

ARTICLE BEGINNING

APPLICATION

TRANSMISSION APPLICATIONS

| Application | Transaxle |
|-------------------------|-----------|
| Geo Prizm (1993-94 LSi) | A-245E |
| Toyota | |
| Celica 1.6L (1993) | A-243L |
| Celica 1.8L (1994) | A-246E |
| Celica 2.2L (1993) | A-241E |
| Corolla 1.8L | A-245E |
| MR2 | A-241E |
| Paseo | A-244E |

IDENTIFICATION

Transaxles may be identified by using the Vehicle Identification Number (VIN). VIN locations are on cowl panel at center of firewall, top left corner of instrument panel or driver's door post. On Geo Prizm, transaxle identification number is located on transaxle, near transaxle rear cover.

DESCRIPTION

Transaxles have 4 forward speeds and reverse. Transaxle assemblies consists of a lock-up torque converter, oil pump, valve body assembly, forward clutch, direct clutch, differential, 3 planetary gear sets and 3 one-way clutches.

The A-240 "E" series transmission shifting and torque converter lock-up are controlled by an Electronic Controlled Transmission (ECT) Electronic Control Unit (ECU). Control unit is a combined engine control and transmission control unit and is referred to as the ECT ECU.

On 1993 Celica with A-241E transaxle, one of 2 different driving modes (NORMAL or POWER) can be selected by driver. Transaxle shift points (speeds) are changed by ECT ECU, depending on mode selected. The MR2 A-241E transaxle is installed in rear of vehicle.

To minimize the possibility of incorrect operation of the vehicle transaxle, a shift lock mechanism has also been added. For more information on the shift lock and key lock system, refer to the [SHIFT INTERLOCK SYSTEMS](#) article.

LUBRICATION

See the appropriate TRANSMISSION SERVICING article.

ADJUSTMENTS

See the appropriate TRANSMISSION SERVICING article.

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

See appropriate AXLE SHAFTS article.

GOVERNOR ASSEMBLY R & I (A-243L)

Removal & Installation

Disconnect speedometer cable. Remove governor cover bolts. Using a screwdriver, remove governor cover. Remove "O" ring from cover. Remove governor body with thrust washer. Remove governor body adapter. Remove governor oil strainer. To install, reverse removal procedure. Install NEW gasket and tighten bolts to 115 INCH lbs. (13 N.m).

SPEED SENSOR & ROTOR R & I (A-240 "E" SERIES)

Removal & Installation

Remove retaining plate and pull out speed sensor. Remove "O" ring from speed sensor. Remove 2 bolts and sensor cover bracket. Using a screwdriver, remove sensor cover. **DO NOT** damage cover. Remove sensor rotor. To install, reverse removal procedure. Tighten bolts to 48 INCH lbs. (5.4 N.m).

THROTTLE CABLE R & I

Removal

Disconnect throttle cable from throttle linkage. Disconnect transaxle control cable from manual shift lever. Remove manual shift lever. Remove park/neutral position switch. Remove valve body assembly. See **VALVE BODY ASSEMBLY R & I** under ON-VEHICLE SERVICE. Remove throttle cable retaining bolt. Pull throttle cable from transaxle.

Installation

1. Install throttle cable in transaxle case. Ensure cable is fully seated. Install retaining bolt. Install valve body assembly. On new throttle cables, stopper must be staked on inner cable. Bend cable in approximately 7.87" (200 mm) radius.
2. Pull inner cable lightly, until a slight resistance is felt, and hold in place. Stake stopper on inner cable, leaving a .031-.059" (.78-1.49 mm) gap between cable housing and stopper. See [Fig. 1](#).

3. Adjust throttle cable and park/neutral position switch (if necessary). See appropriate TRANSMISSION SERVICING article. Install manual shift lever. Install transaxle control cable. Test drive vehicle.

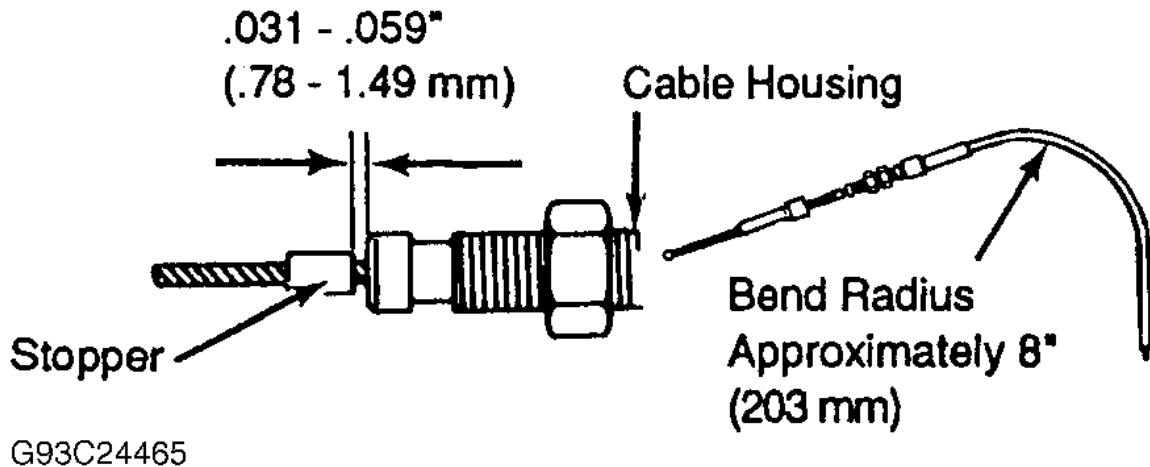


Fig. 1: Locating Throttle Cable Stopper

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

VALVE BODY ASSEMBLY R & I

CAUTION: Note valve body assembly bolts length and location. Proper length bolts must be installed in correct location to prevent case damage.

Removal

1. Clean exterior of transaxle oil pan. Remove drain plug and drain transaxle. Remove oil pan and gasket. Remove oil strainer (filter) and apply tube bracket. Note location of oil tubes. Using large screwdriver, carefully remove oil tubes.
2. Remove manual detent spring. Disconnect solenoid connector(s). Remove valve body assembly bolts. Note bolt length and location. See [Fig. 2](#) and [Fig. 3](#). Remove throttle cable. Disconnect manual valve connecting rod. Remove valve body assembly.

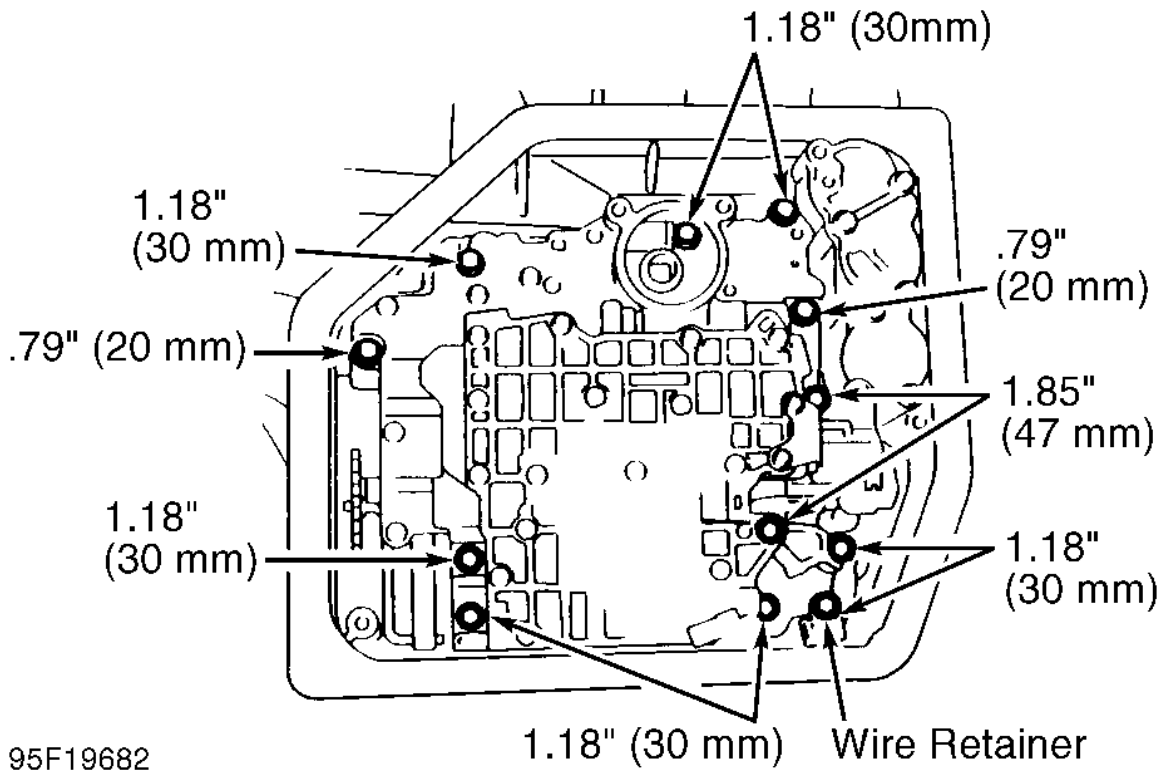


Fig. 2: Valve Body Assembly Bolts (A-241E, A-243L & A-244E)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

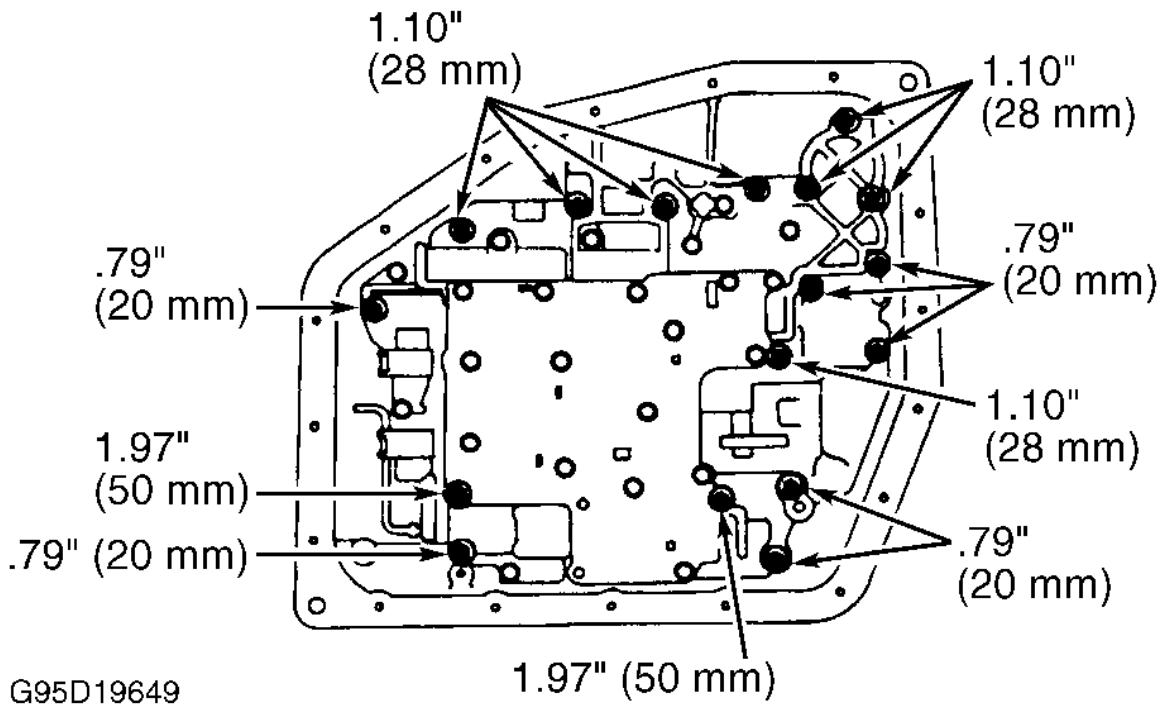


Fig. 3: Valve Body Assembly Bolts (A-245E & A-246E)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Installation

1. Hold valve body cam downward and install throttle cable in slot. Install manual valve connecting rod. Install valve body assembly. Ensure kickdown switch wire is not pinched under valve body assembly.
2. Install valve body assembly bolts finger tight. Ensure proper length bolts are installed in correct location. See [Fig. 2](#) and [Fig. 3](#). Tighten bolts to 89 INCH lbs. (10 N.m). Connect solenoid connector(s). Install detent spring and tighten bolt to 89 INCH lbs. (10 N.m). Ensure manual valve lever contacts center of roller on detent spring. Using a plastic hammer, tap oil tubes into place.
3. Install oil tube clamp and bolt and tighten bolt to 89 INCH lbs. (10 N.m). Install oil strainer. Install magnet in oil pan. Ensure magnet does not interfere with oil tubes. Install oil pan and gasket. Tighten oil pan bolts to 43 INCH lbs. (4.9 N.m). Install drain plug and tighten to 13 ft. lbs. (17 N.m). Fill transaxle with fluid and check for leaks.

TROUBLE SHOOTING

NOTE: For electronic diagnosis and component testing of the A-240E series transaxles, refer to the appropriate [TOYOTA A-240 "E" & "L" SERIES DIAGNOSIS](#) article.

INTRODUCTION

Preliminary Checks

Automatic transaxle malfunctions can be caused by either engine or transaxle. Isolate malfunction to engine or transaxle before proceeding with trouble shooting. Prior to trouble shooting, check and adjust throttle cable, shift linkage, park/neutral position switch and idle speed RPM as necessary. Ensure fluid level is correct. Check tires for correct inflation.

SYMPTOM DIAGNOSIS

Fluid Discolored Or Smells Burnt

Fluid contaminated. Torque converter faulty. Transaxle faulty.

Vehicle Does Not Move In Any Forward Range Or Reverse

Check manual valve, parking lock pawl, primary regulator valve, U/D one-way clutch, U/D direct clutch, U/D brake, front planetary gear, rear planetary gear and U/D planetary gear.

Vehicle Does Not Move In Any Forward Position

Check forward clutch, No. 2 one-way clutch, 1st and reverse brake, 2nd coast brake, 2nd brake and direct clutch.

Vehicle Does Not Move In Reverse ("R") Position

Check 1-2 shift valve, 2-3 shift valve, 2nd coast brake, front planetary gear, rear planetary gear, direct clutch, U/D direct clutch and 1st and reverse brake.

No 1-2 And/Or 2-3 Upshift

Check Throttle Position Sensor (TPS) circuit, No. 1 and No. 2 shift solenoid circuit, Vehicle Speed Sensor (VSS), Electronic Control Transmission Electronic Control Unit (ECT ECU), 1-2 shift valve, 2-3 shift valve, second brake, direct clutch and No. 1 one-way clutch.

No 3-O/D Upshift

Check O/D switch and O/D OFF indicator switch circuit, O/D cancel signal circuit, No. 1 and No. 2 shift solenoid circuit, VSS, Coolant Temperature Sensor (CTS) circuit, ECM, 3-4 shift valve and U/D brake.

No O/D-3 Downshift

Check No. 1 and No. 2 shift solenoid valve, VSS circuit, O/D cancel signal circuit, ECT ECU and 3-4 shift valve.

No 3-2 And/Or 2-1 Downshift

Check No. 1 and No. 2 shift solenoid valve, VSS circuit, TPS circuit, ECT ECU, 2-3 shift valve, 1-2 shift valve and 2nd coast brake.

No Torque Converter Lock-Up

Check shift solenoid valve SL circuit, TPS circuit, VSS circuit, O/D cancel circuit, brakelight circuit, CTS circuit, ECE ECU, lock-up relay valve and torque converter clutch.

Torque Converter Lock-Up Will Not Release

Check shift solenoid valve SL circuit, TPS circuit, IDL switch circuit, brakelight circuit, ECT ECU circuit, lock-up relay valve and torque converter clutch.

Shift Speeds, Too High Or Too Low

Check TPS circuit, VSS circuit, shift solenoid valve SL circuit, O/D cancel signal circuit, pattern select switch circuit and ECT ECU.

Harsh Engagement, Neutral To Reverse

Check direct clutch accumulator, direct clutch, throttle valve and, 1st and reverse brake.

Harsh Engagement, Neutral To Drive

Check front clutch accumulator, throttle valve and forward clutch.

No Engine Braking In Low

Check low modulator valve and, 1st and reverse brake.

No Engine Braking In 2nd

Check 2nd modulator valve and 2nd coast brake.

CLUTCH & BAND APPLICATION

| Selector Lever Position | Elements In Use |
|-------------------------|-----------------|
| "D" (Drive) | |

| Selector Lever Position | Elements In Use |
|---|--|
| 1st Gear | Forward Clutch, No. 2 One-Way Clutch, Underdrive One-Way Clutch & Underdrive Brake |
| Second Gear | Forward Clutch, No. 1 One-Way Clutch, 2nd Brake, Underdrive Brake & Underdrive One-Way Clutch |
| 3rd Gear | Direct Clutch, Forward Clutch, 2nd Brake, Underdrive Brake & Under-Drive One-Way Clutch |
| Overdrive | Direct Clutch, Forward Clutch, 2nd Brake & Underdrive Clutch |
| "2" (Second) | |
| 1st Gear | Forward Clutch, No. 2 One-Way Clutch Underdrive One-Way Clutch & Underdrive Brake |
| 2nd Gear | Forward Clutch, 2nd Brake, No. 1 One-Way Clutch, Underdrive Brake Underdrive One-Way Clutch & 2nd Coast Brake |
| 3rd Gear ⁽¹⁾ | Direct Clutch, Forward Clutch 2nd Brake, Underdrive Brake & Underdrive One-Way Clutch |
| "L" (Low) | |
| First Gear | Forward Clutch, Underdrive Brake, No. 2 One-Way Clutch, Underdrive One-Way Clutch & 1st & Reverse Brake |
| Second Gear ⁽²⁾ | Forward Clutch, 2nd Coast Brake, 2nd Brake, No. 1 One-Way Clutch, Underdrive One-Way Clutch & Underdrive Brake |
| "R" (Reverse) | Direct Clutch, Underdrive Brake & 1st & Reverse Brake |
| "N" (Neutral) | Underdrive Brake |
| "P" (Park) | Underdrive Brake |
| ⁽¹⁾ Downshift only in 3rd gear for "2" position. | |
| ⁽²⁾ Downshift only in 2nd gear for "L" position. Upshift does not occur. | |

TESTING

NOTE: For electronic diagnosis and component testing of A-240E series transaxles, see appropriate DIAGNOSIS article.

PRELIMINARY CHECKS

1. Before testing transaxle, ensure fluid level is correct and selector lever, throttle cable and idle speed are adjusted correctly. Battery must be fully charged for accurate testing.
2. To aid in transaxle fault diagnosis, determine if fault is hydraulic, electronic or a combination of both. Electronic control transaxles are capable of storing self-diagnostic codes. To determine if a fault is electrical, retrieve any stored diagnostic trouble codes. See appropriate DIAGNOSIS article.

TIME LAG TEST

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

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 the condition of the underdrive clutch, the forward clutch, the direct clutch and the 1st and reverse brake. Apply the parking brake and start engine. Ensure idle speed is set to specification. See IDLE SPEED SPECIFICATIONS table.

IDLE SPEED SPECIFICATIONS

| Vehicle Application | Transaxle | RPM |
|--|-----------|-----|
| Geo Prizm | A-245E | (1) |
| Toyota | | |
| Celica 1.6L (1993) | A-243L | 800 |
| Celica 1.8L (1994) | A-246E | 700 |
| Celica 2.2L (1993) | A-241E | 700 |
| Corolla 1.8L | A-245E | 700 |
| MR2 | A-241E | 750 |
| Paseo | A-244E | 750 |
| (1) Idle speed is computer controlled and is not adjustable. | | |

2. Move selector lever from "N" to "D" position. Measure time required for shock to be felt. Time lag must be less than 1.2 seconds. Repeat procedure shifting from "N" to "R" position. Time lag must be less than 1.5 seconds. See the following:

Time Lag Test Results

- **Excessive Time Lag From "N" To "D" Position:**

Low line pressure, defective forward clutch or No. 2 and underdrive one-way clutch.

- **Excessive Time Lag From "N" To "R" Position:**

Low line pressure, defective direct clutch, 1st and reverse brake or underdrive brake worn.

ROAD TEST

NOTE: Ensure transmission is at normal operating temperature. There is no OD upshift or torque converter lock-up when fluid temperature is less than 140°F (60°C).

CAUTION: When checking for abnormal noise or vibration, use extreme care, as problem may be due to an out-of-balance drive shaft, differential, torque converter, tire, or faulty power train rubber mounts.

"D" Range Test

1. Shift into "D" range. Hold accelerator pedal constantly at full throttle position. Check 1-2, 2-3 and 3-OD upshift points.
2. Use procedure outlined in step 1) to check for shock and slip between 1-2 gear, 2-3 gear and 3-OD gear upshifts. Run vehicle in "D" range lock-up or overdrive gear. Check for abnormal noise and vibration.
3. While running in "D" range, 2nd, 3rd and OD gears, confirm correct kickdown vehicle speed limits for 2nd-1st, 3rd-2nd and OD-3rd gears. Check for abnormal shock and slip at kickdown. Abnormal shock and slip at kickdown may be caused by throttle cable misadjustment, faulty throttle valve, or faulty shift valves.
4. While running at 47 MPH in "D" range, OD gear, or lock-up, lightly depress accelerator pedal. Ensure engine RPM does not change abruptly.

"2" Range Test

1. Shift to "2" range and fully depress accelerator pedal to full throttle valve opening position. Ensure 1-2 upshift takes place and shift point conforms to specifications. See appropriate table under **SHIFT SPEED SPECIFICATIONS** .
2. While driving in "2" range, 2nd gear, release accelerator pedal and check engine braking effect. If there is no engine braking effect, 2nd coast brake is faulty. Check for abnormal noise and shock at acceleration and deceleration.

"L" Range Test

While running in "L" range, ensure there is no upshift to 2nd gear. While running in "L" range, release accelerator pedal. If there is no engine braking effect, 1st and reverse brake is faulty. Check for abnormal noise at acceleration and deceleration.

"R" Range Test

Shift into "R" range. Accelerate vehicle from a stop at full throttle. Ensure slipping does not occur.

"P" Range Test

Stop vehicle on 5 degree or more gradient. Shift transmission into "P". Release parking brake. Ensure parking pawl holds vehicle.

NOTE: For A-245E (PRIZM LSi) shift speed specifications, see [Fig. 4](#) .

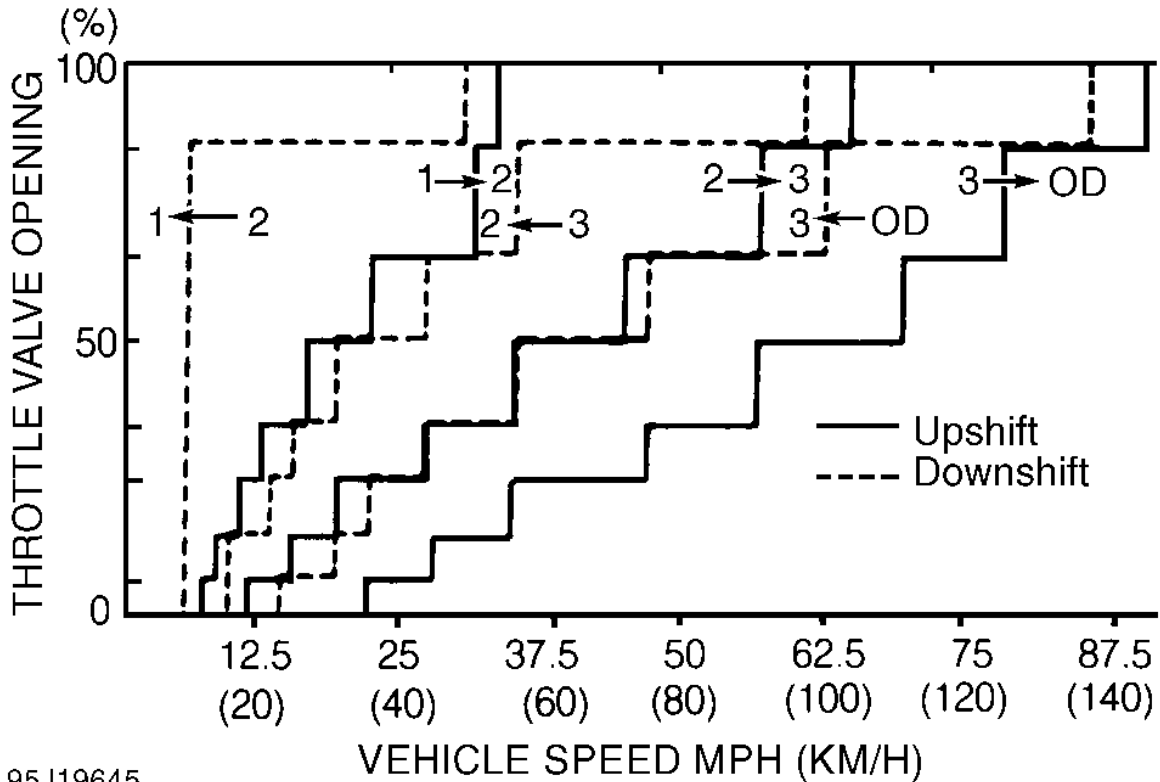


Fig. 4: Prizm LSi (A-245E) Shift Speed Diagram
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

SHIFT SPEED SPECIFICATIONS TABLES 

A-243L (CELICA 1.6L) SHIFT SPEED SPECIFICATIONS ⁽¹⁾ (1993)

| Application | MPH |
|---|----------------|
| "D" Position | |
| 1st-2nd | 27-37 |
| 2nd-3rd | 54-63 |
| 3rd-OD ⁽²⁾ | 16-24 |
| OD-3rd | ⁽³⁾ |
| 3rd-2nd | 52-62 |
| 2nd-1st | 20-26 |
| "L" Position (2nd-1st) | 25-32 |
| ⁽¹⁾ Wide open throttle. ⁽²⁾ Fully closed throttle. | |

| Application | MPH |
|--|-----|
| (3) Downshift is possible up to maximum speed. | |

A-246E (CELICA 1.8L) SHIFT SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|----------------------------|-------|
| "D" Position | |
| 1-2 | 33-38 |
| 2-3 | 61-67 |
| 3-OD | 89-98 |
| 3-OD ⁽²⁾ | 22-27 |
| OD-3 ⁽²⁾ | 17-23 |
| OD-3 | 86-94 |
| 3-2 | 58-63 |
| 2-1 | 25-29 |
| "2" Position | |
| 1-2 | 33-38 |
| 2-1 | 25-29 |
| "L" Position (2-1) | |
| 29-32 | |
| (1) Wide open throttle. | |
| (2) Fully closed throttle. | |

A-241E (CELICA 2.2L) SHIFT SPEED SPECIFICATIONS ⁽¹⁾ (1993)

| Application | MPH |
|--------------------------------|-------|
| "D" Position | |
| 1st-2nd | 33-37 |
| 2nd-3rd | 61-68 |
| 3rd-OD | 81-90 |
| 3rd-OD (NORMAL) ⁽²⁾ | 24-28 |
| 3rd-OD (POWER) ⁽²⁾ | 37-41 |
| OD-3rd ⁽²⁾ | 11-14 |
| OD-3rd | 78-86 |
| 3rd-2nd (NORMAL) | 55-63 |
| 3rd-2nd (POWER) | 58-66 |
| 2nd-1st | 26-30 |
| "2" Position | |
| 1st-2nd | 33-37 |
| 2nd-1st | 26-30 |
| "L" Position (2nd-1st) | |
| 29-34 | |
| (1) Wide open throttle. | |
| (2) Fully closed throttle. | |

A-245E (COROLLA 1.8L) SHIFT SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|----------------------------|--------------|
| "D" Position | |
| 1-2 | 35-39 |
| 2-3 | 65-69 |
| 3-OD ⁽²⁾ | 22-25 |
| OD-3 ⁽²⁾ | 11-14 |
| 3-2 | 61-66 |
| 2-1 | 27-30 |
| "L" Position (2-1) | 29-33 |
| (1) Wide open throttle. | |
| (2) Fully closed throttle. | |

A-241E (MR2) SHIFT SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|-------------------------------|--------------|
| "D" Position | |
| 1st-2nd | 33-37 |
| 2nd-3rd | 61-68 |
| 3rd-OD | 81-89 |
| 3rd-OD ⁽²⁾ | 27-31 |
| OD-3rd ⁽²⁾ | 11-14 |
| OD-3rd | 78-85 |
| 3rd-2nd | 58-65 |
| 2nd-1st | 27-31 |
| "2" Position | |
| 1st-2nd | 33-37 |
| 2nd-1st | 26-30 |
| "L" Position (2nd-1st) | 29-33 |
| (1) Wide open throttle. | |
| (2) Fully closed throttle. | |

A-244E (PASEO) SHIFT SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|-----------------------|------------|
| "D" Position | |
| 1st-2nd | 34-37 |
| 2nd-3rd | 62-68 |
| 3rd-OD | 123-127 |
| 3rd-OD ⁽²⁾ | 25-27 |
| OD-3rd ⁽²⁾ | 11-12 |
| OD-3rd | 119-123 |

| Application | MPH |
|---------------------------------|------------|
| 3rd-2nd | 60-63 |
| 2nd-1st | 28-30 |
| "2" Position | |
| 1st-2nd | 34-37 |
| 2nd-1st | 27-30 |
| "L" Position (2nd-1st) | 32-34 |
| (1) With throttle wide open. | |
| (2) With throttle fully closed. | |

LOCK-UP SPEED SPECIFICATIONS TABLES

A-243L (CELICA 1.6L) LOCK-UP SPEED SPECIFICATIONS (1993) [\(1\)](#)

| Application | MPH |
|---|------------|
| "D" Position (2) | |
| Lock-Up ON in OD | 44-50 |
| Lock-Up OFF in OD | 37-43 |
| (1) With throttle valve opened 5 percent. | |
| (2) There is no lock-up in "2" or "L" position. | |

A-246E (CELICA 1.8L) LOCK-UP SPEED SPECIFICATIONS [\(1\)](#)

| Application | MPH |
|---|------------|
| "D" Position (2) | |
| 3rd Gear | |
| Lock-Up ON | 42-47 |
| Lock-Up OFF | 37-42 |
| OD Gear | |
| Lock-Up ON | 49-54 |
| Lock-Up OFF | 43-48 |
| (1) Throttle valve fully closed. | |
| (2) There is no lock-up in "2" or "L" position. | |

A-241E (CELICA 2.2L) LOCK-UP SPEED SPECIFICATIONS [\(1\)](#)

| Application | MPH |
|--|------------|
| "D" Position (2) - NORMAL | |
| Lock-Up ON | 40-45 |
| Lock-Up OFF | 37-41 |
| "D" Position (2) - POWER | |
| Lock-Up ON | 47-52 |
| Lock-Up OFF | 43-48 |

| Application | MPH |
|---|-----|
| (1) Throttle valve fully closed. | |
| (2) There is no lock-up in "2" or "L" position. | |

A-245E (COROLLA 1.8L) LOCK-UP SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|---|-------|
| "D" Position ⁽²⁾ | |
| Lock-Up ON | 40-45 |
| Lock-Up OFF | 36-40 |
| (1) Throttle valve fully closed. | |
| (2) There is no lock-up in "2" or "L" position. | |

A-241E (MR2) LOCK-UP SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|---|-------|
| "D" Position ⁽²⁾ - 3rd Gear | |
| Lock-Up ON | 39-43 |
| Lock-Up OFF | 35-40 |
| "D" Position ⁽²⁾ - OD | |
| Lock-Up ON | 40-44 |
| Lock-Up OFF | 37-40 |
| (1) With throttle valve opened 5 percent. | |
| (2) There is no lock-up in "2" or "L" position. | |

A-244E (PASEO) LOCK-UP SPEED SPECIFICATIONS ⁽¹⁾

| Application | MPH |
|---|-------|
| "D" Position ⁽²⁾ | |
| Lock-Up ON in OD | 42-45 |
| Lock-Up OFF in OD | 39-42 |
| (1) With throttle valve opened 5 percent. | |
| (2) There is no lock-up in "2" or "L" position. | |

STALL SPEED TEST

1. Operate engine and transaxle at normal operating temperature. Connect tachometer to vehicle and ensure it is visible to driver. Apply parking brake and block front and rear wheels.

CAUTION: DO NOT maintain stall speed RPM for more than 5 seconds. Allow vehicle to idle in neutral or park for at least 2 minutes before performing next test.

2. Start engine, apply service brakes and shift vehicle into "D" position. Depress accelerator to full throttle and note maximum RPM obtained. Repeat test in "R" position. For stall speeds, see the **STALL SPEED SPECIFICATIONS** . See **STALL SPEED TEST RESULTS** .

STALL SPEED SPECIFICATIONS

| Vehicle Application | Transaxle | RPM |
|---------------------|-----------|-----------|
| Geo Prizm | A-245E | 2300-2600 |
| Toyota | | |
| Celica 1.6L (1993) | A-243L | 2300-2800 |
| Celica 2.2L (1993) | A-241E | 2500-2800 |
| Celica 1.8L (1994) | A-246E | 2500-2800 |
| Corolla 1.8L | A-245E | 2300-2600 |
| MR2 | A-241E | 2500-2800 |
| Paseo | A-244E | 2300-2700 |

STALL SPEED TEST RESULTS

- **Stall Speed Is Same In Both Positions, But Less Than Specified:**

Insufficient engine output or defective stator one-way clutch.

NOTE: If stall speed RPM is more than 600 RPM below specified value, torque converter may be faulty.

- **Stall Speed High In "D" Position:**

Low line pressure, forward clutch slipping or defective No. 2 one-way clutch or underdrive one-way clutch.

- **Stall Speed High In "R" Position:**

Low line pressure, direct clutch, 1st and reverse brake or underdrive brake slipping.

- **Stall Speed High In Both Positions:**

Low line pressure, improper fluid level or underdrive brake slipping.

HYDRAULIC PRESSURE TESTS

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

Line Pressure Test

1. Remove appropriate transaxle plug and connect pressure gauge. See [Fig. 5](#) . Block all wheels. Apply parking brake. Start engine and shift into "D" position.

2. Apply service brakes and depress accelerator. Note pressure readings at idle and stall speed. Repeat test in "R" position. Compare pressure readings to those listed in appropriate LINE PRESSURE SPECIFICATIONS table. See [LINE PRESSURE TEST RESULTS](#) .
3. If pressure is lower than specified, check throttle cable adjustment. Adjust throttle cable as necessary. Refer to appropriate TRANSMISSION SERVICING - A/T article in the AUTOMATIC TRANS SERVICING section. Repeat pressure test procedure if throttle cable adjustment was necessary.

LINE PRESSURE TEST RESULTS

- **Line Pressure High In Both Positions:**

Throttle cable out of adjustment, defective throttle valve or regulator valve.

- **Line Pressure Low In Both Positions:**

Throttle cable out of adjustment, defective oil pump, throttle valve, regulator valve, underdrive brake or underdrive one-way clutch.

- **Line Pressure Low In "D" Position Only:**

"D" position circuit leaking pressure, defective forward clutch or underdrive one-way clutch.

- **Line Pressure Low In "R" Position Only:**

"R" position circuit leaking pressure, defective direct clutch, 1st and reverse brake or underdrive one-way clutch.

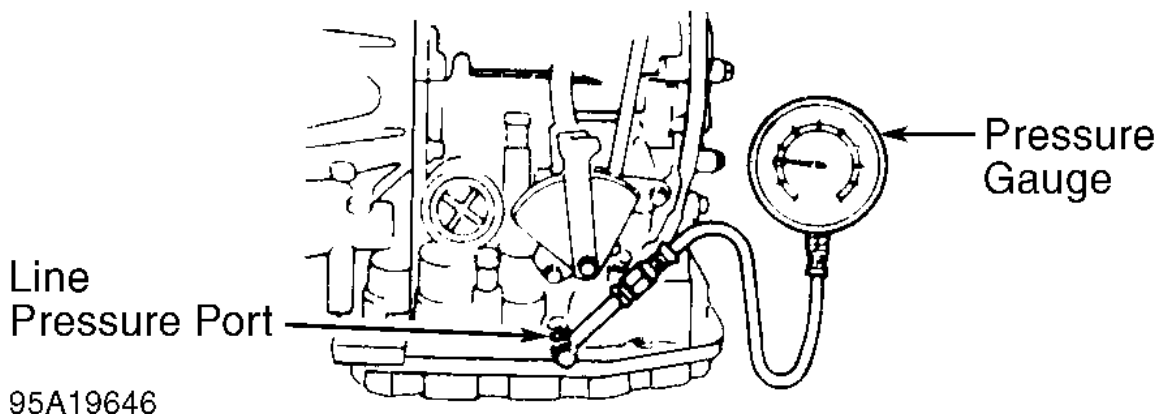


Fig. 5: Checking Governor & Line Pressure (A-241E & A-244E)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

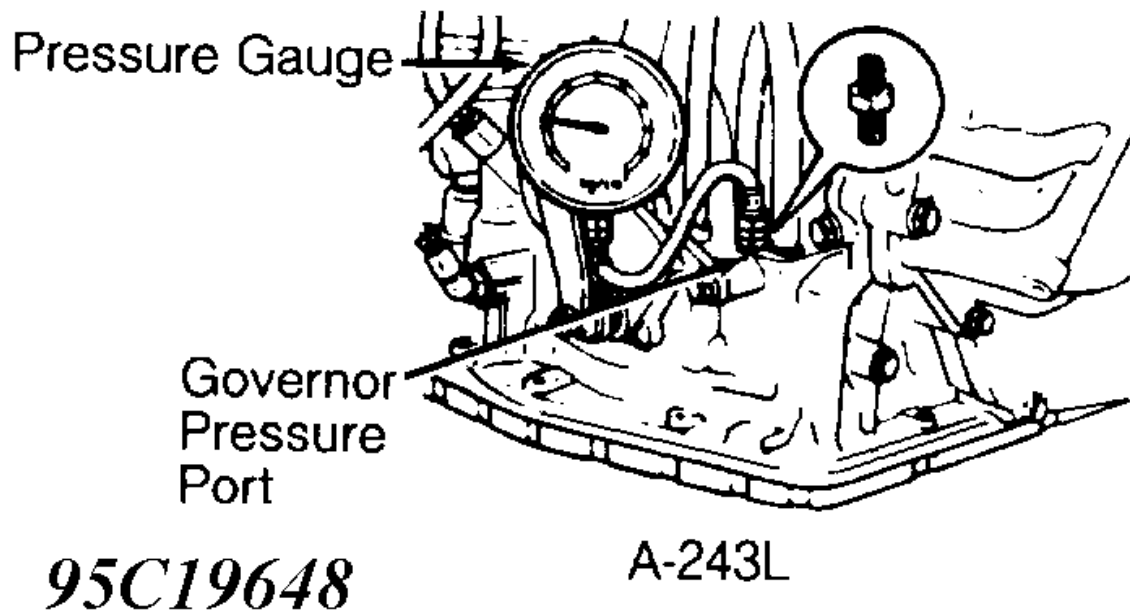
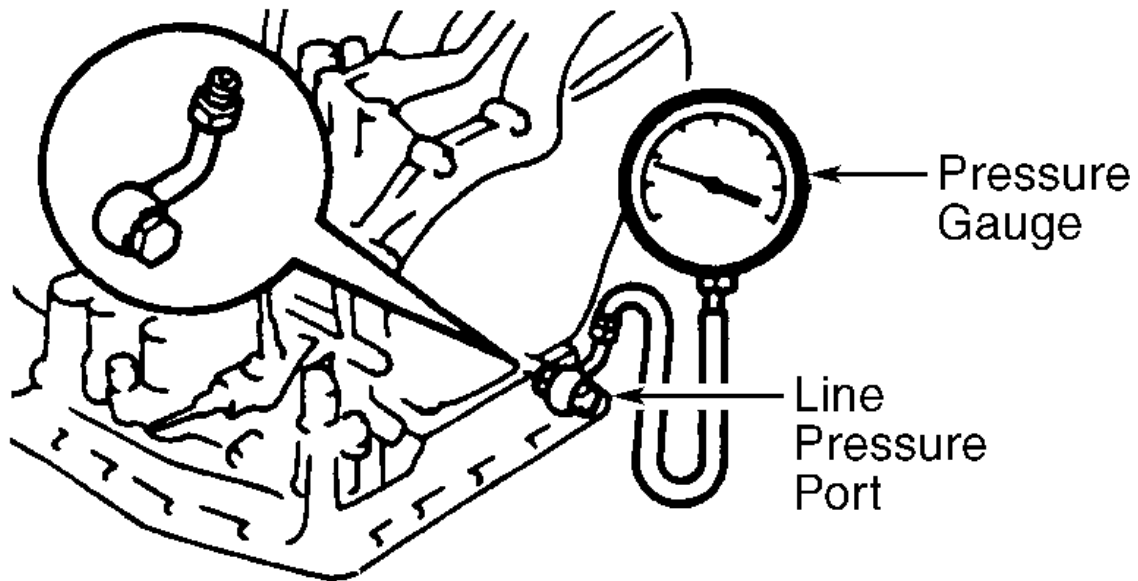


Fig. 6: Checking Governor & Line Pressure (A-243L)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G95B19647

Fig. 7: Checking Governor & Line Pressure (A-245E & A-246E)

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

A-245E (PRIZM) LINE PRESSURE SPECIFICATIONS

| Application | psi (kg/cm²) |
|--------------------|--------------------------------|
| "D" Position | |
| Idle Speed | 54-64 (3.8-4.5) |
| Stall Speed | 139-162 (9.8-11.4) |
| "R" Position | |
| Idle Speed | 85-102 (6.0-7.2) |
| Stall Speed | 198-244 (13.9-17.2) |

A-243L (CELICA) LINE PRESSURE SPECIFICATIONS

| Application | psi (kg/cm²) |
|--------------------|--------------------------------|
| "D" Position | |
| Idle Speed | 54-61 (3.8-4.3) |
| Stall Speed | 131-152 (9.2-10.7) |
| "R" Position | |
| Idle Speed | 80-102 (5.6-7.2) |
| Stall Speed | 205-242 (14.4-17.0) |

A-241E (CELICA) LINE PRESSURE SPECIFICATIONS

| Application | psi (kg/cm ²) |
|--------------|---------------------------|
| "D" Position | |
| Idle Speed | 54-61 (3.8-4.3) |
| Stall Speed | 104-125 (7.3-8.8) |
| "R" Position | |
| Idle Speed | 92-115 (6.5-8.1) |
| Stall Speed | 193-229 (13.6-16.1) |

A-245E (COROLLA) LINE PRESSURE SPECIFICATIONS

| Application | psi (kg/cm ²) |
|--------------|---------------------------|
| "D" Position | |
| Idle Speed | 54-64 (3.8-4.5) |
| Stall Speed | 142-165 (10.0-11.6) |
| "R" Position | |
| Idle Speed | 87-104 (6.1-7.3) |
| Stall Speed | 202-249 (14.2-17.5) |

A-241E (MR2) & A-244E (PASEO) LINE PRESSURE SPECIFICATIONS

| Application | psi (kg/cm ²) |
|--------------|---------------------------|
| "D" Position | |
| Idle Speed | 54-61 (3.8-4.3) |
| Stall Speed | 104-125 (7.3-8.8) |
| "R" Position | |
| Idle Speed | 92-115 (6.5-8.1) |
| Stall Speed | 193-229 (13.6-16.1) |

Governor Pressure Test

1. Transaxle must be at normal operating temperature of 122-176°F (50-80°C). Block rear wheels. **DO NOT** apply parking brake. Raise and support front of vehicle with safety stands.
2. Remove appropriate transaxle plug and connect pressure gauge. See [Fig. 5](#). Start engine and shift vehicle into "D" position. Note governor pressure at specified speeds and engine RPM. See the [GOVERNOR PRESSURE SPECIFICATIONS](#). Reading at 490 RPM can be taken with vehicle on safety stands.

CAUTION: Road test vehicle or use chassis dynamometer to check governor pressures at vehicle speeds above 800 RPM.

3. Incorrect governor pressure may be caused by incorrect line pressure, leakage at governor pressure circuit or defective governor valve.

GOVERNOR PRESSURE SPECIFICATIONS (A-243L)

| Engine RPM | Speed (MPH) | psi (kg/cm ²) |
|------------|-------------|---------------------------|
| 490 | 11 | 3-7 (.2-.5) |
| 1300 | 29 | 26-30 (1.8-2.1) |
| 2600 | 58 | 60-71 (4.2-5.0) |

REMOVAL & INSTALLATION

For transaxle removal and installation procedure, see APPROPRIATE REMOVAL & INSTALLATION article.

TORQUE CONVERTER

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

TORQUE CONVERTER ONE-WAY CLUTCH TEST

1. Install turner and stopper of One-Way Clutch Tester (09350-30020) in torque converter. See [Fig. 8](#) . Turner fits in inner race of one-way clutch. Stopper fits in notch of converter hub and outer race of one-way clutch.
2. Clutch should lock when rotated counterclockwise, and turn freely when rotated clockwise. If necessary, clean converter and retest clutch. Replace converter if clutch does not test as described.

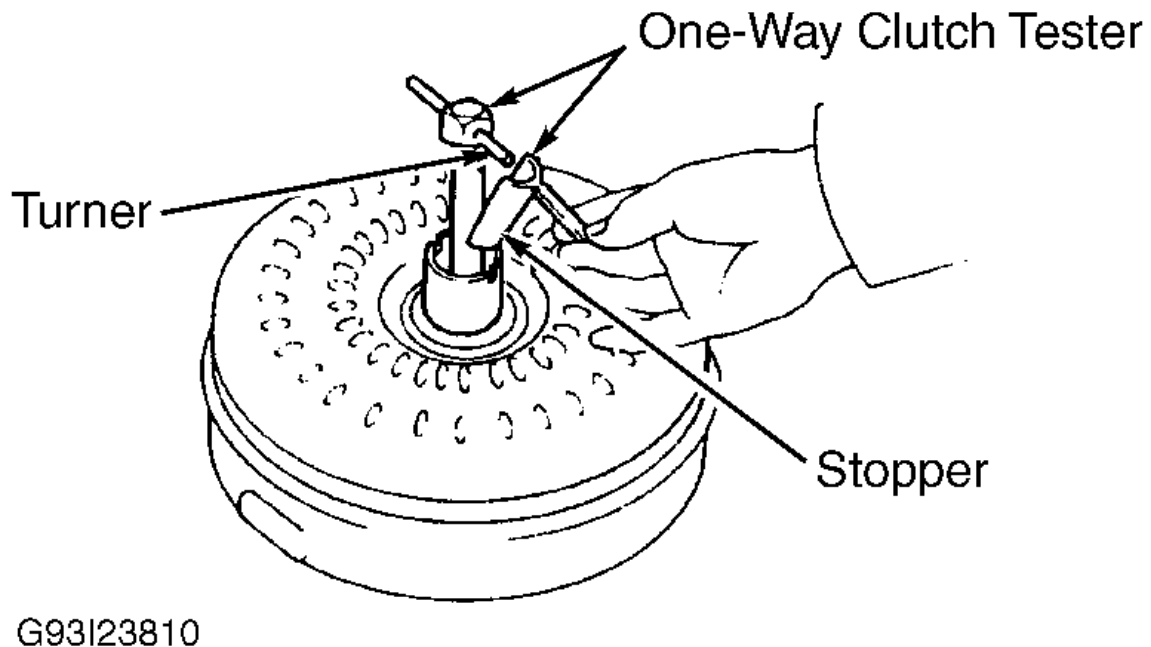


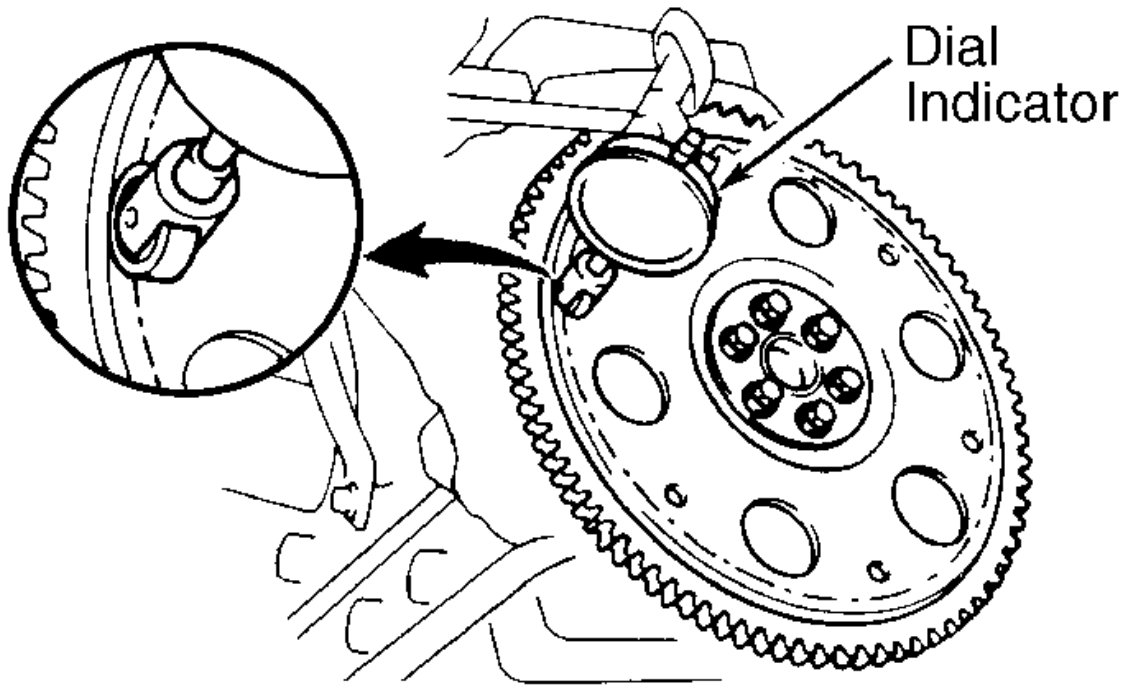
Fig. 8: Checking Torque Converter One-Way Clutch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TORQUE CONVERTER DRIVE PLATE RUNOUT TEST

Measure drive plate runout. See [Fig. 9](#) . 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. On Corolla and Prizm, tighten bolts to 47 ft. lbs. (64 N.m). On all other models, tighten bolts to 61 ft. lbs. (83 N.m).

