2000 AUTOMATIC TRANSMISSIONS

Toyota U340E & U341E Overhaul

APPLICATION

CAUTION: Vehicle is equipped with a Supplemental Restraint System (SRS). When servicing vehicle, use care to avoid accidental air bag deployment. All SRS electrical connections and wiring harness are covered with Yellow insulation. SRS-related components are located in steering column, center console, instrument panel and lower panel of instrument panel. DO NOT use electrical test equipment on these circuits. It may be necessary to deactivate SRS before servicing components. See AIR BAG DEACTIVATION PROCEDURES article in GENERAL INFORMATION.

AUTOMATIC TRANSAXLE APPLICATIONS

Application	Transaxle Model
Celica GT-S	U341E
ECHO	U340E

IDENTIFICATION

Vehicle Identification Number (VIN) is used for correct identification of component parts and assemblies. VIN is located at top left corner of instrument panel. Vehicle certification label is located at left corner of driver's door. This label also contains the VIN.

GEAR RATIOS

TRANSAXLE GEAR RATIOS

Gear Range	Gear Ratio
1st	2.847:1
2nd	1.552:1
3rd	1.000:1
OD	0.700:1
Reverse	2.343:1

DESCRIPTION & OPERATION

The U340E and U341E transaxles are 4-speed electronically controlled transaxles. Transaxle uses a lock-up torque converter, direct clutch, forward clutch, reverse clutch, 2nd coast and Overdrive (O/D) brake, 2 planetary gears, 2nd brake, 2 one-way clutches, 1st/reverse brake, and hydraulic and electronic control systems. See **Fig. 1** .

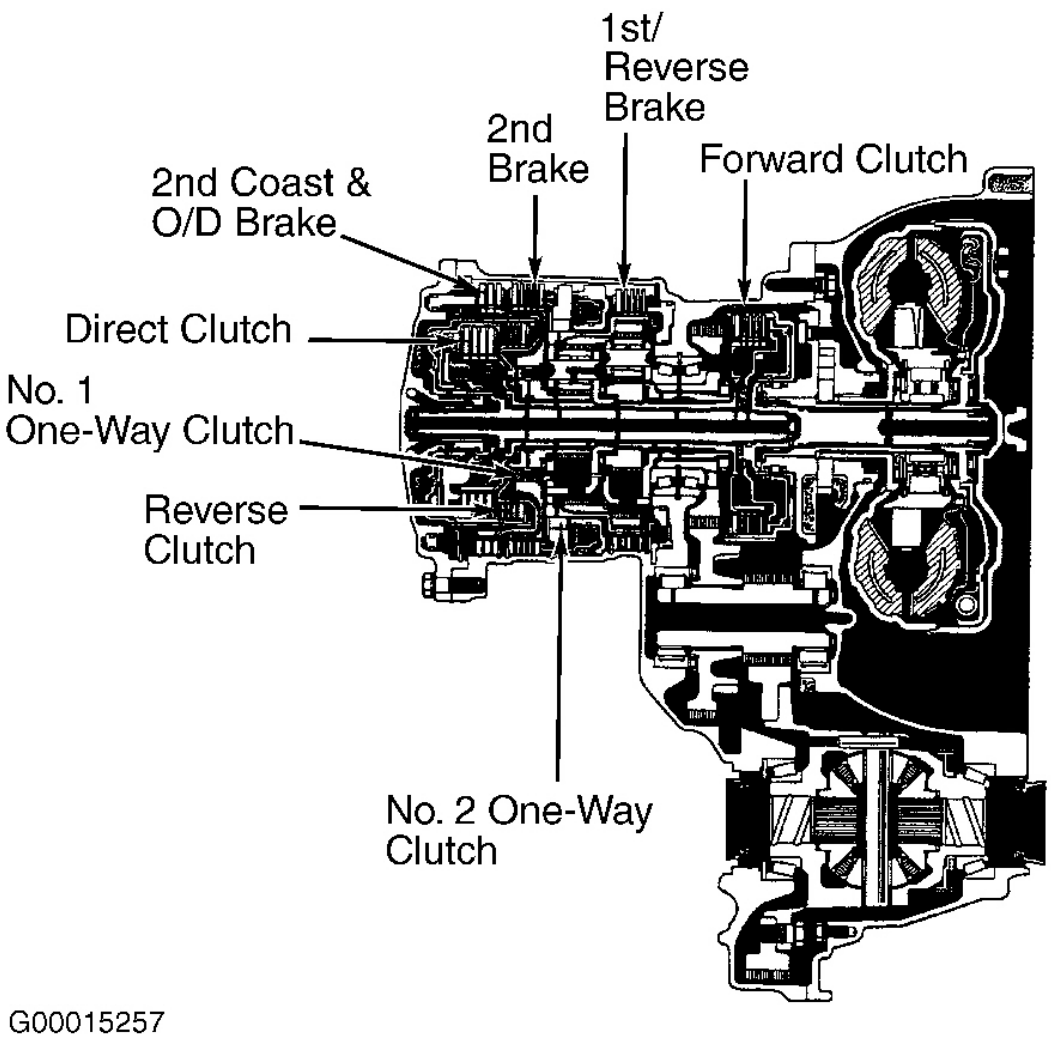

Fig. 1: Identifying Transaxle Component Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

LUBRICATION

RECOMMENDED FLUID

Use Toyota T-IV ATF, or equivalent.

FLUID CAPACITIES

TRANSAXLE FLUID CAPACITIES (1)

Application	Refill - Qts. (L)	Dry Refill - Qts. (L)

U340E	3.1 (2.9)	7.2 (6.9)
U341E	3.1 (2.9)	7.3 (7.0)

(1) Capacities are approximate. Check fluid level after transaxle reaches normal operating temperature.

ON-VEHICLE SERVICE

DRIVE AXLES

NOTE: See appropriate article in DRIVE AXLES.

PARK/NEUTRAL POSITION SWITCH

NOTE: For Park/Neutral Position (PNP) switch installation and adjustment, see appropriate step in TRANSAXLE REASSEMBLY

VALVE BODY ASSEMBLY

Removal

1. Remove engine undercover. Remove drain plug and drain transaxle fluid. Remove 19 oil pan bolts, oil pan and gasket. Check for steel or brass particles in oil pan. Remove 2 oil pan magnets.
2. Remove 3 bolts and oil strainer. Remove and discard "O" ring from oil strainer. Disconnect 5 shift solenoid connectors. Remove fluid temperature sensor. See **Fig. 7** . Separate wire harness from clamps. Remove 2 bolts, cover and detent spring. Remove 12 valve body bolts. Note bolt length and location for reassembly reference. See **Fig. 2** . Remove valve body assembly.

Installation

1. Install magnets in oil pan in original locations. Align groove in manual valve with pin in manual valve lever. Push valve body assembly against check ball body to assist in installation. Install valve body bolts. Ensure manual valve lever contacts center of roller at tip of detent spring.
2. Ensure valve body is aligned. Ensure bolts are installed in correct locations. For bolt length, see **VALVE BODY BOLT IDENTIFICATION** table. Tighten bolts to 97 INCH lbs. (11 N.m). Install NEW "O" ring on oil strainer. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** . To complete installation, reverse removal procedure.

VALVE BODY BOLT IDENTIFICATION

Bolt Identification	Length - In. (mm)
A	.87 (22)
B	1.26 (32)
C	1.77 (45)
D	2.17 (55)
E	.55 (14)

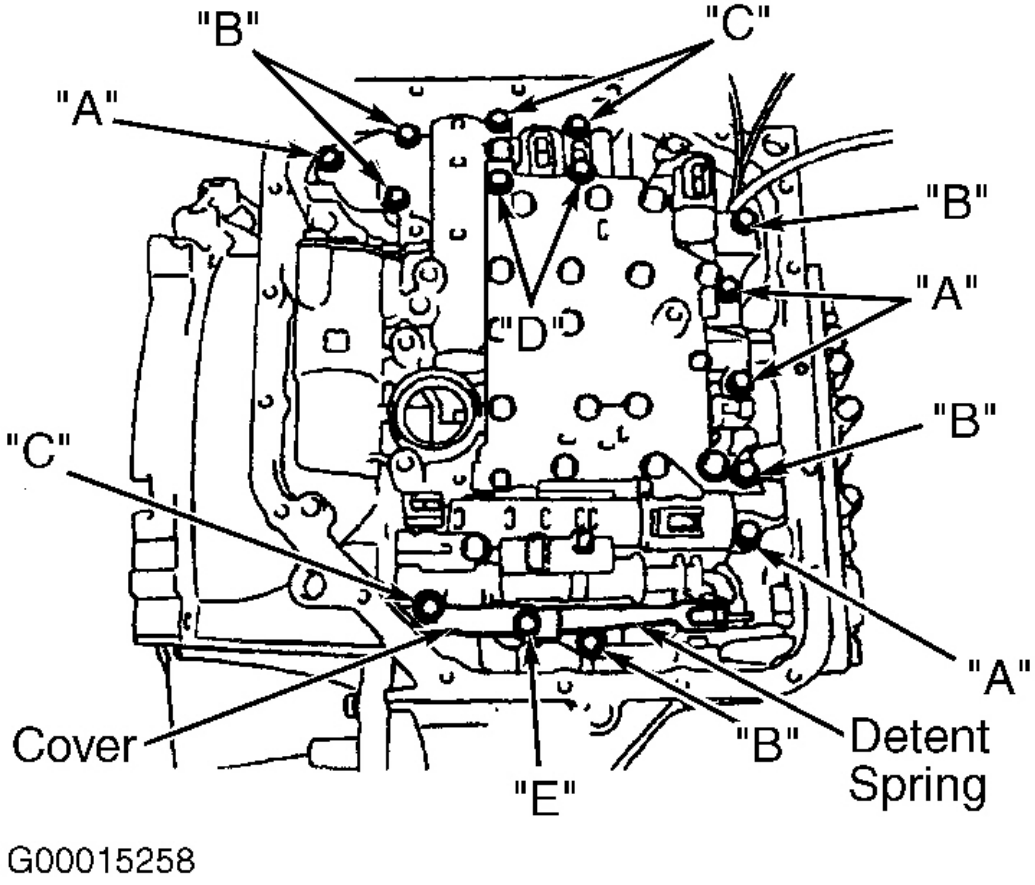

Fig. 2: Identifying Valve Body Bolt Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TROUBLESHOOTING

SYMPTOM DIAGNOSIS

Vehicle Does Not Move In Any Forward Or Reverse Gear

Check manual valve, primary regulator valve, parking lock pawl, front planetary gear, rear planetary gear, forward clutch, reverse clutch, 1st/reverse brake and No. 2 one-way clutch.

Vehicle Does Not Move In Reverse

Check front planetary gear, rear planetary gear, reverse clutch and 1st/reverse brake.

No 1-2 Upshift

Check lower valve body control valves, 2nd brake and No. 1 one-way clutch.

No 2-3 Upshift

Check lower valve body control valves and direct clutch.

No 3-4 Upshift

Check 3-4 shift valve and 2nd coast and O/D brake.

No Lock-Up Or Lock-Up Off

Check lock-up relay valve, lock-up control valve, solenoid relay valve, solenoid modulator valve and torque converter clutch.

No 4-3 Downshift

Check 3-4 shift valve.

No 3-2 Downshift

Check 2-3 shift valve.

No 2-1 Downshift

Check 1-2 shift valve.

Harsh Engagement Neutral To Drive

Check forward clutch accumulator, forward clutch and No. 2 one-way clutch.

Harsh Engagement Neutral To Reverse

Check accumulators, lower valve body control valves, reverse clutch and 1st/reverse brake.

Harsh Engagement Neutral To Low

Check solenoid modulator valve.

Harsh Lock-Up Engagement

Check lock-up relay valve and torque converter clutch.

Harsh Engagement During Upshift

Check accumulator control valve and accumulators.

No Engine Braking In Low

Check reverse control valve and 1st/reverse brake.

No Engine Braking In "2" Position

Check 3-4 shift valve and 2nd coast and O/D brake.

No Kickdown

Check lower valve body control valves and 3-4 shift valve.

Slip Or Shudder In 1st Gear

Check No. 2 one-way clutch.

Slip Or Shudder In 2nd Gear

Check 2nd brake and No. 1 one-way clutch.

Slip Or Shudder In 3rd Gear

Check direct clutch.

Slip Or Shudder In Overdrive

Check 2nd coast and O/D brake.

Slip Or Shudder In Reverse

Check reverse clutch and 1st/reverse brake.

Slip Or Shudder In Forward Position After Warm-Up

Check upper valve body, oil strainer, torque converter clutch, forward clutch, direct clutch, 2nd coast and O/D brake, 2nd brake and No. 1 one-way clutch.

Poor Acceleration (All Positions)

Check torque converter clutch.

CLUTCH & BRAKE APPLICATIONS

CLUTCH & BRAKE APPLICATIONS

Selector Lever Position	Elements In Use
"D" (Drive)	
1st Gear	Forward Clutch & No. 2 One-Way Clutch
2nd Gear	Forward Clutch, 2nd Brake & No.

	1 One-Way Clutch
3rd Gear	Direct Clutch, Forward Clutch & 2nd Brake
Overdrive	Direct Clutch, 2nd Coast & O/D Brake & 2nd Brake
"2" (Second)	
1st Gear	Forward Clutch & No. 2 One-Way Clutch
2nd Gear	Forward Clutch, 2nd Coast & O/D Brake, 2nd Brake & No. 1 One-Way Clutch
"L" (Low)	Forward Clutch, 1st/Reverse Brake & No. 2 One-Way Clutch
"R" (Reverse)	Reverse Clutch & 1st/Reverse Brake
"P" (Park) & "N" (Neutral)	All Clutches & Brakes Are Released Or Ineffective

PERFORMANCE TESTS

PRELIMINARY INSPECTION

Ensure a thorough explanation of when and how transaxle malfunction occurs is received from customer. Check fluid level and condition. Retrieve diagnostic trouble codes. See appropriate TOYOTA ELECTRONIC CONTROLS article.

Proceed as necessary. If no DTCs are present, proceed with symptom diagnosis. See **TROUBLE SHOOTING** . Perform **STALL SPEED TEST** under TORQUE CONVERTER, **TIME LAG TEST** and **HYDRAULIC PRESSURE TESTS** as needed. After repairs are completed, perform **ROAD TEST** to confirm repairs.

ROAD TEST

NOTE: Perform test at normal operating fluid temperature of 122-176°F (50-80°C).

"D" Position

1. Shift transaxle into Drive. Hold accelerator pedal constant at full throttle. Check 1-2, 2-3, and 3-4 upshift and lock-up points. See appropriate table in **SHIFT SPEED SPECIFICATIONS** .

NOTE: There is no overdrive lock-up when coolant temperature is below 140°F (60°C) or when vehicle speed is 6 MPH less than the set cruise control speed. There is no lock-up when brake pedal is depressed.

- **If no 1-2 upshift occurs, check lower valve body control valves or shift solenoid.**

- **If no 2-3 upshift occurs, check lower valve body control valves or shift solenoid.**
- **If no 3-4 upshift occurs, check 3-4 shift valve or shift solenoid.**
- **If all shift points are incorrect, check upper valve body, lower valve body control valves and 3-4 shift valve.**
- **If all lock-up points are incorrect, check lock-up relay valve or shift solenoid.**

2. Use procedure outlined in step 1 to check for shock and slip between 1-2, 2-3, and 3-4 upshifts. If shock is harsh, line pressure may be too high. Check accumulator or check ball.
3. Drive vehicle Drive during lock-up or Overdrive. Check for abnormal noise and vibration.

NOTE: Check for cause of abnormal noise and vibration must be made with extreme care as problem could be due to an unbalanced drive axle, differential, tire, torque converter, etc.

4. While driving in Drive, confirm correct kickdown vehicle speed limits for 2-1, 3-2, 4-3 shift points. Check for abnormal shock and slip at kickdown.
5. Check lock-up function. Drive vehicle in Overdrive ("D" position) with lock-up on. Hold vehicle speed steady at 37 MPH. Lightly depress accelerator pedal. Ensure engine RPM does not change abruptly. Large increase in engine RPM indicates lock-up function is faulty.

"2" Position

1. Shift transaxle to manual 2nd gear. Drive vehicle with accelerator pedal held constantly at full throttle. Ensure 1-2 upshift points take place and are operating properly.

NOTE: In "2" position there will be no lock-up to 2nd gear.

2. While driving in manual 2nd gear, release accelerator pedal and check engine braking effect. If there is no engine braking effect, 2nd brake is defective. Check for abnormal noise and shock at acceleration and deceleration.

"L" Position

While driving in Low, ensure there is no upshift to 2nd gear. While driving in Low, release accelerator pedal. If there is no engine braking effect, 1st/reverse brake is defective. Check for abnormal noise during acceleration and deceleration.

"R" Position

Shift transaxle into Reverse. Accelerate in Reverse from a stop at full throttle. Ensure slipping does not occur.

"P" Position

Stop vehicle on grade of more than 5 percent. Shift transaxle into Park. Release parking brake. Ensure parking pawl holds vehicle.

SHIFT SPEED SPECIFICATIONS

SHIFT SPEED SPECIFICATIONS (CELICA) (1)

Application	MPH
"D" Position	
1st-2nd	35-39
2nd-3rd	69-75
3rd-4th	103-110
3rd-4th (2)	28-31
4th-3rd(2)	20-23
4th-3rd	81-86
3rd-2nd	65-70
2nd-1st	28-31
"2" Position	
1st-2nd	35-39
3rd-2nd	65-70
2nd-1st	26-31
"L" Position	
3rd-2nd	65-70
2nd-1st	32-35
(1) Wide open throttle.	
(2) Fully closed throttle.	

SHIFT SPEED SPECIFICATIONS (ECHO) (1)

Application	MPH
"D" Position	
1st-2nd	32-36
2nd-3rd	60-67
3rd-4th	105-113
3rd-4th(2)	25-29
4th-3rd (2)	19-22
4th-3rd	93-101
3rd-2nd	57-63
2nd-1st	27-30
"2" Position	
1st-2nd	32-36
3rd-2nd	57-63

2nd-1st	27-30
"L" Position	
3rd-2nd	57-63
2nd-1st	28-32

(1) Wide open throttle.

(2) Fully closed throttle.

LOCK-UP SPEEDS (CELICA) (1)

Application	MPH
"D" Position (2)	
Lock-Up On in 3rd (3)	51-55
Lock-Up Off in 3rd (3)	48-51
Lock-Up On in OD	34-37
Lock-Up Off in OD	32-36

(1) Throttle valve opening 5 percent.

(2) There is no lock-up in "L" or "2" position.

(3) With OD switch off.

LOCK-UP SPEEDS (ECHO) (1)

Application	MPH
"D" Position (2)	
Lock-Up On in 3rd (3)	60-67
Lock-Up Off in 3rd (3)	57-63
Lock-Up On in OD	35-39
Lock-Up Off in OD	34-37

(1) Throttle valve opening 5 percent.

(2) There is no lock-up in "L" or "2" position.

(3) With OD switch off.

TORQUE CONVERTER

CAUTION: Perform test at normal operating fluid temperature of 122-176°F (50-80°C). DO NOT continue test longer than 10 seconds.

Stall Speed Test

1. Testing is done to check overall performance of transaxle and engine by measuring maximum engine speeds in Drive and Reverse.

2. Block front and rear wheels. Connect scan tool to Data Link Connector (DLC3) to monitor engine RPM. Apply parking and service brakes. Start engine. Shift transaxle into Drive. Fully depress accelerator pedal. Release pedal within 10 seconds.
3. Record highest engine RPM. Compare reading obtained to specification. Stall speed should be 2220-2520 RPM for Celica and 2130-2550 RPM for ECHO. Repeat test in Reverse.
4. If stall speed is same for both positions, but lower than specified RPM, engine output may be insufficient or stator one-way clutch is not operating properly.

NOTE: If stall speed RPM is more than 600 RPM less than specification, torque converter may be faulty.

5. If stall speed in Drive is higher than specifications, forward clutch may be slipping, No. 2 one-way clutch may not be operating properly, or line pressure is too low.
6. If stall speed in Reverse is higher than specifications, reverse clutch may be slipping, 1st/reverse brake may be slipping or line pressure is too low.
7. If stall speed in Reverse and Drive is higher than specifications, line pressure is too low, incorrect fluid level exists or No. 2 one-way clutch is not operating properly.

HYDRAULIC PRESSURE TESTS

CAUTION: Perform test at normal operating fluid temperature of 122-176°F (50-80°C).

1. Ensure transaxle fluid is at operating temperature. Raise and support vehicle. Remove transaxle case line pressure test plug. See **Fig. 6** . Install hydraulic pressure gauge. Lower vehicle.
2. Fully apply parking brake. Block all wheels. Start engine and ensure idle speed is 700-800 on Celica, or 650-750 RPM on ECHO. Shift transaxle into Drive. Read and record line pressure at idle. Fully apply brakes. Depress accelerator pedal to floor. DO NOT apply full throttle for more than 10 seconds.
3. Measure highest line pressure. Refer to specifications in appropriate LINE PRESSURE SPECIFICATIONS table. Repeat test in Reverse. If pressures exceed specifications in all ranges, regulator valve or shift solenoid SLT in upper valve body is defective. Ensure no TP sensor related trouble codes are present.
4. If pressures in both positions are lower than specifications, oil pump, regulator valve or shift solenoid SLT is defective. Ensure no TP sensor related trouble codes are present.
5. If pressure is lower than specifications in Drive only, forward clutch is defective or Drive circuit has a fluid leak. If pressure is lower than specifications in Reverse only, reverse clutch is defective, 1st/reverse brake is defective or Reverse circuit has a fluid leak.

LINE PRESSURE SPECIFICATIONS (CELICA)

Engine RPM	"D" Range - psi (kg/cm^2)	"R" Range - psi (kg/cm^2)
Idle	54-60 (3.8-4.2)	80-100 (5.6-6.4)
Stall	164-178 (11.5-12.5)	255-284 (18.0-20.1)

LINE PRESSURE SPECIFICATIONS (ECHO)

Engine RPM	"D" Range - psi (kg/cm^2)	"R" Range - psi (kg/cm^2)
Idle	55-60 (3.8-4.2)	78-92 (5.5-6.5)
Stall	161-178 (11.3-12.5)	246-263 (17.3-18.5)

TIME LAG TEST

CAUTION: Perform this test at normal operating fluid temperature of 122-176°F (50-80°C). Allow one minute between tests. Record 3 measurements and average results.

1. If selector lever is actuated with engine idling, a time lag will be noted before shock can be felt. This test is used for checking condition of No. 2 one-way clutch, forward clutch, reverse clutch and 1st/reverse brake.
2. Apply parking brake. Connect scan tool to DLC3 to monitor engine RPM. Start engine. Ensure idle speed is 700-800 RPM on Celica or 650-750 RPM on ECHO, with transaxle in Neutral and A/C off. Shift transaxle from Neutral into Drive. Use a stop watch to measure elapsed time between shifting lever until shock is felt.
3. Standard time lag is less than 1.2 seconds. Repeat test to measure time lag for Neutral to Reverse. Standard time lag is less than 1.5 seconds. If Neutral to Drive time lag is longer than specified, line pressure is too low, forward clutch may be worn or No. 2 one-way clutch is not operating properly.
4. If Neutral to Reverse position time lag is longer than specified, reverse clutch may be worn, 1st/reverse brake may be worn or line pressure is too low.

COMPONENT TESTS

TORQUE CONVERTER

NOTE: Torque converter is a sealed unit and is serviced as complete assembly. Perform following tests to check for defective converter. Torque converter and transaxle cooler must be thoroughly cleaned and flushed if transaxle is contaminated.

Torque Converter One-Way Clutch Test

1. Insert a turning tool into inner race of one-way clutch. Install Tester (09351-32010) so that it fits in notch of converter hub and outer race of one-way clutch.
2. With converter in normal operating position, clutch should lock-up when turned counterclockwise and should rotate freely and smoothly when turned clockwise. See **Fig. 3** . If one-way clutch fails test in either direction, clean converter. Retest clutch. If clutch fails test, replace torque converter.

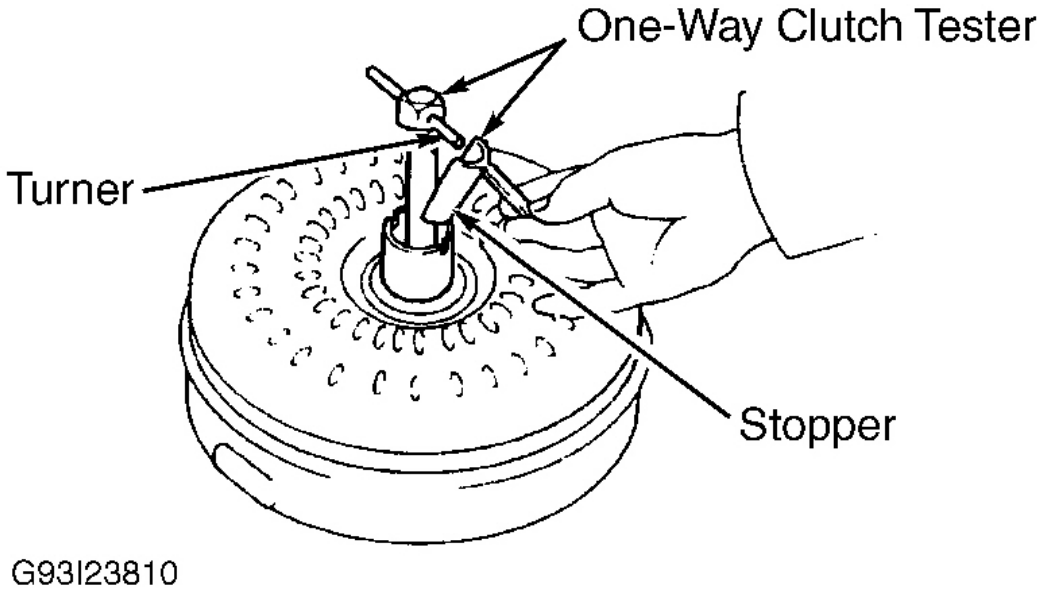

Fig. 3: Checking Torque Converter One-Way Clutch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque Converter Sleeve Runout Test

1. Temporarily mount torque converter to drive plate. Mount a dial indicator with needle resting on converter sleeve. See **Fig. 4** . Rotate converter. If runout exceeds .012" (.30 mm), ensure converter is properly mounted to drive plate.
2. If converter is properly mounted and runout exceeds specifications, replace torque converter. Mark position of converter to ensure correct installation. Remove converter from drive plate.

Drive Plate (Flexplate) Runout Test

Measure drive plate runout. See **Fig. 5** . If runout exceeds .008" (.20 mm), or if ring gear is damaged, replace drive plate. If installing a NEW drive plate, note position of spacers. Tighten bolts to 58 ft. lbs. (78 N.m) on Celica, or 65 ft. lbs. (88 N.m) on ECHO.

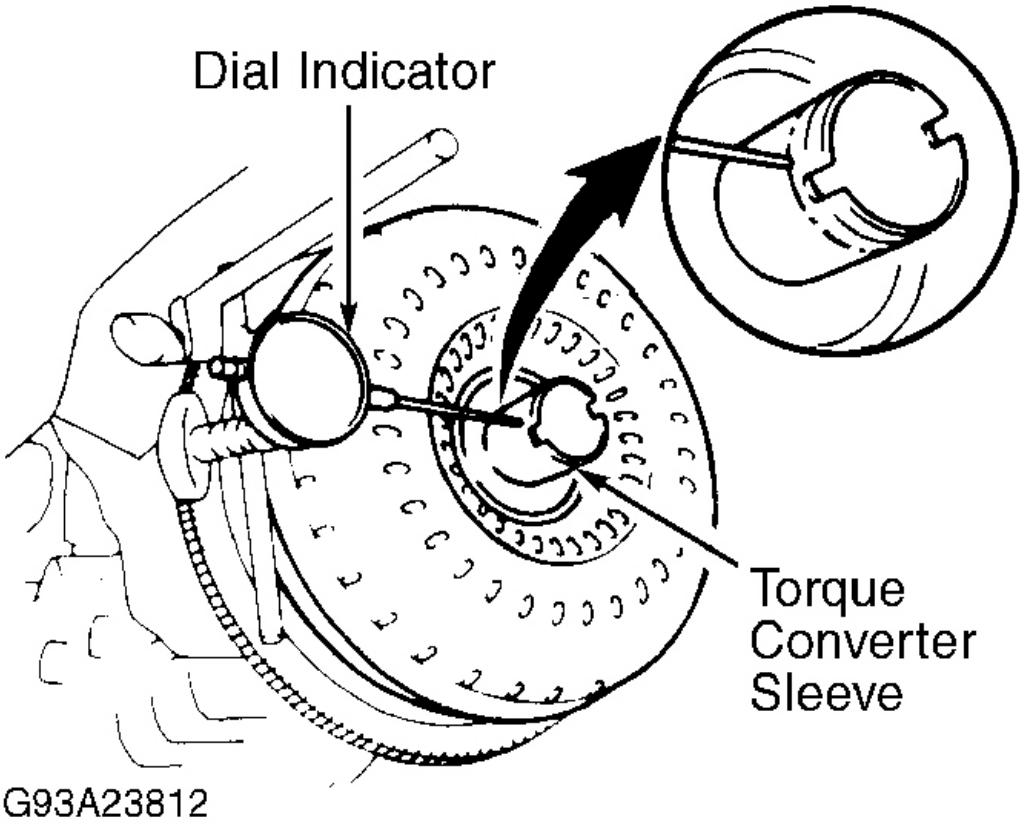

Fig. 4: Checking Torque Converter Sleeve Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

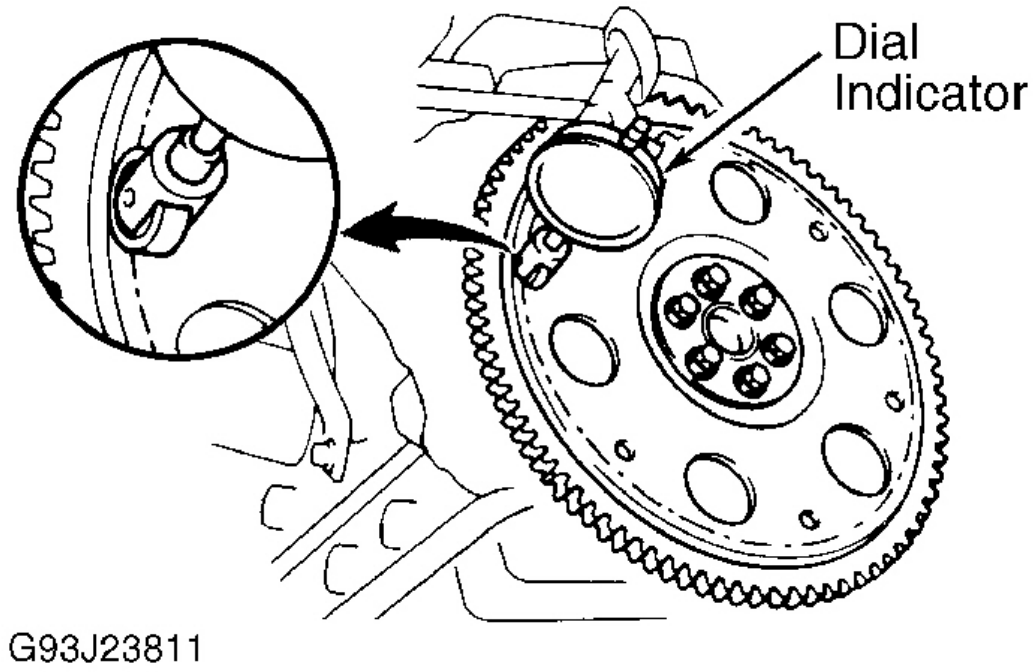

Fig. 5: Checking Drive Plate Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL & INSTALLATION

TRANSAXLE

NOTE: For transaxle removal and installation procedure, see appropriate AUTOMATIC TRANSMISSION REMOVAL article in TRANSMISSION SERVICING.

