever (1), and that it returns to center position when released.

1. Engaging lever 2. Spring retainer 3. Spring 4. Thrust washer
5. Rear housing 6. Spring 7. Thrust washer 8. Engaging lever rod
9. Gasket 10. Cover 11. Lockwasher 12. Bolt



Rear Housing Installation

If removed, install new seal (5).

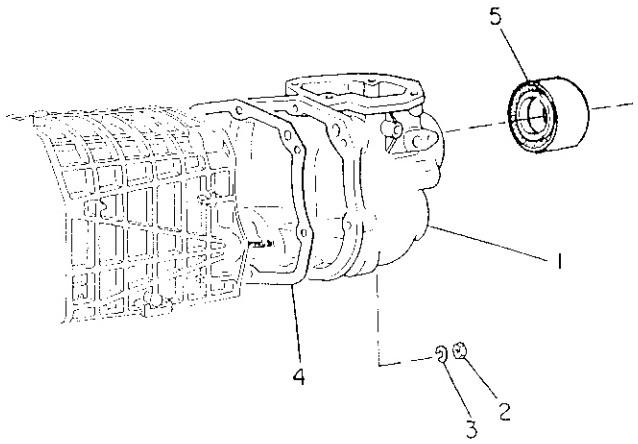
Assemble new gasket (4) on case (sealant is not recommended).

Move gear selection and engaging lever rearward. Slowly assemble rear housing (1) onto case. As rear housing is assembled, guide gear selection and engaging lever into fork shafts.

Assemble six nuts (2) and lockwashers (3). Tighten to 18 ft lb torque.

Check that gear selection and engaging lever can be operated through all gears.

1. Rear housing 2. Nut 3. Lockwasher 4. Gasket 5. Seal

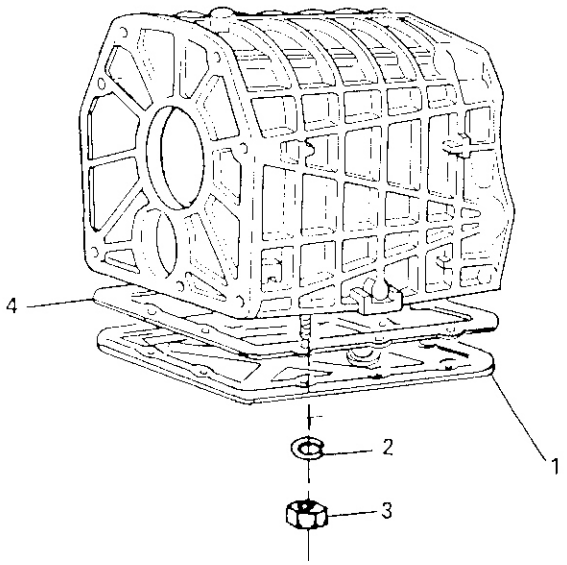


Case Cover Installation

Assemble new gasket (4) to case.

Assemble cover (1), ten lockwashers (2), and nuts (3).

1. Cover 2. Lockwasher 3. Nut 4. Gasket



Yoke Installation

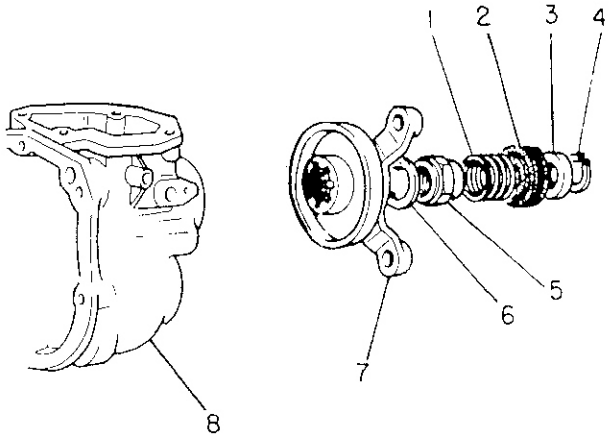
Coat splines of yoke (7) with antiseize compound, then assemble to main shaft.

Assemble washer (6) and nut (5). Using adapter A.55130 on yoke (7), tighten nut to 108 ft lb torque.

Assemble spring (1), seal (2), spacer (3), and snap ring (4).

Coat seal (2) with heavy grease.

1. Spring 2. Seal 3. Spacer 4. Snap ring 5. Nut 6. Washer
7. Yoke 8. Rear housing



Shift Tower Reassembly

If disassembled, install shaft (7) in shift tower (3) and into dog (8). Assemble bolt and washer (9). Tighten screw to 14 ft lb torque.

Assemble new gasket (16), cover (17), and washer and nut (14).

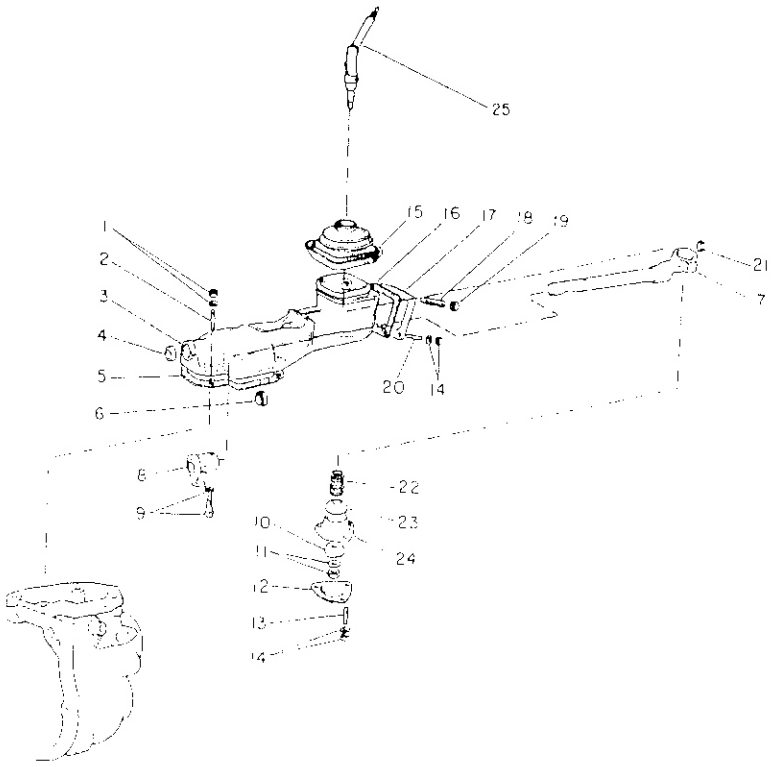
Place spring (21) in groove in shaft (7). Install shift lever (25).

To bottom of shift lever, assemble spring (22), cover (23), socket (24), bearing (10), and washer and nut (11). Tighten nut to 11 ft lb torque.

Assemble cover (12) and three washers and nuts (14).

To adjust reverse lockout screw (18), place shift lever (25) in fifth/reverse gate. Screw reverse lockout screw (18) in until it contacts shift lever, then back out three turns. Tighten locknut (19).

1. Nut and lockwasher
2. Stud
3. Shift tower
4. Cap
5. Gasket
6. Bearing
7. Shaft
8. Dog
9. Bolt and lockwasher
10. Bearing
11. Nut and washer
12. Cover
13. Stud
14. Nut and lockwasher
15. Boot
16. Gasket
17. Cover
18. Reverse lockout screw
19. Locknut
20. Stud
21. Spring
22. Spring
23. Cover
24. Socket
25. Shift lever



Shift Tower Installation

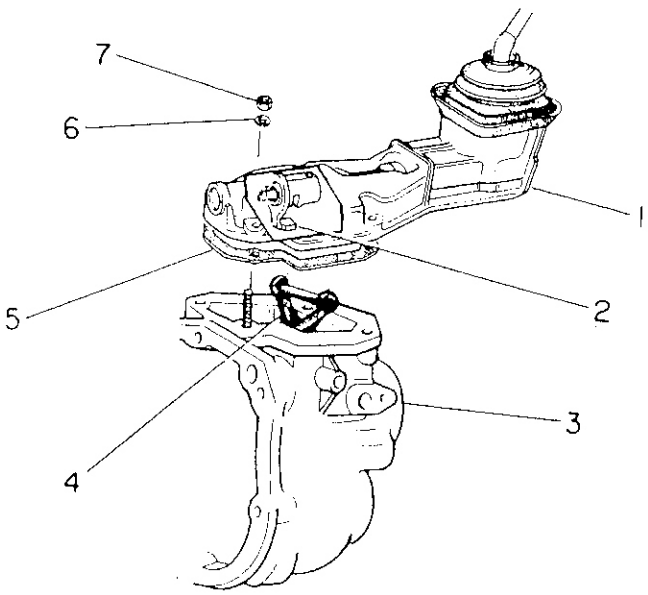
Assemble new gasket (5) on rear housing (3).

Move shift lever forward, then place shift tower (1) on rear housing (3).

Carefully slide shift tower down, then move shift lever rearward to engage dog (2) on engaging lever (4).

Assemble four washers (6) and nuts (7).

1. Shift tower assembly 2. Dog 3. Rear housing 4. Engaging lever 5. Gasket 6. Lockwasher 7. Nut

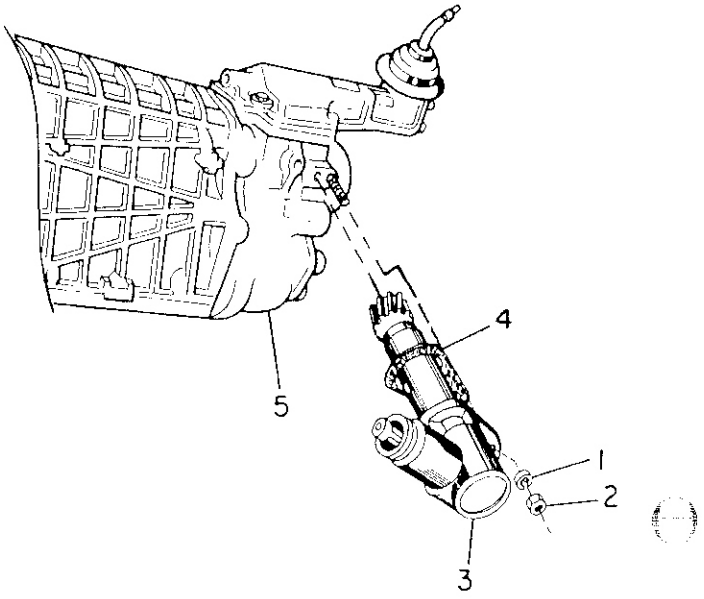


Speedometer Drive Installation

Assemble new gasket (4) and speedometer drive (3) on rear housing (5).

Assemble washer (1) and nut (2).

1. Lockwasher 2. Nut 3. Speedometer drive 4. Gasket 5. Rear housing



Bellhousing Installation

If removed, install new seal (9) in bell housing (4).

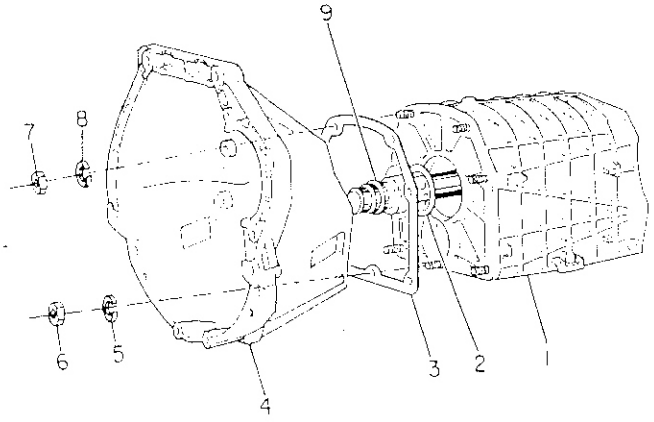
Assemble new gasket (3) on case (1).

Coat spring washer (2) with heavy grease. With cup end forward, place on seal in bellhousing.

Assemble bellhousing (4), six lockwashers (8), nuts (7), and one lockwasher (5) and nut (6).

Tighten nuts (7) to 36 ft lb torque and nut (6) to 18 ft lb torque.

1. Case 2. Spring washer 3. Gasket 4. Bellhousing 5. Lockwasher 6. Nut 7. Nut 8. Lockwasher 9. Seal



Yoke and Throwout Bearing Installation

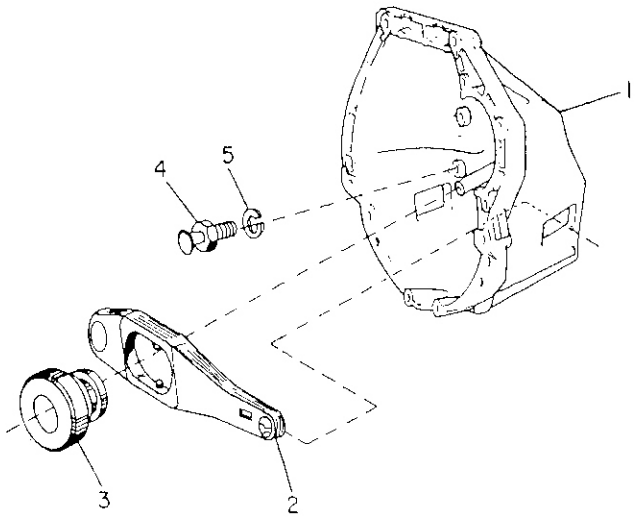
If removed, assemble lockwasher (5) and pivot (4) to bellhousing (1).

Insert throwout bearing (3) into yoke (2).

Insert return spring end of yoke (2) into opening in bellhousing (1) and throwout bearing (3) over input shaft.

Slide yoke (2) over pivot (4) until locked in place.

1. Bellhousing 2. Yoke 3. Throwout bearing 4. Pivot
5. Lockwasher



Oil Plugs Installation

Assemble return spring and rubber boot (5).

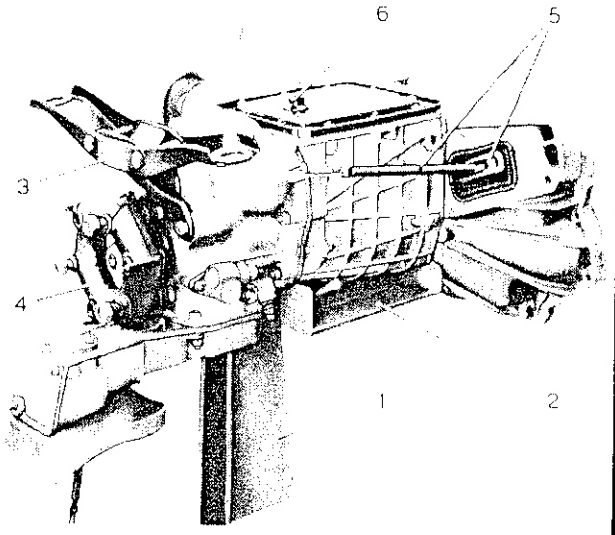
Using two nuts and washers, attach rear supporting cross strut (3) to rear housing.

Using three self-locking nuts and bolts, attach flexible joint (4) to yoke.

Using tools A.50113 and A.55087, install oil drain plug (6) and rear housing oil drain plug. Loosely install oil level plugs until transmission is filled with oil.

After transmission is installed in car, add 1¾ quarts of SAE 90 oil containing antiwear additives. Do not use EP oil.

1. Rotating stand 2. Support 3. Rear supporting cross strut
4. Flexible joint 5. Spring and rubber boot 6. Oil drain plug



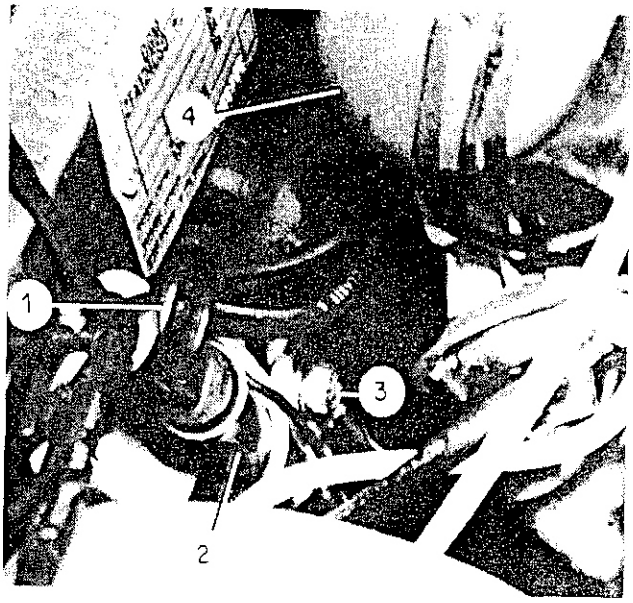
AUTOMATIC TRANSMISSION

REMOVAL AND INSTALLATION

Disconnect battery ground cable.

In engine compartment remove dipstick (1) from filler tube (2). Remove bolt (3) and washers securing filler tube to engine bracket.

NOTE: Do not remove filler tube until transmission has been drained.



1. Dipstick 2. Filler tube 3. Bolt 4. Ignition distributor

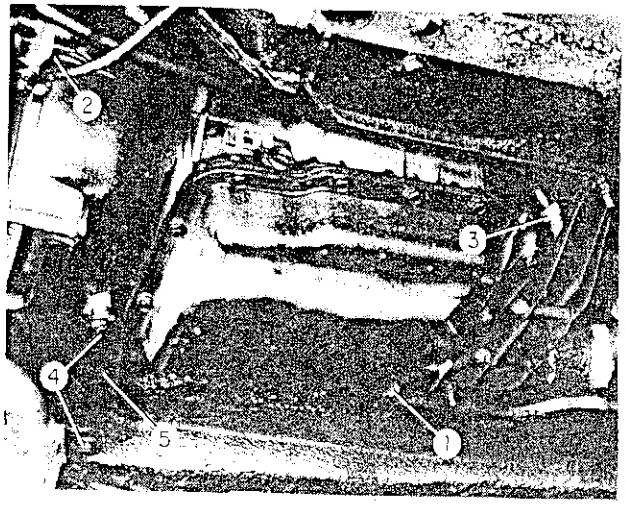
Raise vehicle on lift.

Remove drain plug (1) to drain transmission.

Remove three bolts (2) holding starter to transmission housing. Secure starter out of way.

Unscrew speedometer connector (3) from transmission.

Remove two bolts (4) to remove exhaust pipe bracket (5).

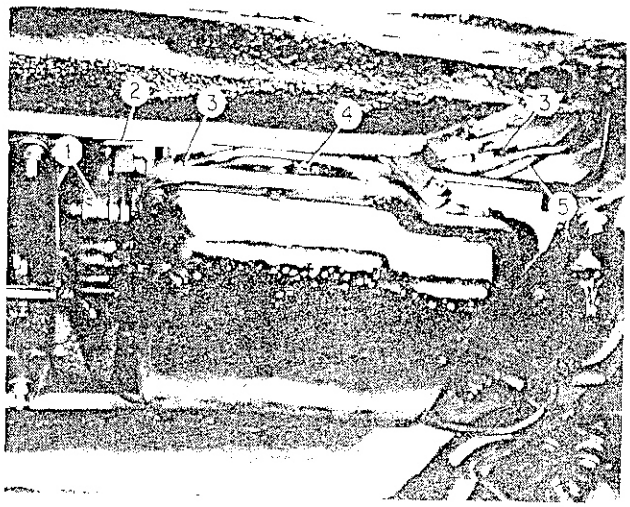


1. Drain plug 2. Starter bolt 3. Speedometer cable connector 4. Bolt 5. Bracket

Disconnect vacuum hose from modulator (1). Disconnect vacuum line from clip (2) on transmission.

Disconnect and cap cooling lines (3) from transmission. Remove bolt and clamp holding cooling line.

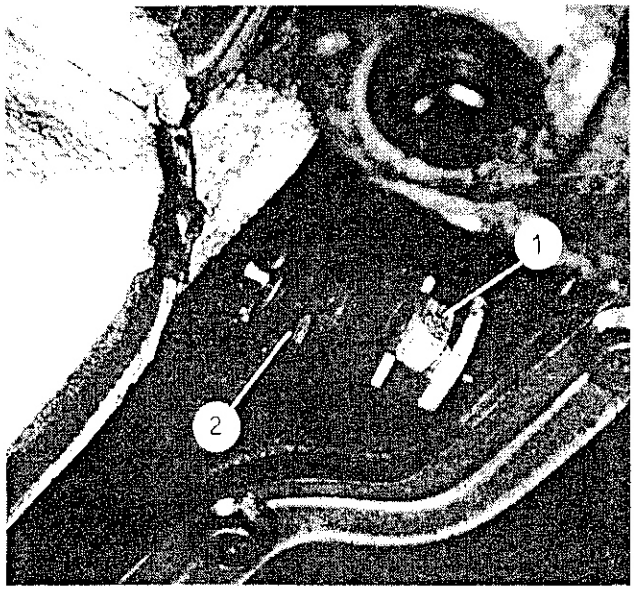
Disconnect kick-down cable (5) by removing bolt and clamp (4).



1. Modulator 2. Clip 3. Transmission cooling lines 4. Bolt and clamp 5. Kick-down cable

Remove nut (1) holding shift lever (2) to transmission control rod. Disconnect lever.

1. Nut 2. Shift lever

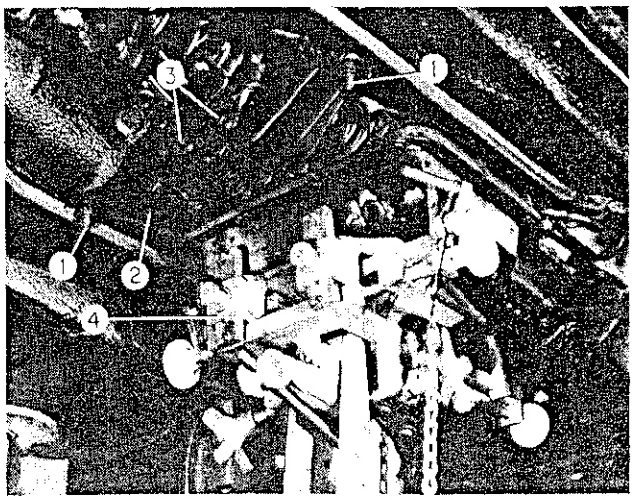


Remove drive shaft assembly (refer to Drive Shaft section).

Place transmission jack (4) under transmission.

Remove two nuts (1) holding transmission mount (2) to body. Remove two bolts (3) holding mount to transmission.

1. Nut 2. Transmission mount 3. Bolt 4. Transmission jack

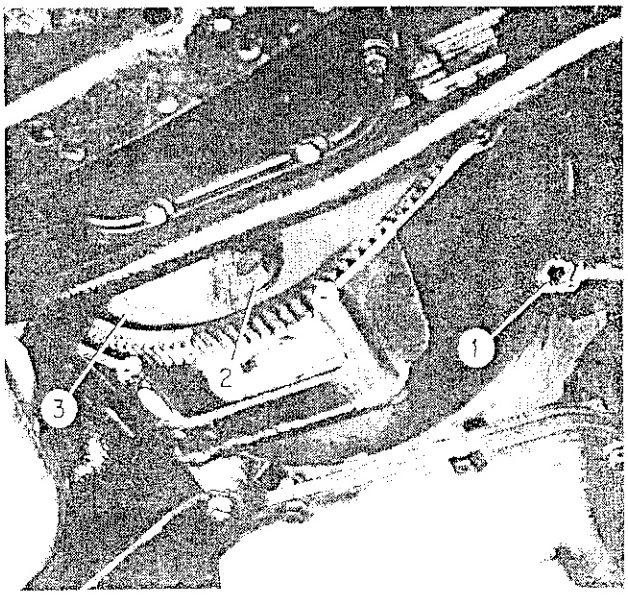


Remove four bolts to remove flywheel cover.

NOTE: Left bolt of flywheel cover also secures engine ground lead (1).

Remove three bolts (2) holding flywheel (3) to torque coverter. Turn flywheel to gain access to bolts.

1. Ground lead 2. Bolt 3. Flywheel

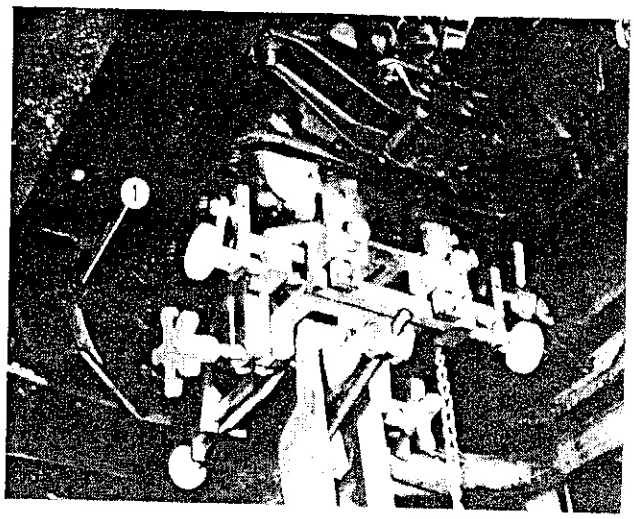


Remove four bolts (1) holding transmission to engine.

Tilt rear of transmission down and slide it back. Lower transmission to ground.

CAUTION: Support torque converter while removing and installing transmission.

1. Bolt



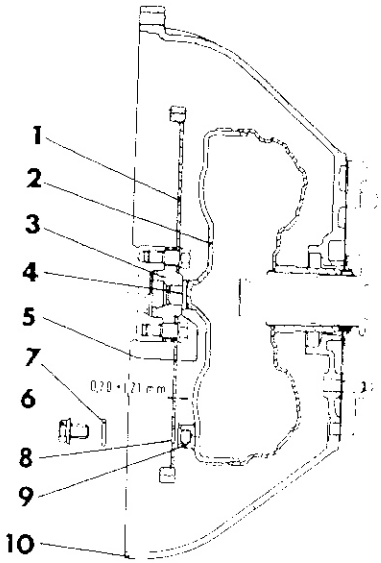
Installation is reverse of removal.

Torque all bolts (refer to Torque Specifications chart).

After attaching transmission to engine, push torque converter (2) against flywheel flange (3). Check that gap between boss (9) and attachment point (8) is .008 to .048 in (0.2 to 1.21 mm). Check at each point with a feeler gage. If clearance is not correct, replace flywheel.

Attach flywheel to converter with three bolts (6) and washers. Torque bolts to 47 ft lb (6.5 kgm).

1. Flywheel 2. Torque converter 3. Flywheel flange 4. Converter contact point 5. Flywheel contact point 6. Bolts 7. Washers 8. Attach point 9. Attachment boss 10. Converter housing



CHECKING AND FILLING TRANSMISSION

CAUTION: Use Dexron type transmission fluid only.

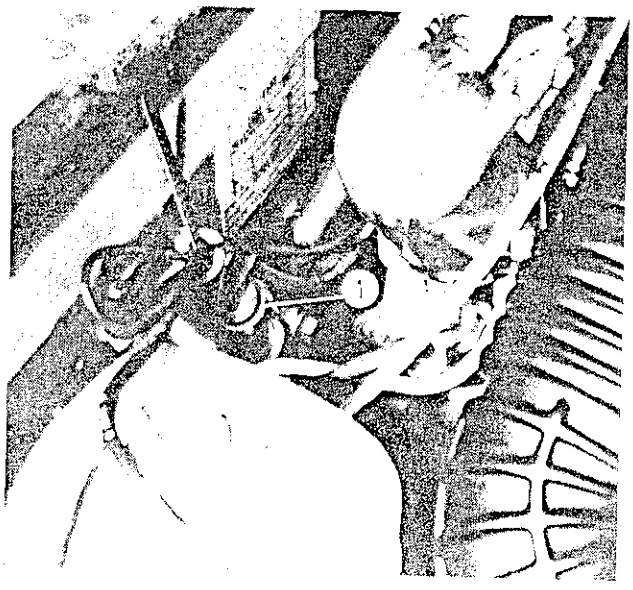
Complete transmission installation in vehicle and install drain plug in fluid sump pan.

Add about 5.28 pints (2.8 liters) of transmission fluid, through filler tube (1).

Apply brakes and block wheels. Start engine and run at normal idle. Place gearshift in "D" (Drive).

