

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

2000 AUTOMATIC TRANSMISSIONS

Toyota A-131L Overhaul

APPLICATION

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

AUTOMATIC TRANSAXLE APPLICATIONS

Application	Transaxle Model
Chevrolet Prizm	A-131L
Toyota Corolla	A-131L

NOTE: Chevrolet models and other imported vehicles sold by domestic manufacturers are normally covered in **TRANSMISSION SERVICE & REPAIR** manual for **DOMESTIC CARS, LIGHT TRUCKS & VANS**. Chevrolet Prizm is covered in this article due to limited use of this model transaxle in domestic vehicles.

IDENTIFICATION

This transaxle may be manufactured by either Aisin-Warner (AW) or Toyota. On Chevrolet Prizm, transaxle identification number is located above left drive axle. Transaxle is manufactured by Aisin-Warner or Toyota. On Corolla, transaxle identification number is located on converter housing (Aisin-Warner), or on top of transaxle case, above left drive axle (Toyota).

GEAR RATIOS

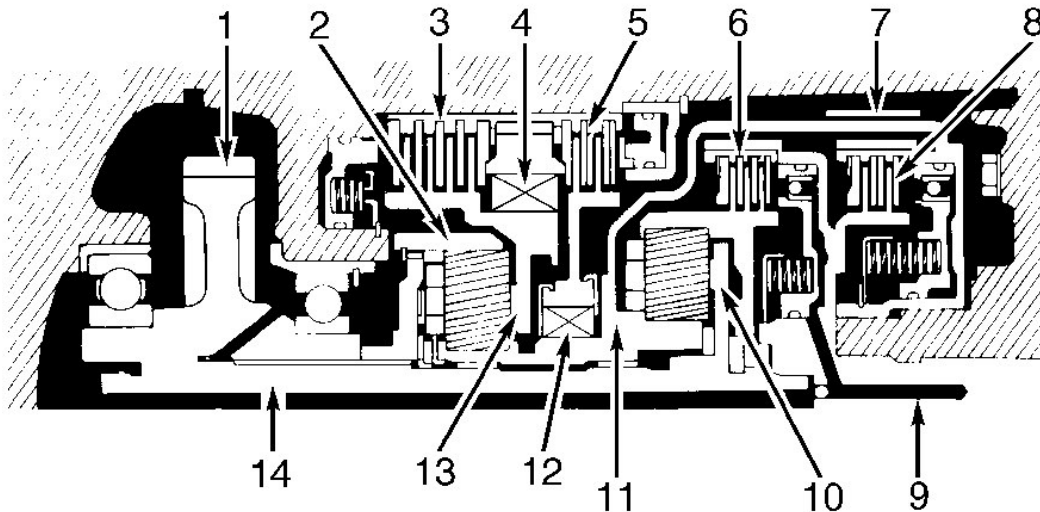
TRANSAXLE GEAR RATIOS

Gear Range	Gear Ratio
1st	2.810:1
2nd	1.549:1
3rd	1.000:1
Reverse	2.296:1

DESCRIPTION & OPERATION

Transaxle has 3 forward speeds and reverse. Transaxle assembly consists of torque converter, oil pump, control

valve assembly, differential, input shaft, intermediate shaft, 2 planetary gear sets, 2 clutch style brakes, forward clutch, direct clutch and 2 one-way clutches. See **Fig. 1** .



- | | |
|-----------------------------|-----------------------------|
| 1. Counter Drive Gear | 8. Direct Clutch |
| 2. Rear Planetary Ring Gear | 9. Input Shaft |
| 3. 1st & Reverse Brake | 10. Front Planetary Carrier |
| 4. No. 2 One-Way Clutch | 11. Front & Rear Planetary |
| 5. 2nd Brake | Sun Gear |
| 6. Forward Clutch | 12. No. 1 One-Way Clutch |
| 7. 2nd Coast Brake | 13. Rear Planetary Carrier |
| | 14. Intermediate Shaft |

G93A24463

Fig. 1: Identifying Transmission Component Locations

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

LUBRICATION

NOTE: For additional information, see appropriate **AUTOMATIC TRANSMISSION SERVICING** article in **TRANSMISSION SERVICING**.

RECOMMENDED FLUID

Transaxle uses DEXRON III transmission fluid.

FLUID CAPACITIES

Fluid capacity for drain and refill is 2.6 qts. (2.5L). Fluid capacity for dry refill is 5.8 qts. (5.5L).

ON-VEHICLE SERVICE

The following components can be serviced on the vehicle:

- Throttle Cable
- Valve Body Assembly
- Governor Assembly
- Drive Axles
- Oil Pan & Oil Strainer
- Park/Neutral Position Switch

TROUBLE SHOOTING

PRELIMINARY INSPECTION

Automatic transaxle malfunction 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

Contaminated fluid, faulty torque converter or transaxle assembly.

No Movement In Any Gear Position

Shift cable out of adjustment, faulty valve body assembly, primary regulator valve, parking lock pawl, torque converter or front/rear planetary gear. Broken converter drive plate or blocked oil pump intake screen.

No Forward Gears

Faulty governor valve, forward clutch, No. 2 one-way clutch, 1st and reverse brake, 2nd coast brake, No. 1 one-way clutch or direct clutch.

No Reverse

Faulty 2nd coast brake, front or rear planetary gear, 1-2 shift valve, 2-3 shift valve, direct clutch or 1st and reverse brake.

Selector Lever Position Incorrect

Shift cable out of adjustment, faulty manual valve and/or lever.

Harsh Engagement Into Any Forward Gear Position

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

Throttle cable out of adjustment, faulty valve body assembly, primary regulator valve or accumulators. See **CLUTCH & BRAKE APPLICATIONS** .

Delayed Upshifts, Or Downshifts From 3-2 Then Shifts Back To 3rd

Throttle cable out of adjustment, faulty valve body assembly or governor assembly.

Slips On Upshift, Or Slips Or Shudders On Acceleration

Shift cable or throttle cable out of adjustment, faulty valve body assembly or clutch assemblies. See **CLUTCH & BRAKE APPLICATIONS** .

Drag, Binding Or Tie-Up On Upshifts

Shift cable out of adjustment, faulty valve body assembly or transaxle assembly.

No Lock-Up

Lock-up relay valve, lock-up signal valve or torque converter.

No Kickdown

Faulty 1-2 or 2-3 shift valve.

Poor Acceleration

Faulty torque converter.

Harsh Downshift

Throttle cable out of adjustment, throttle modulator valve or primary regulator valve.

Downshift Occurs Too Soon Or Too Late While Coasting

Throttle cable out of adjustment, faulty valve body assembly, transaxle assembly or governor assembly.

No Engine Braking In "2" Or "L" Position

1st and reverse brake or 2nd coast brake.

Vehicle Does Not Hold In "P" Position

Shift cable out of adjustment, faulty parking lock pawl cam and spring.

CLUTCH & BRAKE APPLICATIONS

CLUTCH & BRAKE APPLICATIONS

Selector Lever Position	Elements In Use
-------------------------	-----------------

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

"D" (Drive)	
1st Gear	Forward Clutch & No. 2 One-Way Clutch
2nd Gear	Forward Clutch, No. 1 One-Way Clutch & 2nd Brake
3rd Gear	Forward Clutch, Direct Clutch & 2nd Brake
"2" (Second)	
1st Gear	Forward Clutch & No. 2 One-Way Clutch
2nd Gear	Forward Clutch, No. 1 One-Way Clutch, 2nd Brake & 2nd Coast Brake Band
"L" (Low)	
1st Gear	Forward Clutch, No. 2 One-Way Clutch & 1st & Reverse Brake
2nd Gear ⁽¹⁾	Forward Clutch, No. 1 One-Way Clutch, 2nd Brake & 2nd Coast Brake Band
"R" (Reverse)	Direct Clutch & 1st & Reverse Brake
"N" Or "P"	All Clutches & Brakes Released Or Ineffective
(1) Downshift in "L" position, 2nd gear only. No upshift.	

PERFORMANCE TESTS

PRELIMINARY INSPECTION

Before testing transaxle, ensure fluid level is correct and selector lever, throttle cable and idle speed are adjusted correctly.

ROAD TEST

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

"D" Position Test

1. Shift vehicle into Drive. While driving vehicle, hold accelerator constantly at full throttle position. Check 1-2 and 2-3 upshift points. See appropriate SHIFT SPEED SPECIFICATIONS table:
 - If 1-2 upshift does not occur, 1-2 shift valve is stuck or governor valve is defective.
 - If 2-3 upshift does not occur, 2-3 shift valve is stuck.
 - If all shift points are incorrect, throttle cable is out of adjustment or throttle valve, 1-2 or 2-3 shift

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

valves are defective.

2. Repeat procedure and check shock and slip during 1-2 and 2-3 upshifts. Excessive shock can be caused by excessive line pressure, defective accumulator or defective check ball.
3. While driving vehicle in "D" position, check for abnormal noise or vibration. Abnormal noise or vibration may be due to an unbalanced axle shaft, differential, tires or torque converter.
4. While driving vehicle in 3rd gear, confirm correct kickdown speed limits for 3-2 and 2-1 shift points. Check for abnormal shock or slip at kickdown. If kickdown speed limit is incorrect, throttle cable is out of adjustment or throttle valve, 1-2 or 2-3 shift valves are defective.
5. Drive vehicle in "D" position at 37 MPH. Release accelerator pedal and shift into "L" position. Confirm correct downshift speed limits for 2-1 shift point.

Lock-Up Mechanism

Drive vehicle in "D" position with lock-up on and hold vehicle at specified speed. See appropriate LOCK-UP SPEED SPECIFICATIONS table. Lightly depress accelerator pedal. Ensure engine RPM does not change abruptly. Large increase in engine RPM indicates lock-up function is faulty.

"2" Position Test

While driving vehicle in "2" position, release accelerator pedal and check engine braking effect. If no engine braking occurs, 2nd coast brake is defective. Check for abnormal noise during acceleration and deceleration. Check for shock during upshift and downshift.

"L" Position Test

While driving vehicle in "L" position, ensure upshift to 2nd gear does not occur. Release accelerator pedal. If engine braking does not occur, 1st and reverse brake is defective.

"R" Position Test

Shift vehicle to "R" position. Accelerate vehicle from a stop to full throttle. Ensure slipping does not occur.

"P" Position Test

Stop vehicle on slight incline. Shift vehicle to "P" position. Release parking brake. Ensure parking lock pawl holds vehicle.

SHIFT SPEED SPECIFICATIONS (COROLLA)

Application	MPH
"D" Position ⁽¹⁾	
1-2	31-42
2-3	60-72
3-2	58-68
2-1	22-29
"L" Position ⁽²⁾	

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

2-1

26-34

- (1) Wide open throttle.
- (2) Fully closed throttle.

LOCK-UP SPEED SPECIFICATIONS (COROLLA) ⁽¹⁾

Application	MPH
"D" position ⁽²⁾	
Lock-Up On	41-48
Lock-Up Off	39-46
(1) Fully closed throttle.	
(2) There is no lock-up in "L" or "2" position.	

SHIFT SPEED SPECIFICATIONS (PRIZM)

Application	MPH
"D" Position ⁽¹⁾	
1-2	31-40
2-3	60-70
3-2	56-67
2-1	22-29
"L" Position ⁽²⁾	
2-1	26-32
(1) Wide open throttle.	
(2) Fully closed throttle.	

NOTE: Prizm lock-up speed specifications are not provided by manufacturer.

TORQUE CONVERTER

Stall Speed Test

1. Operate engine and transaxle at normal operating temperature. Connect scan tool to vehicle and monitor engine RPM. Apply parking brake and block front and rear wheels.

CAUTION: DO NOT maintain stall speed RPM for more than 5 seconds.

2. Start engine, apply brakes and place selector lever in "D" position. Depress accelerator to full throttle and note maximum RPM obtained. Repeat test in "R" position. For stall speeds, see **STALL SPEED SPECIFICATIONS** table.

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

STALL SPEED SPECIFICATIONS

Application	RPM
Chevrolet Prizm	2150-2450
Toyota Corolla	2350-2650

Stall Speed Test Results

1. If stall speed is same in both positions, but less than specified, check for insufficient engine output or defective stator one-way clutch.

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

2. If stall speed is high in "D" position, check for low line pressure, forward clutch slipping or defective No. 2 one-way clutch.
3. If stall speed is high in "R" position, check for low line pressure or direct clutch or 1st and reverse brake slipping.
4. If stall speed is high in both positions, check for low line pressure or improper fluid level.

HYDRAULIC PRESSURE TESTS

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

Line Pressure Test

1. Remove appropriate transaxle case plug and connect pressure gauge. See **Fig. 2**. Block all wheels. Apply parking brake. Start engine and shift into "D" position. Ensure idle speed RPM is set to specification.
2. Apply service brakes and depress accelerator. Note pressure readings at idle and stall speeds. Repeat test in "R" position. Compare pressure readings to those listed in **LINE PRESSURE SPECIFICATIONS** table.
3. If pressure is lower than specified, check throttle cable adjustment. Adjust as necessary. See appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING for adjustment procedure. Repeat pressure test procedure if throttle cable adjustment was necessary.

Line Pressure Test Results

1. If line pressure is high in both positions, check for throttle cable out of adjustment, defective throttle valve or regulator valve.
2. If line pressure is low in both positions, check for throttle cable out of adjustment, defective oil pump, throttle valve or regulator valve.
3. If line pressure is low in "D" position only, check for "D" position circuit leaking pressure or defective forward clutch.
4. If line pressure is low in "R" position only, check for "R" position circuit leaking pressure, defective 1st

and reverse brake or direct clutch.

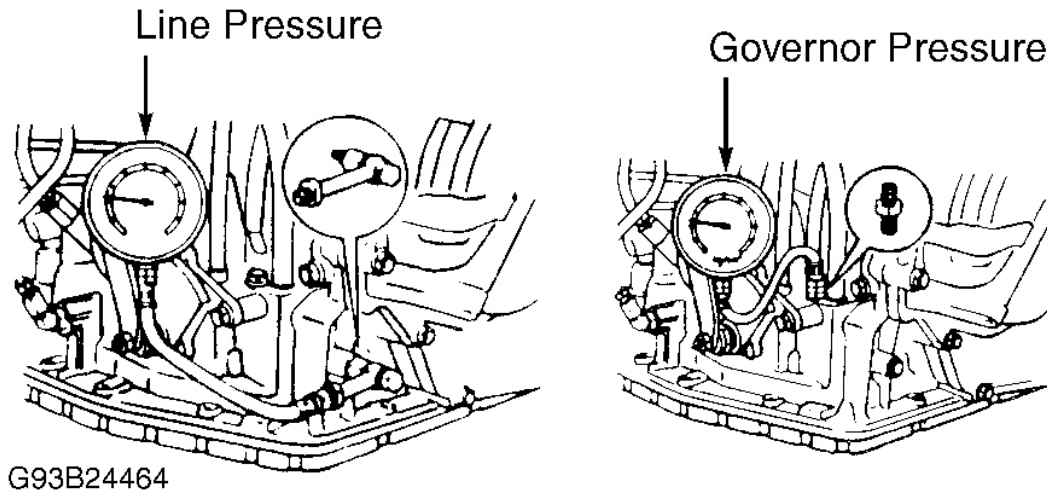


Fig. 2: Checking Governor & Line Pressure
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

LINE PRESSURE SPECIFICATIONS

Application	psi (kg/cm ²)
"D" Position	
Idle Speed	53-61 (3.7-4.3)
Stall Speed	131-152 (9.2-10.7)
"R" Position	
Idle Speed	80-102 (5.6-7.2)
Stall Speed	205-239 (14.4-16.8)

Governor Pressure Test

1. Apply parking brake. Raise and support front of vehicle with safety stands. Remove appropriate transaxle case plug and connect pressure gauge. See **Fig. 2**.

CAUTION: Road test vehicle or use chassis dynamometer to check governor pressures exceeding minimum vehicle speed specification.

2. Start engine and shift to "D" position. Note governor pressure at specified speeds and engine RPM. See appropriate GOVERNOR PRESSURE SPECIFICATIONS table. Incorrect governor pressure may be caused by incorrect line pressure, leakage at governor pressure circuit or defective governor valve.

GOVERNOR PRESSURE SPECIFICATIONS (COROLLA)

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

Vehicle Speed (MPH)	psi (kg/cm ²)
19	11-12 (.7-.8)
37	29-30 (2.0-2.1)
56	47-50 (3.3-3.5)

GOVERNOR PRESSURE SPECIFICATIONS (PRIZM)

Vehicle Speed (MPH)	psi (kg/cm ²)
19	5-17.1 (.34-1.2)
37	22.8-34.1 (1.6-2.4)
56	41.2-52.6 (2.8-3.6)

TIME LAG TEST

NOTE: Perform test with fluid at normal operating temperature of 122-176°F (50-80°C). Wait one minute 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. Apply parking brake and block front and rear wheels. Start engine and check idle speed. Idle speed should be 650-750 RPM. Idle speed is controlled by computer 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.

Time Lag Test Results

1. If time lag from "N" to "D" position is excessive, check for low line pressure or defective forward clutch.
2. If time lag from "N" to "R" position is excessive, check for low line pressure, defective direct clutch or 1st and reverse brake.

COMPONENT TESTS

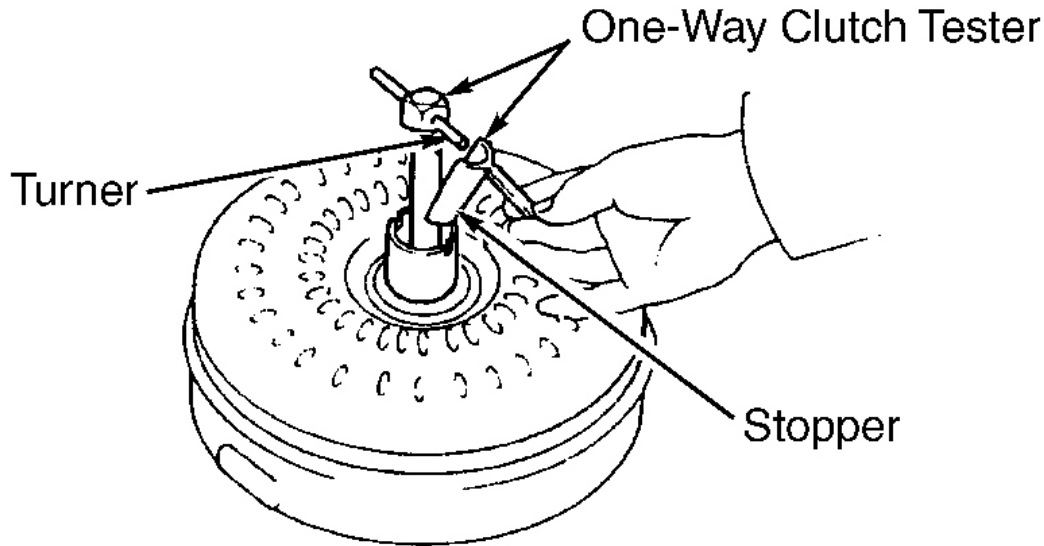
TORQUE CONVERTER

NOTE: Torque converter is 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.

One-Way Clutch Test

1. Install turner and stopper of One-Way Clutch Tester (09350-32014) in torque converter. See **Fig. 3**. 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.



G93I23810

Fig. 3: Checking Torque Converter One-Way Clutch

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

Drive Plate Runout Test

Measure drive plate runout. See **Fig. 4** . If runout exceeds .008" (.20 mm), or if ring gear is damaged, replace drive plate. If installing a NEW drive plate, note position of spacers. Tighten bolts to specification. See **TORQUE SPECIFICATIONS** .

Converter Sleeve Runout Test

1. Temporarily mount torque converter to drive plate. Mount a dial indicator with needle resting on converter sleeve. See **Fig. 5** . 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.

