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ACURA VIGOR MPWA

ACURA 2.5TL M1WA

INTRODUCTION

ACURA VIGOR MPWA
ACURA 2.5TL M1WA

This manual contains tear down and assembly information and some basic electrical diagnostics for the 1992 to 1994 Acura Vigor with the MPWA transaxle and the 1995 and later Acura 2.5 TL with the M1WA transaxle.
Although these two transaxles are very similar, it is the intention of this manual to illustrate the subtle differences between them.
These two transaxles bare a strong resemblance to the Acura Legend with the MPYA transaxle in as much as they all are inline (north-south) mounted and have removable oil pans. The major difference between the MPYA in the Legend and the MPWA/M1WA is the MPYA utilizes a reverse clutch while the MPWA/M1WA utilize a reverse selector and fork assembly.
These transaxles contain a low hold clutch which provides a manual low gearshift position and have a complete compliment of electronics to control shift timing, TCC control as well as line pressure rise.

The information and part numbers contained in this manual have been carefully compiled from industry sources known for their reliability, however, A.T.S.G. Does not guarantee their accuracy.

A.T.S.G. would like to thank American Honda Motor Company for the illustrations and information contained in this manual.

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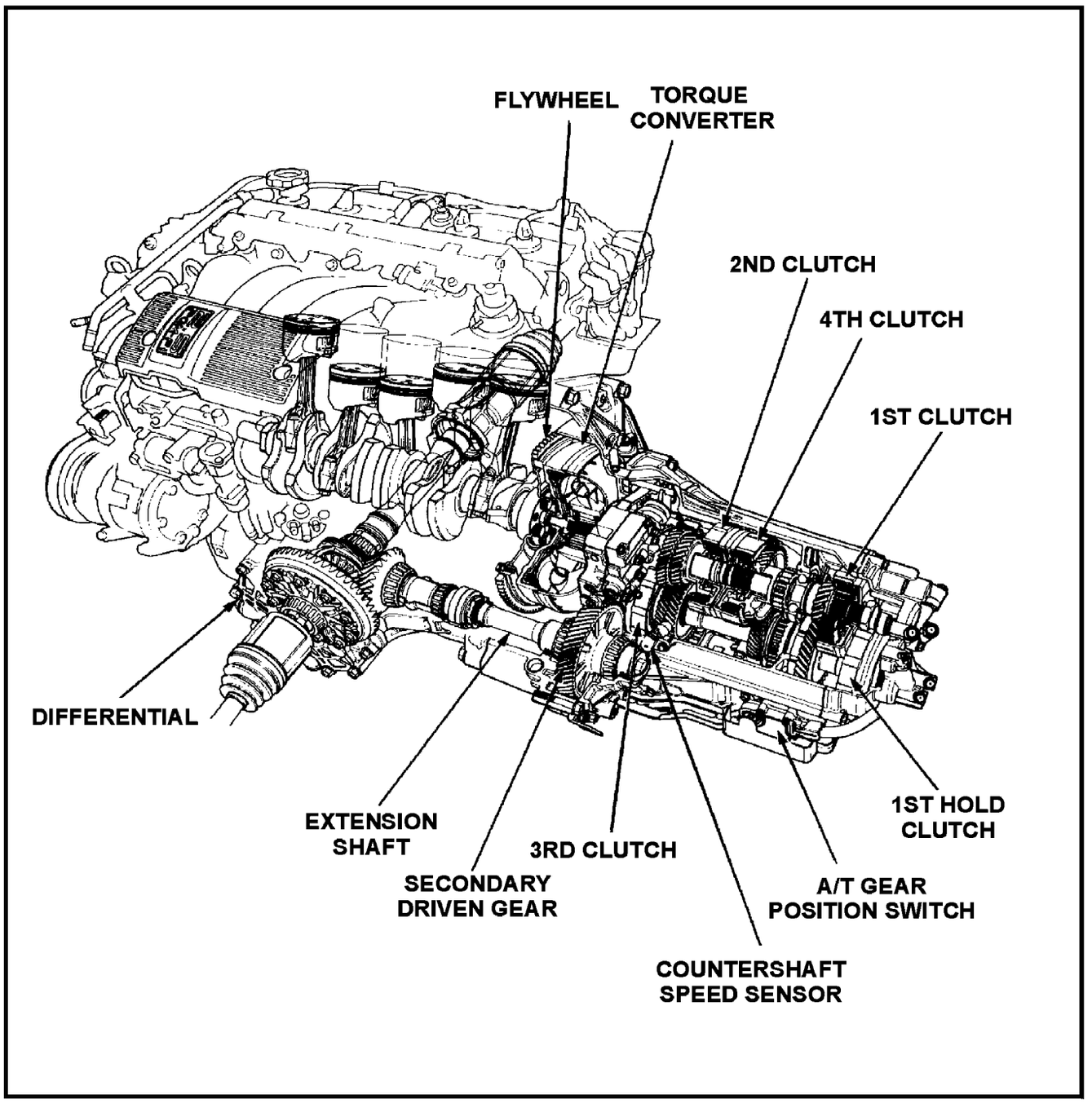
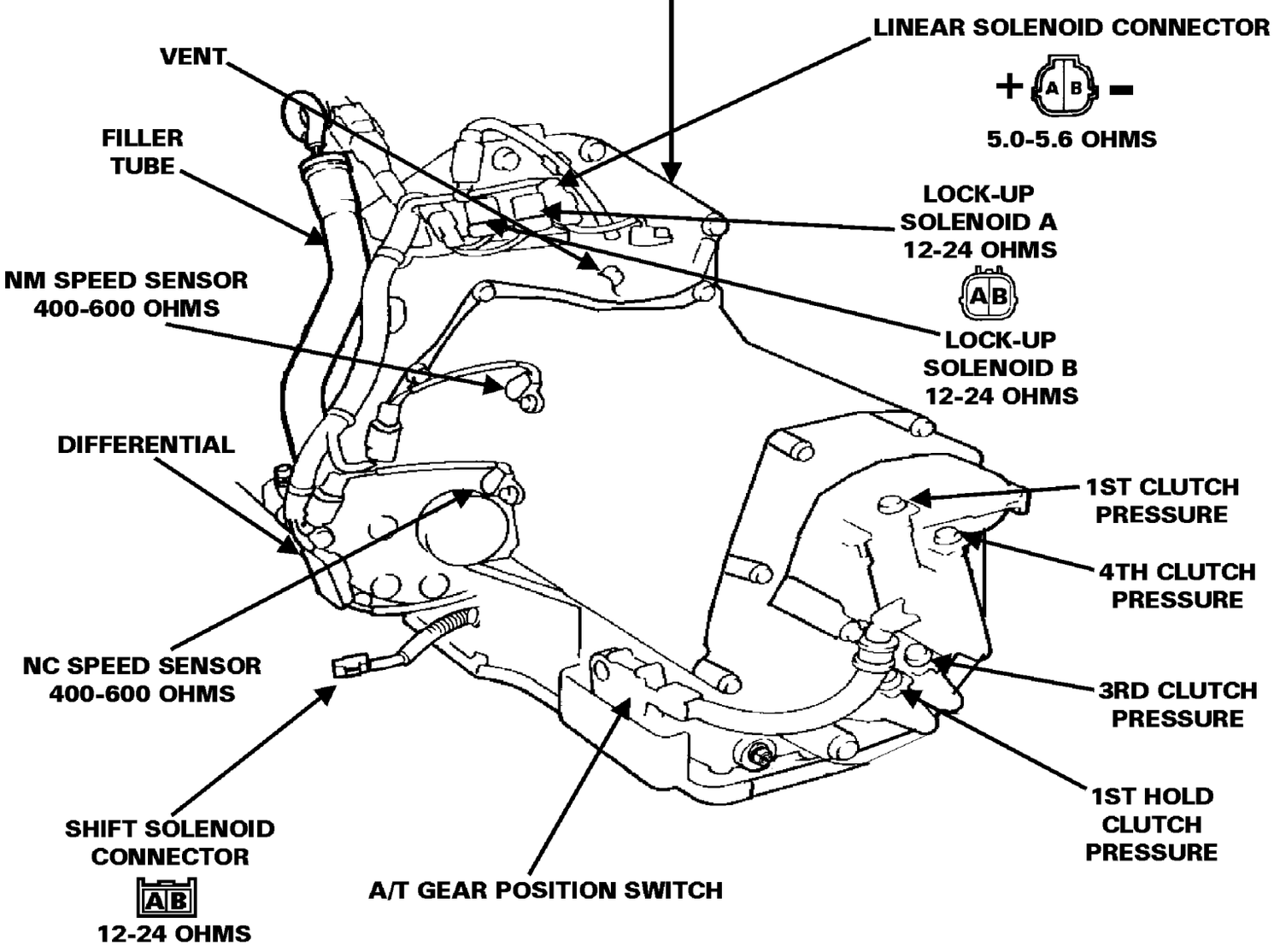
MPWA/M1WA


FLYWHEEL
TORQUE CONVERTER
2ND CLUTCH
4TH CLUTCH
1ST CLUTCH
DIFFERENTIAL
EXTENSION SHAFT
SECONDARY DRIVEN GEAR
3RD CLUTCH
1ST HOLD CLUTCH
A/T GEAR POSITION SWITCH
COUNTERSHAFT SPEED SENSOR

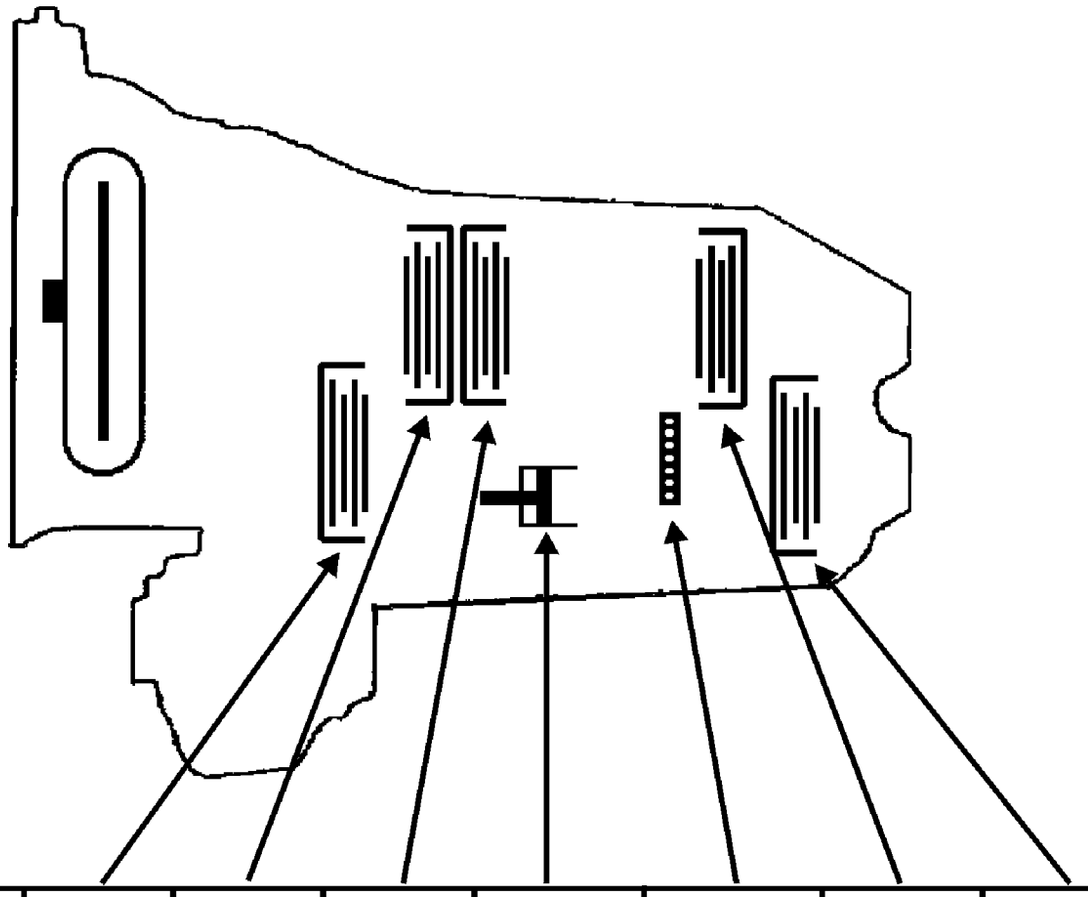
1992-94 ACURA VIGOR
1995 AND LATER ACURA 2.5TL

2 EXTERNAL TCC SOLENOIDS
2 EXTERNAL SPEED SENSORS MOUNTED ON SIDE OF CASE
REMOVABLE OIL PAN
VENT ON TOP CENTER OF BELL HOUSING
FILLER TUBE WITH PUSH-IN DIP STICK
VSS MOUNTED IN DIFFERENTIAL ASSEMBLY
MOUNTED IN-LINE WITH ENGINE

MPWA-0000000



ACURA



RANGE		GEAR	3RD CLUTCH	2ND CLUTCH	4TH CLUTCH	REVERSE FORK	ONE-WAY CLUTCH	1ST CLUTCH	LOW HOLD CLUTCH
P		PARK							
R		REVERSE			ON	ON			
N		NEUTRAL							
D4	1	FIRST					ON	ON	
	2	SECOND		ON				*ON	
	3	THIRD	ON					*ON	
	4	FOURTH			ON			*ON	
D3	1	FIRST					ON	ON	
	2	SECOND		ON				*ON	
	3	THIRD	ON					*ON	
2		SECOND		ON				*ON	
1		LOW					ON	ON	ON

SOLENOID ON/OFF AND RESISTANCE CHARTS

SHIFT SOLENOIDS

RANGE	GEAR	SHIFT SOLENOID A	SHIFT SOLENOID B	RESISTANCE
D4 & D3	FIRST	OFF	ON	12-24 OHMS
	SECOND	ON	ON	
	THIRD	ON	OFF	
D4	FOURTH	OFF	OFF	
2	SECOND	ON	ON	
1	LOW	ON	OFF	
R	REVERSE	OFF	OFF	

LOCK-UP SOLENOIDS

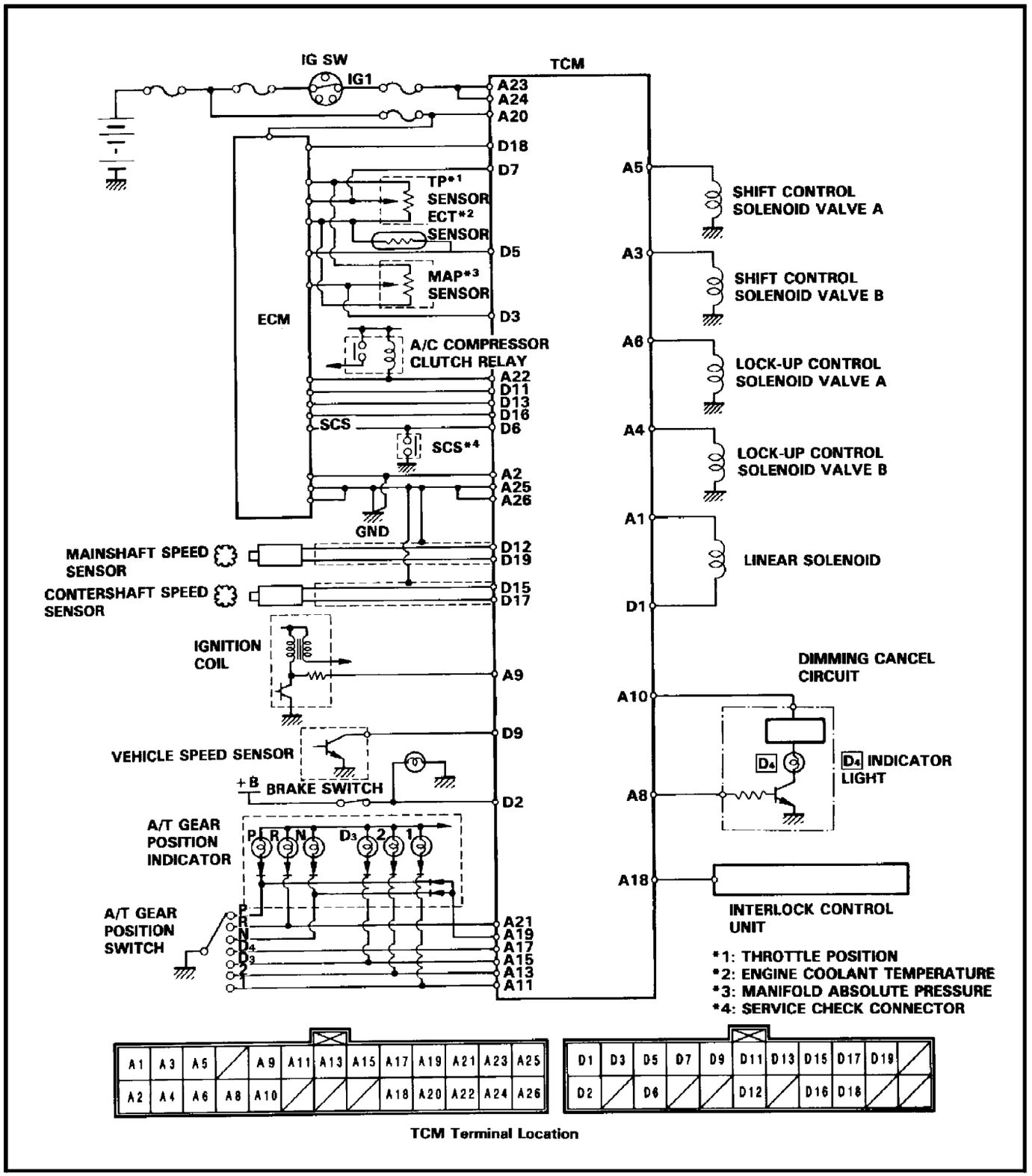
LOCK-UP CONDITION	LOCK-UP SOLENOID A	LOCK-UP SOLENOID B	RESISTANCE
LOCK-UP.....OFF	OFF	OFF	12-24 OHMS
LOCK-UP...PARTIAL	ON	OFF	
LOCK-UP...HALF	ON	ON	
LOCK-UP.....FULL	ON	ON	
LOCK-UP DURING DECELERATION	ON	DUTY OPERATION OFF<>ON	

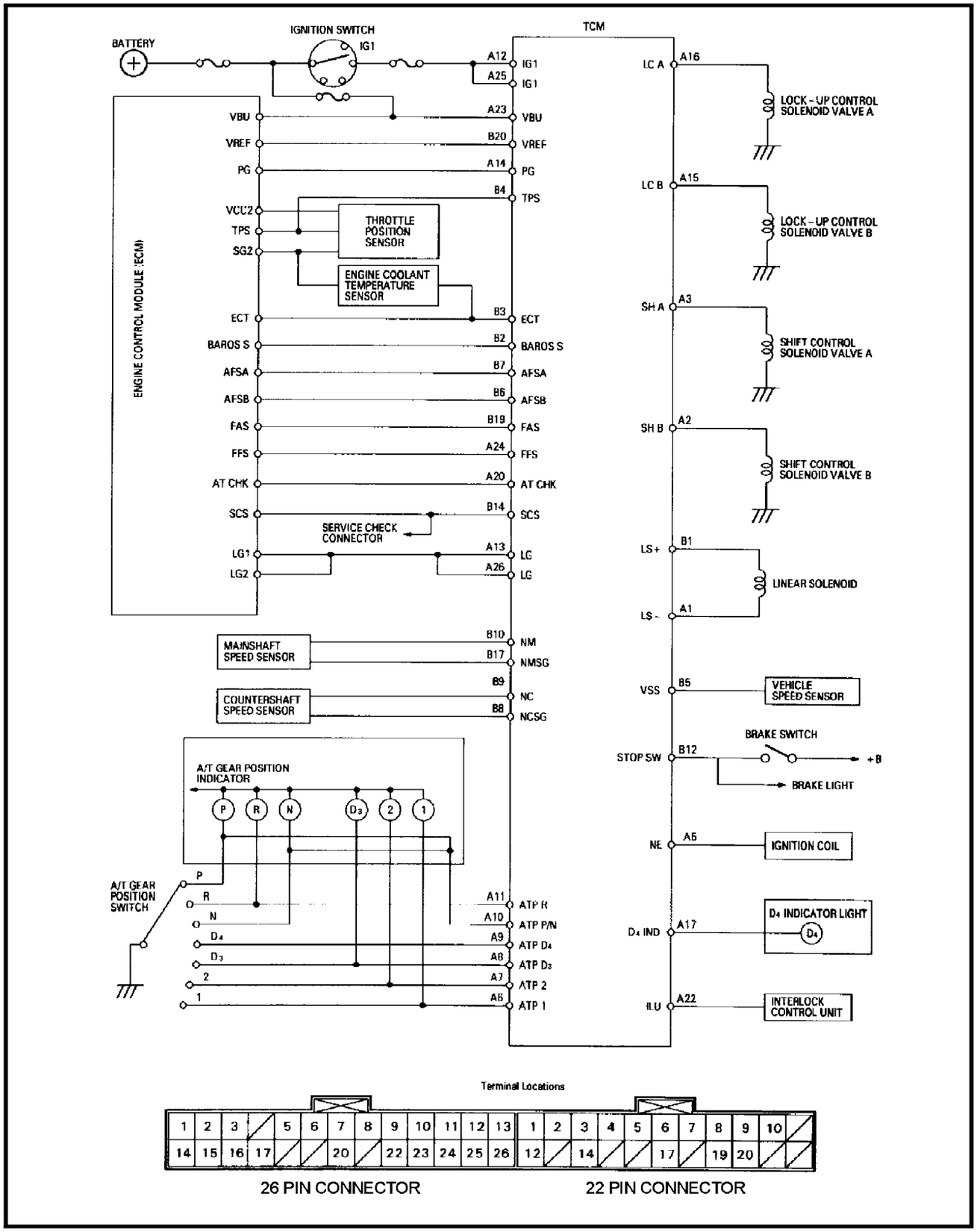
LINEAR SOLENOID

LINEAR SOLENOID CONDITION	RESISTANCE
The Transmission Control Module varies the duty cycle of the linear solenoid based on torque demand.	5.0-5.6 OHMS

CIRCUIT DIAGRAM AND TERMINAL LOCATION

ACURA VIGOR




BATTERY
IGNITION SWITCH
IG1
TCM
ENGINE CONTROL MODULE (ECM)
A12 IG1
A25 IG1
VBU
A23 VBU
VREF
B20 VREF
PG
A14 PG
B4 TPS
VCC2
TPS
SG2
THROTTLE POSITION SENSOR
ENGINE COOLANT TEMPERATURE SENSOR
ECT
B3 ECT
BAROS S
B2 BAROS S
AFSA
B7 AFSA
AFSB
B6 AFSB
FAS
B19 FAS
FFS
A24 FFS
AT CHK
A20 AT CHK
SCS
B14 SCS
SERVICE CHECK CONNECTOR
LG1
LG2
A13 LG
A26 LG
MAINSHAFT SPEED SENSOR
B10 NM
B17 NMSG
COUNTERSHAFT SPEED SENSOR
B9 NC
B8 NCSG
A/T GEAR POSITION INDICATOR
P R N D3 2 1
A/T GEAR POSITION SWITCH
P
R
N
D4
D3
2
1
A11 ATP R
A10 ATP P/N
A9 ATP D4
A8 ATP D3
A7 ATP 2
A6 ATP 1
LC A
A16
LOCK - UP CONTROL SOLENOID VALVE A
LC B
A15
LOCK - UP CONTROL SOLENOID VALVE B
SH A
A3
SHIFT CONTROL SOLENOID VALVE A
SH B
A2
SHIFT CONTROL SOLENOID VALVE B
LS+
B1
LS -
A1
LINEAR SOLENOID
VSS
B5
VEHICLE SPEED SENSOR
BRAKE SWITCH
STOP SW
B12
+B
BRAKE LIGHT
NE
A5
IGNITION COIL
D4 IND
A17
D4 INDICATOR LIGHT
D4
ILU
A22
INTERLOCK CONTROL UNIT
Terminal Locations
1 2 3 5 6 7 8 9 10 11 12 13
14 15 16 17 20 22 23 24 25 26
26 PIN CONNECTOR
1 2 3 4 5 6 7 8 9 10
12 14 17 19 20
22 PIN CONNECTOR

COMPUTER LOCATION/CODE INDICATOR LAMP

1992-94 ACURA VIGOR
1995 AND LATER 2.5TL

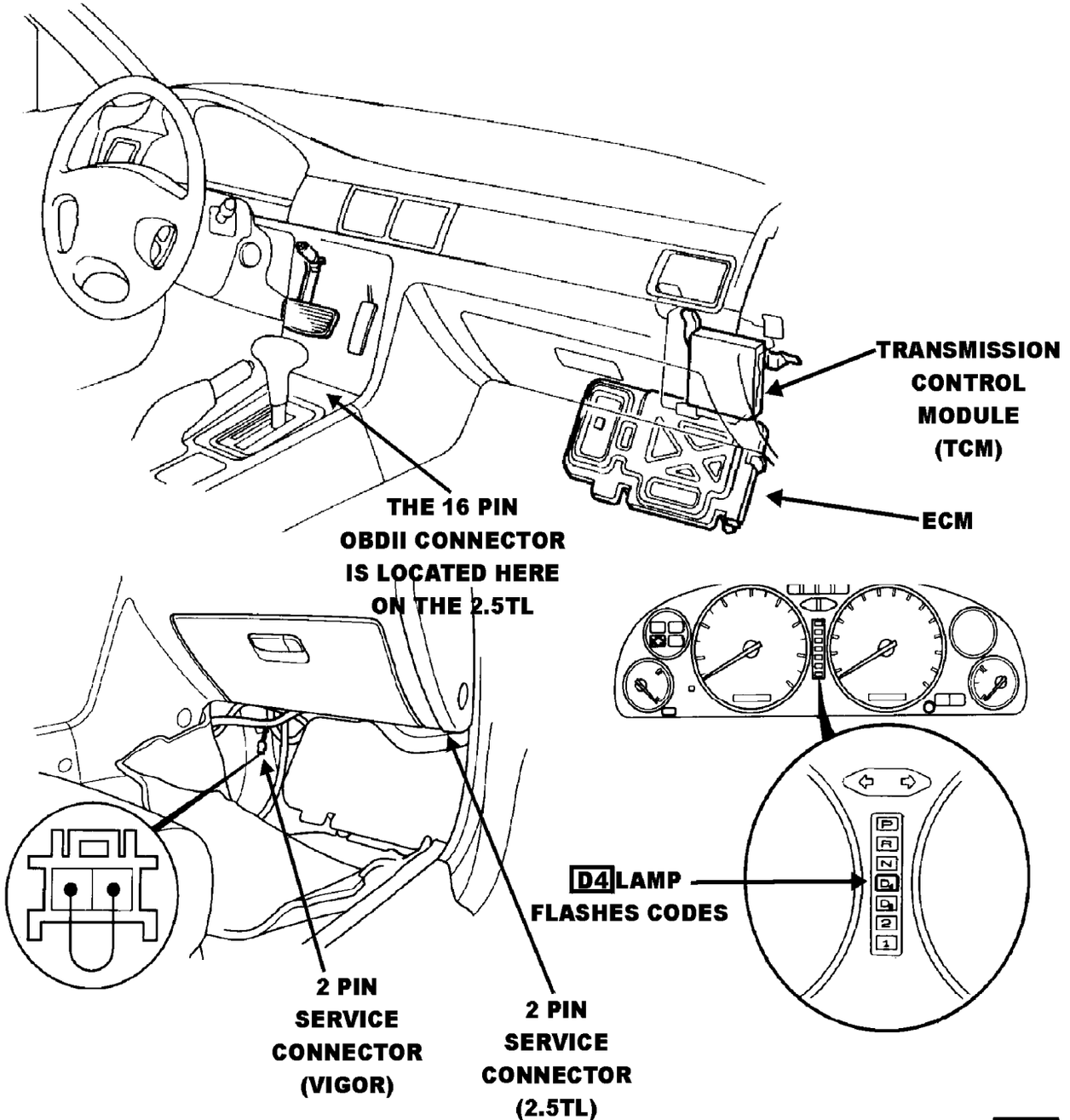
When the Transmission Control Module senses a problem the D4 lamp will flash continuously.

To retrieve codes locate the 2 pin service connector under the center of the dashboard on the passenger side of the console. Put a jumper wire across the 2 pins and the D4 lamp will now flash codes stored by the TCM.

NOTE: Some PGM-FI problems will cause the D4 lamp to flash. These problems must be addressed first.

To clear the codes, remove the 10 amp Back-up fuse from the under hood relay box for 30 seconds.

CAUTION: Removing the Back-up fuse will cancel radio anti-theft code.



TROUBLE CODE	D4 LAMP CONDITION	SYMPTOM	POSSIBLE CAUSE
P1753 (1)	FLASHES	Lock-up clutch does not apply Lock-up clutch does not release	Faulty "A" lock-up solenoid Short or open in lock-up solenoid "A" circuit
P1758 (2)	FLASHES	Lock-up clutch does not apply	Faulty "B" lock-up solenoid Short or open in lock-up solenoid "B" circuit
P1790 (3)	FLASHES or OFF	Lock-up clutch does not apply Late or early shifts	Faulty TP Sensor Short or open in TP Sensor wires
P1791 (4)	FLASHES	Lock-up clutch does not apply	Faulty Vehicle Speed Sensor (VSS) Short or open in Vehicle Speed Sensor (VSS) wires
P1705 (5)	FLASHES	Fails to shift through all gears Wrong gear start Will not come out of park	Faulty A/T gear position switch Short or open in A/T gear position switch wires
P1706 (6)	OFF	Fails to shift through all gears Wrong gear start Will not come out of park	Faulty A/T gear position switch Short or open in A/T gear position switch wires
P0753 (7)	FLASHES	Shifts 2-3, No 1st or 4th gears No kickdown	Faulty "A" shift solenoid Short or open in shift solenoid "A" circuit
P0758 (8)	FLASHES	Shifts 1-4, No 2nd or 3rd gears No kickdown	Faulty "B" shift solenoid Short or open in shift solenoid "B" circuit
P0720 (9)	FLASHES	Lock-up clutch does not apply	Faulty Countershaft Speed Sensor Short or open in Countershaft Speed Sensor (NC) wires
P1792 (10)	FLASHES	Lock-up clutch does not apply	Faulty Engine Coolant Temp Sensor Short or open in Engine Coolant Temp Sensor (ECT) wires
P0725 (11)	OFF	Lock-up clutch does not apply	Fault in ignition coil signal Short or open in ignition coil wire
P1794 (13)	FLASHES	No specific transmission symptom	Faulty Baro sensor (2.5TL) **NOTE:** Baro sensor is located inside the ECM Faulty MAP sensor (VIGOR) Short or open in Baro S (RED/BLUE) wire between B2 TCM terminal and the ECM (2.5TL) Short or open in MAP sensor circuits (VIGOR)
P1786 (14)	FLASHES	Shifts are harsh	Short or open in the FAS (PINK) wire between TCM terminal B19 and ECM Faulty ECM
P0715 (15)	OFF	Shifts are harsh	Short or open in the Mainshaft (NM) sensor wires Faulty Mainshaft (NM) sensor

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NOTE: The DTCs in parenthesis are the number of flashes by the D4 lamp and are retrieved by jumping the service check connector.
The 5 digit codes are retrieved with a scan tool connected to the 16 pin OBDII connector.

TROUBLE CODE	D4 LAMP CONDITION	SYMPTOM	POSSIBLE CAUSE
P1768 (16)	FLASHES	Lock-up clutch does not apply Shifts are harsh	Faulty Linear solenoid Short or open in Linear solenoid circuit
P1787 (18)	OFF	Lock-up clutch does not have on/off duty operation	Short or open in FFS (RED/GREEN) wire between TCM terminal A24 and the ECM Faulty TCM Faulty ECM
P0740 (None)	OFF	Lock-up clutch does not apply Lock-up clutch does not release	Faulty lock-up control system
P0730 (None)	OFF	Fails to shift properly Missing shifts Wrong gear starts	Faulty shift control system

CAUTION: DTCs P0740 and P0730 are ***MECHANICALLY*** generated faults, which means that vehicles equipped with computers that can generate these codes are capable of sensing slip and gear ratio errors.

NOTE: The DTCs in parenthesis are the number of flashes by the D4 lamp and are retrieved by jumping the service check connector.
The 5 digit codes are retrieved with a scan tool connected to the 16 pin OBDII connector.

Sometimes the D4 lamp and the Malfunction Indicator Lamp (MIL) will illuminate at the same time.
In the event this happens, service the MIL generated codes first.

MECHANICAL AND HYDRAULIC TROUBLESHOOTING CHARTS

SYMPTOM	Check these items on the PROBABLE CAUSE List	Check these items on the NOTES List
Engine runs, but car does not move in any gear.	1, 2, 3, 5, 6, 7, 8, 38, 43	K, L, R, S
Car moves in [2], but not in [D3], [D4], or [1] position.	6, 8, 9, 10, 65	C, M, O
Car moves in [D3], [D4], [1], [R], but not in [2] position.	6, 11, 12, 22	C, L
Car moves in [D3], [D4], [2], [1], but not in [R] position.	4, 6, 13, 33, 58	C, L, Q
Car moves in [D3], [D4], [2], but not in [1] position.	6, 8	C, L, M
Car moves in [N] position.	10, 12, 14, 32, 33, 35, 36, 37	C, D
Excessive idle vibration.	2, 34, 38, 49, 50	B, K, L
Poor acceleration; flares on starting off in [D4], [D3] position		
Stall rpm high in [D4], [D3], [2], [1] position.	1, 2, 3, 6, 43, 46	K, L, R
Stall rpm high in [D4], [D3], [1] position.	6, 8, 10	C, D
Stall rpm high in [2] position.	6, 12	C, D
Stall rpm is in specification.	14	N
Stall rpm low.	15, 16, 34, 49, 50	R
No shift	45, 52, 53, 56	G, L
Fails to shift in [D3] position; from 1st to 3rd gear	20, 56	
Fails to shift in [D4] position; from 1st to 4th gear	20, 21, 56	
Erratic upshifting.		V
1-2 upshift, 2-3 upshift, 3-4 upshift	56	
1-2 upshift	52, 56	
2-3 upshift	53, 56	
3-4 upshift	52, 56	
Harsh upshift (1-2).	12, 17, 18, 22, 59	C, D, E, V
Harsh upshift (2-3).	17, 18, 22, 23, 25, 32, 59	C, D, E, H, L, V
Harsh upshift (3-4).	17, 18, 23, 24, 29, 33, 59, 61	C, D, E, I, L, V
Harsh downshift (2-1).	10, 17, 18, 22, 28, 39	O
Harsh downshift (3-2).	12, 17, 18, 22, 23, 29, 40, 59, 61	C, D, E, H
Harsh downshift (4-3).	17, 18, 23, 24, 31, 32, 41, 59, 61, 62	C, D, E, I
Flares on 2-3 upshift.	17, 18, 22, 23, 25, 26, 30, 32, 59	E, L, V
Flares on 3-4 upshift.	17, 18, 22, 24, 26, 29, 31, 33, 59	E, L, V, N
Excessive shock on 2-3 upshift.	17, 18, 22, 23, 25, 26, 32, 39, 47, 59	E, L, N
Excessive shock on 3-4 upshift.	17, 18, 23, 24, 26, 29, 33, 40, 47, 65	E, L, N
Late shift from [N] position to [D4] or [D3] position.	10, 27	M
Late shift from [N] position to [R] position.	4, 19, 33, 57	Q
Noise from transmission in all shift lever positions.	2, 42	K, L, Q
Car does not accelerate more than 31 mph (50 km/h).	15	
Shift lever does not operate smoothly.	6, 44	P
Fails to shift; stuck in 4th gear.	52, 53, 56	
Transmission will not shift into parking gear in [P] position.	6, 44	P
Stall rpm high; all clutch pressures are in specification.	8, 10, 12, 46	D, K, O
Lock-up clutch does not disengage.	17, 18, 48, 49, 50, 51, 54, 55, 56	E, L, V
Lock-up clutch does not operate smoothly.	17, 18, 46, 48, 49, 50, 51, 54, 55, 56	L
Lock-up clutch does not engage.	17, 18, 46, 48, 49, 50, 51, 54, 55, 56	E, L, V
No engine braking in [1] position.	8, 10, 60, 63, 64	C, D, L
Vibration in all positions	38	

PROBABLE CAUSE			
1	Low ATF.	41	4th check ball stuck.
2	ATF pump worn or binding.	42	Torque converter housing or transmission housing ball bearing worn/damaged.
3	Regulator valve stuck or spring worn.	43	ATF strainer clogged.
4	Servo valve stuck.	44	Joint in shift cable and transmission or body worn.
5	Mainshaft worn/damaged.	45	Modulator valve stuck.
6	Shift cable broken/out of adjustment.	46	Torque converter check valve stuck.
7	Secondary drive gear, secondary driven gear, extension shaft worn/damaged.	47	Foreign material in separator plate orifice.
8	One-way (sprag) clutch worn/damaged.	48	Lock-up timing valve stuck.
9	1st gears worn/damaged (2 gears).	49	Lock-up shift valve stuck.
10	1st clutch defective.	50	Lock-up piston defective.
11	2nd gears worn/damaged (2 gears).	51	Lock-up control valve stuck.
12	2nd clutch defective.	52	Shift control solenoid valve A defective.
13	Reverse gears worn/damaged (2 gears).	53	Shift control solenoid valve B defective.
14	Excessive ATF.	54	Lock-up control solenoid valve A defective.
15	Torque converter one-way clutch defective.	55	Lock-up control solenoid valve B defective.
16	Engine throttle cable out of adjustment.	56	TCM defective.
17	Throttle valve stuck.	57	Servo control valve stuck.
18	Linear solenoid defective.	58	Reverse idler gear worn/damaged.
19	1-2 shift valve stuck.	59	Main orifice control valve stuck.
20	2-3 shift valve stuck.	60	1st-hold clutch defective.
21	3-4 shift valve stuck.	61	4th exhaust valve stuck.
22	2nd accumulator defective.	62	4th kick-down valve stuck.
23	3rd accumulator defective.	63	1st-hold accumulator defective.
24	4th accumulator defective.	64	Foreign material in 1st-hold orifice.
25	2-3 orifice control valve stuck.	65	1st accumulator defective.
26	Foreign material in main orifice.		
27	Foreign material in 1st orifice.		
28	Foreign material in 2nd orifice.		
29	3-4 orifice control valve stuck.		
30	Foreign material in 3rd orifice.		
31	Foreign material in 4th orifice.		
32	3rd clutch defective.		
33	4th clutch defective.		
34	Engine output low.		
35	Needle bearing worn/damaged.		
36	Thrust washer worn/damaged.		
37	Clutch clearance incorrect.		
38	Drive plate defective or transmission misassembly.		
39	2nd check ball stuck.		
40	3rd check ball stuck.		

The following symptoms can be caused by improper repair or assembly	Check these items on the PROBABLE CAUSE DUE TO IMPROPER REPAIR List	Items on the NOTES List
Car creeps in [N] position.	R1, R2	
Car does not move in [D3] or [D4] position.	R4	
Transmission locks up in [R] position.	R12	
Excessive drag in transmission.	R6	K, R
Excessive vibration, rpm related.	R7	
Noise with wheels moving only.	R5	
Main seal pops out.	R8	S
Various shifting problems.	R9, R10	
Harsh upshifts.	R11	

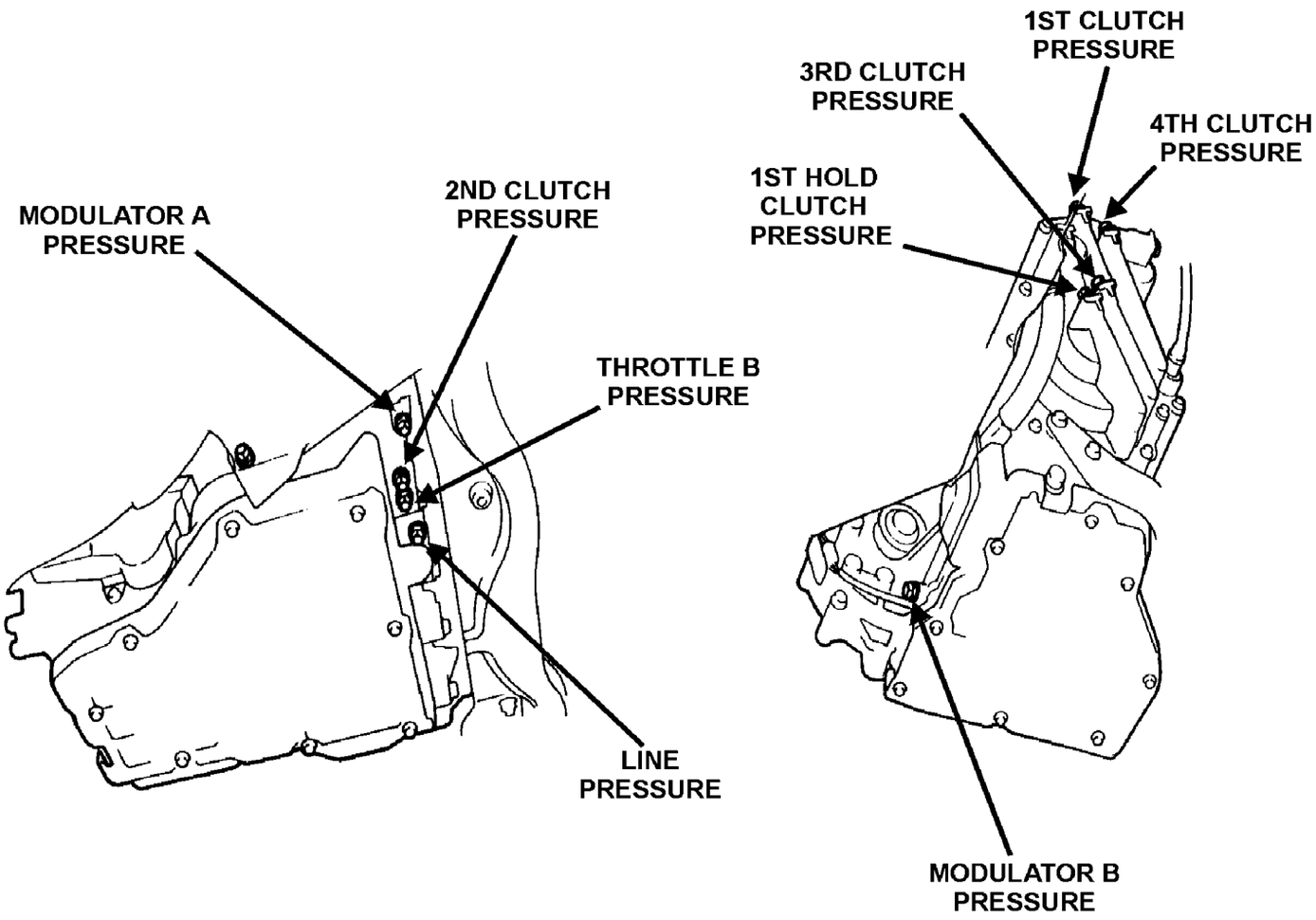
	PROBABLE CAUSE DUE TO IMPROPER REPAIR
R1.	Improper clutch clearance.
R2.	Improper gear clearance.
R4.	One-way (sprag) clutch installed upside down.
R5.	Reverse selector hub installed upside down.
R6.	ATF pump binding.
R7.	Torque converter not fully seated in ATF pump.
R8.	Main seal improperly installed.
R9.	Springs improperly installed.
R10.	Valves improperly installed.
R11.	Check valve balls not installed.
R12.	Shift fork bolt not installed.

NOTES	
A.	Flush or replace cooler and install inline filter
B.	Set idle rpm in gear to specified idle speed. If still no good, adjust 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 valve for free movement.
E.	If the throttle valve is stuck inspect the clutches for wear.
G.	If the 1-2 shift valve is stuck closed, the transmission will not upshift. If stuck open the transmission has no 1st gear.
H.	If the 2-3 orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I.	If the 3-4 orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
K.	Improper alignment of ATF pump body and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak.
L.	If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If OK and no cause for the contamination is found, replace the torque converter.
M.	If the 1st clutch feed pipe guide in the rear cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the rear cover as it is dented. The O-ring under the guide is probably worn.
N.	Replace the mainshaft if the bushings for the 1st and 4th feed pipe are loose or damaged. If the 1st feed pipe is damaged or out of round, replace it. If the 4th feed pipe is damaged or out of round, replace the rear cover.
O.	A worn or damaged sprag clutch is mostly a result of shifting the transmission in D3 or D4 position 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. Reverse selector gear teeth chamfers. 2. Engagement teeth chamfers of countershaft 4th and reverse gear. 3. Shift fork for scuff marks in center. 4. Splines of extension shaft and secondary driven gear for wear. 5. Differential pinion shaft for wear under pinion gears. 6. Bottom of 3rd clutch for swirl marks. Replace items 1, 2, 3, 4 and 5 if worn or damaged. If transmission makes clicking, grinding or whirring noise, also replace mainshaft 4th gear and reverse idler gear and countershaft 4th gear in addition to 1, 2, 3, 4 or 5. If extension shaft, secondary driven gear and/or differential pinion shaft are worn, overhaul extension shaft, secondary driven gear and/or differential assembly and replace ATF strainer and thoroughly clean transmission, flush torque converter, cooler and lines. If bottom of 3rd clutch is swirled and transmission makes gear noise, replace the countershaft and secondary driven gear shaft.
R.	Be very careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the ATF pump body. This will result in ATF pump seizure if not detected. Use proper tools.
S.	Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.
T.	Harsh downshifts when coasting to a stop with zero throttle may be caused by the linear solenoid not working.
U.	Check if servo valve cover is installed with snap ring. If they are not installed, the check valve may have been pushed out by hydraulic pressure causing a leak (internal), affecting all forward gears.
V.	Adjusting the throttle valve body, throttle valve, and linear solenoid are essential for proper operation of the transmission. Not only does it affect the shift quality if misadjusted, but also the lock-up clutch operation.

MPWA/M1WA

SELECTOR LEVER POSITION	GEAR	PRESSURE PORT	CONDITIONS	PRESSURE IN PSI
N or P	N or P	LINE	ENGINE @ 2000 RPM	121-128
D4	FORWARD	TV B	ENGINE @ IDLE, LINEAR SOLENOID CONNECTED	MUST BE 0
D4	FORWARD	TV B	ENGINE @ 1000 RPM,LINEAR SOL. DISCONNECTED	71-75
1	1ST HOLD	1ST HOLD	ENGINE @ 2000 RPM, WHEELS FREE	121-128
D3 or D4	FIRST	1ST CLUTCH	ENGINE @ 2000 RPM, WHEELS FREE	121-128
D3 or D4	SECOND	2ND CLUTCH	ENGINE @ 2000 RPM, WHEELS FREE	71-128
D3 or D4	THIRD	3RD CLUTCH	ENGINE @ 2000 RPM, WHEELS FREE	71-128
D4	FOURTH	4TH CLUTCH	ENGINE @ 2000 RPM, WHEELS FREE	71-128
R	REVERSE	4TH CLUTCH	ENGINE @ 2000 RPM, WHEELS FREE	121-128
N or P	N or P	MODULATOR A	ENGINE @ 2000 RPM	65-73
N or P	N or P	MODULATOR A	ENGINE @ 2000 RPM	65-73

NOTE: PRESSURE PORT FITTING THREAD SIZE IS 8X1.25MM



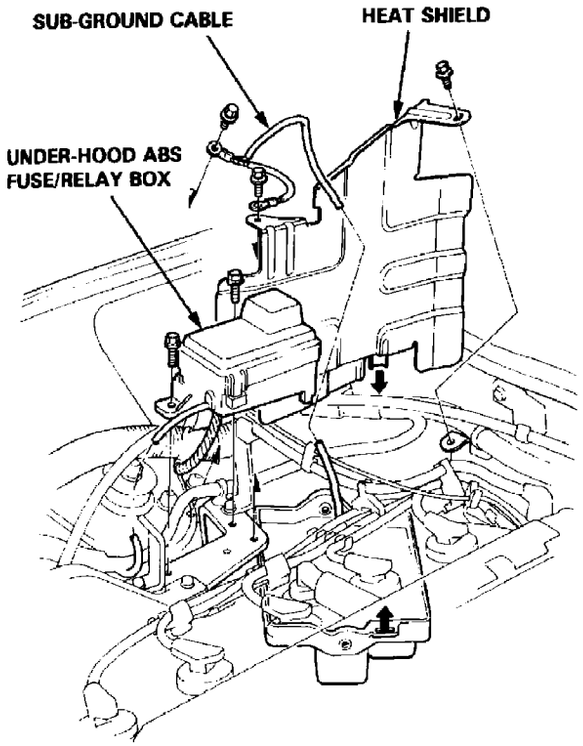
TRANSMISSION REMOVAL

⚠WARNING Make sure lifts are placed properly, and hoist brackets are attached to the correct position on the engine.

CAUTION: Use fender covers to avoid damaging painted surfaces.

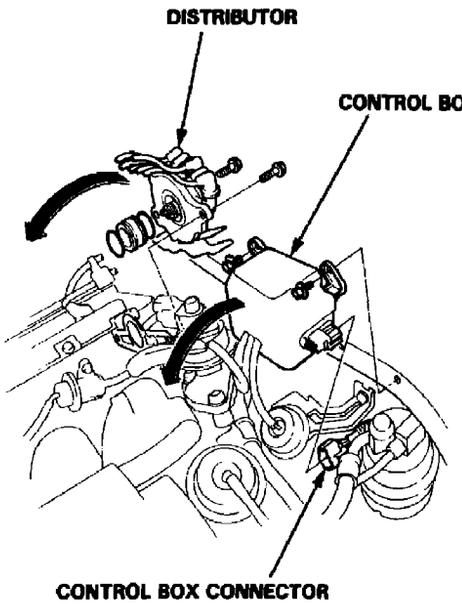
NOTE: The radio may have a coded theft protection circuit. Be sure to get the customer's code number before
– Disconnecting the battery.
– Removing the No. 39 (10 A) fuse in the under-hood fuse/relay box.
– Removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

1. Disconnect the battery negative (–) and positive (+) cables from the battery.
2. Remove the battery set plate.
3. Remove the battery with the battery box.
4. Remove the under-hood ABS fuse/relay box.
5. Remove the sub-ground cable.
6. Remove the heat shield.



