ACURA
INTEGRA - CA

INDEX

AUTOMATIC TRANSMISSION SERVICE GROUP
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INTRODUCTION
CA
ACURA INTEGRA 1987

The Acura Integra transaxle is a hydraulic controlled 4 speed front wheel drive unit with 4 forward speeds and one reverse with a converter clutch. The teardown - assembly and trouble shooting is covered in this manual.

"ATSG would like to thank Honda Motor Co. for the illustrations and information contained in this manual."

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

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The Automatic Transmission is a combination of a 3-element torque converter and dual-shaft automatic transmission which provides 4 speeds forward and 1 speed reverse. The entire unit is positioned in line with the engine.

TORQUE CONVERTER, GEARS, AND CLUTCHES

The torque converter consists of a pump, turbine and stator, assembled in a single unit.
They are connected to the engine crankshaft so they turn together as a unit as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft.
The transmission has two parallel shafts, the mainshaft and countershaft. The mainshaft is in line with the engine crankshaft.
The mainshaft includes the clutches for 1st, and 2nd/4th, and gears for 3rd, 2nd, 4th, Reverse and 1st (3rd gear is integral with the mainshaft, while reverse gear is integral with 4th gear).
The countershaft includes 3rd clutch and gears for 3rd, and 4th, Reverse and 1st.
4th and reverse gears can be locked to the countershaft at its center, providing 4th gear or Reverse, depending on which way the selector is moved.
The gears on the mainshaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft to the countershaft to provide [D3], [D4], [2] and [R].

HYDRAULIC CONTROL

The valve assembly includes the main valve body, secondary valve body, serve valve body, modulator valve body, regulator valve body and lock-up shift valve body, through the respective separator plates.
They are bolted to the torque converter case as an assembly.
The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, 3-4 shait valve, pressure relief valve, 2nd orifice control valve, and oil pump gear.
The secondary valve body includes the CPC valve, REV control valve, lock-up cut valve, kickdown valve, 3-2 timing valve and shift timing valves.

The serve valve body contains the accumulator pistons, 3rd orifice control valve, throttle A and B valves, and the modulator valve.
The regulator valve body contains the lock-up timing valves, pressure regulator valve and lock-up control valve. Fluid from the regulator passes through the manual valve to the various control valves.

The lock-up shift valve body contains a lock-up timing valve and lock-up shift valve. The 1st, 3rd and 4th clutches receive oil from their respective feed pipes.

LOCK-UP MECHANISM

In [D4], pressurized fluid is drained from the back of the torque converter through an oil passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Togehter with hydraulic control, an electronic control unit optimizes the timing of the lock-up mechanism.

The lock-up shift valve body controls the range of lock-up according to vehicle speed and throttle pressure. The lock-up timing valve controls the flow of oil to the lock-up shift valve in 3rd and 4th gear (in [D4] range).

The lock-up cut valve is housed in the secondary valve body and prevents lock-up from taking place when the throttle is not opened sufficiently.

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GEAR SELECTION

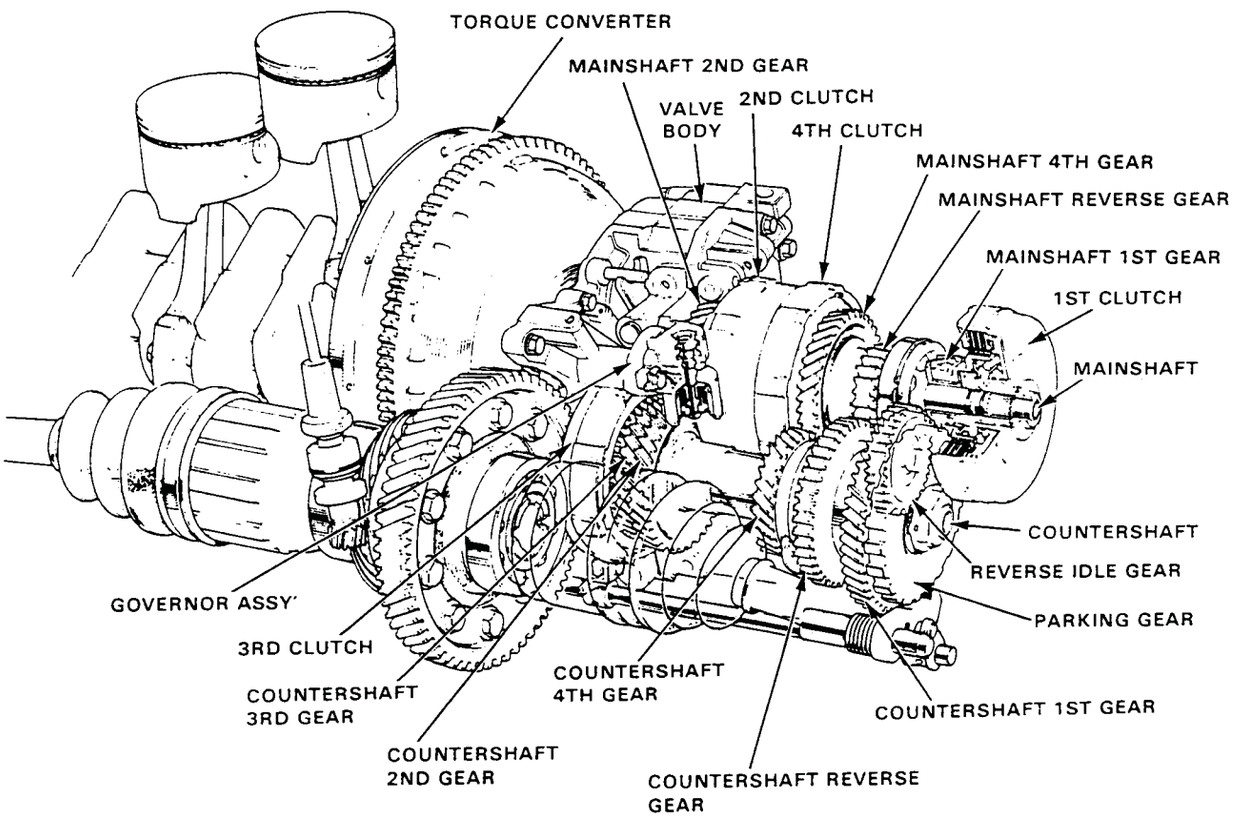
The selector lever has six positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D4] 1st through 4th gear ranges, [D3] 1st through 3rd gear ranges, and [2] 2nd gear.

Position	Description
[P] PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th gear clutch locked.
[N] NEUTRAL	All clutches released.
[D4] DRIVE (1 through 4)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshift through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in [D4].
[D3] DRIVE (1 through 3)	For rapid acceleration at highway speeds and general driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop.
[2] SECOND	For engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.

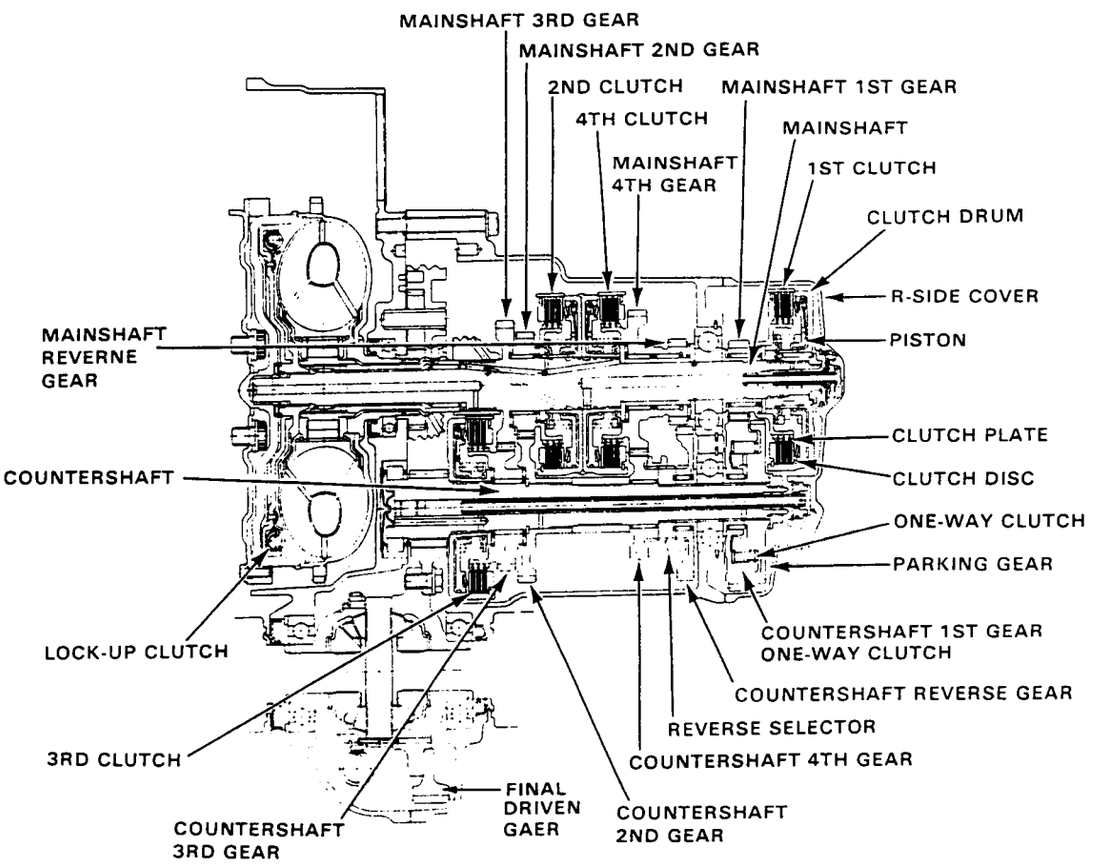
Starting is possible only in [P] and [N] through use of a slide-type, neutral-safety switch.

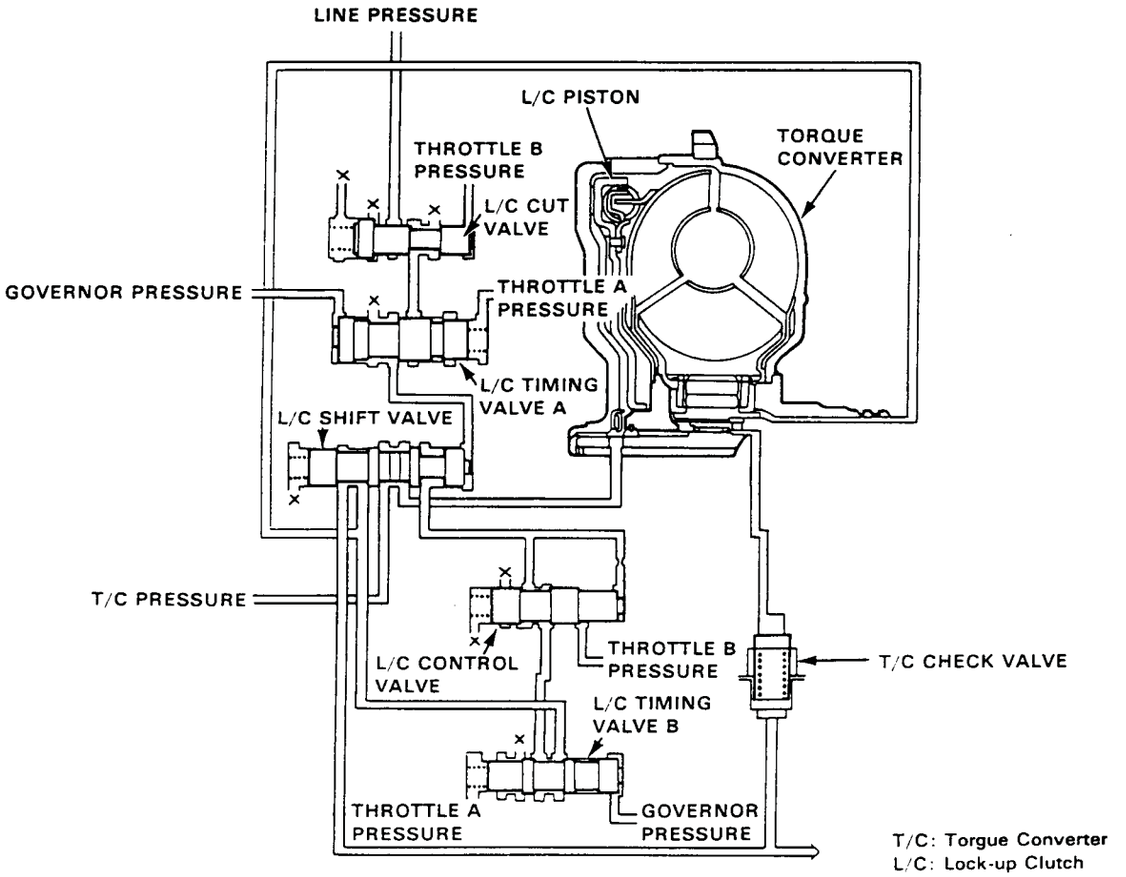
POSITION INDICATOR

A position indicator in the instrument panel shows what gear has been selected without having to look down at the console.

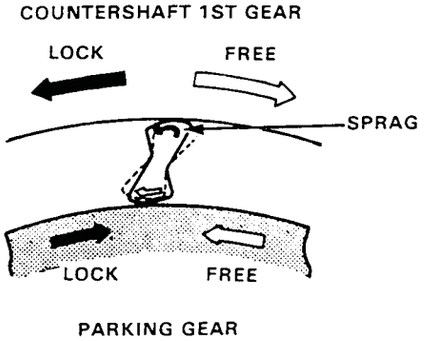


[1st Clutch]
The 1st clutch is on the right end of the mainshaft. In the D3 or D4 range, constant hydraulic pressure is applied to the mainshaft through the 1st clutch to the mainshaft 1st gear.
The clutch plate is mounted on the clutch drum, while the clutch disc is fitted to the mainshaft 1st gear.
The 1st gears are attached to the mainshaft and countershaft through needle bearings, one for each gear.
When select lever is placed in the D3 or D4 range, hydraulic pressure is applied from the right side cover through the mainshaft, and thus to the clutch drum; as the pressure rises, the clutch piston presses the clutch plate and clutch disc, thus causing the clutch to engage.
Power is transmitted from the mainshaft 1st gear, through the countershaft 1st gear, to the one-way clutch, parking gear, and finally to the countershaft. The one-way clutch locks in the forward direction when in 1st gear. In the D3 or D4 range, all others beside 1st gear are not engaged, thus transmitting no power.
[2nd Clutch]
The 2nd clutch is left of center on the mainshaft, and is the same construction as the 1st clutch;
The 2nd clutch is joined back-to-back to the 4th clutch, The mainshaft 2nd gear uses a needle bearing. The countershaft 2nd gear is splined on the countershaft.
In 2nd gear of 2, D3 , or D4, hydraulic pressure is applied to the clutch drum from the mainshaft, thus transmitting power from the mainshaft 2nd gear to the countershaft 2nd gear.
[3rd Clutch]
The 3rd clutch is on the left end of the countershaft.
The clutch hub is joined to the countershaft 3rd gear, on the countershaft, supported by a single needle bearing.
In 3rd gear of D3 or D4, hydraulic pressure is applied to the 3rd clutch on the countershaft, thus causing the clutch to engage, and transmitting power.
[4th Clutch]
The 4th clutch is identical to the 2nd clutch, to which it is joined on the mainshaft. The clutch hub is joined to the mainshaft 4th gear and reverse gear, supported by two needle bearings.
In 4th gear of D4, hydraulic pressure is generated within the mainshaft, applying pressure to the 4th clutch on the mainshaft.





[One-way Clutch]
A one-way sprag clutch disengages 1st gear when in the 2nd and 3rd gear ranges. The clutch is splined to the countershaft between the 1st gear and the parking gear. It is composed of sprag elements and the retainer which supports the central section of the sprags. When the respective gaers move in the → directions, the sprags incline to the left, with the result that they lock the gears together.
When shifting from 1st to 2nd in the [D3] or [D4] range, the different ratio of the two gears causes the countershaft to rotate (via 2nd gear) at a speed greater than that of 1st gear. As a result, the parking gear is rotated in the ⇔ direction, and the sprags move away from their locking position. In the 3rd gear of [D3] or [D4] the same difference of ratio keeps the sprags from locking and keeps 1st gear disengaged.

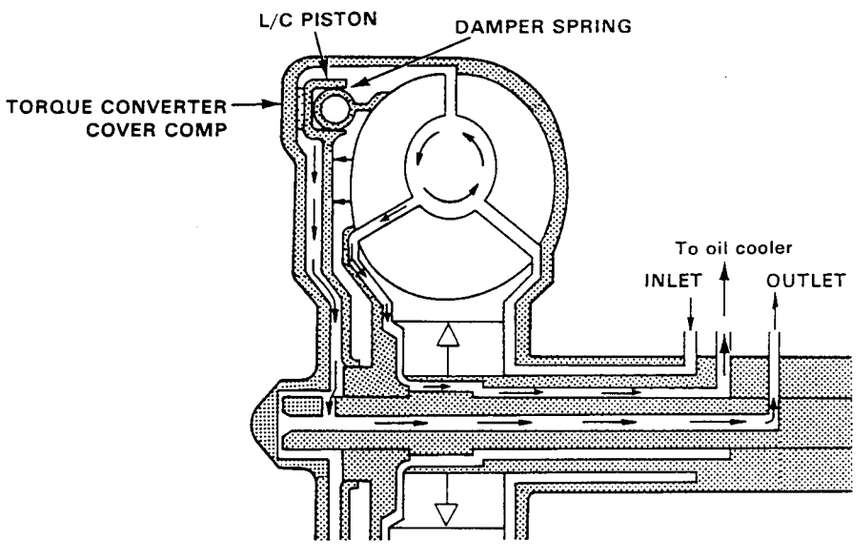


[Lock-up Clutch]
Operation (clutch on)
With the lock-up clutch on, the oil in the chamber between the converter cover and lock-up piston is discharged, and the converter oil exerts pressure through the piston against the converter cover. As a result, the converter turbine is locked on the converter cover firmly. The effect is to bypass the converter, thereby placing the car in direct drive.

Power flow

The power flows by way of:

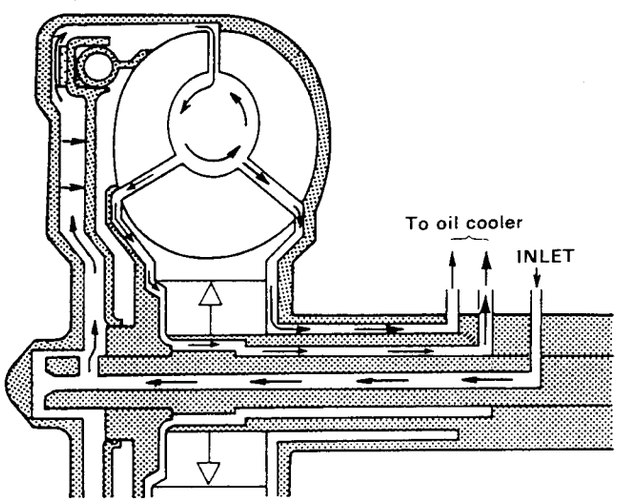
Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



Operation (clutch off)
With the lock-up clutch off, the oil flows in the reverse of CLUTCH ON. As a result, the lock-up Psiton is moved away from the converter cover; that is, the torque converter lock-up is released.

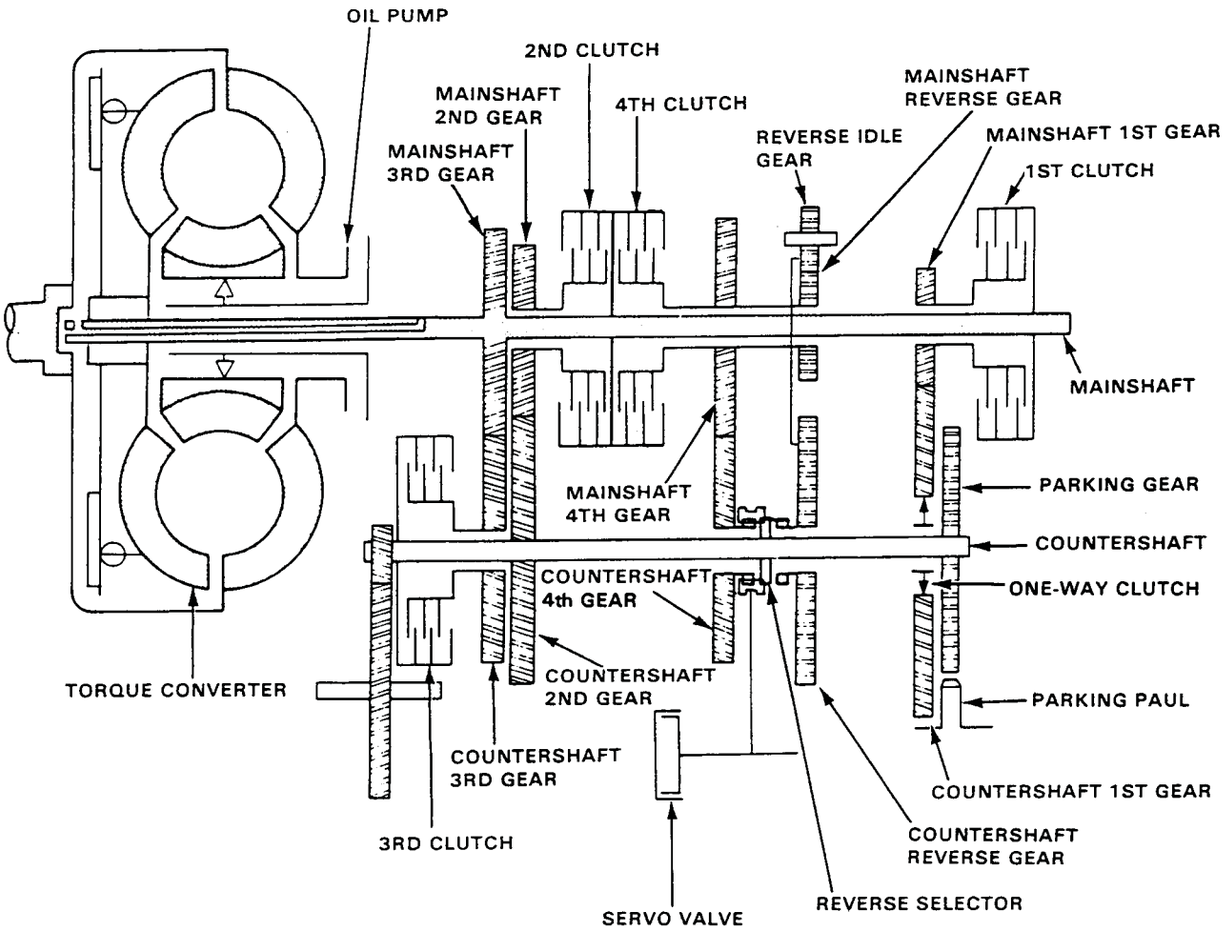
Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft

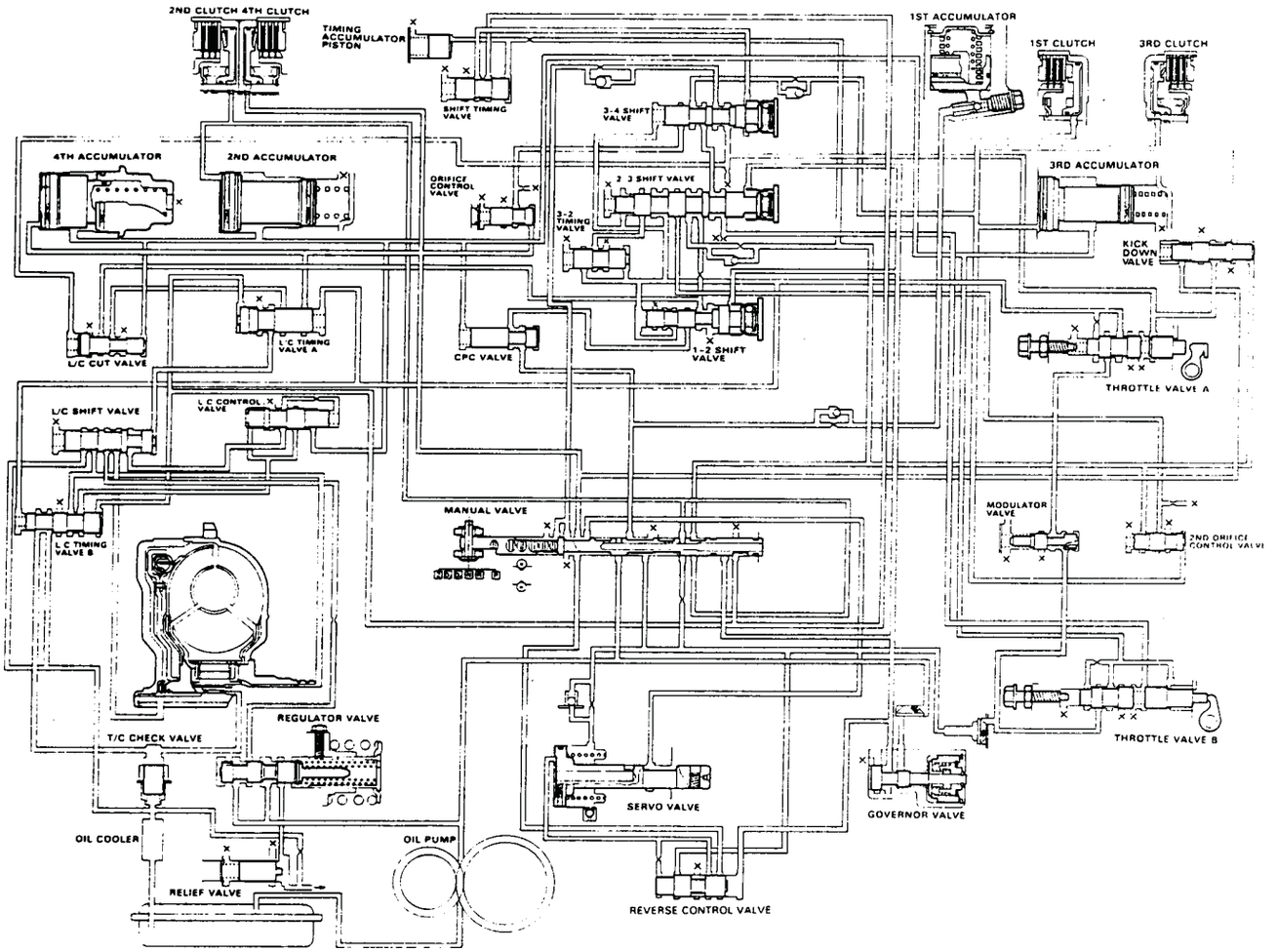


RANGE \ PART		TORQUE CONVERTER	1ST GEAR 1ST CLUTCH	1ST GEAR ONE-WAY CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH GEAR	4TH CLUTCH	REVERSE GEAR	PARKING GEAR
P		○	×	×	×	×	×	×	×	○
R		○	×	×	×	×	×	○	○	×
N		○	×	×	×	×	×	×	×	×
D₃	1ST	○	○	○	×	×	×	×	×	×
	2ND	○	※○	×	○	×	×	×	×	×
	3RD	○	※○	×	×	○	×	×	×	×
D₄	1ST	○	○	○	×	×	×	×	×	×
	2ND	○	※○	×	○	×	×	×	×	×
	3RD	○	※○	×	×	○	×	×	×	×
	4TH	○	※○	×	×	×	○	○	×	×
2	2ND	○	×	×	○	×	×	×	×	×

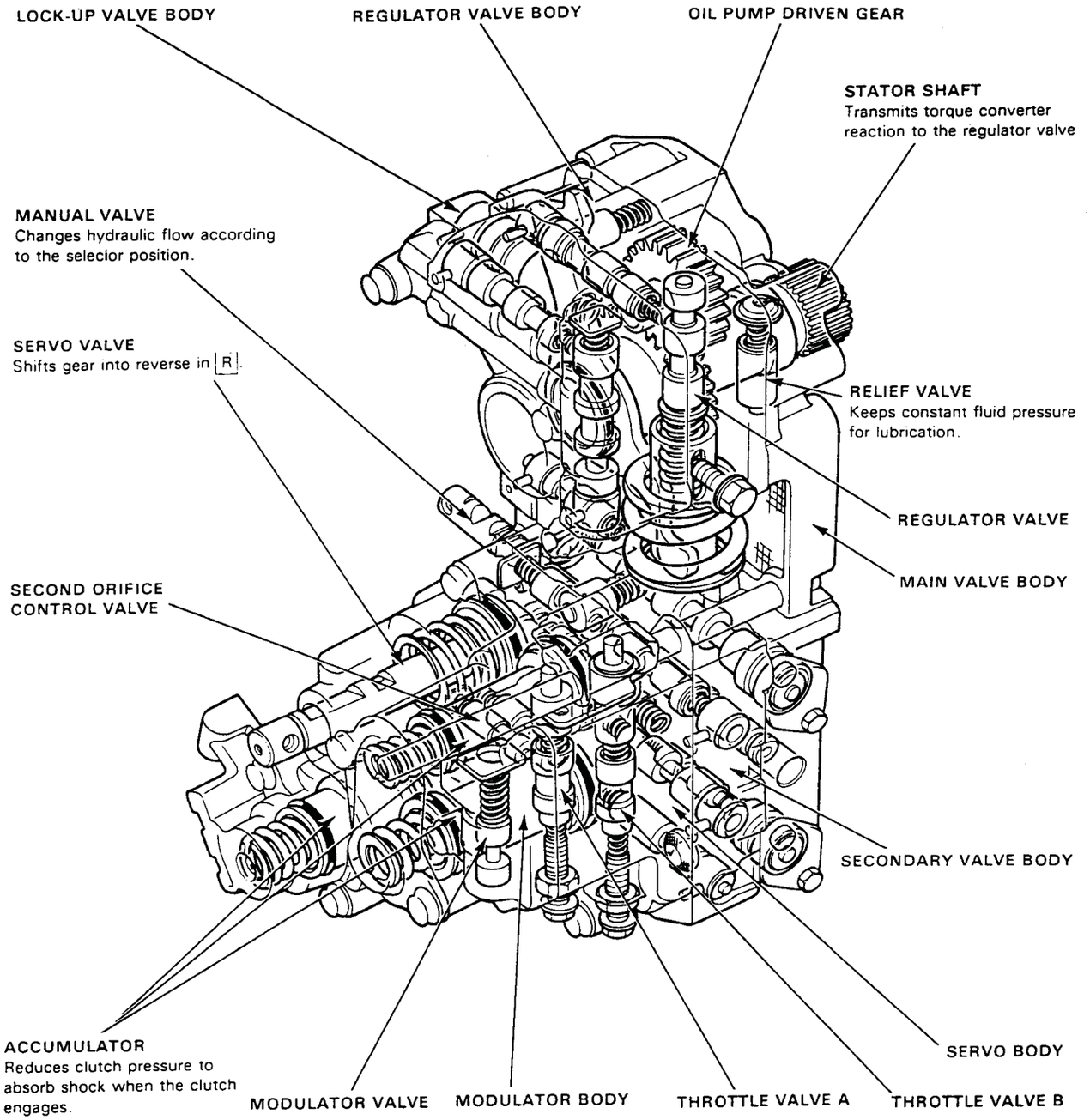
○: Engaged ×: Not Engaged ※: Although the 1st clutch engages, driving power in not transmitted as the one-way clutch races.



No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE
1	LINE	10	1ST CLUTCH	40	4TH CLUTCH	90	TORQUE CONVERTER
2	↑	11	↑	41	↑	91	↑
3	↑	20	2ND CLUTCH	42	↑	92	↑
3'	↑	21	↑	50	THROTTLE A	93	OIL COOLER
3"	↑	22	↑	51	↑	94	TORQUE CONVERTER
4	↑	23	↑	55	THROTTEL B	95	LUBRICATION
4'	↑	24	↑	56	↑	96	TORQUE CONVERTER
5	↑	30	3RD CLUTCH	60	GOVERNOR	97	↑
6	MODULATOR	31	↑	61	↑	99	SUCTION

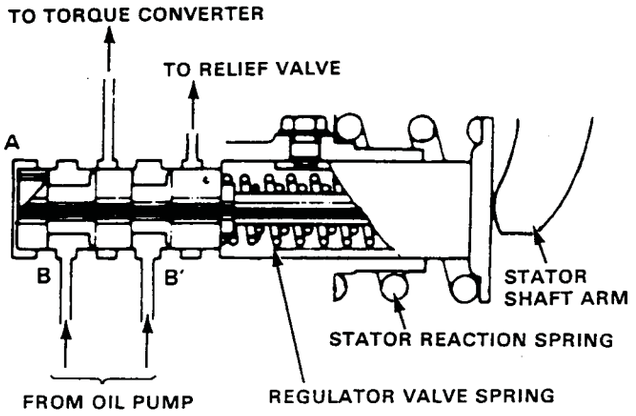


In the hydraulic control unit, the regulator valve, manual valve and oil pump connected to the torque converter are unified and contained inside the valve body. The valve body includes the main valve body, the regulator valve body, the secondary valve body, the servo body, and the lock-up valve body.
The oil pump is driven by splines on the left end of the torque converter which is attached to the engine. Oil flows through the regulator valve, to maintain specified pressure through the main valve body to the manual valve, governor lalve, and servo body, directing pressure to each of the clutches.

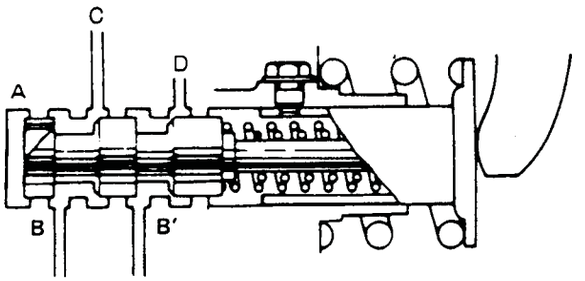


[Regulator Valve]
The regulator valve maintains a constant hydraulic pressure sent from the oil pump to the hydraulic control system, while also furnishing oil to the lubricating system and torque converter.
Oil flows through B and B'. The oil which enters through B flows through the valve orifice to A pushing the regulator valve to the right. According to the level of hydraulic pressure through B, the position of the valve changes, and the amount of the oil through B' from D thus changes. This operation is continued, thus maintaining the line pressure.

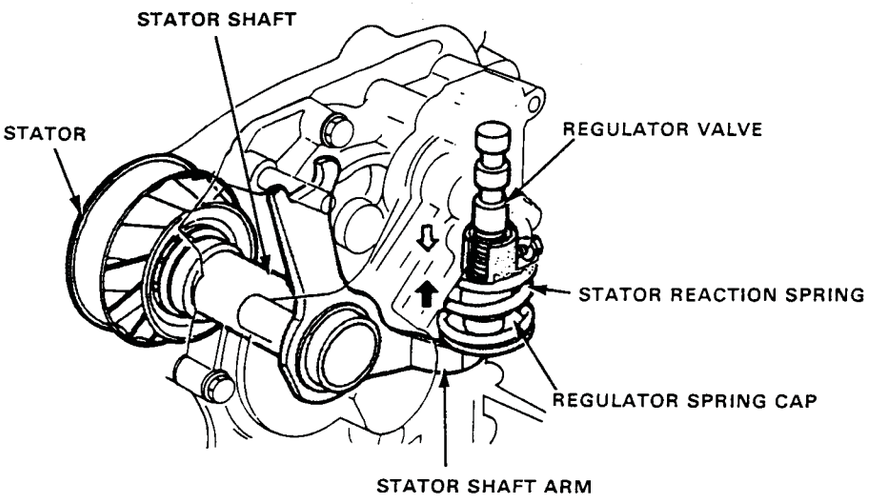
(ENGINE NOT RUNNING)



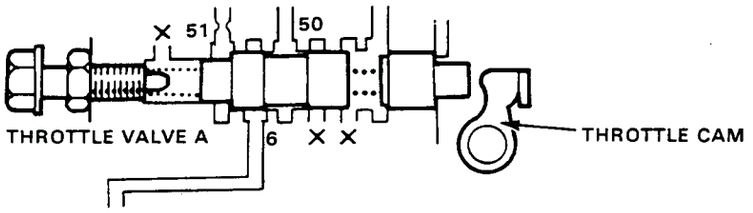
(ENGINE RUNNING)



(Stator Reaction Hydraulic Pressure Control)
Hydraulic pressure increase according to torque is performed by the regulator valve using stator torque reaction. The stator shaft is splined in the stator and its arm end contacts the regulator spring cap. When the car is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft and the stator arm pushes the regulator spring cap → direction in proportion to the reaction. The spring compresses and the valve moves to increase the regulated control pressure or line pressure. Line pressure is maximum when the stator reaction is maximum.

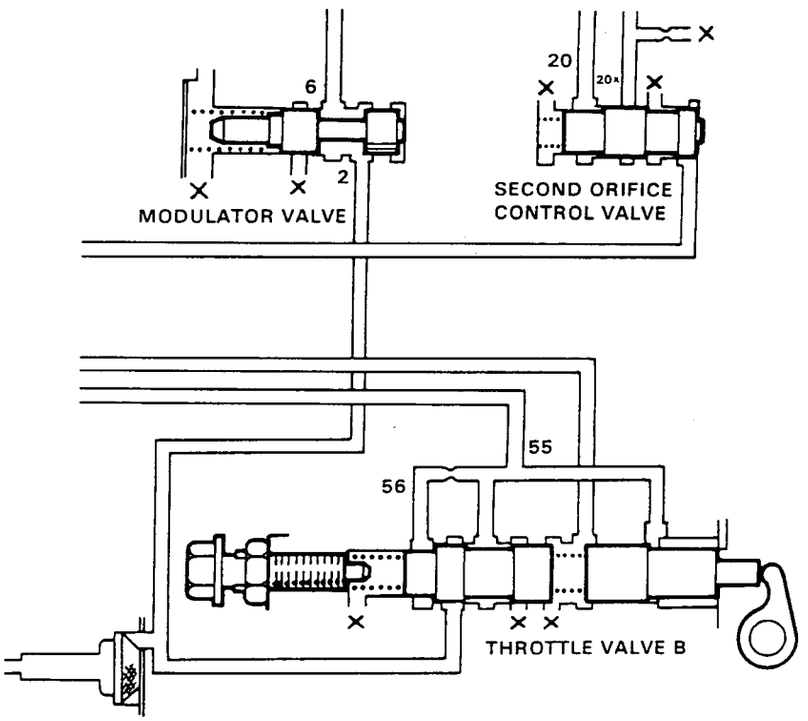


[Throttle Valve A]
Throttle Valve A converts changes in the throttle opening to changes in transmission hydraulic pressure, to determine transmission shift timing. The end of the valve contacts the throttle cam which is connected by a cable to the throttle body. The cable pulls the cam, which, in turn moves the valve. The valve-to-cam engagement is adjustable to allow setting of specifeid shift speeds.



[Throttle Valve B, Mdulator Valve]
Throttle valve B is similar to valve A, except that it operates on accumulator back pressure, to make smooth changes from one gear to another. An assist function is used to lessen the throttle load. The modulator valve maintains line pressure from the regulator, after which the pressure to throttle valve A, thus maintaining accurate shift characteristics.

[Second Orifice Control Valve]
For smooth shifing between second to third, the open pressure on the second gear side is relieved through a fixed orifice. The valve also moves to equalize pressure differences between second and third gears.



