

2002 AUTOMATIC TRANSMISSIONS**MCVA & MRVA Overhaul****APPLICATION**

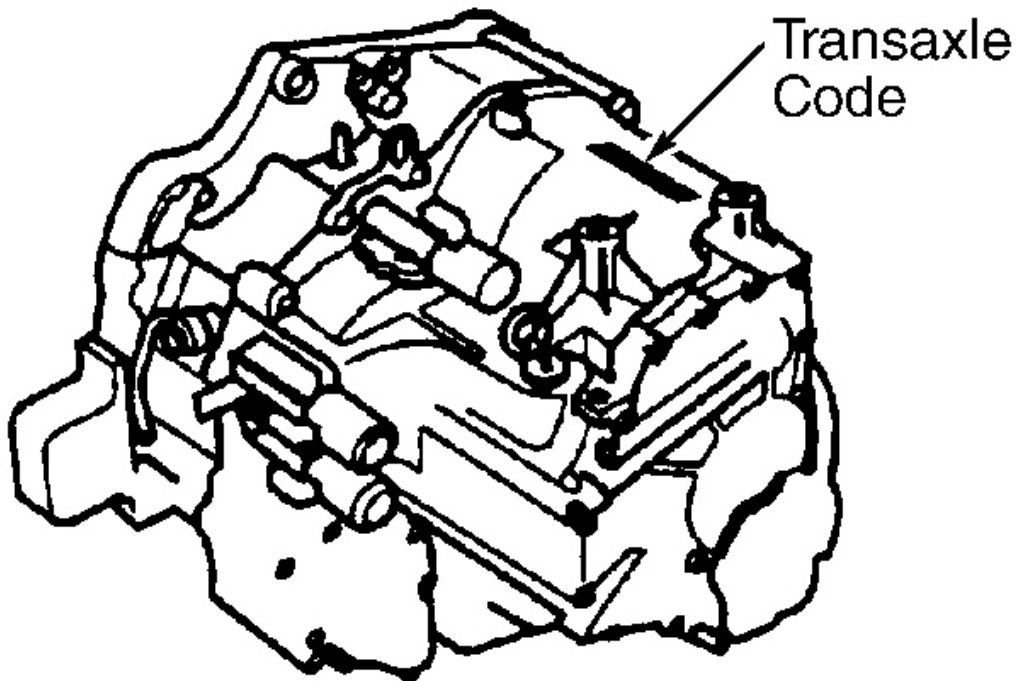
CAUTION: Flush oil cooler and oil cooler lines prior to transaxle installation. Oil cooling system contamination may cause premature transaxle failure. For additional information, see SERVICING - HONDA (FWD) article.

TRANSAXLE APPLICATION

Application	Transaxle Model
CR-V	
2WD	MCVA
4WD	MRVA

IDENTIFICATION**TRANSAXLE**

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



G00072553

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

GEAR RATIOS

TRANSAXLE GEAR RATIOS

Gear Range	Gear Ratio
1st	2.684:1
2nd	1.535:1
3rd	.974:1
4th	.638:1
Reverse	2.000:1
Final Drive	4.438:1

DESCRIPTION & OPERATION

INTRODUCTION

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

Valve body assemblies consists of main valve body, regulator valve body, servo body and accumulator body. Transaxle shifting and torque converter lock-up are controlled by the Powertrain Control Module (PCM). PCM receives information from various inputs and uses this information to control solenoid valves for proper transaxle operation.

Gearshift lever has 6 positions. When gearshift lever is moved, manual valve on main valve body is moved by the shift cable. Gearshift lever also changes position of the transmission range switch, mounted near gearshift lever. Transmission range switch delivers an input signal to PCM to indicate gearshift lever position. PCM uses input signal, and operates shift control solenoid valves to control transaxle shifting.

When certain transaxle gear combinations are engaged by clutches, power is transmitted from mainshaft to countershaft via secondary shaft to final drive gear, providing different gears.

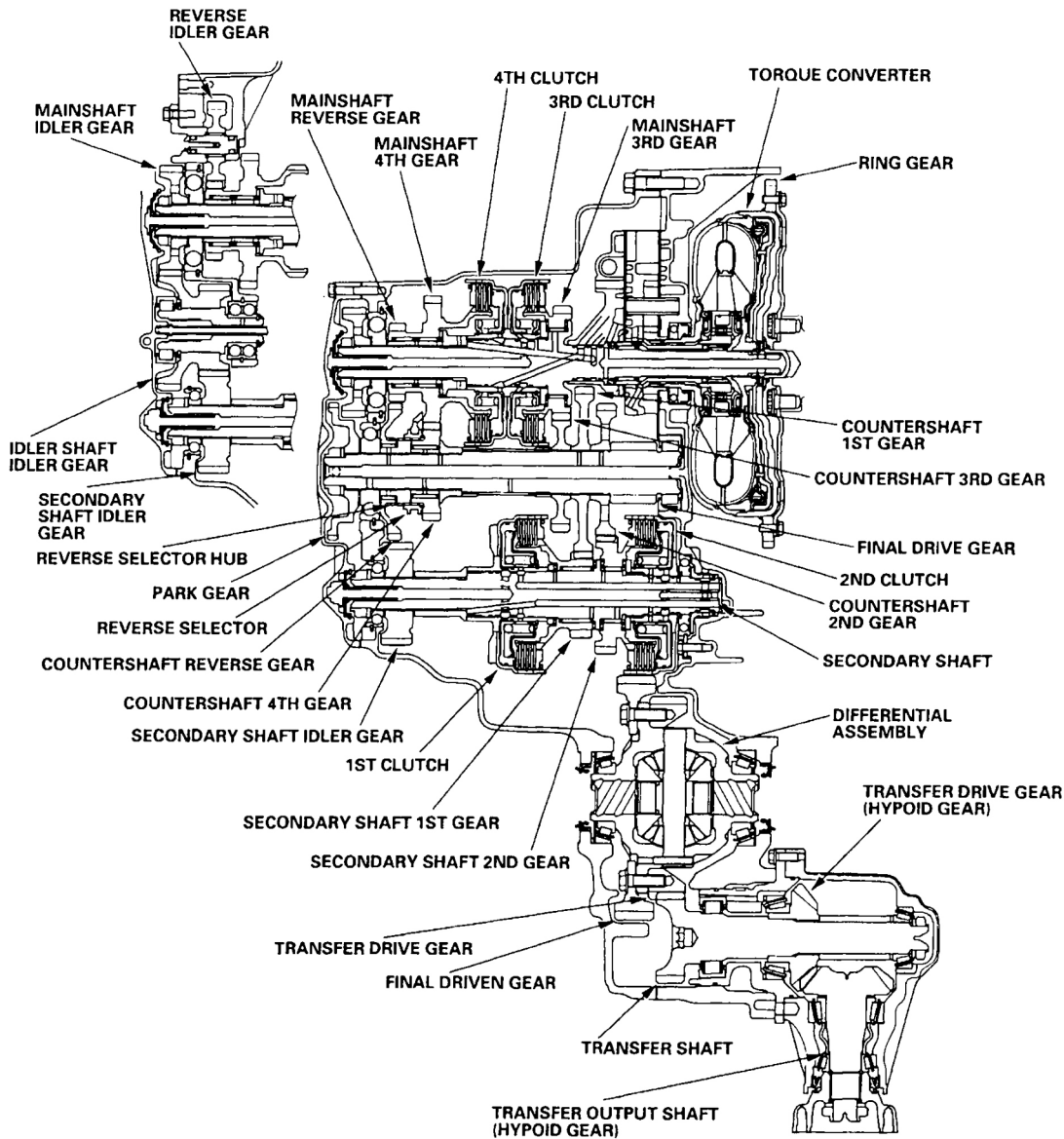
Torque converter lock-up engages and transaxle mainshaft rotates at same speed as engine crankshaft when transaxle is in "D" position (2nd, 3rd and 4th gears), or "D" position with overdrive mode off (3rd gear). Under certain conditions, torque converter lock-up clutch is applied during deceleration when in 3rd and 4th gears. PCM receives various input signals and operates clutch pressure control solenoid valves. Operating clutch pressure control solenoid valves controls modulator pressure.

PCM contains a self-diagnostic system, which will store a Diagnostic Trouble Code (DTC) if a failure or problem exists in the transaxle electronic control system. DTC can be retrieved to identify transaxle problem area.

Overdrive (O/D) switch is located on end of gearshift lever. When ignition switch is turned to ON position, overdrive is turned on. When overdrive switch is depressed, overdrive is turned off. O/D OFF indicator light, located next to "D" position indicator on instrument panel, will illuminate. When overdrive is off, transaxle selects only 1st, 2nd and 3rd gears. When overdrive is on, transaxle uses all 4 forward gears.

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

The A/T gear position indicator on instrument panel contains lights to indicate which position transmission range switch on gearshift lever is in.



G00182155

Fig. 2: Cut-Away View Of Transaxle Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

LUBRICATION

NOTE: For additional information, see SERVICING - HONDA (FWD) article.

TROUBLE SHOOTING

NOTE: Transaxle malfunctions may be caused by poor engine performance, improper adjustments, fluid condition or failure of hydraulic, mechanical or electronic

components. Ensure all concerns have been properly checked prior to transaxle overhaul. See MCVA & MRVA DIAGNOSIS article.

TRANSAXLE DISASSEMBLY

END COVER

NOTE: The following tool is required for disassembly procedure:

- Mainshaft holder (07GAB-PF50101 or 07GAB-PF50100).

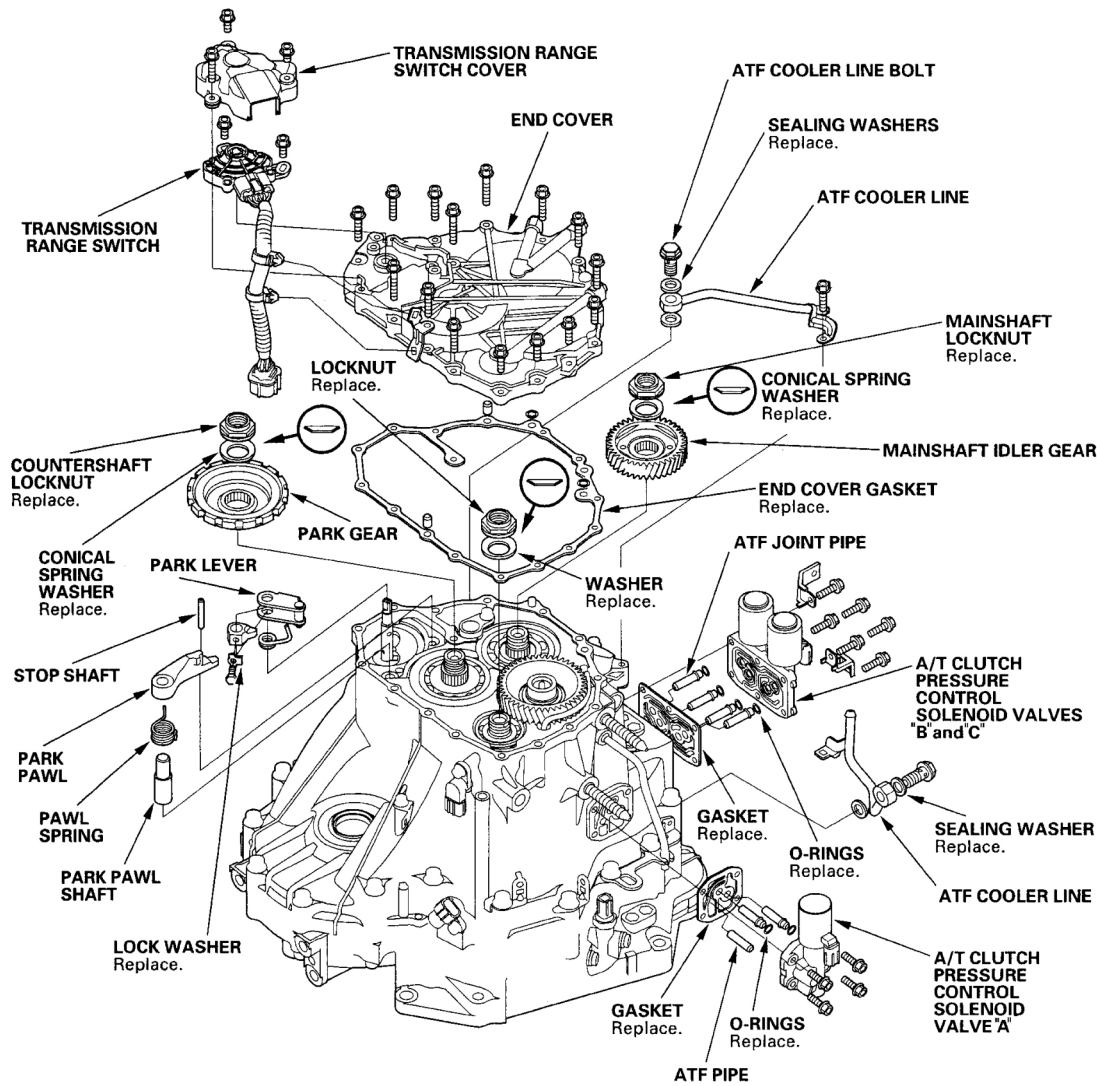
NOTE: To assist in disassembly of transaxle, refer to illustrations. See Fig. 3 and Fig. 4 . Letter references in parenthesis are identified in the following illustrations.

1. Remove the ATF cooler lines.
2. Remove the A/T clutch pressure control solenoid valve "A", then remove the ATF pipe, ATF joint pipes, and gasket.
3. Remove the A/T clutch pressure control solenoid valves "B" and "C", then remove the ATF joint pipes and gasket.
4. Remove the transmission range switch cover.
5. Remove the transmission range switch harness clamps from the clamp brackets, then remove the transmission range switch.
6. Remove the end cover.
7. Slip the holder onto the mainshaft. See Fig. 5 .
8. Engage the park pawl with the park gear.

NOTE: Countershaft and secondary shaft lock nuts have left hand threads.

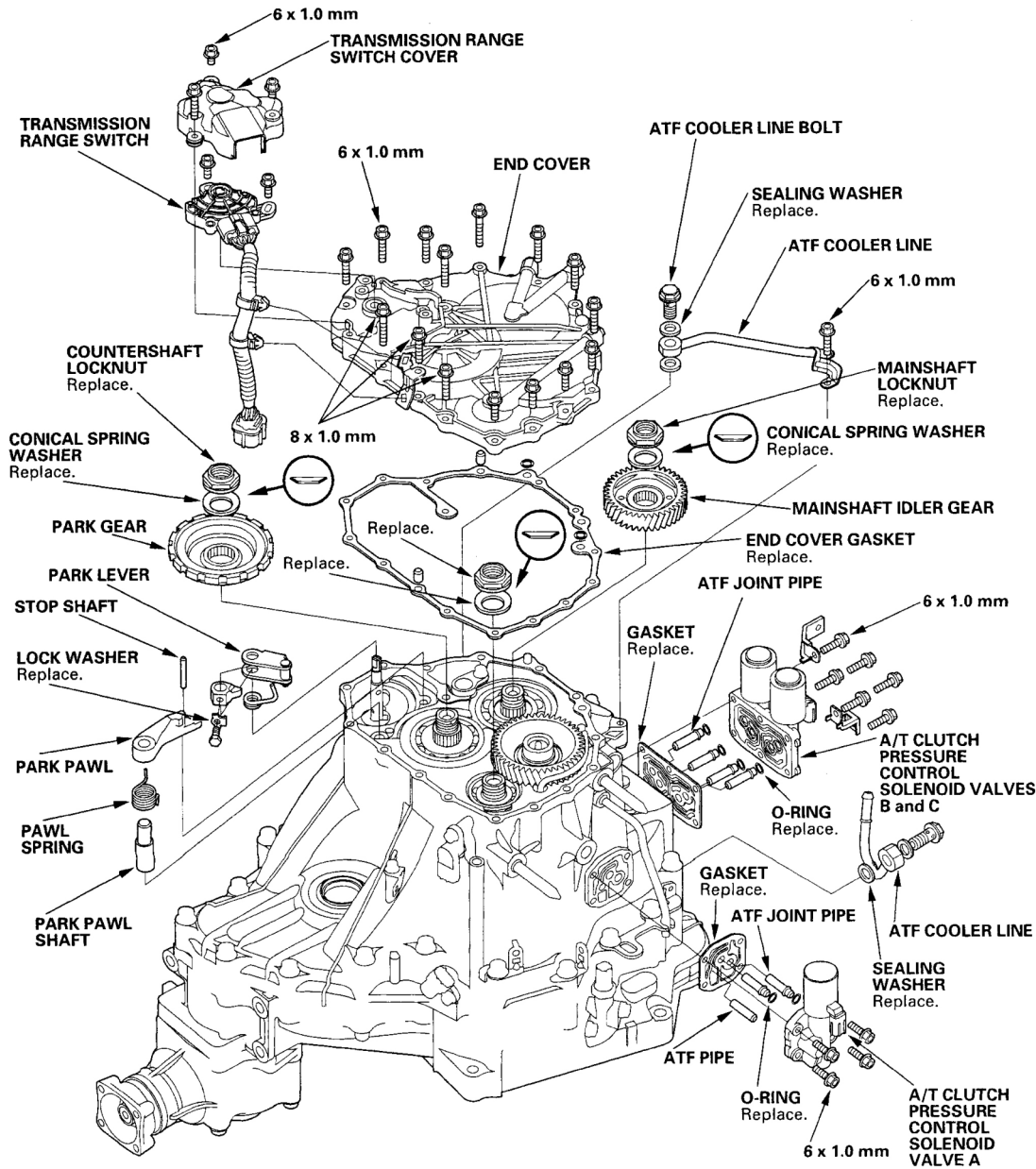
NOTE: Clean and save the old mainshaft and countershaft lock nuts. They are used to install the press fit idler gear onto the mainshaft, and park gear onto the countershaft.

9. Cut the lock tab (A) of the each shaft lock nut (B) using a chisel (C). See Fig. 6 . Remove the lock nuts and conical spring washers from each shaft.
10. Remove the holder from the mainshaft.
11. Set a 2-jaw (or 3-jaw) puller on the countershaft with a collar between the puller and countershaft, then remove the park gear.
12. Install 6 x 1.0 mm bolts (A) on the mainshaft idler gear (B). Set a puller (C) on the mainshaft (D) while putting a collar (E) between the puller and mainshaft, then remove the mainshaft idler gear. See Fig. 7 .
13. Remove the park pawl, park pawl spring, park pawl shaft, and stop shaft.
14. Remove the park lever from the control shaft.



G00085282

Fig. 3: Exploded View Of End Cover & Exterior Components (2WD)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00182156

Fig. 4: Exploded View Of End Cover & Exterior Components (4WD)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

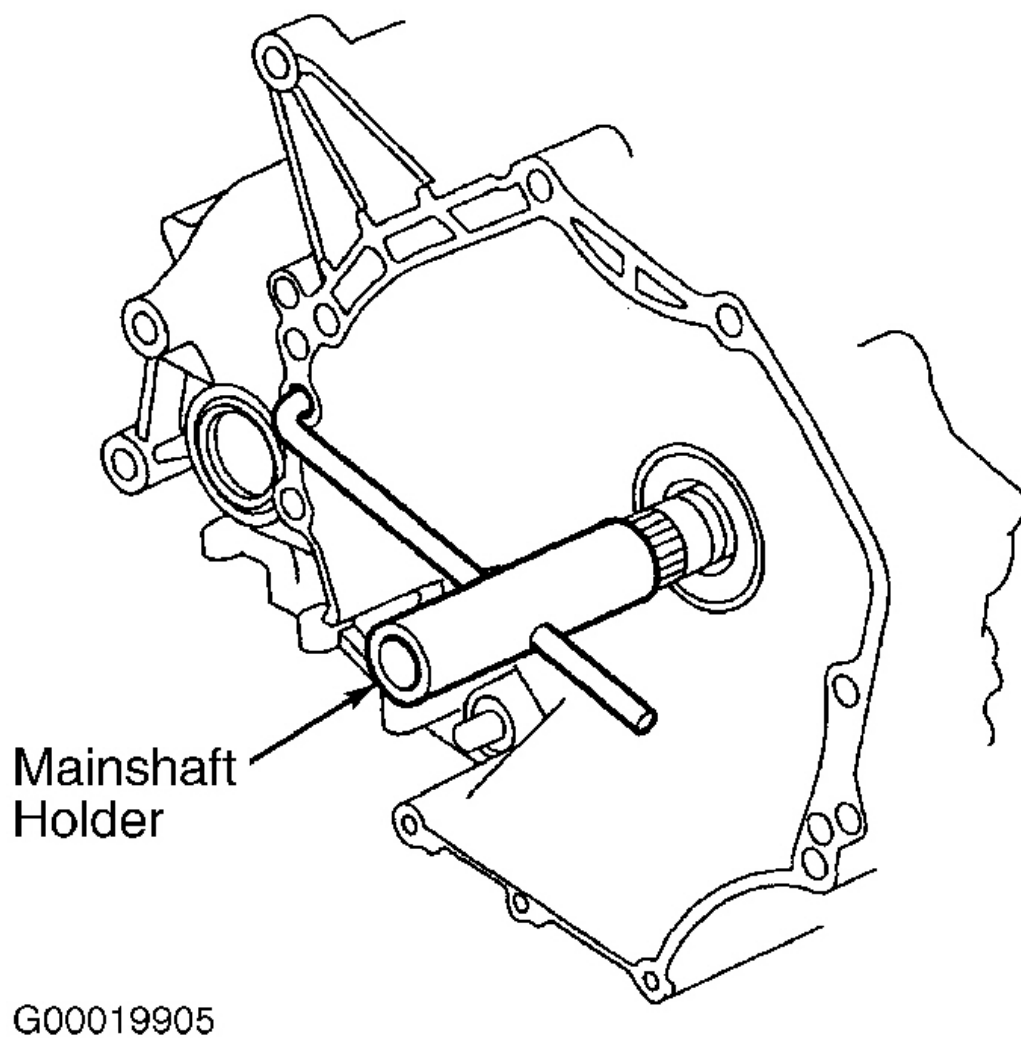


Fig. 5: Securing Mainshaft With Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

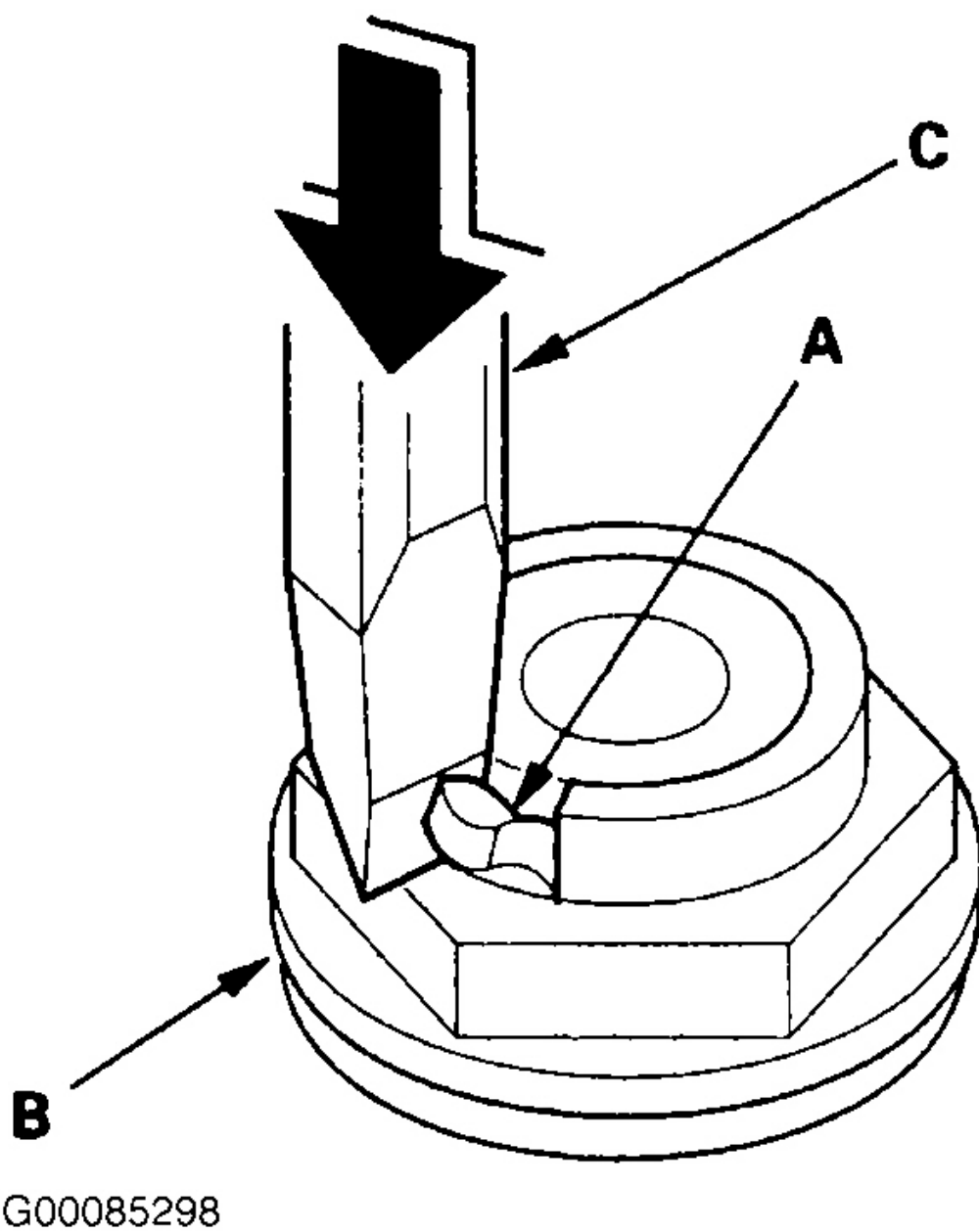
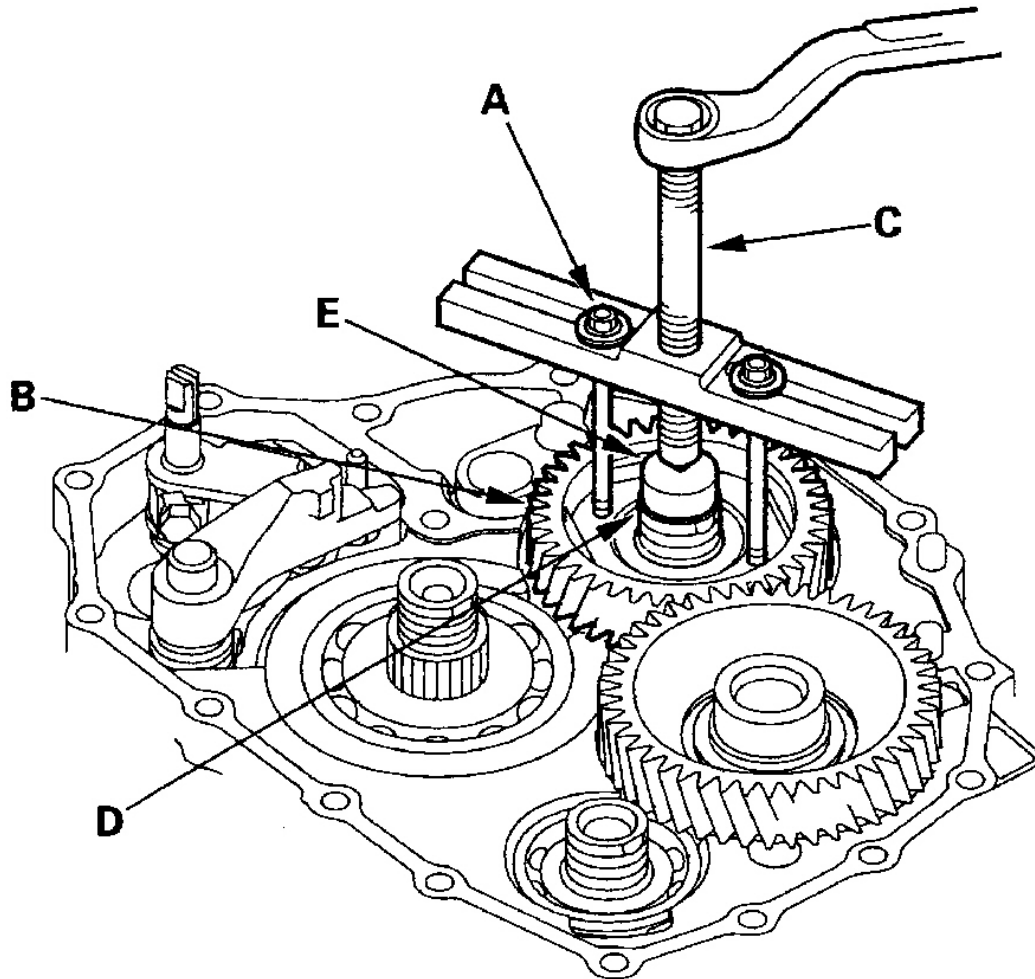


