

1995 Acura 2.5TL

1995-98 AUTOMATIC TRANSMISSIONS M1WA Overhaul

1995-98 AUTOMATIC TRANSMISSIONS

M1WA Overhaul

APPLICATION

TRANSAXLE APPLICATION

Vehicle	Transmission
2.5TL	M1WA

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.

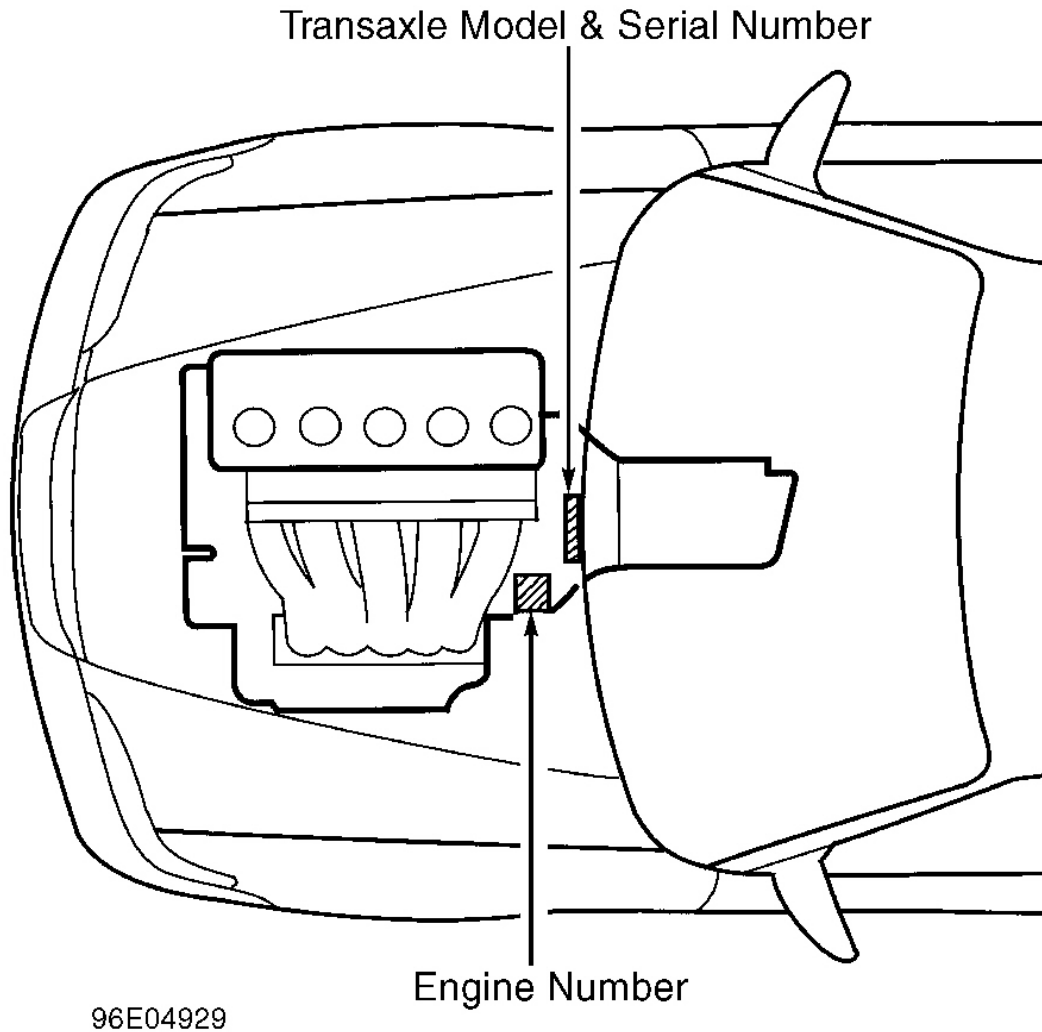


Fig. 1: Locating Transaxle Model & Serial Number
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DESCRIPTION

Automatic transaxle is electronically controlled with 4 forward speeds and one reverse speed. Transaxle consists of clutches, mainshaft, countershaft, shift control solenoid valves, lock-up control solenoid valves, linear solenoid and lock-up torque converter. See **Fig. 2**. Transaxle has a differential assembly bolted to the transaxle. Power is delivered from transaxle to the differential assembly by the extension shaft. See **Fig. 2**.

Lower valve body assembly consists of main valve body, servo body, shift control solenoid valves and oil pass body. Lower valve body is bolted to transaxle housing. Other valve bodies are, regulator valve body, oil pump body, 2nd accumulator body and throttle valve body. These bodies are bolted to torque converter housing.

Transaxle shifting and torque converter lock-up are controlled by the Transmission Control Module (TCM). Transaxle shifting is related to engine torque through the linear solenoid used to operate the throttle valve. The TCM controls the linear solenoid located on the throttle valve body. The TCM determines appropriate shift point and activates proper shift control solenoid valve for transaxle shifting.

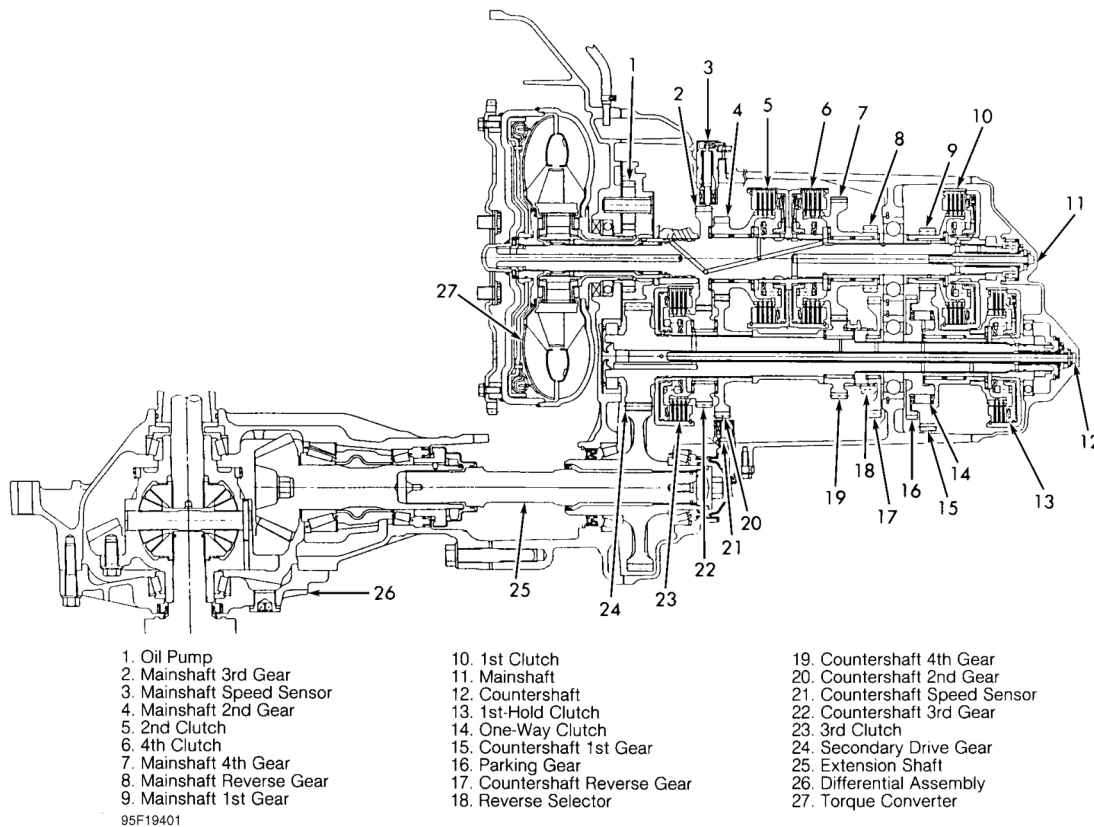


Fig. 2: Identifying Transaxle Components

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 the A/T gear position switch, mounted on the transaxle. The A/T gear position switch delivers an input signal to TCM indicating shift lever position. The TCM uses this input signal for controlling shift control solenoid valves. The TCM determines appropriate shift point and activates proper shift control solenoid valve for transaxle shifting.

GEAR SELECTIONS

When transaxle gear combinations are engaged by clutches, power is transmitted from mainshaft to countershaft 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, operates back-up lights.

"N" (Neutral)

All clutches are released. Neutral position switch, incorporated in A/T gear position switch allows engine starting in this position.

"D4" (Drive)

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 this range, TCM sends signal to operate torque converter lock-up.

"D" (Drive)

Transaxle starts in 1st gear and upshifts automatically to 2nd gear and then 3rd gear. Transaxle will downshift through all gears on deceleration. When in 3rd gear in this range, 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.

TORQUE CONVERTER CLUTCH OPERATION

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. Torque converter lock-up is controlled by the TCM. The TCM receives various input signals and operates lock-up control solenoid valves.

The TCM contains a self-diagnostic system, which stores a fault code if a failure or problem exists in transaxle electronic control system. Fault code 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 the shift and key interlock systems, see appropriate 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 appropriate ELECTRONIC CONTROLS article.

LUBRICATION & ADJUSTMENTS

See appropriate SERVICING article.

ON-VEHICLE SERVICE

AXLE SHAFTS

See appropriate AXLE SHAFTS article in DRIVELINE/AXLES.

DIFFERENTIAL ASSEMBLY

Differential assembly may be removed from vehicle with transaxle in the vehicle. See **DIFFERENTIAL ASSEMBLY** under REMOVAL & INSTALLATION.

LOWER VALVE BODY ASSEMBLY

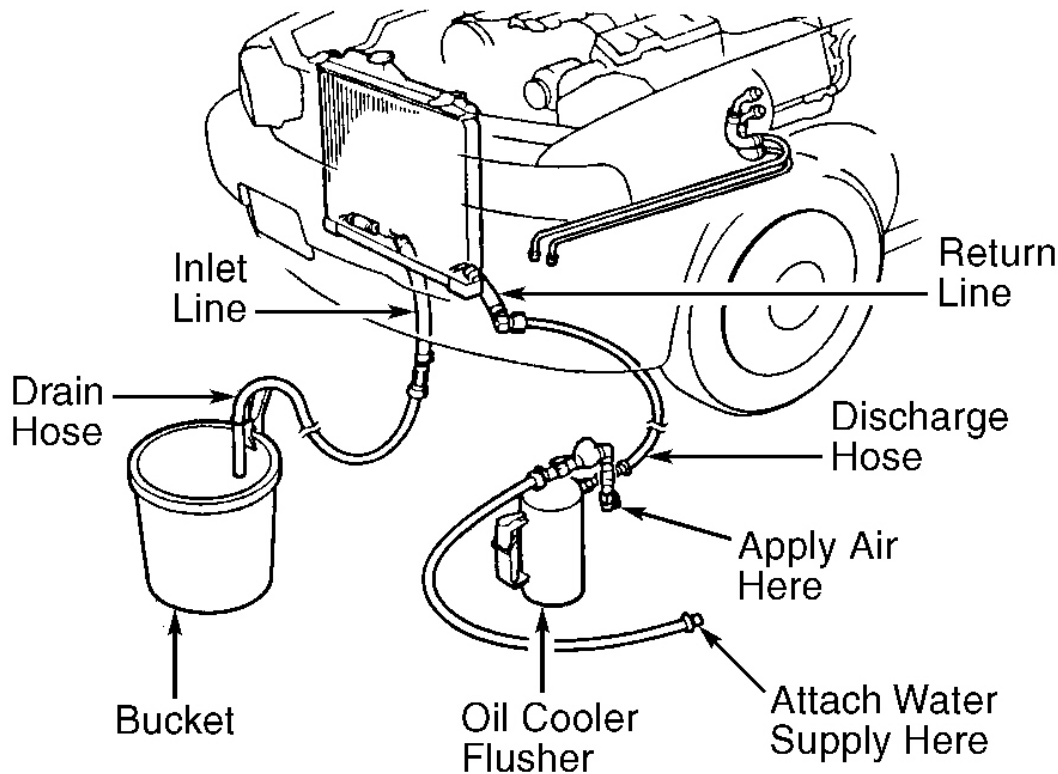
Lower valve body assembly consists of main valve body, servo body, shift control solenoid valves and oil pass body. See **LOWER VALVE BODY ASSEMBLY** under REMOVAL & INSTALLATION.

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 turned 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 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 Dexron-II 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.



93E23667

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** in this article. Refer to the following symptoms and check the specified components:

SYMPTOM DIAGNOSIS

Excessive Drag In Transaxle

- Binding Oil Pump

Excessive Idle Vibration

- Defective Torque Converter Or Oil Pump
- Incorrect Idle RPM
- Lock-Up Shift Valve Stuck

Excessive Vibration (RPM Related)

- Torque Converter Not Fully Seated In Oil Pump

Flares On 1-2 Upshift

- Defective Linear Solenoid
- Defective One-Way Clutch
- Defective 2nd Accumulator
- Improper Throttle Valve Adjustment
- Throttle Valve Stuck
- 1-2 Shift Valve Stuck

Flares On 2-3 Upshift

- Defective Linear Solenoid
- Defective One-Way Clutch
- Defective 3rd Accumulator
- Feedpipe "O" Ring Damaged
- Improper Throttle Valve Adjustment
- Throttle Valve Stuck
- 2-3 Shift Valve Stuck

Flares On 3-4 Upshift

- Defective Linear Solenoid
- Defective 4th Accumulator
- Feedpipe "O" Ring Damaged
- Improper Throttle Valve Adjustment
- Throttle Valve Stuck
- 3-4 Orifice Control Valve Stuck
- 3-4 Shift Valve Stuck

Gear Whine That Changes With Shifts

- Defective 1st Clutch
- Defective 3rd Gears

Gear Whine That Changes With Speed

- Defective Differential Gears

Harsh Downshift At Closed Throttle

- Throttle Valve Stuck

Harsh Kickdown Shifts

- Clutch Pressure Control Valve Stuck
- Defective Linear Solenoid
- Improper Throttle Valve Adjustment
- 3rd Or 4th Kickdown Valve Stuck

Harsh Shift When Manually Shifting To "1"

- Defective 1st-Hold Accumulator

Harsh Upshifts & Downshifts

- Check Balls Missing
- Clutch Pressure Control Valve Stuck
- Defective Linear Solenoid
- Improper Throttle Valve Adjustment
- Improper Type ATF
- Incorrect Clutch Clearance
- Throttle Valve Stuck
- 2-3 Or 3-4 Orifice Control Valve Stuck

Harsh 1-2 Upshift

- Defective 2nd Clutch
- Improper Throttle Valve Adjustment

Harsh 2-1 Kickdown Shift

- Clutch Pressure Control Valve Stuck
- Defective One-Way Clutch Or 1st Clutch

Harsh 2-3 Upshift

- Clutch Pressure Control Valve Stuck
- Defective 3rd Clutch
- Improper Throttle Valve Adjustment
- 2-3 Orifice Control Valve Stuck

Harsh 3-4 Upshift

- Clutch Pressure Control Valve Stuck
- Defective 4th Clutch
- Improper Throttle Valve Adjustment
- 3-4 Orifice Control Valve Stuck

Lock-Up Clutch Does Not Lock Up Smoothly

- Defective Torque Converter
- Lock-Up Control Valve Stuck
- Lock-Up Shift Valve Stuck

Lock-Up Clutch Does Not Operate Properly

- Defective Linear Solenoid
- Improper Throttle Valve Adjustment
- Lock-Up Control Valve Stuck
- Lock-Up Shift Valve Stuck
- Lock-Up Timing Valve Stuck
- Throttle Valve Stuck
- Torque Converter Check Valve Stuck

No Engine Braking In "1"

- Defective 1st Or 1st-Hold Clutch

No Engine Braking In "2"

- Defective 2nd Clutch
- Defective One-Way Clutch

Noise From Transaxle In All Gears

- Defective Oil Pump
- Defective Torque Converter

Noise From Transaxle With Wheels Rolling

- Damaged Reverse Gears
- Defective Differential Assembly Or Secondary Gears

Popping Noise When Taking Off In "R"

- Damaged Reverse Gears
- Worn Reverse Selector

Ratcheting Noise When Shifting To "R"

- Damaged Reverse Gears
- Defective Oil Pump
- Pressure Regulator Stuck
- Worn Reverse Selector

Ratcheting Noise When Shifting From "R" To "P" Or "N"

- Damaged Reverse Gears
- Damaged 4th Gears
- Shift Fork Bent
- Worn Reverse Selector

Shifts Erratically

- Improperly Installed Springs Or Valves
- 3rd Kickdown Valve Stuck

Slips In All Gears

- Defective Oil Pump
- Fluid Strainer Clogged
- Pressure Regulator Stuck

Slips In Reverse

- Defective 4th Clutch
- Servo Valve Stuck
- Worn Reverse Selector Or Reverse Gears

Slips In 1st Gear

- Defective One-Way Clutch
- Defective 1st Clutch Or 1st Accumulator

- Feedpipe "O" Ring Damaged

Slips In 2nd Gear

- Clutch Pressure Control Valve Stuck
- Defective One-Way Clutch
- Defective Seal Rings Or Guide
- Defective 2nd Clutch Or 2nd Accumulator
- 2-3 Shift Valve Stuck

Slips In 3rd Gear

- Clutch Pressure Control Valve Stuck
- Defective 3rd Clutch Or 3rd Accumulator
- Feedpipe "O" Ring Damaged
- 3-4 Shift Valve Stuck

Slips In 4th Gear

- Clutch Pressure Control Valve Stuck
- Defective 4th Clutch Or 4th Accumulator

Vehicle Locks In "R"

- Parking Brake Lever Installed Upside-Down

Vehicle Moves In All Gears Except "R"

- Defective Or Improperly Adjusted Shift Cable
- Defective Or Worn Reverse Gears
- Servo Control Valve Stuck
- Worn Reverse Selector

Vehicle Moves In All Gears Except "2"

- Defective One-Way Clutch
- Defective Or Improperly Adjusted Shift Cable
- Defective Seal Rings Or Guide
- Defective 2nd Clutch Or 2nd Accumulator

Vehicle Moves In "N"

- Defective Or Improperly Adjusted Shift Cable
- Defective 1st, 2nd, 3rd Or 4th Clutch

- Incorrect Gear Or Clutch Clearance

Vehicle Moves In "2" But Not In "D" Or "D4"

- Defective One-Way Clutch
- Defective Or Improperly Adjusted Shift Cable
- Defective 1st Clutch Or 1st Accumulator
- Feedpipe "O" Ring Damaged

Vehicle Will Not Move

- Defective Differential Assembly
- Defective Extension Shaft
- Defective Oil Pump
- Defective Or Improperly Adjusted Shift Cable
- Fluid Strainer Clogged
- Pressure Regulator Stuck

Vehicle Will Not Move In "D" Or "D4"

- One-Way Clutch Installed Upside-Down

Will Not Downshift To Low Gear

- Defective 1st-Hold Clutch
- 1-2 Shift Valve Stuck

Will Not Shift Into 4th Gear When In "D4"

- Defective Or Improperly Adjusted Shift Cable
- Defective 4th Accumulator
- 3-4 Shift Valve Stuck
- 3-4 Orifice Control Valve Stuck

Will Not Upshift (Stays In Low Gear)

- Clutch Pressure Control Valve Stuck
- 1-2 Shift Valve Stuck

TESTING**ROAD TEST**

NOTE: If shift lever cannot be moved from "P" position with brake pedal depressed and

accelerator pedal at idle position, check shift interlock system. See appropriate ELECTRONIC CONTROLS article.

CAUTION: Vehicle is equipped with an air bag system (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 appropriate AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

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) in "D" position. Ensure engine does not stall. Manufacturer recommends monitoring of throttle position sensor voltage when performing road test to ensure proper throttle opening for verifying shift points.
3. Ensure ignition is off. Remove glove box. Remove ABS control unit mounting bolts and turn control unit over. Disconnect radiator fan control module connector on left side. DO NOT disconnect ABS control unit connectors.
4. Remove TCM bracket and remove TCM from bracket. Install Backprobe Test Set (07SAZ-001000A) or equivalent between TCM and Digital Volt-Ohmmeter (DVOM) leads. See **Fig. 4**.
5. Using DVOM, with positive lead at terminal B4 and negative lead at terminal A13 or A26. See **Fig. 4**. Ensure digital volt-ohmmeter is set for measuring voltage.
6. Road test vehicle and check for abnormal noise and clutch slippage. Specified clutch is applied in designated gears. See **CLUTCH APPLICATION** table.
7. Note that shift points and lock-up clutch operation are within specification in accordance with throttle position sensor voltage. See **TRANSAXLE UPSHIFT SPECIFICATIONS** and **TRANSAXLE DOWNSHIFT SPECIFICATIONS** tables.
8. 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.

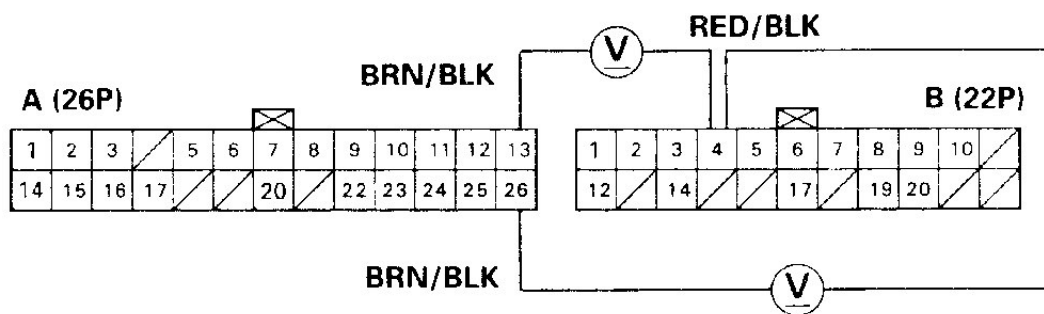
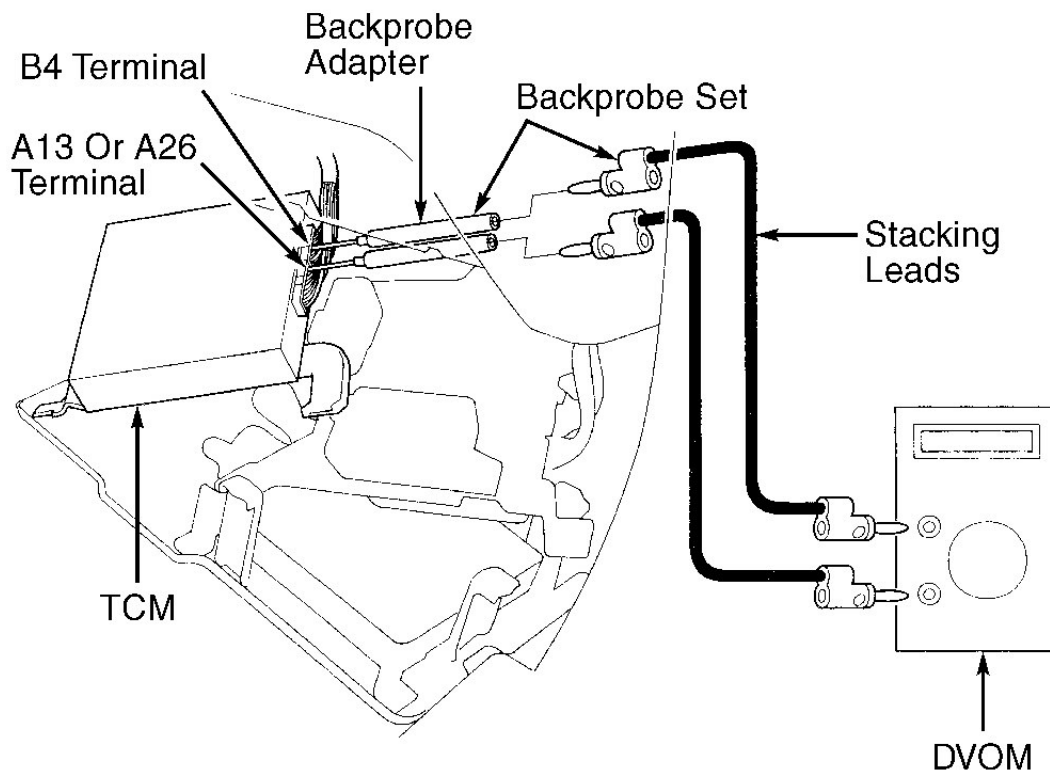
CAUTION: DO NOT shift from "D4" to "2" at speeds greater than 62 MPH or transaxle may be damaged.

9. 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 range.
10. 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 range.
11. Place shift lever in "R" position. Accelerate from a stop at full throttle. Check for abnormal noise or clutch slippage.
12. Park vehicle on a slope. Apply parking brake and 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.
13. Ensure ignition is off. Remove test harness. Reinstall electrical connectors, ABS control unit, TCM

bracket and TCM.

CLUTCH APPLICATION

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



**TCM CONNECTORS
WIRE SIDE OF FEMALE TERMINALS**

G96G04930

Fig. 4: Installing Backprobe Test Set
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE UPSHIFT SPECIFICATIONS

"D4" Position & Condition	1st-2nd Gear	2nd-3rd Gear	3rd-4th Gear	Lock-Up Clutch On
TPS Voltage .75 Volt	10-13 MPH	17.5-20 MPH	28-33.5 MPH	20.5-24 MPH
TPS Voltage 2.25	19-23 MPH	34-40.5 MPH	55-61 MPH	65-71 MPH

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Volts				
TPS Voltage 4.5 Volts (WOT)	35-40.5 MPH	63-72 MPH	100-111 MPH	92-103 MPH

TRANSAXLE DOWNSHIFT SPECIFICATIONS

"D"4 Position & Condition	Lock-Up Clutch Off	4th-3rd Gear	3rd-2nd Gear	2nd-1st Gear
TPS Voltage .75 Volt	15.5-19 MPH	19-22 MPH	7.5-11 MPH	7.5-11 MPH
TPS Voltage 2.25 Volts	48-54 MPH	N/A	N/A	N/A
TPS Voltage 4.5 Volts (WOT)	90-101 MPH	86-96.5 MPH	53-60 MPH	26-32 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 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 the torque converter stall speed.
3. Allow transaxle to cool for 2 minutes at idle in "N" or "P". Repeat test procedure in "D4", "1" and "R" positions.
4. Torque converter stall speed should be the same in "D4", "2", "1" and "R" positions. Torque converter stall speed should be 2200-2500 RPM. If torque converter stall speed is not within specification, see **TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING** table for possible causes.

TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING

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

HYDRAULIC PRESSURE TEST**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. Attach tachometer.

Pressure Testing

1. With engine off, remove pressure tap plug from appropriate 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).
2. Disconnect linear solenoid 2-pin connector at transaxle. See **Fig. 6**. Start and operate engine at 2000 RPM for line and clutch pressure tests or 1000 RPM for throttle "B" pressure measurement. With shift lever in appropriate position, measure each line pressure at full throttle.
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.
4. Apply battery voltage to linear solenoid connector terminals. With shift lever in appropriate position, measure each line pressure at closed throttle. 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.
5. Remove pressure gauge set. Using NEW seal washer, install and tighten pressure tap plug to specification. See **TORQUE SPECIFICATIONS**.

HYDRAULIC PRESSURE TEST SPECIFICATIONS

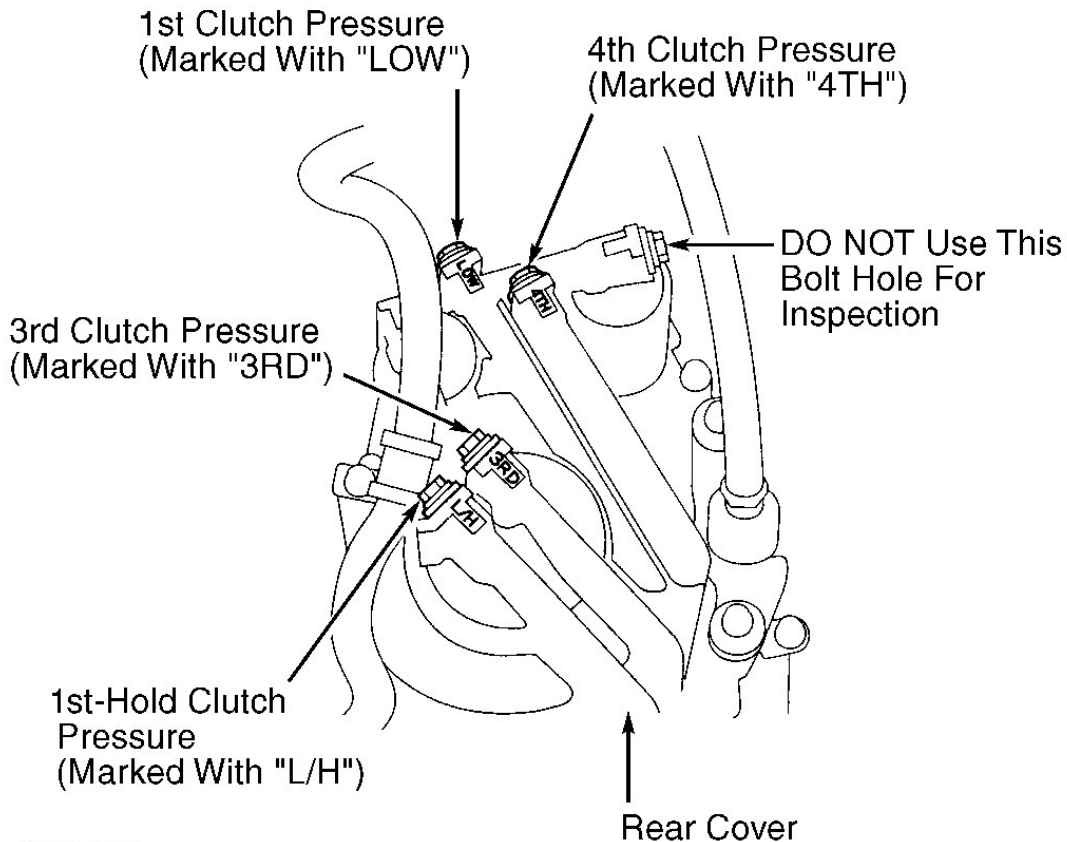
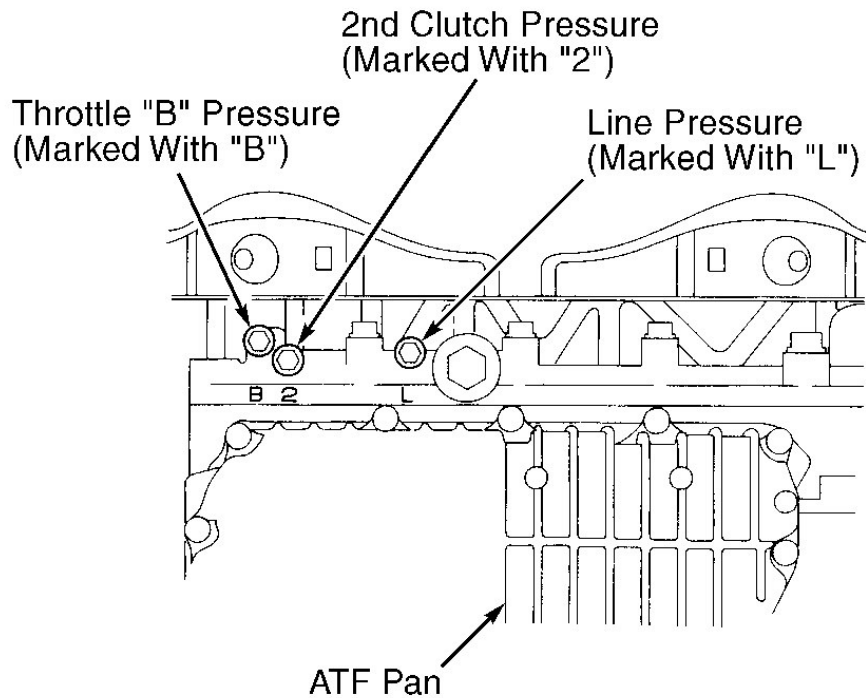
Application/ Engine RPM	Shift Lever Position	psi. (kPa)
Line Pressure With Engine At 2000 RPM	"P" Or "N"	120-128 (830-880)
Clutch Pressures		
1st Clutch With Engine At 2000 RPM	"1" Or "D4"	120-128 (830-880)
2nd Clutch With Engine At 2000 RPM	"2"	120-128 (830-880)
2nd Clutch With Throttle Closed	"D4"	78-86 (540-590)
2nd Clutch With Engine At 2000 RPM	"D4"	120-128 (830-880)
3rd Clutch With Throttle Closed	"D4"	78-86 (540-590)
3rd Clutch With Engine At 2000 RPM	"D4"	120-128 (830-880)
4th Clutch With Throttle Closed	"D4"	78-86 (540-590)
4th Clutch With Engine At 2000 RPM	"D4"	120-128 (830-880)
4th Clutch With Engine At 2000 RPM	"R"	120-128 (830-880)
Clutch Low Pressure (2nd, 3rd Or 4th Clutch)	"D4"	78-86 (540-590)
Clutch High Pressure (2nd, 3rd Or 4th Clutch)	"D4"	120-128

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		(830-880)
Throttle "B" Pressure With Transaxle Sub-Harness Disconnected & No Voltage Applied to Harness	"D4"	81-87 (560-600)
Throttle "B" Pressure With Transaxle Sub-Harness Disconnected & Voltage Applied to Harness	"D4"	0-2.2 (0-15)

HYDRAULIC PRESSURE TEST TROUBLE SHOOTING

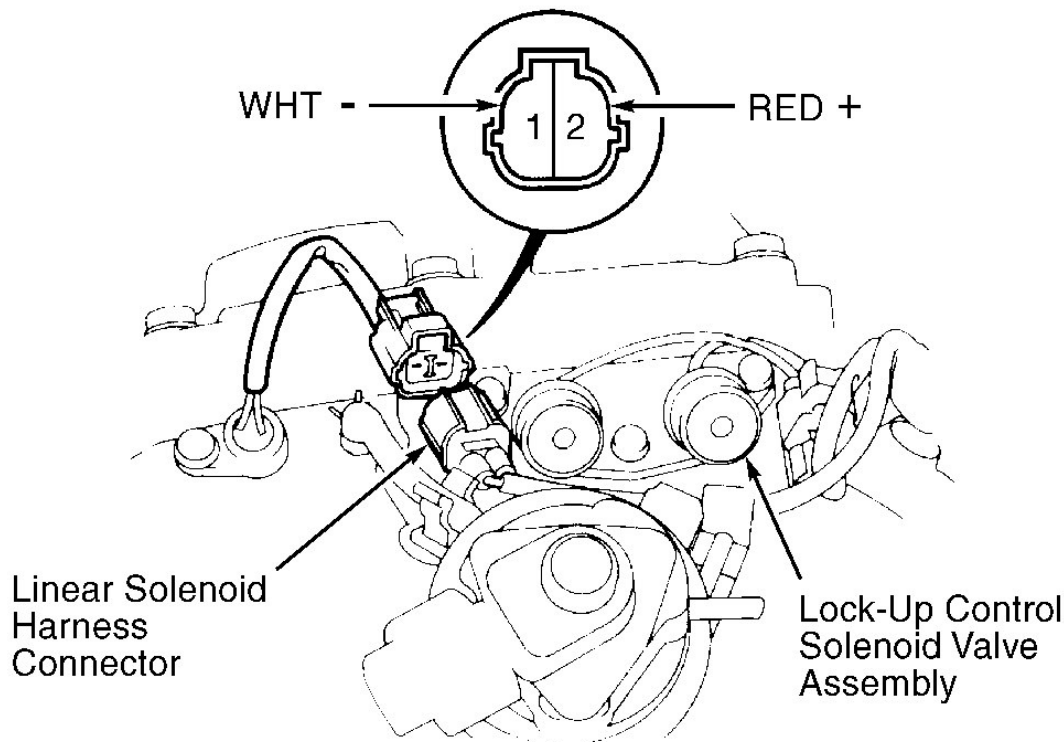
Application	Probable Cause
Line Pressure	
Low Or No Line Pressure	Defective Torque Converter, Defective Torque Converter Check Valve, Defective Oil Pump Pressure Regulator, Defective Oil Pump
Clutch Pressure	
Low Or No 1st Clutch Pressure	Defective 1st Clutch
Low Or No 1st-Hold Clutch Pressure	Defective 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
Clutch 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 "B" Pressure	
Low Or No Throttle "B" Pressure With No Voltage Applied	Linear Solenoid Or Defective Throttle Valve Body
High Throttle "B" Pressure With Voltage Applied	Linear Solenoid Or Defective Throttle Valve Body Defective Throttle Valve Body



96J04922

Fig. 5: Identifying Transaxle Pressure Taps

Courtesy of AMERICAN HONDA MOTOR CO., INC.



96H04921

Fig. 6: Identifying linear solenoid 2-pin Connector

Courtesy of AMERICAN HONDA MOTOR CO., INC.

REMOVAL & INSTALLATION

DIFFERENTIAL ASSEMBLY

NOTE: Before disconnecting negative battery cable, ensure radio anti-theft code is obtained from customer. Radio anti-theft code must be re-entered into radio for radio operation.

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

Removal

1. Obtain radio anti-theft code from customer. Disconnect negative battery cable. Remove air cleaner assembly. Raise and support vehicle. Drain differential assembly gear oil.
2. Remove axle shafts and intermediate shaft. See appropriate AXLE SHAFTS article in DRIVELINE/AXLES. Remove splash guard. Support engine with hoist. Slightly raise engine to remove pressure from engine mounts.
3. Remove left front engine mount and brackets to access differential assembly. Remove transaxle mount and bracket. See **Fig. 7**. Remove secondary cover and sealing bolt from transaxle. See **Fig. 8**.
4. Place gear selector lever in "P". Using puller, remove extension shaft from differential assembly. See **Fig. 8**.
5. Disconnect and plug oil cooler coolant hoses from differential assembly. See **Fig. 9**. Disconnect breather hose from differential assembly. DO NOT disconnect the 2 hoses for the power steering.
6. Remove speed sensor assembly from differential assembly. See **Fig. 9**. Speed sensor assembly contains the Vehicle Speed Sensor (VSS) and power steering speed sensor.
7. Remove differential assembly upper mounting bolts and shim. See **Fig. 10**. Remove lower mounting bolts and differential assembly.

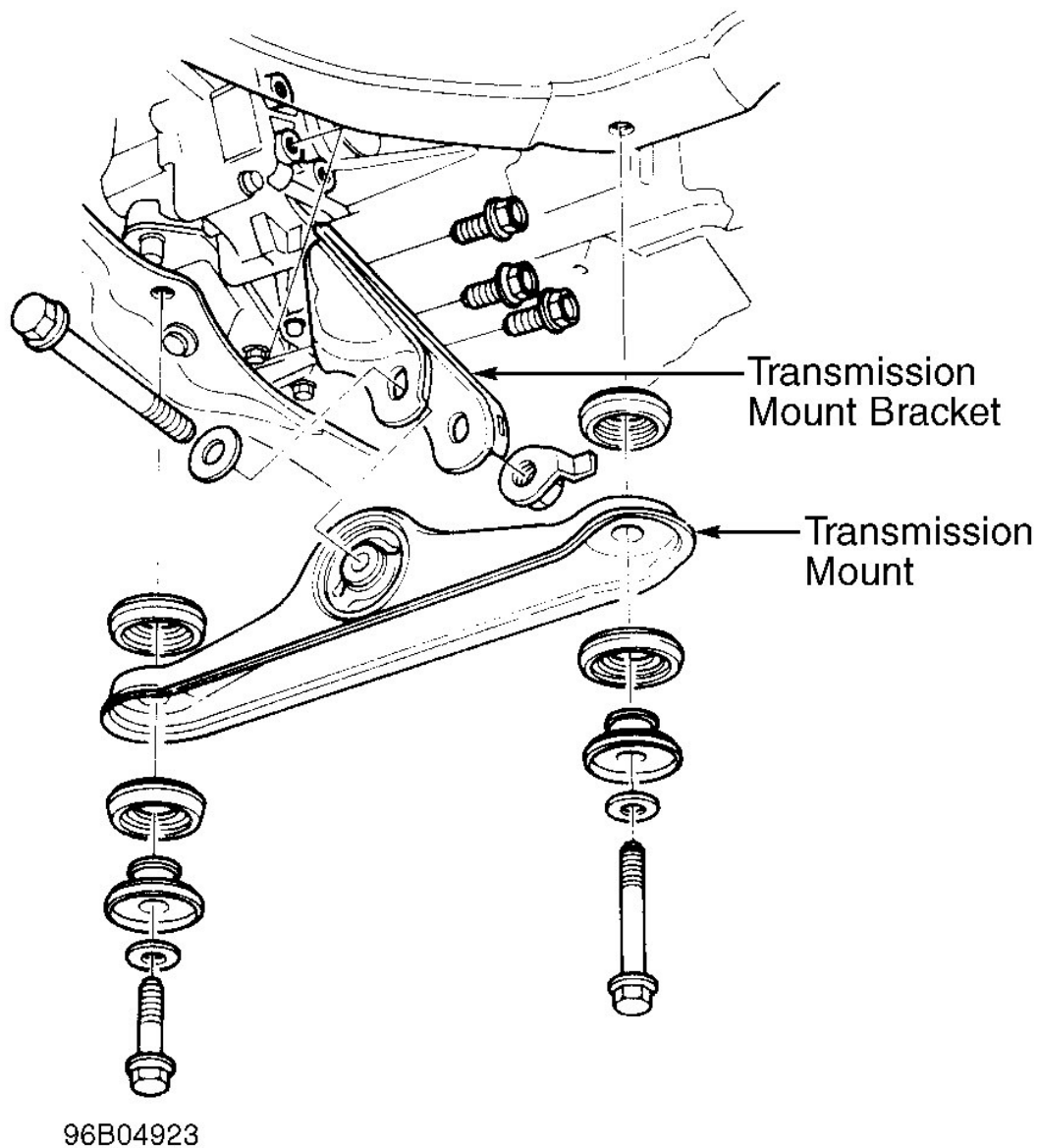
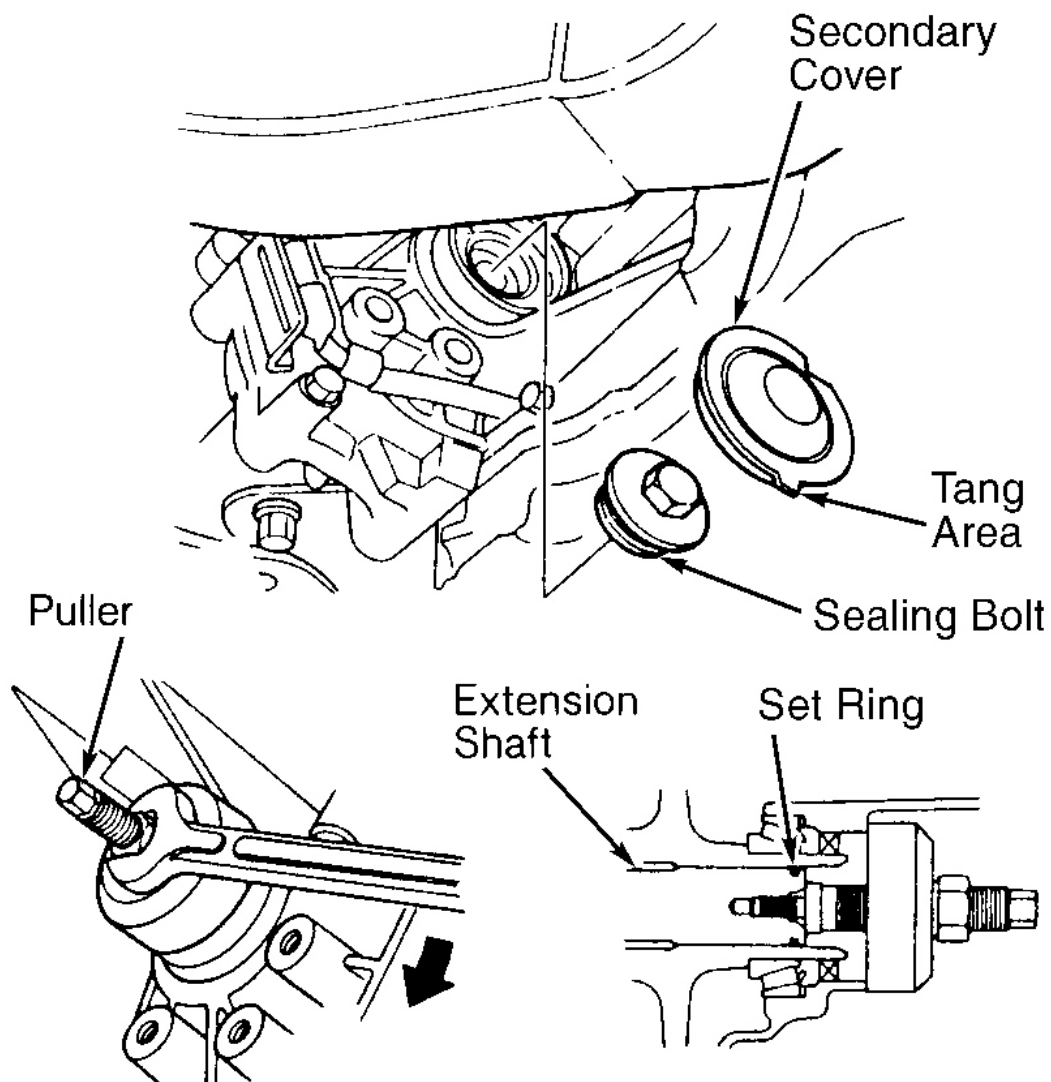
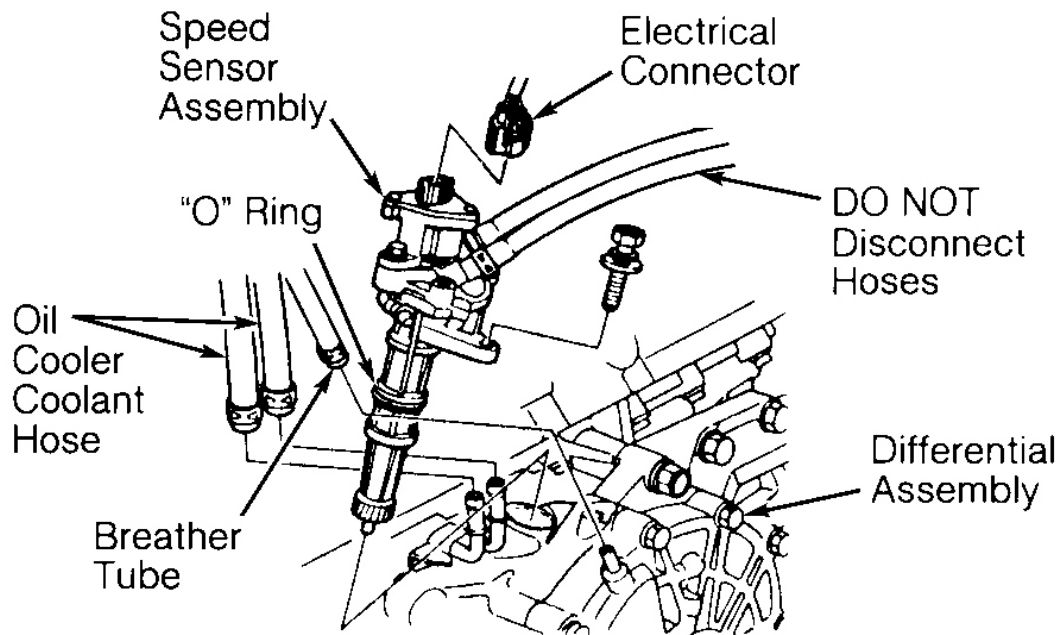


Fig. 7: Identifying Drain Plug, Mount Bracket & Transaxle Mount
Courtesy of AMERICAN HONDA MOTOR CO., INC.



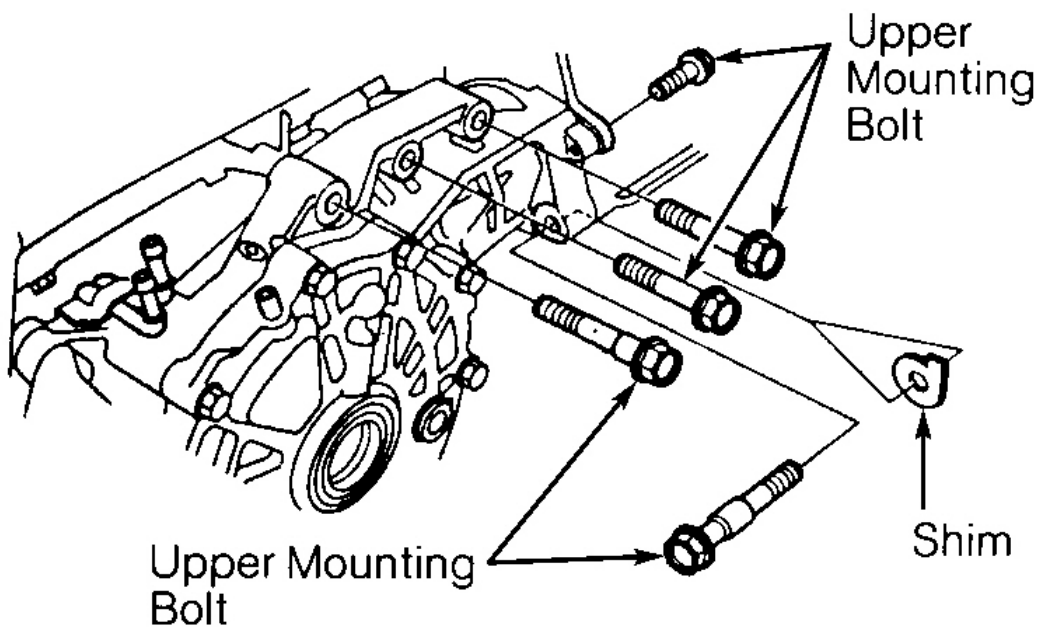
95H19403

Fig. 8: Identifying Secondary Cover, Sealing Bolt & Removing Extension Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.



95I19404

Fig. 9: Identifying Oil Cooler Coolant Hoses, Breather Hose & Speed Sensor Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



95J19405

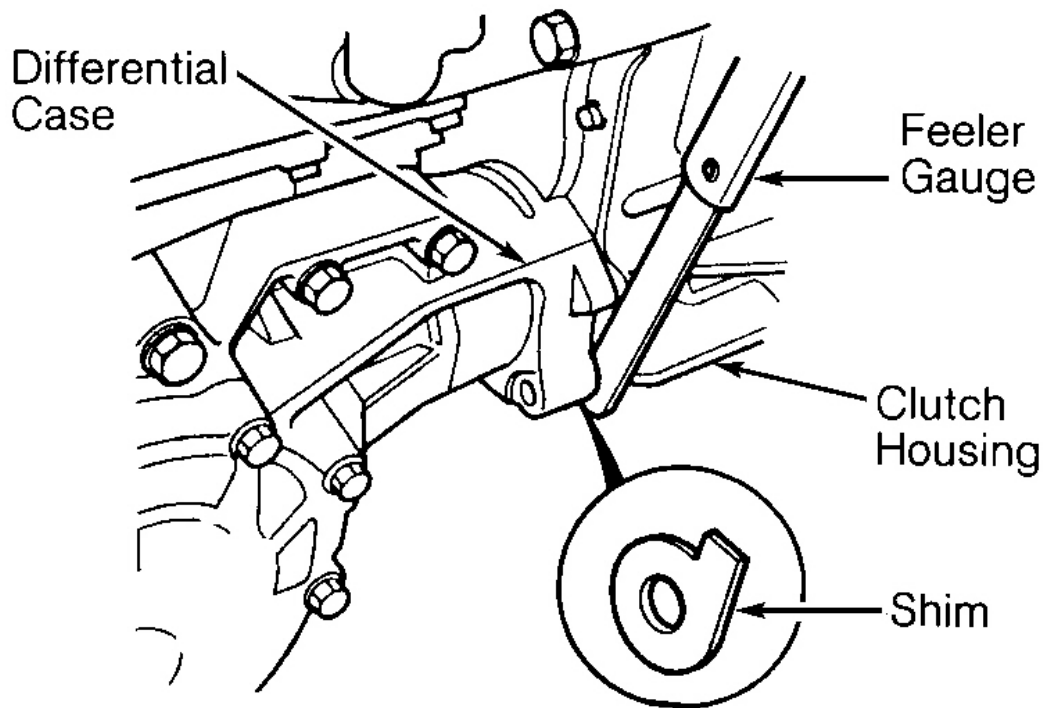
Fig. 10: Differential Assembly Upper Mounting Bolts & Shim
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Installation

1. If differential case was not replaced, proceed to step 4). If differential case was replaced, thickness of shim must be determined. Install differential assembly. Tighten all mounting bolts to specification. See **TORQUE SPECIFICATIONS**.
2. Using feeler gauge, measure clearance between differential case and clutch housing where the shim fits. See **Fig. 11**.