Move selector lever slowly through each range and allow transmission to warm up.

1. Dipstick and filler tube



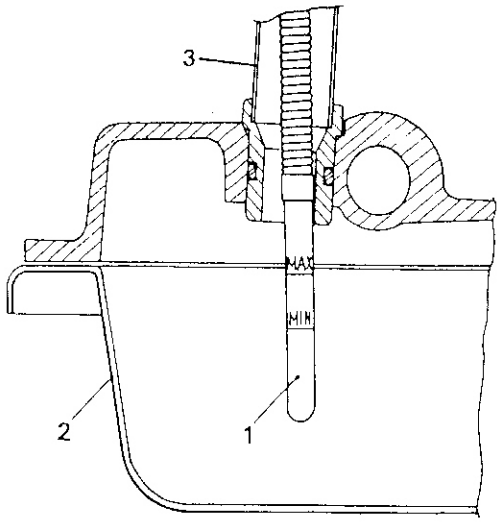
NOTE: Make sure vehicle is on level ground, engine idling, and gearshift in "P" (Park) or "N" (Neutral).

When transmission reaches operating temperature of about 156°F (80°C), move lever to "N" (Neutral) or "P" (Park). Check fluid level. Fill to MAX mark on dipstick (1). Use lint-free cloth when wiping dipstick.

CAUTION: Do not overfill as foaming and fluid loss will occur when fluid heats up.

FILLING CAPACITIES:

Fluid change	3 quarts (2.8 liter)
New Torque Converter	2 quarts (1.9 liter)
Dry Transmission	6 quarts (5.6 liter)



1. Dipstick 2. Oil pan 3. Filler tube

DISASSEMBLY

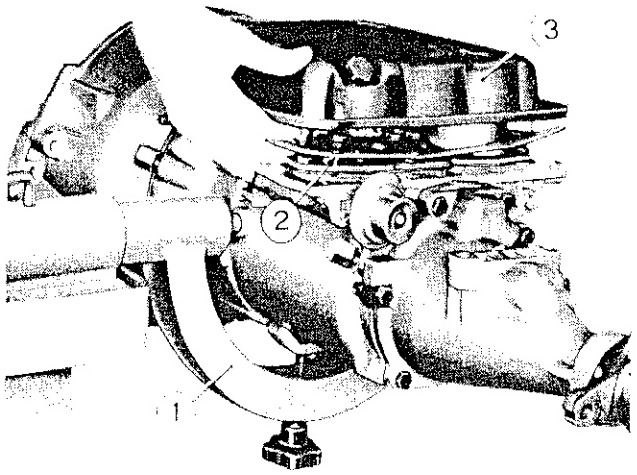
Remove torque converter from within housing by sliding it off splined shaft by hand.

Place transmission in holding fixture 3289-20 and 8763-02.

Remove bolt and lockwasher holding speedometer driven gear. Remove driven gear and gasket.

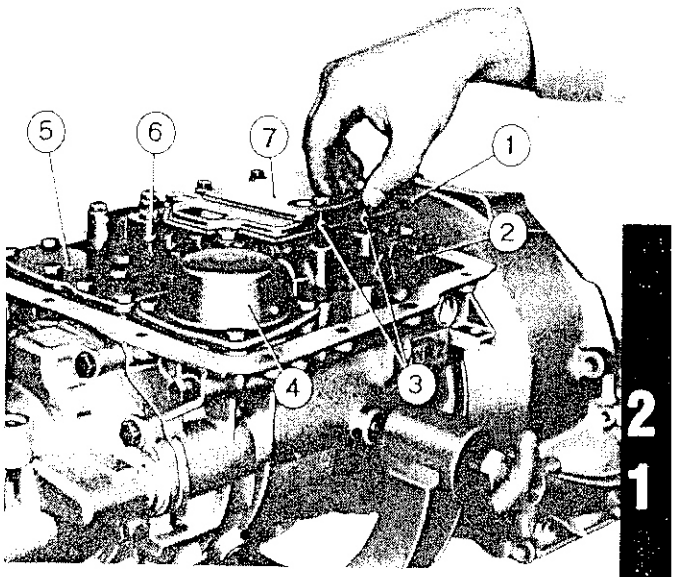
Turn transmission over.

Remove 12 bolts holding oil pan (3). Use a ½ inch socket. Remove pan and gasket (2). Discard gasket.



1. Transmission stand 2. Gasket 3. Oil pan

Remove 2 bolts (3) holding manual detent spring (1). Remove spring. Remove 3 bolts holding oil filter (7). Remove oil filter (7) and gasket. Discard gasket and filter.

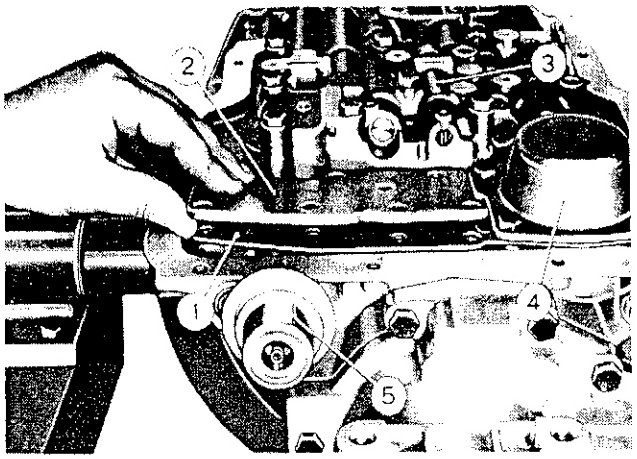


1. Manual detent spring 2. Selector lever 3. Bolts 4. Servo piston
5. Transfer plate reinforcement 6. Valve body 7. Oil filter

Loosen 20 bolts holding valve body (3), reinforcement plate (2) and servo cover (4). Use a ½ inch socket.

Remove the 12 bolts holding the reinforcement plate and servo cover. Remove gasket for servo cover. Discard gasket.

1. Transfer plate 2. Reinforcement plate 3. Valve body 4. Servo cover 5. Vacuum modulator

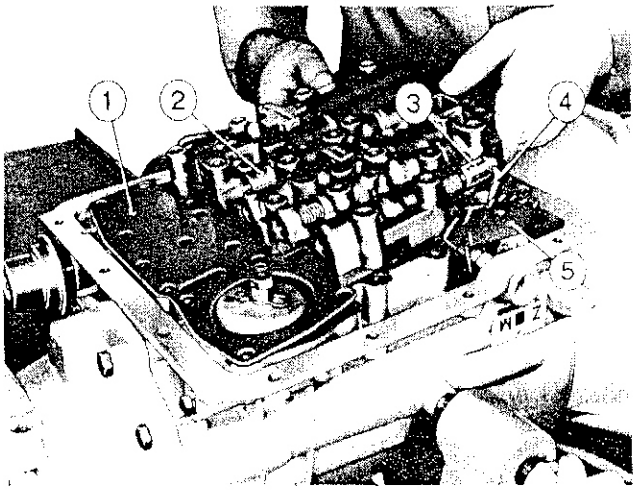


Remove 8 bolts holding valve body (2). Lift valve body and transfer plate (1). Hold manual valve link (4) and disconnect it from selector lever (5).

Make sure manual valve (3) and link (4) are not dropped or damaged. Remove valve body (2) and transfer plate (1). Remove gasket. Discard gasket.

Remove check ball from oil passages in transmission case.

1. Reinforcement 2. Valve body 3. Manual valve 4. Link 5. Selector lever

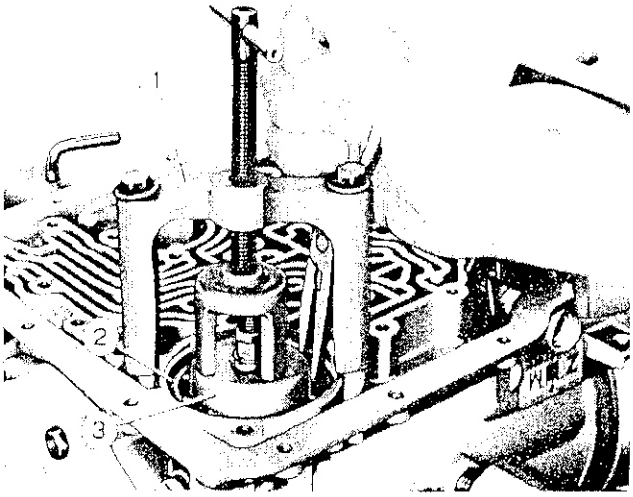


Install tool 23075 on case. Make sure legs of tool are seated. Make sure middle of tool is centered over servo. Carefully thread 2 bolts of tool into case.

Turn tool down just enough to allow removal of snap ring (2). Using pliers, remove snap ring.

Loosen tool slowly to relieve spring pressure on servo piston (3). Remove tool and servo piston. Remove return spring and piston apply rod.

1. Compressor tool 2. Snap ring 3. Servo piston



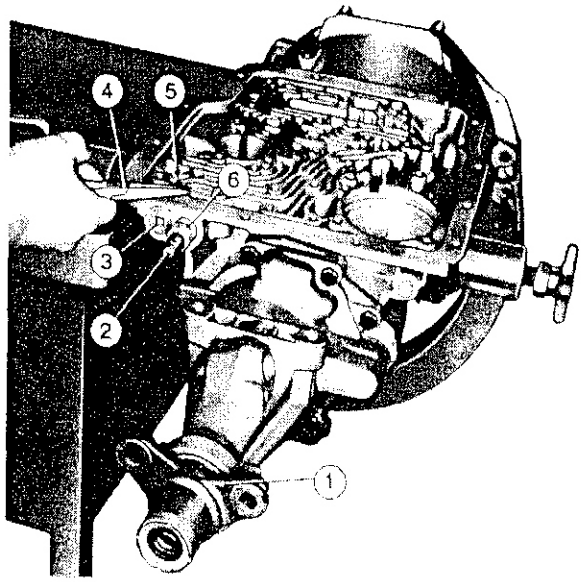
Using wrench 23100, remove vacuum modulator and gasket. Discard gasket. Remove modulator plunger.

Remove valve (2) and sleeve (6) for modulator assembly from case.

Very carefully remove retaining roll pin (5) holding kick-down valve assembly (3).

Remove kick-down sleeve, valve, spring seat, and spring from case.

1. Output shaft flange 2. Modulator valve 3. Kick-down valve assembly 4. Pliers 5. Retaining roll pin 6. Modulator sleeve



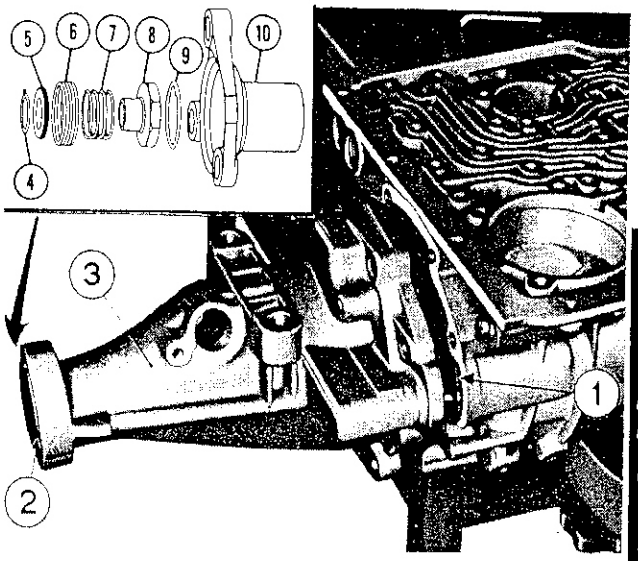
Remove snap ring (4), ring (5), seal (6), spring (7), nut (8) and washer (9) from end of output shaft.

Remove output yoke (10) by pulling it off of output shaft.

Remove seven bolts holding rear housing (3) to case. Use a 9/16 inch socket.

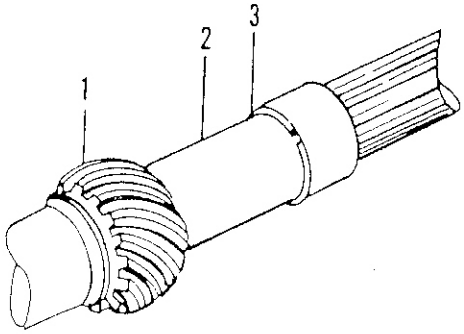
Slide rear housing (3) off output shaft. Remove gasket (1). Discard gasket.

1. Gasket 2. Output shaft seal 3. Rear housing 4. Snap ring 5. Ring 6. Seal 7. Spring 8. Nut 9. Washer 10. Output yoke



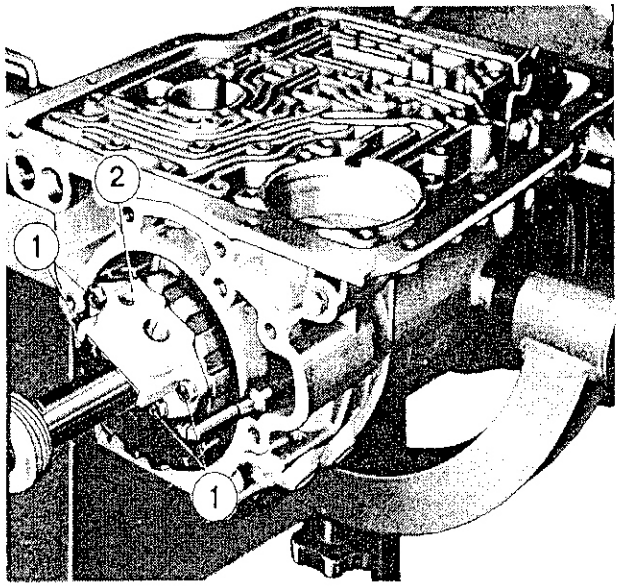
Remove snap ring (3). Slide collar (2) from output shaft and pull off speedometer gear (1).

1. Speedometer gear 2. Collar 3. Snap ring



Remove four bolts (1) holding governor (2) to hub. Use a 7/16 inch socket. Remove governor. Remove and discard gasket.

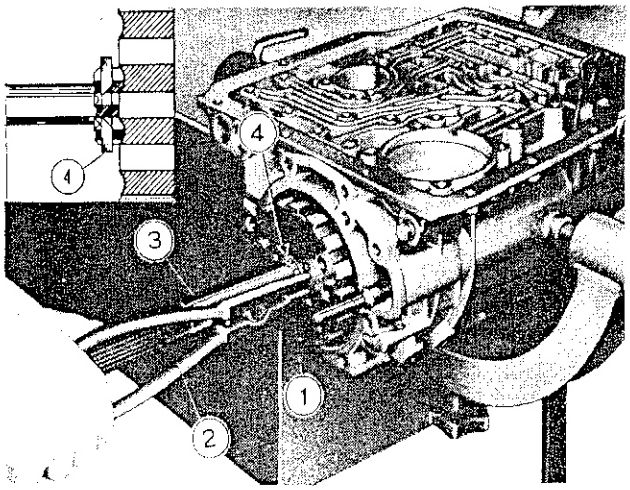
1. Bolts 2. Governor



Remove snap ring (4) holding governor hub (1) to output shaft (3). Use snap ring pliers (2).

Slide hub off shaft.

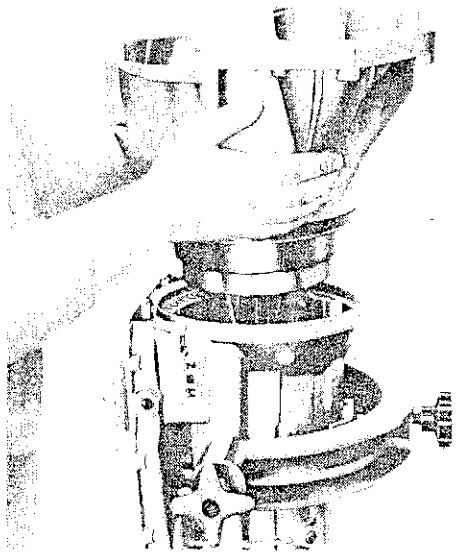
1. Governor hub 2. Pliers 3. Output shaft 4. Snap ring



Position transmission with converter housing up.

Just "crack" 5 inner bolts holding converter to pump.

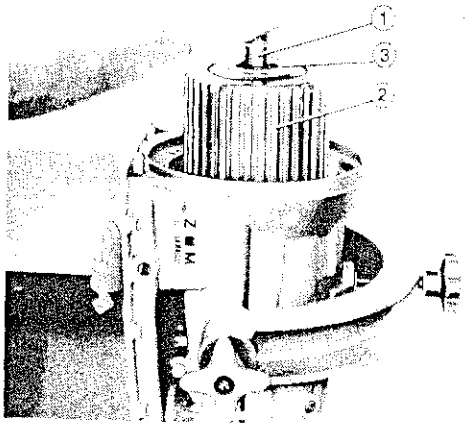
Remove 7 outer bolts and sealing washers holding housing to case. Discard sealing washers. Use a ½ inch socket. Lift housing and oil pump out of case. If necessary, slap sharply on side of housing with rubber mallet to loosen pump assembly.



Lift third clutch assembly (1) and second clutch drum (2) out of case by the input shaft.

Remove selective thrust washer from input shaft.

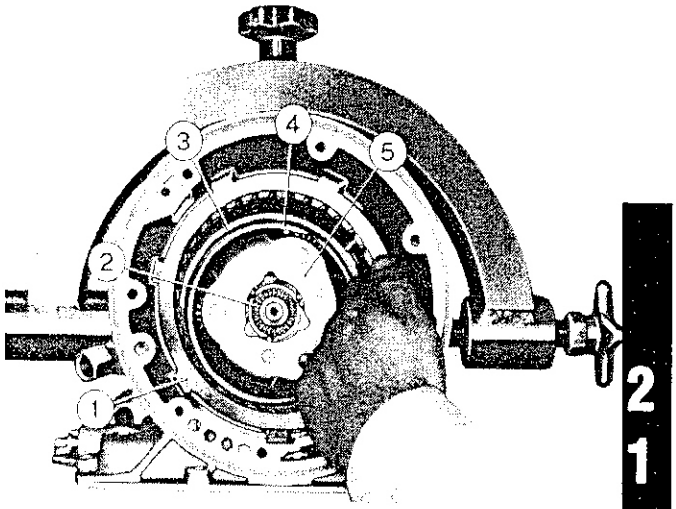
1. Third clutch assembly 2. Second clutch drum 3. Selective thrust washer



Remove reverse clutch plates (1) and reaction plate from case.

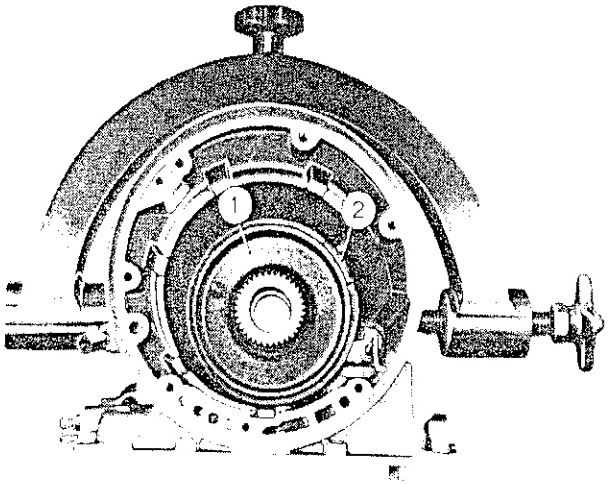
Lift planetary carrier (5) with output shaft out of case. Be careful of needle bearings (2) and races so as not to drop or lose them.

1. Reverse clutch plates 2. Needle bearing 3. Band 4. Drum 5. Planetary carrier



Remove reaction sun gear and drum (1) from case by pulling straight out.

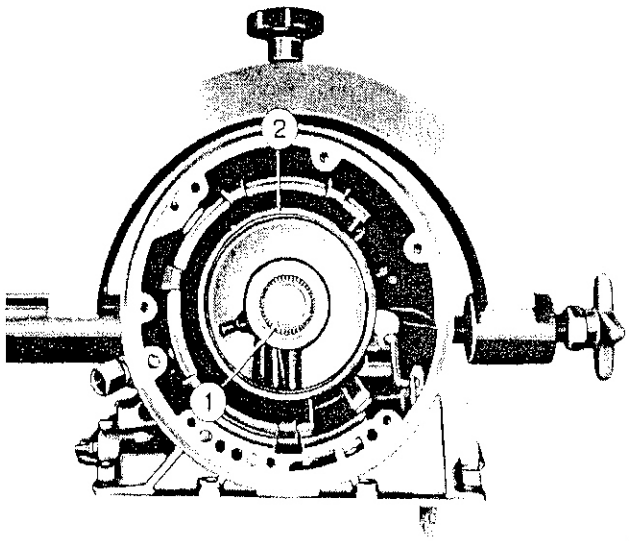
1. Reaction sun gear and drum 2. Band



Remove needle bearing (1) and race from rear of case. Bearing and race may come out with reaction sun gear and drum. Be careful not to lose them.

Slightly compress band (2). Remove band by pulling it straight out.

1. Needle bearing 2. Band

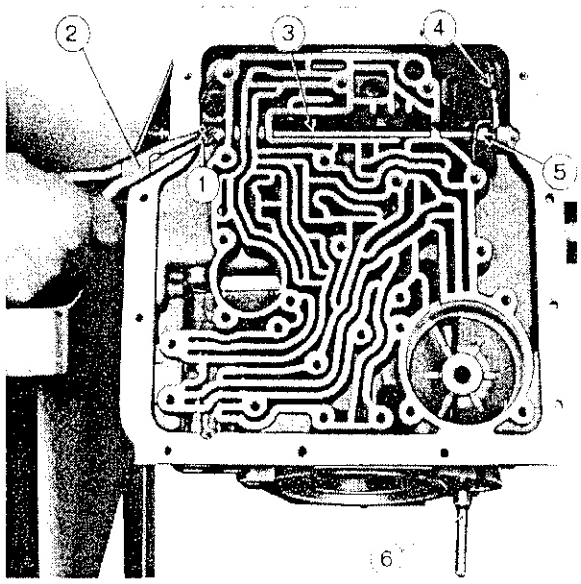


Turn case so that oil passages are up.

Remove nut (5) holding lever (4) to shaft (3). Remove retaining pin (1) holding selector lever shaft (3). Slide lever out of case.

Remove parking lock actuator (6) with selector lever (4). Remove lever from actuator by aligning slot in lever with tab on actuator.

1. Retaining pin 2. Pliers 3. Shaft 4. Selector lever 5. Nut
6. Parking lock actuator



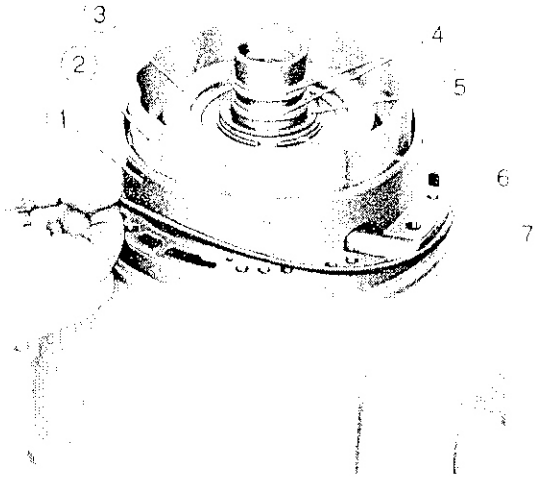
2
1

Disassembly, Inspection and Reassembly of Converter Housing

Remove 5 bolts and sealing washers holding oil pump (1) to housing. Discard sealing washers. Remove outer oil seal (7) from housing. Discard oil seal.

Lift housing off of oil pump.

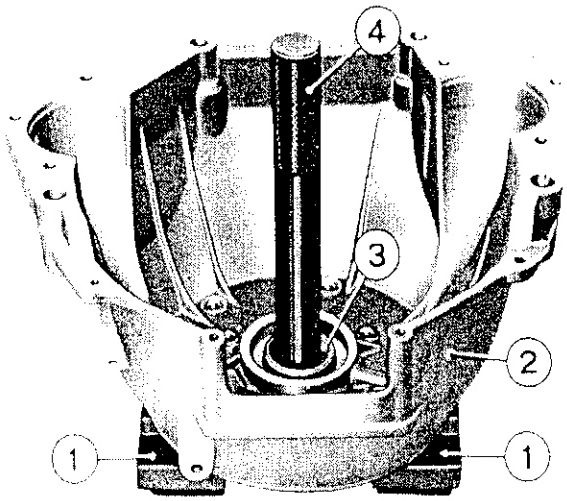
1. Oil pump 2. Reverse clutch piston 3. Spring retainer 4. Seal rings 5. Adjustment washer 6. Snap ring 7. Outer oil seal.



Remove oil seal.

Thoroughly clean converter housing.

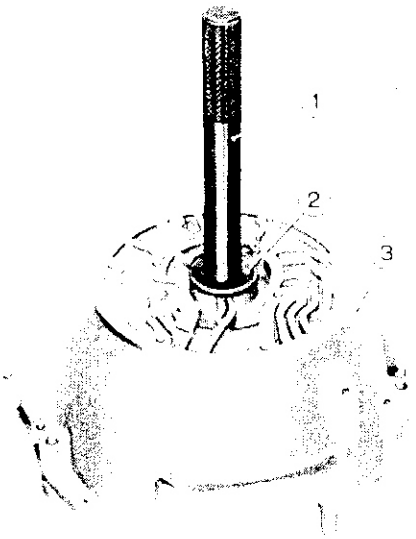
Inspect bushing in housing. If worn, remove bushing from converter side of housing as shown. Use bushing remover 21465-17 and drive handle 8093.



1. Converter housing 2. Front oil seal 3. Slide hammer 7004-1
4. Hook 23129

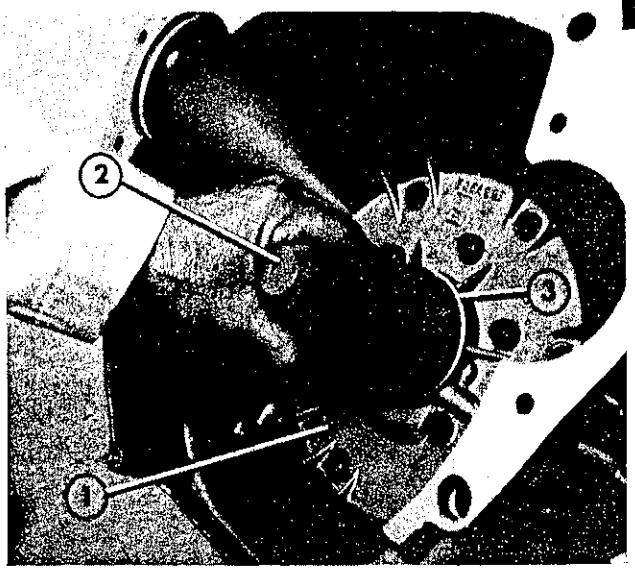
Turn housing over and install bushing in converter housing from oil pump side. Use bushing installer 21465-17 and handle 8093.

Make sure bushing is flush with front face of housing (seal side).



1. Handle 8093 2. Bushing installer 21465-17 3. Converter housing

Install new oil seal in housing. Use seal installer 21359.



1. Converter housing 2. Seal installer 21359 3. Oil seal

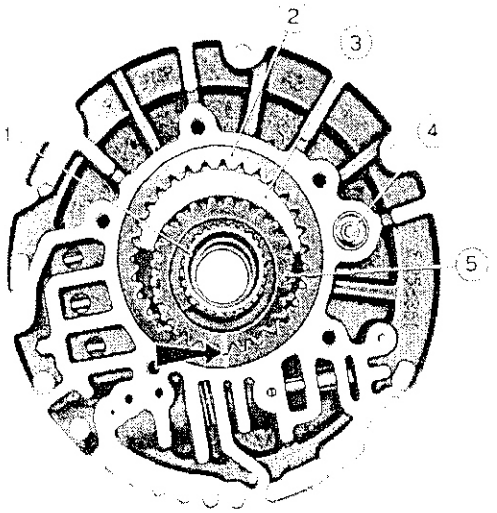
Disassembly, Inspection and Reassembly of Oil Pump and Reverse Clutch

Remove wearplate from oil pump. Mark topside of oil pump gears (2 and 5) as shown.

