

1997 AUTOMATIC TRANSMISSIONS

Honda AOYA, BOYA & MPJA Overhaul

APPLICATION

TRANSAXLE APPLICATION

Vehicle Model	Transmission Model
Honda (1997)	
Accord 2.2L	AOYA, BOYA
Odyssey	MPJA
Isuzu Oasis (1997)	MPJA

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.

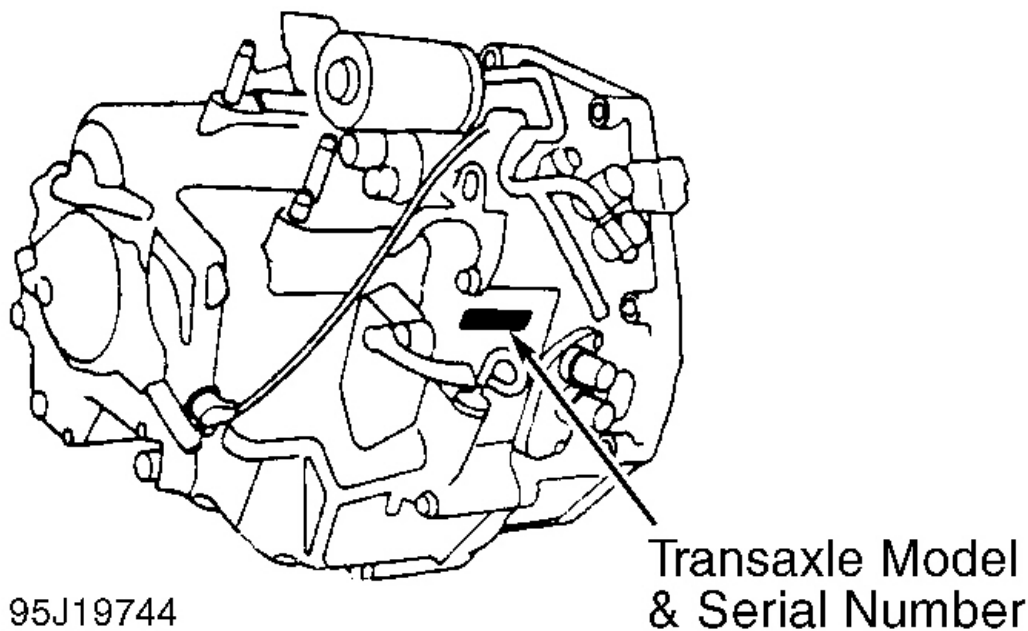
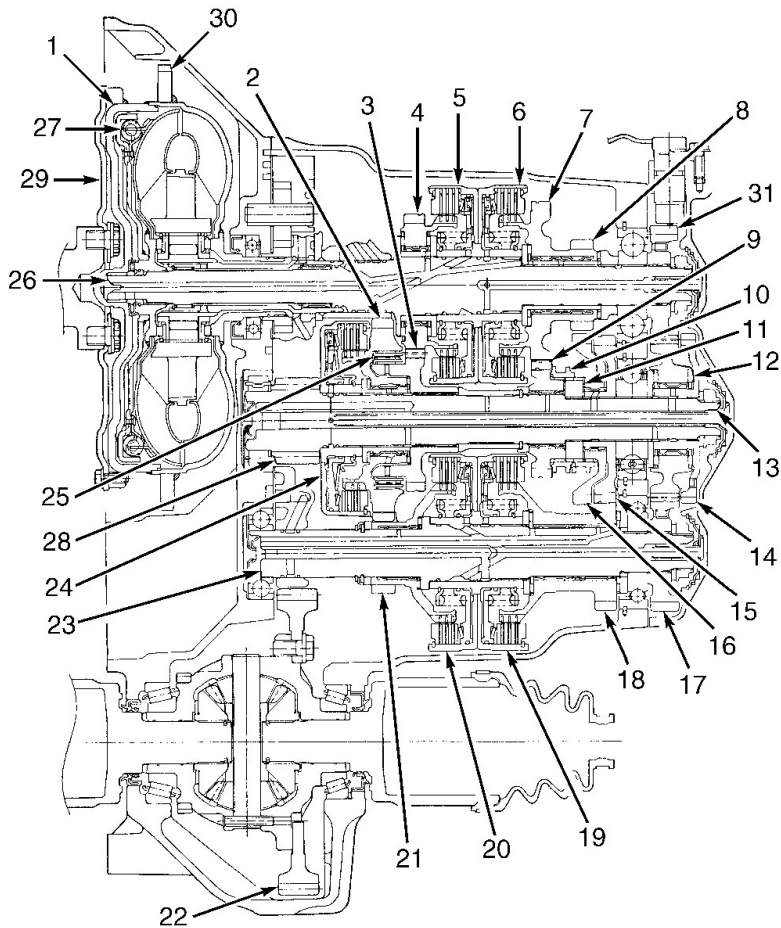


Fig. 1: Identifying Transaxle Model & Serial Number Location
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DESCRIPTION

Automatic transaxle is electronically controlled and has 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** .

Valve assembly consists of main valve body, secondary valve body, servo body, regulator valve body and throttle valve body. Transaxle shifting and torque converter lock-up are controlled by Transmission Control Module (TCM).



- | | |
|-------------------------------|--------------------------------|
| 1. Torque Converter | 17. Secondary Shaft Idler Gear |
| 2. Countershaft 1st Gear | 18. Secondary Shaft 2nd Gear |
| 3. Countershaft 3rd Gear | 19. 2nd Clutch |
| 4. Mainshaft 3rd Gear | 20. 1st Clutch |
| 5. 3rd Clutch | 21. Secondary Shaft 1st Gear |
| 6. 4th Clutch | 22. Differential Ring Gear |
| 7. Mainshaft 4th Gear | 23. Secondary Shaft |
| 8. Mainshaft Reverse Gear | 24. 1st-Hold Clutch |
| 9. Countershaft 4th Gear | 25. One-Way Clutch |
| 10. Reverse Selector | 26. Mainshaft |
| 11. Selector Hub | 27. Lock-Up Piston |
| 12. Countershaft Idler Gear | 28. Final Drive Gear |
| 13. Countershaft | 29. Flex Plate |
| 14. Parking Gear | 30. Flex Plate Ring Gear |
| 15. Countershaft 2nd Gear | 31. Mainshaft Idler Gear |
| 16. Countershaft Reverse Gear | |

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Fig. 2: Identifying Transaxle Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

OPERATION

Shift lever has 7 positions. When shift lever is moved, manual valve on main valve body is moved by the shift cable. Shift lever also changes position of A/T gear position switch, mounted near shift lever. The A/T gear position switch delivers an input signal to the TCM to indicate shift lever position. The TCM uses input signal and operates shift control solenoid valves to control transaxle shifting.

When certain transaxle gear combinations are engaged by clutches, power is transmitted from mainshaft to countershaft by the secondary shaft to provide different gears. Shift lever positions operate as follows:

- **"P" (Park)** - Front wheels lock as parking pawl engages with parking gear on countershaft. All clutches are released. Neutral position switch, incorporated in A/T gear position switch, allows engine starting in this position.
- **"R" (Reverse)** - Reverse selector is engaged with countershaft reverse gear and 4th clutch is applied. Back-up light switch, incorporated in A/T gear position switch, allows back-up lights to operate.
- **"N" (Neutral)** - All clutches are released. Neutral position switch, incorporated in A/T gear position switch, allows engine starting in this position.
- **"D4" (Drive/4th)** - Transaxle starts in 1st gear and upshifts automatically to 2nd, 3rd and then 4th gear. Transaxle will downshift through 3rd, 2nd and 1st gears until vehicle stops. When in 2nd, 3rd or 4th gear in "D4" position, TCM sends signal to operate torque converter lock-up.
- **"D" (Drive/3rd)** - Transaxle starts off in 1st gear and upshifts automatically to 2nd gear and then 3rd gear. Transaxle will downshift through 2nd to 1st gear on deceleration. When in 3rd gear in "D" position, TCM sends signal to operate torque converter lock-up.
- **"2" (Second)** - Transaxle starts off and remains in 2nd gear for engine braking and better traction.
- **"1" (First)** - Transaxle starts off and remains in 1st gear for engine braking.

When in "D" position in 3rd gear or "D4" position in 2nd, 3rd or 4th gear, torque converter lock-up exists and transaxle mainshaft rotates at the same speed as engine crankshaft. Under certain conditions, torque converter lock-up clutch is applied during deceleration when in 3rd and 4th gears. Torque converter lock-up is controlled by the TCM. The TCM receives various input signals and operates lock-up control solenoid valves. Operation of lock-up control solenoid valves controls the modulator pressure.

The TCM contains a logic control system which controls transaxle shifting while vehicle is ascending or descending on a slope or reducing vehicle speed. For more information on calculation of gradient program in TCM, see HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS article.

The TCM contains self-diagnostic system which stores DTC if failure or problem exists in transaxle electronic control system. DTCs may be retrieved to determine transaxle problem area. For information on electronic transaxle components, see HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS 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 pedal 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 interlock systems, see HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS article.

The A/T gear position indicator on instrument panel contains lights to indicate which position A/T gear position

switch on shift lever is in. For information and testing of A/T gear position indicator, see HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS article.

LUBRICATION & ADJUSTMENTS

See appropriate SERVICING article.

ON-VEHICLE SERVICE

AXLE SHAFTS

See appropriate AXLE SHAFTS article in DRIVELINE/AXLES.

OIL COOLER FLUSHING

NOTE: Oil cooler flushing should be preformed before reinstalling transaxle.

1. Attach Oil Cooler Flusher (J38405-A) to oil cooler lines. See **Fig. 3** . Fill oil cooler flusher tank 2/3 full with Flushing Fluid (J35944-20). DO NOT use any other flushing fluid.
2. Ensure water and air valves on oil cooler flusher are off. Apply 80-120 psi (550-829 kPa) air pressure to oil cooler flusher. Turn oil cooler flusher water valve on so water will flow through oil cooler for 10 seconds. Replace oil cooler if water will not flow through oil cooler. Shut water valve off.
3. Depress and hold mixing trigger on oil cooler flusher downward. Turn water valve on and flush oil cooler for 2 minutes. Turn air valve on for 5 seconds every 15-20 seconds to create a surging action.
4. Turn water valve off. Release mixing trigger. Disconnect oil cooler flusher and reverse hoses so oil cooler can be flushed in the opposite direction.
5. Repeat steps 2 and 3 . Turn water valve off. Release mixing trigger. Turn water valve on. Rinse oil cooler for at least one minute. Once oil cooler is flushed in both directions, turn water off. Turn air valve on for 2 minutes or until no moisture is visible from drain hose.

CAUTION: Ensure no moisture exists in oil cooler, as it can damage transaxle.

6. Turn air off. Disconnect oil cooler flusher. Reconnect inlet line on oil cooler. Once transaxle is installed, attach drain hose on return line and place in oil container. Ensure transaxle is in "P" position. Fill transaxle with ATF.
7. Start engine and operate for approximately 30 seconds or until one quart (.9L) of ATF is discharged from return line. Shut engine off. Remove drain hose. Reinstall return line. Fill transaxle to proper level.

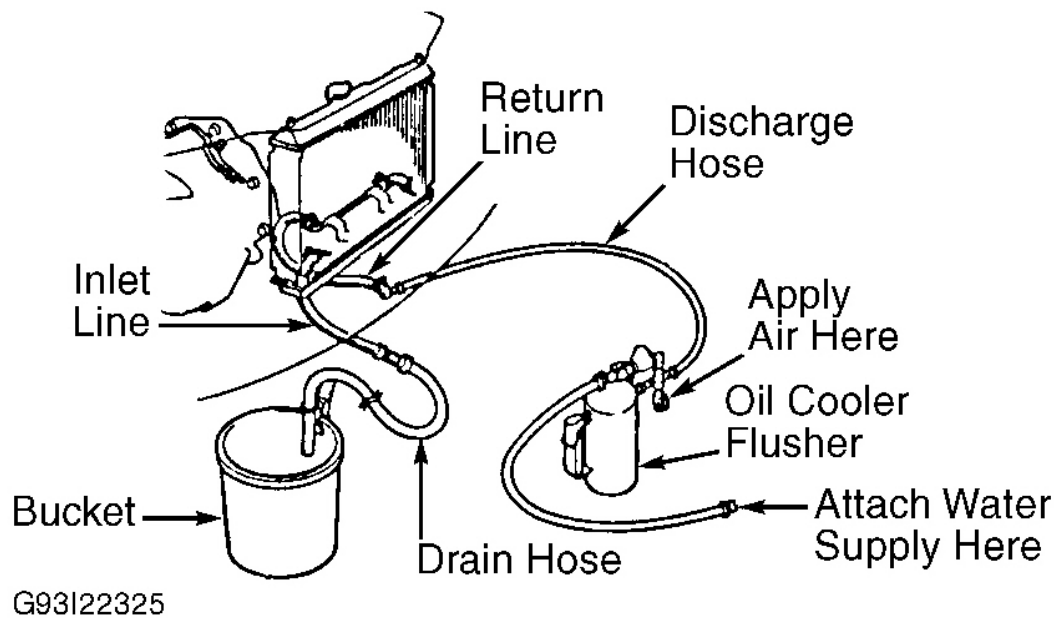


Fig. 3: Installing Oil Cooler Flusher

Courtesy of AMERICAN HONDA MOTOR CO., INC.

TROUBLE SHOOTING

Transaxle malfunctions may be caused by poor engine performance, improper adjustments, or failure of hydraulic, mechanical or electronic components. Always begin by checking fluid level, fluid condition and cable adjustments. Perform road test to determine if problem has been corrected. If problem still exists, several tests must be performed on transaxle. See **TESTING**.

SYMPTOM DIAGNOSIS

Use the following symptoms to identify components or signals that may be the cause of the fault:

Delayed Shift From "N" To "D" Or "D4"

- 1st clutch defective.
- Foreign material in 1st orifice.

Delayed Shift From "N" To "R"

- Servo valve stuck.
- 1-2 shift valve stuck.
- 4th clutch defective.

- Servo control valve stuck.

Engine Runs But Vehicle Does Not Move In Any Gear

- Low fluid.
- ATF pump worn or binding.
- Regulator valve stuck or spring worn.
- Mainshaft worn or damaged.
- Shift cable broken or out of adjustment.
- Final drive gears worn or damaged.
- Flexplate defective.
- ATF strainer clogged.

Erratic Upshift, All Shifts

- PCM defective.

Erratic 1-2 Upshift

- Shift control solenoid valve "A" defective.
- PCM defective.

Erratic 2-3 Upshift

- Shift control solenoid valve "B" defective.
- PCM defective.

Erratic 3-4 Upshift

- Shift control solenoid valve "A" defective.
- PCM defective.

Excessive Idle Vibration

- ATF pump worn or binding.
- Engine output low.
- Flexplate defective.
- Lock-up shift valve stuck.
- Lock-up piston defective.

Flare On Start From "D", Stall RPM High In "D4", "D3", "2" & "1"

- Low fluid.
- ATF pump worn or binding.

- Regulator valve stuck or spring worn.
- Shift cable broken or out of adjustment.
- ATF strainer clogged.
- Converter check valve stuck.

Flare On Start From "D", Stall RPM High In "D4", "D3" & "1"

- Shift cable broken or out of adjustment.
- One way clutch worn or damaged.
- 1st clutch defective.

Flare On Start From "D", Stall RPM High In "2"

- Shift cable broken or out of adjustment.
- 2nd clutch defective.

Flare On Start From "D", Stall RPM Is Within Specification

- Too much fluid.

Flare On Start From "D", Stall RPM Is Low

- Torque converter one-way clutch defective.
- Engine throttle cable out of adjustment.
- Engine output low.
- Lock-up shift valve stuck.
- Lock-up piston defective.

Flare On 2-3 Upshift

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 3rd accumulator stuck.
- 2nd orifice control valve stuck.
- Foreign material in main orifice.
- Foreign material in 3rd orifice.
- 3rd clutch defective.
- Main orifice control valve stuck.

Flare On 3-4 Upshift

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.

- 4th accumulator stuck.
- Foreign material in main orifice.
- Orifice control valve stuck.
- Foreign material in 4th orifice.
- 4th clutch defective.
- Main orifice control valve stuck.

Harsh Shift When Manually Shifting To "1"

- 1st-hold accumulator defective.

Harsh 1-2 Upshift

- 2nd clutch defective.
- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 2nd accumulator stuck.
- Main orifice control valve stuck.

Harsh 2-3 Upshift

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 3rd accumulator stuck.
- 2nd orifice control valve stuck.
- 3rd clutch defective.
- Main orifice control valve stuck.
- 3rd clutch defective.
- 2nd check ball stuck.
- Foreign material in separator plate orifice.

Harsh 3-4 Upshift

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 4th accumulator stuck.
- Orifice control valve stuck.
- Foreign material in 3rd orifice.
- 4th clutch defective.
- 4th check ball stuck.
- Foreign material in separator plate orifice.

- Main orifice control valve stuck.

Harsh 2-1 Downshifts

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 2nd accumulator stuck.
- Foreign material in 2nd orifice.
- Orifice control valve stuck.

Harsh 3-2 Downshifts

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 3rd accumulator stuck.
- Orifice control valve stuck.
- 3rd check ball stuck.
- Main orifice control valve stuck.

Harsh 4-3 Downshifts

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- 4th accumulator stuck.
- 4th check ball stuck.
- 3rd kickdown valve stuck.
- Main orifice control valve stuck.

Lock-Up Clutch Does Not Disengage

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- Lock-up timing valve stuck.
- Lock-up shift valve stuck.
- Lock-up piston defective.
- Lock-up control valve stuck.
- Lock-up control solenoid valve "A" defective.
- Lock-up control solenoid valve "B" defective.
- PCM defective.

Lock-Up Clutch Not Smooth

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- Converter check valve stuck.
- Lock-up timing valve stuck.
- Lock-up shift valve stuck.
- Lock-up piston defective.
- Lock-up control valve stuck.
- Lock-up control solenoid valve "A" defective.
- Lock-up control solenoid valve "B" defective.
- PCM defective.

Lock-Up Clutch Does Not Engage

- Throttle valve "B" stuck.
- Throttle control cable out of adjustment.
- Converter check valve stuck.
- Lock-up timing valve stuck.
- Lock-up shift valve stuck.
- Lock-up piston defective.
- Lock-up control valve stuck.
- Lock-up control solenoid valve "A" defective.
- Lock-up control solenoid valve "B" defective.
- PCM defective.

No Engine Braking In "1"

- 1st-hold clutch defective.
- 1st-hold accumulator defective.

No Shift

- Modulator valve stuck.
- Shift control solenoid valve "A" defective.
- Shift control solenoid valve "B" defective.
- PCM defective.

No Shift, Stuck In 4th Gear

- Shift control solenoid valve "A" defective.
- Shift control solenoid valve "B" defective.
- PCM defective.

No 1-3 Shift From "D"

- 2-3 shift valve stuck.
- PCM defective.

No 1-4 Shift From "D4"

- 2-3 shift valve stuck.
- 3-4 shift valve stuck.
- PCM defective.

Noise From Transaxle In All Gears

- ATF pump worn or binding.
- Case ball bearing worn or damaged.

Slips In All Gears

- ATF pump worn or binding.
- Pressure regulator stuck.
- ATF strainer plugged.

Slips In Reverse

- 4th clutch defective.
- 4th accumulator defective.
- Servo valve stuck.
- Feed pipe "O" ring broken.

Slips In 1st Gear

- 1st clutch defective.
- 1st accumulator defective.
- Feed pipe "O" ring broken.
- One-way clutch defective.

Slips In 2nd Gear

- 2nd clutch defective.
- 2-3 shift valve stuck.
- Clutch pressure control valve stuck.
- 2nd accumulator defective.
- Sealing rings/guide worn.