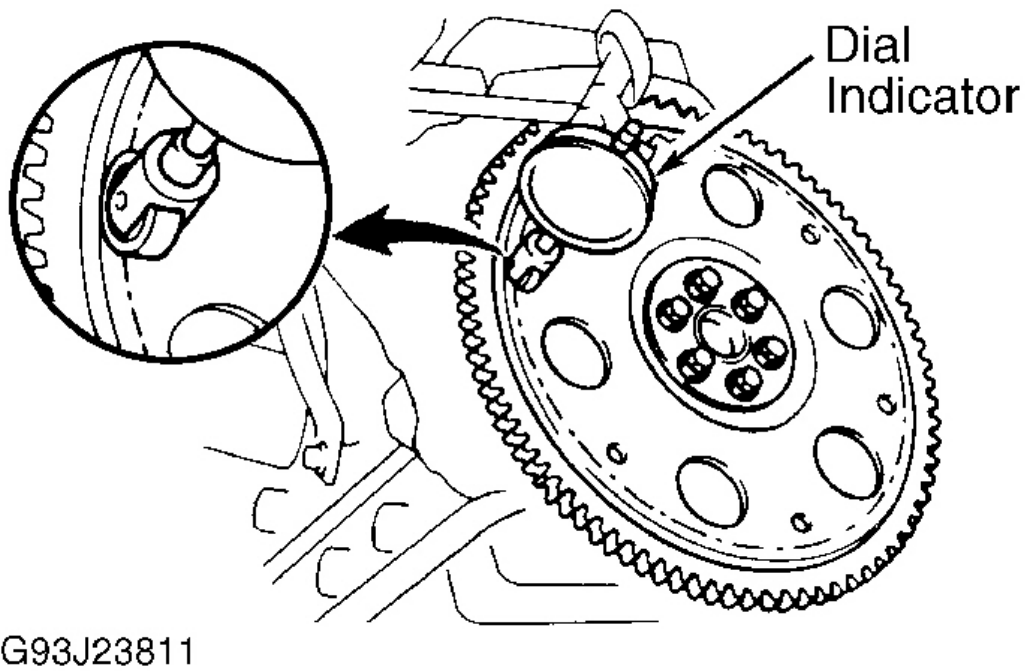


Fig. 4: Checking Drive Plate Runout

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

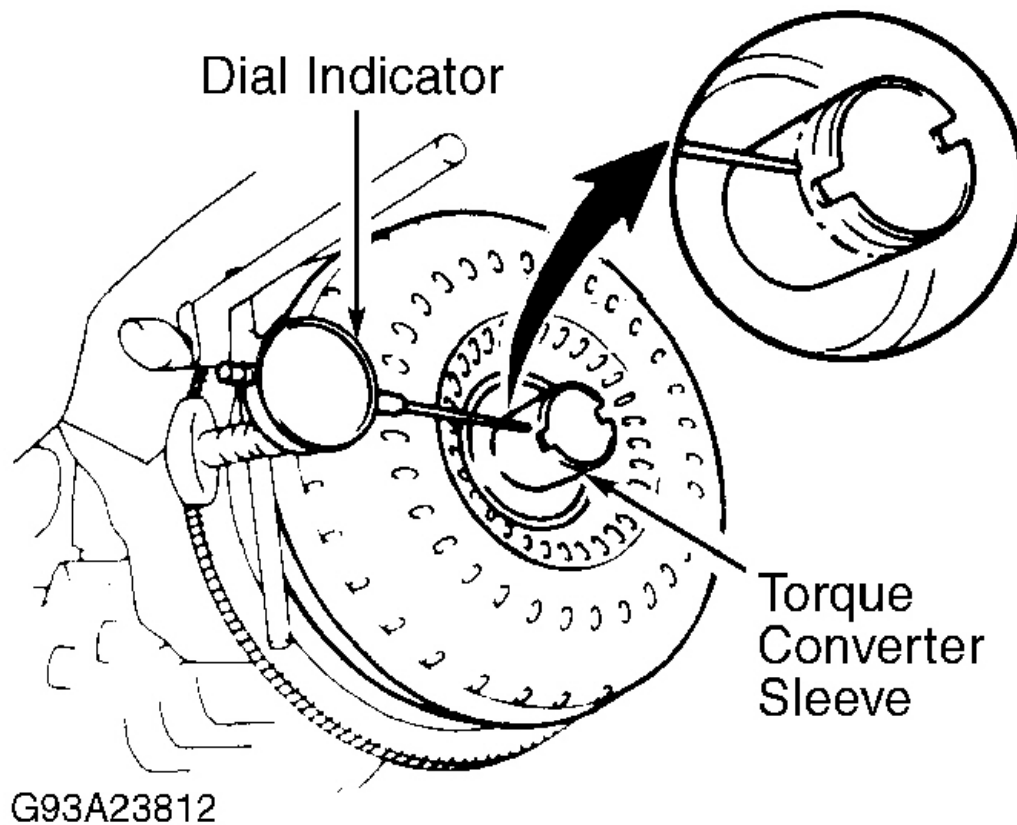


Fig. 5: Checking Converter Sleeve Runout
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL & INSTALLATION

DRIVE AXLES

NOTE: See appropriate article in **DRIVE AXLES**.

GOVERNOR ASSEMBLY

Removal & Installation

Remove transaxle dust cover. Remove left axle shaft. Remove bracket bolts, bracket, governor cover and "O" ring. Remove governor body, washer and thrust washer. Remove governor body adapter. To install, reverse removal procedure. Install NEW "O" ring and tighten bracket bolts to 115 INCH lbs. (13 N.m).

THROTTLE CABLE

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**. Remove throttle cable bolt and retaining plate. Pull throttle cable from transaxle case.

Installation

1. Install throttle cable in transaxle case. Ensure cable is fully seated. Install retaining bolt and plate. Install valve body assembly. On NEW throttle cables, stopper must be staked on inner cable. Bend cable in about a 8" (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" (.80-1.49 mm) gap between cable housing and stopper. See **Fig. 6**.
3. Adjust throttle cable and park/neutral position switch (if necessary). See appropriate AUTOMATIC TRANSMISSION SERVICING article in TRANSMISSION SERVICING. Install manual shift lever. Install transaxle control cable. Test drive vehicle.

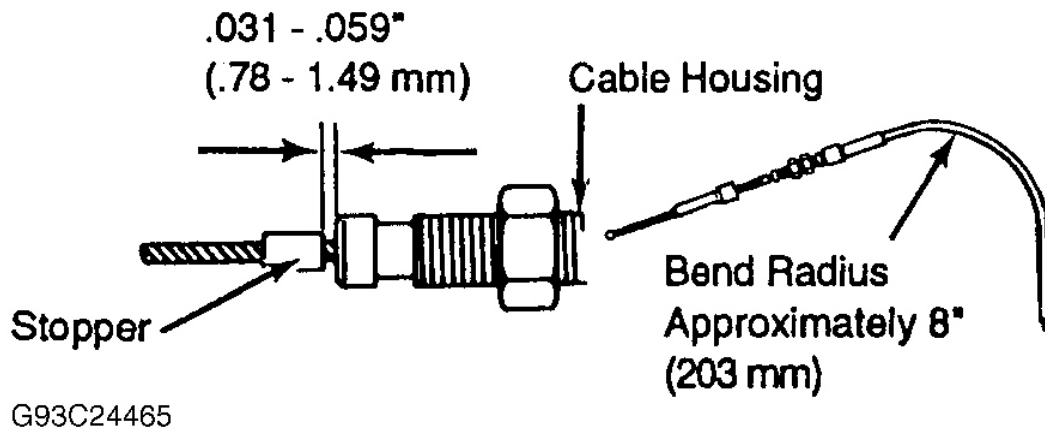


Fig. 6: Locating Throttle Cable Stopper

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

TRANSAXLE

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

VALVE BODY ASSEMBLY

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

Removal

1. Raise and support vehicle. Clean exterior of transaxle oil pan. Drain transaxle fluid. Remove oil pan and gasket. Remove strainer and oil tube bracket. Note location of oil tubes. Using large screwdriver, remove oil tubes.
2. Remove detent spring. Remove manual valve and manual valve body. See **Fig. 7** . Note bolt length and location. Remove valve body assembly bolts. See **Fig. 8** . Remove throttle cable. Remove valve body assembly. Remove governor oil strainer. Remove governor apply gasket.

Installation

1. Install governor apply gasket. Install governor oil strainer. Hold valve body cam downward. Install throttle cable in slot. Install valve body assembly. Ensure kickdown switch wire is not under valve body assembly. Install valve body assembly bolts finger tight. Ensure bolts are installed correctly. See **Fig. 8** . Tighten bolts to 89 INCH lbs. (10 N.m).
2. Align manual valve with pin on manual shift lever. Install manual valve body. Install manual valve body bolts and tighten to 89 INCH lbs. (10 N.m). Install detent spring and tighten bolts 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. Install oil tube bracket. Tighten bolts to 89 INCH lbs. (10 N.m).
3. Install oil strainer. Tighten bolts to 89 INCH lbs. (10 N.m). Install magnets in oil pan. Ensure magnets do not interfere with oil tubes. Install oil pan and gasket. Tighten bolts to 43 INCH lbs. (4.9 N.m). Fill transaxle with fluid.

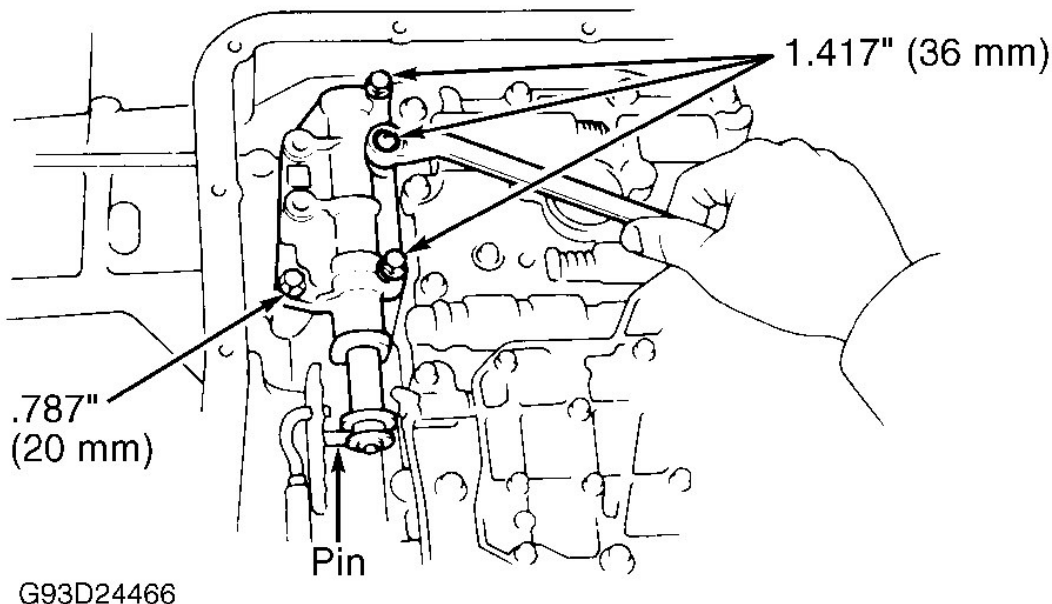
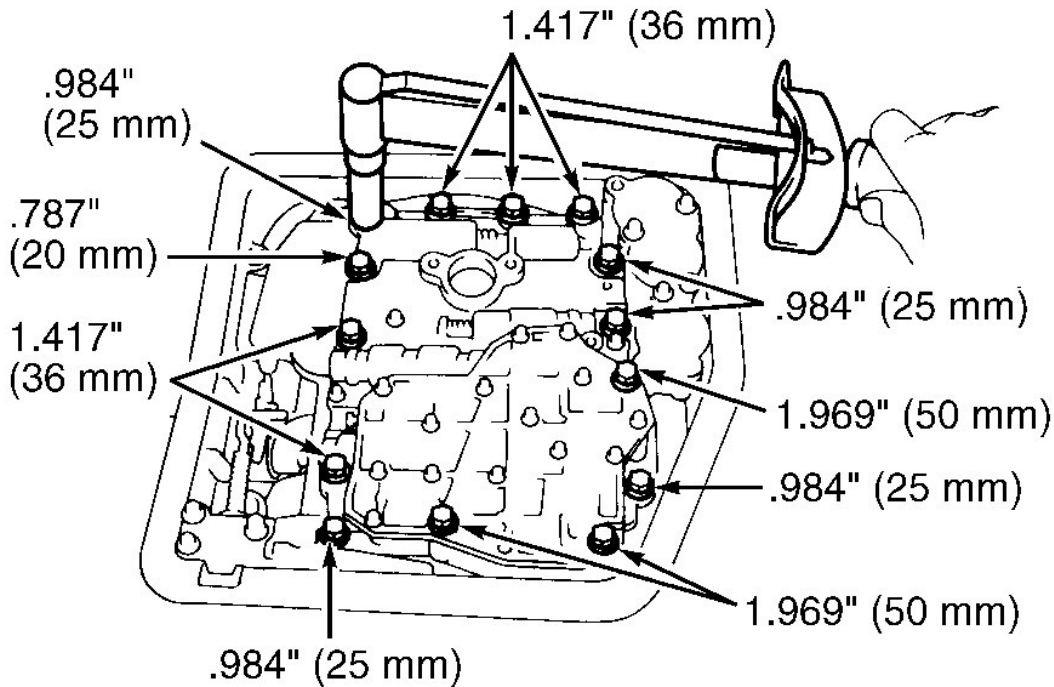


Fig. 7: Identifying Manual Valve Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



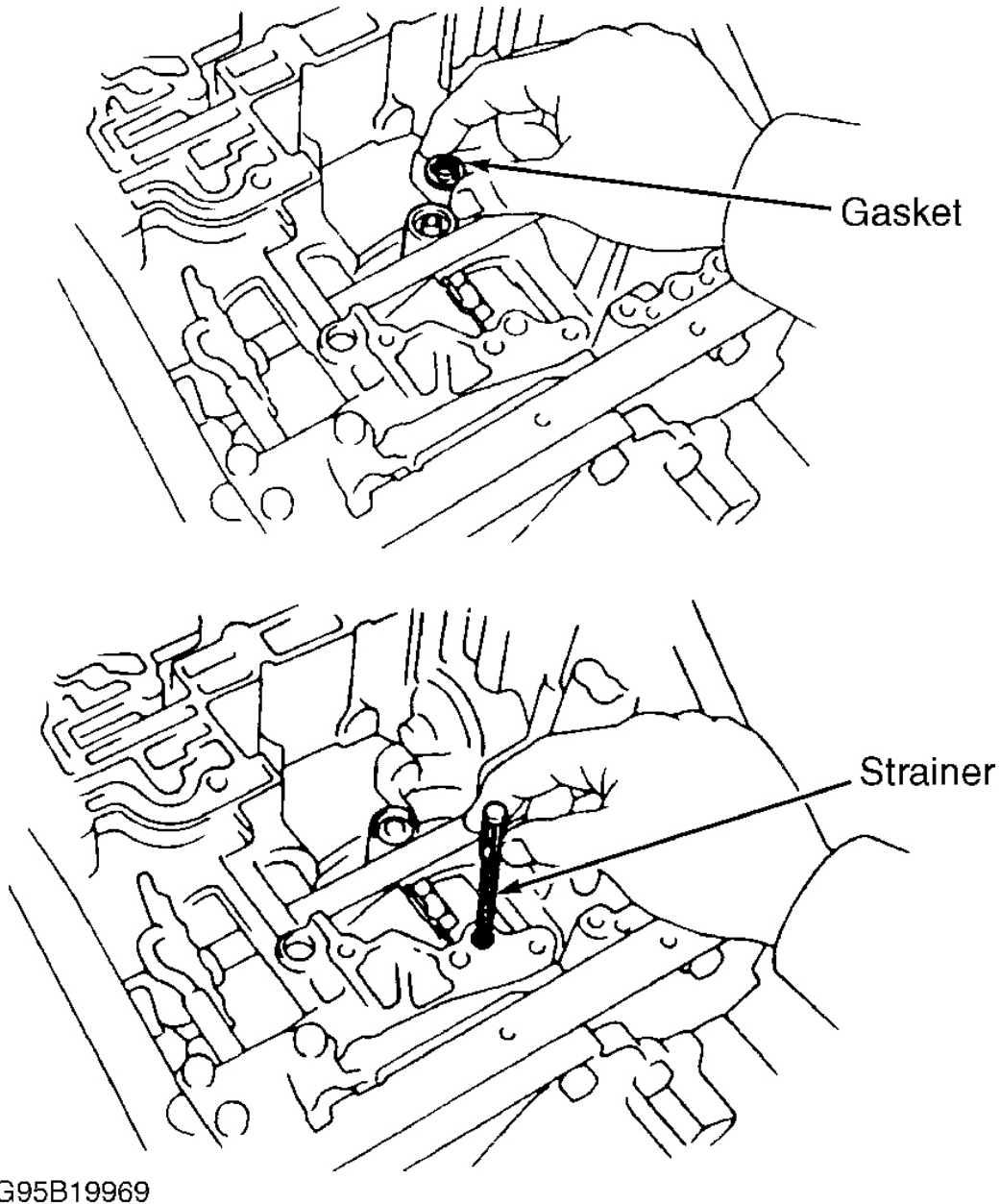
G00045701

Fig. 8: Identifying Valve Body Assembly Bolts

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

TRANSAXLE DISASSEMBLY

1. Remove oil cooler pipes and unions, manual shift lever and park/neutral position switch. Remove filler tube and dipstick. Remove throttle cable retaining plate. Remove governor cover bracket. Remove governor cover and "O" ring. Remove thrust washer. Remove governor assembly, plate washer and governor body adapter.
2. Remove oil pan and gasket. Remove 3 magnets from oil pan. Remove oil tube bracket and oil strainer. Remove valve body assembly. See **VALVE BODY ASSEMBLY** under REMOVAL & INSTALLATION. Remove throttle cable from transaxle case. Remove governor apply gasket and governor oil strainer. See **Fig. 9**.
3. Loosen accumulator cover bolts evenly until spring tension is released. Remove cover and gasket. Remove forward clutch and direct clutch accumulator pistons and springs. Apply 14 psi (1 kg/cm²) of compressed air to oil passage to force 2nd brake piston and springs from bore. See **Fig. 10**.



G95B19969

Fig. 9: Removing 2nd Brake Apply Gasket & Governor Oil Strainer
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

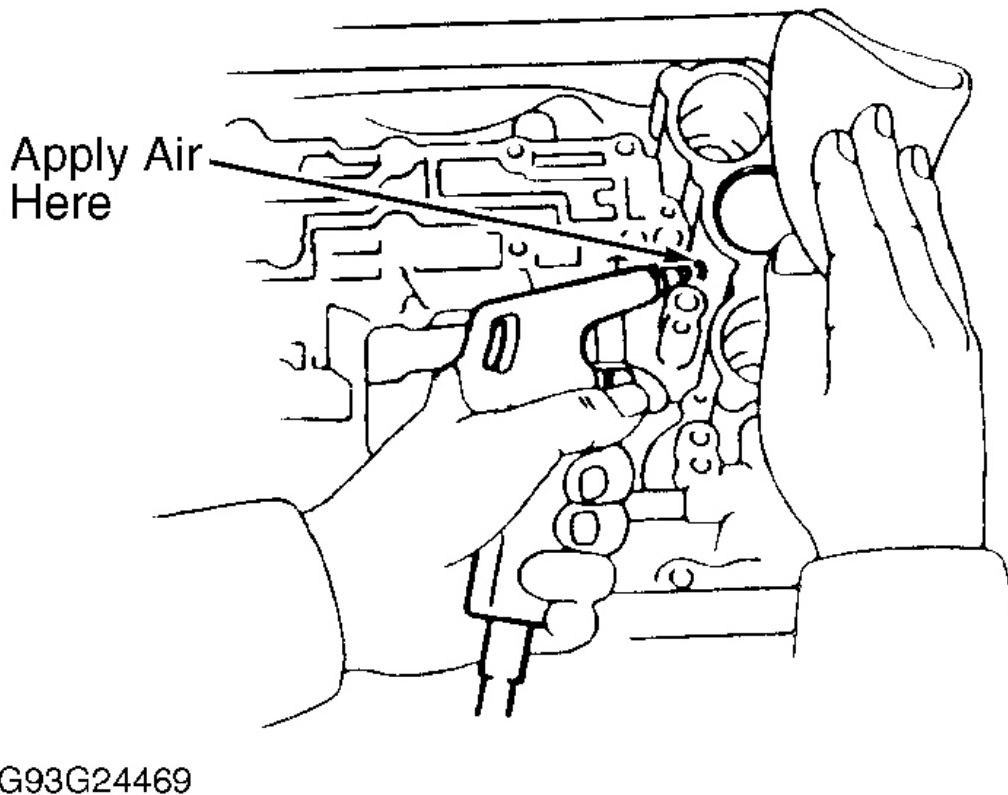


Fig. 10: Removing 2nd Brake Accumulator Piston & Springs
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. Apply small amount of paint to 2nd coast brake piston rod at point that it meets transaxle case. Using appropriate feeler gauge, measure 2nd coast brake piston stroke by applying and releasing compressed air to oil passage in transaxle case. See **Fig. 40** . Note reading for reassembly reference. Piston stroke should be .059-.118" (1.50-3.00 mm). Remove snap ring. Remove 2nd coast brake piston cover. Remove 2nd coast brake piston and outer return spring.
5. Remove oil pump bolts. Using appropriate puller, pull oil pump free from case. Hold input shaft, grasp pump stator shaft and remove oil pump and direct clutch from transaxle case. Firmly push 2nd coast brake band into transaxle case. Ensure brake band does not catch on direct clutch drum. Remove direct clutch and thrust washer from rear of oil pump.
6. Remove forward clutch. Remove race and thrust bearings from forward clutch. Using small screwdriver, push 2nd coast brake band pin inward and remove from oil pump mounting bolt hole. Remove 2nd coast brake band. Remove front planetary ring gear. See **Fig. 11** . Remove bearing and race from ring gear.
7. Remove front planetary gear. Remove bearings and races from planetary gear. Remove sun gear, sun gear input drum, 2nd brake hub and No. 1 one-way clutch. Remove 2nd coast brake band guide. Remove 2nd brake drum snap ring. Remove 2nd brake drum. Remove 2nd brake piston return spring.
8. Remove plates, discs and flange. Note number and location of components. Remove 2nd brake drum

gasket. Remove No. 2 one-way clutch snap ring. Remove No. 2 one-way clutch and rear planetary gear. Remove thrust washers from both sides of planetary gear. Remove rear planetary ring gear, races and thrust bearings. Using compressed air, confirm 1st and reverse brake piston moves smoothly. See **Fig. 12**.

9. Remove flange snap ring. Remove flange, plates and discs. Note number and location of components. Remove transaxle rear cover bolts. Tap rear cover using a plastic hammer. Remove cover. Remove intermediate shaft. Remove snap ring. Using appropriate spring compressor, remove snap ring and piston return spring from transaxle case. Apply compressed air into oil passage. Remove 1st and reverse brake piston. See **Fig. 12** and **Fig. 13**.
10. Remove parking lock pawl bracket. Remove parking lock rod. Remove pin, spring and parking lock pawl. Remove manual valve shaft spring, collar and pin. Remove manual valve lever from transaxle case. Remove manual shaft oil seal. Remove governor pressure adaptor from transaxle case. See **Fig. 11**.

