1988-90 AUTOMATIC TRANSMISSIONS

RL4F02A Overhaul

APPLICATION

TRANSMISSION APPLICATION

Vehicle Application	Transmission Model
1990 Axxess	RL4F02A
1988 Maxima	RL4F02A
1988-89 Pulsar NX (1.8L)	RL4F02A
1988-89 Stanza	RL4F02A

IDENTIFICATION

The transaxle model number can be found on the vehicle identification plate which is located on the right side of the firewall.

DESCRIPTION

Transaxle consists of 3 main units: automatic transaxle, torque converter and differential assembly. The automatic transaxle consists of front, rear and one-way clutches, low-reverse brake assembly, oil pump and hydraulic controls (valve body and servo piston assemblies).

LUBRICATION & ADJUSTMENTS

See appropriate AUTOMATIC TRANSMISSION SERVICING article in GENERAL SERVICING section.

ON-VEHICLE SERVICE

DRIVE AXLE SHAFTS

See FWD AXLE SHAFTS article in AXLE SHAFTS, OVERDRIVES & TRANSFER CASES section.

VALVE BODY

Removal & Installation

1. Remove battery and its bracket. Remove air cleaner, airflow meter, air damper and solenoid valves as an assembly. Disconnect throttle cable and throttle lever. Remove clip and torque control cylinder.
2. Disconnect wiring harness going to valve body. Remove valve body cover. Remove valve body assembly, being careful not to drop manual control valve. To install, set manual control valve in "N".
3. Align manual plate with groove of manual control valve. Reverse removal procedure to complete installation. Ensure control lever can be moved in all positions.

GOVERNOR SHAFT ASSEMBLY

Removal (Maxima)

Remove battery. Remove air cleaner, airflow meter, air damper and solenoid valves as an assembly. Remove governor cap. Remove bolt securing governor shaft. Bolt is located below governor cap. Remove cap and governor shaft assembly.

Installation

To install, reverse removal procedure.

Removal (Stanza Wagon)

1. Remove battery and its bracket. Remove air cleaner and airflow meter. Remove bolts securing front exhaust tube. Remove gasket from side of transaxle case.
2. Remove bolt securing governor shaft and remove governor shaft lock pin. Remove control cable bracket from transaxle. Remove governor cap and governor shaft assembly.

Installation

To install, reverse removal procedure.

TROUBLE SHOOTING

ENGINE DOES NOT START IN "N" & "P"

Check ignition switch and/or starter motor. Control cable out of adjustment. Check inhibitor switch and/or wiring.

ENGINE STARTS IN RANGES OTHER THAN "N" & "P"

Control cable out of adjustment. Check inhibitor switch and/or wiring.

TRANSAXLE NOISE IN "N" & "P"

Incorrect fluid level. Incorrect line pressure. Oil pump faulty.

PARKING GEAR DOES NOT FUNCTION

Control cable out of adjustment. Parking mechanism out of adjustment.

VEHICLE MOVES IN "N"

Control cable out of adjustment. Transmission fluid contaminated. Control valve or low clutch faulty.

VEHICLE WILL NOT MOVE IN "R"; OKAY IN "D", "2" & "1"

Incorrect fluid level. Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve, reverse clutch, low-reverse brake, or low clutch faulty. Leak in hydraulic circuit.

VEHICLE BRAKED WHEN SHIFTED INTO "R"

Transmission fluid contaminated. Reverse clutch, low-reverse brake, low clutch, or brake band faulty. Parking mechanism out of adjustment.

EXCESSIVE SHIFT SHOCK FROM "N" TO "D"

Incorrect engine idle RPM. Throttle cable out of adjustment. Incorrect line pressure. Control valve or low clutch faulty.

VEHICLE WILL NOT MOVE IN "D"; OKAY IN "2", "1" & "R"

Control cable out of adjustment. Incorrect line pressure. Control valve or one-way clutch faulty.

VEHICLE WILL NOT MOVE IN "D", "2" OR "1"; OKAY IN "R"

Incorrect fluid level. Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Engine not performing to specifications or brakes improperly adjusted. Control valve, high clutch, or low clutch faulty. Leak in hydraulic circuit.

CLUTCHES OR BRAKES SLIP

Incorrect fluid level. Control cable or throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or oil pump faulty. Leak in hydraulic circuit.

VEHICLE "CREEPS" EXCESSIVELY

Incorrect engine idle RPM.

VEHICLE WILL NOT "CREEP"

Incorrect fluid level. Control cable out of adjustment. Incorrect engine idle RPM. Transmission fluid contaminated. Control valve, low clutch, oil pump, or torque converter faulty. Leak in hydraulic circuit.

FAILS TO SHIFT FROM 1ST TO 2ND

Control cable or throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, or brake band faulty. Leak in hydraulic circuit.

FAILS TO SHIFT FROM 2ND TO 3RD

Control cable or throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, or high clutch faulty. Leak in hydraulic circuit.

FAILS TO SHIFT FROM 3RD TO 4TH

Control cable or throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve or high clutch faulty. Leak in hydraulic circuit.

1ST-2ND, 2ND-3RD & 3RD-4TH UPSHIFT POINTS HIGH

Throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or governor valve faulty. Leak in hydraulic circuit.

SHIFTS FROM 1ST TO 3RD; SKIPS 2ND

Transmission fluid contaminated. Control valve, governor valve, or brake band faulty. Leak in hydraulic circuit.

EXCESSIVE SHIFT SHOCK FROM 1ST TO 2ND

Throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or brake band faulty.

EXCESSIVE SHIFT SHOCK FROM 2ND TO 3RD

Throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or brake band faulty.

EXCESSIVE SHIFT SHOCK FROM 3RD TO 4TH

Incorrect fluid level. Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve, reverse clutch, low-reverse, or low clutch faulty. Leak in hydraulic circuit.

EXCESSIVE SHIFT SHOCK WHEN CHANGING OD CONTROL SWITCH POSITION WHILE DRIVING IN 4TH GEAR (LOCK-UP)

See **OVERDRIVE CONTROL TEST** .

NO SHIFT SHOCK FELT FROM 1ST TO 2ND

Incorrect fluid level. Control cable or throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or brake band faulty. Leak in hydraulic circuit.

NO SHIFT SHOCK FELT FROM 2ND TO 3RD; ENGINE RACES

Incorrect fluid level. Control cable or throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or high clutch faulty. Leak in hydraulic circuit.

NO SHIFT SHOCK FELT FROM 3RD TO 4TH

Incorrect fluid level. Control cable or throttle cable out of adjustment. Incorrect line pressure. Transmission

fluid contaminated. Control valve or brake band faulty. Leak in hydraulic circuit.

VEHICLE BRAKES IN 1ST-2ND UPSHIFT

Transmission fluid contaminated. Control valve, reverse clutch, high clutch, low-reverse brake, or one-way clutch faulty.

VEHICLE BRAKES IN 2ND-3RD UPSHIFT

Transmission fluid contaminated. Control valve or brake band faulty.

VEHICLE BRAKES IN 3RD-4TH UPSHIFT

Transmission fluid contaminated. Control valve or low clutch faulty.

NO DOWNSHIFT FROM 4TH TO 3RD

Throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, low clutch, or brake band faulty. Leak in hydraulic circuit.

NO DOWNSHIFT FROM 3RD TO 2ND OR FROM 4TH TO 2ND

Throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, or brake band faulty. Leak in hydraulic circuit.

NO DOWNSHIFT FROM 2ND TO 1ST OR FROM 3RD TO 1ST

Throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, brake band, or one-way clutch faulty.

SHIFT SHOCK FELT ON DECELERATION BY RELEASING ACCELERATOR PEDAL

Control cable or throttle cable out of adjustment. Incorrect line pressure. Control valve, governor valve or control solenoid faulty. Leak in hydraulic circuit.

4TH-3RD, 3RD-2ND & 2ND-1ST DOWNSHIFT POINTS HIGH

Control cable or throttle cable out of adjustment. Incorrect line pressure. Control valve or governor valve faulty. Leak in hydraulic circuit.

NO KICKDOWN FROM 4TH WITHIN KICKDOWN SPEED RANGE

Throttle cable out of adjustment. Transmission fluid contaminated. Control valve, governor valve, reverse clutch, brake band, or low clutch faulty. Leak in hydraulic circuit.

KICKDOWN FROM 4TH BEYOND KICKDOWN SPEED RANGE

Control cable or throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve, governor valve, high clutch, or brake band faulty. Leak in hydraulic circuit.

ENGINE RACES ON 4TH-3RD KICKDOWN

Throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve, low clutch, brake band, or torque converter faulty.

ENGINE RACES ON 3RD-2ND KICKDOWN

Throttle cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve, high clutch or brake band faulty.

VEHICLE WILL NOT MOVE

Incorrect fluid level. Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Oil pump or torque converter faulty. Leak in hydraulic circuit. Parking mechanism out of adjustment

NOISE IN "D", "2", "1" & "R"

Incorrect fluid level. Incorrect line pressure. Oil pump, differential (final drive), torque converter, or planetary gearset faulty.

FAILS TO SHIFT FROM 3RD TO 2ND WHEN SHIFT LEVER IS MOVED TO "2"

Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or brake band faulty. Leak in hydraulic circuit.

SHIFTS FROM 2ND TO 3RD WITH SHIFT LEVER IN "2"

Incorrect line pressure. Control valve faulty. Leak in hydraulic circuit.

ENGINE BRAKING DOES NOT TAKE PLACE IN "1"

Control cable out of adjustment. Incorrect line pressure. Transmission fluid contaminated. Control valve or low-reverse brake faulty. Leak in hydraulic circuit.

SHIFTS FROM 1ST TO 2ND IN "1"

Control cable out of adjustment. Incorrect line pressure. Control valve faulty. Leak in hydraulic circuit.

FAILS TO SHIFT FROM 2ND TO 1ST IN "1"

Incorrect fluid level. Control cable out of adjustment. Incorrect line pressure. Control valve, governor valve, low-reverse brake, or brake band faulty. Leak in hydraulic circuit.

EXCESSIVE SHIFT SHOCK ON 2ND-1ST DOWNSHIFT

Throttle cable out of adjustment. Transmission fluid contaminated. Low-reverse brake faulty.

TRANSAXLE OVERHEATS

Incorrect fluid level. Incorrect line pressure. Transmission fluid contaminated. Engine not performing to specifications or brakes improperly adjusted. Torque converter or transaxle components faulty. Leak in hydraulic circuit. Parking mechanism out of adjustment.

TORQUE CONVERTER DOES NOT LOCK

Incorrect line pressure. Control valve, governor valve, oil pump, control solenoids, or torque converter faulty.

LOCK-UP PISTON SLIP

Incorrect line pressure. Oil pump, control solenoids, or torque converter faulty.

LOCK-UP POINT TOO HIGH OR LOW

Control valve, governor valve, or control solenoids faulty.

ENGINE IS STOPPED WHEN SHIFTED TO "R", "D", "2" OR "1"

Control valve out of adjustment. Solenoids not operating properly or torque converter faulty.

INCORRECT TORQUE CONVERTER LOCK-UP PRESSURE

Throttle cable out of adjustment. Incorrect line pressure. Control valve, oil pump, or torque converter faulty.

SHIFTS INTO OVERDRIVE EVEN IF OD CONTROL SWITCH IS "OFF"

OD control switch and/or wiring or control solenoids faulty.

LAMP INSIDE OD CONTROL SWITCH GLOWS EVEN WHEN SHIFTED TO OD

OD control switch and/or wiring or OD indicator switch faulty.

TESTING

ROAD TEST

Preliminary

1. Ensure transmission fluid level is correct. Examine transmission fluid color, texture and odor. If fluid is Dark Black in color and has a brunt odor, clutch friction plates are worn.
2. If fluid is milky Pink in color, fluid is water contaminated. Water may be entering transaxle thorough filler tube or breather. If fluid is light or dark Brown in color and tacky, fluid level is incorrect or transaxle is overheating.

Road Test Procedure

1. Place shift lever in "P" and start engine. Turn engine off and repeat procedure in all ranges, including "N". Road test vehicle, stop on slight upgrade and place shift lever in "P".
2. Release parking brake to ensure transaxle parking mechanism works. Start engine, move shift lever from "P' to "R" and note shift quality. Drive vehicle in reverse long enough to detect slippage or other abnormalities.
3. Move shift lever from "R" and "D" to "N" and note shift quality. With parking brake released and shift lever in "n", lightly depress accelerator to ensure vehicle does not move.
4. Move shift lever from "N" to "D" and note shift quality. Road test vehicle and not upshift/downshift speeds. Upshift/downshift speeds should be close to speeds shown in **SHIFT SPEED SPECIFICATIONS** table.

SHIFT SPEED SPECIFICATIONS

Application (1)	MPH
Axxess 2WD (1990)	
1-2 Upshift	34-38
2-3 Upshift	61-65
3-2 Downshift	57-61
2-1 Downshift	26-30
Axxess 4WD (1990)	
1-2 Upshift	31-35
2-3 Upshift	58-62
3-2 Downshift	54-58
2-1 Downshift	25-29
Maxima (1988)	
1-2 Upshift	39
2-3 Upshift	69
3-2 Downshift	61
2-1 Downshift	30
Pulsar (1988-89)	

1-2 Upshift	32
2-3 Upshift	64
3-2 Downshift	57
2-1 Downshift	23
Stanza (1988-89)	
1-2 Upshift	33
2-3 Upshift	60
3-2 Downshift	53
2-1 Downshift	25
(1) With shift lever in "D" and at full throttle.	

5. Shift speed may vary slightly due to production tolerances or tire size. The important factor is quality of shifts. All shifts should be smooth, responsive and with no slippage or engine speed runaway. Slippage or engine speed runaway in any gear usually indicates clutch or band problems.
6. A slipping clutch or band in a particular gear can usually be identified by noting transaxle operation in other selector positions and comparing internal units which are applied in these position. See **CLUTCH & BAND APPLICATION** table.
7. Road test vehicle with "OVERDRIVE" switch "OFF" position. Ensure overdrive does not engage. If overdrive operation is incorrect, See **OVERDRIVE CONTROL TEST** .

NOTE: After testing overdrive, return "OD" switch to "ON" position.

CLUTCH & BAND APPLICATION

Selector Lever Position	Elements In Use
"D" (Drive)	
Low	Forward Clutch & One-Way Clutch
2nd Gear	Forward Clutch & Band Servo
3rd Gear	High Clutch, Forward Clutch & Band Servo
4th Gear (OD) (2)	Band Servo & High Clutch

"2" (Second)	
Low	Forward Clutch & One-Way Clutch
2nd Gear	Band Servo & Forward Clutch
"1" (First)	
1st Gear	Forward Clutch, Low-Reverse Brake & One-Way
2nd Gear	Band Servo & Forward Clutch
"R" (Reverse) (1)	Low-Reverse Brake
"N" Or "P" (Neutral Or Park)	All Clutches & Bands Released Or Ineffective
(1) Low-reverse brake applied and rever clutch engaged. (2) Lock-up torque converter engaged.	

8. With vehicle in 40-50 MPH range (3rd gear) and at light/half throttle position, fully depress accelerator. Ensure transaxle downshifts from 3rd to 2nd gear.
9. With vehicle in 16-22 MPH range (2nd gear) and at light/half throttle position, fully depress accelerator. Ensure transaxle downshifts from 2nd gear. Continue to increase vehicle speed. Ensure transaxle does not shift into 3rd gear.
10. Move shift lever into "2". Ensure vehicle starts to move in 1st gear. Increase vehicle speed and ensure transaxle upshifts from 1st to 2nd gear. Continue to increase vehicle speed. Ensure transaxle does not shift into 3rd gear.
11. With vehicle in 16-22 MPH range (2nd gear) and at light/half throttle position, fully depress accelerator. Ensure transaxle downshifts from 2nd to 1st gear.
12. Allow vehicle to run at idle in 2nd gear. Ensure transaxle downshifts from 2nd to 1st gear. Move shift lever into "D" and run vehicle in 25-31 MPH range. Shift lever into "2" and ensure transaxle downshifts into 2nd gear.
13. Move shift lever into "1" and accelerate vehicle. Ensure transaxle does not upshift from 2nd to 3rd gear. Release accelerator pedal and ensure engine compression acts as a brake.
14. Move shift lever into "D" or "2" and run vehicle in 12-19 MPH range. Move shift lever into "1" and ensure downshift to 1st gear is made.

STALL SPEED TEST

Stall Test Precautions

Ensure transaxle fluid level is correct and its temperature for Axxess (1990) is 122-176°F (50-80°C). For all other models 109-135°F (43-57°C). DO NOT hold throttle open for more than 5 seconds during test. DO NOT test more than 2 gear ranges at a time.

Stall Test Procedure

1. Connect tachometer to engine. Position tachometer so it can be read from driver's seat. Set parking brake, block wheels, front and rear and apply service brakes.
2. Start engine and place shift lever in "D". Depress accelerator pedal to wide open throttle and note stall speed. Place shift lever in "N" and allow transaxle to cool down.
3. Repeat stall test procedure in "2", "1" and "R", allowing transaxle to cool down between each test. Stall speeds should be close to RPM shown in **STALL SPEED SPECIFICATIONS** table.

STALL SPEED SPECIFICATIONS

Application	Stall RPM
1990 Axxess	1950-2250
1988 Maxima	2300-2600
1988-89 Pulsar W/CA18DE Engine	2550-2850
1988-89 Stanza	2150-2450

Stall Test Results

1. If stall speed in "D" is okay, go to step 3 or 4 . If stall speed in "D" is low, lock-up clutch is dragging, torque converter one-way clutch is faulty, or engine is not performing properly.
2. If stall speed in "D" is high, and stall speed in "1" is incorrect, low clutch slips. If stall speed in "D" is high, and stall speed in "1" is okay, one-way clutch slips.
3. If stall speed in "D" is okay, and stall speed in "R" is low, lock-up clutch is dragging, torque converter one-way clutch is faulty, or engine is not performing properly.
4. If stall speed in "D" is okay, and stall speed in "R" is high, road test vehicle with shift lever in "1". If effective engine braking occurs, reverse clutch is slipping. If no engine braking occurs, low-reverse brake is slipping.

NOTE: If torque converter one-way clutch is frozen, vehicle will have poor high speed performance and low engine RPM when engine is accelerated in "N". If torque converter one-way clutch is slipping vehicle will be sluggish up to 30-40 MPH.

HYDRAULIC PRESSURE TESTS

Line Pressure Test

1. Warm transaxle to normal operating temperature. Connect pressure gauge to line pressure port. See **Fig. 1** . Connect tachometer to engine. Position tachometer and gauge so that they are visible from driver's seat.
2. Apply parking brake and depress the brake pedal. Measure line pressure at idle and at stall speed in "P", "R", "D", "2", and "1" positions. Line pressure should be close to the pressures shown in **LINE PRESSURE SPECIFICATIONS** table.

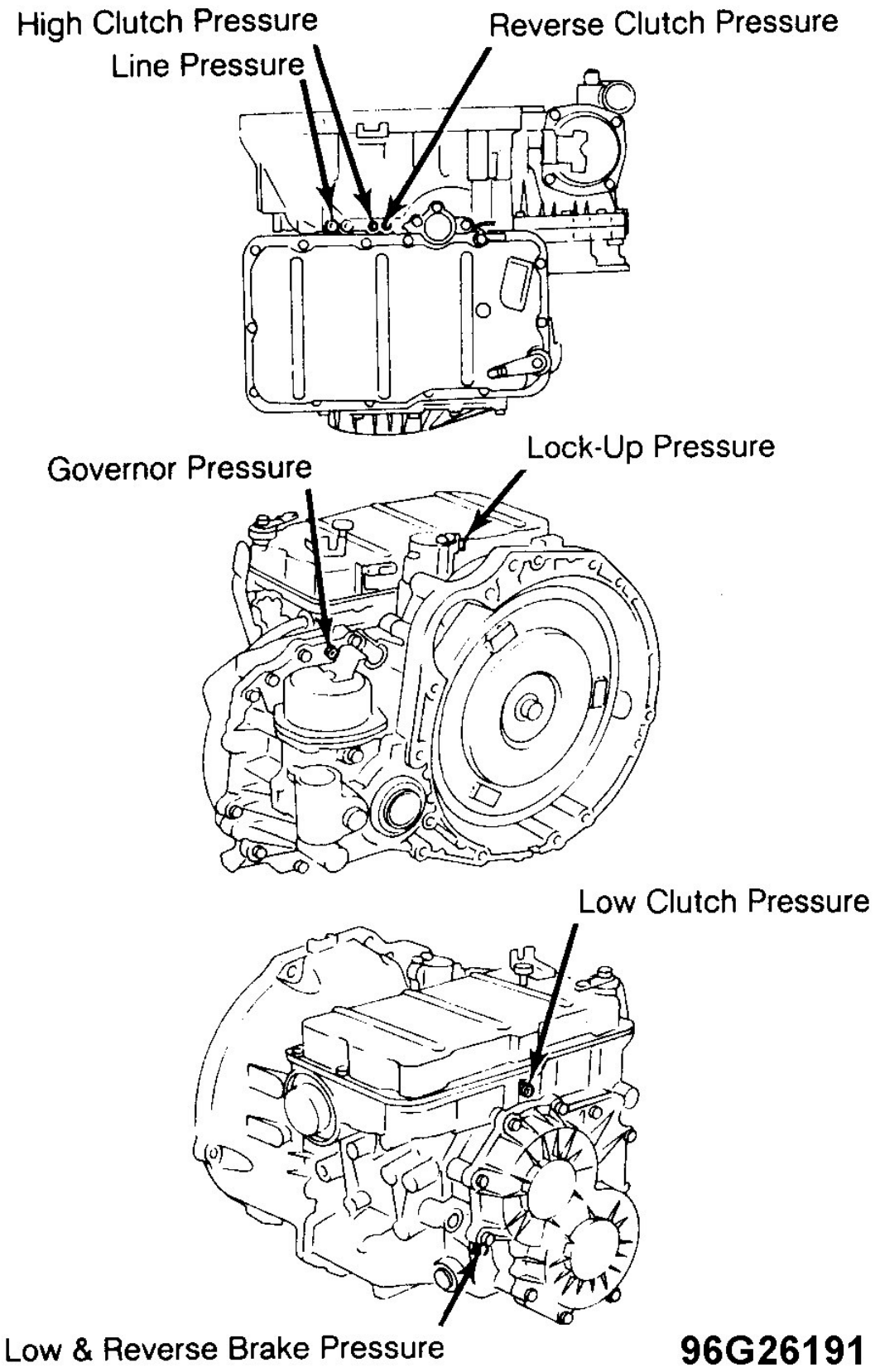


Fig. 1: Hydraulic Pressure Test Ports
Courtesy of NISSAN MOTOR CO., U.S.A.

LINE PRESSURE SPECIFICATIONS

Application	Pressure psi (kg/cm^2)
1990 Axxess	
At Idle	57 (392)
At Stall Speed	199 (1373)
1988 Maxima, 1988-89 Stanza & 1988 Pulsar	
At Idle	54-64 (373-441)
At Stall Speed	175-198 (1206-1363)
1989 Pulsar	
At Idle	54-64 (377-441)
At Stall Speed	181-203 (1245-1402)

Line Pressure Test Results

1. If line pressure is low in all ranges, check for leaks at or around oil pump, valve body, transaxle case, or governor. Check for a sticking pressure regulator valve or pressure modifier valve. Oil pump may be worn.
2. If line pressure (at idle) is low in "D", "2" or "1" but is okay in "R", check for leaks at or around forward clutch. If line pressure is low in "P" and "R" but okay in "D", "2" and "1", check for leaks in low-reverse brake circuit.
3. If line pressure (at idle) is high, pressure regulator valve may be stuck. If line pressure does not rise, ensure throttle cable is properly adjusted and/or connected.

TORQUE CONVERTER LOCK-UP TEST

1. Warm transaxle to normal operating temperature. Connect pressure gauge to lock-up pressure port. See **Fig. 1** . Position gauge so it is visible from driver's seat.
2. Road test vehicle in "D" (4th gear) position and note pressure readings. Readings should be close to the pressures shown in the **LOCK-UP PRESSURE SPECIFICATIONS** table.

LOCK-UP PRESSURE SPECIFICATIONS

Application	Pressure psi (kg/cm^2)
Lock-Up On	7 (49)
Lock-Up Off	28 (196)

A/T CONTROL UNIT TEST

Maxima

1. Locate Automatic Transmission control Unit (ATCU) under driver's seat. Without disconnecting ATCU, connect a voltmeter between terminals No. 1 and 6. See **Fig. 2** . Disconnect low temperature switch (on

engine). See **Fig. 3** .

2. Turn ignition ON. Voltmeter reading should be less than .5 volt with accelerator pedal released. Voltmeter readings should be greater than 10 volts with accelerator pedal depressed.

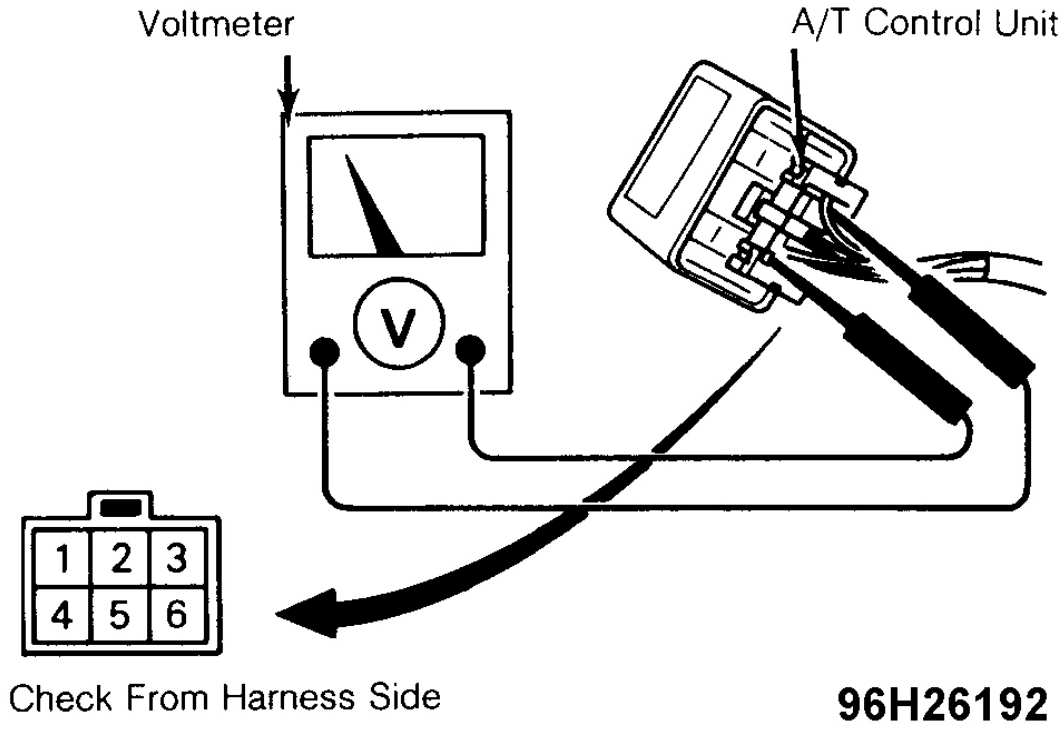


Fig. 2: Testing Automatic Transmission Control Unit
Courtesy of NISSAN MOTOR CO., U.S.A.