Inspect wear plate for signs of scoring and wear.

CAUTION: Do not use center punch.

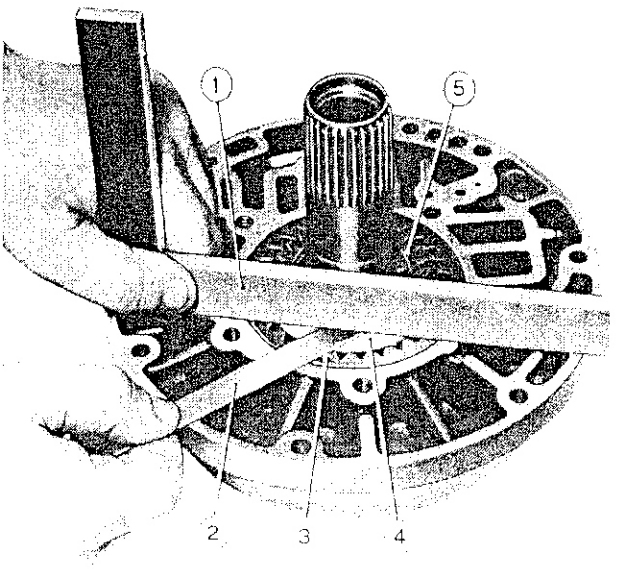
NOTE: Priming valve (4) not installed in later models.



1. Converter stator support 2. Pump gear 3. Sump segment 4. Priming valve 5. Pump gear

Check end clearances of both gears to pump face. Use a straight edge and feeler gauge. Clearance should be 0.013 to 0.038 mm (0.0005 to 0.0015 inch).

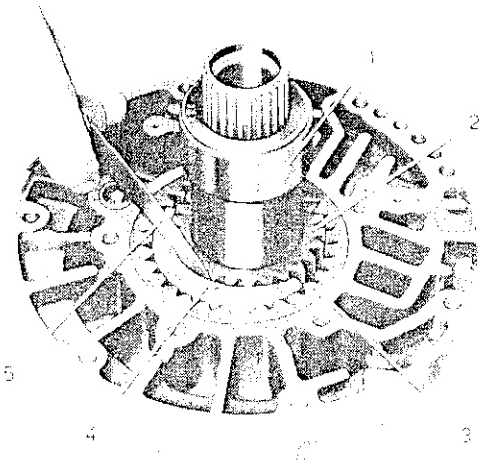
If clearance is not within limits, replace pump.



1. Straight edge 2. Feeler gauge 3. Driven pump gear 4. Pump segment 5. Driving pump gear

Install aligning tool 23082 (1) on oil pump drive gear (2) to center gear. Measure clearance between drive gear (2) and pump segment (4) whild rotating gears thru 360°. Use feeler gauge (5).

If clearance is not between 0.135 and 0.235 mm (0.0053 to 0.0093 inch) replace pump assembly.

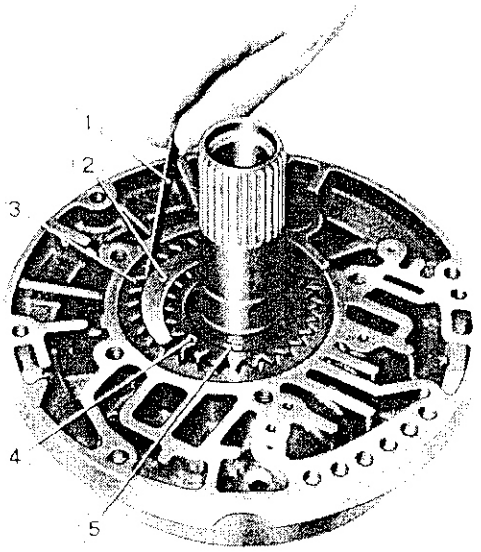


1. Aligning tool 70266 2. Drive gear 3. Driven gear 4. Pump segment 5. Feeler gauge

Measure clearance between outside of driven gear (3) and pump housing. Rotate gear thru 360° while measuring clearance. If clearance is not within 0.069 to 0.165 mm (0.0027 to 0.0065 inch), replace pump assembly.

Measure clearance between inside of driven gear (3) and pump segment (2). Rotate gear thru 360°. If clearance is less than 0.125 mm (0.005 inch), replace pump assembly.

If clearances are good, remove gears (3 and 4).



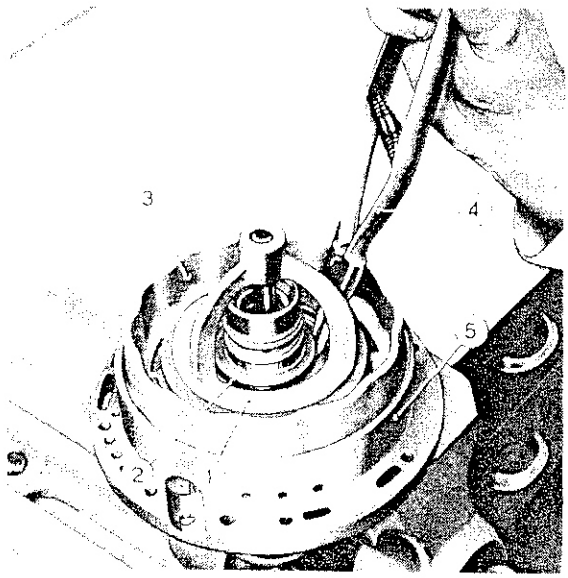
1. Feeler gauge 2. Pump segment 3. Driven gear 4. Drive gear 5. Gear tab

Place compressor tool (1) 23078 on spring retainer for reverse clutch (3). Place adapter on tool shaft and turn nut to compress clutch. Remove snap ring (2).

CAUTION: Release compressor tool slowly. Make sure spring retainer does not catch in snap ring groove.

When springs are released, remove compressor tool and retaining ring.

Remove 24 springs for reverse clutch.

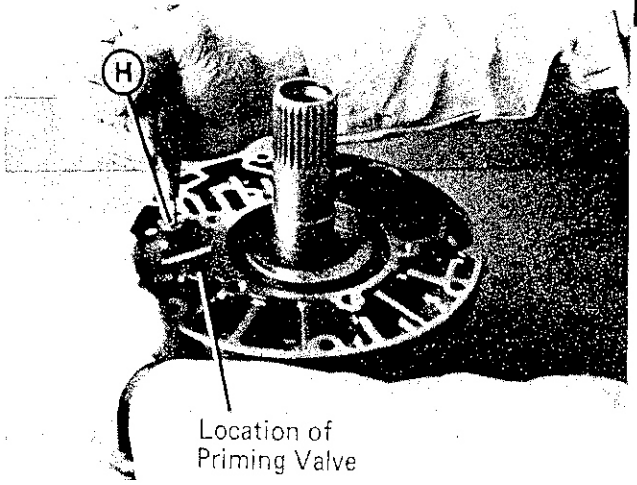


1. Compressor tool 2. Snap ring 3. Reverse clutch piston 4. Pliers 5. Oil pump

WARNING: When using compressed air, always wear eye protection.

Cover priming valve (if installed) by hand.

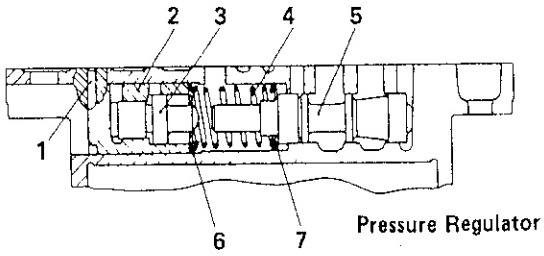
Remove reverse clutch piston (3) by blowing compressed air through hole (H) on front face of oil pump assembly.



Location of Priming Valve

Depress boost valve sleeve (2). Remove retaining pin (1). Use small wire cutters. If necessary, remove burr caused by pin from bore. Remove boost valve sleeve (2), valve (3), spring (4) and seats (6 and 7), and pressure regulator valve (5).

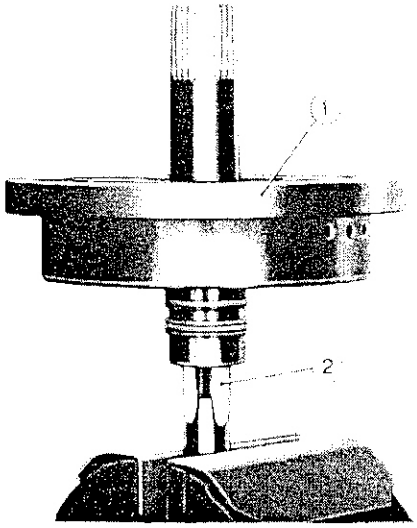
1. Retaining pin 2. Sleeve 3. Boost valve 4. Spring 5. Pressure regulator 6. Spring seat 7. Spring seat



Pressure Regulator

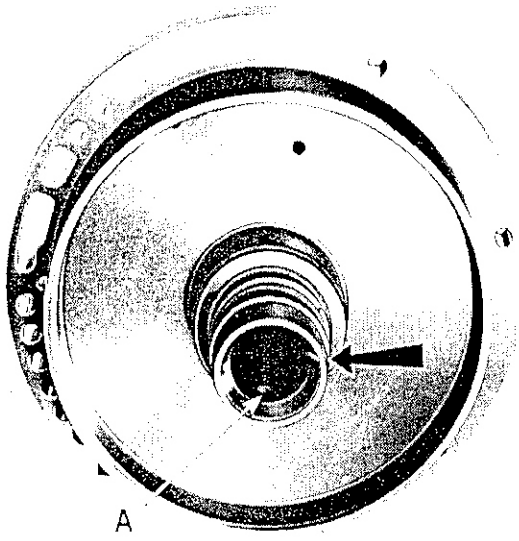
Inspect bushing in oil pump hub for damage. If necessary, remove bushing by threading tool 23130-5 into bushing. Using a press and a drift, press bushing out. Use a rag or cloth to protect oil pump face.

1. Oil pump 2. Tool 23130-5



Thoroughly clean pump body. Make sure all passages are clean.

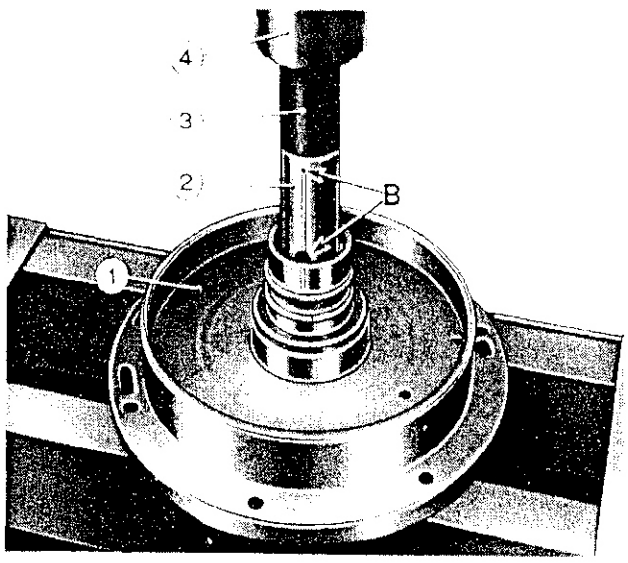
Position oil pump with hole "A" facing downwards. Locate oil groove to right of hole "A" (see arrow). Scribe an aligning mark on inner diameter of shaft at center of oil groove.



Scribe a mark on outer edge of new bushing (2) thru centers of small and large holes "B". Place bushing into pump shaft with small hole up. Align scribe marks.

Press bushing into shaft until bushing is seated in bore. Use an arbor press. Make sure bushing is pressed in straight. Make sure marks are aligned.

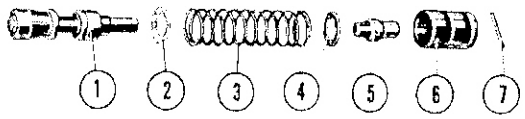
1. Oil pump 2. Bushing 3. Tool 23130-1 4. Press

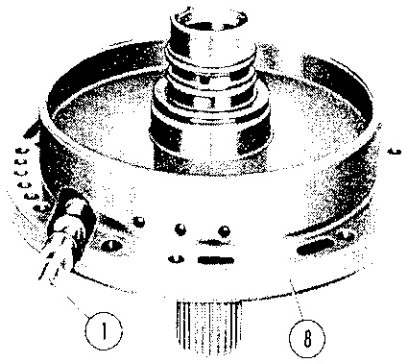


Inspect and thoroughly clean pressure regulator assembly. Immerse valve in transmission fluid before installing.

Install pressure regulator valve (1), spring seat (2), spring (3), seat (4), boost valve (5), and sleeve (6) in pump. Depress sleeve until back end aligns with pin hole. Install retaining pin (7).

1. Pressure regulator valve 2. Seat 3. Spring 4. Seat 5. Boost valve 6. Sleeve 7. Retaining pin 8. Oil pump



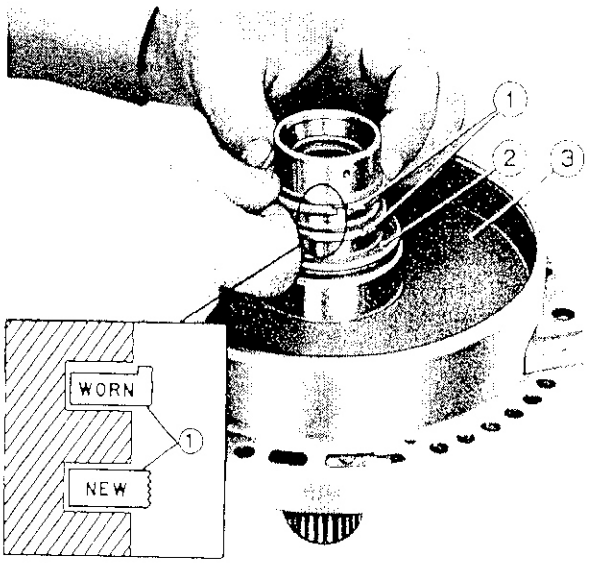


Inspect oil seal rings (1) on oil pump hub (2). Replace rings if damaged or show side wear.

NOTE: Rings should have flat sides and no bright spots.

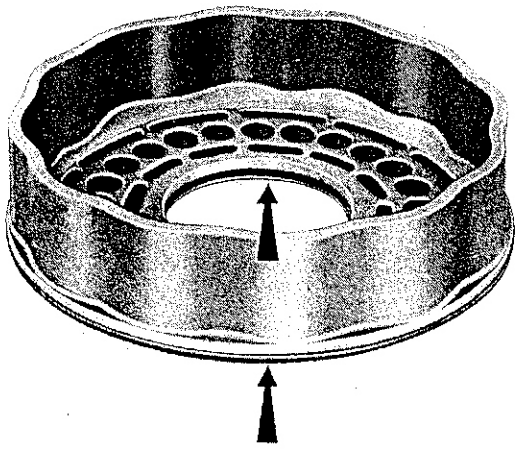
Install rings on hub (2). Make sure split in rings are 90° apart.

1. Oil seal rings 2. Hub 3. Oil pump



Coat each seal, piston, and oil pump with transmission fluid.

Install new inner and outer oil seals on reverse clutch piston as shown by arrows.



Install seal protector 28241 on pump hub.

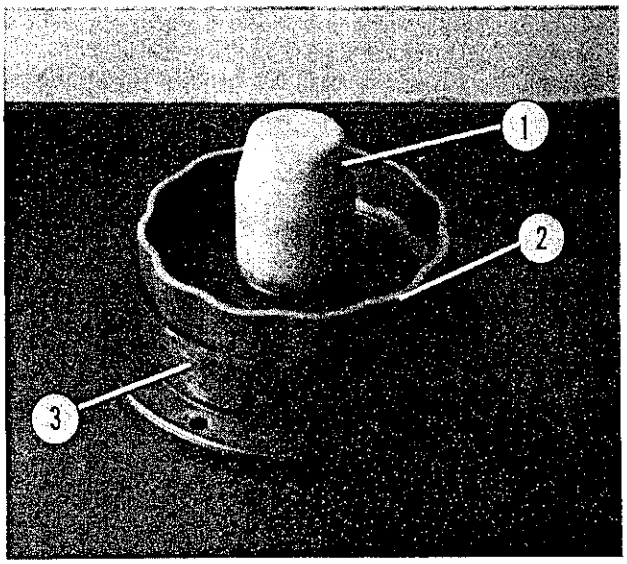
CAUTION: Do not damage seal when installing piston.

Install piston on pump. Remove seal protector 28241.

Inspect return springs for reverse clutch. Look for bent or broken springs or heat discoloration. Replace entire set if any are damaged.

Install 24 return springs on piston.

1. Seal protector 28241 2. Reverse clutch piston 3. Oil pump



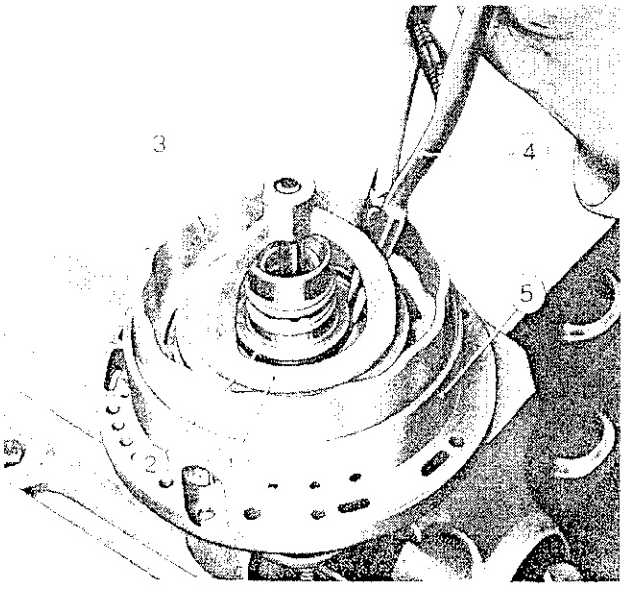
Place spring retainer on springs. Install compressor tool 23078. Compress springs.

CAUTION: Retainer may catch in snap ring groove. Be careful not to damage spring retainer. In next step make sure snap ring is seated in its groove.

Install snap ring. Use pliers. Loosen and remove compressor tool slowly.

CAUTION: Do not air check reverse clutch. Clutch assembly is not complete. Air checking may damage spring retainer and seat.

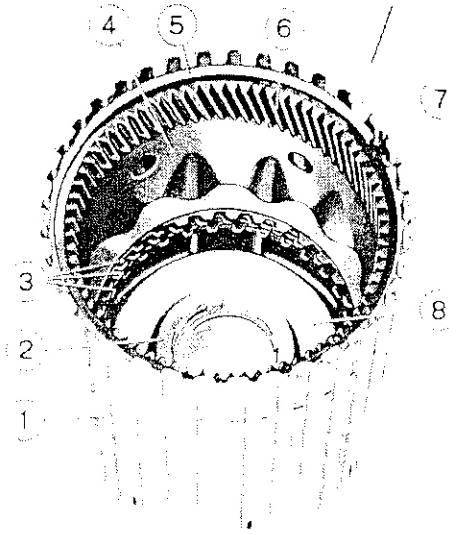
1. Compressor tool 2. Snap ring 3. Reverse clutch 4. Pliers
5. Oil pump



Disassembly, Inspection and Assembly of Second Clutch

Remove retaining ring (5) for ring gear (6).

Remove ring gear.

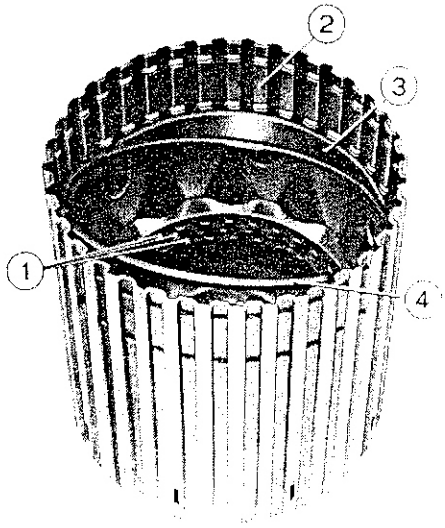


1. Second clutch drum 2. Thrust washer 3. Clutch plates 4. Spacer 5. Retaining ring 6. Ring gear 7. Screwdriver 8. Spring retaining plate

Remove retaining ring (4) for spacer plate (3). Remove spacer plate (3).

NOTE: After removing clutch plates (1), keep them in same sequence.

Remove clutch plates (1).



1. Clutch plates 2. Clutch drum 3. Spacer 4. Retaining ring

Remove thrust washer from center of drum.

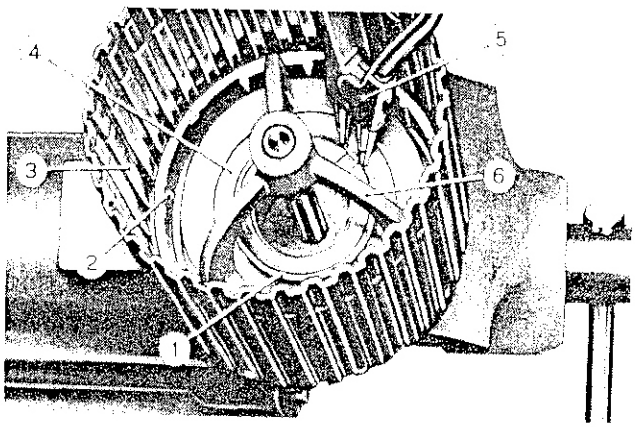
Install compressor tool assembly 23078 or J2590-02, 03, 04, 05 and adapter on spring retainer (4).

Compress springs and remove snap ring (1). Use snap ring pliers (5).

Loosen compressor tool slowly. Remove tool. Remove retainer (4).

CAUTION: Retainer may catch in snap ring groove.

Remove 22 return springs from piston (2). Remove piston from drum.



1. Snap ring 2. Piston 3. Drum 4. Spring retainer 5. Pliers 6. Compressor tool.

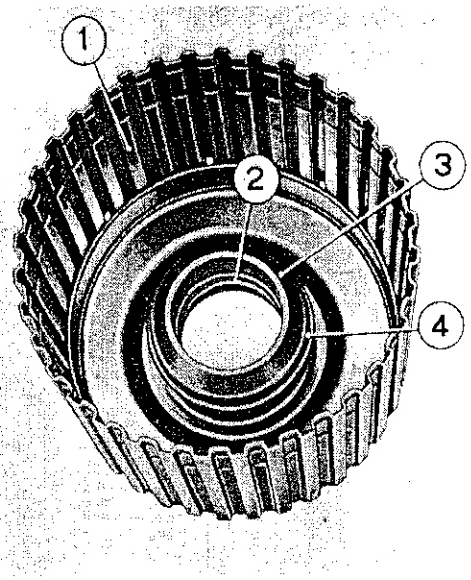
Remove oil seal (4) from hub (3). Discard oil seal.

Inspect bushing (2) in clutch hub (3) for scoring or wear. If necessary, remove bushing. Use tool 23130-6 and handle 8092.

Thoroughly clean hub in solvent. If removed, install new bushing. Use tools 23130-6 and handle 8092. Drive bushing in until tool bottoms on bench.

Install new oil seal (4) on hub (3).

1. Clutch drum 2. Bushing 3. Clutch hub 4. Oil seal

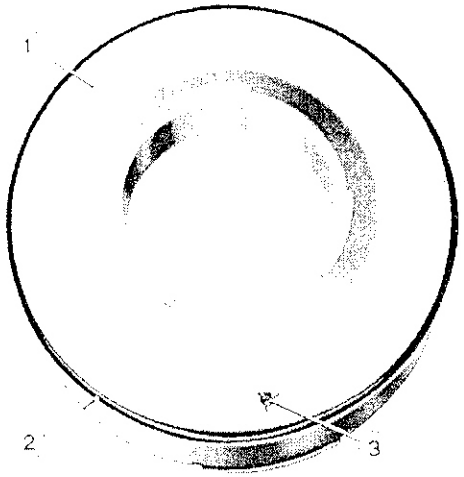


Remove oil seal (2) from piston (1). Discard oil seal.

Inspect piston for damage. Shake the piston and make sure check ball moves freely. If piston is damaged or check ball is stuck, replace piston.

Inspect piston return springs. If any spring is damaged, replace complete set.

1. Piston 2. Oil seal 3. Check ball



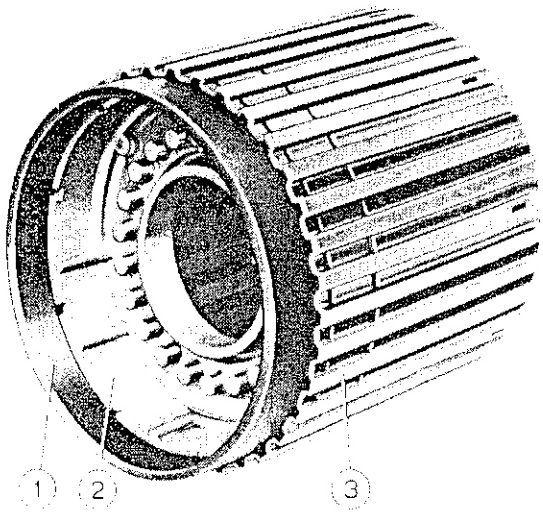
Install new oil seal on piston (2).

Coat oil seal, piston, and drum with transmission fluid. Place tool 23080 on piston to protect oil seal.

Install piston and tool in drum.

Push piston and tool down until tool seats. Then push piston down further until it bottoms. Remove tool.

1. Tool 23080 2. Piston 3. Drum



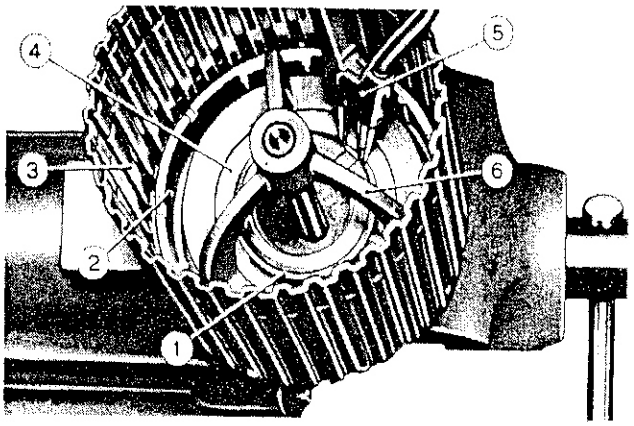
Place 22 springs on piston. Place spring retainer (4) on springs.

Install tool (6) on piston (2). Compress spring retainer.

CAUTION: Retainer may catch in snap ring groove. Be careful not to damage spring retainer. In next step make sure snap ring is seated in its groove.

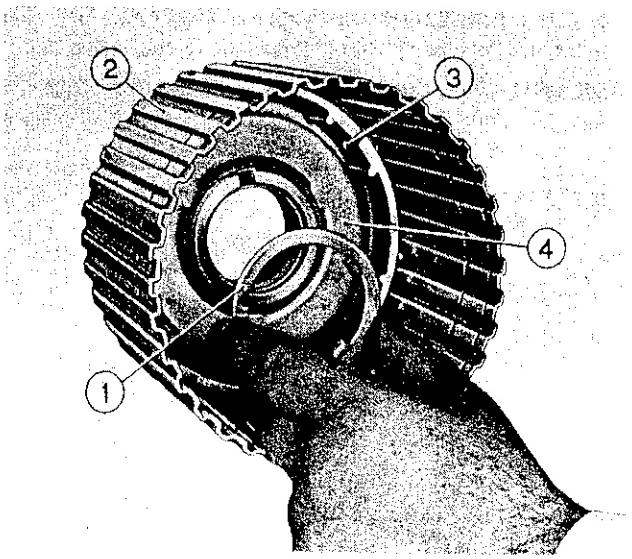
Install snap ring (1). Use pliers (5). Loosen compressor and remove it.

1. Snap ring 2. Piston 3. Drum 4. Spring retainer 5. Pliers 6. Compressor tool



Inspect thrust washer (1) for damage. Install thrust washer on hub. Make sure tang on washer seats in slot of hub. Secure washer with petroleum jelly.

