

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

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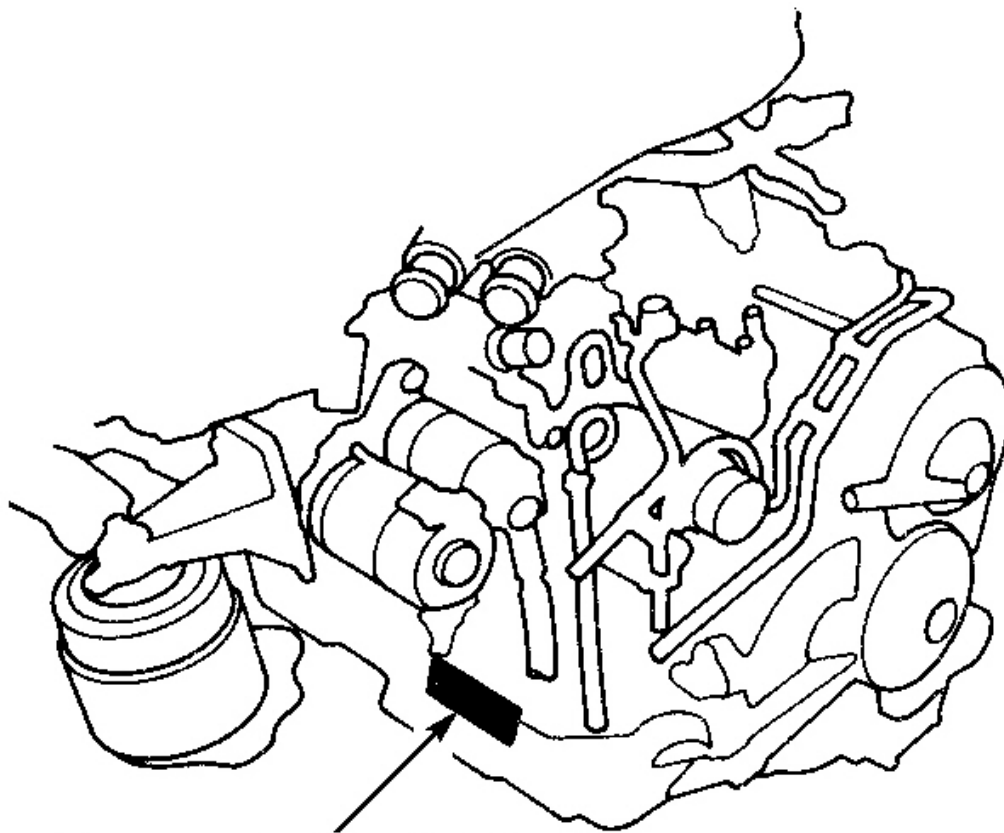
APPLICATION

TRANSAXLE APPLICATION

Vehicle	Transaxle Model
Acura	
1997 3.0CL	M7ZA
1998-1999 3.0CL	B7ZA
Honda	
1998-1999 Accord (3.0L V6)	B7XA

IDENTIFICATION

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



Transaxle Model &
Serial Number

G96C30652

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

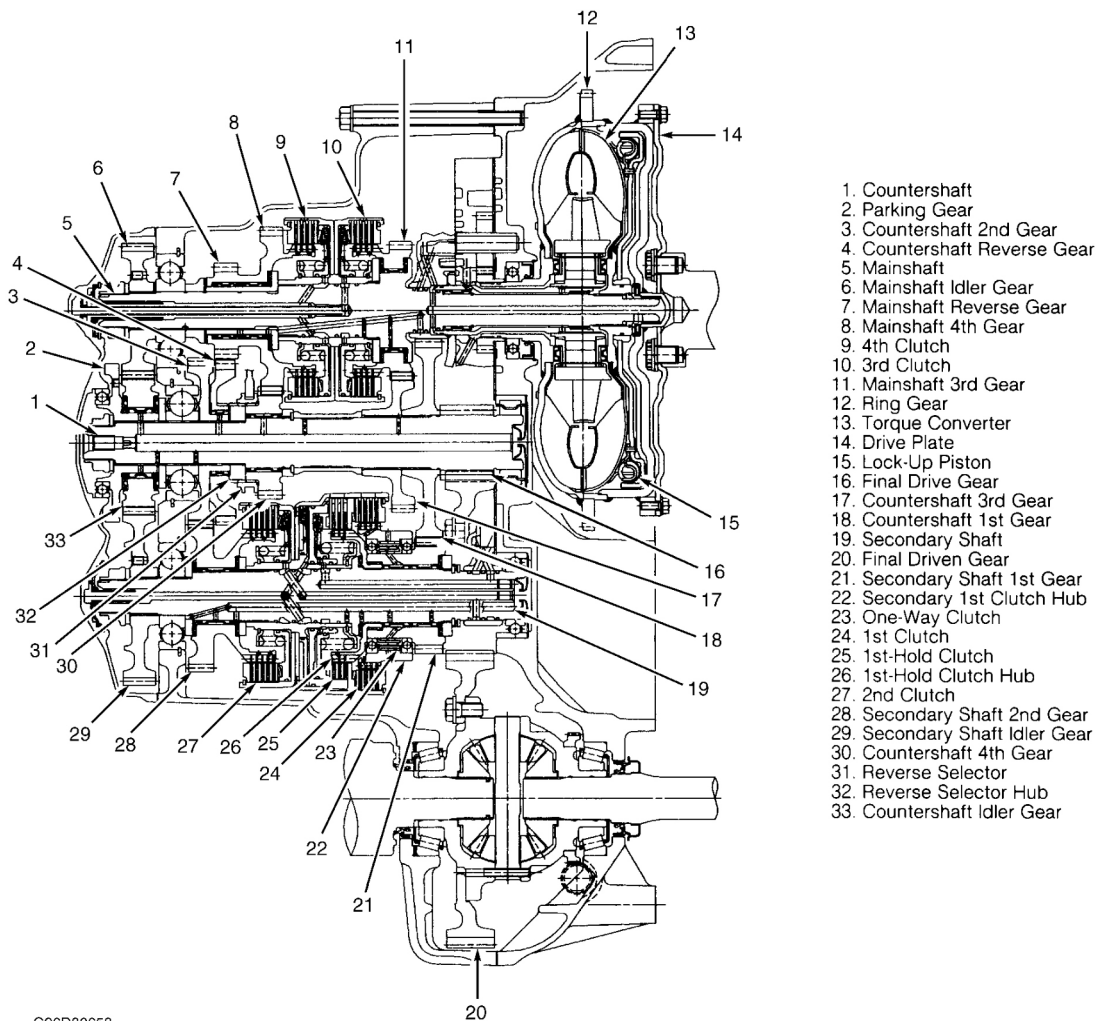
DESCRIPTION

Automatic transaxle is electronically controlled with 4 forward speeds and one reverse speed. Transaxle consists of clutches, mainshaft, countershaft, secondary shaft and a 3-element lock-up torque converter. See **Fig. 2** . Electronic control is provided by the Transmission Control Module (TCM) on 1997 models and by Powertrain Control Module (PCM) on 1998-99 models. PCM or TCM determines appropriate shift point from data provided from sensors and activates appropriate solenoid valve.

NOTE: **References in this article refer to appropriate ELECTRONIC CONTROLS article.**

For 1998-99 models equipped with a PCM, see 1998-99 ACURA B7ZA & HONDA B7XA ELECTRONIC CONTROLS article. For 1997 models equipped with a TCM, see ACURA M7ZA ELECTRONIC CONTROLS article.

Valve bodies include; main valve body, regulator valve body, servo body and accumulator valve body. Main valve body assembly consists of manual valve, shift valve "C", shift valve "D", shift valve "E", servo control valve, modulator valve, torque converter check valve, reverse CPC valve, cooler relief valve, lock-up shift valve, cooler check valve and ATF pump gears. Regulator valve body consists of regulator valve, lock-up timing valve and lock-up control valve. Servo body consists of servo valve, shift valve "A", shift valve "B", CPC valves "A" and "B", 3rd and 4th accumulators. Accumulator valve body consists of 1st and 2nd accumulator pistons and lubrication check valve.



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

G96D30653

Fig. 2: Cut-Away View Of 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. When certain transaxle gear combinations are engaged by clutches, power is transmitted from mainshaft to the countershaft and through the secondary shaft to provide different gears. Shift lever positions operate as follows:

- **"P" (Park)**

Front wheels are locked as parking pawl engages with parking gear on countershaft. All clutches are released.

- **"R" (Reverse)**

Reverse selector engages with countershaft reverse gear and 4th gear clutch is applied.

- **"N" (Neutral)**

All clutches are released.

- **"D4" (Drive/4th)**

Transaxle starts in 1st gear and upshifts automatically to 2nd, 3rd and 4th gears. Transaxle will downshift through 3rd, 2nd and 1st gears until vehicle stops. When in 3rd or 4th gear, TCM or PCM sends signal to operate torque converter lock-up.

- **"D3" (Drive/3rd)**

Transaxle starts off in 1st gear and upshifts automatically to 2nd gear and 3rd gear. On deceleration, transaxle will downshift through 2nd gear to 1st gear. When in 3rd gear, 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 "D3" position in 3rd gear, or "D4" position in 3rd or 4th gear, torque converter lock-up is present 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 TCM or PCM. The TCM or PCM receives various input signals and operates lock-up control solenoid valves. Operation of lock-up control solenoid valves controls modulator pressure.

The TCM or PCM contains a grade logic control system which controls transaxle shifting while vehicle is ascending or descending on a slope or when reducing vehicle speed. For more information on grade logic control system, see appropriate ELECTRONIC CONTROLS article.

The TCM contains a self-diagnostic system, which will store a Diagnostic Trouble Code (DTC) if a failure is present in the transaxle electronic control system. The DTC can be retrieved to determine transaxle problem area. For information on electronic transaxle components, see appropriate 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 ACURA/HONDA SHIFT INTERLOCK SYSTEMS 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 appropriate ELECTRONIC CONTROLS article.

NOTE: **References in this article refer to appropriate ELECTRONIC CONTROLS article. For 1998-99 models equipped with a PCM, see 1998-99 ACURA B7ZA & HONDA B7XA ELECTRONIC CONTROLS article. For 1997 models equipped with a TCM, see ACURA M7ZA ELECTRONIC CONTROLS article.**

LUBRICATION & ADJUSTMENTS

See appropriate SERVICING article.

ON-VEHICLE SERVICE

AXLE SHAFTS

See appropriate AXLE SHAFTS article in DRIVELINE/AXLES.

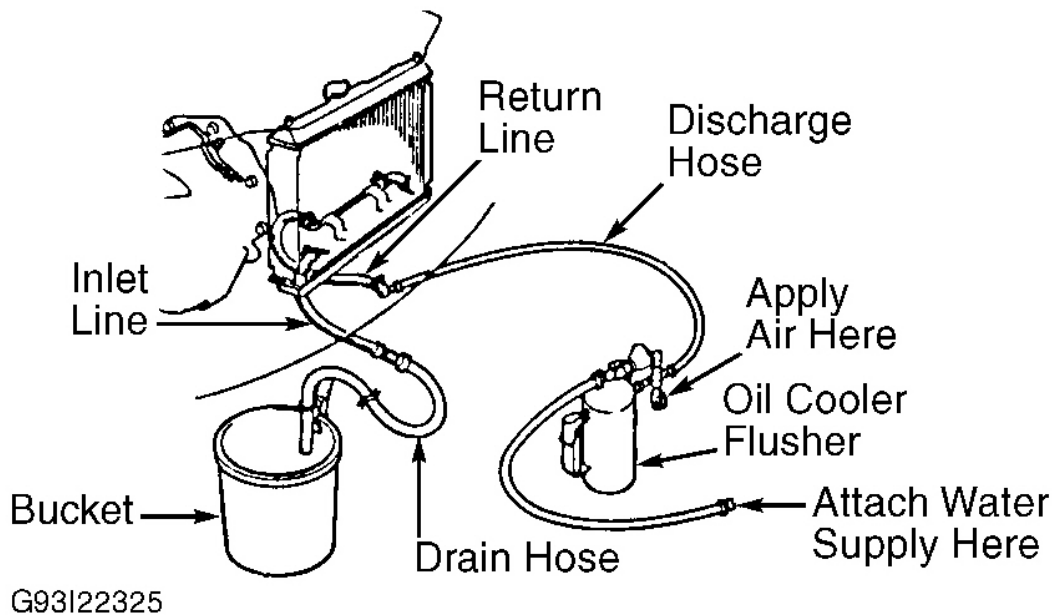
OIL COOLER FLUSHING

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. Shut water valve off. Replace oil cooler if water will not flow through oil cooler.
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 and 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 is present 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 Honda 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 (Typical)**

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 is still present, see **TESTING**.

SYMPTOM DIAGNOSIS

NOTE: Check all items listed for applicable symptom. If component listed is electrical or electronically controlled component, see appropriate **ELECTRONIC CONTROLS** article.

Engine Runs, But Vehicle Does Not Move In Any Gear Position

- Low ATF
- Shift Cable Broken/Out Of Adjustment
- Oil Pump Worn Or Binding
- Regulator Valve Stuck Or Spring Worn
- Oil Filter Clogged
- Mainshaft Worn/Damaged
- Final Gears Worn/Damaged

Vehicle Moves In "R" & "2", But Not In "D4", "D3" Or "1" Position

- 1st Accumulator Defective
- 1st Gears Worn/Damaged
- 1st Clutch Defective

Vehicle Moves In "D4", "D3", "1" & "R", But Not In "2" Position

- Shift Control Solenoid Valve "A" Defective
- Shift Valve "A" Defective
- 2nd Accumulator Defective
- 2nd Gears Worn/Damaged
- 2nd Clutch Defective

Vehicle Moves In "D4", "D3", "2" & "1", But Not In "R" Position

- Shift Fork Shaft Stuck
- Modulator Valve Defective
- Reverse CPC Valve Defective
- 4th Accumulator Defective
- 4th Clutch Defective
- Reverse Gears Worn/Damaged

Poor Acceleration & Flares On Starting Off In "D4" & "D3" Position

See **TORQUE CONVERTER STALL SPEED TEST** under TESTING.

Engine Idle Vibration

- Low ATF
- Lock-Up Control Solenoid Valve Defective
- Drive Plate Defective Or Transaxle Misassembly
- Engine Output Low

- Lock-Up Clutch Piston Defective
- Binding Oil Pump
- Lock-Up Shift Valve Defective
- Restricted Cooler

Vehicle Moves In "N" Position

- ATF Overfilled
- Foreign Material In Separator Plate Orifice
- 1st Clutch Defective
- 2nd Clutch Defective
- 3rd Clutch Defective
- 4th Clutch Defective
- Clutch Clearance Incorrect
- Needle Bearing Worn/Damaged
- Thrust Washer Worn/Damaged

Late Shift From "N" To "D3" & "D4"

- Shift Control Solenoid Valve "C" Defective
- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- Shift Cable Broken/Out Of Adjustment
- Shift Fork Shaft Stuck
- CPC Valve "A" Defective
- Foreign Material In Separator Plate Orifice
- Shift Valve "C" Defective
- Servo Control Valve Defective
- 1st Accumulator Defective
- 1st Clutch Ball Stuck
- 1st Clutch Defective

Late Shift From "N" To "R"

- Shift Control Solenoid Valve "C" Defective
- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- Shift Cable Broken/Out Of Adjustment
- Shift Fork Shaft Stuck
- CPC Valve "A" Defective
- Foreign Material In Separator Plate Orifice
- Reverse CPC Valve Defective

- 4th Accumulator Defective
- 4th Clutch Defective

No Shift

- Modulator Valve Defective

Erratic Performance, No Upshift To 4th When In "D4"

- Shift Control Solenoid Valve "A" Defective
- Mainshaft Speed Sensor Defective
- Countershaft Speed Sensor Defective
- Shift Valve "A" Defective
- Shift Valve "D" Defective

Erratic Performance, No Upshift To 3rd Or 4th When In "D3" Or "D4"

- Shift Control Solenoid Valve "B" Defective
- Shift Fork Shaft Stuck
- Shift Valve "B" Defective
- Servo Control Valve Defective

Erratic Performance, Starts Of In 3rd When In "D3", "D4" Or "1"

- Shift Control Solenoid Valve "B" Defective
- Shift Valve "B" Defective
- Shift Valve "E" Defective

Excessive Shock Or Flare In All Shift Lever Positions

- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- CPC Valve "A" Defective
- CPC Valve "B" Defective
- Foreign Material In Separator Plate Orifice

Excessive Shock Or Flare During 1-2 Or 2-1 Shift

- Shift Control Solenoid Valve "C" Defective
- 2nd Clutch Pressure Switch Defective
- Foreign Material In Separator Plate Orifice
- Shift Valve "C" Defective
- 1st Accumulator Defective
- 2nd Accumulator Defective

- 1st Check Ball Stuck
- 2nd Check Ball Stuck
- 1st Clutch Defective
- 2nd Clutch Defective

Excessive Shock Or Flare During 2-3 Or 3-2 Shift

- Shift Control Solenoid Valve "C" Defective
- 3rd Clutch Pressure Switch Defective
- Foreign Material In Separator Plate Orifice
- Shift Valve "C" Defective
- 2nd Accumulator Defective
- 3rd Accumulator Defective
- 2nd Check Ball Stuck
- 2nd Clutch Defective
- 3rd Clutch Defective

Excessive Shock Or Flare During 3-4 Or 4-3 Shift

- Shift Control Solenoid Valve "C" Defective
- Foreign Material In Separator Plate Orifice
- Shift Valve "C" Defective
- 3rd Accumulator Defective
- 4th Accumulator Defective
- 3rd Clutch Defective
- 4th Clutch Defective

Noise From Transaxle In All Gears

- Oil Pump Worn Or Binding
- Torque Converter Housing Or Transaxle Housing Ball Bearing Worn/Damaged

Vehicle Does Not Accelerate To More Than 31 MPH

- Torque Converter One-Way Clutch Defective

Excessive Vibration (All Engine Speeds)

- Drive Plate Defective Or Transaxle Misassembly

Shift Lever Does Not Operate Smoothly

- A/T Gear Position Switch Defective Or Out Of Adjustment

- Shift Cable Broken/Out Of Adjustment
- Joint In Shift Cable & Transmission Or Body Worn

Shift Lever Does Not Shift Into "P"

- Shift Cable Broken/Out Of Adjustment
- Joint In Shift Cable & Transmission Or Body Worn
- Park Mechanism Defective

Lock-Up Clutch Does Not Disengage

- Lock-Up Control Solenoid Valve Defective
- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- Lock-Up Clutch Piston Defective
- Lock-Up Shift Valve Defective
- Lock-Up Control Valve Defective
- Lock-Up Timing Valve Defective
- Restricted Cooler

Lock-Up Clutch Does Not Operate Smoothly

- Lock-Up Control Solenoid Valve Defective
- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- Lock-Up Clutch Piston Defective
- Torque Converter Check Valve Defective
- Lock-Up Shift Valve Defective
- Lock-Up Control Valve Defective
- Lock-Up Timing Valve Defective

Lock-Up Clutch Does Not Engage

- Lock-Up Control Solenoid Valve Defective
- A/T Clutch Pressure Control Solenoid Valves "A" Or "B" Assembly Defective
- Mainshaft Speed Sensor Defective
- Countershaft Speed Sensor Defective
- Lock-Up Clutch Piston Defective
- Torque Converter Check Valve Defective
- Lock-Up Shift Valve Defective
- Lock-Up Control Valve Defective

TESTING

CAUTION: Vehicle is equipped with a Supplemental Restraint System (SRS). All wires have Yellow insulation and are located underdash or in instrument panel area. To avoid injury from accidental deployment, read and carefully follow all **SERVICE PRECAUTIONS** and **DISABLING & ACTIVATING AIR BAG SYSTEM** procedures in **AIR BAG DEACTIVATION PROCEDURES** article in **GENERAL INFORMATION**.

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**.

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 appropriate **SHIFT INTERLOCK SYSTEMS** 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. Manufacturer recommends monitoring of Throttle Position (TP) sensor voltage when performing road test. This ensures proper throttle opening for verifying shift points and lock-up of torque converter.
3. Install scan tool, and select data sheet for monitoring TP voltage. Road test vehicle on a flat road in "D4" position. Monitor TP sensor voltage and ensure shift points occur at specified speeds. See appropriate tables under **TRANSAXLE UPSHIFT SPECIFICATIONS** and **TRANSAXLE DOWNSHIFT SPECIFICATIONS**. Check for abnormal transaxle noise and clutch slippage. See **CLUTCH APPLICATION** table.
4. 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.
5. 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.
6. 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.
7. Place shift lever in "R" position. Accelerate from a stop at full throttle. Check for abnormal noise or clutch slippage.
8. 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 pawl components.

