

1997 AUTOMATIC TRANSMISSIONS

Acura A6VA Overhaul

APPLICATION

AUTOMATIC TRANSAXLE APPLICATIONS

Application	Transaxle Model
Acura 2.2CL	A6VA

IDENTIFICATION

Transaxle model and serial number are stamped on the transaxle. See **Fig. 1** . Model and serial number may be required when ordering replacement components.

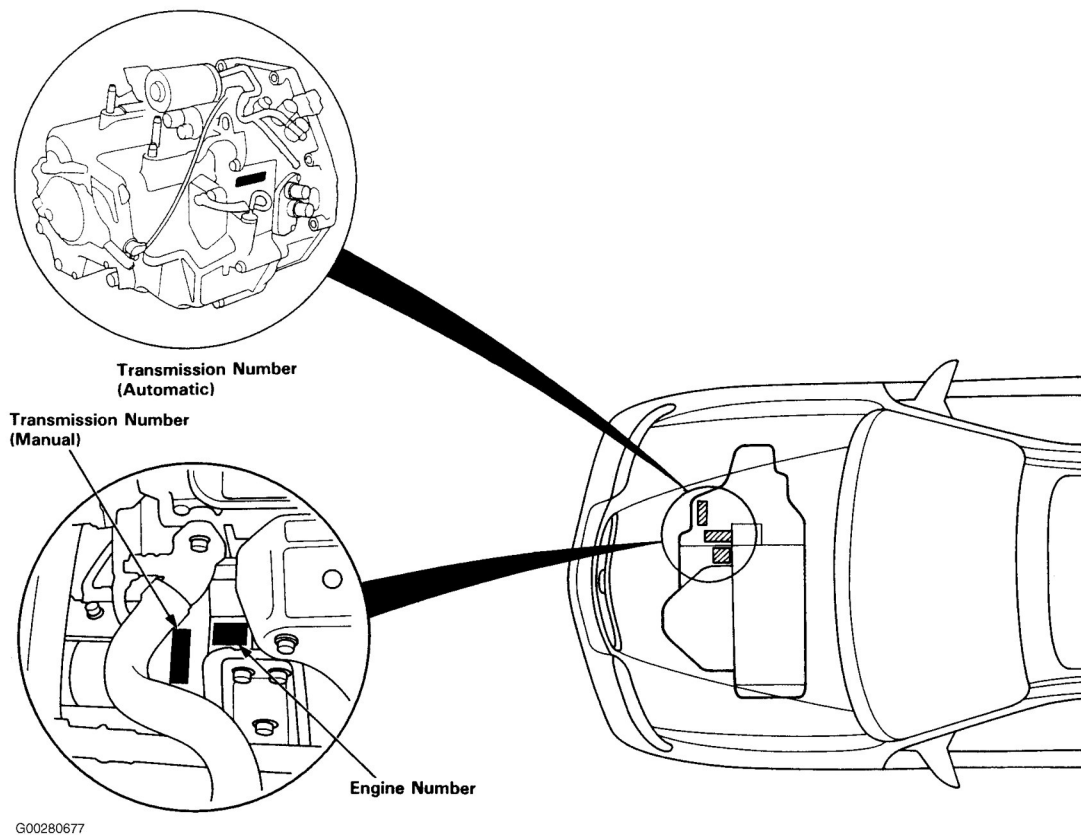


Fig. 1: Identifying Engine & Transaxle Serial Number Locations
Courtesy of AMERICAN HONDA MOTOR CO., INC.

GEAR RATIOS

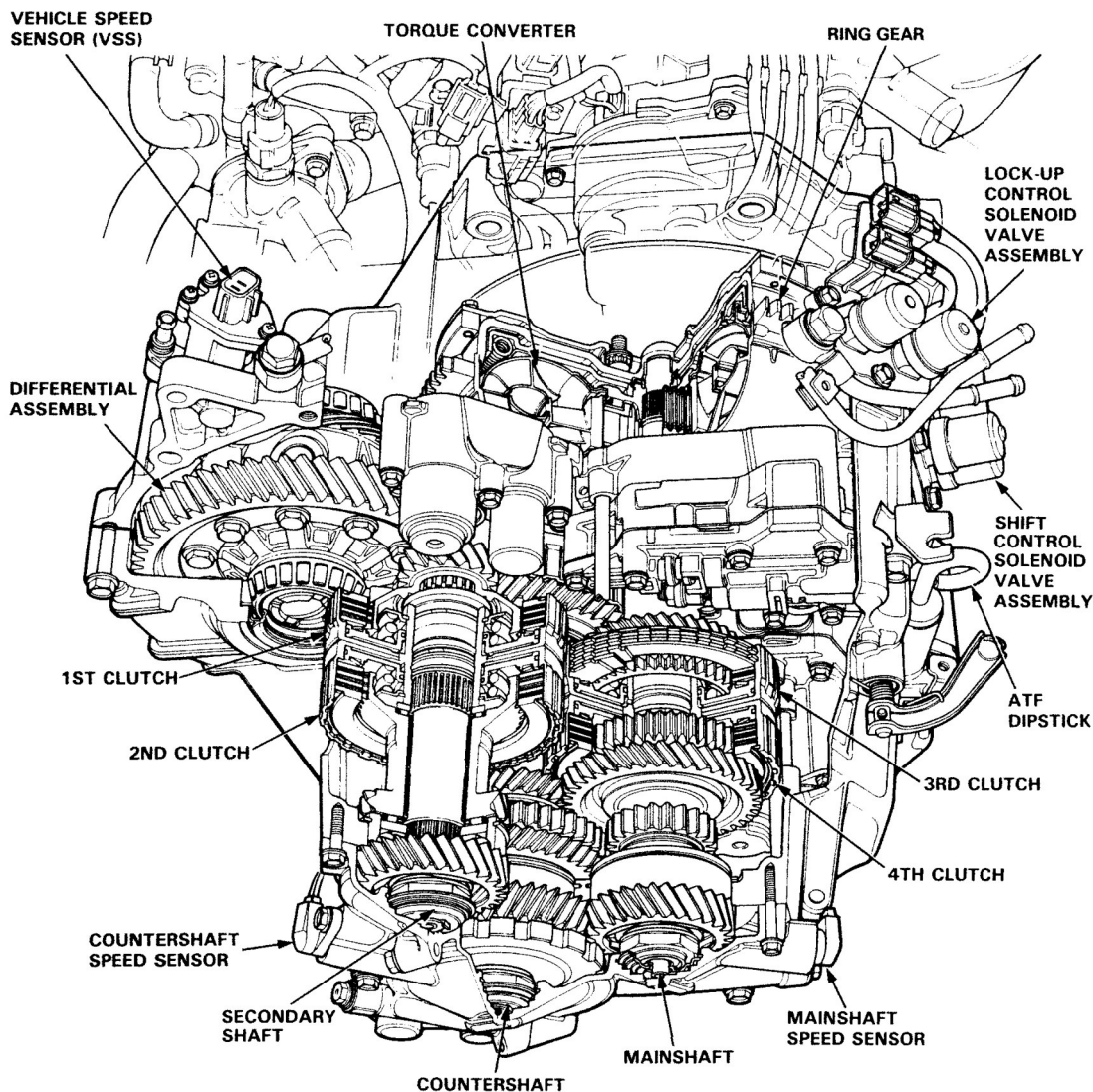
Gear ratio information is not available from manufacturer.

DESCRIPTION & OPERATION

INTRODUCTION

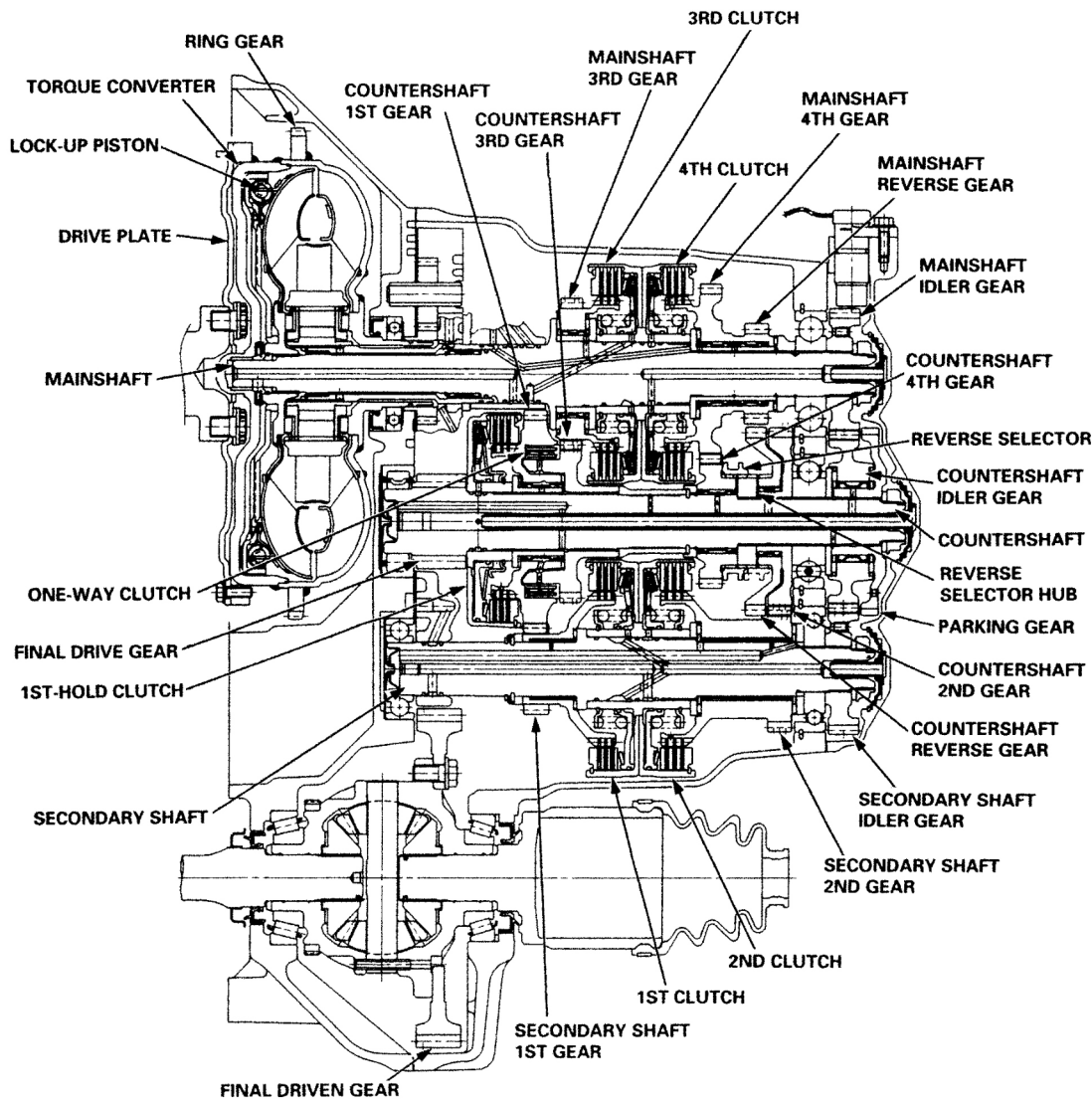
Automatic transaxle is an electronically controlled transaxle with 4 forward speeds and one reverse speed. Transaxle consists of clutches, mainshaft, countershaft, secondary shaft, shift control solenoid valves, lock-up control solenoid valves and lock-up torque converter. See **Fig. 2** and **Fig. 3**.

Valve body assemblies consists of main valve body, regulator valve body, servo body and accumulator body. Transaxle shifting and torque converter lock-up are controlled by the Powertrain Control Module (PCM).



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Fig. 2: Cut-Away View Of A6VA Automatic Transaxle (1 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 3: Cut-Away View Of A6VA Automatic Transaxle (2 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

CLUTCHES

The four-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and the steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch

The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is joined back-to-back to the 2nd clutch. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

1st-Hold Clutch

The 1st-hold clutch engages/disengages 1st-hold or "1" position, and is located at the end of the countershaft, just behind the torque converter housing. The 1st-hold clutch is supplied hydraulic pressure by its ATF feed pipe within the countershaft.

2nd Clutch

The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied hydraulic pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the middle of the mainshaft. The 3rd clutch is joined back-to-back to the 4th clutch. The 3rd clutch is supplied hydraulic pressure through the mainshaft by a circuit connected to the internal hydraulic circuit.

4th Clutch

The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

One-Way Clutch

The one-way clutch is positioned between the countershaft 1st gear and 3rd gear, with the 3rd gear splined to the countershaft. The 1st gear provides the outer race surface, and the 3rd gear provides the inner race surface. The one-way clutch locks up when power is transmitted from the secondary shaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the D4, D3 or "2" position.

However, the one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the D4, D3 or "2" position. This is because the increased rotational speed of the gears on the countershaft overrides the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch free-wheels with the 1st clutch still engaged.

ELECTRONIC CONTROL SYSTEM

The PCM contains a self-diagnostic system, which will store a fault code if a failure or problem exists in the transaxle electronic control system. Fault code can be retrieved to identify transaxle problem area. For information on electronic transaxle components, see **DIAGNOSIS - A6VA** article.

Transaxle is equipped with shift and key interlock systems. Shift interlock system prevents shift lever from

being moved from "P" position unless brake pedal is depressed and accelerator is in idle position. In case of a malfunction, shift lever can be released by placing ignition key in release slot near shift lever. Key interlock system prevents ignition key from being removed from ignition switch unless shift lever is in "P" position. For additional information on shift and key interlock systems, see **SHIFT INTERLOCK SYSTEMS** article.

The A/T gear position indicator on instrument panel contains lights to indicate which position A/T shift switch on shift lever is in. For information and testing of A/T gear position indicator, see **DIAGNOSIS - A6VA** article.

LUBRICATION

For additional information, see **SERVICING - ACURA** article.

RECOMMENDED FLUID

Transaxle

Use Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

FLUID CAPACITIES

Fluid capacities are approximate system quantities. Correct transaxle fluid level should be determined using dipstick.

TRANSAXLE FLUID CAPACITIES ⁽¹⁾

Application	Drain & Refill ⁽²⁾ - Qts. (L)	Overhaul - Qts. (L)
A6VA	2.5 (2.4)	6.3 (6.0)

(1) Fluid capacities listed are approximate. Always fill to specified area on dipstick (if equipped).

(2) Drain and refill capacity does not include torque converter.

TROUBLE SHOOTING

NOTE: Transmission malfunctions may be caused by poor engine performance, improper adjustments, fluid condition or failure of hydraulic, mechanical or electronic components. Ensure all concerns have been properly checked prior to transmission overhaul. See appropriate **DIAGNOSIS - A6VA** article.

TRANSAXLE DISASSEMBLY

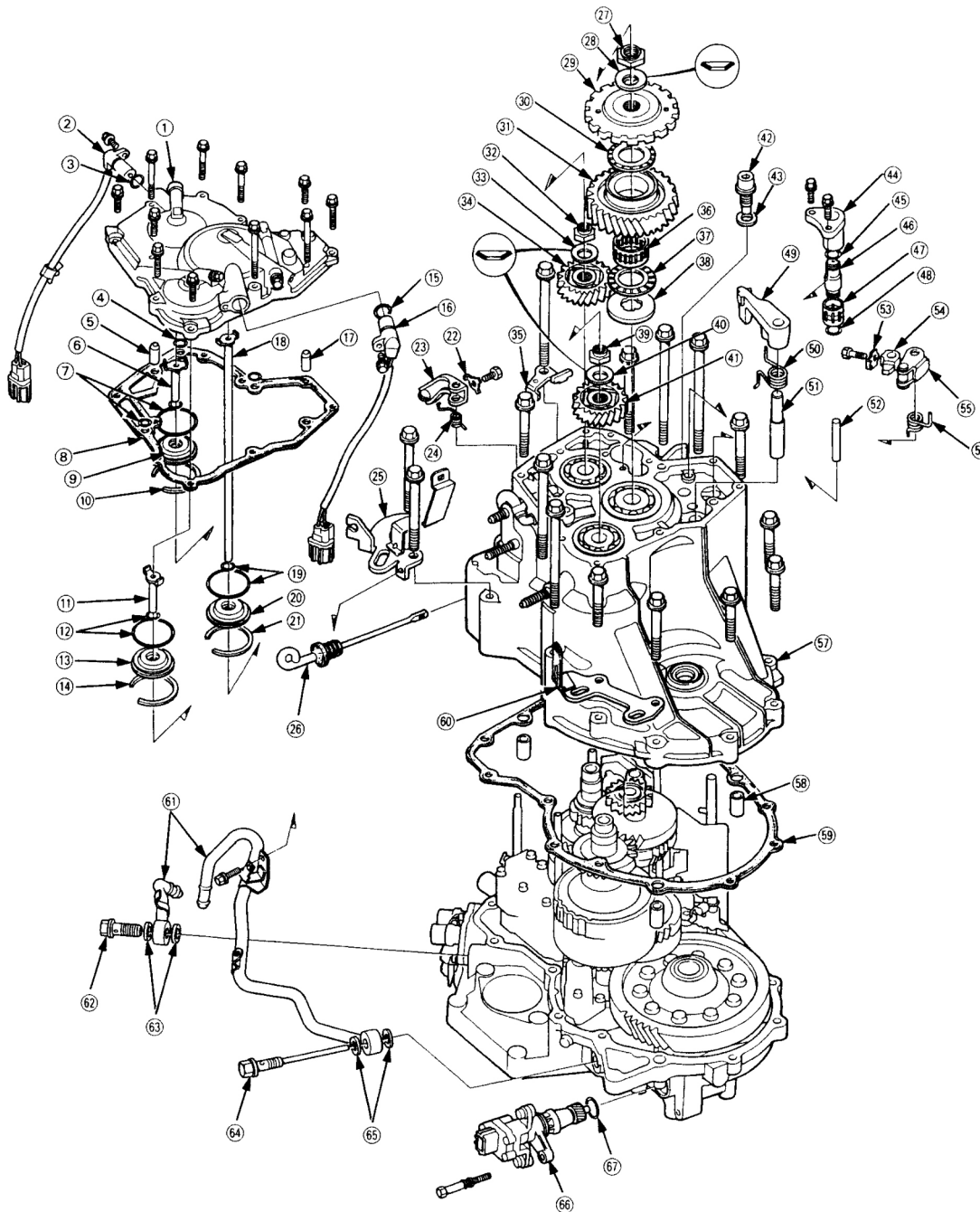
NOTE: For exploded views of transaxle to assist with disassembly, see **Fig. 4 -Fig. 9** .

NOTE: Clean all parts thoroughly in solvent or carburetor cleaner, and dry with

compressed air. Blow out all passages.

NOTE: When removing the transmission right side cover, replace the following:

- Right side cover gasket
- Lock washers
- Transmission housing gasket
- "O" rings
- Each shaft locknut and conical spring washer
- Sealing washers



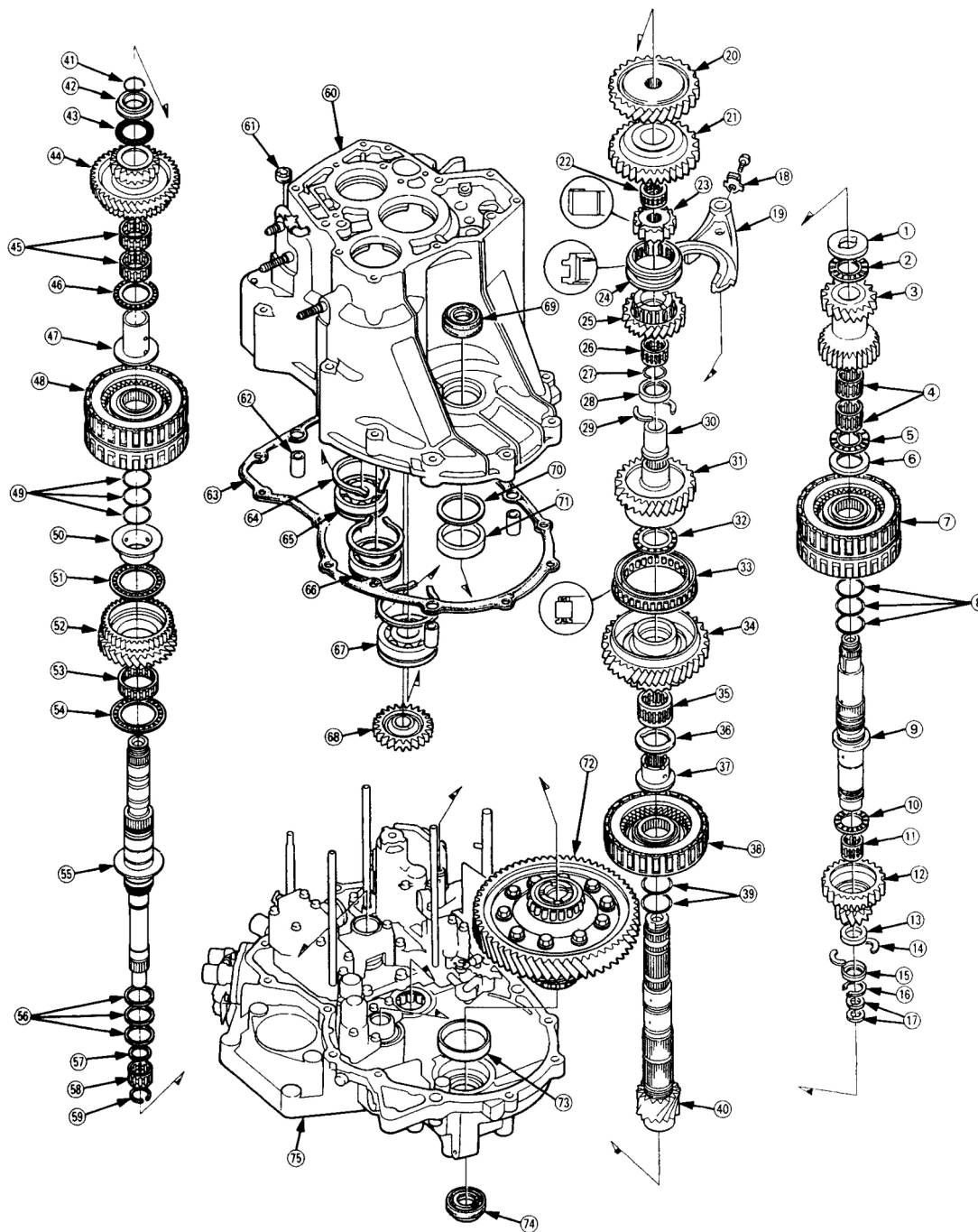
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Fig. 4: Exploded View Of Right Side Cover & Related Components (1 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

