

## 2001 Honda Civic EX

2001-02 AUTOMATIC TRANSMISSIONS BMXA & SLXA Overhaul

### 2001-02 AUTOMATIC TRANSMISSIONS

#### BMXA & SLXA 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 OIL COOLER FLUSHING under LUBRICATION in **SERVICING - HONDA (FWD)** article.

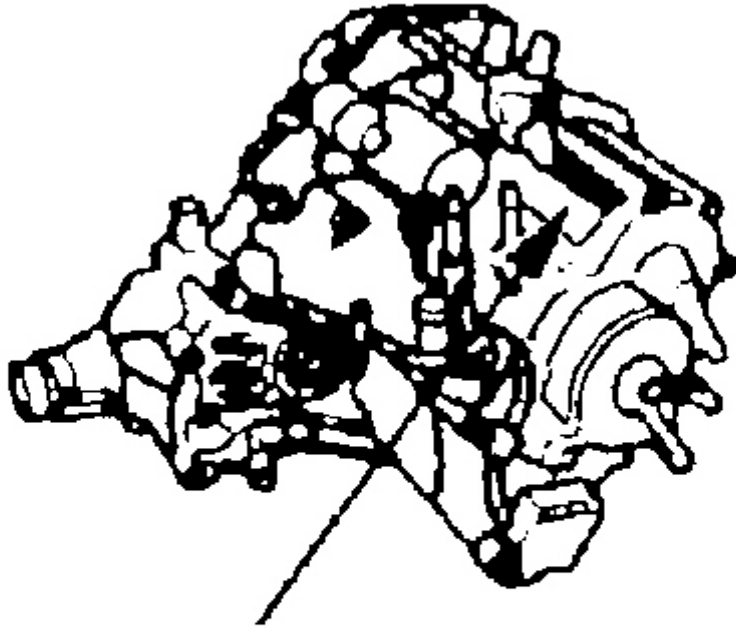
### TRANSAXLE APPLICATION

Application	Transaxle Model
Civic 4-Door	BMXA (USA) & SLXA (Japan)

## 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.



Transaxle Model &  
Serial Number

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

## GEAR RATIOS

### TRANSAXLE GEAR RATIOS

Application & Gear Range	Gear Ratio
Primary	
1st	2.722:1
2nd	1.469:1
3rd	0.975:1
4th	0.674:1
Reverse	1.955:1
Final	

Except VTEC	4.067:1
VTEC	4.357:1

## DESCRIPTION & OPERATION

### INTRODUCTION

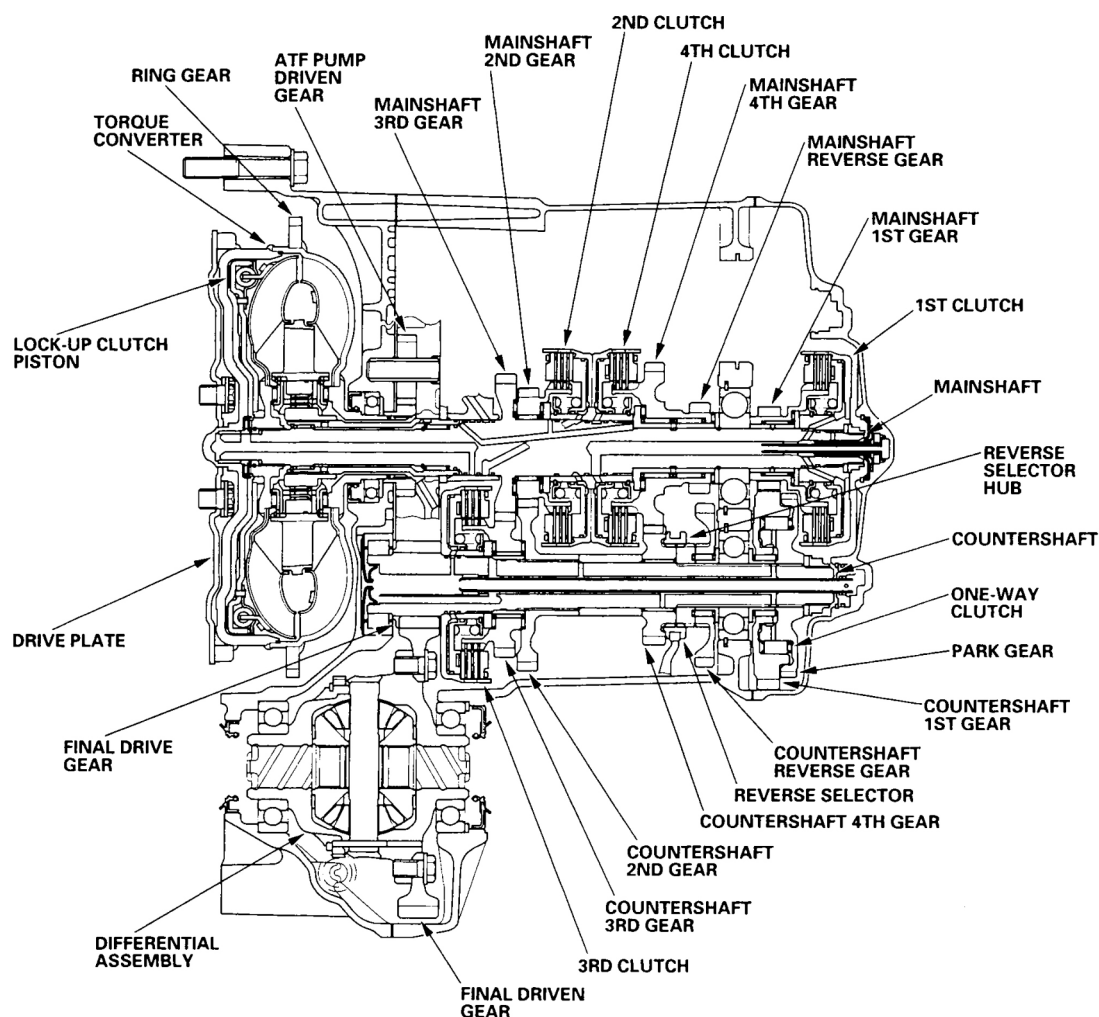
The BMXA and SLXA is an electronically controlled 4-speed automatic transaxle. Transaxle consists of clutches, mainshaft, countershaft, shift control solenoid valves, torque converter clutch solenoid valve, A/T clutch pressure control solenoid valves and a 3-element lock-up torque converter. See **Fig. 2** . Solenoid valves are bolted to transmission housing. Valve bodies include: main valve body, secondary valve body, regulator valve body, servo body and lock-up valve 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 assembly for proper transaxle operation. PCM determines appropriate shift point and activates appropriate shift control solenoid valve, torque converter clutch solenoid valve or A/T clutch pressure control solenoid valve.

When in "D3" position in 3rd gear or "D" position in 3rd or 4th gear, torque converter lock-up exists and transaxle mainshaft rotates at the same speed as engine crankshaft.

PCM contains a grade logic control system which controls transaxle shifting while vehicle is ascending or descending a slope or reducing vehicle speed. PCM contains a self-diagnostic system, which stores a Diagnostic Trouble Code (DTC) if a failure or problem exists in transaxle electronic control system. DTC can be retrieved to determine transaxle problem area. For more information on grade logic control system and electronic transaxle components, see **BMXA & SLXA DIAGNOSIS** article.

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 pedal is in idle position. 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 - CIVIC** article.



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**Fig. 2: Identifying Transaxle Components**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

## LUBRICATION

**NOTE:** 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 BMXA & SLXA DIAGNOSIS article.

## COMPONENT TESTS

## 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 stall speed test, see **STALL SPEED TEST** under **PERFORMANCE TESTS** in **BMXA & SLXA DIAGNOSIS** article.

## TRANSAXLE DISASSEMBLY

### END COVER, 1ST GEARS & 1ST CLUTCH

**NOTE:** Refer to exploded view for reference during the following procedures. See **Fig. 3**.

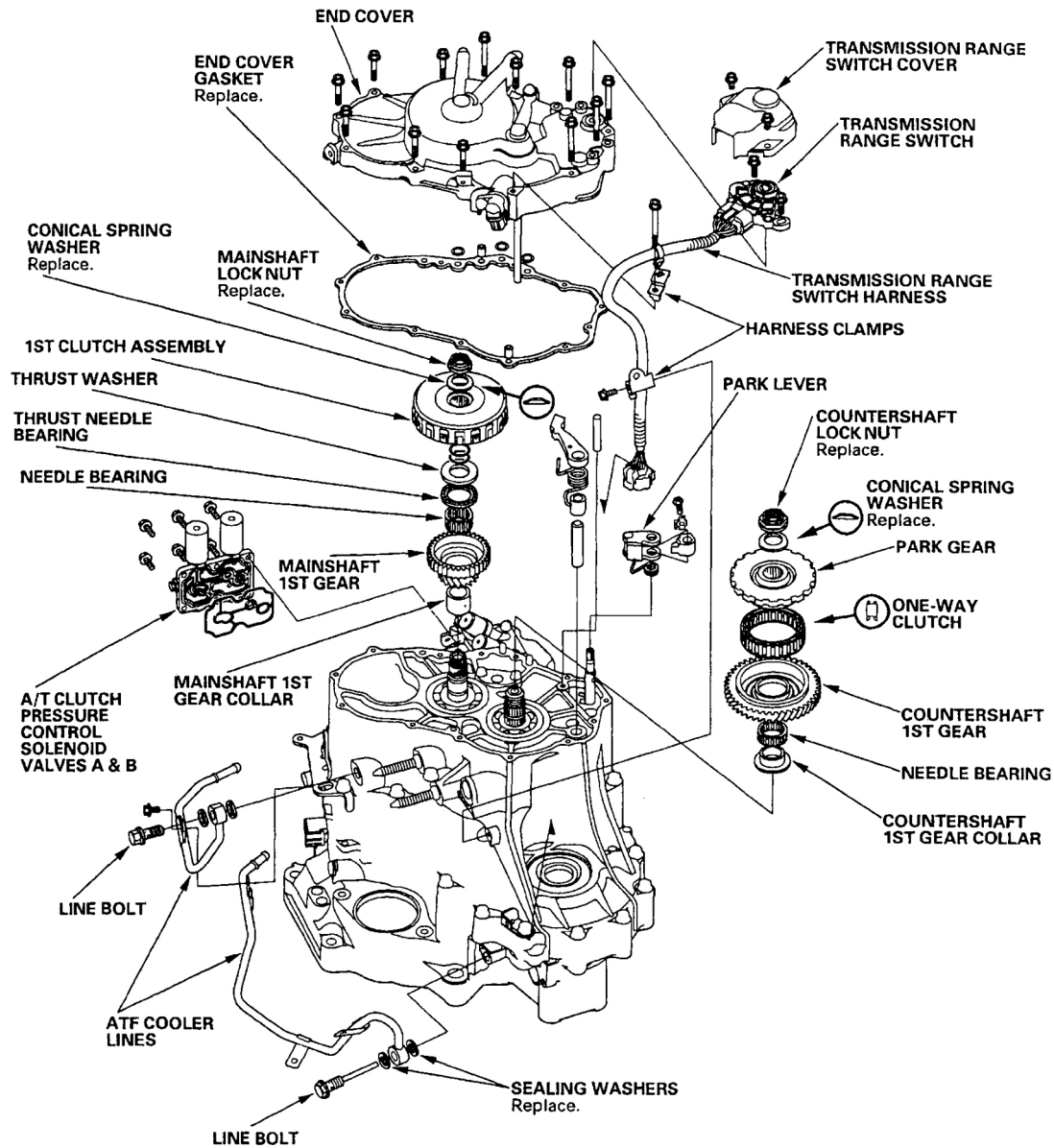
**NOTE:** Letter references in parenthesis are identified in the following illustrations.

1. Remove transmission range switch cover, harness clamps and switch. Remove end cover and gasket. See **Fig. 3**. Install Mainshaft Holder (07GAB-PF50101) on mainshaft to secure mainshaft from rotating. See **Fig. 4**.

**CAUTION: DO NOT use impact wrench to remove lock nuts from countershaft or mainshaft.**

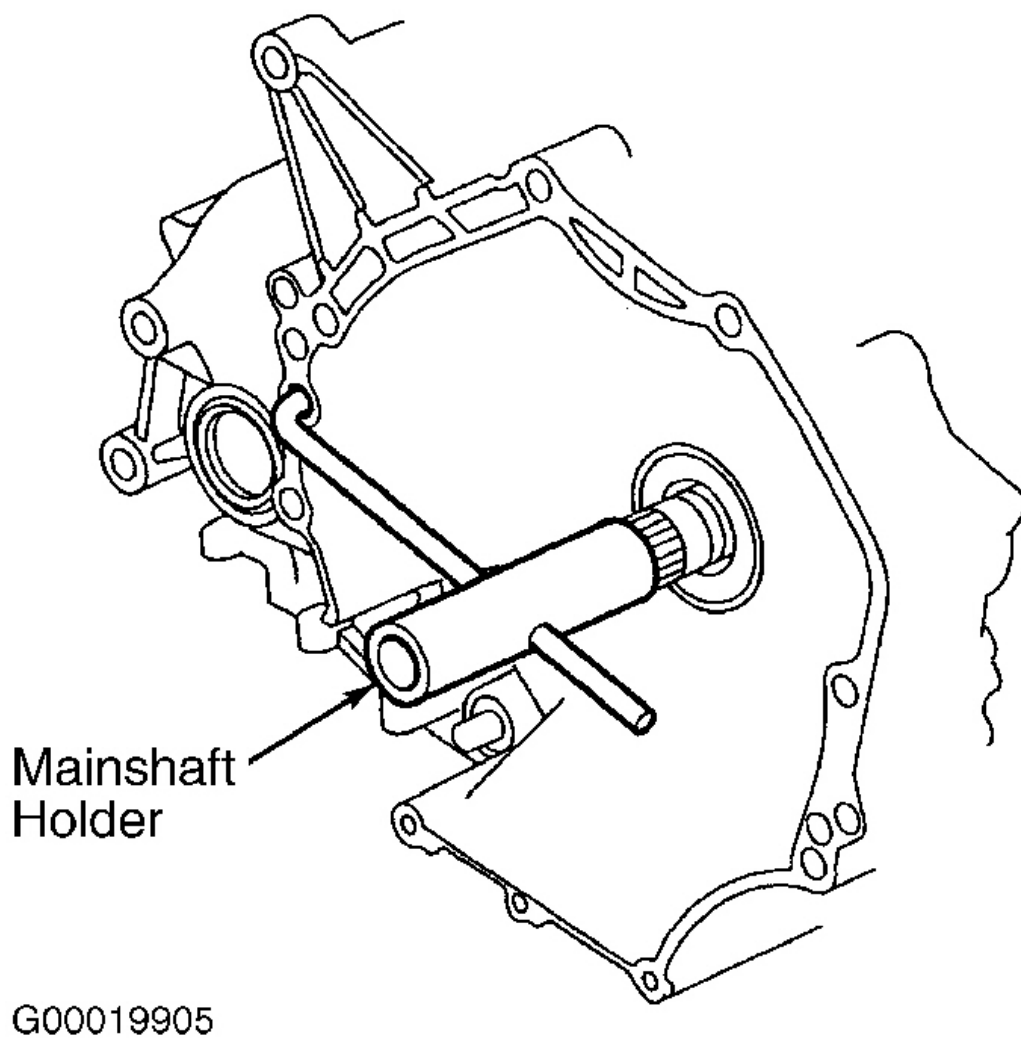
**NOTE:** Mainshaft and countershaft lock nut has left hand thread.

2. Engage park pawl with park gear. Using hammer and chisel (C), cut lock tabs (A) on countershaft and mainshaft lock nuts. See **Fig. 5**. Remove lock nuts and conical spring washers (B). See **Fig. 3**.
3. Remove mainshaft holder once lock nuts are removed. Remove 1st clutch, mainshaft 1st gear assembly and mainshaft 1st gear collar from mainshaft. Remove park pawl, park pawl spring, park pawl shaft and stop shaft. Remove park lever from control shaft.
4. Using puller (B), remove park gear, one-way clutch and countershaft 1st gear assembly (A) from countershaft. See **Fig. 6**. Remove needle bearing and countershaft 1st gear collar from countershaft. Remove oil cooler lines and dipstick. Remove A/T clutch pressure control solenoid valve assembly.

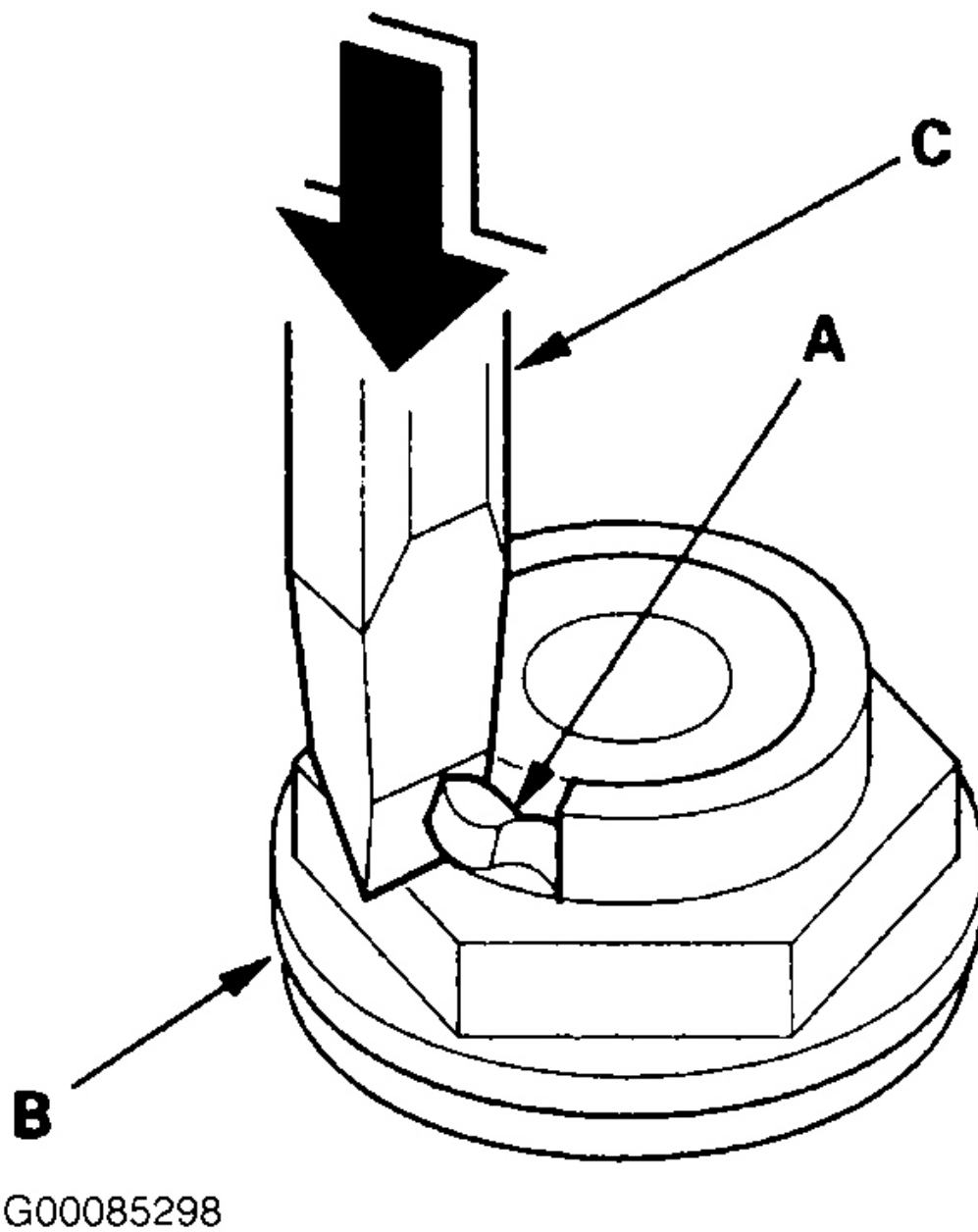


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**Fig. 3: Exploded View Of End Cover, 1st Gears & 1st Clutch Components**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



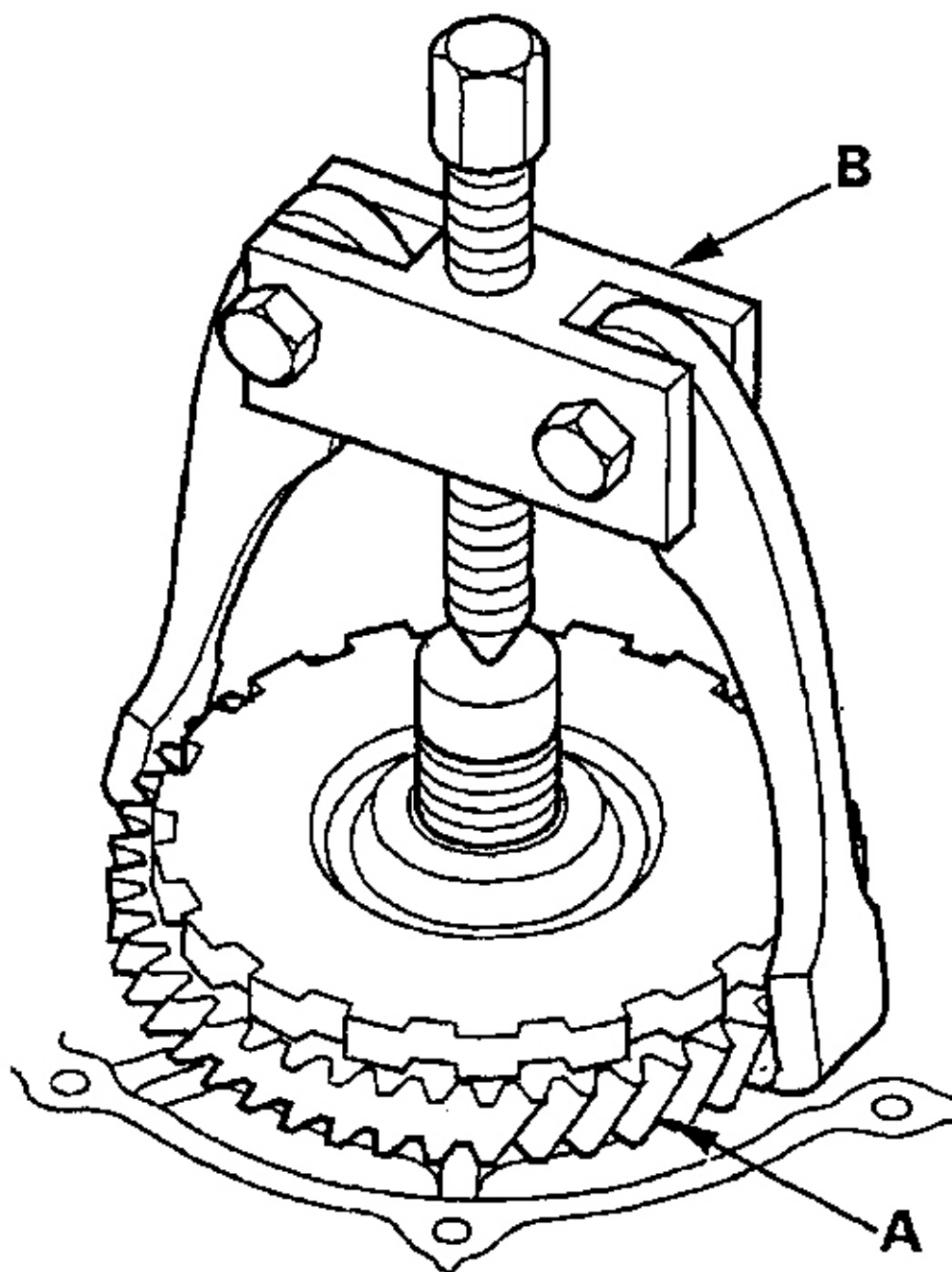
**Fig. 4: Installing Mainshaft Holder**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



**Fig. 5: Cutting Lock Nut Lock Tabs**

Courtesy of AMERICAN HONDA MOTOR CO., INC.