Slips In 3rd Gear

- 3rd clutch defective.
- 3-4 shift valve stuck.
- Clutch pressure control valve stuck.
- 3rd accumulator defective.
- Sealing rings/guide worn.

Slips In 4th Gear

- 4th clutch defective.
- Clutch pressure control valve stuck.
- 4th accumulator defective.
- Feed pipe "O" ring broken.

Shift Lever Operation Rough Or Binding

- Shift cable broken or out of adjustment.
- Shift cable problem.

Stall RPM High, All Clutch Pressures Okay

- Converter check valve stuck.

Vehicle Moves In All Gears Except "2"

- Shift cable broken or out of adjustment.
- 2nd gears worn or damaged.
- 2nd clutch defective.
- 2nd accumulator stuck.

Vehicle Moves In All Gears Except "R"

- Servo valve stuck.
- Shift cable broken or out of adjustment.
- Reverse gears worn or damaged.
- 4th clutch defective.

Vehicle Moves In "R" & "2" Only

- Shift cable broken or out of adjustment.
- One way clutch worn or damaged.
- 1st gears worn or damaged.
- 1st clutch defective.

- 1st accumulator defective.

Vehicle Moves In "N"

- 1st clutch defective.
- 2nd clutch defective.
- Too much fluid.
- 3rd clutch defective.
- 4th clutch defective.
- Needle bearing worn or damaged.
- Thrust washer worn or damaged.
- Clutch clearance incorrect.

Vehicle Will Not Accelerate To Speeds Above 31 MPH

- Torque converter one-way clutch defective.

Vibration In All Gears

- Flexplate defective.

Will Not Shift Into "P" Position

- Shift cable broken or out of adjustment.
- Shift cable problem.

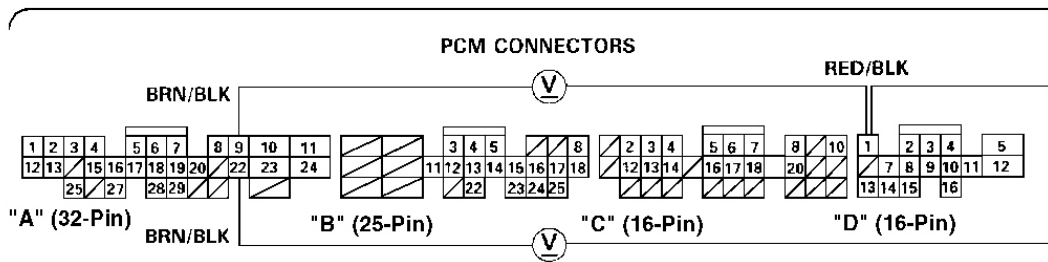
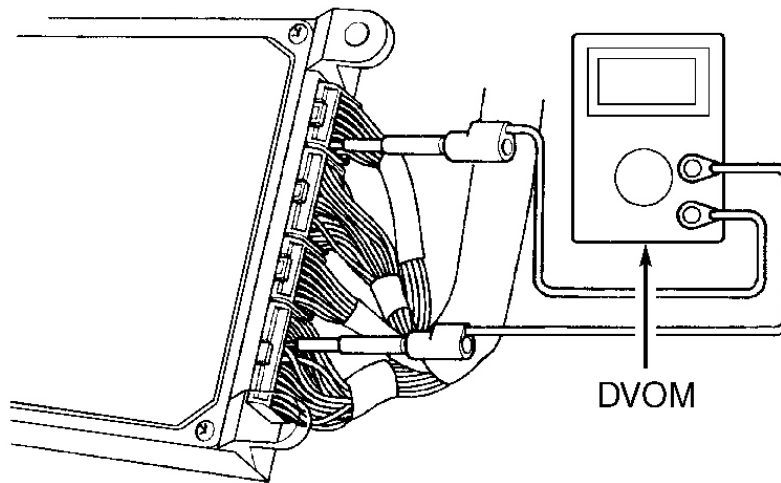
TESTING**ROAD TEST**

NOTE: If shift lever cannot be moved from "P" position with brake pedal depressed and accelerator at idle position, check shift interlock system. See HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS article.

1. Warm engine to normal operating temperature. Apply parking brake and block wheels. Start engine. Move shift lever to "D4" position while depressing brake pedal. Depress accelerator pedal and release it suddenly. Engine should not stall.
2. Repeat step 1 with shift lever in "D" position. Ensure engine does not stall. Shut engine off. Manufacturer recommends monitoring of Throttle Position (TP) sensor voltage when performing road test to ensure proper throttle opening for verifying shift points and lock-up of torque converter.

NOTE: The Engine Control Module (ECM) is referred to as Powertrain Control Module (PCM), components are the same, only the terminology has changed. Throughout this article ECM will be used.

3. Remove door sill molding on passenger's side. Pull carpet back for access to ECM, located on passenger's side, below carpet. See **Fig. 4**.
4. Ensure ignition is off. Install Test Harness (07LAJ-PT3010A) between ECM and ECM electrical connectors.



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Fig. 4: Measuring TP Sensor Voltage
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install Digital Volt-Ohmmeter (DVOM) on test harness with positive lead at terminal D11 and negative lead at terminal D22 for monitoring of throttle position sensor voltage. Terminal numbers are on top of test harness. See **Fig. 4**. Ensure DVOM is set for measuring voltage.
6. Remove ECM cover located above ECM. Turn ECM over to gain access to connectors. Install Backprobe Test Set (07SAZ-001000A) or equivalent between ECM and DVOM leads. See **Fig. 4**.
7. Using DVOM, with positive lead at terminal D1 and negative lead at terminal A9 or A22. Ensure digital volt-ohmmeter is set for measuring voltage.
8. On all models, road test vehicle and check for abnormal noise and clutch slippage. Specified clutch is applied in designated gear. See **CLUTCH APPLICATION** table.
9. Ensure upshift and downshift points and lock-up of torque converter are correct in relation to throttle position sensor voltage or throttle opening and vehicle speed with shift lever in "D4" position. See appropriate TRANSAXLE UPSHIFT SPECIFICATIONS and TRANSAXLE DOWNSHIFT

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SPECIFICATIONS tables.

10. With shift lever in "D4" position, accelerate to about 35 MPH so transaxle is in 4th gear. Move shift lever to "2" position. Ensure engine braking occurs.

CAUTION: DO NOT shift from "D4" to "2" at speeds over 63 MPH, or transaxle may be damaged.

11. Place shift lever in "1" position. Accelerate from a stop at full throttle. Check for abnormal noise or clutch slippage. Upshifts and downshifts should not occur in this shift lever position.
12. Place shift lever in "2" position. Accelerate from a stop at full throttle. Check for abnormal noise or clutch slippage. Upshifts and downshifts should not occur in this shift lever position.
13. Place shift lever in "R" position. Accelerate from a stop at full throttle. Check for abnormal noise or clutch slippage.
14. Park vehicle on a slope. Apply parking brake. Place shift lever in "P" position. Release parking brake. Ensure vehicle does not move. If vehicle moves, check for defective shift cable or parking components.
15. Ensure ignition is off. Remove test harness or backprobe set and reinstall electrical connectors, ECM cover, carpet and door sill molding.

CLUTCH APPLICATION

Shift Lever Position	Elements In Use
"P" & "N"	No Clutches Are Applied
"R"	4th Clutch
"D4"	
1st Gear	1st Clutch, One-Way Clutch
2nd Gear	(1) 2nd Clutch
3rd Gear	(1) 3rd Clutch
4th Gear	(1) 4th Clutch
"D"	
1st Gear	1st Clutch, One-Way Clutch
2nd Gear	(1) 2nd Clutch
3rd Gear	(1) 3rd Clutch
"2"	(1) 2nd Clutch
"1"	1st-Hold Clutch, 1st Clutch, One-Way Clutch
(1) The 1st clutch engages but driving power is not transmitted, as one-way clutch slips.	

TRANSAXLE UPSHIFT SPECIFICATIONS (AOYA & BOYA)

Application (Shift Lever In "D")	1st-2nd Gear	2nd-3rd Gear	3rd-4th Gear	Lock-Up On
Throttle Position Sensor Voltage .83 Volt	11-13 MPH	21-23 MPH	24-33 MPH	14-17 MPH
Throttle Position Sensor Voltage	17-21 MPH	37-41 MPH	52-58 MPH	57-63 MPH

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2.18 Volts Accelerating From Stop				
Full Throttle Accelerating From Stop	31-35 MPH	64-68 MPH	92-98 MPH	84-89 MPH

TRANSAXLE UPSHIFT SPECIFICATIONS (MPJA)

Application (Shift Lever In "D")	1st-2nd Gear	2nd-3rd Gear	3rd-4th Gear	Lock-Up On
Throttle Position Sensor Voltage .83 Volt	12-15 MPH	25-29 MPH	36-40 MPH	N/A MPH
Throttle Position Sensor Voltage 2.18 Volts Accelerating From Stop	19-23 MPH	41-46 MPH	64-70 MPH	76-82 MPH
Full Throttle Accelerating From Stop	34-39 MPH	63-71 MPH	97-108 MPH	89-100 MPH

TRANSAXLE DOWNSHIFT SPECIFICATIONS (AOYA & BOYA)

Application (Shift Lever In "D")	1st-2nd Gear	2nd-3rd Gear	3rd-4th Gear	Lock-Up On
Throttle Position Sensor Voltage .83 Volt	12-16 MPH	N/A	18-22 MPH	6-10 MPH
Throttle Position Sensor Voltage 2.18 Volts, Vehicle Slowing By Grade Or Load	46-52 MPH	N/A	N/A	N/A
Full Throttle, Vehicle Slowing By Grade Or Load	79-84 MPH	78-84 MPH	55-60 MPH	23-28 MPH

TRANSAXLE DOWNSHIFT SPECIFICATIONS (MPJA)

Application (Shift Lever In "D")	1st-2nd Gear	2nd-3rd Gear	3rd-4th Gear	Lock-Up On
Throttle Position Sensor Voltage .83 Volt	12-16 MPH	N/A	19-22 MPH	7-10 MPH
Throttle Position Sensor Voltage 2.18 Volts, Vehicle Slowing By Grade Or Load	49-55 MPH	N/A	N/A	N/A
Full Throttle, Vehicle Slowing By Grade Or Load	85-96 MPH	83-93 MPH	57-64 MPH	26-31 MPH

TORQUE CONVERTER STALL SPEED TEST

CAUTION: DO NOT perform torque converter stall speed test for more than 10 seconds, or transaxle may be damaged. DO NOT move shift lever while increasing engine speed.

1. Apply parking brake. Block front wheels. Connect tachometer and start engine. Ensure A/C is off. Warm engine to normal operating temperature. Place shift lever in "2" position.
2. Fully depress brake pedal. Fully depress accelerator for 6-8 seconds and note engine speed. This is the

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torque converter stall speed.

3. Allow transaxle to cool for 2 minutes. Repeat test procedure with shift lever in "D4", "1" and "R" positions.
4. Ensure torque converter stall speed is within specification. Torque converter stall speed should be the same in "D4", "2", "1" and "R" positions. See **TORQUE CONVERTER STALL SPEED SPECIFICATIONS** table. If torque converter stall speed is not within specification, see **TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING** table for possible causes.

TORQUE CONVERTER STALL SPEED SPECIFICATIONS

Application	Engine RPM
Standard	2650
Service Limit	2500-2800

TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING

Stall Speed Test Results	Probable Cause
High In "D4", "2", "1" & "R"	Low Fluid Level, Low Oil Pump Output, Clogged Fluid Strainer, Pressure Regulator Valve Stuck Closed, Slipping Clutch
High In "R"	Slipping 4th Clutch
High In "2" & "D4"	Slipping 2nd Clutch
High In "1"	Slipping 1st Clutch, Defective One-Way Clutch
Low In "D4", "2", "1" & "R"	Engine Output Low, Torque Converter One-Way Clutch Slipping

HYDRAULIC PRESSURE TEST

Pressure Test Preparation

Ensure transaxle fluid level is correct. Warm engine to normal operating temperature. Apply parking brake, and block rear wheels. Raise and support vehicle so front wheels can rotate.

Line Pressure Test

1. With engine off, remove pressure tap plug from line pressure tap on transaxle. See **Fig. 5** . Attach pressure gauge to line pressure tap using NEW washer. Tighten hose fitting to 13 ft. lbs. (18 N.m).
2. With shift lever in "P" position, start and operate engine at 2000 RPM. Note line pressure. Place shift lever in "N" position and note line pressure with engine at 2000 RPM.
3. Ensure line pressure is within specification. See **HYDRAULIC PRESSURE TEST SPECIFICATIONS** table. If line pressure is not within specification, see **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table. Shut engine off.
4. Remove the pressure gauge set. Using NEW seal washer, install and tighten pressure tap plug to specification. See **TORQUE SPECIFICATIONS** .

NOTE: Clutch pressure should be checked at each clutch pressure tap on transaxle.

See **Fig. 5** .

Clutch Pressure Test

1. With engine off, remove pressure tap plug from appropriate clutch pressure tap on transaxle. See **Fig. 5** . Attach pressure gauge to appropriate pressure tap using NEW washer. Tighten hose fitting to 13 ft. lbs. (18 N.m).

NOTE: Clutch pressure on some applications may vary with position of Throttle Valve (T.V.) lever on the transaxle. The T.V. cable must be disconnected for some tests. Ensure shift lever is in proper position when checking clutch pressures.

2. Raise and support vehicle allowing wheels to rotate freely. Start and operate engine at 2000 RPM. Note clutch pressure reading with shift lever in proper position. See **HYDRAULIC PRESSURE TEST SPECIFICATIONS** table.
3. Ensure clutch pressure is within specification. If clutch pressure is not within specification, see **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table. Shut engine off.
4. Remove the pressure gauge set. Using NEW seal washer, install and tighten pressure tap plug to specification. See **TORQUE SPECIFICATIONS** .

Low/High Pressure Test

1. The low/high pressure is tested at 2nd, 3rd and 4th clutch pressure taps on transaxle. See **Fig. 5** . Disconnect Throttle Valve (T.V.) cable from transaxle T.V. lever.

NOTE: When disconnecting T.V. cable, unhook cable from transaxle T.V. lever. DO NOT loosen lock nuts used for cable adjustment.

2. With engine off, remove pressure tap plug from appropriate clutch pressure tap on transaxle. Attach pressure gauge to appropriate pressure tap using NEW washer. Tighten hose fitting to 13 ft. lbs. (18 N.m).
3. Start engine and allow to idle long enough to maintain normal operating temperature. Move shift lever to "D4" position. Slowly increase engine speed until pressure is indicated on pressure gauge. Release throttle, allowing engine to idle, and note low pressure reading.
4. With engine idling, lift transaxle T.V. lever upward about half the distance of lever travel. Increase engine speed and note highest pressure reading.
5. Repeat procedure on remaining clutches. Ensure low/high pressure is within specification. See **HYDRAULIC PRESSURE TEST SPECIFICATIONS** table. If low/high pressure is not within specification, see **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table.
6. Shut engine off. Remove pressure gauge set. Using NEW seal washer, install and tighten pressure tap plug to specification. See **TORQUE SPECIFICATIONS** . Reconnect T.V. cable.

Throttle Valve "B" Pressure Test

1. Disconnect Throttle Valve (T.V.) cable from transaxle T.V. lever. With engine off, remove pressure tap

plug from throttle valve "B" pressure tap. See **Fig. 5**.

NOTE: When disconnecting T.V. cable, unhook cable from transaxle T.V. lever. **DO NOT** loosen lock nuts used for cable adjustment.

2. Attach pressure gauge to throttle valve "B" pressure tap using NEW washer. Tighten hose fitting to 13 ft. lbs. (18 N.m).
3. Start engine and operate at 1000 RPM with shift lever in "D4" position. No pressure should exist with transaxle T.V. lever closed (released position). Lift transaxle T.V. lever to fully open position. Note throttle valve "B" pressure reading.
4. Ensure throttle valve "B" pressure is within specification. See appropriate **HYDRAULIC PRESSURE SPECIFICATIONS** table. If pressure is not within specification, see **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table. Shut engine off.
5. Remove pressure gauge. Using NEW seal washer, install and tighten pressure tap plug to specification. See **TORQUE SPECIFICATIONS**. Reconnect T.V. cable.

HYDRAULIC PRESSURE SPECIFICATIONS

HYDRAULIC PRESSURE TEST SPECIFICATIONS (CLUTCH PRESSURE)

Application	Lever Position	Pressure psi (kPa)
Line Pressure		
Engine Speed At 2000 RPM	"P" Or "N"	113-130 (780-880)
Clutch Pressure		
1st Clutch		
Engine Speed At 2000 RPM	"1" Or "D4"	113-130 (780-880)
1st-Hold Clutch		
Engine Speed At 2000 RPM	"1"	113-130 (780-880)
2nd Clutch		
Engine Speed At 2000 RPM	"2"	113-130 (780-880)
Throttle Control Lever Fully Closed ⁽¹⁾	"D4"	64-71 (440-490)
Throttle Control Lever Open More Than 3/16 ⁽²⁾	"D4"	113-130 (780-880)
3rd Clutch		
Throttle Control Lever Fully Closed ⁽¹⁾	"D4"	67-75 (460-520)
Throttle Control Lever Open More Than 3/16 ⁽²⁾	"D4"	113-130 (780-880)
4th Clutch		
Engine Speed At 2000 RPM	"R"	113-130 (780-880)
Throttle Control Lever Fully Closed ⁽¹⁾	"D4"	67-75 (460-520)

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Throttle Control Lever Open More Than 3/16 ⁽²⁾	"D4"	113-130 (780-880)
(1) Check pressure with engine speed at 2000 RPM. Fully closed position is with throttle control lever on transaxle in released position and not being pulled upward by T.V. cable.		
(2) Check pressure with engine speed at 2000 RPM. Open position is with transaxle T.V. lever being pulled upward 3/16 the distance of throttle control lever travel.		

HYDRAULIC PRESSURE TEST SPECIFICATIONS (CLUTCH LOW PRESSURE)

Clutch ⁽¹⁾	Lever Position	Pressure psi (kPa)
2nd or 3rd	"D4"	64-71 (440-490)
4th	"D4"	67-75 (460-520)
(1) Throttle control lever fully closed. Check pressure with engine speed at 2000 RPM. Fully closed 4th position is with throttle control lever on transaxle in released position and not being pulled upward by T.V. cable.		

