

**HONDA
RO - MPRA**

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Technical Service Information

The Automatic Transmission is a combination of a 3-element torque converter and a triple-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 speed reverse. The entire unit is positioned in line with the engine.

TORQUE CONVERTER, GEARS AND CLUTCHES

The torque converter consists of a pump, turbine and stator, assembled in a single unit.

They are connected to the engine crankshaft so they turn together as a unit as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft.

The transmission has three parallel shafts, the mainshaft, the countershaft and the secondary shaft. The mainshaft is in line with the engine crankshaft.

The mainshaft includes the clutches for 1st, and 4th, and gears for 3rd, 4th, Reverse and 1st (3rd gear is integral with the mainshaft, while reverse gear is integral with 4th gear).

The countershaft includes 3rd clutch and gears for 2nd, 3rd, and 4th, Reverse and 1st.

The secondary shaft includes 2nd clutch, the secondary drive gear, and 2nd gear.

The 4th and reverse gears can be locked to the countershaft at its center, providing 4th gear or Reverse, depending on which way the selector is moved.

The gears on the mainshaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft to the countershaft to provide **S3**, **S4**, **D**, **2** and **R**.

Electronic Control

The electronic control system consists of an automatic control unit, sensors, and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The A/T control unit is located below the dash to the left of the steering column.

HYDRAULIC CONTROL

The valve assembly includes the main valve body, secondary valve body, servo valve body, and regulator valve body. They are bolted to the torque converter case as an assembly.

The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, 3-4 shift valve, cooler relief valve, 3rd orifice control valve, lock-up shift valve, lock-up control valve, 3-2 kickdown valve, pressure relief valve and oil pump gears.

The secondary valve body includes the 4th exhaust valve, 3rd kickdown valve, modulator valve, 2nd modulator valve, servo control valve and the 2nd orifice control valve.

The servo valve body contains the accumulator pistons T/C check valve, and servo valve. The regulator valve body contains pressure regulator valve and lock-up timing valve. Fluid from the regulator passes through the manual valve to the various control valves.

The 1st, 3rd and 4th clutches receive oil from their respective feed pipes.

SHIFT CONTROL MECHANISM

Input from various sensors located throughout the car determines which shift control solenoid valve the A/T control unit will activate. Activating a shift control solenoid valve changes modulator pressure, causing a shift valve to move. This pressurizes a line to one of the clutches, engaging that clutch and its corresponding gear.

LOCK-UP MECHANISM

In **S4** or **D**, in 2nd, 3rd and 4th, pressurized fluid is drained from the back of the torque converter through an oil passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with hydraulic control, an electronic control unit optimizes the timing of the lock-up mechanism.

The lock-up valves control the range of lock-up according to lock-up control solenoid valves A and B, and throttle valve B. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the A/T control unit.

(cont'd)

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GEAR SELECTION

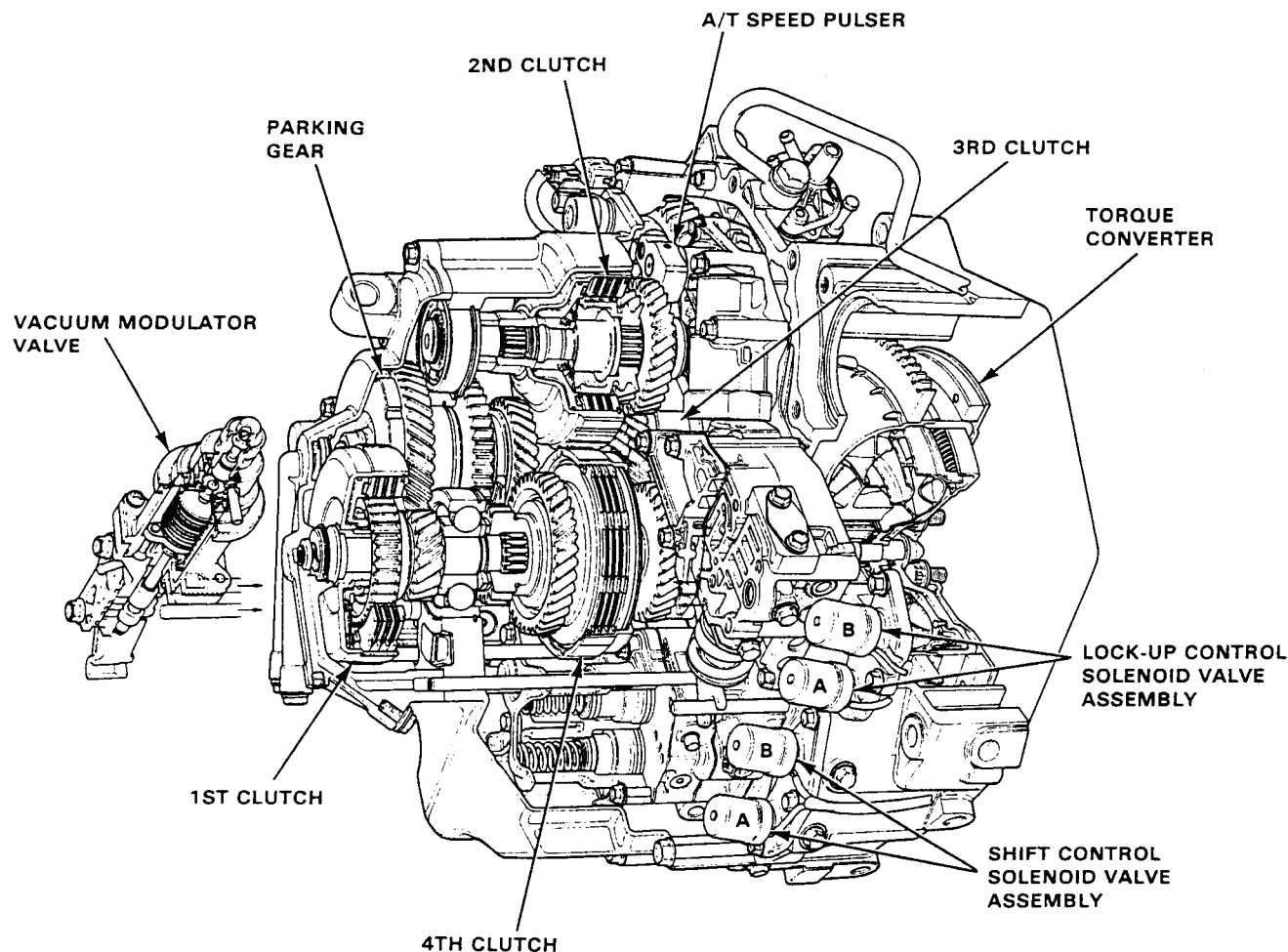
The selector lever has six positions: **P** PARK, **R** REVERSE, **N** NEUTRAL, **D** or **S4** 1st through 4th gear ranges, **S3** 1st through 3rd gear ranges, and **2** 2nd gear.