TRANSAXLE DISASSEMBLY

1. Remove bolt and transaxle revolution sensor from top of transaxle. Remove and discard sensor "O" ring. Remove clip and breather hose. Remove breather plug and "O" ring. Remove nut, washer and control lever. Using a screwdriver, unstake lock tab on nut. Remove 2 bolts and nut, and remove PNP switch. See **Fig. 6** .
2. Remove oil line union and elbow. Remove and discard "O" rings from union and elbow. Remove 4 screw plugs from transaxle housing and transaxle case. Remove and discard "O" rings from plugs. Remove transaxle line pressure test plug from transaxle case. See **Fig. 6** .
3. Place transaxle on wooden blocks. Remove 19 bolts, oil pan and gasket. Remove 3 bolts and oil strainer. Remove and discard "O" ring from oil strainer. Remove bolt, lock plate and fluid temperature sensor. Disconnect 5 shift solenoid connectors. See **Fig. 7** . Remove 2 bolts, detent spring cover and detent

spring. Remove valve body assembly. See **VALVE BODY ASSEMBLY** under ON-VEHICLE SERVICE. Remove solenoid connector bolt, located above PNP switch. Remove transaxle wiring harness with solenoid connector from transaxle case. Remove and discard "O" ring from connector. See **Fig. 10** .

4. Remove 2 apply gaskets, check ball body and spring. See **Fig. 8** . Remove brake drum gasket. See **Fig. 9** . Using 57 psi (4 kg/cm_2) of compressed air applied to transaxle case, remove direct clutch accumulator piston. See **Fig. 11** . Cover piston with shop towel during removal. Remove accumulator spring.

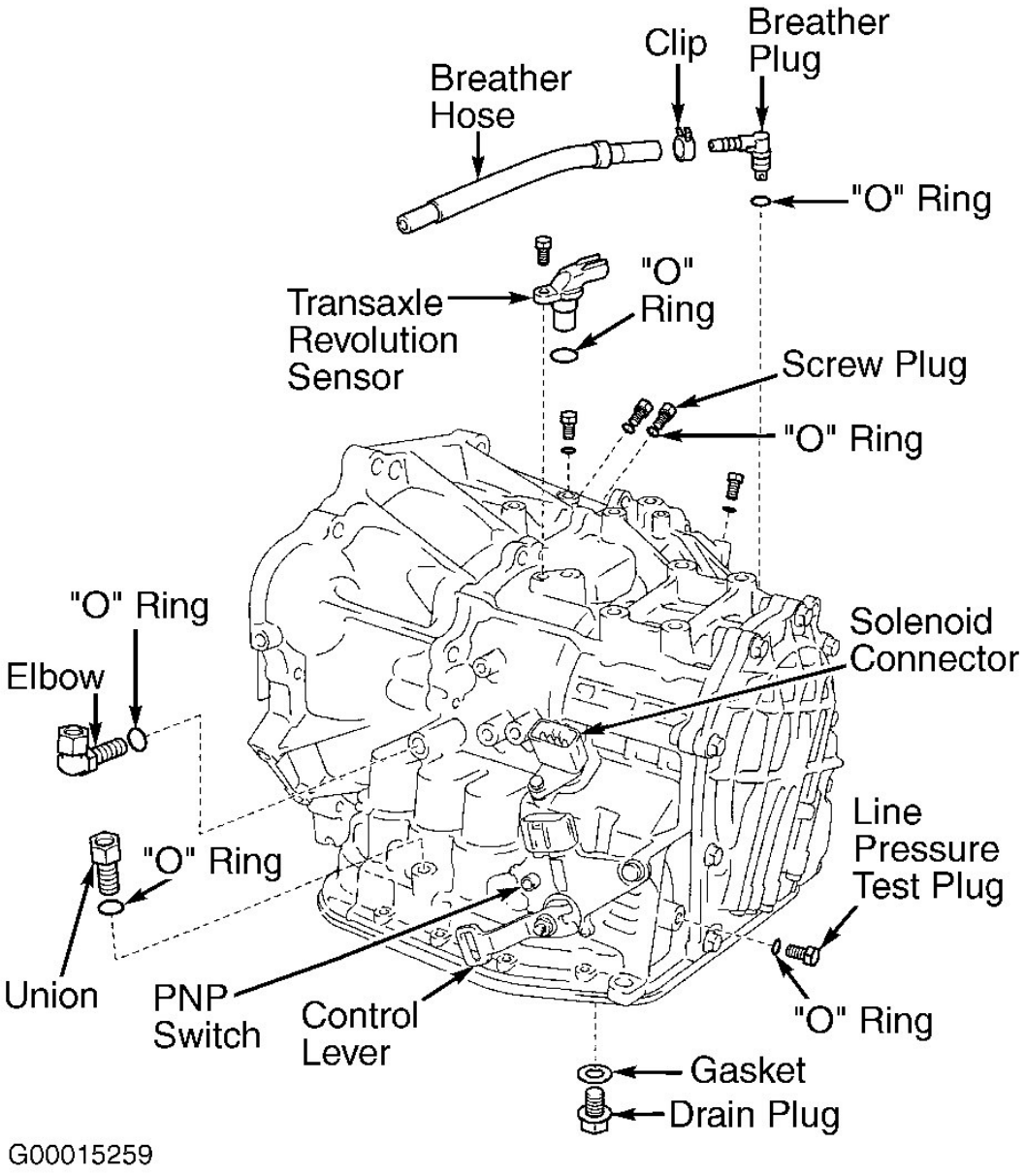

Fig. 6: Identifying Transaxle Case External Component Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

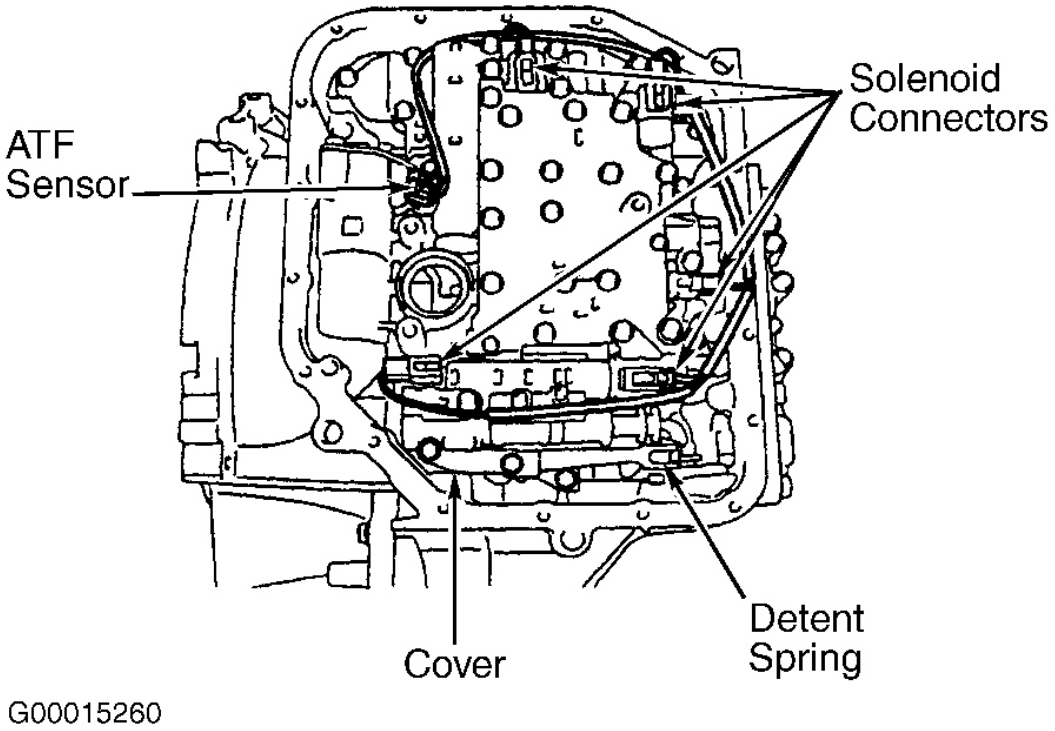

Fig. 7: Locating Fluid Temperature Sensor & Solenoid Connectors
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

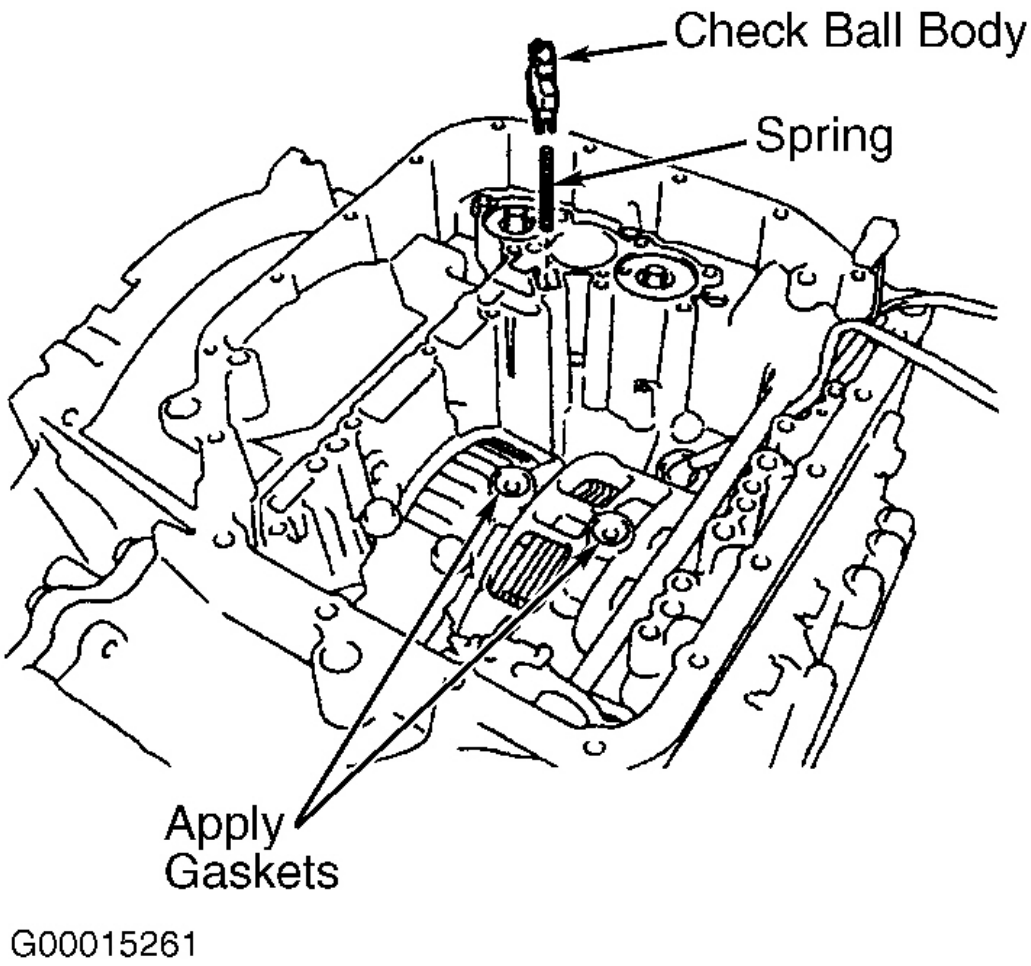

Fig. 8: Locating Check Ball Body, Spring & Apply Gaskets
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

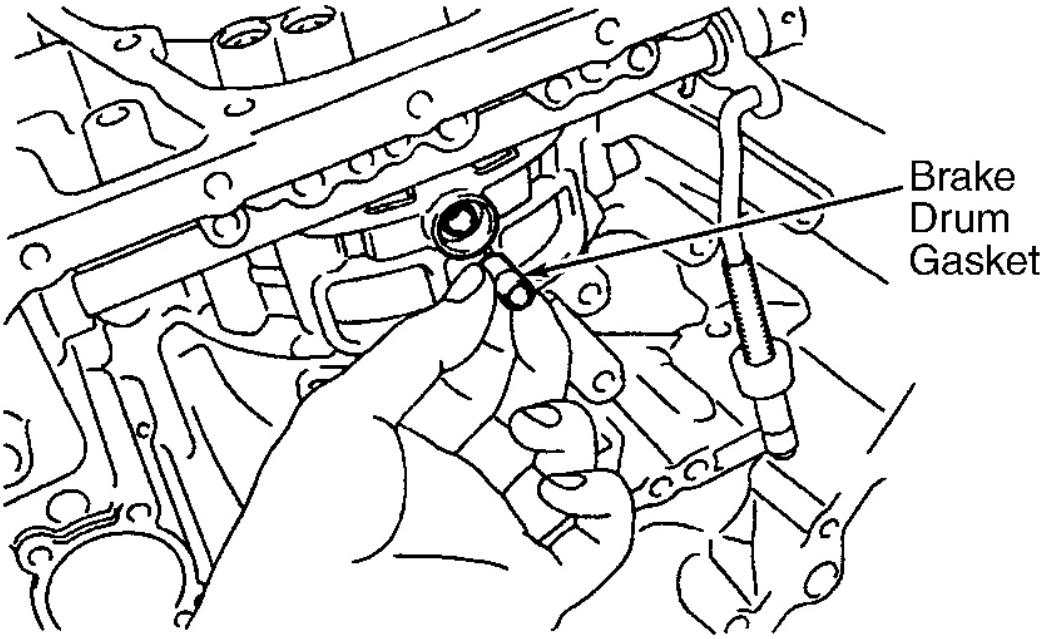

Fig. 9: Locating Brake Drum Gasket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

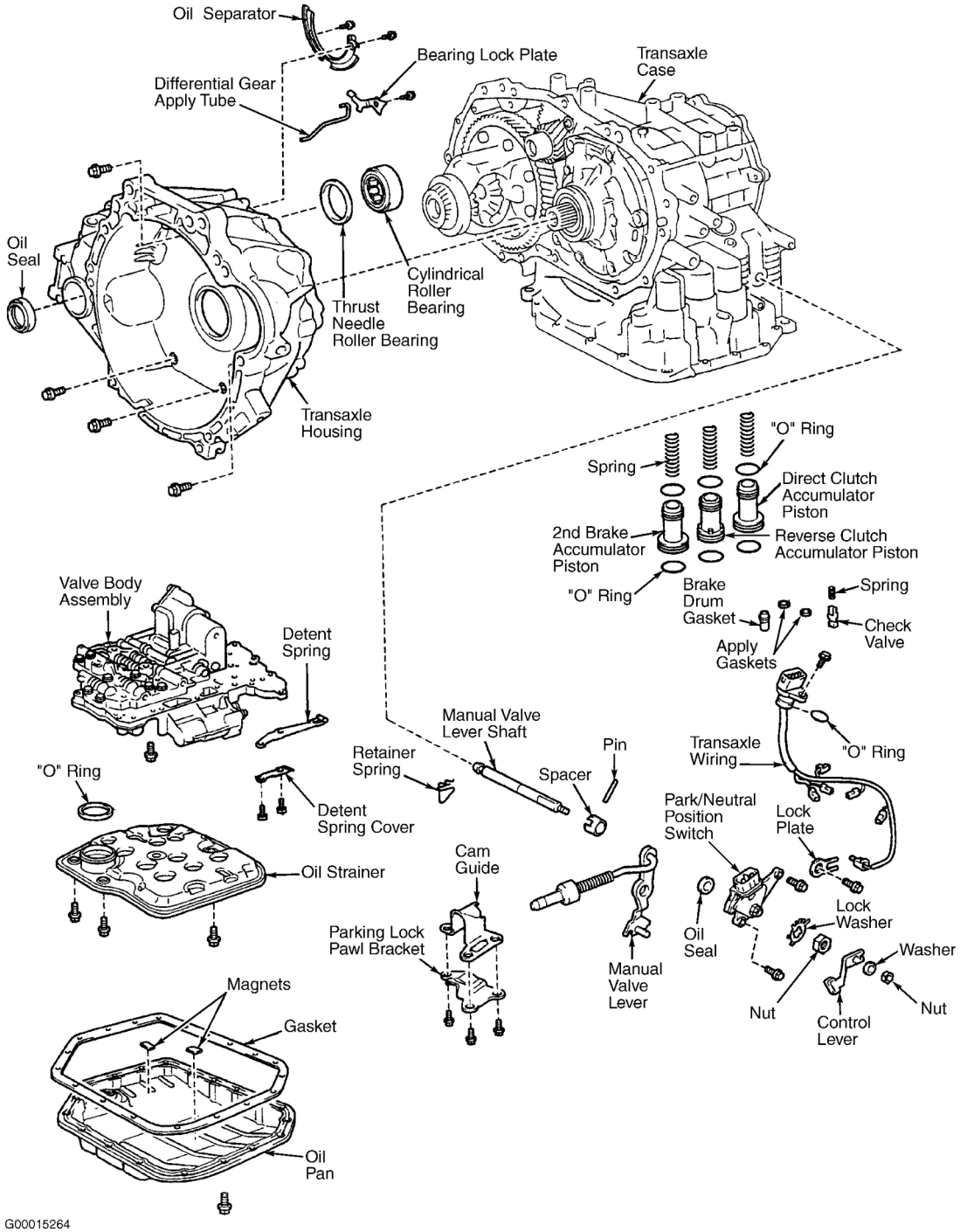

Fig. 10: Exploded View Of Transaxle External Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

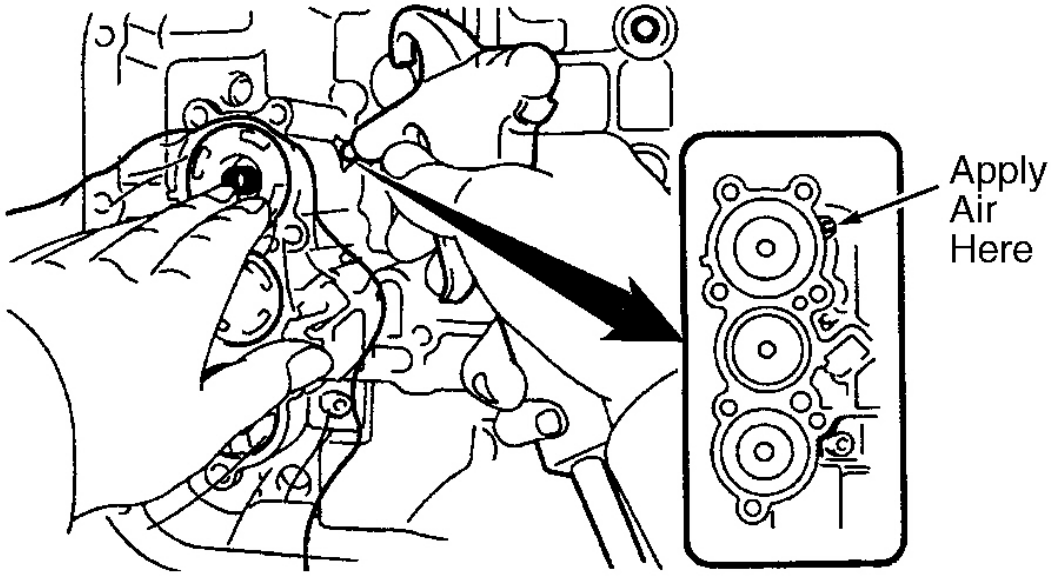

Fig. 11: Removing Direct Clutch Accumulator Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. Using 57 psi (4 kg/cm_2) of compressed air applied to transaxle case, remove reverse clutch accumulator piston and spring, and 2nd brake accumulator piston and spring. Cover pistons with shop towel during removal. See **Fig. 12** and **Fig. 13** .

CAUTION: Use caution when removing transaxle housing. Differential assembly may attach to transaxle housing during removal.

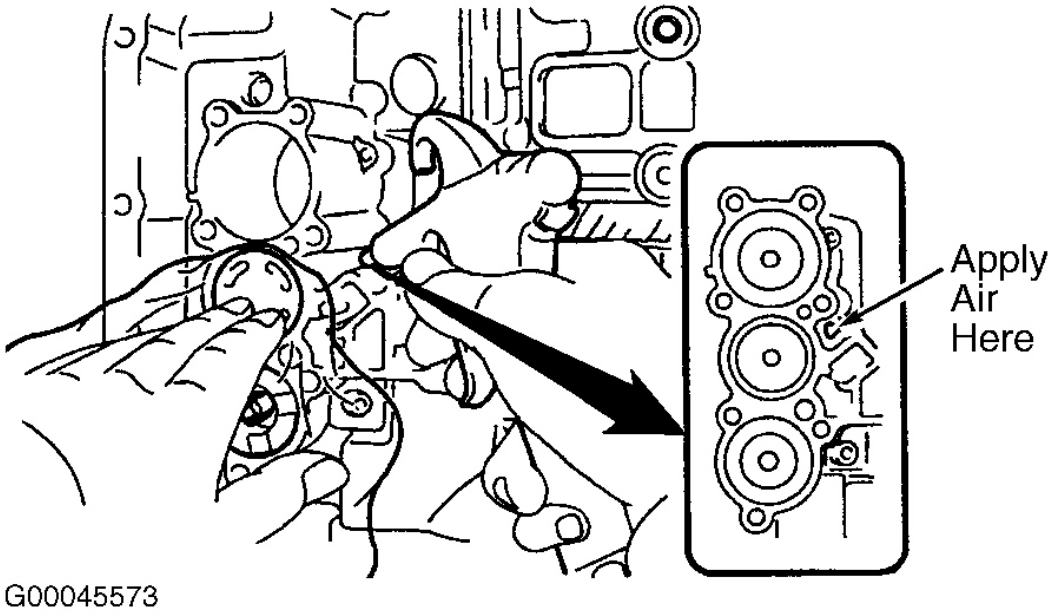

Fig. 12: Removing Reverse Clutch Accumulator Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

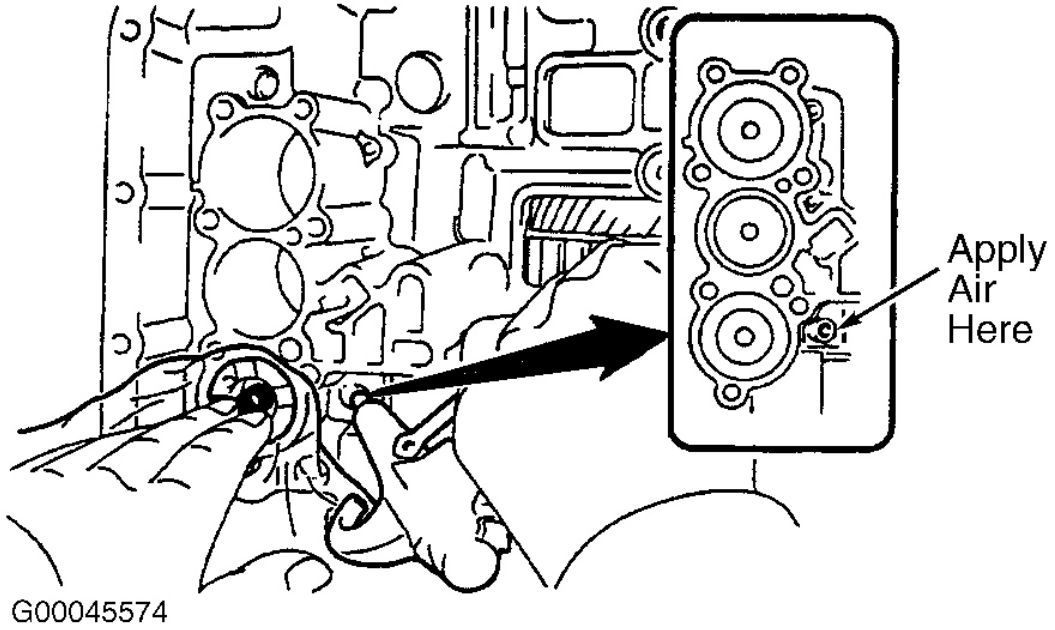

Fig. 13: Removing 2nd Brake Accumulator Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

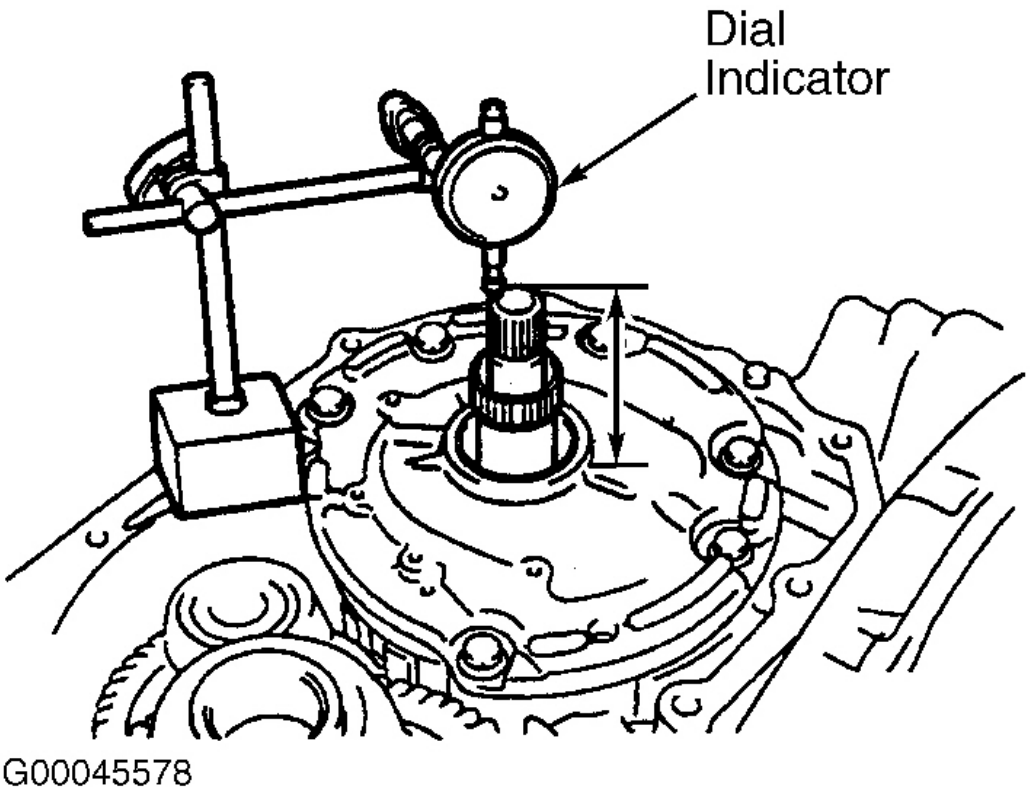

Fig. 14: Measuring Input Shaft End Play
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

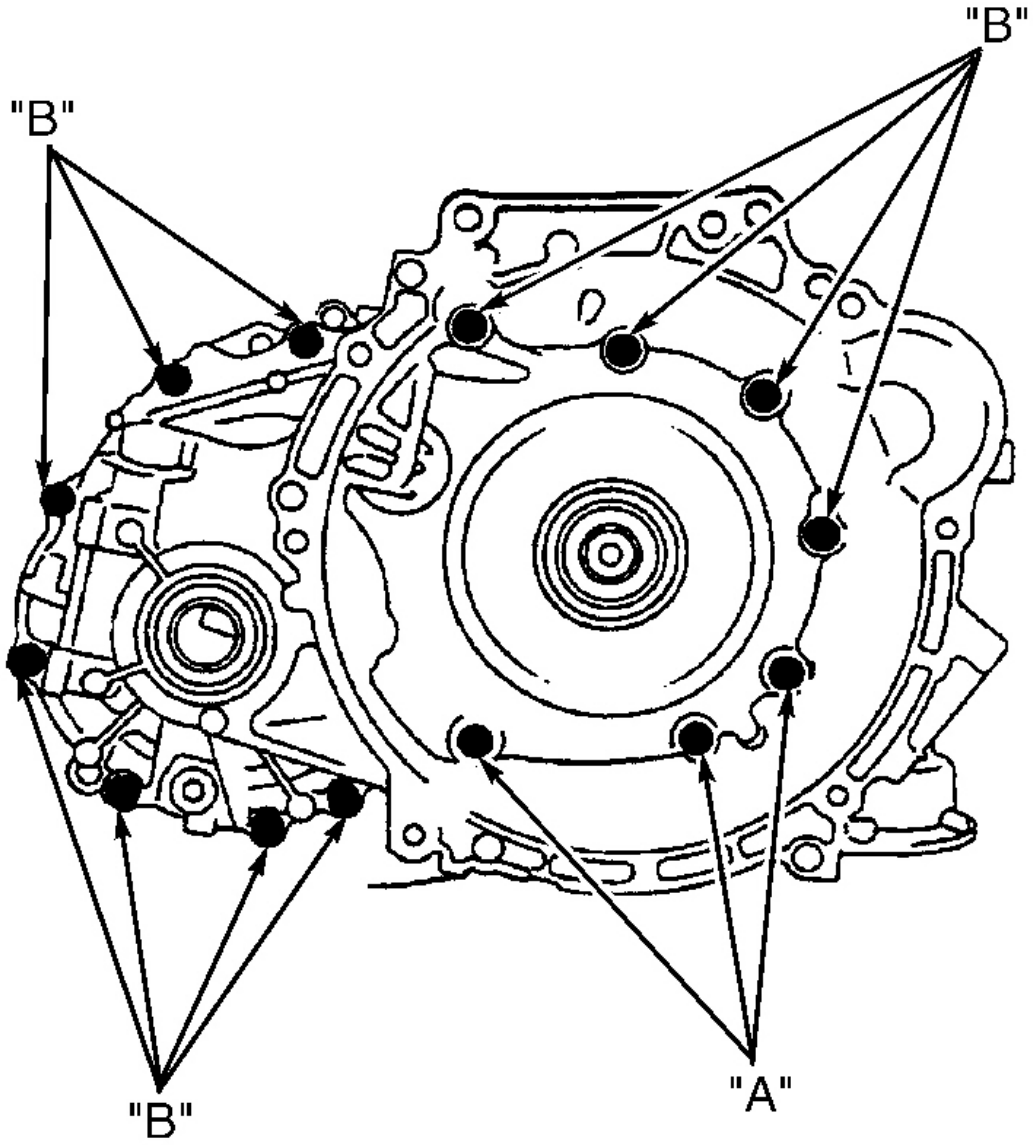

Fig. 15: Removing & Installing Transaxle Housing Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

6. Position transaxle case with oil pump assembly facing upward. Using a dial indicator, measure and record input shaft end play. See **Fig. 14** . End play should be .015-.051" (.37-1.29 mm). Remove 14 transaxle housing bolts. Note bolt length and location during removal for reassembly reference. See **Fig. 15** . Tap on circumference of transaxle housing with a plastic hammer to remove housing from transaxle case.
7. Remove 7 oil pump bolts and oil pump. Remove differential assembly. See **Fig. 16** . Remove 2 apply

gaskets from front of transaxle case. See **Fig. 18** . Remove forward multiple disc clutch assembly from transaxle case. Remove thrust needle roller bearing from forward multiple disc clutch assembly. See **Fig. 17** .