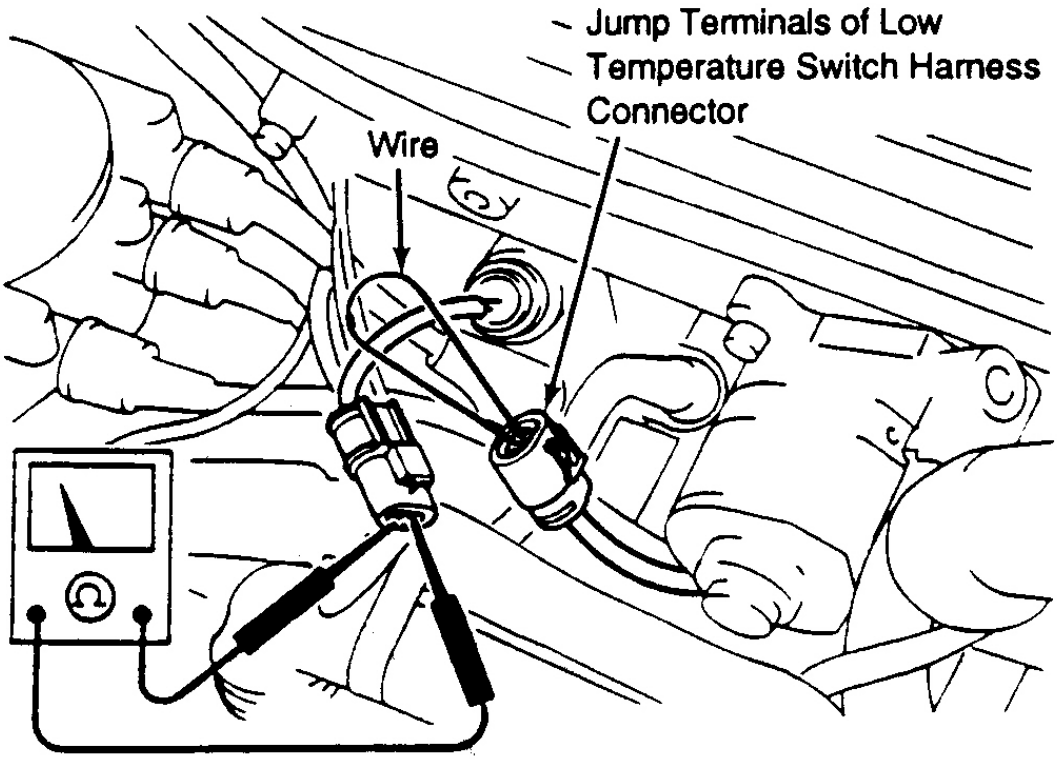


Fig. 3: Locating & Testing Low Temperature Switch
Courtesy of NISSAN MOTOR CO., U.S.A.

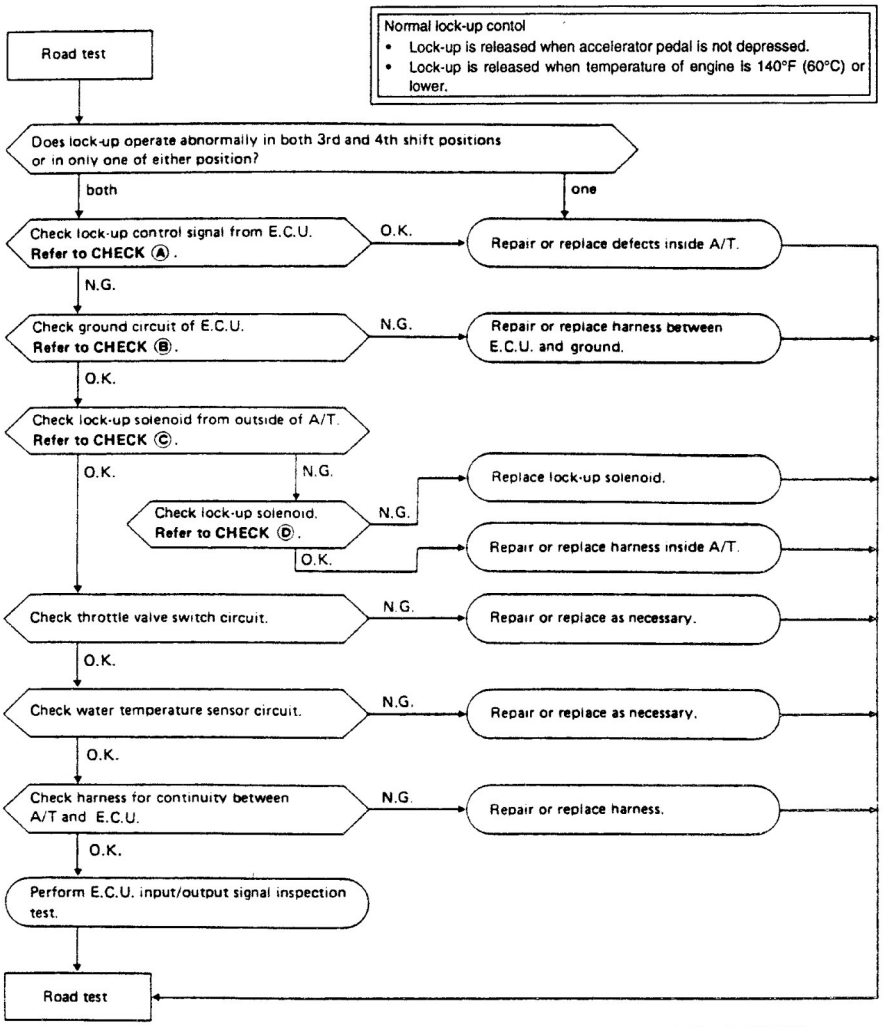
3. Insert a jumper wire between terminals of low temperature switch harness connector. Voltmeter reading should be less than .5 volt with accelerator pedal depressed. See **Fig. 3** . Remove jumper wire from low temperature connectors and leave low temperature connectors disconnected. Turn ignition ON and depress accelerator pedal. Measure voltage when OD control switch is in ON and OFF position. In ON position voltage should be more than 10 volts, in OFF position less than .5 volt.
4. Reconnect low temperature switch. Connect voltmeter between terminals No. 2 and 6. Voltmeter reading should be less than .5 volt with OVERDRIVE switch in the OFF position. Voltmeter reading should be more than 10 volts with OVERDRIVE switch in ON position.
5. Disconnect low temperature switch. Connect voltmeter between terminals No. 3 and 6. Voltmeter reading should be less than .5 volt with OVERDRIVE switch in the ON position.
6. Insert a jumper wire between terminals of low temperature switch harness connector. Voltmeter reading should be less than .5 volt with OVERDRIVE switch in the ON position.
7. Connect voltmeter between terminals No. 4 and 6. Voltmeter reading should be more than 10 volts at all times with ignition ON. Turn ignition OFF. Using an ohmmeter, check continuity between terminal No. 6

and a good known ground. If any test reading is incorrect, check circuit wiring and repair (as necessary).

LOCK-UP CONTROL TEST

1988-89 Stanza

Check lock-up control using lock-up control test chart. See **Fig. 4** . If necessary, perform test(s) as indicated in chart.



Check A – Check Lock-Up Control Signal From ECU

Disconnect water temperature sensor connector. Connect a 2000-ohm resistor between water temperature sensor connector terminals. *See Fig. 6.* Start engine. Backprobe with a voltmeter between terminal No. 20 of Electronic Control Unit (ECU) and ground. *See Fig. 7.* Check voltage between terminal No. 20 and ground with accelerator pedal depressed of zero volts and released of zero volts. Stop engine, connect a 300 ohm resistor between water temperature sensor connector terminals. Start engine. Backprobe with a voltmeter terminal No. 20 and ground of ECU with accelerator pedal depressed and released. With accelerator pedal depressed, battery voltage should be present. With accelerator pedal released, there should be zero volts.

Check B – Check Ground Circuit Of ECU

Turn ignition OFF. Disconnect 16-pin connector from ECU. Using an ohmmeter, check resistance between ECU terminals No. 28, 36 and ground. *See Fig. 8.* There should be zero ohms.

Check C – Lock-Up Control Solenoid Test (Outside AT)

Unplug overdrive cancel/lock-up solenoid harness connector. Connect jumper wires from a 12-volt battery to lock-up solenoid terminals "C "and "D". Ensure solenoid clicks when power is applied. *See Fig. 9.*

Check D – Lock-Up Control Solenoid Test

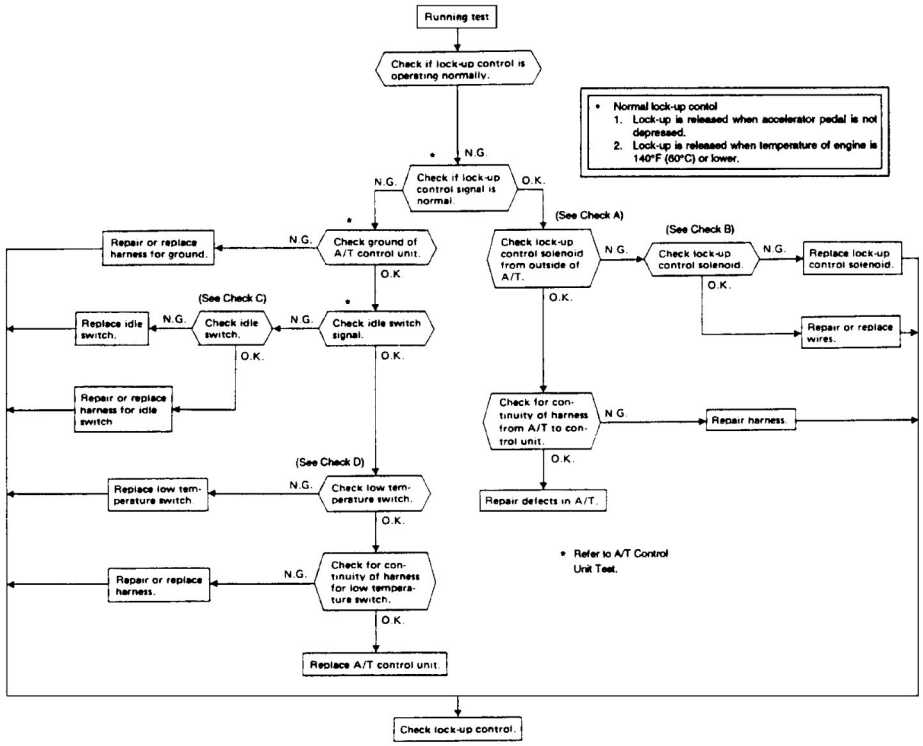
Remove valve body cover. Connect jumper wires from positive battery terminal to Blue wire of solenoid and from negative battery terminal to White wire of solenoid. Ensure solenoid clicks when power is applied. *See Fig. 10.* If solenoid does not click, replace lock-up solenoid.

G00286319

Fig. 4: Lock-up Control Testing (1988-89 Stanza)
Courtesy of NISSAN MOTOR CO., U.S.A.

1988 Maxima

Check lock-up control using lock-up control test chart. See **Fig. 5** . If necessary, perform test(s) as indicated in chart.



Check A – Lock-Up Control Solenoid Test (Outside AT)
Unplug overdrive cancel/lock-up solenoid harness connector. Connect jumper wires from a 12-volt battery to lock-up solenoid terminals and ensure solenoid clicks when power is applied. *See Fig. 9.*

Check B – Lock-Up Control Solenoid Test
Remove valve body cover. Connect jumper wires from positive battery terminal to Blue wire of solenoid and from negative battery terminal to White wire of solenoid. Ensure solenoid clicks when power is applied. *See Fig. 10.* If solenoid does not click, replace lock-up solenoid.

Check C – Idle Switch Test
Using an ohmmeter, check continuity of idle switch. Continuity should exist with throttle valve closed.

Check D – Low Temperature Switch Test
Using an ohmmeter, measure low temperature switch continuity. Ohmmeter should indicate continuity with engine cold, zero continuity with engine hot. If readings are incorrect, replace low temperature switch.

G00286320

Fig. 5: Lock-up Control Testing (1988 Maxima)
Courtesy of NISSAN MOTOR CO., U.S.A.

OVERDRIVE CONTROL TEST

Check overdrive control using overdrive control test chart. See **Fig. 11** or **Fig. 12** . If necessary, perform test(s) as indicated in chart.

REMOVAL & INSTALLATION

See appropriate AUTOMATIC TRANSMISSION REMOVAL article in GENERAL SERVICING section.

TORQUE CONVERTER

Torque converter is a sealed unit and cannot be disassembled for service. Replace if defective.

TRANSAXLE DISASSEMBLY

1. Drain transmission fluid and remove torque converter (if necessary). Remove input shaft. See **Fig. 14** . Remove control cylinder, throttle lever and valve body cover. Disconnect wiring harness from valve body. Remove valve body assembly.
2. Carefully remove terminal assembly. Remove throttle shaft and return spring. Apply compressed air to oil passage next to accumulator to remove accumulator pisyon. Remove side cover and output gear. See **Fig. 15** . Using gear puller, remove idler gear.
3. Remove parking pawl, pawl shaft, return spring and spacer. Remove speedometer case and speedometer gear. Remove governor cap, pin and governor shaft assembly. Remove converter housing, final drive assembly and reduction pinion gear. Remove "O" ring and output shaft.
4. Remove oil strainer, lubrication tube and gutter. Loosen brake band stem lock nut and back off piston stem. Remove brake band and high clutch and reverse clutch pack. DO NOT stretch band unnecessarily. Secure band with clip.
5. Remove one-way clutch, front carrier, rear carrier and low clutch as an assembly. Remove low-reverse brake clutches. Remove low-reverse brake snap ring. Apply compressed air to oil passage to remove low-reverse brake piston. See **Fig. 16** .
6. Remove bearing retainer assembly from side of case. Remove band servo snap ring, band brake servo, retainer and return spring. Loosen manual shaft lock nuts and remove manual plate. Remove retaining pin, manual plate and shaft.

COMPONENT DISASSEMBLY & REASSEMBLY

OIL PUMP

Disassembly

Remove oil pump cover and cam ring spring. Take care not to damage converter housing. Remove cam ring, friction ring, vane ring, and rotor. If necessary remove vanes from rotor. Take care not to damage vanes.

Inspection

1. Check oil pump cover, cam ring, rotor, and vanes for wear or damage. Measure clearance between clutch housing and cam ring, rotor, and vanes in at least 4 places.
2. Clearance should be between .0004-.0009" (.010-.024 mm). If clearance exceeds .0013" (.034 mm) replace oil pump assembly. Measure clearance between seal ring and seal ring groove. Clearance should be .0039-.0098" (.10-.25 mm). If clearance exceeds .001" (.25 mm) replace seal ring(s).

Reassembly

1. Install cam ring, spring retainer, and cam ring spring. Assemble rotor, vanes, friction ring, rotor supporting ring, and vanes. See **Fig. 17** . Ensure punch mark on rotor faces up. Install pump cover and tighten bolts in a criss-cross pattern.
2. With pump assembly complete, rotate pump to ensure all parts rotate freely. Using petroleum jelly, install seal rings onto shaft of pump cover. Be sure to install large diameter rings near center of cover and small diameter rings at end of cover shaft.

HIGH CLUTCH

Disassembly

Using spring compressor, compress clutch springs and remove snap ring from retainer. Remove retainer plate. Note number and arrangement of drive and driven plates. Place clutch drum onto oil pump. See **Fig. 18** . Place clutch drum onto oil pump. Apply compressed air to oil passage to remove clutch piston. See **Fig. 19** .

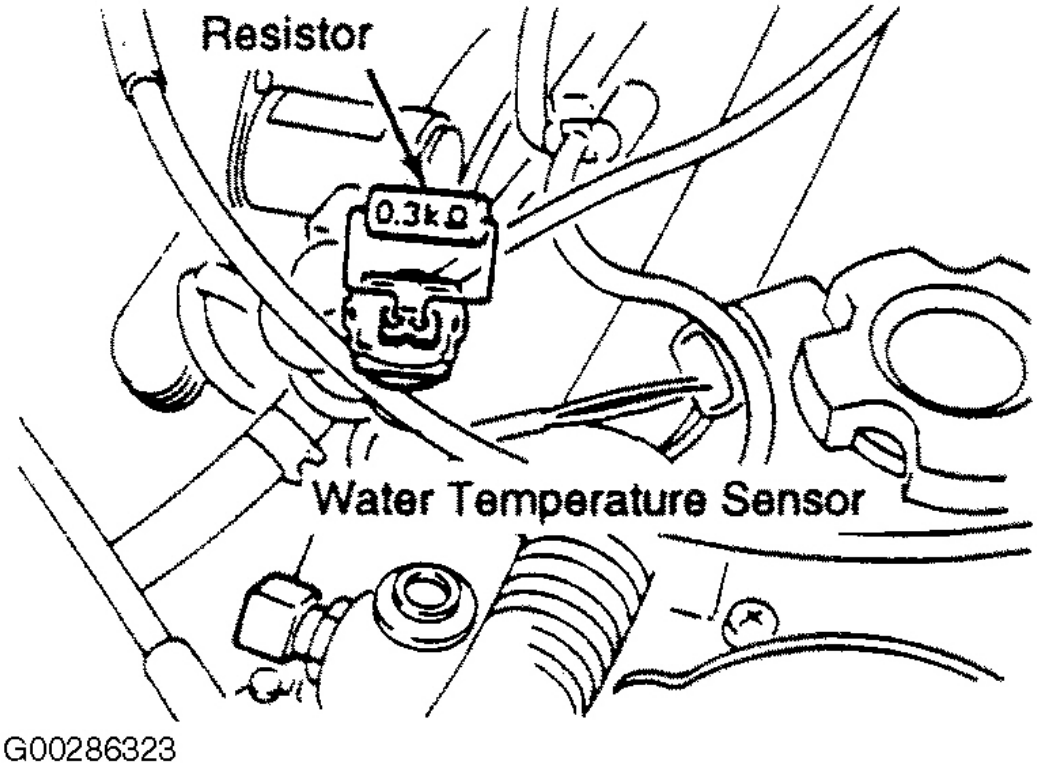


Fig. 6: Locating Water Temperature Sensor
Courtesy of NISSAN MOTOR CO., U.S.A.

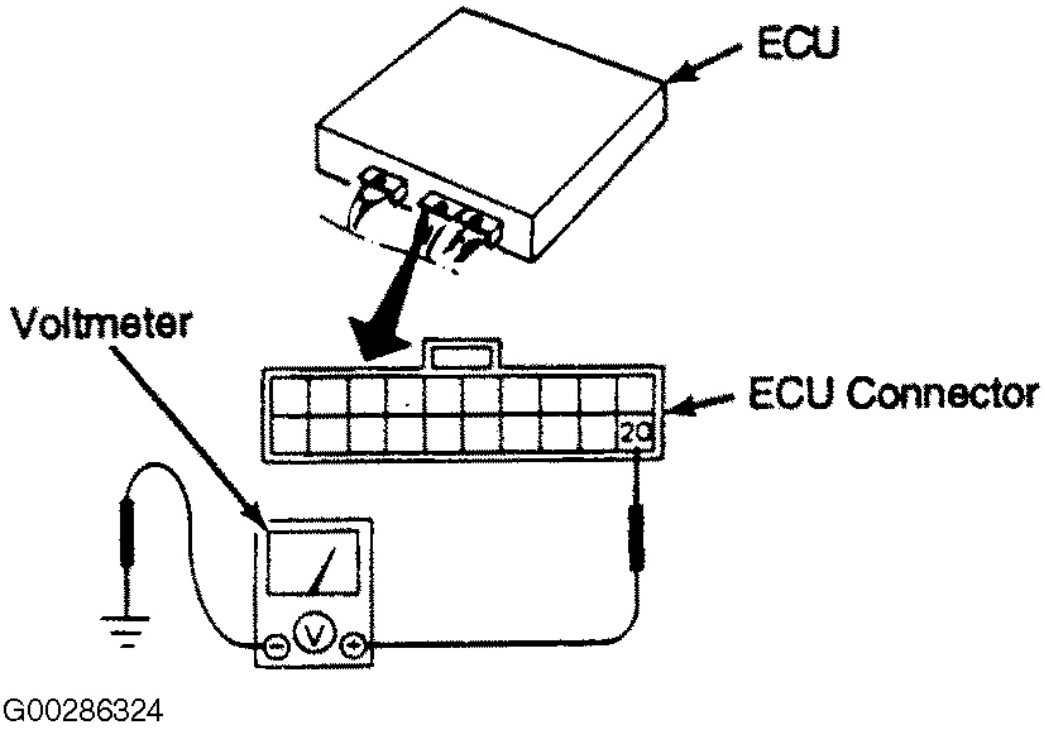


Fig. 7: Testing Lock-Up Control Unit
Courtesy of NISSAN MOTOR CO., U.S.A.

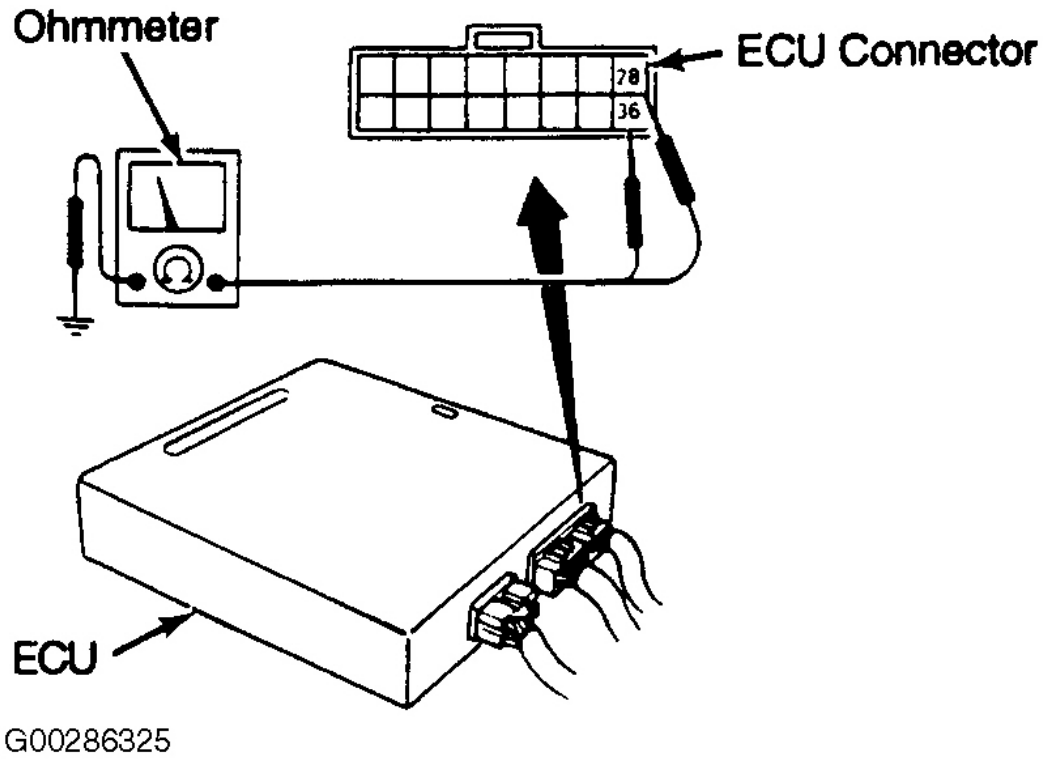


Fig. 8: Testing ECU Ground Circuit
Courtesy of NISSAN MOTOR CO., U.S.A.

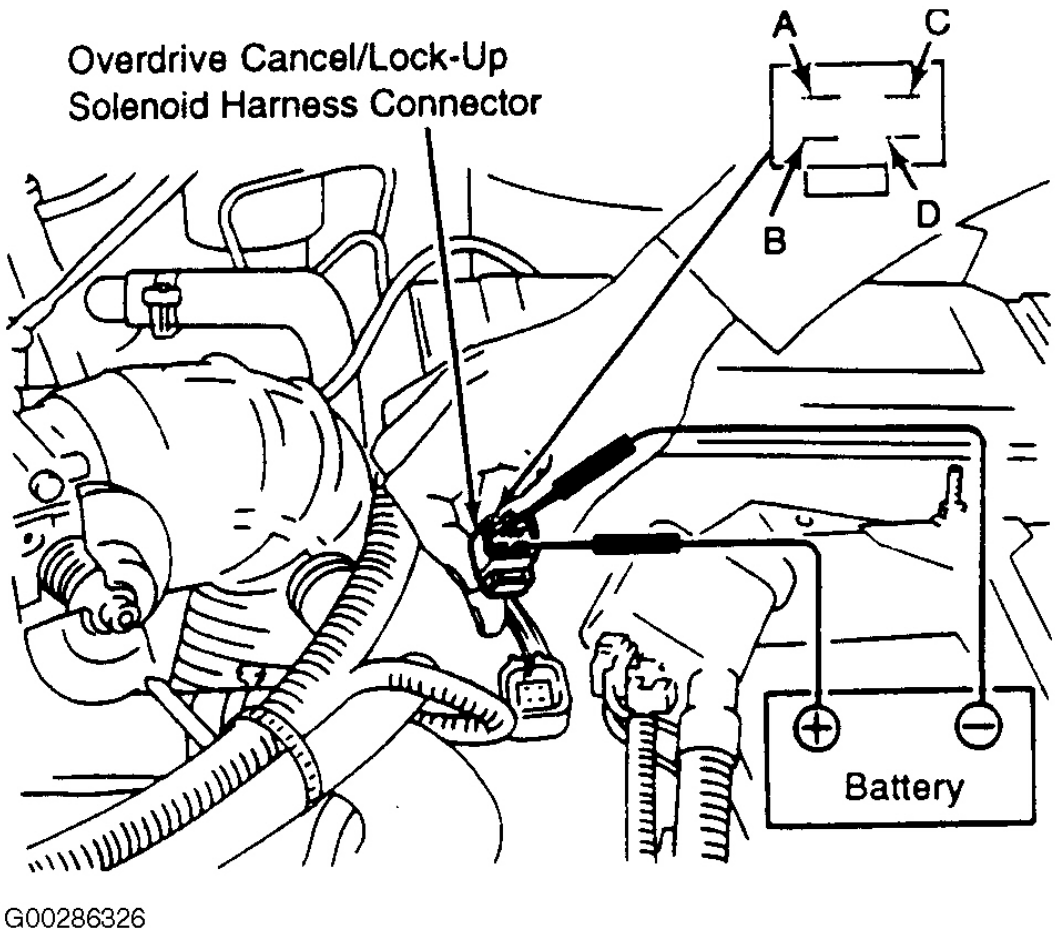


Fig. 9: Testing Lock-Up & OD Solenoid Out Of Transmission
Courtesy of NISSAN MOTOR CO., U.S.A.