Position	Description
P PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th gear clutch locked.
N NEUTRAL	All clutches released.
D DRIVE	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in 2nd, 3rd and 4th when the transmission is in D and S4 .
S SPORTS (1 through 3, or 4)	For rapid acceleration at highway speeds and general driving; starts off in 1st, shifts automatically to 2nd, then 3rd (S3), and then 4th (S4) depending on vehicle speed and throttle position. Downshifts through lower gears on deceleration to stop.
2 SECOND	For engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.

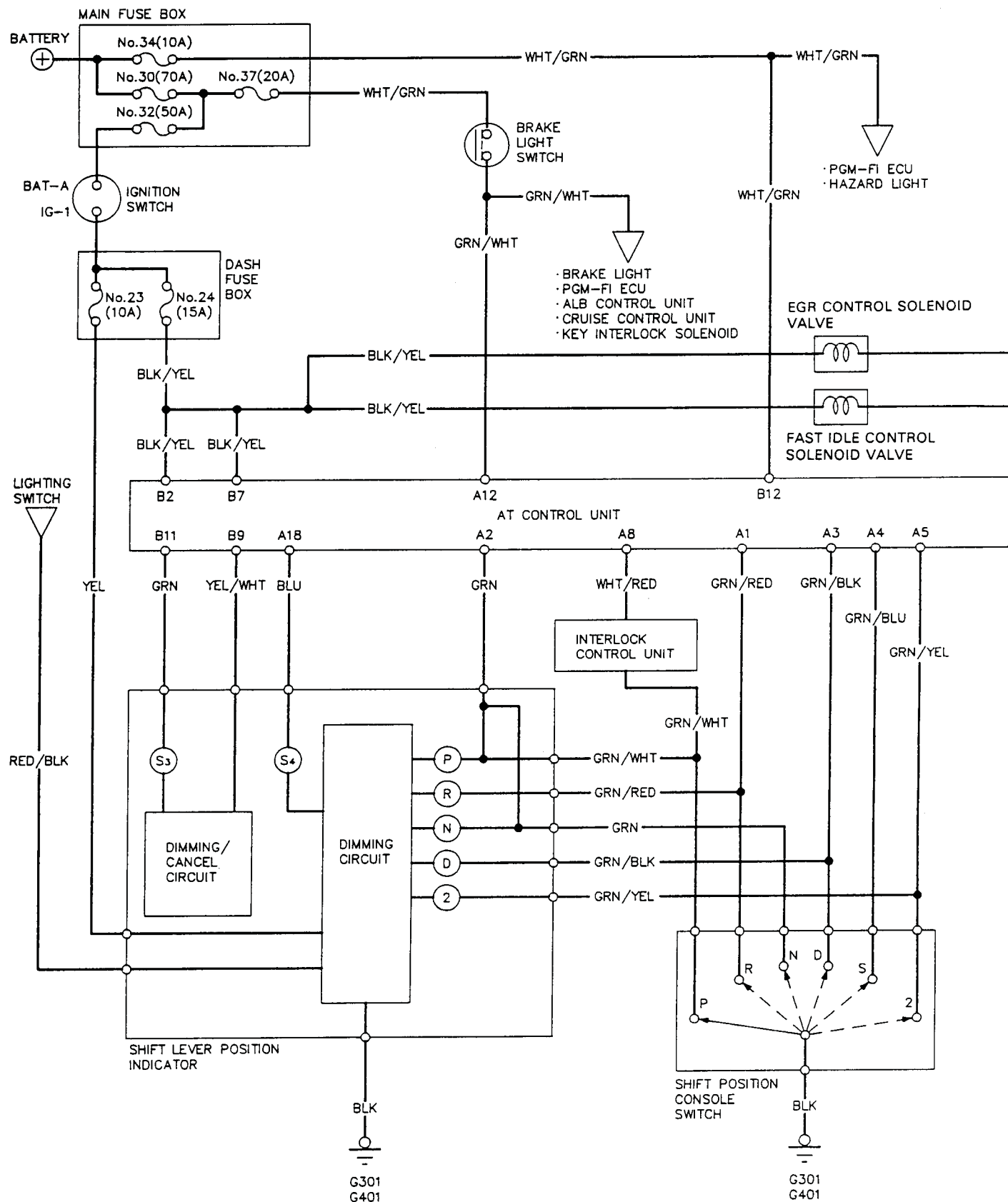
Starting is possible only in **P** and **N** through use of a slide-type, neutral-safety switch.

POSITION INDICATOR

A position indicator in the instrument panel shows what gear has been selected without having to look down at the console.



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Self-diagnosis LED indicator blinks twice.

Disconnect the 12P connector from the control unit.

Turn the ignition switch ON.

Measure the voltage between the B8 (GRN/BLK) and B1 (BLK/RED) terminals.

Is there voltage?

NO

Turn the ignition switch OFF.

Measure the resistance between the B8 (GRN/BLK) and B1 (BLK/RED) terminals.

Is the resistance 12-24 Ω ?

YES

Disconnect the 2P connector from the lock-up control solenoid valve assembly.

