

## 1990 Isuzu Pickup 1 Ton

1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul

### 1988-94 AUTOMATIC TRANSMISSIONS

#### Isuzu AW03-72L Overhaul

## APPLICATION

### TRANSMISSION APPLICATIONS

Vehicle Model	Transmission Model
1988-94 Pickup (2WD)	AW03-72L
1989-94 Amigo (2WD)	AW03-72L

## IDENTIFICATION

Transmission identification number information is not available from manufacturer.

## DESCRIPTION & OPERATION

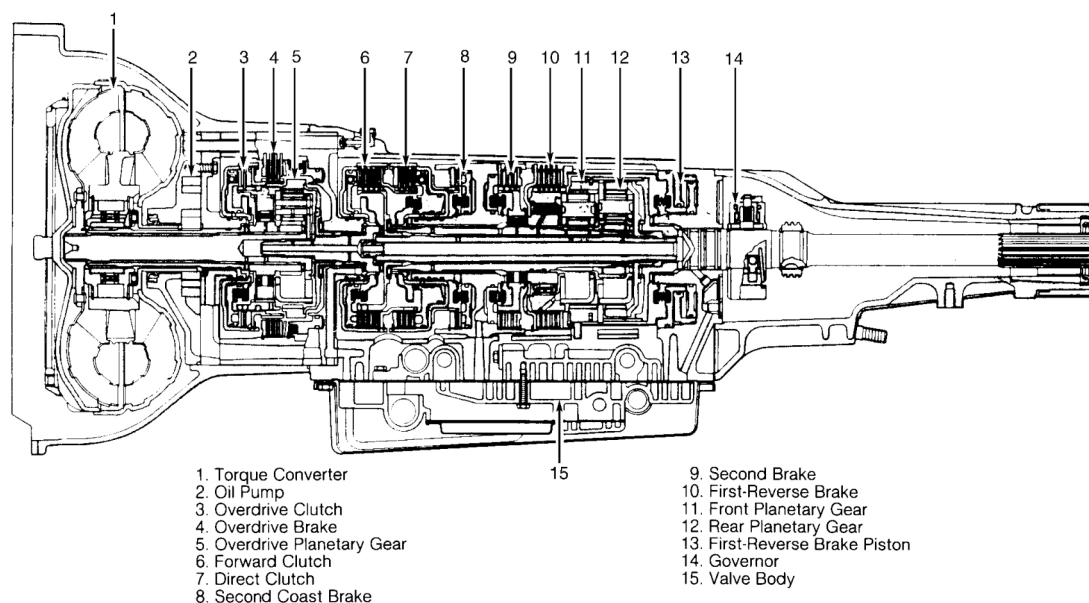
Transmission is a fully automatic 4-speed transmission consisting of clutches, brakes, one-way clutches and planetary gear sets. Transmission uses a lock-up torque converter. See **Fig. 1**.

An Overdrive (OD) switch is mounted on shift lever. When overdrive switch is released to the ON position, transmission will automatically upshift to overdrive and overdrive off indicator light on instrument panel will be off.

When overdrive switch is depressed to the OFF position, transmission will not upshift to overdrive and overdrive off indicator light on instrument panel will come on.

Transmission is equipped with shift and key lock systems. Shift lock system prevents shift lever from being moved from "P" position unless brake pedal is depressed, ignition is on and release button on shift lever is depressed.

Key lock system prevents ignition switch from being placed in LOCK position unless shift lever is in "P" position. A shift control cable is connected between shift lever and ignition switch. When shift lever is placed in "P" position, shift control cable moves lock on ignition switch so ignition switch may be placed in LOCK position.



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**Fig. 1: Identifying Transmission Component Locations**

Courtesy of ISUZU MOTOR CO.

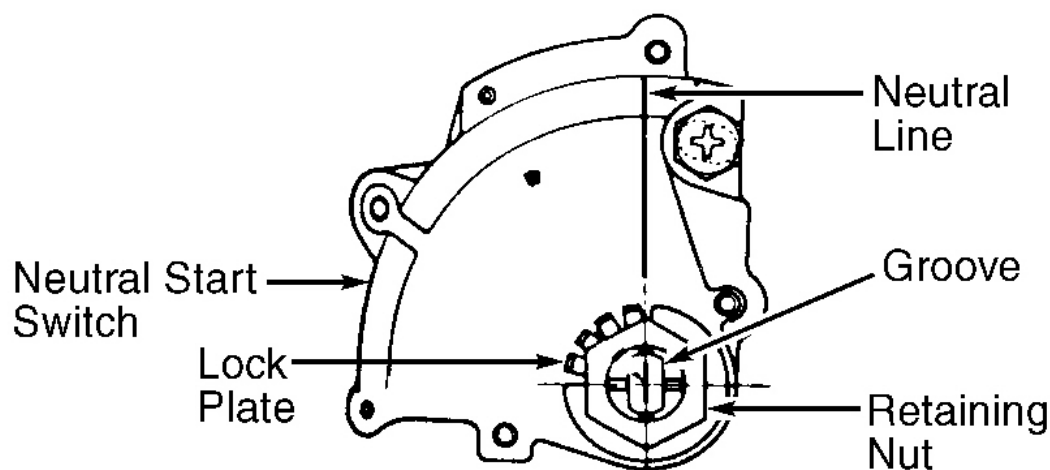
## LUBRICATION & ADJUSTMENTS

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

## ON-VEHICLE SERVICE

### NEUTRAL START SWITCH ADJUSTMENT

1. Apply parking brake. Loosen neutral start switch retaining bolt. Place shift lever in "N" position.
2. Align neutral line on neutral start switch with groove in selector shaft. See **Fig. 2** . Hold neutral start switch in position and tighten retaining bolt to specification. See TORQUE SPECIFICATIONS .



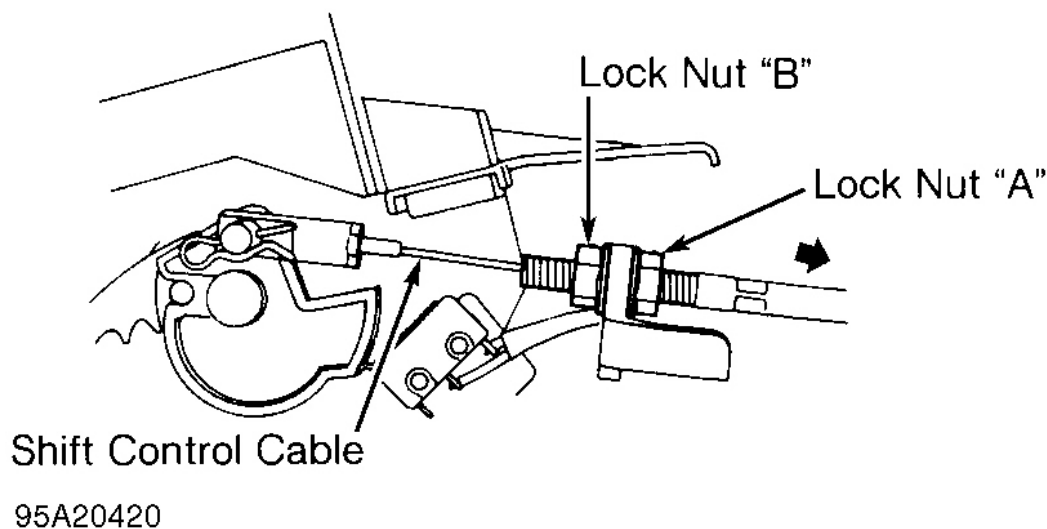
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**Fig. 2: Identifying Neutral Start Switch & Components**  
Courtesy of ISUZU MOTOR CO.