SYMPTOM	Check these items on PROBABLE CAUSE LIST	Check these items on NOTES PAGE
Engine runs, but car does not move in any gear.	1, 6, 7, 16	K, L, R, S
Car moves in R and 2, but not in D3 or D4.	8, 29, 44, 48	C, M, O
Car moves in D3, D4 and R, but not in 2.	9, 30, 49	C, L
Car moves in D3, D4 and 2, but not in R.	1, 11, 12, 22, 38, 39, 40	C, L, Q
Car moves in N.	1, 8, 9, 10, 11, 46, 47	C, D
Excessive idle vibration.	5, 17	B, K, L
Slips in all gears.	6, 7, 16	C, L, U
Slips in low gear.	8, 29, 44, 45, 48	C, N, O, U
Slips in 2nd gear.	9, 20, 23, 30, 45, 49	C, L, U
Slips in 3rd gear.	10, 21, 23, 31, 44, 45	C, L, U
Slips in 4th gear.	11, 23, 32, 45	C, L, U
Slips in reverse gear.	11, 32	C
Slips on 2–3 upshift.	3, 15, 24	E, L, V
Slips on 3–4 upshift.	3, 15, 25	E, L, V
No upshift; trans stays in low gear.	12, 13, 14, 19, 23	E, F, G, L
No downshift to low gear.	12, 19	G, L
Late upshift.	2, 12, 13, 14	E, F, L, V
Early upshift.	3, 13, 14	E, F, L, V
Erratic shifting.	2, 14, 26	E, F, V
Harsh shift (up & down shifts).	2, 4, 15, 23, 24, 25, 27, 47	A, E, H, I, L, V
Harsh shift (1–2).	2, 9	C, D, V
Harsh shift (2–3).	2, 10, 23, 24	C, D, H, L, V
Harsh shift (3–4).	2, 11, 23, 25	C, D, I, L, V
Harsh kickdown shifts.	2, 23, 27	L, V, Q
Harsh kickdown shift (2–1).	48	O
Harsh downshift (3–2) at closed throttle.	15	E, T
Axle(s) slips out of trans on turns.	43, 50	L, P, Q
Axle(s) stuck in trans.	43	L, Q
Ratcheting noise when shifting into R.	6, 7, 38, 39, 40	K, L, Q
Loud popping noise when taking off in R.	38, 39, 40	L, Q
Ratcheting noise when shifting from R to P, or from R to N.	38, 39, 40, 51	K, L, Q
Noise from trans in all selector lever positions.	6, 17	K, L, Q
Noise from trans only when wheels rolling.	39, 42	L, Q
Gear whine, rpm related (pitch changes with shifts).	6, 41	K, L, Q
Gear whine, speed related (pitch changes with speed).	39, 42	L, Q
Trans will not shift into 4th gear in D4.	1, 21, 28	L
Engine stalls on emergency stops (shift lever in D4 only).	2, 33	L, V
Lockup clutch does not lock up smoothly.	35, 37, 17	L
Lockup clutch does not operate properly.	2, 3, 12, 15, 18, 33, 34, 35, 36, 37	E, L, V
Transmission has multitude of problems shifting, at disassembly large deposits of metal found on magnet.	43	L, Q

The following symptoms can be caused by improper repair or assembly.	Check these items on PROBABLE CAUSE DUE TO IM-PROPER REPAIR	Check these ITEMS ON NOTES PAGE
Car creeps in N.	R1, R2	
Car does not move in D3 or D4.	R5	
Trans lock up in R.	R4	
Trans has no park.	R3	
Excessive drag in trans.	R8	RK
Excessive vibration, rpm related.	R9	
Noise with wheels moving only.	R7	
Main seal pops out.	R10	S
Various shifting problems.	R11, R12	
Harsh upshifts.	R13	
In D3 or D4 trans starts in 2nd gear.	R6	

	PROBABLE CAUSE
1.	Shift cable broken/out of adjustment
2.	Throttle cable too short
3.	Throttle cable too long
4.	Wrong type ATF
5.	Idle rpm too low/high
6.	Oil pump worn or seized
7.	Pressure regulator stuck
8.	Low clutch defective
9.	2nd clutch defective
10.	3rd clutch defective
11.	4th clutch defective
12.	Governor valve stuck
13.	Throttle A valve stuck
14.	Modulator valve stuck
15.	Throttle B valve stuck
16.	Oil screen clogged
17.	Torque convertor defective
18.	Torque governor check valve stuck
19.	1–2 shift valve stuck
20.	2–3 shift valve stuck
21.	3–4 shift valve stuck
22.	Reverse control valve stuck
23.	Clutch pressure control valve stuck
24.	2nd orifice control valve stuck
25.	3rd orifice control valve stuck
26.	3–2 timing valve stuck
27.	Kickdown valve stuck
28.	Shift timing valve/accur stuck
29.	Low clutch accumulator defective
30.	2nd clutch accumulator defective
31.	3rd clutch accumulator defective
32.	4th/reverse accumulator defective
33.	Lockup clutch cut valve stuck
34.	Lockup clutch timing valve A stuck
35.	Lockup clutch timing valve B stuck
36.	Lockup clutch shift valve stuck
37.	Lockup clutch control valve stuck
38.	Shift fork bent
39.	Reverse gears worn/damaged (3 gears)
40.	Reverse selector gear worn
41.	3rd gears worn/damaged (2 gears)
42.	Final gears worn/damaged (2 gears)
43.	Differential pinion shaft worn
44.	Feedpipe O-ring broken

PROBABLE CAUSE	
45.	Servo valve check valve loose
46.	Gear clearance incorrect
47.	Clutch clearance incorrect
48.	Sprag clutch defective
49.	Sealing rings/guide worn
50.	Axle-inboard joint clip missing
51.	4th gears worn/damaged (2 gears)

PROBABLE CAUSES DUE TO IMPROPER REPAIR	
R1	Improper clutch clearance
R2	Improper gear clearance
R3	Parking pawl installed upside down
R4	Parking shift arm installled upside down
R5	Sprag clutch installed upside down
R6	Feed pipe missing in governor shaft
R7	Reverse hub installed upside down
R8	Oil pump binding
R9	Torque converter not fully seated in oil pump
R10	Main seal improperly installed
R11	Springs improperly installed
R12	Valves improperly installed
R13	Ball check valves not installed
R14	Shift fork bolt not installed

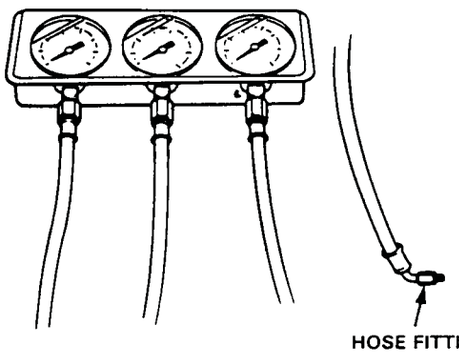
NOTES	
A	Flushing procedure (repeat 3 times): 1. Drain the trans. 2. Refill with 3 qts. of Dexron recommended type ATF. 3. Start engine and shift trans to D4. 4. Let trans shift through gears at least 5 times. 5. Shift to reverse and neutral at least 5 times. 6. Drain and refill.
B	Set idle rpm in gear to specified idle speed. If still no good, adjust the motor mounts as outlined in engine section of service manual.
C	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D	If the clutch pack is seized, or is excessively worn, inspect the other clutches for wear, and check the orifice control valves and throttle valves for free movement.
E	If throttle valve B is stuck, inspect the clutches for wear.
F	If the modulator valve is stuck open (does not modulate line pressure), the trans will shift normally with less than 5/8 throttle but will shift up very late over 5/8 throttle. If the modulator valve is stuck closed, throttle valve A pressure will be zero and result in early upshifts and no forced downshifts.
G	If the 1–2 valve is stuck closed, the transmission will not upshift. If stuck open, the transmission has no low gear.
H	If the 2nd orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I	If the 3rd orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J	If the clutch pressure control valve is stuck closed, the transmission will not shift out of low gear.

NOTES	
K	Improper alignment of main valve body and torque converter case may cause oil pump seizure. The symptoms are mostly an rpm related–ticking noise high pitched squeak. In severe instances, it may stall the engine. Follow instruction procedure on page 14-58.
L	If the oil screen is clogged with particles of steel or aluminum, inspect the oil pump and differential pinion shaft. If both are OK, and no cause for the contamination is found, replace the torque converter.
M	If the low clutch feedpipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the end cover as it is dented. The O-ring under the guide is probably broken.
N	Replace the mainshaft if the bushings for the low-and 4th feedpipe are loose or damaged. If the low feedpipe is damaged or out of round, replace it. If the 4th feedpipe is damaged or out of round, replace the end cover.
O	A worn or damaged sprag clutch is mostly a result of shifting the trans in D3 or D4 while the wheels rotate in reverse, such as rocking the car in snow.
P	Inspect the frame for collision damage.
Q	Inspect for damage or wear: 1. Governor shaft woodruff key 2. Reverse selector gear teeth chamfers 3. Engagement teeth chamfers of countershaft 4th & reverse gear 4. Shift fork, for scuff marks in center 5. Differential pinion shaft for wear under pinion gears 6. Bottom of 3rd clutch for swirl marks Replace items 1, 2, 3 and 4 if worn or damaged. If trans makes clicking, grinding or whirring noise, also replace mainshaft 4th gear and reverse idler gear and counter 4th gear in addition to 1, 2, 3, or 4. If differential pinion shaft is worn, overhaul differential assy and replace oil screen and thoroughly clean trans flush torque converter and cooler and lines. If bottom of 3rd clutch is swirled and trans makes gear noise, replace countershaft and ring gear.
R	Be very careful not to damage the torque converter case when replacing the main ball bearing. You may also damage the oil pump when you torque down the main valve body; this will result in oil pump seizure if not detected. Use proper tools.
S	Install the main seal flush with the torque converter case. When pushing it into the torque converter case until it bottoms out, it will block the oil return passage and result in damage.
T	Harsh downshifts when coasting to a stop with zero throttle may be caused by a bent-in throttle valve retainer/cam stopper. Throttle cable adjustment may clear this problem, check this adjustment, too. See page 14-75.
U	Check if servo valve check valve stopper cap is installed. If it was not installed, the check valve may have been pushed out by hydraulic pressure causing a leak (internal) affecting all forward gears.
V	Throttle cable adjustment is essential for proper operation of the transmission. Not only does it affect the shift points if misadjusted but also the shift quality and lockup clutch operation. A too long adjusted cable will result in throttle pressure being too low for the amount of engine torque input into the transmission, and may cause clutch slippage. A too short adjusted cable will result in too high throttle pressures which may cause harsh shifts, erratic shifts and torque converter hunting.

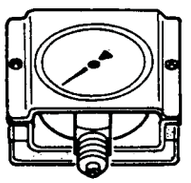
NOTE:

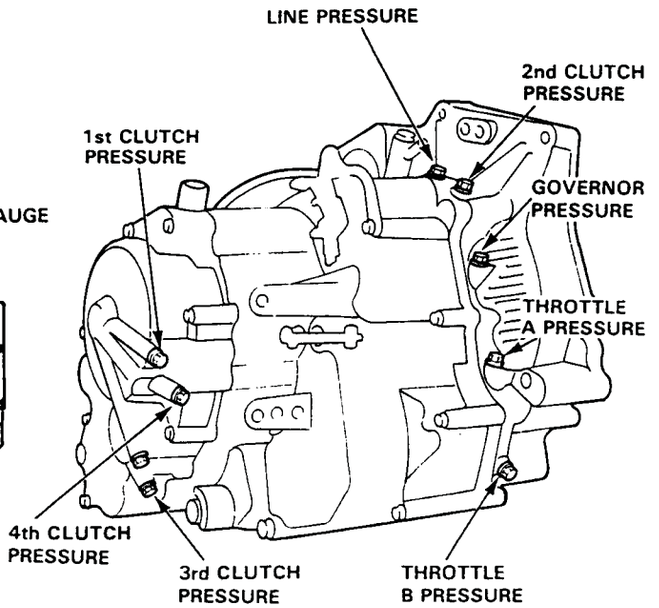
- Stop engine when attaching hoses for pressure tests.
  Torque hose fitting to 18 N·m (1.8 kg-m, 12 lb-ft).
- Do not reuse aluminum washers.
- For throttle and governor test, use Low Pressure Gauge, 07406—0070000.

GAUGE SET 07406—0020003
(includes pressure hose set 07406—0020201)



LOW PRESSURE GAUGE (07406—0070000)





CAUTION: Before checking, be sure transmission is filled to proper level.

PRESSURE	SELECTOR POSITION	MEASUREMENT	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
					Standard	Service Limit
LINE	N or P	· With parking brake applied. · Run engine at 2,000 rpm.	No (or low) LINE pressure	Torque converter, oil pump pressure regulator, torque governor check valve, oil pump	834—883 kpa (8.5—9.0 kg/cm², 121—128 psi)	785 kpa (8.0 kg/cm², 114 psi)
1st	D3 or D4	MEASUREMENTS · With parking brake applied raise front wheels off ground and support with safety stands. · Run engine at 2,000 rpm.	No (or low) FIRST pressure	1st clutch or O-rings	834—883 kpa (8.5—9.0kg/cm², 121—128psi)	785 kpa (8.0 kg/cm², 114 psi)
2nd	2		No. (or low) SECOND pressure	2nd clutch or O-rings	834—883 kpa (8.5—9.0kg/cm², 121—128psi)	785 kPa (8.0 kg/cm², 114 psi)
2nd	D3 or D4		No (or low) SECOND pressure	2nd clutch or O-rings	441—883 kpa (4.5—9.0 kg/cm², 64—128 psi) varies with throttle open.	392 kpa (4.0 kg/cm² 57 psi) with lever released. 785 kPa (8.0 kg/cm², 114 psi) with lever in full throttle position
3rd	D3		No (or low) THIRD pressure	3rd clutch or O-rings		
4th	D4		No (or low) FOURTH pressure	4th clutch		
	R			Servo valve or 4th clutch	834—883 kpa (8.5—9.0kg/cm², 121—128psi)	785 kpa (8.0 kg/cm², 114 psi)
THROTTLE	D3 or D4	· With parking brake applied raise front wheels off ground and support with safety stands. · Run engine at 1,000 rpm. · Disconnect throttle control cable at throttle lever. · Read pressure with lever released. · Manually push lever up simulating full throttle. · Read pressure with lever in full throttle position.	No (or low) THROTTLE pressure	Throttle valve A Throttle modulator valve	0kPa (0 kg/cm², 0 psi) with lever is released. 544—559 kPa (5.55—5.70 kg/cm², 79—81 psi) with lever in full throttle position.	539 kPa (5.50 kg/cm², 78 psi) with lever in full throttle position.
				Throttle valve B	0kPa (0 kg/cm², 0 psi) with lever is released. 834—883 kPa (8.5—9.0 kg/cm², 121—128 psi) with lever in full throttle position.	785 kPa (8.0 kg/cm², 114 psi)
GOVERNOR	D3 or D4	· Place vehicle on chassis dynamometer, or jack up front of car, support with safety stands, block rear wheels, and set hand brake. · Run vehicle at 38 mph.	No (or low) GOVERNOR pressure	Governor valve	213—223 kPa (2.17—2.27 kg/cm², 31—32 psi)	208 kPa (2.12kg/cm², 30 psi)

Test

1. Engage parking brake and block front wheels.
2. Connect safety chains to both front tow hooks and attach, with minimum slack, to some strong stationary object.
3. Connect tachometer, and start engine.
4. After engine has warmed up to normal operating temperature, shift into [D3].
5. Fully depress brake pedal and accelerator for 6 to 8 seconds, and note engine speed.

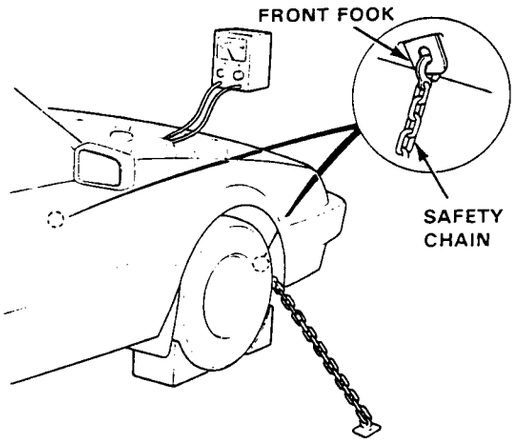
   CAUTION: To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.
6. Allow 2 minutes for cooling, then repeat same test in [D4], [2] and [R]

   Stall speed in [D3], [D4], [2], and [R] must be the same, and must also be within limits:

Stall Speed RPM:

Specification:	2,650 rpm
Service Limit:	2,300 – 2,900 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in [2], [D3], [D4] & [R].	Low fluid level or oil pump output, clogged oil strainer, pressure regulator valve stuck closed. Slipping clutch.
Stall rpm high in [D3], [D4] only.	Slippage of 1st clutch
Stall rpm low in [2], [D3], [D4] & [R].	• Engine output low, throttle cable misadjusted. • Oil pump seized. • Torque converter one-way clutch slipping.



Checking/Changing

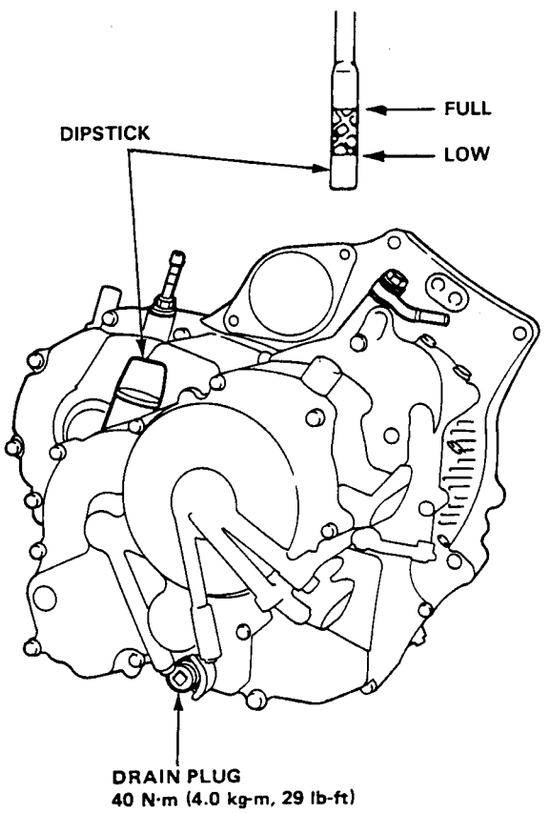
Checking

With the car on level ground, unscrew the transmission dipstick and check the level of fluid immediately after the engine is shut off (within one minute). The fluid level should be between the full and low marks. Do not screw dipstick in to check the fluid level. If the level is at, or below, the low mark, add DEXRON-type automatic transmission fluid.

Changing

1. Bring the transmission up to operating temperature by driving the car. Park the car on level ground, turn the engine off, then remove drain plug.
2. Reinstall the drain plug with a new washer, then refill the transmission to the full mark on the dipstick.

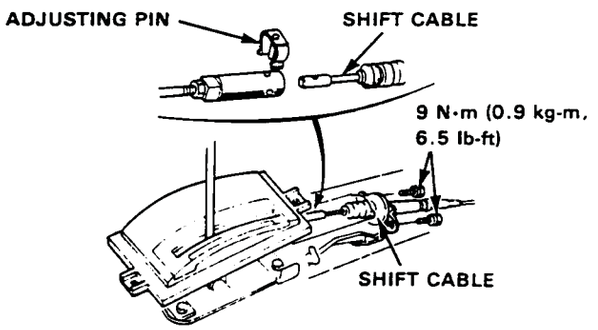
   Automatic transmission Capacity:
   2.4 ℓ (2.5 U.S. qts., 2.1 Imp. qt.) at change
   5.4 ℓ (5.7 U.S. qts., 4.8 Imp. qt.) after overhaul



1. Disconnect the ground cable at battery and transmission.
2. Release the steering lock, and shift gear selector to N.
3. Disconnect the wiring:
   - Battery positive cable from starter.
   - Black/white wire from starter solenoid.
4. Drain transmission fluid. Reinstall drain plug and washer.
5. Disconnect the speedometer cable.

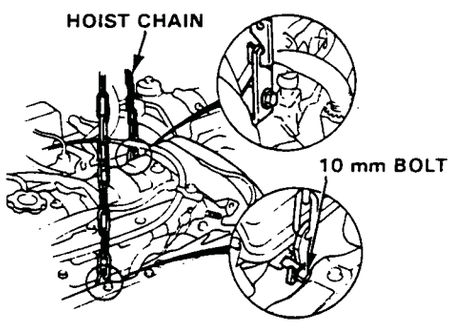
   CAUTION: Be careful not to damage the speedometer cable during transmission removal.
6. Disconnect the cooler hoses, and wire them up next to radiator so ATF won't drain out.
7. Remove the center console, then disconnect the shift cable by removing the adjusting pin.

   CAUTION:
   - **Be careful not to damage the transmission shift cable during transmission removal.**
   - **Take care not to bend the cable when removing it.**
     Do not use pliers to remove the cable from the linkage.
     Always replace a kinked cable with a new one.

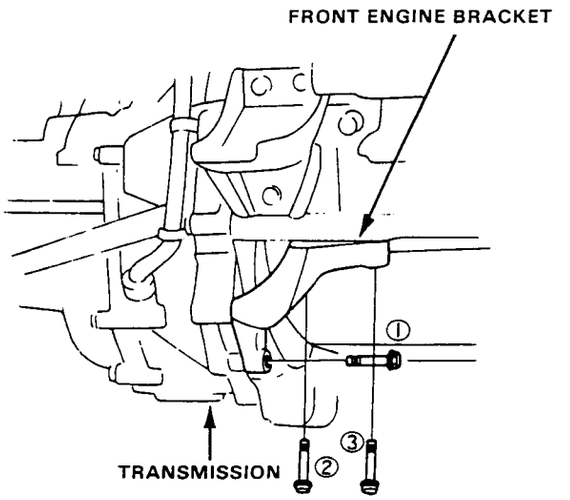


8. Unscrew the cable guide bolt, and pull the throttle control cable out of the cabin.

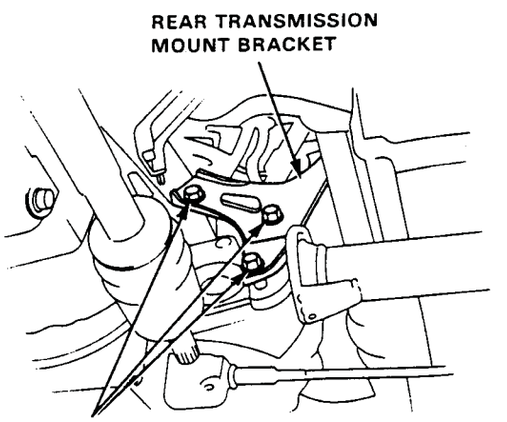
   CAUTION: Be careful not to damage the throttle control cable during transmission removal.
9. Remove the right and left driveshafts and intermediate shaft (see section 16).
10. Screw 10 mm bolt into the cylinder head and attatch a hoist chain to the bolt and the other end to the engine hanger plate, then lift the engine slightly to unload the mounts.



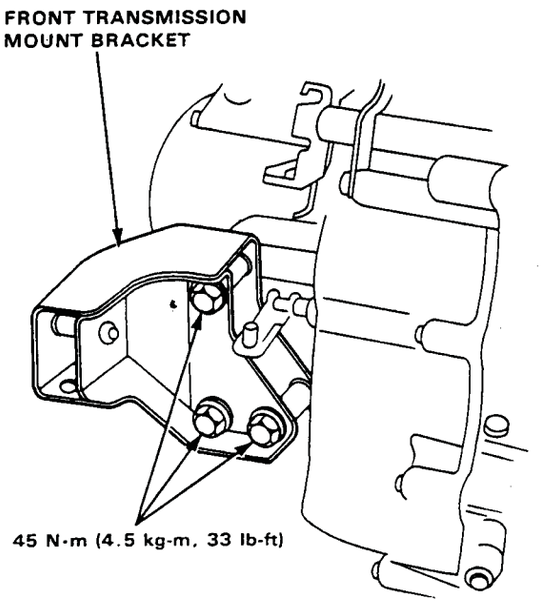
11. Remove the engine under cover and splash shield. (see section, 5).
12. Disconnect the header pipe at exhaust manifold. (see section, 5)
13. Place a jack under the transmission and raise transmission just enough to take weight off mounts.
14. Remove the bolts from the front mount at the front engine bracket.



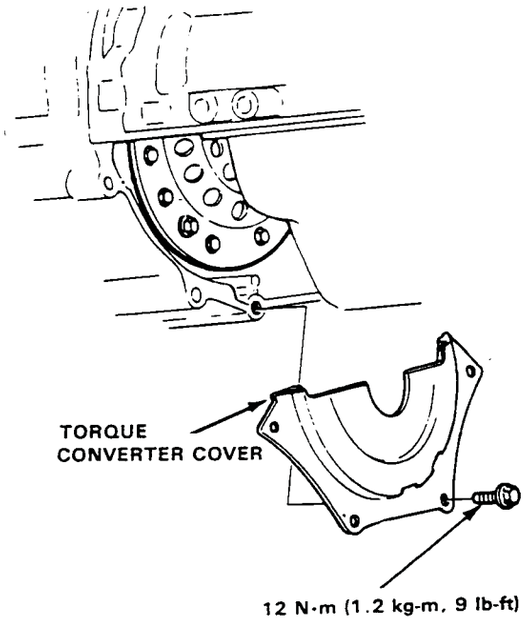
15. Remove the rear transmission mount bracket by removing the mounting bolts.



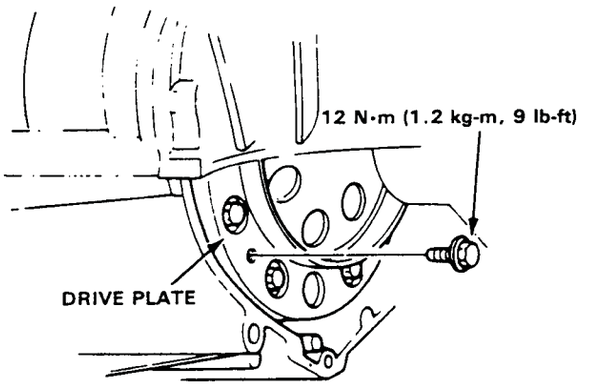
16. Remove the transmission housing bolts from front transmission mount bracket.



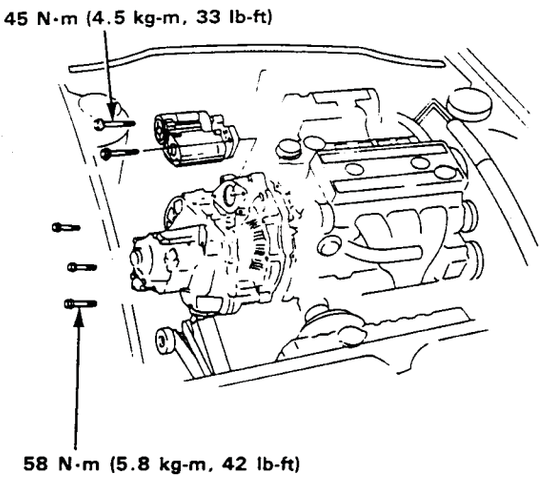
17. Remove the torque converter cover.



18. Remove the drive plate tightening bolts by rotating the engine crankshaft pulley.
CAUTION: The pulley bolt is a right-hand thread, and may occasionally be loosened when the pulley is turned counterclockwise. After removing the drive plate, check that the bolt is tightned securely.

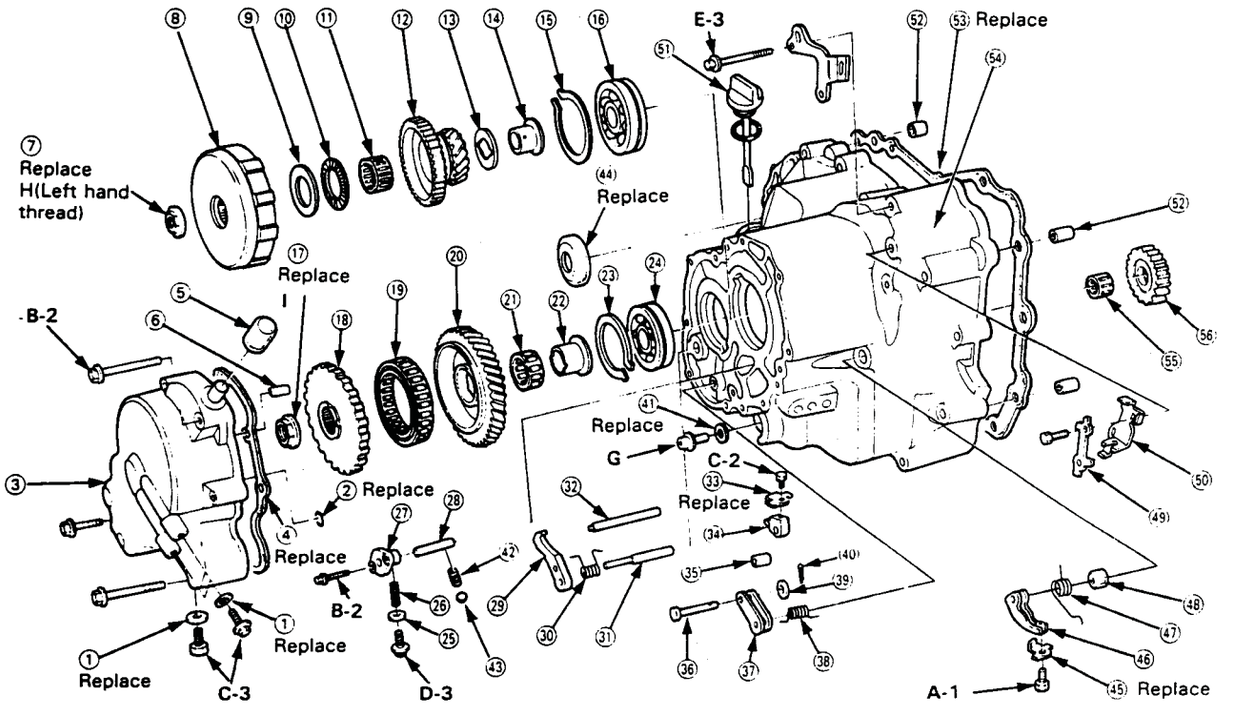


19. Remove the bolts attaching the starter motor, and remove the starter motor.
20. Remove the rest of the transmission mount bolts.



21. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower on the transmission jack.

Torque	Bolt size
A— 8 N·m (0.8 kg-m, 6 lb-ft) B—12 N·m (1.2 kg-m, 9 lb-ft) C—14 N·m (1.4 kg-m, 10 lb-ft) D—18 N·m (1.8 kg-m, 12 lb-ft) E—27 N·m (2.7 kg-m, 20 lb-ft) F—29 N·m (2.9 kg-m, 21 lb-ft) G—40 N·m (4.0 kg-m, 29 lb-ft) H—95→0→95 N·m (9.5→0→9.5 kg-m, 70→0→70 lb-ft) I— 110→0→110 N·m (11.0→0→11.0 kg-m, 80→0→80 lb-ft)	1—5 x 0.8 mm 2—6 x 1.0 mm 3—8 x 1.25 mm



① WASHER 8 mm
② O-RING 6 x 2.3 mm
③ END COVER

④ GASKET
⑤ BREATHER CAP
⑥ DOWEL PIN 8 x 14 mm
⑦ LOCK NUT

⑧ 1st CLUTCH

⑨ THRUST WASHER 23 mm
⑩ THRUST NEEDLE BEARING 31 x 47 x 2 mm
⑪ NEEDLE BEARING 28 x 33 x 16.8 mm
⑫ MAINSHAFT 1st GEAR

⑬ THRUST WASHER
⑭ COLLAR 23 mm
⑮ SNAP RING 70 mm
⑯ MAINSHAFT BEARING

⑰ LOCKNUT

⑱ PARKING GEAR
⑲ ONE-WAY CLUTCH
⑳ COUNTERSHAFT 1st GEAR

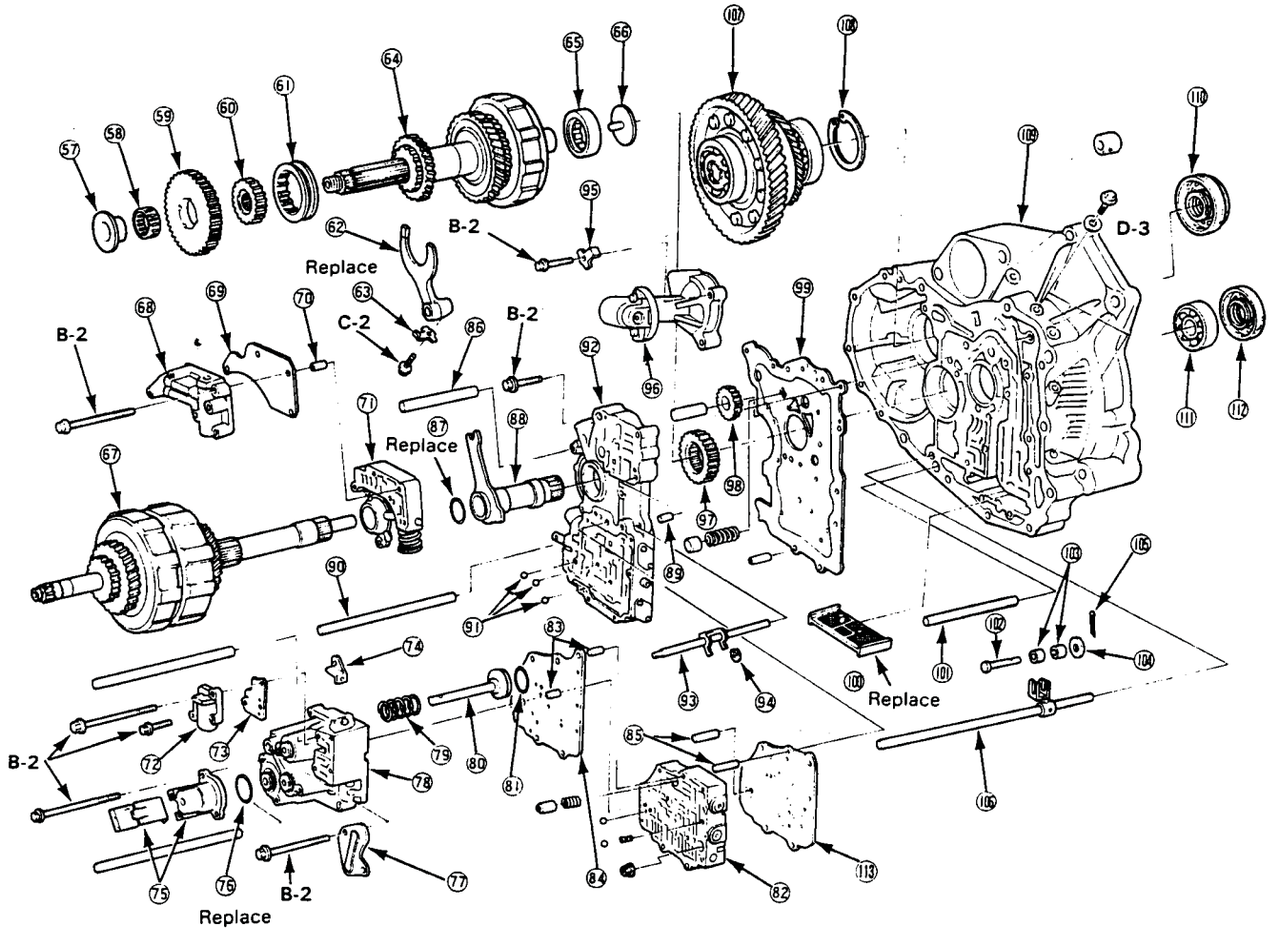
㉑ NEEDLE BEARING
㉒ 1st GEAR COLLAR
㉓ SNAP RING 64 mm
㉔ COUNTERSHAFT BEARING
㉕ WASHER 8 mm
㉖ SPRING
㉗ REVERSE IDLER BEARING HOLDER

㉘ REVERSE GEAR SHAFT
㉙ PARKING PAWL
㉚ PARKING PAWL SPRING
㉛ PARKING PAWL SHAFT
㉜ STOP PIN
㉝ LOCK PLATE
㉞ PARKING LEVER
㉟ PARKING PAWL ROLLER
㊱ ROLLER PIN
㊲ PARKING SHIFT ARM
㊳ RETURN SPRING
㊴ WASHER 5 mm
㊵ COTTER PIN
㊶ WASHER 14 mm
㊷ SPRING
㊸ STEEL BALL
㊹ DIFFERENTIAL OIL SEAL

㊺ LOCK PLATE
㊻ THROTTLE CONTROL LEVER

㊼ THROTTLE CONTROL SHAFT SPRING

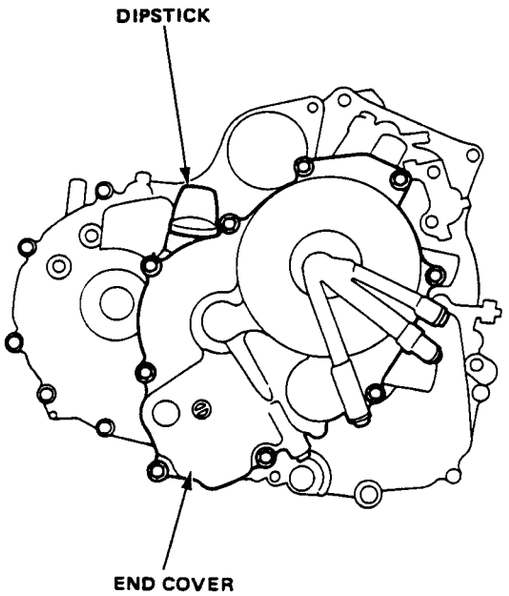
㊽ THROTTLE CONTROL SHAFT SEAL
㊾ LOCK PLATE
㊿ THROTTLE CONTROL CABLE BRACKET
(51) DIPSTICK
(52) DOWEL PIN 14 x 25 mm
(53) GASKET
(54) TRANSMISSION HOUSING
(55) NEEDLE BEARING
(56) REVERSE IDLER GEAR



(57) REVERSE GEAR COLLAR
(58) NEEDLE BEARING
(59) COUNTERSHAFT REVERSE GEAR
(60) SELECTOR HUB
(61) REVERSE GEAR SELECTOR
(62) REVERSE SHIFT FORK
(63) LOCK PLATE
(64) COUNTERSHAFT ASSY
(65) COUNTERSHAFT NEEDLE BEARING
(66) OIL GUIDE PLATE
(67) MAINSHAFT ASSY
(68) LOCK UP SHIFT VALVE BODY
(69) SEPARATOR PLATE
(70) DOWEL PIN
(71) REGULATOR VALVE BODY
(72) MODULATOR VALVE BODY
Removal, page 14-25
(73) SEPARATOR PLATE
(74) CHECK VALVE STOP PLATE
(75) 4th ACCUMULATOR COVER
(76) O-RING
(77) 2nd/3rd ACCUMULATOR COVER
(78) SERVO VALVE BODY ASSY
(79) RETURN SPRING
(80) SERVO VALVE
(81) O-RING 31 x 2.7 mm
(82) SECONDARY VALVE BODY ASSY
(83) DOWEL PINS
(84) SERVO SEPARATOR PLATE
(85) DOWEL PIN
(86) STOP PIN
(87) O-RING
(88) STATOR SHAFT
(89) DOWEL PIN
(90) 1st CLUTCH PIPE
(91) STEEL BALLS
(92) MAIN VALVE BODY ASSY
(93) THROTTLE CONTROL SHAFT
(94) E-CLIP
(95) LOCK PLATE
(96) GOVERNOR VALVE
(97) PUMP DRIVE GEAR
(98) PUMP DRIVEN GEAR
(99) MAIN VALVE SEPARATOR PLATE
(100) FILTER SCREEN
(101) SUCTION PIPE
(102) MANUAL VALVE PIN
(103) ROLLER
(104) WASHER 5 mm
(105) COTTER PIN
(106) CONTROL SHAFT
(107) DIFFERENTIAL
(108) SNAP RING 80 mm
(109) TORQUE CONVERTER HOUSING
(110) DIFFERENTIAL OIL SEAL
(111) MAINSHAFT BEARING
(112) MAINSHAFT OIL SEAL
(113) SECONDARY SEPARATOR PLATE

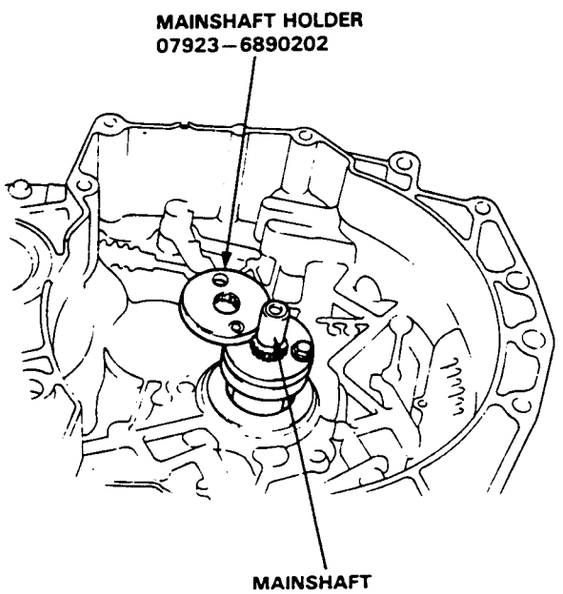
1. Remove the dipstick.