Fig. 6: Cutting Lock Nut Lock Tabs

Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00085330

Fig. 7: Removing Mainshaft Idler Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

HOUSING & SHAFT ASSEMBLIES

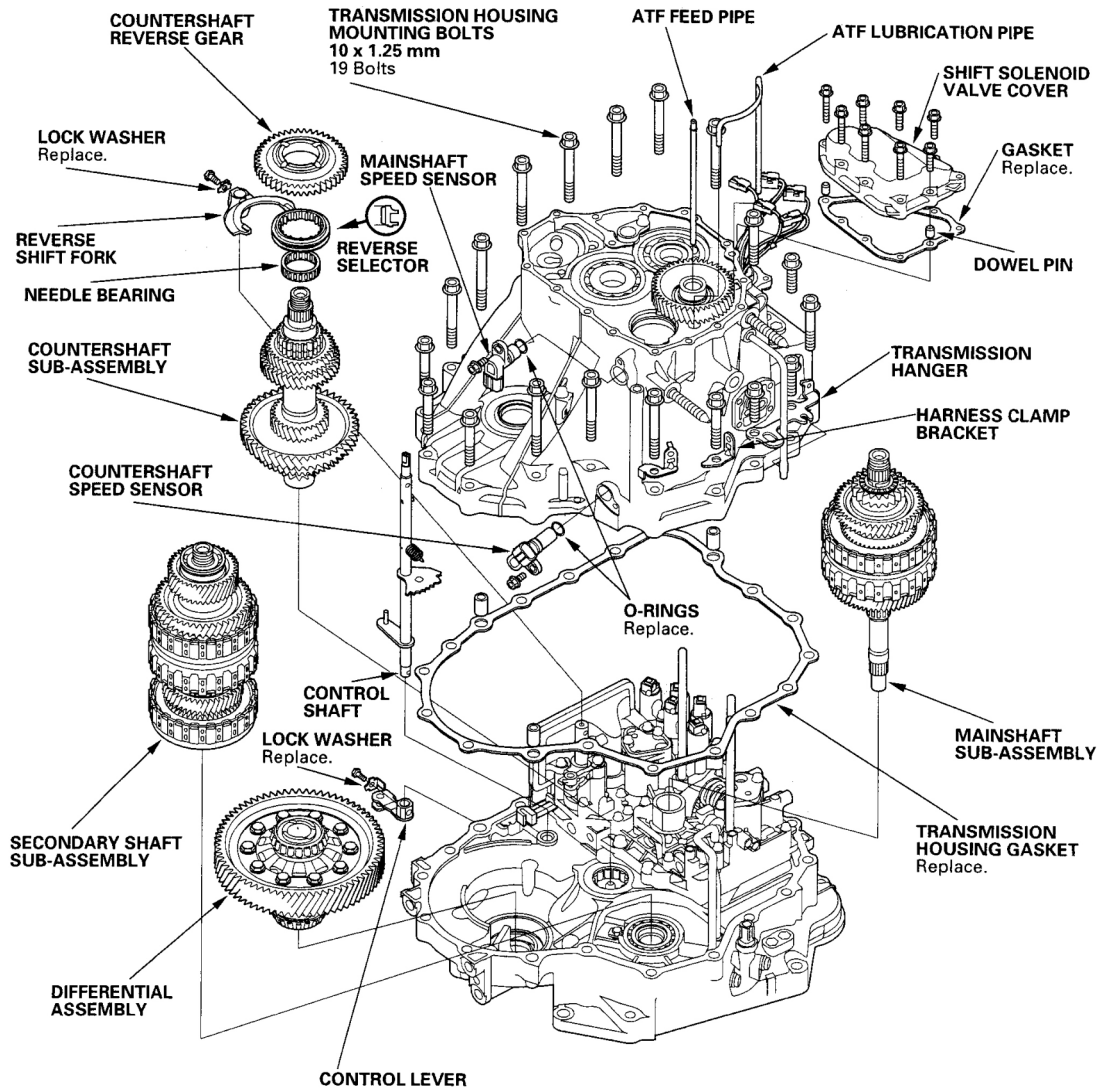
NOTE: To assist in disassembly of components, refer to illustrations. See **Fig. 8** and **Fig. 9**.

1. Remove the ATF feed pipe from the idler gear shaft, and the ATF lubrication pipe from the transmission housing.
2. Remove the shift solenoid valve cover, dowel pins, and gasket.
3. Remove the bolt (A) securing the solenoid harness connector (B), and remove the connector.
4. Disconnect the connectors from the shift solenoid valves. See **Fig. 10**.

5. Remove the mainshaft and countershaft speed sensors.
6. Remove the transmission housing mounting bolts, hanger, and harness clamp brackets.

NOTE: **Do not squeeze the end of the control shaft tips together when turning the shaft. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and the switch.**

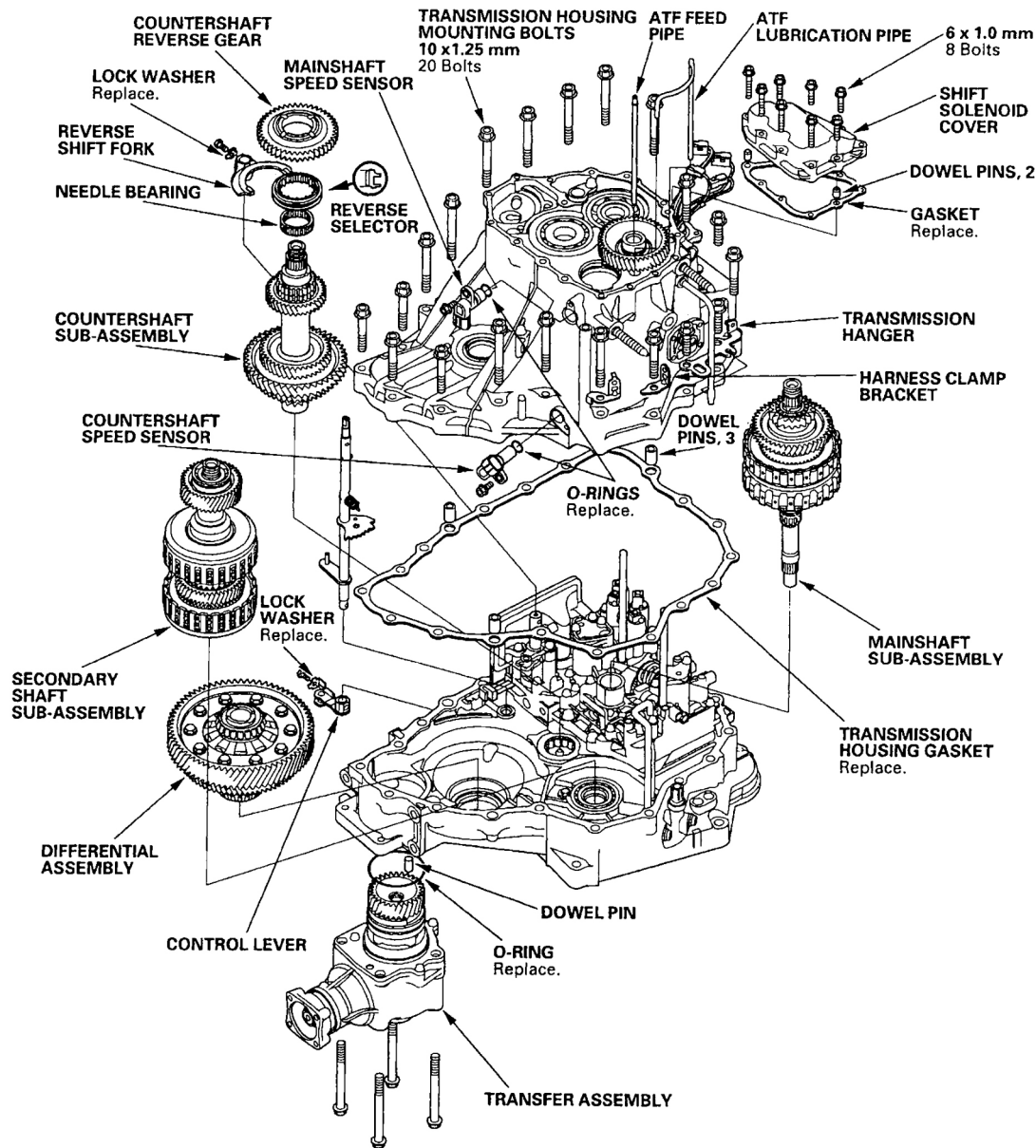
7. Align the spring pin on the control shaft with the transmission housing groove by turning the control shaft.
8. While expanding the snap ring of the secondary shaft bearing using the snap ring pliers, lift the transmission housing. Release the snap ring pliers, and remove the transmission housing.
9. Remove the countershaft reverse gear and needle bearing.
10. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector together.
11. Remove the control lever from the control shaft.
12. Unhook the detent spring from the detent arm.
13. Remove the control shaft.
14. Remove the mainshaft sub-assembly, countershaft sub-assembly, and secondary shaft sub-assembly together.
15. Remove the differential assembly.
16. Remove transfer assembly (A) with "O" ring (B) and dowel pin (C). See **Fig. 11** .



G00085284

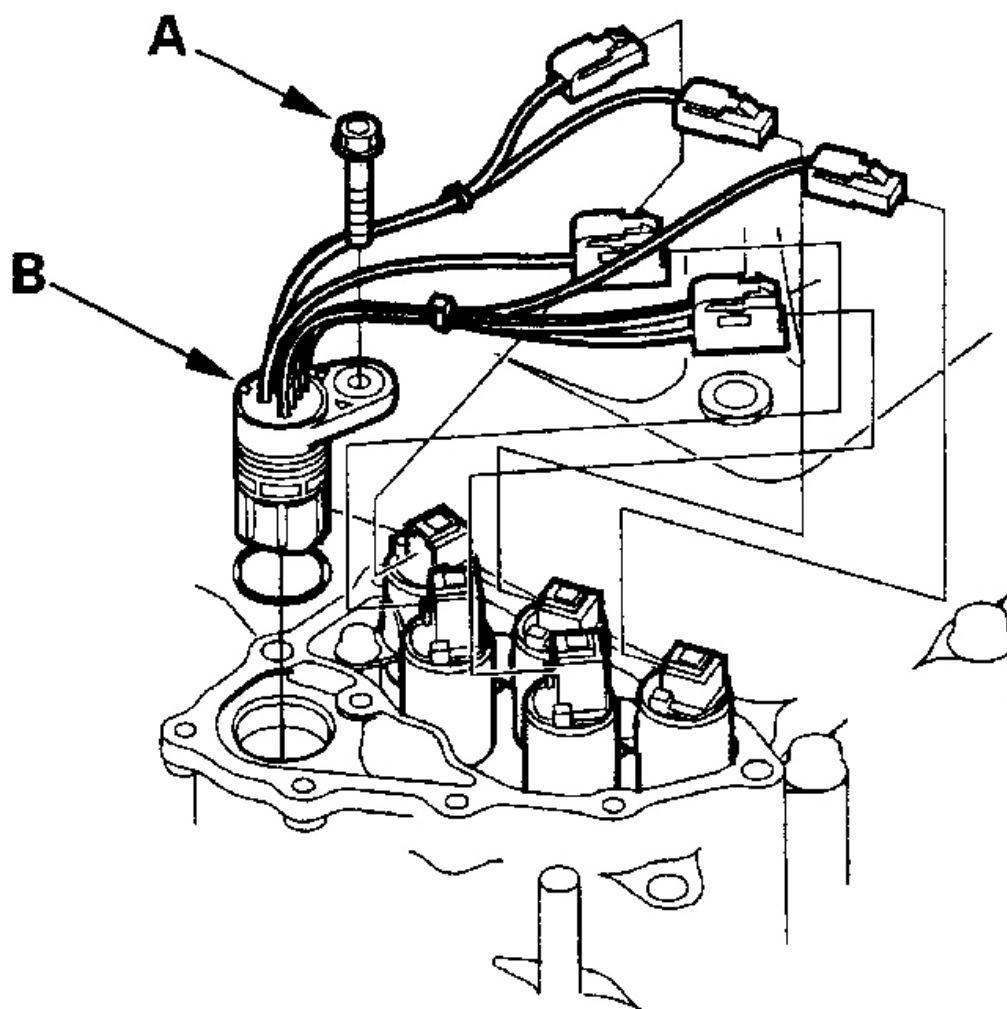
Fig. 8: Exploded View Of Housing & Shaft Assemblies (2WD)

Courtesy of AMERICAN HONDA MOTOR CO., INC.



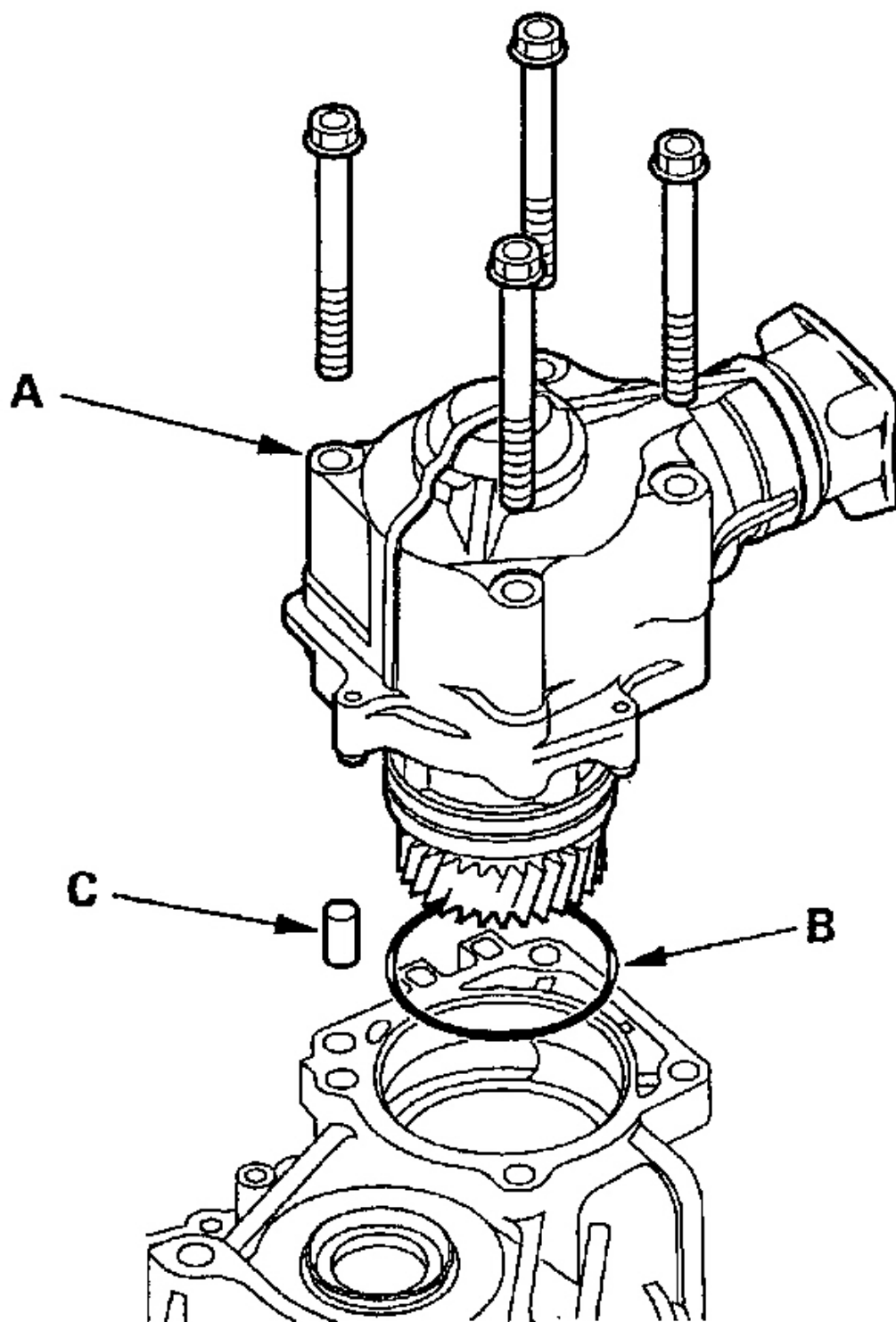
G00182157

Fig. 9: Exploded View Of Housing & Shaft Assemblies (4WD)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00085283

Fig. 10: Disconnect Shift Solenoid Harness Connectors
Courtesy of AMERICAN HONDA MOTOR CO., INC.



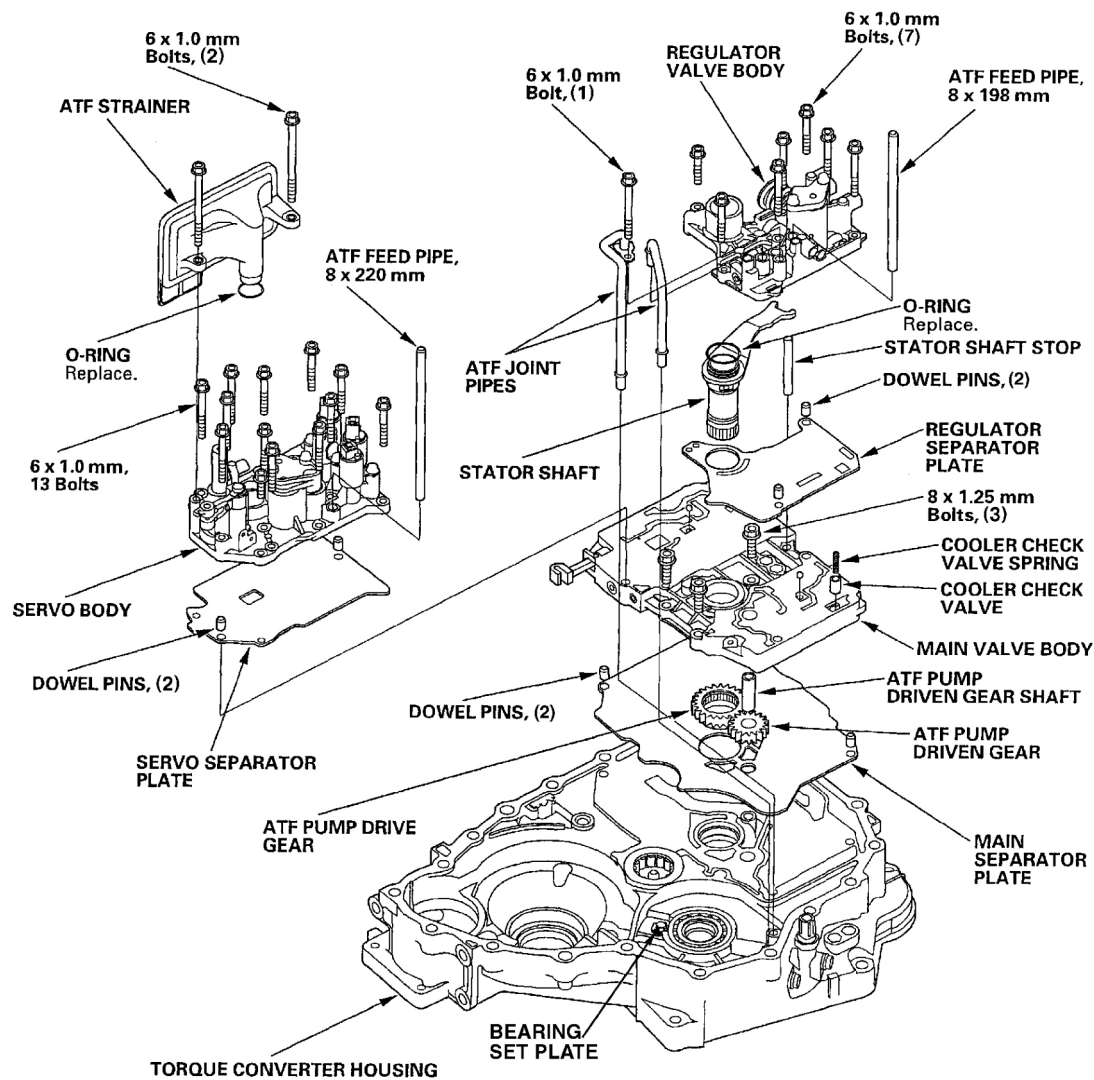
G00182158

Fig. 11: Removing & Installing Transfer Assembly (4WD)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

VALVE BODIES & ATF STRAINER

NOTE: To assist in disassembly of components, refer to illustration. See Fig. 12 .

1. Remove the ATF feed pipes from the regulator valve body, and servo body.
2. Remove the ATF strainer (2 bolts).
3. Remove the servo body (13 bolts), then remove the separator plate and dowel pins (2).
4. Remove the ATF joint pipes (one bolt) from the regulator valve body.
5. Remove the regulator valve body (7 bolts).
6. Remove the stator shaft and stator shaft stop.
7. Remove the regulator separator plate and dowel pins (2).
8. Remove the cooler check valve spring and cooler check valve from the main valve body, then remove the main valve body (3 bolts). Do not let the check balls fall out.
9. Remove the oil pump driven gear shaft, then remove the oil pump gears.
10. Remove the main separator plate and dowel pins (2).
11. Clean the inlet opening of the ATF strainer thoroughly with compressed air, then check that it is in good condition and that the inlet opening is not clogged.
12. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.



G00182159

Fig. 12: Exploded View Of Valve Bodies & ATF Strainer (4WD Transaxle Shown; 2WD Is Similar)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT DISASSEMBLY & REASSEMBLY

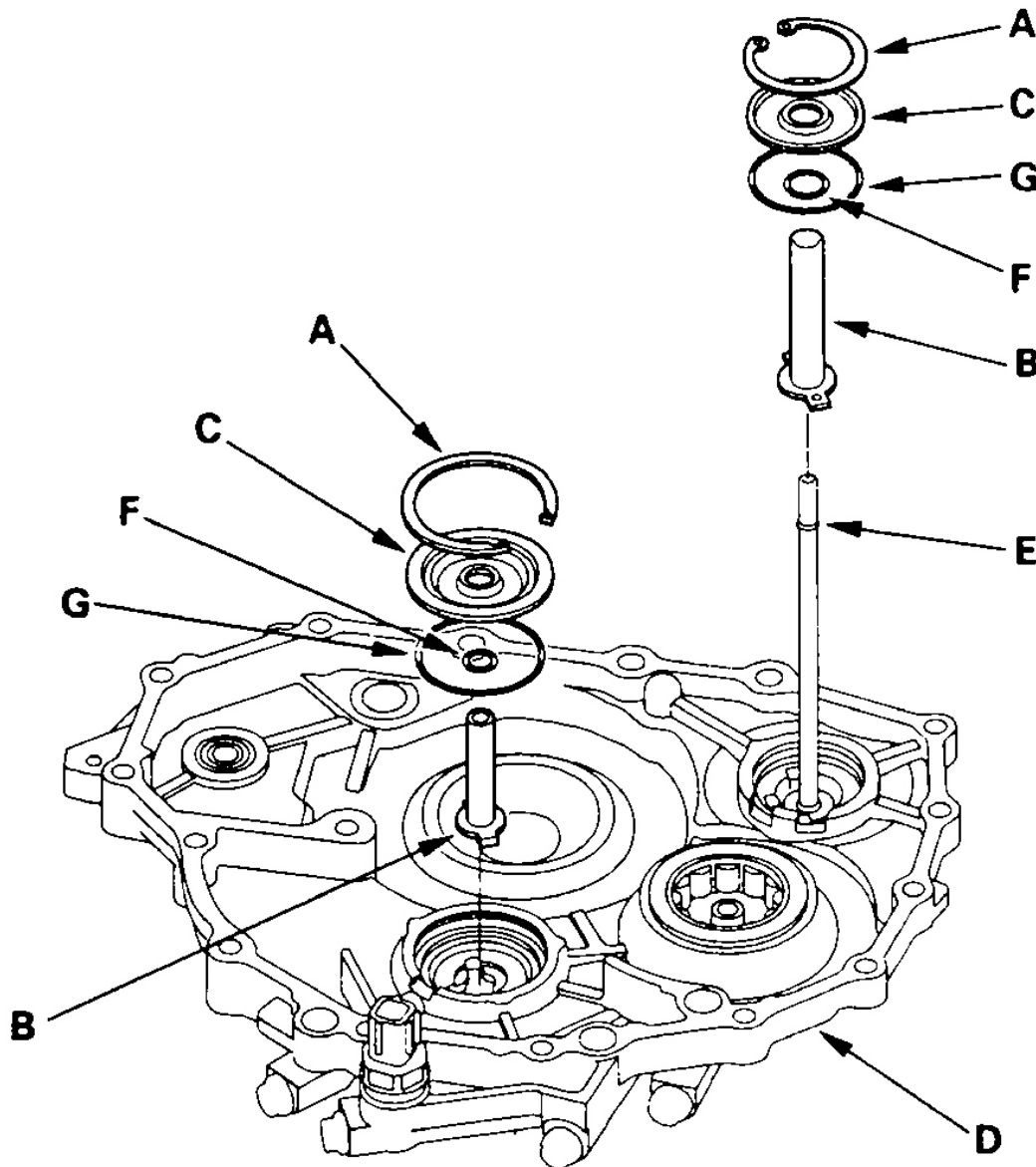
ATF FEED PIPES

Removal & Installation

NOTE: Letter references in parenthesis are identified in the following illustration.

1. Remove the snap rings (A), ATF feed pipes (B), and feed pipe flanges (C) from the end cover (D). See **Fig. 13**.
2. Install the new "O" ring (F) over the ATF feed pipe.

3. Install ATF feed pipe in the end cover by aligning the feed pipe tabs with the indentations in the end cover.
4. Install the new "O" ring (G) in the end cover, then install the feed pipe flange over the ATF feed pipe and "O" ring.
5. Secure the ATF feed pipe and feed pipe flange with the snap ring.



G00085332

Fig. 13: Exploded View Of ATF Feed Pipes
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHAFT BEARINGS**Removal & Installation**

NOTE: Coat all parts with ATF before assembly.