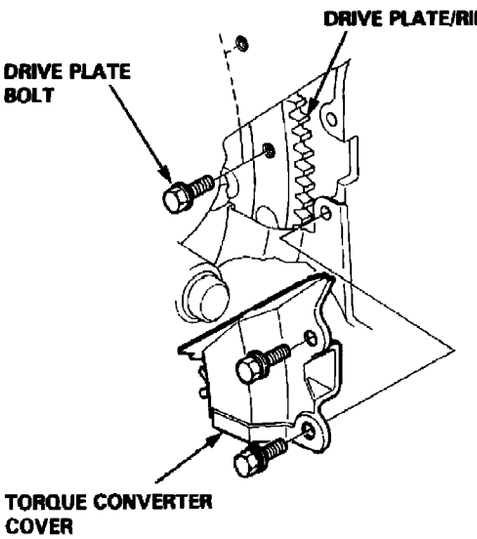
7. Remove the distributor.
8. Disconnect the connector from the control box, then remove the control box.

   CAUTION: Do not disconnect the vacuum tubes from the control box.



9. Remove the torque converter cover.
10. Remove the eight drive plate bolts one at a time while rotating the crankshaft pulley.

    NOTE: If necessary, remove the spark plugs while removing the drive plate bolts.

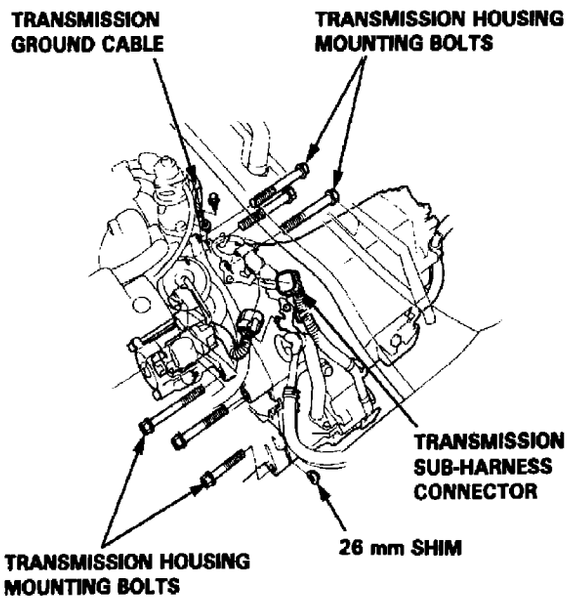


TRANSMISSION REMOVAL

11. Disconnect the transmission sub-harness connector.

12. Remove the transmission ground cable.

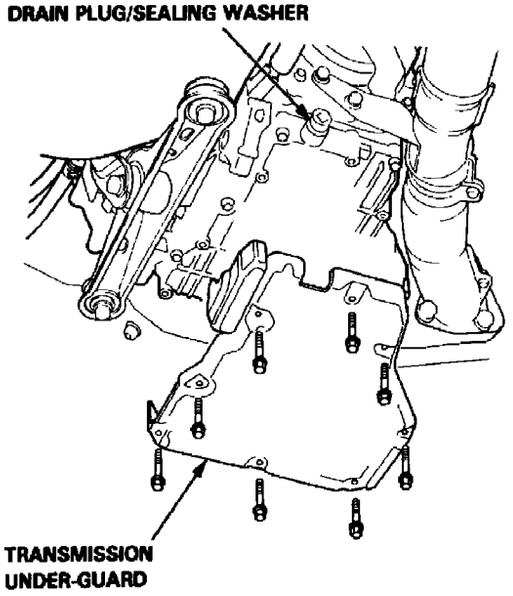
13. Remove the transmission housing mounting bolts and the 26 mm shim.



14. Remove the transmission under-guard.

15. Remove the drain plug and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer.

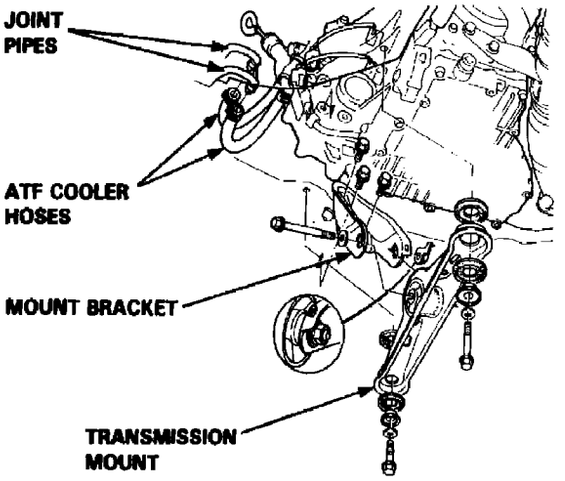
TORQUE: 50 N·m (5.0 kg-m, 36 lb-ft)



16. Remove the transmission mount and mount bracket.

17. Remove the ATF cooler hoses at the joint pipes. Turn the ends of the cooler hoses up to prevent ATF from flowing out, then plug the joint pipes.

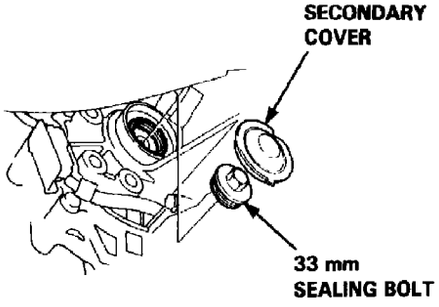
NOTE: Check for any signs of leakage at the hose joints.

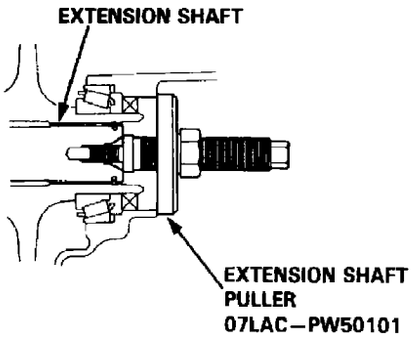


18. Shift to [P] position by rotating the control shaft.

19. Remove the secondary cover and 33 mm sealing bolt.

20. Remove the extension shaft from the differential using the special tool as shown.





21. Remove the two bolts from exhaust pipe A stay.

22. Remove exhaust pipe A.

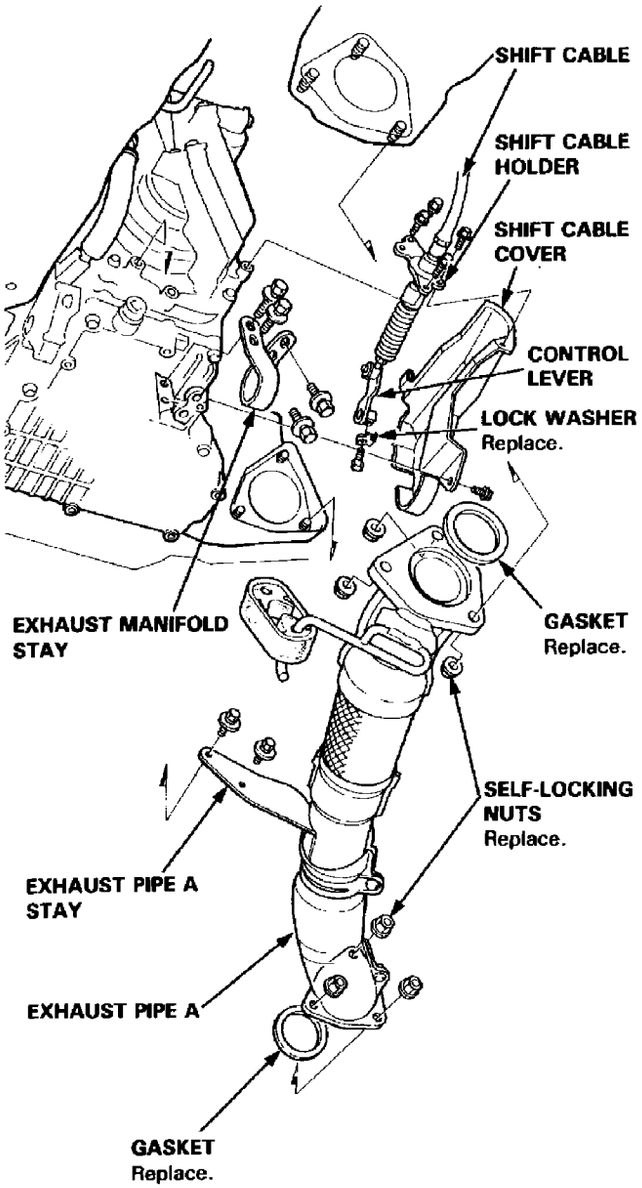
23. Remove the exhaust manifold stay.

24. Remove the shift cable cover.

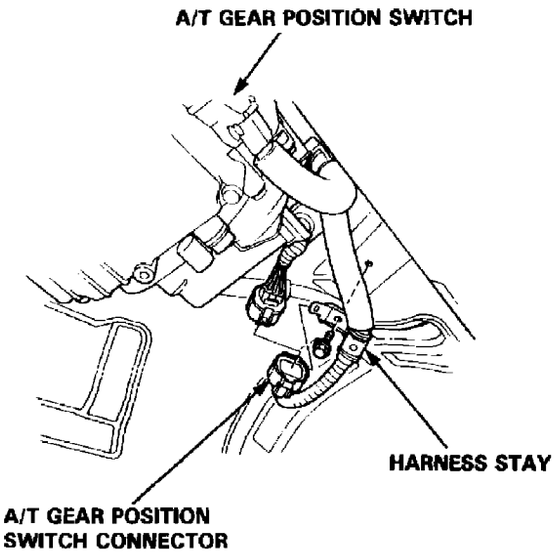
25. Remove the control lever from the control shaft.

26. Remove the shift cable holder from the transmission housing.

    CAUTION: Take care not to bend the shift cable.

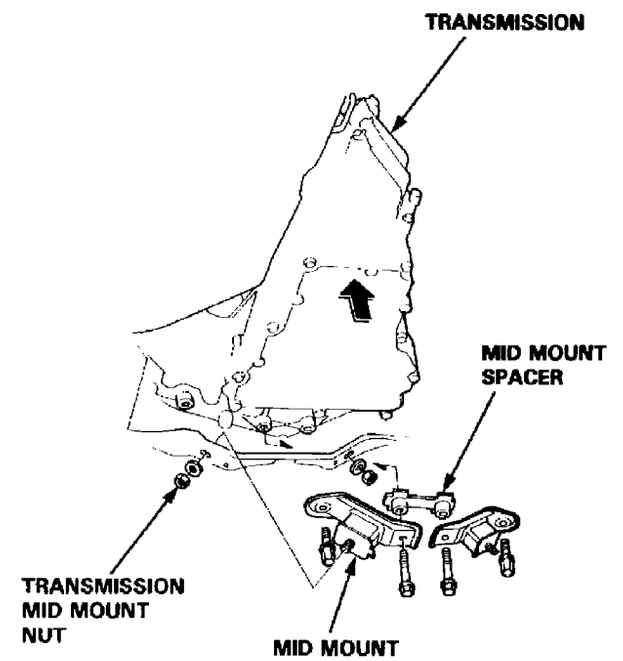


27. Disconnect the A/T gear position switch connector then remove the harness stay.



28. Remove the transmission mid mount nuts.

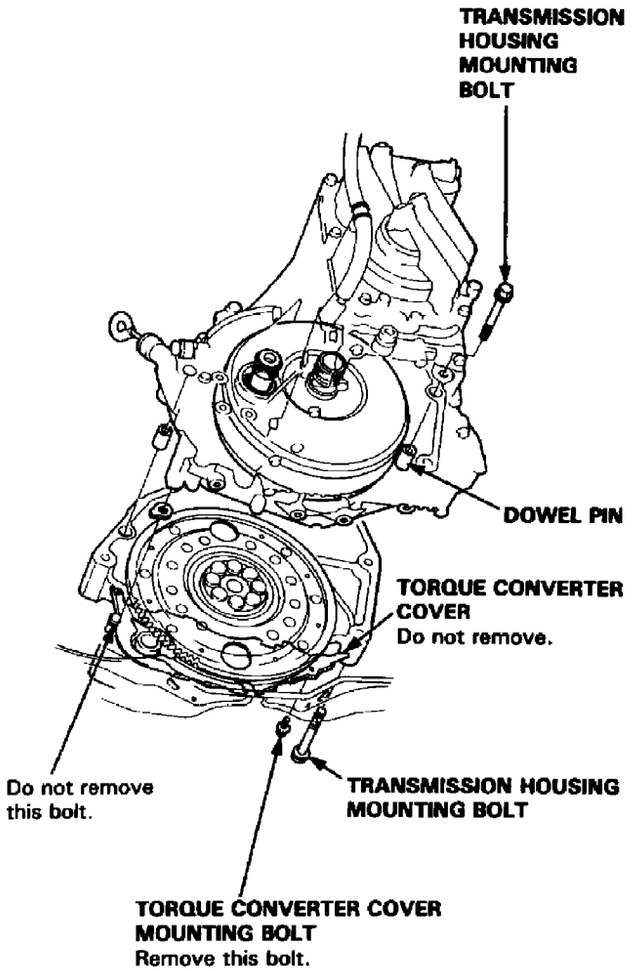
29. Place a jack under the transmission and raise the transmission just enough to take weight off of the mounts, then remove the mid mounts and mid mount spacer.



30. Remove the transmission housing mounting bolts.

31. Remove the torque converter cover mounting bolt on the torque converter housing side.

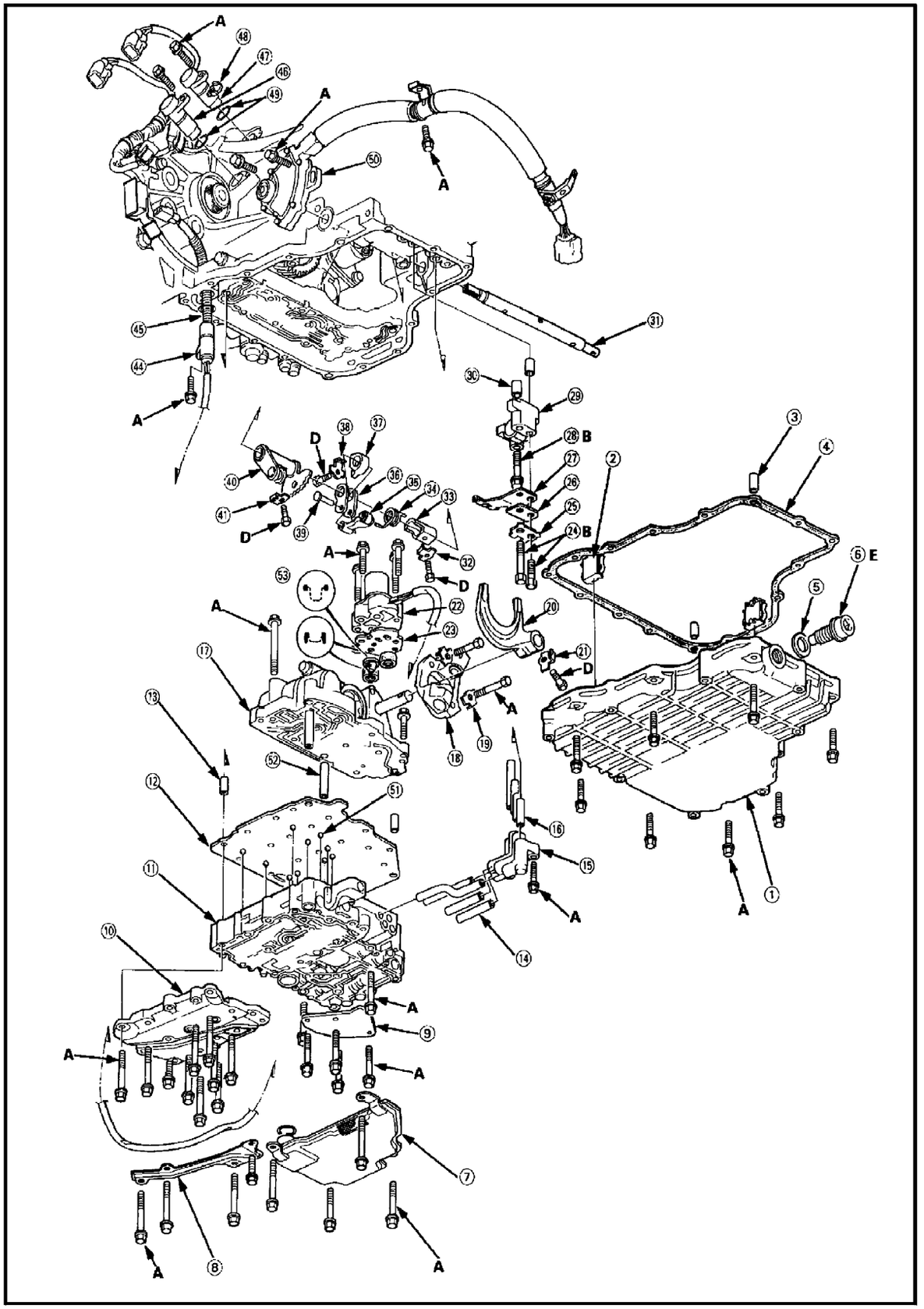
    NOTE: Do not remove the torque converter cover mounting bolt on the differential carrier side, or the torque converter cover.



32. Pull the transmission away from the engine until it clears the dowel pin, then lower it on the transmission jack.

PARTS IDENTIFICATION

TRANSMISSION HOUSING/LOWER VALVE BODY



PARTS IDENTIFICATION

TRANSMISSION HOUSING/LOWER VALVE BODY

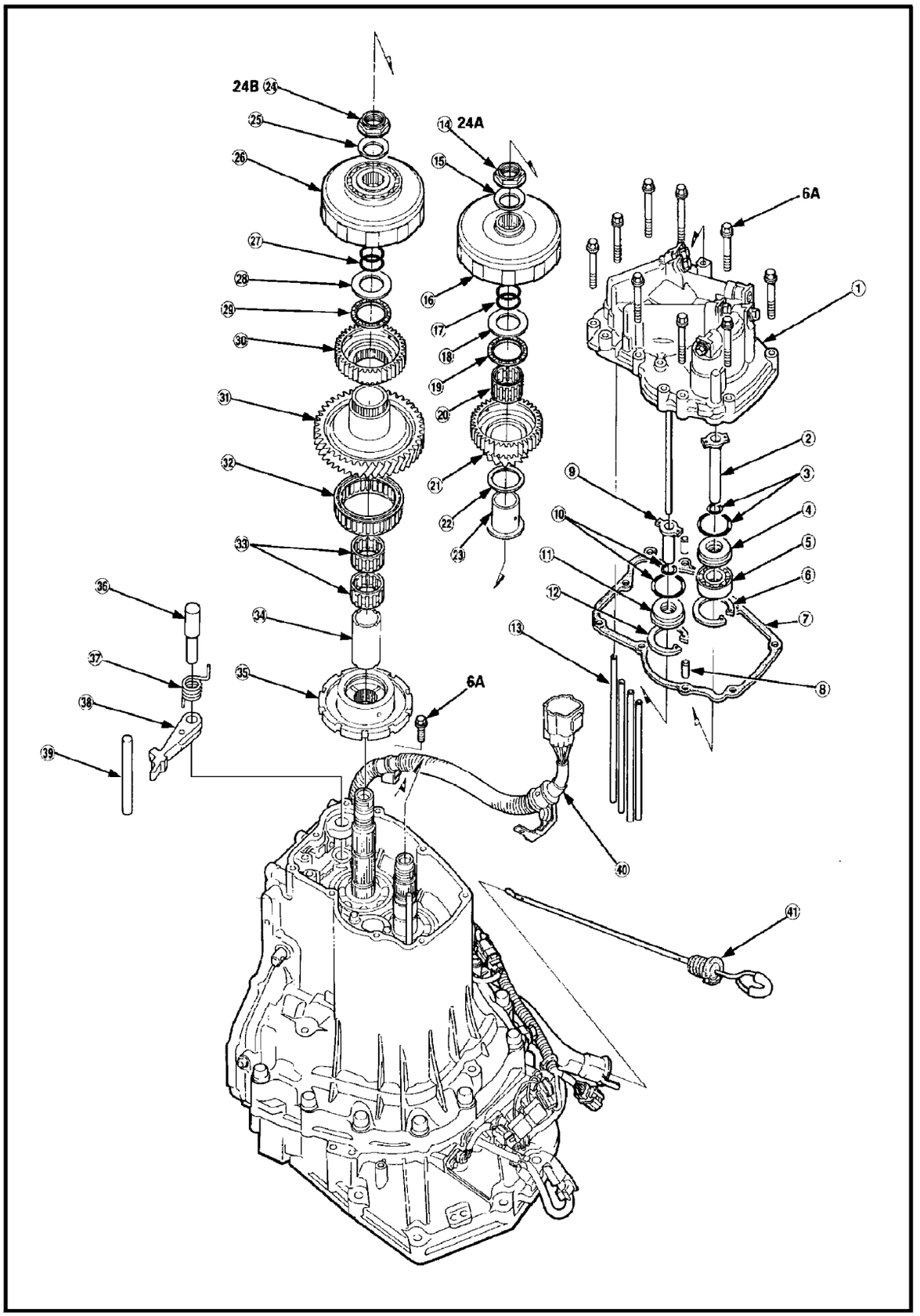
① **TRANSMISSION OIL PAN**
② **ATF MAGNET** Clean.
③ **DOWEL PIN**
④ **OIL PAN GASKET** Replace.
⑤ **SEALING WASHER** Replace.
⑥ **DRAIN PLUG**
⑦ **ATF STRAINER** Clean.
⑧ **HARNESS COVER**
⑨ **MAIN VALVE BODY PLATE**
⑩ **MAIN VALVE BODY COVER**
⑪ **MAIN VALVE BODY**
⑫ **MAIN SEPARATOR PLATE**
⑬ **DOWEL PIN**
⑭ **OIL PIPES**
⑮ **OIL PASS BODY**
⑯ **OIL PIPES**
⑰ **SERVO BODY**
⑱ **SERVO DETENT BASE**
⑲ **LOCK WASHER** Replace.
⑳ **SHIFT FORK**
㉑ **LOCK WASHER** Replace.
㉒ **SHIFT CONTROL SOLENOID VALVE ASSEMBLY**
㉓ **SHIFT CONTROL SOLENOID VALVE SEPARATOR PLATE**
㉔ **SPECIAL BOLTS**
㉕ **LOCK WASHER** Replace.
㉖ **DETENT SPRING PLATE**
㉗ **DETENT SPRING**
㉘ **SPECIAL BOLT**
㉙ **PARKING BRAKE ROLLER GUIDE**
㉚ **DOWEL PIN**
㉛ **CONTROL SHAFT**
㉜ **LOCK WASHER** Replace.
㉝ **CONTROL SHAFT COLLAR**
㉞ **PARKING BRAKE SHIFT ARM SPRING**
㉟ **PARKING BRAKE ROLLER ROD**
㊱ **PARKING BRAKE SHIFT ARM**
㊲ **PARKING BRAKE STOPPER**
㊳ **LOCK WASHER** Replace.
㊴ **SHIFT ARM ROLLER**
㊵ **DETENT LEVER**
㊶ **LOCK WASHER** Replace.
㊹ **SHIFT CONTROL SOLENOID VALVE HARNESS/CONNECTOR**
㊺ **O-RING** Replace.
㊻ **COUNTERSHAFT SPEED SENSOR**
㊼ **MAINSHAFT SPEED SENSOR**
㊽ **MAINSHAFT SPEED SENSOR WASHER**
㊾ **O-RINGS** Replace.
㊿ **A/T GEAR POSITION SWITCH**
(51) **CHECK BALLS**
(52) **OIL PIPES**
(53) **FILTERS**

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
B	30 N·m (3.0 kg-m, 22 lb-ft)	8 x 1.25 mm	
D	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	
E	50 N·m (5.0 kg-m, 36 lb-ft)	18 x 1.5 mm	Drain Plug

PARTS IDENTIFICATION

REAR COVER



PARTS IDENTIFICATION

REAR COVER

① **REAR COVER**
② **1ST CLUTCH FEED PIPE**
③ **O-RINGS** Replace.
④ **FEED PIPE GUIDE**
⑤ **BALL BEARING**
⑥ **SNAP RING**
⑦ **REAR COVER GASKET** Replace.
⑧ **DOWEL PIN**
⑨ **1ST-HOLD CLUTCH FEED PIPE**
⑩ **O-RINGS** Replace.
⑪ **FEED PIPE GUIDE**
⑫ **SNAP RING**
⑬ **ATF FEED PIPES**
⑭ **MAINSHAFT LOCKNUT, 24 x 1.25 mm (Flange nut)** Replace.
⑮ **CONICAL SPRING WASHER** Replace.
⑯ **1ST CLUTCH ASSEMBLY**
⑰ **O-RINGS** Replace.
⑱ **THRUST WASHER**
⑲ **THRUST NEEDLE BEARING**
⑳ **NEEDLE BEARING**
㉑ **MAINSHAFT 1ST GEAR**
㉒ **THRUST WASHER**
㉓ **MAINSHAFT 1ST GEAR COLLAR**
㉔ **COUNTERSHAFT LOCKNUT, 24 x 1.25 mm (Flange nut)** Replace.
㉕ **CONICAL SPRING WASHER** Replace.
㉖ **1ST-HOLD CLUTCH ASSEMBLY**
㉗ **O-RINGS** Replace.
㉘ **THRUST WASHER**
㉙ **THRUST NEEDLE BEARING**
㉚ **1ST-HOLD CLUTCH HUB**
㉛ **COUNTERSHAFT 1ST GEAR**
㉜ **ONE-WAY CLUTCH**
㉝ **NEEDLE BEARINGS**
㉞ **COUNTERSHAFT 1ST GEAR COLLAR**
㉟ **PARKING GEAR**
㊱ **PARKING BRAKE PAWL SHAFT**
㊲ **PARKING BRAKE PAWL SPRING**
㊳ **PARKING BRAKE PAWL**
㊴ **PARKING BRAKE PAWL STOPPER**
㊵ **A/T GEAR POSITION SWITCH HARNESS**
㊶ **ATF DIPSTICK**

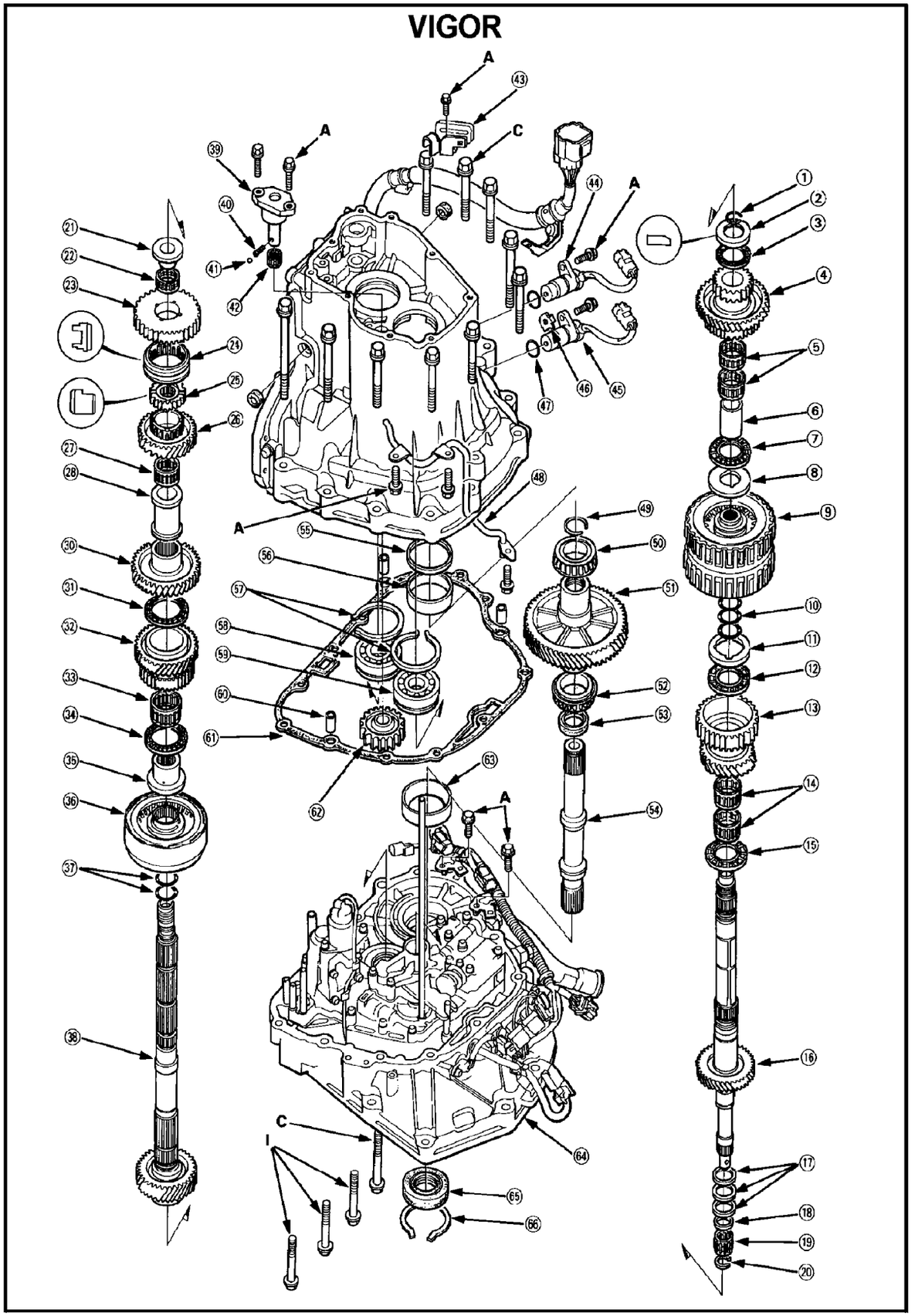
TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
24A	137 N·m (14.0 kgf·m, 101 lbf·ft)	24 x 1.25 mm	Mainshaft locknut: Left-hand threads
24B	137 N·m (14.0 kgf·m, 101 lbf·ft)	24 x 1.25 mm	Countershaft locknut

PARTS IDENTIFICATION

TRANSMISSION HOUSING

VIGOR



PARTS IDENTIFICATION

TRANSMISSION HOUSING

VIGOR

① SNAP RING, 28 mm
② THRUST WASHER
③ THRUST NEEDLE BEARING
④ MAINSHAFT 4TH/REVERSE GEAR
⑤ NEEDLE BEARINGS
⑥ MAINSHAFT 4TH GEAR COLLAR
⑦ THRUST NEEDLE BEARING
⑧ THRUST WASHER
⑨ 4TH/2ND CLUTCH ASSEMBLY
⑩ O-RINGS Replace.
⑪ 2ND GEAR THRUST WASHER, 37.5 x 56 mm Selective part
⑫ THRUST NEEDLE BEARING
⑬ MAINSHAFT 2ND GEAR
⑭ NEEDLE BEARINGS
⑮ THRUST NEEDLE BEARING
⑯ MAINSHAFT/3RD GEAR
⑰ SEALING RINGS, 35 mm
⑱ SEALING RING, 29 mm
⑲ NEEDLE BEARING
⑳ SET RING
㉑ COUNTERSHAFT REVERSE GEAR COLLAR
㉒ NEEDLE BEARING
㉓ COUNTERSHAFT REVERSE GEAR
㉔ REVERSE SELECTOR
㉕ REVERSE SELECTOR HUB
㉖ COUNTERSHAFT 4TH GEAR
㉗ NEEDLE BEARING
㉘ DISTANCE COLLAR Selective part
㉚ COUNTERSHAFT 2ND GEAR
㉛ THRUST NEEDLE BEARING
㉜ COUNTERSHAFT 3RD GEAR
㉝ NEEDLE BEARING
㉞ THRUST NEEDLE BEARING
㉟ COUNTERSHAFT 3RD GEAR COLLAR
㊱ 3RD CLUTCH ASSEMBLY
㊲ O-RINGS Replace.
㊳ COUNTERSHAFT
㊴ REVERSE IDLER GEAR SHAFT HOLDER
㊵ REVERSE IDLER GEAR SHAFT SPRING
㊶ STEEL BALL
㊷ NEEDLE BEARING
㊸ CONNECTOR HOLDER
㊹ COUNTERSHAFT SPEED SENSOR
㊺ MAINSHAFT SPEED SENSOR
㊻ MAINSHAFT SPEED SENSOR WASHER
㊼ O-RING Replace.
㊽ LUBRICATION PIPE
㊾ SET RING Replace.
㊿ TAPERED ROLLER BEARING
(51) SECONDARY DRIVEN GEAR/SECONDARY DRIVEN GEAR SHAFT
(52) TAPERED ROLLER BEARING
(53) SECONDARY GEAR SHAFT OIL SEAL Replace.
(54) EXTENSION SHAFT
(55) THRUST SHIM, 68 mm Selective part
(56) BEARING OUTER RACE
(57) SNAP RINGS
(58) TRANSMISSION HOUSING COUNTERSHAFT BEARING
(59) TRANSMISSION HOUSING MAINSHAFT BEARING
(60) DOWEL PIN
(61) TRANSMISSION HOUSING GASKET Replace.
(62) REVERSE IDLER GEAR
(63) BEARING OUTER RACE
(64) TORQUE CONVERTER HOUSING
(65) TORQUE CONVERTER HOUSING OIL SEAL Replace.
(66) SNAP RING, 74 mm

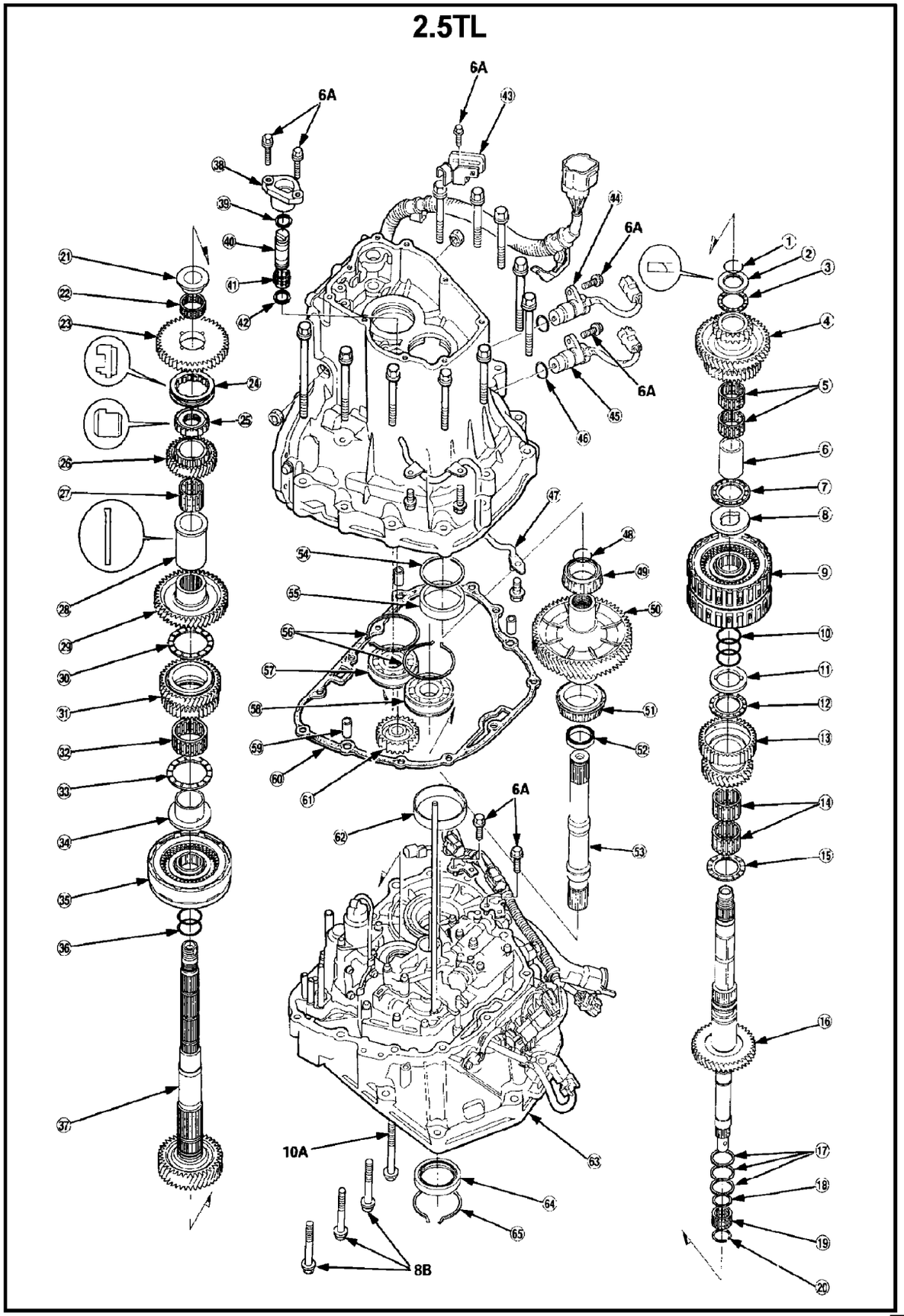
TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N•m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
C	45 N•m (4.5 kg-m, 33 lb-ft)	10 x 1.25 mm	
I	34 N•m (3.4 kg-m, 25 lb-ft)	8 x 1.25 mm	

PARTS IDENTIFICATION

TRANSMISSION HOUSING

2.5TL



PARTS IDENTIFICATION

TRANSMISSION HOUSING

2.5TL

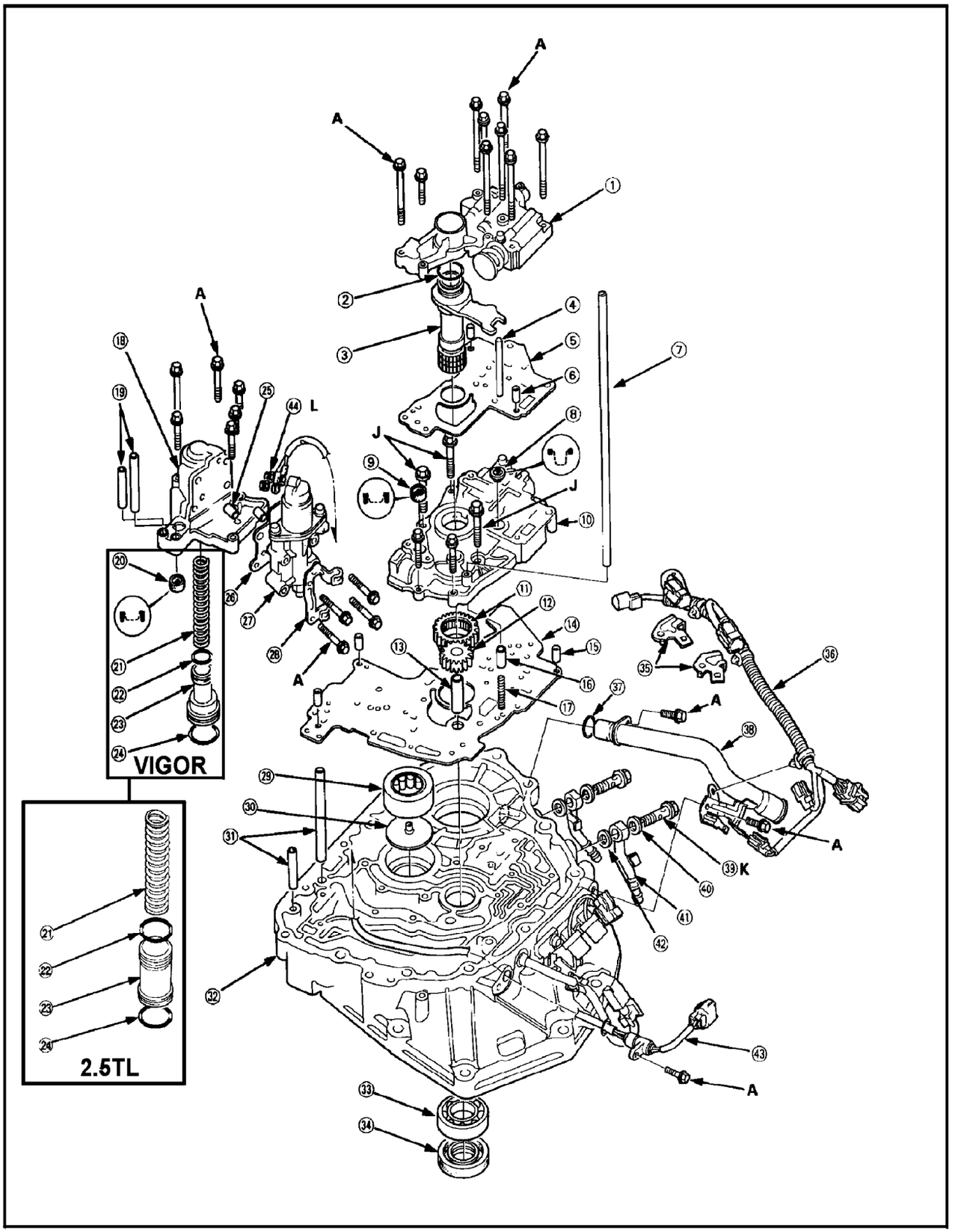
① **SNAP RING**
② **THRUST WASHER**
③ **THRUST NEEDLE BEARING**
④ **MAINSHAFT 4TH/REVERSE GEAR**
⑤ **NEEDLE BEARINGS**
⑥ **MAINSHAFT 4TH GEAR COLLAR**
⑦ **THRUST NEEDLE BEARING**
⑧ **THRUST WASHER**
⑨ **4TH/2ND CLUTCH ASSEMBLY**
⑩ **O-RINGS** Replace.
⑪ **2ND GEAR THRUST WASHER, 37.5 x 56 mm** Selective part
⑫ **THRUST NEEDLE BEARING**
⑬ **MAINSHAFT 2ND GEAR**
⑭ **NEEDLE BEARINGS**
⑮ **THRUST NEEDLE BEARING**
⑯ **MAINSHAFT**
⑰ **SEALING RINGS, 35 mm**
⑱ **SEALING RING, 29 mm**
⑲ **NEEDLE BEARING**
⑳ **SET RING**
㉑ **COUNTERSHAFT REVERSE GEAR COLLAR**
㉒ **NEEDLE BEARING**
㉓ **COUNTERSHAFT REVERSE GEAR**
㉔ **REVERSE SELECTOR**
㉕ **REVERSE SELECTOR HUB**
㉖ **COUNTERSHAFT 4TH GEAR**
㉗ **NEEDLE BEARING**
㉘ **DISTANCE COLLAR, 35 mm** Selective part
㉙ **COUNTERSHAFT 2ND GEAR**
㉚ **NEEDLE BEARING**
㉛ **COUNTERSHAFT 3RD GEAR**
㉜ **NEEDLE BEARING**
㉝ **THRUST NEEDLE BEARING**
㉞ **COUNTERSHAFT 3RD GEAR COLLAR**
㉟ **3RD CLUTCH ASSEMBLY**
㊱ **O-RINGS** Replace.
㊲ **COUNTERSHAFT**
㊳ **REVERSE IDLER GEAR SHAFT HOLDER**
㊴ **O-RING** Replace.
㊵ **REVERSE IDLER GEAR SHAFT**
㊶ **NEEDLE BEARING**
㊷ **O-RING** Replace.
㊸ **CONNECTOR HOLDER**
㊹ **MAINSHAFT SPEED SENSOR**
㊺ **COUNTERSHAFT SPEED SENSOR**
㊻ **O-RING** Replace.
㊼ **LUBRICATION PIPE**
㊽ **SET RING** Replace.
㊾ **TAPERED ROLLER BEARING**
㊿ **SECONDARY DRIVEN GEAR SHAFT**
(51) **TAPERED ROLLER BEARING**
(52) **SECONDARY DRIVEN GEAR SHAFT OIL SEAL** Replace.
(53) **EXTENSION SHAFT**
(54) **THRUST SHIM, 68 mm** Selective part
(55) **TAPERED ROLLER BEARING OUTER RACE**
(56) **SNAP RINGS**
(57) **TRANSMISSION HOUSING COUNTERSHAFT BEARING**
(58) **TRANSMISSION HOUSING MAINSHAFT BEARING**
(59) **DOWEL PIN**
(60) **TRANSMISSION HOUSING GASKET** Replace.
(61) **REVERSE IDLER GEAR**
(62) **TAPERED ROLLER BEARING OUTER RACE**
(63) **TORQUE CONVERTER HOUSING**
(64) **TORQUE CONVERTER HOUSING OIL SEAL** Replace.
(65) **SNAP RING**

TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
8B	31 N·m (3.4 kgf·m, 25 lbf·ft)	8 x 1.25 mm	
10A	44 N·m (4.5 kgf·m, 33 lbf·ft)	10 x 1.25 mm	

PARTS IDENTIFICATION

TORQUE CONVERTER HOUSING/VALVE BODY



PARTS IDENTIFICATION

TORQUE CONVERTER HOUSING/VALVE BODY

① **REGULATOR VALVE BODY**
② **O-RING** Replace.
③ **STATOR SHAFT**
④ **STOPPER SHAFT**
⑤ **REGULATOR SEPARATOR PLATE**
⑥ **DOWEL PIN**
⑦ **OIL FEED PIPE**
⑧ **FILTER** Replace.
⑨ **FILTER** Replace.
⑩ **OIL PUMP BODY**
⑪ **OIL PUMP DRIVE GEAR**
⑫ **OIL PUMP DRIVEN GEAR**
⑬ **OIL PUMP DRIVEN GEAR SHAFT**
⑭ **OIL PUMP BODY SEPARATOR PLATE**
⑮ **DOWEL PIN**
⑯ **TORQUE CONVERTER CHECK VALVE**
⑰ **TORQUE CONVERTER CHECK VALVE SPRING**
⑱ **2ND ACCUMULATOR BODY**
⑲ **OIL PIPES**
⑳ **FILTER** Replace.
㉑ **2ND ACCUMULATOR SPRING**
㉒ **O-RING** Replace.
㉓ **2ND ACCUMULATOR PISTON**
㉔ **O-RING** Replace.
㉕ **DOWEL PIN**
㉖ **THROTTLE VALVE BODY SEPARATOR PLATE**
㉗ **THROTTLE VALVE BODY**
㉘ **HARNESS CLAMP**
㉙ **TORQUE CONVERTER HOUSING COUNTERSHAFT NEEDLE BEARING**
㉚ **OIL GUIDE PLATE**
㉛ **OIL PIPES**
㉜ **TORQUE CONVERTER HOUSING**
㉝ **TORQUE CONVERTER HOUSING MAINSHAFT BALL BEARING**
㉞ **OIL SEAL** Replace.
㉟ **CONNECTOR HOLDERS**
㊱ **TRANSMISSION SUB-HARNESS**
㊲ **O-RING** Replace.
㊳ **ATF LEVEL GAUGE PIPE**
㊴ **JOINT BOLT**
㊵ **SEALING WASHER** Replace.
㊶ **ATF COOLER PIPE**
㊷ **SEALING WASHER** Replace.
㊸ **LINEAR SOLENOID HARNESS**
㊹ **FLANGE NUT, 5 mm**

TORQUE SPECIFICATIONS

No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
J	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	
K	29 N·m (2.9 kg-m, 21 lb-ft)	12 x 1.25 mm	Joint Bolt
L	8 N·m (0.8 kg-m, 6 lb-ft)	5 x 0.8 mm	Flange Nut

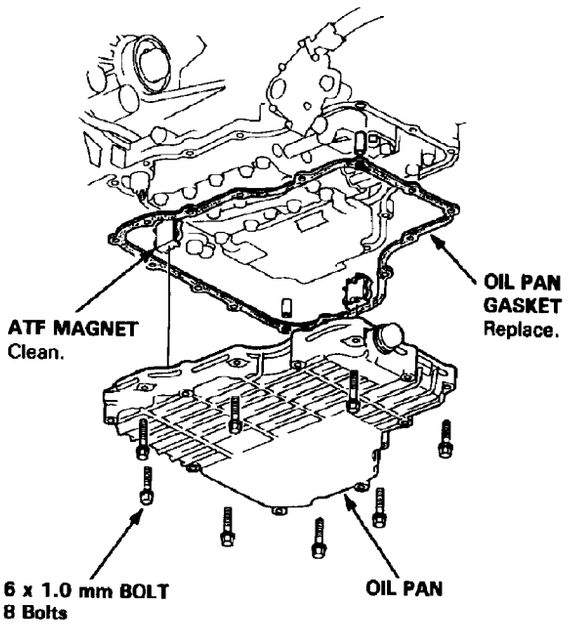
DISASSEMBLY

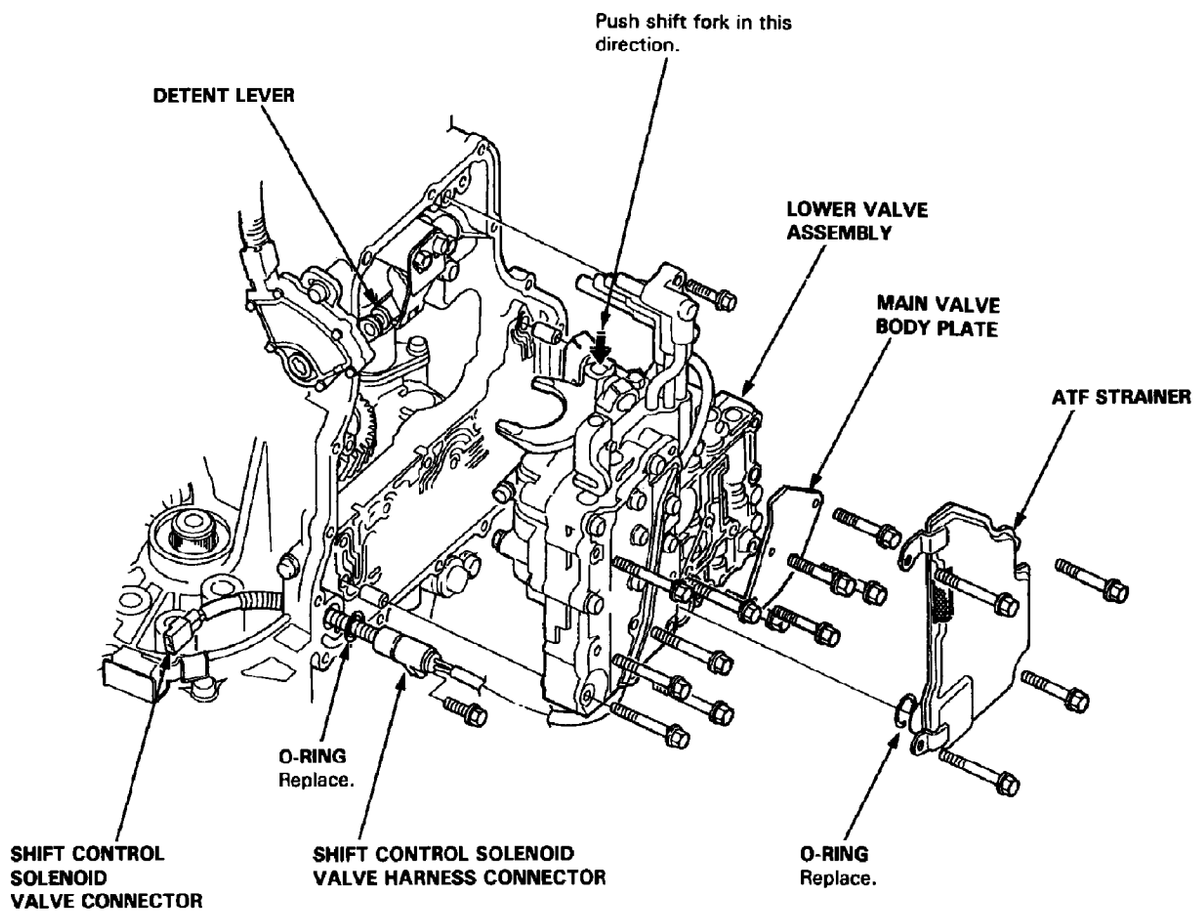
CONVERTER HOUSING/LOWER VALVE BODY

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the lower valve body assembly, replace the following:
  - O-rings
  - Oil pan gasket
  - Sealing washer

CAUTION: Do not turn over the transmission before removing the oil pan.