8. Remove forward clutch hub and thrust needle roller bearing from transaxle case. Using parking lock pawl, lock counter driven gear in position. See **Fig. 19** . Using a hammer and chisel, unstake washer located on counter drive gear nut.
9. Ensure all claws on washer are pushed down to allow socket to fit securely on nut. Using holding tool and socket, remove nut. See **Fig. 20** .
10. Install 2 bolts into counter drive gear threaded holes. Tighten bolts evenly and remove counter drive gear and front planetary sun gear. Remove thrust needle roller bearing from front planetary sun gear and tapered roller bearing from counter drive gear. See **Fig. 16** and **Fig. 17** .
11. Remove 3 bolts, cam guide and parking lock pawl bracket. Using needle nose pliers, remove manual valve lever retainer spring. Using a hammer and chisel, unstake and remove spacer. Using a pin punch and hammer, drive out roll pin. Ensure pin does not fall into transaxle case. See **Fig. 10** .
12. Remove manual valve lever shaft and manual valve lever. Remove parking lock pawl rod from manual valve lever. Using a screwdriver, remove shaft oil seal. See **Fig. 10** . Remove torsion spring, shaft and parking lock pawl. See **Fig. 17** .
13. Remove counter driven gear, differential drive pinion and thrust needle roller bearing from transaxle case. See **Fig. 17** . Remove 11 bolts from transaxle rear cover. If necessary, tap on circumference of rear cover with plastic hammer to remove cover from transaxle case. See **Fig. 16** .

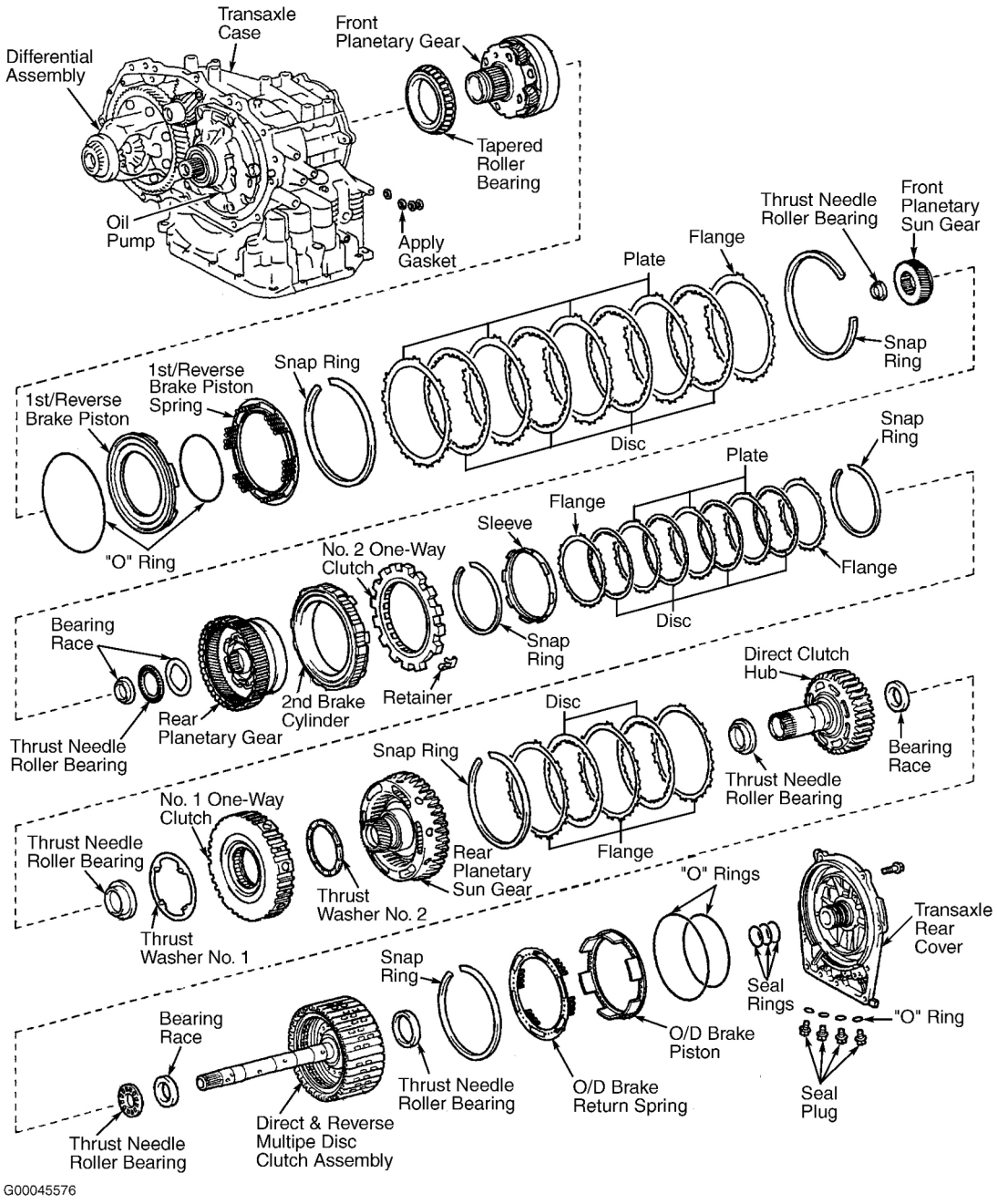

Fig. 16: Exploded View Of Transaxle Internal Components (1 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

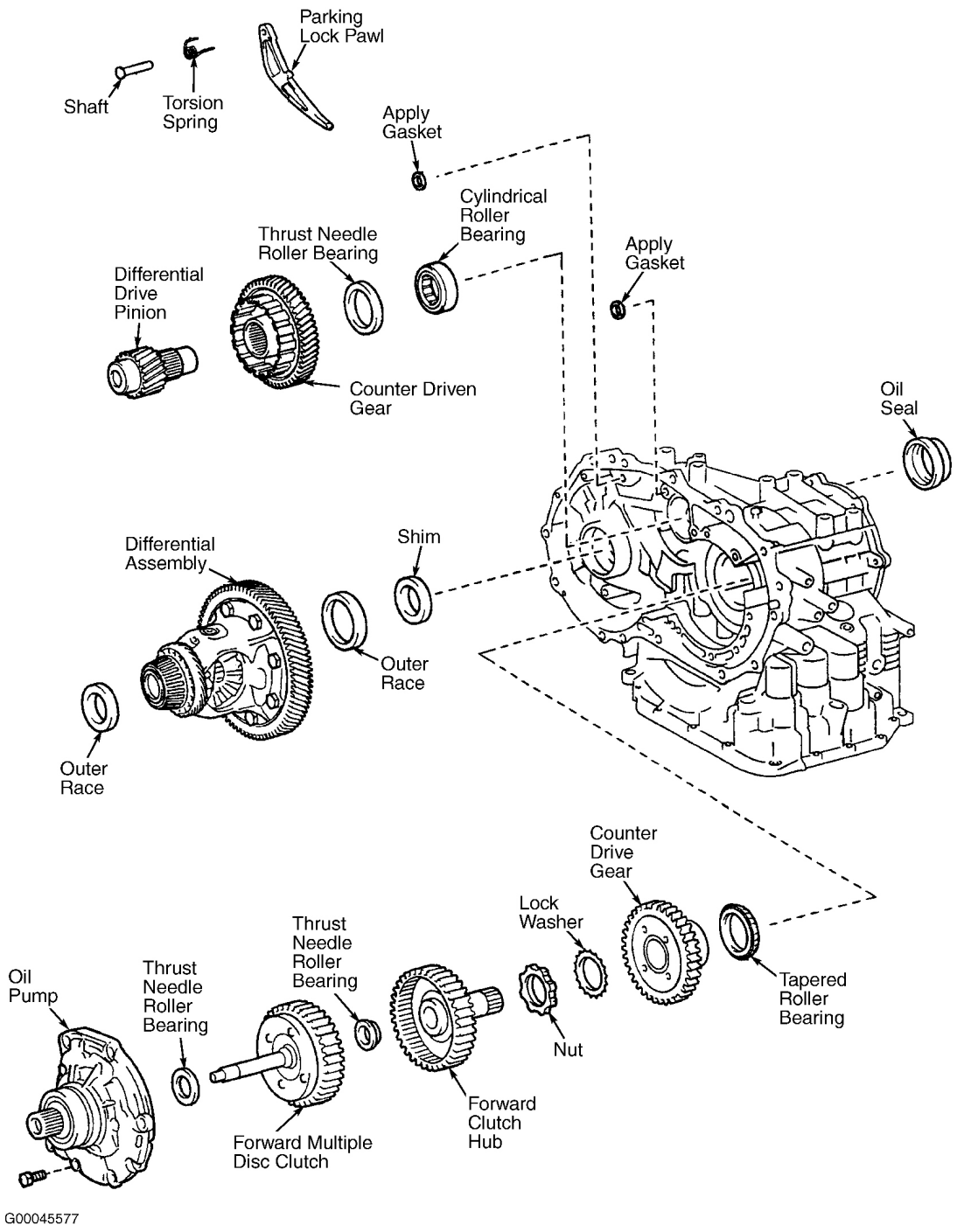

Fig. 17: Exploded View Of Transaxle Internal Components (2 Of 2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

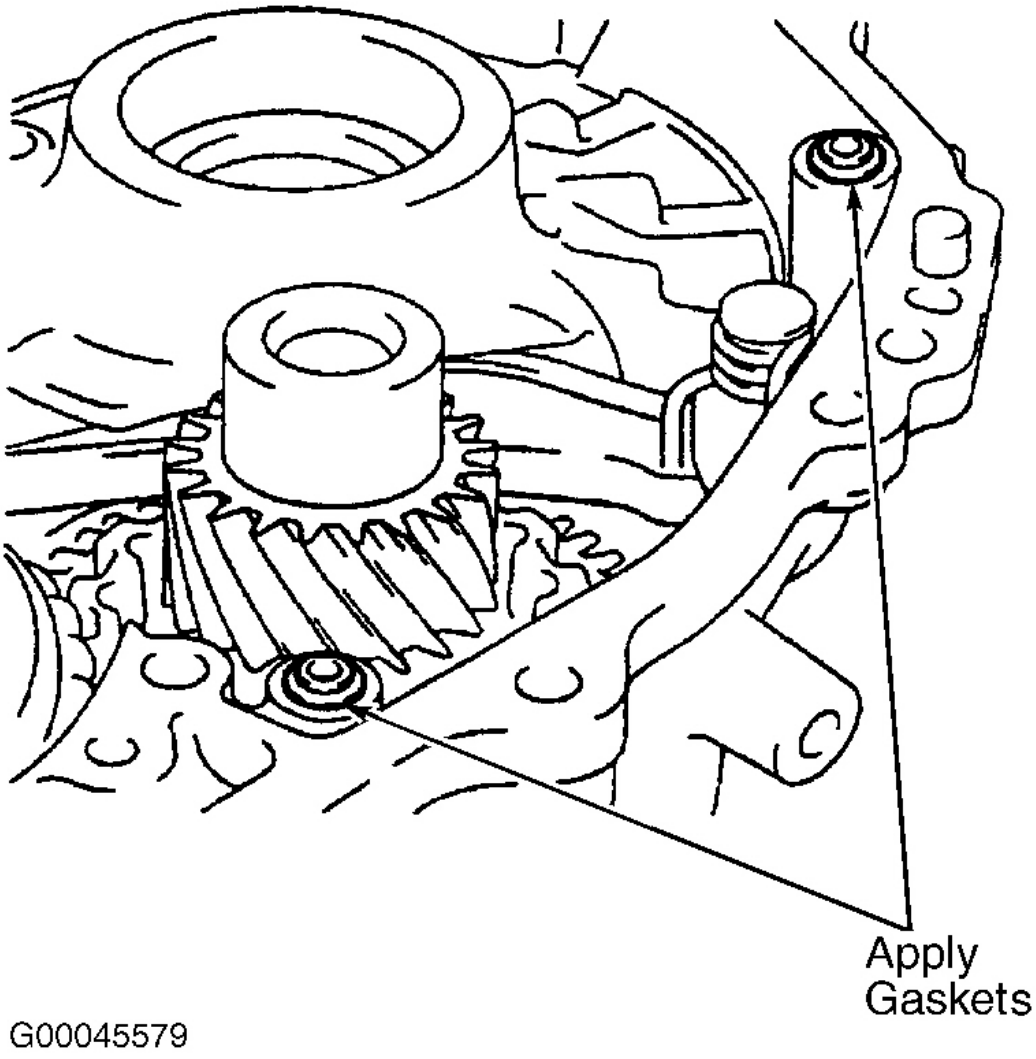

Fig. 18: Removing Transaxle Case Apply Gaskets
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

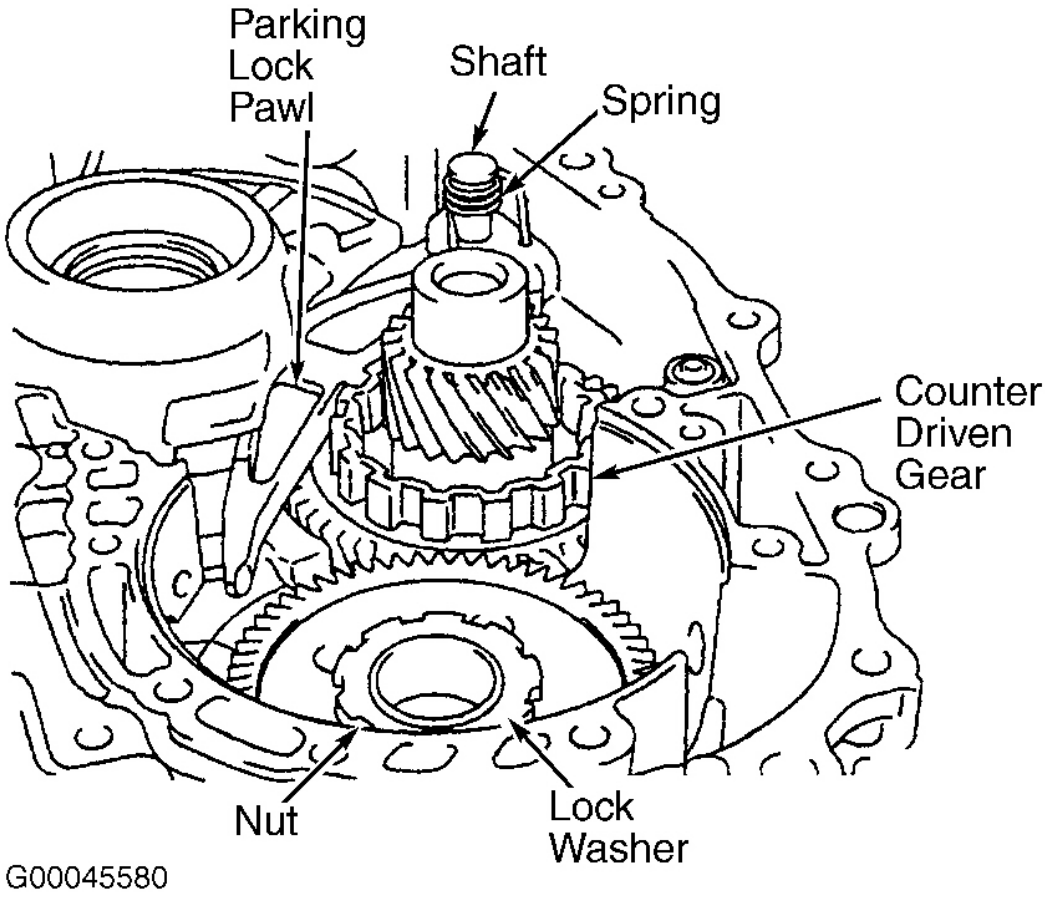

Fig. 19: Locking Counter Driven Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

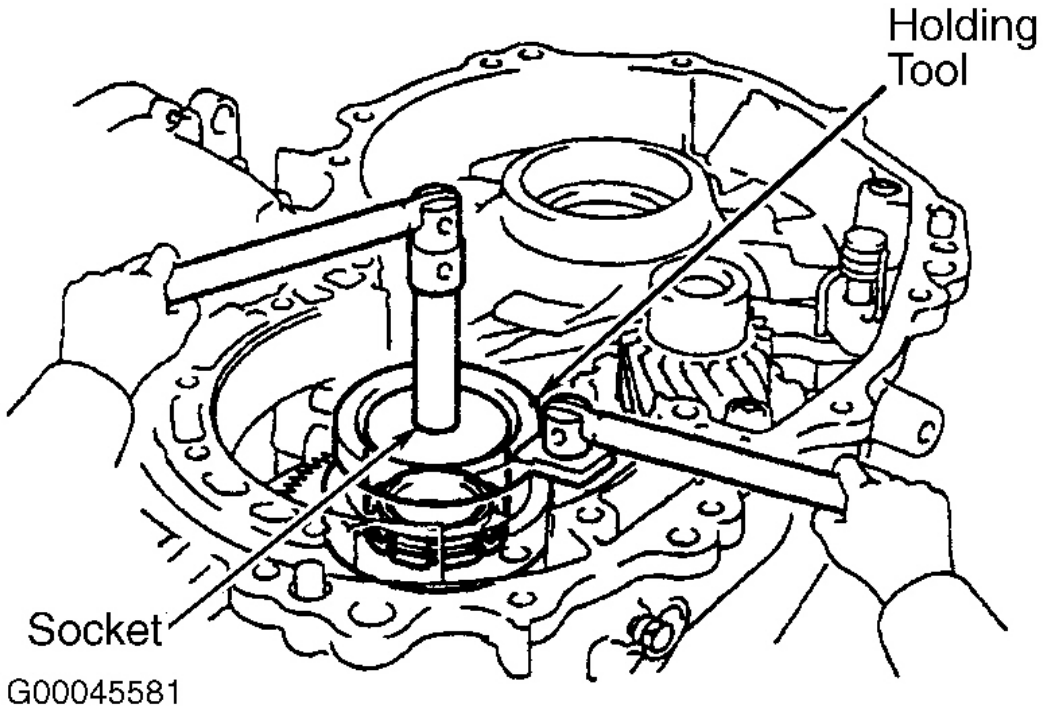

Fig. 20: Removing & Installing Counter Drive Gear Nut
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

14. Remove 4 apply gaskets. See **Fig. 21** . Remove 2nd coast and O/D brake flange, 2 discs and 3 plates. Note location of components during removal for reassembly reference. Using a screwdriver, remove snap ring. See **Fig. 16** .
15. Remove thrust needle roller bearing race and direct and reverse multiple disc clutch assembly. Remove thrust needle roller bearing and race. Remove direct clutch hub and thrust needle roller bearing. Remove rear planetary sun gear and No. 1 one-way clutch. See **Fig. 16** .
16. Remove thrust washer No. 1 and thrust needle roller bearing from No. 1 one-way clutch. Separate rear planetary sun gear and No. 1 one-way clutch. Remove thrust washer No. 2 from rear planetary sun gear. See **Fig. 16** .
17. Using a screwdriver, remove 2nd brake snap ring. On U340E transaxle, remove 4 flanges and 3 discs. On U341E transaxle, remove 2 flanges, 4 discs and 3 plates. Note location of components during removal for reassembly reference. On both transaxles, remove 2nd brake piston sleeve. See **Fig. 16** .
18. Using a screwdriver, remove 2nd brake cylinder snap ring. Remove 2nd brake cylinder, No. 2 one-way clutch and rear planetary gear from transaxle case. Remove thrust needle roller bearing and 2 bearing races from rear planetary gear. Separate 2nd brake cylinder, No. 2 one-way clutch and rear planetary gear. See **Fig. 16** .
19. Remove retainer from No. 2 one-way clutch. See **Fig. 22** . Remove front planetary sun gear and thrust needle roller bearing from transaxle case. Using a screwdriver, remove 1st/reverse brake snap ring.

Remove 1st/reverse brake flange, 4 discs and 4 plates from transaxle case. Note location of components during removal for reassembly reference. See **Fig. 16** .

20. On U340E transaxle, remove front planetary gear. On U341E transaxle, remove front planetary gear and tapered roller bearing. See **Fig. 16** . On both transaxles, using appropriate press, compress 1st/reverse brake piston spring. Using a screwdriver, remove snap ring from 1st/reverse brake. Remove piston spring. Using 57 psi (4 kg/cm_2) of compressed air applied to transaxle case, remove 1st/reverse brake piston from case. See **Fig. 23** . Cover piston with shop towel during removal.

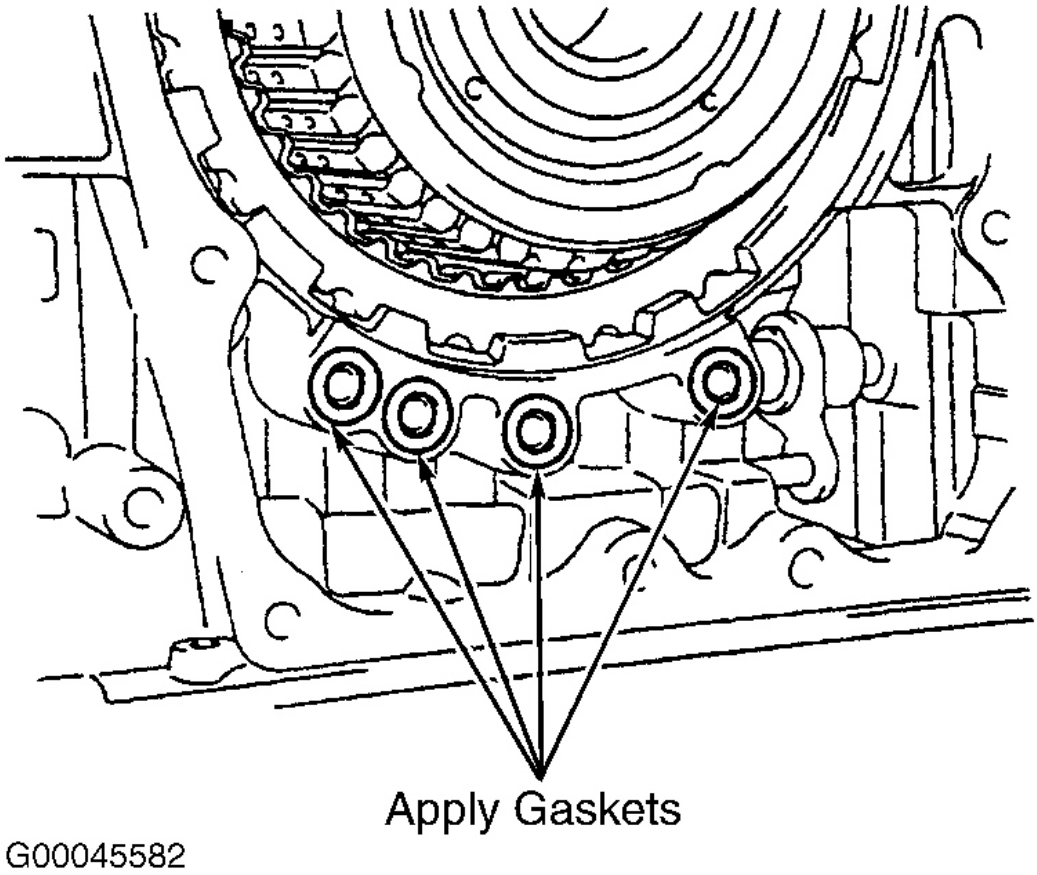

Fig. 21: Locating Transaxle Case Apply Gaskets
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

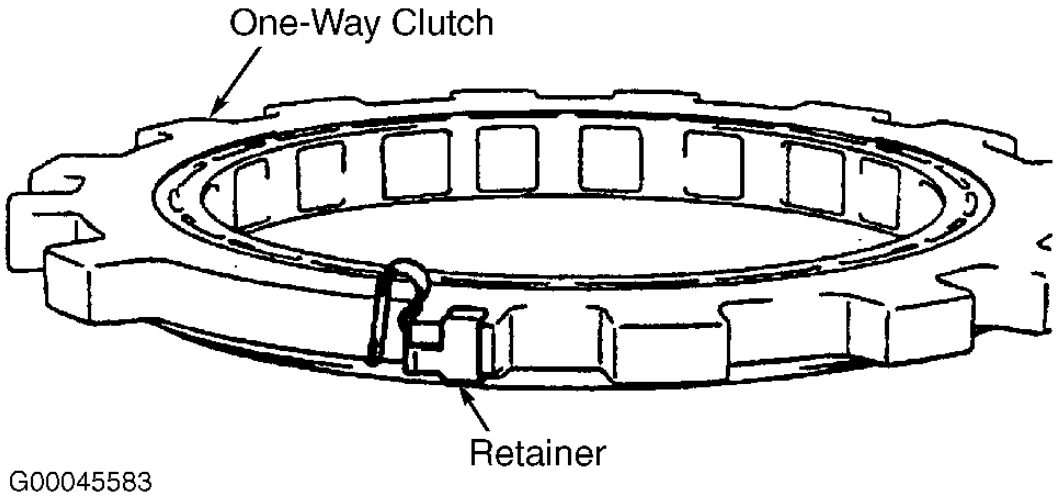

Fig. 22: Locating No. 2 One-Way Clutch Retainer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

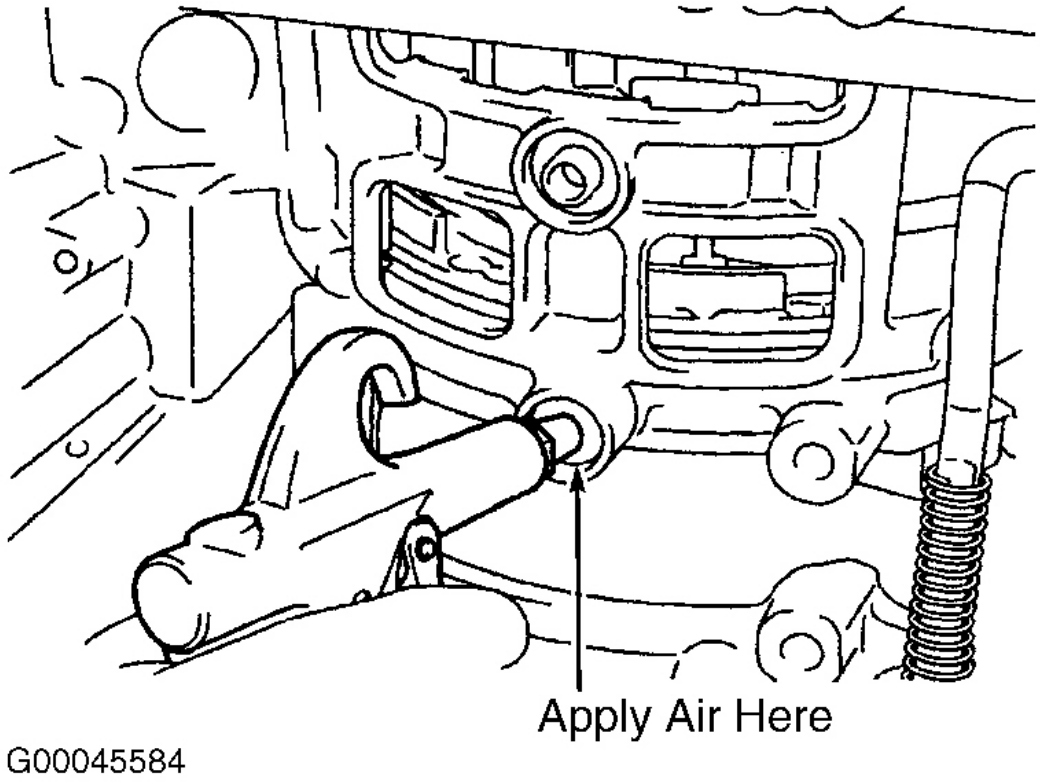

Fig. 23: Removing 1st/Reverse Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. Remove 2 bolts and transaxle housing oil separator from transaxle housing. See **Fig. 24** . Remove bolt, bearing lock plate and differential gear apply tube from transaxle housing. See **Fig. 25** .
22. Using appropriate driver and a hammer, remove transaxle housing oil seal. Using a screwdriver and a hammer, remove bearing outer race. Using appropriate puller, remove cylindrical roller bearing and thrust needle bearing from transaxle housing. See **Fig. 17** .
23. Using appropriate puller, remove transaxle case roller bearing, bearing outer race and shim from transaxle case. See **Fig. 17** . Using appropriate driver and a hammer, remove transaxle case oil seal. Remove 4 screw plugs and "O" rings from transaxle rear cover. See **Fig. 26** .