NOTE: If you are only removing the countershaft bearing, idler gear shaft removal is not needed.

1. Remove the idler gear shaft when removing the mainshaft bearing and idler gear shaft bearing.

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

2. To remove the mainshaft bearing and countershaft bearing from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out.
3. Expand the snap ring of the idler gear shaft bearing with the snap ring pliers, then push the bearing out.
4. To install bearings, expand each snap ring with the snap ring pliers, and install the mainshaft bearing and countershaft bearing part way into the housing.
5. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.
6. Expand the snap ring of the idler gear shaft with the snap ring pliers, and install the bearing part way into the housing.
7. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.
8. After installing the bearings, verify that the snap rings are seated in the bearing and housing grooves, and that the ring end gaps are correct. See **Fig. 14** . Install the idler shaft.

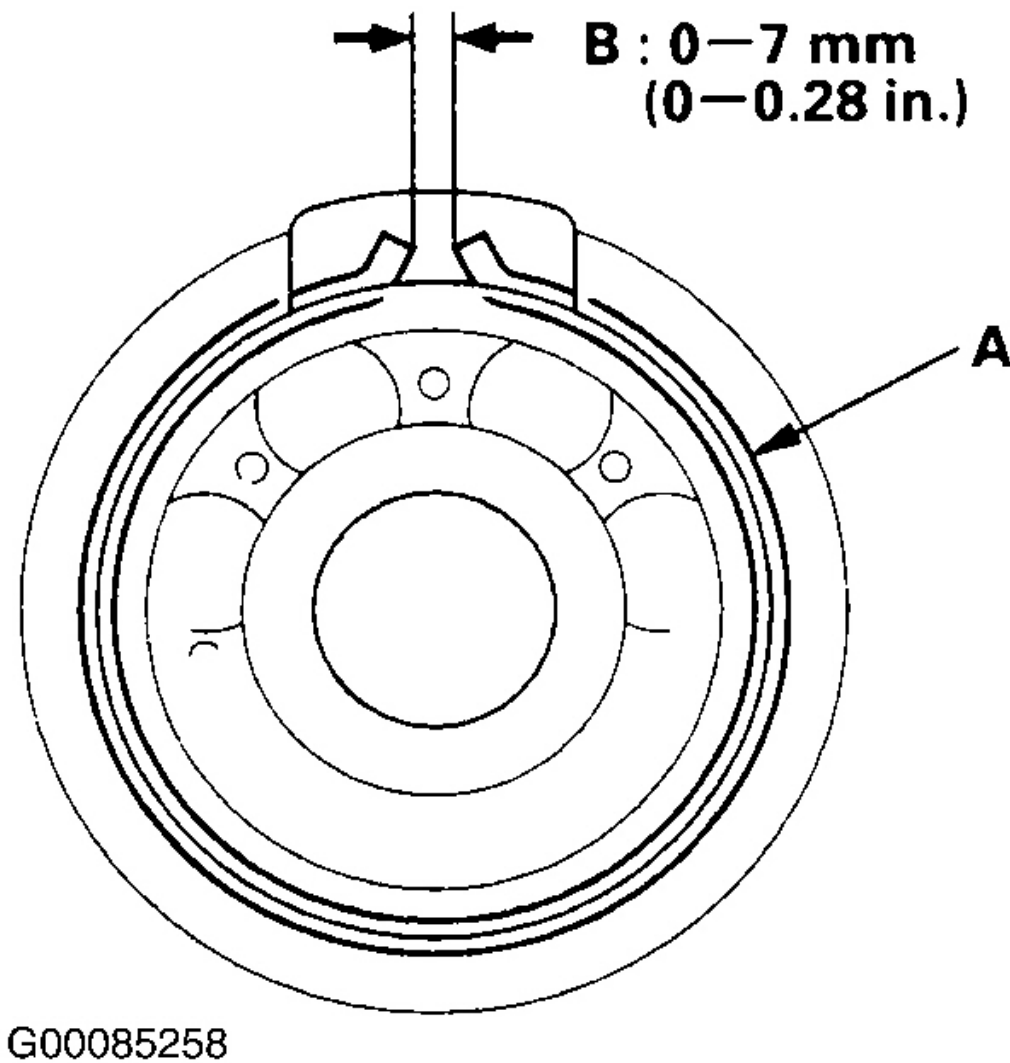


Fig. 14: Measuring Snap Ring End Gap
Courtesy of AMERICAN HONDA MOTOR CO., INC.

PARK LEVER STOP

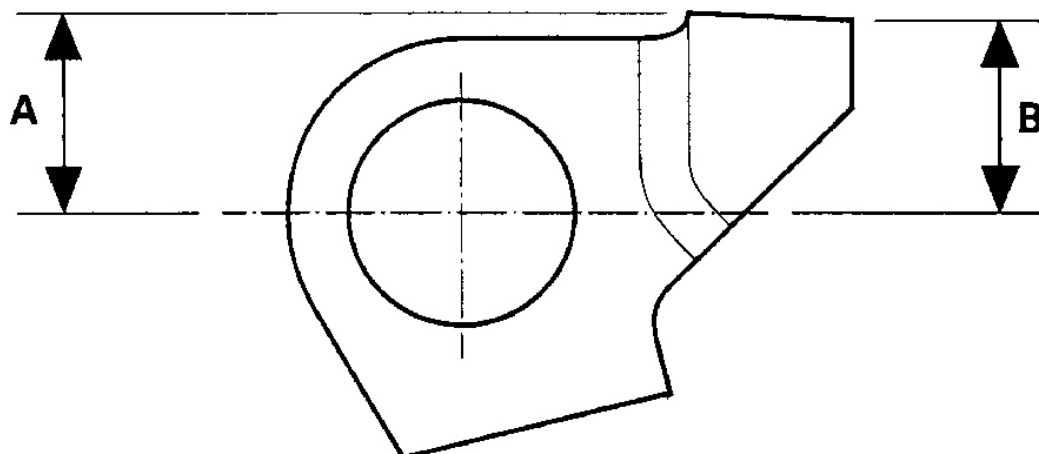
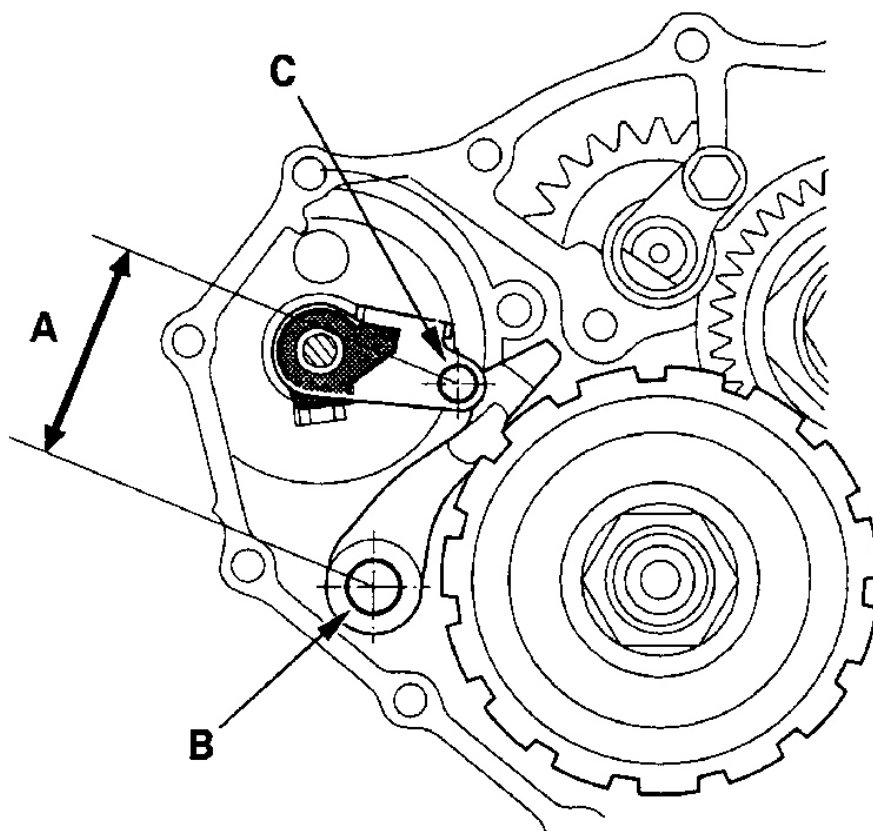
Inspection & Adjustment

NOTE: Letter references in parenthesis are identified in the following illustration.

1. Set the park lever in the "P" position.
2. Measure the distance (A) between the park pawl shaft (B) and the park lever roller pin (C). See **Fig. 15**.

Standard is 2.27-2.31" (57.7-58.7 mm).

3. If the measurement is out of tolerance, select and install the appropriate park lever stop from the selection chart. See **Fig. 16** .
4. After replacing the park lever stop, ensure the distance is within tolerance.



G00085331

Fig. 15: Measuring Park Brake Stop Distance & Park Brake Stop
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Mark	Part Number	"A"	"B"
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
3	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

G00085254

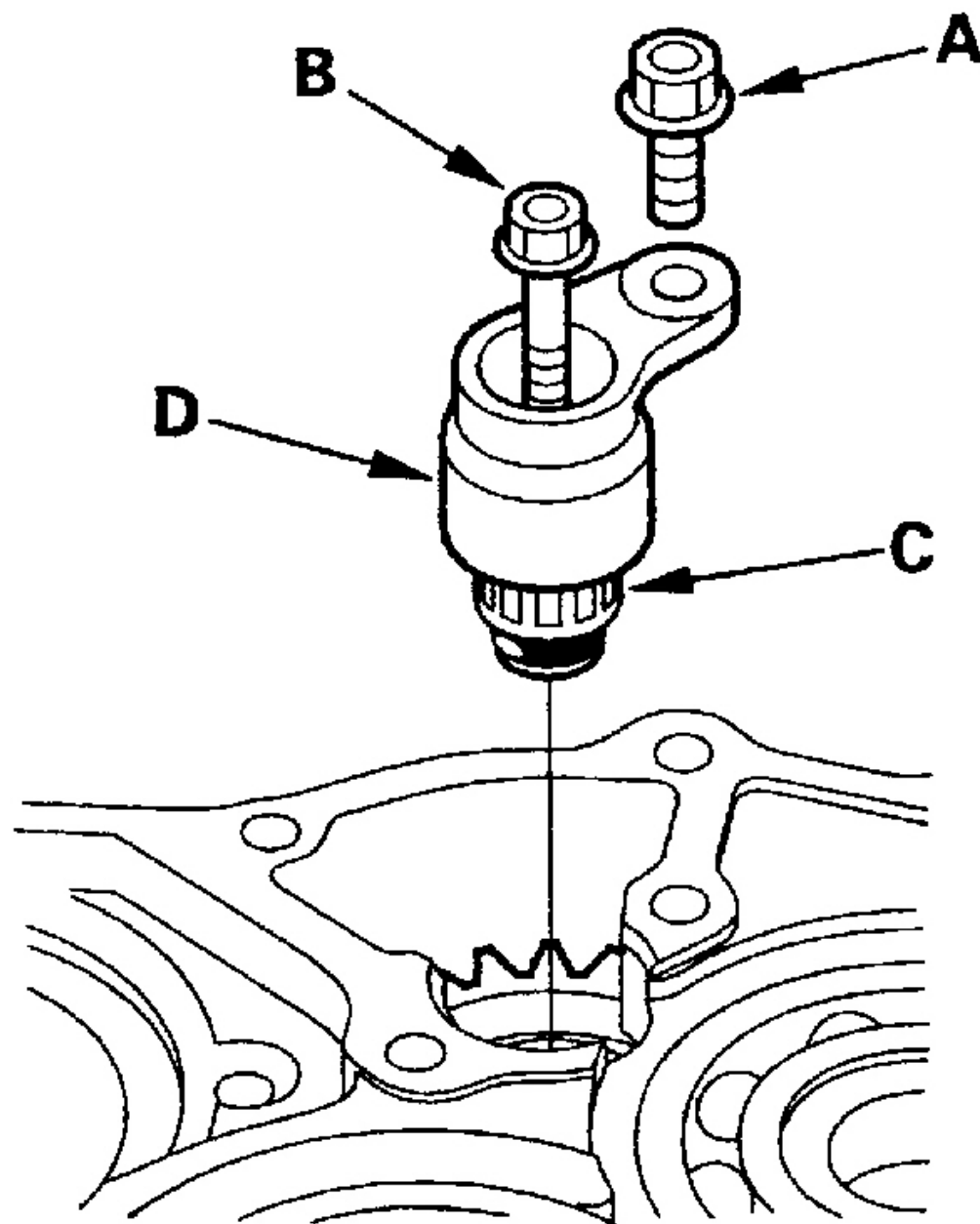
Fig. 16: Park Lever Stop Selection Chart
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

REVERSE IDLER GEAR

NOTE: Letter references in parenthesis are identified in the following illustration.

Removal

1. Remove the bolt (A) securing the reverse idler gear shaft holder.
2. Install a 5 x 0.8 mm bolt (B) in the reverse idler gear shaft, and pull it to remove the reverse idler gear shaft (C) and gear shaft holder (D) together. See **Fig. 17**.
3. Remove the reverse idler gear.



G00085333

Fig. 17: Removing Reverse Idler Gear Shaft Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Installation

1. Install the reverse idler gear in the transmission housing.
2. Coat the reverse idler gear shaft (A), needle bearing (B), and new "O" rings (C) with a light coat of lithium grease. See **Fig. 18**.
3. Assemble the new "O" rings and needle bearing on the reverse idler gear shaft, then install the reverse idler gear shaft in the reverse idler gear shaft holder (D). Align the "D" shaped cut out (E) of the shaft with the "D" shaped area (F) of the holder.
4. Install the reverse idler gear shaft/holder assembly on the transmission housing.

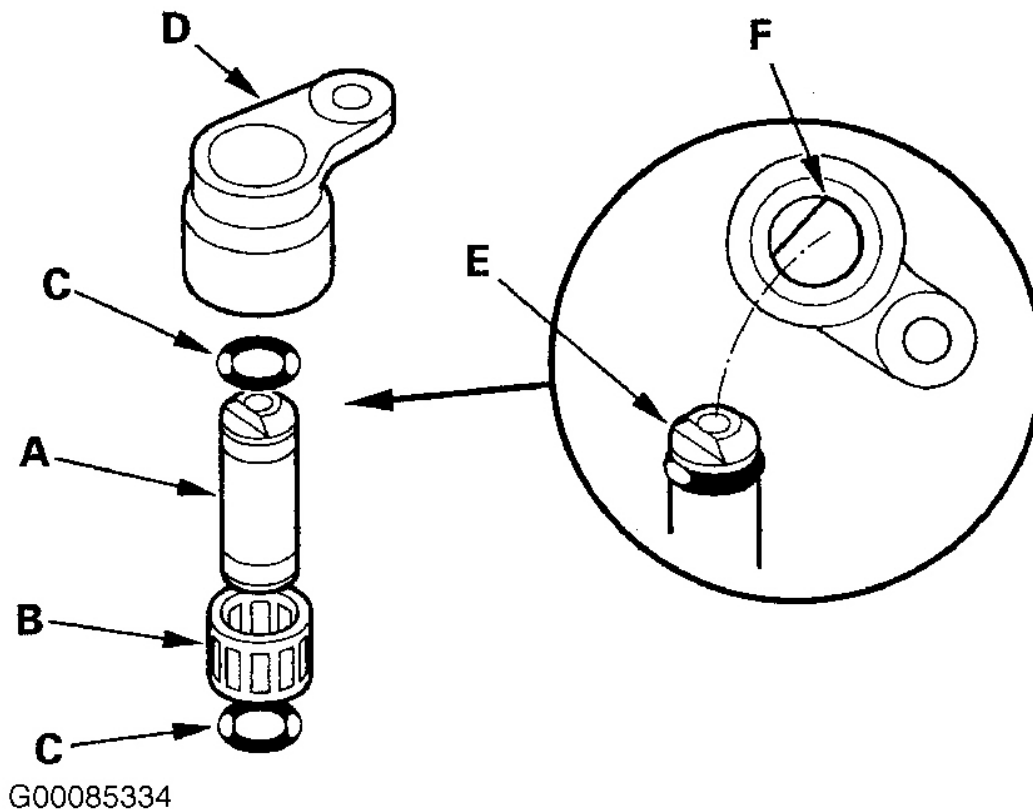


Fig. 18: Exploded View Of Reverse Idler Gear Shaft Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

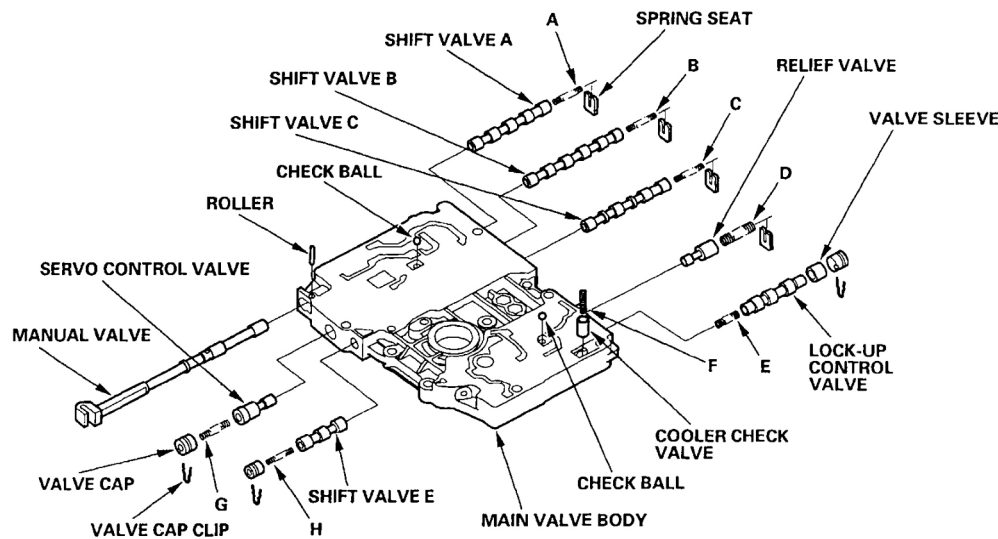
MAIN VALVE BODY

CAUTION: When disassembling main valve body, place main valve body components in order and mark spring locations for reassembly reference. Note direction of valve cap installation before removing from main valve body.

NOTE: To assist in disassembly of component, see **Fig. 19**.

Disassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check ball, it may magnetize the ball.
3. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES**.
4. Replace the valve body as an assembly if any parts are worn or damaged. For valve spring specifications, see **Fig. 19**.



SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Shift valve A spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
B	Shift valve B spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
C	Shift valve C spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
D	Relief valve spring	1.0 (0.039)	9.6 (0.378)	34.1 (1.343)	10.2
E	Lock-up control valve spring	0.65 (0.026)	7.1 (0.280)	23.1 (0.909)	12.7
F	Cooler check valve spring	0.9 (0.035)	6.6 (0.260)	26.5 (1.043)	12.6
G	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
H	Shift valve E spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9

G00182160

Fig. 19: Exploded View Of Main Valve Body
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Valve Body Repair Procedures

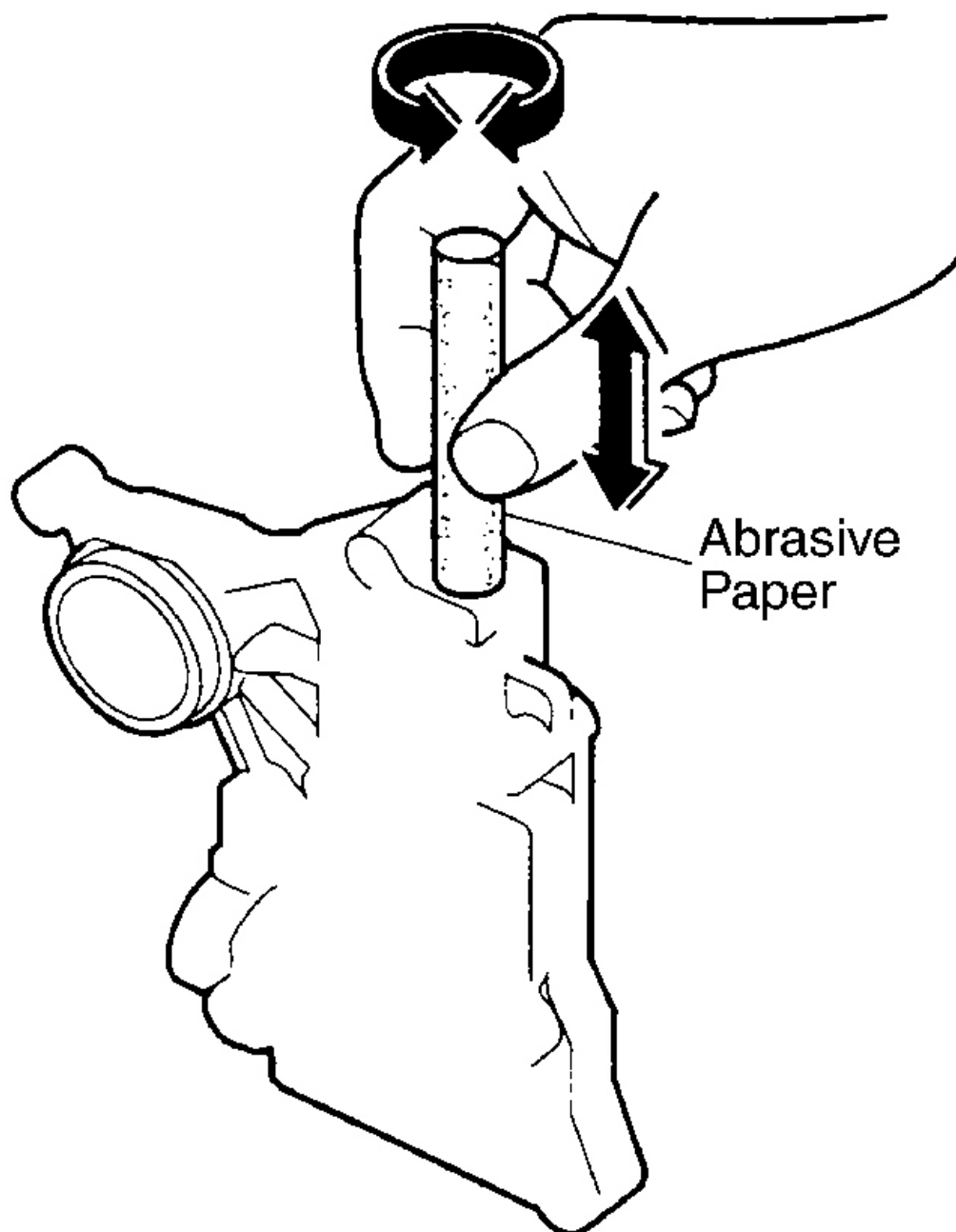
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of No. 600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

3. Inspect the valve for any scuff marks. Use the ATF soaked No. 600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF soaked No. 600 paper and insert it in the valve bore of the sticking valve. See **Fig. 20** . Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

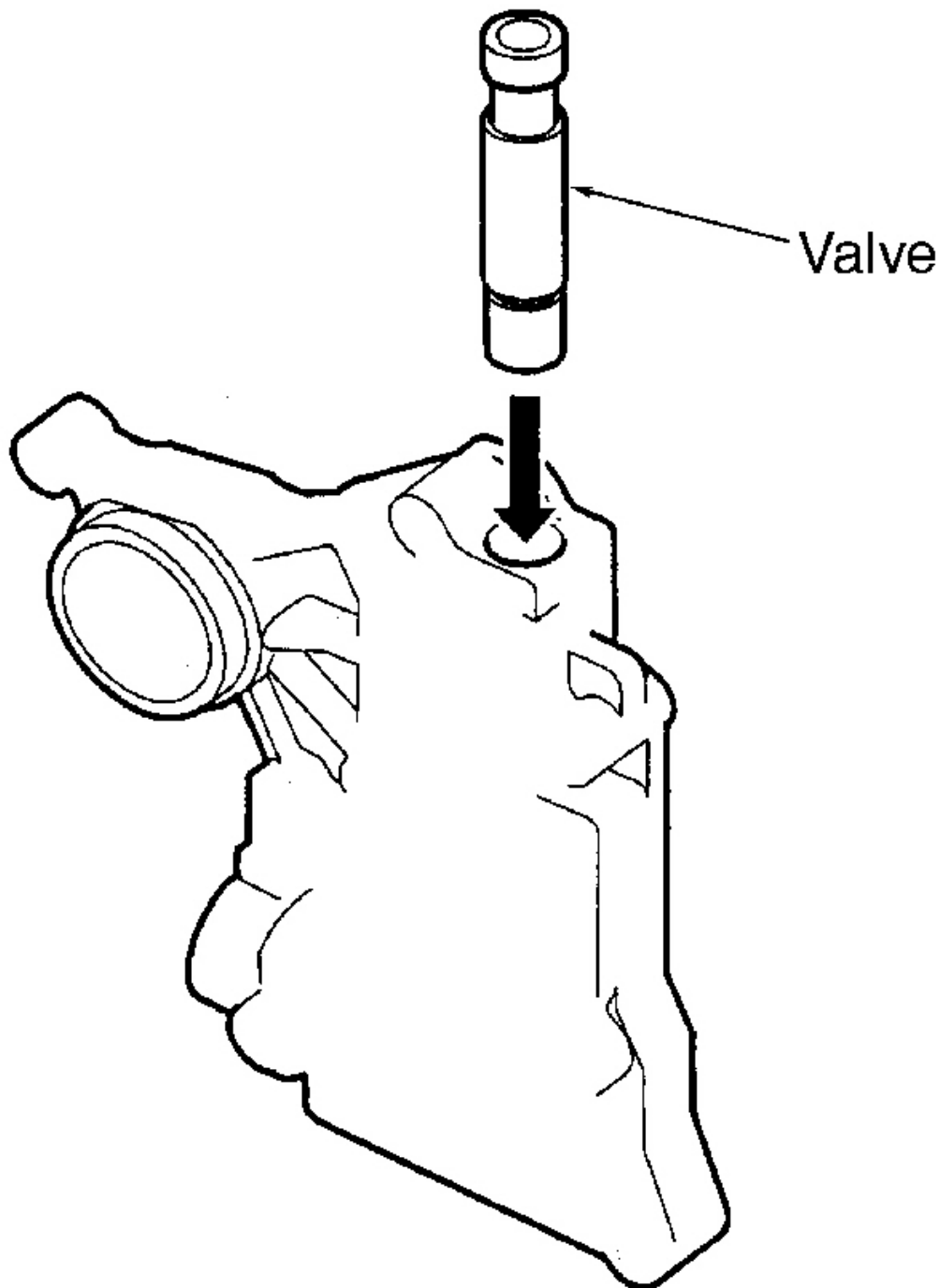
NOTE: **The valve body is aluminum and doesn't require much polishing to remove any burrs.**

5. Remove the No. 600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. See **Fig. 21** . It should drop to the bottom of the bore under its own weight. If not, repeat steps 4 and 5 , then retest. If the valve still sticks, replace the valve body.
7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.



G00085260

Fig. 20: Polishing Valve Body Bore
Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00085261

Fig. 21: Installing Valve In Bore

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

1. Coat all parts with ATF before assembly.
2. Install the valves and springs in reverse order of disassembly.
3. Install all the springs and seats. Insert the spring in the valve, then install the valve in the valve body.
Push the spring in with a screwdriver, then install the spring seat.