- | | |
|---|---|
| ① RIGHT SIDE COVER | ③④ MAINSHAFT IDLER GEAR |
| ② MAINSHAFT SPEED SENSOR | ③⑤ HARNESS BRACKET |
| ③ O-RING Replace. | ③⑥ NEEDLE BEARING |
| ④ O-RING Replace. | ③⑦ THRUST NEEDLE BEARING |
| ⑤ DOWEL PIN | ③⑧ THRUST WASHER |
| ⑥ 4TH CLUTCH FEED PIPE | ③⑨ SECONDARY SHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace. |
| ⑦ O-RINGS Replace. | ④① CONICAL SPRING WASHER Replace. |
| ⑧ RIGHT SIDE COVER GASKET Replace. | ④② SECONDARY SHAFT IDLER GEAR |
| ⑨ FEED PIPE GUIDE | ④③ DRAIN PLUG |
| ⑩ SNAP RING | ④④ SEALING WASHER Replace. |
| ⑪ 1ST CLUTCH FEED PIPE | ④⑤ REVERSE IDLER GEAR SHAFT HOLDER |
| ⑫ O-RINGS Replace. | ④⑥ O-RING Replace. |
| ⑬ FEED PIPE GUIDE | ④⑦ REVERSE IDLER GEAR SHAFT |
| ⑭ SNAP RING | ④⑧ NEEDLE BEARING |
| ⑮ O-RING Replace. | ④⑨ O-RING Replace. |
| ⑯ COUNTERSHAFT SPEED SENSOR | ④⑩ PARKING BRAKE PAWL |
| ⑰ DOWEL PIN | ⑤① PARKING BRAKE PAWL SPRING |
| ⑱ 1ST-HOLD CLUTCH FEED PIPE | ⑤② PARKING BRAKE PAWL STOP |
| ⑲ O-RINGS Replace. | ⑤③ LOCK WASHER Replace. |
| ⑳ FEED PIPE GUIDE | ⑤④ PARKING BRAKE STOP |
| ㉑ SNAP RING | ⑤⑤ PARKING BRAKE LEVER |
| ㉒ LOCK WASHER Replace. | ⑤⑥ PARKING BRAKE LEVER SPRING |
| ㉓ THROTTLE CONTROL LEVER | ⑤⑦ TRANSMISSION HOUSING |
| ㉔ THROTTLE CONTROL LEVER SPRING | ⑤⑧ DOWEL PIN |
| ㉕ THROTTLE CONTROL CABLE BRACKET/
TRANSMISSION HANGER | ⑤⑨ TRANSMISSION HOUSING GASKET Replace. |
| ㉖ ATF DIPSTICK | ⑥① TRANSMISSION HANGER |
| ㉗ COUNTERSHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace. | ⑥② ATF COOLER LINES |
| ㉘ CONICAL SPRING WASHER Replace. | ⑥③ JOINT BOLT |
| ㉙ PARKING GEAR | ⑥④ SEALING WASHERS Replace. |
| ㉚ THRUST NEEDLE BEARING | ⑥⑤ JOINT BOLT |
| ㉛ COUNTERSHAFT IDLER GEAR | ⑥⑥ SEALING WASHERS Replace. |
| ㉜ MAINSHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace. | ⑥⑦ VEHICLE SPEED SENSOR |
| ㉝ CONICAL SPRING WASHER Replace. | ⑥⑧ O-RING Replace. |

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Fig. 5: Exploded View Of Right Side Cover & Related Components (2 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



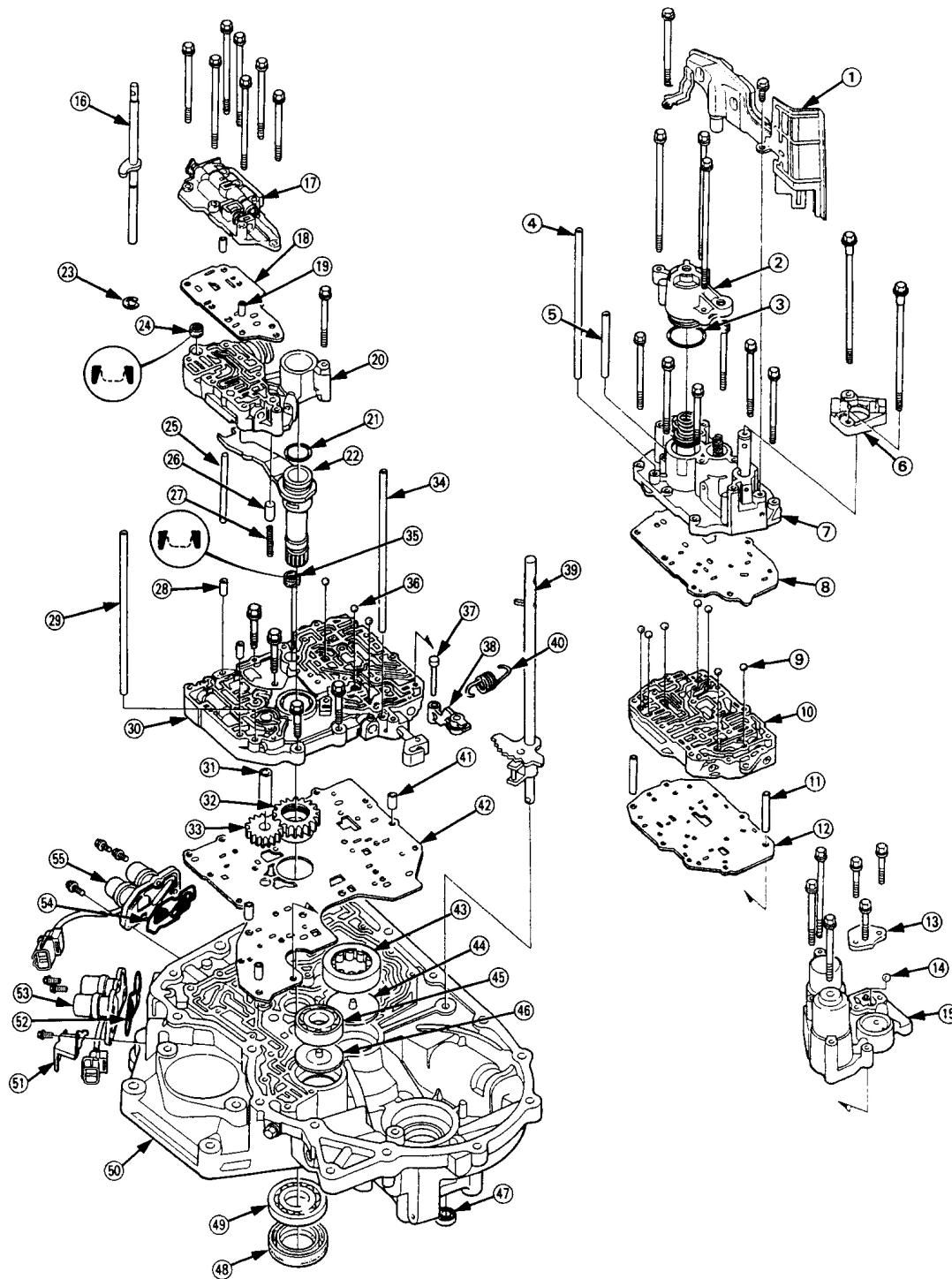
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Fig. 6: Exploded View Of Transaxle Housing & Internal Components (1 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

- | | |
|---------------------------------|---|
| ① THRUST WASHER | ④① SNAP RING |
| ② THRUST NEEDLE BEARING | ④② COLLAR |
| ③ SECONDARY SHAFT 2ND GEAR | ④③ THRUST NEEDLE BEARING |
| ④ NEEDLE BEARINGS | ④④ MAINSHAFT 4TH/REVERSE GEAR |
| ⑤ THRUST NEEDLE BEARING | ④⑤ NEEDLE BEARINGS |
| ⑥ SPLINED WASHER Selective part | ④⑥ THRUST NEEDLE BEARING |
| ⑦ 1ST/2ND CLUTCH ASSEMBLY | ④⑦ 4TH GEAR COLLAR |
| ⑧ O-RINGS Replace. | ④⑧ 3RD/4TH CLUTCH ASSEMBLY |
| ⑨ SECONDARY SHAFT | ④⑨ O-RINGS Replace. |
| ⑩ THRUST NEEDLE BEARING | ⑤① 3RD GEAR COLLAR |
| ⑪ NEEDLE BEARING | ⑤② THRUST NEEDLE BEARING |
| ⑫ SECONDARY SHAFT 1ST GEAR | ⑤③ MAINSHAFT 3RD GEAR |
| ⑬ DISTANCE COLLAR, 5.0 mm | ⑤④ NEEDLE BEARING |
| ⑭ COTTERS, 29 mm | ⑤⑤ THRUST NEEDLE BEARING |
| ⑮ COTTER RETAINER | ⑤⑥ MAINSHAFT |
| ⑯ SNAP RING | ⑤⑦ SEALING RINGS, 35 mm |
| ⑰ SEALING RINGS, 32 mm | ⑤⑧ SEALING RING, 29 mm |
| ⑱ LOCK WASHER Replace. | ⑤⑨ NEEDLE BEARING |
| ⑲ SHIFT FORK | ⑤⑩ SET RING |
| ⑳ COUNTERSHAFT 2ND GEAR | ⑤⑪ TRANSMISSION HOUSING |
| ㉑ COUNTERSHAFT REVERSE GEAR | ⑤⑫ OIL SEAL Replace. |
| ㉒ NEEDLE BEARING | ⑤⑬ DOWEL PIN |
| ㉓ REVERSE SELECTOR HUB | ⑤⑭ TRANSMISSION HOUSING GASKET Replace. |
| ㉔ REVERSE SELECTOR | ⑤⑮ SNAP RING |
| ㉕ COUNTERSHAFT 4TH GEAR | ⑤⑯ TRANSMISSION HOUSING MAINSHAFT BEARING |
| ㉖ NEEDLE BEARING | ⑤⑰ TRANSMISSION HOUSING SECONDARY SHAFT BEARING |
| ㉗ SNAP RING | ⑤⑱ TRANSMISSION HOUSING COUNTERSHAFT BEARING |
| ㉘ COLLAR, 32 mm | ⑤⑲ REVERSE IDLER GEAR |
| ㉙ COTTERS, 29 mm | ⑤⑳ TRANSMISSION HOUSING OIL SEAL Replace. |
| ㉚ DISTANCE COLLAR | ⑤㉑ THRUST SHIM Selective part |
| ㉛ COUNTERSHAFT 3RD GEAR | ⑤㉒ BEARING OUTER RACE |
| ㉜ THRUST NEEDLE BEARING | ⑤㉓ DIFFERENTIAL ASSEMBLY |
| ㉝ ONE-WAY CLUTCH | ⑤㉔ BEARING OUTER RACE |
| ㉞ COUNTERSHAFT 1ST GEAR | ⑤㉕ TORQUE CONVERTER HOUSING OIL SEAL Replace. |
| ㉟ NEEDLE BEARING | ⑤㉖ TORQUE CONVERTER HOUSING |
| ㊱ THRUST WASHER | |
| ㊲ COUNTERSHAFT 1ST GEAR COLLAR | |
| ㊳ 1ST-HOLD CLUTCH ASSEMBLY | |
| ㊴ O-RINGS Replace. | |
| ㊵ COUNTERSHAFT | |

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Fig. 7: Exploded View Of Transmission Housing & Internal Components (2 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 8: Exploded View Of Torque Converter Housing & Valve Body (1 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

- | | |
|---------------------------------------|---|
| ① ATF STRAINER | ③⑤ FILTER Replace. |
| ② 4TH ACCUMULATOR COVER | ③⑥ CHECK BALLS |
| ③ O-RING Replace. | ③⑦ DETENT ARM SHAFT |
| ④ ATF FEED PIPE | ③⑧ DETENT ARM |
| ⑤ ATF FEED PIPE | ③⑨ CONTROL SHAFT |
| ⑥ SERVO DETENT BASE | ④⑥ DETENT ARM SPRING |
| ⑦ SERVO BODY | ④① DOWEL PINS |
| ⑧ SERVO SEPARATOR PLATE | ④② MAIN SEPARATOR PLATE |
| ⑨ CHECK BALLS | ④③ TORQUE CONVERTER HOUSING COUNTERSHAFT |
| ⑩ SECONDARY VALVE BODY | ROLLER BEARING |
| ⑪ DOWEL PINS | ④④ ATF GUIDE PLATE |
| ⑫ SECONDARY SEPARATOR PLATE | ④⑤ TORQUE CONVERTER HOUSING SECONDARY |
| ⑬ ACCUMULATOR BODY COVER | SHAFT BALL BEARING |
| ⑭ CHECK BALL | ④⑥ ATF GUIDE PLATE |
| ⑮ 1ST/2ND ACCUMULATOR BODY | ④⑦ OIL SEAL Replace. |
| ⑯ THROTTLE CONTROL SHAFT | ④⑧ MAINSHAFT OIL SEAL Replace. |
| ⑰ THROTTLE VALVE BODY | ④⑨ TORQUE CONVERTER HOUSING MAINSHAFT |
| ⑱ THROTTLE SEPARATOR PLATE | BALL BEARING |
| ⑲ DOWEL PINS | ⑤① TORQUE CONVERTER HOUSING |
| ⑳ REGULATOR VALVE BODY | ⑤② SOLENOID VALVE CONNECTOR BRACKET |
| ㉑ O-RING Replace. | ⑤③ SHIFT CONTROL SOLENOID VALVE FILTER/GASKET |
| ㉒ STATOR SHAFT | Replace. |
| ㉓ E-RING | ⑤④ SHIFT CONTROL SOLENOID VALVE ASSEMBLY |
| ㉔ FILTER Replace. | ⑤⑤ LOCK-UP CONTROL SOLENOID VALVE |
| ㉕ STOP SHAFT | FILTER/GASKET Replace. |
| ㉖ TORQUE CONVERTER CHECK VALVE | ⑤⑥ LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY |
| ㉗ TORQUE CONVERTER CHECK VALVE SPRING | |
| ㉘ DOWEL PINS | |
| ㉙ ATF FEED PIPE | |
| ㊱ MAIN VALVE BODY | |
| ㊲ ATF PUMP DRIVEN GEAR SHAFT | |
| ㊳ ATF PUMP DRIVE GEAR | |
| ㊴ ATF PUMP DRIVEN GEAR | |
| ㊵ ATF FEED PIPE | |

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Fig. 9: Exploded View Of Torque Converter Housing & Valve Body (2 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

RIGHT SIDE COVER

1. Remove the eleven bolts securing the right side cover, then remove the right side cover. See **Fig. 4**.
2. Slip the mainshaft holder (T/N 07GAB - PF50101) onto the mainshaft. See **Fig. 10**.

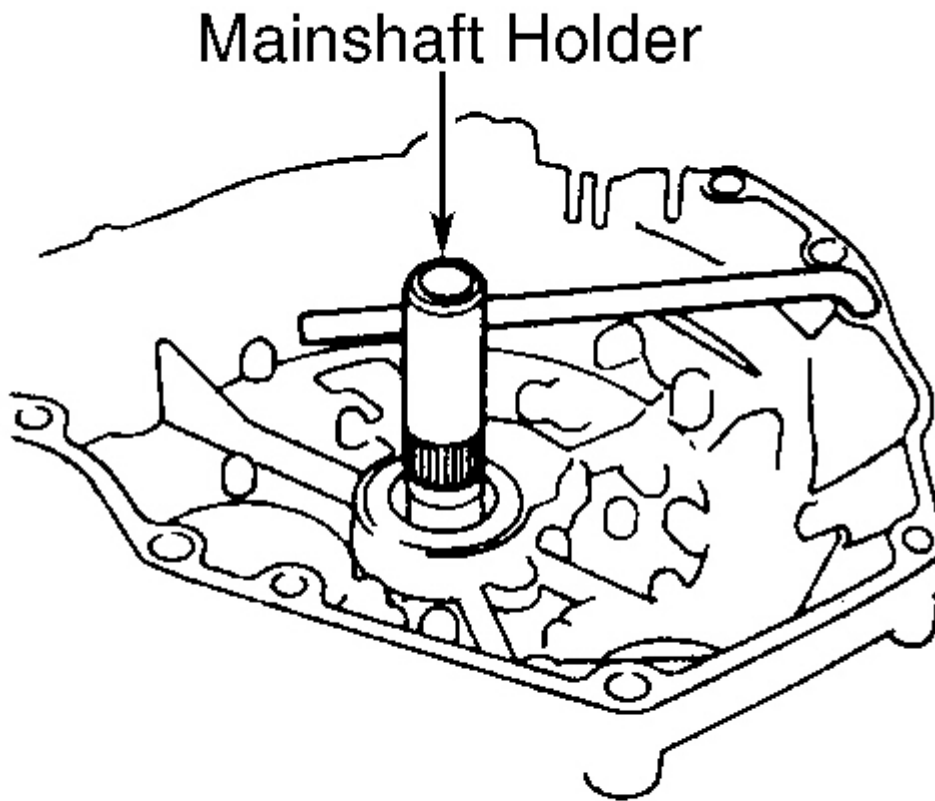
NOTE: Mainshaft locknut has left-hand threads.

3. Engage the parking brake pawl with the parking gear.
4. Cut the lock tabs of each shaft locknut using a chisel as shown. Then remove the locknuts and conical spring washers from each shaft.
5. Remove the mainshaft holder after removing the locknuts.
6. Remove the parking gear using a puller from the countershaft using appropriate puller. Then remove the idler gears from the mainshaft and secondary shaft using appropriate puller.
7. Remove the countershaft idler gear, needle bearing, thrust needle bearing, and thrust washer from the countershaft.
8. Remove the parking brake pawl, spring, shaft, and stop from the housing.
9. Remove the throttle control lever and spring from the throttle control shaft.
10. Remove the ATF cooler line mounting bolt from the transmission hanger.
11. Remove the transmission housing mounting bolts.

12. Remove the reverse idler gear shaft and reverse idler gear shaft holder using a 5 x .8 mm bolt. See **Fig. 11**.

NOTE: The transmission housing will not separate from the torque converter housing if the reverse idler gear is not removed.

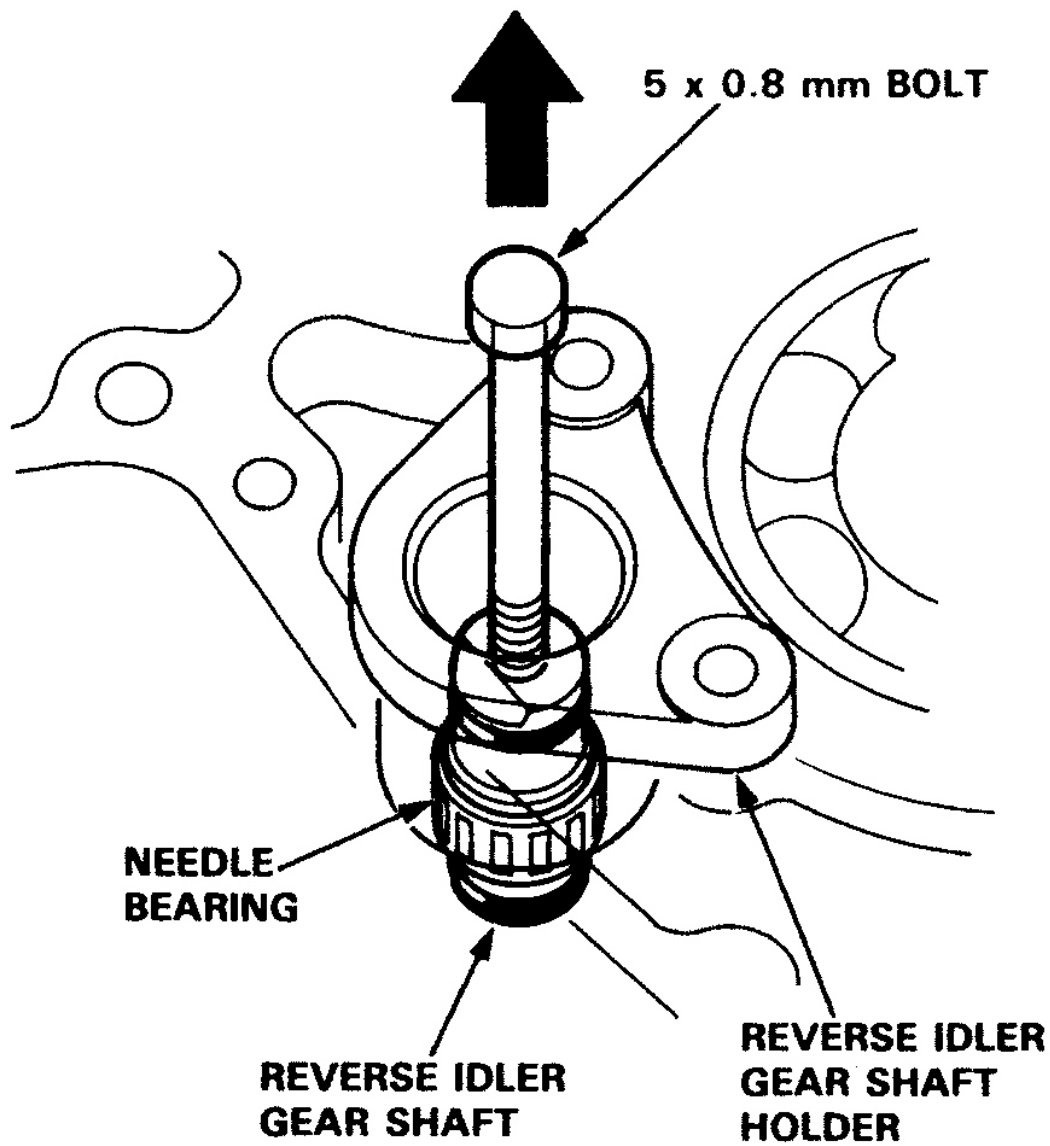
13. Move the reverse idler gear to disengage it from the countershaft and mainshaft reverse gears. See **Fig. 12**.