NOTE: The clutch housing is the surface on torque converter housing.

3. Select proper thickness shim. Shims are available in .1 mm increments ranging from 1.9 mm to 3.0 mm. Remove differential assembly.



95A19406

Fig. 11: Determining Shim Thickness

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Fill cavity on end of extension shaft and drive pinion and splines on extension shaft with high-temperature grease. Ensure 2 dowel pins are installed on rear side of differential assembly.
5. Install differential assembly. Install lower mounting bolts, upper mounting bolts and shim. Tighten mounting bolts to specification. See **TORQUE SPECIFICATIONS**.
6. Using NEW "O" ring, install speed sensor assembly. Tighten bolt to specification. Reconnect oil cooler coolant hoses, breather hose and electrical connector on speed sensor assembly.
7. Install left front engine mount and brackets. Install NEW set ring on end of extension shaft. Install extension shaft. Place gear selector lever "P".
8. Apply thread sealant on threads of sealing bolt. Install and tighten sealing bolt to specification. Install secondary cover so tang area on secondary cover is facing downward. See **Fig. 8**.
9. Install transaxle mount and mount bracket. Install and tighten transaxle mount and mount bracket bolts to specification.
10. Install axle shafts and intermediate shaft using proper procedure. See appropriate AXLE SHAFTS article in DRIVELINE/AXLES.
11. Fill differential assembly with 80W-90 hypoid gear oil with API GL5 rating. Use NEW seal washer when installing differential assembly oil filler plug. Tighten differential assembly oil filler plug to specification.

12. Refill cooling system. Install air cleaner assembly. Reconnect negative battery cable. To re-enter radio anti-theft code, turn radio on. When the word "CODE" is displayed on radio enter anti-theft code by using the radio station preset buttons.

ELECTRICAL COMPONENTS

See appropriate ELECTRONIC CONTROLS article.

TRANSAXLE

See appropriate REMOVAL & INSTALLATION article.

LOWER VALVE BODY ASSEMBLY

NOTE: Lower valve body assembly consists of main valve body, servo body, servo detent base, shift control solenoid valves and oil pass body.

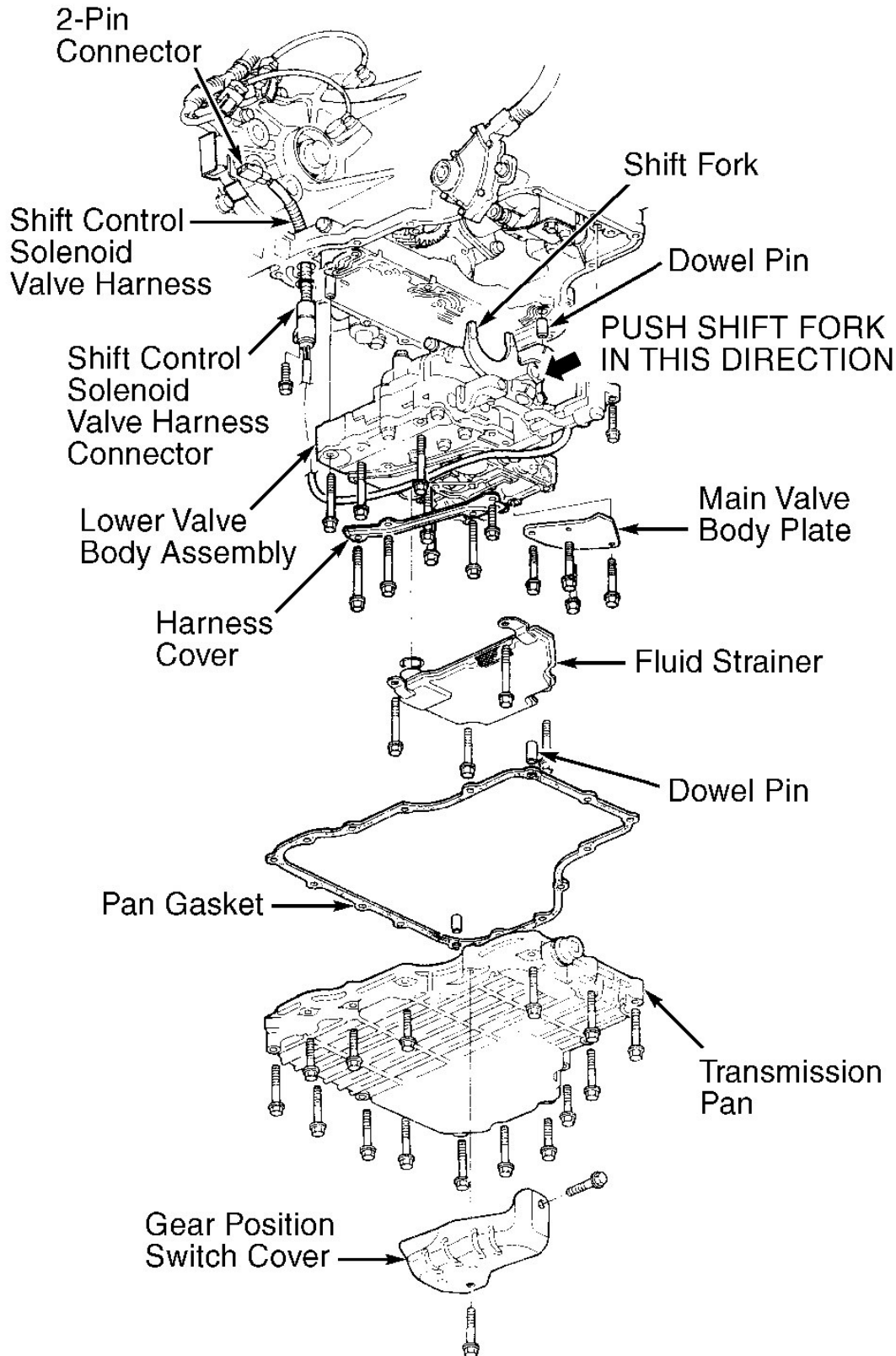
Removal

1. Raise and support vehicle. Drain fluid by removing drain plug and seal washer from rear of transaxle. See **Fig. 7**. Support transaxle with floor jack.
2. Remove transaxle mount and mount bracket. Disconnect shift control solenoid valve harness from transaxle sub-harness. See **Fig. 12**. Remove gear position switch cover, transaxle pan and gasket.
3. Remove shift control solenoid valve 2-pin connector from holder and disconnect. Remove fluid strainer and main valve body cover plate. Remove harness cover. Remove shift control solenoid valve harness connector from case then pull harness out through transaxle housing.
4. Push shift fork into Drive position (toward lower valve body assembly). See **Fig. 12**. Ensure shift lever is in Park. Remove proper bolts for lower valve body assembly. See **Fig. 13**. Remove lower valve body assembly.

NOTE: To disassemble lower valve body assembly, see **LOWER VALVE BODY ASSEMBLY** under **COMPONENT DISASSEMBLY & REASSEMBLY**.

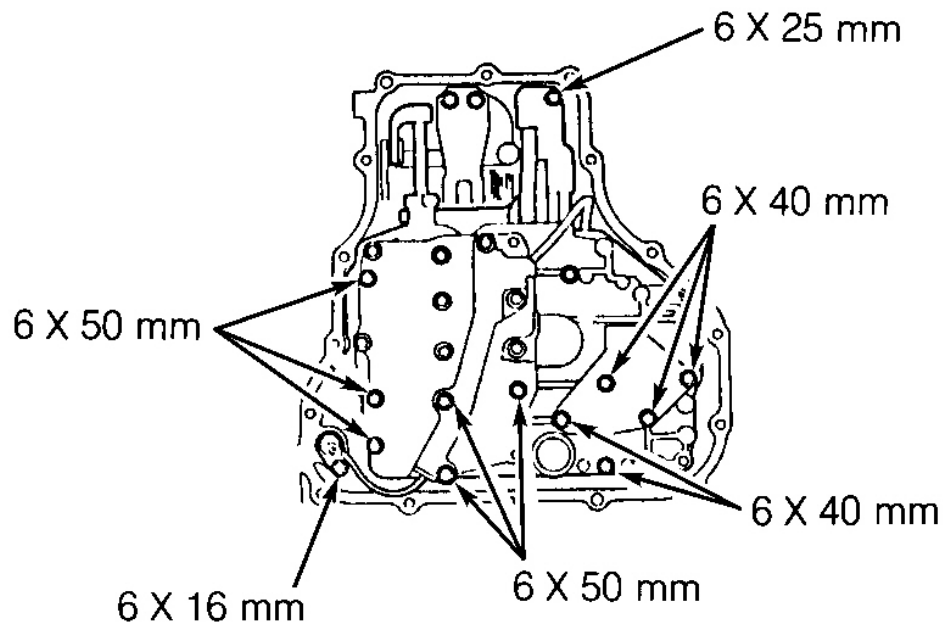
Installation

1. Ensure shift lever is in Park. Push shift fork into Drive position (toward lower valve body assembly). See **Fig. 12**. Install lower valve body assembly while engaging manual valve on valve body with detent lever and engaging shift fork with reverse selector.
2. Install main valve body cover plate. Pass shift control solenoid valve harness through transaxle housing and install connector bolt. Install harness cover. Install fluid strainer and all bolts. Ensure proper length bolts are installed in correct location on lower valve body assembly and fluid strainer. See **Fig. 13**.
3. Tighten all bolts to specification. See **TORQUE SPECIFICATIONS**. Using NEW gasket, install transaxle pan and gear position switch cover. Install and tighten bolts to specification.
4. Install NEW seal washer on drain plug. Install and tighten drain plug for transaxle to specification. For remainder of installation, reverse removal procedure.

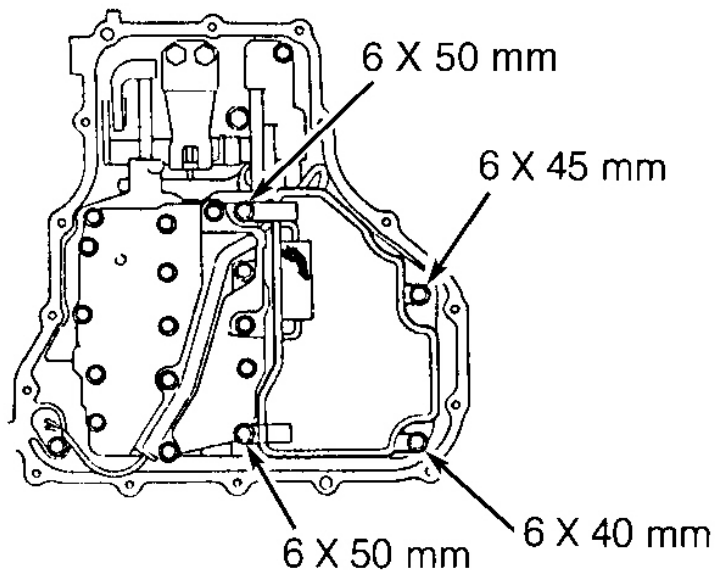


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Fig. 12: Identifying Lower Valve Body Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



IDENTIFYING LOWER VALVE BODY ASSEMBLY BOLTS



IDENTIFYING FLUID STRAINER BOLTS

93J23670

Fig. 13: Identifying Lower Valve Body Assembly & Fluid Strainer Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

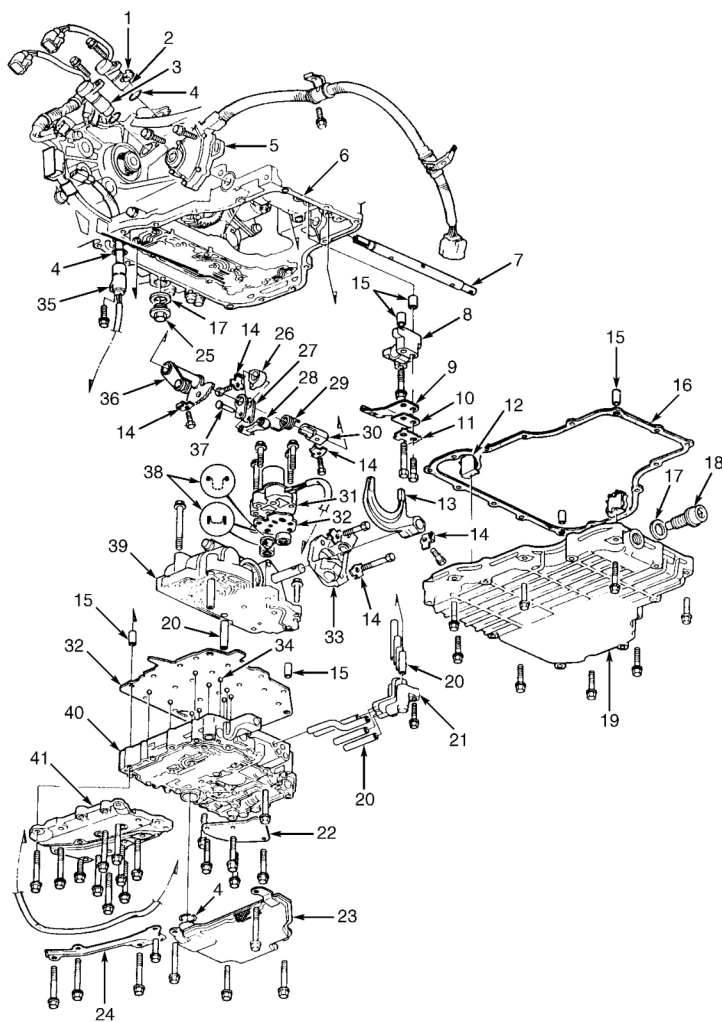
VALVE BODIES & INTERNAL COMPONENTS

1. Disconnect shift control solenoid valve harness from transaxle sub-harness. See **Fig. 12**. Remove gear position switch cover, transaxle pan, gasket, fluid strainer and main valve body cover plate.
2. Ensure shift lever is in Park. Push shift fork into Drive position (toward lower valve body assembly). Remove main valve body plate bolts and harness cover. Remove bolt securing shift control solenoid harness connector and disconnect connector. Pull harness from case. Remove lower valve body assembly bolts. Remove lower valve body assembly.
3. Remove dipstick and bolt from transaxle sub-harness. Remove bolts, rear cover, gasket, dowel pins and all oil pipes. See **Fig. 15**. Install Mainshaft Holder (07GAB-PF50100) onto mainshaft to secure mainshaft. See **Fig. 16**.

NOTE: Mainshaft lock nut has left-hand threads.

4. Engage parking pawl with parking gear. Using hammer and chisel, cut lock tabs on countershaft and mainshaft lock nuts and pry upward. Remove countershaft and mainshaft lock nuts and disc springs. See **Fig. 15**.
5. Remove mainshaft holder. Remove 1st-hold clutch and bearing, thrust washer, thrust needle bearing and 1st-hold clutch hub from countershaft. See **Fig. 15**. Remove 1st clutch, thrust washer, thrust needle bearing, needle bearing and mainshaft 1st gear. See **Fig. 15**. Remove thrust washer and mainshaft 1st gear collar from mainshaft.

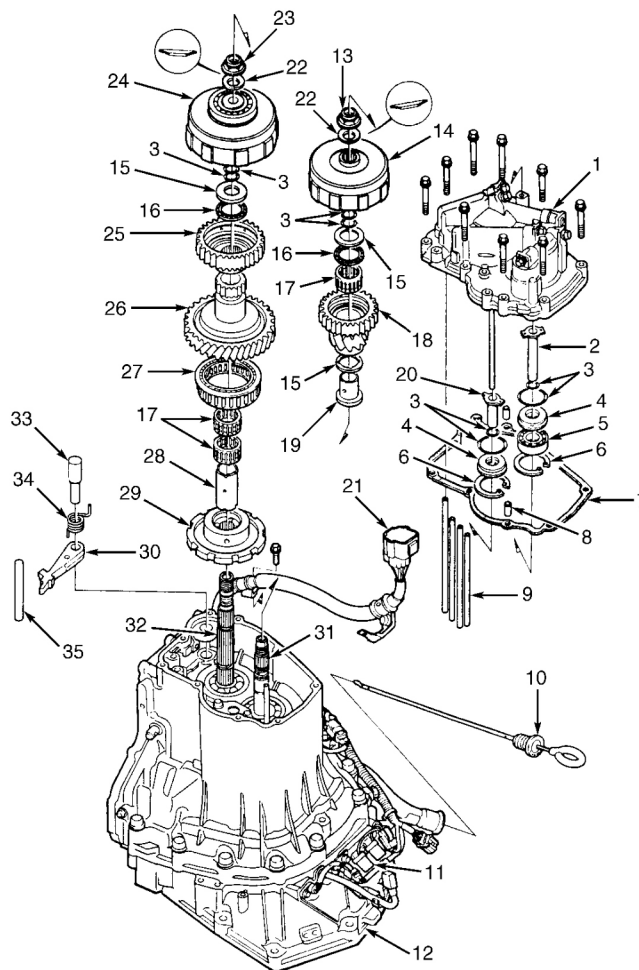
1. Mainshaft Speed Sensor Washer
2. Mainshaft Speed Sensor
3. Countershaft Speed Sensor
4. "O" Ring
5. A/T Gear Position Switch
6. Transaxle Housing
7. Control Shaft
8. Parking Brake Roller Guide
9. Detent Spring
10. Detent Spring Plate
11. Lock Plate
12. Magnet
13. Shift Fork
14. Bolt Lock
15. Dowel Pin
16. Gasket
17. Seal Washer
18. Drain Plug
19. Oil Pan
20. Oil Pipe
21. Oil Pass Body
22. Main Valve Body Cover Plate
23. Fluid Strainer
24. Harness Cover
25. Sealing Bolt
26. Parking Brake Stopper
27. Parking Brake Shift Arm
28. Parking Brake Roller Rod
29. Spring
30. Control Shaft Collar
31. Shift Control Solenoid Valve Assembly
32. Separator Plate
33. Servo Detent Base
34. Check Ball
35. Shift Control Solenoid Valve Harness
36. Detent Lever
37. Shift Arm Roller
38. Filter
39. Servo Body
40. Main Valve Body
41. Main Valve Body Cover



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

1. Rear Cover
2. 1st Clutch Feedpipe
3. "O" Ring
4. Feedpipe Guide
5. Ball Bearing
6. Snap Ring
7. Gasket
8. Dowel Pin
9. Oil Pipe
10. Dipstick
11. Lock-Up Control Solenoid Valve Assembly
12. Torque Converter Housing
13. Mainshaft Lock Nut
14. 1st Clutch
15. Thrust Washer
16. Thrust Needle Bearing
17. Needle Bearing
18. Mainshaft 1st Gear
19. Mainshaft 1st Gear Collar
20. 1st-Hold Clutch Feedpipe
21. Transaxle Sub-Harness
22. Disc Spring
23. Countershaft Lock Nut
24. 1st-Hold Clutch & Bearing
25. 1st-Hold Clutch Hub
26. Countershaft 1st Gear
27. One-Way Clutch
28. Countershaft 1st Gear Collar
29. Parking Gear
30. Parking Pawl
31. Mainshaft
32. Countershaft
33. Parking Pawl Shaft
34. Parking Pawl Spring
35. Parking Pawl Stopper



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Fig. 15: Exploded View Of Rear Cover & Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

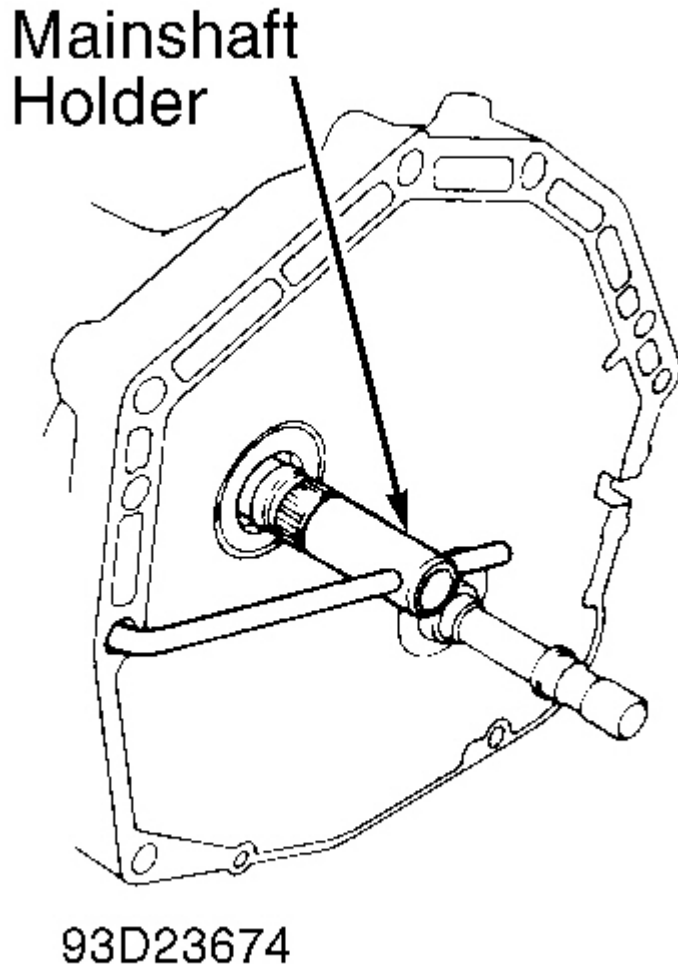


Fig. 16: Installing Mainshaft Holder

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove countershaft 1st gear and one-way clutch as an assembly. Remove needle bearings, countershaft 1st gear collar and parking gear.
7. Remove parking pawl shaft, parking pawl spring, parking pawl and parking pawl stopper from transaxle housing. See **Fig. 15**. Remove connector holder and all wiring harness bolts from transaxle housing.
8. Remove countershaft speed sensor, mainshaft speed sensor, mainshaft speed sensor washer and "O" rings from transaxle housing. See **Fig. 17**. Remove transaxle housing-to-torque converter housing bolts.

NOTE: There are transaxle housing-to-torque converter housing bolts located on inside of torque converter housing. See **Fig. 17**.

CAUTION: Ensure countershaft and mainshaft speed sensors are removed from transaxle housing before removing transaxle housing from torque converter housing.

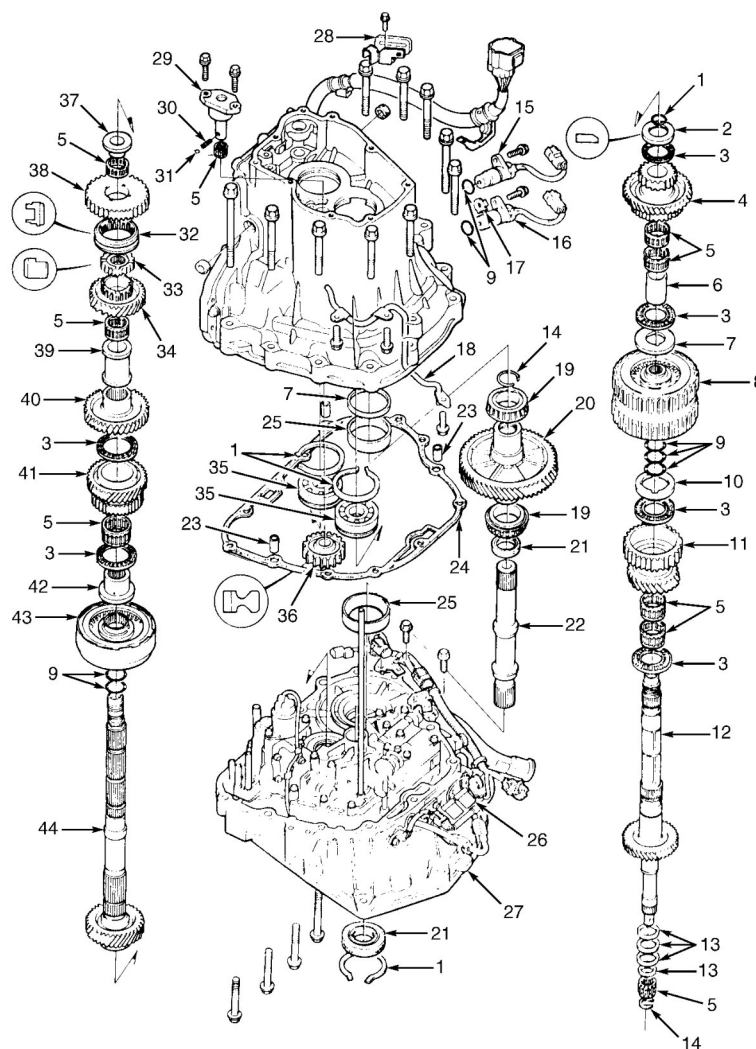
9. Using Puller (07HAC-PK4010A), pull transaxle housing from torque converter housing. See **Fig. 18**. Remove gasket and dowel pins from torque converter housing.
10. Remove countershaft and mainshaft subassemblies from torque converter housing as one unit. Remove secondary gear and extension shaft as an assembly from torque converter housing. See **Fig. 17**.
11. If removing reverse idler gear from transaxle housing, remove bolts and reverse idler gear shaft holder. Remove reverse idler gear from transaxle housing.

CAUTION: Use care when removing reverse idler gear shaft holder from reverse idler gear, as steel ball and spring are located behind needle bearing at bottom of shaft. See **Fig. 17**.

12. Remove oil feedpipes from oil pump body and torque converter housing. See **Fig. 19**. Remove flange nuts and disconnect wiring harness at linear solenoid.
13. Remove regulator valve body, "O" ring, stopper shaft, stator shaft, separator plate and dowel pins. Remove 2nd accumulator body along with throttle valve body. Remove 2nd accumulator piston and 2nd accumulator spring.
14. Remove bolts, harness clamp, throttle valve body and separator plate from 2nd accumulator body (if necessary). Remove oil pump body, oil pump drive and driven gears and oil pump driven gear shaft.
15. Remove torque converter check valve and spring. Remove dowel pins and separator plate.

