

2001 Honda Civic EX

2001-02 AUTOMATIC TRANSMISSIONS MLYA CVT Overhaul

2001-02 AUTOMATIC TRANSMISSIONS

MLYA CVT 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 Coupe	MLYA

IDENTIFICATION

TRANSAXLE

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

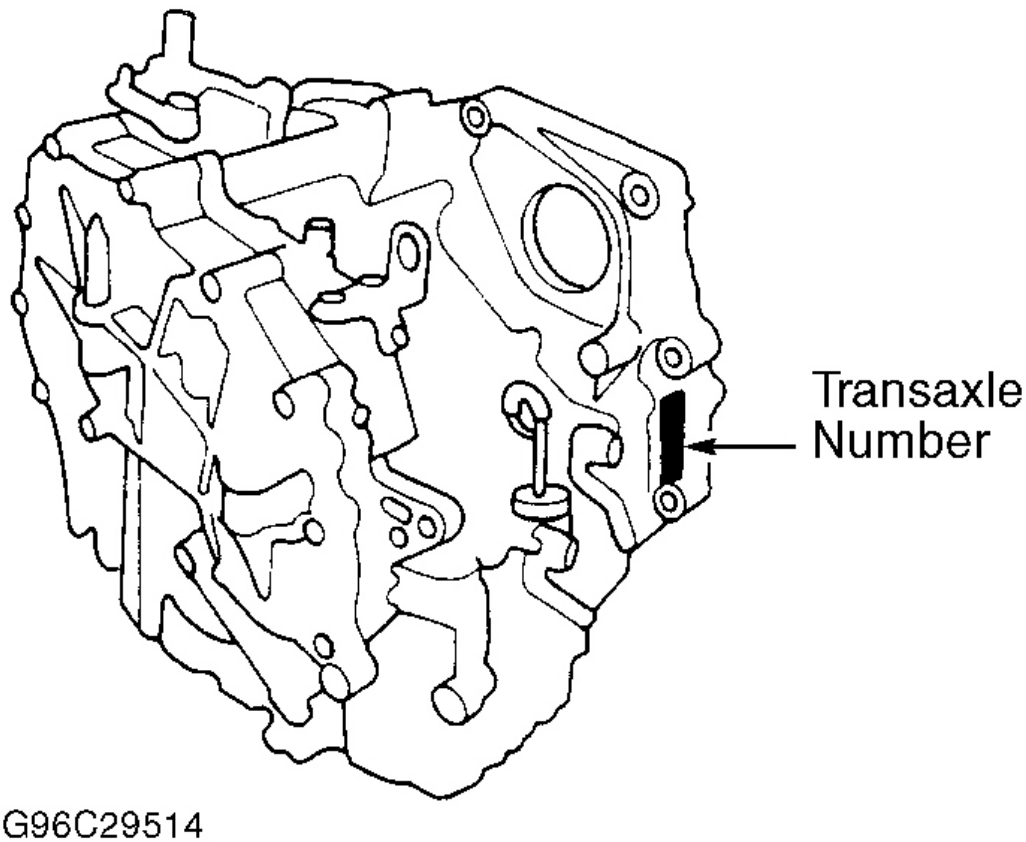


Fig. 1: Identifying Transaxle Model & Serial Number Location
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DESCRIPTION

INTRODUCTION

The Continuously Variable Transaxle (CVT) is an electronically controlled automatic transaxle with drive and driven pulleys, and steel belt. Steel belt is made up of 2 steel loops, comprised of 12 layers each, and about 280 metal elements attached between steel loops. The CVT provides non-stage speeds forward and one reverse. The entire unit is positioned in line with the engine. Transaxle is not equipped with a torque converter. Around the outside of the flywheel is a ring gear which meshes with the starter pinion when the engine is being started. The transaxle has 4 parallel shafts: the input shaft, the drive pulley shaft, the driven pulley shaft, and the secondary gear shaft. See **Fig. 2**. The input shaft is in line with the engine crankshaft. The drive pulley shaft and driven pulley shaft consist of movable and fixed face pulleys. Both pulleys are linked by the steel belt. The input shaft includes the sun gear and planetary gears with carrier. The drive pulley shaft includes the drive pulley and forward clutch. The driven pulley shaft includes the driven pulley, start clutch, and the secondary drive gear which is integral with the park gear. The secondary gear shaft is positioned between the secondary drive gear

and the final driven gear. The secondary gear shaft includes the secondary driven gear and the final drive gear which serves to change the rotation direction, because the drive pulley shaft and driven pulley shaft rotate the same direction. When certain conditions of the planetary gears in the transaxle are engaged by the clutch and the reverse brake, power is transmitted from the drive pulley shaft to the driven pulley shaft to provide gear positions.

The electronic control system consists of the Powertrain Control Module (PCM), sensors, and solenoid valves. Shifting is electronically controlled for comfortable driving under all conditions. PCM is located below dashboard, behind glove box.

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

The lower valve body assembly includes the main valve body, the secondary valve body, the CVT pulley pressure control valve assembly, the CVT speed change control valve assembly, and the CVT start clutch pressure control valve assembly. They are positioned on the lower portion of the transaxle housing. The main valve body contains the Pressure High Control (PHC) valve, the lubrication check valve, the cooler relief valve, and the Clutch Pressure Control (CPC) valve. The secondary valve body contains the start clutch accumulator valve, the shift inhibitor valve, the clutch pressure reducing valve, Pressure High (PH) regulator valve, and the lubrication regulator valve. The CVT pulley pressure control valve assembly contains the Pressure Low (PL) regulator valve and the High/Low Pressure Control (HLC) valve, which is joined with the HLC solenoid. The shift inhibitor solenoid valve is positioned on the CVT pulley pressure control valve assembly. The CVT speed change control valve assembly contains the pulley control valve and the shift control valve. The CVT start clutch pressure control valve assembly contains the start clutch control valve, which is joined with the start clutch control solenoid. The solenoids are controlled by the PCM. The manual valve body is bolted on the intermediate housing, and contains the manual valve and the reverse inhibitor valve.

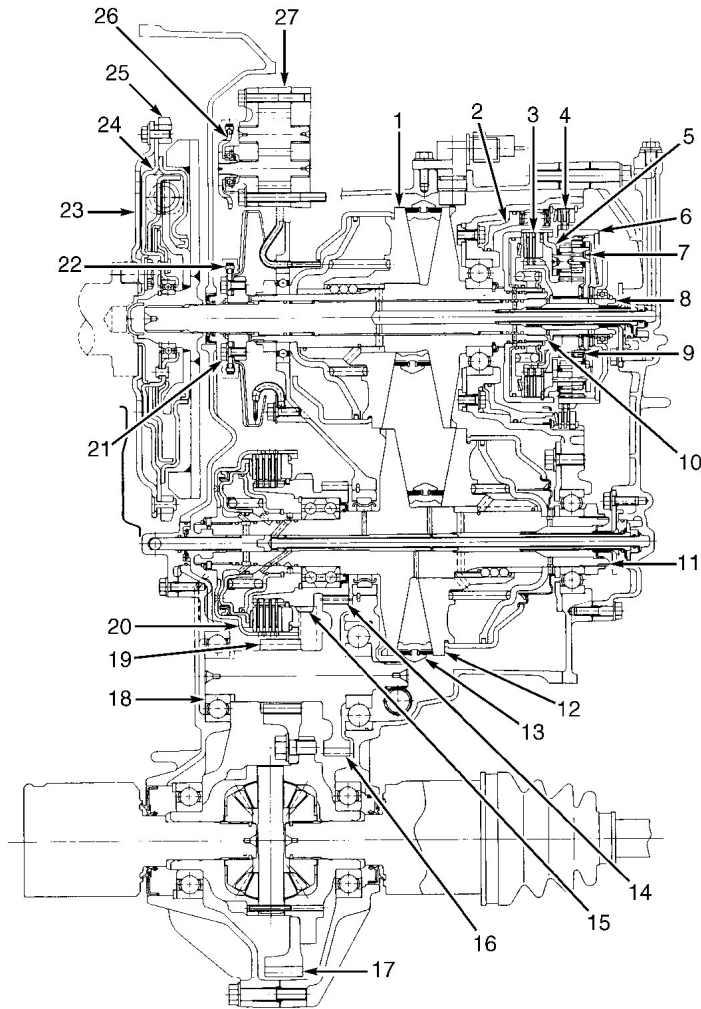
Dual mass flywheel provides a damping effect that helps reduce fluctuations in driveline rotation speed. This results in smoother engine and drivetrain operation. Flywheel is a 2-piece design. One half bolts to crankshaft. Other half is splined to transaxle input shaft. Crankshaft half drives input shaft half using torsion springs, viscous damping chambers that contain grease and a friction surface. Torsion springs allow controlled movement between the 2 surfaces. Grease chambers and friction surface act as dampers.

The oil pump is located on the transaxle housing, and it is linked with the input shaft by the sprockets and the sprocket chain. The pulleys and clutches receive fluid from their respective feed pipes, and the reverse brake receives fluid from internal hydraulic circuit. PCM controls shift pulley ratio to solenoids, while receiving input signal from the various sensors and switches located throughout the vehicle. PCM actuates the shift control solenoid and the shift control valve to change the shift control pressure. The shift control pressure is applied to the drive and driven pulleys, and pulley ratio is changed to their effective ratio.

Transaxle is equipped with shift and key interlock systems. Shift interlock system prevents gearshift lever from being moved from Park unless brake pedal is depressed and accelerator pedal is in idle position. In case of a malfunction, gearshift lever can be released by placing ignition key in key release slot near gearshift lever. Key interlock system prevents ignition key from being removed from ignition lock assembly unless gearshift lever is in Park. For diagnosis of interlock systems, see **SHIFT INTERLOCK SYSTEMS - CIVIC** article.

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

1. Drive Pulley
2. Reverse Brake Piston
3. Forward Clutch
4. Reverse Brake
5. Carrier Assembly
6. Ring Gear
7. Planetary Pinion Gears
8. Input Shaft
9. Sun Gear
10. Drive Pulley Shaft
11. Driven Pulley Shaft
12. Driven Pulley
13. Steel Belt
14. Secondary Drive Gear
15. Parking Gear
16. Secondary Driven Gear
17. Final Driven Gear
18. Secondary Gear Shaft
19. Final Drive Gear
20. Start Clutch
21. Oil Pump Drive Sprocket
22. Oil Pump Drive Chain
23. Drive Plate
24. Flywheel
25. Ring Gear
26. Oil Pump Driven Sprocket
27. Oil Pump



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

OPERATION

TRANSAXLE

CVT is designed with a fail-safe operation mode. Transaxle is driveable through purely hydraulic function in the event of electronic control failure. Drive and driven pulleys provide variable diameters for steel belt to transfer power at various ratios, and maintain optimum side pressure on steel belt. Drive pulley pushes steel belt, driving driven pulley, which drives start clutch. Each pulley consists of a fixed surface and a movable surface. On both pulleys, springs apply pressure to movable surfaces, forcing movable surface toward fixed surface. When torque is applied to steel belt, it tries to wedge surfaces apart.

Hydraulic pressure can be applied to hydraulic control chambers to resist wedging action of steel belt. More hydraulic pressure will force pulley surfaces together, toward a larger pulley diameter. With less hydraulic

pressure, wedging action of steel belt will force pulley surfaces apart, resulting in a smaller diameter pulley.

Each pulley has a cancellor chamber opposite the hydraulic control chamber. See **Fig. 3** . Cancellor chamber is kept full of lubrication oil. Cancellor chamber is necessary because hydraulic control chamber is always full of oil, even when no pressure is applied. As pulley spins, centrifugal force causes it to apply some pressure to movable pulley face. However, centrifugal force on oil in cancellor chamber applies pressure in opposite direction, so net force is zero.

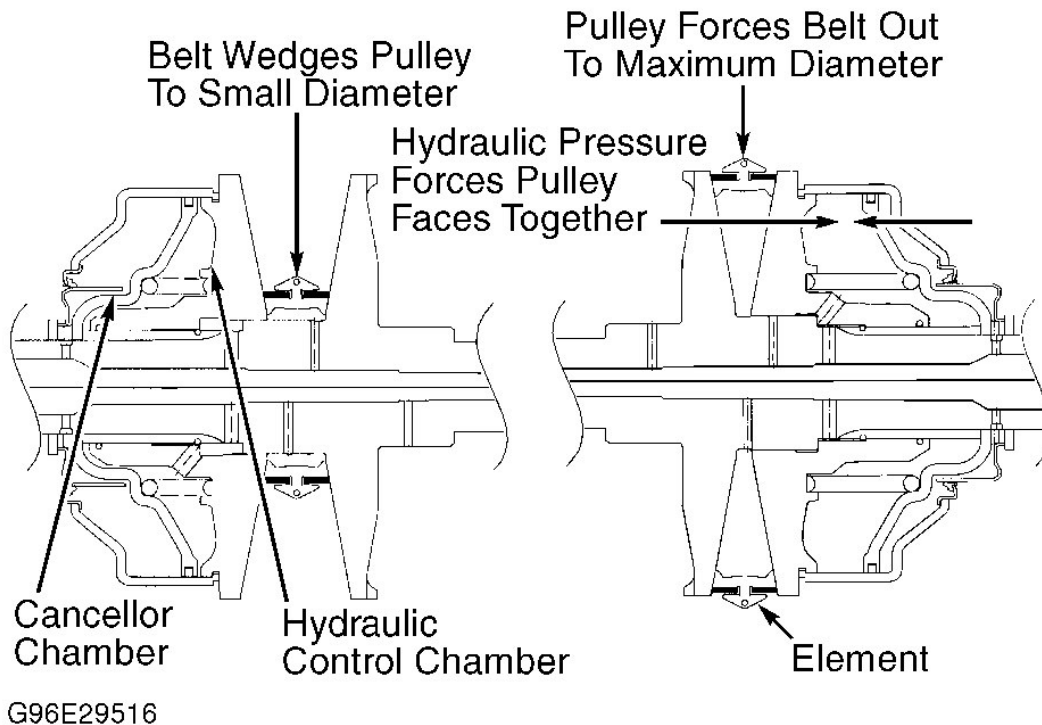
Manual valve has 6 positions but there are only 4 hydraulic positions. Input from various sensors located throughout vehicle determine which control valve PCM will activate. Activating speed change control valve changes shift control valve pressure, causing shift valve to move. This pressurizes drive pulley pressure to drive pulley and driven pulley, which changes their effective pulley ratio. Activating start clutch pressure control valve moves start clutch control valve. Start clutch control valve uncovers port to allow start clutch pressure to start clutch, which engages start clutch. Start clutch slips to allow engine to idle in gear when vehicle is stopped, controls slippage when starting from a stop, and locks up during normal driving for maximum power transfer efficiency and fuel economy.

Reverse inhibitor solenoid is an on/off type solenoid which operates reverse inhibitor valve to prevent reverse engagement until vehicle speed is less than 6 MPH. Start clutch pressure control valve controls pressure applied to start clutch. Low pressure is applied at a stop, increased pressure is applied during acceleration, or full pressure is applied during normal driving conditions. Pulley pressure control valve is used to control amount of side pressure applied to steel belt by pulleys. Under high load situations, valve allows high side pressure to be applied to prevent belt slippage. Under lower load situations, it reduces amount of side pressure to reduce friction and improve fuel economy. Speed change control valve operates shift valve to determine amount of pressure to be applied to drive and driven pulley's hydraulic control chambers. This determines exact drive ratio.

When gearshift lever is moved, manual valve on main valve body is moved by shift cable. Gearshift lever also changes position of transaxle range switch, mounted on top of transaxle. Transaxle range switch delivers an input signal to PCM to indicate gearshift lever position. PCM uses this input signal to control valves. PCM determines appropriate shift point and activates proper valve for transaxle shifting.

When transaxle gear combinations are engaged by clutches and brake, power is transmitted to provide appropriate gears. Gearshift lever positions operate as follows:

- **"P" (Park)** - Front wheels lock as parking pawl engages with parking gear on driven pulley shaft. All clutches are released. Neutral safety switch, incorporated in transaxle range switch, allows engine starting in this position. All hydraulic pressure is blocked at manual valve.
- **"R" (Reverse)** - Reverse brake is engaged. Back-up light switch, incorporated in transaxle range switch, allows back-up lights to operate. Hydraulic pressure is directed to reverse brake.
- **"N" (Neutral)** - All clutches are released. Neutral safety switch, incorporated in transaxle range switch, allows engine starting in this position. All hydraulic pressure is blocked at manual valve.
- **"D" (Drive)** - Transaxle automatically adjusts gear ratio to keep engine at most efficient speed for current driving conditions. Hydraulic pressure is directed to forward clutch.
- **"S" (Second)** - Transaxle shifts into a lower gear for better acceleration and increased engine braking. Used for rapid acceleration at highway speeds. Hydraulic pressure is directed to forward clutch.
- **"L" (Low)** - Transaxle shifts into lowest gear for increased power on hills and for engine braking. Hydraulic pressure is directed to forward clutch.

**Fig. 3: Identifying Pulley Operation**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

START CLUTCH CALIBRATION PROCEDURE

NOTE: When PCM, transaxle assembly, start clutch assembly, lower valve body assembly or engine assembly are replaced, PCM must memorize feedback signal for start clutch control. Perform following procedure to calibrate start clutch.

1. Start engine and warm to normal operating temperature (radiator fan comes on).
2. Place gearshift lever in "D" position.
3. Turn off all electrical systems.
4. Road test vehicle up to 37 MPH on flat road. After speed reaches 37 MPH, release accelerator for 5 seconds. Do not press brake pedal to decelerate vehicle. PCM will memorize feedback signal.
5. Test drive vehicle and check that engine does not stall and vehicle can start off smoothly. If engine stalls or any shifting failure occurs at start off, recalibrate start clutch feedback signal.

NOTE: PCM will not store feedback signal when fluid temperature is less than 104°F (40°C) even if engine coolant temperature reaches normal operating temperature. Repeat these procedures until start clutch calibration is

completed.

LUBRICATION

NOTE: See SERVICING - HONDA (FWD) article.

TROUBLE SHOOTING

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 MLYA CVT DIAGNOSIS article.

TRANSAXLE DISASSEMBLY

NOTE: Refer to exploded views as needed during the following procedures. See Fig. 5 and Fig. 9 .

NOTE: Letters in parenthesis in the following steps are identified in illustration.

1. Remove ATF passage line holder assembly. Remove 20 bolts and flywheel housing. Remove ATF passage line assembly. Remove oil pump drive sprocket, then remove oil pump drive chain. See Fig. 5 . Move pitot flange toward its cutout to clear pitot pipe under pitot flange, then remove pitot flange. See Fig. 6 .
2. Expand snap ring (A) under oil pump driven sprocket (B) with snap ring pliers, then remove oil pump driven sprocket. See Fig. 4 . Remove oil pump body (C) from transaxle housing.

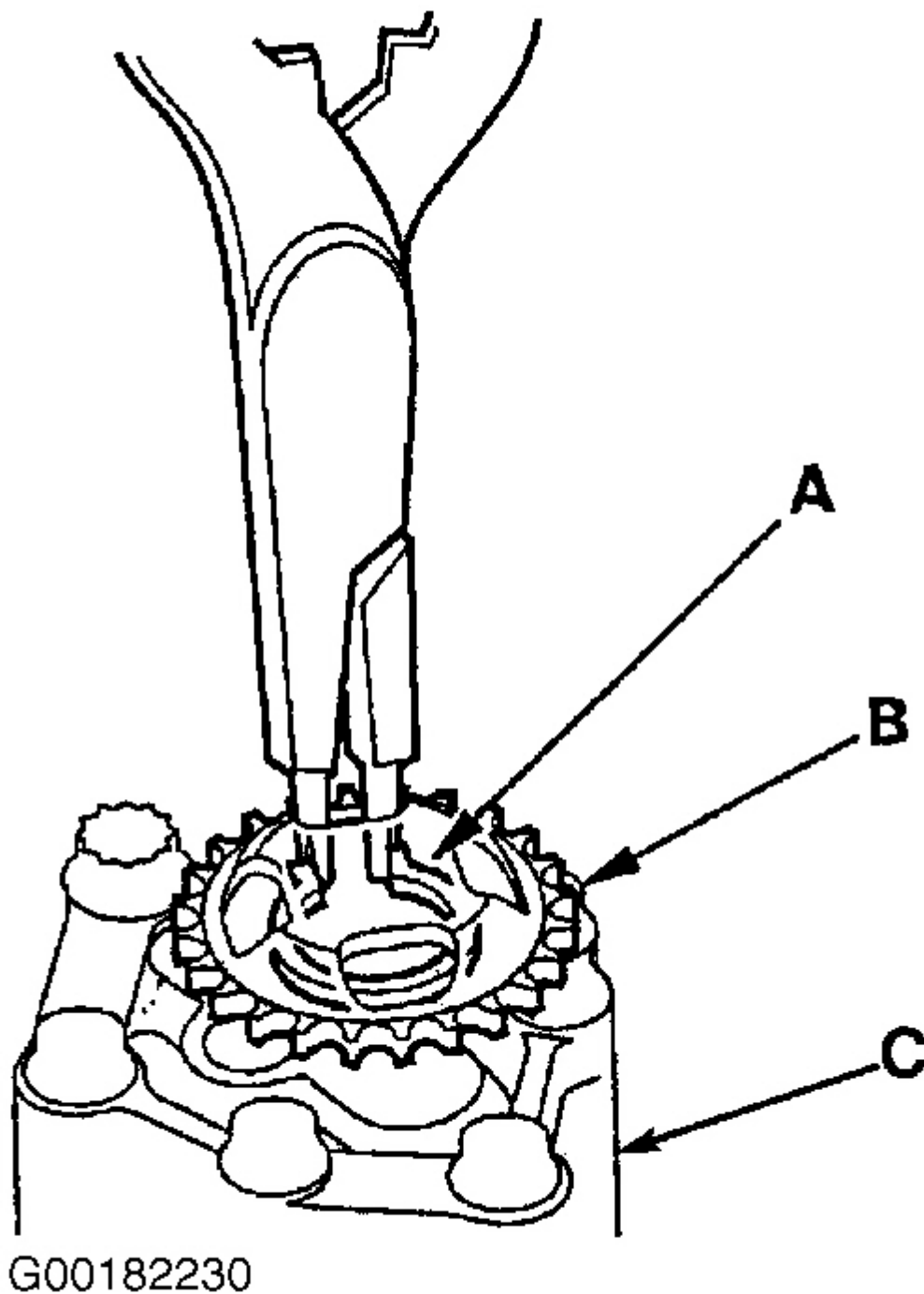


Fig. 4: Expanding Snap Ring Under Oil Pump Driven Sprocket

Courtesy of AMERICAN HONDA MOTOR CO., INC.