1. Thrust washer 2. Drum 3. Clutch piston 4. Spring retainer

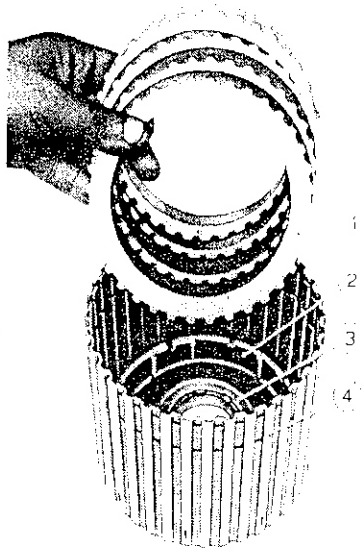


Inspect clutch plates (1) for wear, scores, or excessive heat marks. Replace clutch pack if damaged.

Coat plates with clean transmission fluid.

Install wave washer in drum (4) first. Install clutch plates in drum, first steel plate, composition plate, steel plate, etc.

1. Clutch plates 2. Piston 3. Thrust washer 4. Drum

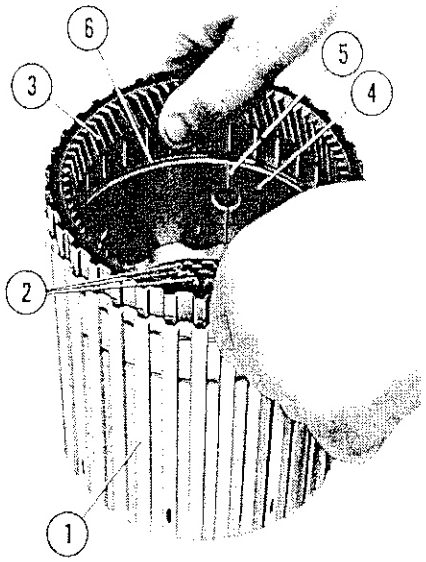


Install spacer plate (4) in drum (1). If plate slides in without pressure, expand plate. Use a screwdriver in slot (5) to expand plate. Make sure spacer seats tightly in drum (1), wave part down.

Install spacer plate retaining ring (6).

Install ring gear (3) in drum. Secure gear with second retaining ring.

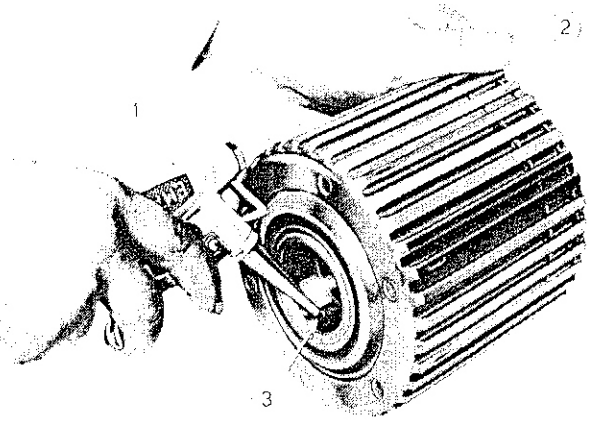
1. Drum 2. Clutch plates 3. Ring gear 4. Spacer plate 5. Slot 6. Retaining ring



Apply air to hole (3) in drum. Check that clutch piston moves. If piston does not move, disassemble clutch. Check seal rings.

WARNING: When using compressed air, always use eye protection.

1. Air gun 2. Drum 3. Hole



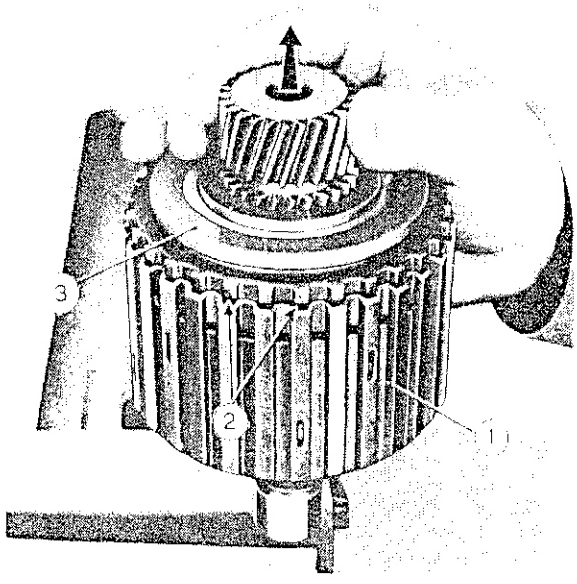
Disassembly, Inspection, and Assembly of Third Clutch

Compress retaining ring (2) at several places around drum (1) while lifting input sun gear (3) in direction of arrow.

Remove input sun gear with clutch hub in direction of arrow.

Remove gear, sprag, and outer race from drum.

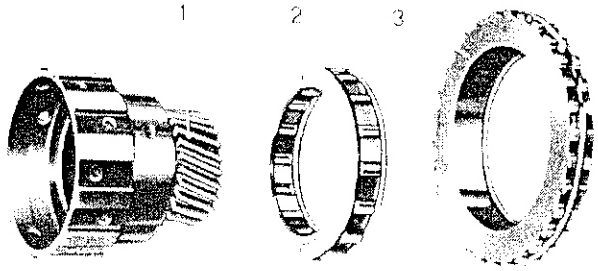
1. Drum 2. Retaining ring 3. Sprag



Remove sprag (2) and outer race (3) from clutch hub (1).

Push sprag (2) out of outer race (3).

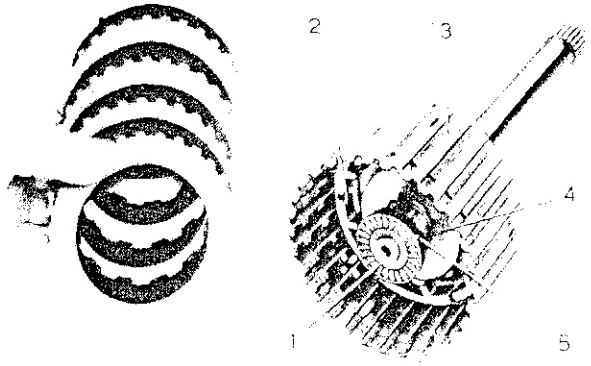
1. Third clutch hub 2. Sprag race 3. Outer race



Remove third clutch plates from drum (3). Keep plates in same order that they were removed.

Remove thrust bearing (1) and washer (5) from input shaft.

1. Thrust bearing 2. Piston 3. Drum 4. Spring retainer
5. Thrust washer

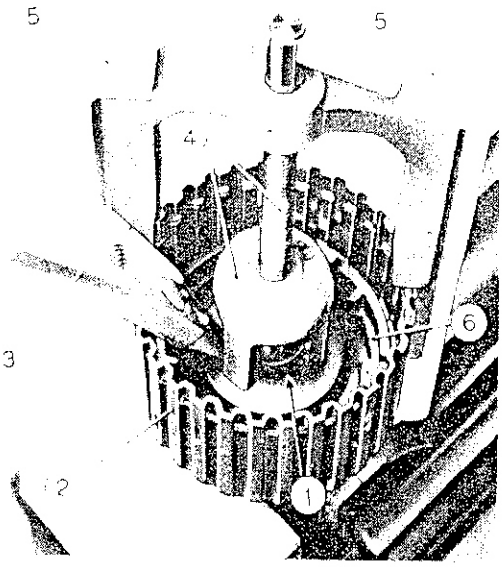


Install spring compressor 23075 (4) on spring retainer. Use puller jaws (5) 23075-10 to hold tool on drum or use a press. Compress springs. Remove snap ring (1).

Loosen and remove tools (4 and 5). Remove spring retainer and 12 springs from piston (6).

CAUTION: Release compressor tool slowly. Make sure spring retainer does not catch in snap ring groove.

1. Snap ring 2. Drum 3. Pliers 4. Compressor tool 5. Puller jaws
6. Piston



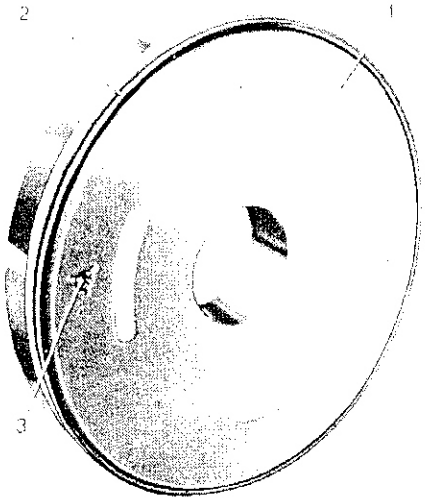
Remove third clutch piston (1) from drum.

Inspect piston for damage. Inspect check ball (3). If ball is stuck, missing, or falls out, replace piston. If piston is damaged, replace it.

Remove oil seal (2). Install new oil seal.

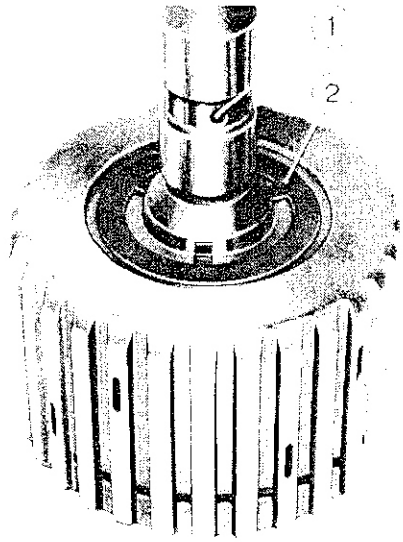
Inspect return springs. If any spring is damaged, replace entire set.

1. Piston 2. Oil seal 3. Check ball

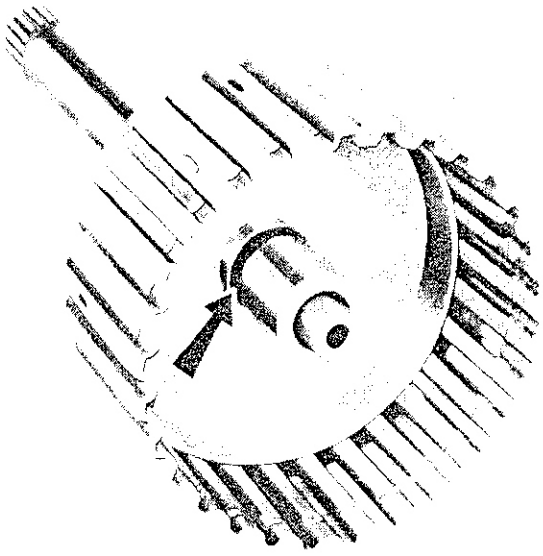


Thoroughly clean third clutch drum. Inspect drum and input shaft for damage. Inspect thrust washer (2) for scoring or damage. Replace if necessary.

1. Oil pressure hole 2. Thrust washer

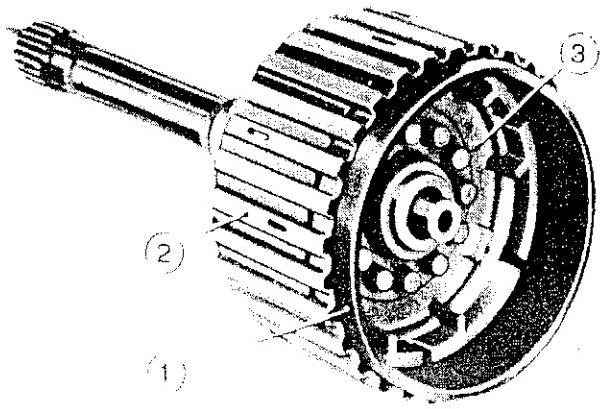


Remove oil seal from input shaft inside drum. Install new oil seal. Be careful not to damage seal on edge of shaft.



Coat oil seal on piston (3) and inside of drum with transmission fluid. Install tool 23084 on piston. Install piston in drum (2). Remove tool.

1. Tool 23084 2. Drum 3. Piston

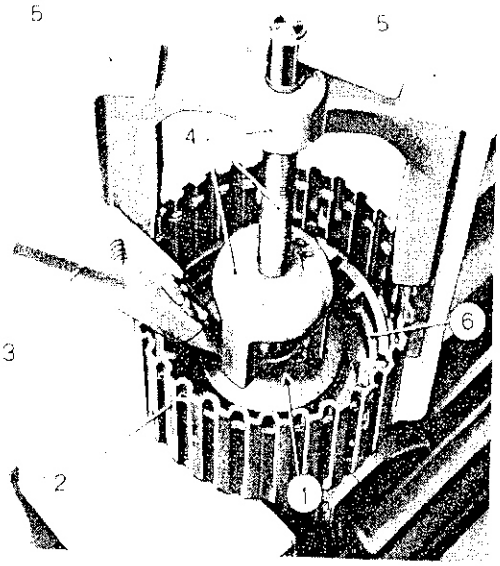


Install 12 return springs on piston. Place spring retainer on piston.

Install compressor 23075 (4) on spring retainer. Install puller jaws 23075-10. Compress spring retainer and install snap ring (1).

CAUTION: Make sure retainer does not catch on snap ring groove. Release compressor tool slowly.

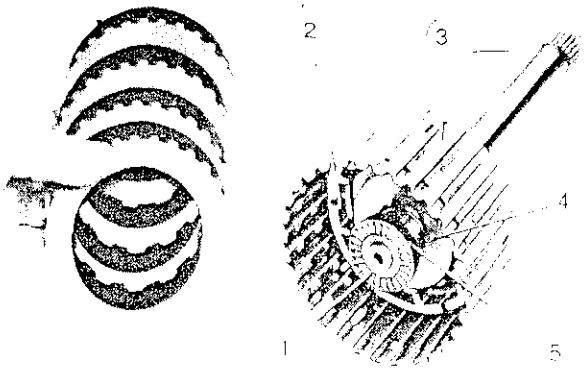
1. Snap ring 2. Drum 3. Pliers 4. Compressor tool 5. Puller jaws 6. Piston



Inspect third clutch plates. If plates are worn, scored, or show excessive heat, replace entire clutch pack.

Inspect thrust washer (5) and bearing (1) for damage. Replace if necessary. Install washer and bearing on input shaft. Secure them with petroleum jelly.

1. Thrust bearing 2. Piston 3. Drum 4. Spring retainer 5. Thrust washer

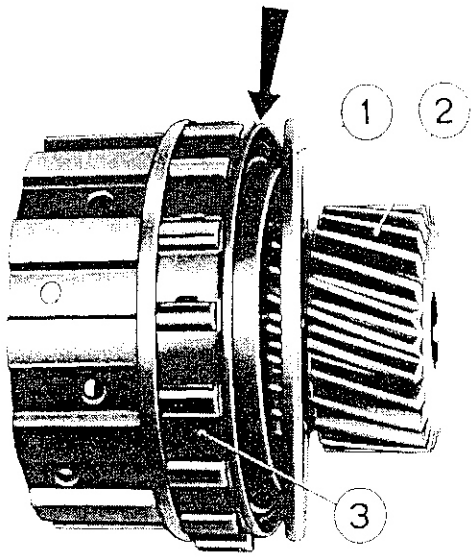


Inspect sprag assembly (3) for wear, damage, or sprags that fall out of cage. Inspect sun gear (2) for chipped or nicked teeth and wear. Replace part if necessary.

Install sprag on third clutch hub with groove (arrow) toward sun gear.

Install sprag race and retainer over sprag assembly.

1. Sprag retainer 2. Sun gear 3. Sprag

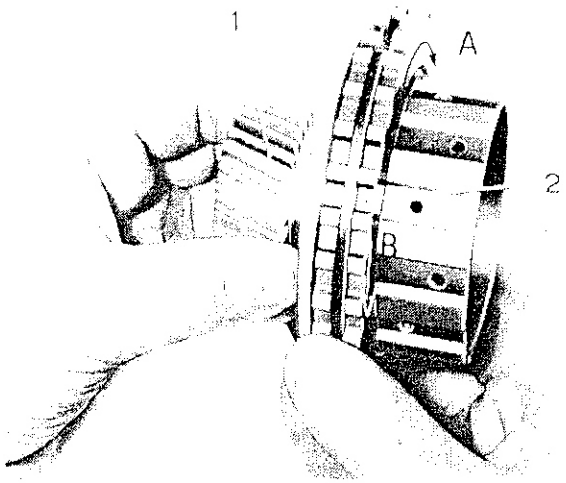


Check sprag for operation as follows:

Hold sun gear (1) with left hand. Turn sprag race (2) in direction of arrow "A". Check that sprag locks up.

Turn sprag race (2) in direction of arrow "B". Check that sprag rotates freely.

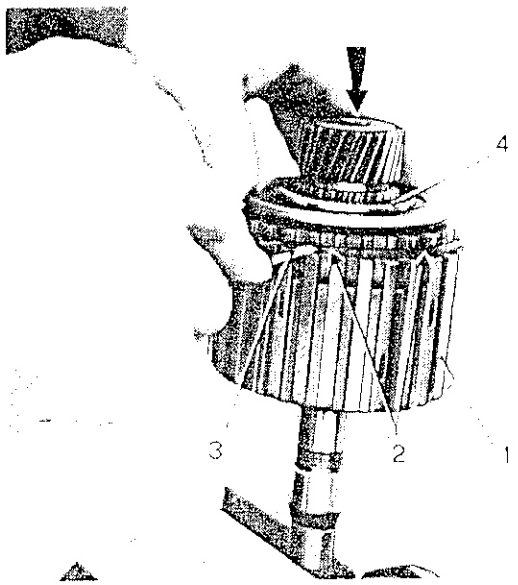
1. Sun gear 2. Sprag race



Place retaining ring (2) on outer race. Install clutch plates in third clutch drum (1). Install wave washer first, then steel plate, composition plate, steel plate, etc.

Align inner teeth of composition plates. Align grooves of clutch hub with these teeth and slide hub into clutch plates. Align outer race with grooves in hub. Using screwdriver (3), compress retaining ring (2). Push outer race in until retaining ring snaps into groove in drum (1).

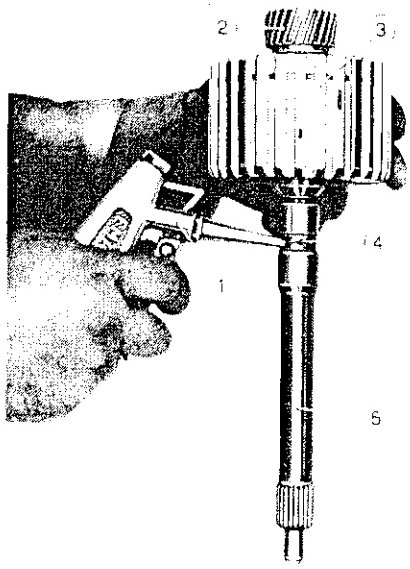
1. Drum 2. Retaining ring 3. Screwdriver 4. Sprag



Apply air from air gun (1) to hole (4) in input shaft (5). Check that clutch moves in drum (3).

WARNING: When using compressed air, always wear eye protection.

1. Air gun 2. Sun gear 3. Drum 4. Oil pressure hole 5. Input shaft



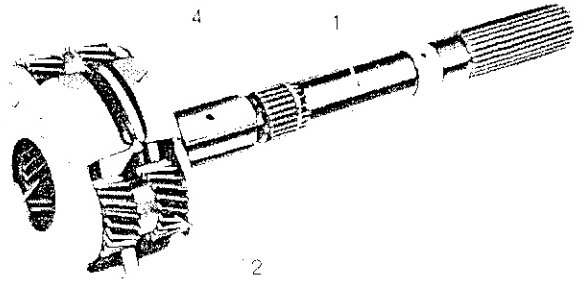
Planetary Carrier Inspection

Inspect planetary carrier and output shaft for distortion or damage.

Inspect planetary pinions for excessive wear or damage. Inspect for chipped teeth.

NOTE: Do not lose needle bearings on either side of carrier.

1. Output shaft 2. Planetary pinions 3. Planetary pinions 4. Carrier

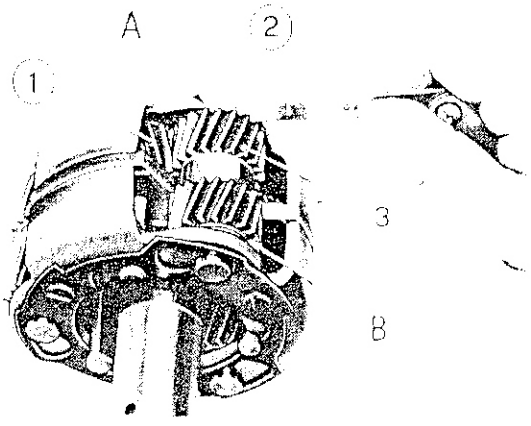


Check end clearance of all planetary pinions (1 and 3) at points A and B. Use a feeler gauge (2).

Clearance should be between 0.13 and 0.89 mm (0.005 and 0.035 inch).

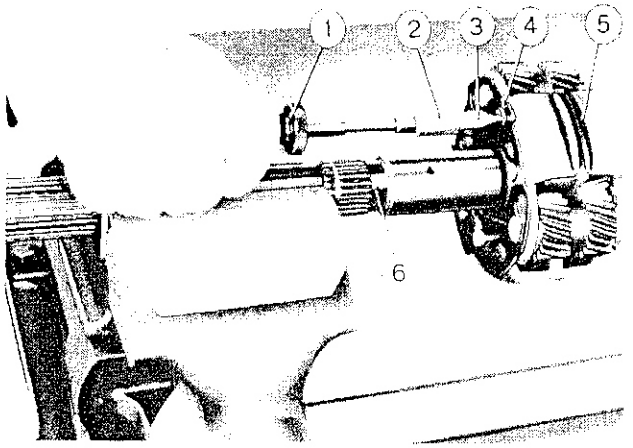
Replace entire assembly if damage or excessive wear is noted.

1. Planetary pinion 2. Feeler gauge 3. Planetary pinion



Check retaining screws (4) for lock plate on planetary carrier (5). Torque to 40 to 52 kgcm (29 to 38 in. lbs).

1. Torque wrench 2. Adapter 3. Screwdriver 4. Retaining screw
5. Planetary carrier 6. Output shaft

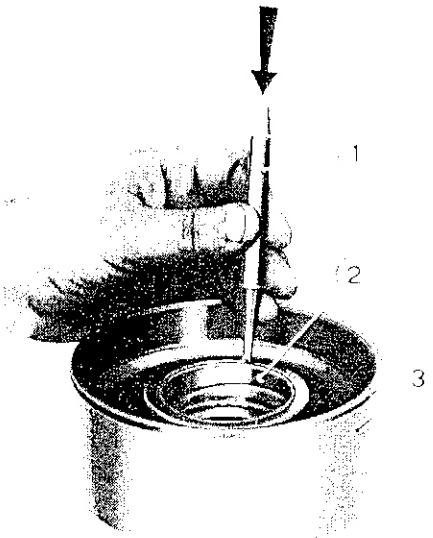


Reaction Sun Gear and Drum
Disassembly, Inspection and Assembly

Inspect reaction sun gear for chipped or nicked teeth. Inspect sun gear for scoring. If necessary, replace entire assembly.

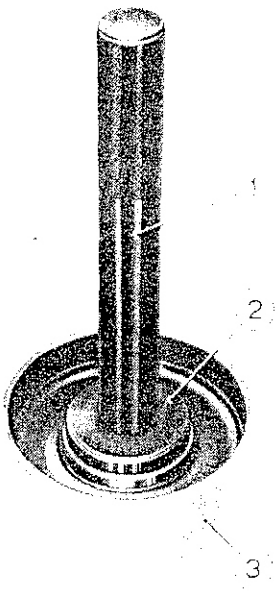
Inspect sun gear drum (3) and bushing (2). If necessary to replace bushing (2), use a chisel. Remove bushing from drum at bushing joint.

1. Chisel 2. Bushing 3. Drum



Thoroughly clean drum (3). Install new bushing. Use installer tool 23130-2 and handle 8093. Install bushing flush with rear face of drum hub.

1. Handle 8093 2. Installer 23130-2 3. Drum



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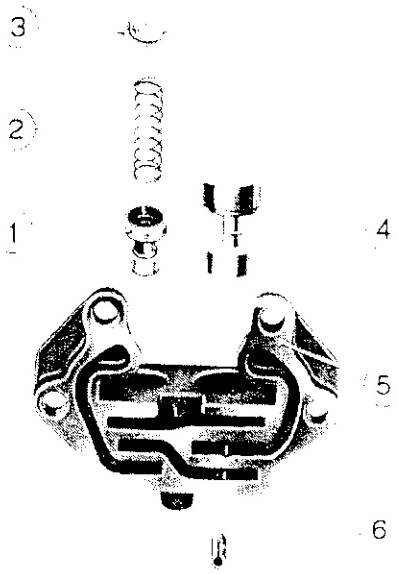
Governor Body Disassembly, Inspection and Assembly

Depress secondary valve (1). Remove spring retainer (3). Remove valve spring (2). Remove valve (1). Remove spring pin (6) from body (5). Remove primary valve (4).

Inspect primary and secondary valves for nicks, burrs, etc. Use crocus cloth to remove small burrs. Inspect valve spring for distortion.

Clean all parts in solvent. Blow parts dry. Inspect all oil passages and valve bores for dirt, nicks, burrs and varnish in body. Replace if necessary.

1. Secondary valve 2. Spring 3. Spring retainer 4. Primary valve
5. Body 6. Spring pin

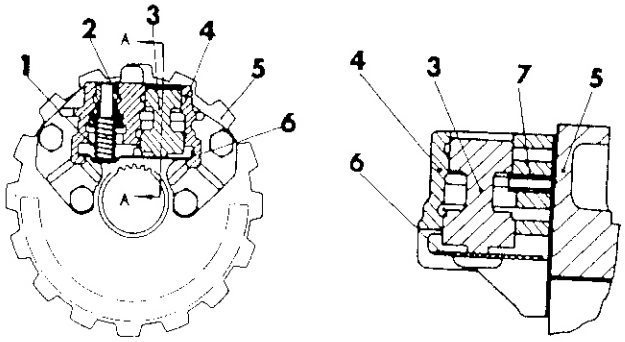


Coat valves with transmission fluid.

Install primary valve (3) in body (4) with smaller section first. Install spring pin (7) in front face of body. Pin should be flush to 0.01 inch below face.

Install secondary valve (2) (small end first) and spring (1) in body. Depress spring and install retainer (6) in body.

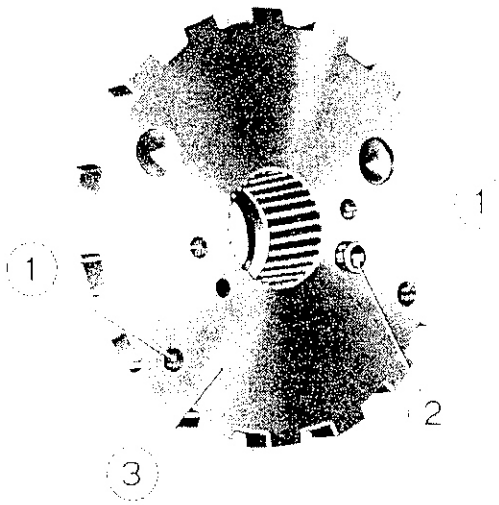
1. Spring 2. Secondary valve 3. Primary valve 4. Body
6. Governor hub 6. Spring retainer 7. Spring pin



Governor Hub Disassembly, Inspection and Assembly

Remove oil screen (2) from hub (3). Clean and inspect screen. Replace if necessary. Install oil screen flush to governor hub.

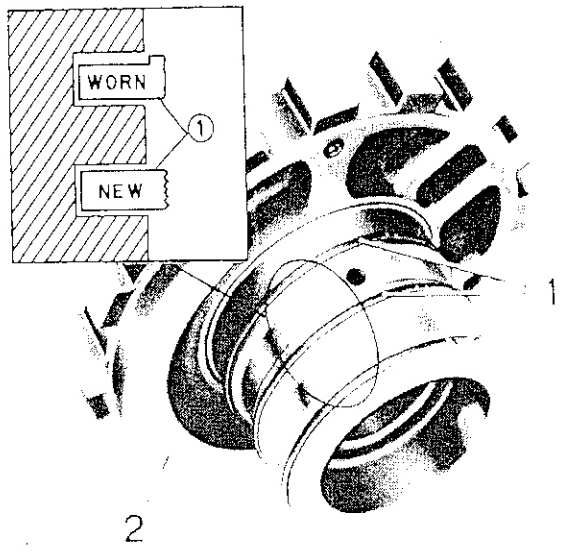
1. Bolt holes 2. Oil screen 3. Hub



Inspect 3 oil rings (1). If broken or side wear is noted, replace rings.