1. Remove the eight bolts securing the oil pan then remove the oil pan and oil pan gasket.
2. Disconnect the shift control solenoid valve connector from the tansmission sub-harness connector.
3. Shift the control shaft to [P] position by turning the detent lever.

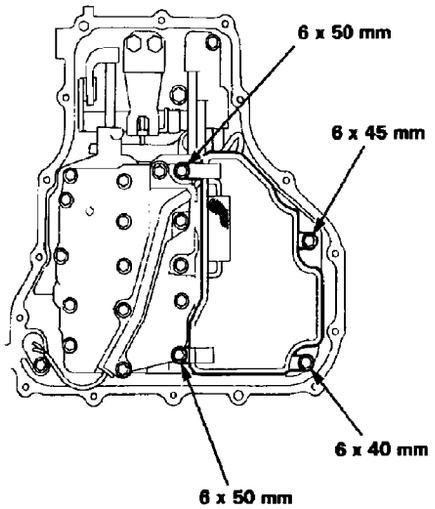




DISASSEMBLY

CONVERTER HOUSING/LOWER VALVE BODY

4. Remove the four bolts securing the ATF strainer then remove the ATF strainer.



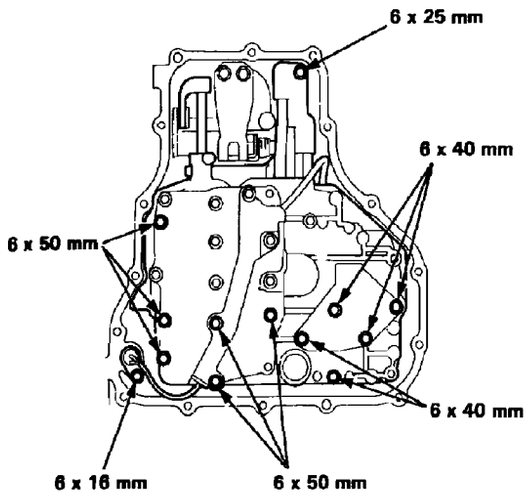
5. Remove the four bolts securing the main valve body plate then remove the main valve body plate.

6. Remove the four bolts securing the harness cover then remove the harness cover.

7. Remove the bolt securing the shift control solenoid valve harness connector then remove the connector.

8. Push the shift fork shaft to the torque converter side.

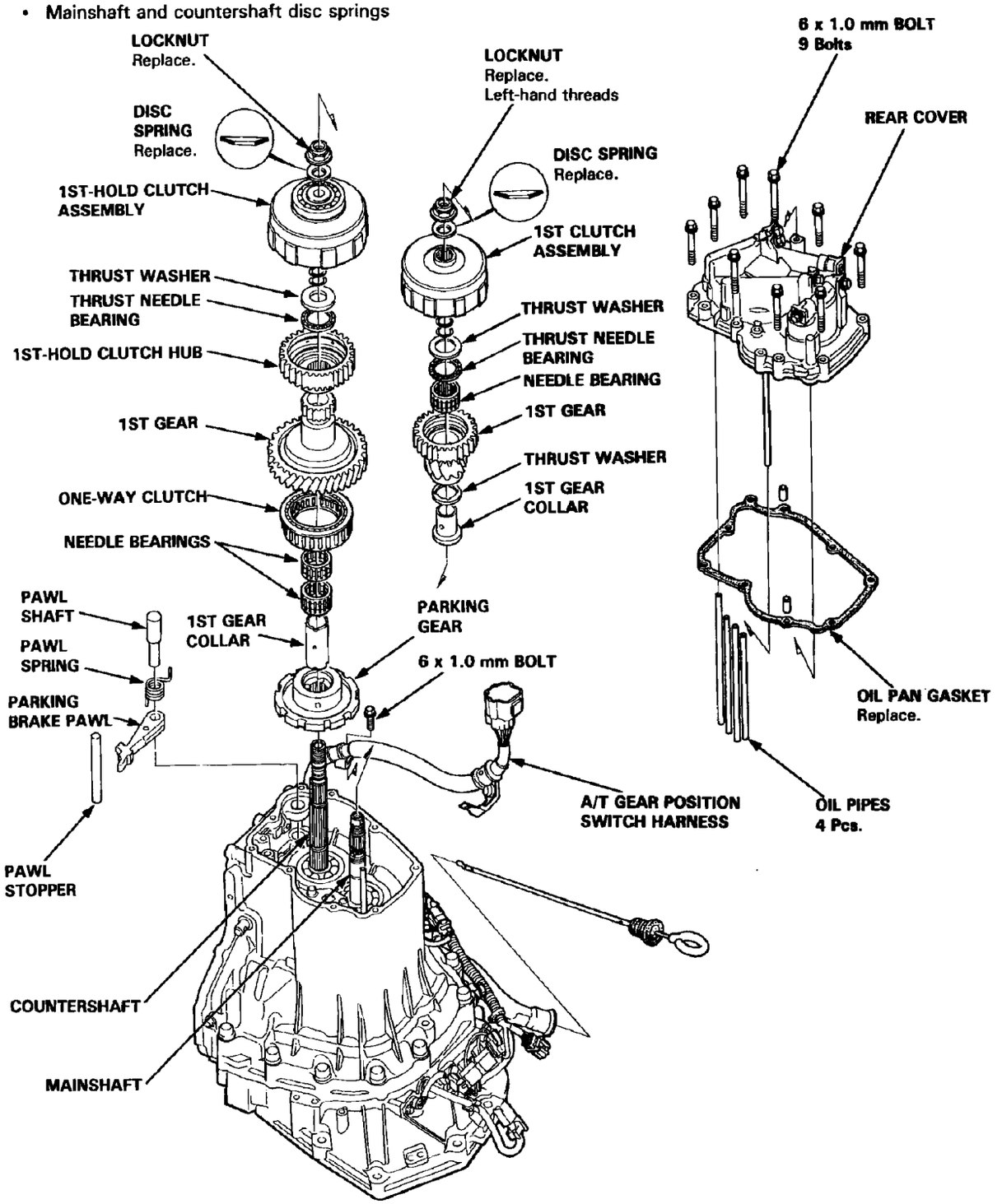
9. Remove the six bolts securing the lower valve body assembly then remove the lower valve body assembly.



DISASSEMBLY

REAR COVER

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the rear cover, replace the following:
  - O-rings
  - Rear cover gasket
  - Mainshaft and countershaft locknuts
  - Mainshaft and countershaft disc springs

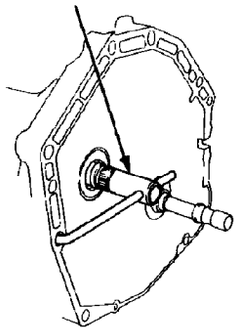


DISASSEMBLY

REAR COVER

1. Remove the bolt securing the A/T gear position switch harness clamp.
2. Remove the nine bolts securing the rear cover then remove the rear cover.
3. Remove the four oil pipes from the transmission housing.
4. Slip the special tool on the mainshaft.

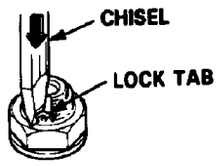
MAINSHAFT HOLDER
07GAB–PF50100



5. Engage the parking brake pawl with the parking gear.
6. Cut the lock tabs of each shaft locknut using a chisel as shown. Then remove the locknuts and disc springs from each shaft.

   CAUTION: Always wear the safety glasses.

   NOTE:
   - Mainshaft locknut has left-hand threads.
   - Keep all of the chiseled particles out of the transmission.

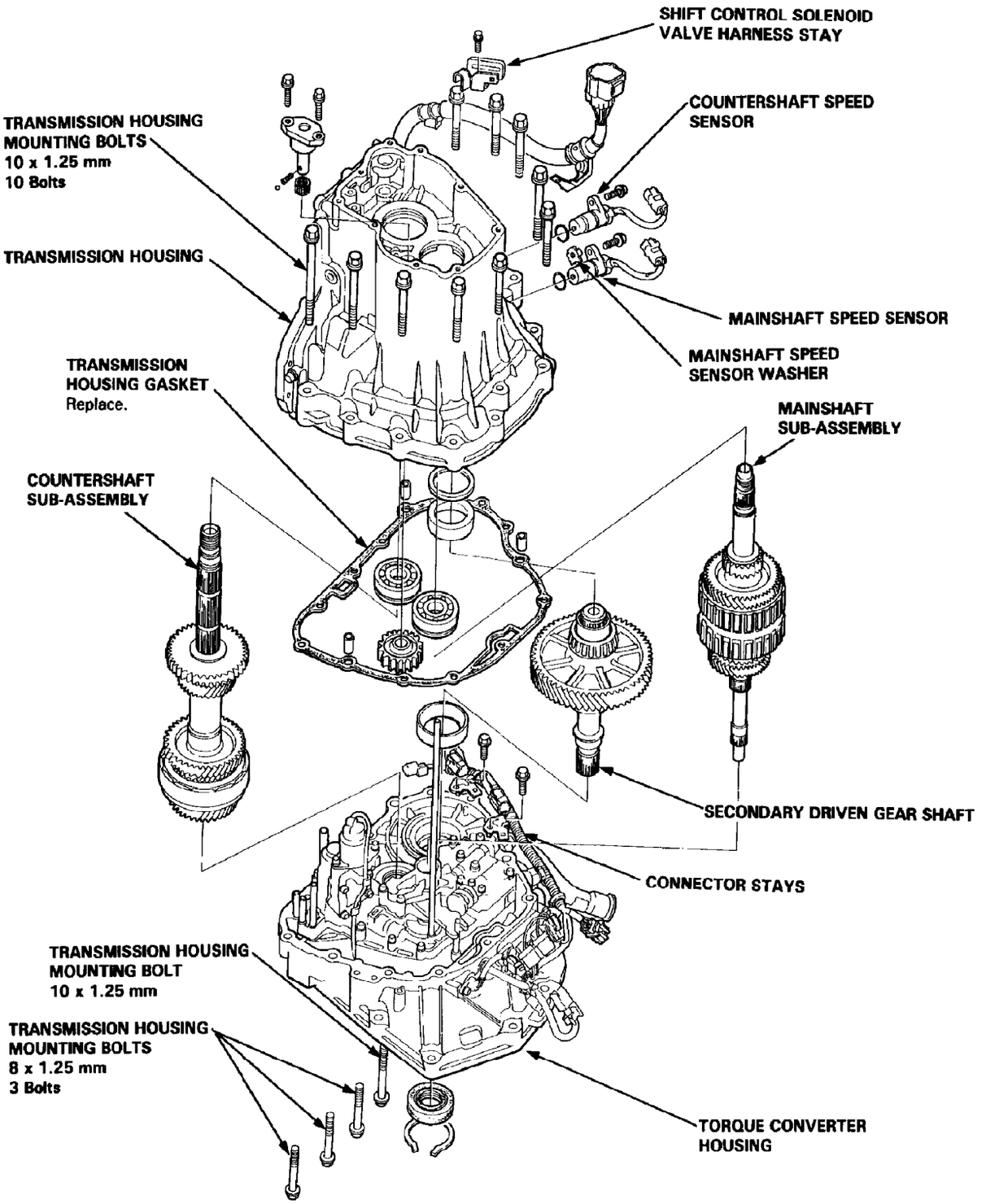


7. Remove the special tool from the mainshaft after removing the locknuts.
8. Remove the 1st-hold clutch assembly, thrust washer, thrust needle bearing and 1st-hold clutch hub from the countershaft.
9. Remove the 1st clutch assembly, thrust washer, thrust needle bearing and 1st gear from the mainshaft.
10. Remove the 1st gear, one-way clutch, needle bearings, 1st gear collar and parking gear from the countershaft.
11. Remove the thrust washer and 1st gear collar from the mainshaft.
12. Remove the parking brake pawl, shaft, spring, and stopper from the transmission housing.

DISASSEMBLY

TRANSMISSION HOUSING

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the transmission housing, replace the following:
  - O-rings
  - Transmission housing gasket



DISASSEMBLY

TRANSMISSION HOUSING

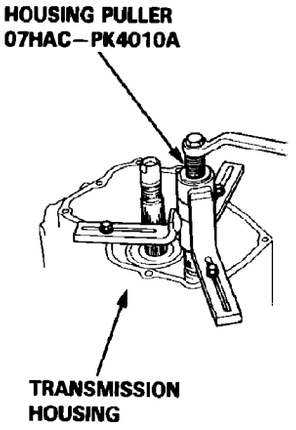
1. Remove the bolts securing the shift control solenoid vavle harness stay, mainshaft speed sensor connector stay and countershaft speed sensor connector stay.

2. Remove the countershaft speed sensor and mainshaft speed sensor with mainshaft speed sensor washer from the transmission housing.

3. Remove the ten bolts securing the transmission housing, and remove the 10 mm bolt and three 8 mm bolts securing the transmission housing from the torque converter housing side.

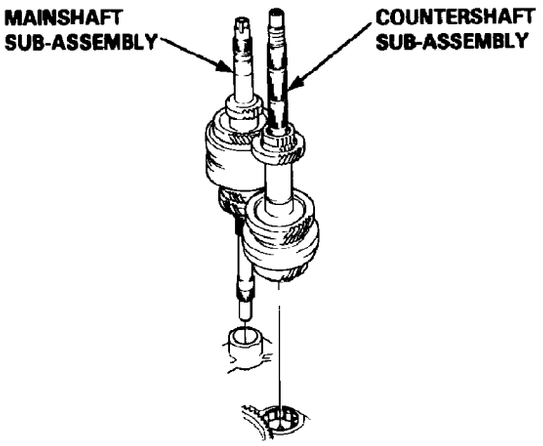
4. Install the special tool on the transmission housing, then remove the transmission housing as shown.

   CAUTION: Make sure that the mainshaft and countershaft speed sensors have been removed from the transmission housing before removing the transmission housing from the torque converter housing.



5. Remove the mainshaft sub-assembly and countershaft sub-assembly together.

   NOTE: When removing the shafts, take care to prevent damage to the regulator valve body.



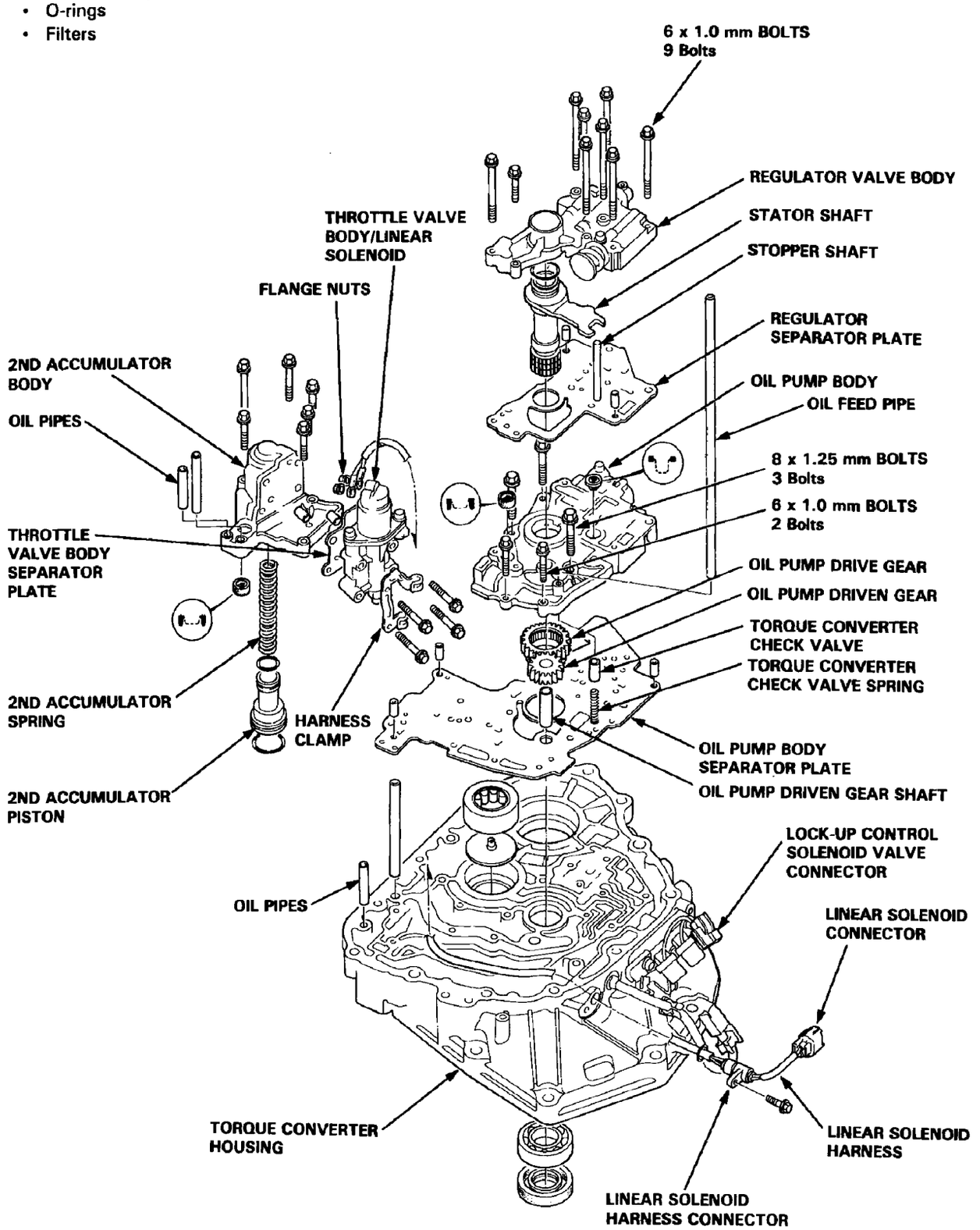
6. Remove the secondary driven gear shaft from the torque converter housing.

DISASSEMBLY

TORQUE CONVERTER HOUSING/VALVE BODY

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the valve bodies, replace the following:
  - O-rings
  - Filters



DISASSEMBLY

TORQUE CONVERTER HOUSING/VALVE BODY

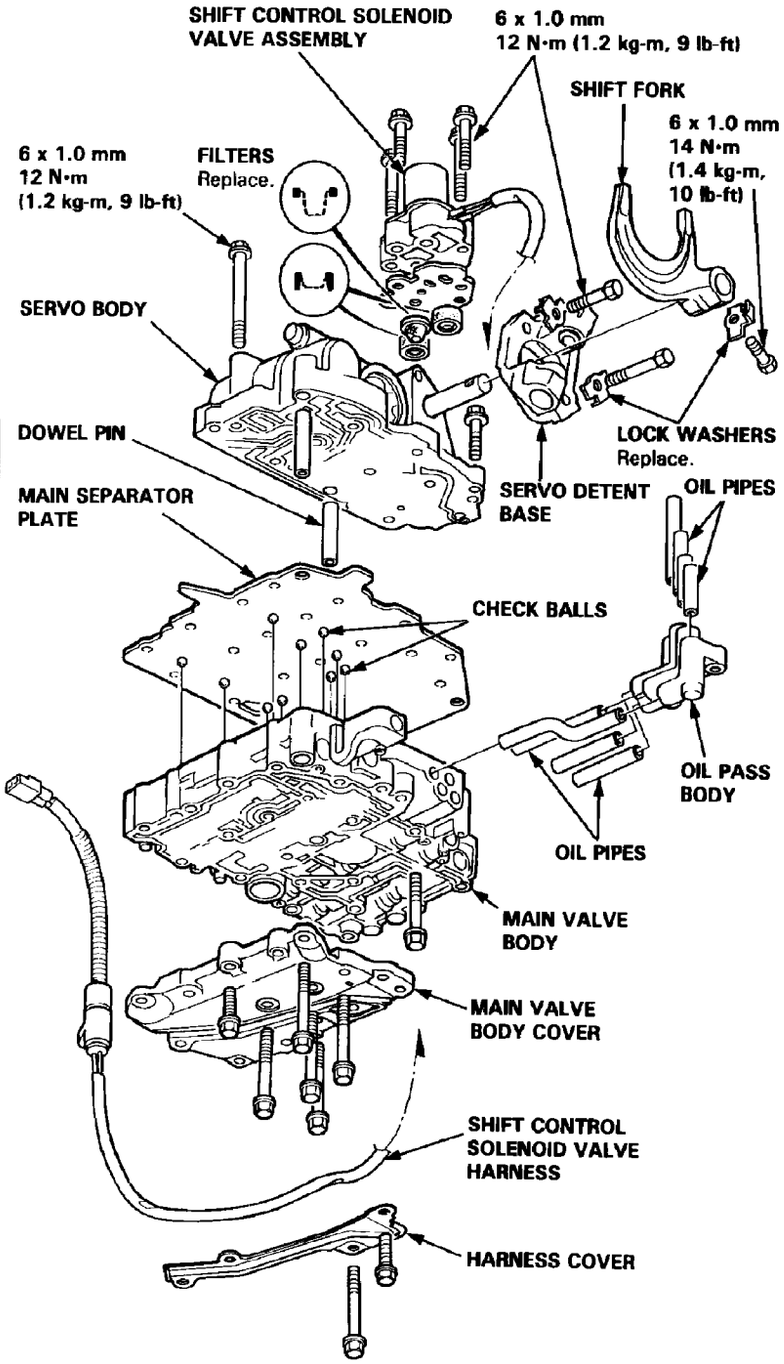
1. Remove the oil feed pipe from the oil pump body and two oil pipes from the torque converter housing.
2. Remove the two flange nuts securing the linear solenoid harness then disconnect the harness from the linear solenoid and harness clamp.
3. Remove the nine bolts securing the regulator valve body then remove the regulator valve body.
4. Remove the stopper shaft and stator shaft.
5. Remove the regulator separator plate with two dowel pins.
6. Remove the six bolts securing the 2nd accumulator body then remove the 2nd accumulator body and throttle valve body/linear solenoid as an assembly.
7. Remove the three 8 mm bolts and two 6 mm bolts securing the oil pump body then remove the oil pump body.
8. Remove the oil pump gears and oil pump driven gear shaft.
9. Remove the torque converter check valve and spring.
10. Remove the oil pump body separator plate with three dowel pins.
11. Remove the bolt securing the linear solenoid harness connector then remove the linear solenoid harness from the torque converter housing.
12. Disconnect the lock-up control solenoid valve connector then remove the transmission sub-harness.

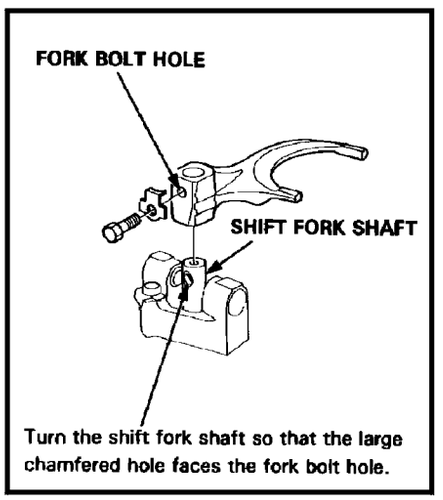
DISASSEMBLY/REASSEMBLY

LOWER VALVE BODY

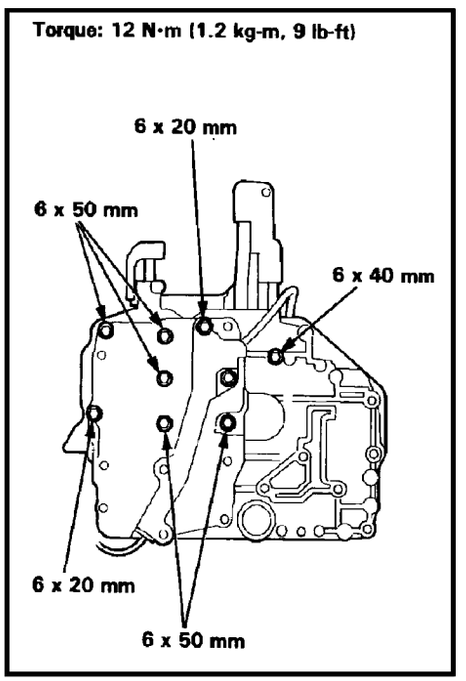
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Coat all parts with ATF before reassembly.
- Replace the filters.
- Install the filters in the direction shown.

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





6 mm BOLT LENGTH

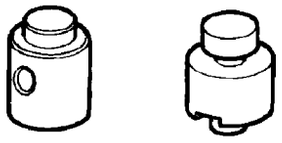


VALVE BODY

BORE PLUGS

- Caps with one projected tip and one flat end are installed with the flat end toward the inside of the valve body.
- Caps with a projected tip on each end are installed with the smaller tip toward the inside of the valve body. The small tip is a spring guide.

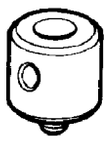
Toward outside of valve body.



Toward inside of valve body.

- Caps with one projected tip and hollow end are installed with the tip toward the inside of the valve body. The tip is a spring guide.

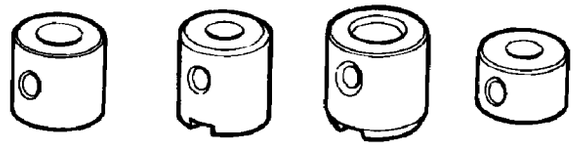
Toward outside of valve body.



Toward inside of valve body.

- Caps with hollow ends are installed with the hollow end away from the inside of the valve body.
- Caps with notched ends are installed with the notch toward the inside of the valve body.
- Caps with flat ends and a hole through the center are installed with the smaller hole toward the inside of the valve body.

Toward outside of valve body.



Toward inside of valve body.

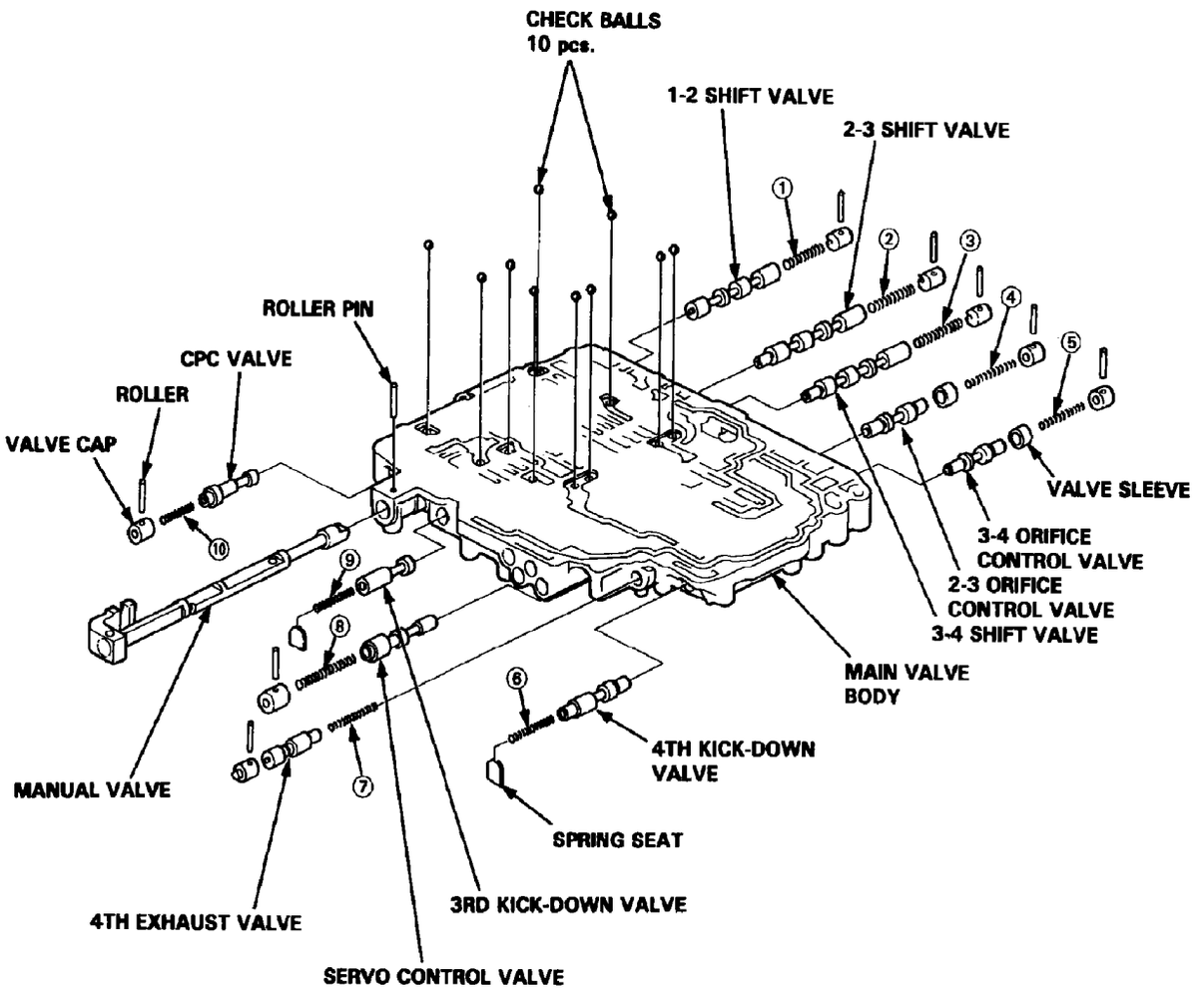
VALVE BODY

MAIN VALVE BODY

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.
- Coat all parts with ATF before reassembly.

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

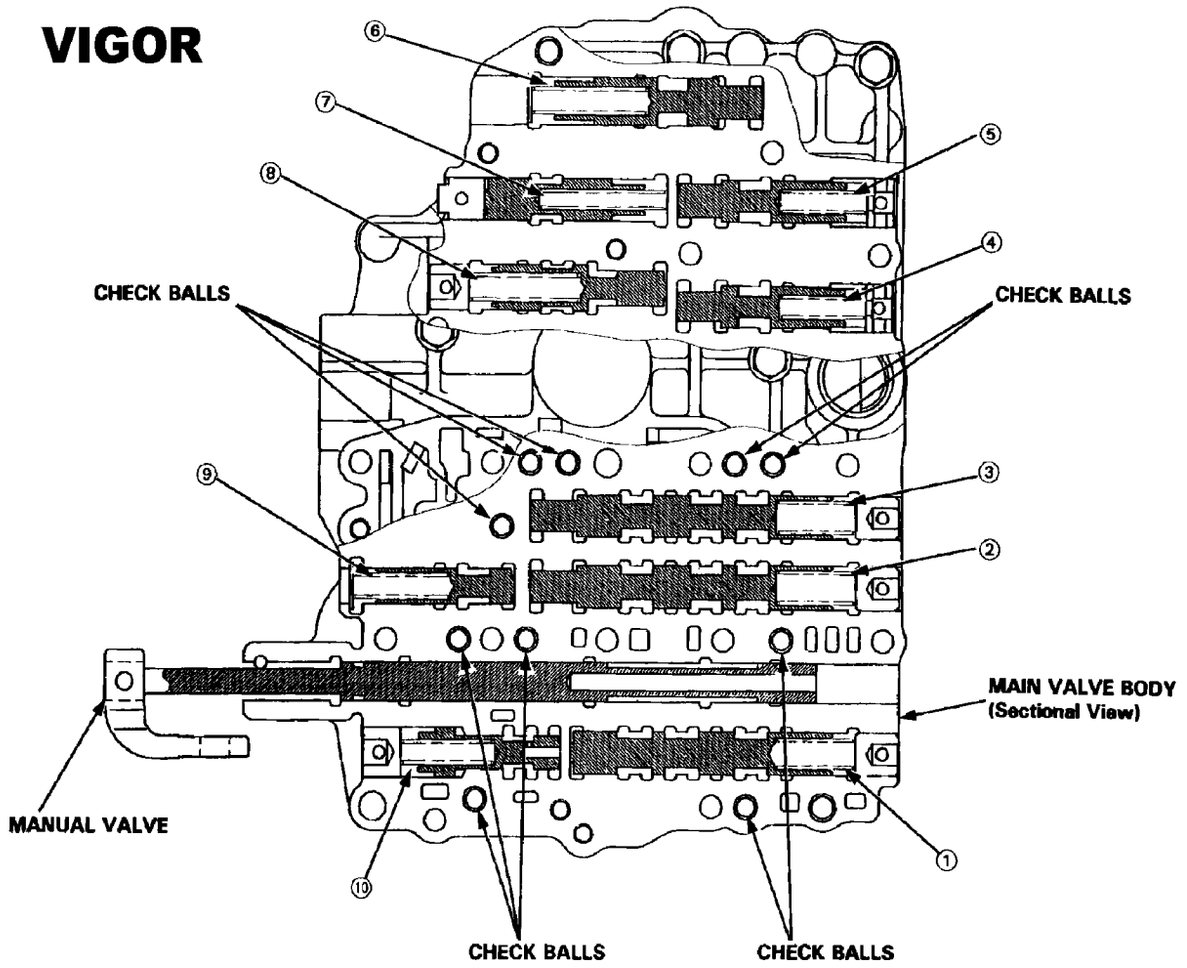
VIGOR



VALVE BODY

MAIN VALVE BODY

VIGOR



SPRING SPECIFICATIONS

Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
②	2-3 shift valve spring	0.9 (0.035)	9.6 (0.378)	43.0 (1.693)	12.1
③	3-4 shift valve spring	0.9 (0.035)	9.6 (0.378)	43.0 (1.693)	12.1
④	2-3 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	39.1 (1.539)	22.0
⑤	3-4 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	34.8 (1.370)	22.0
⑥	4th kick-down valve spring	1.0 (0.039)	7.6 (0.299)	48.2 (1.898)	22.2
⑦	4th exhaust valve spring	0.6 (0.024)	5.6 (0.220)	49.1 (1.933)	21.0
⑧	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.1 (2.051)	20.8
⑨	3rd kick-down valve spring	1.0 (0.039)	7.4 (0.291)	38.6 (1.520)	16.0
⑩	CPC valve spring	1.0 (0.039)	6.8 (0.268)	36.1 (1.421)	17.8

VALVE BODY

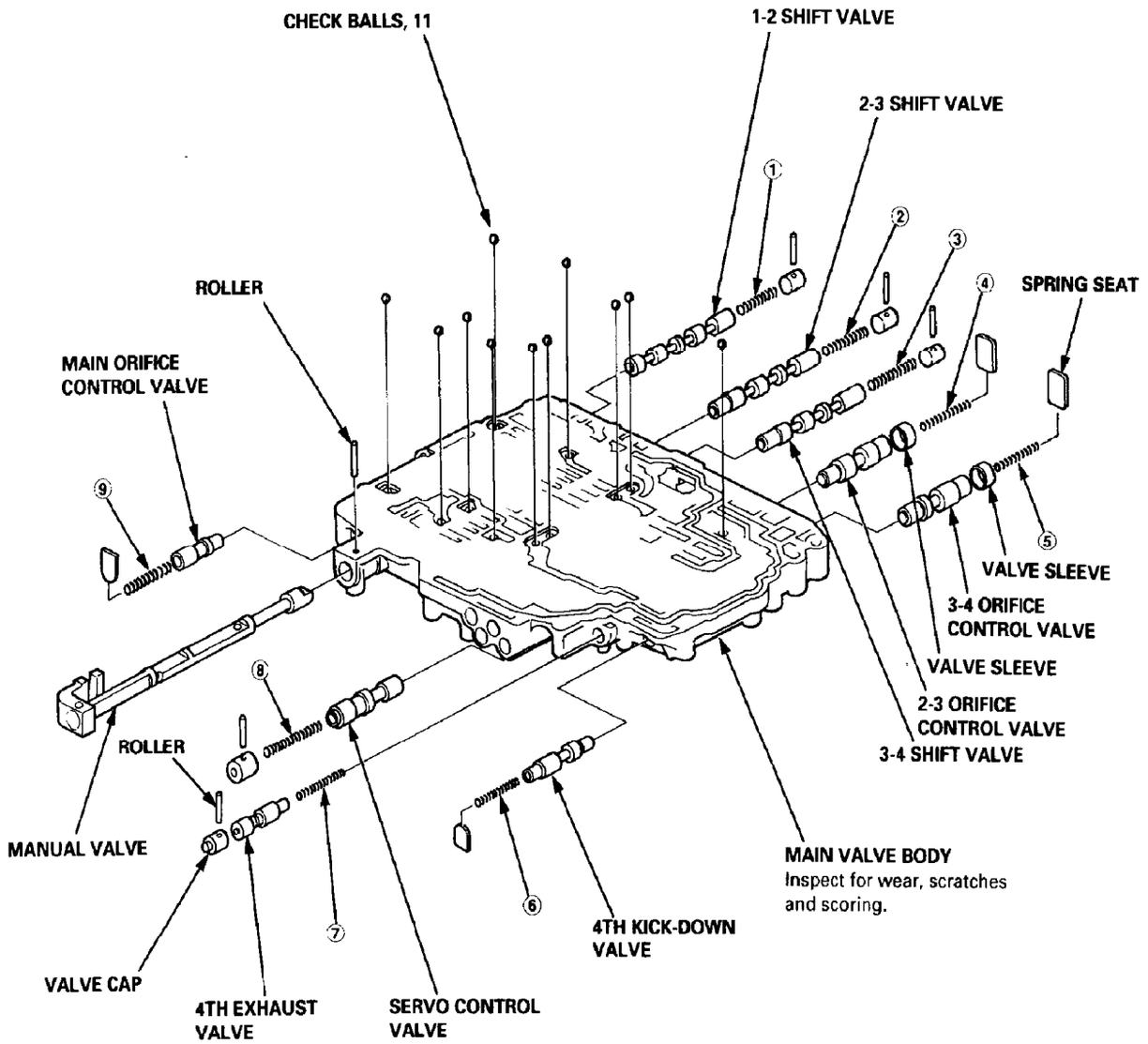
MAIN VALVE BODY

NOTE:

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

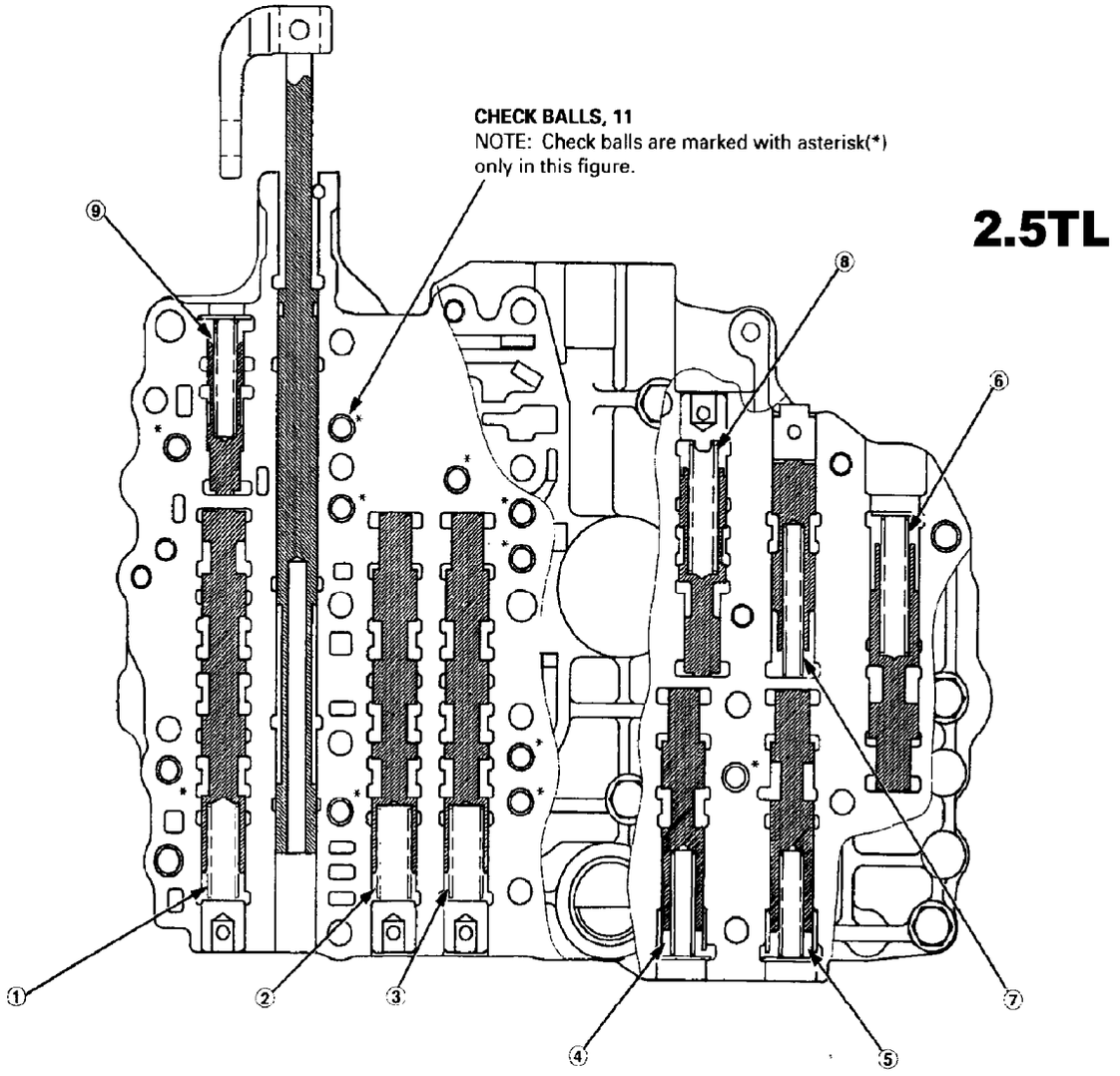
CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.

2.5TL



VALVE BODY

MAIN VALVE BODY



SPRING SPECIFICATIONS

Unit: mm (in)

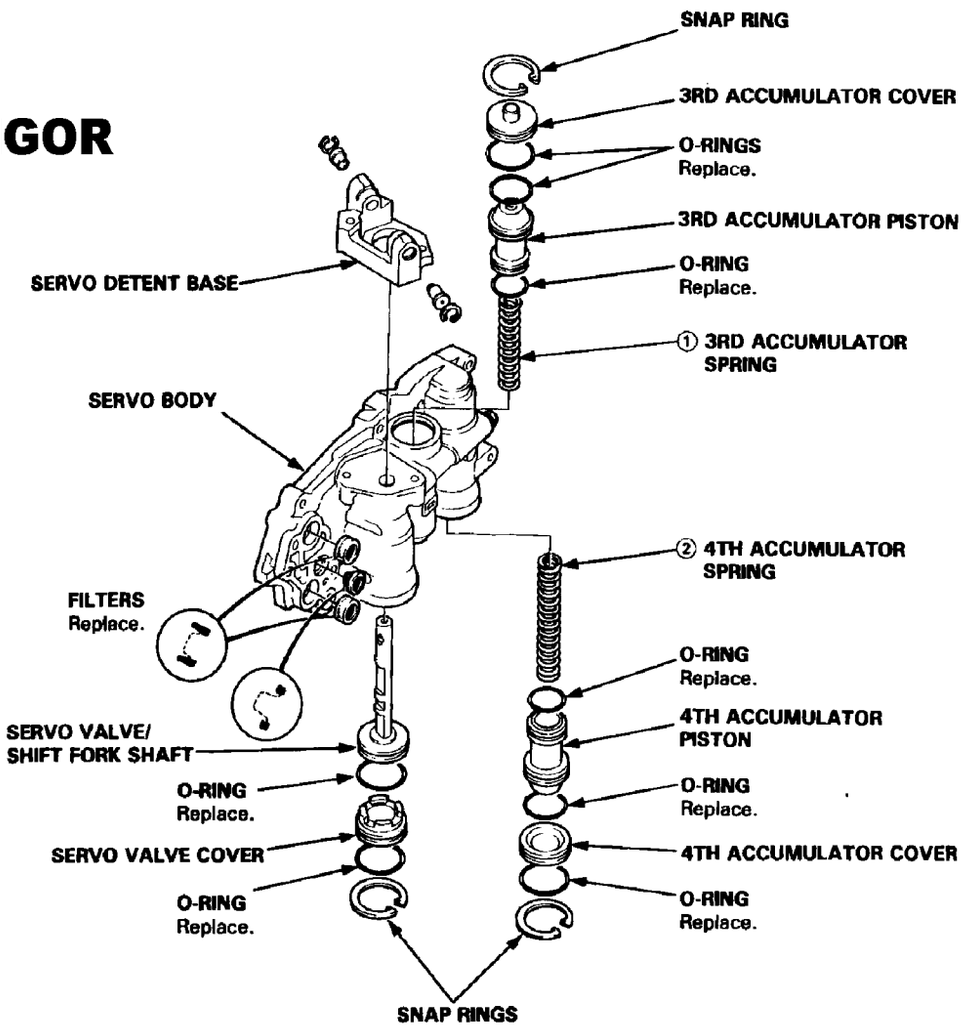
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1 – 2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
②	2 – 3 shift valve spring	0.9 (0.035)	9.6 (0.378)	43.0 (1.693)	12.1
③	3 – 4 shift valve spring	0.9 (0.035)	9.6 (0.378)	43.0 (1.639)	12.1
④	2 – 3 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	33.8 (1.331)	11.7
⑤	3 – 4 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	34.8 (1.370)	22.0
⑥	4th kick-down valve spring	1.0 (0.039)	7.6 (0.299)	48.2 (1.898)	22.2
⑦	4th exhaust valve spring	0.6 (0.024)	5.6 (0.220)	49.1 (1.933)	21.0
⑧	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.1 (2.051)	20.8
⑨	Main orifice control valve spring	0.7 (0.028)	6.1 (0.240)	35.1 (1.381)	22.4

VALVE BODY

SERVO BODY

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.
- Coat all parts with ATF before reassembly.
- Replace the O-rings and filters.
- Install the filters in the direction shown.

VIGOR



SPRING SPECIFICATIONS

Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3rd accumulator spring	3.2 (0.126)	20.5 (0.807)	89.0 (3.504)	12.6
②	4th accumulator spring	3.3 (0.130)	20.5 (0.807)	74.1 (2.917)	11.2

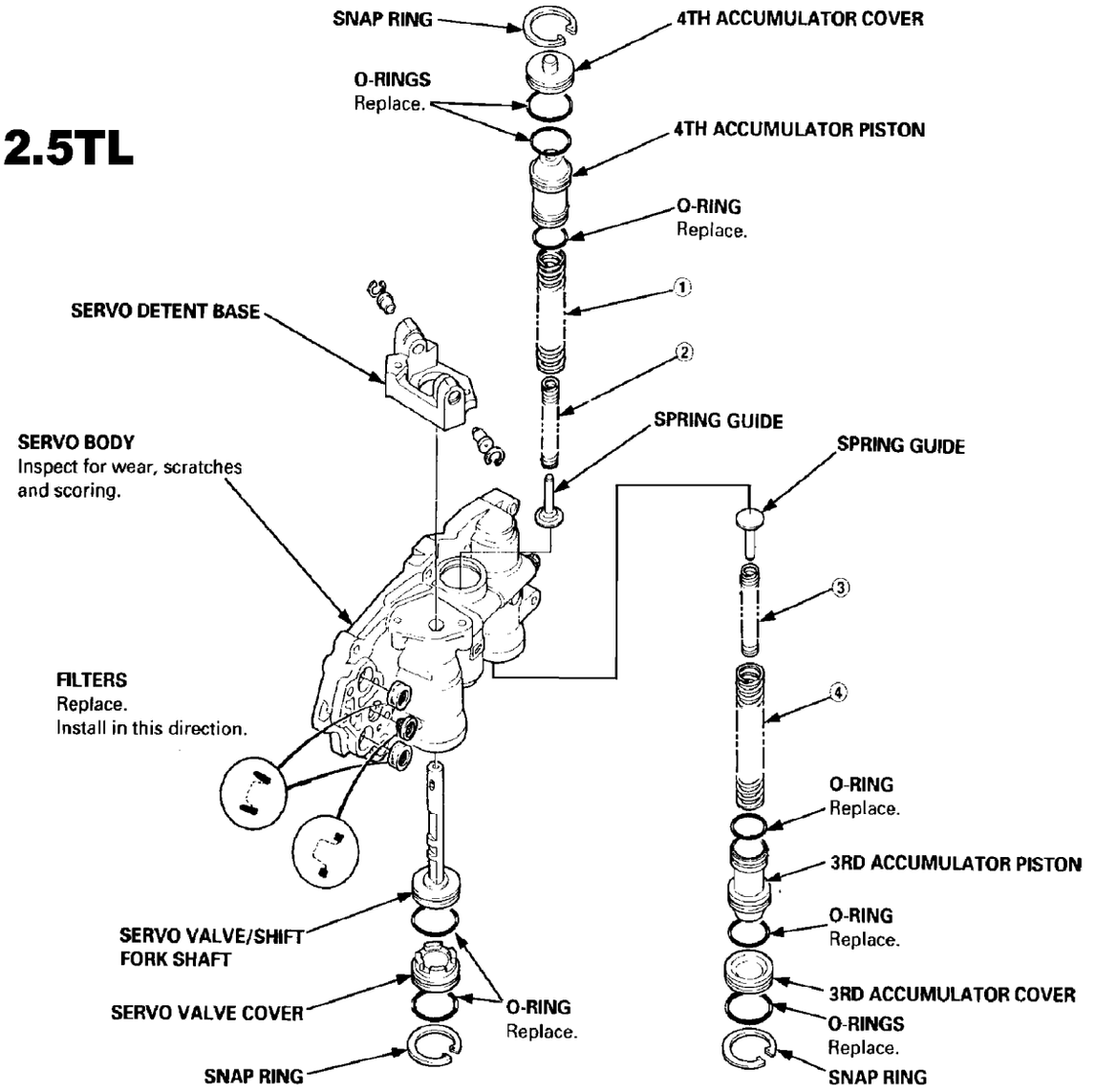
VALVE BODY

SERVO BODY

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the servo body as an assembly if any parts are worn or damaged.
- Replace the O-rings and filters.
- Install the filters in the direction shown.
- Coat all parts with ATF during assembly.