#### SHIFT CONTROL CABLE

**NOTE:** Shift control cable is connected between shift lever and ignition switch. Shift control cable is used for shift lock system which prevents ignition switch from being placed in LOCK position unless shift lever is in "P" position.

1. Place ignition switch in LOCK position. Place shift lever in "P" position. Loosen lock nuts "A" and "B" on shift control cable. Tighten lock nut "A" until no slack exists in shift control cable. See **Fig. 3**.
2. Loosen lock nut "A" 2 full turns until slack exists in shift control cable. Tighten lock nut "B". Ensure ignition switch cannot be placed in LOCK position unless shift lever is in "P" position.



**Fig. 3: Adjusting Shift Control Cable**  
Courtesy of ISUZU MOTOR CO.

## VALVE BODY ASSEMBLY

The valve body may be serviced on the vehicle. See procedures for **VALVE BODY ASSEMBLY R & I** under REMOVAL & INSTALLATION.

## TROUBLE SHOOTING

Transmission malfunctions may be caused by poor engine performance, improper adjustments, or failure of hydraulic or mechanical components. Always begin by checking fluid level, fluid condition, linkage and cable adjustments. Perform road test to determine if the problem has been corrected. If the problem still exists, several tests must be performed on transmission. Refer to **PERFORMANCE TESTS** .

## SYMPTOM DIAGNOSIS

### Delayed Upshifts Or Downshifts

- Defective Governor
- Defective Or Improperly Adjusted Throttle Cable
- Valve Body Malfunction

### Downshift Occurs Too Early Or Late While Coasting

- Defective Or Improperly Adjusted Throttle Cable
- Defective Governor

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- Internal Transmission Failure
- Valve Body Malfunction

### **Drags Or Binds On Upshifts**

- Defective Or Improperly Adjusted Shift Linkage
- Internal Transmission Failure
- Valve Body Malfunction

### **Excessive Shock Or Vibration During Shifts**

- Defective Accumulator
- Excessive Line Pressure
- Missing Check Ball In Valve Body

### **Harsh Downshift**

- Defective Accumulator Pistons
- Defective Or Improperly Adjusted Throttle Cable
- Internal Transmission Failure
- Valve Body Malfunction

### **Harsh Gear Engagement**

- Defective Accumulator Pistons
- Defective Or Improperly Adjusted Throttle Cable
- Internal Transmission Failure
- Valve Body Malfunction

### **No Downshift When Coasting**

- Defective Governor
- Valve Body Malfunction

### **No Engine Braking In "L" Range**

- Defective First-Reverse Brake
- Defective Second Coast Brake

### **No Engine Braking In "2" Range**

- Defective Second Coast Brake

### **No 1-2 Upshift**

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- Defective Governor
- Stuck 1-2 Shift Valve

### No 2-3 Upshift

- Stuck 2-3 Shift Valve

### No 3-4 Upshift

- Defective Overdrive Switch, Wiring Or Solenoid
- Stuck 3-4 Shift Valve

### No 4-3, 3-2 Or 2-1 Kickdown Shifts

- Defective Governor
- Defective Or Improperly Adjusted Throttle Cable
- Valve Body Malfunction

### Slips Or Shudders On Acceleration

- Defective Or Improperly Adjusted Shift Linkage
- Defective Or Improperly Adjusted Throttle Cable
- Internal Transmission Failure
- Valve Body Malfunction

### Shift Speeds Incorrect

- Defective Governor
- Defective Or Improperly Adjusted Throttle Cable
- Sticking Valves In Valve Body

### Vehicle Will Not Move In Any Gear

- Defective Oil Pump
- Defective Or Improperly Adjusted Shift Linkage
- Defective Parking Pawl
- Defective Torque Converter
- Internal Transmission Failure
- Low Fluid Level
- Restricted Oil Strainer
- Valve Body Malfunction

## ELECTRICAL SYSTEM & COMPONENT TESTING

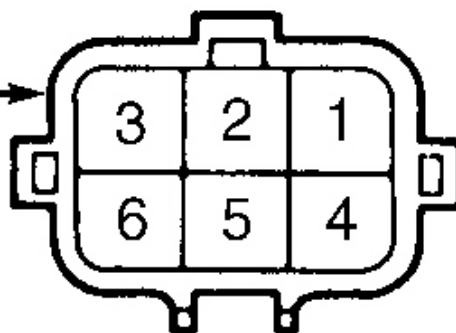
## NEUTRAL START SWITCH

1. Disconnect neutral start switch electrical connector. Neutral start switch is located on side of transmission. See **Fig. 10** .
2. Note terminal identification on neutral start switch electrical connector. See **Fig. 4** .
3. Using an ohmmeter, ensure continuity exists between specified terminals in relation to shift lever position. Refer to the **NEUTRAL START SWITCH CONTINUITY SPECIFICATIONS** table.
4. If continuity is not as specified, check neutral start switch adjustment. See **NEUTRAL START SWITCH ADJUSTMENT** under ON-VEHICLE SERVICE. Replace neutral start switch if correct continuity cannot be obtained.

## NEUTRAL START SWITCH CONTINUITY SPECIFICATIONS

Lever Position	Continuity Between Terminals
"P"	1 & 4
"R"	2 & 5
"N"	1 & 4
"D", "2" Or "L"	3 & 6