CLUTCH APPLICATION

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

Shift Lever Position	Elements In Use
"P" & "N"	No Clutches Are Applied
"R"	4th Clutch
"D4"	
1st Gear	1st Clutch
2nd Gear	2nd Clutch
3rd Gear	3rd Clutch
4th Gear	4th Clutch
"D3"	
1st Gear	1st Clutch
2nd Gear	2nd Clutch
3rd Gear	3rd Clutch
"2"	2nd Clutch
"1"	1st Clutch

TRANSAXLE UPSHIFT SPECIFICATIONS**UPSHIFT SPECIFICATIONS IN MPH (1998-99 ACCORD - B7XA)**

Application (D4 Position)	1st-2nd	2nd-3rd	3rd-4th	Lock-Up Clutch On
Throttle Position Sensor Voltage .7 Volt	9-10	21-23	30-34	45-48
Throttle Position Sensor Voltage 2.25 Volts	24-27	45-48	65-68	77-81
Full Throttle, Throttle Position Sensor Voltage 4.5 Volts	35-39	65-68	98-101	99-103

UPSHIFT SPECIFICATIONS IN MPH (1997 3.0CL - M7ZA)

Application (D4 Position)	1st-2nd	2nd-3rd	3rd-4th	Lock-Up Clutch On
Throttle Position Sensor Voltage .7 Volt	9-11	17-20	27-30	17-20
Throttle Position Sensor Voltage 2.25	23-25	43-47	66-70	73-76
Full Throttle	34-38	63-67	96-99	97-101

UPSHIFT SPECIFICATIONS IN MPH (1998-99 3.0CL - B7ZA)

Application (D4 Position)	1st-2nd	2nd-3rd	3rd-4th	Lock-Up Clutch On
Throttle Position Sensor Voltage 1.1 Volts	9-11	17-20	27-30	17-19
Throttle Position Sensor Voltage 2.5	23-25	44-47	62-66	75-78
Full Throttle, Throttle Position	36-40	65-68	95-101	97-101

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

Sensor Voltage 4.5 Volts

TRANSAXLE DOWNSHIFT SPECIFICATIONS**DOWNSHIFT SPECIFICATIONS IN MPH (1998-99 ACCORD - B7XA)**

Application (D4 Position)	Lock-Up Clutch Off	4th-3rd	3rd-2nd	2nd-1st
Throttle Position Sensor Voltage .8 Volt	44-47	17-19	.....	(1) 6-8
Throttle Position Sensor Voltage 2.25 Volts	68-71	.....	.....	.....
Full Throttle, Throttle Position Sensor Voltage 4.5 Volts	90-94	89-92	54-58	27-31
(1) Downshift from 3rd to 1st.				

DOWNSHIFT SPECIFICATIONS IN MPH (1997 3.0CL - M7ZA)

Application (D4 Position)	Lock-Up Clutch Off	4th-3rd	3rd-2nd	2nd-1st
Throttle Position Sensor Voltage .7 Volt	14-16	17-19	.....	(1) 6-8
Throttle Position Sensor Voltage 2.25 Volts	65-68	.....	.....	.....
Full Throttle	88-91	86-90	56-60	27-31
(1) Downshift from 3rd to 1st.				

DOWNSHIFT SPECIFICATIONS IN MPH (1998-99 3.0CL - B7ZA)

Application (D4 Position)	Lock-Up Clutch Off	4th-3rd	3rd-2nd	2nd-1st
Throttle Position Sensor Voltage 1.2 Volts	14-16	17-19	.....	(1) 6-8
Throttle Position Sensor Voltage 2.5 Volts	67-70	.....	.....	.....
Full Throttle, Throttle Position Sensor Voltage 4.5 Volts	89-93	91-95	59-65	25-31
(1) Downshift from 3rd to 1st.				

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 and block all wheels. Connect tachometer. 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 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. Torque converter stall speed should be the same in "D4", "2", "1" and "R" positions and within specification. 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 problem areas.

TORQUE CONVERTER STALL SPEED SPECIFICATIONS

Application	Engine RPM
Standard	2400
Service Limit	2250-2550

TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING

Stall Speed Test Results (RPM)	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"	Slipping 2nd Clutch
High In "1"	Slipping 1st 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.

Pressure Test (Line & Clutch Pressure)

1. With engine off, remove appropriate pressure tap plugs to be tested. See **Fig. 4** . Attach Pressure Gauge Set (07406-0020400) to appropriate pressure taps. Tighten hose fittings to 13 ft. lbs. (18 N.m).
2. With shift lever in "P" or "N" position, start and operate engine at 2000 RPM. Note pressure at specified shift lever and throttle positions.
3. Line pressure should be 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. Using a NEW seal washer, install and tighten pressure tap plugs to 13 ft. lbs. (18 N.m).

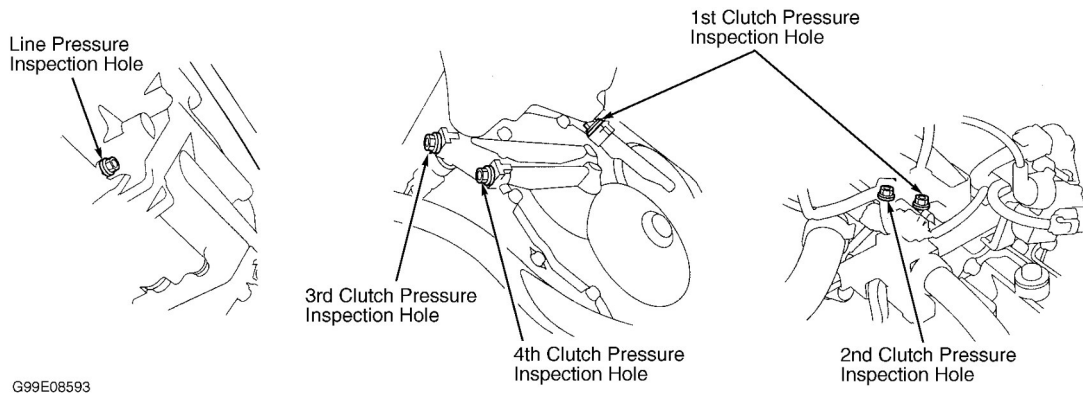


Fig. 4: Testing Line & Clutch Pressures
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

HYDRAULIC PRESSURE TEST SPECIFICATIONS

Application	Lever Position	psi (kPa) @ 2000 RPM
Line Pressure	"P" Or "N"	116-125 (800-860)
Clutch Pressure		
1st Clutch	"1"	115-126 (790-870)
2nd Clutch	"2"	115-126 (790-870)
3rd Clutch	"D3"	115-126 (790-870)
4th Clutch	"R" Or "D4"	115-126 (790-870)

HYDRAULIC PRESSURE TEST TROUBLE SHOOTING

Application	Probable Cause
Line Pressure	
Low Or No Line Pressure	Defective Torque Converter, Defective Torque Converter Check Valve, Defective Pressure Regulator Valve, Defective Oil Pump
Clutch Pressure	
Low Or No 1st Clutch Pressure	Defective 1st 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

REMOVAL & INSTALLATION

ELECTRICAL COMPONENTS

See appropriate ELECTRONIC CONTROLS article.

TRANSAXLE

See appropriate SERVICING article.

TRANSAXLE DISASSEMBLY

LEFT SIDE COVER

NOTE: Refer to illustration during disassembly. See **Fig. 5**.

1. Remove A/T gear position switch cover and switch from left side cover. Remove mainshaft speed sensor harness connector from bracket. Remove 16 left side cover bolts and remove cover. See **Fig. 6**.

NOTE: Countershaft and secondary shaft lock nuts have **LEFT-HAND** threads. Save removed lock nuts for use in installation of press fit idler gears and parking gear.

2. Install Mainshaft Holder (07GAB-PF50100 or 07GAB-PF5101) on mainshaft. Engage parking brake pawl with parking gear. Using a chisel, remove lock tabs from each shaft lock nut. Remove lock nuts and conical washers from each shaft.
3. Remove mainshaft holder. Using a puller, remove idler gears from mainshaft and secondary shaft. See **Fig. 7**. Pull bearing hub, countershaft idler gear and bearings from countershaft.
4. Using a puller, remove parking gear. Remove parking brake pawl, spring, shaft and stop shaft from transaxle housing. Remove parking brake lever and spring from control shaft.
5. Remove connectors from connector bracket on ATF cooler lines. Remove joint bolts and ATF cooler lines.

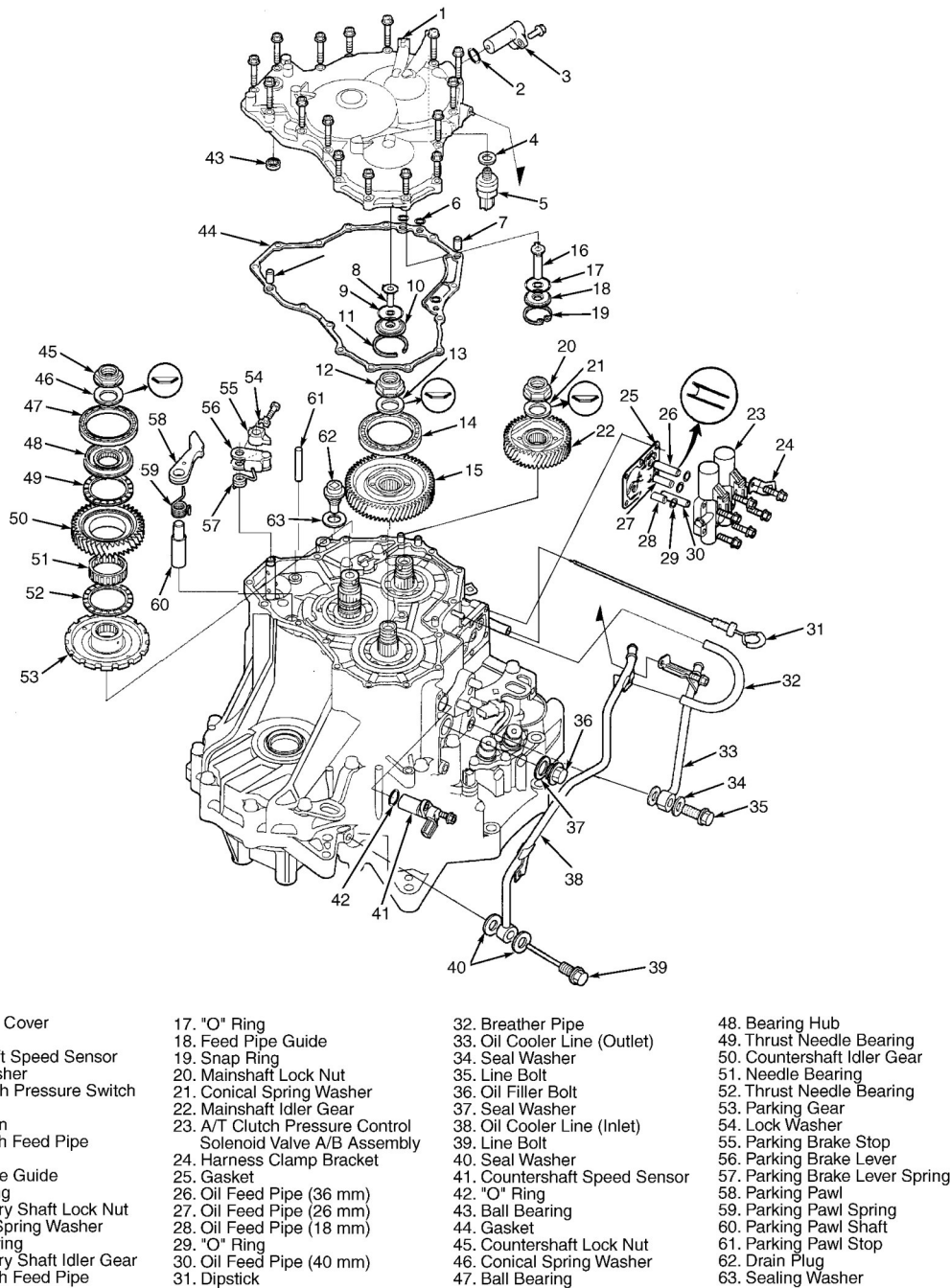
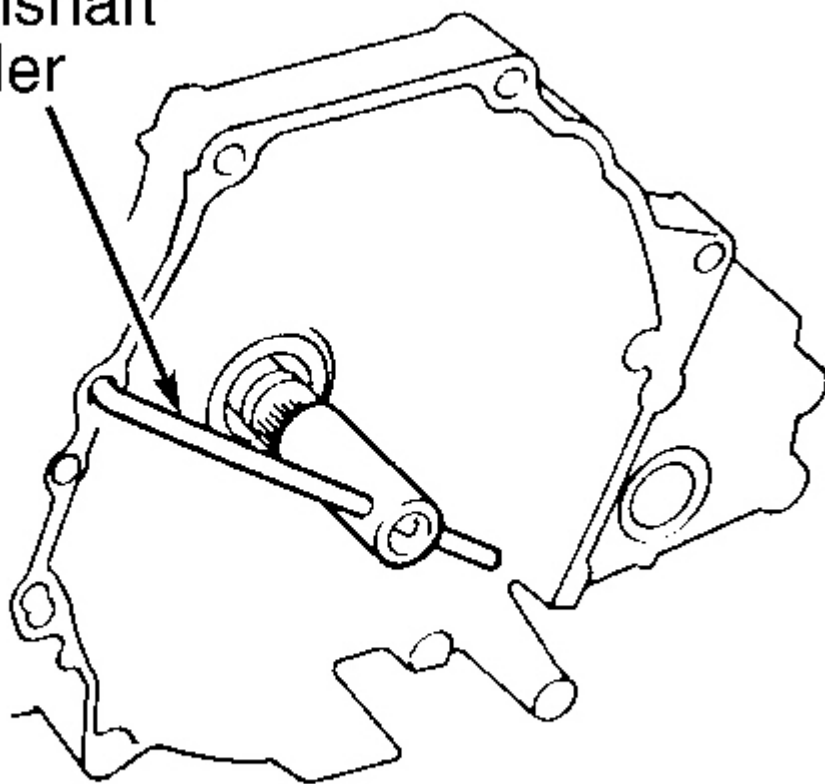


Fig. 5: Exploded View Of Left Side Cover & Related Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Mainshaft
Holder



G93H22928

Fig. 6: Installing Mainshaft Holder

Courtesy of AMERICAN HONDA MOTOR CO., INC.

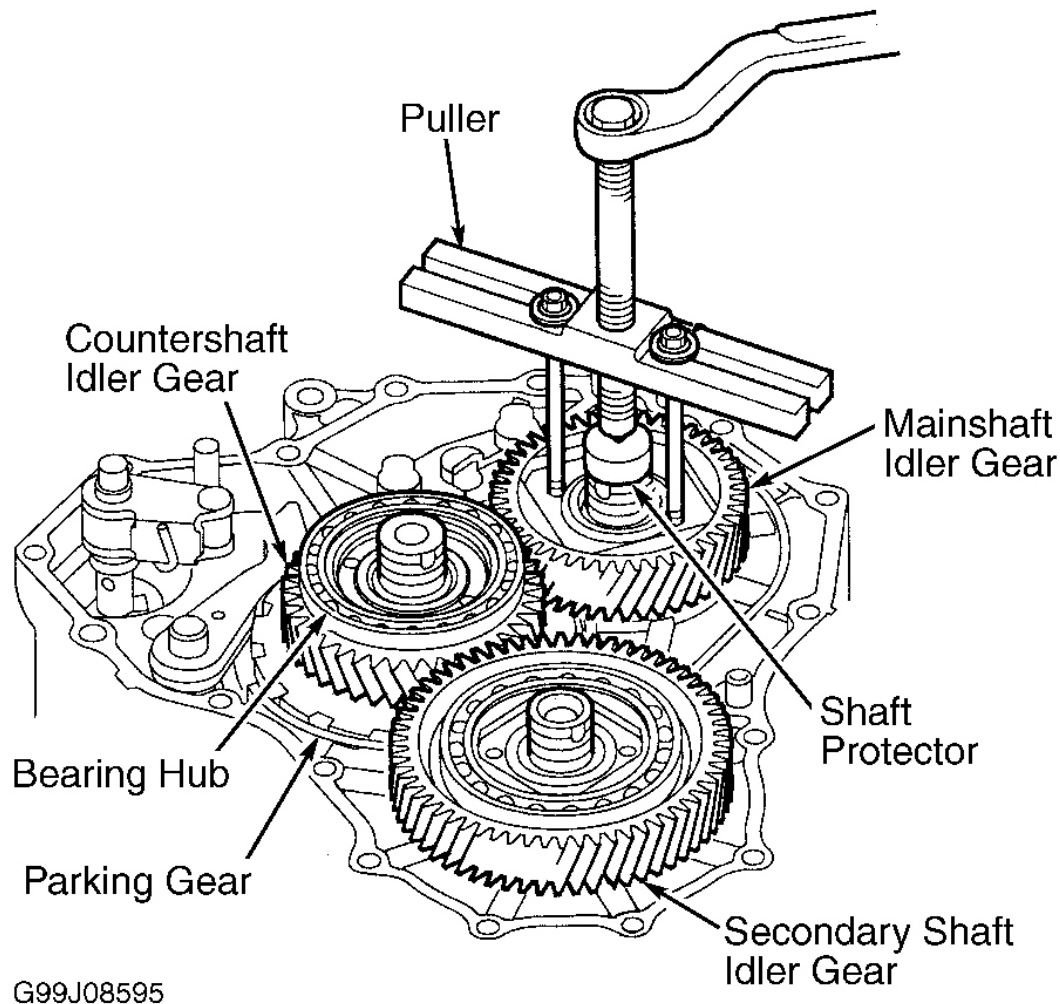


Fig. 7: Removing Idler Gears & Parking Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE HOUSING

NOTE: Refer to illustration during disassembly. See [Fig. 8](#).

1. Remove bolts holding reverse idler gear shaft holder. See [Fig. 9](#). Remove reverse idler shaft holder, shaft and washer. Remove transaxle housing mounting bolts, transaxle hangers and bracket.

NOTE: Transaxle housing will NOT separate from torque converter housing if reverse idler gear is not removed as described in the following step.

2. Disengage reverse idler gear from mainshaft and countershaft reverse gears. See **Fig. 10** . Align control shaft spring pin with transaxle housing groove by turning control shaft. See **Fig. 11** .
3. Install Housing Puller (07HAC-PK40102) over mainshaft. Remove reverse idler gear, needle bearings and thrust washer from transaxle housing.
4. Remove countershaft 2nd gear, countershaft reverse gear and needle bearing. See **Fig. 8** . Remove shift fork lock bolt. Remove shift fork with reverse selector. Remove reverse selector hub and countershaft 4th gear from countershaft.
5. Remove secondary shaft, countershaft and mainshaft sub-assemblies. Remove differential assembly.

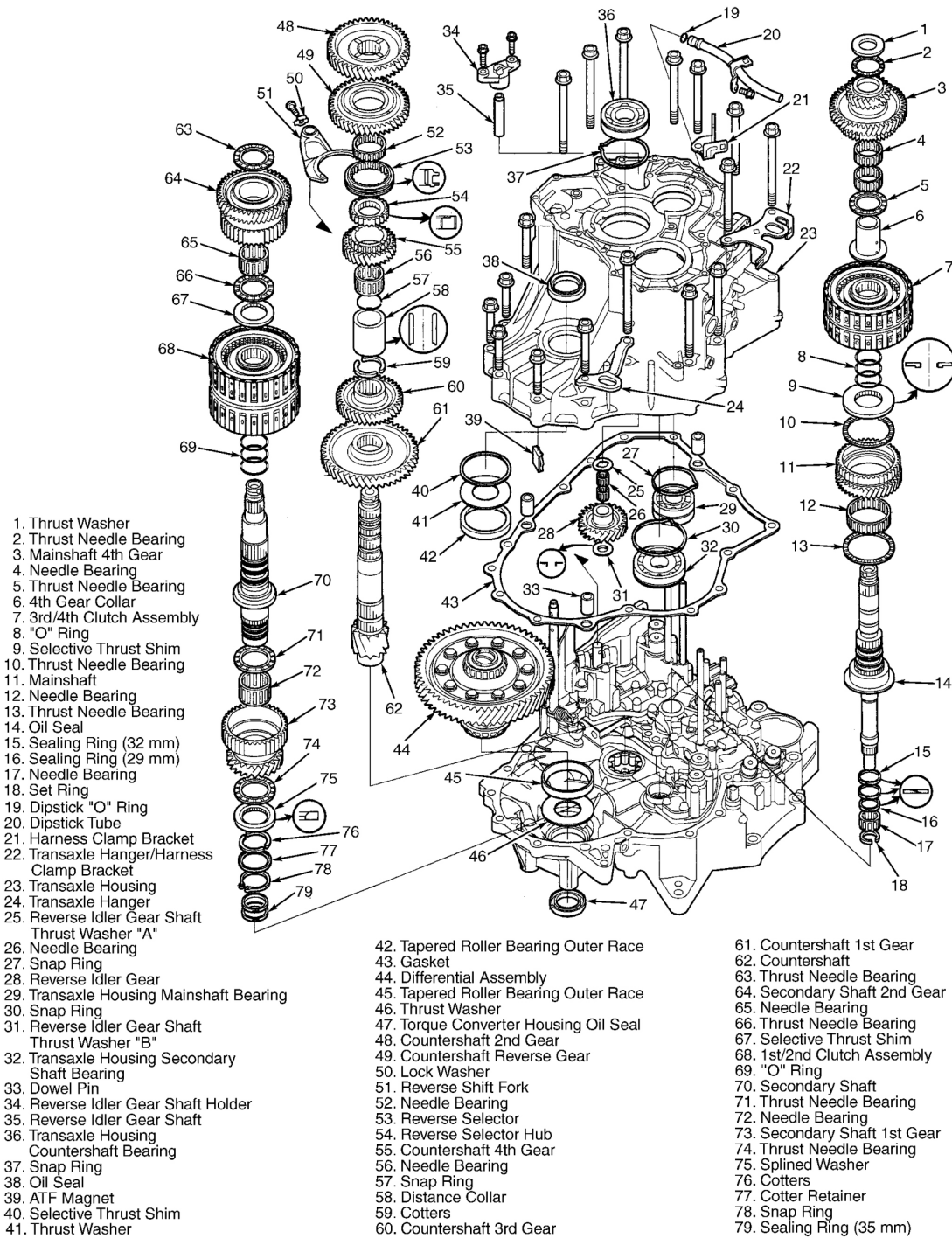


Fig. 8: Exploded View Of Transaxle Housing & Related Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