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**Fig. 6: Removing Park Gear, One-Way Clutch & Countershaft 1st Gear Assembly**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

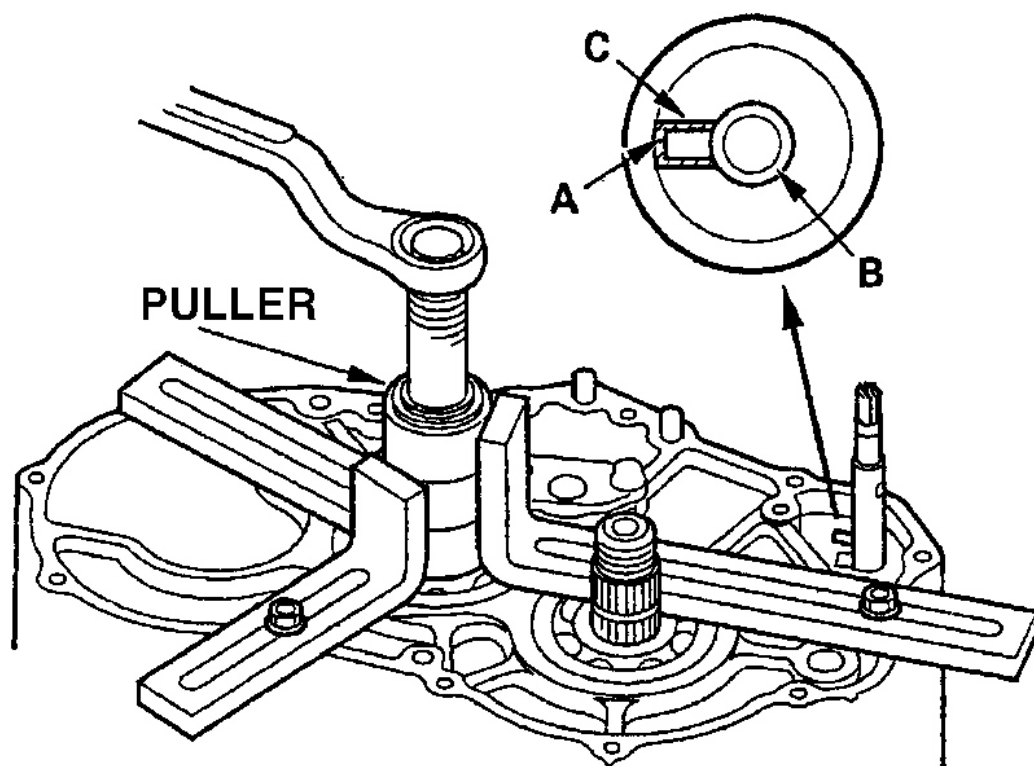
## TRANSMISSION HOUSING & SHAFT ASSEMBLIES

**NOTE:** Refer to exploded view for reference during the following procedures. See **Fig. 9**.

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

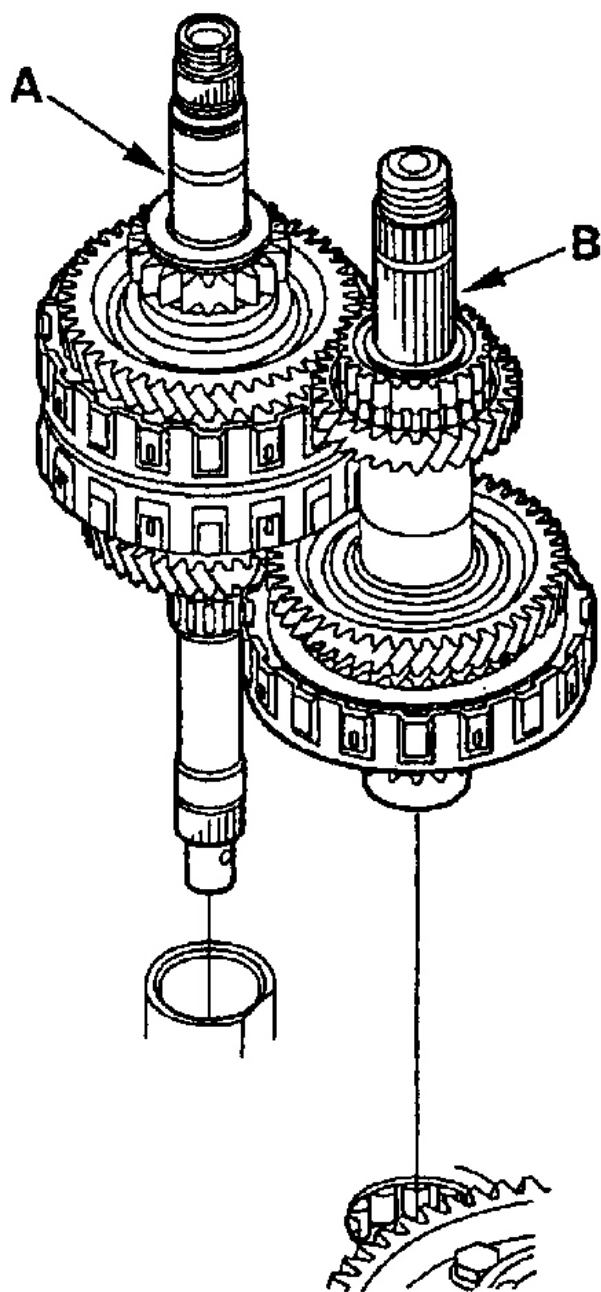
**NOTE:** The mainshaft speed sensor washer is used on SLXA transaxle. Washer is not used on BMXA transaxle. Be careful not to squeeze end of control shaft tips together when turning shaft. If tips are squeezed together, it will cause a faulty signal or position due to play between control shaft and switch.

1. Remove mainshaft speed sensor and sensor washer (if equipped). Remove transmission housing bolts, transaxle hanger and connector bracket. Align spring pin (A) on control shaft (B) with groove (C) in transmission housing by turning control shaft. Using Puller (07HAC-PK4010A), remove transmission housing. See **Fig. 7**.
2. Remove countershaft reverse gear, collar and needle bearing. See **Fig. 9**. Remove lock bolt securing shift fork, then remove shift fork and reverse selector together.
3. Remove mainshaft (A) and countershaft (B) assemblies together. See **Fig. 8**. Remove differential assembly from torque converter housing.
4. Remove reverse idler gear shaft holder and needle bearing. Remove reverse idler gear. See **Fig. 38**.



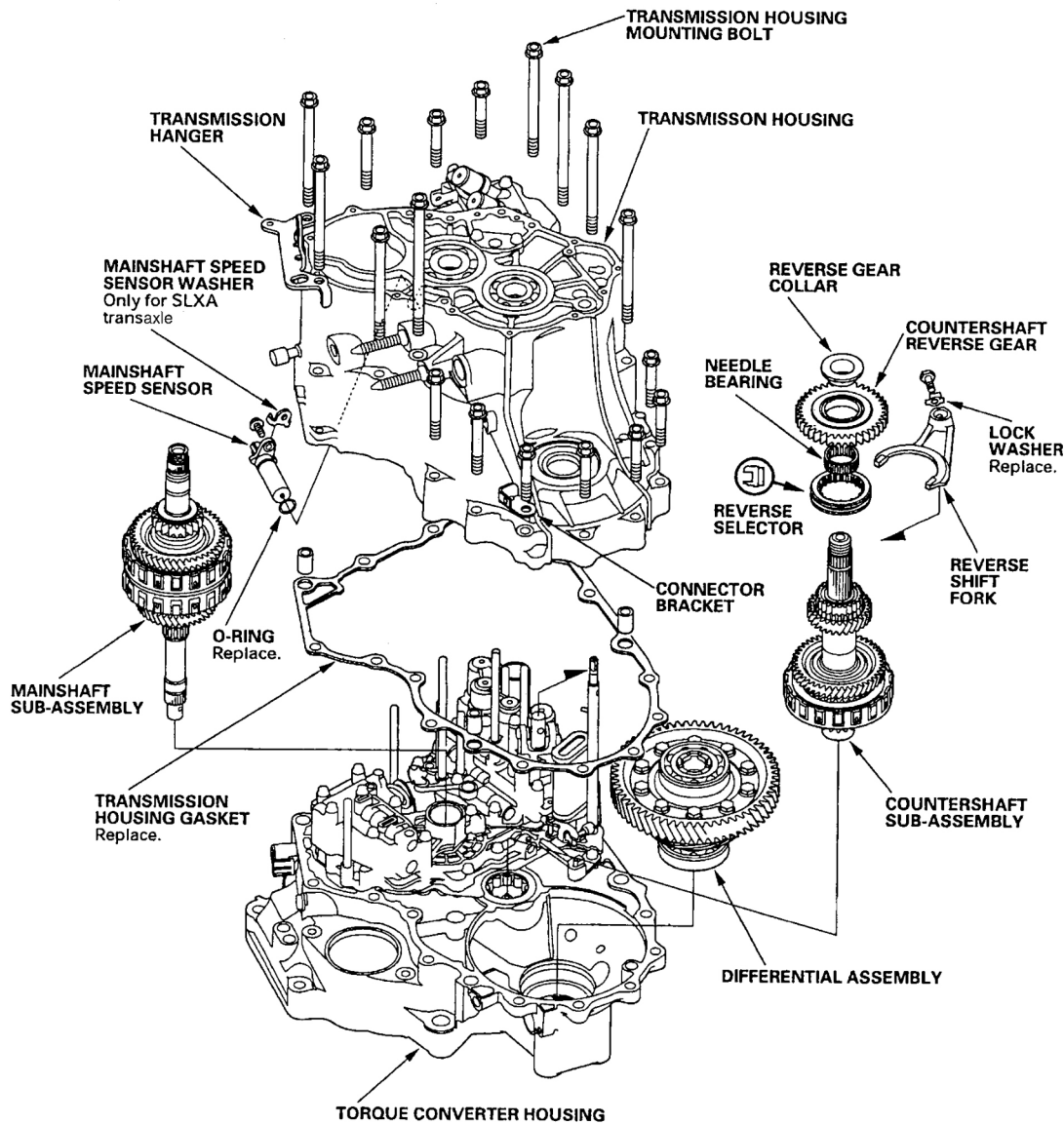
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**Fig. 7: Aligning Spring Pin & Removing Transaxle Housing**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 8: Removing Mainshaft & Countershaft Assemblies**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 9: Exploded View Of Transmission Housing Components With Shaft Assemblies**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

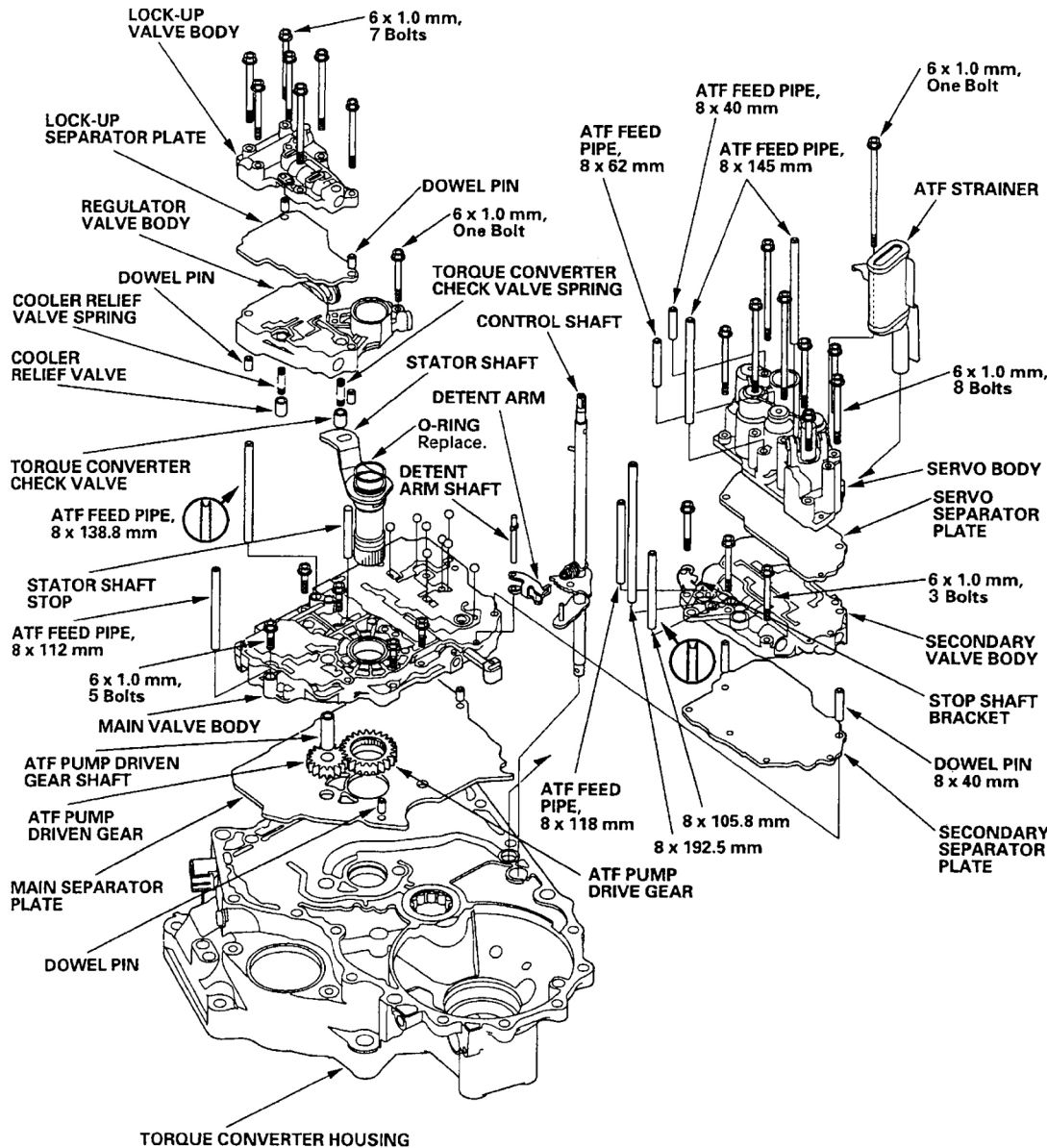
## VALVE BODIES & ATF STRAINER

**NOTE:** Refer to exploded view for reference during the following procedures. See **Fig. 10**.

1. Remove oil feed pipes from servo body, secondary valve body and main valve body. Remove bolt and ATF strainer. Remove 8 bolts, servo body and servo separator plate. See **Fig. 10**.
2. Remove secondary valve body (3 bolts), stop shaft bracket and secondary separator plate and dowel pins (2). Remove lock-up valve body (7 bolts), then remove separator plate and dowel pins (2). Remove cooler

relief valve spring and cooler relief valve, if necessary. See **Fig. 10**.

3. Remove bolt and regulator valve body, and dowel pins (2). Remove torque converter check valve and spring. Remove stator shaft and stator shaft stop. Unhook detent spring from detent arm, then remove detent arm shaft, detent arm and control shaft.
4. Remove main valve body (5 bolts). Use care not to lose 8 check balls in main valve body. Remove oil pump driven gear shaft, oil pump driven gear and oil pump drive gear. Remove main separator plate and dowel pins (2). See **Fig. 10**.



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**Fig. 10: Exploded View Of Valve Bodies & ATF Strainer**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## COMPONENT DISASSEMBLY & REASSEMBLY

### TRANSMISSION HOUSING SHAFT BEARINGS

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

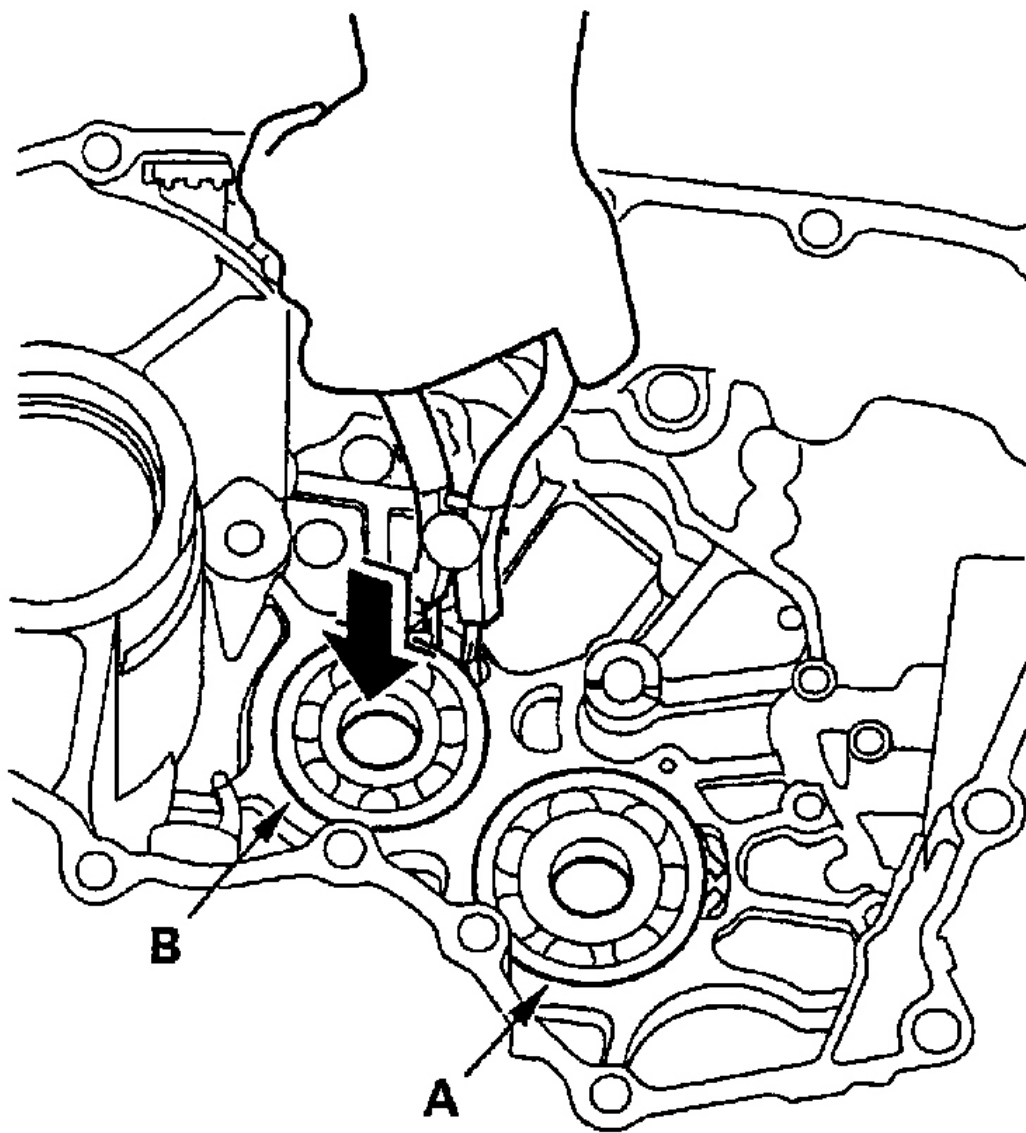
#### Removal & Installation

**NOTE:** Coat all parts with ATF before assembly.

1. To remove the mainshaft bearing (A) and countershaft bearing (B) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out. See **Fig. 11**.

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

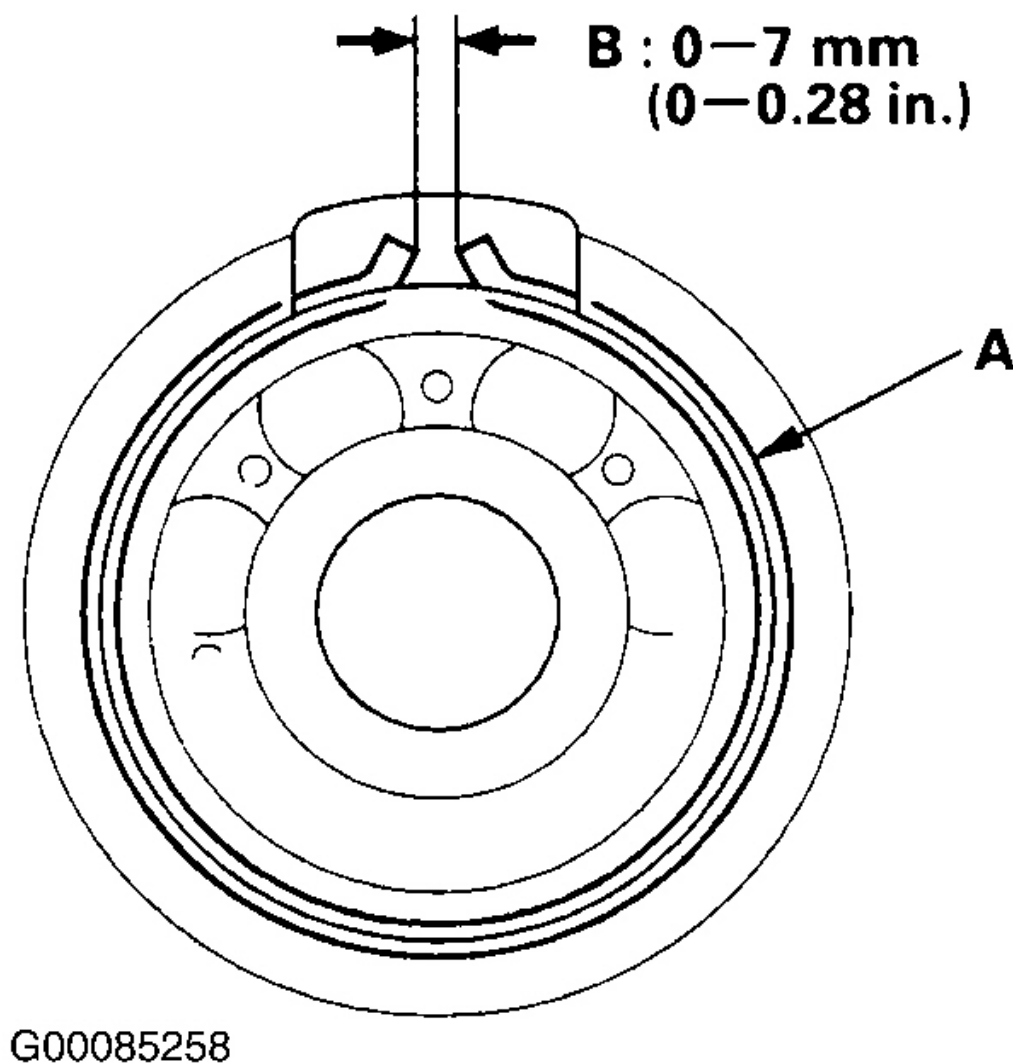
2. Install the bearings by expanding each snap ring with the snap ring pliers, and insert the bearing part way into the housing. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.
3. After installing the bearings verify the following:
  - The snap rings (A) are seated in the bearing and housing grooves.
  - The ring end gaps (B) are correct. See **Fig. 12**.



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**Fig. 11: Removing & Installing Shaft Bearings**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.





**Fig. 12: Measuring Snap Ring End Gap**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### MAIN VALVE BODY

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

**Disassembly**

1. Disassemble main valve body. See **Fig. 15** . Use care when removing valve caps or spring seats, as they are under spring pressure.
2. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES** .

**Cleaning & Inspection**

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

1. Clean components with solvent and dry with compressed air. Replace main valve body if any parts are worn or damaged.
2. Ensure spring free length is within specification. See **Fig. 15** . Replace springs if not within specification.