2.5TL



SPRING SPECIFICATIONS

Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	4th accumulator spring A	2.7 (0.106)	17.2 (0.677)	73.1 (2.878)	11.9
②	4th accumulator spring B	1.9 (0.075)	9.0 (0.354)	49.0 (1.929)	15.1
③	3rd accumulator spring B	1.9 (0.075)	9.0 (0.354)	62.0 (2.441)	21.6
④	3rd accumulator spring A	2.7 (0.106)	17.2 (0.677)	90.7 (3.571)	15.7

VALVE BODY

REGULATOR BODY

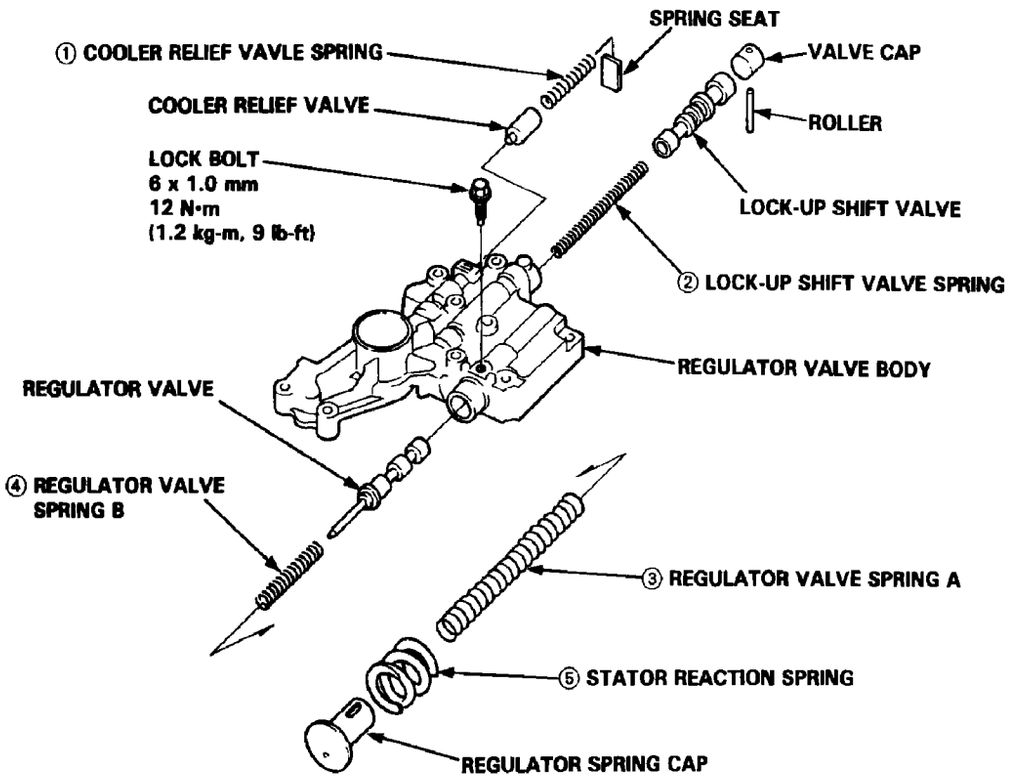
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement.

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

   CAUTION: The regulator spring cap can pop out when the lock bolt is removed.

2. Reassembly is in the reverse order of disassembly.

   NOTE:
   - Coat all parts with ATF.
   - Align the hole in the regulator spring cap with the hole in the valve body, press the regulator spring cap into the body and tighten the lock bolt.



SPRING SPECIFICATIONS

Unit: mm (in)

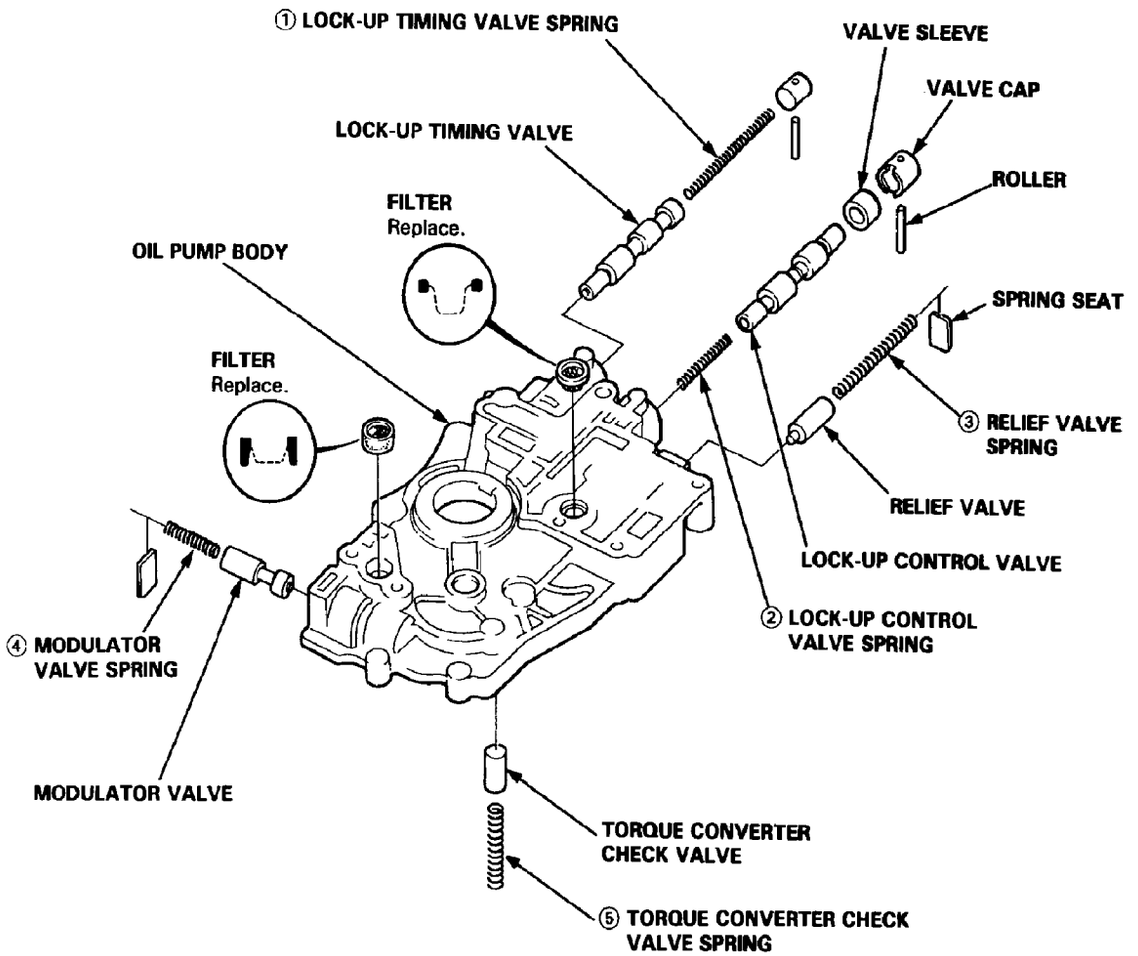
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0
②	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
③	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	88.6 (3.488)	16.5
④	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	7.5
⑤	Stator reaction spring	6.0 (0.236)	38.4 (1.512)	30.3 (1.193)	2.0

VALVE BODY

OIL PUMP BODY

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.
- Coat all parts with ATF before reassembly.
- Install the filters in the direction shown.



SPRING SPECIFICATIONS

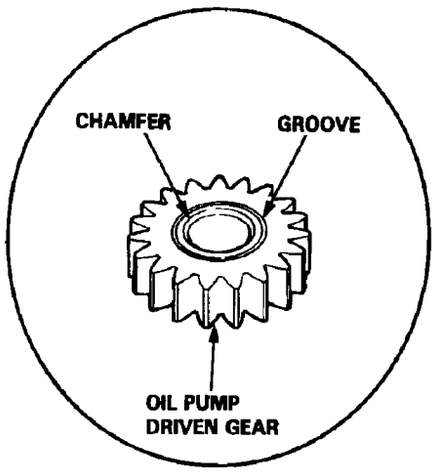
Unit: mm (in)

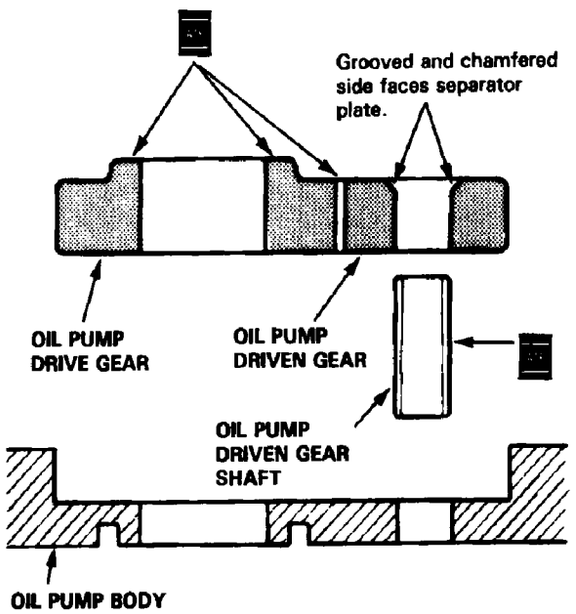
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	59.3 (2.335)	38.8
②	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	14.1
③	Relief valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7
④	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	32.4 (1.276)	10.5
⑤	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7

VALVE BODY

OIL PUMP INSPECTION

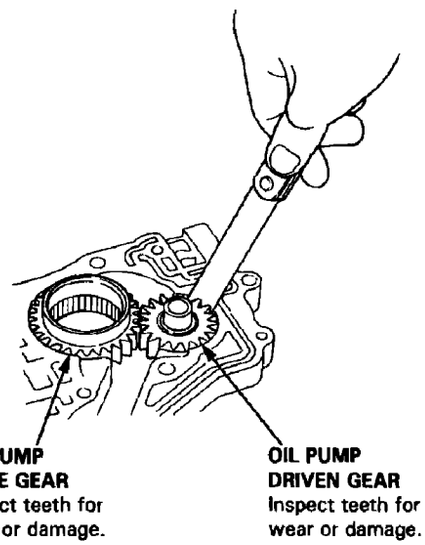
1. Install the oil pump gears and oil pump driven gear shaft in the oil pump body.





2. Measure the side clearance of the oil pump drive and driven gears.

Oil Pump Gears Side (Radial) Clearance:
Standard (New): Drive gear
0.210–0.265 mm
(0.0083–0.0104 in)
Driven gear
0.070-0.125 mm
(0.0028–0.0049 in)



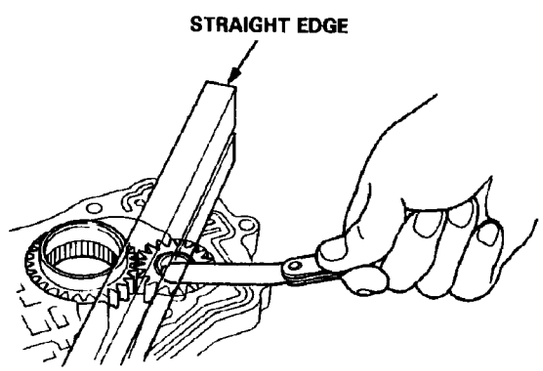
OIL PUMP DRIVE GEAR
Inspect teeth for wear or damage.

OIL PUMP DRIVEN GEAR
Inspect teeth for wear or damage.

3. Remove the oil pump driven gear shaft.

4. Measure the thrust clearance of the oil pump driven gears-to-oil pump body.

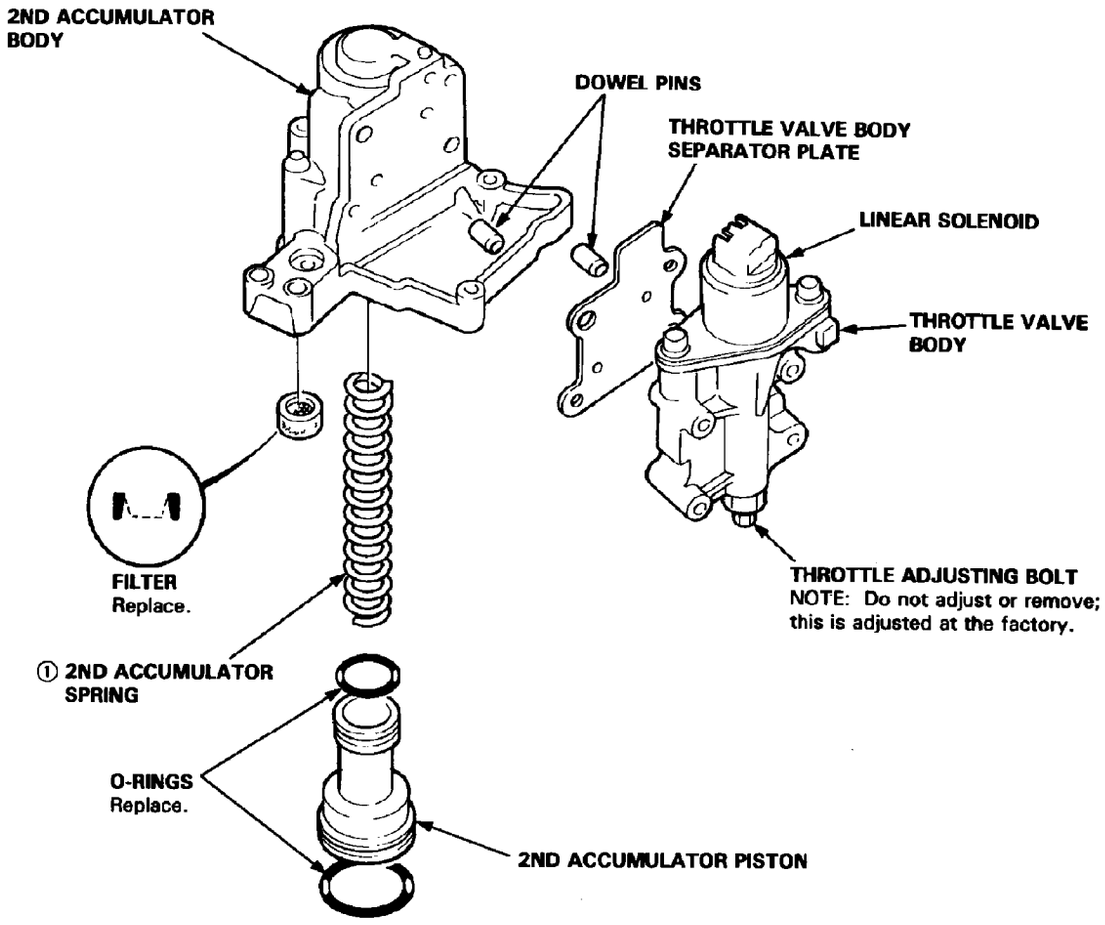
Oil Pump Drive/Driven Gears thrust (Axial) Clearance:
Standard (New): 0.03–0.05 mm
(0.001–0.002 in)
Service Limit: 0.07 mm (0.003 in)



VALVE BODY

2ND ACCUMULATOR/THROTTLE VALVE BODY

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.
- Coat all parts with ATF before reassembly.
- Replace the O-rings and filter.
- Install the filter in the direction shown.



SPRING SPECIFICATIONS

Unit: mm (in)

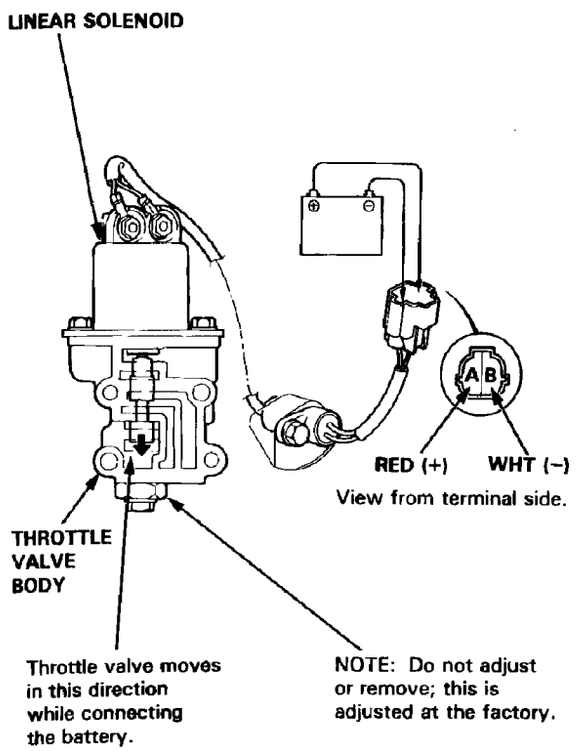
No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	2nd accumulator spring (Vigor)	3.0 (0.118)	18.7 (0.736)	88.1 (3.468)	14.2
②	2nd accumulator spring (2.5TL)	3.0 (0.118)	22.3 (0.878)	95.6 (3.764)	12.6

VALVE BODY

THROTTLE VALVE BODY/LINEAR SOLENOID

1. Connect the linear solenoid harness to the linear solenoid terminals.
2. Connect the A (RED: +) terminal of the linear solenoid to the positive battery terminal and the B (WHT: −) terminal to the negative battery terminal. Check that the throttle valve moves.
3. Repeat the above steps 1 and 2.

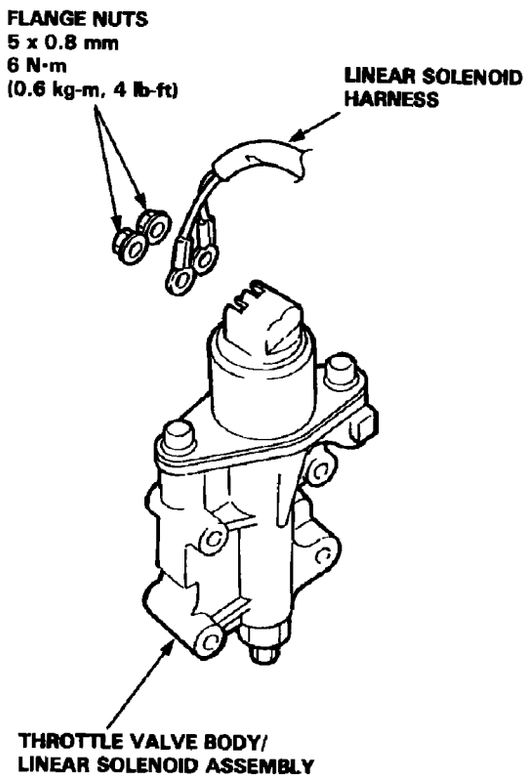
   NOTE: You can see the movement of the throttle valve through the oil passage in the mounting surface of the throttle valve body.



4. If the throttle valve binds, or moves sluggishly, or the linear solenoid does not operate, replace the throttle valve body/linear solenoid as an assembly.
5. If the linear solenoid does not operate, disconnect the linear solenoid harness from the linear solenoid assembly. Connect the battery directly to the linear solenoid.
6. If the linear solenoid operates after connecting the battery, and the throttle valve movement is OK, replace the linear solenoid harness.

NOTE: Throttle valve body/linear solenoid must be replaced as an assembly.

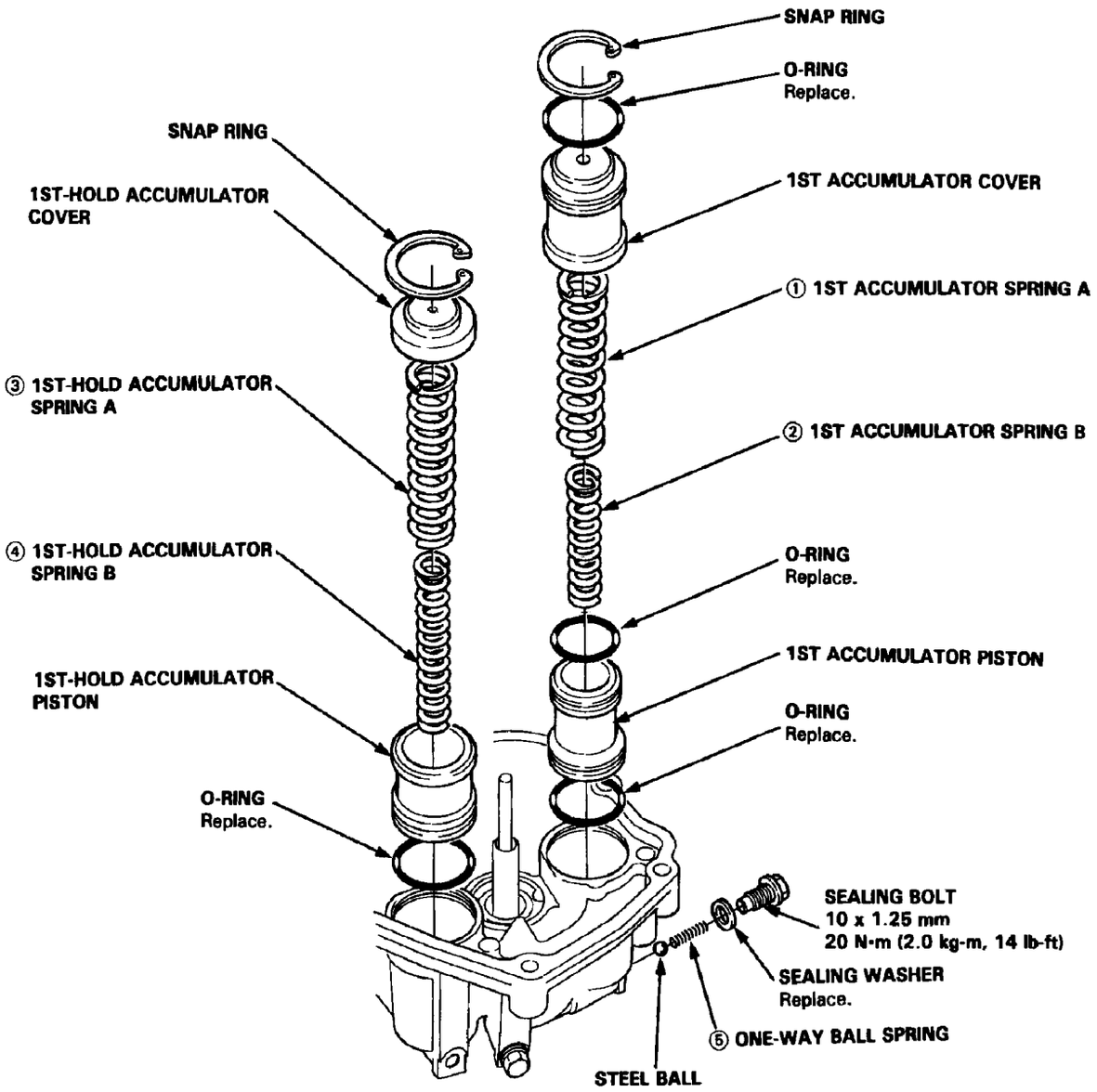
1. Check the throttle valve body passages for dust or dirt, and replace as an assembly, if necessary.
2. Clean the mounting surface and oil passages of the throttle valve body.
3. Assemble the throttle valve body/linear solenoid to the 2nd accumulator body.



1ST ACCUMULATOR/1ST HOLD ACCUMULATOR

DISASSEMBLY/INSPECTION/REASSEMBLY

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- Coat all parts with ATF before reassembly.
- Replace the O-rings and sealing washer.

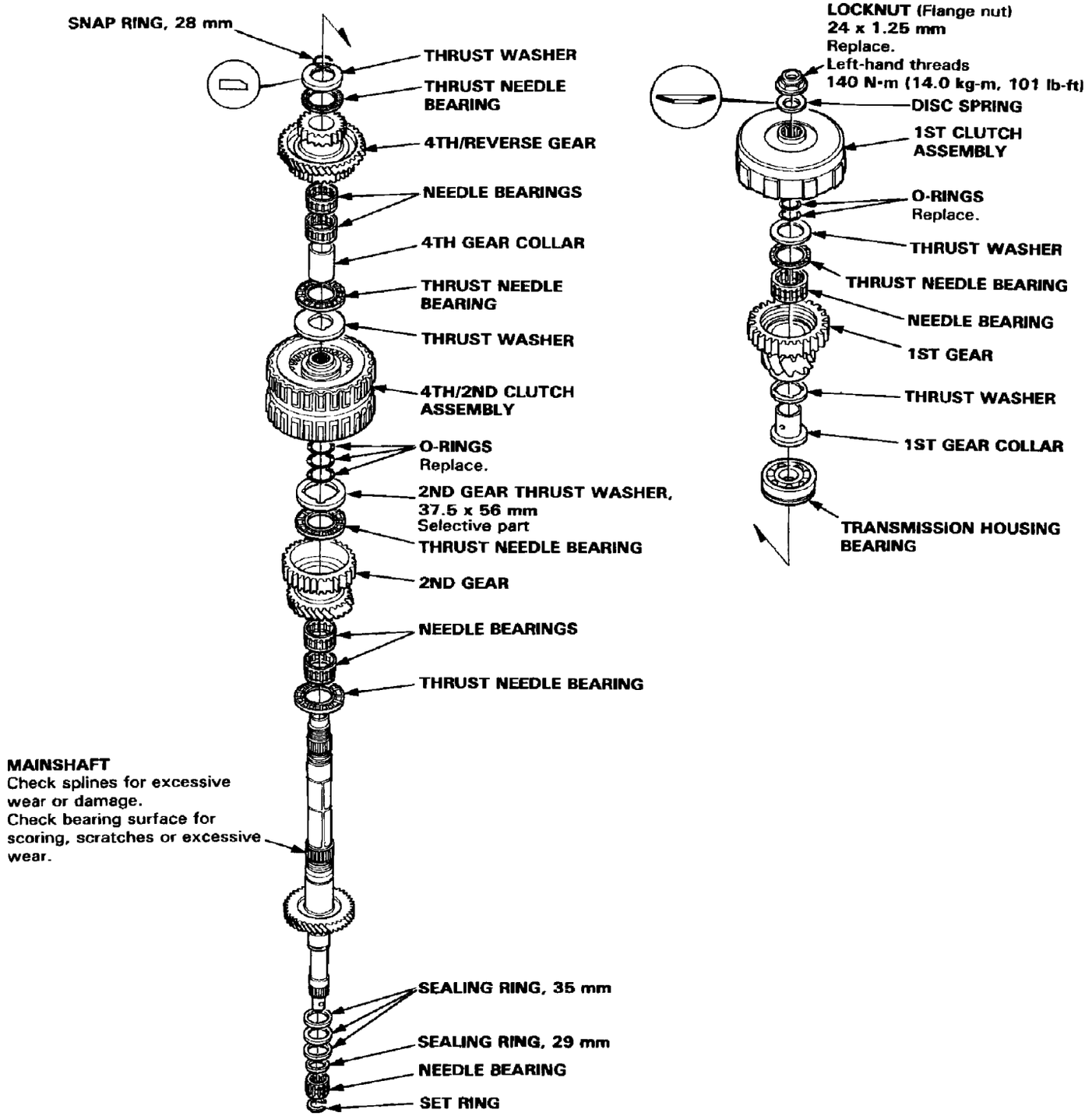


SPRING SPECIFICATIONS Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring A	2.2 (0.087)	17.2 (0.677)	88.6 (3.488)	15.0
②	1st accumulator spring B	1.9 (0.075)	9.8 (0.386)	51.5 (2.028)	8.3
③	1st-hold accumulator spring A	3.5 (0.138)	21.6 (0.850)	55.9 (2.201)	7.7
④	1st-hold accumulator spring B	2.3 (0.091)	12.8 (0.504)	53.4 (2.102)	12.6
⑤	One-way ball spring	0.29 (0.011)	4.0 (0.157)	14.0 (0.551)	13.0

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install the thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.
- Locknut has left-hand threads.



MAINSHAFT

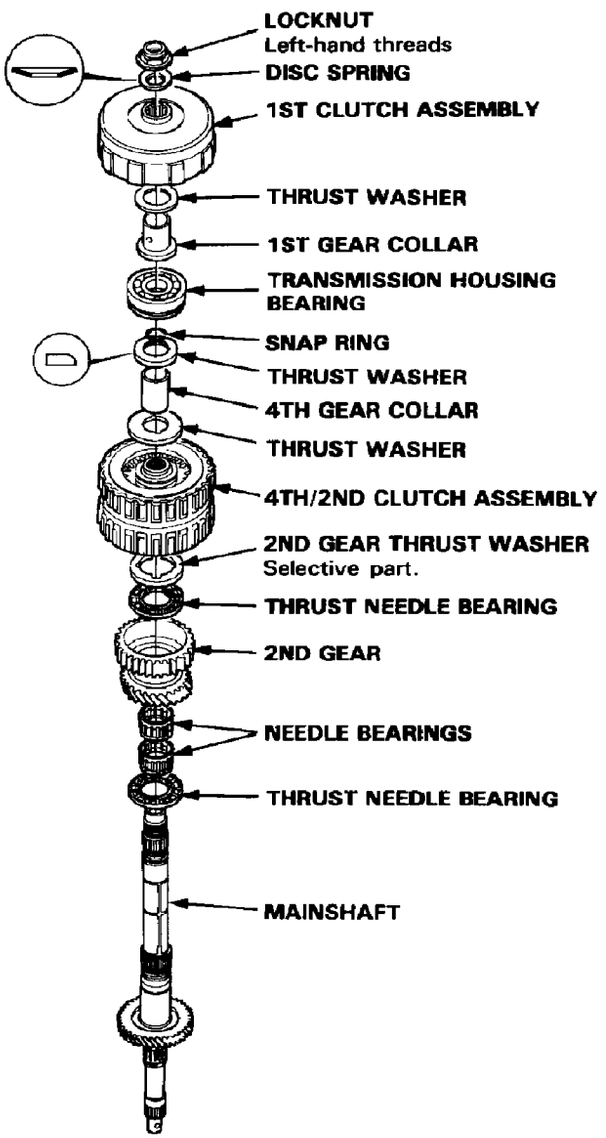
CLEARANCE MEASUREMENTS

- Clearance Measurements

NOTE: Lubricate all parts with ATF during assembly.

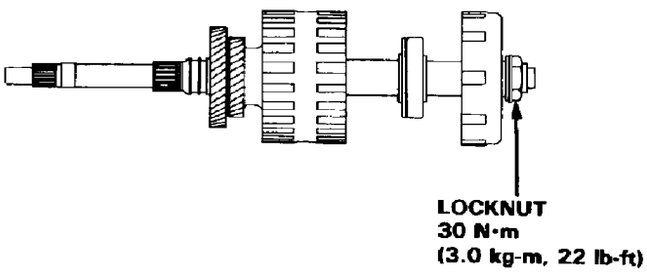
1. Remove the mainshaft bearing from the transmission housing.
2. Assemble the parts below on the mainshaft.

NOTE: Do not install the O-rings during inspection.

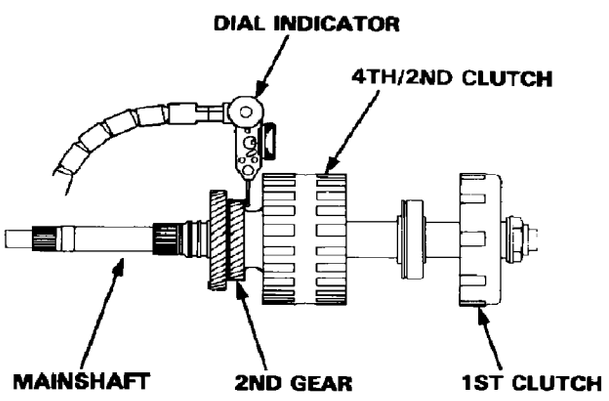


3. Torque the mainshaft locknut to 30 N·m (3.0 kg-m, 22 lb-ft).

NOTE: Mainshaft locknut has left-hand threads.



4. Move the 4th/2nd clutch assembly to check the axial clearances.
5. Attach the dial indicator to the mainshaft 2nd gear as shown.



NOTE: This measurement can be made using a feeler gauge, by inserting it between the mainshaft gear and the second gear.

After inserting feeler gauge, gently pry second gear towards the 2/4 drum, record the measurement. Then gently pry the second gear away from the 2/4 drum, record the measurement.

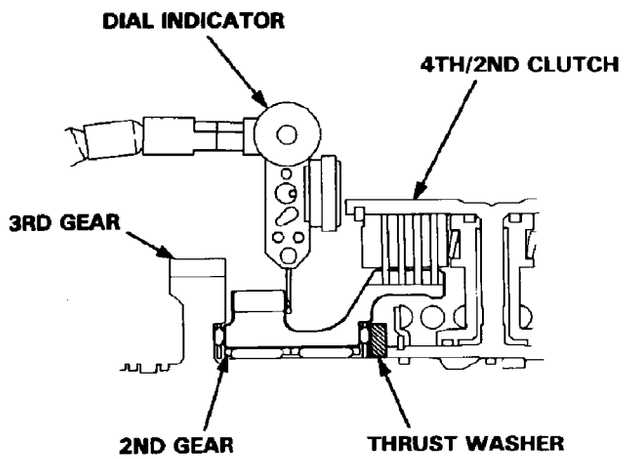
Subtract the first measurement from the second.

The total should be within the spec given after step 6.

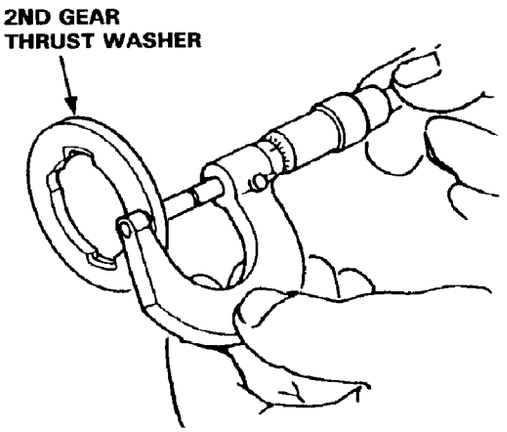
6. Measure the 2nd gear axial clearance while pushing the 4th/2nd clutch toward the 1st clutch.

   STANDARD: 0.07—0.15 mm (0.003—0.006 in)

   NOTE: Take measurements in at least three places and take the average as the actual clearance.



7. If the clearance is out of tolerance, remove the 2nd gear thrust washer and measure the thickness.



8. Select and install a new 2nd gear thrust washer then recheck.

2ND GEAR THRUST WASHER, 37.5 x 56 mm

No.	Part Number	Thickness
1	90441-PW4-000	4.00 mm (0.157 in)
2	90442-PW4-000	4.05 mm (0.159 in)
3	90443-PW4-000	4.10 mm (0.161 in)
4	90444-PW4-000	4.15 mm (0.163 in)
5	90445-PW4-000	4.20 mm (0.165 in)
6	90446-PW4-000	4.25 mm (0.167 in)
7	90447-PW4-000	4.30 mm (0.169 in)
8	90448-PW4-000	4.35 mm (0.171 in)
9	90449-PW4-000	4.40 mm (0.173 in)
10	90450-PW4-000	4.45 mm (0.175 in)
11	90451-PW4-000	4.50 mm (0.177 in)

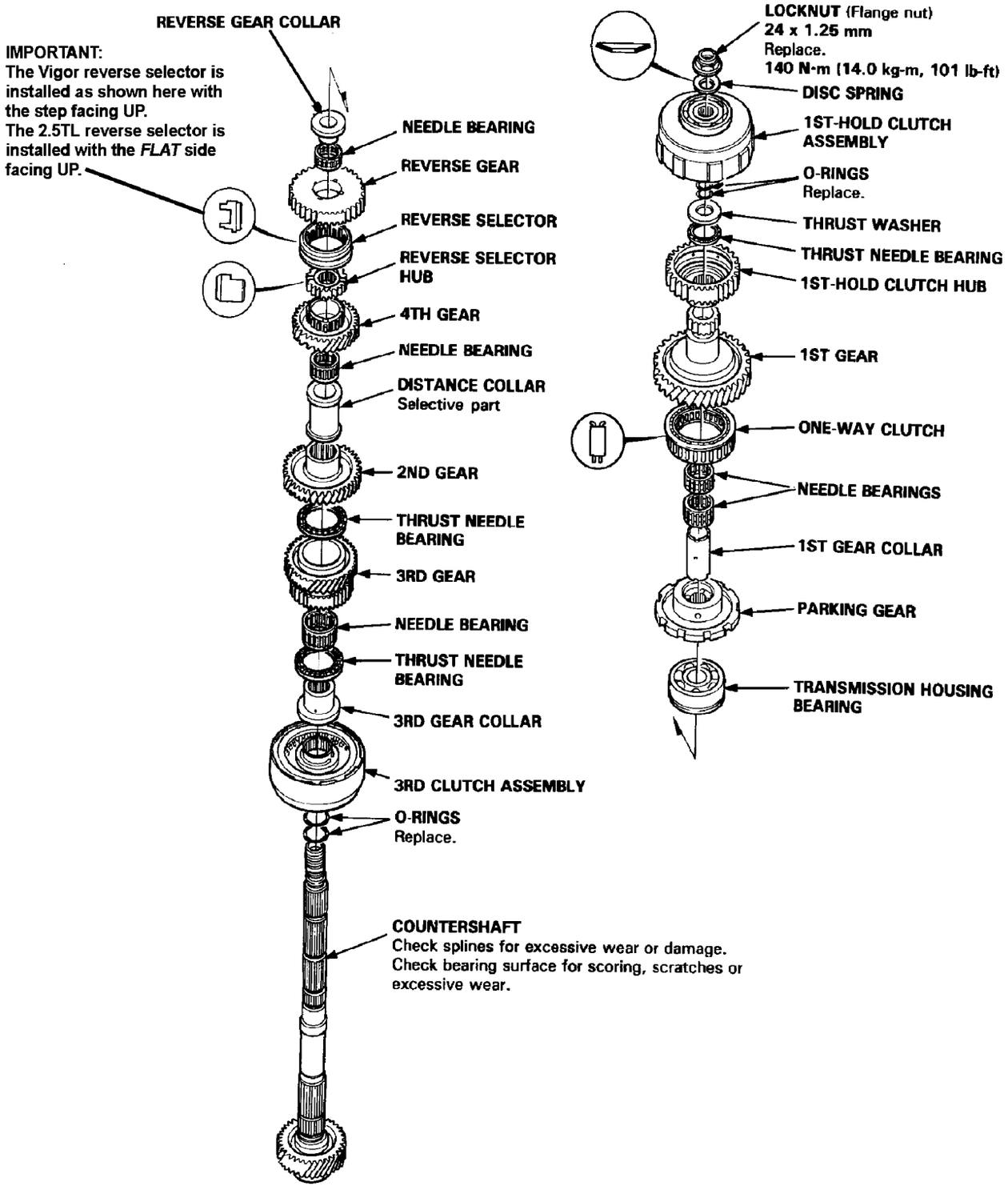
9. After replacing the 2nd gear thrust washer, make sure that the clearance is within tolerance.

COUNTERSHAFT

DISASSEMBLY/INSPECTION/REASSEMBLY

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install the thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

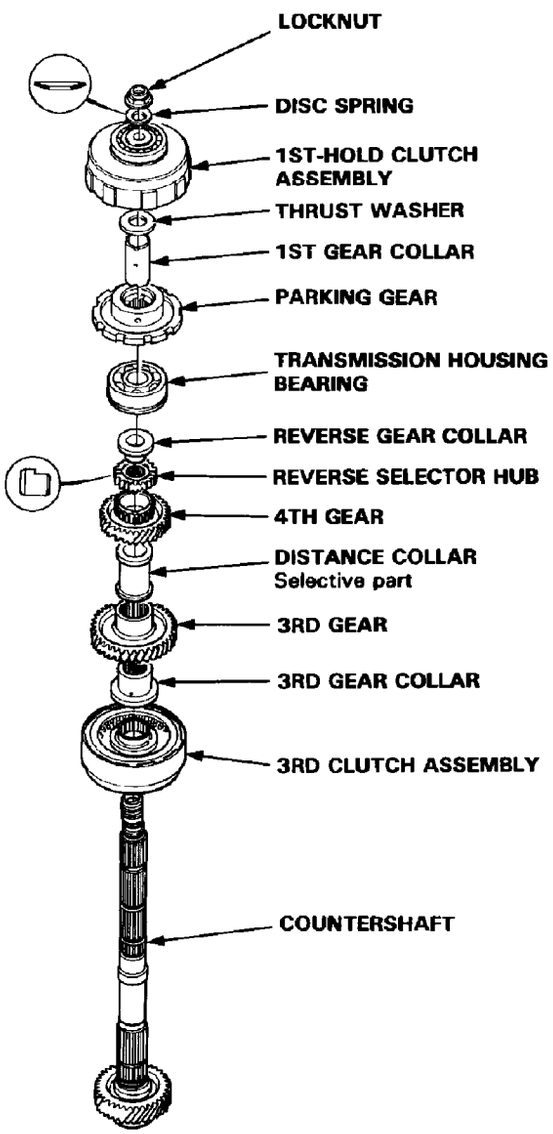


- Clearance Measurement

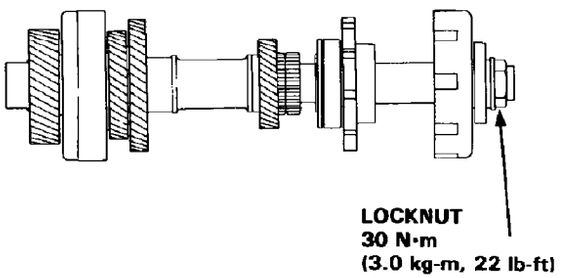
NOTE: Lubricate all parts with ATF during assembly.

1. Remove the countershaft bearing from the transmission housing.
2. Assemble the parts below on the countershaft.

NOTE: Do not install the O-rings during inspection.



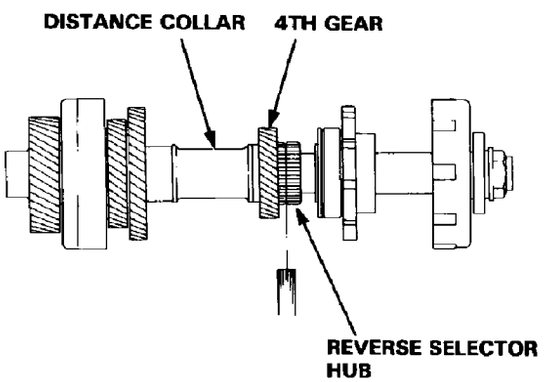
3. Torque the countershaft locknut to 30 N·m (3.0 kg-m, 22 lb-ft).

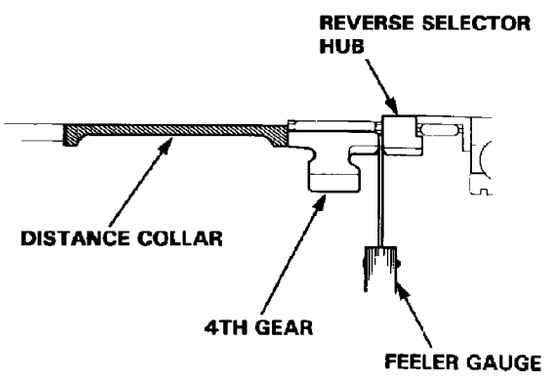


4. Hold the 4th gear against the distance collar. Measure the clearance between the 4th gear and the reverse selector hub with a feeler gauge.

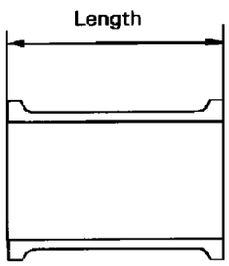
NOTE: Take measurements in at least three places and take the average as the actual clearance.

STANDARD: 0.07—0.15 mm (0.003—0.006 in)





If the clearance is out of tolerance, remove the distance collar and measure the length.



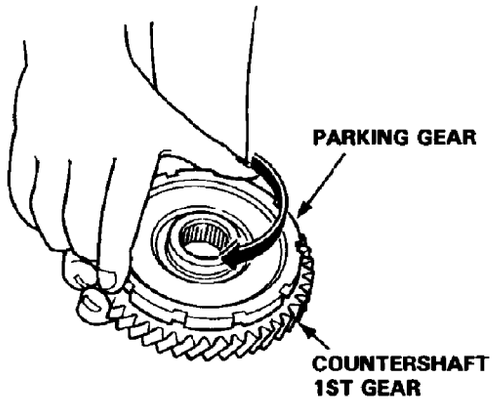
Select and install a new distance collar then recheck.

DISTANCE COLLAR 35 mm

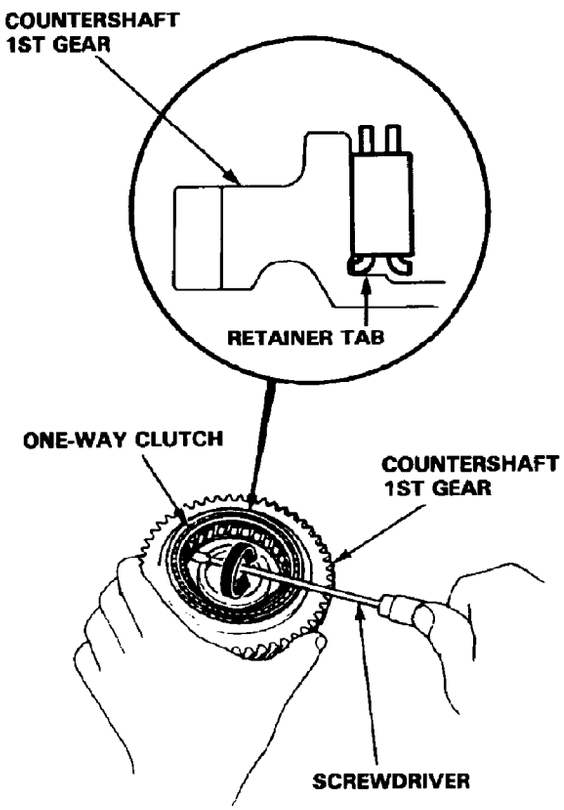
No.	Part Number	Thickness
1	90501-PW7-000	65.65 mm (2.585 in)
2	90502-PW7-000	65.70 mm (2.587 in)
3	90503-PW7-000	65.75 mm (2.589 in)
4	90504-PW7-000	65.80 mm (2.591 in)
5	90505-PW7-000	65.85 mm (2.593 in)
6	90506-PW7-000	65.90 mm (2.594 in)
7	90507-PW7-000	65.95 mm (2.596 in)
8	90508-PW7-000	66.00 mm (2.598 in)
9	90509-PW7-000	66.05 mm (2.600 in)
10	90510-PW7-000	66.10 mm (2.602 in)

After replacing the distance collar, make sure that the clearance is within tolerance.

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



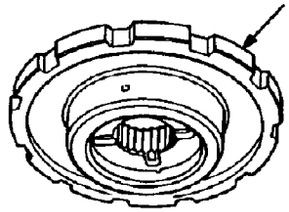
2. Remove the one-way clutch by prying it up with the end of a screwdriver.



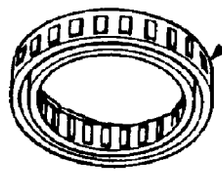
3. Hold countershaft 1st gear and turn the parking gear in the direction shown to be sure it turns freely.

Inspect the parts as follows:

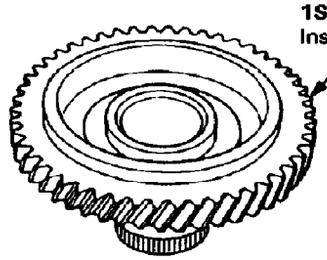
PARKING GEAR
Inspect for wear or scoring.