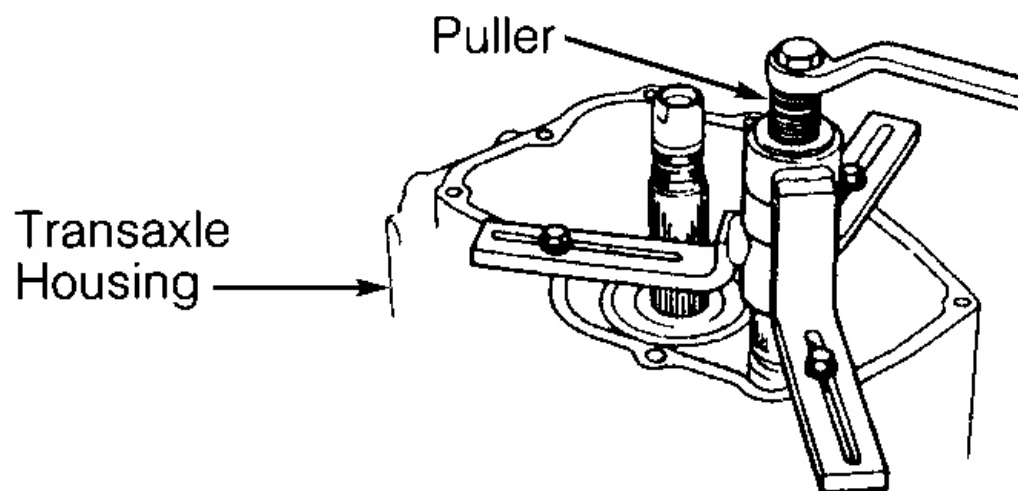
NOTE: If necessary to disassemble lower valve body assembly, see **LOWER VALVE BODY ASSEMBLY** under **COMPONENT DISASSEMBLY & REASSEMBLY**.

1. Snap Ring
2. Thrust Washer
3. Thrust Needle Bearing
4. Mainshaft 4th-Reverse Gear
5. Needle Bearing
6. Mainshaft 4th Gear Collar
7. Thrust Shim
8. 4th-2nd Clutch Assembly
9. "O" Ring
10. Mainshaft 2nd Gear Thrust Shim
11. Mainshaft 2nd Gear
12. Mainshaft
13. Seal Ring
14. Set Ring
15. Countershaft Speed Sensor
16. Mainshaft Speed Sensor
17. Mainshaft Speed Sensor Washer
18. Lubrication Pipe
19. Roller Bearing
20. Secondary Gear
21. Oil Seal
22. Extension Shaft
23. Dowel Pin
24. Gasket
25. Bearing Race
26. Lock-Up Control Solenoid Valve
27. Torque Converter Housing
28. Connector Holder
29. Reverse Idler Gear Shaft Holder
30. Spring
31. Steel Ball
32. Reverse Selector
33. Reverse Selector Hub
34. Countershaft 4th Gear
35. Ball Bearing
36. Reverse Idler Gear
37. Countershaft Reverse Gear Collar
38. Countershaft Reverse Gear
39. Distance Collar
40. Countershaft 2nd Gear
41. Countershaft 3rd Gear
42. Countershaft 3rd Gear Collar
43. 3rd Clutch
44. Countershaft



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Fig. 17: Exploded View Of Transaxle Housing & Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 18: Removing Transaxle Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

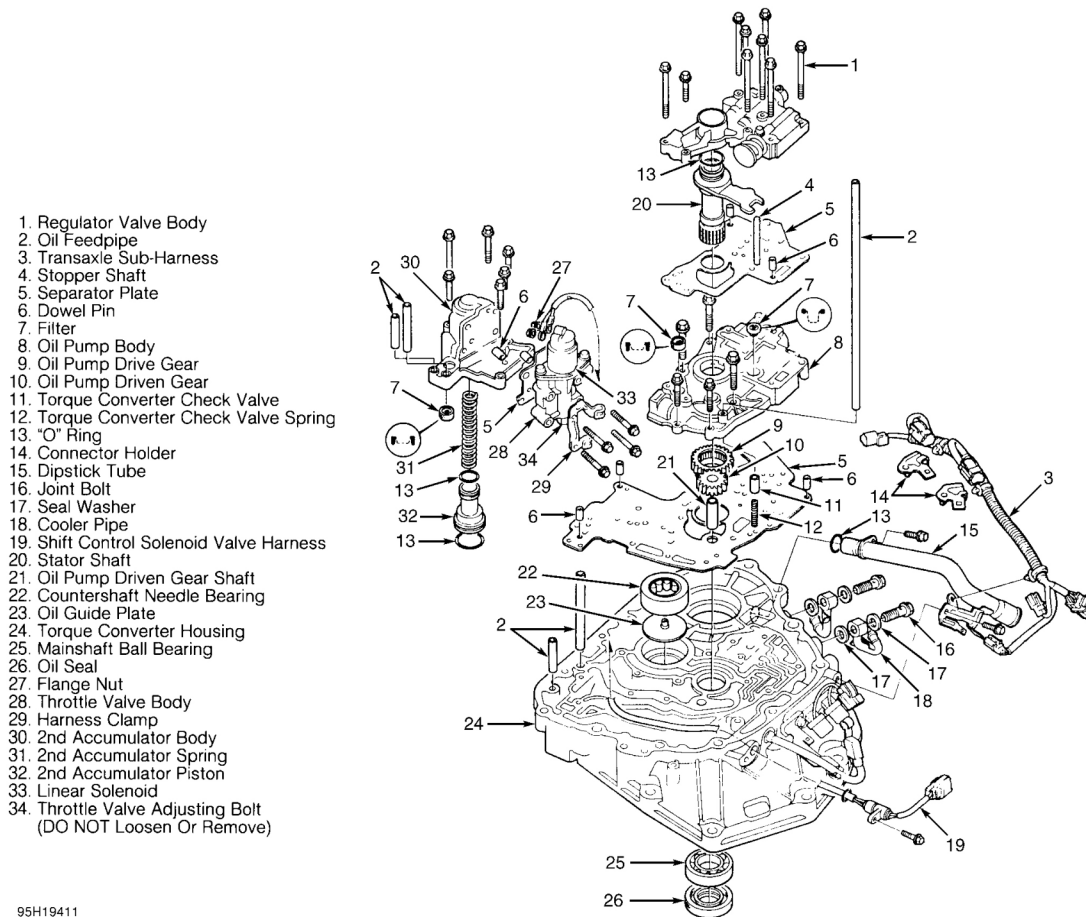


Fig. 19: Exploded View Of Torque Converter Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT DISASSEMBLY & REASSEMBLY

CONTROL SHAFT & COMPONENTS

Removal

1. Remove bolts, lock plate, detent spring plate and detent spring. See **Fig. 20**. Remove bolt, parking brake roller guide and dowel pins from transaxle housing.
2. Remove bolt and bolt lock from detent lever, parking brake stopper and control shaft collar. Remove control shaft, control shaft collar, spring, parking brake shift arm and detent lever.

Installation

1. Coat components with Dexron-II ATF. Install control shaft into transaxle housing. Install control shaft collar and spring on control shaft.
2. Install parking brake stopper and parking brake shift arm on control shaft. Install parking brake roller rod

and shift arm roller on parking brake shift arm.

CAUTION: Ensure shift arm roller is installed with head of roller toward detent lever. See Fig. 20. Ensure parking brake roller rod is installed with rivets in rod facing toward detent lever.

3. Install detent lever on control shaft. Align cutout area on control shaft with A/T gear position switch and install control shaft.
4. Install NEW bolt locks and bolts in control shaft collar, parking brake stopper and detent lever. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**. Bend tabs over on bolt locks.

CAUTION: Ensure detent lever is in any position EXCEPT Park when installing detent spring and components or parking brake roller guide may be damaged.

5. Shift detent lever to any position except Park. Install dowel pins and parking brake roller guide. See **Fig. 20**.
6. Install detent spring, detent spring plate, NEW lock plate and bolts. Tighten parking brake roller guide bolts to specification.

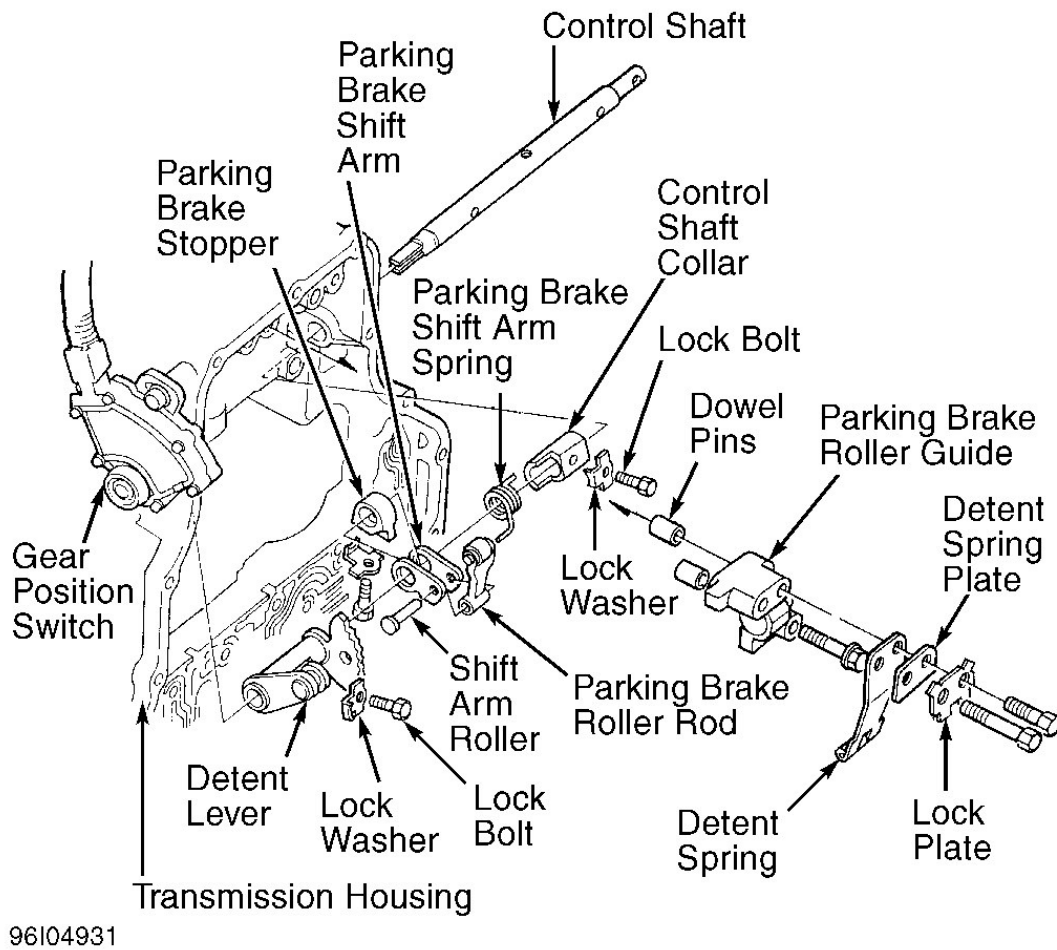


Fig. 20: Identifying Control Shaft & Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

LOWER VALVE BODY ASSEMBLY

Disassembly

1. Remove harness cover and main valve body cover. See **Fig. 14**. Remove oil pass body and oil pipes from main valve body.
2. Remove shift control solenoid valve assembly, separator plate and filters. Remove bolt, bolt lock and shift fork. Remove servo detent base from servo body.
3. Remove servo body, separator plate and dowel pins from main valve body. Use care not to loose check balls in main valve body. Remove check balls from main valve body (if necessary).

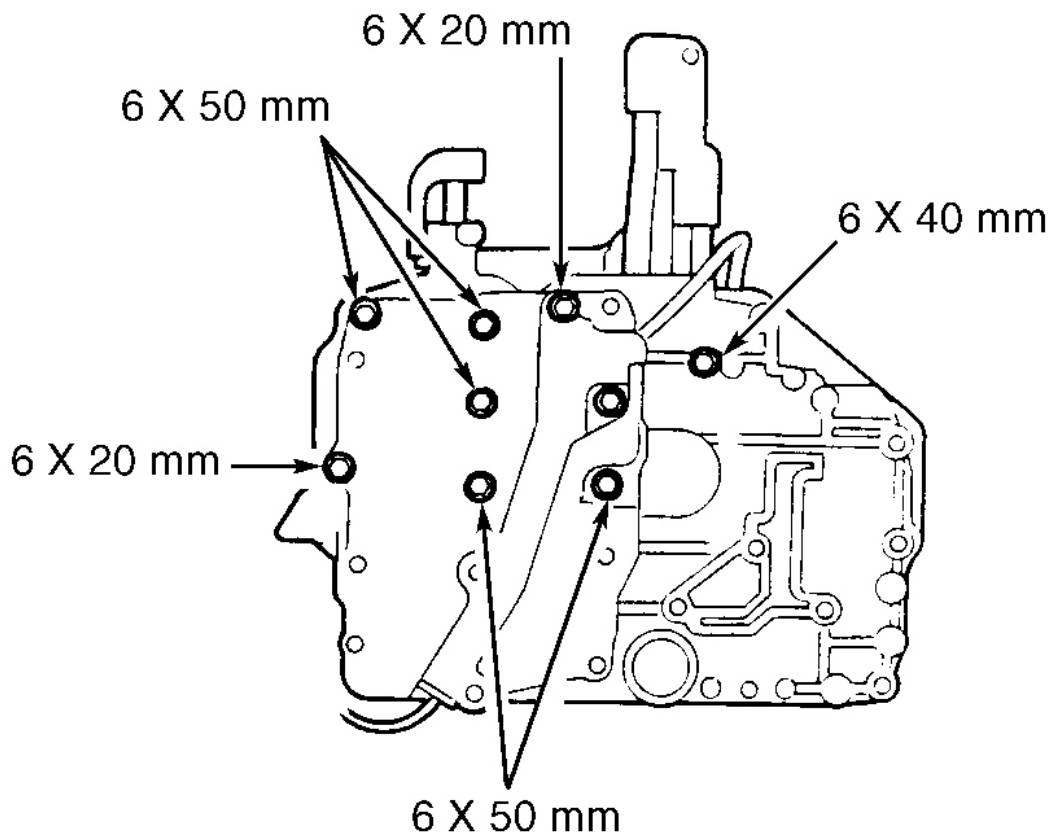
CAUTION: DO NOT use magnet to remove check balls, as check balls may become magnetized.

Cleaning & Inspection

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

Reassembly

1. Coat all components with Dexron-II ATF. To reassemble, reverse disassembly procedure.
2. Ensure check balls are installed in proper areas of main valve body. See **Fig. 22**. Install NEW filters and NEW bolt locks. Ensure all filters are installed in proper direction. See **Fig. 14**.
3. When installing shift fork, rotate shift fork shaft in servo body so large chamfered hole in shaft aligns with bolt hole in shift fork. Install bolt and tighten to specification. See **TORQUE SPECIFICATIONS**. Bend tabs over on bolt locks.
4. Ensure proper length main valve body cover bolts are installed in specified location. See **Fig. 21**. Tighten all bolts to specification.



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Fig. 21: Identifying Main Valve Body Cover Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAIN VALVE BODY

CAUTION: When disassembling main valve body, place main valve body components in order removed 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. 22**. 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 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.

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. 22**.

SPRING SPECIFICATIONS

Application	Free Length - In. (mm)
Main Valve Body	
Main Orifice Control Valve Spring	1.382 (35.10)
Servo Control Valve Spring	2.051 (52.10)
1-2 Shift Valve Spring	1.591 (40.40)
2-3 Orifice Control Valve Spring	1.331 (33.80)
2-3 Shift Valve Spring	1.693 (43.00)
3-4 Orifice Control Valve Spring	1.370 (34.80)
3-4 Shift Valve Spring	1.693 (43.00)
4th Exhaust Valve Spring	1.933 (49.10)
4th Kickdown Valve Spring	1.898 (48.20)
Oil Pump Body	
Lock-Up Control Valve Spring	1.496 (38.00)
Lock-Up Timing Valve Spring	2.394 (60.80)
Modulator Valve Spring	1.087 (27.60)

1995 Acura 2.5TL

1995-98 AUTOMATIC TRANSMISSIONS M1WA Overhaul

Relief Valve Spring	1.500 (38.10)
Torque Converter Check Valve Spring	1.646 (41.80)
Regulator Valve Body	
Cooler Relief Valve Spring	1.539 (39.10)
Lock-Up Shift Valve Spring	2.902 (73.70)
Regulator Valve Spring "A"	3.055 (77.60)
Regulator Valve Spring "B"	1.732 (44.00)
Stator Reaction Spring	1.193 (30.30)
Servo Body	
3rd Accumulator Spring "A"	3.571 (90.70)
3rd Accumulator Spring "B"	2.441 (62.00)
4th Accumulator Spring "A"	2.878 (73.10)
4th Accumulator Spring "B"	1.929 (49.00)
1st & 1st-Hold Accumulator	
1st Accumulator Spring "A"	3.197 (81.20)
1st Accumulator Spring "B"	1.890 (48.60)
1st-Hold Accumulator Spring "A"	2.201 (55.90)
1st-Hold Accumulator Spring "B"	2.102 (53.40)
2nd Accumulator (2nd Accumulator Spring)	3.764 (95.6)

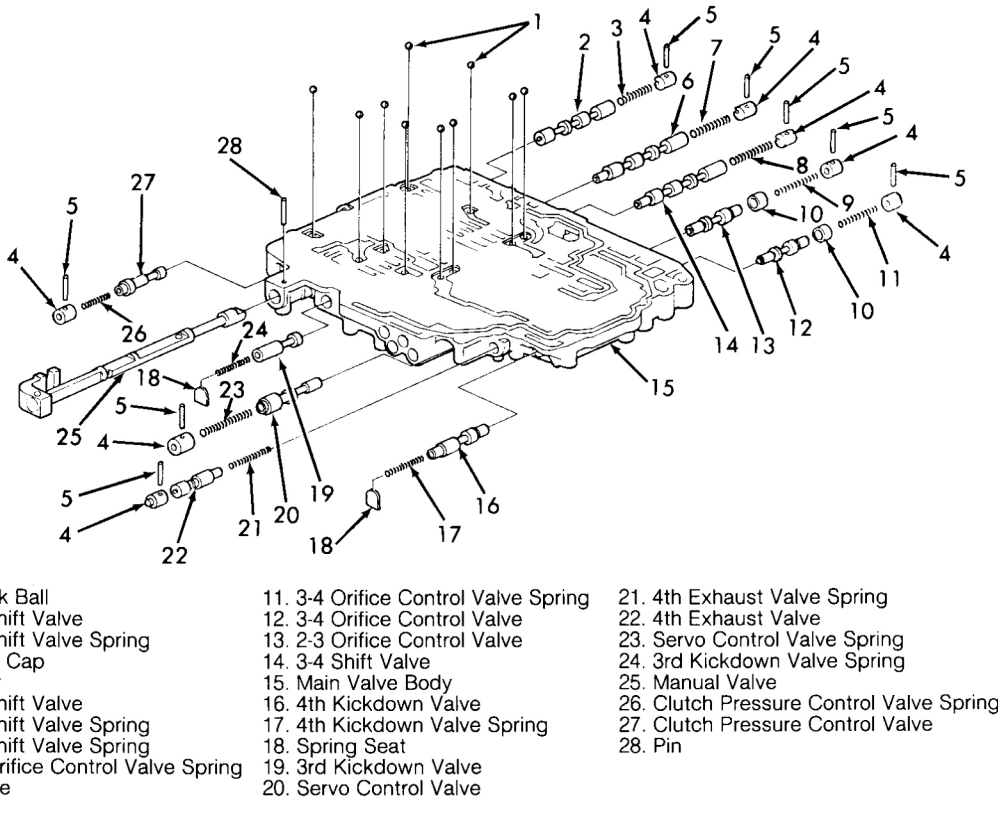


Fig. 22: Exploded View Of Main Valve Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

SERVO BODY

Disassembly

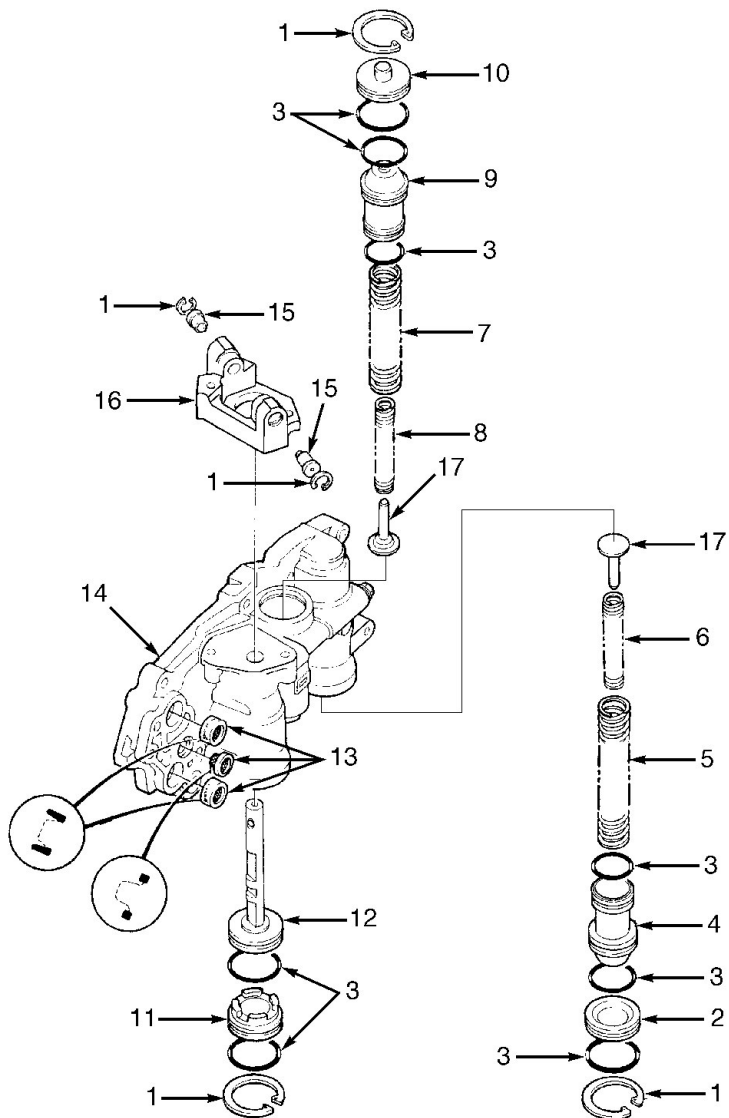
Disassemble servo body. See **Fig. 23**. Use care when removing accumulator covers, as they are under spring pressure.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace servo body if any parts are worn or damaged.
2. Ensure spring free length is within specification. See **SPRING SPECIFICATIONS** table. Replace springs if not within specification.

Reassembly

Coat all components and bores with Dexron-II ATF. To reassemble, reverse disassembly procedure using NEW filters and NEW "O" rings. Make sure filters are installed in proper direction. See **Fig. 23**.



- | | |
|-------------------------------|---------------------------|
| 1. Snap Ring | 10. 4th Accumulator Cover |
| 2. 3rd Accumulator Cover | 11. Servo Valve Cover |
| 3. "O" Ring | 12. Shift Fork Shaft |
| 4. 3rd Accumulator Piston | 13. Filter |
| 5. 3rd Accumulator Spring "A" | 14. Servo Body |
| 6. 3rd Accumulator Spring "B" | 15. Valve |
| 7. 4th Accumulator Spring "A" | 16. Servo Detent Base |
| 8. 4th Accumulator Spring "B" | 17. Spring Guide |
| 9. 4th Accumulator Piston | |

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Fig. 23: Exploded View Of Servo 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 lock bolt. Note direction of valve cap installation before removing from regulator valve body.

Disassembly

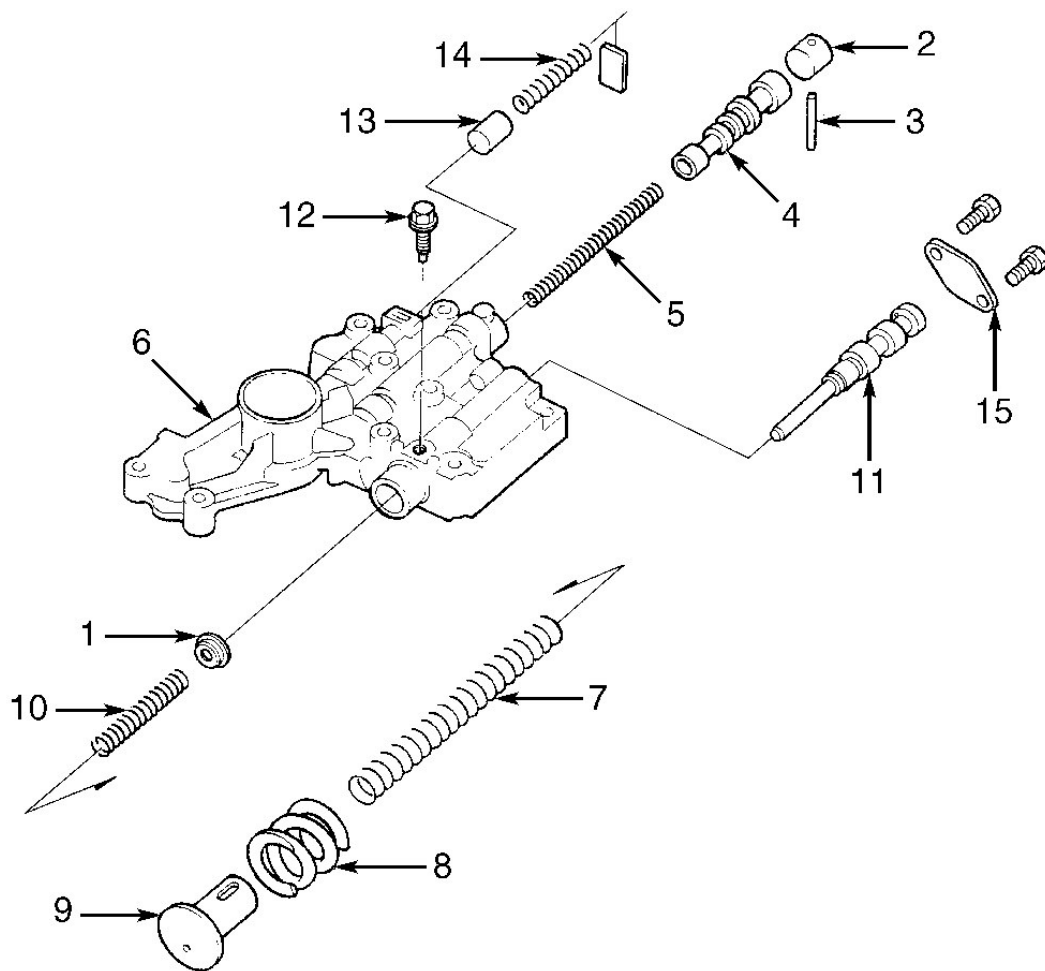
Hold regulator spring cap downward and remove lock bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 24**.