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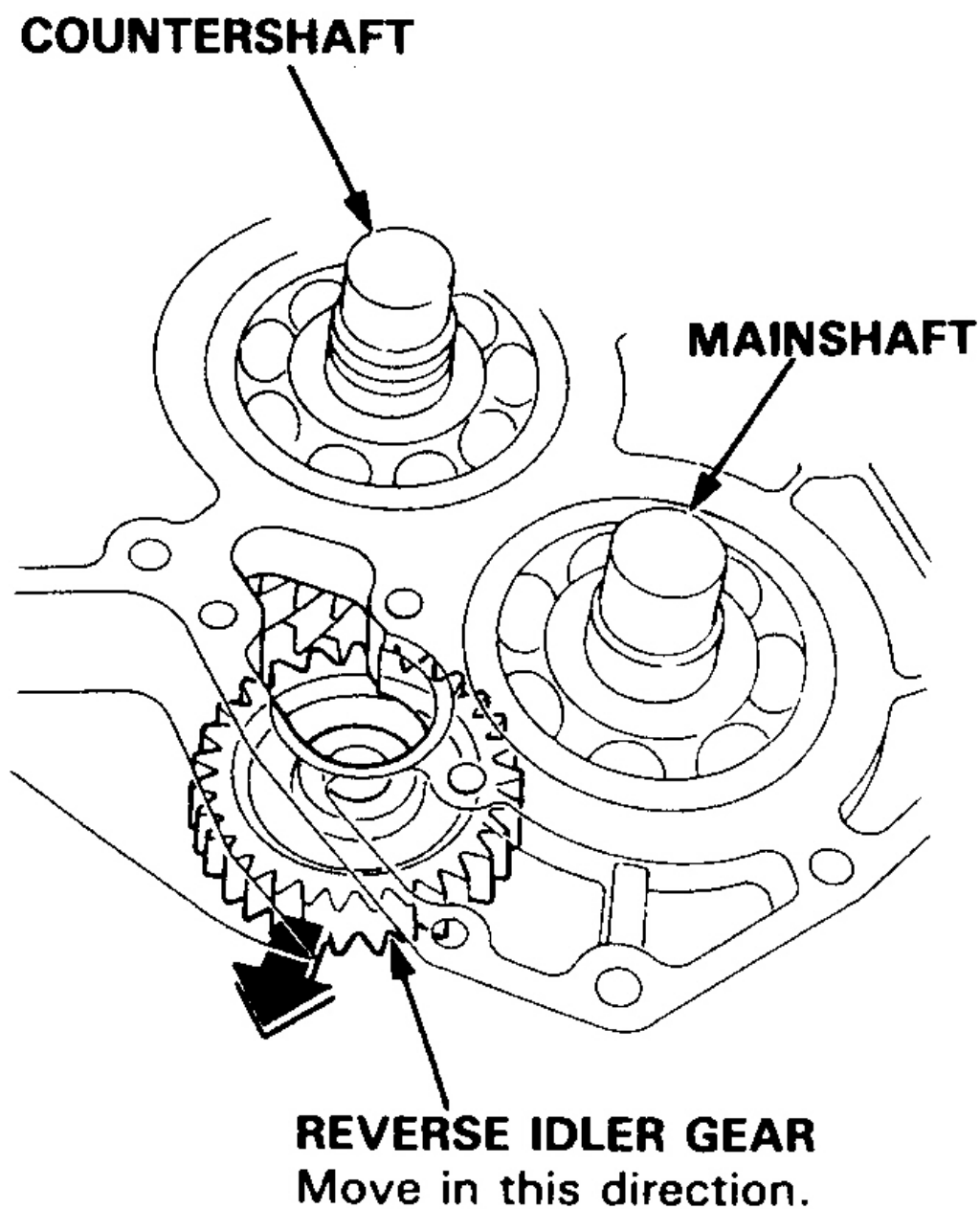
Fig. 10: Installing Mainshaft Holder

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 11: Removing Reverse Idler Gear & Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.



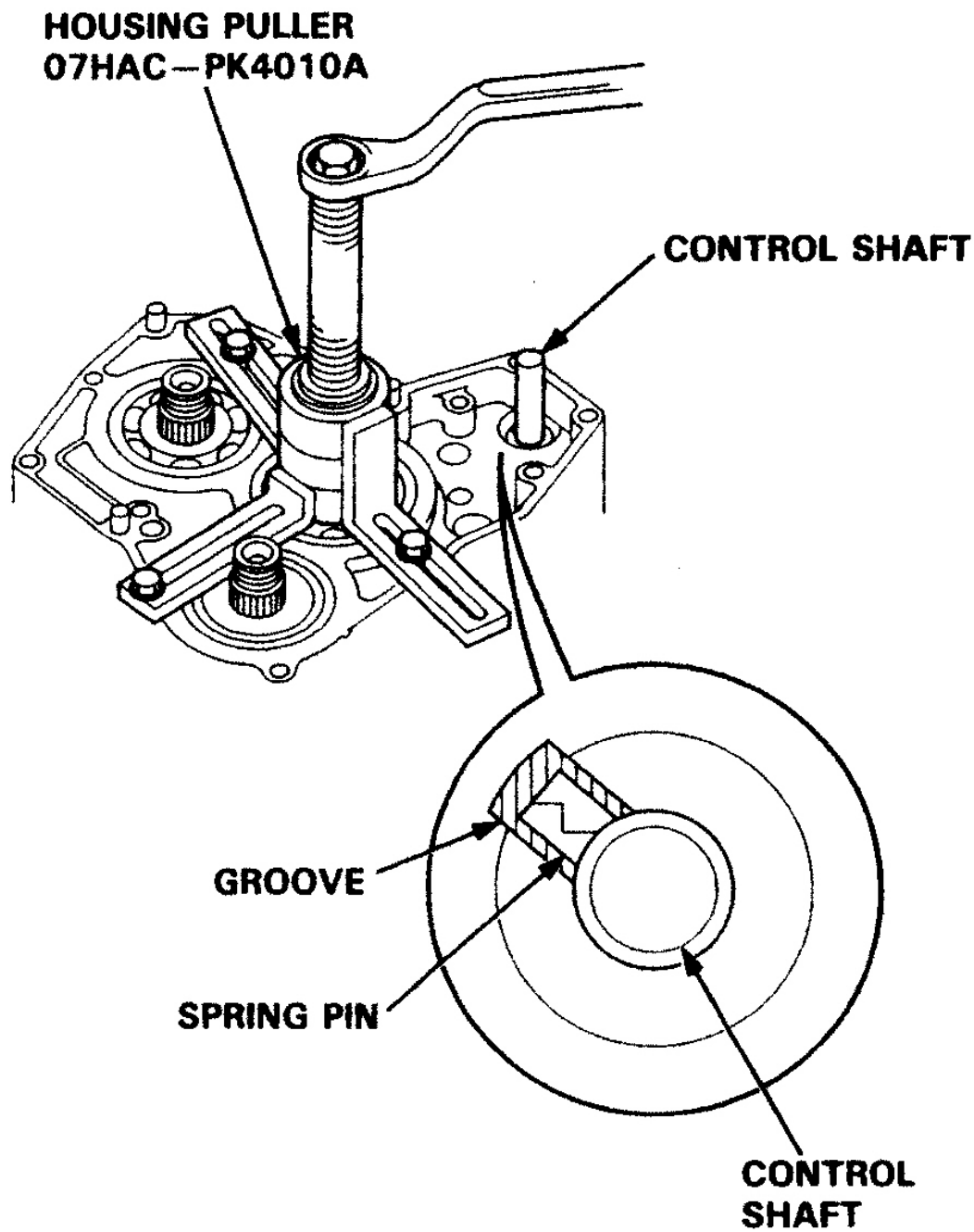
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Fig. 12: Removing/Installing Reverse Idler Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSMISSION HOUSING

NOTE: When removing the transmission housing, replace the transmission housing gasket and lock washer.

1. Remove the transmission housing mounting bolts and hangers. See **Fig. 6** .
2. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft. See **Fig. 13** .
3. Install the Housing Puller (07HAC-P4010A) on the transmission housing, then remove the housing.
4. Remove the reverse idler gear from the transmission housing.
5. Remove the countershaft 2nd gear, reverse gear, secondary shaft 2nd gear, thrust washer, and thrust needle bearing together from the countershaft and secondary shaft.
6. Remove the lock bolt securing the reverse shift fork, then remove the fork with the reverse selector from the countershaft.
7. Remove the needle bearings, thrust needle bearing, and splined washer from the secondary shaft.
8. Remove the secondary shaft sub-assembly.
9. Remove the mainshaft sub-assembly.
10. Remove the countershaft sub-assembly.
11. Remove the differential assembly.



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Fig. 13: Removing Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE CONVERTER HOUSING & VALVE BODY

NOTE: When removing the valve body, replace the "O" rings.

1. Remove the servo detent base (2 bolts). See Fig. 8 .
2. Remove the ATF strainer (2 bolts).
3. Remove the ATF feed pipes from the servo body and main valve body.

NOTE: The 4th accumulator cover is spring loaded. To prevent stripping the threads in the servo body, press down on the accumulator cover while unscrewing the bolts in a crisscross pattern.

4. Remove the 4th accumulator cover (3 bolts).
5. Remove the 7 bolts securing the servo body, then remove the servo body and separator plate.

NOTE: Do not let the seven check balls fall out the secondary valve body when removing the secondary valve body.

6. Remove the secondary valve body and separator plate.
7. Remove the 7 bolts securing the throttle valve body, then remove the throttle valve body and separator plate.
8. Remove the regulator valve body (1 bolt).
9. Remove the stator shaft and stop shaft.
10. Remove the detent spring from the detent arm, then remove the control shaft from the torque converter housing.
11. Remove the detent arm and detent arm shaft from the main valve body.

NOTE: Do not let the 3 check balls fall out the main valve body when removing the main valve body.

12. Remove the main valve body (4 bolts).
13. Remove the 1st/2nd accumulator body (6 bolts).
14. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
15. Remove the main separator plate with 3 dowel pins.
16. Clean the inlet opening of the ATF strainer thoroughly with compressed air, then check that it is in good condition, and the inlet opening is not clogged.

NOTE: The ATF strainer can be reused if it is not clogged.

17. Test the ATF filter by pouring clean ATF fluid through the inlet opening. Replace the ATF strainer if it is clogged or damaged.

COMPONENT DISASSEMBLY & REASSEMBLY

MAIN VALVE BODY

CAUTION: When disassembling main valve body, place main valve body components in order and mark spring locations for reassembly reference. **DO NOT** use force to remove components. **DO NOT** use magnet to remove check balls, as check balls may become magnetized. Note direction of valve cap installation before removing from main valve body.

Disassembly

Disassemble main valve body. See **Fig. 14** . Use care when removing valve caps or spring seats, as they are under spring pressure.

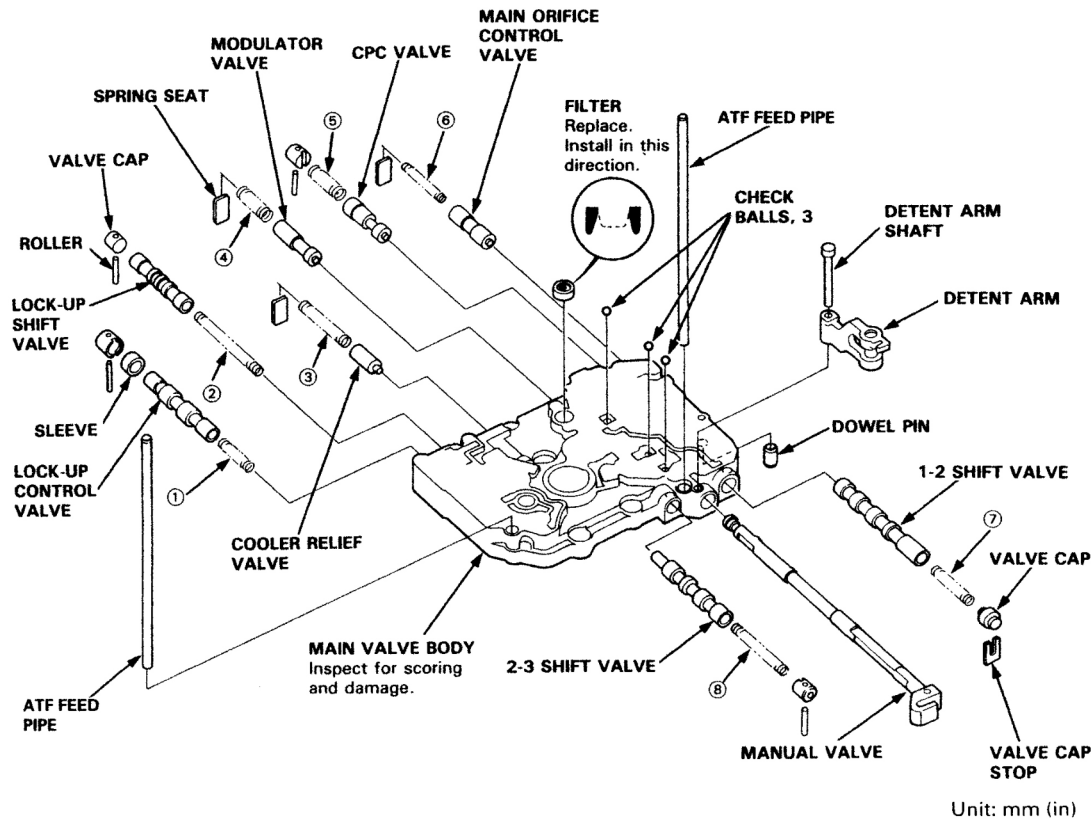
Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace main valve body as an assembly if any parts are worn or damaged.
2. Ensure all valves slide freely in bores. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked in ATF for at least 30 minutes. Thoroughly clean main valve body and components if polishing was needed.
3. Ensure spring free length is within specification. See table. Replace springs if not within specification.

NOTE: Oil pump clearance must be checked in main valve body. See **OIL PUMP** under **COMPONENT DISASSEMBLY & REASSEMBLY**.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Install NEW filter. Ensure all components are installed in correct location. See **Fig. 14** .



No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	24.6
		0.7 (0.028)	6.6 (0.260)	38.5 (1.516)	24.6
		0.7 (0.028)	6.6 (0.260)	39.0 (1.535)	24.6
②	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
③	Cooler relief valve spring	1.0 (0.039)	8.4 (0.331)	46.8 (1.843)	10.8
④	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
⑤	CPC valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
⑥	Main orifice control valve spring	1.1 (0.043)	7.1 (0.280)	49.1 (1.933)	22.7
⑦	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
⑧	2-3 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8

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Fig. 14: Exploded View Of Main Valve Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY VALVE BODY

Disassembly

Hold regulator spring cap downward. Remove stop bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 15**.

Cleaning & Inspection

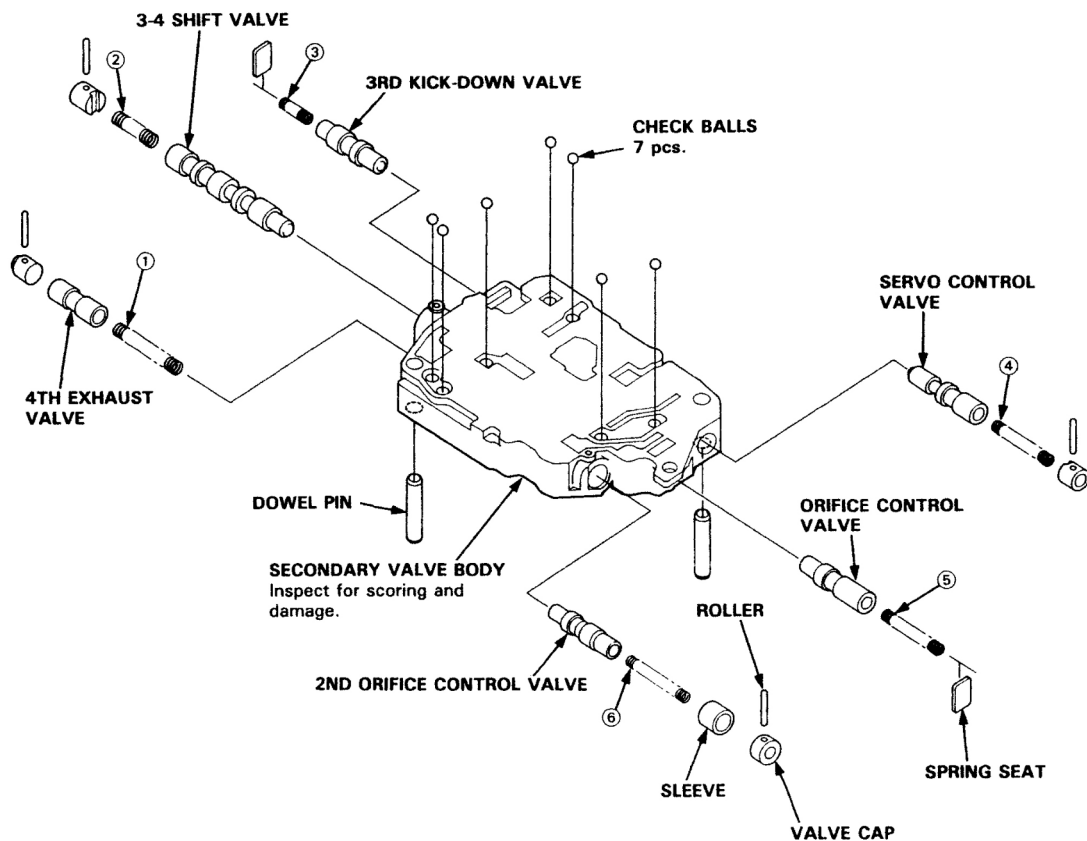
1. Clean components with solvent and dry with compressed air. Replace regulator valve body as an

assembly if any parts are worn or damaged.

2. Ensure all valves slide freely in bore. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked in ATF for at least 30 minutes. Thoroughly clean regulator valve body and components if polishing was needed.
3. Ensure spring free length is within specification. Replace springs if not within specification.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Install NEW filter. Ensure all components are installed in correct location. See **Fig. 15** . Tighten stop bolt to specification. See **TORQUE SPECIFICATIONS** .



Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	4th exhaust valve spring	0.8 (0.031)	7.1 (0.280)	48.8 (1.921)	17.2
②	3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
③	3rd kick-down valve spring	1.0 (0.039)	7.6 (0.299)	48.3 (1.902)	15.6
④	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.6 (2.071)	22.4
⑤	Orifice control valve spring	0.7 (0.028)	6.6 (0.260)	52.5 (2.067)	18.4
⑥	2nd orifice control valve spring	0.6 (0.024)	6.6 (0.260)	66.4 (2.614)	25.0

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Fig. 15: Exploded View Of Secondary Valve Body
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REGULATOR VALVE BODY

CAUTION: Regulator spring cap is under spring pressure. Ensure regulator spring cap is held downward when removing stop bolt.

Disassembly

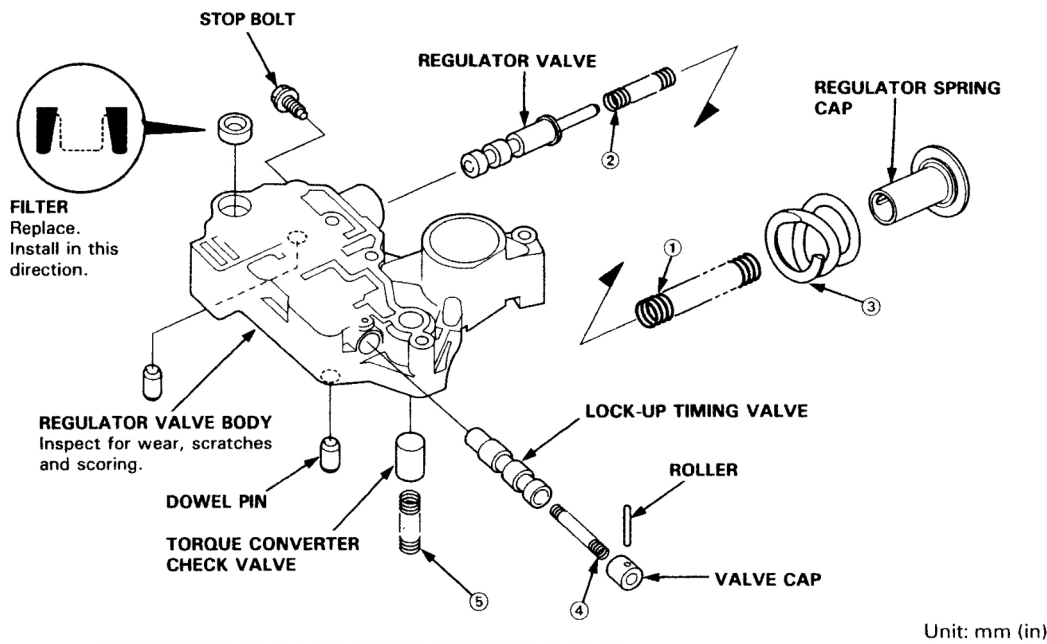
Hold regulator spring cap downward. Remove stop bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 16** .

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace regulator valve body as an assembly if any parts are worn or damaged.
2. Ensure all valves slide freely in bore. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked in ATF for at least 30 minutes. Thoroughly clean regulator valve body and components if polishing was needed.
3. Ensure spring free length is within specification. Replace springs if not within specification.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Install NEW filter. Ensure all components are installed in correct location. See **Fig. 16** . Tighten stop bolt to specification. See **TORQUE SPECIFICATIONS** .



Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	87.8 (3.457)	16.5
②	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	12.7
③	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
④	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	51.1 (2.012)	14.7
⑤	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0

G00323727

Fig. 16: Exploded View Of Regulator Valve Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

THROTTLE VALVE BODY

Disassembly

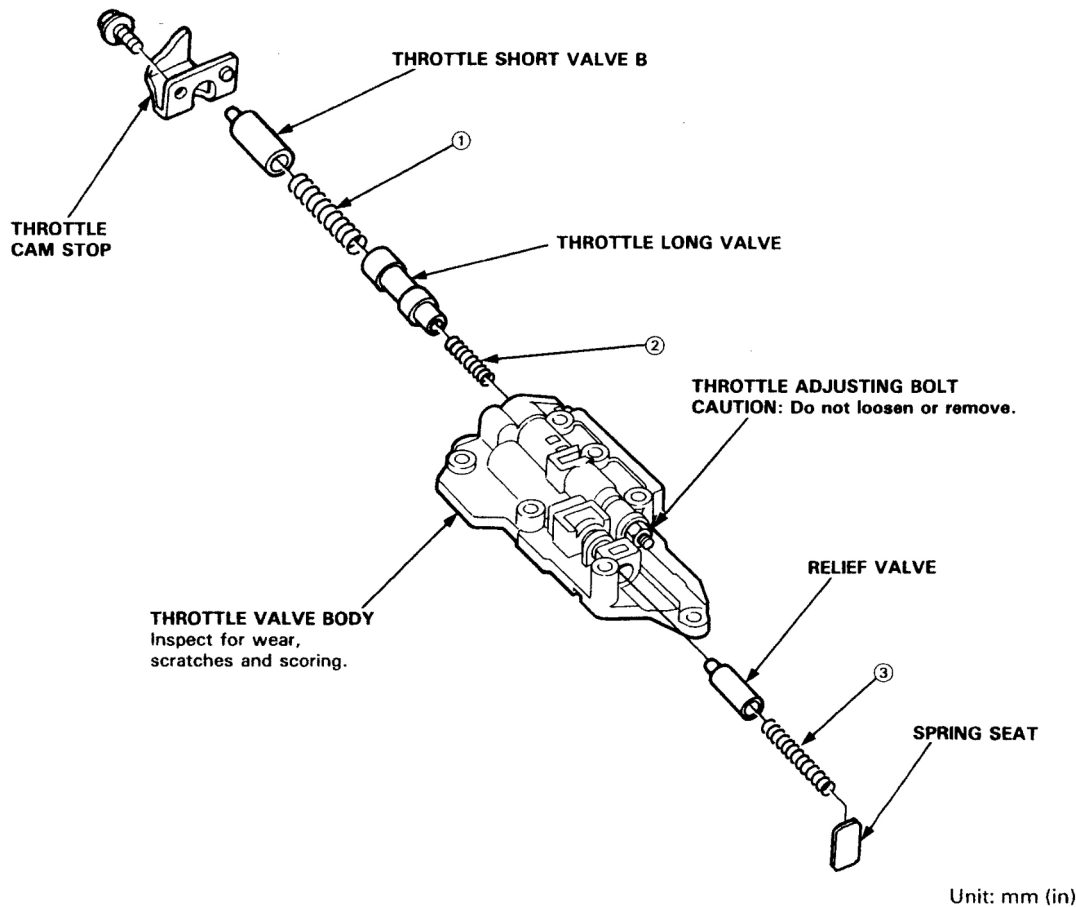
Hold regulator spring cap downward. Remove stop bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 17**.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace regulator valve body as an assembly if any parts are worn or damaged.
2. Ensure all valves slide freely in bore. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked in ATF for at least 30 minutes. Thoroughly clean regulator valve body and components if polishing was needed.
3. Ensure spring free length is within specification. Replace springs if not within specification.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Install NEW filter. Ensure all components are installed in correct location. See **Fig. 17** . Tighten stop bolt to specification. See **TORQUE SPECIFICATIONS** .



Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5
		1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2
		1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4
②	Throttle valve B adjusting spring	0.8 (0.031)	6.2 (0.244)	30.0 (1.181)	8.0
		1.0 (0.039)	8.4 (0.331)	39.1 (1.539)	15.1
③	Relief valve spring				

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Fig. 17: Exploded View Of Throttle Valve Body
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SERVO BODY

Disassembly

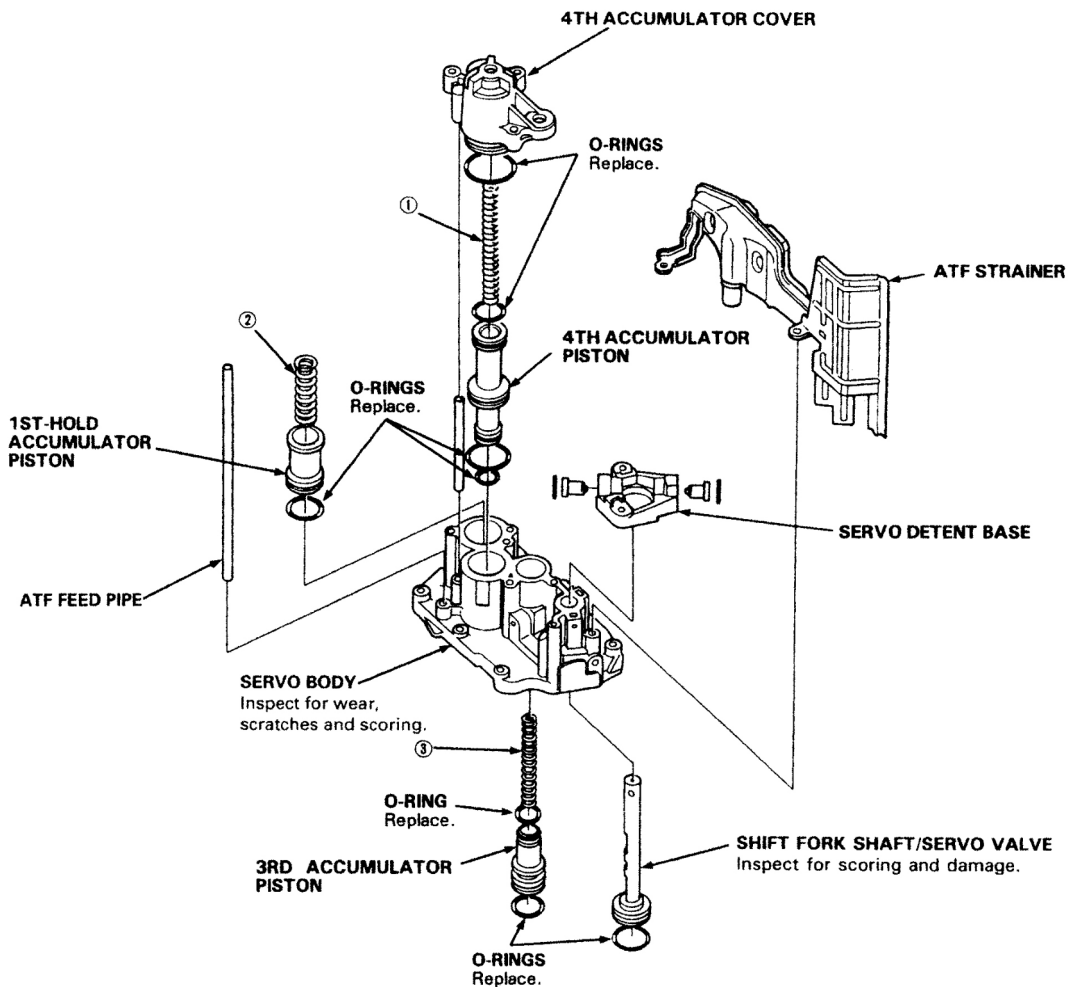
Disassemble servo body. See **Fig. 18** . Use care when removing accumulator cover, as it is under spring pressure.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace components if worn or damaged.
2. Ensure spring free length is within specification. Replace springs if not within specification.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure using NEW "O" rings. See **Fig. 18**.



Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	4th accumulator spring	2.9 (0.114)	22.0 (0.866)	90.1 (3.547)	10.9
②	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	64.7 (2.547)	7.3
③	3rd accumulator spring	2.9 (0.114)	17.5 (0.689)	99.6 (3.921)	16.1

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Fig. 18: Exploded View Of Servo Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

1ST/2ND ACCUMULATOR BODY**Disassembly**

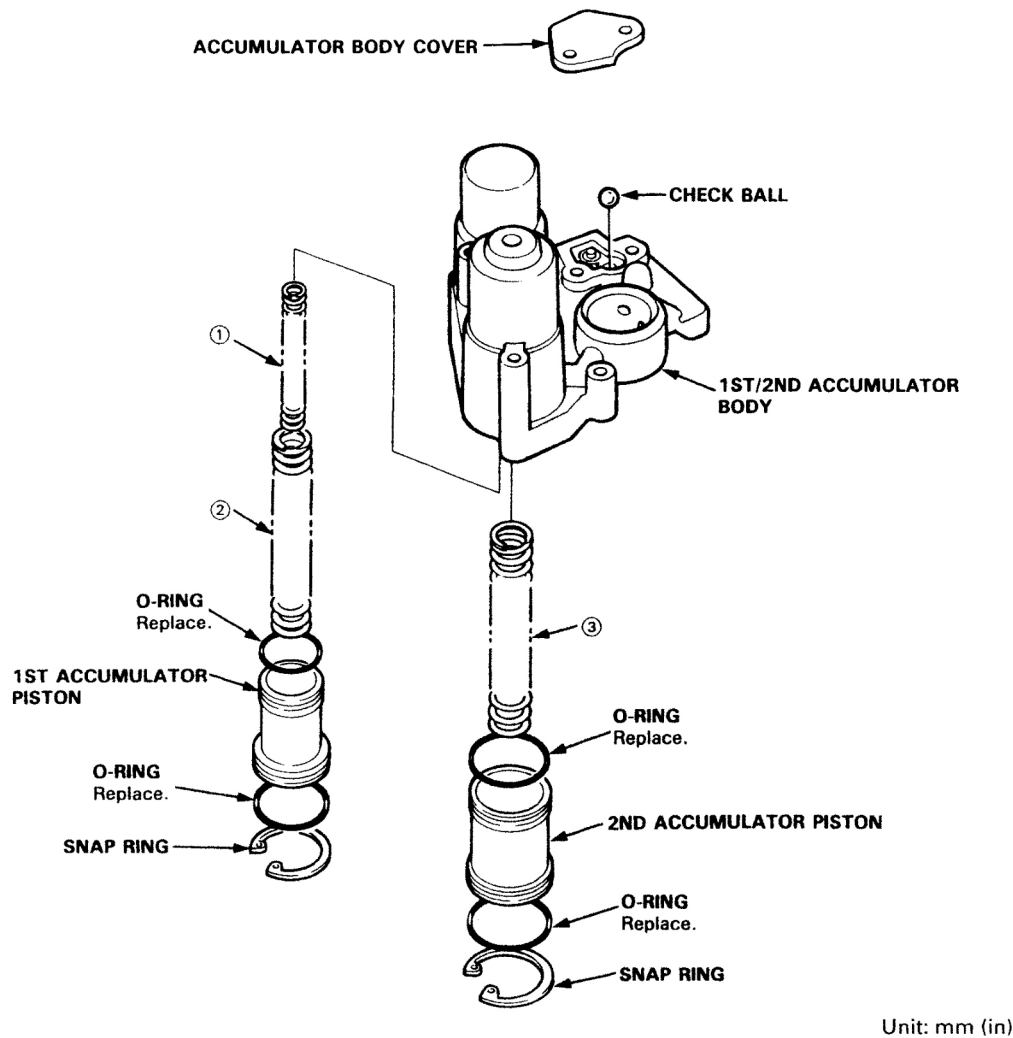
Disassemble 1st/2nd accumulator body. See **Fig. 19** . Use care when removing snap rings, as snap rings are under spring pressure. DO NOT use magnet to remove valves, as valves may become magnetized.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace components if worn or damaged.
2. Ensure spring free length is within specification. Replace springs if not within specification.

Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure using NEW "O" rings. See **Fig. 19** .



Unit: mm (in)

No.	Spring	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring B	1.8 (0.071)	6.3 (0.248)	70.5 (2.776)	15.3
②	1st accumulator spring A	2.3 (0.091)	16.3 (0.642)	109.6 (4.315)	20.0
③	2nd accumulator spring	3.5 (0.138)	22.0 (0.866)	91.0 (3.583)	10.8

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Fig. 19: Exploded View Of 1st/2nd Accumulator Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

OIL PUMP

Disassembly

Note direction of oil pump gear installation in main valve body. Remove oil pump driven gear shaft and oil pump gears from main valve body (if not previously removed).

Cleaning & Inspection

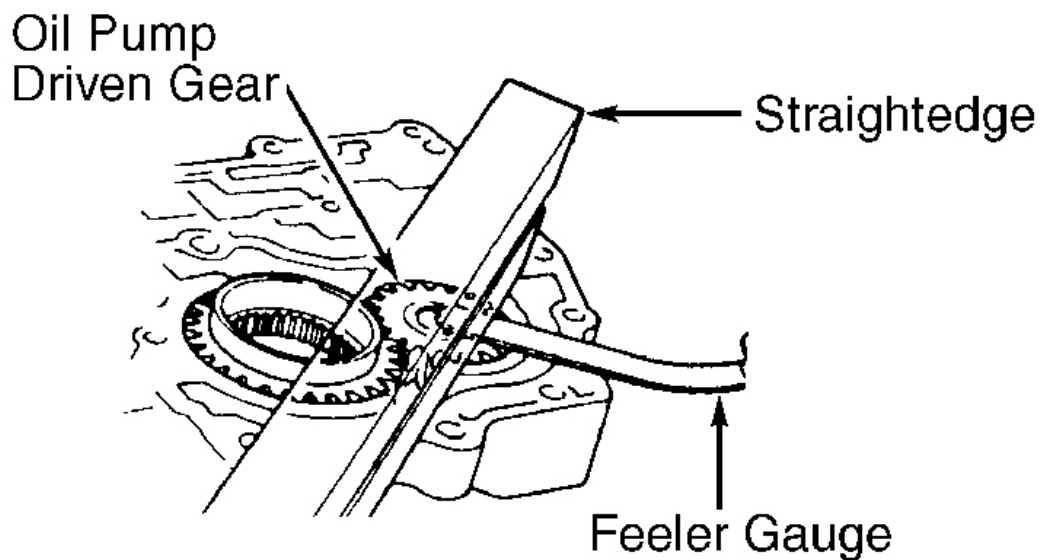
1. Clean components with solvent and dry with compressed air. Inspect components and replace if damaged.
2. Lubricate all parts with ATF prior to reassembly and inspection. Install oil pump gears and oil pump driven gear shaft in main valve body. Ensure chamfered and grooved side of oil pump driven gear is facing upward (toward separator plate side of main valve body).
3. Using feeler gauge, measure side clearance of both gears between tip of gear teeth and main valve body. See **Fig. 20** . Replace oil pump gears and/or main valve body if side clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.
4. Remove oil pump driven gear shaft. Place straightedge across main valve body surface. Using feeler gauge, measure thrust clearance between oil pump gears and straightedge. See **Fig. 20** . Replace oil pump gears and/or main valve body if thrust clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.

OIL PUMP SPECIFICATIONS

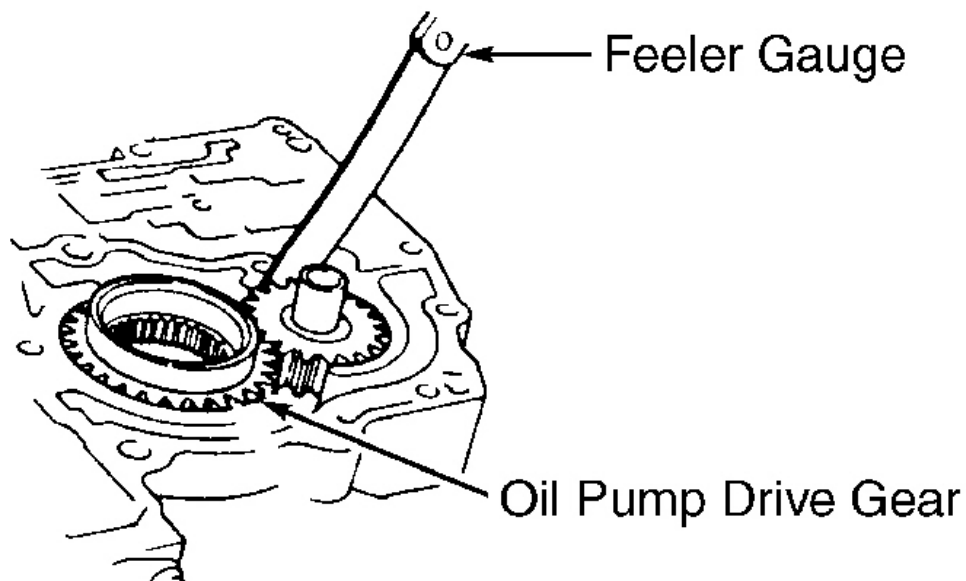
Application	In. (mm)
Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0014-.0025 (.035-.063)
Thrust Clearance	
Standard	.001-.002 (.030-.050)
Wear Limit	.0028 (.070)

Reassembly

Coat components with ATF. To reassemble, reverse disassembly procedure. Ensure chamfered and grooved side of oil pump driven gear is facing upward (toward separator plate side of main valve body).



CHECKING THRUST CLEARANCE



CHECKING SIDE CLEARANCE

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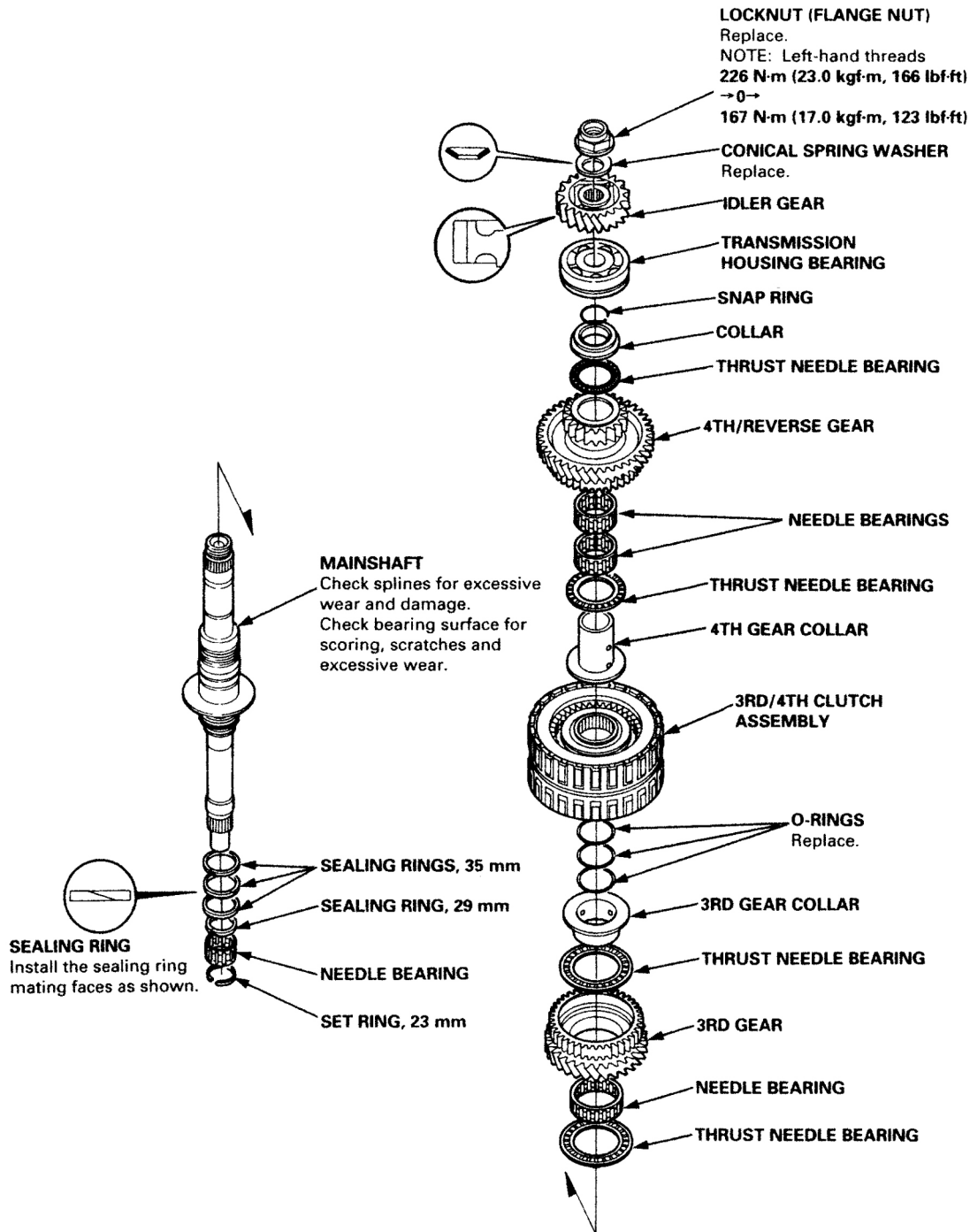
Fig. 20: Measuring Oil Pump Clearances

Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT

Disassembly

Note location of mainshaft components. See **Fig. 21** . Remove mainshaft components.



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Fig. 21: Exploded View Of Mainshaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear. Inspect all needle bearings for galling and rough movement.