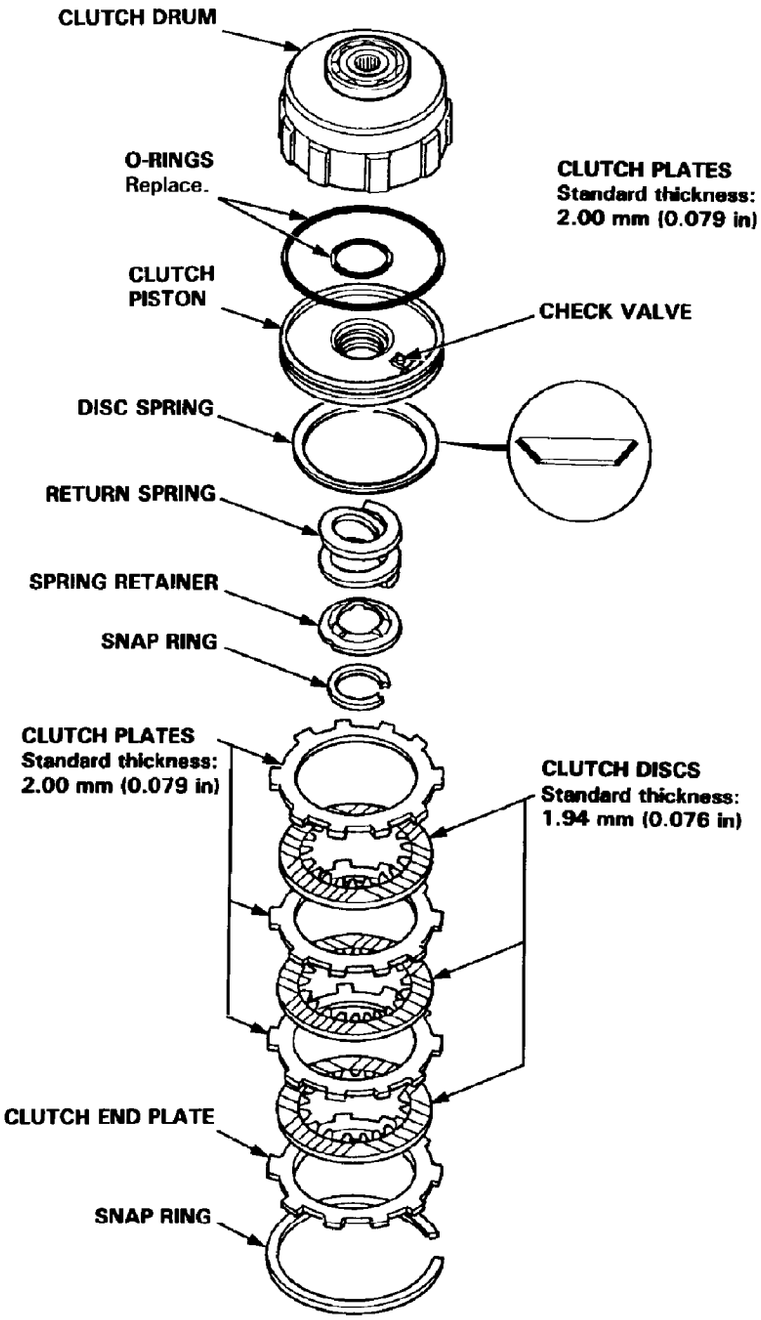
ONE-WAY CLUTCH
Inspect for damage or faulty movement.



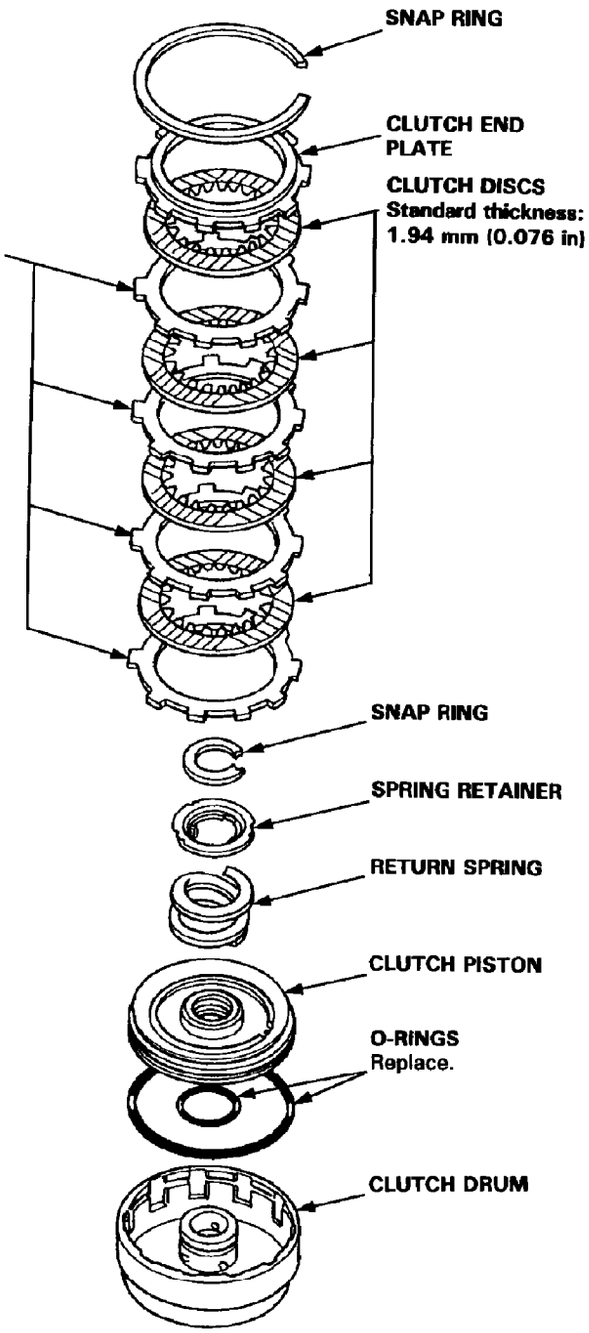
COUNTERSHAFT 1ST GEAR
Inspect for wear or scoring.



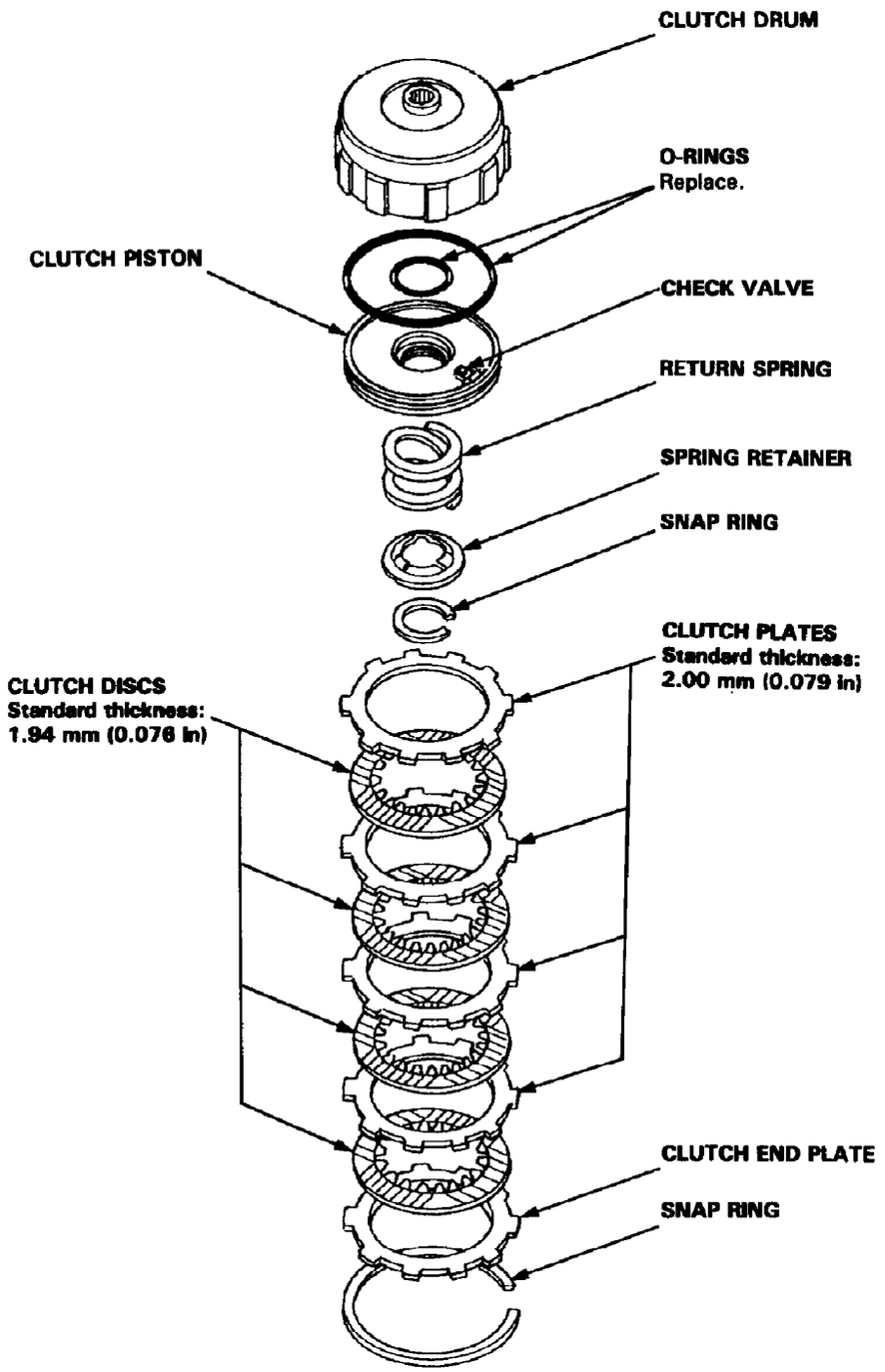
1ST HOLD CLUTCH



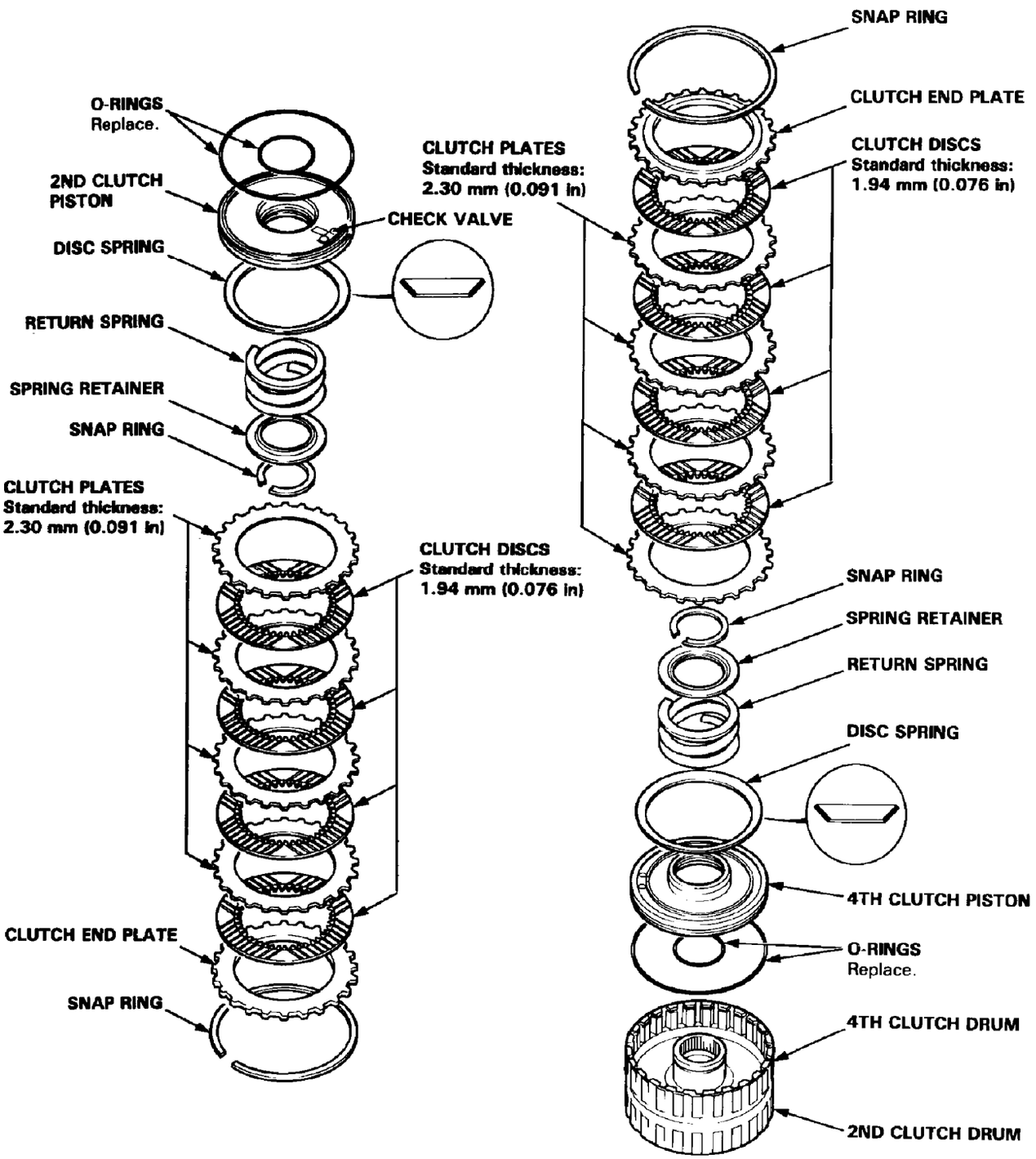
3RD CLUTCH



1ST CLUTCH


CLUTCH DRUM
O-RINGS
Replace.
CLUTCH PISTON
CHECK VALVE
RETURN SPRING
SPRING RETAINER
SNAP RING
CLUTCH PLATES
Standard thickness:
2.00 mm (0.079 in)
CLUTCH DISCS
Standard thickness:
1.94 mm (0.076 in)
CLUTCH END PLATE
SNAP RING

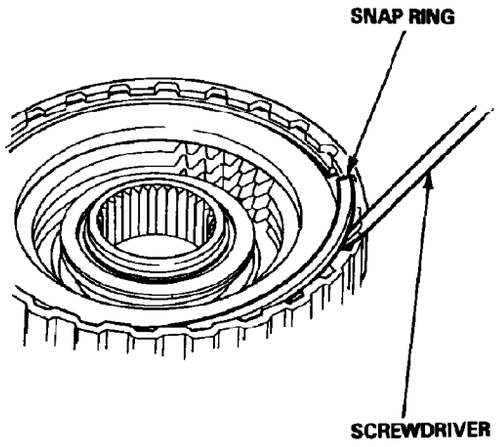
4TH/2ND CLUTCH



CLUTCH DRUM ASSEMBLIES

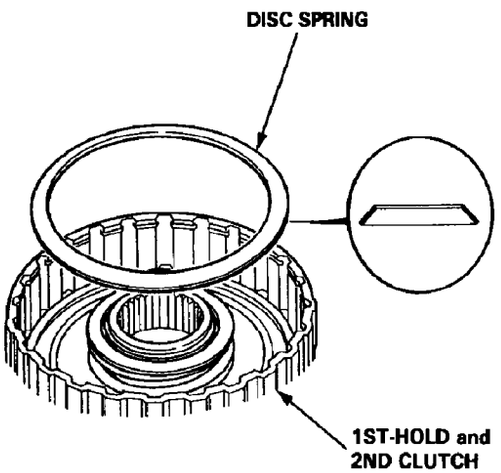
DISASSEMBLY/INSPECTION/ASSEMBLY

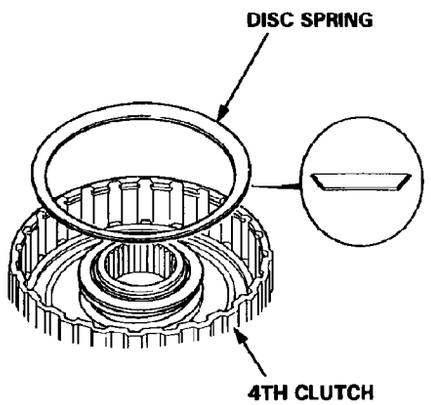
1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.



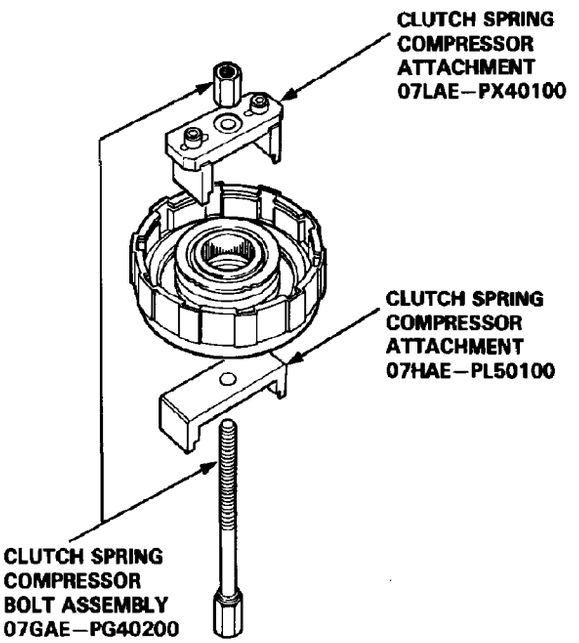
2. Remove the disc spring.

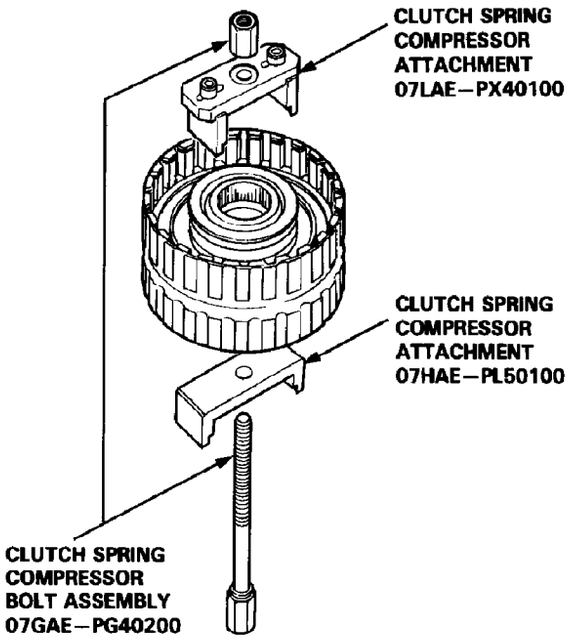
NOTE: For 1st-hold, 2nd and 4th clutches
The 2.5TL does NOT have a cushion plate in the 1st hold clutch





3. Install the special tools as shown.

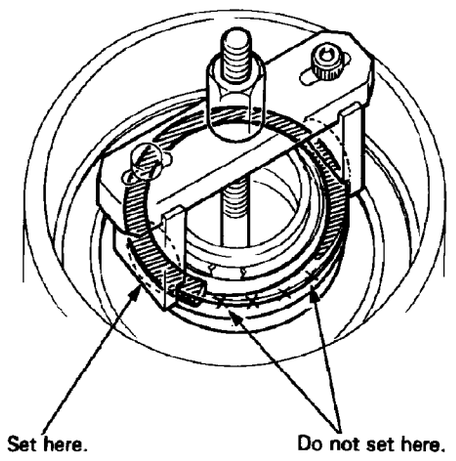




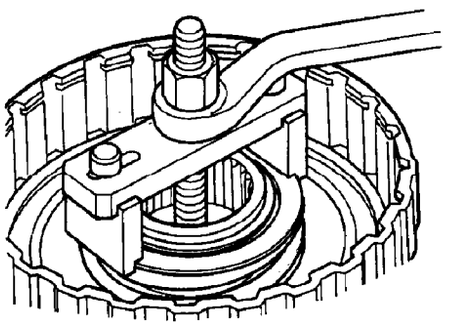
CLUTCH DRUM ASSEMBLIES

DISASSEMBLY/INSPECTION/ASSEMBLY

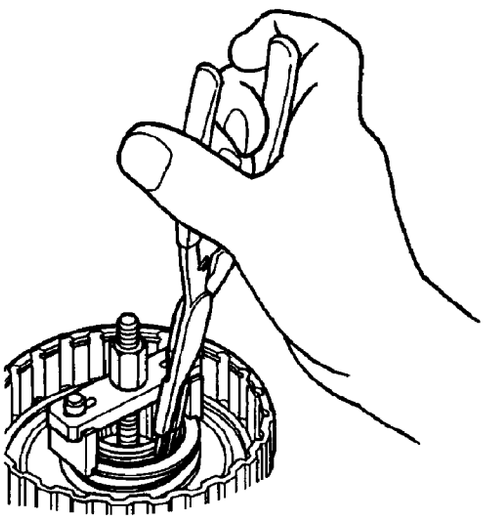
CAUTION: If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



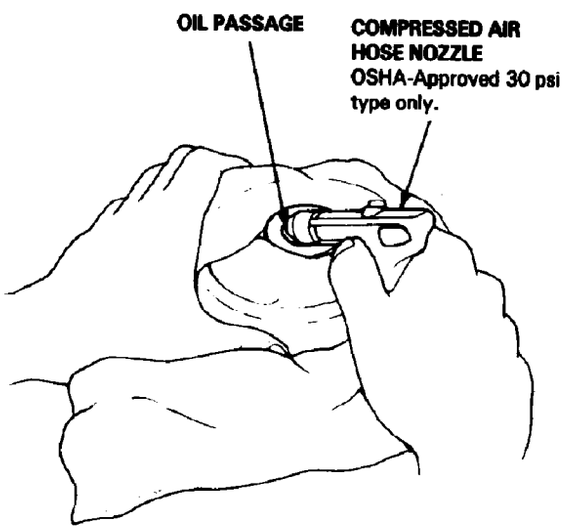
4. Compress the return spring.



5. Remove the snap ring. Then remove the special tools, spring retainer and return spring.

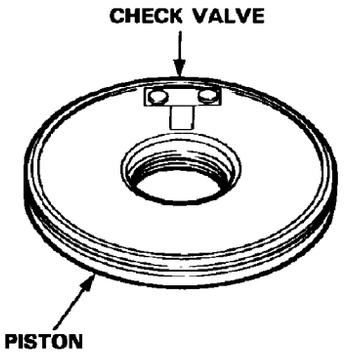


6. Wrap a shop towel around the clutch drum and apply air pressure to the oil passage to remove the piston. Place a finger tip on the other end while applying air pressure.



NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Lubricate all parts with ATF before reassembly.

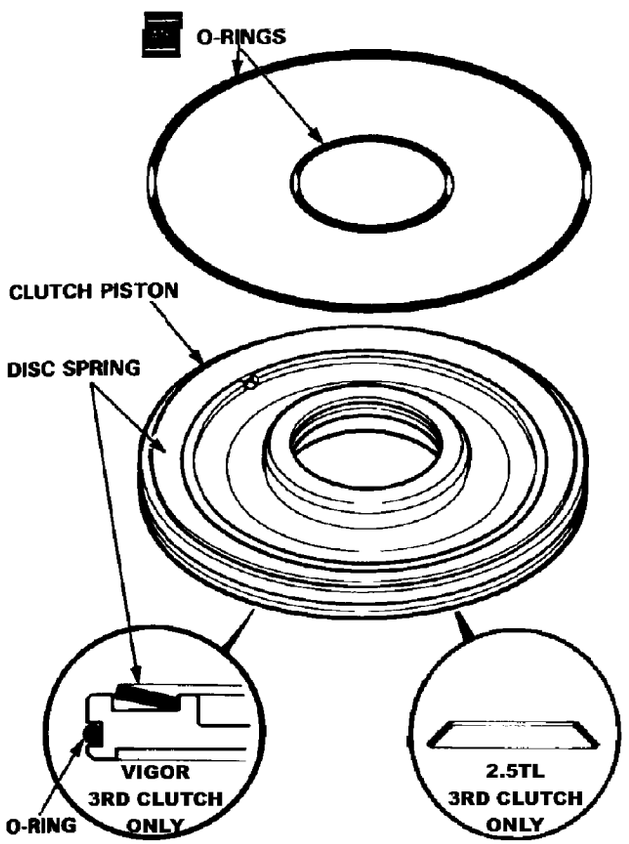
1. Inspect the check valve; if it's loose replace the piston.



2. Install new O-rings on the clutch piston.

3. Be sure that the disc spring is securely staked.

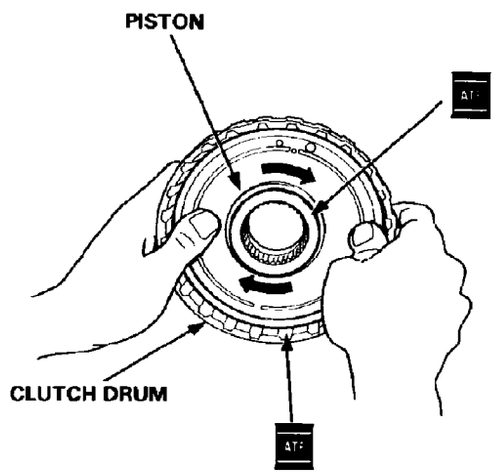
NOTE: For 1st and 3rd clutches.



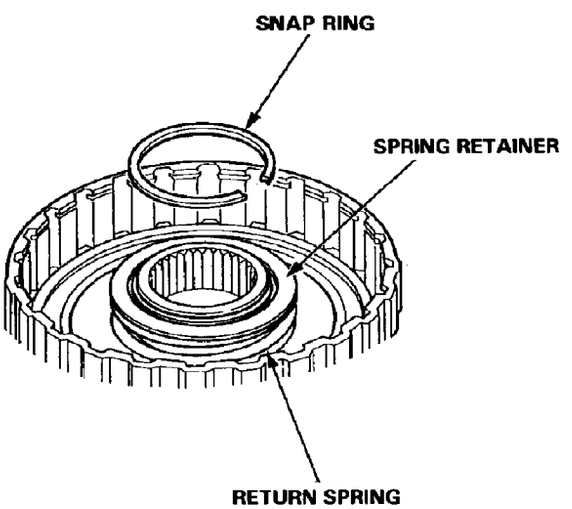
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

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

CAUTION: Do not pinch O-ring by installing the piston with force.



5. Install the return spring and spring retainer and position the snap ring on the spring retainer.

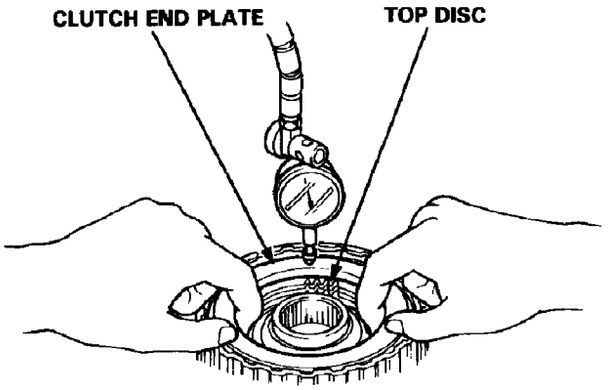


1. Measure the clearance between the clutch end plate and top disc with a dial indicator. Zero the dial indicator with the clutch end plate lowered and lift it up to the snap ring. The distance that the clutch end plate moves is the clearance between the clutch end plate and top disc.

   NOTE: Measure at three locations.

Clutch End Plate-to-Top Disc Clearance:

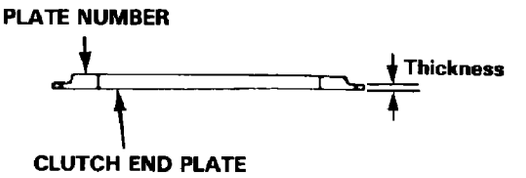
Clutch	Service Limit
1st	0.65—0.85 mm (0.026—0.033 in)
2nd	0.55—0.75 mm (0.022—0.030 in)
3rd	0.55—0.75 mm (0.022—0.030 in)
4th	0.55—0.75 mm (0.022—0.030 in)
1st-hold	0.80—1.00 mm (0.031—0.039 in)



2. If the clearance is not within the service limits, select a new clutch end plate from the following table.

   NOTE: If the thickest clutch end plate is installed but the clearance is still over the standard, replace the clutch discs and clutch plates.

CLUTCH END PLATE



1ST and 1ST-HOLD CLUTCH

Plate No.	Part Number	Thickness mm (in)
1	22551—PF4—000	2.1 (0.083)
2	22552—PF4—000	2.2 (0.087)
3	22553—PF4—000	2.3 (0.091)
4	22554—PF4—000	2.4 (0.094)
5	22555—PF4—000	2.5 (0.098)
6	22556—PF4—000	2.6 (0.102)
7	22557—PF4—000	2.7 (0.106)
8	22558—PF4—000	2.8 (0.110)
9	22559—PF4—000	2.9 (0.114)
10	22560—PF4—000	3.0 (0.118)
11	22561—PF4—000	3.1 (0.122)
12	22562—PF4—000	3.2 (0.126)
13	22563—PF4—000	3.3 (0.130)
14	22564—PF4—000	3.4 (0.134)

2ND and 4TH CLUTCH

Plate No.	Part Number	Thickness mm (in)
1	22631—PR9—000	2.1 (0.083)
2	22632—PR9—000	2.2 (0.087)
3	22633—PR9—000	2.3 (0.091)
4	22634—PR9—000	2.4 (0.094)
5	22635—PR9—000	2.5 (0.098)
6	22636—PR9—000	2.6 (0.102)
7	22637—PR9—000	2.7 (0.106)
8	22638—PR9—000	2.8 (0.110)
9	22639—PR9—000	2.9 (0.114)

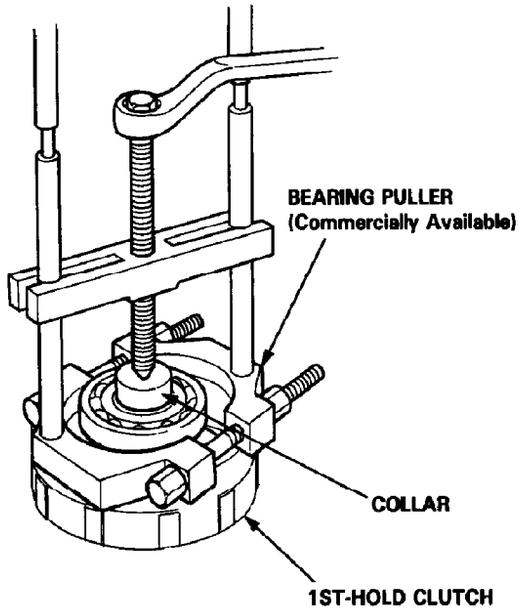
3RD CLUTCH

Plate No.	Part Number	Thickness mm (in)
1	22551—PF4—000	2.1 (0.083)
2	22552—PF4—000	2.2 (0.087)
3	22553—PF4—000	2.3 (0.091)
4	22554—PF4—000	2.4 (0.094)
5	22555—PF4—000	2.5 (0.098)
6	22556—PF4—000	2.6 (0.102)
7	22557—PF4—000	2.7 (0.106)
8	22558—PF4—000	2.8 (0.110)
9	22559—PF4—000	2.9 (0.114)
10	22560—PF4—000	3.0 (0.118)

1ST HOLD CLUTCH DRUM BEARING

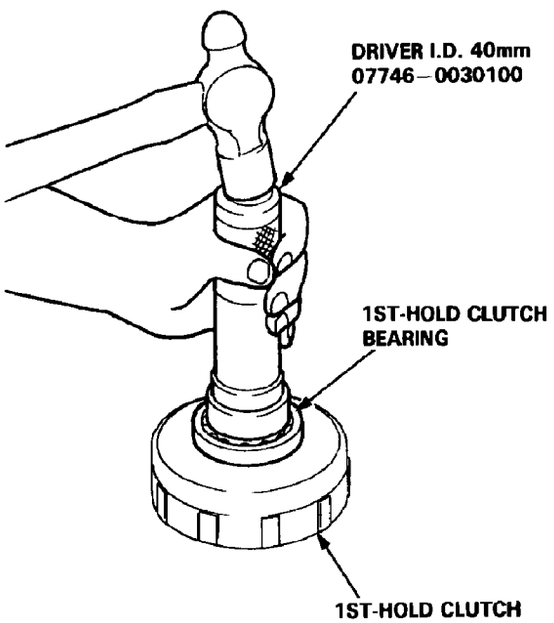
REPLACEMENT

1. Remove the 1st-hold clutch bearing using a bearing puller.

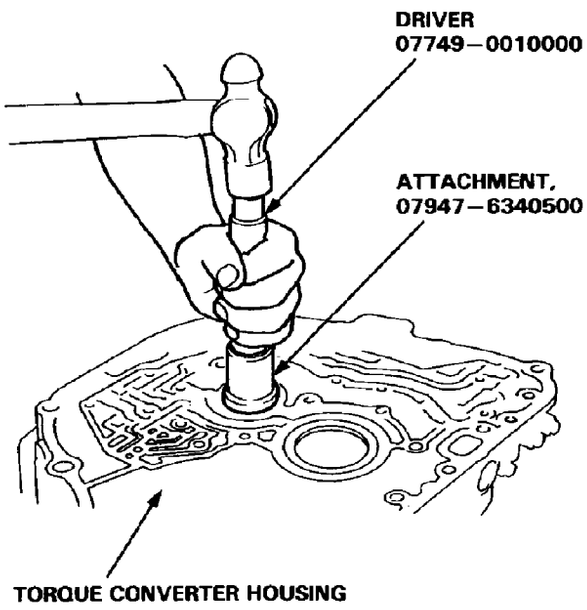


2. Install a new bearing using the special tool as shown.

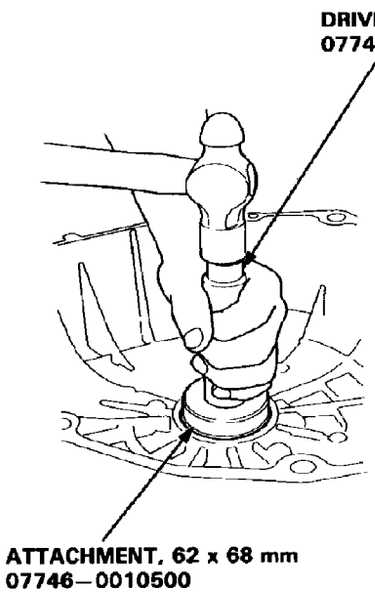
NOTE: Drive in the bearing until it fully bottoms.



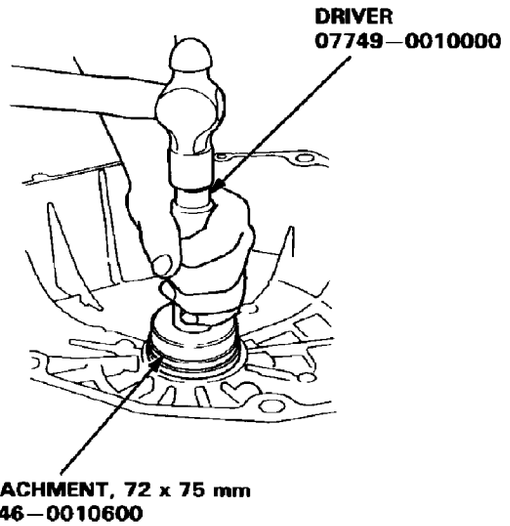
1. Drive out the mainshaft bearing and oil seal using the special tools as shown.



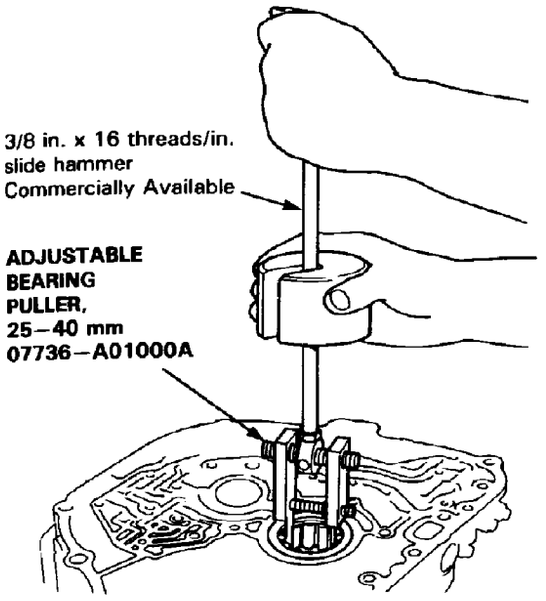
2. Drive in the new mainshaft bearing until it bottoms in the housing, using the special tools as shown.



3. Install the new oil seal flush with the housing using the special tools as shown.

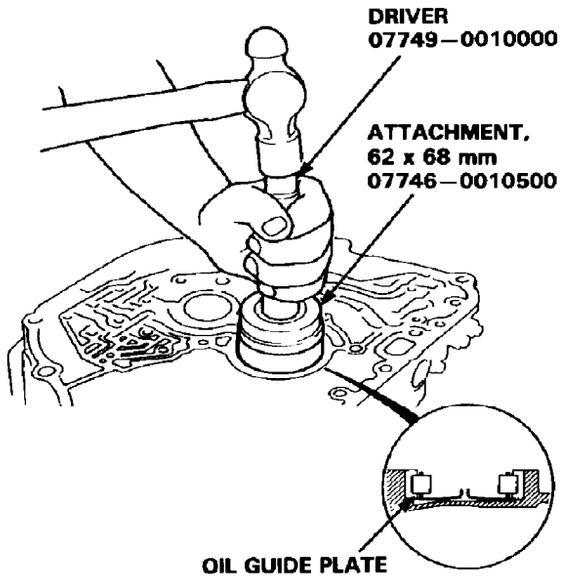


1. Remove the countershaft needle bearing using the special tool.



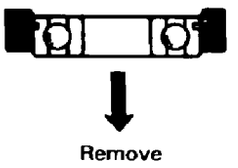
2. Install the oil guide plate.

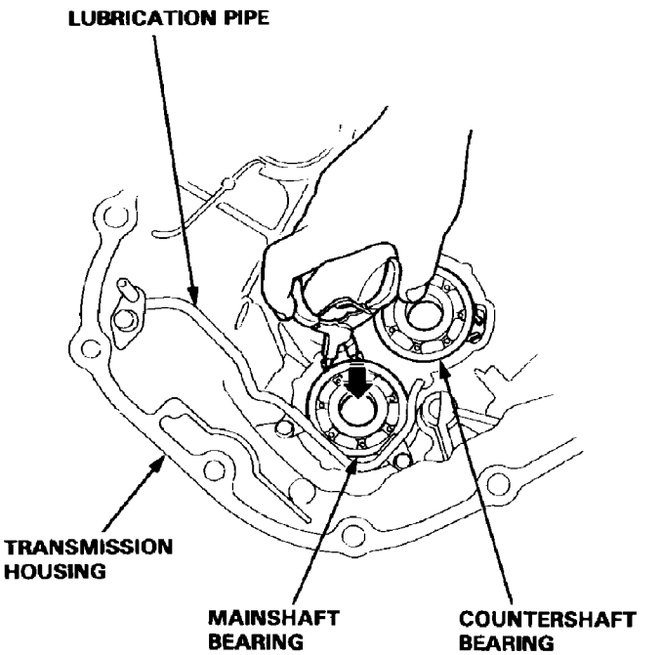
3. Drive the new bearing into the housing using the special tools as shown.



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

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

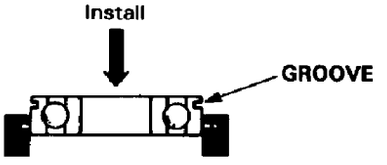




2. Expand each snap ring with the snap ring pliers, insert the new bearing part-way into it, then release the pliers. Push the bearing down into the transmission until the ring snaps in place around it.

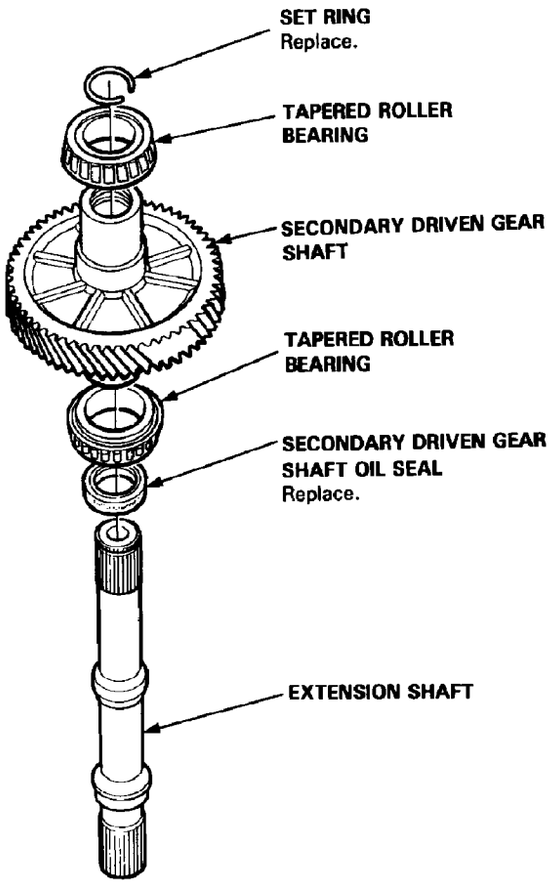
NOTE: Install with groove side of the bearing facing inside the transmission housing.

There should be no up and down movement once the bearings are installed in the housing.

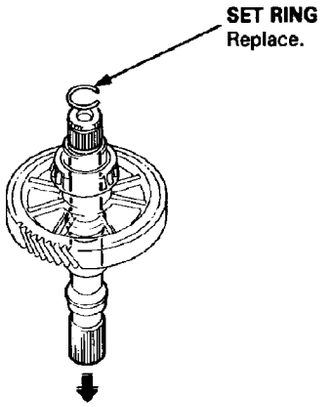


EXTENSION SHAFT

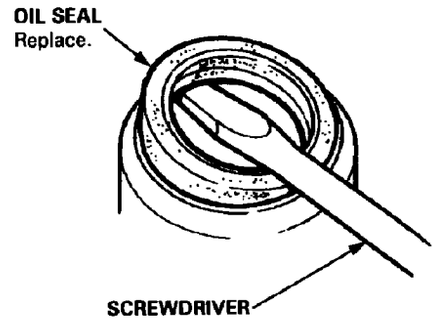
DISASSEMBLY/INSPECTION/REPLACEMENT



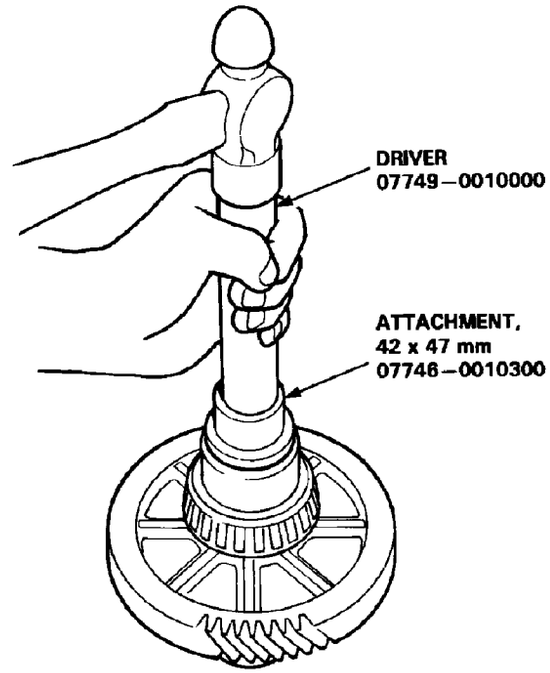
1. Remove the set ring.
2. Remove the extension shaft from the secondary driven gear shaft.



1. Remove the oil seal from the secondary driven gear shaft.

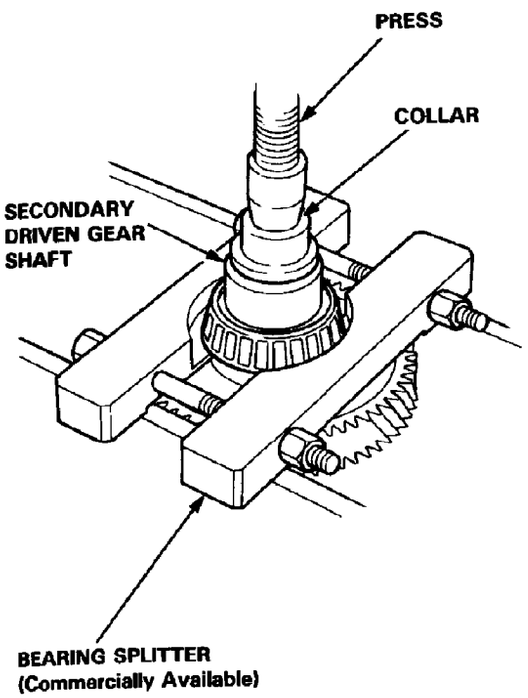


2. Drive the oil seal into the secondary driven gear shaft, using the special tools as shown.



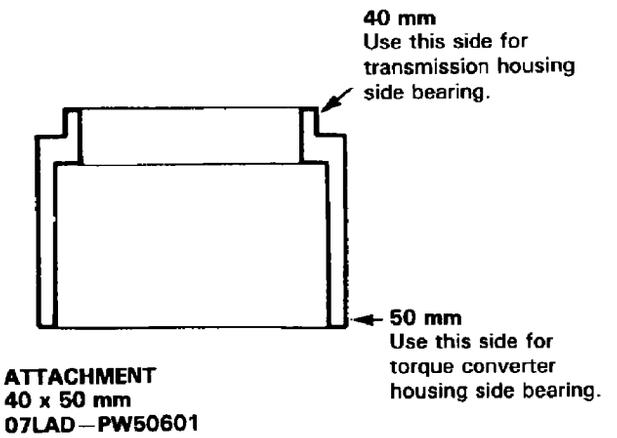
NOTE:
- The bearing and outer race should be replaced as a set.
- If the bearing is replaced, inspect and adjust the bearing preload

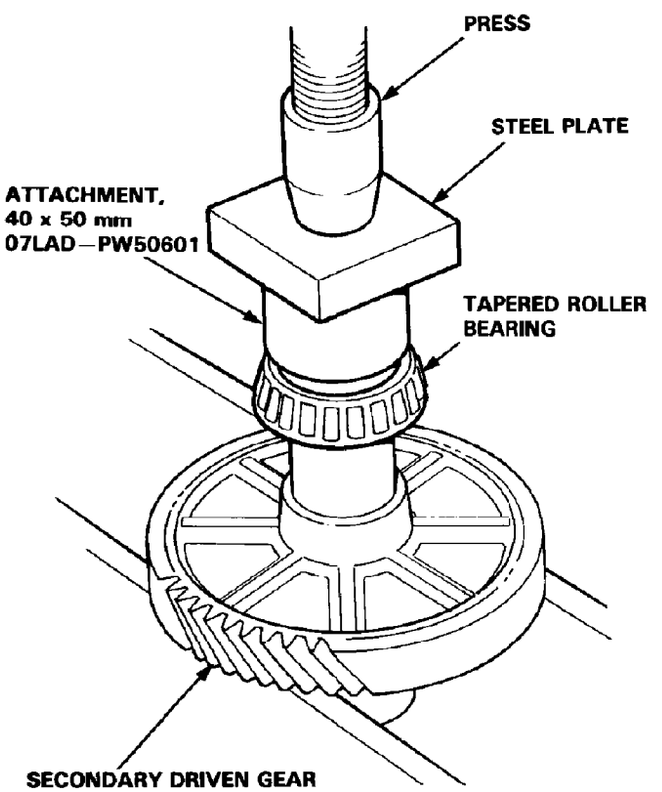
1. Remove the tapered roller bearings from the secondary driven gear shaft, using a press.



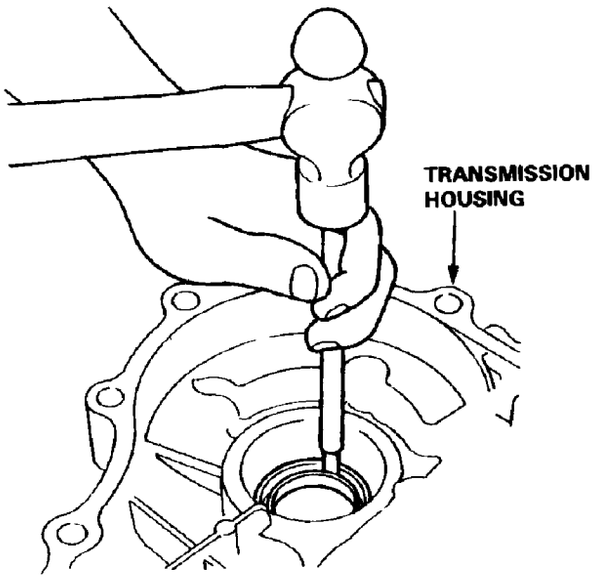
2. Install the bearings using the special tool and a press as shown.

   NOTE: Press the bearings in squarely until they bottom.

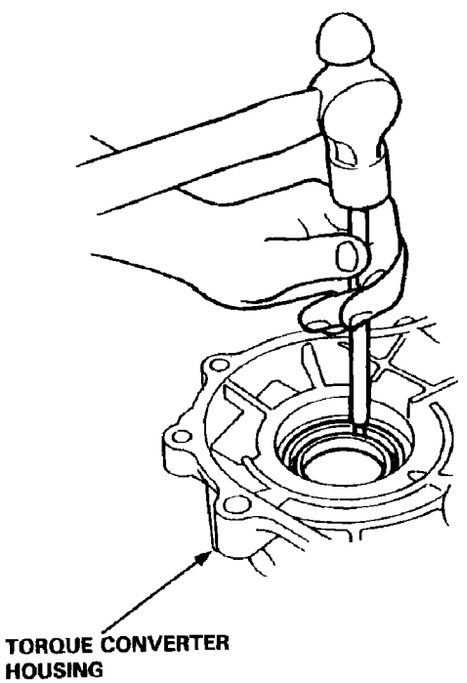




1. Remove the oil seal from the transmission housing.



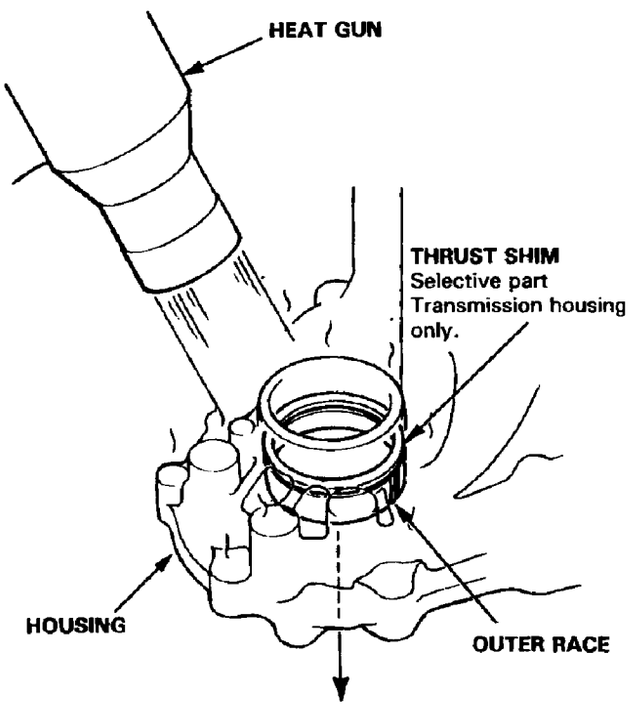
2. Remove the snap ring from the torque converter housing, then remove the oil seal.