HYDRAULIC PRESSURE TEST SPECIFICATIONS (CLUTCH HIGH PRESSURE)

Application	Lever Position	Pressure psi (kPa)
2nd, 3rd Or 4th Clutch (Throttle Control Lever Lifted Upward 1/2 Distance Of Throttle Control Lever Travel)	"D4"	113-130 (780-880)

HYDRAULIC PRESSURE TEST SPECIFICATIONS (THROTTLE "B" PRESSURE)

Application	Lever Position	Pressure psi (kPa)
Throttle Control Lever Fully Closed, Engine Speed at 1000 RPM	"D" Or "D4"	0 (0)
Throttle Control Lever Fully Open, Engine Speed at 1000 RPM	"D" Or "D4"	113-130 (780-880)

HYDRAULIC PRESSURE TEST TROUBLE SHOOTING

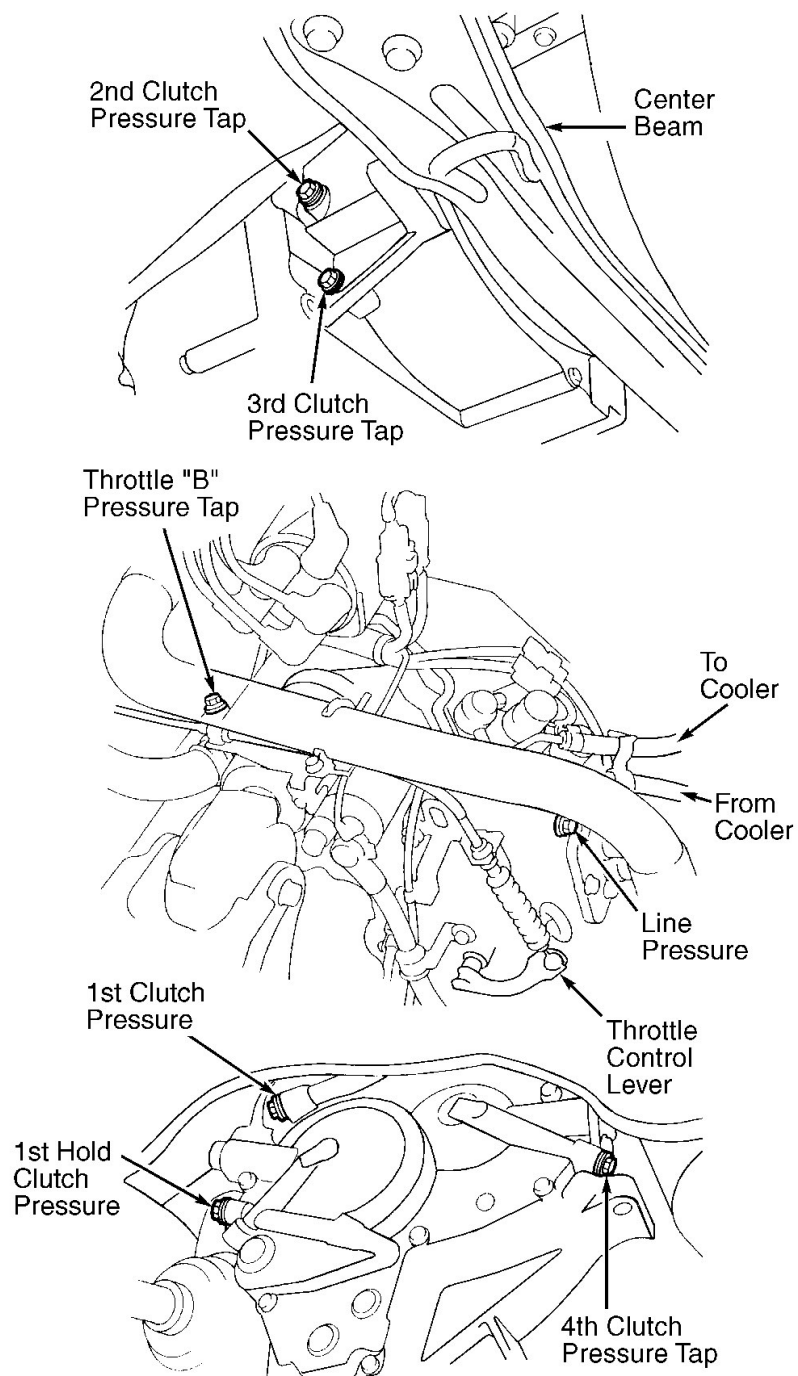
Application	Probable Cause
Line Pressure	
Low Or No Pressure	Defective Torque Converter, Defective Torque Converter Check Valve, Defective Oil Pump Pressure Regulator, Defective Oil Pump
Clutch Pressure	
Low Or No 1st Clutch Pressure	Defective 1st Clutch
Low Or No 1st-Hold Clutch Pressure	Defective 1st-Hold Clutch
Low Or No 2nd Clutch Pressure	Defective 2nd Clutch
Low Or No 3rd Clutch Pressure	Defective 3rd Clutch
Low Or No 4th Clutch Pressure	Defective 4th Clutch, Defective Servo Valve On 4th Clutch

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Low/High Pressure

Low Or No 2nd Clutch Pressure	Defective 2nd Clutch
Low Or No 3rd Clutch Pressure	Defective 3rd Clutch
Low Or No 4th Clutch Pressure	Defective 4th Clutch
Throttle Valve "B" Pressure	
Low Or No Pressure	Defective Throttle Valve "B"



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Fig. 5: Identifying Transaxle Pressure Taps
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

REMOVAL & INSTALLATION

ELECTRICAL COMPONENTS

See HONDA AOYA, BOYA & MPJA ELECTRONIC CONTROLS article

TRANSAXLE

See appropriate REMOVAL & INSTALLATION article.

TORQUE CONVERTER

Torque converter consists of pump, turbine and stator assembled as a unit. Torque converter cannot be serviced and must be replaced if defective.

NOTE: For torque converter stall speed test, see **TORQUE CONVERTER STALL SPEED TEST** under TESTING.

TRANSAXLE DISASSEMBLY

VALVE BODIES & INTERNAL COMPONENTS

1. Remove bolts, right side cover and gasket. See **Fig. 6** . Install Mainshaft Holder (07GAB-PF50100 or 07GAB-PF50101) on mainshaft to secure mainshaft from rotating. See **Fig. 7** .

CAUTION: DO NOT use impact wrench to remove lock nuts from countershaft, mainshaft and secondary shaft.

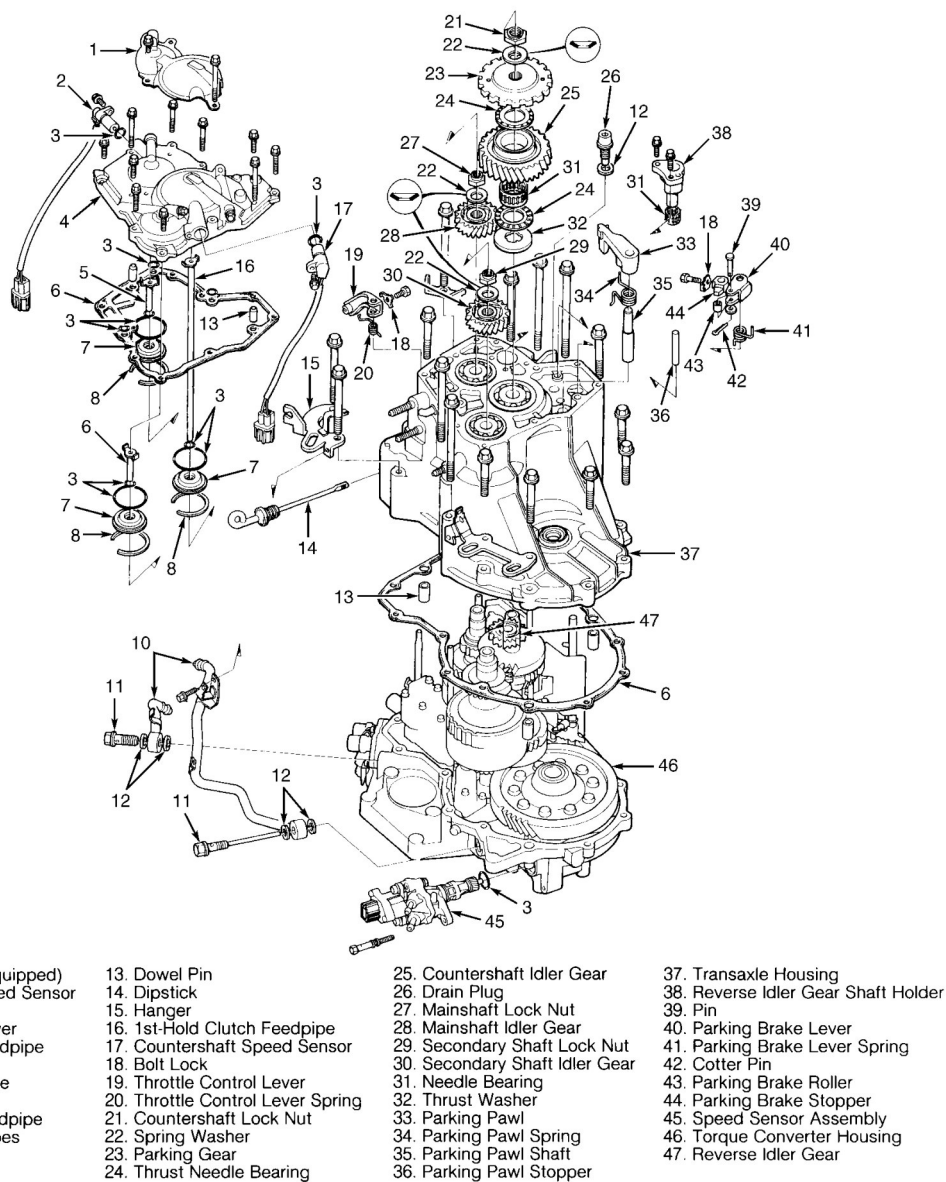
2. Engage parking pawl with parking gear. Using hammer and chisel, cut lock tabs on countershaft, mainshaft and secondary shaft lock nuts. Remove lock nuts and spring washers. See **Fig. 6** .

NOTE: Mainshaft lock nut has left-hand thread.

3. Remove mainshaft holder once all lock nuts are removed. Using puller, remove parking gear from countershaft. Using puller, remove idler gears from mainshaft and secondary shaft.
4. Remove countershaft idler gear, needle bearing, thrust needle bearing and thrust washer from countershaft. Remove parking pawl, parking pawl spring, parking pawl shaft and parking pawl stop.
5. Remove throttle control lever and spring from throttle control shaft. Remove ATF cooler pipe-to-hanger bolt. Remove transaxle housing bolts.
6. Remove bolts from reverse idler gear shaft holder. Screw bolt into center of shaft on reverse idler gear shaft holder. See **Fig. 8** . Pull reverse idler gear shaft holder with shaft and needle bearing from transaxle housing.

NOTE: Transaxle housing will not separate from torque converter housing if reverse idler gear shaft holder is not removed and reverse idler gear repositioned.

7. Move reverse idler gear outward to disengage from countershaft reverse gear. See **Fig. 9** . Align spring pin with groove in transaxle housing by rotating control shaft. Using Puller (07HAC-PK4010A), remove transaxle housing. See **Fig. 10** .



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Fig. 6: Exploded View Of Right Side Cover & Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

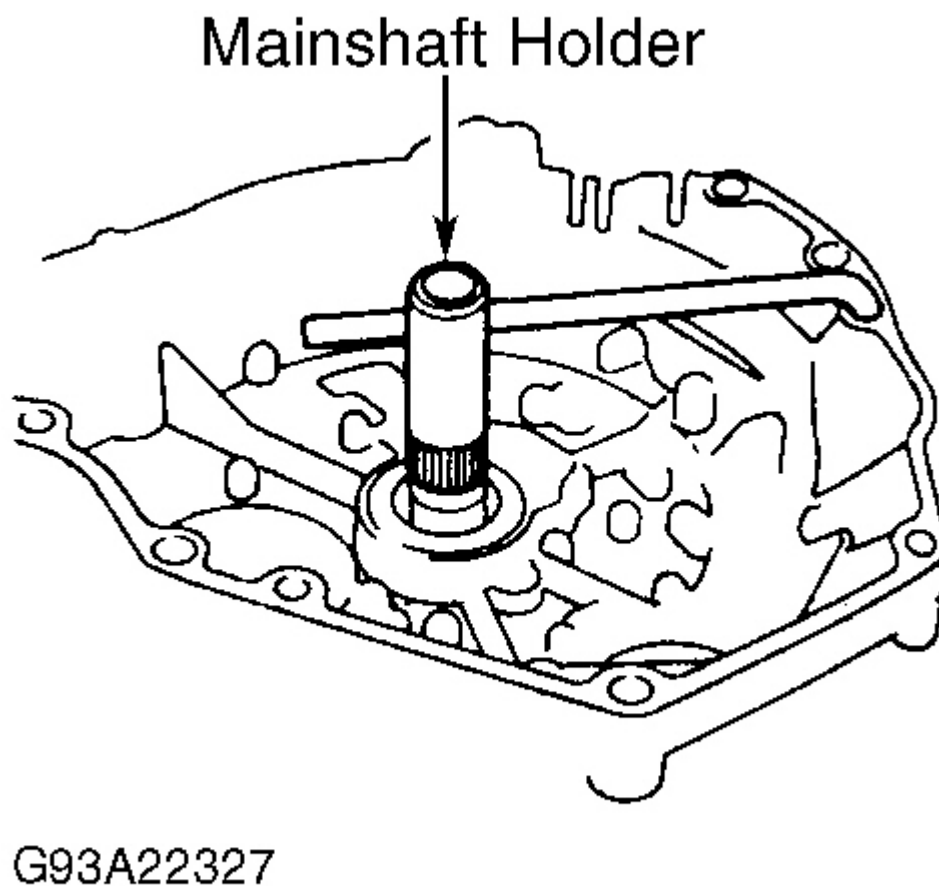
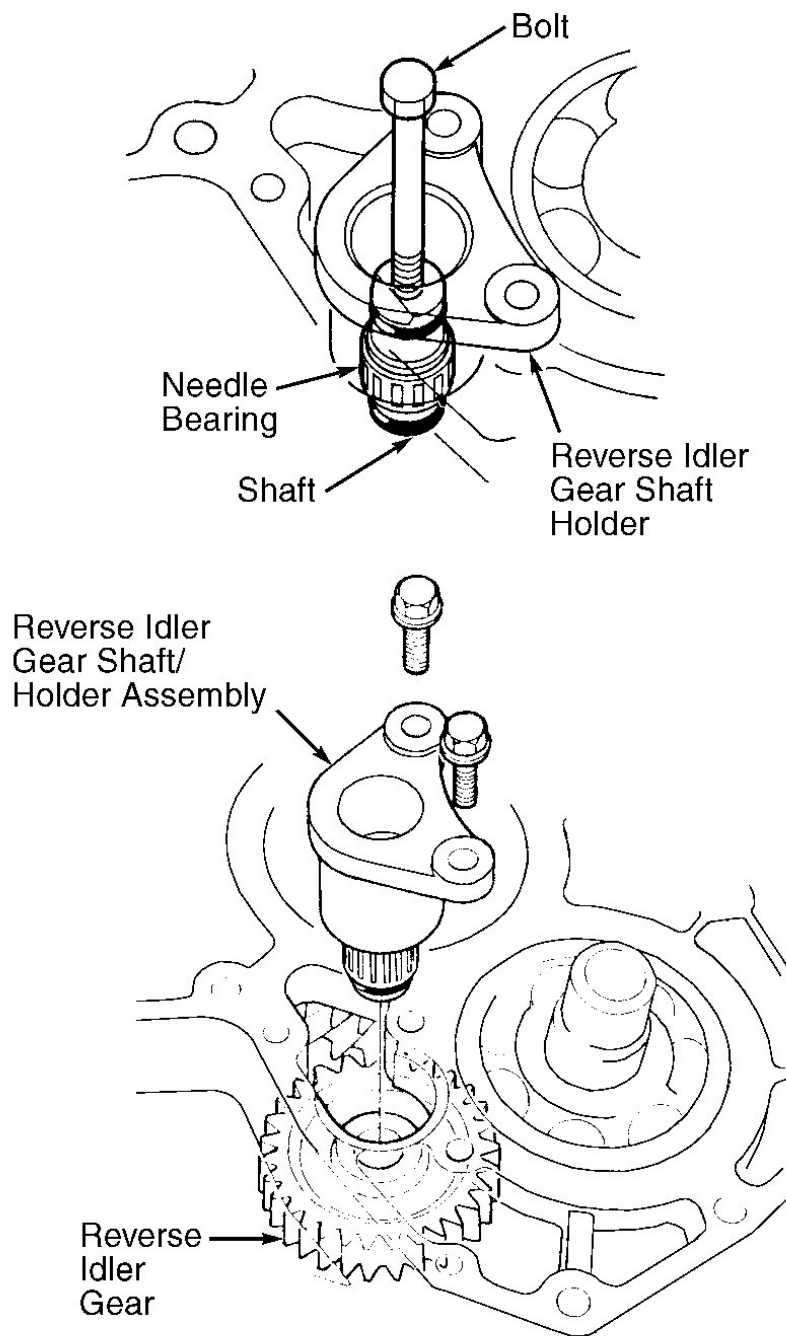


Fig. 7: Installing Mainshaft Holder

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 8: Removing Idler Gear Shaft Holder & Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

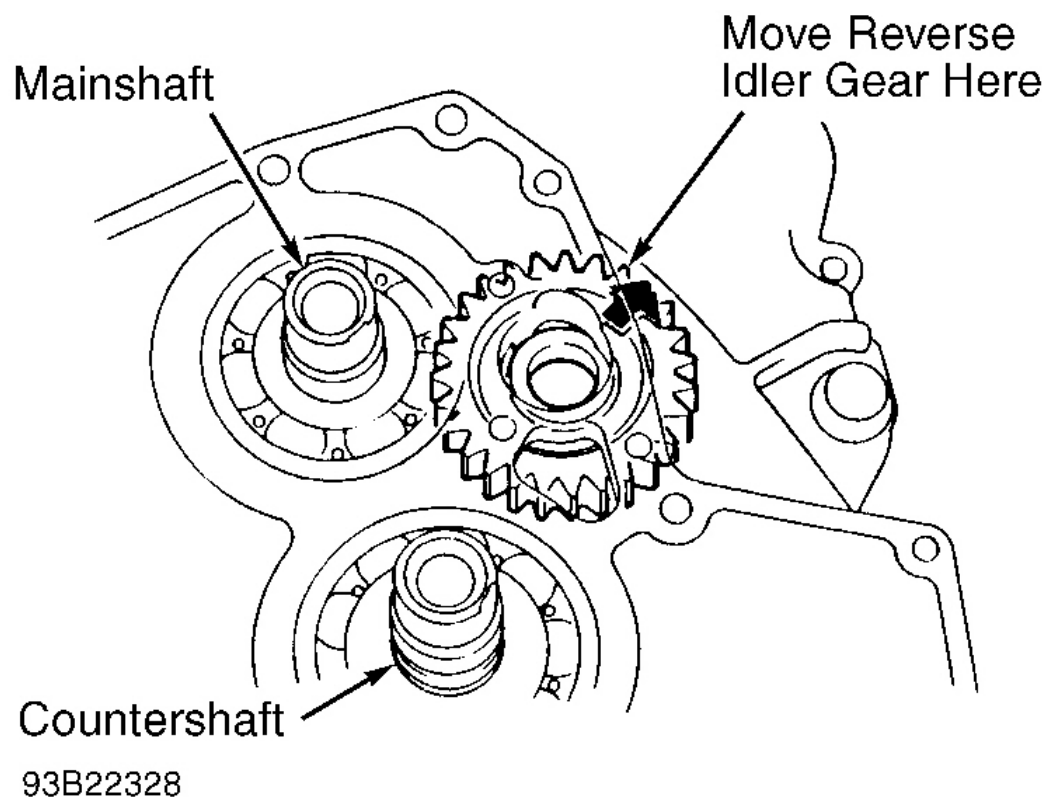
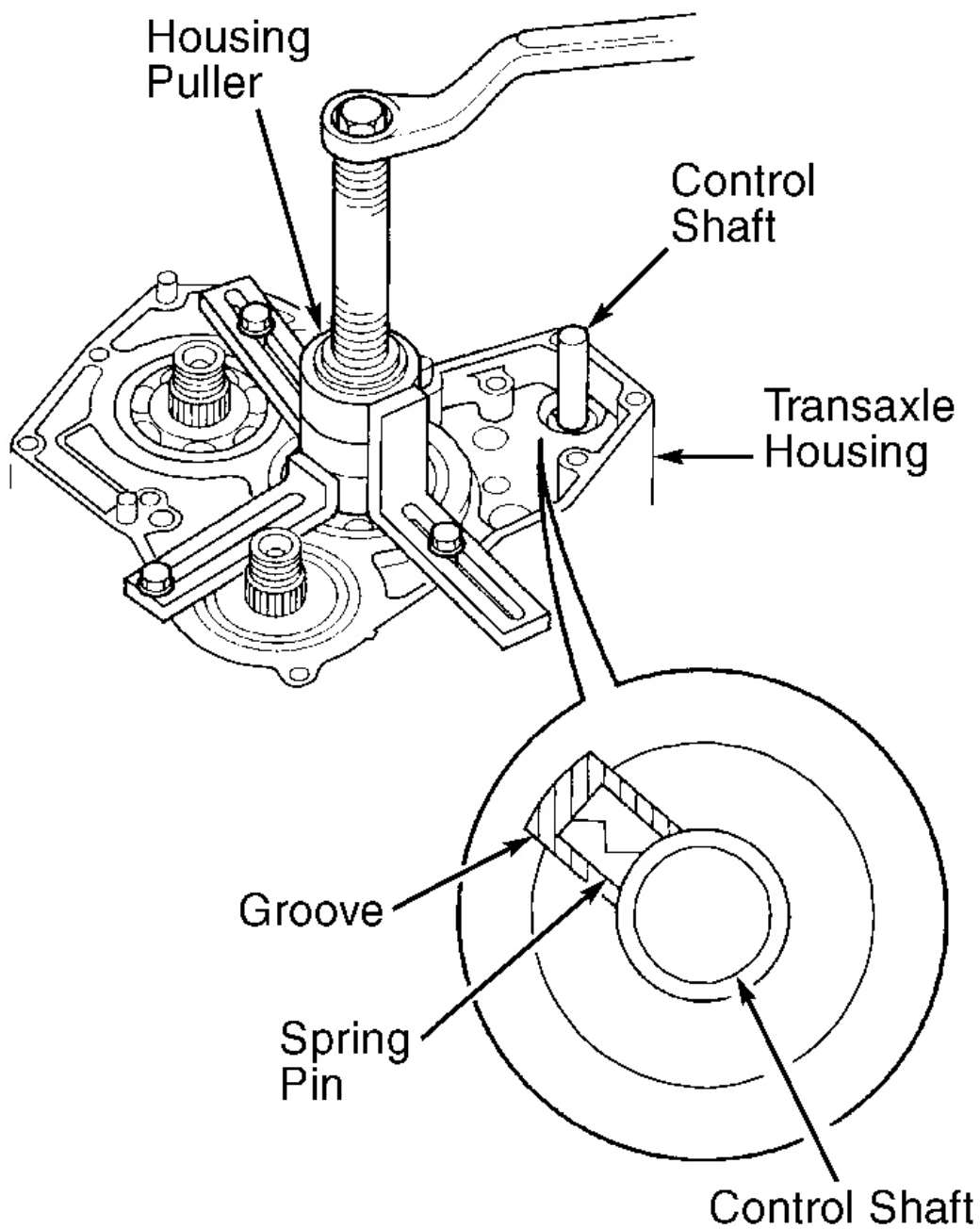