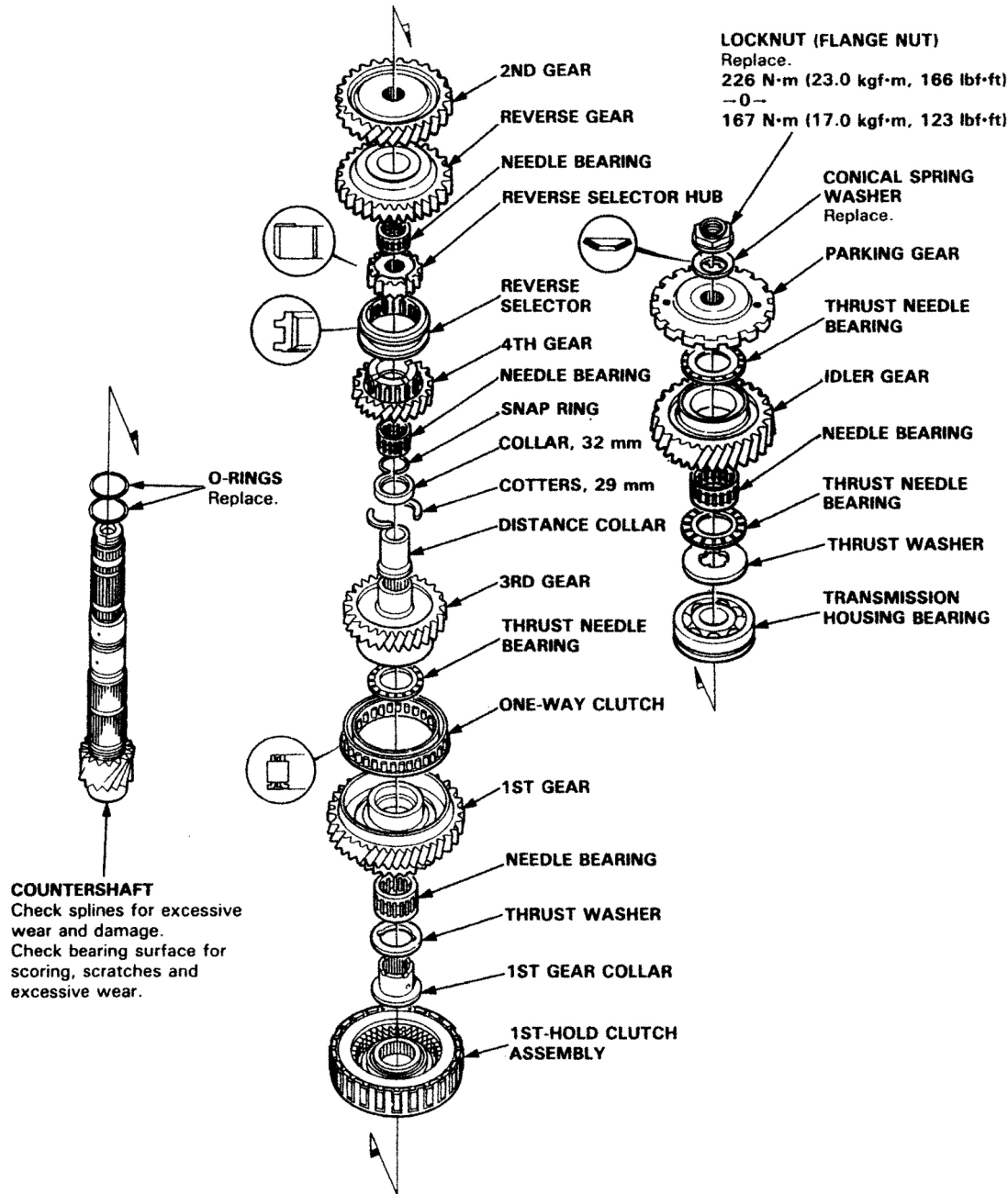
Reassembly

Lubricate components with ATF during installation. See **Fig. 21** .

COUNTERSHAFT

Disassembly

Note location of countershaft components. See **Fig. 22** . Remove countershaft components down to 3rd gear.



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Fig. 22: Exploded View Of Countershaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Removal (1st/3rd Gear)

NOTE: Place an attachment between the press and countershaft to prevent damage to the shaft.

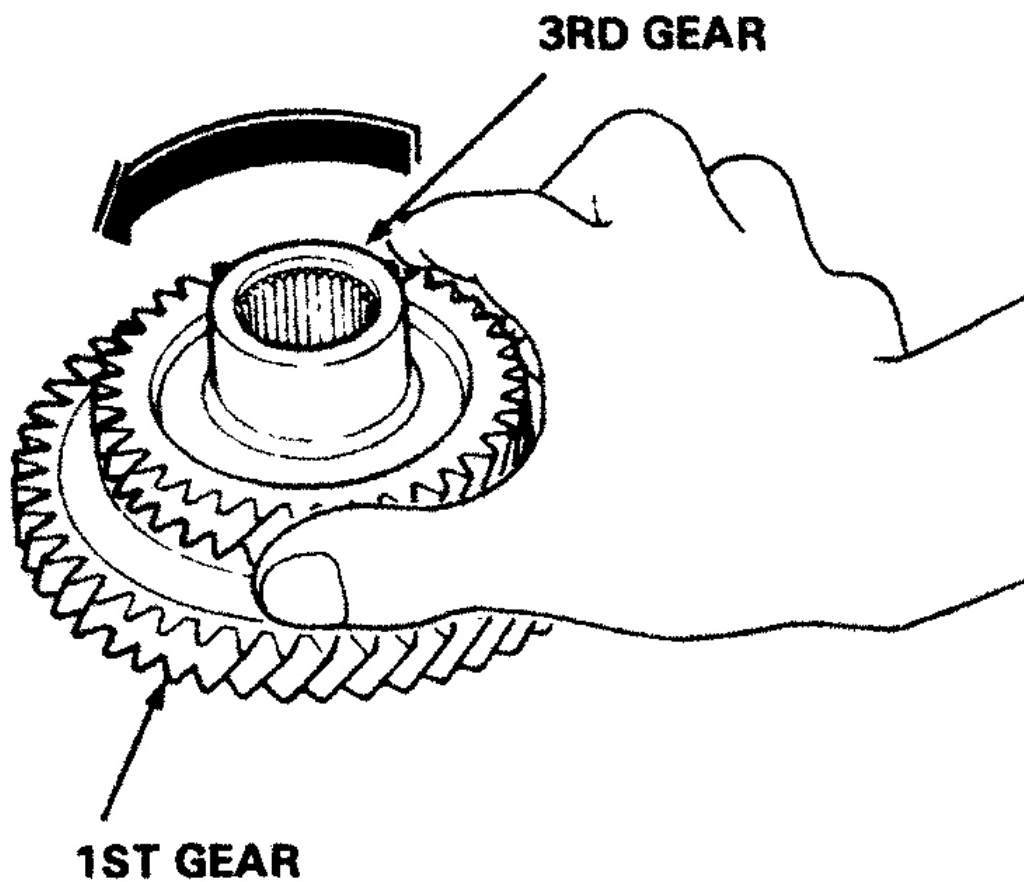
Using a hydraulic press, press the countershaft out from the 1st/3rd gear assembly while supporting the 1st-hold clutch. Hold onto the countershaft to keep it from falling when pressed clear.

Installation (1st/3rd Gear)

1. Install the one-way clutch securely in the 1st gear. See **Fig. 22** . Install the thrust needle bearing in the 1st gear.
2. Assemble the 3rd gear and 1st gear by turning the 3rd gear in the counterclockwise direction. See **Fig. 23** .
3. Hold the 1st gear, and make sure the 3rd gear turns freely in the counterclockwise direction. Also make sure the 3rd gear does not turn in clockwise direction.
4. Install the needle bearing, thrust washer and 1st gear collar in the 1st/3rd gear assembly, then install them in the 1st-hold clutch.
5. Wrap the shaft splines with tape to prevent damage to the "O" rings, and install two new "O" rings in the countershaft.
6. Install the 1st/3rd gear and 1st-hold clutch assembly on the countershaft.

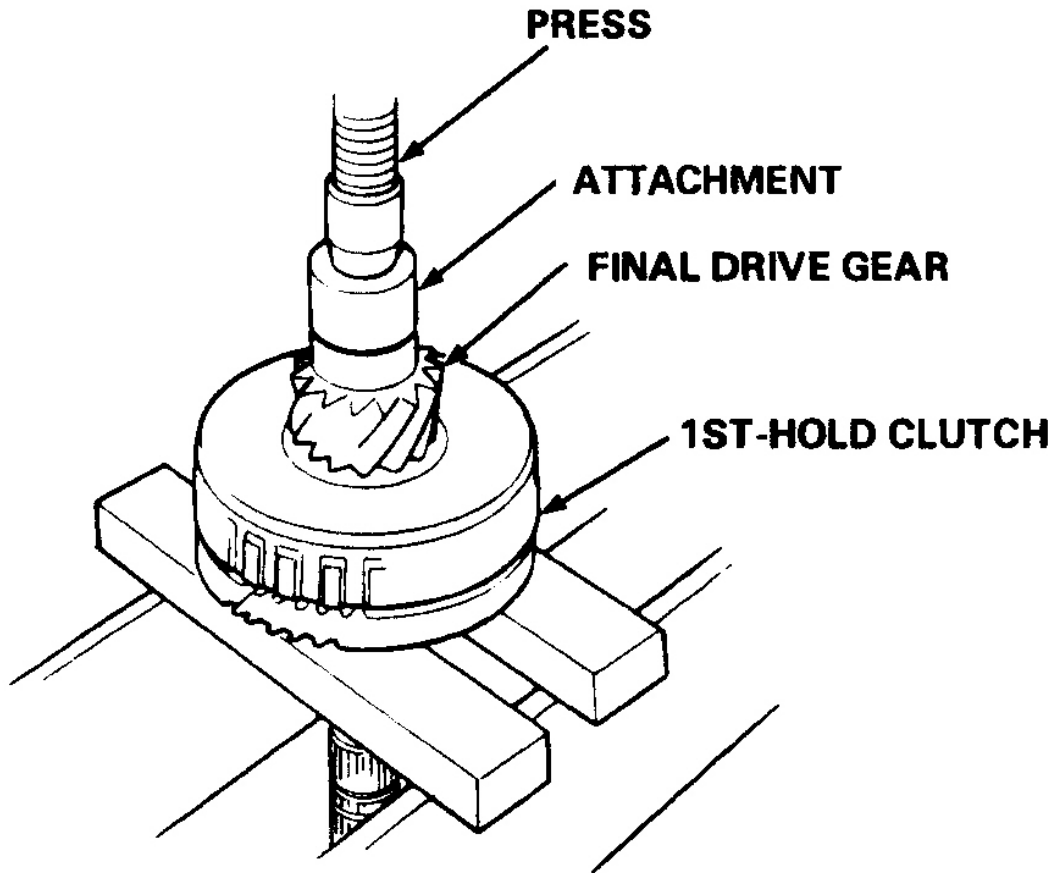
NOTE: **Place an attachment between the press and countershaft to prevent damage to the shaft.**

7. Align the shaft splines with those of 1st-hold clutch, 1st gear collar and 3rd gear, then press the countershaft into 3rd gear using a press. See **Fig. 24** . Stop pressing the countershaft when the 1st-hold clutch contacts the final drive gear.



G00323733

Fig. 23: Identifying 3rd Gear One-Way Clutch Rotation
Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00323734

Fig. 24: Pressing Countershaft Into 1st-Hold Clutch
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear. Inspect all needle bearings for galling and rough movement.

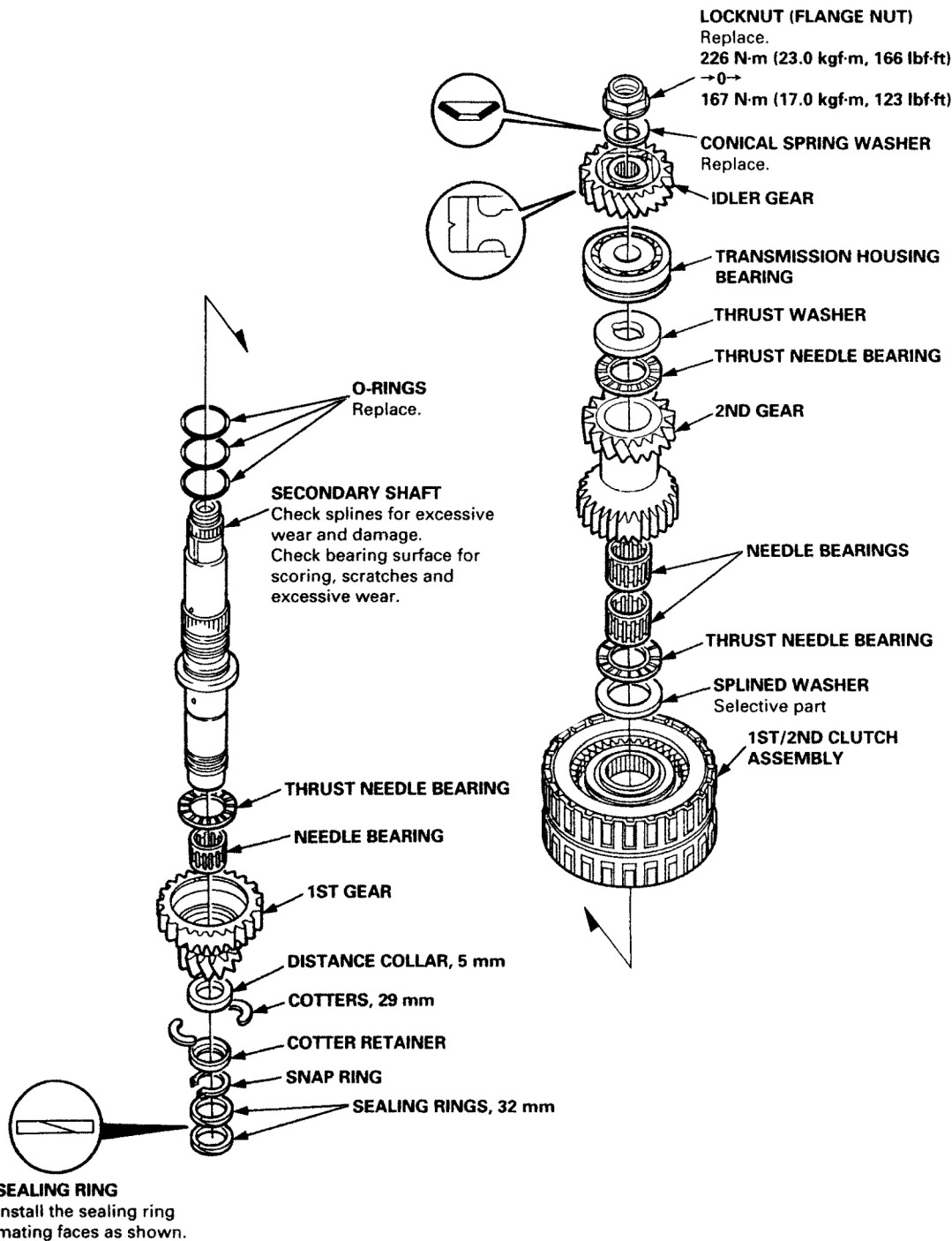
Reassembly

Note location of countershaft components. Assemble countershaft assembly in reverse order of disassembly. See **Fig. 22** .

SECONDARY SHAFT

Disassembly

Note location of secondary shaft components. See **Fig. 25** . Remove secondary shaft components.



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Fig. 25: Exploded View Of Secondary Shaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning

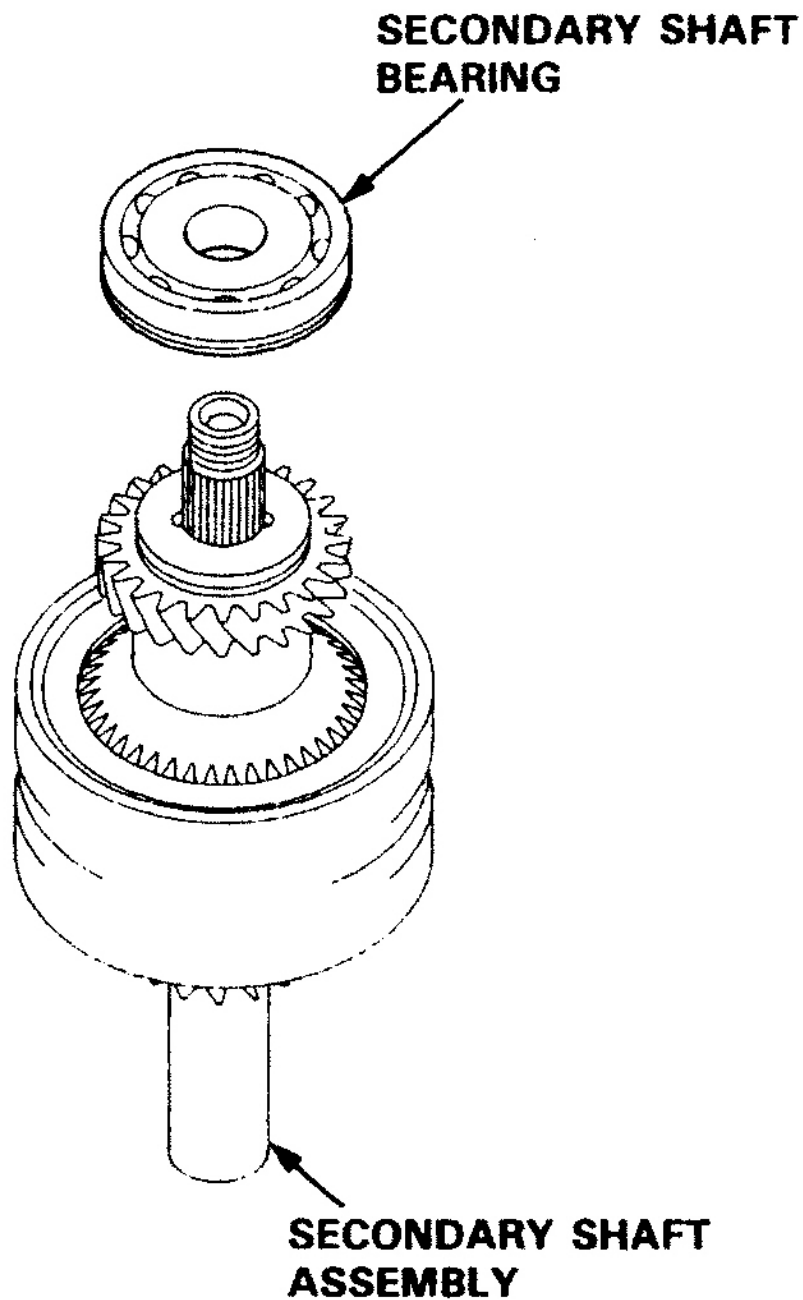
Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear. Inspect all needle bearings for galling and rough movement.

Inspection

1. Remove the secondary shaft bearing from the transmission housing.
2. Assemble the secondary shaft assembly without "O" rings.
3. Install the secondary shaft bearing on the secondary shaft. See **Fig. 26** .
4. Set the dial indicator to the 2nd gear. See **Fig. 27** .

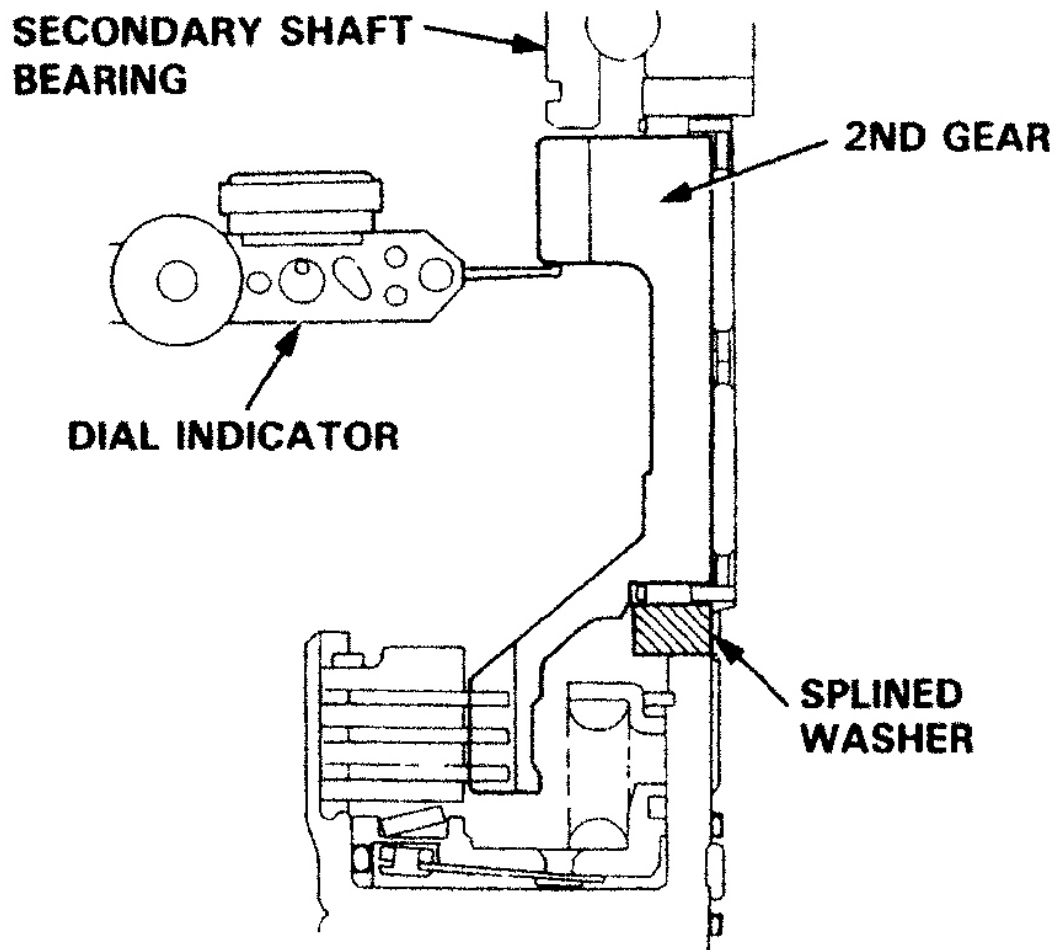
NOTE: **Take measurements in at least three places, and use the average as the actual clearance.**

5. Hold the secondary shaft bearing against the 1st/2nd clutch assembly. Measure the 2nd gear axial clearance while moving the 2nd gear. See **Fig. 28** . Standard is .002-.005" (.04 - 0.12 mm).
6. If the clearance is out of tolerance, remove the splined washer and measure its thickness.
7. Select and install a new splined washer, then recheck. See **Fig. 29** .
8. After replacing the splined washer, make sure that the clearance is within tolerance.