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. 10](#) . 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 specification, replace torque converter. Mark position of converter on drive plate to ensure correct installation. Remove converter from drive plate.



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Fig. 9: Checking Drive Plate Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

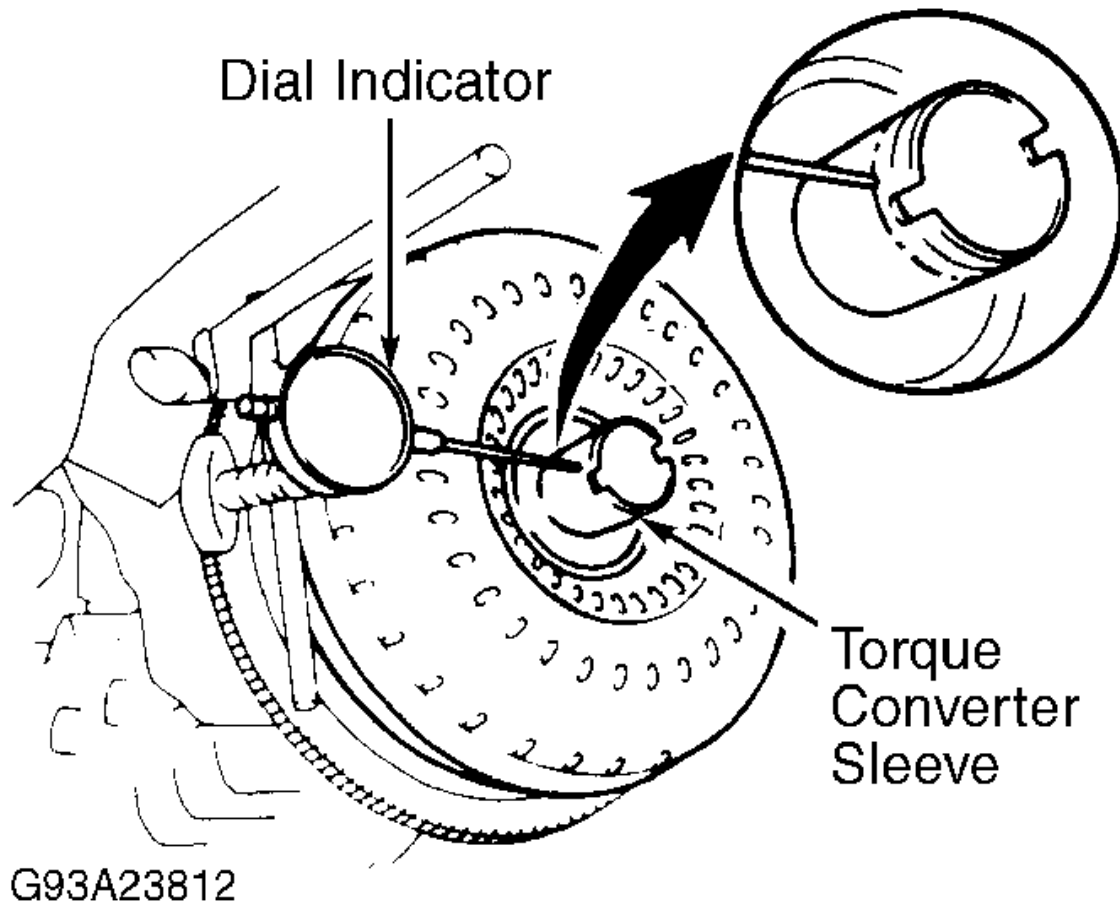


Fig. 10: Checking Converter Sleeve Runout
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TRANSAXLE DISASSEMBLY

DISASSEMBLY (A-243L, A-241E & A-244E MODELS)

1. Remove oil cooler pipes, manual shift lever and park/neutral position switch. Remove filler tube and dipstick. Remove throttle cable retaining plate. Remove solenoid harness connector retainer plate.
2. On A-243L transaxle, remove governor cover. Remove "O" ring from cover. Remove governor assembly with thrust washer. Remove governor body adapter. Remove oil strainer. See [Fig. 8](#).
3. On A-241E and A-244E transaxles, remove retainer plate and pull out vehicle speed sensor. Remove "O" ring from speed sensor. Remove 2 bolts and sensor cover bracket. Using a

screwdriver, remove sensor cover. **DO NOT** damage cover. Remove sensor rotor. Remove sensor adapter. See [Fig. 11](#) .

4. On all models, remove oil pan and gasket. Remove magnet(s) from oil pan. Remove oil strainer (filter) and tube bracket. Carefully remove all oil tubes. Remove the manual detent spring. Disconnect the solenoid harness connectors. Remove the valve body assembly. Refer to [VALVE BODY ASSEMBLY R & I](#) under ON-VEHICLE SERVICE. Remove throttle cable and solenoid sub-harness from transaxle case. Remove 2nd brake apply gasket. Remove 2nd brake drum seal. See [Fig. 12](#) and [Fig. 13](#) .
5. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove underdrive clutch accumulator piston and spring. See [Fig. 14](#) . Loosen accumulator cover bolts evenly until spring tension is released. Remove cover and gasket. Remove forward clutch accumulator piston and springs. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove direct clutch accumulator piston and spring. See [Fig. 15](#) .
6. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove 2nd brake accumulator piston and spring. See [Fig. 16](#) .
7. Apply mark to 2nd coast brake servo apply piston rod where it meets case. Apply air (57-114 psi (4-8 kg/cm²)) and measure piston rod travel (stroke). See [Fig. 17](#) . Piston rod travel should be .059-.118" (1.5-3.0 mm). If rod travel is not within specification, further inspect band during disassembly.
8. Using snap ring expander, remove 2nd coast brake piston snap ring. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove 2nd coast brake cover. Remove 2nd coast brake piston and spring. See [Fig. 18](#) .
9. Remove oil pump retaining bolts. Using appropriate puller, pull oil pump free from transaxle case. Remove oil pump. Remove race from oil pump. Remove direct clutch and forward clutch from transaxle case. Remove direct clutch from forward clutch. Remove thrust washer, bearings and races from both sides of forward clutch. See [Fig. 19](#) .

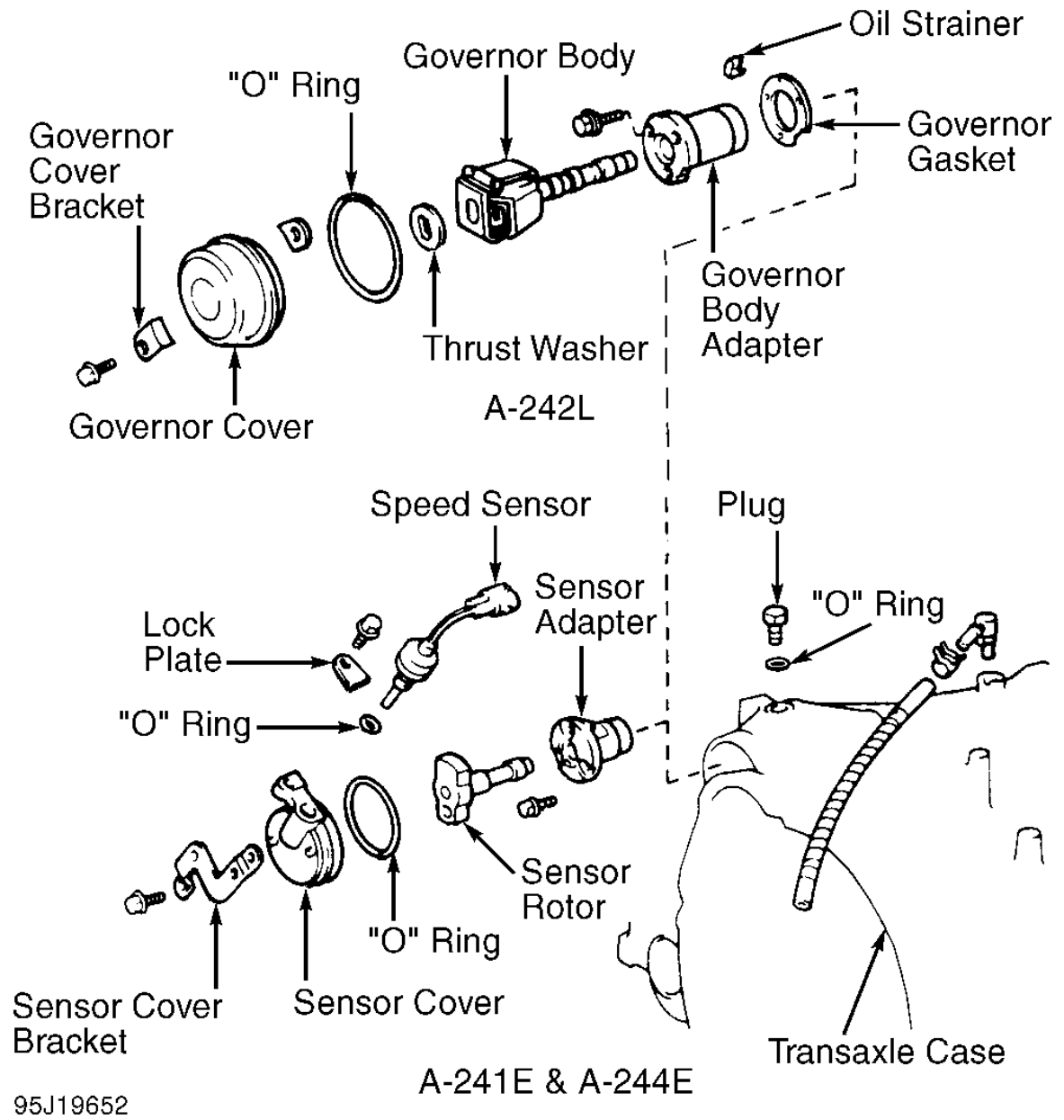


Fig. 11: Exploded View Of Governor/Speed Sensor Assemblies

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

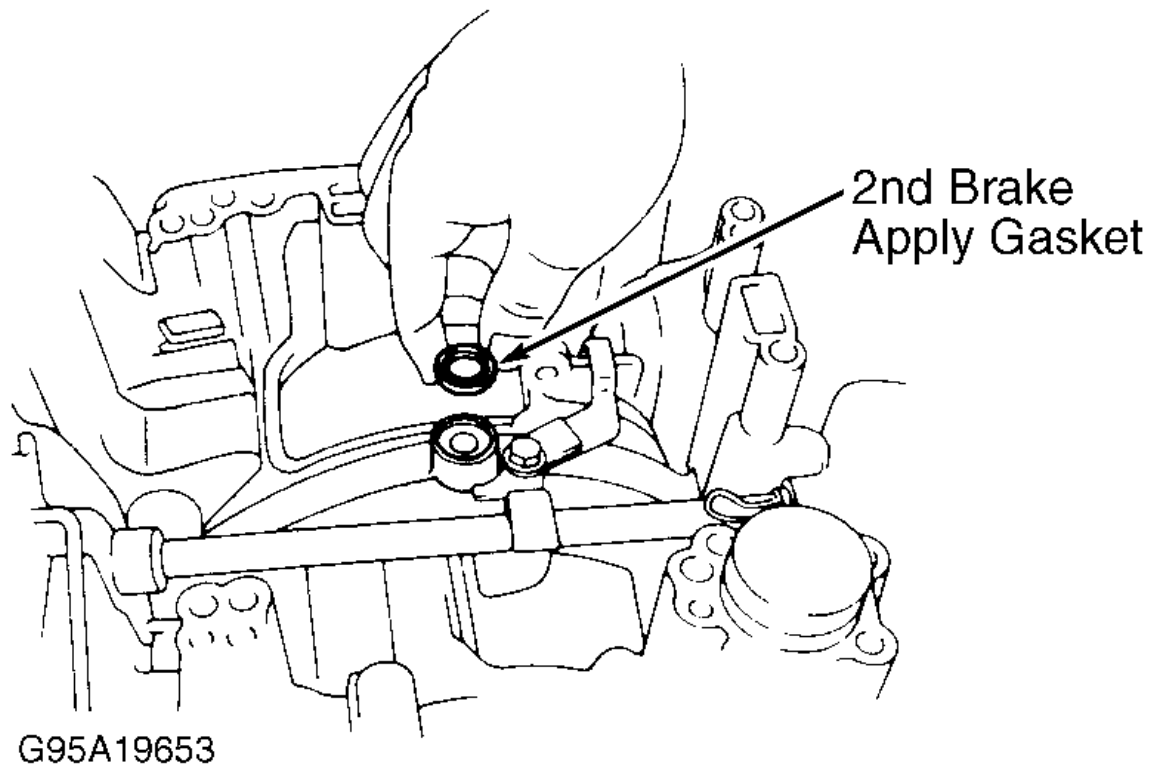


Fig. 12: Removing 2nd Brake Apply Gasket
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

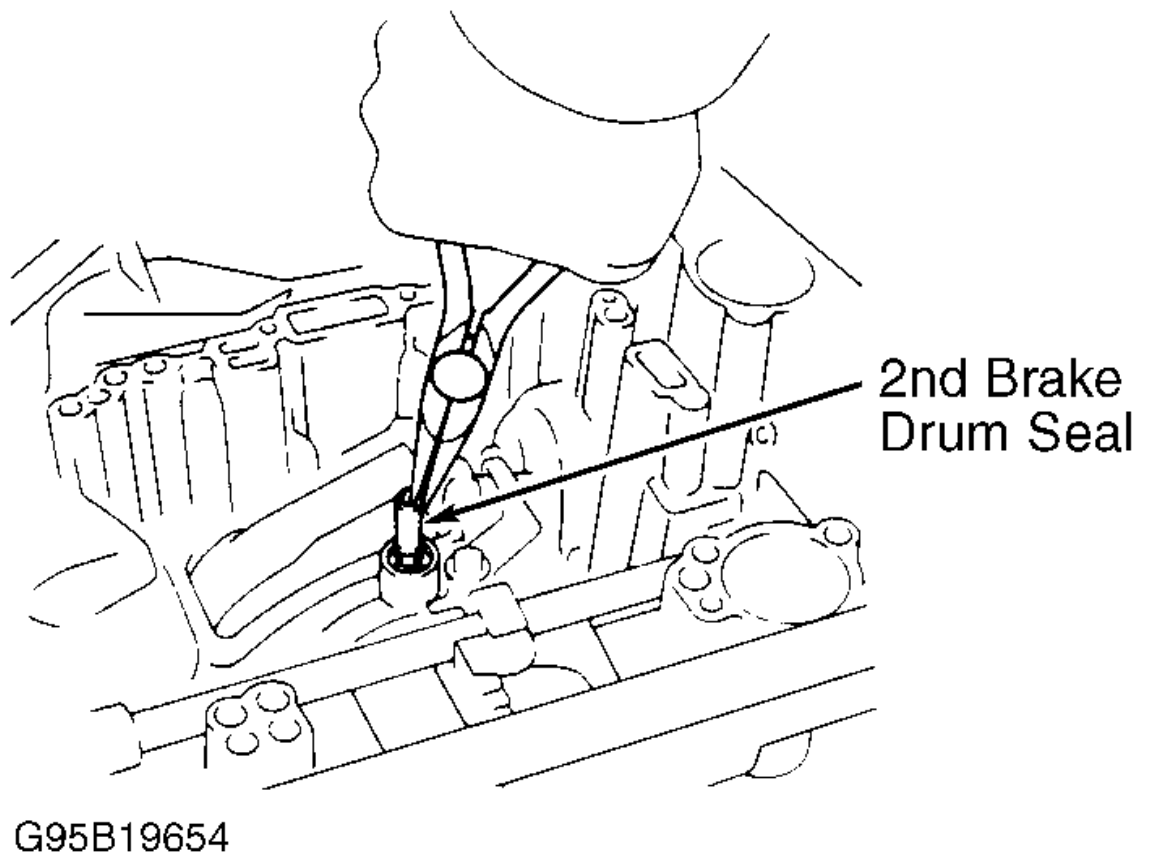


Fig. 13: Removing 2nd Brake Drum Seal
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

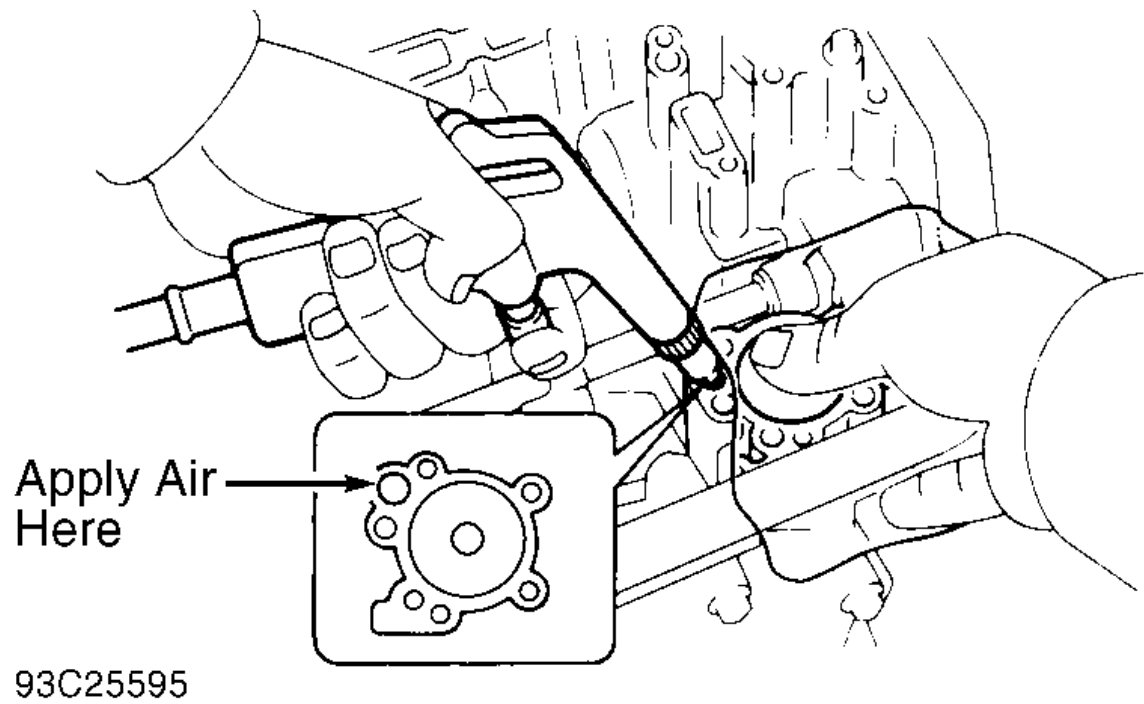


Fig. 14: Removing Underdrive Clutch Accumulator Piston & Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

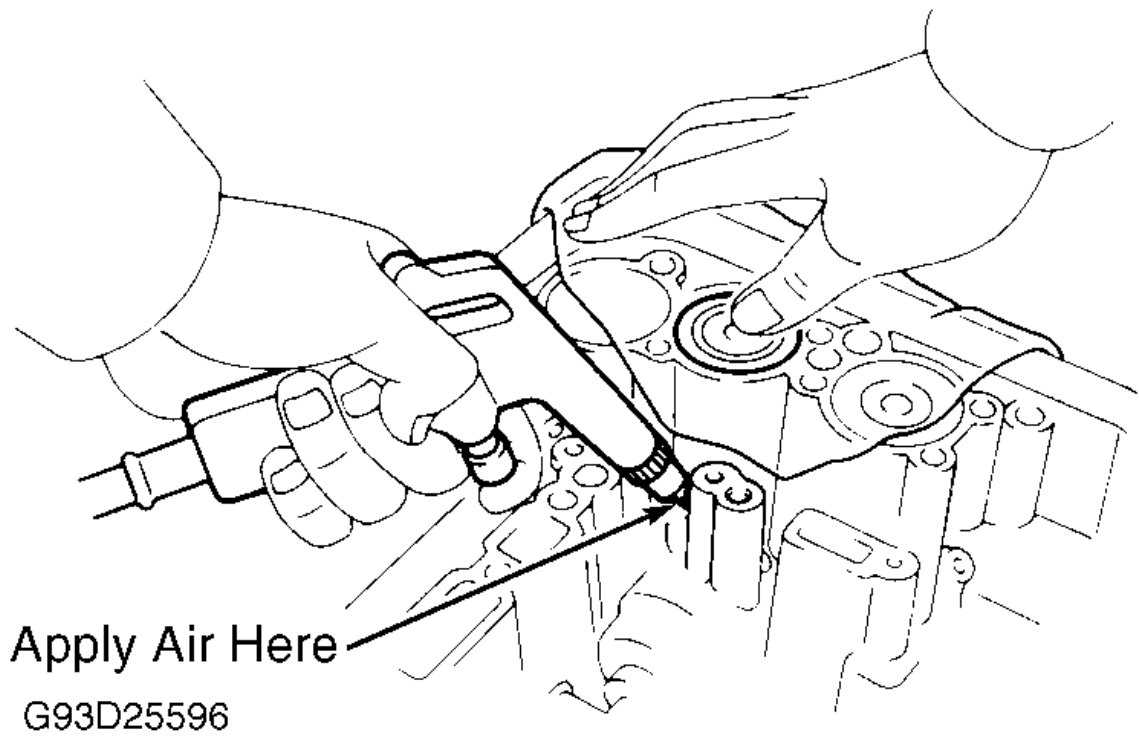


Fig. 15: Removing Direct Clutch Accumulator Piston & Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

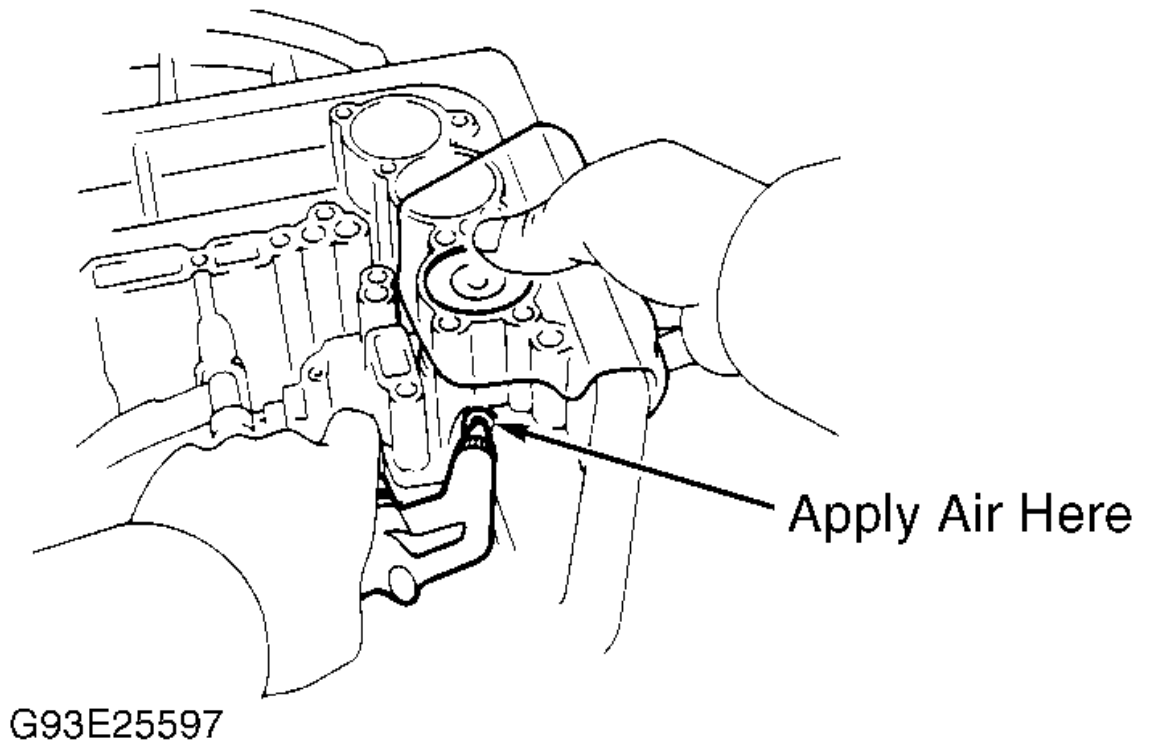


Fig. 16: Removing 2nd Brake Accumulator Piston & Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

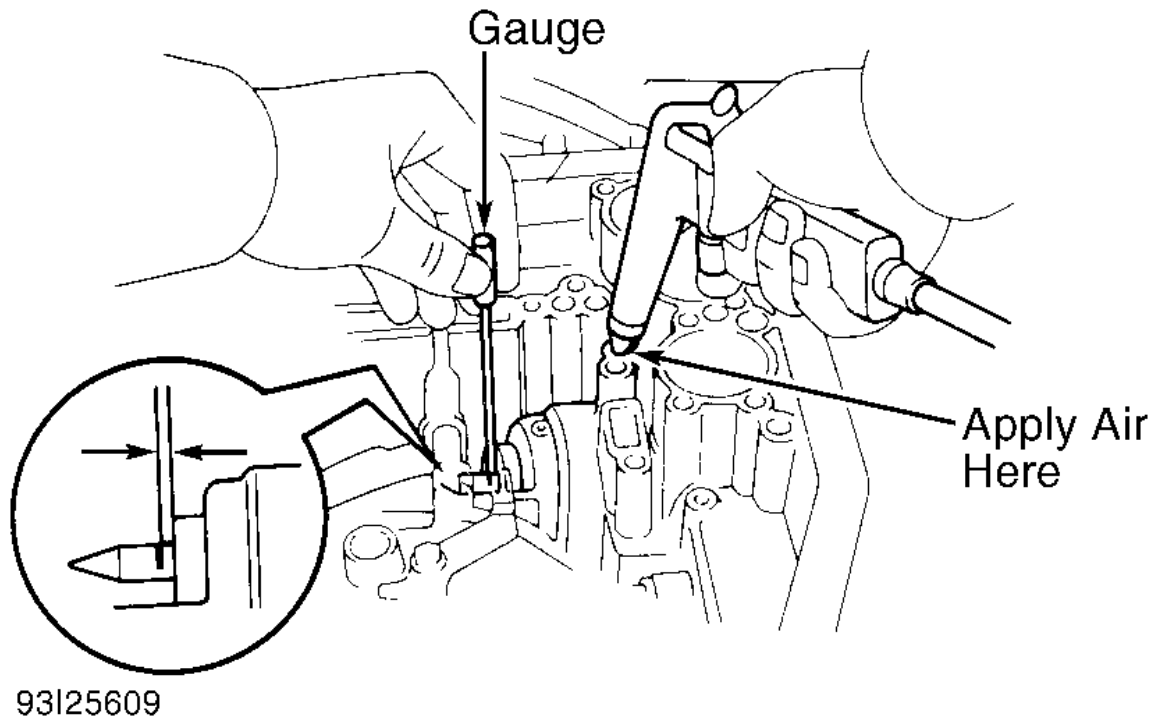
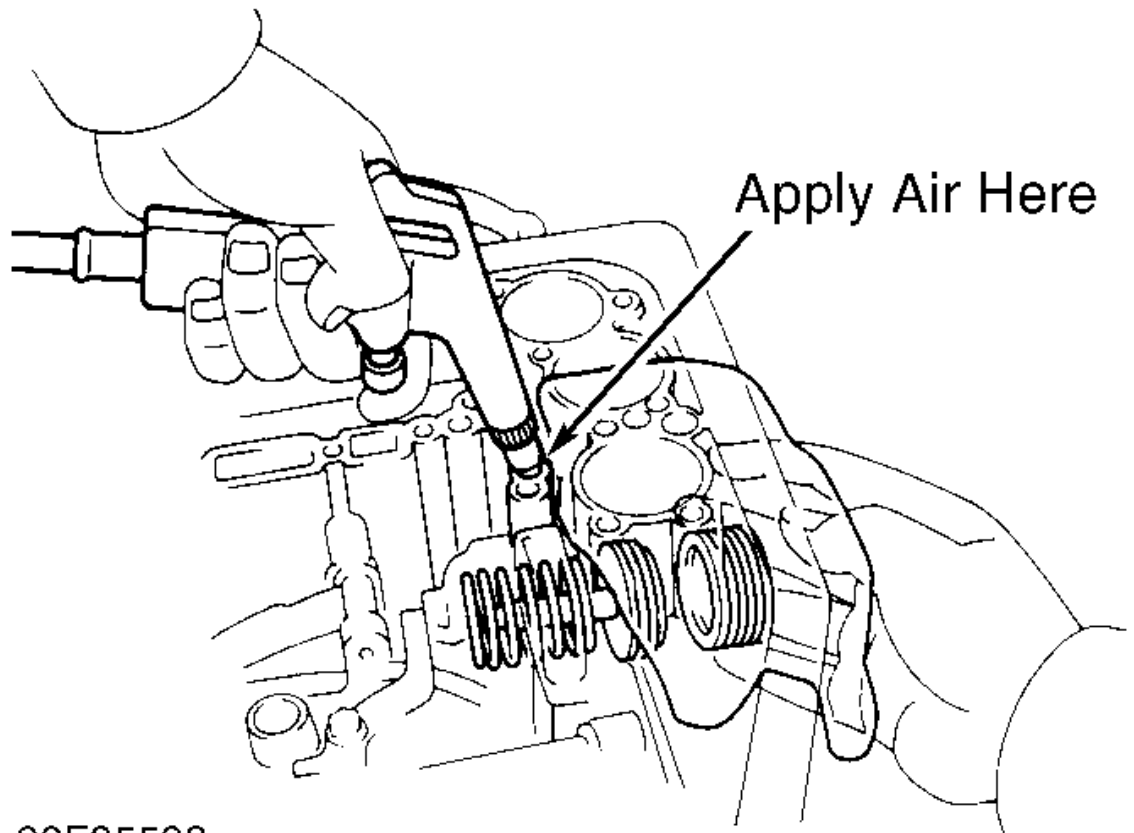


Fig. 17: Checking 2nd Coast Brake Piston Stroke
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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[Fig. 18: Removing 2nd Coast Brake Cover](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

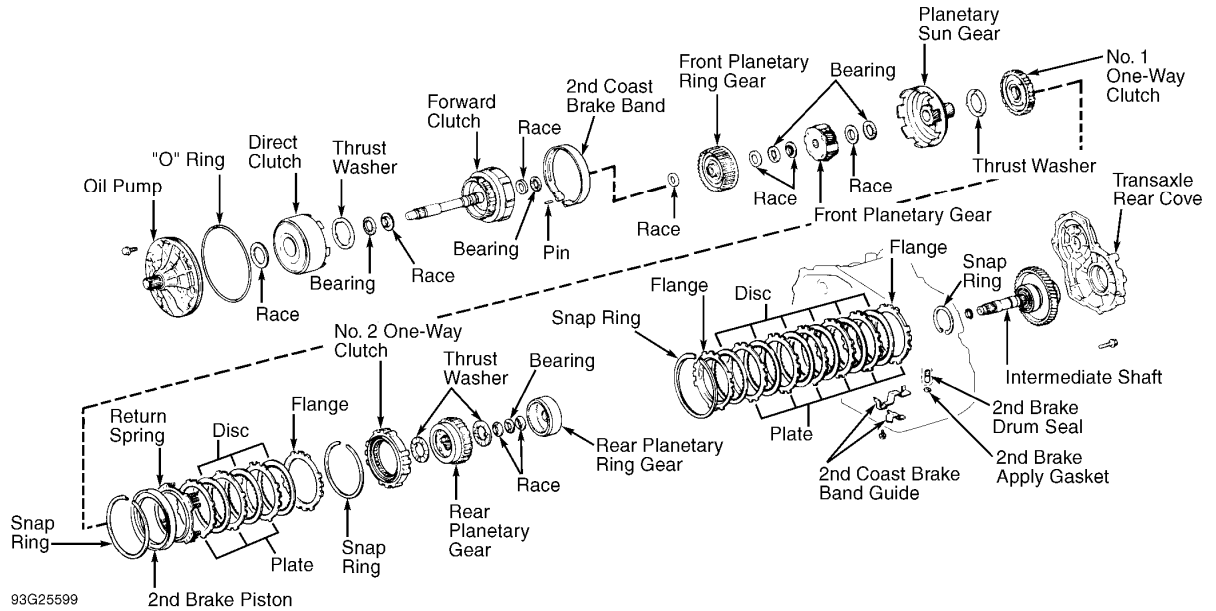


Fig. 19: Exploded View Of Transaxle Case Internal Components (A-241E & A-244E Shown; All Others Similar)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

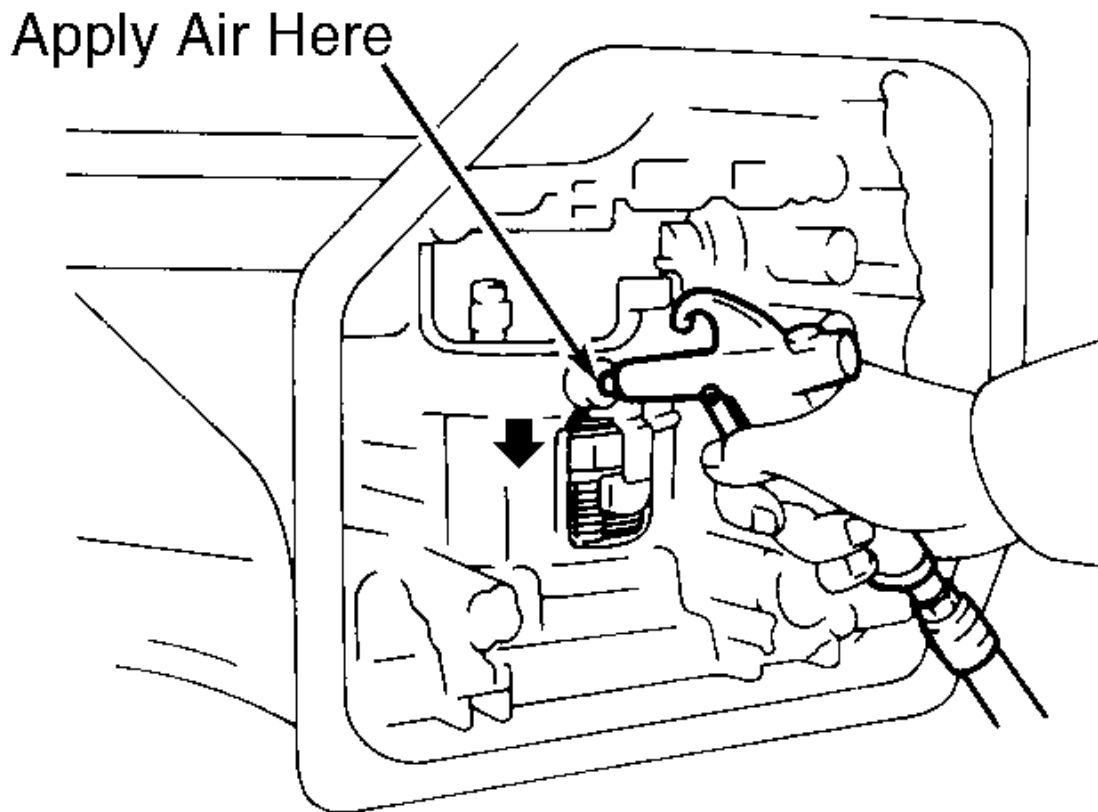
10. Using small screwdriver, push 2nd coast brake band pin inward and remove pin from oil pump mounting bolt hole. Remove 2nd coast brake band. Remove front planetary ring gear. Remove race and bearing from ring gear. See [Fig. 19](#) .
11. Remove front planetary gear. Remove bearings and races from both sides of planetary gear. Remove sun gear, sun gear input drum, thrust washer, 2nd brake hub and No. 1 one-way clutch. Using compressed air, confirm 2nd brake piston operates smoothly. See [Fig. 20](#) . Remove 2nd coast brake band guide.
12. Remove 2nd brake drum retaining snap ring. Remove 2nd brake drum. Remove thrust washer and 2nd brake piston return spring. Remove plates, discs and flange. Note number and location of components. Remove No. 2 one-way clutch retaining snap ring. Remove No. 2 one-way clutch and rear planetary gear. See [Fig. 19](#) .
13. Remove thrust washers from both sides of planetary gear. Remove rear planetary ring gear with bearing and races. Using compressed air, confirm 1st and reverse brake piston operates smoothly. See [Fig. 21](#) . Remove flange retaining snap ring. Remove flange, plates and discs. Note number and location of components. Remove rear transaxle cover bolts. Tap rear cover using a plastic hammer. Remove cover. Remove intermediate shaft.
14. Remove snap ring. Remove transaxle housing-to-case bolts. Remove transaxle housing. Remove differential assembly, governor driven gear and thrust washer. Remove apply gaskets from transaxle case. See [Fig. 22](#) . Using chisel, release staked area of countershaft lock nuts. Secure countershaft driven gear with appropriate holder and remove front and rear countershaft lock nuts.
15. Using appropriate puller, remove counterdriven gear. Remove thrust needle bearing. Remove countershaft assembly. Remove thrust bearing and race from countershaft. Remove underdrive clutch drum and anti-rattle clip. Using compressed air, confirm underdrive brake

piston operates smoothly. See [Fig. 23](#) . Remove oil seal rings. Using appropriate press and adapter, carefully remove underdrive brake snap ring.

16. Remove flange, plates and discs. Note number and location of components. Remove brake return spring. Using compressed air, remove underdrive brake piston. See [Fig. 23](#) . Using appropriate compressor, gradually compress spring assembly and remove snap ring. See [Fig. 24](#) .
17. Remove return spring assembly. Apply compressed air to oil passage in transaxle case and remove 1st and reverse brake piston. See [Fig. 21](#) . If the piston does not pop out, remove it using needle-nose pliers. Remove the parking lock pawl stopper plate, torsion spring and spring guide. Remove pawl shaft clamp, shaft and lock pawl. See [Fig. 22](#) .

NOTE: If manual shift linkage is damaged or needs to be disassembled, see **MANUAL SHIFT LINKAGE** under **COMPONENT DISASSEMBLY & REASSEMBLY**.

18. Remove parking lock sleeve and cam guide bracket. Remove oil gallery cover and gasket. Remove underdrive brake accumulator piston and spring. See [Fig. 22](#) .



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Fig. 20: Checking & Removing 2nd Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

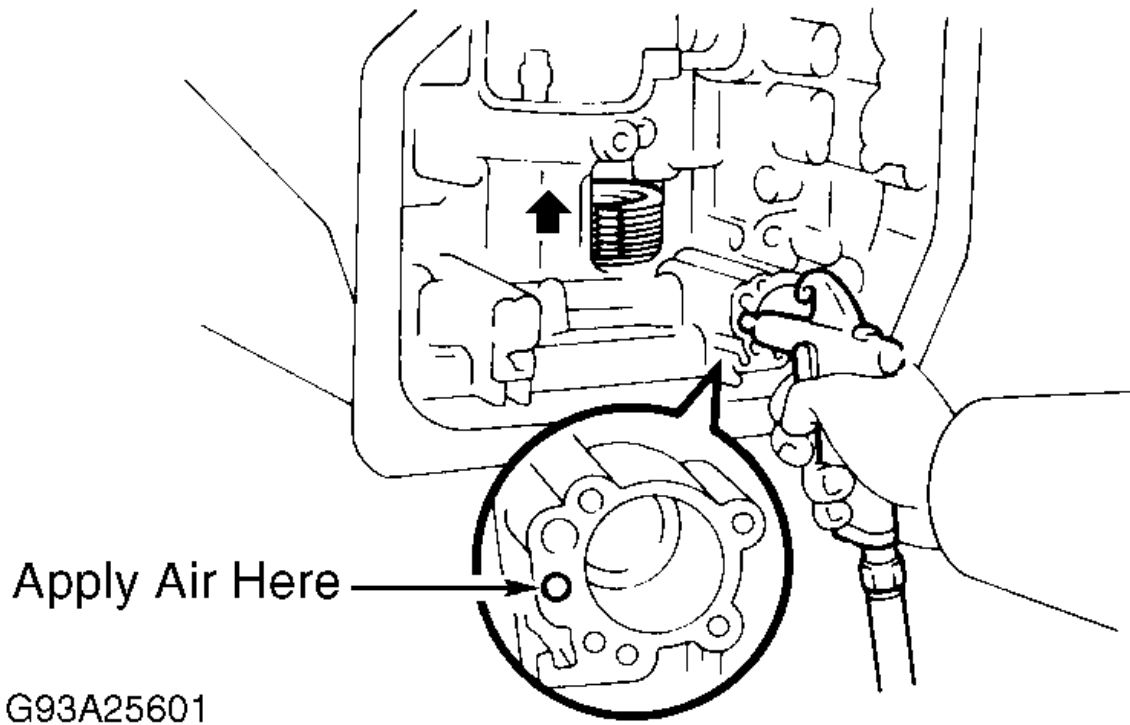
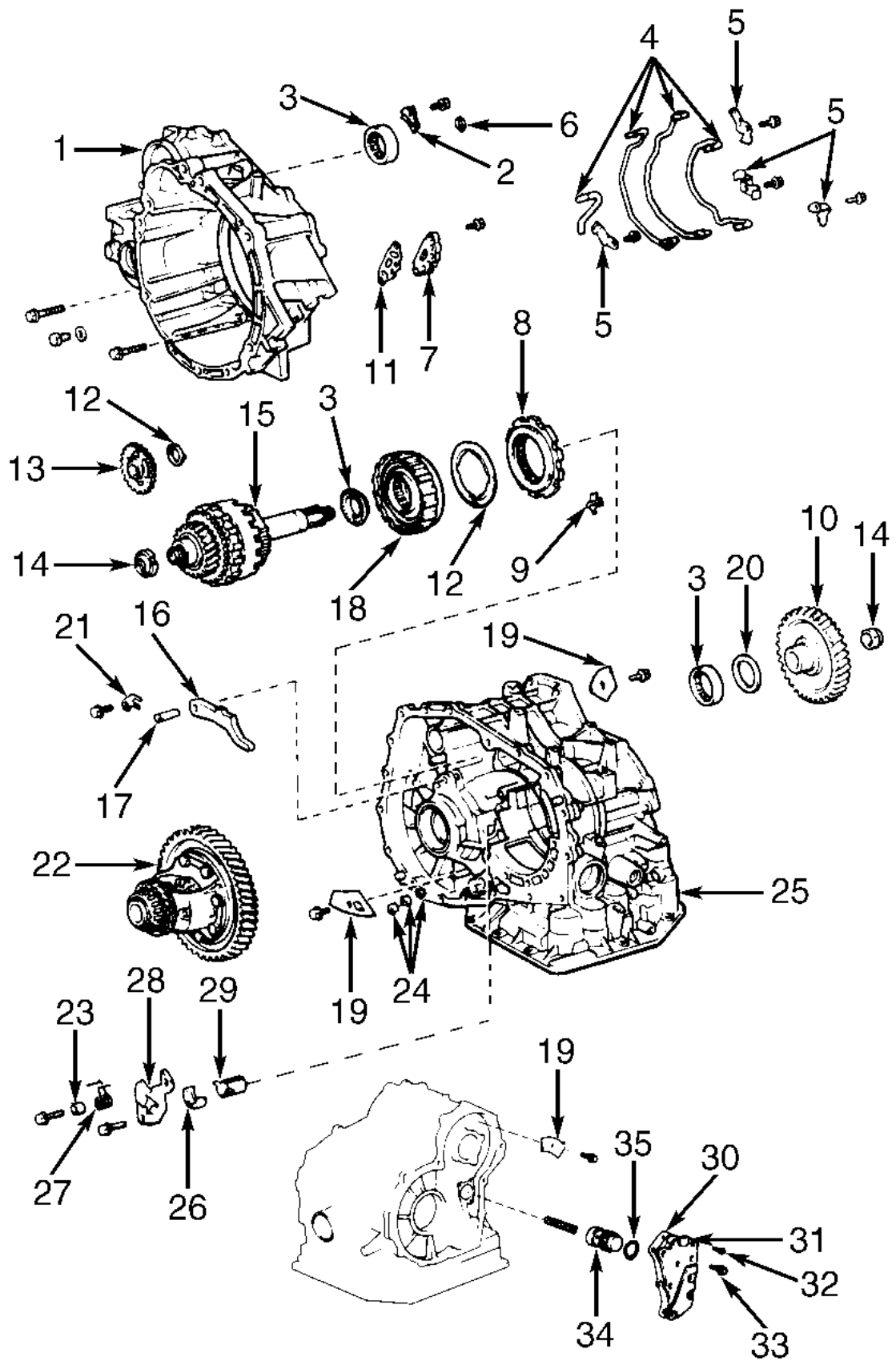


Fig. 21: Checking & Removing 1st & Reverse Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



- | | |
|--|--|
| 1. Transaxle Housing | 18. Underdrive Clutch |
| 2. Bearing Retainer | 19. Plate |
| 3. Bearing | 20. Thrust Needle Bearing |
| 4. Oil Tubes | 21. Pawl Shaft Clamp |
| 5. Clamp | 22. Differential Assembly |
| 6. Oil Seal Ring | 23. Spring Guide |
| 7. Oil Tube Apply Cover | 24. Apply Gaskets |
| 8. No. 3 One-Way Clutch | 25. Transaxle Case |
| 9. Anti-Rattle Clip | 26. Parking Lock Sleeve |
| 10. Counter-Driven Gear | 27. Spring |
| 11. Oil Tube Apply Cover Gasket | 28. Stopper Plate |
| 12. Thrust Washer | 29. Cam Guide Bracket |
| 13. Governor Driven Gear | 30. Gasket |
| 14. Lock Nut | 31. Oil Gallery Cover |
| 15. Underdrive Planetary Gear With Countershaft | 32. Screw |
| 16. Parking Lock Pawl | 33. Bolt |
| 17. Pawl Shaft | 34. Underdrive Brake Accumulator Piston |
| | 35. "O" Ring |

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Fig. 22: Exploded View Of Transaxle Housing & Case Components

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

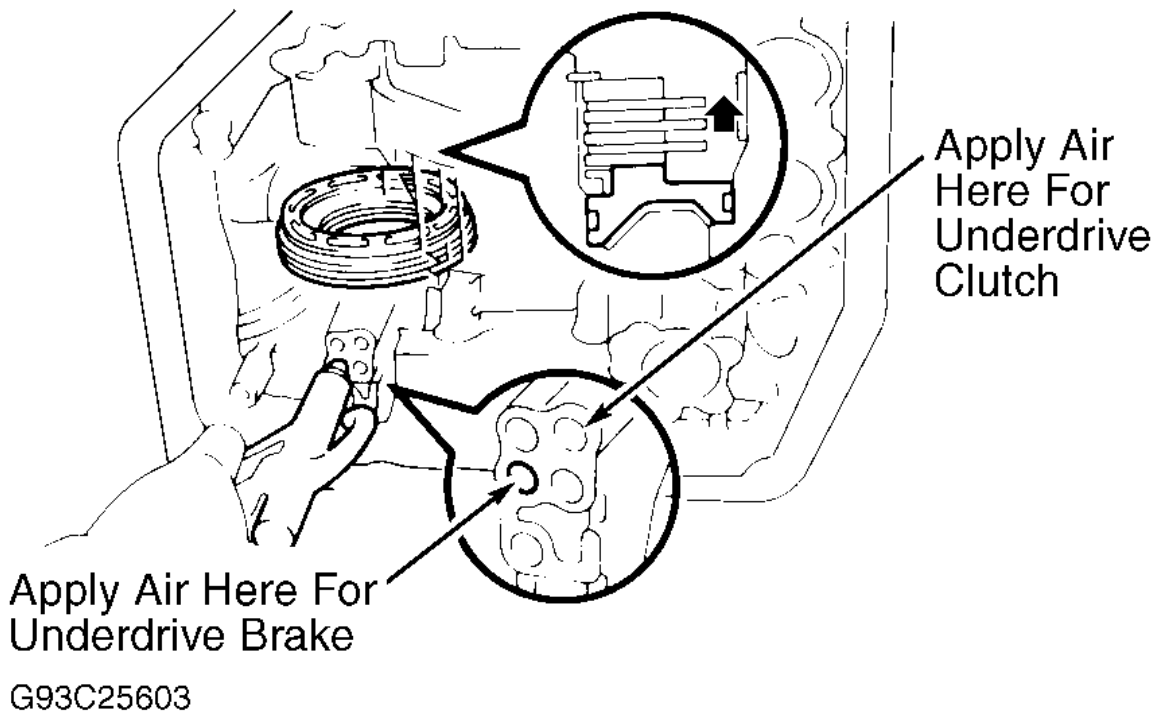
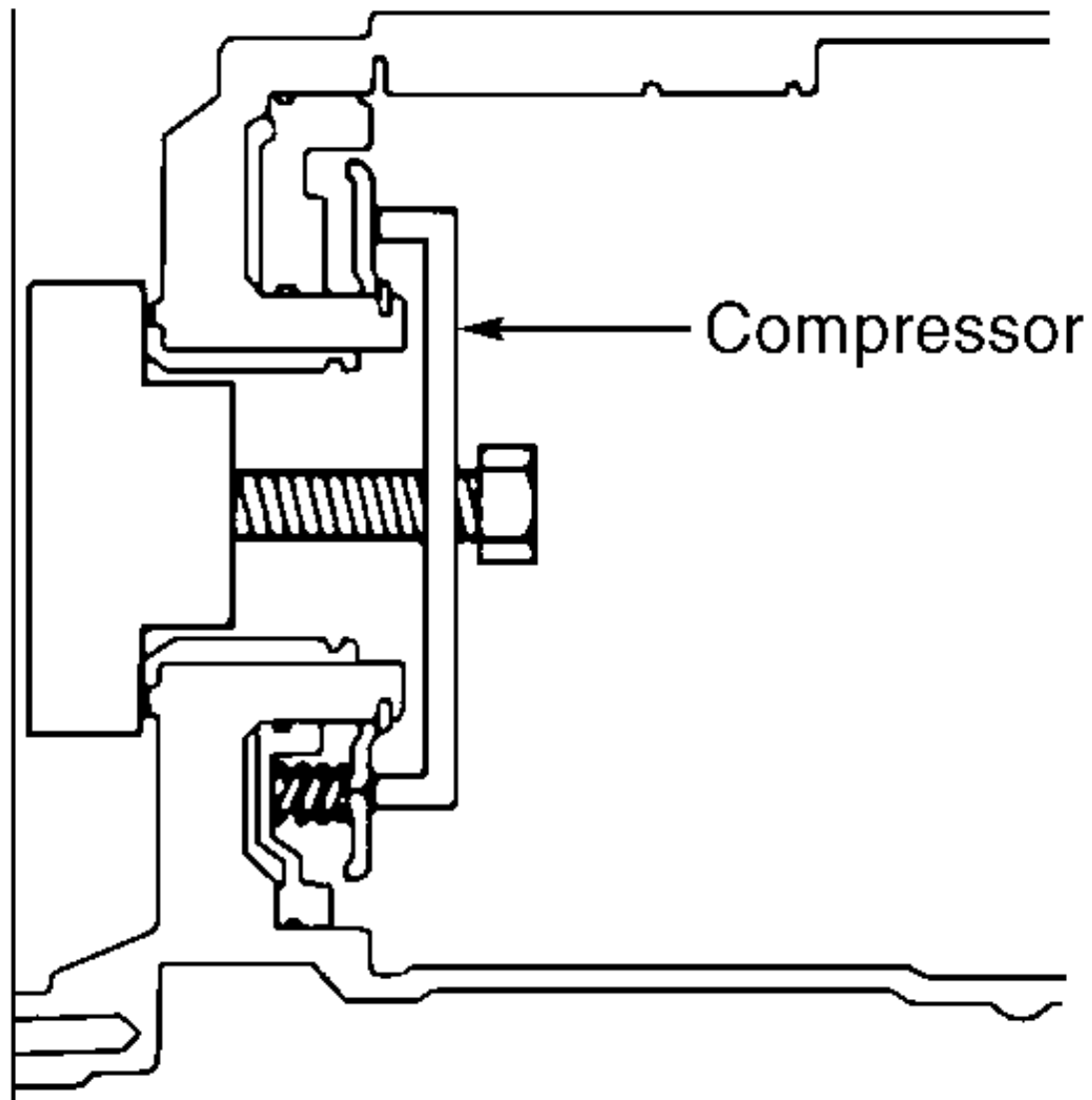


Fig. 23: Checking Underdrive Brake & Clutch Piston Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 24: Compressing Underdrive Brake Spring Plate
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

A-245E & A-246E MODELS 

1. Remove oil cooler pipes, breather hose, manual shift lever and park/neutral position switch. Remove filler tube and dipstick. Remove throttle cable retaining bolt. Remove solenoid harness connector retaining bolt.
2. Remove oil pan and gasket. Remove magnet(s) from oil pan. Remove oil strainer (filter). Remove the manual detent spring. Disconnect the solenoid connectors. Remove the valve body assembly. Refer to [VALVE BODY ASSEMBLY R & I](#) under ON-VEHICLE SERVICE. Remove throttle cable and solenoid sub-harness from transaxle case. Remove check ball body and ball, next to 2nd brake accumulator. Remove 2nd brake apply gasket. Remove 2nd brake drum seal. See [Fig. 12](#) and [Fig. 13](#) .
3. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove underdrive clutch accumulator piston and spring. See [Fig. 21](#) . Remove forward clutch accumulator piston and springs. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove direct clutch accumulator piston and spring. See [Fig. 15](#) .
4. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove 2nd brake accumulator piston and spring. See [Fig. 16](#) .