Inspect splines of hub (2) for cracks or chipped teeth. Replace governor hub if damaged.

1. Oil rings 2. Governor hub



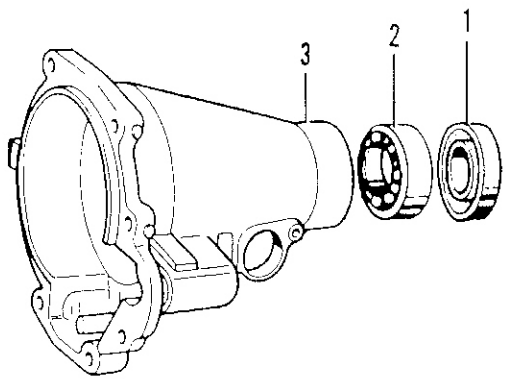
Rear Housing Disassembly, Inspection and Assembly

Thoroughly clean extension housing (3). Inspect housing for damage. Replace housing if necessary.

Remove oil seal (1).

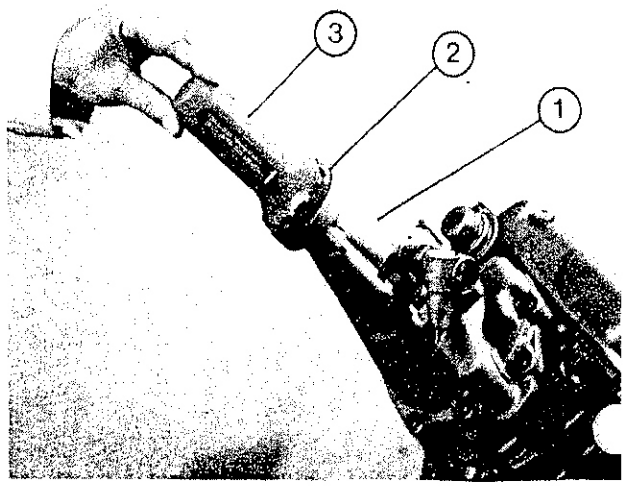
Inspect housing bearing (2). If bearing is worn, scored or damaged, replace it.

1. Rear oil seal 2. Bearing 3. Rear housing

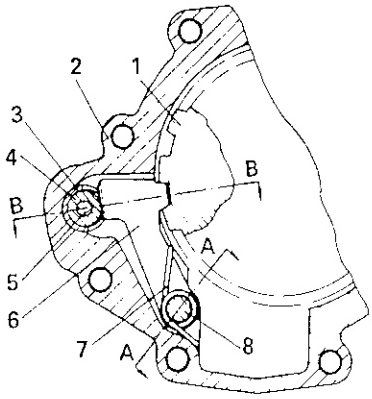


Install new oil seal in extension housing. Use seal installer 21426.

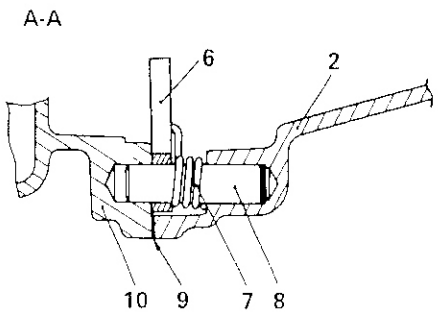
1. Extension housing 2. Rear oil seal 3. Seal installer 21426



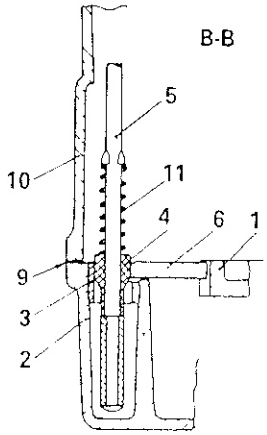
Inspect parking pawl (6) and spring (7) for damage. If damaged, replace.



1. Governor hub
2. Extension housing
3. Guide bushing
4. Actuating rod bushing



5. Actuating rod
6. Parking pawl
7. Spring
8. Pin

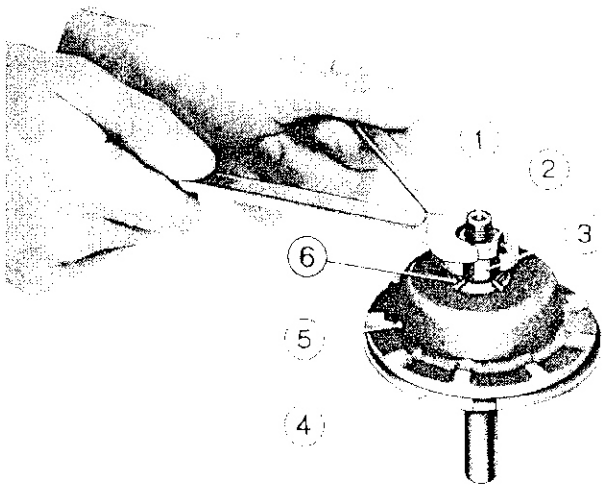


9. Gasket
10. Transmission case
11. Actuating rod spring

Servo Piston
Inspection and Assembly

Remove rod from servo piston (4). Hold sleeve (3) with a wrench on flats on sleeve. Remove locknut (2). Depress piston sleeve and remove retaining clip (6). Remove piston ring (4).

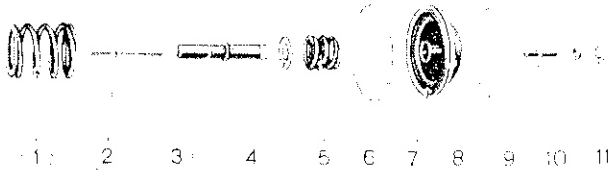
1. Adjusting bolt 2. Locknut 3. Sleeve 4. Piston ring 5. Servo piston 6. Clip



Push sleeve (3) thru piston (7). Remove spring (5) and retainer (4).

Inspect spring, adjusting bolt (9), and sleeve for damage. Inspect piston for damage. Inspect piston ring for side wear. Replace parts as necessary.

Place retainer (4) and spring (5) on sleeve (3). Thread adjusting bolt (9) into sleeve. Push sleeve thru piston (7). Secure sleeve with clip (11). Thread locknut (10) on bolt (9). Install piston ring (6) on piston.



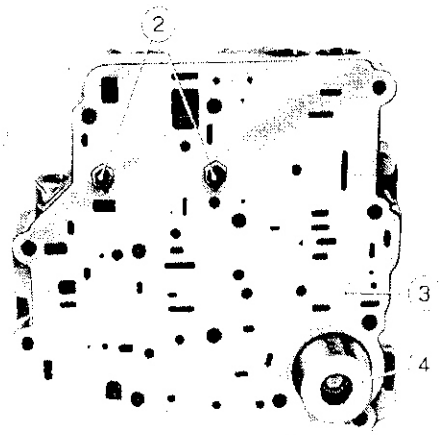
1. Spring 2. Piston apply rod 3. Sleeve 4. Spring retainer 5. Spring 6. Piston ring 7. Piston 8. Retaining ring 9. Adjusting bolt 10. Locknut 11. Clip

Valve Body Disassembly, Inspection and Assembly

Remove manual valve and link from valve body.

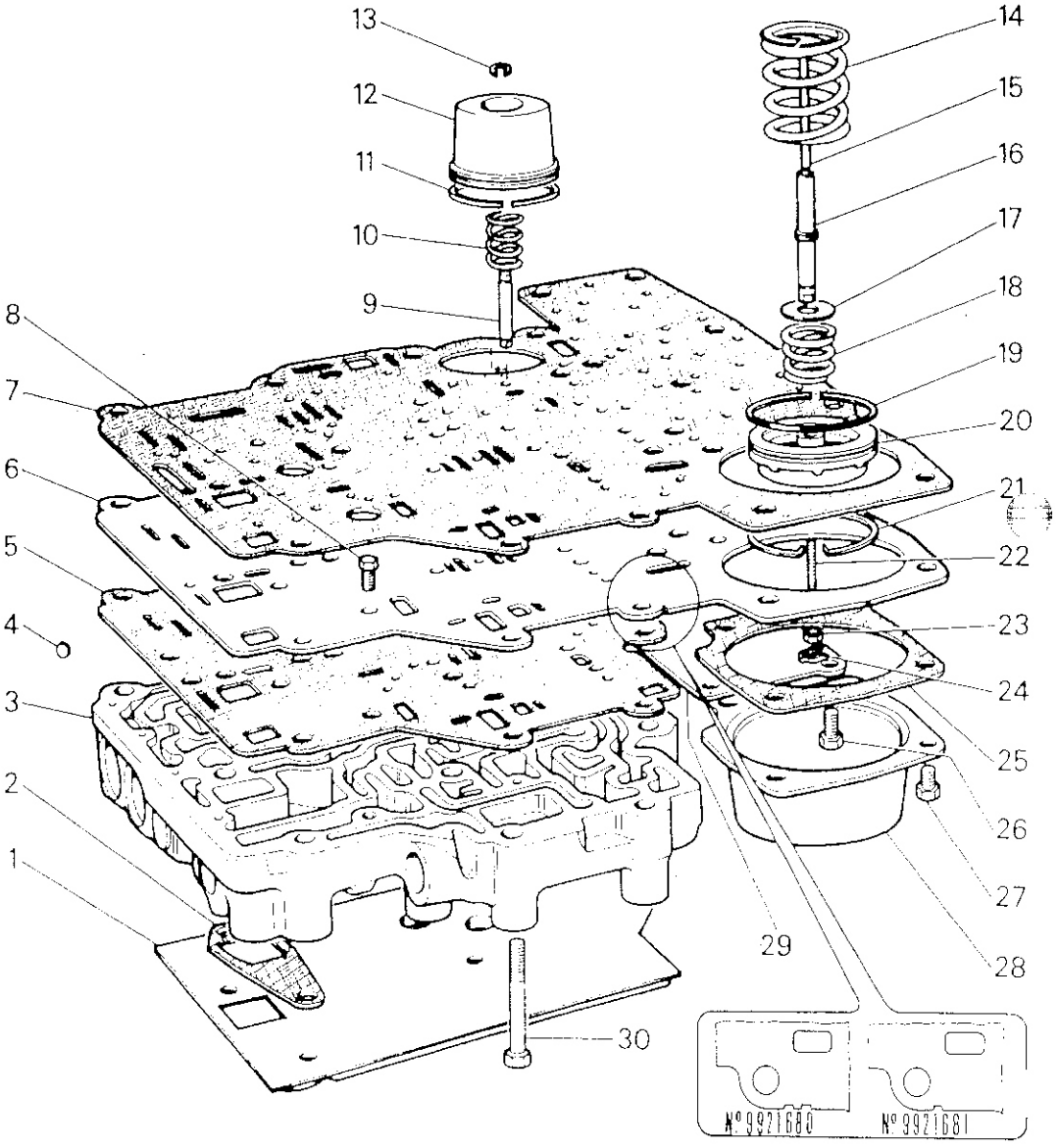
Position valve body with transfer plate (3) up. Remove 2 bolts (2). Remove plate and gasket. Discard gasket.

1. Valve body 2. Bolts 3. Transfer plate 4. Accumulator piston



Valve Body Assembly

1. Oil strainer
2. Gasket
3. Valve body
4. Check ball
5. Gasket
6. Transfer plate
7. Gasket
8. Bolt
9. Accumulator piston
10. Spring
11. Oil ring
12. Accumulator
13. Retaining ring
14. Spring
15. Servo apply rod
16. Servo adjusting sleeve
17. Spring retainer
18. Spring
19. Oil ring
20. Servo piston
21. Retaining ring
22. Adjusting bolt
23. Locknut
24. Retaining ring
25. Gasket
26. Bolt
27. Bolt
28. Servo cover
29. Reinforcement plate
30. Bolt

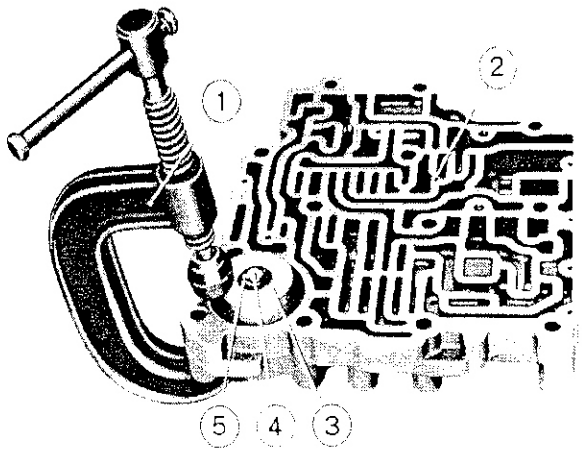


Compress accumulator piston (3). Use a small C clamp (1). Remove retaining ring (5). Carefully loosen clamp. Accumulator piston is under spring tension.

Remove piston (3) and spring from valve body (2). Remove oil ring from piston.

Inspect piston and spring for damage. Inspect oil ring for damage or side wear. Replace parts as necessary.

1. C clamp 2. Valve body 3. Piston 4. Shaft 5. Retaining ring



Disassembly, Inspection, and Assembly of Control Valves

NOTE: Be careful when removing retaining pins. Do not damage valve body. Drive all pins from outside of valve body. If necessary, remove burrs in bore of valve body. Use a fine crocus cloth.

All numbers in parenthesis refer to drawing on the facing page.

1-2 Shift Control Valve

Remove retaining pin (1). Remove sleeve (2). Remove control valve (3), spring (4) and shift valve (5).

2-3 Shift Control Valve

Remove retaining pin (9). Remove sleeve (10). Remove control valve (11), spring (12), seat (13) and shift valve (14).

3-2 Shift Control Valve

Remove retaining pin (15) and plug (16). Remove spring (17) and control valve (18).

Detent Pressure Regulator Valve

Remove retaining pin (20) and spring (21). Remove regulator valve (22).

High Speed Downshift Timing Valve

Remove retaining pin (33) and spring (32). Remove timing valve (31).

Low Speed Downshift Timing Valve

Remove retaining pin (34). Remove plug (30), timing valve (29), and spring (28).

Manual Low and Reverse Control Valves

Remove retaining pin (26) and spring (25). Remove manual low control valve (24) and reverse control valve (23).

1-2 Accumulator Valve

Remove retaining pin (19) and plug (18). Remove accumulator valves (6 and 7).

Cleaning and Inspection

Make sure work area is free of dirt or dust. Make sure hands and tools are clean. Clean valve body and valves in cleaning solvent. Use compressed air to blow out passages.

CAUTION: Do not use paraffin base cleaning solvent to clean parts. This could block passages. Do not use cloth to clean or dry valves. Material removed from cloth could block passages.

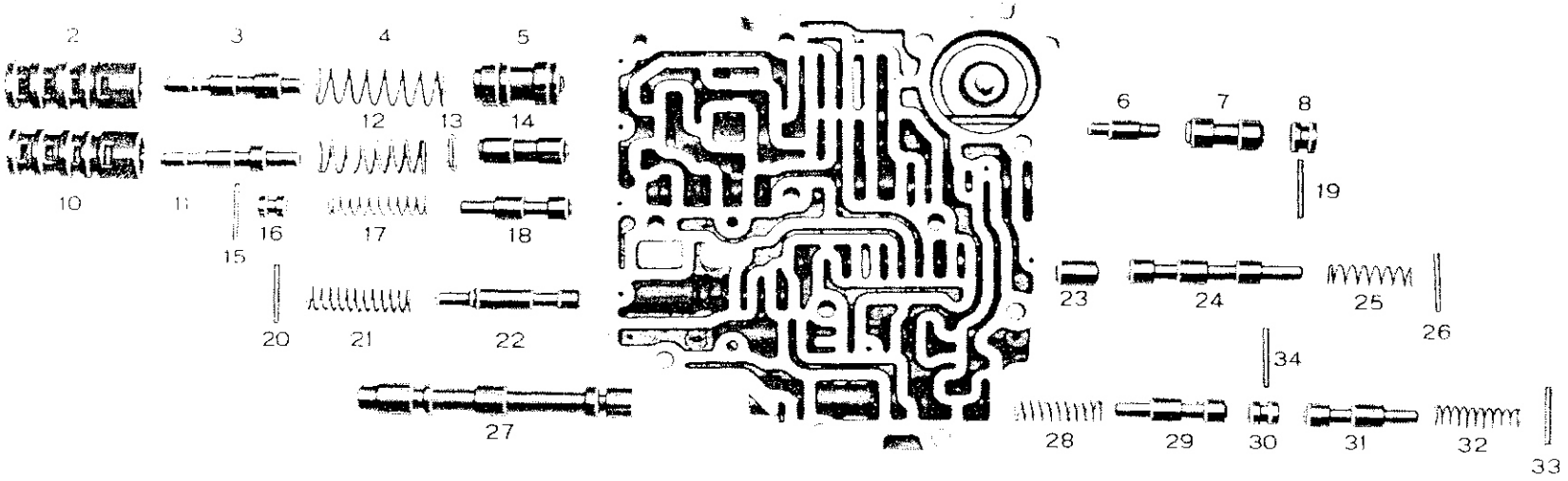
Inspect each valve for free movement in the bore. If necessary, remove small burrs on a valve. Use crocus cloth.

Do not remove sharp edges of the valves. These edges perform a cleaning action within the bore.

Inspect valve springs for distortion or collapsed coils. If necessary, replace springs.

If any damage is found to the valves or valve body, replace valve body assembly.

Reassemble valves, springs, plugs, and retaining pins in their proper location and order. Use a liberal amount of transmission fluid.

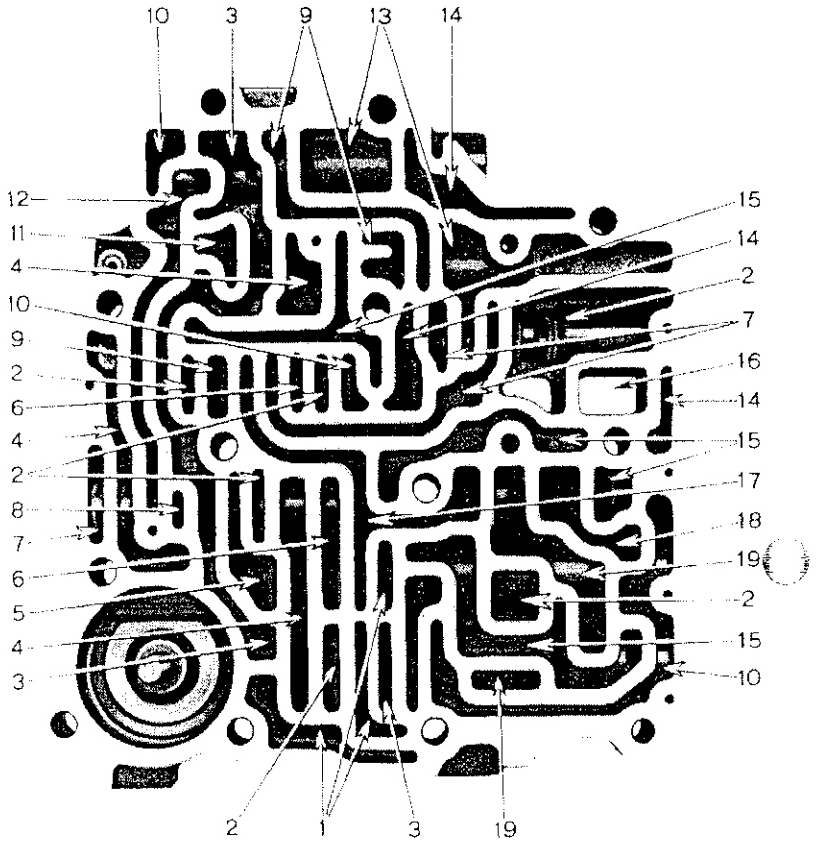


1. Retaining pin
2. 1-2 shift control valve sleeve
3. 1-2 shift control valve
4. Control valve spring
5. 1-2 shift valve
6. Accumulator control valve
7. Accumulator valve
8. Valve plug
9. Retaining pin
10. 2-3 shift control valve
11. 2-3 shift control valve
12. Control valve spring
13. Spring seat
14. 2-3 shift valve
15. Retaining pin
16. Valve plug
17. 3-2 control valve spring
18. 3-2 control valve
19. Retaining pin
20. Retaining pin
21. Regulator valve spring
22. Detent pressure regulator valve
23. Reverse control valve
24. Manual low control valve
25. Control valve spring
26. Retaining pin
27. Manual valve
28. Timing valve spring
29. Low speed downshift timing valve
30. Valve plug
31. High speed downshift timing valve
32. Timing valve spring
33. Retaining pin
34. Retaining pin

VALVE BODY COMPONENTS

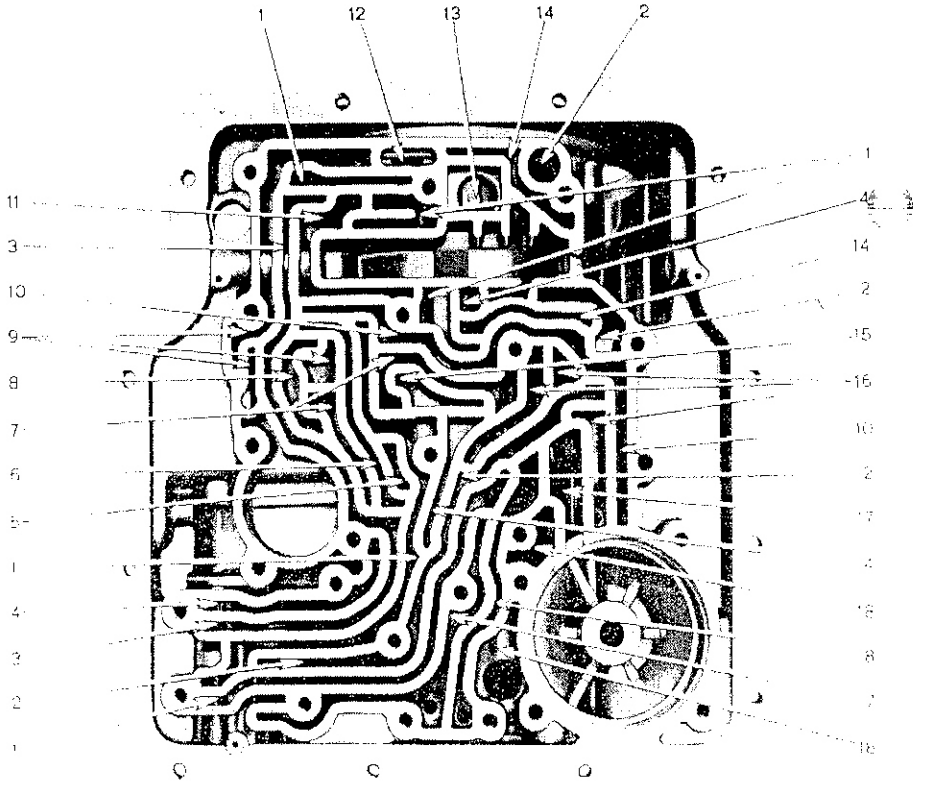
VALVE BODY PASSAGES (Top Side)

1. Second clutch
2. Exhaust
3. Drive
4. Governor
5. 1-2 accumulator
6. 2-3 exhaust
7. Regulator
8. 1-2 shift
9. Servo release
10. Low
11. Servo apply
12. Intermediate
13. Drive
14. Reverse
15. Modulator
16. Suction
17. Third clutch
18. Modulator or detent
19. Detent



TRANSMISSION CASE PASSAGES (Bottom Side)

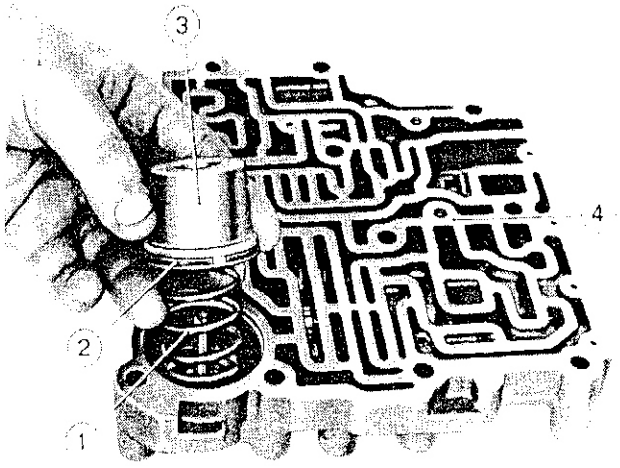
1. Modulator
2. Line
3. Detent
4. Regulator
5. 1-2 accumulator
6. Intermediate
7. Governor
8. Drive
9. Second clutch
10. Low
11. Third clutch
12. Boost
13. Suction
14. Reverse
15. 2-3 exhaust
16. Servo release
17. Regulator
18. Exhaust



Install oil ring (2) on accumulator piston (3). Install spring (1) and piston in valve body (4).

Compress piston and install retaining ring. Use a small C clamp to compress piston.

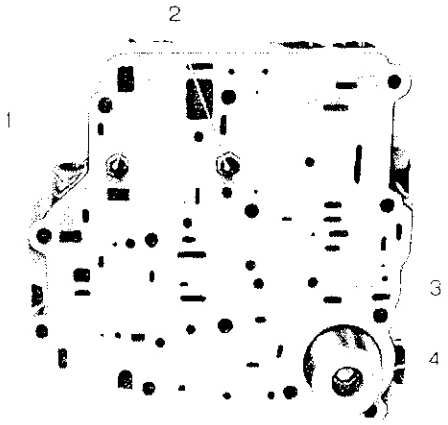
1. Spring 2. Oil ring 3. Accumulator piston 4. Valve body



Inspect transfer plate (3) for dents or distortion. Check particularly area that check balls in case contact transfer plate. Replace plate if necessary.

Install a new valve body gasket on body (1). Use six bolts to center up transfer plate with valve body. Bolt transfer plate (3) to body (1) with 2 bolts (2). Torque bolts (2) to 0.8 to 1.1 kgm (6 to 8 ft lbs).

1. Valve body 2. Bolts 3. Transfer plate 4. Accumulator piston



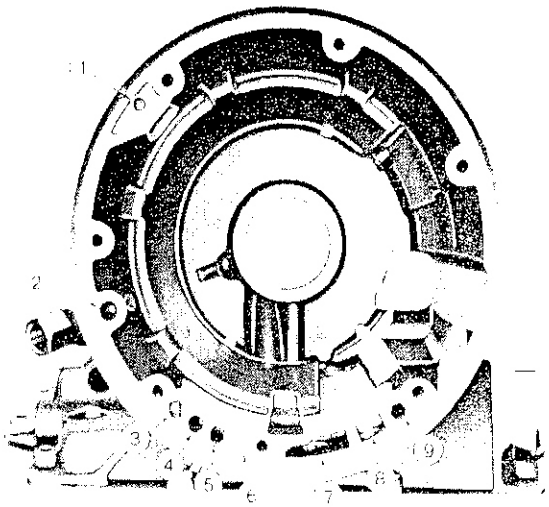
Case Disassembly, Inspection and Assembly

Inspect case for damage. Check that band anchor pins are retained properly and of equal height.

Inspect and clean oil passages in case. Use cleaning solvent and air.

Inspect bores for detent valve and modulator valves for scratches or scoring.

