1991-94 AUTOMATIC TRANSMISSIONS

Nissan RL4F03A Overhaul

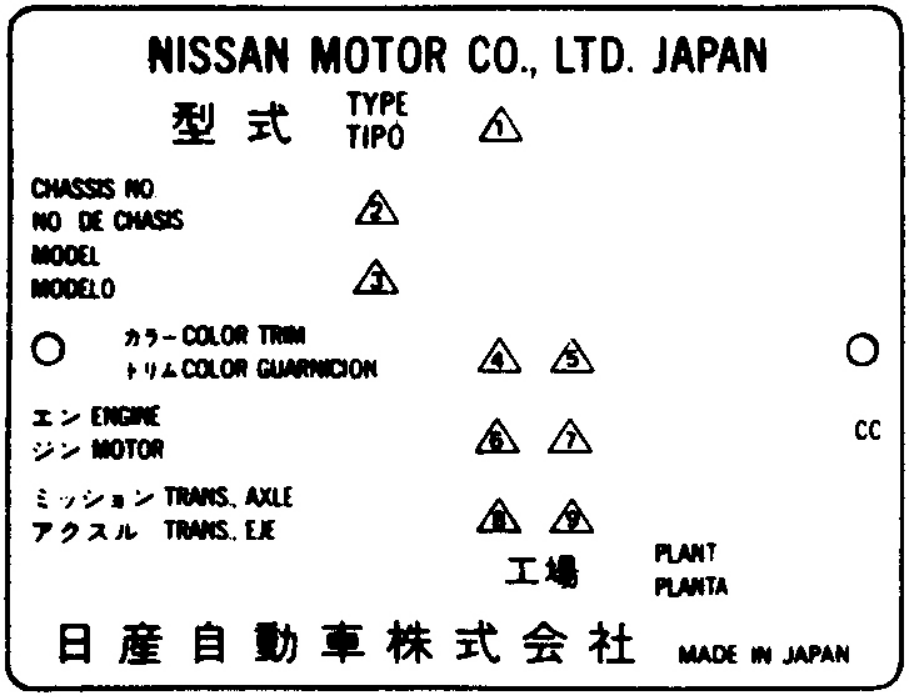
APPLICATION

TRANSAXLE APPLICATIONS

Vehicle Model	Transaxle Model
Infiniti (1991-93)	
G20 (To VIN No. 450021)	RL4F03A/V
Nissan (1991-94)	
NX XE	RL4F03A
NX SE	RL4F03V
Sentra GXE, SE & XE	RL4F03A
Sentra SE-R	RL4F03V

IDENTIFICATION

Transaxle model is located on vehicle identification plate in engine compartment area, on firewall. See **Fig. 1** . Transaxle number is located on transaxle governor cap. See **Fig. 2** .



1. Type
2. Vehicle Identification Number (Chassis Number)
3. Model
4. Body Color Code
5. Trim Color Code
6. Engine Model
7. Engine Displacement
8. Transaxle Model
9. Axle Model

93E22362

Fig. 1: Vehicle Identification Plate Information
Courtesy of NISSAN MOTOR CO., U.S.A.

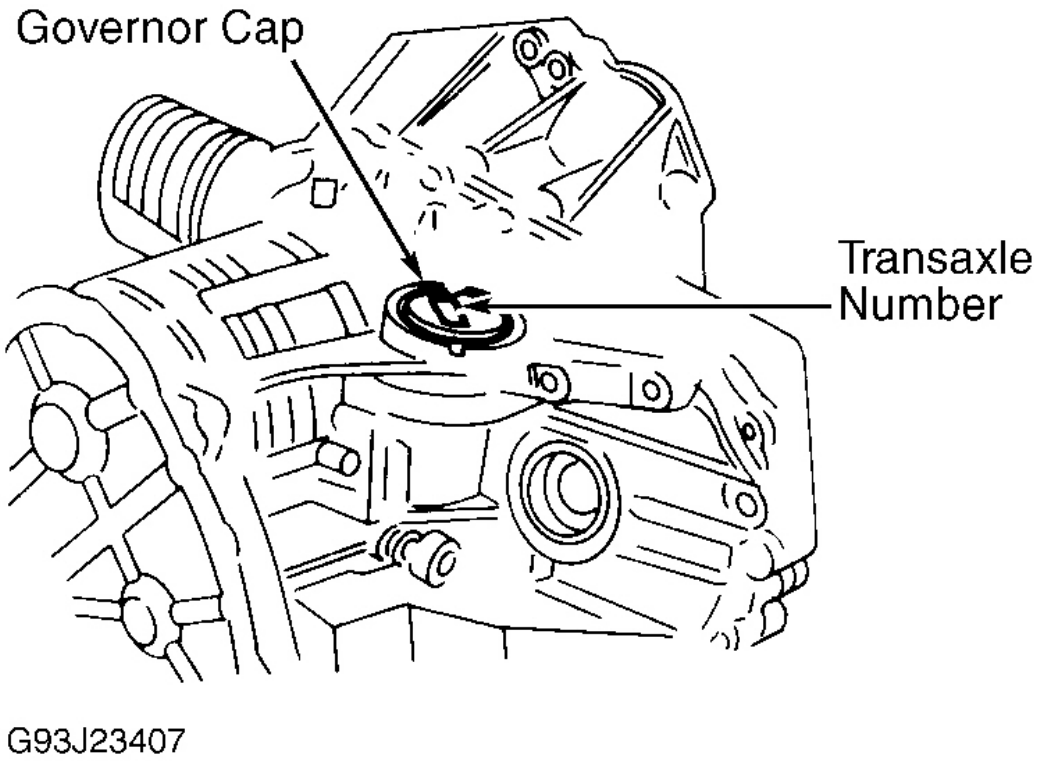
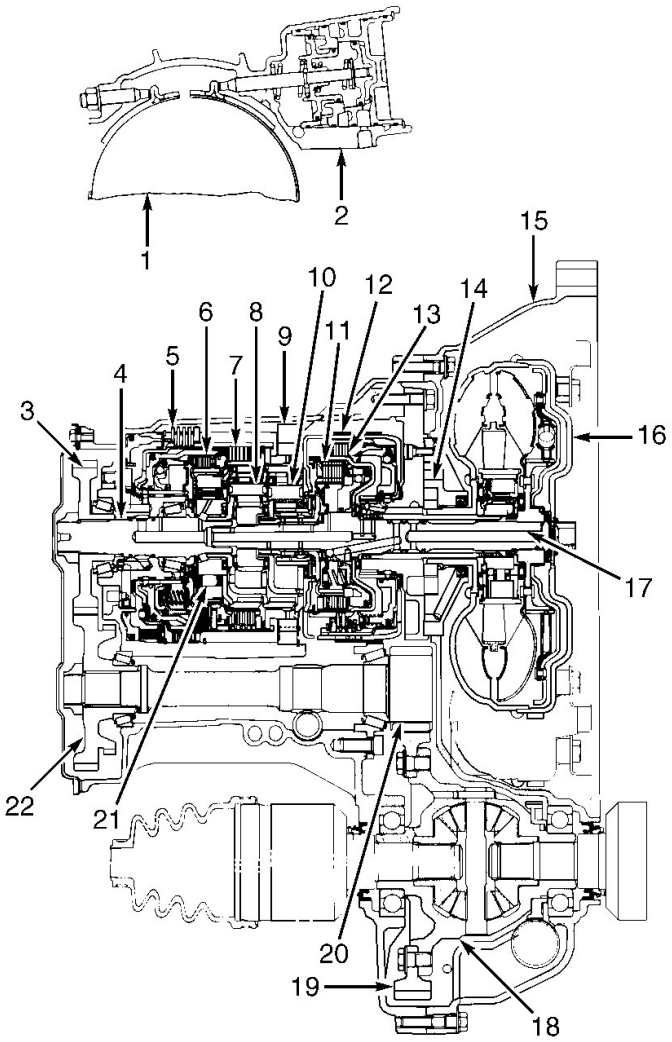


Fig. 2: Locating Automatic Transaxle Number
Courtesy of NISSAN MOTOR CO., U.S.A.

DESCRIPTION & OPERATION

Transaxle consists of 3 main components: automatic transaxle, torque converter and differential assembly. Automatic transaxle consists of forward clutch, high clutch, low-reverse brake, overrun clutch, reverse clutch and brake band servo. See **Fig. 3** .



1. Reverse Clutch Drum
2. Band Servo Piston
3. Output Gear
4. Output Shaft
5. Low-Reverse Brake
6. Overrun Clutch
7. Forward Clutch
8. Rear Planetary Gear
9. Low One-Way Clutch
10. Front Planetary Gear
11. High Clutch
12. Brake Band
13. Reverse Clutch
14. Oil Pump
15. Converter Housing
16. Torque Converter
17. Input Shaft
18. Differential Assembly
19. Ring Gear
20. Reduction Gear
21. Forward One-Way Clutch
22. Idler Gear

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Fig. 3: Identifying Transaxle Component Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

LUBRICATION & ADJUSTMENTS

See the appropriate TRANSMISSION SERVICING - A/T article in the AUTOMATIC TRANS SERVICING section. Refer to the following menu:

ON-VEHICLE SERVICE

CONTROL VALVE ASSEMBLY

Removal & Installation

1. Remove drain plug. Drain fluid. Remove oil pan and gasket. Remove oil strainer. Remove control valve assembly by removing bolts and disconnecting wiring harness connector. See **Fig. 4** . Refer to the **CONTROL VALVE ASSEMBLY BOLT IDENTIFICATION** table. Remove accumulators by applying compressed air (if necessary).

CONTROL VALVE ASSEMBLY BOLT IDENTIFICATION (1)

Letter ID	In. (mm)
A	.984 (25)
B	1.299 (33)
C	1.575 (40)
D	1.713 (43.5)
(1) See **Fig. 4** for bolt locations.	

2. To install control valve assembly, set manual valve in Neutral position and align with manual plate. Install control valve assembly and tighten bolts to 62-80 INCH lbs. (7-9 N.m). To complete installation, reverse removal procedure. Fill transaxle to appropriate fluid level.

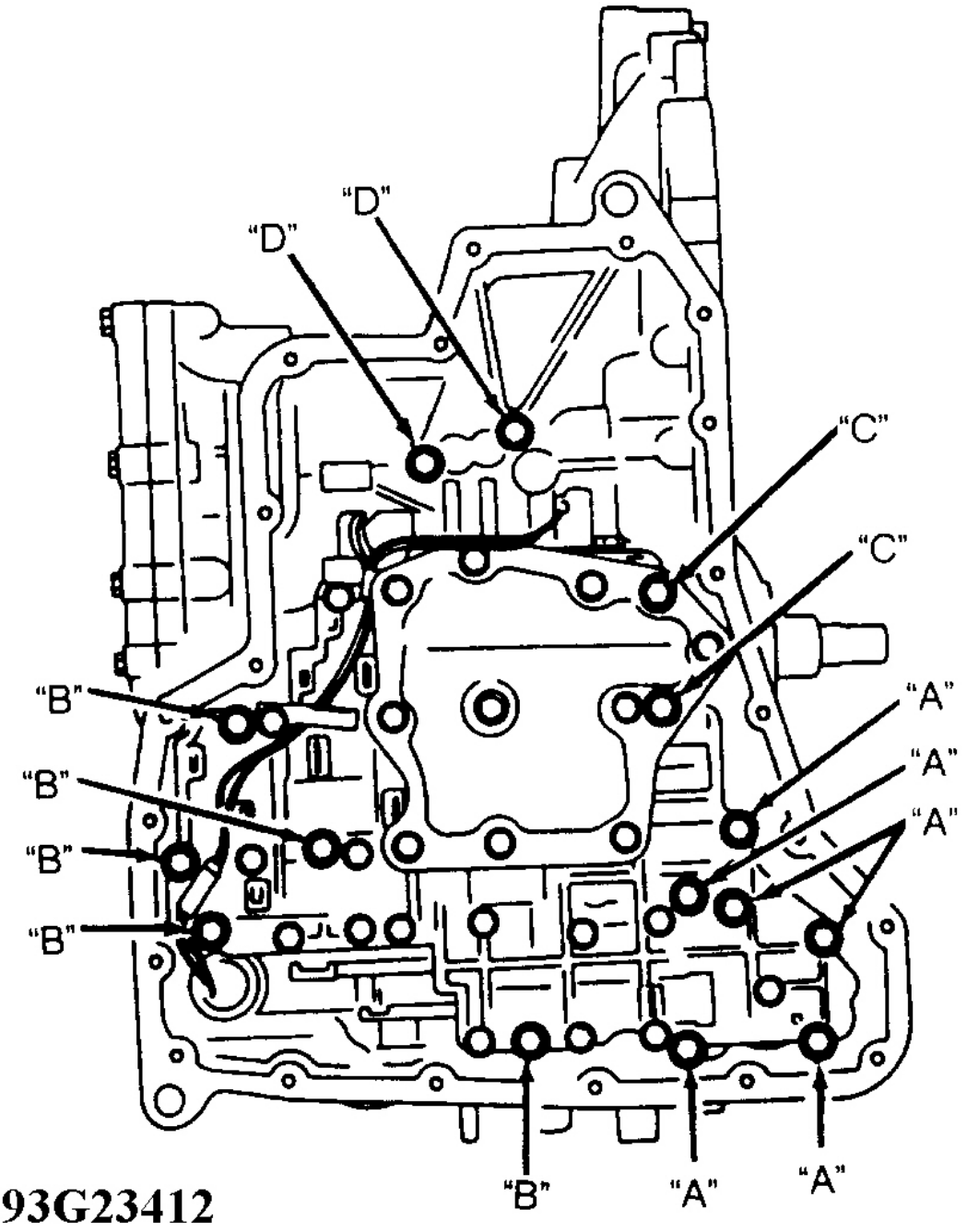


Fig. 4: Identifying Control Valve Assembly Bolt Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

GOVERNOR VALVE ASSEMBLY

Removal & Installation

Remove air duct. Remove governor cap snap ring and spacer. Remove governor cap and governor assembly from transaxle. To install, reverse removal procedure.

INHIBITOR SWITCH ADJUSTMENT

See the appropriate TRANSMISSION REMOVAL & INSTALLATION - A/T article in the AUTOMATIC TRANS SERVICING section. Refer to the following menu:

OIL COOLER FLUSHING PROCEDURE

Vehicles with tube type transaxle fluid cooler may be cleaned using cleaning solvent and compressed air. Cooler lines must also be flushed to remove any foreign material. Vehicles with fin type transaxle fluid cooler cannot be cleaned. Replace radiator (radiator incorporates transaxle cooler) and flush cooler lines to remove any foreign material.

TROUBLE SHOOTING

NOTE: Always check fluid level and linkage. Fluid level should be checked using HOT range on dipstick with fluid temperatures of 122-176°F (50-80°C) after vehicle has been driven approximately 5 minutes after initial warm-up. Use caution not to overfill.

SYMPTOM DIAGNOSIS

Engine Will Not Start In "P" Or "N"

Inhibitor switch or control cable misadjusted, damaged ignition switch or starter.

Engine Starts In Position Other Than "P' Or "N"

Inhibitor switch or control cable misadjusted.

Excessive Shock From "N" To "D"

Incorrect fluid level, line pressure, engine idle RPM, control cable or throttle cable adjustment. Damaged N-D accumulator, oil pump, reverse clutch or control valve.

Excessive Shock During 1-2 Or 2-3 Upshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, 3-R accumulator, brake band or control valve.

Excessive Shock During 3-4 Upshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, overrun

clutch, brake band or control valve.

Excessive Shock During D-2 & D-1 Downshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged high clutch, overrun clutch, brake band or control valve. See the **CLUTCH & BAND APPLICATION** table.

Excessive Shock During 2-1 Downshift In "1" Position

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, low-reverse brake or control valve.

Excessive Shock When OD Switch Is Set From ON To OFF

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged high clutch, overrun clutch, brake band or control valve.

Slips During 1-2 Upshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, brake band or control valve.

Slips During 2-3 Upshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, brake band, high clutch, 3-R accumulator or control valve.

Slips During 3-4 Upshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged oil pump, brake band, high clutch, or control valve.

Slips On Acceleration During 4-1 Or 3-1 Downshift

Incorrect fluid level, governor pressure, line pressure, control cable or throttle cable adjustment. Damaged governor valve, oil pump, high clutch, forward one-way clutch, brake band or control valve.

Slips On Acceleration During 4-2 Downshift

Incorrect transaxle fluid level, governor pressure, line pressure, control cable or throttle cable adjustment. Damaged governor valve, torque converter, oil pump, reverse clutch, high clutch, forward clutch, forward one-way clutch, overrun clutch, low one-way clutch, low-reverse brake, brake band or control valve. Refer to the **CLUTCH & BAND APPLICATION** table.

Slips On Acceleration During 4-3 Downshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged 3-R accumulator, oil pump, high clutch, overrun clutch, low-reverse brake, brake band or control valve.

Poor Acceleration

Incorrect fluid level, governor pressure, line pressure, control cable or throttle cable adjustment. Damaged governor valve, N-D accumulator, oil pump, high clutch, forward clutch or control valve.

Poor Acceleration During Upshift

Incorrect fluid level, governor pressure, line pressure, control cable or throttle cable adjustment. Damaged governor valve, oil pump, forward clutch or control valve.

No Engine Braking During D-2 Or D-1 Downshift

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged overrun clutch or control valve.

No Engine Braking During 2-1 Downshift In "1" Position

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged overrun clutch, low-reverse brake or control valve.

No Engine Braking When OD Switch Is Set From ON To OFF

Incorrect fluid level, line pressure, control cable or throttle cable adjustment. Damaged OD cancel solenoid, OD control switch and wiring or overrun clutch.

Shift Points To Low Or High

Incorrect fluid level, governor pressure, line pressure, or throttle cable adjustment, or damaged governor valve.

No 4-2 Or 3-2 Kickdown On Acceleration

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

No 1-2 Upshift In "D" & "2" Positions

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

No 3-4 Upshift In "D" Position

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve, OD cancel solenoid, OD control switch and wiring or control valve.

Transaxle Does Not Start From "1" In "D" & "2" Positions

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

Shifts From 3rd To 1st (Skips 2nd)

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

Shifts To "2" In "1" Position

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

Lock-Up Point Is Extremely High Or Low

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve or control valve.

Torque Converter Does Not Lock Up

Incorrect fluid level, governor pressure, line pressure or throttle cable adjustment. Damaged governor valve, lock-up cancel solenoid, torque converter or control valve.

Lock-Up Is Not Released On Deceleration

Incorrect fluid level, damaged lock-up cancel solenoid, torque converter or control valve.

Vehicle Moves In "P" Position

Misadjusted control cable or damaged parking components.

CLUTCH & BAND APPLICATION

Selector Lever Position	Elements In Use
"D" (Drive) (1)	
First Gear	Forward Clutch, (2) Forward One-Way Clutch, (3) (4) Overrun Clutch & (2) Low One-Way Clutch
Second Gear	Band Servo (2nd Apply), Forward Clutch, (2) Forward One-Way Clutch & (3) , (4) Overrun Clutch
Third Gear	Band Servo ((5) 2nd Apply & 3rd Release), Forward Clutch, (2) Forward One-Way Clutch, High Clutch & (3) , (4) Overrun Clutch
Fourth Gear	Band Servo ((6) 2nd & 4th Apply, 3rd Release), Forward Clutch, High Clutch & Lock-up
"2" (Intermediate)	

First Gear	Forward Clutch, (2) Forward One-Way Clutch (2) Low One-Way Clutch & Overrun Clutch
Second Gear	Band Servo (2nd Apply), Forward Clutch, (2) Forward One-Way Clutch & Overrun Clutch
"1" (Low)	
First Gear	Forward Clutch, (2) Forward One-Way Clutch Low-Reverse Brake, Overrun Clutch
Second Gear	Band Servo (2nd Apply), Forward Clutch (2) Forward One-Way Clutch & Overrun Clutch
"R" (Reverse)	Low-Reverse Brake & Reverse Clutch
"N" Or "P" (Neutral Or Park)	All Clutches & Bands Released Or Ineffective

(1) Transaxle will not shift to 4th gear when overdrive switch is in OFF position.

(2) Operates during progressive acceleration.

(3) Operates when overdrive switch is in OFF position.

(4) Operates when throttle opening is less than 1/16.

(5) Oil pressure is applied to both 2nd apply and 3rd release side of band servo piston. Brake band does not contract because oil pressure area on release side is greater than apply side.

(6) Oil pressure is applied to 4th apply side in 3rd gear, and brake band contracts.

TESTING

ROAD TEST

Preliminary Checks

1. Check fluid level using HOT range on dipstick with fluid temperatures of 122-176°F (50-80°C) after vehicle has been driven approximately 5 minutes after initial warm-up. COLD range on dipstick is for reference only.
2. Fluid level should be checked with vehicle on level surface and parking brake applied. Check fluid level while engine is idling and selector lever is in "P" position.
3. If fluid level is at low side of either range, add fluid. Check fluid condition. Check for fluid leakage. Examine fluid color, texture and odor. If fluid is Black and has a burnt odor, clutch friction plates are worn.
4. If fluid is milky Pink in color, fluid is water-contaminated. Water may be entering transaxle through filler tube or breather. If fluid is Light or Dark Brown in color and tacky, fluid level is incorrect or transaxle is overheating.

Check With Engine Idling

1. Start engine and let idle. Release parking brake. Apply foot brake, move selector lever to "R" position. Vehicle should creep backwards after foot brake is released.
2. Move selector lever to "D", "2" and "1" positions. Vehicle should creep forward in all three positions. Move selector lever to "N" position. Vehicle should not creep forward or backward.

Road Test Procedure

1. Place selector lever in "P" position, and start engine. Turn engine off and repeat procedure in all positions, including "N" position. Ensure engine starts in "P" and "N" positions only. In "P" position, transaxle parking mechanism should be locked and vehicle should not move. Release parking brake to ensure parking mechanism remains locked.
2. Start engine, move selector lever from "P" to "R" position, and note shift quality. Drive vehicle in reverse long enough to detect slippage or other abnormalities. Stop vehicle and move selector lever into "P" position.
3. Move selector lever from "R" and "D" positions to "N" position and note shift quality. With parking brake released and selector lever in "N" position, lightly depress accelerator to ensure vehicle does not move.
4. Move the selector lever from "N" to "D" position, and note the shift quality. Road test the vehicle while noting the upshift/downshift speeds. Upshift/downshift speeds should be close to the speeds shown in the SHIFT SPEED CHART. See **Fig. 5** . Also, refer to the **SHIFT SPEED SPECIFICATIONS** table.
5. Shift speeds should be checked at light, half and full throttle positions. Note when shift shock occurs during shifting. Determine if lock-up occurs while driving vehicle in appropriate gear position and at correct speed. See the **LOCK-UP SPEED SPECIFICATIONS** table. Ensure transaxle does not shift to overdrive with OD switch in OFF position.
6. When vehicle is being driven 37-43 MPH ("D" position) at half to light throttle position, fully depress accelerator pedal to ensure transaxle downshifts from 3rd to 2nd gear. When vehicle is being driven 16-22 MPH ("D2" position) at half to light throttle position, fully depress accelerator pedal to ensure transaxle downshifts from 2nd to 1st gear.
7. Shift vehicle to "2" position and ensure vehicle starts in 1st gear. As vehicle speed is increased, ensure transaxle upshifts from 1st to 2nd gear. Further increase vehicle speed. Ensure transaxle does not upshift to 3rd gear.
8. While driving vehicle 16-22 MPH with throttle at half to light position ("2" position), fully depress accelerator pedal to ensure transaxle downshifts from 2nd to 1st gear. Decelerate vehicle and ensure 2-1 downshift. Shift to "D" position and drive vehicle at 19-25 MPH. Shift into "2" position. Ensure 3-2 downshift occurs.
9. Shift vehicle to "1" position. Transaxle should not upshift from 1st to 2nd as vehicle speed increases. Accelerate and decelerate vehicle to determine engine braking. Ensure engine compression acts as a brake. Drive vehicle in "2" position at 9-16 MPH. Ensure 2-1 downshift occurs when selector lever is moved to "1" position.

LOCK-UP SPEED SPECIFICATIONS (1)

Application	MPH
Lock-Up ON in 4th Gear	41-66
Lock-Up OFF in 4th Gear	39-43

(1) With 1/4 throttle opening.