Fig. 9: Positioning Reverse Idler Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 10: Aligning Spring Pin & Removing Transaxle Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

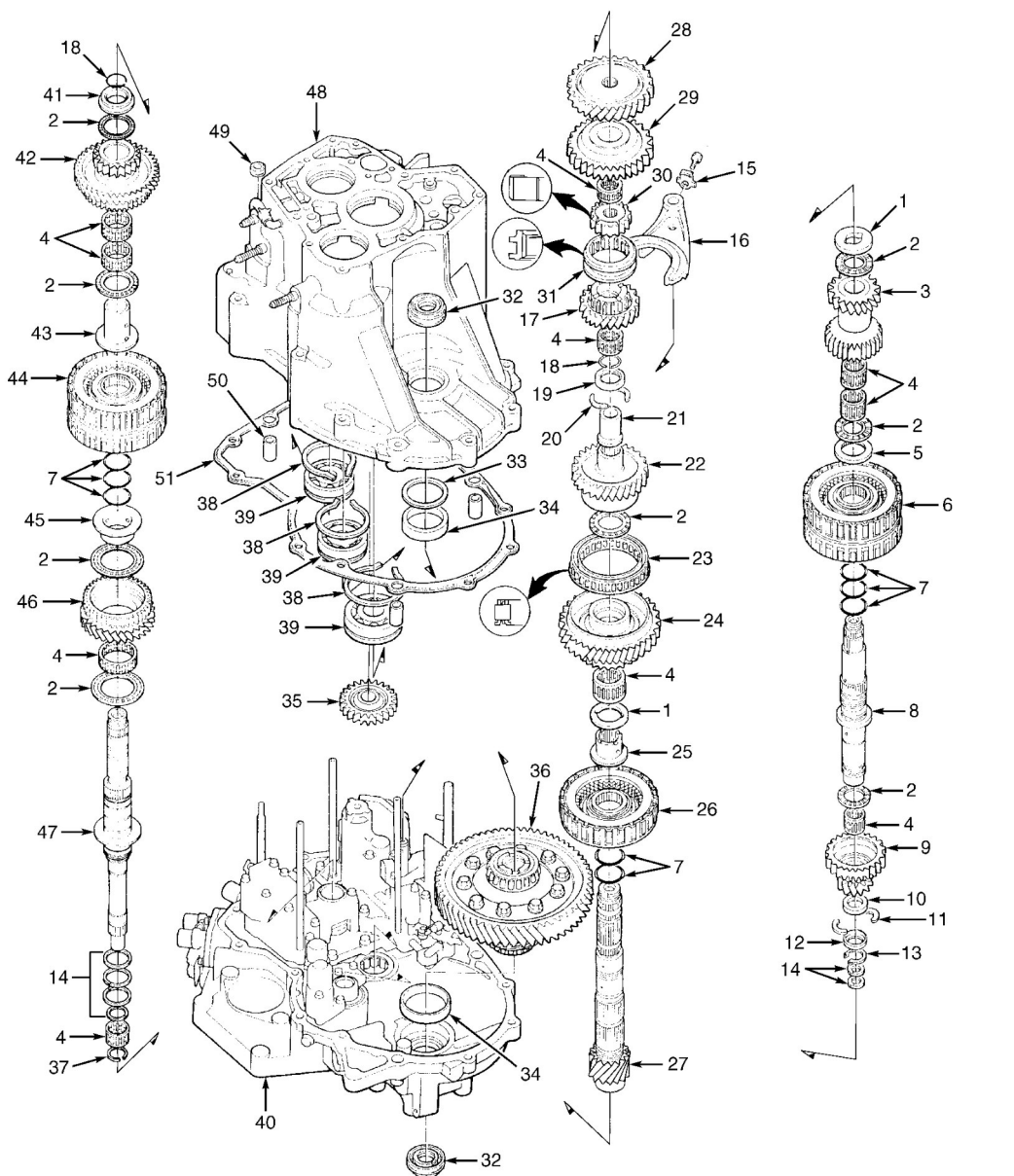
8. Remove reverse idler gear from transaxle housing. Remove countershaft 2nd gear, countershaft reverse gear, thrust washer, thrust needle bearing and secondary shaft 2nd gear together from countershaft and secondary shaft. See **Fig. 11** .
9. Remove bolt, bolt lock, shift fork, reverse selector hub and reverse selector. Remove needle bearings, thrust needle bearing and splined washer from secondary shaft.
10. Remove secondary shaft, mainshaft and countershaft assemblies. Remove differential assembly from torque converter housing. Remove bolt and servo detent base. See **Fig. 12** . Remove bolts and fluid strainer.

CAUTION: To prevent bolt damage, ensure accumulator cover is held downward when removing bolts. Use care when removing bolts and accumulator cover, as accumulator cover is under spring tension.

11. Remove oil feedpipes from servo body and main valve body. Remove bolts and accumulator cover. See **Fig. 12** . Remove bolts, servo body and servo separator plate.
12. Remove secondary valve body and secondary separator plate. Use care not to lose check balls in secondary valve body. Remove bolts, throttle valve body and throttle separator plate.
13. Remove bolt and regulator valve body. Remove stop shaft, "O" ring and stator shaft. Disconnect detent spring from detent arm. Remove control shaft from torque converter housing. Remove detent arm shaft and detent arm from main valve body.
14. Remove bolts and main valve body. Use care not to lose check balls in main valve body. Remove bolts and 1st-2nd accumulator body.
15. Remove oil pump driven gear shaft, oil pump driven gear and oil pump drive gear. Remove main separator plate and dowel pins. Remove lock-up control solenoid valve assembly and shift control solenoid valve assembly (if necessary).

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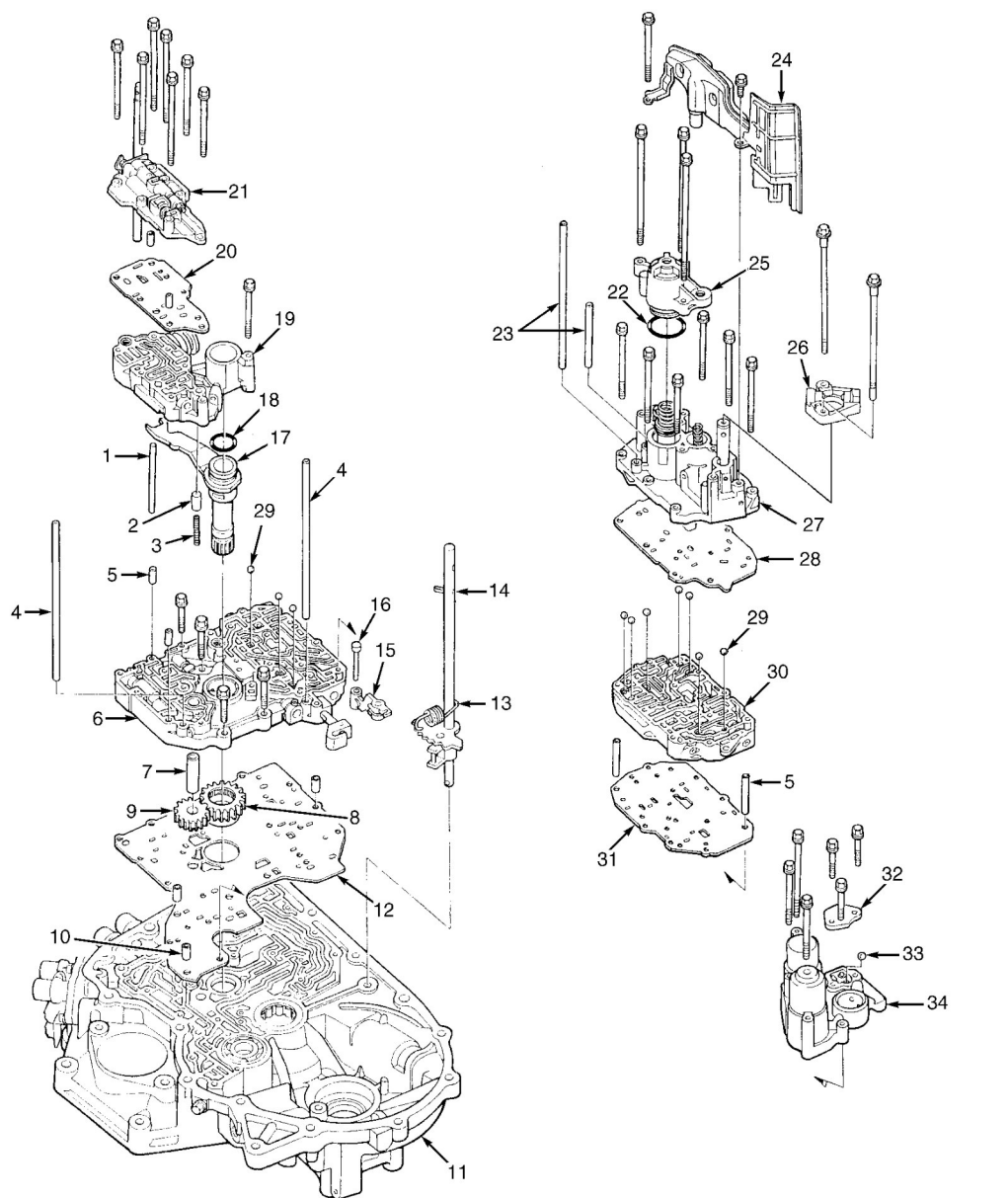
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- | | | | |
|-----------------------------|----------------------------------|-------------------------------|--------------------------------|
| 1. Thrust Washer | 14. Seal Ring | 27. Countershaft | 40. Torque Converter Housing |
| 2. Thrust Needle Bearing | 15. Bolt Lock | 28. Countershaft 2nd Gear | 41. Collar |
| 3. Secondary Shaft 2nd Gear | 16. Shift Fork | 29. Countershaft Reverse Gear | 42. Mainshaft 4th-Reverse Gear |
| 4. Needle Bearing | 17. Countershaft 4th Gear | 30. Reverse Selector Hub | 43. 4th Gear Collar |
| 5. Splined Washer | 18. Snap Ring | 31. Reverse Selector | 44. 3rd-4th Clutch Assembly |
| 6. 1st-2nd Clutch Assembly | 19. Collar | 32. Differential Oil Seal | 45. 3rd Gear Collar |
| 7. "O" Ring | 20. Cotter | 33. Thrust Shim | 46. Mainshaft 3rd Gear |
| 8. Secondary Shaft | 21. Distance Collar | 34. Bearing Outer Race | 47. Mainshaft |
| 9. Secondary Shaft 1st Gear | 22. Countershaft 3rd Gear | 35. Reverse Idler Gear | 48. Transaxle Housing |
| 10. Distance Collar | 23. One-Way Clutch | 36. Differential Assembly | 49. Oil Seal |
| 11. Cotter | 24. Countershaft 1st Gear | 37. Set Ring | 50. Dowel Pin |
| 12. Cotter Retainer | 25. Countershaft 1st Gear Collar | 38. Snap Ring | 51. Transaxle Housing Gasket |
| 13. Snap Ring | 26. 1st-Hold Clutch Assembly | 39. Transaxle Housing Bearing | |

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Fig. 11: Exploded View Of Transaxle Housing & Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.



- | | | | |
|---------------------------------|------------------------------|------------------------------|-------------------------------|
| 1. Stop Shaft | 10. Dowel Pin | 19. Regulator Valve Body | 27. Servo Body |
| 2. Torque Converter Check Valve | 11. Torque Converter Housing | 20. Throttle Separator Plate | 28. Servo Separator Plate |
| 3. Spring | 12. Main Separator Plate | 21. Throttle Valve Body | 29. Check Ball |
| 4. Oil Feedpipe | 13. Detent Spring | 22. "O" Ring | 30. Secondary Valve Body |
| 5. Dowel Pin | 14. Control Shaft | 23. Oil Feedpipe | 31. Secondary Separator Plate |
| 6. Main Valve Body | 15. Detent Arm | 24. Fluid Strainer | 32. Accumulator Body Cover |
| 7. Oil Pump Driven Gear Shaft | 16. Detent Arm Shaft | 25. Accumulator Cover | 33. Check Ball |
| 8. Oil Pump Drive Gear | 17. Stator Shaft | 26. Servo Detent Base | 34. 1st-2nd Accumulator Body |
| 9. Oil Pump Driven Gear | 18. "O" Ring | | |

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Fig. 12: Exploded View Of Torque Converter Housing & Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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. 13** . 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 if any parts are worn or damaged.
2. Ensure all valves slide freely in their bores. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked for 30 minutes in ATF. Thoroughly clean main valve body and components if polishing was needed.
3. Ensure spring free length is within specification. See **SPRING SPECIFICATIONS** 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. 13** .

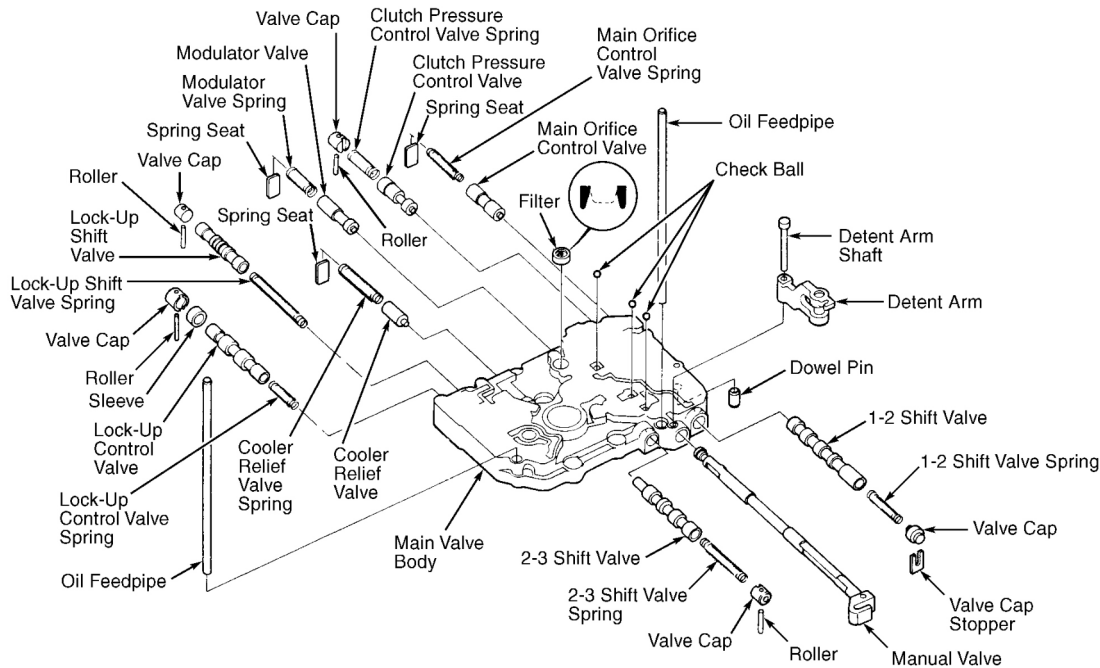
SPRING SPECIFICATIONS

Application	Free Length In. (mm)
Main Valve Body	
Clutch Pressure Control Valve Spring	1.299 (33.00)
Cooler Relief Valve Spring	1.843 (46.81)
Lock-Up Control Valve Spring	(1)
Lock-Up Shift Valve Spring	2.902 (73.70)
Main Orifice Control Valve Spring	1.933 (49.10)
Modulator Valve Spring	1.299 (33.00)
1-2 Shift Valve Spring	1.591 (40.40)
2-3 Shift Valve Spring	2.244 (57.00)
Regulator Valve Body	
Lock-Up Timing Valve Spring	2.012 (51.10)

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Regulator Valve Spring "A"	
AOYA & BOYA	3.457 (87.80)
MPJA	3.488 (88.60)
Regulator Valve Spring "B"	
Stator Reaction Spring	1.193 (30.30)
Torque Converter Check Valve Spring	1.504 (38.20)
Secondary Valve Body	
Servo Control Valve Spring	2.071 (52.60)
Orifice Control Valve Spring	2.067 (52.50)
2nd Orifice Control Valve Spring	2.614 (66.40)
3rd Kickdown Valve Spring	1.902 (48.30)
3-4 Shift Valve Spring	2.244 (57.00)
4th Exhaust Valve Spring	1.921 (48.80)
Servo Body	
1st-Hold Accumulator Spring	2.547 (64.70)
3rd Accumulator Spring	3.921 (99.60)
4th Accumulator Spring	3.547 (90.10)
Throttle Valve Body	
Relief Valve Spring	1.539 (39.10)
Throttle Valve "B" Spring	(2)
Throttle Valve "B" Adjusting Spring	1.181 (30.00)
1st-2nd Accumulator Body	
1st Accumulator Spring "A"	4.315 (109.60)
1st Accumulator Spring "B"	2.776 (70.50)
2nd Accumulator Spring	3.583 (91.00)
(1) Free length may be 1.496" (38.00 mm), 1.516" (38.50 mm) or 1.535" (39.00 mm).	
(2) Free length may be 1.634" (41.50 mm) or 1.638" (41.60 mm).	