NOTE:
- The bearing and outer race should be replaced as a set.
- If the bearings and/or thrust shim are replaced, inspect and adjust the bearing preload

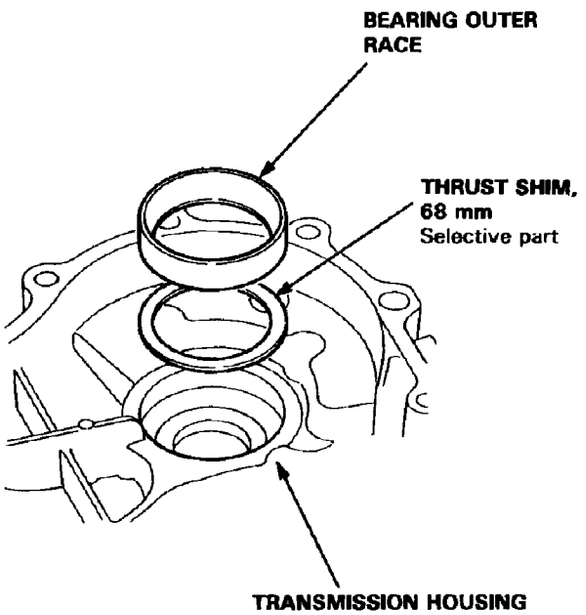
1. Remove the bearing outer race by heating the housings to 212°F (100°C) with a heat gun, then tap the housing until the bearing outer race falls out.

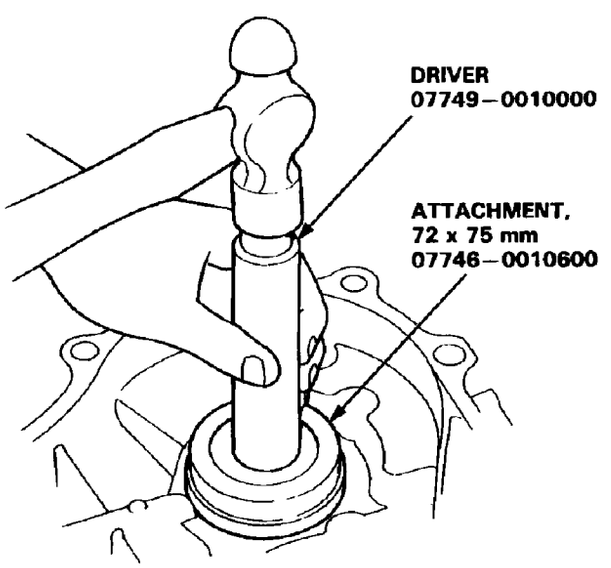
   CAUTION: Do not heat the housings in excess of 212°F (100°C).



2. Install the thrust shim and bearing outer race in the transmission housing.

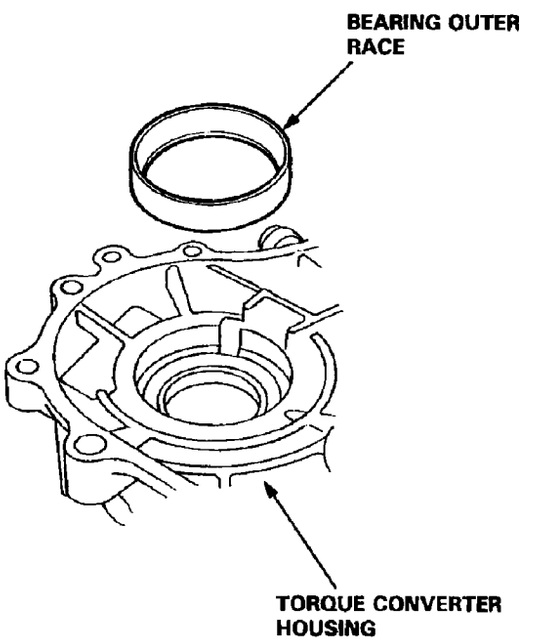
3. Drive the bearing outer race into the transmission housing, using the special tools as shown.

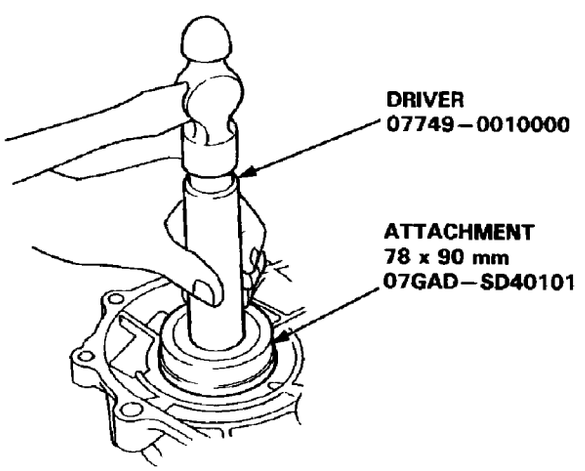




4. Install bearing outer race in the torque converter housing.

5. Drive the bearing outer race into the torque converter housing, using the special tools as shown.





TRANSMISSION HOUSING BEARINGS AND SEALS

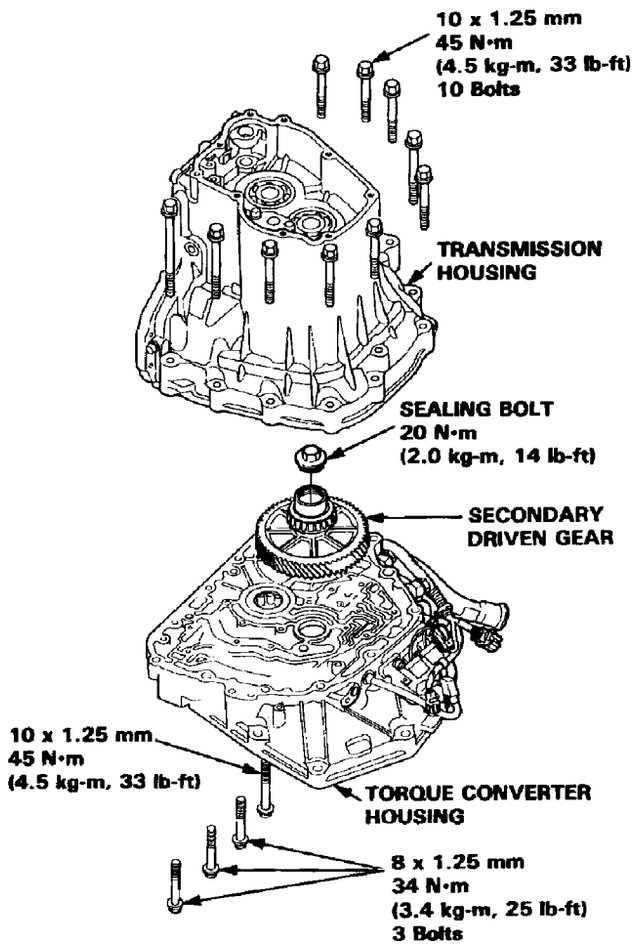
REPLACEMENT AND BEARING PRELOAD

NOTE:
- If any of the listed parts were replaced, the bearing preload must be adjusted:
  - Transmission Housing
  - Torque Converter Housing
  - Tapered Roller Bearing/Bearing Outer Race
  - 68 mm Thrust Shim

CAUTION: If the outer race was removed using heat, let the transmission cool down to room temperature before adjusting the bearing preload.

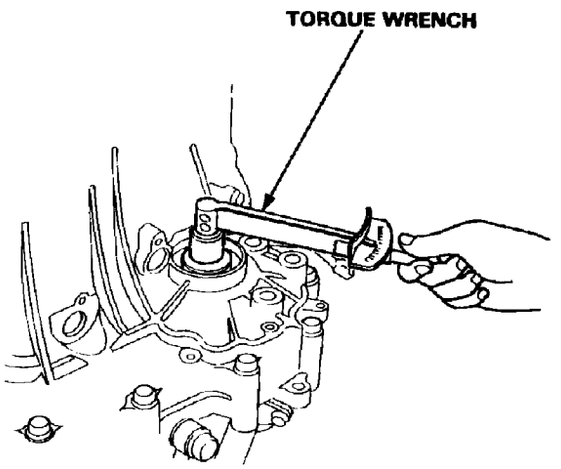
1. Remove the oil seals from both housings.
2. Install the sealing bolt to the secondary driven gear shaft and torque to 20 N·m (2.0 kg-m, 14 lb-ft).
3. Install the secondary driven gear in the torque converter housing, then install the transmission housing.

   NOTE: Do not install the mainshaft and countershaft.



4. Rotate the secondary driven gear in both directions to seat the bearings.
5. Measure the starting torque of the secondary driven gear with a torque wrench.

NOTE:
- Measure the preload at room temperature in both directions.
- Do not use more than one thrust shim to adjust the bearing preload.



TRANSMISSION HOUSING BEARINGS AND SEALS

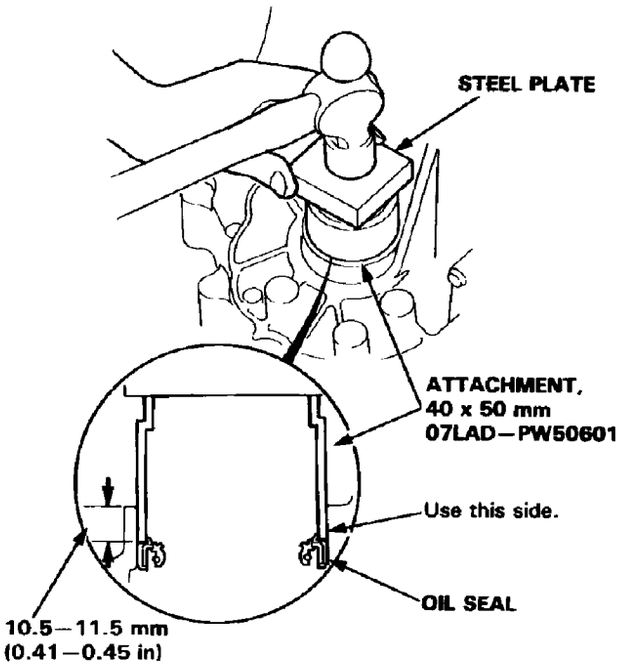
REPLACEMENT AND BEARING PRELOAD

6. If the bearing preload is out of tolerance, select and install a new thrust shim then recheck.

THRUST SHIM 68 mm

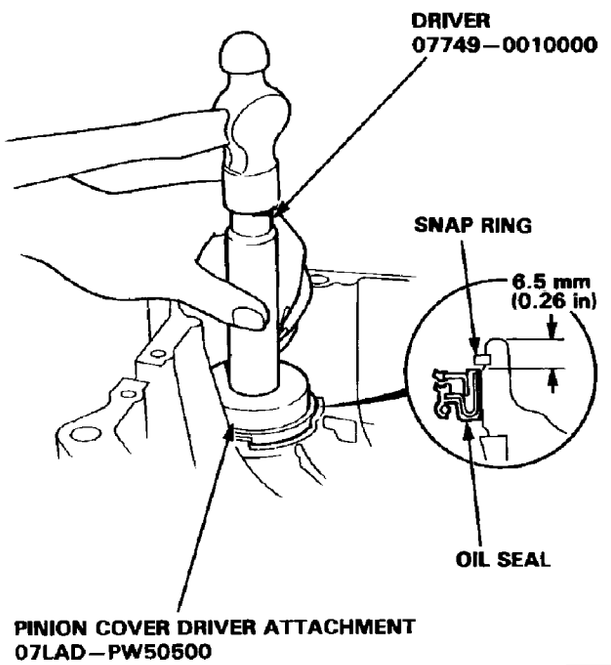
No.	Part Number	Thickness mm (in)
A	23941—PW5—000	1.56 (0.061)
B	23942—PW5—000	1.59 (0.063)
C	23943—PW5—000	1.62 (0.064)
D	23944—PW5—000	1.65 (0.065)
E	23945—PW5—000	1.68 (0.066)
F	23946—PW5—000	1.71 (0.067)
G	23947—PW5—000	1.74 (0.069)
H	23948—PW5—000	1.77 (0.070)
I	23949—PW5—000	1.80 (0.071)
J	23950—PW5—000	1.83 (0.072)
K	23951—PW5—000	1.86 (0.073)
L	23952—PW5—000	1.89 (0.074)
M	23953—PW5—000	1.92 (0.076)
N	23954—PW5—000	1.95 (0.077)
O	23955—PW5—000	1.98 (0.078)
P	23956—PW5—000	2.01 (0.079)
Q	23957—PW5—000	2.04 (0.080)
R	23958—PW5—000	2.07 (0.081)
S	23959—PW5—000	2.10 (0.083)
T	23960—PW5—000	2.13 (0.084)
U	23961—PW5—000	2.16 (0.085)
V	23962—PW5—000	2.19 (0.086)
W	23963—PW5—000	2.22 (0.087)
X	23964—PW5—000	2.25 (0.089)
Y	23965—PW5—000	2.28 (0.090)
Z	23966—PW5—000	2.31 (0.091)
AA	23967—PW5—000	2.34 (0.092)
AB	23968—PW5—000	2.37 (0.093)
AC	23969—PW5—000	2.40 (0.094)
AD	23970—PW5—000	2.43 (0.096)

1. Install the oil seal into the transmission housing, using the special tool.



2. Install the oil seal into the torque converter housing, using the special tools as shown.

3. Install the snap ring in the torque converter housing.



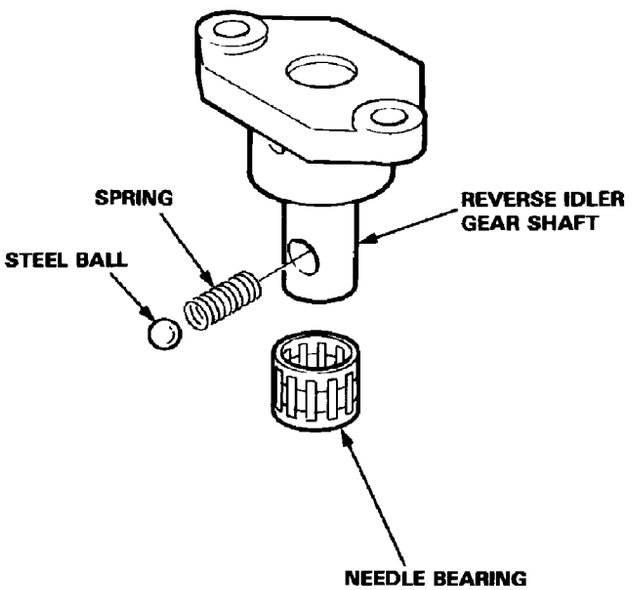
REVERSE IDLER GEAR

INSTALLATION

VIGOR

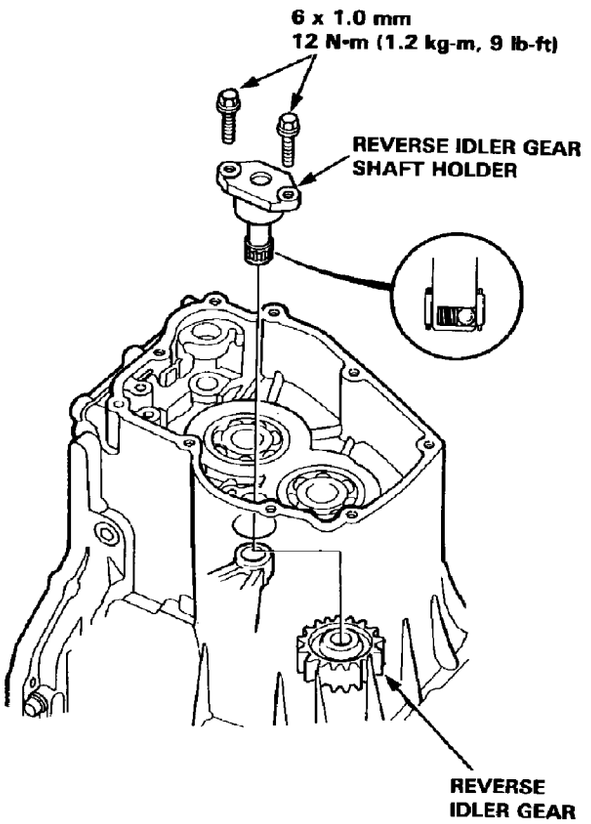
1. Set the spring in the reverse idler gear shaft. Push the spring in with the steel ball then install the needle bearing.

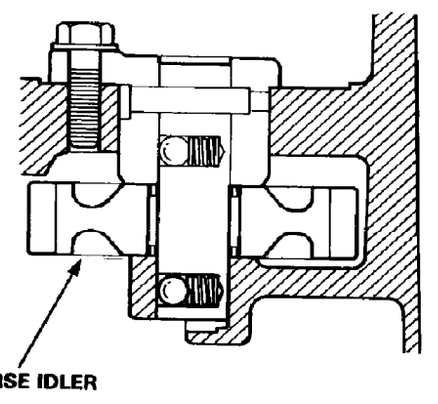
   NOTE: The steel ball is under spring pressure. Take care not to let it pop out.



2. Install the reverse idler gear.

3. Install the reverse idler gear shaft holder in the transmission housing, then tighten the bolts.



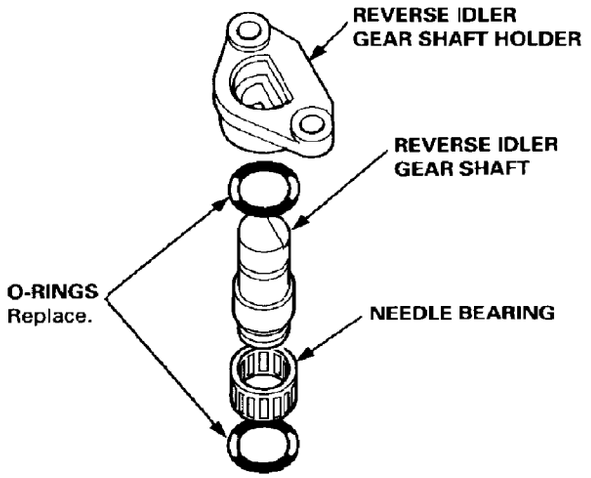


REVERSE IDLER GEAR

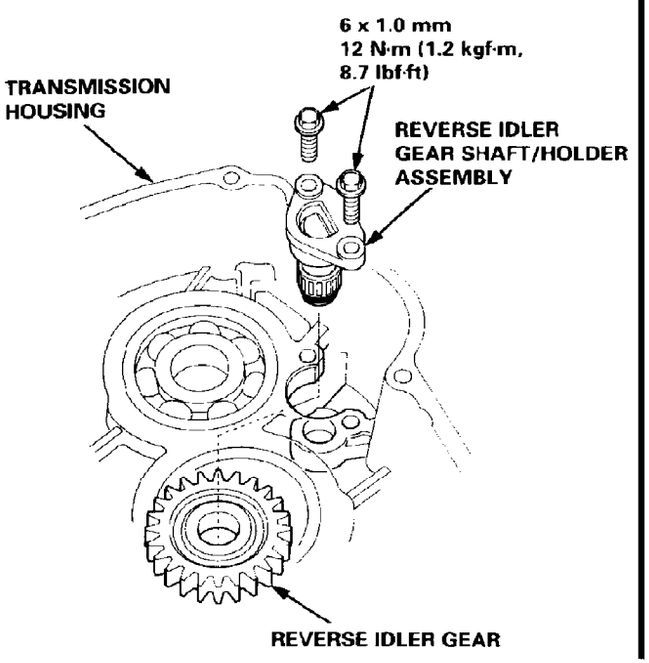
INSTALLATION

2.5TL

1. Coat the reverse idler gear shaft, needle bearing and new O-rings with lithium grease lightly.
2. Assemble new O-rings and needle bearing on the reverse idler gear shaft.
3. Install the reverse idler gear shaft in the reverse idler gear shaft holder, aligning the D-shaped cutout of the shaft with the D-shaped area of the holder.



4. Install the reverse idler gear into the transmission housing.
5. Install the reverse idler gear shaft holder assembly in the transmission housing, then tighten the bolts.



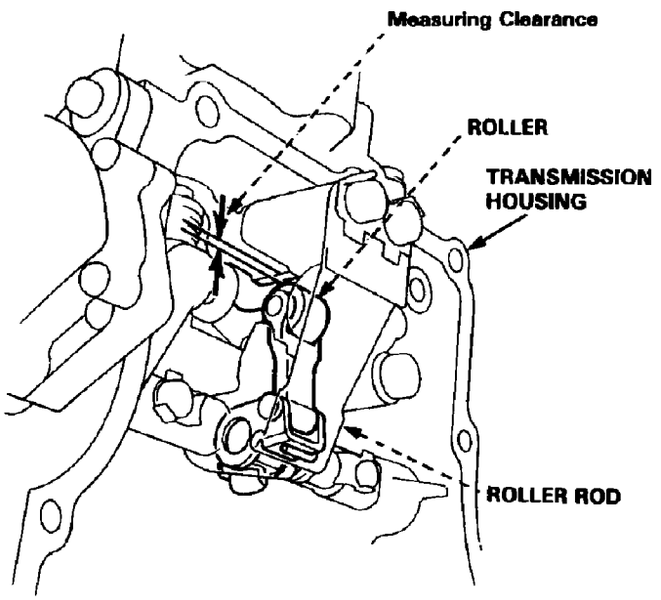
PARKING BRAKE ROLLER ROD

ADJUSTMENT

VIGOR

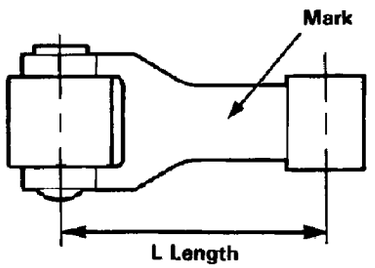
1. Move the detent lever to the [P] position.
2. Measure the clearance between the parking brake roller rod and the transmission housing as shown.

   STANDARD: 4.0—4.5 mm (0.157—0.177 in)



3. If the clearance is out of tolerance, select and install a new parking brake roller rod.

PARKING BRAKE ROLLER ROD



PARKING BRAKE ROLLER ROD

Mark	Part Number	Length "L"
1 or None	24550-PW7-010	36.0 mm (1.42 in)
2	24560-PW7-010	35.6 mm (1.40 in)
3	24580-PW7-010	36.4 mm (1.43 in)

4. After replacing the parking brake roller rod, make sure that the clearance is within tolerance.

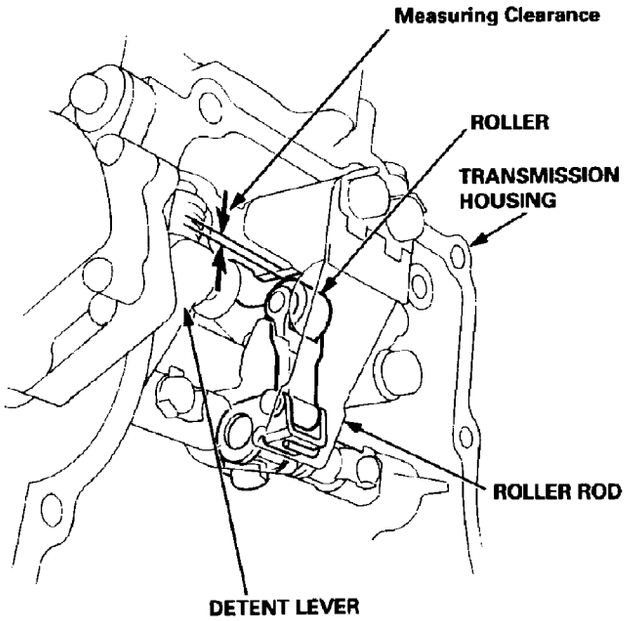
PARKING BRAKE ROLLER ROD

ADJUSTMENT

2.5TL

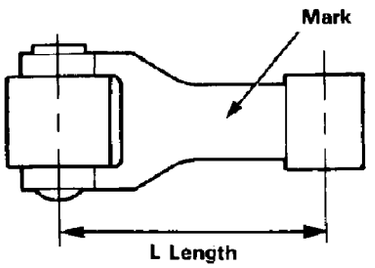
1. Move the detent lever to the [P] position.
2. Measure the clearance between the parking brake roller rod and the transmission housing as shown.

   STANDARD: 3.8 – 4.3 mm (0.15 – 0.17 in)



3. If the clearance is out of tolerance, select and install a new parking brake roller rod.

PARKING BRAKE ROLLER ROD



PARKING BRAKE ROLLER ROD

Mark	Part Number	Length "L"
1 or None	24550 – PW4 – 010	36.0 mm (1.417 in)
2	24560 – PW4 – 010	35.6 mm (1.402 in)
0	24580 – PW4 – 010	36.4 mm (1.433 in)
3	24590 – PW4 – 000	36.2 mm (1.425 in)

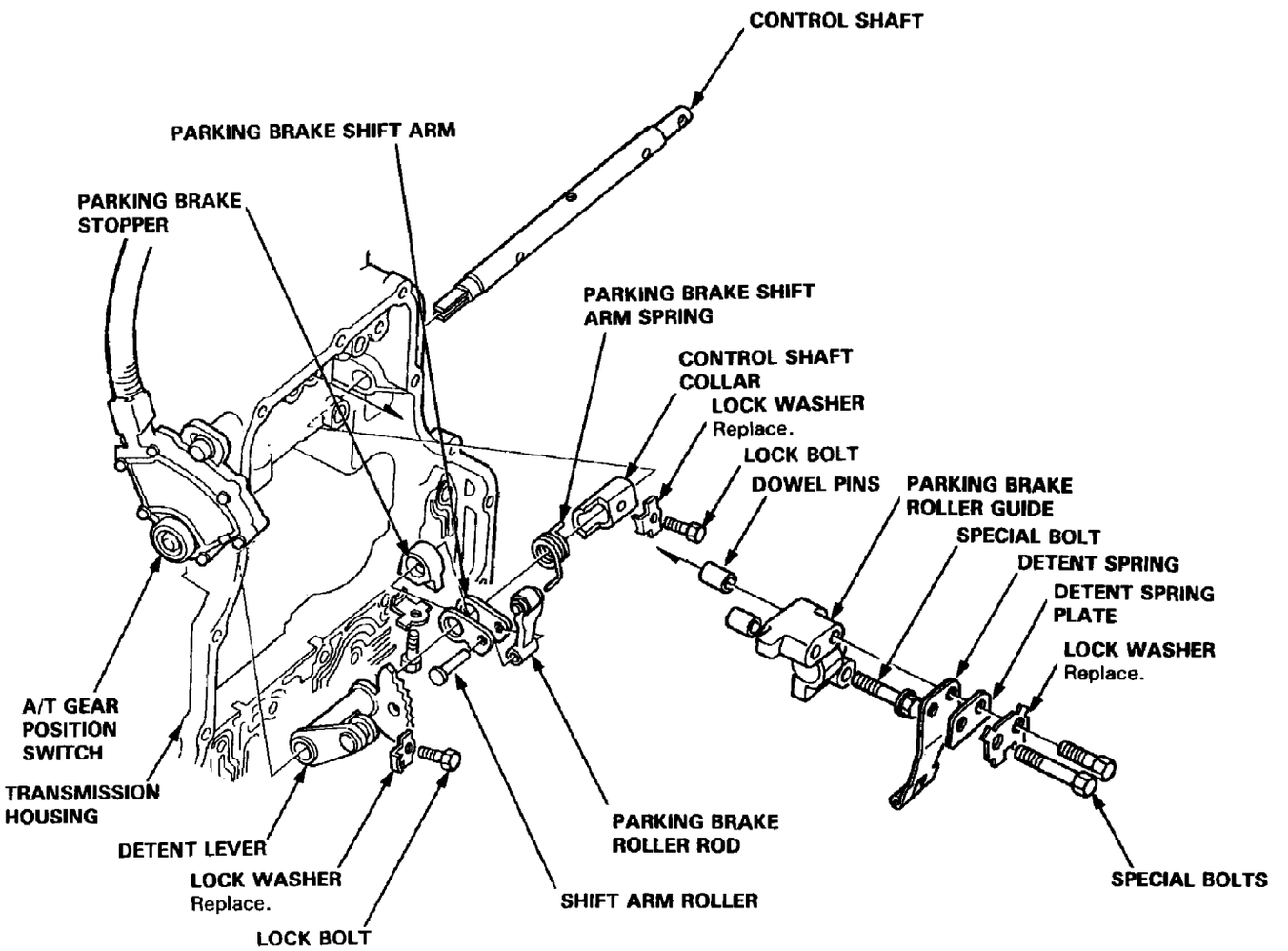
4. After replacing the parking brake roller rod, make sure that the clearance is within tolerance.

INTERNAL LINKAGE

DISASSEMBLY

NOTE: It is necessary to disassemble that the control shaft and/or detent spring maintenance is required.

1. Remove the two special bolts, lock washer, detent spring plate and detent spring.
2. Remove the special bolt securing the parking brake roller guide then remove the parking brake roller guide with two dowel pins from the transmission housing.
3. Remove the three lock bolts with lock washers from the control shaft.
4. Pull the control shaft and remove the detent lever, shift arm roller, parking brake stopper, parking brake shift arm, parking brake roller rod, parking brake shift arm spring and control shaft collar.



INTERNAL LINKAGE

REASSEMBLY

NOTE:
- Coat all parts with ATF.
- Replace the lock washers.

1. Insert the control shaft into the torque converter housing, and install the control shaft collar and parking brake shift arm spring on the control shaft.

2. Set the parking brake shift arm with the parking brake stopper then insert the control shaft into the hole of the parking brake shift arm/parking brake stopper assembly.

3. Install the parking brake roller rod with the shift arm roller on the parking brake shift arm, then install the detent lever on the control shaft.

   CAUTION:
   - **Install the parking brake roller rod with the rivets facing the detent lever.**
   - **Install the shift arm roller with its flange side facing the detent lever.**

4. Align the cutout of the control shaft with the A/T gear position switch, then insert the control shaft in the A/T gear position switch.

5. Install the lock bolts with new lock washers on the control shaft, and tighten the bolts. Then bend the lock washers against the bolt head.

6. Move the detent lever to other than [P] position.

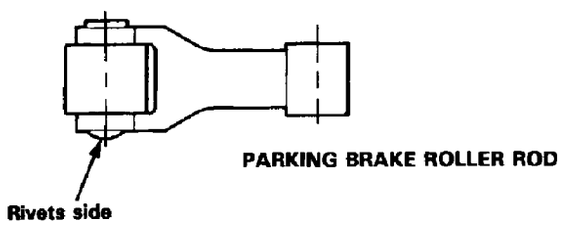
   CAUTION: If the detent lever is in [P] position when installing the detent spring; you may damage the parking brake roller guide.

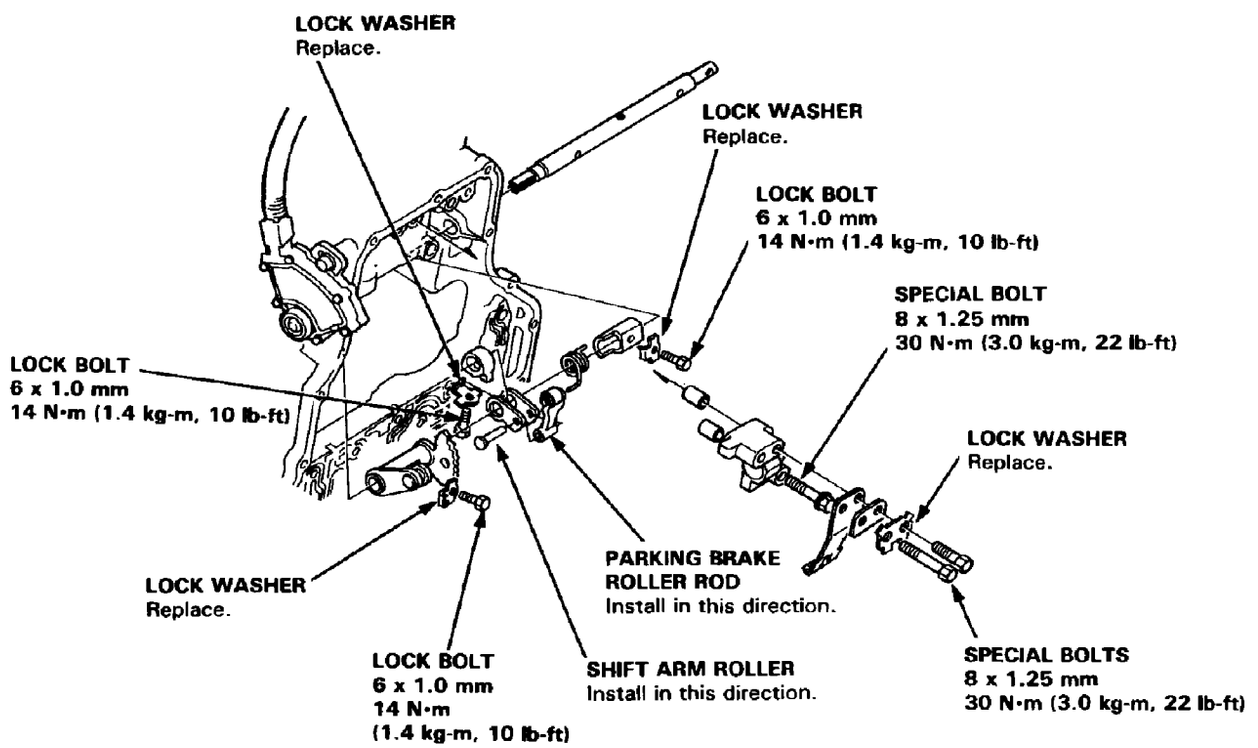
7. Install the parking brake roller guide on the transmission housing with the two dowel pins and the special bolt.

8. Install the detent spring, detent spring plate, lock washer and the two special bolts.

9. Tighten the bolts then bend the lock washer.

   TORQUE: 30 N·m (3.0 kg-m, 22 lb-ft)



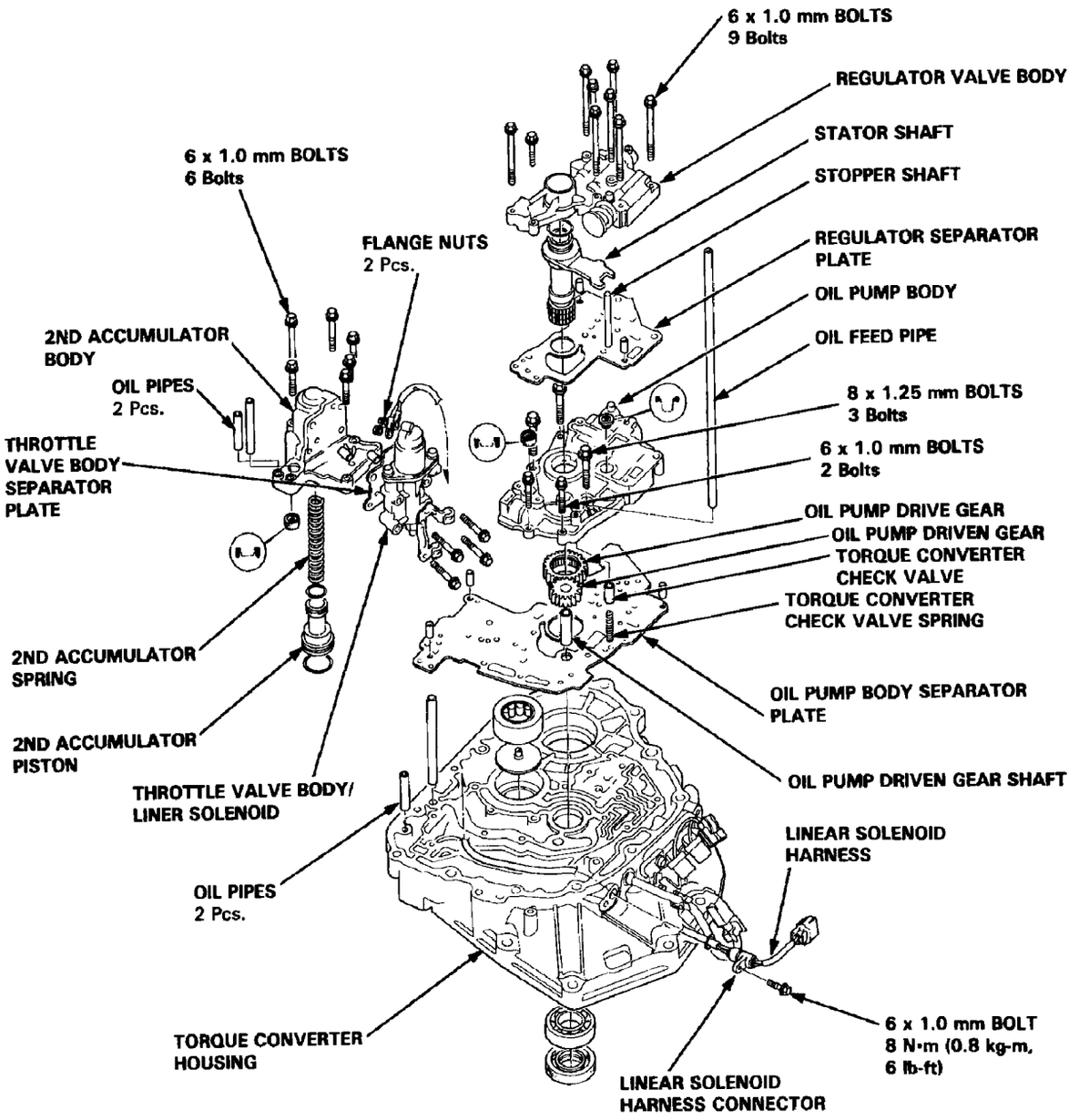


TRANSMISSION

REASSEMBLY

NOTE:
- Coat all parts with ATF.
- Replace parts below:
  - O-rings
  - Lock washers
  - Gaskets
  - Mainshaft and countershaft locknuts and disc springs
  - Sealing washers

TORQUE:
- **6 x 1.0 mm Bolts: 12 N·m (1.2 kg-m, 9 lb-ft)**
- **8 x 1.25 mm Bolts: 18 N·m (1.8 kg-m, 13 lb-ft)**
- **5 x 0.8 mm Flange nuts: 6 N·m (0.6 kg-m, 4 lb-ft)**



TRANSMISSION

REASSEMBLY

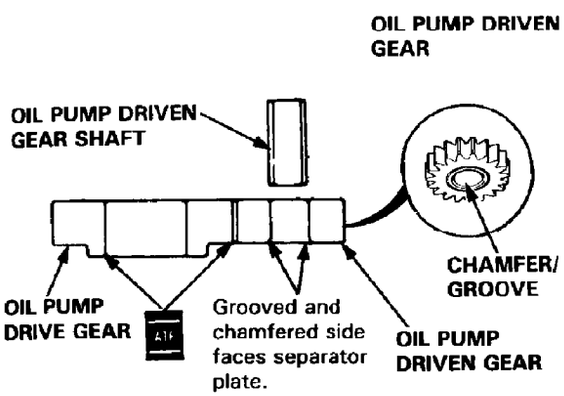
1. Install the linear solenoid harness and linear solenoid harness connector into the torque converter housing.

2. Install the oil pump body separator plate with three dowel pins on the torque converter housing.

   CAUTION: Take care not to pinch the linear solenoid harness.

3. Install the oil pump drive gear, oil pump driven gear, oil pump driven gear shaft, torque converter check valve, and spring on the torque converter housing.

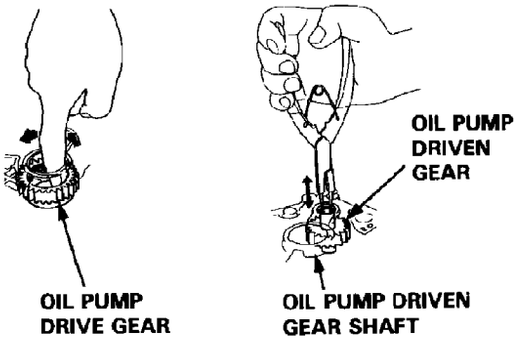
   NOTE: Install the oil pump driven gear with its grooved and chamfered side facing down.



4. Install the oil pump body with three 8 mm bolts and two 6 mm bolts. Make sure the oil pump drive gear rotates smoothly in the normal operating direction and the oil pump driven gear shaft moves smoothly in the axial and normal operating directions.

5. If the oil pump drive gear and oil pump driven gear shaft do not move freely, loosen the oil pump body bolts, realign the oil pump driven gear shaft, and then retighten to the specified torque.

   CAUTION: Failure to align the oil pump driven gear shaft correctly will result in seized oil pump gears and oil pump driven gear shaft.



6. Install the throttle valve body/linear solenoid on the 2nd accumulator body with two dowel pins, throttle valve body separator plate, harness clamp and four bolts.

7. Install the 2nd accumulator piston and 2nd accumulator spring in the 2nd accumulator body, then install the 2nd accumulator body on the torque converter housing with six bolts.

8. Install the regulator separtor plate on the oil pump body with two dowel pins.

9. Install the stator shaft with a new O-ring and stopper shaft.

10. Install the regulator valve body with nine bolts.

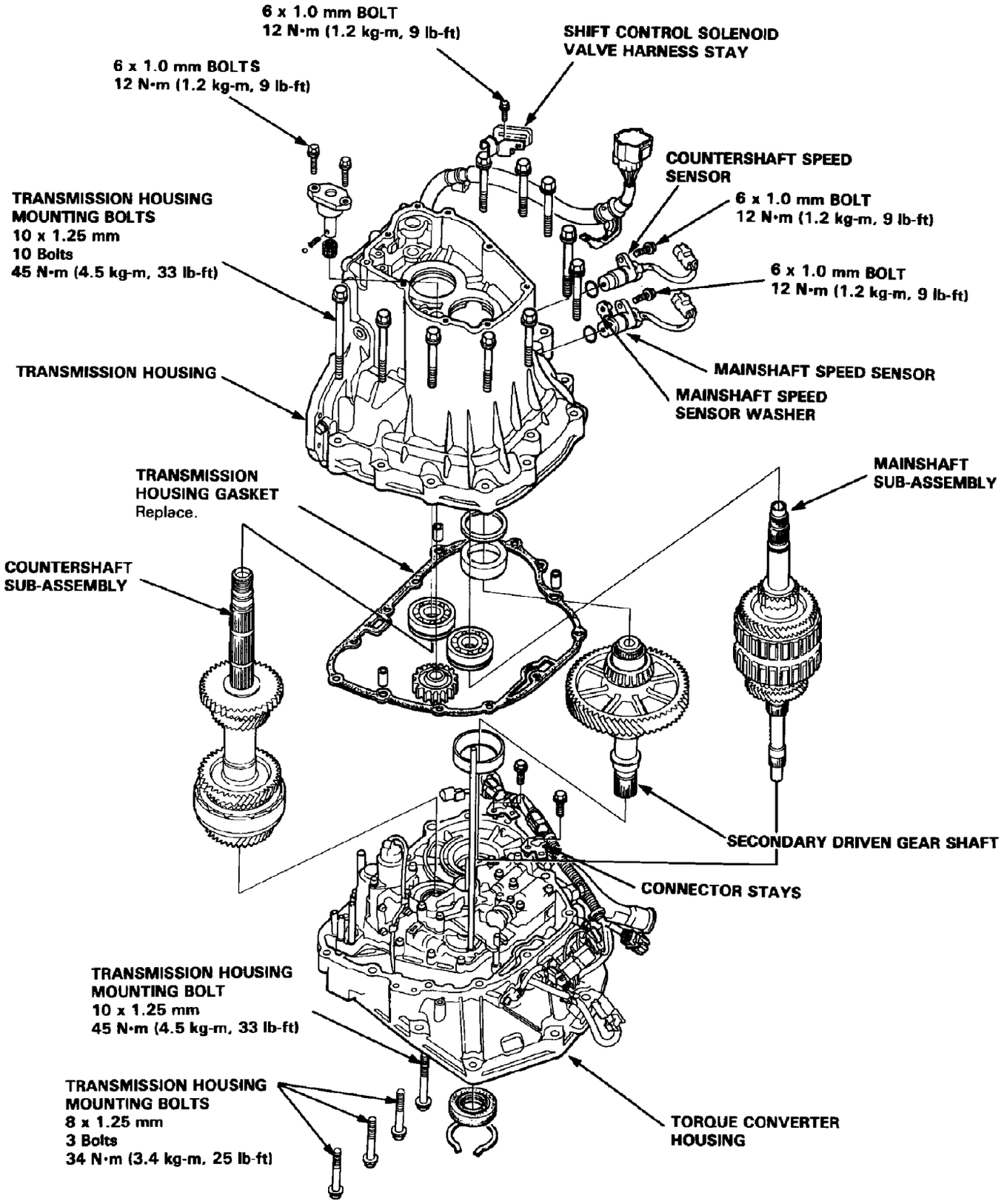
11. Connect the linear solenoid harness to the linear solenoid terminal, then tighten the flange nuts to 6 N·m (0.6 kg-m, 4 lb-ft).

12. Tighten the linear solenoid harness connector bolt to 8 N·m (0.8 kg-m, 6 lb-ft).

13. Install the oil feed pipe in the oil pump body, two oil pipes in the torque converter housing, and two oil pipes in the 2nd accumulator body.

TRANSMISSION

REASSEMBLY



TRANSMISSION

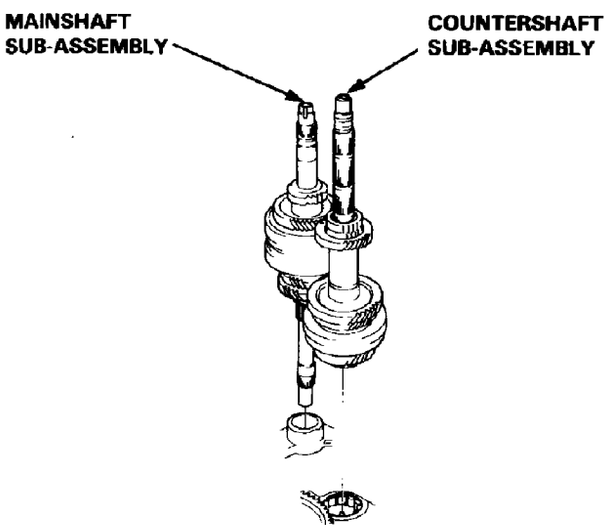
REASSEMBLY

14. Install the reverse idler gear and reverse idler gear shaft holder in the transmission housing.

15. Install the secondary driven gear shaft in the torque converter housing.

16. Install the mainshaft sub-assembly and countershaft sub-assembly together in the torque converter housing.

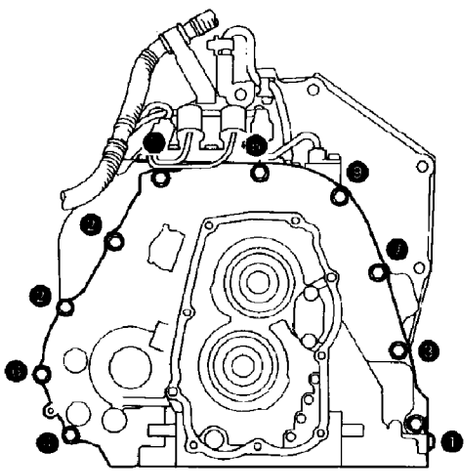
17. Install three dowel pins and a new gasket on the torque converter housing.



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

CAUTION: Make sure that the mainshaft and countershaft speed sensors are not installed on the transmission housing before installing the transmission housing on the torque converter housing.

19. Install the ten transmission housing bolts and tighten to the 45 N·m (4.5 kg-m, 33 lb-ft) in two or more steps in the pattern as shown.



20. Install the 10 mm bolt and three 8 mm bolts to the transmission housing from the torque converter housing to specified torque.

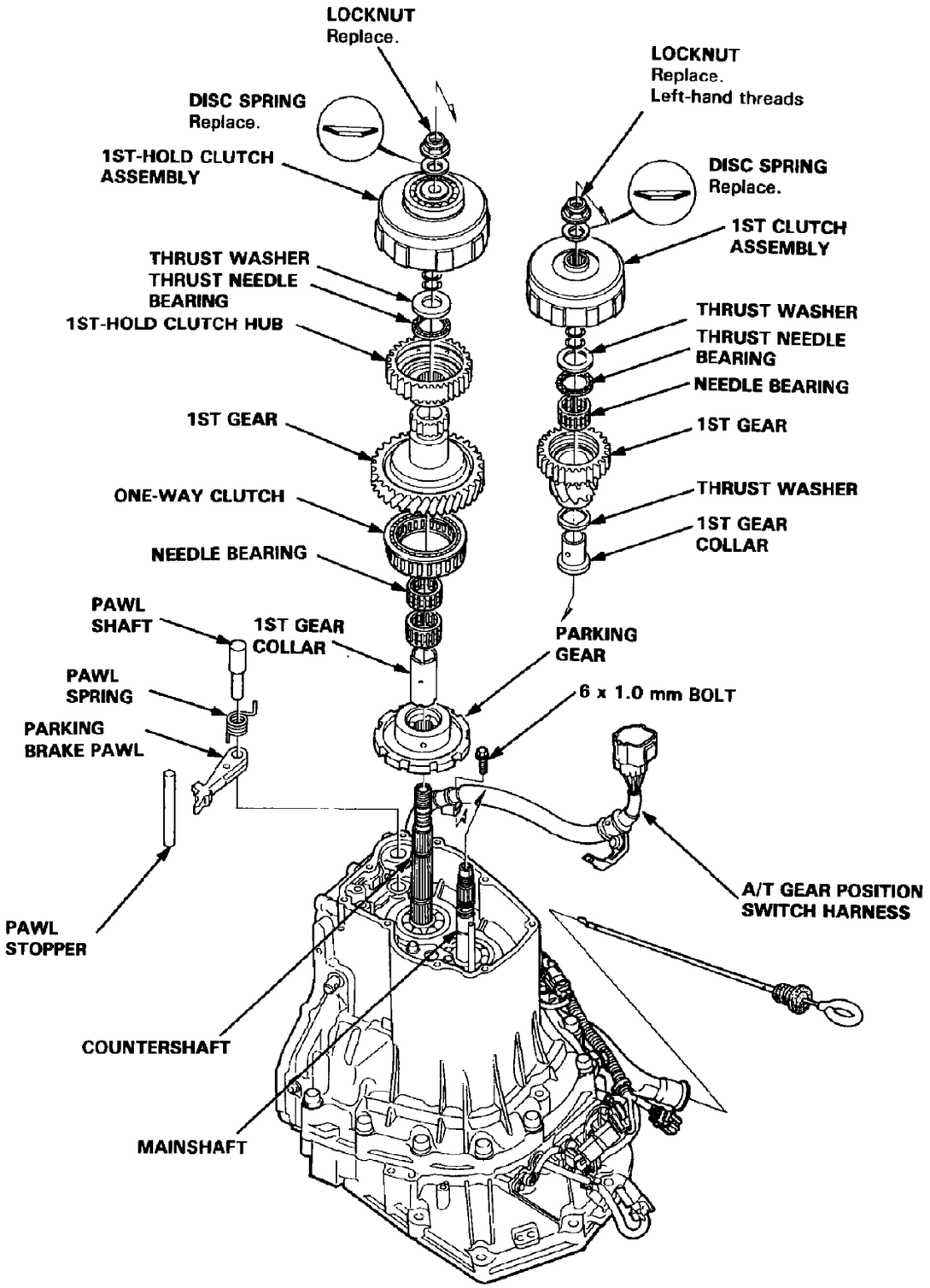
TORQUE:
10 mm Bolt 45 N·m (4.5 kg-m, 33 lb-ft)
8 mm Bolts 34 N·m (3.4 kg-m, 25 lb-ft)

21. Install the mainshaft speed sensor with the mainshaft speed sensor washer and the countershaft speed sensor in the transmission housing.