SHIFT SPEED SPECIFICATIONS

Application	Full Throttle MPH	Half Throttle MPH
1st-2nd	32-37	17-22
2nd-3rd	60-65	31-36
3rd-4th	N/A	60-65
4th-3rd	93-98	39-43
3rd-2nd	55-60	25-30
2nd-1st	24-29	5-10

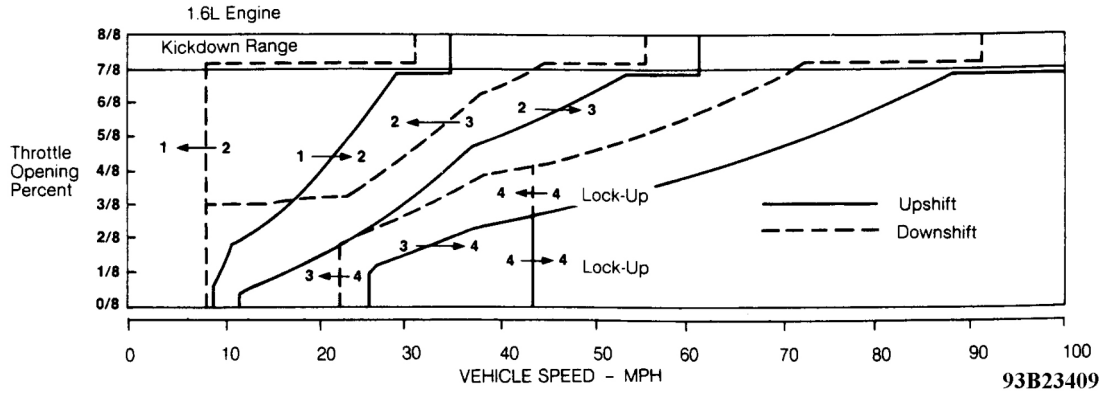


Fig. 5: Shift Speed Chart
Courtesy of NISSAN MOTOR CO., U.S.A.

STALL SPEED TEST

Stall Speed Test Procedure

1. Check engine and transaxle fluid levels. Ensure engine and transaxle are at normal operating temperatures. Set parking brake and block wheels.
2. Install tachometer so it is visible to driver. Start engine, apply foot brake and move selector lever to "D" position. Gradually depress accelerator pedal to wide-open throttle position while applying foot brake. Note engine stall speed and release accelerator pedal immediately. Stall speed should be 2450-2750 RPM.
3. Place selector lever in "N" position and run engine at idle for one minute to allow transaxle to cool. Repeat stall speed test procedure in "2", "1" and "R" positions, allowing transaxle to cool between each test.

CAUTION: DO NOT hold wide-open throttle for more than 5 seconds during test.

STALL SPEED TEST RESULTS

Stall Speed Low In All Positions

Insufficient engine performance or faulty torque converter one-way clutch.

Stall Speed High In All Positions

Low and reverse brake slipping, faulty low one-way clutch or hydraulic circuit for line pressure control.

Stall Speed High In "R" Position Only

Reverse clutch slipping or low and reverse brake slipping.

Stall Speed High In "D", "2" & "R", Okay In "1"

Defective reverse clutch, forward clutch, forward one-way

clutch or low one-way clutch.

Stall Speed High In "D", "2" & "1", Okay In "R"

Defective forward clutch, overrun clutch or forward one-way

clutch.

Stall Speed High In "D" & "2", Okay In "1" & "R"

Defective forward clutch, low one-way clutch and overrun

clutch.

NOTE: Condition of high clutch and brake band cannot be confirmed by stall speed test.

HYDRAULIC PRESSURE TESTS

Line Pressure Test Procedure

1. Warm engine and transaxle to normal operating temperature. Check engine and transaxle fluid levels and add fluid as necessary. Install pressure gauge to line pressure port. See **Fig. 6** .
2. Set the parking brake and block the wheels. Apply foot brake fully while line pressure test at stall speed is performed. Start engine and measure line pressure at idle and stall speed in "D", "2", "1" and "R" positions. When measuring line pressure at stall speed, follow stall speed test procedure. Note pressure readings and refer to the **LINE PRESSURE SPECIFICATIONS** table.

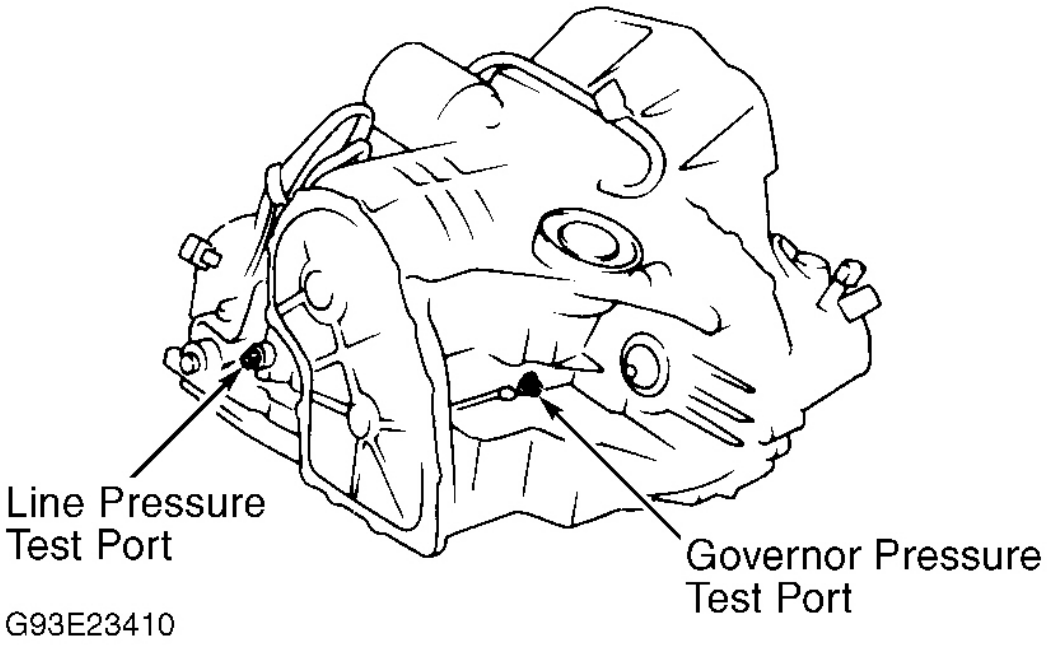


Fig. 6: Identifying Hydraulic Pressure Test Ports
Courtesy of NISSAN MOTOR CO., U.S.A.

LINE PRESSURE SPECIFICATIONS

Application	psi (kPa)
At Idle	
In "D"	78 (539)
In "2" & "1"	112 (775)
In "R"	128 (883)
At Stall Speed	
In "D", "2" & "1"	156 (1079)
In "R"	256 (1765)

Line Pressure Test Results

1. If line pressure is low at idle in all positions, possible causes are: oil pump wear; oil leakage at or around oil pump, control valve, transaxle case or governor; sticking pressure regulator or modifier valve.
2. If line pressure is low at idle in a particular position, check for oil leaks at or around low and reverse brake circuit, causing line pressure to be low in "R" position, but normal in "D", "2" or "1" position. If line pressure is high at idle, pressure regulator valve may be sticking.

Governor Pressure Test Procedure

1. Warm engine and transaxle to normal operating temperature. Check engine and transaxle fluid levels and add fluid as necessary. Install pressure gauge to governor pressure port. See **Fig. 6** . Set parking brake and block rear wheels. Raise and support front wheels.
2. Start engine, apply foot brake and move selector lever to "D" position. Release foot brake and accelerate engine. Note pressure gauge reading. Governor pressure should not be generated when front wheels are not rotating. Governor pressure should gradually rise as vehicle speed increases. If pressure does not increase with vehicle speed, check governor valve condition.

ELECTRICAL COMPONENT TESTING

SHIFT LOCK SYSTEM TESTING

Detention Switch

1. Disconnect 9-pin shift lock harness connector, located below shift lever housing. Check for continuity between shift lock harness connector, terminal No. 5 (Blue/Black wire) and terminal No. 6 (Black wire).
2. When selector lever is in Park and selector lever button is released, continuity should not exist. Continuity should exist for all other conditions. If continuity is not as specified, replace detention switch (located at base of shift lever).

Shift Lock Solenoid

Disconnect 9-pin shift lock harness connector, located below shift lever housing. Connect fused jumper wire from battery positive terminal to terminal No. 8 (Blue/Green wire) at shift lock harness connector. Connect jumper wire from battery negative terminal to terminal No. 9 (Black wire) at shift lock harness connector. Shift lock solenoid should operate. Replace solenoid if necessary.

Shift Lock Control Module

1. Check voltage at specified terminals of 8-pin shift lock control module connector, located to right of hood release handle. If voltage is not as specified, check appropriate component, connector or wiring harness and repair as necessary.
2. With ignition switch in ON position, check voltage between shift lock control module terminal No. 1 (Yellow wire) and terminal No. 8 (Black wire). Battery voltage should exist. Voltage should not exist under any other conditions. If voltage is not as specified, check 10-amp fuse in fuse block.
3. Check for voltage between shift lock control module terminal No. 2 (Red/Yellow wire) and terminal No. 8. Battery voltage should exist under all conditions. If voltage is not as specified, check 15-amp fuse on NX and Sentra, or 20-amp fuse on G20, located in fuse block.
4. With ignition switch in ON position, selector lever in Park, and brake pedal applied, check for voltage between shift lock control module terminal No. 4 (Blue/Green wire) and terminal No. 8. Battery voltage should exist. Voltage should not exist under any other conditions. If voltage is not as specified, check shift lock solenoid.
5. Check for voltage between shift lock control module terminal No. 5 (Red/Green wire) and terminal No. 8. With brake pedal applied, battery voltage should exist. With brake pedal released, voltage should not exist. If voltage is not as specified, check stoplight switch.
6. Check for voltage between shift lock control module terminal No. 6 (Blue/Black wire) and terminal No.

8. When ignition key is inserted into key cylinder, selector lever is in Park and selector lever button is pushed, battery voltage should exist. When selector lever is set to any other position except Park, battery voltage should exist. Voltage should not exist under any other conditions. If voltage is not as specified, check detention switch.

REMOVAL & INSTALLATION

TRANSAXLE

See the appropriate TRANSMISSION REMOVAL & INSTALLATION - A/T article in the AUTOMATIC TRANS SERVICING section. Refer to the following menu:

TORQUE CONVERTER

1. Torque converter is a sealed unit and cannot be disassembled for service. Replace torque converter if damaged. Check converter one-way clutch using flat-blade screwdriver and suitable wire. See **Fig. 7** .
2. Hook wire into groove of bearing support unitized with one-way clutch outer race. While holding bearing support with wire, rotate one-way clutch spline using screwdriver. Ensure inner race rotates clockwise only. If inner race rotates in both directions, replace torque converter.

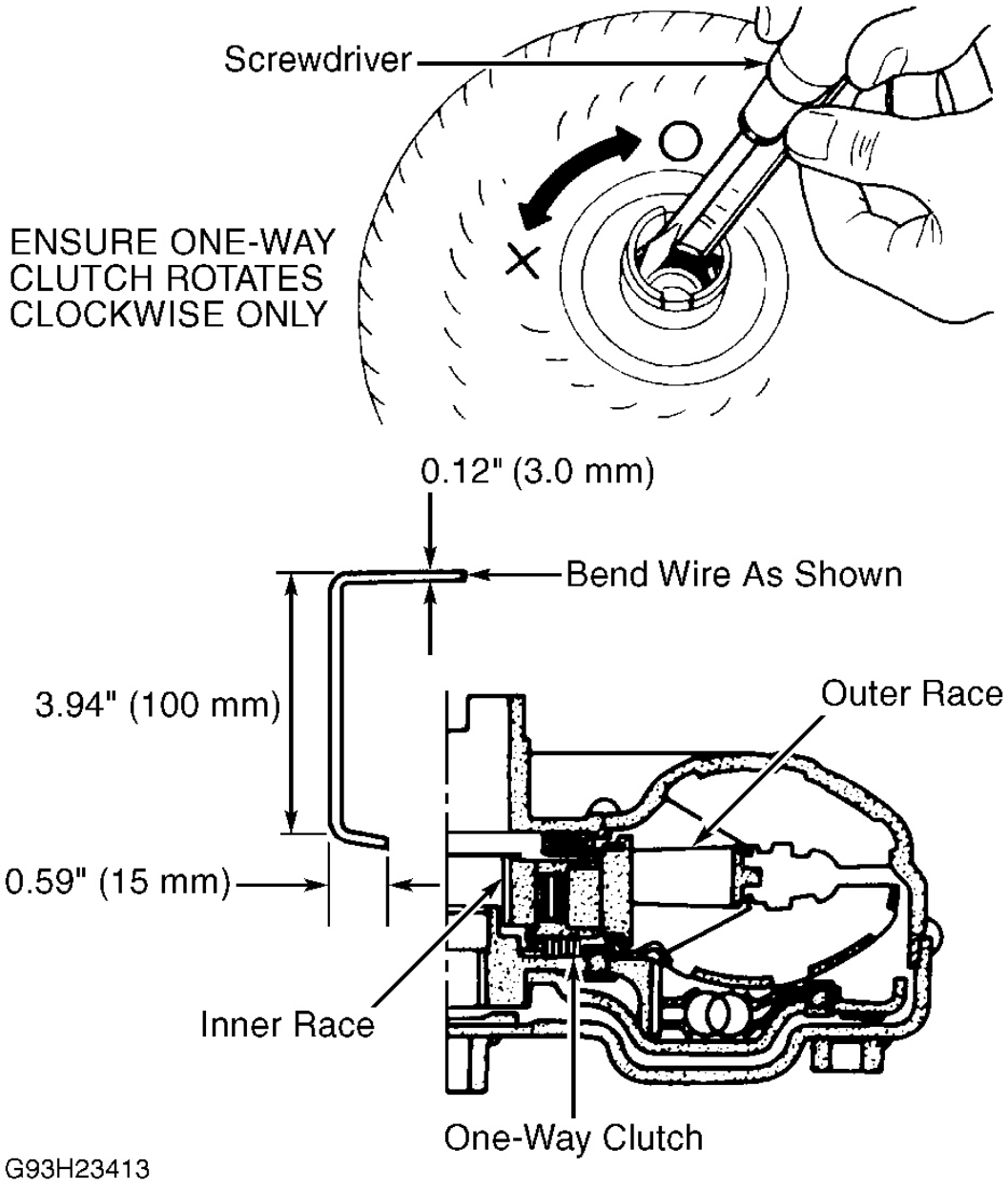


Fig. 7: Checking Torque Converter One-Way Clutch
Courtesy of NISSAN MOTOR CO., U.S.A.

TRANSAXLE DISASSEMBLY

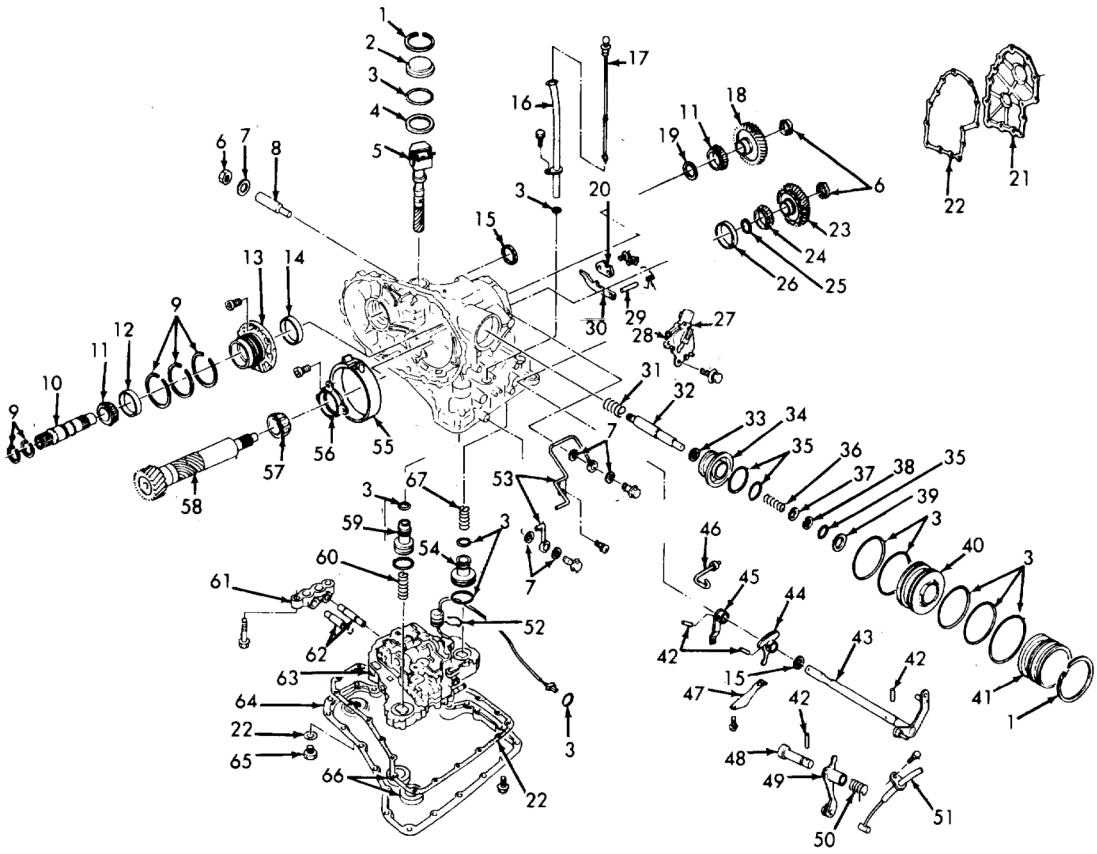
1. Remove drain plug and drain transaxle fluid. Remove the torque converter. Check torque converter one-way clutch. Refer to **TORQUE CONVERTER** . Remove dipstick and dipstick tube. Remove oil cooler tube. Set manual lever to "P" position. Remove inhibitor switch. Remove oil pan and gasket. See **Fig. 8** .

DO NOT reuse oil pan bolts.

2. Remove control valve assembly bolts. See **Fig. 4** . Remove clip from terminal body. Push terminal body into transaxle case and remove solenoid harness. Remove manual valve from control valve assembly. Remove return spring from 3-R accumulator piston. Using compressed air, remove 3-R accumulator piston. See **Fig. 9** .
3. Remove "O" rings from 3-R accumulator piston. Using compressed air, remove N-D accumulator piston and return spring. See **Fig. 9** . Remove "O" rings from N-D accumulator piston. Check accumulator pistons and contact surface of transaxle case for damage. Check accumulator return springs free length and diameter. See the **ACCUMULATOR SPRING SPECIFICATIONS** table.

ACCUMULATOR SPRING SPECIFICATIONS

Application	In. (mm)
N-D Accumulator Spring	
Free Length	1.713 (43.50)
Outer Diameter	1.102 (280)
3-R Accumulator Spring	
Free Length	2.220 (56.40)
Outer Diameter	.827 (21.00)



1. Snap Ring
2. Governor Cap
3. "O" Ring
4. Spacer
5. Governor Valve Assembly
6. Lock Nut
7. Washer
8. Anchor End Pin
9. Seal Rings
10. Output Shaft
11. Bearing
12. Output Shaft Bearing Race
13. Bearing Retainer
14. Output Gear Bearing Race
15. Oil Seal
16. Dipstick Tube
17. Dipstick
18. Output Gear
19. Adjusting Spacer
20. Parking Actuator Support
21. Side Cover
22. Gasket
23. Idler Gear
24. Idler Gear Bearing
25. Adjusting Shim
26. Idler Gear Bearing Race
27. Inhibitor Switch
28. Return Spring
29. Parking Shaft
30. Parking Pole
31. 2nd Servo Return Spring
32. Band Servo Piston Stem
33. Band Servo Thrust Washer
34. Band Servo Piston
35. "D" Rings
36. OD Servo Return Spring
37. Spring Retainer
38. "E" Ring
39. OD Band Servo Piston
40. Servo Piston Retainer
41. OD Servo Piston
42. Retaining Pin
43. Manual Shaft
44. Manual Plate
45. Parking Rod Plate
46. Parking Rod
47. Detent Spring
48. Throttle Shaft
49. Throttle Lever
50. Throttle Lever Spring
51. Throttle Cable
52. Clip
53. Oil Cooler Tube
54. N-D Accumulator Piston
55. Brake Band
56. Reduction Gear Bearing Race
57. Reduction Gear Bearing
58. Reduction Gear
59. 3-R Accumulator Piston
60. 3-R Accumulator Spring
61. Tube Connector
62. Tube
63. Control Valve Assembly
64. Oil Pan
65. Drain Plug
66. Magnet
67. N-D Accumulator Spring

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Fig. 8: Exploded View Of Transaxle Case Components
Courtesy of NISSAN MOTOR CO., U.S.A.

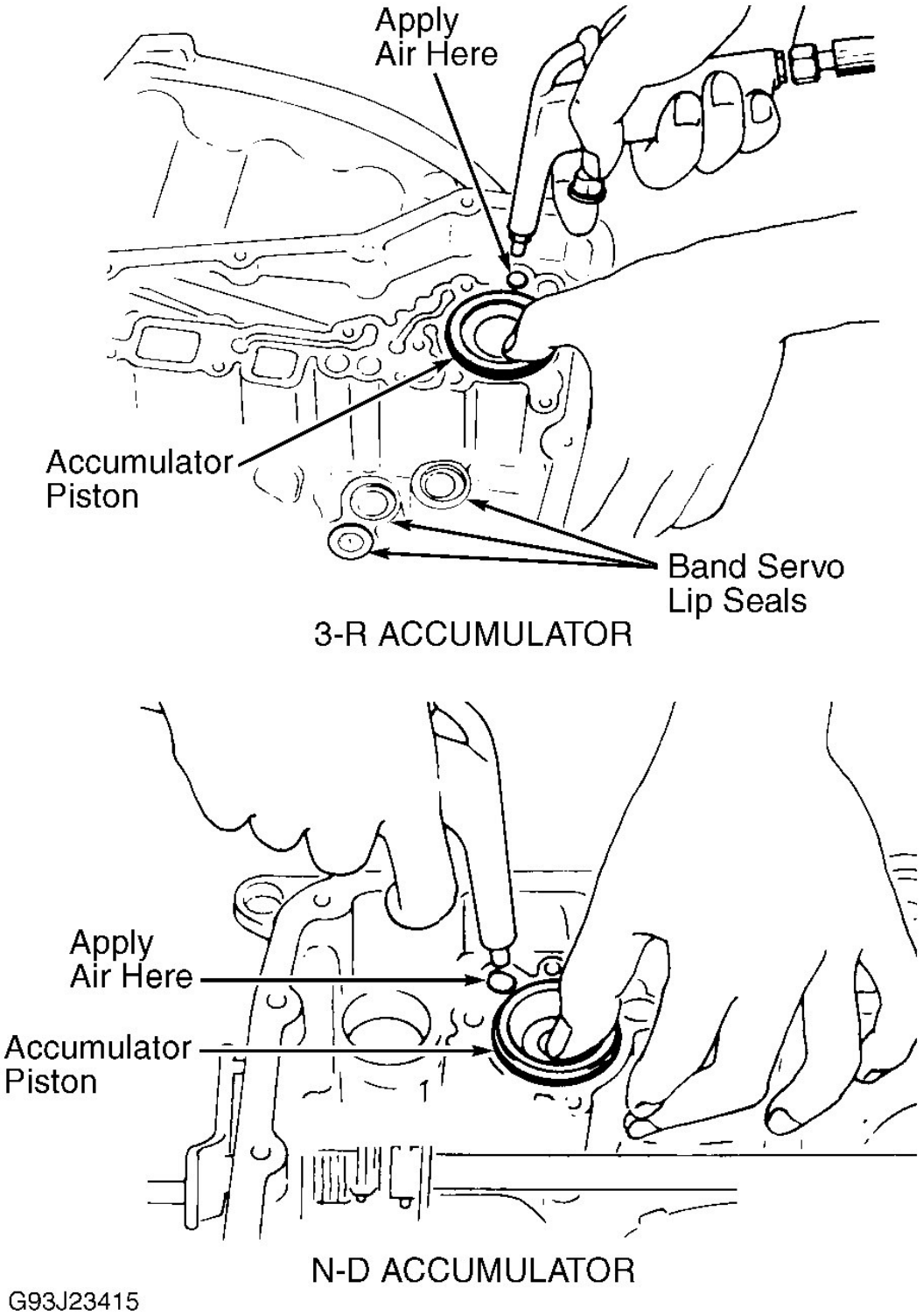


Fig. 9: Removing N-D & 3-R Accumulator Pistons

Courtesy of NISSAN MOTOR CO., U.S.A.