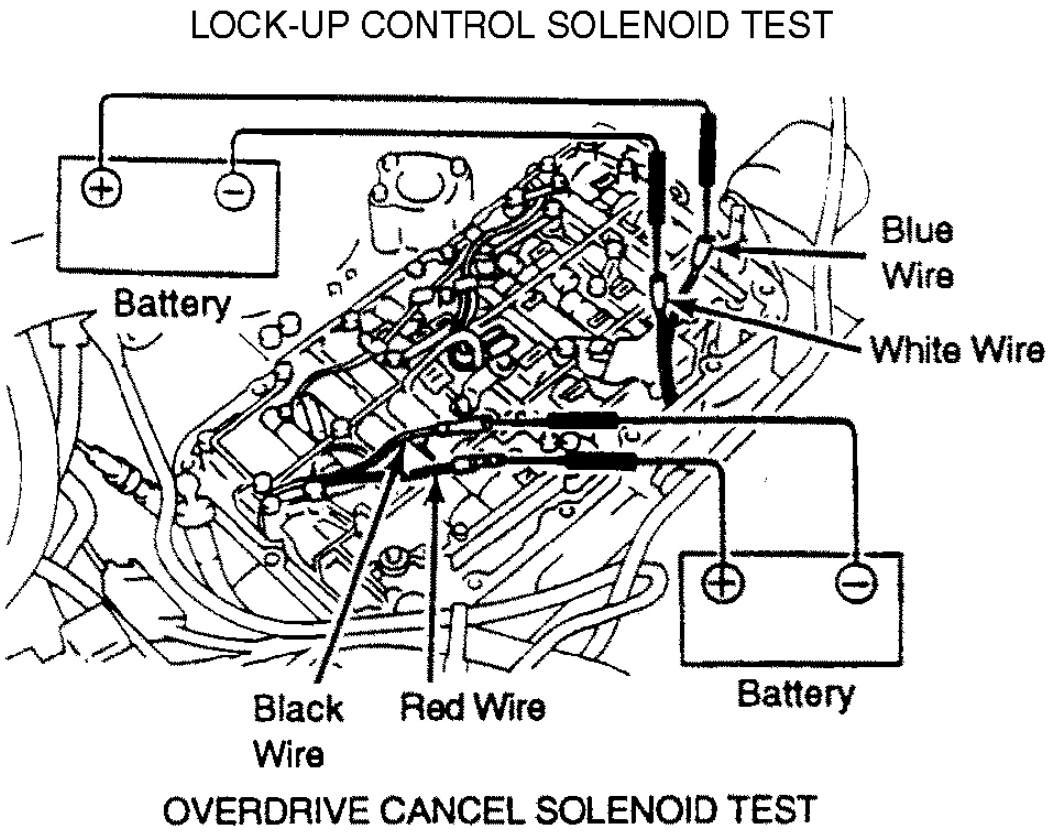


Fig. 10: Testing Lock-Up & OD Solenoids In Transmission
Courtesy of NISSAN MOTOR CO., U.S.A.

NOTE: For additional electrical circuit information, see WIRING DIAGRAMS.

Inspection

Check clutch discs for wear or damage. Measure drive plate thickness. See **HIGH CLUTCH PLATE SPECIFICATIONS** table. Replace drive plate(s) if beyond service limits. Check snap ring, springs and spring retainer for damage, wear or warpage. Replace defective components as required.

HIGH CLUTCH PLATE SPECIFICATIONS

Application	Thickness In. (mm)
1990 Axxess, 1988 Maxima, 1989 Stanza & 1989 Pulsar	
New	.063 (1.60)
Service Limit	.055 (1.40)
1988 Stanza & 1988 Pulsar	

New	.079-(2.00)
Service Limit	.071-(1.80)

Reassembly

1. Lubricate clutch components with ATF. Install inner seal and piston seal, taking care not to damage seal during installation. Install piston in drum, taking care not to kink or damage seal. Turn piston by hand to ensure there is no binding.
2. Install clutch springs. Using spring compressor, install spring retainer and snap ring. Install driven plates, drive plates, and secure with snap ring. Measure clearance between retainer plate and snap ring. See **Fig. 20** . See **HIGH CLUTCH RETAINER PLATE-TO-SNAP RING CLEARANCE** table.
3. If clearance exceeds specifications, replace retaining plate. Selective size retaining plates are available. See **HIGH CLUTCH RETAINER SELECTIVE SIZES** table.
4. If clearance is correct (on either model), install clutch on oil pump. Apply compressed air to third oil passage to check operation. See **Fig. 19** .

HIGH CLUTCH RETAINER PLATE-TO-SNAP RING CLEARANCE

Application	Clearance In. (mm)	Maximum In. (mm)
1990 Axxess & 1988 Maxima	.055-.071 (1.40-1.80)	.102 (2.60)
1989 Stanza	.055-.071 (1.40-1.80)	.094 (2.40)
1988-89 Pulsar	.071-.087 (1.80-2.20)	.118 (3.00)
1988 Stanza	.071-.087 (1.80-2.20)	.110 (2.80)

HIGH CLUTCH RETAINER SELECTIVE SIZES

Application	(1) Thickness In. (mm)
1990 Axxess & 1989 Pulsar	.142-.197 (3.60-5.00)
1988 Maxima & 1989 Stanza	.142-.189 (3.60-4.80)
1988 Pulsar	.134-.173 (3.40-4.40)
1988 Stanza	.142-.213 (3.60-5.40
(1) All retainer plates in .008" (.20mm) increments.	

LOW CLUTCH

Disassembly

Using spring compressor, compress clutch springs and remove snap ring from retainer. Remove retainer plate. Note number and arrangement of drive and driven plates. See **Fig. 21** . Install bearing retainer into low clutch hub, plug one oil passage hole by finger and apply compressed air to other hole to force clutch piston out of drum. See **Fig. 22** .

Inspection

Check clutch discs for wear or damage. Measure drive plate thickness. Plate thickness should be .079" (2.0 mm). If less than .071" (1.8 mm) replace drive plate(s). Check snap ring, springs and spring retainer for damage,

wear or warpage. Replace defective components as required.

Reassembly

1. Lubricate clutch components with ATF. Install inner seal and piston seal, taking care not to damage seal during installation. Install piston in drum, taking care not to kink or damage seal. Turn piston by hand to ensure there is no binding.

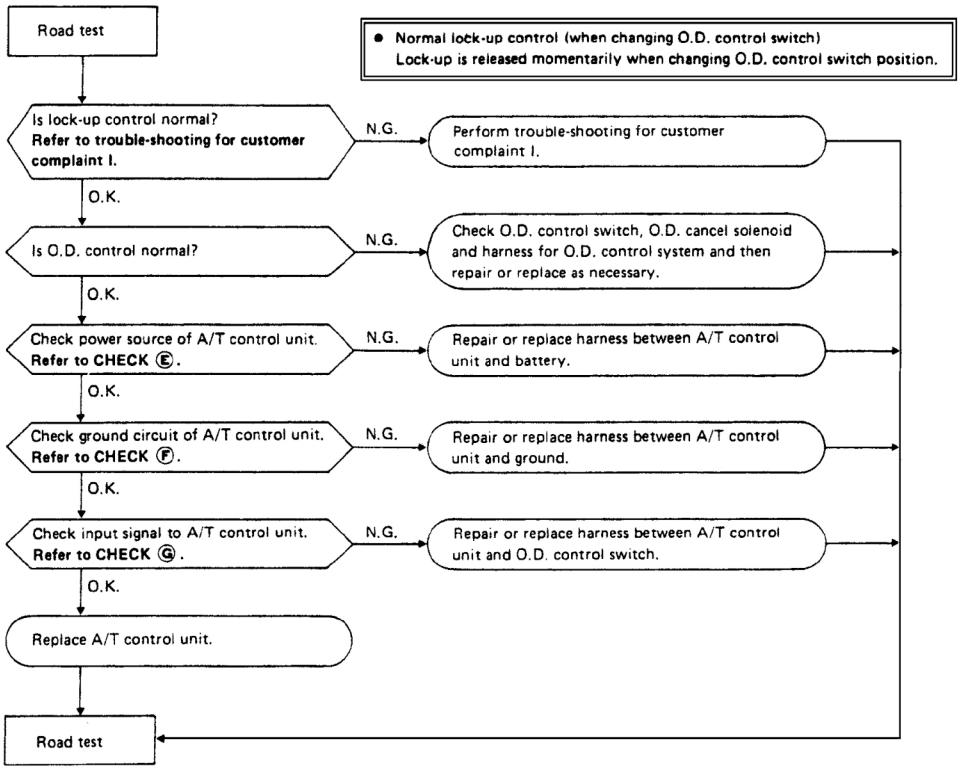


Fig. 11: Overdrive Control Testing (1988-89 Stanza)
Courtesy of NISSAN MOTOR CO., U.S.A.

2. Install clutch springs. Using spring compressor, install spring retainer and snap ring. Install driven plates, drive plates, retaining plate and secure with snap ring. Measure clearance between retaining plate and snap ring. See **Fig. 20** . See **LOW CLUTCH RETAINER PLATE-TO-SNAP RING CLEARANCE** table.
3. If clearance exceeds specifications, replace retaining plate. Selective size retaining plates are available. See **LOW CLUTCH RETAINER PLATE SIZES** table.
4. If clearance is correct, install bearing retainer, plug one oil passage hole by finger and apply compressed

air to oil passage to check clutch operation. See **Fig. 22** .

LOW CLUTCH RETAINER PLATE-TO-SNAP RING CLEARANCE

Application	Standard In. (mm)	Maximum In. (mm)
1990 Axxess	.020-.031 (.50-.80)	.071 (1.80)
1988 Maxima	.020-.031 (.50-.80)	.079 (2.00)
1988-89 Pulsar & 1988-89 Stanza	.20-.031 (.50-.80)	.063 (1.60)

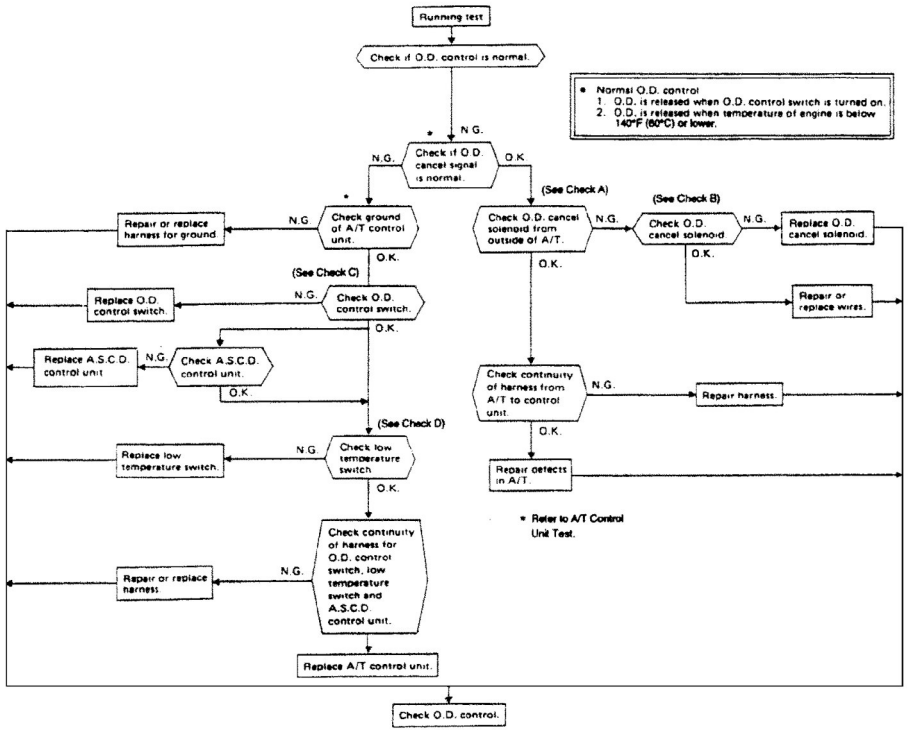
LOW CLUTCH RETAINER PLATE SIZES

Application	(1) Thickness In. (mm)
1990 Axxess, 1988-89 Pulsar & 1988-89 Stanza	.189-.236 (4.80-6.00)
1988 Maxima	.126-.165 (3.20-4.20)
(1) Retainer plates are in .008" (.20 mm) increments.	

REVERSE CLUTCH

Disassembly

Remove snap ring, retainer plate, drive and driven plates and dished plate. Compress return springs with a suitable spring compressor just enough to remove snap ring. Remove spring compressor, spring retainer and return spring. See **Fig. 23** . Place reverse clutch drum on oil pump, apply compressed air to reverse clutch oil passage to remove reverse clutch piston. See **Fig. 19** .



Check A – Overdrive Cancel Solenoid Test (Outside AT)
Unplug overdrive cancel/lock-up solenoid harness connector. Connect jumper wires from a 12-volt battery to overdrive cancel solenoid terminals and ensure solenoid clicks when power is applied. *See Fig. 8.*

Check B – Overdrive Cancel Solenoid Test
Remove valve body cover. Connect jumper wires from positive battery terminal to Red wire of solenoid and from negative battery terminal to Black wire of solenoid. Ensure solenoid clicks when power is applied. *See Fig. 9.* If solenoid does not click, replace overdrive solenoid.

Check C – "OVERDRIVE" Switch Test
Using an ohmmeter check continuity between overdrive switch terminals. Continuity between terminals should exist with switch in OFF position. No continuity should exist with switch in ON position. If readings are incorrect, replace overdrive switch.

Check D – Low Temperature Switch Test
Using an ohmmeter, measure low temperature switch continuity. Ohmmeter should indicate continuity with engine cold, zero continuity with engine hot. If readings are incorrect, replace low temperature switch.

G00286322

Fig. 12: Overdrive Control Testing (1988 Maxima)
Courtesy of NISSAN MOTOR CO., U.S.A.

Inspection

Check clutch discs for wear or damage. Measure drive plate thickness. Plate thickness should be .079" (2.0 mm). If less than .071" (1.8 mm) replace drive plate(s). Check snap ring, springs and spring retainer for damage, wear or warpage. Replace defective components as required.

Reassembly

1. Lubricate clutch components with ATF. Install inner seal and piston seal, taking care not to damage seal during installation. Install piston in drum, taking care not to kink or damage seal.
2. Turn piston by hand to ensure there is no binding. Install clutch springs. Using spring compressor, install spring retainer and snap ring. Install driven plates, drive plates, and secure with snap ring.
3. Measure clearance between retainer plate and snap ring. Clearance should be .020-.031" (.50-.80 mm). If clearance exceeds .047" (1.2 mm), replace retaining plate. On Maxima (1988) and Axxess (1990), retaining plate is available in thicknesses of .181-.213" (4.60-5.40 mm) in .2 mm increments.

4. On Stanza (1988-89), retaining plate is available in thickness of .181-.236" (4.60-6.00 mm) in .008" (.20 mm) increments. If clearance is correct, install clutch on oil pump. Apply compressed air to center oil passage to check clutch operation. See **Fig. 19** .

LOW & REVERSE BRAKE

Disassembly and reassembly of low and reverse brake is performed in **TRANSAXLE DISASSEMBLY** and **TRANSAXLE REASSEMBLY** . Note layout of low and reverse brake assembly. See **Fig. 24** . Some models use 2 retaining plates.

Inspection

1. Check brake for wear or damage. Measure drive plate thickness. Plate thickness should be .079" (2.00 mm). If less than .071" (1.80 mm) replace drive plate(s).
2. Check snap ring, springs and spring retainer for damage, wear or warpage. Replace defective components as required.

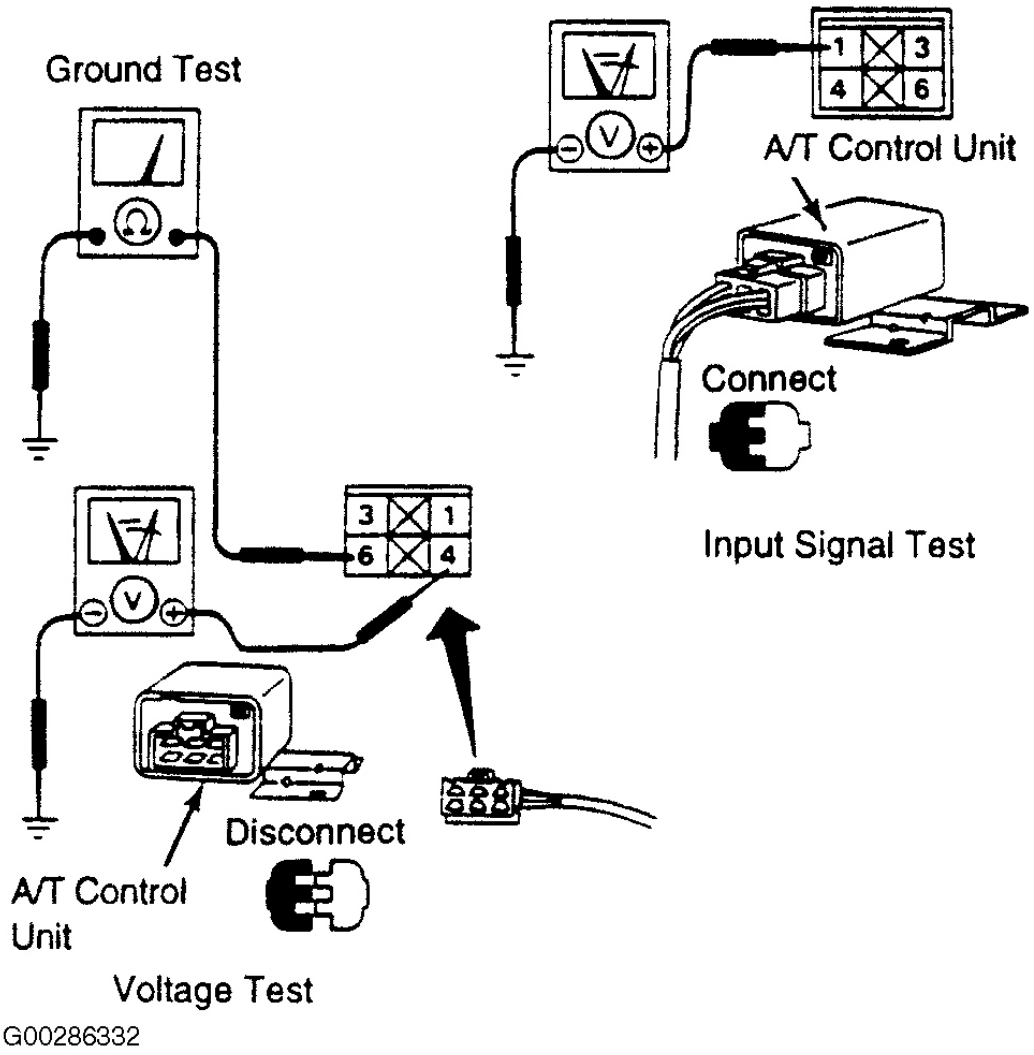


Fig. 13: Testing Automatic Transmission Control Unit For Ground, Voltage & Input Signal
Courtesy of NISSAN MOTOR CO., U.S.A.

BRAKE BAND & BAND SERVO

Disassembly

Disassemble the piston assembly and discard the "O" rings. See **Fig. 25** .

Inspection

Check brake band friction material for wear. Replace band if cracked, chipped, or burnt. Check band servo components and replace if worn or scored.

Reassembly

To assemble, reverse disassembly procedure. Install new "O" rings. Tighten accumulator spring retainer screw to 34-45 INCH lbs. (3.8-5.1 N.m).

CONTROL CYLINDER

Disassembly

Remove snap ring and push on control rod to remove internal parts. Remove "O" ring from cylinder plug, snap retainer, control rod, small "O" ring and seal. See **Fig. 26** .

Inspection

Inspect control cylinder body, control piston and cylinder plug for scratches or damage. Replace as necessary.

Reassembly

Reassembly is reversal of disassembly. Apply air pressure to oil passage for operation check. See **Fig. 26** .

GOVERNOR ASSEMBLY

Disassembly

Disassemble governor and place components in order of disassembly. DO NOT interchange primary and secondary governor components. See **Fig. 27** . Governors on 1990 Axxess are not repairable, is defect is found replace governor. See **Fig. 28** .

Inspection

Check governor valves for burns and scratches. Inspect springs for weakness and burning. Check spring free length. See **GOVERNOR SPRING SPECIFICATIONS** table. If any abnormalities are found, replace governor body, valves and springs as an assembly.

GOVERNOR SPRING SPECIFICATIONS

Application	Free Length In. (mm)
1988 Maxima	
Primary Governor	1.272 (32.30)
Secondary Governor	.988 (25.10)
Governor Boost	1.11 (28.2)
1988 Pulsar	
Primary Governor	1.272 (32.30)
Secondary Governor	.862 (21.90)
Governor Boost	1.11 (28.2)
1989 Pulsar	
Primary Governor	1.272 (32.30)

Secondary Governor	.862 (21.90)
Governor Boost	1.13 (28.7)
1988-89 Stanza	
Primary Governor	1.272 (32.30)
Secondary Governor	1.161 (29.50)
Governor Boost	1.11 (28.2)

Reassembly

To assemble, reverse disassembly procedure. Ensure governor boost, primary and secondary governor springs are properly installed.

PLANETARY CARRIER

Inspection

Measure clearance between planetary carrier and pinion washer. See **PLANETARY CARRIER PINION CLEARANCE** table. Check planetary gear sets and bearings for damage or wear. Replace as necessary.

PLANETARY CARRIER PINION CLEARANCE

Application	(1) Clearance In. (mm)
1990 Axxess Front Carrier	.006-.028 (.15-.70)
1990 Axxess Rear Carrier	.008-.028 (.20-.70)
1988 Maxima & 1988 Stanza Front & Rear Carrier	.006-.028 (.15-.70)
1988-89 Pulsar & 1989 Stanza Front & Rear Carrier	.008-.028 (.20-.70)
(1) Maximum clearance for all models .032" (.80 mm).	

BEARING RETAINER & OUTPUT SHAFT

Inspection

Measure clearance between seal rings and ring grooves. Clearance should be .004-.01" (.10-.25 mm). If clearance exceeds .01" (.25 mm), replace seal ring(s).

CONVERTER HOUSING & TRANSAXLE CASE

Disassembly

Remove reduction pinion gear front outer race using Race Remover (J-34286). Using a drift, remove differential side bearing outer race. Using a drift, remove torque converter and differential oil seals.

Reassembly

Using appropriate size drifts, replace races into case. Install new oil seals with proper size drift.

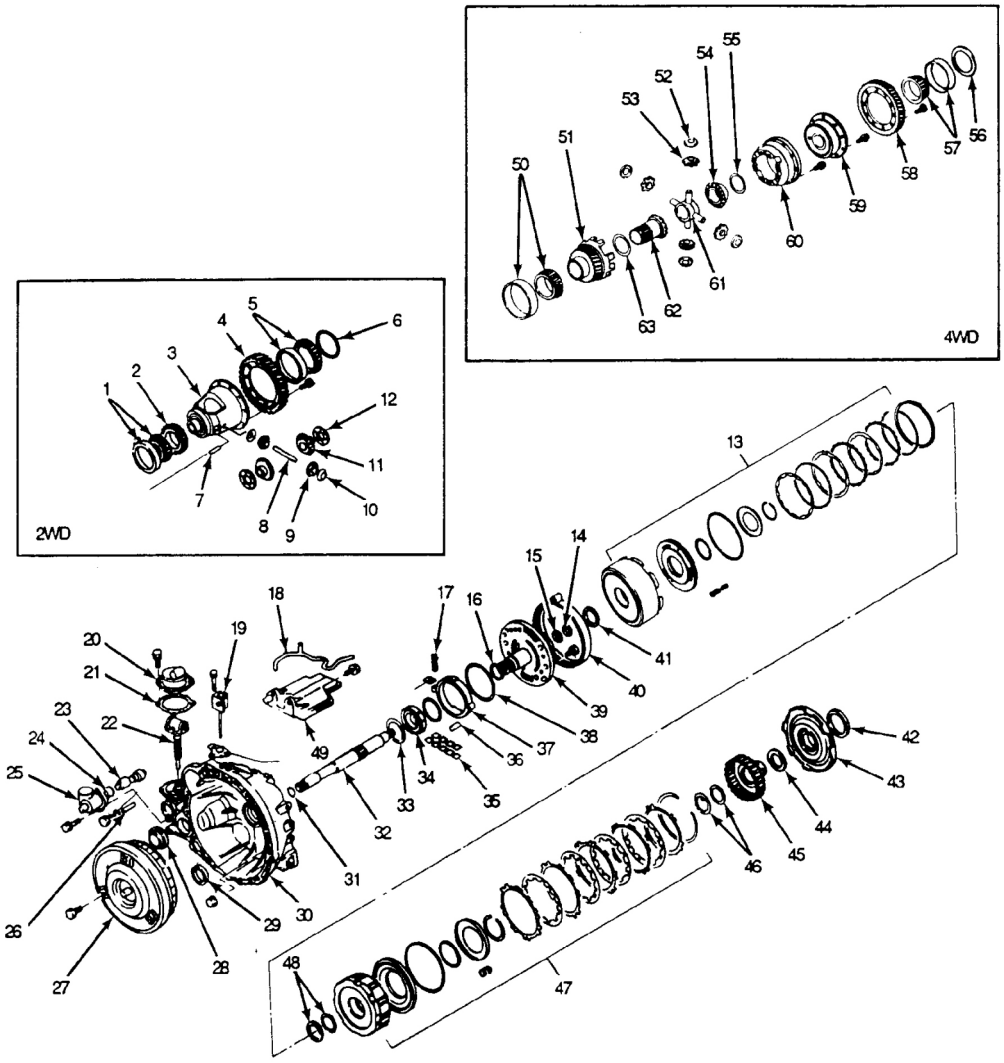
VALVE BODY

Disassembly

During disassembly, DO NOT lose 9 steel check balls on valve body for Maxima, Pulsar and Stanza. For Axxess, 12 steel check balls in upper valve body and 1 in lower valve body. Place valves and springs in order of removal for reassembly reference. Using wire, push out pins from manual valve side of valve body. See **Fig. 29** and **Fig. 30** . Remove valve body plugs.

Inspection

1. Clean valves in alcohol or lacquer thinner. Dip valve body in carburetor cleaner or lacquer thinner. DO NOT leave valve body in cleaner longer than 5 minutes. Rinse parts thoroughly and blow dry.
2. Use only crocus cloth to remove burns or heavy varnish deposits. DO NOT use emery cloth as it is too coarse and can scratch valves or valve bores. Replace valves if deposits cannot be removed. Check valves for rounded edges. If edges are not sharp, replace valve.



1. Differential Side Bearing
2. Governor Drive Gear
3. Differential Case
4. Ring Gear
5. Differential Side Bearing
6. Differential Adjustment Shim
7. Lock Pin
8. Pinion Shaft
9. Pinion Gear
10. Thrust Washer
11. Side Gear
12. Thrust Washer
13. Reverse Clutch Assembly
14. Bearing Race
15. Needle Bearing
16. Rotor Support Ring
17. Return Spring
18. Lubrication Tube
19. Control Cylinder
20. Governor Cap
21. Gasket
22. Governor Valve & Shaft
23. Speedometer Gear
24. Seal Ring
25. Speedometer Case
26. Pin
27. Torque Converter
28. Oil Seal
29. Oil Seal
30. Converter Housing
31. "O" Ring
32. Input Shaft
33. Vane Ring
34. Rotor
35. Vane
36. Pivot Pin
37. Cam Ring
38. Friction Ring
39. Oil Pump Cover
40. Brake Band
41. Thrust Washer
42. Seal
43. High Clutch Carrier
44. Needle Bearing
45. High Clutch Hub
46. Needle Bearing
47. High Clutch Assembly
48. Needle Bearing
49. Oil Strainer
50. Differential Side Bearing
51. Differential Case
52. Thrust Washer
53. Pinion Gear
54. Side Gear
55. Thrust Washer
56. Differential Side Bearing Shim
57. Differential Side Bearing
58. Ring Gear
59. Viscous Coupling
60. Differential Case
61. Pinion Cross Shaft
62. Side Gear
63. Thrust Washer

G00286331

Fig. 14: Exploded View Of Differential, Oil Pump, Reverse Clutch & High Clutch Assemblies
Courtesy of NISSAN MOTOR CO., U.S.A.