Check for continuity between the B8 (GRN/BLK) and B1 (BLK/RED) terminals.

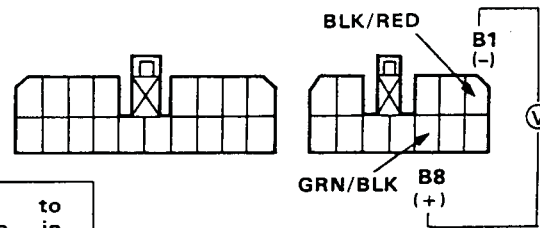
Is there continuity?

NO

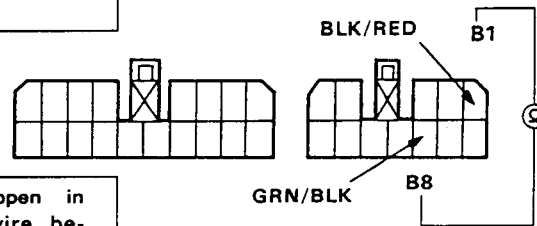
Connect the 2P connector to the lock-up control solenoid valve assembly.

Check for loose control unit connectors. If necessary, substitute a known-good control unit and recheck.

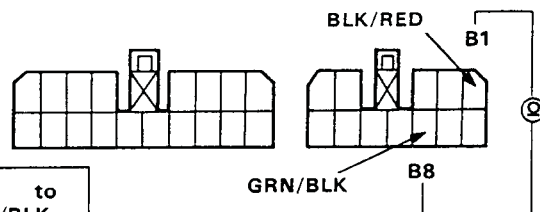
View from wire side.



Repair short to power source in GRN/BLK wire between the B8 terminal and the lock-up control solenoid valve B.

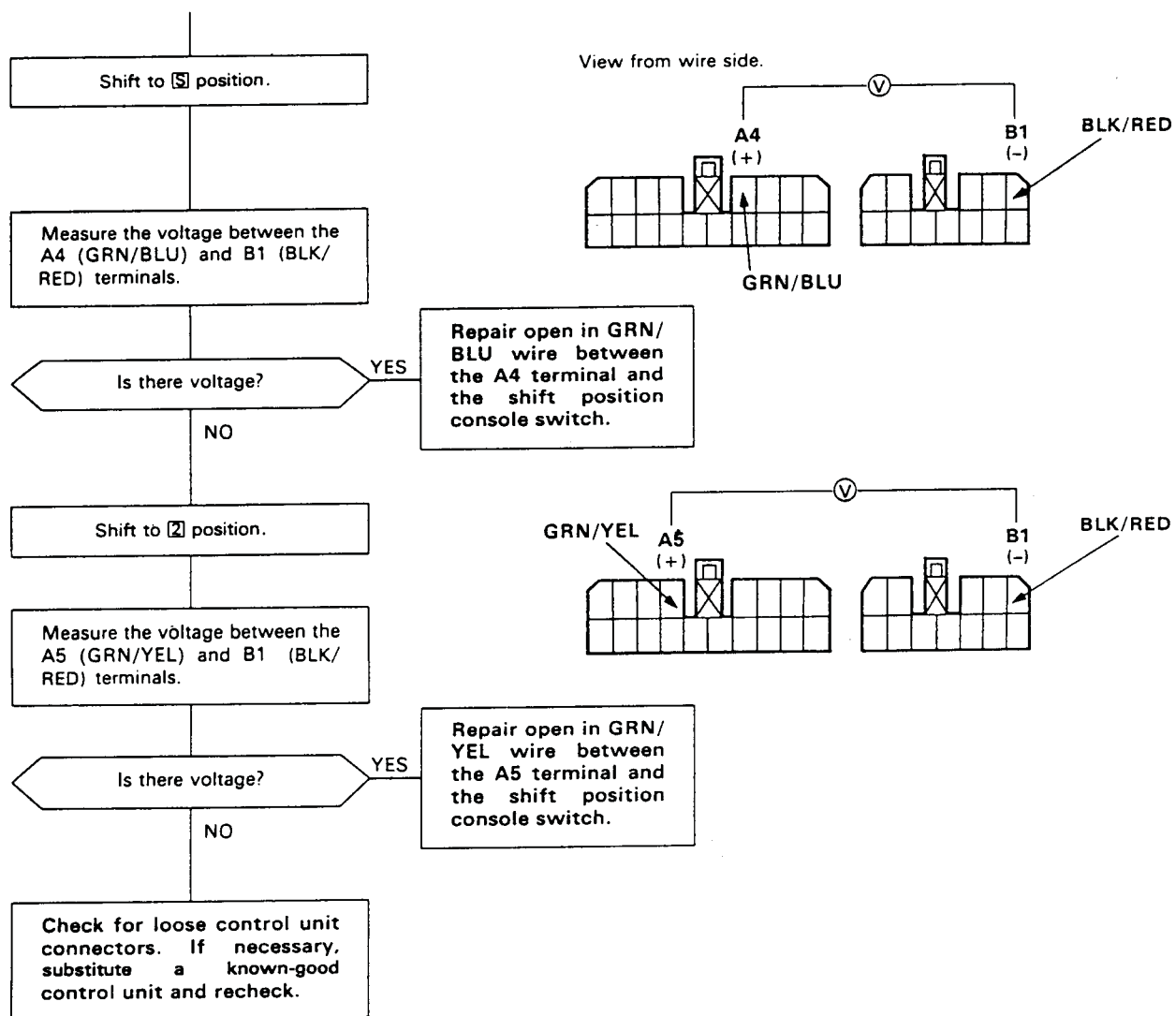


Check for open in GRN/BLK wire between the B8 terminal and the lock-up control solenoid valve B. If wire is OK, check the Lock-up Control Solenoid Valve B.



Repair short to ground in GRN/BLK wire between the B8 terminal and the lock-up control solenoid valve B.