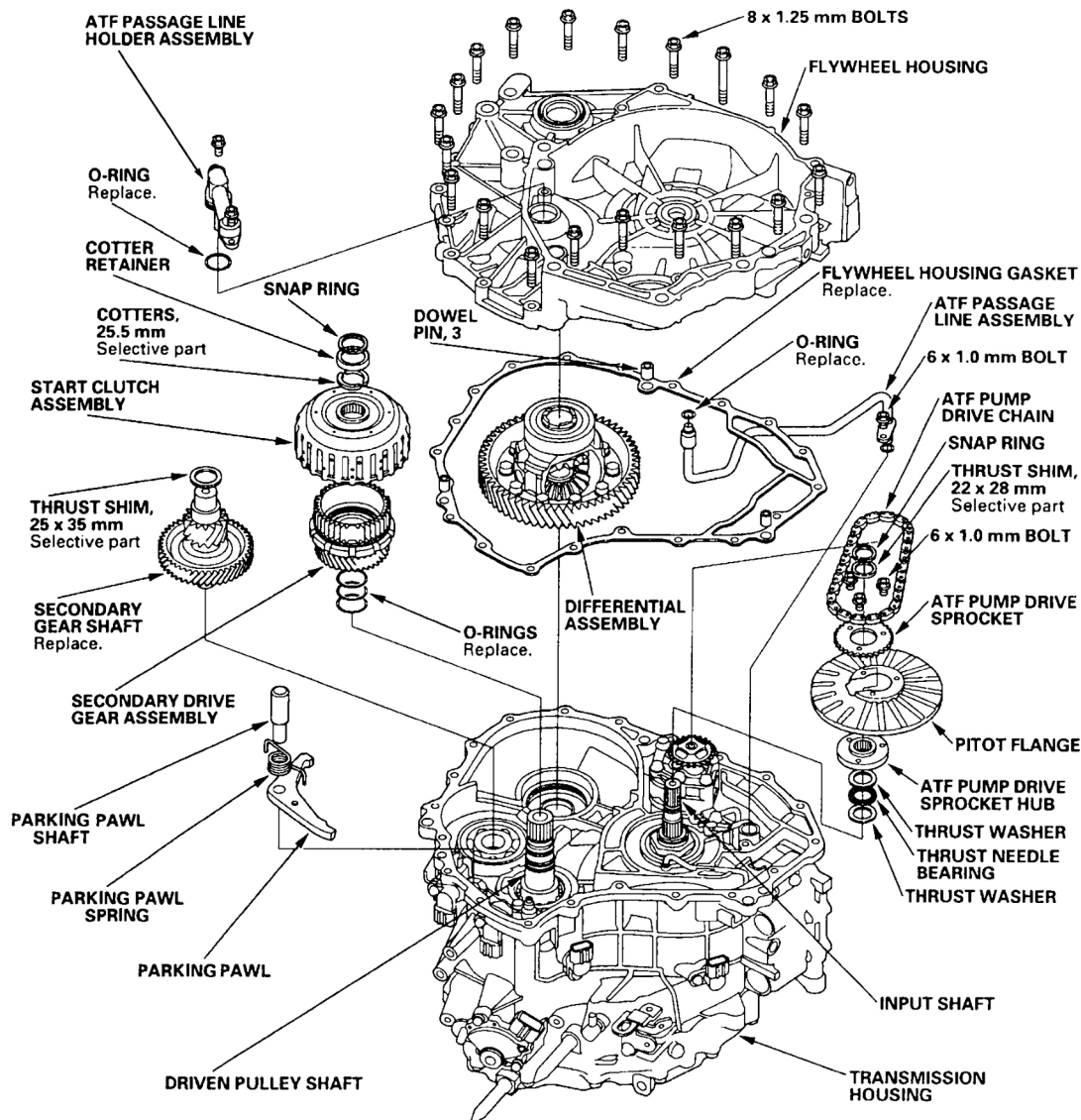
3. Remove snap ring securing oil pump drive sprocket hub. Remove thrust shim, oil pump drive sprocket hub, thrust washers and thrust needle bearing. Remove differential assembly. Remove parking pawl shaft, parking pawl spring and parking pawl. See **Fig. 7** . Remove snap ring securing start clutch. Remove cotter retainer and cotters. See **Fig. 5** .
4. Set Start Clutch Remover (07TAE-P4V0120) on start clutch. Attach jaws of remover to parking gear. See **Fig. 8** . Remove start clutch and secondary drive gear assembly.

CAUTION: DO NOT place jaws of remover on start clutch guide. If jaws of remover contacts start clutch guide, start clutch guide may be damaged.

5. Remove sealing ring (A) from secondary drive gear (B), and clean it for reassembly on NEW secondary drive gear. See **Fig. 38** . Remove secondary gear shaft.
6. Remove 6 mm (3) and 8 mm (11) end cover bolts and remove cover. Remove manual valve body lines. Remove input shaft/planetary carrier assembly and ring gear.
7. Remove snap ring securing reverse brake discs and plates. Remove reverse brake end plate, discs, plates and disc spring. See **Fig. 9**
8. Remove snap ring securing forward clutch end plate, then remove forward clutch end plate, discs and plates.
9. Remove snap ring securing forward clutch to drive pulley shaft, then remove forward clutch.

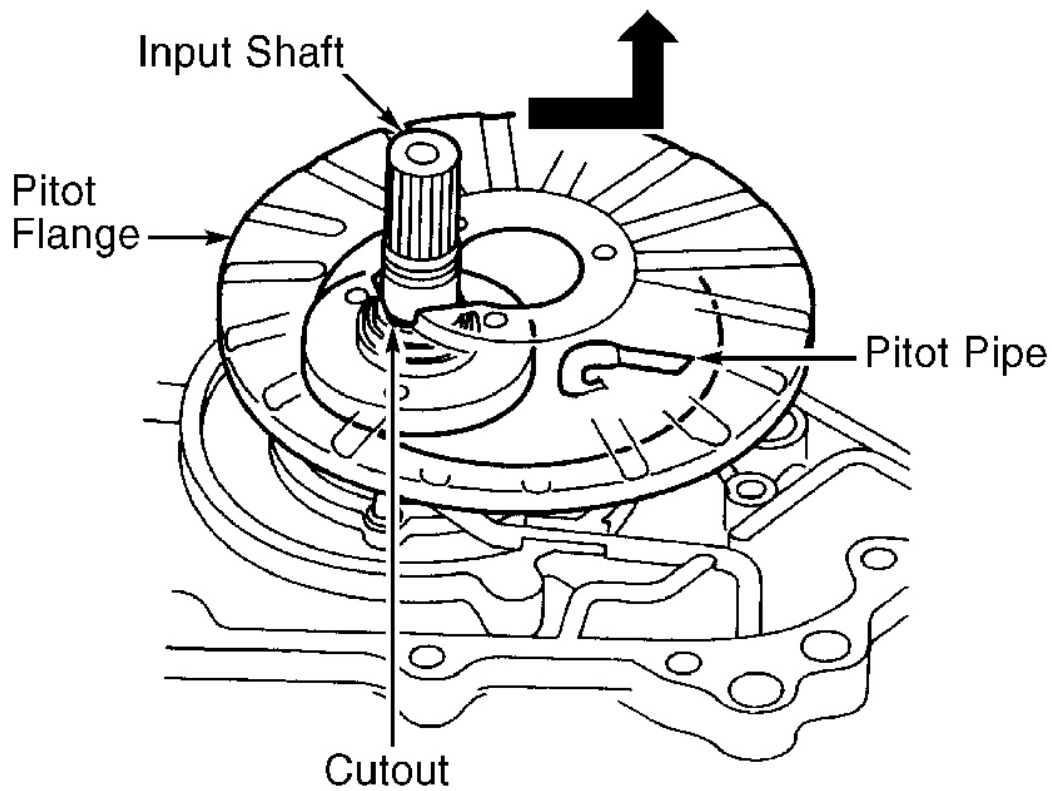
CAUTION: If spring retainer tab is on reverse brake piston, spring retainer may be damaged. Ensure spring retainer tab is not on piston. See Fig. 10 .

10. Install Reverse Brake Spring Compressor (07TAE-P4V0110) on reverse brake to remove snap ring securing reverse brake return spring retainer. Compress reverse brake return spring and remove snap ring. See **Fig. 11** .
11. Remove spring compressor and remove spring retainer/return spring assembly (A). Apply air pressure to reverse brake pressure circuit hole (B) to remove reverse brake piston (C). See **Fig. 12** .
12. Remove snap ring retainer from drive pulley shaft. Remove 5 bolts and remove manual valve body and separator plate. Remove roller and push control shaft assembly toward outside of transaxle housing. Remove 4 bolts and intermediate housing. See **Fig. 9** .



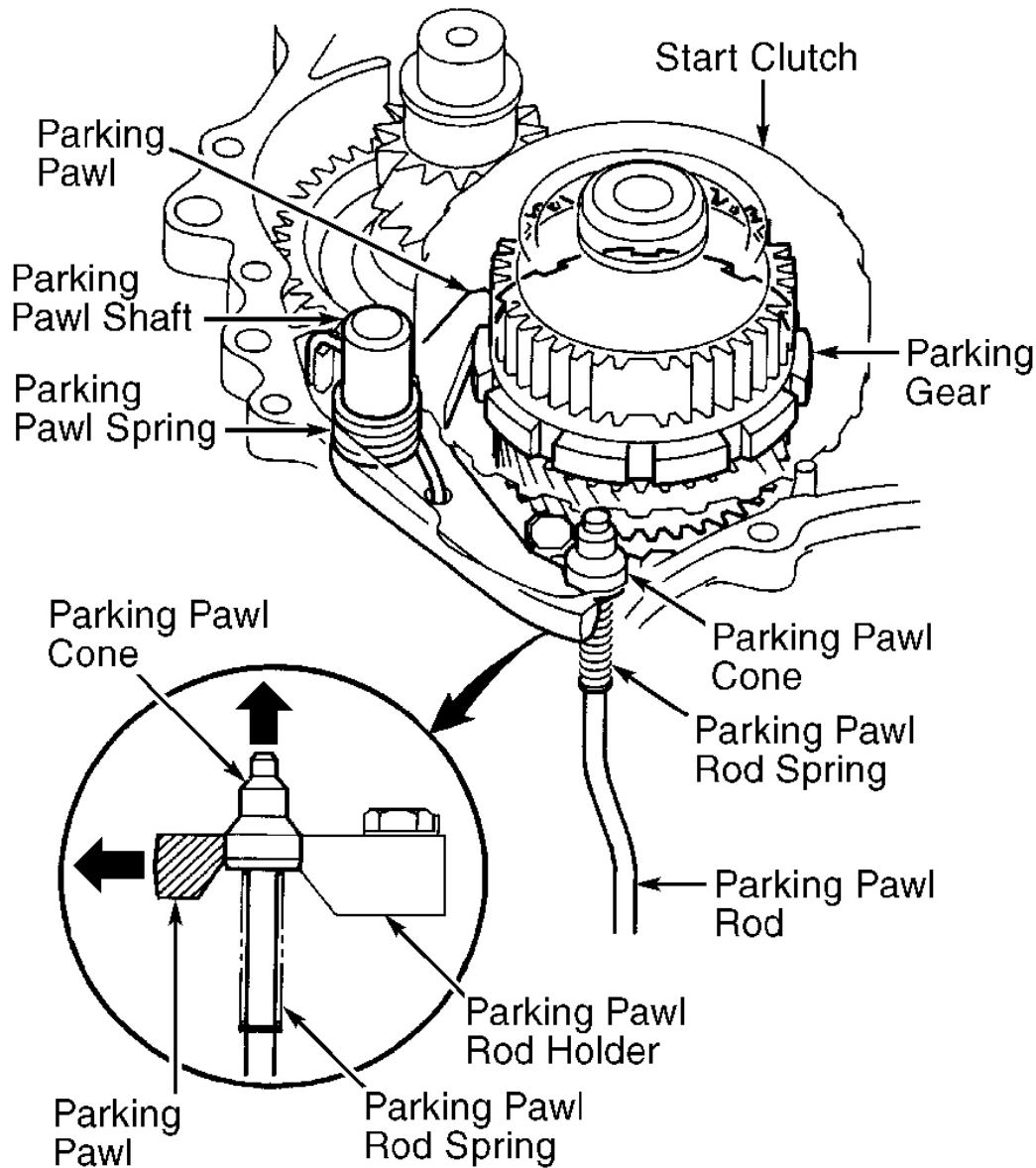
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Fig. 5: Exploded View Of Flywheel & Transaxle Housing Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 6: Removing & Installing Pitot Flange
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 7: Identifying Parking Pawl Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

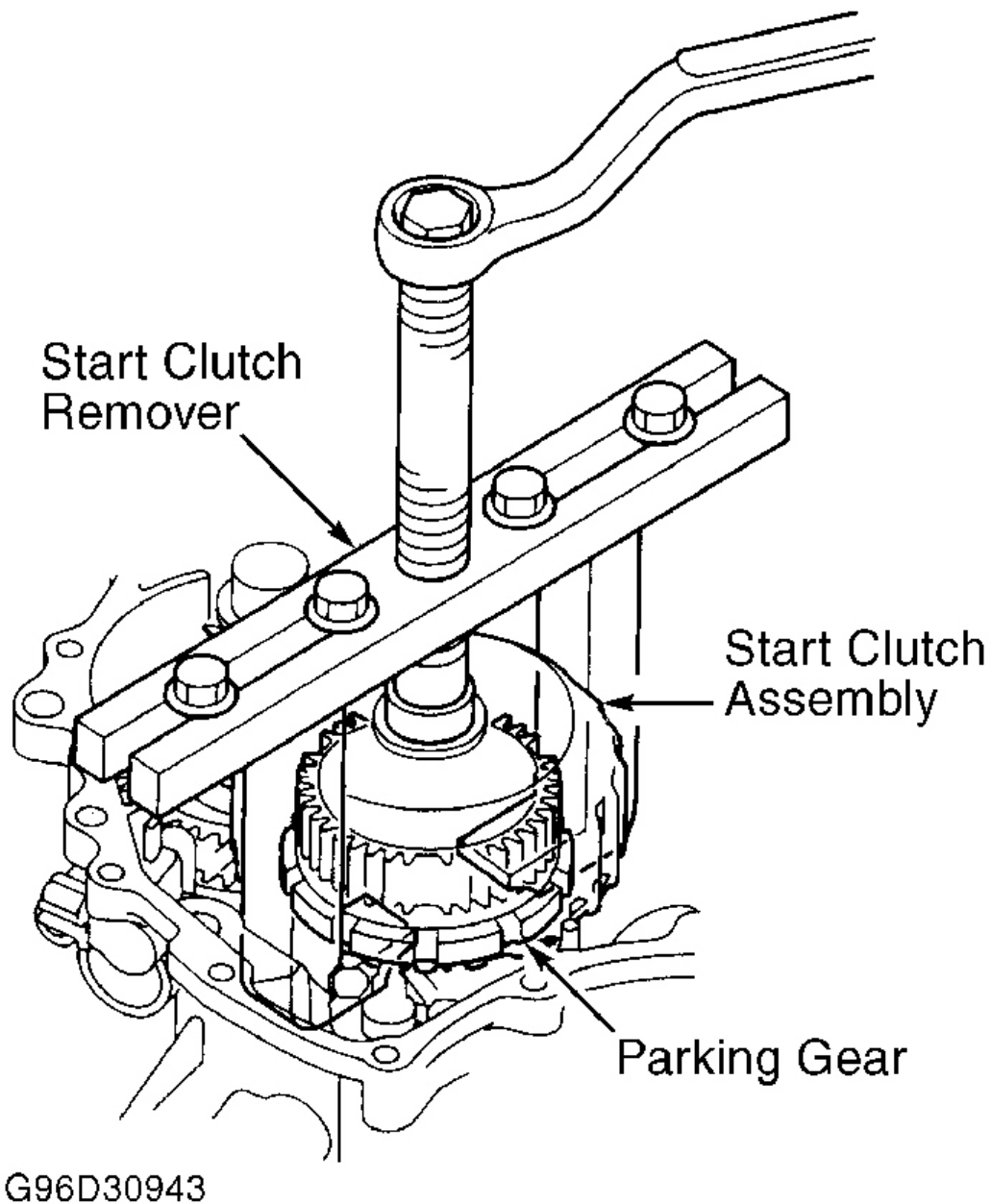
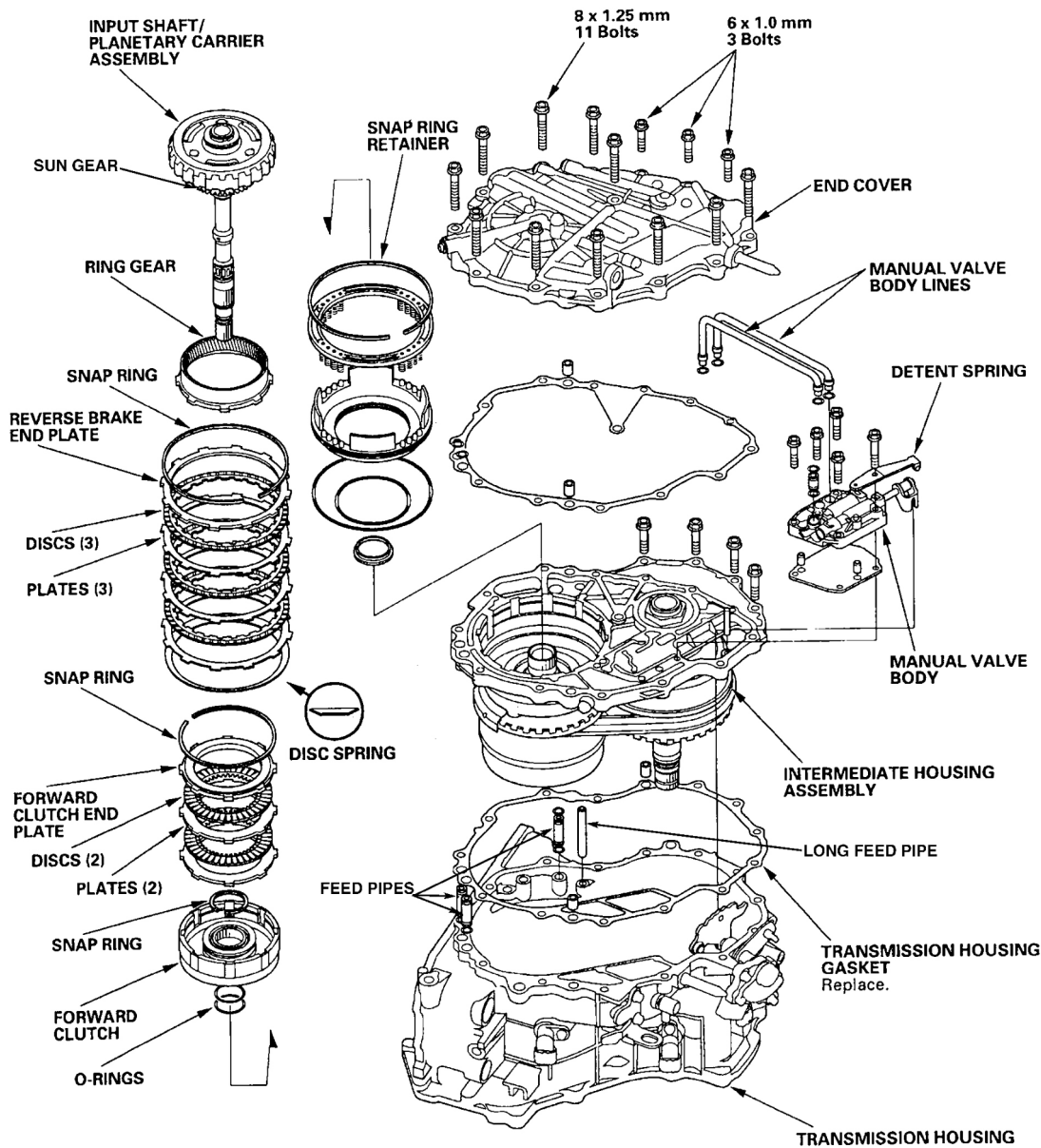