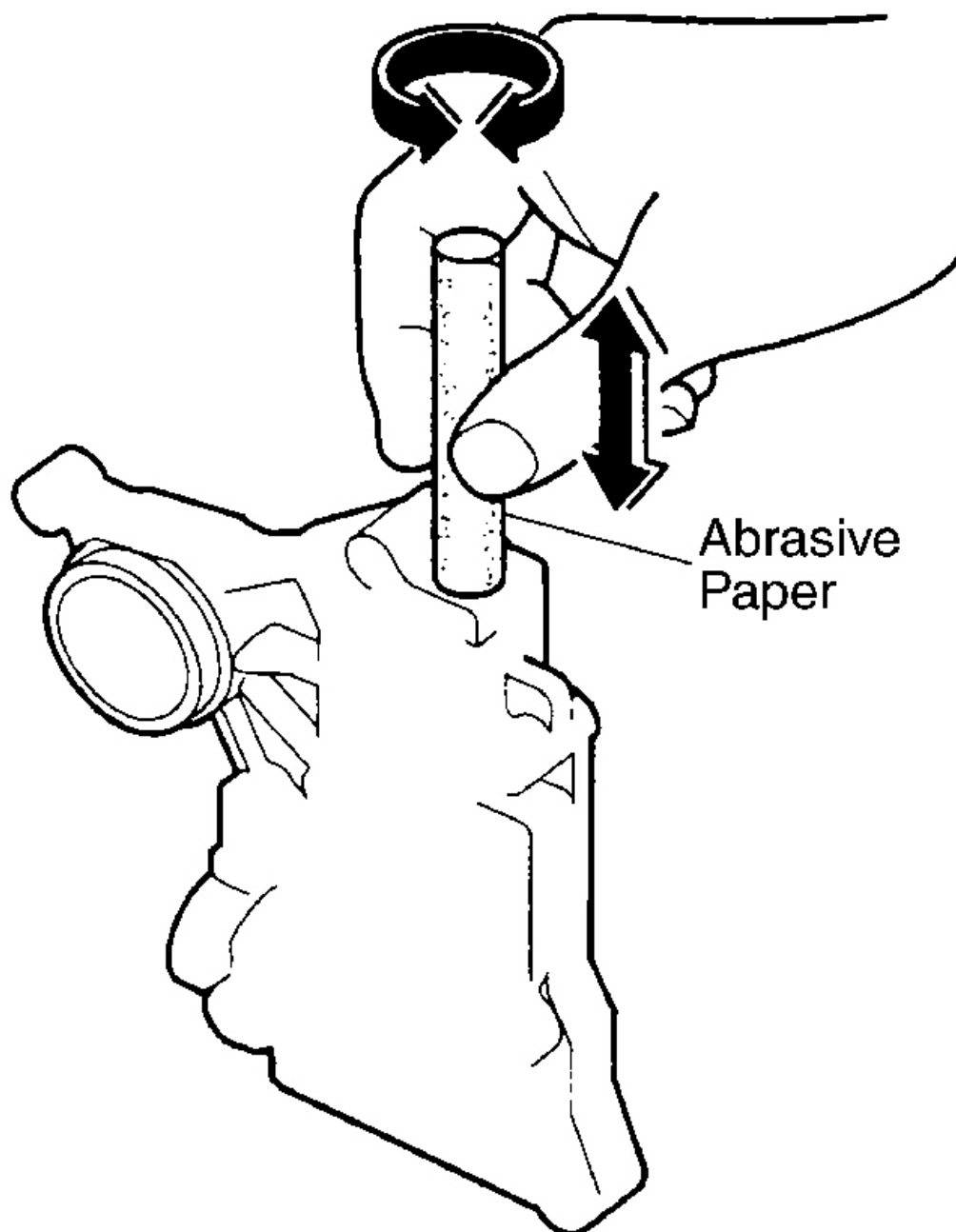
**Valve Body Repair Procedures**

**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. 13** . 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.

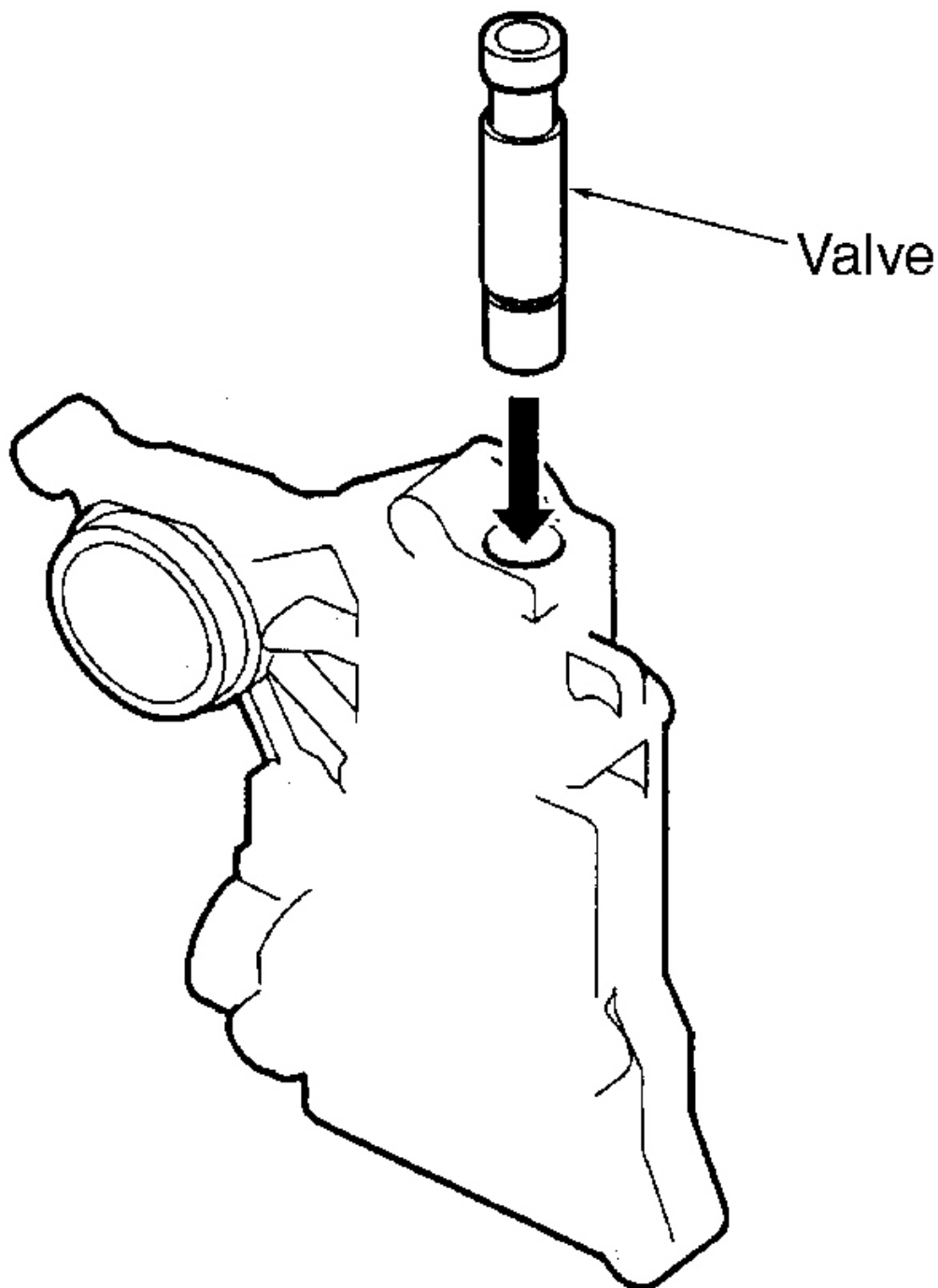
5. Remove the No. 600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. See **Fig. 14** . It should drop to the bottom of the bore under its own weight. If not, repeat steps 4 and 5 , then retest. If the valve 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.



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**Fig. 13: Polishing Valve Body Bore**

Courtesy of AMERICAN HONDA MOTOR CO., INC.



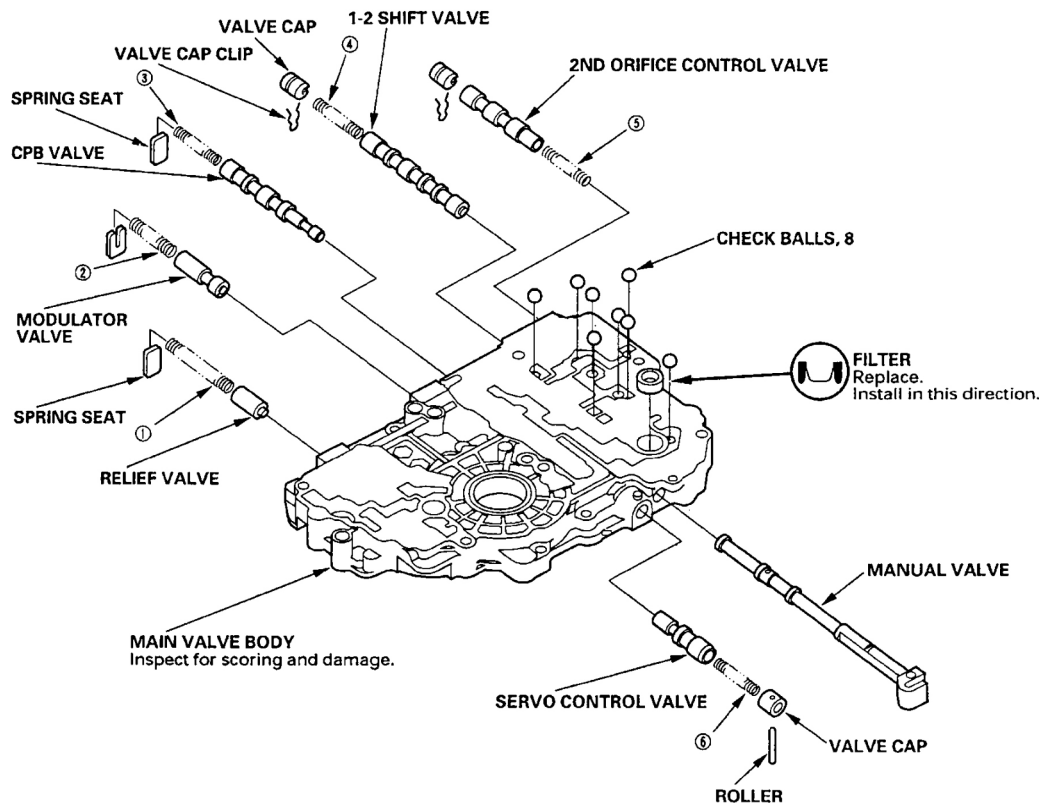
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**Fig. 14: Installing Valve In Bore**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

### Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Install NEW filter in correct direction. Ensure all components are installed in correct location. See **Fig. 15**.



### SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Relief valve spring	1.1 (0.043)	8.6 (0.339)	37.1 (1.461)	13.4
②	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	33.8 (1.331)	10.9
③	CPB valve spring	1.0 (0.039)	8.1 (0.319)	40.9 (1.610)	16.2
④	1-2 shift valve spring	0.9 (0.035)	7.6 (0.299)	41.3 (1.626)	16.3
⑤	2nd orifice control valve spring	0.7 (0.028)	6.6 (0.260)	34.8 (1.370)	22.0
⑥	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.1 (2.051)	20.8

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**Fig. 15: Exploded View Of Main Valve Body & Spring Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

### OIL PUMP

#### Disassembly

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

**Cleaning & Inspection**

1. Clean components with solvent and dry with compressed air. Inspect components and replace if damaged.
2. Install oil pump gears and oil pump driven gear shaft in main valve body. Ensure chamfered and grooved side of oil pump driven gear is facing upward (toward separator plate side of main valve body).
3. Using feeler gauge, measure side clearance of both gears between tip of gear teeth and main valve body. See **Fig. 16** . Replace oil pump gears and/or main valve body if side clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.
4. Remove oil pump driven gear shaft. Place straightedge across main valve body surface. Using feeler gauge, measure thrust clearance between oil pump gears and straightedge. Replace oil pump gears and/or main valve body if thrust clearance is not within specification. See **OIL PUMP SPECIFICATIONS** table.

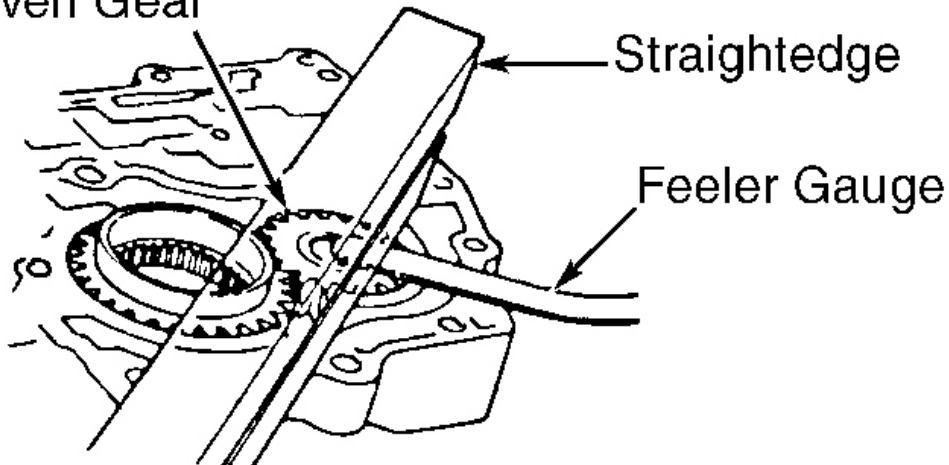
**OIL PUMP SPECIFICATIONS**

Application	In. (mm)
Side Clearance	
Oil Pump Drive Gear	.0041-.0052 (.105-.133)
Oil Pump Driven Gear	.0014-.0025 (.035-.063)
Thrust Clearance	
Standard	.001-.002 (.03-.05)
Wear Limit	.003 (.07)

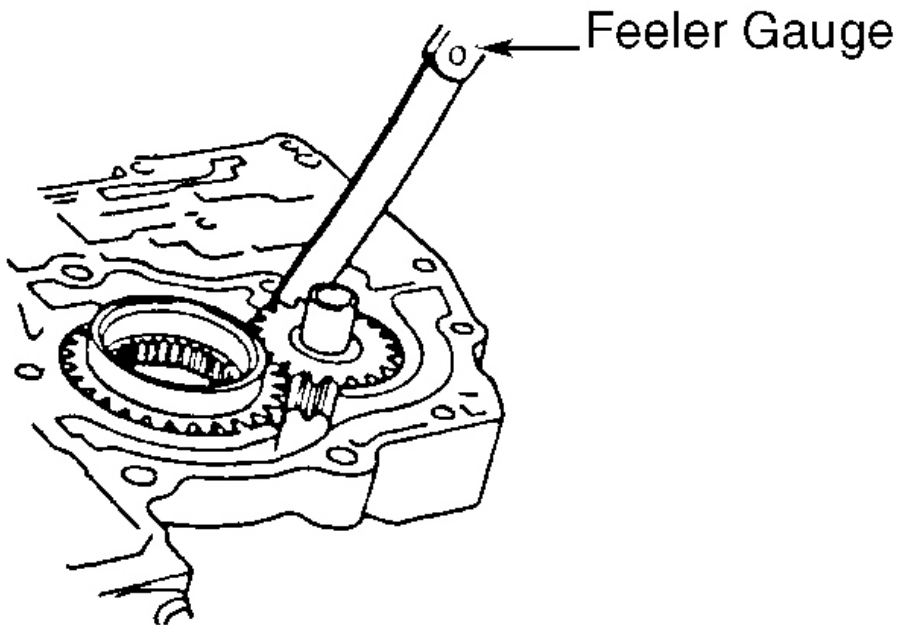
**Reassembly**

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

Oil Pump  
Driven Gear



CHECKING THRUST CLEARANCE



CHECKING SIDE CLEARANCE

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**Fig. 16: Measuring Oil Pump Clearances**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

**REGULATOR VALVE BODY**

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

**Disassembly**

1. Hold regulator spring cap downward. Remove stop bolt. Slowly remove regulator spring cap and components from regulator valve body. See **Fig. 17** .
2. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES** under MAIN VALVE BODY.

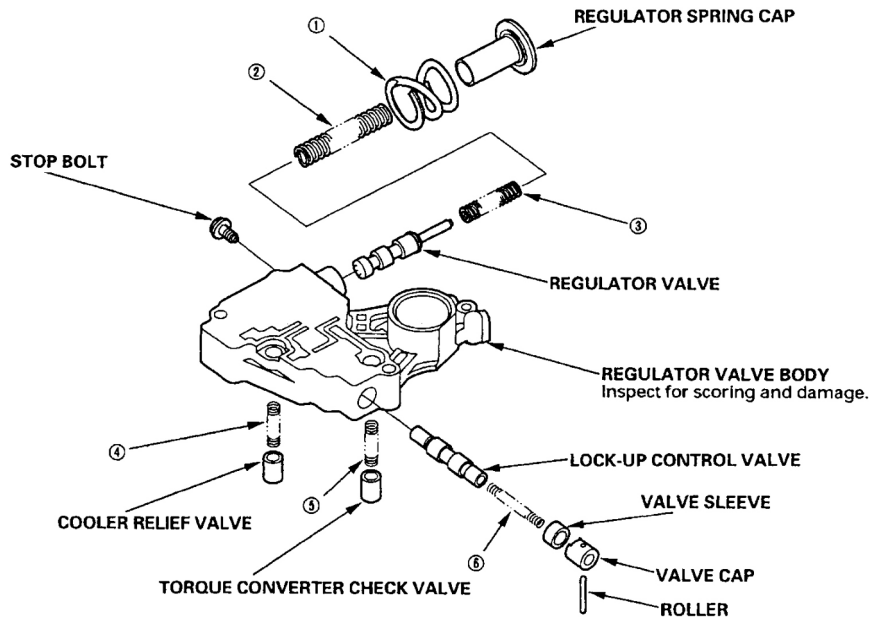
**Cleaning & Inspection**

1. Clean components with solvent and dry with compressed air. Replace regulator valve body if any parts are worn or damaged.
2. Ensure spring free length is within specification. See **Fig. 17** . Replace springs if not within specification.

**Reassembly**

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Align hole in regulator spring cap with hole in valve body, then press spring cap into valve body. Tighten stop bolt to specification. See **TORQUE SPECIFICATIONS** . Ensure all components are installed in correct location. See **Fig. 17** .





## SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.9
②	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	77.4 (3.047)	15.2
③	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	12.6
④	Cooler relief valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
⑤	Torque converter check valve spring	1.0 (0.039)	8.4 (0.331)	33.8 (1.331)	8.2
⑥	Lock-up control valve spring	0.8 (0.031)	6.0 (0.236)	38.4 (1.512)	30.3

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**Fig. 17: Exploded View Of Regulator Valve Body & Spring Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## SECONDARY VALVE BODY

**CAUTION:** Clutch Pressure Control (CPC) valve is installed in secondary valve body, behind lock bolt. See [Fig. 18](#) . DO NOT remove lock bolt. If CPC valve becomes frozen, replace secondary valve body assembly.

## Disassembly

1. Disassemble secondary valve body. See [Fig. 18](#) . Use care when removing valve caps, sleeves or spring seats, as they are under spring pressure.
2. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES** under MAIN VALVE BODY.

## Cleaning &amp; Inspection

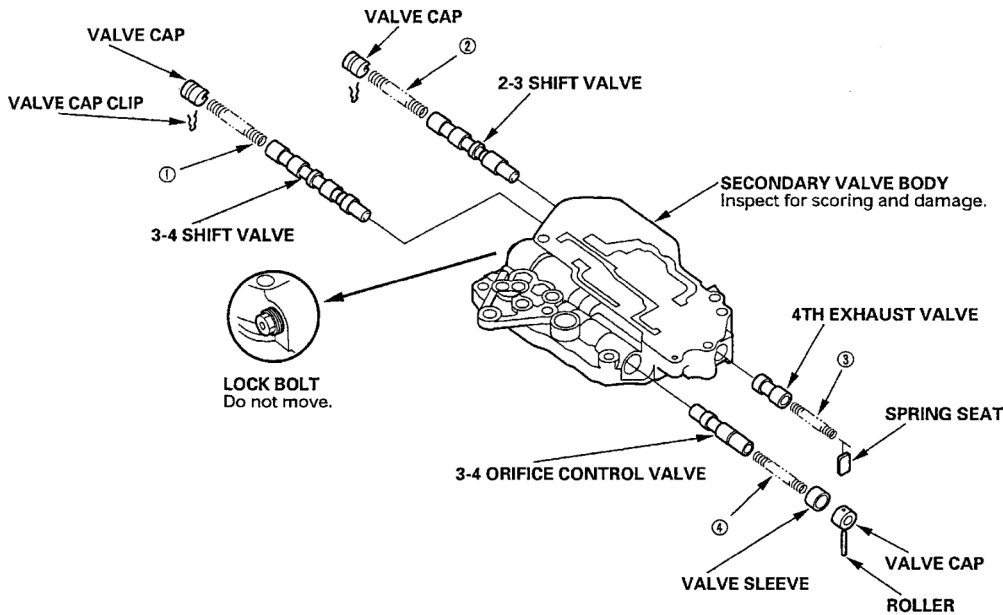
1. Clean components with solvent and dry with compressed air. Replace secondary valve body if any parts

are worn or damaged.

2. Ensure spring free length is within specification. See **Fig. 18** . Replace springs if not within specification.

### Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Ensure all components are installed in correct location. See **Fig. 18** .



### SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
②	2-3 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8
③	4th exhaust valve spring	0.9 (0.035)	6.1 (0.240)	36.4 (1.433)	19.5
④	3-4 orifice control valve spring	0.7 (0.028)	6.6 (0.260)	37.5 (1.476)	24.6

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**Fig. 18: Exploded View Of Secondary Valve Body & Spring Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

### SERVO BODY

#### Disassembly

**NOTE:** The 3rd sub accumulator is used on vehicles without VTEC engine.

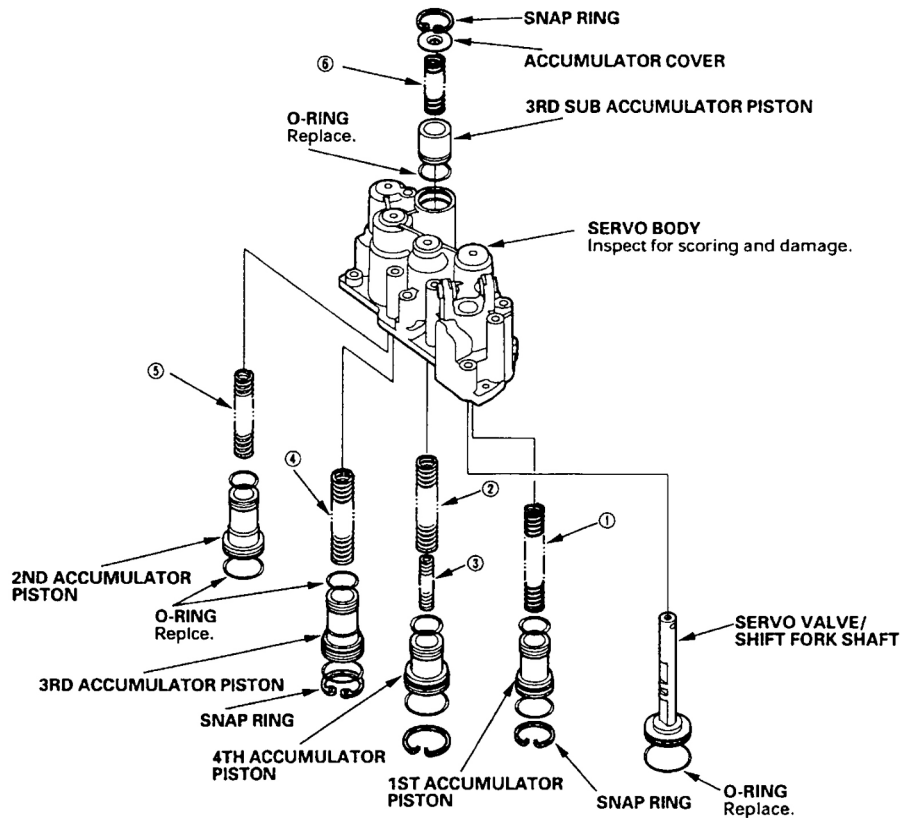
Disassemble servo body. See **Fig. 19** . Use care when removing accumulator piston snap rings, as they are under spring pressure.

#### Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Inspect for wear, scratches or scoring. Replace components if worn or damaged.
2. Ensure spring free length is within specification. See **Fig. 19** . Replace springs if not within specification.

### Reassembly

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



### SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring	2.1 (0.083)	16.0 (0.630)	89.1 (3.508)	16.2
②	4th accumulator spring A	2.6 (0.102)	17.0 (0.669)	88.4 (3.480)	14.2
③	4th accumulator spring B	2.3 (0.091)	10.2 (0.402)	51.6 (2.031)	13.8
④	3rd accumulator spring	2.9 (0.110)	17.5 (0.689)	89.2 (3.713)	13.4
⑤	2nd accumulator spring A	2.4 (0.087)	14.5 (0.571)	68.0 (2.677)	12.5
⑥	3rd sub accumulator spring	2.7 (0.106)	17.0 (0.669)	39.0 (1.535)	6.3

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**Fig. 19: Exploded View Of Servo Body & Spring Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

### LOCK-UP VALVE BODY

#### Disassembly

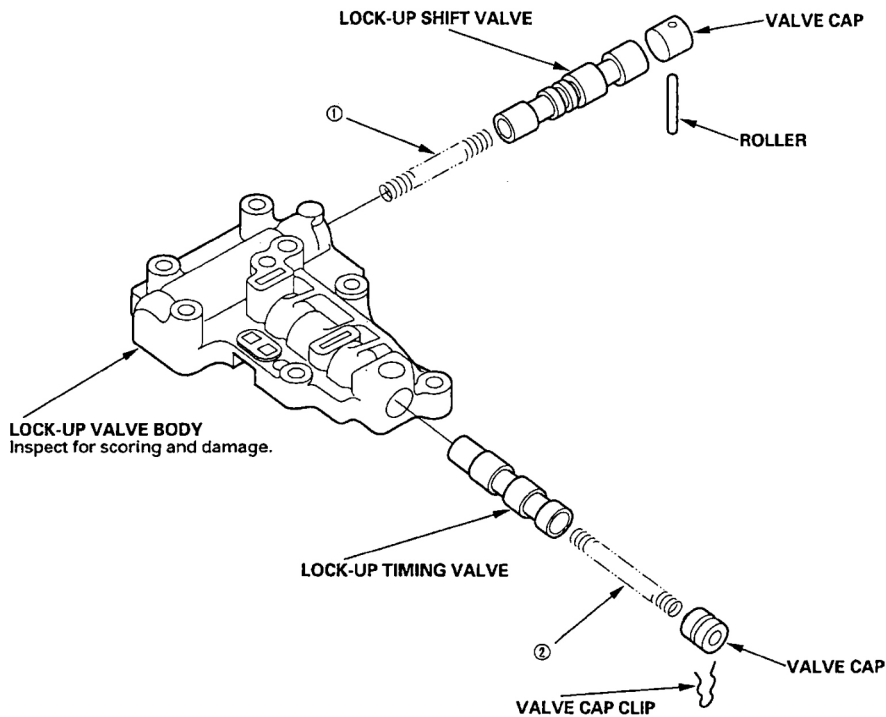
1. Disassemble lock-up valve body. See **Fig. 20** .
2. Check all valves for free movement. If any fail to slide freely, see **VALVE BODY REPAIR PROCEDURES** under MAIN VALVE BODY.

#### Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Replace lock-up valve body if any parts are worn or damaged.
2. Ensure spring free length is within specification. See **Fig. 20** . Replace springs if not within specification.

#### Reassembly

Coat all components and bores with ATF. To reassemble, reverse disassembly procedure. Ensure all components are installed in correct location. See **Fig. 20** .



#### SPRING SPECIFICATIONS

No.	Spring	Standard (New)-Unit: mm (in.)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0
②	Lock-up timing valve spring	0.9 (0.035)	8.1 (0.319)	80.7 (3.177)	54.2

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**Fig. 20: Exploded View Of Lock-Up Valve Body & Spring Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### MAINSHAFT

**NOTE:** Refer to exploded view for reference during the following procedures. See **Fig. 22** .

**NOTE:** Mainshaft lock nut has left hand threads.

#### Disassembly

Note location of mainshaft components. See **Fig. 22** . Remove mainshaft components.

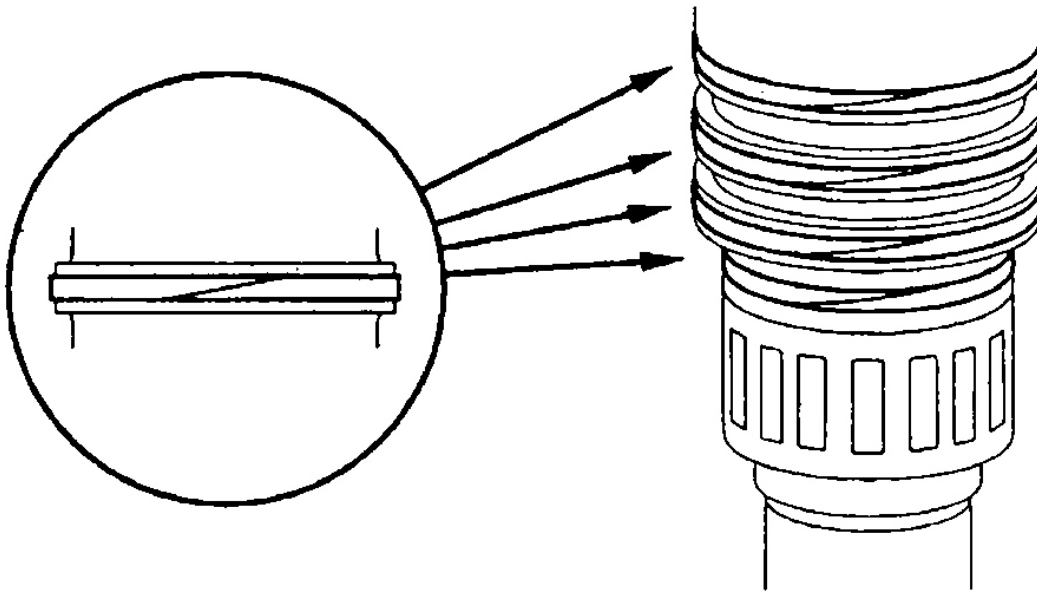
#### Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect splines for excessive wear and damage. Check bearing surfaces for scoring, scratches or wear. Inspect all needle and thrust bearings for galling and rough movement. Inspect the condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them. See **MAINSHAFT SEALING RING REPLACEMENT** .

#### 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. 21** .

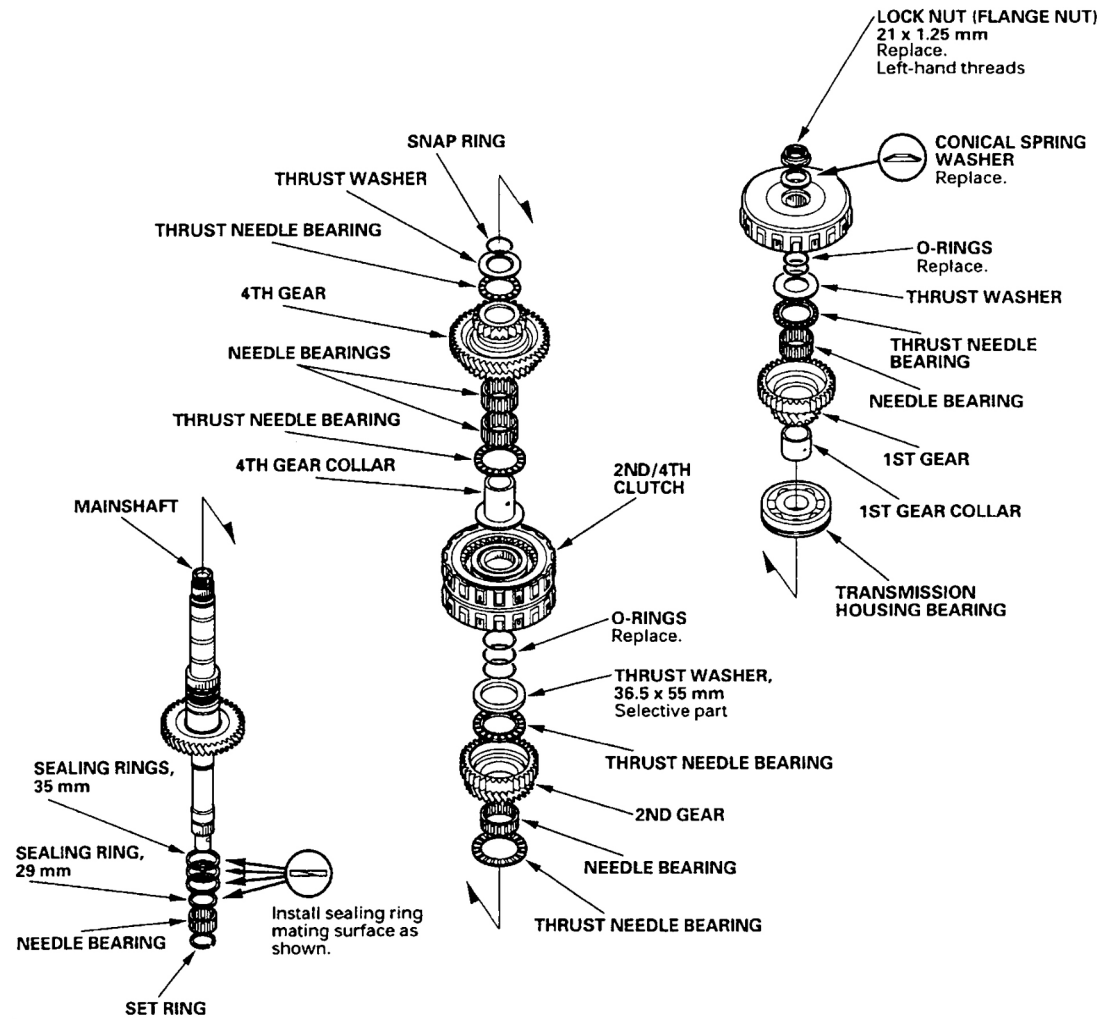


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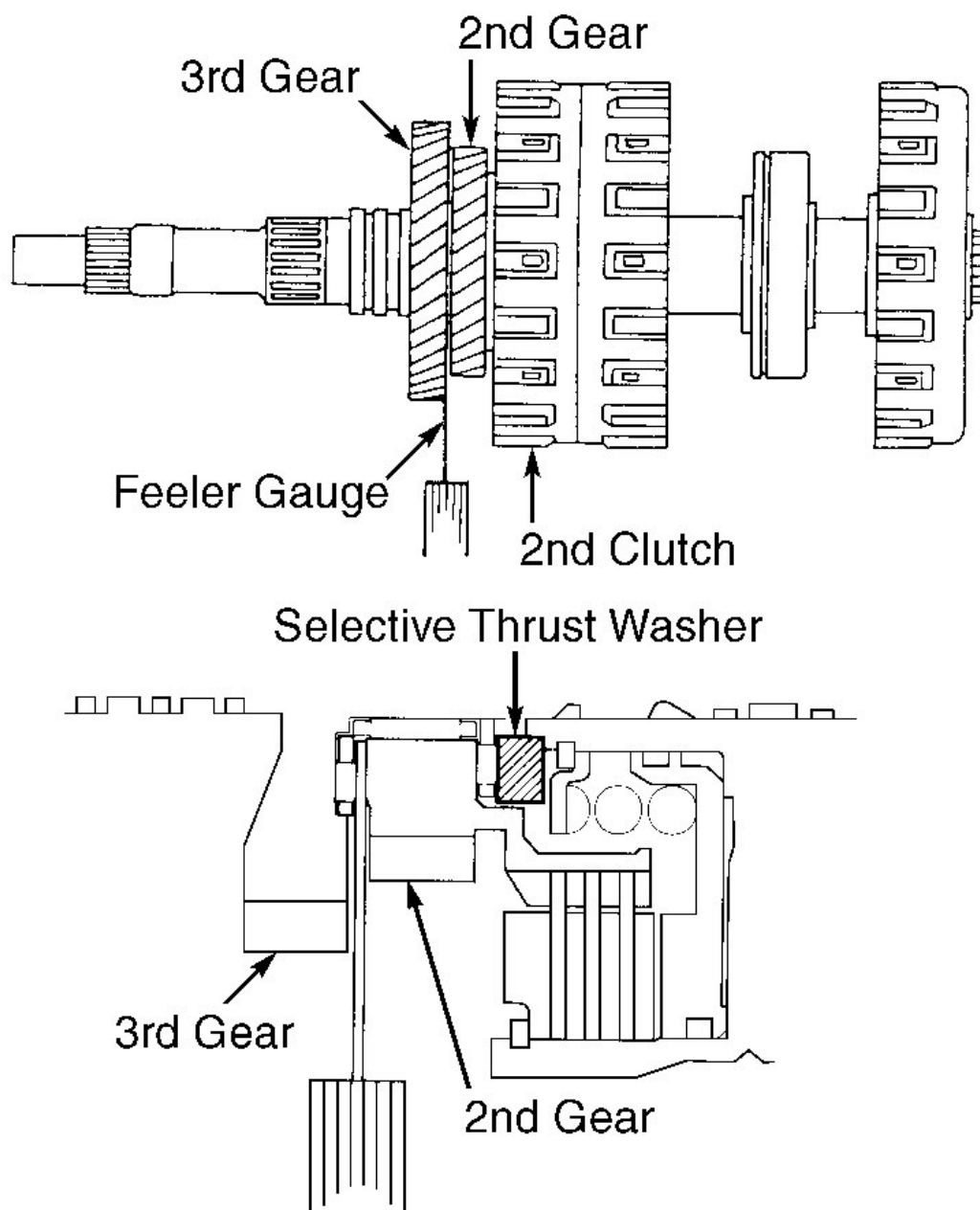
**Fig. 21: Installing Mainshaft Sealing Rings**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### Reassembly

1. Remove mainshaft bearing from transmission housing. Reassemble thrust needle bearing, needle bearing, 2nd gear, thrust needle bearing, 36.5 x 55 mm thrust washer, 2nd/4th clutch, 4th gear collar, thrust washer, snap ring, transmission housing bearing, 1st gear collar, thrust washer, 1st clutch, conical spring washer and lock nut on mainshaft. See **Fig. 22** . Tighten mainshaft lock nut to 22 ft. lbs. (29 N.m). Lock nut has left hand threads.
2. Push 2nd gear towards 2nd clutch. Using a feeler gauge, measure clearance between 2nd and 3rd gear. See **Fig. 23** . Check mainshaft clearance at 3 places. Average the 3 readings to obtain mainshaft clearance.
3. Clearance should be .002-.005" (.05-.13 mm). If clearance is not as specified, replace 36.5 x 55 mm thrust washer. See **Fig. 24** . Install different thickness thrust washer (if necessary) and recheck clearance.
4. Lubricate all components with ATF. Reassemble mainshaft. See **Fig. 22** . Before installing NEW "O" rings on mainshaft, wrap splines on mainshaft with tape to prevent damage to "O" rings.



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



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**Fig. 23: Checking Mainshaft Clearance**

Courtesy of AMERICAN HONDA MOTOR CO., INC.



No.	Part Number	Thickness
1	90441-P4P-000	4.00 mm (0.157 in.)
2	90442-P4P-000	4.05 mm (0.159 in.)
3	90443-P4P-000	4.10 mm (0.161 in.)
4	90444-P4P-000	4.15 mm (0.163 in.)
5	90445-P4P-000	4.20 mm (0.165 in.)
6	90446-P4P-000	4.25 mm (0.167 in.)
7	90447-P4P-000	4.30 mm (0.169 in.)
8	90448-P4P-000	4.35 mm (0.171 in.)
9	90449-P4P-000	4.40 mm (0.173 in.)
10	90450-P4P-000	4.45 mm (0.175 in.)

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**Fig. 24: Thrust Washer (36.5 X 55 mm) Selection Table**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## COUNTERSHAFT

**NOTE:** Refer to exploded view for reference during the following procedures. See Fig. 25.

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

**NOTE:** Countershaft lock nut has left hand threads.

### Disassembly

1. Note location of countershaft components. See Fig. 25. Remove countershaft components down to reverse selector hub.
2. Remove reverse selector hub (A) and 4th gear (B) using universal 2-jaw (or 3-jaw) puller (C). Place a shaft protector (D) between puller and countershaft (E) to prevent countershaft damage. See Fig. 26. Disassemble remainder of countershaft assembly.

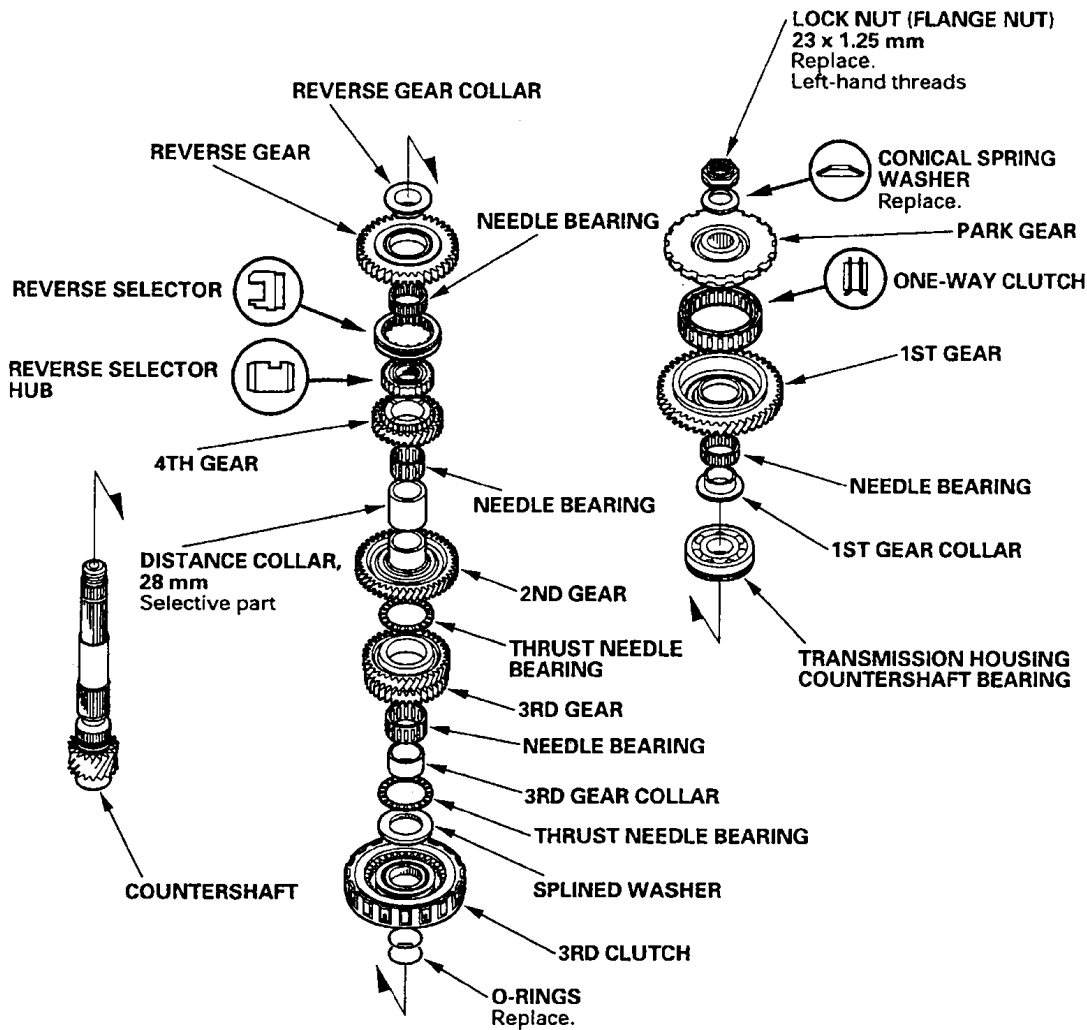
### Cleaning & Inspection

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

Check bearing surfaces for scoring, scratches or wear. Inspect all thrust and needle bearings for galling and rough movement.

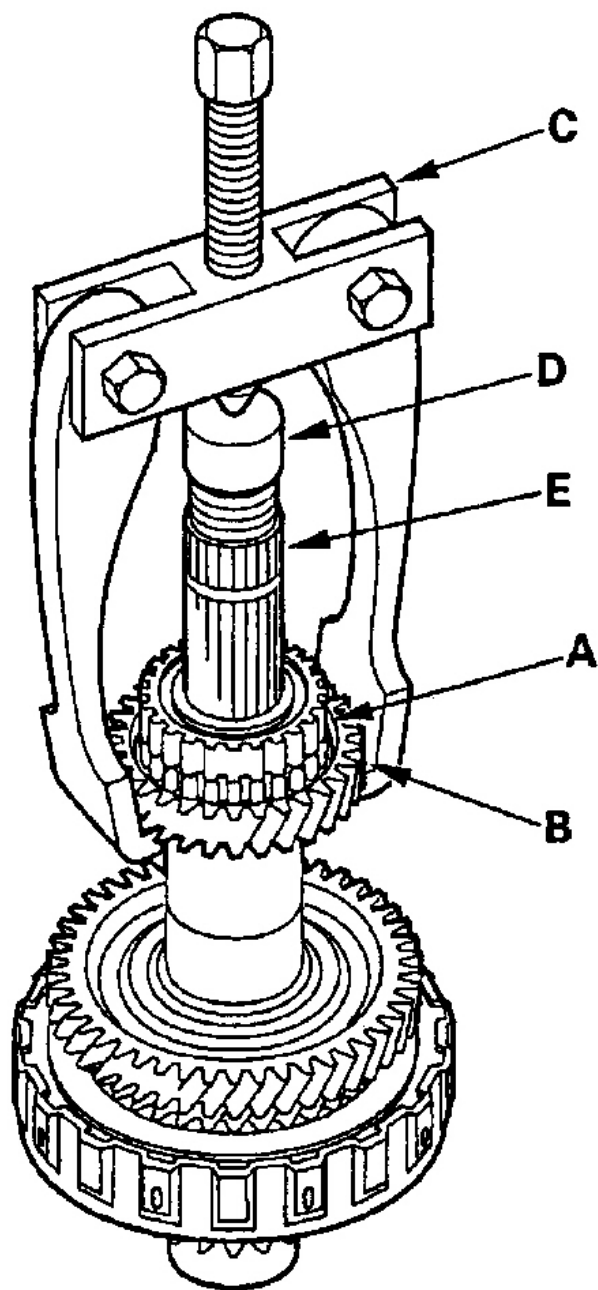
**Reassembly**

1. Remove countershaft bearing from transmission housing. Remove "O" rings from countershaft (if necessary).
2. Install 3rd clutch, splined washer, thrust needle bearing, 3rd gear collar, needle bearing, 3rd gear, thrust needle bearing, 2nd gear, 28 mm distance collar, needle bearing and 4th gear on countershaft. See **Fig. 25** . Slide reverse selector hub (A) over countershaft (B), then press it into place with a driver and a press. See **Fig. 27** .
3. Install reverse gear collar, transmission housing countershaft bearing, 1st gear collar, needle bearing, 1st gear collar, needle bearing, 1st gear/one-way clutch/park gear, and conical spring washer on the countershaft. See **Fig. 25** . Tighten countershaft lock nut to 22 ft. lbs. (29 N.m).
4. Using a feeler gauge, measure clearance between 2nd gear and 28 mm distance collar. See **Fig. 28** . Check countershaft clearance at 3 places. Average the 3 readings to obtain countershaft clearance.
5. Ensure countershaft clearance is .004-.007" (.10-.18 mm). If clearance is not as specified, replace distance collar with appropriate collar. See **Fig. 29** . Install different thickness distance collar (if necessary) and recheck clearance. Disassemble countershaft and gears. Install bearing into transmission housing.
6. Lubricate all components with ATF. Install all components from 3rd clutch assembly through reverse selector hub. See **Fig. 25** .
7. Before installing NEW "O" rings on mainshaft, wrap splines on countershaft with tape to prevent damage to "O" rings. Slide reverse selector hub (A) over countershaft (B), then press it into place using a driver and a press. See **Fig. 27** . Install remaining components.