2. Remove the nine bolts from the end cover, then remove the cover.



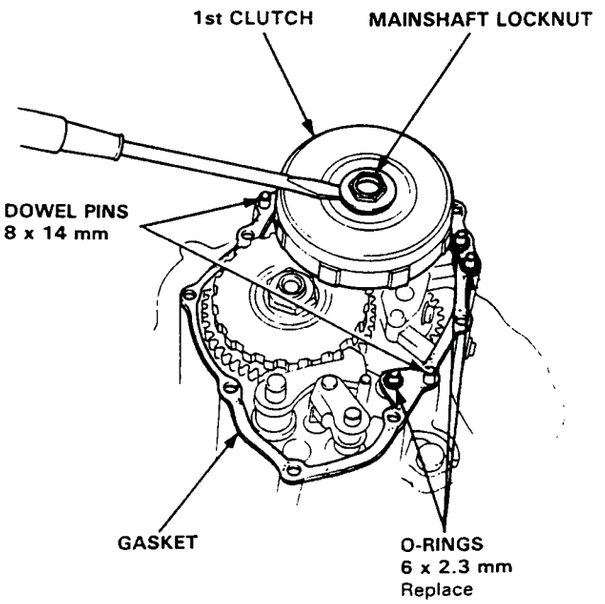
3. Shift the transmission to PARK.

4. Lock the mainshaft using the mainshaft holder.



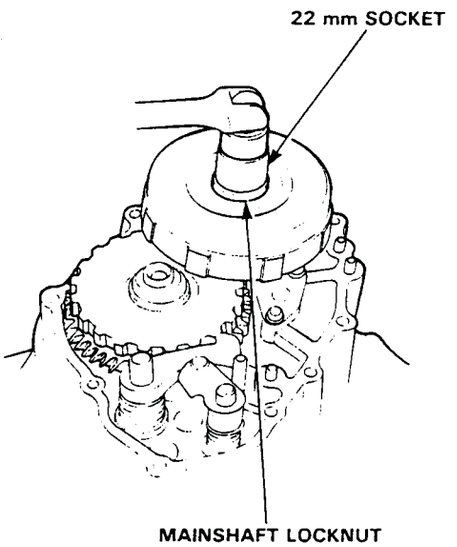
5. Remove the end cover gasket, dowel pins, and O-rings.

6. Pry the staked edge of the locknut flange out of the notch in the 1st clutch.



7. Remove the mainshaft locknut.

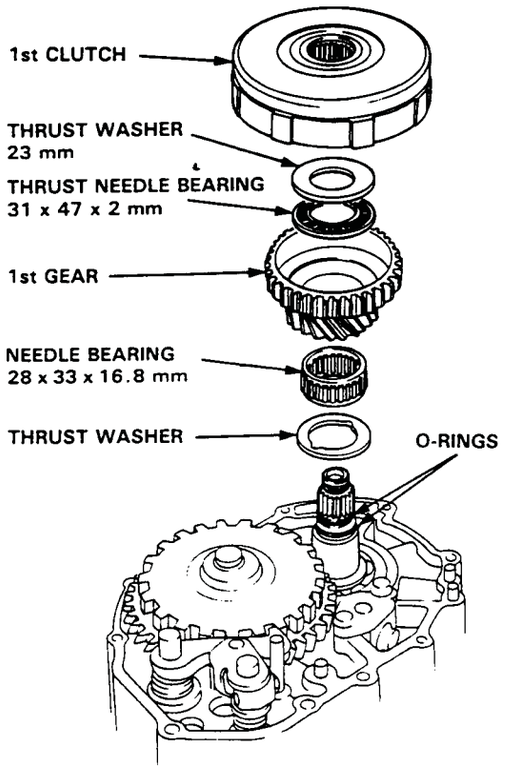
CAUTION: The mainshaft locknut has left-hand threads.



8. Remove the 1st clutch.

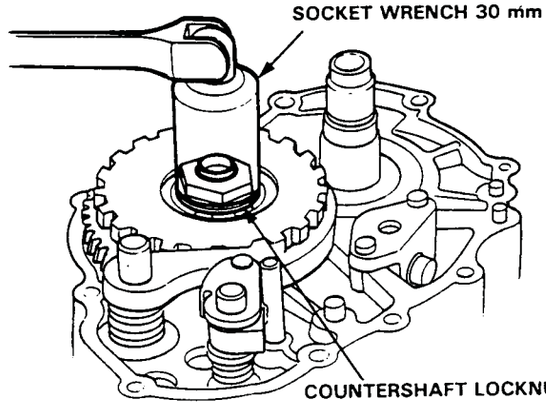
9. Remove the needle bearing and thrust washer from the mainshaft.

10 Remove the O-rings and first gear from the mainshaft.

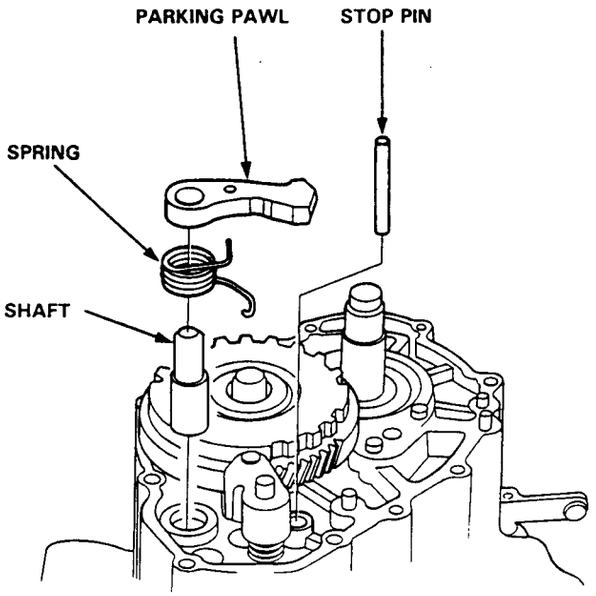


11. Pry the staked edge of the locknut out of the notch in the parking gear.

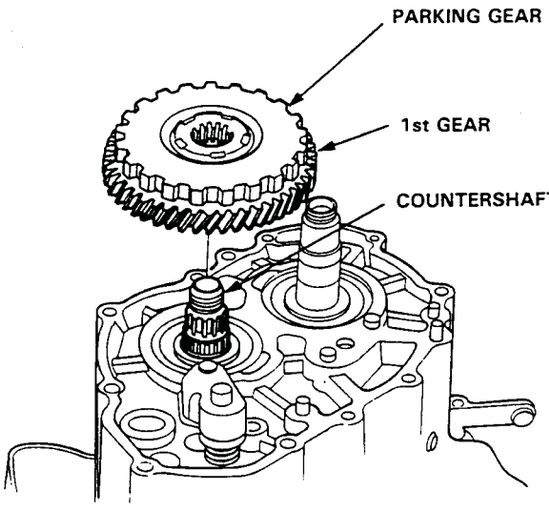
12. Remove the countershaft locknut.



13. Remove the parking pawl, shaft, stop pin and spring.

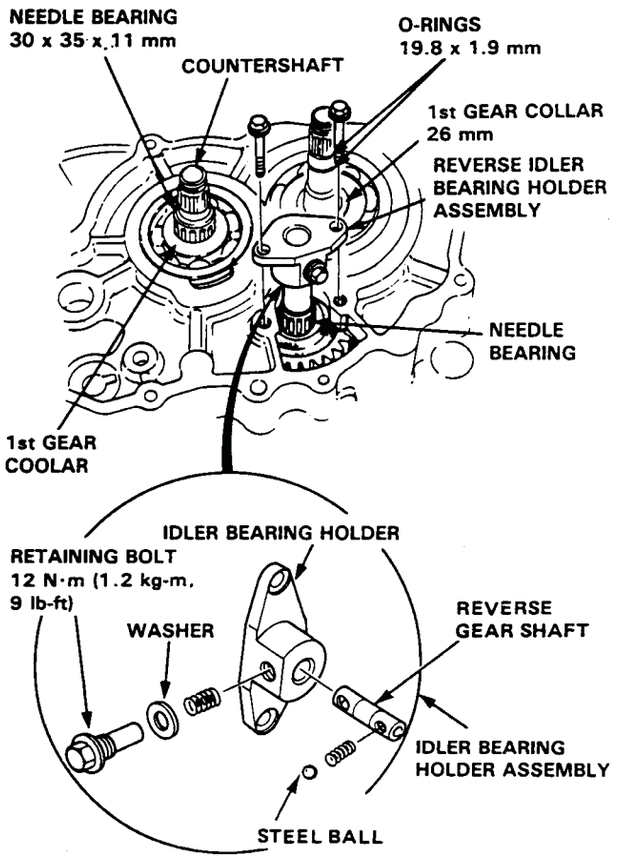


14. Remove the parking gear and countershaft 1st gear as a unit.



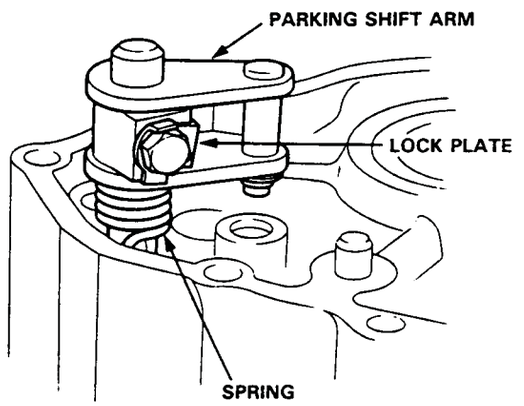
15. From the countershaft, remove the needle bearing and 1st gear collar. From the mainshaft, remove the 1st gear collar.

16. Remove the reverse idler bearing holder assembly.

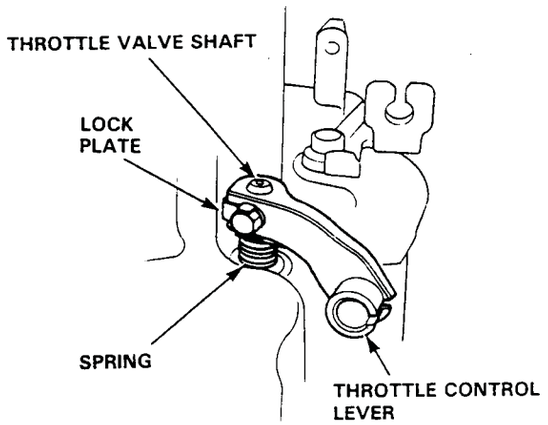


17. Bend down the tab on the lock plate under the parking shift arm bolt.

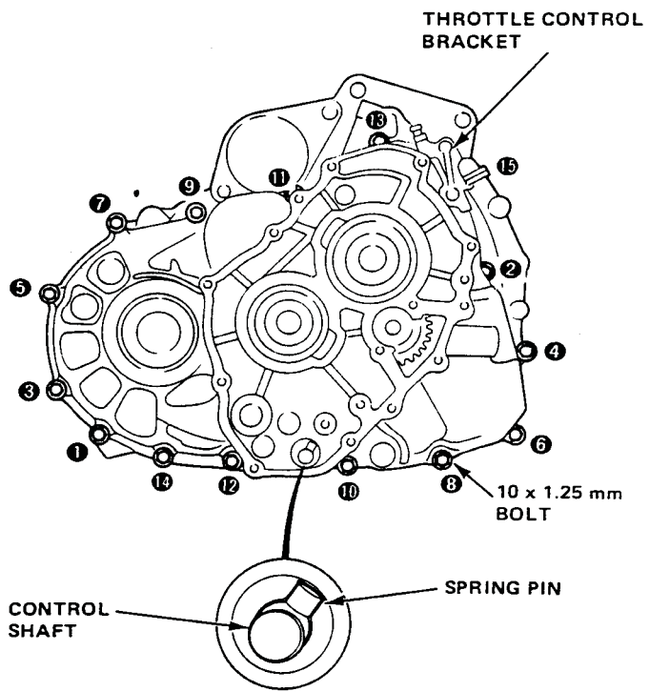
18. Remove the bolt, then remove the parking shift arm.



19. Bend down the tab on the throttle control lever bolt lock plate, then remove the bolt. Now, remove the throttle control lever and spring from the throttle valve shaft.

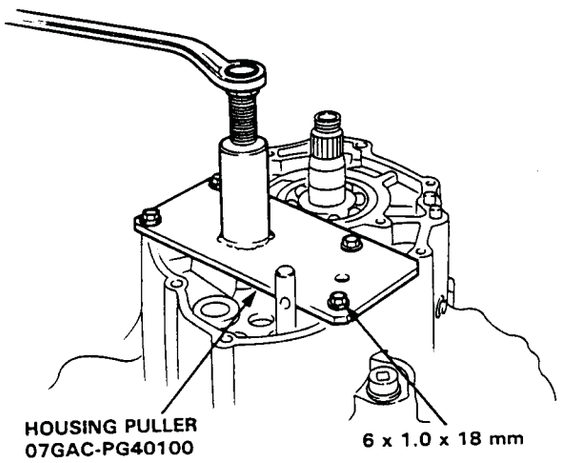


20. Remove the 8 x 1.25 mm bolts and 10 x 1.25 mm bolt, (1) thru (15), in the sequence shown.



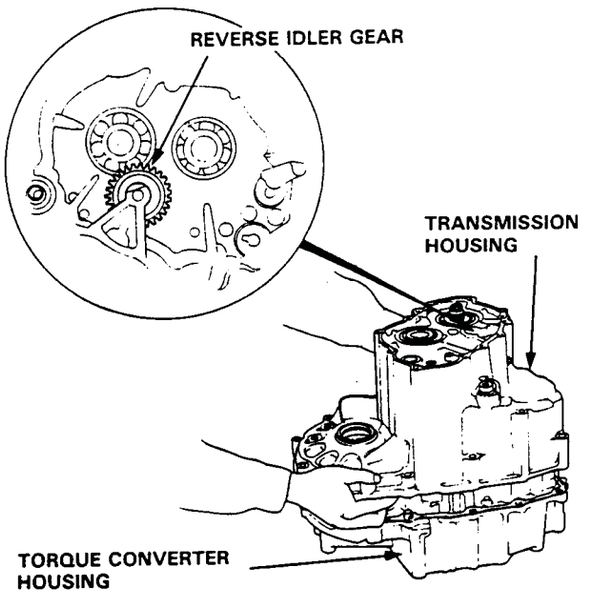
21. Align the control shaft spring pin with the cutout in the transmission housing.

22. Install the transmission housing puller over the countershaft with four bolts and tighten securely. Then screw in the puller bolt against the end of the countershaft until the transmission housing comes loose.

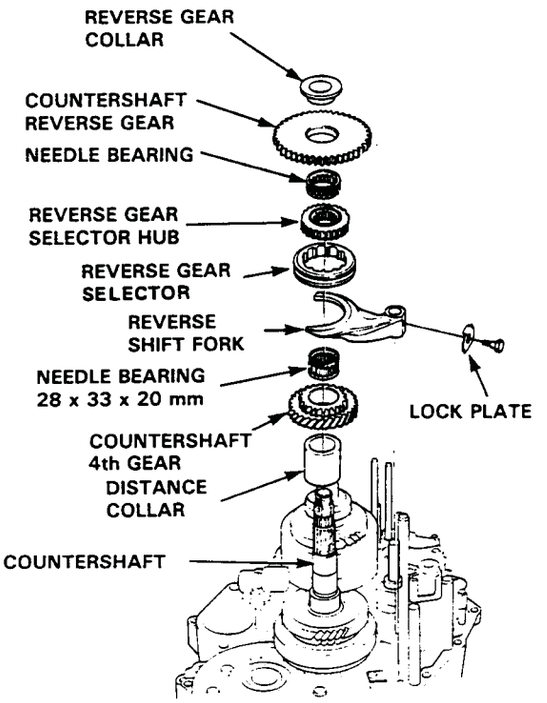


23. Remove the puller and separate the housings. Remove the reverse idler gear and needle bearing from the transmission housing.

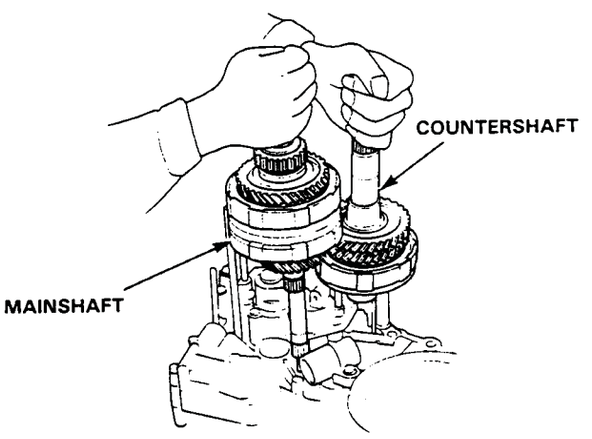
24. Remove the gasket and the dowel pins.



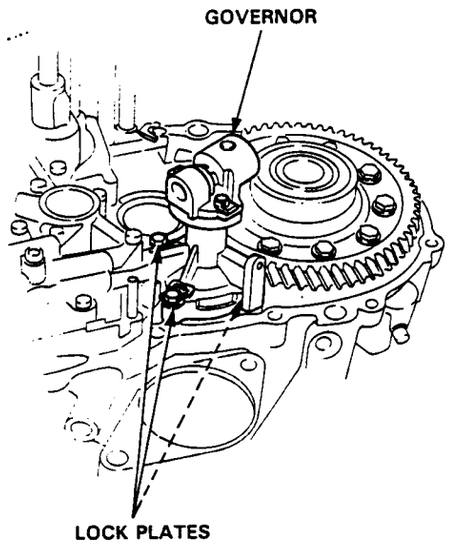
1. Remove the reverse gear collar, countershaft reverse gear and needle bearing.



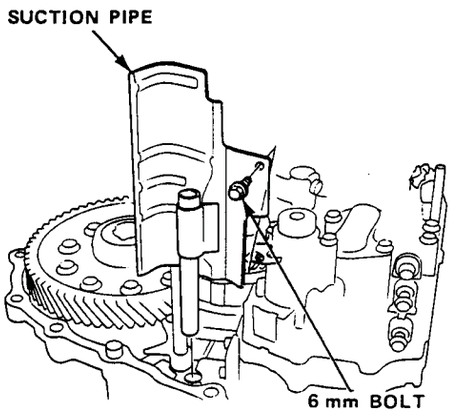
2. Bend down the tab on the lock plate and remove the bolt from the reverse shift fork.
3. Remove the reverse shift fork and reverse gear selector as a unit.
4. Remove the selector hub, countershaft 4th gear, needle bearing and distance collar.
5. Remove the mainshaft and countershaft together. NOTE: It will be necessary to pull up the countershaft at a slight angle to clear the governor.



1. Bend down the tabs on the lock plates, remove the bolts holding the governor to the torque converter housing, and remove the governor.



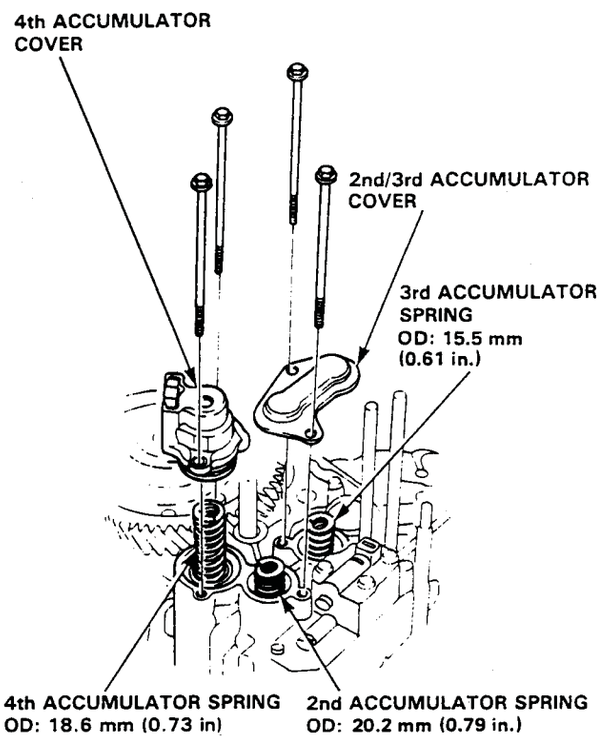
1. Remove the suction pipe.



2. Remove the accumulator covers.

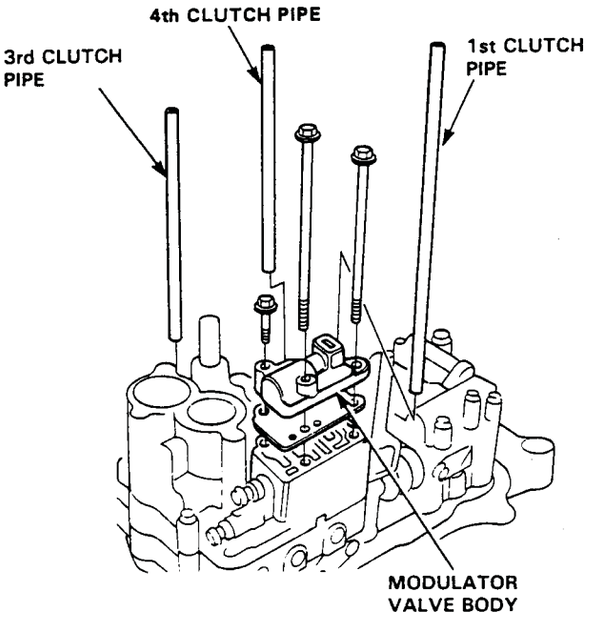
CAUTION: Accumulator covers are spring loaded; to prevent stripping the threads in the torque converter housing, press down on the accumulator covers while unscrewing the bolts in a criss-cross pattern.

3. Remove the accumulator springs.



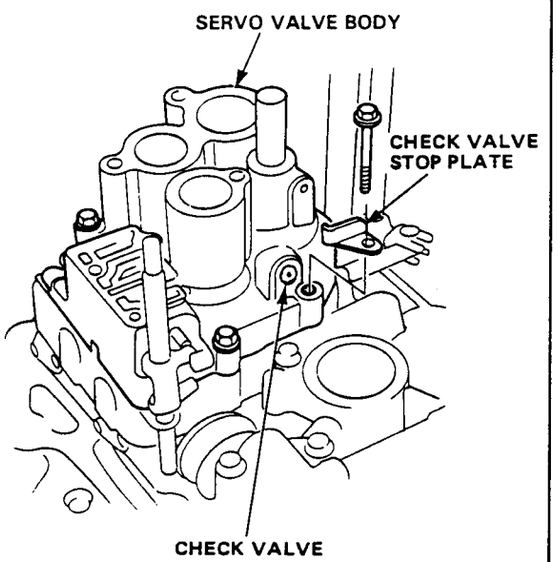
4. Remove the three bolts attaching the modulalor valve body.

5. Remove the 1st, 4th and 3rd clutch pipes.



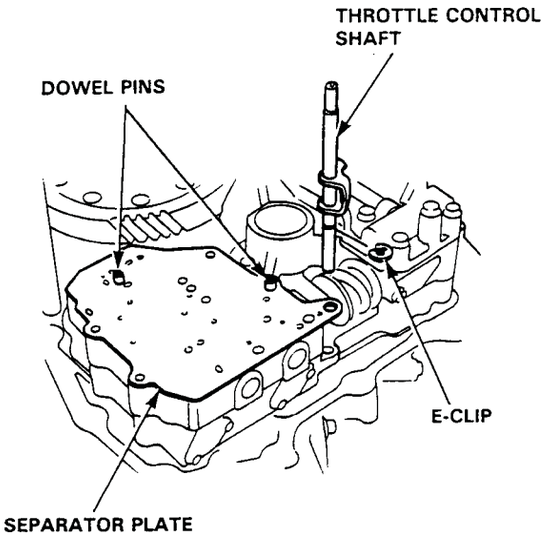
6. Remove the servo valve body (3 bolts).

7. Remove the check valve stop plate.



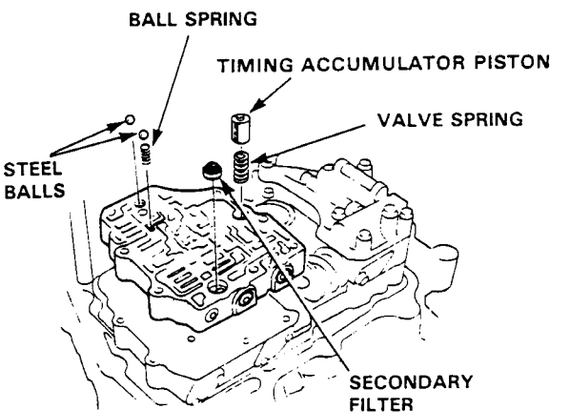
8. Remove the E-clip. Then remove the thottle control shaft from the separator plate.

9. Remove the separator plate and dowel pins.

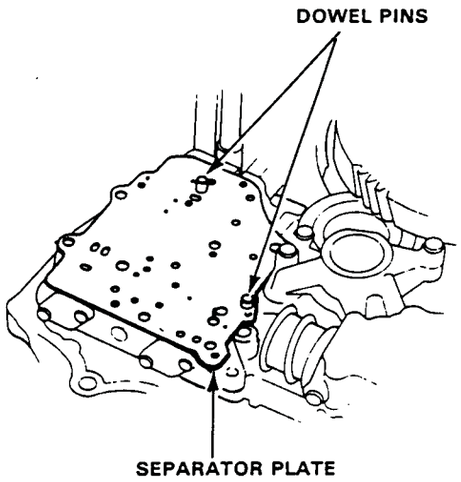


10. Remove the secondary valve body, being careful not to lose the 2 steel balls, ball spring, timing accumulator piston and valve spring, and secondary filter.

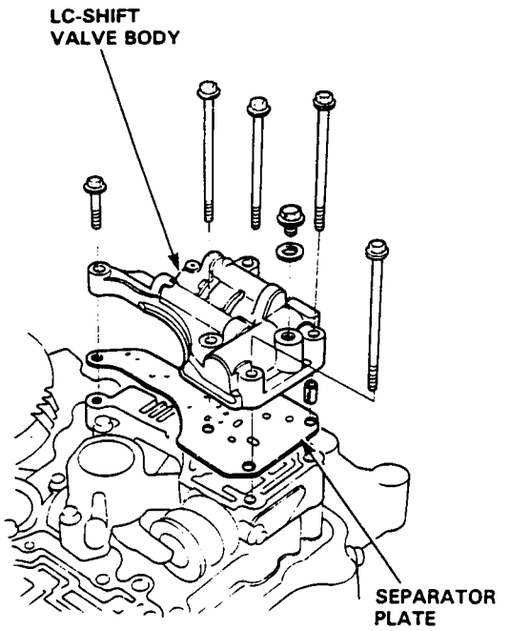
CAUTION: Do not use a magnet to remove the steel balls; it may magnetize the balls.



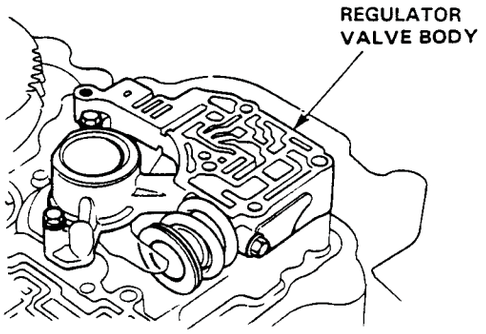
11. Remove the separator plate and dowel pins.



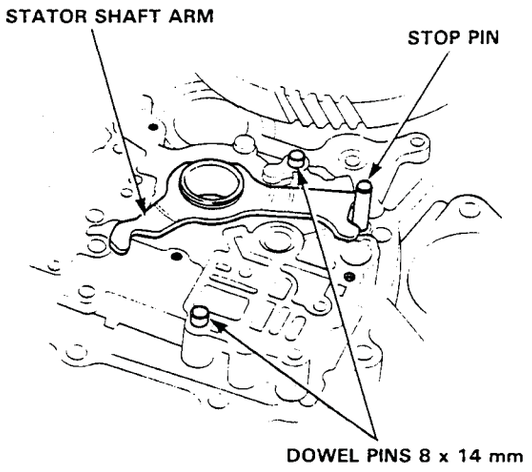
12. Remove the LC-Shift valve body and separator plate (5 bolts).



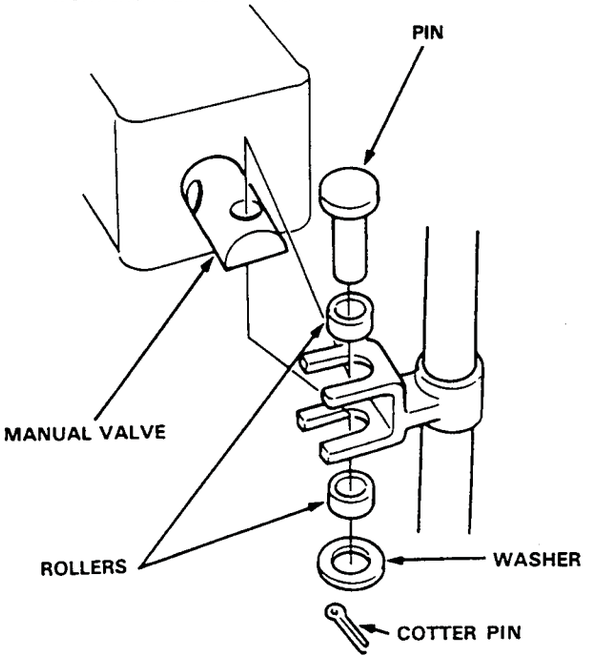
13. Remove the regulator valve body.



14. Remove the stator shaft arm, dowel pins and stop pin.



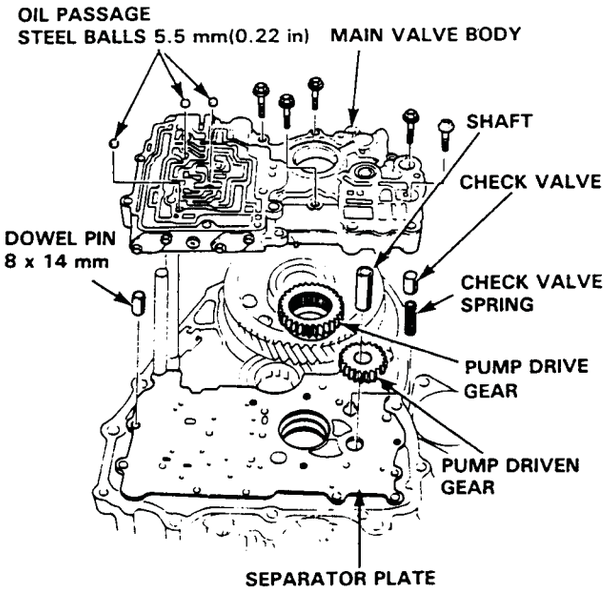
15. Remove the cotter pin , washer, rollers, and pin from the manual valve.



16. Remove the main valve body being careful not to lose the 3 steel balls, check ball spring, torque converter check valve and spring.

CAUTION: Do not use a magnet to remove the steel balls; it may magnetize the balls.

NOTE: Top oil passage steel ball in this drawing has a spring beneath it.

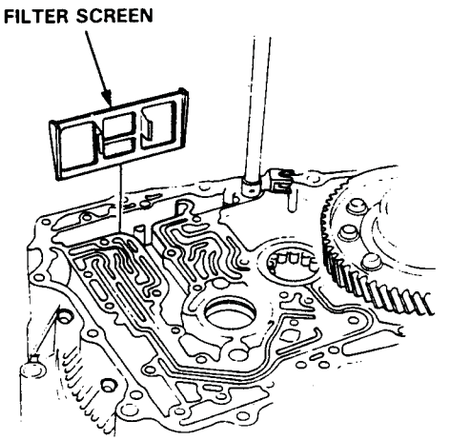


17. Remove the pump gears and shaft.

18. Remove the separator plate, dowel pins, check valve, and spring.

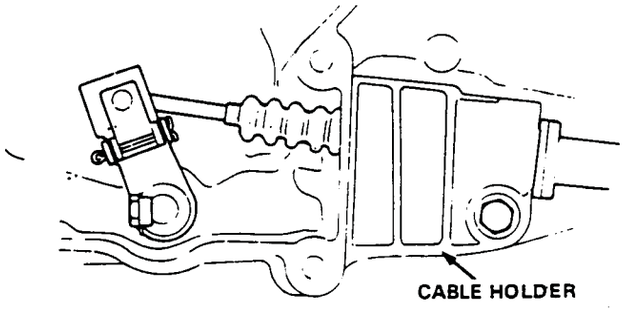
19. Remove the filter screen.

NOTE: Do not reuse filter screen; install a new one on reassembly.

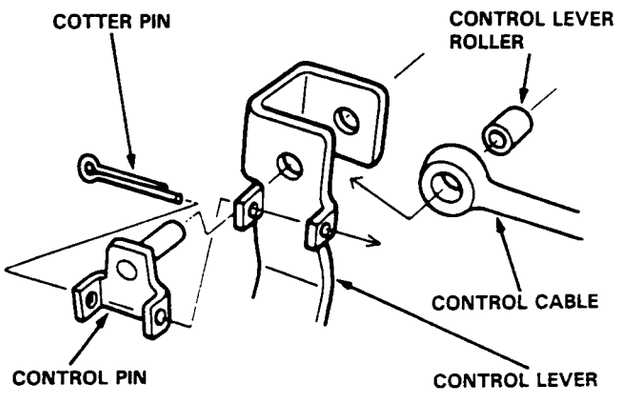


Removal

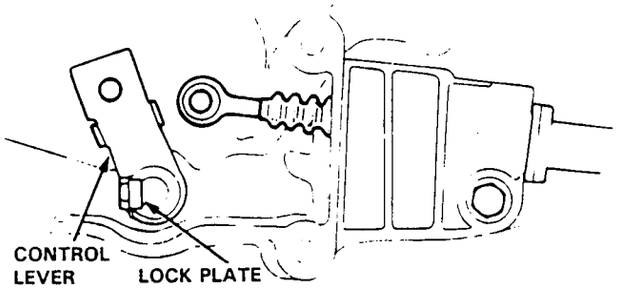
1. Remove the cable holder.



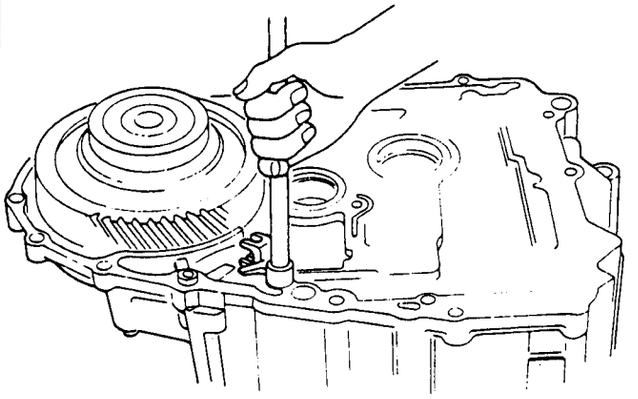
2. Remove the cotter pin, control pin, and control lever roller from the control lever.



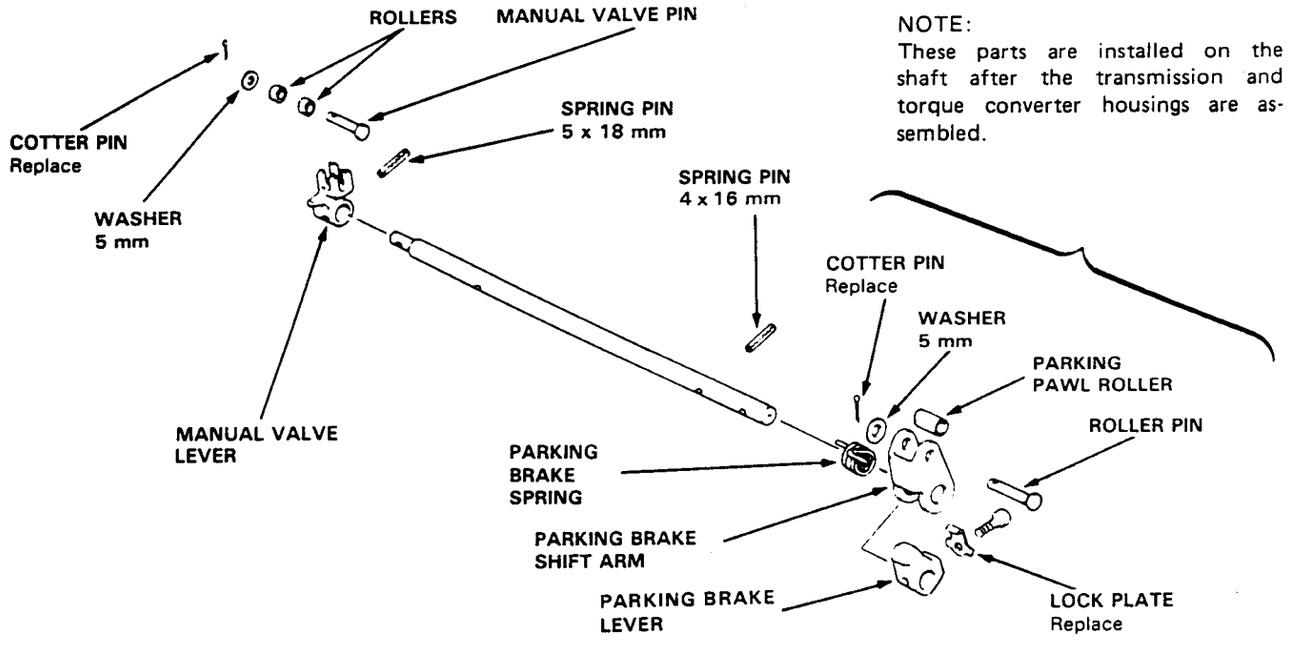
3. Bend down the tab on the lock plate under the bolt in the control lever. Then remove the bolt and lever.