Fig. 8: Removing Start Clutch & Secondary Drive Gear Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 9: Exploded View Of End Cover & Intermediate Housing Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

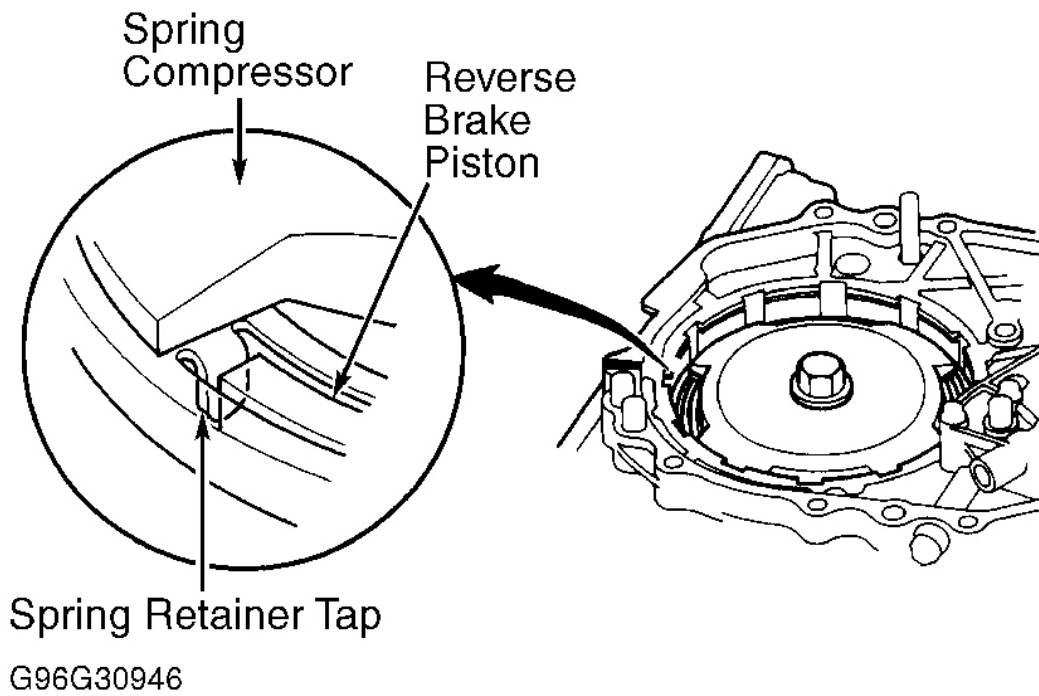


Fig. 10: Positioning Spring Retainer On Reverse Brake Piston
Courtesy of AMERICAN HONDA MOTOR CO., INC.

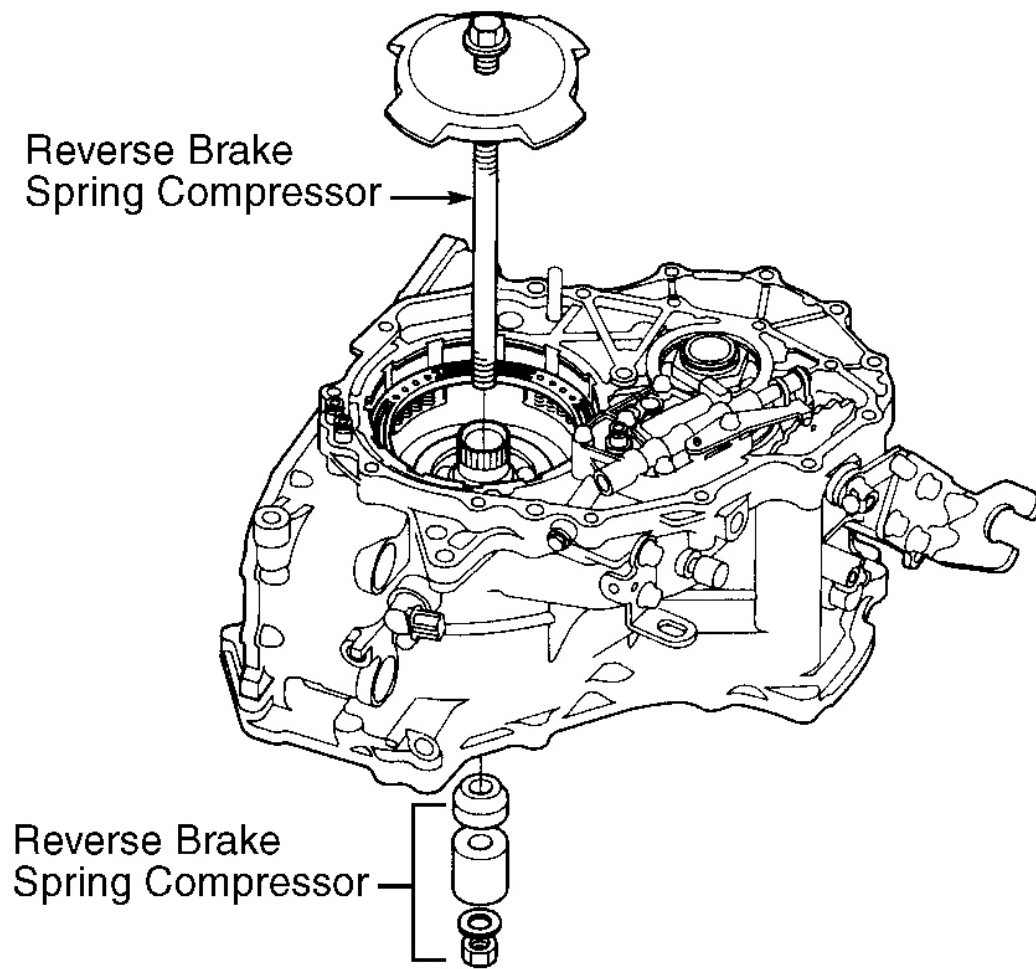
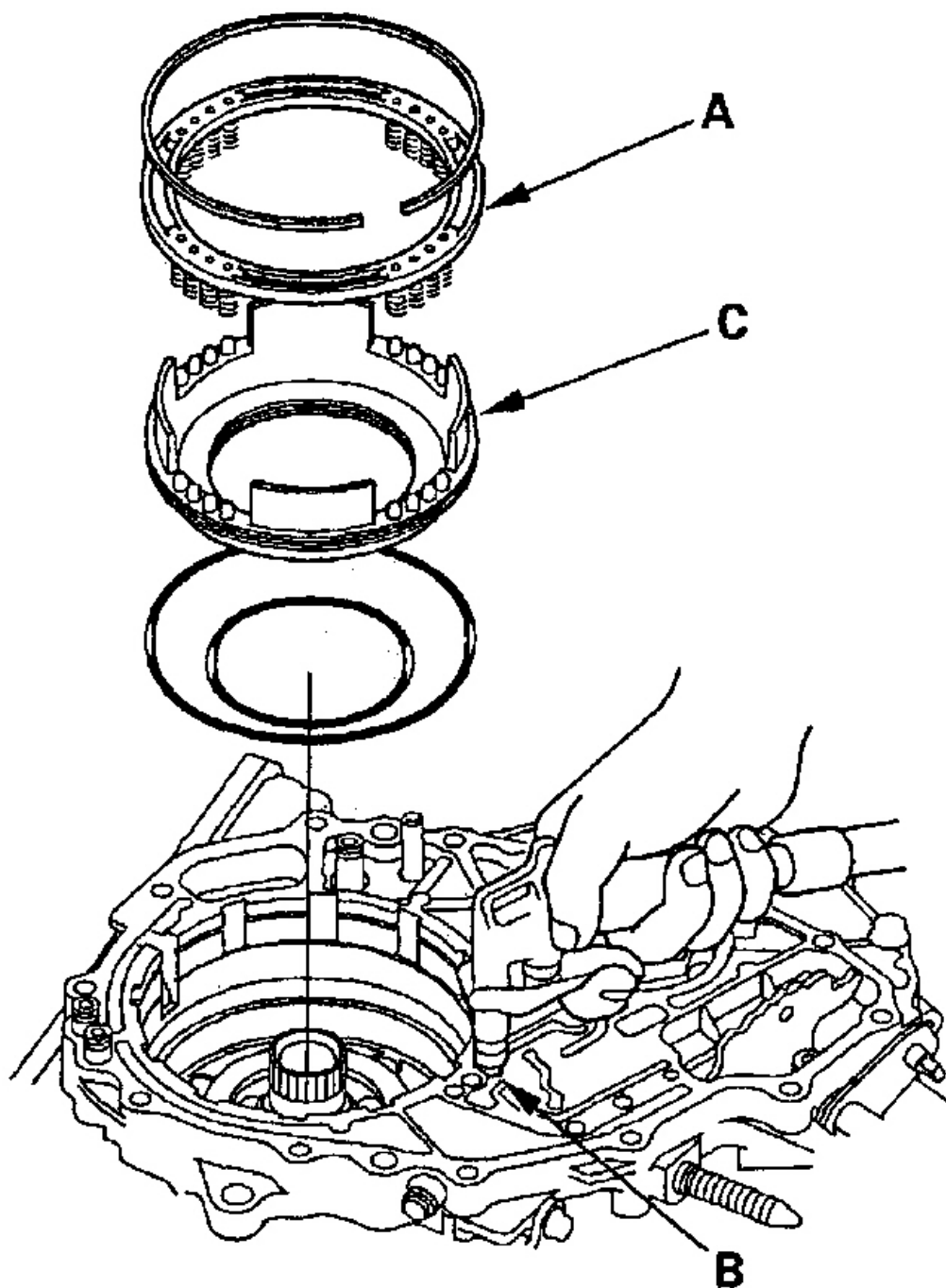


Fig. 11: Installing Reverse Brake Spring Compressor
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 12: Applying Air Pressure To Reverse Brake Circuit
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT DISASSEMBLY & REASSEMBLY

MANUAL VALVE BODY

Disassembly & Reassembly

Remove spring seat, spring and reverse inhibitor valve. Remove manual valve from valve body. Clean all parts in solvent and dry with compressed air. Blow out all passages. Inspect valve body for wear, scratches and scoring. See **Fig. 13** . To reassemble, reverse disassembly procedures. Lubricate all components with ATF during reassembly.

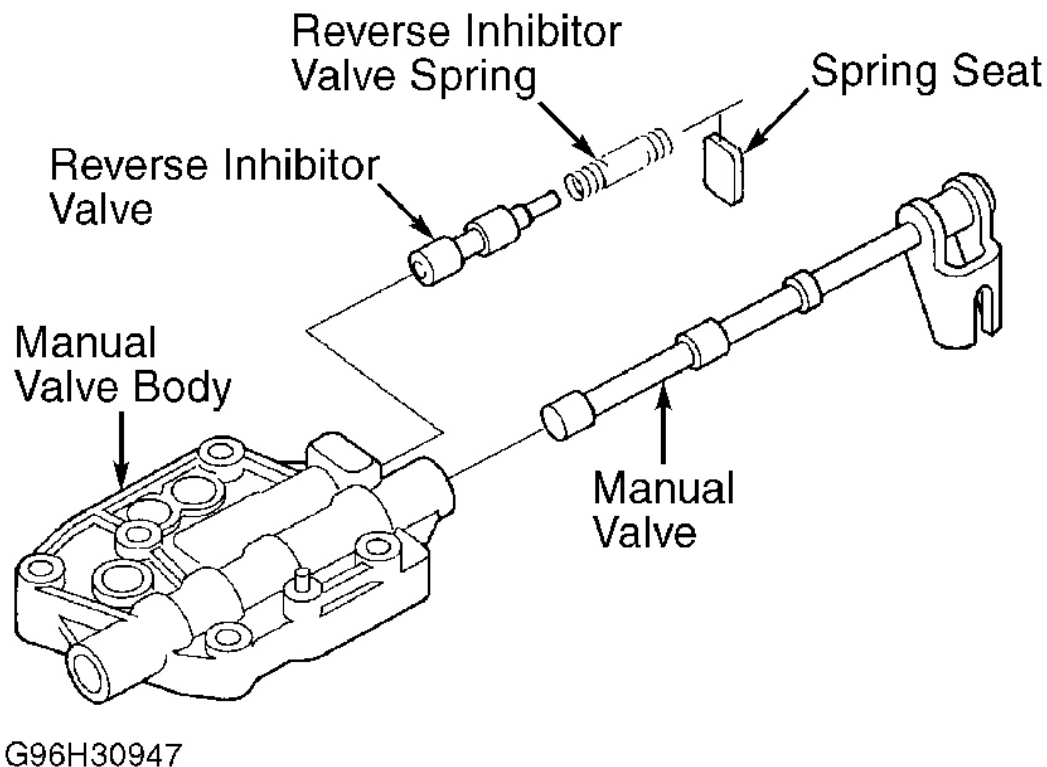


Fig. 13: Identifying Manual Valve Body Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.

FORWARD CLUTCH

Disassembly

1. Remove snap ring. Remove clutch end plate, discs and plates. See **Fig. 14** . Remove disc spring. Install Clutch Spring Compressor Attachments (07LAE-PX40100 and 07HAE-PL50101) and Bolt Assembly (07GAE-PG40200) to forward clutch assembly. See **Fig. 15** .

CAUTION: If either end of compressor is set over an area of spring retainer which is not supported by return spring, retainer may be damaged. Ensure compressor is adjusted for full contact with spring retainer. See Fig. 15 .

2. Compress return spring. Remove snap ring, spring compressor components, spring retainer and return spring. See Fig. 14 . Wrap shop towel around clutch drum. Apply compressed air to oil passage to remove piston. Place a finger tip on other end while applying air pressure. See Fig. 16 .

Cleaning & Inspection

Clean all parts in solvent and dry with compressed air. Blow out all passages. Inspect check valve. If valve is loose, replace piston. See Fig. 17 . Lubricate components with ATF prior to reassembly.

Reassembly

1. Install NEW "O" rings on clutch piston in correct direction. See Fig. 18 . Install piston in clutch drum. Apply pressure and rotate to ensure proper seating. DO NOT pinch "O" ring by installing piston with too much force.
2. Install return spring and spring retainer. Position snap ring on retainer. Install clutch spring compressor on forward clutch. Compress return spring. Install snap ring and remove spring compressor.

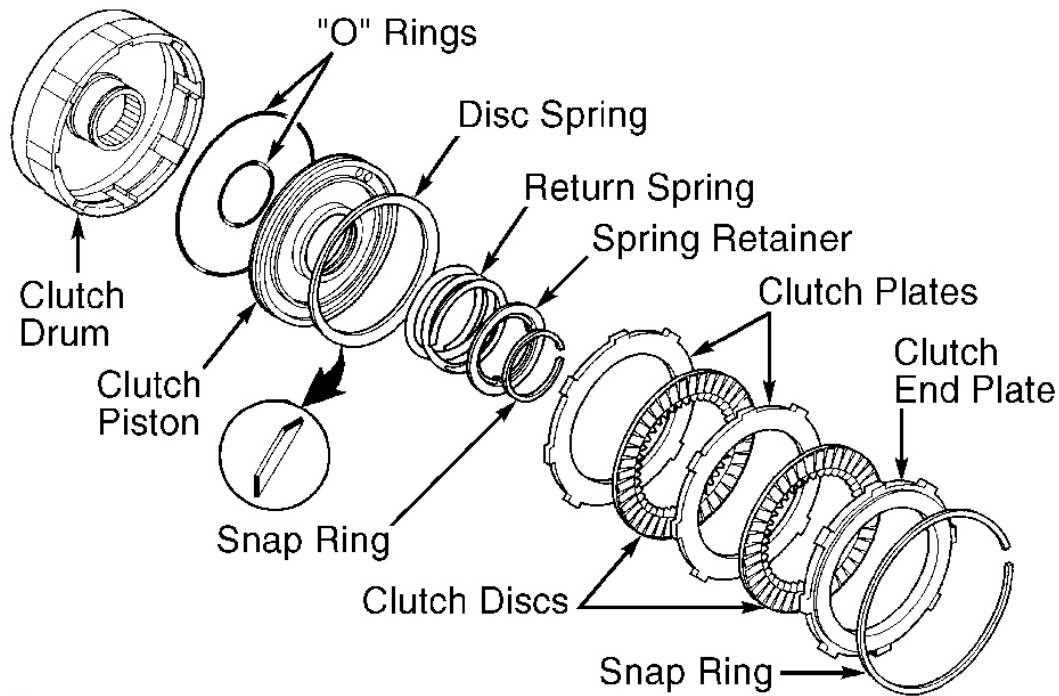
CAUTION: If either end of compressor is set over an area of spring retainer which is not supported by return spring, retainer may be damaged. Ensure compressor is adjusted for full contact with spring retainer. See Fig. 15 .

3. Install disc spring with narrow side down. See Fig. 14 . Soak clutch discs in ATF for a minimum of 30 minutes. Starting with clutch plate, alternately install plates and discs. Install clutch end plate with flat side toward disc.

NOTE: Prior to installing plates and discs, ensure inside of clutch drum is free of dirt or other foreign matter.

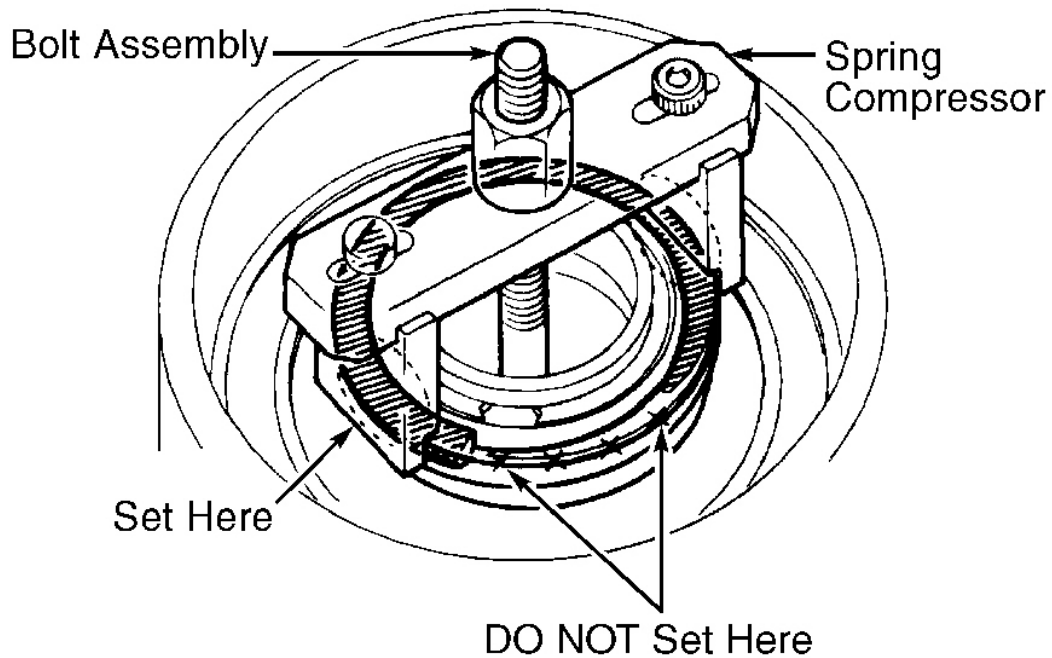
4. Install snap ring. Ensure snap ring end gap is .31" (7.9 mm). Using a dial indicator, measure clearance between clutch end plate and top disc. Zero dial indicator with clutch end plate lowered and lift plate up to snap ring. See Fig. 19 .
5. Distance clutch end plate moves is clearance between clutch end plate and top disc. Measure clearance in at least 3 places and use average as actual measurement. Clearance should be .024-.031" (.60-.80 mm).
6. If clearance is not within specification, select a NEW clutch end plate, then recheck. End plates are available in thickness range from .138" (3.50 mm) to .185" (4.70 mm), in increments of .004" (.10 mm). See Fig. 20 . After replacing clutch end plate, ensure clearance is within specification.