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 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. Replace springs if not within specification.

Reassembly

1. Coat all components and bores with Dexron-II ATF. To reassemble, reverse disassembly procedure. Ensure all components are installed in correct location. See **Fig. 24**.
2. Ensure hole in regulator spring cap aligns with hole for lock bolt in valve body before tightening lock bolt. Tighten lock bolt to specification. See **TORQUE SPECIFICATIONS**.



- | | |
|-------------------------------|--------------------------------|
| 1. Spring Seat | 9. Regulator Spring Cap |
| 2. Valve Cap | 10. Regulator Valve Spring "B" |
| 3. Roller | 11. Regulator Valve |
| 4. Lock-Up Shift Valve | 12. Lock Bolt |
| 5. Lock-Up Shift Valve Spring | 13. Cooler Relief Valve |
| 6. Regulator Valve Body | 14. Cooler Relief Valve Spring |
| 7. Regulator Valve Spring "A" | 15. Valve Cover |
| 8. Stator Reaction Spring | |

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Fig. 24: Exploded View Of Regulator Valve Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

OIL PUMP BODY

CAUTION: When disassembling oil pump body, place components in order and mark

spring locations for reassembly reference. DO NOT use force to remove components. Note direction of valve cap installation before removing from oil pump body.

Disassembly

Disassemble oil pump body. See **Fig. 25**. Use care when removing valve caps or spring seats, as they are under spring pressure.

Cleaning & Inspection

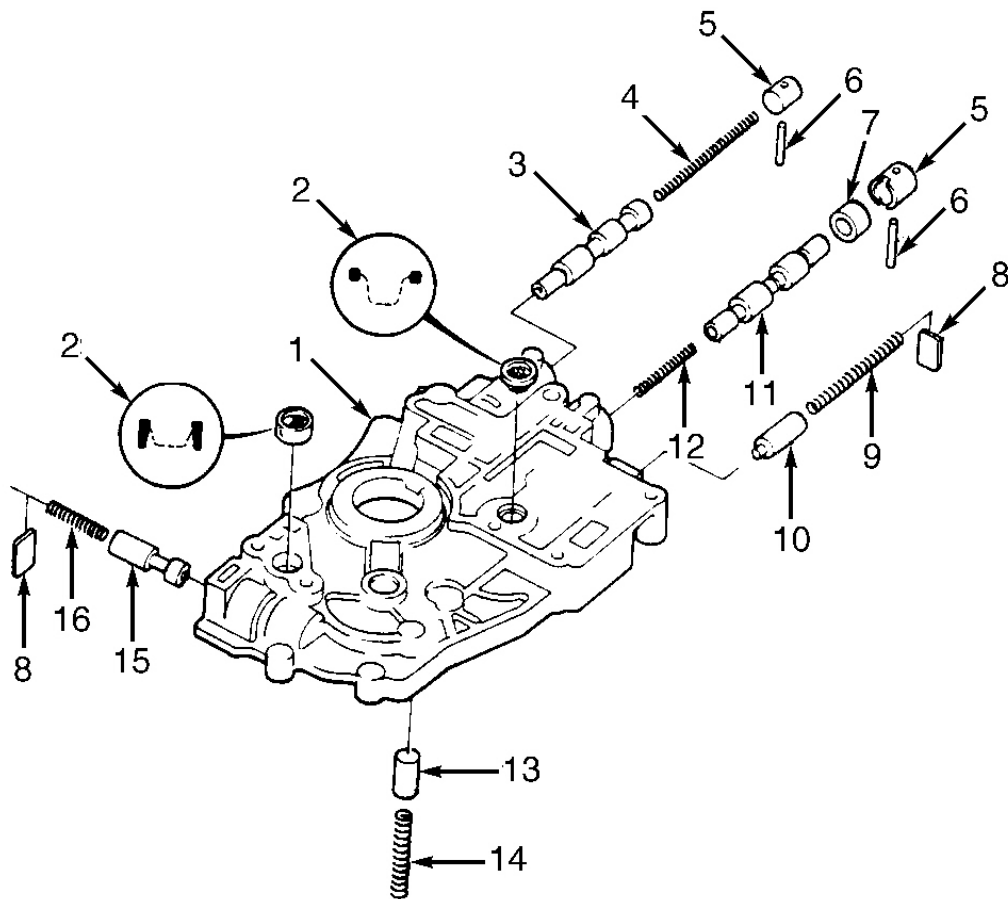
1. Clean components with solvent and dry with compressed air. Replace oil pump body if any parts are worn or damaged.
2. Ensure all valves slide freely in bores. If valves do not slide freely, polish burrs or rough areas using No. 600 sandpaper soaked for 30 minutes in ATF. Thoroughly clean oil pump 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.
4. Install oil pump gears and oil pump driven gear shaft in oil pump body. Ensure chamfered and grooved side of oil pump driven gear is facing upward (toward separator plate side of oil pump body).
5. Using feeler gauge, measure side clearance of both gears between tip of gear teeth and oil pump valve body. See **Fig. 26**. Replace oil pump gears and/or oil pump body if side clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.
6. Remove oil pump driven gear shaft. Place straightedge across oil pump body surface. Using feeler gauge, measure thrust clearance between oil pump driven gear and straightedge. See **Fig. 27**. Replace oil pump gears and/or oil pump body if thrust clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.

OIL PUMP SPECIFICATIONS

Application	In. (mm)
Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0028-.0049 (.070-.125)
Thrust Clearance	
Standard	.001-.002 (.03-.05)
Wear Limit	.0028 (.070)

Reassembly

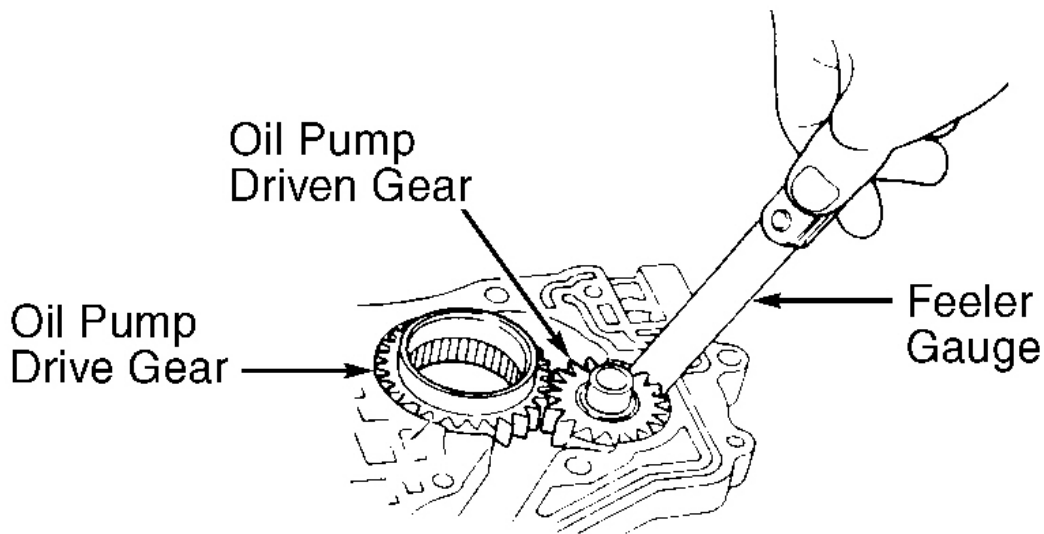
Coat components with Dexron-II ATF. To reassemble, reverse disassembly procedure using NEW filters. Ensure chamfered and grooved side of oil pump driven gear faces upward (toward separator plate side of oil pump body). Ensure filters are installed in proper direction. See **Fig. 25**.



- | | |
|--------------------------------|---|
| 1. Oil Pump Body | 9. Relief Valve Spring |
| 2. Filter | 10. Relief Valve |
| 3. Lock-Up Timing Valve | 11. Lock-Up Control Valve |
| 4. Lock-Up Timing Valve Spring | 12. Lock-Up Control Valve Spring |
| 5. Valve Cap | 13. Torque Converter Check Valve |
| 6. Roller | 14. Torque Converter Check Valve Spring |
| 7. Sleeve | 15. Modulator Valve |
| 8. Spring Seat | 16. Modulator Valve Spring |

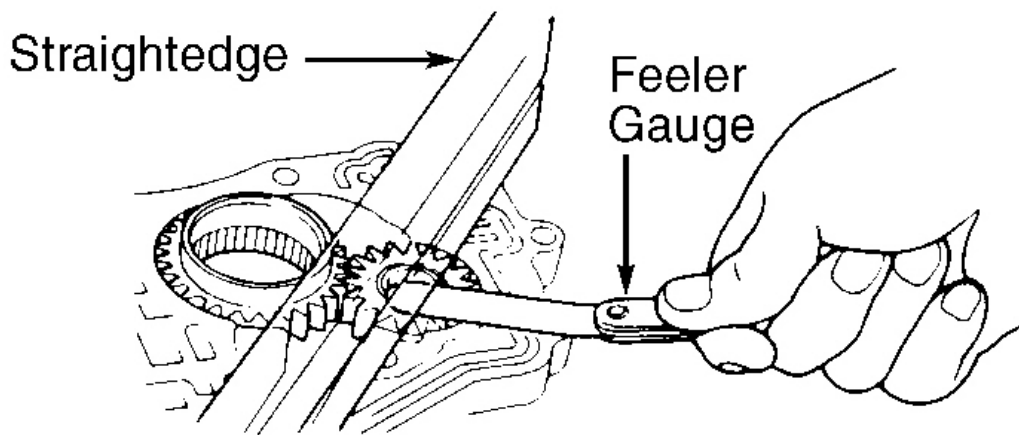
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Fig. 25: Exploded View Of Oil Pump Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



93E23683

Fig. 26: Measuring Oil Pump Clearances Checking Side Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 27: Measuring Oil Pump Clearances Checking Thrust Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2ND ACCUMULATOR BODY & THROTTLE VALVE BODY

Disassembly

Remove 2nd accumulator piston, 2nd accumulator spring and filter from 2nd accumulator body. See **Fig. 19**. Remove bolts, harness clamp, throttle valve body and separator plate from 2nd accumulator body.

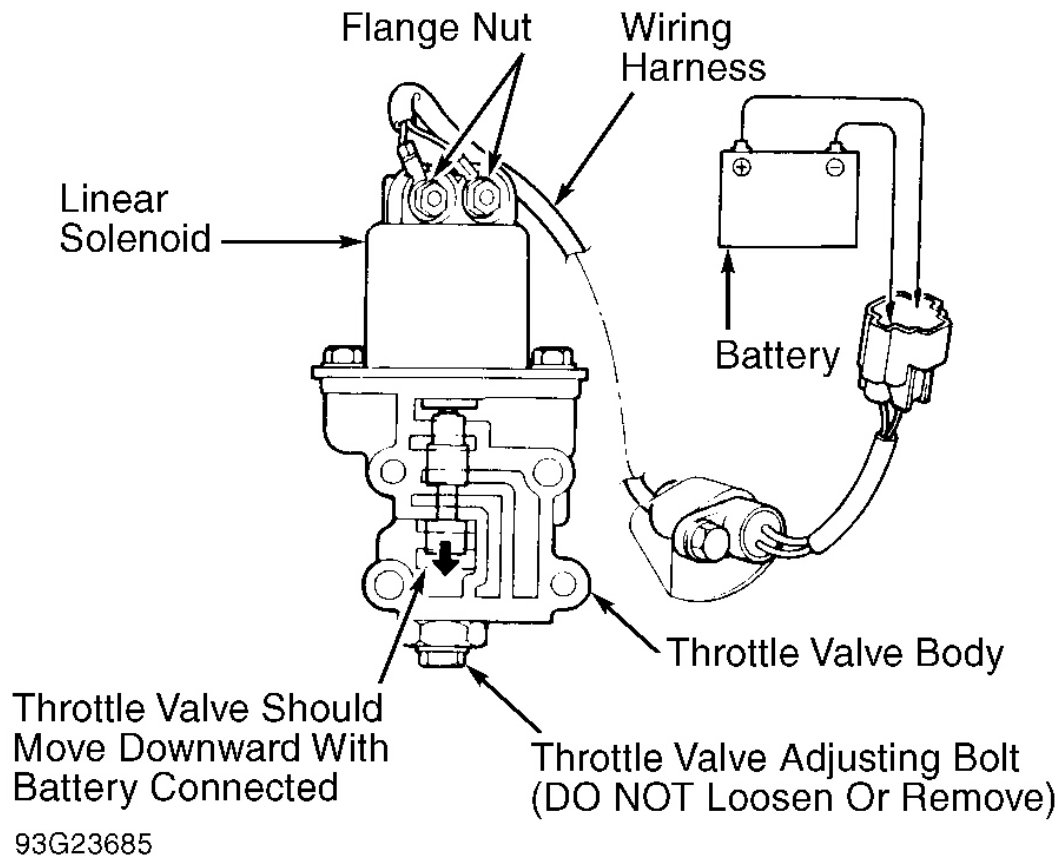
CAUTION: DO NOT loosen or remove throttle valve adjusting bolt on bottom of throttle valve body. See Fig. 19. DO NOT remove linear solenoid from throttle valve body.

Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace components if worn or damaged.
2. Ensure 2nd accumulator spring free length is 3.468" (88.10 mm). Replace spring if free length is not within specification.
3. To check linear solenoid operation, connect wiring harness to linear solenoid. Tighten flange nuts to specification. See **TORQUE SPECIFICATIONS**.
4. Connect positive battery terminal to Red wire and negative battery terminal to White wire of wiring harness. See **Fig. 28**. Ensure throttle valve moves downward in throttle valve body by looking through passage on throttle valve body. If throttle valve moves downward with battery connected, linear solenoid is operating.
5. If throttle valve does not move, disconnect wiring harness at linear solenoid. Connect battery directly to linear solenoid. If throttle valve now moves, repair or replace wiring harness for linear solenoid. If linear solenoid still does not operate, replace linear solenoid and throttle valve body as an assembly.

Reassembly

1. Coat components with Dexron-II ATF. To reassemble, reverse disassembly procedure using NEW filter and NEW "O" rings. Ensure filter is installed in proper direction. See **Fig. 19**.
2. Tighten throttle valve body bolts to specification. See **TORQUE SPECIFICATIONS**.

**Fig. 28: Checking Linear Solenoid Operation**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

1ST & 1ST-HOLD ACCUMULATOR**NOTE:** The 1st and 1st-hold accumulators are located in rear cover.**Disassembly**

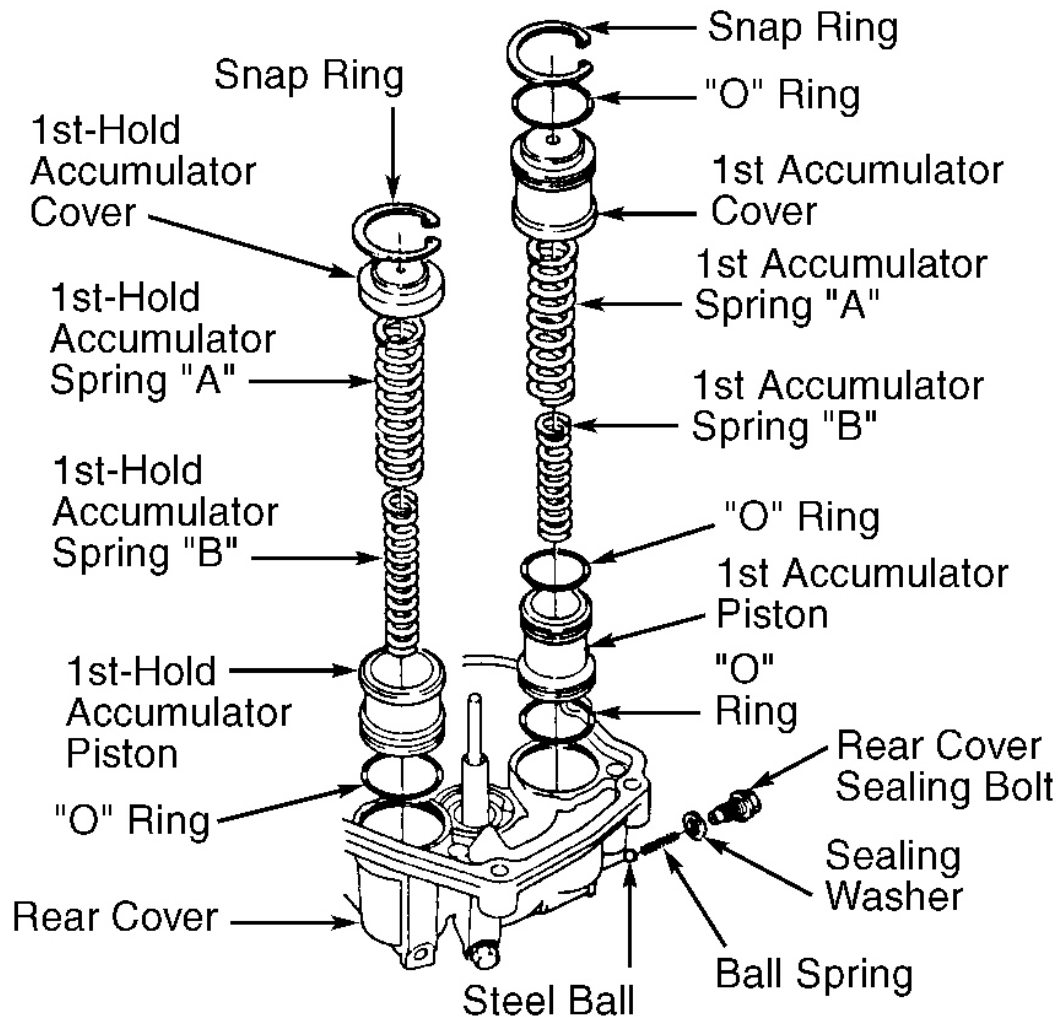
Disassemble 1st and 1st-hold accumulators. See **Fig. 29**. Use care when removing accumulator covers, as they are under spring pressure.

Cleaning & Inspection

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

Reassembly

Coat all components and bores with Dexron-II ATF. To reassemble, reverse disassembly procedure using NEW sealing washer and NEW "O" rings. Tighten rear cover sealing bolt to specification. See **TORQUE SPECIFICATIONS**.



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Fig. 29: Exploded View Of 1st & 1st-Hold Accumulators
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT

Disassembly

Note location of mainshaft components. See **Fig. 17**. Remove components from mainshaft.

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.

NOTE: Mainshaft 2nd gear clearance must be checked during reassembly.

Reassembly

1. Install all components on mainshaft except mainshaft 4th-reverse gear and needle bearings without installing "O" rings on mainshaft. See **Fig. 17**. Remove ball bearing for mainshaft from transaxle housing. Install ball bearing on mainshaft.
2. Install mainshaft 1st gear collar, thrust washer and 1st clutch on mainshaft. DO NOT install mainshaft 1st gear and needle bearings at this time. See **Fig. 15**.
3. Install disc spring and used mainshaft lock nut on mainshaft. Ensure disc spring is installed with largest side against lock nut. See **Fig. 15**. Tighten mainshaft lock nut to 22 ft. lbs. (30 N.m).

NOTE: Mainshaft lock nut has left-hand threads.

4. Install dial indicator on mainshaft so stem of dial indicator is resting against mainshaft 2nd gear. See **Fig. 30**. Move 4th-2nd clutch toward 1st clutch and note reading on dial indicator. This is the mainshaft 2nd gear clearance.
5. Measure mainshaft 2nd gear clearance in 3 different places. Use average reading as mainshaft 2nd gear clearance. Mainshaft 2nd gear clearance should be .003-.006" (.07-.15 mm).
6. Install different thickness mainshaft 2nd gear thrust shim and recheck clearance if mainshaft 2nd gear clearance is not within specification. Mainshaft 2nd gear thrust washers are available in .02" (.05 mm) increments. See [MAINSHAFT 2ND GEAR THRUST SHIM SPECIFICATIONS](#) table.

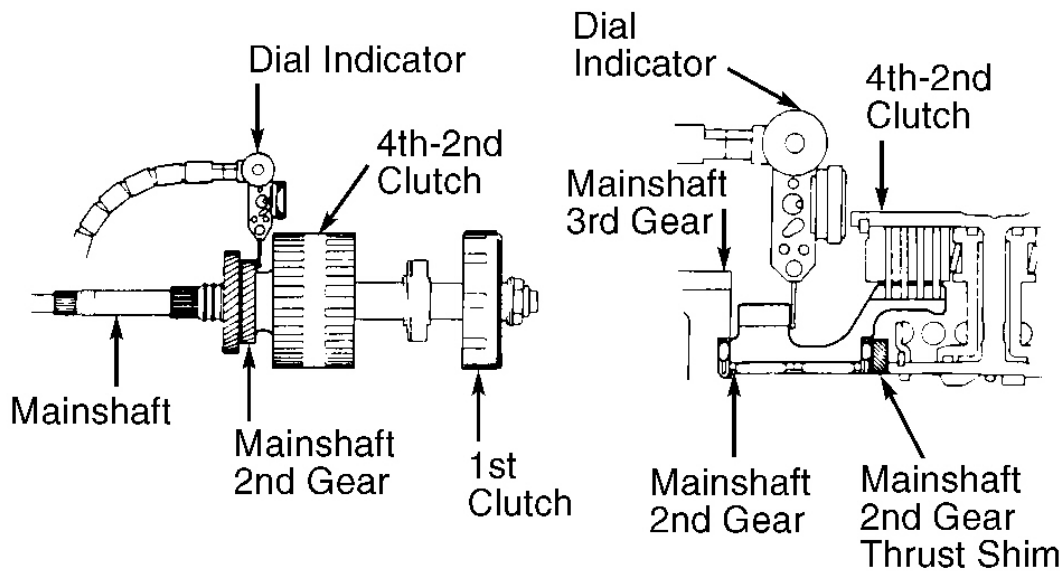
MAINSHAFT 2ND GEAR THRUST SHIM SPECIFICATIONS

Thrust Shim No.	Part Number	Thickness In. (mm)
1	90441-PW4-000	.157 (4.00)
2	90442-PW4-000	.159 (4.05)
3	90443-PW4-000	.161 (4.10)
4	90444-PW4-000	.163 (4.15)
5	90445-PW4-000	.165 (4.20)
6	90446-PW4-000	.167 (4.25)
7	90447-PW4-000	.169 (4.30)
8	90448-PW4-000	.171 (4.35)
9	90449-PW4-000	.173 (4.40)
10	90450-PW4-000	.175 (4.45)
11	90451-PW4-000	.177 (4.50)

7. Once correct mainshaft 2nd gear thrust shim is obtained, disassemble mainshaft. Lubricate all

components with Dexron-II ATF. Wrap splines of mainshaft with tape.

8. Install NEW "O" rings on mainshaft. Reassemble mainshaft. Ensure thrust needle bearings are installed with unrolled edge of bearing retainer facing washer.



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Fig. 30: Checking Mainshaft 2nd Gear Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT

Disassembly

Note location of countershaft components. See **Fig. 17**. Remove components from countershaft.

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.

NOTE: Countershaft 4th gear clearance must be checked during reassembly.

Reassembly

1. Install components on countershaft without installing "O" rings on countershaft. See **Fig. 31**.
2. Install disc spring and used countershaft lock nut on countershaft. Ensure disc spring is installed with largest side against countershaft lock nut. See **Fig. 15**.

3. Tighten countershaft lock nut to 22 ft. lbs. (30 N.m). Hold countershaft 4th gear against distance collar. Using feeler gauge, measure countershaft 4th gear clearance between countershaft 4th gear and reverse selector hub. See **Fig. 32**.
4. Measure countershaft 4th gear clearance in 3 different places. Use average reading as countershaft 4th gear clearance. Countershaft 4th gear clearance should be .003-.006" (.07-.15 mm).
5. Install different length distance collar and recheck clearance if countershaft 4th gear clearance is not within specification. Countershaft distance collars are available in .02" (.05 mm) increments. See **DISTANCE COLLAR SPECIFICATIONS** table.

DISTANCE COLLAR SPECIFICATIONS

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

6. Once correct distance collar size is obtained, disassemble countershaft. Lubricate all components with Dexron-II ATF. Wrap splines of countershaft with tape.
7. Install NEW "O" rings on countershaft. Reassemble countershaft. Ensure thrust bearings are installed with unrolled edge of bearing retainer facing washer.