4. Turn the torque converter housing over and remove the control shaft.

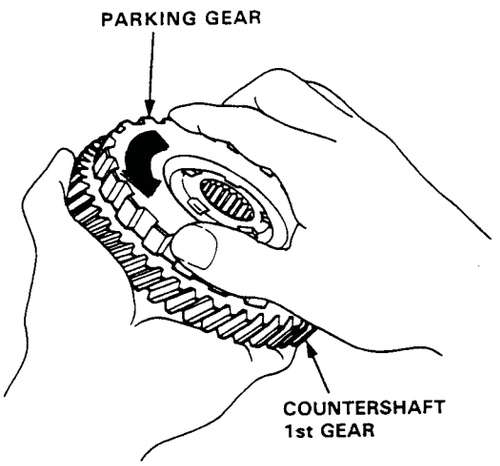


Disassembly/Reassembly



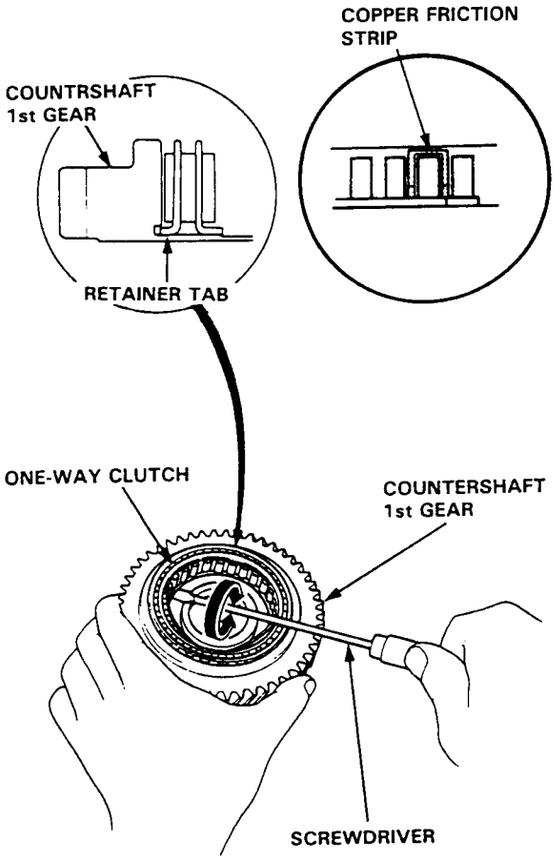
NOTE:
These parts are installed on the shaft after the transmission and torque converter housings are assembled.

1. Separate the countershaft 1st gear from the parking gear by turning the parking gear in the direction shown.



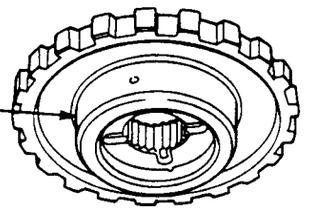
2. Remove the one-way clutch by prying it up with the end of a screwdriver.

CAUTION: Do not pry on the three copper friction strips; if you break a strip, the clutch will not work properly.

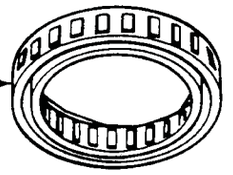


Inspect the parts as follows:

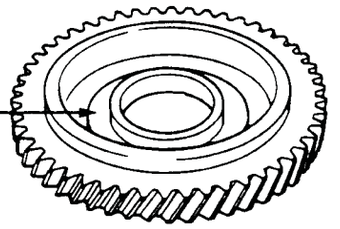
Inspect the parking gear for wear or scoring



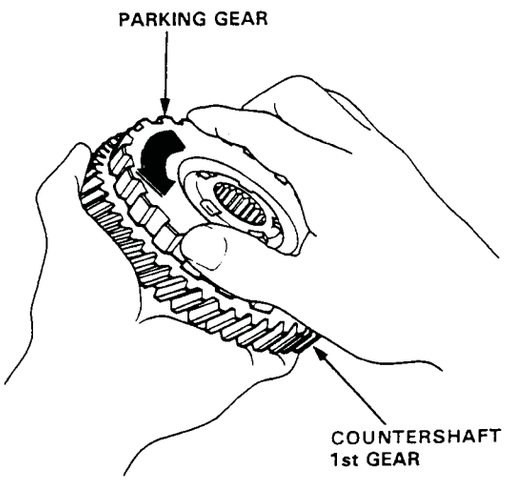
Inspect the one-way clutch for damage or faulty movement



Inspect the countershaft 1st gear for wear or scoring

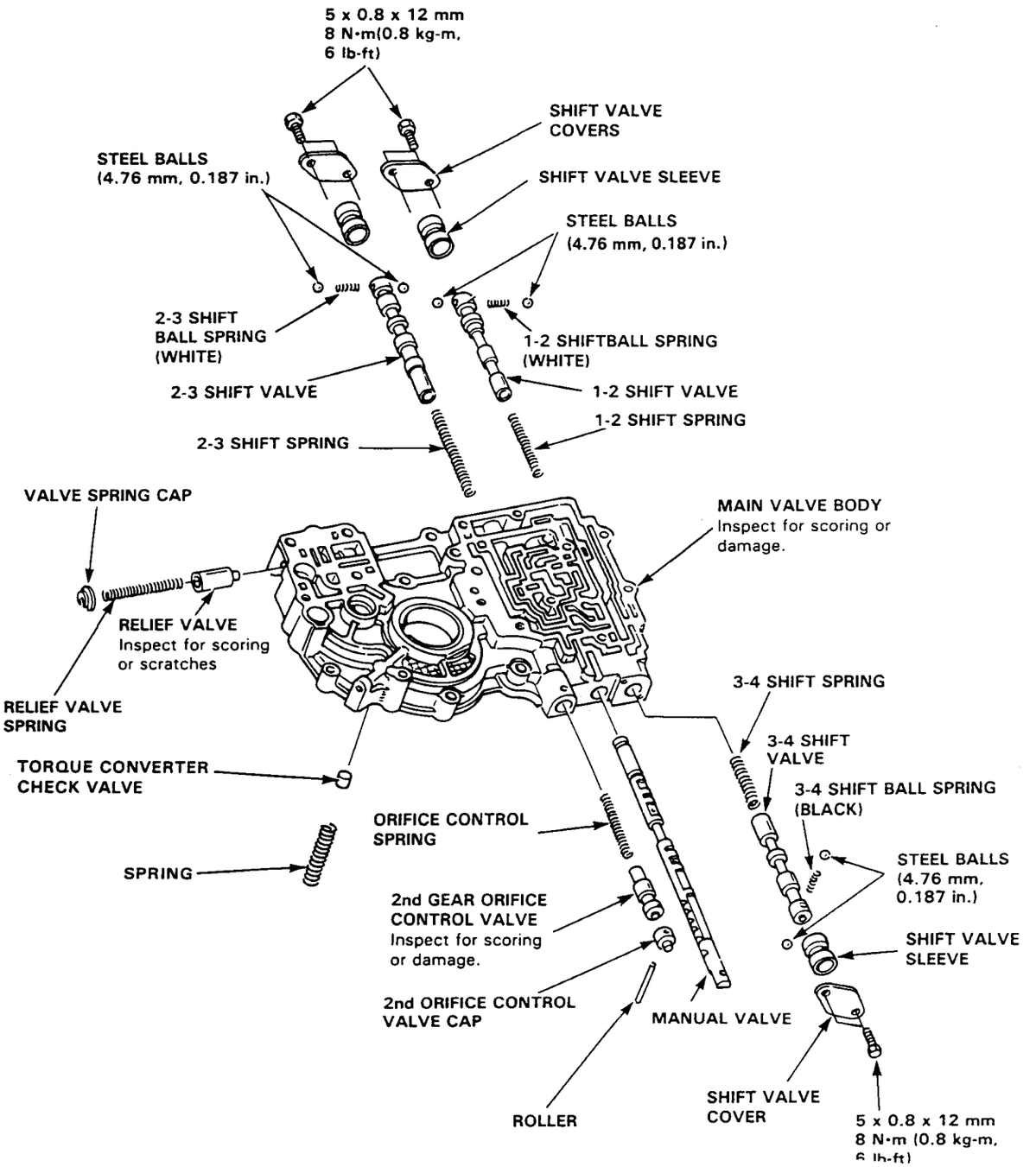


After the parts are assembled, hold the countershaft 1st gear and turn the parking gear in direction shown to be sure it turns freely.



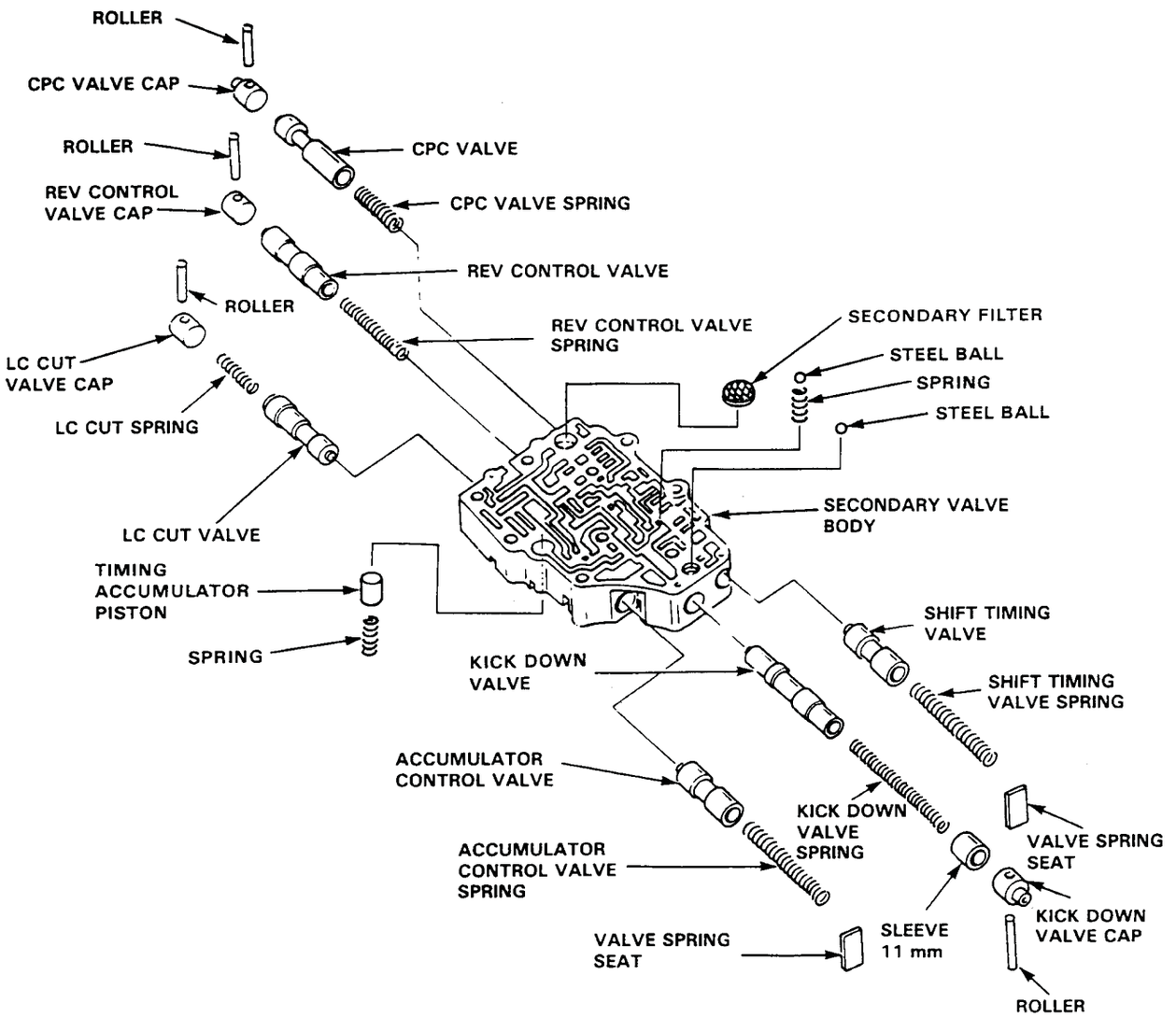
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement.
- See Section 3 for spring specifications.
- Coat all parts with ATF before reassembly.



NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement.
- See Section 3 for spring specifications.



NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. You may use this procedure to free the valves in the main valve body, regulator valve body, lock-up shift valve body, and servo valve body. DO NOT use this procedure to free the valves in the governor; if any governor valves are stuck, the governor must be replaced as an assembly.

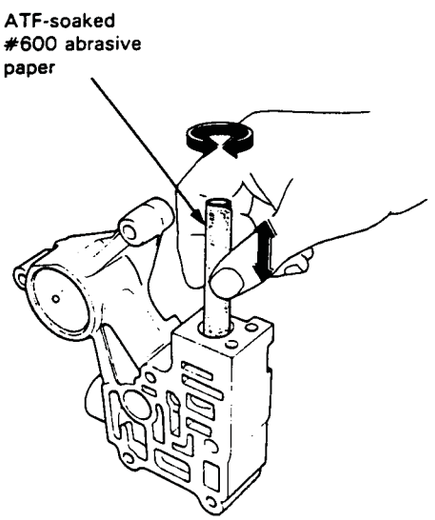
1. Soak a sheet of #600 abrasive paper in ATF for about 30-minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

   CAUTION: It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.

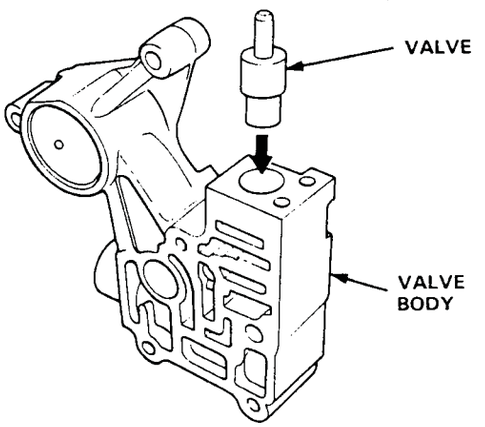
4. Roll up half a sheet of ATF-soaked paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   CAUTION: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the #600 paper and thoroughly wash the entire valve body in solvent, then dry with compressed air.

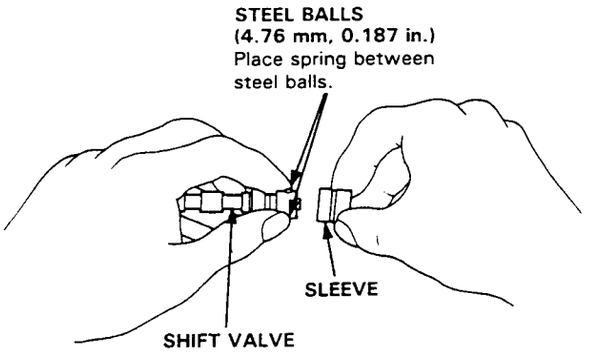
6. Coat the valve with ATF then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4, then retest.



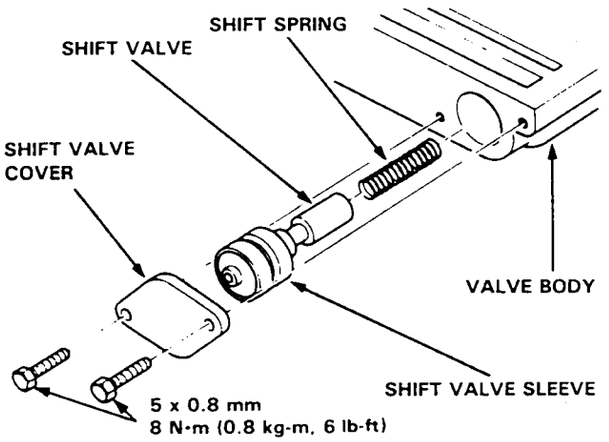
7. Remove the valve and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

NOTE: Coat all parts with ATF before assembling.

1. Slide the spring into the hole in the big end of the shift valve.
   While holding the steel balls with the tips of your fingers, put the sleeve over valve.

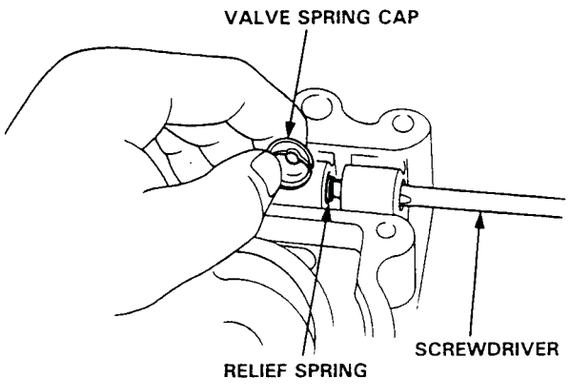


2. Place the shift spring in the valve, then slip it into the valve body and install the valve cover.

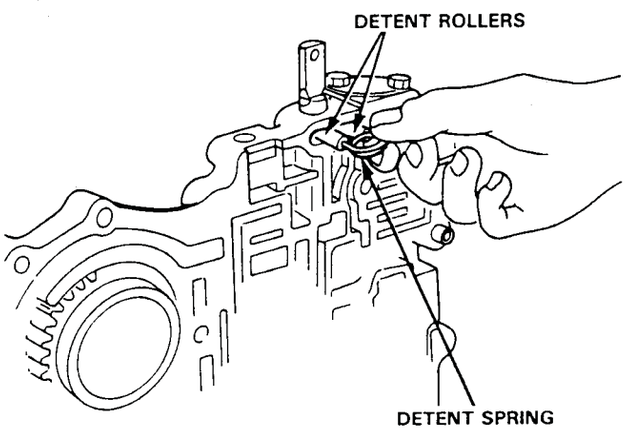


3. Set the relief spring in the relief valve and install it in the main valve body.

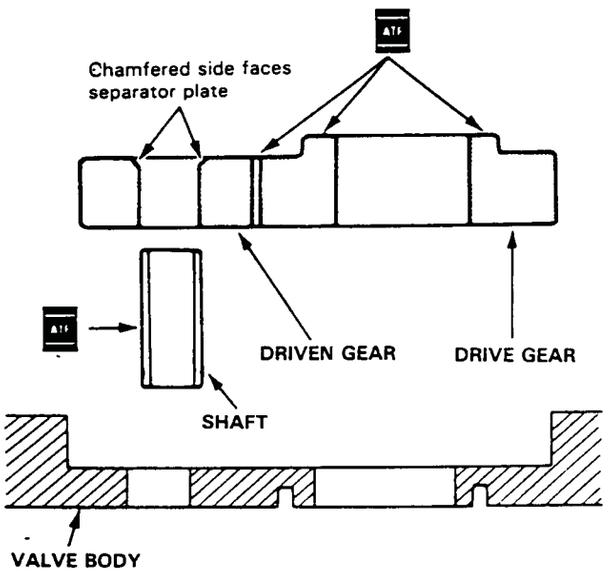
4. Install the spring with a screwdriver, then install the check valve cap with the cutout aligned with the screwdriver.



5. Install the manual valve, detent rollers and spring.

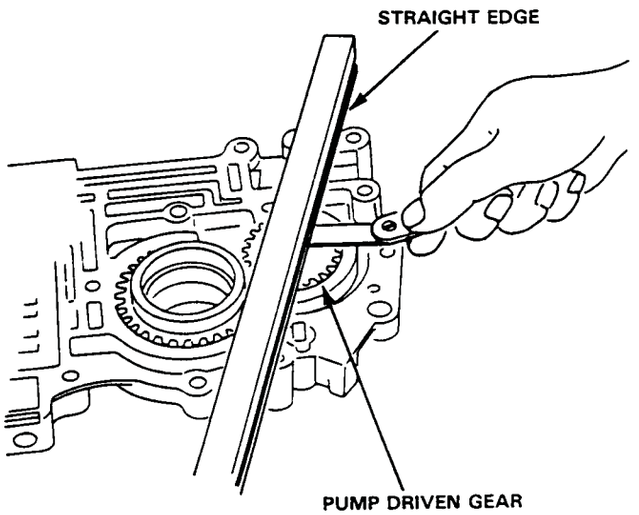


6. Install the pump gears and shaft in the main valve body.



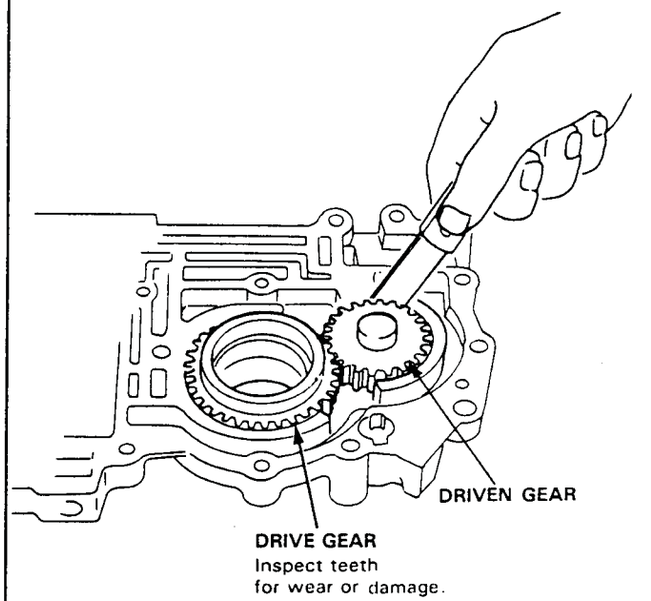
7. Measure the thrust clearance of the driven gear-to-valve body.

Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New): 0.03—0.05 mm (0.001—0.002 in.)
Service Limit: 0.07 mm (0.0028 in.)



8. Install the oil pump shaft and measure the side clearance of the drive and driven gears.

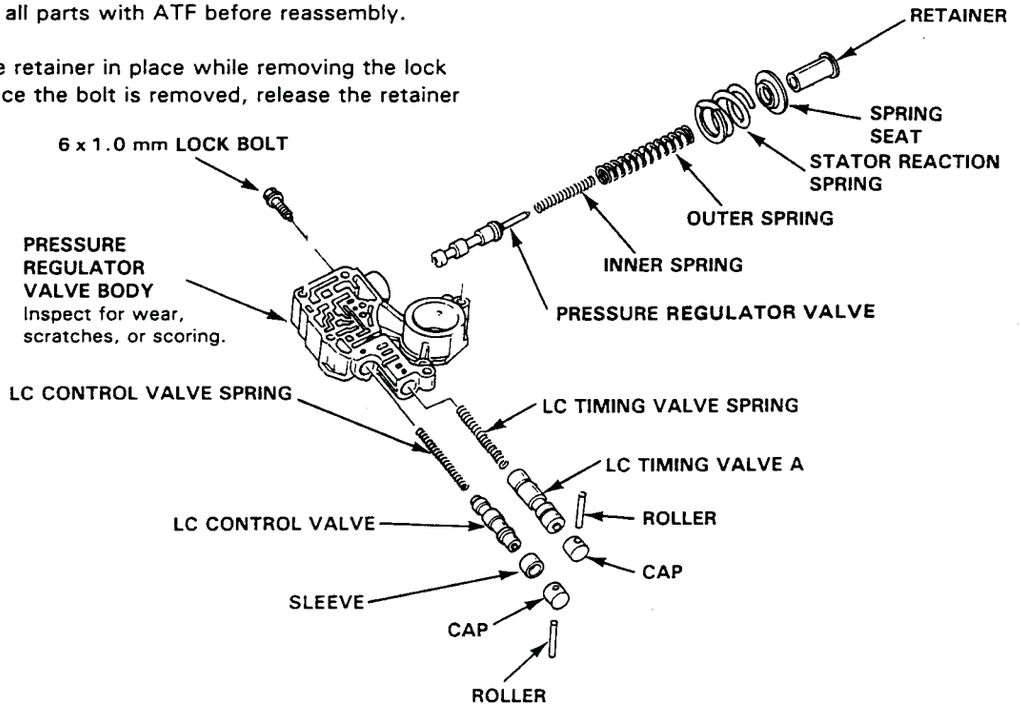
Pump Gears Side (Radial) Clearance:
Standard (New): Drive gear 0.210—0.266 mm (0.0083—0.0105 in.)
Driven gear 0.05—0.088 mm (0.0020—0.0035 in.)



Disassembly/Inspection

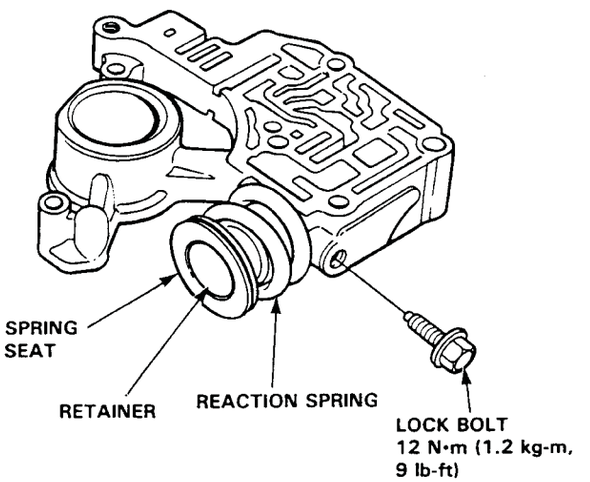
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement,
- See Section 3 for spring specifications.
- Coat all parts with ATF before reassembly.

1. Hold the retainer in place while removing the lock bolt. Once the bolt is removed, release the retainer slowly.



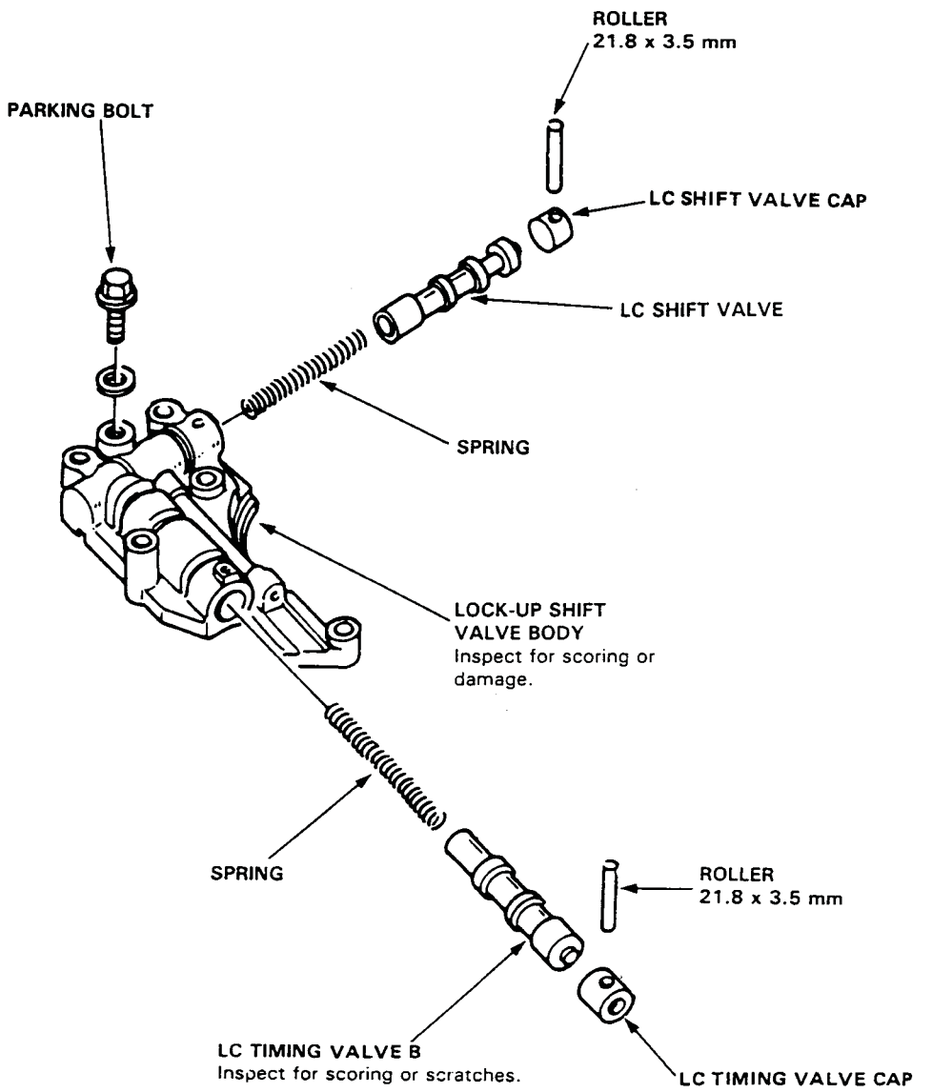
Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
2. Coat all valves with ATF.
3. Install the pressure regulator valve, and the inner and outer springs.
4. Install the reaction spring, spring seat, and retainer. Align the hole in the retainer with the hole in the valve body, then press the retainer into the valve body and tighten the lock bolt.

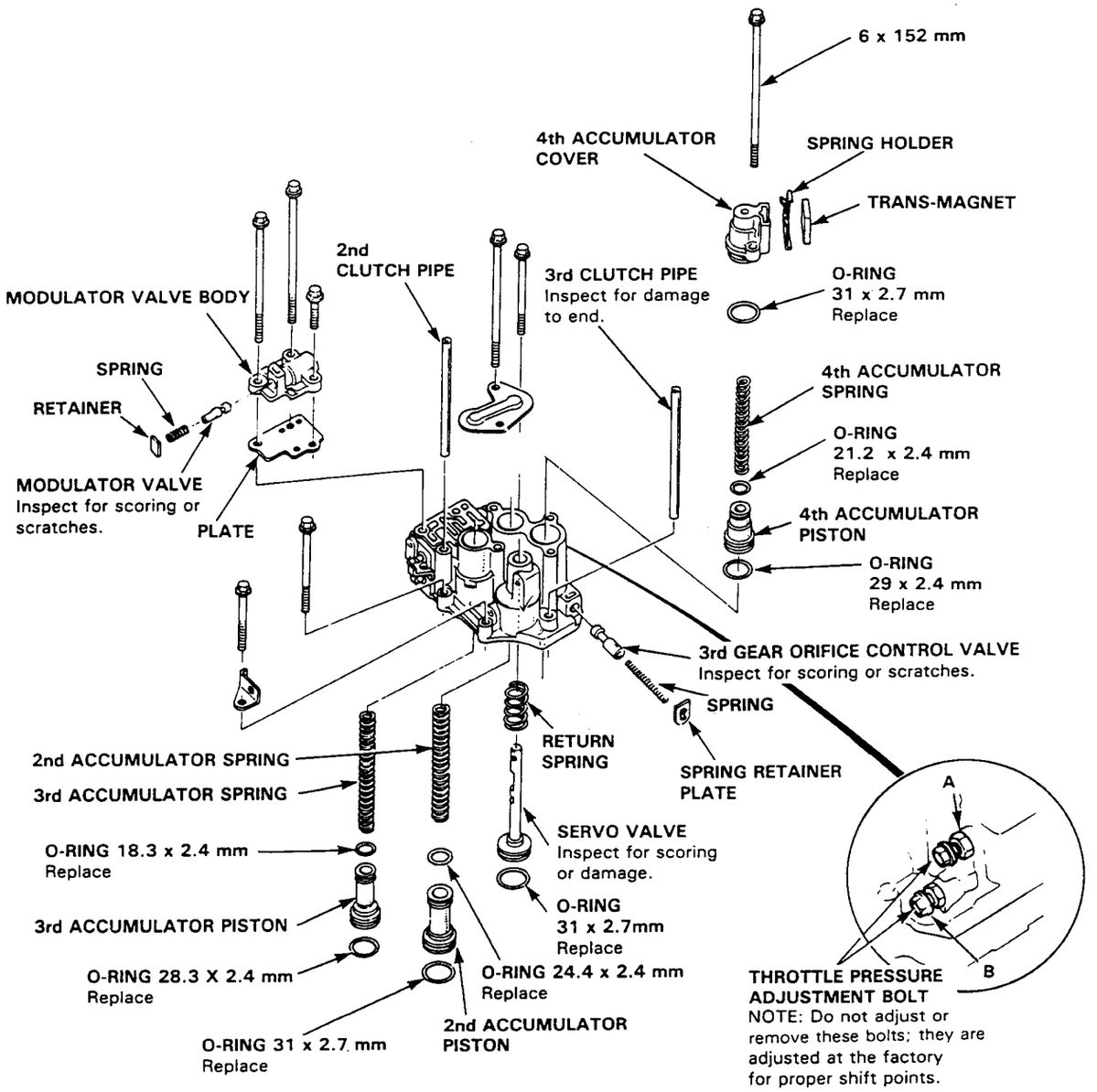


NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement,
- See Section 3 for spring specifications.
- Coat all parts with ATF before reassembly.

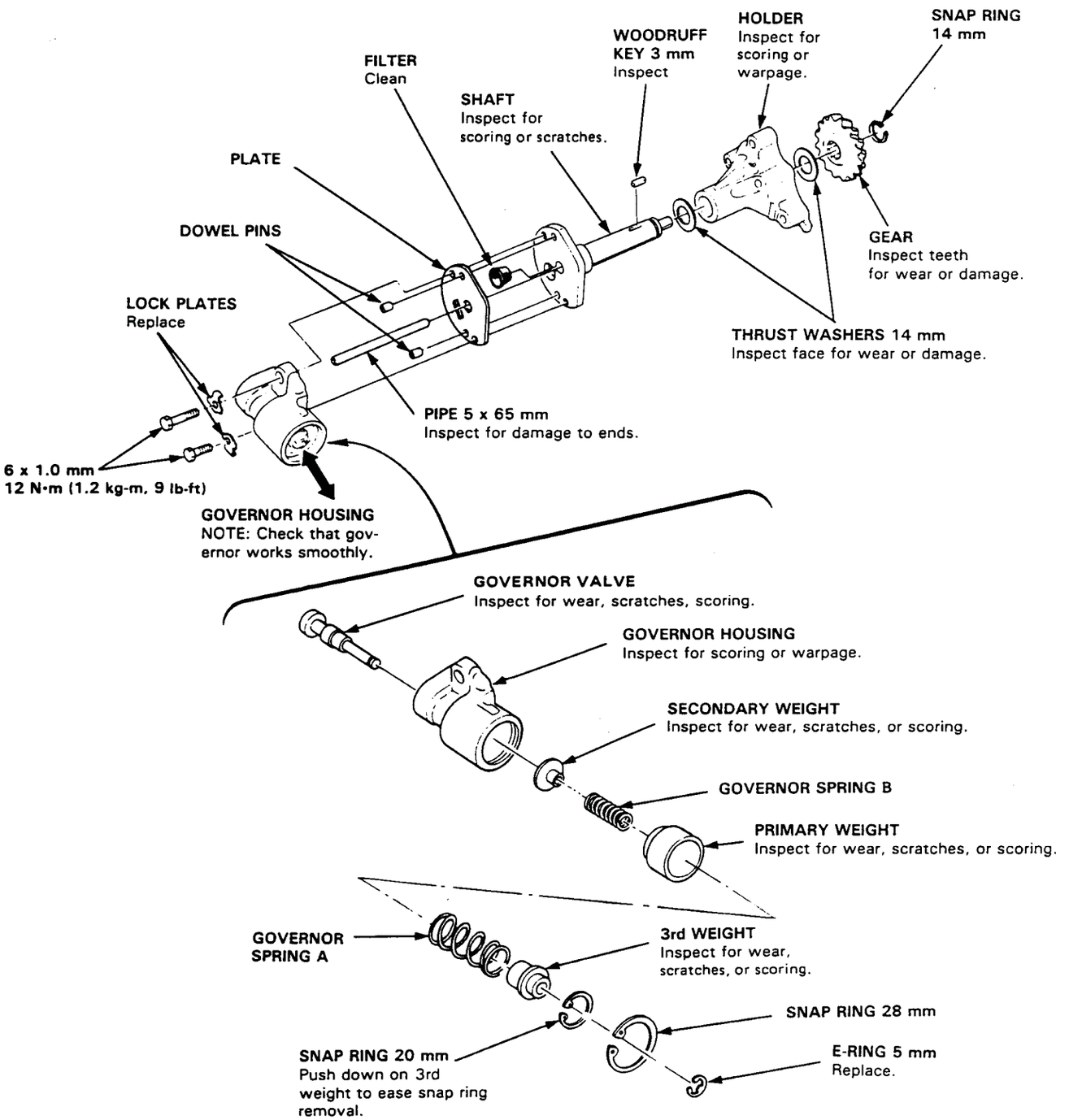


NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement.
- See Section 3 for spring specifications.

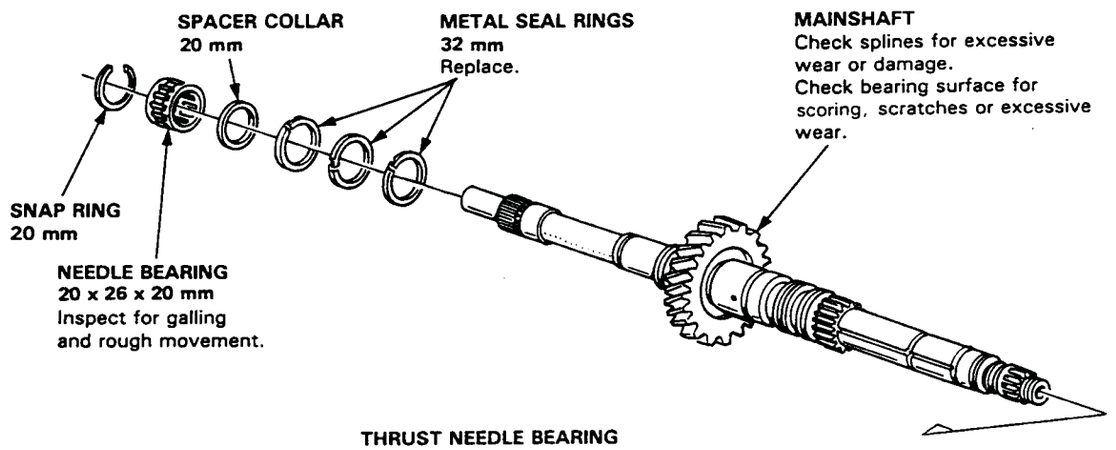


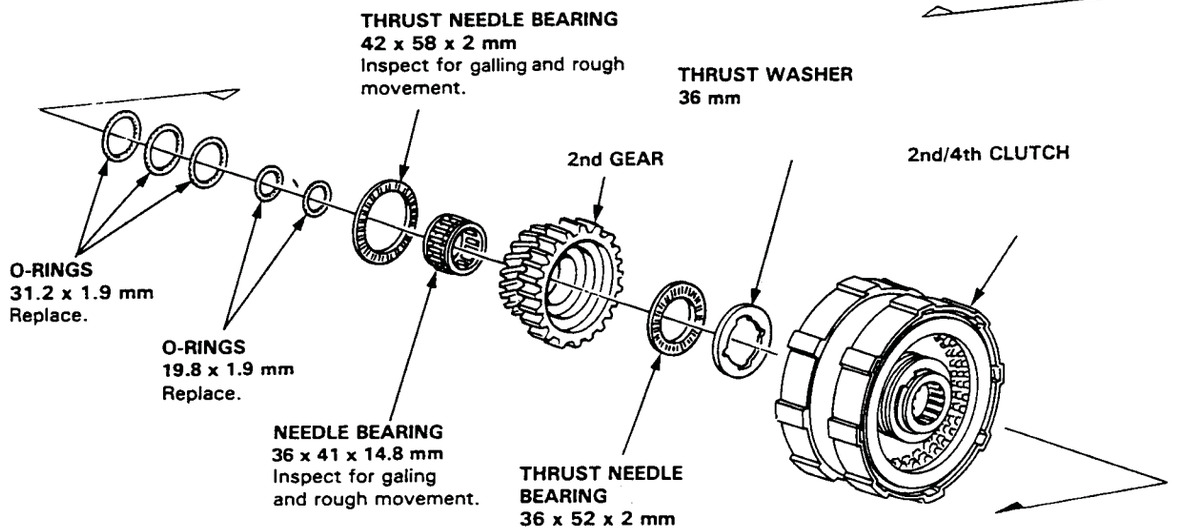
NOTE:

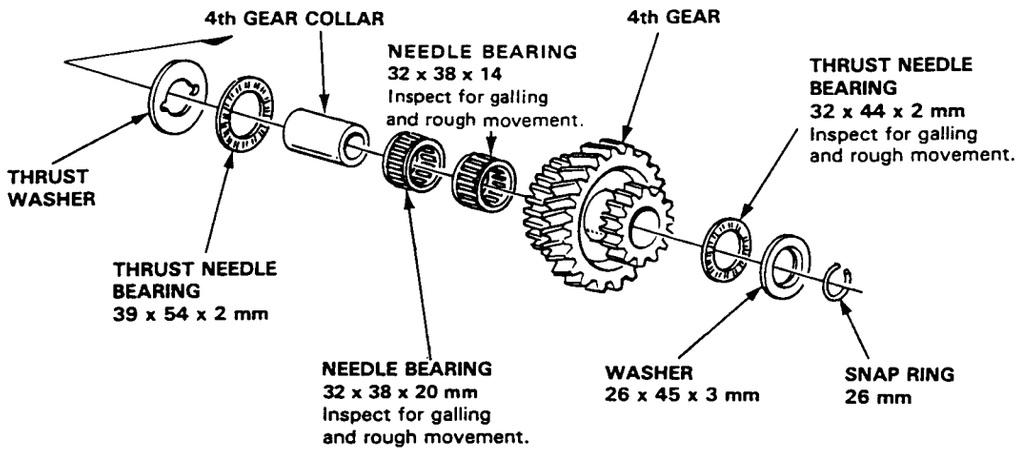
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check that the governor works smoothly; replace it if it does not.
- See Section 3 for spring specifications.
- Coat all parts with ATF before reassembly.