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



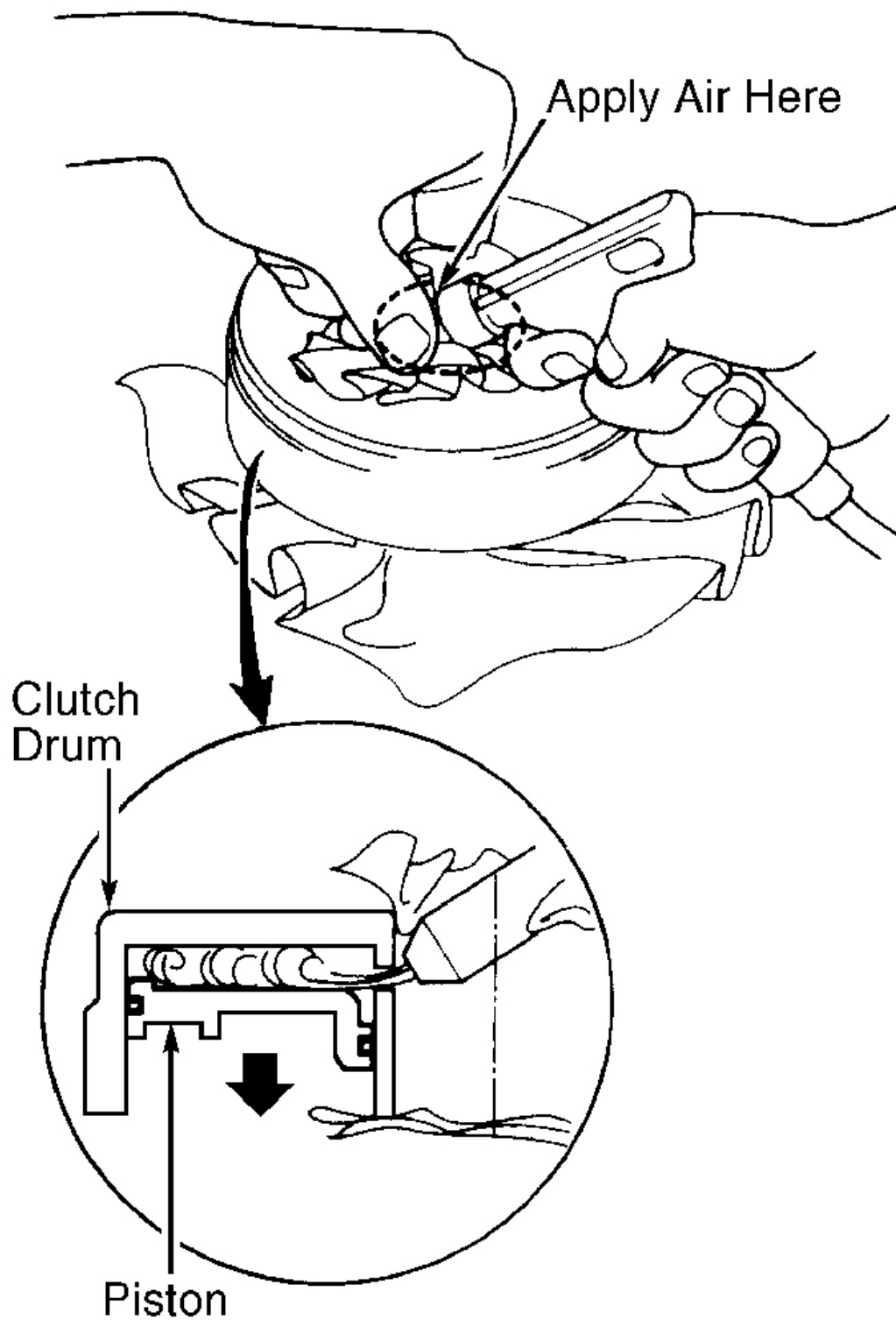
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Fig. 14: Exploded View Of Forward Clutch Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 15: Compressing Forward Clutch Return Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 16: Removing Forward Clutch Piston

Courtesy of AMERICAN HONDA MOTOR CO., INC.

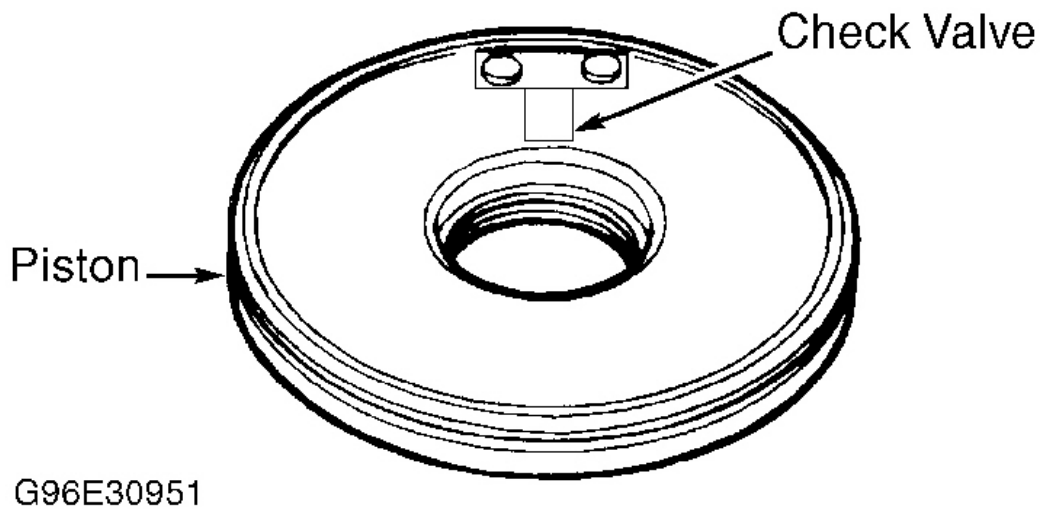
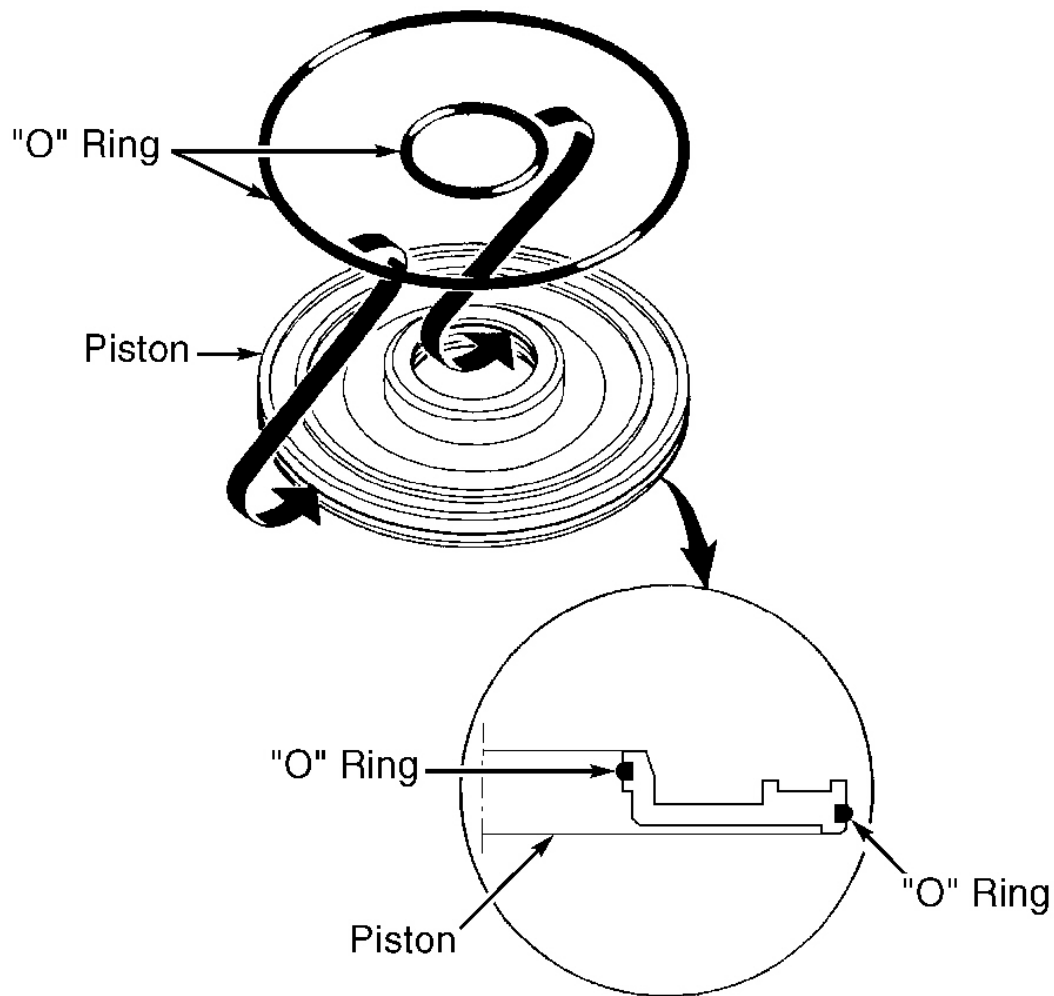


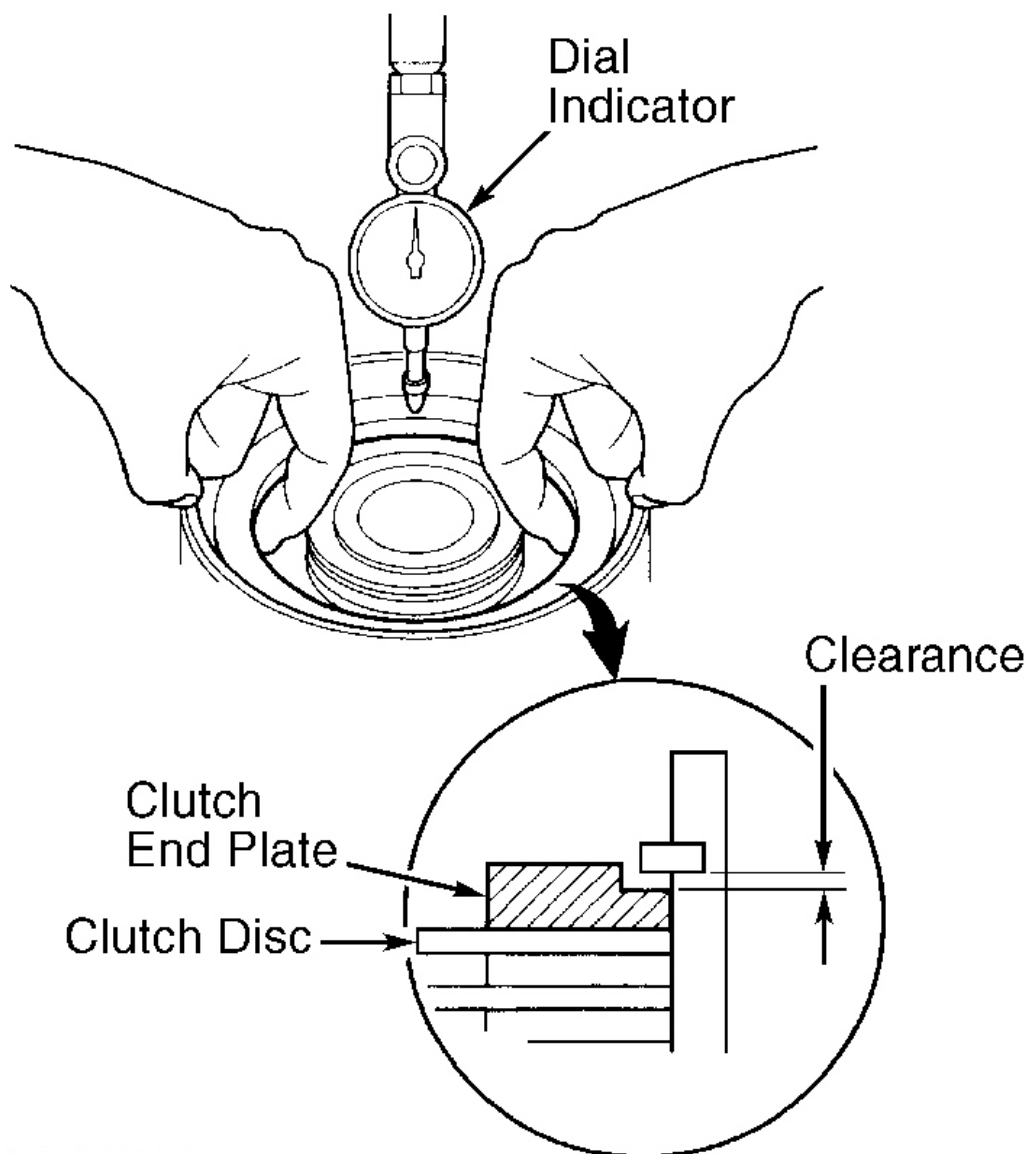
Fig. 17: Checking Forward Clutch Piston Check Valve

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 18: Installing Forward Clutch Piston "O" Rings
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 19: Measuring Forward Clutch Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

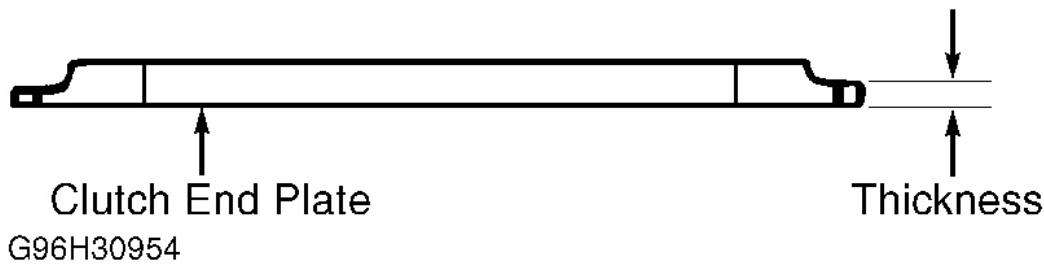


Fig. 20: Measuring Forward Clutch End Plate Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DIFFERENTIAL ASSEMBLY

Disassembly

1. Prior to disassembly, place differential assembly on "V" blocks and install both axles. Using dial indicator, measure pinion gear backlash. See **Fig. 21** . Backlash should be .002-.006" (.05-.15 mm). If backlash is not as specified, replace differential carrier.
2. Remove final driven gear from differential carrier. Final driven gear bolts have left-hand threads. Using appropriate bearing puller, remove differential carrier bearings (if necessary). See **Fig. 22** .

Cleaning & Inspection

Check bearings for wear and rough rotation. Inspect final driven gear teeth for damage. Replace components as necessary.

Reassembly

To reassemble, reverse disassembly procedure. Install NEW bearings using appropriate driver and press. Install final driven gear on differential carrier with chamfered side of gear on inner bore, facing differential carrier. Tighten bolts to 72 ft. lbs. (98 N.m).

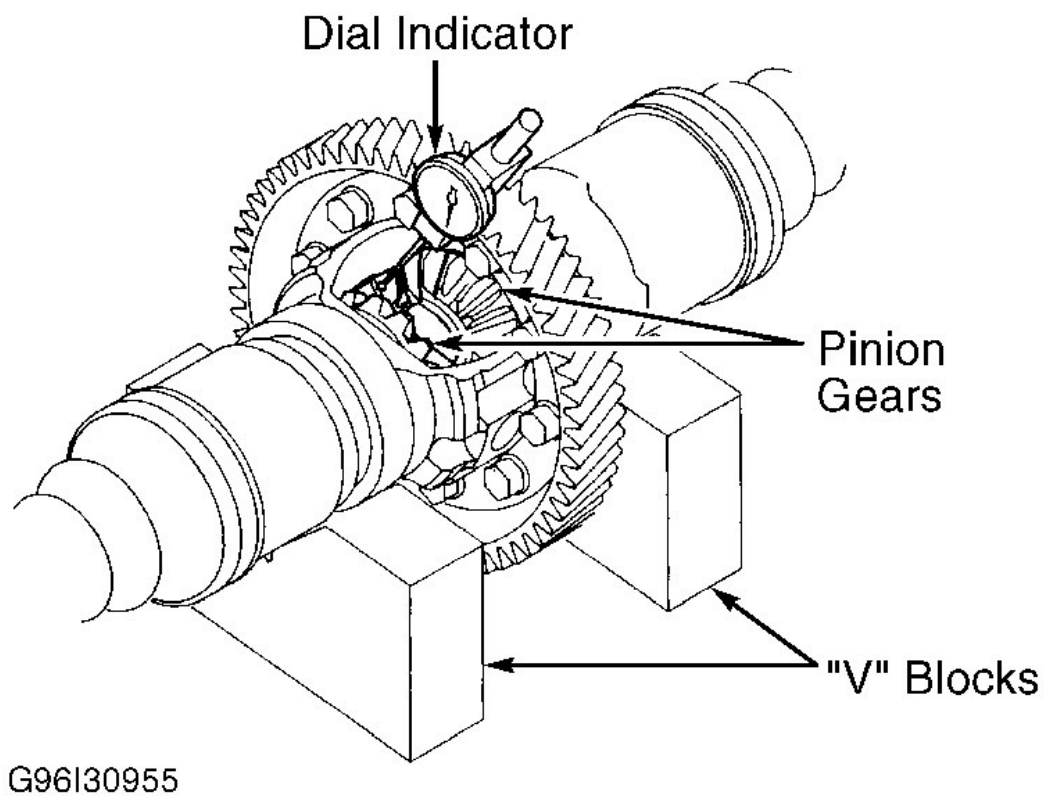
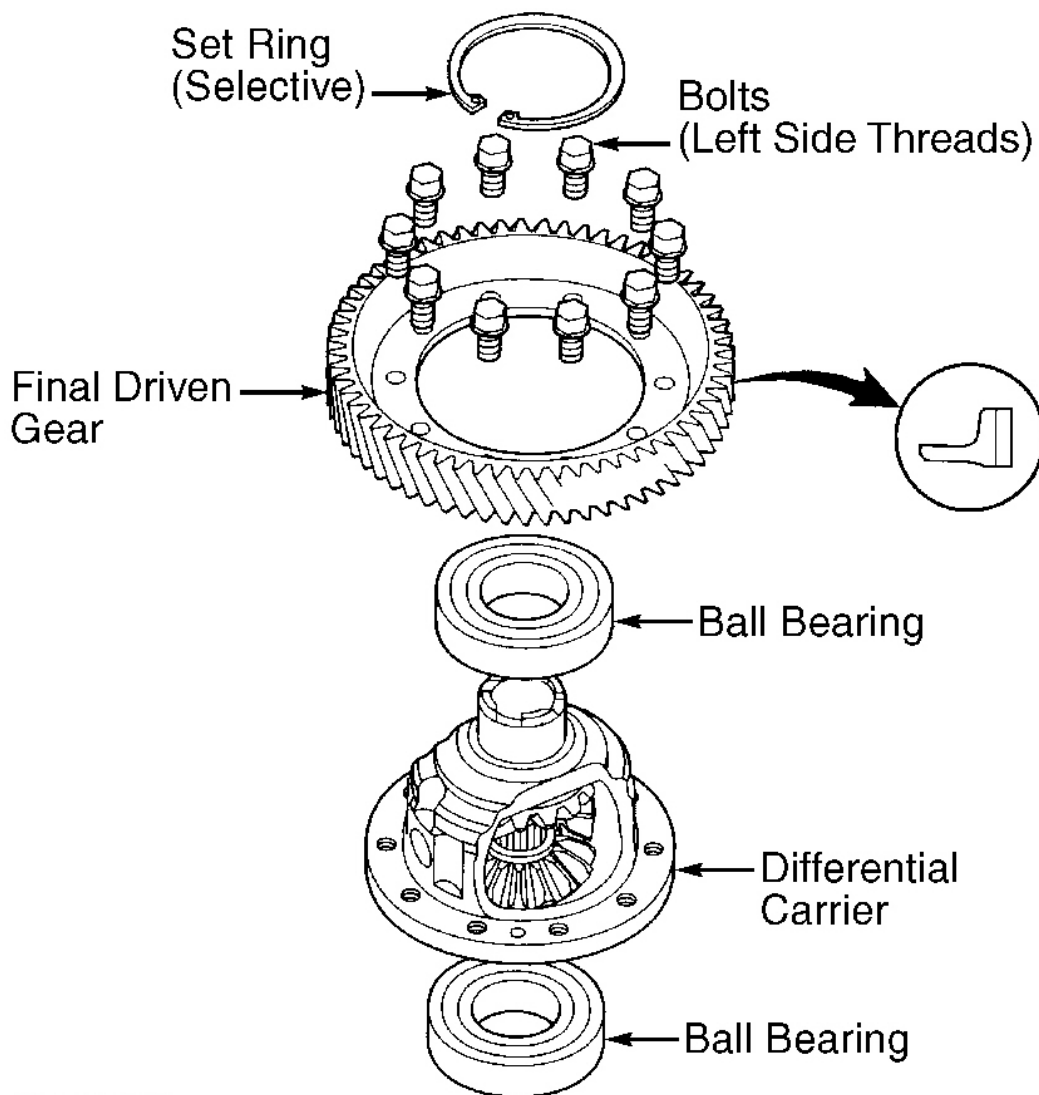


Fig. 21: Measuring Pinion Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 22: Identifying Differential Assembly Components
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE & FLYWHEEL HOUSING OIL SEALS

Disassembly & Reassembly

1. Remove oil seal from transaxle housing and flywheel housing using pin punch and hammer. Install a 3.15" (80 mm) wide, .098" (2.50 mm) thick set ring into flywheel housing. DO NOT install oil seal. Using appropriate driver, install differential assembly into transaxle housing.
2. Install flywheel housing with 3 dowel pins and gasket, and tighten bolts to 21 ft. lbs. (29 N.m). Using

feeler gauge, measure clearance between 3.15" (80 mm) set ring and outer race of bearing in flywheel housing. See **Fig. 23** . Clearance should be 0-.006" (0-.15 mm). If clearance is more than specified, remove set ring and measure its thickness. Select and install NEW set ring, then go to next step. Set ring is available in thickness range from .098" (2.50 mm) to .118" (3.00 mm) in increments of .004" (.10 mm). If set ring-to-bearing outer race clearance is less than specification, set ring does not need replacement.