REGULATOR VALVE BODY

CAUTION: When disassembling valve body, place components in order and mark spring locations for reassembly reference. Note direction of valve cap installation before removing from valve body.

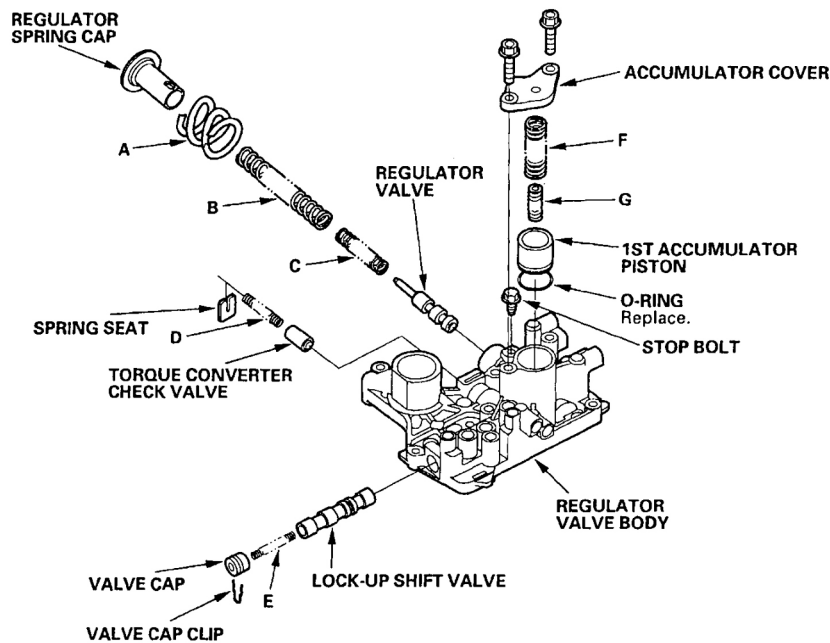
NOTE: To assist in disassembly of component, see Fig. 22 .

Disassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner and dry them with compressed air. Blow out all passages.
2. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES** under MAIN VALVE BODY.
3. Replace the valve body as an assembly if any parts are worn or damaged. For valve spring specifications, see Fig. 22 .
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out. See Fig. 22 .

Reassembly

1. Reassemble in the reverse order of disassembly. See Fig. 22 .
2. Coat all parts with ATF during assembly.
3. Align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.



SPRING SPECIFICATIONS

Spring		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
B	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
C	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
D	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	33.8 (1.331)	12.2
E	Lock-up shift valve spring	1.0 (0.039)	6.6 (0.260)	35.5 (1.398)	18.2
F	1st accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
G	1st accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6

G00182161

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

SERVO BODY

CAUTION: When disassembling valve body, place components in order and mark spring locations for reassembly reference.

NOTE: To assist in disassembly of component, see Fig. 24 .

Disassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner; and dry them with compressed air. Blow out all passages.
2. Check CPB valve for free movement. If valve fails to slide freely, see **VALVE BODY REPAIR PROCEDURES** under MAIN VALVE BODY.
3. Do not hold the shift solenoid valve connector to remove and install it. Ensure to hold the shift solenoid

valve body. When installing the shift solenoid valves, refer to **SHIFT SOLENOID VALVE INSTALLATION**.

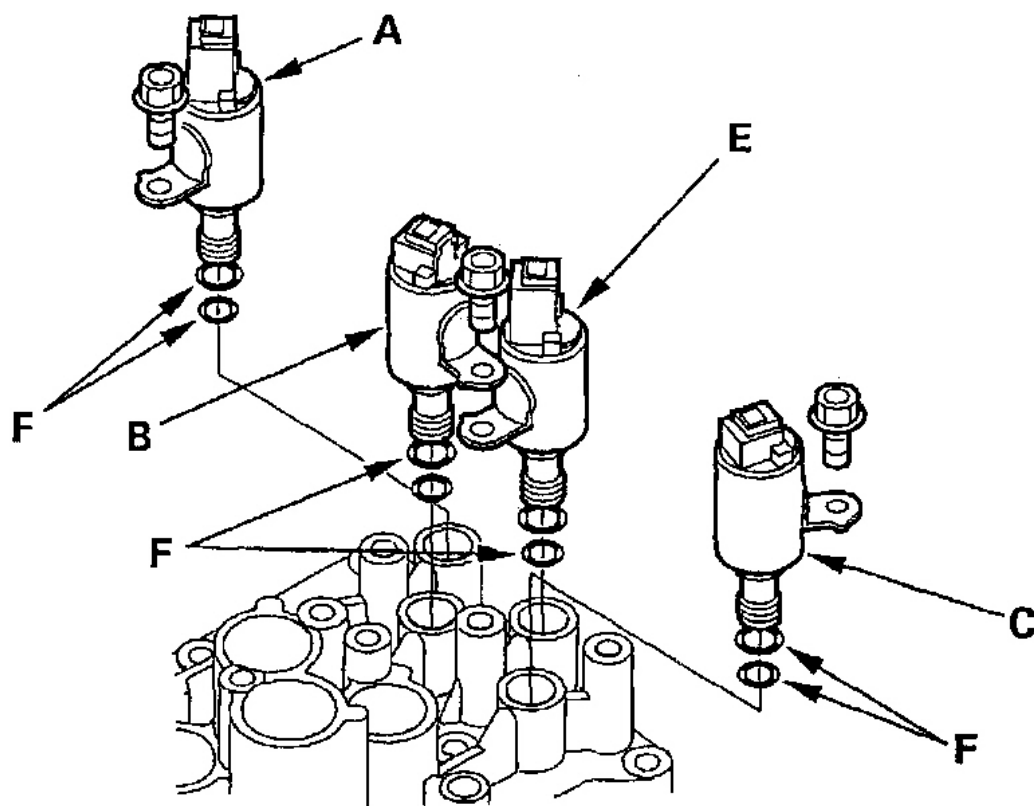
4. Replace the valve body as an assembly if any parts are worn or damaged. For valve spring specifications, see **Fig. 24**.

Shift Solenoid Valve Installation

NOTE: Do not install the shift solenoid valve "B" before installing the shift solenoid valve "E". Damage to hydraulic control system may occur. Do not hold the shift solenoid valve connector to install it. Hold the shift solenoid valve body.

NOTE: Letter references in parenthesis are identified in following illustration. See **Fig. 23**.

1. Install the new "O" rings (F) on each shift solenoid valves. New shift solenoid valves are equipped with new "O" rings.
2. Install shift solenoid valve (A) while holding the shift solenoid valve body. Install the valve until its mounting bolt bracket contacts the servo body.
3. Install shift solenoid valve (E) while holding the shift solenoid valve body. Install the valve until its mounting bolt bracket contacts the servo body.
4. Install shift solenoid valve (B) while holding the shift solenoid valve body. Install the valve until its mounting bolt bracket contacts the bracket of shift solenoid valve (E).
5. Install shift solenoid valve (C) while holding the shift solenoid valve body. Install the valve until its mounting bolt bracket contacts the servo body.



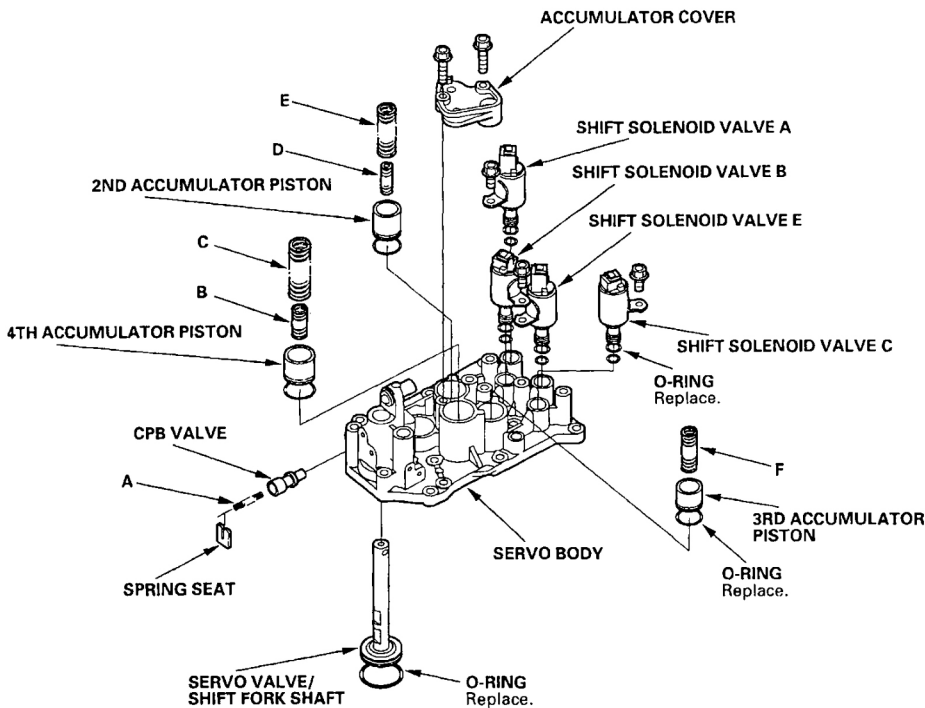
G00182162

Fig. 23: Installing Shift Solenoids

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

1. Reassemble in the reverse order of disassembly.
2. Coat all parts with ATF during assembly.

**SPRING SPECIFICATIONS**

Springs		Standard (New) Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	CPB valve spring	0.7 (0.028)	9.1 (0.358)	32.3 (1.272)	8.6
B	4th accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6
C	4th accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
D	2nd accumulator spring B	2.0 (0.079)	10.6 (0.417)	34.0 (1.339)	8.0
E	2nd accumulator spring A	2.2 (0.087)	16.6 (0.654)	48.2 (1.898)	8.5
F	3rd accumulator spring	2.5 (0.098)	14.6 (0.575)	29.9 (1.177)	4.9

G00182163

Fig. 24: Exploded View Of Servo Body

Courtesy of AMERICAN HONDA MOTOR CO., INC.

OIL PUMP**Disassembly**

Note direction of oil pump gear installation in main valve body. Remove oil pump driven gear shaft and oil pump gears from main valve body (if not previously removed). See **Fig. 12**.

Cleaning & Inspection

1. Install the oil pump drive gear, driven gear, and oil pump driven gear shaft in the main valve body. Lubricate all parts with ATF, and install the oil pump driven gear with its grooved and chamfered side facing up.
2. Measure the side clearance of the oil pump drive gear and driven gear. See **Fig. 25**. See **OIL PUMP SPECIFICATIONS** table. If clearance is not within specification, replace components as needed.
3. Remove the oil pump driven gear shaft. Measure the thrust clearance between the oil pump driven gear

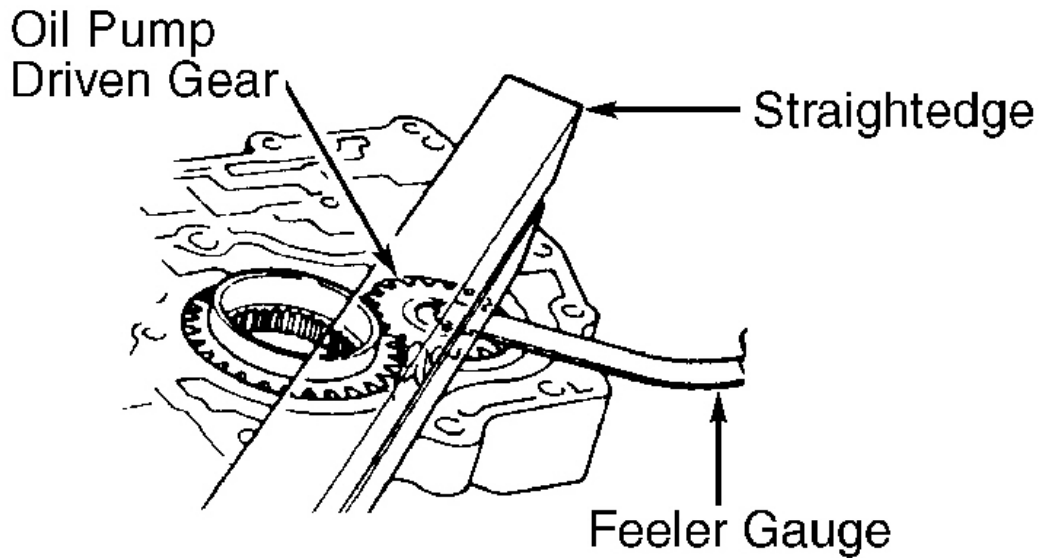
and the valve body with a straight edge and a feeler gauge. If clearance is not within specification, replace components as needed.

OIL PUMP SPECIFICATIONS

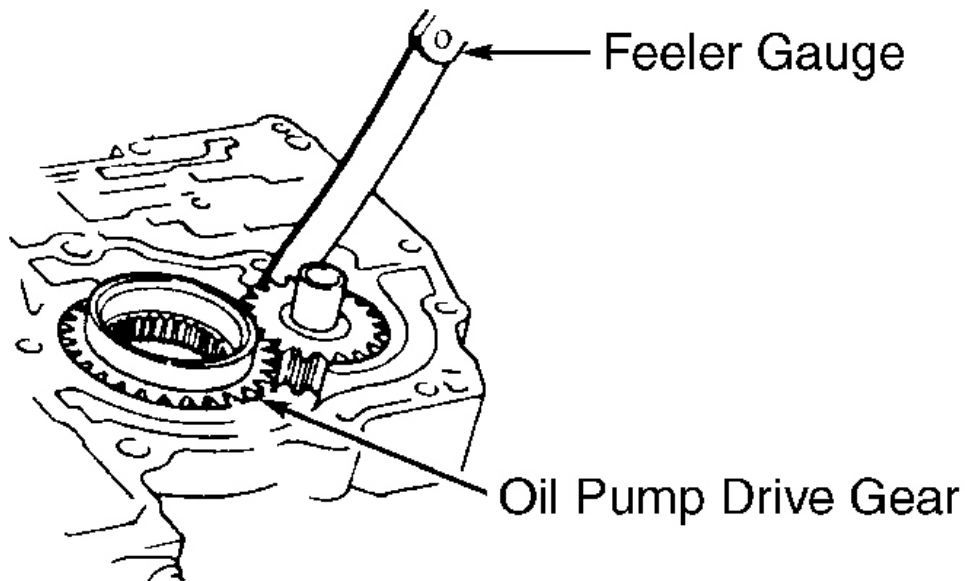
Application	In. (mm)
Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0028-.0049 (.070-.125)
Thrust Clearance	
Standard	.0011-.0020 (.030-.050)
Wear Limit	.0028 (.070)

Reassembly

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



CHECKING THRUST CLEARANCE



CHECKING SIDE CLEARANCE

G95B19613

Fig. 25: Measuring Oil Pump Clearances
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT

Disassembly

Note location of mainshaft components. See **Fig. 26** . Remove mainshaft components.

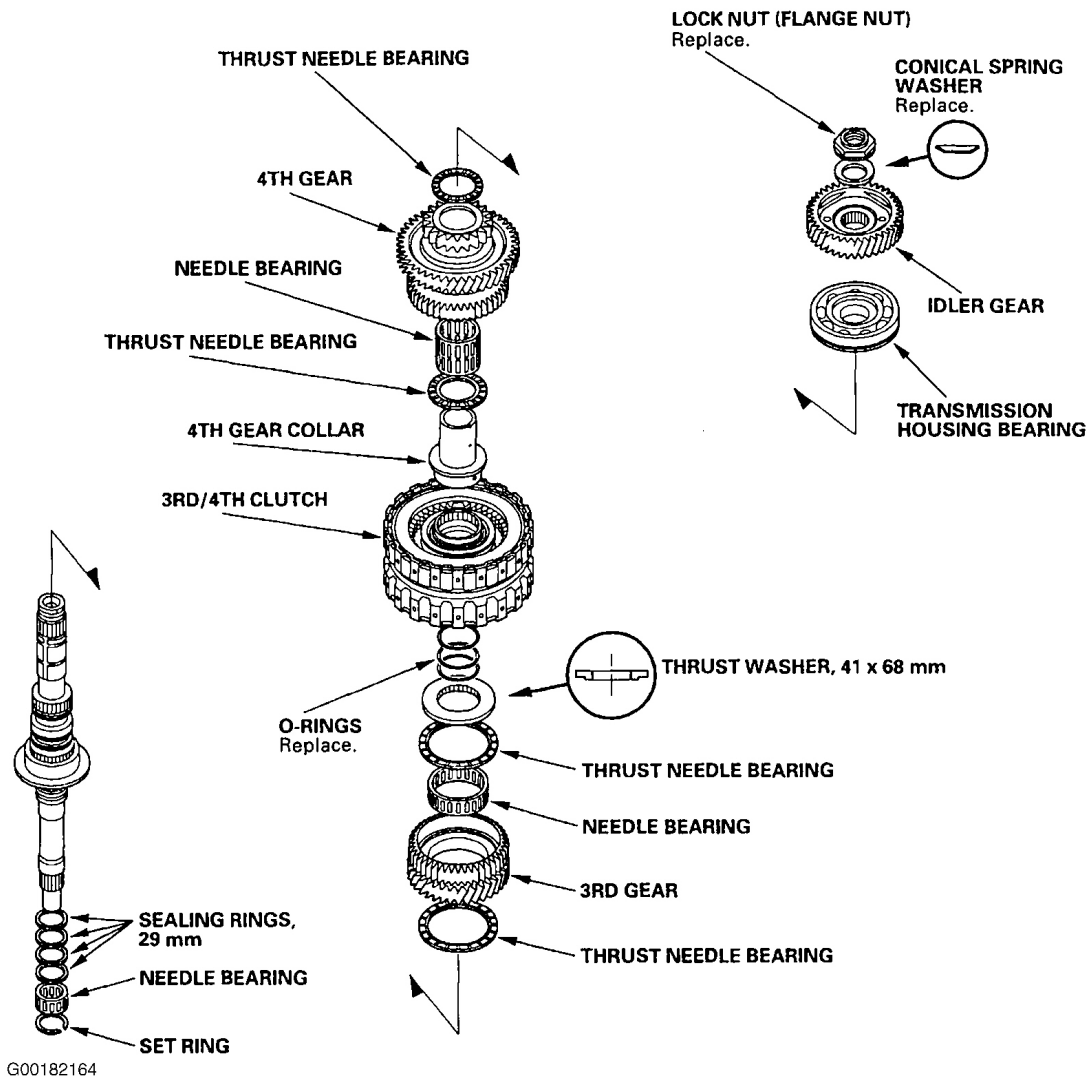


Fig. 26: Exploded View Of Mainshaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Inspection

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surfaces for scoring and excessive wear.

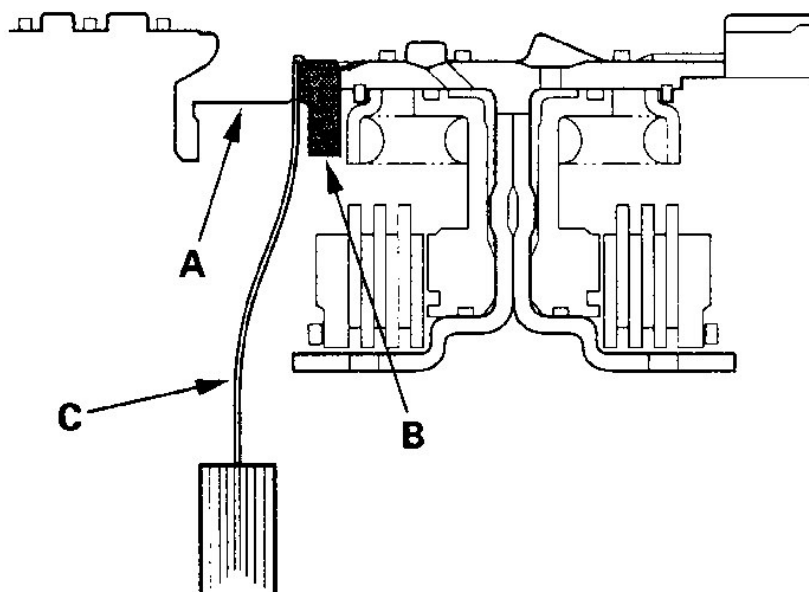
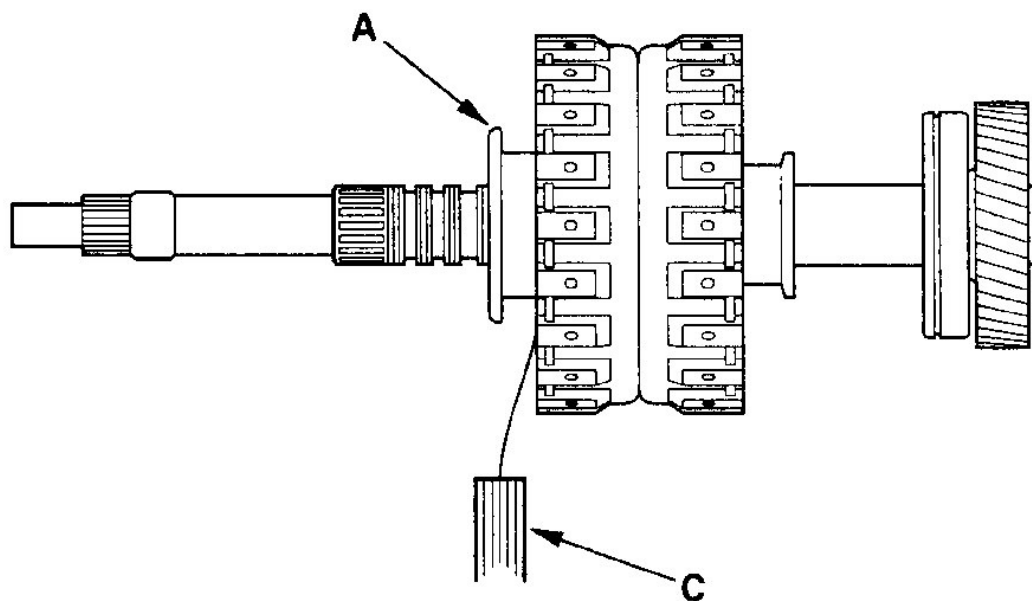
4. Inspect the condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them. See **MAINSHAFT SEALING RING REPLACEMENT** .

Reassembly

1. Lubricate all parts with ATF during assembly.
2. Before installing the "O" rings, wrap the mainshaft splines with tape to prevent "O" ring damage.
3. Install the conical spring washer and 41 x 68 thrust washer in the direction shown. See **Fig. 26** .
4. Replace the lock nut and conical spring washer when assembling the transaxle.
5. Check the clearance of the 3rd/4th clutch assembly. See **3RD/4TH CLUTCH CLEARANCE INSPECTION** .

3rd/4th Clutch Clearance Inspection

1. Remove the mainshaft transmission housing bearing.
2. Assemble the 41 x 68 mm thrust shim, 3rd/4th clutch assembly, 4th gear collar and transmission housing bearing on the mainshaft. See **Fig. 26** . Do not install "O" rings during inspection.
3. Install the idler gear on the mainshaft with a press, then install the conical spring washer and lock nut.
4. Tighten the lock nut to 22 ft. lbs. (29 N.m).
5. Measure the clearance between the mainshaft flange (A) and 41 x 68 mm thrust washer (B) with a feeler gauge (C), in at least 3 places. See **Fig. 27** . Use the average as the actual clearance. Clearance should be .001-.004" (.03-.11 mm). If clearance is not as specified, remove 41 x 68 mm thrust washer and measure it's thickness. Select and install a new thrust washer, then recheck. See **Fig. 28** .
6. Disassemble the shaft and gears. Reinstall the bearing in the transmission housing.



G00085301

Fig. 27: Measuring 3rd/4th Clutch Assembly Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90414-PRP-000	6.35 mm (0.250 in.)
2	90415-PRP-000	6.40 mm (0.252 in.)
3	90416-PRP-000	6.45 mm (0.254 in.)
4	90417-PRP-000	6.50 mm (0.256 in.)
5	90418-PRP-000	6.55 mm (0.258 in.)
6	90419-PRP-000	6.60 mm (0.260 in.)

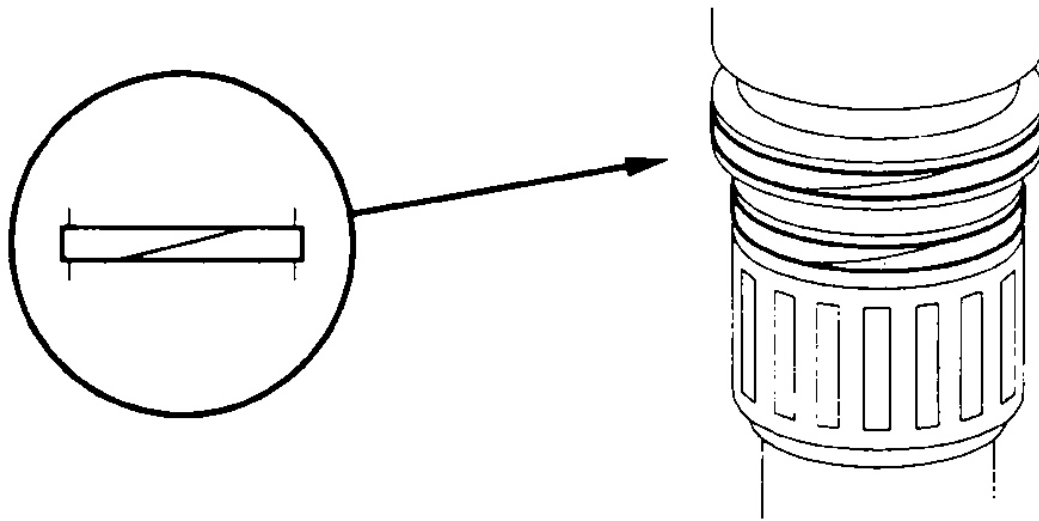
G00085302

Fig. 28: Mainshaft Thrust Washer Selection Chart
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Mainshaft Sealing Ring Replacement

NOTE: The sealing rings are synthetic resin with chamfered ends. Check the condition of the sealing rings, and replace them only if they are worn, distorted, or damaged.

1. For a better fit, squeeze sealing rings together slightly before installing them.
2. Apply ATF to the new sealing rings, then install them on the mainshaft.
3. After installing the sealing rings, verify the following:
 - The rings are fully seated in the groove.
 - The rings are not twisted.
 - The chamfered ends of the rings are properly joined. See **Fig. 29**.



G00085270

Fig. 29: Identifying Sealing Ring Installation

Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT**NOTE:** Lock nut has left hand threads.**NOTE:** Letter references in parenthesis are identified in following illustrations.**Disassembly****NOTE:** Some reverse selector hubs are not press fitted, and can be removed without using the bearing separator and press. Place a shaft protector between the countershaft and press to prevent damaging the countershaft.

1. Remove the lock nut, and take off components down to the reverse selector hub. See **Fig. 30**.
2. Set a press on the countershaft (B) by putting a shaft protector (C) between the press and countershaft. Remove the reverse selector hub (D) and 4th gear (A) from countershaft using a press. See **Fig. 31**.
3. Remove the needle bearing, set ring, 35 x 47 x 7.8 mm collar, 31 mm cotters, and 37 x 41 x 82.8 mm collar from the countershaft. See **Fig. 30**.
4. Remove 3rd gear, 1st gear and 2nd gear from countershaft by hand.