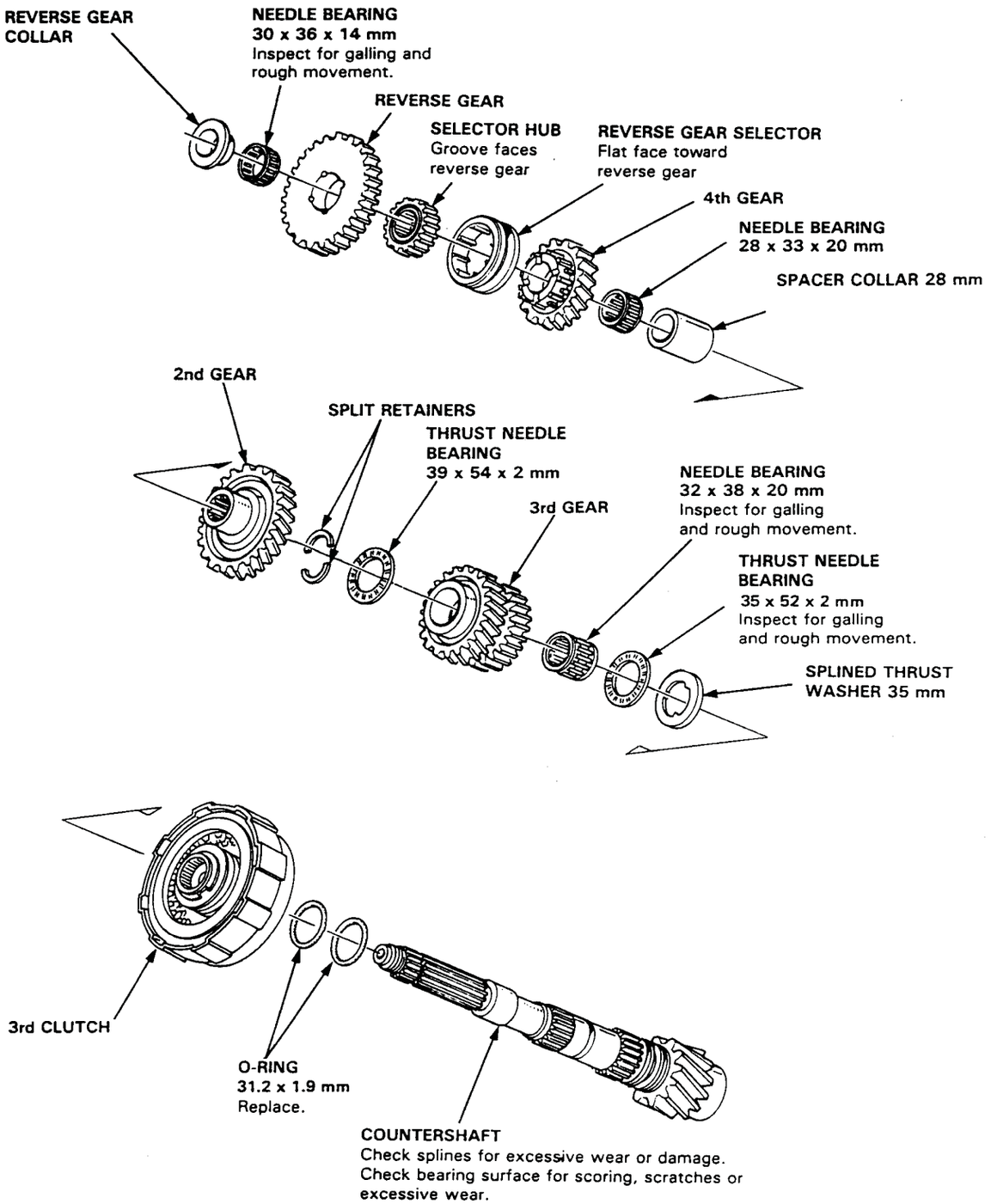
NOTE:
- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.







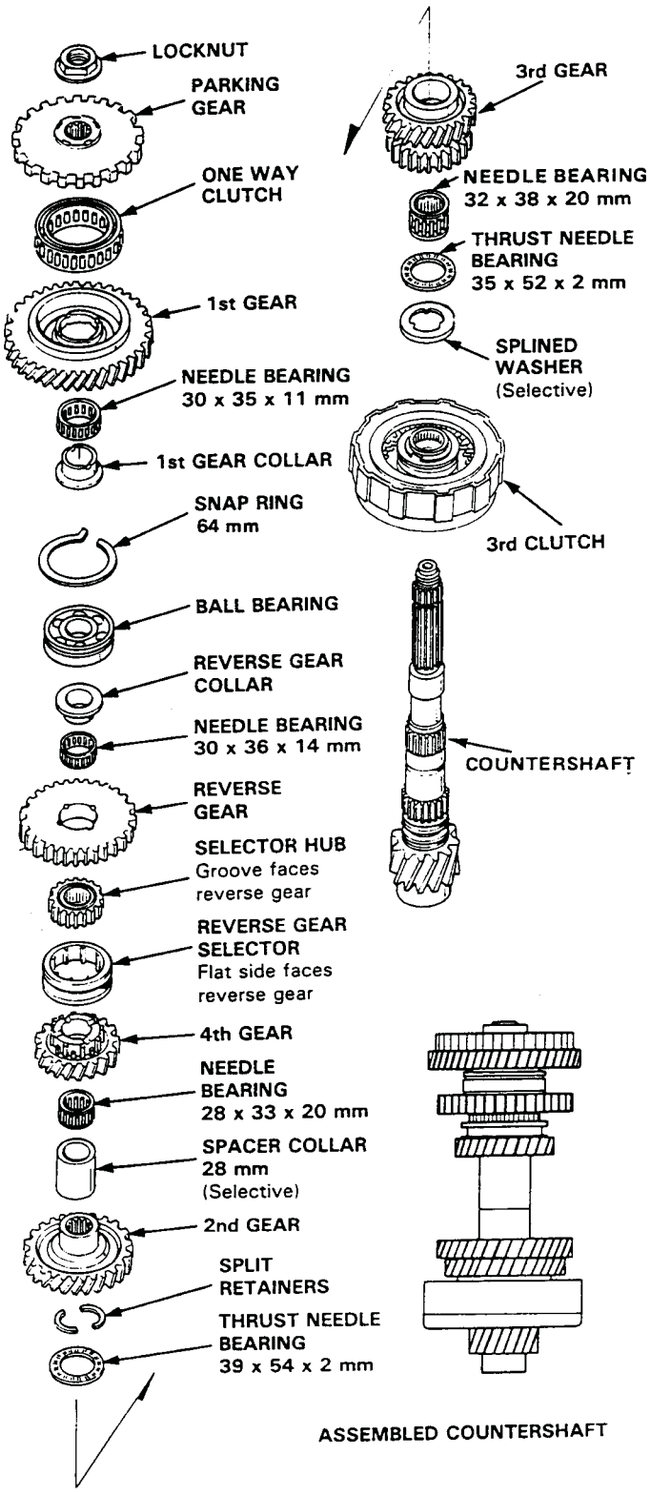
NOTE:
- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearing with unrolled edge of bearing retainer facing washer.



1. Remove both the mainshaft and countershaft bearings from the transmission housing.
2. Assemble the mainshaft and the countershaft including bearings and all parts shown below.
3. Install the mainshaft and countershaft assemblies into the torque converter housing.
4. Install the mainshaft holder to prevent the shafts from turning.
5. Torque the mainshaft locknut to 35 N·m (3.5 kg-m, 25 lb-ft). (Left-hand threads.)
6. Hold the parking gear on the countershaft with your hand and torque the countershaft locknut to 35 N·m (3.5 kg-m, 25 lb-ft).
7. Measure clearances as described on the next page.

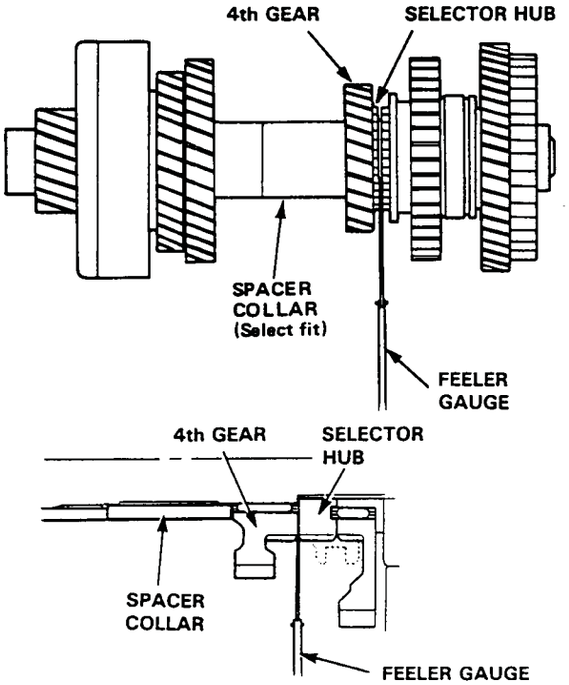
ATF Lubricate all parts with ATF before final reassembly.

Countershaft Assembly



8. On the countershaft, measure the clearance between the shoulder on the selector hub and the shoulder on 4th gear.

Countershaft 4th Gear Clearance:
Standard: 0.07—0.15 mm (0.003—0.006 in.)



If clearance exceeds the service limit, measure the thickness of the spacer collar and select one which gives correct clearance.

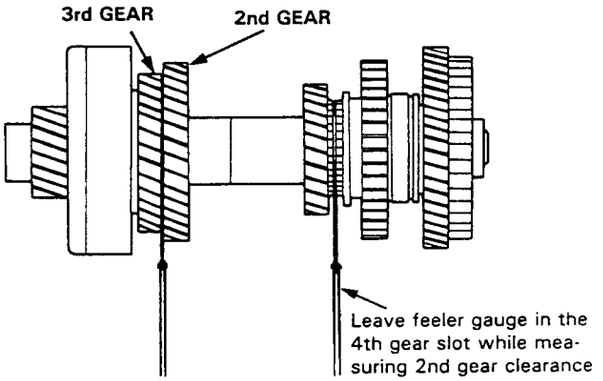
Replacement spacer collars:

CLASS	P/N	THICKNESS
1	90511-PH0-000	34.00 mm (1.339 in.)
2	90512-PH0-000	34.05 mm (1.341 in.)
3	90513-PH0-000	34.10 mm (1.342 in.)
4	90514-PH0-000	34.15 mm (1.344 in.)
5	90515-PH0-000	34.20 mm (1.346 in.)
6	90516-PH0-000	34.25 mm (1.348 in.)
7	90517-PH0-000	34.30 mm (1.350 in.)

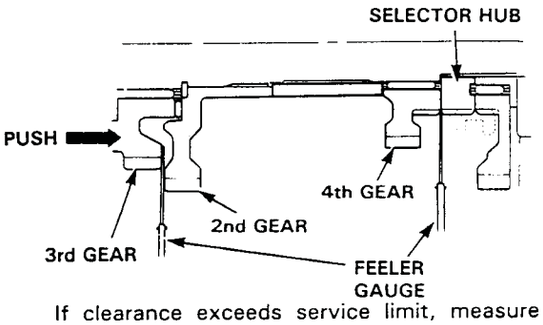
NOTE: Leave feeler gauge in place (4th gear) while measuring 2nd gear clearance.

Countershaft 2nd Gear Clearance:
Standard: 0.07—0.15 mm (0.003—0.006 in.)

9. Slide the 3rd gear out fully. Measure and record the clearance between the 2nd and 3rd gears with a feeler gauge.



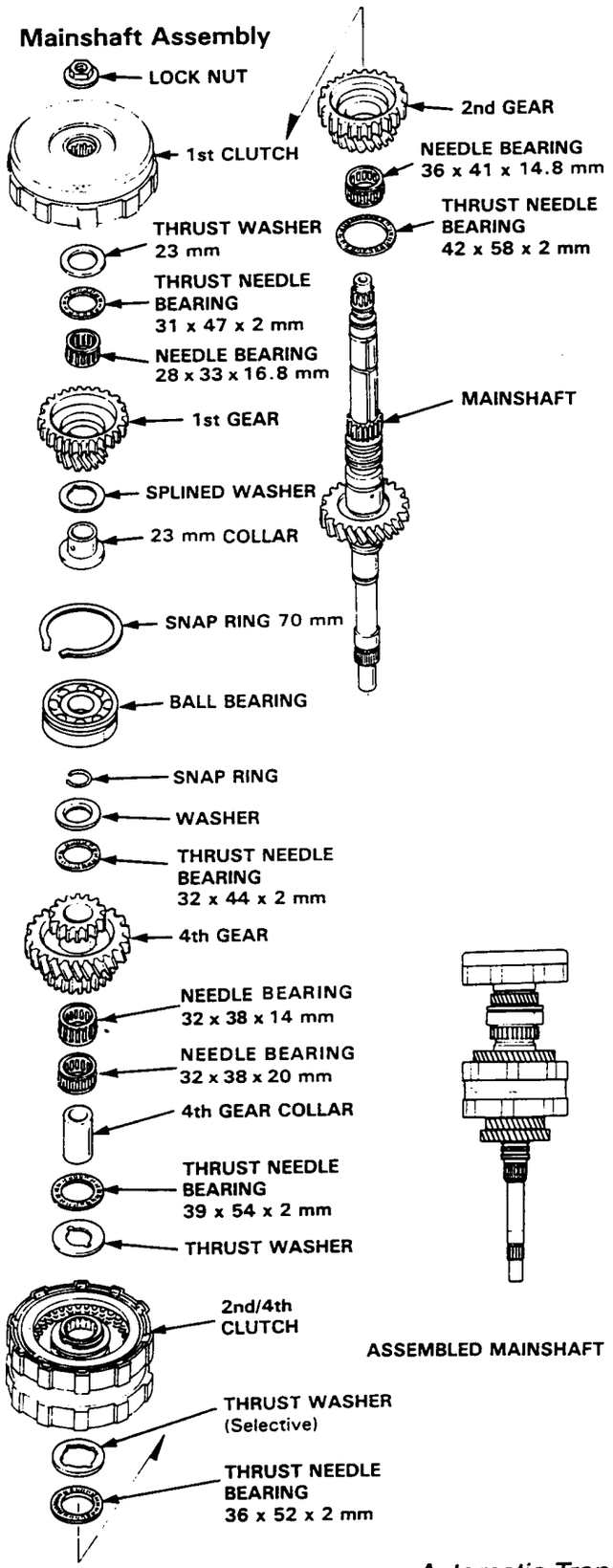
- Slide the 3rd gear in fully and again measure the clearance between the 2nd and 3rd gears with another feeler gauge.
- Calculate the difference between the two readings to determine the actual clearance between the two gears.



If clearance exceeds service limit, measure the thickness of the splined thrust washer (35 mm I.D.) and select one which gives the proper clearance.

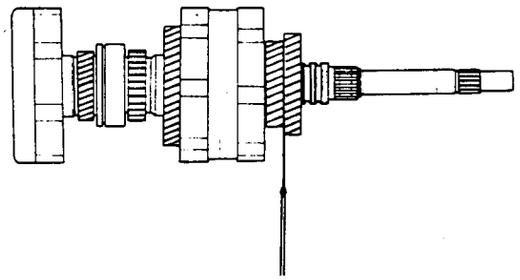
Replacement splined thrust washers:

P/N	THICKNESS
90411—PA9—010	2.97—3.00 mm (0.117—0.118 in.)
90412—PA9—010	3.02—3.05 mm (0.119—0.120 in.)
90413—PA9—010	3.07—3.10 mm (0.121—0.122 in.)
90414—PA9—010	3.12—3.15 mm (0.123—0.124 in.)
90415—PA9—010	3.17—3.20 mm (0.125—0.126 in.)
90418—PA9—000	3.22—3.25 mm (0.127—0.128 in.)
90419—PA9—000	3.27—3.30 mm (0.129—0.130 in.)
90420—PA9—000	3.32—3.35 mm (0.131—0.132 in.)
90421—PA9—000	3.37—3.40 mm (0.133—0.134in.)

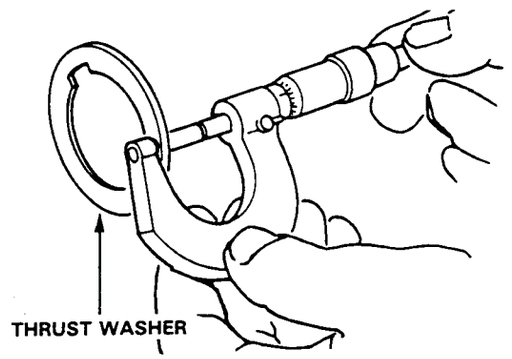


NOTE: Make all measurements before changing the thrust washers. Recheck after making the adjustments.

10. On the mainshaft measure the clearance between the shoulder of 2nd gear and main 3rd gear, the same way you did on the countershaft in step 9.
Mainshaft 2nd Gear Clearance:
Standard (New): 0.07—0.15 mm
(0.003—0.006 in.)



If the clearance exceeds the service limit, measure the thickness of the 2nd clutch thrust washer (36 mm I.D.) and select one which gives the correct clearance.



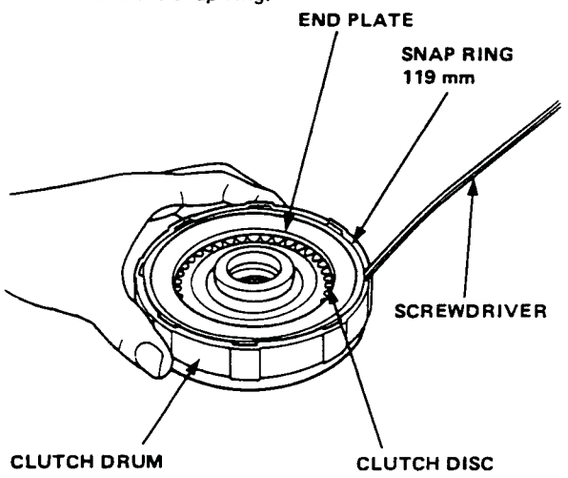
Replacement washer (36 mm I.D.)

CLASS	P/N	THICKNESS
A	90441—PC9—010	3.47—3.50 mm (0.137—0.138 in.)
B	90442—PC9—010	3.52—3.55 mm (0.139—0.140 in.)
C	90443—PC9—010	3.57—3.60 mm (0.141—0.142 in.)
D	90444—PC9—010	3.62—3.65 mm (0.143—0.144 in.)
E	90445—PC9—010	3.67—3.70 mm (0.145—0.146 in.)
F	90446—PC9—010	3.72—3.75 mm (0.147—0.148 in.)
G	90447—PC9—010	3.77—3.80 mm (0.149—0.150 in.)
H	90448—PC9—010	3.82—3.85 mm (0.151—0.152 in.)
I	90449—PC9—010	3.87—3.90 mm (0.153—0.154 in.)

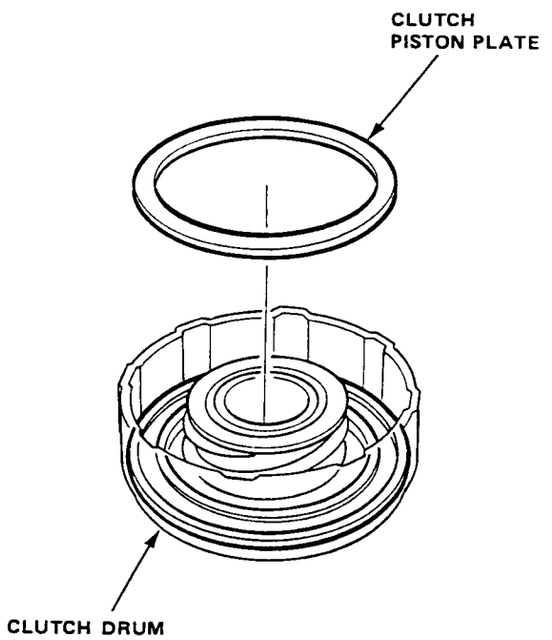
NOTE:

- The 1st and 3rd clutches are identical except for the piston plate installed in the 1st clutch.
- To disassemble the 2nd/4th clutch, use the special tool in Step 3 in the same manner as for the 1st and 3rd clutches.

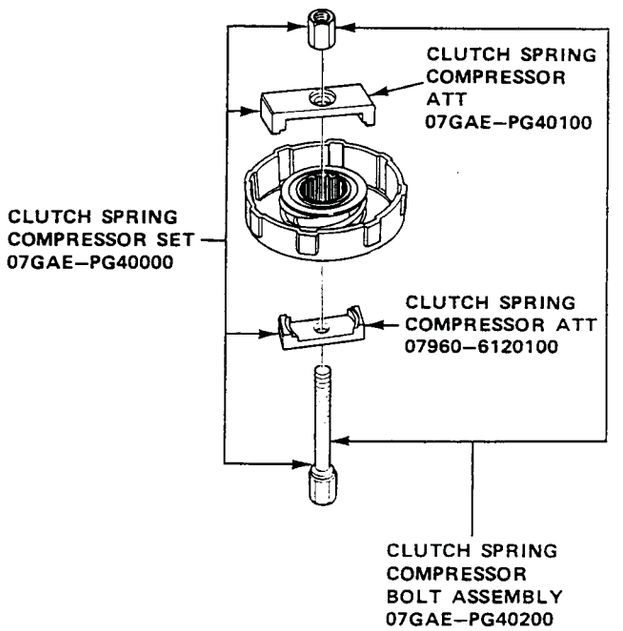
1. Remove the snap ring.



2. Remove the end plate, clutch discs and plates.
   1st clutch only: Also remove the clutch piston plate.

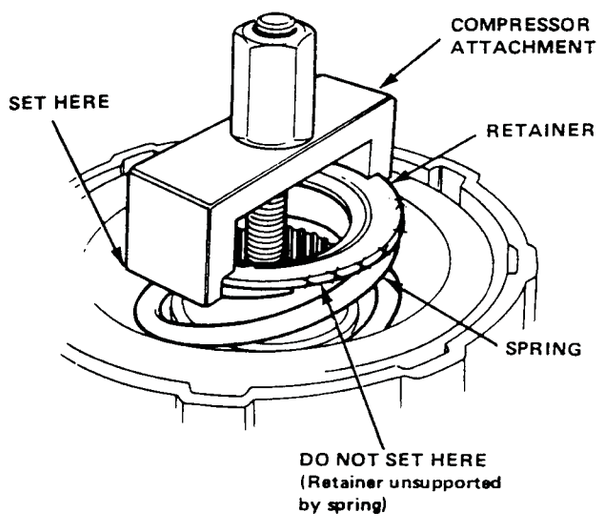


3. Install the clutch spring compressor as shown.

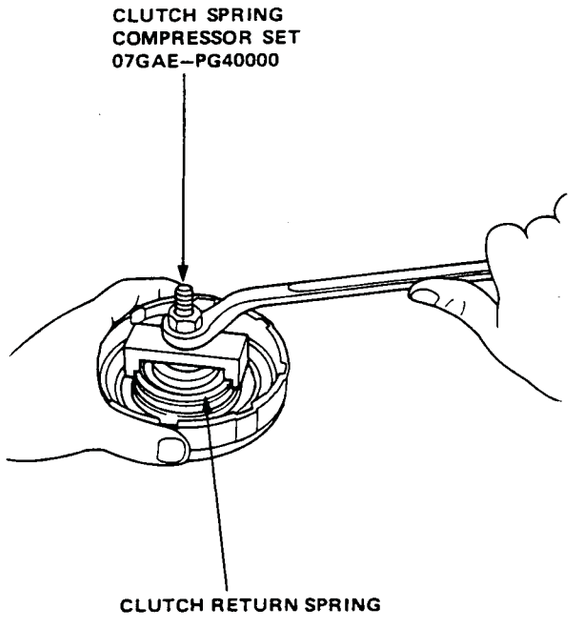


1st and 3rd Clutches

CAUTION: If either end of the compressor attachment is set over an area of the retainer which is unsupported by the spring, the retainer may be damaged.

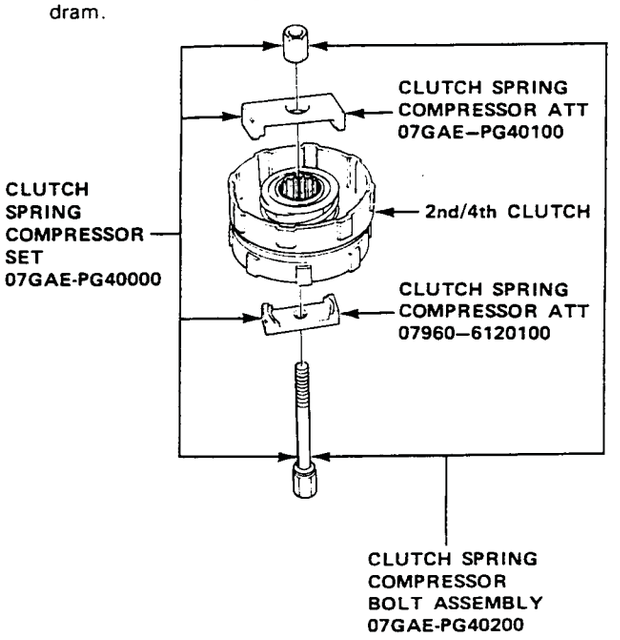


- Compress the clutch return spring.

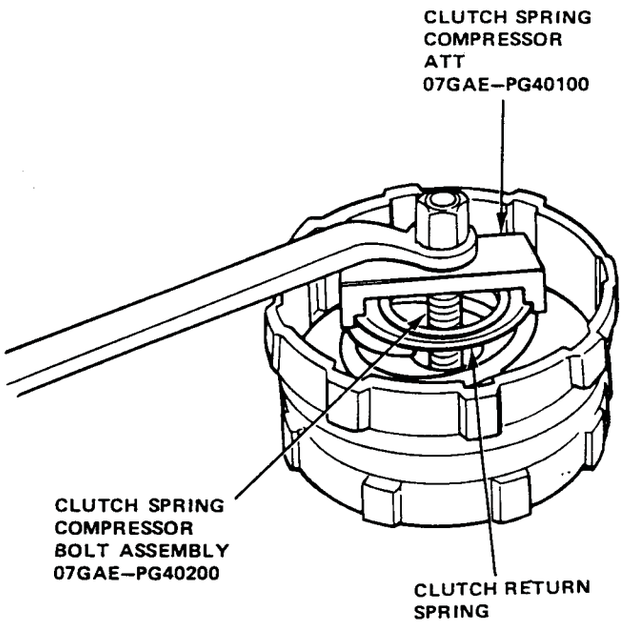


2nd/4th Clutch

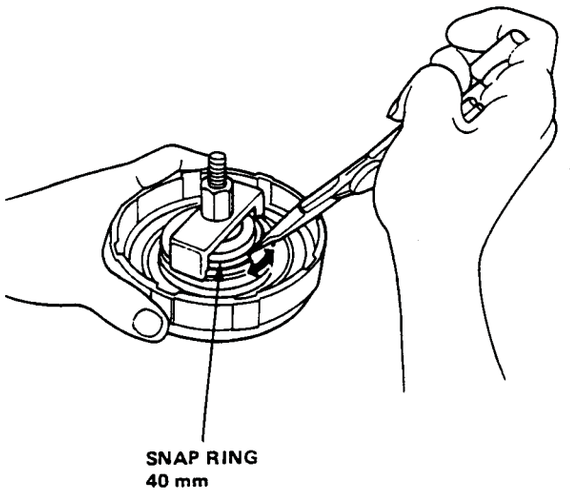
- Assemble the spring compressor on the clutch dram.



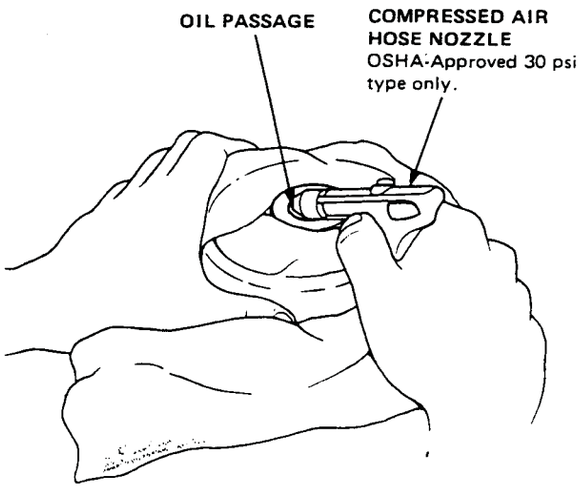
- Compress the clutch return spring.



4. Remove the snap ring. Then remove the clutch spring compressor, spring retainer and spring.



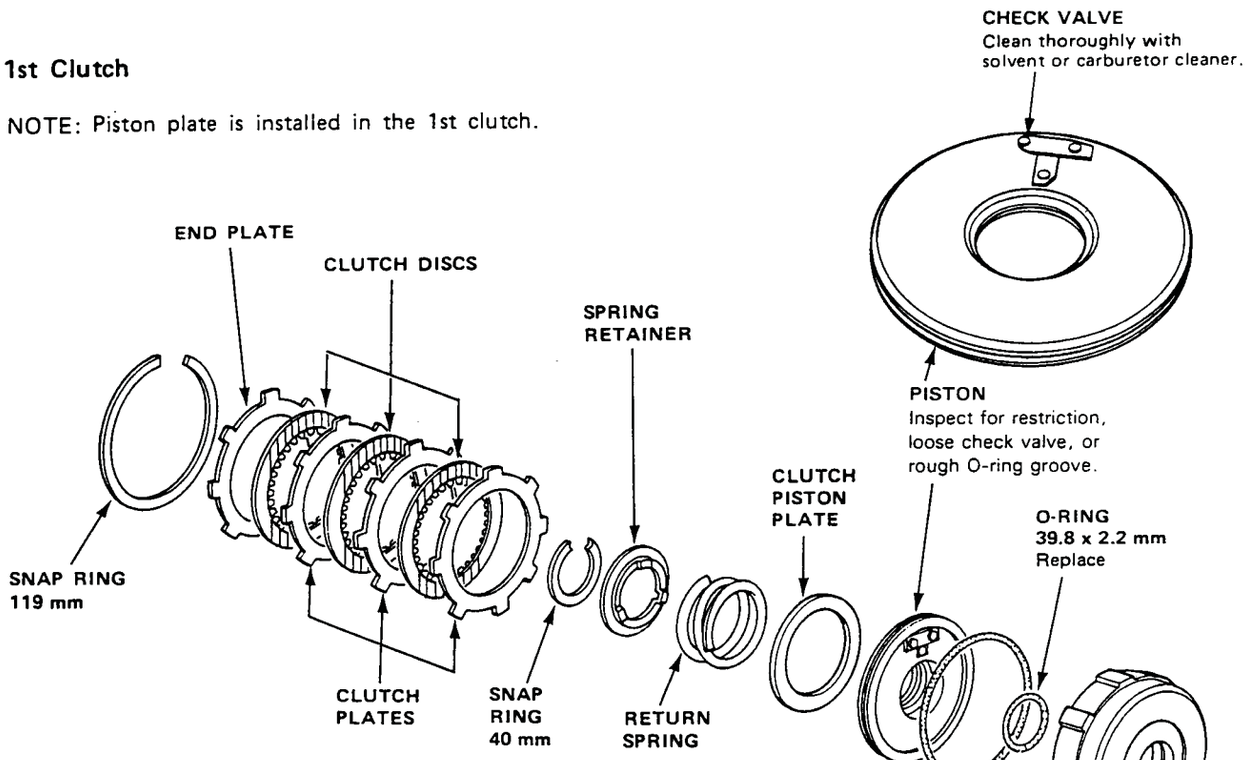
5. Wrap a shop rag around the clutch drum and apply air pressure to the oil passage to remove the piston. Place a finger tip on the other end while applying air pressure.



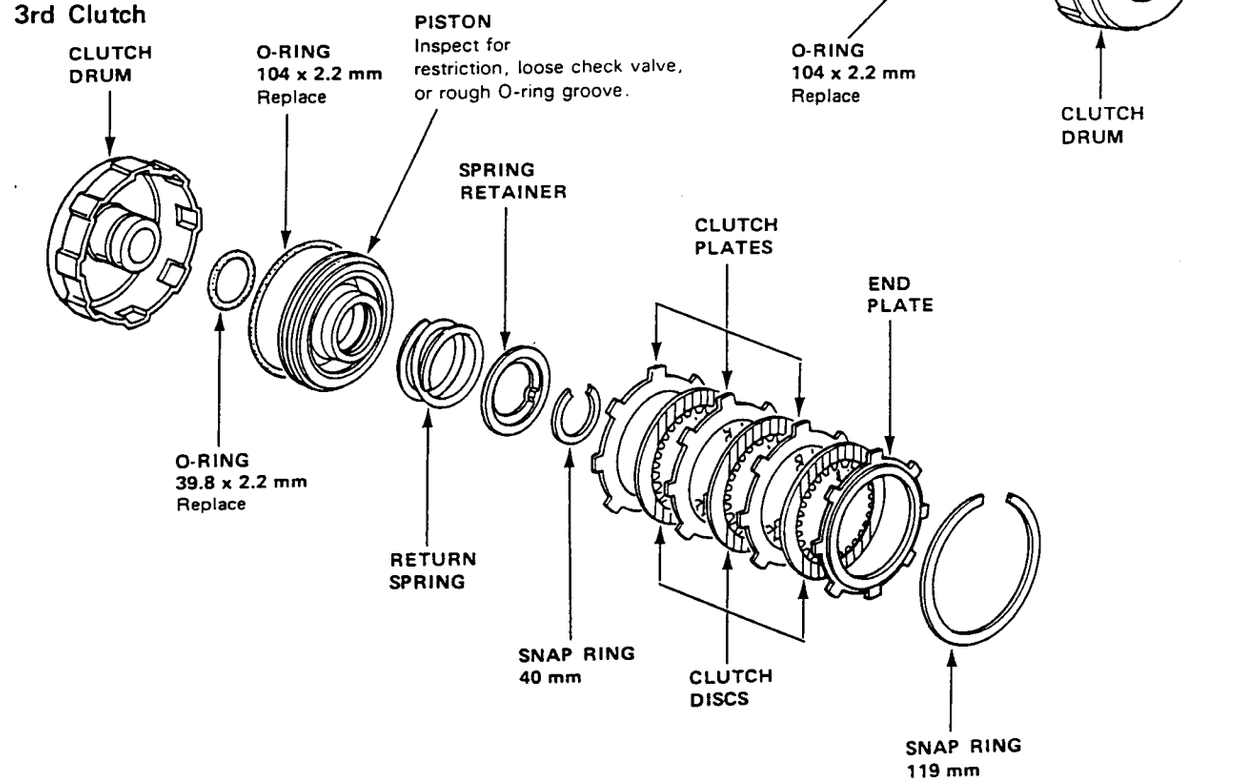
Disassembly/Inspection

1st Clutch

NOTE: Piston plate is installed in the 1st clutch.

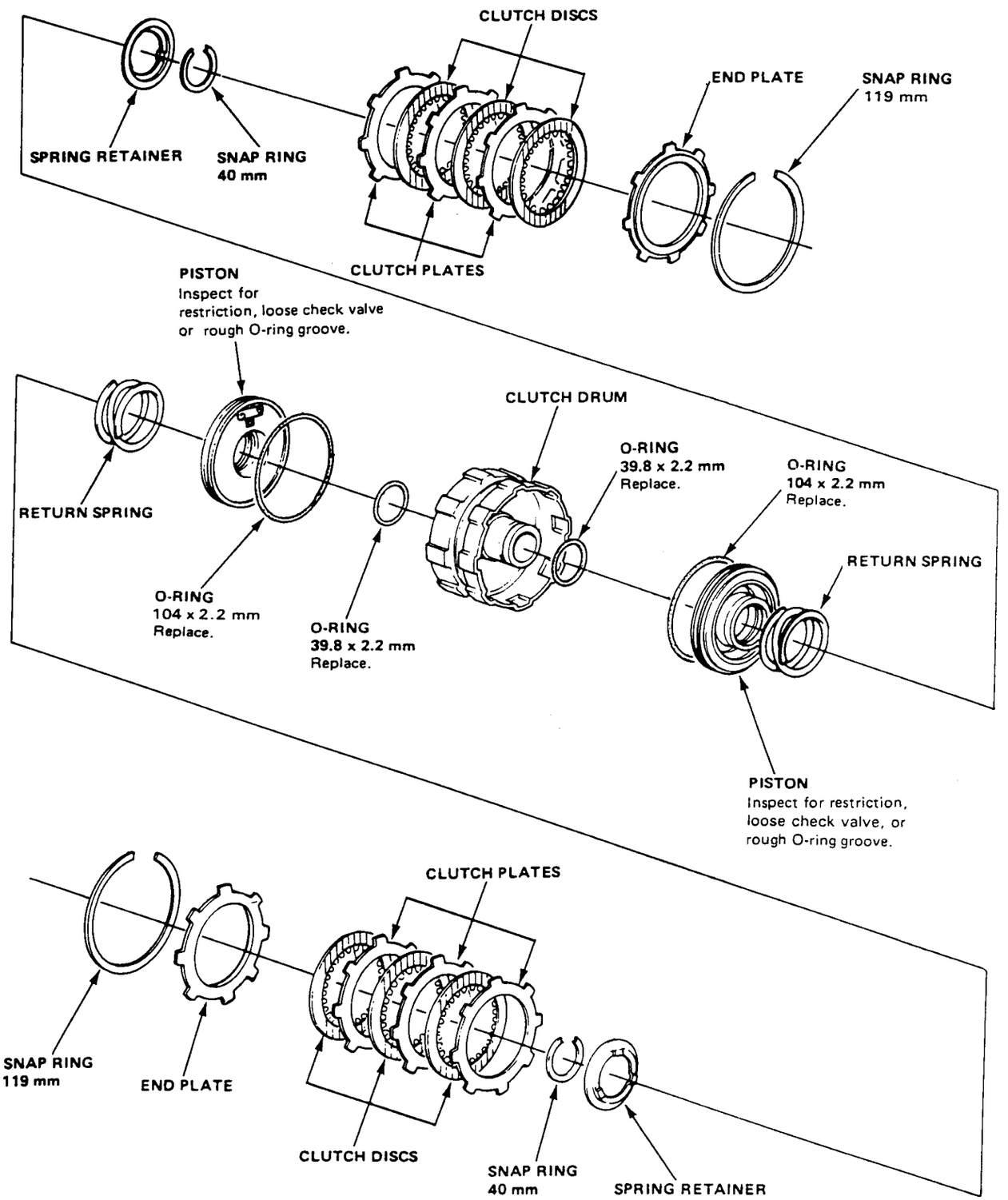


3rd Clutch



Disassembly/Inspection (cont'd)

2nd/4th Clutch

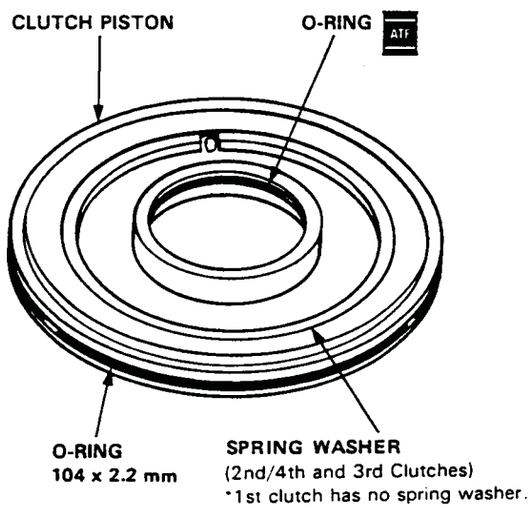


NOTE:

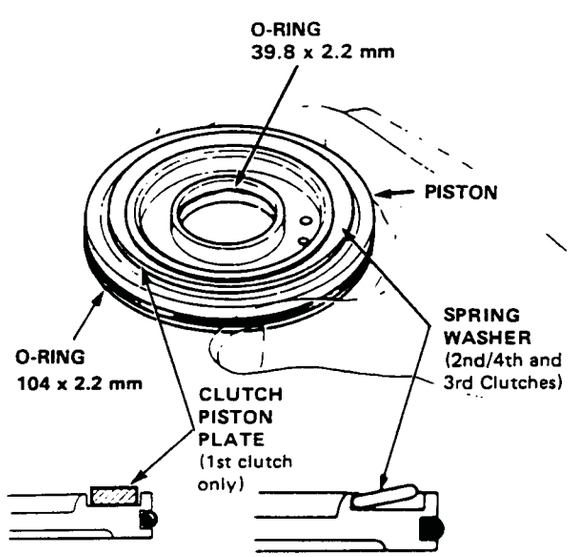
- The 1st and 3rd clutch assemblies are identical except installing the clutch piston plate in the 1st clutch.
- To reassemble the 2nd/4th clutch, use the special tool in Step 7 in the same manner as for the 1st and 3rd clutches.