NOTE: In the following step, stop press when piston return spring is compressed .039-.079" (1.00-2.00 mm) from snap ring groove. This prevents piston from becoming deformed. DO NOT expand snap ring excessively.

24. Using appropriate adapter, press and a screwdriver, remove O/D brake piston snap ring. Remove adapter, press and O/D brake return spring. Remove 3 seal rings from transaxle rear cover. See **Fig. 16** .

25. Using 57 psi (4 kg/cm_2) of compressed air applied to transaxle rear cover, remove O/D brake piston from rear cover. Cover piston with shop towel during removal. See **Fig. 27** . Remove 2 "O" rings from O/D brake piston. See **Fig. 16**

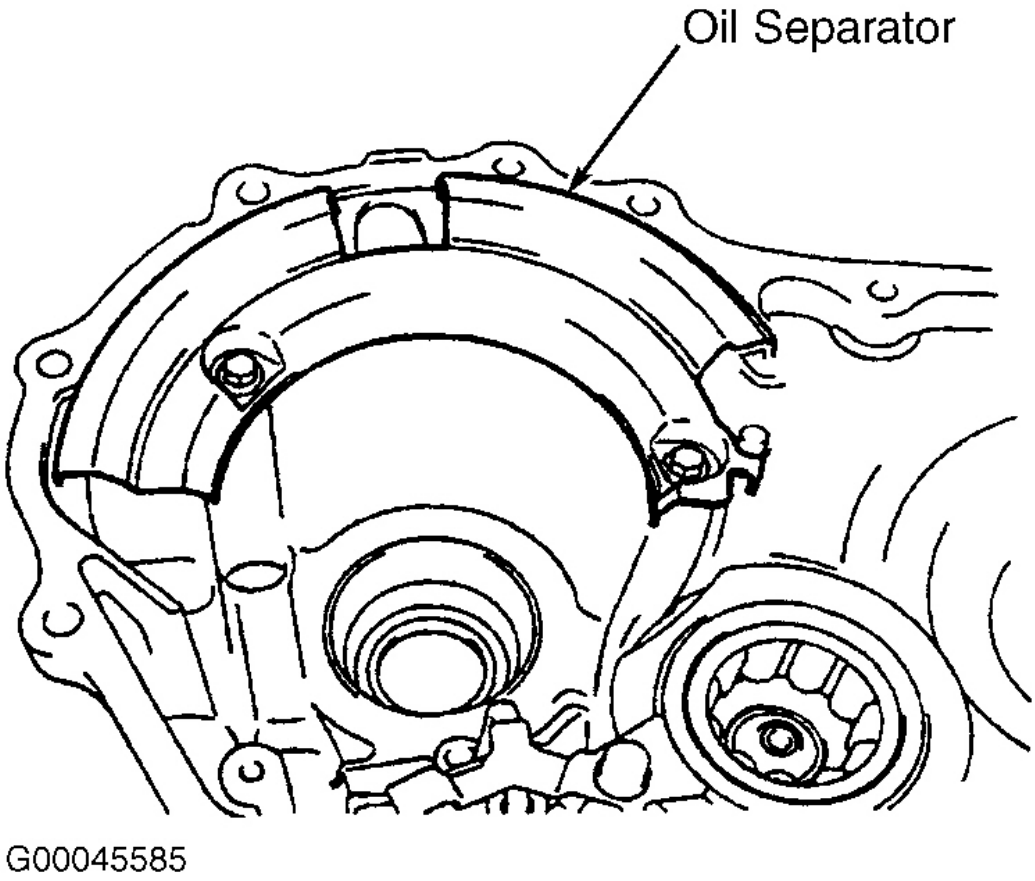

Fig. 24: Removing & Installing Oil Separator
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

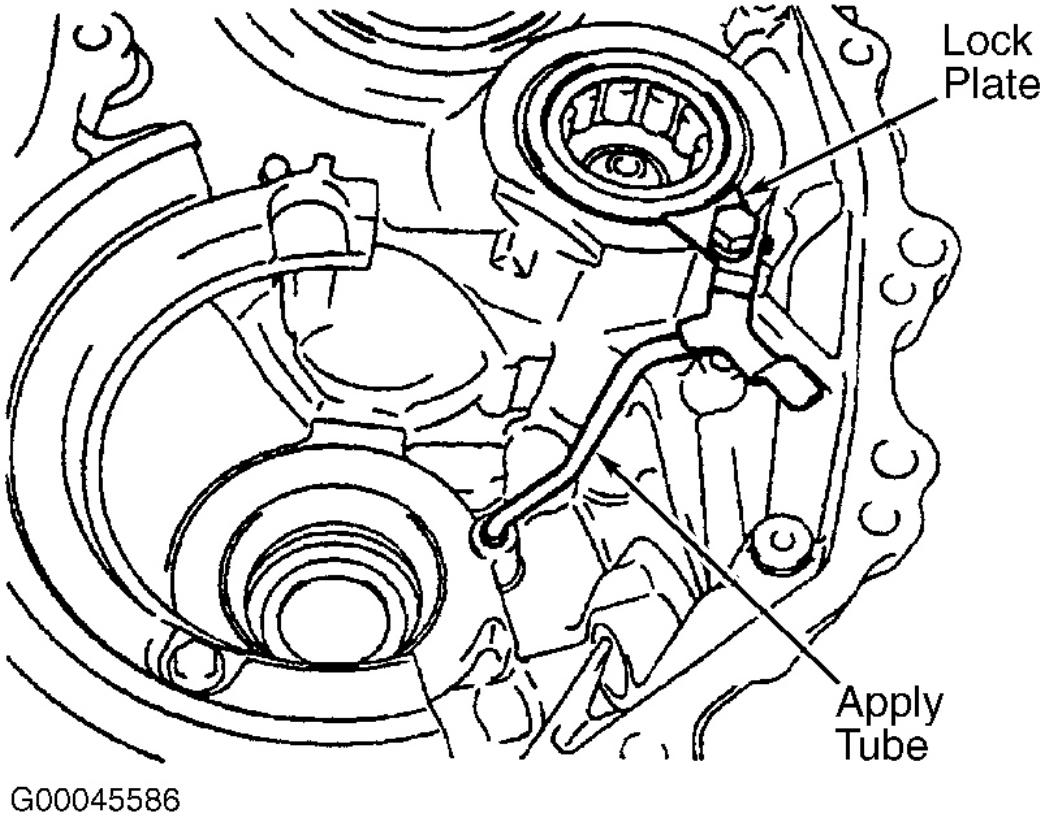

Fig. 25: Removing Differential Gear Apply Tube
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

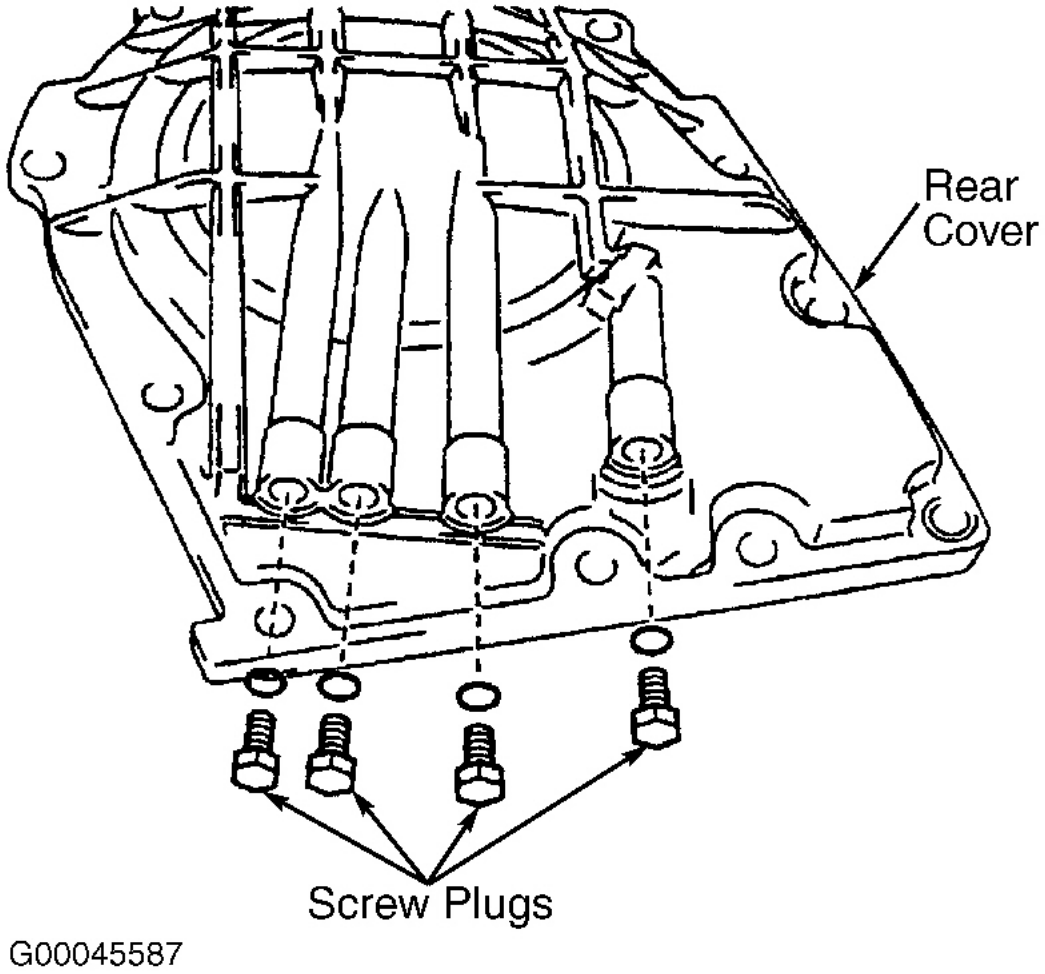

Fig. 26: Removing Transaxle Rear Cover Screw Plugs
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

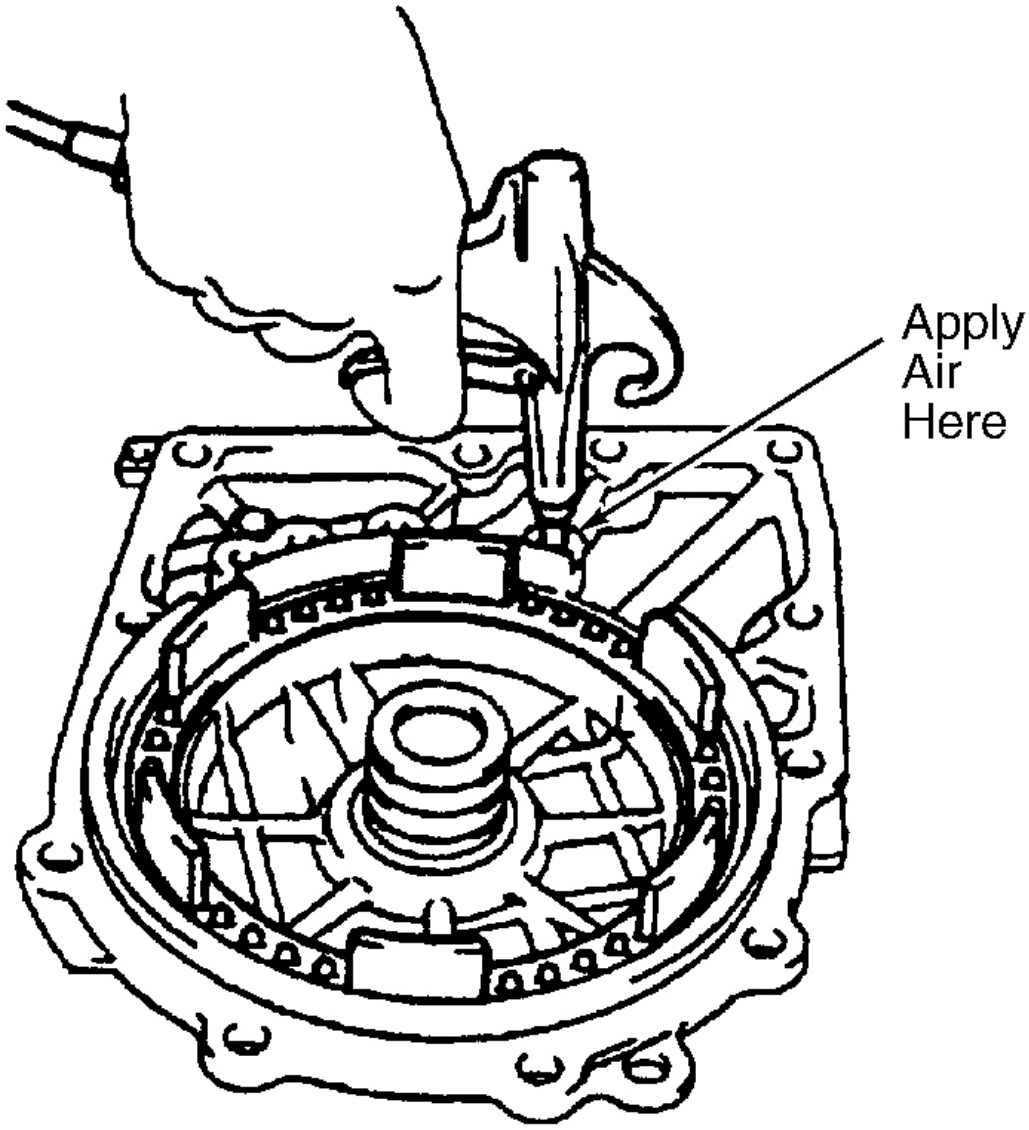

Fig. 27: Removing O/D Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPONENT DISASSEMBLY & REASSEMBLY

OIL PUMP ASSEMBLY

Disassembly

Using 2 screwdrivers, turn drive gear and check for smooth rotation. Remove 2 oil seal rings. Using T30 Torx socket, remove 10 bolts attaching oil pump body and stator shaft. Remove "O" ring from oil pump body. See **Fig. 28** . Note direction and location of drive and driven gears. Leave gears in oil pump body for inspection.

Inspection

1. Check body clearance of driven gear. Push driven gear to one side of body. Using a feeler gauge, measure clearance. See **Fig. 29** . Body clearance should be .004-.006" (.10-.15 mm). Maximum body clearance is .006" (.15 mm). If body clearance exceeds specification, replace oil pump body.
2. Using a feeler gauge, check gear tip clearance. Measure between drive and driven gear teeth. See **Fig. 30** . Tip clearance is .003-.006" (.07-.15 mm). Maximum tip clearance is .006" (.15 mm). If tip clearance exceeds specification, replace oil pump body.
3. Check side clearance of both gears. Use a steel straightedge and feeler gauge to measure side clearance of both gears. See **Fig. 31** . Clearance is .0008-.0020" (.020-.050 mm). Maximum side clearance is .0020" (.05 mm). Replace gears as necessary. If side clearance is not within specification after gear replacement, replace oil pump body.
4. Using a dial indicator, measure inside diameter of oil pump body bushing. See **Fig. 32** . Maximum inside diameter is 1.501" (38.14 mm). If inside diameter exceeds specification, replace oil pump body.
5. Using a dial indicator, measure inside diameter of stator shaft bushing. See **Fig. 33** . Maximum inside diameter is .847" (21.53 mm). If inside diameter exceeds specification, replace stator shaft.
6. Inspect front oil seal for cracks, damage or wear. Replace oil seal (if necessary). Remove oil seal with slide hammer. Install a NEW oil seal. Seal is properly installed when it is flush with outer edge of pump body.

Reassembly

1. Install front oil seal. Install driven gear and drive gear. Ensure top of gears are facing upward. Install stator shaft on oil pump body. Align bolt holes. Install 10 stator shaft-to-oil pump body bolts. Tighten bolts in crisscross pattern to 87 INCH lbs. (9.8 N.m).
2. Install 2 oil seal rings on oil pump. DO NOT expand ring ends excessively. Turn drive gear with screwdrivers to ensure a smooth rotation. DO NOT damage oil seal lip. Install NEW "O" ring on oil pump body.

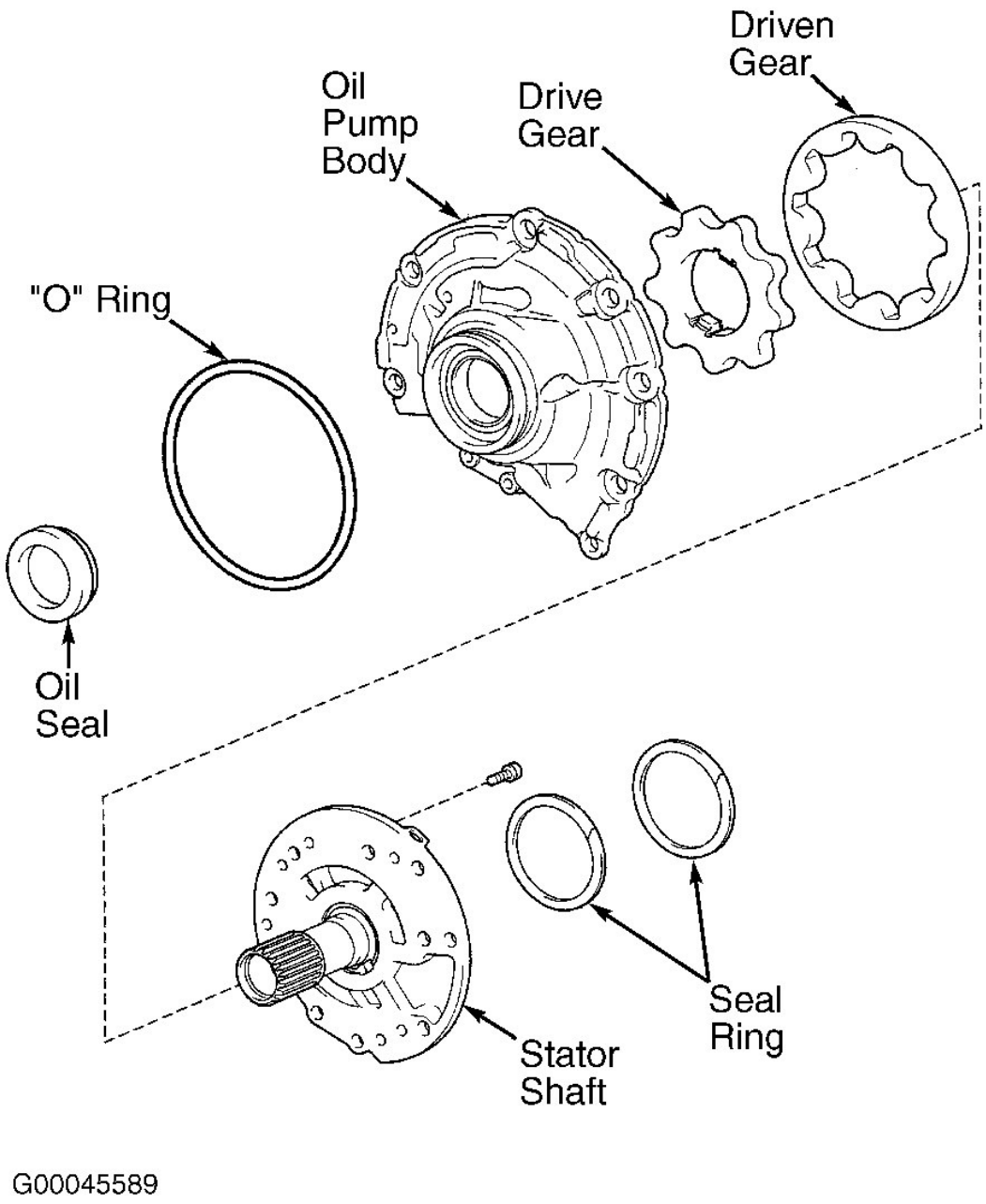

Fig. 28: Exploded View Of Oil Pump Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

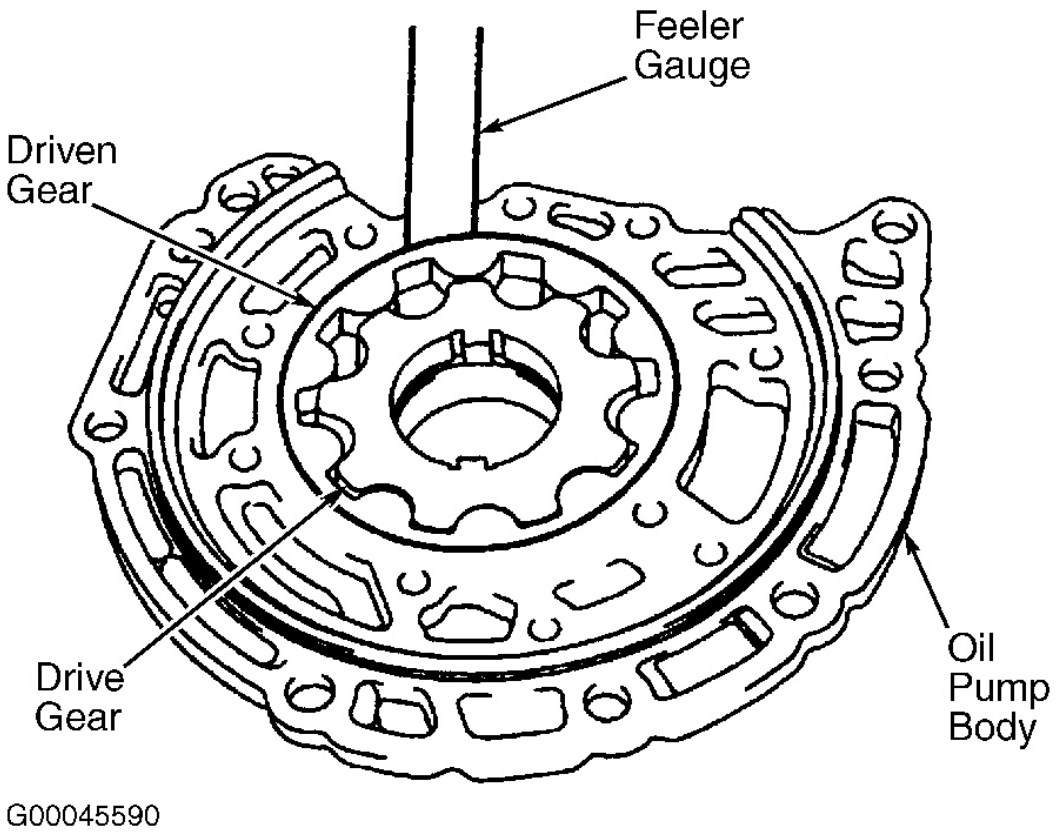

Fig. 29: Checking Oil Pump Driven Gear Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

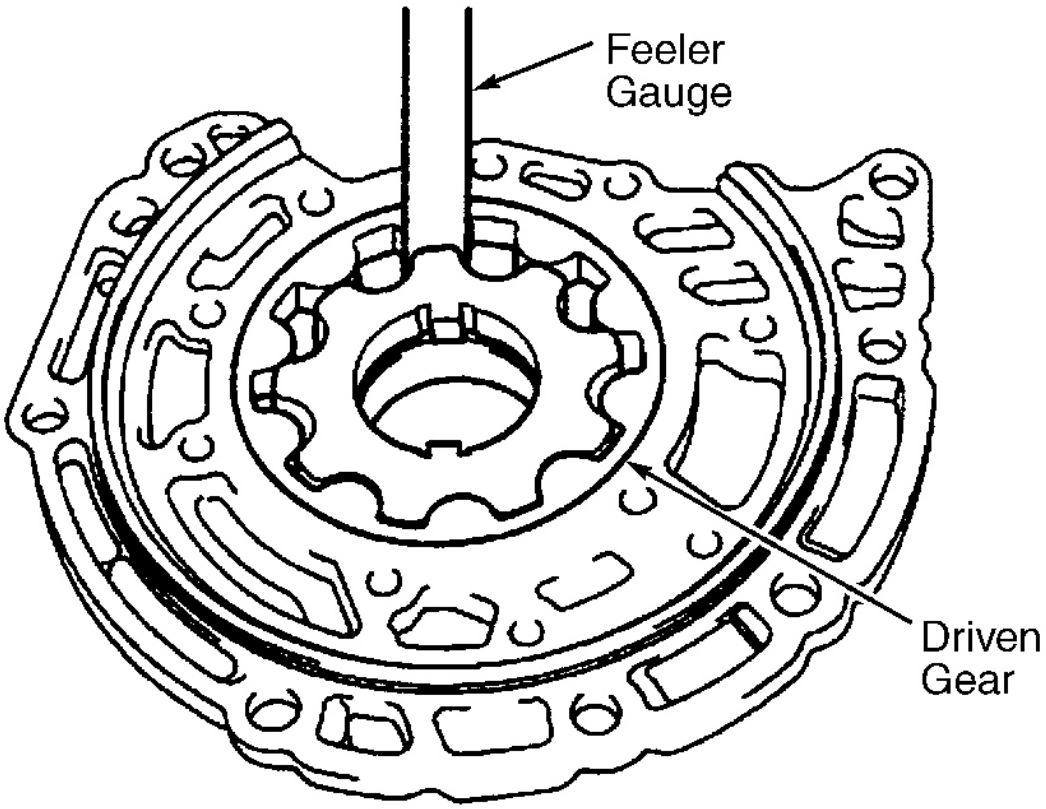

Fig. 30: Checking Oil Pump Driven Gear Tip Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

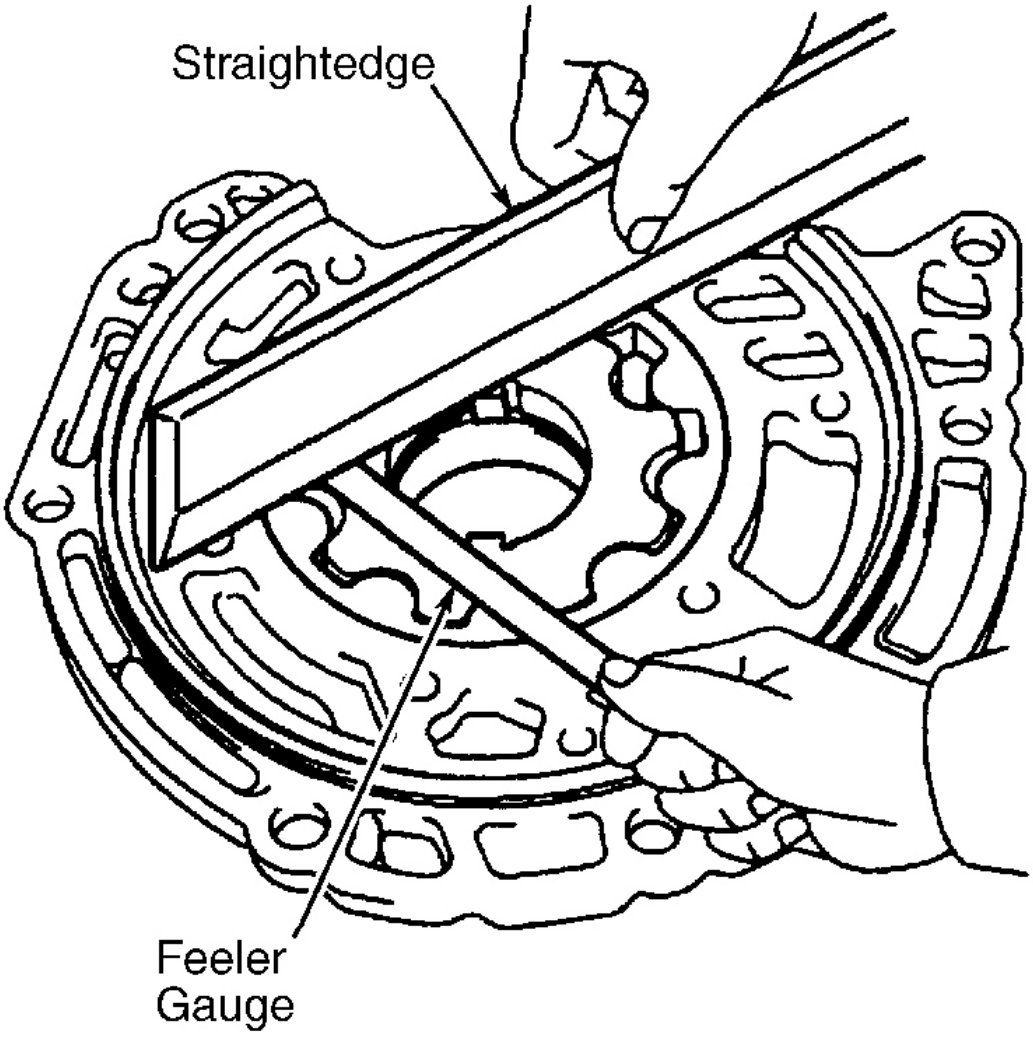

Fig. 31: Checking Oil Pump Side Gear Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

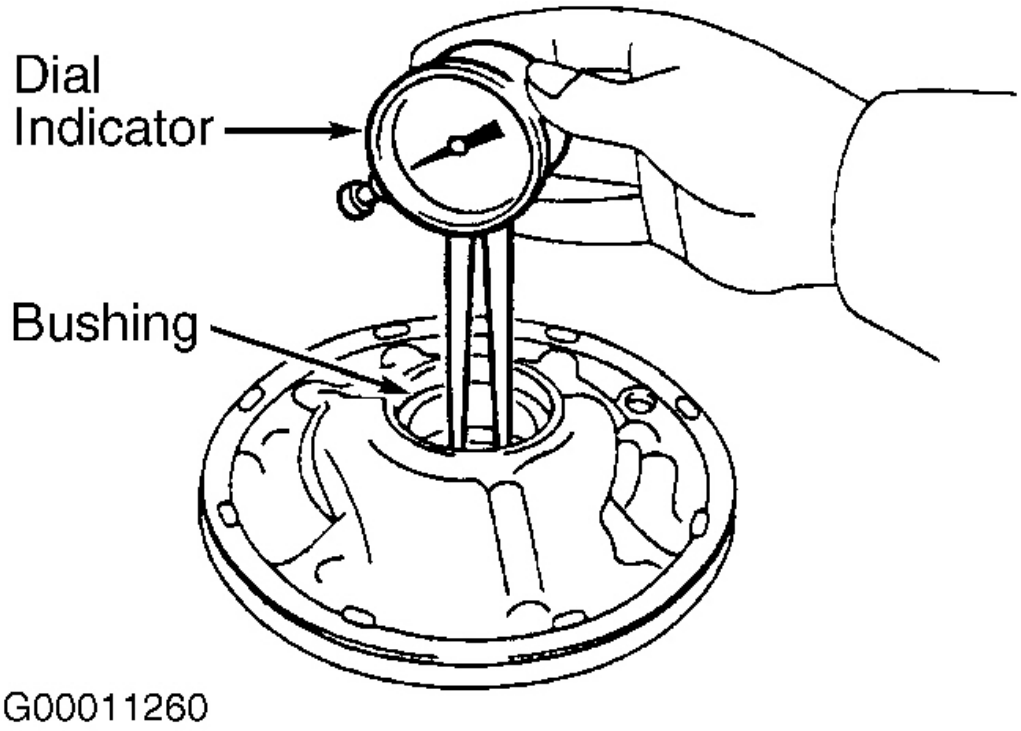

Fig. 32: Checking Oil Pump Body Bushing Diameter
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