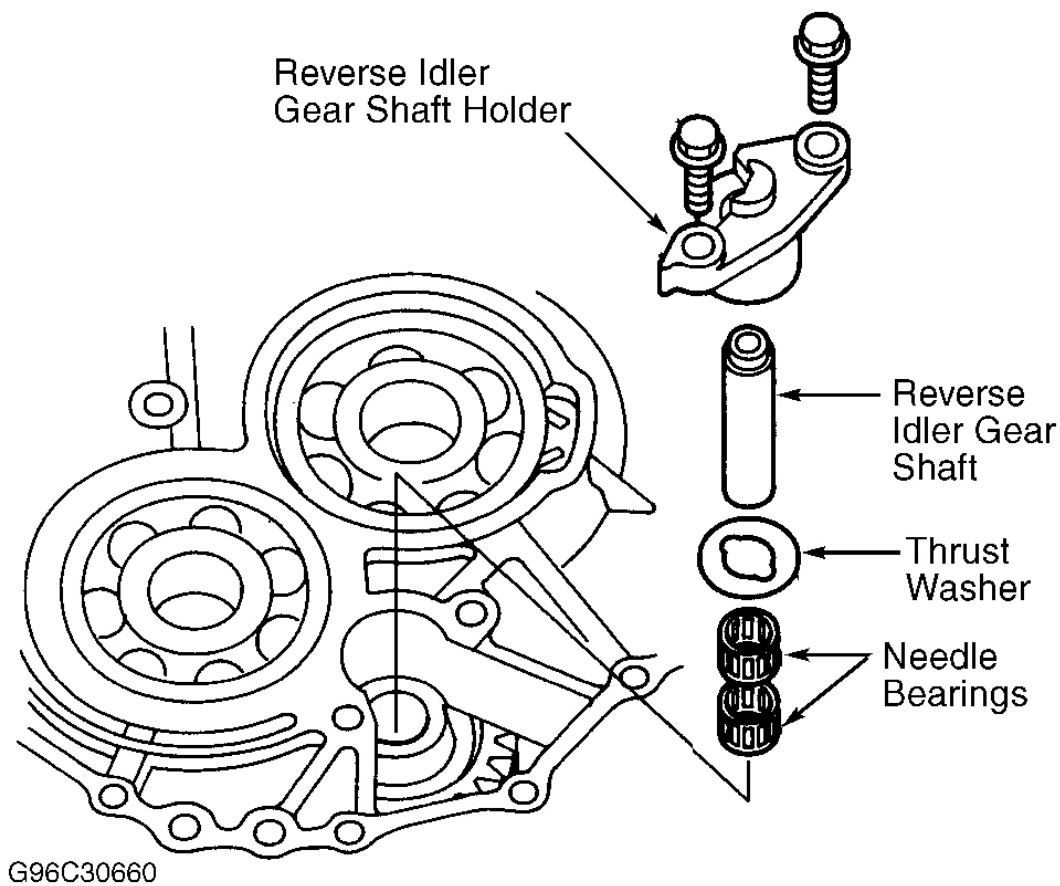


Fig. 9: Removing Reverse Idler Gear Shaft Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

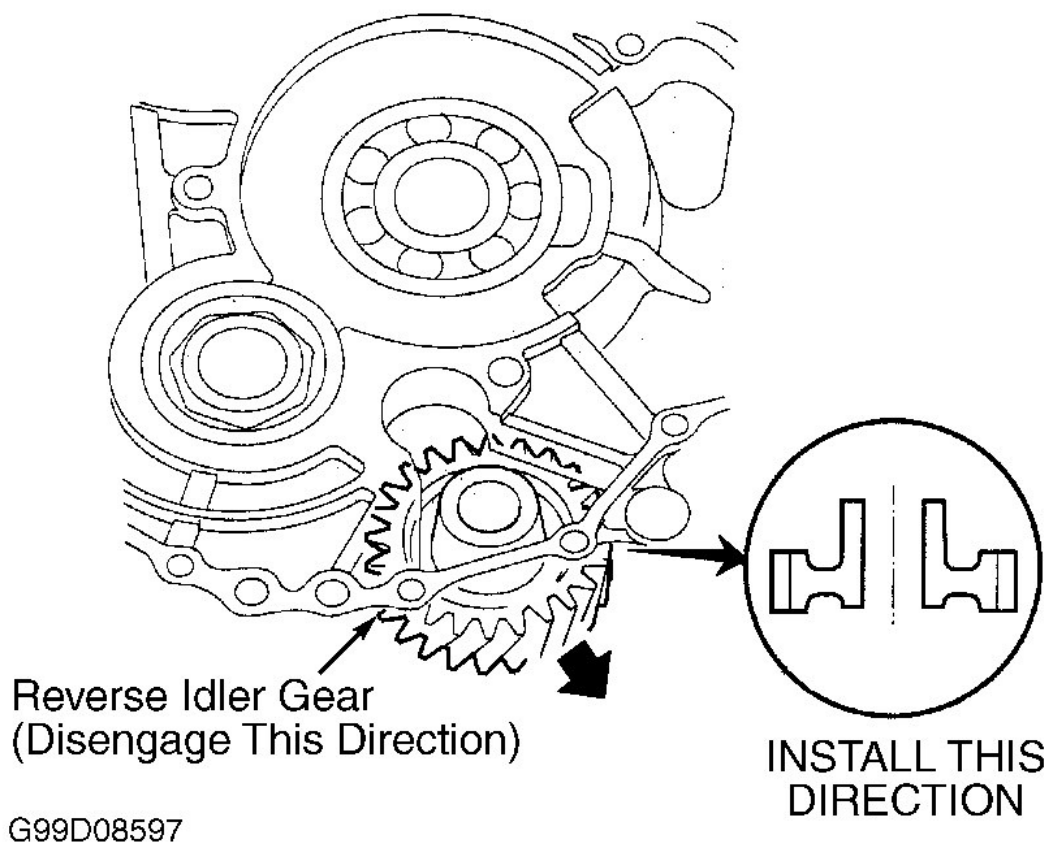


Fig. 10: Disengaging Or Installing Reverse Idler Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

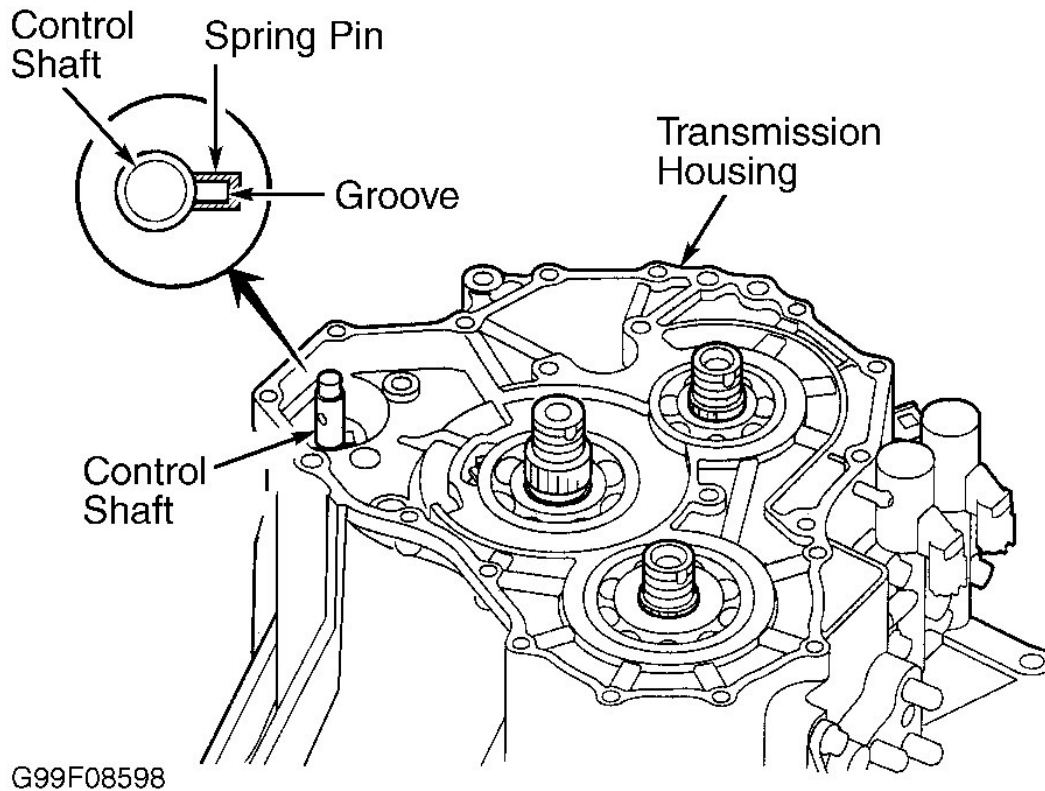


Fig. 11: Control Shaft Alignment & Housing Removal
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE CONVERTER HOUSING/VALVE BODY

NOTE: Refer to illustration during disassembly. See [Fig. 12](#) .

1. Remove 2 ATF feed pipes from regulator valve body and 2 pipes from servo body. Remove 2 bolts and servo detent base. Remove ATF strainer.

CAUTION: Accumulator is spring loaded. Press down on accumulator cover during bolt removal to prevent stripping servo body threads.

2. Remove accumulator cover. Remove servo body, separator plate and dowel pins. Remove accumulator body.
3. Remove regulator valve body. Remove stator shaft and stop shaft. Remove regulator separator plate and 2 dowel pins. Unhook detent spring from detent arm. Separate detent arm shaft, detent arm and control shaft.
4. Remove cooler check valve spring and cooler check valve (ball). Remove main valve body. Remove

accumulator body. Remove torque converter check valve and spring.

5. Remove oil pump driven gear shaft and oil pump gears. Remove main separator plate and 3 dowel pins. DO NOT let check balls fall from secondary valve body during removal.

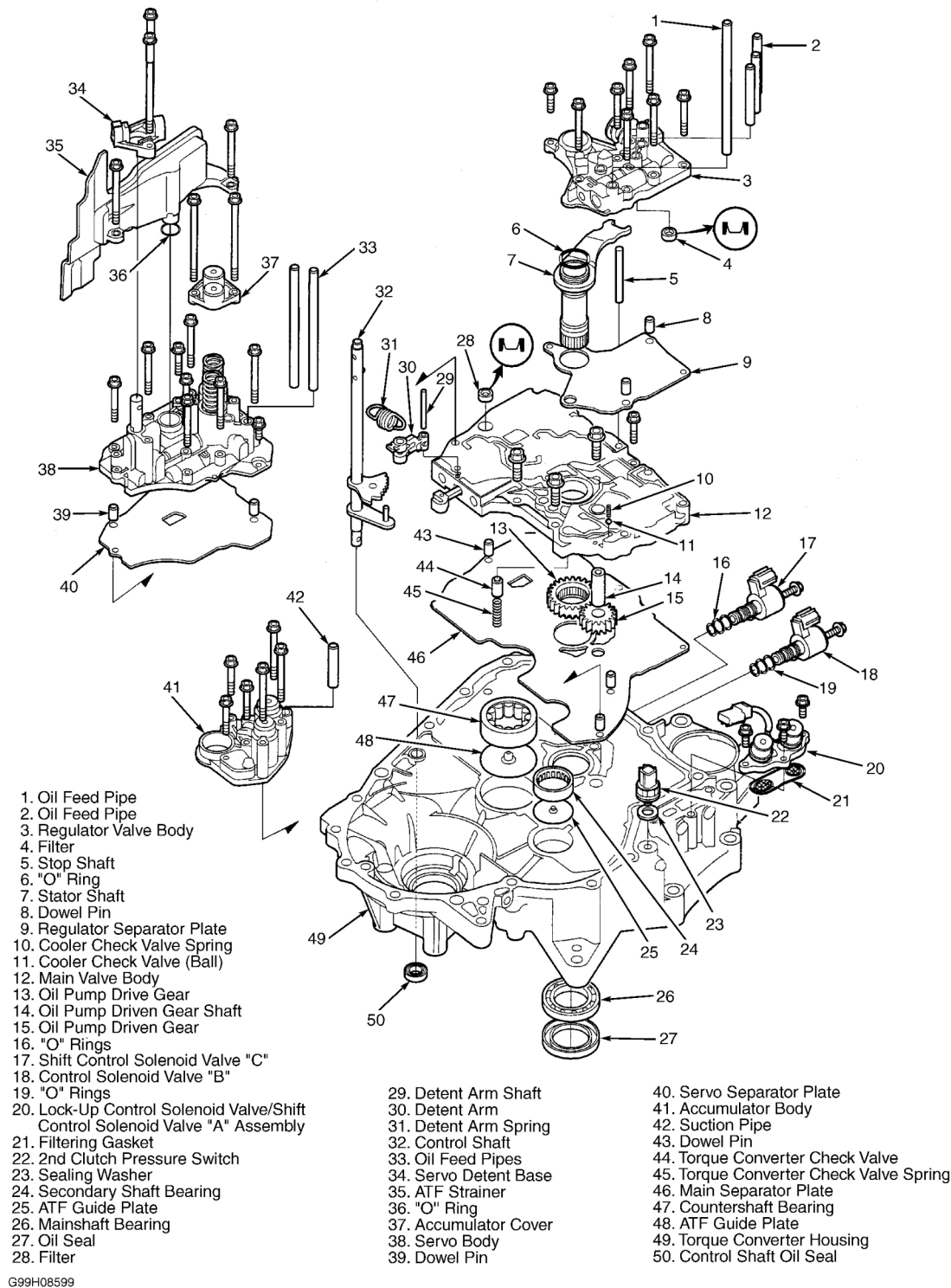


Fig. 12: Exploded View Of Torque Converter Housing/Valve Body & Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 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. Place straightedge across main valve body surface. Using a feeler gauge, measure thrust clearance between oil pump driven gear and straightedge. See **Fig. 13** . Replace oil pump gears and/or main valve body if thrust clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.
4. Install oil pump driven gear shaft in oil pump driven gear. Using a feeler gauge, measure side clearance of both gears between tip of gear teeth and main valve body. See **Fig. 13** . Replace oil pump gears and/or main valve body if side clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.

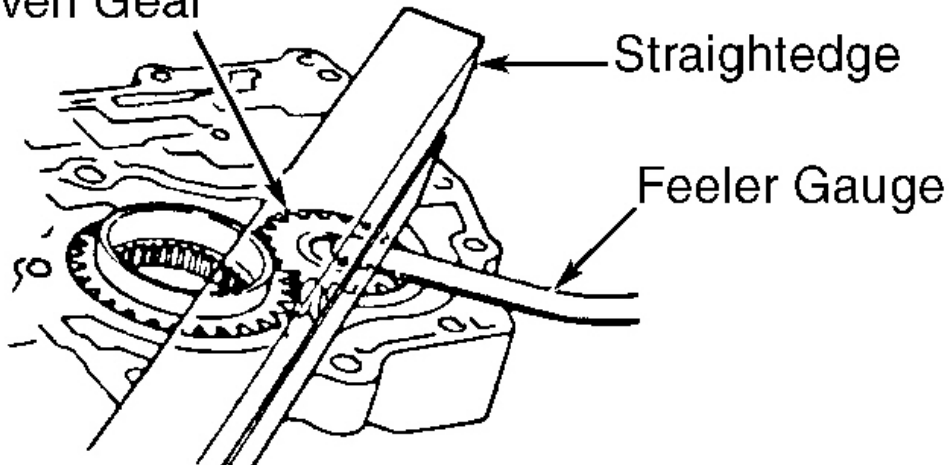
OIL PUMP SPECIFICATIONS

Application	In. (mm)
Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0042-.0085 (.106-.217)
Thrust Clearance	
Standard	.0010-.0020 (.030-.050)
Wear Limit	.0028 (.070)

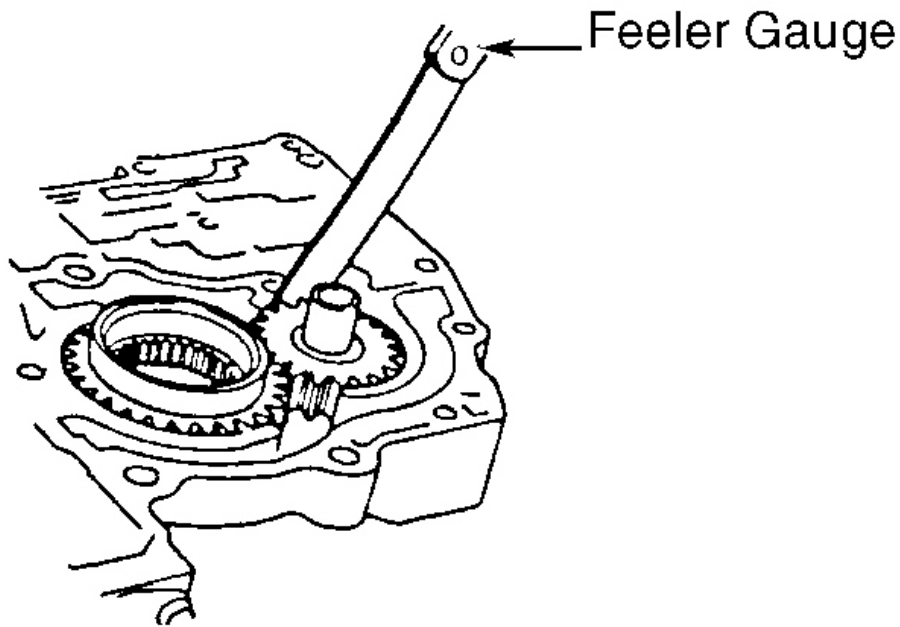
Reassembly

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

Oil Pump
Driven Gear



CHECKING THRUST CLEARANCE



CHECKING SIDE CLEARANCE

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Fig. 13: Checking Oil Pump Clearances
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 seat, 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 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 **SPRING SPECIFICATIONS** table. Replace springs if not within specification.

NOTE: Oil pump clearance must be checked in main valve body. See **OIL PUMP** .

Reassembly

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

SPRING SPECIFICATIONS

Application	Free Length - In. (mm)
Main Valve Body	
Modulator Valve Spring	1.318 (33.50)
Shift Valve "C" Spring	
1997	1.949 (49.50)
1998-99	1.933 (49.10)
Shift Valve "D" Spring	1.406 (35.70)
Shift Valve "E" Spring	1.268 (32.20)
Relief Valve Spring	1.185 (30.10)
Lock-Up Shift Valve Spring	2.480 (63.00)
Cooler Check Valve Spring	.567 (14.40)
Torque Converter Check Valve Spring	
1997	1.350 (34.30)

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

1998-99	1.382 (35.10)
Servo Control Valve Spring	1.406 (35.70)
Reverse CPC Valve Spring	.701 (17.80)
Regulator Valve Body	
Stator Reaction Spring	1.193 (30.30)
Regulator Valve Spring "A"	3.445 (87.50)
Regulator Valve Spring "B"	1.732 (44.00)
Lock-Up Control Valve Spring	
1997	1.807 (45.90)
1998-99	1.689 (42.90)
Lock-Up Timing Valve Spring	1.370 (34.80)
Accumulator Valve Body	
1st Accumulator Spring "B"	2.067 (52.50)
1st Accumulator Spring "A"	3.445 (87.50)
2nd Accumulator Spring "B"	2.106 (53.50)
2nd Accumulator Spring "A"	2.610 (66.30)
Servo Body	
Shift Valve "B" Spring	1.591 (40.40)
Shift Valve "A" Spring	1.591 (40.40)
CPC Valve "A" Spring	.701 (17.80)
CPC Valve "B" Spring	.701 (17.80)
4th Accumulator Spring "A"	2.614 (66.40)
4th Accumulator Spring "B"	2.028 (51.50)
3rd Accumulator Spring "A"	2.614 (66.40)
3rd Accumulator Spring "B"	2.028 (51.50)

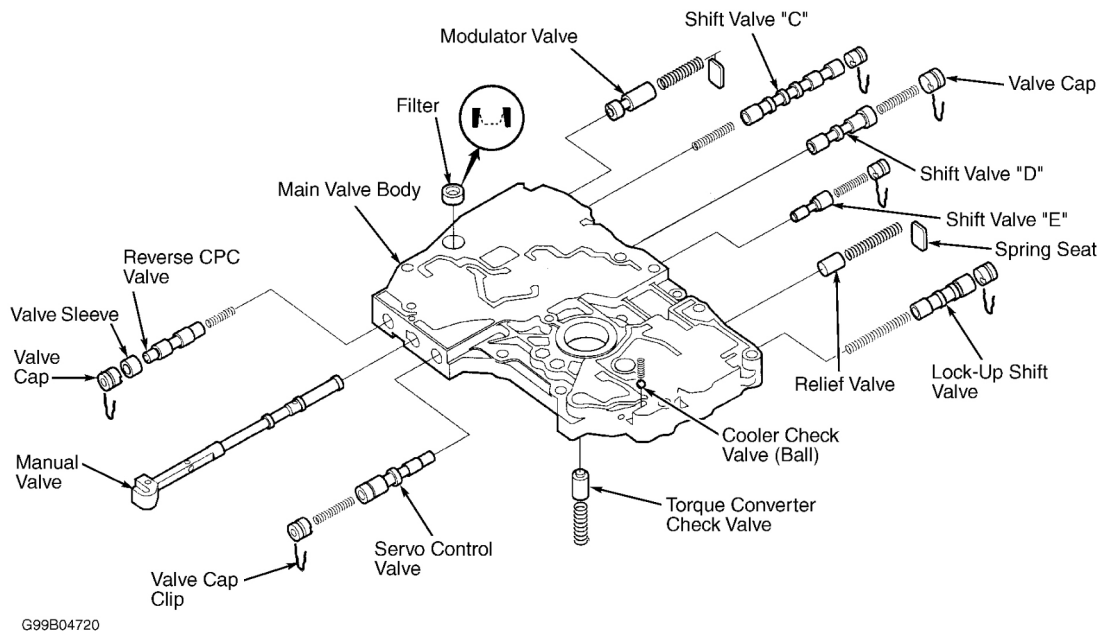


Fig. 14: Exploded View Of Main Valve Body
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REGULATOR VALVE BODY

CAUTION: Regulator spring cap is under spring pressure. Ensure regulator spring cap is held down when removing stop bolt. Use care when removing valve cap, as valve cap is under spring pressure.