NOTE: If manual shift linkage is damaged or needs to be disassembled, see [MANUAL SHIFT LINKAGE](#) under COMPONENT DISASSEMBLY & REASSEMBLY.

5. Remove 2nd brake band guide. Remove transaxle assembly bolts. Remove converter housing. Remove differential assembly. Remove apply gasket. Unbolt and remove oil pump assembly.
6. Apply mark to 2nd coast brake servo apply piston rod where it meets case. Apply air 57-114 psi (4-8 kg/cm²) and measure piston rod travel (stroke). See [Fig. 26](#) . Piston rod travel should be .059-.118" (1.5-3.0 mm). If rod travel is not within specification, further inspect band during disassembly.
7. Remove 2nd coast brake piston snap ring. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to remove 2nd coast brake cover. Remove 2nd coast brake piston and spring. See [Fig. 27](#) .
8. Remove direct clutch with forward clutch from transaxle case. Remove direct clutch from forward clutch. Remove thrust washer, bearings and races from forward clutch. See [Fig. 28](#) .

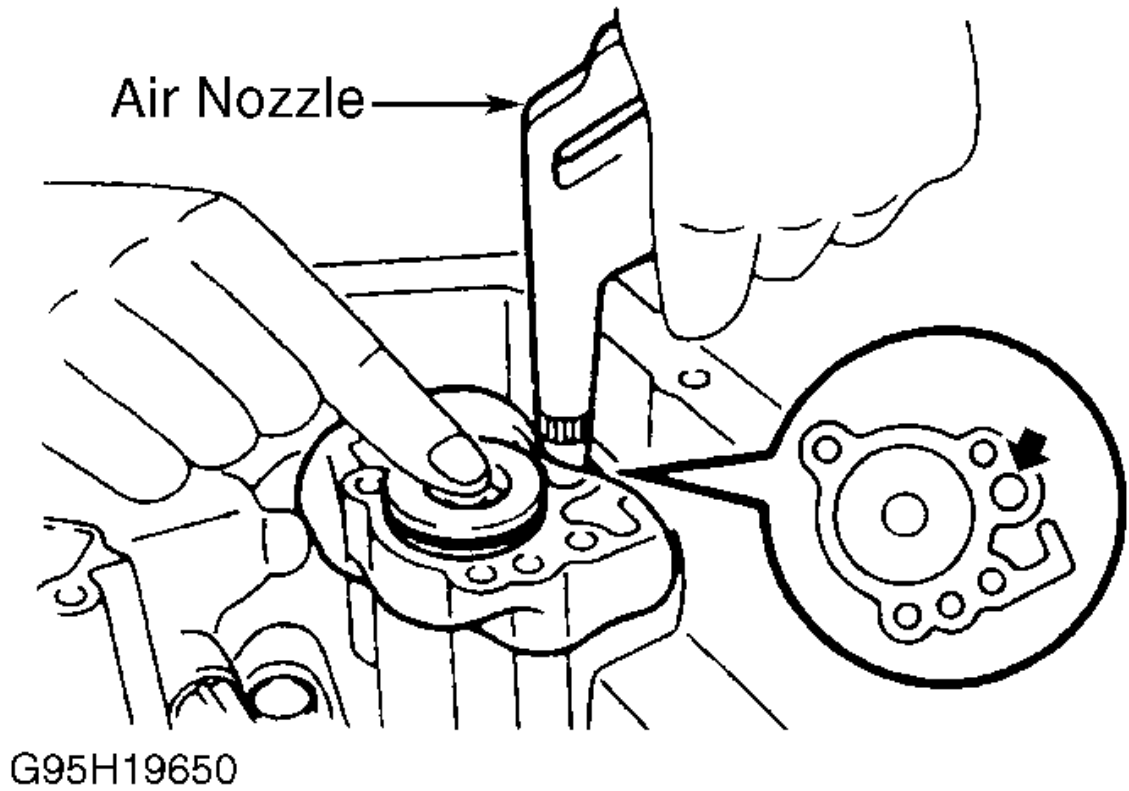
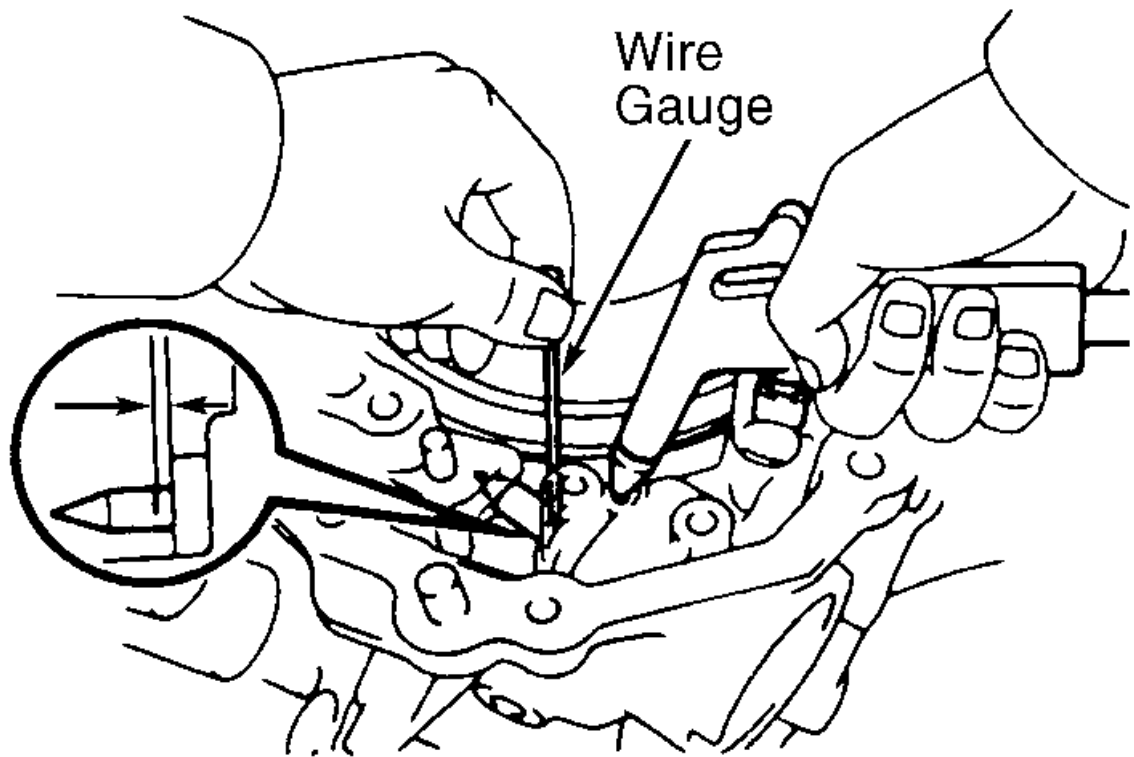


Fig. 25: Removing Underdrive Clutch Accumulator Piston & Spring
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 26: Checking 2nd Coast Brake Piston Stroke
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

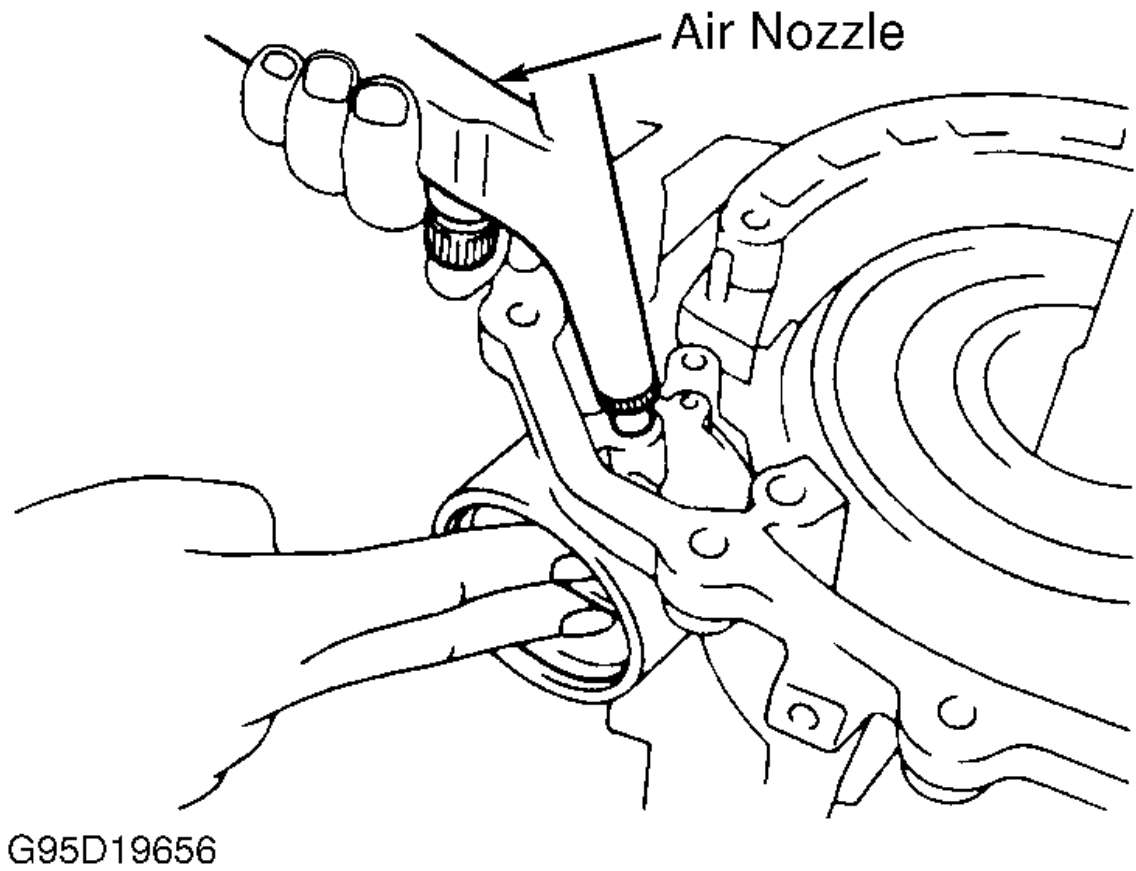
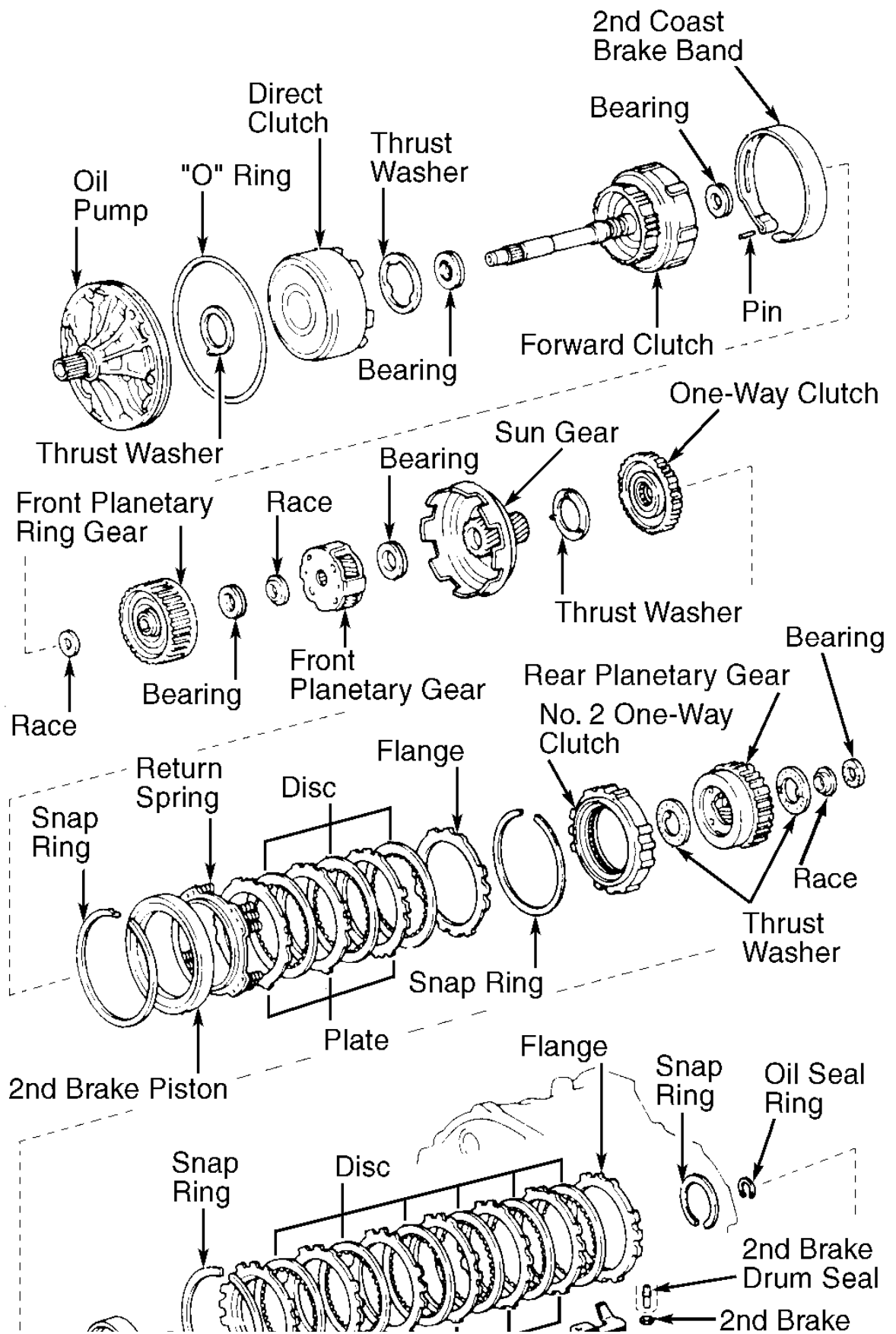
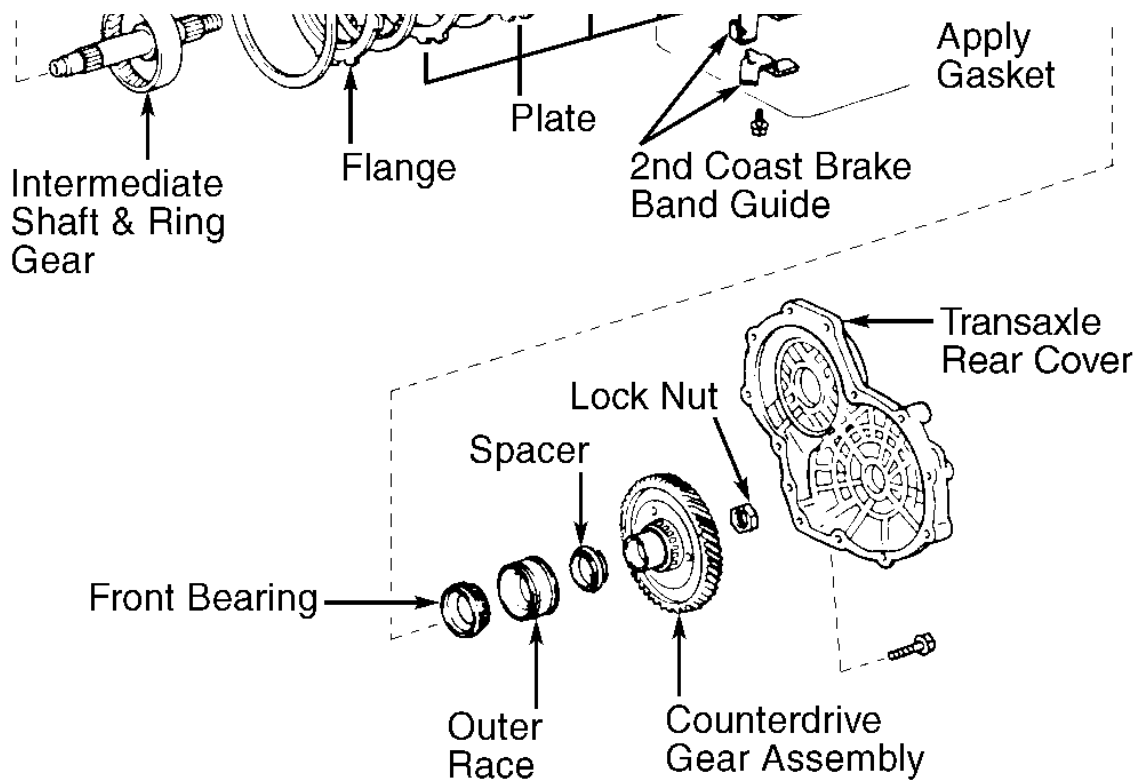


Fig. 27: Removing 2nd Coast Brake Cover
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.





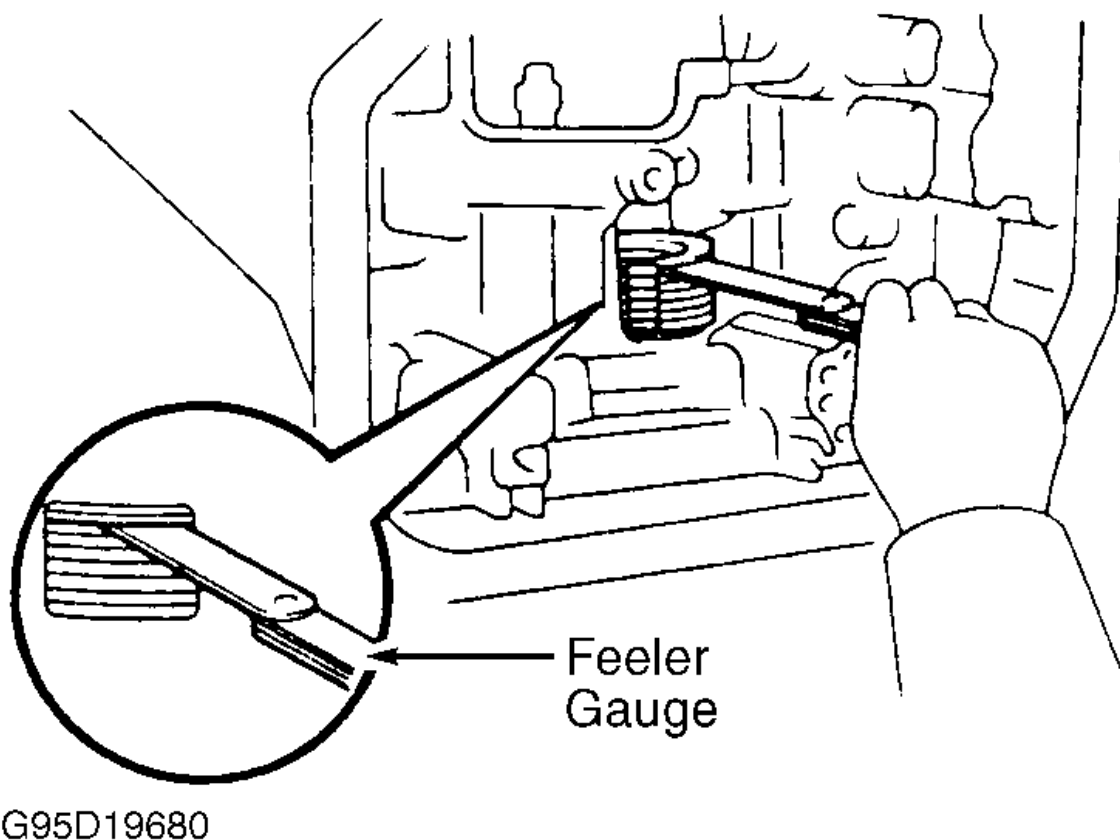
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Fig. 28: Exploded View Of Transaxle Case Internal Components (A-245E & A-246E Shown, All Others Similar)

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

9. Pull 2nd coast brake band pin and remove. Remove 2nd coast brake band. Remove front planetary ring gear. Remove race and bearing from ring gear. See [Fig. 28](#) .
10. Remove front planetary gear. Remove bearings and races from both sides of planetary gear. Remove sun gear, sun gear input drum, thrust washer, 2nd brake hub and No. 1 one-way clutch. Using compressed air, confirm 2nd brake piston operates smoothly. See [Fig. 20](#) . Remove 2nd coast brake band guide.
11. Remove 2nd brake drum retaining snap ring. Remove 2nd brake drum. Remove thrust washer and 2nd brake piston return spring. Remove plates, discs and flange. Note number and location of components. Remove No. 2 one-way clutch retaining snap ring. Remove No. 2 one-way clutch and rear planetary gear. See [Fig. 28](#) .
12. Remove thrust washers from both sides of planetary gear. Remove rear planetary ring gear with bearing and races. Using feeler gauge, measure 1st and reverse pack clearance. See [Fig. 29](#) . Clearance should be .047-.089 (1.19-2.25 mm) for 1993 A-245E models. Clearance should be .095-.125 (2.42-3.18 mm) for 1994 A-245E and A-246E models.
13. Remove flange retaining snap ring. Remove flange, plates and discs. Note number and location of components. Remove rear transaxle cover bolts. Tap rear cover using a plastic hammer. Remove cover. Using chisel, release staked area of intermediate shaft lock nut.
14. Secure counterdriven gear with appropriate holder. Remove intermediate gear lock nut. Remove intermediate shaft. Press out counterdrive gear. Using chisel, release staked area of countershaft lock nuts. Remove both lock nuts.

15. Using appropriate puller, remove counterdriven gear with thrust bearing. Remove countershaft assembly. Remove thrust bearing and race from countershaft. Remove underdrive clutch drum and anti-rattle clip. Using compressed air, confirm underdrive brake piston operates smoothly. See [Fig. 23](#) . Remove oil seal rings. Using appropriate press and adapter, carefully remove underdrive brake snap ring.
16. Remove flange, plates and discs. Note number and location of components. Remove brake return spring. Using compressed air, remove underdrive brake piston. See [Fig. 27](#) . Using appropriate compressor, gradually compress spring assembly and remove snap ring. See [Fig. 24](#) .
17. Remove return spring assembly. Apply compressed air to oil passage in transaxle case and remove 1st and reverse brake piston. See [Fig. 21](#) . If piston does not pop out, remove using needle-nose pliers.
18. Remove parking lock pawl stopper plate, torsion spring and spring guide. Remove pawl shaft clamp, shaft and lock pawl. See [Fig. 22](#) . Remove underdrive brake accumulator piston cover and gasket. Remove accumulator piston and spring.



[Fig. 29: Check 1st & Reverse Brake Clutch Pack Clearance](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COMPONENT DISASSEMBLY & REASSEMBLY

OIL PUMP

Disassembly

1. Remove race from stator shaft. Remove "O" ring and oil seal rings from oil pump body and stator shaft. Remove clutch drum thrust washer from stator shaft.
2. Mark stator shaft and oil pump body for reassembly reference. Remove stator shaft bolts. Separate stator shaft and oil pump body. Mark gear location for reassembly reference. Remove pump gears. Using screwdriver, remove front seal. See [Fig. 30](#).

Inspection

1. Note position of oil pump gears. Clean all parts with solvent. Dry parts using compressed air. Ensure oil passages are clear. Check driven gear-to-body clearance. Push driven gear against one side of oil pump. Measure clearance between driven gear and oil pump body. See [Fig. 31](#). Replace oil pump body if clearance is not within specification. See [OIL PUMP CLEARANCE SPECIFICATIONS](#).
2. Measure tip clearance between driven gear and crescent-shaped part of oil pump body. See [Fig. 32](#). Replace oil pump body if clearance is not within specification. See [OIL PUMP CLEARANCE SPECIFICATIONS](#).
3. Using feeler gauge and straightedge, measure side clearance of both gears. See [Fig. 33](#). Replace oil pump body if clearance is not within specification. See the [OIL PUMP CLEARANCE SPECIFICATIONS](#). Gears are available in 3 different thicknesses. See [DRIVE & DRIVEN GEAR THICKNESS SPECIFICATIONS](#).

DRIVE & DRIVEN GEAR THICKNESS SPECIFICATIONS

| Identifying Mark | Thickness: In. (mm) |
|------------------|-----------------------|
| A-243L | |
| A | .371-.372 (9.44-9.46) |
| B | .372-.373 (9.46-9.47) |
| C | .373-.374 (9.47-9.49) |
| A-241E & A-244E | |
| None | .422 (10.72) |
| A-245E & A-246E | |
| N/A | N/A |

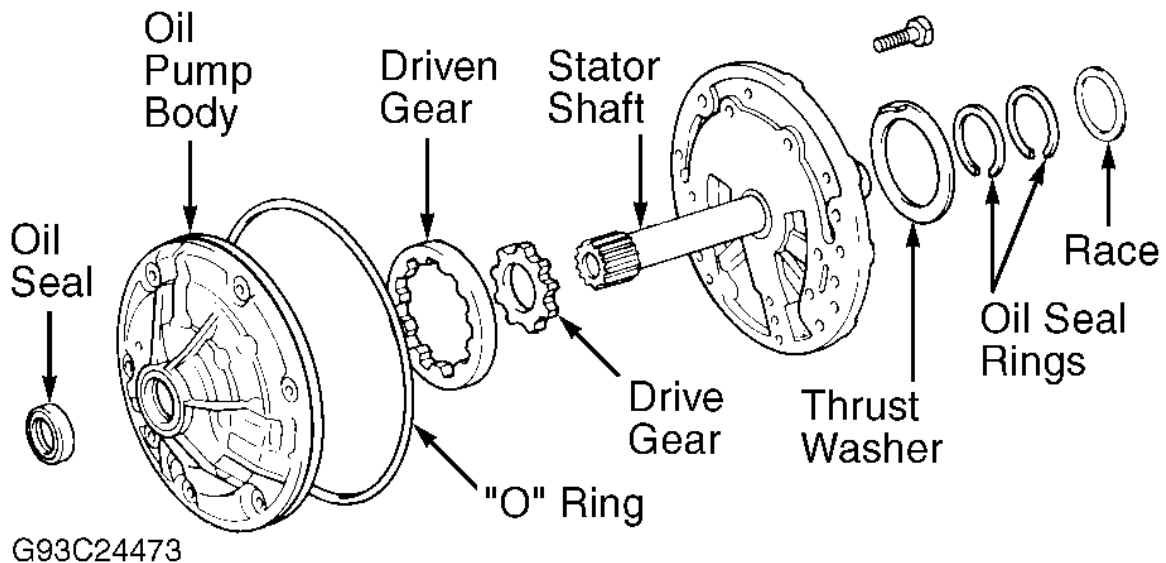
4. Using a dial indicator, measure inside diameter of oil pump body bushing. Maximum inside diameter should be 1.503" (38.18 mm). If inside diameter exceeds specification, replace oil pump body.
5. Measure inside diameter of stator shaft bushings. Maximum front side bushing inside diameter should be .849" (21.57 mm). Maximum rear side bushing inside diameter should be 1.066" (27.07 mm). If inside diameter exceeds specification, replace stator shaft.

OIL PUMP CLEARANCE SPECIFICATIONS

| Application | In. (mm) |
|-----------------------------|-------------------------|
| Driven Gear-To-Pump Body | |
| Standard | .0028-.0059 (.071-.149) |
| Maximum | .012 (.30) |
| Gear-To-Crescent | |
| A-245E (1993) - Standard | .0002-.0098 (.004-.248) |
| A-245E (1993) - Maximum | .012 (.30) |
| All Other Models - Standard | .0043-.0055 (.109-.139) |
| All Other Models - Maximum | .012 (.30) |
| Gear Side Clearance | |
| Standard | .0008-.0020 (.020-.050) |
| Maximum | .004 (.10) |

Reassembly

1. Install NEW oil seal. Seal must be even with edge of oil pump body. Coat all components with ATF. Install pump gears aligning reference marks. Install stator shaft on pump body. Align bolt holes and tighten bolts to 89 INCH lbs. (10 N.m).
2. Coat thrust washer with petroleum jelly. Install thrust washer on oil pump body. Align washer tab with oil pump body. Install oil seal rings. Use care not to over expand rings. Using screwdrivers, check drive gear for smooth rotation. Install "O" ring. Install race on stator shaft. See [Fig. 30](#) .



[Fig. 30: Exploded View Of Oil Pump Assembly](#)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

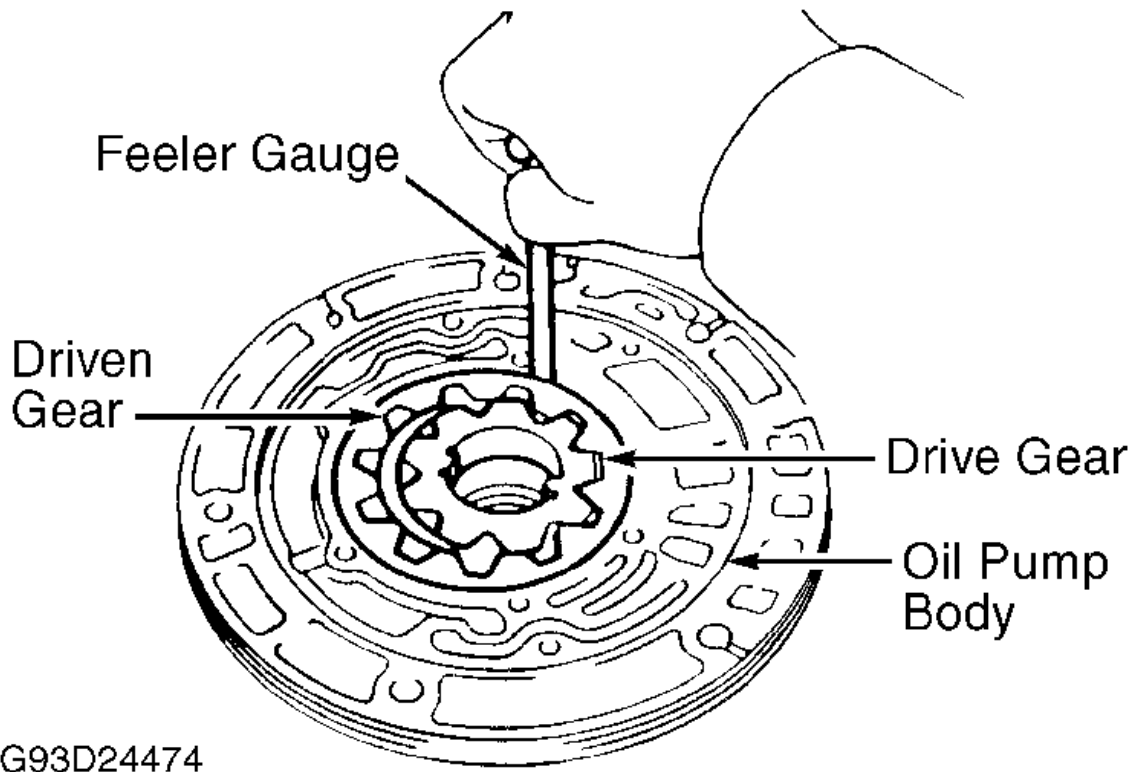


Fig. 31: Checking Oil Pump Driven Gear Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

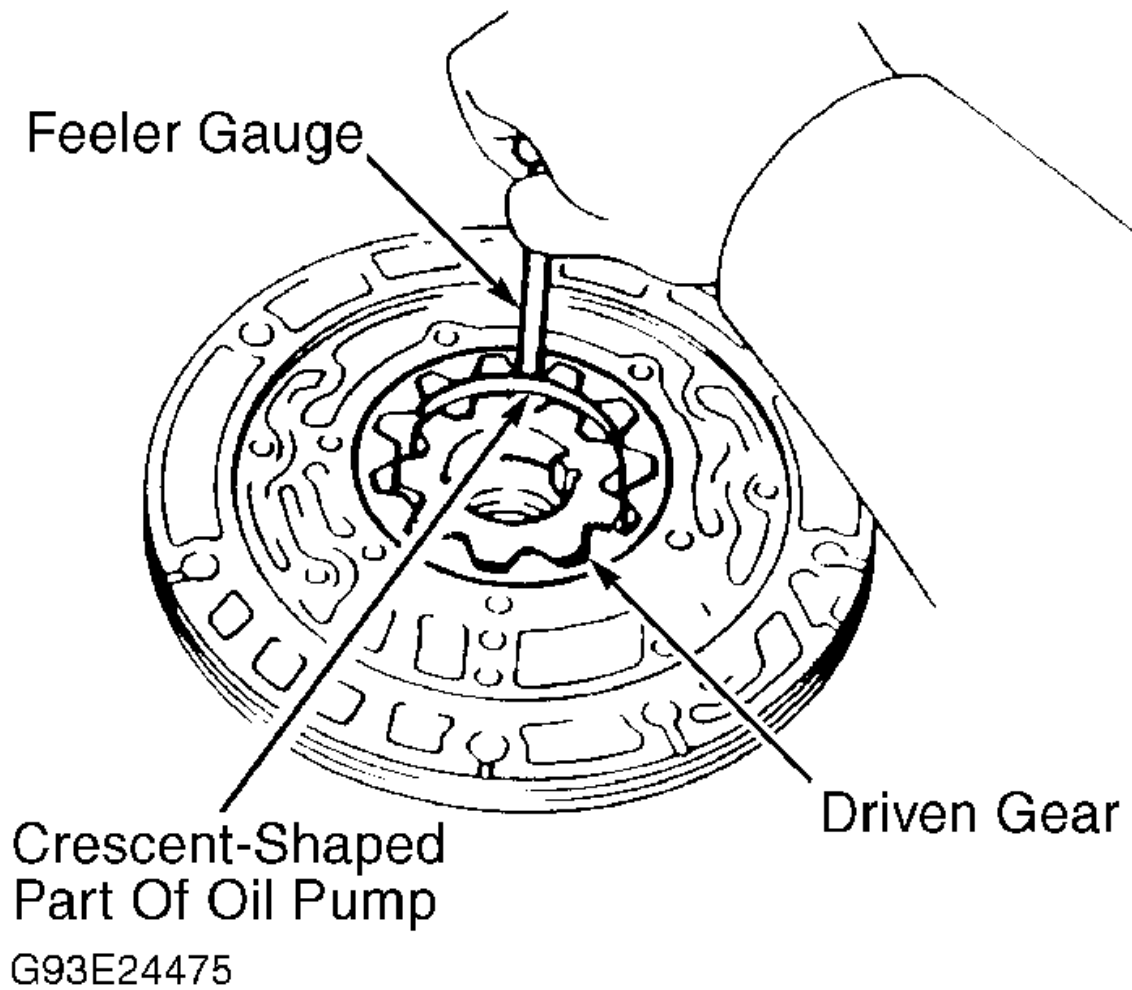


Fig. 32: Checking Oil Pump Gear Tip Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

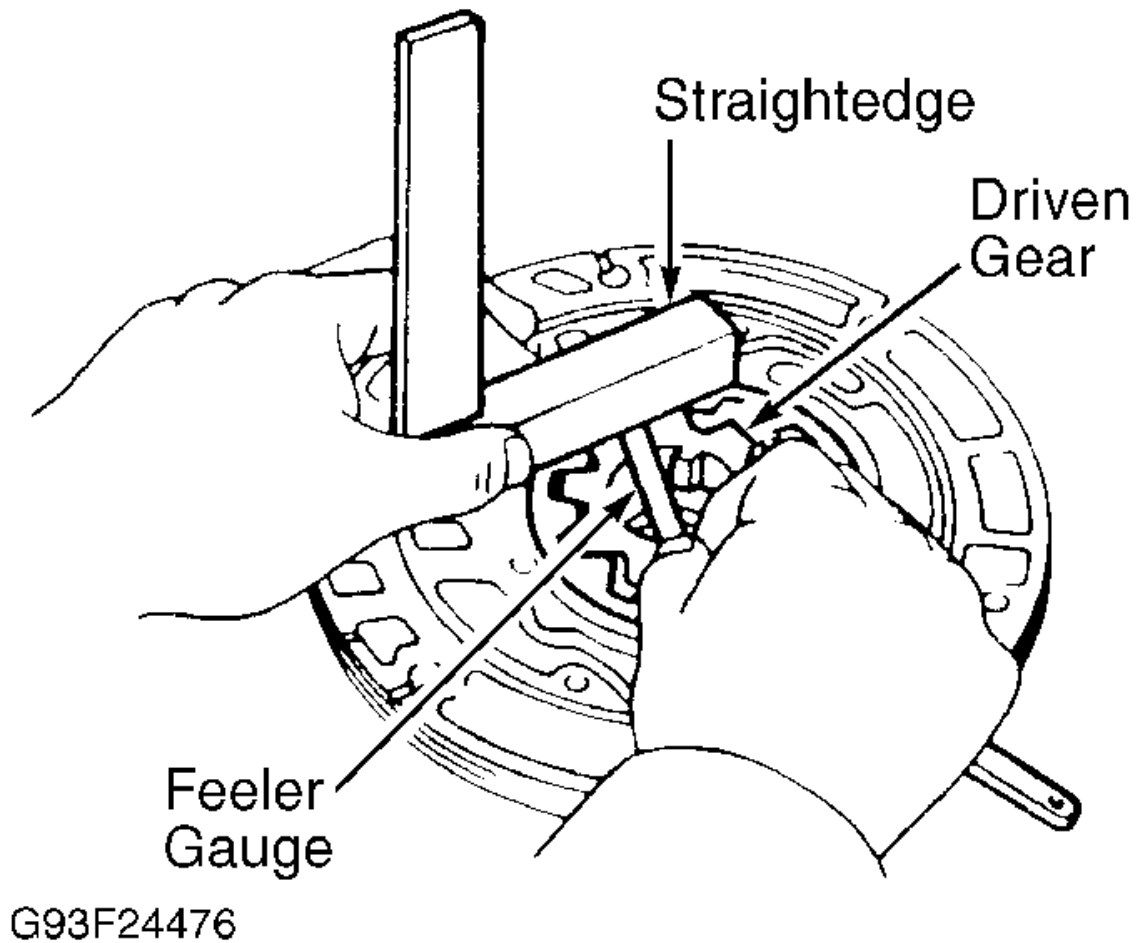


Fig. 33: Checking Oil Pump Gear Side Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DIRECT CLUTCH

Disassembly

1. Remove snap ring from direct clutch drum. Remove flange, discs and plates. Note number and location of components. See [Fig. 34](#) . Using appropriate spring compressor, compress spring retainer and springs. Remove snap ring, clutch spring compressor, spring retainer and piston return springs.
2. Install direct clutch on oil pump. Apply compressed air to oil pump oval shaped oil passage to remove piston. See [Fig. 35](#) . Remove direct clutch from oil pump. Remove clutch piston "O" rings.

Inspection

1. Clean all parts (except discs) with solvent. Dry parts using compressed air. Ensure check ball is free in piston. Apply low air pressure to small hole in piston to check for air leakage around piston valve. Inspect discs and plates for wear or burnt areas. If disc lining is peeled or discolored, replace discs as necessary. Replace all damaged components as necessary.

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

2. Measure inside diameter of direct clutch bushing. See the [DIRECT CLUTCH BUSHING SPECIFICATIONS](#) . If inside diameter exceeds specification, replace direct clutch.

DIRECT CLUTCH BUSHING SPECIFICATIONS

| Application | Diameter INCH (mm) |
|-------------------------|--------------------|
| A-243L, A-241E & A-244E | 1.853 (47.07) |
| A-245E | |
| 1993 | 1.900 (48.27) |
| 1994 | 1.898 (48.21) |
| A-246E | 1.898 (48.21) |

Reassembly

1. Install NEW "O" rings on piston and coat with ATF. Using hand pressure, press direct clutch piston into clutch drum with cup side upward. Use care not to damage "O" rings. Install piston return springs, retainer and snap ring. Compress return springs and retainer using clutch spring compressor.
2. Ensure snap ring gap does not align with spring retainer claw. Install plates and discs in reverse order of removal. Install flange with flat side facing downward. Install snap ring. Ensure snap ring gap does not align with drum cutout.
3. Install direct clutch on oil pump. Using a dial indicator, measure direct clutch piston stroke. Apply compressed air to oil pump passage and note dial indicator reading. See [Fig. 35](#) . Refer to [DIRECT CLUTCH PISTON STROKE SPECIFICATIONS](#) for stroke specification. If piston stroke is not as specified, select appropriate flange to obtain correct piston stroke. Refer to the [DIRECT CLUTCH FLANGE APPLICATION](#) for flange thicknesses.