Neutral Start  
Switch  
Electrical  
Connector



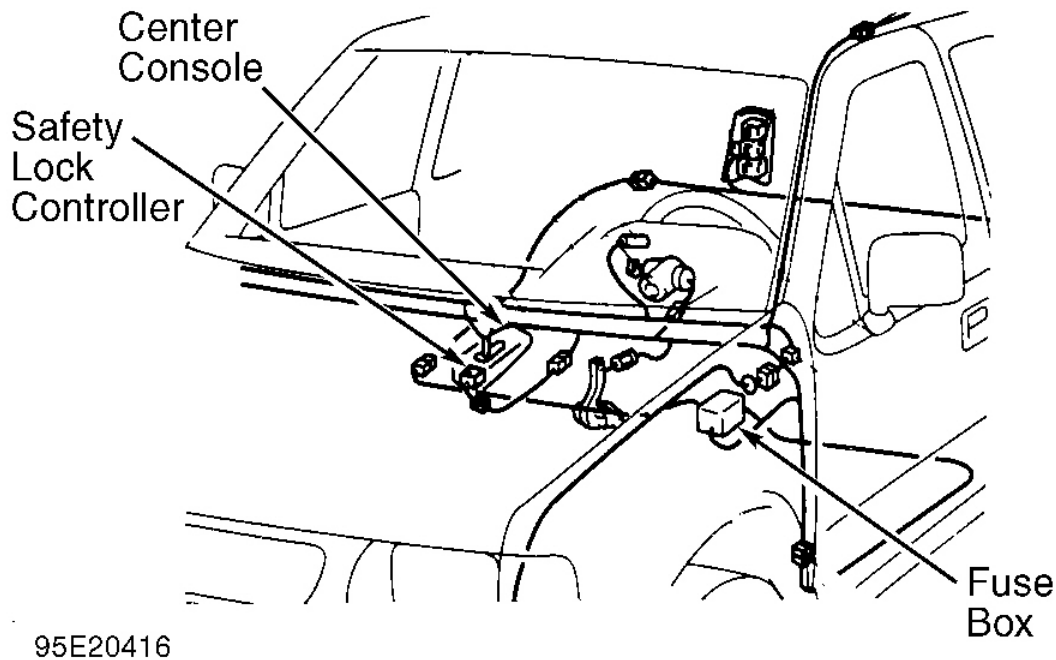
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**Fig. 4: Neutral Start Switch Electrical Connector Terminals I.D.**  
Courtesy of ISUZU MOTOR CO.

## SHIFT LOCK SYSTEM

**NOTE:** Shift lock system prevents shift lever from being moved from "P" position unless brake pedal is depressed, ignition is on and release button on shift lever is depressed.

1. Shift lock system use safety lock controller and stoplight switch for controlling shift lock system. Safety lock controller is located near shift lever. See **Fig. 5** .
2. For system testing, see shift lock system wiring diagram. See **WIRING DIAGRAMS** . No other testing information is available from manufacturer.



**Fig. 5: Identifying Safety Lock Controller**  
Courtesy of ISUZU MOTOR CO.

### OVERDRIVE SOLENOID

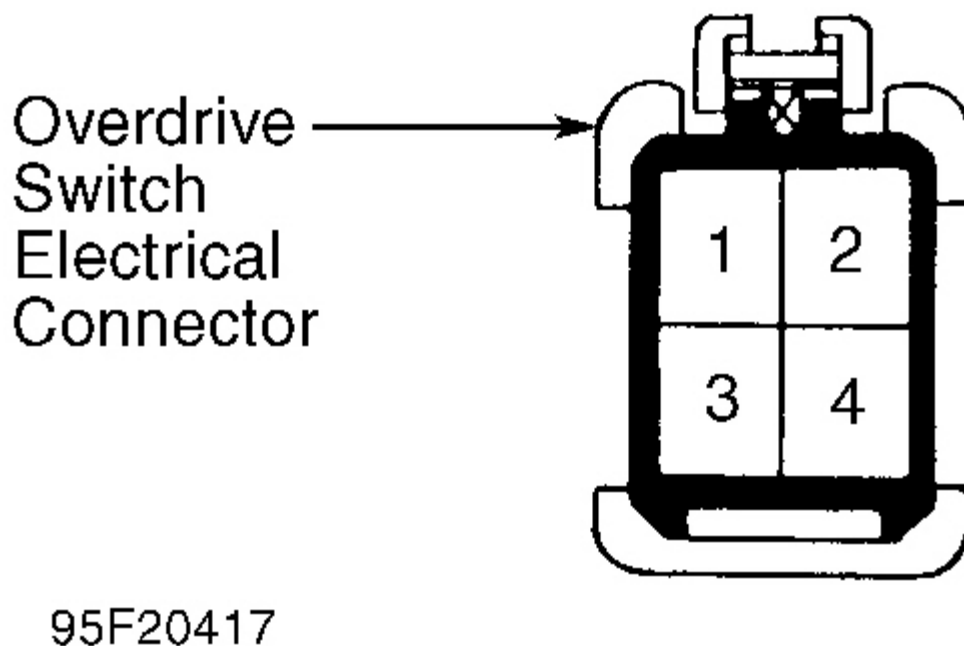
1. Overdrive solenoid is located on side of transmission. See **Fig. 10** . Using ohmmeter, ensure continuity exists between electrical terminal on overdrive solenoid and ground.
2. With electrical connector installed on overdrive solenoid, turn ignition on. Ensure operating sound is heard at overdrive solenoid.
3. If operating sound is not heard, ensure voltage supply exists at electrical connector with ignition on. Replace overdrive solenoid if voltage exists, but overdrive solenoid fails to operate.

### OVERDRIVE (OD) SWITCH

1. Overdrive switch is mounted on shift lever. Disconnect overdrive switch electrical connector and note terminal identification. See **Fig. 6** .
2. Release overdrive switch to the ON position. Using ohmmeter, ensure no continuity exists between any terminals.



3. Depress overdrive switch to the OFF position. Using ohmmeter, ensure continuity exists between terminals No. 3 and 4. Replace overdrive switch if continuity is not as specified.



**Fig. 6: Overdrive (OD) Switch Electrical Connector Terminals I.D.**  
Courtesy of ISUZU MOTOR CO.

## PERFORMANCE TESTS

### ROAD TEST

1. Before performing road test, warm engine to normal operating temperature. Ensure fluid level is correct and in good condition. Ensure shift linkage and throttle cable are properly adjusted.
2. Road test vehicle and check for abnormal noise, vibration and clutch slippage. Specified clutch and brake are applied in designated gear. See the **CLUTCH & BRAKE APPLICATION** table. Abnormal noise and vibrations are sometimes caused by unbalanced propeller shaft, differential, tires, torque converter, engine, etc.
3. Drive vehicle in "D", at full throttle. Ensure upshift and downshift speeds are correct in relation to vehicle speed. Refer to the **SHIFT SPEED SPECIFICATIONS** table. Stop vehicle.
4. Place shift lever in "2" position. Drive vehicle and ensure a 1-2 upshift exists. Release accelerator. Ensure transmission downshifts and engine braking exists. Stop vehicle.

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5. Place shift lever in "L" position. Drive vehicle and ensure no upshift exists and transmission remains in 1st gear. Release accelerator. Ensure engine braking exists. Stop vehicle.
6. Place shift lever in "R" position. Accelerate at full throttle and check for clutch slippage. Stop vehicle.
7. Place vehicle on a grade. Apply parking brake. Place shift lever in "P" position. Release parking brake. Ensure vehicle is held in place by parking pawl engagement.