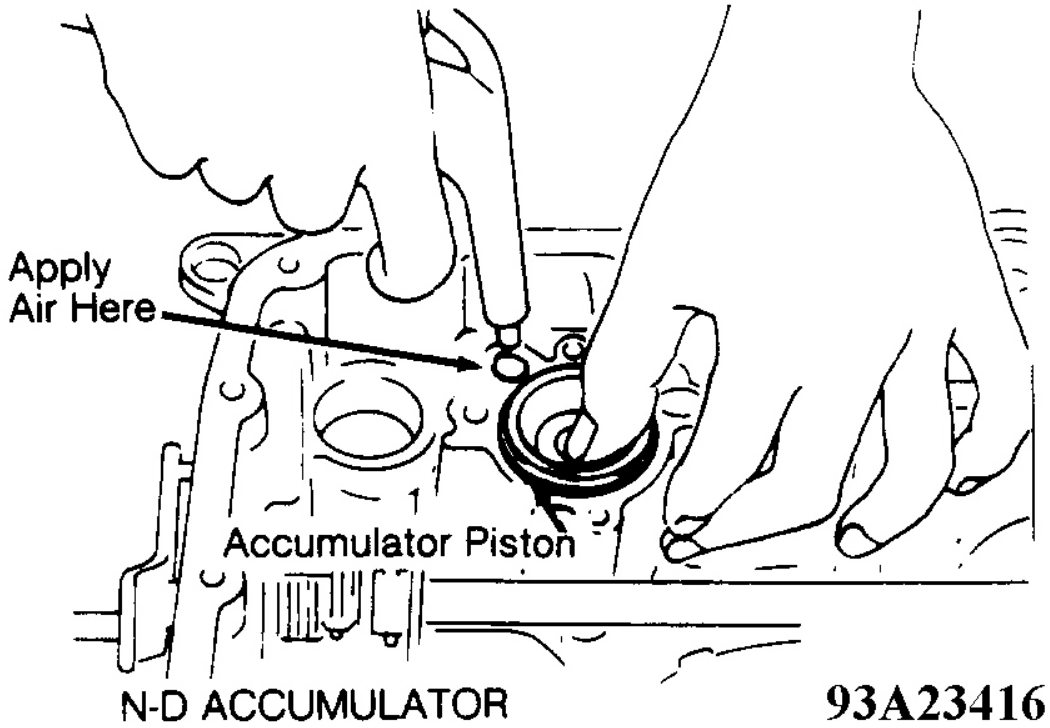


Fig. 10: Removing N-D & 3-R Accumulator Pistons
Courtesy of NISSAN MOTOR CO., U.S.A.

4. Remove lip seals from band servo oil port. Using snap ring pliers, remove governor valve oil filter. Check filter for damage or clogging. Remove throttle cable from throttle lever. Remove throttle cable mounting bolt and remove throttle cable from transaxle case. Remove converter housing bolts and remove converter housing by tapping housing with soft-faced hammer. Remove "O" ring from differential oil port.
5. Remove differential assembly from transaxle case. It may be necessary to tap differential assembly with soft-faced hammer to remove assembly from case. Using a hammer and screwdriver, remove oil seal from converter housing, being careful not to damage converter housing. Remove seal from transaxle case.
6. Remove oil tube from converter housing. Remove "O" ring from input shaft. See **Fig. 11** . Remove oil pump assembly bolts and remove oil pump assembly from transaxle case. Remove thrust washer and bearing race from oil pump assembly. Loosen anchor end pin lock nut, then back off anchor end pin.
7. Remove brake band from transaxle case. When removing brake band, insert wire clip into brake band ends for support. To prevent brake lining from cracking or peeling, **DO NOT** stretch brake band. Check brake band facing for damage, cracks, wear or burns. Remove high clutch (with input shaft assembly) and reverse clutch assemblies. Remove high clutch from reverse clutch. See **Fig. 12** .
8. Remove needle bearing from high clutch drum. Remove high clutch hub and needle bearing from transaxle case. Remove front sun gear and needle bearings from transaxle case. Check all components for

damage or wear.

9. Remove snap ring and front planetary carrier assembly with low one-way clutch. Ensure low one-way clutch rotates counterclockwise only. Remove low one-way clutch from front planetary carrier by rotating one-way clutch counterclockwise. Remove needle bearing from planetary carrier. See **Fig. 12** . Check all components for damage or wear.
10. Remove rear planetary carrier assembly from transaxle case. Remove rear sun gear from rear planetary carrier. Remove needle bearings from rear planetary carrier. Check all components for damage or wear.
11. Using a feeler gauge, check clearance between pinion washer and planetary carrier. Clearance between pinion washer and planetary carrier should be .006-.028" (.15-.70 mm). Replace appropriate planetary carrier if clearance exceeds .031" (.80 mm).
12. Remove rear internal gear from transaxle case. Remove needle bearing from rear internal gear and check bearing for damage or wear. Remove forward clutch assembly from transaxle case. Remove thrust washer and bearing race from transaxle case. Remove side cover bolts and side cover. See **Fig. 8** .

NOTE: DO NOT reuse side cover bolts.

13. Set manual lever to "P" position to lock idler gear and output gear. Using a hammer and pin punch, unlock both idler gear and output gear lock nuts. Remove idler gear and output gear lock nuts.

NOTE: DO NOT reuse idler gear or output gear lock nuts.

14. Using appropriate puller, remove idler gear and output gear. Remove reduction gear and output shaft. Remove adjusting shim from reduction gear. Remove adjusting spacer from output shaft.
15. Remove return spring from parking shaft. Remove parking shaft and parking pole from transaxle case. Check parking shaft and pole for wear or damage. Note direction of parking actuator support and remove actuator support from transaxle case. Inspect actuator support for wear or damage. Remove governor assembly snap ring. Remove spacer from governor cap. Using pliers, remove governor cap. Remove the "O" ring from the governor cap. Remove the governor valve assembly. See **Fig. 8** .
16. With low primary weight closed, ensure governor valve lowers under its own weight. Check low and high secondary weight operation. See **Fig. 13** . Using a hammer and screwdriver, remove side oil seal from transaxle case. Remove manual shaft and throttle lever components. See **MANUAL SHAFT & THROTTLE LEVER** under COMPONENT DISASSEMBLY & REASSEMBLY.

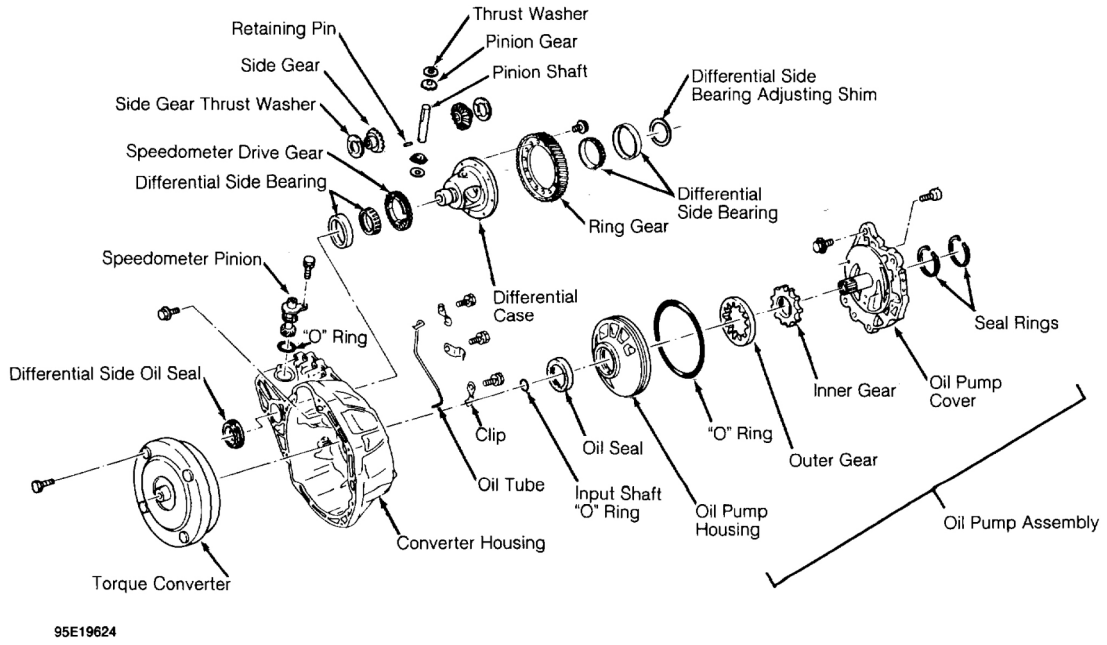
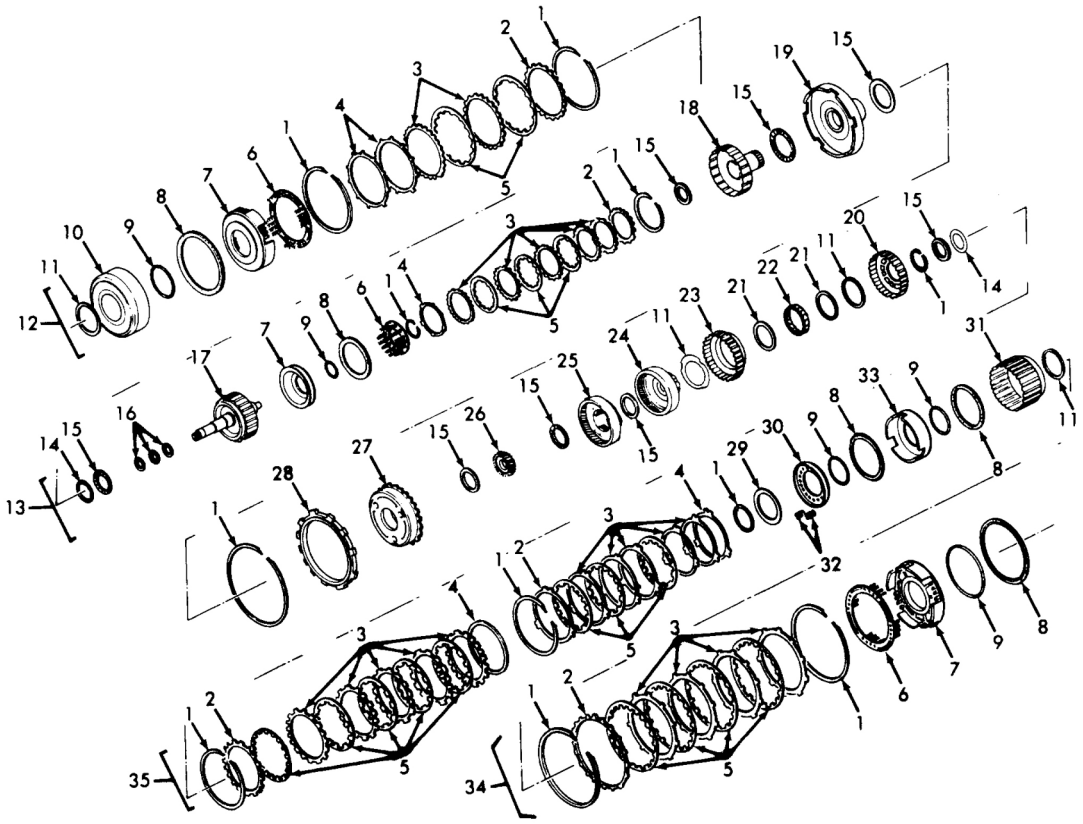


Fig. 11: Exploded View Of Torque Converter Housing & Differential Components
Courtesy of NISSAN MOTOR CO., U.S.A.



1. Snap Ring
2. Retaining Plate
3. Driven Plate
4. Dish Plate
5. Drive Plate
6. Return Spring & Spring Retainer
7. Piston
8. Oil Seal
9. "D" Ring
10. Reverse Clutch Drum
11. Thrust Washer
12. Reverse Clutch Assembly
13. High Clutch Assembly
14. Bearing Race
15. Needle Bearing
16. Seal Rings
17. High Clutch Drum
18. High Clutch Hub
19. Front Sun Gear
20. Overrun Clutch Hub
21. Bearing
22. Forward One-Way Clutch
23. Forward Clutch Hub
24. Rear Internal Gear
25. Rear Planetary Carrier
26. Rear Sun Gear
27. Front Planetary Carrier
28. Low One-Way Clutch
29. Spring Retainer
30. Overrun Clutch Piston
31. Forward Clutch Drum
32. Return Springs
33. Forward Clutch Piston
34. Low & Reverse Brake Assembly
35. Forward & Overrun Clutch Assembly

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Fig. 12: Exploded View Of Forward Clutch, High Clutch, Low-Reverse Brake, Overrun Clutch & Reverse Clutch Assemblies
Courtesy of NISSAN MOTOR CO., U.S.A.

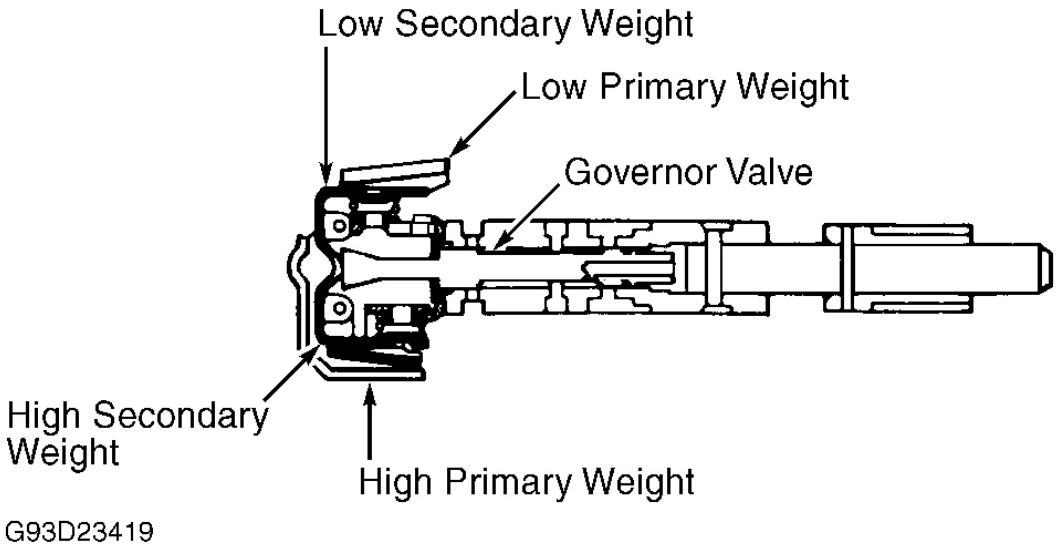


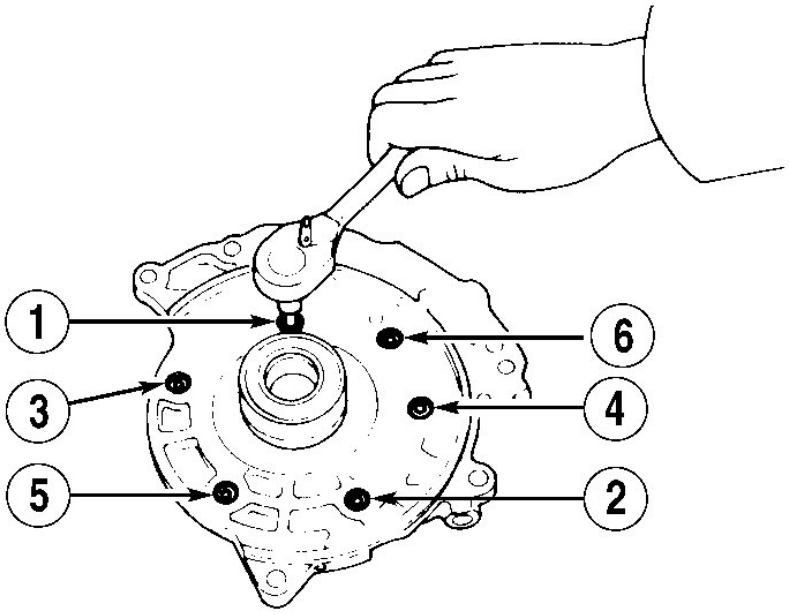
Fig. 13: Identifying Governor Valve Components
Courtesy of NISSAN MOTOR CO., U.S.A.

COMPONENT DISASSEMBLY & REASSEMBLY

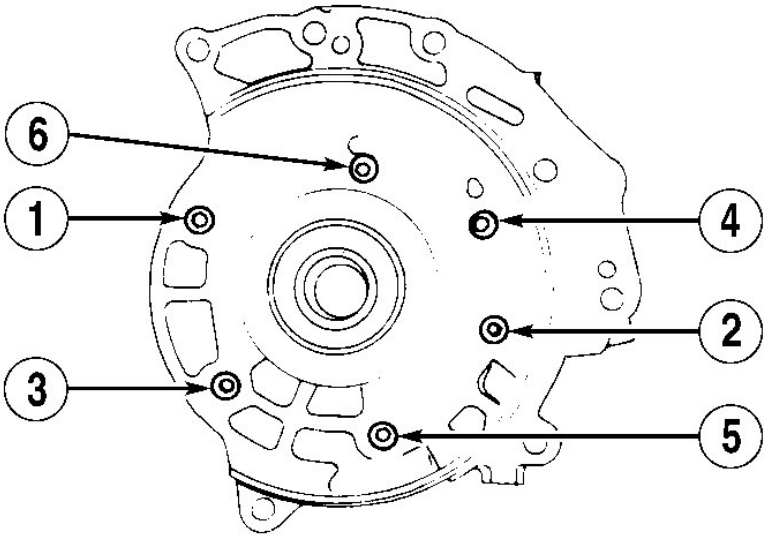
OIL PUMP

Disassembly

Remove seal rings. Remove oil pump cover bolts in numerical order and remove oil pump cover. See **Fig. 14** . Remove inner and outer gears from oil pump housing, noting direction of inner gear prior to removal. Remove "O" ring from oil pump housing. Using a screwdriver, pry out oil pump housing oil seal. See **Fig. 16** .



REMOVAL



INSTALLATION

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Fig. 14: Removal & Installation Of Oil Pump Cover
Courtesy of NISSAN MOTOR CO., U.S.A.

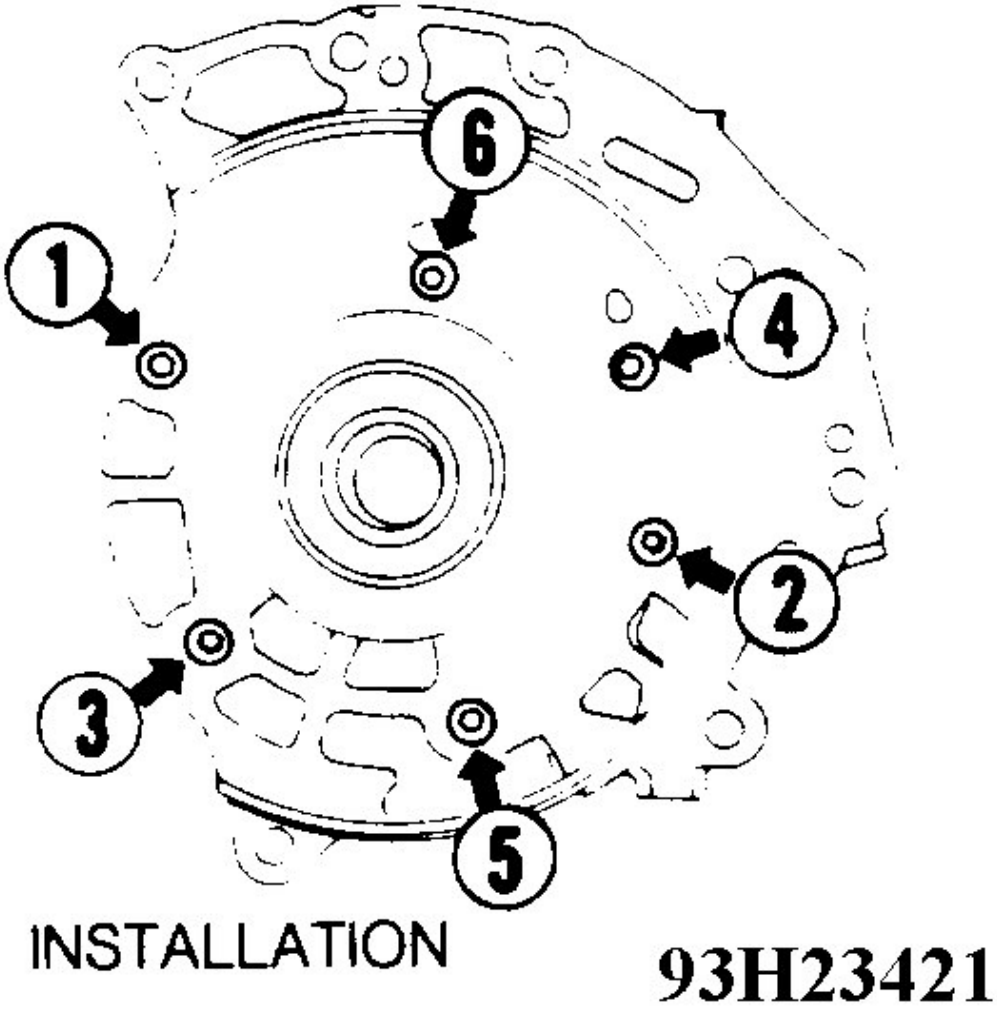


Fig. 15: Removal & Installation Of Oil Pump Cover
Courtesy of NISSAN MOTOR CO., U.S.A.

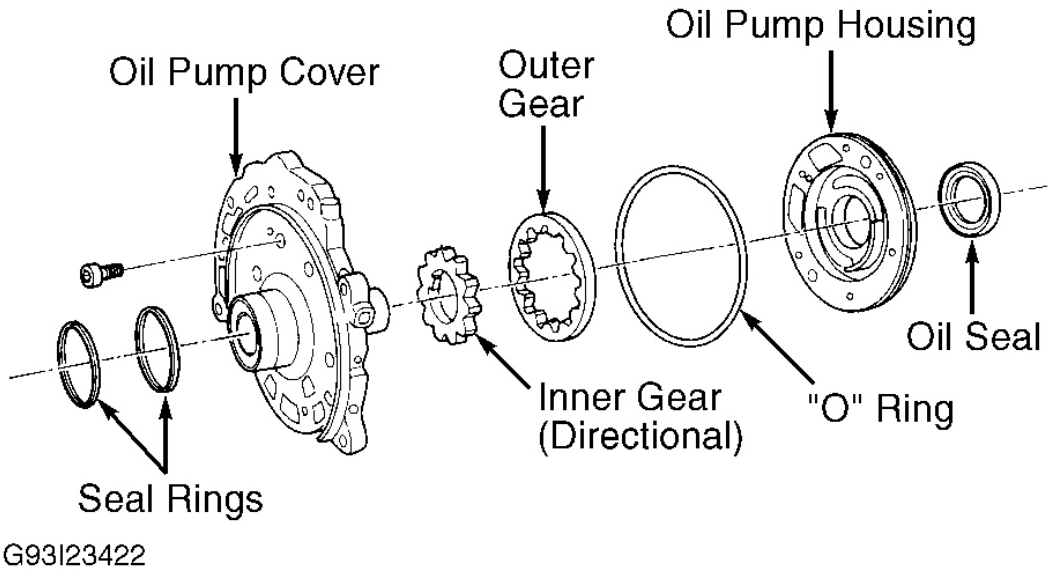


Fig. 16: Exploded View Of Oil Pump Assembly
Courtesy of NISSAN MOTOR CO., U.S.A.

Inspection

1. Inspect oil pump housing, oil pump cover and inner and outer gear for wear or damage. Using a dial indicator, measure side clearance between end of oil pump housing and inner and outer gears in at least 4 places along their circumferences. Clearance should be .0008-.0016" (.020-.040 mm). See **Fig. 17** .
2. If clearance is less then specified, replace inner and outer gears as a set. Ensure clearance is as specified. Gears are available in thicknesses of .3925-.3929" (9.970-9.980 mm), .3929-.3933" (9.980-9.990 mm) and .3933-.3937" (9.990-10.000 mm). If clearance is greater than specified, replace oil pump assembly, except oil pump cover.
3. Using a feeler gauge, measure clearance between outer gear and oil pump housing. Clearance should be .003-.006" (.08-.15 mm). If clearance is not as specified, replace oil pump assembly, except oil pump cover. Install NEW seal rings onto oil pump cover. Measure clearance between seal ring and ring groove. Clearance should be .004-.010" (.10-.25 mm), with allowable limit of .010" (.25 mm). If clearance is not as specified, replace oil pump cover.