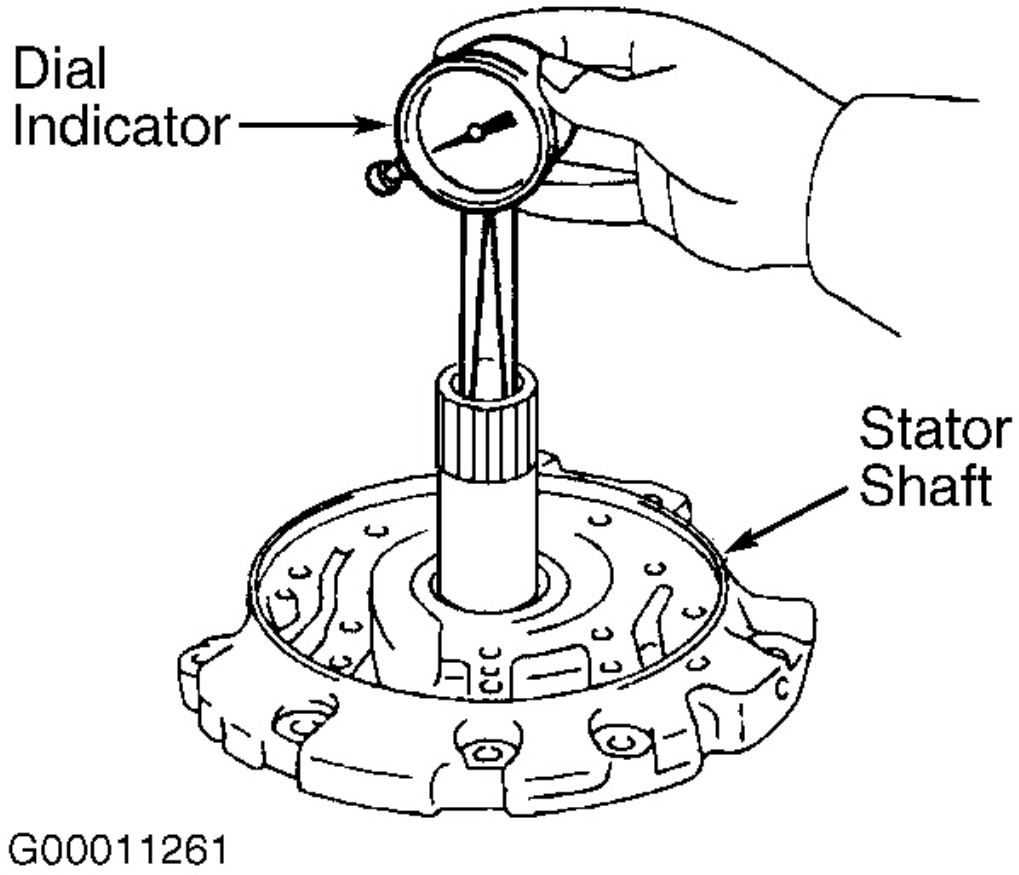

Fig. 33: Checking Stator Shaft Bushing Diameter
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DIRECT & REVERSE CLUTCH

Disassembly

1. Using a screwdriver, remove snap ring from direct clutch drum. On U340E transaxle, remove flange, 2 discs and 2 plates. On U341E transaxle, remove flange, 3 discs and 3 plates. On both transaxles, using a screwdriver, remove second snap ring. Remove flange, 3 discs and 3 plates. Note location of components during removal for reassembly reference. See **Fig. 34** .

NOTE: In the following step, stop press when piston return spring seat is lowered .039-.079" (1.00-2.00 mm) from snap ring groove. This prevents spring seat from becoming deformed. DO NOT expand snap ring excessively.

2. Position appropriate press on piston return spring seat. Compress piston return springs and remove snap ring from direct clutch drum. Remove press and piston return springs from direct clutch drum. Install intermediate shaft and housing on transaxle rear cover. While holding direct clutch piston, apply 57 psi (4 kg/cm_2) of compressed air to transaxle rear cover to remove direct clutch piston and drum. See **Fig. 35** .
3. If piston cannot be removed using compressed air, wrap needle nose pliers tips with vinyl tape and remove piston using pliers. Remove "O" rings from direct clutch drum and piston.

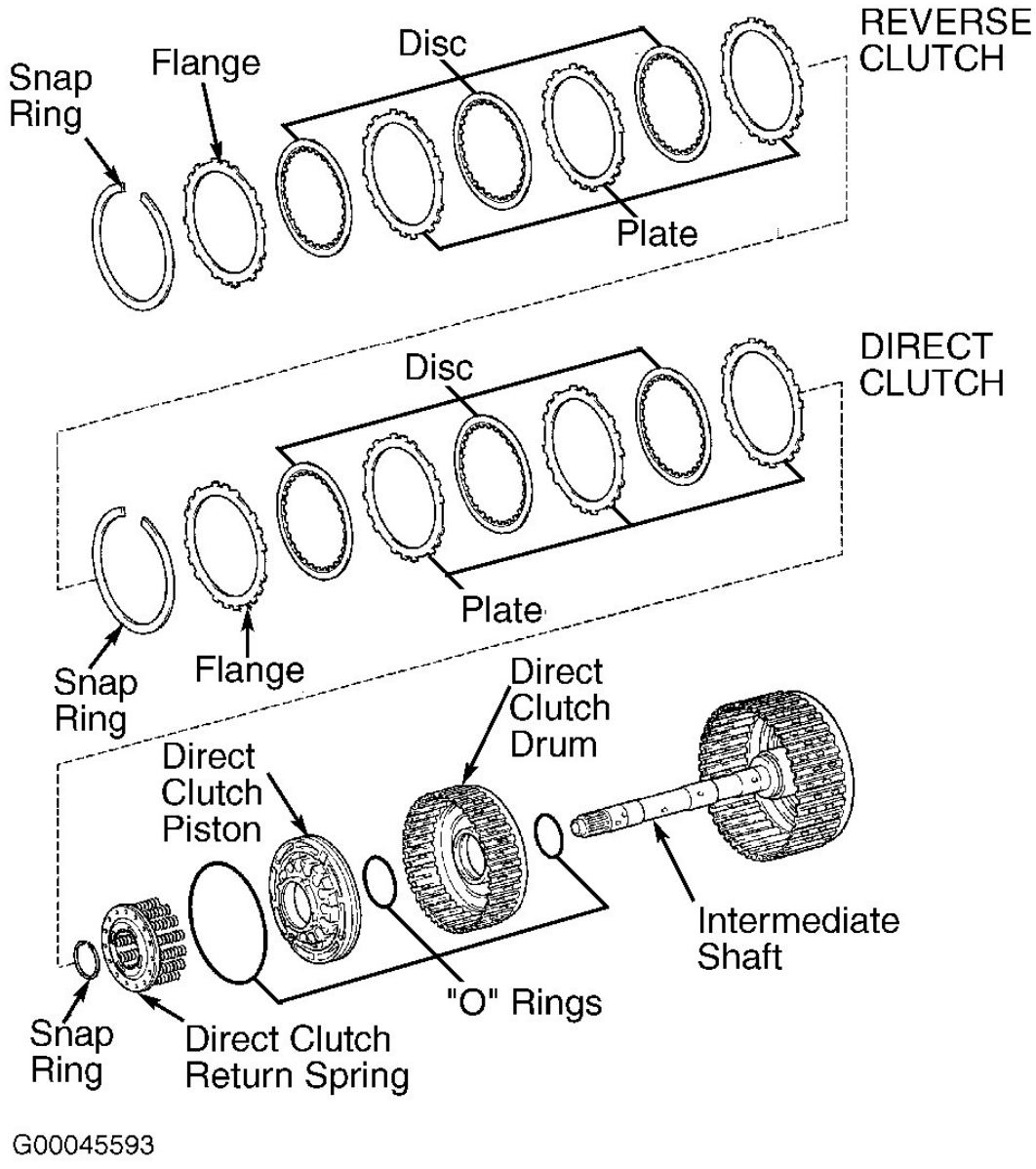

Fig. 34: Exploded View Of Direct & Reverse Clutch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

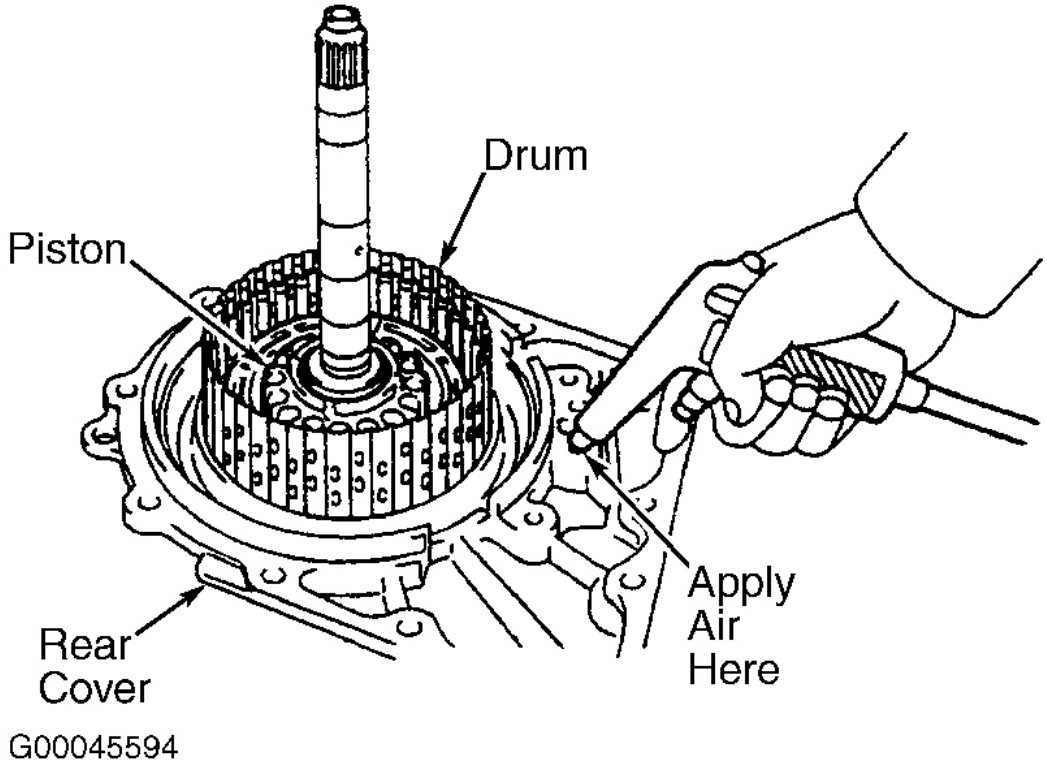

Fig. 35: Removing Direct Clutch Piston & Drum
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Inspection

1. Clean all parts (except discs) with solvent. Dry parts using compressed air. Inspect discs and plates for wear or burnt areas. If disc lining is peeled or discolored, replace discs as necessary. Replace all damaged components.
2. Using vernier calipers, measure direct clutch piston return spring free length with spring mounted to spring seat. Free length should be 1.295" (32.90 mm). Replace springs as necessary.

NOTE: New discs must be soaked in ATF at least 15 minutes prior to reassembly.

Reassembly

1. Install NEW "O" rings on direct clutch drum and piston. Coat piston with ATF. Install direct clutch drum into intermediate shaft housing. Using hand pressure, press piston into direct clutch drum. Ensure piston lip seal is not damaged. Install piston return springs onto direct clutch drum. Set snap ring in position.

NOTE: In the following step, stop press when piston return spring seat is

lowered .039-.079" (1.00-2.00 mm) from snap ring groove. This prevents spring seat from becoming deformed. DO NOT expand snap ring excessively.

2. Using appropriate press positioned on piston return spring seat, compress piston return springs. Using snap ring expander, install snap ring.
3. Install 3 plates and 3 discs, starting with plate and alternating with disc. Install flange on top of disc. Install direct clutch snap ring. On U340E transaxle, install 2 discs and 2 plates, starting with plate and alternating with disc. Install flange. On U341E transaxle, install, 3 discs and 3 plates, starting with plate and alternating with disc. Install flange. On both transaxles, install snap ring. See **Fig. 34** .
4. Check reverse clutch pack clearance. Install direct and reverse clutch assembly, and thrust needle roller bearing on transaxle rear cover. Using a dial indicator, measure reverse clutch pack clearance by applying and releasing 57 psi (4 kg/cm_2) of compressed air to transaxle rear cover. See **Fig. 36** .
5. Clutch pack clearance should be .034-.050" (.86-1.26 mm). If clutch pack clearance is not within specification, disassemble and reassemble reverse clutch components.
6. Measure clutch pack clearance again. If measurement is still not within specification, replace flange. Flange is available in 4 thicknesses, from .118" (3.00 mm) to .142" (3.60 mm) in increments of .008" (.20 mm).

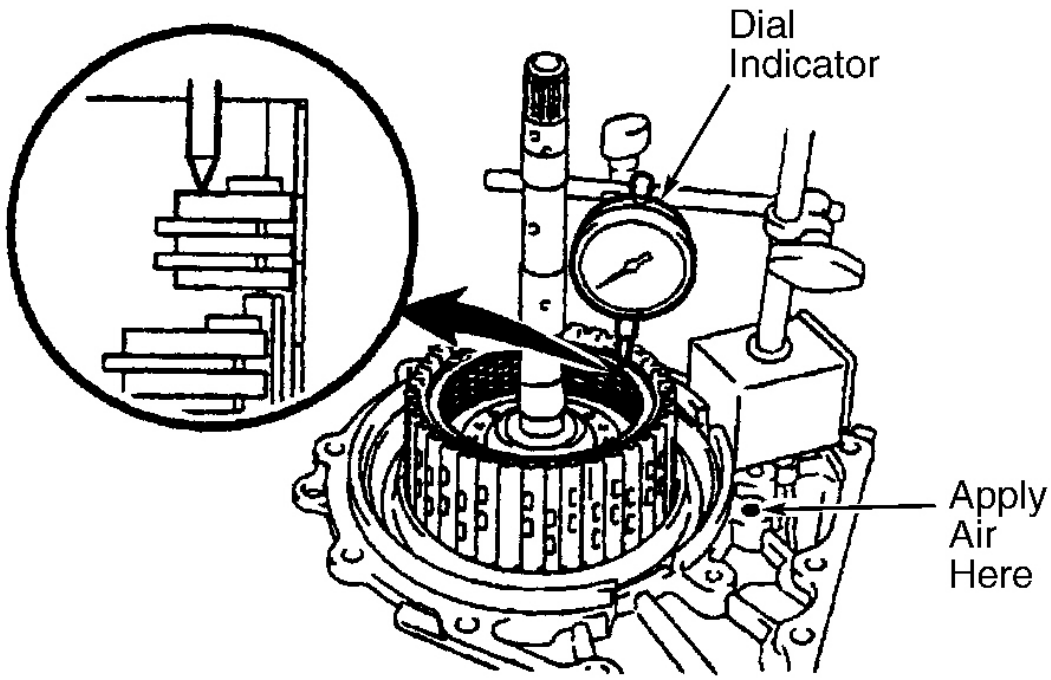

Fig. 36: Checking Reverse Clutch Pack Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: In the following step, direct and reverse clutch assembly may raise intermediate shaft housing as compressed air is applied. To ensure accurate clutch pack clearance reading, secure assembly in appropriate press prior to applying pressure to transaxle rear cover to secure intermediate shaft housing to transaxle rear cover.

7. Measure direct clutch pack clearance. Using a dial indicator and adapter, measure direct clutch pack clearance by applying and releasing 57 psi (4 kg/cm_2) of compressed air to transaxle rear cover. See **Fig. 37** .
8. Clutch pack clearance should be .024-.040" (.62-1.02 mm). If clutch pack clearance is not within specification, disassemble and reassemble direct clutch components.
9. Measure clutch pack clearance again. If measurement is still not within specification, replace flange. Flange is available in 4 thicknesses, from .118" (3.00 mm) to .142" (3.60 mm) in increments of .008" (.20 mm).

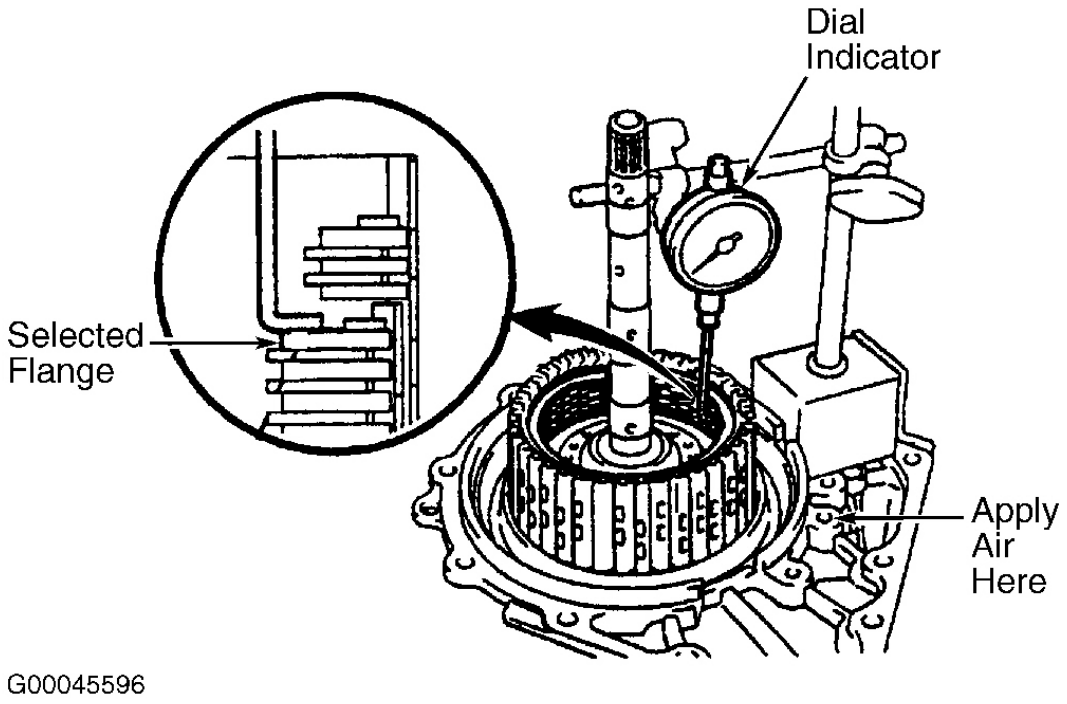

Fig. 37: Checking Direct Clutch Pack Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

FORWARD CLUTCH

Disassembly

1. Using a screwdriver, remove snap ring from forward clutch drum. Remove flange, 4 discs and 4 plates.

Note location of components during removal for reassembly reference. Using appropriate press positioned on clutch balancer, compress piston return springs. Using snap ring expander, remove snap ring. See **Fig. 38** .

2. Remove press, clutch balancer and piston return springs. Install forward clutch with input shaft on oil pump assembly. While holding forward clutch piston, apply 57 psi (4 kg/cm_2) of compressed air to oil pump to remove forward clutch piston. See **Fig. 39** . Opening in oil pump may be large. To prevent air from discharging, surround air nozzle with shop towel.
3. If piston cannot be removed using compressed air, wrap needle nose pliers tips with vinyl tape and remove piston using pliers. Remove "O" ring from piston.

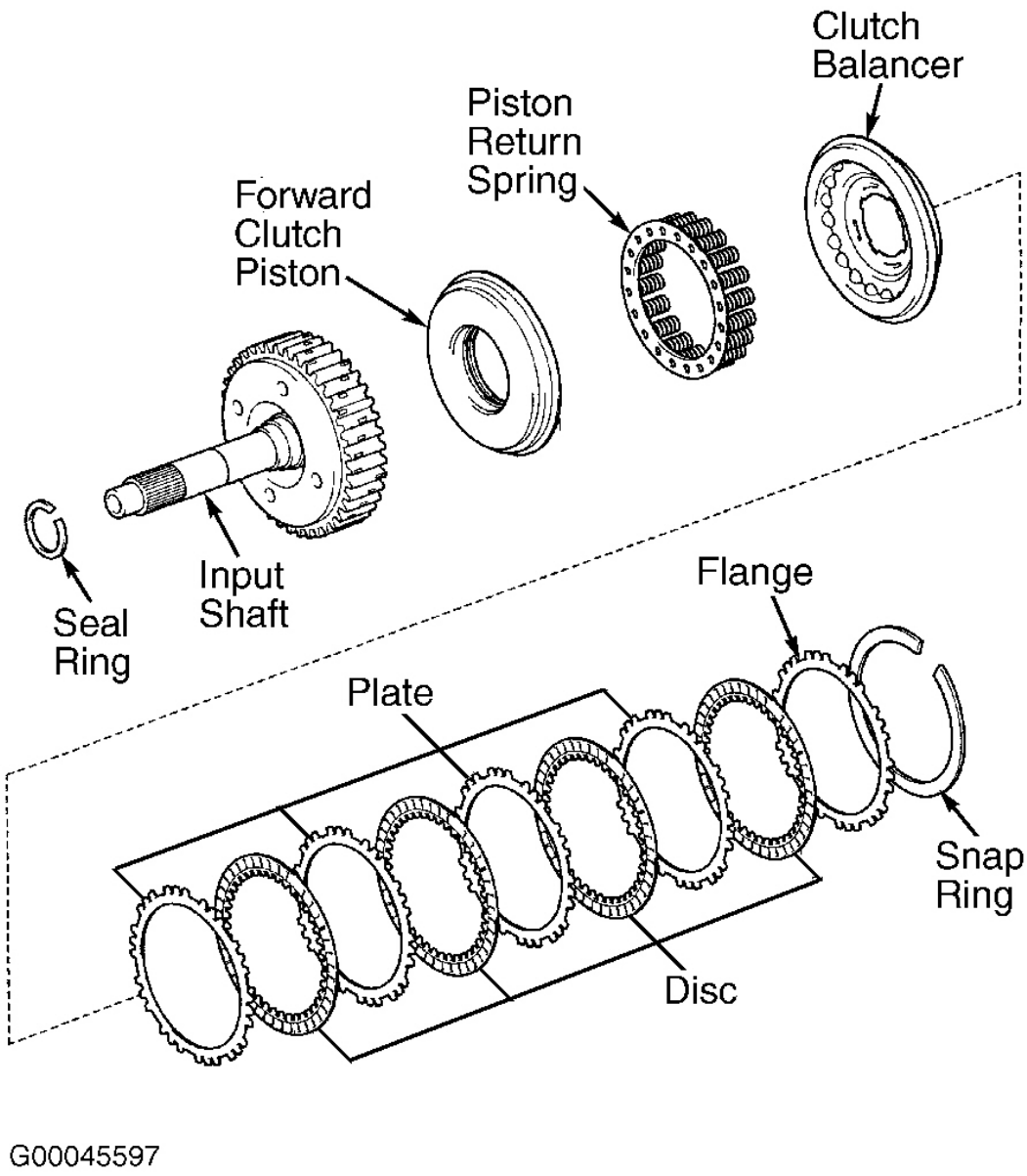

Fig. 38: Exploded View Of Forward Clutch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

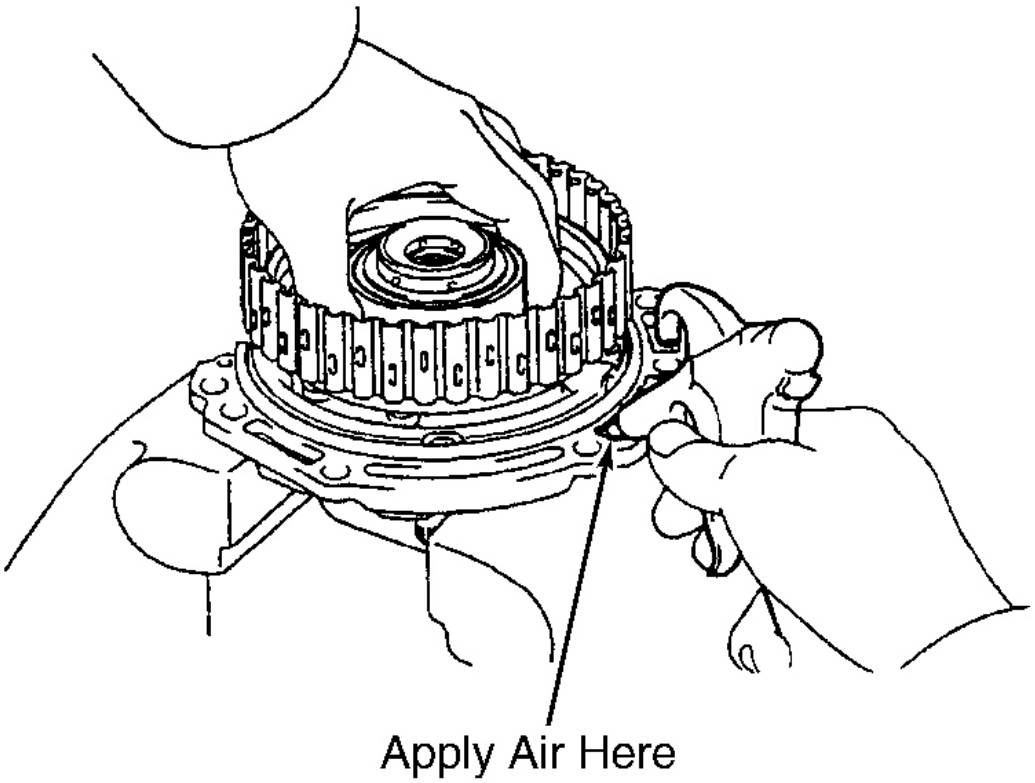

Fig. 39: Removing Forward Clutch Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Inspection

1. Clean all parts (except discs) with solvent. Dry parts using compressed air. Inspect discs and plates for wear or burnt areas. If disc lining is peeled or discolored, replace discs as necessary. Replace all damaged components.
2. Using vernier calipers, measure forward clutch piston return spring free length with spring mounted to spring seat. Free length should be .854" (21.69 mm). Replace springs as necessary.

NOTE: New discs must be soaked in ATF for 15 minutes prior to reassembly.

Reassembly

1. Coat NEW piston "O" ring with ATF. Install "O" ring on forward clutch piston. Using hand pressure, press piston into forward clutch drum. Ensure "O" ring is not damaged. Set piston return springs and clutch balancer in position.

NOTE: In the following step, stop press when piston return spring seat is lowered .039-.079" (1.00-2.00 mm) from snap ring groove. This prevents spring seat from becoming deformed. DO NOT expand snap ring excessively.

2. Position spring seat on a press. Compress piston return springs. Using snap ring expander, install snap ring in forward clutch drum groove. Ensure end gap of spring is not aligned with gap in spring retainer claw.
3. Install 4 plates and 4 discs, starting with plate and alternating with disc. Install flange on top of disc. See **Fig. 38** . Install snap ring. Ensure end gap of snap ring is not aligned with cutouts of forward clutch drum.
4. Check forward clutch pack clearance. Install forward clutch on oil pump assembly. Using a dial indicator, measure forward clutch pack clearance by applying and releasing 57 psi (4 kg/cm_2) of compressed air to oil pump. See **Fig. 40** . Clutch pack clearance should be .055-.071" (1.40-1.81 mm). If clutch pack clearance is not within specification, disassemble and reassemble forward clutch components.
5. Measure clutch pack clearance again. If measurement is still not within specification, replace flange. Flange is available in 4 thicknesses from .118" (3.00 mm) to .142" (3.60 mm) in increments of .008" (.20 mm).