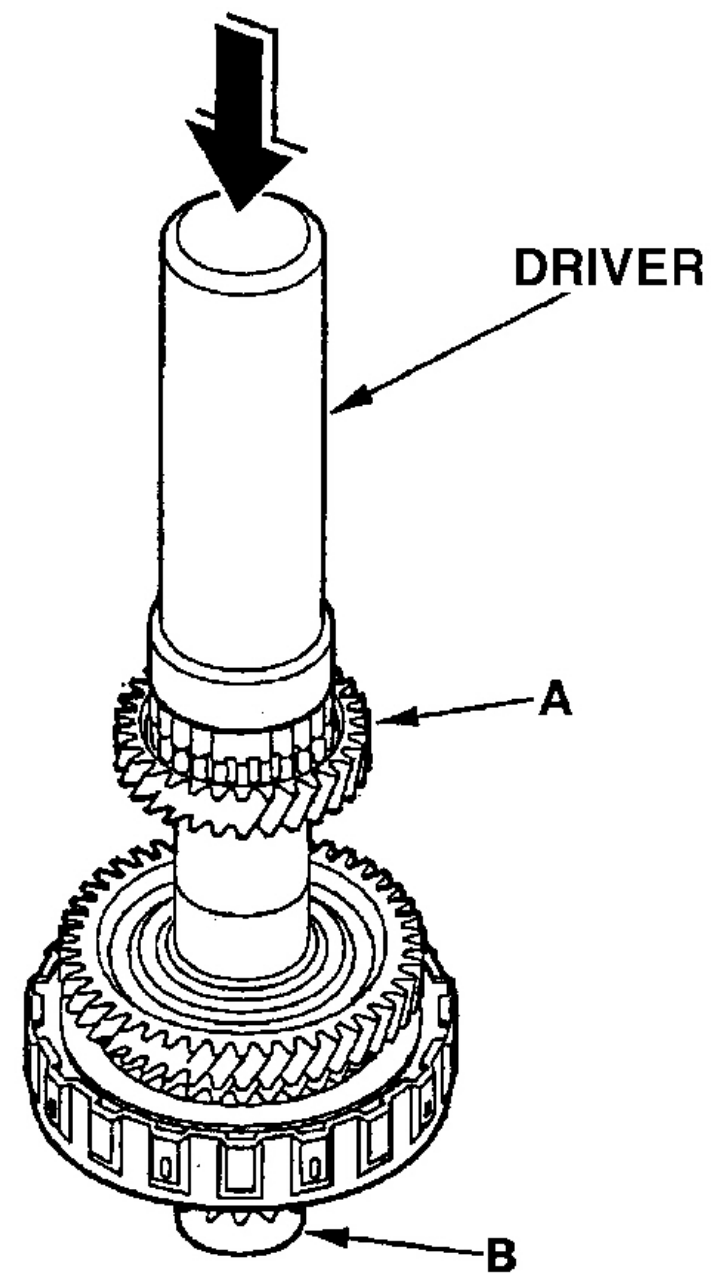
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**Fig. 25: Exploded View Of Countershaft Assembly**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



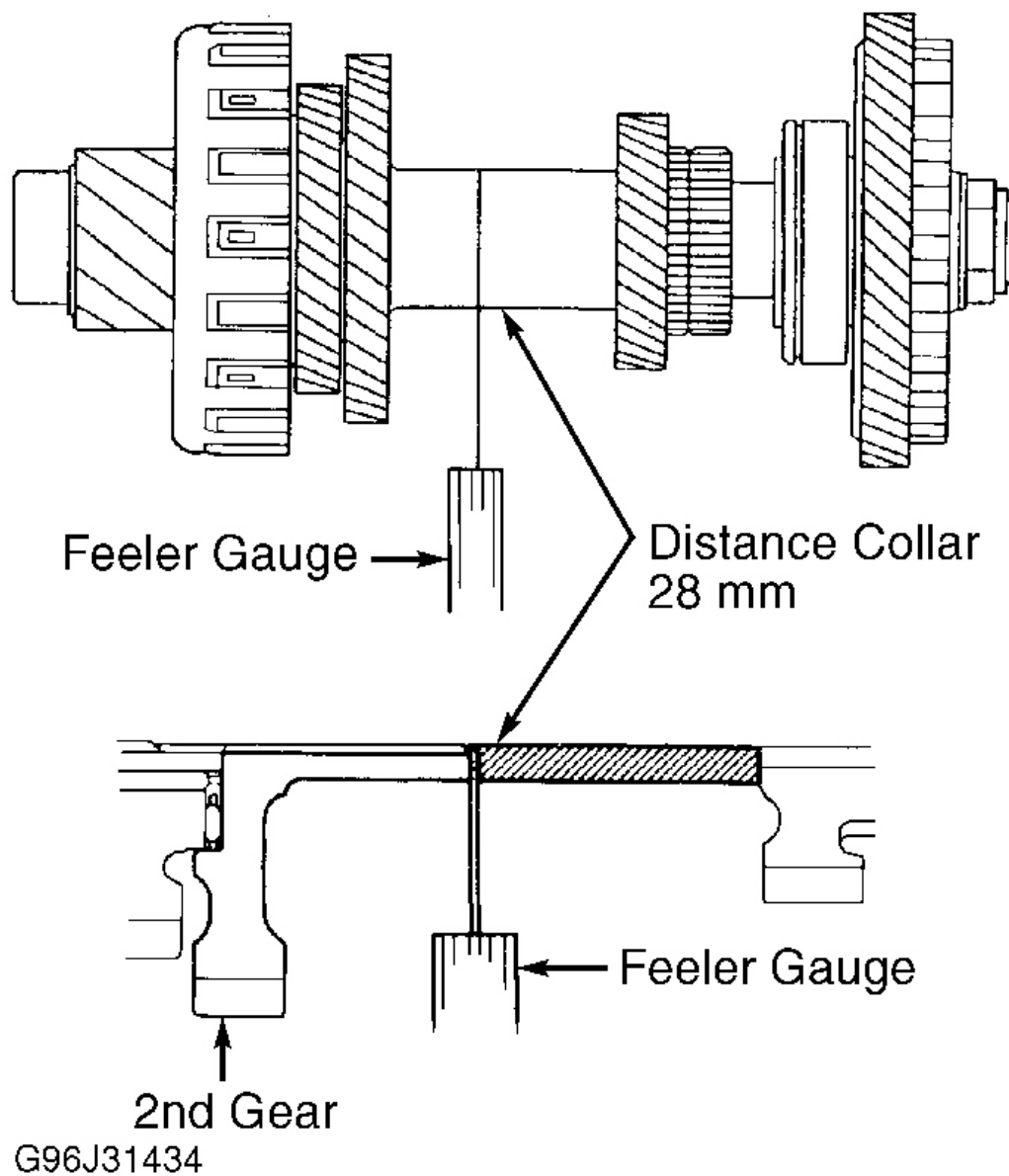
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**Fig. 26: Removing Reverse Selector Hub & 4th Gear**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 27: Installing Reverse Selector Hub**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



**Fig. 28: Checking Countershaft Clearance**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90503-PC9-000	39.00 mm (1.535 in.)
2	90504-PC9-000	39.10 mm (1.539 in.)
3	90505-PC9-000	39.20 mm (1.543 in.)
4	90507-PC9-000	39.30 mm (1.547 in.)
5	90508-PC9-000	39.05 mm (1.537 in.)
6	90509-PC9-000	39.15 mm (1.541 in.)
7	90510-PC9-000	39.25 mm (1.545 in.)
8	90511-PC9-000	38.90 mm (1.531 in.)
9	90512-PC9-000	38.95 mm (1.533 in.)

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**Fig. 29: Distance Collar (28 mm) Selection Table**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

### 1ST GEAR ONE-WAY CLUTCH

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

#### Disassembly

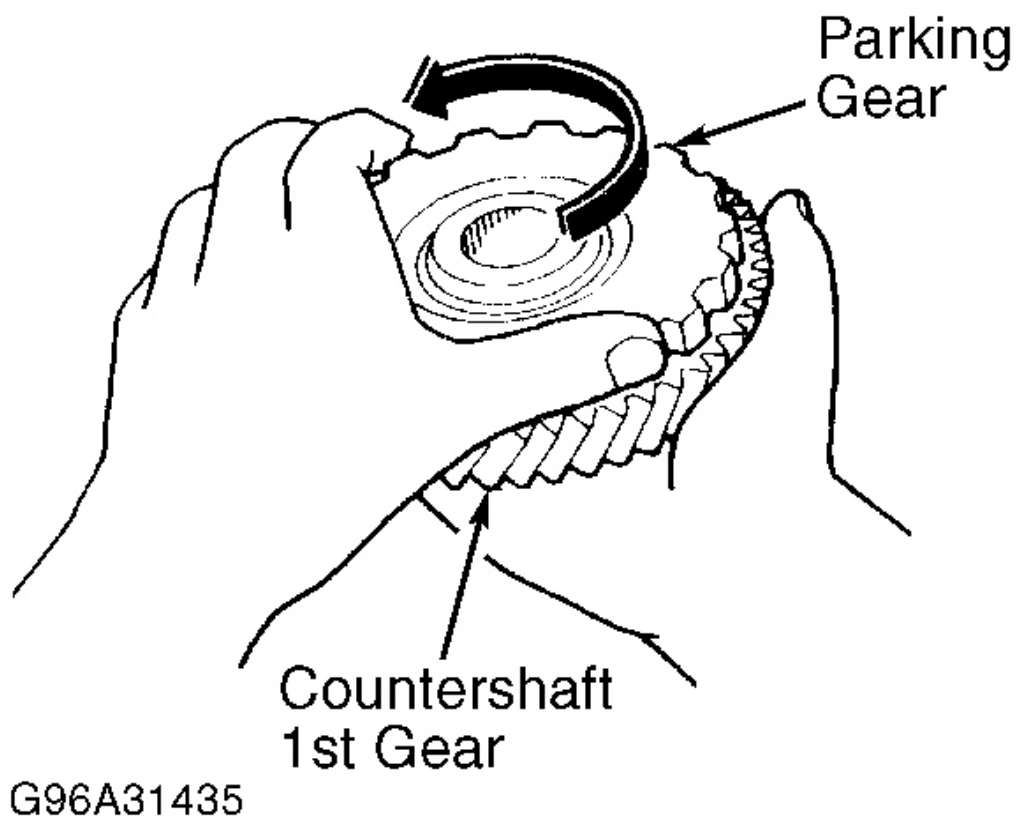
Separate countershaft 1st gear from park gear by rotating park gear counterclockwise while holding countershaft 1st gear. See **Fig. 30** . Remove one-way clutch from countershaft 1st gear by prying up with end of screwdriver. See **Fig. 31** .

#### Inspection

Check park gear (A) and 1st gear (B) for wear and scoring. Check one-way clutch (C) for damage and movement in wrong direction. See **Fig. 32** . One-way clutch should only turn in direction shown. See **Fig. 30** .

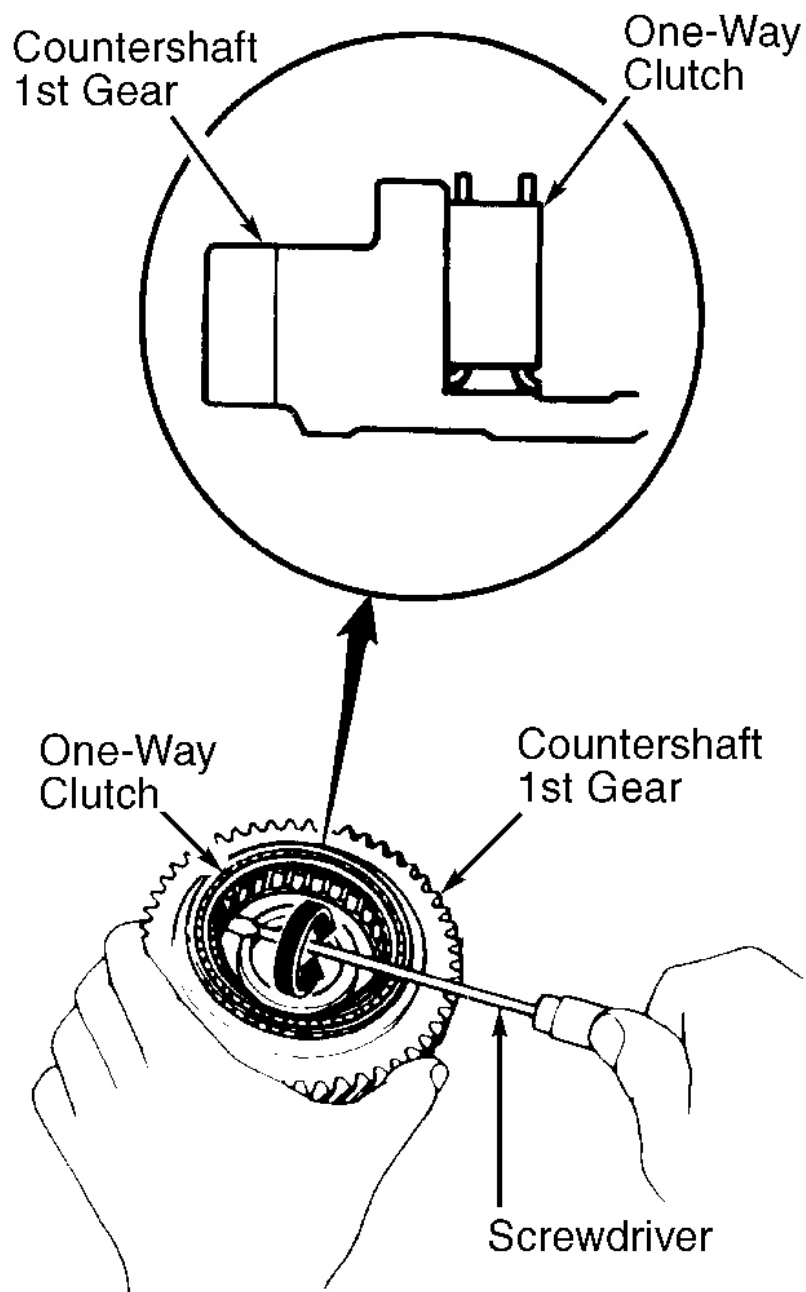
#### Reassembly

To reassemble, reverse disassembly procedure. Ensure one-way clutch is installed correctly. See **Fig. 31** . Check one-way clutch rotation. One-way clutch is defective if park gear will rotate clockwise. See **Fig. 30** .



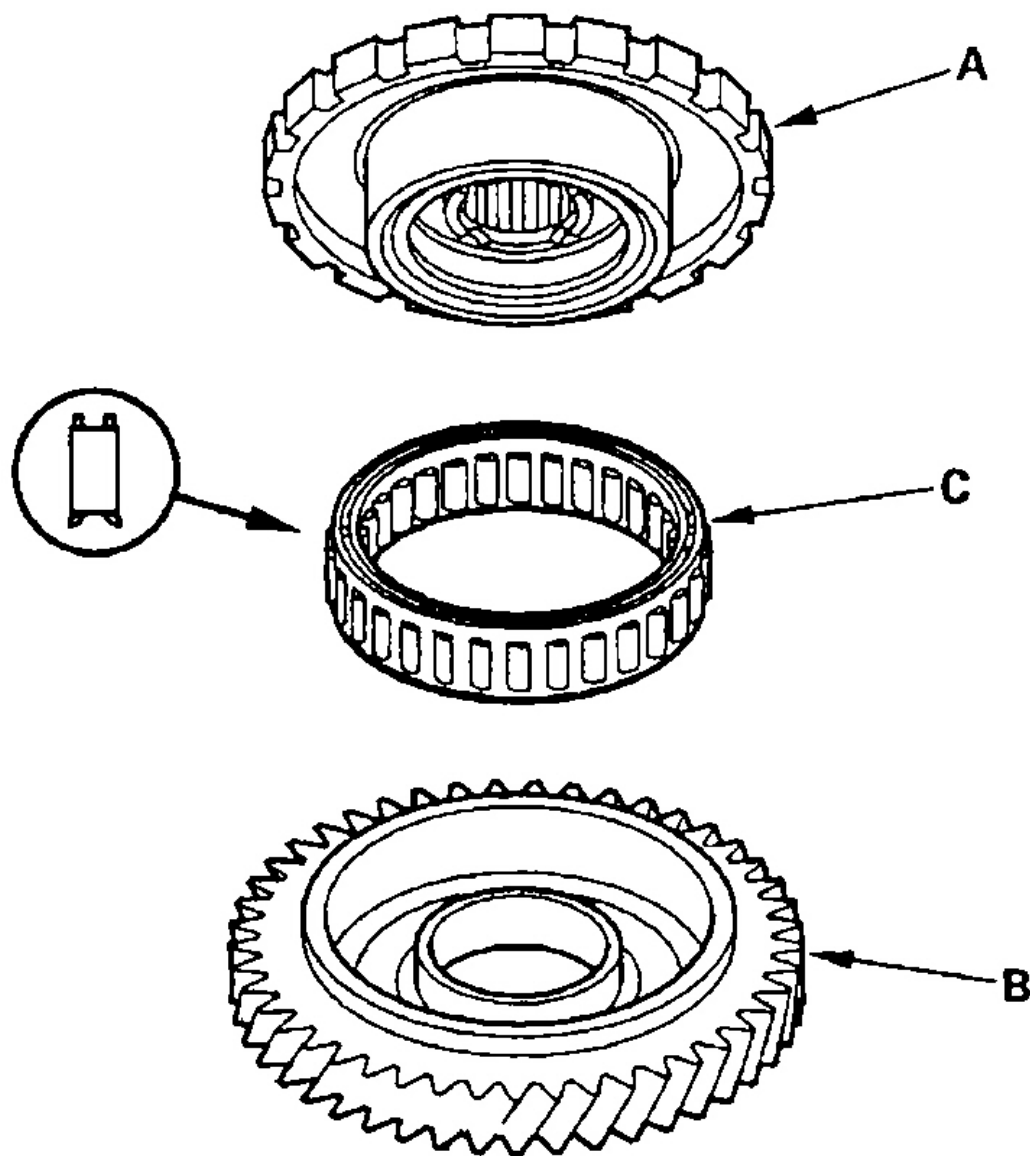
**Fig. 30: Removing Parking Gear & Checking One-Way Clutch Operation**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.





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**Fig. 31: Removing & Installing One-Way Clutch**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 32: Inspecting Park Gear, 1st Gear & One-Way Clutch**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## CLUTCH ASSEMBLIES

### Disassembly

1. Remove snap ring, clutch end plate, clutch discs and clutch plates. Remove wave spring from 1st, 3rd and 4th clutches. Note direction of wave spring installation. The 2nd clutch is not equipped with a wave

spring. See **Fig. 34** and **Fig. 35**.

**CAUTION:** Ensure spring compressor fully contacts spring retainer. Spring compressor must be positioned as shown or damage will occur. See **Fig. 33**.

2. Using spring compressor, compress return spring. Remove snap ring. Release and remove spring compressor. Remove spring retainer and return spring.
3. Wrap shop towel around clutch drum. Apply light air pressure to oil passage on clutch drum to remove clutch piston. Remove "O" rings.

### Cleaning & Inspection

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

### Reassembly

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

1. Lubricate all components with ATF. Install NEW "O" rings. Install clutch piston in clutch drum. Slightly rotate clutch piston during installation to prevent damaging "O" rings.
2. Install return spring. Install spring retainer in clutch drum. Place snap ring on spring retainer. Using spring compressor, compress return spring. Install snap ring. Release and remove spring compressor.
3. Install wave spring (except 2nd clutch). Ensure wave spring is installed in proper direction. See **Fig. 34** and **Fig. 35**.

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

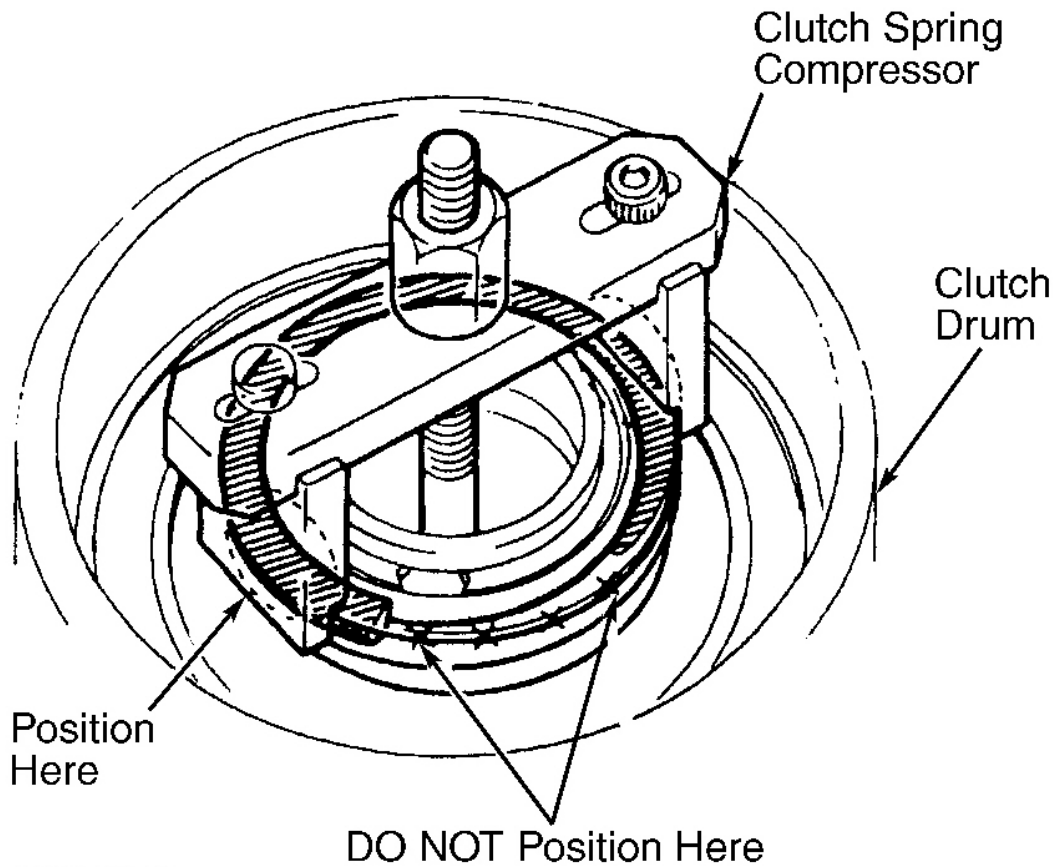
4. Alternately install clutch plates and clutch discs starting with clutch plate. Install clutch end plate with flat side toward clutch disc. Install snap ring.
5. Using dial indicator, measure clutch clearance between clutch end plate and top clutch disc. See **Fig. 36**. Zero dial indicator with clutch end plate lowered, and then lift clutch end plate upward against snap ring. Measure clutch clearance at 3 different locations.