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Fig. 13: Exploded View Of Main Valve 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. 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. 14**. 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. 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)
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Side Clearance

Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0014-.0025 (.035-.063)

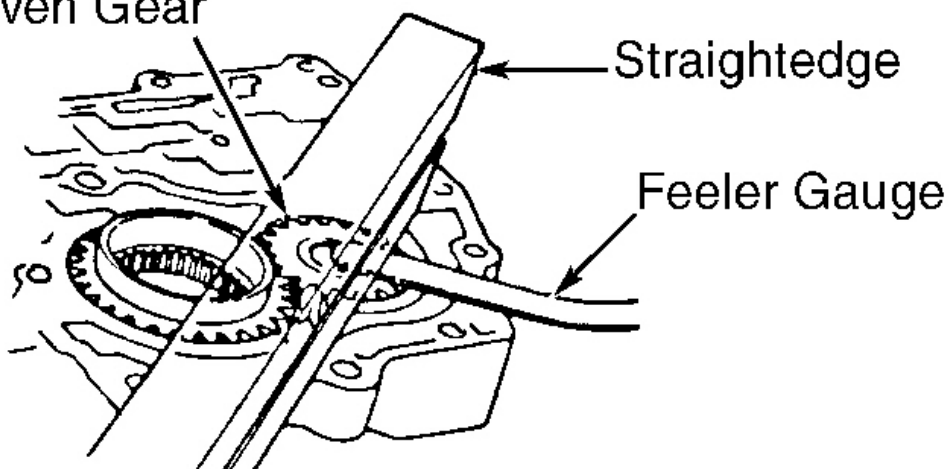
Thrust Clearance

Standard	.001-.002 (.03-.05)
Wear Limit	.003 (.07)

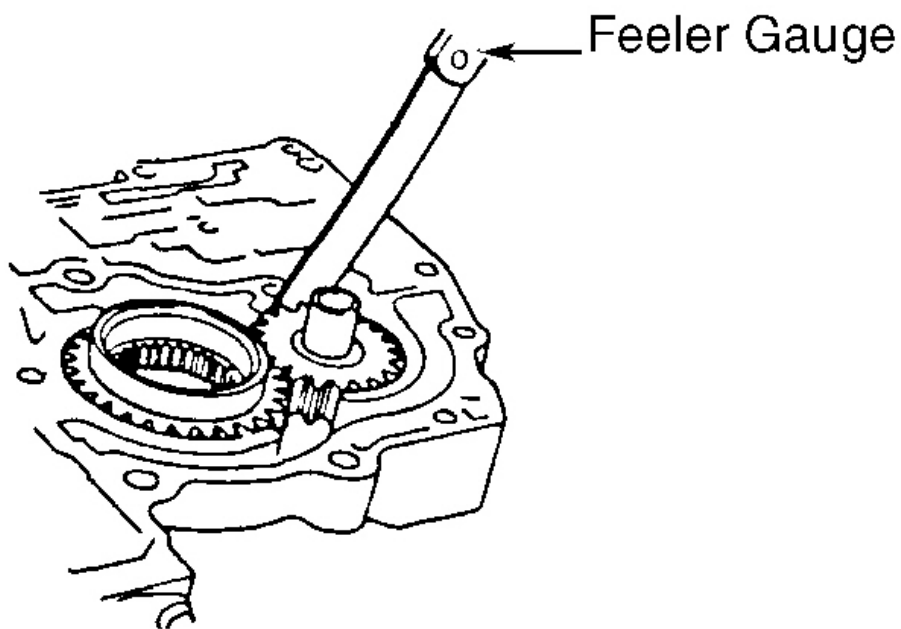
Reassembly

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

Oil Pump
Driven Gear



CHECKING THRUST CLEARANCE



CHECKING SIDE CLEARANCE

G95C19754

Fig. 14: Measuring Oil Pump Clearances
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY VALVE BODY

CAUTION: When disassembling secondary valve body, place secondary 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 secondary valve body.

Disassembly

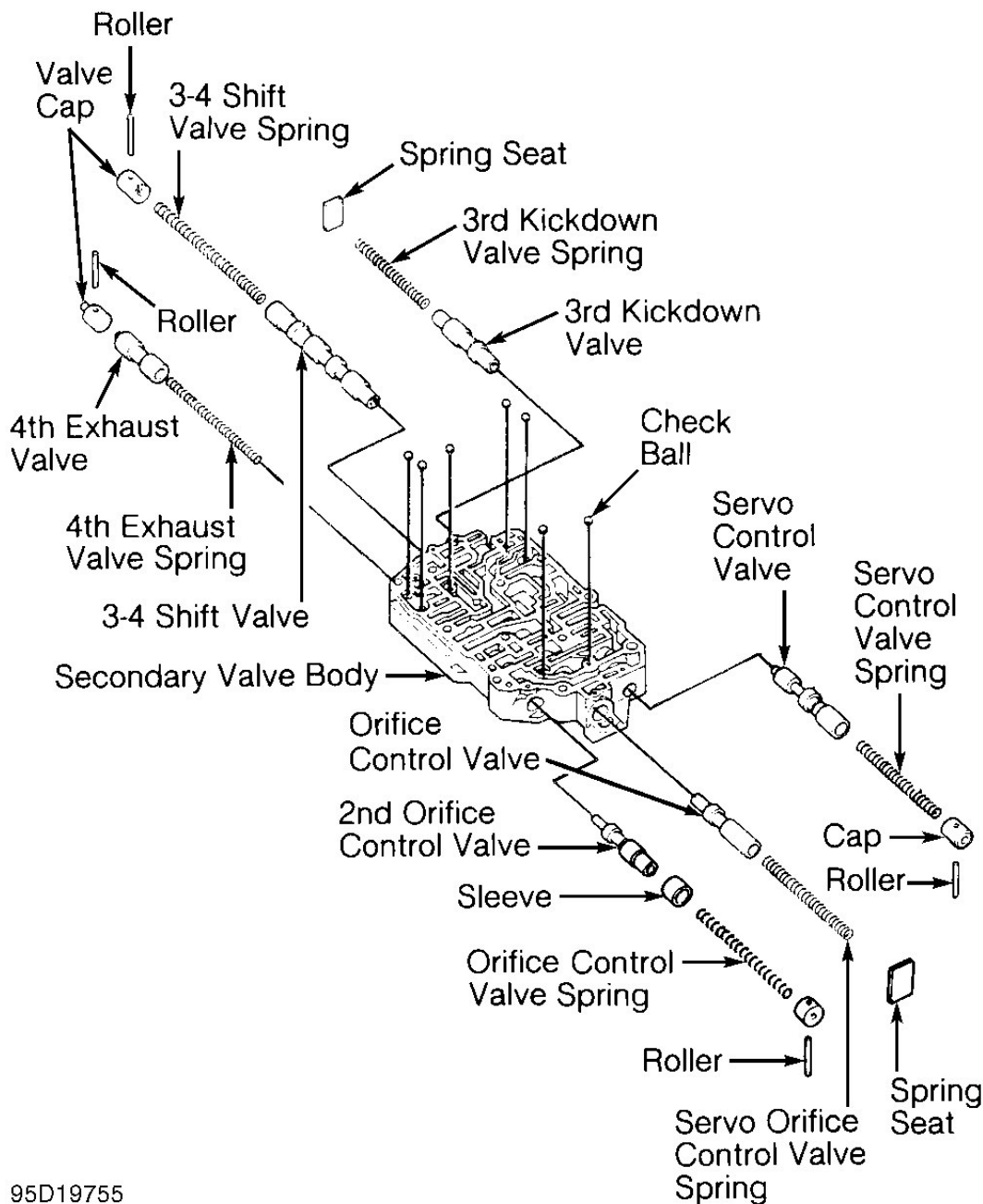
Disassemble secondary valve body. See **Fig. 15** . Use care when removing valve caps or spring seats, as they are under spring pressure.

Cleaning & Inspection

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

Reassembly

Coat all components and bores with Dexron-II ATF. To reassemble, reverse disassembly procedure. Ensure all components are installed in correct location. See **Fig. 15** .



95D19755

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 stopper bolt.

Disassembly

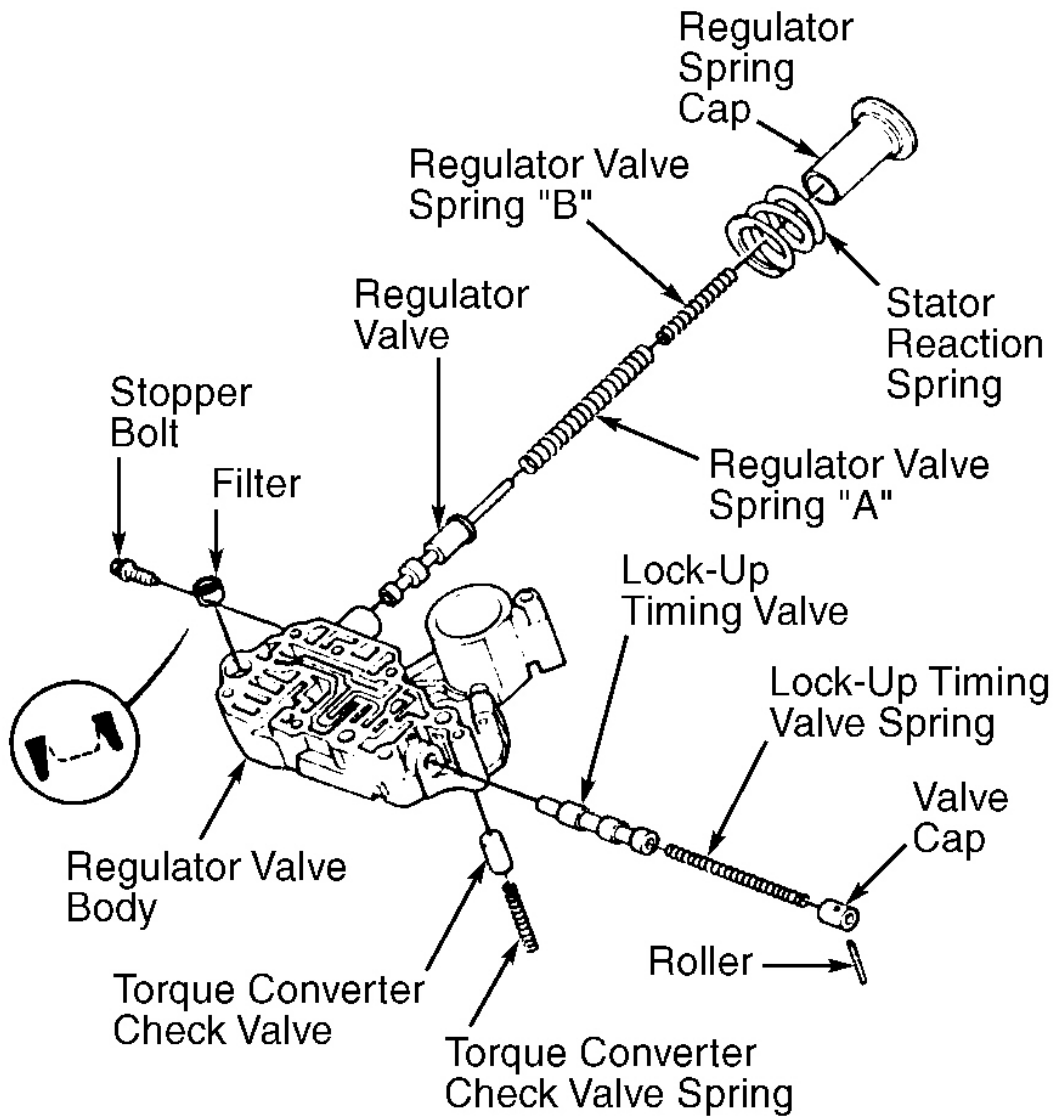
Hold regulator spring cap downward. Remove stopper bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 16** .

Cleaning & Inspection

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

Reassembly

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



93B22344

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

THROTTLE VALVE BODY

NOTE: DO NOT loosen or remove throttle adjusting bolt.

Disassembly

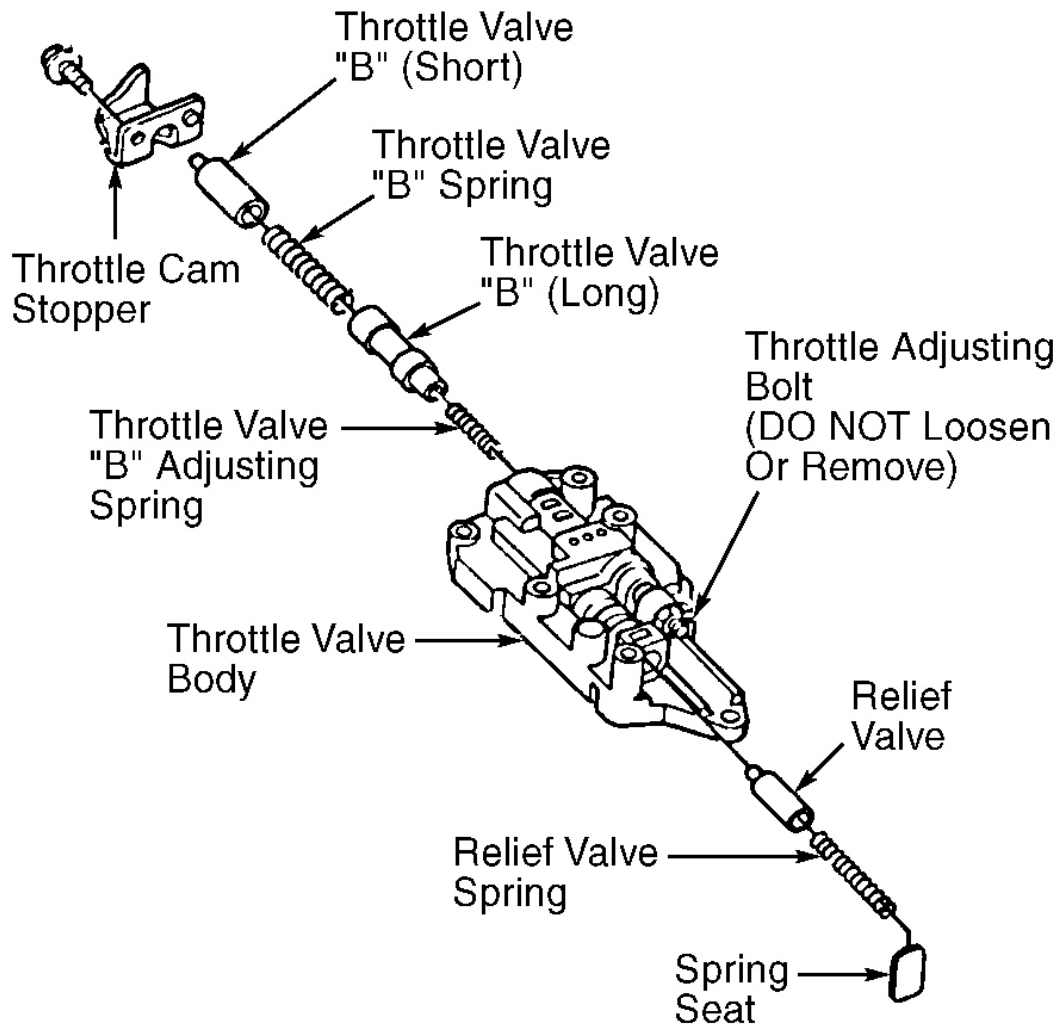
Disassemble throttle valve body. See **Fig. 17** . Use care when removing throttle cam stopper and spring seat, as they are under spring pressure.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace throttle valve body if any parts are worn or damaged.
2. Ensure all valves slide freely in the bore. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked for 30 minutes in ATF. Thoroughly clean throttle valve body and components if polishing was needed.
3. Ensure spring free length is within specification. See **SPRING SPECIFICATIONS** table under MAIN VALVE BODY. Replace springs if not within specification.

Reassembly

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



93C22345

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. Replace fluid strainer if clogged. Ensure spring free length is within specification. See **SPRING SPECIFICATIONS** table under MAIN VALVE BODY. Replace springs if not within specification.

Reassembly

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

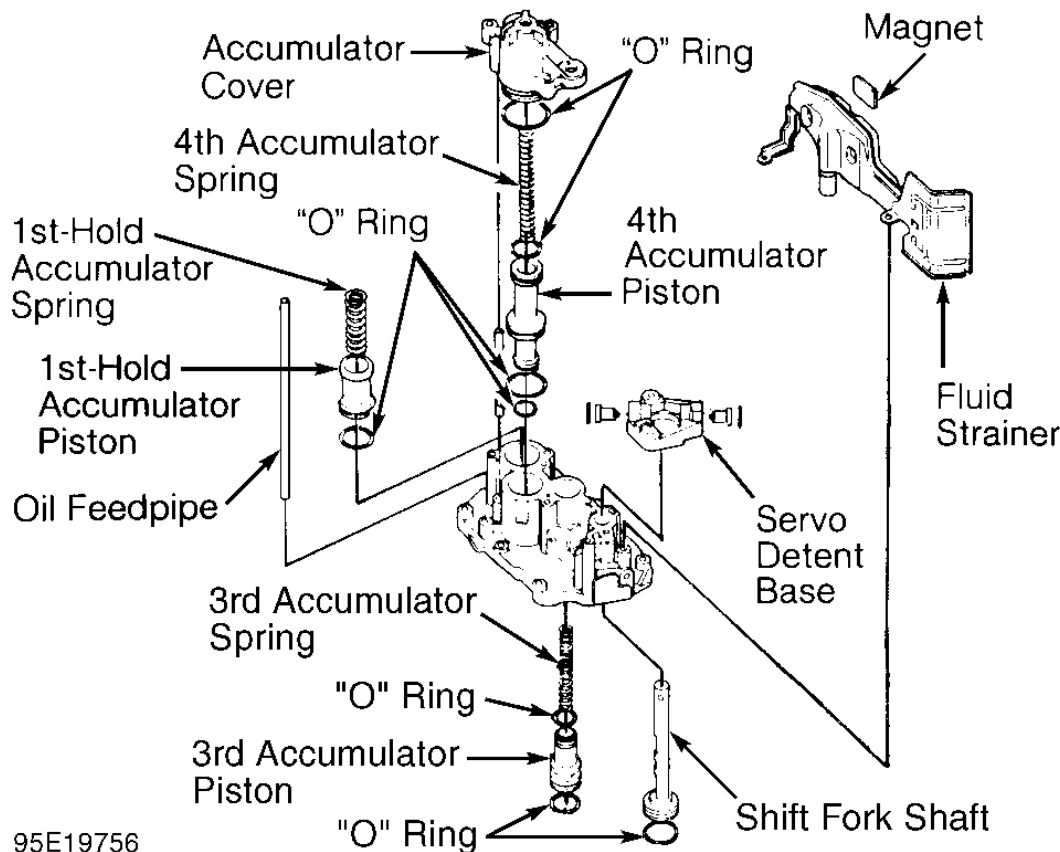


Fig. 18: Exploded View Of Servo Body
Courtesy of AMERICAN HONDA MOTOR CO., INC.

1ST-2ND ACCUMULATOR BODY

Disassembly

Disassemble 1st-2nd accumulator body. See **Fig. 19**. Use care when removing snap rings, as they are under spring pressure. DO NOT use magnet to remove steel ball, as they 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. See **SPRING SPECIFICATIONS** table under MAIN VALVE BODY. Replace springs if not within specification.