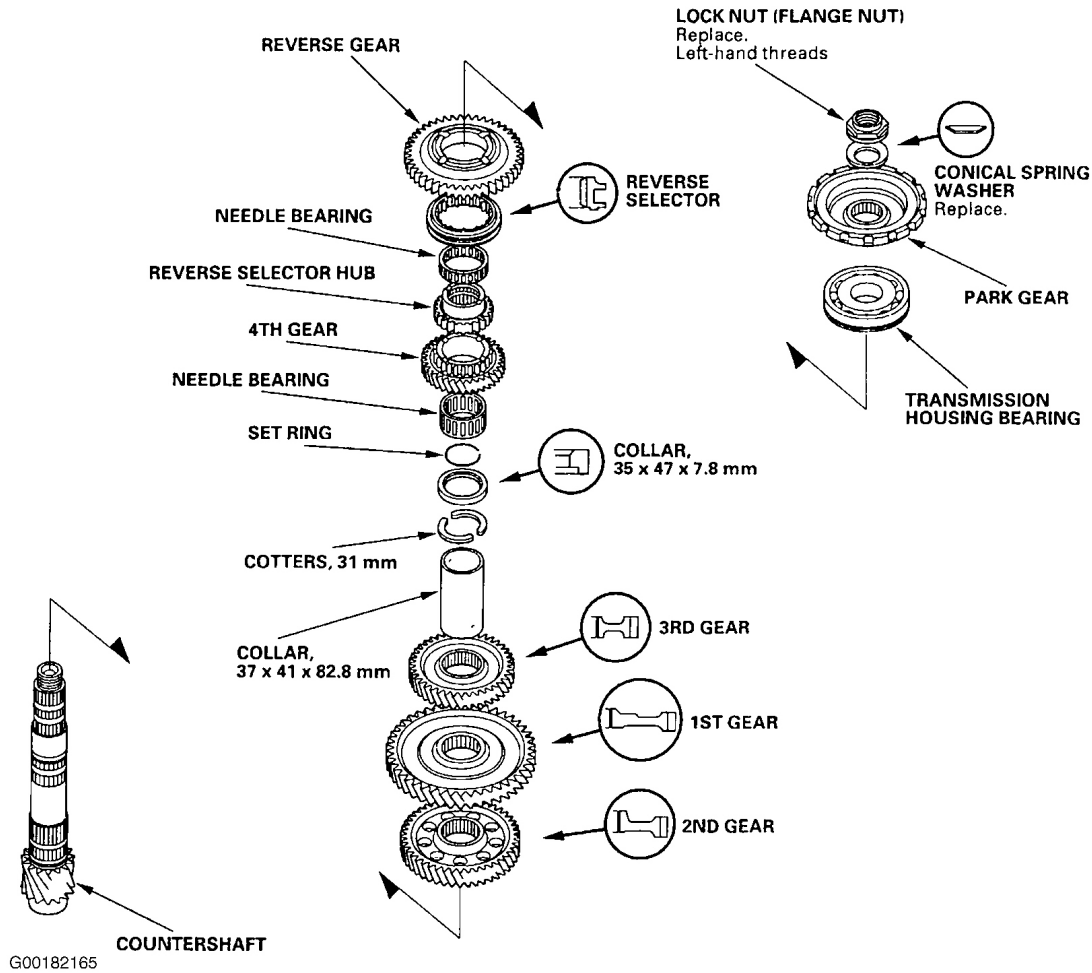
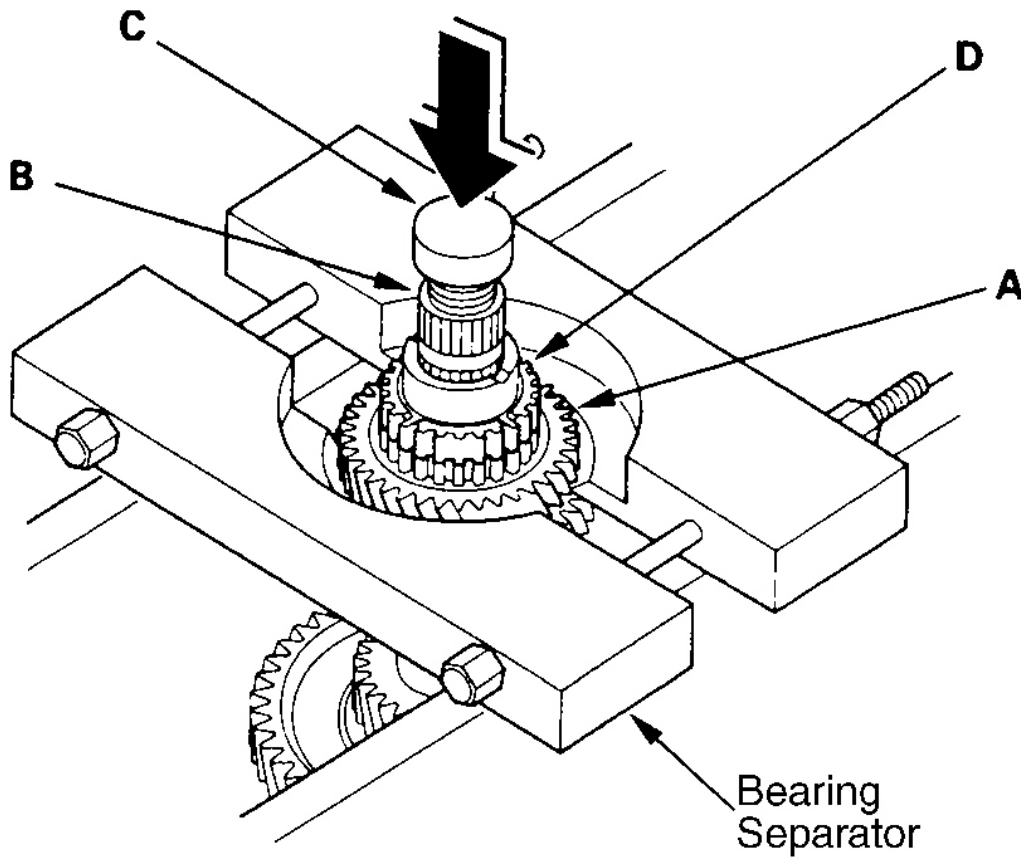


Fig. 30: Exploded View Of Countershaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00085304

Fig. 31: Removing 4th Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning & Inspection

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.
2. Check the splines for excessive wear and damage.
3. Check the shaft bearing surfaces for scoring and excessive wear.

Reassembly

NOTE: Some reverse selector hubs are not press fitted, and can be installed without using the driver and press. Place a shaft protector between the countershaft and press to prevent damaging the countershaft.

1. Lubricate all parts with ATF during reassembly. Assemble the 2nd gear, 1st gear and 3rd gear on the countershaft by hand.

2. Install the 37 x 41 x 82.8 mm collar, 31 mm cotters, 35 x 47 x 7.8 mm collar, set ring, needle bearing and 4th gear onto the countershaft. See **Fig. 30** .
3. Slide the reverse selector hub over the countershaft, then press it in place with a driver and a press.

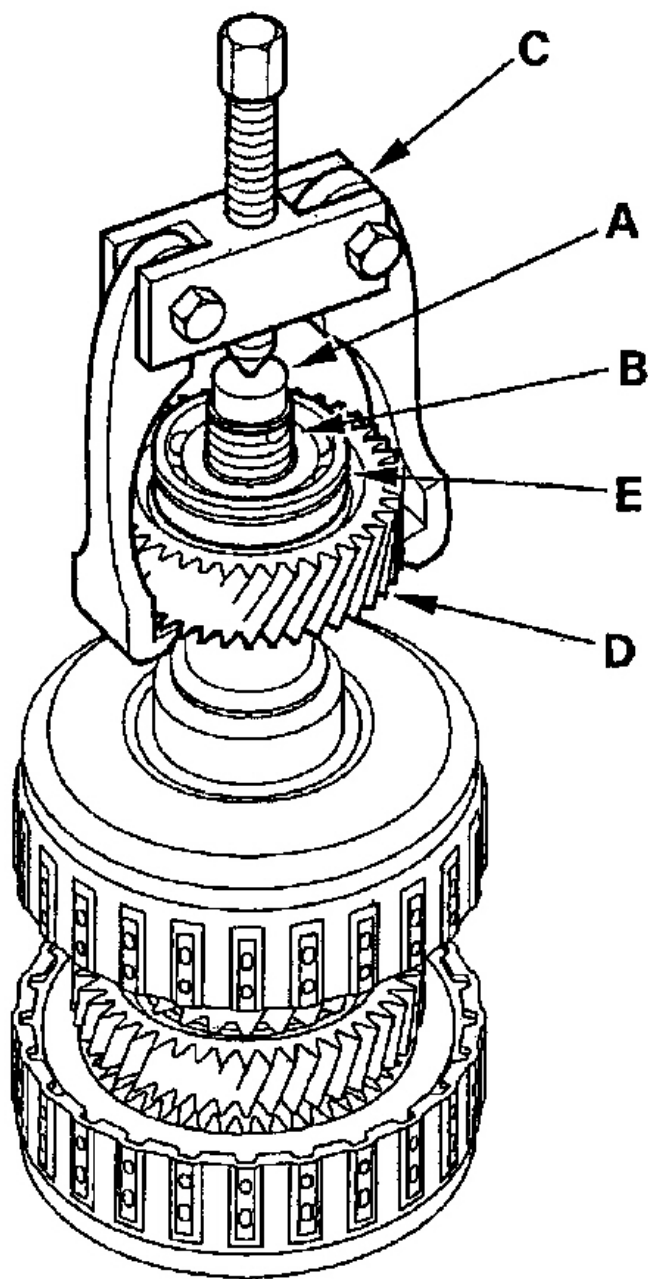
SECONDARY SHAFT

NOTE: **Lock nut has left hand threads.**

NOTE: **Letter references in parenthesis are identified in following illustrations.**

Disassembly

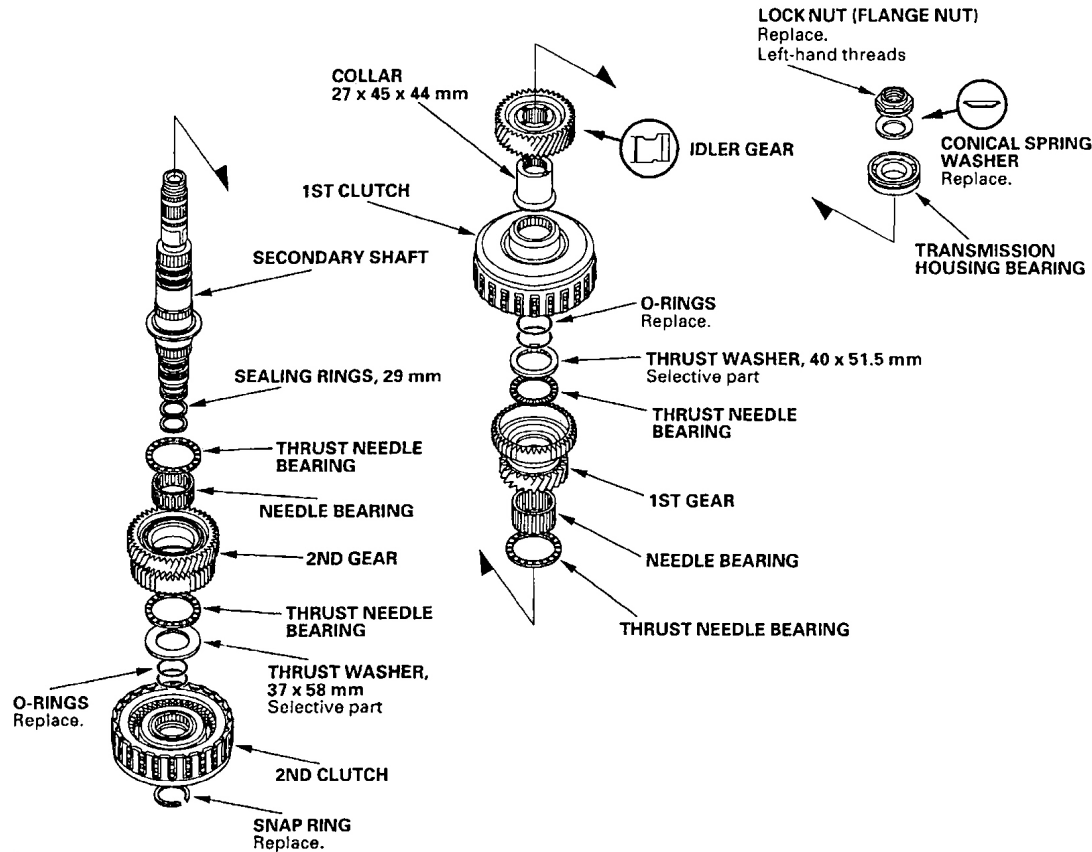
1. Remove the lock nut.
2. Place a shaft protector (A) on the secondary shaft (B), and set the puller (C) under the idler gear (D), then remove the idler gear and ball bearing (E). See **Fig. 32** .
3. Disassemble remaining secondary shaft components. See **Fig. 33** .
4. Inspect the thrust needle bearing and needle bearing for galling and rough movement.
5. Check the clearance of the secondary shaft assembly. See **2ND GEAR CLEARANCE INSPECTION** and **1ST GEAR CLEARANCE INSPECTION** .
6. Check the splines for excessive wear and damage.
7. Check the shaft bearing surfaces for scoring and excessive wear.
8. Check the idler gear bearing for wear and rough movement. If the bearing is worn or damaged, replace it.



G00182166

Fig. 32: Removing Idler Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

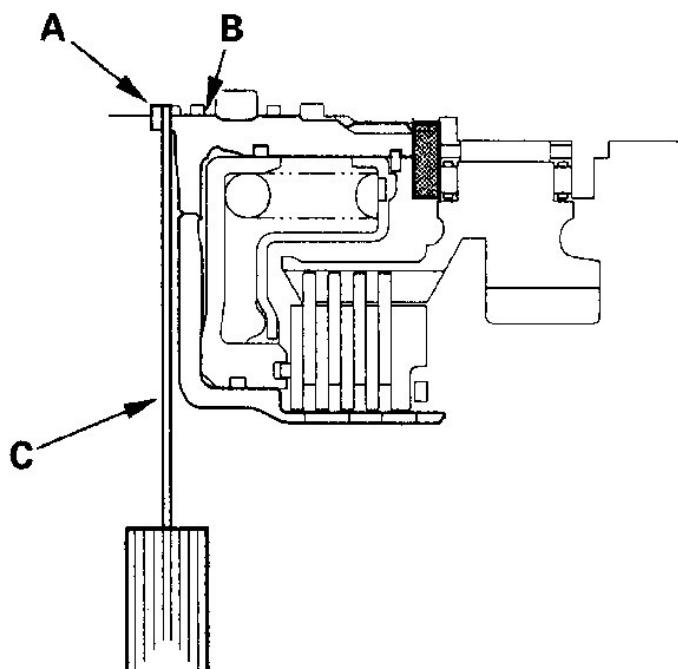
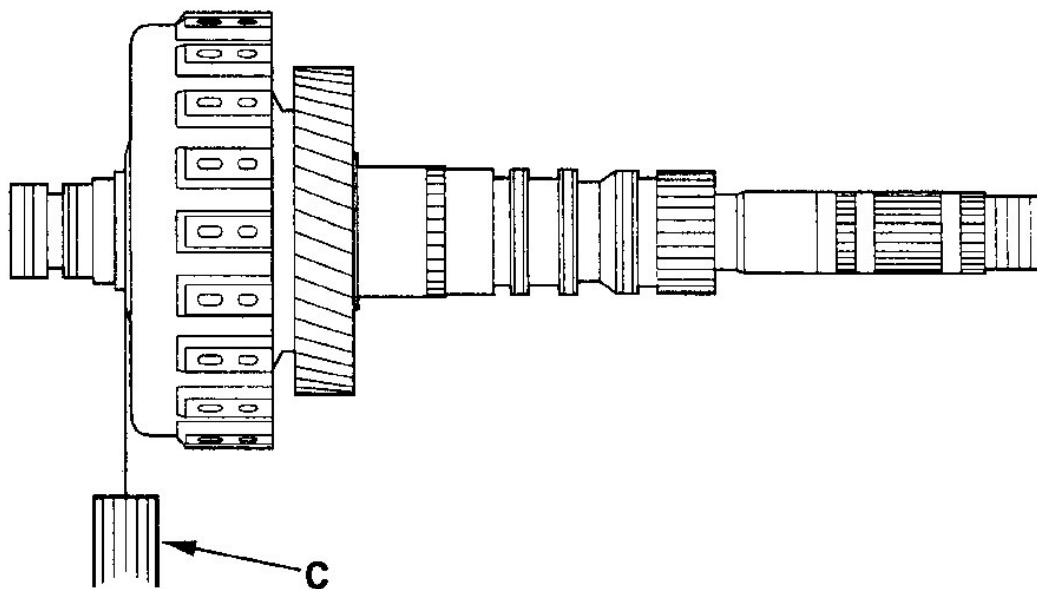


G00182168

Fig. 33: Exploded View Of Secondary Shaft Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2nd Gear Clearance Inspection

1. Install the thrust needle bearing, needle bearing, 2nd gear, thrust needle bearing, 37 x 58 mm thrust washer, and 2nd clutch on the secondary shaft, then secure them with the snap ring. See **Fig. 33**.
2. Measure the clearance between the snap ring (A) and the 2nd clutch guide (B) with a feeler gauge (C), in at least 3 places. Use the average as the actual clearance. See **Fig. 34**. Standard is .002-.005" (.04-.12 mm).
3. If the clearance is out of standard, remove the 37 x 58 mm thrust washer and measure its thickness.
4. Select and install a new thrust washer, then recheck. See **Fig. 35**.
5. After replacing the thrust washer, ensure the clearance is within standard.
6. Disassemble the shaft and gears.



G00085313

Fig. 34: Measuring 2nd Gear Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90511-PRP-010	3.900 mm (0.154 in.)
2	90512-PRP-010	3.925 mm (0.155 in.)
3	90513-PRP-010	3.950 mm (0.156 in.)
4	90514-PRP-010	3.975 mm (0.156 in.)
5	90515-PRP-010	4.000 mm (0.157 in.)
6	90516-PRP-010	4.025 mm (0.158 in.)
7	90517-PRP-010	4.050 mm (0.159 in.)
8	90518-PRP-010	4.075 mm (0.160 in.)
9	90519-PRP-010	4.100 mm (0.161 in.)
10	90520-PRP-010	4.125 mm (0.162 in.)
11	90521-PRP-010	4.150 mm (0.163 in.)
12	90522-PRP-010	4.175 mm (0.164 in.)
13	90523-PRP-000	4.200 mm (0.165 in.)
14	90524-PRP-000	4.225 mm (0.166 in.)
15	90525-PRP-000	4.250 mm (0.167 in.)
16	90526-PRP-000	4.275 mm (0.168 in.)
17	90527-PRP-000	4.300 mm (0.169 in.)
18	90528-PRP-000	4.325 mm (0.170 in.)
19	90529-PRP-000	4.350 mm (0.171 in.)
20	90530-PRP-000	4.375 mm (0.172 in.)

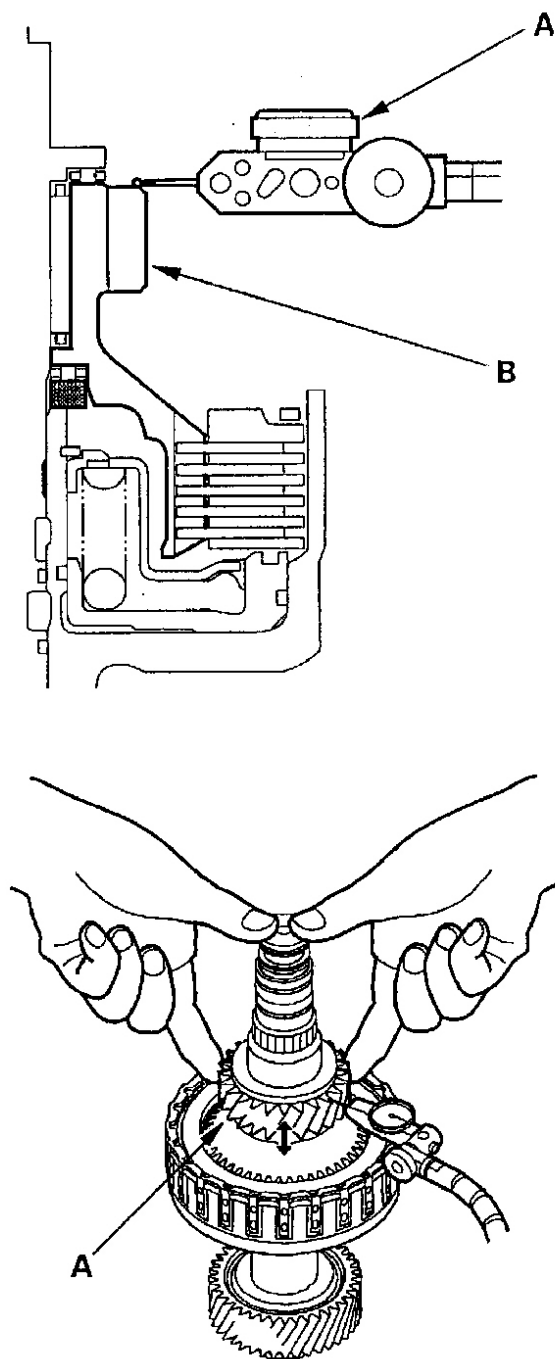
G00182169

Fig. 35: Thrust Washer (37 x 58 mm) Selection Chart
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

1st Gear Clearance Inspection

1. Install the thrust needle bearing, needle bearing, 1st gear, thrust needle bearing, 40 x 51.5 mm thrust washer, 1st clutch, and 27 x 45 x 44 mm collar on the secondary shaft. See **Fig. 33** .
2. Install the idler gear, then install the ball bearing on the idler gear with a driver and press.
3. Install the conical spring washer and lock nut, then tighten the lock nut to 22 ft. lbs. (29 N.m).

4. Turn the secondary shaft assembly upside down, and set the dial indicator (A) on the 1st gear (B). See **Fig. 36**.
5. Hold the secondary shaft, and measure the 1st gear axial clearance in at least 3 places while moving the 1st gear (C). Use the average as the actual clearance. Standard is .002-.005" (.04-.12 mm).
6. If the clearance is out of standard, remove the 40 x 51.5 mm thrust washer and measure its thickness.
7. Select and install a new thrust washer, then recheck. See **Fig. 37**.
8. After replacing the thrust washer, ensure the clearance is within standard.
9. Disassemble the shaft and gears.



G00182170

Fig. 36: Measuring 1st Gear Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90503-PRP-000	4.80 mm (0.189 in.)
2	90504-PRP-000	4.85 mm (0.191 in.)
3	90505-PRP-000	4.90 mm (0.193 in.)
4	90506-PRP-000	4.95 mm (0.195 in.)
5	90507-PRP-000	5.00 mm (0.197 in.)
6	90508-PRP-000	5.05 mm (0.199 in.)

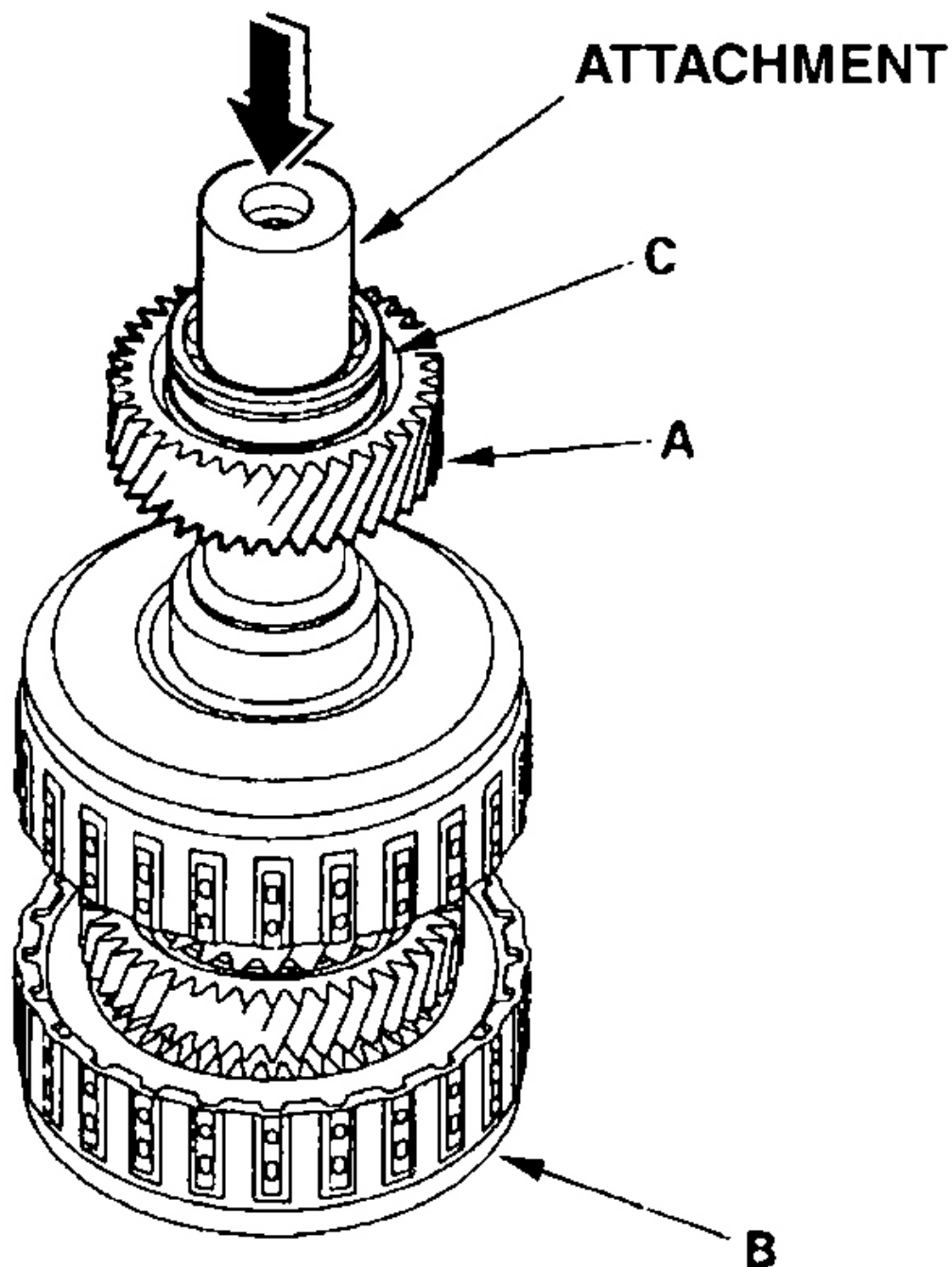
G00085316

Fig. 37: Thrust Washer (40 x 51.5 mm) Selection Chart
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

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

1. Lubricate all parts with ATF during reassembly.
2. Install the idler gear (A) on the secondary shaft (B), and install the ball bearing (C) on the countershaft over the idler gear with the special tool and a press. See **Fig. 38**.