**CLUTCH & BRAKE APPLICATION**

Shift Lever Position	Elements In Use
"P" (Park)	OD Clutch & 1st-Reverse Brake
"R" (Reverse)	OD Clutch, Direct Clutch & 1st-Reverse Brake
"N" (Neutral)	OD Clutch
"D" (Drive)	
1st Gear	OD Clutch & Forward Clutch
2nd Gear	OD Clutch, Forward Clutch & 2nd Brake
3rd Gear	OD Clutch, Forward Clutch, Direct Clutch & 2nd Brake
3rd Gear (OD Switch ON)	OD Brake, Forward Clutch, Direct Clutch & 2nd Brake
"2" (2nd Gear)	
1st Gear	OD Clutch & Forward Clutch
2nd Gear	OD Clutch, Forward Clutch, 2nd Coast Brake & 2nd Brake
"L" (Low)	
1st Gear	OD Clutch, Forward Clutch & 1st-Reverse Brake

**SHIFT SPEED SPECIFICATIONS**

Model/Lever Position	Gear	MPH
1988-91 Amigo		
"D"	1-2	28-32
"D"	2-3	57-61
"D"	3-2	53-58
"D"	2-1	22-29

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"L"	2-1	25-32
1988-91 Pickup		
"D"	1-2	28-32
"D"	2-3	57-61
"D"	3-2	53-58
"D"	2-1	22-29
"L"	2-1	25-32
1992 Pickup		
"D"	1-2	29-34
"D"	2-3	59-64
"D"	3-2	55-61
"D"	2-1	23-30
"L"	2-1	25-32
1993-94 Amigo		
"D"	1-2	31-36
"D"	2-3	63-69
"D"	3-2	59-65
"D"	2-1	25-33
"L"	2-1	25-32
1993-94 Pickup		
"D"	1-2	29-34
"D"	2-3	59-64
"D"	3-2	55-61
"D"	2-1	23-30
"L"	2-1	25-32

### TORQUE CONVERTER STALL SPEED TEST

**CAUTION: DO NOT perform torque converter stall speed test for more than 5 seconds or transmission may be damaged.**

1. Apply parking brake. Block all wheels. Connect tachometer. Start and warm engine to normal operating temperature. Place shift lever in "D" position.
2. Fully depress brake pedal. Fully depress accelerator for no more than 5 seconds and note engine speed. This is the torque converter stall speed.
3. Allow transmission to cool. Repeat test procedure with shift lever in "R" position. Torque converter stall speed should be 2450-2750 RPM in both "D" and "R" positions.
4. If torque converter stall speed is not within specification, see **TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING** table for possible causes.

### TORQUE CONVERTER STALL SPEED TROUBLE SHOOTING

Stall Speed Test Results (RPM)	Probable Cause
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Low In "D" & "R" (1)	Engine Output Low, Defective Torque Converter Stator One-Way Clutch
High In "D" & "R"	Low Fluid Level, Low Line Pressure, Defective OD One-Way Clutch
High In "D"	Low Line Pressure, Slipping OD Or Forward Clutch, (2) Defective No. 2 Or OD One-Way Clutch
High In "R"	Low Line Pressure, Slipping Direct Clutch, Slipping 1st-Reverse Brake, Defective OD One-Way Clutch

(1) If torque converter stall speed is more than 600 RPM below specification, torque converter may be faulty.

(2) No. 2 one-way clutch is mounted on rear planetary gear. Overdrive one-way clutch is located on overdrive planetary gear.

### TIME LAG TEST

**NOTE:** Time lag test is amount of time required for clutch engagement when shift lever is moved from "N" to "D" and "R" positions. Time lag test can be used to check overdrive clutch, front clutch, rear clutch and first-reverse brake.

1. Apply parking brake. Install tachometer. Start and warm engine to normal operating temperature. Ensure idle speed is 850-950 with A/C off. Adjust idle speed if necessary.
2. With engine idling, move shift lever from "N" to "D" position. Using stop watch, note and record amount of time elapsed before clutch engagement is felt. This is the time lag.
3. Wait one minute and repeat procedure. Procedure must be done a total 3 times. Average the 3 time lag readings to obtain the final time lag. Time lag must be less than 1.2 seconds.
4. Wait one minute. With engine idling, move the shift lever from "N" to "R" position and note time lag. Wait one minute and repeat procedure. Procedure must be done a total 3 times. Average the 3 time lag readings to obtain the final time lag. Time lag must be less than 1.5 seconds. If time lag is not within specification, refer to the **TIME LAG TEST TROUBLE SHOOTING** table.

### TIME LAG TEST TROUBLE SHOOTING

Time Lag Test Results	Probable Cause
<b>"N" To "D" Time Lag</b>	
Exceeds Specification	Low Line Pressure, Defective Forward Clutch, Defective Overdrive One-Way Clutch
<b>"N" To "R" Time Lag</b>	
Exceeds Specification	Low Line Pressure, Defective Direct Clutch, Defective Overdrive One-Way Clutch, Defective

**HYDRAULIC PRESSURE TEST****Pressure Test Preparation**

Warm engine to normal operating temperature. Ensure transmission fluid level is correct.

**Line Pressure Test**

1. With engine off, remove pressure tap plug from line pressure tap on transmission. See **Fig. 7** . Install pressure gauge on line pressure tap.
2. Apply parking brake. Block all wheels. Connect tachometer. Start engine. Place shift lever in "D" position. Note and record line pressure with engine idling.
3. Fully depress brake pedal. Fully depress accelerator for no more than 5 seconds until torque converter stall speed is obtained and note line pressure. Repeat line pressure tests with shift lever in "R" position.
4. Line pressure should be within specification. Refer to the **LINE PRESSURE SPECIFICATIONS** table. If line pressure is not within specification, check and adjust throttle cable so throttle valve is fully open with accelerator pedal fully depressed. Recheck line pressure.
5. If line pressure still is not within specification, see the **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table. Shut engine off. Remove pressure gauge. Install pressure tap plug.

**LINE PRESSURE SPECIFICATIONS**

Engine Speed & Shift Lever Position	psi (kg/cm <sup>2</sup> )
At Idle Speed	
"D" Position	64-72 (4.5-5.1)
"R" Position	97-108 (6.8-7.6)
At Torque Converter Stall Speed	
"D" Position	144-169 (10.1-11.9)
"R" Position	213-270 (15.0-19.0)

**Governor Pressure Test**

1. With engine off, remove pressure tap plug from governor pressure tap. See **Fig. 7** . Install pressure gauge on governor pressure tap. Position pressure gauge so governor pressure may be monitored while driving vehicle.
2. Drive vehicle and note governor pressure at specified speeds. See the **GOVERNOR PRESSURE SPECIFICATIONS** table. Governor pressure should be within specification.
3. If governor pressure is not within specification, see the **HYDRAULIC PRESSURE TEST TROUBLE SHOOTING** table. Shut engine off. Remove pressure gauge. Install pressure tap plug.