Reassembly

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

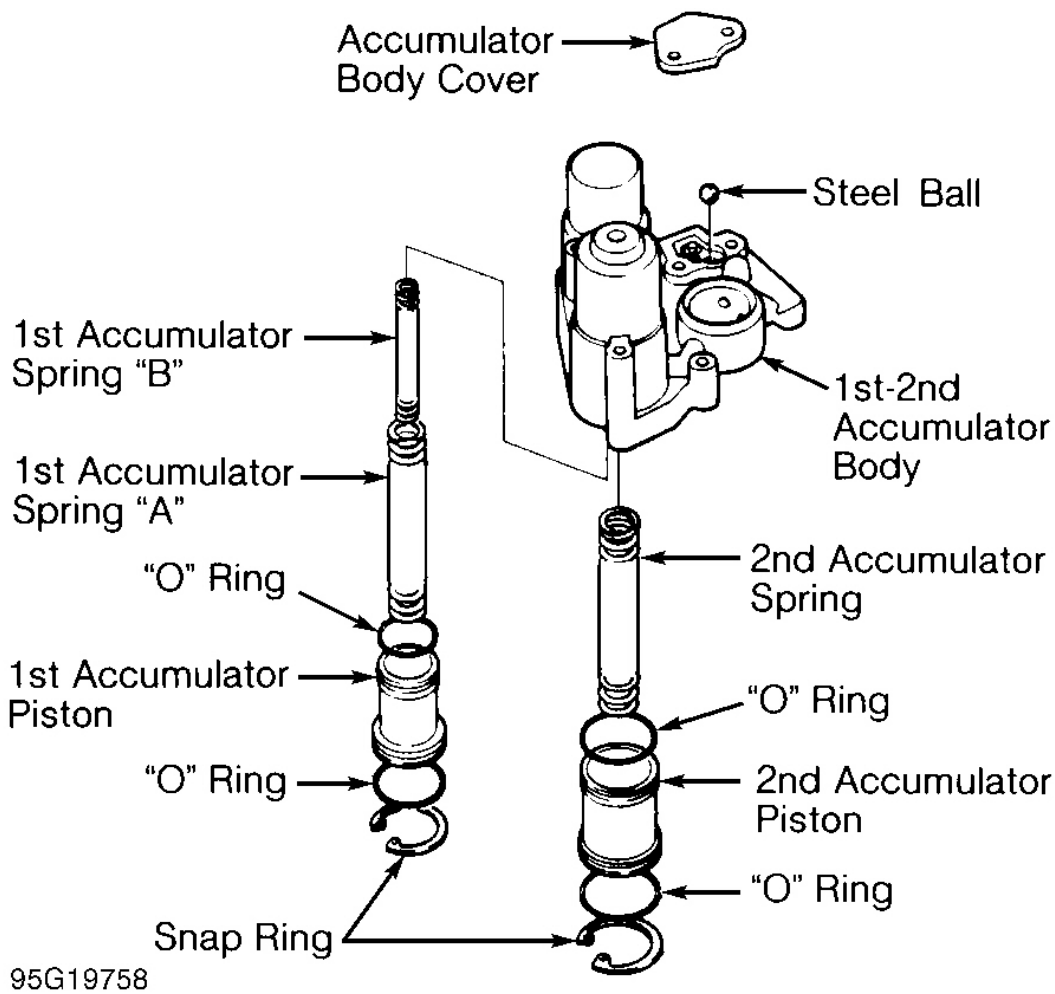


Fig. 19: Exploded View Of 1st-2nd Accumulator Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT

Disassembly

Note location of mainshaft components. See **Fig. 11** . Remove mainshaft components.

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 all components with Dexron-II ATF. Reassemble mainshaft. Ensure thrust needle bearings are installed with unrolled edge of bearing retainer facing washer. Before installing NEW "O" rings on mainshaft, wrap splines on mainshaft with tape to prevent damage to "O" rings.

COUNTERSHAFT & ONE-WAY CLUTCH

Disassembly

1. Note location of countershaft components. See **Fig. 11** . Remove countershaft components down to the countershaft 3rd gear.
2. Place countershaft in hydraulic press while supporting 1st-hold clutch assembly. Place a protective cap between hydraulic press and countershaft to prevent damage to shaft. Press countershaft from countershaft 3rd gear and 1st-hold clutch assembly.
3. Separate countershaft 3rd gear with countershaft 1st gear from 1st-hold clutch assembly. Remove needle bearing, thrust washer and countershaft 1st gear collar from 1st-hold clutch assembly.
4. To separate countershaft 3rd gear from countershaft 1st gear, hold countershaft 1st gear and rotate countershaft 3rd gear counterclockwise. Remove countershaft 3rd gear.
5. Note direction of one-way clutch installation in countershaft 1st gear. Gently pry one-way clutch from countershaft 1st gear.

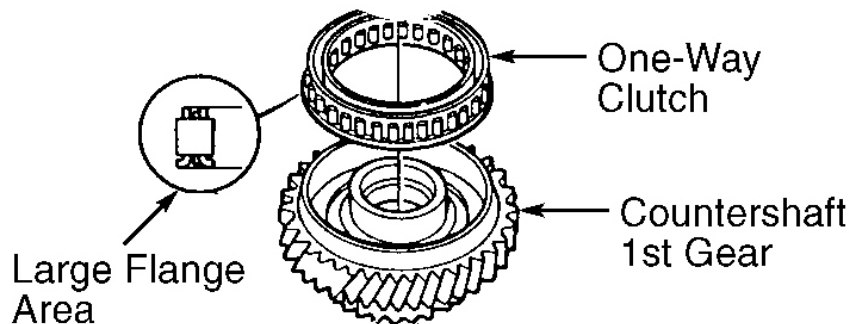
Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear.
2. Inspect all needle bearings for galling and rough movement. Inspect one-way clutch for damage.

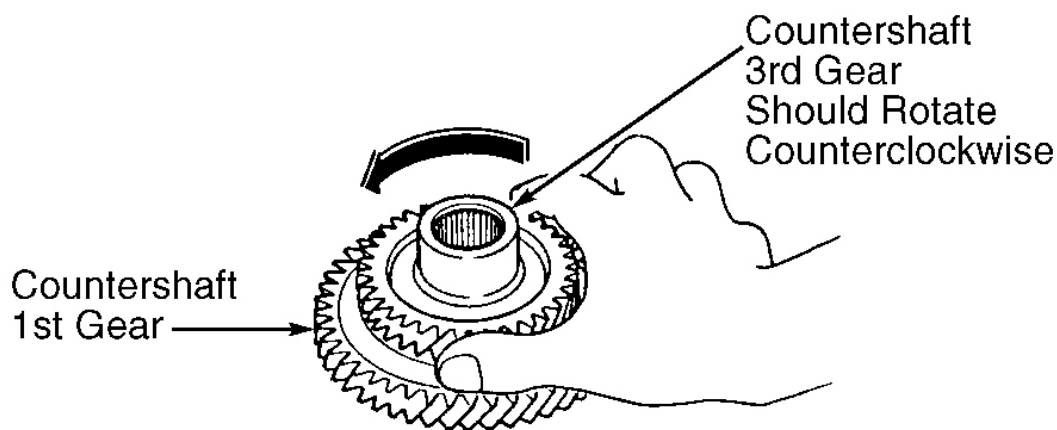
Reassembly

1. Lubricate all components with ATF. Install countershaft 1st gear collar, thrust washer and needle bearing on 1st-hold clutch assembly.
2. Install one-way clutch in countershaft 1st gear with large flange area toward countershaft 1st gear. See **Fig. 20** . Install thrust needle bearing on countershaft 1st gear. Install countershaft 3rd gear on countershaft 1st gear. Hold countershaft 1st gear. Ensure countershaft 3rd gear rotates counterclockwise.
3. Install countershaft 1st gear with countershaft 3rd gear on 1st-hold clutch assembly. Using press, press countershaft into countershaft 3rd gear and 1st-hold clutch assembly. Ensure all splines are aligned when installing countershaft. Ensure final drive gear on countershaft contacts 1st-hold clutch assembly.
4. Reassemble countershaft components. Ensure thrust needle bearings are installed with unrolled edge of

bearing retainer facing washer. Before installing NEW "O" rings on countershaft, wrap splines on countershaft with tape to prevent damage to "O" rings.



INSTALLING ONE-WAY CLUTCH



CHECKING ONE-WAY CLUTCH OPERATION

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Fig. 20: Installing & Checking One-Way Clutch Operation
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY SHAFT

Disassembly

Note location of secondary shaft components. See **Fig. 11** . Remove secondary shaft components.

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

1. Lubricate all components with ATF. Reassemble secondary shaft without "O" rings. Ensure thrust needle bearings are installed with unrolled edge of bearing retainer facing washer.
2. Remove transaxle housing bearing for secondary shaft from transaxle housing. Install transaxle housing bearing for secondary shaft on secondary shaft. Using press, press secondary shaft idler gear on secondary shaft. Install spring washer and used secondary shaft lock nut on secondary shaft. See **Fig. 21**.
3. Tighten secondary shaft lock nut to 22 ft. lbs. (30 N.m). Attach dial indicator on secondary shaft with stem against secondary shaft 2nd gear. Push secondary shaft 2nd gear inward (toward 1st-2nd clutch assembly) and zero dial indicator.
4. Pull secondary shaft 2nd gear outward and note secondary shaft 2nd gear clearance. Check secondary shaft 2nd gear clearance at 3 places on secondary shaft. Average the 3 readings to obtain secondary shaft 2nd gear clearance.
5. Install different thickness splined washer on secondary shaft if secondary shaft 2nd gear clearance is not .003-.006" (.07-.15 mm). Different thickness splined washers are available. See **SPLINED WASHER SPECIFICATIONS** table. Install different thickness splined washer (if necessary) and recheck clearance.

SPLINED WASHER SPECIFICATIONS

Plate No.	Part No.	Thickness In. (mm)
1	90406-PX4-700	.159 (4.05)
2	90407-PX4-700	.161 (4.10)
3	90408-PX4-700	.163 (4.15)
4	90409-PX4-700	.165 (4.20)
5	90410-PX4-700	.167 (4.25)
6	90411-PX4-700	.169 (4.30)
7	90412-PX4-700	.171 (4.35)
8	90413-PX4-700	.173 (4.40)
9	90414-PX4-700	.175 (4.45)

6. Remove secondary shaft lock nut, spring washer, secondary shaft idler gear and transaxle housing bearing. Lubricate all components with ATF.
7. Reassemble secondary shaft. Ensure thrust needle bearings are installed with unrolled edge of bearing retainer facing washer. Before installing NEW "O" rings on secondary shaft, wrap splines on secondary shaft with tape to prevent damage to "O" rings.

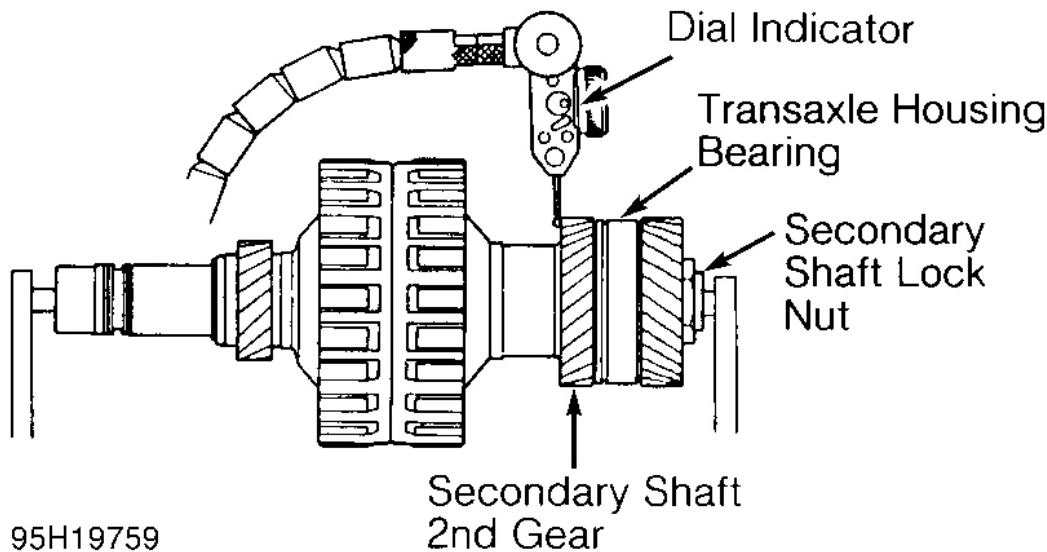


Fig. 21: Checking Secondary Shaft 2nd Gear Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

CLUTCH ASSEMBLIES

NOTE: The 1st-2nd and 3rd-4th clutch assemblies are equipped with 2 different styles of clutch pistons, if replacement is necessary, ensure proper type clutch is used. See Fig. 22 -Fig. 24 . Ensure spring compressor is making full contact with spring retainer or damage will occur.

Disassembly

1. Remove snap ring, clutch end plate, clutch discs and clutch plates. See Fig. 22 -Fig. 24 .
2. Note direction of disc spring installation. Remove disc spring. On all clutches, using spring compressor, compress return spring. Remove snap ring. Release and remove spring compressor. Remove spring retainer and return spring.
3. 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

Clean metal components with solvent and dry with compressed air. Ensure check valve on rear of clutch piston is thoroughly cleaned and securely fastened on clutch piston. Inspect components for damage and replace if necessary. Ensure no rough edges exist on "O" ring sealing areas.

Reassembly

1997 Honda Accord DX

1997 AUTOMATIC TRANSMISSIONS Honda AOYA, BOYA & MPJA Overhaul

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. On 1st-hold clutch, ensure return spring is installed in correct direction. See **Fig. 22** . On all clutches, install spring retainer in clutch drum. Place snap ring on spring retainer. Using spring compressor, compress return spring. Install snap ring. Release and remove spring compressor.
3. Install disc spring. Ensure disc spring is installed in proper direction. See **Fig. 22** and **Fig. 23** .

CAUTION: Ensure clutch discs are soaked 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. See **Fig. 24** . Install snap ring.
5. Using dial indicator, measure clutch clearance between clutch end plate and top clutch disc. See **Fig. 25** . 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. Ensure clutch clearance is within specification. See **CLUTCH CLEARANCE SPECIFICATIONS** table.
7. If clutch clearance is not within specification, install different thickness clutch end plate. See **CLUTCH END PLATE SPECIFICATIONS** table.

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

CLUTCH END PLATE SPECIFICATIONS

Plate No.	Part No. ⁽¹⁾	Thickness In. (mm)
1	22551-PX4-003	.083 (2.10)
2	22552-PX4-003	.087 (2.20)
3	22553-PX4-003	.091 (2.30)
4	22554-PX4-003	.094 (2.40)
5	22555-PX4-003	.098 (2.50)
6	22556-PX4-003	.102 (2.60)
7	22557-PX4-003	.106 (2.70)

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1997 AUTOMATIC TRANSMISSIONS Honda AOYA, BOYA & MPJA Overhaul

8	22558-PX4-003	.110 (2.80)
9	22559-PX4-003	.114 (2.90)

(1) On 1st-hold clutch the center portion of part number may be POX instead of PX4.

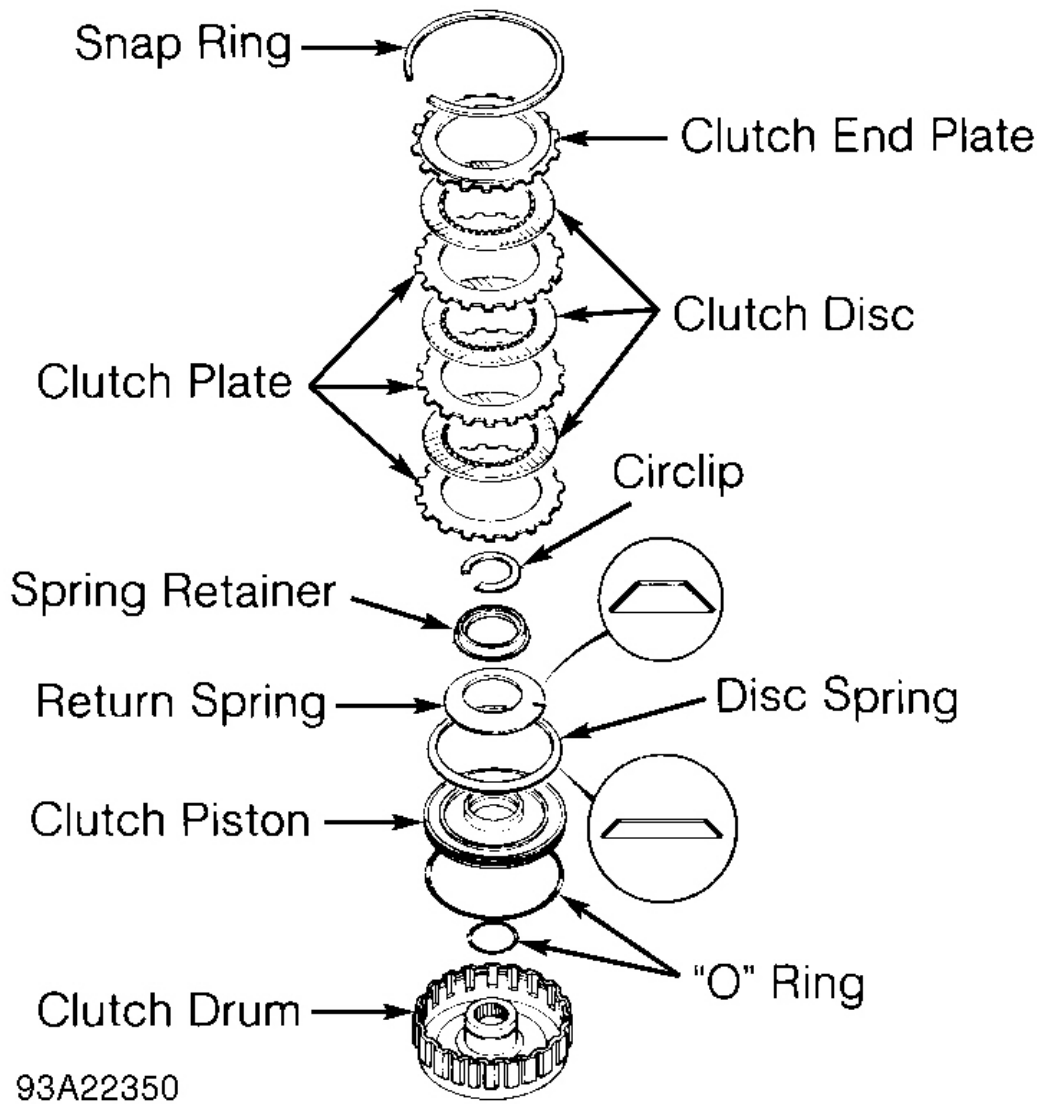
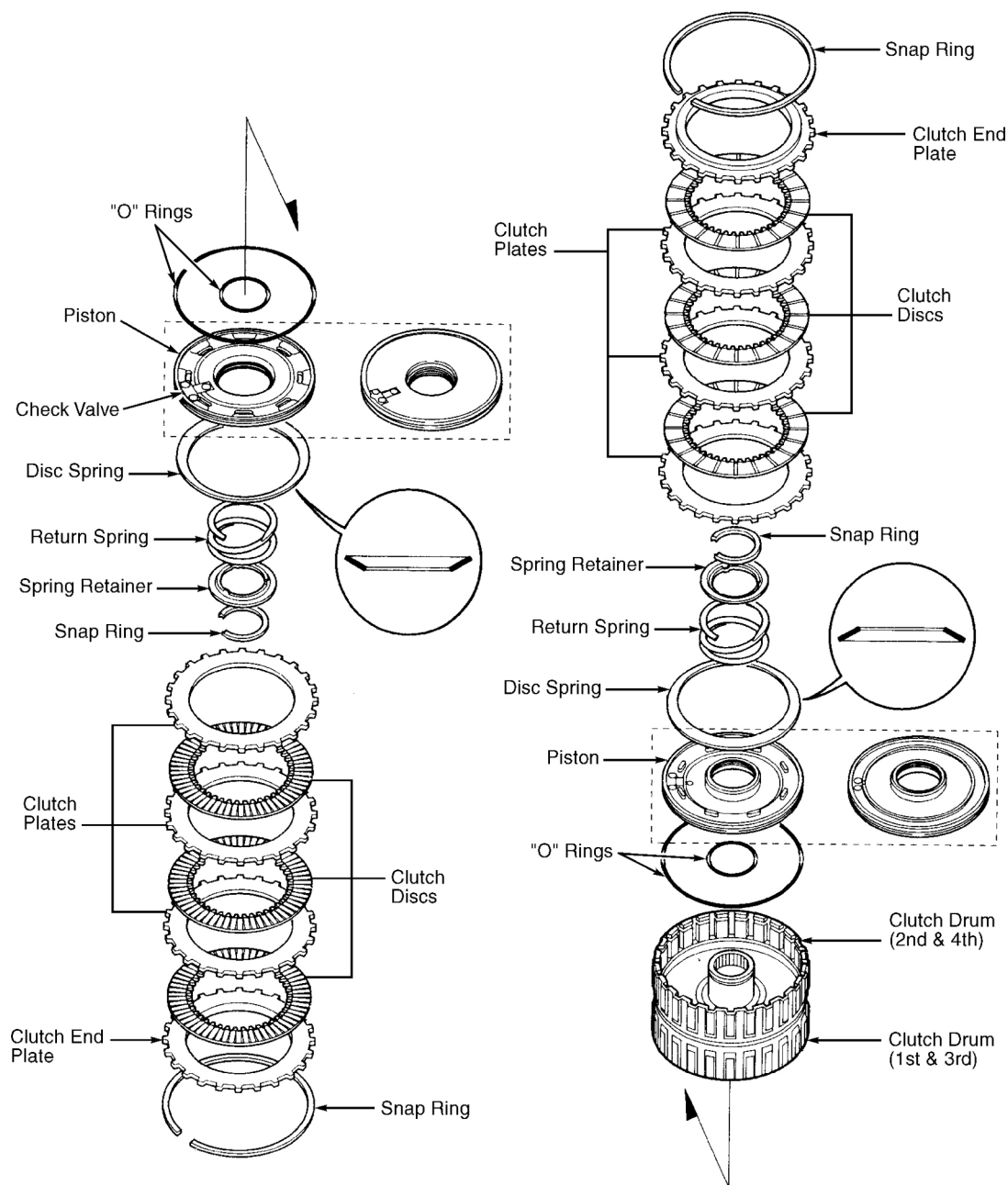