3. Remove flywheel housing. Install correct thickness set ring. Install oil seal in transaxle housing and flywheel housing using appropriate driver, pilot, adapter and hammer. Ensure oil seal in flywheel housing is installed to correct depth. See **Fig. 24** .

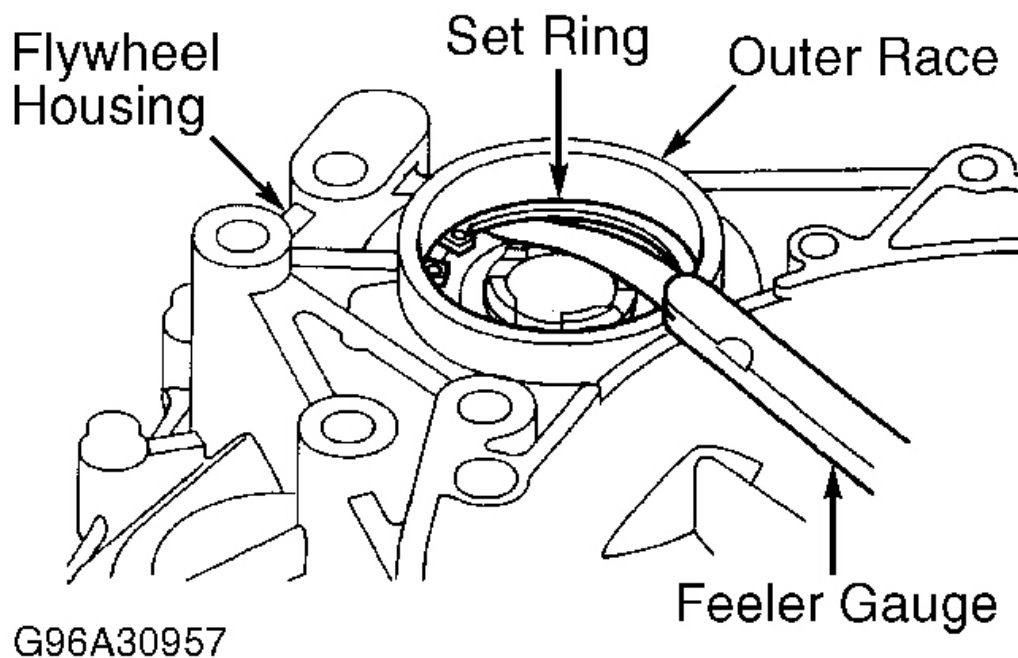
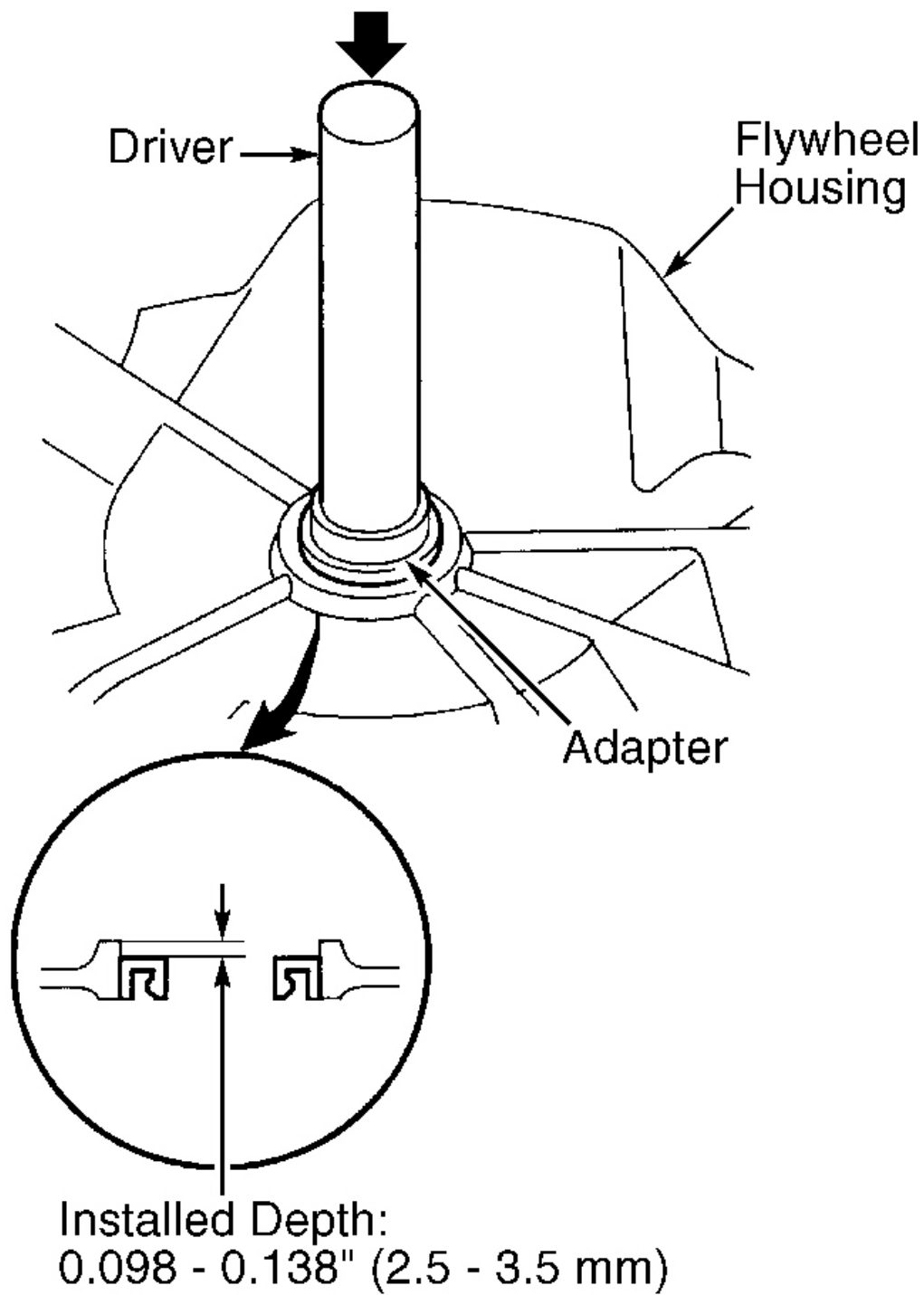


Fig. 23: Measuring Set Ring Clearance

Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 24: Installing Flywheel Housing Oil Seal

Courtesy of AMERICAN HONDA MOTOR CO., INC.

DRIVEN PULLEY SHAFT BEARING**Disassembly & Reassembly**

1. Expand snap ring with snap ring pliers, then push bearing out using driver, adapter and press. See **Fig. 25** . DO NOT remove snap ring unless it is necessary to clean groove in housing. Lubricate parts with ATF. Expand snap ring with pliers. Insert NEW bearing part way into housing using driver and adapter. Install bearing with groove facing outside housing.
2. Release pliers, then push bearing down into housing until ring snaps in place around bearing. After installing bearing, ensure snap ring is seated in bearing and housing grooves. See **Fig. 26** . Ensure bearing operates properly and snap ring end gap is 0-.35" (0-9 mm).

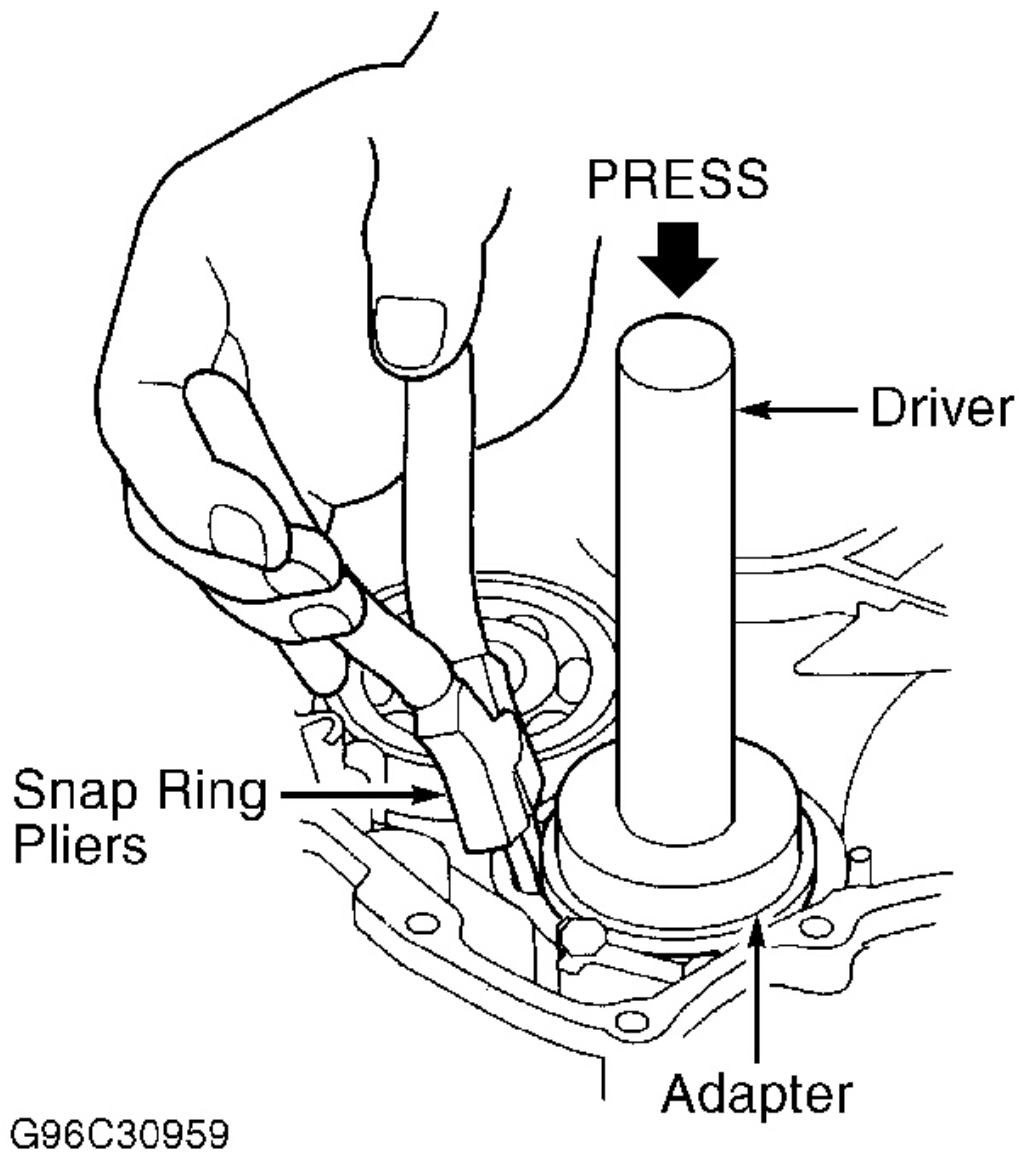


Fig. 25: Removing Driven Pulley Shaft Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

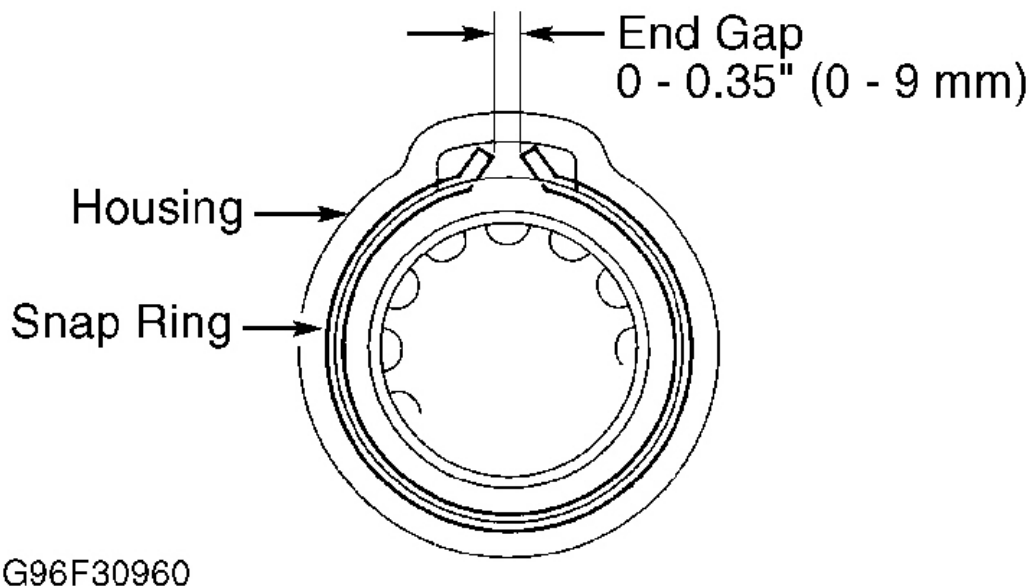


Fig. 26: Measuring Snap Ring End Gap

Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY GEAR SHAFT BEARING

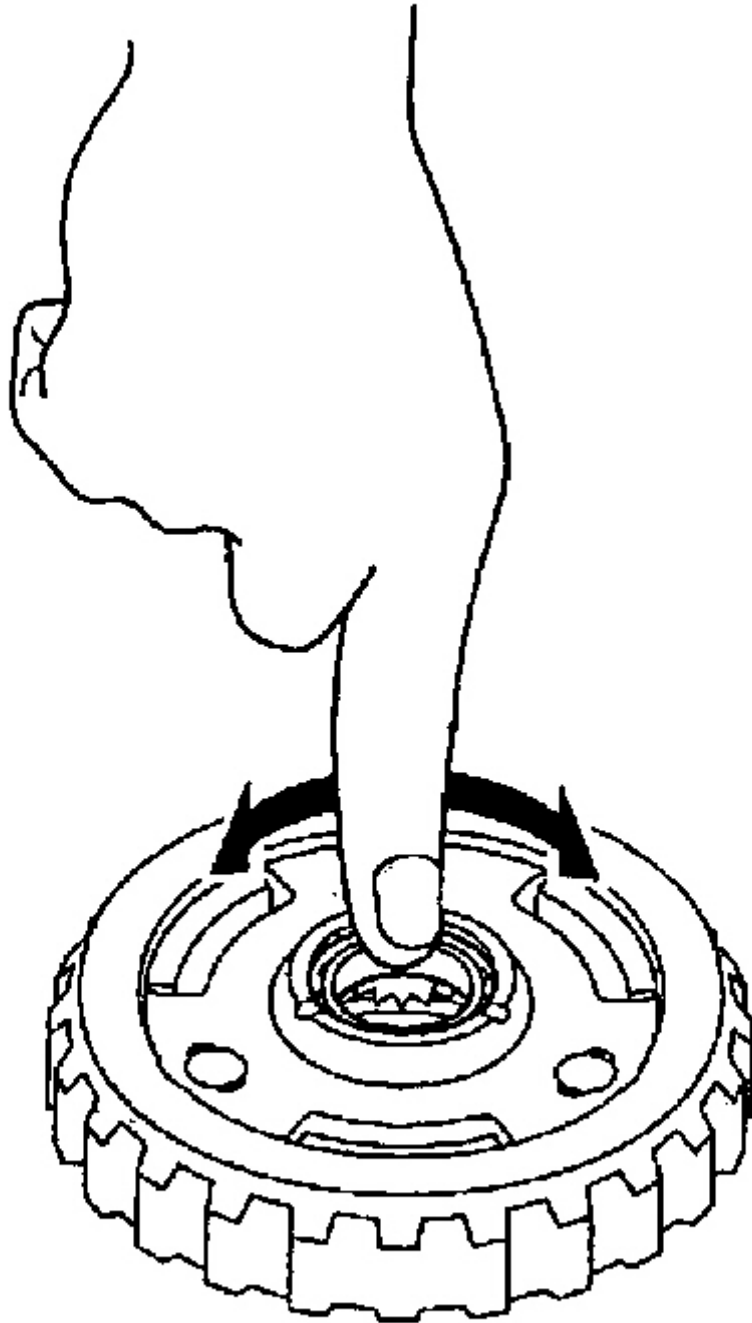
Disassembly & Reassembly

Using slide hammer and bearing puller, remove secondary gear shaft bearing from transaxle housing and flywheel housing. See **Fig. 5** . Using adapter, driver and press, install NEW secondary gear shaft bearing until it bottoms in transaxle housing or flywheel housing.

PLANETARY CARRIER BEARING

Inspection

Check planetary carrier bearing for play by spinning it by hand. See **Fig. 27** . If excessive play exists, replace planetary carrier assembly. See **Fig. 9** .



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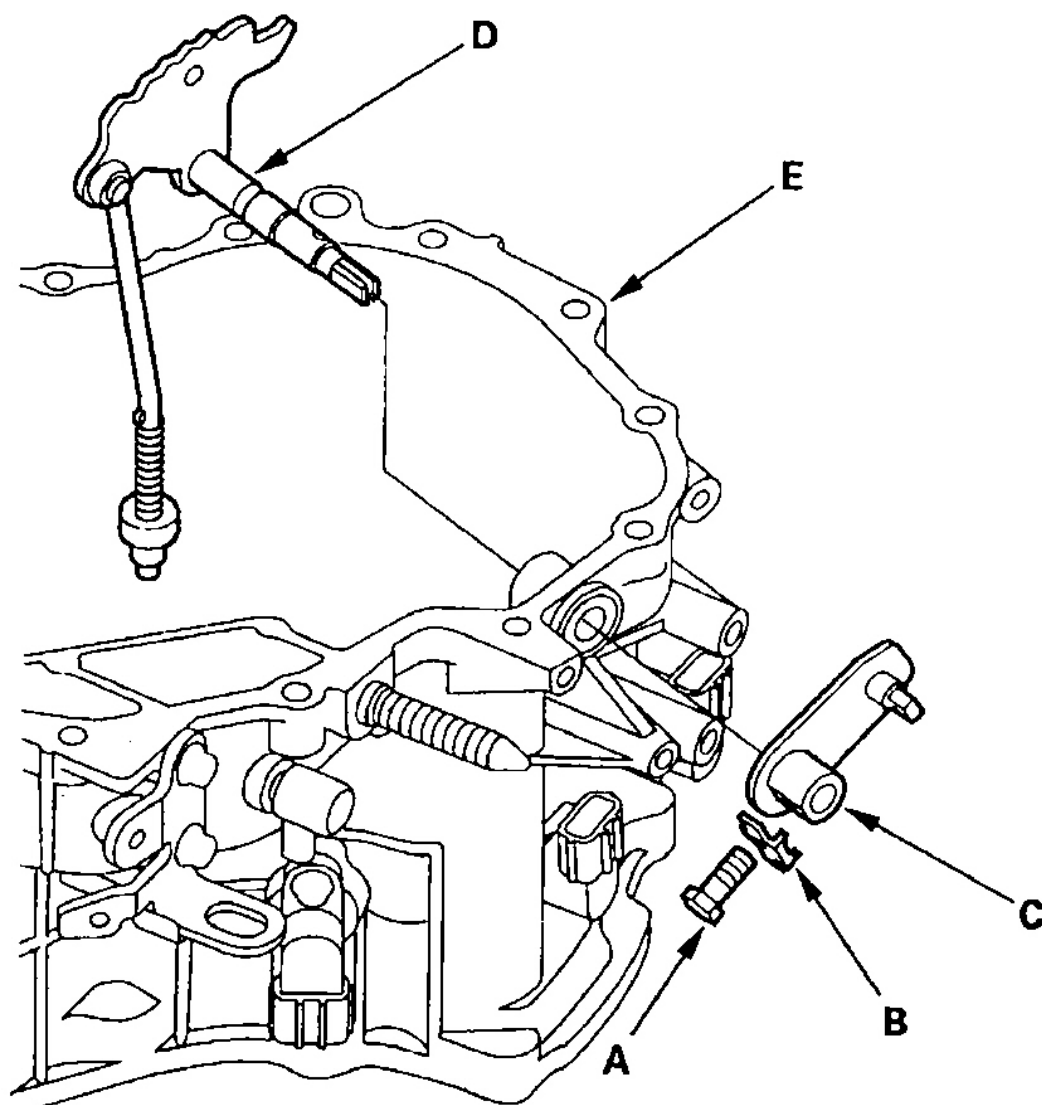
Fig. 27: Inspecting Planetary Carrier Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

CONTROL SHAFT ASSEMBLY**Removal & Installation**

NOTE: Letters in parenthesis in the following steps are identified in illustration.

Remove bolt (A) and lock washer (B). Remove control lever (C) from control shaft (D). Remove control shaft assembly from transaxle housing. See **Fig. 28** . To reassemble, reverse removal procedure.