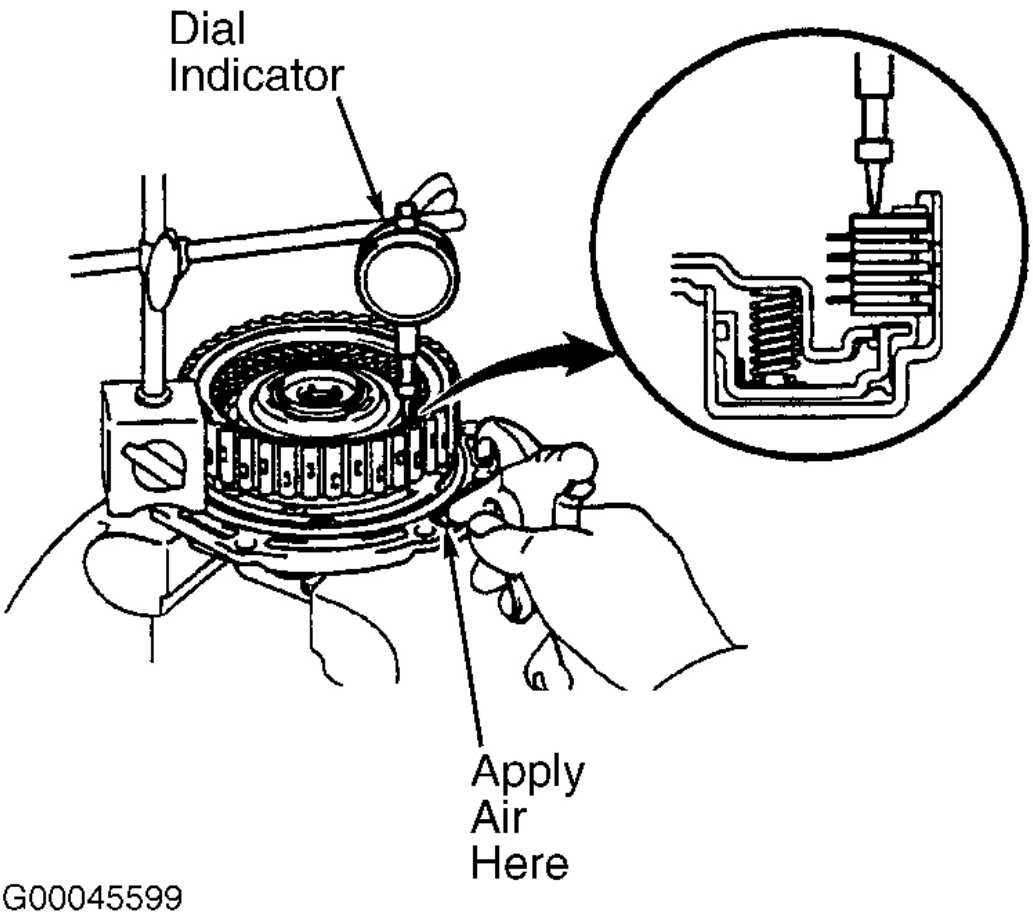

Fig. 40: Checking Forward Clutch Pack Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2ND BRAKE

Disassembly & Reassembly

1. Using appropriate press, position press on piston return springs and compress springs. Using a screwdriver, remove snap ring. Remove press and piston return springs. See **Fig. 41** . While holding 2nd brake piston, apply 57 psi (4 kg/cm_2) of compressed air to 2nd brake cylinder to remove piston. See **Fig. 42** . Remove 2 "O" rings from 2nd brake cylinder.
2. Using vernier calipers, measure 2nd brake piston return spring free length with spring mounted to spring seat. Free length should be .577" (14.65 mm). Replace springs as necessary. Coat NEW "O" rings with ATF and install on 2nd brake cylinder.
3. Carefully press 2nd brake piston by hand into 2nd brake cylinder. See **Fig. 41** . Using appropriate press, compress piston return springs and install snap ring. Ensure end gap of snap ring is not aligned with gap

in piston return spring claw.

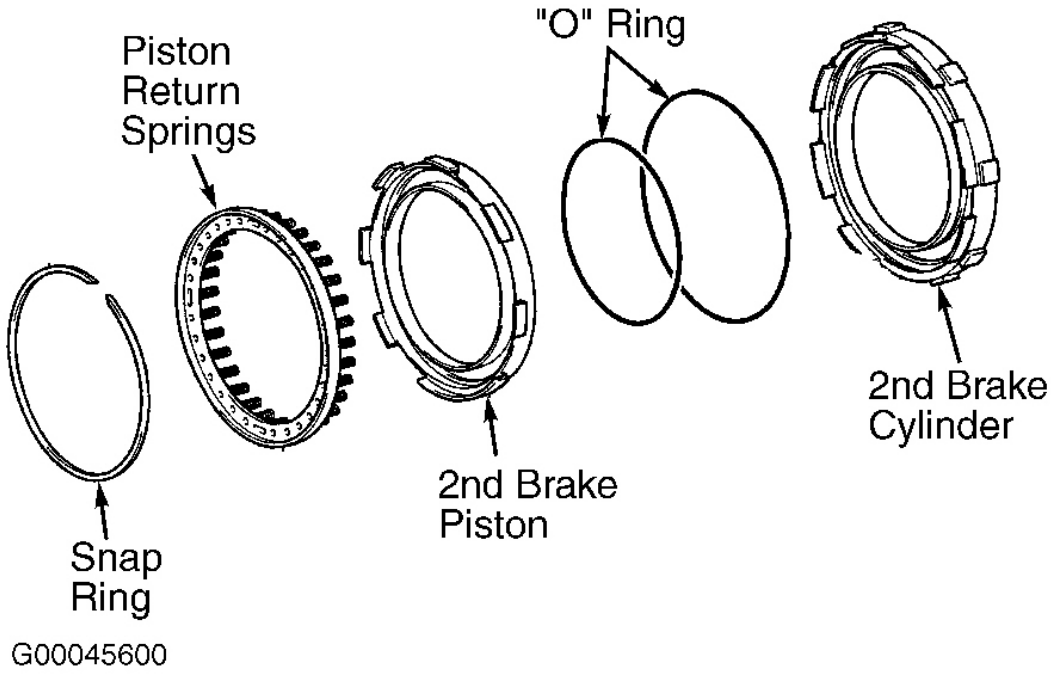

Fig. 41: Exploded View Of 2nd Brake Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

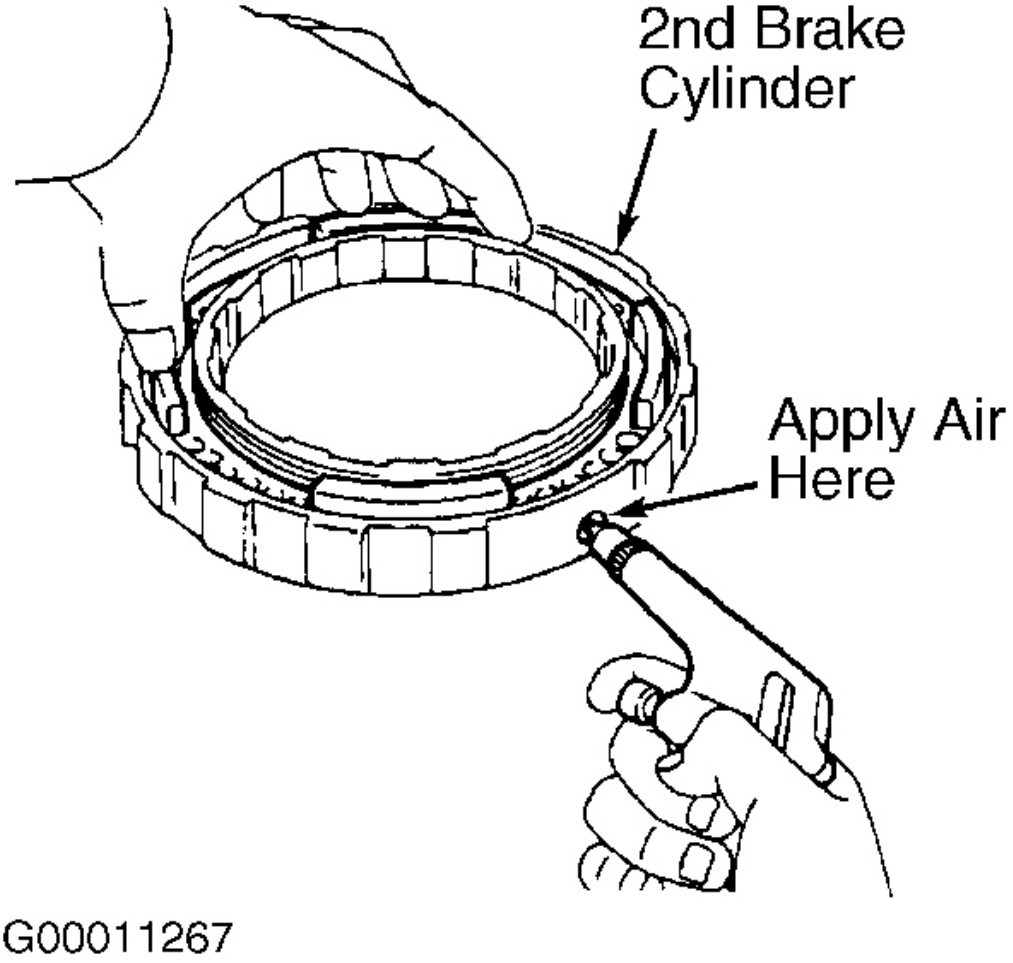

Fig. 42: Removing 2nd Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

VALVE BODY ASSEMBLY

NOTE: All valve body components must be installed in original location. Lay all components in sequence during removal for reassembly reference. Primary regulator valve position controls line pressure. Note location of primary regulator valve sleeve, plug and pin prior to disassembly. See Fig. 44 .

Disassembly

1. Remove 5 bolts and 5 shift solenoids. See **Fig. 43** and **Fig. 45** . Remove 14 valve body assembly lower bolts, 2 gaskets and plate. See **Fig. 46** . DO NOT lose check balls. Turn valve body assembly over.

Remove bolt, cover and pressure relief ball from upper valve body. Remove 9 valve body assembly upper bolts. See **Fig. 47** .

2. Turn valve body assembly over. Hold plate against lower valve body and carefully remove lower valve body from upper valve body. Remove plate from lower valve body. DO NOT lose check balls. Remove 3 bolts, cover, forward clutch accumulator piston and spring from lower valve body. Remove "O" rings from accumulator piston. See **Fig. 43** .
3. Remove 4 bolts, cover and 2nd coast and O/D brake accumulator piston and spring. Remove "O" rings from accumulator piston. See **Fig. 43** . Note location of check balls, keys, plugs and pins in valve body. See **Fig. 48** -**Fig. 51** .

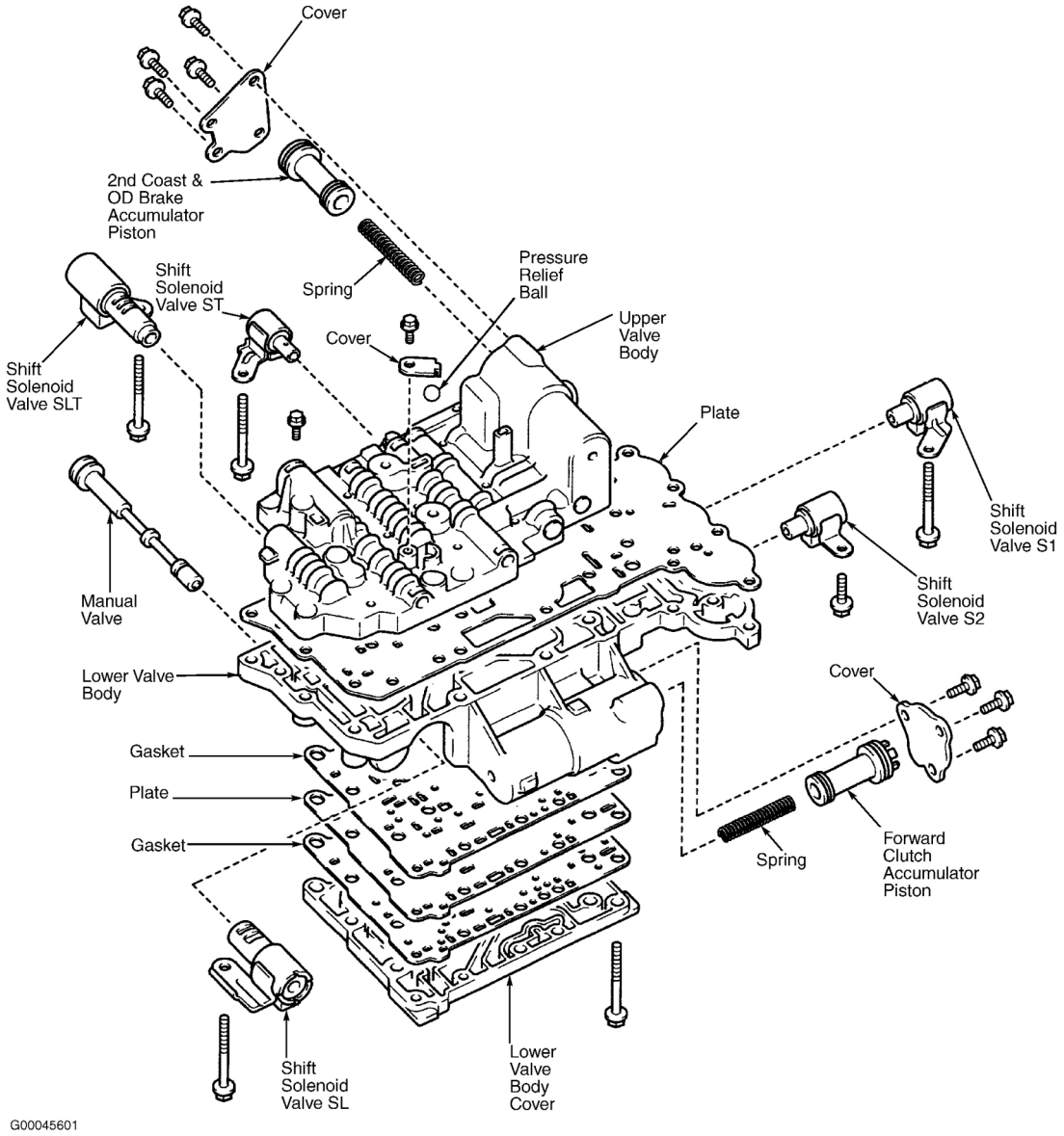

Fig. 43: Exploded View Of Valve Body Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

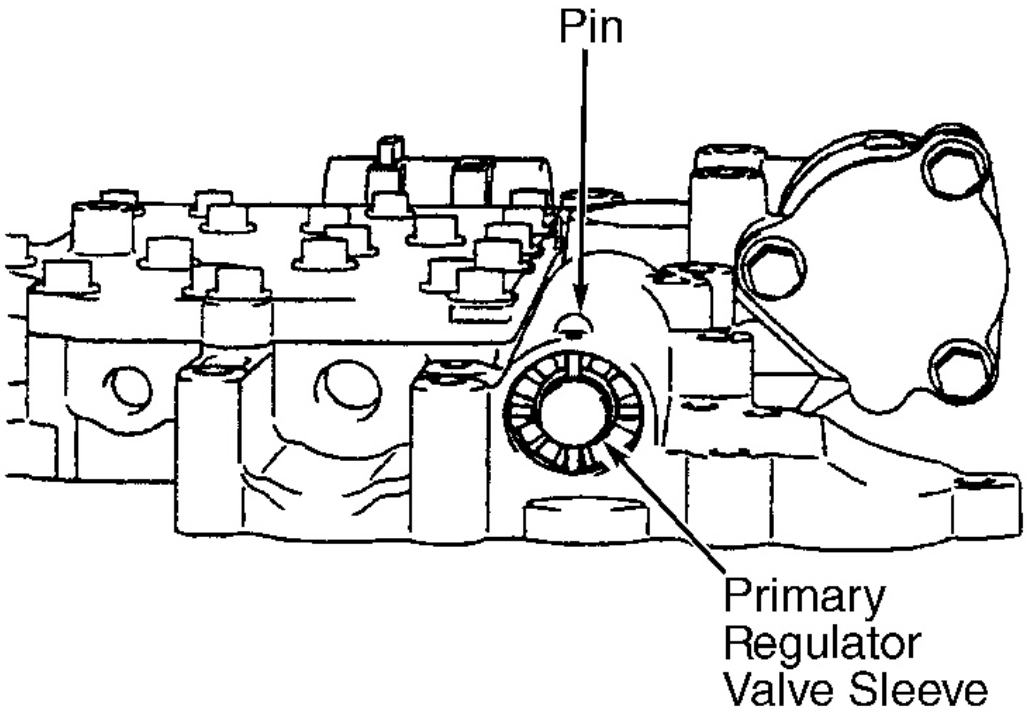

Fig. 44: Identifying Primary Regulator Valve Position
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

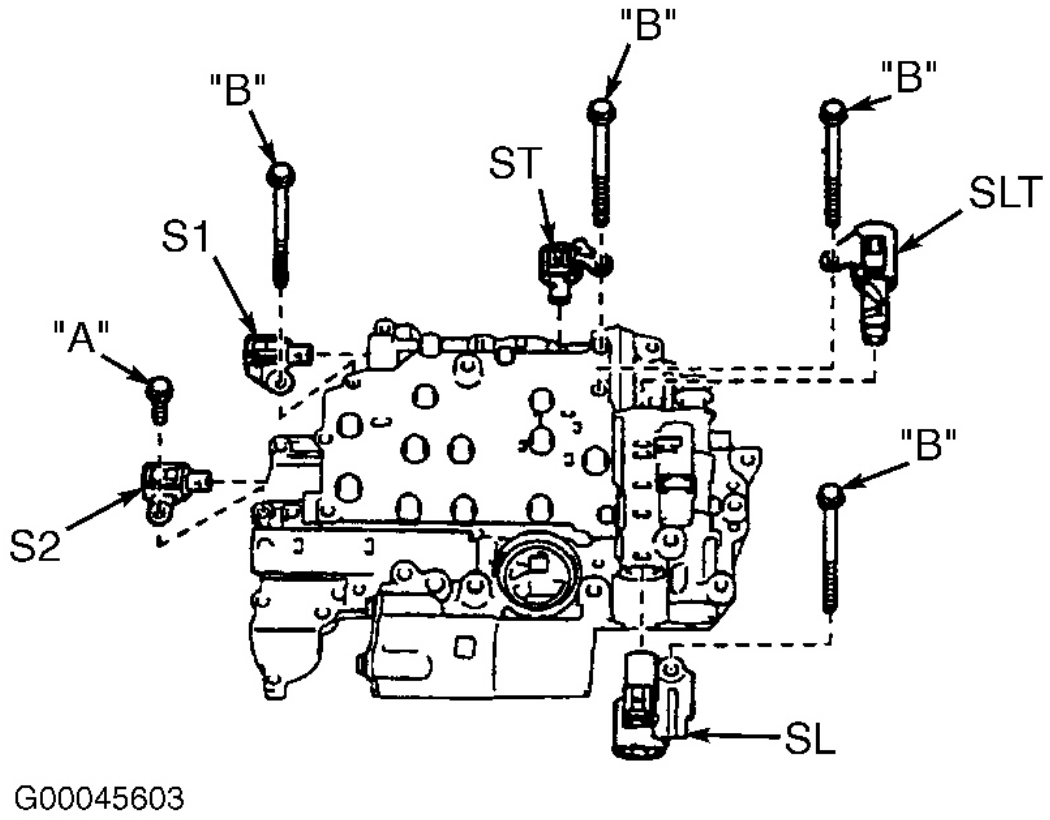

Fig. 45: Locating Shift Solenoids
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

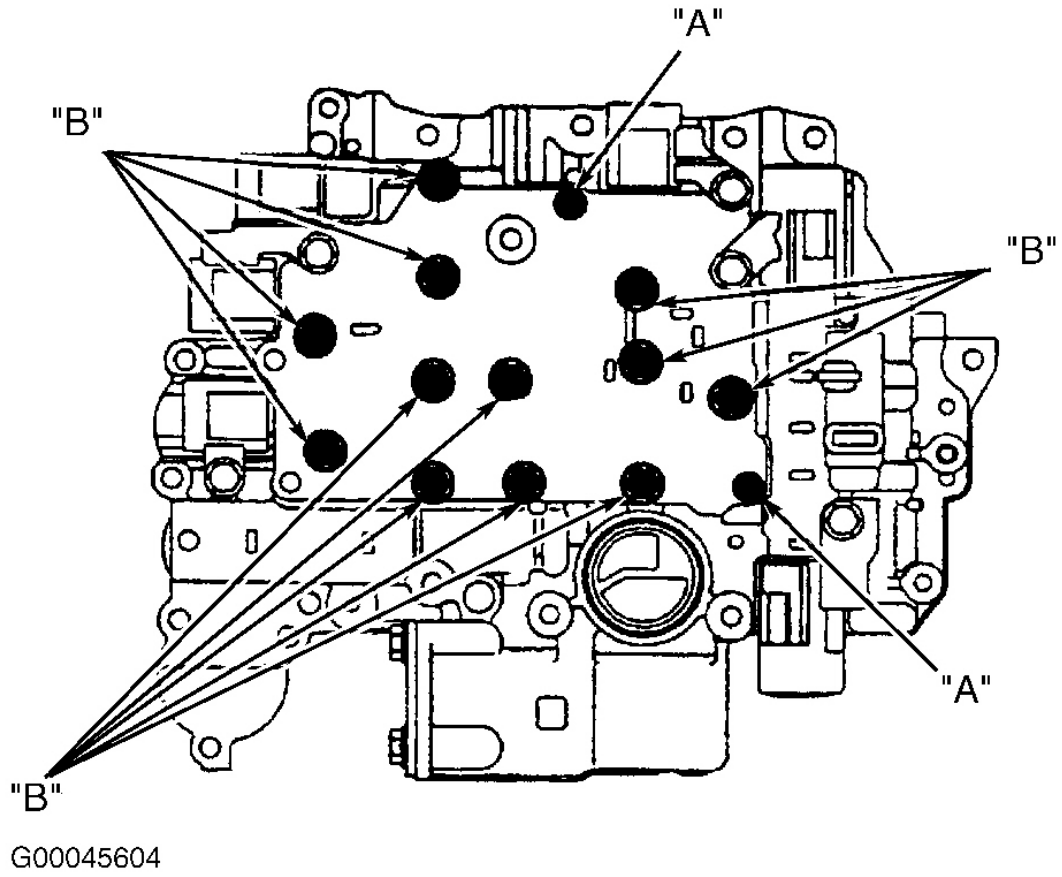

Fig. 46: Removing Valve Body Assembly Lower Bolts (14)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

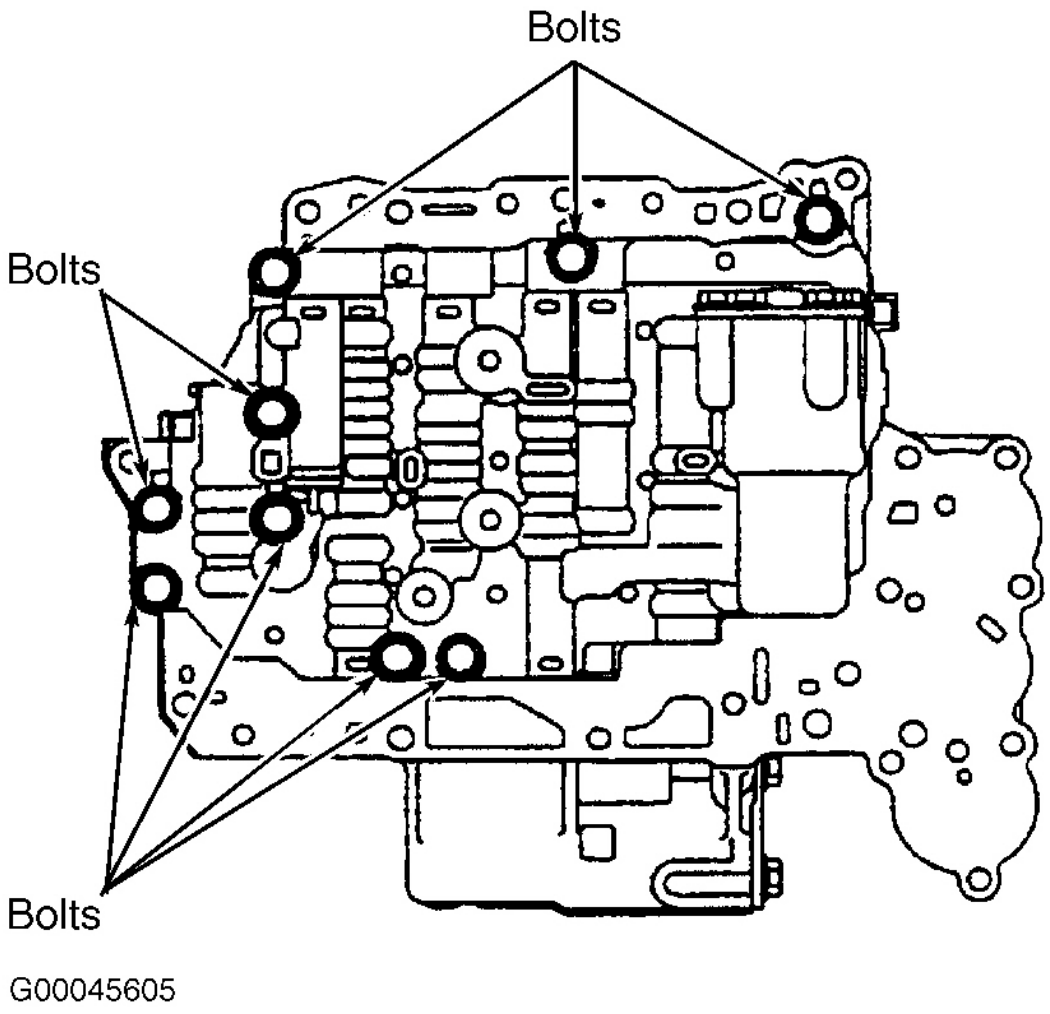

Fig. 47: Removing Valve Body Assembly Upper Bolts (9)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Inspection

1. Clean all parts with solvent. Dry parts with compressed air. Ensure all valve body oil passages are clear. Inspect valves for scoring or roughness. See **Fig. 48** and **Fig. 49** . Inspect valve springs for damage, squareness, rust and collapsed coils. Measure spring free length and outer diameter.
2. Replace spring if not within specification. See appropriate VALVE BODY SPRING SPECIFICATIONS table. Ensure valve body springs correspond with appropriate valve. Ensure keys are installed in appropriate locations. See appropriate VALVE BODY KEY SPECIFICATIONS table.

UPPER VALVE BODY SPRING SPECIFICATIONS

Application (Color) (1)	Outer Diameter - In. (mm)	Free Length - In. (mm)

Coast Relay Valve (Blue)	.335 (8.50)	.870 (22.10)
Lock-Up Relay Valve (Orange)	.231 (5.86)	.922 (23.42)
Low Modulator Valve (Red)	.291 (7.40)	1.008 (25.60)
Reverse Control Valve (None)	.394 (10.00)	.925 (23.50)
Secondary Regulator Valve (None)	.343 (8.70)	2.114 (53.70)
Solenoid Modulator Valve (Orange)	.323 (8.20)	1.173 (29.80)
Solenoid Relay Valve (Purple)	.311 (7.90)	.818 (20.78)
SLT Damper (Yellow)	.394 (10.00)	1.221 (31.00)
2-3 Shift Valve (None)	.386 (9.80)	1.023 (25.98)
3-4 Shift Timing Valve (White)	.311 (7.90)	1.575 (40.00)
4-3 Shift Timing No. 1 Valve (Lt. Green)	.327 (8.30)	1.264 (32.11)
(1) For spring locations, refer to illustration. See **Fig. 48** .		

LOWER VALVE BODY SPRING SPECIFICATIONS

Application (Color) (1)	Outer Diameter - In. (mm)	Free Length - In. (mm)
Accumulator Control Valve (None)	.433 (11.00)	1.067 (27.10)
Lock-Up Control Valve (None)	.219 (5.55)	.823 (20.90)
Pressure Relief Valve (None)	.406 (10.30)	1.006 (25.55)
Primary Regulator Valve (None)	.862 (21.90)	2.358 (59.90)
1-2 & 3-4 Shift Valve (None)	.386 (9.80)	1.023 (25.98)
(1) For spring locations, refer to illustration. See **Fig. 49** .		

UPPER VALVE BODY KEY SPECIFICATIONS

Key I.D. Letter(1)	(2) Height - In. (mm)
D, F, G & J	.394 (10.00)
E	1.122 (28.50)
All Other Keys	.906 (23.00)
(1) For key locations, refer to illustration. See **Fig. 48** .	
(2) Thickness for key "E" is .114" (2.90 mm). Width is .157" (4.00 mm). For keys "D", "F", "G" and "J" width is .197" (5.00 mm). Thickness is .126" (3.20 mm). Width for all other keys is not available.	

LOWER VALVE BODY KEY SPECIFICATIONS

Key I.D. Letter (1)	(2) Height - In. (mm)
A, B & C	.453 (11.50)
D	.827 (21.00)
(1) For key locations, refer to illustration. See **Fig. 49** .	

(2) Width for all keys except "D", is .197" (5.00 mm). Width for key "D" is not available. Thickness for all keys is .126" (3.20 mm).