Fig. 22: Exploded View Of 1st-Hold Clutch

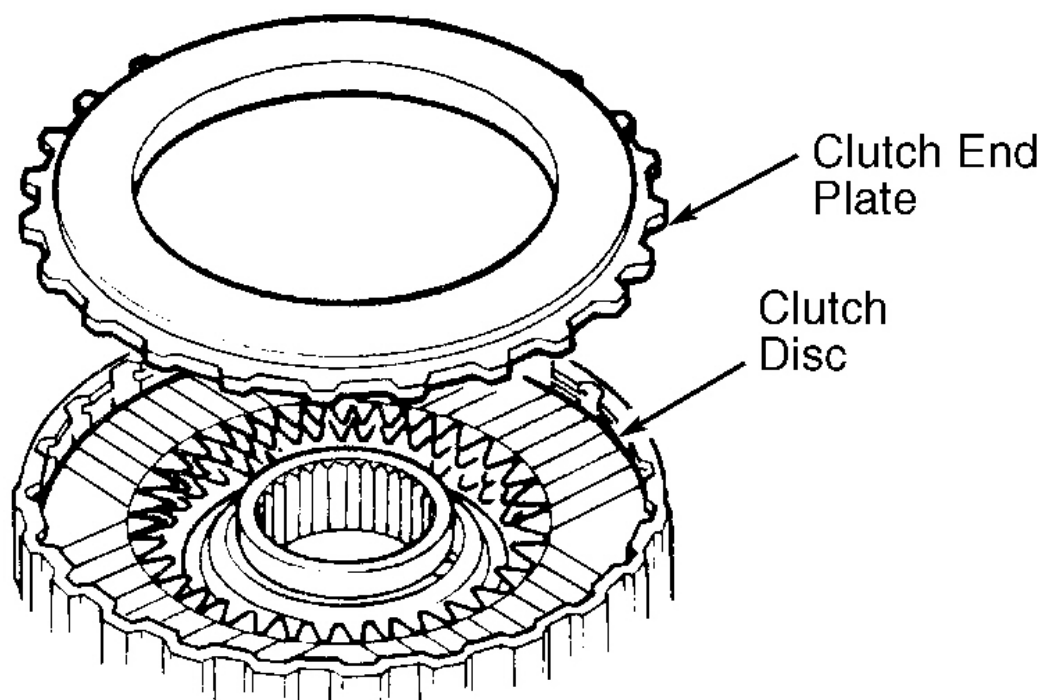
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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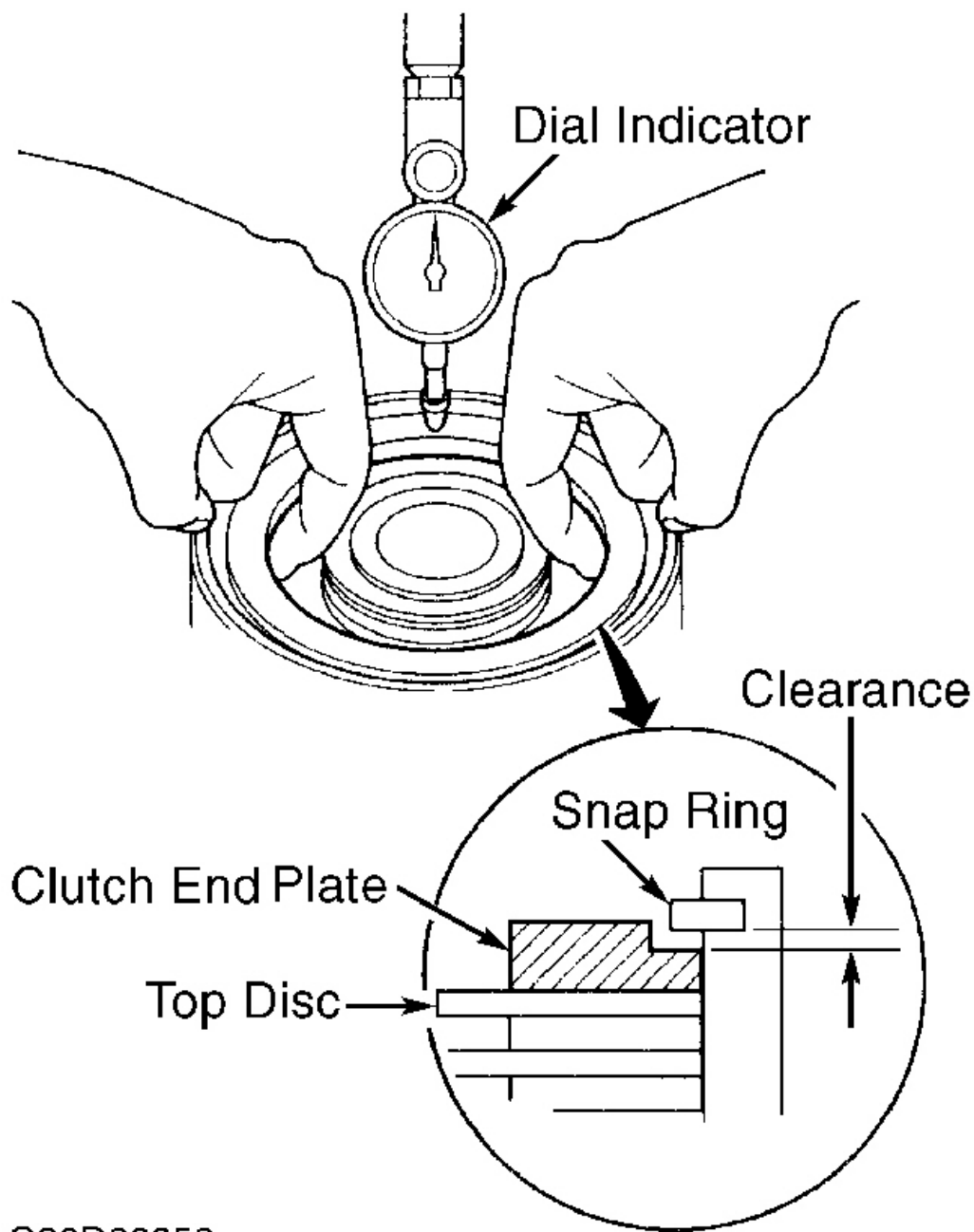
Fig. 23: Exploded View Of Clutches

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 24: Installing Clutch End Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 25: Measuring Clutch Clearance

Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE CONVERTER HOUSING

Disassembly

1. If removing countershaft bearing from torque converter housing, use slide hammer to remove countershaft bearing. Remove oil guide plate from bore in torque converter housing. See **Fig. 12** .

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

2. If removing secondary shaft bearing from torque converter housing, use heat gun to heat torque converter housing around secondary shaft bearing to 212°F (100°C). Tap secondary shaft bearing from torque converter housing. Remove oil guide plate from bore in torque converter housing. See **Fig. 12** .
3. Remove mainshaft bearing and oil seal using hammer and bearing driver. If removing bearing outer race for differential assembly from torque converter housing, use heat gun to heat torque converter housing around bearing outer race to 212°F (100°C).

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

4. Tap bearing outer race from torque converter housing. Using hammer and drift, tap differential oil seal from torque converter housing.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect torque converter housing for cracks and damage in bearing areas. Replace torque converter housing if damaged.

Reassembly

1. To install mainshaft bearing, use hammer and bearing installer. Install mainshaft bearing until mainshaft bearing fully bottoms in torque converter housing.
2. Using hammer and oil seal installer, install NEW oil seal for mainshaft in torque converter housing. Oil seal should be even with surface on torque converter housing.
3. To install countershaft bearing, install NEW oil guide plate in countershaft bearing bore of torque converter housing. Ensure oil guide plate is installed so tab in center of oil guide plate faces upward (away from torque converter housing surface). See **Fig. 12** .
4. Using hammer and bearing installer, drive countershaft bearing into torque converter housing. To install secondary shaft bearing, install NEW oil guide plate in secondary shaft bearing bore of torque converter housing.
5. Ensure oil guide plate is installed so tab in center of oil guide plate faces upward (away from torque converter housing surface). Ensure oil guide is installed to a depth of 0-.001" (0-.03 mm), zero being flush and .001" is past flush.
6. Using hammer and bearing installer, drive secondary shaft bearing into torque converter housing.
7. To install bearing outer race for differential assembly, use hammer and bearing race installer. Install bearing outer race until race is even with surface on torque converter housing.

CAUTION: DO NOT install thrust shim in torque converter housing below differential bearing outer race. Thrust shim must be installed in transaxle housing.

8. To install differential oil seal, using hammer and oil seal installer, install NEW oil seal in torque converter housing until oil seal is fully seated.

TRANSAXLE HOUSING

NOTE: DO NOT remove snap rings for bearing replacement unless necessary for cleaning snap ring groove. Expand snap ring enough to push bearing out.

Disassembly

1. Expand snap ring. Press transaxle housing bearings (for mainshaft, countershaft and secondary shaft) from transaxle housing. Using hammer and drift, tap differential oil seal from transaxle housing.

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

2. If removing bearing outer race for differential assembly, use heat gun to heat transaxle housing around bearing outer race to 212°F (100°C).
3. Tap bearing outer race from transaxle housing. Remove thrust shim, located below differential bearing outer race from transaxle housing.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect transaxle housing for cracks and damage in bearing areas. Replace transaxle housing if damaged.

NOTE: Ensure original thickness thrust shim is installed. If any components have been changed, differential assembly bearing preload must be checked. See DIFFERENTIAL ASSEMBLY BEARING PRELOAD under TRANSAXLE REASSEMBLY.

Reassembly

1. Install thrust shim in transaxle housing. Using hammer and bearing race installer, install bearing outer race until race is fully seated in transaxle housing.
2. To install transaxle housing bearing for mainshaft, countershaft and secondary shaft, expand snap ring and install bearing part way into transaxle housing. Release snap ring.
3. Press bearing into transaxle housing until snap ring engages with groove on bearing. Ensure snap ring end gap is 0-.276" (0-7 mm). If snap ring end gap is not within specification, reseal or replace snap ring.

CAUTION: Ensure transaxle housing bearings are installed with groove of

bearing facing inside of transaxle housing so snap ring engages in bearing when bearing is fully installed.

4. To install differential oil seal, use hammer and oil seal installer, install NEW oil seal into transaxle housing until oil seal is fully seated.

RIGHT SIDE COVER

Disassembly

Remove snap rings retaining clutch feedpipes in right side cover. Remove feedpipe guides, 4th clutch feedpipe, 1st-hold clutch feedpipe, 1st clutch feedpipe and "O" rings from right side cover. See **Fig. 6** .

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for cracks or damage. Replace components if necessary.

Reassembly

To reassemble, reverse disassembly procedure using NEW "O" rings. Ensure lugs on clutch feedpipes align with grooves in right side cover.

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. 26** . Check side gear backlash. Side gear backlash should be .002-.006". If side gear backlash is not within specification, replace differential carrier assembly.
3. If replacing bearings, use bearing puller to remove bearings from differential carrier. Remove bolts and ring gear.

NOTE: Ring gear bolts have left-hand threads.

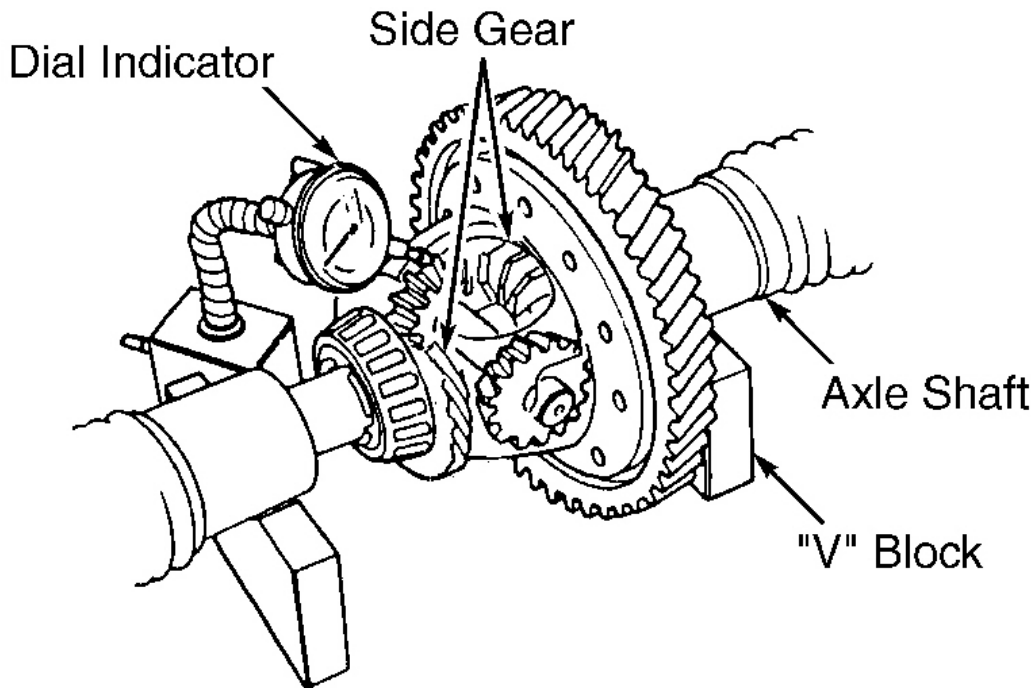
Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for wear and damage. Inspect differential bearings for rough rotation. Replace components if necessary.

CAUTION: Ring gear must be installed with chamfered edge on inside of ring gear toward differential carrier.

Reassembly

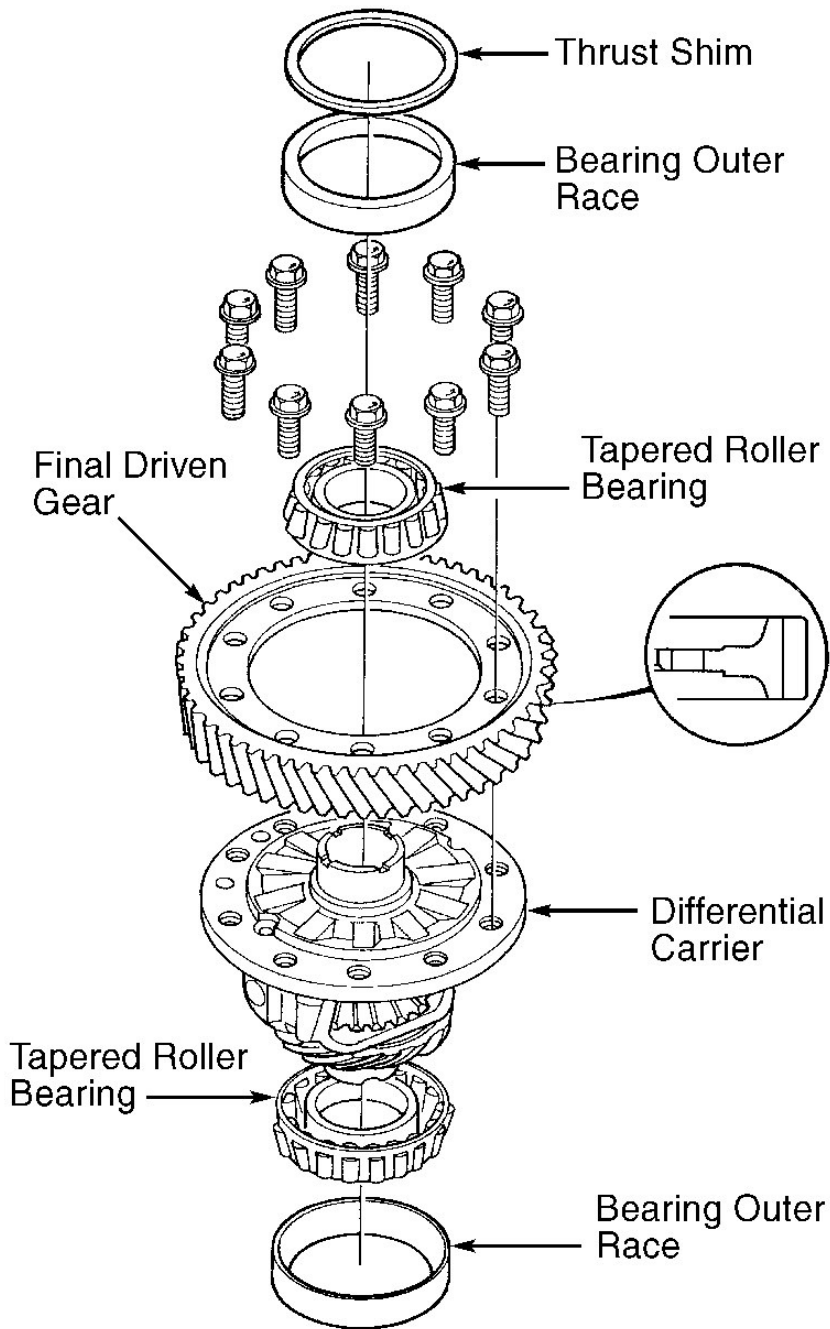
1. Install ring gear on differential carrier. Ensure chamfered edge on inside of ring gear is toward differential carrier.
2. Install and tighten ring gear retaining bolts in crisscross pattern to specification. See **TORQUE SPECIFICATIONS** table. See **Fig. 27** . Press NEW bearings on differential carrier (if removed). Bearing preload must be reset if bearings are replaced.