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

6. Ensure clutch clearance is within specification. See **CLUTCH CLEARANCE SPECIFICATIONS** table. If clutch clearance is not within specification, install different thickness clutch end plate. See **Fig. 37**.

**CLUTCH CLEARANCE SPECIFICATIONS**

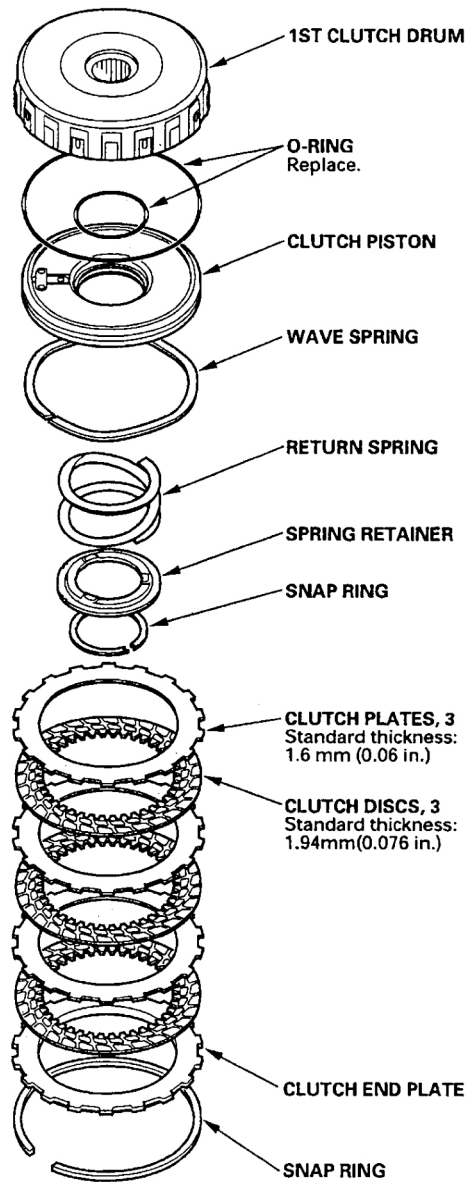
Application	In. (mm)
1st & 2nd Clutches	.026-.033 (.65-.85)
3rd & 4th Clutches	.016-.024 (.40-.60)



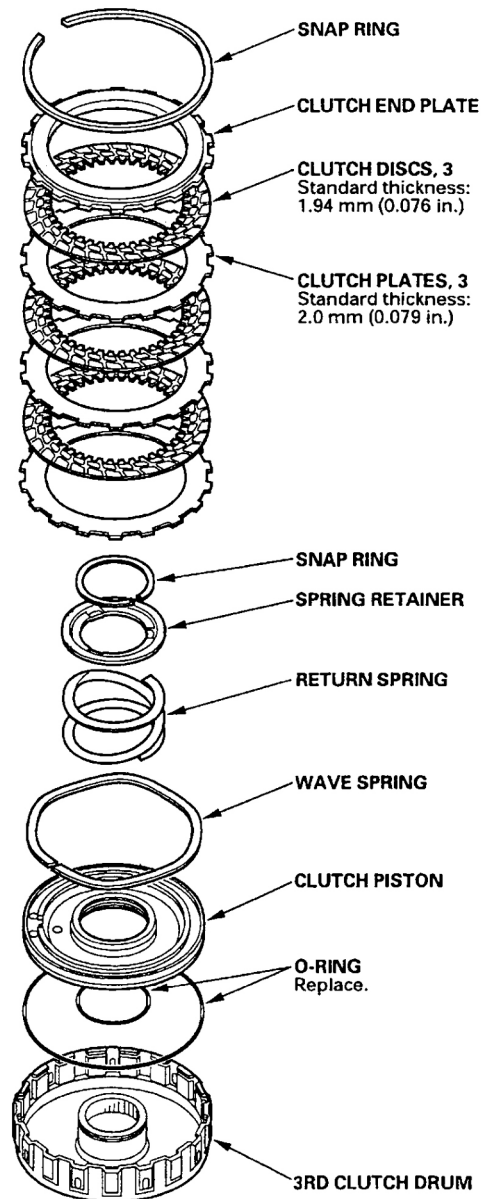
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**Fig. 33: Identifying Clutch Spring Compressor Placement**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

1ST CLUTCH

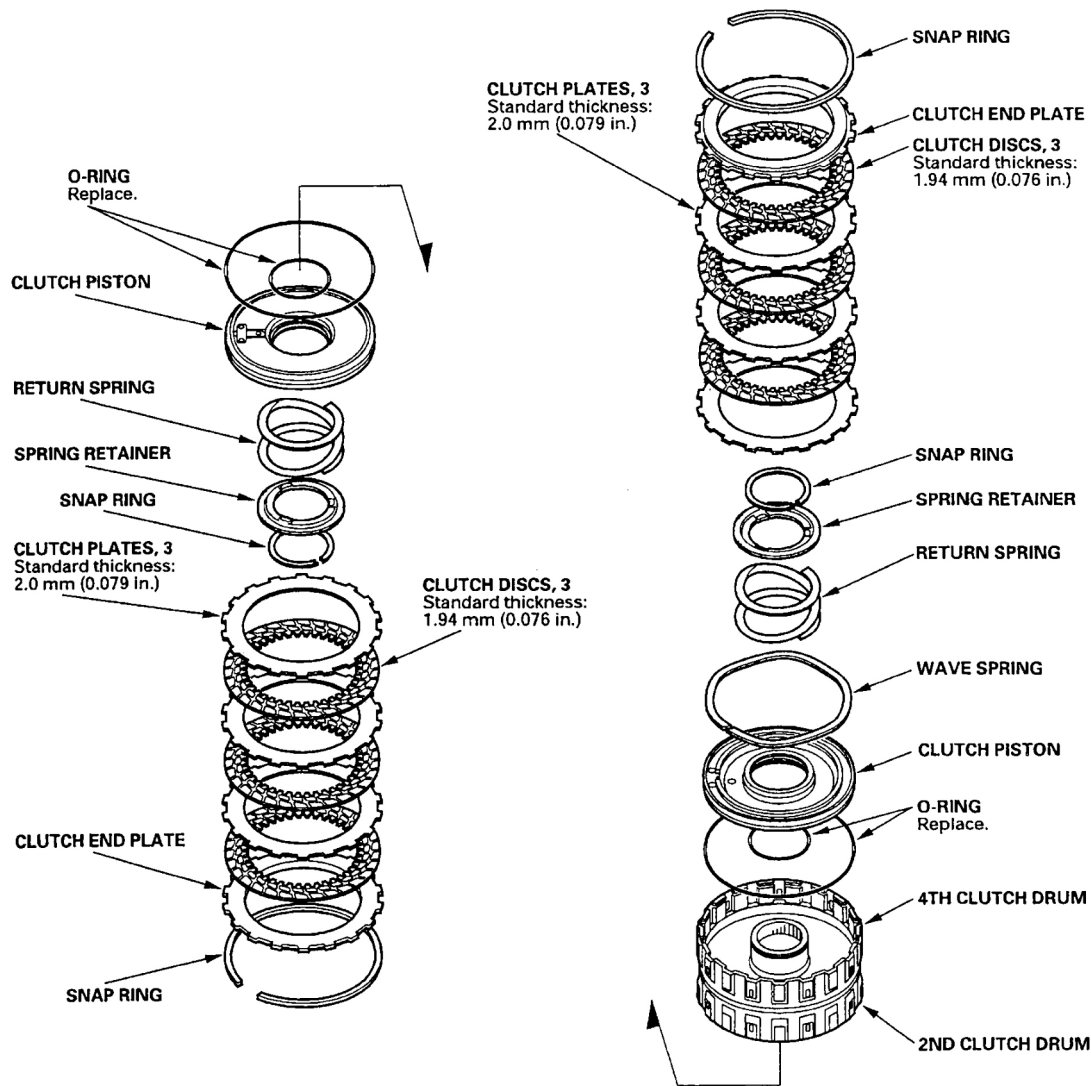


3RD CLUTCH



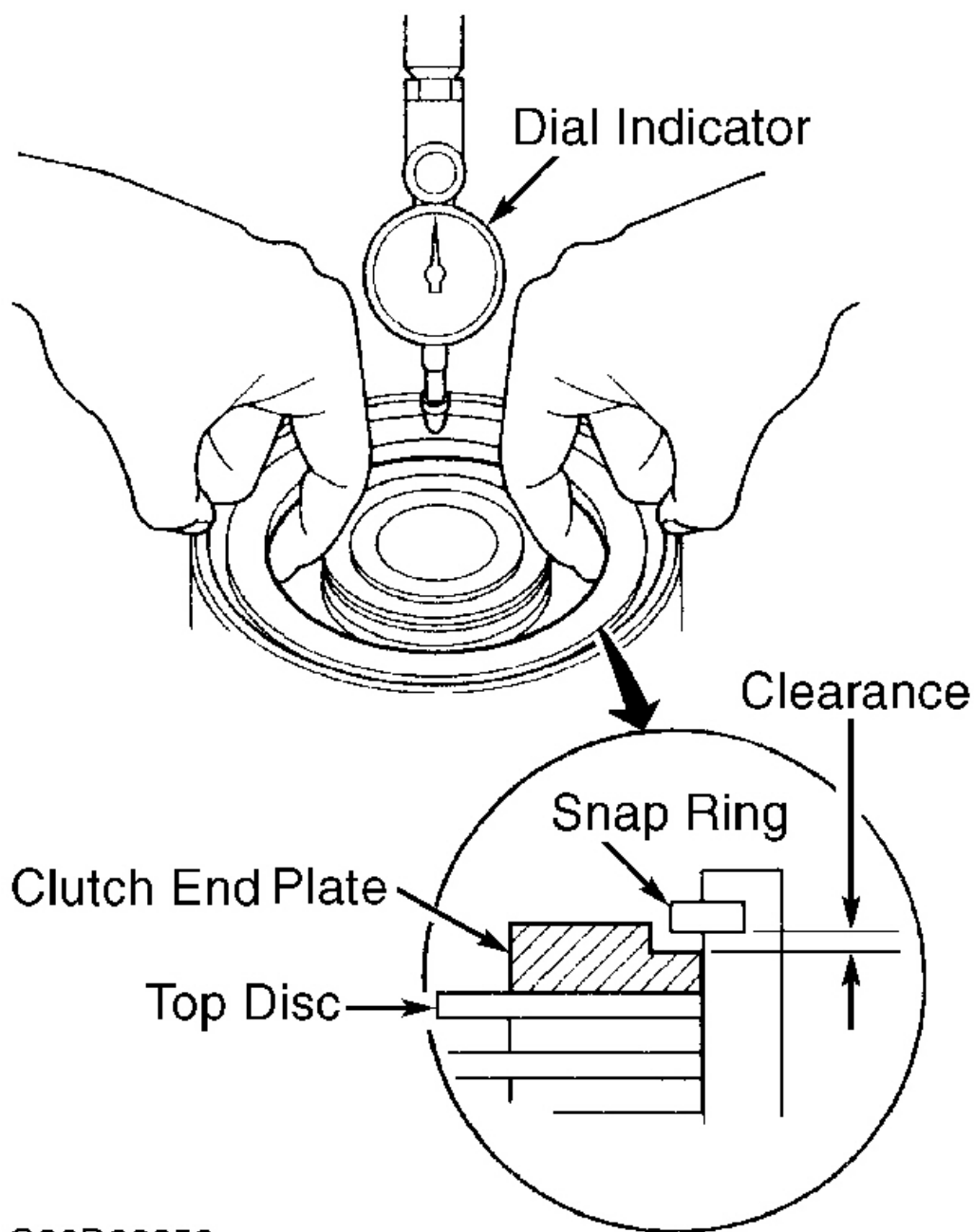
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**Fig. 34: Exploded View Of 1st & 3rd Clutch Assemblies**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 35: Exploded View Of 2nd & 4th Clutch Assemblies**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 36: Measuring Clutch Clearance**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

**CLUTCH**

Mark	Part Number	Thickness
1	22551-P4R-003	2.1 mm (0.083 in.)
2	22552-P4R-003	2.2 mm (0.087 in.)
3	22553-P4R-003	2.3 mm (0.091 in.)
4	22554-P4R-003	2.4 mm (0.094 in.)
5	22555-P4R-003	2.5 mm (0.098 in.)
6	22556-P4R-003	2.6 mm (0.102 in.)
7	22557-P4R-003	2.7 mm (0.106 in.)
8	22558-P4R-003	2.8 mm (0.110 in.)
9	22559-P4R-003	2.9 mm (0.114 in.)

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**Fig. 37: Clutch End Plate Selection Table**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

**TORQUE CONVERTER HOUSING****Disassembly**

If removing countershaft bearing from torque converter housing, use slide hammer to remove countershaft bearing. Remove oil guide plate from bore in torque converter housing. Remove mainshaft bearing and oil seal using slide hammer.

**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 bearing installer, install mainshaft bearing until bearing is fully seated in torque converter housing.
2. Using hammer and oil seal installer, install NEW oil seal for mainshaft in torque converter housing. Oil seal should be even with surface of torque converter housing.
3. To install countershaft bearing, install oil guide plate in countershaft bearing bore of torque converter housing. Ensure oil guide plate is installed so tab in center of oil guide plate faces upward (away from torque converter housing surface), at a depth of 0-.001" (0-.03 mm), with zero being flush and .0010" (.025 mm) past flush (inset).



4. Using hammer and bearing installer, install countershaft bearing into torque converter housing.

**TRANSAXLE HOUSING**

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

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

**Disassembly**

1. Expand snap ring. Press mainshaft and countershaft bearings from transmission housing. Using hammer and drift, tap differential oil seal from transmission housing.
2. Remove 2 bolts and reverse idler gear shaft holder (A). Remove needle bearing (B) and reverse idler gear from transmission housing. See **Fig. 38**.

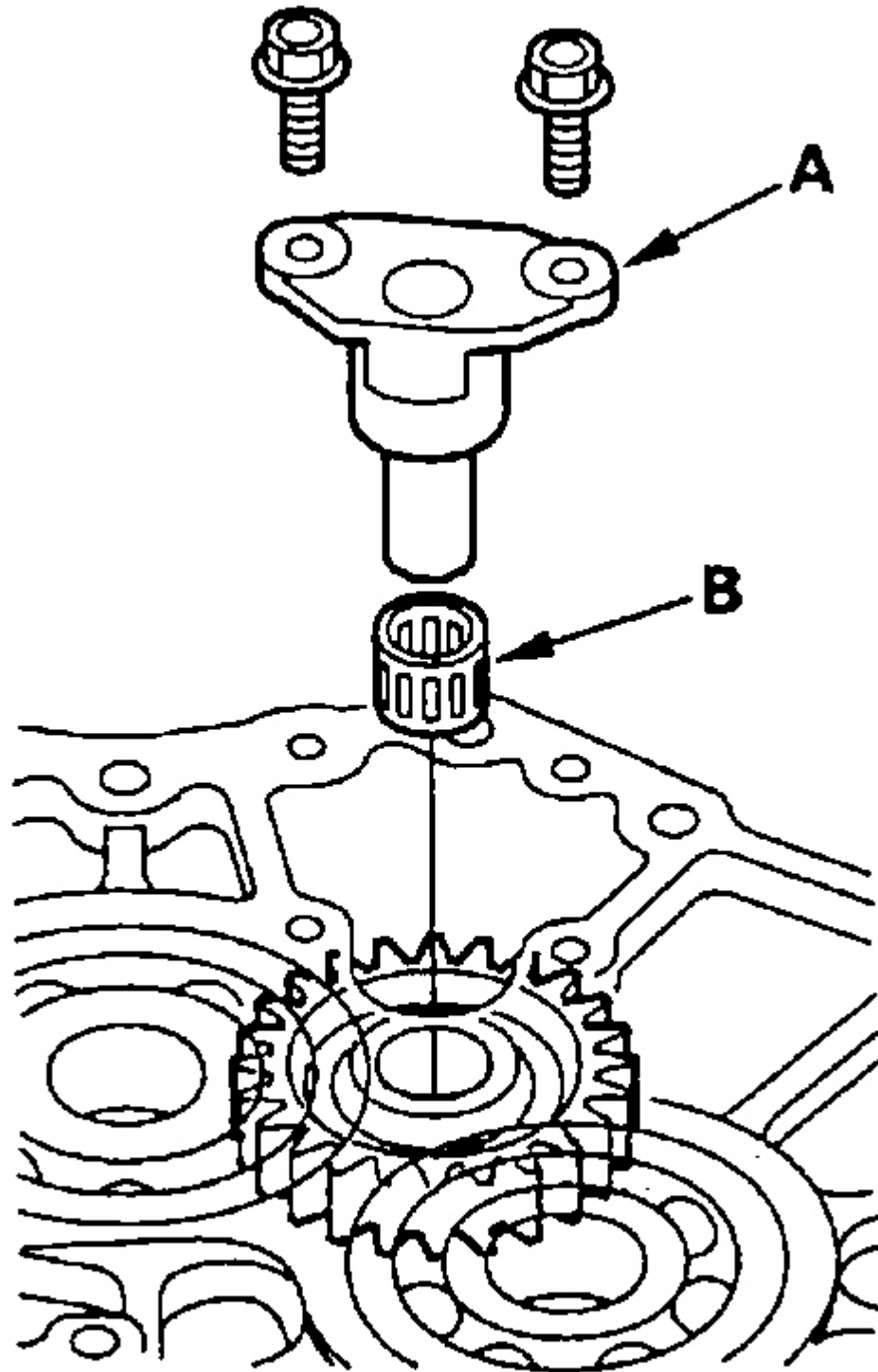
**Cleaning & Inspection**

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

**Reassembly**

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

1. To install mainshaft and countershaft bearings, expand snap ring and install bearing part of the way into transmission housing. Release snap ring.
2. Press bearing into transmission housing until snap ring engages with groove on bearing. Ensure snap ring end gap is 0-.28" (0-7 mm). If snap ring end gap is not within specification, reseal or replace snap ring.
3. Install needle bearing into reverse idler gear. To install reverse idle gear, slide reverse idle gear into transmission housing until it aligns with shaft hole. Install reverse idle gear shaft holder onto transmission housing. See **Fig. 38**. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**.



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**Fig. 38: Removing Reverse Idler Gear Shaft Holder & Needle Bearing**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## DIFFERENTIAL ASSEMBLY

**CAUTION:** If differential carrier, differential bearings, transmission housing, torque converter housing or snap rings are replaced, differential bearing side clearance must be checked. See DIFFERENTIAL BEARING SIDE CLEARANCE .

### 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. 39 . 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 assembly.

**NOTE:** Ring gear bolts have left hand threads.

3. If replacing bearings, use bearing puller to remove bearings from differential carrier. To replace differential carrier assembly, remove bolts and ring gear. Pry speedometer drive gear snap ring off differential carrier. Pull speedometer drive gear and roll pin from carrier assembly. See Fig. 40 .
4. Drive out differential seals from transmission and converter housings from inside to outside. Remove set ring from transmission housing. See Fig. 44 .

### Cleaning & Inspection

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

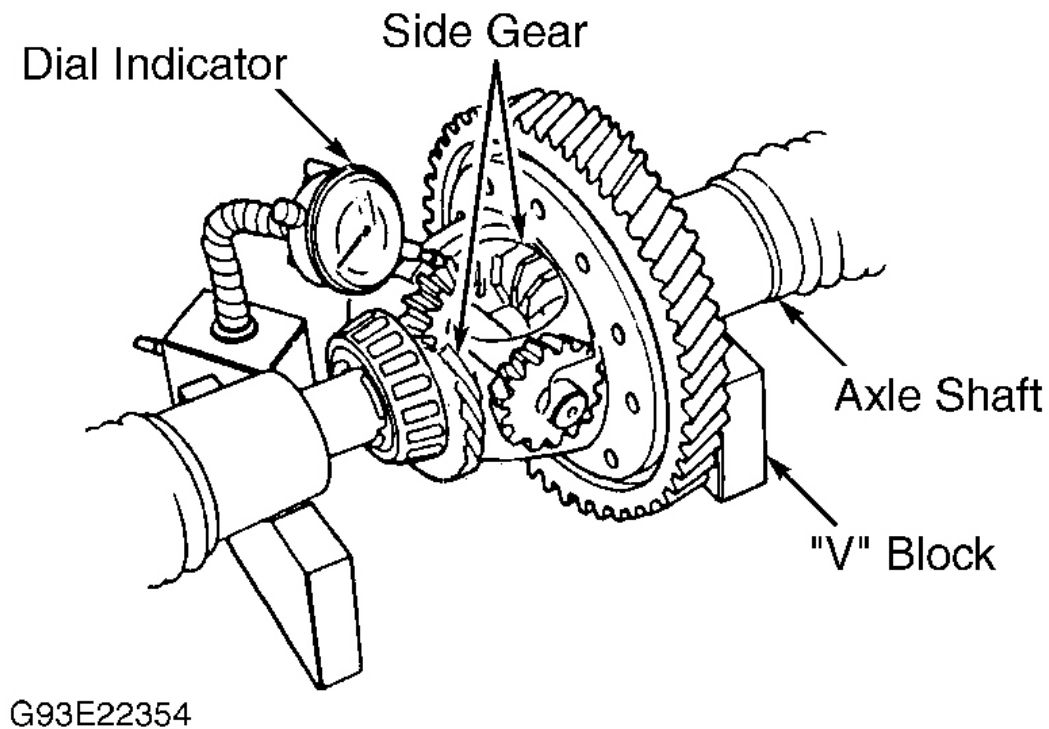
### Reassembly

1. Install speedometer drive gear roll pin. Install speedometer drive gear with chamfered side facing carrier. Align cutout in speedometer drive gear with roll pin.
2. Align speedometer drive gear snap ring hooked end with spring pin in pinion shaft. See Fig. 41 . Install snap ring in differential carrier groove.