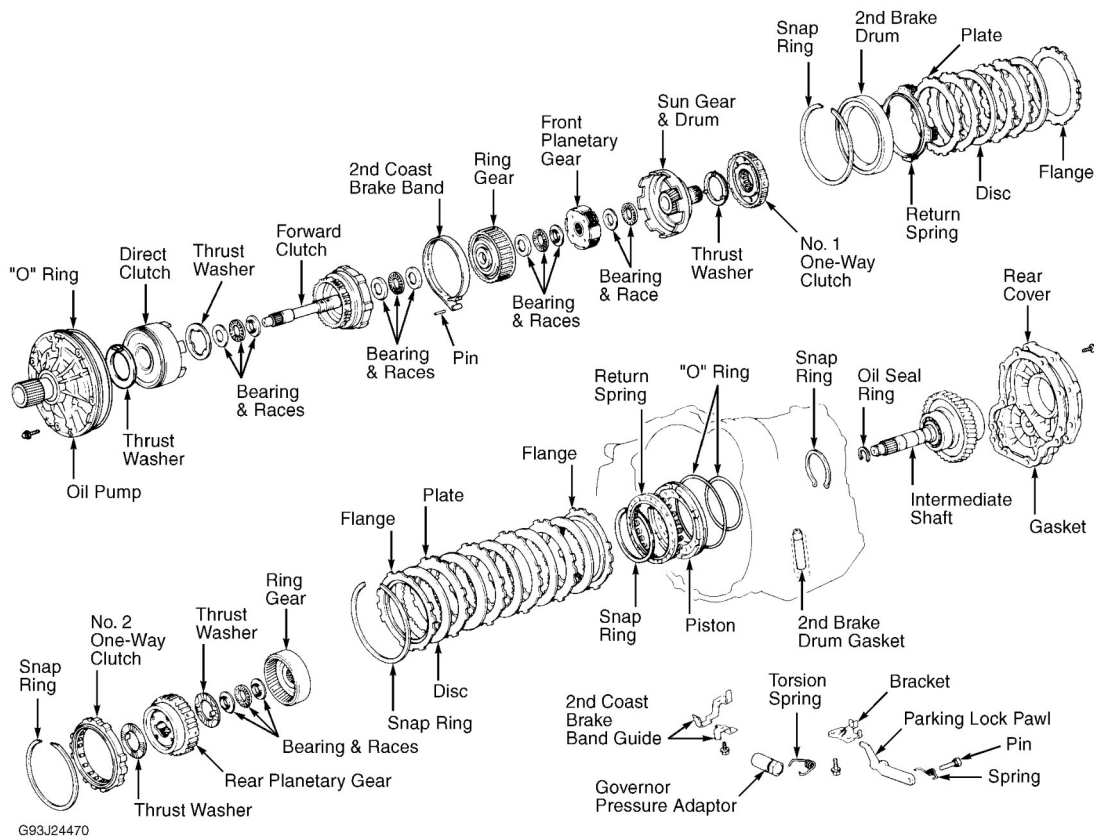


Fig. 11: Exploded View Of Transaxle Internal Components

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

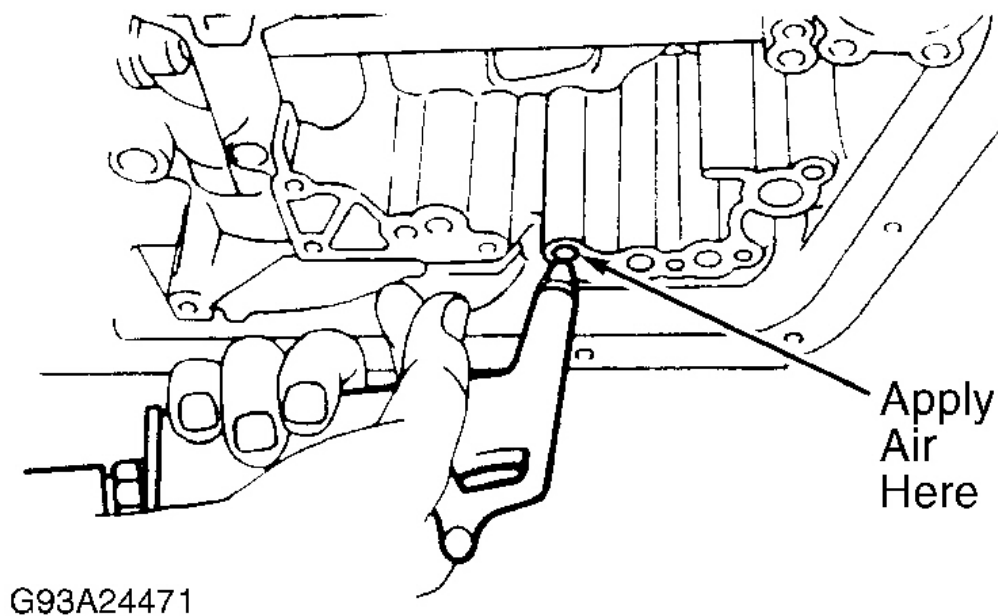


Fig. 12: Removing 1st & Reverse Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

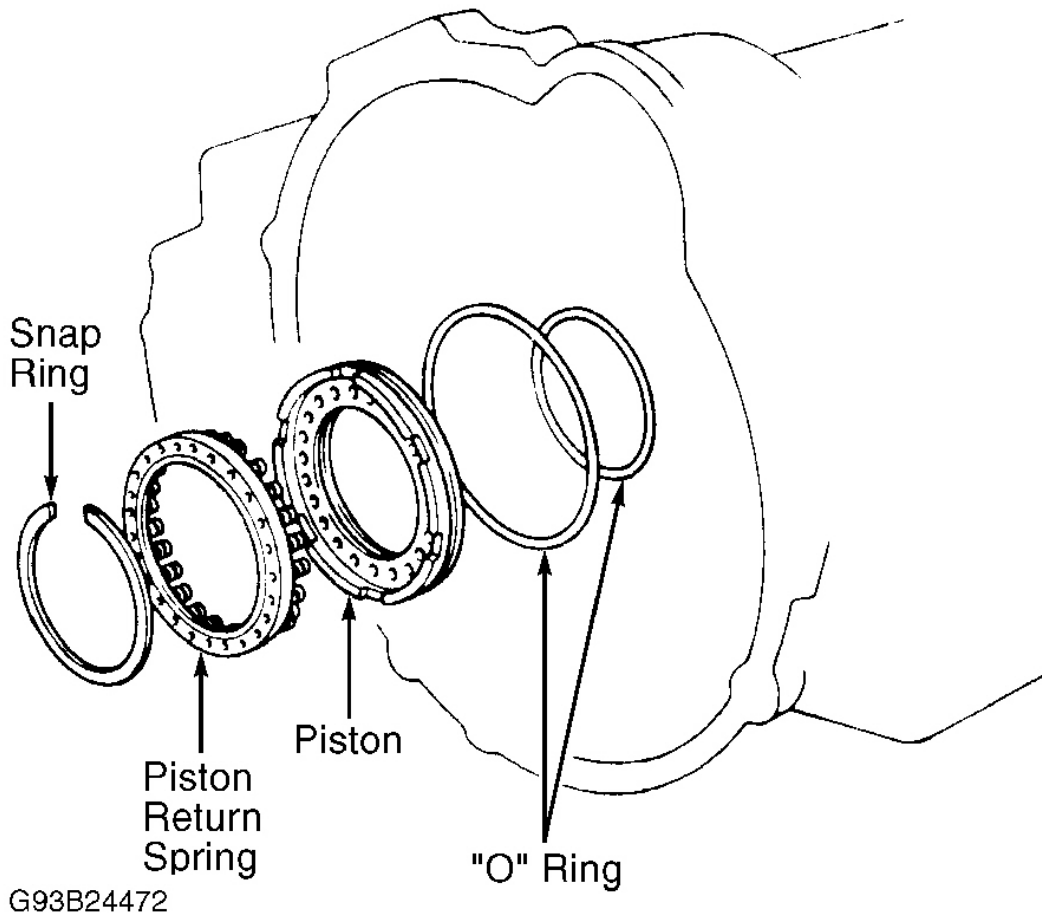


Fig. 13: Exploded View Of 1st & Reverse Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

COMPONENT DISASSEMBLY & REASSEMBLY

OIL PUMP ASSEMBLY

Disassembly

1. Remove race from stator shaft. Remove "O" ring and oil seal rings from pump body and stator shaft. Remove clutch drum thrust washer from stator shaft.
2. Mark stator shaft and pump body for reassembly reference. Remove stator shaft bolts. Separate stator shaft and pump body. Mark gear location for reassembly reference. Remove pump gears. Using screwdriver, remove oil seal. See **Fig. 14**.

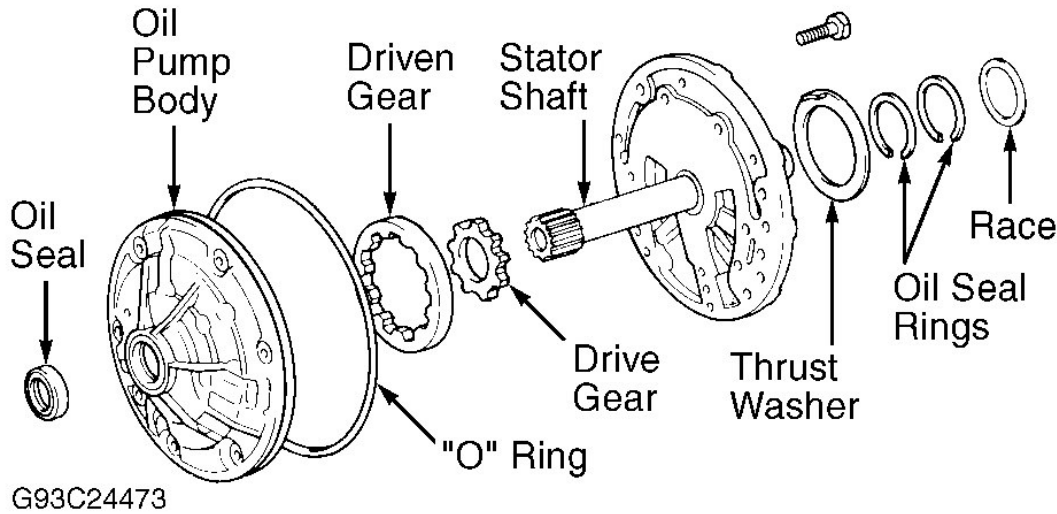


Fig. 14: Exploded View Of Oil Pump Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Inspection

1. Clean all parts with solvent. Use compressed air to ensure oil passages are clear. Install oil pump gears into pump body. Check driven gear-to-body clearance. Push driven gear against one side of pump. Using a feeler gauge, measure clearance between driven gear and pump body. See **Fig. 15** . Replace pump body if clearance is not within specification. See **OIL PUMP CLEARANCE SPECIFICATIONS** table.
2. Using a feeler gauge, measure tip clearance between both gears and crescent-shaped part of pump body. See **Fig. 16** . Replace pump body if clearance is not within specification. See **OIL PUMP CLEARANCE SPECIFICATIONS** table.
3. Using a feeler gauge and straightedge, measure side clearance of both gears. See **Fig. 17** . Replace pump body if clearance is not within specification. See **OIL PUMP CLEARANCE SPECIFICATIONS** table. Drive and driven gears are available in 3 different thicknesses. See **DRIVE & DRIVEN GEAR THICKNESS SPECIFICATIONS** table.

OIL PUMP CLEARANCE SPECIFICATIONS

Application	In. (mm)
Driven Gear-To-Pump Body	
Standard	.0028-.0059 (.071-.149)
Maximum	.012 (.30)
Gear-To-Crescent Tip Clearance	
Standard	.0043-.0055 (.109-.139)
Maximum	.012 (.30)
Gear Side Clearance	
Standard	.0008-.0020 (.020-.050)

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

Maximum	.004 (.10)
---------	------------

DRIVE & DRIVEN GEAR THICKNESS SPECIFICATIONS

I.D. Mark	In. (mm)
A	.3717-.3723 (9.440-9.456)
B	.3723-.3730 (9.456-9.474)
C	.3730-.3736 (9.474-9.490)

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

Reassembly

1. Install NEW oil seal. Seal must be even with edge of pump body. Coat all components with ATF. Install pump gears (if necessary), aligning reference marks. Install stator shaft on pump body. Align bolt holes and tighten bolts to 89 INCH lbs. (10 N.m). Coat thrust washer with petroleum jelly.
2. Install thrust washer on pump body. Align washer tab with hollow of pump body. Install oil seal rings. Ensure rings rotate smoothly after installation. DO NOT spread oil seal ring ends more than necessary for installation. Using screwdrivers, check drive gear for smooth rotation. Install "O" ring. Install race on stator shaft. See **Fig. 14**.

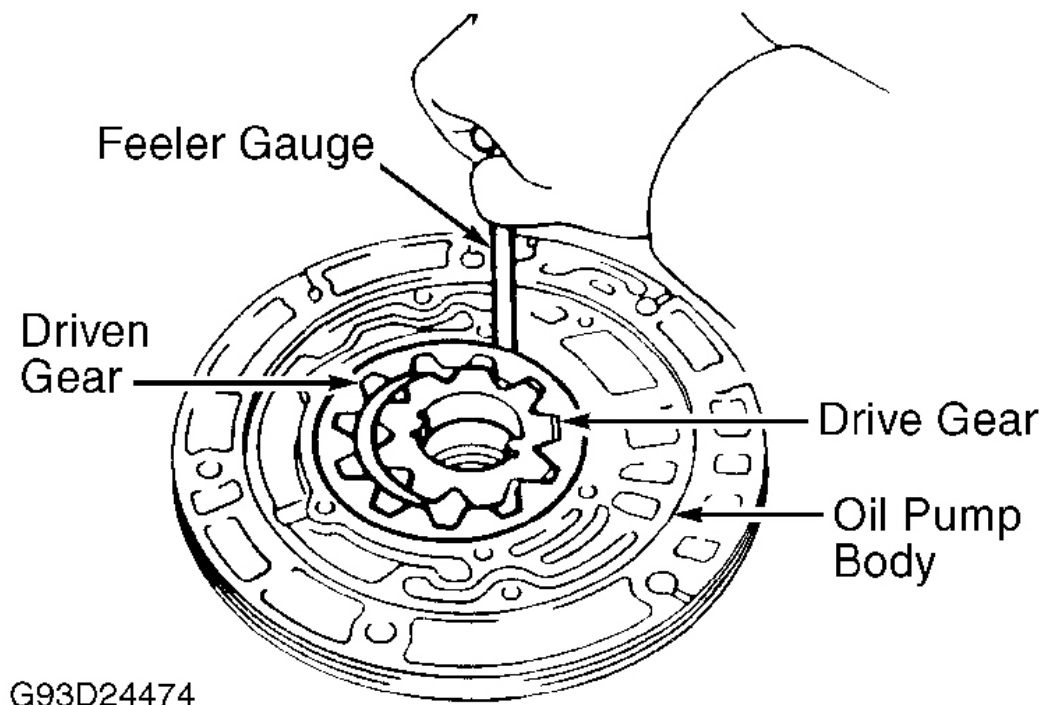


Fig. 15: Checking Oil Pump Driven Gear Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

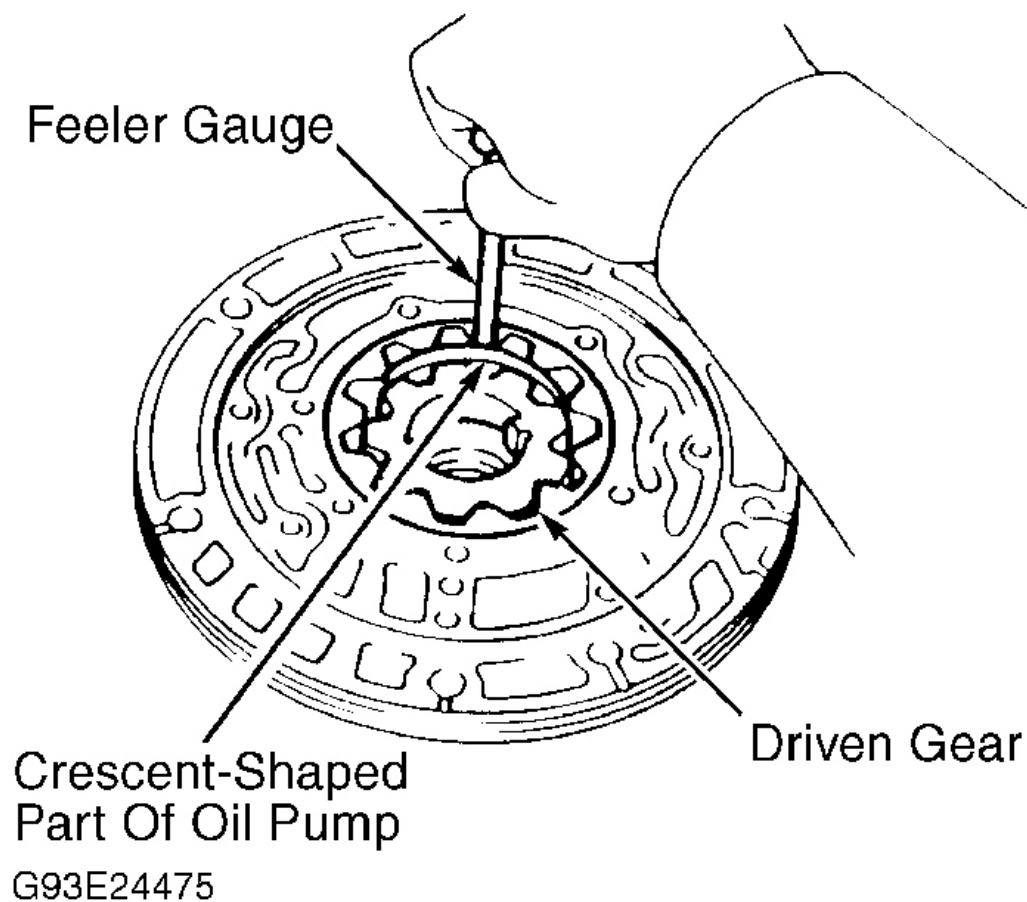


Fig. 16: Checking Oil Pump Gear Tip Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

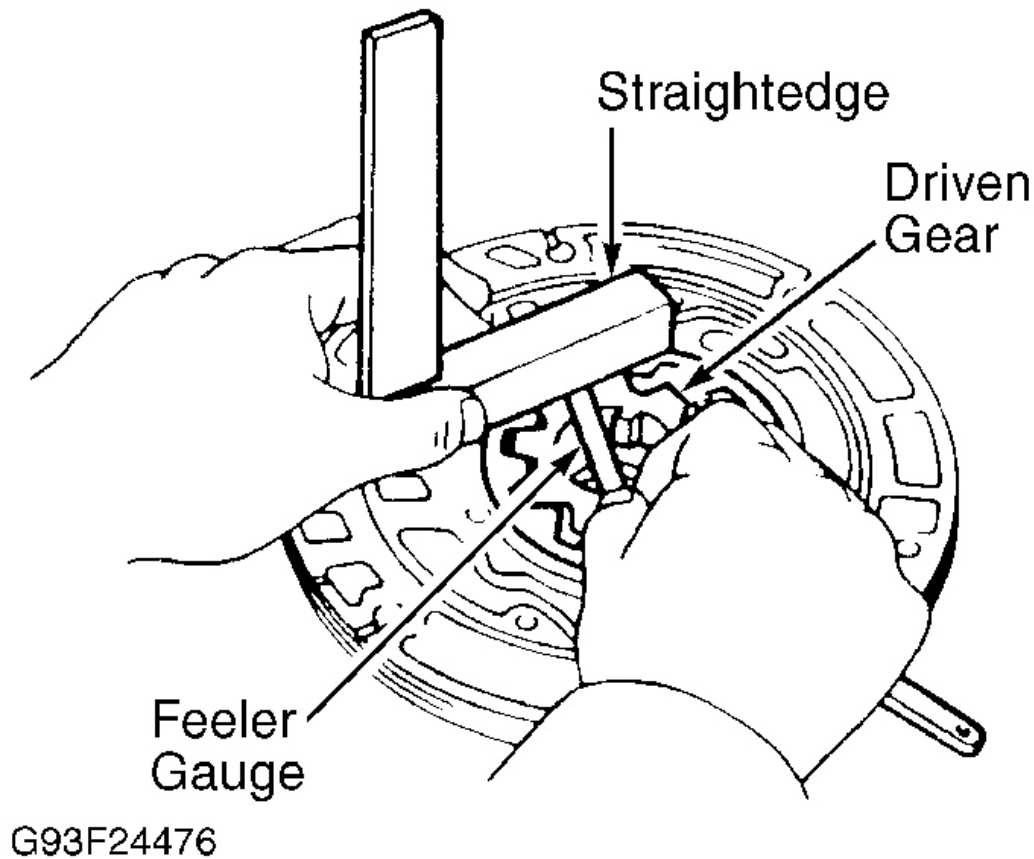


Fig. 17: Checking Oil Pump Gear Side Clearance
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

DIRECT CLUTCH

Disassembly

1. Remove snap ring from clutch drum. Remove flange, discs and plates. Note number and location of components. See **Fig. 18** . Using appropriate clutch spring compressor, compress piston return springs. Remove snap ring, clutch spring compressor, spring retainer and piston return spring.
2. Install direct clutch on oil pump. Apply compressed air to oil pump oval shaped passage to remove piston. See **Fig. 19** . Remove direct clutch from oil pump. Remove clutch piston "O" rings.