1. Case vent 2. Converter out 3. 2nd clutch 4. 3rd clutch
5. Modulator 6. Boost 7. Suction 8. Line 9. Reverse

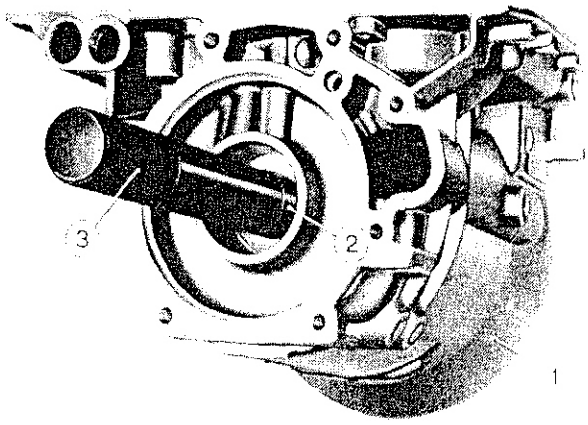


Inspect bushing inside rear of case. If damaged, remove bushing. Use tool 23130-3 and handle.

Inspect bushing sleeve for sun gear drum inside case for scoring. If damaged, remove sleeve by grinding. Be very careful when grinding to prevent damage to aluminum case.

Install new sleeve. Use installer 32130-7 and handle. Install new bushing. Use installer 23130-3 and handle. Make sure bushing is flush with case at rear.

1. Case 2. Tool 23130-3 3. Handle



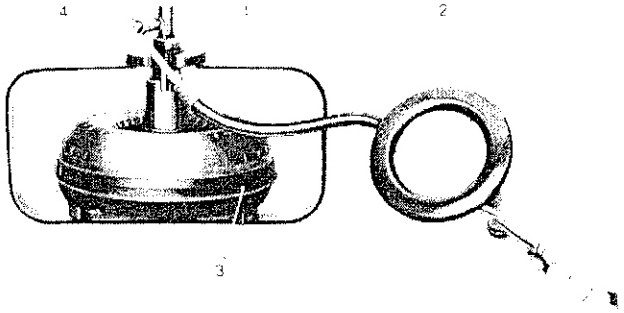
Torque Converter Inspection

Drain converter. Check fluid for clutch material or foreign matter. If foreign matter or clutch material is found, replace converter. Converter cannot be cleaned properly.

Check hub surfaces of converter for scoring or wear.

If available, use tool to check converter for leaks. Apply 71 to 85 psi air pressure to tool. Submerge converter in water. Check for leaks.

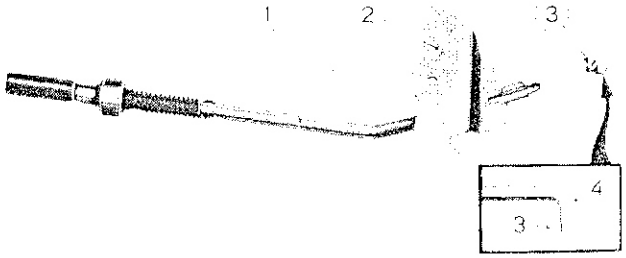
1. Tool for checking converter 2. Air gauge 3. Converter 4. Gauge fitting



Selector Lever and Shaft Installation

Install selector lever (2) on parking lock actuator (1) by aligning tab (3) on actuator with slot lever. Place actuator with lever in case.

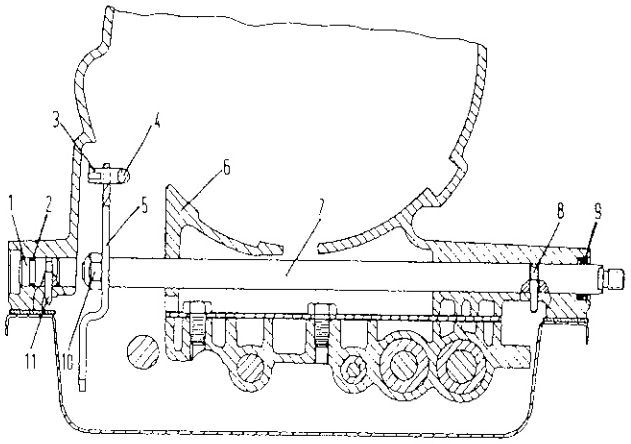
1. Parking lock actuator 2. Selector lever 3 & 4. Tab



Install new oil seal (9) in case (6). Insert selector lever shaft (7) thru case from outside. Be careful not to damage oil seal (9). Install retaining pin (8) thru case and shaft.

Position selector lever (5) over shaft (7). Secure lever to shaft with nut (10). Torque nut (10) to 1.1 to 1.5 kgm (8 to 11 ft lbs).

1. Plug 2. Gasket 3. Tab 4. Parking lock actuator 5. Selector lever 6. Case 7. Shaft 8. Retaining pin 9. Oil seal 10. Nut 11. Retaining pin



REASSEMBLY

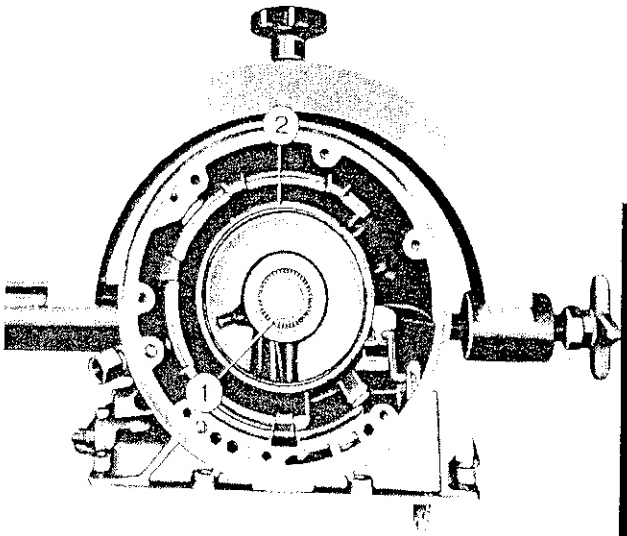
Turn transmission so that front of case is up.

Inspect band for cracks, flaking, burring or looseness. Replace, if necessary.

Place band in case. Locate band so that tabs on outer edges of band seat against anchor pins in case.

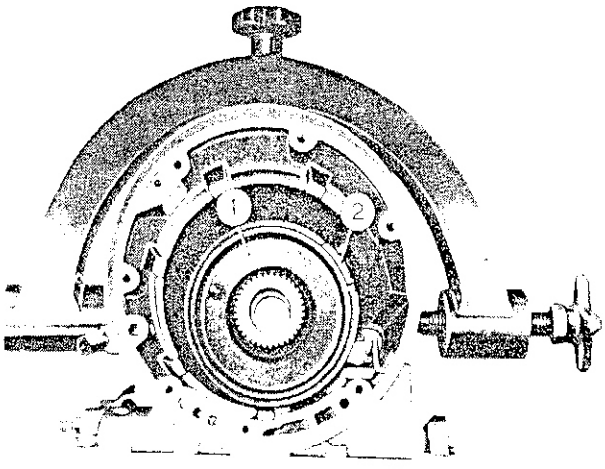
Place race for thrust bearing on rear of case. Secure with petroleum jelly. Place thrust bearing on race. Secure with petroleum jelly.

1. Needle bearing 2. Low band



Install reaction sun gear and drum (1) into band (2) with sun gear up. Place thrust bearing on sun gear. Place race on thrust bearing. Secure with petroleum jelly.

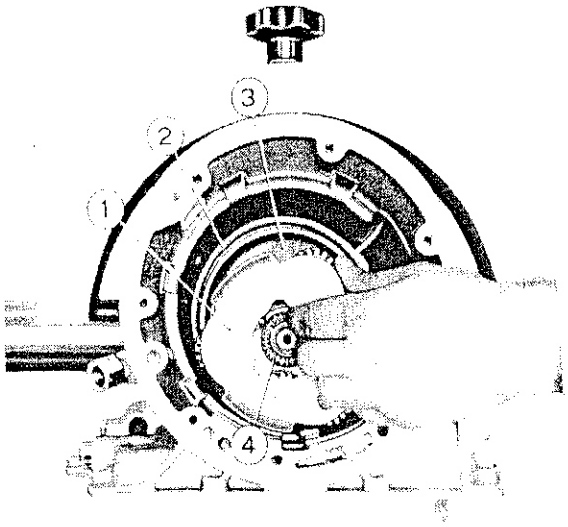
1. Reaction sun gear and drum 2. Low band



Place thrust washer in carrier (1). Place thrust bearing (4) on washer.

Install output shaft and planetary carrier (1) into case to spline with reaction sun gear.

1. Planetary carrier 2. Low band 3. Reaction sun gear and drum
4. Thrust bearing

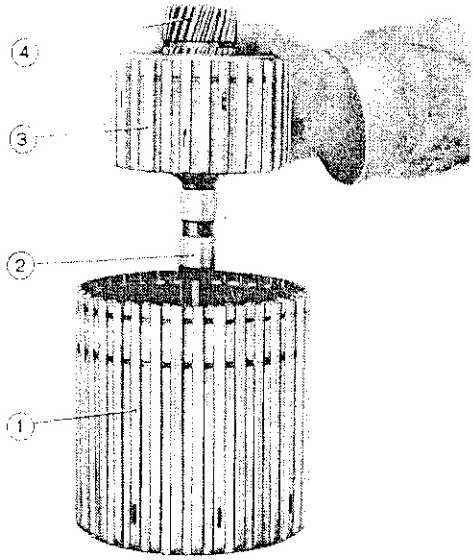


On the bench, align clutch plates in second clutch drum (1).

NOTE: Check that thrust washer is seated correctly on second clutch hub.

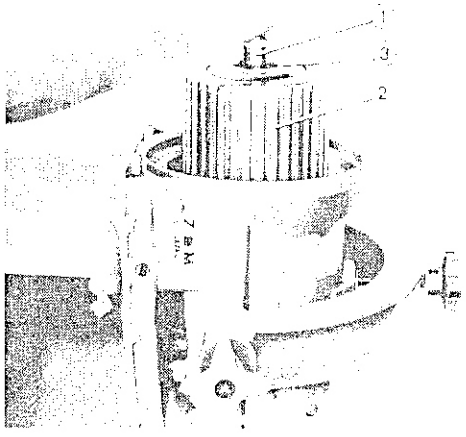
Insert third clutch drum (3) and input shaft (2) thru top of drum (1). Seat splines of drum (3) into splines of clutch plates inside drum (1).

1. Second clutch drum 2. Input shaft 3. Third clutch drum
4. Input sun gear



Hold clutch assemblies (2) by input shaft (1). Lower assembly into case. Turn drum and shaft to align ring gear and input sun gear with planetary pinions.

1. Input shaft 2. Clutch assemblies 3. Selective thrust washer

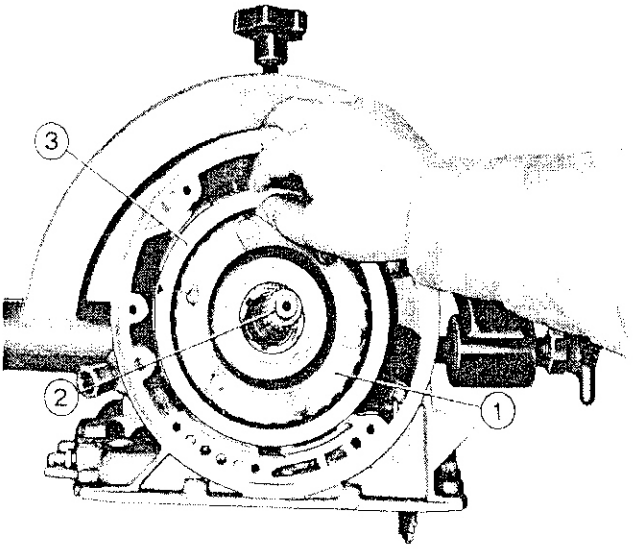


Inspect clutch plates for third clutch. If plates are worn, scored, or burned, replace the pack.

Place steel reaction plate (3) in case. Place reverse clutch steel plate, composition plate, steel plate, composition plate, etc. into case. Use a liberal amount of transmission fluid.

Place reverse clutch cushion plate (wave washer) in case.

1. Third clutch drum 2. Input shaft 3. Reaction plate

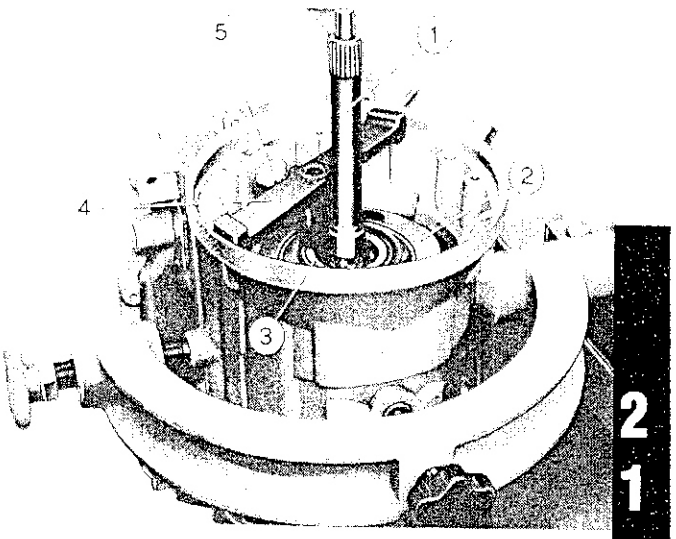


Place gauging tool 23085 (4) on case flange against input shaft (1).

Loosen thumb screw (5) on tool. Allow inner shaft to drop on second clutch drum (3). Tighten thumb screw and remove tool.

Place selective washer against inner shaft of tool. Washer should be flush with top face of shaft. If not, select next larger or smaller washer until correct size is obtained.

1. Input shaft 2. Reverse clutch plate 3. Second clutch drum
4. Gauging tool 23085 5. Thumb screw



The washer selected should be exactly flush or slightly below inner shaft for correct end play in transmission.

NOTE: Selective washer removed from transmission may be oil soaked and discolored.

Selective Washer Chart

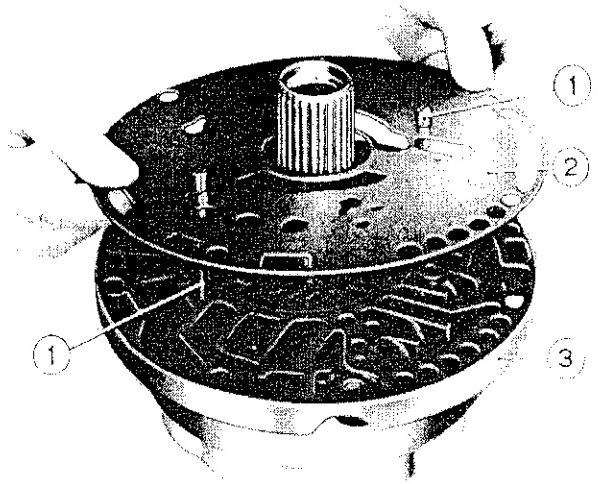
No.	Identification Code Color	Thickness Inch
2	Yellow	0.070 to 0.074
3	Blue	0.076 to 0.080
4	Red	0.081 to 0.085
5	Brown	0.086 to 0.090
6	Green	0.091 to 0.095
7	Black	0.097 to 0.101

Install two gears into oil pump (3) noting topside marks made at disassembly.

Place wear plate (2) on oil pump (3).

Insert guide pins (1) in oil pump for alignment of converter housing.

1. Guide pins 2. Wear plate 3. Oil pump



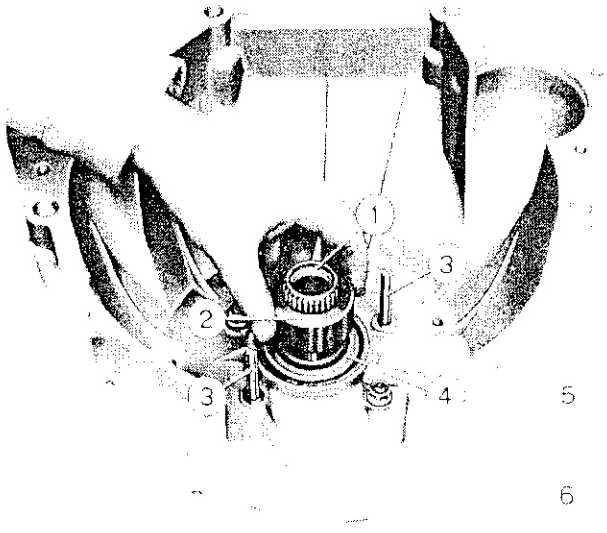
Lower converter housing (5) onto oil pump (6).

Install new sealing washers on 5 bolts for converter housing. Remove guide pins (3). Loosely install bolts thru housing (5) into oil pump.

Install aligning tool 23082 (2) on the shaft (1) to align housing to pump. Tool should bottom on oil pump gear.

Tighten bolts "finger tight" only.

1. Converter stator support shaft 2. Tool 23082 3. Guide pins
4. Oil seal 5. Converter housing 6. Oil pump



Install new rubber oil seal on converter housing (4). Install new gasket on pump flange.

Place selective washer, previously selected, on oil pump shaft. Use petroleum jelly to secure it.

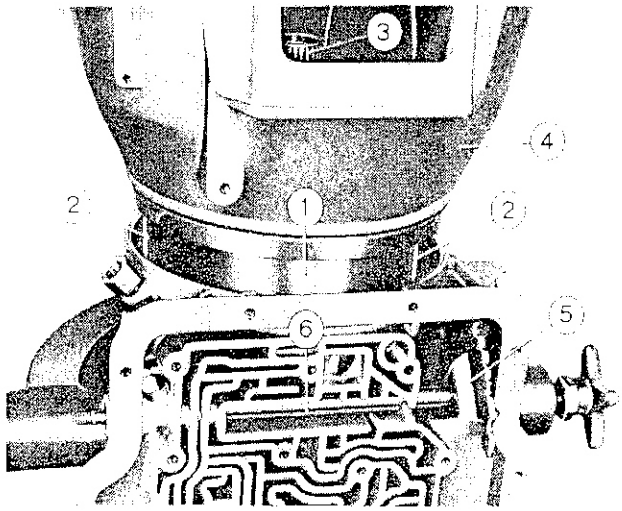
Install 2 glide pins (2) in case. Lower converter housing (4) and oil pump onto case. Place new sealing washers on 7 bolts. Remove glide pins. Loosely install 7 case bolts.

Torque outer 7 bolts to 3 to 3.6 kgm (22 to 26 ft lbs) and torque 5 bolts to 1.8 to 2.3 kgm (13 to 17 ft lbs). Remove tool 23082.

NOTE: Torque in "star" pattern.

Check for correct assembly by turning input shaft by hand.

1. Oil pump 2. Guide pins 3. Input shaft 4. Converter housing
5. Selector lever 6. Shaft

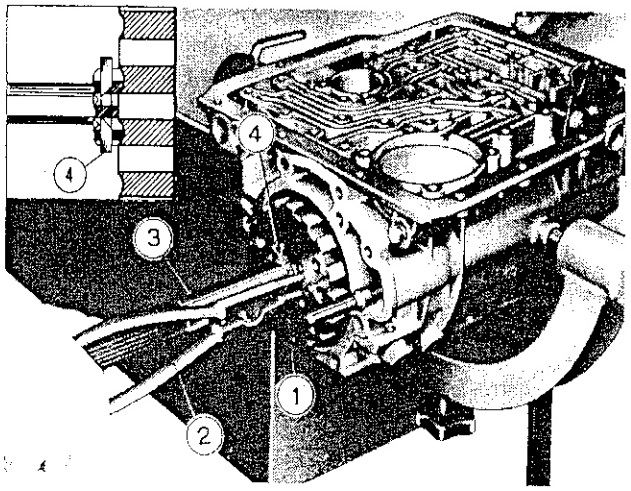


Turn case so that bottom of case is facing up.

Stagger seal ring gaps on hub.

Slide governor hub (1) along output shaft (3). Seat hub in case. Secure hub with snap ring (4), narrow side towards rear or outwards.

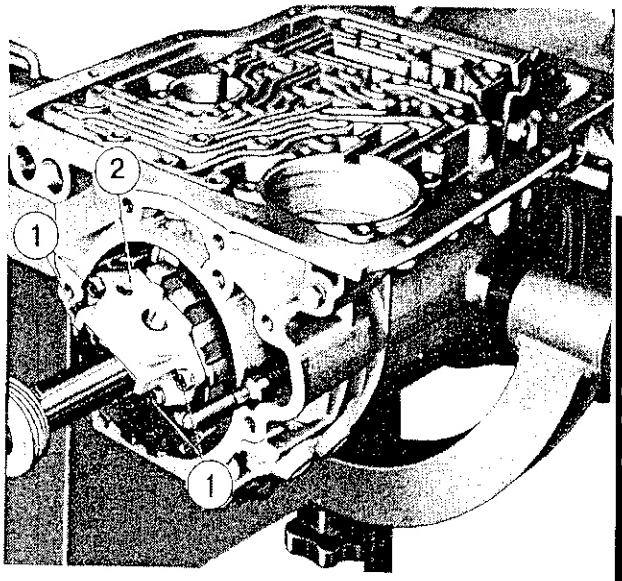
1. Governor hub 2. Pliers 3. Output shaft 4. Snap ring

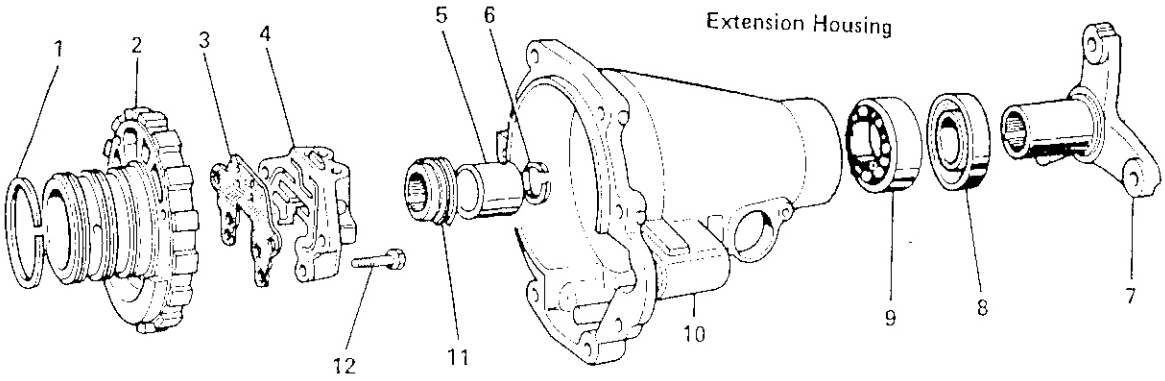


Place new gasket on governor body (2). Secure governor (2) to hub with four bolts (1). Torque bolts to 6 to 8 ft lbs (0.8 to 1 kgm). Check that valves in governor body move freely after bolts are torqued.

Slide speedometer drive gear and collar into position on shaft. Install snap ring.

1. Bolts 2. Governor





1. Seal ring
2. Governor hub
3. Gasket
4. Governor body
5. Collar
6. Snap ring
7. Output flange
8. Oil seal
9. Bearing
10. Rear extension housing
11. Speedometer drive gear
12. Bolt

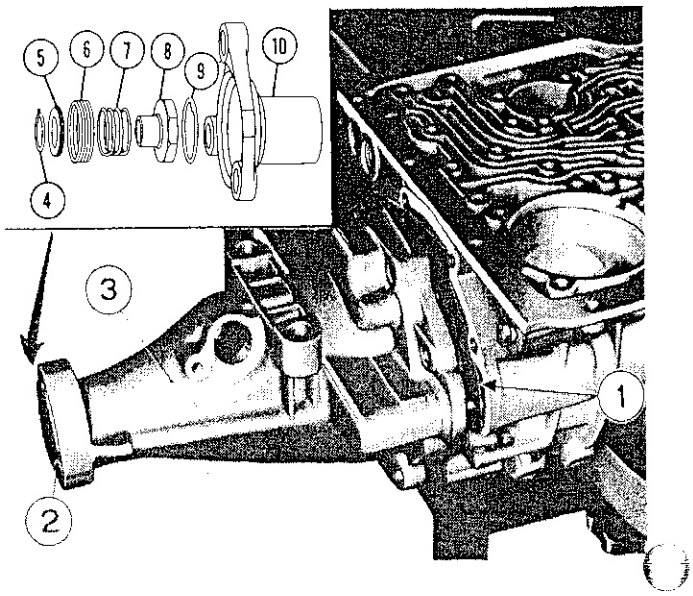
Install new gasket (1) on case. Slide extension housing (3) over output shaft. Align parking lock actuator with extension housing. Align bolt holes. Install 7 bolts. Torque bolts to 2.8 to 3.5 kgm. (20 to 25 ft lbs).

Slide output yoke (10) onto output shaft.

Install washer (9) and nut (8) on end of output shaft. Torque nut to 108 ft lbs (15 kgm).

Install spring (7), seal (6), ring (5) and snap ring (4) on end of output shaft.

1. Gasket 2. Output shaft seal 3. Rear housing 4. Snap ring
5. Ring 6. Seal 7. Spring 8. Nut 9. Washer 10. Output yoke



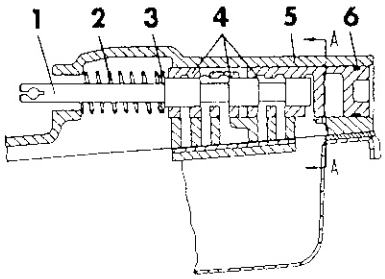
Replace "O" ring on detent valve sleeve (4). Coat parts with transmission fluid.

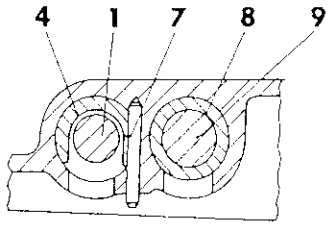
Place spring seat (3) and spring (2) on detent valve (1). Install valve in sleeve (4). Install sleeve (4) in case with slots in sleeve facing oil pan.

Align groove in sleeve (4) with retaining pin bore. Use a 3/8 inch drive tool inserted in end of sleeve.

Depress valve spring and sleeve (4). Install retaining pin (7) thru case and sleeve. Make sure pin is inserted into groove in sleeve and not into one of the oil passage slots.

1. Detent valve 2. Spring 3. Spring seat 4. Sleeve 5. Case
6. O ring 7. Retaining pin 8. Modulator valve sleeve 9. Modulator valve



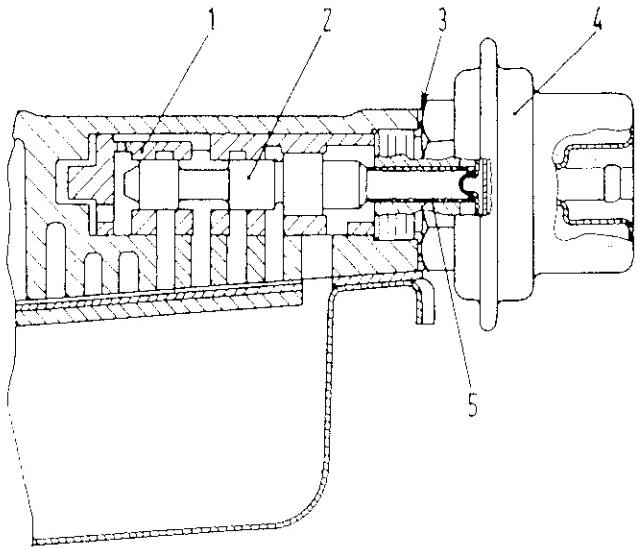


A-A

Install modulator valve (2), small end first into sleeve (1). Install sleeve in case.

Place new gasket (3) on modulator (4). Install plunger (5) in modulator. Thread modulator (4) into case. Tighten with wrench J23100.

1. Modulator valve sleeve 2. Modulator valve 3. Gasket
4. Modulator 5. Plunger

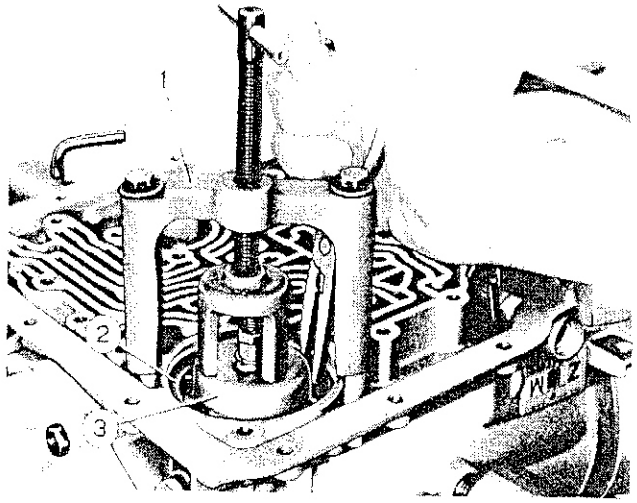


Coat servo parts with transmission fluid.