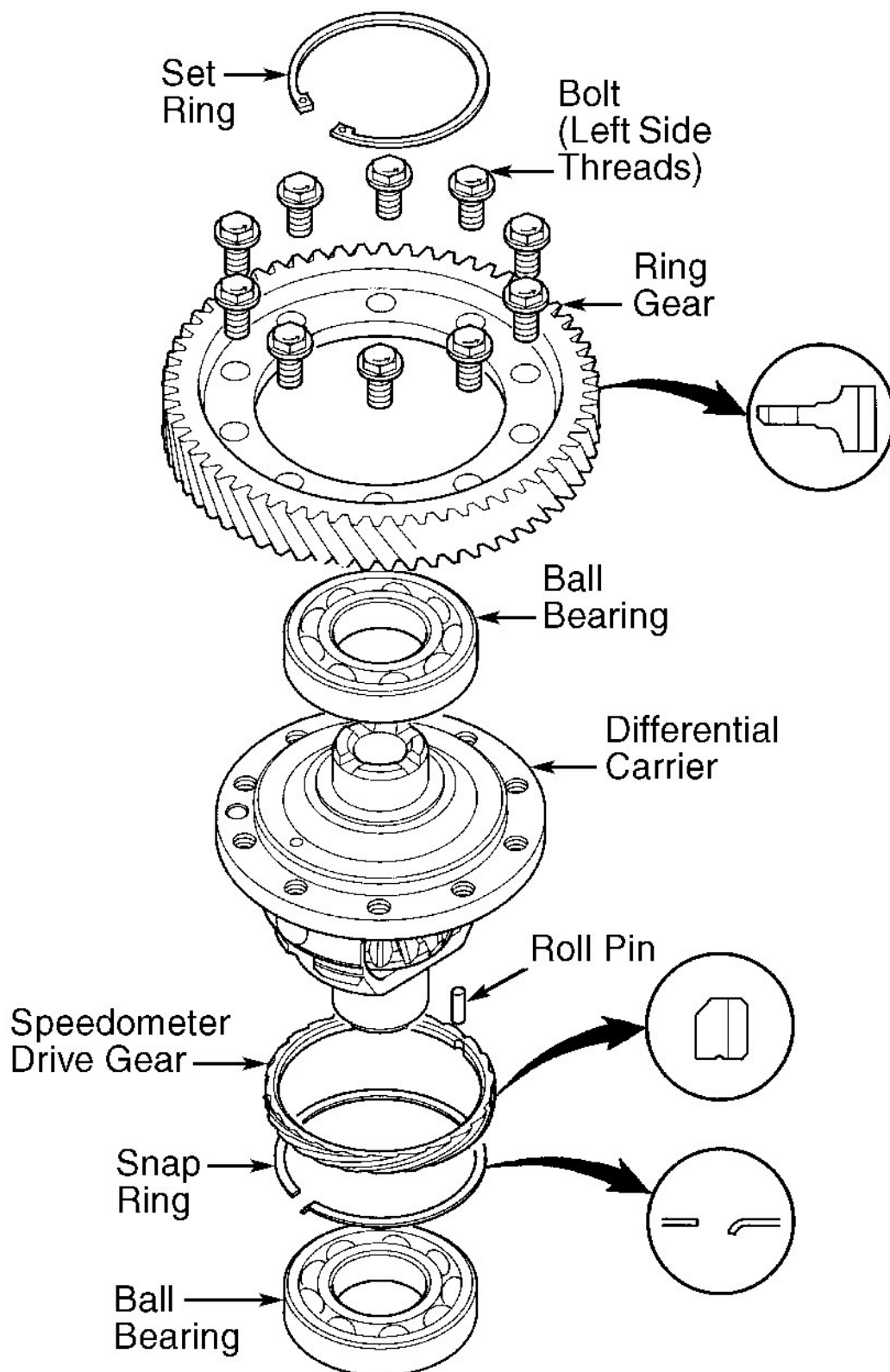
**CAUTION:** Ring gear must be installed with chamfered edge on inside of ring gear toward differential carrier.

3. Install ring gear on differential carrier. See Fig. 40 . Install and tighten ring gear bolts in crisscross pattern to specification. See TORQUE SPECIFICATIONS .
4. Press NEW bearings onto differential carrier (if removed). Install set ring in transmission housing. See Fig. 44 . Do not install oil seal until differential side bearing clearance has been checked. See

**DIFFERENTIAL BEARING SIDE CLEARANCE .**



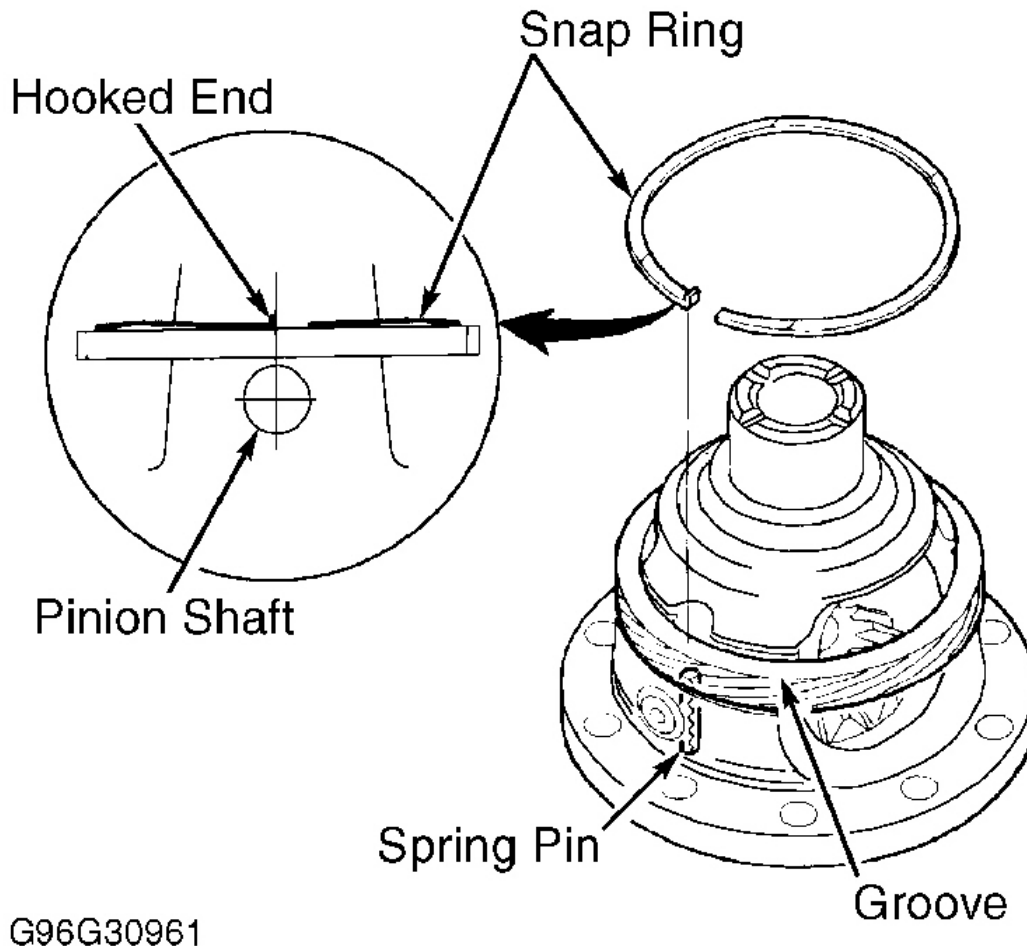
**Fig. 39: Checking Side Gear Backlash**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 40: Exploded View Of Differential Assembly**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

**Fig. 41: Installing Speedometer Drive Gear**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

**Differential Bearing Side Clearance**

**CAUTION:** If differential carrier, differential bearings, transmission housing, torque converter housing or snap rings are replaced, differential bearing side clearance must be checked.

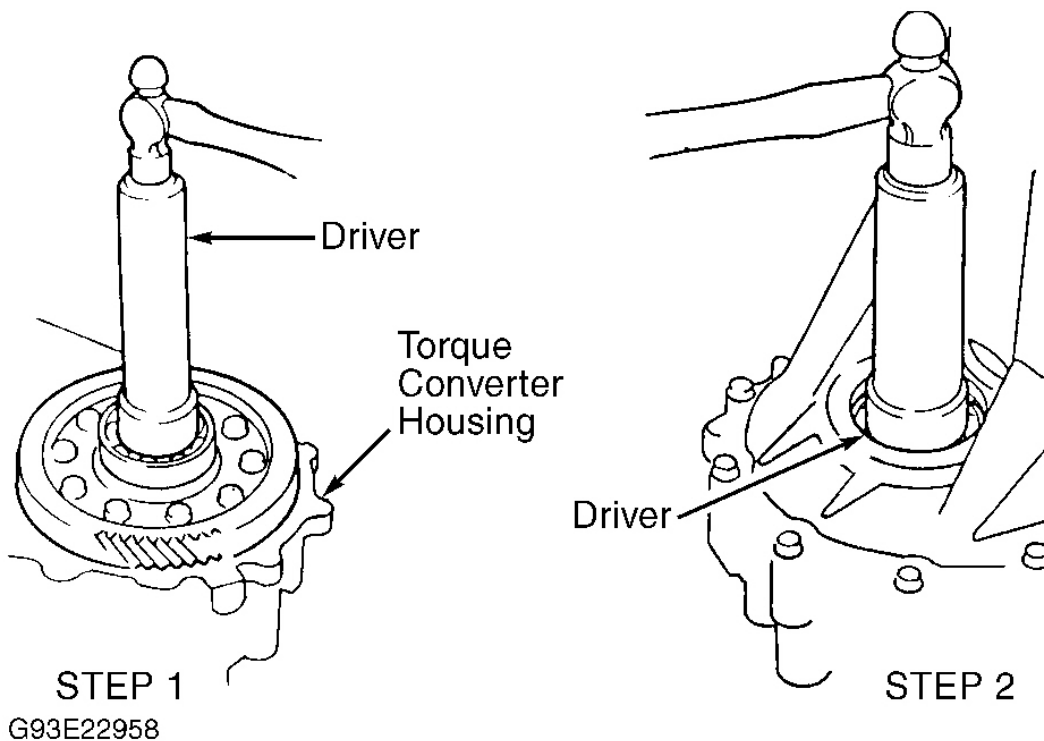
**NOTE:** Letter references in parenthesis are identified in the following illustrations.

1. Install set ring into transmission housing. See **Fig. 44** . Ensure set ring is fully seated.

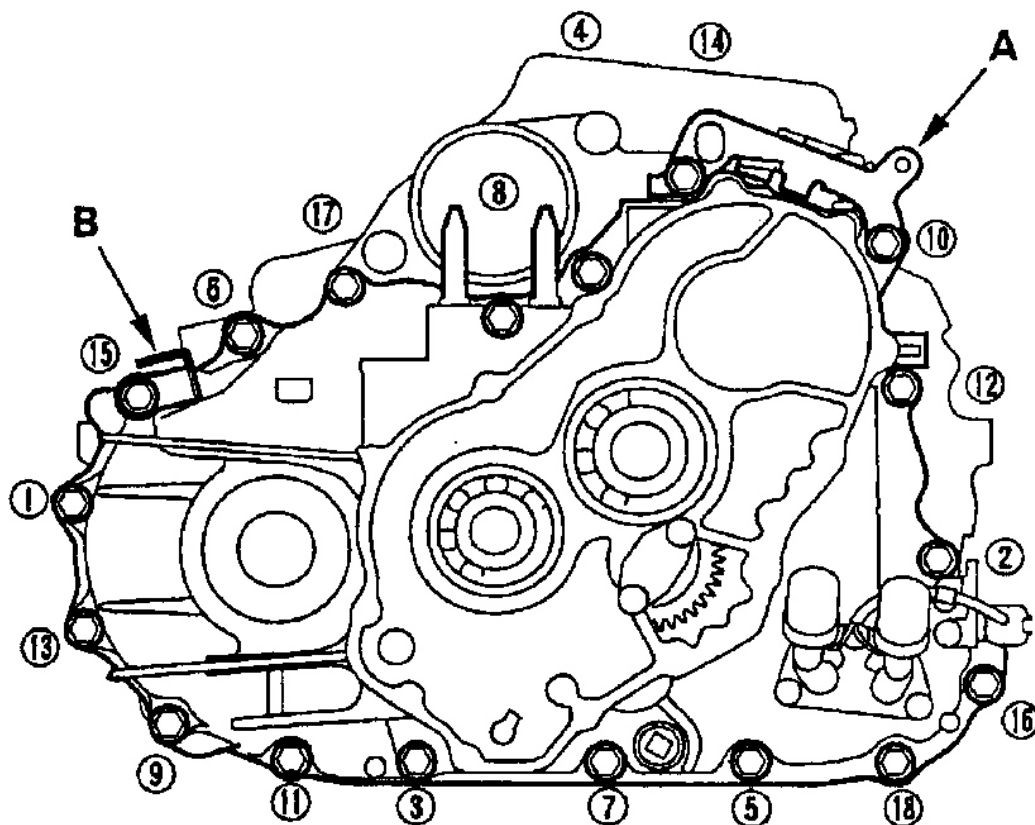
2. Tap differential assembly into torque converter housing using Driver (07746-0030100). See **Fig. 42** . Ensure differential bearing is fully seated in torque converter housing.

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

3. Align spring pin (A) on control shaft (B) with groove (C) in transmission housing by turning control shaft. See **Fig. 7** .
4. Install 3 dowel pins, gasket and transmission housing onto torque converter housing. Install and tighten transmission housing bolts (with hanger and connector bracket) to 32 ft. lbs. (44 N.m) in 2 steps using proper sequence. See **Fig. 43** .
5. Using driver, tap on transmission housing side of differential assembly to fully seat differential. See **Fig. 42** .
6. Using feeler gauge, measure differential bearing side clearance between set ring and bearing outer race on transmission housing. See **Fig. 44** . Replace set ring if differential bearing side clearance exceeds .006" (.15 mm). See **Fig. 45** . Recheck differential bearing side clearance. Remove transmission housing and differential assembly.



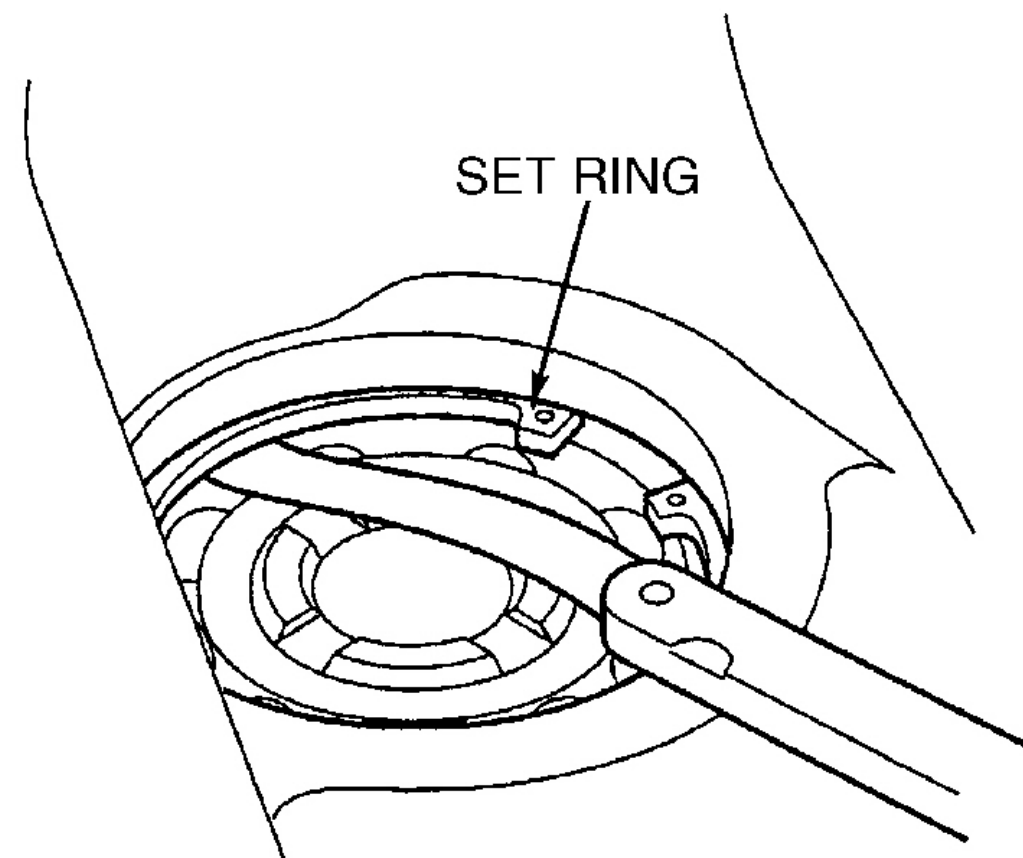
**Fig. 42: Installing Differential Assembly**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 43: Transmission Housing Bolt Tightening Sequence**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.





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**Fig. 44: Measuring Differential Bearing Side Clearance**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

No.	Part Number	Thickness
1	90414-689-000	2.50 mm (0.098 in.)
2	90415-689-000	2.60 mm (0.102 in.)
3	90416-689-000	2.70 mm (0.106 in.)
4	90417-689-000	2.80 mm (0.110 in.)
5	90418-689-000	2.90 mm (0.114 in.)
6	90419-PH8-000	3.00 mm (0.118 in.)

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**Fig. 45: Set Ring (80 mm) Selection Table**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

## TRANSAXLE REASSEMBLY

**CAUTION:** If transmission housing, torque converter housing, differential carrier or differential carrier bearings are replaced, differential assembly bearing side clearance must be checked. See **DIFFERENTIAL BEARING SIDE CLEARANCE** under DIFFERENTIAL ASSEMBLY in COMPONENT DISASSEMBLY & REASSEMBLY.

**NOTE:** Coat all components with ATF before reassembly.

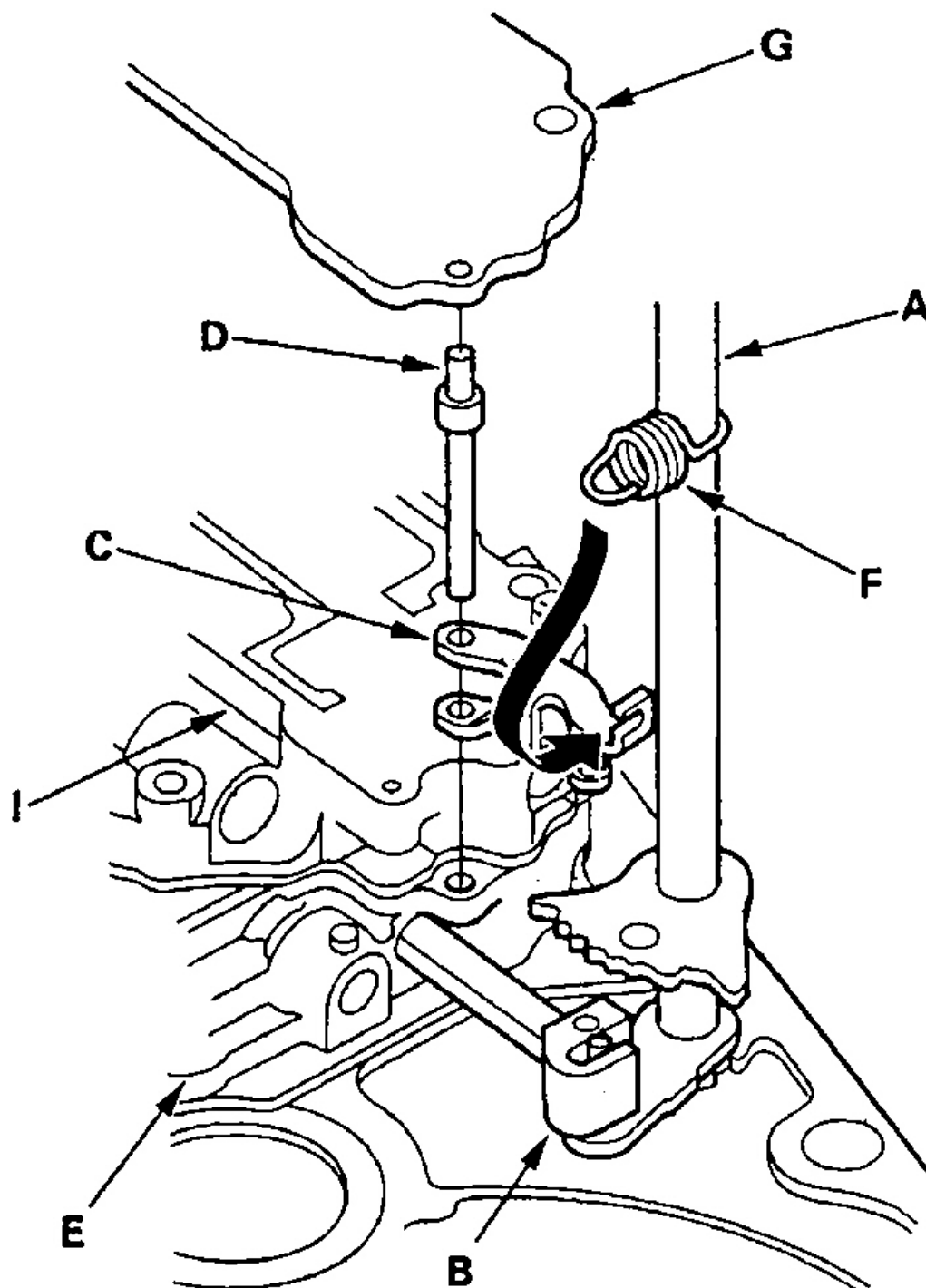
**NOTE:** Letter references in parenthesis are identified in the following illustrations.

1. Install suction pipe collar into torque converter housing. Install dowel pins (2) and main separator plate for main valve body onto torque converter housing. See **Fig. 10**.

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

2. Install oil pump drive gear, oil pump driven gear and oil pump driven gear shaft. Install main valve body. Install and loosely tighten 5 main valve body bolts. Ensure oil pump drive gear rotates smoothly in normal operating direction, and oil pump driven gear shaft moves smoothly in axial and normal operating direction.
3. Ensure check balls are installed in main valve body. See **Fig. 15**. Install separator plate, dowel pins (2) and secondary valve body onto main valve body. DO NOT install bolts.
4. Install control shaft (A) into torque converter housing with manual valve (B) together. Install detent arm

(C) and detent arm shaft (D) onto main valve body (E). Hook detent arm spring (F) onto detent arm. See **Fig. 46** .



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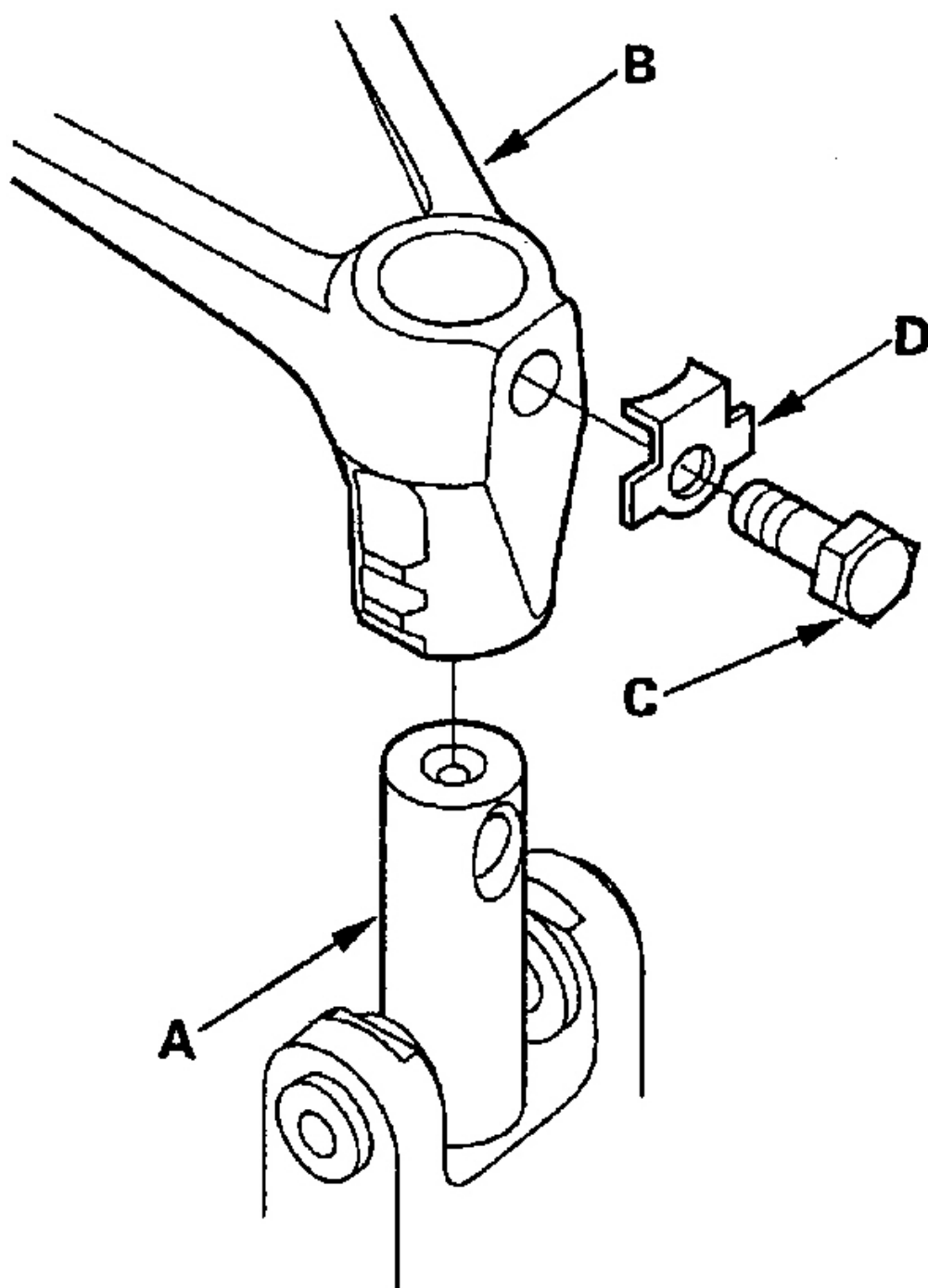
**Fig. 46: Installing Control Shaft With Manual Valve & Detent Components**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

5. Install separator plate and servo body. Install and tighten bolts to specification. See **TORQUE SPECIFICATIONS** . Install ATF strainer. See **Fig. 10** . Tighten main valve body bolts to specification. Ensure oil pump gears rotate smoothly and oil pump driven gear shaft moves freely.
6. Install stator shaft, NEW "O" ring and stator shaft stop. Install stop shaft bracket and bolts on secondary valve body. Tighten secondary valve body bolts to specification.
7. Install torque converter check valve and valve spring, cooler relief valve and valve spring into regulator valve body. Install regulator valve body with dowel pins (2) onto main valve body. Install and tighten bolt to specification.
8. Install lock-up separator plate and dowel pins (2) onto regulator valve body. Install lock-up valve body and bolts (7), and tighten bolts to specification. **TORQUE SPECIFICATIONS** . Install oil feed pipes (4) into servo body. Install oil feed pipes (3) into secondary valve body. Install feed pipe (105.8 mm) with filter side away from secondary valve body. Install oil feed pipes (2) into main valve body. Install feed pipe (138.8 mm) with filter side away from main valve body. See **Fig. 10** .
9. Install needle bearing in reverse idler gear. Install reverse idler gear into transmission housing (if removed). Install reverse idler gear shaft holder onto transmission housing. See **Fig. 38** . Install and tighten reverse idler gear shaft holder bolts to specification. See **TORQUE SPECIFICATIONS** .
10. Install differential assembly into torque converter housing. Using Driver (07746-0030100), tap differential assembly into torque converter housing. See **Fig. 42** . Ensure differential carrier bearing is fully seated in torque converter housing.
11. Install mainshaft and countershaft assemblies into torque converter housing. See **Fig. 8** . Rotate shift fork shaft (A) so large chamfered hole aligns with hole in reverse shift fork. See **Fig. 47** .
12. Install reverse shift fork and reverse selector on the shift fork shaft and countershaft. See **Fig. 9** . Secure shift fork (B) to shift fork shaft with lock bolt (C) and a NEW lock washer (D), then bend lock washer against the bolt head. Tighten bolt to specification. See **Fig. 47** .