DIRECT CLUTCH PISTON STROKE SPECIFICATIONS

| Application | In. (mm) |
|-----------------|-----------------------|
| A-241E | .044-.058 (1.11-1.47) |
| A-243L & A-244E | .064-.078 (1.63-1.97) |
| A-245E & A-246E | .044-.060 (1.12-1.52) |

DIRECT CLUTCH FLANGE APPLICATION

| Application | In. (mm) |
|-----------------|---|
| A-241E | .102 (2.60) & .118 (3.00) |
| A-243L & A-244E | .102 (2.60), .110 (2.80) & .118 (3.00) |
| A-245E & A-246E | .102 (2.60), .110 (2.80), .118 (3.00) & .126 (3.20) |

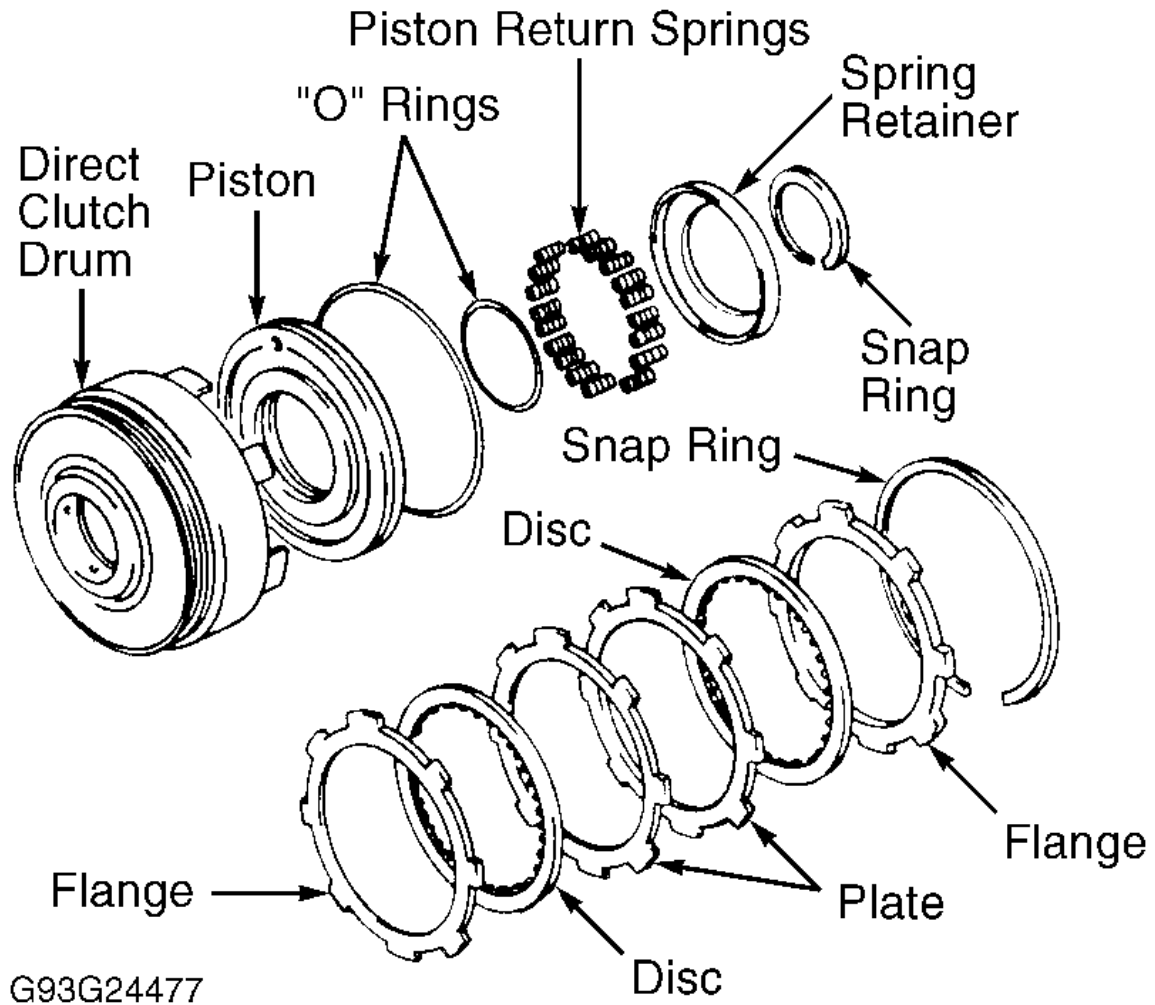
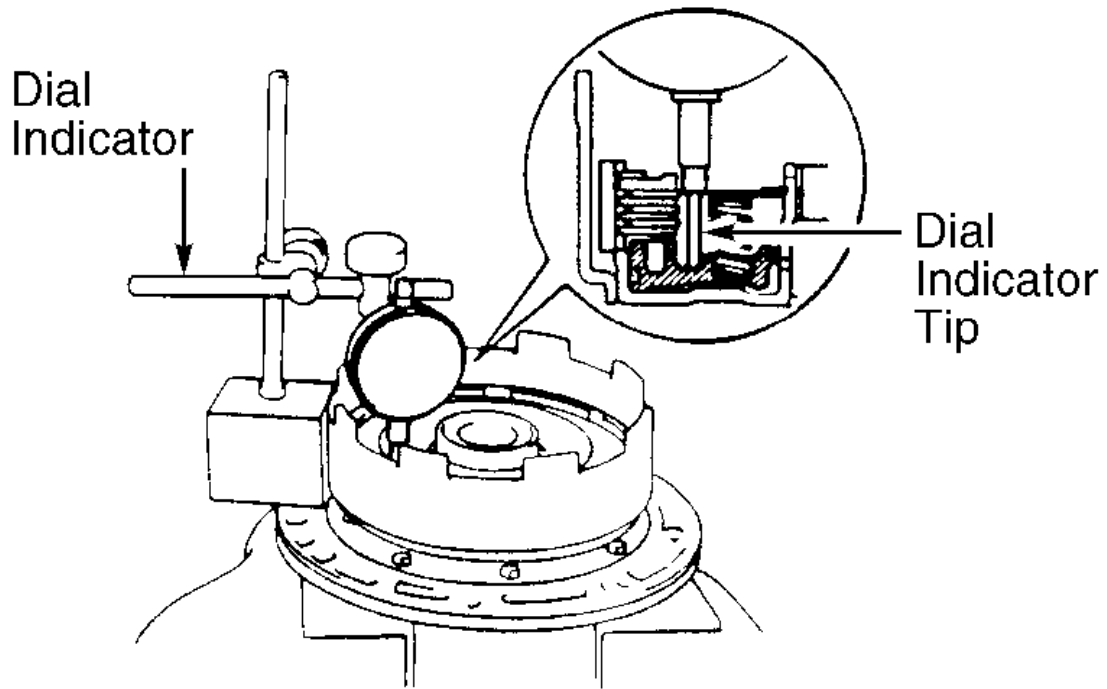
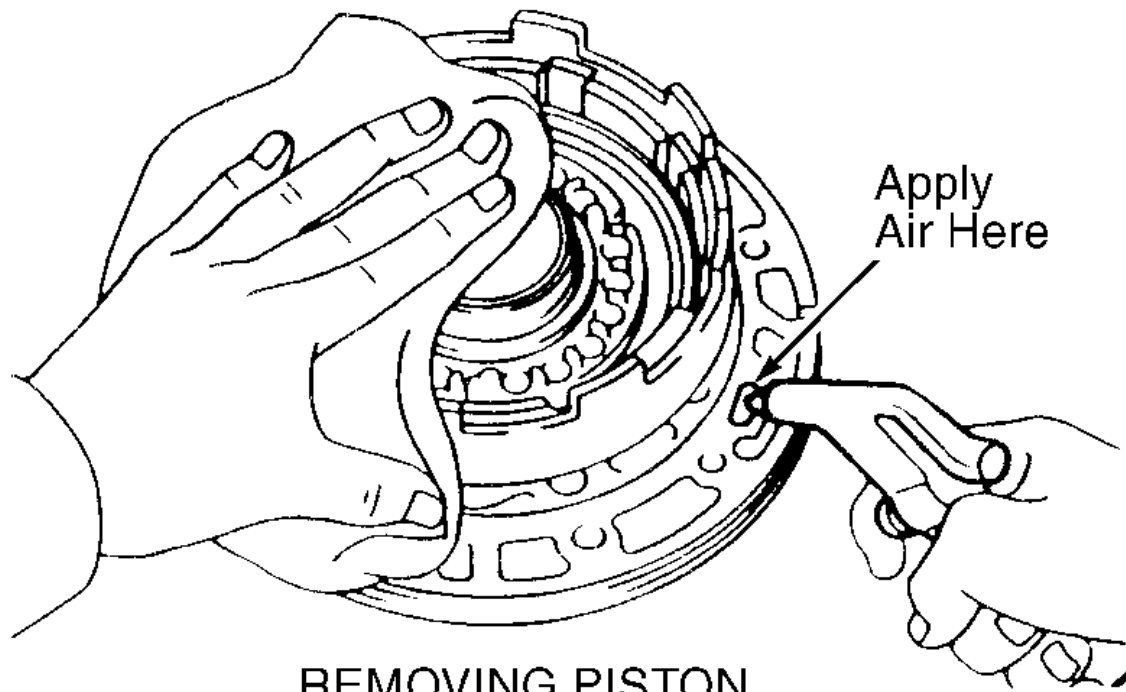


Fig. 34: Exploded View Of Direct Clutch Assembly (Typical)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



CHECKING PISTON TRAVEL



REMOVING PISTON

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

FORWARD CLUTCH 

Disassembly 

1. Remove thrust washer. Remove thrust bearings and races from both sides of clutch. Remove clutch drum snap ring. Remove flange, discs and plates. Note number and location of components. See [Fig. 36](#) . Using appropriate spring compressor, compress spring retainer and return springs.
2. Remove snap ring. Remove spring compressor, spring retainer and return springs. To remove piston from clutch drum, apply compressed air to oil passage (hole nearest piston) on rear of forward clutch shaft. Remove "O" rings from piston. If necessary, remove oil seal rings.

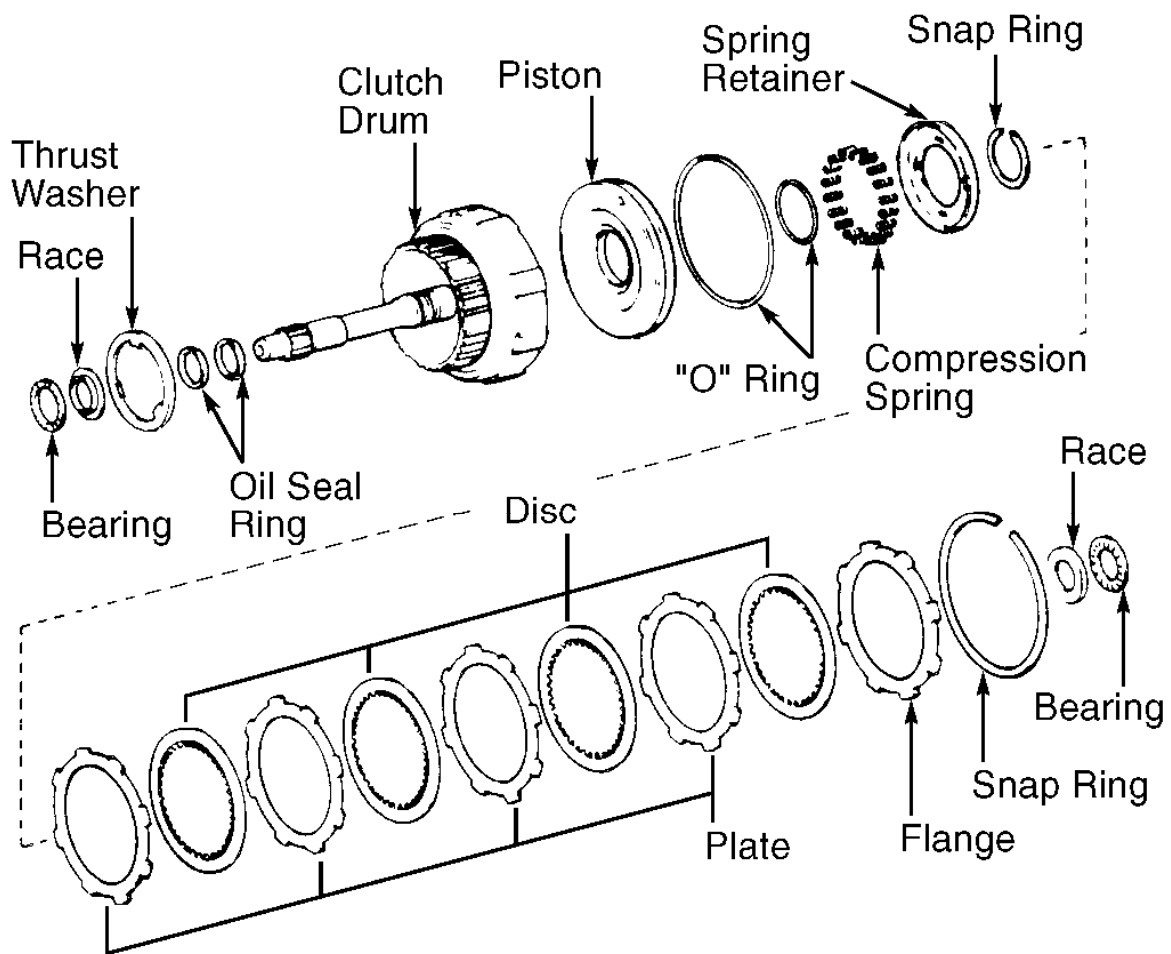
Inspection 

Clean all parts (except discs) with solvent. Dry parts using compressed air. Ensure check ball is free in piston. Apply low air pressure to small hole in piston to check for air leakage around piston valve. Inspect discs and plates for wear or burnt areas. If disc lining is peeled or discolored, replace discs as necessary. Replace all damaged components as necessary.

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

Reassembly 

1. Install NEW oil seal rings (if necessary). **DO NOT** over expand seal rings. Install NEW "O" rings on piston and coat with ATF. Using hand pressure, install piston in clutch drum with cup side upward. Use care not to damage "O" rings. Install piston return springs, retainer and snap ring. Compress return springs and retainer using clutch spring compressor. Install snap ring so ring gap does not align with spring retainer claw.
2. Install plate and disc in reverse order of removal. Install flange with flat side facing inward. Install snap ring. Ensure end gap of snap ring is not aligned with drum cutout. Position dial indicator on piston flange. Measure piston stroke by applying compressed air to oil passage (hole nearest piston) on rear of forward clutch shaft and note dial indicator reading.
3. Piston stroke for A-244E transaxle should be .044-.058" (1.11-1.47 mm). Piston stroke for all other transaxles should be .056-.071" (1.42-1.81 mm). If piston stroke is not as specified, select appropriate flange to obtain correct piston stroke.
4. Flanges are available in thicknesses of .110" (2.80 mm) to .126" (3.20 mm) in .20 mm increments. Also available are .132" (3.37 mm) and .141" (3.60 mm) flanges. Coat thrust washer, races and bearings with petroleum jelly and install components. See [Fig. 36](#) .



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Fig. 36: Exploded View Of Forward Clutch

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

FRONT PLANETARY GEAR

Disassembly

1. Check No. 1 one-way clutch operation. Hold sun gear (shell) and turn hub. Hub should rotate freely clockwise and lock when turned counterclockwise. See [Fig. 37](#) . Remove 2nd brake hub and No. 1 one-way clutch from sun gear.
2. Remove thrust washer from sun gear input drum. Remove snap ring. Remove sun gear input drum. Remove shaft snap ring from sun gear. Remove one-way clutch retainer if clutch requires replacement. Remove one-way clutch from hub. See [Fig. 38](#) .

Inspection



1. Clean all parts with solvent. Dry parts using compressed air. Check thrust bearings, races and one-way clutch for wear or damage. Replace if necessary.
2. Measure inside diameter of sun gear flange bushing. Standard inside diameter should be .867-.868" (22.03-22.05 mm). Maximum inside diameter is .870" (22.10 mm). If inside diameter exceeds specification, replace flange.
3. Measure planetary pinion gear thrust clearance. Standard clearance should be .008-.020" (.20-.50 mm). Maximum clearance is .020" (.50 mm). If clearance exceeds specification, replace planetary gear. See [Fig. 39](#).
4. Measure inside diameter of ring gear flange bushing. Standard inside diameter should be .749-.750" (19.03-19.05 mm). If inside diameter exceeds specification, replace flange.

Reassembly



Install shaft snap ring to sun gear. Install sun gear to drum. Install snap ring to drum. Install thrust washer to sun gear input drum. See [Fig. 38](#). Rotate hub clockwise. Install one-way clutch and 2nd brake hub. Check one-way clutch operation. Hold sun gear and rotate hub. Hub should rotate freely clockwise and lock counterclockwise.

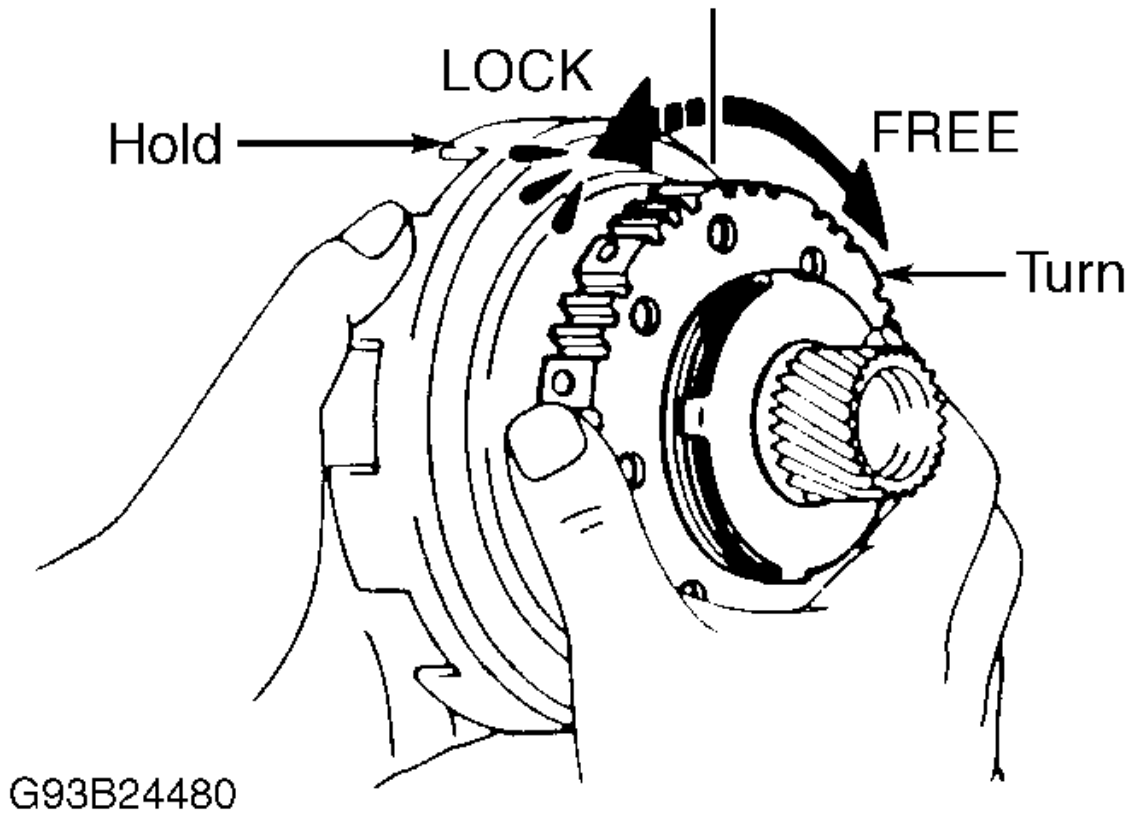


Fig. 37: Checking No. 1 One-Way Clutch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

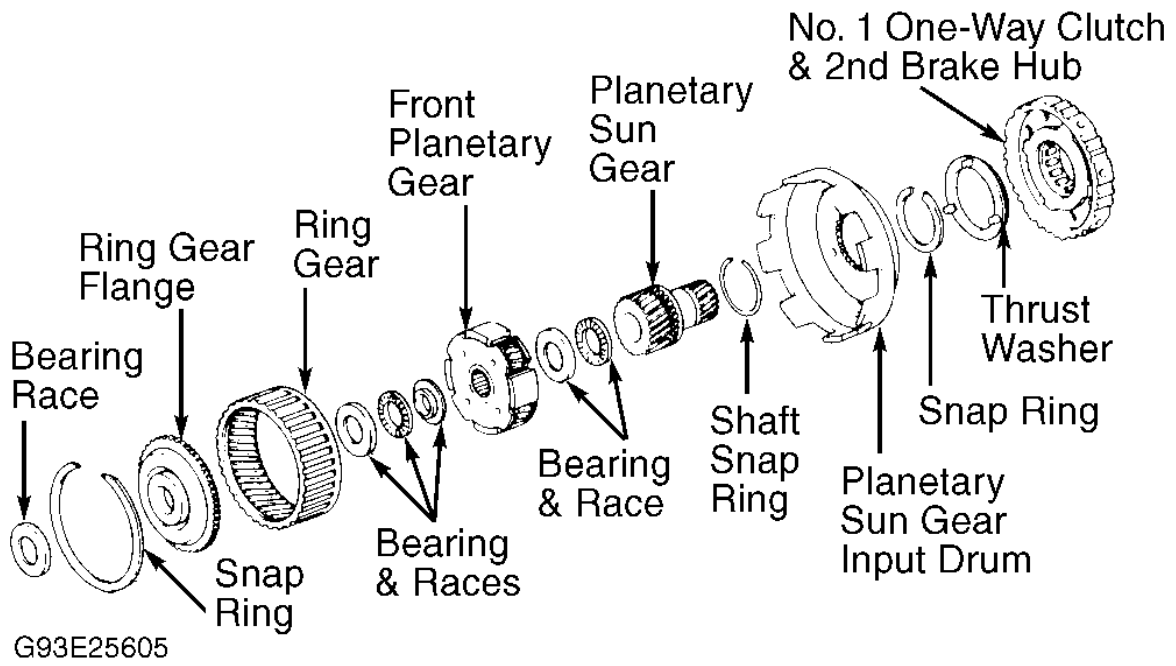


Fig. 38: Exploded View Of Front Planetary Gear
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

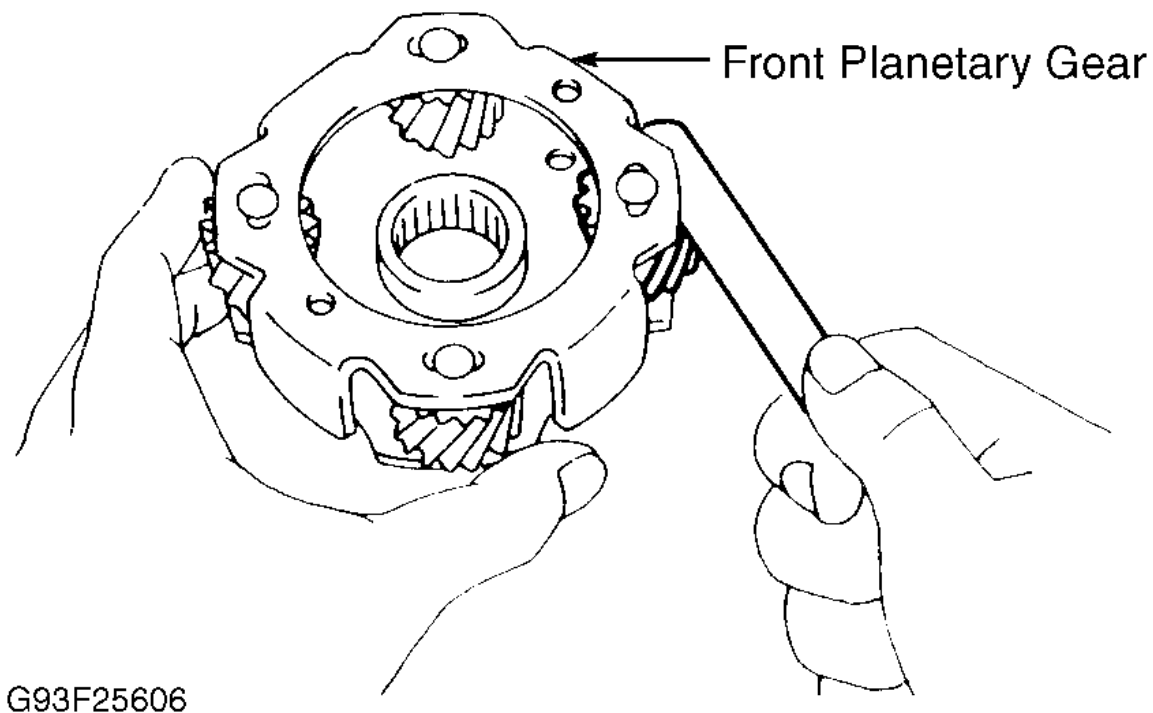


Fig. 39: Measuring Planetary Gear Thrust Clearance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REAR PLANETARY GEAR

Disassembly

1. Check No. 2 one-way clutch operation. Hold outer race and rotate hub. Hub should rotate freely counterclockwise and lock clockwise. See [Fig. 40](#) .
2. Remove thrust washers from both sides of planetary gear. Separate No. 2 one-way clutch and planetary gear. Remove snap rings and side retainers from No. 2 one-way clutch. Note position of No. 2 one-way clutch and remove from outer race. See [Fig. 41](#) .

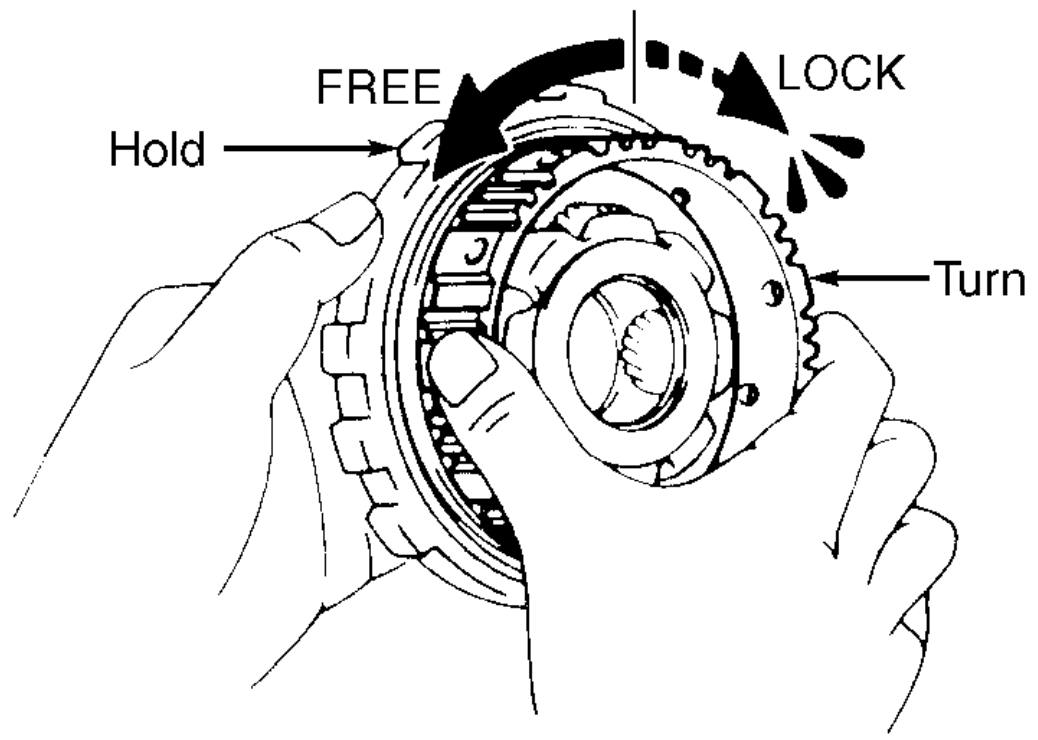
Inspection

Clean all parts with solvent. Dry parts using compressed air. Check thrust washers and one-way clutch for wear or damage. Replace damaged parts as necessary.

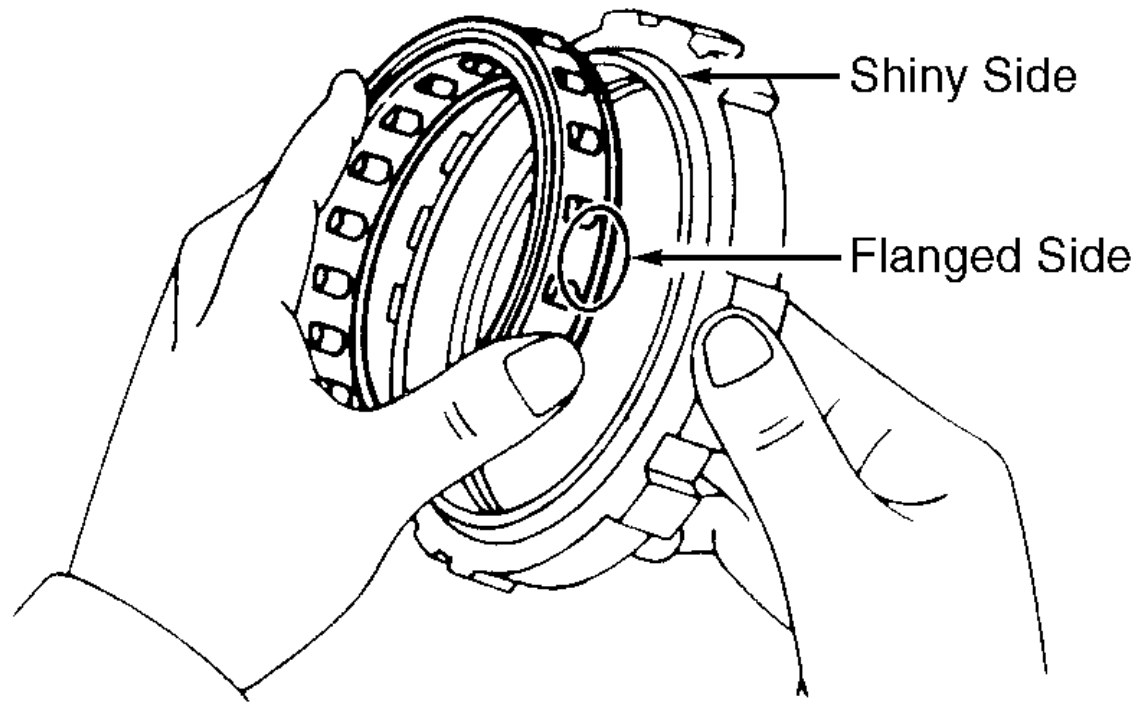
Reassembly

1. Coat all parts with ATF. Install one-way clutch into outer race. Flanged side should face inward away from shiny side of outer race. See [Fig. 40](#) . Install side retainers and snap rings.

2. Install planetary gear into one-way clutch. Planetary gear inner race should face inward from back side of outer race. Check operation of one-way clutch. See [Fig. 40](#) . Coat thrust washers with petroleum jelly. Install thrust washers on both sides of gear, aligning thrust washer tab with hollow area in gear.



CHECKING OPERATION



INSTALLING CLUTCH

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Fig. 40: Installing & Checking No. 2 One-Way Clutch
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

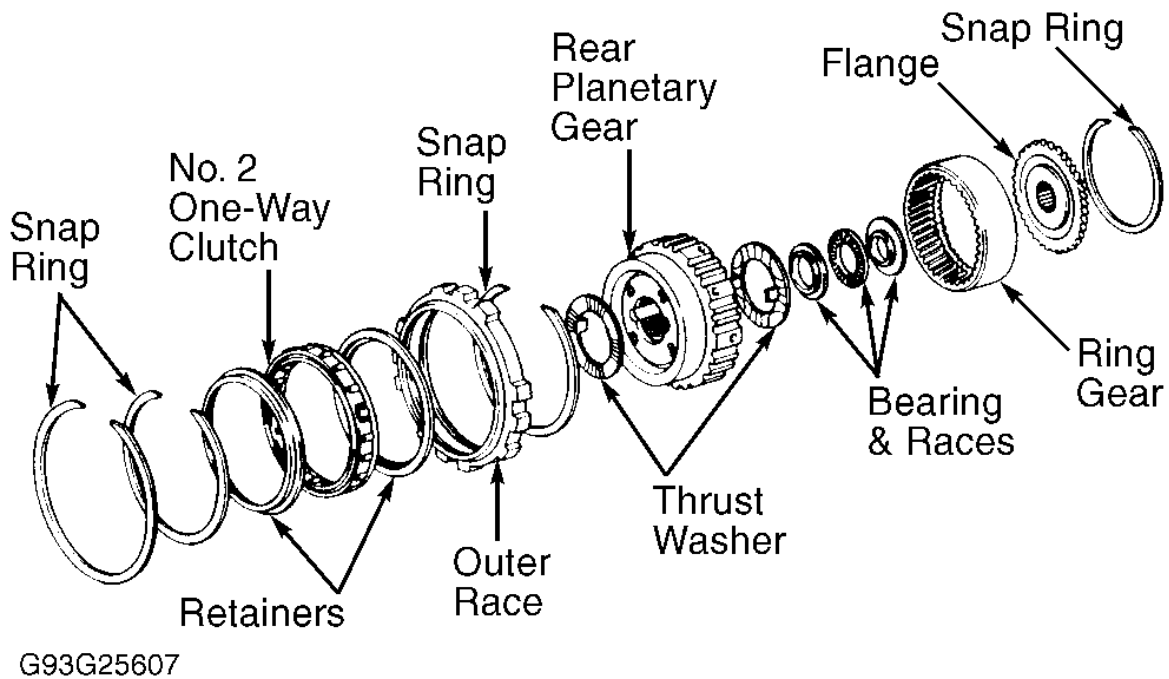


Fig. 41: Exploded View Of Rear Planetary Gear
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

1ST & REVERSE BRAKE PISTON

Disassembly

1. Using appropriate compressor, compress springs. See [Fig. 24](#) . Remove spring retainer snap ring and compressor.
2. Remove piston return spring assembly. Apply compressed air to oil passage in transaxle case to remove piston. See [Fig. 21](#) . Remove piston "O" rings.

Inspection

Clean all parts with solvent. Dry parts using compressed air. Inspect piston for roughness or damage. Replace as necessary.

Reassembly

1. Install NEW "O" rings on piston and coat with ATF. Install piston in transaxle case with spring seats facing upward. Install piston return spring assembly and snap ring in place. See [Fig. 42](#) .
2. Using clutch spring compressor, compress piston return springs. Avoid bending spring retainer or damaging transaxle case by overtightening compressor. Push snap ring into place with fingers.
3. Ensure snap ring is fully seated and centered by spring retainer lugs. Ensure snap ring end gap is not aligned with cutouts. Remove spring compressor.

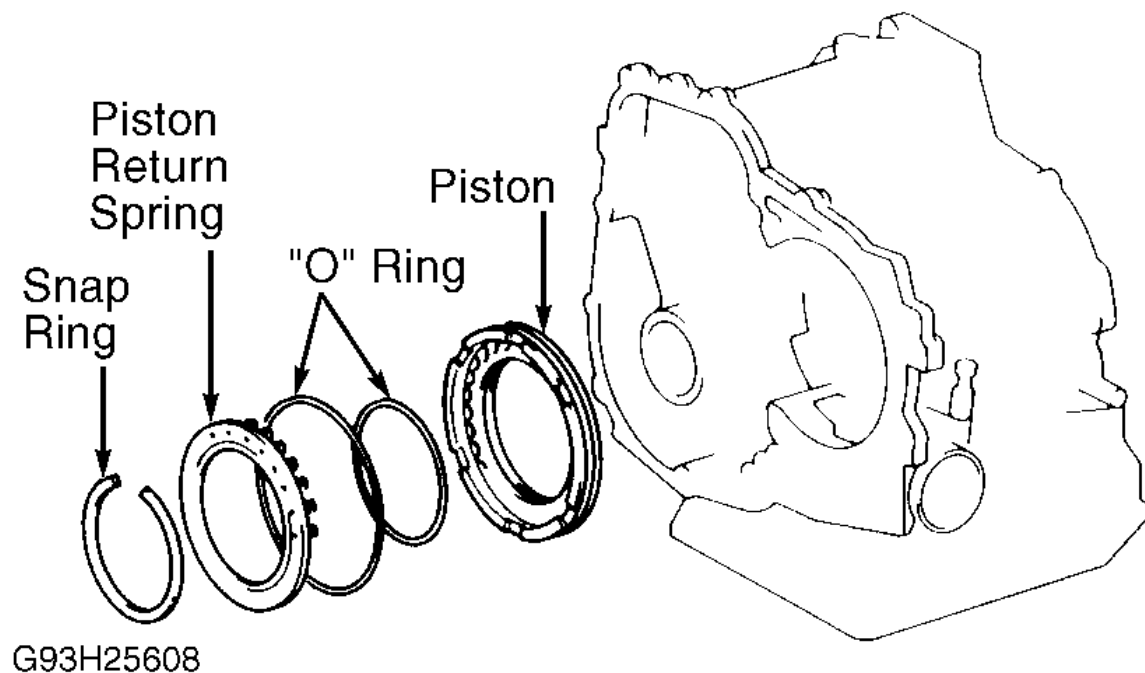


Fig. 42: Exploded View Of 1st & Reverse Brake Piston

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

2ND COAST BRAKE

Disassembly

1. Prior to disassembly, check brake piston stroke. Apply paint to piston rod at point rod meets transaxle case. Apply compressed air to oil passage and measure piston stroke using appropriate wire gauge set. Piston stroke should be .059-.118" (1.50-3.00 mm). See [Fig. 17](#) and [Fig. 26](#) .
2. If piston stroke exceeds specification, check brake band. If brake band is serviceable but piston rod stroke is not within specification, select NEW piston rod. Piston rod is available in lengths of 2.811" (71.40 mm) and 2.870" (72.90 mm).

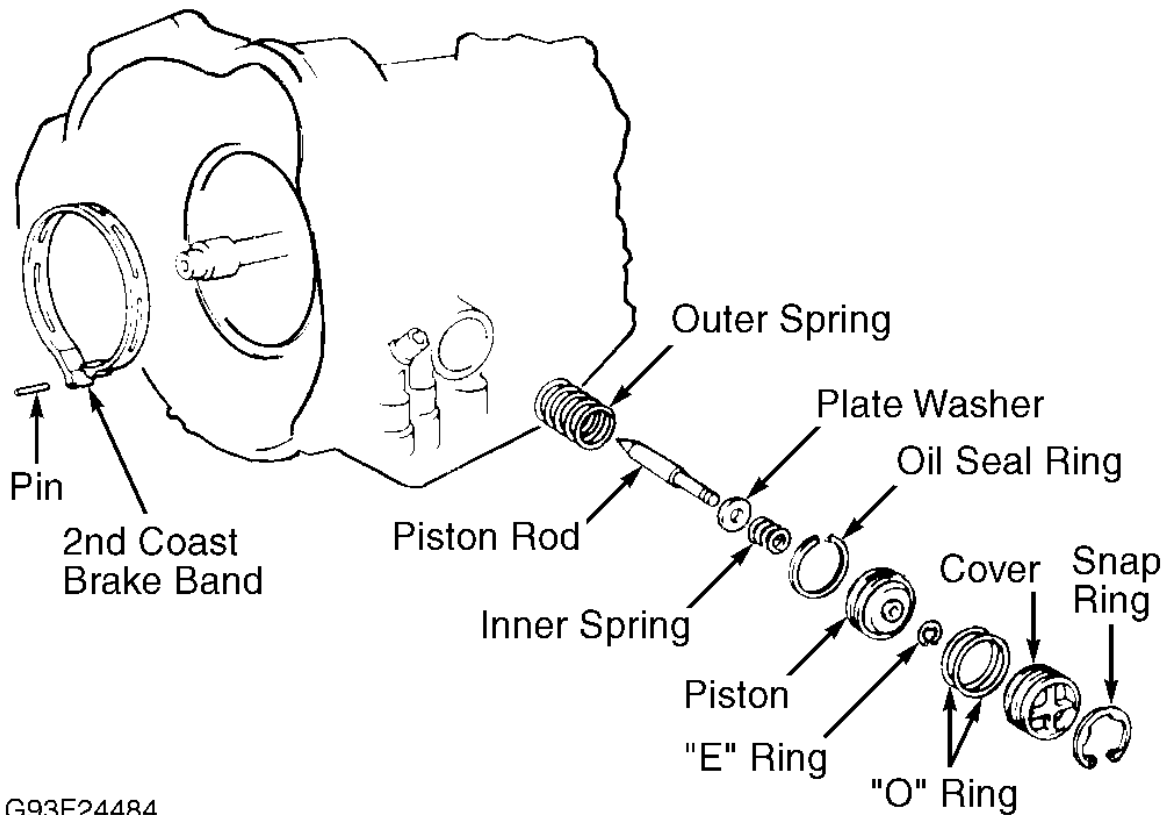
3. Remove oil seal ring from piston. Remove "E" ring while pushing piston with needle-nose pliers. Remove spring, washer and piston rod. See [Fig. 43](#).

Inspection

Replace brake band if lining is peeled or discolored or printed numbers are defaced. Before assembling new band, soak in ATF for 15 minutes.

Reassembly

Install washer and spring to piston rod. Install "E" ring. Install oil seal ring. **DO NOT** expand oil seal ring ends more than necessary for installation. See [Fig. 43](#).

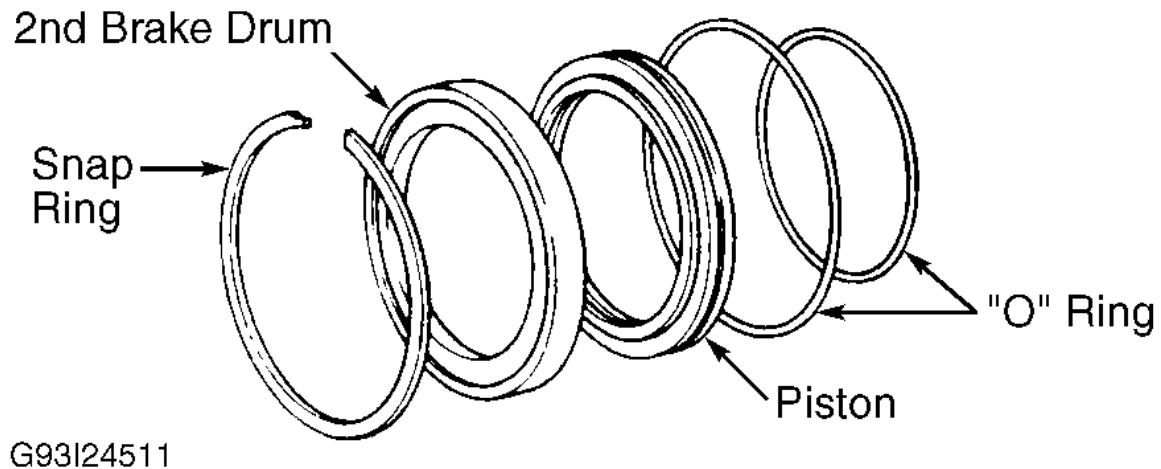


[Fig. 43: Exploded View Of 2nd Coast Brake](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2ND BRAKE PISTON

Disassembly & Reassembly

Apply compressed air to oil passage and remove 2nd brake piston. See [Fig. 20](#) . Remove "O" rings from piston. Coat NEW "O" rings with ATF and install. Carefully press 2nd brake piston into 2nd brake drum. See [Fig. 44](#) .

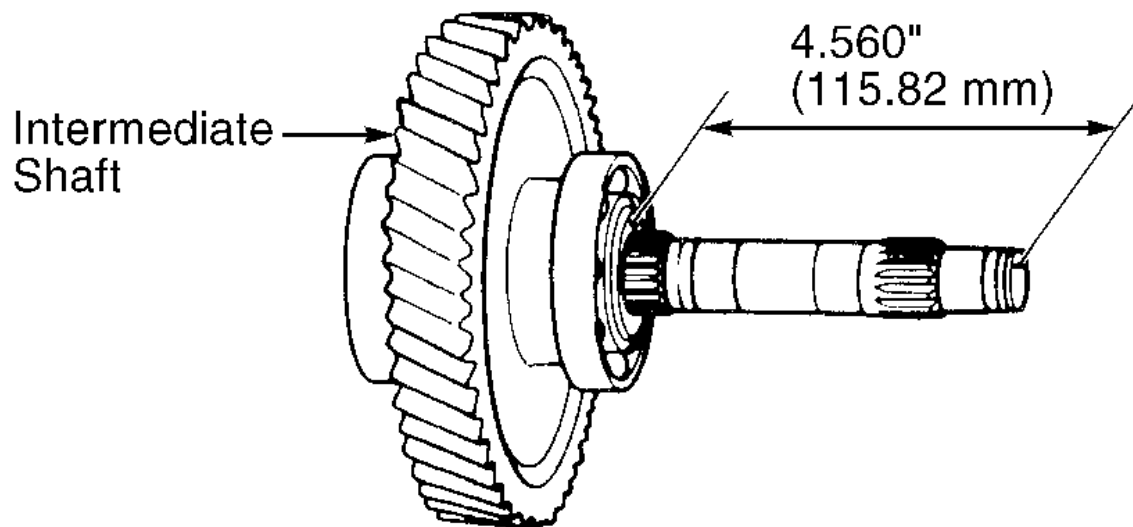


[Fig. 44: Exploded View Of 2nd Brake Piston](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INTERMEDIATE SHAFT

Disassembly & Reassembly (A-243L, A-241E & A-244E Only)

Using appropriate puller, press intermediate shaft bearings from shaft. Install intermediate shaft bearings using proper puller and press. Ensure gear flange end to intermediate shaft end measurement is 4.560" (115.82 mm). See [Fig. 45](#) .



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Fig. 45: Checking Intermediate Shaft Gear Flange
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

COUNTERSHAFT ASSEMBLY

Disassembly

1. Remove planetary sun gear from countershaft. Remove snap ring from sun gear and countershaft assembly. Remove underdrive planetary gear, thrust bearing and race. See [Fig. 46](#).
2. Remove drive pinion with output flange, outer bearing, race and spacer. Note thickness and size of bearing race. Remove ring gear retaining snap ring. Remove ring gear from countershaft.
3. Remove remaining bearing from countershaft. Remove outer bearing race from drive pinion using a brass punch and hammer. Note size of bearing and bearing race.

Inspection

1. Clean all parts with solvent. Dry parts using compressed air. Inspect bearings, races, thrust bearing and race, drive pinion and gears for wear or damage. Replace components as necessary.
2. Measure inside diameter of planetary sun gear bushing. Standard diameter should be 1.173-1.174" (29.80-29.83 mm). Maximum inside diameter is 1.176" (29.87 mm). If clearance exceeds specification, replace planetary sun gear.

3. Measure planetary pinion gear thrust clearance. Standard clearance should be .008-.020" (.20-.50 mm). See [Fig. 39](#) . If clearance exceeds specification, replace planetary gear assembly.

Reassembly

1. Press bearing of thick inner race on countershaft. Install ring gear and snap ring to countershaft. Install bearing outer races to drive pinion. Press thick bearing race into flange side of drive pinion. Using adapters, press thin bearing race on remaining side of drive pinion. See [Fig. 46](#) .
2. Install NEW spacer on countershaft. Install drive pinion on countershaft. Using bearing installer, install remaining countershaft bearing. Ensure clearance exists between output flange and bearing. Install inner race.
3. Temporarily install counterdriven gear on countershaft. Secure counterdriven gear. Install NEW lock nut. **DO NOT** use old lock nut. Countershaft bearing preload must be checked.
4. Tighten NEW lock nut using torque wrench. Tighten lock nut to 130-159 ft. lbs. (177-216 N.m) for all other transaxles.
5. Using Countershaft Adapter (09351-32170) and a spring scale, measure starting torque of countershaft. Before measuring starting torque, turn countershaft firmly to seat bearing. Starting torque should be 2.6-4.4 lbs. (1.2-2.0 kg). Replace spacer if starting torque exceeds specification. Recheck starting torque. See [Fig. 47](#) .
6. Using a punch and hammer, stake lock nut. Remove counterdriven gear. Install thrust bearing and race "H". See [Fig. 88](#) . Install underdrive planetary gear and snap ring. Install snap ring to sun gear. Install planetary sun gear to countershaft. See [Fig. 46](#) .