Disassembly

Note direction of valve cap installation before removing from regulator valve body. Hold regulator spring cap down, and 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 assembly 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 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. 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. 15** . Tighten stop bolt to specification. See **TORQUE SPECIFICATIONS** .

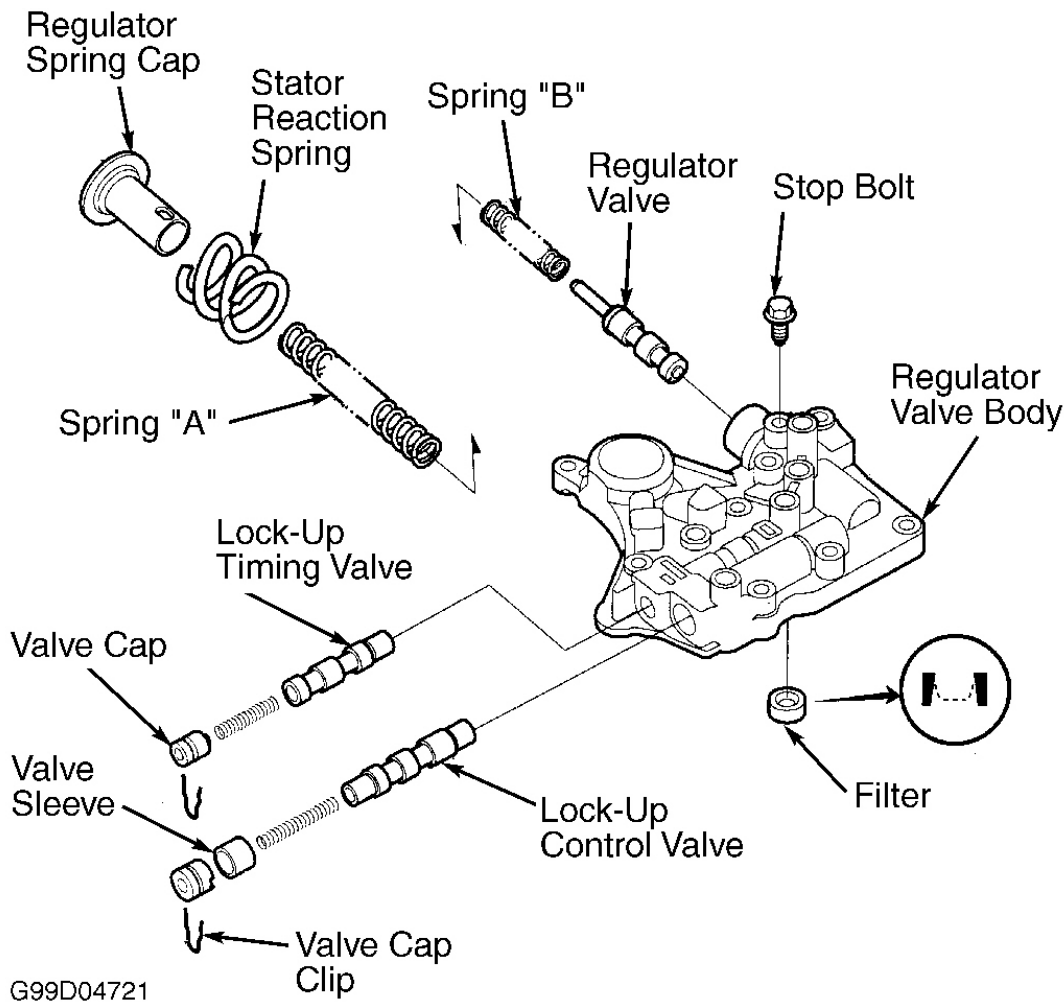


Fig. 15: Exploded View Of Regulator Valve Body
Courtesy of AMERICAN HONDA MOTOR CO., INC.

ACCUMULATOR BODY

Disassembly

Disassemble accumulator body. See **Fig. 16** .

Cleaning & Inspection

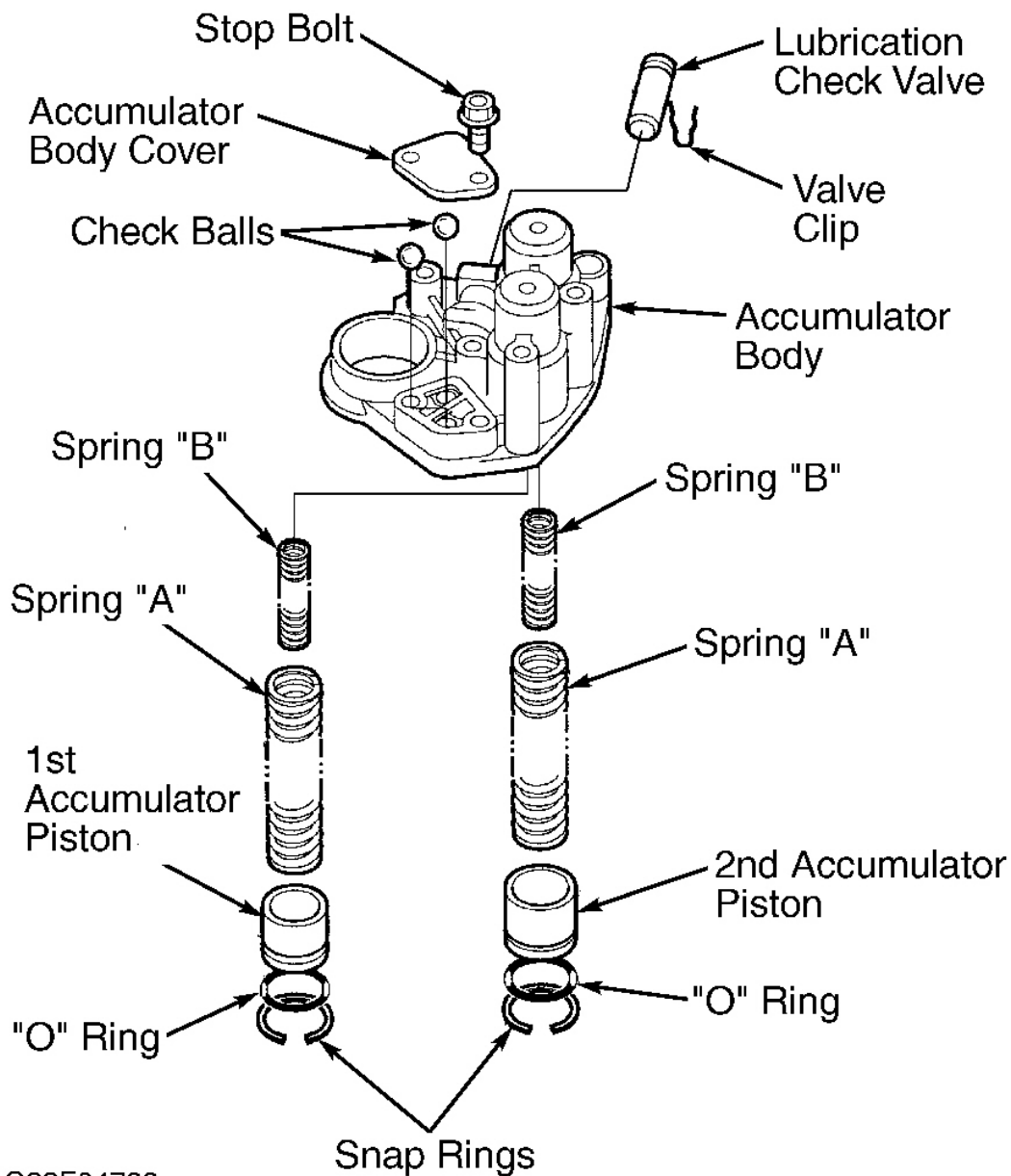
1. Clean components with solvent and dry with compressed air. Replace servo body assembly if any parts

are worn or damaged. Ensure all pistons slide freely in their bores.

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.



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Fig. 16: Exploded View Of Accumulator Body

Courtesy of AMERICAN HONDA MOTOR CO., INC.

SERVO BODY**Disassembly**

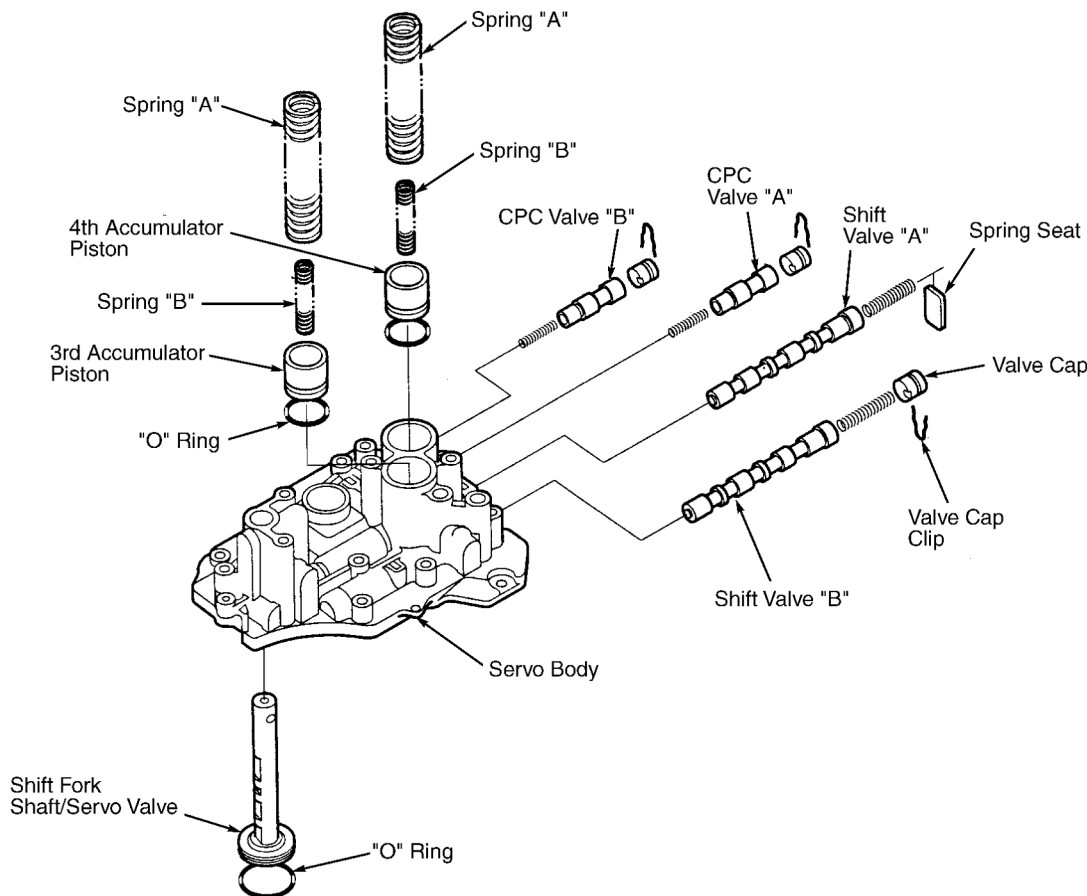
Disassemble servo body. See **Fig. 17**.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace servo body assembly if any parts are worn or damaged. Ensure all pistons slide freely in their bores.
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.



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Fig. 17: Exploded View Of Servo Body

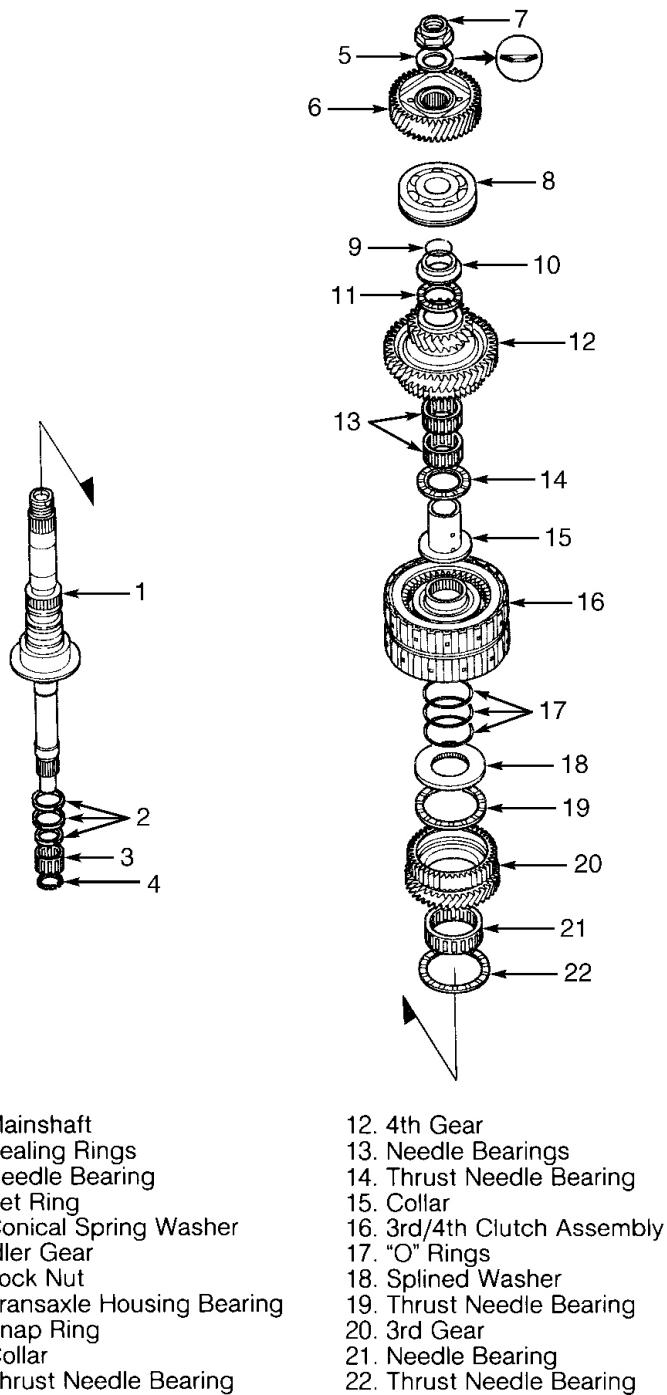
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT**Disassembly**

Note location of mainshaft components. See **Fig. 18** . Remove mainshaft components.

Cleaning & Inspection

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



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Fig. 18: Exploded View Of Mainshaft Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

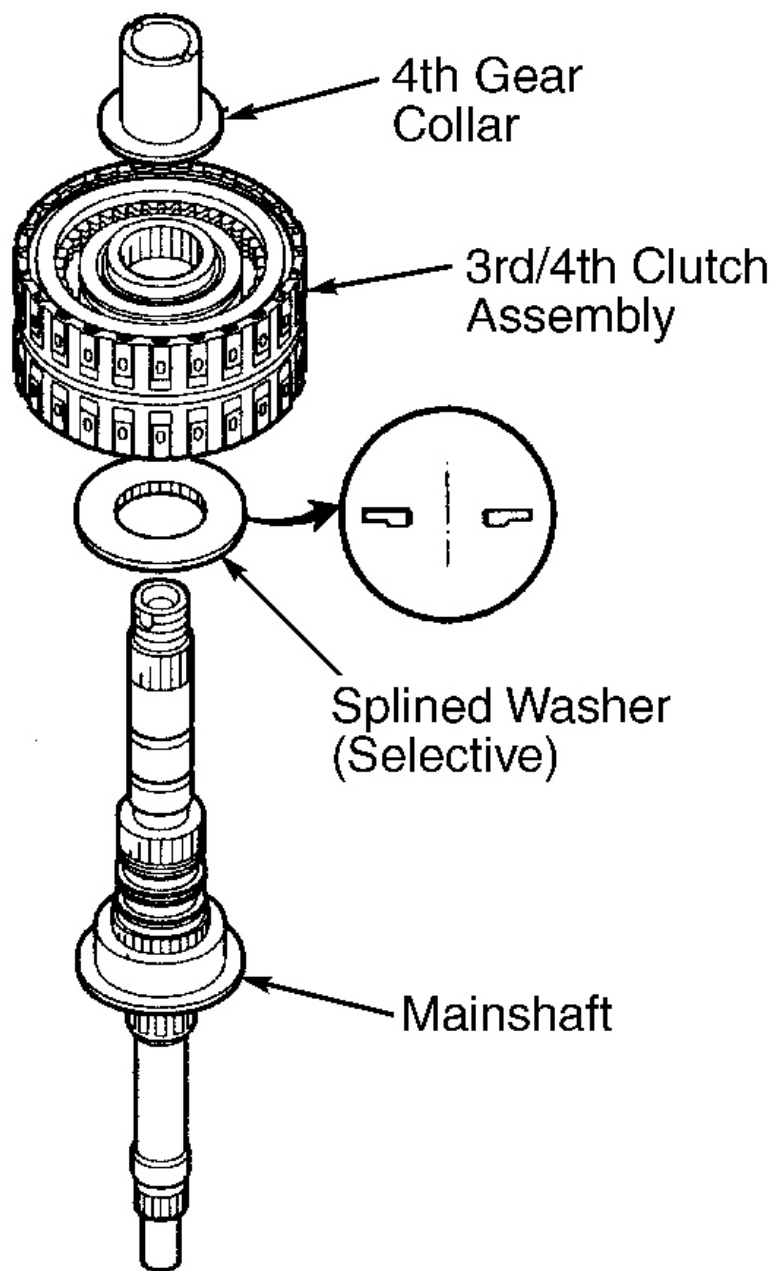
NOTE: Mainshaft 4th clutch hub-to-collar clearance must be checked during

reassembly.**Reassembly**

1. To check mainshaft 4th clutch hub-to-collar clearance, install proper components, except "O" rings on mainshaft. See **Fig. 19**.
2. Hold collar against 3rd-4th clutch assembly. Using a feeler gauge, measure clearance between collar and 4th clutch hub in at least 3 places. See **Fig. 20**. Use average measurement as actual clearance. Specified clearance is .001-.004" (.03-.11 mm).
3. If clearance is not as specified, remove splined washer and measure thickness. Different thickness splined washers are available. Select and install a new splined washer to obtain proper clearance. See **MAINSHAFT SPLINED WASHER THICKNESS** table.
4. Once correct thickness splined washer is obtained, lubricate all components with ATF. Reassemble mainshaft using a NEW lock nut. Before installing NEW "O" rings on mainshaft, wrap splines with tape.