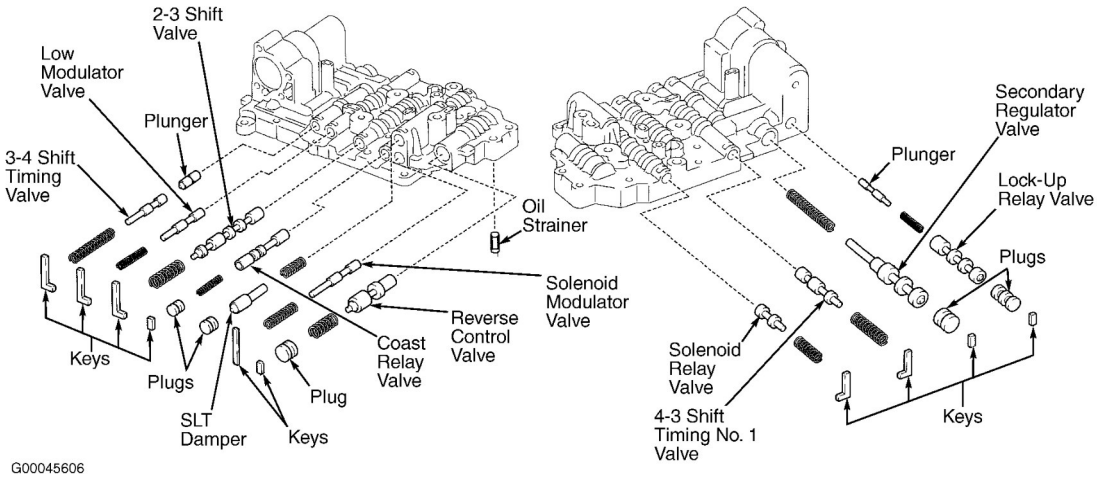

Fig. 48: Exploded View Of Upper Valve Body
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

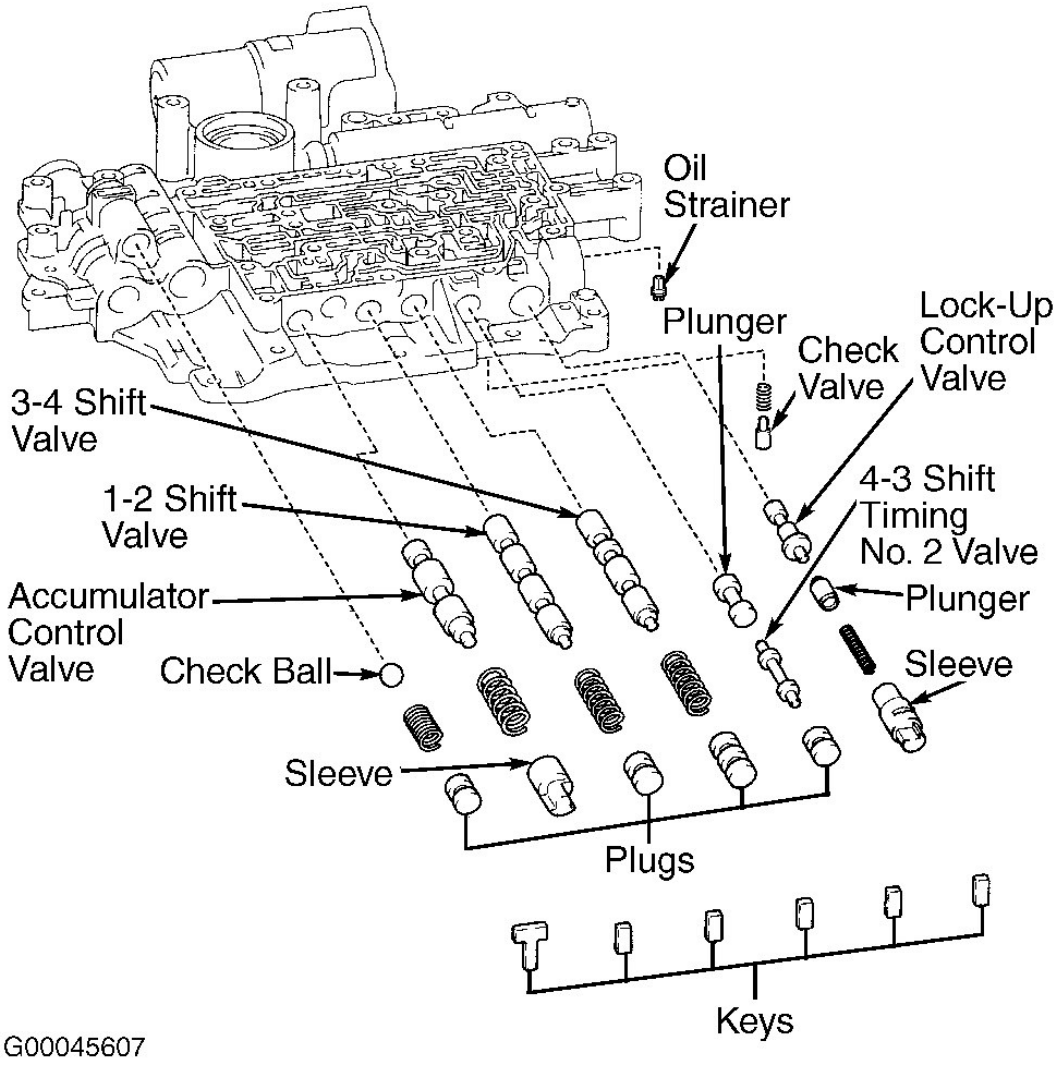

Fig. 49: Exploded View Of Lower Valve Body
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

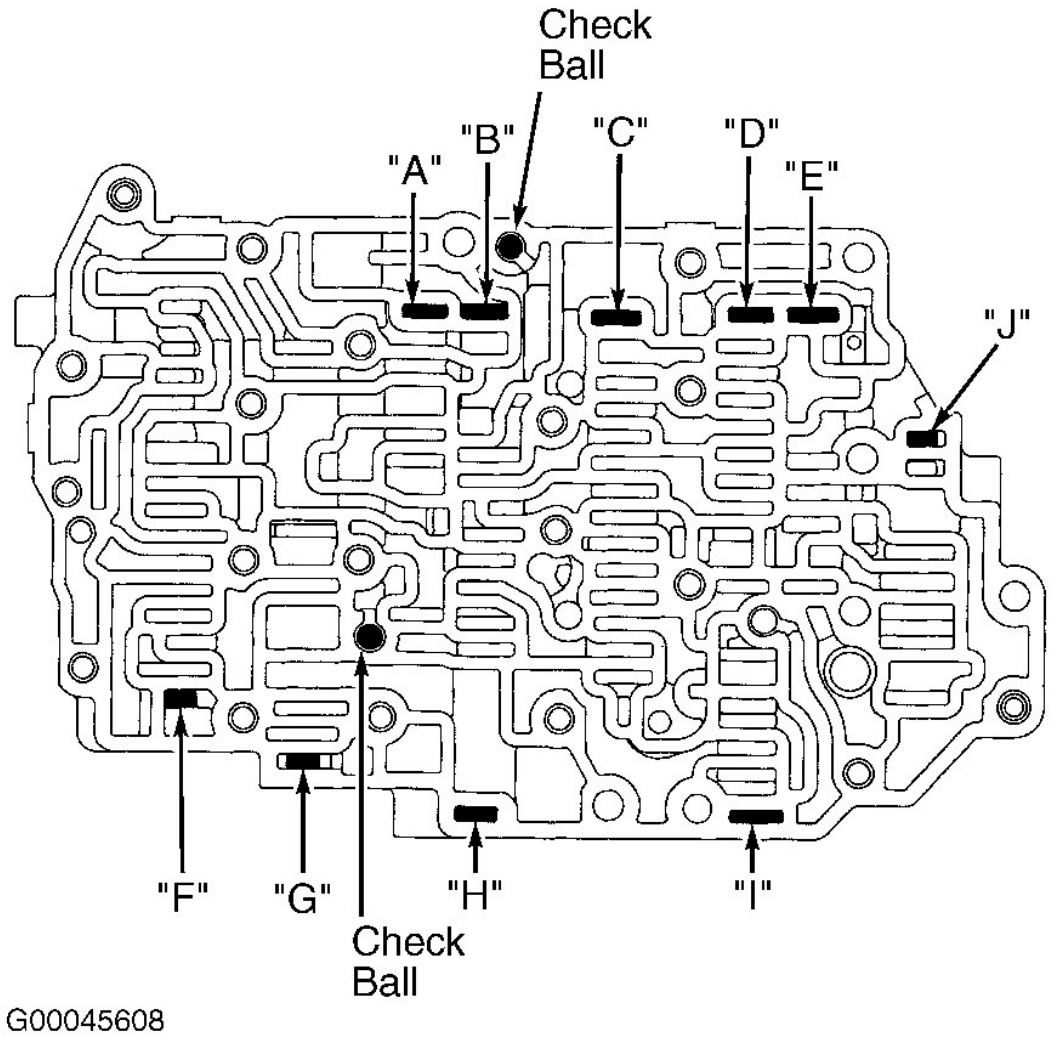

Fig. 50: Identifying Upper Valve Body Check Ball & Key Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

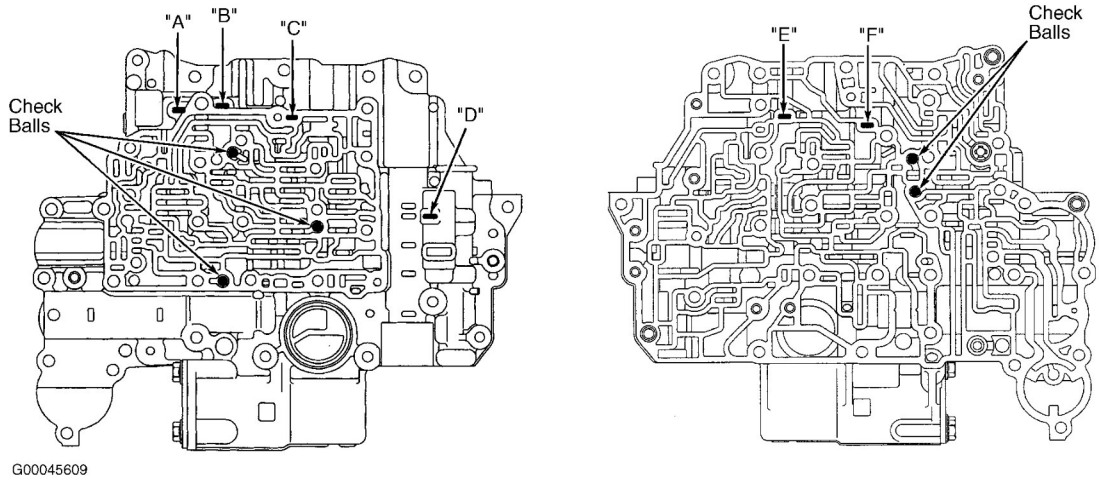

Fig. 51: Identifying Lower Valve Body Check Ball & Key Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Reassembly

1. Install NEW "O" rings to forward clutch and 2nd coast and O/D brake accumulator pistons. Install .594" (85.10 mm) outside diameter spring, 2nd coast and O/D brake accumulator piston, cover and 4 bolts. Install .787" (20.00 mm) outside diameter spring, forward clutch accumulator piston, cover and 3 bolts. Tighten bolts to 97 INCH lbs. (11 N.m). See **Fig. 43** .
2. Install check balls in upper and lower valve bodies. Ensure check balls are installed in correct locations. See **Fig. 50** and **Fig. 51** .
3. Install plate to lower valve body. Install lower valve body with plate to upper valve body. Turn valve body assembly over. Install 9 upper valve body bolts and tighten to 97 INCH lbs. (11 N.m). Install pressure relief ball, cover and bolt. Tighten bolt to 58 INCH lbs. (6.6 N.m).
4. Turn valve body assembly over. Install 2 gaskets, plate cover and 14 lower valve body bolts. Ensure bolts are installed in correct locations. Tighten bolts "A" to 58 INCH lbs. (6.6 N.m). Tighten bolts "B" to 97 INCH lbs. (11 N.m). See **Fig. 46** .
5. Install 5 shift solenoids and bolts. Tighten shift solenoid S2 bolt "A" to 58 INCH lbs. (6.6 N.m). Bolt length is .55" (14.0 mm). Tighten all other shift solenoid bolts to 97 INCH lbs. (11 N.m). Bolt length is 2.17" (55.0 mm). See **Fig. 45** . Ensure primary regulator valve is installed in correct position. See **Fig. 44** .

DIFFERENTIAL ASSEMBLY

Disassembly

1. Perform pre-disassembly inspection. Position dial indicator assembly on transaxle case. Position dial indicator tip against side gear. See **Fig. 53** . Measure side gear backlash while holding one pinion gear toward case. Backlash should be .002-.008" (.05-.20 mm). Note and record reading.
2. Mark ring gear and differential case for reassembly reference. Unstake lock plates. Remove 8 ring gear bolts and 4 lock plates. Using a plastic hammer, tap on ring gear to remove it from differential case. See

Fig. 52 .

3. Using appropriate puller, remove front and rear tapered roller bearings (if necessary). Remove speedometer drive gear. Using a pin punch and hammer, drive out pinion shaft pin from ring gear side of case. Remove differential pinion shaft from differential case.
4. Remove 2 differential pinion gears, side gears, and 4 thrust washers. Using appropriate puller, remove side gear bearing outer races and shim from transaxle housing and transaxle case. Remove oil seals from transaxle housing and transaxle case.

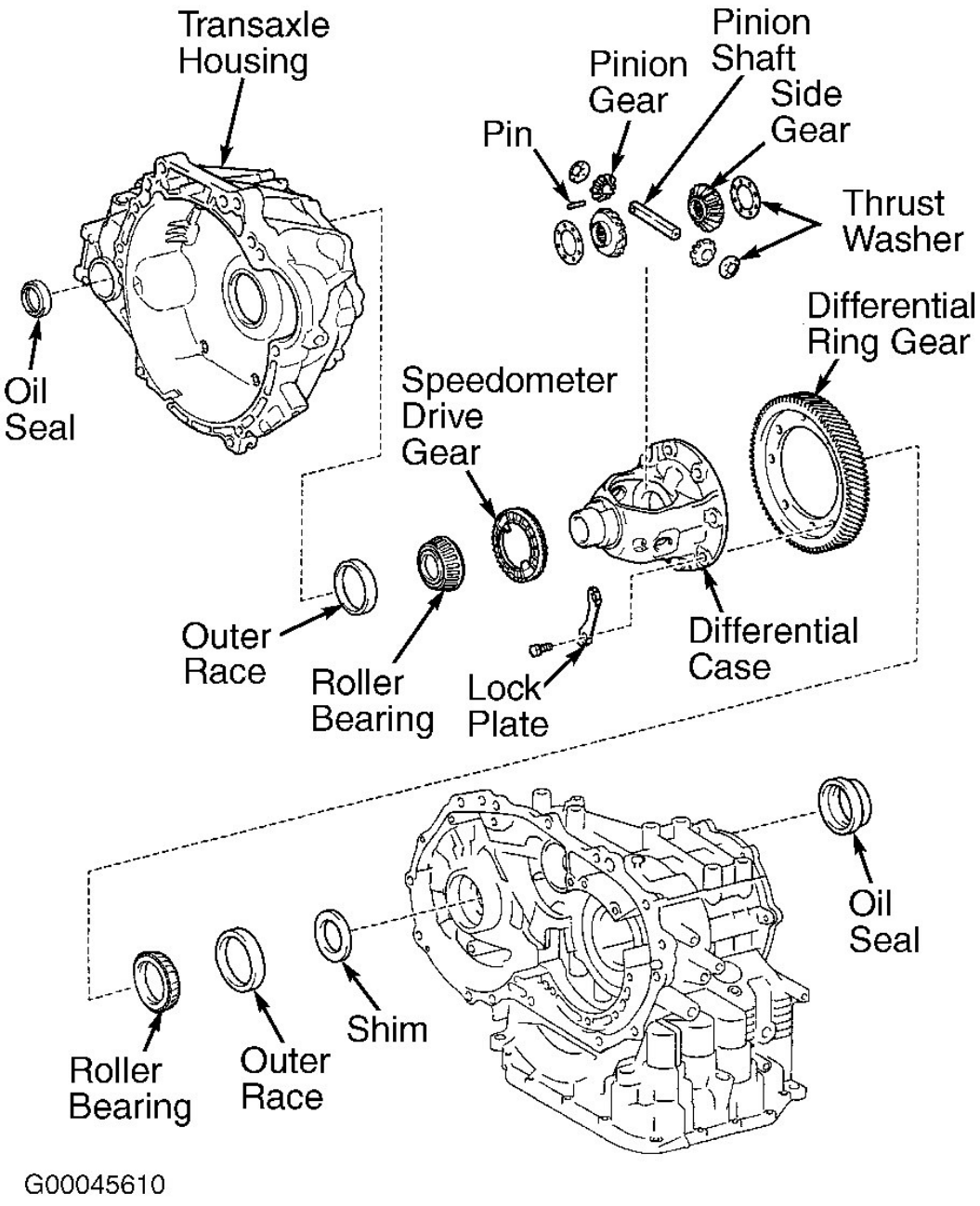

Fig. 52: Exploded View Of Differential Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

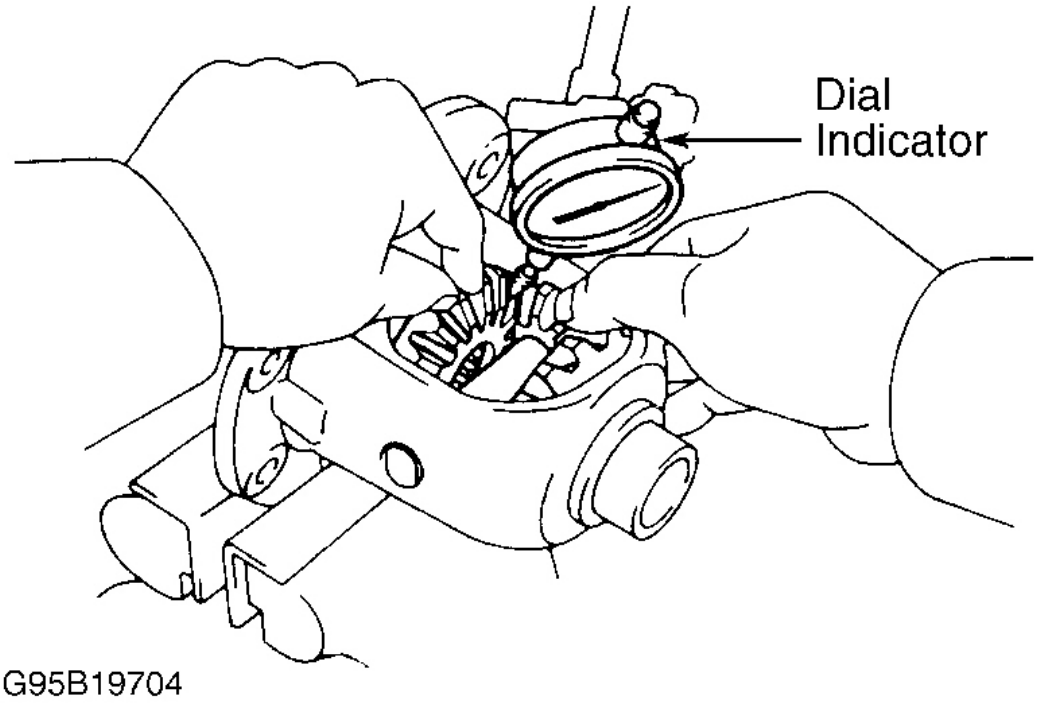

Fig. 53: Measuring Differential Side Gear Backlash
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Cleaning & Inspection

Clean all parts with solvent. Dry with compressed air. Check bearings, races and gears for wear or damage. Replace if necessary.

Reassembly

1. Install original shim (if removed) into transaxle case. Using appropriate race installer and hammer, install outer race into transaxle housing and transaxle case (if removed). Drive outer races in until shim and outer race contact housing or case surface.
2. Coat thrust washers, side gears and pinion gears with ATF. Install 2 thrust washers onto 2 differential side gears. Install 2 thrust washers with 2 side gears, and 2 thrust washers with pinion gears into differential case. Install pinion shaft, aligning lock pin holes on pinion shaft and differential case.
3. Mount differential case in a soft-jawed vise. Using a dial indicator, check side gear backlash. Hold one pinion gear against case. Measure side gear backlash. See **Fig. 53** . Backlash must be .002-.008" (.05-.20 mm). If backlash is not within specification, side gear thrust washers must be replaced.
4. Select thrust washers that will ensure correct side gear backlash. Thrust washers are available in thicknesses of .037-.047" (.95-1.20 mm) in .002" (.05 mm) increments. Install thrust washers and side gears in differential case. If possible, install same size thrust washers on both sides. Install pinion gears

and pinion shaft. Check side gear backlash to ensure proper thrust washers are used.

5. Using a pin punch and hammer, drive pinion shaft pin through transaxle case and pinion shaft. Stake differential case. Using appropriate press, install differential case tapered roller bearings.
6. Remove any material from transaxle housing and case mating surfaces. DO NOT allow oil to contact surfaces. Install differential assembly into transaxle case. Install transaxle housing onto transaxle case. Install 14 bolts and tighten all bolts except 3 lower bolts ("A") inside transaxle housing to 22 ft. lbs. (29 N.m). Tighten 3 lower bolts ("A") inside transaxle housing to 16 ft. lbs. (22 N.m). Ensure bolts are in correct locations. See **Fig. 15** .
7. Using appropriate adapter and ratchet, rotate differential assembly in both directions to seat bearings. Using an INCH-lb. torque wrench, measure differential side bearing preload. See **Fig. 54** . Preload should be 8.7-13.9 INCH lbs. (.98-1.57 N.m) for NEW bearings and 4.3-6.9 INCH lbs. (.5-.8 N.m) for used bearings.

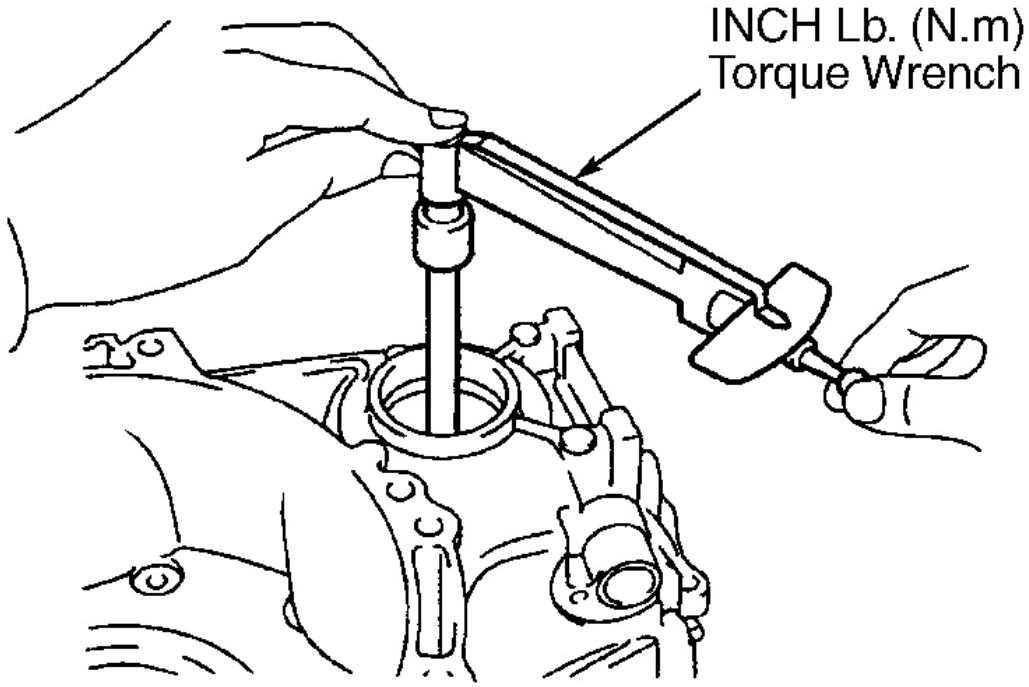

Fig. 54: Measuring Differential Bearing Preload
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

8. If preload is not within specifications, remove 14 transaxle housing bolts. Using a plastic hammer, remove transaxle housing from transaxle case. Remove differential assembly from transaxle case and replace shim at rear tapered roller bearing with appropriate shim.
9. Adjustment shims are marked in numeric order and are available in thicknesses from .075 (1.90 mm),

marked with a "01", to .110" (2.80 mm), marked with the number "19". Shims increase in increments of .002" (.05 mm). Recheck preload after shim replacement.

10. Clean contact surface of differential case and ring gear using cleaning solvent. Heat ring gear to 212°F (100°C) in water. DO NOT heat ring gear greater than 230°F (110 °C).
11. After moisture on ring gear has completely evaporated, quickly align match marks made during disassembly. Install ring gear on differential case. Install ring gear bolts and lock plates and tighten bolts to 65 ft. lbs. (88 N.m).
12. Install NEW oil seals in transaxle housing and transaxle case. On U340E transaxle, transaxle housing oil seal installed depth is .059-.098" (1.50-2.50 mm). On U341E transaxle, transaxle housing oil seal installed depth is -.020-.020" (-.50-.50 mm). On U340E transaxle, transaxle case oil seal installed depth is .213-.252" (5.40-6.40 mm). On U341E transaxle, transaxle case oil seal installed depth is .087 to .126" (2.20-3.20 mm). On both transaxles, coat lip of oil seals with lubricant.

TRANSAXLE REASSEMBLY

NOTE: Coat all oil seal rings, clutch discs, clutch plates, rotating parts and sliding surfaces with ATF prior to reassembly. All gaskets and rubber "O" rings should be replaced. Ensure ends of snap rings are not aligned with cutouts of drum. Check thrust bearings and races for wear or damage. Use petroleum jelly to secure parts in place. Clutch discs should be soaked in ATF for at least 15 minutes before installation.

NOTE: For thrust bearing and race locations, refer to illustration. See Fig. 60 . For component dimensions, see THRUST BEARING & RACE SPECIFICATIONS table.

1. Install 4 NEW "O" rings and 4 screw plugs to transaxle rear cover. See **Fig. 26** . Install 3 seal rings to transaxle rear cover. Using vernier calipers, measure O/D brake piston return spring free length with spring mounted to spring seat. Free length should be .704" (17.88 mm). Replace springs as necessary.
2. Coat 2 NEW "O" rings with ATF and install onto O/D brake piston. Coat O/D brake piston with ATF and install onto transaxle rear cover. Use care not to damage "O" rings.

NOTE: In the following step, stop press when piston return spring seat is lowered .039-.079" (1.00-2.00 mm) from snap ring groove. This prevents spring seat from becoming deformed. DO NOT expand snap ring excessively.

3. Using appropriate adapter and press, compress O/D brake piston return springs and install snap ring to transaxle rear cover. DO NOT apply excessive force. Using appropriate adapter and a hammer, install roller bearing into transaxle case. Install NEW oil seals into transaxle case and transaxle housing (if necessary). See **REASSEMBLY** under DIFFERENTIAL ASSEMBLY.
4. Using appropriate adapter and a hammer, install thrust needle roller bearing and NEW cylindrical roller bearing. See **Fig. 10** . Install differential gear apply tube, bearing lock plate and bolt to transaxle housing. See **Fig. 25** . Tighten bolt to 97 INCH lbs. (11 N.m).
5. Install transaxle housing oil separator and 2 bolts. See **Fig. 24** . Tighten bolts to 87 INCH lbs. (9.8 N.m).

Coat 2 NEW "O" rings with ATF and install onto 1st/reverse brake piston. Install 1st/reverse brake piston into transaxle case. Use care not to damage "O" rings.

6. Using vernier calipers, measure 1st/reverse brake piston return spring free length with spring mounted to spring seat. Free length should be .550" (13.96 mm). Replace springs as necessary. Using appropriate adapter, press and a screwdriver, install piston return spring and snap ring into transaxle case.
7. Install 1st/reverse brake. Install 4 plates and 4 discs, starting with a plate and alternating with a disc. Install flange. Using a screwdriver, install snap ring. Measure 1st/reverse brake clutch pack clearance. Using vernier calipers, measure dimension "A" while by applying and releasing 57 psi (4 kg/cm_2) of compressed air to transaxle case. See **Fig. 55** . Clutch pack clearance equals dimension "A", minus flange thickness, minus snap ring thickness.
8. Clutch pack clearance should be .032-.048" (.81-1.21 mm). Select appropriate flange to ensure clutch pack clearance is within specification. Flanges are marked in numeric order and are available in thicknesses from .134" (3.40 mm), marked with the number "1", to .157" (4.00 mm), marked with the number "4", in increments of .008" (.20 mm). Remove snap ring, install appropriate flange and reinstall snap ring. Recheck clutch pack clearance after flange is installed.
9. Using appropriate adapter and press, install front tapered roller bearing to counter drive gear until bearing contacts gear. DO NOT apply excessive force. Install counter drive gear and bearing into transaxle case. See **Fig. 17** .
10. On U341E transaxle, using appropriate adapter and press, install tapered roller bearing onto counter drive gear and transaxle case. DO NOT apply excessive pressure. On both transaxles, using appropriate adapter and press, install front planetary gear to counter drive gear. See **Fig. 16** .
11. Using holding tool, socket and torque wrench, install NEW lock washer and nut onto counter drive gear. Tighten nut to 207 ft. lbs. (280 N.m). See **Fig. 20** . Using socket, adapter and INCH-lb. torque wrench, measure counter drive gear tapered roller bearing rotating torque by rotating counter drive gear 60 turns per minute. Rotating torque should be 2.0-4.0 INCH lbs. (.2-.5 N.m). If rotating torque is not within specification, gradually tighten nut until rotating torque is within specification. Stake lock washer to nut. See **Fig. 17** .
12. Install thrust needle bearing and front planetary sun gear. See **Fig. 16** . Install retainer to No. 2 one-way clutch. See **Fig. 22** . Assemble 2nd brake cylinder, No. 2 one-way clutch and rear planetary gear. Install thrust needle roller bearing and 2 bearing races to transaxle case. Install 2nd brake cylinder, No. 2 one-way clutch and rear planetary gear into transaxle case. Install snap ring.
13. Install 2nd brake. Install 2nd brake piston sleeve. On U340E transaxle, install 3 discs and 4 plates, starting with a plate and alternating with a disc. On U341E transaxle, install flange, 4 discs and 3 plates, starting with a flange, then a disc, then a plate and alternating with a disc. Install second flange. Using a screwdriver, temporarily install snap ring.
14. Using vernier calipers, measure 2nd brake pack clearance dimension "A" while applying pressure to top plate (U340E) or flange (U341E). See **Fig. 56** . Pack clearance equals dimension "A", minus flange thickness, minus snap ring thickness.
15. Pack clearance should be .033-.049" (.85-1.25 mm). Select appropriate flange to ensure pack clearance is within specification. Flanges are marked in numeric order and are available in thicknesses from .118" (3.00 mm), marked with the number "1", to .142" (3.60 mm), marked with the number "4", in increments of .008" (.20 mm). Remove snap ring, install appropriate flange and reinstall snap ring. Recheck pack clearance after flange is installed.