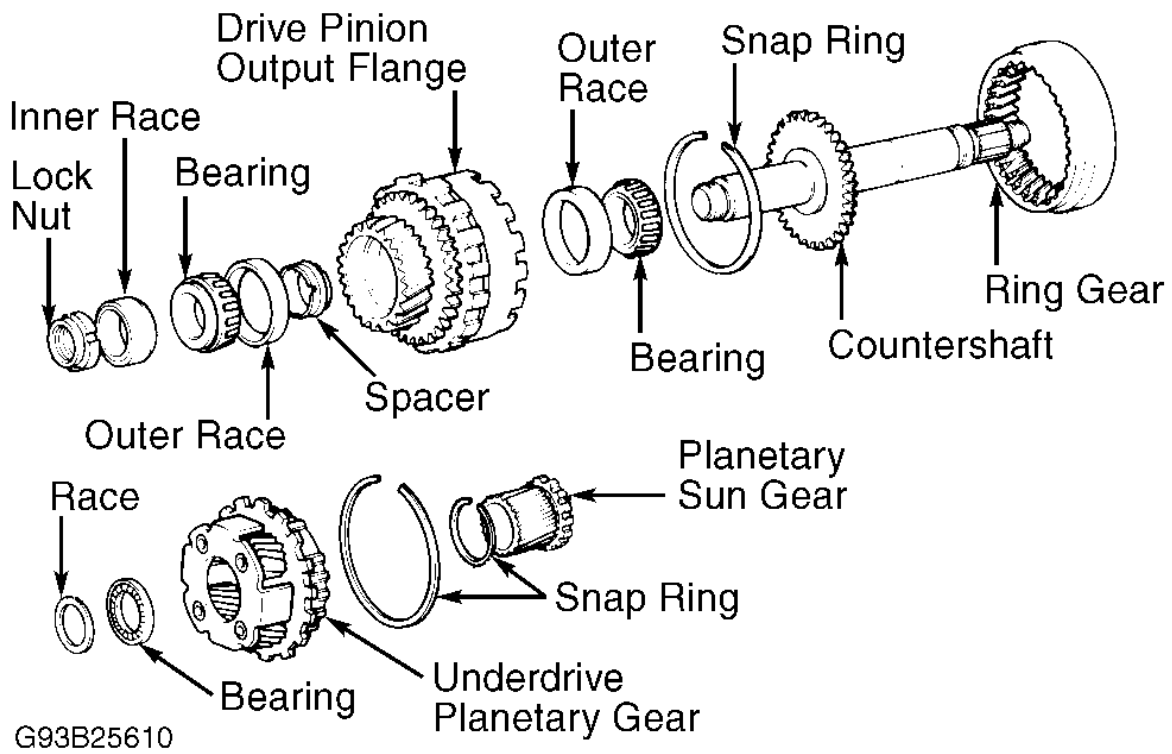


Fig. 46: Exploded View Of Countershaft Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

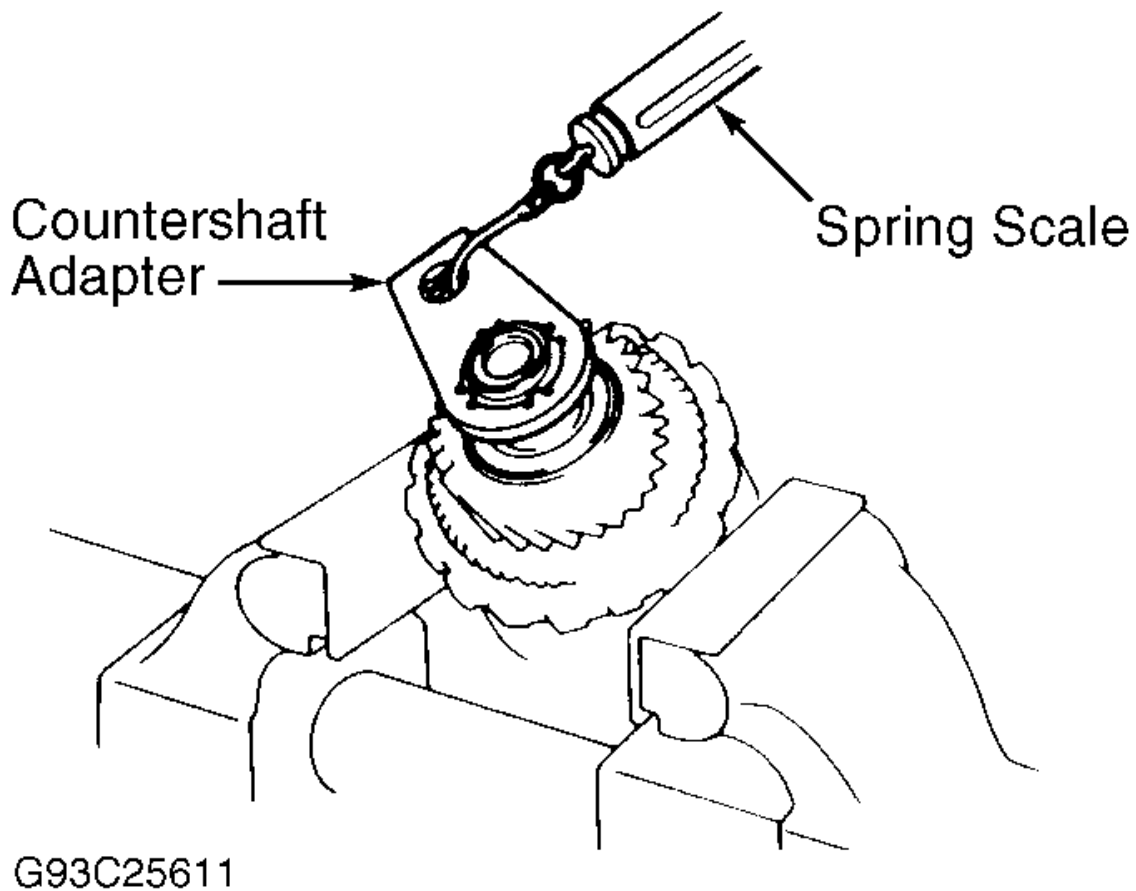


Fig. 47: Measuring Countershaft Torque

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

UNDERDRIVE CLUTCH & NO. 3 ONE-WAY CLUTCH

Disassembly

1. Remove one-way clutch and thrust washer from underdrive clutch drum. Remove snap ring from underdrive clutch drum. See [Fig. 48](#) . Remove flange, discs and plates from clutch drum. Note number and location of components. Using appropriate spring compressor, compress return spring plate.
2. Remove snap ring. Remove return spring and spring plate. Install oil seal rings to transaxle case (if necessary). Install underdrive clutch to transaxle case. Apply compressed air to oil passage in transaxle case to remove piston. See [Fig. 23](#) . Remove "O" rings from piston.

Inspection

1. Clean all parts (except discs) with solvent. Dry parts using compressed air. Inspect discs and plates for wear or burnt areas. If discs are peeled or discolored, replace discs as necessary.
2. Ensure check ball is free in piston. Apply low air pressure to small hole in piston to check for air leakage around piston valve. Inspect discs and plates for wear or burnt areas. Replace all damaged components.

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

3. Measure inside diameter of underdrive clutch drum bushing. Standard diameter for front side of bushing should be 1.831-1.832" (46.50-46.53 mm). Standard diameter for rear side of bushing should be 2.165-2.167" (55.00-55.03 mm). Maximum inside diameter should be 1.833" (46.57 mm) for front side and 2.169" (55.08 mm) for rear side. Replace underdrive clutch drum if not within specification.

Reassembly

1. Coat "O" rings with ATF. Install "O" rings on piston. Carefully install underdrive clutch into clutch drum. Install spring plate and return spring to underdrive clutch. Compress return spring and install snap ring.
2. Ensure snap ring end does not align with spring retainer claw. Install plates and discs in reverse order of disassembly, ending with disc. Install flange with round end facing inward. Install snap ring.
3. Measure underdrive clutch piston stroke. Mount dial indicator so tip rests on underdrive clutch assembly. Apply air pressure to activate piston. See **UNDERDRIVE CLUTCH PISTON STROKE SPECIFICATIONS** for stroke specifications. Also, see [Fig. 23](#) . If piston stroke is not within specification, replace flange.

UNDERDRIVE CLUTCH PISTON STROKE SPECIFICATIONS

| Application | In. (mm) |
|--------------------|-----------------------|
| A-243L | .059-.073 (1.50-1.86) |
| A-241E & A-244E | .048-.061 (1.21-1.55) |
| A-245E & A-246E | .059-.075 (1.50-1.90) |

4. For A-241E and A-243L transaxle, flange is available in thicknesses of .091" (2.30 mm), .098" (2.50 mm) and .106" (2.70 mm). For all other transaxles, flange is available in thicknesses of .080" (2.04 mm), .094" (2.40 mm) and .098" (2.50 mm). Install appropriate flange to obtain correct clearance.
5. Install thrust washer on underdrive clutch drum. Install underdrive one-way clutch on underdrive clutch drum. Retainer claw must be facing upward. Check operation of one-way clutch. Hold clutch drum and rotate one-way clutch. One-way clutch should turn freely counterclockwise and lock clockwise.

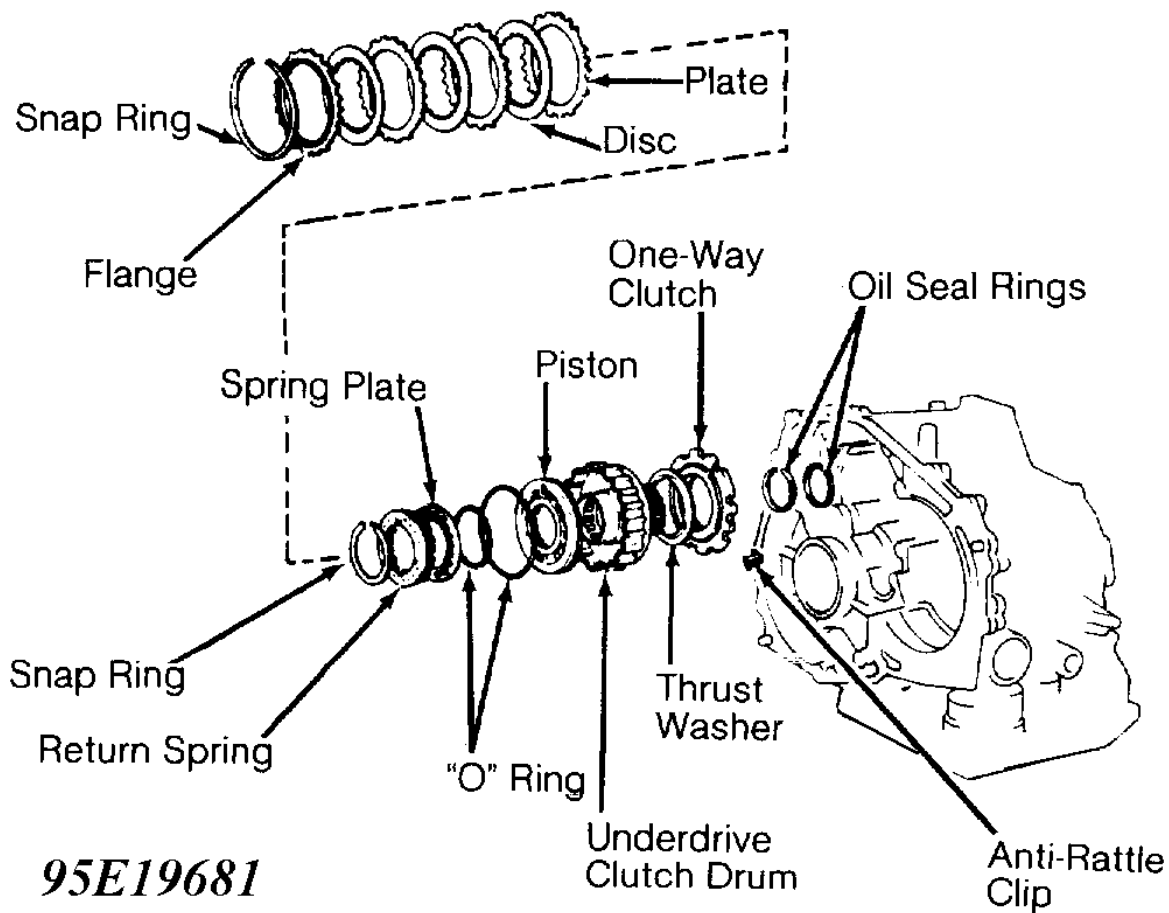


Fig. 48: Exploded View Of Underdrive Clutch & No. 3 One-Way Clutch
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

UNDERDRIVE BRAKE & ACCUMULATOR

Disassembly

1. Compress return spring and remove snap ring. Remove plates, discs and flange. Note number and location of components. Remove return spring. Remove oil seal rings (if necessary).
2. Apply compressed air to oil passage in transaxle case to remove underdrive piston from transaxle case. See [Fig. 23](#) . Remove "O" rings from piston. Remove oil gallery cover and gasket. Remove accumulator piston and spring from transaxle case. Remove "O" ring from piston. See [Fig. 49](#) .

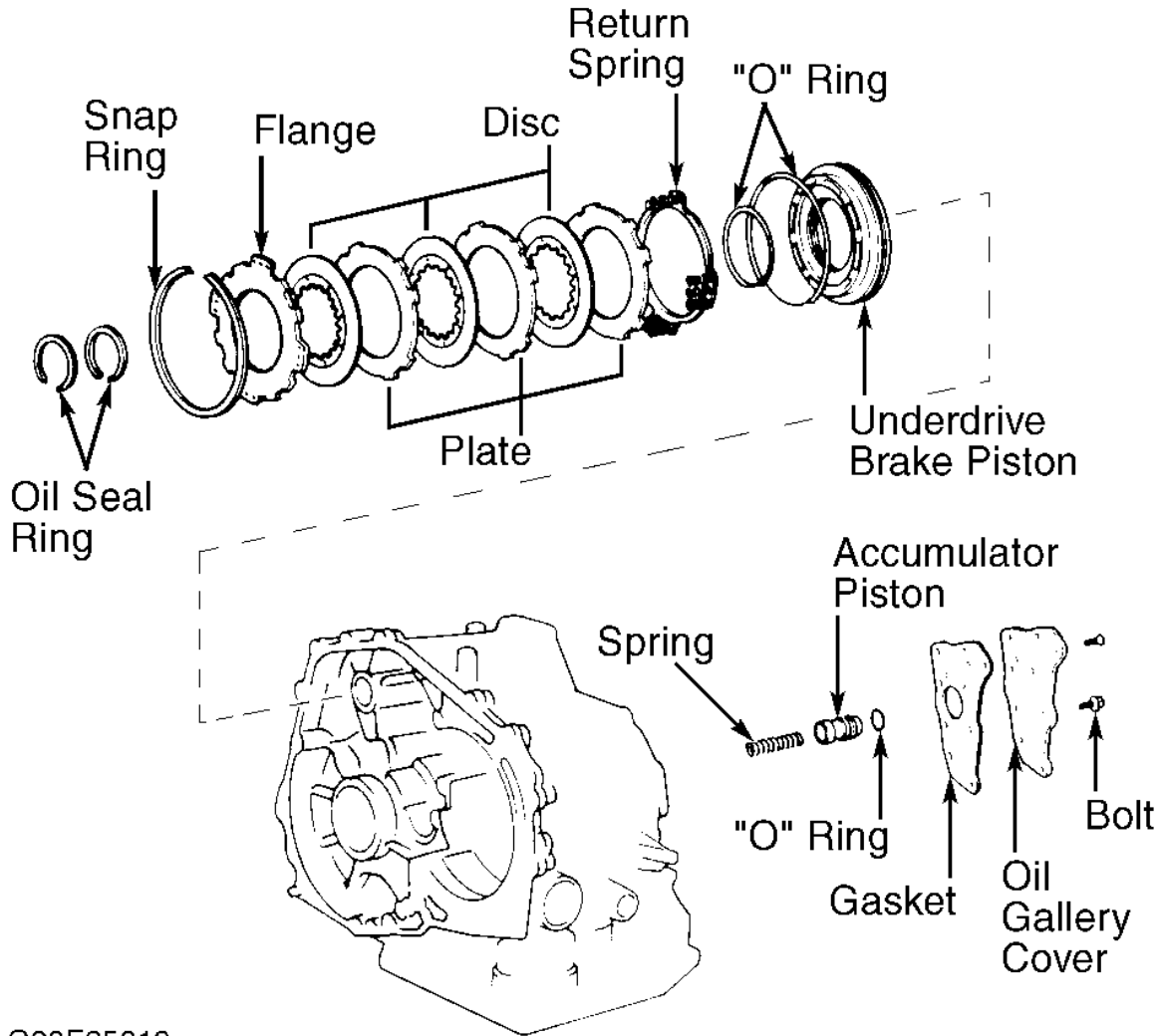
Inspection

1. Clean all parts (except discs) with solvent. Dry parts using compressed air. Inspect discs and plates for wear or burnt areas. If discs are peeled or discolored, replace discs as necessary.
2. Inspect underdrive brake piston. Ensure check ball is free by shaking piston. Ensure valve does not leak by applying low pressure compressed air to small hole in piston.

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

Reassembly

1. Coat NEW "O" ring with ATF and install on accumulator piston. Install accumulator piston and spring. Install oil gallery gasket and cover. Tighten bolts to 89 INCH lbs. (10 N.m). Apply thread sealant to screws for oil gallery cover. Install screws and tighten to 65 INCH lbs. (7.4 N.m).
2. Install underdrive brake piston "O" rings. Coat "O" rings with ATF. Install piston in transaxle case with cupped side upward. Use care not to damage "O" rings. Install brake piston return spring. Install plates and discs. Install flange with flat end facing inward.
3. Using spring compressor, compress return spring. Install snap ring. Ensure snap ring end gap is not aligned with cutout. Using compressed air, ensure underdrive brake piston operates smoothly. See [Fig. 49](#) .



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Fig. 49: Exploded View Of Underdrive Brake & Accumulator

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

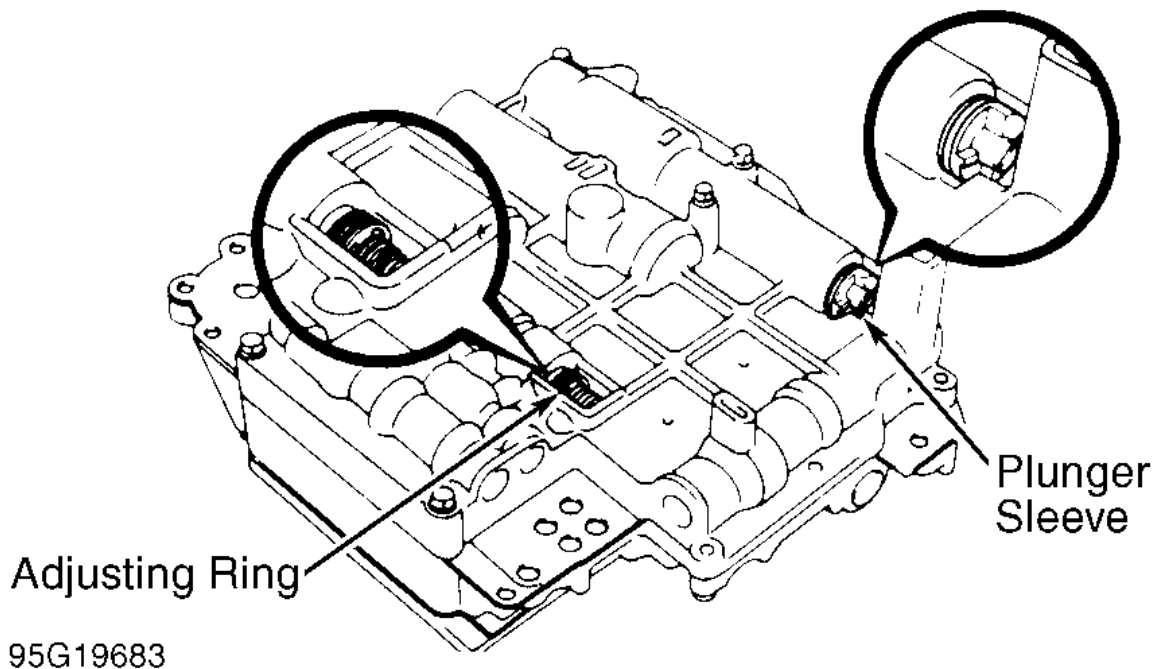
VALVE BODY ASSEMBLY

NOTE: All valve body assembly components must be installed in original location. Arrange components in sequence during removal for reassembly reference. Throttle pressure is changed according to number of adjusting rings. When assembling valve body, install same number of adjusting rings as were removed. Some valve bodies do not have adjusting rings.

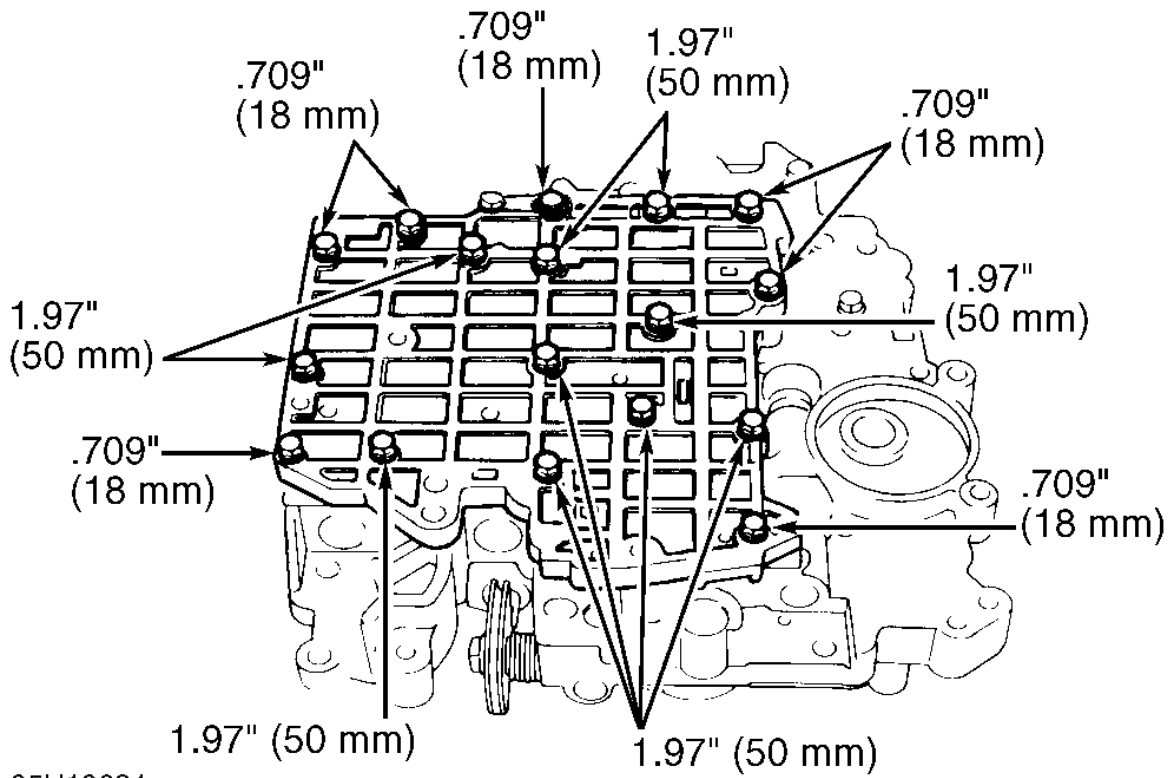
CAUTION: Note which step at end of primary regulator valve sleeve contacts valve body prior to removal. Line pressure is affected by plunger location. See [Fig. 50](#) .

Disassembly (A-243L) 

Remove solenoid. Remove 17 bolts and lower valve body cover. See [Fig. 51](#) . Remove strainer, gaskets and plate. Remove 8 bolts from upper valve body. See [Fig. 52](#) . Remove 5 bolts from lower valve body. See [Fig. 53](#) . Hold plate against lower valve body and carefully remove lower valve body. **DO NOT** lose check balls. Note location of check balls, retainers, pins and plugs in valve body. Remove plate and gasket. See [Fig. 54](#) .



[Fig. 50: Identifying Adjusting Ring & Plunger Sleeve Locations](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 51: Identifying Lower Valve Body Cover Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

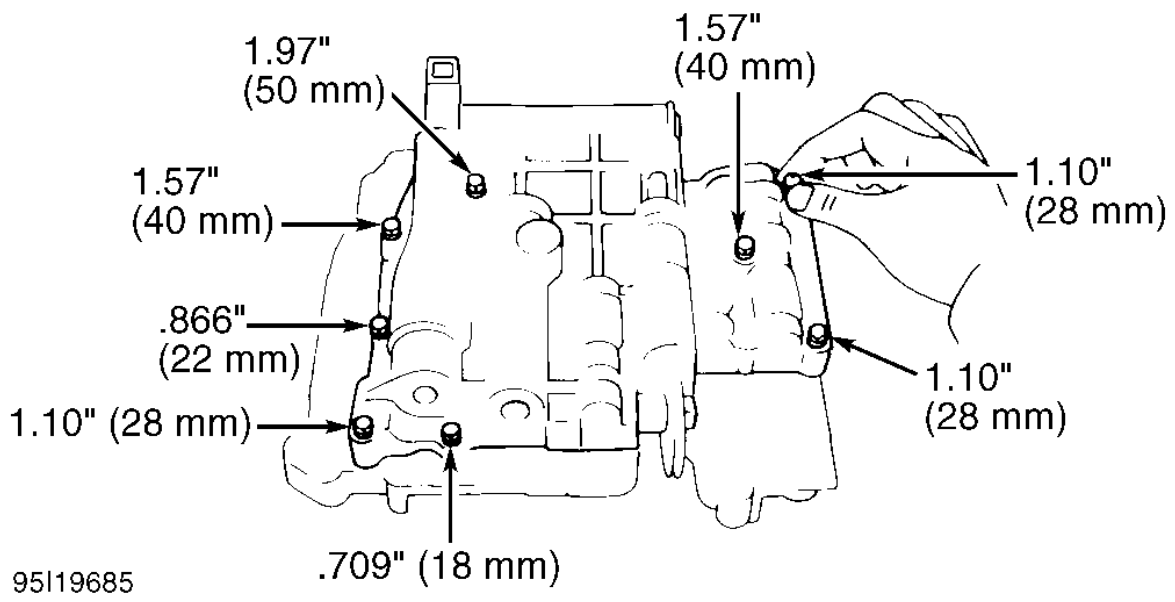


Fig. 52: Identifying Upper Valve Body Cover Bolts
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

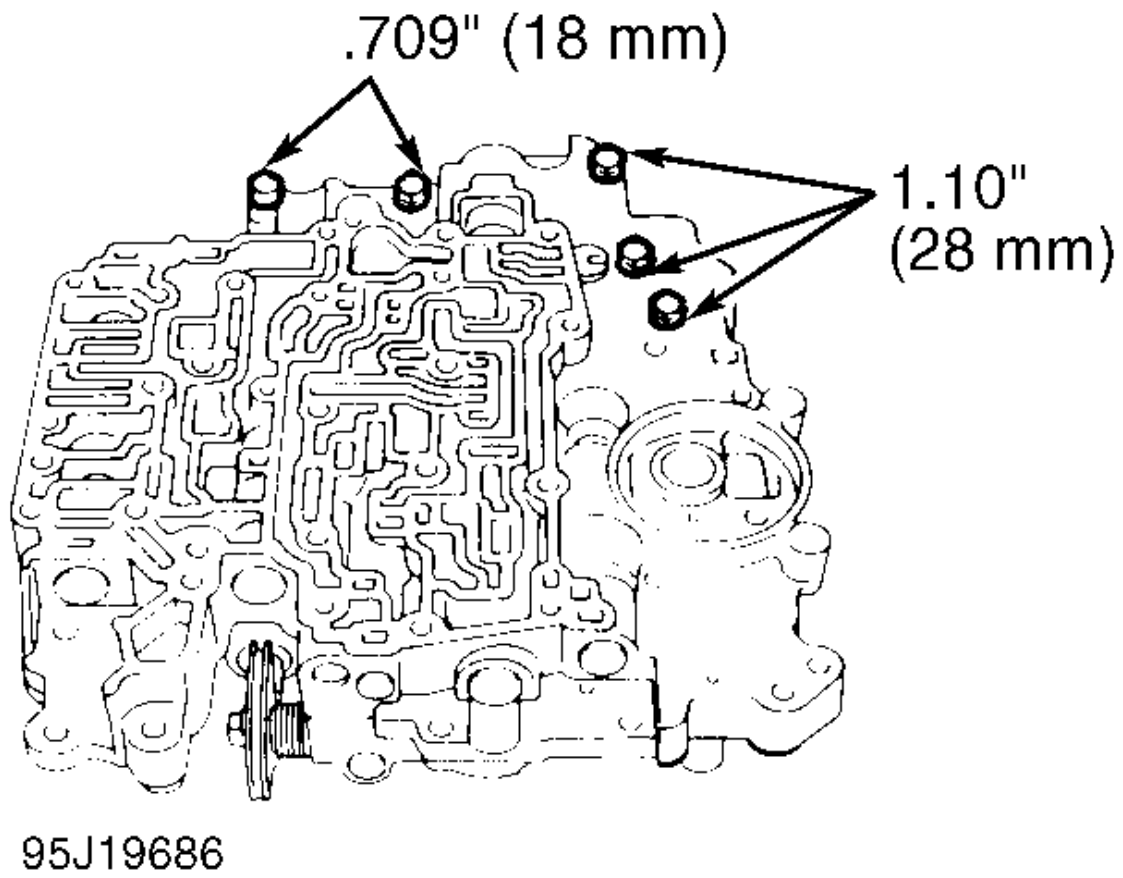
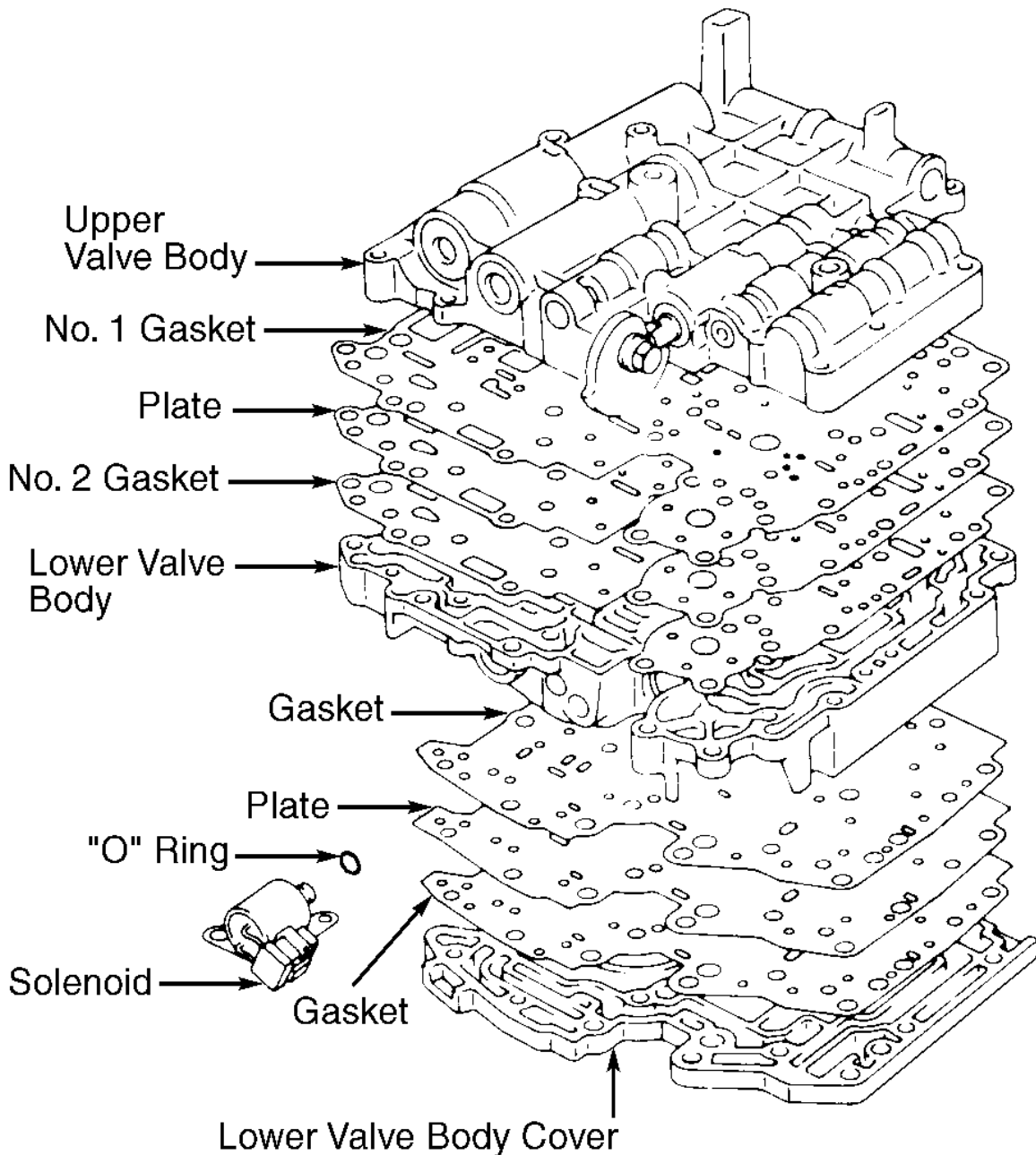


Fig. 53: Identifying Lower Valve Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.




95A19687

Fig. 54: Exploded View Of A-243L Valve Body Assembly

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

CAUTION: Note which step at end of primary regulator valve sleeve contacts valve body prior to removal. Line pressure is affected by plunger location. See [Fig. 46](#) .

Disassembly (A-241E & A-244E) 

Remove solenoids. Remove 10 bolts and lower valve body cover. See [Fig. 55](#) . Remove strainer, gaskets and plate. Remove 8 bolts from upper valve body. See [Fig. 52](#) . Remove 9 bolts from lower valve body. See [Fig. 56](#) . Hold plate against lower valve body and carefully remove lower valve body. **DO NOT** lose check balls. Note location of check balls, retainers, pins and plugs in valve body. Remove plate and gasket. See [Fig. 57](#) .

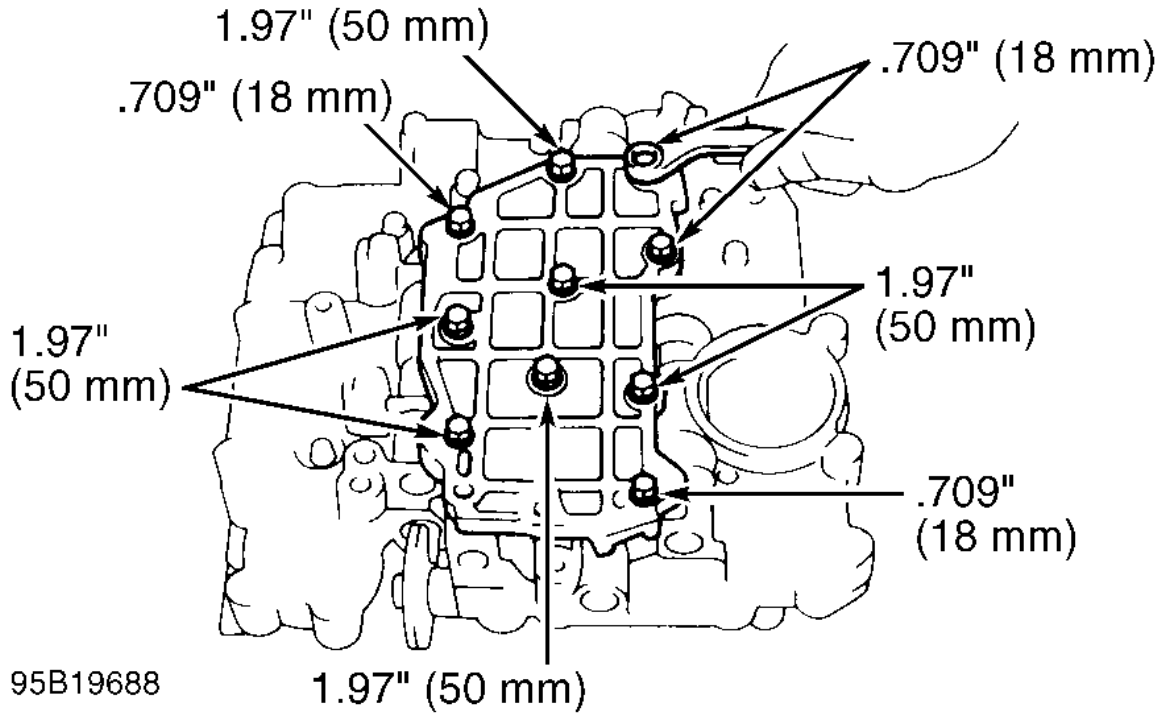
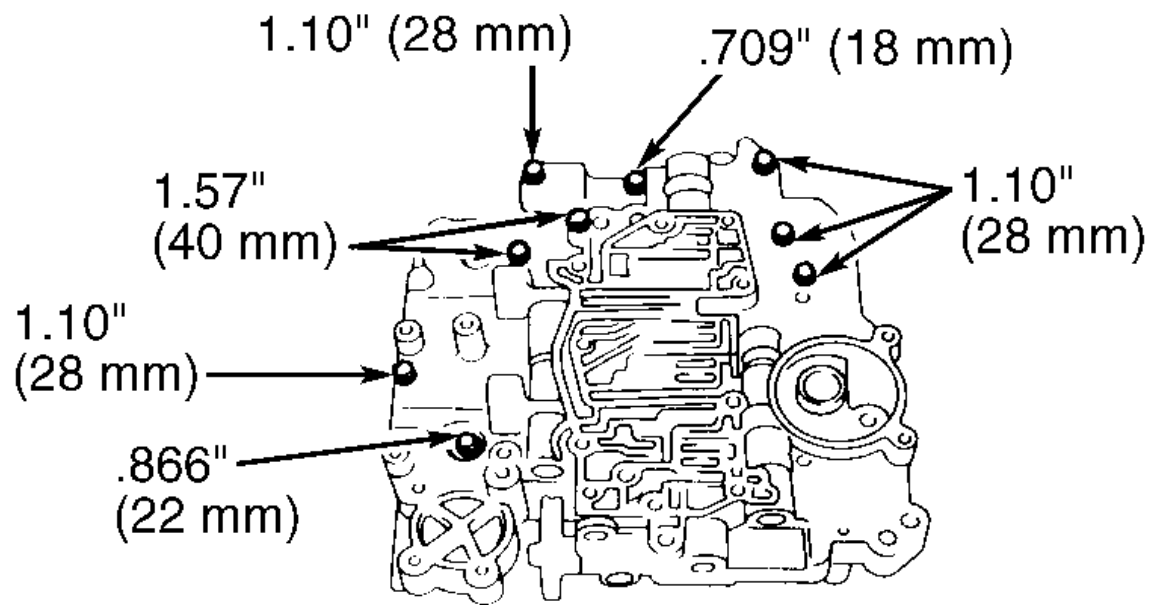
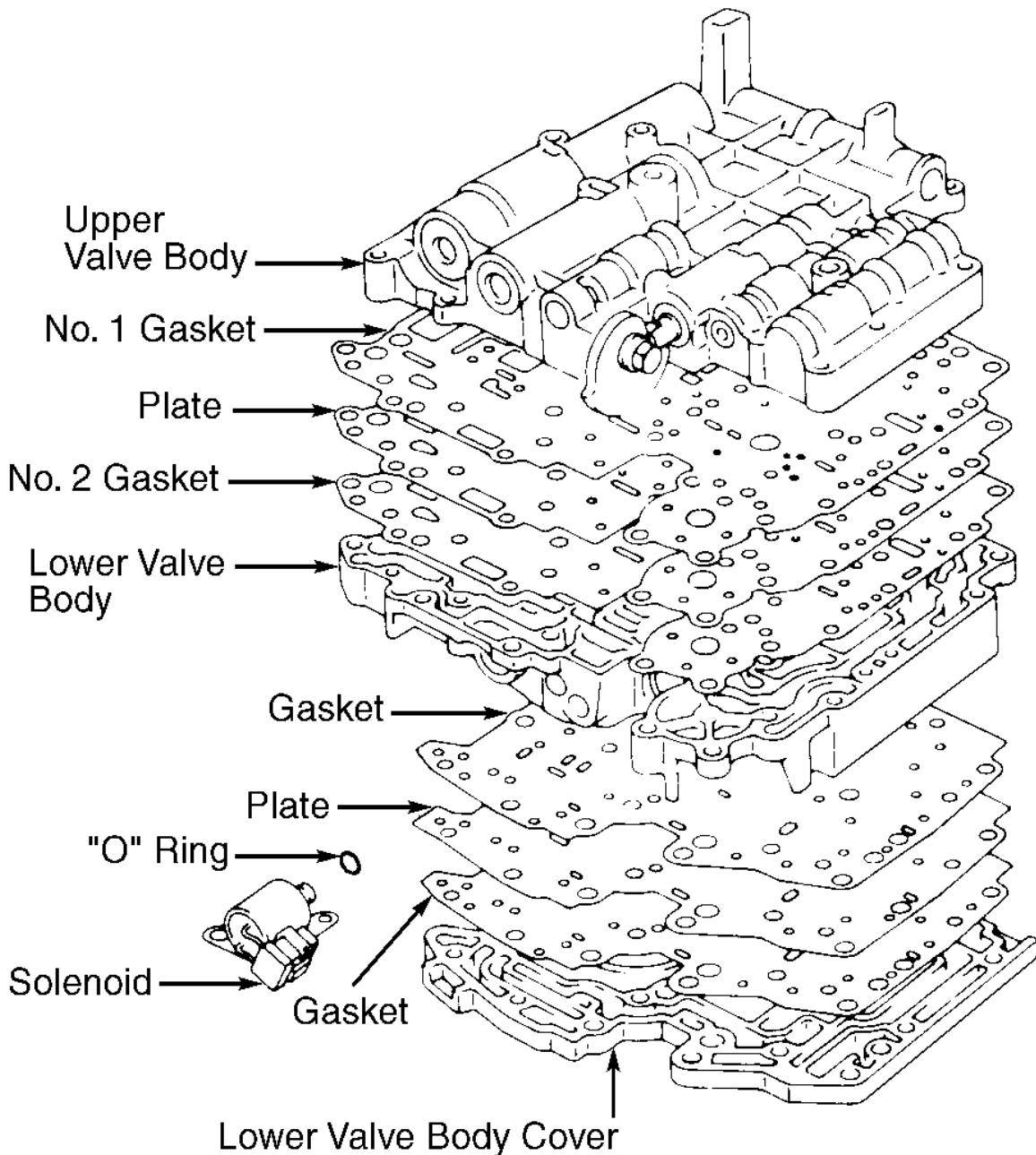


Fig. 55: Identifying Lower Valve Body Cover Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



95C19689

Fig. 56: Identifying Lower Valve Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



95A19687

Fig. 57: Exploded View Of A-241E & A-244E Valve Body Assembly

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

CAUTION: Note position of throttle valve adjusting screw before disassembly. Also note which step at end of primary regulator valve sleeve contacts valve body prior to removal. Line pressure is affected by plunger location. See [Fig. 58](#) .

Disassembly (A-245E & A-246E) 

Remove throttle cam. Remove solenoids. Remove pressure relief valve. Remove 10 bolts and lower valve body cover. See [Fig. 55](#) . Remove strainer, gaskets and plate. Remove 8 bolts from upper valve body. See [Fig. 52](#) . Remove 21 bolts from lower valve body. See [Fig. 59](#) . Hold plate against lower valve body and carefully remove lower valve body. **DO NOT** lose check balls. Note location of check balls, retainers, pins and plugs in valve body. Remove plate and gasket. See [Fig. 60](#) .

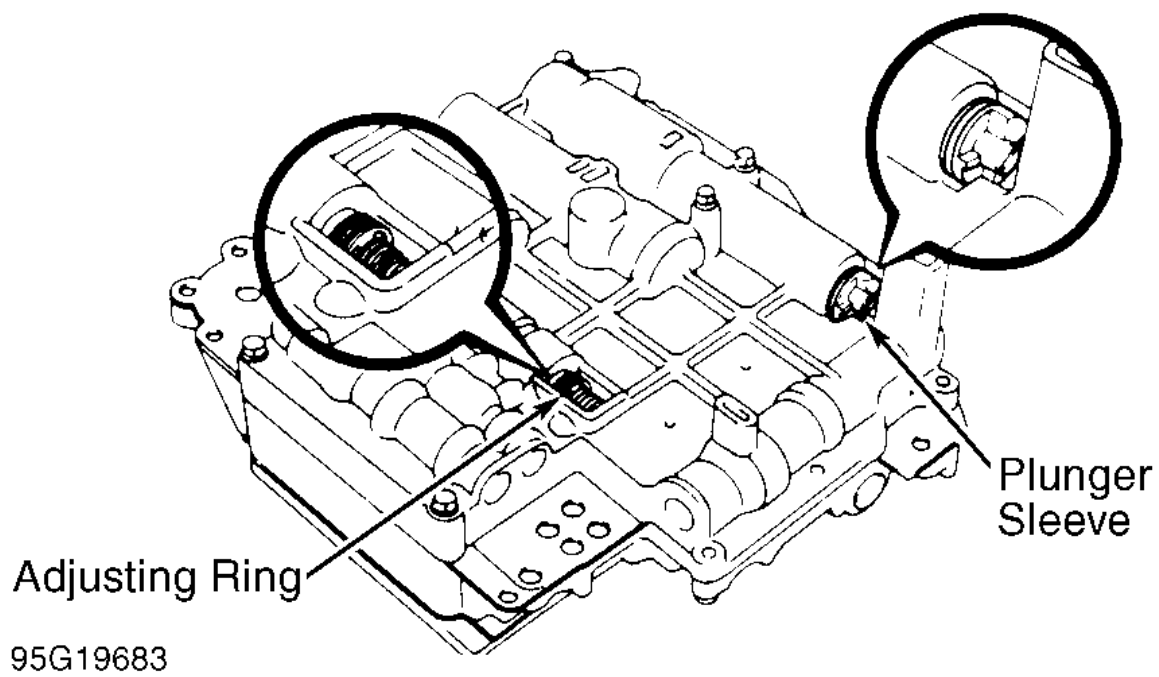
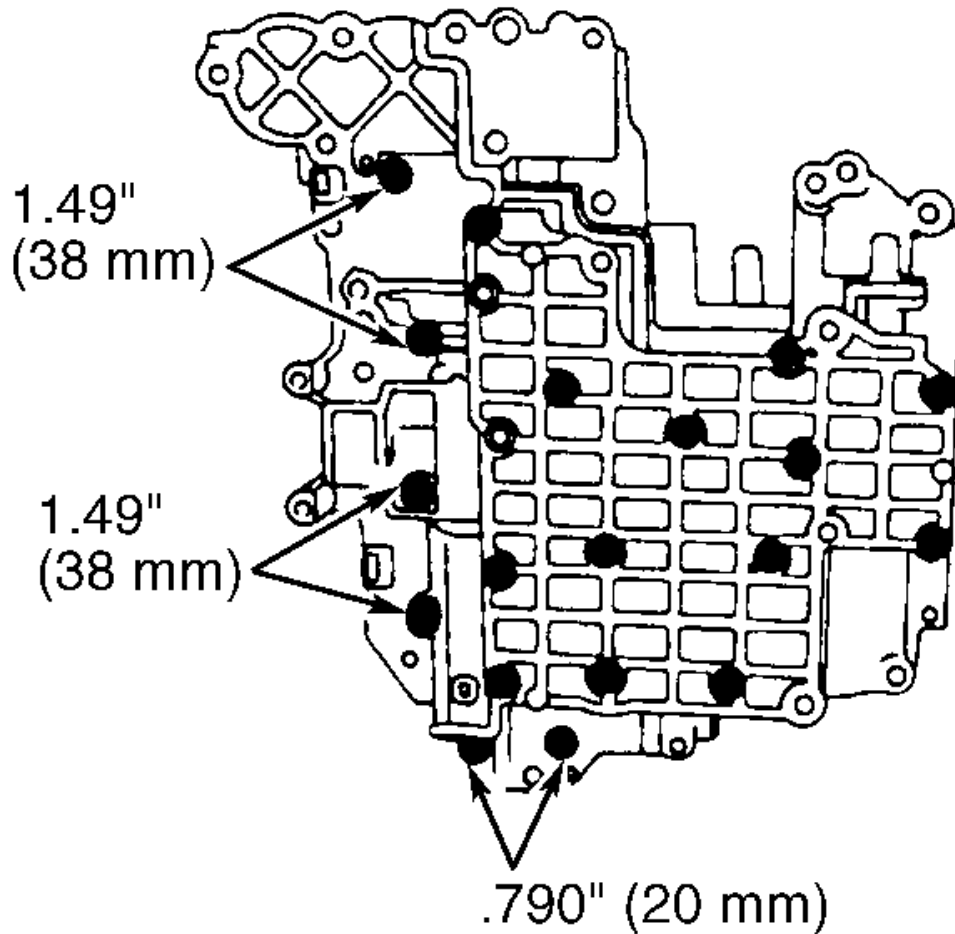
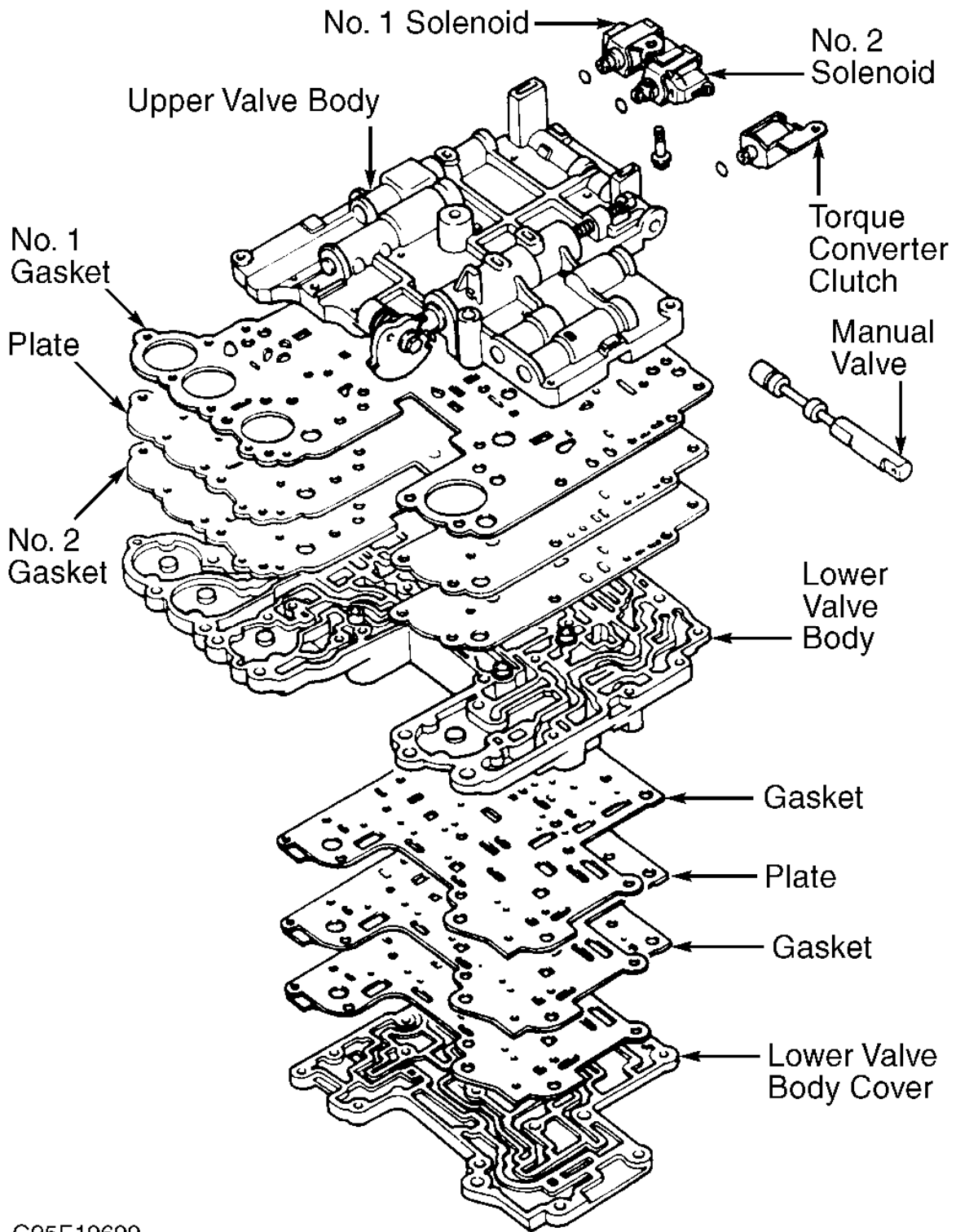


Fig. 58: Identifying Adjusting Screw & Plunger Sleeve Locations
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



NOTE: All remaining bolts are 1.97" (50 mm).
G95H19692

Fig. 59: Identifying A-245E & A-246E Lower Valve Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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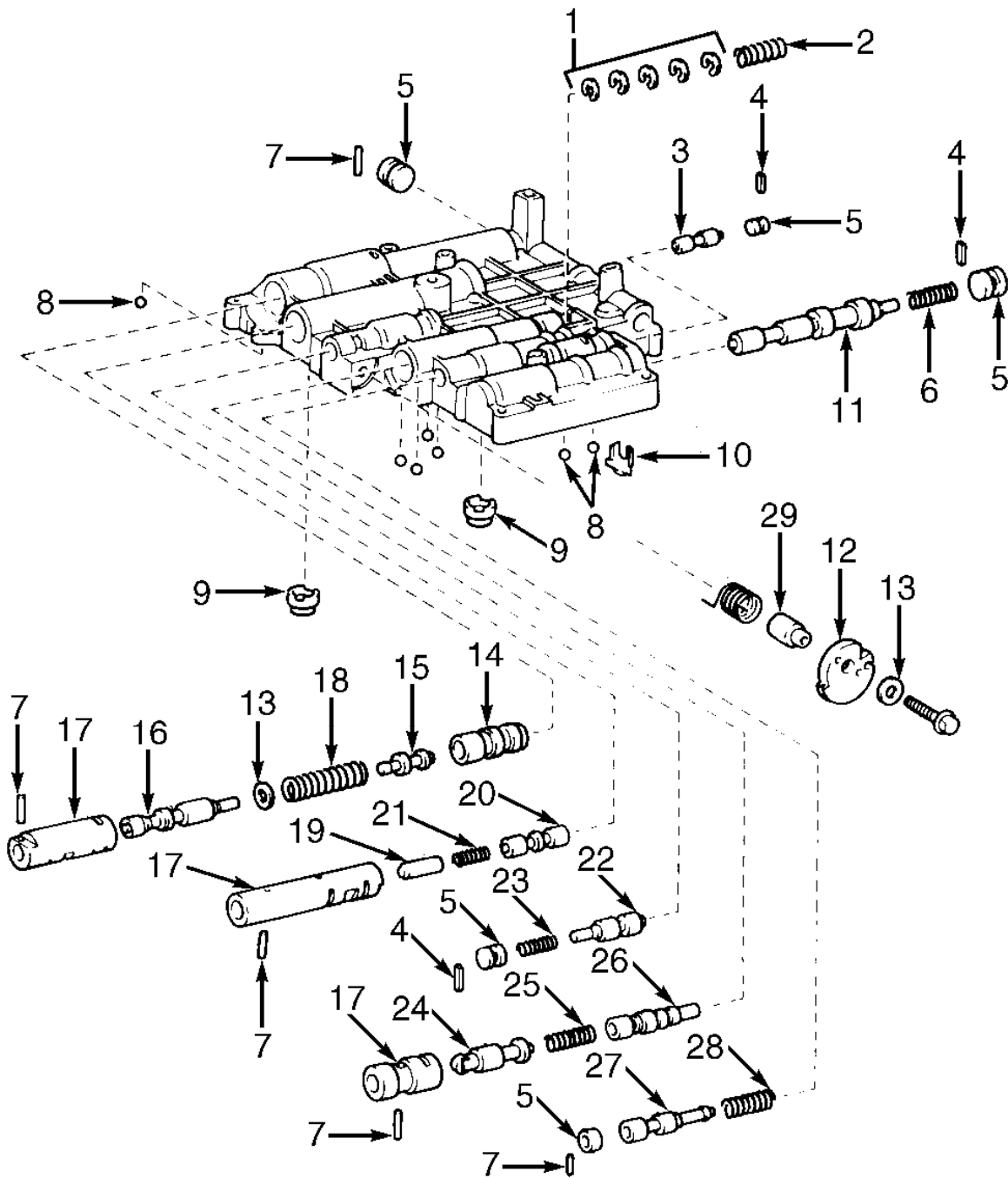
Fig. 60: Exploded View Of A-245E & A-246E Valve Body Assembly

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

INSPECTION 

(All Models) 

1. Clean all parts with solvent. Dry parts with compressed air. When disassembling upper or lower valve body, maintain parts in order for reassembly reference. Ensure each valve is kept with corresponding spring. For upper valve body exploded views, see [Fig. 61 -Fig. 63](#) . For lower valve body exploded views, see [Fig. 62 -Fig. 65](#) .
2. Ensure all valve body oil passages are clear. Inspect valves for scoring or roughness. Inspect valve springs for damage, squareness, rust and collapsed coils. Measure spring free length and outer diameter.
3. Replace spring if not within specification. See appropriate table under **VALVE BODY SPRING SPECIFICATIONS** . Ensure valve body springs correspond with appropriate valve. Ensure check balls, pins, retainers, strainers and vibrating stopper is installed in appropriate locations. See [Fig. 66 -Fig. 68](#) .