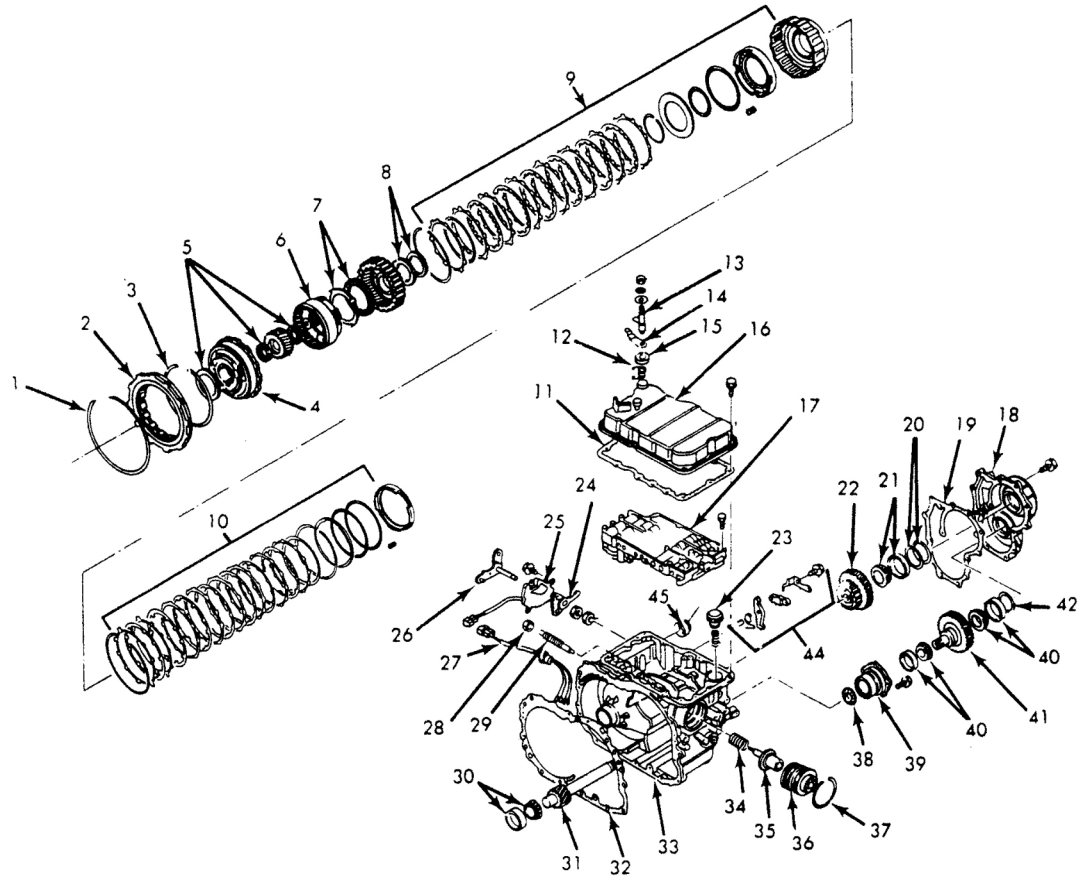


Fig. 15: Exploded View Of Front Carrier, Rear Carrier, Low Clutch, Low-Reverse Brake & Transaxle Assembly
Courtesy of NISSAN MOTOR CO., U.S.A.

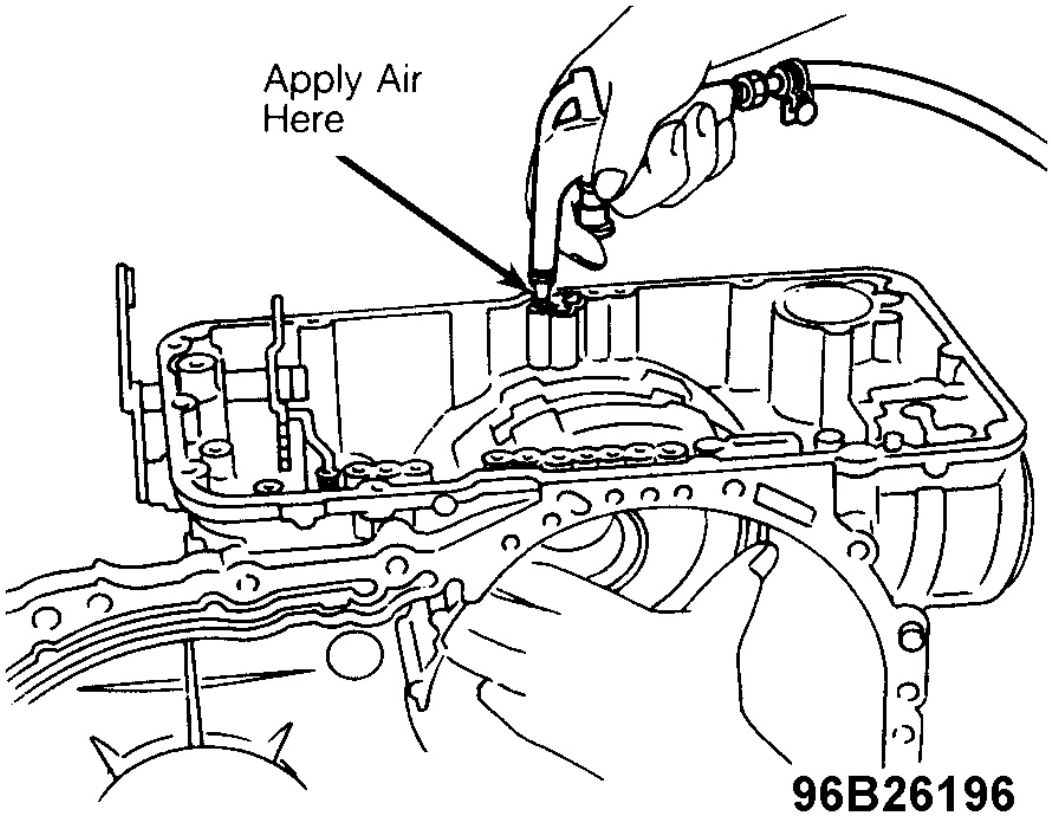


Fig. 16: Removing & Checking Low-Reverse Brake Piston
Courtesy of NISSAN MOTOR CO., U.S.A.

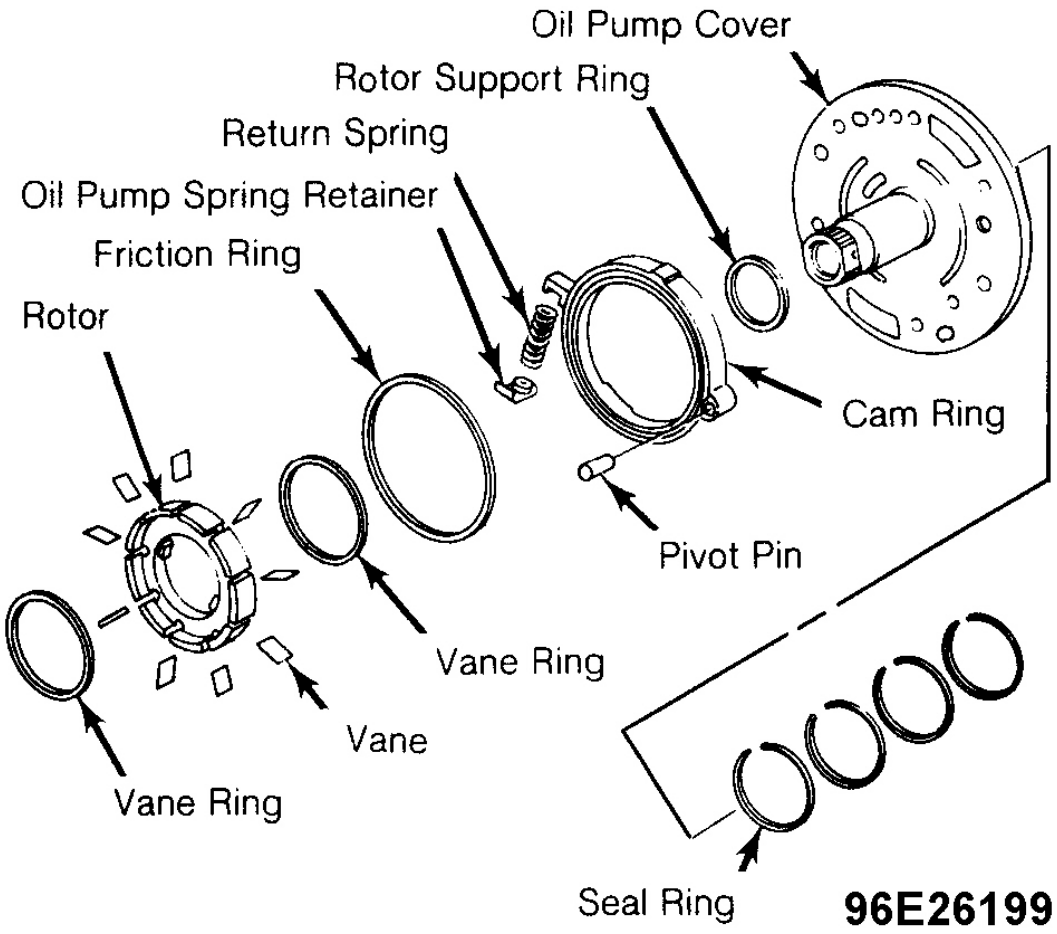


Fig. 17: Exploded View of Oil Pump Assembly
Courtesy of NISSAN MOTOR CO., U.S.A.

3. Check separator plate for scratches or damage. Separator plate must not be scratched or damaged or oil will by-pass correct oil passages and system malfunction will result. Inspect upper and lower valve body oil passages for varnish deposits, scratches or other damage that would impair valve movement.
4. Check valve body and bolts for stripped threads. Repair any damaged thread holes. Check valve spring free length. Refer to **VALVE BODY SPRING SPECIFICATIONS** table. Replace defective components as required.

NOTE: If clearance between valves and valve bores exceeds .001" (.03 mm), replace entire valve body.

VALVE BODY SPRING SPECIFICATIONS

Valve Spring	Free Length In. (mm)
Back-up Valve	.740 (18.80)

Detent Valve	1.146 (29.10)
Lock-Up Accumulator	1.646 (41.80)
Lock-Up Control Valve	1.417 (36.00)
Lock-Up Timing Valve	1.169 (29.70)
Low Clutch Timing Valve	1.169 (29.70)
Pressure Modifier Valve	
1990 Axxess	1.004 (25.50)
1988 Maxima & 1988-89 Pulsar	1.827 (46.40)
1988-89 Stanza	1.756 (44.60)
Pressure Regulator	
1990 Axxess	1.693 (43.00)
1988 Maxima & 1988-89 Pulsar	1.587(40.30)
1988-89 Stanza	1.583 (40.20)
Throttle Valve	
1990 Axxess	1.348 (34.25)
1988 Maxima	1.309 (33.25)
1988 Pulsar & 1988-89 Stanza	1.329 (33.75)
1989 Pulsar	1.348 (34.25)
Torque Converter Regulator Valve	1.063 (27.00)
1st Reducing Valve	
1990 Axxess	1.106 (28.10)
All Other Models	1.039 (36.40)
1-2 Shift Valve	
1990 Axxess	1.890 (48.00)
All Other Models	1.972 (50.10)
2-3 Shift Valve	
1990 Axxess	1.610 (40.90)
1990 Maxima & 1988 Stanza	1.701 (43.20)
1988 Pulsar	1.555 (39.50)
1989 Pulsar	1.654 (42.00)
1989 Stanza	1.681 (42.70)
2-3 Shift Plug	
1988 Maxima, 1989 Pulsar & 1989 Stanza	1.555 (39.50)
2-3 Timing Valve	
1990 Axxess	1.169 (29.70)
2-3 Throttle Modulator Valve	
1990 Axxess	1.291 (32.80)
2-4 Timing Valve	
1990 Axxess & 1988-89 Pulsar	1.346 (34.20)
1988 Maxima & 1988-89 Stanza	1.339 (34.00)
3-2 Downshift Valve	
All Models	

	1.654 (42.00)
3-2 Timing Valve	
1990 Axxess, 1988-89 Pulsar & 1989 Stanza	.843 (21.40)
1989 Maxima & 1988 Stanza	.906 (23.00)
3-4 Shift Plug	
1990 Axxess	1.752 (44.50)
3-4 Shift Valve	
1990 Axxess	2.382 (60.50)
1989 Maxima & 1988-89 Stanza	2.776 (70.50)
1989-89 Pulsar	2.764 (70.20)
3 & 4 Speed Cut Valve	
1988 Maxima	.874 (22.20)
1988 Stanza	.909 (23.10)
3-Speed Cut Valve	
1989 Stanza	.854 (21.70)
3-4 Governor Valve	
1988 Maxima	.906 (23.00)
4-Speed Cut Valve	
1990 Axxess & 1988-89 Pulsar	.890 (22.60)
1989 Stanza	.909 (23.10)
4-2 timing Valve	
1990 Axxess, 1988 Pulsar & 1988-89 Stanza	.811 (20.60)
1988 Maxima & 1989 Pulsar	.909 (23.10)
4-3 timing Valve	
All Models	1.169 (29.70)
OD Inhibitor Valve	
1988 Maxima & 1988 Stanza	.854 (21.70)

Reassembly

Install valves and springs in correct locations. For all models except Axxess, place 9 steel check balls in correct position in valve body. Axxess uses 12 steel check balls. See **Fig. 29** , **Fig. 30** , **Fig. 31** and **Fig. 32** . Assemble separator plate and valve bodies. See **Fig. 33** . Install 2 reamer bolts. See **Fig. 34** . Install and tighten remaining bolts. Pay attention to position of harness clamps when installing valve body bolts. Install lock-up and cancel solenoids.

FRONT DIFFERENTIAL

Disassembly

Remove ring gear mount bolts. Separate ring gear from differential case. Using drift punch and hammer, drive out pinion shaft lock pin and remove pinion shaft. Remove pinion gears and thrust washer. Remove side gears and thrust washers from case. Using bearing puller, remove side bearing and side bearing outer race. Remove governor drive gear from differential case. See **Fig. 14** and **Fig. 15** .

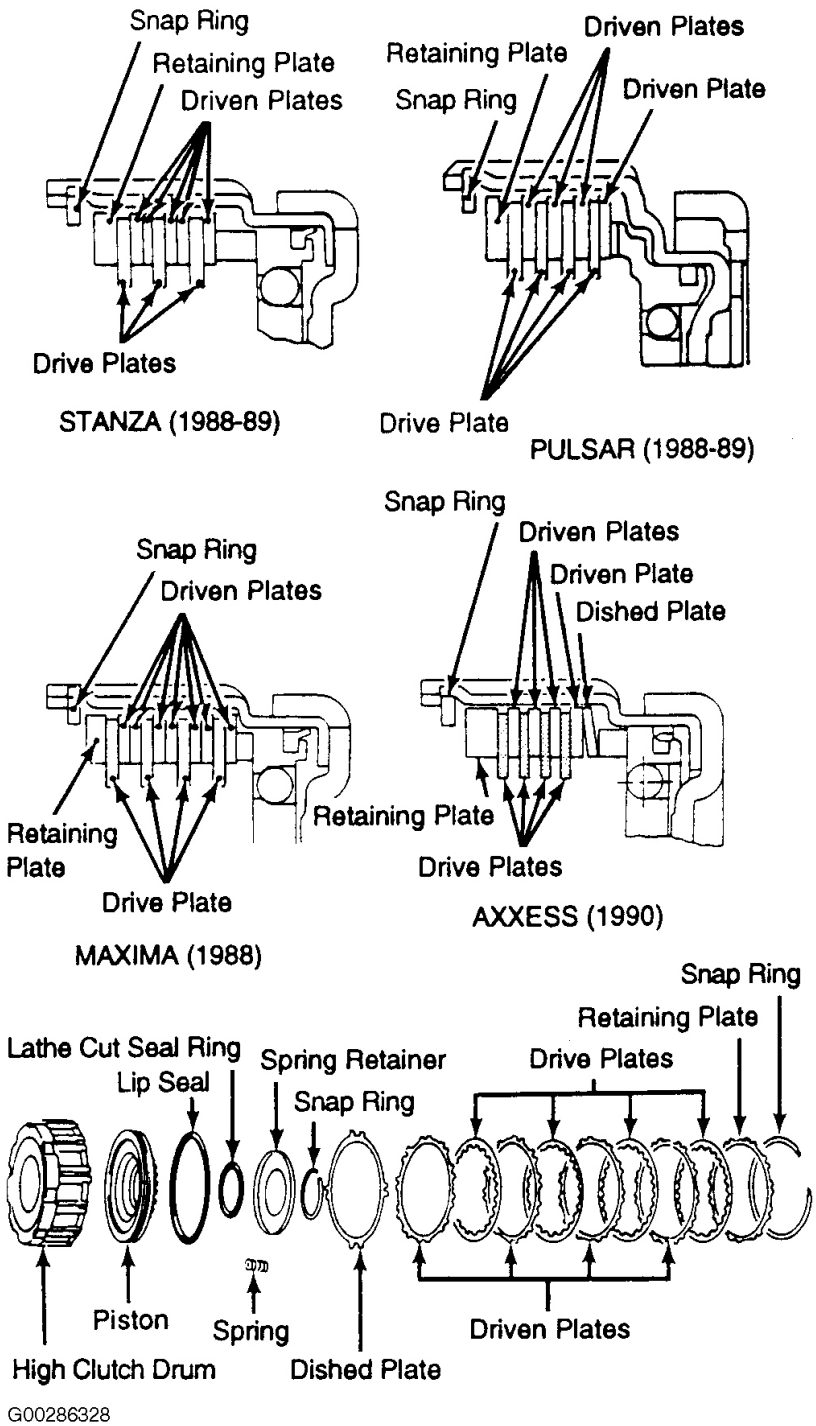


Fig. 18: Exploded View Of High Clutch
Courtesy of NISSAN MOTOR CO., U.S.A.

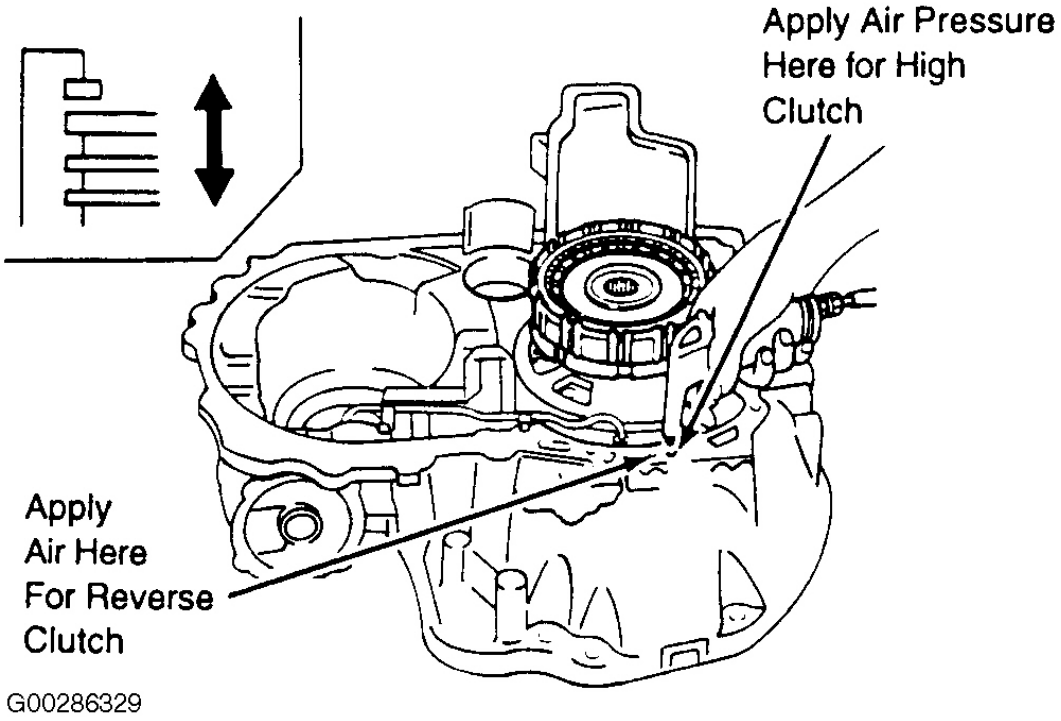


Fig. 19: Removing & Checking Piston
Courtesy of NISSAN MOTOR CO., U.S.A.

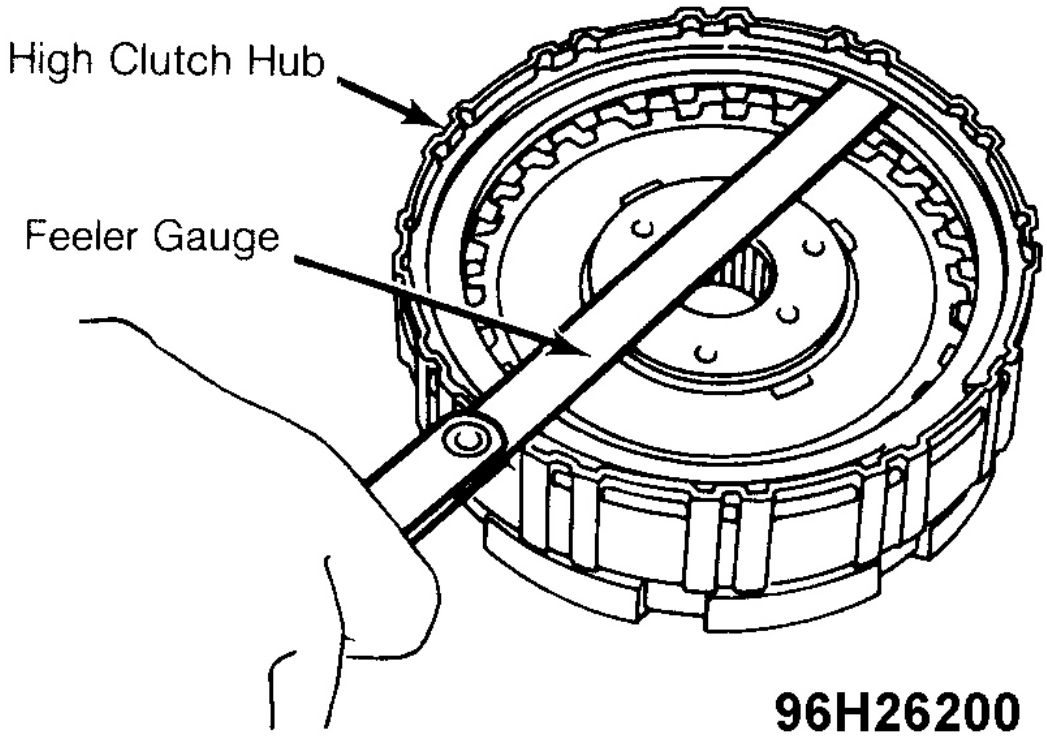


Fig. 20: Measuring Clutch Clearance
Courtesy of NISSAN MOTOR CO., U.S.A.

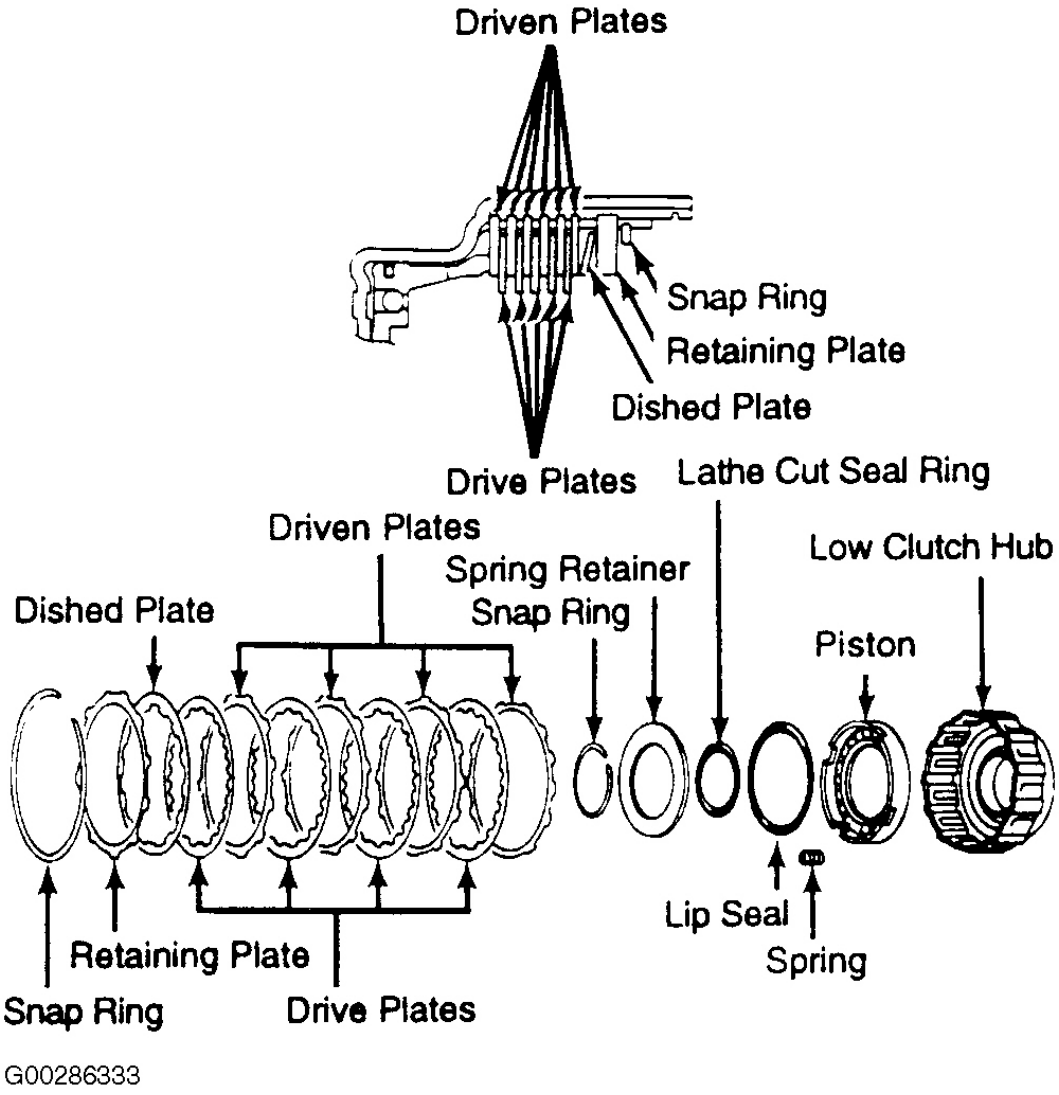


Fig. 21: Exploded View Of Low Clutch
Courtesy of NISSAN MOTOR CO., U.S.A.