G00182167

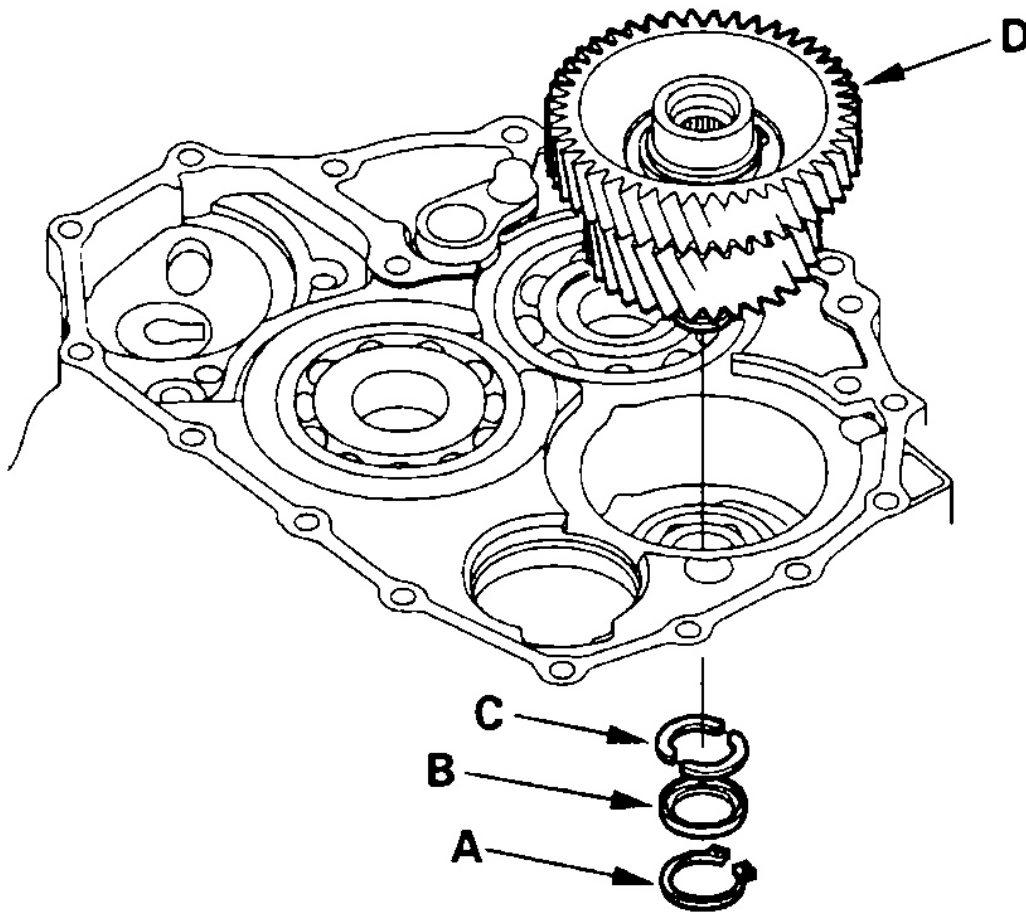
Fig. 38: Installing Secondary Shaft Idler Gear & Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

IDLER GEAR ASSEMBLY

NOTE: Letter references in parenthesis are identified in following illustration.

Removal & Installation

1. Remove the snap ring (A), cotter retainer (B), and cotters (C). Do not distort the snap ring.
2. Remove the idler gear shaft/idler gear assembly (D) from the transmission housing.
3. Check the snap rings and cotter retainer for wear and damage. Replace them if they are worn, distorted, or damaged.
4. Install the idler gear and shaft in the reverse order of removal.



G00085317

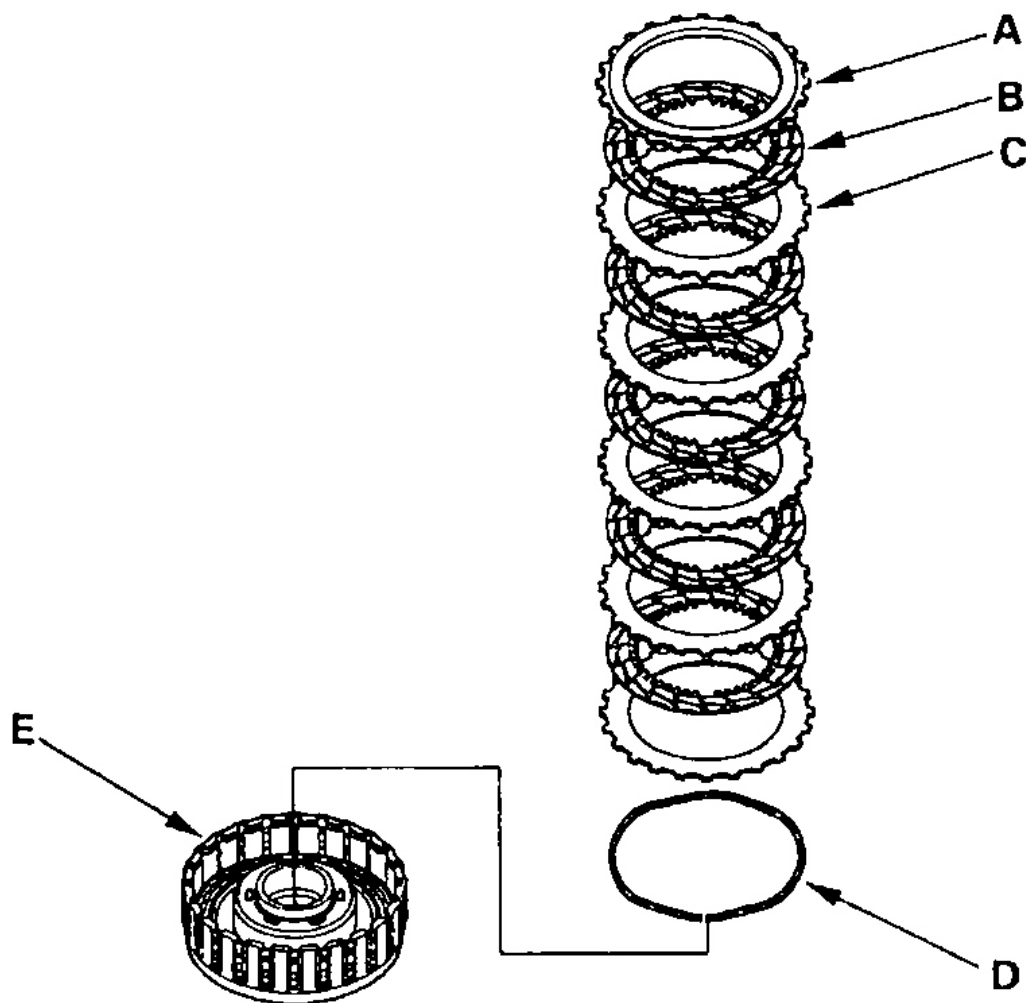
Fig. 39: Removing Idler Gear Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CLUTCH ASSEMBLIES

NOTE: Letter references in parenthesis are identified in following illustrations.

Disassembly

1. Remove the snap ring with a screwdriver.
2. Remove the clutch end plate (A), clutch discs (5) (B), clutch waved plates (5) (C), and waved spring (D) from the 1st clutch drum (E). See **Fig. 40** .
3. Remove the clutch end plate (A), clutch discs (5) (B), clutch waved plates (3) (C), clutch flat plates (2) (D), and waved spring (E) from the 2nd clutch drum (F). See **Fig. 41** .
4. Make a reference marks on the clutch flat plates (D).
5. Remove the clutch end plate (A), clutch discs (3) (B), clutch waved plates (3) (C) and waved spring (D) from the 3rd clutch drum (E). See **Fig. 42** .
6. Remove the clutch end plate (A), clutch discs (3) (B), clutch waved plates (3) (C), and waved spring (D) from the 4th clutch drum (E). See **Fig. 42** .
7. Install appropriate spring compressor on clutch drum.
8. Ensure the spring compressor is adjusted to have full contact with the spring retainer on the 3rd and 4th clutches.
9. Set the spring compressor on the spring retainer of the 1st and 2nd clutches in such a way that the spring compressor works on the clutch return spring.
10. If either end of the spring compressor is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.
11. Compress the return spring until the snap ring can be removed.
12. Remove the snap ring with snap ring pliers.
13. Remove the spring compressor.
14. Remove the snap ring, spring retainer, and return spring.
15. Wrap a shop rag around the clutch drum, and apply air pressure to the fluid passage to remove the piston. Place a finger tip on the other passage while applying air pressure.
16. Remove the piston, then remove the "O" rings from the 3rd and 4th clutch pistons.
17. Remove the piston, then remove the "O" ring from the 1st and 2nd clutch drum, and remove the "O" ring from each clutch piston.



G00182171

Fig. 40: Exploded View Of 1st Clutch

Courtesy of AMERICAN HONDA MOTOR CO., INC.

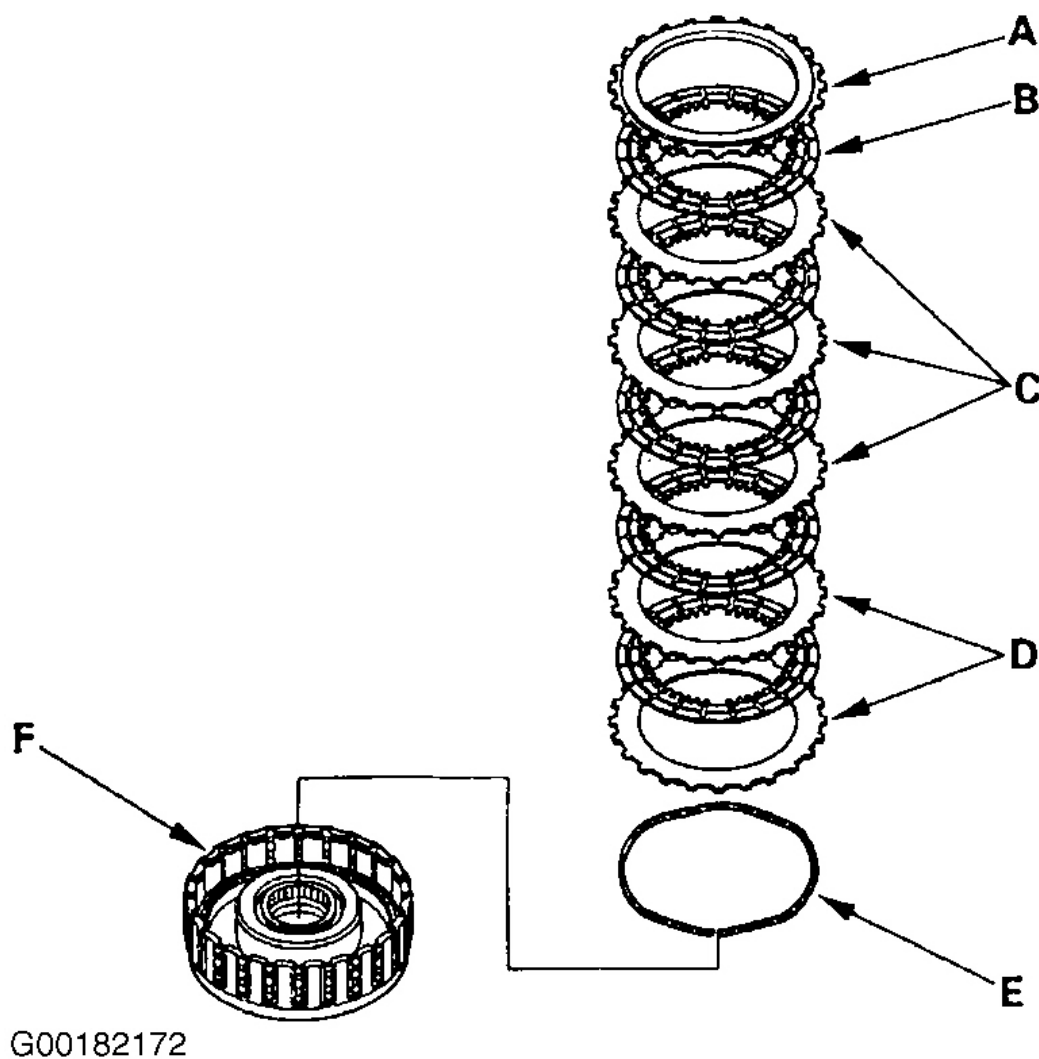


Fig. 41: Exploded View Of 2nd Clutch
Courtesy of AMERICAN HONDA MOTOR CO., INC.

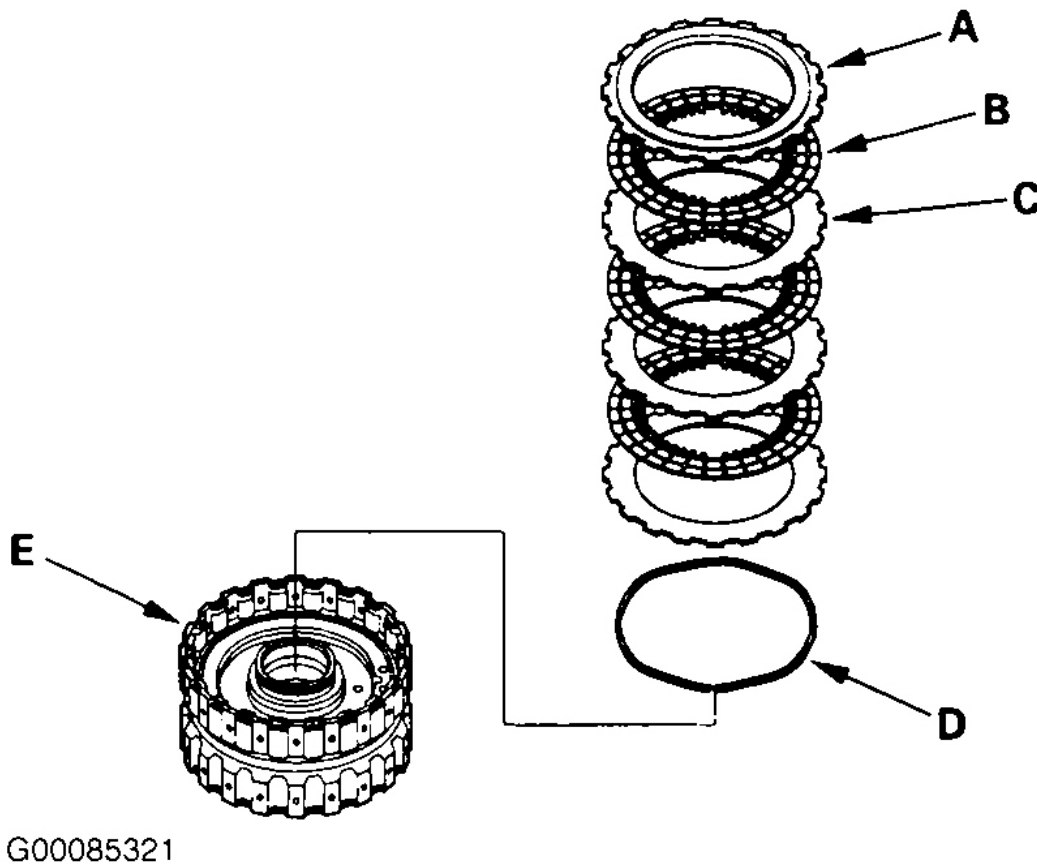


Fig. 42: Exploded View Of 3rd & 4th Clutches
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Cleaning & Inspection

1. Inspect the 3rd and 4th clutch pistons and clutch piston check valves.
2. If the clutch piston check valve is loose or damaged, replace the clutch piston.
3. Check the spring retainer for wear and damage.
4. Check the oil seal on the spring retainer of the 1st and 2nd clutches for wear, damage, and peeling.
5. If the oil seal is worn, damaged, or peeling, replace the spring retainer.
6. Inspect the clutch discs, clutch plates, and clutch end plate for wear, damage, and discoloration. Standard thickness for clutch discs is .076" (1.94 mm). For standard thickness of clutch plates, see **CLUTCH PLATE THICKNESS SPECIFICATIONS** table.

CLUTCH PLATE THICKNESS SPECIFICATIONS

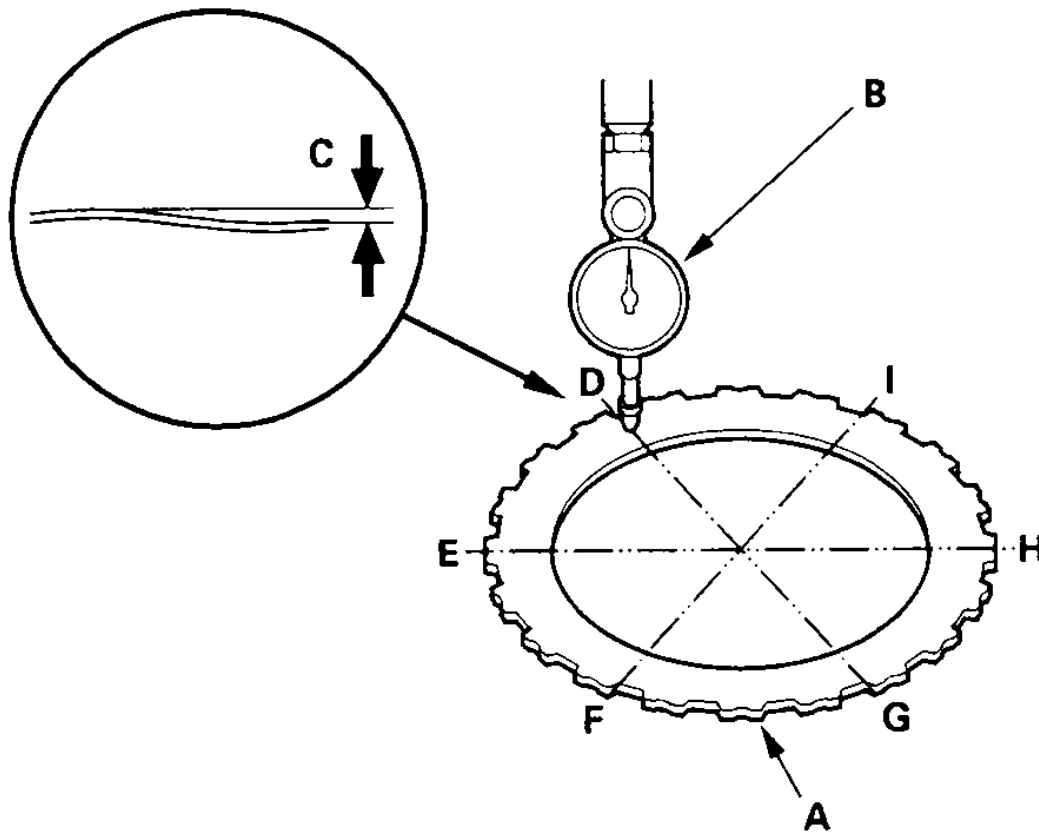
Application	In. (mm)
1st Clutch	.063 (1.60)

2nd Clutch	.079 (2.00)
3rd & 4th Clutch	.091 (2.30)

7. If the clutch discs are worn or damaged, replace them as a set. If the clutch discs are replaced, inspect the clutch end plate-to-top disc clearance. See **CLEARANCE INSPECTION**.
8. If any plate is worn, damaged, or discolored, replace the damaged plate with the new plate, and inspect the other waved plates for a phase difference. See **CLUTCH WAVED PLATE PHASE DIFFERENCE INSPECTION**. If the clutch plate is replaced, inspect the clutch end plate-to-top disc clearance.
9. If the clutch end plate is worn, damaged, or discolored, inspect the clutch end plate-to-top disc clearance, then replace the clutch end plate.

Clutch Waved Plate Phase Difference Inspection

1. Place the clutch waved plate (A) on a surface plate, and set a dial indicator (B) on the waved plate.
2. Find the bottom (D) of a phase difference of the waved plate, zero the dial indicator and make a reference mark on the bottom of the waved plate.
3. Rotate the 1st and 2nd clutch waved plate about 60 degrees by holding the waved plate by its circumference. Rotate the 3rd and 4th clutch waved plate about 72 degrees or 54 degrees apart from the bottom. The dial indicator should be at the top (E) of a phase difference. See **Fig. 43**. Do not rotate the waved plate while holding its surface, always rotate it while holding its circumference.
4. Read the dial indicator. The dial indicator reads the phase difference (C) of the waved plate between bottom and top. Standard is .002" (.05 mm) minimum.
5. Rotate the 1st and 2nd clutch waved plate about 60 degrees from the top position, and rotate the 3rd and 4th clutch waved plate about 54 degrees or 72 degrees apart from the top. The dial indicator should be at the bottom of a phase difference (F and H). Zero the dial indicator.
6. Measure the phase difference at the other 2 tops (G and I) of the waved plate by following steps 3 -5.
7. If the 2 values of the 3 measurements are within the standard, the waved plate is okay. If the 2 values of the 3 measurements are out of the standard, replace the waved plate.



G00085322

Fig. 43: Measuring Waved Plate Phase Difference
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Clearance Inspection

1. Inspect the clutch piston, discs, plates, and end plate for wear and damage, and inspect clutch waved plate phase difference, if necessary. See **CLUTCH WAVED PLATE PHASE DIFFERENCE INSPECTION**.
2. Install the clutch piston in the clutch drum. Do not install the "O" rings during inspection.
3. Install the waved spring in the 1st clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (5) and discs (5), then install the clutch end plate with the flat side toward the disc. See **Fig. 40**.
4. Install the waved spring in the 2nd clutch drum. Install the clutch flat plate, clutch disc and clutch flat plate. Starting with the clutch disc, alternately install the clutch discs (4) and waved plates (3), then install the clutch end plate with the flat side toward the disc. See **Fig. 41**.
5. Install the waved spring in the 3rd clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (3), and discs (3), then install the clutch end plate with the flat side toward the disc. See **Fig. 42**.

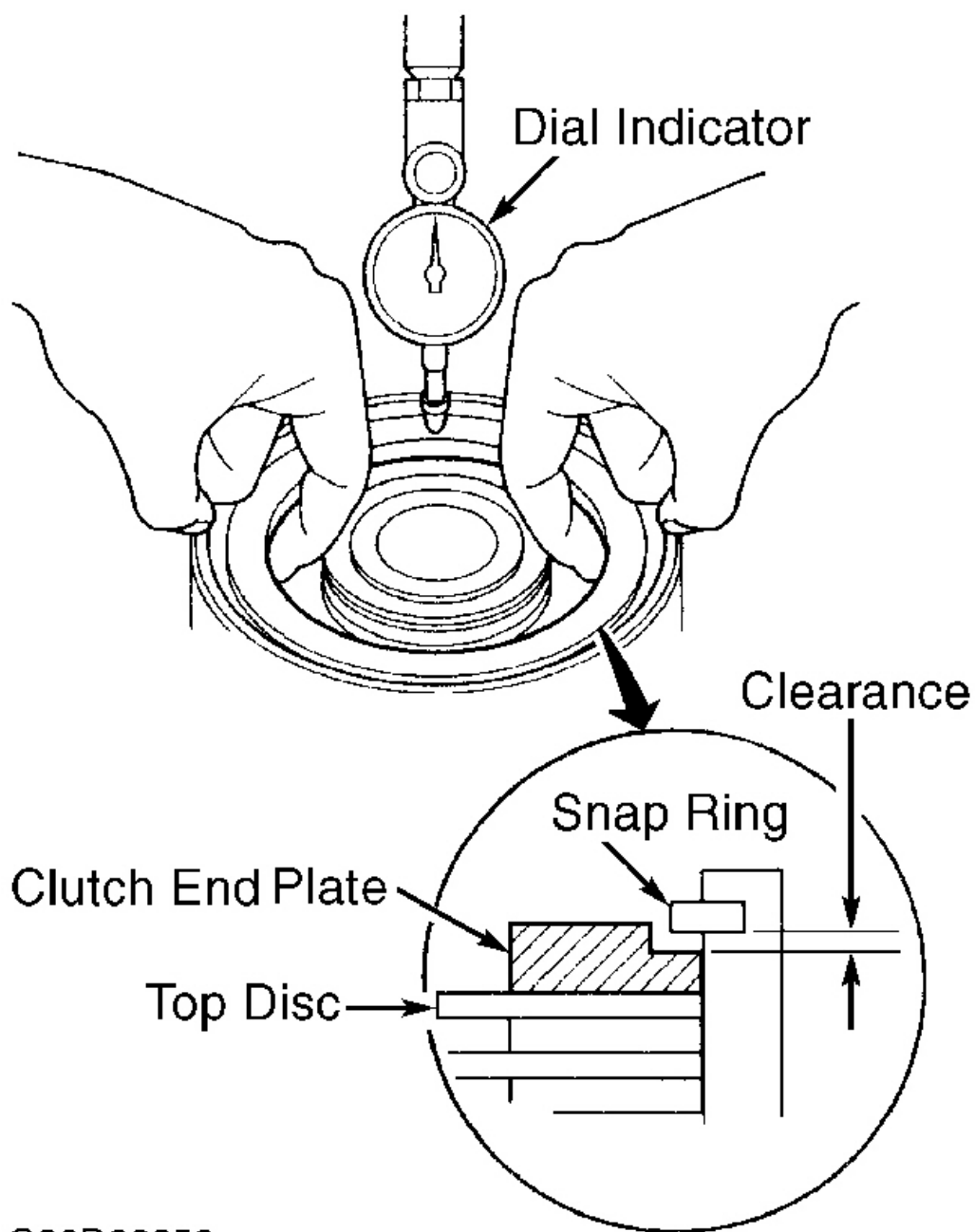
6. Install the waved spring in the 4th clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (3) and discs (3), then install the clutch end plate with the flat side toward the disc. See **Fig. 42**.
7. Install the snap ring with a screwdriver.
8. Set a dial indicator on the clutch end plate.
9. Zero the dial indicator with the clutch end plate lifted up to the snap ring. See **Fig. 44**.
10. Release the clutch end plate to lower the clutch end plate, then put the spring compressor on the end plate.
11. Press the spring compressor down with 33-35 lbs. (150-160 N) using a force gauge, and read the dial indicator. The dial indicator reads the clearance between the clutch end plate and top disc. Take measurements in at least 3 places, and use the average as the actual clearance. See **CLUTCH CLEARANCE SPECIFICATIONS** table.
12. If the clearance is out of the service limit, select a new clutch end plate from appropriate table. See **Fig. 45 -Fig. 47**.

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

13. Install the new clutch end plate, then recheck the clearance.

CLUTCH CLEARANCE SPECIFICATIONS

Application	In. (mm)
1st Clutch	.050-.058 (1.28-1.48)
2nd Clutch	.033-.041 (.85-1.05)
3rd & 4th Clutch	.029-.037 (.73-.93)



G93D22353

Fig. 44: Measuring End Plate Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Plate No.	Part Number	Thickness
1	22551-PPV-003	2.6 mm (0.102 in.)
2	22552-PPV-003	2.7 mm (0.106 in.)
3	22553-PPV-003	2.8 mm (0.110 in.)
4	22554-PPV-003	2.9 mm (0.114 in.)
5	22555-PPV-003	3.0 mm (0.118 in.)
6	22556-PPV-003	3.1 mm (0.112 in.)
7	22557-PPV-003	3.2 mm (0.126 in.)
8	22558-PPV-003	3.3 mm (0.130 in.)
9	22559-PPV-003	3.4 mm (0.134 in.)

G00182173

Fig. 45: 1st Clutch End Plate Selection Table

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Plate No.	Part Number	Thickness
1	22571-PRP-003	2.6 mm (0.102 in.)
2	22572-PRP-003	2.7 mm (0.106 in.)
3	22573-PRP-003	2.8 mm (0.110 in.)
4	22574-PRP-003	2.9 mm (0.114 in.)
5	22575-PRP-003	3.0 mm (0.118 in.)
6	22576-PRP-003	3.1 mm (0.122 in.)
7	22577-PRP-003	3.2 mm (0.126 in.)
8	22578-PRP-003	3.3 mm (0.130 in.)
9	22579-PRP-003	3.4 mm (0.134 in.)