Install servo apply rod, spring, and piston into case.

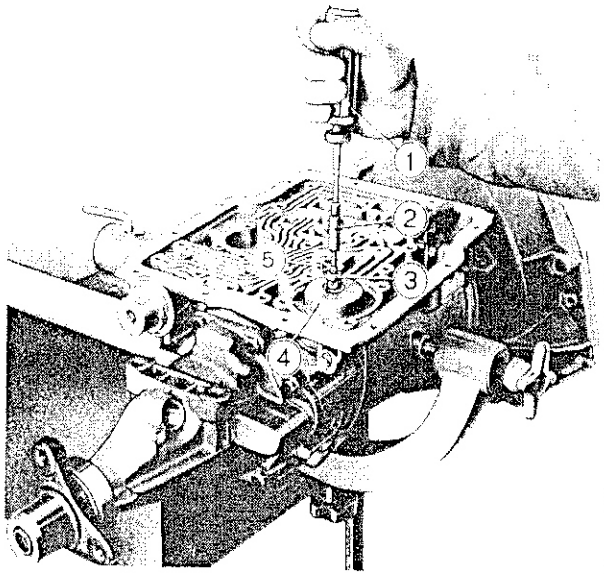
Install compressor tool 23075 (1) on case. Make sure legs of tool are straight. Turn tool down to compress piston (3). Lightly tap on piston while compressing until piston is seated to prevent damage to oil ring. Install retaining ring (2). Remove tool 23075 carefully, insuring retaining ring has seated.

1. Compressor tool 2. Retaining ring 3. Servo piston



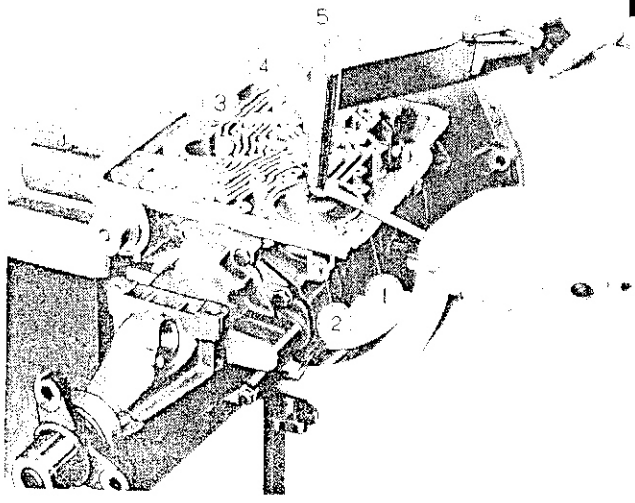
Using a 3/16" hex head wrench on servo adjusting bolt, adjust servo apply rod. Torque adjusting bolt to 46 kgcm (40 in lbs). Back off bolt exactly 4 turns.

1. Torque wrench 2. Adapter 3. Lock nut 4. Servo piston 5. Adjusting bolt



Hold sleeve of servo piston with a wrench on flats. Using 9/16 inch socket and torque wrench, torque lock nut to 1.7 to 2.1 kgm (12 to 15 ft lbs).

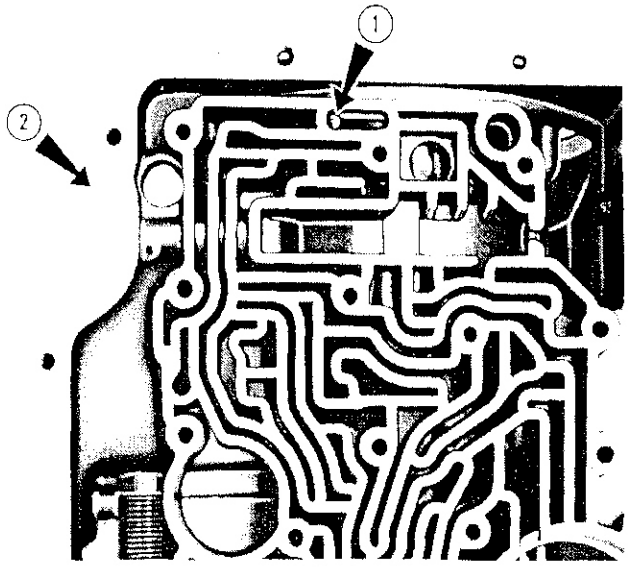
1. Wrench 2. Servo piston 3. Socket 4. Extension 5. Torque wrench



Clean check ball with lint-free rag.

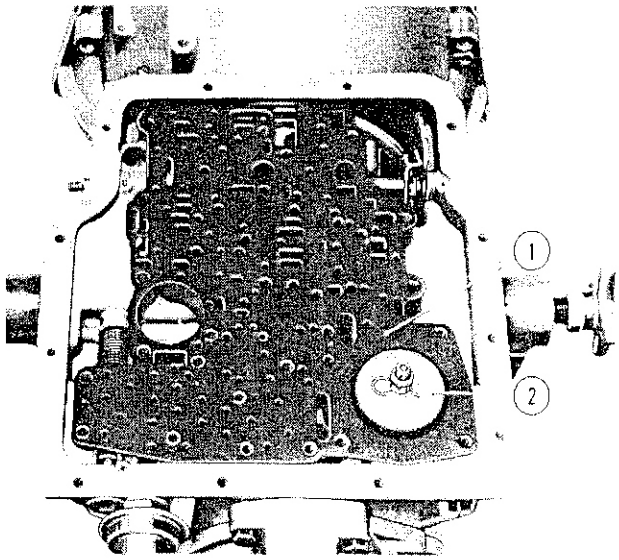
Insert ball in oil passage of transmission case as shown by arrows.

1. Check ball 2. Transmission case



Install new gasket (1) on case.

1. Gasket 2. Servo piston

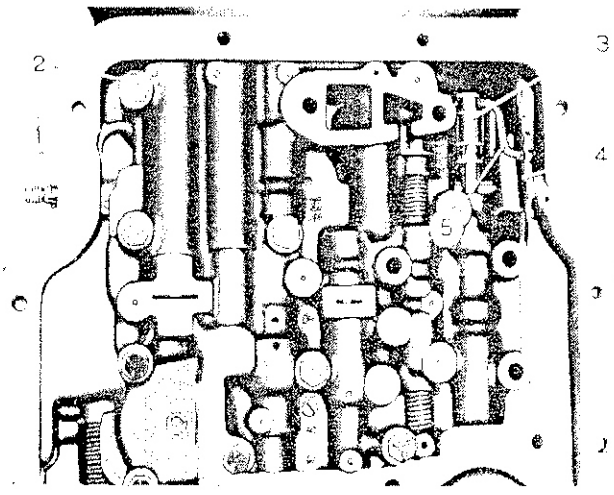


Coat manual valve with transmission fluid. Install manual valve (3) in valve body. Install long side of link (5) in manual valve.

Install small end of link (5) into selector lever (4) and position valve body and transfer plate onto large gasket and casing.

Loosely install 8 bolts (2) holding valve body to transmission case.

1. Selector lever shaft 2. Bolt 3. Manual valve 4. Selector lever 5. Link



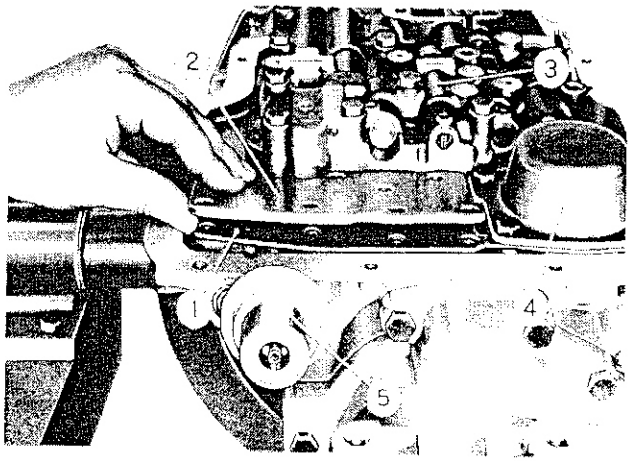
Install gasket for servo cover (4) on transfer plate (1). Install cover (4) with 4 bolts.

Install reinforcement plate (2) on transfer plate (1). Secure plate with 8 bolts. Torque bolts for valve body (3) to 1.8 to 2.1 kgm (13 to 15 ft lbs). Torque bolts from center working outward.

Torque bolts for reinforcement plate (2) to 1.8 to 2.1 kgm (13 to 15 ft lbs).

Torque bolts for servo cover (4) to 2.3 to 2.6 kgm (17 to 19 ft lbs).

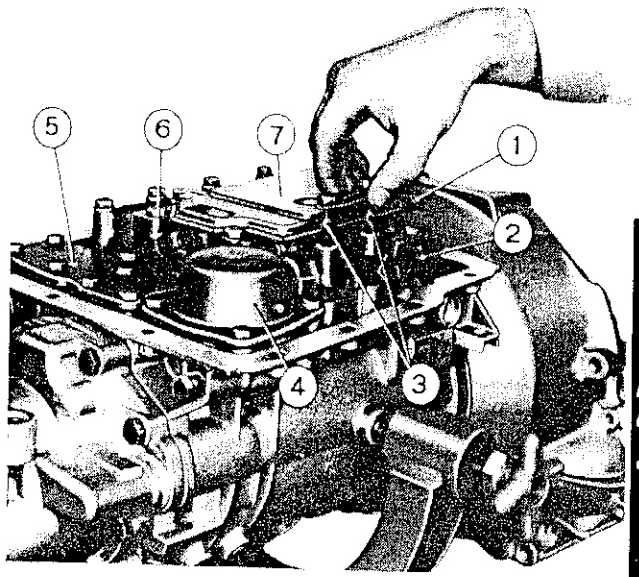
1. Transfer plate 2. Reinforcement plate 3. Valve body
4. Servo cover 5. Modulator



Place oil filter gasket on valve body. Install filter on valve body (6) with 3 bolts. Torque bolts to 1.8 to 2.1 kgm (13 to 15 ft lbs).

Install manual detent spring (1) with 2 bolts (3). Torque bolts to 1.8 to 2.1 kgm (13 to 15 ft lbs).

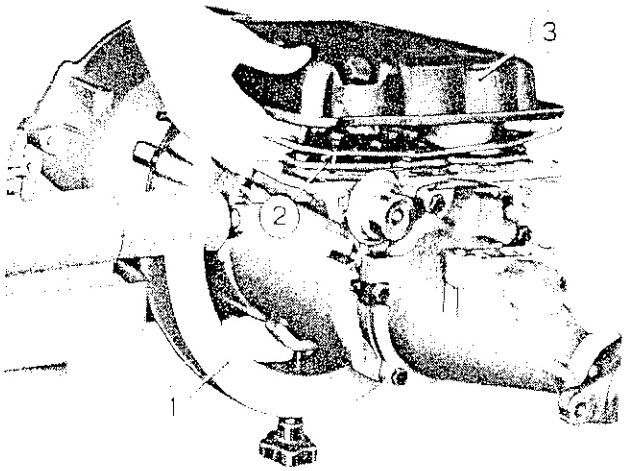
1. Detent spring 2. Selector lever 3. Bolts 4. Servo cover
5. Reinforcement plate 6. Valve body 7. Oil filter



Install new gasket (2) for oil pan (3). Secure pan to case with 12 bolts. Torque bolts to 1 to 1.3 kgm (7 to 10 ft lbs).

Install output shaft flange, sliding it on by hand.

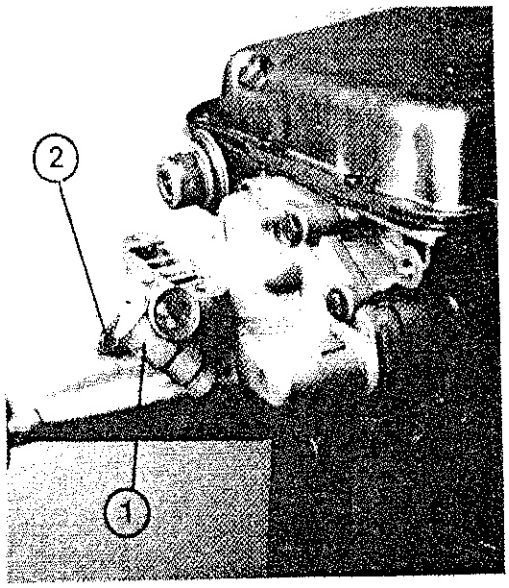
1. Tool 2. Gasket 3. Oil pan



Slide torque converter over stator shaft and input shaft. Make sure keyway on converter hub is seated into drive lugs on oil pump. Rotate converter to check that it is fully seated.

Install gasket, speedometer driven gear (1), bolt (2), and lock-washer.

1. Speedometer driven gear 2. Bolt

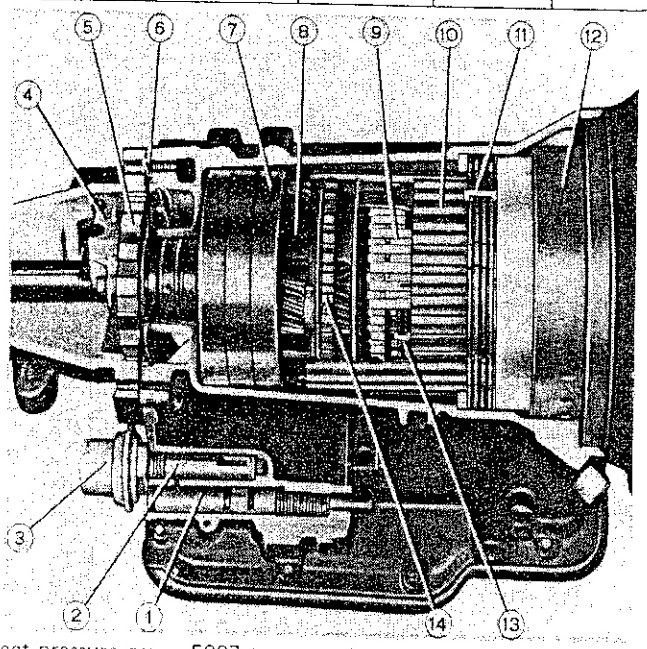


TRANSMISSION BOLT TORQUE CHART

DESCRIPTION	TORQUE	
	Kgm	Ft lb
Bolt, oil pan to case	1.0 to 1.3	7 to 9
Bolt, filter to case	1.8 to 2.1	13 to 15
Bolt, reinforcement plate to case	1.8 to 2.1	13 to 15
Bolt, valve body to case	1.8 to 2.1	13 to 15
Bolt, transfer plate to valve body	0.8 to 1.1	6 to 8
Bolt, servo cover to body	2.3 to 2.6	17 to 19
Bolt, converter housing to case	3.0 to 3.6	22 to 26
Bolt, converter housing to oil pump	1.8 to 2.3	13 to 17
Nut, selector lever to shaft	1.1 to 1.5	8 to 11
Bolt, governor body to governor	0.8 to 1.0	6 to 7
Bolt, extension housing to case	2.8 to 3.5	20 to 25
Bolt, servo adjusting	0.46	3.3 (40 in lb)
Nut, lock, servo adjusting bolt	1.7 to 2.1	12 to 15
Screw, lock plate to planetary carrier	0.4 to 0.5	2.5 to 3.2 (29 to 38 in lb)
Nut, output flange	7	51

COMPONENT OPERATION CHART

Selector Lever Position	Gear Engaged	Reverse Clutch	Second Clutch	Third Clutch	Band	Sprag Clutch Locked	Parking Pawl
P	Park						X
R	Reverse	X		X			
N	Neutral						
D	1st Gear				X	X	
	2nd Gear		X		X		
	3rd Gear		X	X			
2	1st Gear				X	X	
	2nd Gear		X		X		
1	1st Gear			X	X		



1. Kick Down valve
2. Modulator sleeve
3. Modulator
4. Governor
5. Governor hub
6. Gasket
7. Band
8. Planetary carrier
9. Third clutch drum
10. Second clutch drum
11. Reverse clutch discs
12. Pump body
13. Third clutch discs
14. Ring gear

OIL PRESSURE CHECKS

To check oil pressures of transmission, connect pressure gauge 5907 to transmission. Connect vacuum gauge in vacuum line to modulator. Position gauge inside car so it can be read during driving. Start engine and operate car until engine and transmission reach normal operating temperature. Check that engine is running properly.

Normal Oil Pressure Check:
With selector in D, and engine at idle (750 to 850 rpm), check that the oil pressure is 61 to 70 psi (4.3 to 4.9 Kg/cm2).

Modulator Oil Pressure Check:
Drive car with selector in D and accelerator pedal down past KICK-DOWN position. Check that transmission shifts up when oil pressure reads 108 to 119 psi (7.5 to 8.4 Kg/cm2). Vacuum gauge should read 0.86 in/Hg (25 mm/Hg).

Regulator Boost Oil Pressure Check:
Place selector in 1 with car stopped. Check that oil pressure is 98 to 109 psi (6.9 to 7.7 Kg/cm2) with approximately 12 in/Hg (305 mm/Hg) of vacuum.

CAUTION: In the next step do not keep engine at stall speed longer than a few seconds. Maintaining stall speed could overheat transmission.

Stall Speed Oil Pressure Check:
Place selector in 1 or R. Apply brakes and run engine to stall speed. Check that oil pressure is 156 to 160 psi (10.9 to 11.7 Kg/cm2).

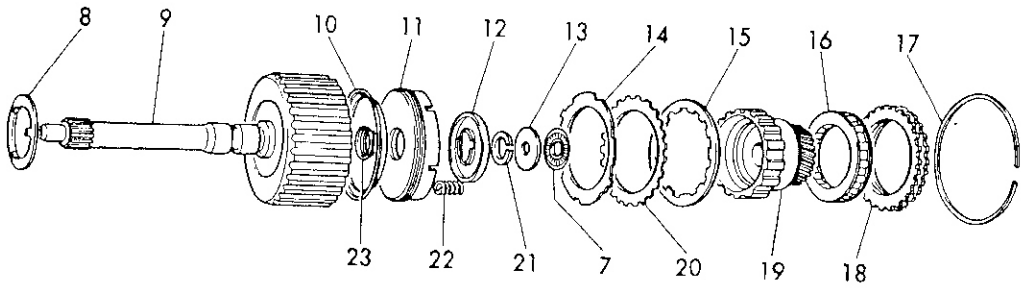
NOTE: Stall speed is maximum speed engine can obtain with brakes applied and accelerator pressed all the way. Read engine rpm on tachometer. Stall speed should be 2200–2300 rpm.

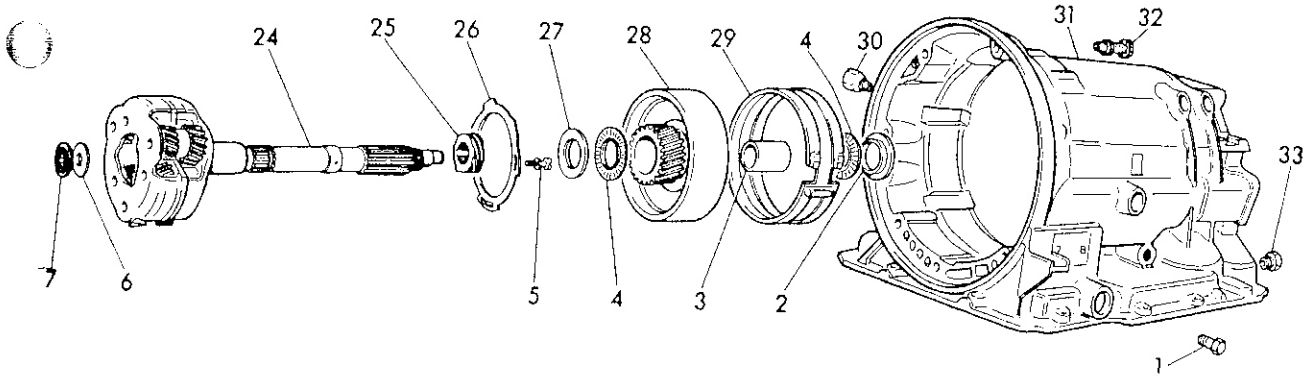
TROUBLE DIAGNOSIS

CONDITION	POSSIBLE CAUSE
Low oil level	1. Oil coming out of filler tube 2. External oil leak 3. Failed vacuum modulator diaphragm
Oil coming out of filler tube	1. Oil level too high 2. Water in oil 3. External vent clogged 4. Leak in pump suction circuit
External oil leaks	1. Converter housing area a. Leaking converter b. Converter housing seal (front seal) c. Sealing washers under converter housing to case bolts d. Sealing washers under converter housing to pump bolts e. Converter housing to case seal
	2. Case and extension area a. Shifter shaft seal b. Extension seal c. Oil pan gasket d. Filler tube O-ring (bottom of tube) e. Extension to case gasket f. Vacuum modulator gasket g. Drain plug gasket h. Cooler line fittings i. Speedo drive housing gasket
Excessive smoke coming from exhaust	1. Failed modulator diaphragm
No drive in any selector position	1. Low oil level 2. Clogged suction screen 3. Inner manual valve linkage disconnected 4. External linkage disconnected 5. Input shaft broken 6. Pressure regulator stuck in open position 7. Failed pump
No forward drive	1. Band worn or adjustment loose 2. Band servo piston stuck 3. Band servo seal ring cracked
No drive in D or 2 but drive in 1 and R	1. Input sprag installed backwards 2. Input sprag failure
No drive in R. Drive in all other ranges	1. Reverse clutch failure
Drive in neutral	1. Selector lever linkage improperly adjusted 2. Planetary carrier broken (lock-up) 3. Band improperly adjusted (too tight)
Low oil pressure	1. Low oil level 2. Clogged suction screen 3. Leak in pump suction circuit 4. Internal leak in pressure circuit 5. Priming valve stuck 6. Pressure regulator malfunction
High oil pressure	1. Broken or disconnected vacuum line to transmission 2. Failed modulator or stuck modulator valve 3. Leak in any part of engine or accessory vacuum system 4. Pressure regulator malfunction

TROUBLE DIAGNOSIS (cont'd)

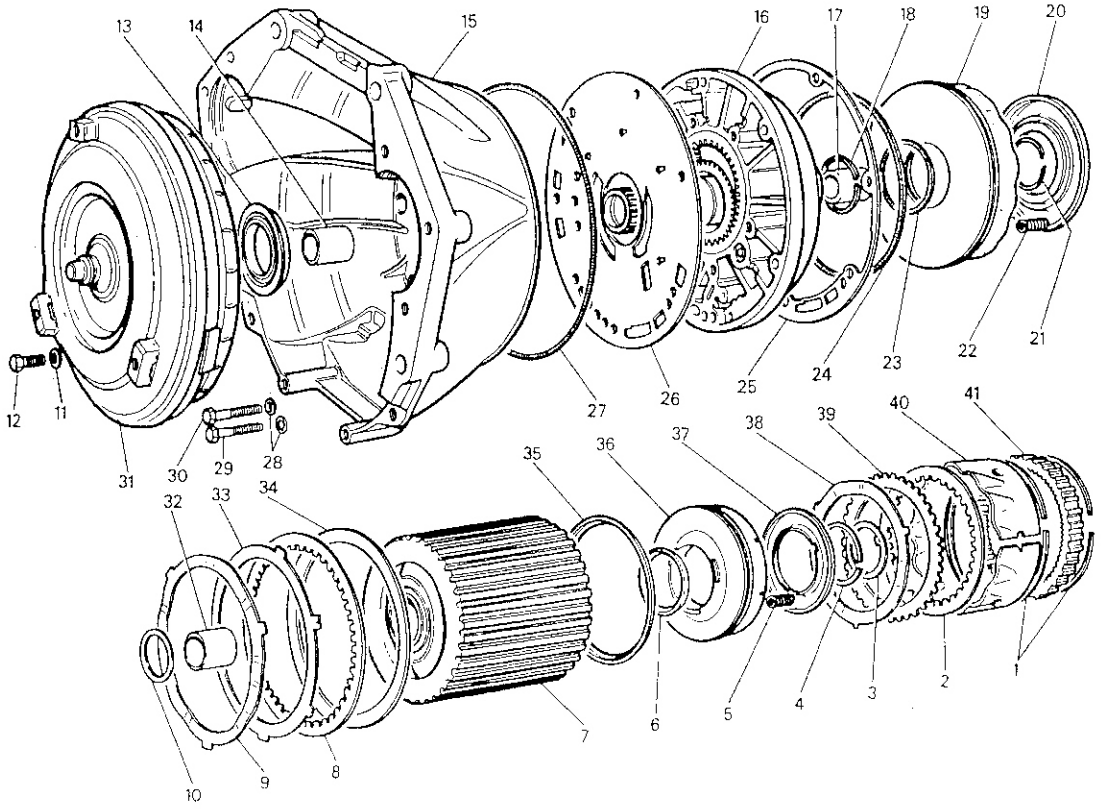
CONDITION	POSSIBLE CAUSE
Will not shift at any speed	1. Governor valves stuck 2. 1-2 shift valve stuck in downshifted position 3. Large leak in governor pressure passage
Upshifts only at part throttle	1. Detent pressure regulator valve stuck 2. Detent cable broken or misadjusted
Upshifts only at full throttle	1. Modulator valve stuck 2. Failed modulator diaphragm 3. Broken or disconnected vacuum line to modulator 4. Engine vacuum leak
Will not make part throttle 3-2 downshift at lower car speeds	1. 3-2 downshift control valve stuck
Only upshifts from 1 to 2	1. 2-3 shift valve stuck
Sudden engagement after an increase in rpm	1. Band servo piston binding
Slipping 1-2 upshifts	1. Low oil pressure 2. 1-2 accumulator valve stuck 3. Second clutch piston seals leaking 4. Second clutch piston centrifugal ball stuck open 5. Second clutch piston cracked or broken
Slipping 2-3 upshifts	1. Low oil pressure 2. Third clutch piston seals leaking 3. Third clutch piston centrifugal ball stuck open 4. Third clutch piston cracked or broken 5. Input shaft bushing worn
Abrupt 1-2 upshift	1. High oil pressure 2. 1-2 accumulator valve stuck 3. Governor valves stuck
Abrupt 2-3 upshift	1. High oil pressure 2. Governor valves stuck
Abrupt 3-2 forced downshift at high speed	1. High speed downshift timing valve stuck open
Abrupt 3-2 coast downshift	1. Low speed downshift timing valve stuck open