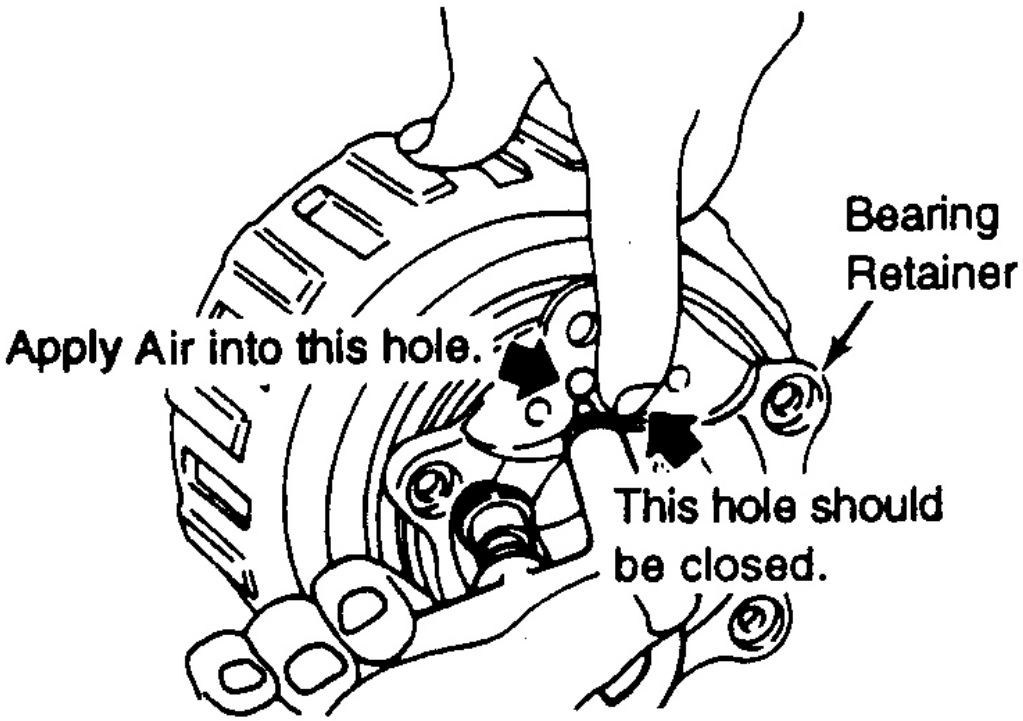


Fig. 22: Removing & Checking Low Clutch Piston
Courtesy of NISSAN MOTOR CO., U.S.A.

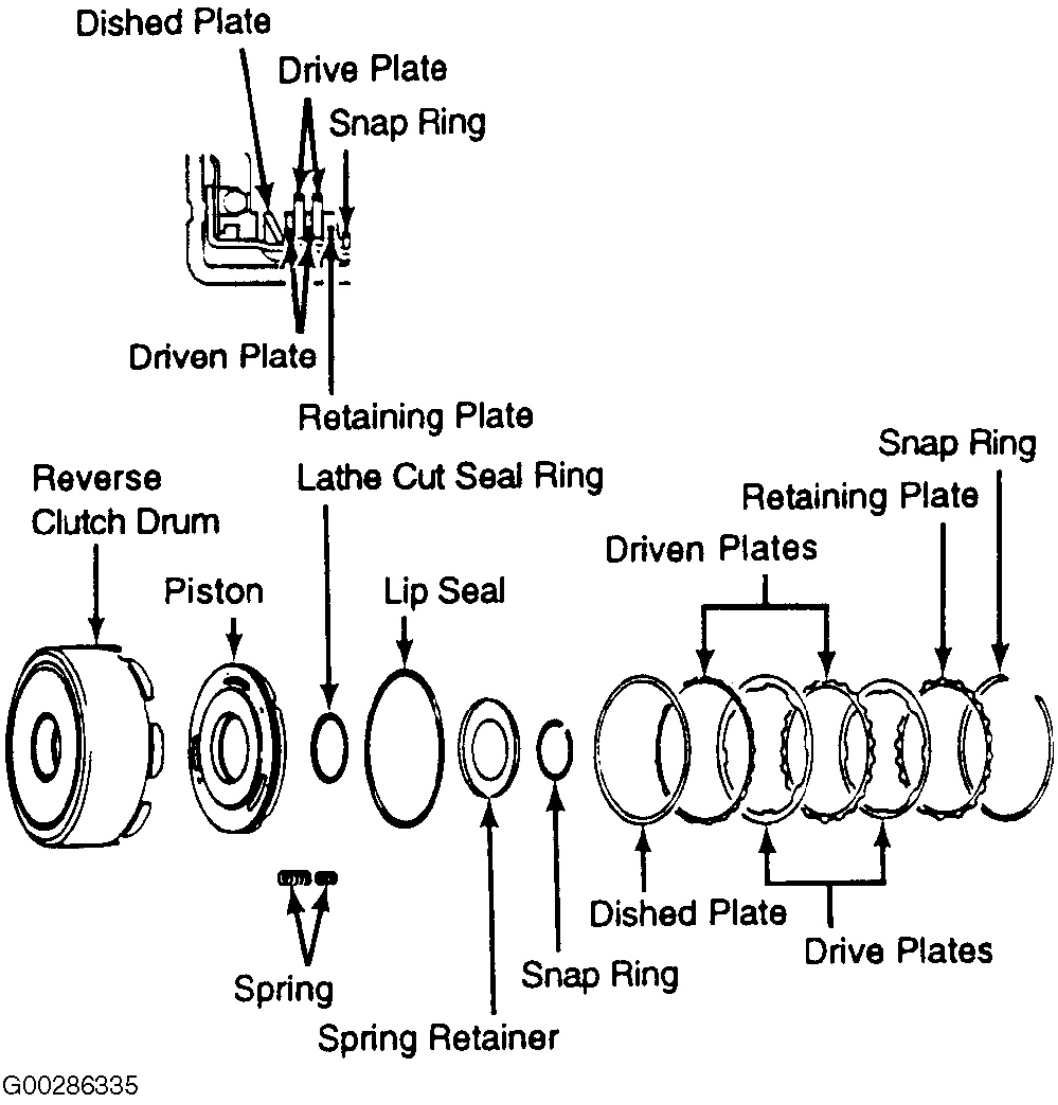


Fig. 23: Exploded View Of Reverse Clutch
Courtesy of NISSAN MOTOR CO., U.S.A.

Inspection

Check mating surface of differential case, side gears and pinion gears. Check tapered roller bearings for wear, scratches, pitting or flaking.

Reassembly

1. Install side gears and thrust washers in differential case. Install pinion gear and thrust washers while rotating them. Install pinion shift. Using inspection procedure, measure clearance between side gears. Using dial indicator and Gauge Block (J-34284), check clearance between side gear and differential case.

Move side gear up and down and note reading on dial indicator. See **Fig. 35** .

2. Repeat procedure on the other side gear. Side gear clearance must be .004-.008" (.10-.20 mm), .034-.035" (.85-.90 mm) and .035-.037" (.90-.95 mm) thicknesses.
3. If clearance is correct, install pinion shaft lock pin. Ensure pinion lock pin is flush with case. Install governor drive gear with beveled side toward case. Press on side bearings and install ring gear.

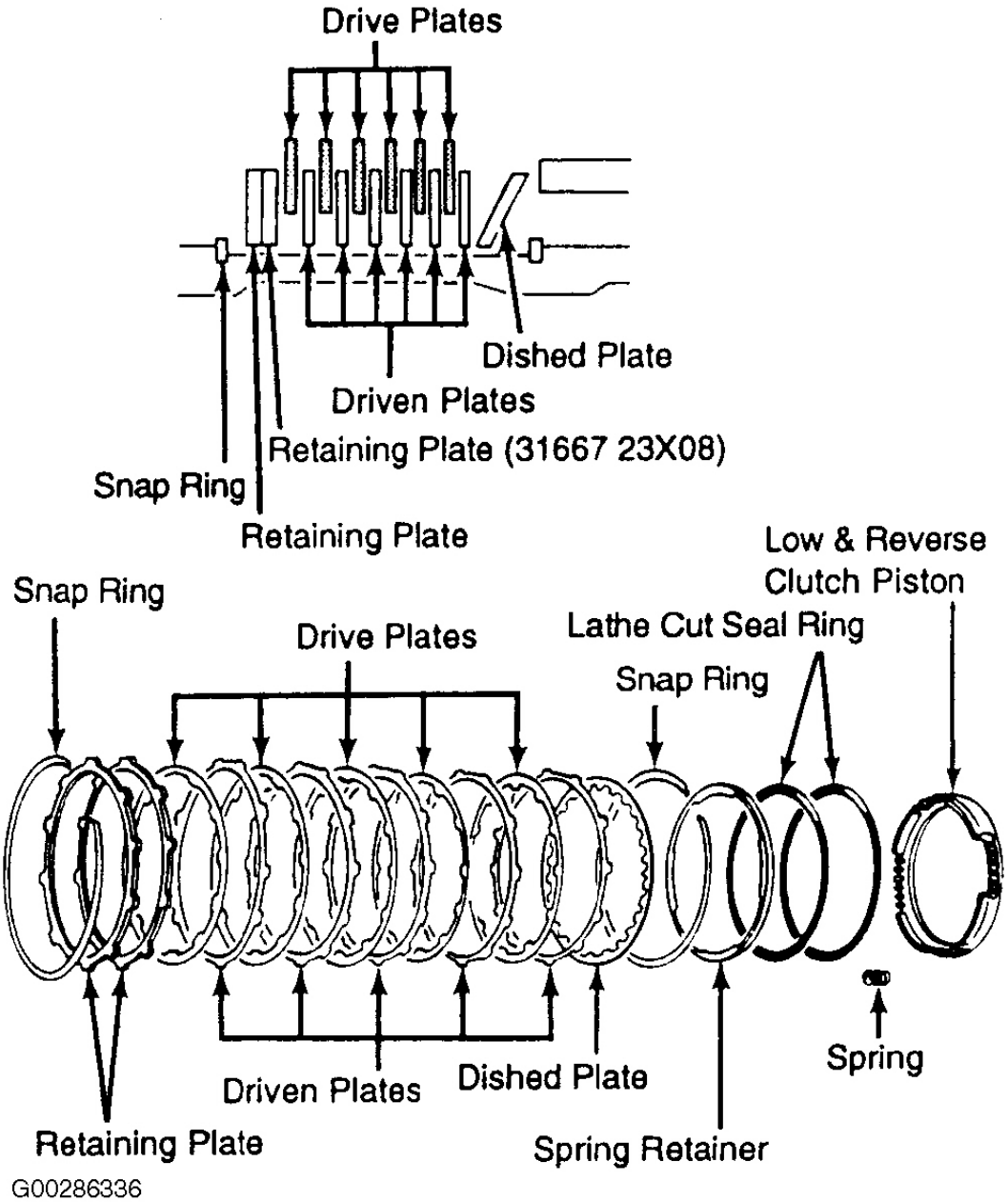


Fig. 24: Exploded View Of Low & Reverse Brake
Courtesy of NISSAN MOTOR CO., U.S.A.

CENTER DIFFERENTIAL 4WD

Disassembly

Remove ring gear, viscous coupling and separate differential case halves. Remove pinion cross shaft with pinion gears and thrust washers. Remove side gear with thrust washer. Pull bearing off viscous coupling and differential case. See **Fig. 36** .

Inspection

Inspect viscous coupling for case cracks and silicone oil leakage. Inspect mating surface of differential case, side gear and pinion gear for wear, damage and cracks. Check thrust washers for wear. Ensure bearings roll freely and are free from noise, cracks, pitting or wear. When replacing roller bearings, replace inner and outer races as a set.

Reassembly

1. Install side gears without thrust washers. Install pinion cross shaft with pinion gears and thrust washers. Bolt differential case halves together.
2. Measure clearance between side gear and viscous coupling surface of differential case, this is measurement "A". See **Fig. 37** . Measure dimension "B" and "C" of viscous coupling. Clearance between side gear and viscous coupling with thrust washer ("A"-"B"+"C") is .001-.006" (.03-.14 mm). Adjustment is made by 4 selective size thrust washers of .030-.031" (.75-.80 mm), .031-.033" (.80-.85 mm), .033-.035" (.85-.90 mm) and .035-.037" (.90-.95 mm).
3. Install left side gear thrust washer as selected above and bolt case halves together. Set dial indicator on right side gear. See **Fig. 38** . Zero dial indicator and lift right side gear up to measure clearance of .001-.006" (.03-.14 mm). Adjustment is made by selective size thrust washers of .025" (.63 mm), .028" (.72 mm), .032" (.81 mm) and .035" (.90 mm). Install selected thrust washer and side gear. Fasten case halves together. Install viscous coupling and ring gear. Press on bearings.

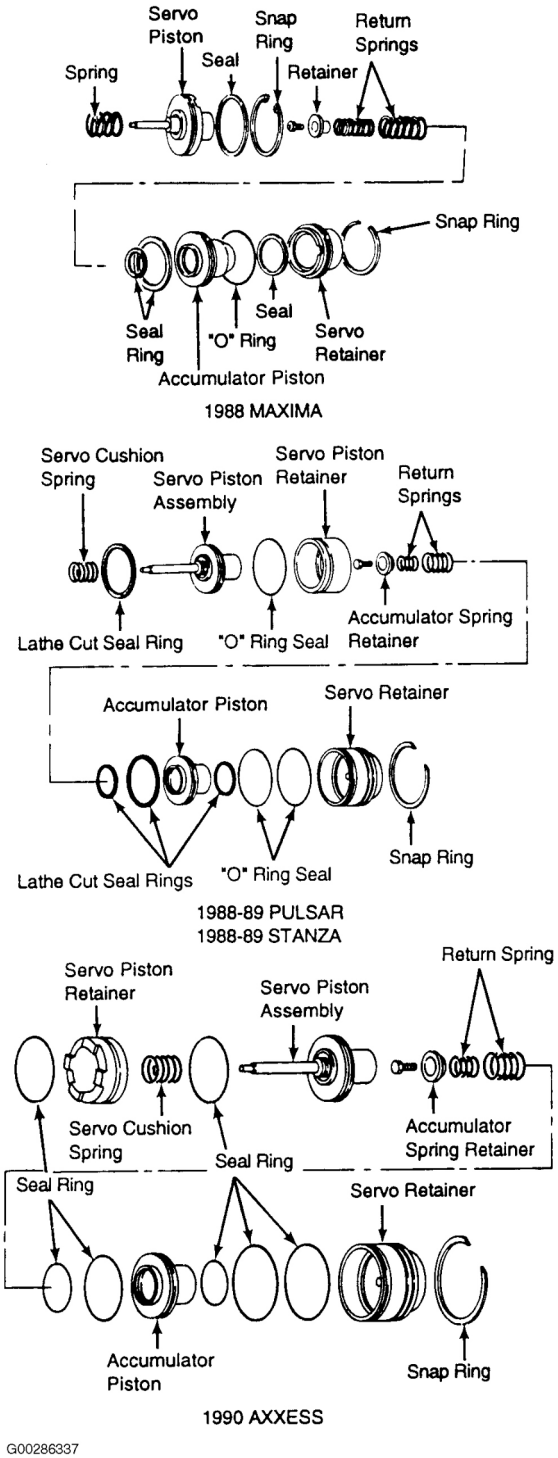


Fig. 25: Exploded View Of Brake Band Servo
Courtesy of NISSAN MOTOR CO., U.S.A.

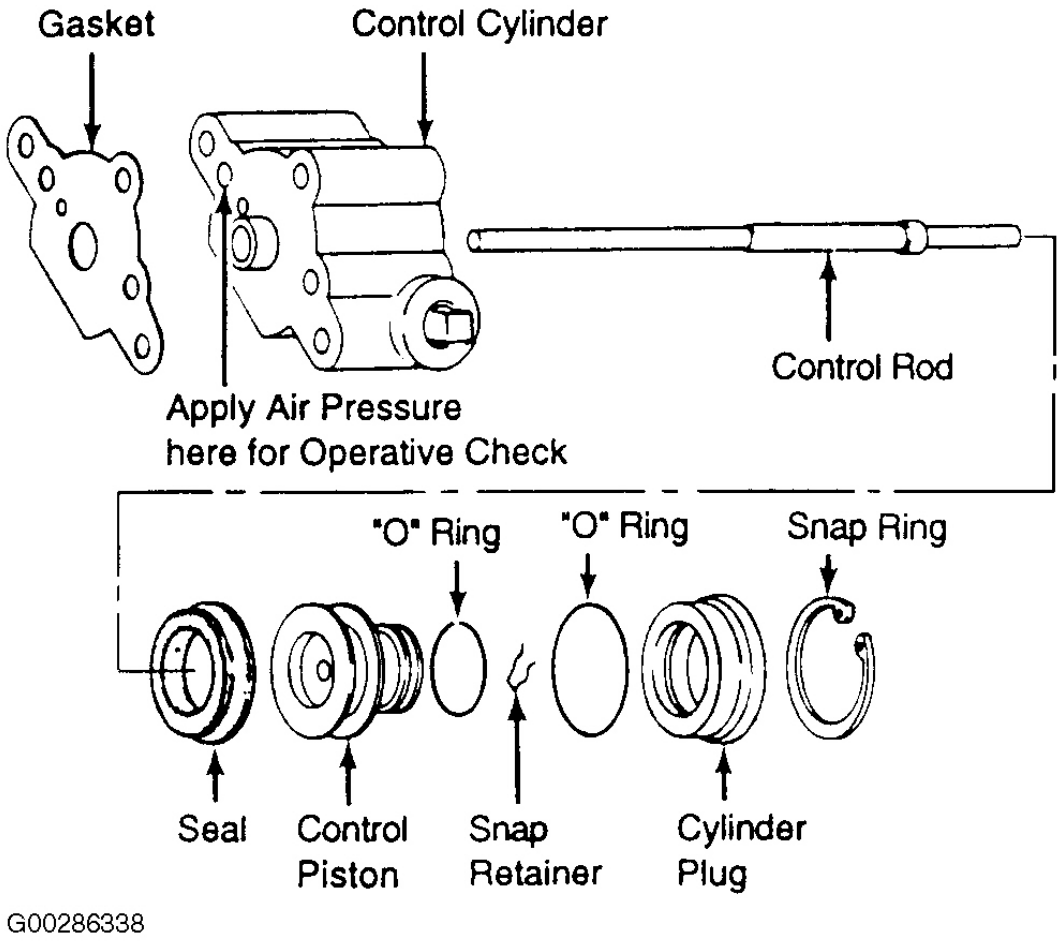


Fig. 26: Exploded View Of Control Cylinder
Courtesy of NISSAN MOTOR CO., U.S.A.

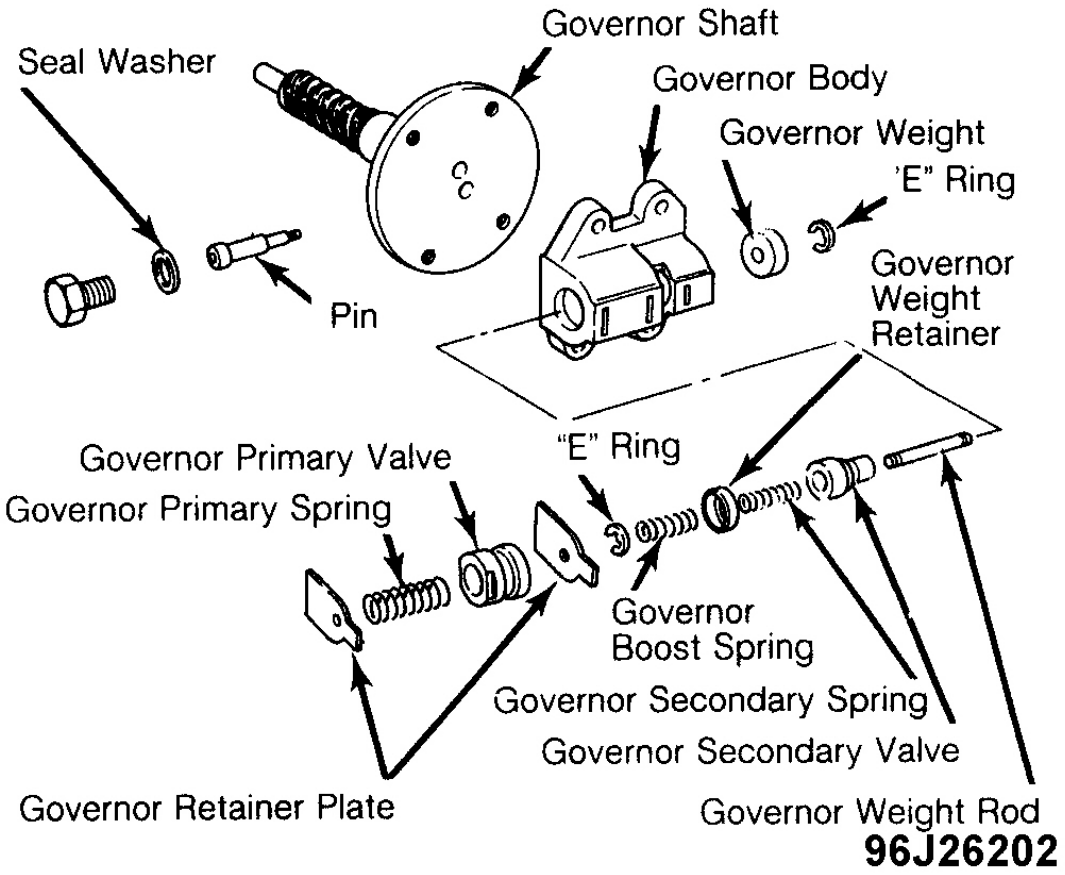


Fig. 27: Exploded View Of Governor Assembly
Courtesy of NISSAN MOTOR CO., U.S.A.

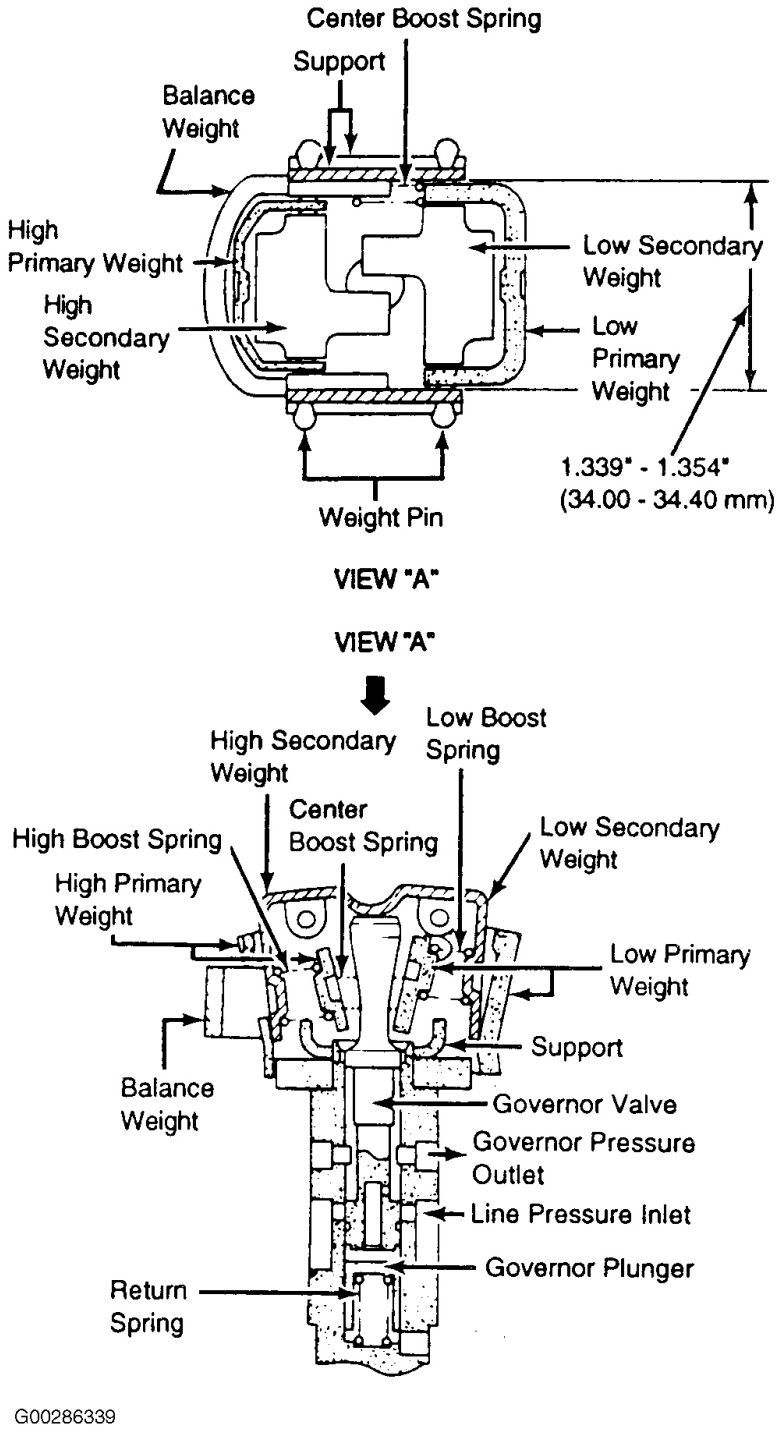


Fig. 28: Internal View Of 1990 Axxess Governor
Courtesy of NISSAN MOTOR CO., U.S.A.

TRANSAXLE REASSEMBLY

INSTALLATION

1. Install differential lubrication tube and gutter on converter housing. Install oil strainer. Install detent spring assembly. Pass parking rod into hole in manual plate and install manual plate on manual shaft. Install band brake servo, retainer, and return spring.
2. Install reduction pinion gear into transmission case, position idler gear to mesh with reduction pinion gear shaft. Place into a press and press idler gear on reduction pinion gear shaft.
3. Install seal rings into bearing retainer with great care. Liberally apply petroleum jelly to hold rings in place. Install bearing retainer. Install parking pawl, shaft, spacer and return spring. Install output gear, side cover and gasket. See **Fig. 15** .
4. Lubricate low-reverse brake piston seal. Install piston by tapping lightly into place. Install low-reverse rake retainer and secure with snap ring. Install low-reverse brake driven and drive plates, retainer plate, and secure with snap ring. With low-reverse brake assembled, measure clearance between snap ring and retainer plate. Clearance should be within specifications. See **LOW & REVERSE BRAKE SNAP RING-TO-RETAINER CLEARANCE** table. If clearance exceeds specifications, replace retainer plate. Retainer plate is available in selective sizes. See **LOW & REVERSE BRAKE RETAINER PLATE** table.
5. On all models, apply compressed air to oil passage (in transaxle case) to check low-reverse brake operation. See **Fig. 16** . Assemble front carrier, rear carrier and low clutch by installing needle bearing onto rear internal gear and install into low clutch assembly. Install needle bearing into rear internal gear. Apply petroleum jelly to bearing race and install on rear carrier pinion side. Install rear carrier into rear internal gear. Install needle bearing, sun gear needle bearing and front carrier. See **Fig. 15** . Install carrier assembly.

LOW & REVERSE BRAKE SNAP RING-TO-RETAINER CLEARANCE

Application	Standard In. (mm)	Maximum In. (mm)
1990 Axxess	.047-.063 (1.20-1.60)	.150 (3.80)
1988 Maxima	.087-.102 (2.20-2.60)	.157 (4.00)
1988-89 Pulsar & 1988-89 Stanza	.087-.102 (2.20-2.60)	.142 (3.60)

LOW & REVERSE BRAKE RETAINER PLATE

Application	Thickness In. (mm)
1990 Axxess, 1988 Maxima & 1988-89 Pulsar	.134-.197 (3.40-5.00)
1988 Stanza	.449-.512 (11.40-13.00)
1989 Stanza	.488-.551 (12.40-14.00)

6. Install one-way clutch assembly while rotating front carrier with high clutch hub. Remove high clutch hub and install snap ring. Apply petroleum jelly to bearing races and place on high clutch assembly. Install high clutch into reverse clutch assembly. Install needle bearing, sun gear assembly and bearing race with petroleum jelly. See **Fig. 14** and **Fig. 15** .