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Fig. 28: Removing & Installing Control Shaft Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

LOWER VALVE BODY ASSEMBLY

NOTE: For control valve assemblies valve descriptions, see INTRODUCTION under **DESCRIPTION**.

Manufacturer does not supply exploded views, disassembly procedures or specifications for lower valve body assembly. When disassembling valve bodies, note location of all components for reassembly reference. See **Fig.**

29 -Fig. 31 . Clean components with solvent and dry with compressed air. Inspect components for damage. Replace components as necessary. Coat all components with ATF prior to reassembly. Ensure all components are installed in correct locations. For solenoid testing, see **MLYA CVT DIAGNOSIS** article.

Removal & Installation

1. Raise and support vehicle. Remove transaxle drain plug. Disconnect transaxle cooler hoses at cooler lines. Remove 14 transaxle oil pan bolts. Remove oil pan. Remove 2 bolts and remove the oil strainer. See **Fig. 32** .
2. Remove 8 bolts and remove the lower valve body assembly. Remove the bolt securing the solenoid harness connector while holding the lower valve body assembly, and remove the connector and valve body assembly. Remove the oil cooler lines.
3. Clean the inlet opening of the oil strainer thoroughly with compressed air. See **Fig. 33** . Check that the oil strainer is in good condition, and that the inlet opening is not clogged. Test the oil strainer by pouring clean ATF through the inlet opening, and replace oil strainer if it is clogged or damaged.
4. To install, reverse removal procedure. Tighten fasteners to specification. See **TORQUE SPECIFICATIONS** . Perform **START CLUTCH CALIBRATION PROCEDURE** under OPERATION.

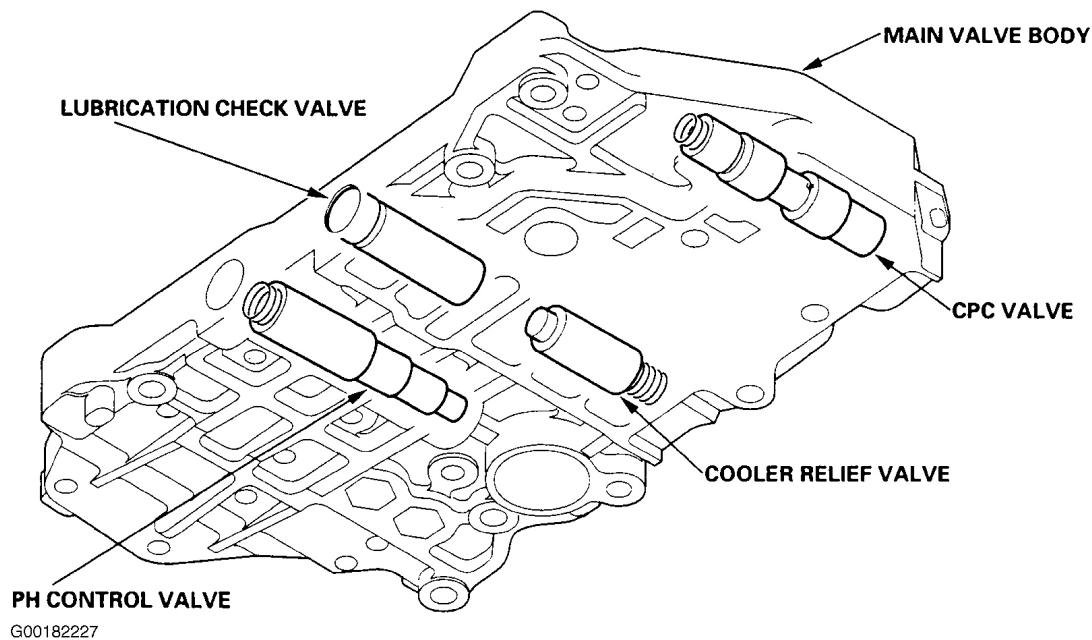


Fig. 29: Identifying Main Valve Body Valves
Courtesy of AMERICAN HONDA MOTOR CO., INC.

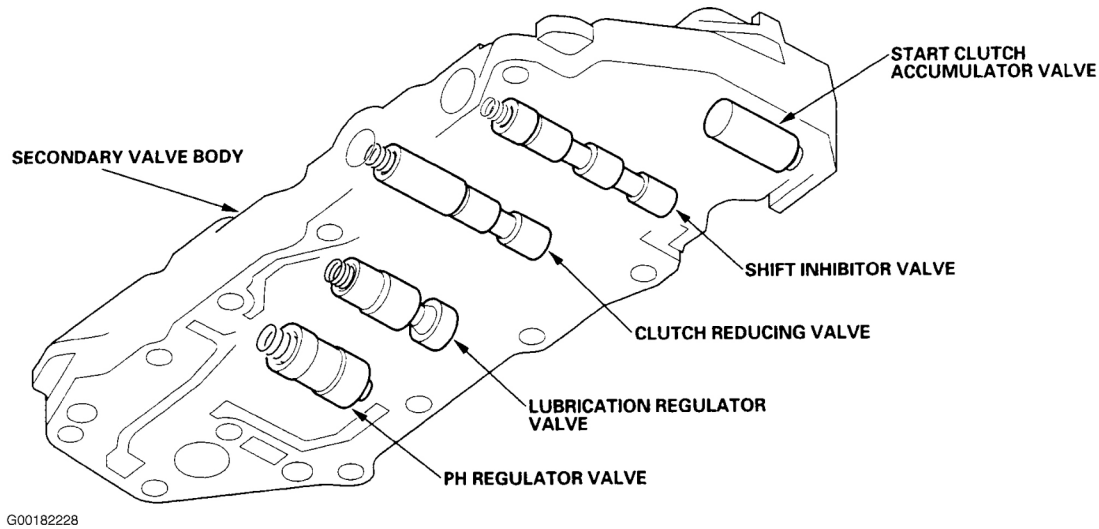


Fig. 30: Identifying Secondary Valve Body Valves
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

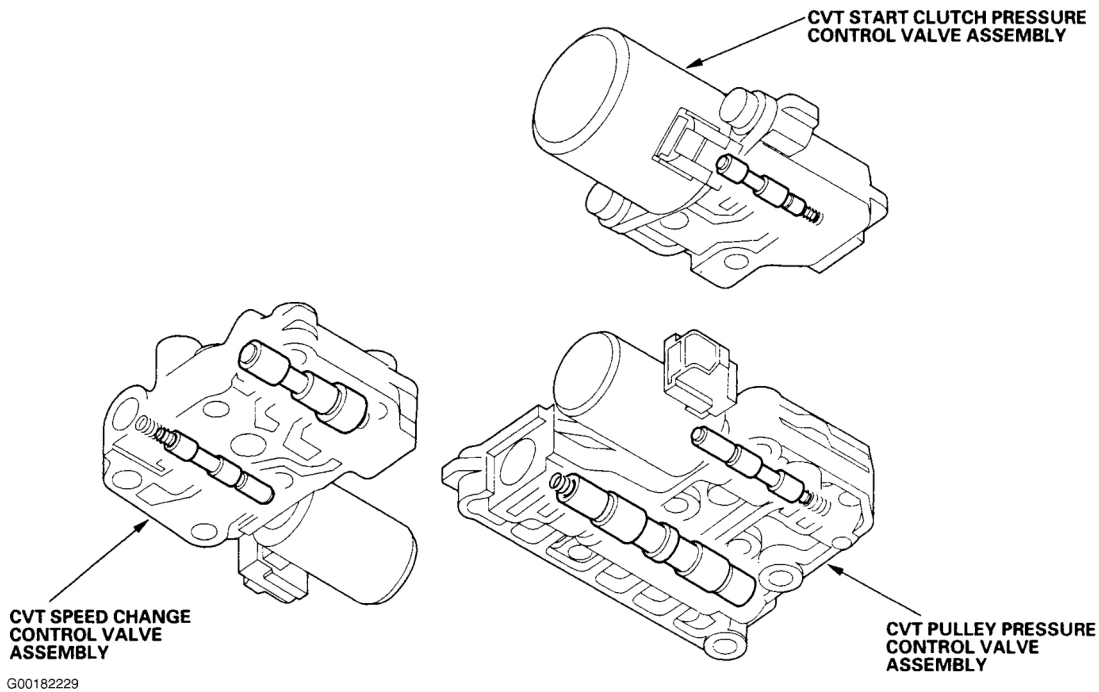
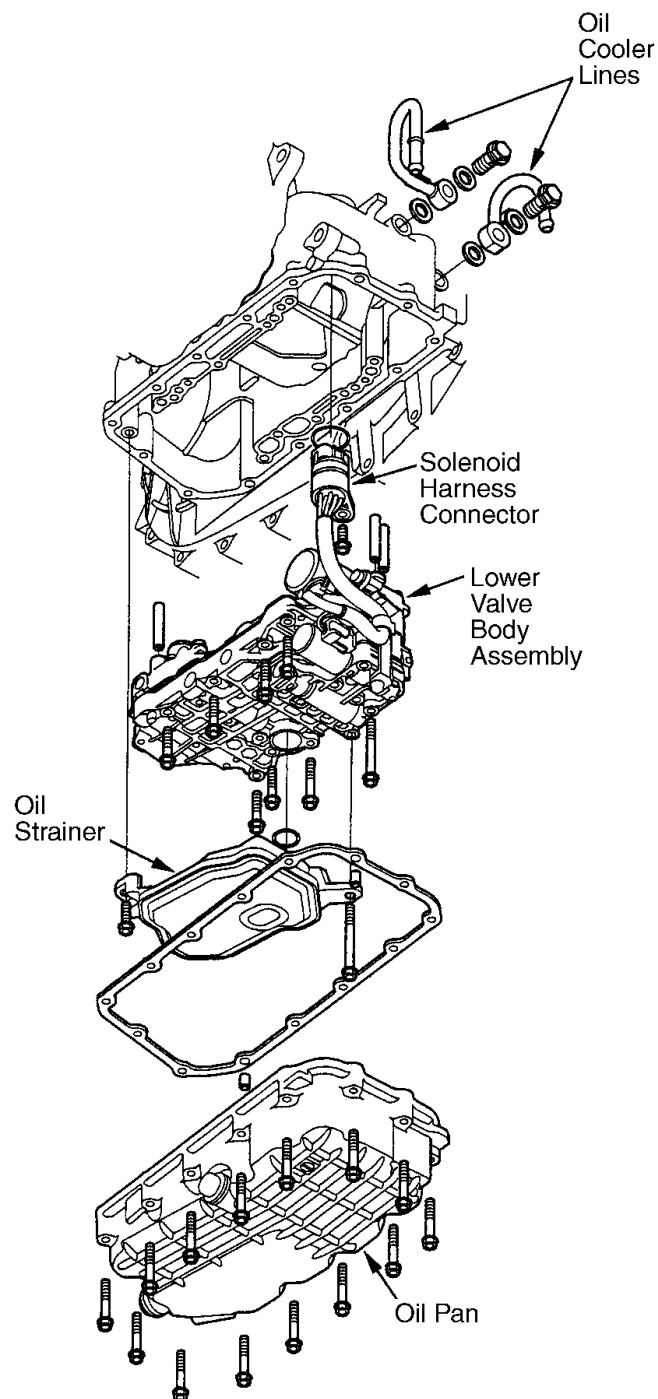
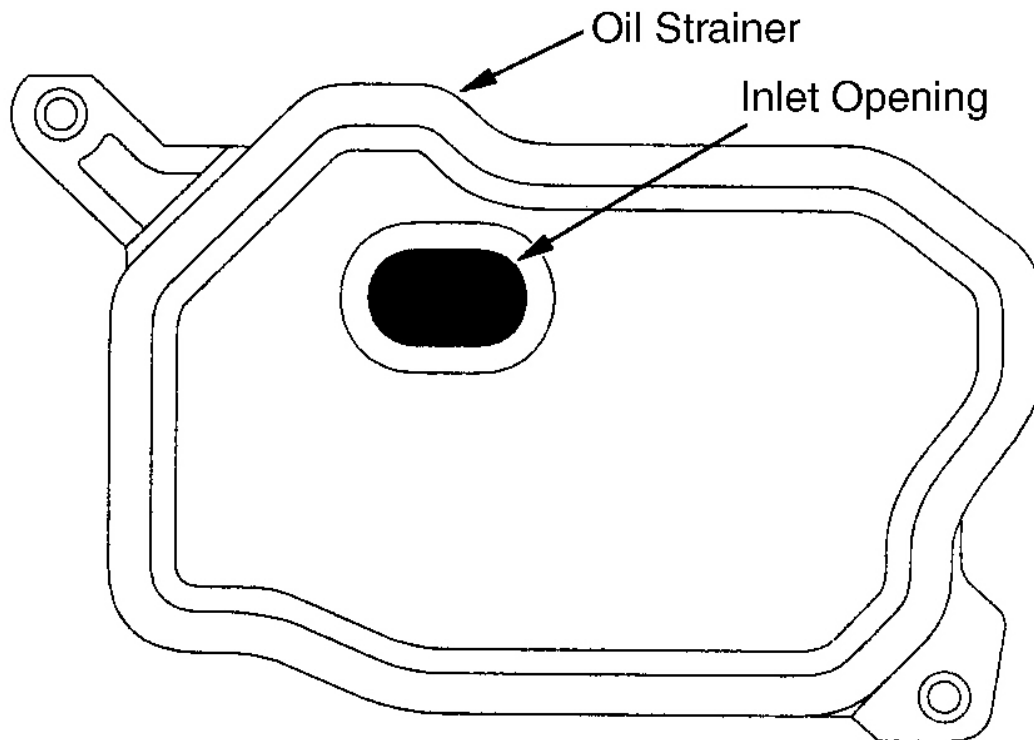


Fig. 31: Identifying Speed Change, Start Clutch Pressure & Pulley Pressure Control Valve Assemblies Valves
 Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 32: Removing Oil Pan, Oil Strainer & Lower Valve Body Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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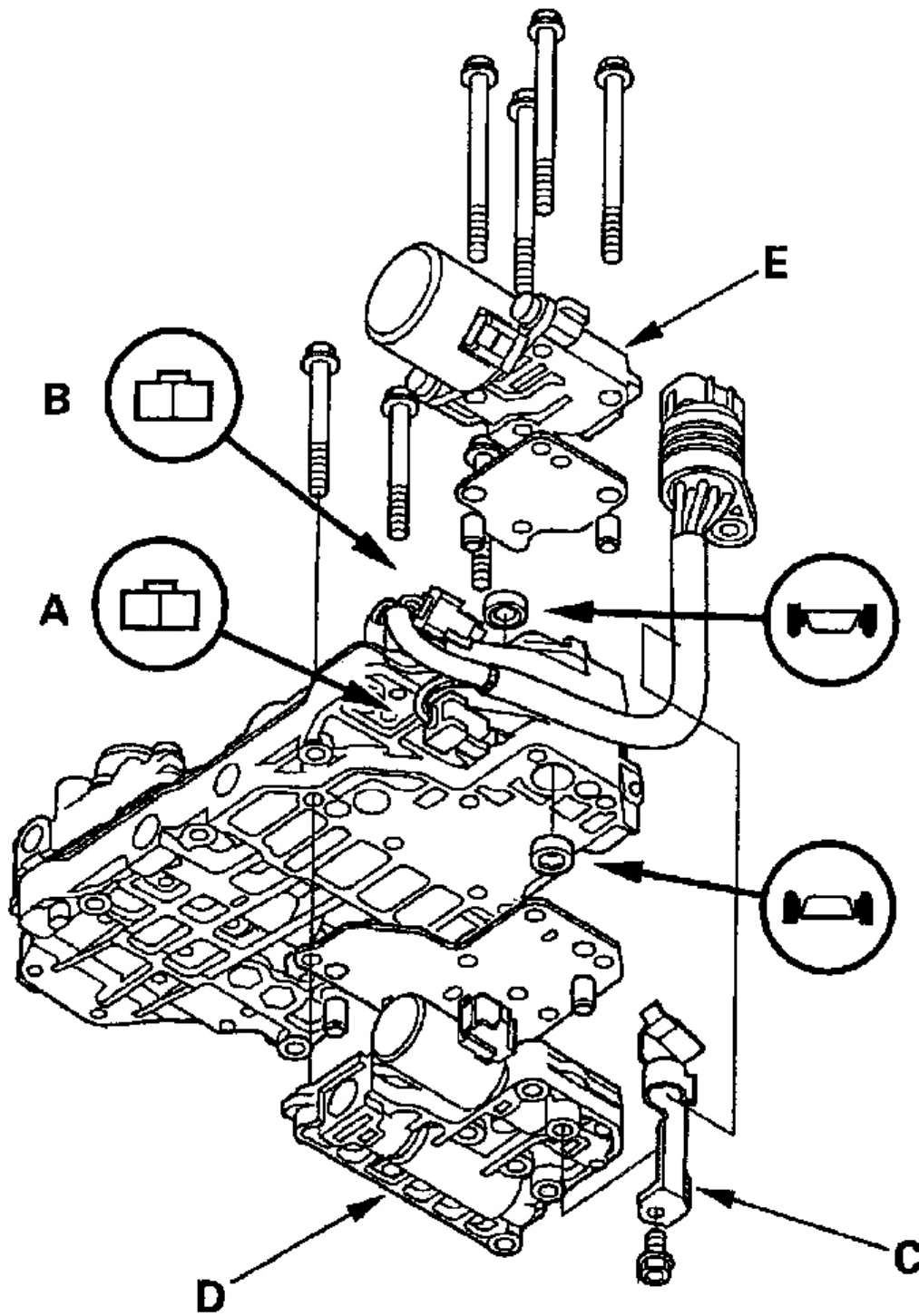
Fig. 33: Locating Inlet Opening On Oil Strainer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CONTROL VALVE ASSEMBLY REPLACEMENT

Removal & Installation

NOTE: Letters in parenthesis in the following steps are identified in illustration.

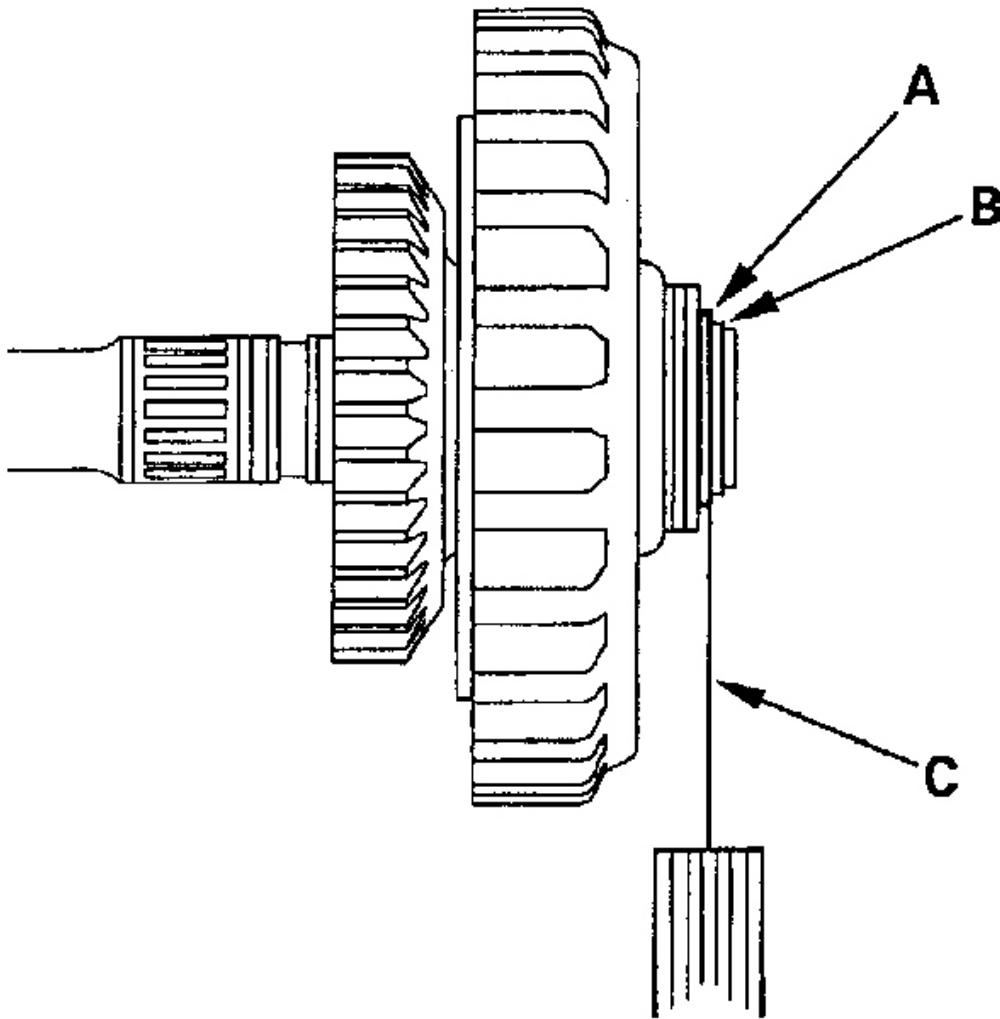
1. Remove lower valve body assembly. See **REMOVAL & INSTALLATION** under LOWER CONTROL VALVE ASSEMBLY. Disconnect speed change control valve assembly connector (A) and start clutch pressure control valve assembly connector (B).
2. Remove solenoid harness clamp (C). Remove 7 bolts, and remove speed change control valve assembly (D). Remove 4 bolts, and remove start clutch pressure control valve assembly (E). See **Fig. 34** . To install, reverse removal procedure. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** .