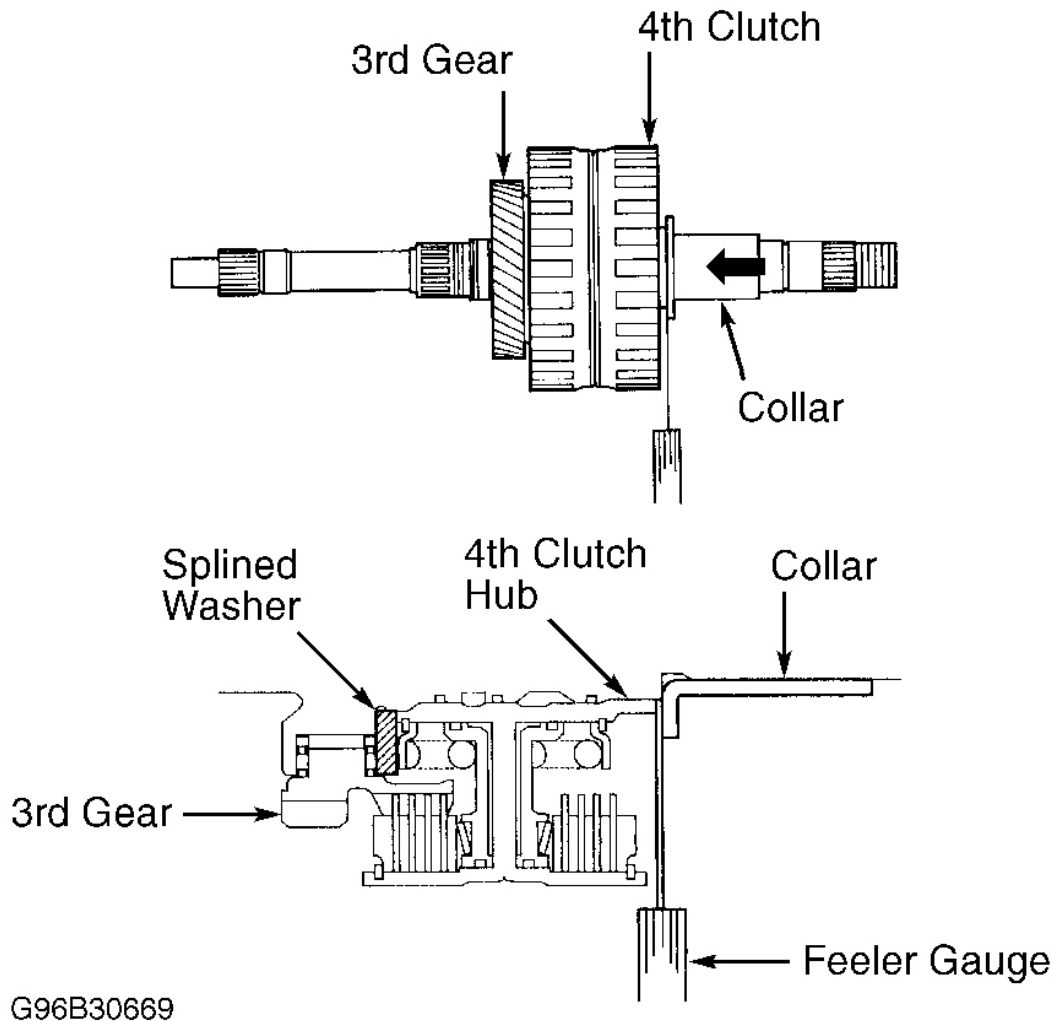
MAINSHAFT SPLINED WASHER THICKNESS

Washer Number (Mark)	Part Number	Thickness - In. (mm)
1997		
1	90414-P7Z-000	.230 (5.85)
2	90415-P7Z-000	.232 (5.90)
3	90416-P7Z-000	.234 (5.95)
4	90417-P7Z-000	.236 (6.00)
5	90418-P7Z-000	.238 (6.05)
6	90419-P7Z-000	.240 (6.10)
1998-99		
1	90414-P7X-000	.309 (7.85)
2	90415-P7X-000	.311 (7.90)
3	90416-P7X-000	.313 (7.95)
4	90417-P7X-000	.315 (8.00)
5	90418-P7X-000	.317 (8.05)
6	90419-P7X-000	.319 (8.10)



G99J04724

Fig. 19: Installed Components For Clearance Check
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 20: Measuring Mainshaft 4th Clutch Hub-To-Collar Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT

NOTE: Countershaft lock nut has **LEFT-HAND** threads.

Disassembly

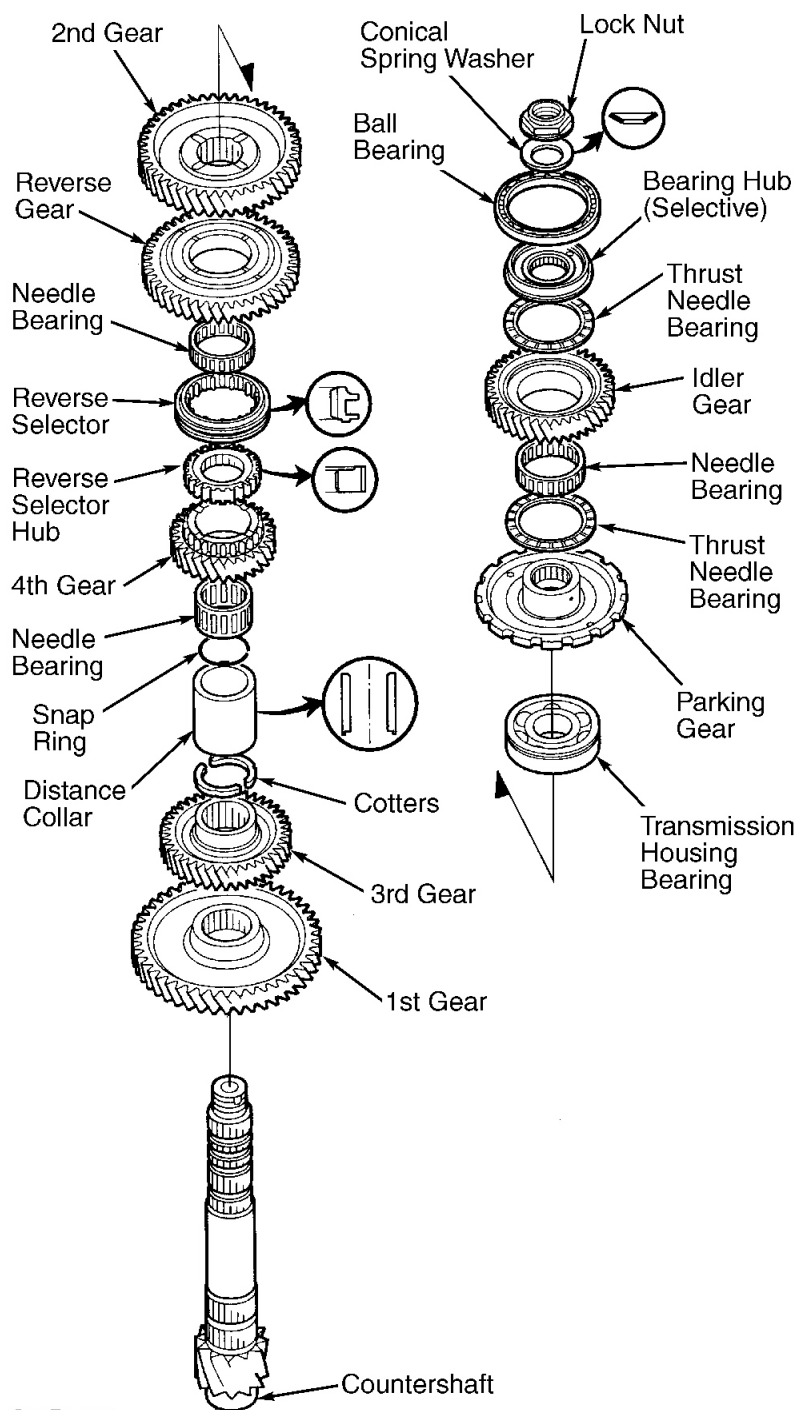
1. Note location of countershaft components. See **Fig. 21** . Using puller, remove all components from countershaft down to 1st and 3rd gears. Ensure shaft protector is used when removing 4th gear.
2. Place countershaft in hydraulic press while supporting countershaft 1st gear. Threaded end of countershaft must be facing upward (toward ram of press). Place a protective cap between hydraulic press and countershaft to prevent damage to countershaft. Press countershaft from 1st and 3rd gears.

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 parts with ATF. Align splines of 1st gear with splines on countershaft and press on until gear contacts final drive gear. See **Fig. 22** .
2. Align 3rd gear splines with countershaft splines and press on until gear contacts 1st gear. Assemble remaining components as shown using a NEW lock nut. See **Fig. 21** .



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Fig. 21: Exploded View Of Countershaft Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

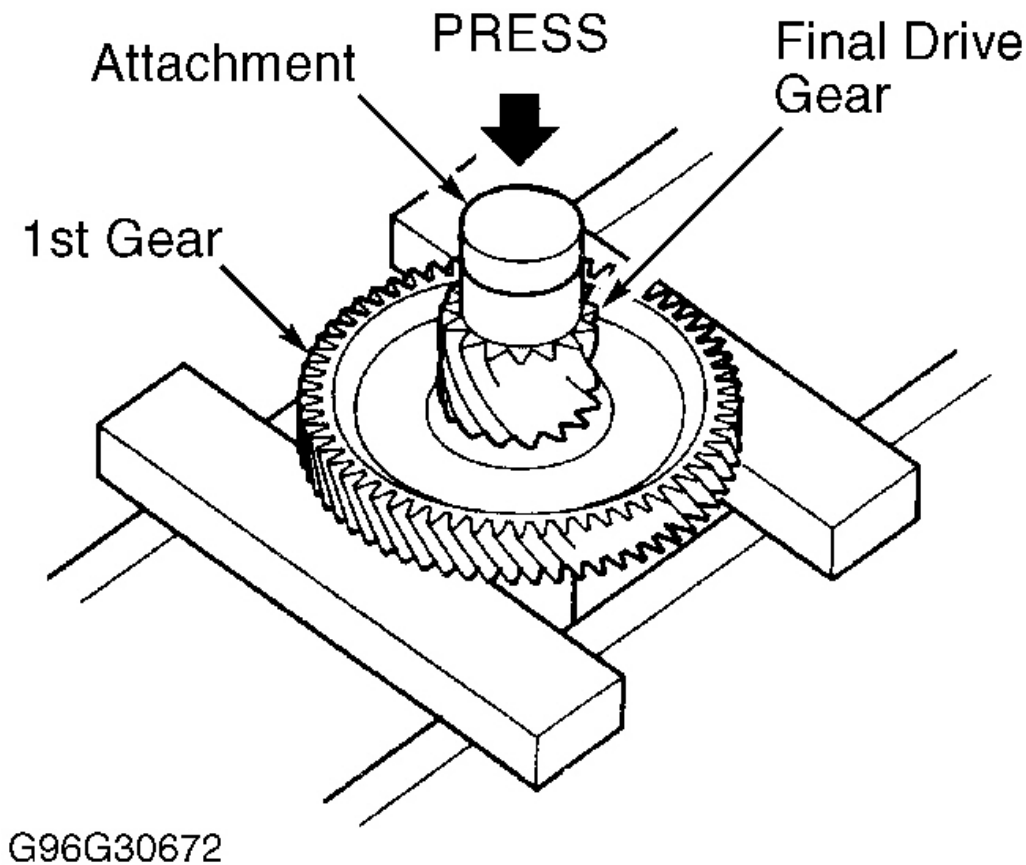


Fig. 22: Installing 1st Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY SHAFT

NOTE: Secondary shaft lock nut has LEFT-HAND threads.

Disassembly

Note location of secondary shaft components. See [Fig. 23](#) . Remove secondary shaft components.

Cleaning & Inspection

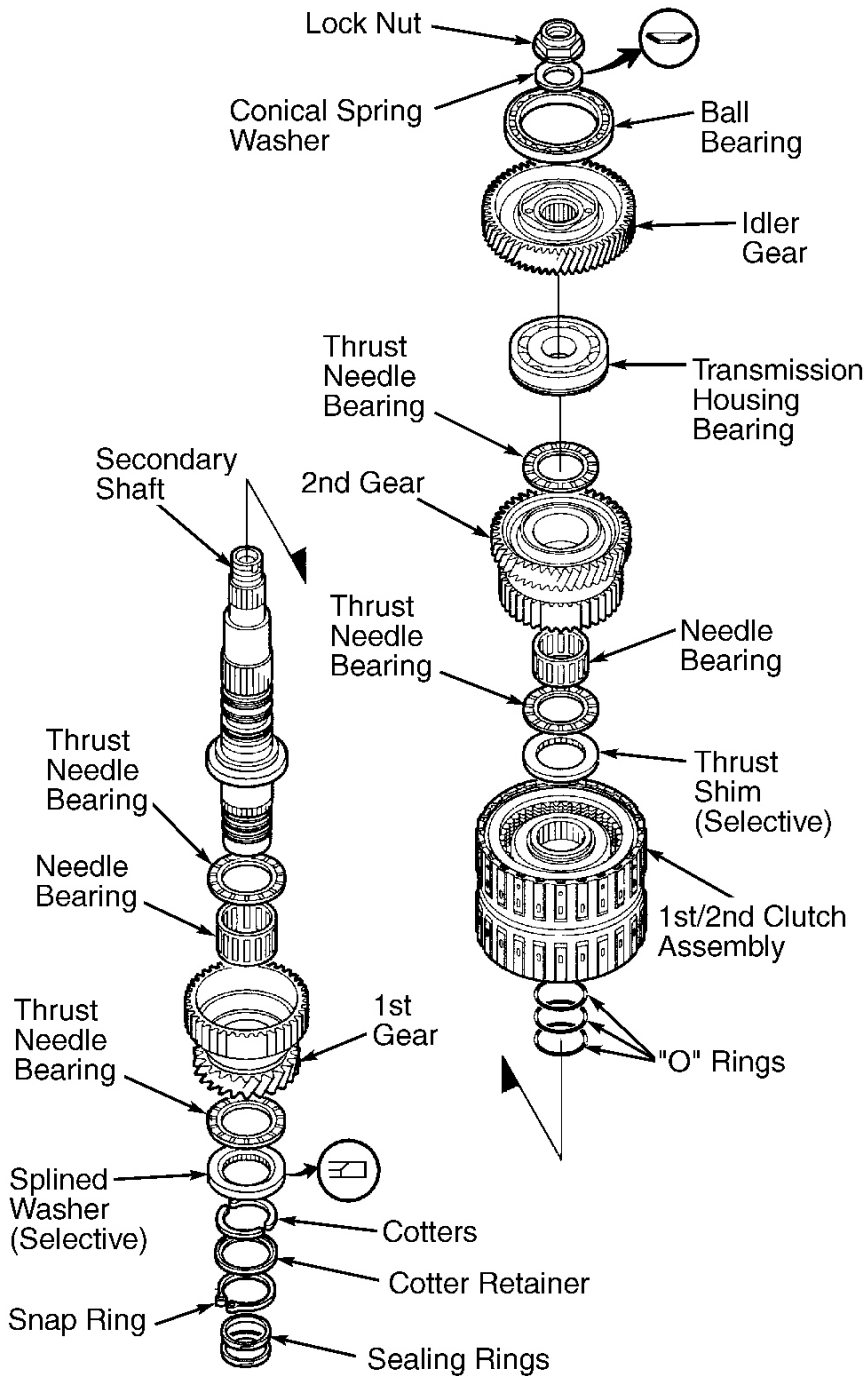
Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear. Inspect all needle bearings for galling and rough movement.

Reassembly (1st Gear)

1. Lubricate all components with ATF. Reassemble specified secondary shaft components. See **Fig. 24** . Using a feeler gauge, measure clearance between splined washer and cotter retainer in at least 3 places. See **Fig. 25** . Use average measurement as actual clearance. Specified clearance is .003-.006" (.07-.15 mm).
2. If clearance is not as specified, remove splined washer and measure thickness. Different thickness splined washers are available. Select and install a new splined washer to obtain proper clearance. See **1ST GEAR SPLINED WASHER THICKNESS** table.
3. Once correct thickness splined washer is obtained, lubricate all components with ATF and reassemble. Before installing NEW "O" rings on secondary shaft, wrap splines with tape.

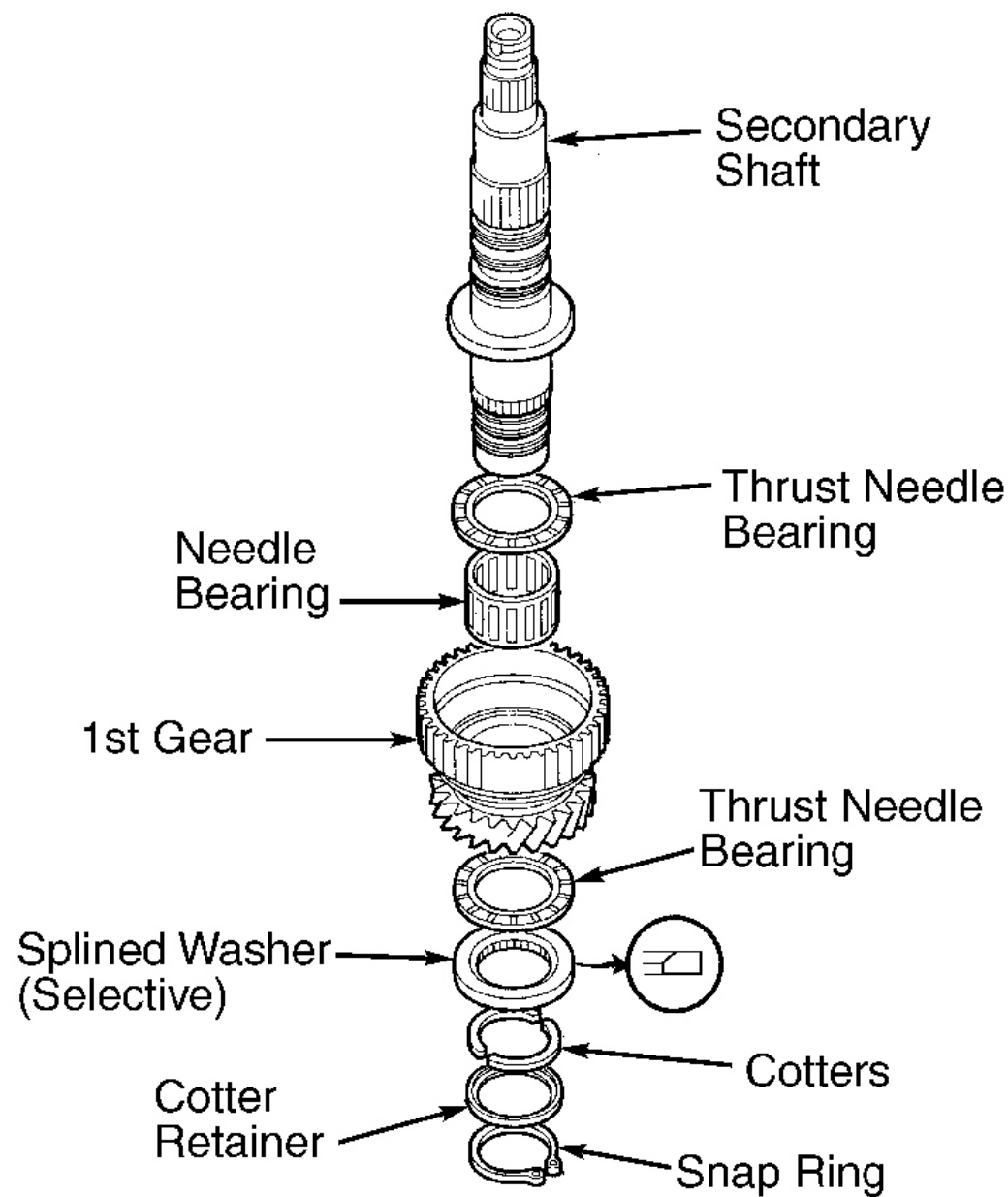
1ST GEAR SPLINED WASHER THICKNESS

Washer Number (Mark)	Part Number	Thickness - In. (mm)
1	90502-P0Z-000	.270 (6.85)
2	90503-P0Z-000	.272 (6.90)
3	90504-P0Z-000	.274 (6.95)
4	90505-P0Z-000	.276 (7.00)
5	90506-P0Z-000	.278 (7.05)
6	90507-P0Z-000	.280 (7.10)