NOTE: Countershaft speed sensor does not have a washer.

TRANSMISSION

REASSEMBLY



TRANSMISSION

REASSEMBLY

22. Install the mainshaft 1st gear collar and thrust washer on the mainshaft.

23. Install the parking gear, countershaft 1st gear collar and needle bearings on the countershaft.

24. Assemble the one-way in countershaft 1st gear, then install them on the countershaft.

25. Install new O-rings on the mainshaft and countershaft.

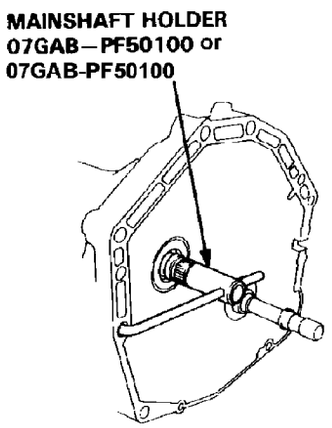
    NOTE: Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

26. Install the thrust washer, thrust needle bearing, needle bearing and mainshaft 1st gear in the 1st clutch assembly, then install them on the mainshaft.

27. Install the thrust washer, thrust needle bearing and 1st-hold clutch hub in the 1st-hold clutch assembly, then install them on the countershaft.

28. Install the parking brake pawl and spring on the transmission housing. Align the holes of the pawl and spring with the transmission housing, then install the parking brake pawl shaft. And install the parking brake pawl stopper.

29. Install the special tool onto the mainshaft as shown, then engage the parking brake pawl with the parking gear.



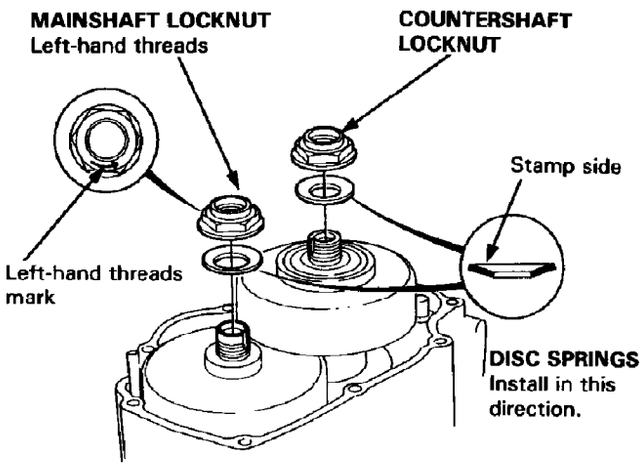
30. Install new locknuts with disc springs on the mainshaft and countershaft.

    NOTE:
    - Install the disc spring so that the stamp side on it faces the locknut as shown.
    - Coat the disc springs with ATF before installing them.

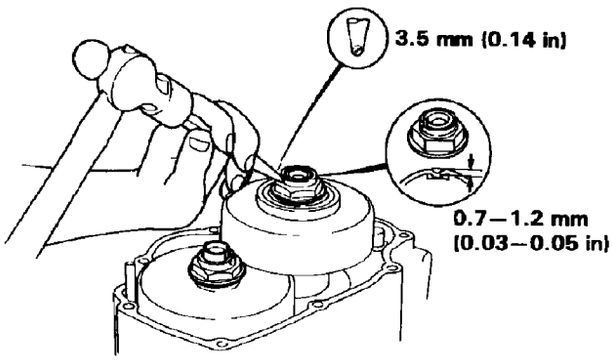
31. Tighten the locknuts to specified torque.

    TORQUE: 140 N·m (14.0 kg-m, 101 lb-ft)

    NOTE: Mainshaft locknut has left-hand threads.



32. Stake each locknut into its shaft using a 3.5 mm (0.14 in) punch.



TRANSMISSION

REASSEMBLY

33. Assemble the lower valve body assembly

34. Shift the control shaft to [P] position by turning the detent lever.

35. Push the shift fork on the lower valve body assembly to drive position in the direction as shown.

36. Pass the shift control solenoid valve harness through the transmission housing, and put the manual valve and detent lever together. Then put the shift fork and reverse selector together before installing the lower valve body.

37. Install the lower valve body assembly with two dowel pins and eight bolts in the transmission housing.

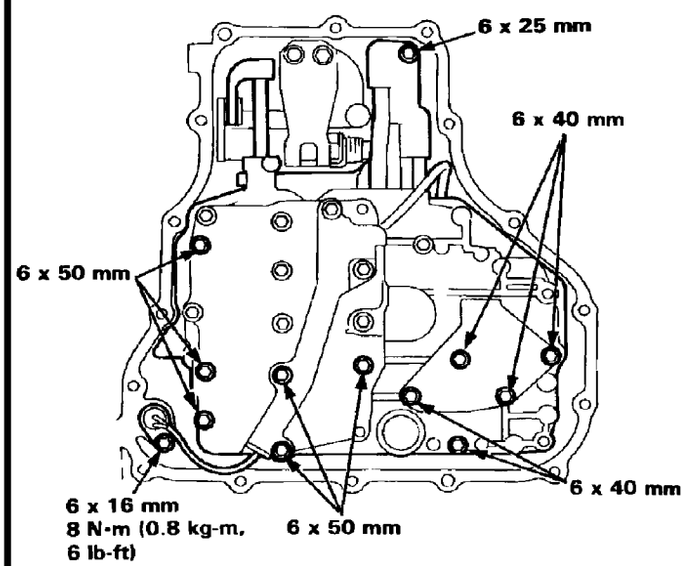
    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

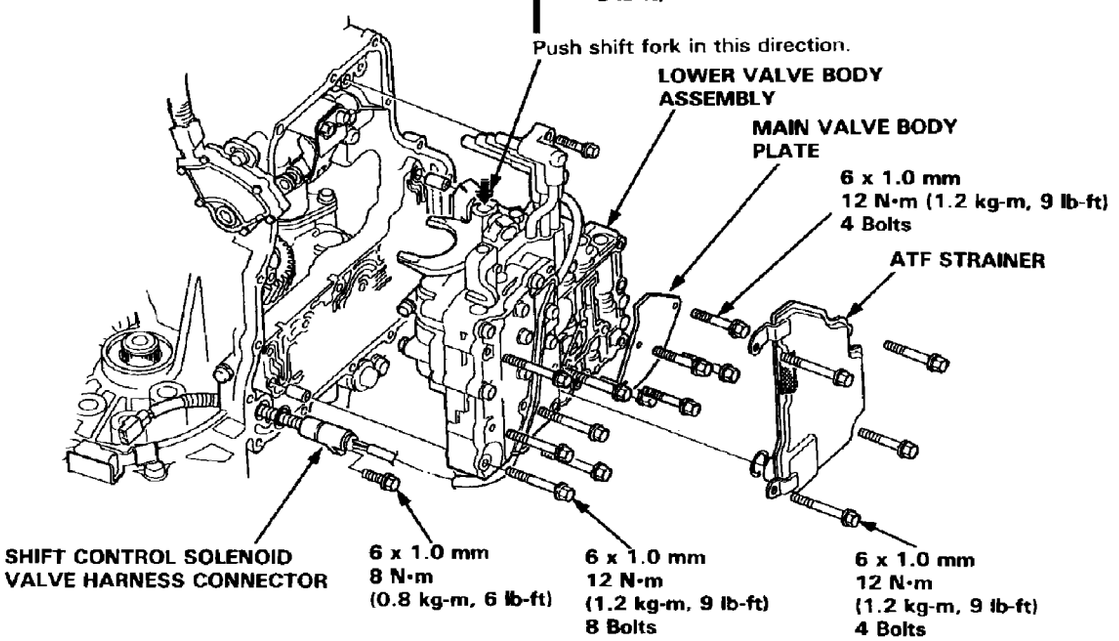
38. Install the main valve body plate on the lower valve body assembly with four bolts.

    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

39. Install the shift control solenoid valve harness connector with the bolt.

    TORQUE: 8 N·m (0.8 kg-m, 6 lb-ft)





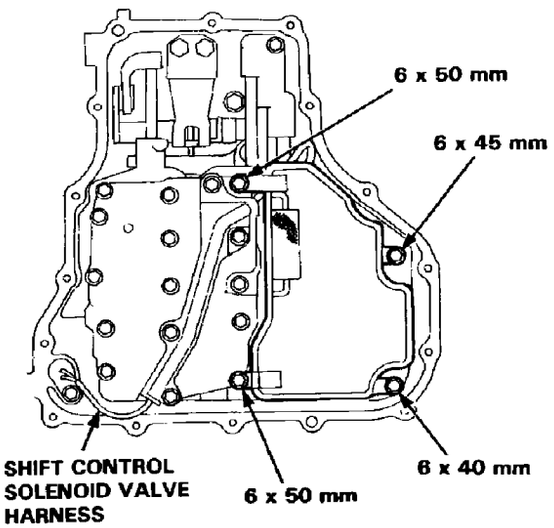
TRANSMISSION

REASSEMBLY

40. Install the ATF strainer on the lower valve body assembly with four bolts.

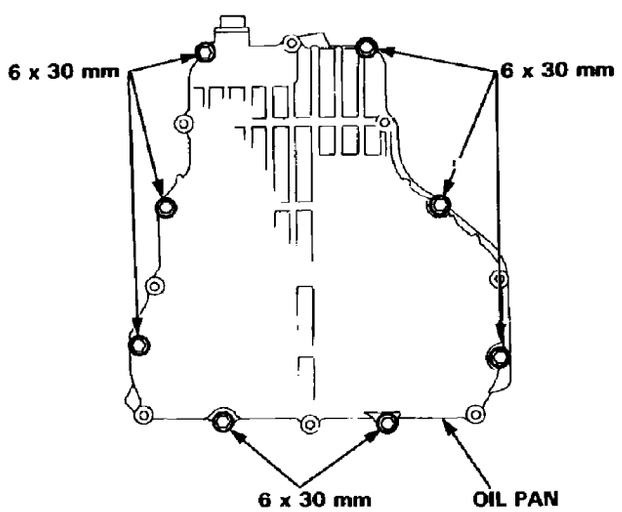
    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

41. Lightly pull the shift control solenoid valve harness from the harness cover, then bring the shift control solenoid valve harness back. Make sure that the shift control solenoid valve harness is not pinched. If the shift control solenoid valve harness is pinched, loosen four bolts securing the harness cover then retighten the bolts.



42. Install the oil pan with new oil pan gasket, two dowel pins and eight bolts on the transmission housing.

    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)



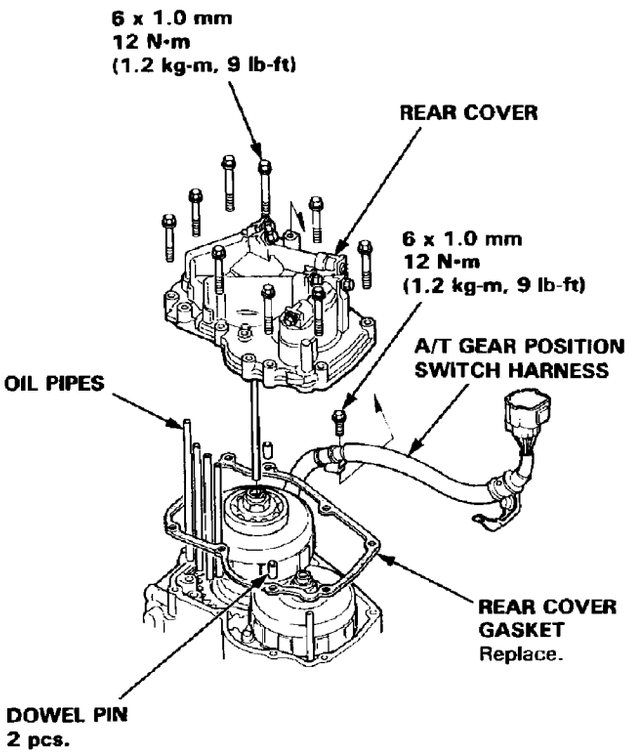
43. Install four oil pipes in the transmission housing.

44. Install the rear cover with new rear cover gasket, two dowel pins and nine bolts on the transmission housing.

    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

45. Install the A/T gear position switch harness clamp then tighten the bolt.

    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)



46. Install the ATF cooler pipes with new sealing washers and tighten the joint bolts.

    TORQUE: 29 N·m (2.9 kg-m, 21 lb-ft)

47. Install the ATF level gauge pipe with new O-ring and the bolt.

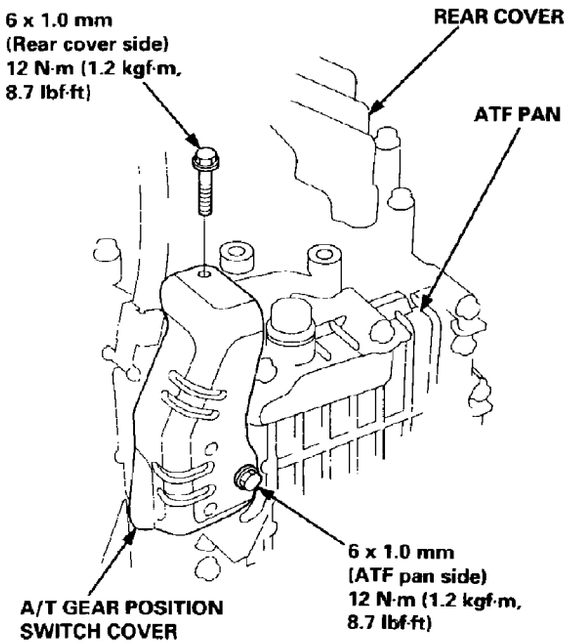
    TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)

48. Install the connector stays with the bolts, then connect the shift control solenoid valve connector, mainshaft speed sensor connector, countershaft speed sensor connector and linear solenoid connector to the transmission sub-harness securely.

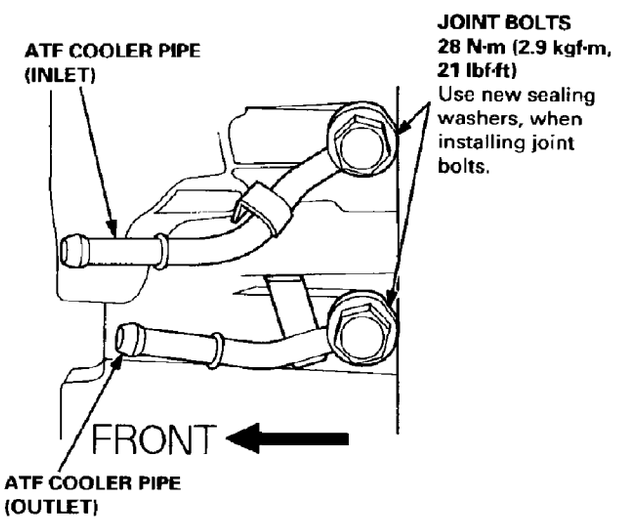
TRANSMISSION

REASSEMBLY

49. Install the A/T gear position switch cover. Tighten the bolt on the ATF pan side loosely so that there is no clearance between the A/T gear position switch cover and the ATF pan. Then tighten the bolt on the rear side cover side to the specified torque, and tighten the bolt on the ATF pan side to the specified torque.



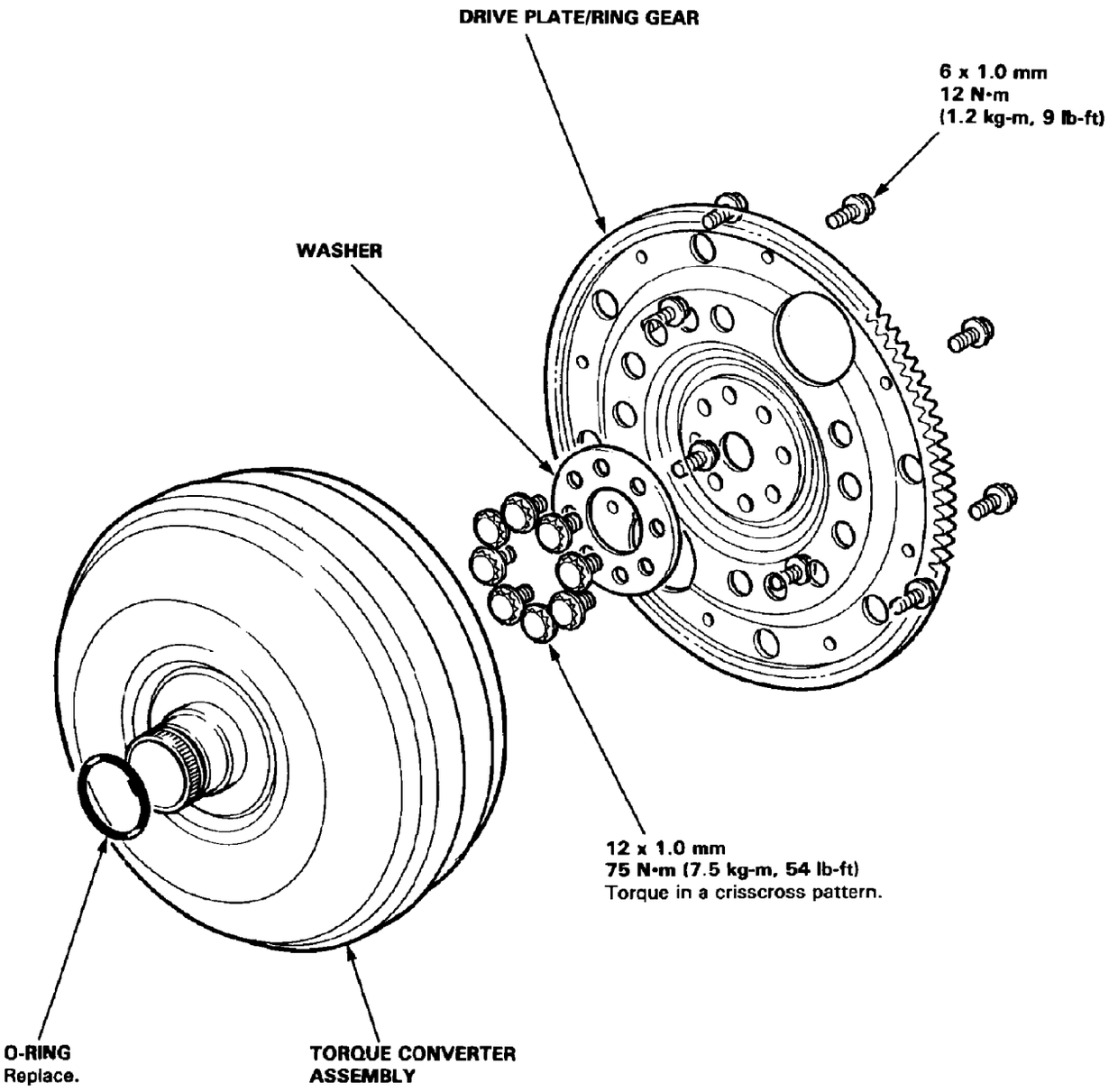
50. Install the ATF cooler pipes on the transmission housing, if necessary.



51. Install the ATF dipstick.

52. Connect the connectors, and install them on the connector brackets and connector holder.

TORQUE CONVERTER/FLYWHEEL

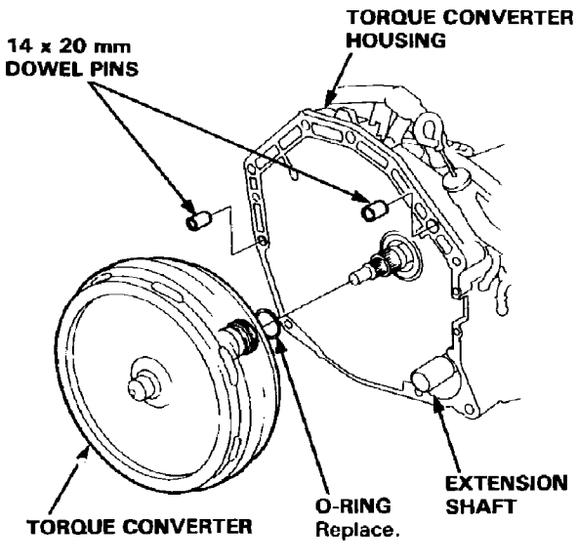


TRANSMISSION

INSTALLATION

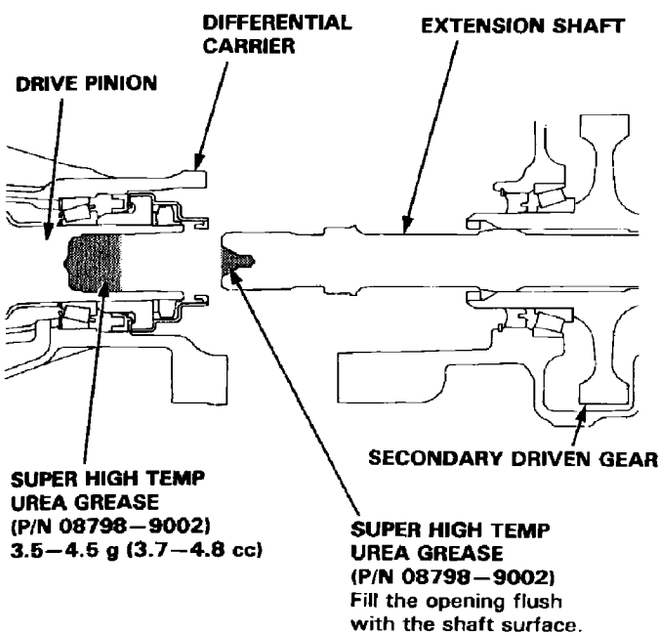
1. Flush the ATF cooler.

2. Install the torque converter with a new O-ring and two 14 x 20 mm dowel pins in the torque converter housing.



3. Set the extension shaft, apply Super High Temp Urea Grease (P/N 08798—9002) to the shaft splines.

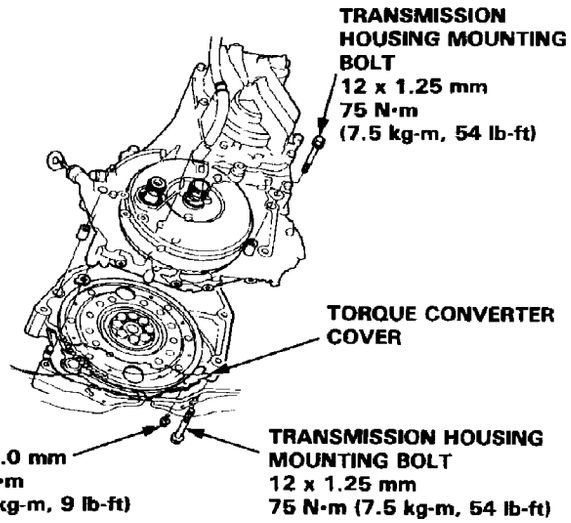
4. Fill the opening of the drive pinion and extension shaft with Super High Temp Urea Grease (P/N 08798—9002), as shown.



5. Place the transmission on a transmission jack, and raise to the engine level.

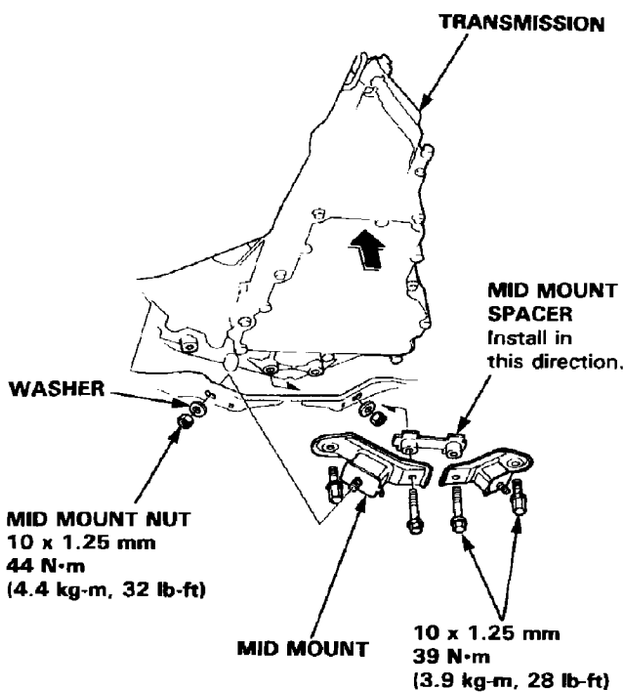
6. Install the transmission housing mounting bolts.

7. Install the torque converter cover mounting bolt on the torque converter housing side.



8. Install the mid mount spacer and mid mounts.

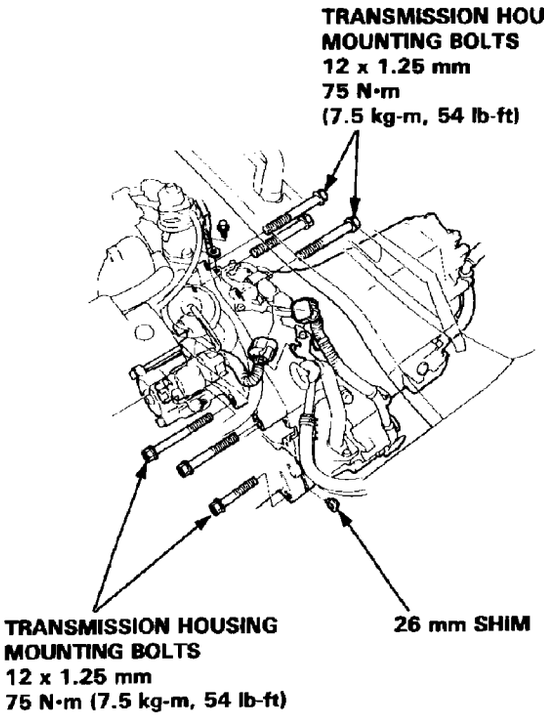
9. Install the mid mount nuts.



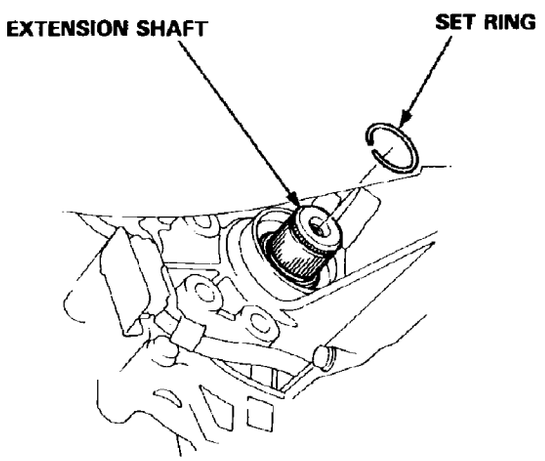
TRANSMISSION

INSTALLATION

10. Install the transmission housing mounting bolts and 26 mm shim.



11. Install a new set ring in the extension shaft groove.

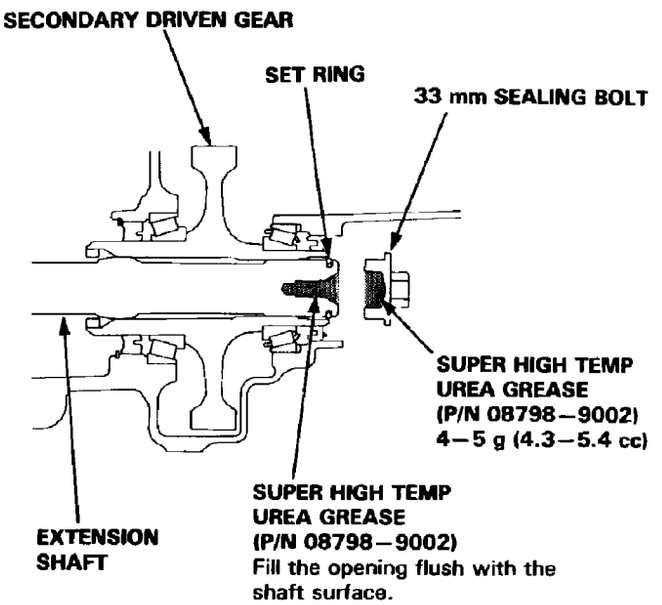


12. Fill the opening of the extension shaft and 33 mm sealing bolt with Super High Temp Urea Grease (P/N 08798—9002), as shown.

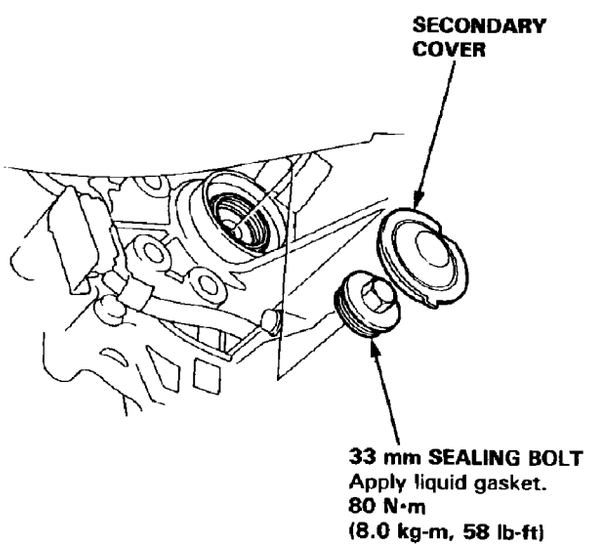
13. Apply liquid gasket (P/N 08718—0001) to the 33 mm sealing bolt threads.

14. Install the extension shaft.

15. Shift to [P] position by rotating the control shaft.



16. Install the 33 mm sealing bolt and secondary cover on the transmission housing.



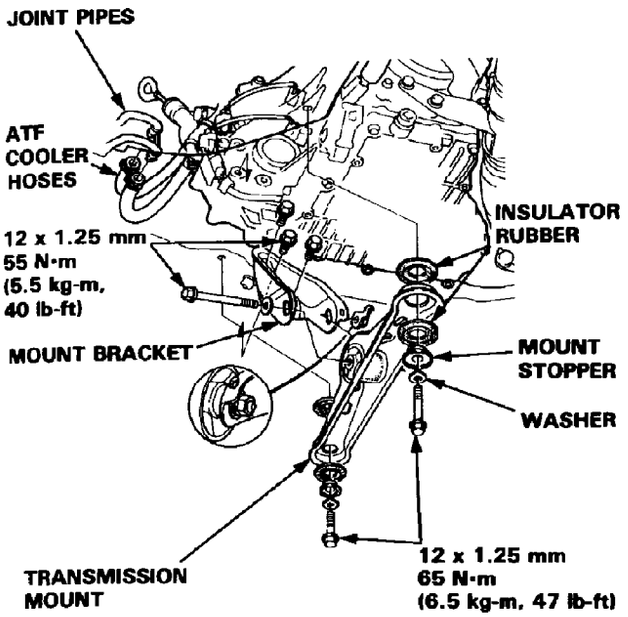
TRANSMISSION

INSTALLATION

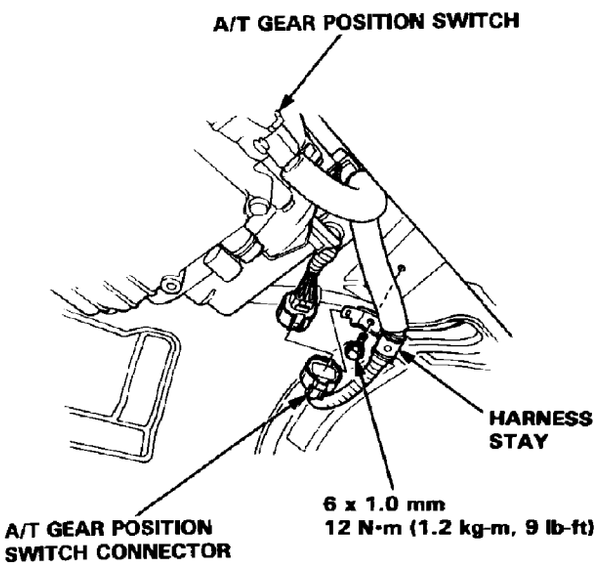
17. Connect the ATF cooler hoses to the joint pipes.

    NOTE: Flush the ATF cooler before connecting the cooler hoses.

18. Install the transmission mount bracket and mount.



19. Install the A/T gear position switch harness stay, then connect the A/T gear position switch connector.



20. Install the shift cable holder on the transmission housing.

21. Install the control lever with a new lock washer to the control shaft.

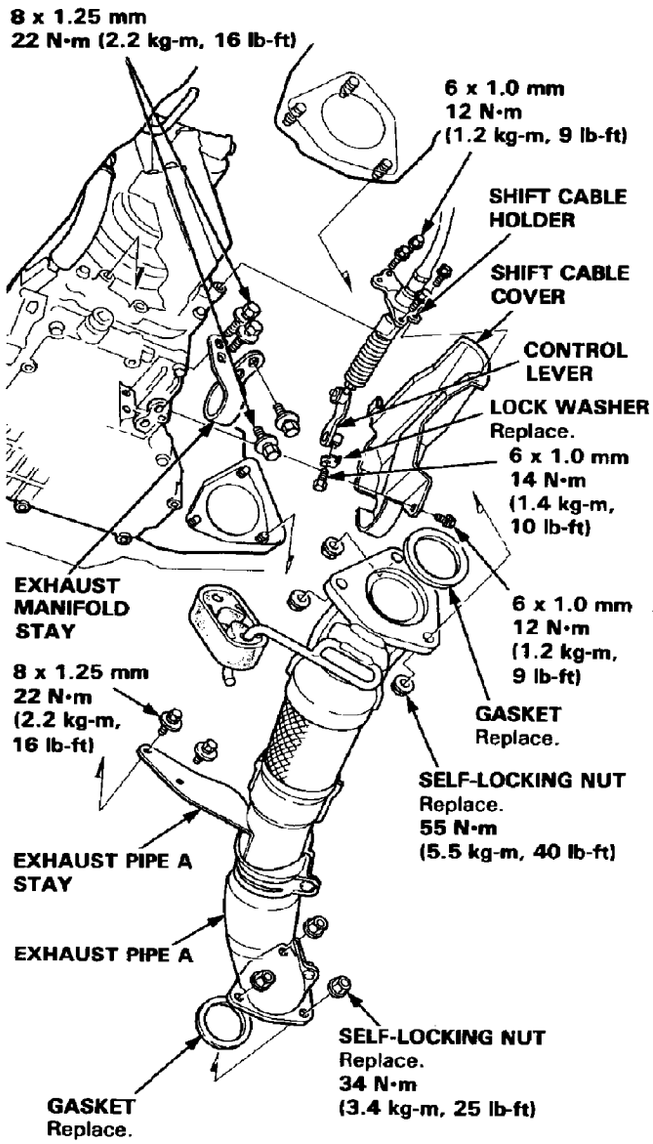
    CAUTION: Take care not to bend the shift cable.

22. Install the shift cable cover.

23. Install the exhaust manifold stay.

24. Install the exhaust pipe A.

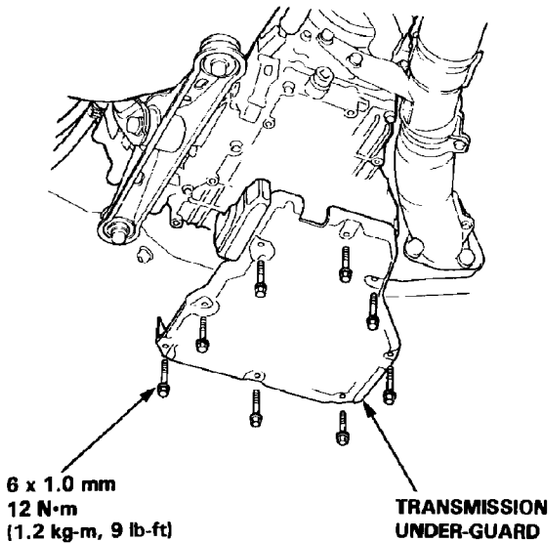
25. Install the two bolts of the exhaust pipe A stay to the transmission rear cover.



TRANSMISSION

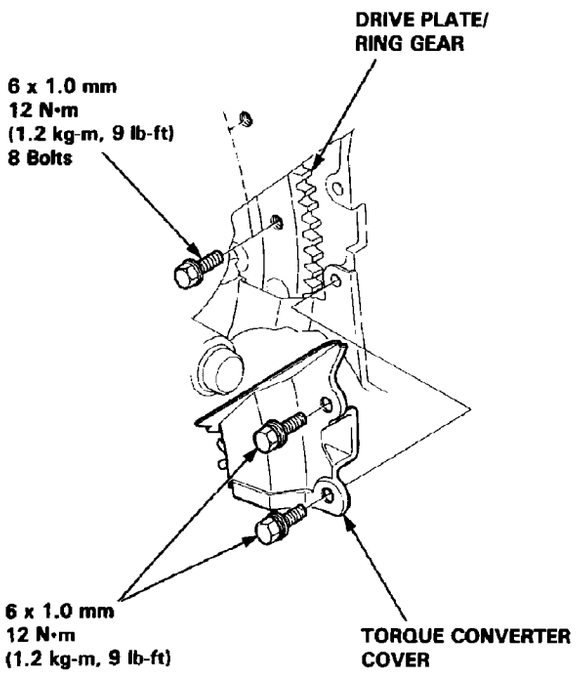
INSTALLATION

26. Install the transmission under-guard.



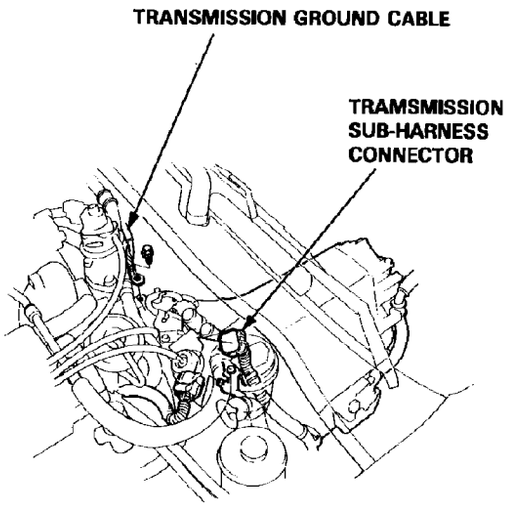
27. Attach the torque converter to the drive plate with eight bolts and torque to 12 N•m (1.2 kg-m, 9lb-ft). Rotate the crankshaft as necessary to tighten the bolts to 1/2 of the specified torque, then final torque, in a criss-cross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

28. Install the torque converter cover.



29. Install the transmission ground cable.

30. Connect the transmission sub-harness connector.

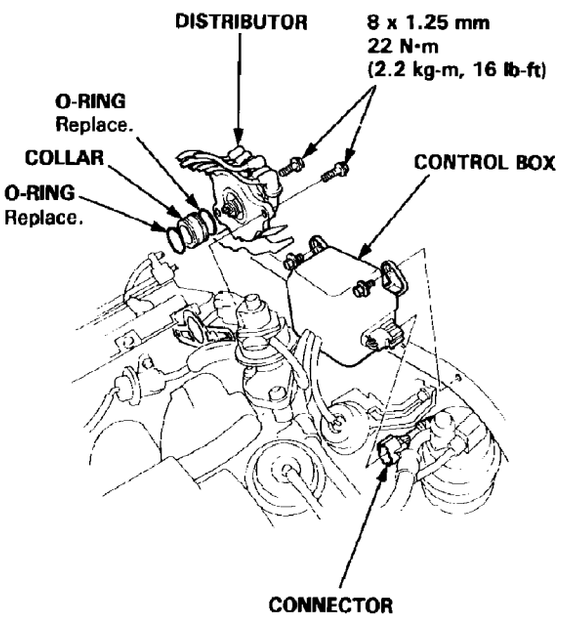


31. Install the control box, then connect the connector.

32. Install the collar with new O-rings in the distributor.

CAUTION: Do not install the collar in the cylinder head.

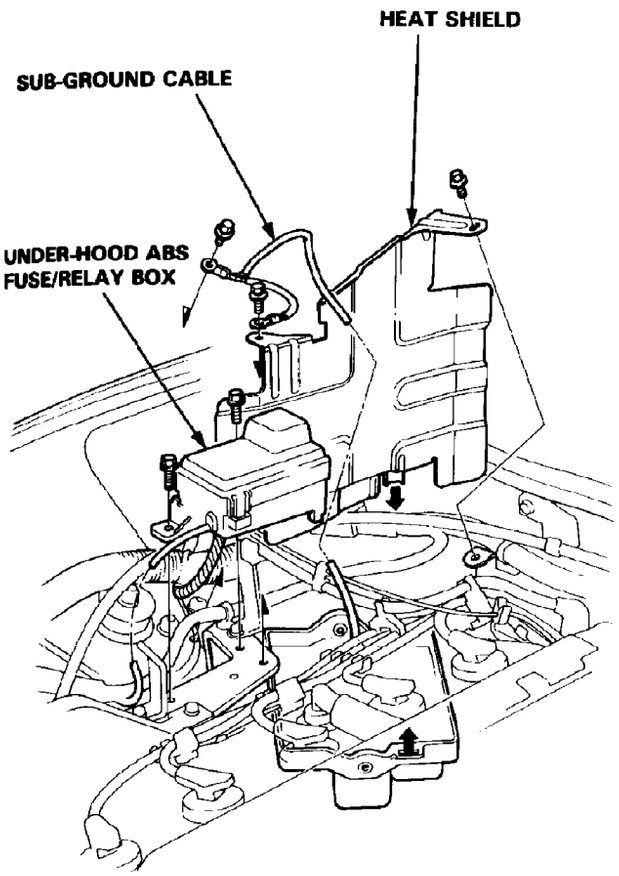
33. Install the distributor to the cylinder head.



TRANSMISSION

INSTALLATION

34. Install the heat shield.
35. Install the sub-ground cable.
36. Install the under-hood ABS fuse/relay box.
37. Install the battery with the battery box.
38. Install the battery set plate.



39. Refill the transmission with ATF
40. Connect the battery positive (+) and negative (−) cables to the battery.
41. Check the ignition timing. (Refer to a tune-up manual)
42. Start the engine. Set the parking brake, and shift the transmission through all gears three times. Check for proper shift cable adjustment.
43. Let the engine reach normal operating temperature (the radiator fan comes on) with the transmission in [N] or [P] position, then turn it off and check fluid level.
44. Road test.
45. Reset the radio stations.

COOLER FLUSHING

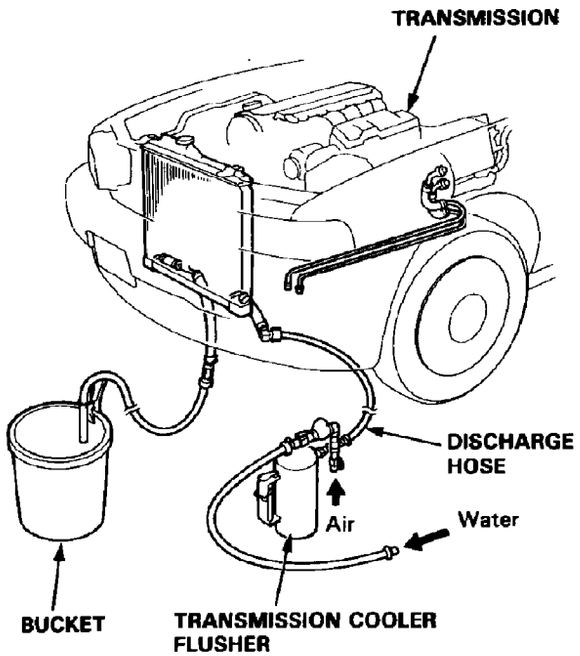
⚠WARNING To prevent injury to face and eyes, always wear safety glasses or a face shield when using the transmission flusher.

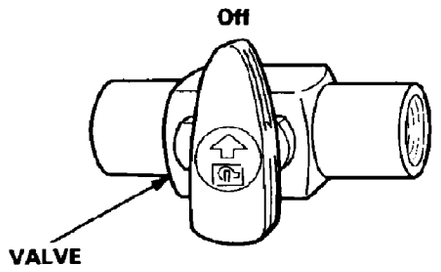
NOTE: This procedure should be performed before reinstalling the transmission.

1. Check tool and hoses for wear or cracks before using. If wear or cracks are found, replace the hoses before using.
2. Secure the flusher filler cap and pressurize the tank with compressed air to between 560—845 kPa (5.6—8.45 kg/cm², 80—120 psi).

   NOTE: The air line should be equipped with a water trap to ensure a dry air system.
3. Hang the tool under the vehicle.
4. Attach the discharge hose of the tank to the return line of the transmission cooler using a clamp.
5. Connect the drain hose to the inlet line of the transmission cooler using a clamp.

   IMPORTANT: Securely clamp the opposite end of the drain hose to a bucket or floor drain.
6. With the water and air valves off, attach the water and air supplies to the flusher. (Hot water if available.)





7. Turn on the flusher water valve so water will flow through the oil cooler for 10 seconds.

   NOTE: If water does not flow through the oil cooler it is completely plugged, cannot be flushed, and must be replaced.
8. Depress the trigger to mix the flushing fluid into the water flow. Use the wire clip to hold the trigger down.
9. While flushing with the water and flushing fluid for 2 minutes, turn the air valve on for 5 seconds every 15—20 seconds to create a surging action.
   AIR PRESSURE:
   MAX 845 kPa (8.45 kg/cm², 120 psi)
10. Turn the water valve off. Release the trigger, then reverse the hoses to the cooler so you can flush in the opposite direction. Repeat steps 8 through 10.
11. Release the trigger and allow water only to rinse the cooler with water for one minute.
12. Turn the water valve off and turn off the water supply.
13. Turn the air valve on to dry the system out with air for two full minutes or until no moisture is visible leaving the drain hose.

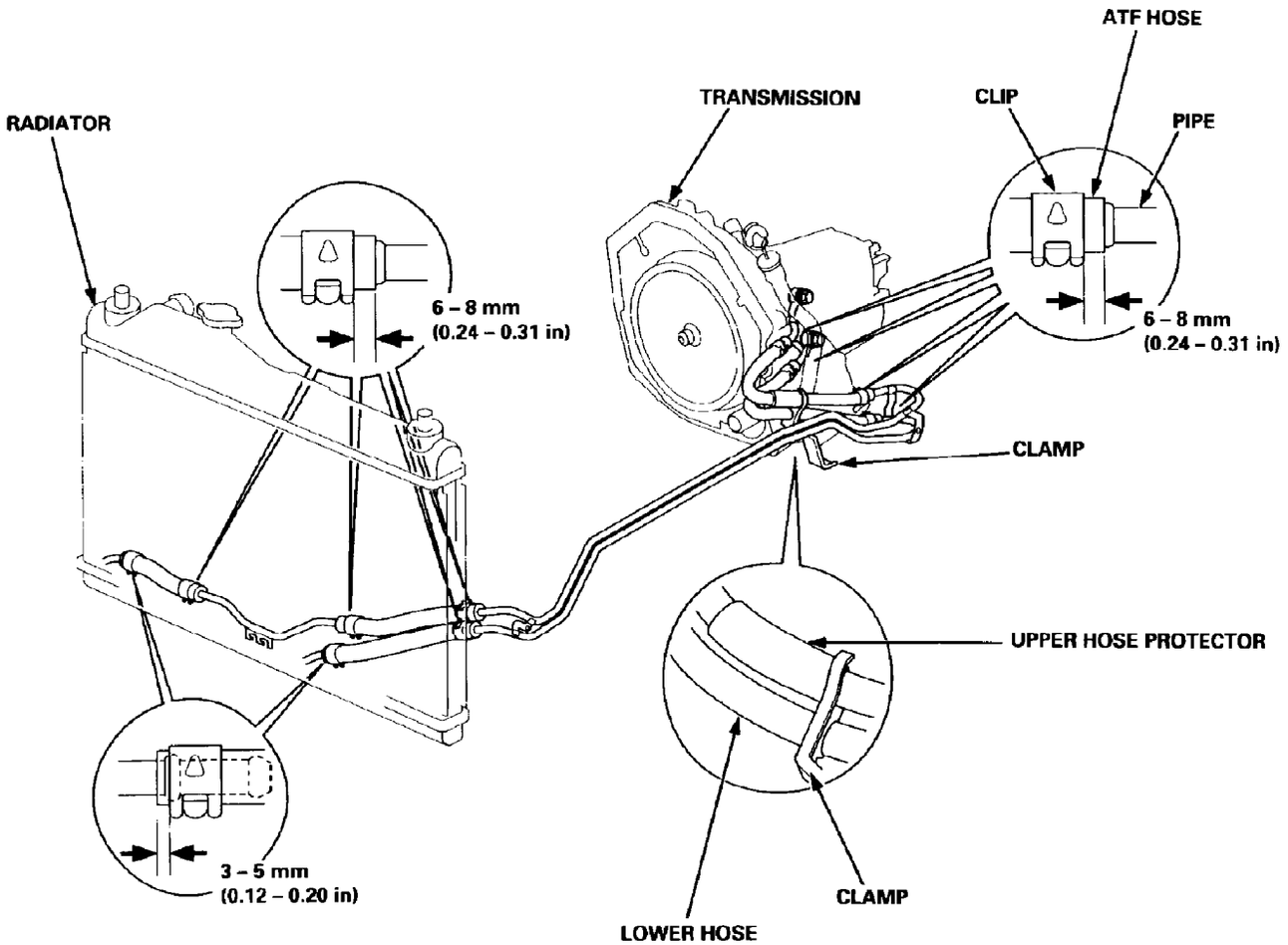
    CAUTION: Residual moisture in the ATF cooler or pipes can damage the transmission.
14. Remove the flusher from the cooler line. Attach the drain hose to an oil container.
15. Install the transmission and leave the drain hose attached to the cooler line.
16. Make sure the transmission is in the [P] position. Then fill the transmission with ATF and run the engine for 30 seconds or until approximately 0.95 ℓ (1.0 US qt., 0.8 Imp qt.) is discharged.
17. Remove the drain hose and reconnect the cooler return hose to the transmission.
18. Refill the transmission with ATF to the proper level.