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



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**Fig. 47: Installing Shift Fork To Shift Fork Shaft**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

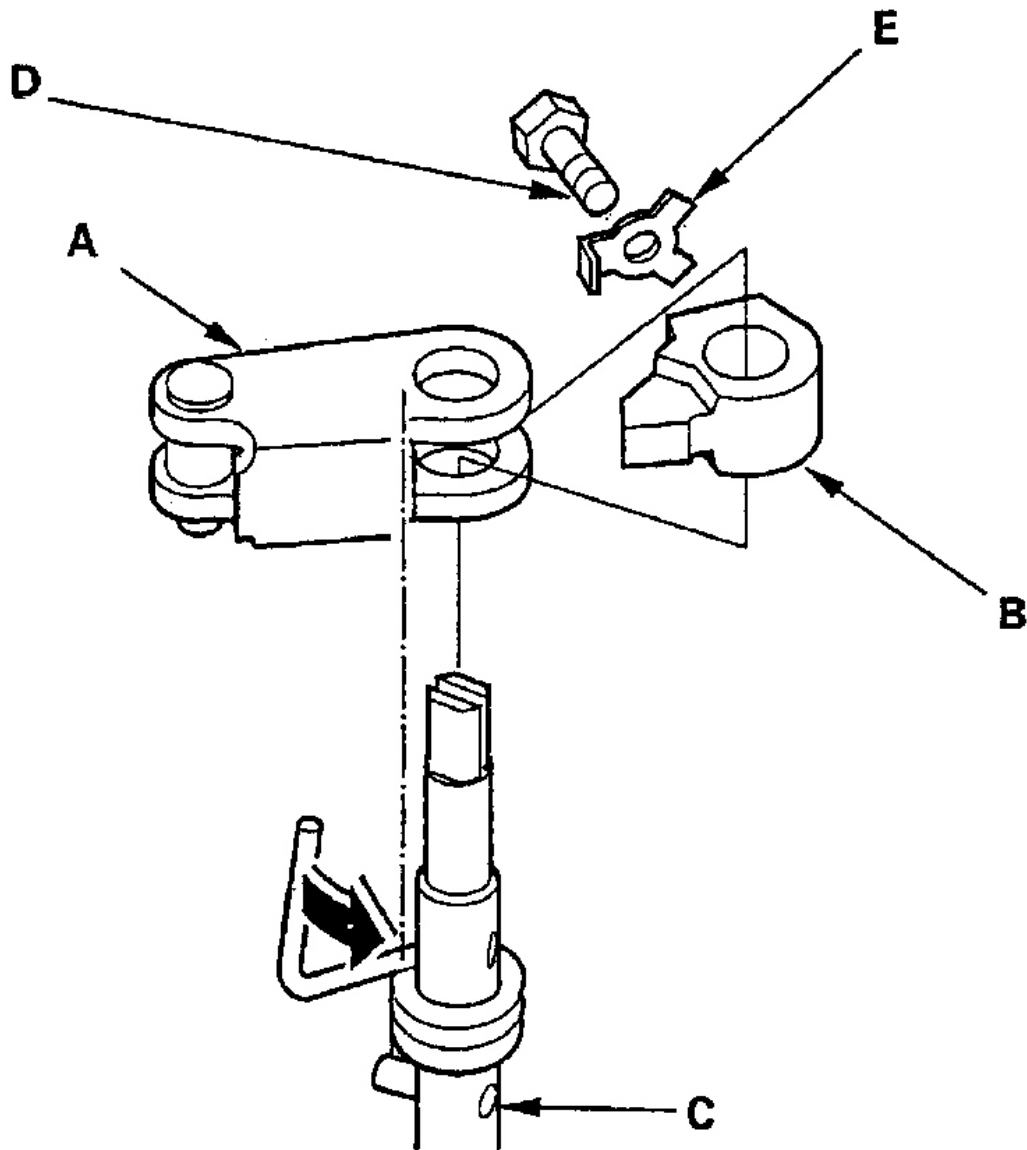
13. Install needle bearing, countershaft reverse gear and countershaft reverse gear collar onto countershaft. See **Fig. 9** . Align spring pin (A) on control shaft (B) with groove (C) on transmission housing by turning control shaft. See **Fig. 7** .

**CAUTION:** Ensure mainshaft speed sensor is not installed in transmission housing before installing transmission housing onto torque converter housing.

14. Install dowel pins (3), NEW gasket, transmission housing with transaxle hanger and connector bracket onto torque converter housing. Install and tighten transmission housing bolts to specification in 2 steps in correct sequence. See **Fig. 43** . See **TORQUE SPECIFICATIONS** .

**NOTE:** The mainshaft speed sensor washer is used on SLXA transaxle. Washer is not used on BMXA transaxle.

15. Install mainshaft speed sensor with sensor washer (if equipped).
16. Install park lever (A) with park lever stop (B) onto control shaft (C), then install lock bolt (D) with a NEW lock washer (E). Do not bend the lock tab of lock washer at this time. See **Fig. 48** .



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**Fig. 48: Installing Park Lever & Park Lever Stop**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Lubricate the following components with ATF; splines of countershaft and park gear, old lock nut threads and old conical spring washer, and washer to park gear contact areas. Assemble countershaft 1st gear and park gear and one-way clutch. See **Fig. 31** . Install countershaft 1st gear collar, needle bearing and countershaft 1st gear with one-way clutch and park gear onto countershaft.
18. Ensure one-way clutch is installed in correct direction. Align park gear splines with those of countershaft,



then push park gear onto countershaft by hand. Install park pawl shaft, pawl shaft collar, park pawl spring, park pawl, and stop shaft onto transmission housing.

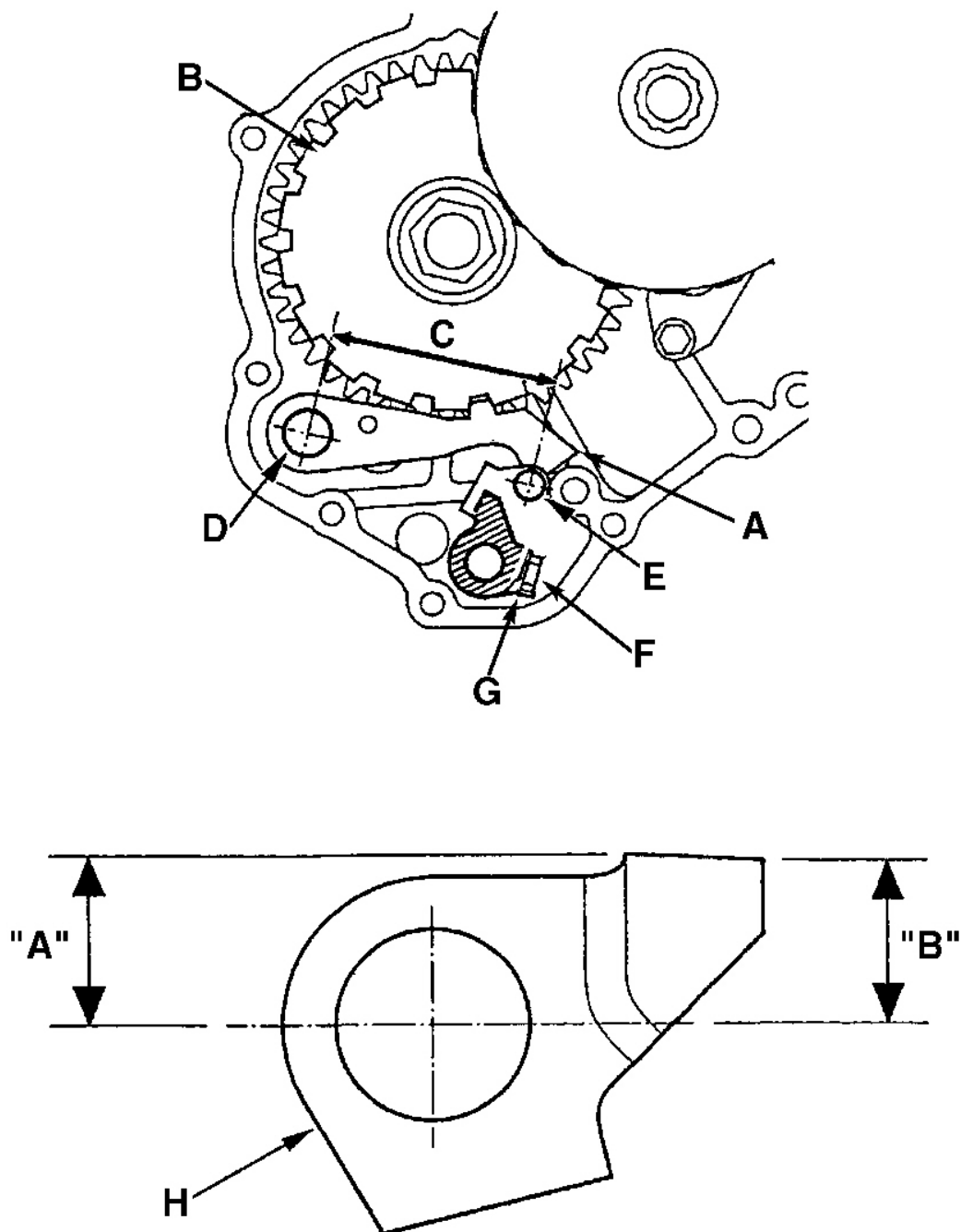
**NOTE: Countershaft lock nut has left hand threads. Use a torque wrench to tighten lock nut. DO NOT use an impact wrench.**

19. Engage park pawl with park gear. Install old conical spring washer and lock nut on countershaft. Tighten lock nut to 76 ft. lbs (103 N.m), then remove old lock nut and conical spring washer. Install mainshaft holder onto mainshaft. See **Fig. 4** . Install mainshaft 1st gear collar, mainshaft 1st gear, needle bearing, thrust needle bearing and thrust washer onto mainshaft. See **Fig. 22** . Wrap splines on mainshaft with tape to prevent "O" ring damage. Install NEW "O" rings onto mainshaft, then remove tape.
20. Install 1st clutch assembly onto mainshaft. Lubricate threads of both shafts, NEW lock nuts and new conical spring washers with ATF.

**NOTE: Ensure spring washers are installed in correct direction. See **Fig. 22** and **Fig. 25** .**

**NOTE: Countershaft and mainshaft lock nuts have left hand threads. Use a torque wrench to tighten lock nuts. DO NOT use an impact wrench.**

21. Install NEW conical spring washers and lock nuts on countershaft and mainshaft. Tighten lock nuts to specifications. See **TORQUE SPECIFICATIONS** . Remove mainshaft holder. Using hammer and punch, stake lock nuts at groove in mainshaft and countershaft.
22. Place park lever in "P" position. Ensure park pawl (A) engages park gear (B). If park pawl does not engage fully, measure distance (C) between park shaft (D) and park lever roller pin (E). See **Fig. 49** .
23. Distance should be 2.87-2.91" (72.9-73.9 mm). If distance is not within specification, install different size park lever stop (H), and recheck distance. See **Fig. 49** . Park lever stop is available in 3 different sizes. See **Fig. 50** .
24. Once correct park lever stop distance is obtained, tighten lock bolt (F) and bend the lock tab of lock washer (G) against bolt head. See **Fig. 49** .
25. Install end cover (A) and bolts with 2 dowel pins, NEW "O" rings, NEW gasket and connector bracket (B). See **Fig. 51** . Tighten bolts to specification. See **TORQUE SPECIFICATIONS** .
26. Set control shaft to "N" position. Align the cutouts (A) on rotary frame with neutral positioning cutouts (B) on transmission range switch, then put a .080" (2.00 mm) feeler gauge blade (C) in cutouts to hold switch in "N" position. See **Fig. 52** .
27. Install transmission range switch gently on control shaft while holding shaft in "N" position with feeler gauge blade. Install and tighten bolts to specification. Remove feeler gauge.
28. To install remaining components, reverse disassembly procedure. Use NEW seal washers when installing cooler line bolts. Use NEW "O" rings when installing mainshaft or countershaft speed sensors. Tighten all fasteners to specification.



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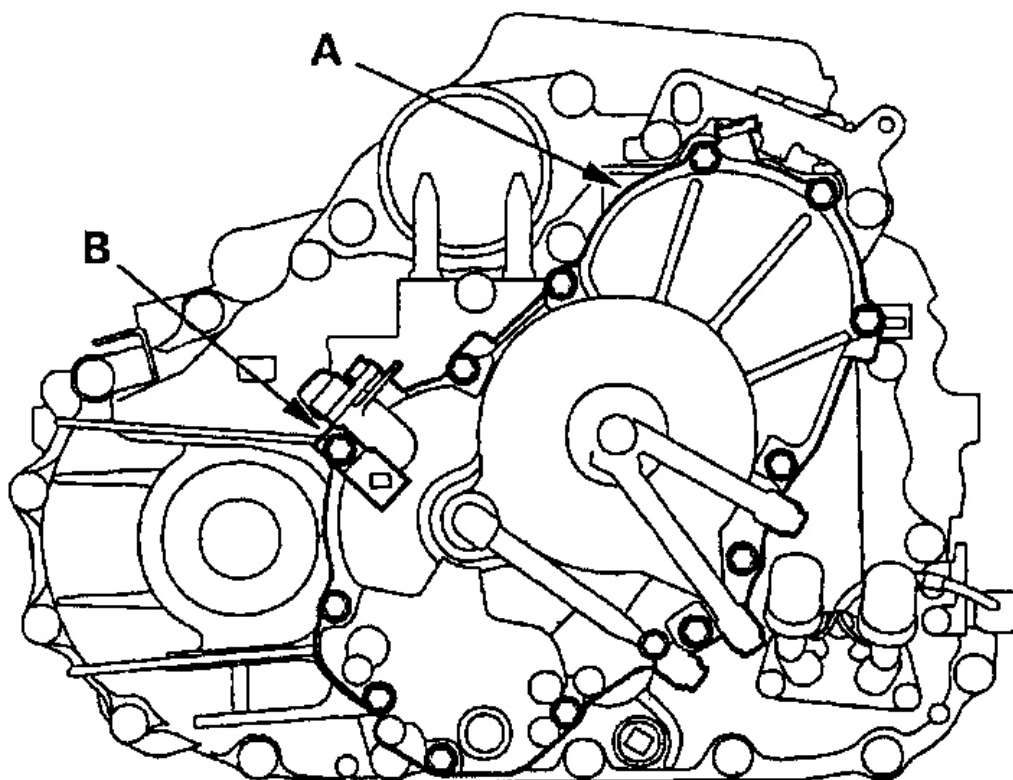
**Fig. 49: Measuring Park Pawl Shaft-To-Roller Pin Distance**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.)

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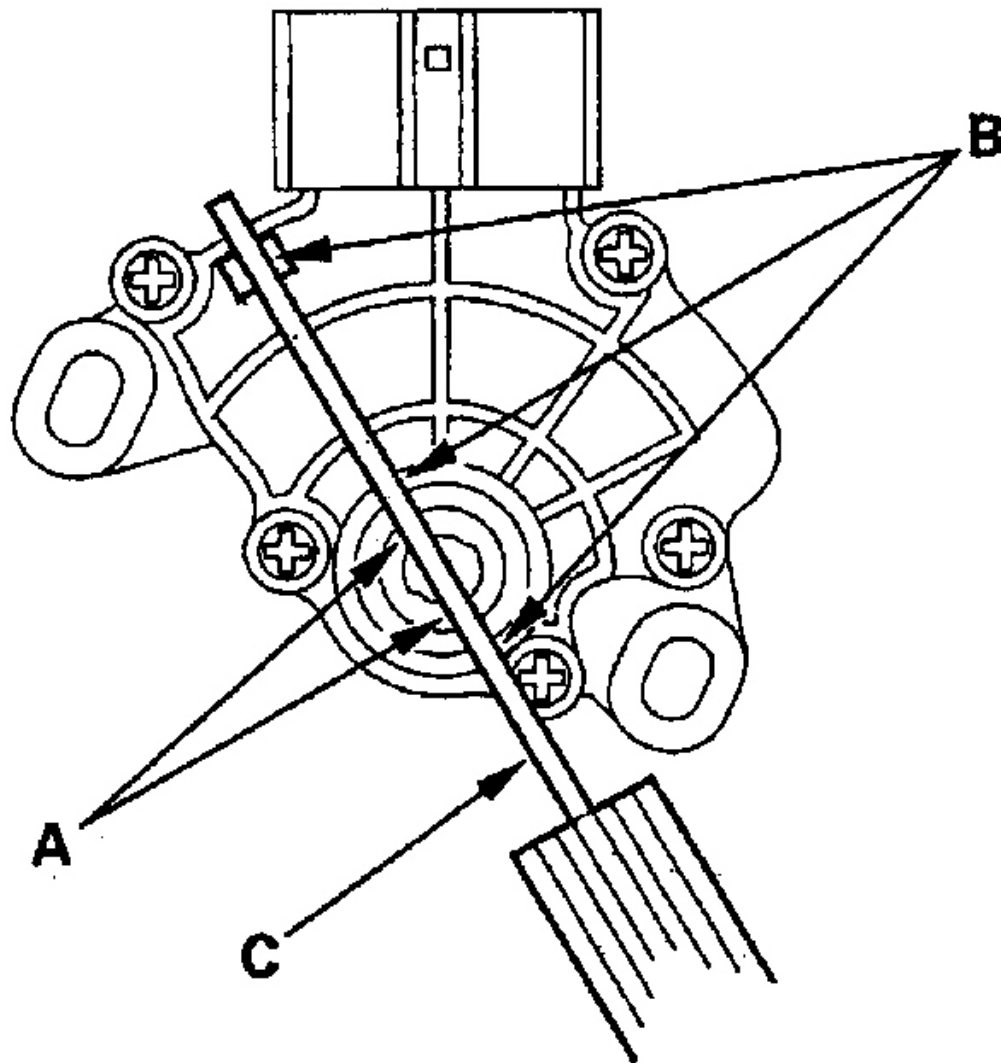
**Fig. 50: Park Lever Stop Selection Chart**

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 51: Identifying End Cover Bolt Locations**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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**Fig. 52: Installing Feeler Gauge Blade At Switch**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS

## 2001 Honda Civic EX

### 2001-02 AUTOMATIC TRANSMISSIONS BMXA & SLXA Overhaul

Application	Ft. Lbs. (N.m)
Cooler Line Bolt	21 (28)
Countershaft Lock Nut	76 (103)
Drain Plug	36 (49)
Mainshaft Lock Nut	58 (79)
Pressure Tap Plug	13 (18)
Ring Gear Bolt	76 (103)
Transmission Housing Bolt <sup>(1)</sup>	32 (44)
<b>INCH Lbs. (N.m)</b>	
Countershaft Speed Sensor Bolt	106 (12.0)
End Cover Bolt	106 (12.0)
Lock-Up Valve Body Bolt	106 (12.0)
Mainshaft Speed Sensor Bolt	106 (12.0)
Main Valve Body Bolt	106 (12.0)
Parking Lever Bolt	124 (14.0)
Regulator Valve Body Bolt	106 (12.0)
Regulator Valve Body Stop Bolt	106 (12.0)
Reverse Idler Gear Shaft Holder Bolt	106 (12.0)
Reverse Shift Fork Bolt	124 (14.0)
Secondary Valve Body Bolt	106 (12.0)
Servo Body Bolt	106 (12.0)
Solenoid Valve Assembly Bolt	106 (12.0)
Transmission Range Switch & Cover Bolt	106 (12)
(1) Tighten bolts to specification in sequence. See <b>Fig. 43</b> .	

## TRANSAXLE SPECIFICATIONS

### TRANSAXLE SPECIFICATIONS

Application	Specification In. (mm)
Clutch Clearance	
1st & 2nd Clutches	.026-.033 (.65-.85)
3rd & 4th Clutches	.016-.024 (.40-.60)
Countershaft 2nd Gear Clearance	.004-.007 (.10-.18)
Differential Bearing Side Clearance	<sup>(1)</sup> .006 (.15)
Differential Side Gear Backlash	.002-.006 (.05-.15)
Mainshaft Clearance	.002-.005 (.05-.13)
Oil Pump Clearances	
Side Clearance	
Oil Pump Drive Gear	.0041-.0052 (.105-.133)
Oil Pump Driven Gear	.0014-.0025 (.035-.063)

**2001 Honda Civic EX**

2001-02 AUTOMATIC TRANSMISSIONS BMXA &amp; SLXA Overhaul

**Thrust Clearance**

Standard	.001-.002 (.03-.05)
Wear Limit	.003 (.07)
Parking Lever Stop Distance	2.87-2.91 (72.9-73.9)
(1) Maximum clearance. Replace set ring with different thickness set ring if clearance exceeds specification.	

**CLUTCH DISC & PLATE QUANTITY**

<b>Component</b>	<b>Disc</b>	<b>Plate</b>
1st, 2nd, 3rd & 4th Clutch	3	3