7. Install assembled reverse clutch and high clutch. Install brake band and anchor pin. Tighten anchor pin finger tight.

Total End Play

1. Measure total clutch pack end play by removing thrust bearing race from high clutch drum. See **Fig. 39** .
2. Install needle bearing on top of oil pump cover. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) on machined gasket surface of converter housing. Allow gauging cylinder to rest on needle bearings and lock in place with thumb screw. See **Fig. 40** .
3. Insert Gauging Plunger (J-34290-7) into gauging cylinder. Place b ridge with legs facing up, onto machined gasket surface of transaxle case. Allow gauging plunger to rest on surface where a bearing race was removed. Lock plunger in place. See **Fig. 41** .
4. Remove bridge and use a feeler gauge to measure gap between gauging cylinder and shoulder of plunger. Feeler gauge reading is used to select a proper bearing race to obtain correct total clutch pack end play. See **CLUTCH PACK SPECIFICATIONS** table. See **Fig. 39** . Bearing race is available in thicknesses of .031-.079" (.80-2.00 mm) in .2 mm increments.

CLUTCH PACK SPECIFICATIONS

Application	Specification In. (mm)
Total Clutch Pack End Play	.010-.22 (.25-.55)
Clutch Pack End Play	.016-.031 (.40-.80)

Clutch Pack End Play

1. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) onto machined gasket surface of transaxle case. Allow cylinder to rest on thrust washer surface of high clutch drum. Lock cylinder in place. Insert Gauging Plunger (J-34290-6) into gauging cylinder. See **Fig. 42** .
2. Remove thrust washer (if installed) from oil pump. Place bridge, gauging cylinder and gauging plunger onto machined gasket surface of converter housing. See **Fig. 43** . Lock plunger in place.
3. Use a feeler gauge to measure gap between gauging cylinder and shoulder of gauging plunger. Feeler gauge reading is used to select a proper thrust washer to obtain correct clutch pack and play. Thrust washers are available in thicknesses of .028-.075" (.70-1.90 mm) in .008" (.20 mm) increments.

Differential Side Bearing Preload (2WD)

1. Remove left side bearing inner race and shims from transaxle case to adjust differential side bearing preload. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) on machined gasket surface of transaxle case. See **Fig. 44** .

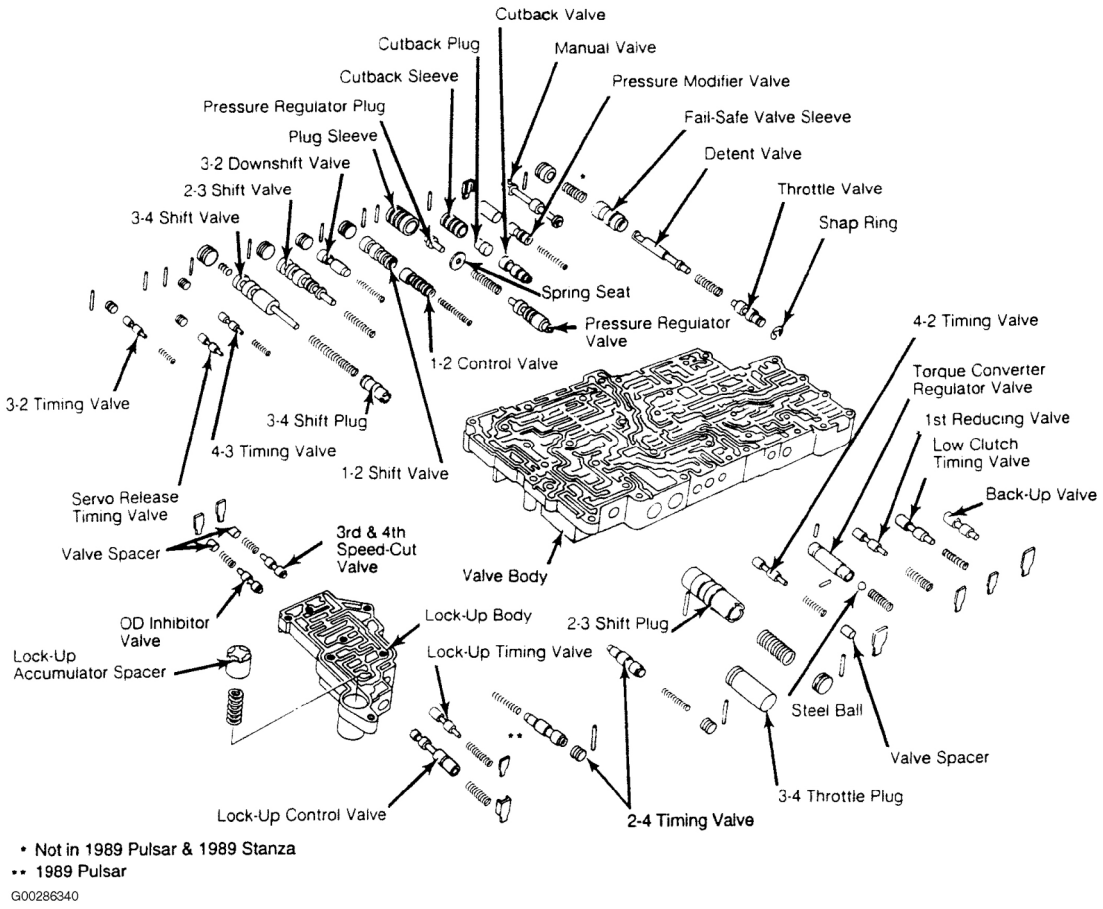


Fig. 29: Exploded View Of Valve Body (1988 Maxima, 1988-89 Pulsar & Stanza)
Courtesy of NISSAN MOTOR CO., U.S.A.

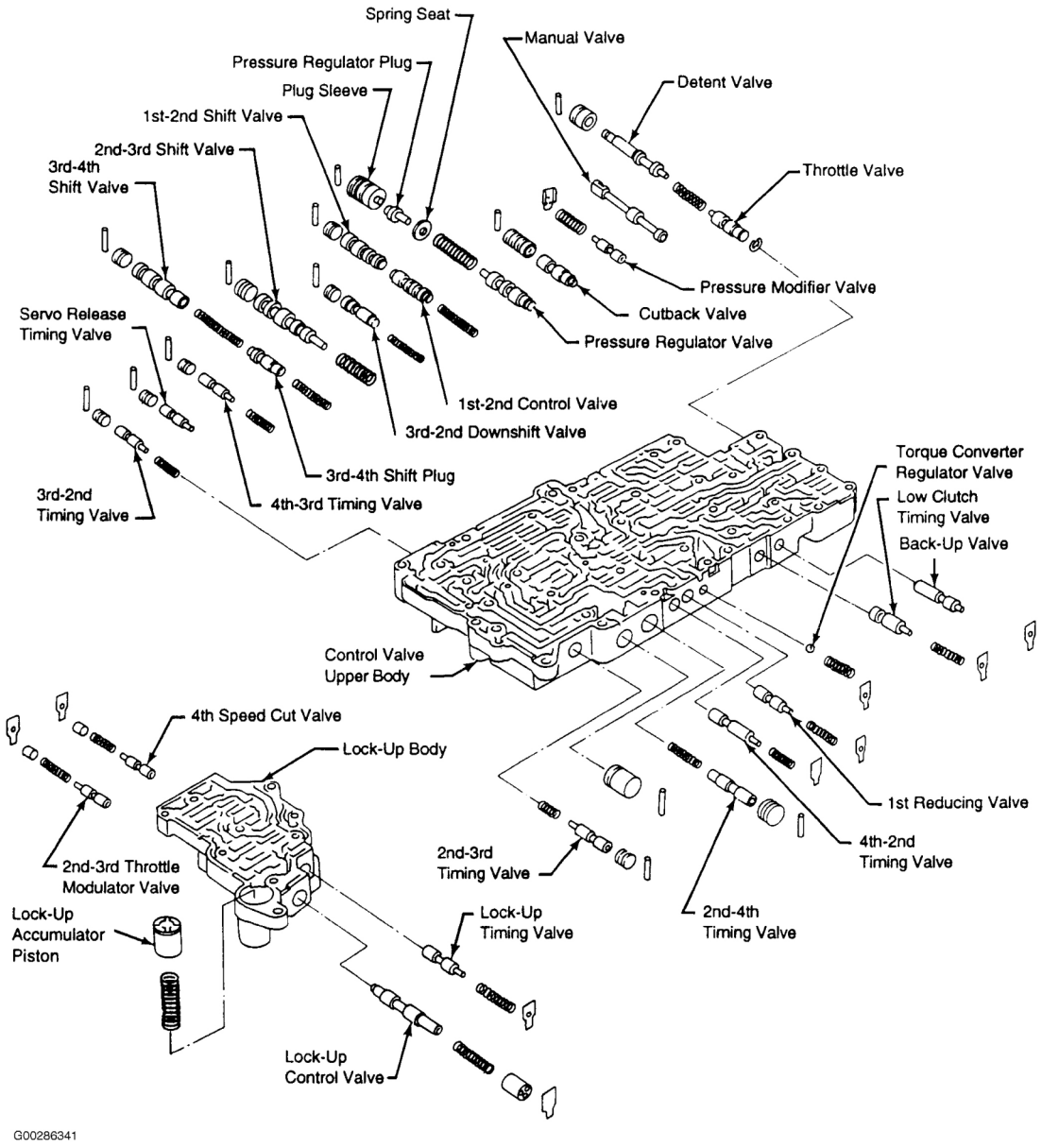


Fig. 30: Exploded View Of Valve Body (1990 Axxess)
Courtesy of NISSAN MOTOR CO., U.S.A.

2. Allow gauging cylinder to reset on bearing inner race mating surface. Lock cylinder in place. Place differential assembly into converter housing. Place side bearing inner race on differential case. Seat bearings by rotating differential assembly while holding inner bearing race.
3. Insert Gauging Plunger (J-34290-3) into gauging cylinder. Place bridge, gauging cylinder and gauging plunger onto machined gasket surface of converter housing. Allow gauging plunger to rest on surface of bearing inner race. See **Fig. 44** . Lock plunger in place.
4. Use a feeler gauge to measure clearance between gauging cylinder and shoulder of gauging plunger. Feeler gauge reading is used to select correct side bearing preload adjustment shim. Shims (13) are

available in thicknesses of .0173-.0362" (.440-.920 mm) in .0016" (.40 mm) increments, for 1988 Pulsar and Stanza and 1989 Maxima. For 1989 Pulsar and Stanza and 1990 Axxess, shims (21) are available from .0047-.0362" (.120-.920 mm) in .0016" (.040 mm) increments.

5. Using selected shim(s), install shims and left bearing inner race on transaxle case. Place transaxle on wooden blocks. Install reduction pinion gear and differential assembly. Place gasket on transaxle case and install converter housing. Ensure reduction pinion gear does not contact transaxle case.

Differential Side Bearing Preload (4WD)

1. Remove left side bearing outer race and preload adjusting shims from transmission case. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) on machined surface of transmission case and allow gauging cylinder to rest on bottom of bearing race bore. See **Fig. 45** .
2. Place final drive assembly into converter housing. Set side bearing outer race on differential side bearing and turn outer race to seat bearing.
3. Insert differential side bearing Gauging Plunger (J-34290-3) into gauging cylinder. Place bridge, gauging cylinder and gauging plunger onto machined gasket surface of converter housing and allow gauging plunger to rest on rear surface of side bearing outer race. Lock plunger in place.
4. Use feeler gauge to measure clearance between gauging cylinder and shoulder of gauging plunger. Use feeler gauge reading to select appropriate side bearing preload shim(s). Shims are available from .014-.036" (.36-.92 mm) in .0016" (.040 mm) increments. Install selected shim(s) and left side bearing outer race. Install output shaft. Install selected thrust washer and bearing on oil pump cover. Place gasket on transmission case and install converter housing. See **Fig. 46** . Always use new bolts to positions "A", "B", "H" and "I" as they are self sealing. See **Fig. 46** . Apply ATF to all other bolts. Install "O" ring onto input shaft.

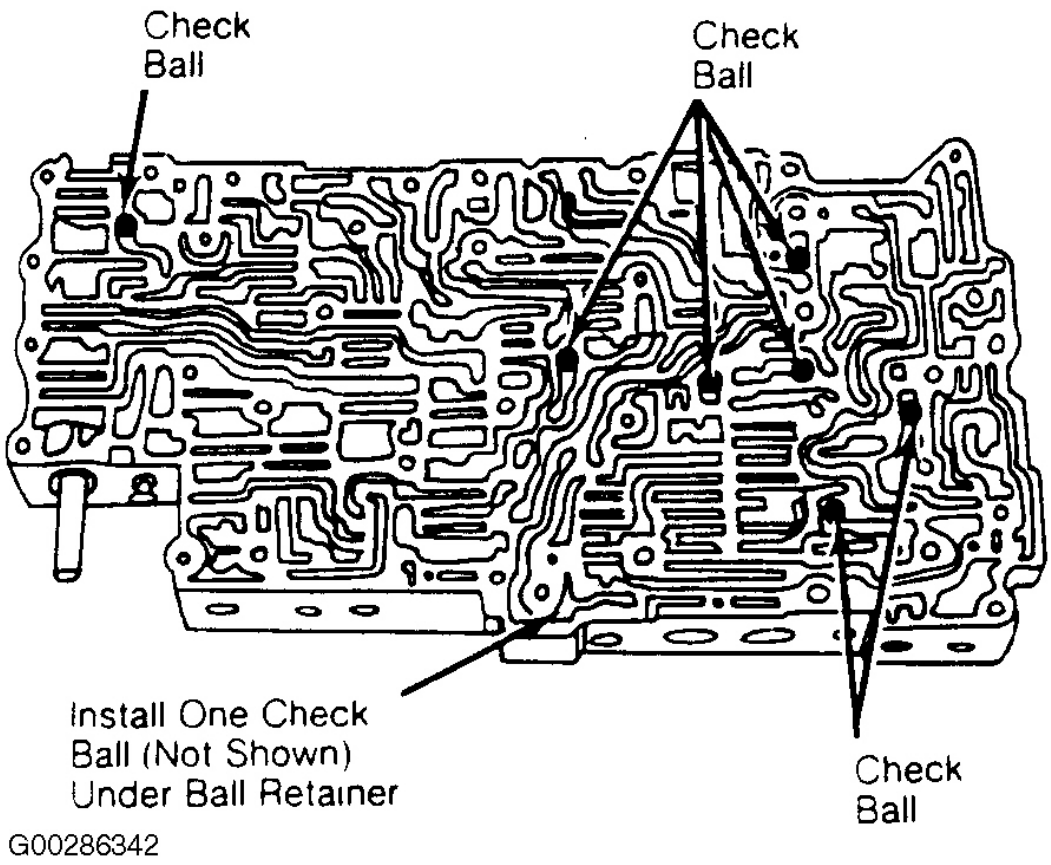


Fig. 31: Locating Valve Body Check Balls (All Models Except 1990 Axxess)
Courtesy of NISSAN MOTOR CO., U.S.A.

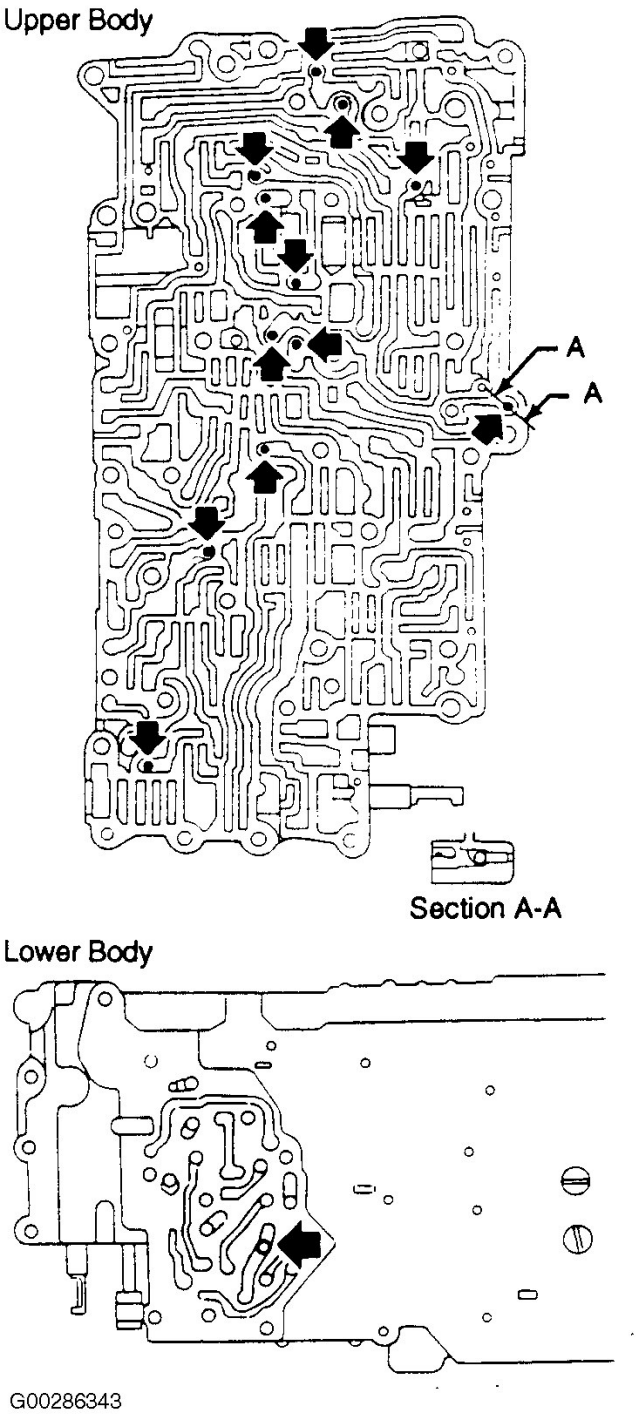


Fig. 32: Locating Valve Body Check Balls (1990 Axxess)
Courtesy of NISSAN MOTOR CO., U.S.A.

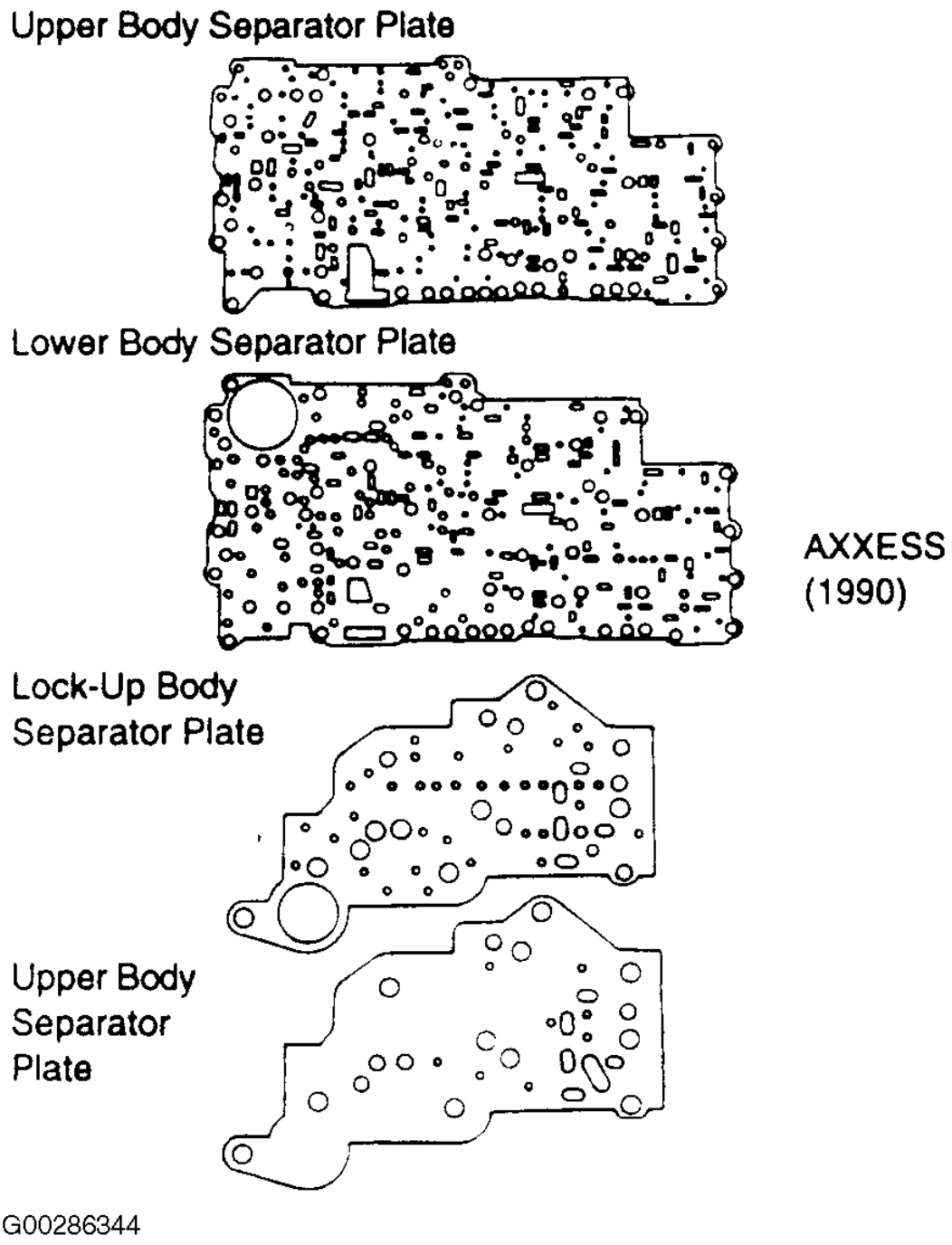
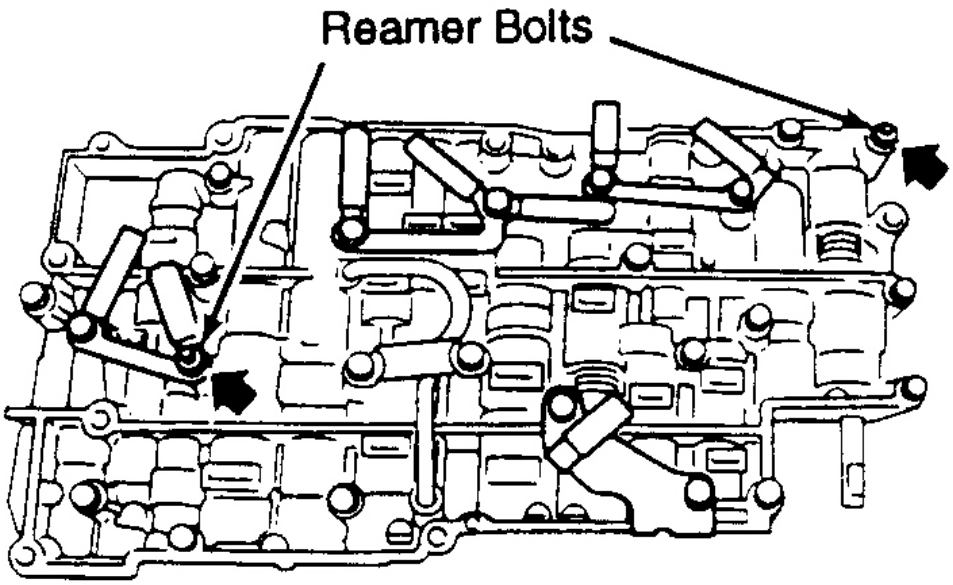
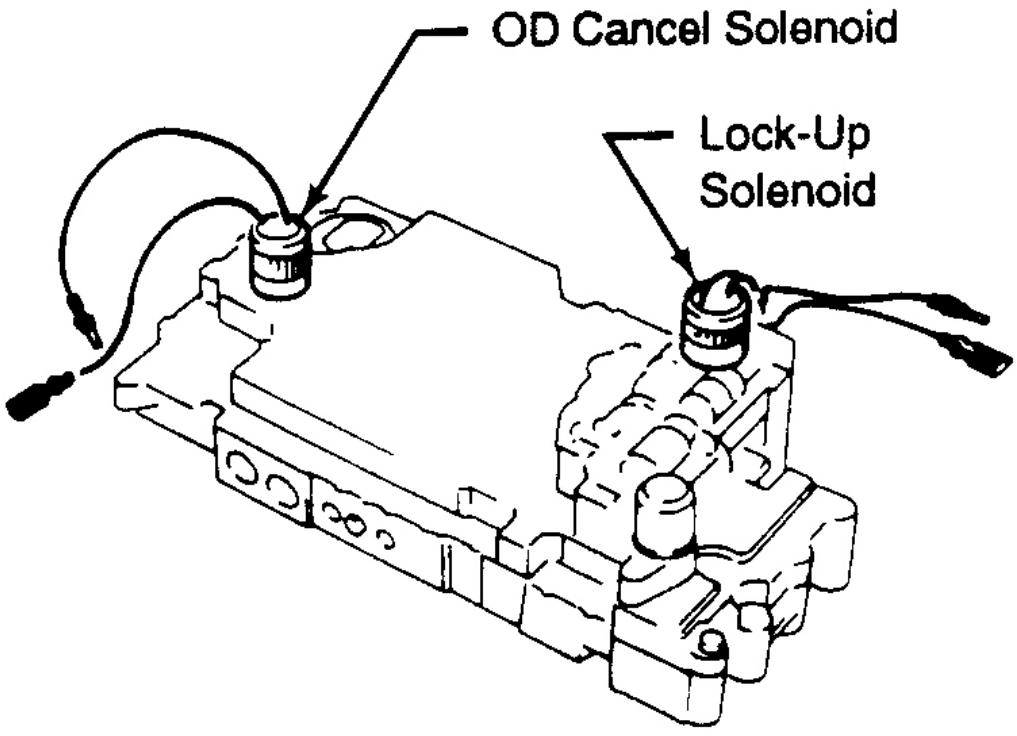


Fig. 33: Identifying Separator Plates & Gaskets
Courtesy of NISSAN MOTOR CO., U.S.A.



UPPER VALVE BODY



G00286345

Fig. 34: Locating Reamer Bolts & Solenoids
Courtesy of NISSAN MOTOR CO., U.S.A.