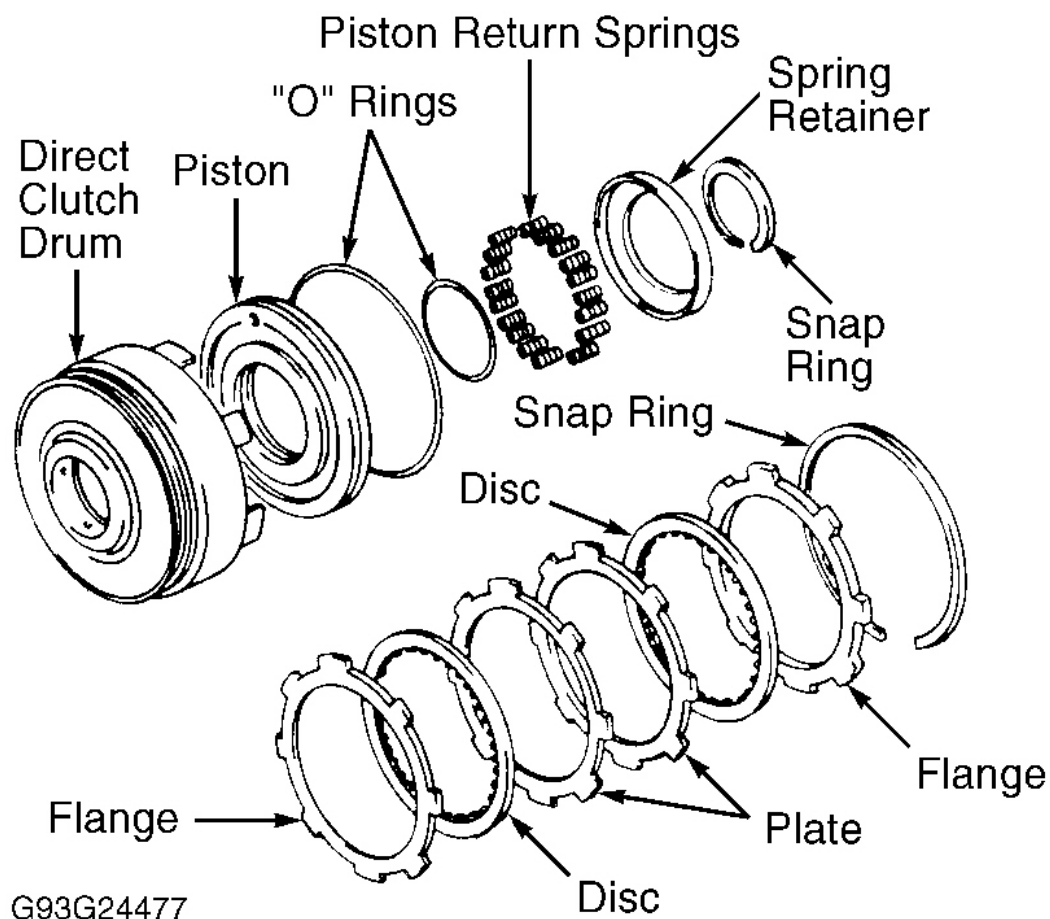
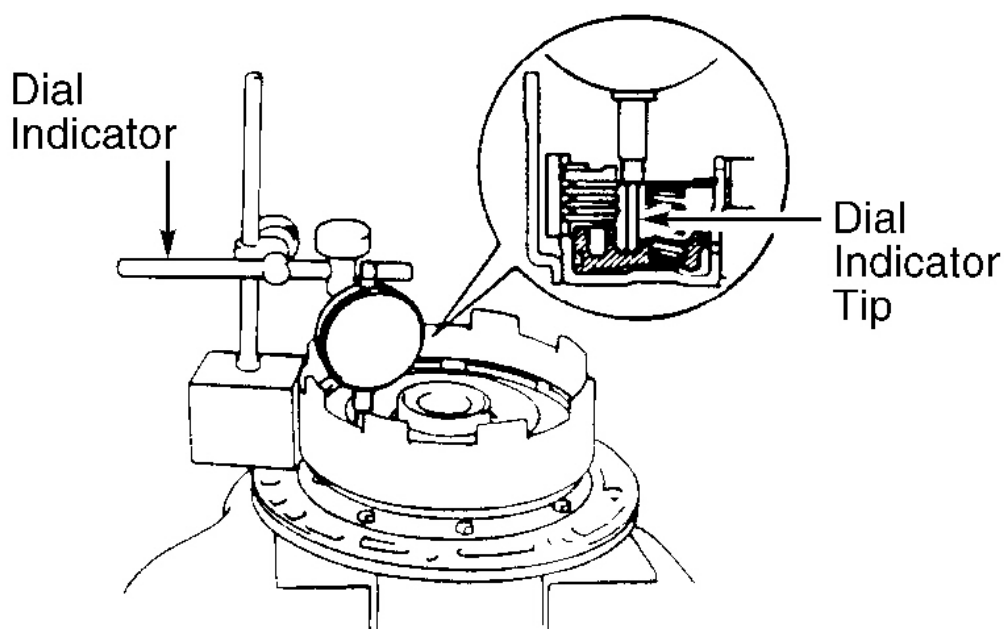
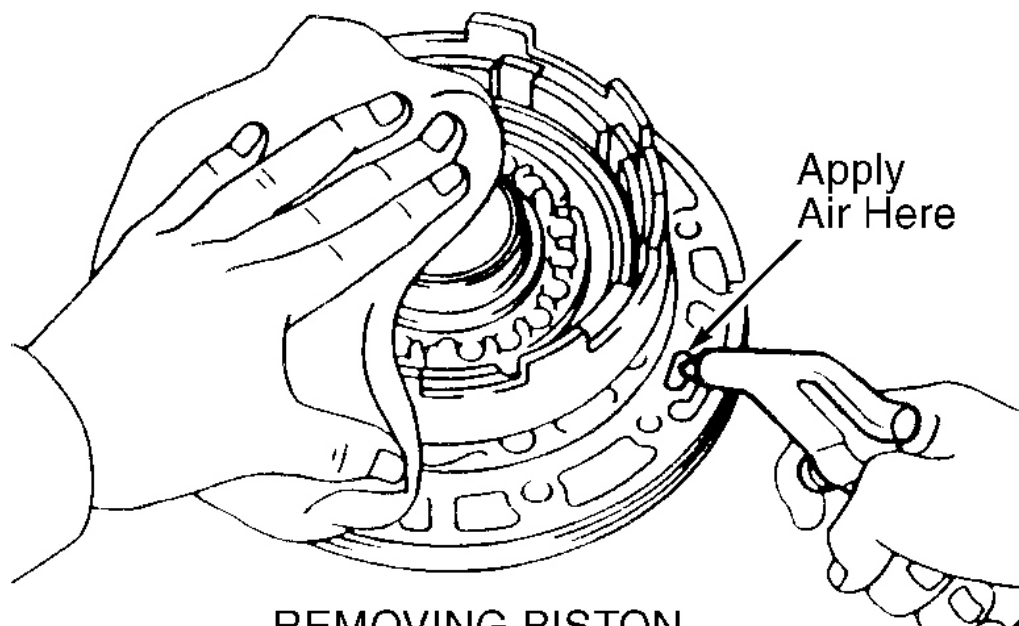


Fig. 18: Exploded View Of Direct Clutch Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



CHECKING PISTON TRAVEL



REMOVING PISTON

G93H24478

Fig. 19: Checking Direct Clutch Piston Stroke
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

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.
2. If disc lining is peeled or discolored, replace discs as necessary. Replace all damaged components. Using a dial indicator, measure inside diameter of direct clutch bushing. Maximum inside diameter is 1.853" (47.07 mm). If inside diameter exceeds specification, replace direct clutch drum.

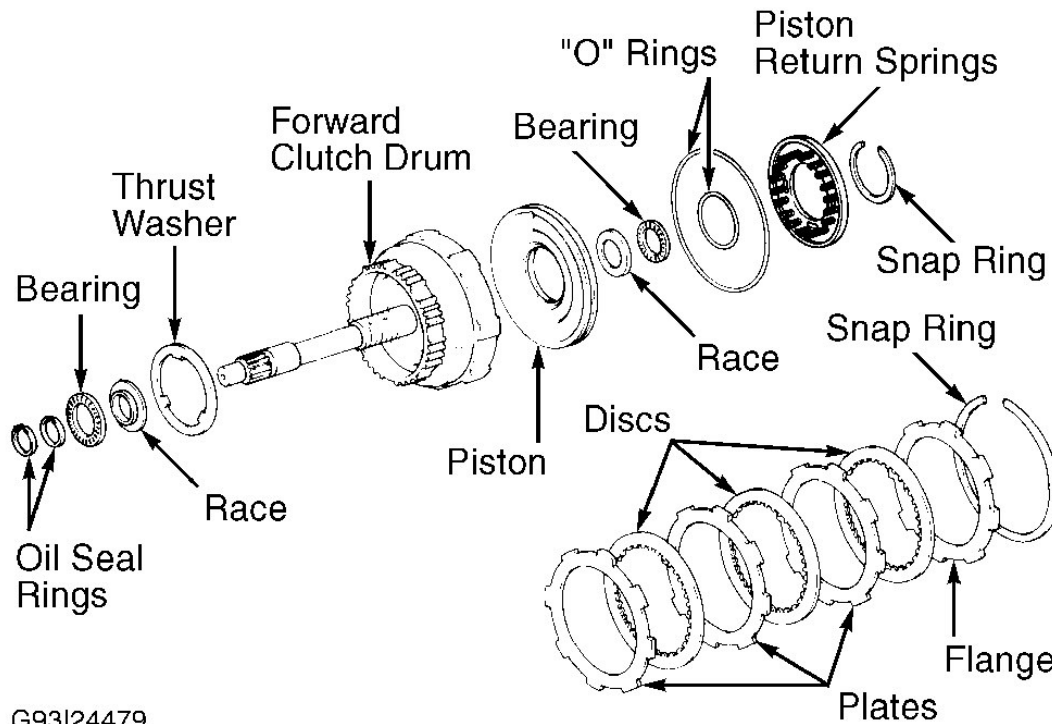
NOTE: **New discs must be soaked in ATF for 15 minutes prior to reassembly.**

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 up. Install piston return spring and retainer. Compress piston return spring and install snap ring.
2. Ensure snap ring gap does not align with spring retainer claw. Install plates, discs, and flange. 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. Use dial indicator to check direct clutch piston stroke. Apply air pressure to oil pump passage and note reading. See **Fig. 19** . Clutch piston stroke should be .054-.067" (1.37-1.70 mm). If piston stroke is not as specified, select appropriate flange to obtain correct piston stroke. Flange is available in thicknesses of .118" (3.00 mm) and .133" (3.37 mm).

FORWARD CLUTCH**Disassembly**

1. Remove thrust washer. Remove races and thrust bearings from both sides of clutch drum. Remove clutch drum snap ring. Remove flange, discs and plates. Note number and location of components. See **Fig. 20** .
2. Using appropriate clutch spring compressor, compress piston return spring. Remove snap ring. Remove spring compressor and piston return spring.
3. To remove forward clutch piston, apply compressed air to oil passage hole (nearest piston) on rear of forward clutch shaft. Remove oil seal rings (if necessary).



G93I24479

Fig. 20: Exploded View Of Forward Clutch Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

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.

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

Reassembly

1. Install NEW seal rings (if necessary). Use care not to 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.
2. Install piston return spring. Compress piston return spring using clutch spring compressor. Install snap ring. Ensure snap ring gap does not align with spring retainer claw.
3. Install plates and discs in appropriate order. See **Fig. 20** . Install flange with flat side facing downward. Install snap ring. Ensure snap ring gap does not align with drum cutout.
4. Position dial indicator tip on flange. Measure piston stroke by applying compressed air to oil passage hole (nearest piston) on rear of forward clutch shaft and note reading. Clutch piston stroke should be .044-

.058" (1.11-1.47 mm).

5. If piston stroke is not as specified, select appropriate flange to obtain correct piston stroke. Flange is available in thicknesses of .118" (3.00 mm) and .133" (3.37 mm). Coat thrust washer, races and bearing with petroleum jelly and install.

FRONT PLANETARY GEAR

Disassembly

1. Check No. 1 one-way clutch operation. Hold sun gear and rotate hub. Hub should rotate freely in clockwise direction and lock when rotated in counterclockwise direction. See **Fig. 21** . Turn hub clockwise and remove 2nd brake hub and one-way clutch from sun gear.
2. Remove thrust washer and snap ring. Remove sun gear from input drum. Remove shaft snap ring from sun gear. Remove one-way clutch retainer if clutch requires replacement. Remove one-way clutch from hub.

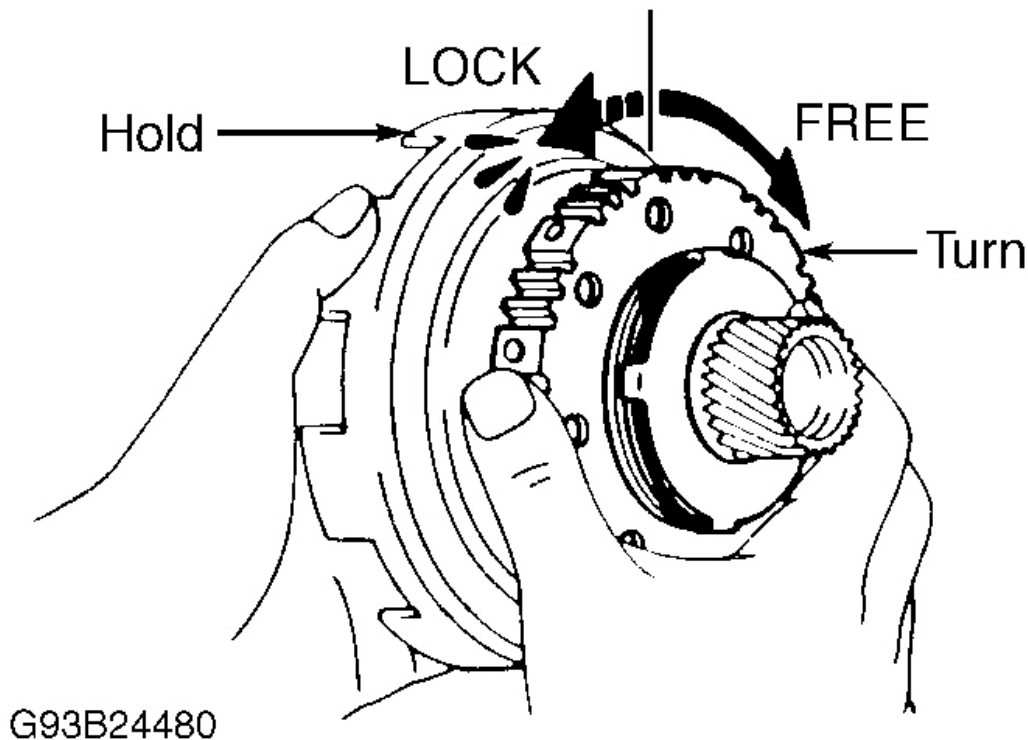


Fig. 21: Checking No. 1 One-Way Clutch
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

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. Using a dial indicator, measure inside diameter of sun gear 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 sun gear.
3. Using a feeler gauge, measure clearance between planetary pinion gear and planetary gear case. Standard clearance should be .008-.020" (.20-.50 mm). Maximum clearance is .020" (.50 mm). If clearance exceeds specification, replace planetary gear.
4. Using a dial indicator, 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. 22** . Rotate hub clockwise. Install one-way clutch and 2nd brake hub. Hold sun gear and rotate hub. Hub should rotate freely in clockwise direction and lock when rotated in counterclockwise direction.

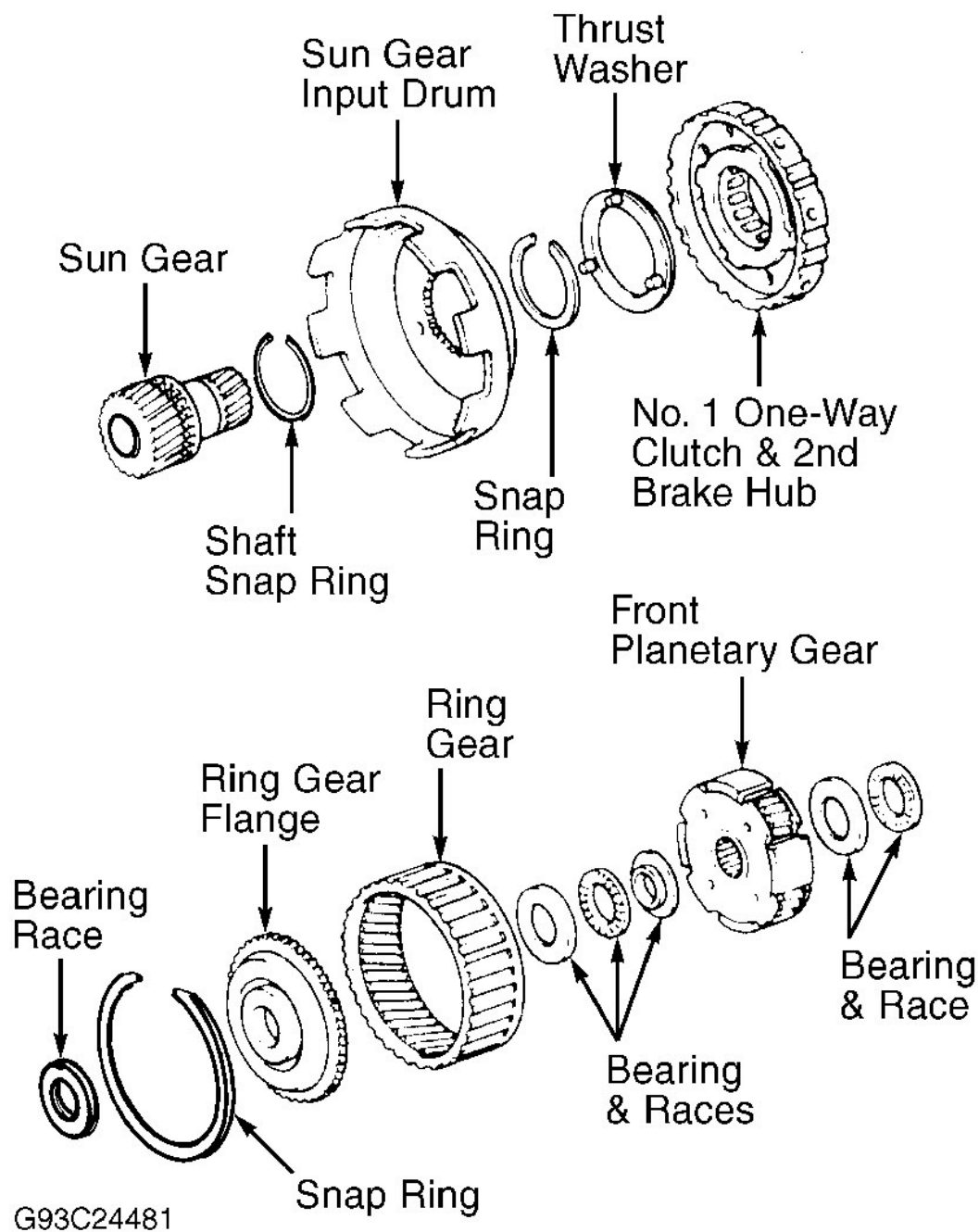


Fig. 22: Exploded View Of Front Planetary Gear Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

REAR PLANETARY GEAR

Disassembly

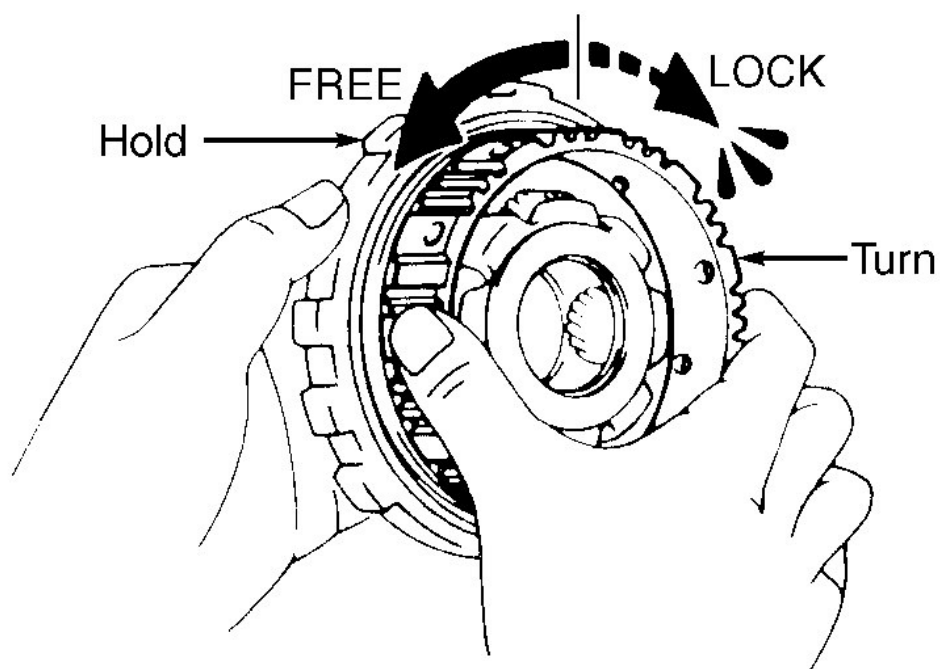
1. Check No. 2 one-way clutch operation. Hold outer race and rotate hub. Hub should rotate freely in counterclockwise direction and lock when rotated in clockwise direction. See **Fig. 23** .
2. Remove thrust washers from both sides of rear planetary gear. Separate No. 2 one-way clutch and planetary gear. Remove snap rings and retainers from No. 2 one-way clutch. Note position of No. 2 one-way clutch. Remove one-way clutch from outer race.