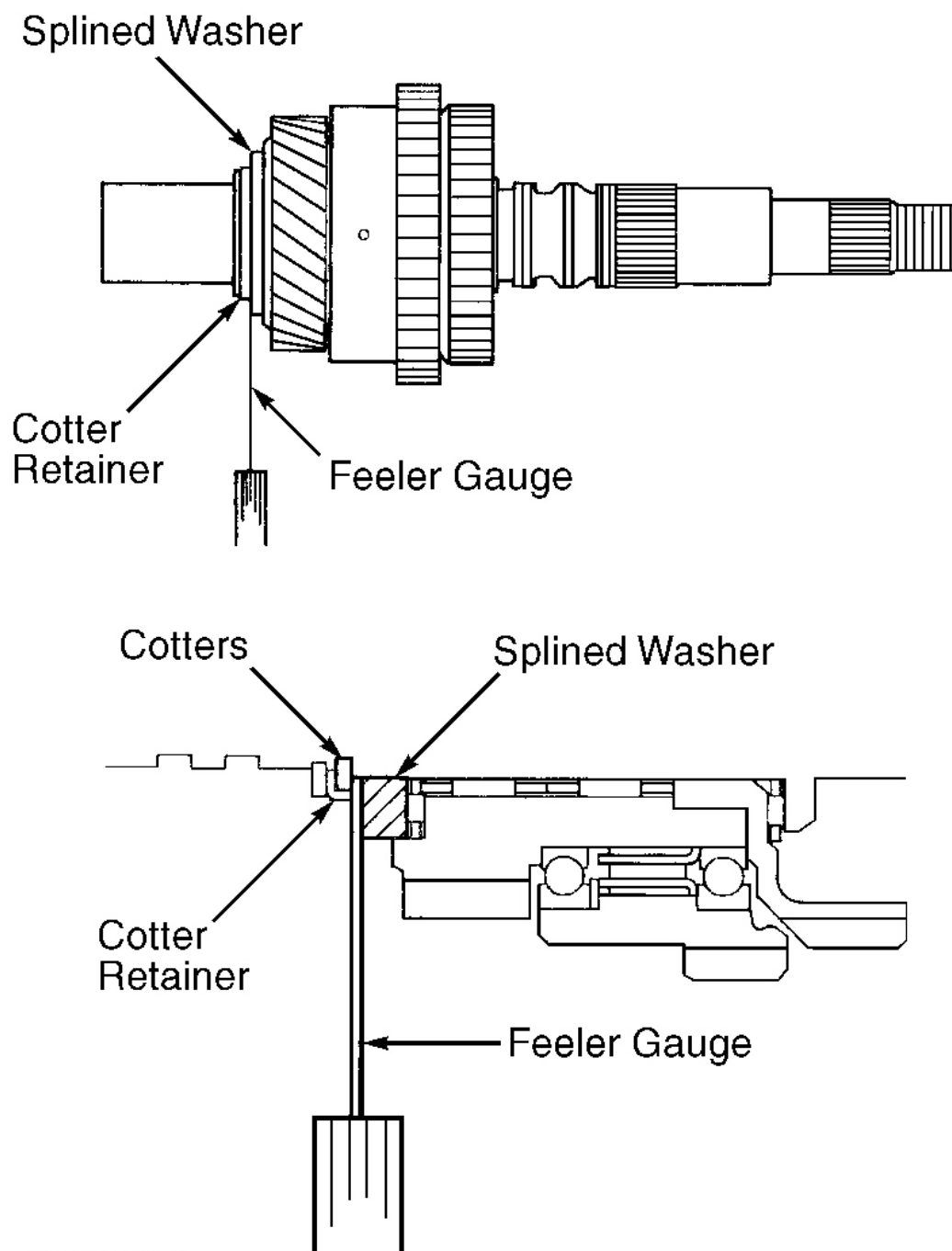
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Fig. 23: Exploded View Of Secondary Shaft Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 24: Installed Components For 1st Gear End Play Check
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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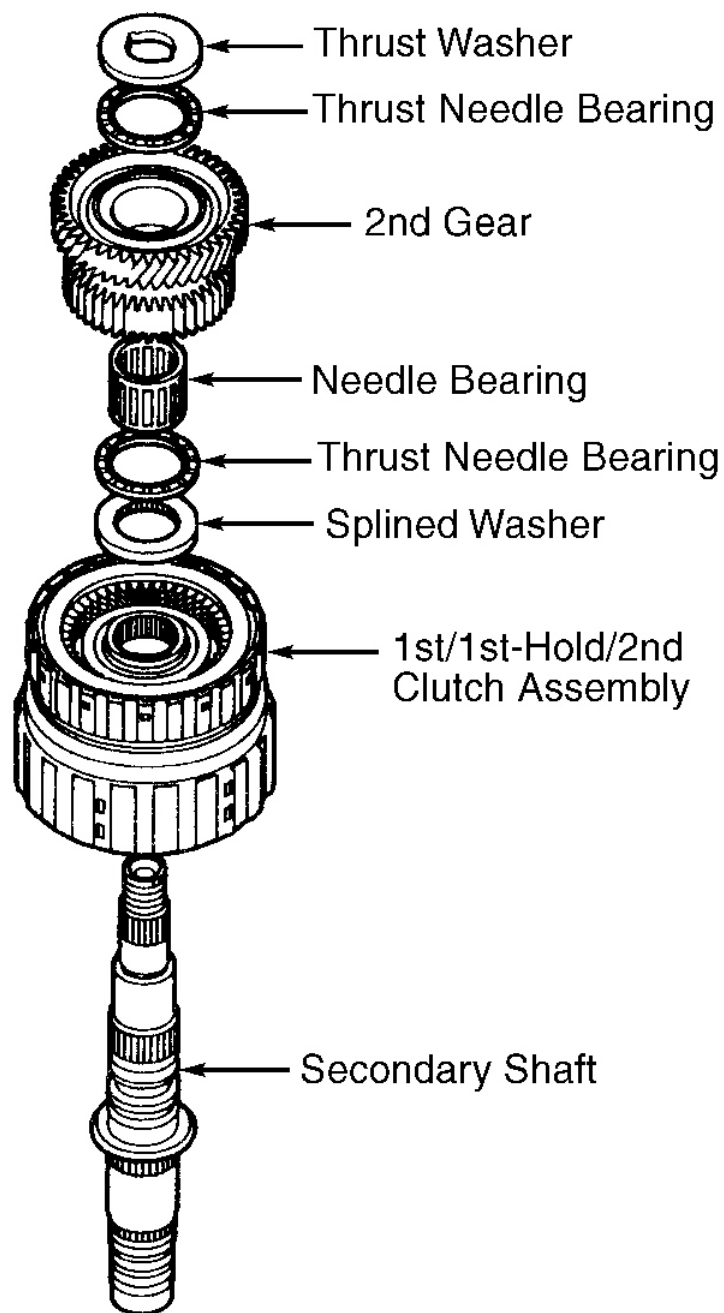
Fig. 25: Measuring 1st Gear End Play
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly (2nd Gear)

1. Lubricate all components with ATF. Reassemble specified secondary shaft components without "O" rings. See **Fig. 26** . Position dial indicator against 2nd gear. Hold thrust washer against clutch assembly. Measure 2nd gear axial clearance in at least 3 places while moving 2nd gear. See **Fig. 27** . Use average measurement as actual clearance. Specified clearance for 1997 models are .003-.006" (.07-.15 mm) and for 1998-99 models are .002-.005" (.04-.12 mm).
2. If clearance is not as specified, remove splined washer under 2nd gear and measure thickness. Different thickness splined washers are available. Select and install a new splined washer to obtain proper clearance. See **2ND GEAR SPLINED WASHER THICKNESS** table.
3. Once correct thickness splined washer is obtained, lubricate all components with ATF. Reassemble using a NEW lock nut. Before installing NEW "O" rings on secondary shaft, wrap splines with tape.

2ND GEAR SPLINED WASHER THICKNESS

Washer Number (Mark)	Part Number	Thickness - In. (mm)
1	90406-P0Z-000	.193 (4.90)
2	90407-P0Z-000	.195 (4.95)
3	90408-P0Z-000	.197 (5.00)
4	90409-P0Z-000	.199 (5.05)
5	90410-P0Z-000	.201 (5.10)
6	90411-P0Z-000	.203 (5.15)
7	90412-P0Z-000	.205 (5.20)



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Fig. 26: Installed Components For 2nd Gear End Play Check
Courtesy of AMERICAN HONDA MOTOR CO., INC.

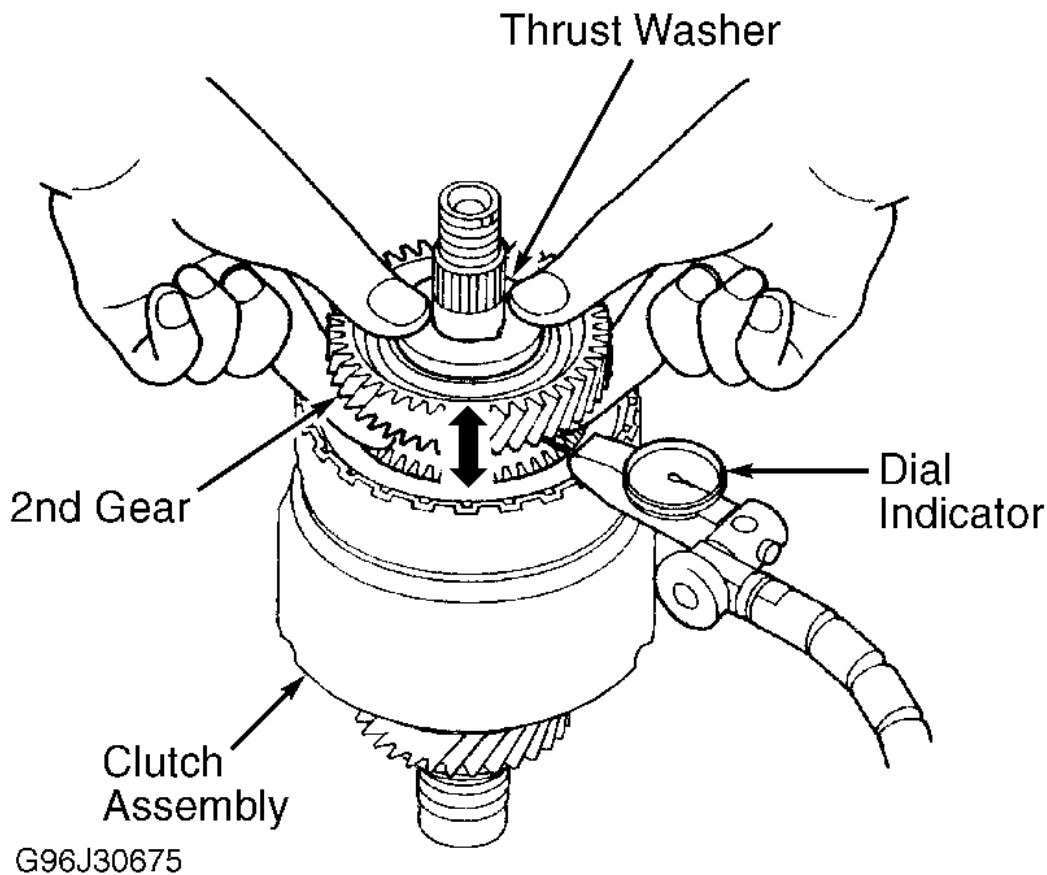


Fig. 27: Measuring 2nd Gear End Play
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

CLUTCH ASSEMBLIES

NOTE: 1998-99 models have 2 types of spring retainers. Some have seal lips and others have removable "O" rings. On seal lip type spring retainers, the seal can NOT be removed.

Disassembly

1. Remove snap ring, clutch end plate, clutch discs and clutch plates. See **Fig. 28**.
2. Remove disc spring from 1st, 3rd and 4th clutches. 2nd clutch does not have a disc spring. Install appropriate clutch spring compressor. Compress return spring and remove snap ring. Release and remove spring compressor. Remove spring retainer and return spring.
3. On 3rd and 4th clutches, wrap shop towel around clutch drum. Apply air pressure to oil passage on clutch drum to remove clutch piston. Remove "O" rings.

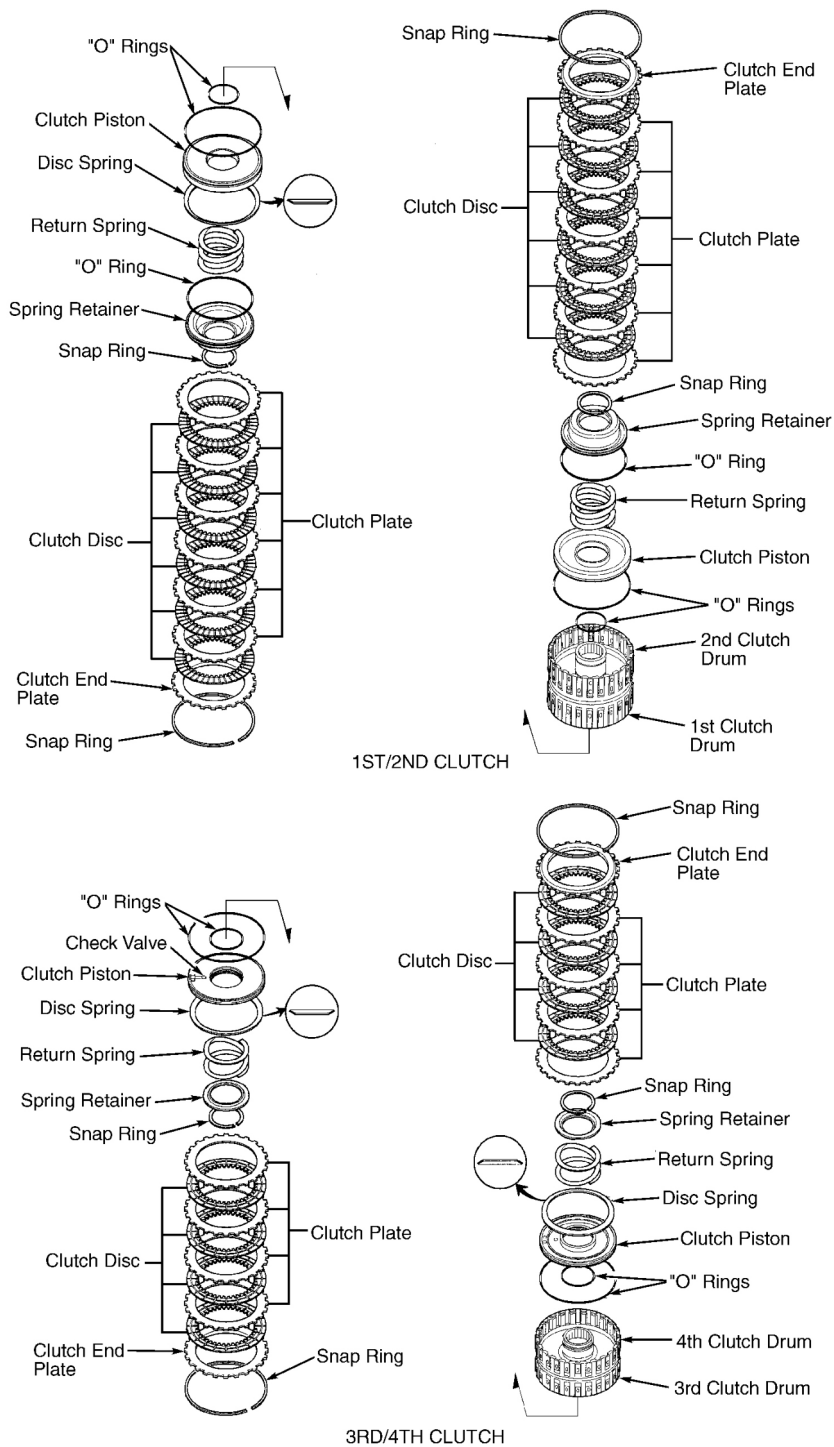


Fig. 28: Exploded View Of Clutch Assemblies
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning & Inspection

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

1. 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.
2. Inspect components for damage. Replace if necessary. Ensure no rough edges are present on "O" ring sealing areas.

Reassembly

NOTE: Coat all components with ATF prior to assembly. Ensure all clutch are soaked in ATF for at least 30 minutes prior to assembly.

1. Install piston in clutch drum, applying pressure and rotating to seat. Install return spring and spring retainer. Position snap ring on retainer. Install appropriate clutch spring compressor. Compress return spring and install snap ring.
2. Remove spring compressor. Install disc spring into clutch drum, except 2nd clutch. Starting with a clutch plate, alternately install clutch plates and discs. Install clutch end plate with flat side toward disc. Install snap ring.
3. Using a dial indicator, measure clearance between clutch end plate and top disc. Zero dial indicator with clutch end plate lowered, and lift up to snap ring for measurement. See **Fig. 29**.
4. Measure clutch clearance at 3 different locations. Clutch clearance should be within specification. See **CLUTCH CLEARANCE SPECIFICATIONS** table.
5. If clutch clearance is not within specification, install different thickness clutch end plate. See appropriate CLUTCH END PLATE THICKNESS table.

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

CLUTCH CLEARANCE SPECIFICATIONS

Application	In. (mm)
1st Clutch	.047-.055 (1.20-1.40)
2nd Clutch	.033-.041 (.85-1.05)
3rd Clutch	.022-.030 (.55-.75)
4th Clutch	.022-.030 (.55-.75)

1ST & 2ND CLUTCH END PLATE THICKNESS

Plate Number	Part Number	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)
8	22558-PX4-003	.110 (2.80)

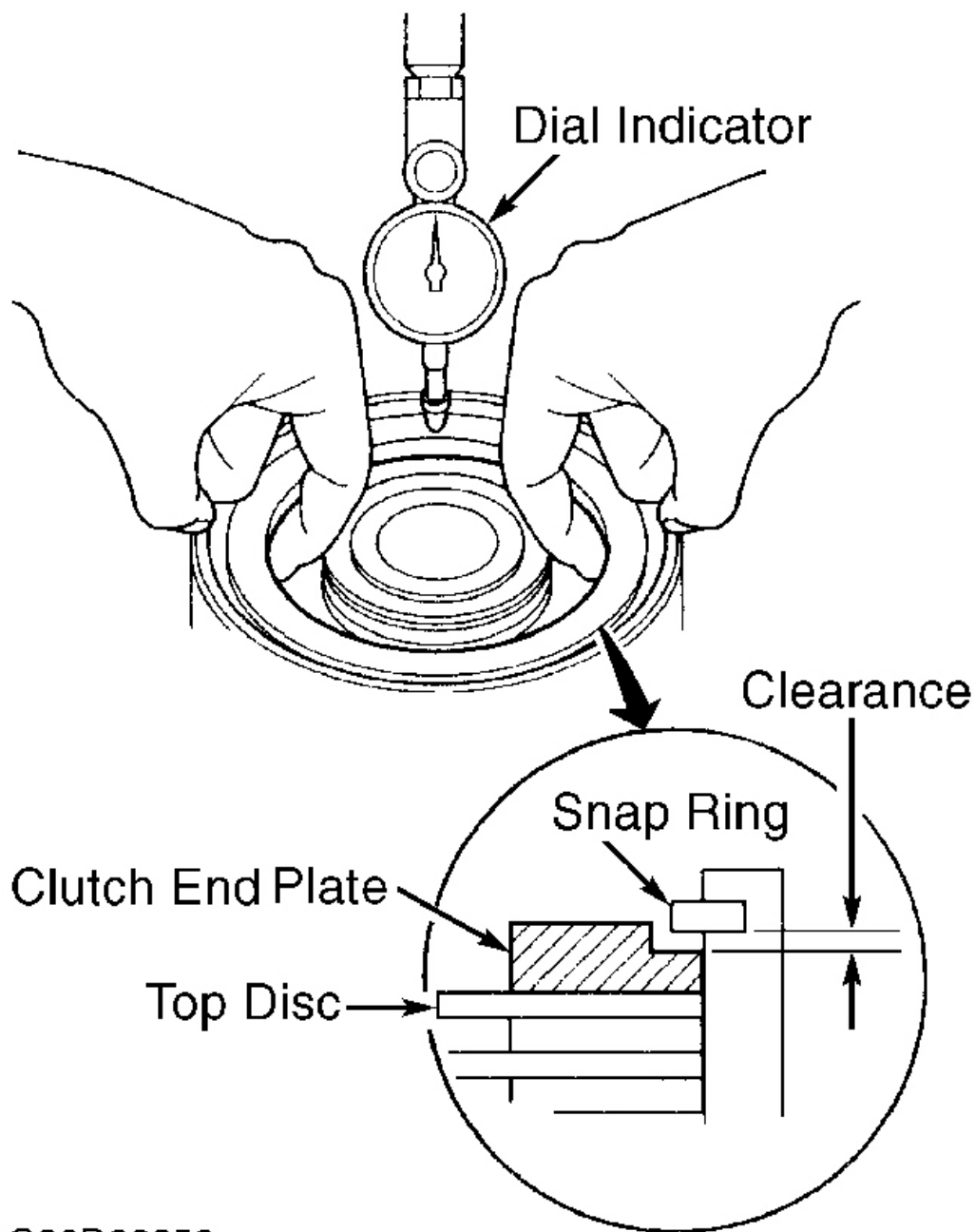
1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

9	22559-PX4-003	.114 (2.90)
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3RD & 4TH CLUTCH END PLATE THICKNESS

Plate Number	Part Number	Thickness - In. (mm)
1	22551-P7Z-003	.102 (2.60)
2	22552-P7Z-003	.106 (2.70)
3	22553-P7Z-003	.110 (2.80)
4	22554-P7Z-003	.114 (2.90)
5	22555-P7Z-003	.118 (3.00)
6	22556-P7Z-003	.122 (3.10)
7	22557-P7Z-003	.126 (3.20)
8	22558-P7Z-003	.130 (3.30)
9	22559-P7Z-003	.134 (3.40)



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Fig. 29: Measuring Clutch End Plate 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. 30** . 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.

CAUTION: Ring gear bolts are LEFT-HAND thread.

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. 31 .

If installing NEW bearings, bearing preload must be checked and adjusted. See **DIFFERENTIAL ASSEMBLY BEARING PRELOAD** under TRANSAXLE REASSEMBLY. Install ring gear and tighten ring gear bolts to 75 ft. lbs. (101 N.m).

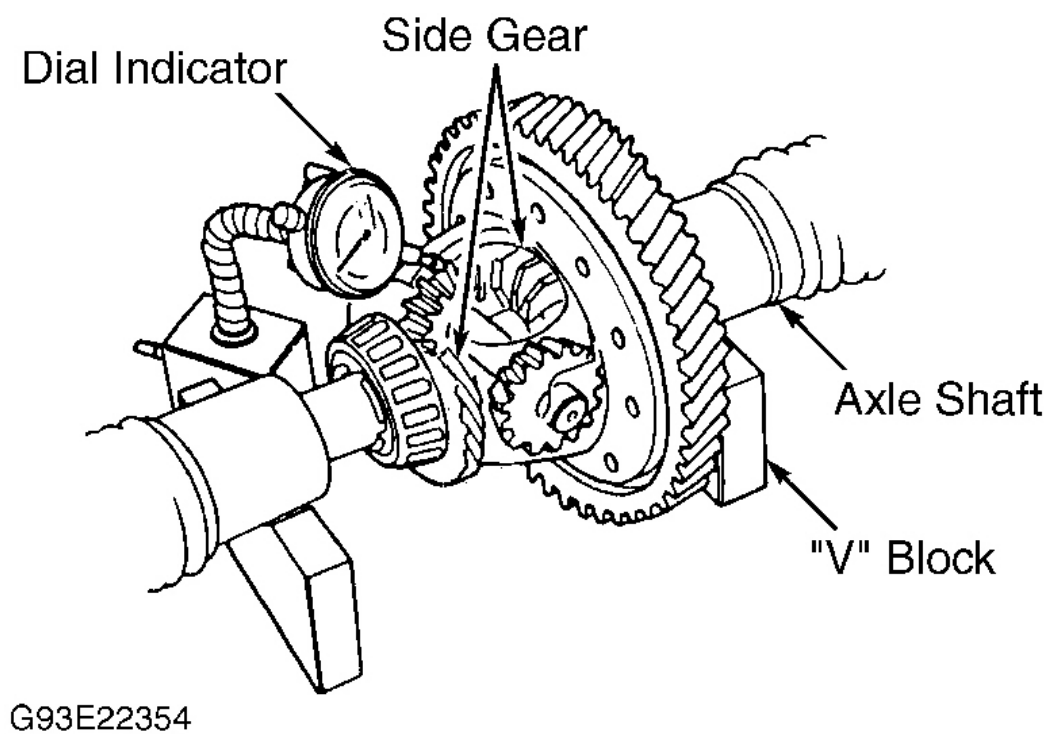


Fig. 30: Checking Side Gear Backlash

Courtesy of AMERICAN HONDA MOTOR CO., INC.