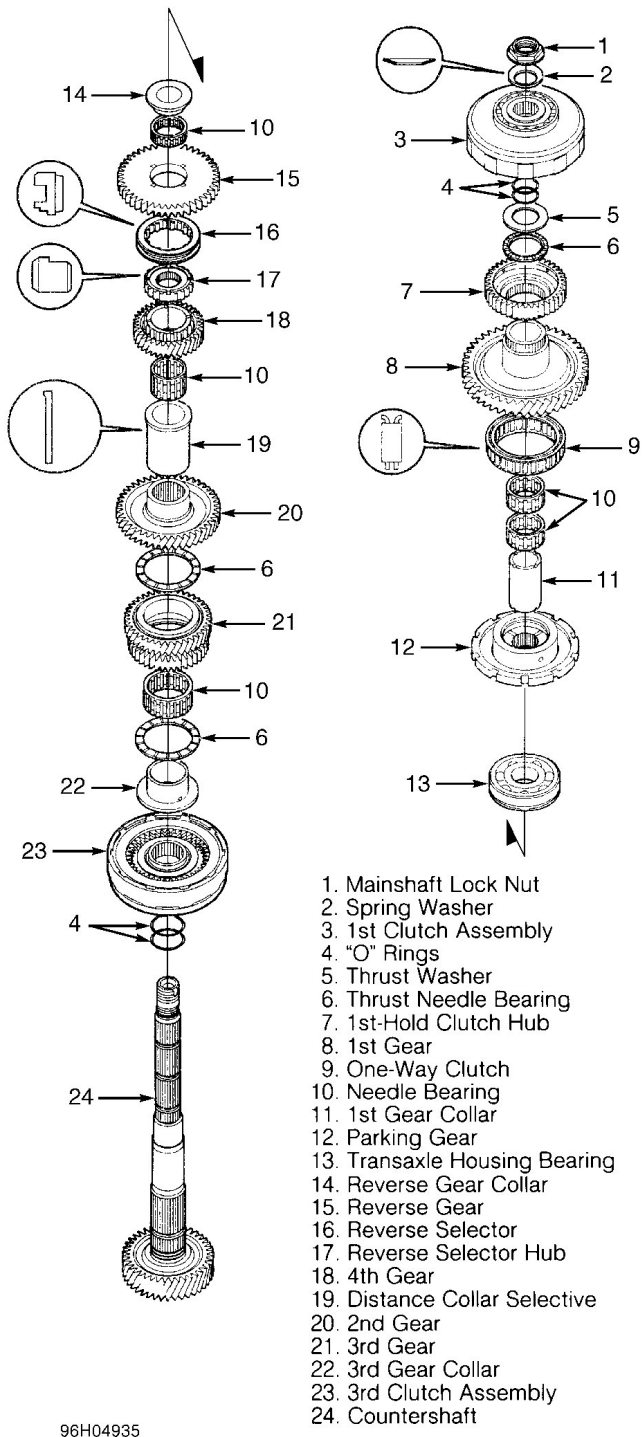


Fig. 31: Assembling Countershaft For Checking Countershaft 4th Gear Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

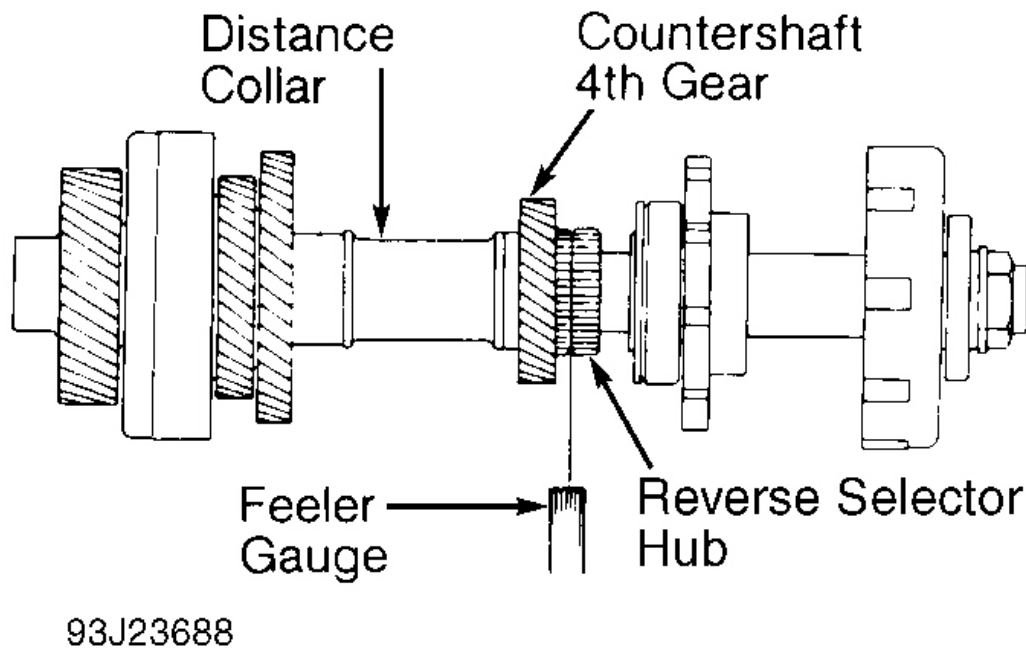


Fig. 32: Checking Countershaft 4th Gear Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

PARKING GEAR & ONE-WAY CLUTCH

Disassembly

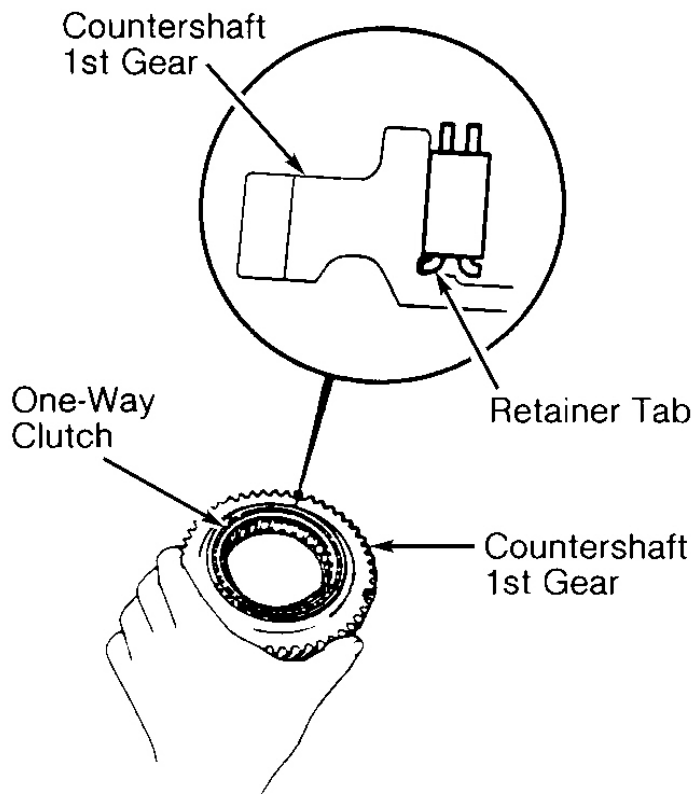
1. To separate parking gear from countershaft 1st gear, hold countershaft 1st gear with parking gear facing upward. Rotate parking gear clockwise and remove from countershaft 1st gear.
2. Note direction of one-way clutch installation in countershaft 1st gear. Using screwdriver, gently pry one-way clutch from countershaft 1st gear.

Cleaning & Inspection

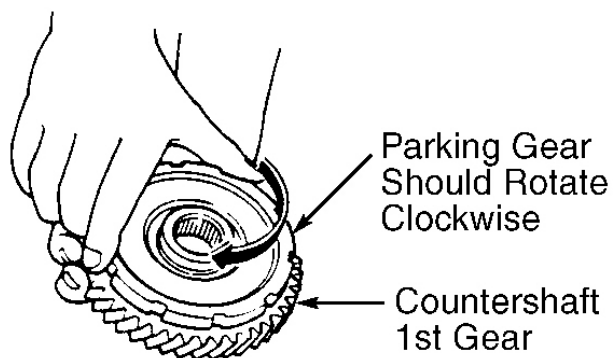
Clean components with solvent and dry with compressed air. Inspect components for damage.

Reassembly

Lubricate all components with Dexron-II ATF. Install one-way clutch with retainer tab toward countershaft 1st gear. See **Fig. 33**. Install parking gear. Ensure parking gear rotates clockwise when holding countershaft 1st gear and does not turn counterclockwise.



INSTALLING ONE-WAY CLUTCH



CHECKING ONE-WAY CLUTCH OPERATION

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Fig. 33: Installing & Checking One-Way Clutch Operation
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

CLUTCH ASSEMBLIES

Disassembly

1. Remove snap ring, clutch end plate, clutch discs and clutch plates. See **Fig. 34**. On 1st clutch, 2nd clutch, 3rd clutch and 4th clutches, note direction of disc spring installation. Remove disc spring if not staked on clutch piston.

NOTE: **Disc spring is not used on 1st-hold clutch. On all other clutch assemblies disc spring may be staked on clutch piston.**

2. Using spring compressor, compress return spring. Remove circlip. Release and remove spring compressor. Remove 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

1. Clean metal components with solvent and dry with compressed air. Ensure check valve on rear of clutch piston is thoroughly cleaned.
2. Inspect components for damage and replace if necessary. Ensure no rough edges exist on "O" ring sealing areas. On 1st and 3rd clutches, ensure disc spring is securely staked to clutch piston. Inspect for loose check valve on rear of clutch piston.

Reassembly

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

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

2. Install return spring and retainer in clutch drum. Place circlip on retainer. Using spring compressor, compress return spring. Install circlip. Remove spring compressor.
3. Install disc spring if not staked on clutch piston. Ensure disc spring is installed in proper direction. See **Fig. 34**.

CAUTION: Ensure clutch discs are soaked in Dexron-II ATF for at least 30 minutes before installing.

4. Alternately install clutch plates and clutch discs starting with clutch plate. Install clutch end plate with flat side toward clutch disc. Install snap ring. Momentarily apply air to oil passage on clutch drum and note that the clutch piston moves and clutch engages.
5. Using dial indicator, measure clutch clearance between clutch end plate and top clutch disc. See **Fig. 35**. Zero dial indicator with clutch end plate lowered. Lift clutch end plate upward against snap ring and dial indicator reading. Distance measured is clutch clearance.
6. Measure clutch clearance at 3 different locations. Ensure clutch clearance is within specification. See

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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 Clutch	.026-.033 (.65-.85)
1st-Hold Clutch	.031-.039 (.80-1.00)
2nd, 3rd & 4th Clutches	.022-.030 (.55-.75)

CLUTCH END PLATE SPECIFICATIONS

Clutch & Plate No.	Part Number	Thickness In. (mm)
1st Clutch		
1	22551-PF4-000	.083 (2.10)
2	22552-PF4-000	.087 (2.20)
3	22553-PF4-000	.091 (2.30)
4	22554-PF4-000	.094 (2.40)
5	22555-PF4-000	.098 (2.50)
6	22556-PF4-000	.102 (2.60)
7	22557-PF4-000	.106 (2.70)
8	22558-PF4-000	.110 (2.80)
9	22559-PF4-000	.114 (2.90)
10	22560-PF4-000	.118 (3.00)
11	22561-PF4-000	.122 (3.10)
12	22562-PF4-000	.126 (3.20)
13	22563-PF4-000	.130 (3.30)
14	22564-PF4-000	.134 (3.40)
1st-Hold Clutch		
3	22553-PF4-000	.091 (2.30)
4	22554-PF4-000	.094 (2.40)
5	22555-PF4-000	.098 (2.50)
6	22556-PF4-000	.102 (2.60)
7	22557-PF4-000	.106 (2.70)
8	22558-PF4-000	.110 (2.80)
9	22559-PF4-000	.114 (2.90)
10	22560-PF4-000	.118 (3.00)
2nd & 4th Clutches		
1	22631-PR9-000	.083 (2.10)

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2	22632-PR9-000	.087 (2.20)
3	22633-PR9-000	.091 (2.30)
4	22634-PR9-000	.094 (2.40)
5	22635-PR9-000	.098 (2.50)
6	22636-PR9-000	.102 (2.60)
7	22637-PR9-000	.106 (2.70)
8	22638-PR9-000	.110 (2.80)
9	22639-PR9-000	.114 (2.90)
3rd Clutch		
4	22554-PF4-000	.094 (2.40)
5	22555-PF4-000	.098 (2.50)
6	22556-PF4-000	.102 (2.60)
7	22557-PF4-000	.106 (2.70)
8	22558-PF4-000	.110 (2.80)
9	22559-PF4-000	.114 (2.90)
10	22560-PF4-000	.118 (3.00)

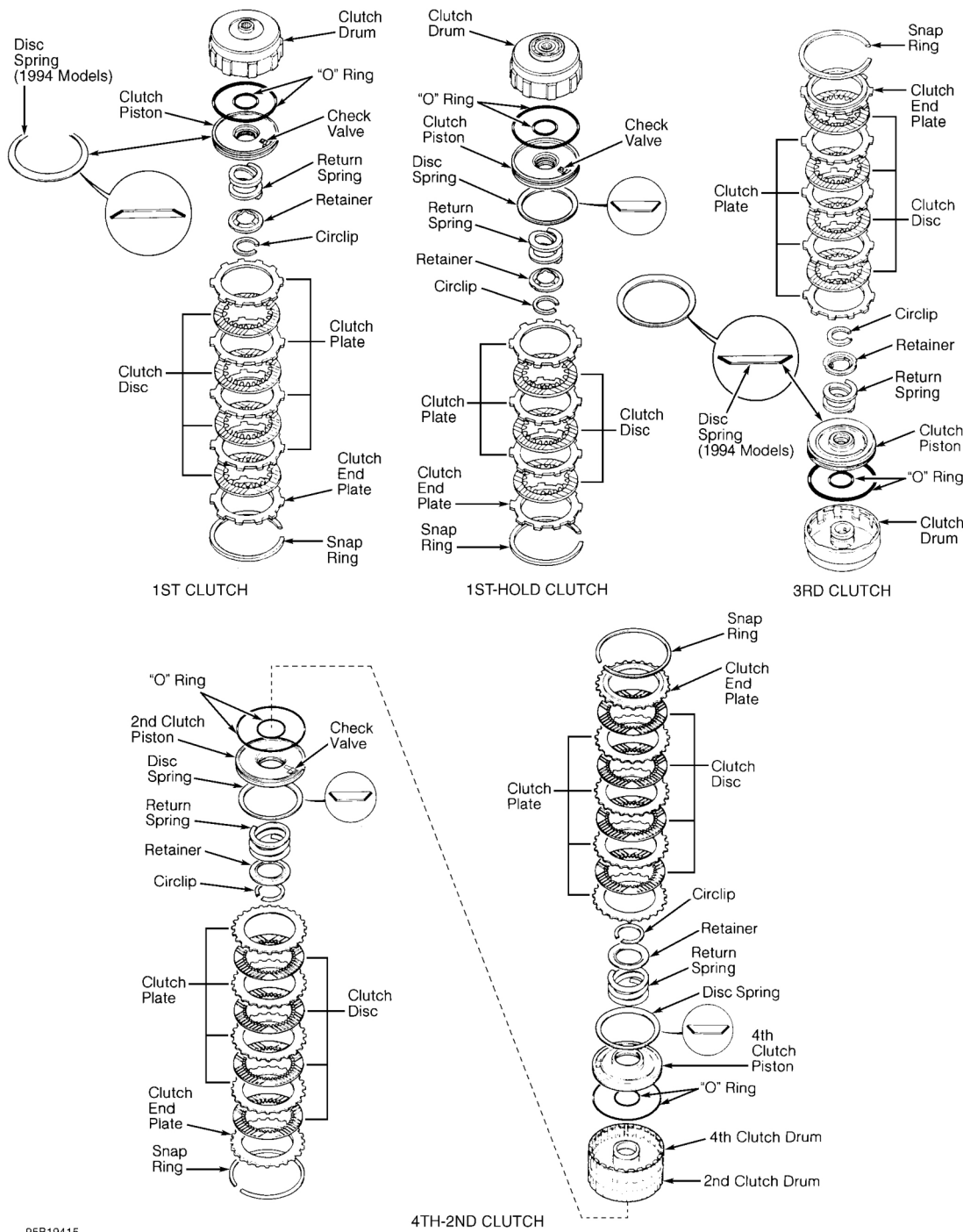
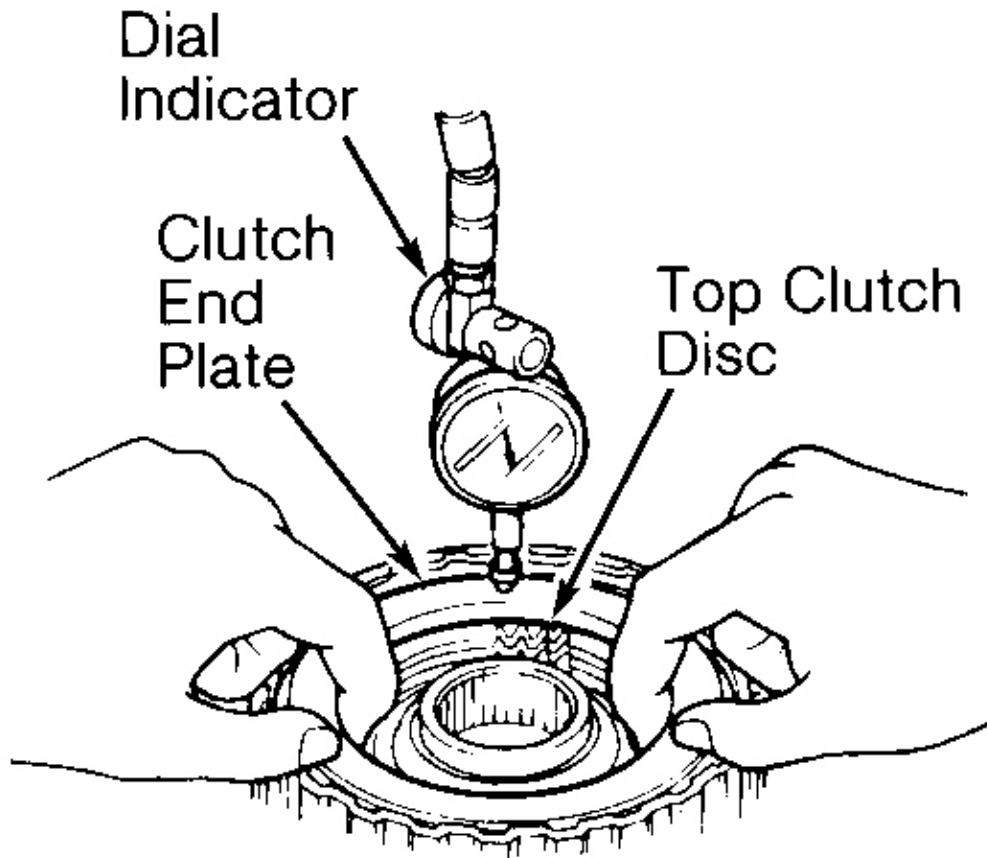


Fig. 34: Exploded View Of Clutch Assemblies
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 35: Measuring Clutch Clearance

Courtesy of AMERICAN HONDA MOTOR CO., INC.

1ST-HOLD CLUTCH BEARING**NOTE:** Bearing is located on rear of 1st-hold clutch. See [Fig. 15](#).**Removal & Installation**

Using puller, remove bearing from rear of 1st-hold clutch. To install, use hammer and bearing driver. Drive bearing on 1st-hold clutch until bearing bottoms.

TORQUE CONVERTER HOUSING

Disassembly

1. Using slide hammer puller, remove countershaft needle bearing from torque converter housing. Remove oil guide plate. See **Fig. 19**.
2. Using hammer and driver, remove mainshaft ball bearing and oil seal from torque converter housing. Remove snap ring retaining extension shaft oil seal in torque converter housing. Using hammer and drift, tap secondary gear 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. Using hammer and driver, drive mainshaft ball bearing until bearing bottoms in torque converter housing. Using hammer and oil seal installer, install NEW mainshaft oil seal in torque converter housing until surface of oil seal is even with surface on torque converter housing surface.
2. To install countershaft needle bearing, install oil guide plate in countershaft bearing bore of torque converter housing. Ensure oil guide plate is installed so tab in center faces upward (away from torque converter housing surface). See **Fig. 19**. Using hammer and driver, drive countershaft needle bearing into torque converter housing.

NOTE: If secondary gear, roller bearings, bearing races, thrust shim, transaxle housing or torque converter housing are replaced, secondary gear bearing preload must be checked before installing secondary gear oil seal. See **SECONDARY GEAR BEARING PRELOAD** under **TRANSAXLE REASSEMBLY**.

3. Using hammer and oil seal installer, install NEW secondary gear oil seal in torque converter housing. Install snap ring in torque converter housing.

TRANSAXLE HOUSING**Disassembly**

Expand snap ring and press mainshaft and countershaft ball bearings from transaxle housing. Using hammer and drift, tap secondary gear oil seal 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.

Reassembly

1. Expand snap ring and install ball bearing part way into transaxle housing. Release snap ring. Press ball

bearing into transaxle housing until snap ring engages with groove in ball bearing.

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

NOTE: If secondary gear, roller bearings, bearing races, thrust shim, transaxle housing or torque converter housing are replaced, secondary gear bearing preload must be checked before installing secondary gear oil seal. See SECONDARY GEAR BEARING PRELOAD under TRANSAXLE REASSEMBLY.

2. Using hammer and oil seal installer, install NEW secondary gear oil seal into transaxle housing.

SECONDARY GEAR & EXTENSION SHAFT

NOTE: If secondary gear, roller bearings, bearing races, thrust shim, transaxle housing or torque converter housing are replaced, secondary gear bearing preload must be checked before installing secondary gear oil seal. See SECONDARY GEAR BEARING PRELOAD under TRANSAXLE REASSEMBLY.

Disassembly

1. Remove set ring and extension shaft from secondary gear. See Fig. 17. Using screwdriver, pry oil seal for extension shaft from secondary gear.
2. If removing roller bearing from secondary gear, support secondary gear in press using bearing remover. Using press, press secondary gear from roller bearing.

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

3. If removing bearing races for secondary gear from torque converter or transaxle housing, use heat gun to heat area around bearing race to 212°F (100°C). Tap bearing race from housing.

CAUTION: When removing bearing race from transaxle housing, use care not to damage thrust shim located below bearing race. See Fig. 17.

Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect splines for excessive wear. Check bearing surfaces for scoring or wear. Inspect secondary gear for damage.

Reassembly

1. To reassemble extension shaft, use hammer and oil seal installer, install NEW oil seal in secondary gear. If installing roller bearings on secondary gear, use press to press roller bearings on secondary gear. Ensure roller bearing fully bottoms on secondary gear.
2. Install extension shaft in secondary gear. Install NEW set ring on end of extension shaft.
3. If installing bearing race for secondary gear in transaxle housing, install thrust shim in transaxle housing. Using hammer and driver, tap bearing race into transaxle housing.
4. If installing bearing race for secondary gear in torque converter housing, use hammer and driver, tap bearing race into transaxle housing.

NOTE: If secondary gear, roller bearings, bearing races, thrust shim, transaxle housing or torque converter housing are replaced, secondary gear bearing preload must be checked before installing secondary gear oil seal. See **SECONDARY GEAR BEARING PRELOAD** under TRANSAXLE REASSEMBLY.

TRANSAXLE REASSEMBLY

SECONDARY GEAR BEARING PRELOAD

1. Oil seals must be removed from torque converter housing and transaxle housing before checking secondary gear bearing preload. Remove snap ring retaining extension shaft oil seal in torque converter housing.
2. Using hammer and drift, tap extension shaft oil seal from torque converter housing and transaxle housing. Remove set ring and extension shaft from secondary gear. See **Fig. 17**.
3. Install sealing bolt in secondary gear. See **Fig. 36**. Tighten sealing bolt to 15 ft. lbs. (20 N.m). Install secondary gear in torque converter housing. DO NOT install mainshaft and countershaft in torque converter housing.
4. Install dowel pins and gasket on torque converter housing. Install transaxle housing on torque converter housing. Install and tighten transaxle housing bolts to specification in sequence. See **Fig. 37**. See **TORQUE SPECIFICATIONS**.

CAUTION: Ensure transaxle housing bolts are also installed on inside of torque converter housing. See **Fig. 17**.

5. Rotate secondary gear in both directions to fully seat roller bearings on secondary gear. Secondary gear bearing preload is determined by measuring starting torque required to rotate secondary gear in both directions.
6. Using INCH-lb. torque wrench, measure starting torque required to rotate secondary gear in both directions at room temperature. See **Fig. 36**. The starting torque should be 20-29 INCH lbs. (2.3-3.3 N.m).
7. If starting torque is not within specification, install different thickness thrust shim below bearing race in transaxle housing. See **Fig. 17**. See **THRUST SHIM SPECIFICATIONS** table. Changing thrust shim to next thickness will increase or decrease starting torque approximately 3 INCH lbs. (3-4 N.m).

THRUST SHIM SPECIFICATIONS

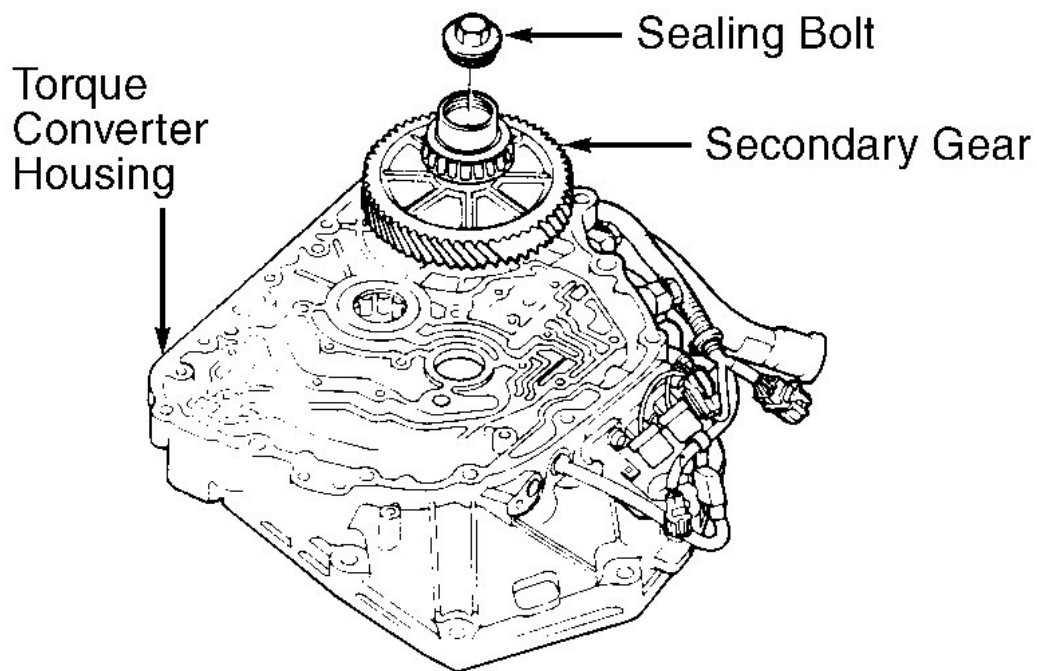
Shim ID Letter	Part Number	Thickness In. (mm)
A	23941-PW5-000	.061 (1.56)
B	23942-PW5-000	.063 (1.59)
C	23943-PW5-000	.064 (1.62)
D	23944-PW5-000	.065 (1.65)
E	23945-PW5-000	.066 (1.68)
F	23946-PW5-000	.067 (1.71)
G	23947-PW5-000	.069 (1.74)
H	23948-PW5-000	.070 (1.77)
I	23949-PW5-000	.071 (1.80)
J	23950-PW5-000	.072 (1.83)
K	23951-PW5-000	.073 (1.86)
L	23952-PW5-000	.074 (1.89)
M	23953-PW5-000	.076 (1.92)
N	23954-PW5-000	.077 (1.95)
O	23955-PW5-000	.078 (1.98)
P	23956-PW5-000	.079 (2.01)
Q	23957-PW5-000	.080 (2.04)
R	23958-PW5-000	.081 (2.07)
S	23959-PW5-000	.083 (2.10)
T	23960-PW5-000	.084 (2.13)
U	23961-PW5-000	.085 (2.16)
V	23962-PW5-000	.086 (2.19)
W	23963-PW5-000	.087 (2.22)
X	23964-PW5-000	.089 (2.25)
Y	23965-PW5-000	.090 (2.28)
Z	23966-PW5-000	.091 (2.31)
AA	23967-PW5-000	.092 (2.34)
AB	23968-PW5-000	.093 (2.37)
AC	23969-PW5-000	.094 (2.40)
AD	23970-PW5-000	.096 (2.43)

8. If changing thrust shim, remove transaxle housing from torque converter housing. Using heat gun, heat area around bearing race in transaxle housing to 212°F (100°C). Tap bearing race from transaxle housing. Remove thrust shim.