1. Clean all parts thoroughly in solvent, and dry with compressed air. Blow out all passages.

2. Lubricate all parts with ATF before reassembly.



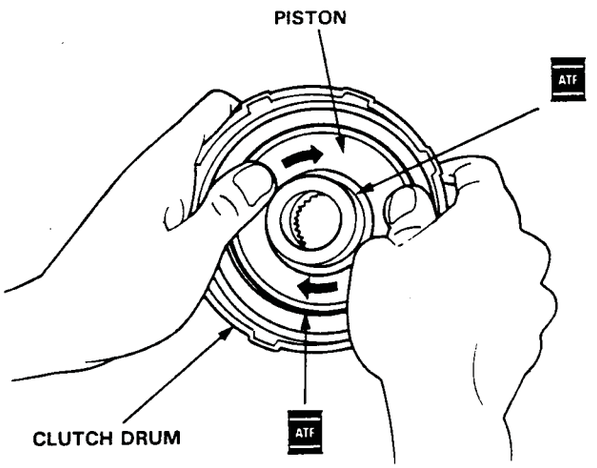
3. Install new O-ring on clutch piston.
   2nd/4th and 3rd Clutches:
   Make sure the spring washer is properly positioned as shown.



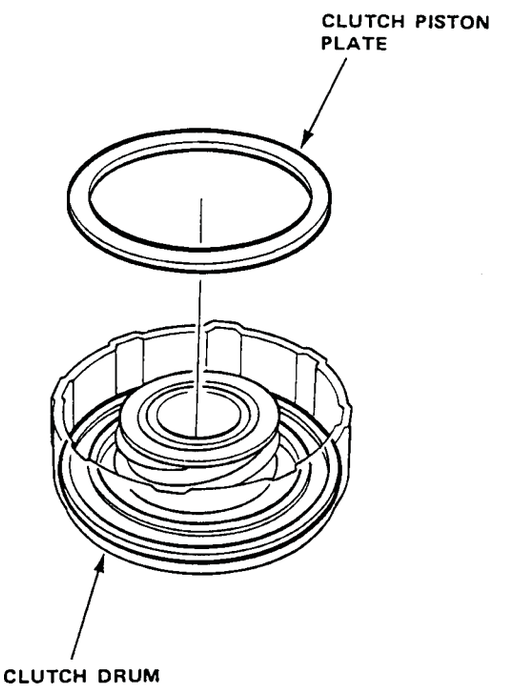
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

   NOTE: Lubricate the piston O-ring with ATF before installing.

   CAUTION: Do not pinch O-ring by forcing piston installation.

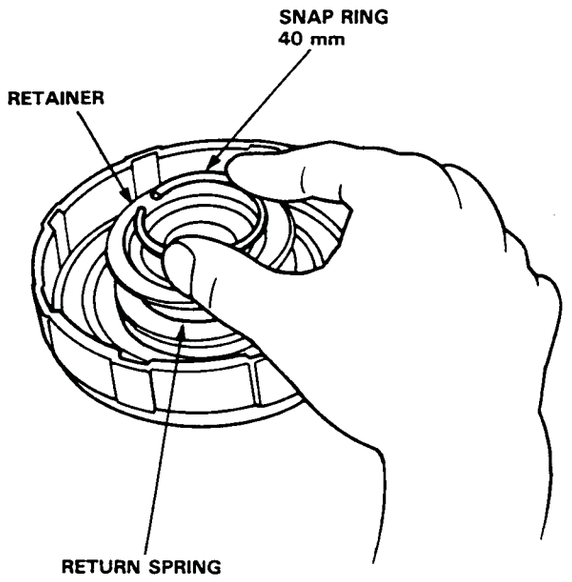


- 1st clutch only:
  Install the clutch piston plate.



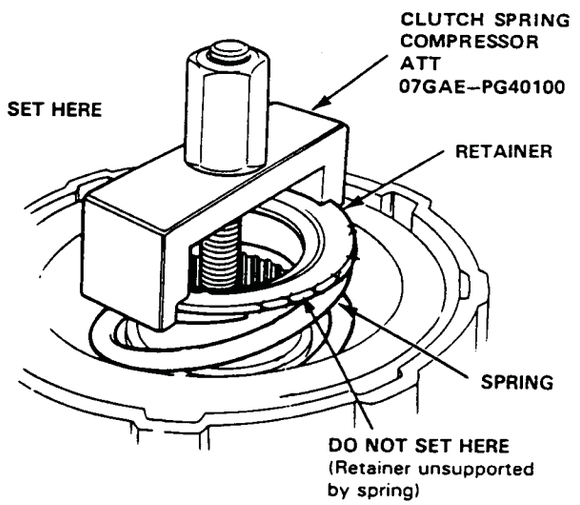
5. Install the return spring and retainer.

6. Position the 40 mm snap ring on the spring retainer.



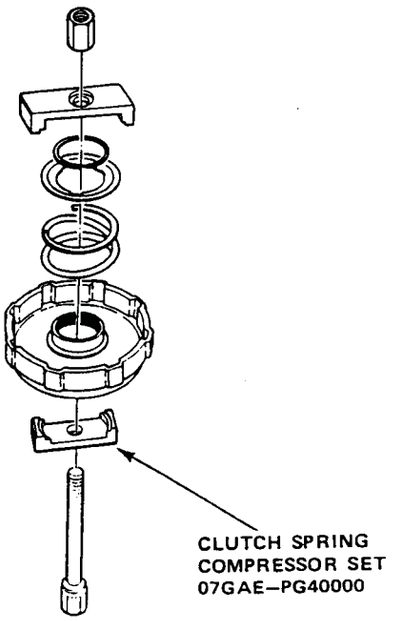
7. Assemble the spring compressor on the clutch drum.

CAUTION: If either end of the compressor attachment is set over an area of the retainer which is unsupported by the spring, the retainer may be damaged.

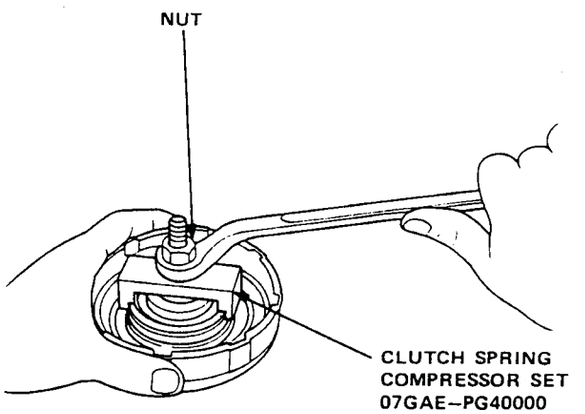


1st and 3rd clutches

- Assemble the spring compressor on the clutch drum.

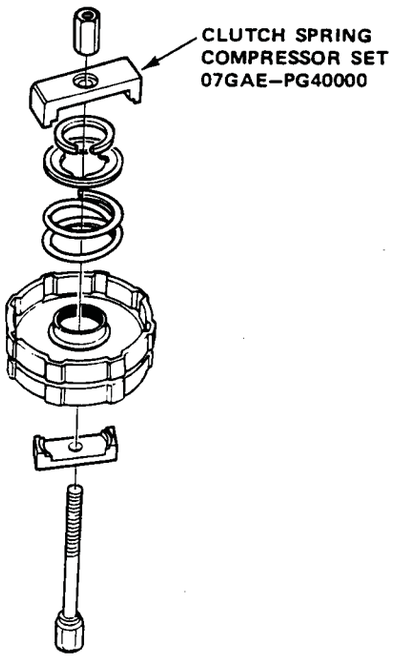


8. Compress the spring until the retainer is below the snap ring groove in the hub.

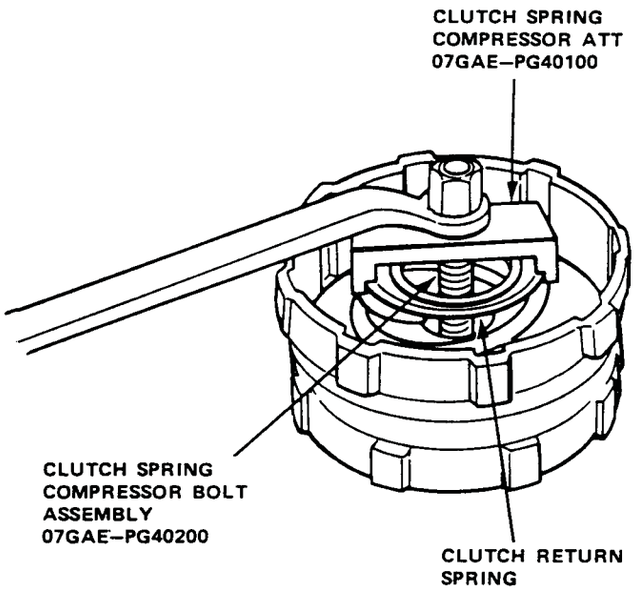


2nd/4th Clutch

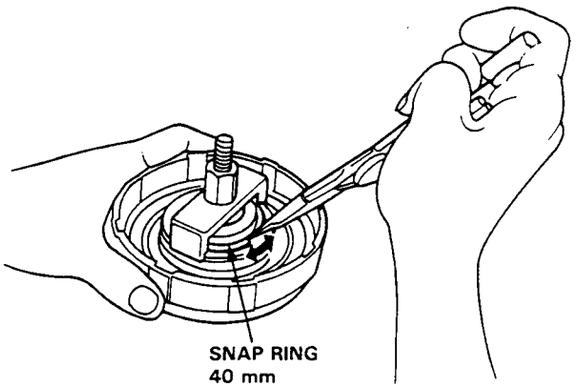
- Assemble the spring compressor on the clutch drum.



- Compress the clutch return spring.



9. Then install the snap ring (with its rounded edge facing in) in the hub groove and remove the spring compressor.

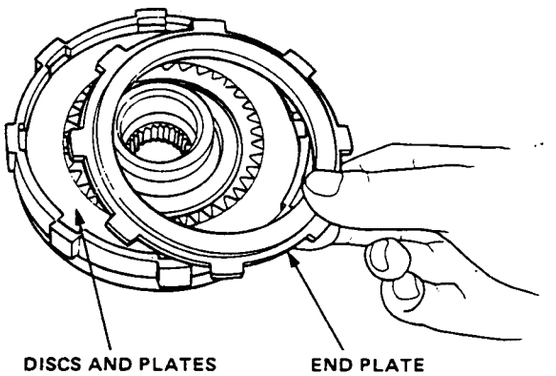


10. Soak the clutch discs thoroughly in automatic transmission fluid for a minimum of 30 minutes.

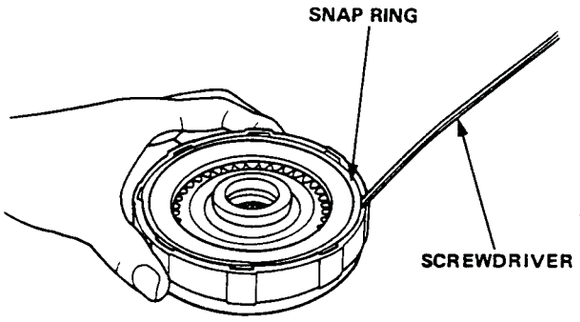
    NOTE:
    Clutch piston plate is installed only in the 1st clutch.

11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

    NOTE: Before installing the plates and discs, make sure the inside of the clutch drum is free of grit or other foreign matter.



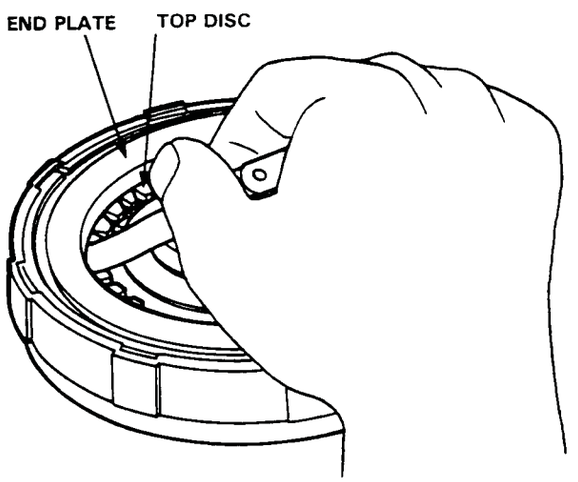
12. Install the 119 mm snap ring.



13. Using bent feeler gauges, carefully measure the clearance between the clutch end plate and the top disc. Do not damage the disc.

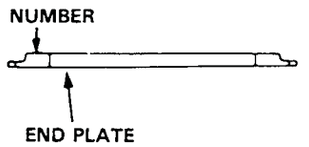
End Plate-to-Top Disc Clearance:

	Service Limit	
LOW	0.65 – 0.85 mm	(0.026–0.033 in.)
2ND	0.65–0.8 mm	(0.026–0.031 in.)
3RD	0.4–0.6 mm	(0.016–0.023 in.)
4TH	0.4–0.6 mm	(0.016–0.023 in.)

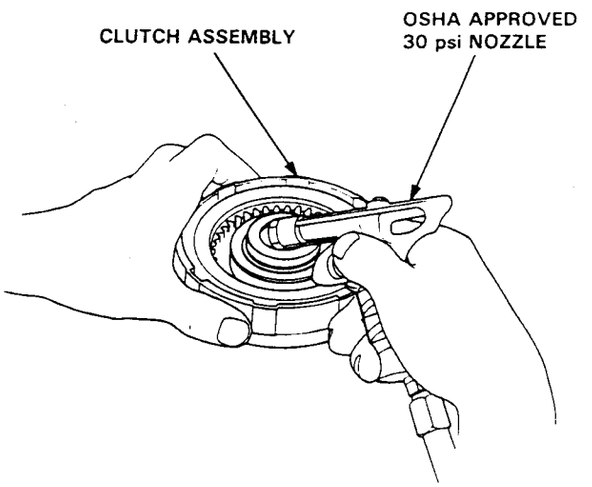


14. If not within service limit, select a new clutch end plate from following table.

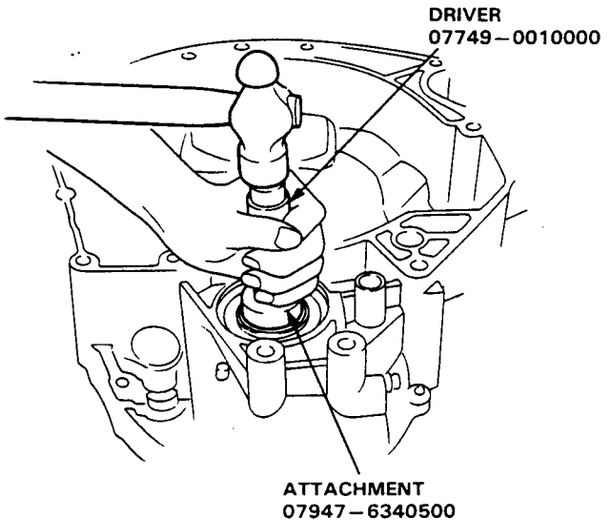
P/N	PLATE NO.	THICKNESS
22551–PC9–000	1	2.4 mm (0.094 in.)
22552–PC9–000	2	2.5 mm (0.098 in.)
22553–PC9–000	3	2.6 mm (0.102 in.)
22554–PC9–000	4	2.7 mm (0.106 in.)
22555–PC9–000	5	2.8 mm (0.110 in.)
22556–PC9–000	6	2.9 mm (0.114 in.)
22557–PC9–000	7	3.0 mm (0.118 in.)
22558–PC9–000	8	3.1 mm (0.122 in.)
22559–PC9–000	9	3.2 mm (0.126 in.)
22560–PC9–000	10	3.3 mm (0.130 in.)



15. Check the clutch engagement by blowing air into the oil passage in the clutch drum hub. Remove the air pressure and check that the clutch releases.

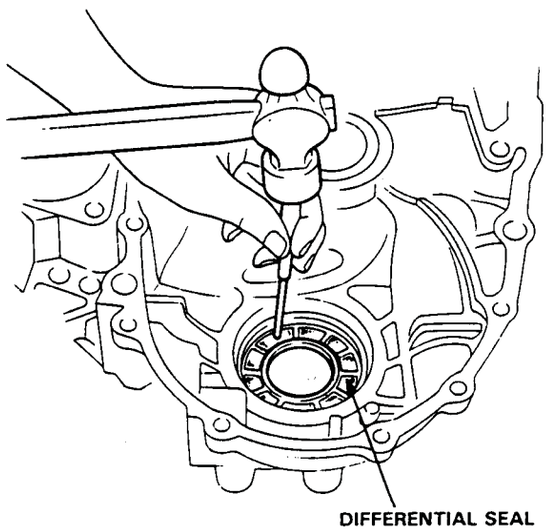


1. If seals are to be replaced, or if differential needs repair, remove the differential.

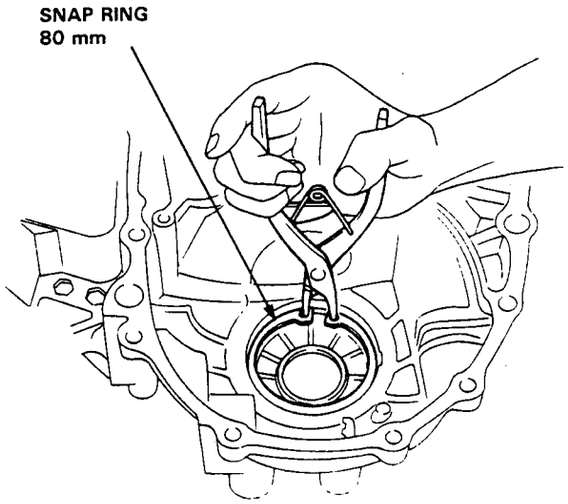


2. On the torque converter housing, remove the 80 mm snap ring, then drive out the seal as shown.

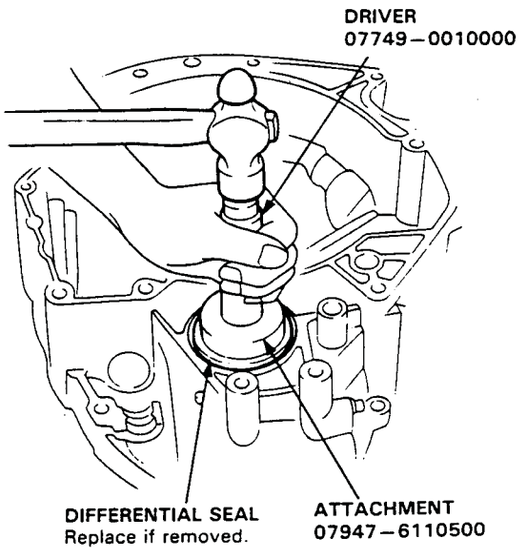
3. Remove the differential seal from the transmission housing in the same way.



4. On the torque converter housing, install the differential 80 mm snap ring if removed.

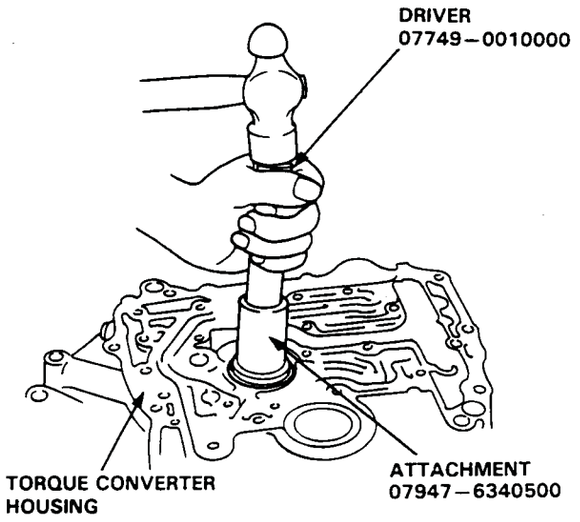


5. Install the differential seals into the torque converter housing and transmission housing.

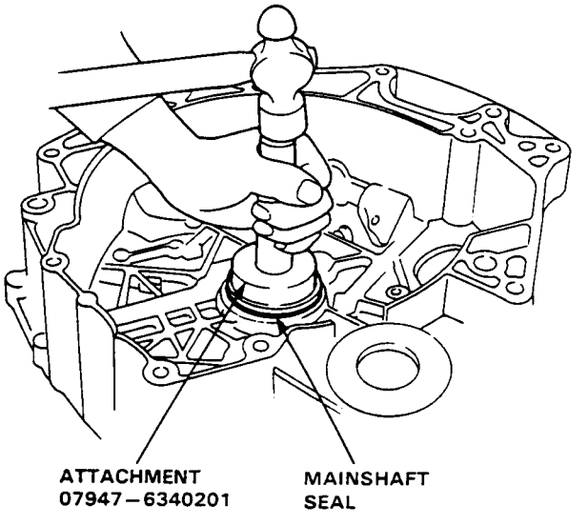


Torque converter housing

1. Remove the mainshaft bearing and seal from the torque converter housing.

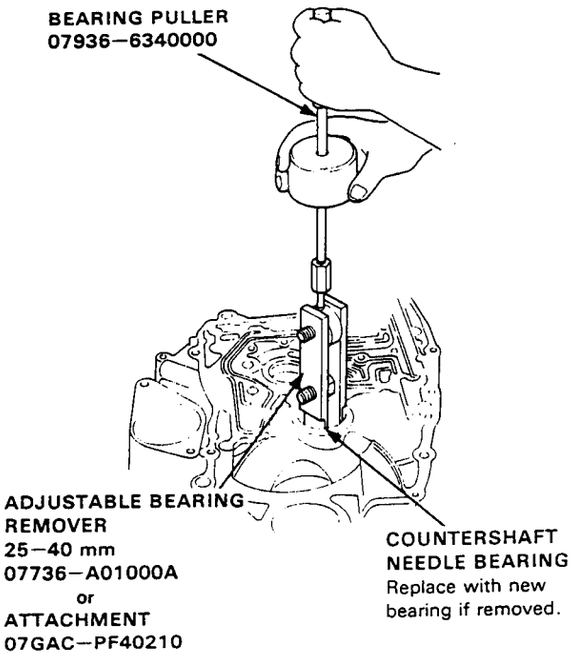


2. Drive in the new mainshaft bearing until it bottoms in housing.

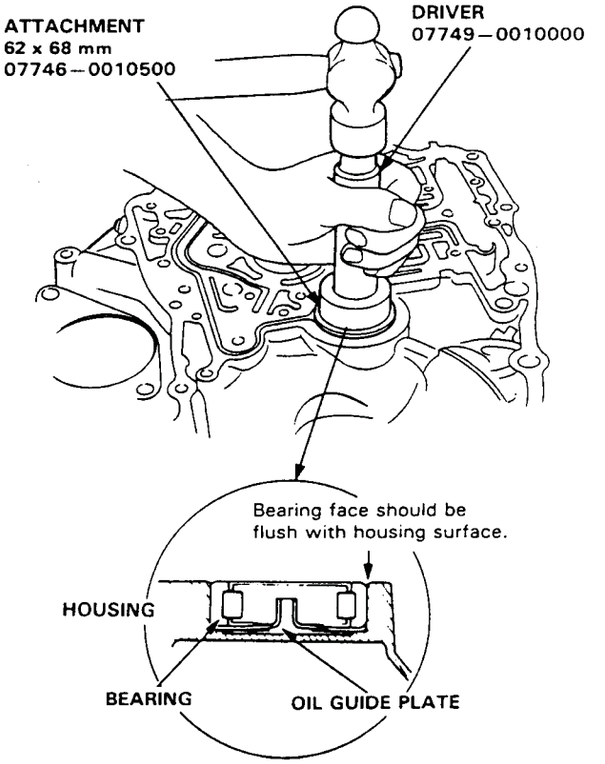


3. Then install the new mainshaft seal flush with the housing, using attachment 07947–6340201.

4. Turn the torque converter housing over and remove the countershaft bearing.



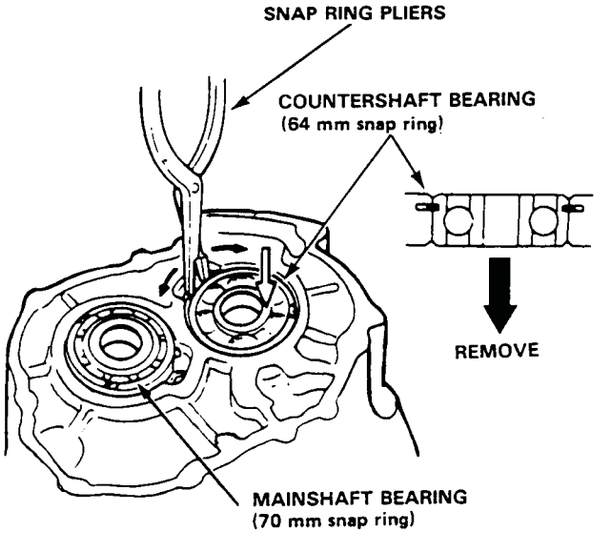
5. Make sure the oil guide plate is installed in the bearing hole, then install a new countershaft bearing flush with the housing.



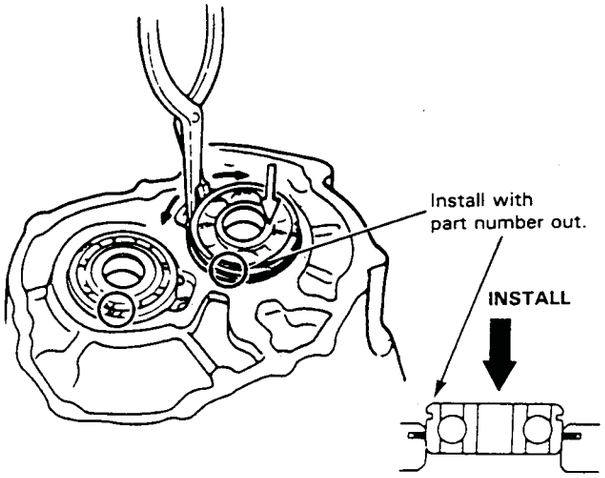
Transmission housing

1. To remove the mainshaft and countershaft bearings from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out by hand.

   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



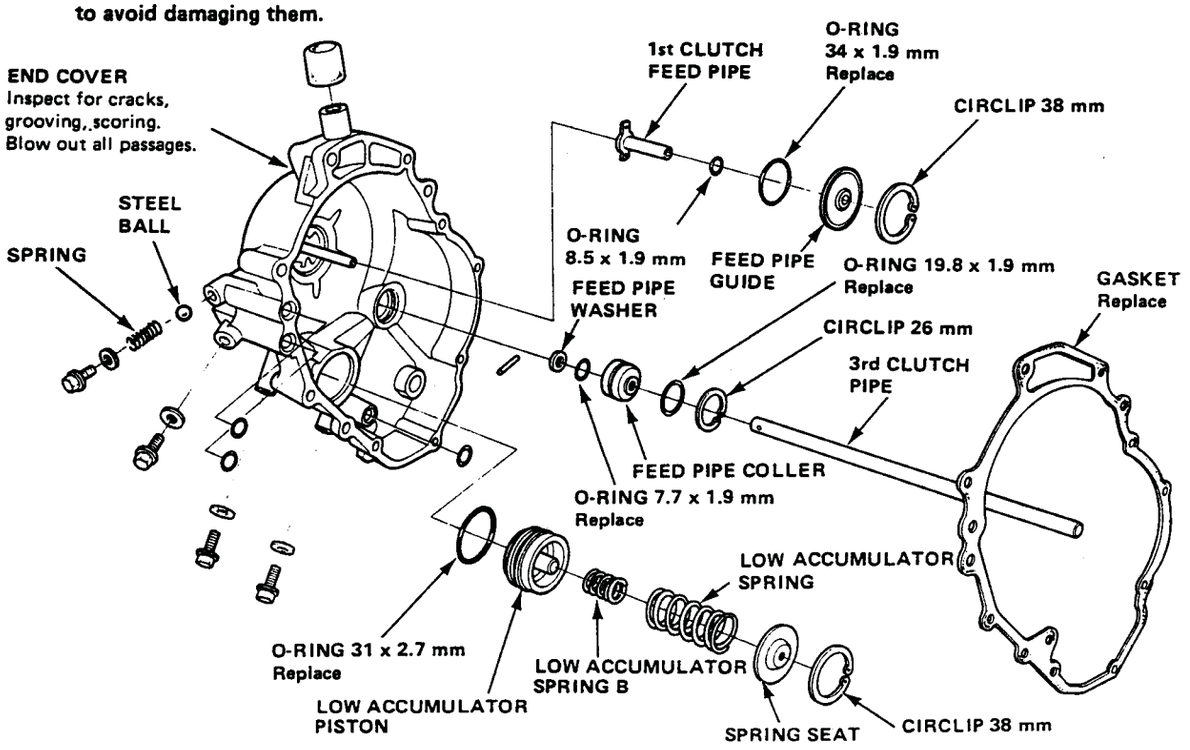
2. Expand each snap ring with snap ring pliers, insert the new bearing part-way into it, then release the pliers. Push the bearing down into the transmission until the ring snaps in place around it.



3. Make sure the snap rings are seated in the bearing and housing grooves.

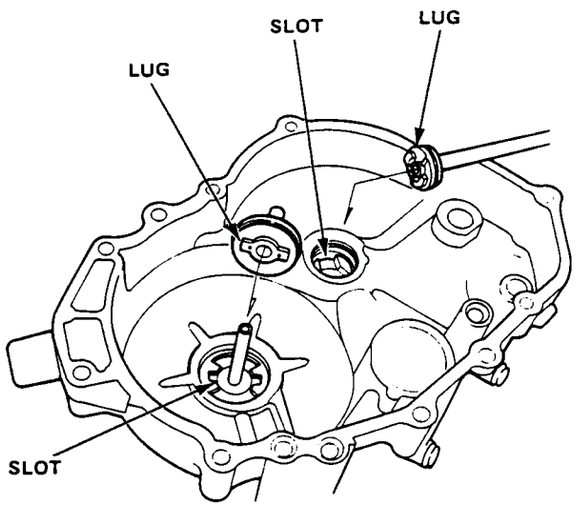
Disassembly/Inspection

CAUTION: Remove and install the parts carefully to avoid damaging them.

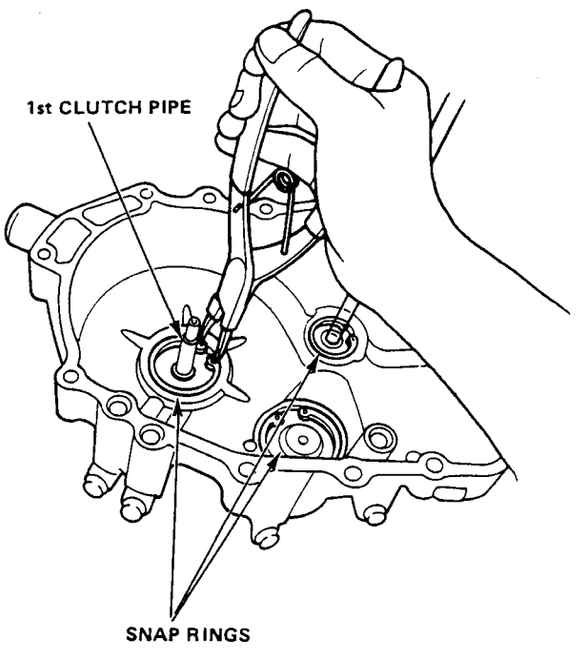


Reassembly

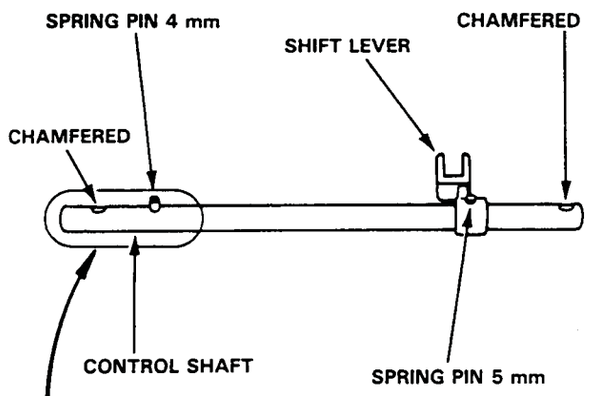
1. With feed pipes assembled, align the lugs on collars with the slots in end cover.



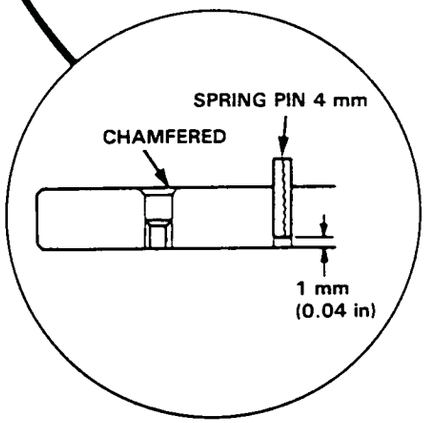
2. Install the feed pipes and low accumulator in the end cover with the snap rings.



Installation



Drive the 4 mm spring pin to a depth 1 mm in from the side that is opposite the chamfer in the threaded hole.

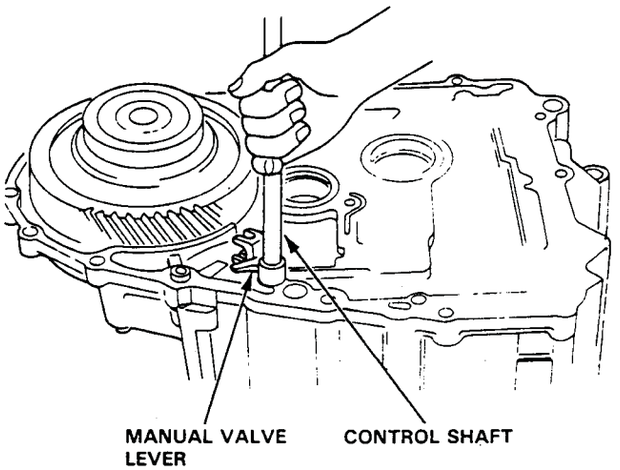


Reassembly

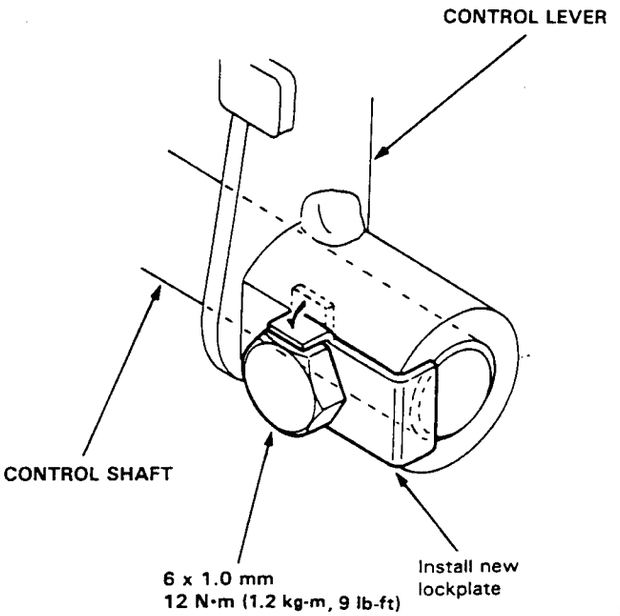
NOTE: Lubricate all parts with ATF during reassembly.

1. Install the differential assembly. If the torque converter housing, transmission housing and/or differential side bearings were replaced, the differential side clearance must be checked as shown in section 15.

2. Assemble the manual valve lever on the control shaft, then install in the torque converter housing as shown.

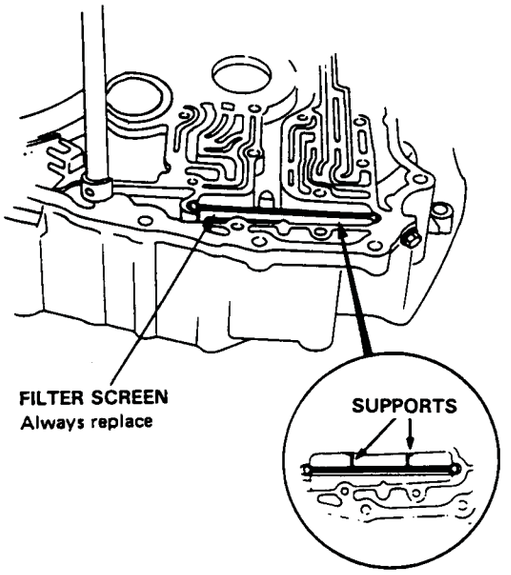


3. Install the control lever and new lock plate on the other end of the shaft. Tighten the bolt to the torque shown, then bend the tab over against the bolt head.