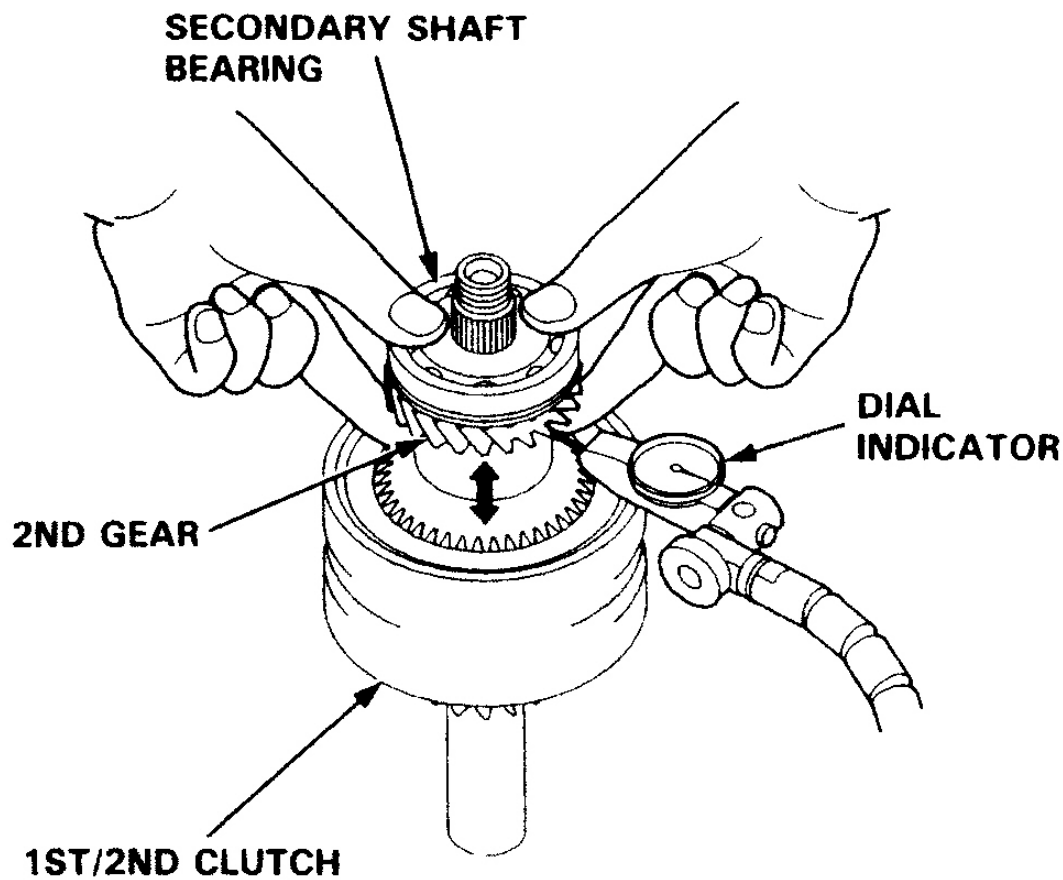
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Fig. 26: Installing Secondary Shaft Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 27: Identifying 2nd Gear Clearance Measurement Set-Up
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 28: Measuring 2nd Gear Axial Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90406 – PX4 – 700	4.05 mm (0.159 in)
2	90407 – PX4 – 700	4.10 mm (0.161 in)
3	90408 – PX4 – 700	4.15 mm (0.163 in)
4	90409 – PX4 – 700	4.20 mm (0.165 in)
5	90410 – PX4 – 700	4.25 mm (0.167 in)
6	90411 – PX4 – 700	4.30 mm (0.169 in)
7	90412 – PX4 – 700	4.35 mm (0.171 in)
8	90413 – PX4 – 700	4.40 mm (0.173 in)
9	90414 – PX4 – 700	4.45 mm (0.175 in)

G00323739

Fig. 29: Splined Washer Availability Chart
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

Note location of secondary shaft components. Assemble secondary shaft assembly in reverse order of disassembly. See **Fig. 25**.

CLUTCH ASSEMBLIES

Disassembly

1. Remove snap ring, clutch end plate, clutch discs and clutch plates. See **Fig. 30 -Fig. 32**.
2. Remove disc spring from 1st, 3rd and 4th clutches. Note direction of disc spring installation.
3. Using clutch spring compressor, compress return spring. Remove snap ring. Release and remove clutch spring compressor. Remove spring retainer and return spring.
4. Wrap shop towel around clutch drum. Apply light air pressure to oil passage on clutch drum to remove clutch piston. Remove "O" rings.

Cleaning & Inspection

1. Clean metal components with solvent and dry with compressed air. Blow out all passages with

compressed air. Ensure check valve on rear of clutch piston is thoroughly cleaned and securely fastened on clutch piston.

2. Inspect components for damage. Ensure check valve on 3rd and 4th pistons is tight. If check valve is loose, replace piston. Replace if necessary. Ensure no rough edges exist on "O" ring sealing areas.

Reassembly

1. Lubricate all components with ATF. Install NEW "O" rings. Install clutch piston in clutch drum. Slightly rotate clutch piston back and forth during installation to prevent damaging "O" rings.

CAUTION: DO NOT apply excessive force on clutch piston, or "O" rings will be damaged.

2. Install return spring and spring retainer in clutch drum. Place snap ring on spring retainer. Using clutch spring compressor, compress return spring. Install snap ring. Remove clutch spring compressor.
3. On 1st, 3rd and 4th clutches, install disc spring. Ensure disc spring is installed in proper direction. See .

CAUTION: Soak clutch discs in ATF for at least 30 minutes before installing.

4. Alternately install clutch plates and clutch discs starting with clutch plate. Install clutch end plate with flat side toward clutch disc. Install snap ring.
5. Using dial indicator, measure clutch clearance between clutch end plate and top clutch disc. See **Fig. 33** . Zero dial indicator with clutch end plate lowered, and then lift clutch end plate upward against snap ring. Distance measured is clutch clearance.
6. Measure clutch clearance at 3 different locations. Clutch clearance should be within specification. See **CLUTCH CLEARANCE SPECIFICATIONS** table.
7. If clutch clearance is not within specification, install different thickness clutch end plate. End plates for 1st, 2nd, 3rd, 4th and 1st-hold clutches range in thickness from .083" (2.10 mm) to .114" (.114 mm) in .004" (.10 mm) increments.

NOTE: If thickest clutch end plate is installed and clutch clearance still exceeds specification, replace clutch discs and clutch plates.

CLUTCH CLEARANCE SPECIFICATIONS

Application	In. (mm)
1st Clutch	.026-.033 (.65-.85)
2nd Clutch	.026-.033 (.65-.85)
3rd Clutch	.016-.024 (.40-.60)
4th Clutch	.016-.024 (.40-.60)
1st-Hold Clutch	.031-.039 (.80-1.00)

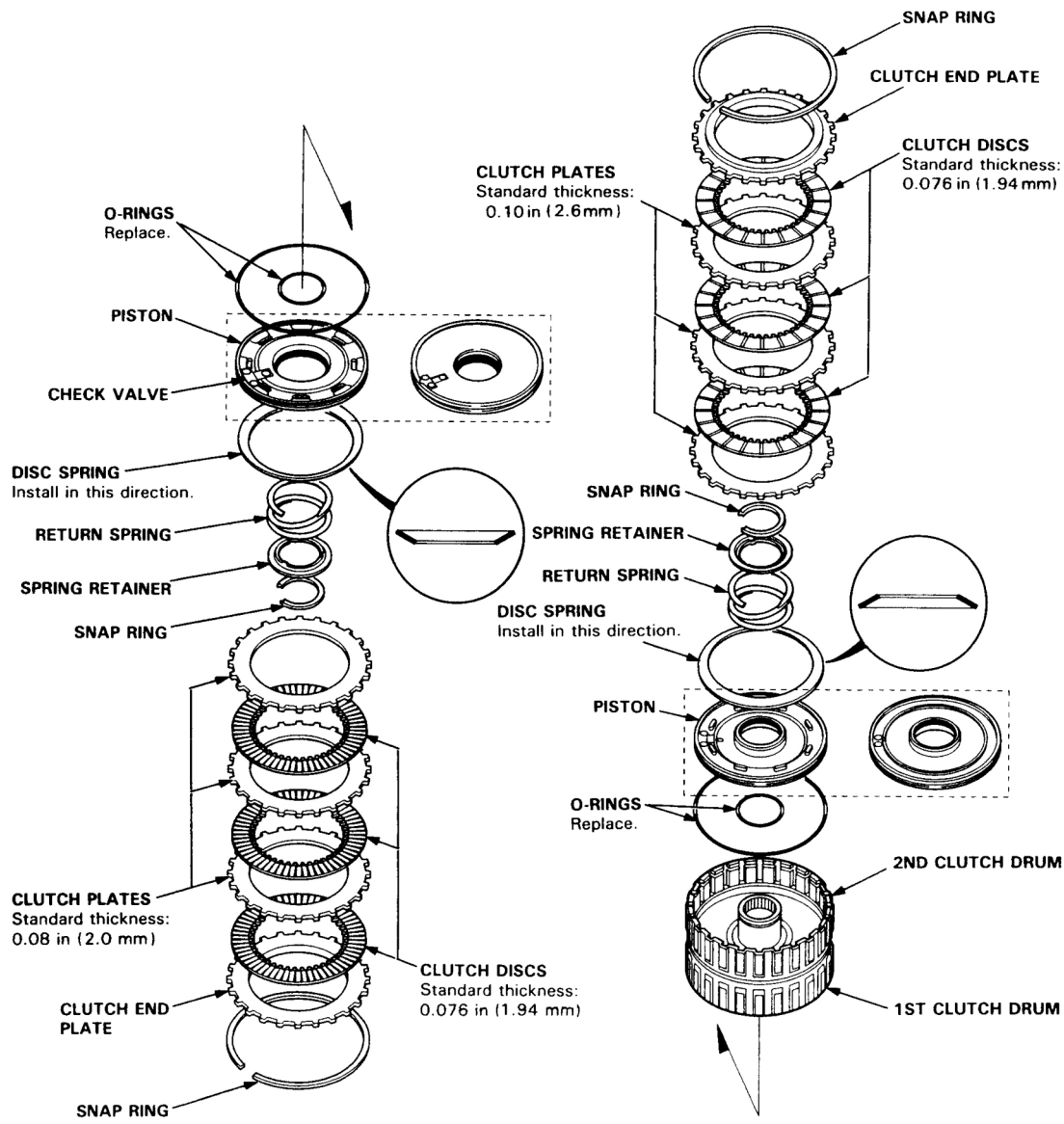


Fig. 30: Exploded View Of 1st/2nd Clutch Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

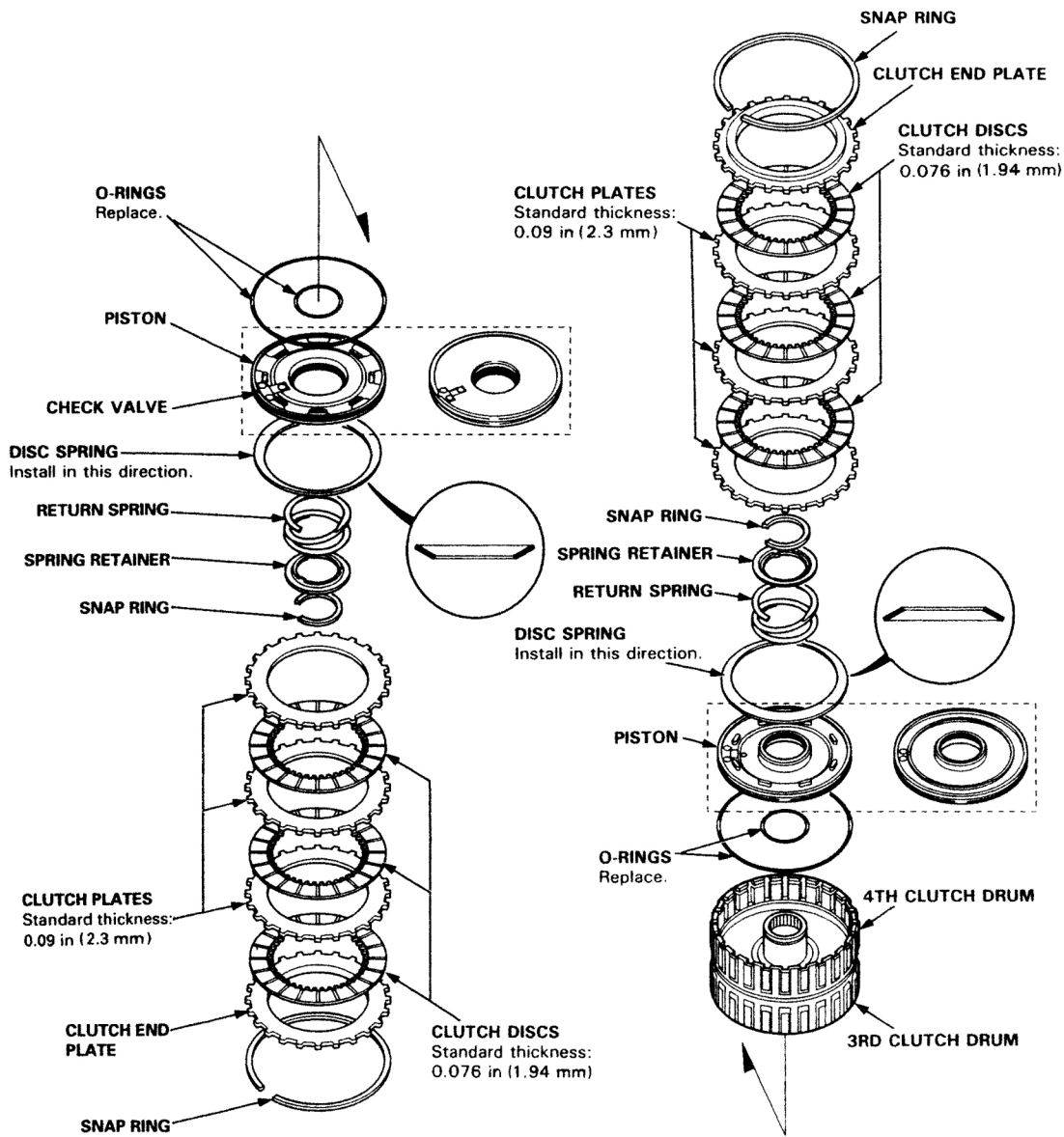
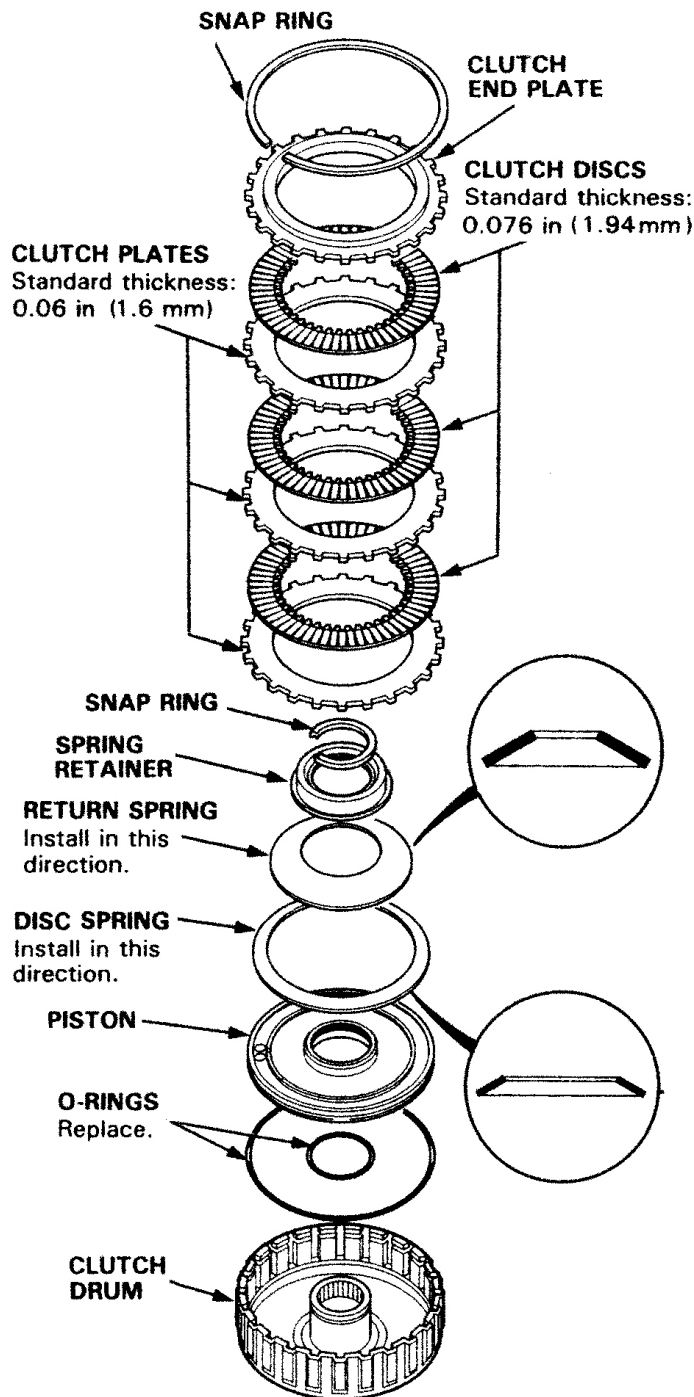
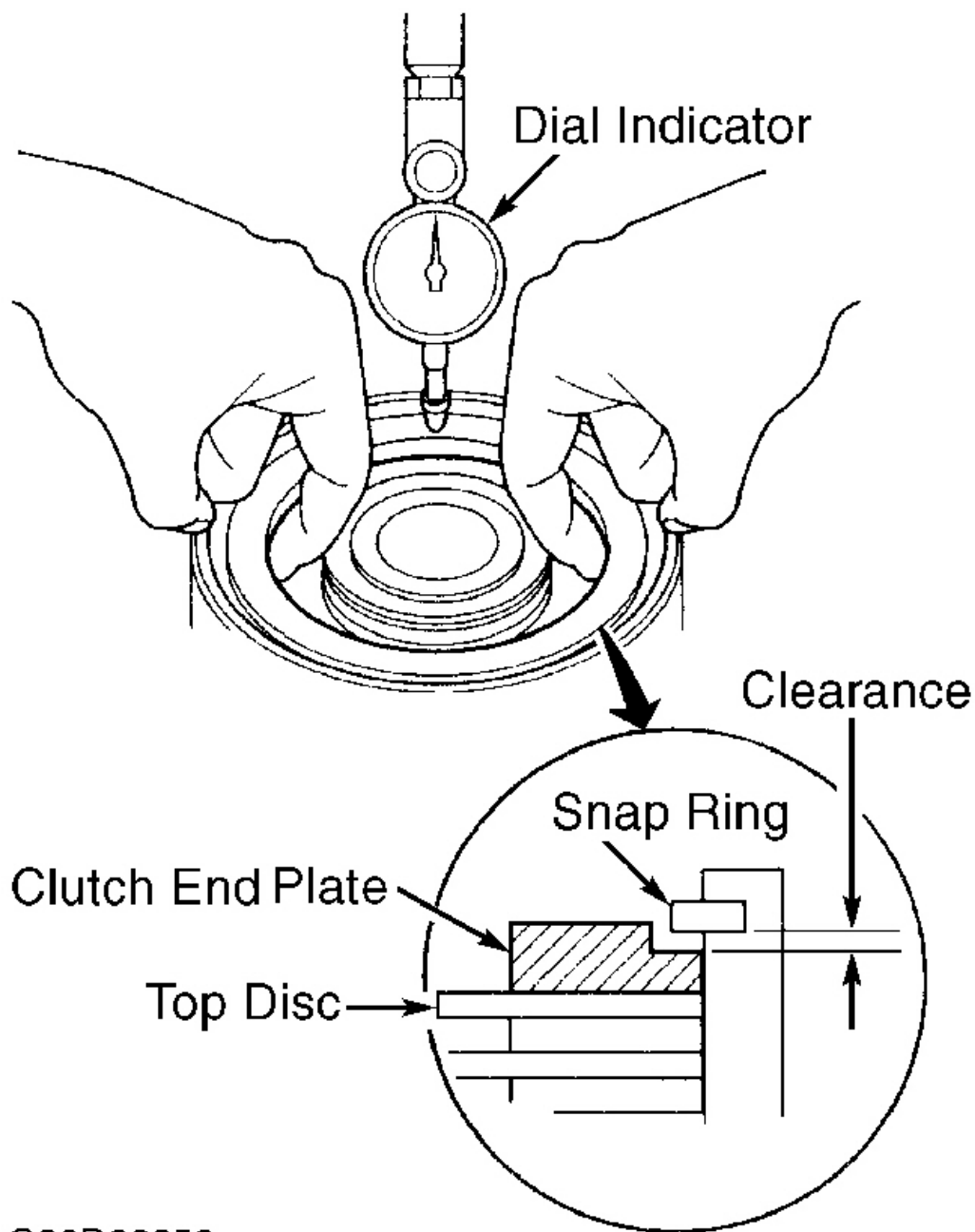


Fig. 31: Exploded View Of 3rd/4th Clutch Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 32: Exploded View Of 1st/Hold Clutch Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 33: Measuring Clutch Clearance

Courtesy of AMERICAN HONDA MOTOR CO., INC.

DIFFERENTIAL ASSEMBLY

Disassembly

1. Before disassembling differential assembly, check side gear backlash. Place differential assembly on "V" blocks with both axle shafts installed.
2. Install dial indicator with stem resting against pinion gear. See **Fig. 34** . Check side gear backlash. Side gear backlash should be .002-.006" (.05-.15 mm). If side gear backlash is not within specification, replace differential carrier.

NOTE: Ring gear bolts have left-hand threads.

3. If replacing bearings, use bearing puller to remove bearings from differential carrier. Remove bolts and ring gear.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for wear and damage. Replace components as necessary.

Reassembly

CAUTION: Ring gear must be installed with chamfered side of ring gear toward differential carrier. See Fig. 35 . Ring gear bolts are left-hand thread.

Install ring gear. Install and tighten ring gear bolts to specification. See **TORQUE SPECIFICATIONS** . Using press, install NEW bearings on differential carrier (if removed). Ensure bearings are fully seated on differential carrier.