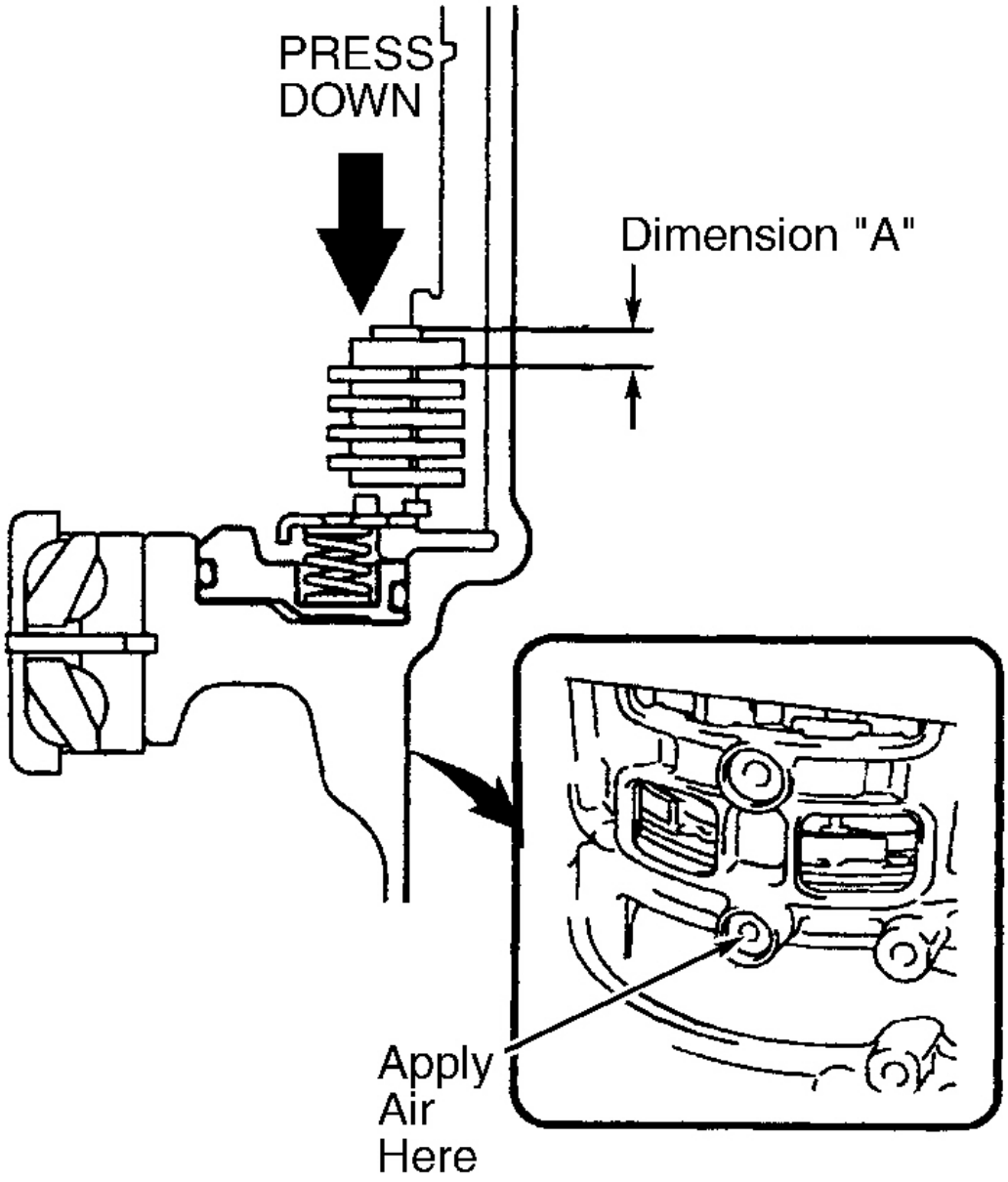

Fig. 55: Checking 1st/Reverse Brake Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

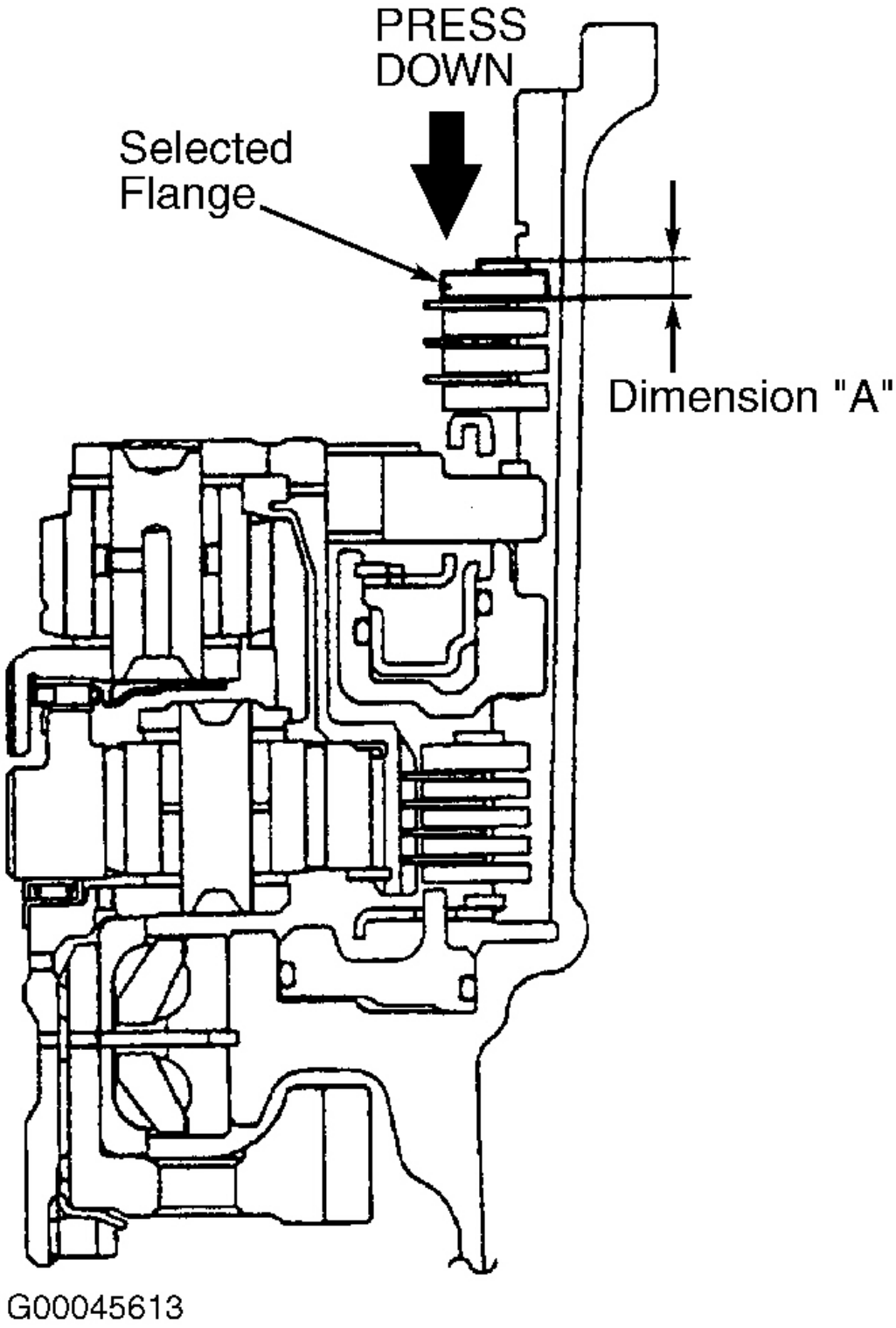

Fig. 56: Checking 2nd Brake Pack Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

16. Install thrust washer No. 2 to rear planetary sun gear. Assemble rear planetary sun gear and No. 1 one-way clutch. Install thrust washer No. 1 and thrust needle roller bearing to No. 1 one-way clutch. Install components into transaxle case. See **Fig. 16** .
17. Install thrust needle roller bearing, direct clutch hub, bearing race and thrust needle roller bearing. Install bearing race to direct and reverse clutch multiple disc clutch assembly. Install direct and reverse clutch multiple disc clutch assembly and bearing race to transaxle case.
18. Using a screwdriver, install 2nd coast and O/D brake snap ring into transaxle case. Install 2 discs and 3 plates, starting with a plate and alternating with a disc. Using vernier calipers, measure 2nd coast and O/D brake pack clearance dimensions "A" and "B" while applying pressure to top plate. See **Fig. 57** . Pack clearance equals dimension "A", minus dimension "B", minus selected flange thickness.
19. Pack clearance should be .082-.098" (2.09-2.49 mm). Select appropriate flange to ensure pack clearance is within specification. Flanges are marked in numeric order and are available in thicknesses from .157" (4.00 mm), marked with the number "4", to .181" (4.60 mm), marked with the number "7", in increments of .008" (.20 mm). Remove snap ring, install appropriate flange and reinstall snap ring. Recheck pack clearance after flange is installed.

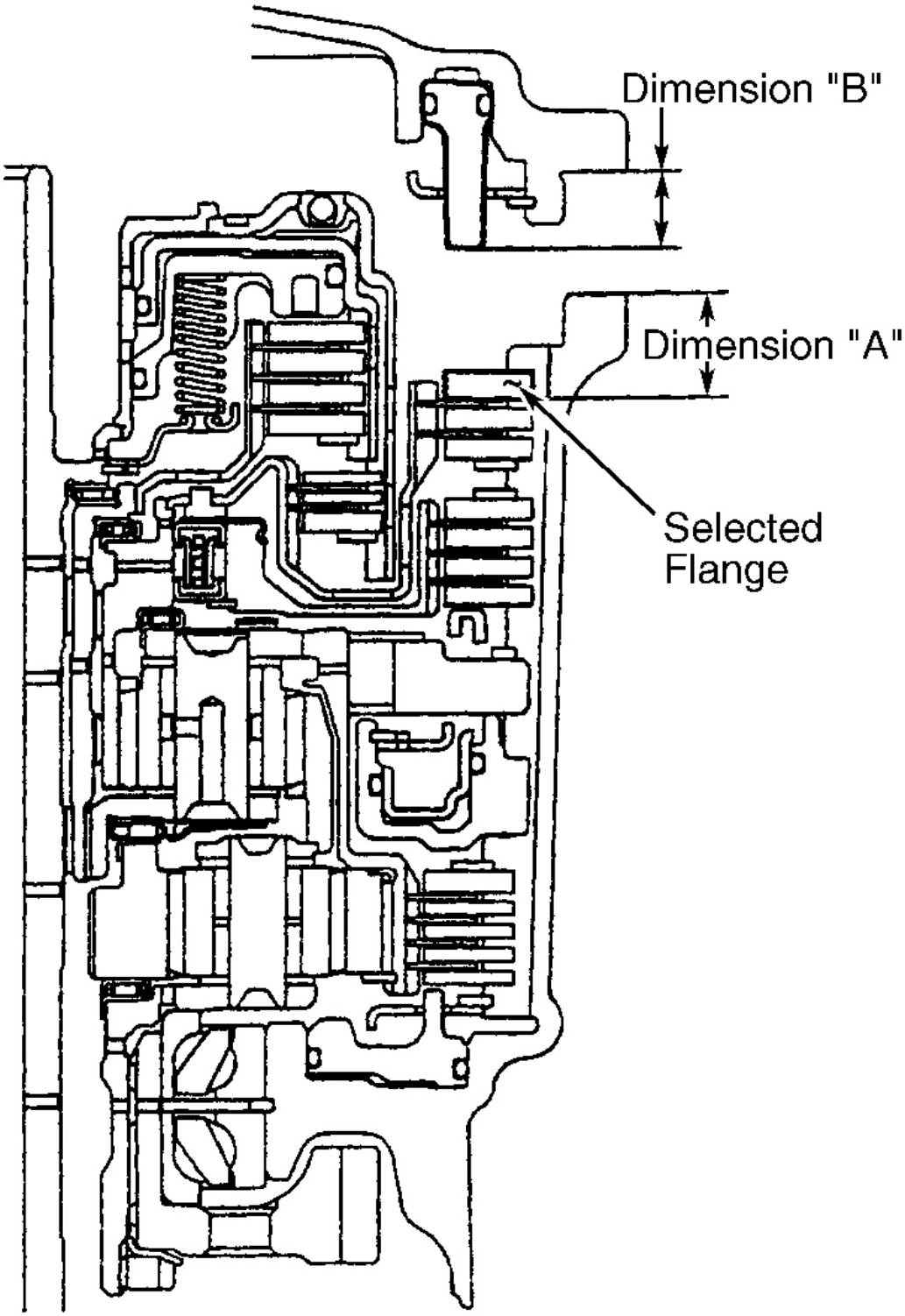

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Fig. 57: Checking 2nd Coast & O/D Brake Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

20. Install thrust needle roller bearing to direct and reverse multiple disc clutch assembly. Install 4 NEW apply gaskets to transaxle case. See **Fig. 21** . Ensure transaxle case and rear cover surfaces are clean. DO NOT allow oil to contact surfaces. Apply Three Bond (1281) or equivalent gasket sealer to transaxle rear cover sealing surface. Install transaxle rear cover and 11 bolts. Tighten bolts to 18 ft. lbs. (24 N.m).
21. Install thrust needle roller bearing, counter driven gear and differential drive pinion into transaxle case. Install parking lock pawl, torsion spring and shaft to transaxle case. Install forward clutch hub and thrust needle roller bearing. See **Fig. 17** .
22. Install thrust needle roller bearing to forward multiple disc clutch assembly. Install forward multiple disc clutch assembly into transaxle case. Coat oil pump "O" ring with ATF. Install oil pump and 7 bolts. Tighten bolts to 16 ft. lbs. (22 N.m).
23. Inspect input shaft end play. Using a dial indicator, measure input shaft end play. See **Fig. 14** . End play should be .015-.051" (.37-1.29 mm). If end play is not as specified, select appropriate thrust needle roller bearing. Install differential assembly into transaxle case.
24. Install brake drum gasket. See **Fig. 9** . Install 2 NEW apply gaskets. See **Fig. 8** . Ensure transaxle case and transaxle housing surfaces are clean. DO NOT allow oil to contact surfaces. Apply Three Bond (1281) or equivalent gasket sealant about .047" (1.20 mm) wide, to transaxle case around inside edges of bolt holes. Install transaxle housing to transaxle case.
25. Install 14 transaxle housing bolts. Tighten all bolts except 3 lower bolts ("A") inside transaxle housing to 22 ft. lbs. (29 N.m). Tighten 3 lower bolts ("A") inside transaxle housing to 16 ft. lbs. (22 N.m). Ensure bolts are in correct locations. See **Fig. 15** .
26. Coat NEW manual valve lever shaft oil seal with ATF. Install oil seal into transaxle case. Install parking lock pawl rod to manual valve lever (if removed). Install NEW spacer to manual valve lever shaft. Install manual valve lever shaft and manual valve lever. Using a pin punch and hammer, drive in NEW pin.
27. Turn spacer and lever shaft to align small hole for locating staking position in spacer with position mark on lever shaft. Using a pin punch and hammer, stake spacer through small hole. Ensure spacer does not turn. See **Fig. 58** . Using needle nose pliers, install retainer spring. Install cam guide, bracket and 3 bolts. Tighten bolts to 15 ft. lbs. (20 N.m).

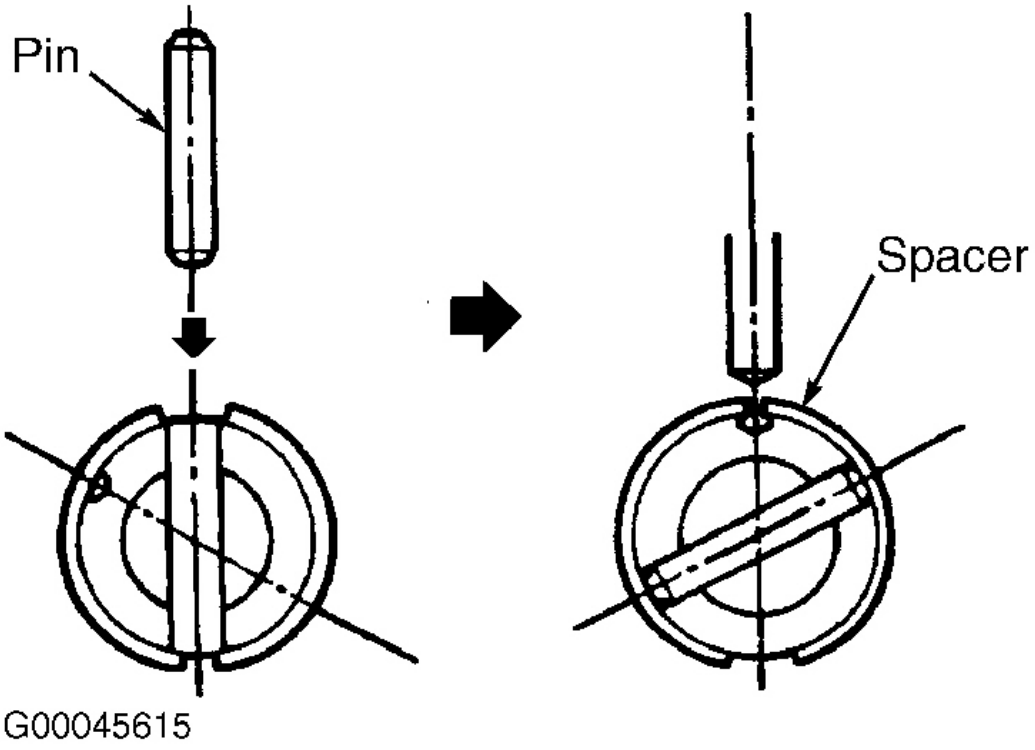

Fig. 58: Staking Spacer To Manual Valve Lever Shaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

28. Coat NEW "O" rings with ATF and install them onto accumulator pistons. Coat springs and 3 accumulator pistons with ATF, and install components into transaxle case holes. See **Fig. 10** . See **ACCUMULATOR SPRING FREE LENGTH SPECIFICATIONS** table for spring specifications and identification.

ACCUMULATOR SPRING FREE LENGTH SPECIFICATIONS

Application (Color)	Free Length - In. (mm)	Outer Diameter - In. (mm)
Direct Clutch (None)	2.634 (66.90)	.677 (17.20)
Reverse Clutch		
U340E (Blue)	3.158 (80.20)	.736 (18.70)
U341E (Orange)	3.437 (87.30)	.736 (18.70)
2nd Brake		

U340E (Green)	2.634 (66.90)	.610 (15.50)
U341E (White)	2.634 (66.90)	.610 (15.50)

29. Install check ball body and spring. See **Fig. 8** . Coat NEW "O" ring with ATF and install on transaxle solenoid connector. Install connector into transaxle case, above park/neutral position switch, and tighten bolt to 48 INCH lbs. (5.4 N.m).
30. Install valve body assembly. See **VALVE BODY ASSEMBLY** under ON-VEHICLE SERVICE. Push valve body assembly against check ball body to assist in installation. Coat NEW oil strainer "O" with ATF and install on oil strainer. Install oil strainer and tighten bolts to 97 INCH lbs. (11 N.m).
31. Connect 5 shift solenoid connectors. Coat NEW "O" with ATF and install on fluid temperature sensor. Install fluid temperature sensor, lock plate and bolt. Tighten bolt to 97 INCH lbs. (11 N.m). See **Fig. 7** . Install 2 magnets into oil pan in original locations. Apply Three Bond (2430) or equivalent to 19 oil pan bolt threads. Install NEW oil pan gasket, oil pan and bolts. Tighten bolts to 69 INCH lbs. (7.8 N.m) within 10 minutes of installation.
32. Coat 4 NEW "O" rings with ATF and install on screw plugs. Install screw plugs and tighten to 65 INCH lbs. (7.4 N.m). Install NEW "O" rings on oil line union and elbow. Install oil line union and elbow into transaxle case. Tighten to 20 ft. lbs. (27 N.m). See **Fig. 6** .
33. Coat NEW "O" ring with ATF and install on line pressure test plug. Install transaxle line pressure test plug into transaxle case and tighten to 65 INCH lbs. (7.4 N.m). Install park/neutral position switch onto manual valve lever shaft and temporarily install 2 adjusting bolts. See **Fig. 6** .
34. Install NEW lock washer and nut. Tighten nut to 61 INCH lbs. (6.9 N.m). Temporarily install control lever. Turn lever counterclockwise until it stops, then turn it clockwise 2 notches. Remove control lever. Align groove in park/neutral position switch to neutral basic line. Tighten 2 adjusting bolts to 48 INCH lbs. (5.4 N.m). Stake lock washer onto nut. Install control lever, washer and nut. See **Fig. 10** . Tighten nut to 10 ft. lbs. (14 N.m).
35. Coat NEW "O" ring with ATF and install on breather plug. Install breather plug, clip and breather hose. Coat NEW "O" ring with ATF and install on transaxle revolution sensor. Install transaxle revolution sensor and bolt. See **Fig. 6** . Tighten bolt to 48 INCH lbs. (5.4 N.m).
36. Install torque converter into transaxle housing while rotating. Ensure converter is properly installed by measuring distance from edge of transaxle housing. See **Fig. 59** . On U340E transaxle, distance should be .366" (9.30 mm). On U341E transaxle, distance should be .524" (13.30 mm).

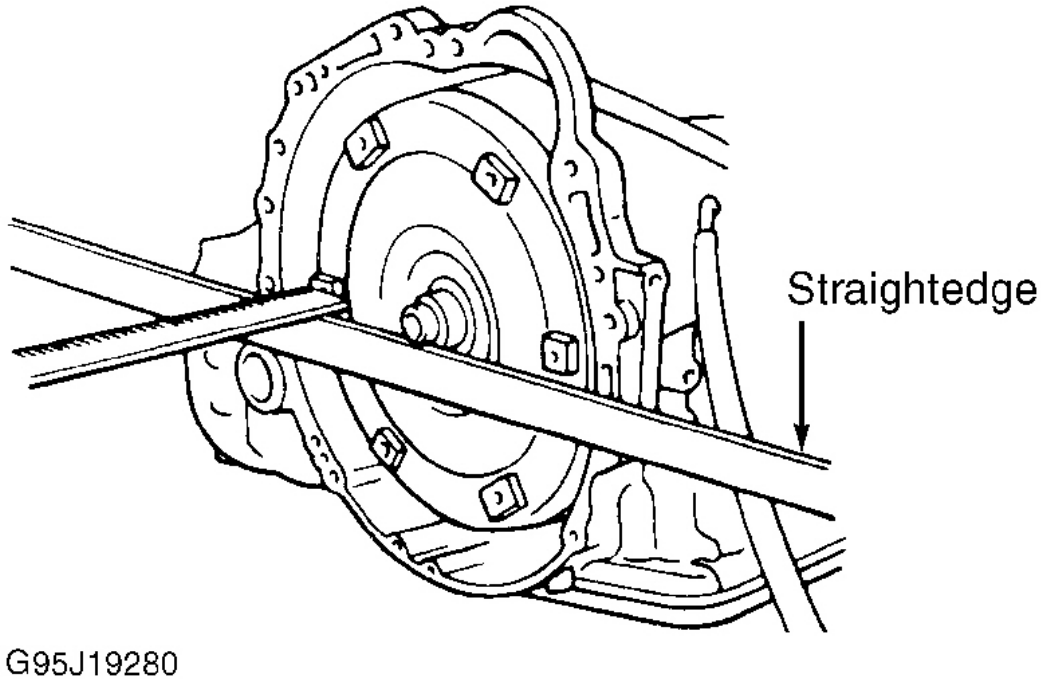

Fig. 59: Measuring Torque Converter Depth
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

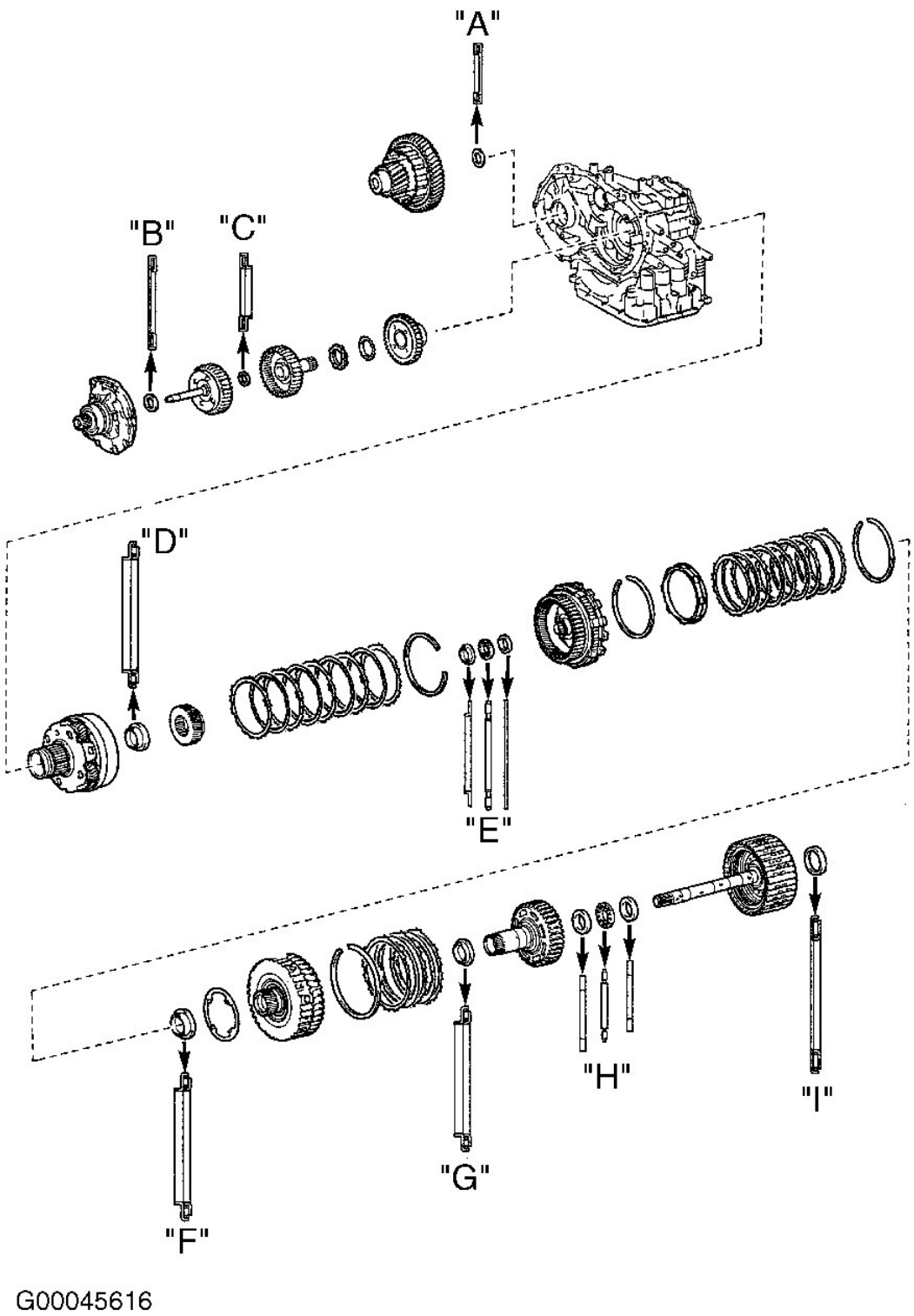

Fig. 60: Identifying Thrust Bearing & Race Locations

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

THRUST BEARING & RACE SPECIFICATIONS (1)

Application	Inner Diameter - In. (mm)	Outer Diameter - In. (mm)
A		
Bearing	1.776 (45.10)	2.563 (65.10)
B		
Bearing	1.024 (26.00)	1.709 (43.40)
C		
Bearing	.827 (21.00)	1.372 (34.85)
D		
Bearing	1.260 (32.00)	1.890 (48.00)
E		
Front Race	1.447 (36.75)	1.967 (49.95)
Bearing	1.335 (33.90)	2.047 (52.00)
Rear Race	N/A	2.035 (51.70)
F		
Bearing	1.711 (43.45)	2.303 (58.50)
G		
Bearing	1.157 (29.40)	1.748 (44.40)
H		
Front Race	.925 (23.50)	1.469 (37.30)
Bearing	.886 (22.50)	1.469 (37.30)
Rear Race	.799 (20.30)	1.331 (33.80)
I		
Bearing	1.711 (43.45)	2.410 (61.20) Or 2.431 (61.74)

(1) For component locations, refer to illustration. See **Fig. 60** .

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Converter-To-Drive Plate Bolt	
U340E	20 (27)
U341E	30 (41)
Counter Drive Gear Nut	207 (280)

Differential Ring Gear Bolt	65 (88)
Drive Plate Bolt	
U340E	65 (88)
U341E	58 (78)
Elbow	20 (27)
Oil Pan Drain Plug	36 (49)
Oil Pump Bolt	16 (22)
Parking Lock Pawl Bracket Bolt	15 (20)
Transaxle Housing-To-Transaxle Case Bolt	
Lower Bolts (3)	16 (22)
All Other Bolts	22 (29)
Transaxle Rear Cover Bolt	18 (24)
Union	20 (27)
	INCH Lbs. (N.m)
Accumulator Piston Cover Bolt	97 (11)
Apply Tube & Bearing Lock Plate Bolt	97 (11)
Control Lever Nut	115 (13)
Detent Spring Bolt	106 (12)
Line Pressure Test Plug	65 (7.4)
Lower Valve Body Cover Bolt	
Bolt "A"	58 (6.6)
All Other Bolts	97 (11)
Oil Pan Bolt	69 (7.8)
Oil Separator Bolt	87 (9.8)
Oil Strainer Bolt	97 (11)
Park/Neutral Position Switch	
Nut	61 (6.9)
Bolt	48 (5.4)
Pressure Relief Ball Cover Bolt	58 (6.6)
Revolution Sensor Bolt	48 (5.4)
Screw Plug	65 (7.4)
Shift Solenoids	
Bolt "A"	58 (6.6)
All Other Solenoid Bolts	97 (11)
Solenoid Connector Bolt	48 (5.4)
Stator Shaft-To-Oil Pump Bolt	87 (9.8)
Temperature Sensor Lock Plate Bolt	97 (11)
Upper Valve Body Bolt	97 (11)
Valve Body Bolt	97 (11)

CLUTCH DISC & PLATE SPECIFICATIONS

CLUTCH DISC & PLATE QUANTITY

Component	Discs	Plates
Direct Clutch	3	3
Forward Clutch	4	4
Reverse Clutch		
U340E	2	2
U341E	3	3
1st/Reverse Brake	4	4
2nd Brake		
U340E	3	4
U341E	4	3
2nd Coast & O/D Brake	2	3

TRANSAXLE SPECIFICATIONS

TRANSAXLE SPECIFICATIONS

Application	In. (mm)
Bushing Inside Diameter (Maximum)	
Oil Pump Body	1.501 (38.14)
Oil Pump Stator Shaft	.847 (21.53)
Input Shaft End Play	.015-.051 (.37-1.29)
Oil Pump	
Driven Gear-To-Body Clearance	.004-.006 (.10-.15)
Driven Gear Tip-To-Cresent Clearance	.003-.006 (.07-.15)
Gear Side Clearance	.0008-.0020 (.020-.050)
Pack Clearance	
Direct Clutch	.024-.040 (.62-1.02)
Forward Clutch	.055-.071 (1.40-1.81)
Reverse Clutch	.034-.050 (.86-1.26)
1st/Reverse Brake	.032-.048 (.81-1.21)
2nd Brake	.033-.049 (.85-1.25)
2nd Coast & O/D Brake	.082-.098 (2.09-2.49)
Side Gear Backlash	.002-.008 (.05-.20)
Torque Converter Runout (Maximum)	
Drive Plate	.008 (.20)
Sleeve	.012 (.30)
Torque Converter Installed Depth	
U340E	.366 (9.30)
U341E	.524 (13.30)