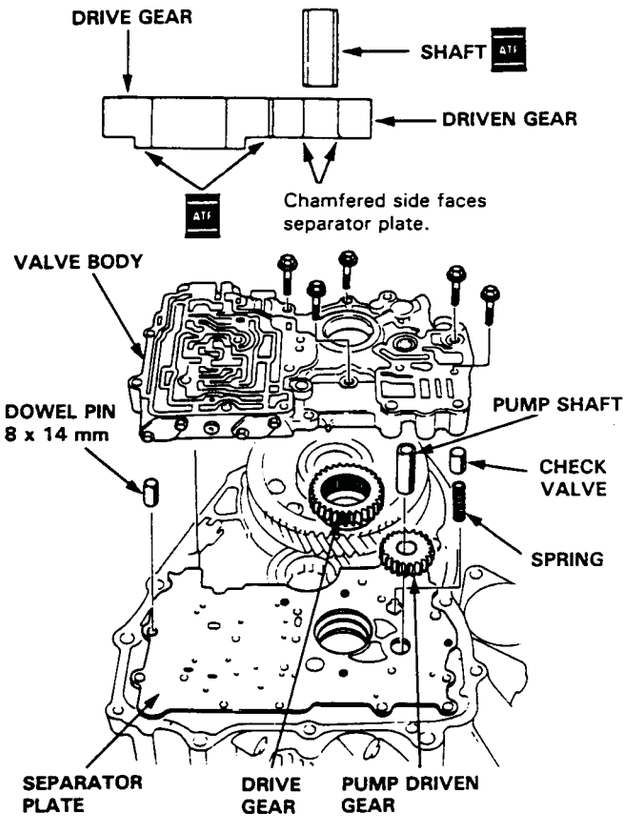


(cont'd)

4. Install the new filter screen.



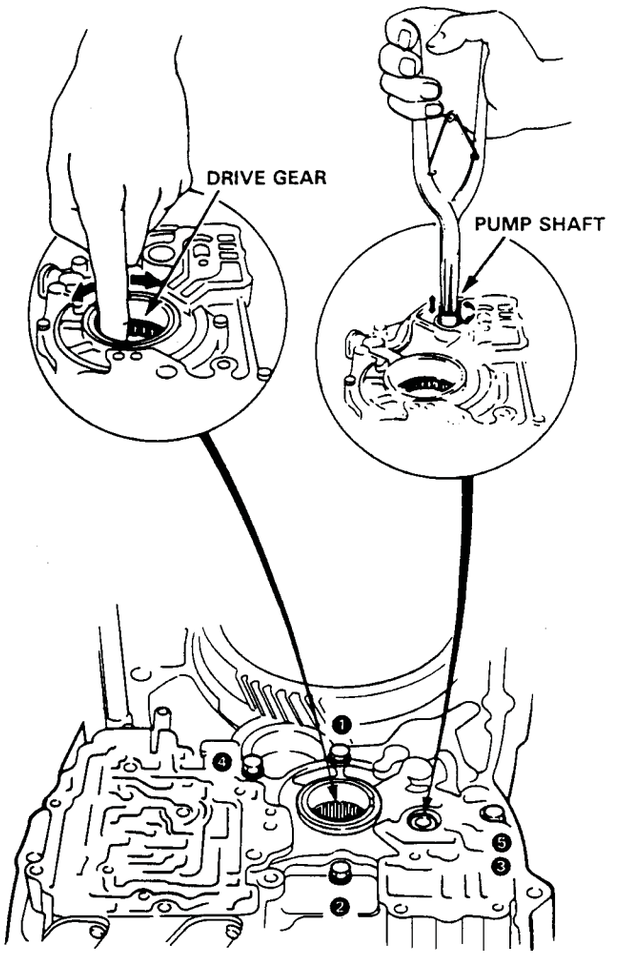
5. Install the separator plate, dowel pin, pump gears, and shaft.
6. Install the check valve and spring, then install the main valve body on the torque converter housing.



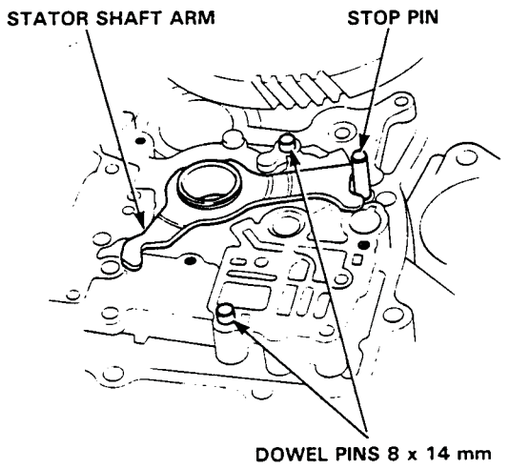
7. Tighten the 4 valve body bolts in the sequence shown. Make sure the pump drive gear rotates smoothly in the normal operating direction and the pump shaft moves smoothly in both the axial and normal operating directions.

8. Torque the valve body bolts to 12 N·m (1.2 kg-m, 9 lb-ft), and again check that the pump gear and pump shaft move freely.

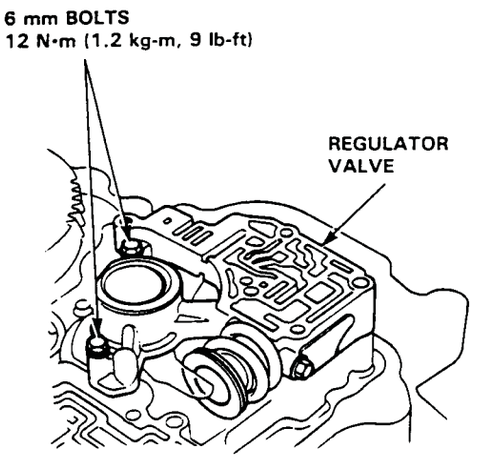
CAUTION: If the pump gear and pump shaft do not move freely, Loosen the valve body bolts, realign the shaft, and then retighten to the specified torque. Failure to align the pump shaft correctly will result in seized pump gear or pump shaft.



9. Install the stator shaft arm, stop pin and dowel pins.

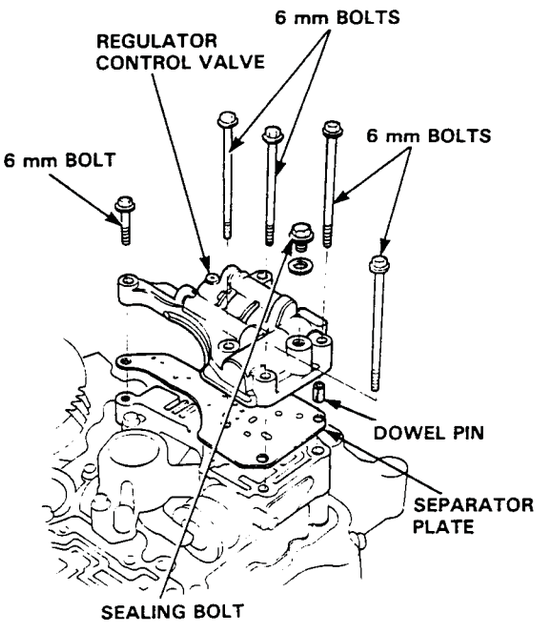


10. Install the regulator valve and torque its 2 bolts to 12 N•m (1.2 kg-m, 9 lb-ft).

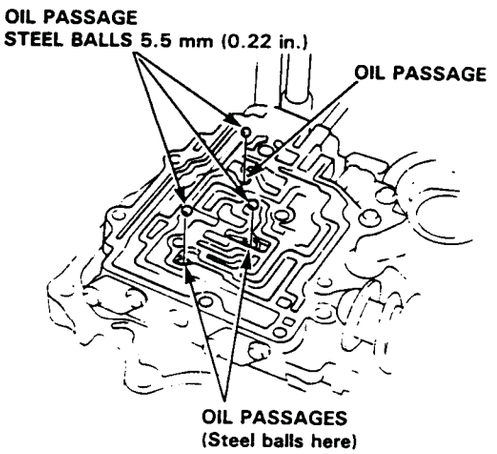


11. Install the dowel pin, and separator plate.

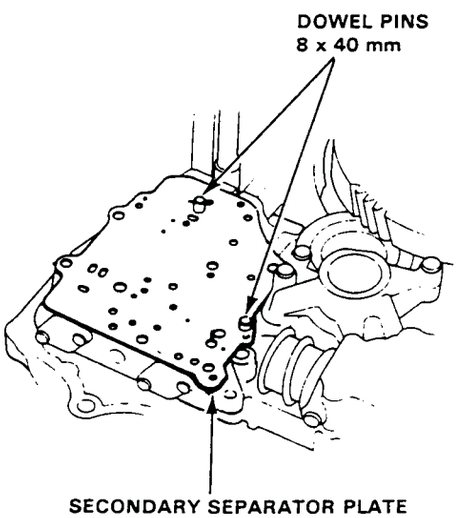
12. Install the regulator control valve body bolts as shown, and torque to 12 N•m (1.2 kg-m, 9 lb-ft).



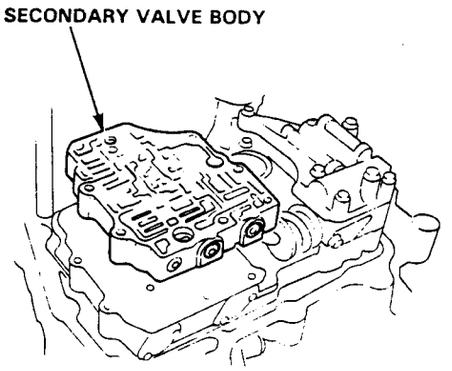
13. Install the 3 steel balls in main valve body oil passages.



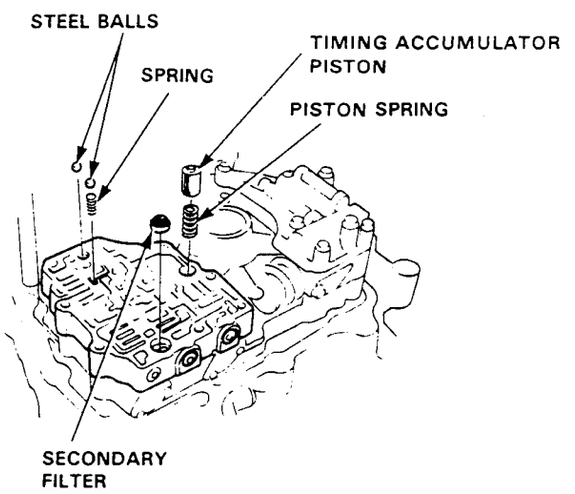
14. Install the separator plate and dowel pins.



15. Install the secondary valve body.

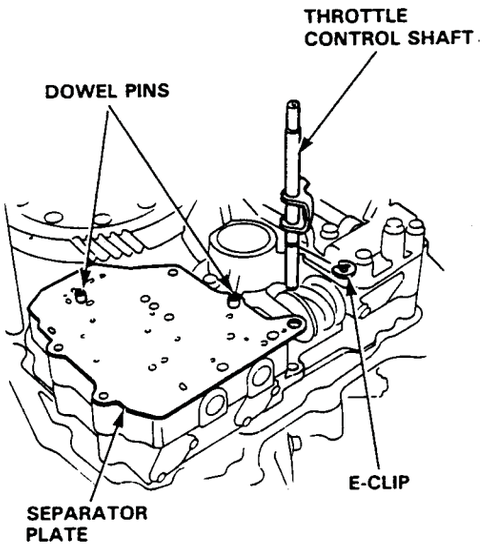


16. Install the steel balls, ball spring, timing accumlator piston, piston spring and secondary filter in the secondary valve body.

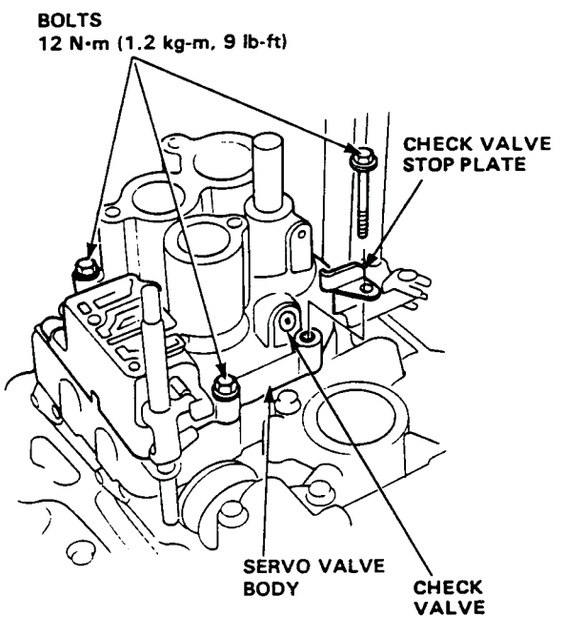


NOTE: The ball for the top oil passage has a spring to press the ball against the separator plate.

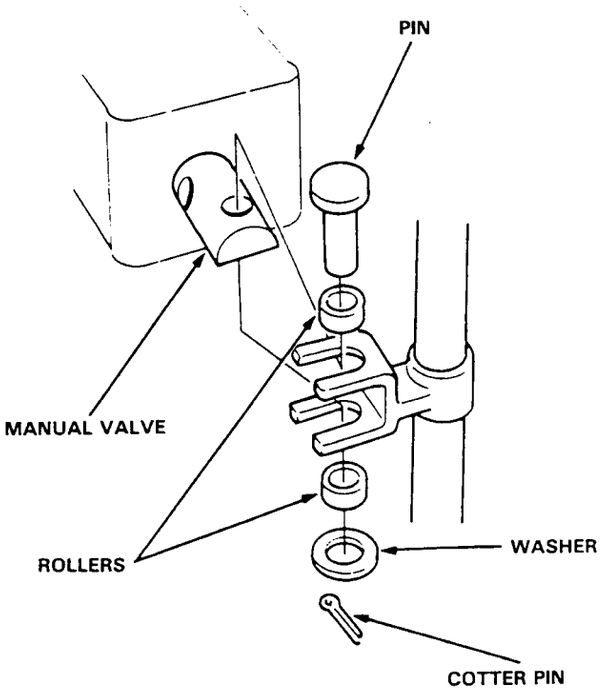
17. Install the separator plate and dowel pins, then install the throttle control shaft.



18. Install the servo valve body (2 bolts) and check valve stop plate (1 bolt) as shown.

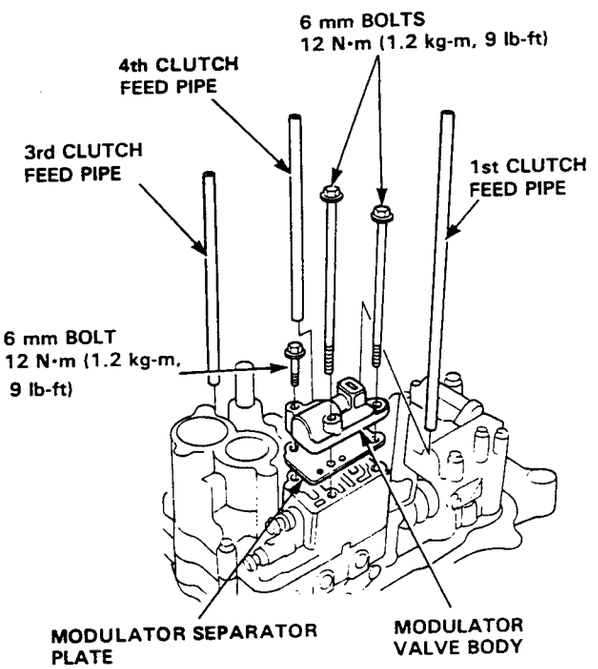


19. Put the rollers on each side of the manual valve stem, then attach the valve to the lever with the pin. Secure with the lock pin.

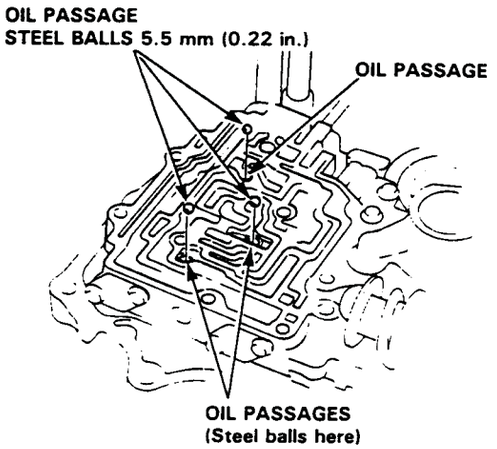


20. Install the separator plate.

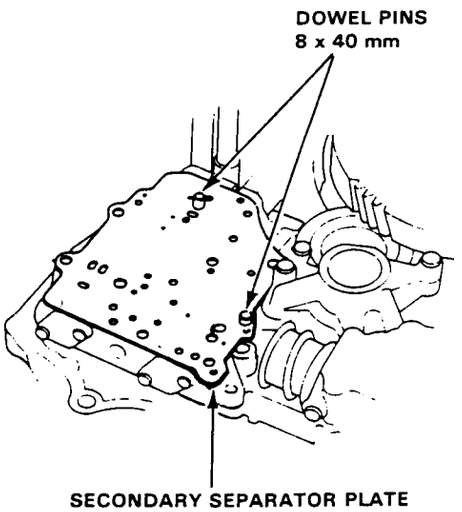
21. Install the 1st, 3rd and 4th clutch feed pipes.



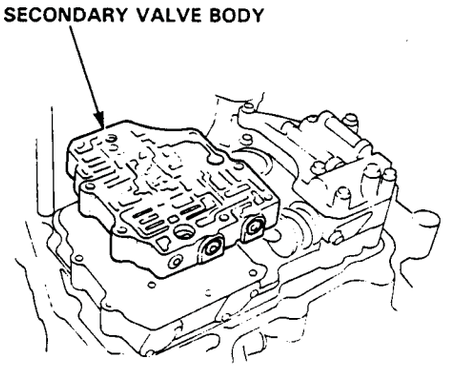
13. Install the 3 steel balls in main valve body oil passages.



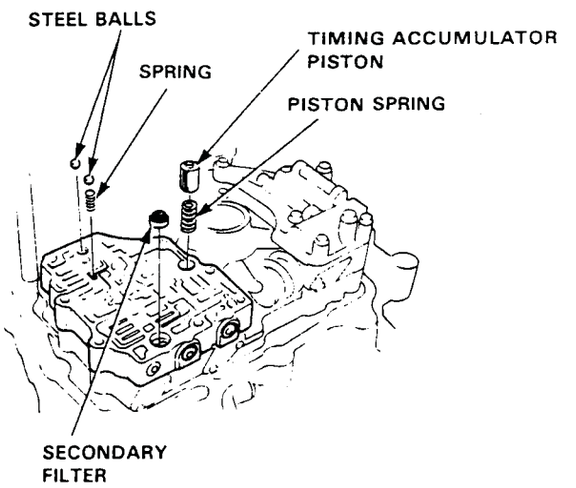
14. Install the separator plate and dowel pins.



15. Install the secondary valve body.

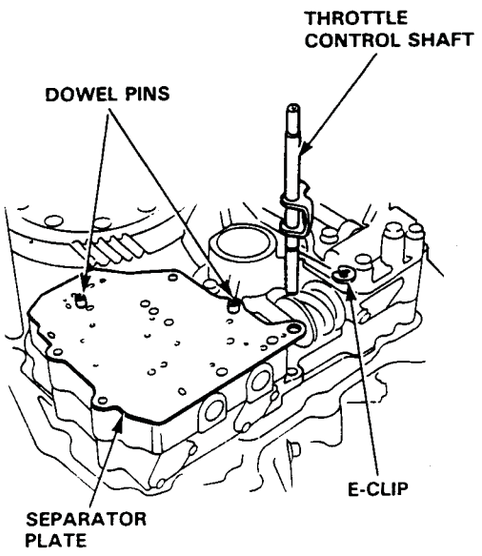


16. Install the steel balls, ball spring, timing accumlator piston, piston spring and secondary filter in the secondary valve body.

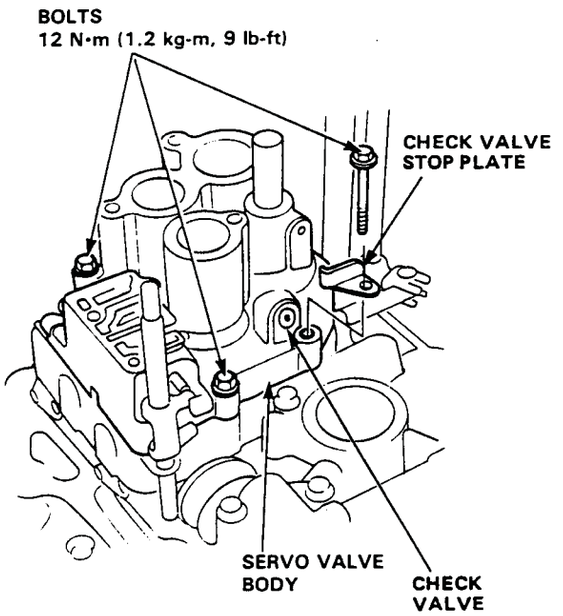


NOTE: The ball for the top oil passage has a spring to press the ball against the separator plate.

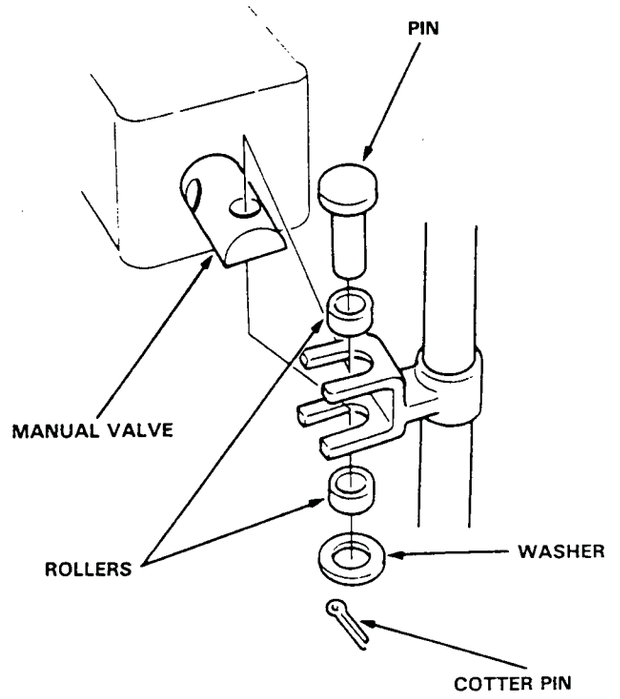
17. Install the separator plate and dowel pins, then install the throttle control shaft.



18. Install the servo valve body (2 bolts) and check valve stop plate (1 bolt) as shown.

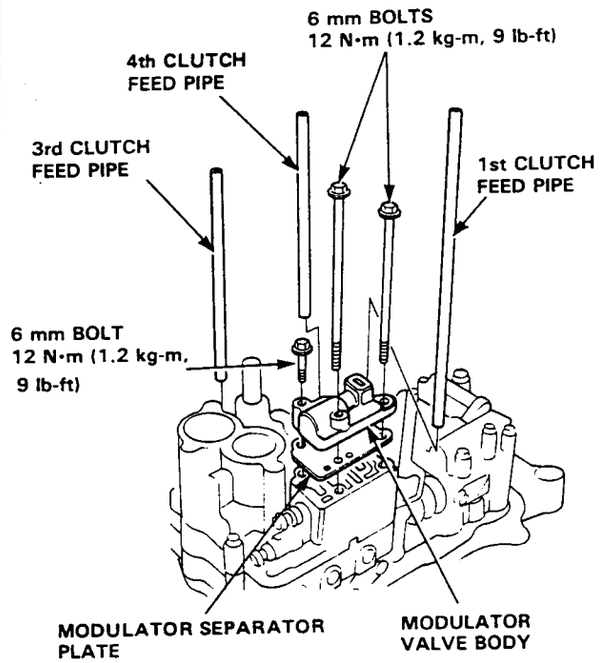


19. Put the rollers on each side of the manual valve stem, then attach the valve to the lever with the pin. Secure with the lock pin.



20. Install the separator plate.

21. Install the 1st, 3rd and 4th clutch feed pipes.

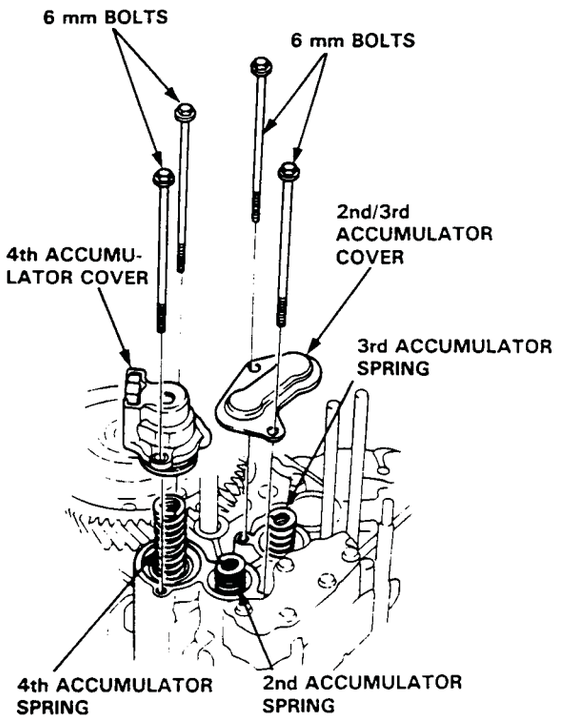


22. Install the accumulator springs.

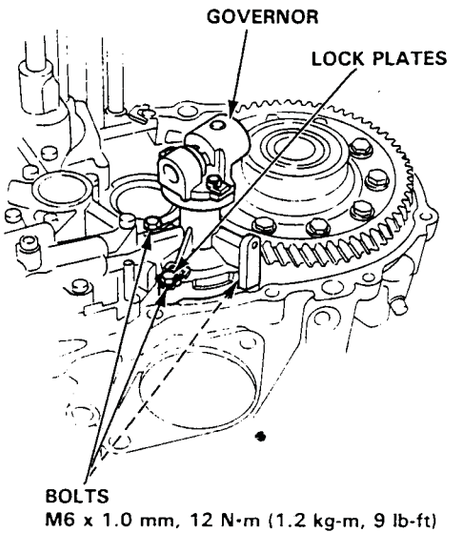
23. Install the 2nd/3rd accumulator cover, and torque the bolts to 12 N·m (1.2 kg-m, 9 lb-ft) in a criss-cross pattern.

24. Install the 4th accumulator cover, and torque the bolts to 12 N·m (1.2 kg-m, 9 lb-ft) in a criss-cross pattern.

CAUTION: To prevent stripping the threads, press down on accumulator cover, then install the bolts.

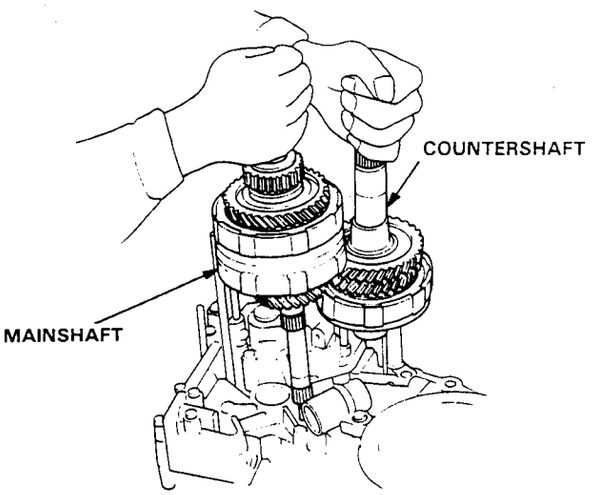


25. Install the governor valve using new lock plates, and the three 6 mm bolts.



26. Set the countershaft and mainshaft in place as an assembly.

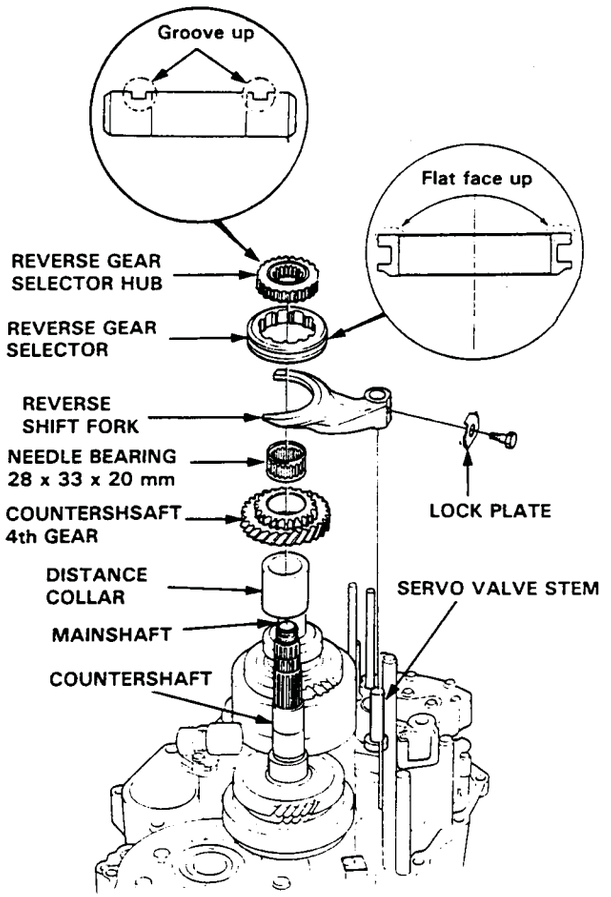
NOTE: Do not tap on the shafts with a hammer to drive in.



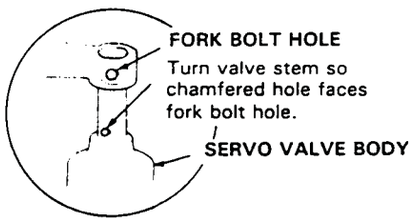
27. Install 4th gear and its needle bearing, and the countershaft 4th gear and its selector hub.

28. Assemble the reverse shift fork and selector sleeve, then install them as an assembly on the countershaft.

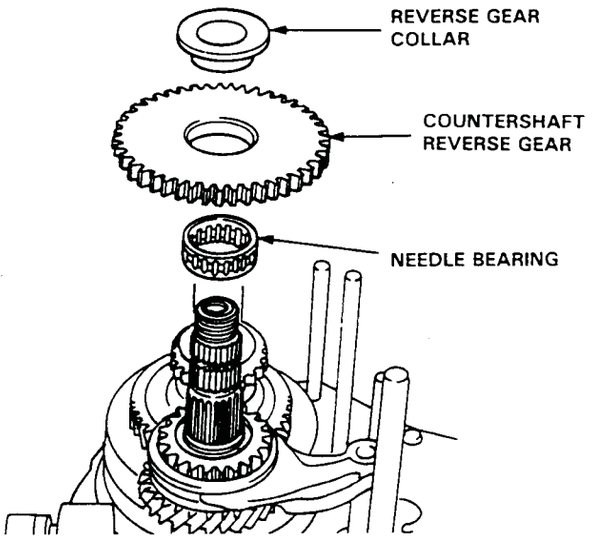
NOTE:
- Install the sleeve with its flat face up.
- Install the reverse gear selector hub with the groove facing up.



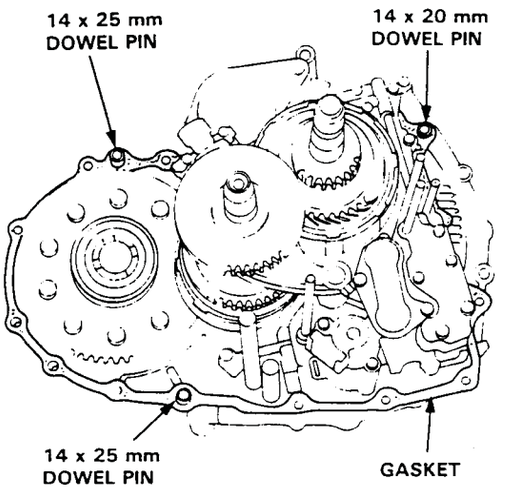
29. Install the reverse shift fork over the servo valve stem. Align the hole in the stem with hole in fork as shown, and install the bolt and new lock plate. Bend the lock tab against the bolt head.



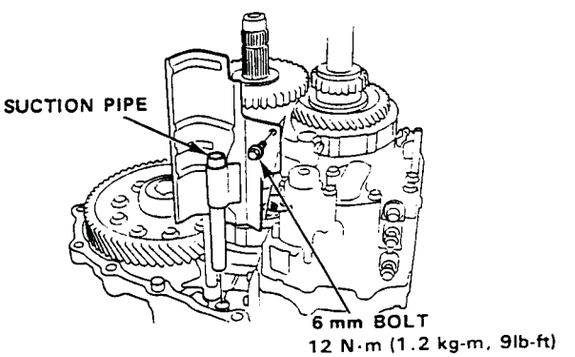
30. Install the countershaft reverse gear, needle bearing, and reverse gear collar.



31. Install the new gasket and three dowel pins in the torque converter housing.

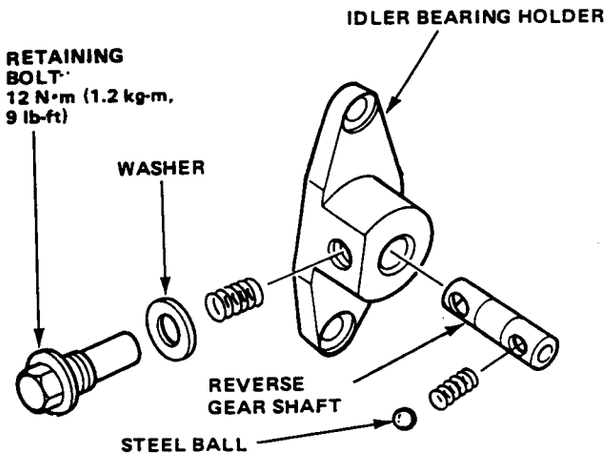


32. Install the suction pipe.



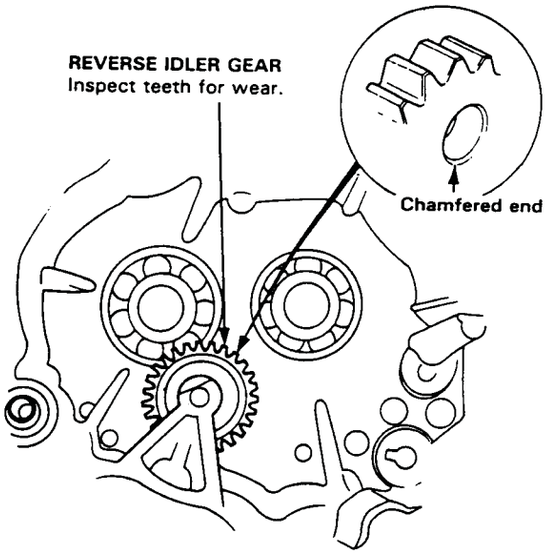
33. Assemble the idler bearing holder.

NOTE: Align the hole in the shaft with the spring.



34. Install the reverse idler gear.

NOTE: Install the reverse idler gear so that the larger chamfer on the shaft bore faces the torque converter housing.

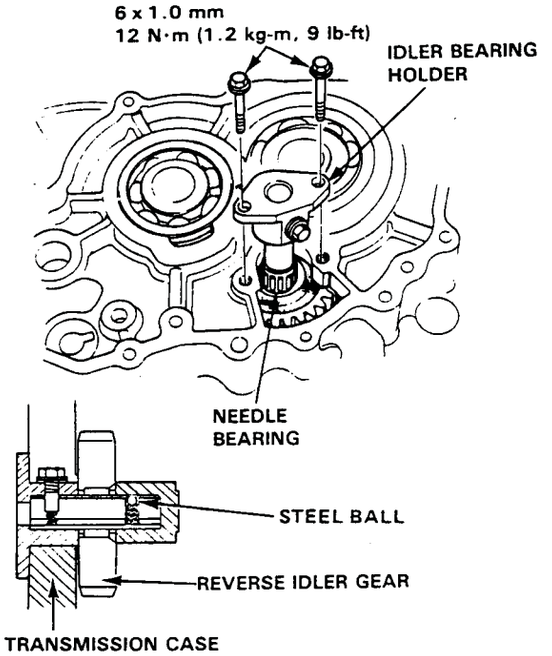


35. Install the needle bearing into the idler gear.

36. Install the idler bearing holder into the transmission housing.

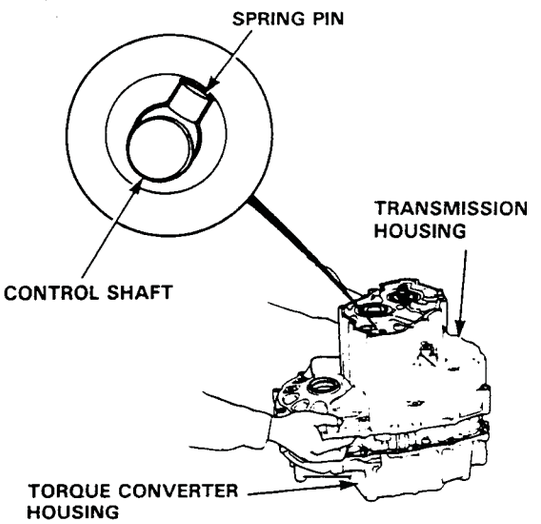
37. Tighten the reverse idler bearing holder bolts.

38. Install the spring and then tighten the retaining bolt and washer.



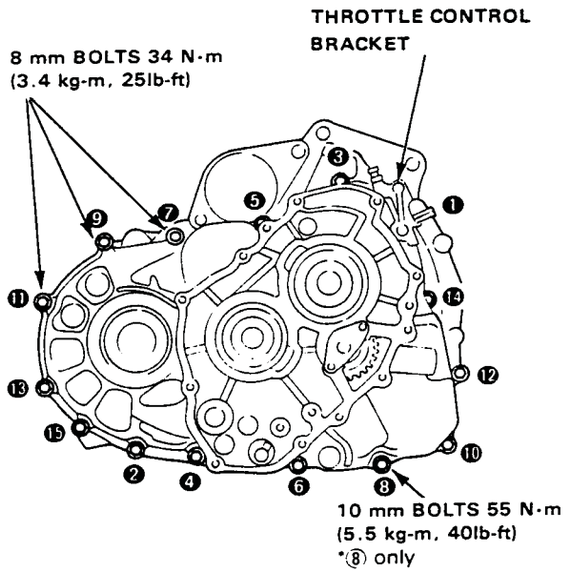
39. Place the transmission housing on the torque converter housing.

NOTE: Be sure the main valve control shaft lines up with the hole in the housing and that the reverse idler gear meshes with the mainshaft and countershaft, or the housing will not go on.



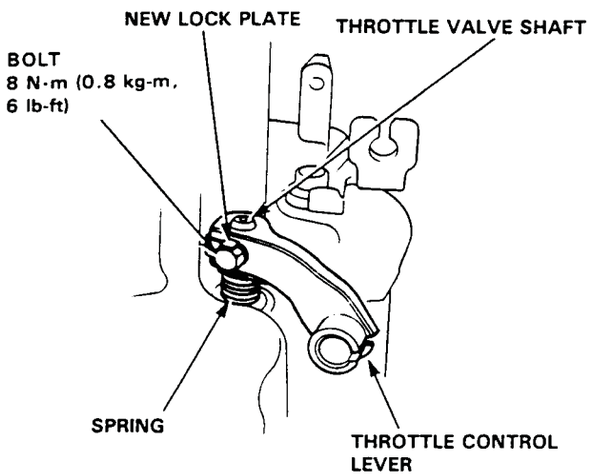
40. Install the bolts in the locations shown. Tighten the bolts in sequence shown; tighten in two or three steps to prevent distortion:

NOTE: When tightening the transmission housing bolts, take care that you do not distort or damage the throttle control bracket; distortion or damage to the bracket will change transmission shift points.



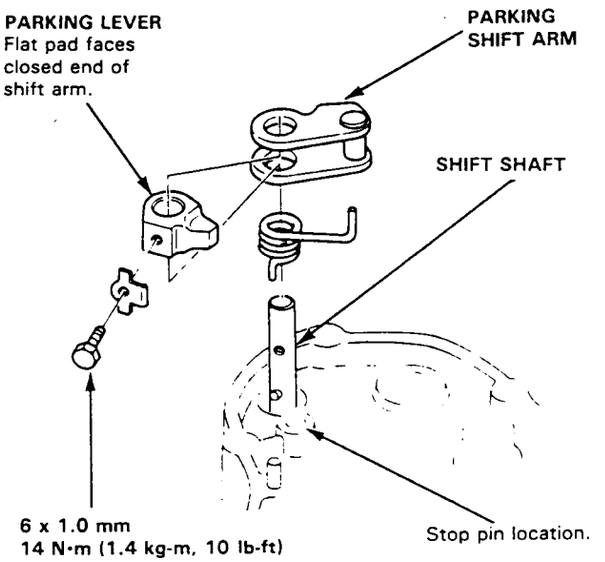
41. Install the throttle control lever and spring on the throttle control shaft.