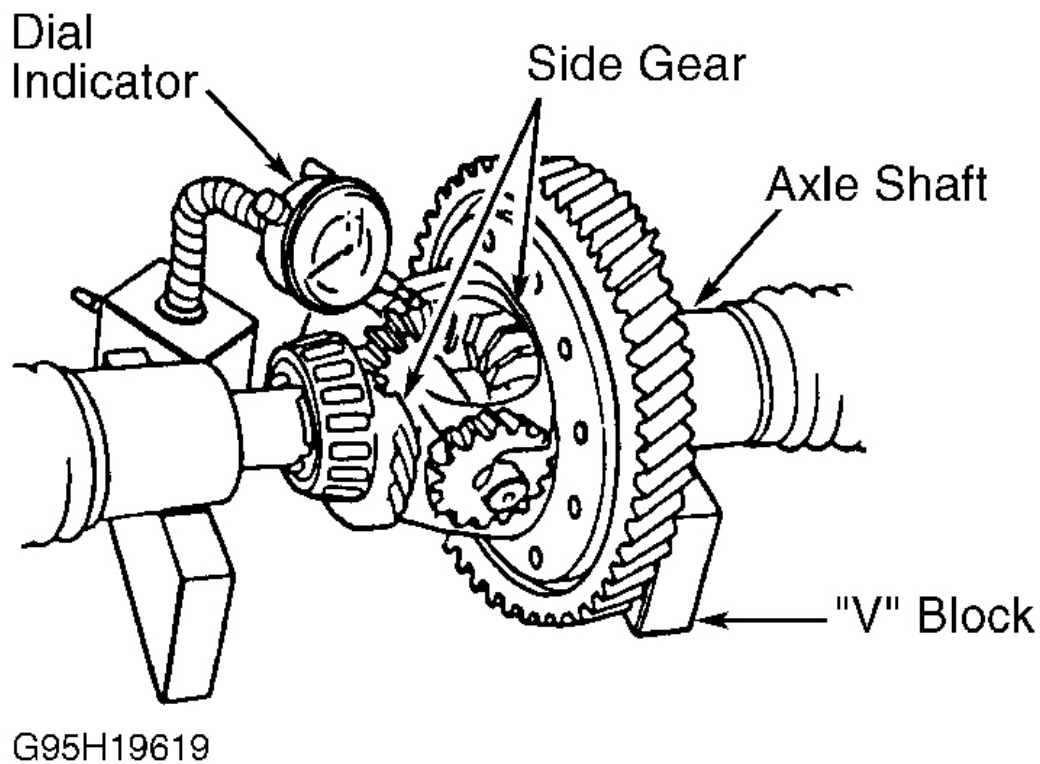
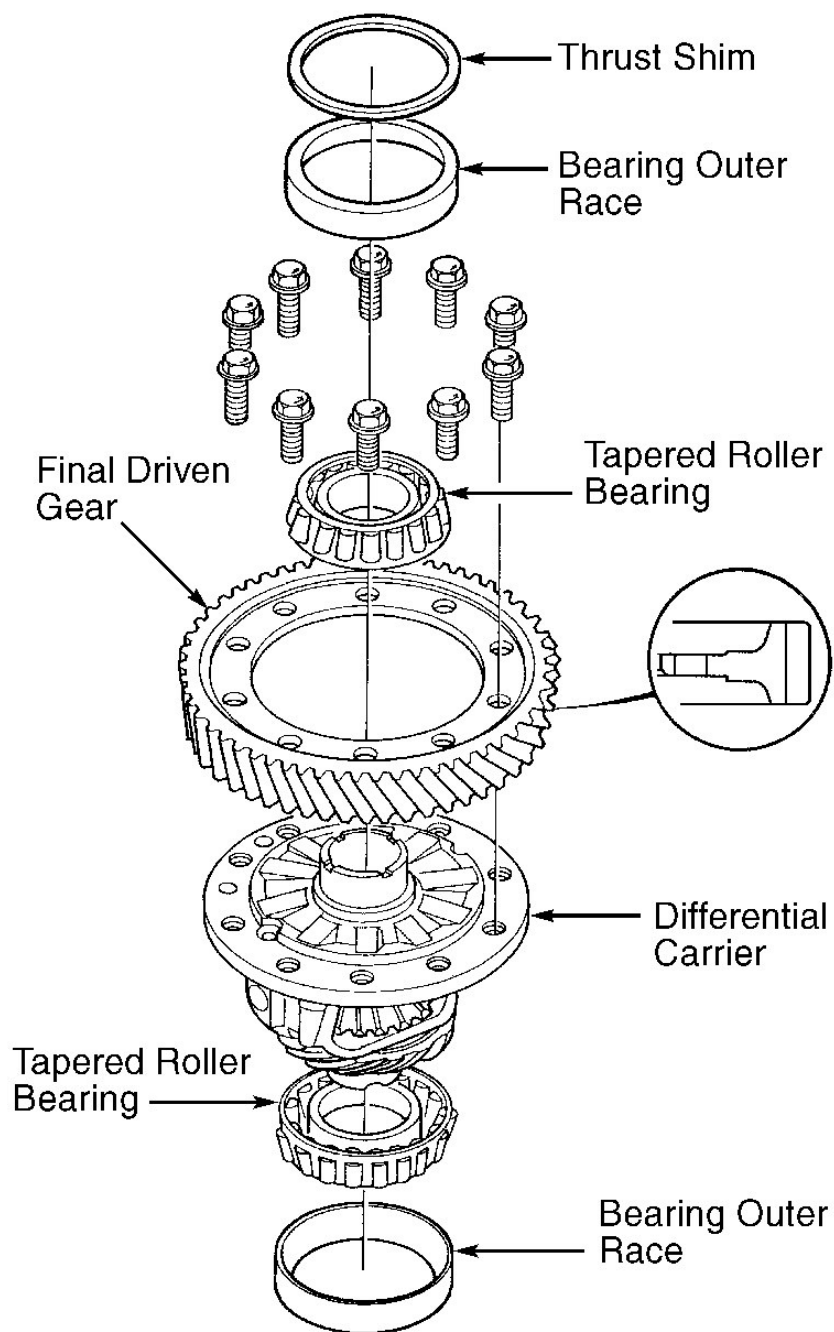


Fig. 34: Checking Side Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 35: Exploded View Of Differential Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Differential Assembly Bearing Preload

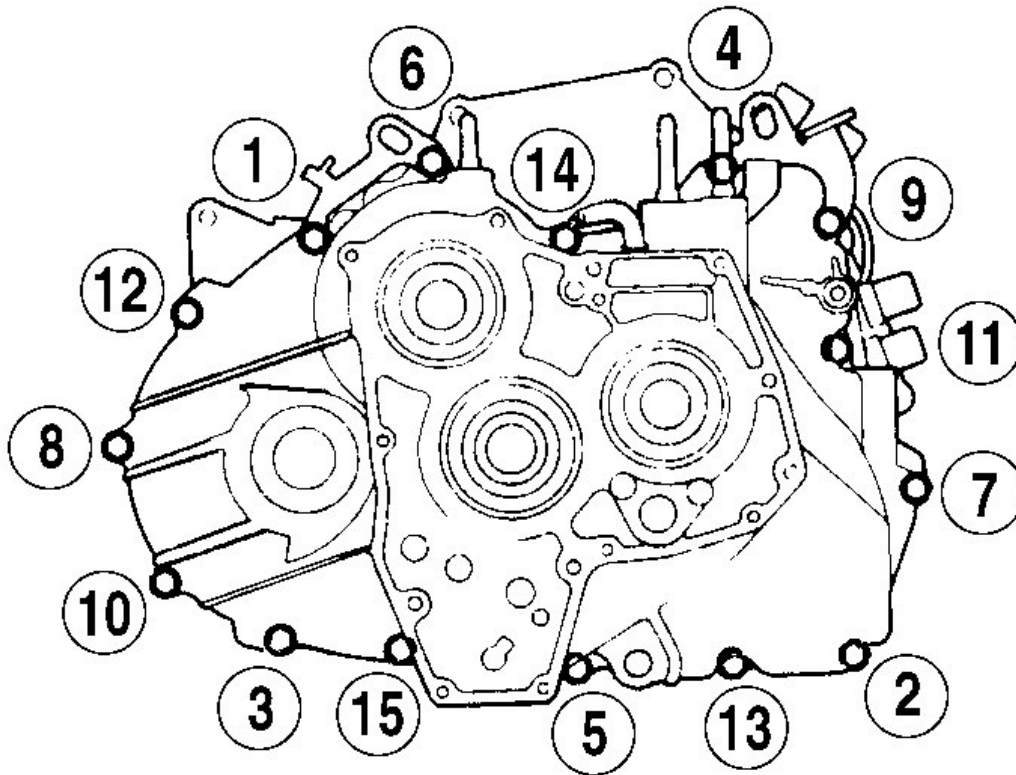
NOTE: If transaxle housing, torque converter housing, differential carrier, bearings, thrust shim, spacer or differential bearing outer races are replaced, differential assembly bearing preload must be checked.

CAUTION: DO NOT heat transaxle housing to more than 212°F (100°C), or housing may be damaged.

1. Using heat gun, heat transaxle housing around differential bearing outer race and thrust shim to 212°F (100°C). Tap differential bearing outer race from transaxle housing. Remove thrust shim located below differential bearing outer race, from transaxle housing.
2. Allow transaxle housing to cool to room temperature. Install a .102" (2.60 mm) thrust shim in transaxle housing. Using hammer and bearing race installer, install differential bearing outer race in transaxle housing. Ensure differential bearing outer race is fully seated in transaxle housing.

CAUTION: Ensure gasket is installed when checking differential assembly bearing preload.

3. Install gasket on torque converter housing. DO NOT apply sealer at this time. Install differential assembly in torque converter housing. Install transaxle housing on torque converter housing without mainshaft, countershaft and secondary shaft installed.
4. Install and tighten transaxle housing-to-torque converter housing bolts to 33 ft. lbs. (44 N.m) in sequence. See **Fig. 36** . Rotate differential assembly several turns to seat bearings.



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Fig. 36: Transaxle Housing Bolt Tightening Sequence
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install Preload Adapter (07HAJ-PK40201) into differential assembly. See **Fig. 37** . Install INCH-lb. torque wrench on preload adapter. Measure differential assembly bearing preload by checking starting torque required to rotate differential assembly in both directions at room temperature.
6. Differential assembly bearing preload should be within specification. See **DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS** table.

DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS ⁽¹⁾

Application	INCH Lbs. (N.m)
New Bearings	24-35 (2.7-3.9)
Used Bearings	22-32 (2.5-3.6)
(1) Starting torque required to rotate differential assembly.	

7. If differential assembly bearing preload is not within specification, select proper thickness thrust shim to

obtain correct reading. Thrust shims range in thickness from .087" (2.20 mm) to .120" (3.05 mm) in .002" (.05 mm) increments.

8. Changing thrust shim to the next size will increase or decrease bearing preload about 2.7-3.5 INCH lbs. (.3-.4 N.m). Increase thrust shim thickness to increase differential assembly bearing preload. Decrease thrust shim thickness to decrease bearing preload.
9. If adjusting differential assembly bearing preload, remove transaxle housing from torque converter housing. Remove differential bearing outer race from transaxle housing. Install correct thrust shim. Using hammer and bearing race installer, install differential bearing outer race in transaxle housing.
10. Reinstall transaxle housing and recheck differential assembly bearing preload. Once correct differential assembly bearing preload is obtained, remove transaxle housing, gasket and differential assembly from torque converter housing.

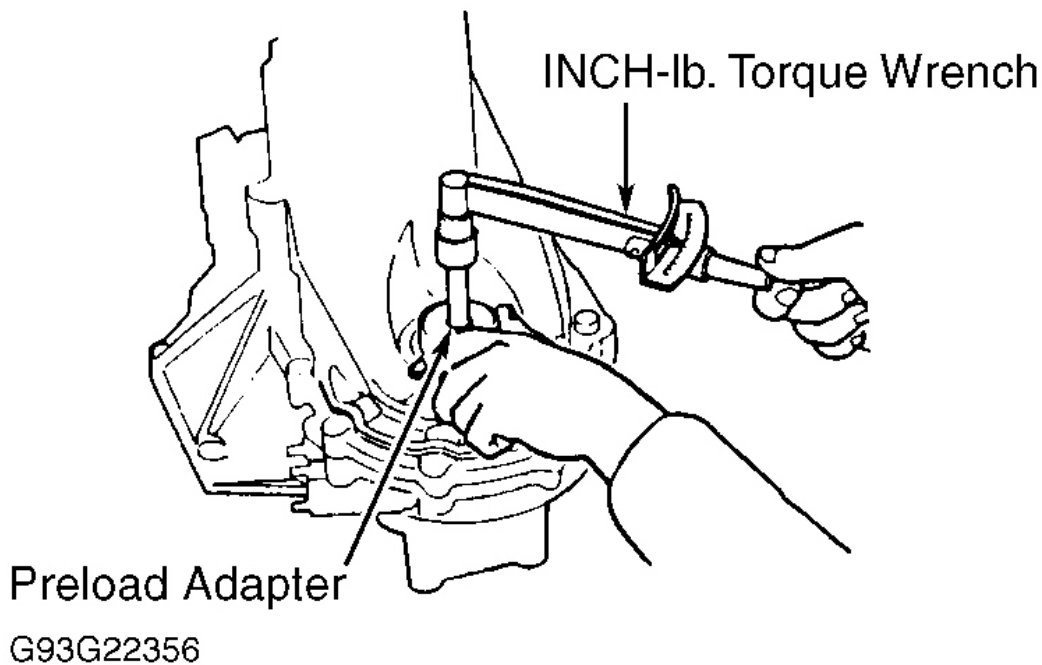


Fig. 37: Checking Differential Bearing Preload
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE REASSEMBLY

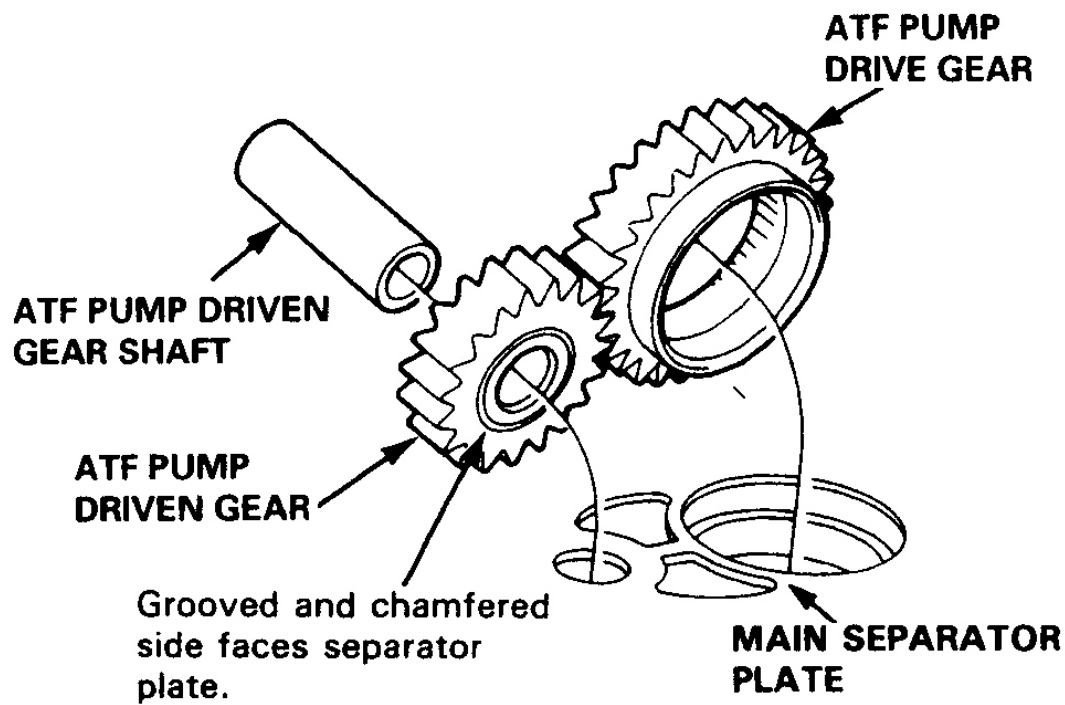
NOTE: If transaxle housing, torque converter housing, differential carrier, bearings, thrust shim, spacer or differential bearing outer races are replaced, differential assembly bearing preload must be checked. See DIFFERENTIAL ASSEMBLY under **COMPONENT DISASSEMBLY & REASSEMBLY**.

NOTE: Coat all components with ATF before reassembly.

1. Install the main separator plate and the three dowel pins on the torque converter housing. See **Fig. 8** and **Fig. 9** . Install the ATF pump gears and ATF pump driven gear shaft. Install the ATF pump driven gear with its grooved and chamfered side facing down. See **Fig. 38** .
2. Install the main valve body with four bolts. Make sure the ATF pump drive gear rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft moves smoothly in the axial and normal operating directions. See **Fig. 39** .

CAUTION: Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.

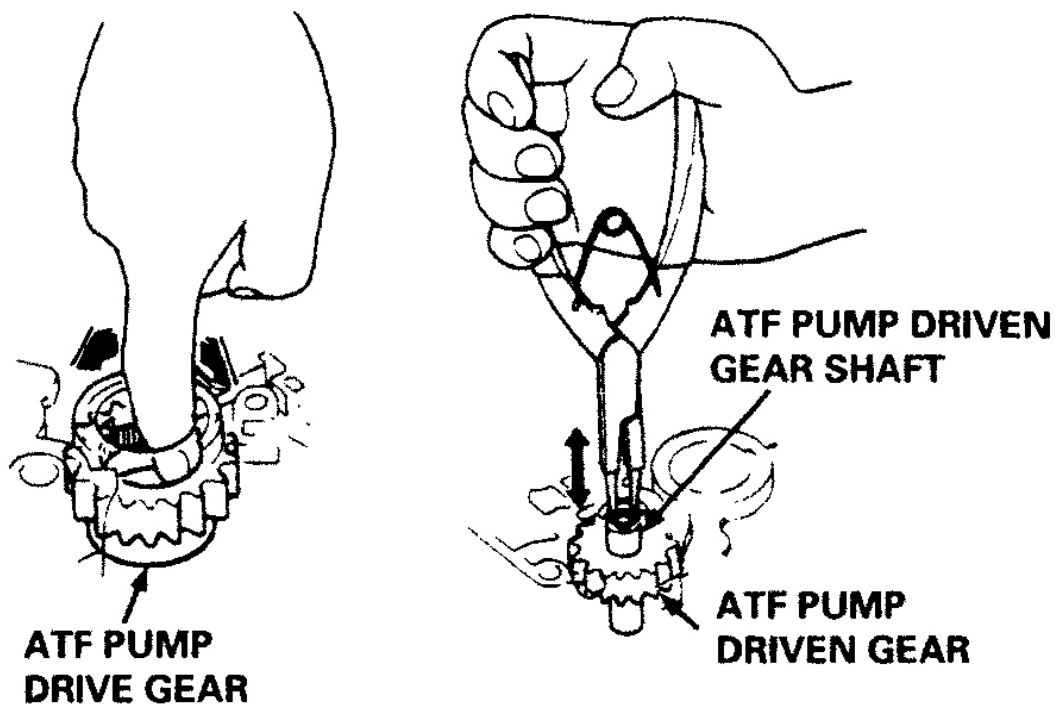
3. If the ATF pump drive gear and ATF pump driven gear shaft do not move freely, loosen the main valve body bolts, realign the ATF pump driven gear shaft, and then retighten to the specified torque. See **TORQUE SPECIFICATIONS** .
4. Install the stator shaft and stop shaft.
5. Install the two dowel pins, torque converter check valve and torque converter check valve spring in the main valve body.
6. Install the regulator valve body with the bolt on the main valve body.
7. Install the two dowel pins and separator plate on the regulator valve body, then install the throttle valve body (seven bolts).
8. Install the secondary separator plate with two dowel pins on the main valve body.
9. Install the control shaft in the housing with the control shaft and manual valve together. See **Fig. 40** .



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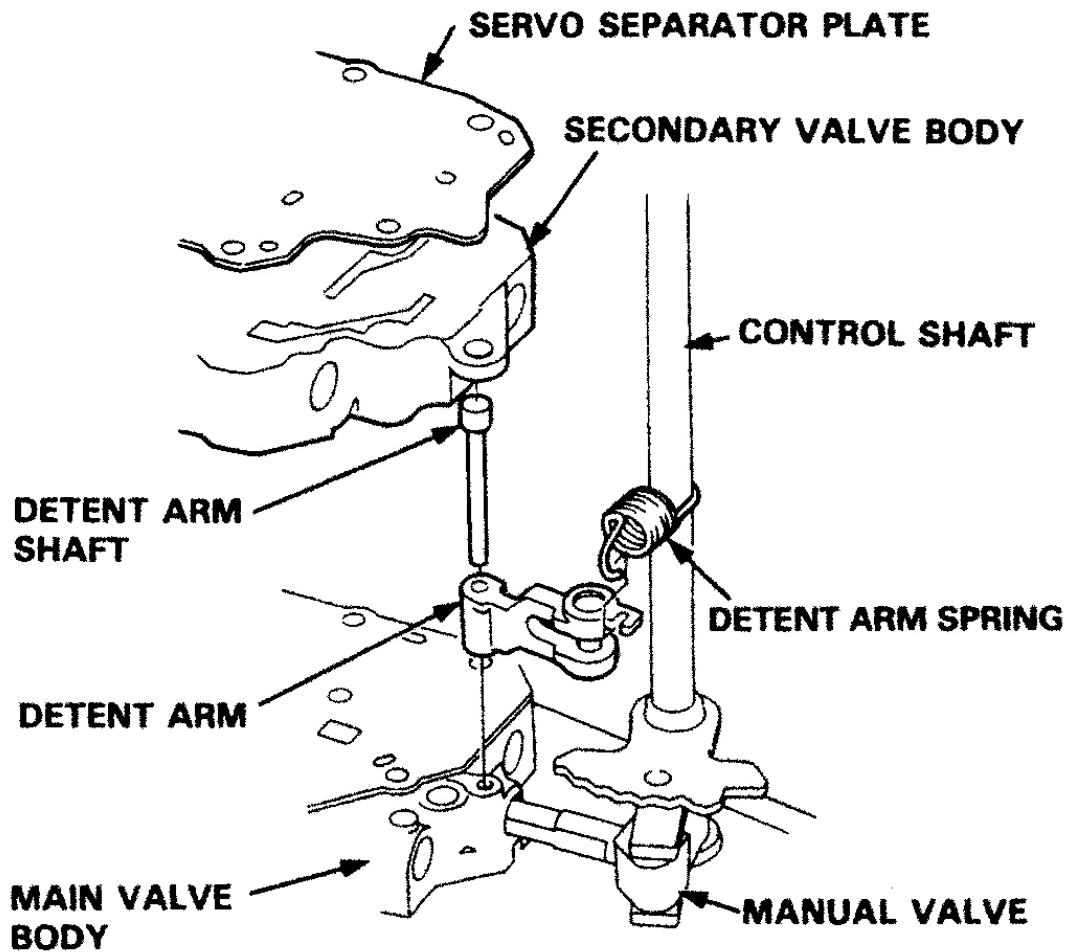
Fig. 38: Installing Pump Gears

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 39: Checking Pump Gear Installation
Courtesy of AMERICAN HONDA MOTOR CO., INC.