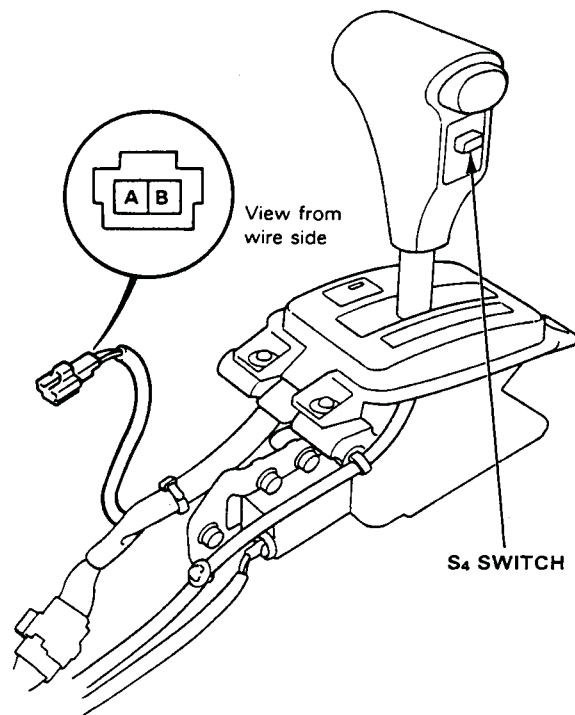
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Test

1. Remove the center console.
2. Disconnect the switch connector.
3. Check for continuity between A and B terminals. There should be continuity when the switch is pressed.



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CAUTION:

- To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.
- Do not shift the lever while raising the engine speed.
- Be sure to remove the pressure gauge before testing stall speed.

1. Engage parking brake and block the front wheels.
2. Connect safety chains to both front two hooks and attach, with minimum slack, to some strong stationary object.
3. Connect tachometer, and start the engine.
4. After the engine has warmed up to normal operating temperature, shift into **[2]**.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed.
6. Allow 2 minutes for cooling, then repeat same test in **[D]**, **[S]**, and **[R]**.

Stall speed in **[D]**, **[S]**, **[2]** and **[R]** must be the same, and must also be within limits:

NOTE:

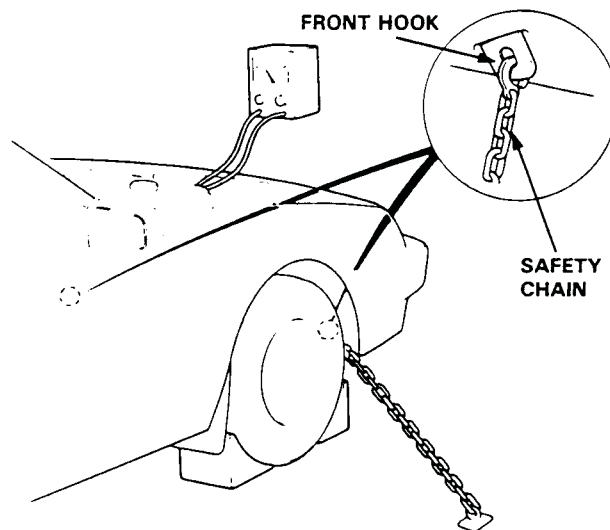
Stall speed test must be made only for checking the cause of trouble.

Stall Speed RPM:

Specification: 2,600 rpm

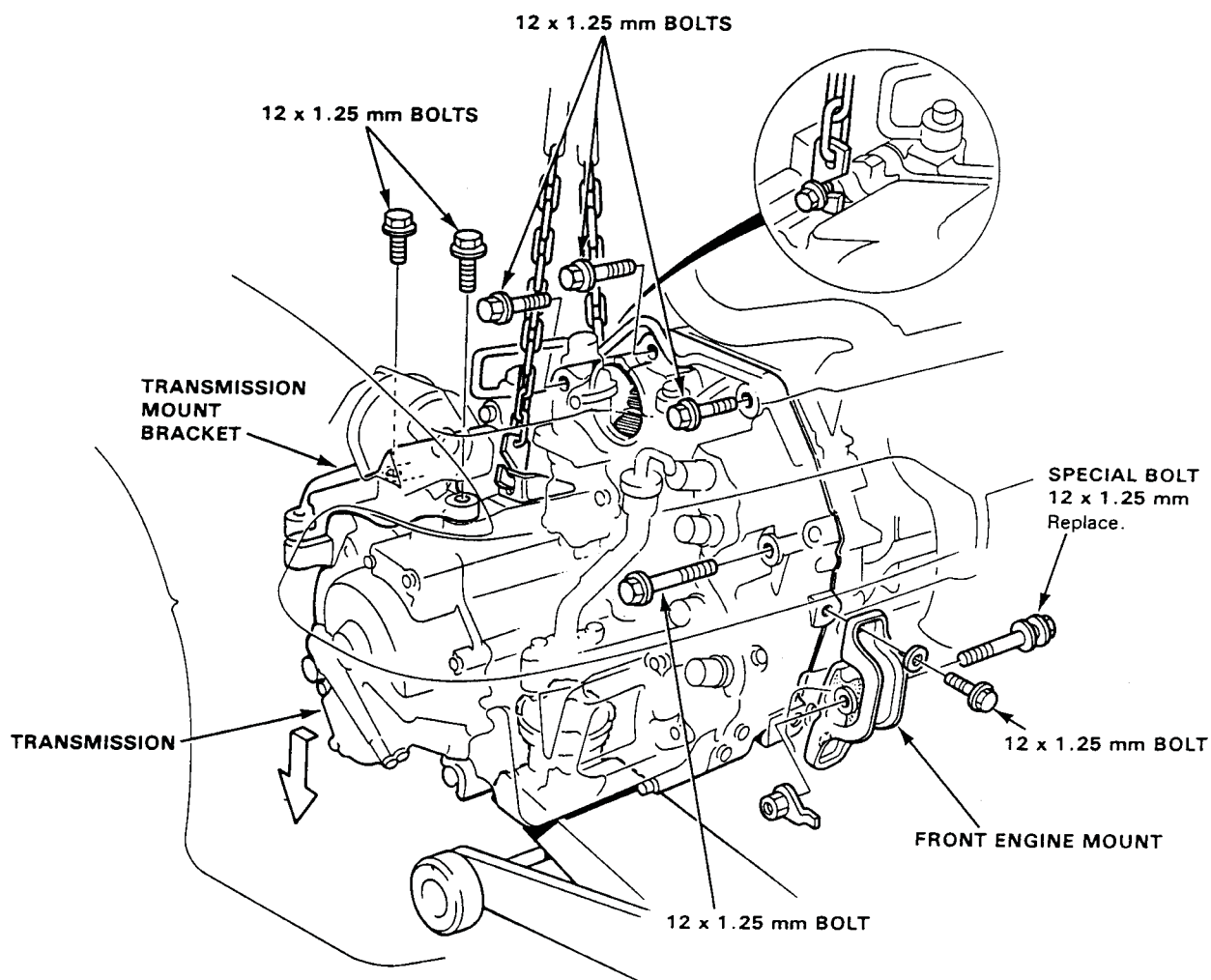
Service Limit: 2,450–2,750 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D] , [S] , [2] & [R]	<ul style="list-style-type: none"> • Low fluid level or oil pump output. • Clogged oil strainer. • Pressure regulator valve stuck closed. • Slipping clutch.
Stall rpm high in [R]	<ul style="list-style-type: none"> • Slippage of 4th clutch
Stall rpm high in [2]	<ul style="list-style-type: none"> • Slippage of 2nd clutch
Stall rpm high in [D] & [S]	<ul style="list-style-type: none"> • Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm low in [D] , [S] , [2] & [R]	<ul style="list-style-type: none"> • Engine output low • Torque converter one-way clutch slipping