42. Install the bolt and new lock plate. Bend the lock tab against the bolt head.



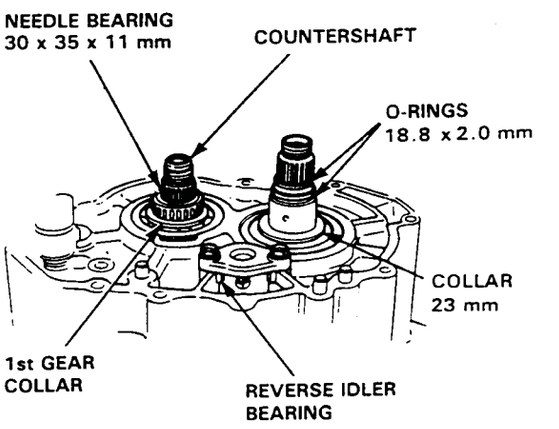
43. Install the parking shift arm and spring on the shift shaft with the bolt and a new lock plate. Bend the lock tab against the bolt head.

NOTE: The spring should put clockwise tension on the shift arm, forcing it against the stop pin.

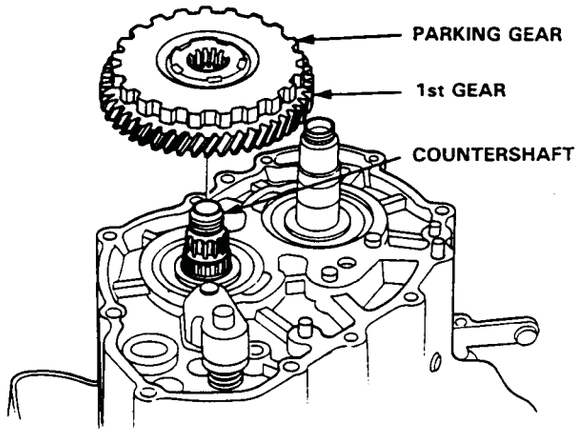


44. Install the 1st gear collar and needle bearing on the countershaft. Install the 26 mm collar on the mainshaft.

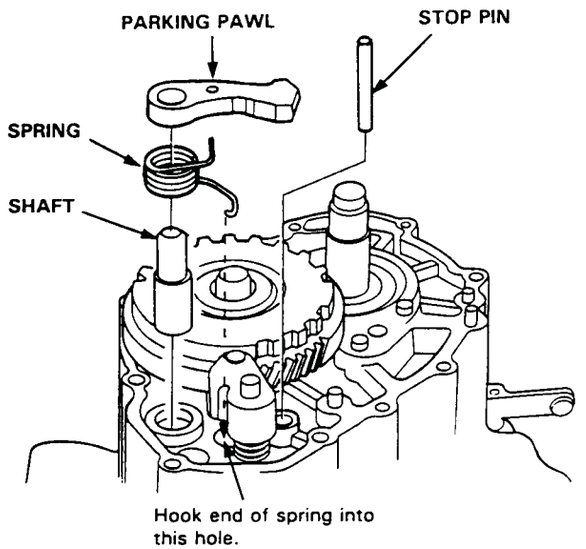
45. Install new 18.8 x 2.0 mm O-rings on the mainshaft.



46. Install the countershaft 1st gear and parking gear on the countershaft.



47. Install the stop pin, parking pawl shaft, parking pawl, and pawl release spring.

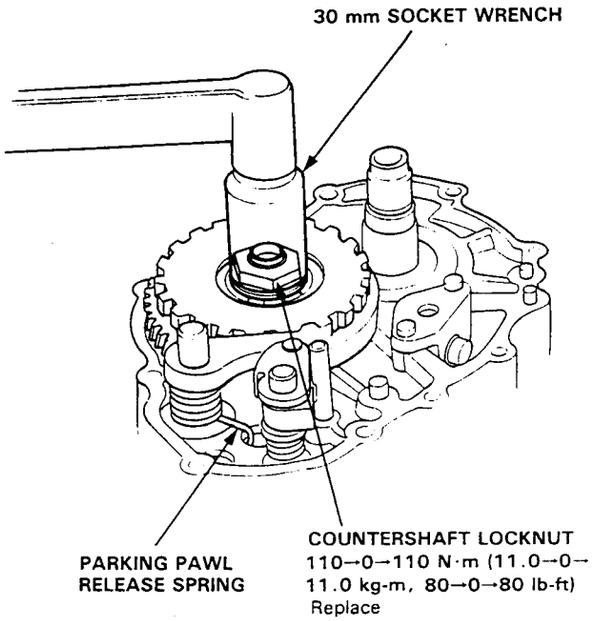


NOTE:

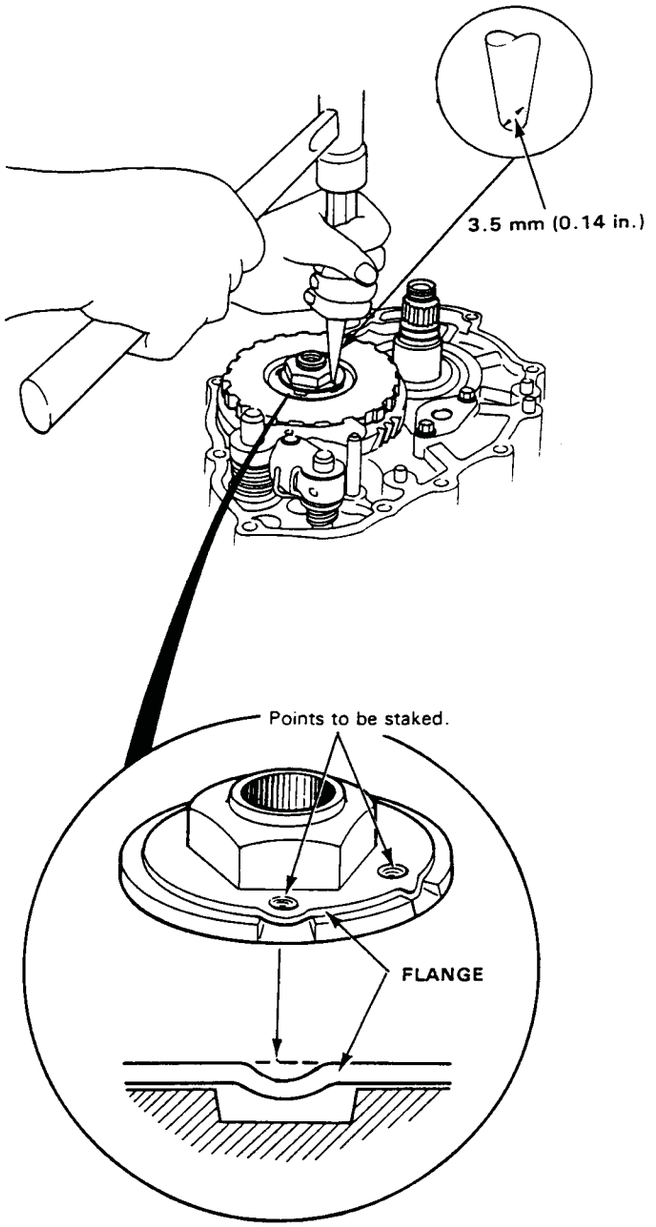
- One end of the parking pawl release spring fits into the hole in the parking pawl, the other end into the hole in the transmission housing as shown.
- The release spring should put clockwise tension on the pawl, forcing it away from the parking gear.

48. Shift to PARK and install the mainshaft holder.

49. Install and torque the new countershaft locknut.

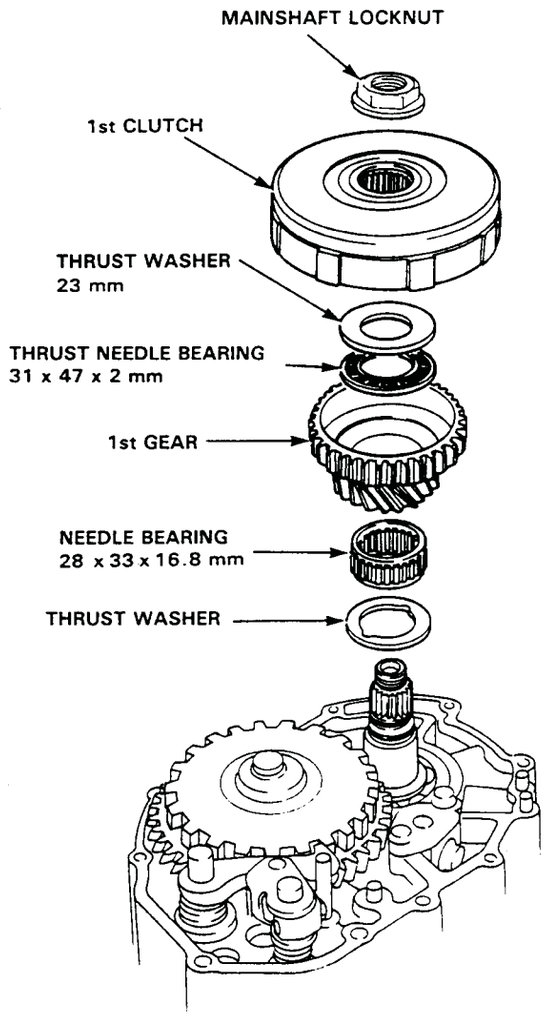


50. Stake the locknut flange at two places into the gear grooves using a 3.5mm punch.



51. Install 28 x 33 x 16.8 mm needle bearing and thrust washer on the mainshaft.

52. Install 1st gear, thrust needle bearing, and the thrust washer on the mainshaft.

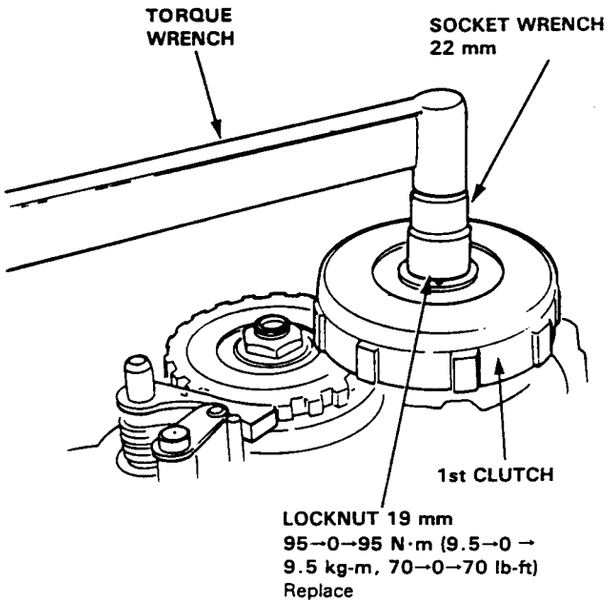


53. Install the 1st clutch on the mainshaft.

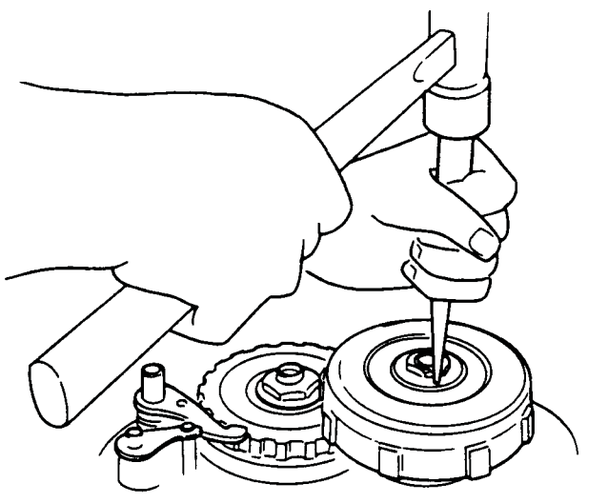
54. Attach the mainshaft holder from the underside of the torque converter case.

55. Install and torque the new mainshaft locknut.

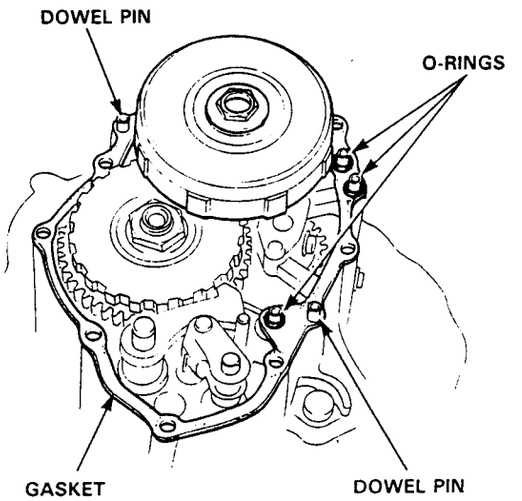
CAUTION: Locknut has left-hand threads.



56. Stake the locknut flange into the groove in the 1st clutch.



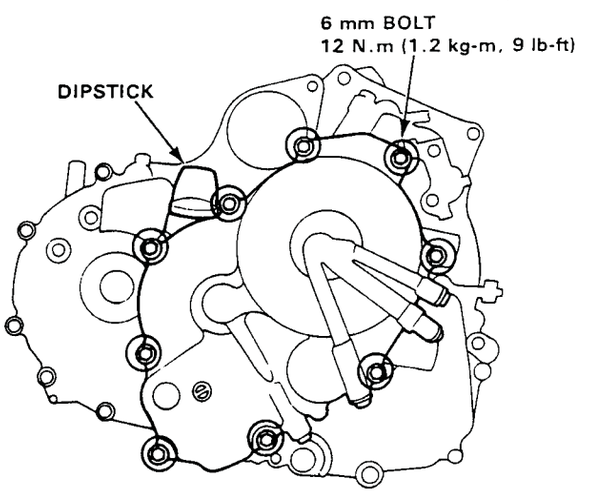
57. Install the gasket, dowel pins, and O-rings on the transmission housing.



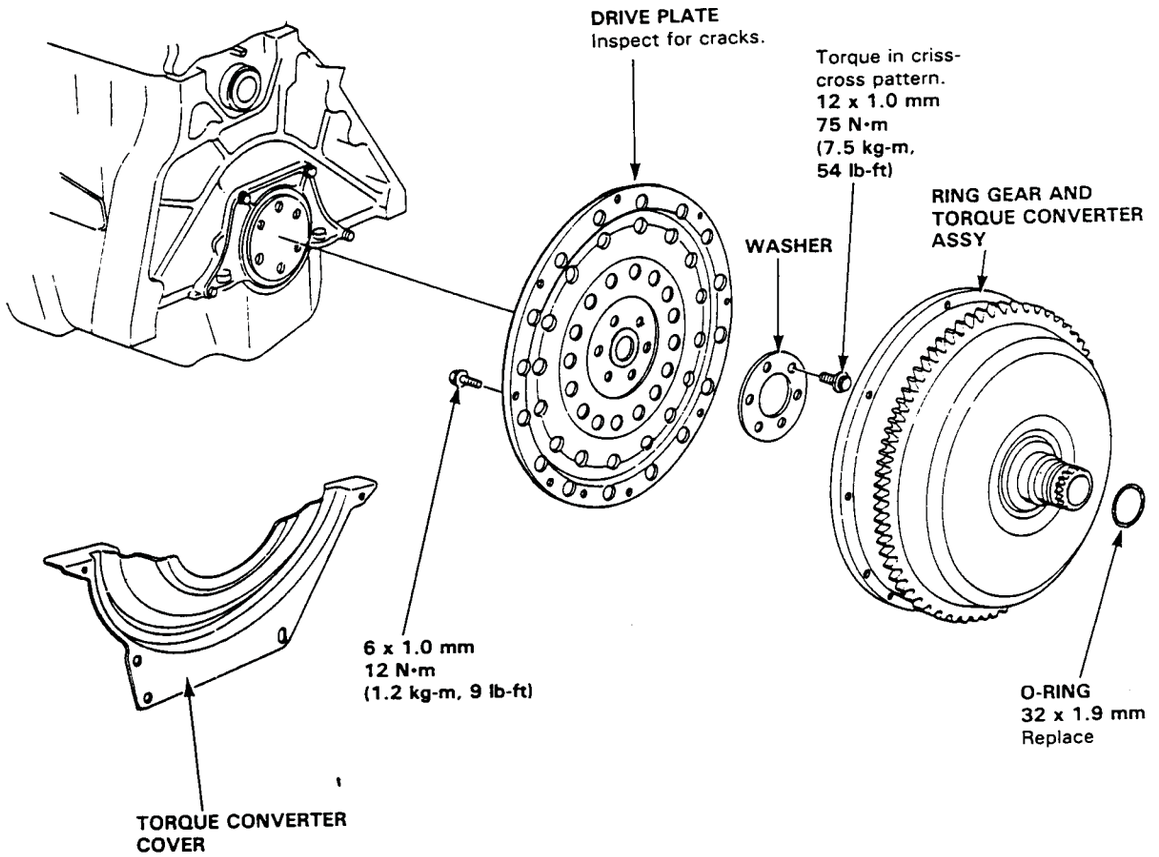
58. Install the end cover and torque all bolts (9) to 12 N·m (1.2 kg-m. 9 lb-ft).

59. Install the dipstick.

60. Install the transmission cooler banjo fitting, but do not tighten until the transmission is installed in the car and the hose is positioned properly.



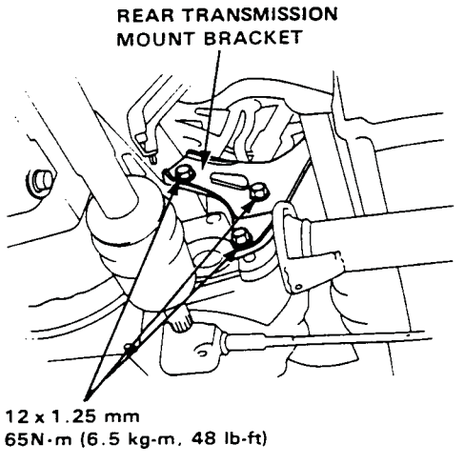
Disassembly



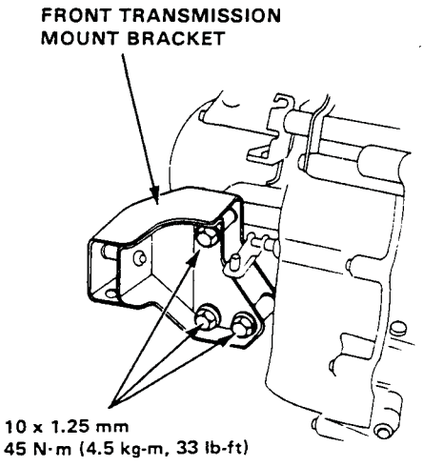
1. Place the transmission on the transmission jack, and raise to the engine level.
2. Check that the two 14 mm dowel pins are installed in the torque converter housing.
3. Align the dowel pins with holes in block; align the torque converter bolt heads with holes in drive plate.
4. If you left the front end connected on driver's side, insert the left axle (with new spring clip on the end) into the differential as you roll the transmission up to the engine.

   CAUTION: New 26 mm spring clips must be used on both axles.
5. Secure the transmission to engine with the engine side mounting bolt (12 x 1.25 x 70 mm) and torque to 58 N·m (5.8 kg-m, 42 lb-ft).
6. Attach the torque converter to the drive plate with eight (6 x 10 x 12 mm) bolts, and torque to 12 N·m (9 lb-ft). Rotate the crank as necessary to tighten bolts to 1/2 torque, then final torque, in a criss-cross pattern. Check for free rotation after tightening the last bolt.
7. Install the shift cable.

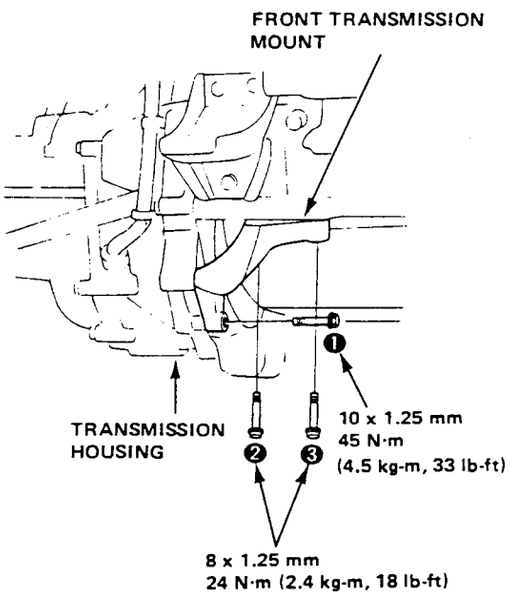
   CAUTION: Be careful not to damage the transmission shift cable during transmission installation. On installation, check the cable is not kinked or binding. Take care not to bend the cable when installation it. Always replace a kinked cable with a new one.
8. Remove the transmission jack.
9. Install the torque converter cover plate.
10. Install the rear transmission mount bracket; torque its bolts to 65 N·m (6.5 kg-m, 48 lb-ft)



11. Install the front transmission mount bracket and torque its bolts to 45 N·m (4.5 kg-m, 33lb-ft).



12. Loosely install the front transmission mount bolts, then torque in the sequence shown.



13. Install the starter mounting bolts and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

14. Install the intermediate shaft and right and left driveshafts

15. Install a new 26 mm spring clip on the end of each axle.

16. Turn the right steering knuckle fully outward, and slide axle into the differential until you feel its spring clip engage side gear. Repeat on the left side or, if the left axle is already in (step 5), check to be sure the spring clip has engaged side gear.

17. Reconnect the lower arm ball joints and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

18. Reconnect the tie-rod end ball joints and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

19. Install the splash shields and exhaust header pipe.

20. Install the front wheels, lower car to ground, and torque lug nuts to 110 N·m (11.0 kg-m, 80 lb-ft).

21. Remove the hoist chain from the 10 mm bolt on the cylinder head and engine hanger plate.

22. Insert the speedometer cable into gear holder, then secure the cable with clip and install the boot.

    CAUTION: Be careful not to damage the speedometer cable during transmission installation. Take care not to bend the cable when installation it. Always replace a kinked cable with a new one.

23. Install the top three transmission mounting bolts (12 x 1.25 x 60 mm) and torque to 65 N·m (6.5 kg-m, 48 lb-ft).

24. Connect the cooler hoses, and torque the banjo bolts to 29 N·m (2.9 kg-m, 21 lb-ft).

25. Attach the shift cable to shaft lever with pin and clip, if removed. Check the cable adjustment

26. Reinstall the center console.

27. Connecting wiring:

    - Battery positive cable to starter.
    - Black/white wire to starter solenoid.
    - Transmission ground cable.

28. With the ignition key OFF, connect the ground cable to the battery and transmission.

29. Unscrew the dipstick from the top of transmission housing and add 2.5 quarts Dexron®ATF through the hole. Reinstall the disptick.

    NOTE: If the torque converter was replaced, the ATF fill quantity is 5.7 quarts.

30. Start the engine, set the parking brake, and shift the transmission through all gears three times. Check for proper control cable adjustment.

31. Let the engine reach operating temperature with the transmission in Neutral or Park, then turn it off and check the fluid level.

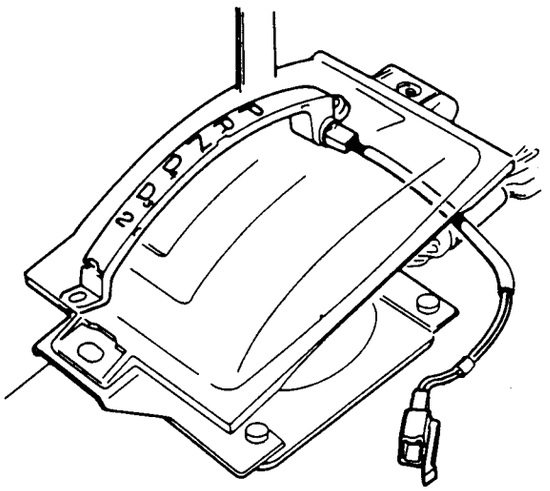
32. Install the throttle control cable and adjust (page 14-76).

    CAUTION: Be careful not to damage the throttle control cable during transmission installation, check the cable is not kinked or binding. Always replace a kinked cable with a new one.

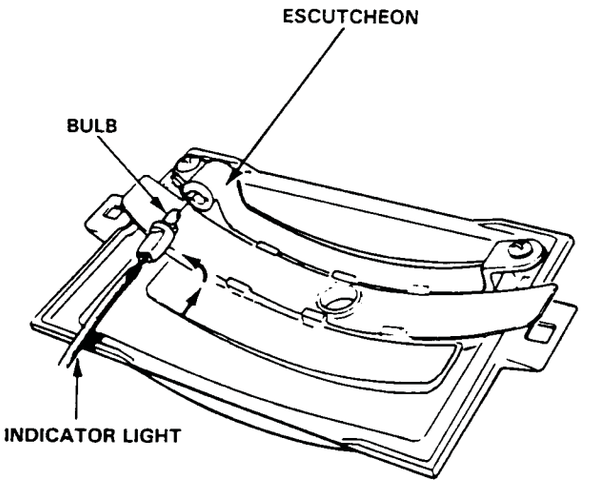
33. Road test

Check and Installation

1. Check for continuity between indicator light connector terminals as shown. If there is no continuity, check for burned out bulb or open circuit.



2. Install the indicator bulb in the bulb housing. Insert the bulb housing into slot in escutcheon, then turn 90° to bulb housing.

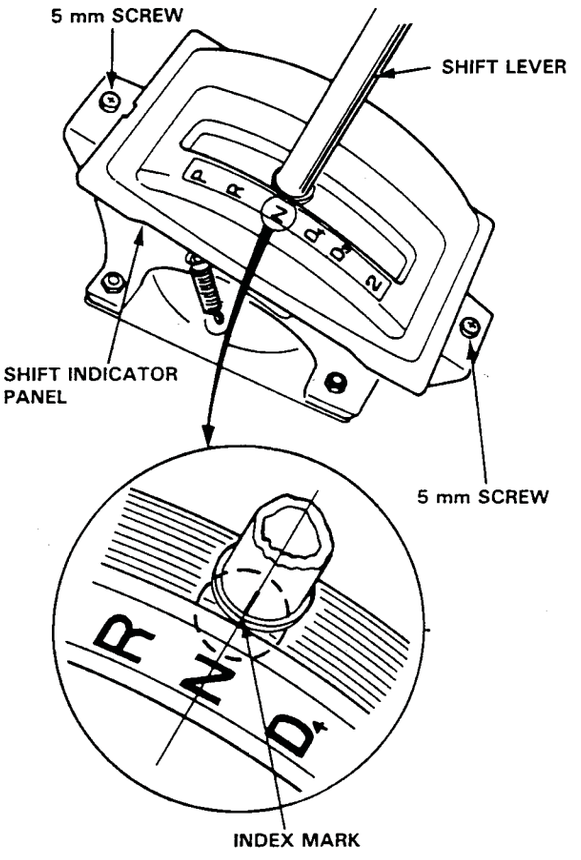


Adjustment

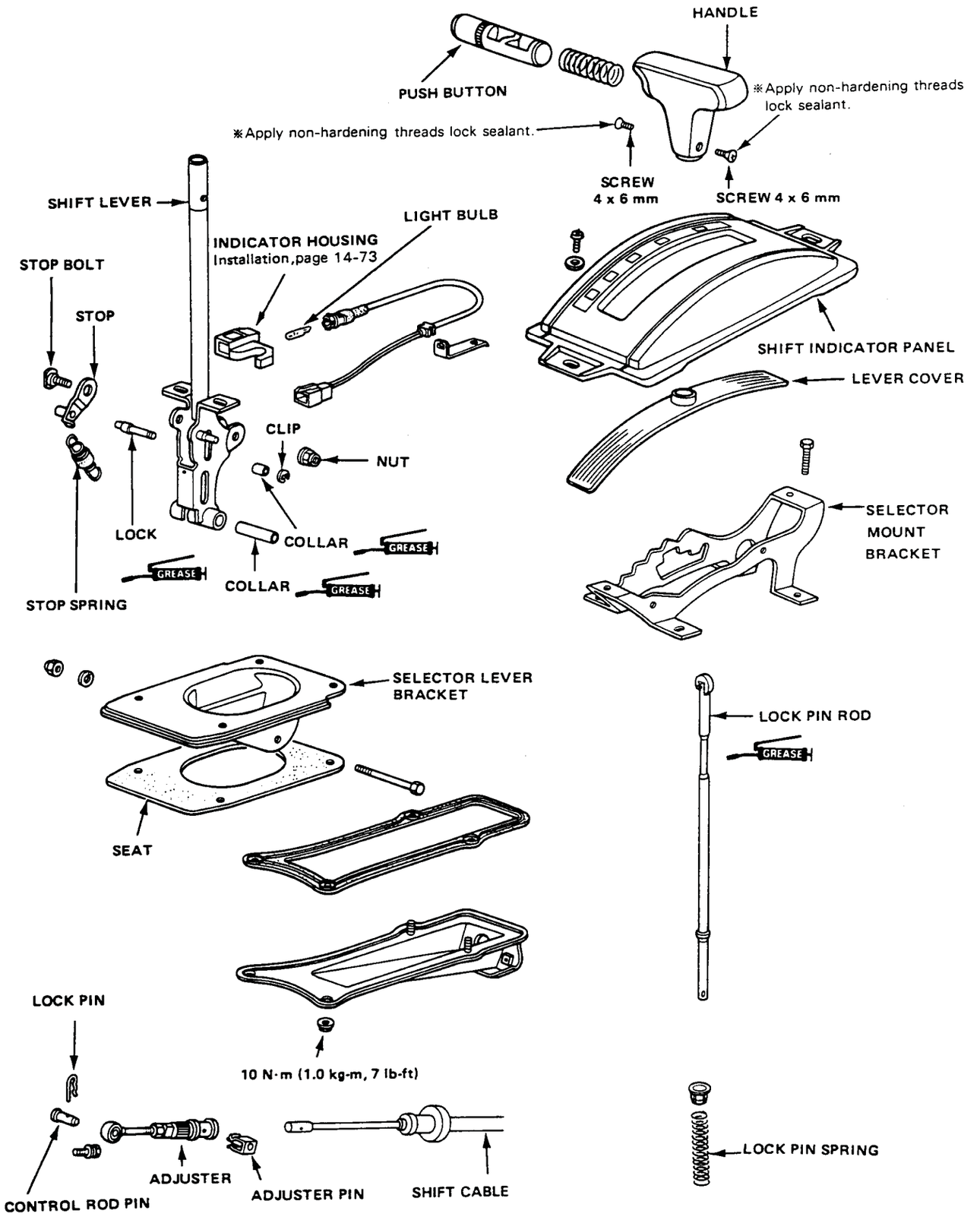
1. Check that the index mark of the indicator aligns with the N mark of the shift indicator panel with the transmission in NEUTRAL.

2. If not aligned, remove the panel mounting screws and adjust by moving panel.

   NOTE: Whenever escutcheon is removed for indicator bulb replacement etc., adjust the panel as described above.



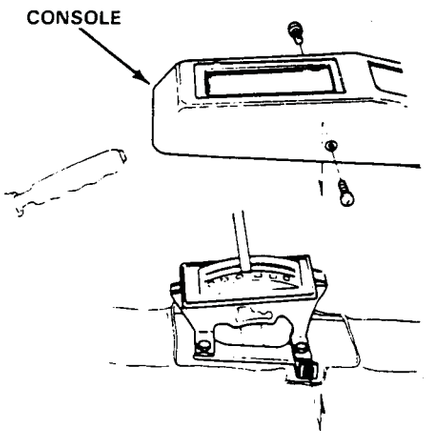
Overhaul



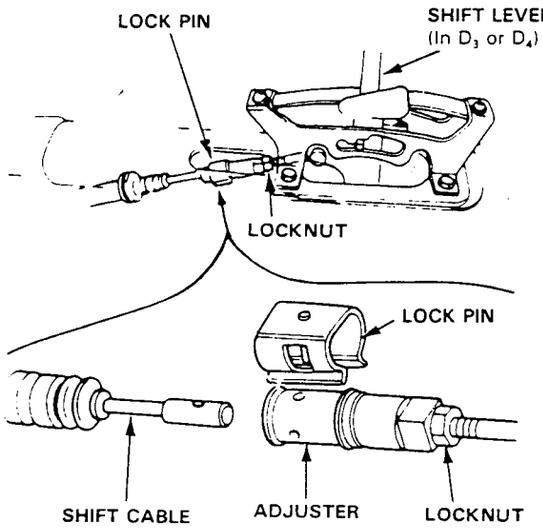
Adjustment

1. Start the engine. Shift to reverse to see if the reverse gear engages.If not, refer to troubleshooting

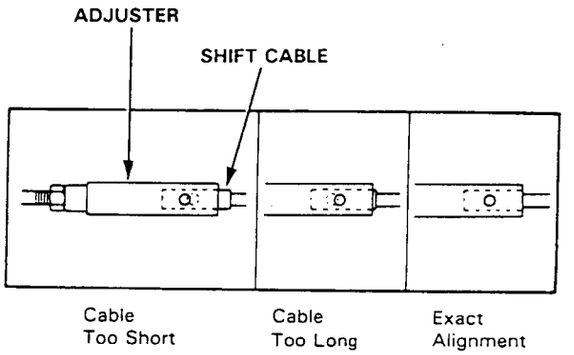
2. With the engine off, remove the console.



3. Shift to Neutral or Reverse, then remove the lock pin from the cable adjuster.



4. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable.



NOTE: There are two holes in the end of the shift cable. They are positioned 90° apart to allow cable adjustments in 1/4 turn increments.

5. If not perfectly aligned, loosen the locknut on shift cable and adjust as required.

6. Tighten the locknut.

7. Install the lock pin on the adjuster.

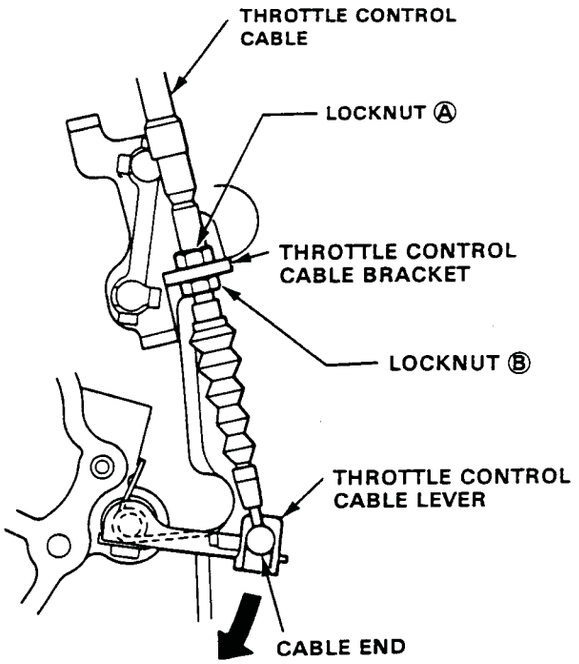
NOTE: If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.

8. Start the engine and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting

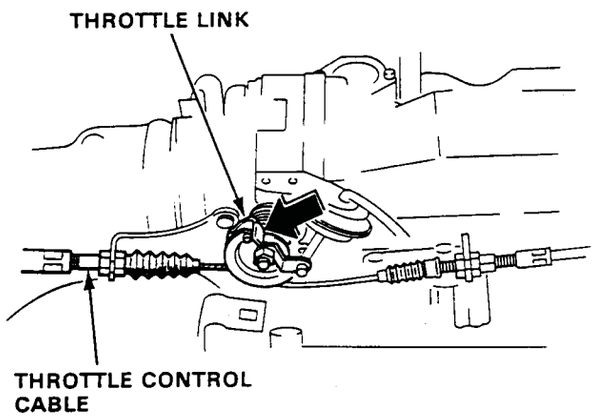
Adjustment/Inspection

1. Loosen locknuts (A) and (B) on the throttle control cable.

2. Press down as shown on the throttle control lever until it stops.



3. While pressing down on the throttle control lever, pull on the throttle link to check the amount of throttle control cable free play.



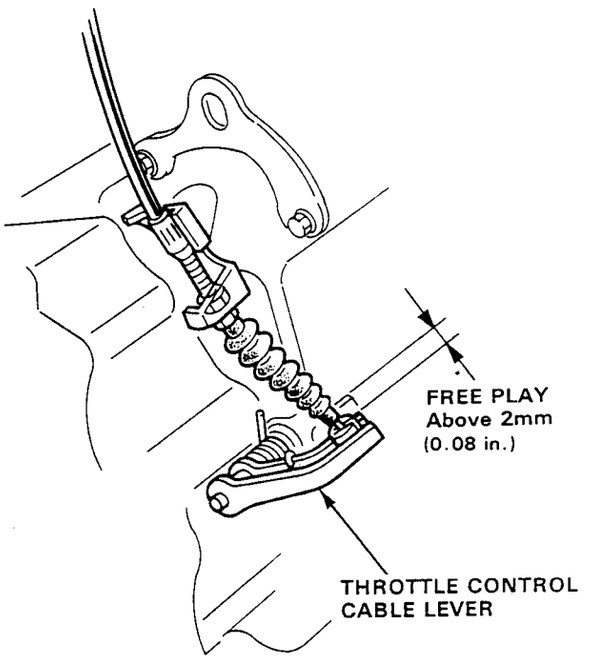
Remove all throttle control cable free play by gradually turning lock not "A".

Until no movement can be felt in the throttle link, while continuing to press down on the throttle control lever, pull open the throttle link.
The control lever should begin to move at precisely the same time as the link.

NOTE: Correct "Fine Tune" adjustment of the throttle control cable is critical for proper operation of the transmission and lock-up torque convertor.

4. Check the follwing items before starting the engine:

   Depress the accelerator to the floor. While its depresse, check that there is play in the throttle control lever.



- Check that the cable moves freely by depressing the accelerator.

NOTE: After transmission is installed;
- Make sure the floor mat does not interfere with accelerator pedal travel. Fully depress accelerator pedal and check to make sure the throttle lever is fully opened.
- Release the accelerator pedal and check both inner control cables to be sure they have slight play.

Warm up the engine to operating temperature.

D3 and D4 Range

1. Apply parking brake and block the wheels. Start the engine, then move the selector to D4 while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. Engine should not stall.
2. Check that shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

- **Upshift**

	1st → 2nd	2nd → 3rd	3rd → 4th	LC. ON
Full-throttle Acceleration from a stop	35–39 mph	61–67 mph	93–98 mph	94–100 mph
Half-throttle Acceleration from a stop	20–23 mph	39–44 mph	53–61 mph	54–63 mph
Closed-throttle Coasting down-hill from a stop	11–13 mph	20–23 mph	28–31 mph	———

- **Downshift**

	4th → 3rd	3rd → 2nd	2nd → 1st
Full-throttle When car is slowed by increased grade, wind, etc.	76–82 mph	54–58 mph	22–26 mph

	4th → 2nd	2nd → 1st
Closed-throttle Coasting or braking to a stop	15–17 mph	5–7 mph

3. Accelerate to about 35 mph so the transmission is in 4th, then shift from D4 to 2. The car should immediately begin slowing down from engine braking.

CAUTION: Do not shift from D4 or D3 to 2 at speeds over 60 mph; you may damage the transmission.

2 (2nd Gear)

1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
2. Upshifts and downshifts should not occur with the selector in this range.

R (Reverse)

Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

P (Park)

Park car on a slope (approx. 16°), apply the parking brake, and shift into Park. Then release the brake; the car should not move.