Inspection

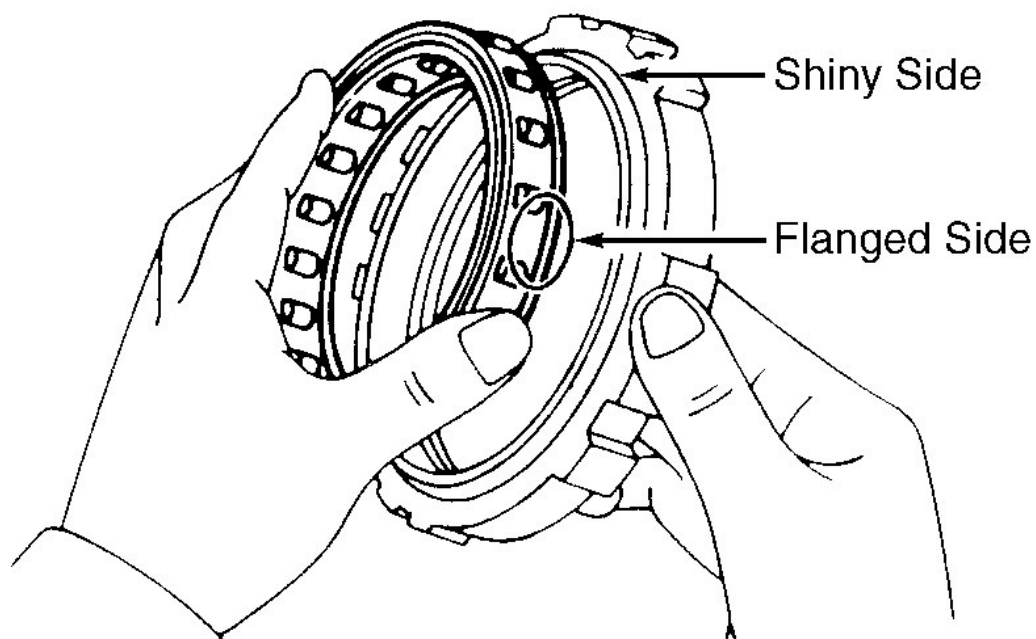
1. Clean all parts with solvent. Dry parts using compressed air. Check thrust washers and one-way clutch for wear or damage. Replace if necessary.
2. Using a feeler gauge, measure clearance between planetary pinion gear and planetary gear case. Standard clearance should be .008-.020" (.20-.50 mm). Maximum clearance is .020" (.50 mm). If clearance exceeds specification, replace planetary gear.

Reassembly

1. Coat all parts with ATF. Install one-way clutch into outer race. Flanged side of one-way clutch should face toward shiny side of outer race. See **Fig. 23** . Install retainers and snap rings.
2. Install planetary gear into one-way clutch. Planetary gear inner race should face toward back side of outer race. Check operation of one-way clutch. Coat thrust washers with petroleum jelly. Install thrust washers on both sides of planetary gear. Ensure thrust washer tab is aligned with hollow area in gear. See **Fig. 24** .



CHECKING OPERATION



INSTALLING CLUTCH

G93D24482

Fig. 23: Checking & Installing No. 2 One-Way Clutch
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

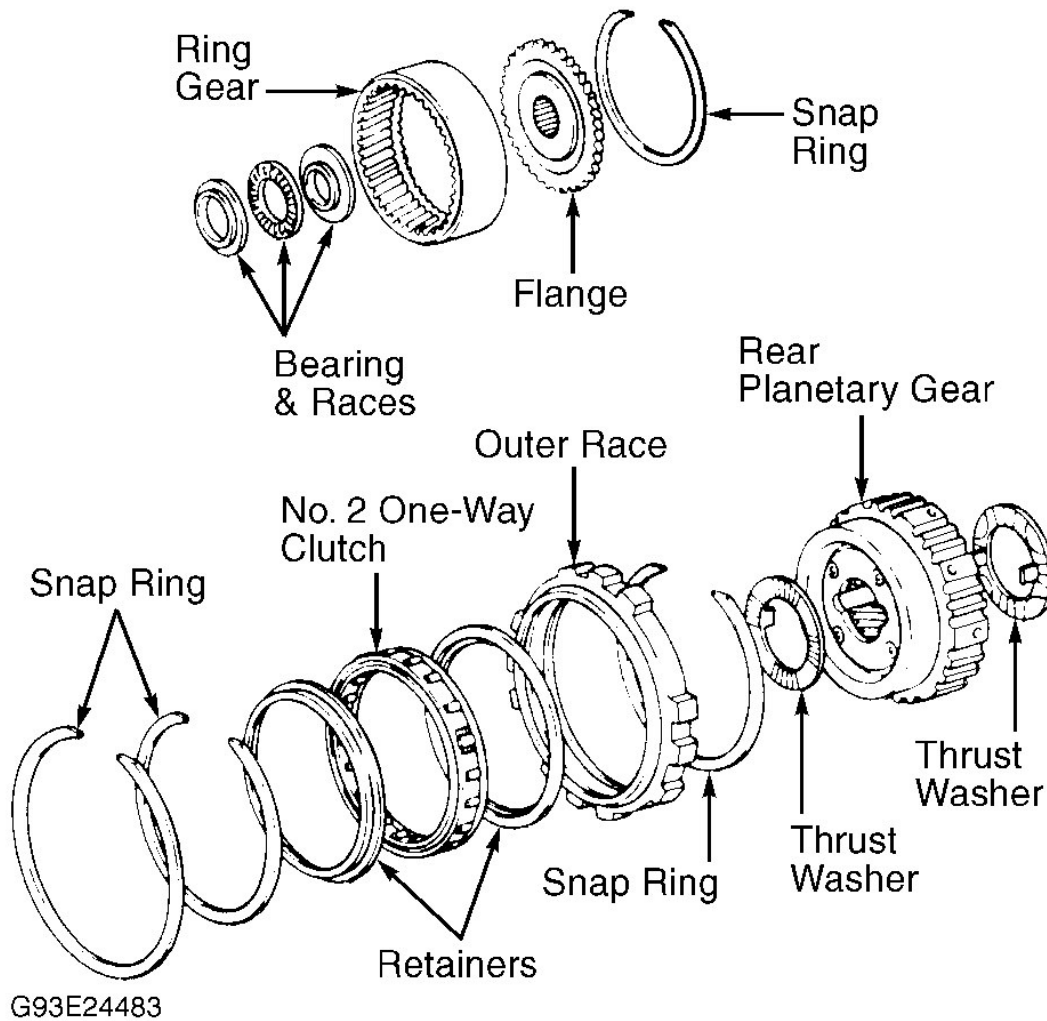


Fig. 24: Exploded View Of Rear Planetary Gear Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

1ST & REVERSE BRAKE PISTON

Disassembly

Using appropriate spring compressor, compress springs by tightening bolt gradually. Remove snap ring and compressor. Remove piston return spring. Apply compressed air to oil passage in transaxle case to remove piston. See [Fig. 12](#) . 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 and snap ring in place. Using clutch spring compressor, compress piston return spring. Avoid bending spring retainer or damaging transaxle case by overtightening compressor.
2. Push snap ring into place with fingers. Ensure snap ring is fully seated and centered by spring retainer lugs. Snap ring end gap must not align with spring retainer claw. Remove spring compressor. See **Fig. 13**.

2ND COAST BRAKE**Disassembly**

Remove oil seal ring from piston. Remove "E" ring from piston with needle-nose pliers. Remove spring, washer and piston rod. See **Fig. 25**.

Inspection

Replace brake band if lining is peeled, discolored or printed numbers are defaced. Before assembling NEW band, soak in ATF for 15 minutes. If band is serviceable but piston rod stroke is not within specification, select a NEW piston rod. Piston stroke should be .059-.118" (1.50-3.00 mm). Piston rods are available in lengths of 2.811" (71.40 mm) and 2.870" (72.90 mm).

Reassembly

Install washer and spring to piston rod. Install "E" ring while pushing piston. Apply ATF to oil seal ring. Install oil seal ring to piston. DO NOT spread oil seal ring ends more than necessary for installation. See **Fig. 25**.

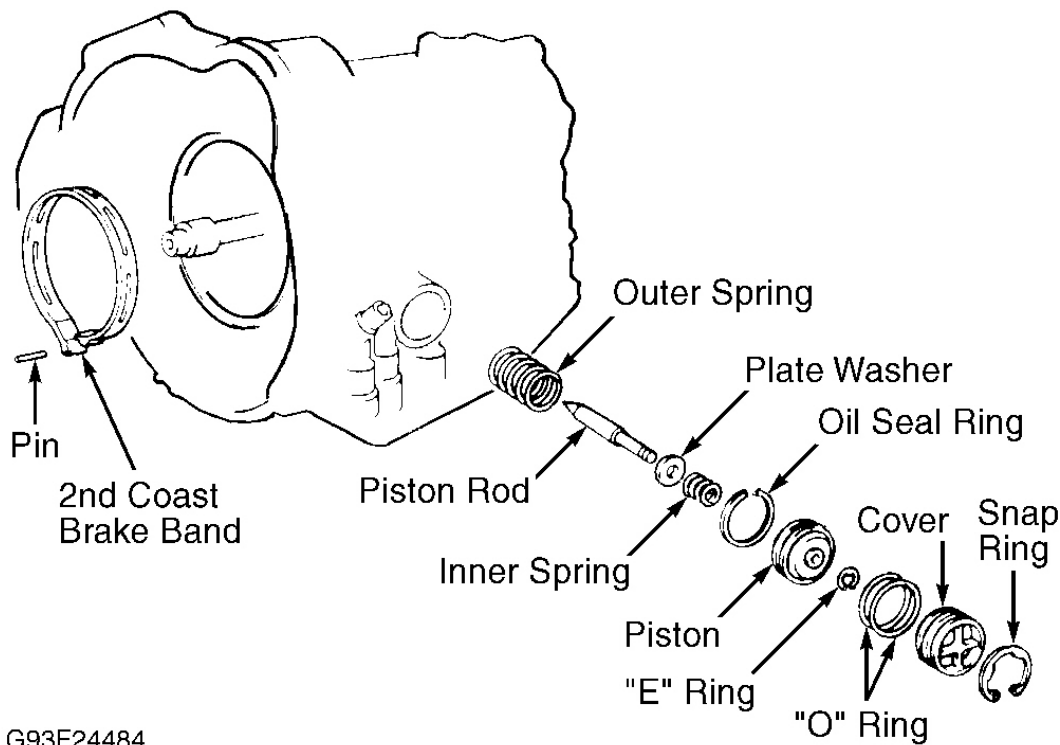


Fig. 25: Exploded View Of 2nd Coast Brake
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

2ND BRAKE PISTON

Disassembly & Reassembly

Apply compressed air to oil hole on 2nd brake drum and remove 2nd brake piston. Remove 2 "O" rings from piston. Coat NEW "O" rings with ATF. Install "O" rings on piston. Using hand pressure, carefully press 2nd brake piston into 2nd brake drum. See **Fig. 26** .

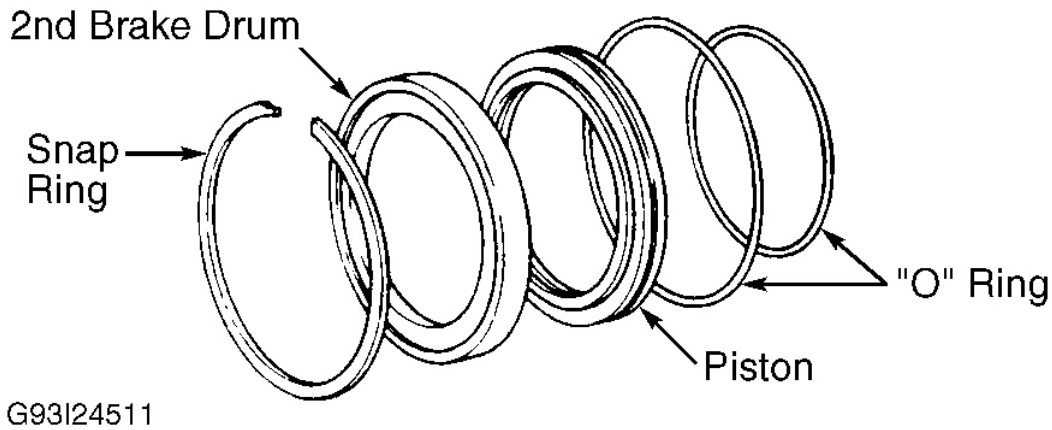


Fig. 26: Exploded View Of 2nd Brake Piston
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

INTERMEDIATE SHAFT

Disassembly & Reassembly

Using appropriate bearing splitter and puller or press, remove intermediate shaft bearings from shaft. Install intermediate shaft bearings. Ensure gear flange end to intermediate shaft end measurement is 4.560" (115.82 mm). See **Fig. 27**.

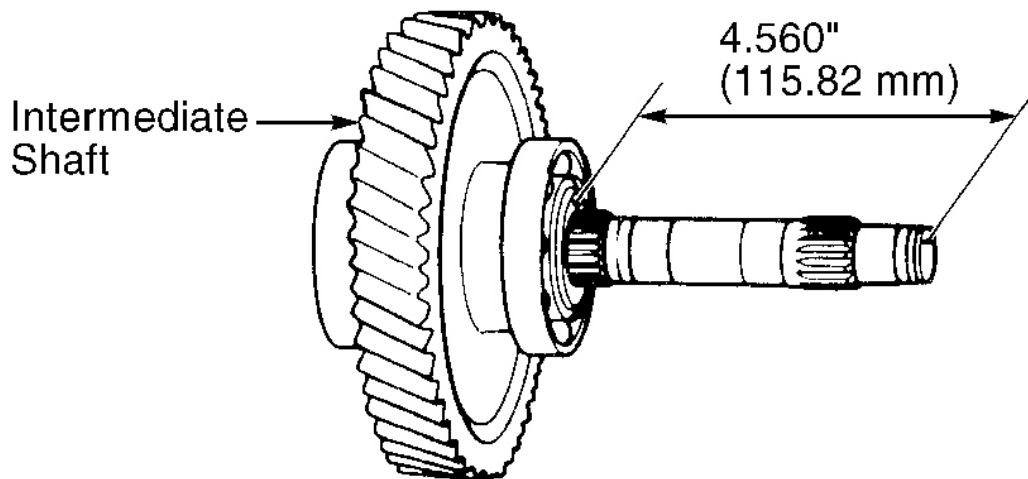


Fig. 27: Checking Intermediate Shaft Gear Flange
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

VALVE BODY ASSEMBLY

NOTE: All valve body assembly components must be installed in original location. Lay all components in sequence during removal for reassembly reference. Throttle pressure is changed according to number of adjusting rings. See [Fig. 28](#) . When assembling valve body, install same number of adjusting rings as were removed. Some valve bodies do not have adjusting rings.

Disassembly

Remove 9 bolts and upper valve body cover. Remove strainer, 2 gaskets and plate. Remove sleeve stopper. Remove 3 bolts and upper valve body. Remove 14 bolts, lower valve body cover and gasket. Remove 3 lower valve body bolts. Hold plate against lower valve body and carefully remove lower valve body. DO NOT lose check balls. Note location of check balls, retainers and pins in valve body. Remove plate and gasket. See [Fig. 28](#) .

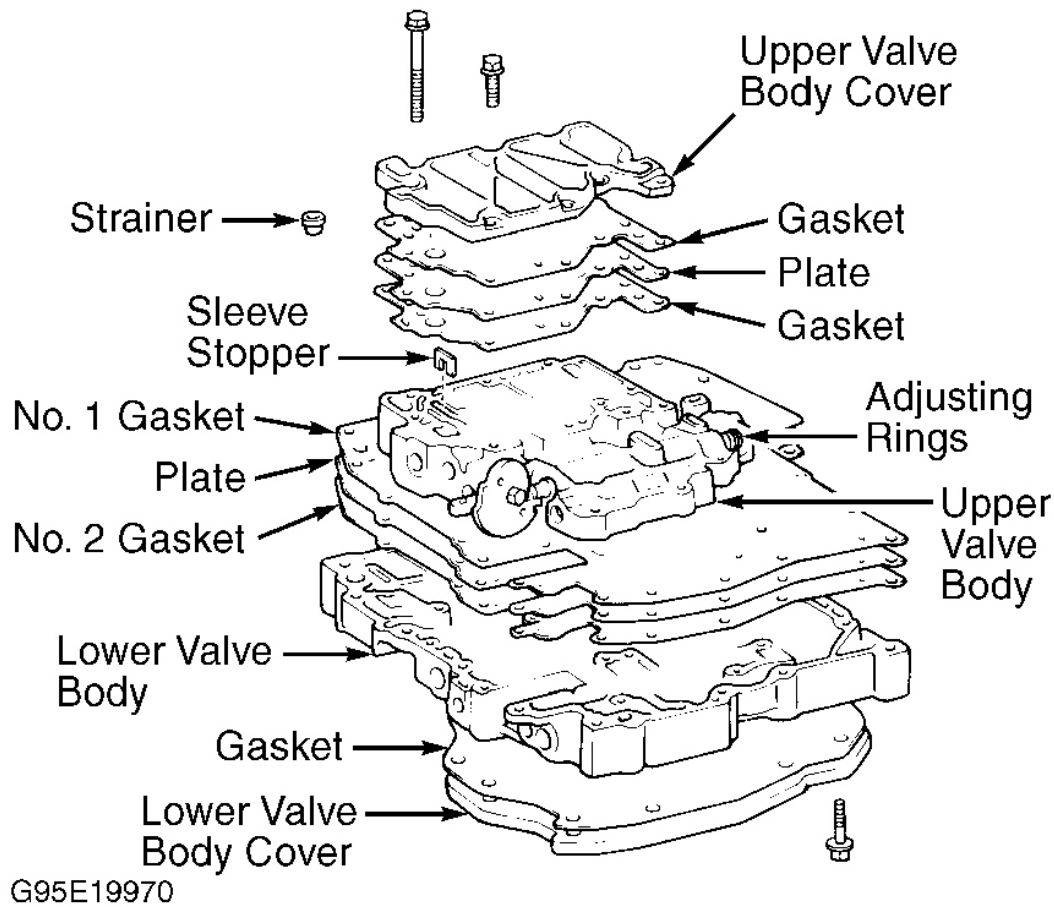


Fig. 28: Exploded View Of Valve Body Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

Inspection

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

UPPER VALVE BODY SPRING SPECIFICATIONS

Spring No. (1)	Diameter - In. (mm)	Free Length - In. (mm)
1	.374 (9.50)	.854 (21.70)
2 (Chevrolet)	.409 (10.40)	1.307 (33.20)

2000 Chevrolet Prizm**2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul**

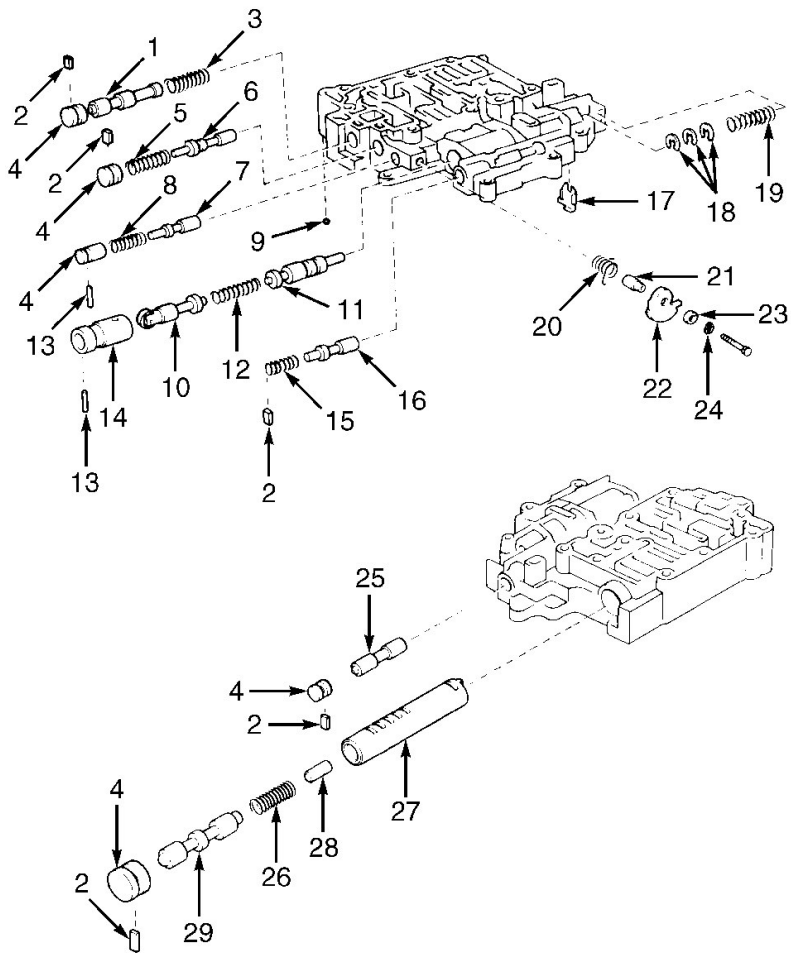
2 (Toyota)	.417 (10.60)	1.106 (28.10)
3	.311 (7.90)	.921 (23.40)
4 (AW)	.343 (8.70)	1.140 (28.95)
4 (Toyota)	.343 (8.70)	1.173 (29.80)
5	.362 (9.20)	1.209 (30.70)
6	.335 (8.50)	.823 (20.90)
7	.402 (10.20)	1.047 (26.60)

(1) For spring locations, refer to illustration. See **Fig. 29** .