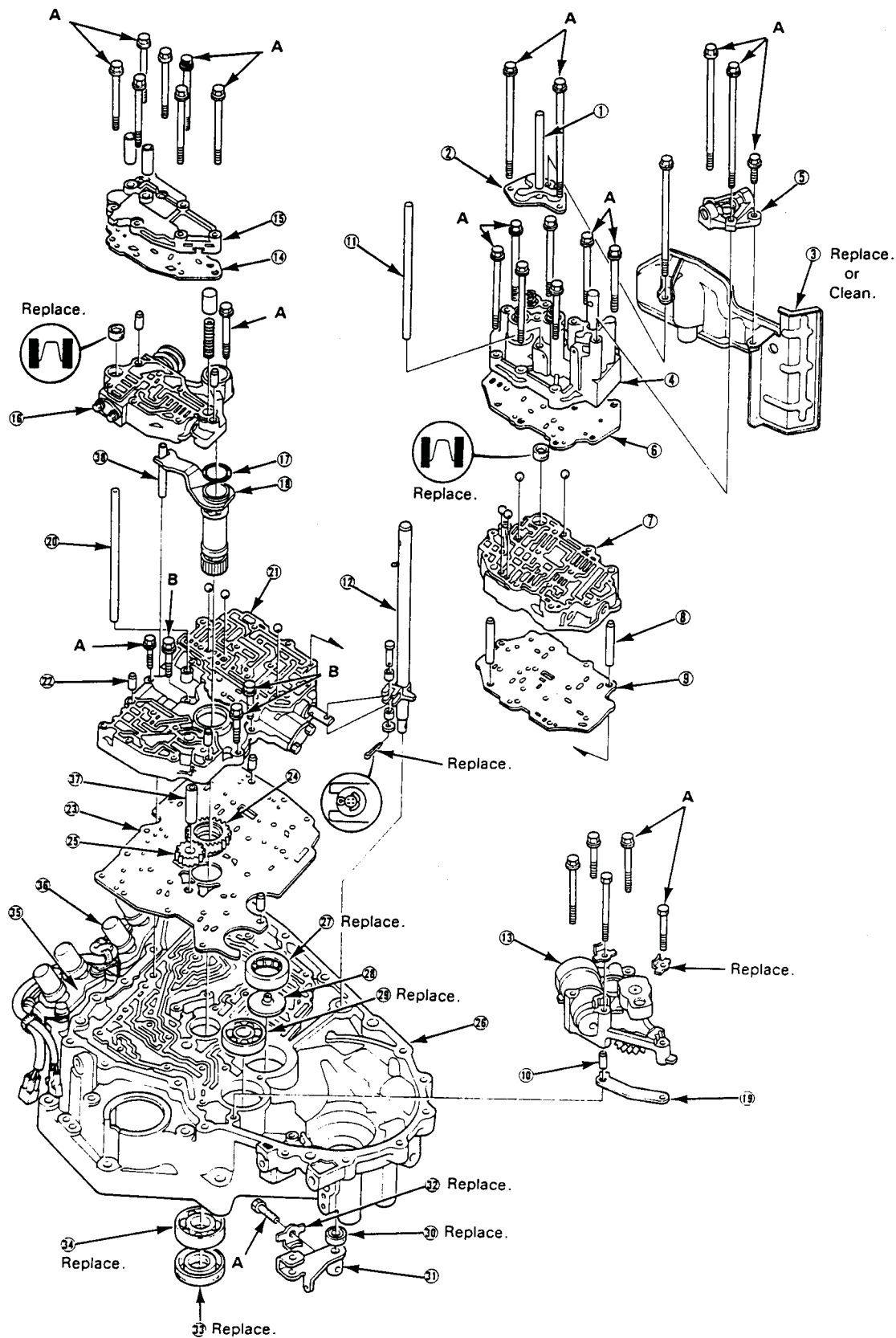


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31. Loosen the differential housing mounting bolt.
32. Attach a chain hoist to the transmission housing hoist bracket and differential housing-to-engine mounting bolt, then lift the engine slightly to unload the mounts as shown.
33. Place a jack under the transmission and raise transmission just enough to take weight off mounts.
34. Remove the front engine mount.
35. Remove the 4 transmission housing mounting bolts and 2 mount bracket bolts.
36. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower on the transmission jack.