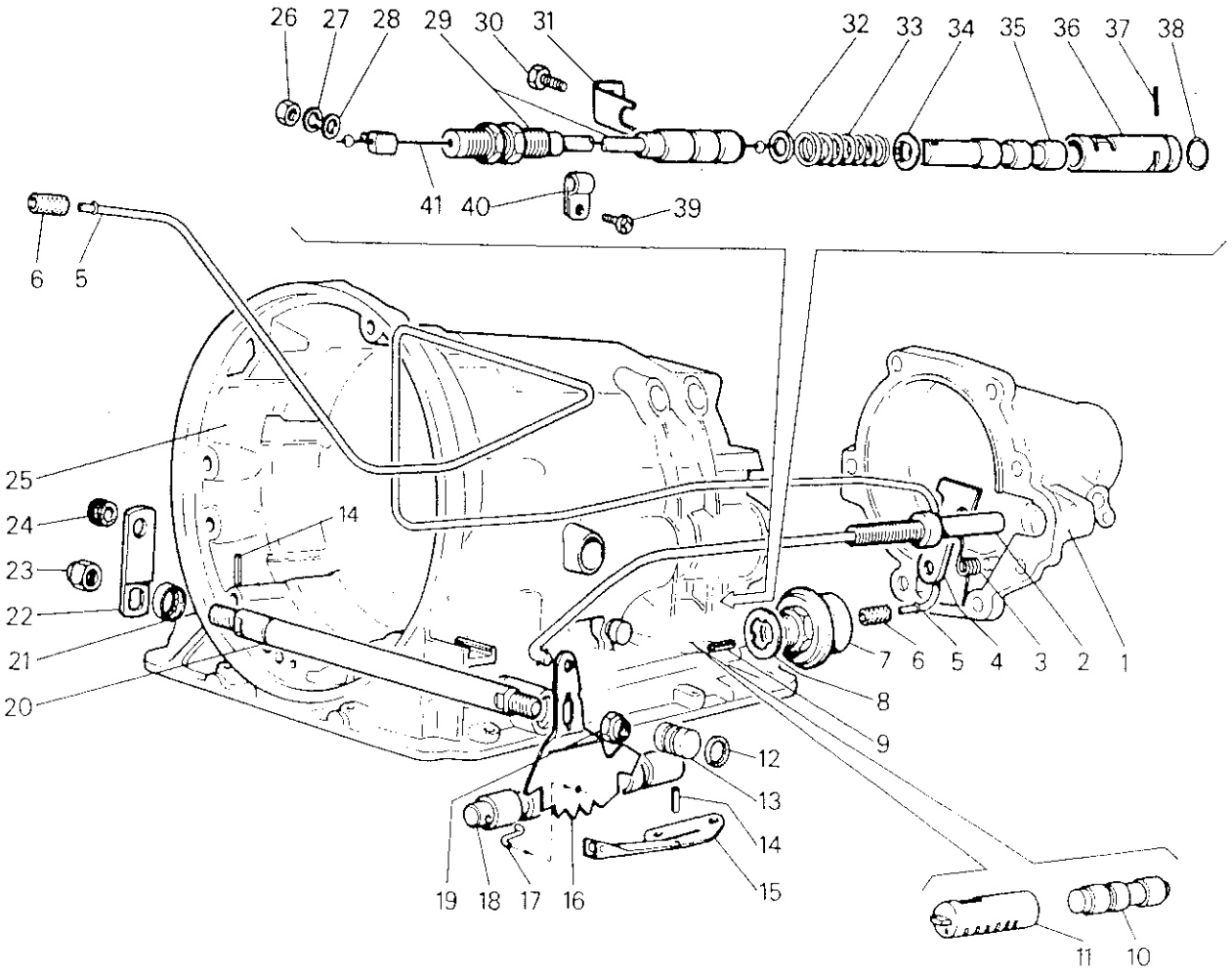
1. Bolt
2. Thrust bearing race
3. Bushing
4. Thrust bearing
5. Screw and washer
6. Thrust washer
7. Thrust bearing
8. Thrust washer
9. Input shaft
10. Oil seal
11. Third clutch piston
12. Spring retainer
13. Thrust washer
14. Wave washer
15. Clutch plate
16. Sprag assembly
17. Retaining ring
18. Outer race
19. Input sun gear
20. Clutch plate
21. Snap ring
22. Clutch spring
23. Oil seal
24. Output shaft
25. Speedometer drive gear
26. Lock plate
27. Thrust bearing race
28. Reaction sun gear and drum
29. Low band
30. Connection
31. Main case
32. Vent
33. Connection

HIRD CLUTCH, PLANETARY CARRIER, REACTION SUN GEAR, LOW BAND, AND MAIN CASE



1. Retaining ring
2. Clutch plate
3. Thrust washer
4. Snap ring
5. Clutch spring
6. Oil seal
7. Second clutch drum
8. Clutch plate
9. Wave washer
10. Selective washer
11. Washer
12. Bolt
13. Oil seal
14. Bushing
15. Converter housing
16. Oil pum
17. Bushing
18. Oil seal rings
19. Reverse clutch piston
20. Spring retainer
21. Snap ring
22. Clutch spring
23. Inner seal
24. Outer seal
25. Gasket
26. Wear plate
27. Outer seal
28. Seal washers
29. Bolt
30. Bolt
31. Torque converter
32. Bushing
33. Clutch plate
34. Reaction plate
35. Oil seal
36. Second clutch piston
37. Spring retainer
38. Wave washer
39. Clutch plate
40. Spacer
41. Ring gear

TORQUE CONVERTER, OIL PUMP, REVERSE CLUTCH, AND SECOND CLUTCH



1. Extension housing
2. Parking lock actuator
3. Spring
4. Parking pawl
5. Vacuum tube
6. Hose
7. Modulator
8. Gasket
9. Plunger
10. Modulator valve
11. Sleeve
12. Gasket
13. Plug
14. Retaining pin
15. Detent spring
16. Selector lever
17. Link
18. Manual valve
19. Nut
20. Shaft
21. Seal
22. Control lever
23. Nut
24. Washers
25. Main case
26. Nut
27. Lockwasher
28. Washer
29. Kickdown cable
30. Bolt
31. Support
32. Washer
33. Spring
34. Spring seat
35. Detent valve
36. Sleeve
37. Retaining pin
38. Oil seal
39. Screw
40. Clamp
41. Cable

TRANSMISSION INNER CONTROLS

BRAKE BAND ADJUSTMENT

Adjust brake band in car as follows:

Drain transmission oil.

Remove sump and gasket.

Remove servobrake cover (15).

Loosen locknut (14) of adjusting screw (13).

Using torque wrench and socket tighten screw (13) to 40 in lb (46 kgm).

Then back off screw five turns.

Tighten locknut (14) to 12 to 15 ft lbs (1.7 to 2.1 kgm). Hold sleeve (5) and screw (13) to prevent rotation.

Install servobrake cover (15).

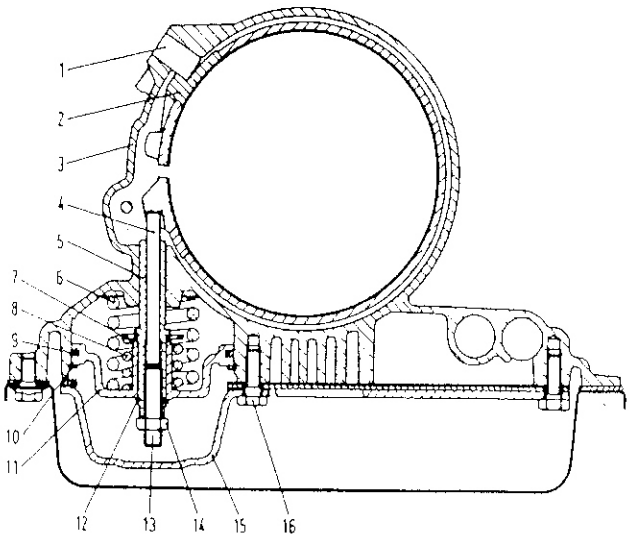
Use a new gasket. Tighten bolts (16) to 17 to 19 ft lbs (2.3 to 2.5 kgm).

Install oil sump with new gasket. Tighten attaching bolts to 7 to 9 ft lbs (1 to 3 kgm).

Fill transmission with oil.

NOTE: The correct adjustment of the brake band is not confined to clearance between band and drum but includes the correct preload setting of the servobrake release spring. The servobrake acts as an accumulator for oil directed to the reverse clutch when shifting from intermediate to high gear. Therefore the band adjustment directly affects the operation of the rear clutch.

1. Brake band anchoring pin
2. Brake band
3. Transmission main case
4. Brake actuating rod
5. Sleeve
6. Release spring
7. Damping spring seat
8. Damping spring
9. Piston ring
10. Retainer
11. Piston
12. Circlip
13. Adjusting screw
14. Nut
15. Servobrake cover
16. Cover bolt

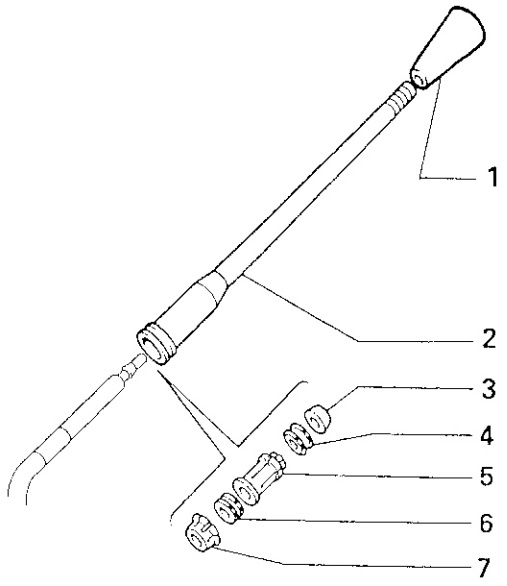


MANUAL TRANSMISSION LINKAGE

REMOVAL AND INSTALLATION

Refer to Manual Transmission portion in this section for removal and installation.

1. Knob 2. Upper half of gearshift lever 3. Shoulder block
4. Rubber bushing 5. Spacer 6. Rubber bushing 7. Plastic retainer



AUTOMATIC TRANSMISSION LINKAGE

ADJUSTMENT (Carburetor Vehicles Only)

Refer to illustration on facing page.

The travel of accelerator pedal between positions I and III is divided into two parts (Travel "A" and "B"). Travel "A" is from pedal released (position I) up to wide open throttle (position II). Travel "B" is from wide open throttle (position II) up to travel stop (position III). This additional travel is accomplished by overcoming the action of the spring in the telescoping link (3). Travels "A" and "B" must be adjusted together since they make up the total travel "D" and are interdependent. Pedal travel is limited by stops (15 and 16).

The correct setting for KICK-DOWN is when the telescoping link (3) has extended 0.276 to 0.354 in (7 to 9 mm) with the carburetor butterfly full open and the accelerator pedal against stop (15).

Checking and Adjusting Travel

Disconnect telescoping link (3) from control lever (1).

Push accelerator pedal (13) down until ball end (6) on cable (7) is just touching cable pin (5). Push pedal to stop (15). Check that cable (7) has extended 0.276 to 0.354 in (7 to 9 mm).

If cable travel is not correct, adjust nuts (10).

Push pedal (13) to stop (15).

Hold control lever (1) in full throttle (position II). Extend telescoping link (3) 0.315 to 0.393 in (8 to 10 mm). Check that link can be connected to control lever (1) when extended.

If link cannot be connected, loosen nuts (2 and 4) and adjust link (3).

Release accelerator pedal until ball end (6) is just touching cable pin (5). Move control lever (1) to full throttle (position II). Check that telescoping link (3) can be connected to control lever (1) without extending.

If link cannot be connected, loosen nuts (2 and 4) and adjust link (3).

When adjusting link (3) make equal adjustments at each end. Adjusting only one end could cause that end to run out of threads.

NOTE: For correct adjustment it is necessary for the kick-down valve to move its specified travel when accelerator pedal is fully depressed (position III).

THROTTLE AND KICK-DOWN CABLE ADJUSTMENT (Fuel Injection Only)

Make sure engine idle speed is set correctly (Refer to Engine Section).

Throttle Cable

Check for cable slack at the cable housing support on the intake manifold.

Pull back lightly on the cable housing until just prior to moving throttle lever. Check for approximate clearance of 1 mm between adjustment nuts and support.

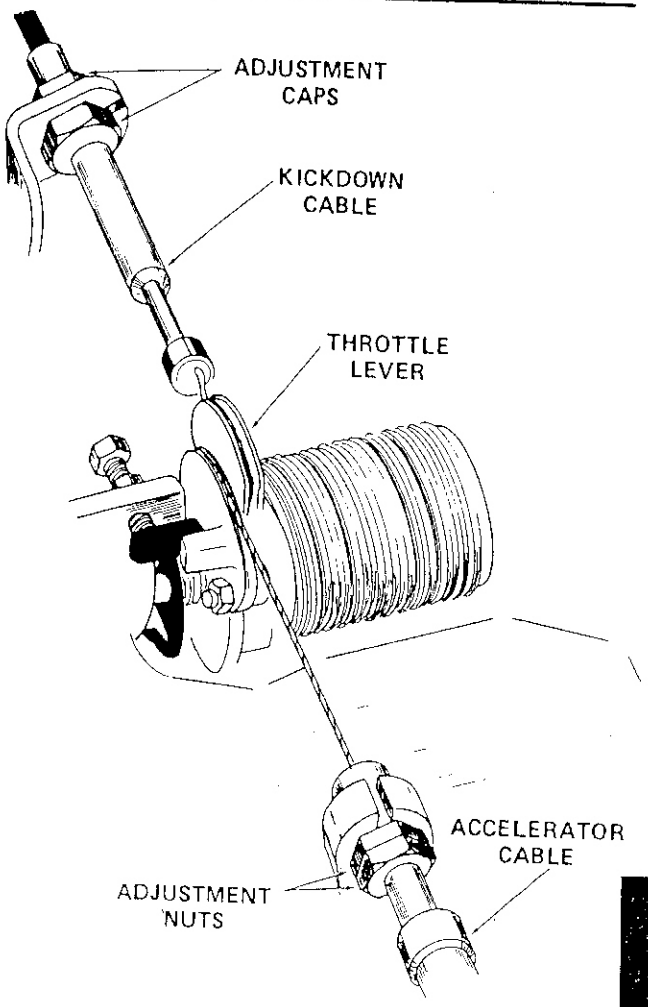
If necessary, adjust nuts to obtain clearance.

Kick-Down Cable

Depress throttle cable until lever contacts the maximum opening stop. Check that kick-down cable starts to pull at this point.

Fully depress throttle. Check that kick-down cable extends 9 to 11 mm.

If necessary, adjust nuts on housing to obtain correct extension of cable.



SELECTOR VALVE LINKAGE

ADJUSTMENT

Refer to illustration on facing page.

This adjustment may be required to correct a loose condition in linkage or as a result of power plant taking some set on rubber mounts.

A misadjustment of linkage will eventually affect selector lever (3), so that movement of lever will fail to affect a corresponding movement of selector valve.

To adjust linkage, proceed as follows:

- Disconnect tie rod (13) from relay lever (10) and set this in position [P].
- Set lever (14) in position [P] (all the way back): to check that this position is correct, make sure vehicle is blocked.
- Adjust length of rod (13), if necessary, by turning nut (12) as required, and reconnect rod to relay lever (10), after locking nut (12).

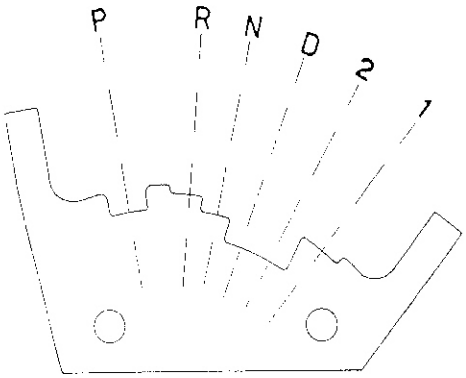
With lower handle (2) up, check all six positions: a definite click should be felt in each position.

Then check selector lever (3) for correct positioning in gear selector (5) gate, as follows:

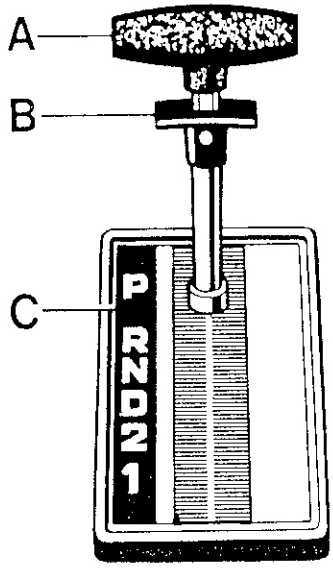
- With lower handle (2) fully up, select position [1] and release handle: stop tooth should engage selector gate without causing selector lever (3) to be shifted from its position.
- Repeat above check in all other positions and correct adjustment of rod (13), if required.

Make sure selector positions are in line with numbers and letters on selector plate; if not, adjust plate as required.

CAUTION: Misadjustment of linkage may cause manual valve to direct part of oil under pressure to discharge, when positions [D], [2], [1], and [R] are selected, without driver being able to notice trouble. This will result in a sudden drop of hydraulic pressure, with possible clutch slippage and attendant clutch lining burning.



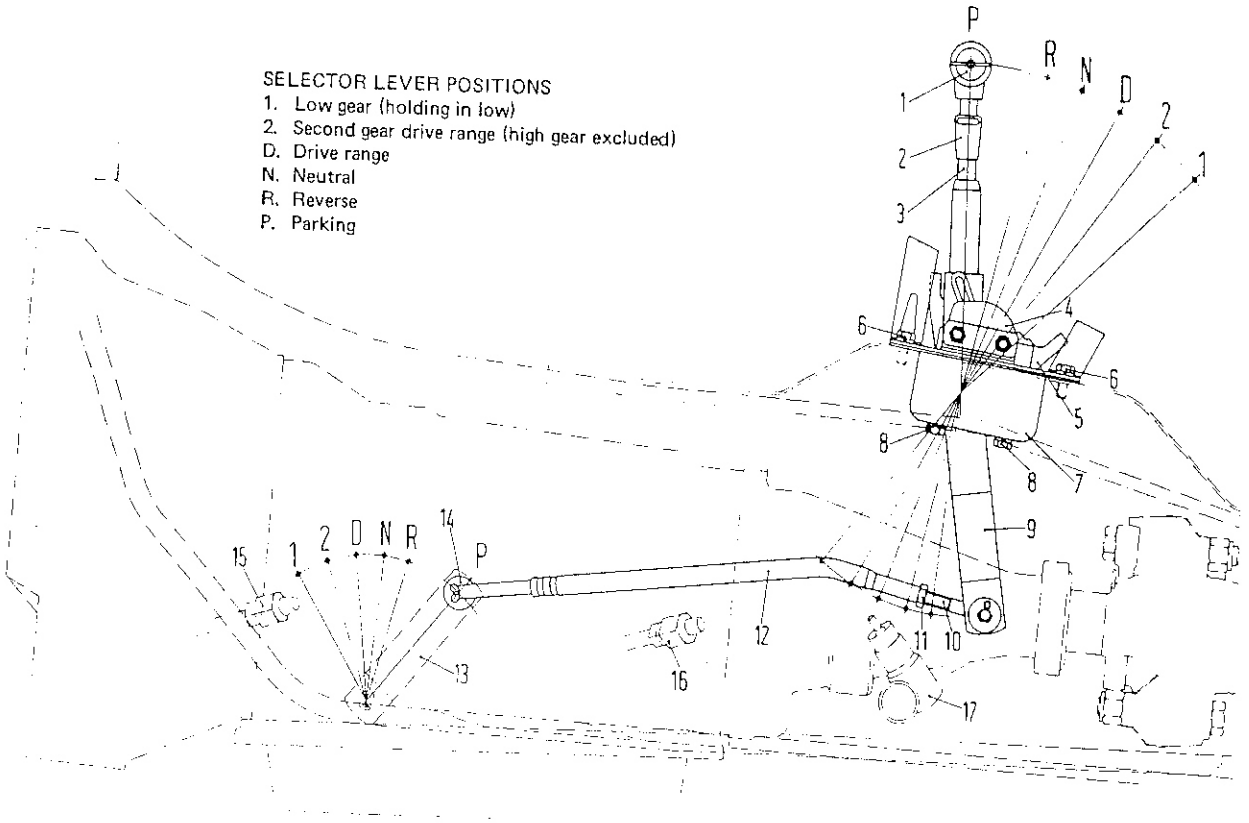
P. Parking
R. Reverse
N. Neutral
D. Drive range
1. Drive range (high gear excluded)
2. Low gear (holding in low)



A. Selector lever upper handle
B. Lower handle to be raised for shifting [P-R], [R-P], [N-R], [D-N], [2-1]
C. Gear indicator.

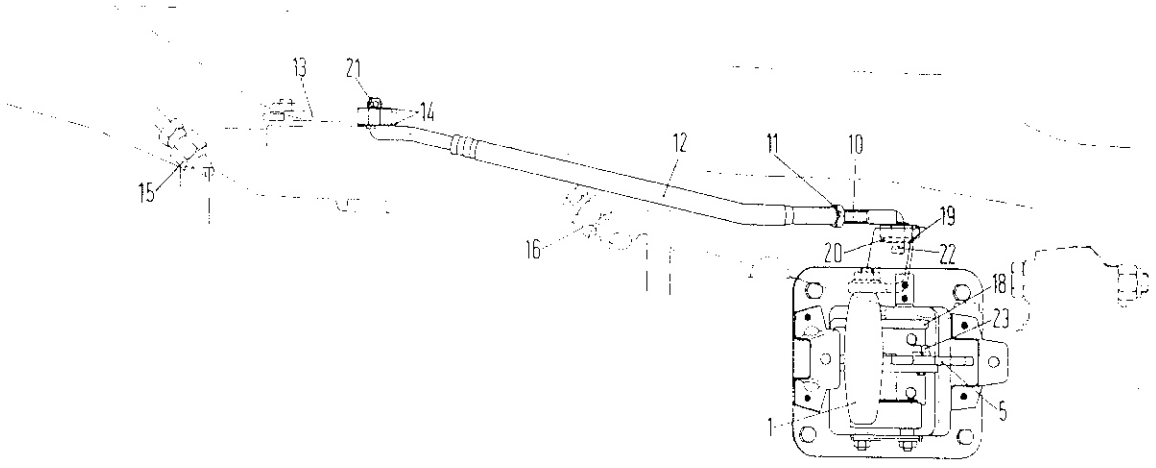
AUTOMATIC TRANSMISSION LINKAGE

SELECTOR LEVER POSITIONS
1. Low gear (holding in low)
2. Second gear drive range (high gear excluded)
D. Drive range
N. Neutral
R. Reverse
P. Parking



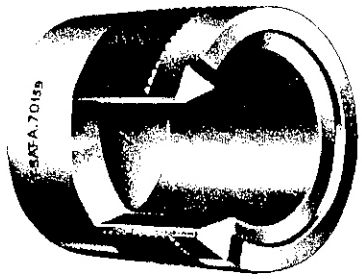
SELECTOR VALVE CONTROL AND PARKING LOCK LINKAGE

1. Upper handle
2. Lower handle
3. Selector lever
4. Starter inhibitor switch
5. Gear selector
6. Bolt
7. Support
8. Bracket bolt
9. Relay lever
10. Tie rod adjustable end
11. Adjusting nut
12. Tie rod
13. Cross shaft actuating lever
14. Flat washer
15. Oil union
16. Oil union
17. Speedometer drive support
18. Bracket
19. Flat washer
20. Bushing
21. Cotter pin
22. Cotter pin
23. Gear selector bolt

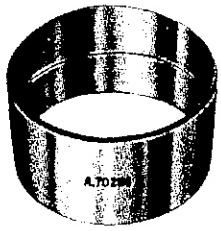


NOTE: Number given in parentheses is Kent-Moore catalogue number.

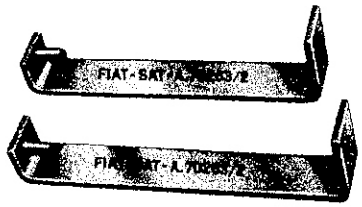
A.70159 (J28103) Remover and installer, snap ring and spring washer



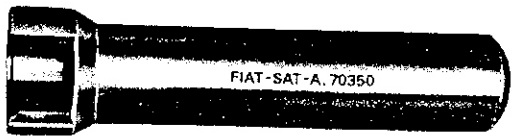
A.70256 (J23084) Ring for installing third clutch piston



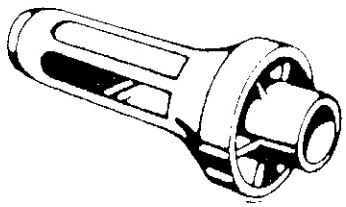
A.70263/2 (J23075-10) Holding brackets for tool 23075



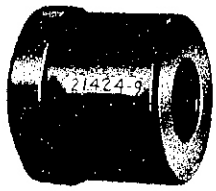
A.70350 (J28117) Remover and installer, snap ring and spring washer



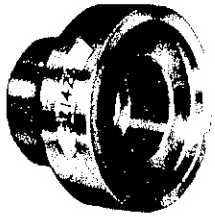
A.21359 (J23159) Converter housing seal installer



A.21424-9 (J21424-9) Extension housing bushing installer

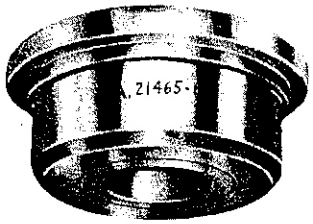


A.21426 (J21426) Extension housing oil seal installer

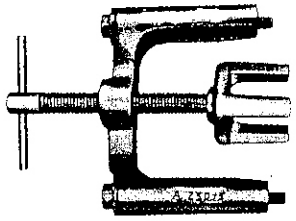


2
1

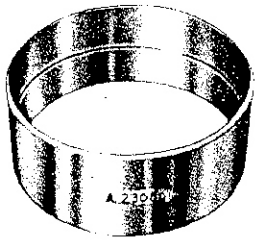
21465-17 (J21465-17) Remover and installer, converter housing bushing



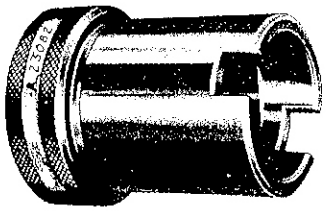
23075 (J23075) Spring compressor



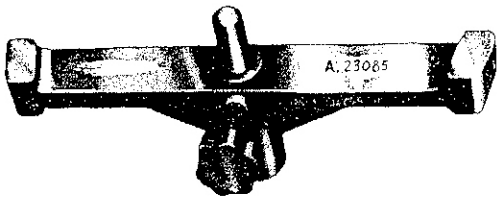
A.70255 (J23080-A) Second clutch piston seal installer



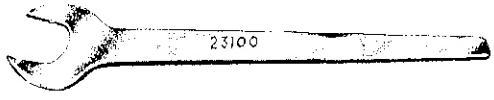
23082 (J23082-01) Converter housing to oil pump aligning tool



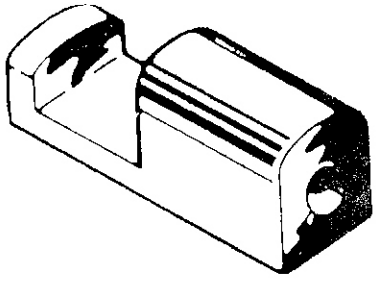
23085 (J23085) Oil pump hub to second clutch gauging tool



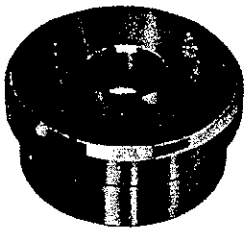
23100 (J23100) Vacuum modulator wrench



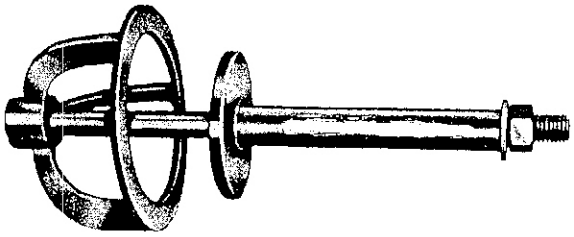
23129 (J23129) Converter housing seal remover



23130 (J23130) Bushing service tool set

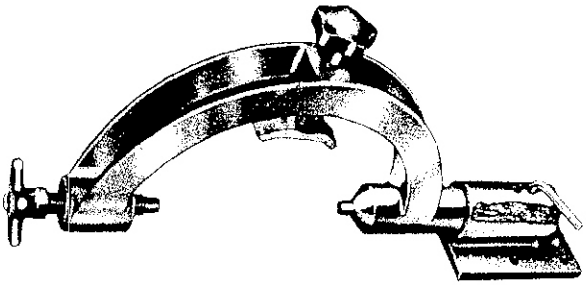


70250 (J23078) Clutch spring compressor
(J2590-02, 03, 04, 05 can be used)

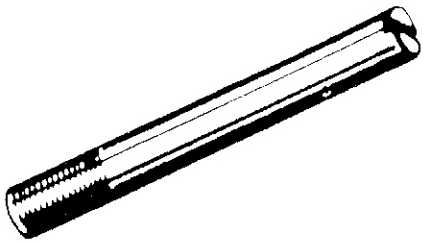


328920 (J3289-20) Holding fixture base

A.876302 (J8763-02) Transmission holding fixture



33872 (J3387-2) Aligning pins



5907 (J5907) Pressure gauge set