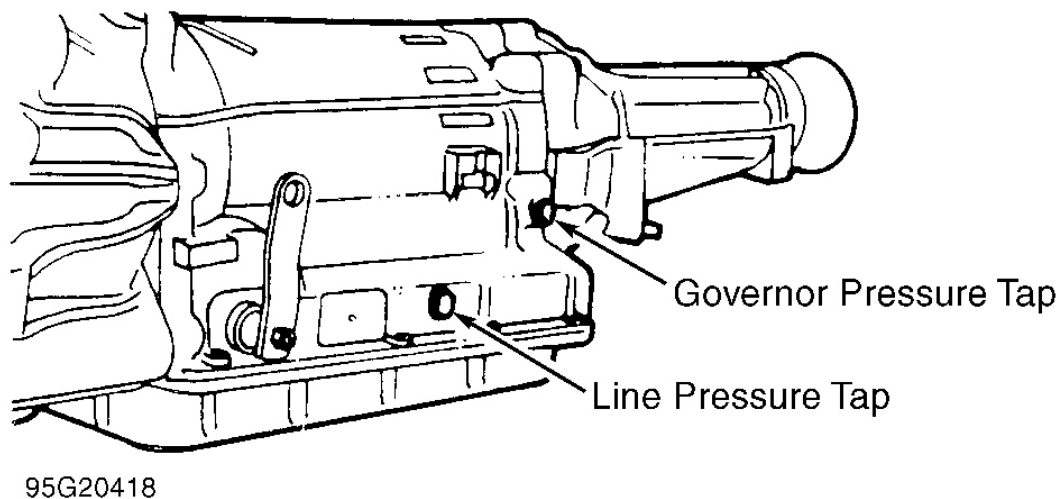
**GOVERNOR PRESSURE SPECIFICATIONS**

Application	Output Shaft RPM	psi (kPa)
1986-92 Models		

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At 17 MPH	1000	17-26 (117-179)
At 34 MPH	2000	33-43 (228-296)
At 58 MPH	3000	61-78 (420-538)
1993 Amigo		
19 MPH	N/A	20-24 (1.4-1.7)
39 MPH	N/A	36-41 (2.5-2.9)
62 MPH	N/A	58-67 (4.1-4.7)
1993-94 Pickup		
18 MPH	N/A	20-24 (1.4-1.7)
36 MPH	N/A	36-41 (2.5-2.9)
57 MPH	N/A	58-67 (4.1-4.7)



**Fig. 7: Identifying Pressure Taps**  
Courtesy of ISUZU MOTOR CO.

### HYDRAULIC PRESSURE TEST TROUBLE SHOOTING

Application	Probable Cause
Line Pressure	
Low Pressure In All Ranges	Defective Oil Pump Or Overdrive Clutch, Pressure Regulator Valve Sticking, Throttle Valve Sticking,

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	Defective Or Improperly Adjusted Throttle Cable
Low Pressure In "D" Only	Defective Forward Or Overdrive Clutch, Oil Pressure Leakage In "D" Range Hydraulic Circuit
Low Pressure In "R" Only	Defective Direct Or Overdrive Clutch, Defective First-Reverse Brake, Oil Pressure Leakage In "R" Range Hydraulic Circuit
High Pressure In All Ranges	Defective Or Improperly Adjusted Throttle Cable, Throttle Valve Sticking, Pressure Regulator Valve Sticking
Governor Pressure	
Pressure Not Within Specification	Incorrect Line Pressure, Oil Pressure Leakage In Governor Hydraulic Circuit, Faulty Governor

## REMOVAL & INSTALLATION

### TRANSMISSION R & I

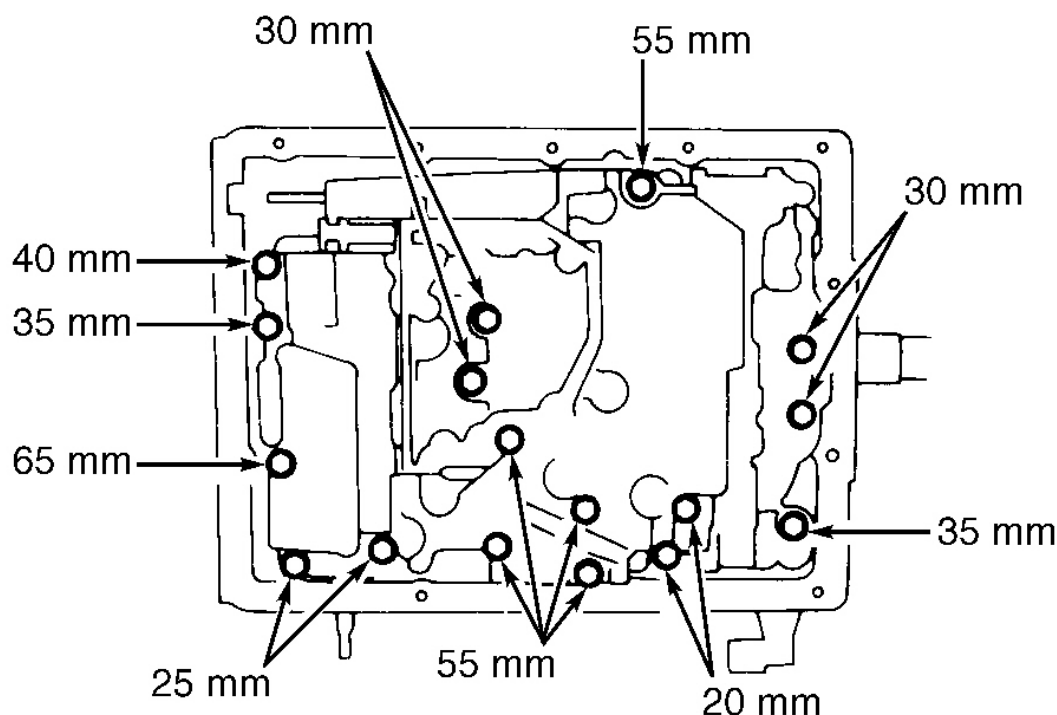
See the [TRANSMISSION REMOVAL & INSTALLATION - A/T](#) article in the AUTOMATIC TRANS SERVICING section.

### VALVE BODY ASSEMBLY R & I

#### Removal

1. Raise and support vehicle. Remove drain plug from oil pan and drain transmission fluid. Remove bolts, oil pan and gasket. Note oil pipe location for reassembly reference. Note valve body assembly-to-transmission case bolt location for reassembly reference, as different bolt lengths are used. See **Fig. 8**.

2. Using screwdriver, carefully pry oil pipes from valve body and transmission case. Use care not to damage oil pipe. Remove oil strainer.
3. Remove valve body assembly-to-transmission case bolts. Slightly lower valve body assembly. Disconnect throttle cable from throttle cam on valve body assembly. Remove valve body assembly.



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**Fig. 8: Valve Body Assembly-To-Transmission Case Bolt Length I.D.**

Courtesy of ISUZU MOTOR CO.