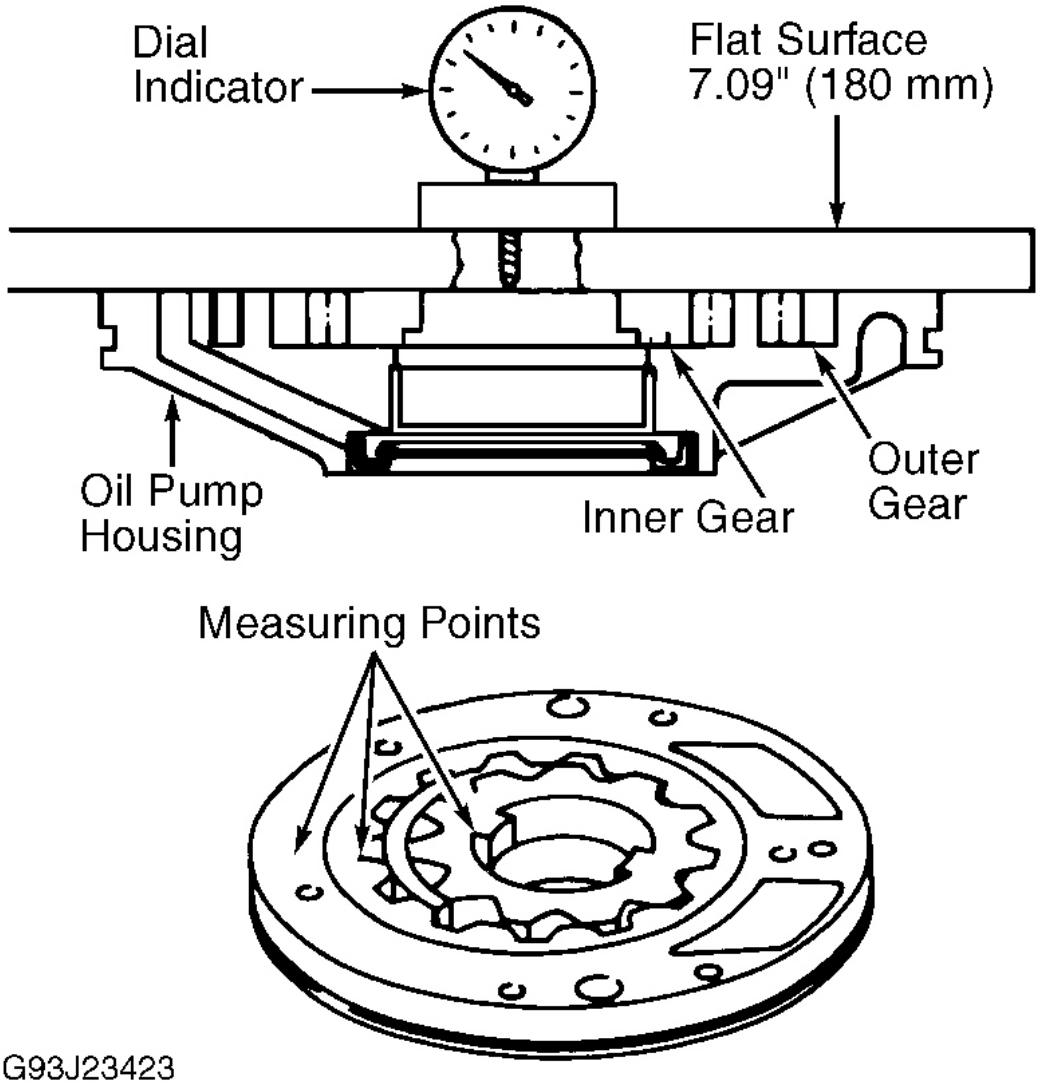


Fig. 17: Measuring Oil Pump Side Clearance
Courtesy of NISSAN MOTOR CO., U.S.A.

Reassembly

1. Using appropriate adapter, install NEW oil seal on oil pump housing. Apply ATF to NEW "O" ring and install "O" ring on oil pump housing. Install inner and outer gears on oil pump housing. Ensure inner gear is installed in same direction as removed.
2. Wrap oil pump splines with masking tape to protect oil seal. Position oil pump cover on oil pump housing, then remove masking tape. Tighten bolts in numerical order to 62-97 INCH lbs. (7-11 N.m). See **Fig. 14** . Pack ring groove with petroleum jelly, then carefully install NEW seal rings. Connect seal ring hooks. **DO NOT** spread gap of seal ring excessively while installing as ring may become deformed.

CONTROL VALVE ASSEMBLY

Disassembly

1. Remove tube connector and tube from control valve lower body. Disassemble upper, inter and lower valve bodies. See **Fig. 18** . Note bolt length, number of bolts and location. See **VALVE BODY BOLT IDENTIFICATION** table.

VALVE BODY BOLT IDENTIFICATION (1)

Bolt I.D. (Letter)	Length - In. (mm)	No. Of Bolts
A	.53 (13.5)	4
B	2.28 (58.0)	3
C	1.57 (40.0)	6
D	2.60 (66.0)	11
E	1.30 (33.0)	2
F	3.07 (78.0)	2
(1) See **Fig. 19** for bolt location.		

2. Remove bolts "A", "D" and "F", and remove oil strainer from control valve assembly. Remove OD cancel solenoid and lock-up solenoid from control valve assembly. Remove "O" rings from OD cancel solenoid, lock-up solenoid and harness terminal body. Place upper valve body face down. Remove bolts "B", "C" and "F".
3. Remove inter valve body from lower valve body. Turn lower valve body over and remove accumulator support plate. Remove separating plate and separating gasket from lower valve body. See **Fig. 18** . Remove check balls and relief valve springs from lower valve body. **DO NOT** lose check balls or relief valve springs.
4. Remove inter valve body with separating plate and separating gasket from upper valve body. Ensure steel balls are properly positioned in upper and inter valve bodies, then remove balls from valve bodies. **DO NOT** lose steel balls.

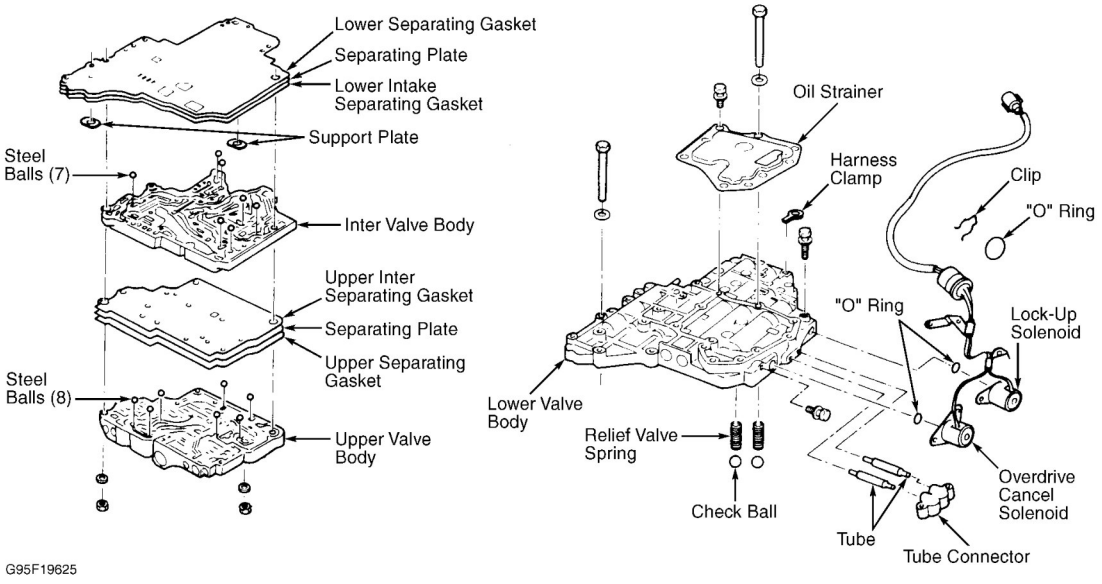


Fig. 18: Exploded View Of Control Valve Assembly
Courtesy of NISSAN MOTOR CO., U.S.A.

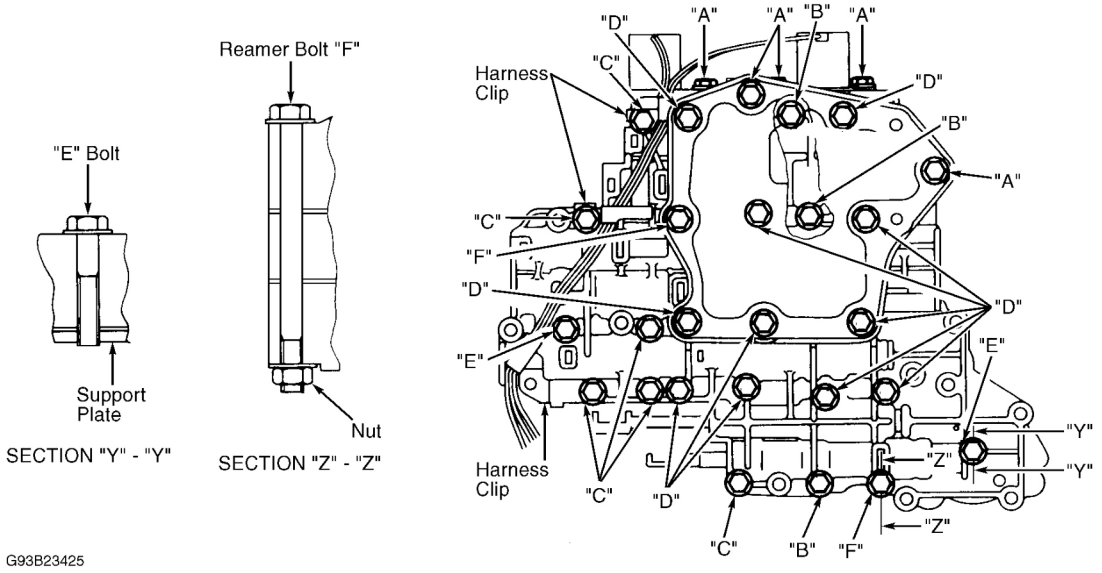
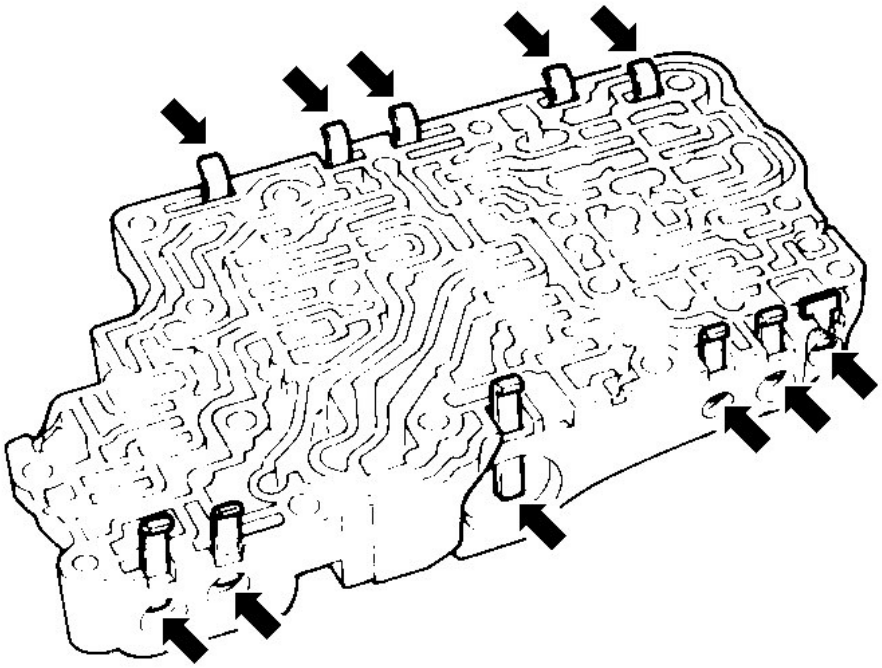


Fig. 19: Identifying Valve Body Bolt Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

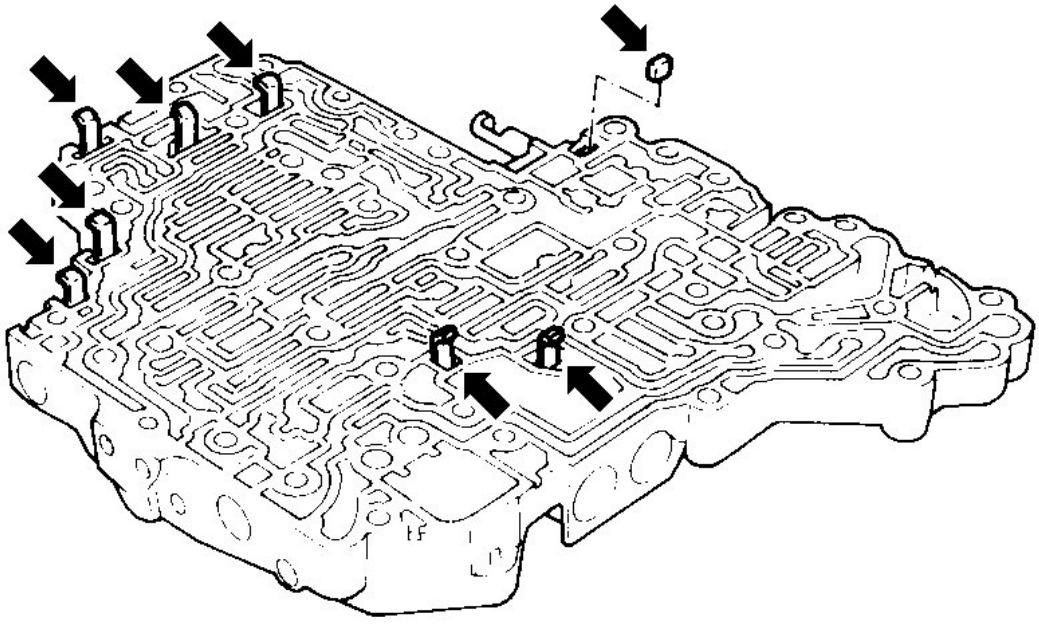
Inspection

Ensure retainer plates are properly positioned in lower and upper valve bodies. See **Fig. 20** . **DO NOT** lose retainer plates. Check oil strainer for damage. Inspect OD and lock-up cancel solenoids. Check oil cooler relief valve springs for damage or deformation. Measure spring free length and outer diameter. Free length should

be .670" (17.02 mm) and diameter should be .315" (8.00 mm). Replace springs if not as specified.



UPPER VALVE BODY



LOWER VALVE BODY

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Fig. 20: Identifying Retainer Plate Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

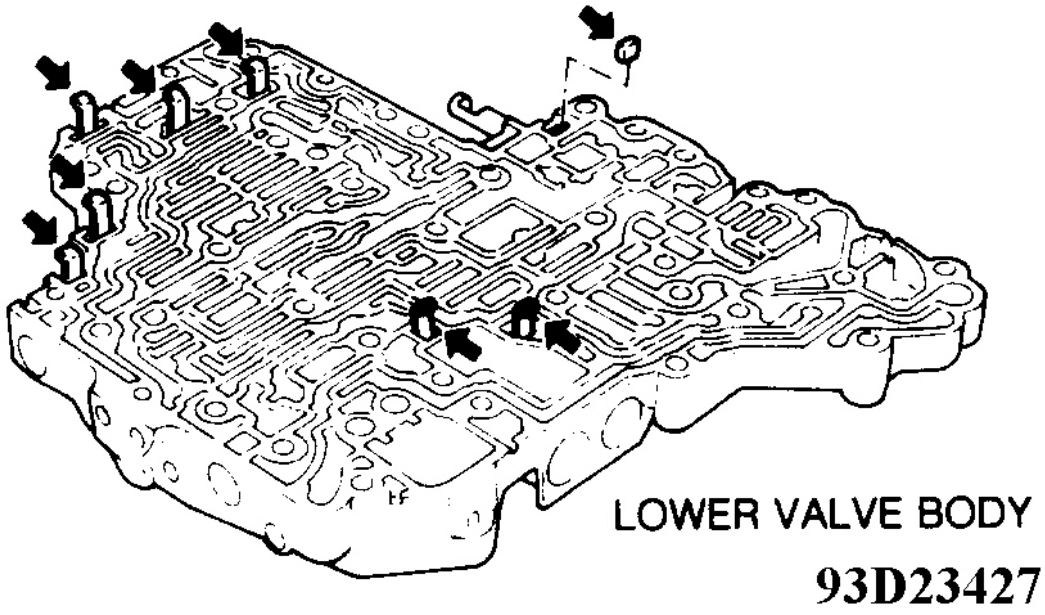
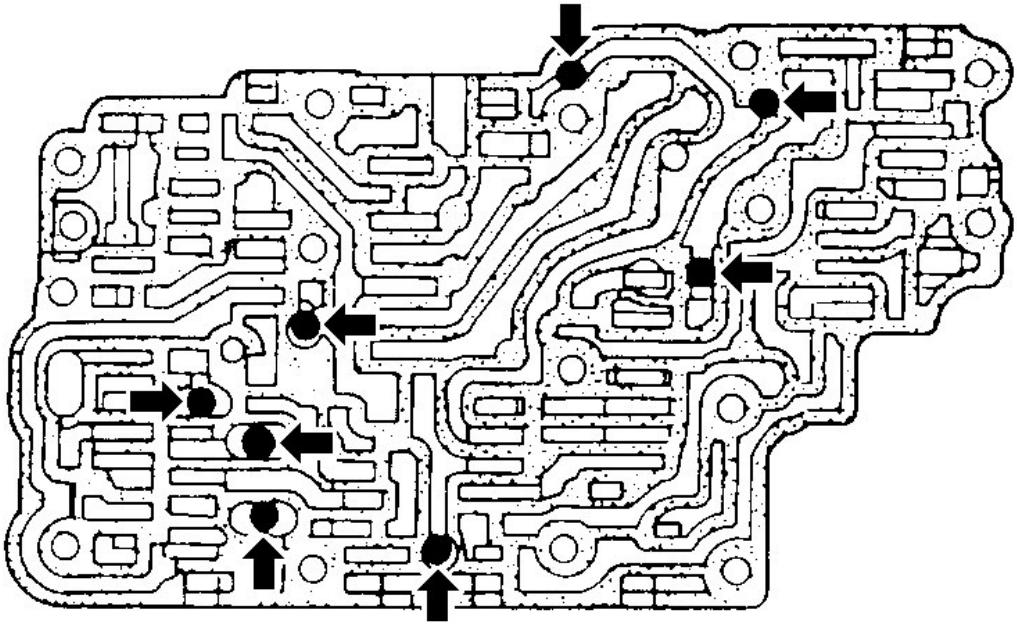


Fig. 21: Identifying Retainer Plate Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

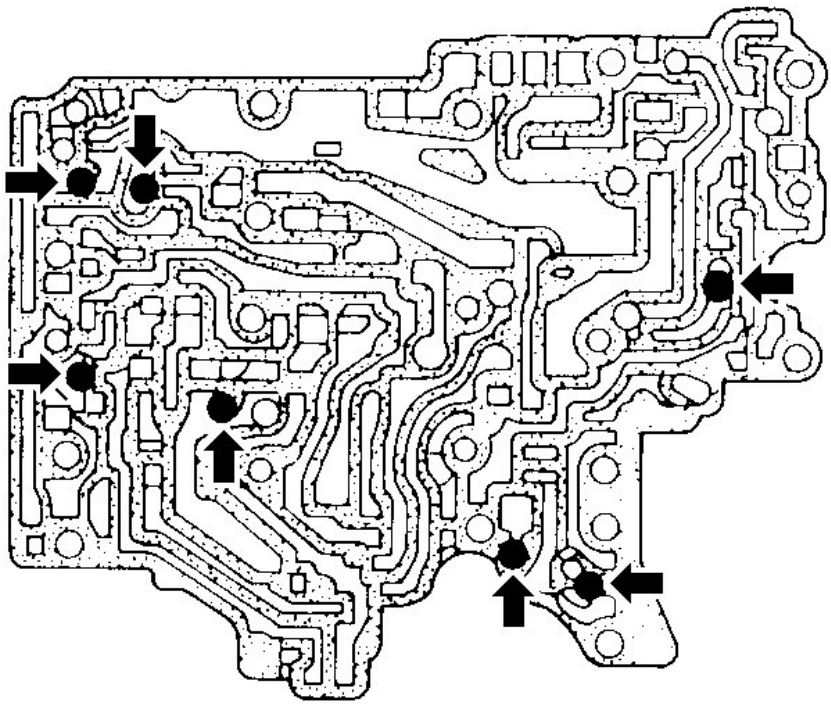
Reassembly

1. Place oil circuit of upper valve body face up. Install steel balls in proper positions. See **Fig. 22** . Install upper separating gasket, upper inter separating gasket and upper separating plate. Install reamer bolts "F" from bottom of upper valve body. Install separating gaskets and separating plates as a set on upper valve body, using reamer bolts as a guide.
2. Place lower valve body side of inter valve body face up. Install steel balls in proper positions. Install inter valve body on upper valve body, using reamer bolts "F" as a guide. **DO NOT** lose steel balls. Install steel balls and relief valve springs in proper positions in lower valve body. Install lower separating gasket, inter separating gasket and lower separating plate. See **Fig. 18** .
3. Install support plate bolts "E" from bottom of lower valve body. Install separating gaskets and separating plate as a set on lower valve body using bolts "E" as a guide. Temporarily install support plates on lower valve body. Install lower valve body on inter valve body using reamer bolts "F" as a guide. See **Fig. 19** . Tighten bolts.
4. Install "O" rings to OD cancel solenoid, lock-up solenoid and harness connector. Apply ATF to "O" rings prior to installation. Install and snug bolts "B". Install OD cancel solenoid and lock-up solenoid to lower valve body. Install and snug bolts "A" and 'C".
5. Remove both reamer bolts "F" previously installed as guides. Install one reamer bolt "F" from lower valve body side. Tighten bolts "A", "B", "C" and "F" to 62-80 INCH lbs. (7-9 N.m). Install oil strainer

and other reamer bolt "F". Tighten bolts "A", "D" and "F' to 62-80 INCH lbs. (7-9 N.m). Install support plates and tighten bolts "E" to 62-80 INCH lbs. (7-9 N.m). Install tube connector and tubes to lower valve body. Install oil circuit side of tube connector face up.



UPPER VALVE BODY



INTER VALVE BODY

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Fig. 22: Identifying Steel Ball Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

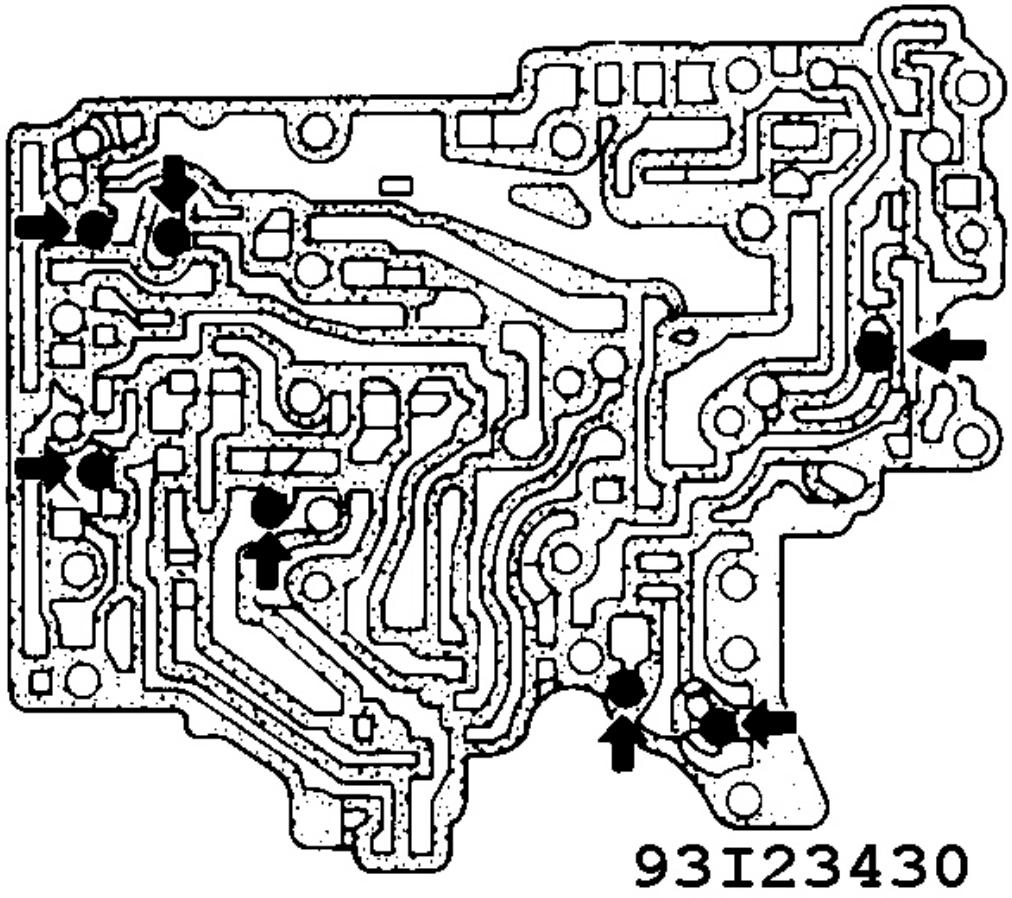


Fig. 23: Identifying Steel Ball Locations
Courtesy of NISSAN MOTOR CO., U.S.A.