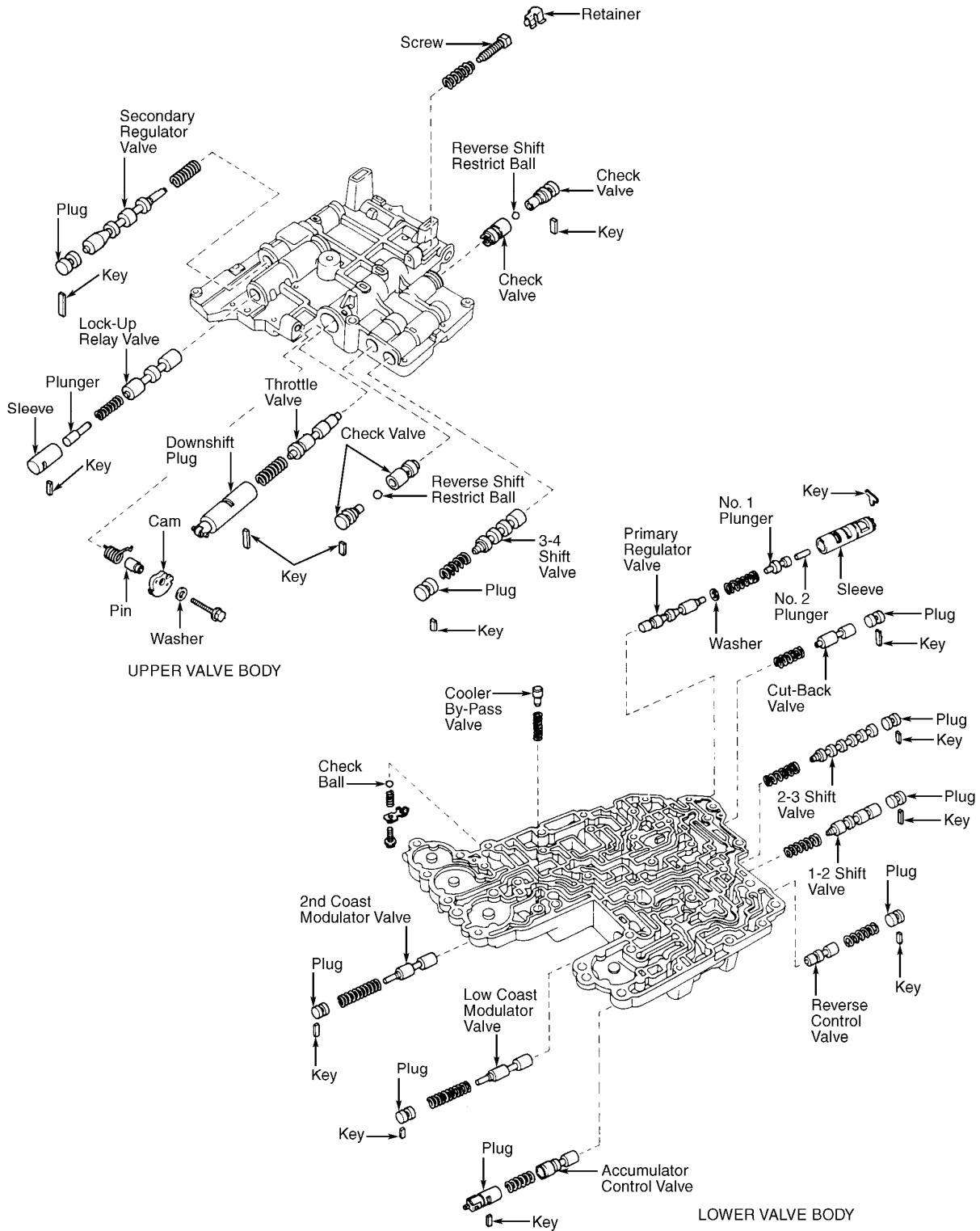


- | | |
|--------------------|---|
| 1. Adjusting Rings | 17. Sleeve |
| 2. Spring No. 6 | 18. Spring No. 1 |
| 3. Cut-Back Valve | 19. Lock-Up Relay Control Valve |
| 4. Retainer | 20. Lock-Up Relay Valve |
| 5. Plug | 21. Spring No. 2 |
| 6. Spring No. 7 | 22. 2nd Coast Modulator Valve (A-242L) |
| 7. Pin | 23. Low Coast Modulator Valve (A-241F & A-241E) |
| 8. Check Ball | |
| 9. O-Ring | |
| 10. O-Ring | |
| 11. O-Ring | |
| 12. O-Ring | |
| 13. O-Ring | |
| 14. O-Ring | |
| 15. O-Ring | |
| 16. O-Ring | |
| 18. O-Ring | |
| 19. O-Ring | |
| 20. O-Ring | |
| 21. O-Ring | |
| 22. O-Ring | |
| 23. O-Ring | |
| 24. O-Ring | |
| 25. O-Ring | |
| 26. O-Ring | |
| 27. O-Ring | |
| 28. O-Ring | |
| 29. O-Ring | |

- | | |
|-------------------------------|------------------------------|
| 9. Strainer | (A-241E & A-244E) |
| 10. Vibrating Stopper | 23. Spring No. 3 |
| 11. Accumulator Control Valve | 24. Down Shift Plug |
| 12. Cam | 25. Spring No. 4 |
| 13. Washer | 26. Throttle Valve |
| 14. Plunger Sleeve | 27. Throttle Modulator Valve |
| 15. Plunger | 28. Spring No. 5 |
| 16. Primary Regulator Valve | 29. Cam Pin |

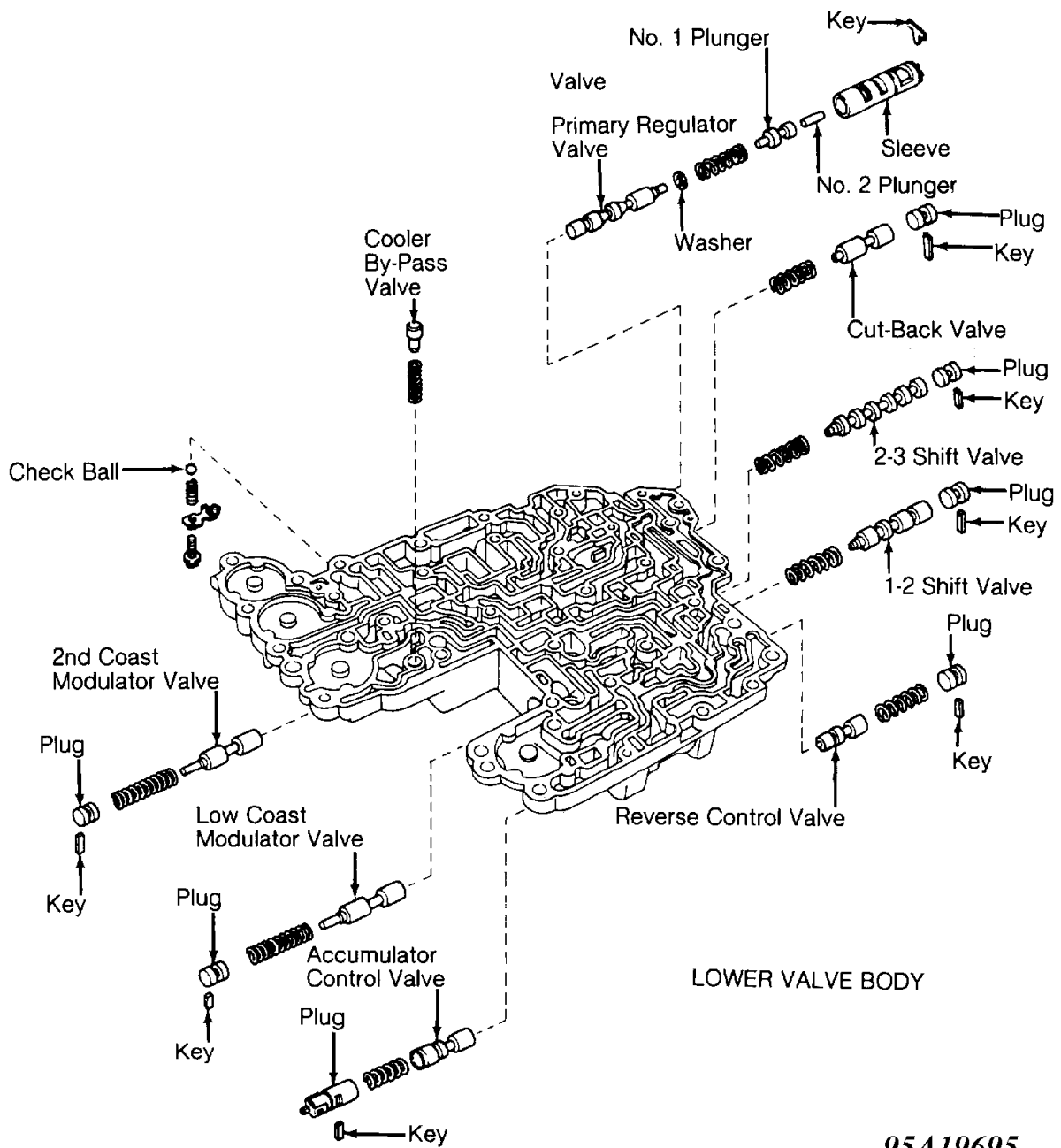
95I19693

Fig. 61: Exploded View Of Upper Valve Body (A-243L, A-241E & A-244E)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



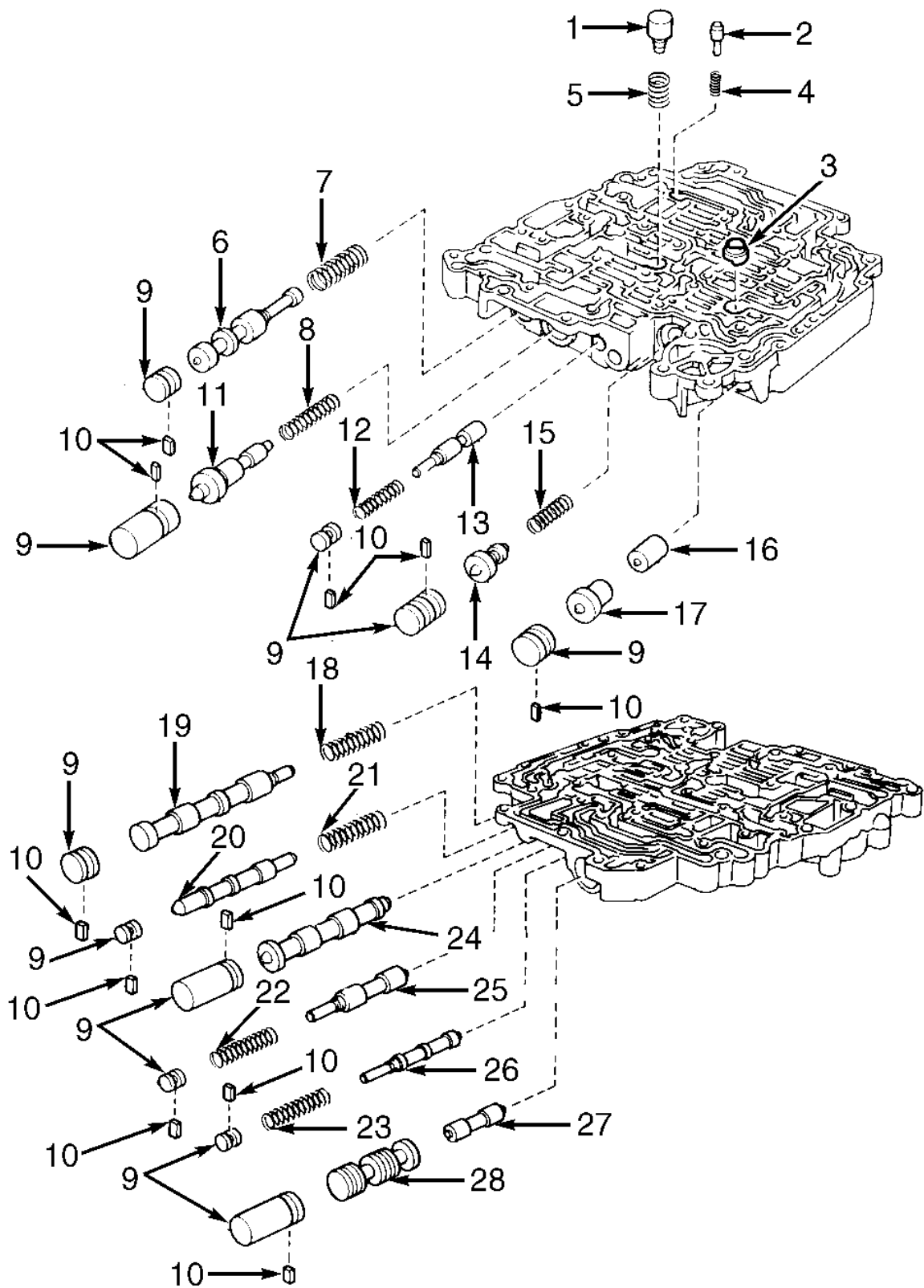
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Fig. 62: Exploded View Of Upper Valve Body (A-245E & A-246E)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



95A19695

Fig. 63: Exploded View Of Lower Valve Body (A-245E & A-246E)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

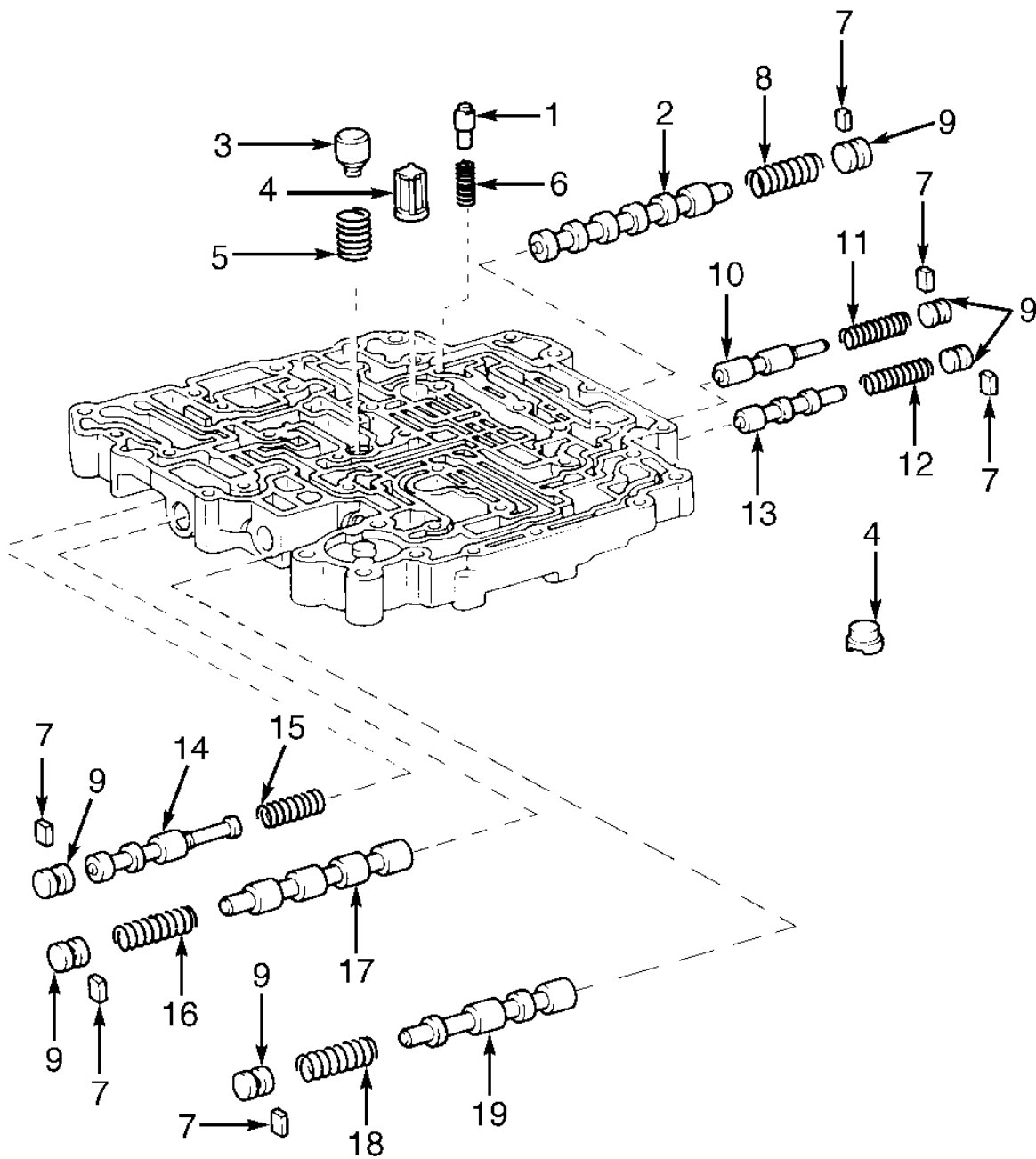


1. Cooler By-Pass Valve
 2. Pressure Relief Valve
 3. Strainer

15. Spring No. 4
 16. 3-4 Coast Shift Valve
 17. 2nd Coast Shift Valve

- 3. Strainer
 - 4. Spring No. 6
 - 5. Spring No. 5
 - 6. Secondary Regulator Valve
 - 7. Spring No. 1
 - 8. Spring No. 2
 - 9. Plug
 - 10. Retainer
 - 11. Low Modulator Valve
 - 12. Spring No. 3
 - 13. Low Coast Shift Valve
 - 14. Intermediate Shift Valve
 - 17. 3rd Coast Shift Valve
 - 18. Spring No. 7
 - 19. 3-4 Shift Valve
 - 20. Lock-Up Signal Valve
 - 21. Spring No. 8
 - 22. Spring No. 9
 - 23. Spring No. 10
 - 24. 2-3 Shift Valve
 - 25. Detent Regulator Valve
 - 26. 3-4 Switch Valve
 - 27. 1-2 Shift Upper Valve
 - 28. 1-2 Shift Lower Valve
- 93D25620

Fig. 64: Exploded View Of Lower Valve Body (A-243L)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



- | | |
|-------------------------------|-------------------------------|
| 1. Pressure Relief Valve | 11. Spring No. 4 |
| 2. 2-3 Shift Valve | 12. Spring No. 5 |
| 3. Cooler By-Pass Valve | 13. Lock-Up Signal Valve |
| 4. Strainer | 14. Secondary Regulator Valve |
| 5. Spring No. 1 | 15. Spring No. 6 |
| 6. Spring No. 2 | 16. Spring No. 7 |
| 7. Retainer | 17. 1-2 Shift Valve |
| 8. Spring No. 3 | 18. Spring No. 8 |
| 9. Plug | 19. 3-4 Shift Valve |
| 10. 2nd Coast Modulator Valve | |

93A25619

Fig. 65: Exploded View Of Lower Valve Body (A-241E & A-244E)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

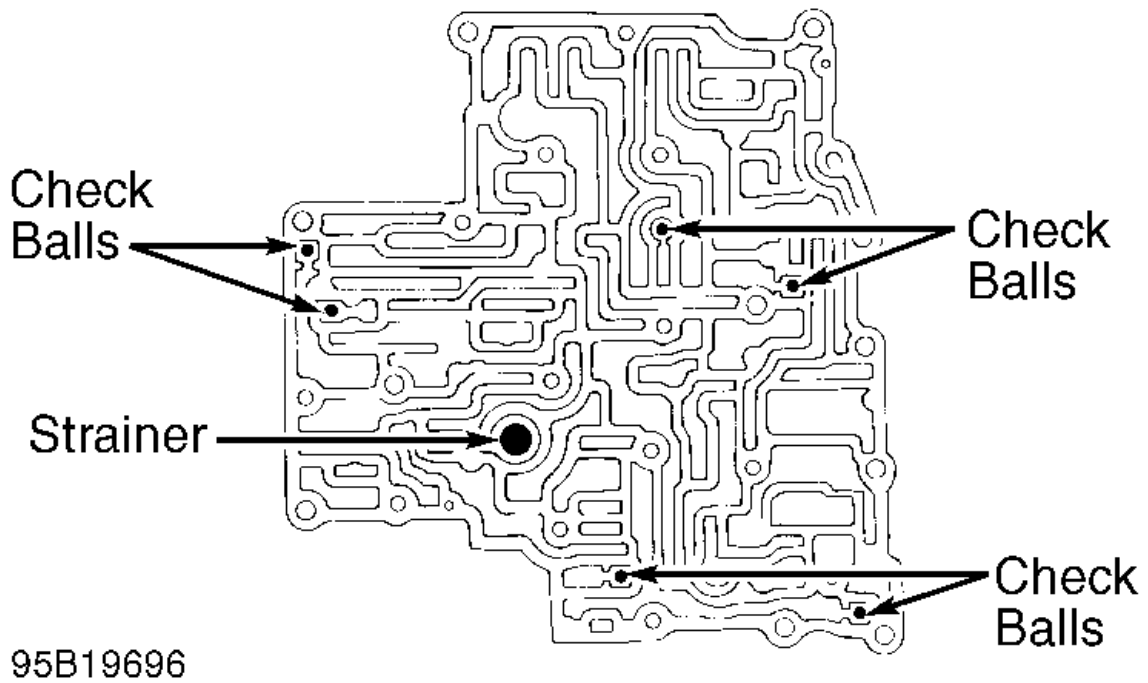
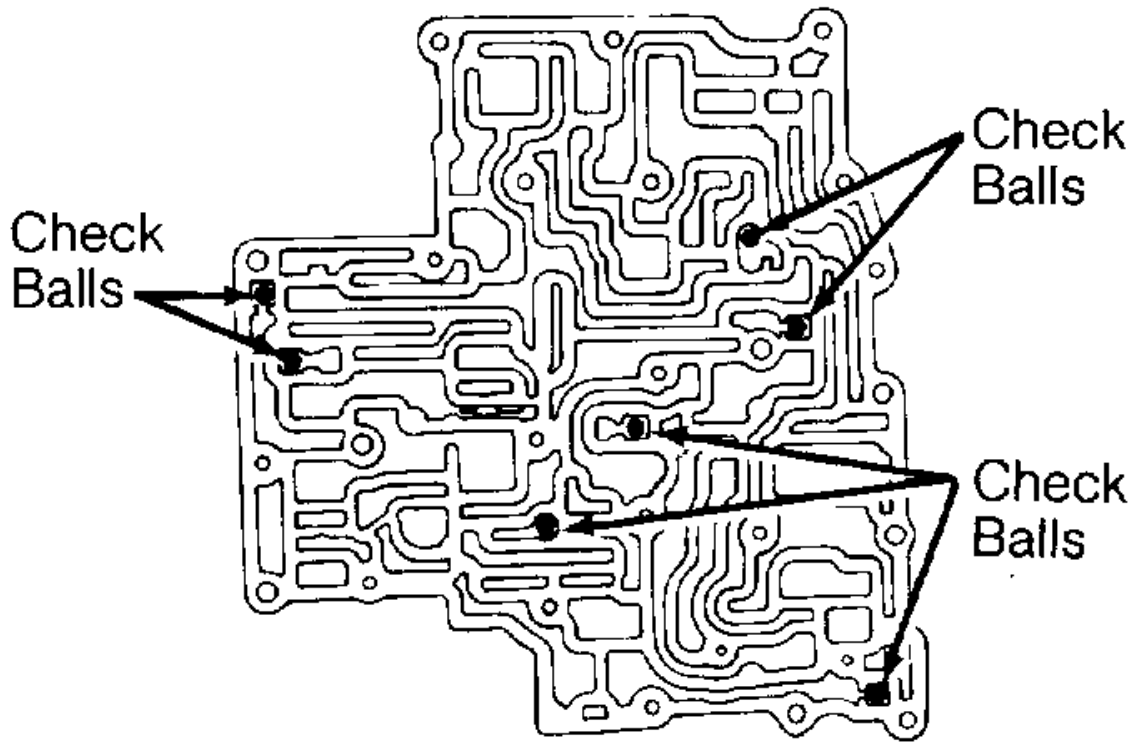


Fig. 66: Upper Valve Body Check Ball Locations (A-243L)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



A-241E & A-244E

Fig. 67: Upper Valve Body Check Ball Locations (A-243L)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

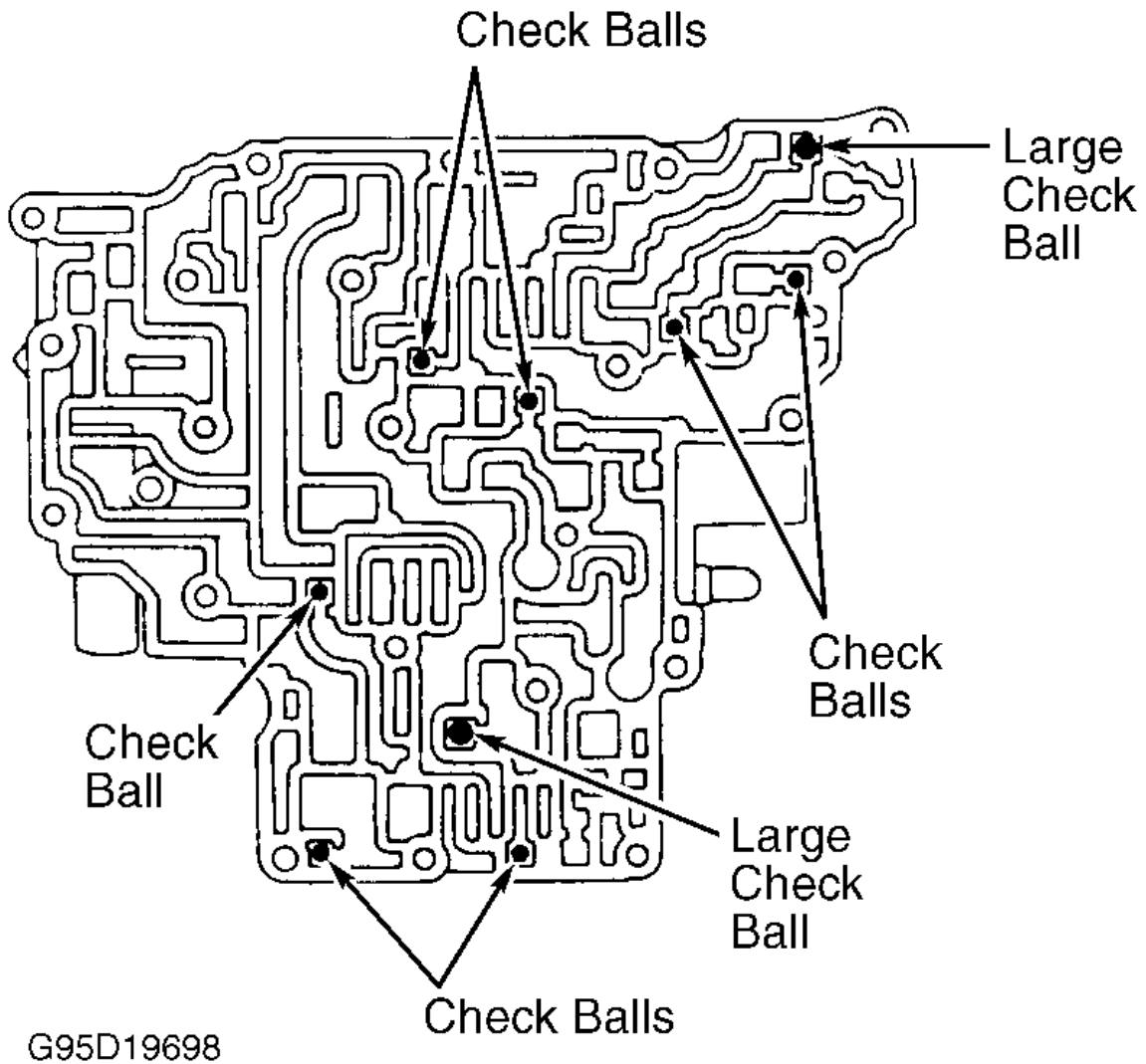


Fig. 68: Upper Valve Body Check Ball Locations (A-243L)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

VALVE BODY SPRING SPECIFICATIONS TABLES 

UPPER VALVE BODY SPRING SPECIFICATIONS (A-243L)

| Application | Color | Free Height: In. (mm) |
|---------------------------|--------|-----------------------|
| Primary Regulator Valve | Purple | 2.626 (66.70) |
| Lock-Up Relay Valve | None | .740 (18.80) |
| 2nd Coast Modulator Valve | Red | 1.169 (29.70) |
| Down Shift Plug | Red | 1.173 (29.80) |

| Application | Color | Free Height: In. (mm) |
|---------------------------|--------------|------------------------------|
| Throttle Valve | Lt. Green | 1.150 (29.20) |
| Throttle Modulator Valve | Green | 1.177 (29.90) |
| Accumulator Control Valve | Yellow | 1.504 (38.20) |

UPPER VALVE BODY SPRING SPECIFICATIONS (A-241E & A-244E)

| Application | Color | Free Height: In. (mm) |
|--|-----------------------|------------------------------|
| Primary Regulator Valve | None | 2.626 (66.70) |
| Lock-Up Relay Valve | None | .740 (18.80) |
| Low Coast Modulator Valve | Yellow | 1.083 (27.50) |
| Down Shift Plug | Red ⁽¹⁾ | .957 (24.30) |
| Throttle Valve | Lt. Green | 1.150 (29.20) |
| Throttle Modulator Valve | Green | 1.177 (29.90) |
| Accumulator Control Valve | Orange ⁽²⁾ | ⁽³⁾ 1.307 (33.20) |
| <p>(1) A-244E spring color is Blue.</p> <p>(2) Spring for A-244E has no color.</p> <p>(3) Spring length is 1.370" (34.80 mm) for A-244E.</p> | | |

UPPER VALVE BODY SPRING SPECIFICATIONS (A-245E & A-246E)

| Application | Color | Free Height: In. (mm) |
|---------------------------|--------------|------------------------------|
| Secondary Regulator Valve | None | 1.449 (36.80) |
| Lock-Up Relay Valve | None | .740 (18.80) |
| 3-4 Shift Valve | Red | 1.004 (25.50) |
| Down Shift Plug | Yellow | 1.075 (27.30) |
| Throttle Valve | Red | .689 (17.50) |

LOWER VALVE BODY SPRING SPECIFICATIONS (A-243L)

| Application | Color | Free Height: In. (mm) |
|---------------------------|--------------|------------------------------|
| Secondary Regulator Valve | Blue | 1.079 (27.4) |
| 1-2 Shift Valve | Yellow | 1.071 (27.20) |
| Low Modulator Valve | None | 1.150 (29.20) |
| 2-3 Shift Valve | None | 1.091 (27.70) |
| Cooler By-Pass Valve | Yellow | .720 (18.30) |
| Pressure Relief Valve | None | .441 (11.20) |
| 3-4 Shift Valve | None | 1.091 (27.70) |
| Lock-Up Signal Valve | Blue | .717 (18.20) |
| Detent Regulator Valve | Brown | 1.260 (32.00) |
| 3-4 Switch Valve | None | 1.217 (30.90) |

LOWER VALVE BODY SPRING SPECIFICATIONS (A-241E & A-244E)

| Application | Color | Free Height: In. (mm) |
|---------------------------|--------|-----------------------|
| Cooler By-Pass Reg. Valve | Yellow | .720 (18.30) |
| Pressure Relief Valve | None | .441 (11.20) |
| 2-3 Shift Valve | Purple | 1.209(30.70) |
| 2nd Coast Modulator Valve | Red | 1.165 (29.6) |
| Lock-Up Signal Reg. Valve | Orange | 1.181 (30.00) |
| Secondary Regulator Valve | Blue | 1.079 (27.4) |
| 1-2 Shift Valve | Purple | 1.213 (30.80) |
| 3-4 Shift Valve | Purple | 1.213 (30.80) |

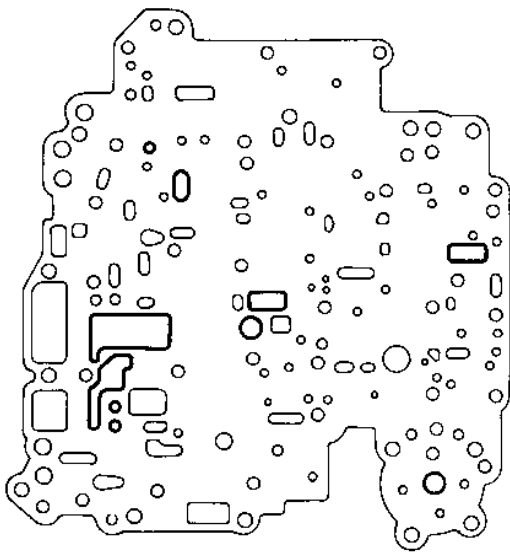
LOWER VALVE BODY SPRING SPECIFICATIONS (A-245E & A-246E)

| Application | Color | Free Height: In. (mm) |
|---------------------------|-------|-----------------------|
| Cooler By-Pass Valve | None | .965 (24.50) |
| Pressure Relief Valve | Red | .709 (18.00) |
| 2-3 Shift Valve | Red | 1.004 (25.50) |
| 2nd Coast Modulator Valve | White | 1.268 (32.20) |
| Cut-Back Valve | None | .740 (18.80) |
| Primary Regulator Valve | Red | 1.638 (41.60) |
| 1-2 Shift Valve | Red | 1.004 (25.50) |
| Reverse Control Valve | None | 1.008 (25.60) |
| Accumulator Control Valve | Pink | 1.54 (290.30) |
| Low Coast Modulator Valve | Blue | 1.122 (28.50) |

REASSEMBLY

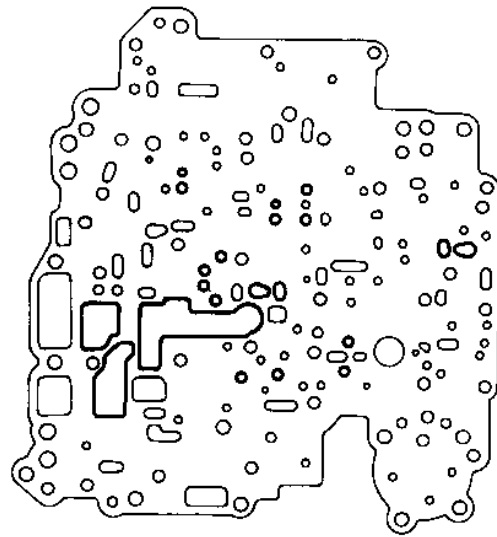
A-243L Model

1. Coat all components with ATF. Position NEW No. 2 gasket, plate and NEW No. 1 gasket on lower valve body. Ensure gaskets are installed in correct locations. See [Fig. 69](#) .
2. Place lower valve body with plate and gaskets on upper valve body. **DO NOT** let components separate. Align each bolt hole in valve bodies with gaskets and plate.
3. Install and finger tighten bolts in lower valve body to secure upper valve body. See [Fig. 53](#) . Install lower valve body cover over NEW gasket. Install and finger tighten cover bolts. See [Fig. 51](#) . Install and finger tighten bolts in upper valve body. See [Fig. 52](#) .
4. Tighten upper and lower valve body bolts to 56 INCH lbs. (6.4 N.m). Install NEW "O" ring on solenoid. Lubricate "O" ring with ATF and install solenoid. Tighten bolts for single solenoid to 56 INCH lbs. (6.5 N.m).



NO. 1 GASKET

95H19700



NO. 2 GASKET

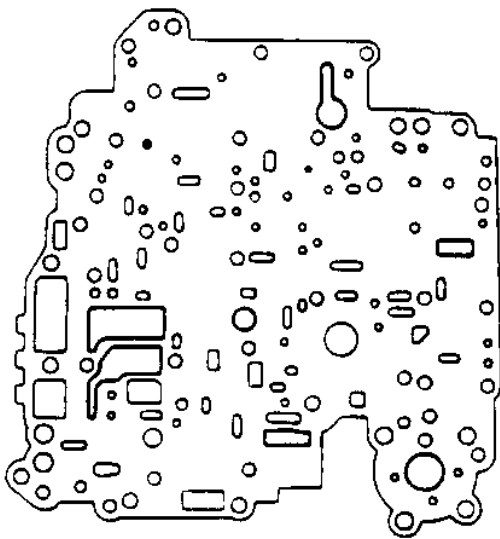
Fig. 69: Identifying A-243L Valve Body Gaskets

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

REASSEMBLY

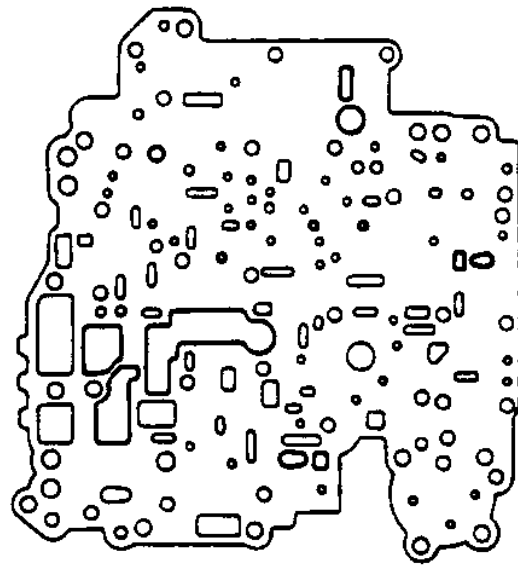
A-241E & A-244E Models

1. Coat all components with ATF. To reassemble, reverse disassembly procedure. Position NEW No. 2 gasket, plate and NEW No. 1 gasket on lower valve body. Ensure gaskets are installed in correct locations. See [Fig. 70](#) .
2. Place lower valve body with plate and gaskets on upper valve body. **DO NOT** let components separate. Align each bolt hole in valve bodies with gaskets and plate.
3. Install and finger tighten bolts in lower valve body to secure upper valve body. See [Fig. 56](#) . Install lower valve body cover over NEW gasket. Install and finger tighten cover bolts. See [Fig. 55](#) . Install and finger tighten bolts in upper valve body. See [Fig. 52](#) .
4. Ensure retainers are installed correctly. Position NEW gasket, plate and gasket. Tighten upper and lower valve body bolts to 56 INCH lbs. (6.4 N.m). Install NEW "O" rings on solenoids. Lubricate "O" rings with ATF and install solenoids. Tighten bolts for single solenoid to 56 INCH lbs. (6.5 N.m). Tighten bolts for 2 solenoids mounted together to 89 INCH lbs. (10 N.m).



NO. 1 GASKET

95119701



NO. 2 GASKET

Fig. 70: Identifying A-241E & A-244E Valve Body Gaskets

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

REASSEMBLY 

A-245E & A-246E Models 

1. Coat all components with ATF. To reassemble, reverse disassembly procedure. Position NEW No. 2 gasket, plate and NEW No. 1 gasket on lower valve body. Ensure gaskets are installed in correct locations. See [Fig. 71](#) .
2. Place lower valve body with plate and gaskets on upper valve body. **DO NOT** let components separate. Align each bolt hole in valve bodies with gaskets and plate. Turn assembly over and install lower valve body cover.
3. Install and finger tighten bolts in lower valve body to secure upper valve body. See [Fig. 59](#) . Tighten valve body bolts to specifications. See [TORQUE SPECIFICATIONS](#) . Install NEW "O" rings on solenoids. Lubricate "O" rings with ATF and install solenoids. Tighten bolts to 56 INCH lbs. (6.5 N.m).

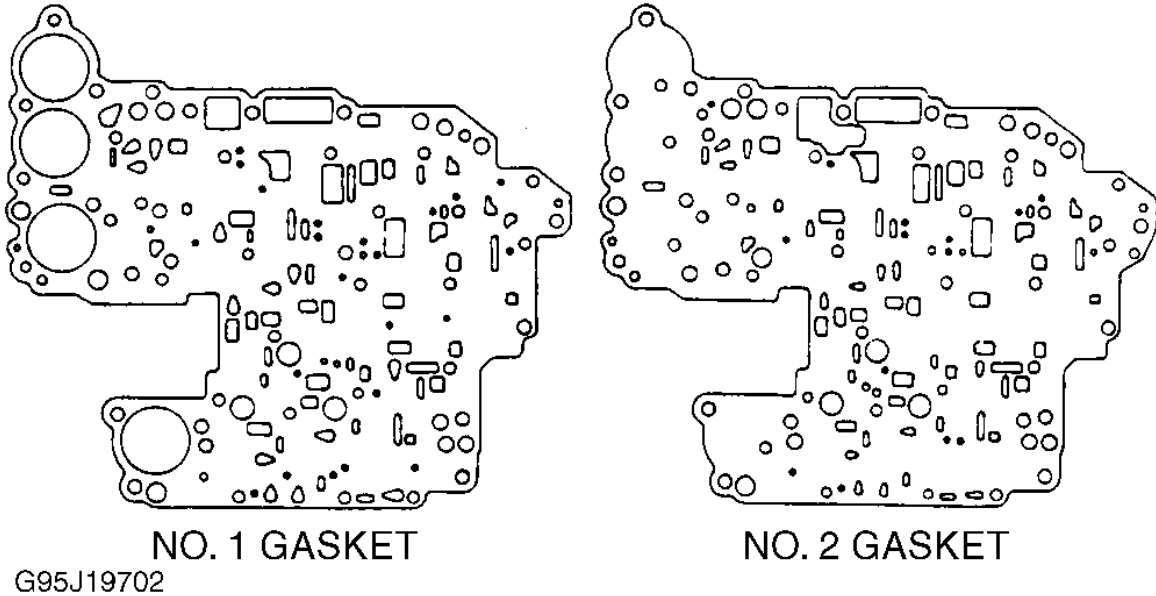


Fig. 71: Identifying A-245E & A-246E Valve Body Gaskets

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

MANUAL SHIFT LINKAGE

Disassembly & Reassembly

Unstake manual shaft spacer and remove. Drive out roll pin. Remove retaining hitch pin. Slide out shaft and remove manual valve lever and washer. Replace shaft seal as needed. To reassemble, reverse disassembly procedure.