LOWER VALVE BODY SPRING SPECIFICATIONS

Spring No. ⁽¹⁾	Diameter - In. (mm)	Free Length - In. (mm)
1	.429 (10.90)	1.717 (43.60)
2	.252 (6.40)	1.071 (27.20)
3	.327 (8.30)	1.091 (27.70)
4	.315 (8.00)	1.236 (31.40)
5	.311 (7.90)	1.146 (29.10)
6	.732 (18.60)	2.626 (66.70)
7	.433 (11.00)	.783 (19.90)
8	.252 (6.40)	.441 (11.20)

(1) For spring locations, refer to illustration. See **Fig. 31** .



- | | |
|------------------------------|--------------------------------|
| 1. Throttle Modulator Valve | 16. 2nd Coast Modulator Valve |
| 2. Retainer | 17. Vibrating Stopper |
| 3. Spring No. 1 | 18. Adjusting Ring |
| 4. Plug | 19. Spring No. 5 |
| 5. Spring No. 2 | 20. Spring |
| 6. Accumulator Control Valve | 21. Cam Pin |
| 7. Low Coast Modulator Valve | 22. Cam |
| 8. Spring No. 3 | 23. Plate Washer |
| 9. Steel Check Ball | 24. Wave Washer |
| 10. Downshift Plug | 25. Cut-Back Valve |
| 11. Throttle Valve | 26. Spring No. 7 |
| 12. Spring No. 4 | 27. Lock-Up Relay Valve Sleeve |
| 13. Pin | 28. Control Valve |
| 14. Throttle Valve Sleeve | 29. Lock-Up Relay Valve |
| 15. Spring No. 6 | |

G93B24514

Fig. 29: Exploded View Of Upper Valve Body
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

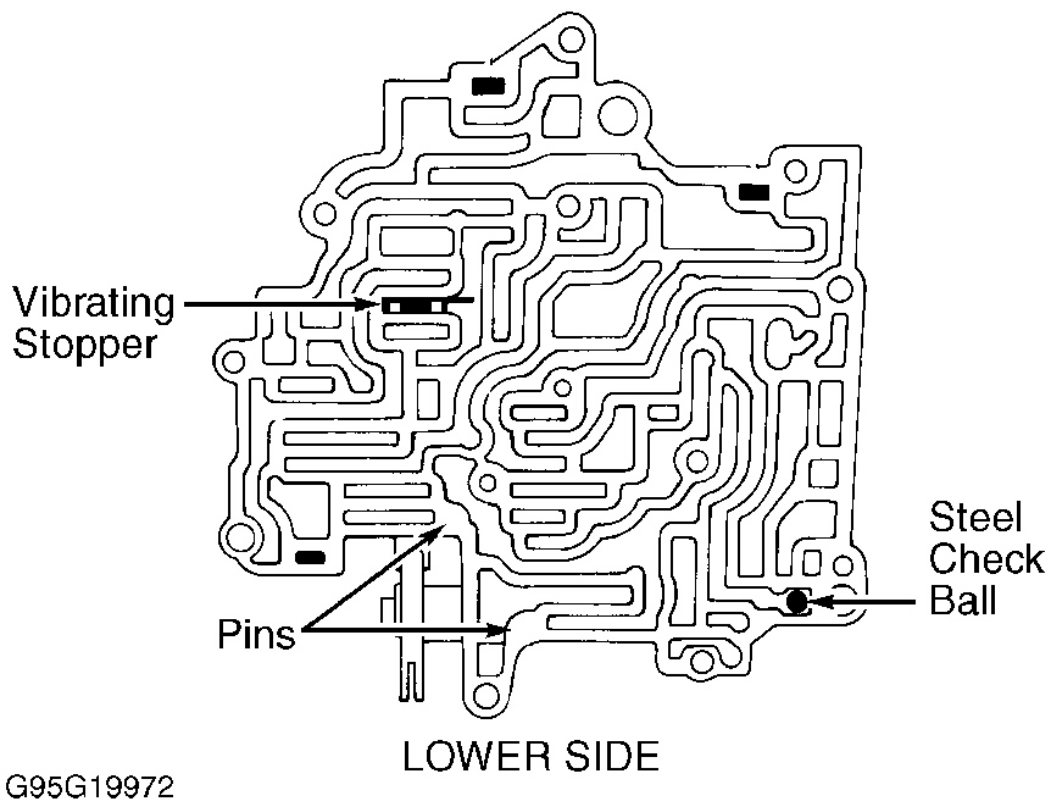
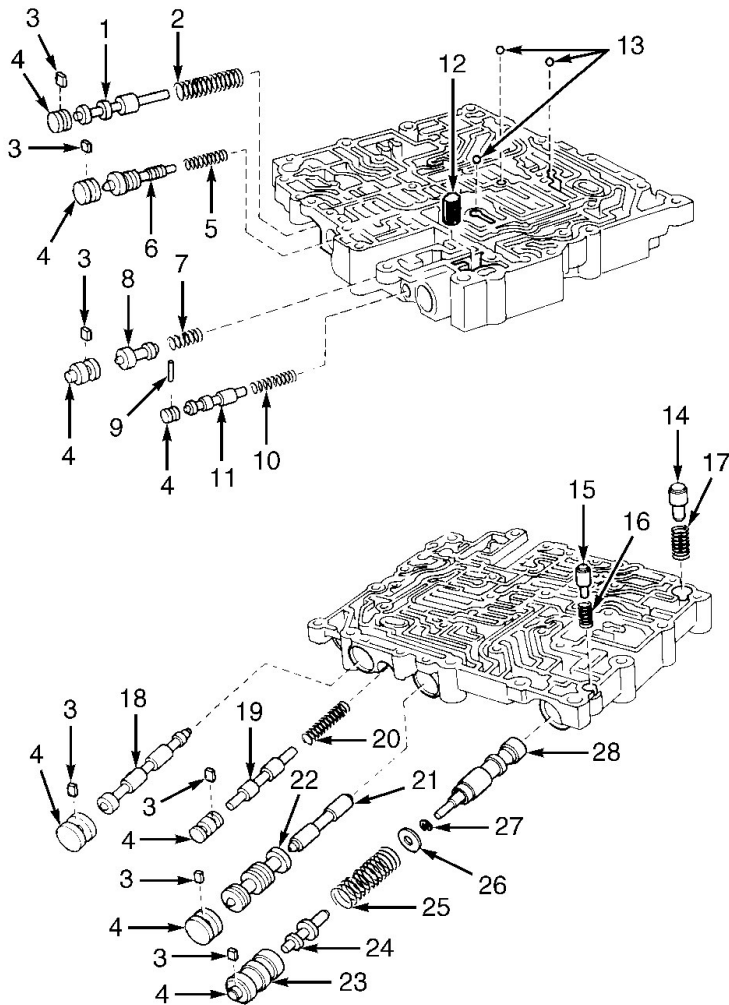


Fig. 30: Identifying Upper Valve Body Check Ball, Pin & Retainer Locations
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



- | | |
|-----------------------------------|-----------------------------|
| 1. Secondary Regulator Valve | 15. Pressure Relief Valve |
| 2. Spring No. 1 | 16. Spring No. 8 |
| 3. Retainer | 17. Spring No. 7 |
| 4. Plug | 18. 2-3 Shift Valve |
| 5. Spring No. 2 | 19. Detent Regulator Valve |
| 6. Low Coast Shift Valve | 20. Spring No. 5 |
| 7. Spring No. 3 | 21. 1-2 Shift Upper Valve |
| 8. Intermediate Shift Valve | 22. 1-2 Shift Lower Valve |
| 9. Pin | 23. Sleeve |
| 10. Spring No. 4 | 24. Plunger |
| 11. Lock-Up Signal Valve | 25. Spring No. 6 |
| 12. Strainer (A-131L Toyota Only) | 26. Plate Washer |
| 13. Rubber Check Ball | 27. Adjusting Ring |
| 14. Cooler By-Pass Valve | 28. Primary Regulator Valve |

G95F19971

Fig. 31: Exploded View Of Lower Valve Body
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

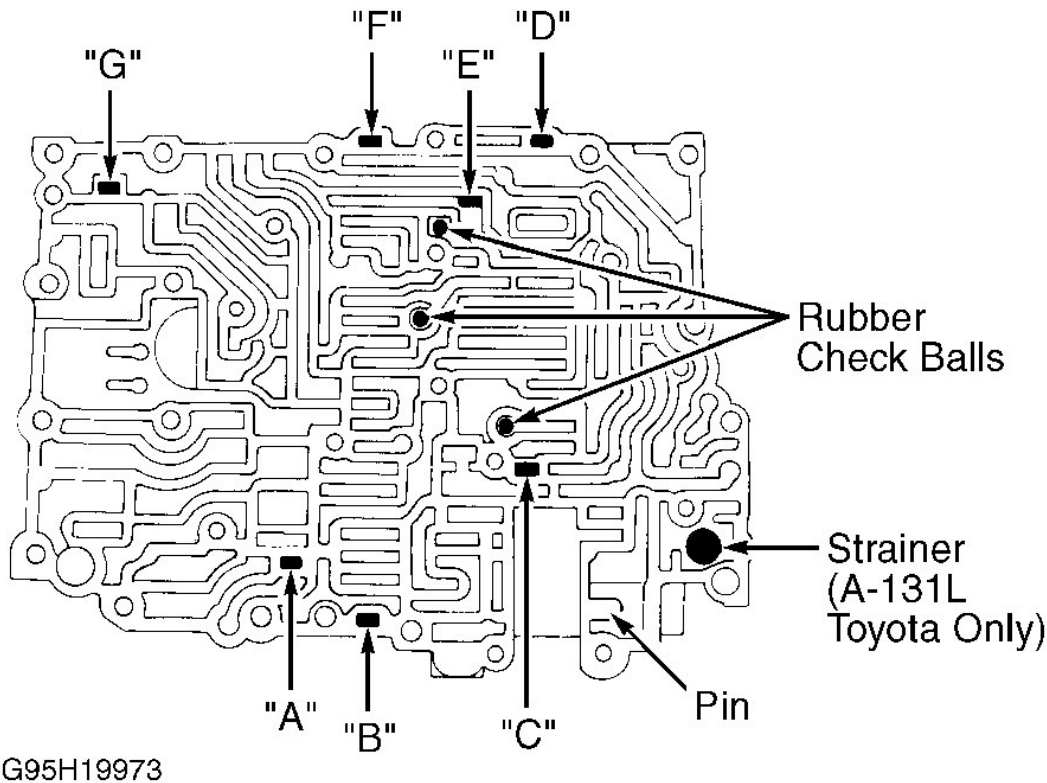


Fig. 32: Identifying Lower Valve Body Check Ball, Pin & Retainer Locations

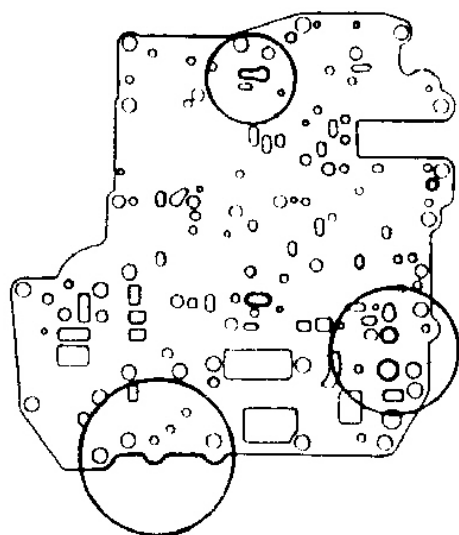
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: Valves may be held in with pins or retainers and plugs. Remove components and note locations. Arrange parts in order for reassembly reference.

Reassembly

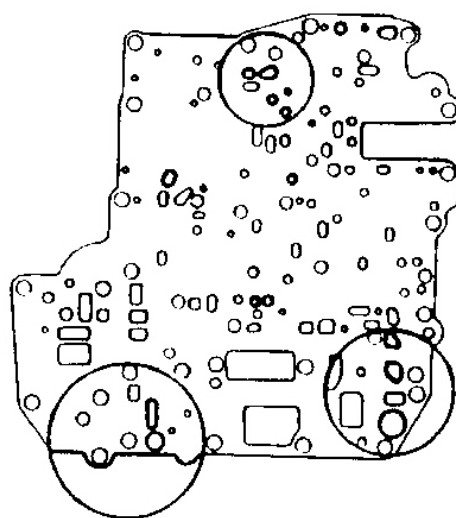
1. Coat all components with ATF. To reassemble, reverse disassembly procedure. Ensure check balls, pins and strainer on upper side of lower valve body are installed correctly. See **Fig. 32**. Ensure check ball, pins, retainers and vibrating stopper on lower side of upper valve body are installed correctly. See **Fig. 30**.
2. Position NEW No. 2 gasket, plate and NEW No. 1 gasket on lower valve body. Ensure gaskets are installed in correct locations. See **Fig. 33**. 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. 34**. Install lower valve body cover over NEW gasket. Install and finger tighten 14 cover bolts. See **Fig. 35**. Install and finger tighten 1.102" (28 mm) bolts (3) in upper valve body.
4. Ensure retainers are installed correctly on upper side of upper valve body. Install sleeve stopper. Position NEW gasket, plate and gasket. Install strainer onto plate. Position upper valve body cover and install and

finger tighten 9 bolts. See **Fig. 35** . Check alignment of gaskets and plates. Tighten upper and lower valve body bolts to 48 INCH lbs. (5.4 N.m).



NO. 1 GASKET

G93F24518



NO. 2 GASKET

Fig. 33: Identifying Valve Body Gaskets

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

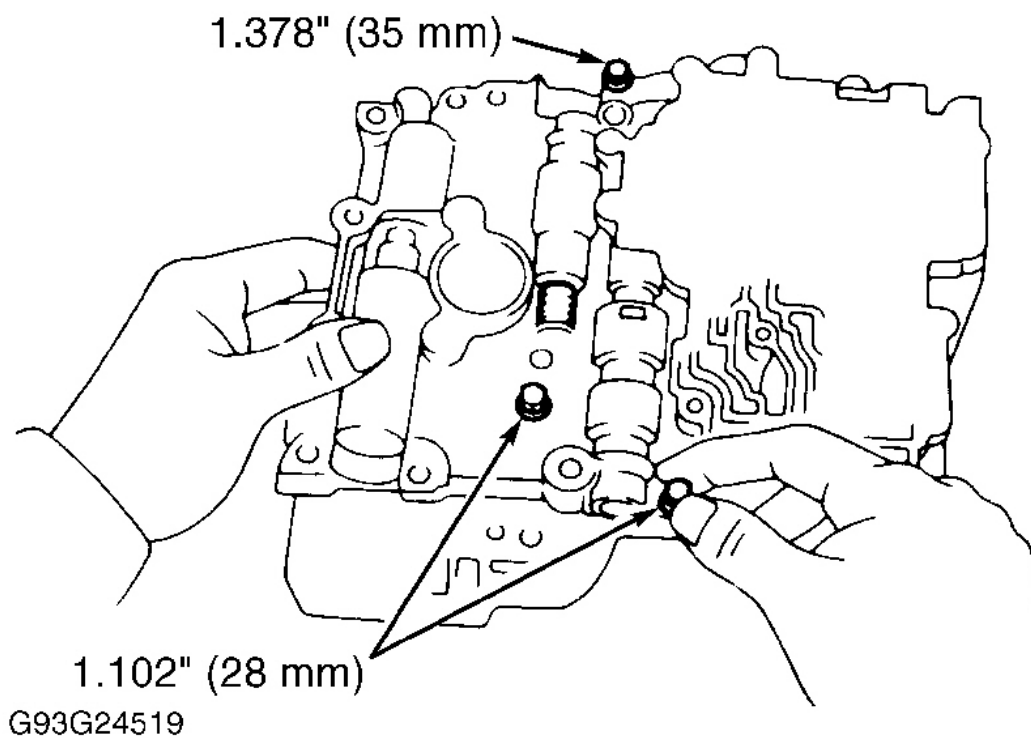
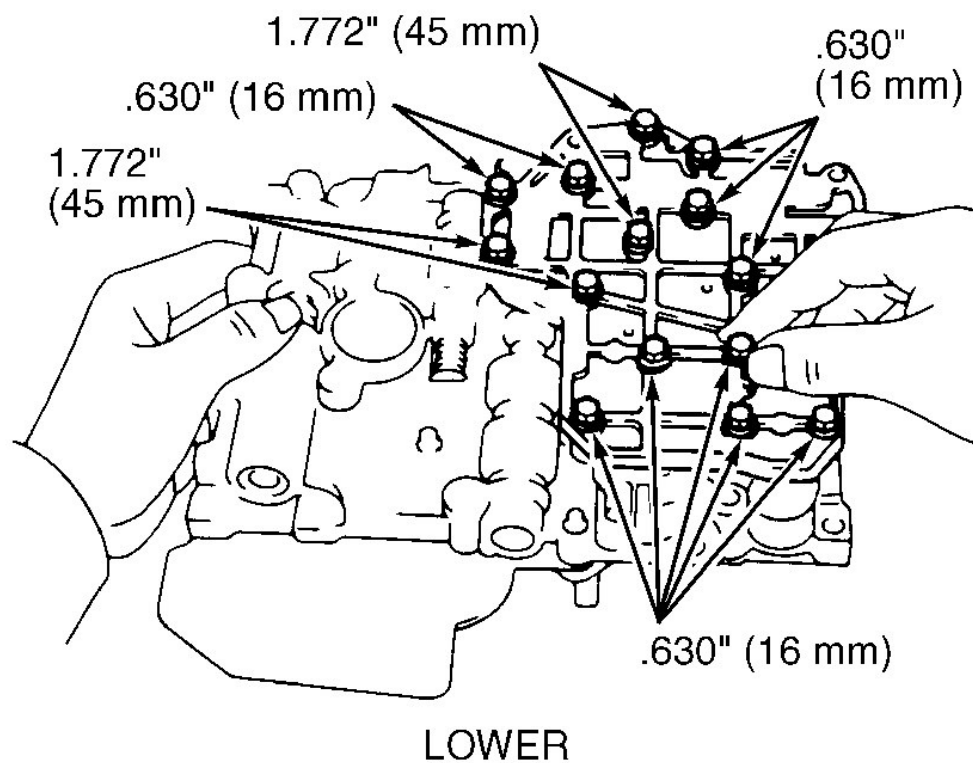
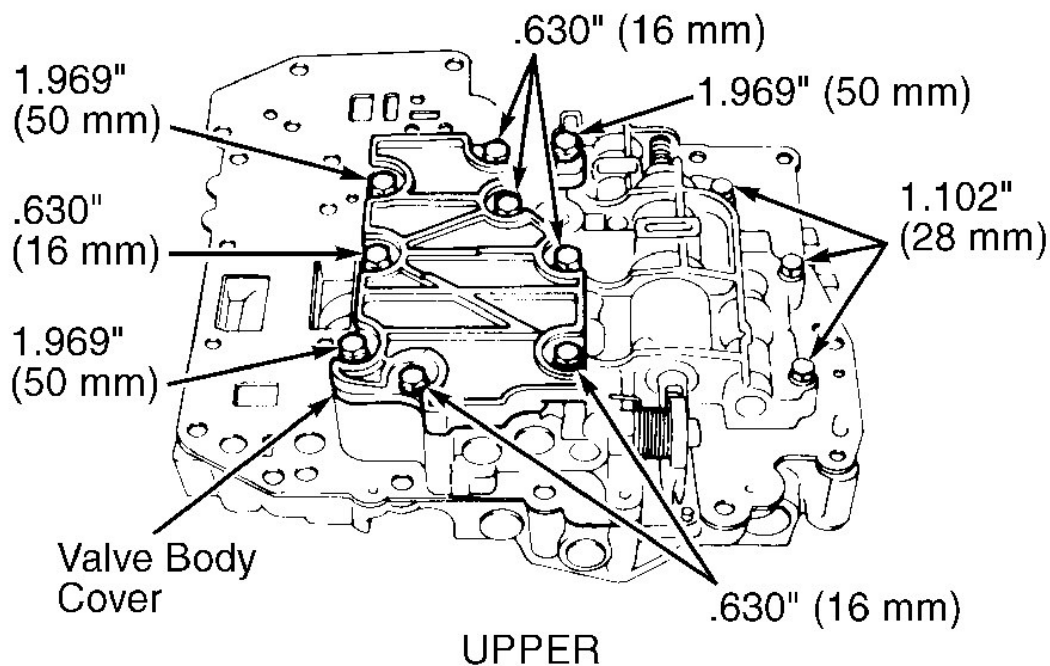


Fig. 34: Installing Lower Valve Body-To-Upper Valve Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G93J24520

Fig. 35: Identifying Upper & Lower Valve Body Cover Bolt Locations

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

DIFFERENTIAL ASSEMBLY**Disassembly**

1. Remove carrier cover. Attach an INCH-lb. torque wrench to end of pinion shaft. See **Fig. 36** . Measure total preload required to rotate pinion. Note and record reading. Position dial indicator assembly on transaxle case. Position dial indicator tip against side gear. See **Fig. 37** . Measure side gear backlash while holding one pinion toward case. Backlash should be .002-.008" (.05-.20 mm). Note and record reading.
2. Remove left side bearing retainer bolts. Remove bearing retainer. Remove "O" ring from retainer. Remove right side bearing cap. Remove differential, outer race and adjustment shim from transaxle case.
3. Attach an INCH-lb. torque wrench to end of pinion shaft. Measure drive pinion preload. Note and record reading. Starting preload should be 4-7 INCH lbs. (.5-.8 N.m) for a used bearing. Total preload reading minus drive pinion preload should equal 1-2 INCH lbs. (.1-.2 N.m). If not within specification, side bearing preload requires adjustment.
4. Remove bearings from differential case using appropriate puller. Remove speedometer drive gear. Mark ring gear and case for reassembly reference. Spread ring gear bolt locking plates. Remove ring gear bolts and locking plates. Using brass hammer, tap ring gear from differential case.
5. Using a dial indicator, check side gear backlash. Hold one pinion against case. Measure side gear backlash. Backlash must be .002-.008" (.05-.20 mm). If backlash is not within specification, side gear thrust washers must be replaced.
6. Drive out pinion shaft lock pin from ring gear side. Remove pinion shaft, pinion gears, side gears and thrust washers. Remove left oil seals from transaxle case or bearing retainer. Using a long screwdriver, remove right oil seal from transaxle case. Remove left outer bearing race and shim from retainer.