CONTROL VALVE UPPER BODY

Disassembly

1. Use a screwdriver to pry out retainer plates. Remove retainer plates while holding spring, plugs and sleeves. Remove plug slowly to prevent internal parts from jumping out.
2. Place mating surface of valve body face down and remove internal parts. If valve is hard to remove, lightly tap body with soft-faced hammer. **DO NOT** use a magnet to remove valves. **DO NOT** drop or damage valves or sleeves.

Inspection

Measure spring free length and outer diameter. See **UPPER VALVE BODY SPRING IDENTIFICATION** table. Check for deformation or damage. Replace valve springs if deformed or fatigued. Check sliding surfaces of valves, sleeves and plugs.

UPPER VALVE BODY SPRING IDENTIFICATION (1)

Spring No.	Length In. (mm)	Diameter In. (mm)
1	.98 (25.0)	.32 (8.2)
2	1.59 (40.5)	.35 (9.0)
3	2.00 (50.9)	.50 (12.6)
4	1.04 (26.3)	.28 (7.2)
5	.89 (22.6)	.29 (7.3)
6	1.76 (44.6)	.21 (5.2)
7	1.16 (29.5)	.22 (5.5)
8	.92 (23.4)	.26 (6.7)
9	1.56 (39.5)	.19 (5.0)
10	1.56 (39.5)	.20 (5.1)

(1) See **Fig. 24** for spring locations.

Reassembly

1. Lay control valve body face down when installing valves. **DO NOT** stand valve body on edge. Lubricate valves and control valve body with ATF prior to installation. Install control valves by sliding valves into appropriate bores. **DO NOT** scratch or damage valve body. Wrap shaft of small screwdriver with vinyl tape and insert valves into bores using screwdriver where necessary.
2. Install 1-2 accumulator valve, then align 1-2 accumulator retainer plate with 1-2 accumulator valve from opposite side of control valve body. Install return spring and 1-2 accumulator piston. See **Fig. 24** . While pushing plug or return spring, install retainer plates. See the **RETAINER PLATE IDENTIFICATION** table for retainer plate dimensions.

RETAINER PLATE IDENTIFICATION (1)

Application	Length "A" In. (mm)	Length "B" In. (mm)
Lock-Up Control, Pressure Modifier & 4-2 Sequence Valves	.24 (6.0)	1.10 (28.0)
Torque Converter Relief Valve (2)	.51 (13.0)	.67 (17.0)
1-2 Accumulator Valve	.24 (6.0)	1.48 (37.5)
All Other Valves	.24 (6.0)	.85 (21.5)

(1) See **Fig. 24** for retainer plate locations.

(2) Type "B" retainer plate. All others are type "A". See **Fig. 25** .

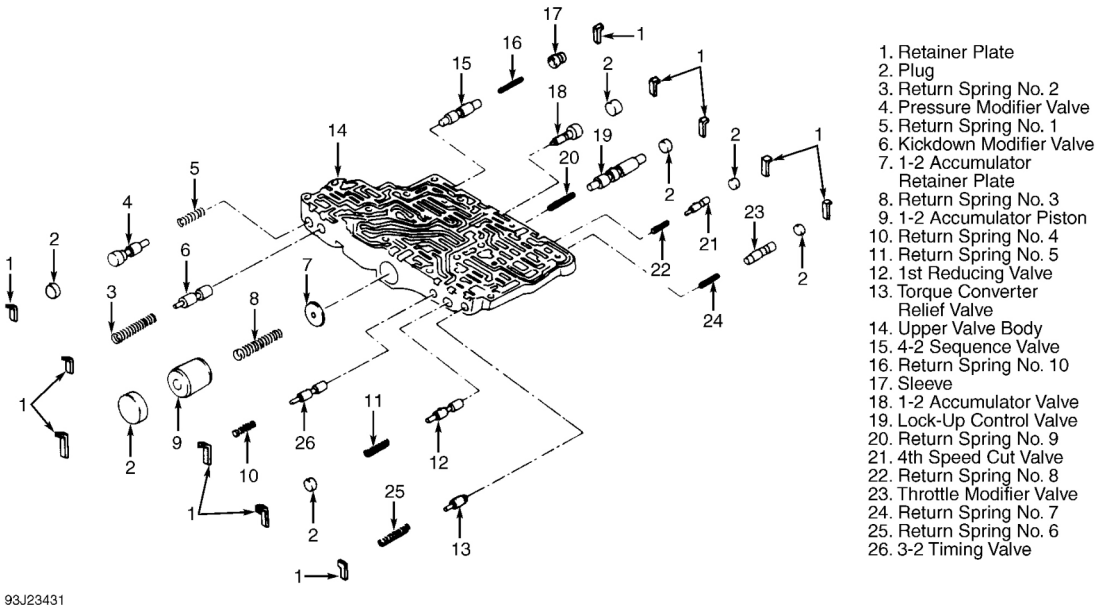


Fig. 24: Exploded View Of Control Valve Upper Body
Courtesy of NISSAN MOTOR CO., U.S.A.

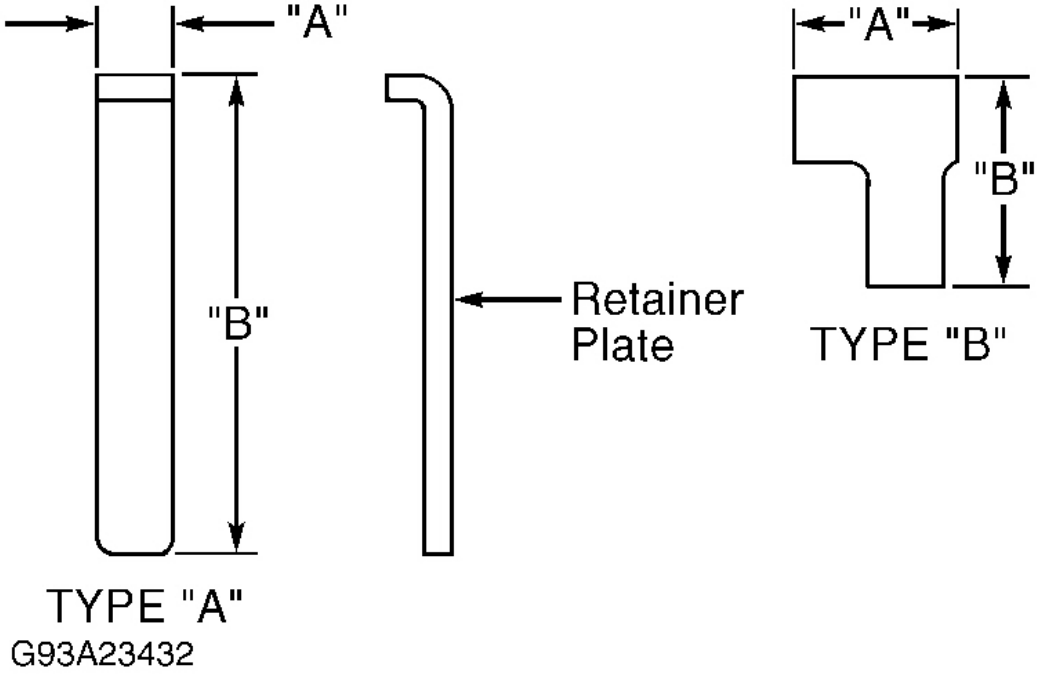


Fig. 25: Measuring Retainer Plate Dimensions

Courtesy of NISSAN MOTOR CO., U.S.A.

CONTROL VALVE LOWER BODY

Disassembly

Use a screwdriver to pry out retainer plates. Remove retainer plates while holding spring, plugs and sleeves. Remove plug slowly to prevent internal parts from jumping out. Place mating surface of valve body face down and remove internal parts. If valve is hard to remove, lightly tap body with soft-faced hammer. **DO NOT** use a magnet to remove valves. **DO NOT** drop or damage valves or sleeves. Remove throttle valve "E" ring and throttle valve.

Inspection

Measure spring free length and outer diameter. Refer to the **LOWER VALVE BODY SPRING IDENTIFICATION** table. Also check for deformation or damage. Replace valve springs if deformed or fatigued. Check sliding surfaces of valves, sleeves and plugs.

LOWER VALVE BODY SPRING IDENTIFICATION (1)

Spring No.	Length-In. (mm)	Diameter-In. (mm)
1	1.30 (33.0)	.39 (10.0)
2	2.06 (52.24)	.59 (15.0)
3	2.06 (52.0)	.32 (8.0)
4	2.07 (52.7)	.28 (7.0)
5	1.81 (45.9)	.21 (5.3)
6	1.93 (48.9)	.28 (7.0)
(1) See **Fig. 26** for spring locations.		

Reassembly

1. Insert throttle valve to control valve body and install "E" ring. Install pressure regulator valve after assembling sleeve plug, plug "A" and plug "B". Ensure spool plugs and retainer plates on opposite side of 3-4 and 2-3 shift valves are installed. Install 3-4 and 2-3 shift valves. See **Fig. 26** .
2. Lay control valve body face down when installing valves. **DO NOT** stand valve body on edge. Lubricate valves and control valve body with ATF prior to installation. Install control valves by sliding valves into appropriate bores. **DO NOT** scratch or damage valve body.
3. Wrap shaft of small screwdriver with vinyl tape and insert valves into bores using screwdriver where necessary. While pushing plug or return spring, install retainer plates. See **RETAINER PLATE IDENTIFICATION** table for retainer plate dimensions.

RETAINER PLATE IDENTIFICATION (1)

Application	Length "A" In. (mm)	Length "B" In. (mm)
Throttle & Detent Valves (2)	.24 (6.0)	.28 (7.2)
All Other Valves	.24 (6.0)	1.10 (28.0)

(1) See **Fig. 26** for retainer plate locations.

(2) Type "B" retainer plate. All others are type "A". See **Fig. 25** .

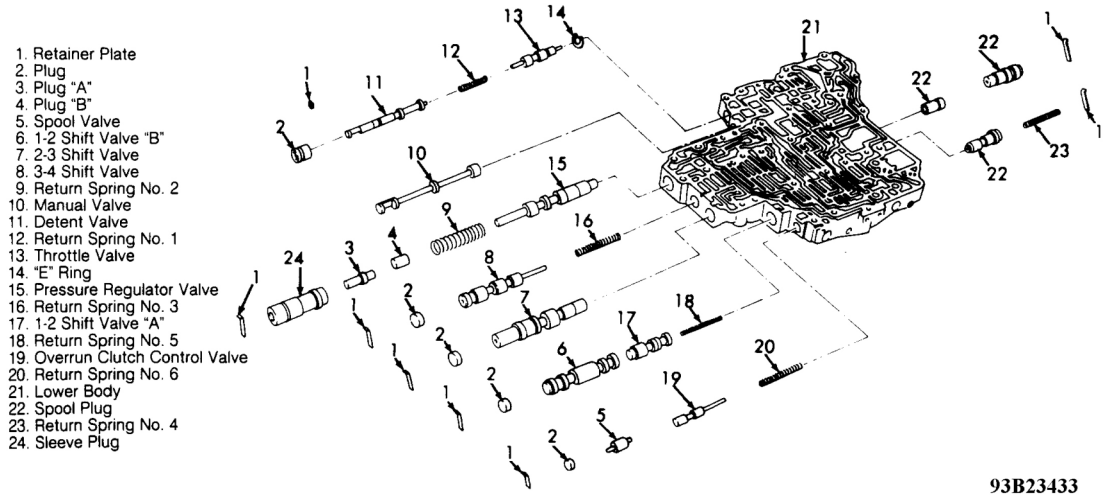


Fig. 26: Exploded View Of Control Valve Lower Body
Courtesy of NISSAN MOTOR CO., U.S.A.

REVERSE CLUTCH

Disassembly

Remove snap ring from reverse clutch assembly. Remove drive plates, driven plates, retaining plate, and dish plates. See **Fig. 12** . Record number of plates for reassembly reference. Remove snap ring from clutch drum while compressing springs. Remove spring retainer and return springs. **DO NOT** remove return springs from spring retainer. Remove piston from clutch drum by turning piston clockwise. Remove "D" ring and oil seal from piston.

Inspection

Check dish plate and return springs for deformation, fatigue or damage. Always replace spring retainer and return springs as a set (if necessary). Inspect drive plate facing for burns, cracks or damage. Dish plate thickness should be .110" (2.80 mm). Drive plate thickness should be .079" (2.00 mm). Service limit is .071" (1.80 mm). If drive plate is not as specified, replace drive plate. Ensure check balls in reverse clutch piston are not seized.

Reassembly

1. Prior to installation, apply ATF to "D" ring, oil seal and inner surface of drum. Install "D" ring and oil seal on piston. Install piston assembly in drum while slowly turning clockwise. Install return springs and spring retainer on piston. Compress springs and install snap ring. Install dish plate, drive plates, driven plates, retaining plate and snap ring. **DO NOT** align projections of dish plates.
2. Measure clearance between retaining plate and snap ring. Specified clearance is .019-.031" (.50-.80 mm).

Service limit is .047" (1.20 mm). Retaining plate is available in selective thicknesses of .17-.20" (4.4-5.2 mm) in .008" (.20 mm) increments.

3. Check reverse clutch operation. Install seal ring onto drum support of oil pump cover. Install reverse clutch assembly. Apply compressed air to oil hole. See **Fig. 27** . Ensure retaining plates move toward snap ring. If retaining plate does not move as described, "D" ring or oil seal may be damaged.

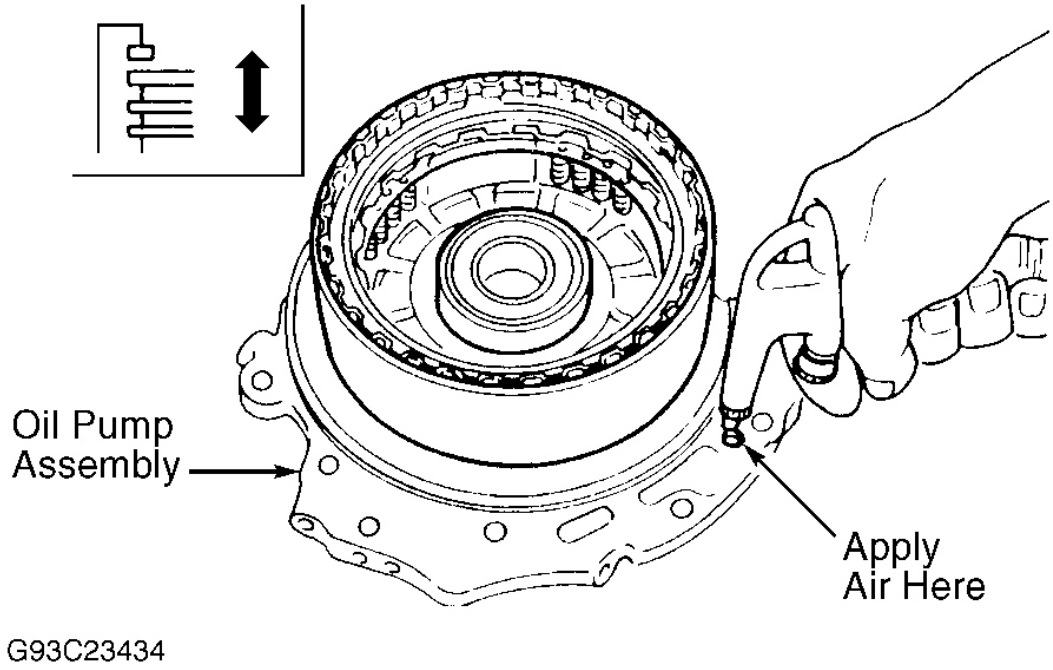


Fig. 27: Checking Reverse Clutch Operation
Courtesy of NISSAN MOTOR CO., U.S.A.

HIGH CLUTCH

Disassembly & Inspection

1. Remove seal rings from input shaft. Service procedures for high clutch are same as for reverse clutch. Dish plate thickness should be .106" (2.70 mm). Drive plate thickness should be .078" (2.00 mm). Service limit is .071" (1.80 mm).
2. Measure clearance between retaining plate and snap ring. Specified clearance is .055-.071" (1.40-1.80 mm). Service limit is .094" (2.40 mm). Retaining plate is available in selective thicknesses of .142-.189" (3.60-4.80 mm) in .008" (.20 mm) increments. Ensure check balls in high clutch piston are not seized.

Reassembly

1. Install NEW seal rings on input shaft. Measure clearance between seal ring and ring groove. Specified

clearance is .003-.009" (.08-.23 mm). Service limit is .009" (.23 mm). If clearance is not as specified, replace input shaft. Check operation of high clutch.

2. Apply compressed air to oil hole (hole nearest high clutch drum) of input shaft. Plug opposite side of oil hole. Ensure retaining plate moves toward snap ring. If retaining plate does not move as described, "D" ring or oil seal may be damaged. Apply petroleum jelly to seal rings. Tape thick paper around seal rings to prevent rings from spreading.

FORWARD & OVERRUN CLUTCHES

Disassembly

Service procedures for forward clutch and overrun clutch are same as for reverse clutch. See **Fig. 12** .

Inspection

Check forward clutch and overrun clutch return springs for deformation or damage. Check spring free length and outer diameter. Inner spring free length should be 1.035" (26.30 mm). Inner spring diameter should be .30" (7.7). Outer spring free length should be 1.047" (26.60 mm). Outer spring diameter should be .417" (10.60 mm). Inspect drive plate facing for burns, cracks or damage. Ensure check balls in forward clutch and overrun clutch pistons are not seized.

Reassembly

1. Reassembly procedures for forward and overrun clutches are same as for reverse clutch. Dish plate thickness for forward clutch should be .098" (2.50 mm). Dish plate thickness for overrun clutch should be .085" (2.15 mm). Drive plate thickness for forward clutch should be .071" (.1.80 mm). Service limit is .063" (1.60 mm). Drive plate thickness for overrun clutch should be .063" (1.60 mm). Service limit is .055" (1.40 mm).
2. Measure clearance between retaining plate and snap ring. Specified clearance for forward clutch is .018-.034" (.45-.85 mm). Service limit is .073" (1.85 mm). Specified clearance for overrun clutch is .039-.055" (1.00-1.40 mm). Service limit is .079" (2.00 mm).
3. Forward clutch retaining plate is available in selective thicknesses of .14-.18" (3.6-4.6 mm) in .008" (.20 mm) increments. Overrun clutch retaining plate is available in selective thicknesses of .14-.17" (3.6-4.4 mm) in .008" (.20 mm) increments.
4. Check forward and overrun clutch operation. Install bearing retainer on forward clutch drum. Apply compressed air to appropriate oil hole of forward clutch drum. See **Fig. 28** . Ensure retaining plate moves toward snap ring. If retaining plate does not move as described, "D" ring or oil seal may be damaged.

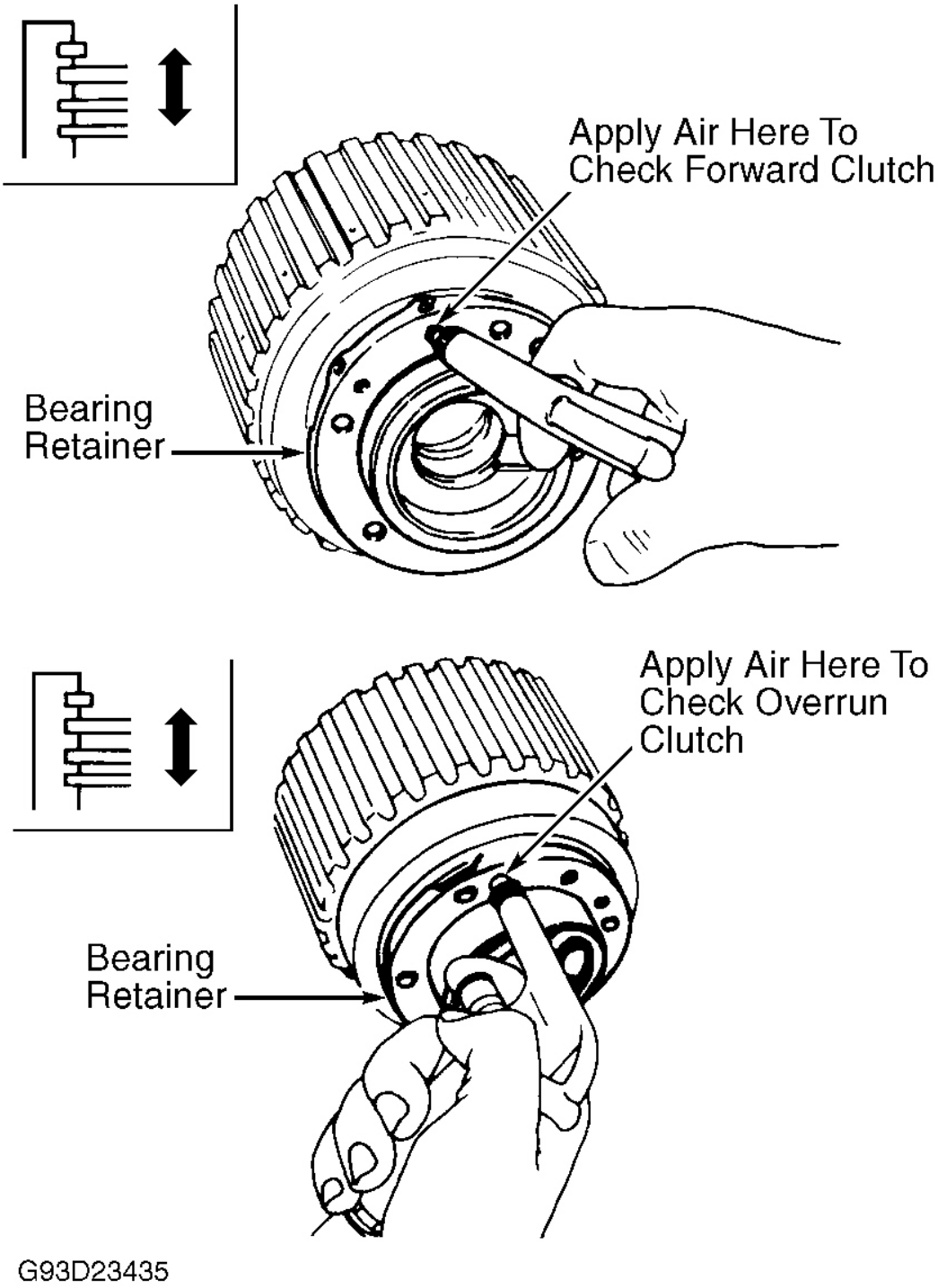


Fig. 28: Checking Forward & Overrun Clutch Operation
Courtesy of NISSAN MOTOR CO., U.S.A.

LOW- REVERSE BRAKE

Disassembly

Position transaxle case to obtain access to low-reverse brake snap ring. Remove snap ring. Remove drive plates, driven plates and retaining plate from transaxle case. See **Fig. 12** . Record number of plates for reassembly reference. Compress return springs and remove snap ring. Remove spring retainer and return springs from transaxle case. **DO NOT** remove return springs from spring retainer. Apply compressed air to oil hole in transaxle case and remove piston. See **Fig. 29** . Remove "D" ring and oil seal from piston.

Inspection

Check low-reverse brake snap ring, springs and retainer for deformation or damage. Always replace spring retainer and return springs as a set (if necessary). Check low and reverse drive plates for burns, cracks or damage.

Reassembly

1. Reassembly procedures for low-reverse brake are same as for reverse clutch. Drive plate thickness should be .079" (2.00 mm). Service limit is .07" (1.8 mm). Specified clearance is .055-.071" (1.40-1.80 mm). Service limit is .110" (2.80 mm). Retaining plate is available in selective thicknesses of .141-.181" (3.60-4.60 mm), in increments of .008" (.20 mm).
2. Check low-reverse brake operation. Apply compressed air to oil hole in transaxle case. See **Fig. 30** . Ensure retaining plate moves toward snap ring. If retaining plate does not move, "D" ring or oil seal may be damaged.