DIFFERENTIAL

Disassembly

1. Mark ring gear and differential case for reassembly reference. Spread ring gear bolt lock tabs. Remove ring gear bolts and lock tabs. Using brass hammer, tap ring gear from differential case. Remove bearings from differential case using appropriate bearing splitter and puller. Remove speedometer drive gear.
2. Use a dial indicator to check side gear backlash. Hold one pinion against differential case. Measure side gear backlash. See [Fig. 72](#) . Backlash should be .002-.008" (.05-.20 mm). If backlash is not within specification, side gear thrust washers must be replaced.
3. Drive out pinion shaft lock pin from ring gear side. Remove pinion shaft, pinion gears, side gears, and thrust washers. See [Fig. 73](#) . Remove oil seals from transaxle housing and transaxle case. Remove bearing outer races and shims from transaxle case and housing.

Inspection

Clean all parts with solvent. Dry parts using compressed air. Check bearings and gears for wear or damage. Replace parts as necessary.

Reassembly

1. Install bearing outer races and original shims in transaxle housing and case. Select thrust washers that will ensure correct side gear backlash. Thrust washers are available in thicknesses of .037-.047" (.95-1.20 mm) in .05 mm increments. Install thrust washers and side gears in differential case.
2. If possible, install same size thrust washers on both sides. Install pinion gears and pinion shaft. Check gear backlash to ensure proper thrust washers are used. When backlash is correct, drive lock pin through differential case and into pinion shaft. Stake differential case to retain lock pin.
3. Press side bearing on differential case. Install speedometer drive gear on differential case. Install remaining side bearing on differential case.
4. Install differential in transaxle case. Install transaxle housing. Install bolts in correct locations and tighten bolts to 21 ft. lbs. (29 N.m). See [Fig. 74](#) . Measure differential bearing preload, using Differential Preload Adapter (09564-32011) and an INCH-lb. torque wrench. See [Fig. 75](#) .
5. Preload must be within specification. Refer to the **DIFFERENTIAL PRELOAD SPECIFICATIONS** . If preload is incorrect, remove differential from transaxle case and replace adjusting shim under bearing. Adjusting shims are available in thicknesses of .079" (2.00 mm) to .114" (2.90 mm) in .05 mm increments. Preload will change approximately 2.6-3.5 INCH lbs. (.3-.4 N.m) with each shim thickness.
6. When correct preload is obtained, remove differential from transaxle case. Install ring gear on differential case. Clean ring gear and mounting surface. Heat ring gear to 212°F (100°C) in an oil bath. **DO NOT** heat ring gear at temperatures greater than 230°F (110°C). Align ring gear on differential case and install NEW bolts. Tighten bolts evenly in crisscross pattern to 72 ft. lbs. (97 N.m).
7. Stake locking tabs. Stake one tab flush with flat surface of nut. Stake 2nd tab against corner of nut on tightening side. Coat lip of oil seals with multipurpose grease.

DIFFERENTIAL PRELOAD SPECIFICATIONS

| Application | INCH Lbs. (N.m) |
|---------------|-------------------|
| New Bearings | 7.1-12.4 (.8-1.4) |
| Used Bearings | 3.5-6.2 (.4-.7) |

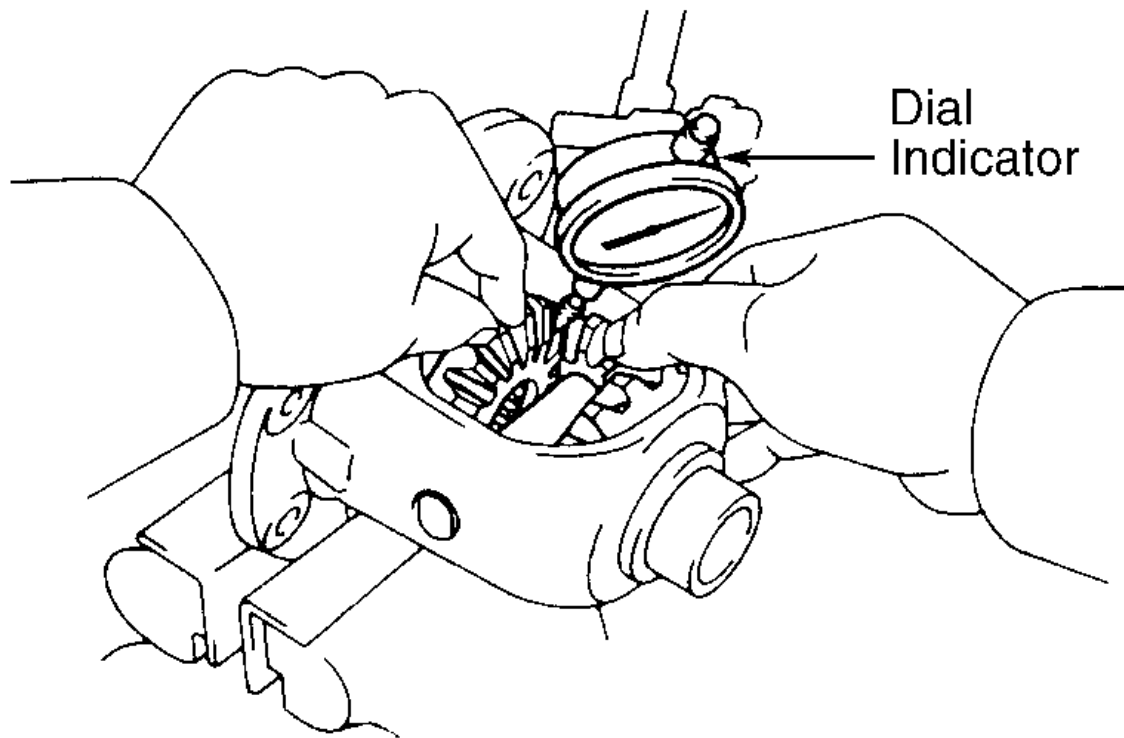
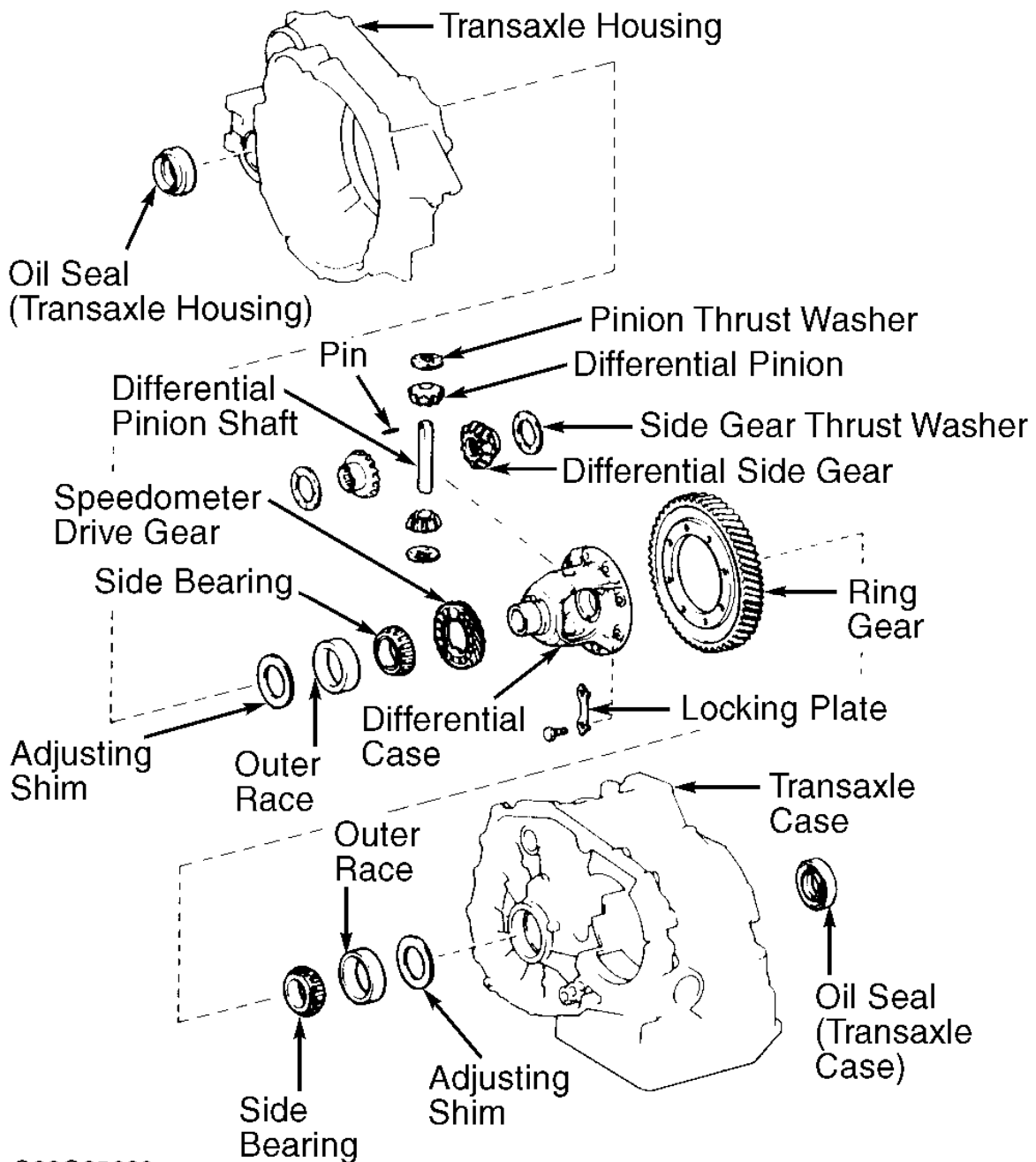
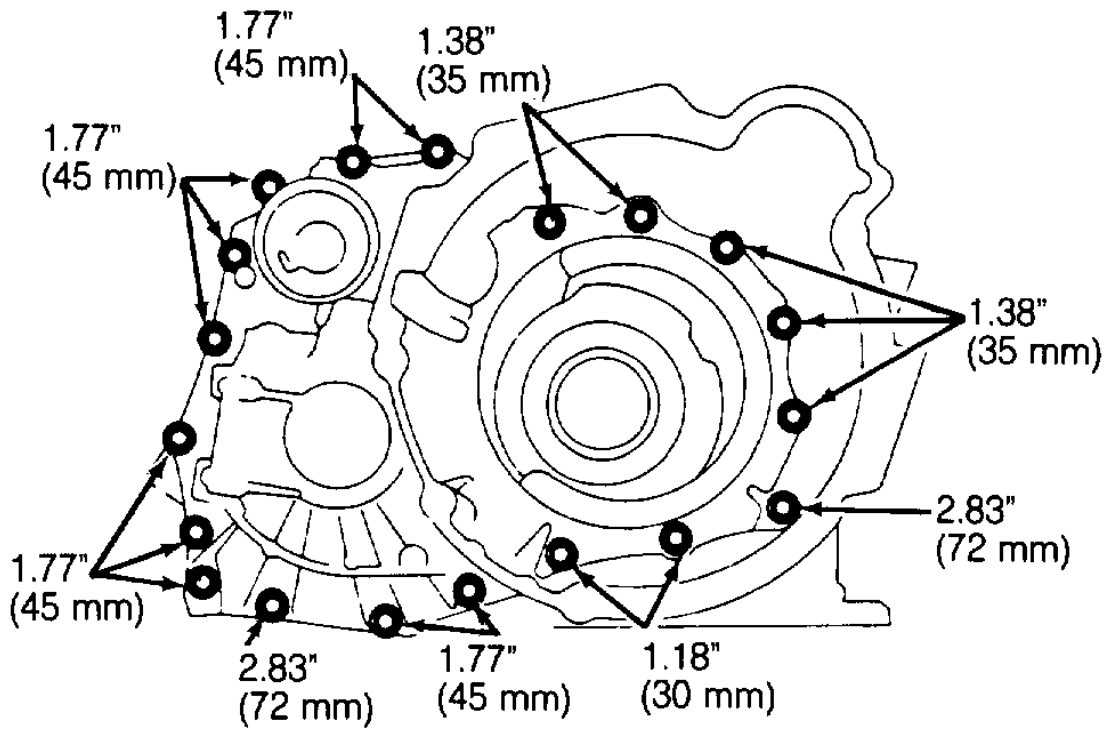


Fig. 72: Measuring Differential Pinion Gear Backlash
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

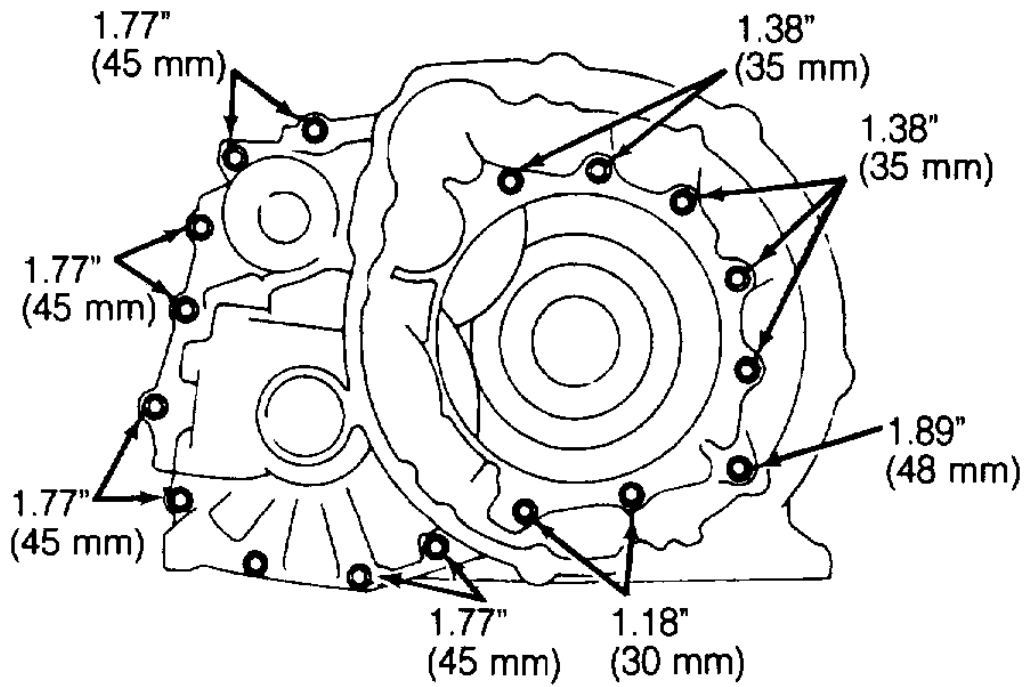


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Fig. 73: Exploded View Of Differential Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



A-243L, A-241E & A-244E



A-245E & A-246E

Fig. 74: Installing Transaxle Housing Bolts

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

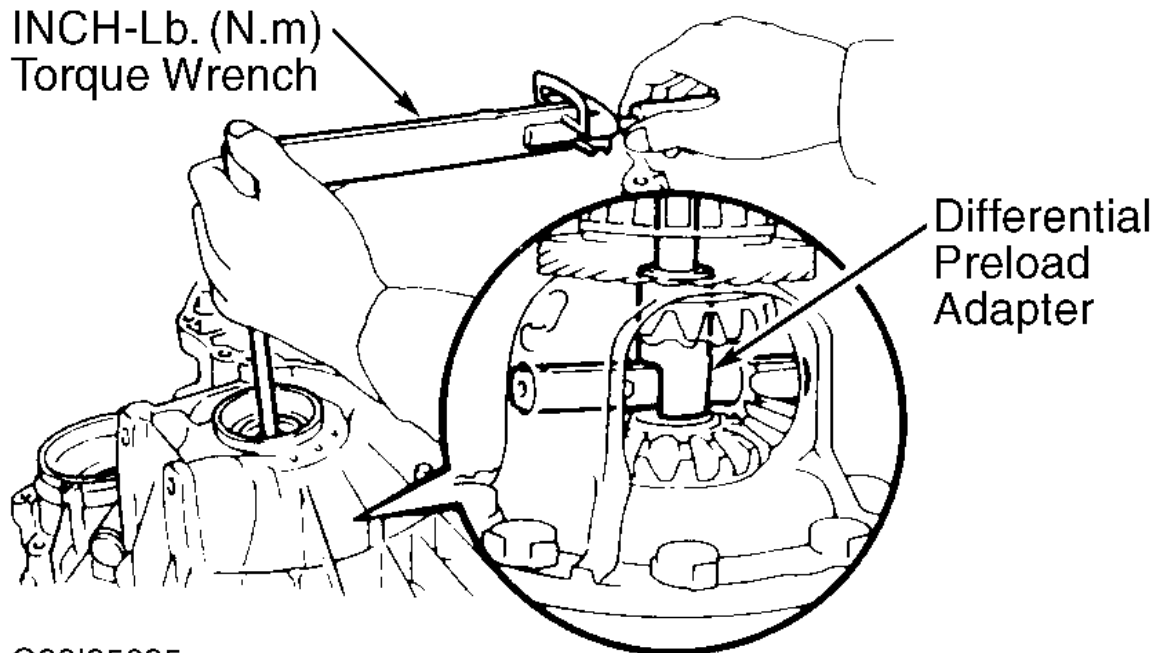


Fig. 75: Measuring Differential Bearing Preload

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

TRANSAXLE REASSEMBLY

A-243L, A-241E & A-244E MODELS

NOTE: Coat all oil seal rings, discs, plates, rotating parts and sliding surfaces with ATF prior to reassembly. Use petroleum jelly to hold parts in place. Discs should be soaked in ATF for 15 minutes prior to installation.

NOTE: For bearing race and thrust bearing specifications and location, see [Fig. 88](#) .

1. Install oil tube apply cover and gasket. Install oil tubes. Install oil tube clamps. Install underdrive brake accumulator piston and spring. See [Fig. 22](#) .
2. Install oil gallery cover and gasket. Tighten bolts to 89 INCH lbs. (10 N.m). Apply thread sealant to screws for oil gallery cover. Install screws and tighten.

3. Install cam guide bracket. Install parking lock rod in guide bracket. Install parking lock sleeve with raised portion up. Install stopper plate on raised portion of lock sleeve. Install guide sleeve and spring. Install parking lock pawl, pawl shaft and shaft clamp. See [Fig. 22](#) .
4. Install NEW "O" rings on 1st and reverse brake piston. Lubricate "O" rings with ATF. Using appropriate compressor, press 1st and reverse brake piston into transaxle case.
5. Install piston return spring and snap ring. Avoid bending spring retainer by overtightening bolt. See [Fig. 24](#) . Ensure snap ring is fully seated and centered by 3 lugs on spring retainer. Ensure end gap of snap ring is not aligned with spring retainer claw.
6. Install underdrive brake piston "O" rings. Coat "O" rings with ATF. Install piston in transaxle case with cup side upward. Use care not to damage "O" rings. Install brake piston return spring. Install plates and discs. Start with plate and alternate with disc ending with disc. Install flange with flat end down.
7. Using appropriate compressor, compress return spring. Install snap ring. Ensure snap ring end gap is not aligned with cutout. Using compressed air, confirm underdrive brake piston moves smoothly. See [Fig. 23](#) . Install oil seal rings to transaxle case.
8. Install underdrive one-way clutch assembly. Install anti-rattle clip. Align clutch disc tabs and install underdrive clutch assembly. Check operation of underdrive one-way clutch. Clutch should turn freely counterclockwise and lock clockwise. See [Fig. 76](#) .

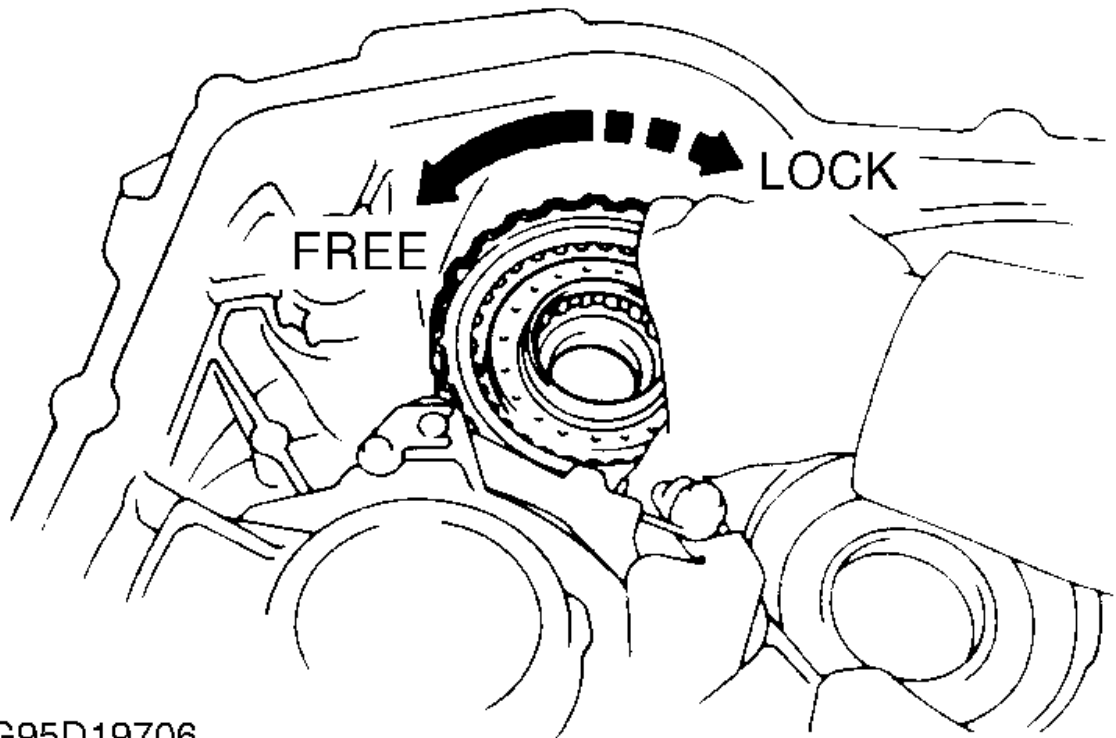
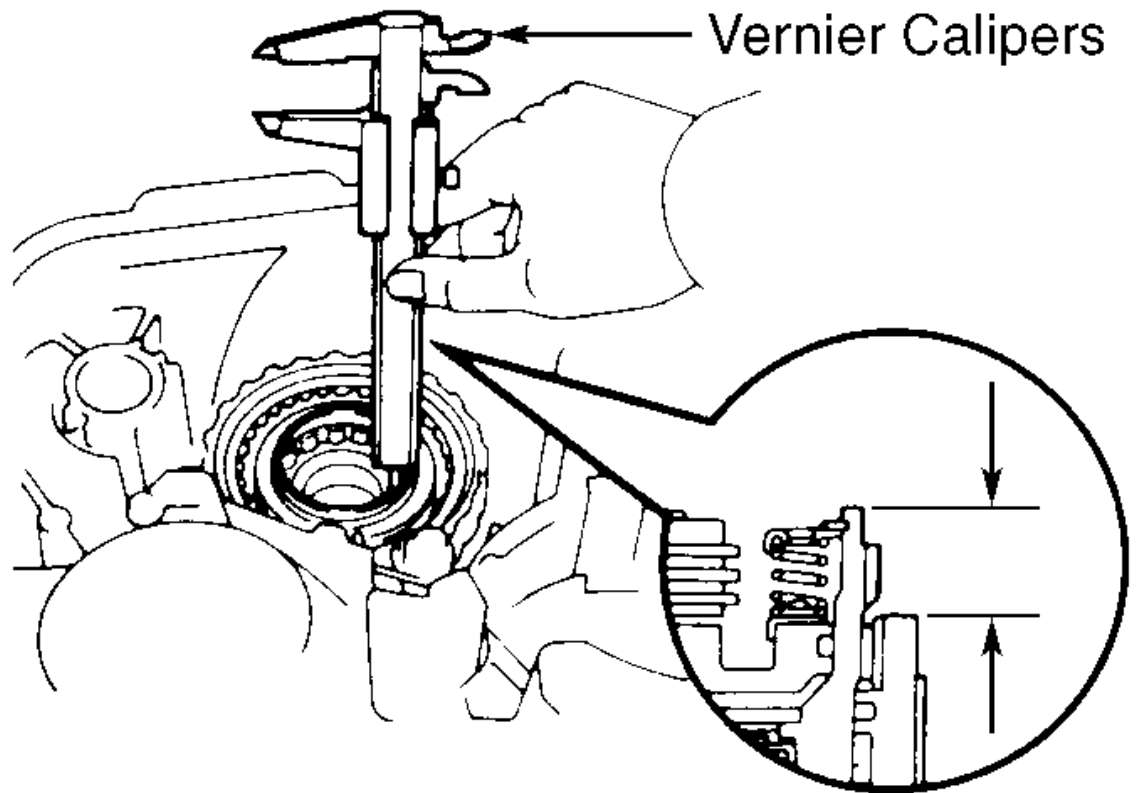


Fig. 76: Checking Underdrive Clutch Operation

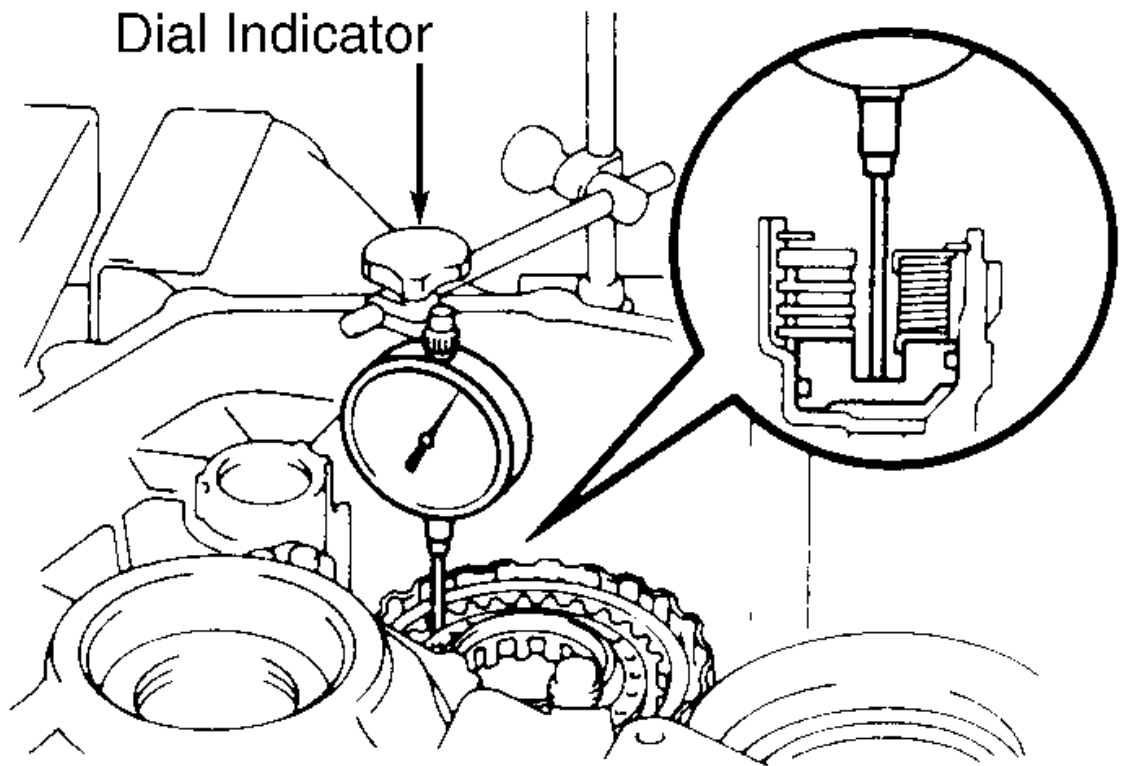
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9. Measure clutch assembly height from sleeve to inner race. Height should be .681-.717" (17.29-18.21 mm). See [Fig. 77](#) . Check underdrive clutch piston stroke. Position dial indicator stem on underdrive clutch assembly. See [Fig. 78](#) . Apply compressed air to oil passage in transaxle case. See [Fig. 23](#) .
10. For A-241E and A-243L transaxles, piston stroke should be .048-.061" (1.21-1.55 mm). For A-244E transaxles, piston stroke should be .059-.073" (1.50-1.86 mm). If piston stroke is not within specification, install correct flange.
11. Flanges are available in thicknesses of .080" (2.04 mm) and .094" (2.40 mm) for A-244E. Flanges for A-241E and A-243L transaxle are available in thicknesses of .091" (2.30 mm), .098" (2.50 mm) and .106" (2.70 mm) . Install thrust bearing "G". See [Fig. 88](#) . Install sun gear in transaxle case.
12. Align clutch disc tabs in underdrive clutch. Install countershaft assembly. Check countershaft height. Measure distance from tip of countershaft to bolt seat of clutch support. See [Fig. 79](#) . Countershaft height should be 1.311-1.398" (33.30-35.50 mm).
13. Install thrust bearing "F". See [Fig. 81](#) . Press in counterdriven gear. Install NEW lock nut. Using holder and adapter, tighten lock nut to 116 ft. lbs. (157 N.m). Using a dial indicator, measure countershaft end play. End play should be .009-.035" (.23-.89 mm). Stake lock nut. Install snap ring in transaxle case.
14. Install intermediate shaft. Apply gasket sealer to rear cover sealing areas. Install transaxle rear cover and bolts. Ensure bolts are installed in correct locations. See [Fig. 80](#) . Tighten bolts to 21 ft. lbs. (29 N.m). Install apply gaskets in transaxle case. Install thrust washer and governor driven gear. See [Fig. 18](#) . Ensure intermediate shaft rotates smoothly.



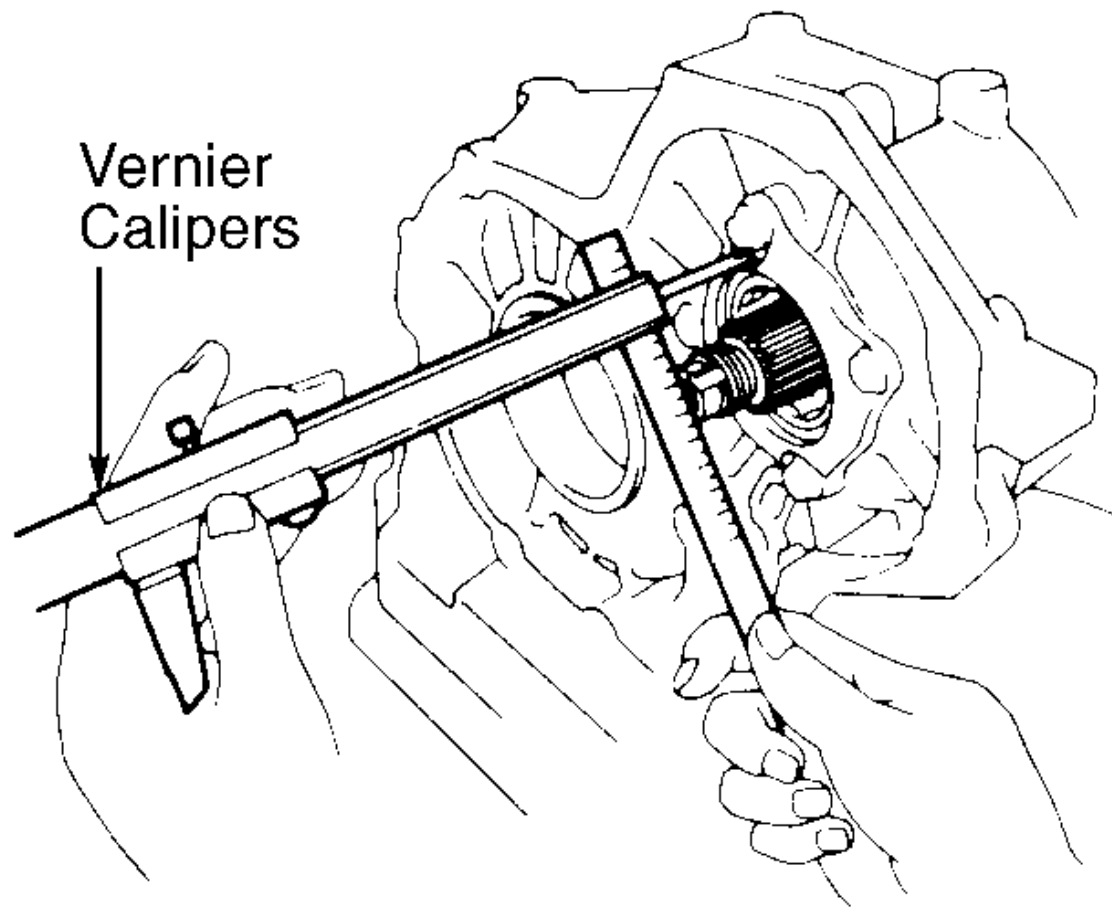
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Fig. 77: Measuring Underdrive Clutch Assembly Height
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 78: Measuring Underdrive Clutch Piston Stroke
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 79: Measuring Height Of Countershaft
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

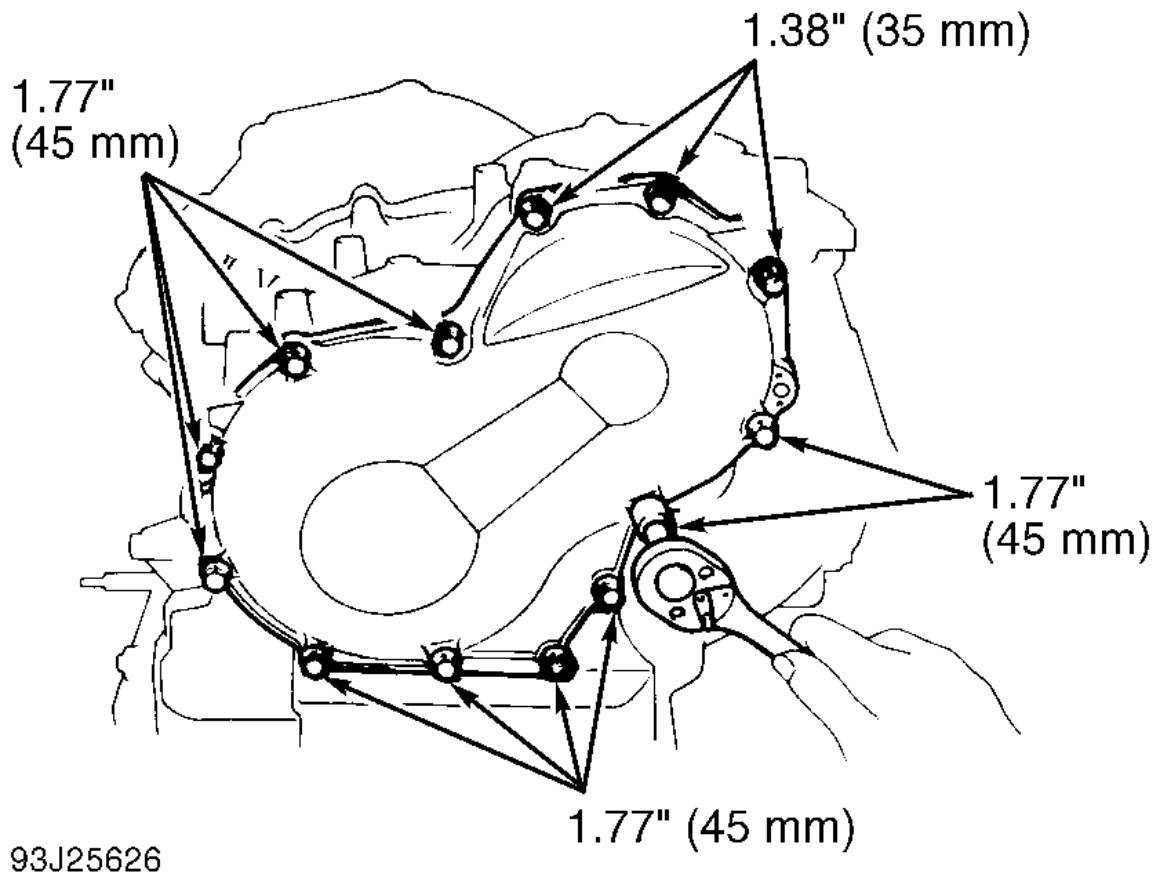


Fig. 80: Identifying Transaxle Rear Cover Bolts

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

15. Install 1st and reverse brake components in transaxle case. Install inner flange with flat end facing upward. Install discs and plates. Start with disc, alternate with plate, ending with disc. Install outer flange with flat area facing inward. Install snap ring in groove. Ensure end gap does not align with transaxle case cutout.
16. Check 1st and reverse brake operation. Apply light air pressure to oil passage. See [Fig. 21](#) . Ensure piston moves smoothly. Install thrust bearing and races "A" in rear planetary ring gear. See [Fig. 88](#) . Align disc tabs. Install rear planetary ring gear in transaxle case. Install thrust washer on rear planetary gear. Ensure tabs align with grooves of gear.
17. Align spline of planetary gear with tabs of 1st and reverse brake discs. Install rear planetary gear into 1st and reverse brake. Ensure inner surface of rear planetary gear is below upper surface of flange. See [Fig. 81](#) . Install No. 2 one-way clutch with shiny side upward. Rotate planetary gear clockwise while installing No. 2 one-way clutch.
18. Check No. 2 one-way clutch operation. Planetary gear should rotate clockwise and lock counterclockwise. See [Fig. 82](#) . Install thrust washer on planetary gear. Install snap ring. Ensure end gap of snap ring is not aligned with case cutouts.

19. Install 2nd brake flange with flat end facing upward. Install discs and plates, starting with disc, alternating with plate and ending with plate. Install piston return spring assembly with springs over case protrusions. Install 2nd coast brake band guide with tip contacting transaxle case. Align 2nd brake drum groove with bolt in transaxle case.
20. Install 2nd brake drum. Install snap ring in groove while compressing piston return springs with hammer handles. Ensure end gap of snap ring is not aligned with transaxle case cutouts. Install 2nd brake drum gasket in center oil passage until it contacts 2nd brake drum. Apply compressed air into 2nd brake oil passage in transaxle case. Ensure 2nd brake piston operates smoothly. See [Fig. 20](#) .
21. Align 2nd brake disc tabs. Install No. 1 one-way clutch and 2nd brake hub. Check distance between surface of 2nd brake hub and rear planetary gear. See [Fig. 83](#) . Distance should be approximately .20" (5.0 mm). Install thrust washer on sun gear input drum. Install sun gear and sun gear input drum. Rotate sun gear clockwise while installing gear into one-way clutch.
22. Install thrust bearing and race "B" on front planetary gear. See [Fig. 81](#) . Install planetary gear. Install thrust bearing and race "C" on front planetary ring gear. See [Fig. 88](#) . Install front planetary ring gear. Install intermediate shaft oil seal ring.
23. If components installed in transaxle case are correctly installed, end of ring gear flange bushing will be even or slightly lower than intermediate shaft shoulder. See [Fig. 84](#) . Install thrust bearing and races "D" on tip of ring gear flange. Install 2nd coast brake band into transaxle case. Install pin through oil pump mounting bolt hole.
24. Install thrust bearing and race "E" on forward clutch drum. See [Fig. 88](#) . Install clutch drum thrust washer on direct clutch drum with oil groove facing upward. Align clutch disc tabs. Install direct clutch into forward clutch. If tabs are aligned with hub correctly, end of direct clutch drum bushing will be flush with surfaces of forward clutch.
25. Rotate forward clutch to mesh with front planetary gear and discs. Install direct clutch and forward clutch into transaxle case. Check installation of direct/forward clutch assembly. Measure distance between direct clutch and sun gear drum (shell). See [Fig. 85](#) . Distance should be .118" (3.0 mm).
26. Install differential. Apply gasket sealer (Loctite 518 or equivalent) to transaxle housing. Install transaxle housing. Install mounting bolts in original locations. See [Fig. 74](#) . Tighten bolts to 21 ft. lbs. (29 N.m). Check differential side bearing preload. Refer to **DIFFERENTIAL** under COMPONENT DISASSEMBLY & REASSEMBLY.
27. Install race on stator shaft. Install "O" ring on oil pump. Install oil pump. Hold input shaft and tightly press oil pump body to slide oil seal rings on stator shaft through direct clutch drum. Install and tighten bolts to 18 ft. lbs. (25 N.m).

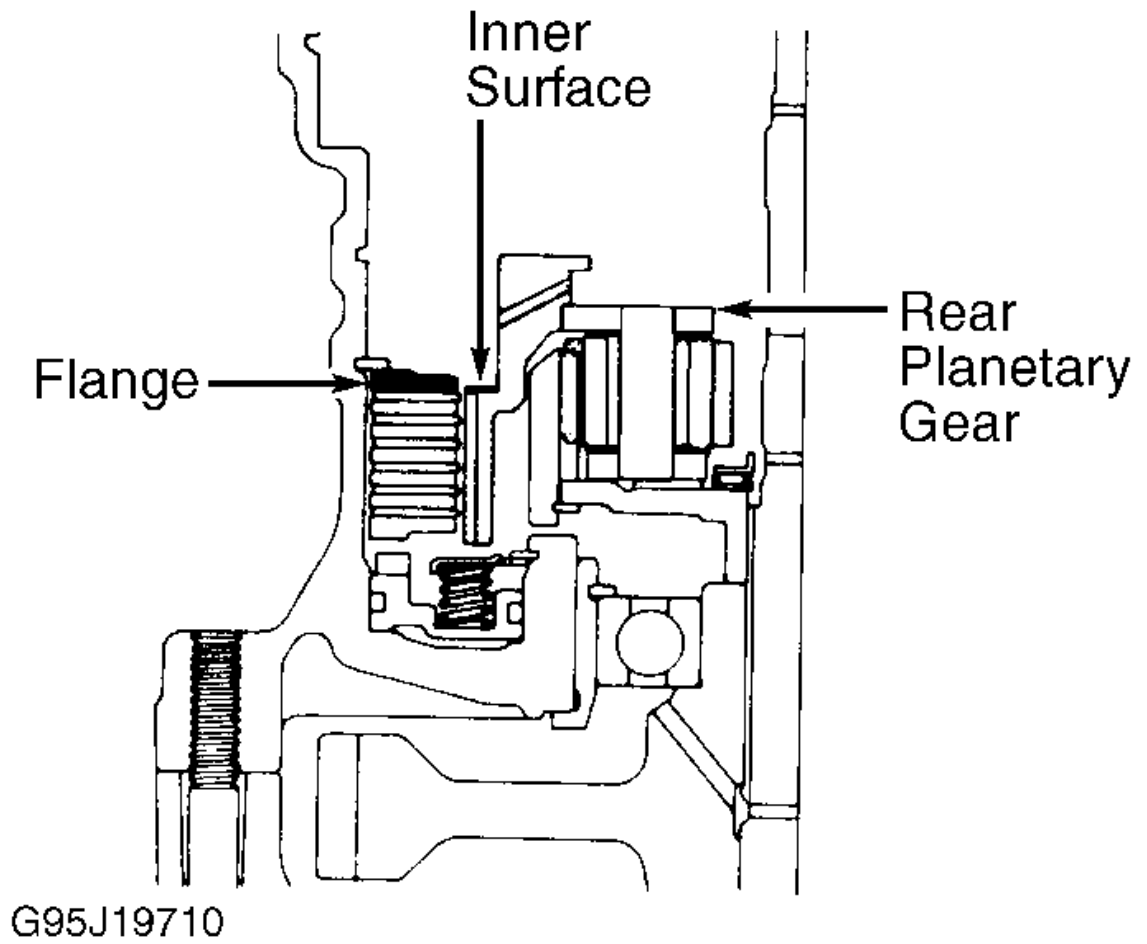


Fig. 81: Checking Rear Planetary Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

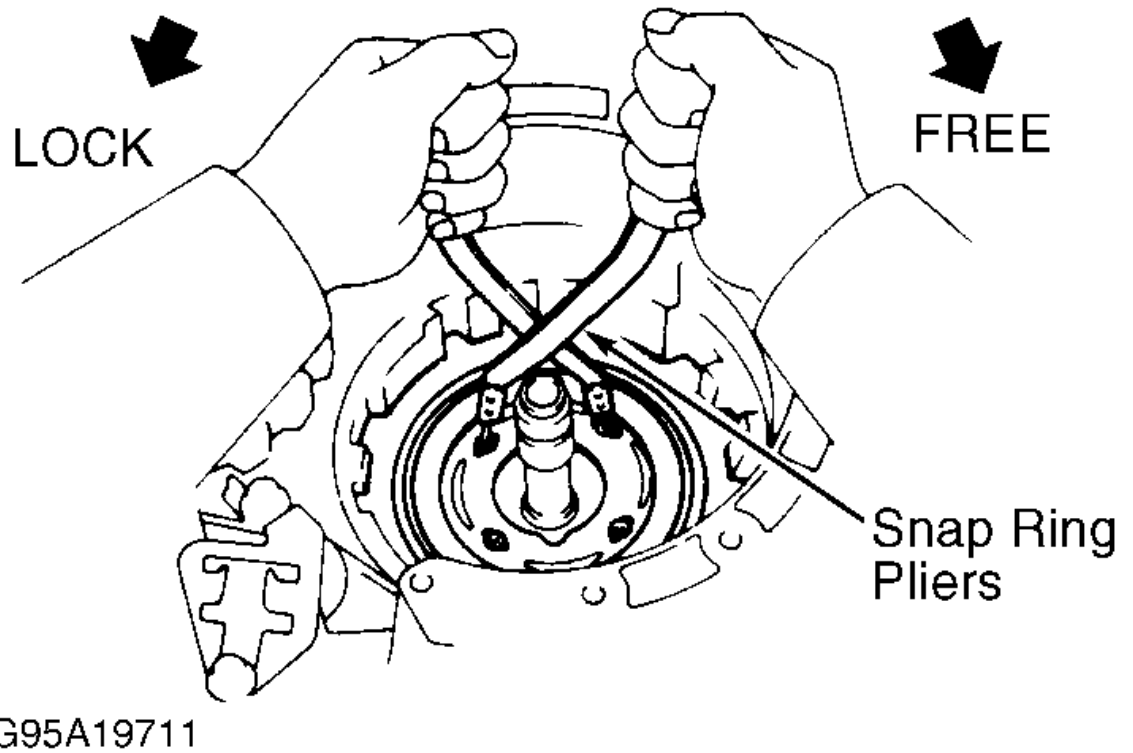
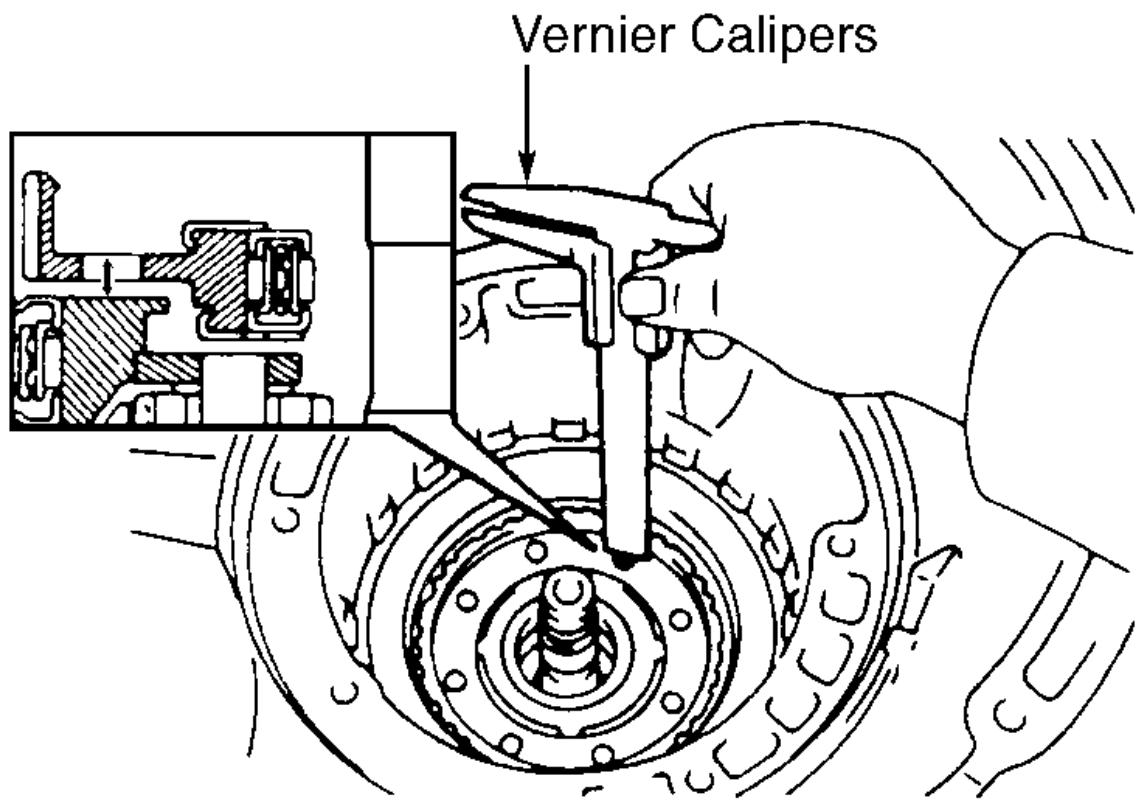