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Fig. 26: Checking Side Gear Backlash

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 27: Exploded View Of Differential Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE REASSEMBLY

DIFFERENTIAL ASSEMBLY BEARING PRELOAD

NOTE: If transaxle housing, torque converter housing, differential carrier, bearings, thrust shim 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 transaxle housing may be damaged.

1. Using heat gun, heat transaxle housing around bearing outer race for differential assembly to 212°F (100°C). Tap 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. Select thrust shim "I" with a thickness of .102" (2.60 mm). See **THRUST SHIM SPECIFICATIONS** table. DO NOT reuse original shim.

CAUTION: DO NOT use more than 2 thrust shims when adjusting differential assembly bearing preload.

THRUST SHIM SPECIFICATIONS

I.D. Letter	Part Number	Thickness In. (mm)
A	41441-PK4-000	.087 (2.20)
B	41442-PK4-000	.089 (2.25)
C	41443-PK4-000	.091 (2.30)
D	41444-PK4-000	.093 (2.35)
E	41445-PK4-000	.094 (2.40)
F	41446-PK4-000	.096 (2.45)
G	41447-PK4-000	.098 (2.50)
H	41448-PK4-000	.100 (2.55)
I ⁽¹⁾	41449-PK4-000	.102 (2.60)
J	41450-PK4-000	.104 (2.65)
K	41451-PK4-000	.106 (2.70)
L	41452-PK4-000	.108 (2.75)
M	41453-PK4-000	.110 (2.80)
N	41454-PK4-000	.112 (2.85)
O	41455-PK4-000	.114 (2.90)
P	41456-PK4-000	.116 (2.95)
O	41457-PK4-000	.118 (3.00)
R	41458-PK4-000	.120 (3.05)
(1) This is the standard thrust shim.		

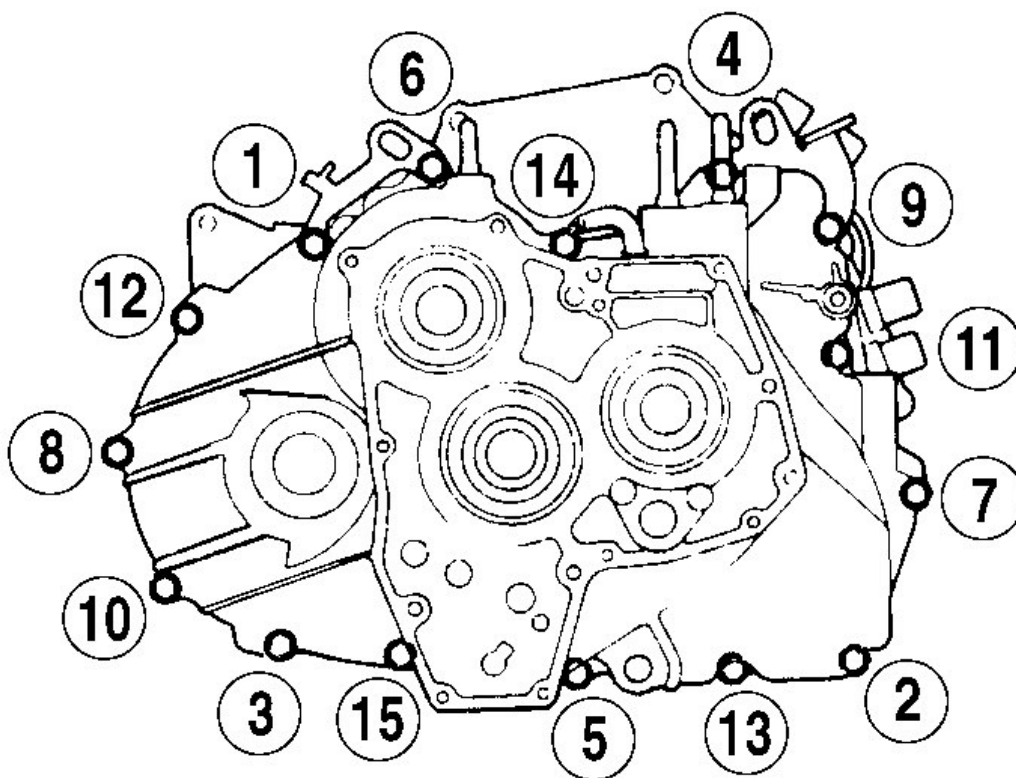
3. Install thrust shim in transaxle housing. Using hammer and bearing race installer, install bearing outer

race until race is fully seated in transaxle housing.

4. 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.

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

5. Install and tighten transaxle housing bolts to 40 ft. lbs. (54 N.m) in sequence. See **Fig. 28** . Rotate differential assembly several revolutions to seat bearings.



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Fig. 28: Transaxle Housing Bolt Tightening Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install Preload Adapter (07HAJ-PK40201) into differential assembly. See **Fig. 29** . 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.

7. Ensure differential assembly bearing preload is within specification. See **DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS** table.

DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS

Application	(1) INCH Lbs. (N.m)
New Bearings	24-35 (2.8-4.0)
Used Bearings	22-32 (2.5-3.7)
(1) This is the starting torque required to rotate differential assembly.	

8. If differential assembly bearing preload is not within specification, select proper thickness thrust shim to obtain correct reading. See **THRUST SHIM SPECIFICATIONS** table.
9. Changing thrust shim by one size will increase or decrease differential assembly bearing preload about 2.60-3.50 INCH lbs. (.3-.4 N.m). Increase thrust shim thickness to increase differential assembly bearing preload. Decrease thrust shim thickness to decrease differential assembly bearing preload.

CAUTION: DO NOT use more than 2 thrust shims when adjusting differential assembly bearing preload.

10. 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 bearing outer race in transaxle housing.
11. Recheck differential assembly bearing preload. Once correct differential assembly bearing preload is obtained, remove transaxle housing, gasket and differential assembly from torque converter housing.

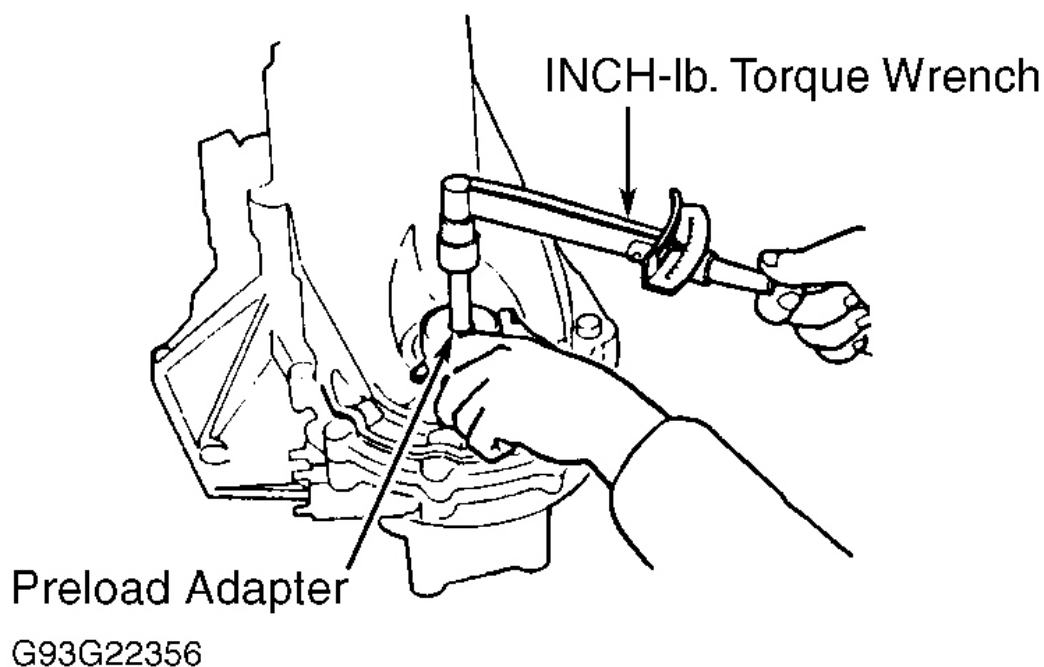


Fig. 29: Checking Differential Bearing Preload
Courtesy of AMERICAN HONDA MOTOR CO., INC.

VALVE BODIES & INTERNAL COMPONENTS

NOTE: If transaxle housing, torque converter housing, differential carrier, bearings, thrust shim or bearing outer races for differential assembly are replaced, differential assembly bearing preload must be checked. See DIFFERENTIAL ASSEMBLY BEARING PRELOAD under TRANSAXLE REASSEMBLY.

NOTE: Coat all components with ATF before reassembly.

1. Install main separator plate and 3 dowel pins on torque converter housing. Install oil pump drive gear, oil pump driven gear and oil pump driven gear shaft.

CAUTION: Ensure oil pump driven gear is installed with grooved and chamfered side facing downward, toward main separator plate. Ensure oil pump tolerances are within specification. See OIL PUMP under COMPONENT DISASSEMBLY & REASSEMBLY.

2. Install main valve body. Loosely install all main valve body bolts. Once all bolts are installed, tighten main valve body bolts to specification. See TORQUE SPECIFICATIONS.

CAUTION: Ensure oil pump gears rotate smoothly and oil pump driven gear shaft moves freely once main valve body is installed. If components do not operate correctly, loosen main valve body bolts and realign oil pump gears and oil pump driven gear shaft. Failure to align oil pump driven gear shaft may result in seized oil pump gears or shaft.

3. Ensure filter and check balls are installed in main valve body. See **Fig. 13** . Install stator shaft, NEW "O" ring and stop shaft. Install dowel pins, spring and torque converter check valve in main valve body.
4. Install regulator valve body and retaining bolt on main valve body. Ensure filter is installed on regulator valve body. See **Fig. 12** . Install dowel pins and throttle separator plate on regulator valve body.
5. Install secondary separator plate and dowel pins on main valve body. Install control shaft on torque converter housing. Ensure control shaft engages with manual valve on main valve body.
6. Install detent arm and detent arm shaft on main valve body. Install detent spring and hook on detent arm and control shaft.
7. Install secondary valve body on secondary separator plate. Ensure check balls are installed in secondary valve body. See **Fig. 15** .
8. Install servo separator plate and servo body on secondary valve body. Install and tighten servo body bolts to specification.
9. Install oil feedpipe and 4th accumulator cover on servo body. Install and tighten 4th accumulator cover bolts to specification.
10. Install fluid strainer. Install and tighten fluid strainer bolts to specification. Install servo detent base. Install and tighten bolts to specification.
11. Install 1st-2nd accumulator body. Install and tighten bolts to specification. Ensure steel check ball is located in 1st-2nd accumulator body. See **Fig. 19** . Install accumulator body cover. Install and tighten bolts to specification.
12. Install oil feedpipes in main valve and servo body. Install differential assembly, mainshaft, secondary shaft and countershaft in torque converter housing.
13. Install splined washer, thrust needle bearing and needle bearings on secondary shaft. See **Fig. 11** .
14. Install needle bearing, countershaft 4th gear, reverse selector hub, reverse selector with shift fork on countershaft. Ensure reverse selector is installed with flanged side of reverse selector facing upward (away from torque converter housing).
15. Install needle bearing on reverse selector hub. Rotate shift fork shaft on servo body so large chamfered hole aligns with hole in shift fork. Install shift fork bolt and NEW lock washer. Tighten bolt to specification. Bend over tabs on bolt lock.
16. Install secondary shaft 2nd gear, thrust needle bearing and thrust washer on secondary shaft. Install countershaft reverse gear and countershaft 2nd gear on countershaft.
17. Install reverse idler gear in transaxle case. Install NEW gasket and dowel pins on torque converter housing. Align spring pin with groove in transaxle housing by rotating control shaft. See **Fig. 10** .
18. Install transaxle housing with transmission hanger, throttle control cable bracket and harness bracket on torque converter housing. Install and tighten bolts to specification in sequence using several steps. See **Fig. 28** . Engage reverse idler gear with countershaft reverse gear.
19. Install NEW "O" rings on shaft for reverse idler gear shaft holder. See **Fig. 8** . Coat shaft, needle bearing and NEW "O" rings with grease.

20. Install shaft in reverse idler gear shaft holder. Ensure flat area on shaft engages with flat area on reverse idler gear shaft holder. Install reverse idler gear shaft holder with needle bearing on transaxle housing. Install and tighten bolts to specification.
21. Install parking brake lever spring and parking brake lever on control shaft. See **Fig. 6** . Install bolt and NEW bolt lock on parking brake lever. DO NOT tighten bolt at this time.
22. Install Mainshaft Holder (07GAB-PF50100 or 07GAB-PF50101) on mainshaft to secure mainshaft from rotating. See **Fig. 7** . Install mainshaft idler gear on mainshaft. Install old mainshaft lock nut on mainshaft. Mainshaft has left-hand threads.
23. Tighten mainshaft lock nut to 166 ft. lbs. (230 N.m) to seat mainshaft idler gear on mainshaft. DO NOT use hammer to install mainshaft idler gear on mainshaft or impact wrench to tighten lock nut.
24. Install secondary shaft idler gear on secondary shaft. Install thrust washer, thrust needle bearing, needle bearing, countershaft idler gear and parking gear on countershaft. See **Fig. 6** .
25. Install old secondary shaft lock nut on secondary shaft. Tighten secondary shaft lock nut to 166 ft. lbs. (230 N.m) while holding countershaft idler gear to seat secondary shaft idler gear on secondary shaft. DO NOT use hammer to install secondary shaft idler gear on secondary shaft or impact wrench to tighten lock nut.
26. Place 24-mm socket at center of parking gear. Install a 10 x 1.25-mm bolt in end of countershaft. Install parking pawl shaft, parking pawl stopper, parking pawl spring and parking pawl. Engage parking pawl with parking gear.
27. Tighten bolt to pull parking gear onto countershaft. DO NOT use hammer to install parking gear on countershaft. Remove bolt and socket.
28. Install old countershaft lock nut on countershaft. Tighten countershaft lock nut to 166 ft. lbs. (230 N.m) to seat parking gear on countershaft. DO NOT use impact wrench to tighten lock nut.
29. Remove lock nuts from mainshaft, countershaft and secondary shaft. Install NEW spring washers and NEW lock nuts on mainshaft, countershaft and secondary shaft. Ensure spring washers are installed so large area of spring washer is against lock nut. See **Fig. 6** .
30. Tighten all lock nuts to specification. See **TORQUE SPECIFICATIONS** . DO NOT use impact wrench to tighten lock nuts. Stake lock nuts against shaft. Remove mainshaft holder.

CAUTION: Ensure all lock nuts are securely staked against the shaft.

31. 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. 30** .
32. 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.
33. 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)

1997 Honda Accord DX

1997 AUTOMATIC TRANSMISSIONS Honda AOYA, BOYA & MPJA Overhaul

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. 30** .

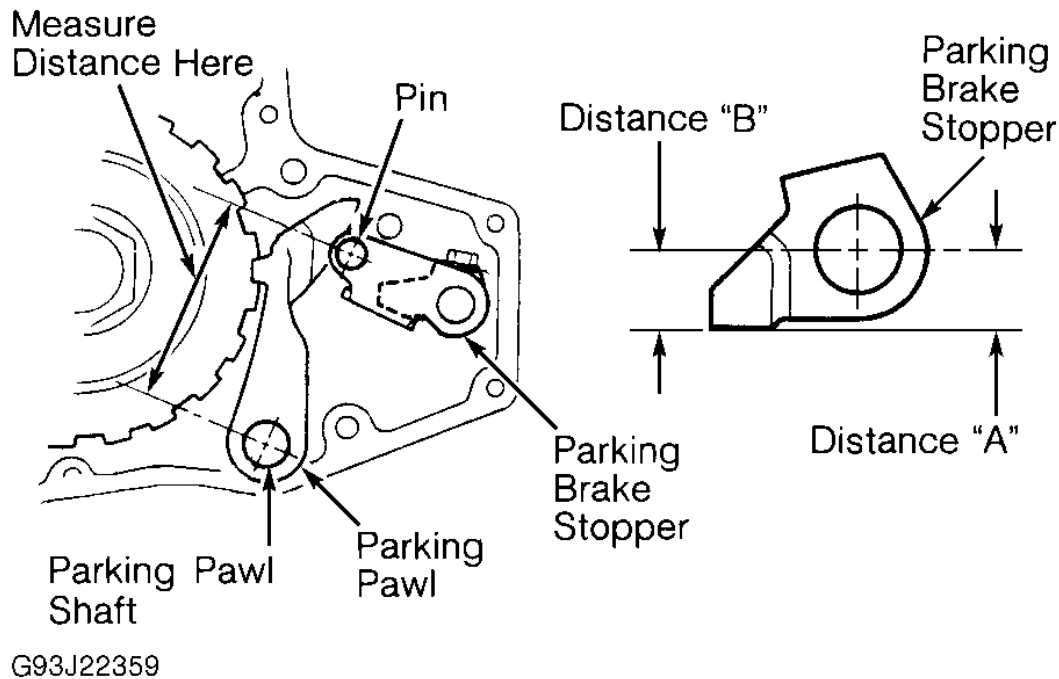


Fig. 30: Measuring Parking Brake Stop Distance & Parking Brake Stop
Courtesy of AMERICAN HONDA MOTOR CO., INC.

34. Tighten parking brake lever bolt to specification. Bend over tabs on bolt lock. Using NEW gasket, install right side cover. Install and tighten bolts to specification.
35. To install remaining components, reverse removal procedure. Use NEW seal washers when installing joint bolts for ATF cooler pipes. Tighten all fasteners to specification.

CAUTION: If transaxle failure existed, flush oil cooler. See **OIL COOLER FLUSHING** under ON-VEHICLE SERVICE.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
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1997 Honda Accord DX

1997 AUTOMATIC TRANSMISSIONS Honda AOYA, BOYA & MPJA Overhaul

Countershaft Lock Nut	123 (167)
Joint Bolt	21 (29)
Mainshaft Lock Nut	123 (167)
Main Valve Body Bolt	
6 mm Bolt	(1)
8 mm Bolt	13 (18)
Pressure Tap Plug	13 (18)
Ring Gear Bolt	74 (100)
Secondary Shaft Lock Nut	123 (167)
Speed Sensor Assembly Bolt	13 (18)
Transaxle Housing Bolt ⁽²⁾	40 (54)
INCH Lbs. (N.m)	
Accumulator Body Cover Bolt	106 (12.0)
Accumulator Cover Bolt	106 (12.0)
Fluid Strainer Bolt	106 (12.0)
Lock-Up Control Solenoid Valve Assembly Bolt	106 (12.0)
Parking Brake Lever Bolt	124 (14.0)
Regulator Valve Body Bolt	106 (12.0)
Reverse Idler Gear Shaft Holder Bolt	106 (12.0)
Right Side Cover Bolt	106 (12.0)
Servo Detent Base Bolt	106 (12.0)
Servo Body Bolt	106 (12.0)
Shift Control Solenoid Valve Assembly Bolt	106 (12.0)
Shift Fork Bolt	124 (14.0)
Stop Bolt	106 (12.0)
Throttle Cam Stop Bolt	71 (8.0)
Throttle Valve Body Bolt	106 (12.0)
1st-2nd Accumulator Body Bolt	106 (12.0)
(1) Tighten bolt to 106 INCH lbs. (12.0 N.m).	
(2) Tighten bolts to specification in sequence. See Fig. 28 .	

TRANSAXLE SPECIFICATIONS

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⁾	

1997 Honda Accord DX

1997 AUTOMATIC TRANSMISSIONS Honda AOYA, BOYA & MPJA Overhaul

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.	