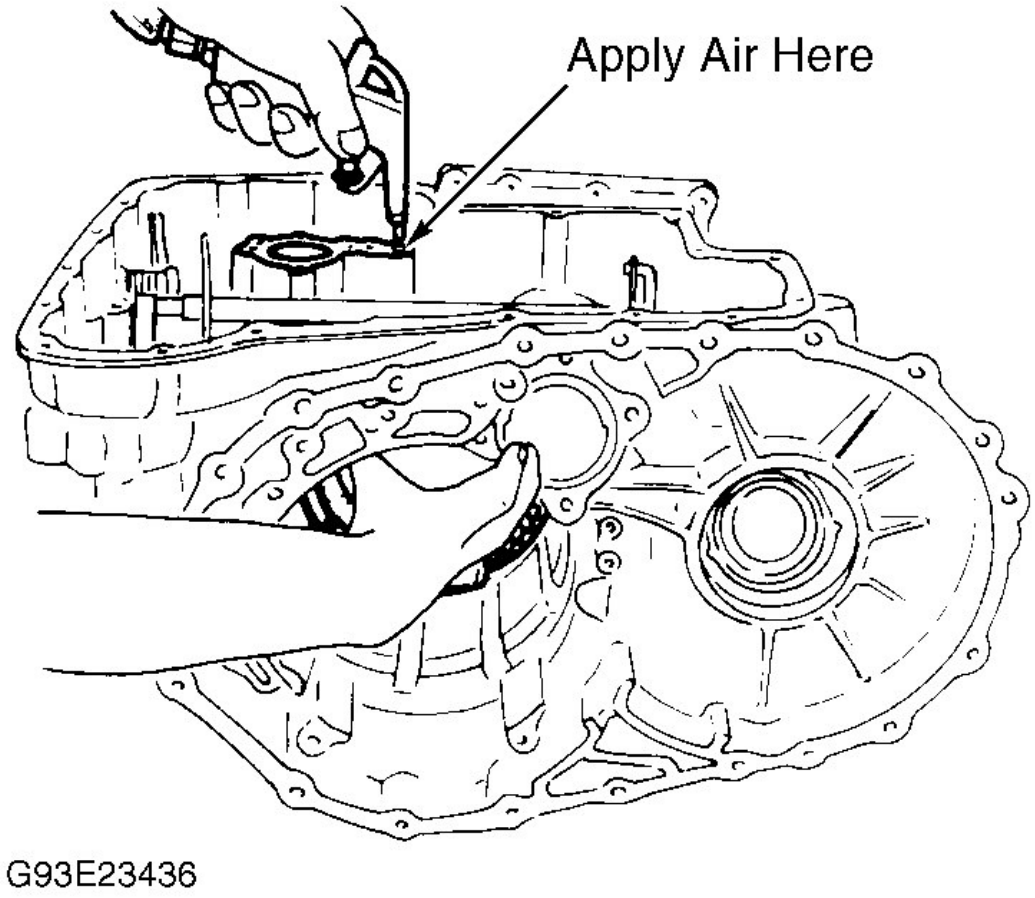


Fig. 29: Removing Low-Reverse Brake Piston
Courtesy of NISSAN MOTOR CO., U.S.A.

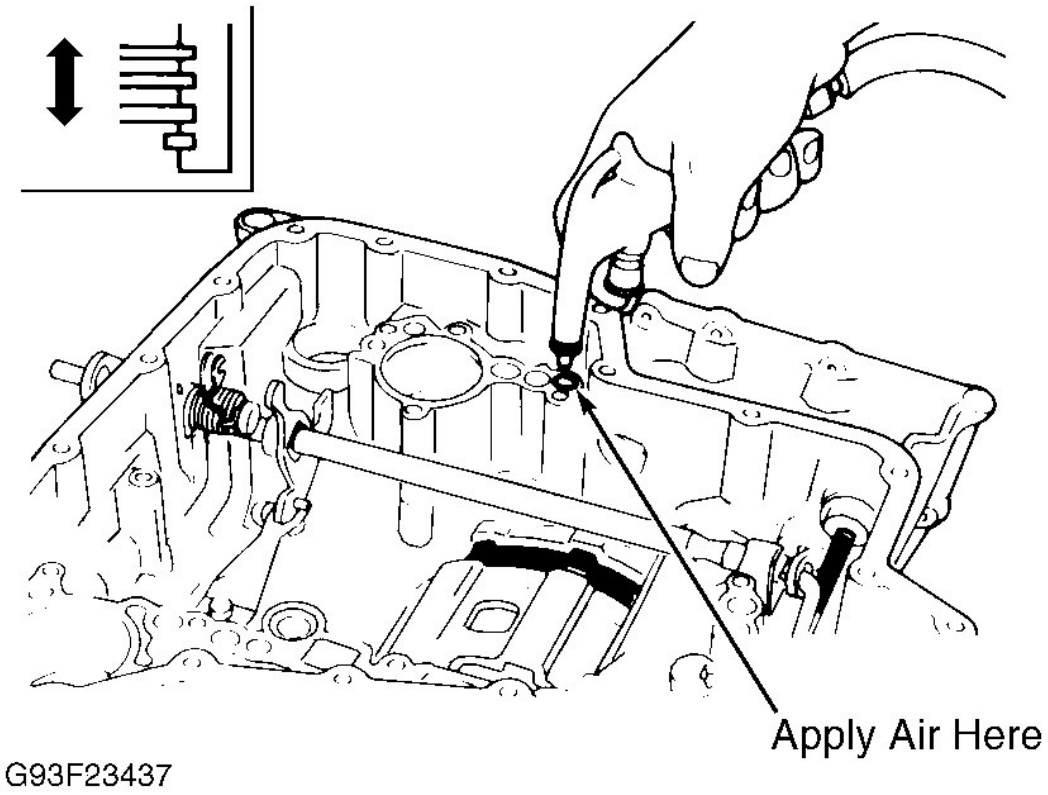


Fig. 30: Checking Low & Reverse Operation
Courtesy of NISSAN MOTOR CO., U.S.A.

REAR INTERNAL GEAR, FORWARD CLUTCH HUB & OVERRUN CLUTCH HUB

Disassembly

Remove snap ring from overrun clutch hub. Remove overrun clutch hub from forward clutch hub. See **Fig. 12** . Remove thrust washer from forward clutch hub. Remove forward clutch hub from rear internal gear. Remove end bearing from rear internal gear. Remove thrust washer from rear internal gear. Remove end bearing from forward one-way clutch. Remove one-way clutch from forward clutch hub.

Inspection

Check frictional surfaces for wear or damage. Check forward one-way clutch, end bearing and snap ring for wear or damage.

Reassembly

1. Install forward one-way clutch on forward clutch hub with arrow facing forward. See **Fig. 31** . Apply petroleum jelly to end bearings and thrust washers. Install end bearing on forward one-way clutch.

2. Install thrust washer on rear internal gear. Align pawls of thrust washer with holes in rear internal gear. Install end bearing on rear internal gear. Install forward clutch hub on rear internal gear. Ensure forward clutch hub rotates counterclockwise only.
3. Install thrust washer on overrun clutch hub. Align pawls of thrust washer with holes in overrun clutch hub. Install overrun clutch hub on rear internal gear. Align projections of rear internal gear with holes in overrun clutch hub. Install snap ring to rear internal gear.

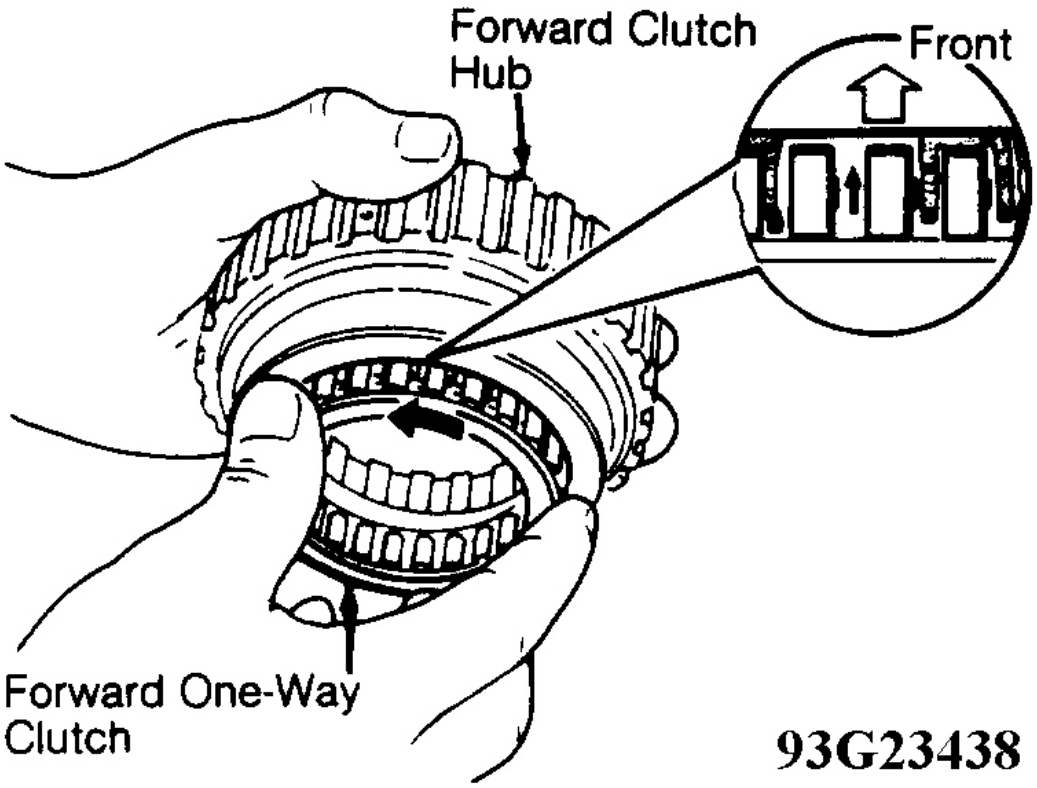


Fig. 31: Checking Forward One-Way Clutch Rotation
Courtesy of NISSAN MOTOR CO., U.S.A.

BAND SERVO PISTON ASSEMBLY

Disassembly

1. Use appropriate puller to compress servo piston. Remove band servo piston snap ring. Apply compressed air to oil hole in transaxle case to remove OD servo piston retainer and band servo piston assembly. See **Fig. 28** .
2. Apply compressed air to oil hole in servo piston retainer to remove OD band servo piston from retainer. Secure OD band servo piston while applying compressed air. Remove "D" ring from OD band servo

piston. Remove "O" rings from OD servo piston retainer. See **Fig. 8** .

3. Remove band servo piston assembly from servo piston retainer by pushing forward. Place piston stem end on wooden block. While pushing servo piston spring retainer down, remove "E" ring. Remove OD servo retainer spring, band servo thrust washer and band servo piston stem from band servo piston. Note direction of "O" rings and "D" rings. Remove "O" rings from servo piston retainer. Remove "D" rings from band servo piston.

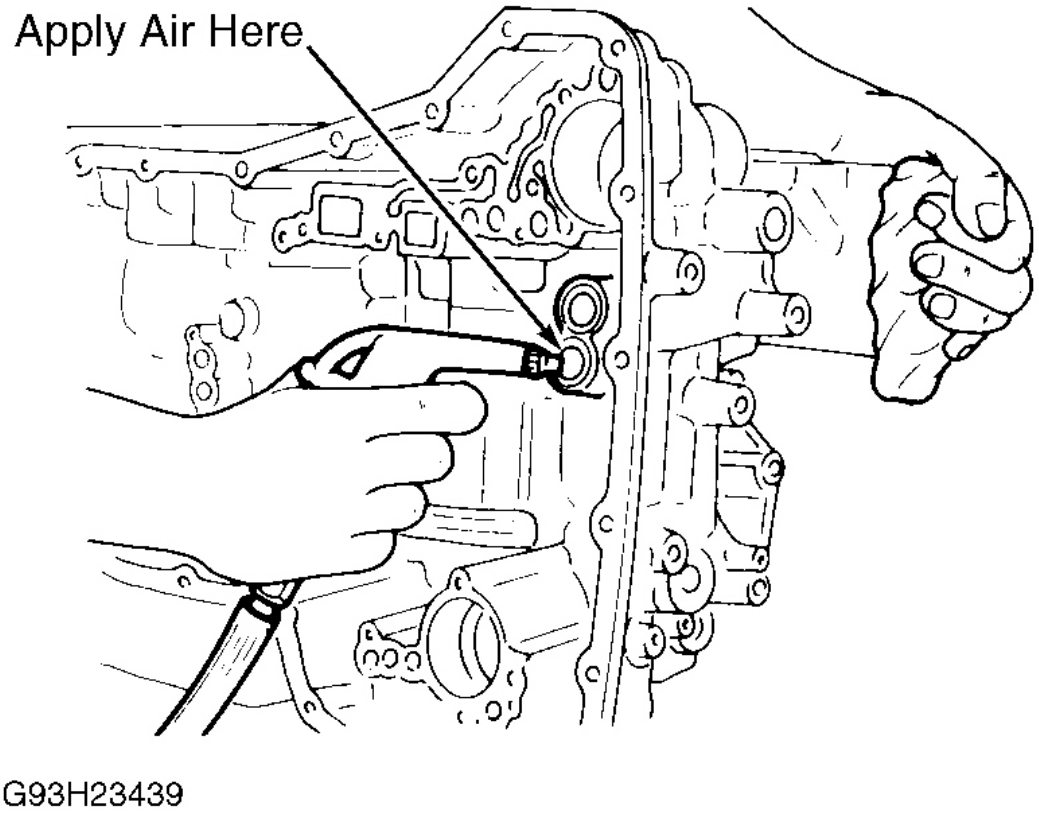


Fig. 32: Removing OD Piston Retainer & Band Servo Piston
Courtesy of NISSAN MOTOR CO., U.S.A.

Inspection

Check frictional surfaces for abnormal wear or damage. Check return springs for deformation or damage. Check spring free length and outer diameter. Free length of 2nd servo return spring should be 1.28" (32.5 mm), diameter should be 1.020" (25.90 mm). Free length of OD servo return spring should be 1.220" (31.00 mm), diameter should be .854" (21.70 mm). Replace spring(s) if not as specified.

Reassembly

1. Apply ATF to all "D" rings and "O" rings prior to installation. Install "D" rings on servo piston retainer.

Install band servo piston stem, band servo thrust washer, OD servo return spring and spring retainer on band servo piston. Place piston stem on wooden block. While pushing servo piston spring retainer down, install "E" ring.

2. Install "O" rings on servo piston retainer. Install band servo piston assembly into servo piston retainer by pushing inward. Install "D" ring on OD band servo piston. Install "O" rings on OD servo piston retainer.
3. Install OD band servo piston to OD servo piston retainer. Install band servo piston assembly and 2nd servo return spring in transaxle case. Install OD band servo piston assembly to transaxle case. Install band servo piston snap ring on transaxle case. See **Fig. 8** .

OUTPUT SHAFT & GEAR, IDLER GEAR, REDUCTION GEAR & BEARING RETAINER

Disassembly

1. Remove seal rings from output shaft and bearing retainer. See **Fig. 8** . Using appropriate press and adapter, press off output shaft bearing. Using appropriate puller, remove output shaft bearing race from bearing retainer. Using appropriate puller and drift, remove output gear bearing.
2. Using appropriate puller and drift, remove idler gear bearing from idler gear. Using appropriate puller, remove idler gear bearing race from transaxle case. Using press and adapter, press reduction gear bearing from reduction gear. Remove 4 bolts and remove reduction gear bearing race from transaxle case. See **Fig. 8** .

Inspection

1. Inspect output shaft for cracks, wear or damage. Check all gears for wear, chips and cracks. Ensure bearings roll freely and are free from noise, cracks, pitting or wear.
2. Install NEW seal rings to output shaft and bearing retainer. Measure clearance between seal ring and ring grooves of output shaft and bearing retainer. Specified clearance is .004-.010" (.10-.25 mm). Service limit is .010" (.25 mm). If clearance is not as specified, replace output shaft or bearing retainer as necessary.

Reassembly

To reassemble, reverse disassembly procedure. Tighten reduction gear bearing race bolts to 46-49 ft. lbs. (63-67 N.m). Apply petroleum jelly to NEW seal rings and install seal rings on output shaft and bearing retainer. Tape thick paper around seal rings to prevent rings from spreading.

MANUAL SHAFT & THROTTLE LEVER

Disassembly

1. Remove detent spring from transaxle case. Pull out throttle shaft retaining pin, then remove throttle shaft from transaxle case. Drive out manual plate retaining pin. Drive and pull out parking rod plate retaining pin. Remove parking rod plate from manual shaft. See **Fig. 8** .
2. Remove parking rod from transaxle case. Pull out manual shaft retaining pin. Remove manual shaft and manual plate from transaxle case. Remove manual shaft oil seal. Inspect all components for wear or damage.

Reassembly

To reassemble, reverse disassembly procedure. Apply ATF to outer surface of oil seal prior to installation. Manual plate and parking rod plate retaining pins should extend .197-.236" (5.00-6.00 mm) outside of shaft. Tighten detent spring bolt to 57-66 INCH lbs. (6.4-7.5 N.m).

DIFFERENTIAL ASSEMBLY

Disassembly

Remove ring gear. Using appropriate puller, adapter and drift, remove differential side bearings. Remove speedometer drive gear. Drive out pinion shaft retaining pin. Remove pinion shaft from differential case. Remove pinion gears and side gears. See **Fig. 11** .

Inspection

Check mating surfaces of differential case, side gears and pinion gears for wear, scoring or damage. Check washers for wear or damage. Ensure bearings roll freely and are free from cracks, pitting or wear.

Reassembly

1. Install side gears and thrust washers in differential case. Install pinion gears and thrust washers in case by rotating gears. Apply ATF to all components. Position 2 feeler gauges of same thickness on opposite sides of differential case. Measure clearance between side gear thrust washers and differential case.
2. Specified clearance should be .004-.008" (0.10-0.20 mm). If clearance is not as specified, adjust clearance by changing thickness of side gear thrust washers. Washers are available in selective thicknesses of .030-.040" (.75-1.00 mm), in increments of .002" (.05 mm).
3. Install retaining pin. Ensure retaining pin is flush with case. Install speedometer drive gear in differential case. Align projections of speedometer drive gear with groove in differential case. See **Fig. 33** .
4. Press differential side bearings on differential case. Install ring gear and tighten bolts in numerical order. See **Fig. 34** . Tighten bolts to 54-65 ft. lbs. (74-88 N.m).

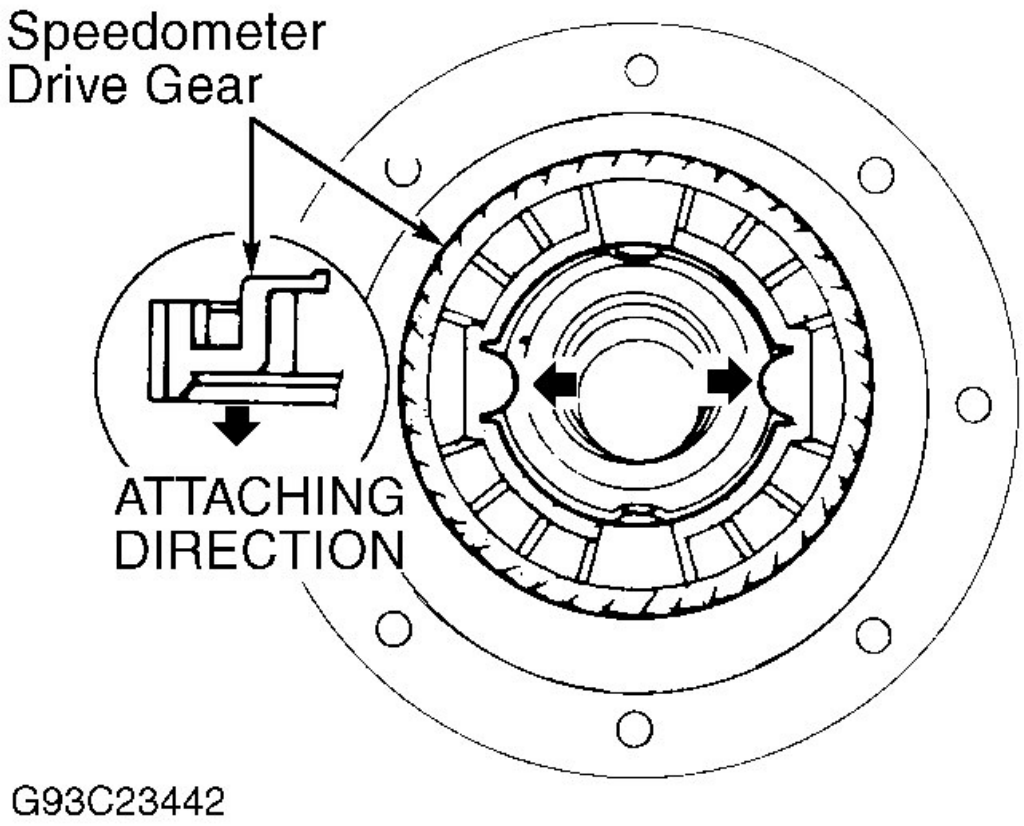


Fig. 33: Installing Speedometer Drive Gear
Courtesy of NISSAN MOTOR CO., U.S.A.

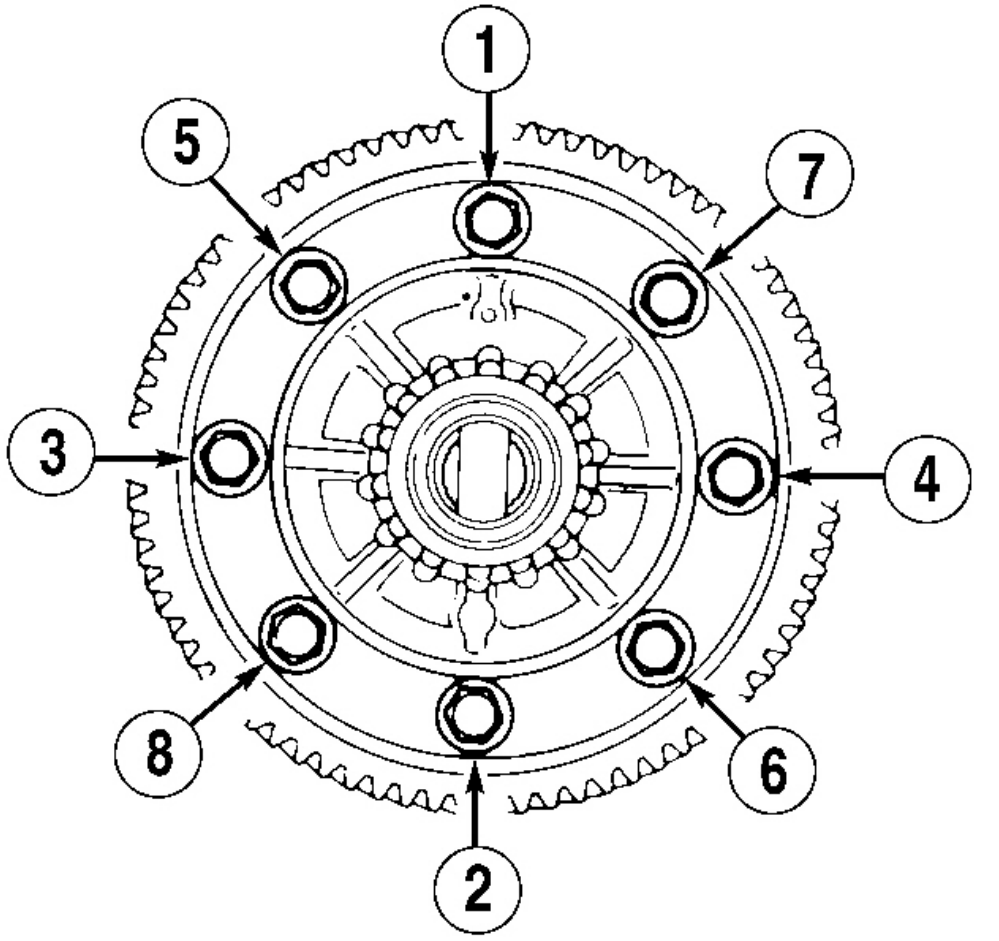


Fig. 34: Tightening Ring Gear Bolts
Courtesy of NISSAN MOTOR CO., U.S.A.

TRANSAXLE ADJUSTMENTS

NOTE: Transaxle adjustments are performed as part of transaxle assembly procedure. See TRANSAXLE REASSEMBLY .