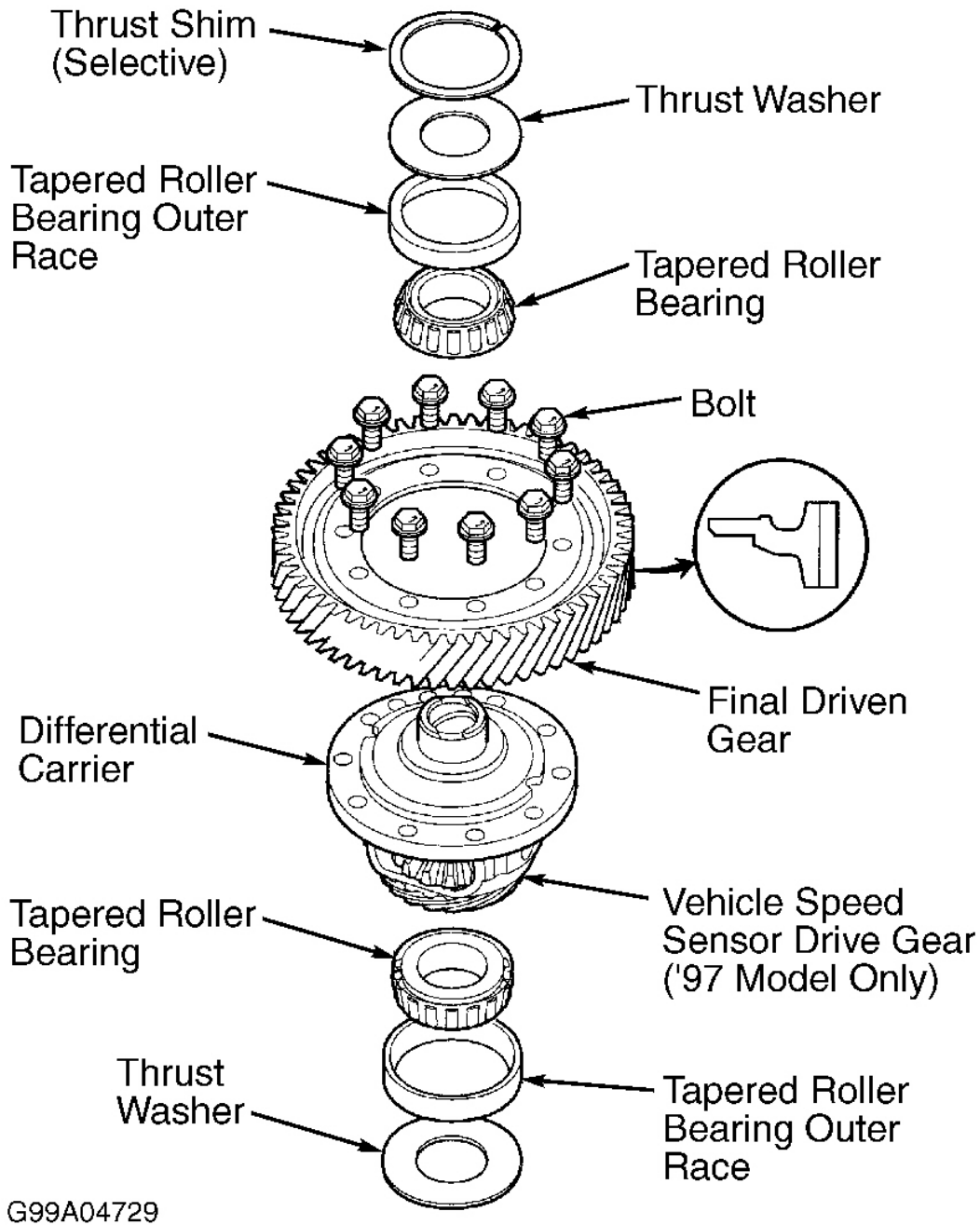


Fig. 31: Exploded View Of Differential Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE CONVERTER HOUSING

Disassembly

1. Remove countershaft bearing from torque converter housing using a slide hammer (if necessary). Remove oil guide plate from torque converter housing.
2. Remove secondary shaft bearing from torque converter housing using a slide hammer (if necessary). Remove oil guide plate from torque converter housing.
3. Remove oil seal and mainshaft bearing as an assembly from torque converter housing using a slide hammer (if necessary).
4. If removing differential bearing outer race from torque converter housing, tap bearing race from torque converter housing. Using a 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 a hammer and bearing remover/installer to install bearing until bearing bottoms in torque converter housing.
2. Using a hammer and oil seal installer, install NEW mainshaft oil seal in torque converter housing. Oil seal should be flush with torque converter housing surface.
3. To install countershaft bearing, install 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). Ensure oil guide is installed to a depth of 0-.001" (0-.03 mm), below housing surface.
4. Using a hammer and bearing installer, install countershaft bearing into torque converter housing. To install secondary shaft bearing, install 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 is facing upward (away from torque converter housing surface). Ensure oil guide is installed to a depth of 0-.001" (0-.03 mm), below surface. Using a hammer and bearing installer, install secondary shaft bearing into torque converter housing.
6. Using driver, install thrust washer and differential bearing outer race. Ensure outer race bottoms in torque converter housing. To install differential oil seal, use a hammer and oil seal installer. Install NEW oil seal into torque converter housing until oil seal is fully seated.

TRANSAXLE HOUSING

Disassembly

1. Expand snap ring and press mainshaft, countershaft and secondary shaft bearings from transaxle housing. Using a hammer and drift, tap differential oil seal from transaxle housing.

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

2. If removing differential bearing outer race, use heat gun to heat transaxle housing around differential

bearing outer race to 212°F (100°C).

3. Tap differential bearing outer race from transaxle housing. Remove thrust washer and 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 and thrust washer. Using a hammer and bearing race installer, install differential bearing outer race in transaxle housing.
2. To install mainshaft, countershaft and secondary shaft bearings, 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" (0-7.00 mm). If snap ring end gap is not within specification, reseal or replace snap ring.

CAUTION: **Ensure bearings are installed with groove of bearing facing inside of transaxle housing so snap ring engages in bearing when bearing is fully installed. Ensure snap ring fully engages in bearing.**

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

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 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 and thrust washer, located below differential bearing outer race, from transaxle housing.
2. Allow transaxle housing to cool to room temperature. Select thrust shim so total thickness of thrust shim

is .102" (2.60 mm). See **THRUST SHIM SPECIFICATIONS** table. Whenever outer race is replaced, replace tapered roller bearing.

CAUTION: DO NOT use thrust shim on torque converter housing side of transaxle.

THRUST SHIM SPECIFICATIONS

ID Letter	Part Number	Thickness - In. (mm)
S	41438-PX4-700	.081 (2.05)
T	41439-PX4-700	.083 (2.10)
U	41440-PX4-700	.085 (2.15)
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 and thrust washer in transaxle housing. Using a hammer and bearing race installer, install differential bearing outer race in transaxle housing. Ensure differential bearing outer race is fully seated in transaxle housing.
4. Install gasket and dowel pins 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-to-torque converter housing bolts to 33 ft. lbs. (44 N.m) in sequence. See **Fig. 32** . Rotate differential assembly several revolutions in both directions to seat bearings.

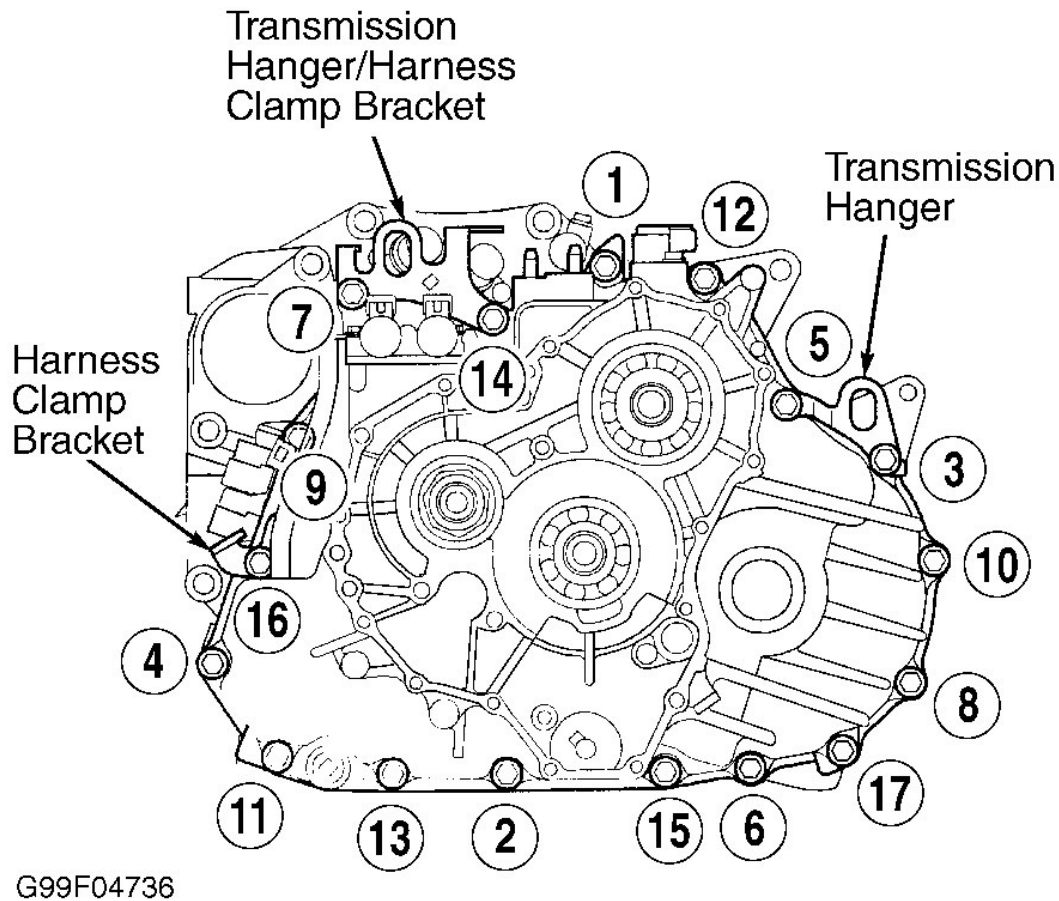


Fig. 32: Transaxle Housing Bolt Tightening Sequence
Courtesy of AMERICAN HONDA MOTOR CO., INC.

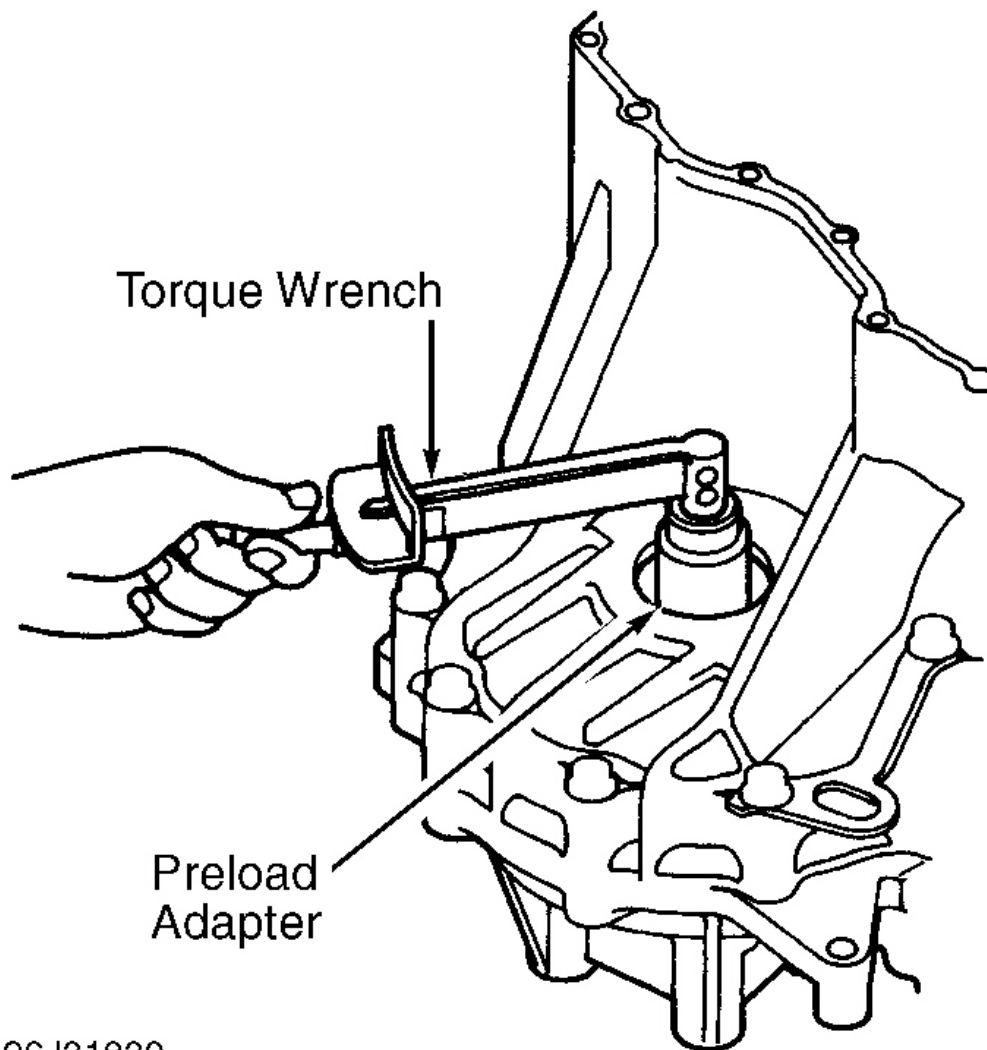
6. Install Preload Adapter (07HAJ-PK40201) into differential assembly. See **Fig. 33** . Install INCH-lb. torque wrench on preload adapter. Measure differential assembly bearing preload by checking starting torque required to rotate differential assembly in both directions at room temperature.
7. Differential 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) 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 to the next size will increase or decrease 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 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 a hammer and bearing race installer, install differential bearing outer race in transaxle housing.
11. 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.



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Fig. 33: 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 differential bearing outer races are replaced, differential assembly bearing preload must be checked. See DIFFERENTIAL ASSEMBLY BEARING PRELOAD under TRANSAXLE REASSEMBLY.

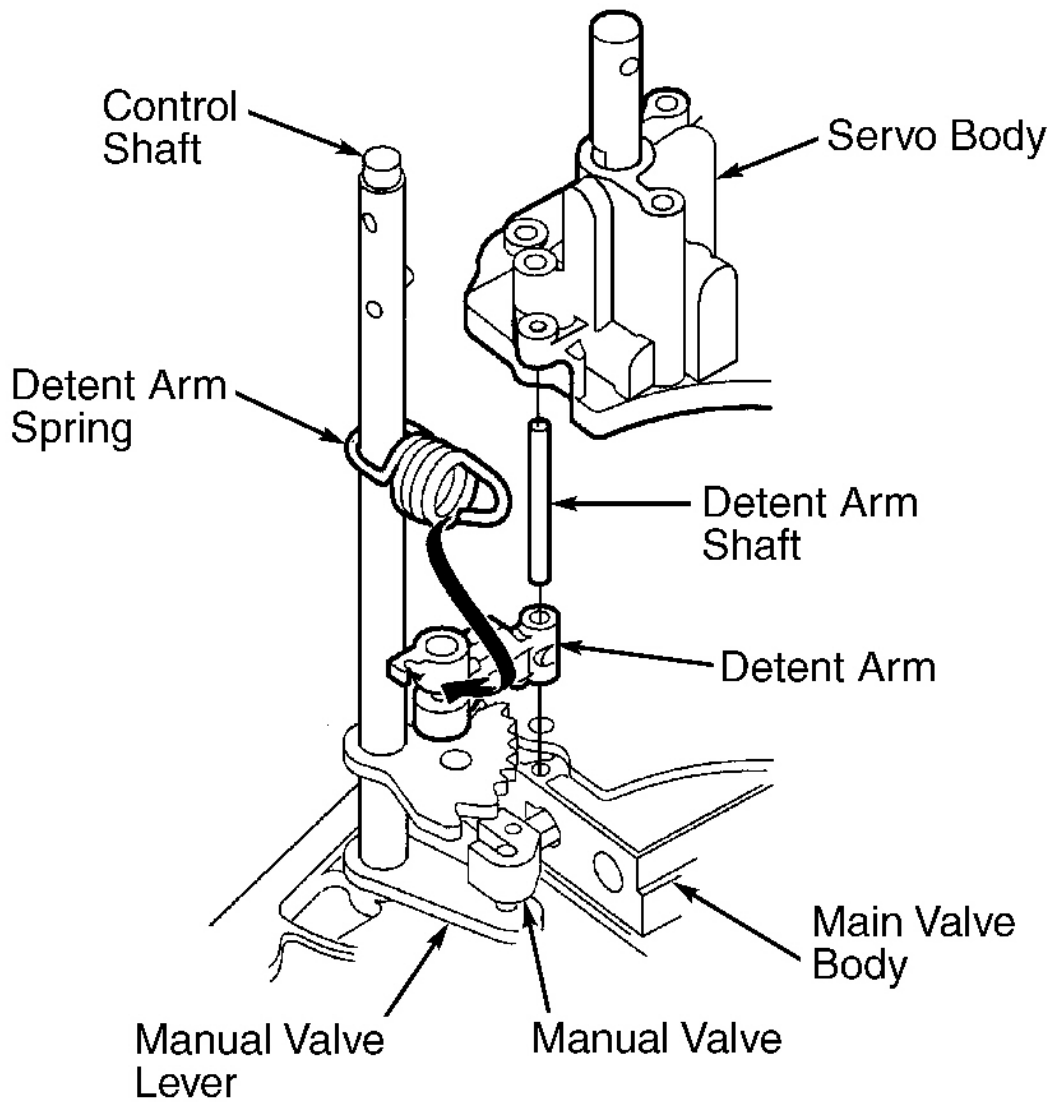
NOTE: Coat all components with ATF before reassembly.

CAUTION: Ensure oil pump driven gear is installed with groove and chamfered side facing downward (toward main separator plate).

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 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.

2. Install torque converter check valve and spring. See **Fig. 14** . 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** .
3. Install cooler check valve and spring. Install dowel pins and regulator separator plate. Install stator shaft, NEW "O" ring and stop shaft. Install regulator valve body and 8 bolts on main valve body.
4. Install dowel pins and servo separator plate on main valve body. Install control shaft in torque converter housing. Align control shaft with manual valve lever. Install detent arm and arm shaft in main valve body. Hook detent spring to detent arm. See **Fig. 34** .



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Fig. 34: Installing Manual Valve, Detent Arm & Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install servo body and valve clip, if equipped. Install accumulator cover, ATF strainer, servo detent base and accumulator body. Tighten bolts to specification.
6. Install 2 oil feed pipes in servo body, 4 oil feed pipes in regulator valve body and one suction pipe in accumulator body.
7. Install differential assembly, countershaft sub-assembly, mainshaft sub-assembly and secondary shaft sub-assembly in torque converter housing. Rotate shift fork shaft on servo body so large chamfered hole

aligns with hole in shift fork.

8. Install shift fork bolt and reverse selector hub on shift fork shaft and countershaft as an assembly. Install NEW bolt lock and washer on shift fork. Tighten bolt to specification. Bend over tabs on bolt lock.
9. Install needle bearing, countershaft reverse gear and countershaft 2nd gear on countershaft. Install thrust washer for reverse idler gear in transaxle housing. Ensure thrust washer is installed in correct direction. See [Fig. 35](#).