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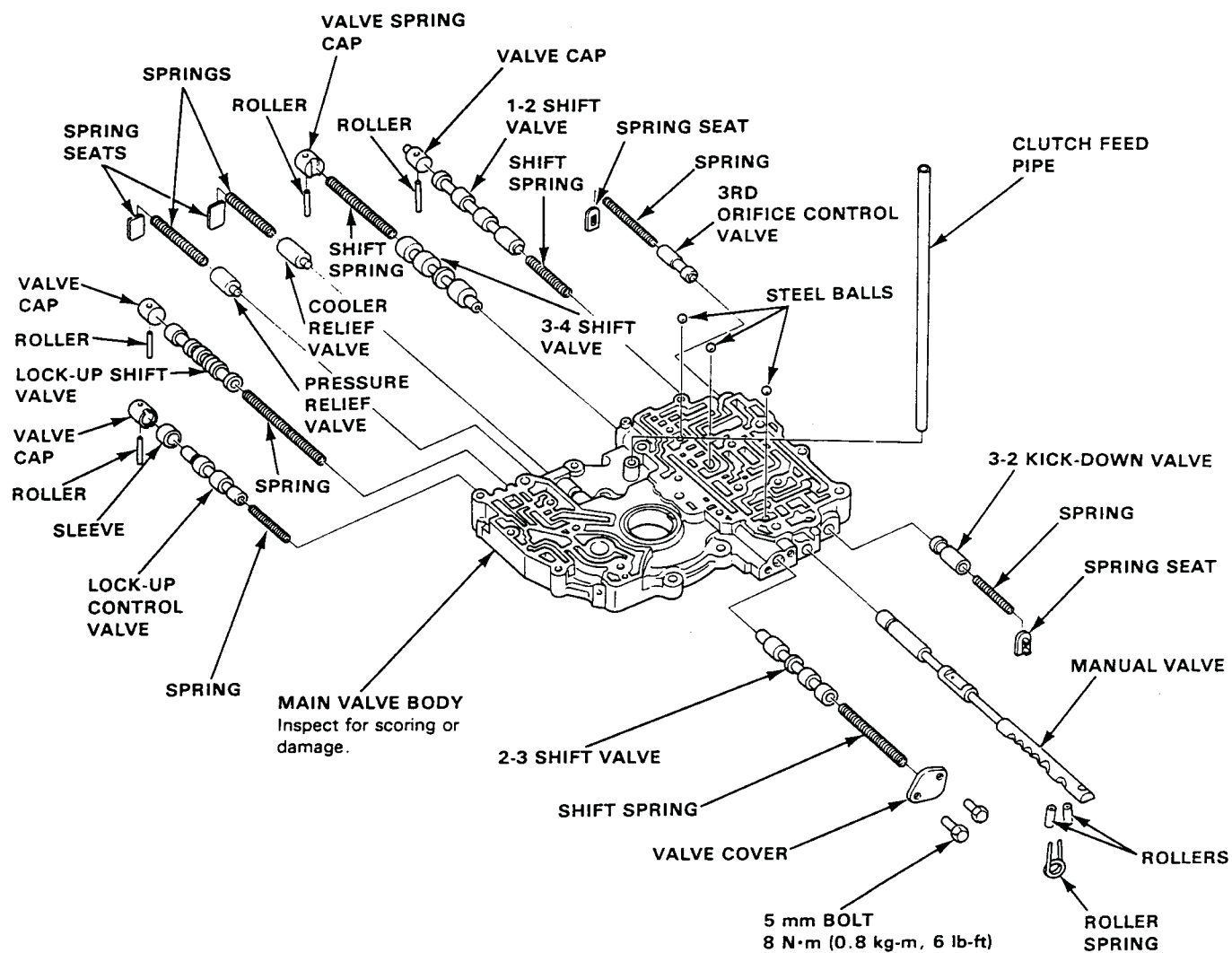


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NOTE:

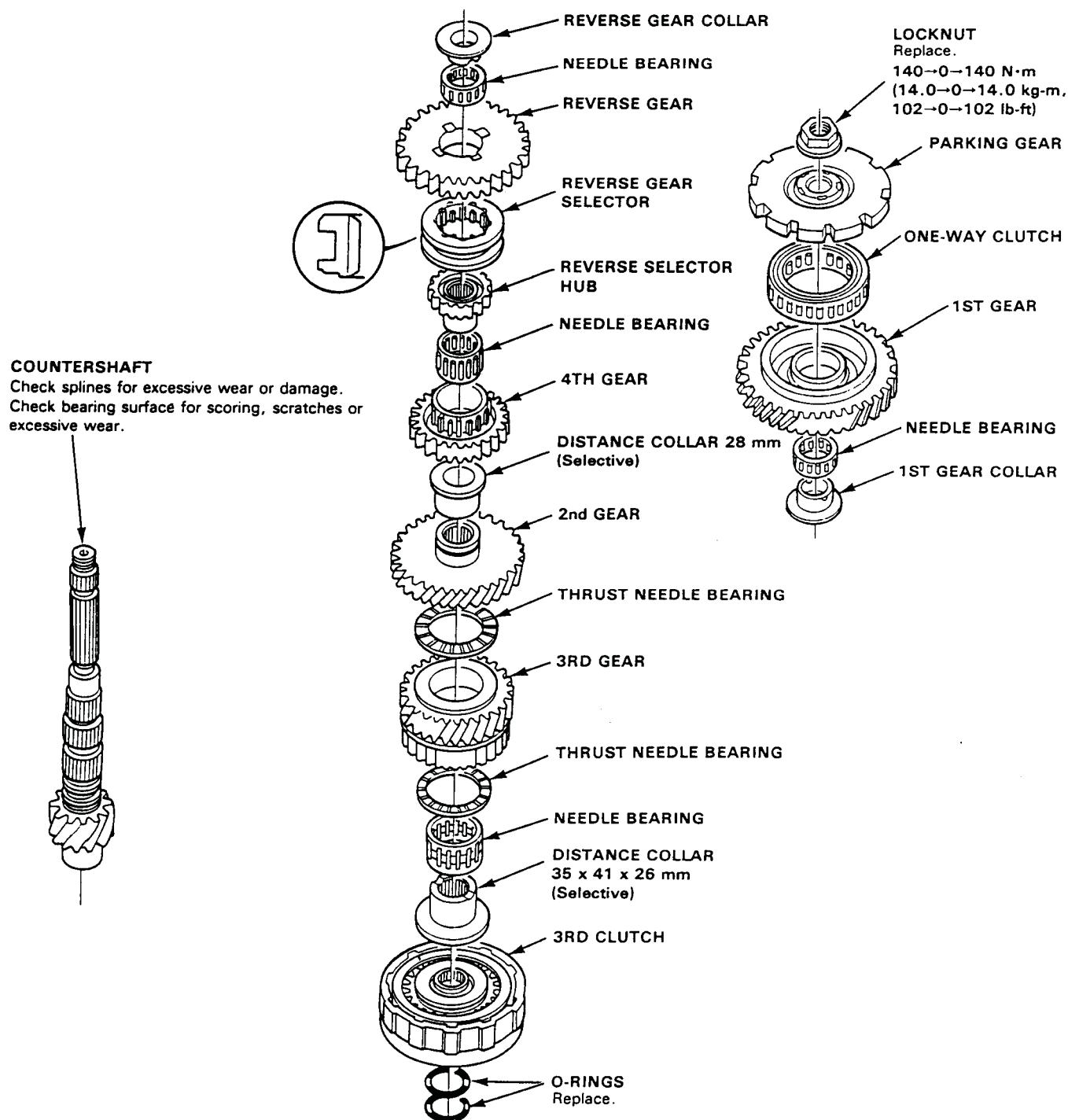
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely
- See Section 3 for spring specifications.
- Coat all parts with ATF before reassembly.