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Fig. 34: Replacing Control Valve Assemblies**Courtesy of AMERICAN HONDA MOTOR CO., INC.****ADJUSTMENTS****INPUT SHAFT & PLANETARY CARRIER THRUST SHIM SELECTION****NOTE: Letters in parenthesis in the following steps are identified in illustration.****NOTE: Perform this procedure prior to transaxle reassembly.**

1. Measure clearance between 25 x 31 mm thrust shim (A) and snap ring (B) with a feeler gauge (C). See **Fig. 35** . Take measurements in at least 3 places and use an average as the actual clearance. Clearance should be .0020-.0045" (.050-.115 mm).
2. If clearance is not as specified, remove 25 x 31 mm thrust shim (A) and measure its thickness. Select and install a NEW thrust shim and secure it using snap ring, then recheck. Thrust shims are available in thickness range from .041" (1.05 mm) to .070" (1.79 mm) in increments of .003" (.07 mm). After replacing thrust shim, ensure clearance is as specified. Verify that snap ring outside diameter is 1.21" (30.7 mm) or less.



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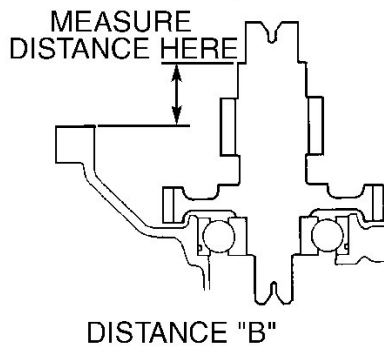
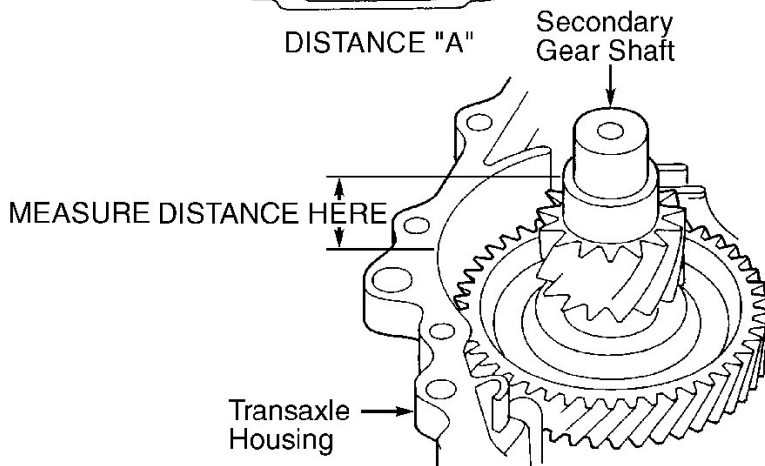
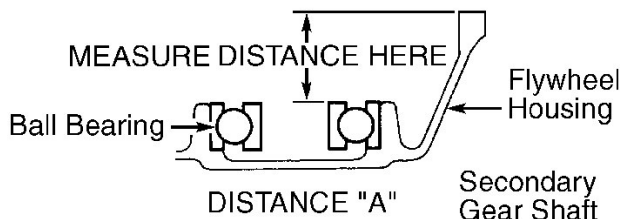
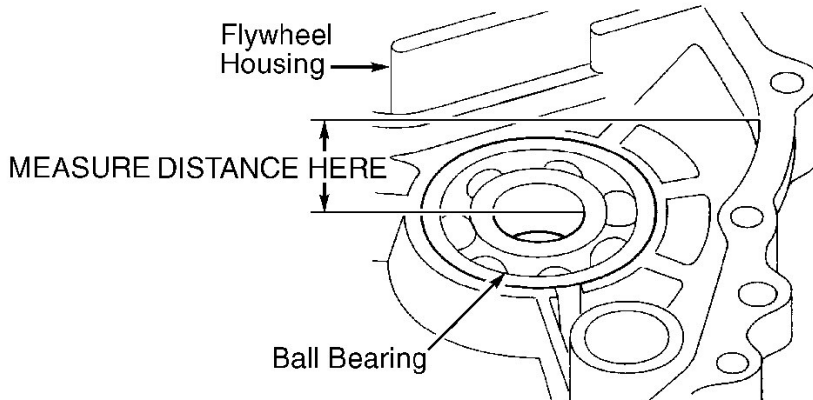
Fig. 35: Measuring Input Shaft & Planetary Carrier Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SECONDARY GEAR SHAFT THRUST SHIM SELECTION

NOTE: Perform this procedure prior to transaxle reassembly.

1. Measure distance "A" between flywheel housing surface and ball bearing. See **Fig. 36** . Install secondary gear shaft in transaxle housing. Measure distance "B" between transaxle housing surface and thrust shim mounting surface of secondary gear shaft. See **Fig. 36** .

2. Calculate thrust shim thickness using following formula to ensure secondary gear shaft thrust clearance is 0-.006" (0-.15 mm): Measurement "A" minus measurement "B" plus flywheel housing gasket thickness of .020" (.50 mm). Shims are available in thickness range from .110" (2.80 mm) to .150" (3.80 mm) in increments of .004" (.10 mm).



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Fig. 36: Calculating Secondary Gear Shaft Thrust Shim Thickness

Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSAXLE REASSEMBLY

NOTE: When PCM, transaxle assembly, start clutch assembly, lower valve body assembly or engine assembly are replaced, PCM must memorize feedback signal for start clutch control. Perform **START CLUTCH CALIBRATION PROCEDURE** under **OPERATION** to calibrate start clutch after installing transaxle.

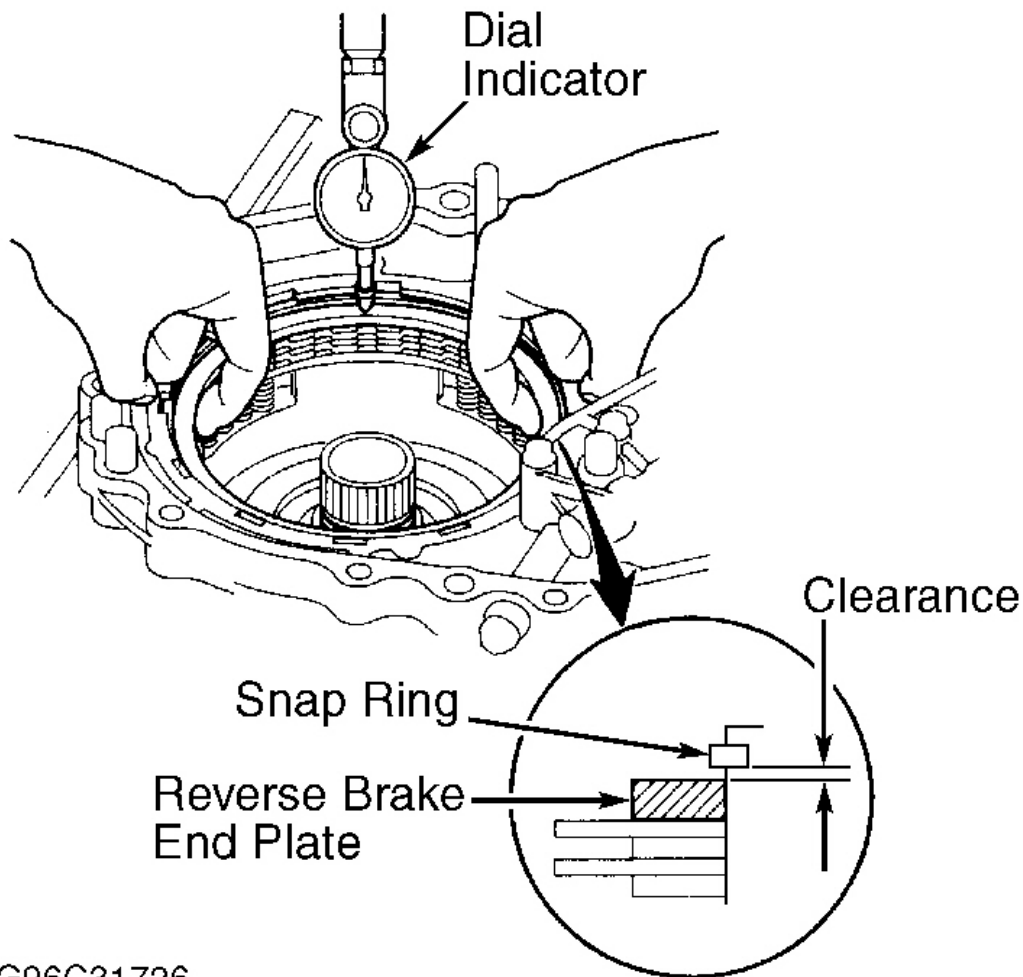
NOTE: Letters in parenthesis in the following steps are identified in illustrations.

1. Install long oil feed pipe in transaxle housing. Install 2 oil feed pipes with NEW "O" rings in transaxle housing. Install 2 dowel pins and NEW transaxle housing gasket on transaxle housing. See **Fig. 9** . Push control shaft assembly toward outside of transaxle housing, then install intermediate housing assembly (4 bolts).
2. Install manual valve body separator plate and 2 dowel pins on intermediate housing. Install manual valve body (5 bolts) with detent spring. Pull control shaft assembly back, then install roller on intermediate housing by aligning groove on control shaft. Install reverse brake piston with NEW "O" ring in intermediate housing. See **Fig. 9** .
3. Install spring retainer/return spring assembly (A) on reverse brake piston (C). See **Fig. 12** . Install return springs on spring guides of reverse brake piston. Install reverse brake spring compressor through the drive pulley shaft on reverse brake return spring. See **Fig. 11** .

CAUTION: If spring retainer tab is on reverse brake piston, spring retainer may be damaged. Ensure spring retainer tab is not on piston. See **Fig. 10** .

4. Compress return springs, then install snap ring in intermediate housing above spring retainer. Ensure snap ring end gap is a minimum of .59" (15 mm). Soak reverse brake discs in ATF for a minimum of 30 minutes. Install disc spring on reverse brake piston in correct direction. See **Fig. 9** .
5. Starting with a reverse brake plate, alternately install reverse brake plate and discs. Install reverse brake end plate and snap ring. Ensure snap ring end gap is a minimum of .71" (18 mm), and inside diameter of snap ring is a minimum of 5.65" (143.5 mm).
6. Using a dial indicator, measure clearance between reverse brake end plate and top disc. See **Fig. 37** .
7. Zero dial indicator with reverse brake end plate lowered. Lift end plate up toward snap ring. Take measurement in at least 3 places and use average as actual clearance. Clearance should be .018-.030" (.45-.75 mm).
8. If clearance is not as specified, remove reverse brake end plate and measure end plate thickness. Select and install NEW reverse brake end plate, then recheck clearance. End plate is available in thickness range from .142" (3.61 mm) to .200" (5.08 mm) in increments of .008" (.20 mm).

NOTE: If thickest reverse brake end plate is installed, but clearance is still over specification, replace reverse brake discs and plates.



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Fig. 37: Measuring Reverse Brake End Plate Clearance
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. After replacing reverse brake end plate, ensure clearance is within specification. Install snap ring retainer on drive pulley shaft.
10. Wrap drive pulley shaft splines with tape to prevent damage to "O" rings. Install NEW "O" rings in drive pulley shaft grooves, then remove tape. Install forward clutch assembly on drive pulley shaft. Install snap ring. Ensure outside diameter of snap ring is 1.63" (41.4 mm) maximum. Install ring gear on forward clutch.
11. Install input shaft/planetary carrier assembly through drive pulley shaft while aligning sun gear to clutch discs and aligning planetary carrier to reverse brake discs. See [Fig. 9](#).
12. Install manual valve body lines with NEW "O" rings on manual valve body and intermediate housing. Install feed pipe with NEW "O" rings. Install 2 dowel pins and NEW end cover gasket on intermediate

housing. See **Fig. 9** . Install NEW "O" rings on oil feed pipes. Install end cover and bolts.

13. Install sealing ring (A) on NEW secondary drive gear (B). See **Fig. 38** . Install parking pawl, parking pawl spring and parking pawl shaft on transaxle housing. Move control lever to any gear position except "P" position.
14. Install secondary gear shaft with selected thrust shim. See **SECONDARY GEAR SHAFT THRUST SHIM SELECTION** under ADJUSTMENTS. Wrap driven pulley shaft splines with tape to prevent damage to "O" rings. Install NEW "O" rings, then remove tape. Assemble secondary drive gear assembly in start clutch assembly. See **Fig. 5** . Install both components on driven pulley shaft.
15. Pull handle of Start Clutch Installer (07TAE-P4V0130) up, then install tip of installer into driven pulley shaft hole. Set installer on start clutch. See **Fig. 39** . Push handle of installer, then tighten nut to seat secondary drive gear assembly on driven pulley shaft securely. See **Fig. 40** .
16. Pull handle of installer up and remove installer. Install 25.5 mm cotters to cotter groove on driven pulley shaft, then measure clearance between cotters (A) and start clutch guide (B) using a feeler gauge (C). See **Fig. 41** . Take measurement in at least 3 places and use average as actual clearance. Clearance should be 0-.005" (0-.13 mm).

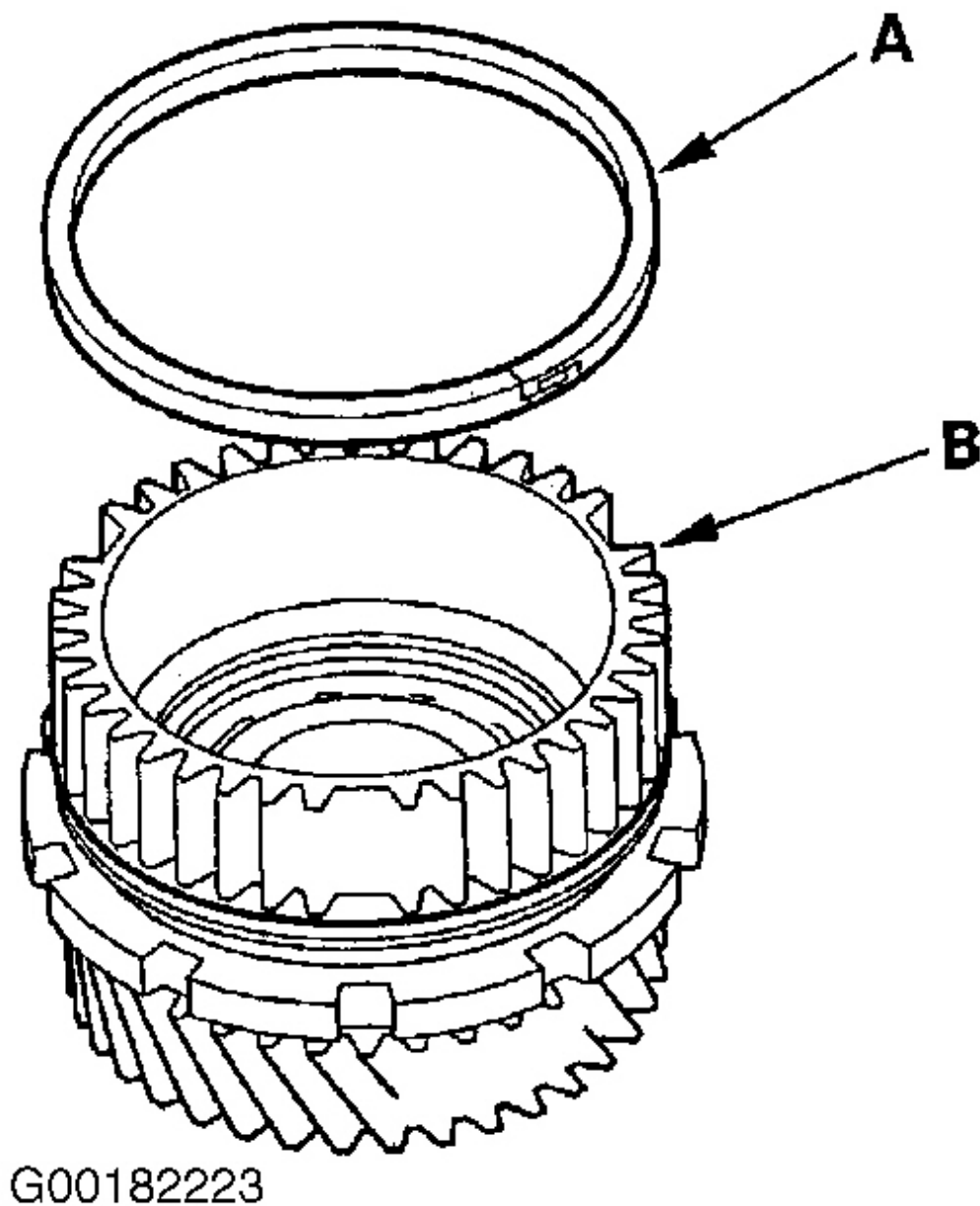


Fig. 38: Installing Sealing Ring On Secondary Drive Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

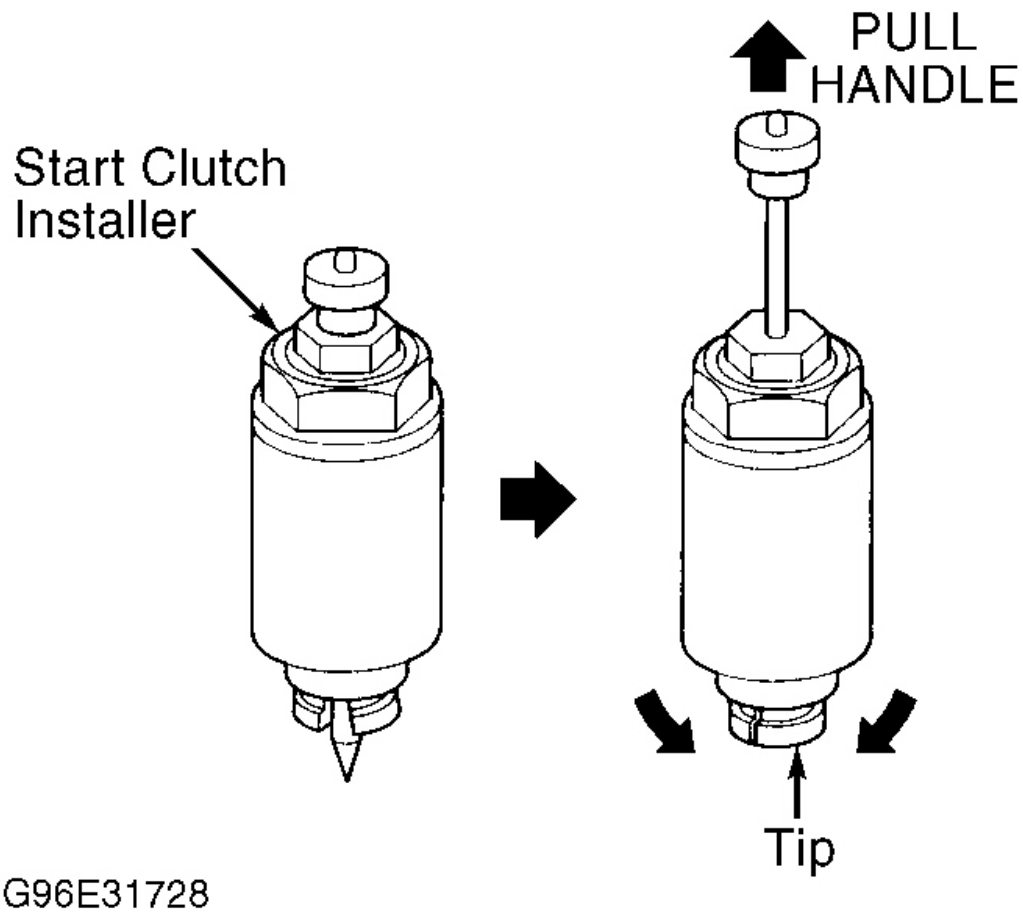
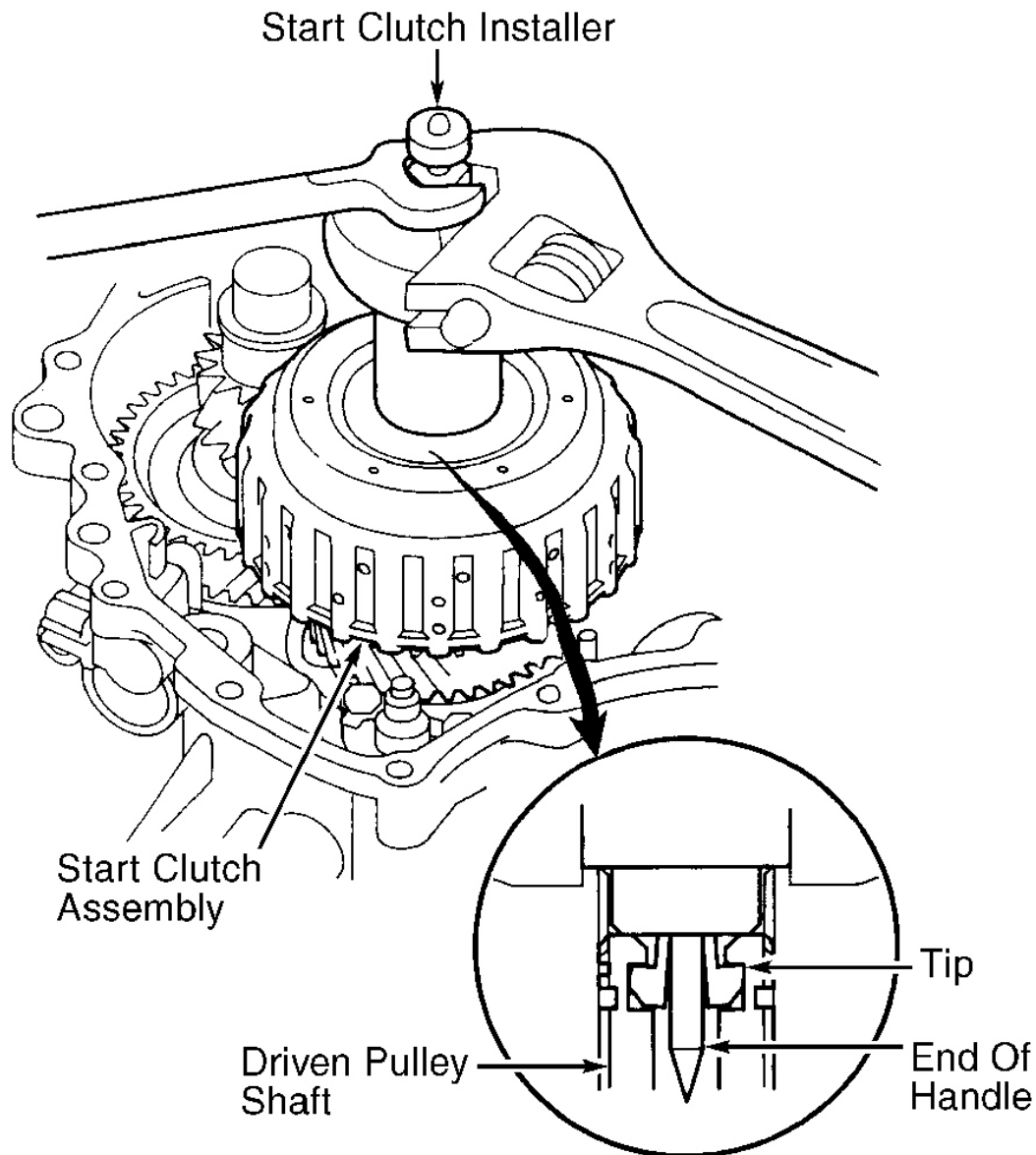


Fig. 39: Identifying Start Clutch Installer Components
Courtesy of AMERICAN HONDA MOTOR CO., INC.