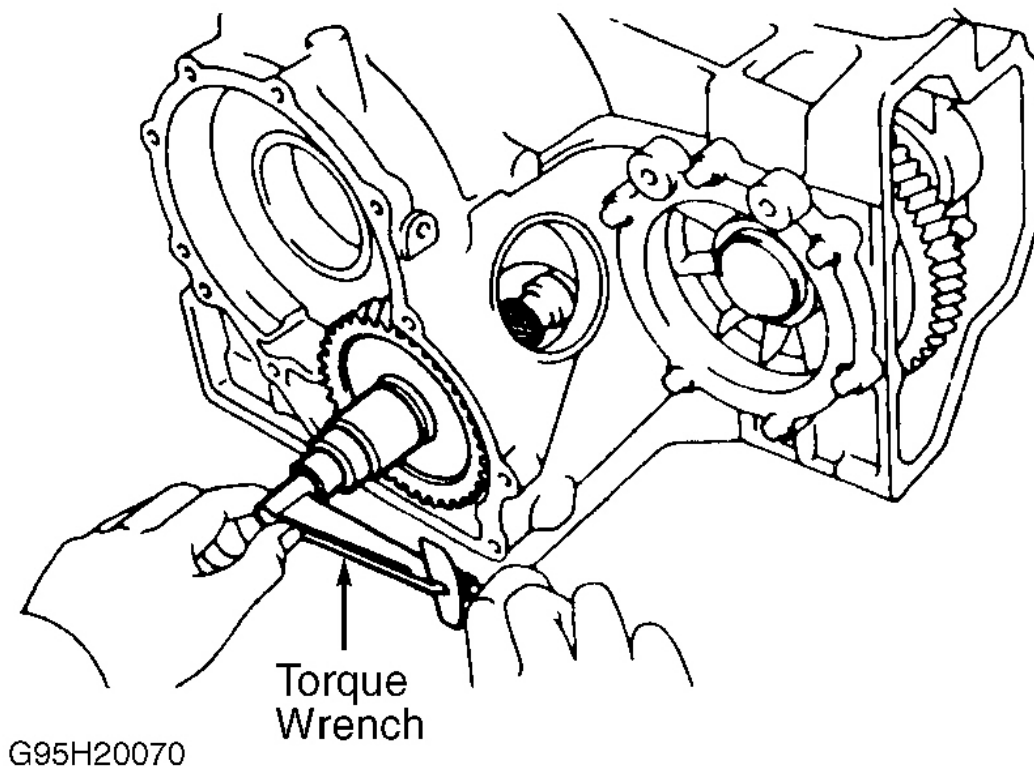
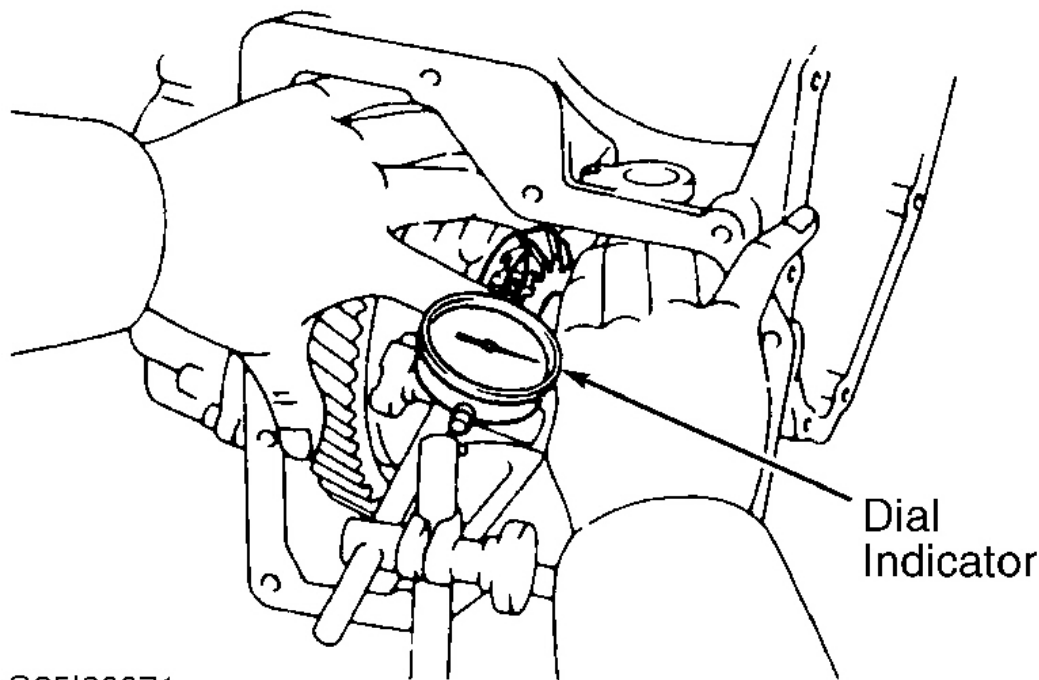


Fig. 36: Measuring Total Preload

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



G95I20071

Fig. 37: Measuring Differential Side Gear Backlash
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Cleaning & Inspection

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

Reassembly

1. Install original shim onto retainer. Install outer race. Lubricate oil seal lip. Install oil seals until oil seal surface is flush with surface of transaxle case or bearing retainer.
2. Select thrust washers that will ensure correct side gear backlash. Thrust washers are available in thicknesses of .037-.047" (.95-1.20 mm) in .20" (.05 mm) increments. Install thrust washers and side gears in differential case. If possible, install same size thrust washers on both sides. Install pinion gears and pinion shaft. Check side gear backlash to ensure proper thrust washers are used.
3. Once backlash is correct, using hammer and punch, drive lock pin through differential case and into pinion shaft. Stake differential case to retain lock pin. Install speedometer drive gear onto differential case. Install side bearings onto differential case.
4. Clean ring gear contact surface of differential case. Heat ring gear to 212°F (100°C) in an oil bath. DO NOT heat ring gear above 230°F (110 °C). Clean contact surface of ring gear using cleaning solvent. Align ring gear with differential case. Install ring gear on differential case.

5. Install NEW locking plates and bolts. Tighten bolts evenly and in several steps to 72 ft. lbs. (97 N.m). Stake lock plates. Stake one tab flush with flat surface of bolt. Stake 2nd tab against corner of bolt.
6. Install outer race and original adjusting shim on right side bearing. Remove differential drive pinion. See **DIFFERENTIAL DRIVE PINION ASSEMBLY** . Install differential in transaxle case. Install left bearing outer race, shim and retainer without "O" ring. Snug bolts evenly and gradually while turning ring gear. Tighten bolts to 14 ft. lbs. (19 N.m). Install right side bearing cap. Snug bolts evenly and gradually while turning ring gear. Tighten bolts to 36 ft. lbs. (49 N.m).
7. Using Differential Preload Adapter (09564-32011) and an INCH-lb. torque wrench, measure differential bearing preload with differential drive pinion removed. See **Fig. 38** . Preload must be within specifications. See **DIFFERENTIAL PRELOAD SPECIFICATIONS** table. If preload is not within specifications, remove differential from transaxle case and replace adjustment shim at right side bearing with appropriate shim.
8. Adjustment shims are available in thicknesses of .063-.104" (1.60-2.65 mm) in .020" (.05 mm) increments. Preload will change approximately 2.6-3.5 INCH lbs. (.3-.4 N.m) with each shim thickness.

DIFFERENTIAL PRELOAD SPECIFICATIONS

Application	INCH Lbs. (N.m)
New Bearings	9-14 (1.0-1.6)
Used Bearings	4-7 (.5-.8)

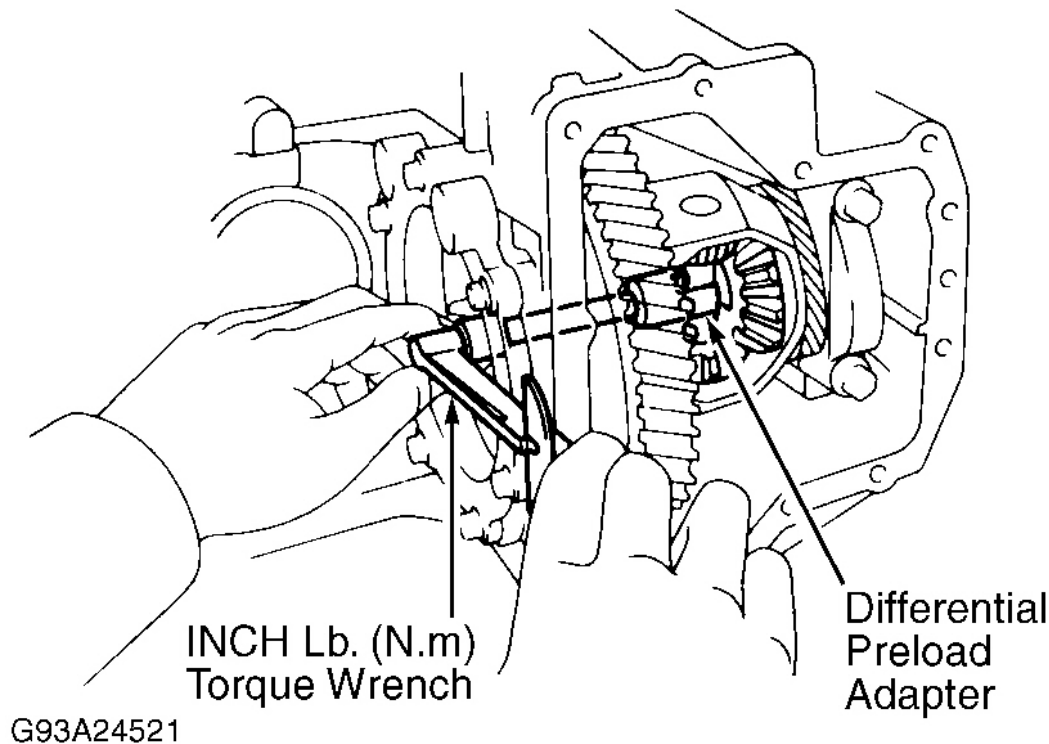
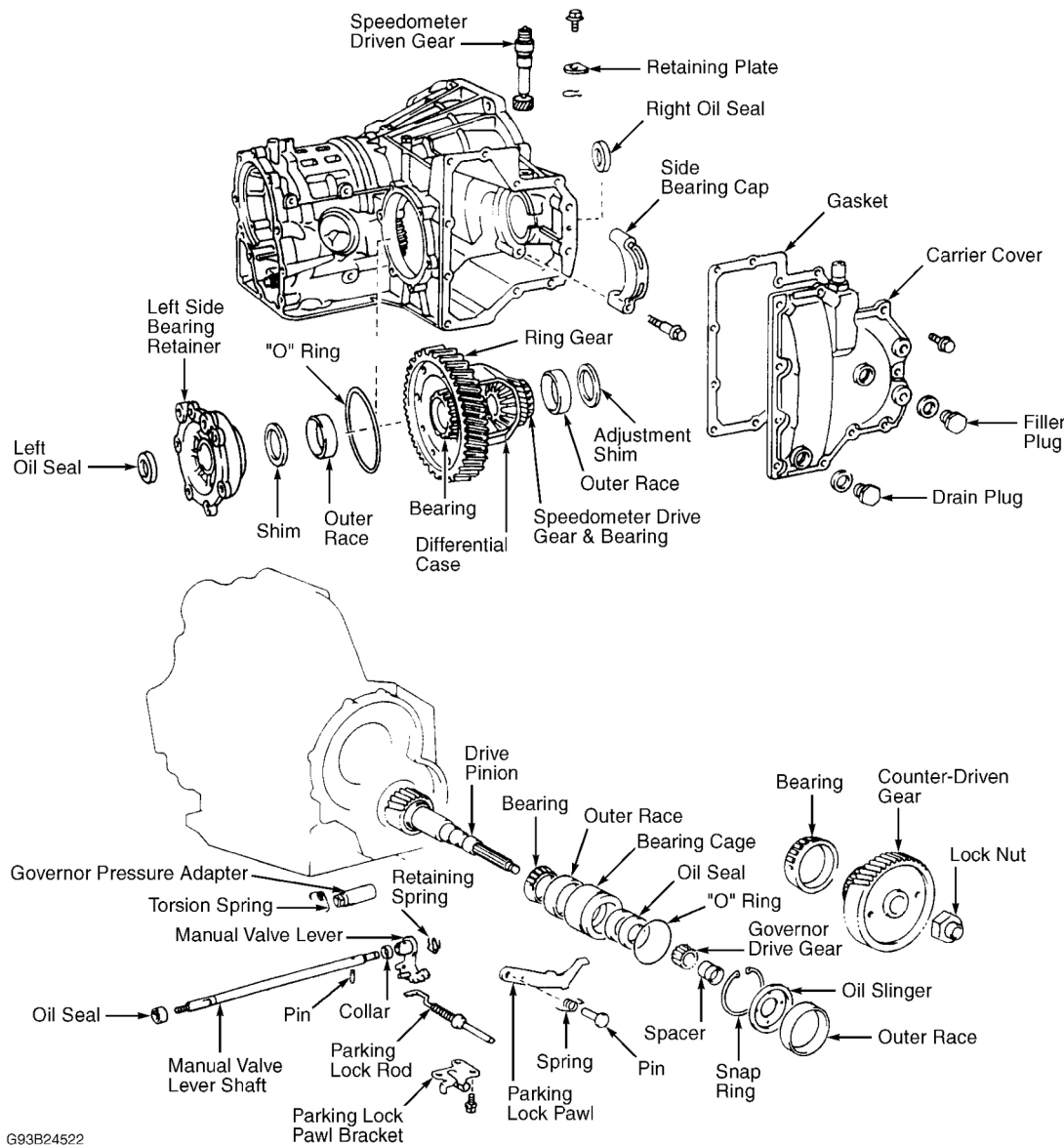


Fig. 38: Measuring Differential Bearing Preload**Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.**

9. If preload is within specification, remove left bearing retainer. DO NOT lose selected adjustment shim. Install "O" ring on left bearing retainer. Remove right side bearing cap bolts and coat threads with sealant. Tighten bolts evenly and gradually to 36 ft. lbs. (49 N.m) while turning ring gear.
10. With drive pinion installed in case, measure total preload using procedure used during disassembly. Starting preload should be drive pinion preload of 4-7 INCH lbs. (.5-.8 N.m) plus 3-4 INCH lbs. (.3-.4 N.m) for NEW bearings or 1-2 INCH lbs. (.1-.2 N.m) for used bearings.
11. If total preload is not within specification, disassemble differential and readjust. If total preload is correct, stake counter-driven gear lock nut. Install drive pinion cap. Coat carrier cover bolt threads with sealant. Install carrier cover and gasket. Install bolts and tighten to 18 ft. lbs. (25 N.m). To complete reassembly, reverse disassembly procedure. Tighten all bolts to specification. See **Fig. 39**.



G93B24522

Fig. 39: Exploded View Of Differential Assembly, Drive Pinion & Case Components
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

DIFFERENTIAL DRIVE PINION ASSEMBLY

Disassembly

1. Using an INCH-lb. torque wrench, measure drive pinion preload with differential assembly removed. Starting preload should be 4-7 INCH lbs. (.5-.8 N.m) for used bearings. Remove drive pinion bolt and cap. Using chisel, loosen staked area of counter-driven gear lock nut. Secure gear from turning. Remove lock nut. Using appropriate puller, remove counter-driven gear and bearing.
2. Remove bearing race from transaxle case. Remove oil slinger, bearing spacer and governor drive gear.

Remove snap ring from transaxle case. Using brass drift and hammer, drive pinion and bearing cage from bore. Press governor drive gear from drive pinion shaft. Remove bearing cage from drive pinion. Remove "O" ring from bearing cage. See **Fig. 39**.

3. Press bearing from counter-driven gear. Using bearing remover, remove pinion shaft bearing. Using hammer and brass drift, drive out drive bearing outer race from cage. Note position of oil seal lips. Remove seals from cage.

Cleaning & Inspection

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

Reassembly

1. Lubricate lips of oil seals. Install inner seal with lip facing downward. Oil seal must be installed to proper depth of .315" (8.00 mm).
2. Using seal installer, install outer seal with lip facing upward. Position oil seal flush with cage surface. Install outer bearing race in bearing cage.
3. Install drive pinion shaft bearing. Using remover/installer, install bearing on counter-driven gear. Install "O" ring on bearing cage. Install cage on drive pinion shaft. Use care not to damage oil seals. Install governor drive gear. Install shaft assembly into transaxle case.
4. Tap bearing cage into transaxle case. Ensure cage is past snap ring groove. Install snap ring. Insert brass bar into hole and tap drive pinion shaft against snap ring. Ensure snap ring is fully seated. Install oil slinger with lip facing outward. Install outer race in transaxle case with narrow end facing out. Install NEW bearing spacer, small end first.
5. Drive counter-driven gear onto shaft until lock nut can be installed. DO NOT tap on transaxle case. Lubricate lock nut threads and install lock nut on shaft. Install holder on gear. Tighten counter-driven gear lock nut to 127 ft. lbs. (172 N.m). Rotate counter-driven gear both directions several times.
6. Using an INCH-lb. torque wrench, measure drive pinion preload. Starting preload should be 9-14 INCH lbs. (1.0-1.6 N.m) for NEW bearings and 4-7 INCH lbs. (.5-.8 N.m) for used bearings. Replace bearing spacer if preload exceeds specifications. Recheck preload procedure (if necessary).
7. If preload is less than specification, tighten lock nut in additional increments of 9.5 ft. lbs. (13 N.m). Tighten lock nut until specified preload is obtained. If maximum torque of 213 ft. lbs. (289 N.m) is exceeded while tightening nut, replace bearing spacer and repeat procedure. DO NOT back off nut to reduce preload.

TRANSAXLE REASSEMBLY

NOTE: Coat all oil seal rings, clutch discs, clutch plates, rotating parts and sliding surfaces with ATF prior to reassembly. Soak clutch discs in ATF for 15 minutes prior to installation. For bearing race and thrust bearing installation direction and locations, See **Fig. 42**. For bearing race and thrust bearing outer diameter specifications, see **BEARING RACE & THRUST BEARING SPECIFICATIONS** table under **ACCUMULATOR SPRING SPECIFICATIONS**.

1. Install governor pressure adapter into case. Align adapter and transaxle case hole and install torsion

- spring. Ensure adapter does not slide and spring does not fall out when pulled. Install manual valve lever shaft oil seal to transaxle case. Install NEW collar on manual valve lever. See **Fig. 39**.
2. Install manual valve lever shaft to transaxle case through manual valve lever. Using a pin punch, drive in roll pin until flush with manual valve lever surface. Align collar hole with notch in lever and stake in position using a hammer and punch. Install retaining spring. Ensure lever moves smoothly.
 3. Install parking lock pawl in transaxle case. Hook spring end on pawl and transaxle case. Install pin into hole of transaxle case, through spring and pawl. Install parking lock rod.
 4. Install parking lock pawl bracket. Tighten to 65 INCH lbs. (7.4 N.m). Check operation of parking lock pawl to ensure counter-driven gear is locked when manual valve lever is in "P" position. Install 1st and reverse brake piston (if necessary). See **1ST & REVERSE BRAKE PISTON** under COMPONENT DISASSEMBLY & REASSEMBLY. Install intermediate shaft. Install transaxle rear cover and gasket. Tighten bolts to 18 ft. lbs. (25 N.m).
 5. Ensure intermediate shaft turns smoothly. Using a dial indicator, check intermediate shaft end play. End play should be .019-.059" (.49-1.51 mm). If end play is not as specified, check installation of intermediate shaft. On Aisin-Warner transaxles, install discs and plates starting with plate, alternating with disc and ending with disc. On Toyota transaxles, install 1st and reverse brake inner flange with flat end facing upward. Install discs and plates starting with disc, alternating with plate and ending with disc.
 6. On both transaxles, install outer flange with flat side toward piston. Install snap ring. Ensure end gap of snap ring is not aligned with cutout of transaxle case. Apply compressed air to oil passage to ensure piston moves. See **Fig. 12**. Coat bearings and races "E" with petroleum jelly and install on ring gear. See **Fig. 42**. Install ring gear in transaxle case.
 7. Align flukes of discs in 1st and reverse brake. Coat thrust washer with petroleum jelly. Align tab of thrust washer with hollow of planetary carrier. Align planetary carrier splines with flukes of discs. Install rear planetary gear. Install No. 2 one-way clutch in transaxle case with shiny side upward. Install one-way clutch on inner race while turning planetary gear clockwise.
 8. Coat thrust washer with petroleum jelly and install on planetary gear. Check No. 2 one-way clutch operation by turning planetary gear. Gear should rotate freely in clockwise direction and lock in counterclockwise direction. Install snap ring. Ensure snap ring end is not aligned with cutout of transaxle case.
 9. Install 2nd coast brake band guide with tip contacting transaxle case. Install 2nd brake flange with flat side facing upward. Install discs and plates in the following order: install disc, plate, disc, plate, disc, plate.
 10. Install piston return spring assembly with springs over protrusions in transaxle case. Align groove of 2nd brake drum with guide. Install drum in transaxle case. Install snap ring. Using 2 hammers, compress piston return springs with handles. Install snap ring into groove. Ensure end gap of ring is not aligned with cutout in transaxle case.
 11. Install 2nd brake drum gasket until gasket makes contact with 2nd brake drum. See **Fig. 9**. Apply compressed air to center oil passage (next to manual valve lever shaft) and ensure piston movement. Align flukes of 2nd brake discs. Install hub on 2nd brake discs. Check distance between surfaces of 2nd brake hub and rear planetary gear. Distance should be about .20" (5.0 mm).
 12. Install sun gear and input drum on No. 1 one-way clutch while turning sun gear clockwise. Ensure thrust washer is on sun gear input drum. Coat bearings and races "D" and "C" with petroleum jelly and install on ring gear and front planetary gear. See **Fig. 42**. Install planetary gear on ring gear. Install front planetary gear assembly on sun gear.
 13. If planetary gear is correctly installed, ring gear flange bushing will be flush with or below intermediate

shaft shoulder. Coat race with petroleum jelly and install on ring gear flange. Install intermediate shaft oil seal ring.