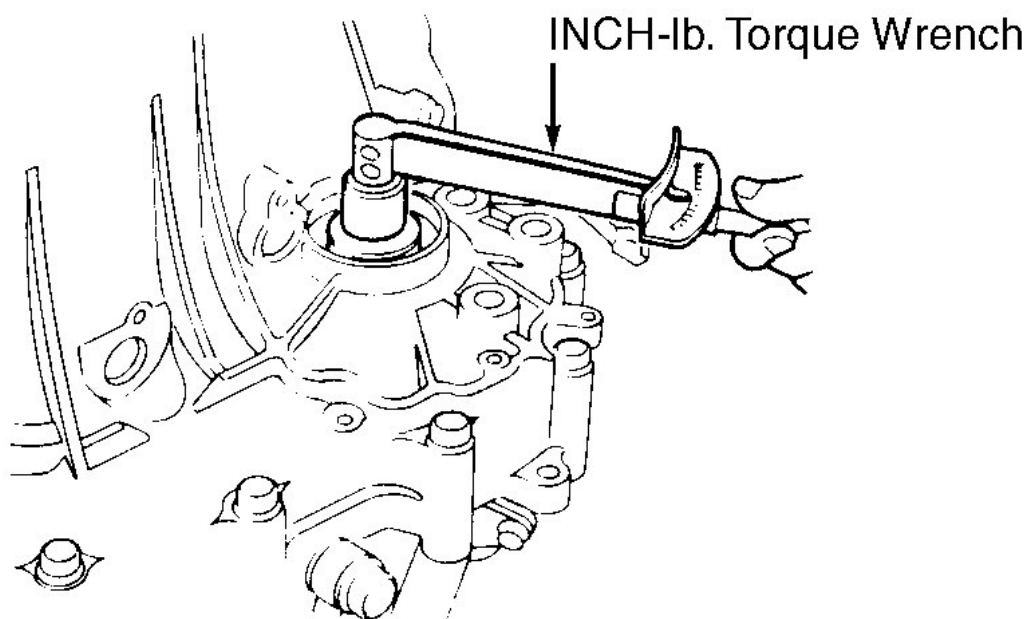
CAUTION: DO NOT heat transaxle housing to more than 212°F (100°C) or housing may be damaged.

9. Install thrust shim in transaxle housing. Using hammer and driver, tap bearing race into transaxle housing. Recheck secondary gear bearing preload.

10. Once correct secondary gear bearing preload is obtained, remove transaxle housing and secondary gear from torque converter housing. Using hammer and oil seal installer, install NEW secondary gear oil seal in torque converter housing. Install snap ring in torque converter housing.
11. Using hammer and oil seal installer, install NEW secondary gear oil seal into transaxle housing. Install extension shaft in secondary gear. Install NEW set ring on end of extension shaft.



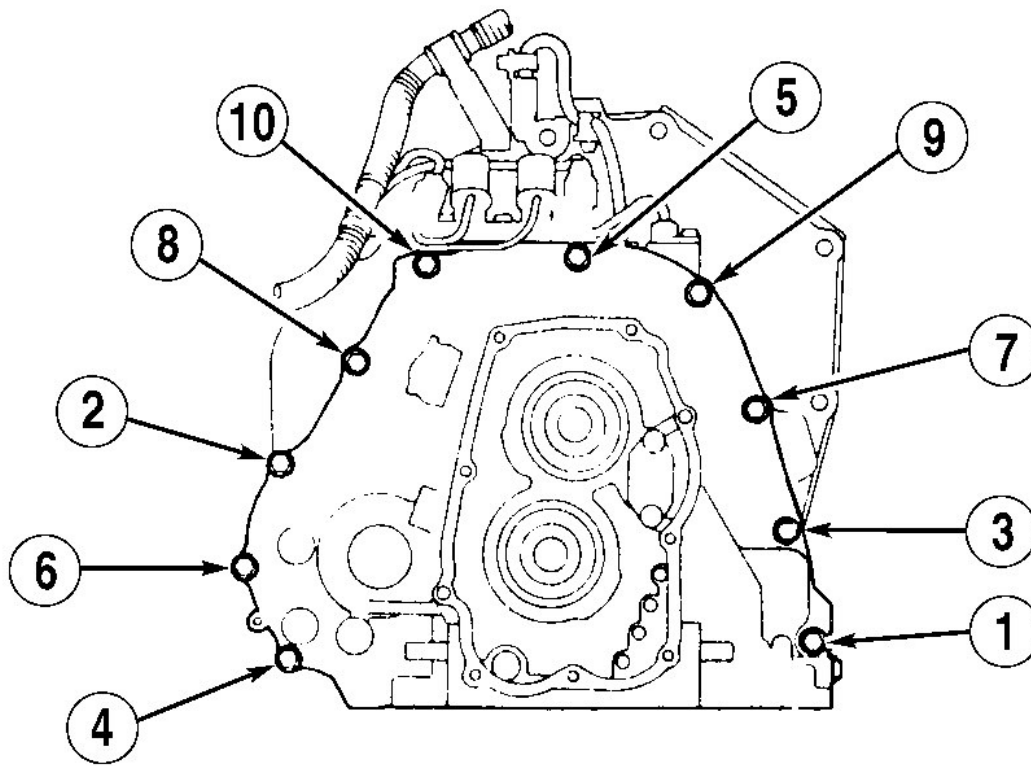
INSTALLING SEALING BOLT



CHECKING STARTING TORQUE

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Fig. 36: Installing Sealing Bolt & Checking Starting Torque
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 37: Transaxle Housing Bolt Tightening Sequence
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

VALVE BODIES & INTERNAL COMPONENTS

CAUTION: If secondary gear, roller bearings, bearing races, thrust shim, transaxle housing or torque converter housing are replaced, secondary gear bearing preload must be checked before installing secondary gear oil seal. See **SECONDARY GEAR BEARING PRELOAD** under TRANSAXLE REASSEMBLY.

NOTE: Coat all components with Dexron-II ATF during reassembly.

1. If installing reverse idler gear in transaxle housing, install spring and steel ball in reverse idler gear shaft holder. Install needle bearing on end of reverse idler gear shaft holder. Ensure needle bearing retains steel

ball and spring in reverse idler gear shaft holder.

2. Install reverse idler gear in transaxle housing. See **Fig. 17**. Install reverse idler gear shaft holder on transaxle housing. Install and tighten reverse idler gear shaft holder bolts to specification. See **TORQUE SPECIFICATIONS**.
3. Install shift control solenoid valve harness in torque converter housing. See **Fig. 19**. Install and tighten solenoid valve harness bolt to specification. Install dowel pins and separator plate on torque converter housing.

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

4. Install oil pump drive gear, oil pump driven gear and oil pump driven gear shaft. Install torque converter check valve and spring.
5. Install oil pump body. Install and tighten oil pump body bolts to specification.

CAUTION: Ensure oil pump gears rotate smoothly and oil pump driven gear shaft moves freely once oil pump body is installed. If components do not operate correctly, loosen 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.

6. Install NEW filters in oil pump body. Ensure filters are installed in proper direction. See **Fig. 19**.
7. Install dowel pins, separator plate, throttle valve body/linear solenoid and harness clamp on 2nd accumulator body. Install and tighten throttle valve body bolts to specification.
8. Install NEW "O" rings on 2nd accumulator piston. Install 2nd accumulator spring and 2nd accumulator piston in 2nd accumulator body. Install NEW filter in 2nd accumulator body. Ensure filter is installed in proper direction.
9. Install 2nd accumulator body. Install and tighten 2nd accumulator body bolts to specification. Install oil feedpipes in 2nd accumulator body. Install dowel pin and separator plate for regulator valve body.
10. Install stator shaft, NEW "O" ring and stopper shaft. Install regulator valve body. Install and tighten regulator valve body bolts to specification.
11. Connect shift control solenoid harness connector to linear solenoid terminal. Install flange nuts and harness connector bolt. Install oil feedpipes in oil pump body, torque converter housing and 2nd accumulator housing. See **Fig. 19**. Install wiring harness on linear solenoid. Tighten flange nuts on linear solenoid to specification.
12. Install NEW "O" ring and dipstick tube. Install and tighten bolt to specification. Using NEW seal washers, install cooler pipes and joint bolts. Tighten joint bolts to specification.
13. Install reverse idler gear and reverse idler gear shaft assembly in torque converter housing. Install extension shaft and secondary gear in torque converter housing. Install countershaft and mainshaft as an assembly in torque converter housing. Install dowel pins and NEW gasket on torque converter housing.

CAUTION: Ensure mainshaft and countershaft speed sensors ARE NOT installed in transaxle housing when installing transaxle housing on

torque converter housing.

14. Install transaxle housing on torque converter housing. Install and tighten transaxle housing bolts to specification in sequence. See **Fig. 37**.
15. Ensure transaxle housing-to-torque converter housing bolts are installed on inside of torque converter housing. See **Fig. 17**. Tighten bolts to specification.
16. Install NEW "O" rings on mainshaft and countershaft speed sensors. Install countershaft speed sensor. Install mainshaft speed sensor washer and mainshaft speed sensor. See **Fig. 17**. Install and tighten speed sensor bolts to specification.

CAUTION: Ensure mainshaft speed sensor washer is installed when installing mainshaft speed sensor. Countershaft speed sensor does not use a washer.

17. Install parking pawl, parking pawl spring, parking pawl shaft and parking pawl stopper. Turn control shaft or detent lever to shift into any gear except park. Install mainshaft 1st gear collar and thrust washer on mainshaft.
18. Install parking gear, countershaft 1st gear collar and needle bearings on countershaft. See **Fig. 15**. Install one-way clutch and countershaft 1st gear as an assembly on countershaft.
19. Wrap splines of countershaft and mainshaft with tape. Install NEW "O" rings on countershaft and mainshaft. Remove tape from countershaft and mainshaft.
20. Install mainshaft 1st gear, needle bearing, thrust needle bearing, thrust washer and 1st clutch on mainshaft. Install 1st-hold clutch hub, thrust needle bearing, thrust washer and 1st-hold clutch on countershaft.
21. Coat NEW disc springs and NEW lock nuts with Dexron-II ATF. Install disc spring on mainshaft and countershaft. Ensure disc spring is installed with largest side against lock nut.
22. Install mainshaft and countershaft lock nuts. Install Mainshaft Holder (07GAB-PF50100) on mainshaft to secure mainshaft. See **Fig. 16**.
23. Engage parking pawl with parking gear. Tighten mainshaft and countershaft lock nuts to specification. Remove mainshaft holder. Stake lock nuts against the shaft.

CAUTION: Ensure mainshaft and countershaft lock nuts are securely staked.

24. Position control shaft in Park position. Push shift fork into Drive position (toward lower valve body assembly). See **Fig. 12**. Install lower valve body assembly while engaging manual valve on valve body with detent lever and engaging shift fork with reverse selector.
25. Install main valve body cover plate. Pass shift control solenoid valve harness through transaxle housing. Install harness connector bolt. Install harness cover. See **Fig. 12**. Install fluid strainer ensuring proper length bolts are installed in correct location on lower valve body assembly and fluid strainer. See **Fig. 13**.
26. Ensure wiring harness is not pinched. Tighten all bolts to specification. Install dowel pins, NEW gasket and oil pan. Install and tighten oil pan bolts to specification. Install NEW seal washer on drain plug. Tighten drain plug to specification.

27. Install oil pipes, dowel pins, NEW gasket and rear cover. Install and tighten rear cover bolts to specification. Reconnect shift control solenoid valve harness to transaxle sub-harness. Install gear position switch cover. See **Fig. 38**. Tighten bolt on transaxle pan side first hand tight, then tighten side cover side bolt to specification. Tighten transaxle pan side bolt to specification.

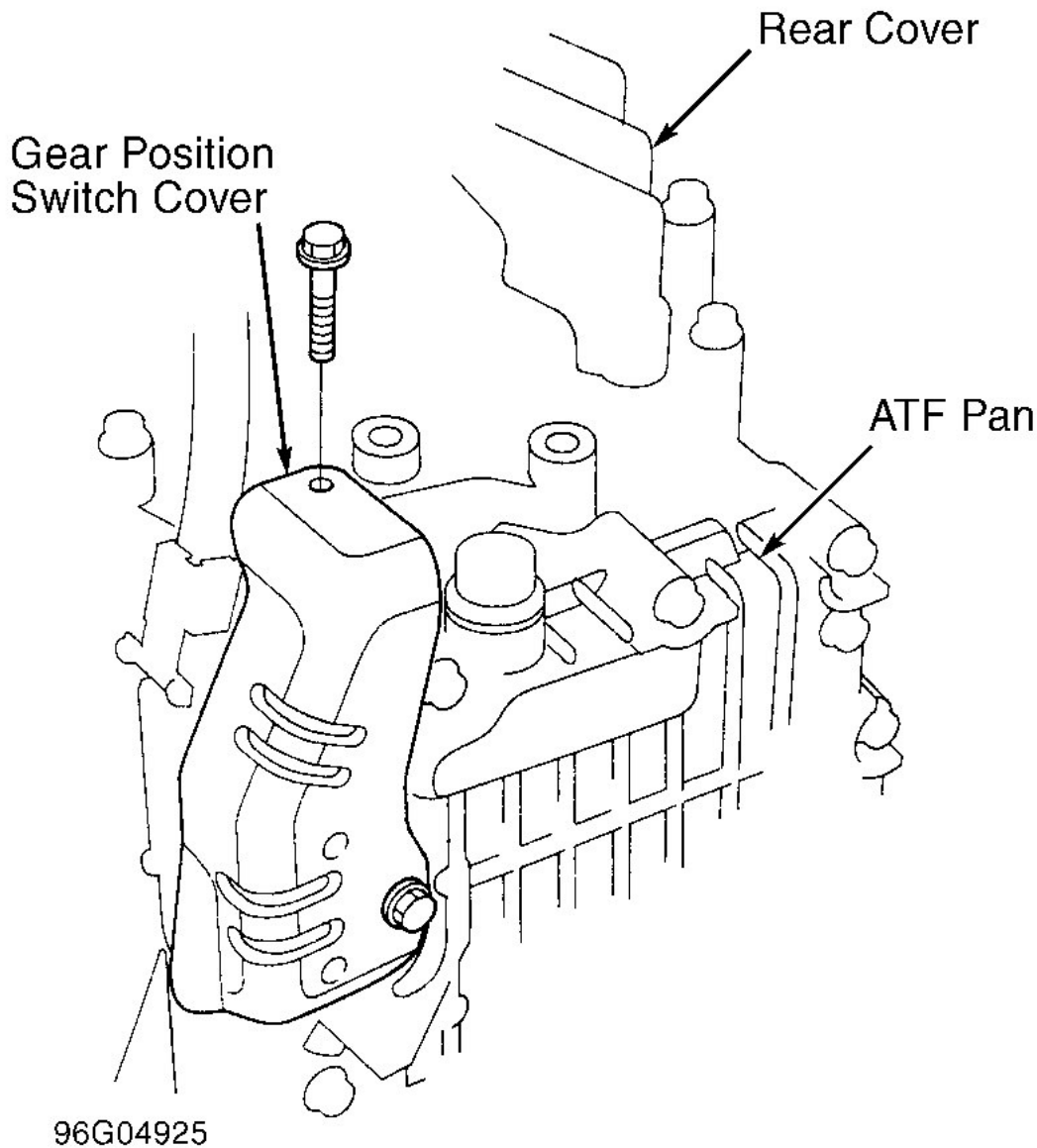


Fig. 38: Installing Gear Position Switch Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CAUTION: If transaxle failure existed, flush oil cooler. See **OIL COOLER FLUSHING**

under ON-VEHICLE SERVICE.

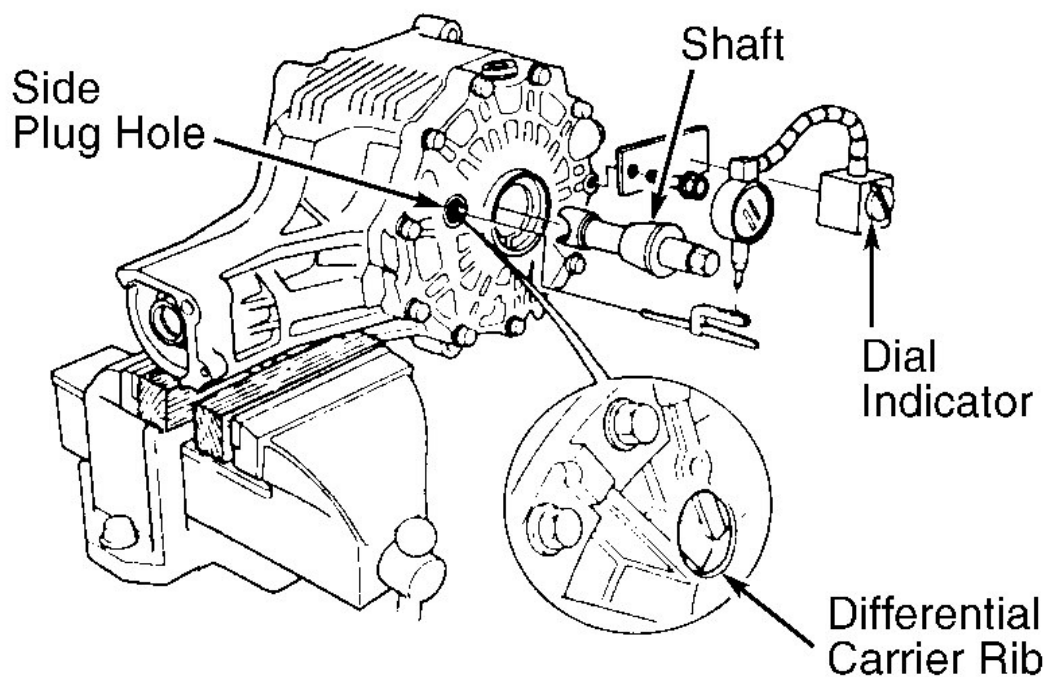
DIFFERENTIAL ASSEMBLY

OVERHAUL

NOTE: Pre-disassembly inspection should be performed before disassembly of differential assembly. This will indicate if proper thrust shims and thrust washers are used.

Pre-Disassembly Inspection - Ring Gear Backlash

1. Check ring gear backlash, total bearing preload and gear tooth contact pattern before disassembling differential assembly. Record measurements for use during reassembly.
2. To check ring gear backlash, mount differential assembly in soft-jawed vice. Remove side plug and seal washer from differential case cover. See **Fig. 41**. Remove oil seal from differential case cover. Align differential carrier rib with side plug hole.
3. Install Shaft (07HAJ-PK40201) in differential assembly. See **Fig. 39**. Mount dial indicator on differential case cover.
4. Measure ring gear backlash in 3 different locations on differential carrier. Ring gear backlash should be .002-.004" (.04-.10 mm) and maximum variation in ring gear backlash readings should not exceed .0016" (.040 mm).
5. If ring gear backlash is within specification, proper thickness thrust shims are installed behind bearing races for differential carrier bearings provided no components are changed. If ring gear backlash is not within specification, different thickness thrust shim must be installed during reassembly.



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Fig. 39: Checking Differential Assembly Ring Gear Backlash
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Bearing Preload

1. Punch 2 holes on opposite sides in surface of pinion collar seal. Using wood block, screwdriver and 2 holes, pry pinion collar oil seal from differential case. See **Fig. 40**.
2. Remove differential case cover and differential carrier. To measure pinion preload, install a dial-type INCH-lb. torque wrench on end of drive pinion. Rotate drive pinion and note pinion preload. Pinion preload should be 5.6-9.1 INCH lbs. (.64-1.03 N.m).
3. Reinstall differential carrier and differential case cover. To measure total bearing preload, install a dial-type INCH-lb. torque wrench on end of drive pinion. Rotate drive pinion and note total bearing preload. Total bearing preload should be 13.50-19.08 INCH lbs. (1.536-2.16 N.m) with used bearings.

NOTE: If total bearing preload is not within specification, different thickness shim must be installed behind bearing race for differential carrier bearings.

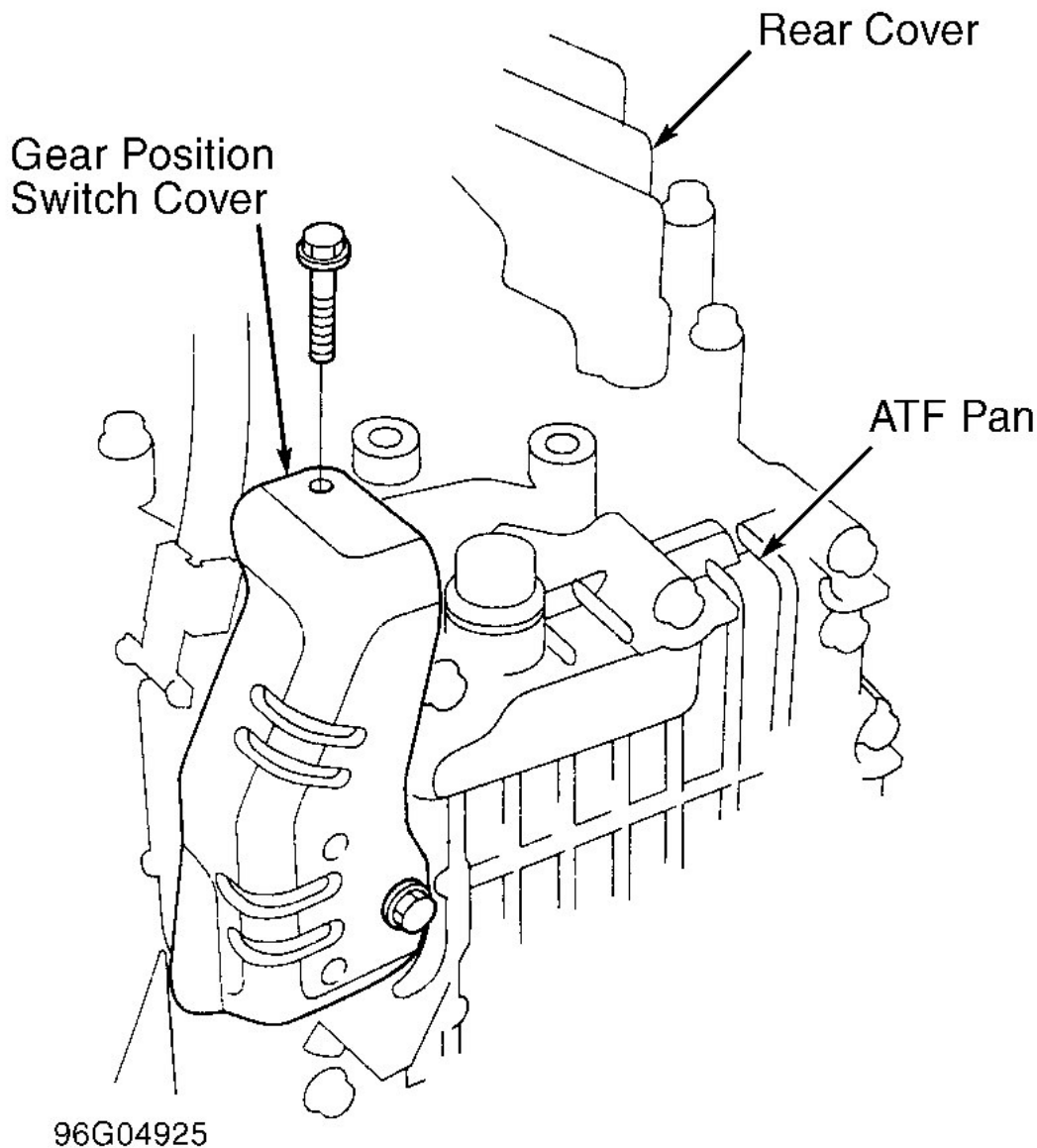


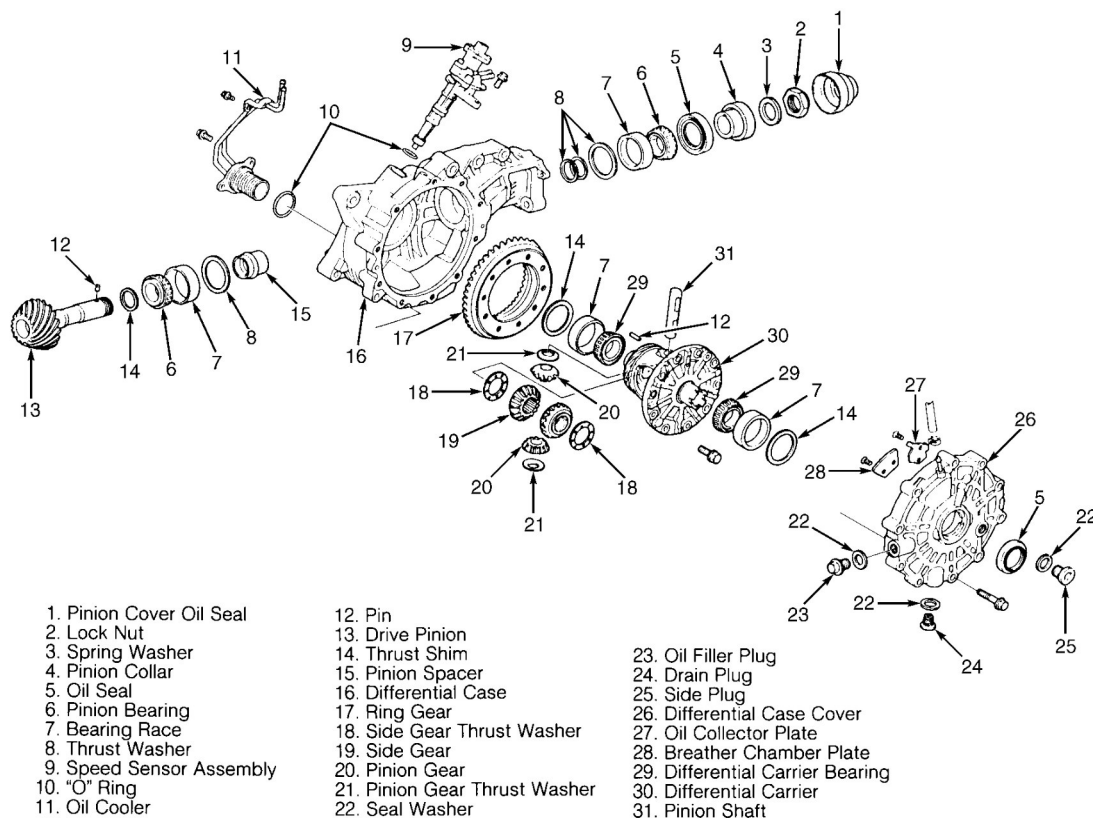
Fig. 40: Removing Pinion Collar Seal

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Gear Tooth Contact

1. To check gear tooth contact pattern, remove differential case cover bolts in a crisscross pattern. Remove differential case cover. See **Fig. 41**. Clean and paint both sides of ring gear teeth with Prussian Blue.
2. Install differential case cover. Install and tighten bolts in a crisscross pattern to 35 ft.lbs. (47 N.m). Install Shaft (07HAJ-PK40201) in differential assembly.
3. Rotate ring gear one full turn in both directions while applying resistance on pinion shaft. Remove

differential case cover and inspect ring gear tooth contact pattern. Correct gear tooth contact should be centered on the ring gear. See **GEAR TOOTH CONTACT PATTERNS** article in GENERAL INFORMATION.