Fig. 82: Checking No. 2 One-Way Clutch Operation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 83: Checking 2nd Brake Hub Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

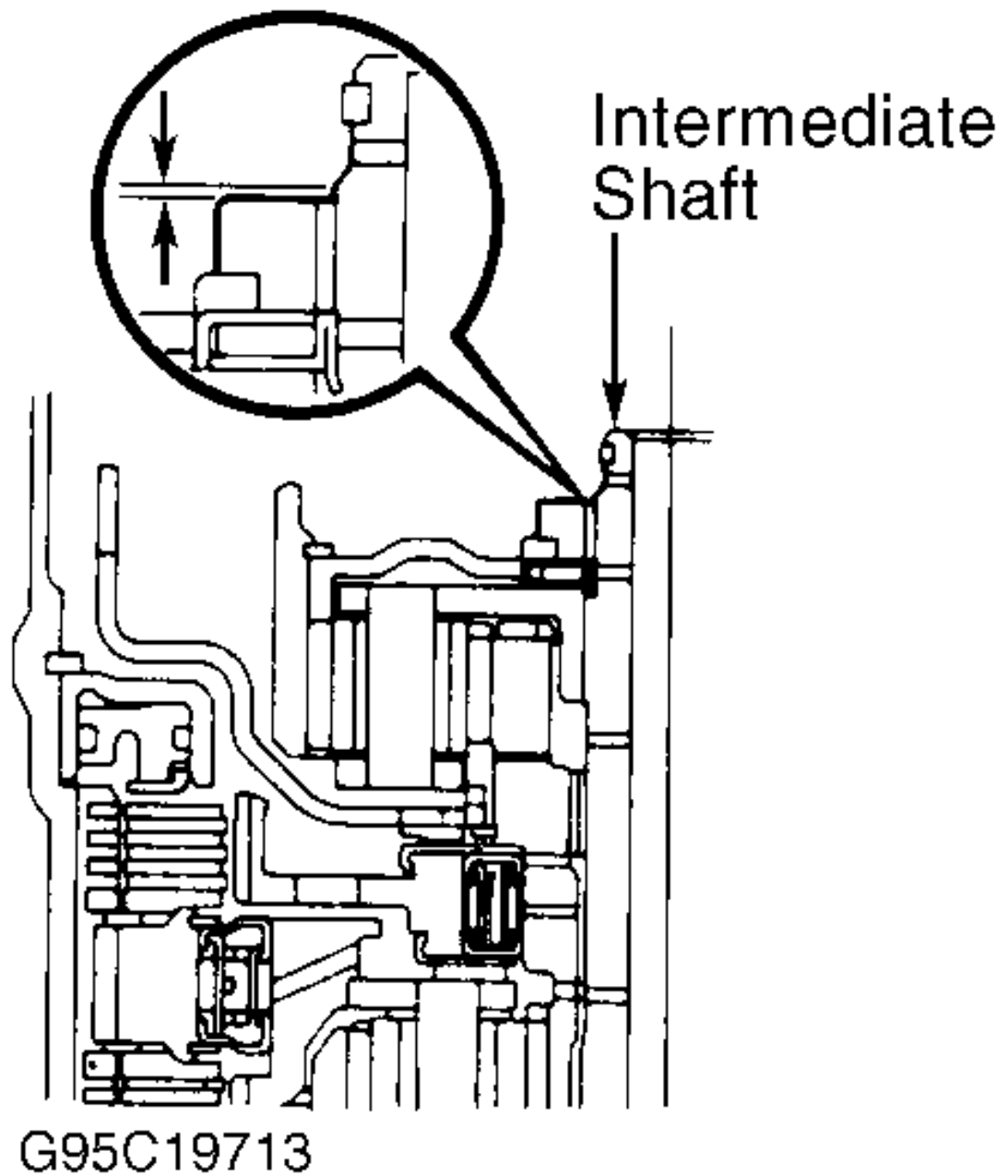


Fig. 84: Checking Front Planetary Ring Gear Installation
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

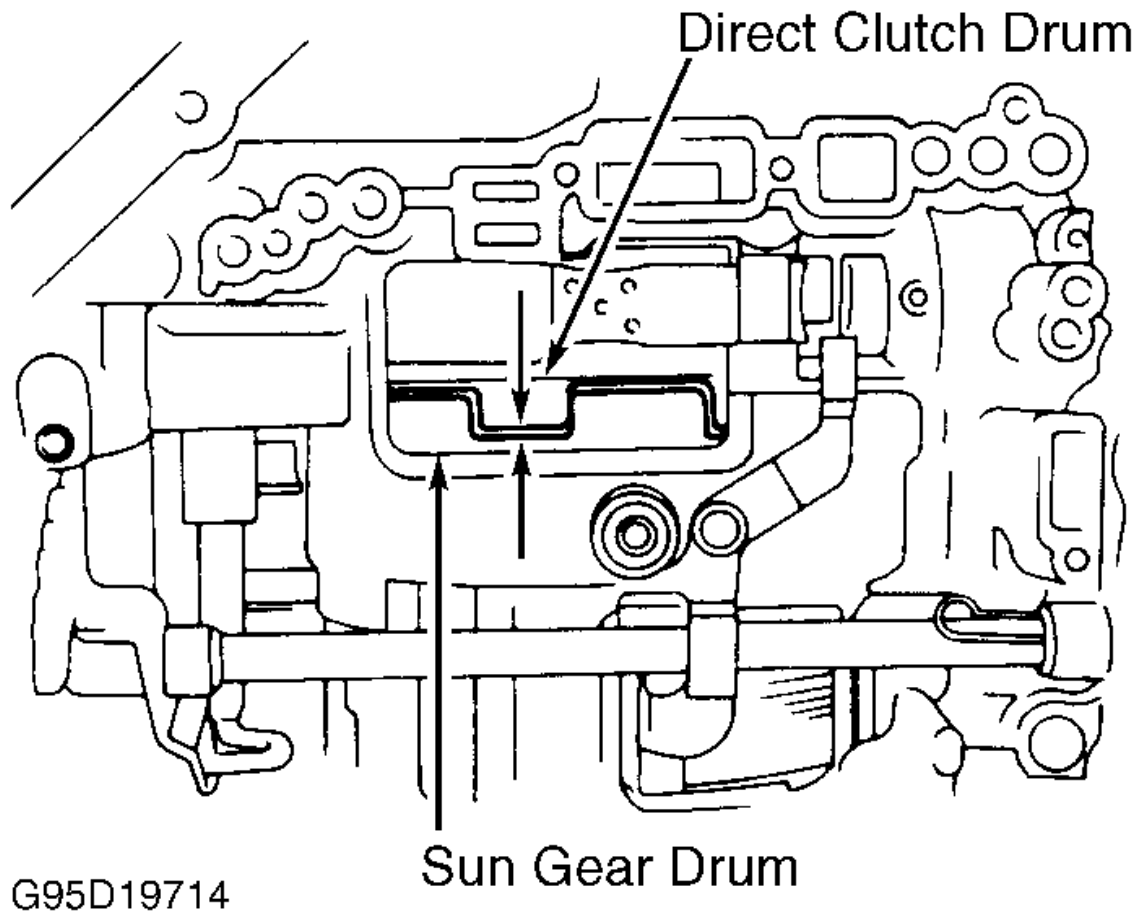


Fig. 85: Checking Direct/Forward Clutch Drum Assembly Installation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: DO NOT apply excessive pressure on oil pump. Seal rings will stick to direct clutch drum if excessive pressure is used.

28. Ensure input shaft rotates smoothly. Using a dial indicator, measure input shaft end play. End play should be .012-.035" (.30-.90 mm). Replace oil pump race if end play is incorrect. Oil pump races are available in thicknesses of .031" (.80 mm) and .055" (1.40 mm).
29. Install spring, 2nd coast brake piston and cover into bore. Install snap ring. Ensure front end of piston rod contacts center of 2nd brake band depression.
30. Measure 2nd coast brake piston stroke by applying compressed air to oil passage in transaxle case. See [Fig. 17](#) . Piston stroke should be .059-.118" (1.50-3.00 mm). Replace band if stroke is not within specification.
31. Recheck piston stroke after band. Coat accumulator piston "O" rings with ATF. Install "O" rings on accumulator pistons. Measure spring free length and replace as necessary.

32. See appropriate ACCUMULATOR SPRING SPECIFICATIONS table. Install pistons and springs in transaxle case. See [Fig. 86](#) . Install accumulator cover and NEW gasket. Tighten bolts to 89 INCH lbs. (10 N.m).

ACCUMULATOR SPRING SPECIFICATIONS (A-241E, A-243L & A-244E)

| Application | Color | Free Length: In. (mm) |
|--|------------------|----------------------------------|
| A-243L ⁽¹⁾ | | |
| Direct Clutch | Blue/Lt. Blue | 2.817 (71.54) |
| Forward Clutch - Inner Spring | None | 1.673 (42.50) |
| Forward Clutch - Outer Spring | None | 3.063 (77.80) |
| Underdrive Clutch | White | 2.420 (61.47) |
| 2nd Brake | Yellow | 2.231 (56.68) |
| A-241E ⁽¹⁾ | | |
| Direct Clutch - No. 1 Spring | Pink | .610 (15.50) |
| Direct Clutch - No. 2 Spring | Pink | 462 (62.54) |
| Forward Clutch - Inner Spring | Pink | 614 (41.00) |
| Forward Clutch - Outer Spring | Pink | 917 (74.10) |
| Underdrive Clutch | Purple | 2.397 (60.88) |
| 2nd Brake - No. 1 Spring | Green | .610 (15.50) |
| 2nd Brake - No. 2 Spring | Green | 2.397 (60.88) |
| A-244E ⁽¹⁾ | | |
| Direct Clutch | Red/White | 2.446 (62.12) |
| Forward Clutch - Inner Spring | None | 1.457 (37.00) |
| Forward Clutch - Outer Spring | None | 3.063 (77.80) |
| Underdrive Clutch | Yellow | 2.231 (56.68) |
| 2nd Brake | Blue | 2.314 (58.77) |
| ⁽¹⁾ For accumulator spring locations, see Fig. 86 . | | |

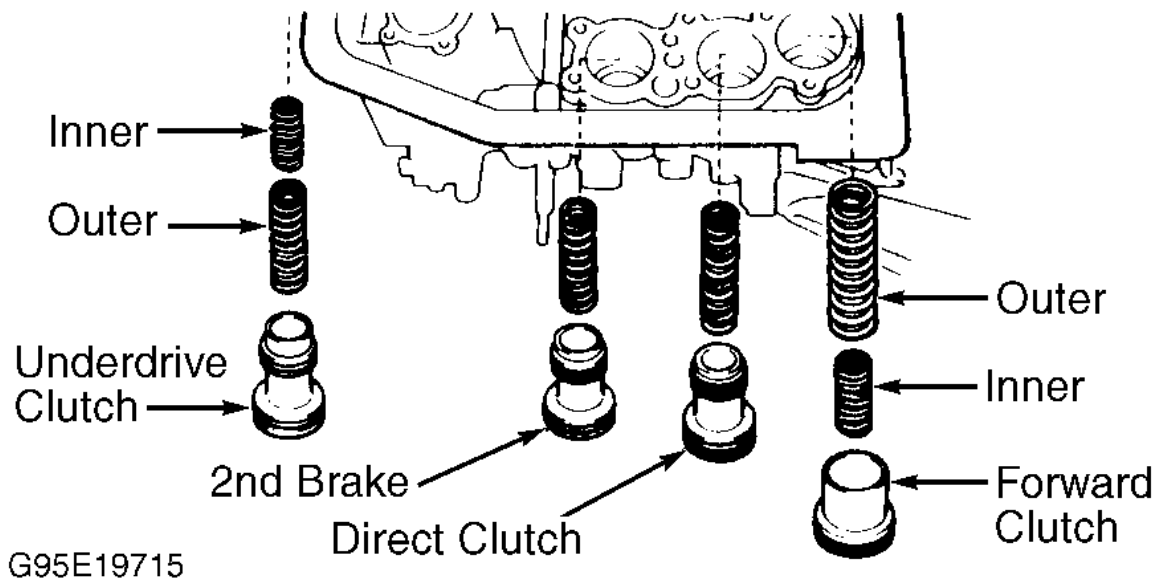


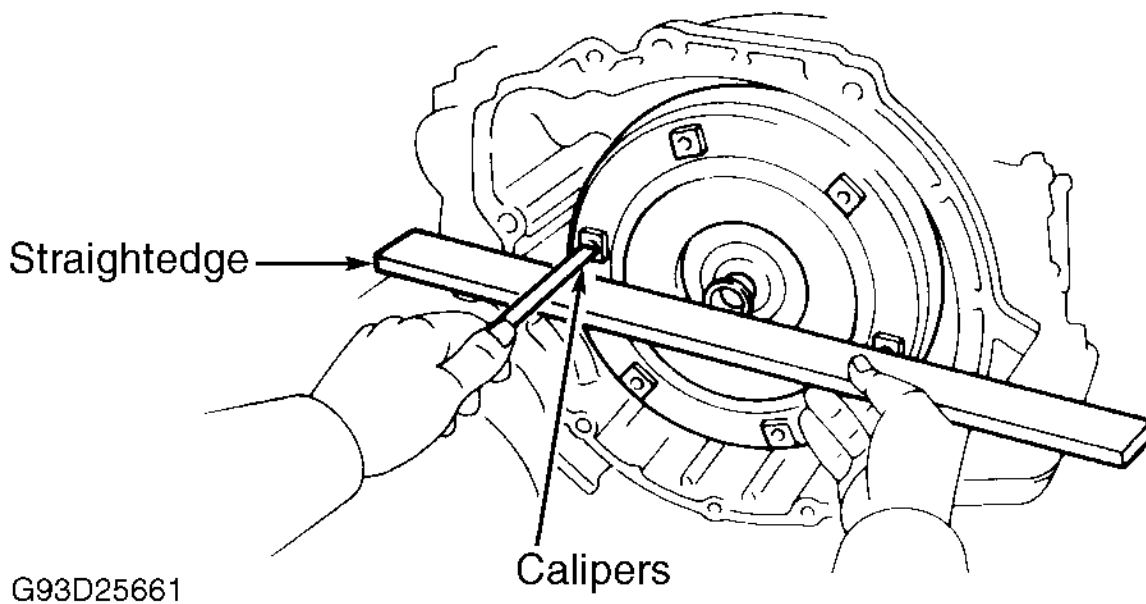
Fig. 86: Identifying Accumulator Pistons & Springs
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

33. Install 2nd brake apply gasket. Install throttle cable. Use care not to damage "O" ring. Ensure cable is fully seated in transaxle case. Install solenoid wire(s) in transaxle case. Install VALVE BODY assembly. See [VALVE BODY ASSEMBLY R & I](#) under ON-VEHICLE SERVICE. Ensure proper length bolt is installed in proper location. Connect solenoid wiring.
34. Install manual detent spring and cover. Install bolt and tighten bolt to 89 INCH lbs. (10 N.m). Ensure manual valve lever is in contact with center of roller at tip of detent spring. Install oil tubes. Install oil tube clamp and bracket. Tighten bolts to 89 INCH lbs. (10 N.m). Install oil strainer (filter) with NEW gasket.
35. Install magnet(s) in oil pan. Install NEW oil pan gasket and install oil pan. Tighten oil pan bolts to 43 INCH lbs. (4.9 N.m). Install speed sensor and sensor rotor (if equipped). Install NEW "O" ring on sensor cover and install cover. Install sensor bracket and tighten bolts to 115 INCH lbs. (13 N.m).
36. On A-243L transaxles, install governor oil strainer. Install NEW gasket to governor body adapter. Install governor body adapter, governor body and thrust washer. Install NEW "O" ring on cover. Install cover and cover brackets. Tighten bracket bolts to 115 INCH lbs. (13 N.m). Install throttle cable and solenoid lock plates.
37. On all transaxles, install oil cooler pipe unions (if necessary). Install park/neutral position switch to manual valve shaft. Install packing, nut, stopper and nut. Tighten nut to 61 INCH lbs. (6.9 N.m). Adjust park/neutral position switch (if necessary) and tighten adjusting bolts to 48 INCH lbs. (5.4 N.m). See appropriate TRANSMISSION SERVICING - A/T article in the AUTOMATIC TRANS SERVICING section. Stake nut to stopper. Install manual shift lever and tighten nut. Install filler tube and dipstick. Install oil cooler pipes.

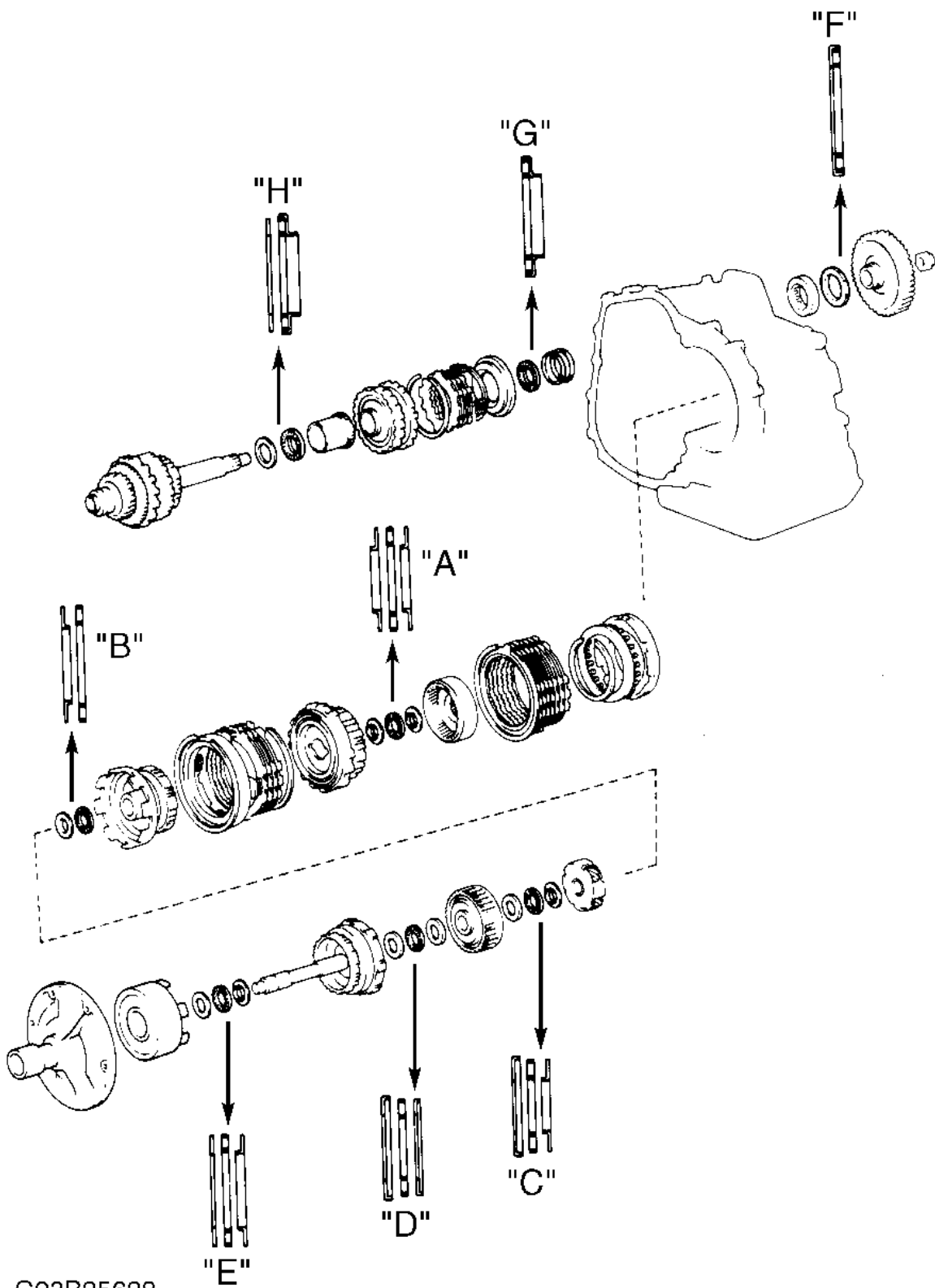
38. Install torque converter on transaxle. Using a straightedge and calipers, measure torque converter installed depth. For torque converter depth specifications, see [TORQUE CONVERTER DEPTH SPECIFICATIONS](#) . See [Fig. 87](#) .

TORQUE CONVERTER DEPTH SPECIFICATIONS

| Application | In. (mm) |
|-------------|--------------|
| Celica | .898 (22.80) |
| MR2 | .906 (23.00) |
| Paseo | .528 (13.40) |



[Fig. 87: Measuring Torque Converter Depth](#)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 88: Identifying Bearing Race & Thrust Bearing Locations

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

THRUST BEARING & RACE SPECS (A-241E/A-241L/A-244E) 

THRUST BEARING & RACE SPECIFICATIONS (A-241E & A-244E) ⁽¹⁾

| Application | Outer Diameter: INCH (mm) | Inner Diameter: INCH (mm) |
|--|---------------------------|---------------------------|
| "A" | | |
| Front Race | 1.469 (37.3) | .949 (24.1) |
| Rear Race | 1.480 (37.6) | .874 (22.2) |
| Bearing | 1.480 (37.6) | .945 (24) |
| "B" | | |
| Front Race | 1.772 (45) | 1.102 (28) |
| Bearing | 1.772 (45) | 1.181 (30) |
| "C" | | |
| Front Race | 1.492 (37.9) | .866 (22) |
| Rear Race | 1.378 (35) | .748 (19) |
| Bearing | 1.421 (36.1) | .874 (22.2) |
| "D" | | |
| Front Race | 1.492 (37.9) | .866 (22) |
| Rear Race | 1.406 (35.7) | .906 (23) |
| Bearing | 1.421 (36.1) | .874 (22.2) |
| "E" | | |
| Front Race | 1.693 (43) | 1.201 (30.5) |
| Rear Race | 1.654 (42) | 1.138 (28.9) |
| Bearing | 1.654 (42) | 1.067 (27.1) |
| "F" Bearing | 2.272 (57.7) | 1.614 (41) |
| "G" Bearing | 1.780 (45.2) | 1.220 (31) |
| "H" | | |
| Front Race | 1.646 (41.8) | 1.181 (30) |
| Bearing | 1.720 (43.7) | 1.220 (31) |
| ⁽¹⁾ For thrust bearing locations, see Fig. 88 . | | |

THRUST BEARING & RACE SPECIFICATIONS (A-243L) ⁽¹⁾

| Application | Outer Diameter: INCH (mm) | Inner Diameter: INCH (mm) |
|-------------|---------------------------|---------------------------|
| "A" | | |
| Front Race | 1.469 (37.3) | .949 (24.1) |
| Rear Race | 1.480 (37.6) | .874 (22.2) |
| Bearing | 1.480 (37.6) | .945 (24) |
| "B" | | |

| Application | Outer Diameter: INCH (mm) | Inner Diameter: INCH (mm) |
|---|---------------------------|---------------------------|
| Front Race | 1.772 (45) | 1.102 (28) |
| Bearing | 1.772 (45) | 1.181 (30) |
| "C" | | |
| Front Race | 1.492 (37.9) | .866 (22) |
| Rear Race | 1.378 (35) | .748 (19) |
| Bearing | 1.421 (36.1) | .874 (22.2) |
| "D" | | |
| Front Race | 1.492 (37.9) | .866 (22) |
| Rear Race | 1.406 (35.7) | .906 (23) |
| Bearing | 1.772 (45) | 1.181 (30) |
| "E" | | |
| Front Race | 1.693 (43) | 1.201 (30.5) |
| Rear Race | 1.654 (42) | 1.138 (28.9) |
| Bearing | 1.654 (42) | 1.067 (27.1) |
| "F" Bearing | 2.272 (57.7) | 1.614 (41) |
| "G" Bearing | 1.780 (45.2) | 1.220 (31) |
| "H" | | |
| Front Race | 1.646 (41.8) | 1.181 (30) |
| Bearing | 1.720 (43.7) | 1.220 (31) |
| (1) For thrust bearing locations, see Fig. 88 . | | |

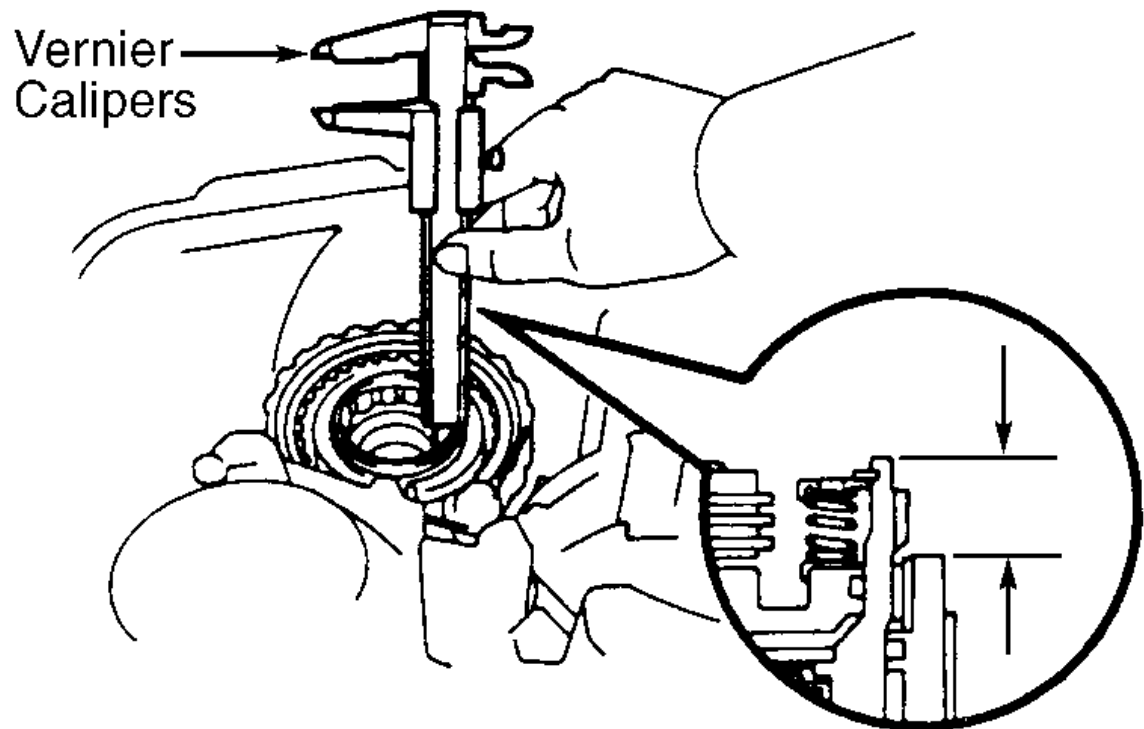
A-245E & A-246E MODELS

NOTE: Coat all oil seal rings, discs, plates, rotating parts and sliding surfaces with ATF prior to reassembly. Use petroleum jelly to hold parts in place. Discs should be soaked in ATF for at least 15 minutes prior to installation.

NOTE: For bearing race and thrust bearing specifications and location, see [Fig. 88](#) .

1. Install oil tube apply cover and gasket. Install oil tubes. Install oil tube clamps. Install underdrive brake accumulator piston and spring. See [Fig. 22](#) .
2. Install oil gallery cover and gasket. Tighten bolts to 89 INCH lbs. (10 N.m). Apply thread sealant to screws for oil gallery cover. Install screws and tighten.
3. Install cam guide bracket. Install parking lock rod in guide bracket. Install parking lock sleeve with raised portion up. Install stopper plate on raised portion of lock sleeve. Install guide sleeve and spring. Install parking lock pawl, pawl shaft and shaft clamp. See [Fig. 22](#) .
4. Install NEW "O" rings on 1st and reverse brake piston. Lubricate "O" rings with ATF. Using appropriate compressor, press 1st and reverse brake piston into transaxle case.
5. Install piston return spring and snap ring. Avoid bending spring retainer by overtightening bolt. See [Fig. 24](#) . Ensure snap ring is fully seated and centered by 3 lugs on spring retainer. Ensure end gap of snap ring is not aligned with spring retainer claw.

6. Install underdrive brake piston "O" rings. Coat "O" rings with ATF. Install piston in transaxle case with cup side upward. Use care not to damage "O" rings. Install brake piston return spring. Install plates and discs. Start with plate and alternate with disc ending with disc. Install flange with flat end down.
7. Using appropriate compressor, compress return spring. Install snap ring. Ensure snap ring end gap is not aligned with cutout. Using compressed air, confirm underdrive brake piston moves smoothly. See [Fig. 23](#) . Install oil seal rings to transaxle case.
8. Place counterdrive on press platform with NEW spacer installed. Place case on gear. Press bearing onto counterdrive shaft until seated. Install intermediate shaft. Install lock nut. Secure counterdrive gear from turning and tighten lock nut to 130 ft. lbs. (177 N.m).
9. Using INCH lb. torque wrench, measure starting torque of intermediate shaft at counterdrive gear lock nut. Starting torque for new bearings is 2.7-6.2 INCH lbs. (.3-.7 N.m). Starting torque for used bearings is 1.8-3.5 INCH lbs. (.2-.4 N.m).
10. If starting torque is less than specification, replace spacer and recheck. Loosen lock nut if starting torque is greater than specification. Stake lock nut in place.
11. Install underdrive one-way clutch assembly. Install anti-rattle clip. Align clutch disc tabs and install underdrive clutch assembly. Check operation of underdrive one-way clutch. Clutch should turn freely counterclockwise and lock clockwise. See [Fig. 76](#) .
12. Measure clutch assembly height from sleeve to inner race. Height should be .681-.717" (17.29-18.21 mm). See [Fig. 89](#) . Check underdrive clutch piston stroke. Position dial indicator stem on underdrive clutch assembly. See [Fig. 78](#) . Apply compressed air to oil passage in transaxle case. See [Fig. 27](#) .
13. Piston stroke should be .059-.075" (1.50-1.90 mm). If piston stroke is not within specification, install correct flange. Flanges are available in thicknesses of .080" (2.04 mm), .091" (2.30 mm), .094" (2.40 mm) and .098" (2.50 mm). Install thrust bearing "G". See [Fig. 88](#) . Install sun gear in transaxle case.
14. Align clutch disc tabs in underdrive clutch. Install countershaft assembly. Check countershaft height. Measure distance from tip of countershaft to bolt seat of clutch support. See [Fig. 79](#) . Countershaft height should be 1.193-1.280" (30.30-32.50 mm).
15. Install thrust bearing "F". See [Fig. 88](#) . Press in counterdriven gear. Install NEW lock nut. Using holder and adapter, tighten lock nut to 133 ft. lbs. (180 N.m). Using a dial indicator, measure countershaft end play. End play should be .009-.035" (.23-.89 mm). Stake lock nut.
16. Apply gasket sealer to rear cover sealing areas. Install transaxle rear cover and bolts. Ensure bolts are installed in correct locations. See [Fig. 90](#) . Tighten bolts to 84 INCH lbs. (10 N.m). Ensure intermediate shaft turns smoothly.



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Fig. 89: Measuring Underdrive Clutch Assembly Height
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

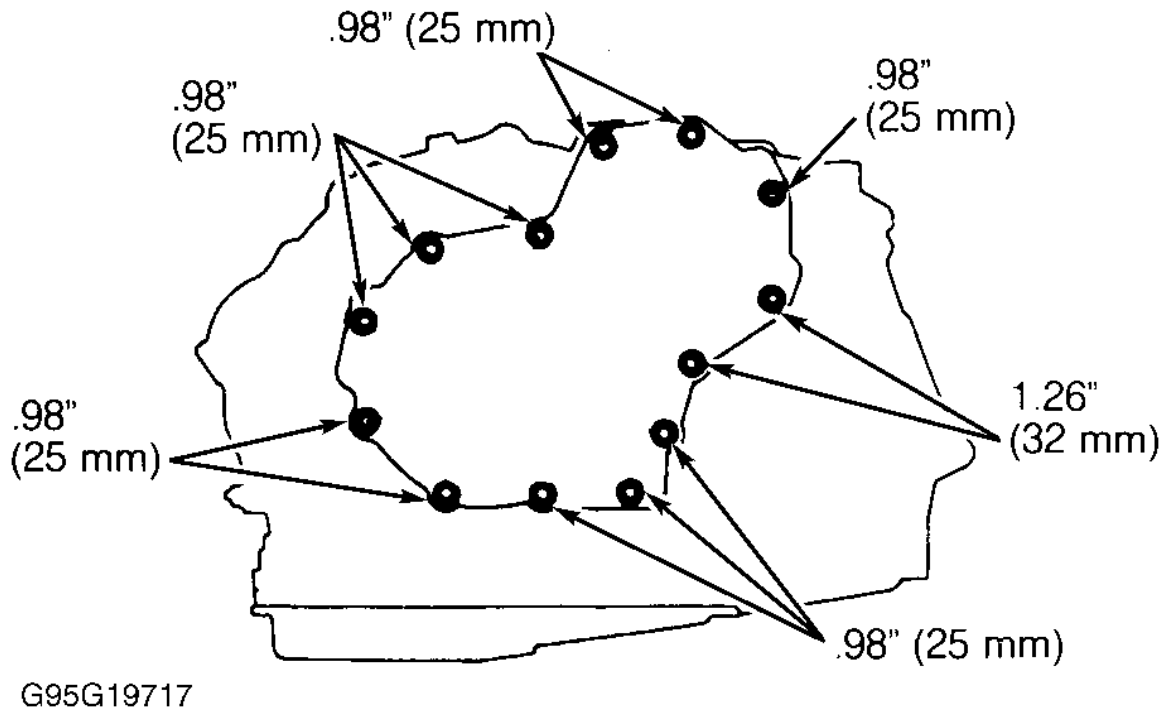


Fig. 90: Identifying Transaxle Rear Cover Bolts

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

17. Install 1st and reverse brake components in transaxle case. Install discs and plates. Start with plate, alternate with disc, ending with disc. Install outer flange with flat area facing inward. Install snap ring in groove. Ensure end gap does not align with transaxle case cutout.
18. Check 1st and reverse brake clutch pack clearance. See [Fig. 29](#) . Install thrust bearing and races "A" in rear planetary ring gear. See [Fig. 88](#) . Align disc tabs. Install thrust washer on rear planetary gear. Ensure tabs align with grooves of gear.
19. Align spline of planetary gear with tabs of 1st and reverse brake discs. Install rear planetary gear into 1st and reverse brake. Ensure inner surface of rear planetary gear is below upper surface of flange. See [Fig. 81](#) . Install No. 2 one-way clutch with shiny side upward. Rotate planetary gear clockwise while installing No. 2 one-way clutch.
20. Check No. 2 one-way clutch operation. Planetary gear should rotate clockwise and lock counterclockwise. See [Fig. 82](#) . Install thrust washer on planetary gear. Install snap ring. Ensure end gap of snap ring is not aligned with case cutouts.
21. Install 2nd brake flange with flat end facing upward. Install discs and plates, starting with disc, alternating with plate and ending with plate. Install piston return spring assembly with springs over case protrusions. Install 2nd coast brake band guide with tip contacting transaxle case. Align 2nd brake drum groove with bolt in transaxle case.
22. Install 2nd brake drum. Install snap ring in groove while compressing piston return springs with hammer handles. Ensure end gap of snap ring is not aligned with transaxle case cutouts. Install 2nd brake drum gasket in center oil passage until it contacts 2nd brake drum. Apply

compressed air into 2nd brake oil passage in transaxle case. Ensure 2nd brake piston operates smoothly. See [Fig. 20](#) .

23. Align 2nd brake disc tabs. Install No. 1 one-way clutch and 2nd brake hub. Check distance between surface of 2nd brake hub and rear planetary gear. See [Fig. 83](#) . Distance should be approximately .20" (5.0 mm). Install thrust washer on sun gear input drum. Install sun gear and sun gear input drum. Rotate sun gear clockwise while installing gear into one-way clutch.
24. Install thrust bearing and race "B" on front planetary gear. See [Fig. 88](#) . Install planetary gear. Install thrust bearing and race "C" on front planetary ring gear. See [Fig. 88](#) . Install front planetary ring gear. Install intermediate shaft oil seal ring.
25. If components installed in transaxle case are correctly installed, end of ring gear flange bushing will be even or slightly lower than intermediate shaft shoulder. See [Fig. 84](#) . Install thrust bearing and races "D" on tip of ring gear flange. Install 2nd coast brake band into transaxle case. Install pin.
26. Install thrust bearing and race "E" on forward clutch drum. See [Fig. 88](#) . Install clutch drum thrust washer on direct clutch drum with oil groove facing upward. Align clutch disc tabs. Install direct clutch into forward clutch. If tabs are aligned with hub correctly, end of direct clutch drum bushing will be flush with surfaces of forward clutch.
27. Rotate forward clutch to mesh with front planetary gear and discs. Install direct clutch and forward clutch into transaxle case. Check installation of direct/forward clutch assembly. Measure distance between direct clutch and sun gear drum (shell). See [Fig. 85](#) . Distance should be .118" (3.0 mm).
28. Install spring, 2nd coast brake piston and cover into bore. Install snap ring. Ensure front end of piston rod contacts center of 2nd brake band depression.
29. Measure 2nd coast brake piston stroke by applying compressed air to oil passage in transaxle case. See [Fig. 26](#) . Piston stroke should be .059-.118" (1.50-3.00 mm). Replace rod if stroke is not within specification. Rod lengths available are, 2.811" (71.4 mm) and 2.870" (72.9 mm). Install apply gasket in transaxle case.
30. Install differential. Install apply tube if removed. Apply gasket sealer (Loctite 518 or equivalent) to transaxle housing. Install transaxle housing. Install mounting bolts in original locations. See [Fig. 74](#) . Tighten bolts to 21 ft. lbs. (29 N.m). Check differential side bearing preload. See [DIFFERENTIAL](#) under COMPONENT DISASSEMBLY & REASSEMBLY.
31. Install race on stator shaft. Install "O" ring on oil pump. Install oil pump. Hold input shaft and tightly press oil pump body to slide oil seal rings on stator shaft through direct clutch drum. Install and tighten bolts to 18 ft. lbs. (25 N.m).

NOTE: **DO NOT apply excessive pressure on oil pump. Seal rings will stick to direct clutch drum if excessive pressure is used.**

32. Ensure input shaft rotates smoothly. Using a dial indicator, measure input shaft end play. End play should be .012-.035" (.30-.90 mm). Replace oil pump race if end play is incorrect. Oil pump races are available in thicknesses of .031" (.80 mm) and .055" (1.40 mm).
33. Coat accumulator piston "O" rings with ATF. Install "O" rings on accumulator pistons. Measure spring free length and replace as necessary. See appropriate ACCUMULATOR SPRING SPECIFICATIONS table. Install pistons and springs in transaxle case. See [Fig. 86](#) .

ACCUMULATOR SPRING SPECIFICATIONS (A-245E & A-246E) ⁽¹⁾

| Application | Color | Free Length: In. (mm) |
|---|--------|--------------------------|
| Direct Clutch | Blue | 2.768 (70.30) |
| Forward Clutch | | |
| Inner Spring | Red | 1.437 (36.50) |
| Outer Spring | Red | 2.480 (63.00) |
| Underdrive Clutch | | |
| Inner Spring | Yellow | 1.969 (50.00) |
| Outer Spring - A-245E | White | 2.815 (71.50) |
| Outer Spring - A-246E | White | 2.692 (68.40) |
| 2nd Brake | Brown | 2.547 (64.70) |
| (1) For accumulator spring locations, see Fig. 86 . | | |

THRUST BEARING & RACE SPECIFICATIONS (A-245E & A-246E) ⁽¹⁾

| Application | Outer Diameter: INCH (mm) | Inner Diameter: INCH (mm) |
|---|------------------------------|------------------------------|
| "A" | | |
| Front Race | 1.480 (37.6) | .949 (24.1) |
| Bearing | 1.480 (37.6) | .870 (22.1) |
| "B" Bearing | 1.772 (45) | 1.106 (28.1) |
| "C" | | |
| Rear Race | 1.378 (35) | .748 (19) |
| Bearing | 1.496 (38.0) | .866 (22.0) |
| "D" | | |
| Rear Race | 1.555 (39.5) | 1.024 (26) |
| Bearing | 1.654 (42.0) | 1.016 (25.8) |
| "E" Bearing | 1.811 (46) | 1.209 (30.7) |
| "F" Bearing | 2.283 (58.0) | 1.614 (41) |
| "G" Bearing | 1.728 (43.9) | 1.220 (31) |
| "H" | | |
| Front Race | 1.646 (41.8) | 1.181 (30) |
| Bearing | 1.728 (43.9) | 1.220 (31) |
| (1) For thrust bearing locations, see Fig. 88 . | | |

34. Install 2nd brake apply gasket. Install check ball body in passage next to 2nd brake accumulator. Install throttle cable. Use care not to damage "O" ring. Ensure cable is fully seated in transaxle case. Install solenoid wire(s) in transaxle case. Install VALVE BODY assembly. See **VALVE BODY ASSEMBLY R & I** under ON-VEHICLE SERVICE. Ensure proper length bolt is installed in proper location. Connect solenoid wiring.
35. Install manual detent spring and cover. Install bolt and tighten bolt to 89 INCH lbs. (10 N.m). Ensure manual valve lever is in contact with center of roller at tip of detent spring. Install oil tubes. Install oil tube clamp and bracket. Tighten bolts to 89 INCH lbs. (10 N.m). Install oil strainer (filter) with NEW gasket.

36. Install magnet(s) in oil pan. Install NEW oil pan gasket and install oil pan. Tighten oil pan bolts to 43 INCH lbs. (4.9 N.m). Install throttle cable and solenoid lock plates.
37. Install oil cooler pipe unions (if necessary). Install the park/neutral position switch to the manual valve shaft. Install packing, nut, stopper and nut. Tighten nut to 61 INCH lbs. (6.9 N.m). Adjust the park/neutral position switch (if necessary) and tighten adjusting bolts to 48 INCH lbs. (5.4 N.m). Refer to the appropriate TRANSMISSION SERVICING - A/T article in TRANSMISSION SERVICING section. Stake nut to stopper. Install manual shift lever and tighten nut. Install filler tube and dipstick. Install oil cooler pipes.
38. Install torque converter on transaxle. Using a straightedge and calipers, measure torque converter installed depth. For torque converter depth specifications, see [TORQUE CONVERTER DEPTH SPECIFICATIONS](#) . See [Fig. 87](#) .

TORQUE CONVERTER DEPTH SPECIFICATIONS

| Application | In. (mm) |
|--------------------|--------------|
| Celica 1.8L (1994) | .898 (22.80) |
| Corolla | .898 (22.80) |
| Prizm | .906 (23.00) |

TRANSMISSION SPECIFICATIONS

TRANSMISSION SPECIFICATIONS (A-243L, A-241E & A-244E)

| Application | In. (mm) |
|---------------------------------|---------------------------|
| Countershaft End Play | .009-.035 (.23-.89) |
| Countershaft Height | 1.311-1.398 (33.30-35.50) |
| Bushing Inside Diameter | |
| Direct Clutch | 1.853 (47.07) |
| Oil Pump Body | 1.503 (38.18) |
| Ring Gear Flange | .749-.750 (19.03-19.05) |
| Stator Shaft | |
| Front | .849 (21.57) |
| Rear | 1.066 (27.07) |
| Sun Gear Flange | .867-.868 (22.03-22.05) |
| Underdrive Clutch (Front) | |
| Standard | 1.831-1.832 (46.50-46.53) |
| Maximum | 1.833 (45.57) |
| Underdrive Clutch (Rear) | |
| Standard | 2.165-2.167 (55.00-55.03) |
| Maximum | 2.169 (55.08) |
| Input Shaft End Play | .012-.035 (.30-.90) |
| Piston Stroke | |
| Direct Clutch - A-241E | .044-.058 (1.11-1.47) |
| Direct Clutch - A-243L & A-244E | .064-.078 (1.63-1.97) |
| Forward Clutch - A-244E | .044-.058 (1.11-1.47) |

| Application | In. (mm) |
|---------------------------------------|-----------------------|
| Forward Clutch - All Other Transaxles | 056-.071 (1.42-1.81) |
| Underdrive Clutch | |
| A-244E | .059-.073 (1.50-1.86) |
| A-243L & A-241E | .048-.061 (1.21-1.55) |
| 2nd Coast Brake | .059-.118 (1.50-3.00) |
| Planetary Pinion Gear | |
| Thrust Clearance | .008-.020 (.20-.50) |
| Side Gear Backlash | .002-.008 (.05-.20) |

TRANSMISSION SPECIFICATIONS (A-245E & A-246E)

| Application | In. (mm) |
|--|---------------------------|
| Countershaft End Play | .008-.035 (.20-.89) |
| Countershaft Height | |
| A-245E (1993) | 1.193-1.280 (30.30-32.50) |
| A-245E (1994) & A-246E | 1.311-1.398 (33.30-35.50) |
| Bushing Inside Diameter | |
| Direct Clutch - A-245E (1993) | 1.900 (48.27) |
| Direct Clutch - All Others | 1.898 (48.21) |
| Oil Pump Body | 1.503 (38.18) |
| Ring Gear Flange | .749-.750 (19.03-19.05) |
| Stator Shaft | |
| Front | .849 (21.57) |
| Rear | 1.066 (27.07) |
| Sun Gear Flange | .867-.868 (22.03-22.05) |
| Underdrive Clutch (Front) | |
| Standard | 1.831-1.832 (46.50-46.53) |
| Maximum | 1.833 (45.57) |
| Underdrive Clutch (Rear) | |
| Standard | 2.165-2.167 (55.00-55.03) |
| Maximum | 2.169 (55.08) |
| Underdrive Sun Gear | 1.173-1.174 (29.80-29.83) |
| 1st & Reverse Clutch Pack Clearance | |
| A-245E (1993) | .047-.089 (1.19-2.25) |
| A-245E (1994) & A-246E | .095-.125 (2.42-3.18) |
| Input Shaft End Play | .012-.035 (.30-.90) |
| Piston Stroke | |
| Direct Clutch | .044-.060 (1.12-1.52) |
| Forward Clutch | .056-.071 (1.41-1.81) |
| Underdrive Clutch | .059-.075 (1.50-1.90) |
| 2nd Coast Brake | .059-.118 (1.50-3.00) |
| Planetary Pinion Gear | |
| Thrust Clearance | .008-.020 (.20-.50) |

| Application | In. (mm) |
|--------------------|---------------------|
| Side Gear Backlash | .002-.008 (.05-.20) |

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

| Application | Ft. Lbs. (N.m) |
|---|-----------------------|
| Converter-To-Drive Plate Bolt | |
| Paseo | 18 (25) |
| All Other Models | 20 (27) |
| Countershaft Lock Nut | 130-159 (177-216) |
| Drive Plate Mounting Bolt | |
| Paseo | 8 (25) |
| All Other Models | 20 (27) |
| Oil Cooler Union Nut | 25 (34) |
| Oil Pan Drain Plug | 13 (18) |
| Oil Pump Mounting Bolt | 18 (25) |
| Ring Gear Bolt | 72 (97) |
| Transaxle Housing Mounting Bolt | 21 (29) |
| Transaxle Rear Cover Bolt | |
| A-245E & A-246E | 21 (29) |
| All Other Models | 7 (10) |
| | INCH lb. (N.m) |
| Accumulator Cover Bolt | 89 (10) |
| Brake Band Guide Bolt | 48 (5.4) |
| Park/Neutral Position Switch | |
| Adjusting Bolt | 48 (5.4) |
| Retaining Nut | 61 (6.9) |
| Oil Pan Bolt | 43 (4.9) |
| Oil Pump Stator Shaft Bolt | 89 (10) |
| Oil Strainer Bolt | 89 (10) |
| Oil Tube Clamp Bolt | 89 (10) |
| Parking Lock Pawl Bracket Bolt | 65 (7.4) |
| Sensor Bracket Bolt | 115 (13) |
| Sensor Cover Bolt | 48 (5.4) |
| Solenoid Bolt | |
| Single Solenoid Bolt | 56 (6.5) |
| Other Solenoids (2) Bolt | 89 (10) |
| Upper Valve Body-To-Lower Valve Body Bolt | 56 (6.4) |
| Underdrive Brake Accumulator | |
| Bolt | 89 (10) |
| Screw | 65 (7.4) |
| Valve Body-To-Transaxle | 89 (10) |

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