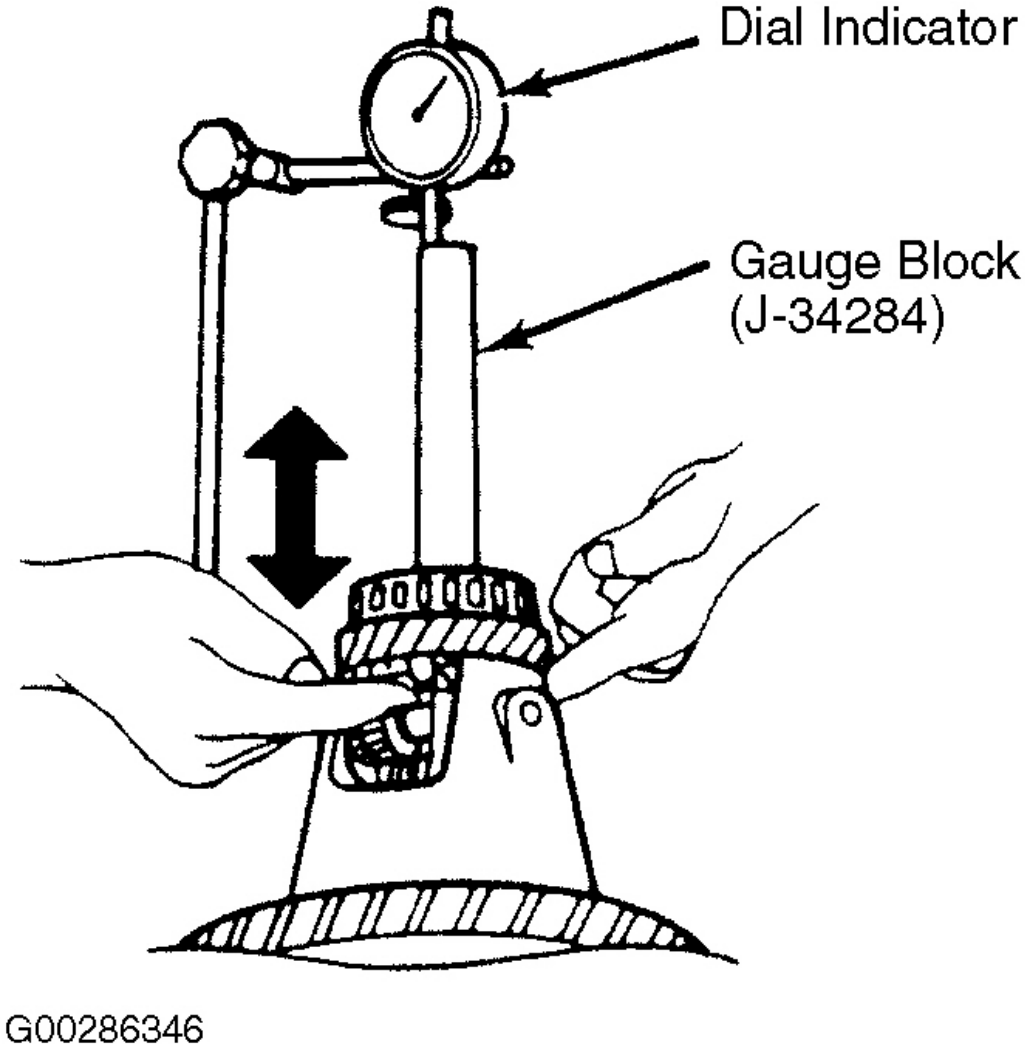


Fig. 35: Measuring Differential Side Gear Clearance
Courtesy of NISSAN MOTOR CO., U.S.A.

Output Shaft Preload

1. Install parking pawl, return spring, pawl shaft and spacer. Install idler gear. Lubricate output seal rings with petroleum jelly and install output gear.
2. Remove output shaft and idler gear bearing outer races and shims from side cover. Keep each race with correct bearing. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) on machined gasket surface

of side cover. See **Fig. 47** .

3. Allow gauging cylinder to drop into output gear bearing race bore. Using thumb screw, lock cylinder in place. Install outer bearing race on output shaft bearing. Turn race by hand to seat bearing.
4. Insert Gauging Plunger (J-34290-4) into gauging cylinder and place bridge on machined gasket surface of transaxle case. Allow gauging plunger to drop onto rear surface of output shaft bearing race.
5. Lock plunger in place. Use a feeler gauge to measure gap between gauging cylinder and shoulder of gauging plunger. See **Fig. 47** . Feeler gauge reading is used to select correct output shaft preload adjustment shim. Shims are available in thicknesses of .0047-.0362" (.120-.920 mm) in .001" (.04 mm) increments, .0567" (1.440 mm) and .0772" (1.960 mm).

Idler Gear Preload

1. Place Bridge (J-34290-1) and Gauging Cylinder (J-34290-2) on machined gasket surface of side cover. See **Fig. 47** . Allow gauging cylinder to drop into idler gear bearing race bore. Using thumb screw, lock cylinder in place.
2. Install outer bearing race on idler gear bearing. Turn race by hand to seat baring. Insert Gauging Plunger (J-34290-3) into gauging cylinder and place bridge on machined gasket surface of transaxle case. Allow gauging plunger to drop onto rear surface of idler gear bearing race.
3. Lock plunger in place. Use a feeler gauge to measure gap between gauging cylinder and shoulder of gauging plunger. Feeler gauge reading is used to select correct idler gear preload adjustment shim. Shims are available in thicknesses of .0142-.0362" (.360-.920 mm) in .0016" (.040 mm) increments, .0567" (1.440 mm) and .0772" (1.960 mm).
4. Install select output gear and idler gear preload shims into side cover. DO NOT intermingle adjustment shims. Install side cover and gasket. Always use new bolts at positions "B" and "D" as they are self-sealing bolts. Apply ATF to threads on all other side cover bolts. See **Fig. 48** . Move manual lever until parking pawl engages idler gear.
5. Use a feeler gauge to measure clearance between parking pawl and parking actuator. Clearance should be .011-.024" (.27-.61 mm). If clearance is incorrect, replace parking pawl.
6. Install input shaft into transaxle as far as possible. On Maxima, measure distance between step on input shaft and tip of input shaft. See **Fig. 49** . Measurement should be 1.14-1.22" (29.0-31.0 mm).

Final Assembly

1. On either model, insert Preload Adapter (J-34284) on torque converter side of output shaft. Attach a torque wrench to adapter and check for smooth rotation of internal parts by turning torque wrench in a clockwise and counterclockwise direction.
2. If transaxle is assembled correctly, a slightly higher torque will be required to turn components in a counterclockwise direction. If drag is not as indicated, disassemble transaxle components to ensure they are properly assembled. Readjust differential, output shaft and idle gear bearing preload as required.
3. Adjust brake band by torquing anchor pin to 35-53 INCH lbs. (4-6 N.m) and back off anchor pin 5 1/4 turns. Tighten anchor pin lock nut while holding anchor pin stationary.
4. Install terminal assembly noting direction of hook. Install accumulator and accumulator spring. Install throttle shaft and return spring. Insert manual valve into valve body. Install valve body in case, paying attention to manual valve and detent valve grooves.
5. Install throttle valve return spring. Connect harness connectors between terminal assembly and solenoids.

Using a new gasket install valve body cover and throttle lever. Install control cylinder.

6. Install governor shaft assembly and speedometer assembly. Fill torque converter with 2 1/8 qts. (2.0L) automatic transmission fluid. Install torque converter in converter housing.
7. When connecting torque converter to transaxle, measure distance between torque converter and housing. See **Fig. 50** . For Maxima, distance "A" should be .709" (18.00 mm) or more. For all other models distance "A: should be .748" (19.00 mm) or more. Install drain plug using sealant on threads. Install inhibitor switch. Check that manual lever operates correctly.

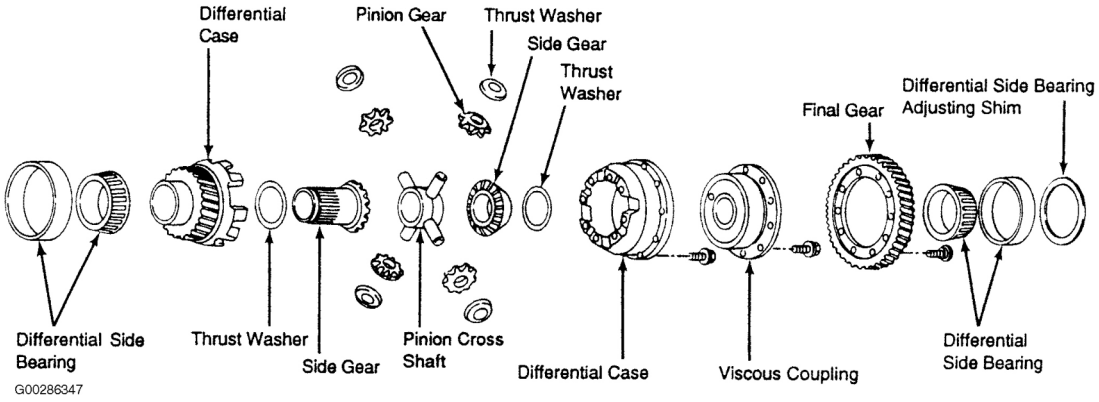


Fig. 36: Exploded View Of Center Differential (1990 Axxess 4WD)
Courtesy of NISSAN MOTOR CO., U.S.A.

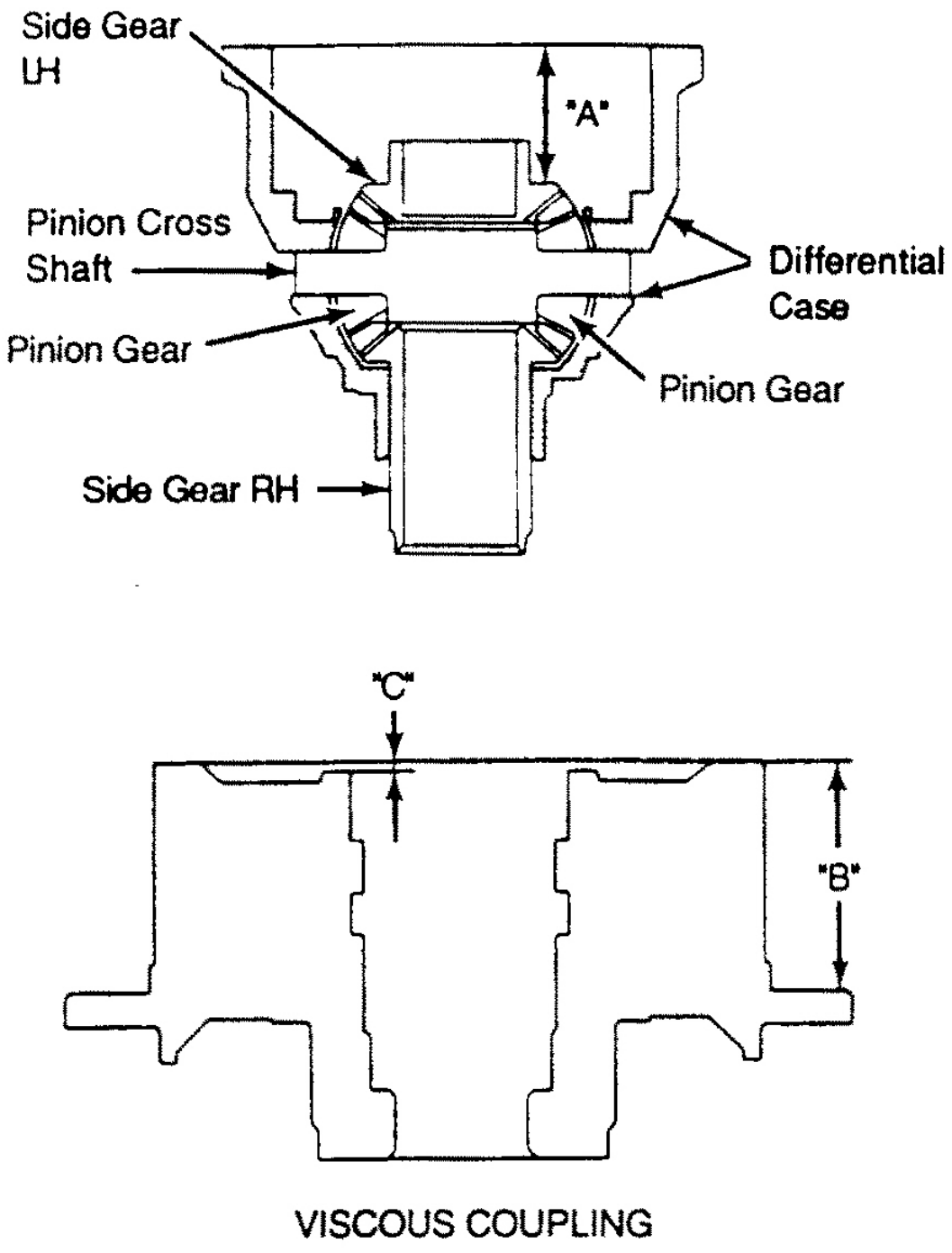


Fig. 37: Identifying Side Gear Clearance Measurement Locations
Courtesy of NISSAN MOTOR CO. U.S.A.

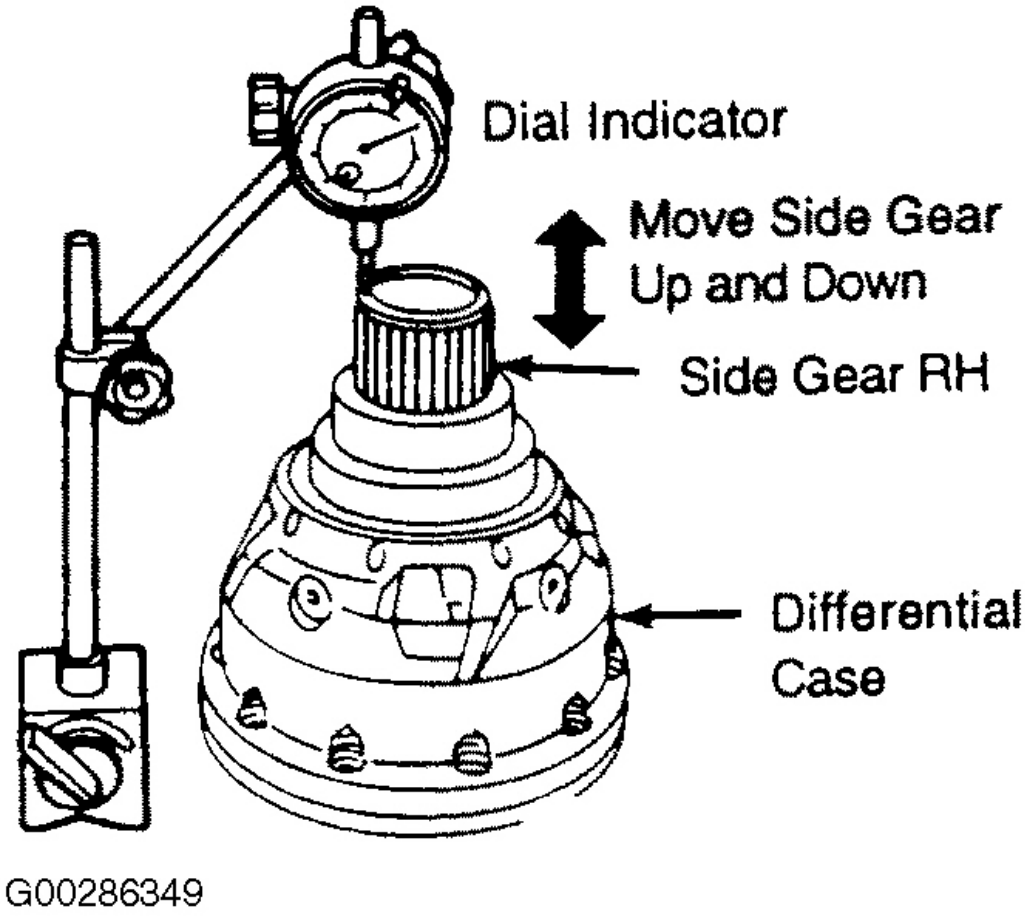


Fig. 38: Measuring Right Side Gear Clearance
Courtesy of NISSAN MOTOR CO., U.S.A.

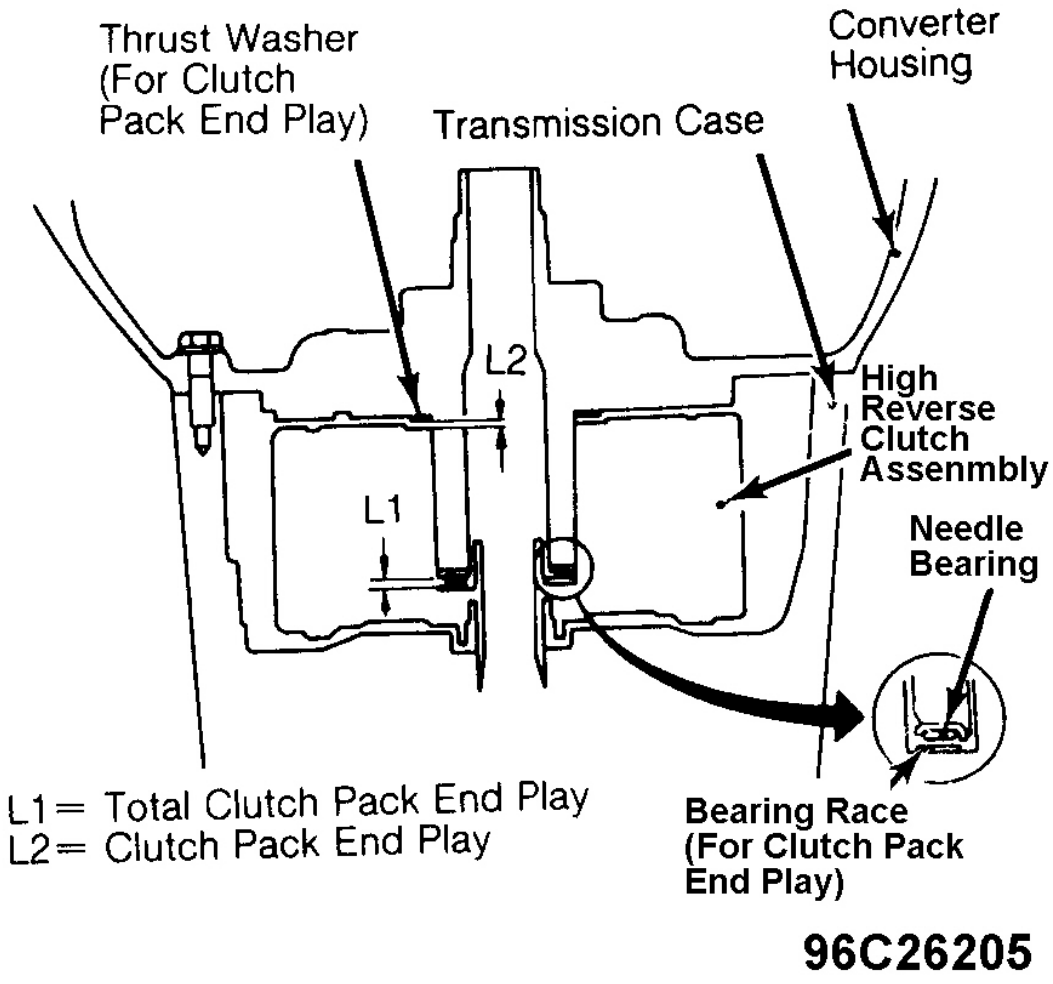


Fig. 39: Adjusting Clutch Pack & Clutch Pack End Play
Courtesy of NISSAN MOTOR CO., U.S.A.

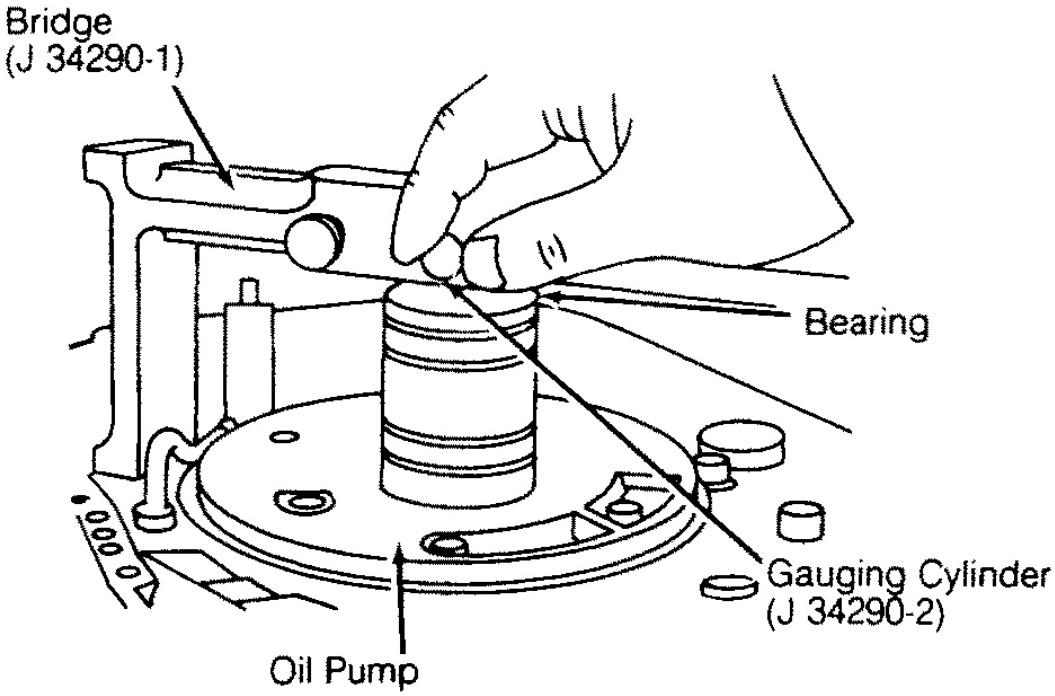


Fig. 40: Measuring Oil Pump Depth
Courtesy of NISSAN MOTOR CO., U.S.A.

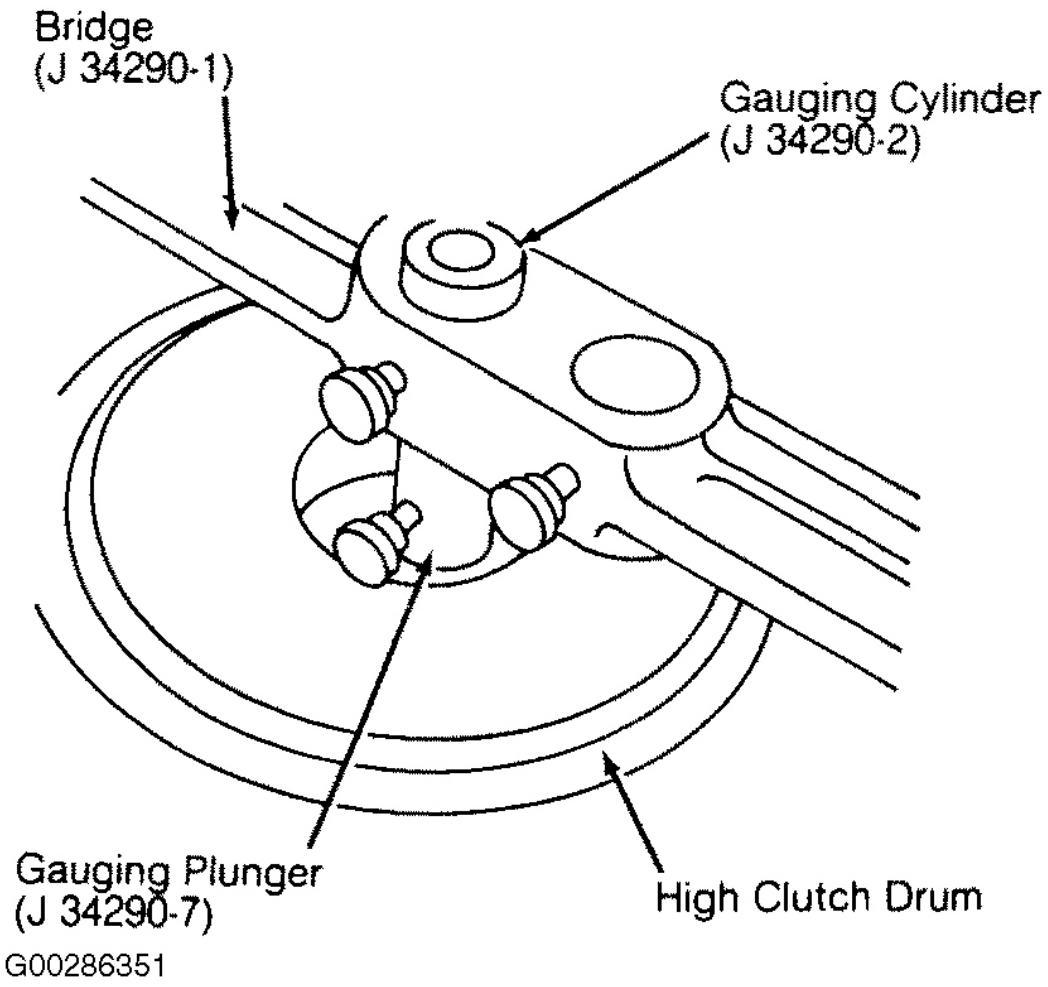


Fig. 41: Measuring Total End Play
Courtesy of NISSAN MOTOR CO., U.S.A.

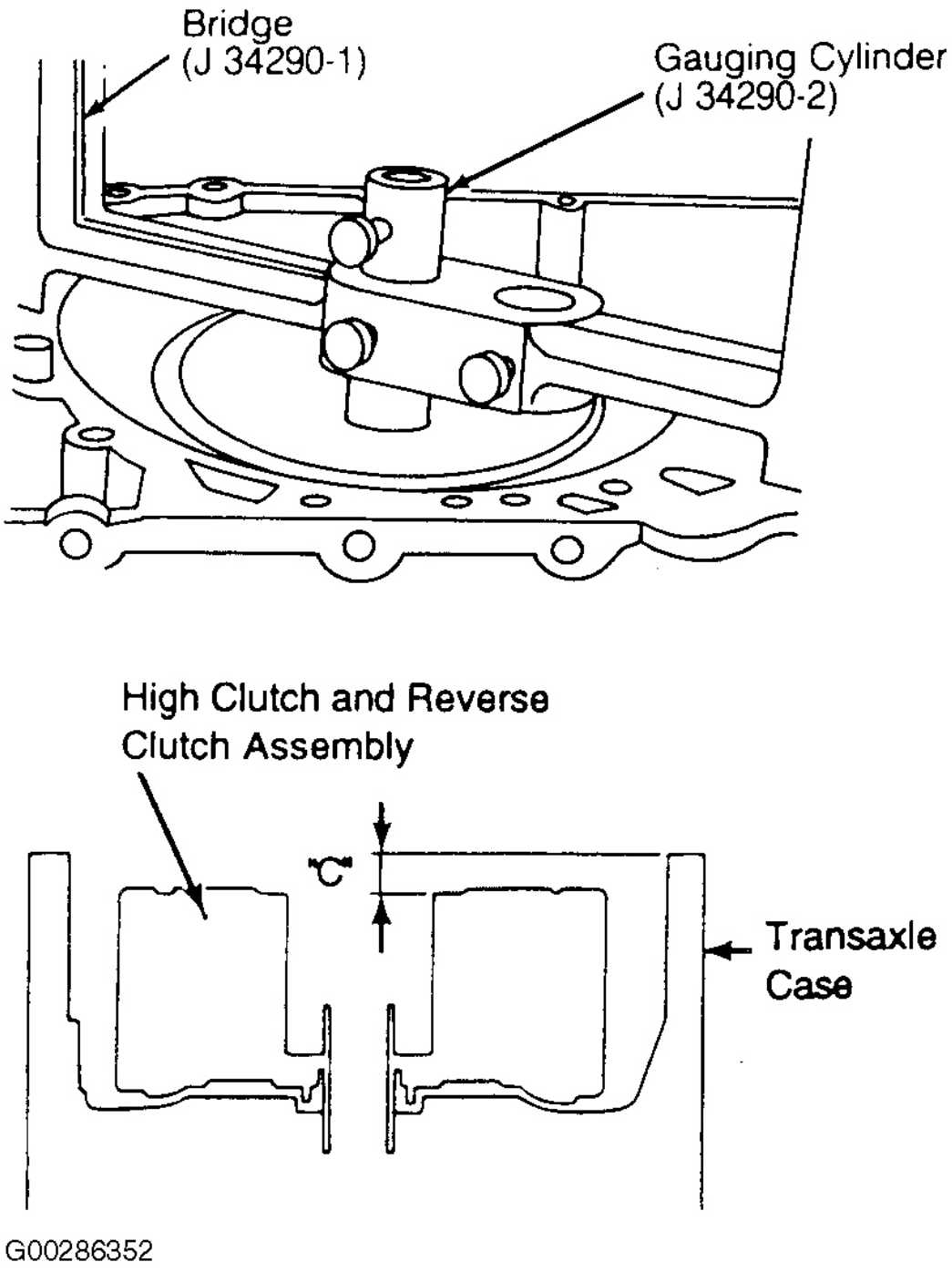


Fig. 42: Measuring Reverse Clutch Depth "C"
Courtesy of NISSAN MOTOR CO., U.S.A.