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Fig. 41: Exploded View Of Differential Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Disassembly

1. Remove differential case cover bolts in a crisscross pattern. Remove differential case cover. Remove oil collector plate and breather chamber plate from differential case cover (if necessary). See **Fig. 41**.
2. Remove differential carrier with ring gear from differential case. Remove bolts, oil cooler and "O" ring. Punch 2 small holes in pinion collar seal 180 degrees apart from each other. See **Fig. 40**.
3. Place wooden block on differential case to protect case when prying pinion collar seal from differential case. Place screwdriver in small holes and pry pinion collar seal from differential case.
4. Using hammer and chisel, cut lock nut tab and pry away from drive pinion. Insert Allen wrench or hex socket into gear end of drive pinion.

NOTE: Lock nut on drive pinion contains left-hand threads.

5. Secure long end of 1 1/4" (32 mm) Allen wrench in vise or hold hex socket. Remove lock nut and spring

washer from drive pinion.

6. Remove pinion collar and oil seal. Remove pin from end of drive pinion. Tap drive pinion out of the front pinion bearing. Remove drive pinion, pinion spacer and thrust washers. See **Fig. 41**.
7. Inspect pinion bearings. If replacing pinion bearing on drive pinion, use press and bearing remover to press bearing from drive pinion. Remove thrust shim from drive pinion.

NOTE: If pinion bearings are replaced, bearing races must also be replaced.

8. Use a hammer and drift to remove pinion bearing races from differential case. Remove thrust washer, located below bearing race, from differential case. See **Fig. 41**.
9. Inspect differential carrier bearings. If replacing differential carrier bearings, use press and bearing remover to press bearing from differential carrier.

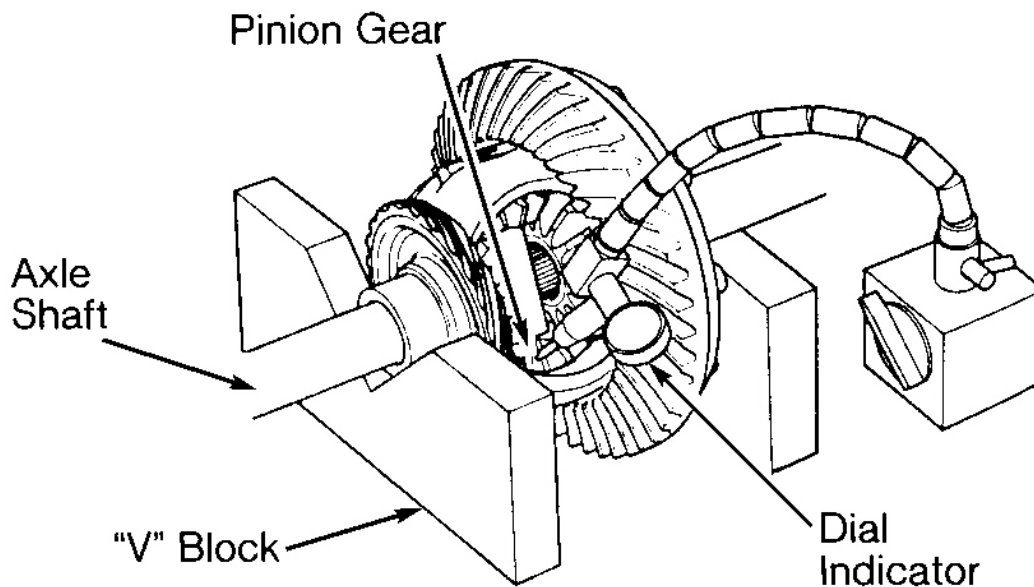
NOTE: If differential carrier bearings are replaced, bearing races must also be replaced.

10. Use a hammer and drift to remove differential carrier bearing races. Remove thrust shim, located below bearing race, from differential case or differential case cover. See **Fig. 41**.

NOTE: Thrust shim must be replaced if bearing race was removed from differential case or differential case cover.

NOTE: Pinion gear backlash must be checked. Differential carrier bearings must be removed from differential carrier to measure pinion gear backlash.

11. Mount differential carrier in "V" blocks with axle shaft and intermediate shaft inserted into side gears. See **Fig. 42**. Using dial indicator, check pinion gear backlash. Pinion gear backlash should be .002-.012" (.05-.30 mm).
12. If pinion gear backlash is not within specification, replace differential carrier as an assembly. Remove bolts and ring gear from differential carrier in crisscross pattern.



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Fig. 42: Checking Pinion Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.

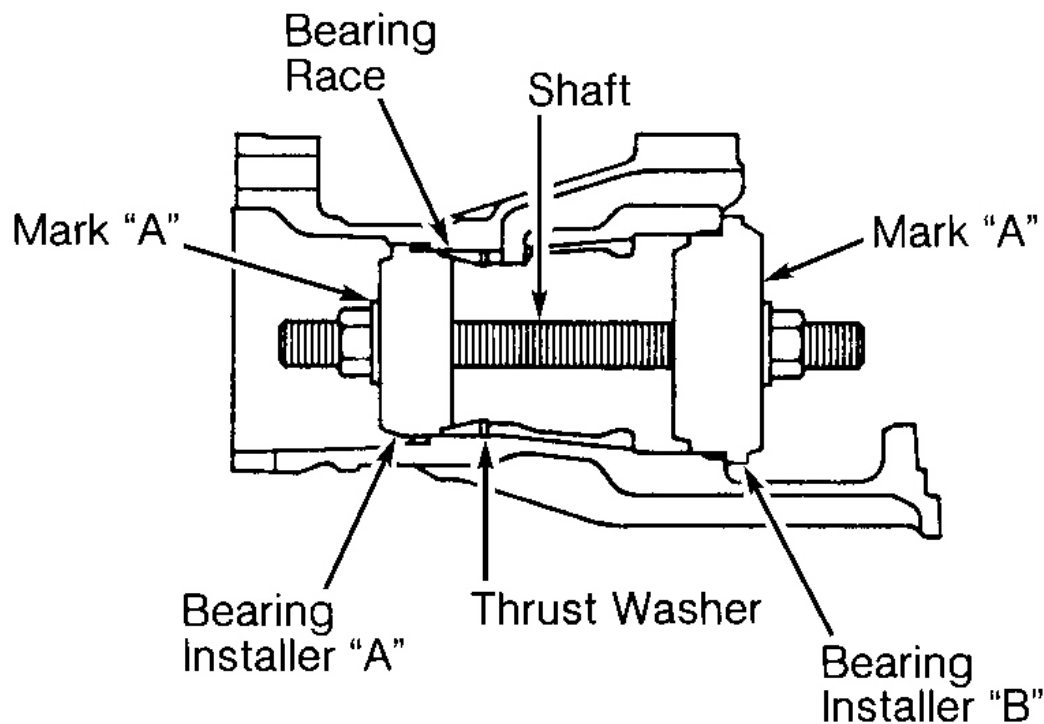
Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for damage. Replace components if damaged.

Reassembly

1. Install ring gear on differential carrier. Install and tighten ring gear bolts to specification in a crisscross pattern. See **TORQUE SPECIFICATIONS**. Using press, press NEW differential carrier bearings on differential carrier (if removed).
2. If installing bearing races for drive pinion in differential case, install thrust washer, located behind bearing race, in differential case. Use Shaft (07MAF-SP0013A) and Bearing Race Installer "A" (07MAF-SP0011A) and "B" (07MAF-SP0012A) to install bearing races. See **Fig. 43**.
3. Install bearing races for drive pinion in differential case, starting with outer bearing race (lock nut side) and then the inner bearing race.

CAUTION: Heating differential case to 212°F (100°C) will assist in bearing race installation. DO NOT exceed 212°F (100°C) or differential case may be damaged.



95I19420

Fig. 43: Installing Bearing Race (Outer Race Shown; Inner Race Is Similar)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. If installing bearing races for differential carrier bearings, install NEW thrust shim in differential case or differential case cover. Ensure thrust shim is the same thickness as thrust shim that was removed. Using hammer and bearing race installer, drive bearing race into differential case and differential case cover.
5. If original drive pinion and ring gear are being installed, install original thickness thrust shim on drive pinion (if removed). If NEW drive pinion and ring gear are being installed, proper thickness thrust shim must be determined to obtain correct drive pinion height. See **DRIVE PINION HEIGHT** under ADJUSTMENTS.
6. If installing pinion bearing on drive pinion, ensure thrust shim is installed on drive pinion. Using press, old pinion spacer and bearing installer, press pinion bearing onto drive pinion. Lubricate all pinion bearings with oil.
7. Install drive pinion in differential case. DO NOT install pinion spacer and thrust washers at this time. Install pinion bearing on drive pinion.
8. Using hammer and bearing installer, drive outer pinion bearing onto drive pinion while supporting drive pinion. Install pin in drive pinion. Install pinion collar. Ensure groove in pinion collar aligns with pin in drive pinion.
9. Apply light coat of hypoid gear oil on threads on drive pinion. Install spring washer and lock nut on drive

pinion. Tighten lock nut to 15 ft. lbs. (20 N.m). DO NOT overtighten lock nut or pinion bearings may be damaged. Clean drive pinion and ring teeth and coat with Prussian Blue.

10. Lubricate differential carrier bearings with oil. Install differential carrier into differential case. Install differential case cover. Install and tighten differential case cover bolts in a crisscross pattern to 35 ft.lbs. (47 N.m).
11. Install Shaft (07HAJ-PK40201) in differential assembly. Rotate ring gear one full revolution in both directions while applying resistance on pinion shaft.
12. Remove differential cover and inspect ring gear tooth contact pattern. Correct gear tooth contact pattern should be centered on the ring gear. See **GEAR TOOTH CONTACT PATTERNS** article in GENERAL INFORMATION.
13. If gear tooth contact pattern is incorrect, drive pinion height must be changed to correct gear tooth contact pattern. Change thrust shim located below bearing on drive pinion to adjust drive pinion height.
14. If gear tooth contact pattern is correct, remove components from drive pinion for installation of pinion spacer. Install NEW pinion spacer and thrust washers on drive pinion.
15. Install outer pinion bearing on drive pinion. Using hammer and bearing installer, drive outer pinion bearing onto drive pinion while supporting drive pinion. Using hammer and oil seal installer, install NEW oil seal for drive pinion.
16. Install pin in drive pinion. Install pinion collar. Install NEW spring washer and NEW lock nut. Ensure spring washer is installed with raised area toward the lock nut. Check pinion bearing preload. See **PINION BEARING PRELOAD** under ADJUSTMENTS.
17. Once correct pinion bearing preload is obtained, stake lock nut against drive pinion. Clean drive pinion and ring teeth and coat with Prussian Blue. Lubricate differential carrier bearings with oil.
18. Install differential carrier into differential case. Install differential case cover. Install and tighten differential case cover bolts in a crisscross pattern to 35 ft.lbs. (47 N.m).
19. Check total bearing preload. See **TOTAL BEARING PRELOAD** under ADJUSTMENTS. Once correct total bearing preload is correct, check ring gear backlash. See **RING GEAR BACKLASH** under ADJUSTMENTS.
20. Once correct ring gear backlash is obtained, remove differential case cover and check gear tooth contact pattern. Correct gear tooth contact should be centered on the ring gear. See **GEAR TOOTH CONTACT PATTERNS** article in GENERAL INFORMATION.
21. Install oil collector plate and breather chamber plate on differential case cover (if removed). Install and tighten bolts to specification. Stake heads of bolts against differential case cover.
22. Apply Liquid Gasket (08718-0001) on differential case cover-to-differential case sealing surfaces. Install differential case cover. Install and tighten bolts to specification in a crisscross pattern.
23. Using hammer and oil seal installer, install NEW oil seal in differential case and differential case cover. Install oil cooler and NEW "O" ring. Install and tighten bolts to specification. Using hammer and oil seal installer, install NEW pinion collar seal.

ADJUSTMENTS

DRIVE PINION HEIGHT

NOTE: If drive pinion and ring gear are replaced, drive pinion height must be set. Drive pinion height may also need to be set if incorrect gear tooth contact pattern

exists.

1. Drive pinion height is controlled by thickness of thrust shim located between rear pinion bearing and drive pinion. When installing used drive pinion and ring gear and gear tooth contact pattern is incorrect, see **GEAR TOOTH CONTACT PATTERNS** article in GENERAL INFORMATION to determine if thrust shim should be thicker or thinner.
2. When installing NEW drive pinion and ring gear, calculate thrust shim thickness by noting etched mark located on side of drive pinion. See **Fig. 44**.
3. Etched mark indicate with a (+) positive or (-) negative mark along with a numerical digit to indicate drive pinion size. Etched mark is positive or negative in thousandths of a millimeter.

NOTE: **Etched mark is indicated in thousandths of a millimeter. If etched mark is -20, this would be a negative .02 mm.**

4. If etched mark on old drive pinion is positive, add it to the old thrust shim thickness. If etched mark on old drive pinion is negative, subtract it from the old thrust shim thickness.
5. If etched mark on NEW drive pinion is positive, subtract it from thrust shim thickness obtained in step 4). If etched mark on NEW drive pinion is negative, add it to thrust shim thickness obtained in step 4).
6. For example; if old thrust shim thickness is 1.30 mm and old drive pinion etched mark is +20 (.02 mm) and NEW drive pinion etched mark is -20 (.02mm), replacement thrust shim thickness should be 1.34 mm.
7. Select thrust shim that is closest to, but not more than, the determined thrust shim thickness. Thrust shims are available in thickness from .047-.064" (1.18-1.63 mm) in .001" (.03 mm) increments. Part numbers are 41381-PW5-000 to 41396-PW5-000. See **DRIVE PINION THRUST SHIMS** table.

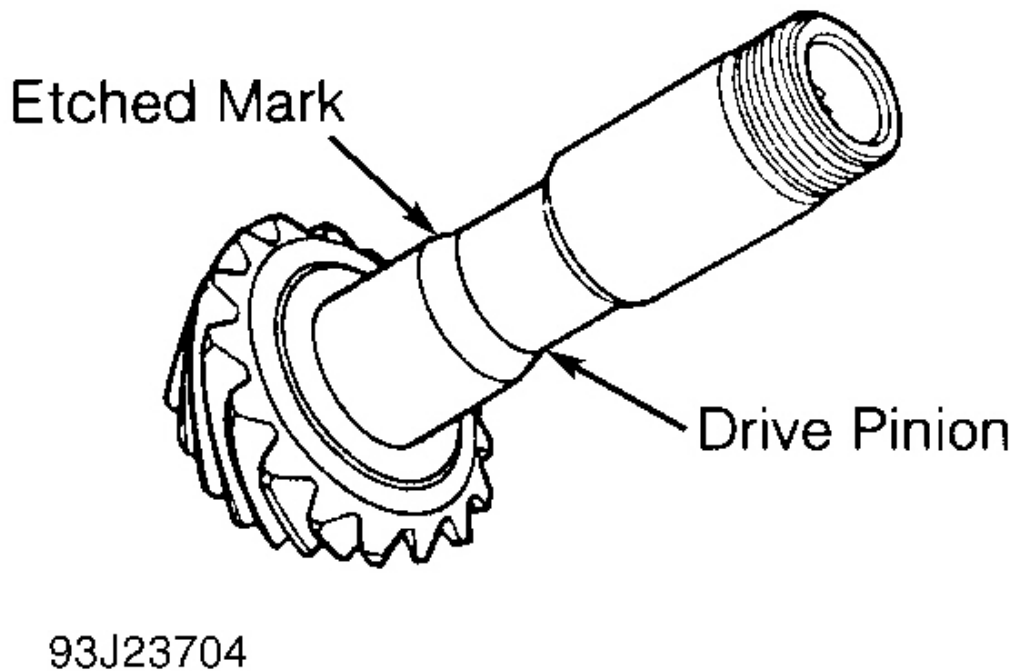


Fig. 44: Identifying Drive Pinion Markings
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

DRIVE PINION THRUST SHIMS

Shim ID Letter	Part Number	Thickness In. (mm)
A	41381-PW5-000	1.18 (.047)
B	41382-PW5-000	1.21 (.048)
C	41383-PW5-000	1.24 (.049)
D	41384-PW5-000	1.27 (.050)
E	41385-PW5-000	1.30 (.051)
F	41386-PW5-000	1.33 (.052)
G	41387-PW5-000	1.36 (.054)
H	41388-PW5-000	1.39 (.055)
I	41389-PW5-000	1.42 (.056)
J	41390-PW5-000	1.45 (.057)
K	41391-PW5-000	1.48 (.058)
L	41392-PW5-000	1.51 (.059)
M	41393-PW5-000	1.54 (.061)
N	41394-PW5-000	1.57 (.062)

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O	41395-PW5-000	1.60 (.063)
P	41396-PW5-000	1.63 (.064)

PINION BEARING PRELOAD

1. Tighten drive pinion lock nut to 188 ft. lbs. (255 N.m). Install a dial-type INCH-lb. torque wrench on end of drive pinion. Rotate drive pinion and note pinion bearing preload. Pinion bearing preload should be within specification. See **PINION BEARING PRELOAD SPECIFICATIONS** table.

PINION BEARING PRELOAD SPECIFICATIONS

Application	INCH Lbs. (N.m)
New Bearings	11.30-14.80 (1.3-1.7)
Used Bearings	5.6-9.1 (.64-1.03)

2. If pinion bearing preload exceeds specification, replace pinion spacer. If pinion bearing preload is less than specified, slightly tighten lock nut until correct pinion bearing preload is obtained.

CAUTION: DO NOT tighten lock nut to more than 239 ft. lbs. (325 N.m). If pinion bearing preload is still less than specified with lock nut tightened to 239 ft. lbs. (325 N.m), replace pinion spacer.

TOTAL BEARING PRELOAD

1. With differential fully assembled, install Shaft (07HAJ-PK40201) in differential assembly. Rotate ring gear one full revolution in both directions while applying resistance on drive pinion. Remove shaft from differential assembly.
2. Install a dial-type INCH-lb. torque wrench on end of drive pinion. Rotate drive pinion and note total bearing preload. Total bearing preload should be within specification. See **TOTAL BEARING PRELOAD SPECIFICATIONS** table.

TOTAL BEARING PRELOAD SPECIFICATIONS

Application	INCH Lbs. (N.m)
All New Bearings	22.40-28.63 (2.58-3.30)
New Differential Carrier Bearings Only	
Outer Bearing (Ring Gear Side Only)	16.80-23.00 (1.93-2.65)
Inner Bearing (Drive Pinion)	19.20-24.72 (2.21-2.85)

Side Only)	
Used Bearings	13.53-19.10 (1.56-2.20)

- If total bearing preload is not within specification, increase preload by increasing thickness of thrust shim located below bearing races in differential case and differential case cover.

CAUTION: Ensure thrust shim thickness is increased the same amount on both thrust shims.

RING GEAR BACKLASH

- Mount differential assembly in soft-jawed vice. Remove side plug and seal washer from differential case cover. See **Fig. 41**. Remove oil seal from differential case cover. Align differential carrier rib with side plug hole.
- Install Shaft (07HAJ-PK40201) in differential assembly. See **Fig. 39**. Mount dial indicator on differential case cover.
- Measure ring gear backlash in 3 different locations on differential carrier. Ring gear backlash should be .002-.004" (.04-.10 mm) and maximum variation in ring gear backlash readings should not exceed .0015" (.040 mm).
- If ring gear backlash is within specification, proper thickness thrust shims are installed behind bearing races for differential carrier bearings provided no components are changed.
- If ring gear backlash exceeds specification, decrease thrust shim thickness on thrust shim located behind bearing race in differential case. Increase thickness of thrust shim in differential case cover the same amount.
- If ring gear backlash is less than specified, increase thrust shim thickness on thrust shim located behind bearing race in differential case. Decrease thickness of thrust shim in differential case cover the same amount.
- Thrust shims are available in thickness from .0657-.0941" (1.67-2.39 mm) in .0012" (.03 mm) increments. Part numbers are 41402-PW8-010 to 41426-PW8-010. One shim is available at .0260" (.660 mm), part number is 41401-PW8-010.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Control Shaft Lock Bolts	10 (14)
Countershaft Lock Nut	101 (137)
Differential Assembly Drain Plug	33 (44)
Differential Assembly Mounting Bolt	
Lower 12-mm Mounting Bolt	55 (75)
Upper Mounting Bolt	

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6-mm Bolt	(1)
12-mm Bolt	55 (75)
Differential Assembly Oil Filler Plug	33 (44)
Differential Case Cover Bolt	35 (47)
Drive Pinion Lock Nut ⁽²⁾	188-239 (255-325)
Joint Bolt	21 (28)
Mainshaft Lock Nut	101 (137)
Mount Bracket Bolt	40 (54)
Oil Cooler Bolt	
6-mm Bolt	(1)
8-mm Bolt	20 (27)
Oil Pump Body Bolt	
6-mm Bolt	(1)
8-mm Bolt	13 (18)
Parking Brake Roller Guide Bolt	22 (29)
Pressure Tap Plug	13 (18)
Rear Cover Sealing Bolt	15 (20)
Ring Gear Bolt	100 (135)
Sealing Bolt	59 (80)
Secondary Driven Gear Sealing Bolt	20 (15)
Side Plug	33 (44)
Transaxle Drain Plug	36 (49)
Transaxle Housing Bolt ⁽³⁾	
8-mm Bolt	24 (33)
10-mm Bolt	33 (44)
Transaxle Mount Bolt	47 (64)
Wheel Lug Nut	80 (109)
INCH Lbs. (N.m)	
A/T Gear Position Switch Bolt	106 (12.0)
Breather Chamber Plate Bolt	106 (12.0)
Control Shaft Collar Bolt	124 (14.0)
Countershaft Speed Sensor Bolt	106 (12.0)
Detent Lever Bolt	124 (14.0)
Dipstick Tube Bolt	106 (12.0)
Flange Nut	53 (6.0)
Fluid Strainer Bolt	106 (12.0)
Harness Cover Bolt	106 (12.0)
Linear Solenoid Assembly Flange Nuts	53 (6)
Lower Valve Body Assembly Bolt	106 (12.0)
Main Valve Body Cover Bolt	106 (12.0)

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Main Valve Body Cover Plate Bolt	106 (12.0)
Mainshaft Speed Sensor Bolt	106 (12.0)
Oil Collector Plate Bolt	106 (12.0)
Oil Pan Bolt	106 (12.0)
Oil Pass Body Bolt	106 (12.0)
Parking Brake Stopper Bolt	124 (14.0)
Rear Cover Bolt	106 (12.0)
Regulator Valve Body Valve Cover Bolt	71 (8)
Regulator Valve Body Bolt	106 (12.0)
Regulator Valve Body Lock Bolt	106 (12.0)
Reverse Idler Gear Shaft Holder 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 Harness Bolt	106 (12.0)
Shift Fork Bolt	124 (14.0)
Throttle Valve Body Bolt	106 (12.0)
Transaxle Sub-Harness Bolt	106 (12.0)
VSS/Power Steering Sensor Bolt	106 (12.0)
2nd Accumulator Body Bolt	106 (12.0)

(1) Tighten bolt to 106 INCH lbs. (12.0 N.m).

(2) Pinion bearing preload is adjusted when tightening lock nut. See **PINION BEARING PRELOAD** under ADJUSTMENTS.

(3) Tighten bolts to specification in sequence. See **Fig. 37**.

TRANSAXLE SPECIFICATIONS**TRANSAXLE SPECIFICATIONS**

Application	Specification In. (mm)
Clutch Clearance	
1st Clutch	.026-.033 (.65-.85)
1st-Hold Clutch	.031-.039 (.80-1.00)
2nd, 3rd & 4th Clutches	.022-.030 (.55-.75)
Differential Assembly Ring Gear Backlash	.002-.004 (.04-.10)
Gear Clearance	
Countershaft (4th Gear Clearance)	.003-.006 (.07-.15)
Mainshaft (2nd Gear Clearance)	.003-.006 (.07-.15)
Oil Pump Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0028-.0049 (.070-.125)

1995 Acura 2.5TL

1995-98 AUTOMATIC TRANSMISSIONS M1WA Overhaul

Oil Pump Thrust Clearance

Standard	.001-.002 (.03-.05)
Wear Limit	.0028 (.070)
Pinion Gear Backlash	.002-.012 (.05-.30)
Secondary Gear Bearing Preload ⁽¹⁾	20-29 INCH lbs. (2.3-3.3 N.m)

(1) Starting torque needed to rotate secondary gear both directions.