TRANSMISSION COOLER LINES

DISASSEMBLY/REASSEMBLY

Connection

1. Connect the ATF hoses to the joint pipes, and secure them with the clips as shown.
2. Install the lower hose on lower cutout of the clamp and install upper hose aligning the edge of the protector tube on upper part of the clamp.

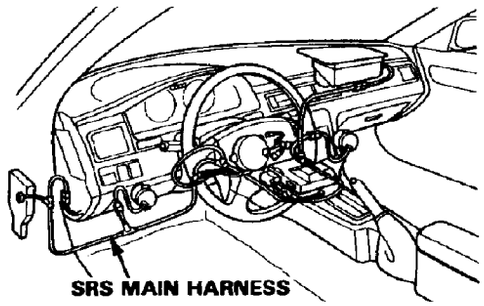


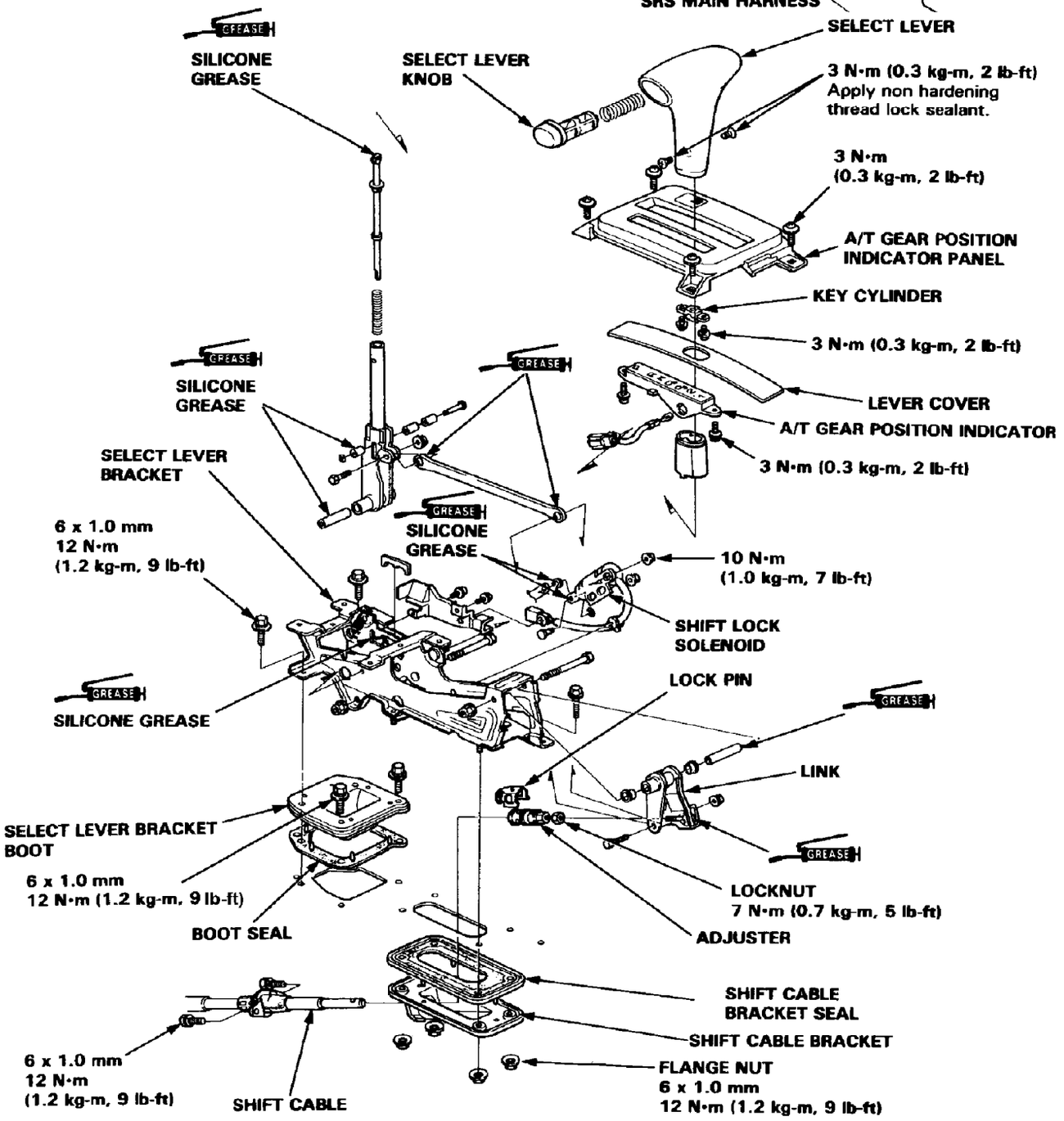
GEARSHIFT SELECTOR

DISASSEMBLY/REASSEMBLY

CAUTION:

- **All SRS electrical wiring harnesses are covered with yellow outer insulation.**
- **Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s).**
- **Replace the entire affected SRS harness assembly if it has an open circuit or damage wiring.**

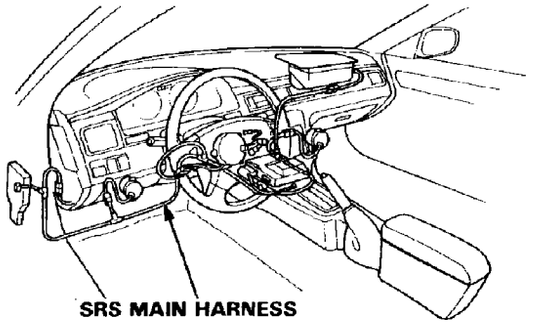




GEARSHIFT CABLE

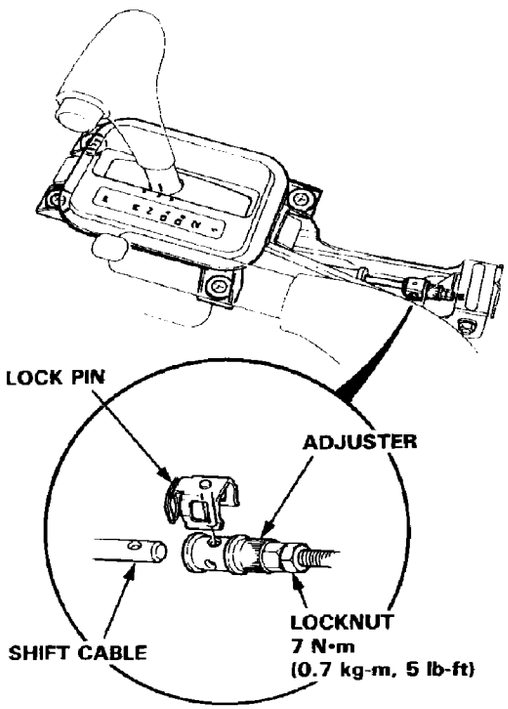
REMOVAL/INSTALLATION

CAUTION:
- **All SRS electrical wiring harnesses are covered with yellow outer insulation.**
- **Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s).**
- **Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.**



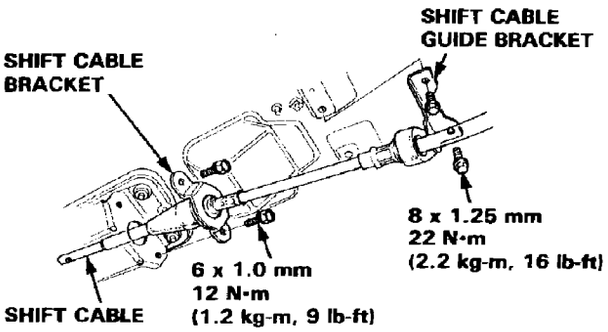
⚠ WARNING
- **Make sure lifts, jacks and safety stands are placed properly.**
- **Apply parking brake and block rear wheels, so the car will not roll off of the stands and fall while you are working under it.**

1. Remove the center console.
2. Shift to [N] position, then remove the lock pin from the cable adjuster.

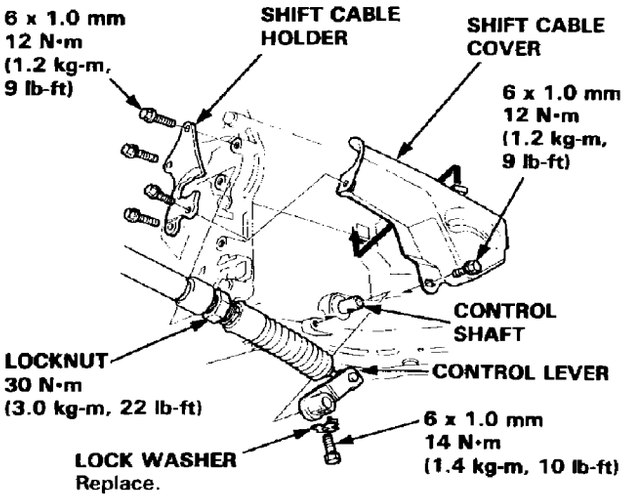


3. Remove the exhaust pipe A/catalytic converter/exhaust pipe B assembly.
4. Remove the floor heat shield.
5. Remove the shift cable bracket and shift cable guide bracket.

   CAUTION: Take care not to bend the cable when removing/installing it.



6. Remove the shift cable cover.
7. Remove the shift cable holder from the transmission rear cover.
8. Remove the control lever from the control shaft, then remove the shift cable.
9. Remove the shift cable holder from the shift cable.

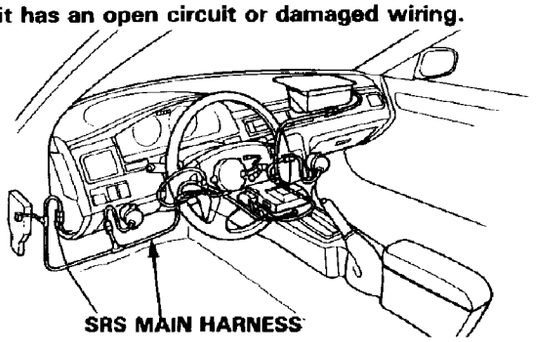


10. Install the shift cable in the reverse order of removal.
11. Check the cable adjustment after reassembly.

GEARSHIFT CABLE

ADJUSTMENT

CAUTION:
- **All SRS electrical wiring harnesses are covered with yellow outer insulation.**
- **Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s).**
- **Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.**

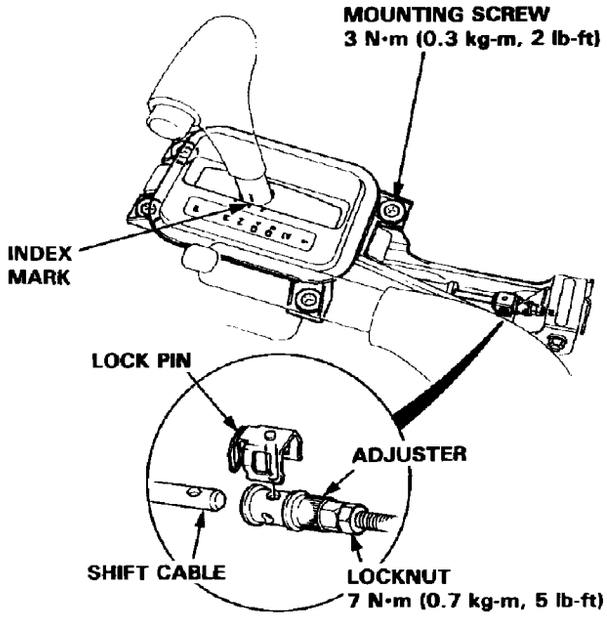


⚠ WARNING
- **Make sure lifts, jacks and safety stands are placed properly.**
- **Apply parking brake and block rear wheels, so the car will not roll off of the stands and fall while you are working under it.**

1. Start the engine. Shift to [R] position and see if the reverse gear engages. If not, refer to troubleshooting.

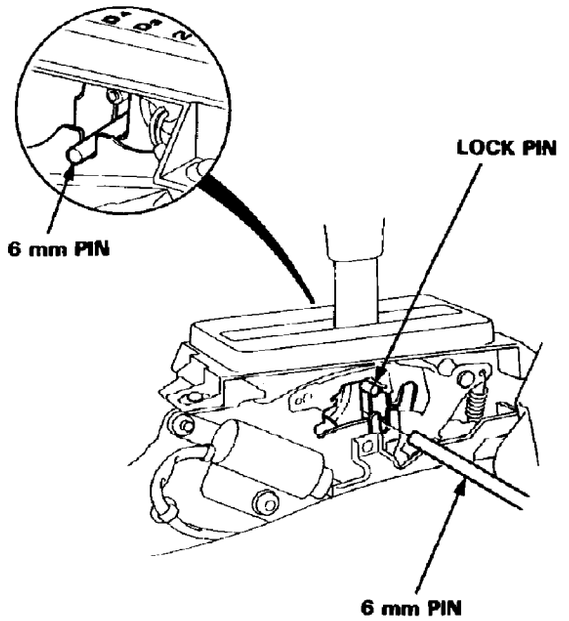
2. With the engine off, remove the center console

3. Shift to [N] position, then remove the lock pin from the cable adjuster.

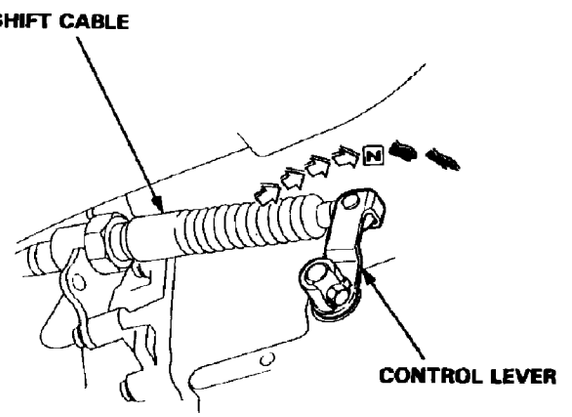


4. Insert a 6 mm pin into the select lever bracket through the lock pin sliding hole.

CAUTION: Be sure to use a 6 mm pin.



5. Verify that the shift position is in [N] position on the transmission.



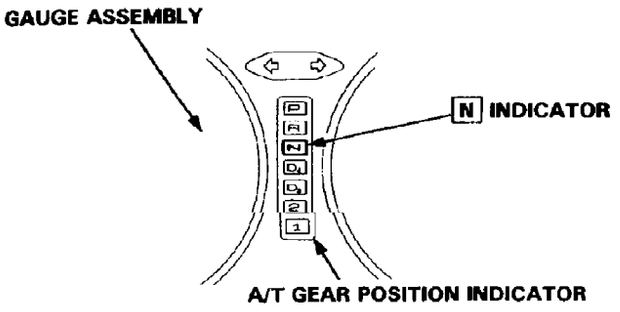
GEARSHIFT CABLE

ADJUSTMENT

6. Verify that the index mark of the select lever aligns with the [N] mark of the A/T gear position indicator panel. If not aligned, remove the A/T gear position indicator panel mounting screws and adjust by removing the panel.

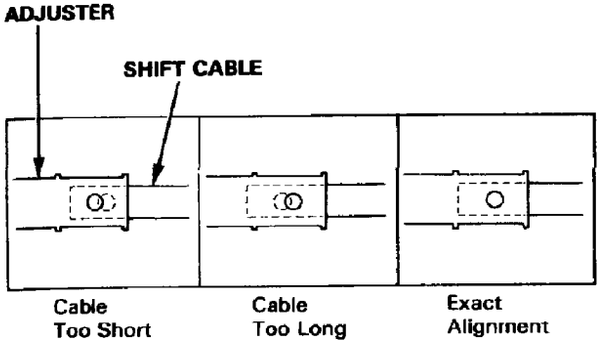
7. Turn the ignition switch to ON position, verify that the [N] indicator light comes on.

   CAUTION: Do not start the engine.



8. 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 adjustment in 1/4 turn increments.



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

10. Tighten the locknut to 7 N·m (0.7 kg-m, 5 lb-ft).

11. Install the lock pin on the adjuster.

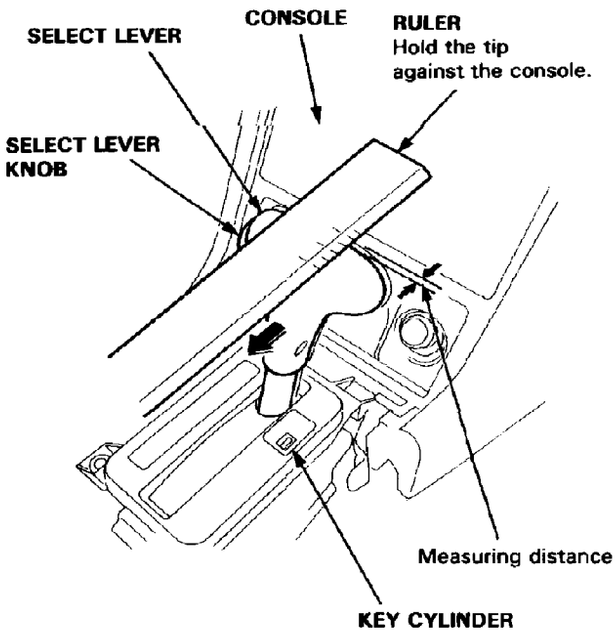
    NOTE: If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.

12. Remove the 6 mm pin from the select lever bracket.

13. Shift the select lever to [P] position. Pull the select lever without pressing the select lever knob and measure the distance shown using a ruler.

    NOTE: When measuring, hold the tip of the ruler against the console and mark at any point on the top of the select lever.

    STANDARD: 0—4 mm (0—0.16 in)
    - Measure at the top of the select lever



14. If the distance is beyond the standard, readjust the alignment holes in the adjuster and shift cable.

15. Move the select lever through all gears and verify that the A/T gear position indicator follows the A/T gear position switch.

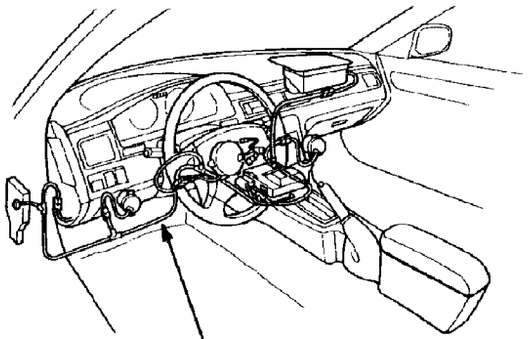
16. Start the engine and check the shift lever in all gears.

17. Insert the ignition key into the key cylinder on the A/T gear position indicator panel and verify that the shift lock lever is released.

GEAR POSITION INDICATOR PANEL

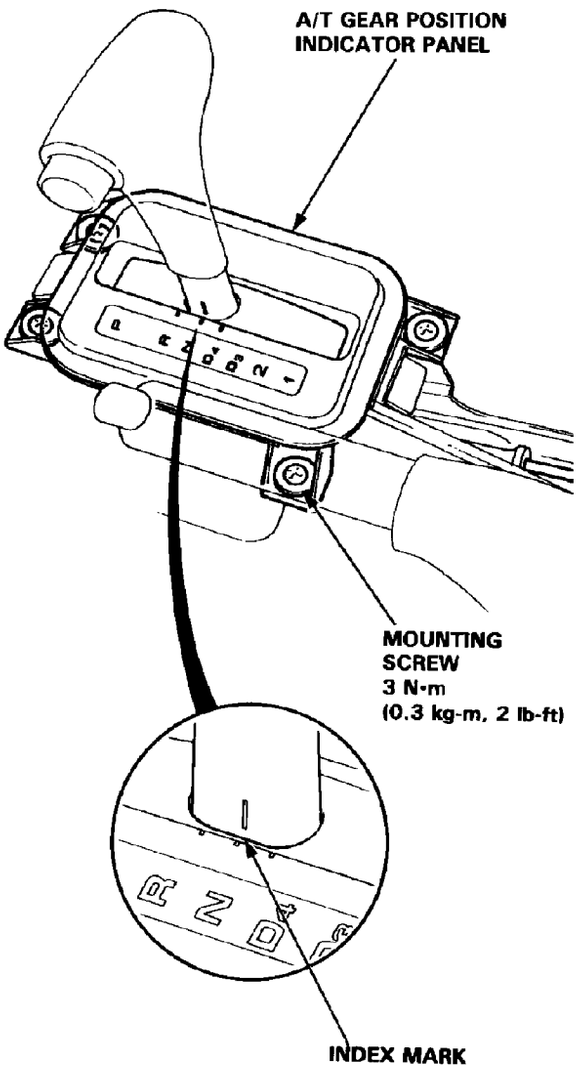
ADJUSTMENT

CAUTION:
- **All SRS electrical wiring harnesses are covered with yellow outer insulation.**
- **Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s).**
- **Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.**



1. Check that the index mark of the select lever aligns with the [N] mark of the A/T gear position indicator panel with the transmission in [N] position.
2. If not aligned, remove the center console.
3. Remove the A/T gear position indicator panel mounting screws and adjust by moving the panel.

   NOTE: Whenever the A/T gear position indicator panel is removed, reinstall the panel as described above.



SPECIFICATIONS

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)		7.2 (7.6, 6.3) for overhaul 2.5 (2.6, 2.2) for fluid change	
Hydraulic pressure kPa (kg/cm², psi)	Line pressure at 2,000 rpm [N] or [P] position		850—900 (8.5—9.0, 121—128)	800 (8.0, 114)
	1st clutch pressure at 2,000 rpm [D4] or [1] position			
	2nd clutch pressure at 2,000 rpm [D4] position		500 (5.0, 71) throttle fully closed | 900 (9.0, 128) throttle more than 1/4 opened	450 (4.5, 64) throttle fully closed | 800 (8.0, 114) throttle more than 1/4 opened
	3rd clutch pressure at 2,000 rpm [D4] position			
	4th clutch pressure at 2,000 rpm [D4] position			
	2nd clutch pressure at 2,000 rpm [2] position		850—900 (8.5—9.0, 121—128)	800 (8.0, 114)
	1st and 1st-hold clutch pressure at 2,000 rpm [1] position		850—900 (8.5—9.0, 121—128)	800 (8.0, 114)
	Throttle B pressure	Throttle fully closed	0 (0, 0)	
		Throttle fully open	500—530 (5.0—5.3, 71—75)	470 (4.7, 67)
	Modulator pressure		460—510 (4.6—5.1, 65—73)	410 (4.1, 58)
Stall speed rpm (check with car on level ground)			2,200—2,500	
Clutch	Clutch initial clearance	1st-hold	0.80—1.00 (0.031—0.039)	
		1st	0.65—0.85 (0.026—0.033)	
		2nd, 3rd, 4th	0.55—0.75 (0.022—0.030)	
	Clutch return spring free length	1st, 3rd	33.2 (1.31)	31.2 (1.23)
		2nd, 4th	33.9 (1.33)	31.9 (1.26)
		1st-hold	32.0 (1.30)	30.0 (1.18)
			31.0 (1.22)	29.0 (1.14)
	Clutch disc thickness		1.88—2.00 (0.074—0.079)	Until grooves worn out
	Clutch plate thickness	1st, 3rd, 1st-hold	1.95—2.05 (0.077—0.081)	Discoloration
		2nd, 4th	2.25—2.35 (0.089—0.093)	Discoloration
	Clutch end plate thickness (1st, 1st-hold and 3rd)	Mark 1	2.05—2.10 (0.081—0.083)	Discoloration
		Mark 2	2.15—2.20 (0.085—0.087)	↕
		Mark 3	2.25—2.30 (0.089—0.091)	↕
		Mark 4	2.35—2.40 (0.093—0.094)	↕
		Mark 5	2.45—2.50 (0.096—0.098)	↕
		Mark 6	2.55—2.60 (0.100—0.102)	↕
		Mark 7	2.65—2.70 (0.104—0.106)	↕
		Mark 8	2.75—2.80 (0.108—0.110)	↕
		Mark 9	2.85—2.90 (0.112—0.114)	↕
		Mark 10	2.95—3.00 (0.116—0.118)	↕
		Mark 11*	3.05—3.10 (0.120—0.122)	↕
		Mark 12*	3.15—3.20 (0.124—0.126)	↕
		Mark 13*	3.25—3.30 (0.128—0.130)	↕
	*1st and 1st-hold only	Mark 14*	3.35—3.40 (0.132—0.134)	Discoloration
	Clutch end plate thickness (2nd and 4th)	Mark 1	2.05—2.10 (0.081—0.083)	Discoloration
		Mark 2	2.15—2.20 (0.085—0.087)	↕
		Mark 3	2.25—2.30 (0.089—0.091)	↕
		Mark 4	2.35—2.40 (0.093—0.094)	↕
		Mark 5	2.45—2.50 (0.096—0.098)	↕
		Mark 6	2.55—2.60 (0.100—0.102)	↕
		Mark 7	2.65—2.70 (0.104—0.106)	↕
		Mark 8	2.75—2.80 (0.108—0.110)	↕
		Mark 9	2.85—2.90 (0.112—0.114)	Discoloration

SPECIFICATIONS

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Valve body	Stator shaft needle bearing contact I.D.		
	Torque converter side	27.000–27.021 (1.0630–1.0638)	Wear or damage
	Oil pump side	29.000–29.013 (1.1417–1.1422)	——
	Oil pump gear side clearance	0.03–0.05 (0.001–0.002)	0.07 (0.003)
	Oil pump gear-to-body clearance Drive	0.210–0.265 (0.0083–0.0104)	——
	Driven	0.070–0.125 (0.0028–0.0049)	——
	Oil pump driven gear I.D.	14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump driven gear shaft O.D.	13.980–13.990 (0.5504–0.5508)	Wear or damage
Shifting device and parking brake control	Reverse shift fork finger thickness	5.90–6.00 (0.232–0.236)	5.40 (0.213)
	Parking brake rachet pawl	——	Wear or other defect
	Parking gear	——	Wear or other defect
Servo body	Shift fork shaft bore I.D.	14.000–14.010 (0.5512–0.5516)	——
	Shift fork shaft valve bore I.D.	37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Regulator valve body	Sealing ring contact I.D.	35.000–35.025 (1.3780–1.3789)	35.050 (1.3799)
Stator shaft	Sealing ring contact I.D.	29.000–29.013 (1.1417–1.1422)	29.050 (1.1437)
Transmission	Thrust washer thickness		
	Mainshaft ball bearing Fr side	3.45–3.55 (0.136–0.140)	Wear or damage
	Mainshaft 1st gear Fr side	1.45–1.50 (0.057–0.059)	1.40 (0.055)
	Mainshaft 1st gear Rr side	2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 1st gear Rr side	3.43–3.50 (0.135–0.138)	Wear or damage
	Mainshaft 4th gear collar length	47.50–47.55 (1.870–1.872)	——
	Mainshaft 1st gear collar length	35.50–35.55 (1.398–1.400)	——
	Mainshaft 1st gear collar flange thickness	3.25–3.40 (0.128–0.134)	Wear or damage
	Mainshaft 2nd gear thrust washer thickness	3.97–4.00 (0.156–0.157)	Wear or damage
		4.02–4.05 (0.158–0.159)	↑
		4.07–4.10 (0.160–0.161)	↑
		4.12–4.15 (0.162–0.163)	↑
		4.17–4.20 (0.164–0.165)	↑
		4.22–4.25 (0.166–0.167)	↑
		4.27–4.30 (0.168–0.169)	↑
		4.32–4.35 (0.170–0.171)	↑
		4.37–4.40 (0.172–0.173)	↑
		4.42–4.45 (0.174–0.175)	↑
		4.47–4.50 (0.176–0.177)	Wear or damage
	Mainshaft sealing ring 35 mm thickness	1.980–1.995 (0.0780–0.0785)	1.80 (0.071)
	Mainshaft sealing ring 29 mm thickness	1.980–1.995 (0.0780–0.0785)	1.80 (0.071)
	Mainshaft sealing ring groove width	2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
	Countershaft 3rd gear distance collar length	24.05–24.10 (0.947–0.949)	——
	Countershaft 3rd gear distance collar flange thickness	4.35–4.50 (0.171–0.177)	Wear or damage
	Countershaft reverse gear collar length	14.00–14.05 (0.551–0.553)	——
	Countershaft reverse gear collar flange thickness	2.45–2.60 (0.096–0.102)	Wear or damage
	Countershaft 1st gear collar length	60.00–60.05 (2.362–2.364)	——
	Countershaft distance collar 35 mm length	65.625–65.675 (2.5837–2.5856)	——
		65.675–65.725 (2.5856–2.5876)	——
		65.725–65.775 (2.5876–2.5896)	——
		65.775–65.825 (2.5896–2.5915)	——
		65.825–65.875 (2.5915–2.5935)	——
		65.875–65.925 (2.5935–2.5955)	——
		65.925–65.975 (2.5955–2.5974)	——
		65.975–66.025 (2.5974–2.5994)	——
		66.025–66.075 (2.5994–2.6014)	——
		66.075–66.125 (2.6014–2.6033)	——

SPECIFICATIONS

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft feed pipe O.D.	11.47—11.48 (0.4516—0.4520)	11.45 (0.451)
	Mainshaft feed pipe O.D.	5.97—5.98 (0.2350—0.2354)	5.95 (0.234)
	Countershaft feed pipe O.D.	11.47—11.48 (0.4516—0.4520)	11.45 (0.451)
	Countershaft feed pipe O.D.	7.97—7.98 (0.3138—0.3142)	7.95 (0.313)
	Mainshaft bushing I.D.	11.500—11.518 (0.4528—0.4535)	11.530 (0.4539)
	Mainshaft bushing I.D.	6.018—6.030 (0.2369—0.2374)	6.045 (0.2380)
	Countershaft bushing I.D.	11.500—11.518 (0.4528—0.4535)	11.530 (0.4539)
	Countershaft bushing I.D.	8.000—8.015 (0.3150—0.3156)	8.030 (0.3161)
	Diameter of needle bearing contact area		
	On mainshaft and stator shaft	22.980—22.993 (0.9047—0.9052)	Wear or damage
	On mainshaft 1st gear collar	32.975—32.991 (1.2982—1.2989)	↕
	On mainshaft 4th gear collar	33.975—33.991 (1.3376—1.3382)	↕
	On mainshaft 2nd collar	36.975—36.991 (1.4557—1.4563)	↕
	On countershaft (Fr side)	38.505—38.515 (1.5159—1.5163)	↕
	On countershaft 3rd gear distance collar	43.975—43.991 (1.7313—1.7319)	↕
	On countershaft 1st gear collar	33.975—33.991 (1.3376—1.3382)	↕
	On countershaft 4th gear	31.975—31.991 (1.2589—1.2595)	↕
	On countershaft reverse gear collar	32.975—32.991 (1.2982—1.2989)	↕
	On reverse idler gear shaft	13.990—14.000 (0.5508—0.5512)	↕
	Reverse idler gear shaft holder I.D.	14.416—14.434 (0.5676—0.5683)	↕
	Diameter of one-way clutch contact area		↕
	Countershaft 1st gear I.D.	83.339—83.365 (3.2811—3.2821)	↕
	Parking gear O.D.	66.685—66.696 (2.6254—2.6258)	↕
	Selector hub O.D.	51.87—51.90 (2.042—2.043)	↕
	Inside diameter		↕
	Mainshaft 1st gear	37.000—37.016 (1.4567—1.4573)	↕
	Mainshaft 2nd gear	43.000—43.016 (1.6929—1.6935)	↕
	Mainshaft 4th gear	40.000—40.016 (1.5748—1.5754)	↕
	Countershaft 1st gear	40.000—40.016 (1.5748—1.5754)	↕
	Countershaft 3rd gear	49.000—49.016 (1.9291—1.9298)	↕
	Countershaft 4th gear	38.000—38.016 (1.4961—1.4967)	↕
	Countershaft reverse gear	39.000—39.016 (1.5354—1.5361)	↕
	Reverse idler gear	18.007—18.020 (0.7089—0.7094)	Wear or damage
	End play		
	Mainshaft 1st gear	0.08—0.24 (0.003—0.009)	——
	Mainshaft 2nd gear	0.07—0.15 (0.003—0.006)	——
	Mainshaft 4th gear	0.10—0.22 (0.004—0.009)	——
	Countershaft 1st gear	0.10—0.41 (0.004—0.016)	——
	Countershaft 3rd gear	0.05—0.17 (0.002—0.007)	——
	Countershaft 4th gear	0.07—0.15 (0.003—0.006)	——
	Countershaft reverse gear	0.10—0.25 (0.004—0.010)	——
	Reverse idler gear	0.05—0.23 (0.002—0.009)	——
Secondary gear shaft taper roller bearing starting torque N·m (kg-cm, lb-in)		2.3—3.3 (23—33, 20—29)	——

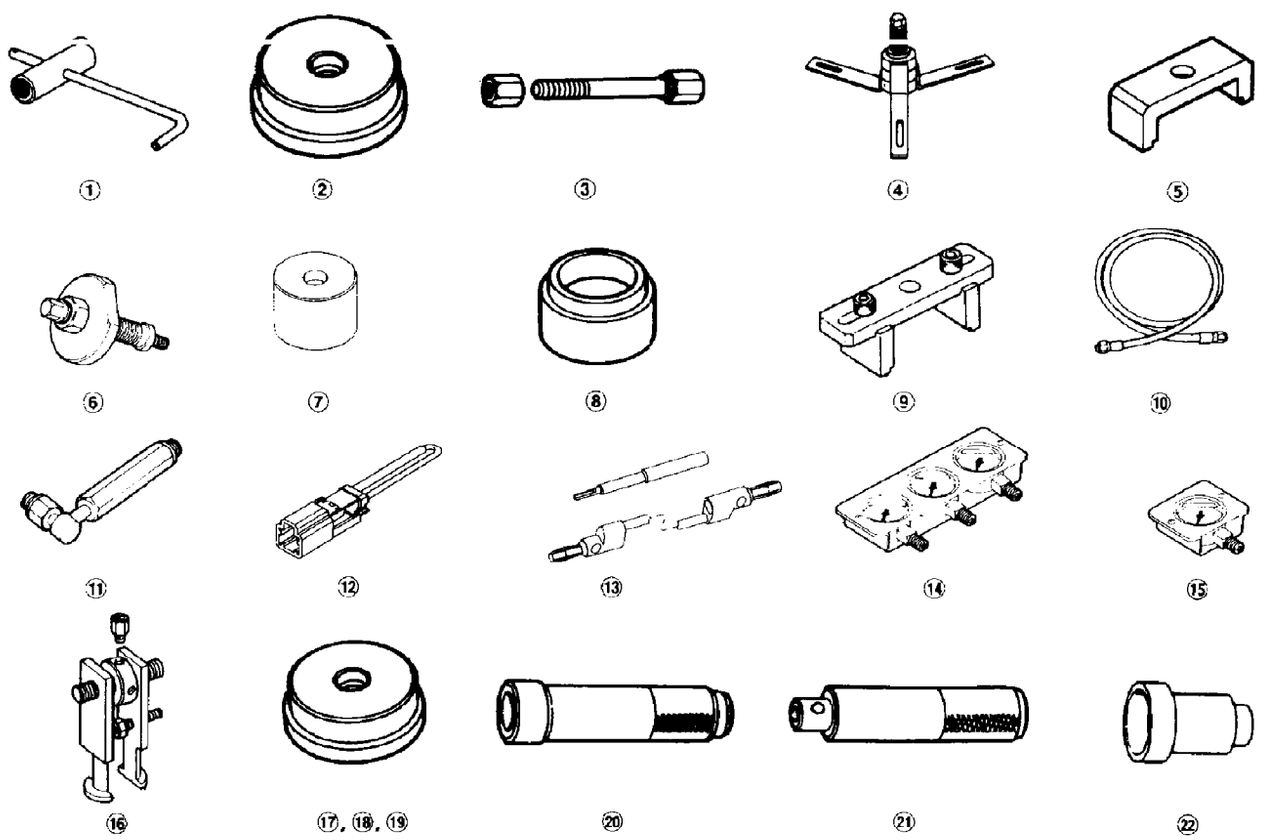
SPECIFICATIONS

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Springs	1st one-way ball spring	0.29 (0.011)	4.0 (0.157)	14.0 (0.551)	13.0
	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	88.6 (3.488)	16.5
	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	7.5
	Stator reaction spring	6.0 (0.236)	38.4 (1.512)	30.3 (1.193)	2.0
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7
	Relief valve spring	1.1 (0.043)	8.4 (0.331)	41.8 (1.646)	15.7
	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0
	3-4 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	34.8 (1.370)	22.0
	2-3 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	39.1 (1.539)	22.0
	Throttle valve spring	1.0 (0.039)	7.6 (0.299)	28.3 (1.114)	12.1
	4th exhaust valve spring	0.6 (0.024)	5.6 (0.220)	49.1 (1.933)	21.0
	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
	2-3 shift valve spring	0.9 (0.035)	9.6 (0.378)	43.0 (1.693)	12.1
	1st accumulator spring A	2.2 (0.087)	17.2 (0.677)	88.6 (3.488)	15.0
	1st accumulator spring B	1.9 (0.075)	19.8 (0.386)	51.5 (2.028)	8.3
	4th accumulator spring	3.3 (0.130)	20.5 (0.807)	74.1 (2.917)	11.2
	2nd accumulator spring	3.0 (0.118)	18.7 (0.736)	88.1 (3.468)	14.2
	1st-hold accumulator spring A	3.5 (0.138)	21.6 (0.850)	55.9 (2.201)	7.7
	3rd accumulator spring	3.2 (0.126)	20.5 (0.807)	89.0 (3.504)	12.6
	1st-hold accumulator spring B	2.3 (0.091)	12.8 (0.504)	53.4 (2.102)	12.6
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	59.3 (2.335)	38.8
	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.1 (2.051)	20.8
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	14.1
	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	32.4 (1.276)	10.5
	CPC valve spring	1.0 (0.039)	6.8 (0.268)	36.1 (1.421)	17.8
	4th kick-down spring	1.0 (0.039)	7.6 (0.299)	48.2 (1.898)	22.2
	3rd kick-down spring	1.0 (0.039)	7.4 (0.291)	38.6 (1.520)	16.0

SPECIAL TOOLS

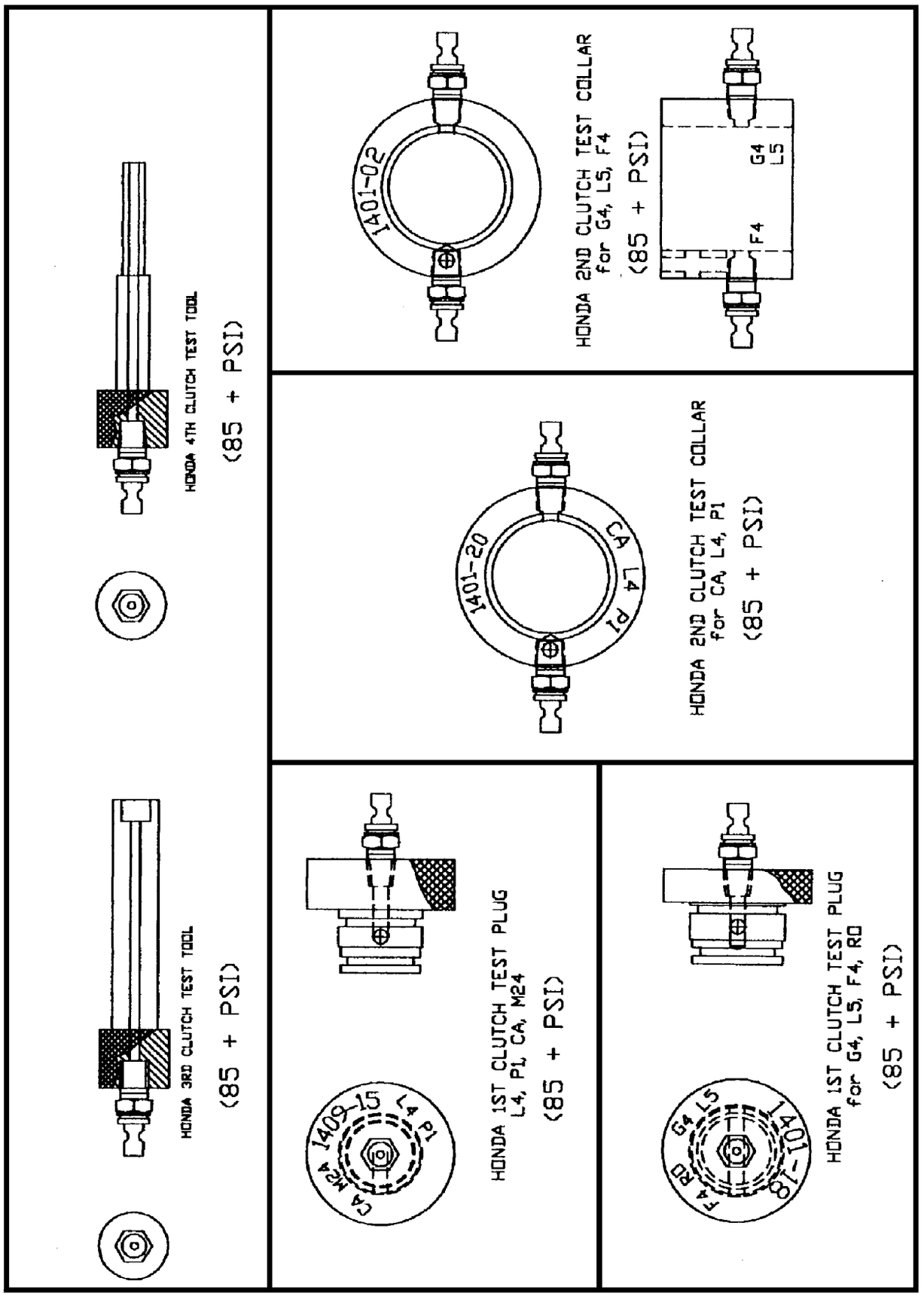
Ref. No.	Tool Number	Description	Qty
①	07GAB–PF50100 or 07GAB–PF50101	Mainshaft Holder	1
②	07GAD–SD40101	Attachment, 78 x 90 mm	1
③	07GAE–PG40200	Clutch Spring Compressor Bolt Assembly	1
④	07HAC–PK4010A	Housing Puller	1
⑤	07HAE–PL50101	Clutch Spring Compressor Attachment	1
⑥	07LAC–PW50101	Extension Shaft Puller	1
⑦	07LAD–PW50500	Pinion Cover Driver Attachment	1
⑧	07LAD–PW50601	Attachment, 40 x 50 mm	1
⑨	07LAE–PX40100	Clutch Spring Compressor Attachment	1
⑩	07MAJ–PY4011A	A/T Pressure Hose, 2210 mm	4
⑪	07MAJ–PY40120	A/T Pressure Gauge Set w/panel	4
⑫	07PAZ–0010100	SCS Service Connector	1
⑬	07SAZ–001000A	Backprobe Set	2
⑭	07406–0020400	A/T Pressure Gauge Set w/panel	1
⑮	07406–0070300	A/T Low Pressure Gauge w/panel	1
⑯*	07736–A01000A	Adjustable Bearing Puller, 25 – 40 mm	1
⑰	07746–0010300	Attachment, 42 x 27 mm	1
⑱	07746–0010500	Attachment, 62 x 68 mm	1
⑲	07746–0010600	Attachment, 72 x 75 mm	1
⑳	07746–0030100	Driver 40 mm I.D.	1
㉑	07749–0010000	Driver	1
㉒	07947–6340500	Driver Attachment	1

* Must be used with commercially available 3/8" – 16 slide hammer.



SPECIAL TOOLS

ANSWERMATIC PRESSURE RETENTION TOOLS



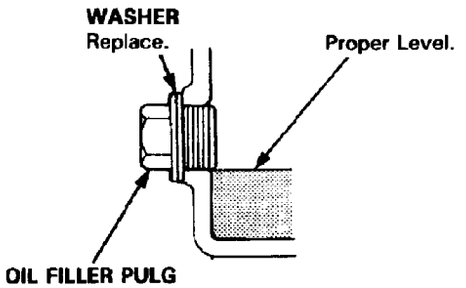
These pressure retention tools are available from Answermatic and can be used with the AMI or VBT machines to pressure test the clutch drum assemblies. These tools can also be used to air check the clutch drum assemblies which is otherwise a difficult task.
Inquiries can be directed to Answermatic at 1-800-322-0806.

DIFFERENTIAL

MAINTENANCE

NOTE: Check the oil with engine OFF, and the car on level ground.

1. Remove the oil filler plug, then check the level and condition of the oil.



2. The oil level must be up to the fill hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug with a new washer.

3. If the differential oil is dirty, remove the drain plug and drain the oil.

4. Reinstall the drain plug with a new washer, and refill the differential oil to the proper level.

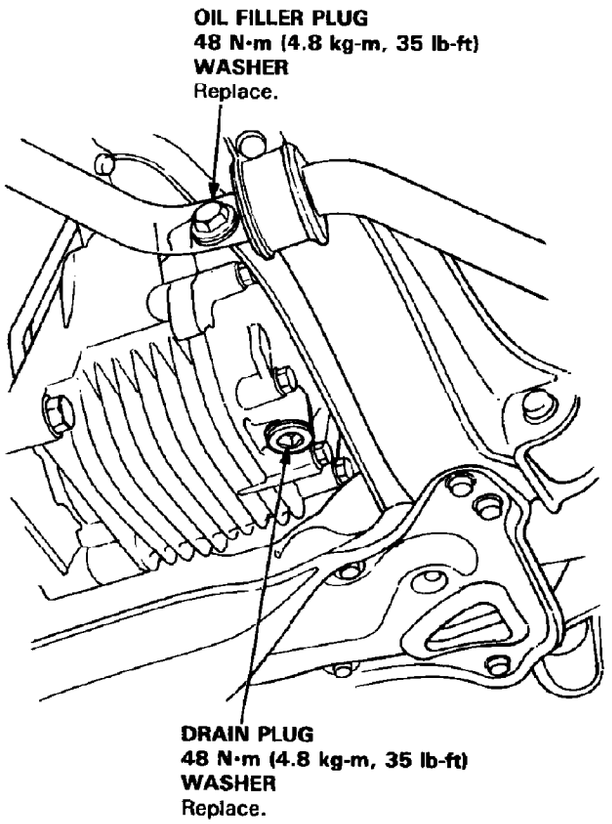
   NOTE:
   - The drain plug washer should be replaced at every oil change.
   - Clean the drain plug before reinstalling.

CAUTION: The differential is a separate sump and must be filled separately. The transmission has no fluid connection to the differential.

5. Reinstall the oil filler plug with a new washer.

Oil Capacity
0.95 ℓ (1.00 US qt, 0.84 Imp qt) at oil change.
1.05 ℓ (1.11 US qt, 0.92 Imp qt) at overhaul.

Recommended oil:
Hypoid gear oil
API Classification GL4 or GL5, viscosity:
SAE 90 above 0°F (−18°C)
SAE 80 W 90 below 0°F (−18°C)



DIFFERENTIAL

TROUBLESHOOTING

NOTE: Most problems in the unit are to be diagnosed by Identifying noises from the gears or bearings. Care should be taken during diagnoisis not to confuse differential noises with those from other drivetrain components.

[Noise symptoms will be most prominent]

Symptom	Probable Cause	Remedy
Consistent noise during cruising	• Lack of oil • Foreign matter stuck in gears, etc. • Improper tooth contact between ring gear and drive pinion • Worn or damaged side bearing • Deformed ring gear or carrier	• Replenish oil • Clean and inspect • Adjust or replace • Replace any damaged or faulty parts
Gear noises while accelerating	• Lack of oil • Foreign matter stuck in gears, etc. • Improper drive pinion preload • Chipped or damaged gears	• Replenish oil • Clean and inspect • Adjust • Replace
Gear noises while coasting or accelerating	• Improper drive pinion preload • Damaged or chipped gears	• Adjust or replace
Bearing noises while accelerating or coasting/deceleration	• Cracked or damaged drive pinion bearing or side bearing	• Replace
Abnormal noises when rounding a curve	• Worn (excessive play) or damaged side bearing • Damaged side gear, pinion, or pinion shaft	• Replace
Abnormal noises during acceleration or when first driving away from a stop.	• Excessive backlash between ring gear and drive pinion. • Improper ring gear or drive pinion preload • Excessive pinion backlash • Worn differential splines • Loose companion flange nuts and other fasteners	• Adjust • Adjust or replace • Recheck torque or replace
Oil leak	• Oil level too high • Clogged breather hole • Loose carrier or inadequate sealing • Worn or damaged oil seal	• Lower to proper level • Clean or replace • Recheck torque or apply sealant • Replace
Overheating	• Lack of oil • Insufficient ring gear-to-pinion backlash • Excessive ring gear or drive pinion preload • Chipped or damaged oil cooler	• Replenish • Adjust • Adjust or replace • Replace
Coolant leak	• Inadequate hose or clamp	• Recheck torque or replace