**Installation**

1. Ensure accumulator pistons and springs are installed in transmission case. Install throttle cable on throttle cam.
2. Align manual valve on valve body assembly with detent lever in transmission case. Install valve body assembly on transmission case.
3. Install proper length valve body assembly-to-transmission case bolts in specified area. See **Fig. 8**. Tighten the valve body assembly-to-transmission case bolts to specification. Refer to the **TORQUE SPECIFICATIONS** table.
4. Install NEW gasket and oil strainer. Install and tighten oil strainer bolts to specification. Install oil pipes. Install magnets in oil pan. Ensure magnets are positioned so they do not interfere with the oil pipes.
5. Using NEW gasket, install oil pan. Install and tighten oil pan bolts to specification. Install and tighten



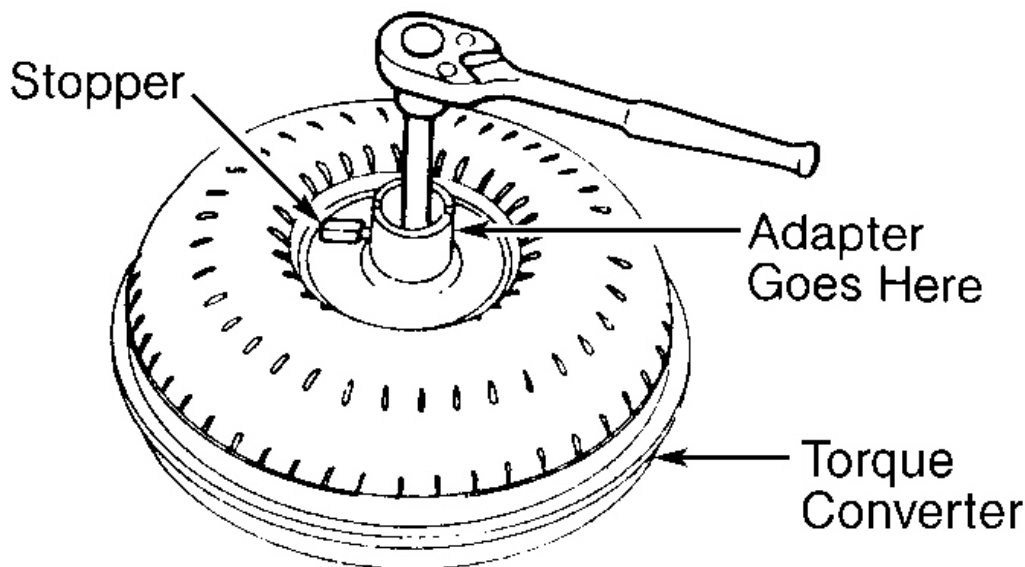
drain plug to specification. Fill transmission with Dexron-III ATF.

## TORQUE CONVERTER

**NOTE:** Torque converter is a sealed unit and cannot be serviced and must be replaced if defective. For torque converter stall speed test, see **TORQUE CONVERTER STALL SPEED TEST** under **PERFORMANCE TESTS**.

### TORQUE CONVERTER ONE-WAY CLUTCH OPERATION

1. Install adapter from One-Way Clutch Kit (J-35467) into inner race of torque converter one-way clutch. Insert stopper from one-way clutch kit so it fits in notch of torque converter hub and cutaway portion of stator thrust washer. See **Fig. 9**.
2. Hold torque converter from rotating. Rotate adapter clockwise. One-way clutch should rotate freely smoothly clockwise and lock when rotated counterclockwise. Replace torque converter if one-way clutch operation is not as specified. Remove adapter and stopper.



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**Fig. 9: Checking Torque Converter One-Way Clutch Operation**  
Courtesy of ISUZU MOTOR CO.