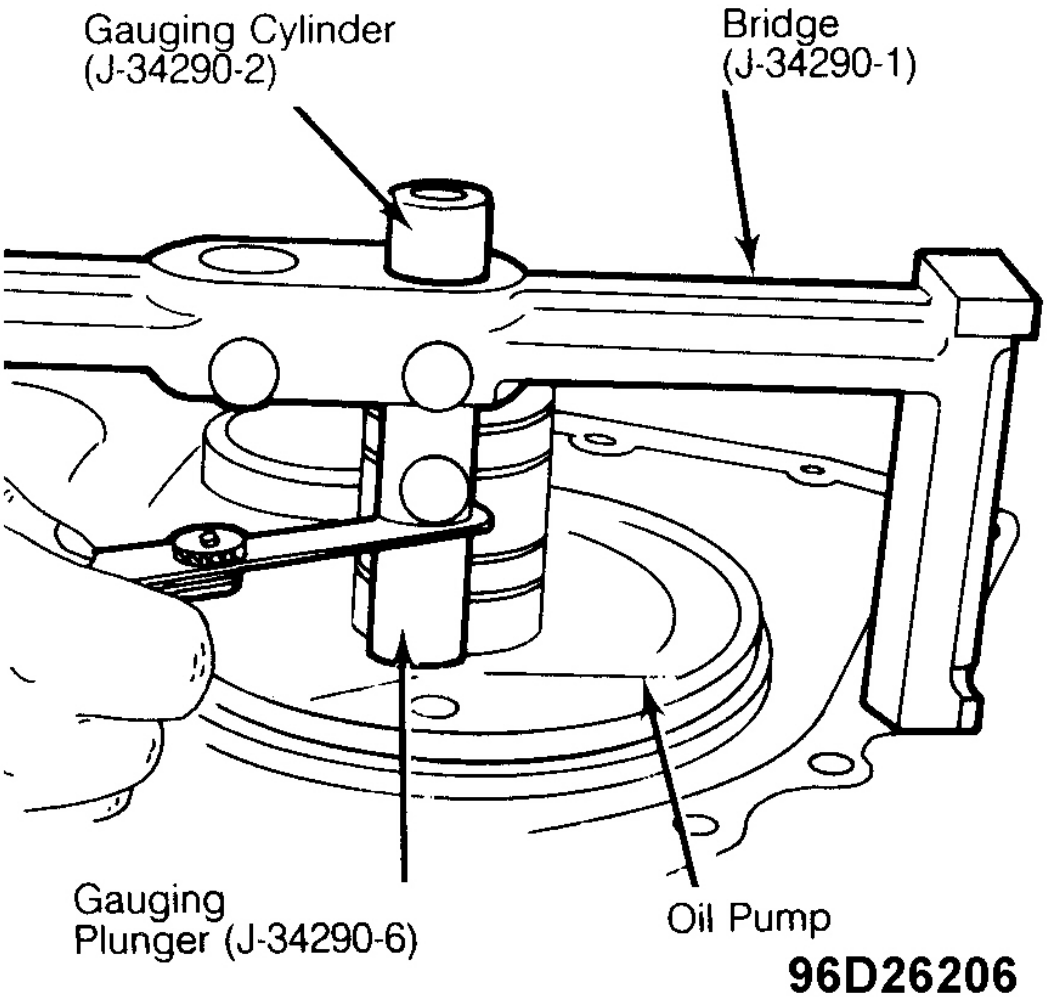


Fig. 43: Measuring Clutch Pack End Play
Courtesy of NISSAN MOTOR CO., U.S.A.

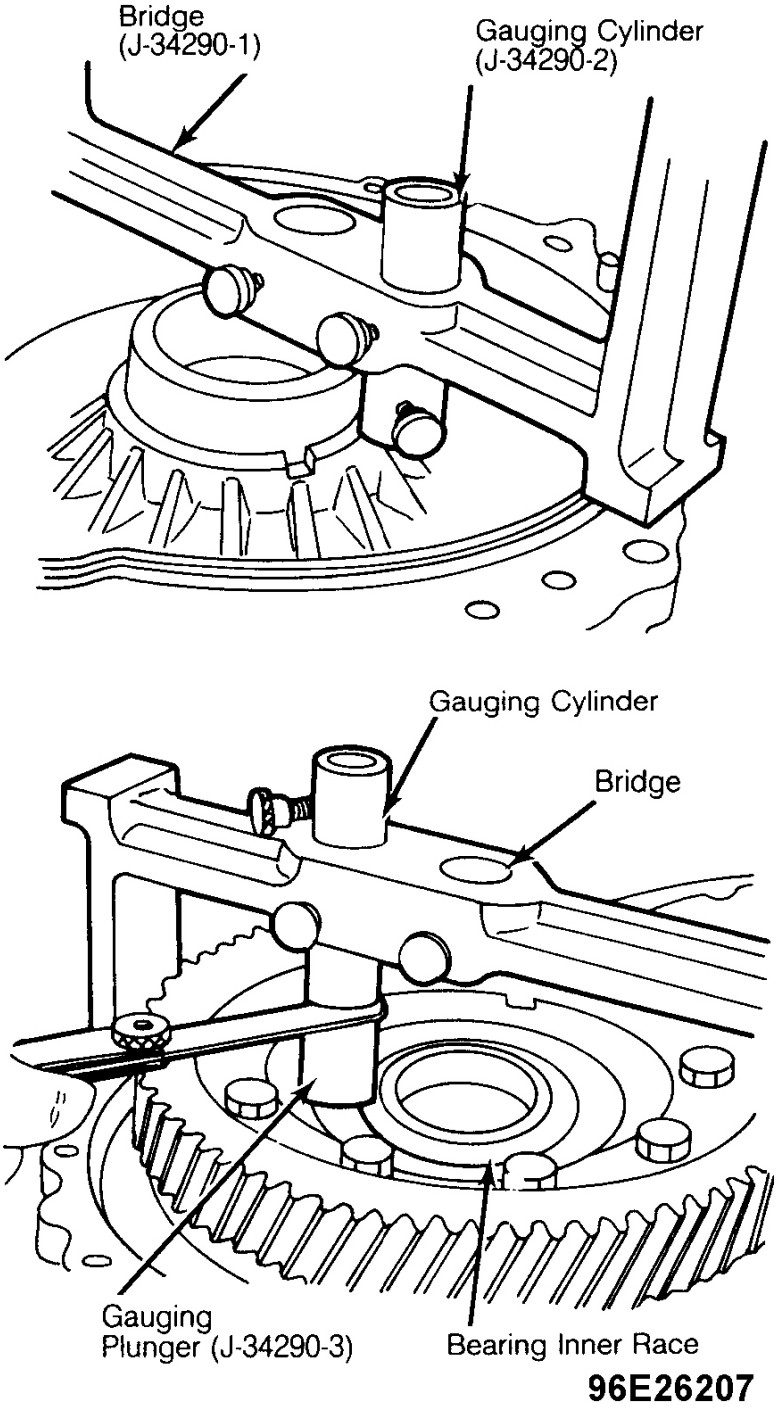


Fig. 44: Measuring Differential Side Bearing Preload (2WD)
Courtesy of NISSAN MOTOR CO., U.S.A.

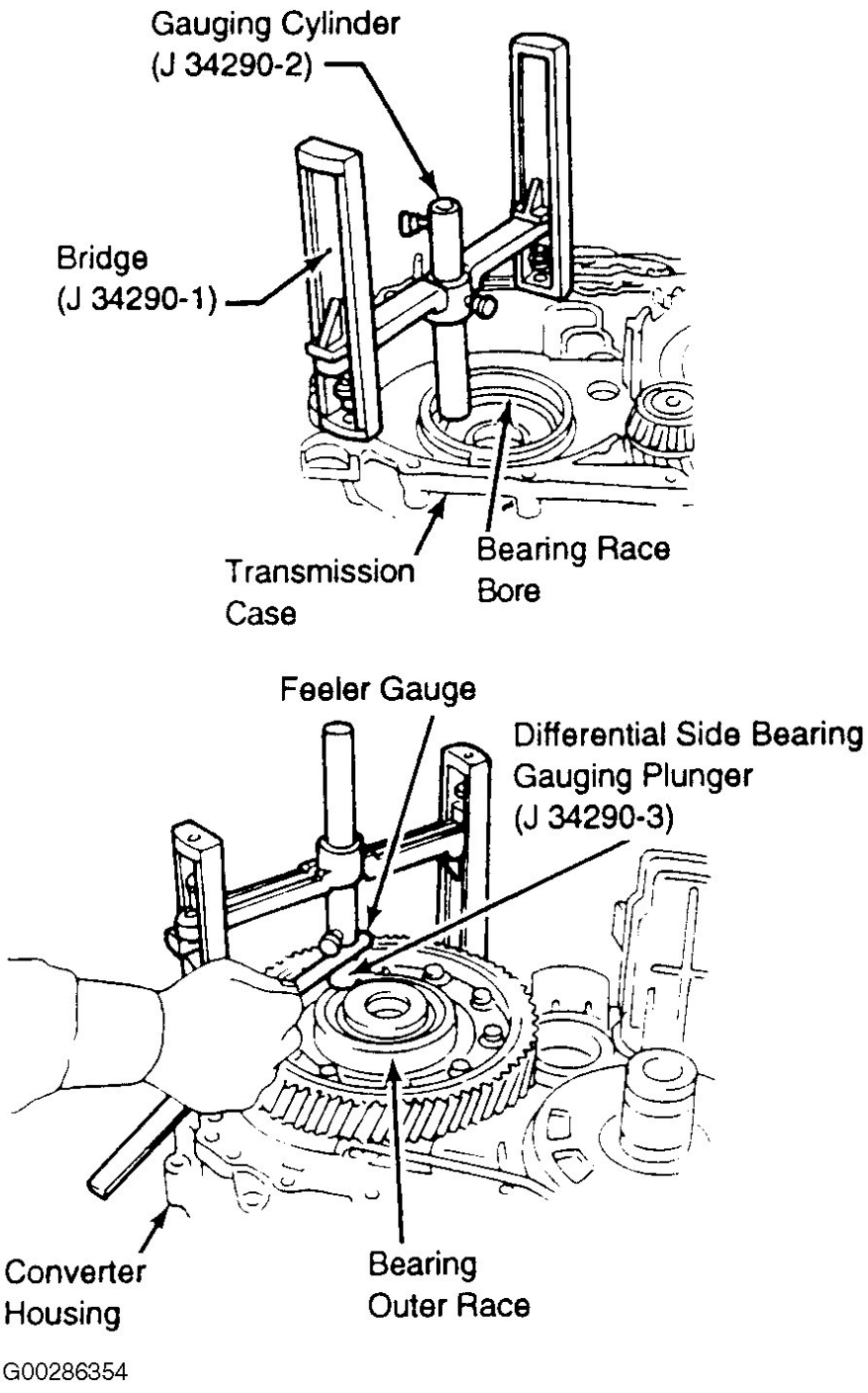
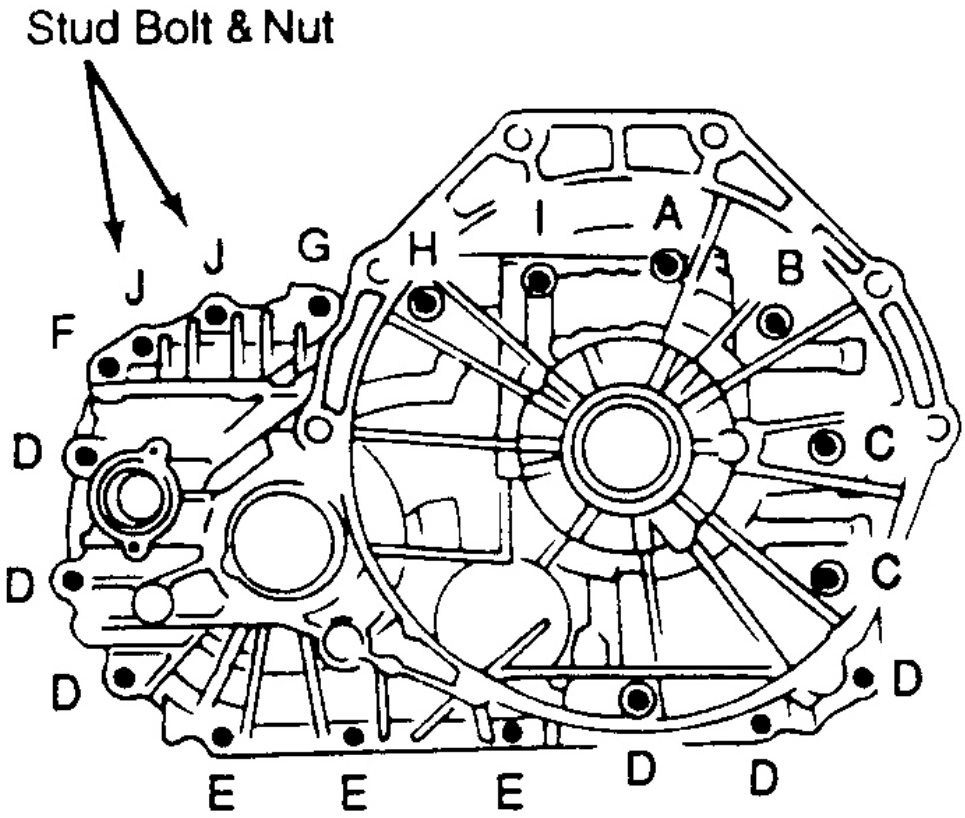


Fig. 45: Measuring Differential Side Bearing Preload (4WD)
Courtesy of NISSAN MOTOR CO., U.S.A.



Bolt	Torque Ft. Lb. (N.m)
A, B, C, D, F & J	17 (23)
E, G, H & I	33 (45)

Bolt	Length In. (mm)
A & D	1.24 (31.5)
B & C	1.06 (27.0)
E & I	1.38 (35.0)
F	1.97 (50.0)
G & H	1.54 (39.0)

G00286355

Fig. 46: Locating Torque Converter-To-Transmission Case Bolts

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

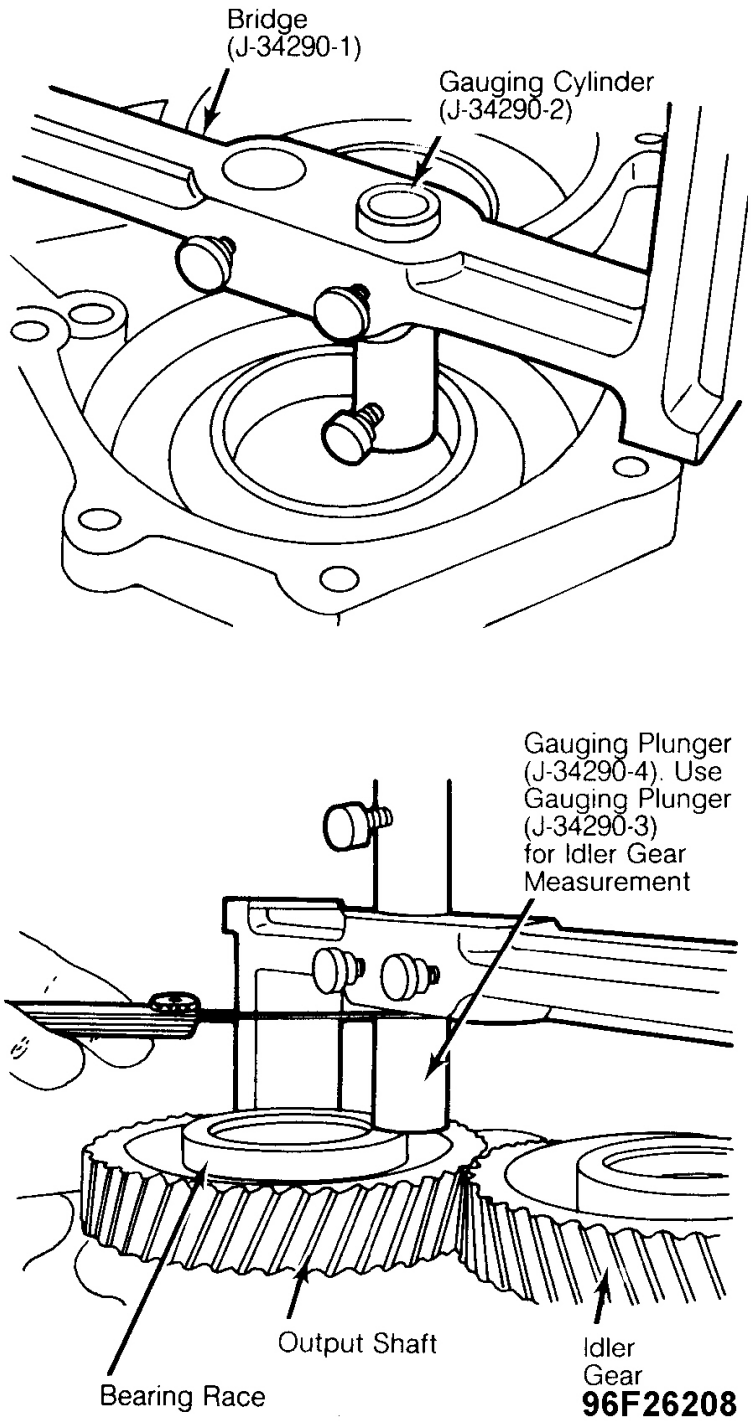
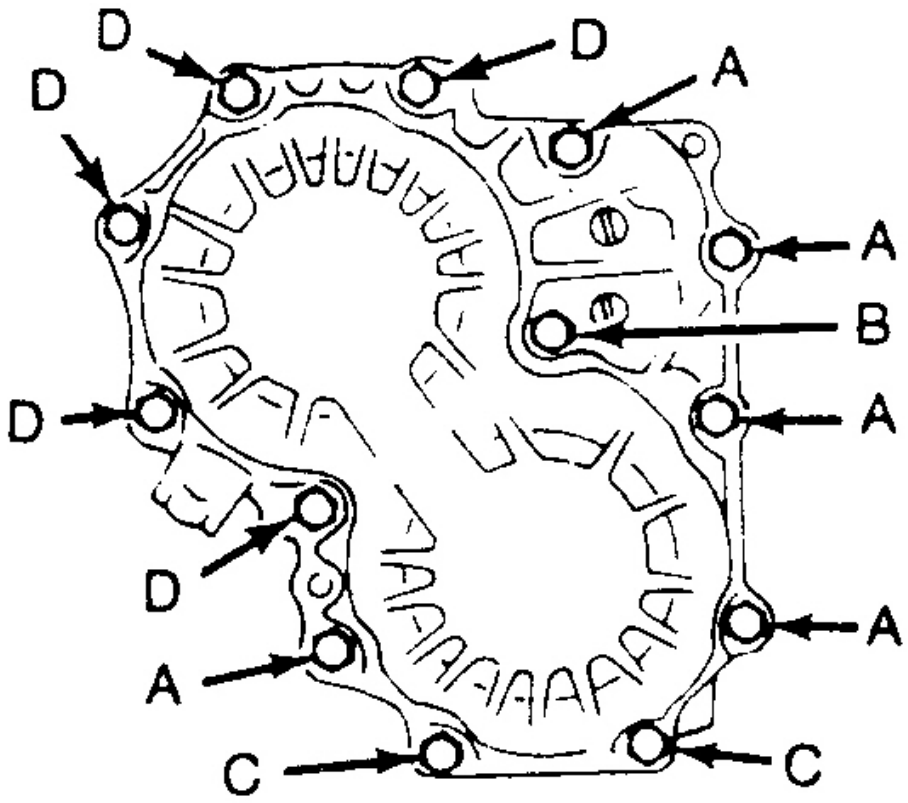


Fig. 47: Measuring Output Shaft & Idler Gear Preload



Bolt	Length In. (mm)
A	1.24 (31.5)
B	1.97 (50.0)
C	2.17 (55.0)
D	1.24 (31.5)

G00286356

Fig. 48: Locating Side Cover Bolts
Courtesy of NISSAN MOTOR CO., U.S.A.

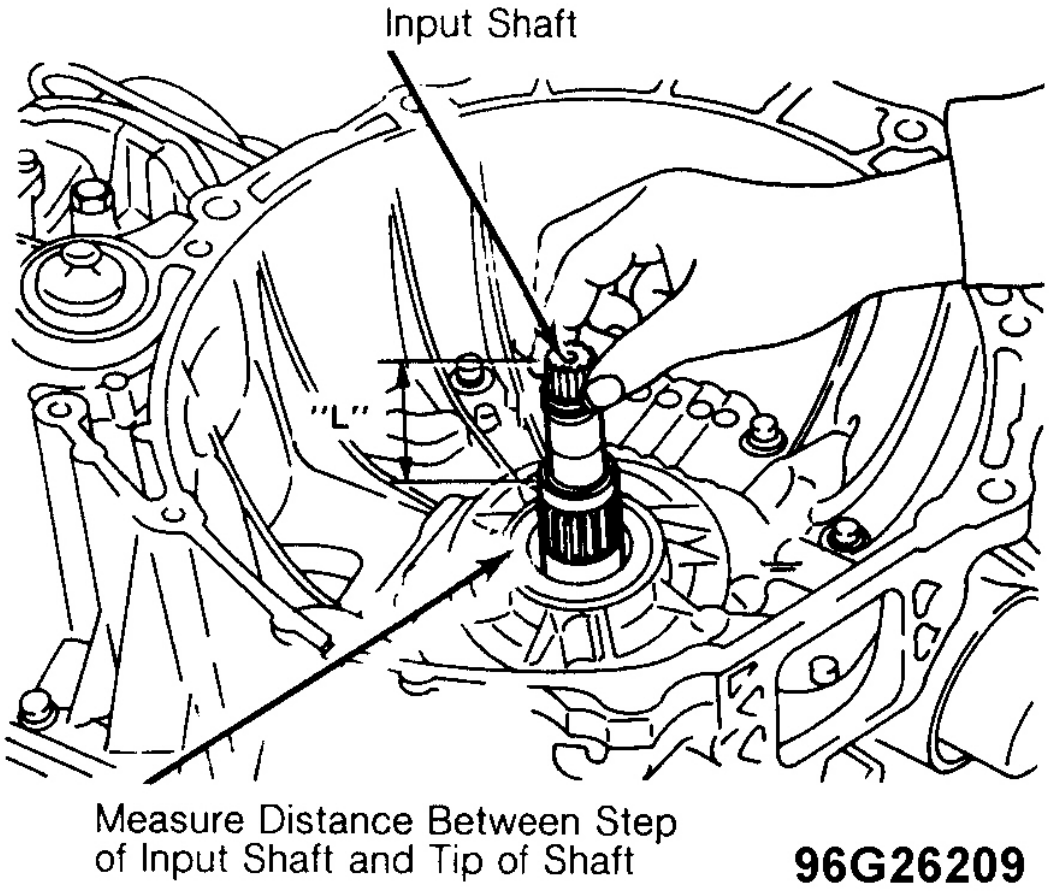


Fig. 49: Measuring Maxima Input Shaft
Courtesy of NISSAN MOTOR CO., U.S.A.

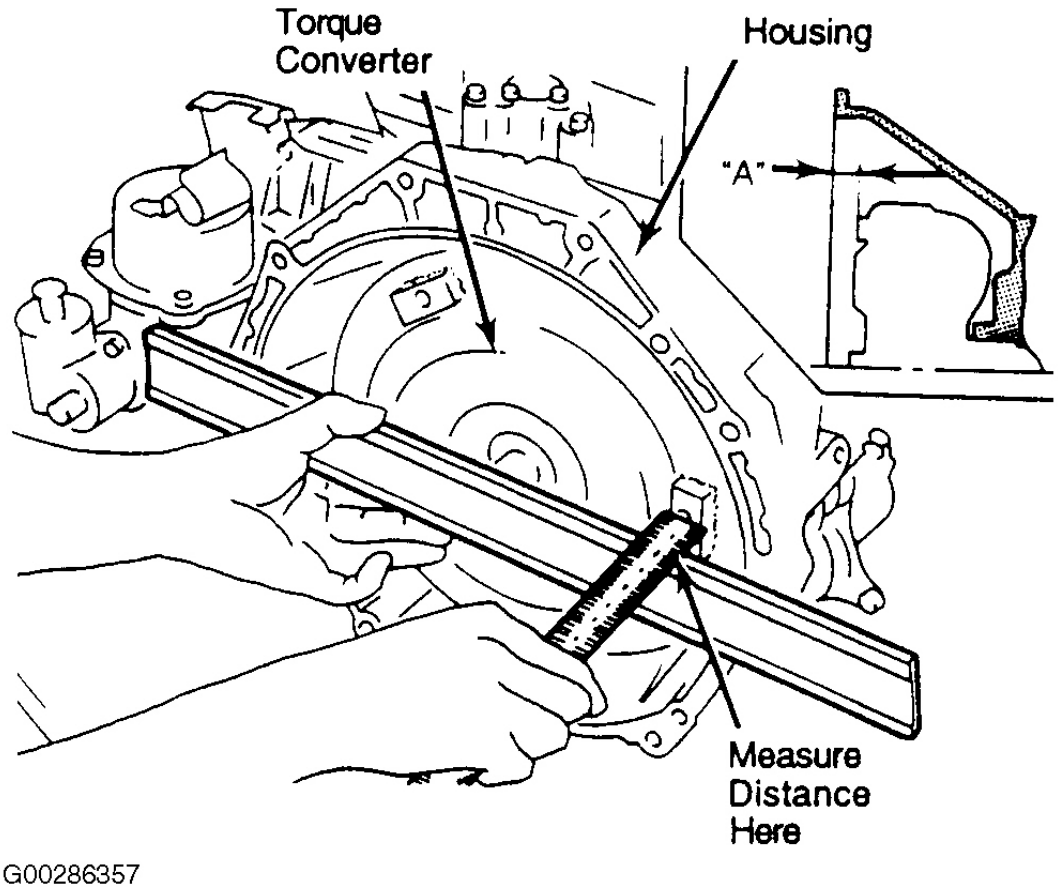


Fig. 50: Measuring Torque Converter Installed Depth
Courtesy of NISSAN MOTOR CO., U.S.A.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Bearing Retainer Bolts	14-18 (19-25)
Brake Band Lock-Nut	23-31 (31-42)
Converter Housing-To-Transaxle Case Bolts	14-17 (19-23)
Front Cover-To-Transaxle Case	14-17 (19-23)
Governor Shaft Assembly Bolt	14-20 (19-27)
Idler Gear	19-27 (26-36)
Manual Shaft Lock Nut	23-31 (31-42)
Oil Pump Bolts	12-15 (16-20)
Parking Pawl Bolt	12-15 (16-20)

Ring Gear Bolts	54-65 (73-88)
Side Gear Bolts	12-15 (16-20)
	INCH Lbs. (N.m)
Accumulator Spring Retainer Screw	34-45 (3.8-5.1)
Governor Valve Body-to-Governor Shaft	44-62 (5-7)
Oil Strainer	89-106 (10-12)
Valve Body Bolts	
Short Corner Bolt	33-44 (3.7-5.0)
All Other Bolts	62-80 (7-9)
Valve Body Cover Bolts	44-62 (5-7)