14. Install 2nd coast brake band in transaxle case. Install pin through oil pump mounting bolt hole. Coat bearings and races "A" and "B" with petroleum jelly and install on both sides of forward clutch drum. See **Fig. 42** . Coat clutch drum thrust washer with petroleum jelly and install with oil groove facing upward on direct clutch drum. Align flukes of direct clutch discs.
15. Mesh hub with direct clutch flukes while turning clutch drum or forward clutch. If disc flukes are meshed with hub correctly, end of direct clutch drum bushing will be flush with surface of forward clutch. Place direct clutch and forward clutch into transaxle case. Rotate forward clutch to mesh front planetary ring gear and discs. Assembly is fully seated when distance is about .118" (3.00 mm) between direct clutch drum and sun gear input drum (shell).
16. Coat race "A" with petroleum jelly and install on stator shaft. See **Fig. 42** . Install "O" ring on oil pump. Install oil pump into transaxle case. Hold input shaft and lightly press oil pump body to slide oil seal rings on stator shaft through direct clutch drum. Install and tighten bolts to 16 ft. lbs. (22 N.m).

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

17. Measure input shaft end play. End play should be .012-.035" (.30-.90 mm). If end play is not as specified, replace oil pump race. Oil pump races are available in thicknesses of .031" (.80 mm) and .055" (1.40 mm). Ensure input shaft rotates smoothly. Install "O" rings on brake piston cover. Install outer 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.
18. Measure 2nd coast brake piston stroke by applying compressed air to oil passage in transaxle case. See **Fig. 40** . Piston stroke should be .059-.118" (1.50-3.00 mm). If piston stroke is not within specification, replace piston rod. Piston rods are available in lengths of 2.811" (71.40 mm) and 2.870" (72.90 mm). Recheck piston travel after changing piston rod. If travel still exceeds specification, replace 2nd coast brake band.
19. Apply compressed air to oil passage and check piston rod movement. See **Fig. 40** . Coat accumulator piston "O" rings with ATF. Install "O" rings on accumulator pistons. Check accumulator spring free length. See **ACCUMULATOR SPRING SPECIFICATIONS** . Replace as necessary. Install pistons and springs in appropriate locations. See **Fig. 41** . Install accumulator cover and gasket. Tighten bolts to 89 INCH lbs. (10 N.m).
20. Install 2nd brake apply gasket and governor oil strainer. Install throttle cable into transaxle case. Use care not to damage "O" ring. Ensure cable is fully seated in transaxle case. Install control valve assembly. Ensure proper length bolt is used in proper location. See **VALVE BODY ASSEMBLY** under REMOVAL & INSTALLATION. Tighten bolts to 89 INCH lbs. (10 N.m).
21. Align manual valve with pin on manual shift lever. Install manual valve body. Tighten bolts to 89 INCH lbs. (10 N.m). Install detent spring on manual valve body. Tighten bolts to 89 INCH lbs. (10 N.m). Ensure manual valve lever is touching center of detent spring tip roller.
22. Install oil tubes. DO NOT bend or damage tubes. Install oil tube bracket. Tighten bolts to 89 INCH lbs. (10 N.m). Install oil strainer (filter). Tighten bolts to 89 INCH lbs. (10 N.m). Install magnets into oil pan. Ensure magnets do not interfere with oil tubes. Install oil pan with NEW gasket. Tighten bolts to 43 INCH lbs. (4.9 N.m).
23. Install governor body adapter, governor body with plate washer and thrust washer onto governor body.

Install cover and "O" ring. Install cover bracket with 2 bolts. Tighten bolts to 115 INCH lbs. (13 N.m). Install throttle cable retaining plate. Install filler tube and dipstick. Install seal and park/neutral position switch. Tighten and secure with lock plate. Tighten nut to 61 INCH lbs. (6.9 N.m).

24. Adjust park/neutral position switch and tighten adjusting bolts to 48 INCH lbs. (5.4 N.m). Install manual shift lever. Tighten nut to 115 INCH lbs. (13 N.m). Install oil cooler pipes and unions. Tighten unions to 20 ft. lbs. (27 N.m).
25. Install torque converter on transaxle. Using a straightedge and calipers, measure torque converter installed depth. Distance should be .528" (13.40 mm) for Corolla or .906" (23.00 mm) for Prizm. See **Fig. 43**.

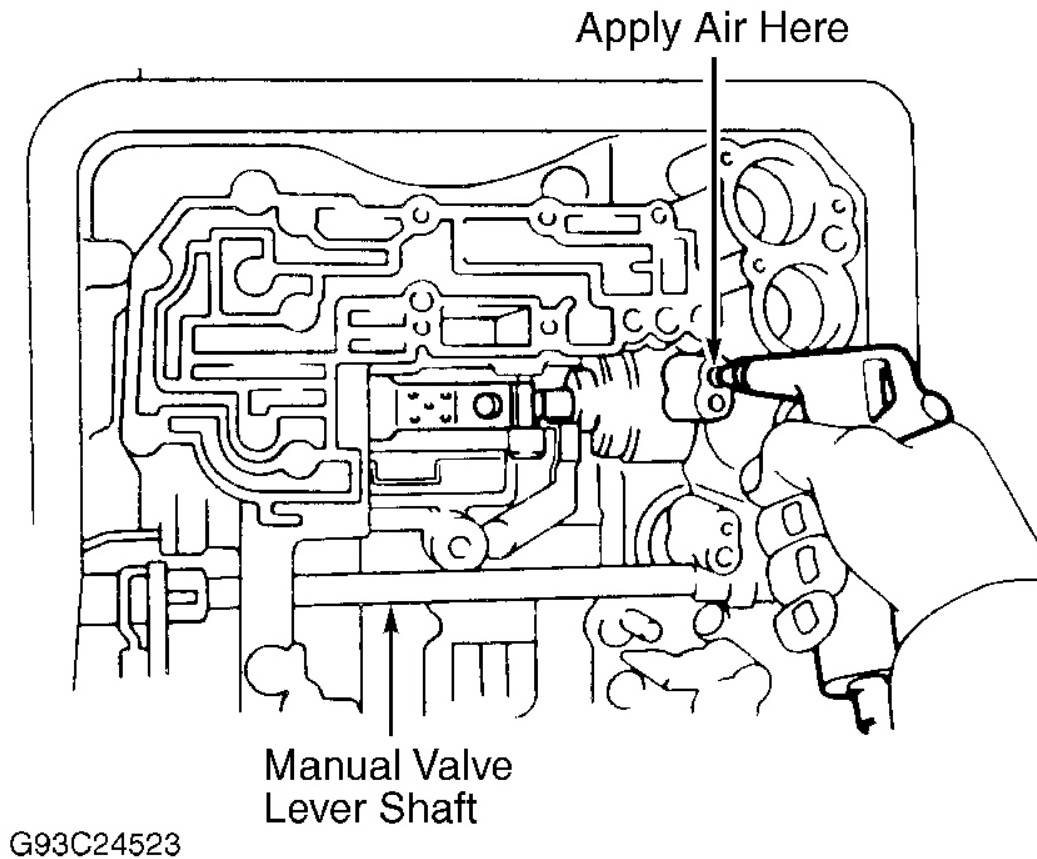


Fig. 40: Checking 2nd Coast Brake Band
Courtesy of TOYOTA MOTOR SALES, U.S.A. INC.

ACCUMULATOR SPRING SPECIFICATIONS

ACCUMULATOR SPRING SPECIFICATIONS (COROLLA - WITH AW A-131L)

Application	Color	Length - In. (mm)
Forward Clutch		
Inner	Brown	1.523 (38.68)

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

Outer	Yellow/Green	2.074 (52.68)
Direct Clutch	Blue/Red	2.935 (74.54)
2nd Brake		
No. 1	Yellow	1.385 (35.18)
No. 2	Yellow	2.231 (56.68)

ACCUMULATOR SPRING SPECIFICATIONS (PRIZM - WITH AW A-131L)

Application	Color	Length - In. (mm)
Forward Clutch		
Inner	Red	1.890 (48.00)
Outer	Yellow/Green	3.193 (81.10)
Direct Clutch	Blue	2.935 (74.54)
2nd Brake		
No. 1	Yellow	1.385 (35.18)
No. 2	Yellow	2.231 (56.68)

ACCUMULATOR SPRING SPECIFICATIONS (COROLLA - WITH TOYOTA A-131L)

Application	Color	Length - In. (mm)
Forward Clutch		
Inner	Brown	1.523 (38.68)
Outer	Yellow/Green	2.074 (52.68)
Direct Clutch	Yellow/Red	3.101 (78.76)
2nd Brake	Green/Red	2.482 (63.05)

ACCUMULATOR SPRING SPECIFICATIONS (PRIZM - WITH TOYOTA A-131L)

Application	Color	Length - In. (mm)
Forward Clutch		
Inner	Red	1.890 (48.00)
Outer	Yellow	3.193 (81.10)
Direct Clutch	Yellow	2.842 (72.18)
2nd Brake	Purple	2.625 (66.68)

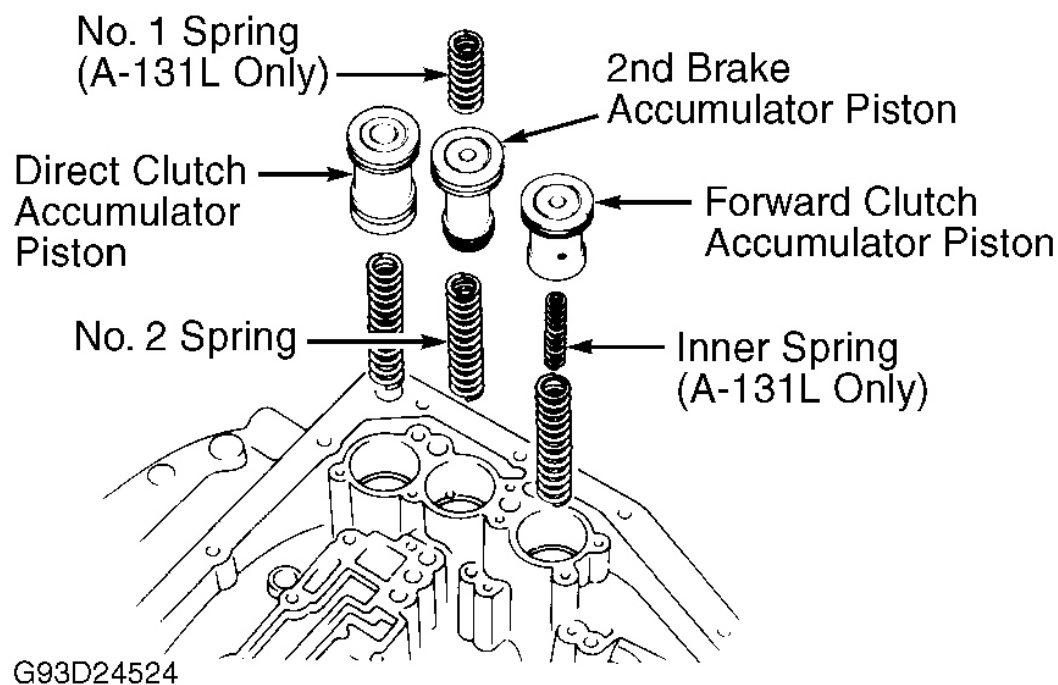
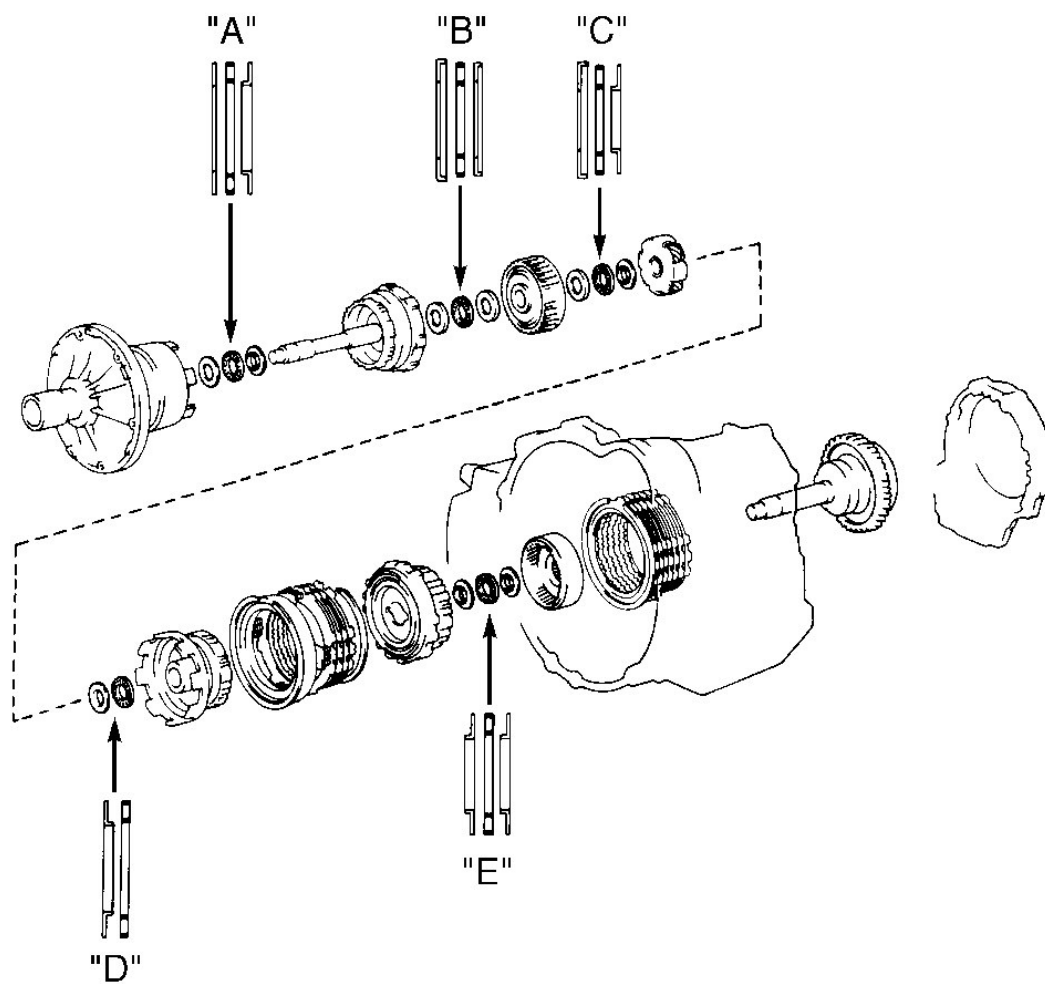


Fig. 41: Identifying Accumulator Piston & Spring Locations
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G93E24525

Fig. 42: Identifying Thrust Bearing & Race Locations
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

BEARING RACE & THRUST BEARING SPECIFICATIONS

Identification ⁽¹⁾	Outer Diameter - In. (mm)
Front Bearing Race	
A	1.693 (43.00)
B & C	1.492 (37.90)
D	1.772 (45.00)
E	1.469 (37.30)
Thrust Bearing	
A	1.654 (42.00)
B & C	1.421 (36.10)

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

D	1.772 (45.00)
E	1.480 (37.60)
Rear Bearing Race	
A	1.654 (42.00)
B	1.406 (35.70)
C	1.378 (35.00)
D	N/A
E	1.480 (37.60)
(1) For bearing race and thrust bearing locations, refer to illustration. See Fig. 42 .	

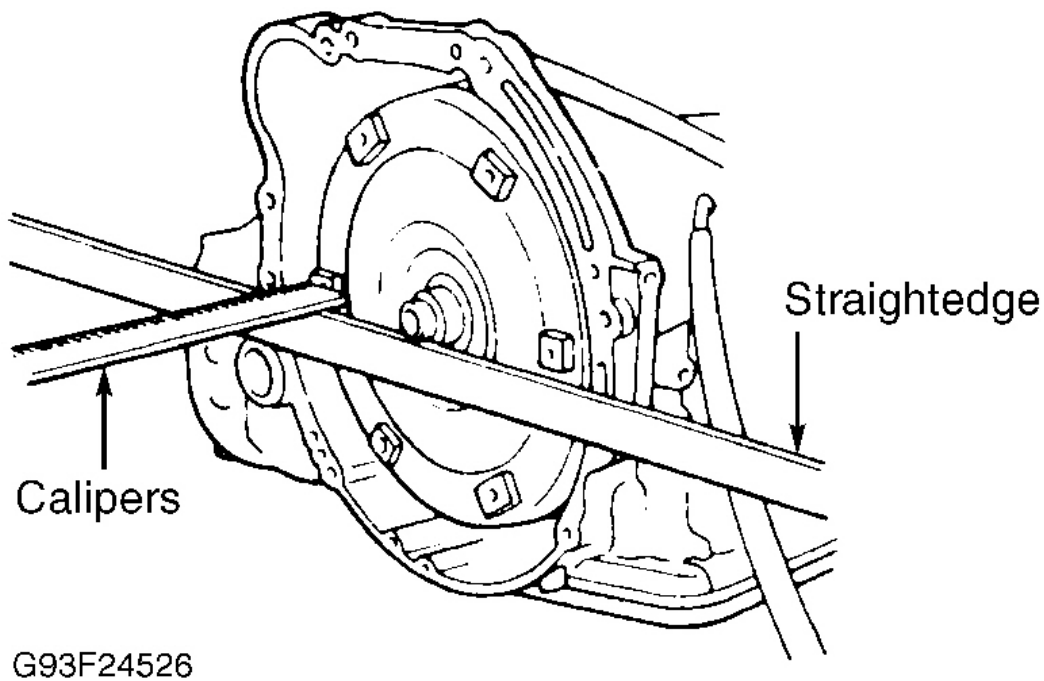


Fig. 43: Measuring Torque Converter Depth
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bearing Retainer Bolt	14 (19)
Converter-To-Drive Plate Bolt	
Corolla	18 (25)

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

Prizm	14 (19)
Counter-Driven Gear Lock Nut	
Standard	127 (172)
Maximum	213 (289)
Drive Plate Mounting Bolt	
Corolla	47 (64)
Prizm	61 (83)
Oil Cooler Union Nut	20 (27)
Oil Pan Drain Plug	
Corolla	36 (49)
Prizm	17 (23)
Oil Pump Mounting Bolt	16 (22)
Ring Gear Bolt	72 (97)
Side Bearing Cap Bolt	36 (49)
Transaxle-To-Engine Bolt	
10-mm	34 (46)
12-mm	47 (64)
Transaxle Rear Cover Bolt	18 (25)
INCH Lbs. (N.m)	
Accumulator Cover Bolt	89 (10)
Detent Spring Bolt	89 (10)
Governor Bracket Bolt	115 (13)
Manual Shift Lever Nut	115 (13)
Manual Valve Body Bolt	89 (10)
Oil Pan Bolt	43 (4.9)
Oil Pump Stator Shaft Bolt	89 (10)
Oil Strainer Bolt	89 (10)
Oil Tube Bracket	89 (10)
Park/Neutral Position Switch	
Adjusting Bolt	48 (5.4)
Retaining Nut	61 (6.9)
Parking Lock Pawl Bracket Bolt	65 (7.4)
Upper Valve Body-To-Lower Valve Body Bolt	48 (5.4)
Valve Body Assembly-To-Transaxle Bolt	89 (10)

CLUTCH DISC & PLATE SPECIFICATIONS

CLUTCH DISC & PLATE QUANTITY

Component	Disc	Plate
Direct Clutch	2	3
Forward Clutch	3	3

2000 Chevrolet Prizm

2000 AUTOMATIC TRANSMISSIONS Toyota A-131L Overhaul

1st & Reverse Brake

Aisin-Warner	6	6
Toyota	6	5
2nd Brake	3	3

TRANSAXLE SPECIFICATIONS**TRANSAXLE SPECIFICATIONS**

Application	In. (mm)
Bushing Inside Diameter (Maximum)	
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	
Standard	.867-.868 (22.03-22.05)
Maximum	.870 (22.10)
Converter Sleeve Runout	.012 (.30)
Drive Plate Runout	.008 (.20)
Input Shaft End Play	.012-.035 (.30-.90)
Intermediate Shaft End Play	.019-.059 (.49-1.51)
Intermediate Shaft Length	4.560 (115.82)
Piston Stroke	
Direct Clutch	.054-.067 (1.37-1.70)
Forward Clutch	.044-.058 (1.11-1.47)
2nd Coast Brake	.059-.118 (1.50-3.00)
Planetary Pinion Gear Clearance	.008-.020 (.20-.50)
Side Gear Backlash	.002-.008 (.05-.20)
Torque Converter Depth	
Corolla	.528 (13.40)
Prizm	.906 (23.00)