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Fig. 40: Installing Start Clutch Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

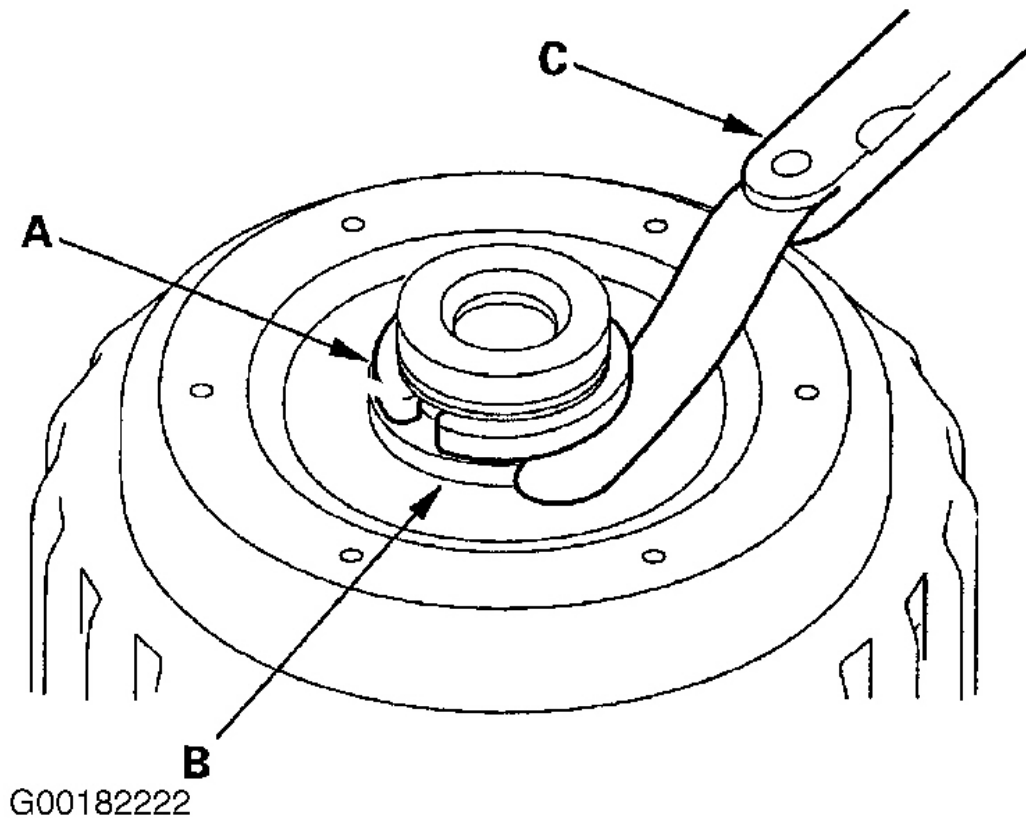
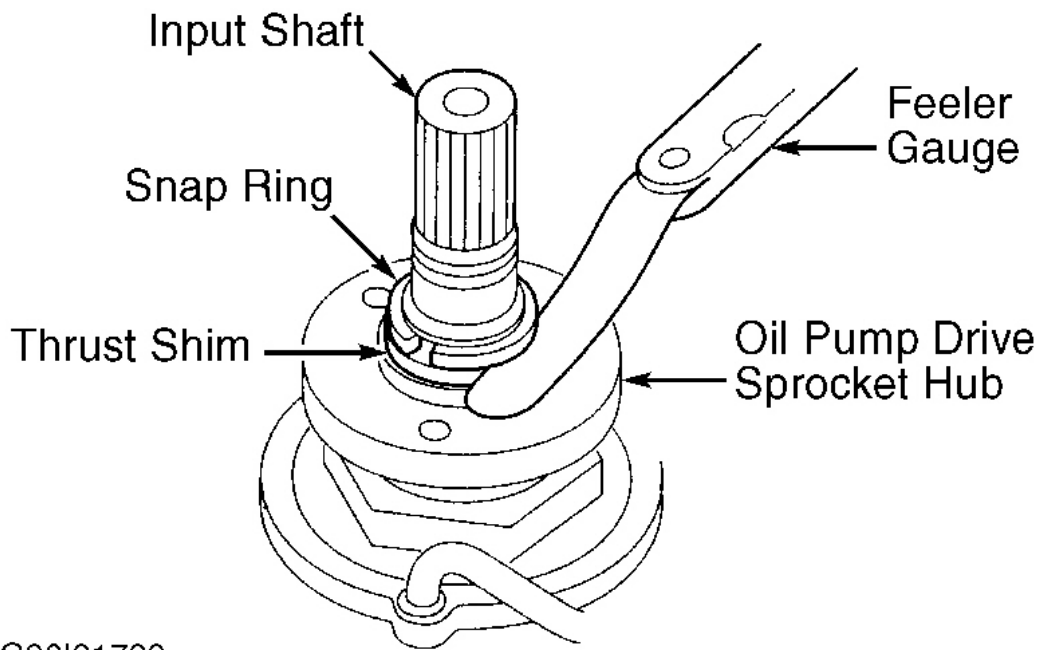


Fig. 41: Measuring Clearance Between Start Clutch Guide & Cotters
Courtesy of AMERICAN HONDA MOTOR CO., INC.

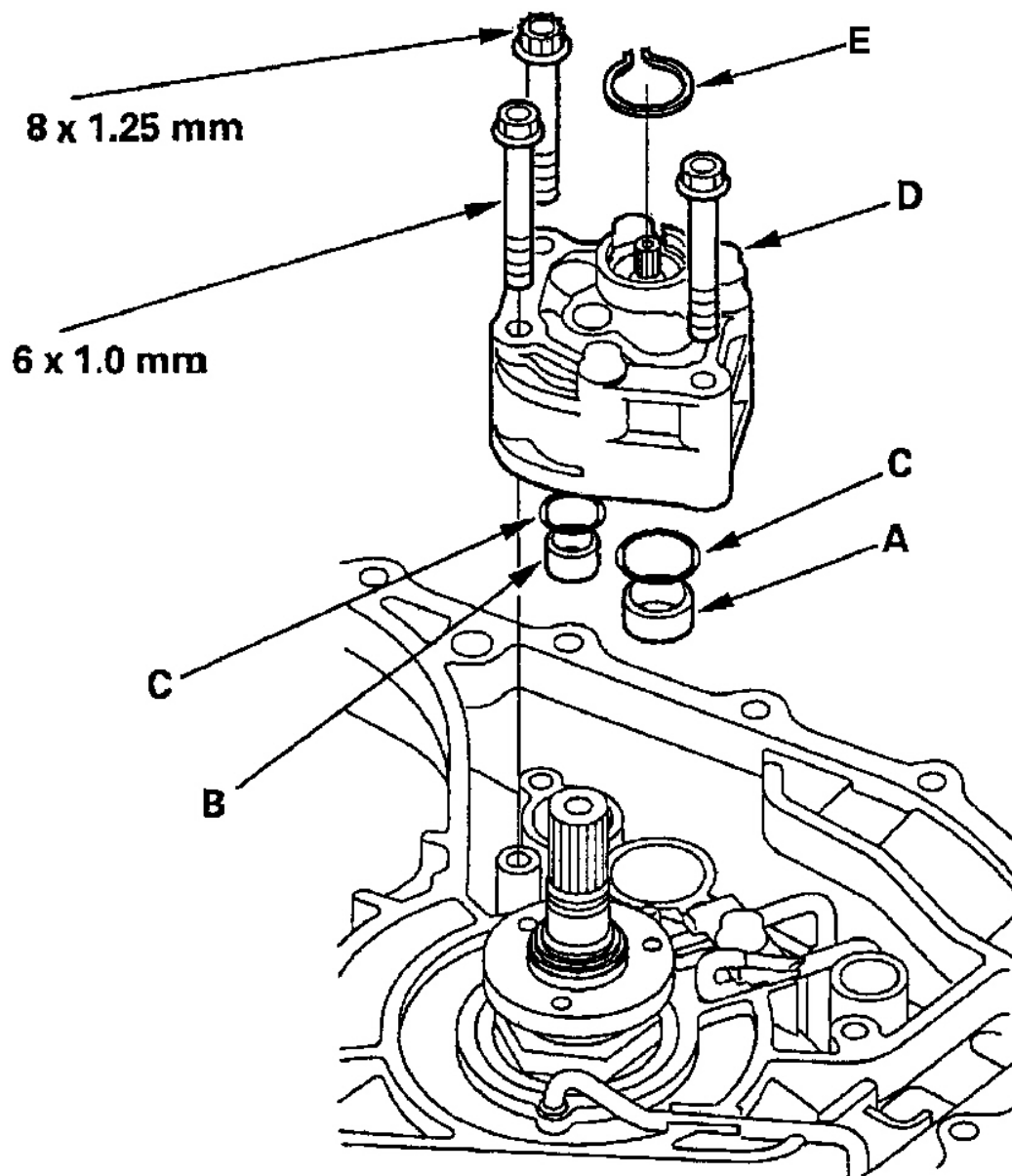
17. If clearance is not as specified, remove cotters and measure their thickness. Select and install NEW cotters, then recheck clearance. Cotters are available in thickness range from .114" (2.90 mm) to .126" (3.20 mm) in increments of .004" (.10 mm). After replacing cotters, ensure clearance is within specification.
18. Install cotter retainer and snap ring. Ensure outside diameter of snap ring is 1.33" (33.9 mm) minimum. Install thrust washer, thrust needle bearing, thrust washer, oil pump drive sprocket hub and 22 x 28 mm thrust shim on input shaft. See **Fig. 5** . Install snap ring. Ensure outside diameter of snap ring is 1.04" (26.3 mm) maximum.
19. Using a feeler gauge, measure clearance between 22 x 28 mm thrust shim and snap ring. See **Fig. 42** . Take measurement in at least 3 places and use average as actual clearance. Clearance should be .015-.026" (.37-.65 mm). If clearance is not as specified, remove thrust shim and measure shim thickness.



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Fig. 42: Measuring Oil Pump Drive Sprocket Hub Thrust Shim-To-Snap Ring Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Select and install NEW thrust shim, then recheck clearance. Thrust shims are available in thickness range from .045" (1.15 mm) to .095" (2.40 mm) in increments of .010" (.25 mm). After replacing thrust shim, ensure clearance is within specification and snap ring outside diameter is correct.
21. Install 22 x 10 mm ATF pipe (A) and 18 x 10 mm pipe (B) in transaxle housing, then install NEW "O" rings (C) over ATF pipes. Install NEW oil pump body (D). Do not pinch "O" rings. Install snap ring (E) in snap ring groove. See **Fig. 43** . Install oil pump drive sprocket. Install pitot flange using cutout to clear pitot pipes. See **Fig. 6** .



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Fig. 43: Install Oil Pump Body

Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Install oil pump drive chain on oil pump drive and driven sprockets. Install and tighten sprocket bolts to specification. See **TORQUE SPECIFICATIONS** . Install differential assembly. Install ATF passage line assembly using NEW "O" rings. See **Fig. 5** .
23. Install 3 dowel pins and NEW flywheel housing gasket on transaxle housing. Install flywheel housing and 20 bolts. Install ATF passage line holder assembly. See **Fig. 5** .

24. Install solenoid harness connector with NEW "O" ring. Install lower valve body assembly with 3 oil feed pipes and 8 bolts. Install oil strainer with NEW "O" ring. Install oil pan with 2 dowel pins and NEW oil pan gasket. See **Fig. 32** . Install breather cap on breather pipe so arrow points toward flywheel housing. See **Fig. 44** .

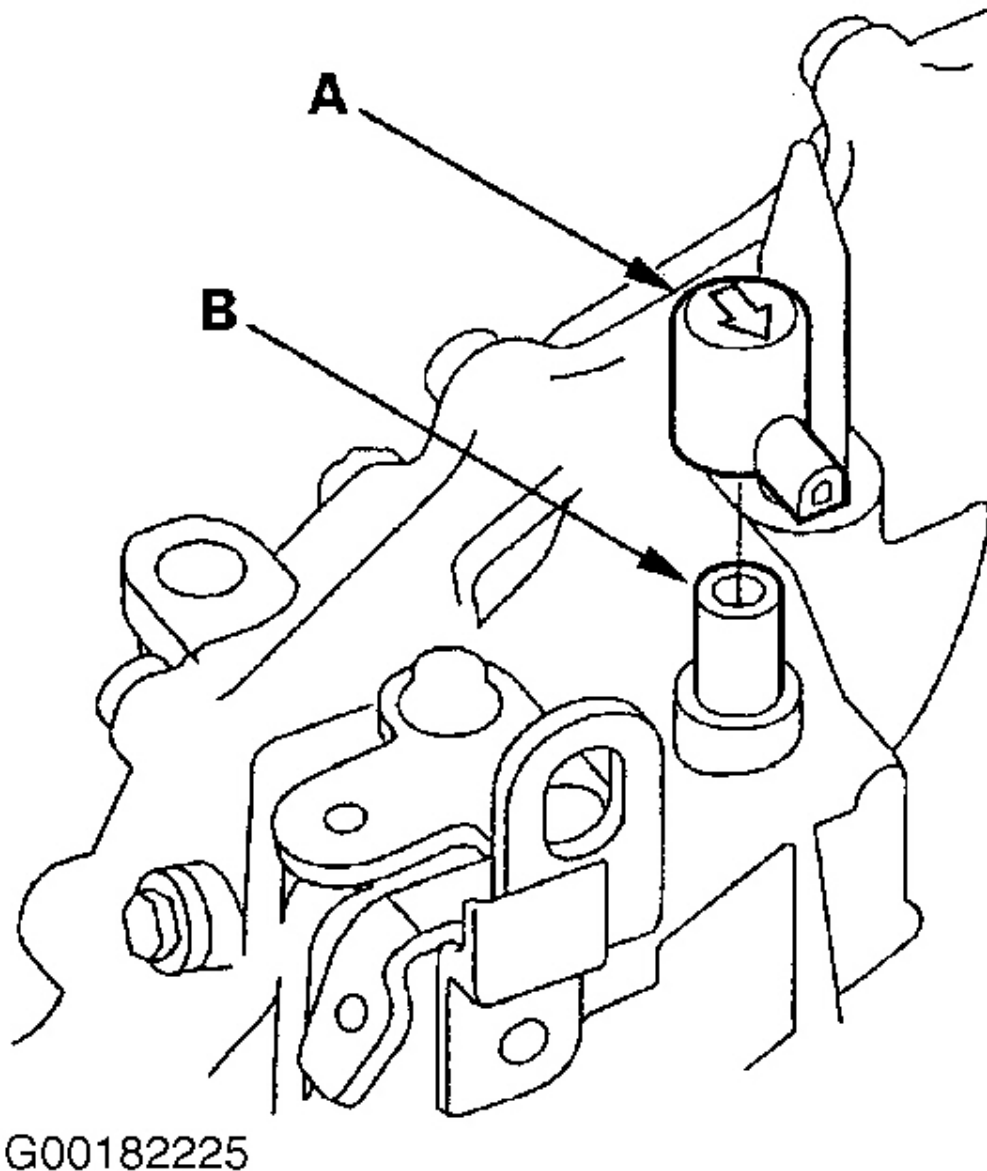


Fig. 44: Installing Breather Cap On Breather Pipe
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Drive Plate-To-Crankshaft Bolt	55 (74)
End Cover Bolt	
6 mm Bolt	(1)
8 mm Bolt	27 (37)
Flywheel Housing Bolt	21 (29)
Oil Pan Drain Plug	36 (49)
Oil Pump Assembly 8-mm Bolt	19 (26)
Pressure Plug	13 (18)
Ring Gear Bolt	72 (98)
	INCH Lbs. (N.m)
All Speed Sensor Bolts	106 (12.0)
ATF Passage Line Assembly Bolt	106 (12.0)
ATF Passage Line Holder Assembly Bolt	106 (12.0)
Control Lever Bolt	124 (14.0)
Control Valve Assemblies Bolt	106 (12.0)
Intermediate Housing Bolt	106 (12.0)
Lower Valve Body Assembly Bolt	106 (12.0)
Lower Valve Body Assembly-To-Transaxle Housing Bolt	106 (12.0)
Manual Valve Bolt	106 (12.0)
Oil Pan Bolt	106 (12.0)
Oil Pump Assembly 6-mm Bolt	106 (12.0)
Oil Pump Drive Sprocket Bolt	106 (12.0)
Oil Strainer Bolt	106 (12.0)
Solenoid Harness Bolt	106 (12.0)
Transaxle Range Switch Bolt	106 (12.0)
(1) Tighten bolt to 106 INCH lbs. (12.0 N.m).	

TRANSAXLE SPECIFICATIONS

TRANSAXLE SPECIFICATIONS

Application	Specification - In. (mm)
Clearance	
Cotters-To-Start Clutch Guide	0-.005 (0-.13)
Flywheel Housing Set Ring-To-Outer Race	.006 (.15)
Forward Clutch	.024-.031 (.60-.80)
Input Shaft/Planetary Carrier Thrust Shim-To-Snap Ring	.0020-.0045 (.050-.115)
Oil Pump Drive Sprocket Hub	.015-.026 (.37-.65)

2001 Honda Civic EX**2001-02 AUTOMATIC TRANSMISSIONS MLYA CVT Overhaul**

Reverse Brake	.018-.030 (.45-.75)
Secondary Gear Shaft Thrust	0-.006 (0-.15)
Differential Pinion Gear Backlash	.002-.006 (.05-.15)
Snap Ring Diameter	
Cotter Retainer (Minimum)	1.33 (33.9)
Forward Clutch (Maximum)	1.63 (41.4)
Oil Pump Drive Sprocket Hub (Maximum)	1.04 (26.3)
Planetary Carrier (Maximum)	1.21 (30.7)
Reverse Brake (Minimum)	5.65 (143.5)
Snap Ring End Gap	
Driven Pulley Shaft Bearing	0-.35 (0-9)
Forward Clutch	.31 (7.9)
Intermediate Housing (Minimum)	.59 (15)
Reverse Brake Drum (Minimum)	.71 (18)

CLUTCH DISC & PLATE QUANTITY

Component	Disc	Plate
Forward Clutch	2	2
Reverse Brake	3	3