G00182174

Fig. 46: 2nd Clutch End Plate Selection Table

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Plate No.	Part Number	Thickness
1	22571-PPV-A01	2.1 mm (0.083 in.)
2	22572-PPV-A01	2.2 mm (0.087 in.)
3	22573-PPV-A01	2.3 mm (0.091 in.)
4	22574-PPV-A01	2.4 mm (0.094 in.)
5	22575-PPV-A01	2.5 mm (0.098 in.)
6	22576-PPV-A01	2.6 mm (0.102 in.)
7	22577-PPV-A01	2.7 mm (0.106 in.)
8	22578-PPV-A01	2.8 mm (0.110 in.)
9	22579-PPV-A01	2.9 mm (0.114 in.)

G00182175

Fig. 47: 3rd & 4th Clutch End Plate Selection Table
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reassembly

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.
2. Install the new "O" rings on the 3rd and 4th clutch piston.
3. Install the new "O" ring in the 1st and 2nd clutch pistons, and install the new "O" ring on the clutch drums.
4. Install the clutch piston in the clutch drum. Apply pressure and rotate piston to ensure proper seating. Lubricate the piston "O" ring with ATF before installing. Do not pinch the "O" ring by installing the piston with too much force.
5. Install the return spring and spring retainer, and position the snap ring on the retainer.
6. Install appropriate clutch spring compressor.
7. Ensure the spring compressor is adjusted to have full contact with the spring retainer on the 3rd and 4th clutches.
8. Set the spring compressor on the spring retainer of the 1st and 2nd clutches in such a way that the spring compressor fits on the clutch return spring.
9. If either end of the spring compressor is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.
10. Compress the return spring.
11. Install the snap ring using snap ring pliers.
12. Remove the spring compressor.

13. Install the waved spring in the 1st clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (5) and discs (5), then install the clutch end plate with the flat side toward the disc. See **Fig. 40**.
14. Install the waved spring in the 2nd clutch drum. Install the clutch flat plate, clutch disc and clutch flat plate. Starting with the clutch disc, alternately install the clutch discs (4) and waved plates (3), then install the clutch end plate with the flat side toward the disc. See **Fig. 41**.
15. Install the waved spring in the 3rd clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (3) and discs (3), then install clutch end plate with the flat side toward the disc. See **Fig. 42**.
16. Install the waved spring in the 4th clutch drum. Starting with the clutch waved plate, alternately install the clutch plates (3) and discs (3), then install the clutch end plate with the flat side toward the disc. See **Fig. 42**.
17. Install the snap ring with a screwdriver.
18. Check that the clutch piston moves by applying air pressure into fluid passage.

COUNTERSHAFT BEARING

Removal & Installation

1. Remove the countershaft bearing with the appropriate puller and slide hammer.
2. Install the ATF guide plate.
3. Install the new bearing into the housing with the appropriate driver.

MAINSHAFT BEARING & SEAL

Removal & Installation

1. Remove the mainshaft bearing and oil seal with the appropriate puller and slide hammer.
2. Install the new mainshaft bearing with appropriate driver until it bottoms in the housing.
3. Install the new oil seal flush to the housing with appropriate driver.

SECONDARY SHAFT BEARING

Removal & Installation

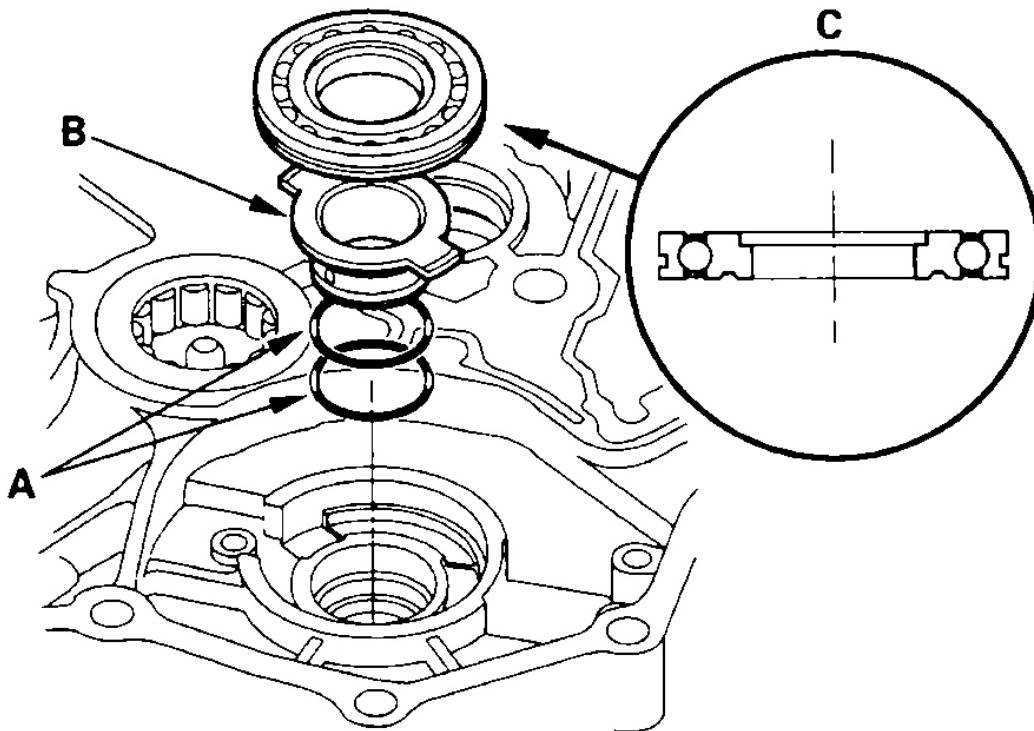
NOTE: Letter references in parenthesis are identified in following illustration. See **Fig. 48**.

1. Remove the bolt, then remove the lock washer and bearing set plate. See **Fig. 12**.

NOTE: Let the housing cool to normal temperature before installing the bearing.

2. Remove the secondary shaft bearing by heating the housing to about 212°F (100°C) with a heat gun. Do not heat the housing in excess of 212°F (100°C).

3. Install the new "O" rings (A) on the ATF guide collar (B), then install the ATF guide collar in the housing. See **Fig. 48**.
4. Install the new secondary shaft bearing (C) in the direction shown. See **Fig. 48**.
5. Drive the secondary shaft bearing with appropriate bearing driver, and install it securely in the housing.
6. Check that the bearing groove aligns with the housing surface, then install the bearing set plate while aligning the bearing groove.
7. Install the new lock washer and bolt, then bend the lock tab of the lock washer against the bolt head.



G00085299

Fig. 48: Installing Secondary Shaft Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DIFFERENTIAL ASSEMBLY

Disassembly

1. Before disassembling differential assembly, check side gear backlash. Place differential assembly on "V" blocks with both axle shafts installed.
2. Install dial indicator with stem resting against pinion gear. See **Fig. 49**. Check side gear backlash. Side gear backlash should be .002-.006" (.05-.15 mm). If side gear backlash is not within specification, replace differential carrier.

NOTE: Ring gear bolts have left hand threads.

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

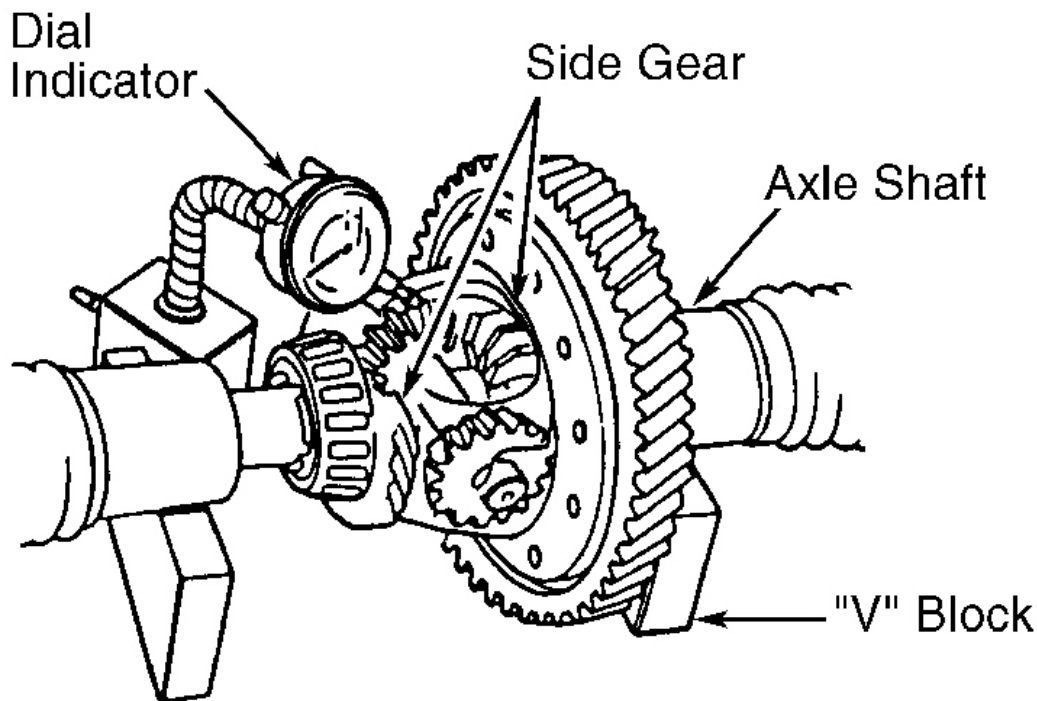
Cleaning & Inspection

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

Reassembly

CAUTION: Ring gear must be installed with chamfered side of ring gear toward differential carrier. See [Fig. 50](#) and [Fig. 51](#) . Ring gear bolts have left hand thread.

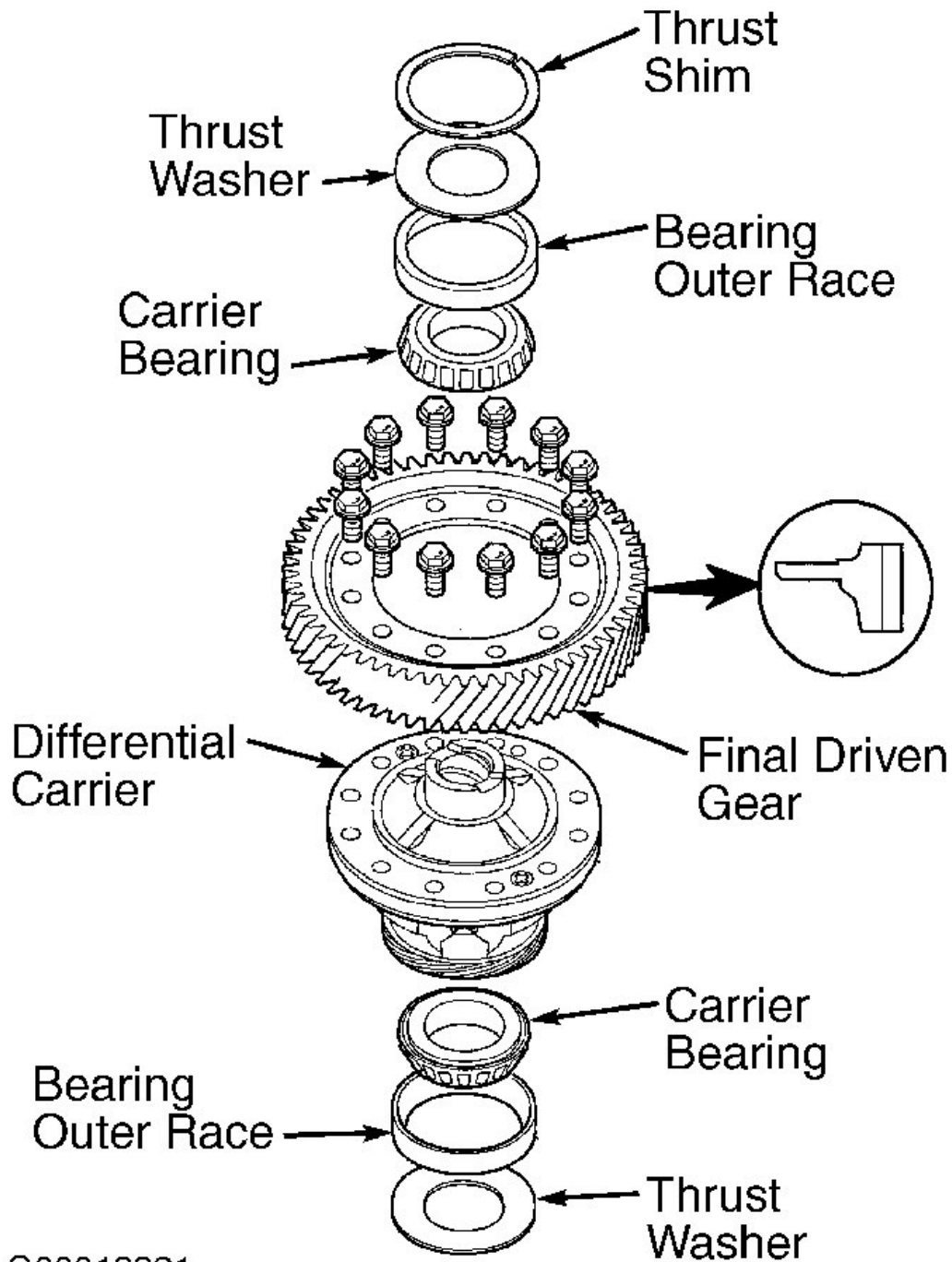
Install ring gear in appropriate direction. Install and tighten ring gear bolts to specification. See **TORQUE SPECIFICATIONS** . Using press, install NEW bearings on differential carrier (if removed). Ensure bearings are fully seated on differential carrier.



G95H19619

Fig. 49: Checking Side Gear Backlash

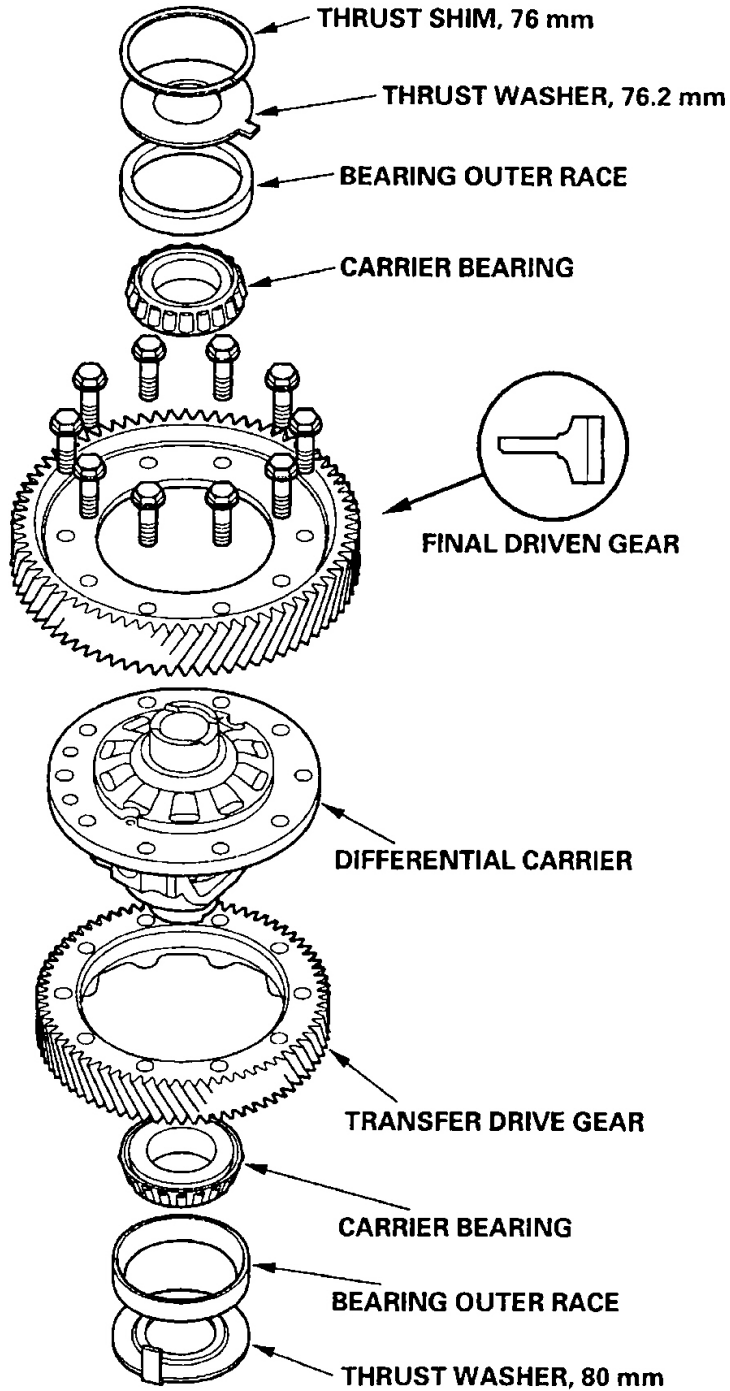
Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00019921

Fig. 50: Exploded View Of Differential Assembly (2WD)

Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00182176

Fig. 51: Exploded View Of Differential Assembly (4WD)

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Differential Assembly Bearing Preload

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

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

1. Using heat gun, heat transmission housing around differential bearing outer race and thrust shim to 212°F (100°C). Tap differential bearing outer race from transmission housing. Remove thrust shim and thrust washer, located below differential bearing outer race, from transmission housing.
2. Allow transmission housing to cool to room temperature. Install the 76 mm thrust shim in transmission housing. Install 76.2 mm thrust washer. Using hammer and bearing race installer, install differential bearing outer race in transmission housing. Ensure differential bearing outer race is fully seated in transmission housing, and there is no clearance between outer race, thrust washer, thrust shim and transmission housing.

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

3. Install gasket and dowel pins (if removed) on torque converter housing. DO NOT apply sealer at this time. Install differential assembly in torque converter housing. Install transmission housing with hanger and harness clamp brackets on torque converter housing without mainshaft, countershaft and secondary shaft installed.
4. Install and tighten transmission housing-to-torque converter housing bolts to 32 ft. lbs. (44 N.m) in sequence. Rotate differential assembly several turns to seat bearings.
5. Install Preload Adapter (07HAJ-PK40201) into differential assembly. See **Fig. 54** . Install INCH-lb. torque wrench on preload adapter. Measure differential assembly bearing preload by checking starting torque required to rotate differential assembly in both directions at room temperature.
6. Differential assembly bearing preload should be within specification. See **DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS** table.
7. If differential assembly bearing preload is not within specification, select proper thickness thrust shim from appropriate thrust shim selection table to obtain correct reading. See **Fig. 52** and **Fig. 53** .

DIFFERENTIAL ASSEMBLY BEARING PRELOAD SPECIFICATIONS ⁽¹⁾

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

No.	Part Number	Thickness
A	41428-PAX-000	1.575 mm (0.062 in.)
B	41429-PAX-000	1.625 mm (0.064 in.)
C	41430-PAX-000	1.675 mm (0.066 in.)
D	41431-PAX-000	1.725 mm (0.068 in.)
E	41432-PAX-000	1.775 mm (0.070 in.)
F	41433-PAX-000	1.825 mm (0.072 in.)
G	41434-PAX-000	1.875 mm (0.074 in.)
H	41435-PAX-000	1.925 mm (0.076 in.)
I	41436-PAX-000	1.975 mm (0.078 in.)
J	41437-PAX-000	2.025 mm (0.080 in.)
K	41438-PAX-000	2.075 mm (0.082 in.)
L	41439-PAX-000	2.125 mm (0.084 in.)
M	41440-PAX-000	2.175 mm (0.086 in.)
N	41441-PAX-000	2.225 mm (0.088 in.)
O	41442-PAX-000	2.275 mm (0.090 in.)
P	41443-PAX-000	2.325 mm (0.092 in.)
Q	41444-PAX-000	2.375 mm (0.094 in.)
R	41445-PAX-000	2.425 mm (0.095 in.)
S	41446-PAX-000	2.475 mm (0.097 in.)
T	41447-PAX-000	2.525 mm (0.099 in.)
U	41448-PAX-000	2.575 mm (0.101 in.)
V	41449-PAX-000	2.625 mm (0.103 in.)
W	41450-PAX-000	2.675 mm (0.105 in.)
X	41451-PAX-000	2.725 mm (0.107 in.)
Y	41452-PAX-000	2.775 mm (0.109 in.)
Z	41453-PAX-000	2.825 mm (0.111 in.)
0A	41454-PAX-000	2.875 mm (0.113 in.)
0B	41455-PAX-000	2.925 mm (0.115 in.)
0C	41456-PAX-000	2.975 mm (0.117 in.)
0D	41457-PAX-000	3.025 mm (0.119 in.)

G00182177

Fig. 52: Thrust Washer (76 mm) Selection Table (1 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
S	41438-PX4-700	2.05 mm (0.080 in.)
T	41439-PX4-700	2.10 mm (0.082 in.)
U	41440-PX4-700	2.15 mm (0.084 in.)
A	41441-PK4-000	2.20 mm (0.086 in.)
B	41442-PK4-000	2.25 mm (0.088 in.)
C	41443-PK4-000	2.30 mm (0.090 in.)
D	41444-PK4-000	2.35 mm (0.092 in.)
E	41445-PK4-000	2.40 mm (0.094 in.)
F	41446-PK4-000	2.45 mm (0.096 in.)
G	41447-PK4-000	2.50 mm (0.098 in.)
H	41448-PK4-000	2.55 mm (0.099 in.)
I	41449-PK4-000	2.60 mm (0.101 in.)
J	41450-PK4-000	2.65 mm (0.103 in.)
K	41451-PK4-000	2.70 mm (0.105 in.)
L	41452-PK4-000	2.75 mm (0.107 in.)
M	41453-PK4-000	2.80 mm (0.109 in.)
N	41454-PK4-000	2.85 mm (0.111 in.)
O	41455-PK4-000	2.90 mm (0.113 in.)
P	41456-PK4-000	2.95 mm (0.115 in.)
Q	41457-PK4-000	3.00 mm (0.117 in.)
R	41458-PK4-000	3.05 mm (0.119 in.)
0A	41428-PRP-000	1.55 mm (0.061 in.)
0B	41429-PRP-000	1.60 mm (0.063 in.)
0C	41430-PRP-000	1.65 mm (0.065 in.)
0D	41431-PRP-000	1.70 mm (0.067 in.)
0E	41432-PRP-000	1.75 mm (0.069 in.)
0F	41433-PRP-000	1.80 mm (0.071 in.)
0G	41434-PRP-000	1.85 mm (0.073 in.)
0H	41435-PRP-000	1.90 mm (0.075 in.)
0I	41436-PRP-000	1.95 mm (0.077 in.)
0J	41437-PRP-000	2.00 mm (0.079 in.)

G00182178

Fig. 53: Thrust Washer (76 mm) Selection Table (2 Of 2)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Changing thrust shim to the next size will increase or decrease bearing preload about 2.7-3.5 INCH lbs. (.3-.4 N.m). Increase thrust shim thickness to increase differential assembly bearing preload. Decrease

thrust shim thickness to decrease bearing preload.

9. After adjusting differential assembly bearing preload, remove transmission housing from torque converter housing. Remove differential bearing outer race from transmission housing. Install correct thrust shim. Using hammer and bearing race installer, install differential bearing outer race in transmission housing.
10. Reinstall transmission housing and recheck differential assembly bearing preload. Once correct differential assembly bearing preload is obtained, remove transmission housing, gasket and differential assembly from torque converter housing.

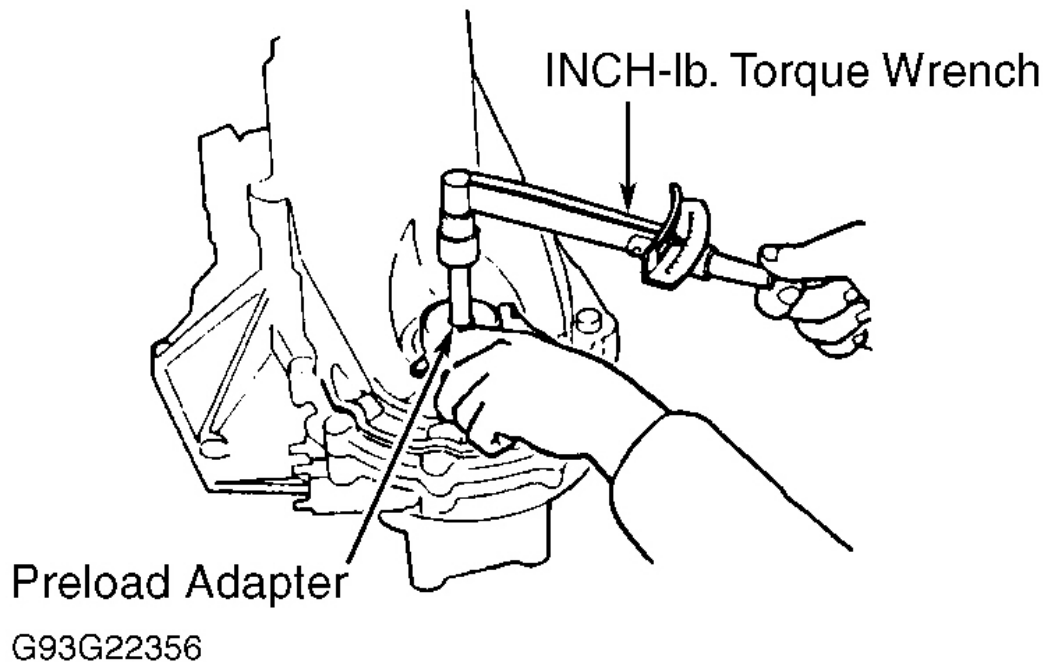


Fig. 54: Checking Differential Bearing Preload
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE REASSEMBLY

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

NOTE: Coat all components with ATF before reassembly.

VALVE BODIES & ATF STRAINER

NOTE: To assist in reassembly of components, refer to illustration. See Fig. 12 .

1. Install the main separator plate and 2 dowel pins on the torque converter housing. Then install the oil pump drive gear, driven gear, and oil pump driven gear shaft. Install the oil pump driven gear with its grooved and chamfered side facing down.
2. Install the main valve body.
3. Ensure the oil pump drive gear rotates smoothly in the normal operating direction, and the oil pump driven gear shaft moves smoothly in the axial and normal operating direction.
4. If the oil pump drive gear and oil pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the oil pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the oil pump driven gear shaft correctly will result in a seized oil pump drive gear or oil pump driven gear shaft.
5. Ensure that the check balls (2) are in the main valve body. Install cooler check valve and cooler check valve spring.
6. Install the regulator separator plate and dowel pins (2) on the main valve body.
7. Install the stator shaft and stator shaft stop.
8. Install the regulator valve body (7 bolts).
9. Install the servo separator plate and dowel pins (2) on the main valve body.
10. Install the servo body (13 bolts).
11. Install the ATF strainer (2 bolts).
12. Install the ATF joint pipes (one bolt).
13. Install the ATF feed pipes in the regulator valve body and servo body.

HOUSING & SHAFT ASSEMBLIES

NOTE: To assist in reassembly of components, refer to illustrations. See Fig. 8 and Fig. 9 . Letter references in parenthesis are identified in the following illustrations.