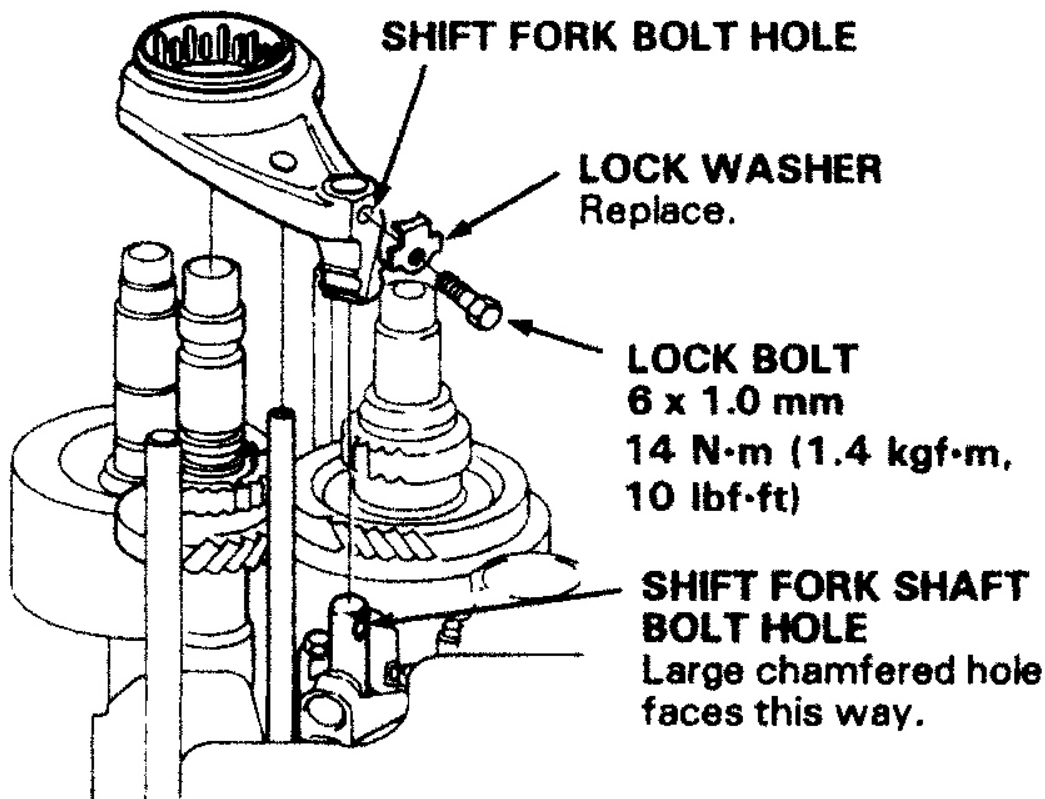


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Fig. 40: Installing Control Shaft To Manual Valve
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the detent arm and arm shaft in the main valve body, then hook the detent arm spring to the detent arm.
11. Install the secondary valve body, servo separator plate and servo body (6 bolts).
12. Install the ATF feed pipe in the servo body, then install the 4th accumulator cover (3 bolts).
13. Install the ATF strainer (2 bolts).
14. Install the servo detent base (2 bolts).
15. Install the 1st/2nd accumulator body (6 bolts).
16. Install 2 ATF feed pipes in the main valve body and the ATF feed pipe in the servo body.
17. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly, and secondary shaft sub-assembly in the torque converter housing. See **Fig. 6** and **Fig. 7**.

18. Install the splined washer, thrust needle bearing and needle bearings on the secondary shaft.
19. Install the needle bearings, countershaft 4th gear, reverse selector hub, and reverse selector with the shift fork on the countershaft.
20. Turn the shift fork shaft so the large chamfered hole is facing the fork bolt hole. Then install the shift fork and the lock bolt with a new lock washer, and torque the lock bolt. Bend the lock tab against the bolt head. See **Fig. 41**.



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Fig. 41: Installing Shift Fork

Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Install the secondary shaft 2nd gear on the secondary shaft and the countershaft reverse gear on the countershaft one at a time. Then install the countershaft 2nd gear on the countershaft, and install the thrust needle bearing and thrust washer on the secondary shaft.
22. Install the reverse idler gear into the transmission housing, then slip it the direction as shown. See **Fig. 12**.
23. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.
24. Install three dowel pins and a new gasket on the torque converter housing.

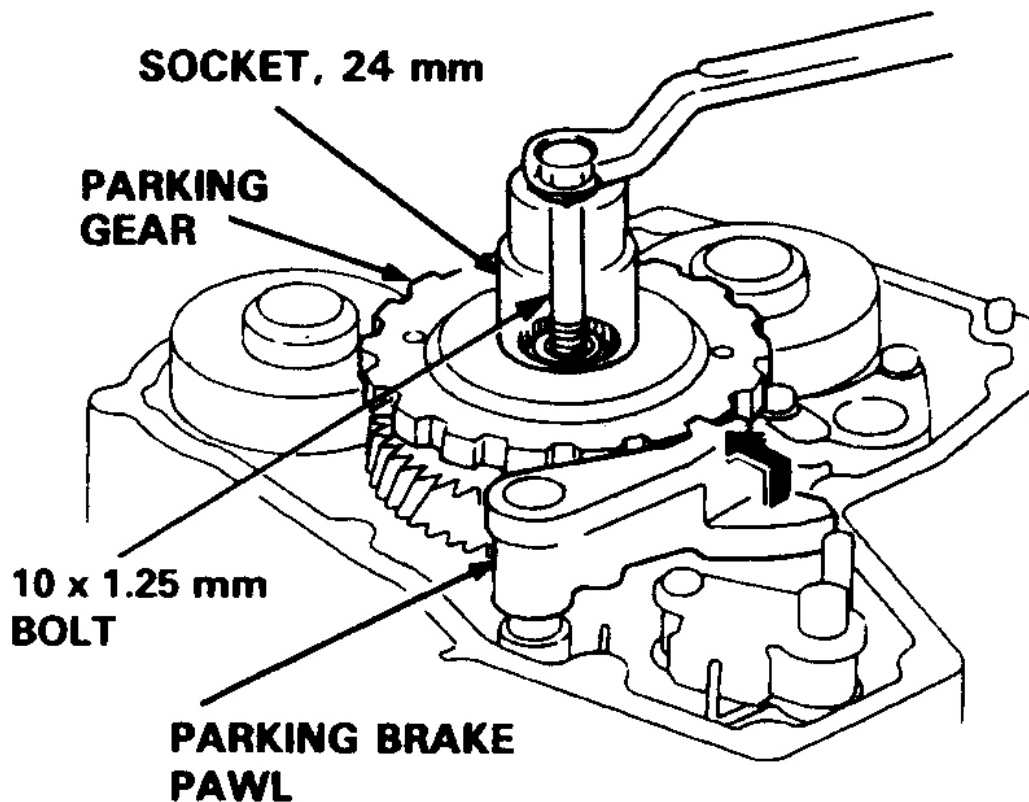
25. Place the transmission housing on the torque converter housing.
26. Install the transmission housing bolts along with the transmission hanger, the throttle control cable bracket/ transmission hanger and the harness bracket. Tighten the bolts in two or more steps in the sequence shown. See [Fig. 36](#) . See **TORQUE SPECIFICATIONS** .
27. Coat the reverse idler gear shaft, needle bearing and new "O" rings with lithium grease lightly. Assemble new "O" rings and needle bearing on the reverse idler gear shaft. Then install the reverse idler gear shaft in the reverse idler gear shaft holder. Align the "D" shaped cut out of the shaft with the "D" shaped area of the holder.
28. Engage the reverse idler gear to the countershaft and mainshaft reverse gears, then install the reverse idler gear shaft/holder assembly on the transmission housing.

NOTE: **Do not tighten the lock bolt to the specified torque or bend the lock tab in step 29 .**

29. Install the parking brake lever on the control shaft, then install the lock bolt loosely with a new lock washer.
30. Slip the holder onto the mainshaft. See [Fig. 10](#) .
31. Lubricate the following parts with ATF:
 - Splines and threads of each shaft.
 - Threads of the old locknuts.
 - Splines of the mainshaft and countershaft idler gears.
 - Splines of the parking gear.
32. Install the mainshaft idler gear. See [Fig. 4](#) and [Fig. 5](#) .

NOTE: **The mainshaft locknut has left-hand threads.**

33. Install the old locknut on the mainshaft to seat the idler gear. Do not drive the idler gear on with a hammer. Do not use an impact wrench, always use a torque wrench to tighten the locknut.
34. Install the secondary shaft idler gear on the secondary shaft.
35. Install the thrust washer, the thrust needle bearing, the needle bearing, the countershaft idler gear and the parking gear on the countershaft.
36. Install the old locknut on the secondary shaft. Tighten the old locknut to seat the secondary shaft idler gear while holding the countershaft idler gear. Do not drive the idler gear on with a hammer. Do not use an impact wrench, always use a torque wrench to tighten the locknut.
37. Install the parking brake pawl shaft and spring in the transmission housing, then install the parking brake pawl.
38. Place a 24-mm socket on the parking gear, and install a 10 x 1.25 mm bolt in the countershaft. Then engage the parking brake pawl with the parking gear by moving up the parking brake pawl. Keep all of the particles out of the transmission when installing a 10 x 1.25 mm bolt. See [Fig. 42](#) .



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Fig. 42: Installing Parking Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: Do not drive the parking gear on with a hammer.

39. Tighten the bolt and lightly seat the parking gear.
40. Remove the bolt and socket.
41. Use the old locknut to tighten the press fit parking gear to the specified torque, then loosen it. See **TORQUE SPECIFICATIONS**. Do not use an impact wrench, always use a torque wrench to tighten the locknut.

CAUTION: Install the conical spring washers in the correct direction. See **Fig. 4** and **Fig. 5**.

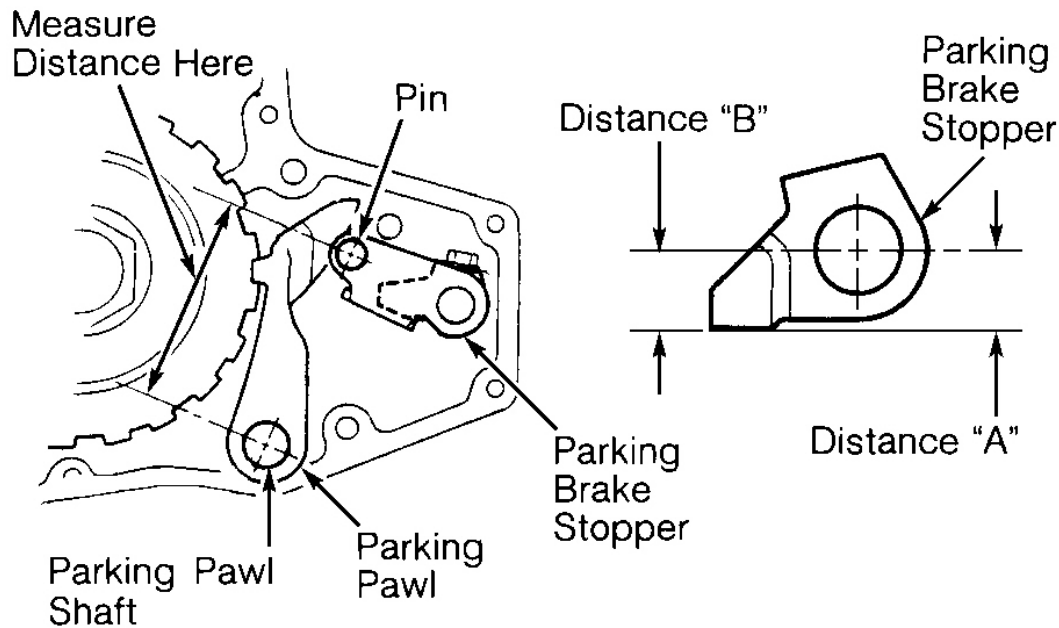
42. Remove the old locknut, then install new conical spring washers and new locknuts on each shaft.
43. Tighten the locknuts to specified torque. The mainshaft locknut has left-hand threads.

44. Stake each locknut into its shaft using a 3.5 mm punch.
45. Set the parking brake lever in the position, then verify that the parking brake pawl engages the parking gear.
46. If the pawl does not engage fully, check the parking brake pawl stop clearance.
47. Place parking brake lever in "P" position. Ensure parking pawl fully engages with parking gear. If parking pawl does not fully engage, measure parking brake stop distance between parking pawl shaft and pin on parking brake stop. See **Fig. 43**.
48. Parking brake stop distance should be 2.54-2.58" (64.5-65.6 mm). If parking brake stop distance is not within specification, install different size parking brake stop.
49. Parking brake stop is available in different sizes. See **PARKING BRAKE STOP SPECIFICATIONS** table.

PARKING BRAKE STOP SPECIFICATIONS ⁽¹⁾

I.D.	Part No.	Distance "A" In. (mm)	Distance "B" In. (mm)
1	24537-PA9-003	.433 (11.00)	.433 (11.00)
2	24538-PA9-003	.425 (10.80)	.419 (10.65)
3	24539-PA9-003	.417 (10.60)	.406 (10.30)

(1) Distances "A" and "B" are measured from center of parking brake stop. See **Fig. 43**.



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Fig. 43: Measuring Parking Brake Sop Distance & Parking Brake Stop
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

50. Tighten the bolt, and bend the lock tab against the bolt head.
51. Install the right side cover.
52. Install the throttle control lever and the spring on the throttle control shaft.
53. Install the ATF cooler lines with new sealing washers. Install the ATF dipstick.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Cooler Line Joint Bolt	21 (28)
Countershaft Lock Nut	123 (167)
Drain Plug	36 (49)
Joint Bolt	21 (28)
Lock-Up Control Solenoid Valve Assembly Bolt	18 (12.0)
Main Valve Body Bolt	
6-mm Bolt	(1)
8-mm Bolt	13 (18)
Mainshaft Lock Nut ⁽²⁾	123 (167)
Ring Gear Bolt	74.5 (101)
Secondary Shaft Lock Nut	123 (167)
Throttle Control Cable Bracket Bolt	33 (44)
Transaxle Housing Bolt ⁽³⁾	33 (44)
	INCH Lbs. (N.m)
A/T Gear Position Switch	106 (12.0)
Accumulator Body Cover Bolt	106 (12.0)
Accumulator Cover Bolt	106 (12)
Fluid Strainer Bolt	106 (12.0)
Parking Brake Lever Bolt	124 (14)
Parking Brake Stop Bolt	124 (14)
Regulator Valve Body Bolt	106 (12.0)
Reverse Idler Gear Shaft Holder Bolt	106 (12)
Reverse Shift Fork Bolt	124 (14)
Reverse Idler Gear Shaft Holder Bolt	106 (12)
Right Cover Bolt	106 (12)
Servo Body Bolt	106 (12)
Shift Control Solenoid Valve Assembly Bolt	106 (12)
Throttle Control Lever Bolt	72 (8)
Throttle Valve Body Bolt	106 (12)

- (1) Tighten bolt to 106 INCH lbs. (12.0 N.m).
- (2) Left hand threads.
- (3) Tighten bolts to specification in sequence. See **Fig. 36** .

TRANSAXLE SPECIFICATIONS

For additional A6VA transaxle specifications, see **Fig. 44 -Fig. 46** .

TRANSAXLE SPECIFICATIONS

Application	Specification
Clutch Clearance	
1st & 2nd Clutches	.026-.033" (.65-.85 mm)
1st-Hold Clutch	.031-.039" (.80-1.00 mm)
3rd & 4th Clutches	.016-.024" (.40-.60 mm)
Differential Bearing Preload ⁽¹⁾	
New Bearings	24-35 INCH lbs. (2.8-4.0 N.m)
Used Bearings	22-32 INCH lbs. (2.5-3.7 N.m)
Oil Pump Clearances	
Side Clearance	
Oil Pump Drive Gear	.0083-.0104" (.210-.265 mm)
Oil Pump Driven Gear	.0014-.0025" (.035-.063 mm)
Thrust Clearance	
Standard	.001-.002" (.03-.05 mm)
Wear Limit	.003" (.07 mm)
Secondary Shaft 2nd Gear Clearance	.003-.006" (.07-.15 mm)
Side Gear Backlash	.002-.006" (.05-.15 mm)
Parking Brake Stop Distance	2.54-2.58" (64.5-65.6 mm)
(1) Starting torque required to rotate differential assembly.	

DIFFERENTIAL BEARING PRELOAD ⁽¹⁾

Application	INCH Lbs (N.m)
New Bearings	24-35 (2.7-3.9)
Used Bearings	22-32 (2.5-3.6)
(1) Starting torque required to rotate differential assembly.	

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)	6.0 (6.3, 5.3) for overhaul 2.4 (2.5, 2.1) for fluid change	
Hydraulic pressure kPa (kgf/cm ² , psi)	Line pressure at 2,000 rpm in [N] or [P] position	830 (8.5, 120) throttle fully-closed 880 (9.0, 130) throttle more than 1/4 open	780 (8.0, 110) throttle more than 1/4 open
	4th clutch pressure at 2,000 rpm in [D_s] position	520 (5.3, 75) throttle fully-closed 880 (9.0, 130) throttle more than 1/4 open	460 (4.7, 67) throttle fully-closed 780 (8.0, 110) throttle more than 1/4 open
	3rd and 2nd clutch pressure at 2,000 rpm in [D_s] position	490 (5.0, 71) throttle fully-closed 880 (9.0, 130) throttle more than 1/4 open	440 (4.5, 64) throttle fully-closed 780 (8.0, 110) throttle more than 1/4 open
	2nd clutch pressure at 2,000 rpm in [2] position	830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	1st and 1st-hold clutch pressure at 2,000 rpm in [1] position	830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	Throttle B pressure	Throttle fully closed Throttle fully open	— 780 (8.0, 110)
	Throttle B pressure	0 (0, 0) 830 – 880 (8.5 – 9.0, 120 – 130)	— 780 (8.0, 110)
Stall speed rpm (Check with car on level ground)		2,650	2,500 – 2,800
Clutch	Clutch initial clearance	1st-hold 1st, 2nd 3rd, 4th	— — —
	Clutch return spring free length 1st, 2nd, 3rd, 4th	0.80 – 1.00 (0.031 – 0.039) 0.65 – 0.85 (0.026 – 0.033) 0.4 – 0.6 (0.016 – 0.024)	— — —
	Clutch disc thickness	33.5 (1.32)	31.5 (1.24)
	Clutch plate thickness	1.88 – 2.00 (0.074 – 0.079)	Until grooves worn out.
	1st, 1st-hold	1.95 – 2.05 (0.077 – 0.081)	Discoloration
	2nd	2.55 – 2.65 (0.100 – 0.104)	Discoloration
	3rd, 4th	2.25 – 2.35 (0.089 – 0.093)	Discoloration
	Clutch end plate thickness	Mark 1 Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9	Discoloration ↑ ↓ Discoloration
		2.05 – 2.10 (0.081 – 0.083) 2.15 – 2.20 (0.085 – 0.087) 2.25 – 2.30 (0.089 – 0.091) 2.35 – 2.40 (0.093 – 0.094) 2.45 – 2.50 (0.096 – 0.098) 2.55 – 2.60 (0.100 – 0.102) 2.65 – 2.70 (0.104 – 0.106) 2.75 – 2.80 (0.108 – 0.110) 2.85 – 2.90 (0.112 – 0.114)	
Valve body	Stator shaft needle bearing contact I.D.		
	Torque converter side	27.000 – 27.021 (1.0630 – 1.1638)	Wear or damage
	ATF pump side	29.000 – 29.013 (1.1417 – 1.1422)	—
	ATF pump gear thrust clearance	0.03 – 0.05 (0.001 – 0.002)	0.07 (0.003)
	ATF pump gear-to-body clearance	0.210 – 0.265 (0.0083 – 0.0104)	—
	ATF pump driven gear I.D.	0.070 – 0.125 (0.0028 – 0.0049)	—
	ATF pump driven gear shaft O.D.	14.016 – 14.034 (0.5518 – 0.5525) 13.980 – 13.990 (0.5504 – 0.5508)	Wear or damage Wear or damage

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Fig. 44: A6VA Transaxle Specifications Chart (1 Of 3)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

1997 AUTOMATIC TRANSMISSIONS Acura A6VA Overhaul

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lunes, 20 de febrero de 2023 03:57:38 p. m.

1997 Acura 2.2CL

1997 AUTOMATIC TRANSMISSIONS Acura A6VA Overhaul

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Spring	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	87.8 (3.457)	16.5
	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	12.7
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	38.2 (1.504)	14.0
	Relief valve spring	1.0 (0.039)	8.4 (0.331)	39.1 (1.539)	15.1
	Cooler relief valve spring	1.0 (0.039)	8.4 (0.331)	46.8 (1.843)	10.8
	2nd orifice control valve spring	0.6 (0.024)	6.6 (0.260)	66.4 (2.614)	25.0
	Orifice control valve spring	0.7 (0.028)	6.6 (0.260)	52.5 (2.067)	18.4
	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.6 (2.071)	22.4
	4th exhaust valve spring	0.8 (0.031)	7.1 (0.280)	48.8 (1.921)	17.2
	Throttle valve B adjusting spring	0.8 (0.031)	6.2 (0.244)	30.0 (1.181)	8.0
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5
		1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2
		1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4
	1-2 shift valve spring	0.9 (0.035)	8.6 (0.339)	40.4 (1.591)	14.5
	2-3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	64.7 (2.547)	7.3
	1st accumulator spring A	2.3 (0.091)	16.3 (0.642)	109.6 (4.315)	20.0
	1st accumulator spring B	1.8 (0.071)	6.3 (0.248)	70.5 (2.776)	15.3
	4th accumulator spring	2.9 (0.114)	22.0 (0.866)	90.1 (3.547)	10.9
	2nd accumulator spring	3.5 (0.138)	22.0 (0.866)	91.0 (3.583)	10.8
	3rd accumulator spring	2.9 (0.114)	17.5 (0.689)	99.6 (3.921)	16.1
	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)	51.1 (2.012)	14.7
	CPC valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	24.6
		0.7 (0.028)	6.6 (0.260)	38.5 (1.516)	24.6
		0.7 (0.028)	6.6 (0.260)	39.0 (1.535)	24.6
	3rd kick-down valve spring	1.0 (0.039)	7.6 (0.299)	48.3 (1.902)	15.6
	Main orifice control valve spring	1.1 (0.043)	7.1 (0.280)	49.1 (1.933)	22.7

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Fig. 46: A6VA Transaxle Specifications Chart (3 Of 3)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.