REDUCTION GEAR BEARING PRELOAD

1. Preload is adjusted by adjusting shim thickness. Remove converter housing and differential assembly from transaxle case (if necessary). Install reduction gear and idler gear in transaxle case. Using a depth gauge and straightedge, measure distance between end of reduction gear and surface of transaxle case in at least 2 places (Dimension "B"). See **Fig. 35** . Measure distance between surface of idler gear bearing and surface of transaxle case in at least 2 places (Dimension "C").
2. Measure distance between end of reduction gear and adjusting shim mating surface of reduction gear in at least 2 places (Dimension "D"). Dimension "A" equals Dimension "D" minus (Dimensions "B" plus "C"). See **Fig. 35** .
3. For example, Dimension "D" is .24" (6.0 mm). Dimension "B" is .08" (2.0 mm) and Dimension "C" is .04" (1.0 mm). Total Dimension "A" would be .12" (3.0 mm).
4. Measure distance between end of idler gear and idler gear bearing mating surface of idler gear in at least 2 places (Dimension "E"). Reduction gear bearing preload should be .002" (.05 mm).
5. Select proper thickness of reduction gear bearing adjusting shim by subtracting Dimension "E" from Dimension "A". Shims are available in thicknesses of .043-.111" (1.10-2.82 mm), in increments of .002" (.04 mm). If total dimension is .045-.046" (1.13-1.17 mm), required shim thickness is .043" (1.10 mm). For each .002" (.04 mm) dimension increase, shim thickness will increase same amount up to .112-.114" (2.85-2.89 mm).
6. Install selected adjusting shim. Press idler gear bearing on idler gear. Press idler gear on reduction gear. Ensure idler gear locks on parking pawl. Lock idler gear with parking pawl and tighten idler gear lock nut to 181-203 ft. lbs. (245-275 N.m).
7. Turn reduction gear in both directions several times to seat bearings. Using a torque wrench and appropriate socket, measure reduction gear turning torque. Turning torque should be .97-6.10 INCH lbs. (.11-.69 N.m). After adjusting turning torque, stake lock nut to ensure nut will not loosen.

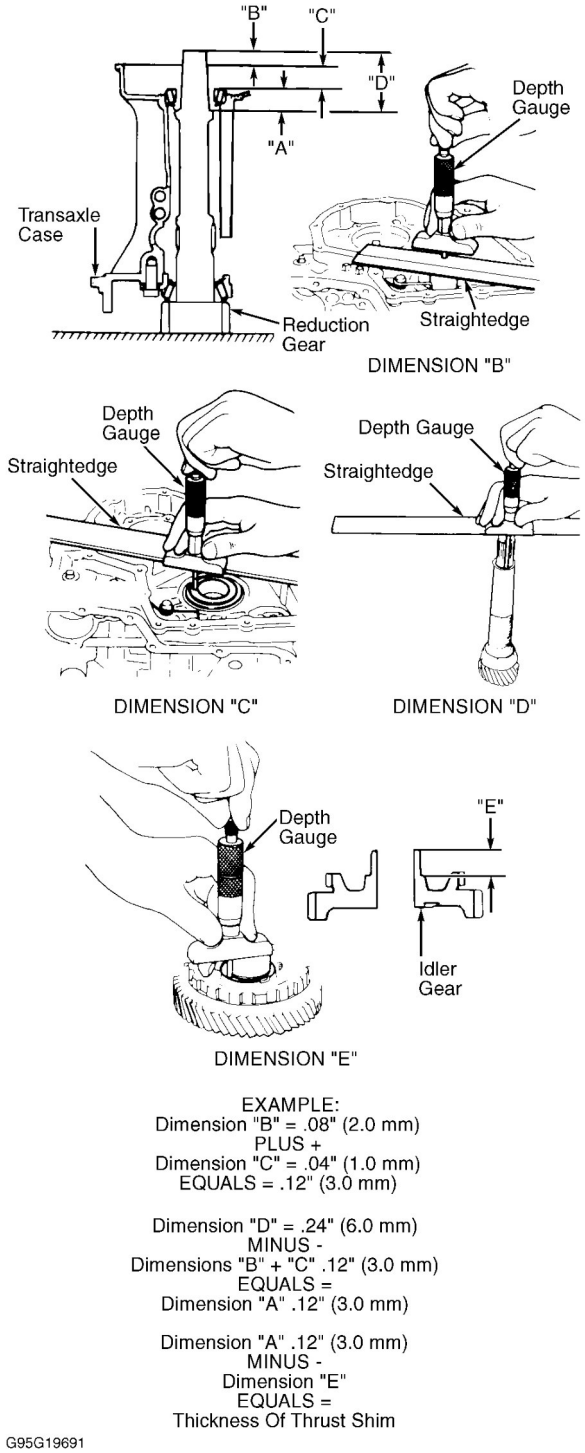


Fig. 35: Measuring Reduction Gear Bearing Preload
Courtesy of NISSAN MOTOR CO., U. S. A.

OUTPUT SHAFT BEARING PRELOAD

1. Output shaft bearing preload is adjusted by adjusting thickness of output shaft adjusting spacer. Remove paper from output shaft. Install bearing retainer on output shaft. Install output gear bearing in bearing retainer. Using a depth gauge and straightedge, measure distance between end of output shaft and surface of output gear bearing in at least 2 places (Dimension "G"). Measure distance between end of output shaft and adjusting spacer mating surface of output shaft (Dimension "H"). See **Fig. 36** .
2. Dimension "H" minus Dimension "G" equals Dimension "F". Measure distance between end of output gear (adjusting spacer mating surface), and bearing surface (Dimension "I"). Dimension "F" minus Dimension "I" equals output shaft bearing preload. See **Fig. 36** . Output shaft bearing preload should be .001-.003" (0.03-0.08 mm). Select proper thickness of output shaft adjusting spacer.
3. Spacers are available in thicknesses of .221-.284" (5.62-7.22 mm), in increments of .002" (.04 mm). If total dimension is .222-.224" (5.65-5.69 mm), required shim thickness is 0.022" (5.62 mm). For each .002" (.04 mm) dimension increase, shim thickness will increase same amount up to .285-.287" (7.25-7.29 mm).
4. Install bearing retainer on transaxle case. Tighten retainer bolts to 12-15 ft. lbs. (16-21 N.m). Install output shaft on bearing retainer. Install selected output shaft bearing adjusting spacer on output shaft. Press output gear bearing on output gear. Press output gear on output shaft. Tighten output gear lock nut to 181-203 ft. lbs. (245-275 N.m). Remove idler gear to measure output shaft preload.
5. Turn output shaft in both directions several times to seat bearings. Using a torque wrench and appropriate socket, measure output shaft turning torque. Turning torque should be 2.2-7.8 INCH lbs. (.25-.88 N.m). Install idler gear and tighten lock nut to 181-203 ft. lbs. (245-275 N.m). After adjusting turning torque, stake lock nuts to ensure nut will not loosen. Install NEW side cover gasket and install side cover on transaxle case. Tighten bolts to 44-62 INCH lbs. (5-7 N.m).

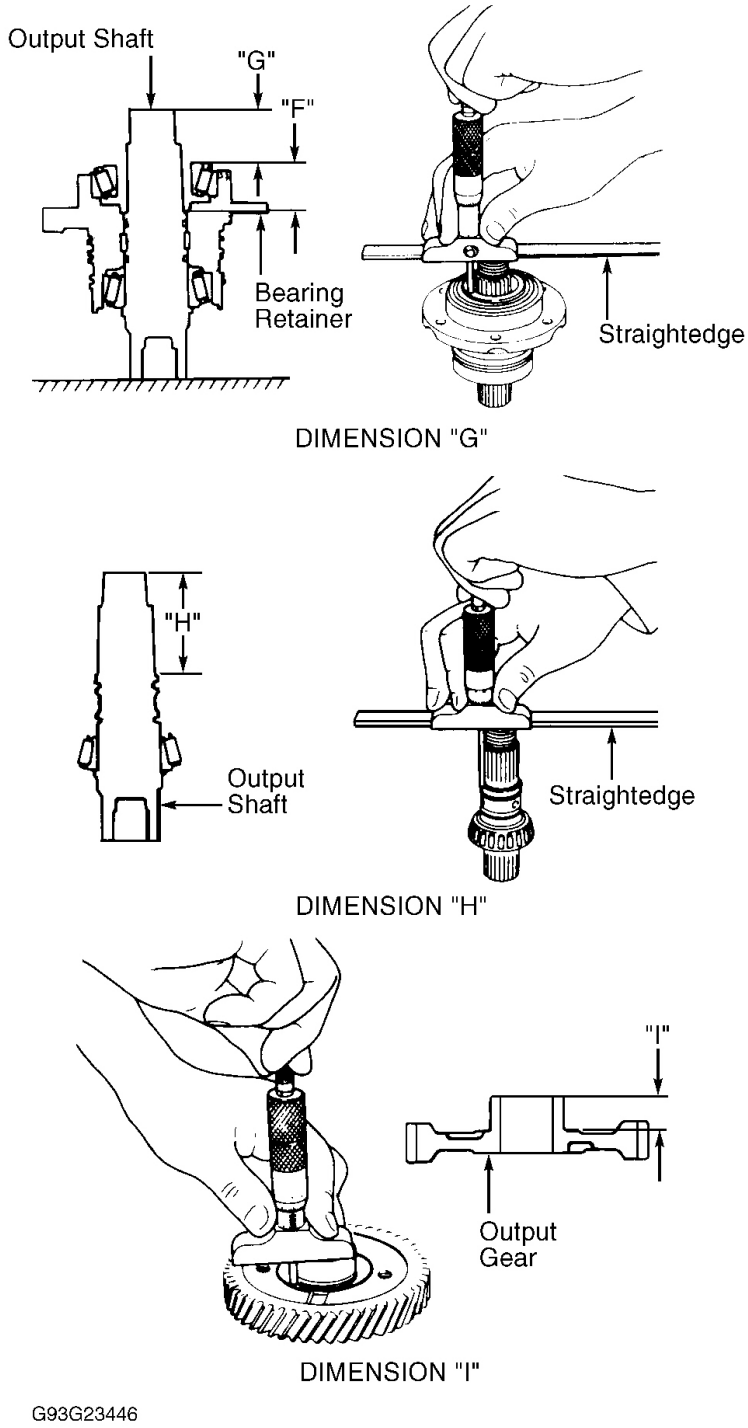
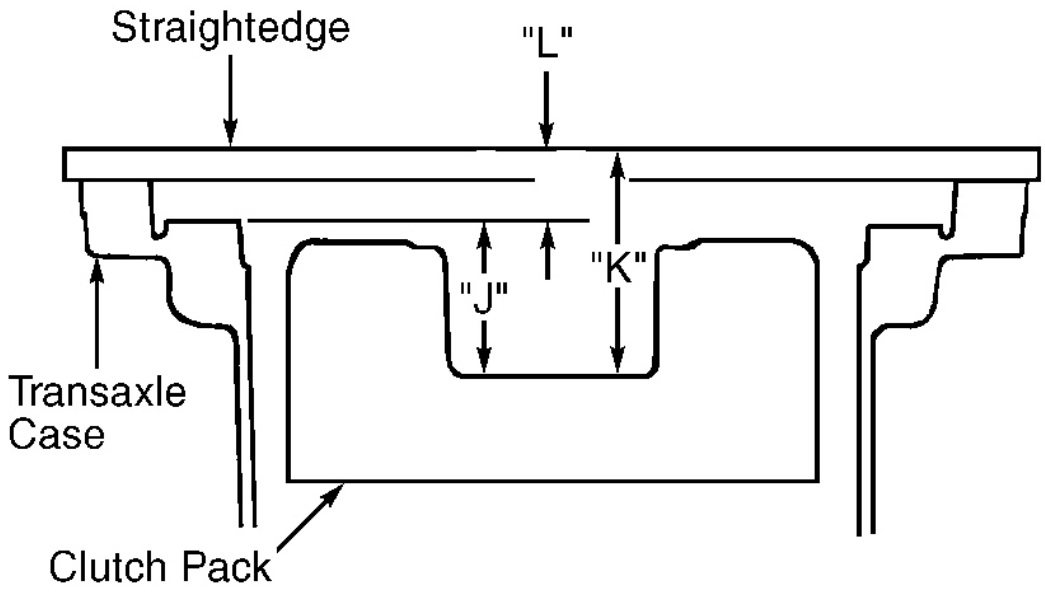


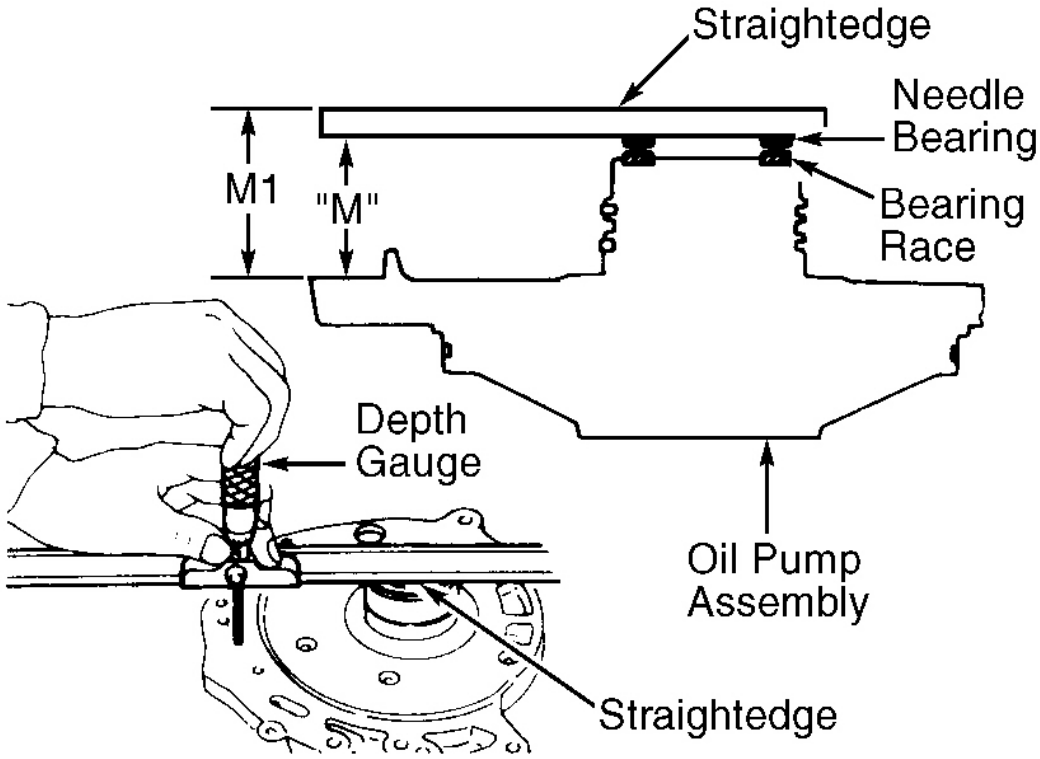
Fig. 36: Measuring Output Shaft Bearing Preload
Courtesy of NISSAN MOTOR CO., U. S. A.

TOTAL END PLAY

1. Total end play is adjusted by adjusting bearing race thickness. Using a depth gauge and straightedge, measure dimensions "K" and "L". Dimension "K" minus Dimension "L" equals distance between oil pump surface of transaxle case and needle bearing mating surface of high clutch drum (Dimension "J"). See **Fig. 37** . Install bearing race and needle bearing on oil pump assembly. Measure distance between transaxle case surface and needle bearing on oil pump cover (Dimension "M").
2. Dimension "M1" minus straightedge thickness equals Distance "M". Dimension "J" minus Dimension "M" equals total end play. See **Fig. 37** . Total end play should be .010-.022" (.25-.55 mm). Bearing races are available in thicknesses of .024-.087" (.60-2.20 mm) in increments of .015" (.40 mm). Select proper thickness of bearing race to ensure total end play is as specified.



DIMENSION "J"



DIMENSION "M"

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Fig. 37: Measuring Total End Play
Courtesy of NISSAN MOTOR CO., U. S. A.

REVERSE CLUTCH END PLAY

1. Reverse clutch end play is adjusted by adjusting thrust washer thickness. Place thrust washer on reverse clutch drum. Using a depth gauge and straightedge, measure distance between thrust washer and straightedge (Dimension "O"). Measure distance between oil pump mating surface on transaxle case and straightedge (Dimension "P"). See **Fig. 38** . Dimension "O" minus Dimension "P equals distance between oil pump surface of transaxle case and thrust washer on reverse clutch drum (Dimension "N").
2. Measure distance between oil pump surface and straightedge (Dimension "R"). See **Fig. 38** . Measure distance between thrust washer mating surface and straightedge (Dimension "S"). Dimension "R" minus Dimension "S" is distance between transaxle case surface and thrust washer mating surface (Dimension "Q").
3. Dimension "N" minus Dimension "Q" equals total reverse clutch end play. Reverse clutch end play should be .026-.039" (.65-1.00 mm). Thrust washers are available in thicknesses of .026-.061" (.65-1.55 mm), in increments of .006" (.15 mm). Select proper thickness thrust washer to ensure reverse clutch end play is as specified.

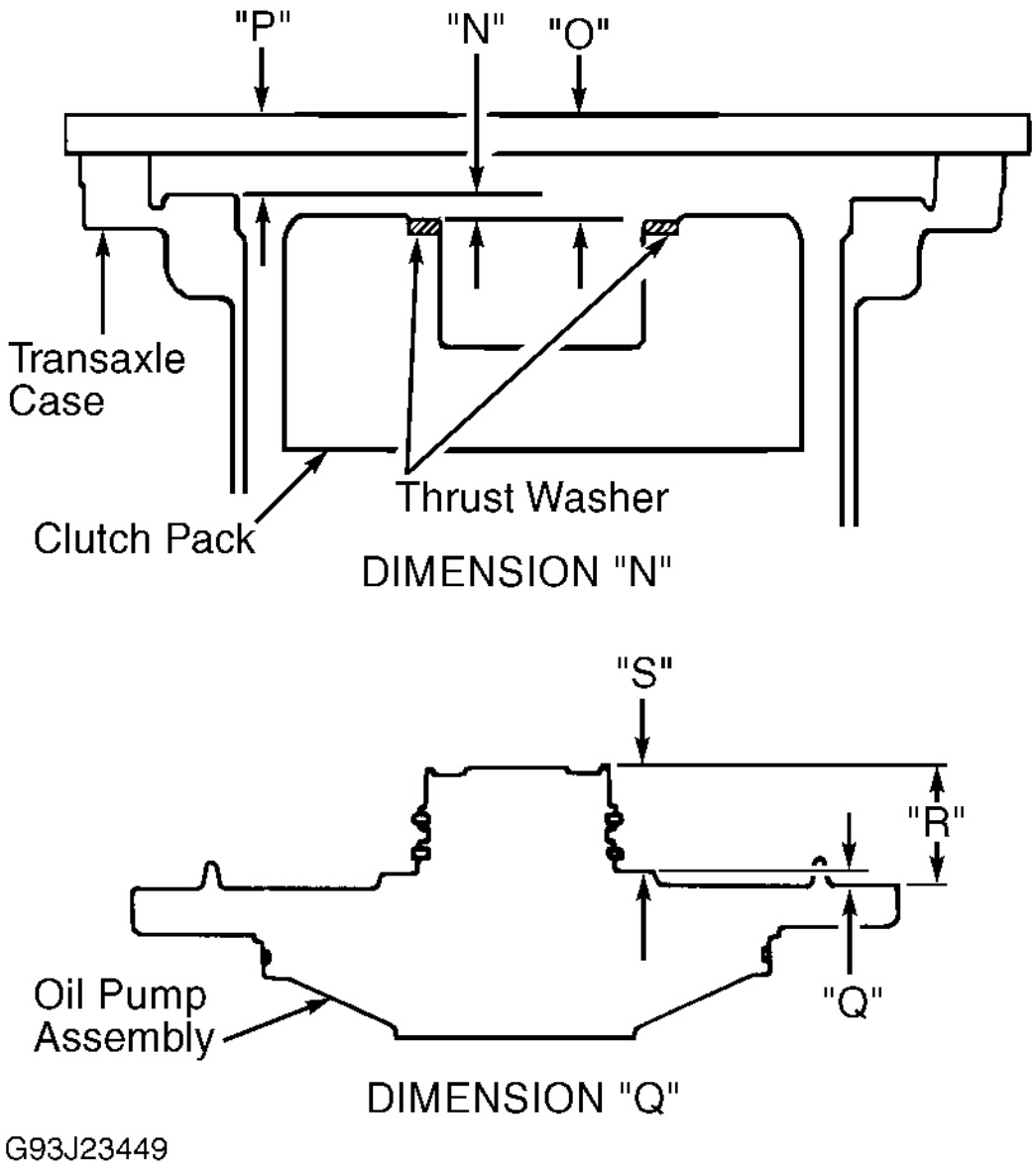

Fig. 38: Measuring Reverse Clutch End Play
Courtesy of NISSAN MOTOR CO., U. S. A.

DIFFERENTIAL ASSEMBLY END PLAY

1. Differential assembly end play is adjusted by adjusting differential side bearing shim thickness. Using a depth gauge and straightedge, measure distance between side bearing surface of transaxle case and converter housing surface of transaxle case. Measure thickness of straightedge (Dimension "T2"). See **Fig. 39** .
2. Depth gauge measurement minus thickness of straightedge equals total distance between side bearing

surface of transaxle case and converter housing surface of transaxle case (Dimension "T"). Place differential assembly on converter housing. Measure distance between end of differential case and transaxle case surface of converter housing (Dimension "U"). See **Fig. 39** .

3. Measure distance between end of differential case and adjusting shim mating surface of differential side bearing (Dimension "V"). Dimension "T" minus Dimension "U" plus Dimension "V" equals differential assembly end play. Differential assembly end play should be 0-.006" (0-.15 mm).
4. Differential side bearing adjusting shims are available in thicknesses of .017-.035" (.44-.88 mm), in increments of .015" (.40 mm). Select proper thickness differential side bearing adjustment shim to ensure differential end play is within specification.

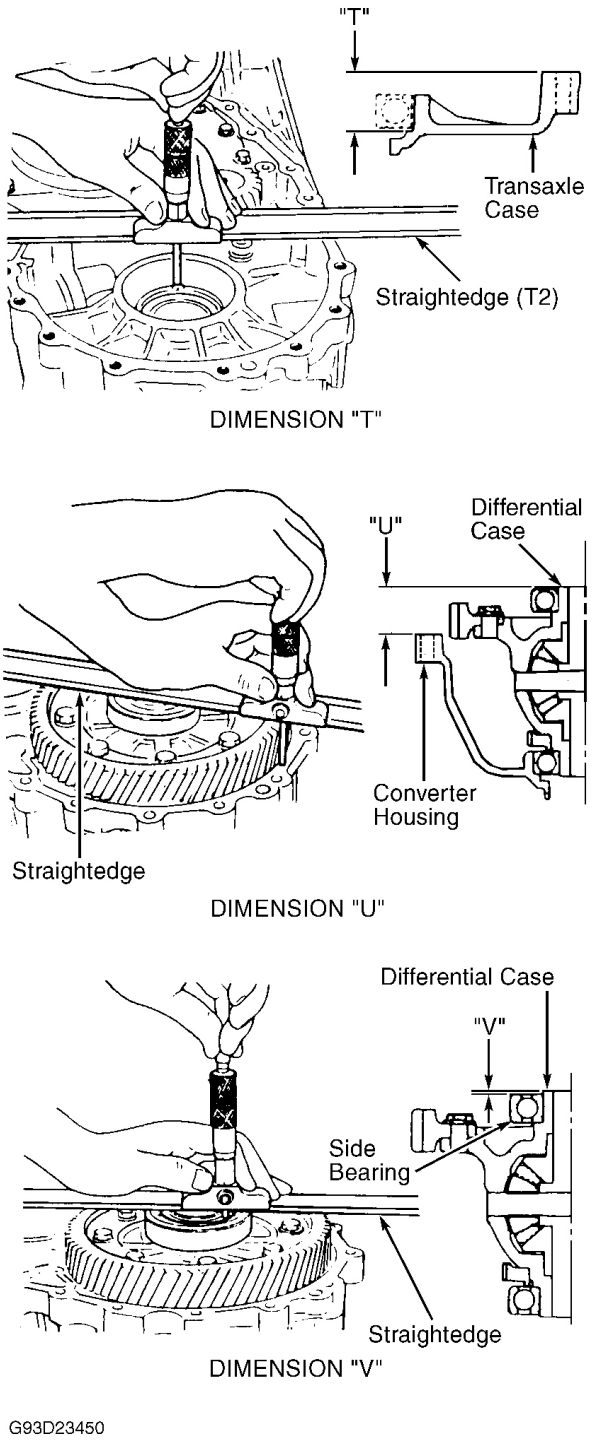

Fig. 39: Measuring Differential Assembly End Play
Courtesy of NISSAN MOTOR CO., U. S. A.

TRANSAXLE REASSEMBLY

NOTE: See NEEDLE BEARING, SNAP RING, THRUST WASHER & SHIM LOCATIONS table for component locations. Also see Fig. 41 .