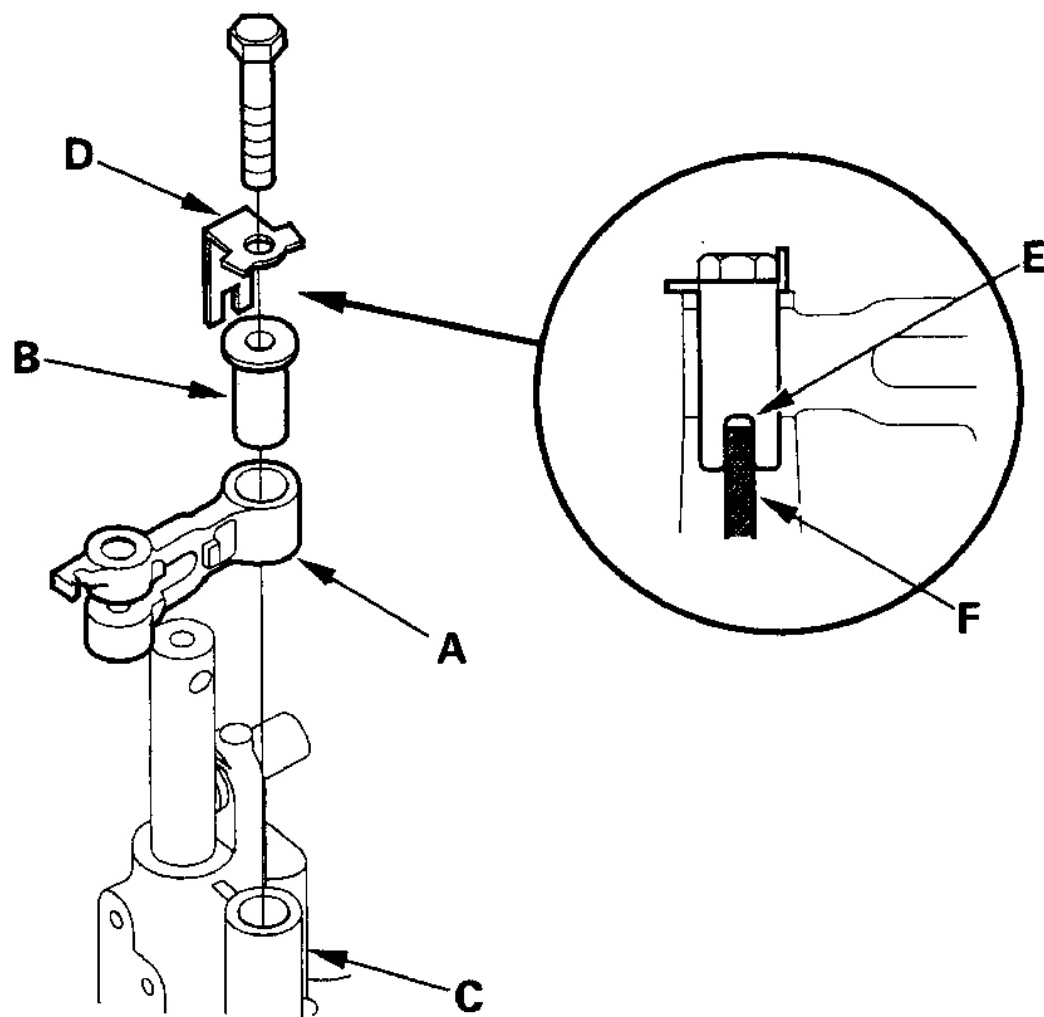
1. Install the differential assembly in the torque converter housing.
2. Assemble the mainshaft, countershaft, and secondary shaft.
3. Join the mainshaft sub-assembly, countershaft sub-assembly, and secondary shaft sub-assembly together, and install them in the torque converter housing.
4. If the detent arm was removed, install the detent arm (A) with arm collar (B) on the servo body (C), and install the new lock washer (D) by aligning its cutout (E) with the projection (F) of the servo body. See Fig. 55 . Install and tighten the bolt, then bend the lock tab of the lock washer against the bolt head.
5. Install the control shaft in the torque converter housing aligning the manual valve lever pin on the control shaft with the guide of the manual valve. Pull the manual valve gently when aligning the manual valve with the control shaft.
6. Hook the detent arm spring to the detent arm.
7. Turn the shift fork shaft so the large chamfered hole is facing the fork bolt hole of the shift fork.
8. Install the shift fork and reverse selector together on the shift fork shaft and countershaft. Secure the shift fork to the shift fork shaft with the lock bolt and a new lock washer, then bend the lock tab of the lock

washer against the bolt head.

9. Install the needle bearing and countershaft reverse gear on the countershaft.
10. Install the reverse idler gear in the transmission housing. See **REVERSE IDLER GEAR** under COMPONENT DISASSEMBLY & REASSEMBLY.
11. Install the idler gear shaft, if it was removed. See **IDLER GEAR ASSEMBLY** under COMPONENT DISASSEMBLY & REASSEMBLY.
12. Install the 3 dowel pins and a new gasket on the torque converter housing.

NOTE: Do not squeeze the end of the control shaft tips together when turning the shaft. If the tips are squeezed together, it will cause a faulty signal or position due to the play between the control shaft and the switch.

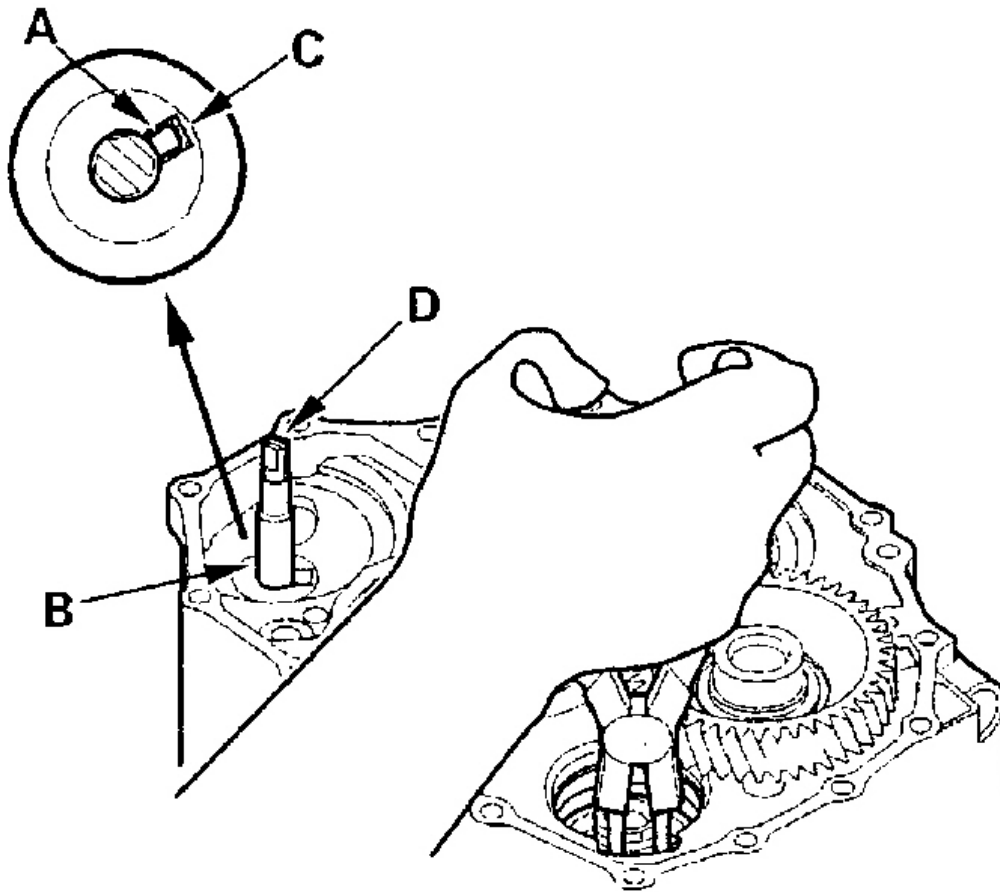
13. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft. See **Fig. 56** .
14. Place the transmission housing on the torque converter housing. Do not install the mainshaft and countershaft speed sensors before installing the transmission housing on the torque converter housing.
15. While expanding the snap ring of the secondary shaft bearing using the snap ring pliers, install the transmission housing onto the bearing part way. Then release the pliers, and push down the housing until it bottoms and until the snap ring snaps in place around the transmission housing snap ring groove.
16. Verify that the secondary shaft bearing snap ring is seated in the bearing and housing groove, and that the ring end gap is correct. Gap should be 0-.28" (0-7 mm). See **Fig. 14** .
17. Install the transmission housing mounting bolts along with the transmission hanger (A) and harness clamp brackets (B). Tighten the bolts (19 bolts for 2WD and 20 bolts for 4WD) in 2 or 3 steps in a crisscross pattern to specification. See **Fig. 57** . See **TORQUE SPECIFICATIONS** .
18. Install the mainshaft speed sensor and countershaft speed sensor with new "O" rings.
19. Install the shift solenoid harness connector in the transmission housing with the new "O" ring.
20. Connect the connector (Blue/White and White wires) to the shift solenoid valve "A".
21. Connect the connectors to respective solenoid valves:
 - Orange wire to shift solenoid valve "B".
 - Green wire to shift solenoid valve "C".
 - Red wire to shift solenoid valve "E".
22. Install the shift solenoid valve cover and bolts with the 2 dowel pins and the new gasket, and tighten the bolts (8) to specification. See **TORQUE SPECIFICATIONS** . Install the one bolt with the bracket for the ATF cooler line in the bolt hole.



G00085327

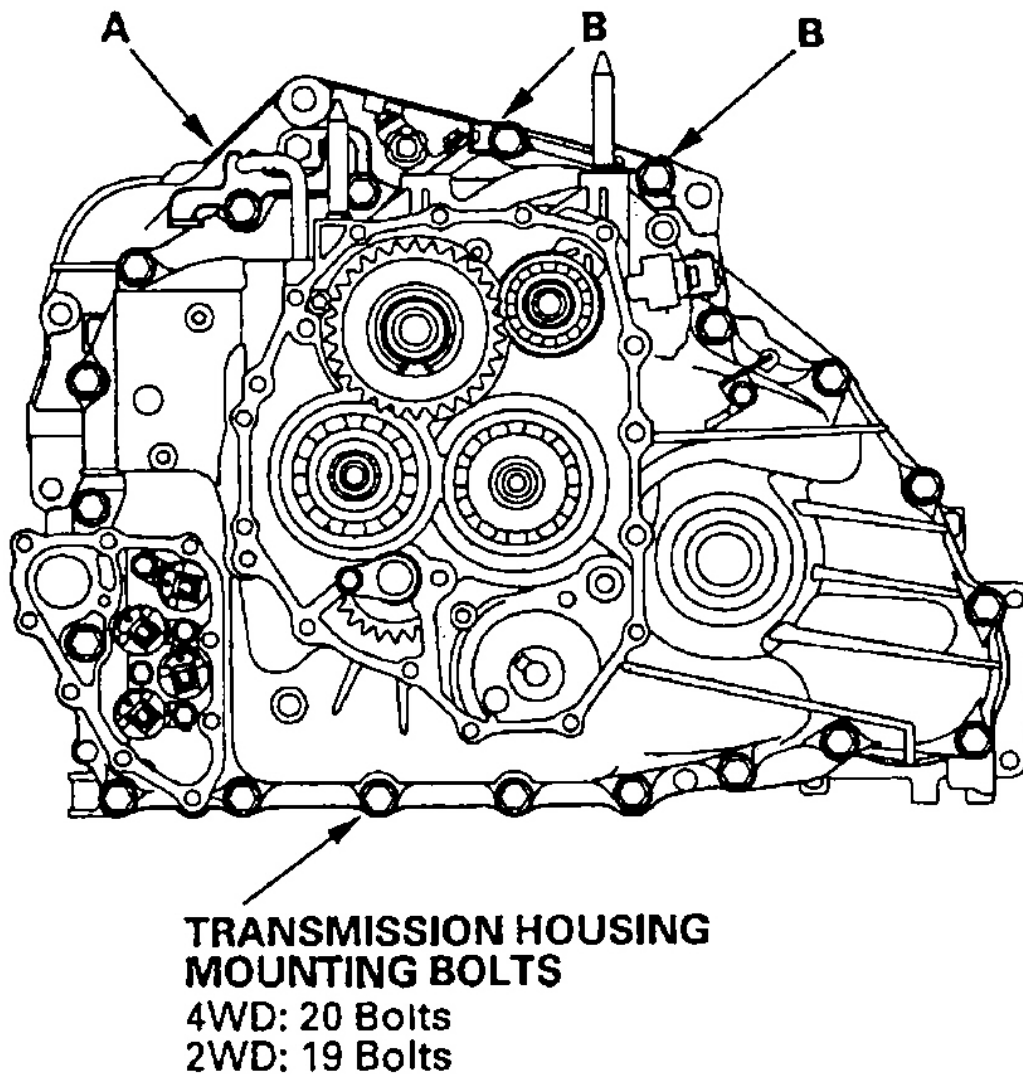
Fig. 55: Identifying Detent Arm Components

Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00085341

Fig. 56: Aligning Control Shaft Spring Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.



G00182179

Fig. 57: Installing Transmission Housing & Hanger Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

END COVER

NOTE: To assist in reassembly of transaxle, refer to illustrations. See [Fig. 3](#) and [Fig. 4](#) . Letter references in parenthesis are identified in the following illustrations.

1. Install the special tool onto the mainshaft. See [Fig. 5](#) .
2. Lubricate the following parts with ATF:
 - Splines and threads of the mainshaft.

- Splines of the mainshaft idler gear.
- Old conical spring washer and old lock nut.

NOTE: **Do not tap the idler gear to install. Use a torque wrench to tighten the lock nut. Do not use an impact wrench.**

3. Install the mainshaft idler gear, old conical spring washer, and old lock nut on the mainshaft, and tighten the lock nut to 166 ft. lbs. (226 N.m).
4. Install the park lever and park lever stop on the control shaft, then install the lock bolt with the new lock washer. Do not bend the lock tab of the lock washer until step 18 .
5. Install the park pawl shaft, park pawl spring, park pawl, and stop shaft on the transmission housing.
6. Lubricate the following parts with ATF:
 - Threads and splines of the countershaft.
 - Old conical spring washer and old lock nut.
 - Areas where the park gear contacts the conical spring washer.
7. Install the park gear, old conical spring washer, and old lock nut on the countershaft.

NOTE: **Do not tap the park gear to install. Use a torque wrench to tighten the lock nut. Do not use an impact wrench. Countershaft lock nut has left hand threads.**

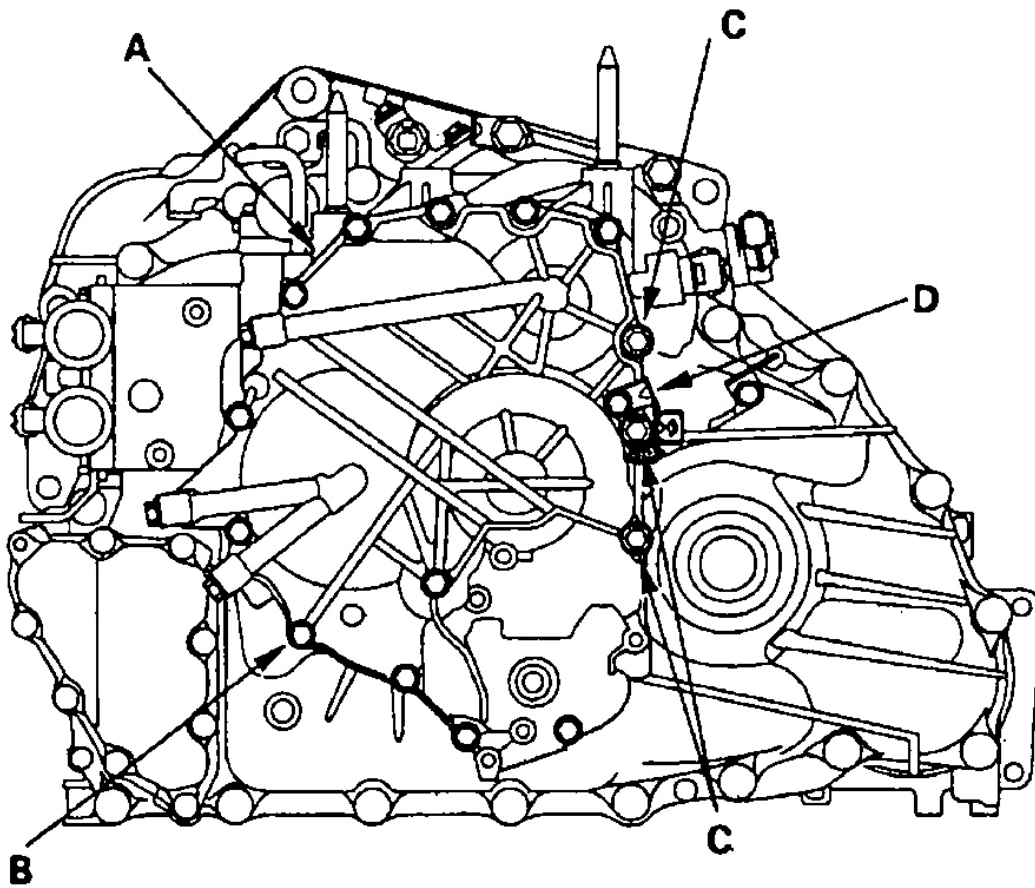
8. Lift the park pawl up, and engage it with the park gear, then tighten the lock nut to 166 ft. lbs. (226 N.m).
9. Remove the lock nuts and conical spring washers from the mainshaft and countershaft.
10. Lubricate the threads of the shafts, the new lock nuts and the new conical spring washers with ATF.
11. Install the new conical spring washers with facing stamped mark side up in the direction shown, and install the new mainshaft lock nut, the new countershaft lock nut, and the new secondary shaft lock nut. See **Fig. 3** and **Fig. 4** .

NOTE: **Ensure to install the conical spring washers in the direction shown. Use a torque wrench to tighten the lock nut. Do not use an impact wrench. Countershaft and secondary shaft lock nuts have left hand threads.**

12. Tighten the lock nuts to 123 ft. lbs. (167 N.m).
13. Remove the holder from the mainshaft.
14. Stake the lock nuts into the shafts with a punch.
15. Install the control level on the control shaft, and install the bolt with the new lock washer, then bend the lock tab of the lock washer against the bolt head.
16. Set the park lever in the "P" position, then verify that the park pawl engages the park gear.
17. If the park pawl does not engage fully, check the distance between the pawl shaft and the park lever roller pin. See **PARK LEVER STOP** under COMPONENT DISASSEMBLY & REASSEMBLY.
18. Tighten the lock bolt, and bend the lock tab of the lock washer against the bolt head.
19. Install the ATF feed pipe into the idler gear shaft, and install the ATF lubrication pipe into the

transmission housing.

20. Install the end cover (A) with the 2 dowel pins, new "O" rings, new gasket, and harness clamp bracket (D). Tighten the 6 mm bolts (12) (B) and 8 mm bolts (3) (C) to specification. See **Fig. 58** . See **TORQUE SPECIFICATIONS** .



G00182181

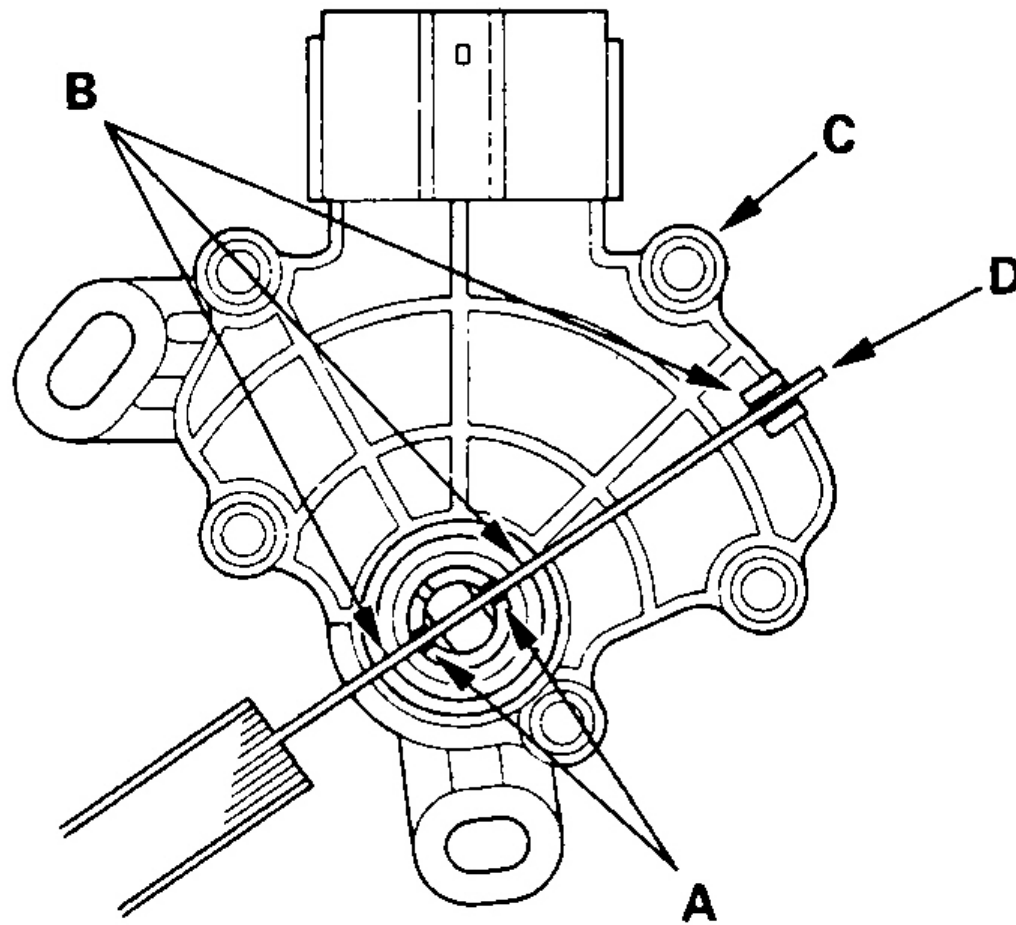
Fig. 58: Installing End Cover, Dowel Pins & Gasket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: Do not squeeze the end of the control shaft tips together when turning the shaft. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and the switch.

21. Set the control shaft to the "N" position by turning the control lever on the torque converter side.

NOTE: Ensure to use a .08" (2.0 mm) feeler gauge blade or equivalent to hold the switch in the "N" position.

22. Align the cutouts (A) on the rotary frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a .08" (2.0 mm) feeler gauge blade (D) in the cutouts to hold the switch in the "N" position. See [Fig. 59](#) .
23. Install the transmission range switch gently on the control shaft while holding it in the "N" position with the .08" (2.0 mm) feeler gauge blade.
24. Tighten the bolts on the transmission range switch while you continue to hold it in the "N" position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.
25. Connect the transmission range switch connector securely, then install the harness clamps on the clamp bracket.
26. Install the transmission range switch cover. See [Fig. 3](#) and [Fig. 4](#) .
27. Install the new gasket on the transmission housing, and install the ATF pipe and ATF joint pipes.
28. Install the new "O" rings over the ATF joint pipes.
29. Install the A/T clutch pressure control solenoid valve "A".
30. Install the new gasket on the transmission housing, and install the ATF joint pipes.
31. Install the new "O" rings over the ATF joint pipes.
32. Install the A/T clutch pressure control solenoid valves "B" and "C", and harness clamp brackets.
33. Install the ATF cooler inlet line with the new sealing washers, and install the bracket of the ATF cooler inlet line on the shift solenoid valve cover hole.
34. Install the ATF cooler outlet line with the new sealing washers.
35. Install the breather tube with the dot on the tube facing in a rearward position (differential side), then install the other end in the slot of the transmission hanger.
36. On 4WD models, install transfer assembly with new "O" ring and dowel pin. See [Fig. 11](#) .
37. On all models, install the ATF dipstick.



G00085342

Fig. 59: Aligning Transmission Range Switch Rotary Frame
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
ATF Cooler Inlet & Outlet Line Bolt	21 (28)
Countershaft Lock Nut	123 (167)
Drain Plug	36 (49)
End Cover Bolt ⁽¹⁾	
6 mm Bolt	(2)

2002 Honda CR-V EX

2002 AUTOMATIC TRANSMISSIONS MCVA & MRVA Overhaul

8 mm Bolt	21 (28)
Main Valve Body Bolt	
6 mm Bolt	(2)
8 mm Bolt	13 (18)
Mainshaft Lock Nut	123 (167)
Pressure Tap Plug	13 (18)
Ring Gear Bolt	
2WD	76 (103)
4WD	74 (101)
Secondary Shaft Lock Nut	123 (167)
Transmission Housing Bolt ⁽³⁾	32 (44)
Transfer Assembly Bolt	32 (44)
INCH Lbs. (N.m)	
Accumulator Cover Bolt	106 (12.0)
A/T Clutch Pressure Control Solenoid Valve Bolt	106 (12.0)
Bearing Set Plate Bolt	106 (12.0)
Control Lever Bolt	124 (14.0)
Countershaft Speed Sensor Bolt	106 (12.0)
Detent Arm Bolt	106 (12.0)
Fluid Strainer Bolt	106 (12.0)
Mainshaft Speed Sensor Bolt	106 (12.0)
Park Lever Stop Bolt	124 (14.0)
Regulator Valve Body Bolt	106 (12.0)
Reverse Idler Gear Shaft Holder Bolt	106 (12.0)
Reverse Shift Fork Bolt	124 (14.0)
Servo Body Bolt	106 (12.0)
Shift Solenoid Harness Connector Bolt	106 (12.0)
Shift Solenoid Valve Bolt	106 (12.0)
Transmission Range Switch Bolt	106 (12.0)
(1) See Fig. 58 .	
(2) Tighten bolt to 106 INCH lbs. (12.0 N.m).	
(3) Tighten bolts to specification in sequence. See Fig. 57 .	

TRANSAXLE SPECIFICATIONS

TRANSAXLE SPECIFICATIONS

Application	Specification - In. (mm)
Clutch Clearance	
1st Clutch	.050-.058 (1.28-1.48)
2nd Clutch	.033-.041 (.85-1.05)

2002 Honda CR-V EX**2002 AUTOMATIC TRANSMISSIONS MCVA & MRVA Overhaul**

3rd & 4th Clutch	.029-.037 (.73-.93)
Clutch Disc Thickness	.076 (1.94)
Clutch Plate Thickness	
1st Clutch	.063 (1.60)
2nd Clutch	.079 (2.00)
3rd & 4th Clutch	.091 (2.30)
Oil Pump Side Clearance	
Oil Pump Drive Gear	.0083-.0104 (.210-.265)
Oil Pump Driven Gear	.0028-.0049 (.070-.125)
Oil Pump Thrust Clearance	
Standard	.0011-.0020 (.030-.050)
Wear Limit	.0028 (.070)
Mainshaft Clearance	.001-.004 (.03-.11)
Secondary Shaft 1st Gear Clearance	.002-.005 (.04-.12)
Secondary Shaft 2nd Gear Clearance	.002-.005 (.04-.12)
Side Gear Backlash	.002-.006 (.05-.15)
Parking Brake Stopper Distance	2.27-2.31 (57.7-58.7)

DIFFERENTIAL BEARING PRELOAD ⁽¹⁾

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

CLUTCH DISC & PLATE QUANTITY

Component	Disc	Plate
1st Clutch	5	5
2nd Clutch	4	3
3rd Clutch	3	3
4th Clutch	3	3