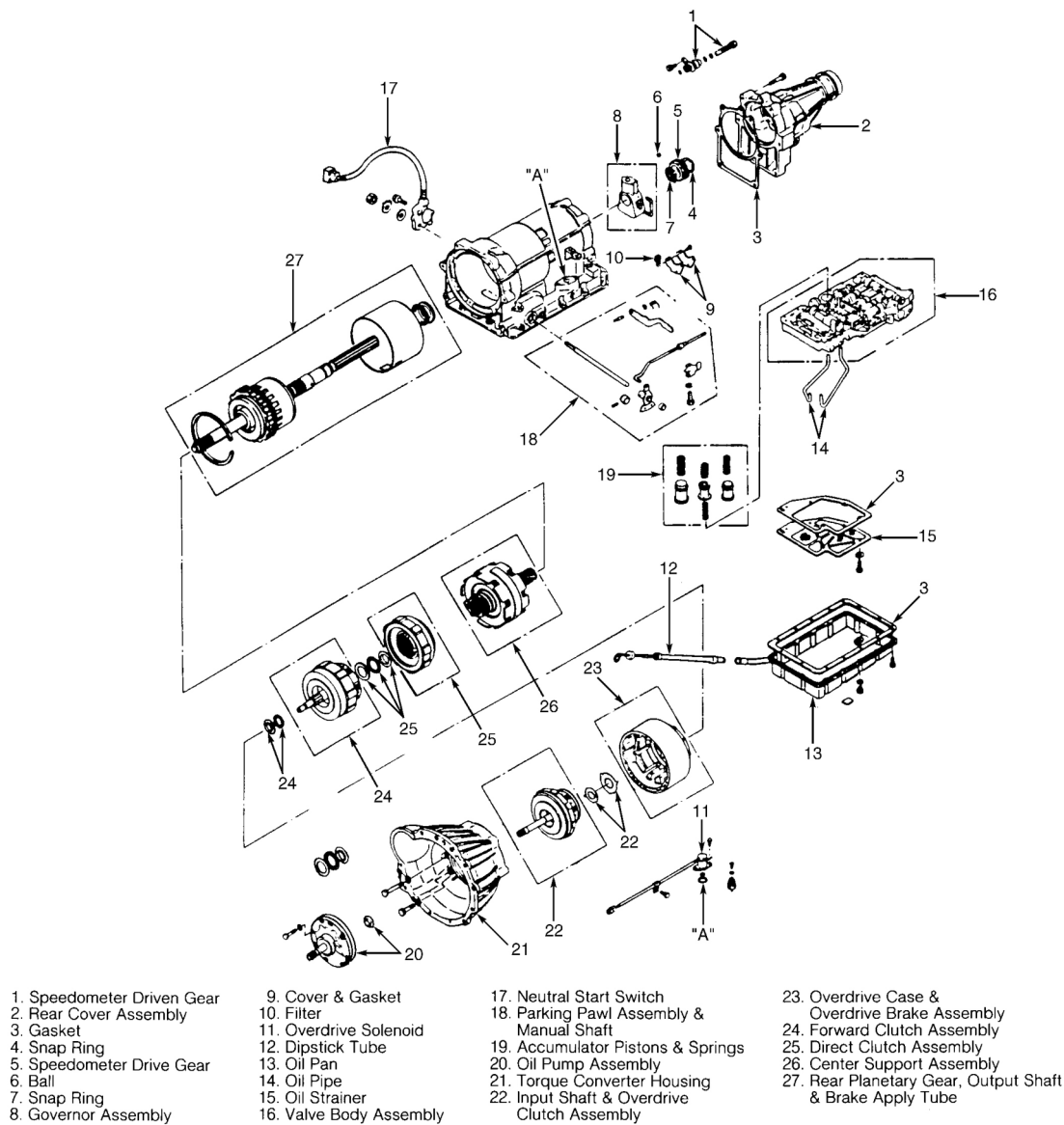
## TRANSMISSION DISASSEMBLY

### VALVE BODY ASSEMBLY & INTERNAL COMPONENTS

1. Remove bolts, rear cover assembly, gasket, snap rings and speedometer drive gear. See **Fig. 10** . Bend over tabs on bolt lock and remove governor assembly bolts.
2. Using screwdriver, raise governor retaining ring located at governor assembly. Remove governor assembly.
3. Remove bolts, oil pan and gasket. Note oil pipe location for reassembly reference. Note valve body assembly-to-transmission case bolt location for reassembly reference, as different bolt lengths are used. See **Fig. 8** .
4. Using screwdriver, carefully pry oil pipes from valve body and transmission case. Use care not to damage oil pipe. Remove oil strainer.
5. Remove valve body assembly-to-transmission case bolts. Slightly lower valve body assembly. Disconnect throttle cable from throttle cam on valve body assembly. Remove valve body assembly.
6. Bend over lock plate on neutral start switch. See **Fig. 2** . Remove nut, lock plate, retaining bolt and neutral start switch.

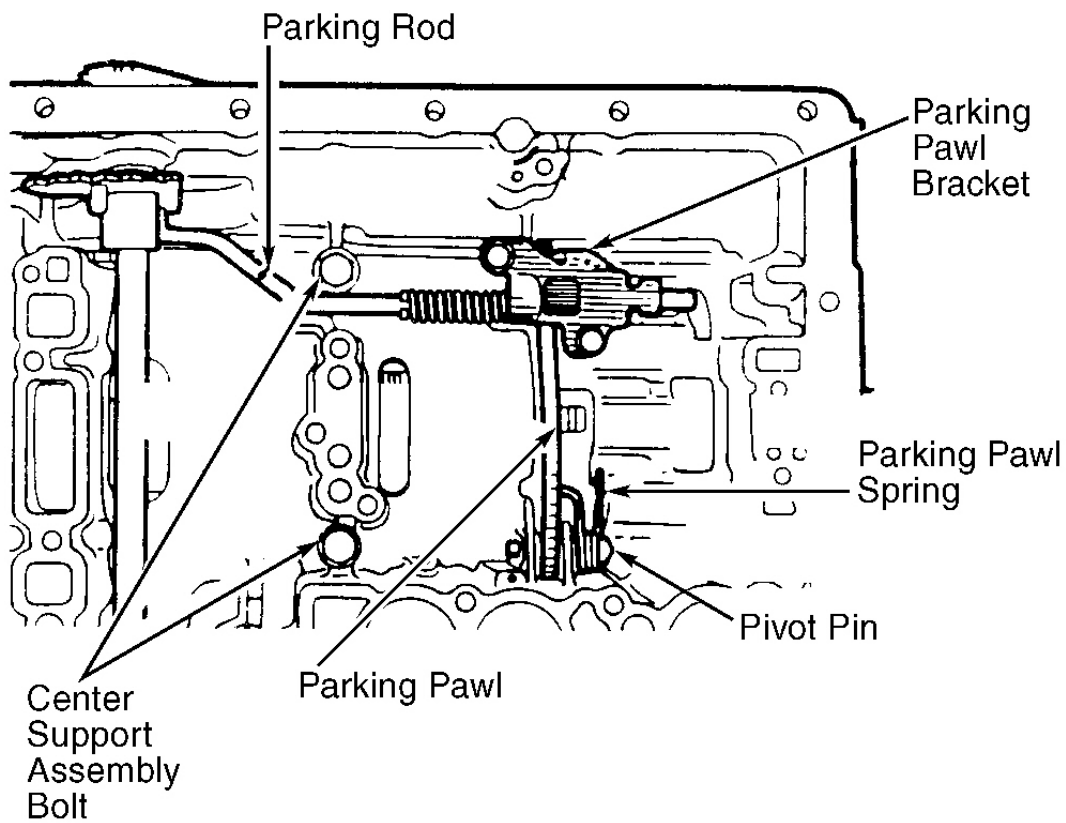
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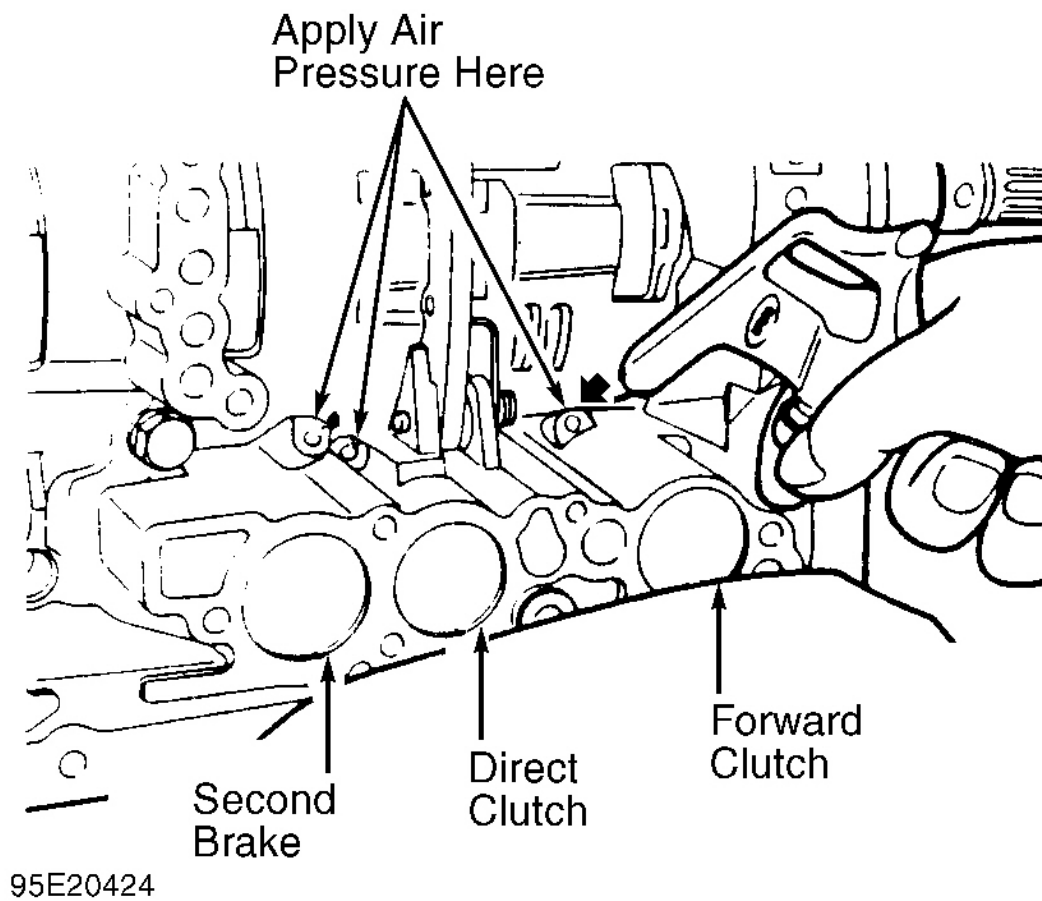
**Fig. 10: Exploded View Of Transmission Components**  
Courtesy of ISUZU MOTOR CO.