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NOTE:

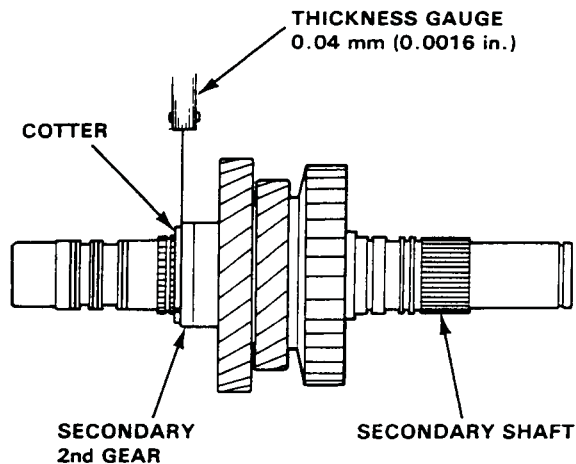
- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect thrust needle and needle bearings for galling and rough movement.



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3. Measure the clearance between the secondary 2nd gear and cotter using a 0.04 mm (0.0016 in.) feeler gauge.

Standard: 0–0.04 mm (0–0.0016 in.)
Service Limit: 0.06 mm (0.0024 in.)



4. The clearance should be rechecked with a 0.06 mm (0.0024 in.) feeler gauge if the 0.04 mm (0.0016 in.) gauge goes in.
5. The clearance is out of tolerance if the 0.06 mm (0.0024 in.) gauge goes in.
6. Remove the cotters and select cotters which will bring the clearance within tolerance.

NOTE: It is recommended to adjust the clearance if it exceeds 0.04 mm (0.0016 in.).

1. Assemble the secondary shaft assembly (page 14-105).
2. Select and install the shortest distance collar 25 mm (standard).

Part No.	Collar Width (mm, in)
90520—PRO—000	16.85 (0.6634)
90521—PRO—000	16.90 (0.6654)
90522—PRO—000	16.95 (0.6673)
90513—PRO—000	17.00 (0.6693)
90514—PRO—000	17.05 (0.6713)
90515—PRO—000	17.10 (0.6732)
90516—PRO—000	17.15 (0.6752)
90517—PRO—000	17.20 (0.6772)
90518—PRO—000	17.25 (0.6791)
90519—PRO—000	17.30 (0.6811)

3. Install the secondary shaft assembly in the torque converter housing.

NOTE: It is not necessary to install the countershaft, mainshaft, etc. at this time.

4. Place a new packing on the torque converter housing, and install the transmission housing.

NOTE: Check that all shafts and gears in the torque converter and transmission rotate freely without binding.

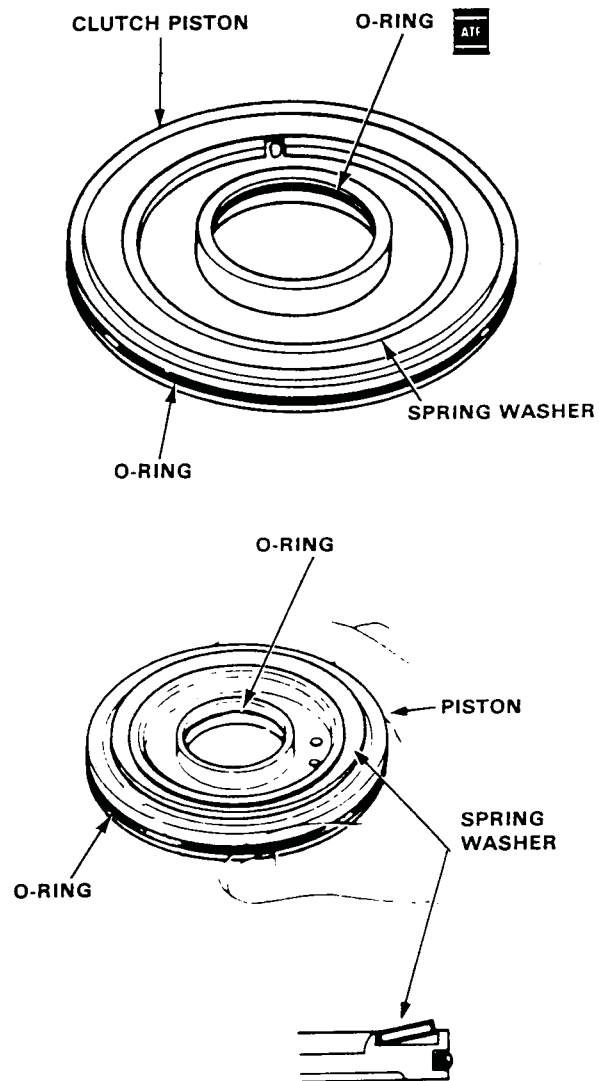
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NOTE:

- Clean all parts thoroughly in solvent, and dry with compressed air. Blow out all passages.
- Lubricate all parts with ATF before reassembly.