1. Install differential side oil seal in converter housing with .216-.259" (5.50-6.60 mm) of seal protruding from housing. Install differential side oil seal in transaxle case with 0.02" (0.5 mm) of seal recessed inside housing.
2. Install parking actuator support to transaxle case with beveled edge inward. Install parking pawl on transaxle case and secure with parking shaft. Install return spring. See **Fig. 8** . Perform Reduction Gear Bearing Preload and Output Shaft Bearing Preload adjustment procedures. See **TRANSAXLE ADJUSTMENTS** .
3. Remove paper from bearing retainer. Apply petroleum jelly to thrust washer, bearing race and needle bearing. Install thrust washer on bearing retainer. Ensure bearing retainer seal rings are not spread. Align teeth of low-reverse brake drive plates. Install forward clutch assembly. Install bearing race on bearing retainer. Install bearings on rear internal gear with smooth side down.
4. Hold forward clutch hub and turn overrun clutch hub. Ensure overrun clutch hub rotates counterclockwise and does not rotate clockwise. If overrun clutch hub does not operate as described, check installed direction of forward one-way clutch. Align forward clutch and overrun clutch drive plate teeth and install rear internal gear assembly. See **Fig. 12** .
5. Apply petroleum jelly to needle bearing and install needle bearing with smooth side down on rear planetary carrier. Install rear sun gear on rear planetary carrier with grooved side facing out. Install rear planetary carrier in transaxle case. Apply petroleum jelly to thrust needle bearing and install bearing on front planetary carrier with grooved side down.
6. Install low one-way clutch to front planetary carrier by rotating clutch counterclockwise. Ensure one-way clutch does not rotate in clockwise direction. Install front planetary carrier assembly in transaxle case. Install snap ring.

NOTE: Snap ring will not fit in groove of transaxle case if forward clutch and bearings are not installed correctly.

7. Apply petroleum jelly to thrust needle bearing and needle bearings. Install thrust needle bearing on front sun gear with flat side down. Install front sun gear on front planetary carrier. Install needle bearing on front sun gear with smooth side down. Install high clutch hub on front sun gear. Install needle bearing on high clutch hub with smooth side up. See **Fig. 12** .
8. Remove paper from input shaft. Align teeth of high clutch drive plates and install input shaft assembly. Align teeth of reverse clutch drive plates. Apply petroleum jelly to needle bearing and install needle bearing on high clutch assembly with smooth side down.
9. Install reverse clutch assembly. Install anchor end pin, washer and lock nut on transaxle case. Place brake band on reverse clutch drum. Tighten anchor end pin enough that brake band is on reverse drum evenly.
10. Apply petroleum jelly on bearing race selected in TOTAL END PLAY adjustment procedure. See **TOTAL END PLAY** under TRANSAXLE ADJUSTMENTS. Install bearing race on oil pump cover. Apply petroleum jelly on thrust washer selected in **REVERSE CLUTCH END PLAY** adjustment procedure under TRANSAXLE ADJUSTMENTS. Install thrust washer on reverse clutch drum. Install oil pump assembly on transaxle case.
11. Tighten oil pump bolts to 13-15 ft. lbs. (18-21 N.m). Apply ATF to input shaft "O" ring and install "O" ring on input shaft. Adjust brake band. Tighten anchor end pin to 35-53 INCH lbs. (4-6 N.m). Back off

anchor end pin 2 1/2 turns. While holding anchor end pin, tighten lock nut. Apply compressed air to oil holes in transaxle case to ensure correct brake band operation. See **Fig. 40** .

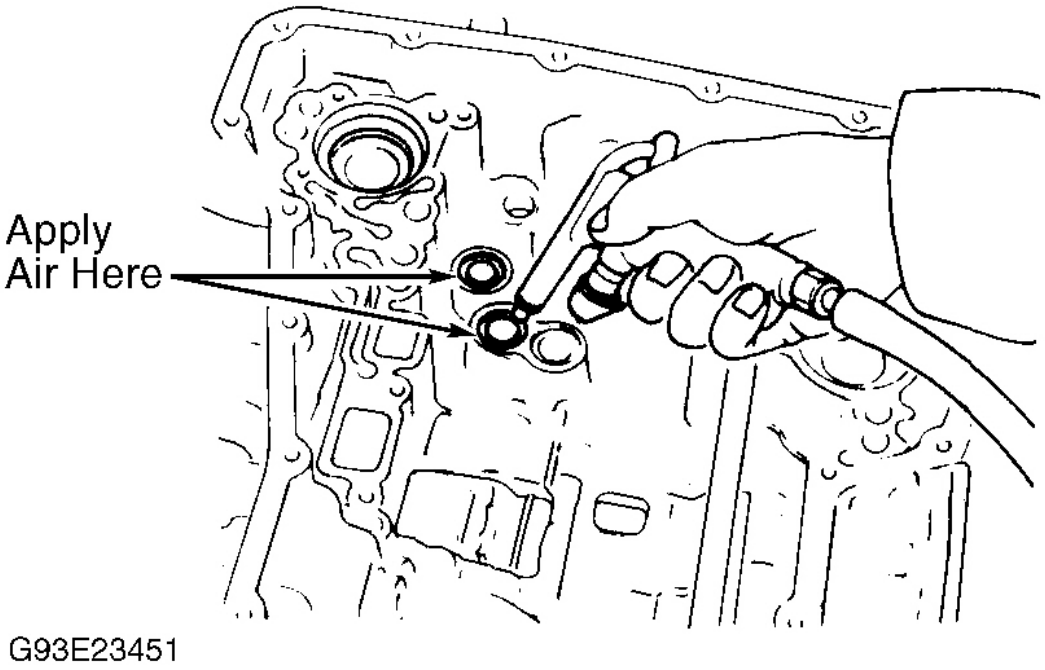

Fig. 40: Checking Brake Band Operation
Courtesy of NISSAN MOTOR CO., U. S. A.

12. Install differential side bearing adjusting shim selected in **DIFFERENTIAL ASSEMBLY END PLAY** adjustment procedure into transaxle case. Install differential assembly on transaxle case. Install oil tube on converter housing and tighten bolts to 44-62 INCH lbs. (5-7 N.m). Install "O" ring on differential oil port of transaxle case. Apply a bead of liquid gasket .060" (1.5 mm) in diameter on inside edge of converter housing mating surface. Install converter housing on transaxle case. Tighten bolts to 20-22 ft. lbs. (26-30 N.m).
13. Check contact surface of accumulator piston for damage. Apply ATF to "O" rings and install on accumulator piston. Install accumulator pistons and return springs in transaxle case. Apply petroleum jelly to lip seals for band servo oil holes and install in transaxle case. Install governor valve oil filter. Install throttle cable to transaxle case. Tighten throttle mounting bolt to 18-35 INCH lbs. (2-4 N.m). Install throttle cable to throttle lever.
14. Apply ATF to manual valve and insert valve into control valve assembly. Set manual shaft in Neutral position. Install control valve assembly on transaxle case while aligning manual valve with manual plate and detent valve with throttle lever.
15. Put solenoid harness into transaxle case and push terminal body onto transaxle case. Install clip to terminal body. Install and tighten control valve assembly bolts to 44-62 INCH lbs. (5-7 N.m). See **Fig. 4** . Attach magnet to oil pan. Install NEW oil pan gasket and install oil pan. Tighten NEW pan bolts in a

crisscross pattern to 44-62 INCH lbs. (5-7 N.m). Install drain plug (if necessary) and tighten to 22-29 ft. lbs. (29-39 N.m) .

NOTE: Always replace oil pan bolts. Bolts are self-sealing.

16. Install governor valve assembly into transaxle. Soak "O" ring in ATF and install on governor cap. Install governor cap on transaxle. Install spacer on governor cap. Install snap ring into transaxle case, aligning snap ring gap with notch on transaxle. Install inhibitor switch and adjust if necessary.
17. Apply ATF to NEW "O" ring and install on dipstick tube. Install dipstick tube and oil cooler tube to transaxle. Tighten dipstick tube bolt to 40-62 INCH lbs. (4-5 N.m). Tighten oil cooler tube bolts to 22-36 ft. lbs. (29-49 N.m).
18. Pour 1.1 qt. (1.0L) of ATF into torque converter and install torque converter. Measure distance "A" to ensure torque converter is installed correctly. See **Fig. 42** . Distance "A" should be 0.83" (21.1 mm) for the RL4F03A transaxle and 0.63" (15.9 mm) for the RL4F03V transaxle.

NEEDLE BEARING, SNAP RING, THRUST WASHER & SHIM LOCATIONS

RL4F03A NEEDLE BEARING, SNAP RING, THRUST WASHER & SHIM LOCATIONS (1)

Application & Number	Outer Diameter In. (mm)
Snap Rings	
No. 1	5.59 (142.0)
No. 2	4.45 (113.0)
No. 3	6.39 (162.4)
No. 4	5.33 (135.4)
No. 5	4.96 (126.0)
No. 6	6.26 (159.0)
Needle Bearings	
No. 7	1.85 (47.0)
No. 8	1.38 (35.0)
No. 9	2.36 (60.0)
No. 10	2.36 (60.0)
No. 11	1.85 (47.0)
No. 12	1.68 (42.6)
No. 13	1.89 (48.0)
No. 14	2.13 (54.0)
Thrust Washers	
No. 15 (Selective)	2.84 (72.0)
No. 16	3.09 (78.5)
Races, Shims & Spacer	
No. 17 (Selective)	1.89 (48.0)
No. 18 (Selective)	1.14 (29.0)
No. 19 (Selective)	1.36 (34.5)
No. 20 (Selective)	3.13 (79.5)

No. 21	2.17 (55.0)

(1) See **Fig. 41** for component locations.

RL4F03V NEEDLE BEARING, SNAP RING, THRUST WASHER & SHIM LOCATIONS (1)

Application & Number	Outer Diameter - In. (mm)
Snap Rings	
No. 1	5.59 (142.0)
No. 2	4.45 (113.0)
No. 3	6.39 (162.4)
No. 4	5.33 (135.4)
No. 5	4.96 (126.0)
No. 6	6.26 (159.0)
No. 7	1.59 (40.5)
Needle Bearings	
No. 8	1.85 (47.0)
No. 9	1.38 (35.0)
No. 10	2.36 (60.0)
No. 11	2.36 (60.0)
No. 12	1.85 (47.0)
No. 13	1.68 (42.6)
No. 14	1.89 (48.0)
No. 15	2.13 (54.0)
No. 16	2.36 (60.0)
Thrust Washers	
No. 17 (Selective)	2.84 (72.0)
No. 18	3.09 (78.5)
Races, Shims & Spacer	
No. 19 (Selective)	1.89 (48.0)
No. 20 (Selective)	2.83 (72.0)
No. 21 (Selective)	1.36 (34.5)
No. 22 (Selective)	4.13 (105.0)

(1) See **Fig. 41** for component locations.

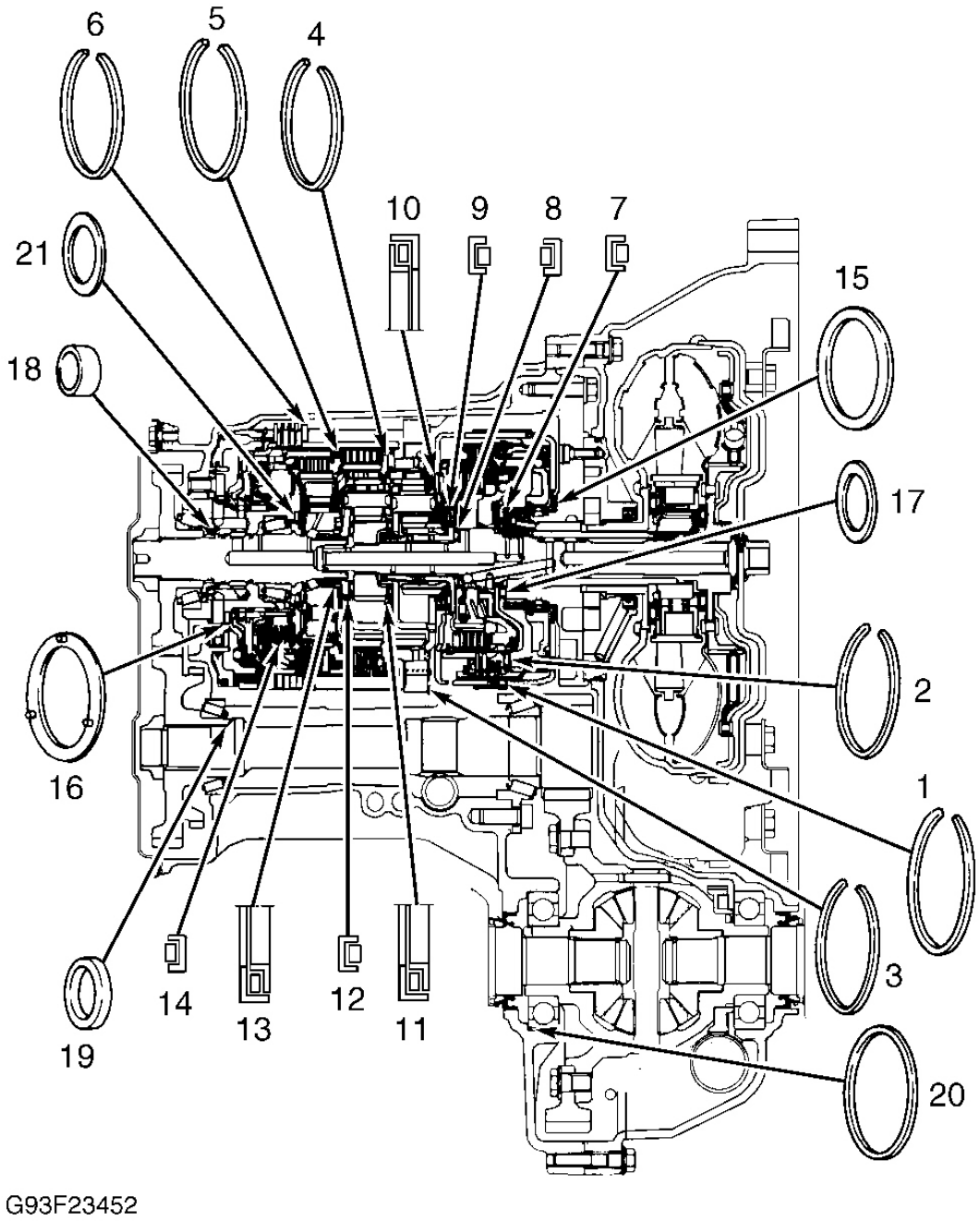

Fig. 41: Needle Bearing, Snap Ring, Thrust Washer & Selective Shim Locations
Courtesy of NISSAN MOTOR CO., U. S. A.

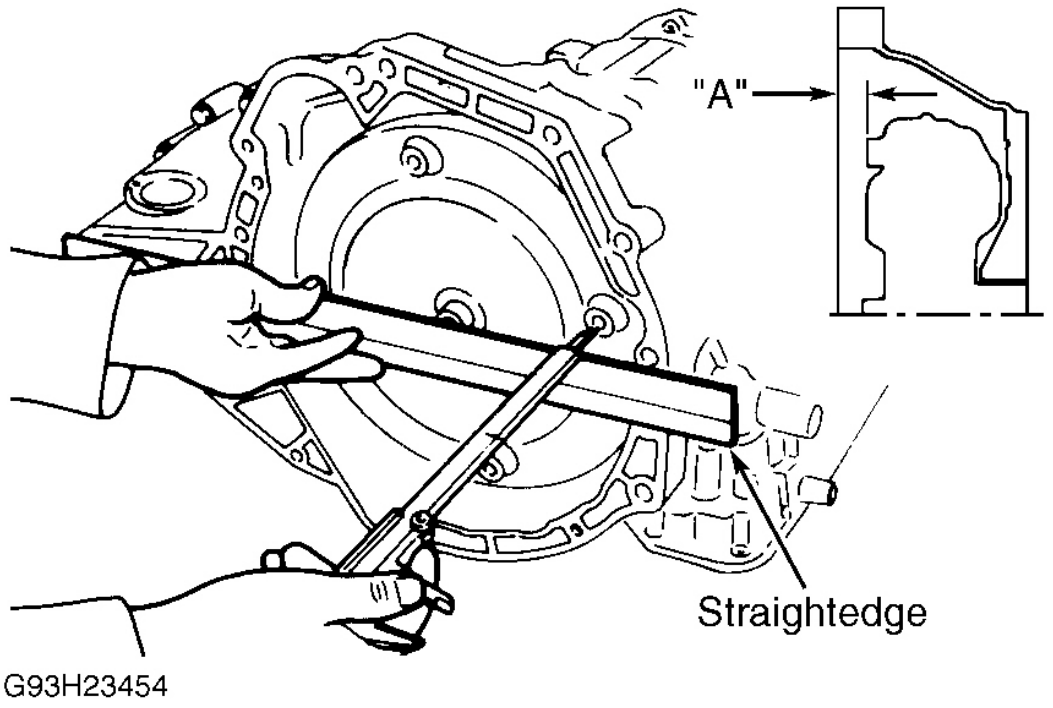

Fig. 42: Measuring Converter Installed Depth
Courtesy of NISSAN MOTOR CO., U. S. A.

TRANSAXLE SPECIFICATIONS

TRANSAXLE SPECIFICATIONS

Application	In. (mm)
Differential Assembly Side Gear-To-Differential Case Specified Clearance	.004-.008 (0.10-0.20)
Differential End Play	0-.006 (0-.15)
Differential Side Bearing Preload (RL4F03V)	.002-.004 (.04-.10)
Final Drive End Play (RL4F03A)	0-.006 (0-.15)
Forward & Overrun Clutches Dish Plate Thickness	
Forward Clutch	.098 (2.50)
Overrun Clutch	.085 (2.15)
Drive Plate Thickness (Forward Clutch)	
Standard Clearance	.071 (1.80)
Allowable Limit	.063 (1.60)
Drive Plate Thickness (Overrun Clutch)	
Standard Clearance	.063 (1.60)
Allowable Limit	.055 (1.40)

Retaining Plate-To-Snap Ring	
Specified Clearance	
Forward Clutch	.018-.033 (.45-.85)
Overrun Clutch	.039-.055 (1.00-1.40)
Allowable Limit	
Forward Clutch	.073 (1.85)
Overrun Clutch	.079 (2.00)
High Clutch	
Dish Plate Thickness	.106 (2.70)
Drive Plate Thickness	.079 (2.00)
Allowable Limit	.071 (1.80)
Retaining Plate-To-Snap Ring	
Specified Clearance	.055-.071 (1.40-1.80)
Allowable Limit	.094 (2.40)
Input Shaft Seal Ring-To-Ring Groove	
Specified Clearance	.003-.009 (.08-.23)
Allowable Limit	.009 (.23)
Low-Reverse Brake	
Drive Plate Thickness	
Standard	.079 (2.00)
Allowable Limit	.071 (1.80)
Specified Clearance	
Standard	.055-.071 (1.40-1.80)
Allowable Limit	.110 (2.80)
Oil Pump Seal Ring-To-Ring Groove	
Specified Clearance	.004-.010 (.10-.25)
Allowable Limit	.010 (.25)
Oil Pump Side Clearance	.0008-.0016 (.020-.040)
Output Shaft Bearing Preload (RL4F03A)	.001-.003 (.03-.08)
Output Shaft End Play (RL4F03V)	0-.020 (0-.50)
Output Shaft Seal Ring-To-Ring Groove	
Specified Clearance	.004-.010 (.10-.25)
Allowable Limit	.010 (.25)
Pinion Washer-To-Planetary Gear	
Specified Clearance	.006-.028 (.15-.70)
Allowable Limit	.031 (.80)
Reverse Clutch	
Dish Plate Thickness	.110 (2.80)
Drive Plate Thickness	.079 (2.00)
Allowable Limit	.071 (1.80)
Retaining Plate-To-Snap Ring	
Specified Clearance	

	.020-.031 (.50-.80)
Allowable Limit	.047 (1.20)
Reduction Gear Bearing Preload	.002 (.05)
Reverse Clutch End Play	.026-.039 (.65-1.00)
Total End Play	.010-.022 (.25-.55)

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	**Ft. Lbs. (N.m)**
Anchor End Pin	23-31 (31-42)
Converter Housing Bolt	19-22 (26-30)
Idler Gear Lock Nut	181-203 (245-275)
Oil Cooler Tube Bolt	21-36 (29-49)
Oil Pan Drain Plug	21-29 (29-39)
Oil Pump-To-Transaxle Case Bolt	13-15 (18-21)
Output Gear Lock Nut	181-203 (245-275)
Output Shaft Bearing Retainer Bolt	12-15 (16-21)
Parking Actuator Support Bolt	15-18 (20-24)
Reduction Gear Bearing Race Bolt	46-49 (63-67)
Ring Gear Bolt	
RL4F03A	55-65 (74-88)
RL4F03V	39-50 (53-68)
	INCH Lbs. (N.m)
Control Valve Assembly Bolt	62-80 (7-9)
Control Valve Body Bolt	44-62 (5-7)
Detent Spring Bolt	57-66 (6.4-7.5)
Dipstick Tube	35-44 (4-5)
Inhibitor Switch Bolt	18-22 (2-2.5)
Oil Pan Bolt	44-62 (5-7)
Oil Pump Cover-To-Housing Bolt	62-97 (7-11)
Oil Tube	44-62 (5-7)
Side Cover Bolt	44-62 (5-7)
Speedometer Pinion Bolt	33-44 (3.7-5)
Throttle Cable Bolt	18-35 (2-4)

OIL CIRCUIT DIAGRAM

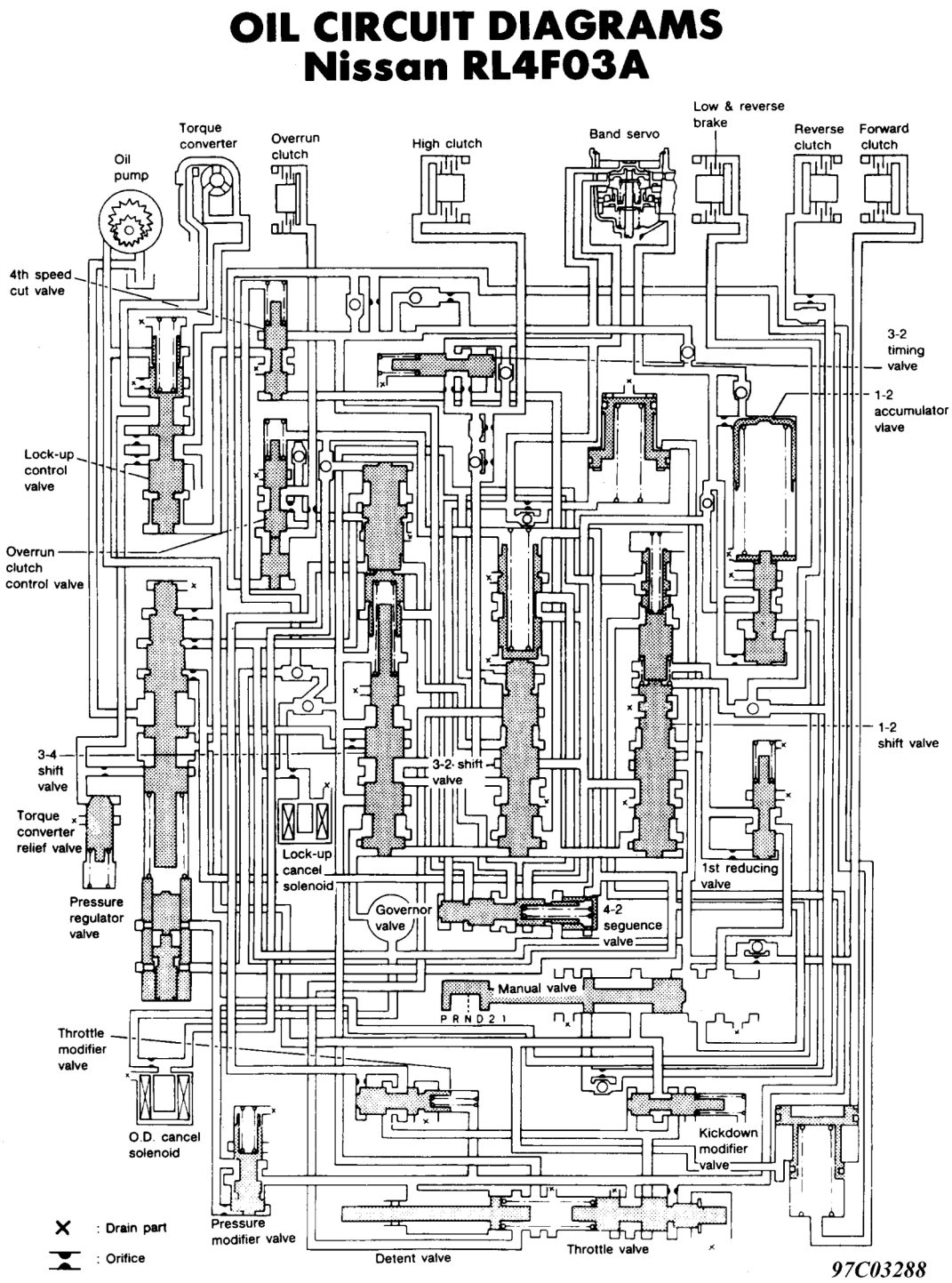

Fig. 43: Oil Circuit Diagram