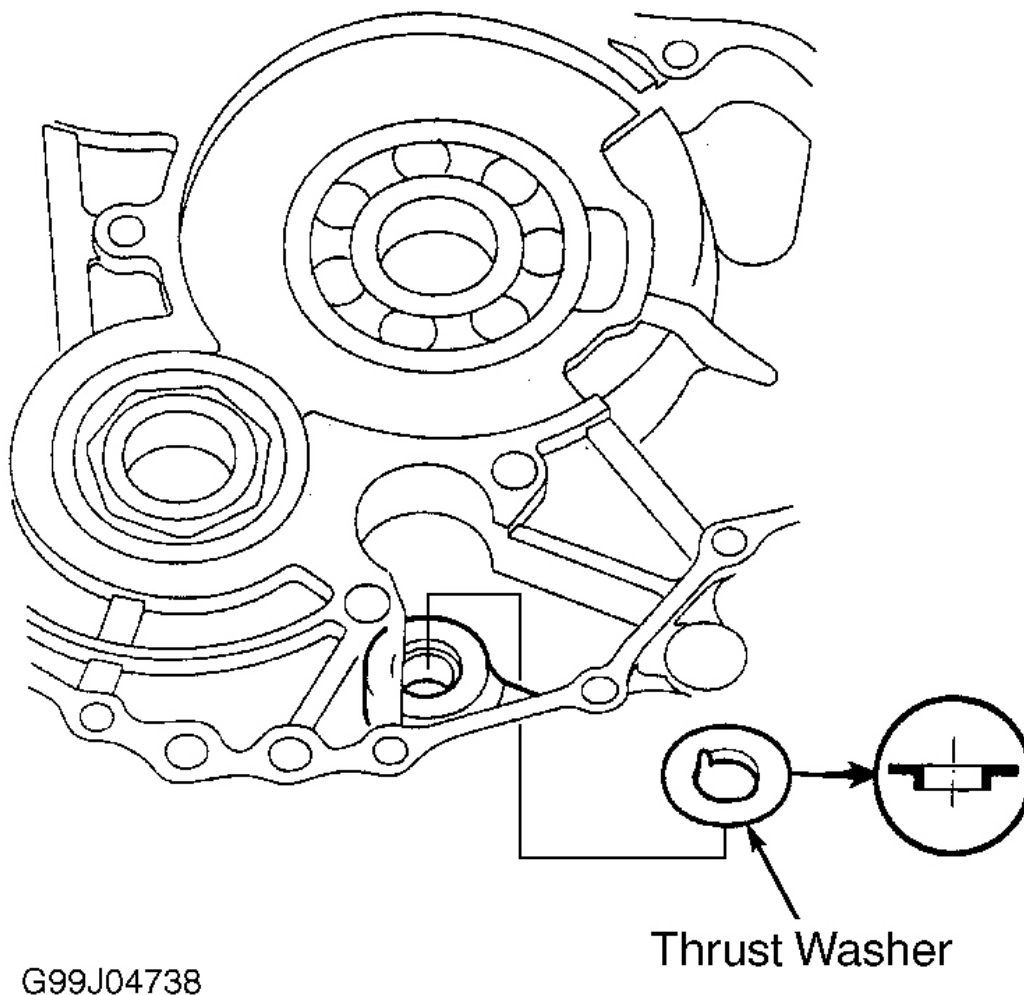
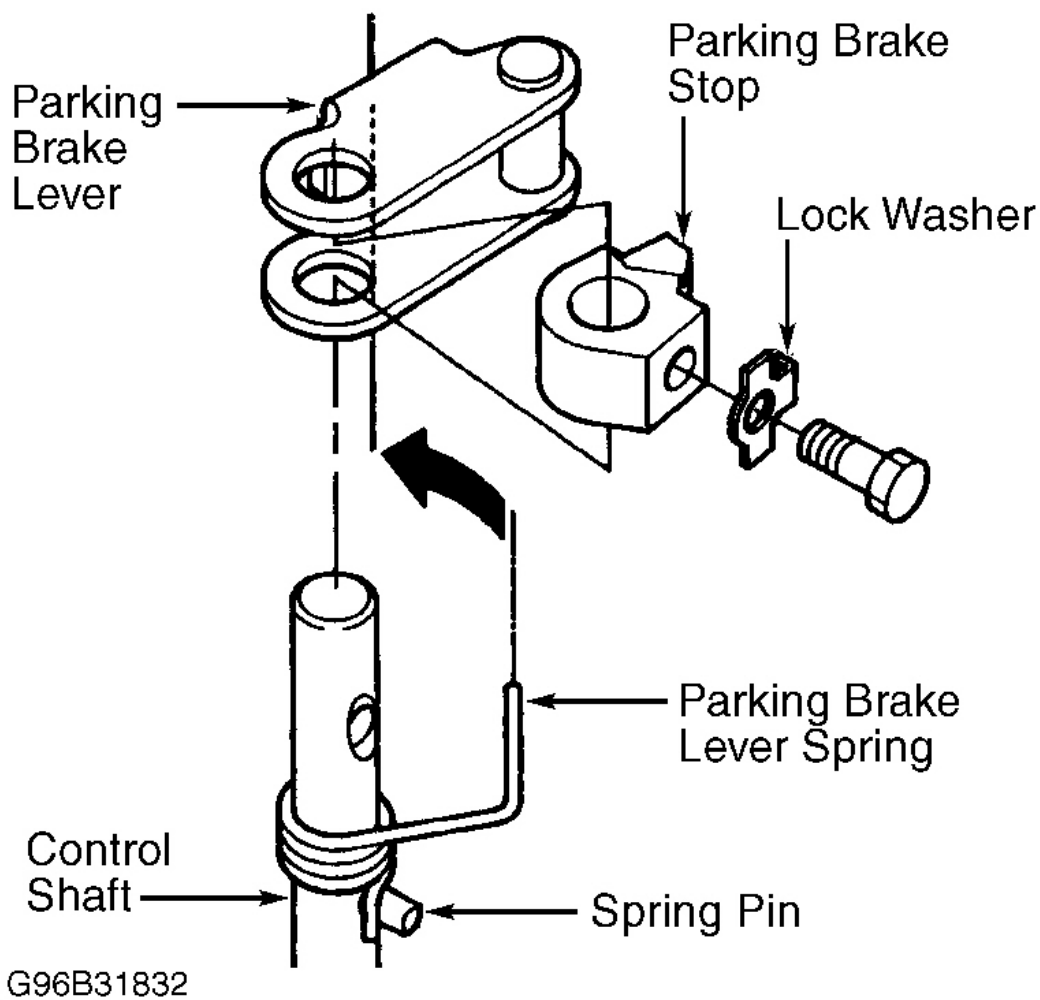


Fig. 35: Installing Reverse Idler Gear Thrust Washer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install reverse idler gear in transaxle case with largest chamfered area facing upward (away from transaxle housing). See [Fig. 10](#). Align spring pin with groove in transaxle housing by rotating control shaft. See [Fig. 11](#).

11. Install dowel pins and NEW gasket on torque converter housing. Install transaxle housing on torque converter housing. Install and tighten bolts to specification in sequence using several steps. See **Fig. 32**.
12. Engage reverse idler gear with countershaft reverse gear and mainshaft reverse gear. Coat reverse idler gear shaft and needle bearings with grease. Install needle bearings, reverse idler gear shaft and thrust washer in reverse idler gear.
13. Install reverse idler gear shaft holder on transaxle housing. Install and tighten bolts to specification. Install parking brake lever on control shaft. See **Fig. 36**. Install bolt and NEW lock washer on parking brake lever. DO NOT tighten bolt at this time.



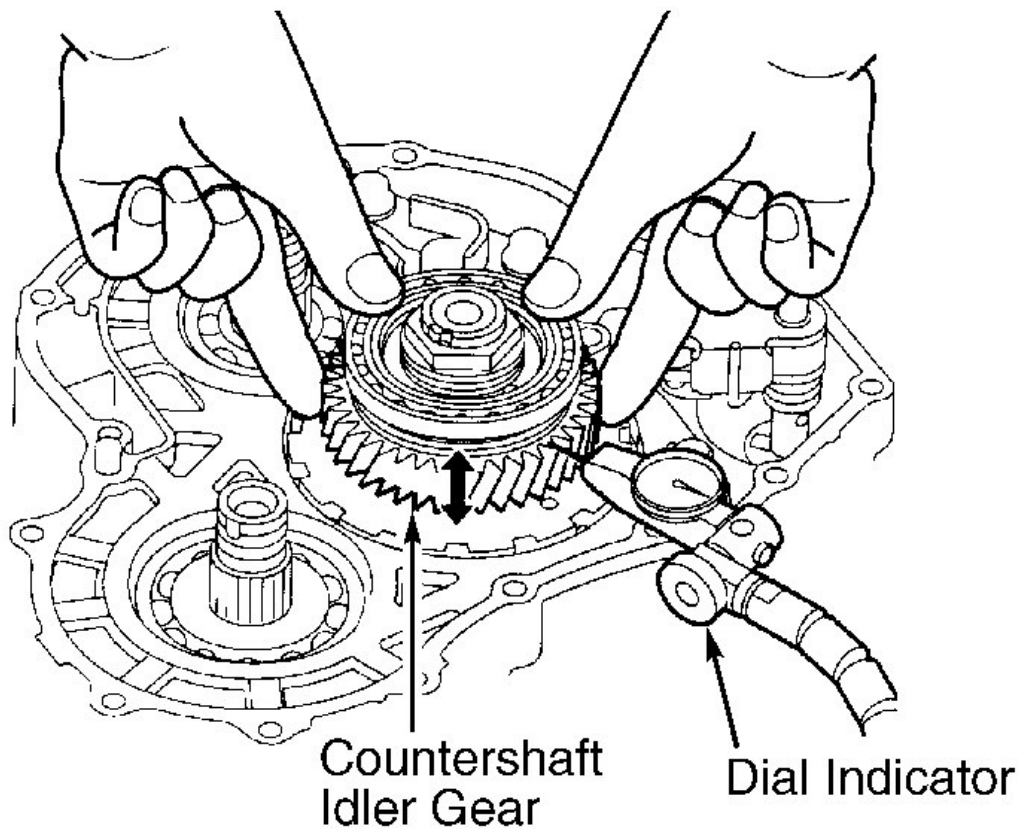
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Fig. 36: Installing Parking Brake Lever Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: Countershaft lock nut has LEFT-HAND threads. DO NOT use impact to

tighten lock nut.

14. Coat countershaft splines, used lock nut, conical spring washer and countershaft threads with ATF. Install parking gear on countershaft using old lock nut and a collar. Engage parking pawl with parking gear. Tighten lock nut until countershaft splines appear above park gear.
15. Remove used lock nut and collar. Install bearing hub/bearing assembly and used conical spring washer. Tighten used lock nut to 166 ft. lbs. (226 N.m) to seat park gear. Remove used lock nut and conical spring washer.
16. Using a puller, remove bearing hub/bearing assembly. Install thrust needle bearing, needle bearing, countershaft idler gear, thrust needle bearing, bearing hub/bearing assembly, and used conical spring washer on countershaft. See **Fig. 5** . Tighten used lock nut to 166 ft. lbs. (226 N.m) to seat bearing hub/bearing assembly.
17. Using dial indicator, measure countershaft idler gear axial clearance. See **Fig. 37** . Zero dial indicator with countershaft idler gear in resting position, and then lift countershaft idler gear upward. Distance measured is countershaft idler gear axial clearance.



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Fig. 37: Measuring Countershaft Idler Gear Axial Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

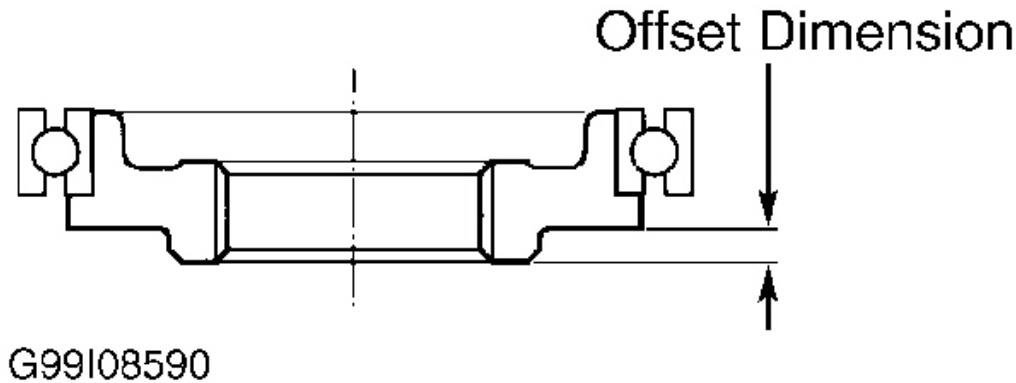


Fig. 38: Identifying Selective Portion (Snout) Of Bearing Hub/Bearing Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. If clearance is not .0006-.0018" (.015-.045 mm), using a puller, remove bearing hub/bearing assembly. Select and install appropriate bearing hub/bearing assembly. See **BEARING HUB/BEARING ASSEMBLY SPECIFICATIONS** table. Recheck countershaft idler gear axial clearance.

BEARING HUB/BEARING ASSEMBLY SPECIFICATIONS

ID	Part Number	(1) Offset Dimension - In. (mm)
A	90520-P6H-000	.1379 (3.503)
B	90521-P6H-000	.1374 (3.490)
C	90522-P6H-000	.1369 (3.477)
D	90523-P6H-000	.1364 (3.464)

(1) Thickness of bearing hub/bearing assembly snout, see **Fig. 38**.

NOTE: DO NOT use impact wrench to tighten lock nut.

19. Remove used lock nut and conical spring washer from countershaft. Install Mainshaft Holder (07GAB-PF50100 or 07GAB-PF50101) on mainshaft to secure mainshaft from rotating. See **Fig. 6**. Install mainshaft idler gear on mainshaft.
20. Coat mainshaft splines, secondary shaft splines, idler gears, used lock nuts, conical spring washers, mainshaft threads and secondary shaft threads with ATF. Install used conical spring washer on mainshaft. Tighten used lock nut to 166 ft. lbs. (226 N.m).

NOTE: Secondary shaft lock nut has LEFT-HAND threads.

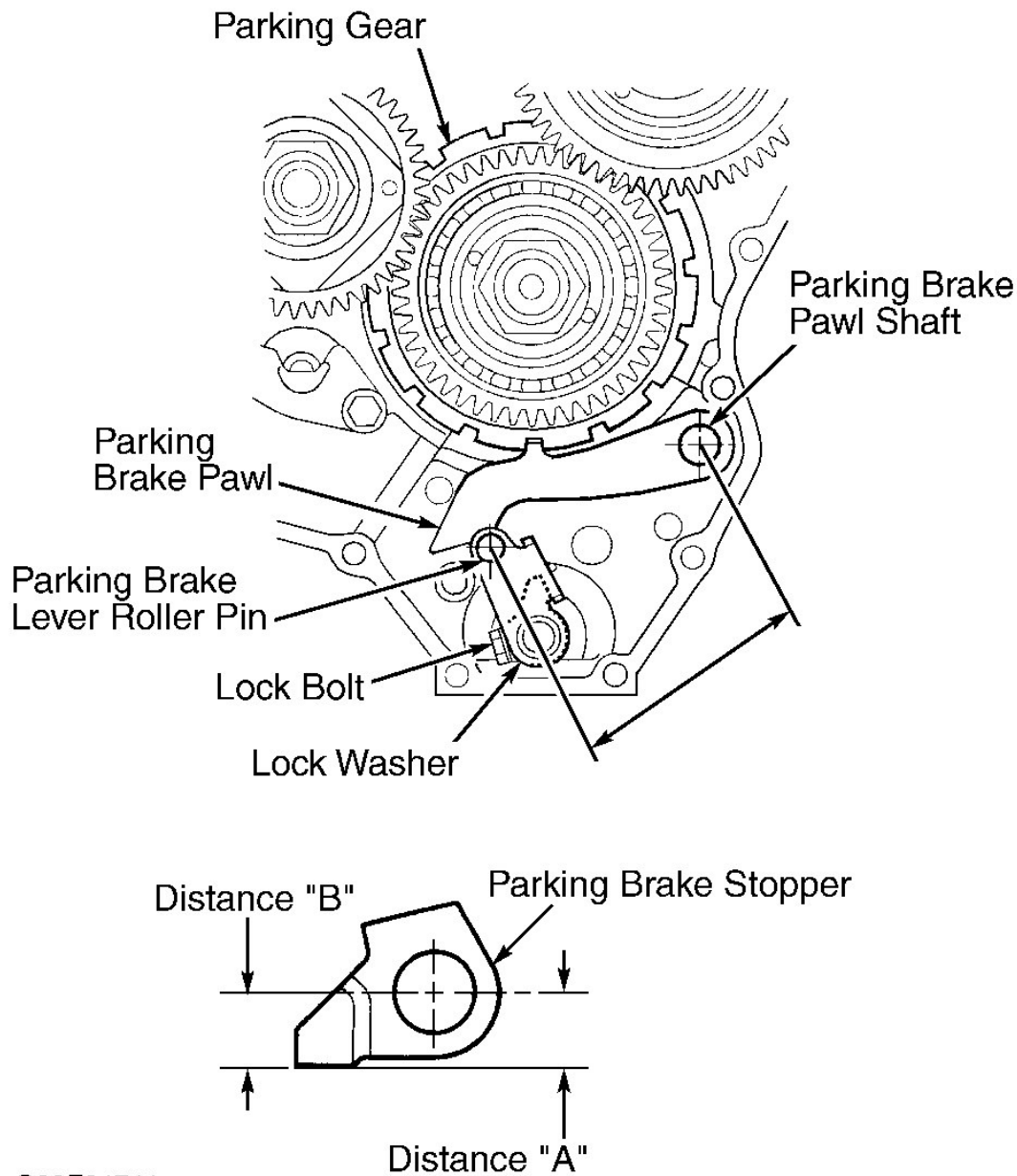
21. Install secondary shaft idler gear and used conical spring washer on secondary shaft. Tighten used lock nuts to 166 ft. lbs. (226 N.m) to seat idler gears. Remove used lock nuts and conical spring washers from mainshaft and secondary shaft.
22. Coat new lock nut, conical spring washers and shaft threads with ATF. Install new lock nuts and conical spring washers on all 3 shafts. Ensure conical spring washers are installed so large area of spring washer is against lock nut. Tighten all lock nuts to 123 ft. lbs. (167 N.m). Stake all lock nuts against shaft.
23. 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. 39** .
24. 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. 39** .
25. Parking brake stop is available in different sizes. See **PARKING BRAKE STOP SPECIFICATIONS** table. Tighten parking brake lever bolt to specification. Bend over tabs on bolt lock.

PARKING BRAKE STOP SPECIFICATIONS⁽¹⁾

ID	Part Number	Distance "A" - In. (mm) ⁽¹⁾	Distance "B" - In. (mm) ⁽¹⁾
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) Measured from center of parking brake stop. See Fig. 39 .			

26. Using NEW gasket, install right side cover. Install and tighten bolts to specification. 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: Flush oil cooler if a transaxle failure was present. See OIL COOLER FLUSHING under ON-VEHICLE SERVICE.



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Fig. 39: Measuring Parking Brake Stop Distance & Parking Brake Stop
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

Countershaft Lock Nut	123 (167)
Drain Plug	36 (49)
Drive Plate Bolts	55 (74)
Joint Bolt	21 (29)
Main Valve Body Bolt	
6-mm Bolt	(1)
8-mm Bolt	13 (18)
Mainshaft Lock Nut	123 (167)
Pressure Tap Plug	13 (18)
Reverse Idler Gear Shaft Holder Bolt	19 (26)
Ring Gear Bolt	75 (101)
Secondary Shaft Lock Nut	123 (167)
Transaxle Housing Bolt ⁽²⁾	33 (44)
INCH Lbs. (N.m)	
Accumulator Body Stop Bolt	106 (12.0)
A/T Clutch Pressure Control Solenoid Valve A/B Assembly	106 (12.0)
ATF Strainer Bolt	106 (12.0)
Countershaft Speed Sensor Bolt	106 (12.0)
Left Side Cover Bolt	106 (12.0)
Lock-Up Control Solenoid Valve Assembly Bolt	106 (12.0)
Mainshaft Speed Sensor Bolt	106 (12.0)
Parking Brake Lever Bolt	120 (14.0)
Regulator Valve Body Bolt	106 (12.0)
Servo Body Bolt	106 (12.0)
Servo Detent Base Bolt	106 (12.0)
Shift Control Solenoid Valve Assembly Bolt	106 (12.0)
Shift Control Solenoid Valve "B" Or "C" Bolt	106 (12.0)
Shift Fork Bolt	120 (14.0)
(1) Tighten bolt to 106 INCH lbs. (12.0 N.m).	
(2) Tighten bolts to specification in sequence. See Fig. 32 .	

TRANSAXLE SPECIFICATIONS**TRANSAXLE SPECIFICATIONS**

Application	Specification
Clutch Clearance	
1st Clutch	.047-.055" (1.20-1.40 mm)
2nd Clutch	.033-.041" (.85-1.05 mm)
3rd Clutch	.022-.030" (.55-.75 mm)
4th Clutch	.022-.030" (.55-.75 mm)

1997 Acura 3.0CL

1997-99 AUTOMATIC TRANSMISSIONS Acura B7ZA, M7ZA & Honda B7XA Overhaul

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	
Pump Drive Gear	.0083-.0104" (.210-.265 mm)
Pump Driven Gear	.0041-.0085" (.106-.217 mm)
Thrust Clearance	
Standard	.0010-.0020" (.030-.050 mm)
Wear Limit	.0028" (.070 mm)
Secondary Shaft 1st Gear Clearance	.003-.006" (.07-.15 mm)
Secondary Shaft 2nd Gear Clearance	
1997	.003-.006" (.07-.15 mm)
1998-1999	.002-.006" (.04-.15 mm)
Differential Side Gear Backlash	.002-.006" (.05-.15 mm)
Parking Brake Stop Distance	2.88-2.92" (73.2-74.2 mm)
4th Clutch Hub-To-Mainshaft End Play	.001-.004" (.03-.11 mm)

(1) This is the starting torque required to rotate differential assembly.