1. 3rd and 4th clutch.

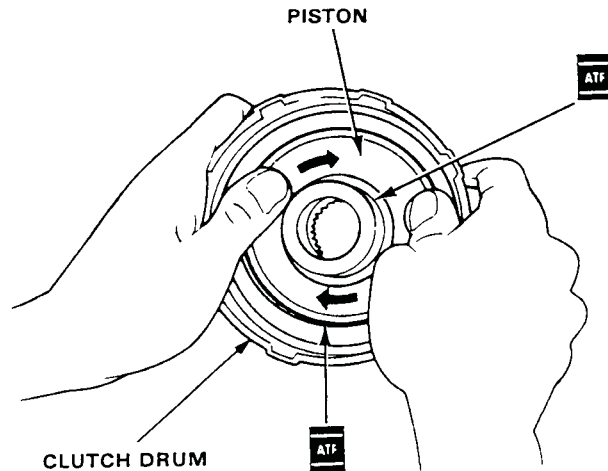
- 1. Install a new O-ring on the clutch piston. Be sure that the disc spring is securely staked.



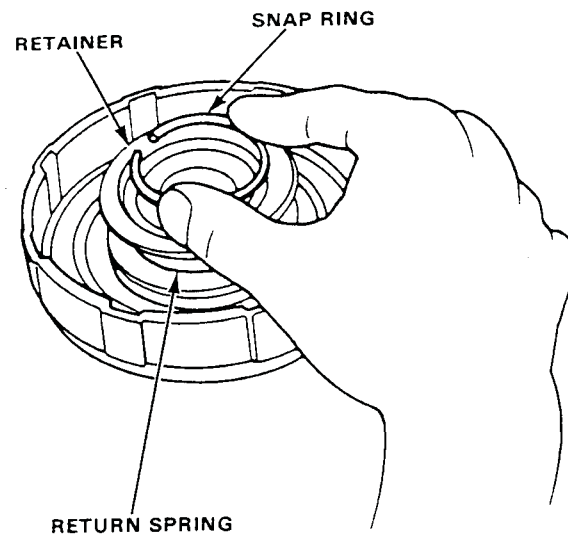
- 2. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

NOTE: Lubricate the piston O-ring with ATF before installing.

CAUTION: Do not pinch O-ring by installing the piston with force.



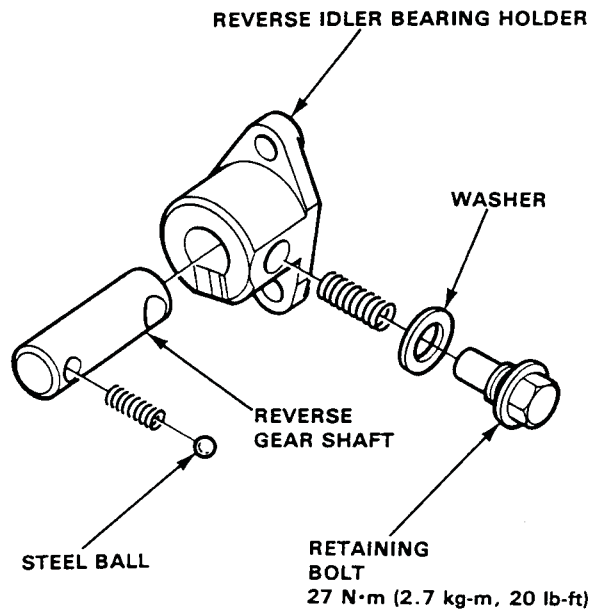
- 3. Install the return spring and retainer.
- 4. Position the snap ring on the spring retainer.



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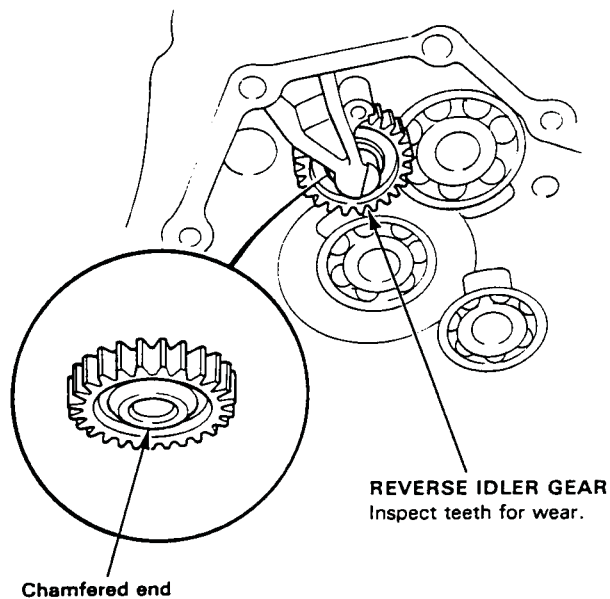
1. Assemble the reverse idler bearing holder.

NOTE: Align the hole in the shaft with the spring.



2. Install the reverse idler gear.

NOTE: Install the reverse idler gear so that the larger chamfer on the shaft bore faces the torque converter housing.



3. Install the needle bearing into the idler gear.
4. Install the reverse idler bearing holder into the transmission housing.

5. Tighten the reverse idler bearing holder bolts.
6. Install the spring and then tighten the retaining bolt and washer.