7. Remove bolts, parking pawl bracket, pivot pin, parking pawl spring and parking pawl. See **Fig. 11** . Remove pin from manual shaft. Remove manual shaft with parking rod from transmission case.
8. Remove accumulator pistons by applying air pressure on passages in transmission case. See **Fig. 12** . Remove accumulator springs. Mark accumulator piston and spring locations for reassembly reference.
9. Remove torque converter and overdrive solenoid. Remove oil pump assembly bolts. Using Oil Pump Puller (J-25042), remove oil pump assembly. See **Fig. 13** .

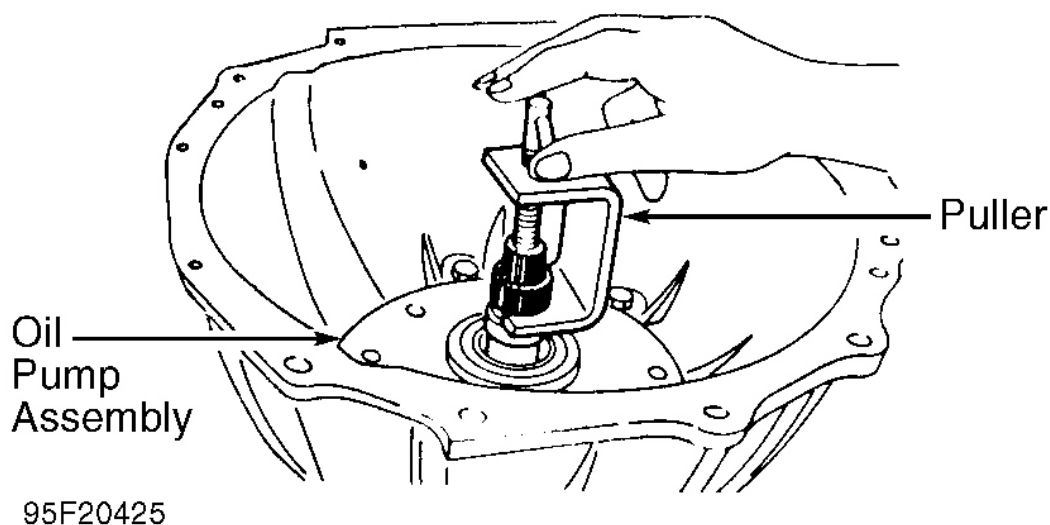


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**Fig. 11: Parking Pawl Components & Center Support Assembly Bolts I.D.**  
Courtesy of ISUZU MOTOR CO.



**Fig. 12: Removing Accumulator Pistons**  
Courtesy of ISUZU MOTOR CO.



**Fig. 13: Removing Oil Pump Assembly**  
Courtesy of ISUZU MOTOR CO.

10. Remove input shaft and overdrive clutch assembly. See **Fig. 10** . Remove bolts and torque converter housing.
11. Remove overdrive case and overdrive brake assembly from transmission case. See **Fig. 10** . Remove forward clutch assembly and then direct clutch assembly from transmission case.
12. Remove center support assembly bolts from transmission case. See **Fig. 11** . Remove center support assembly with planetary sun gear from transmission case.
13. From inside transmission case, remove snap ring that retains planetary gear and output shaft in transmission case. Remove planetary gear, output shaft and brake apply tube. See **Fig. 10** .

## COMPONENT DISASSEMBLY & REASSEMBLY

### GOVERNOR ASSEMBLY

#### Disassembly

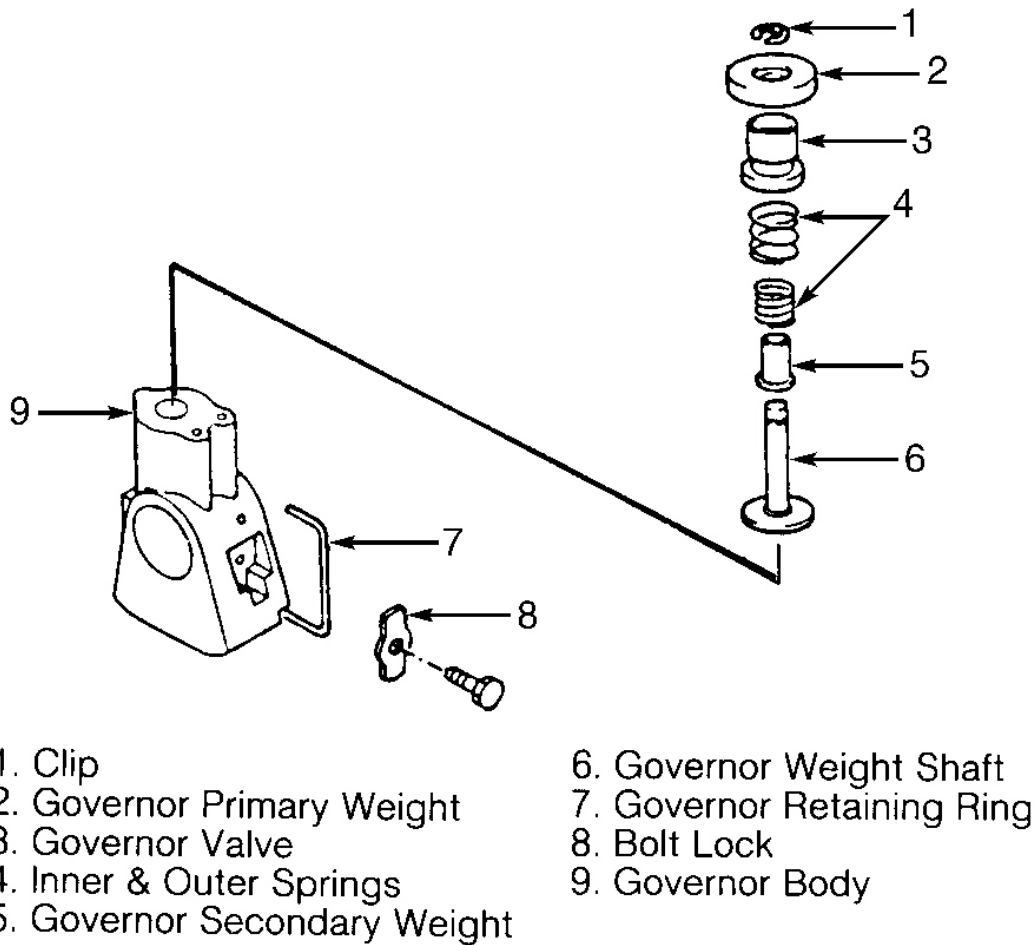
Remove clip and components from governor body. See **Fig. 14** .

#### Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for damage. Replace components as required. Measure free length of inner and outer springs. Replace spring if free length is not .4524" (11.490 mm) for inner spring or .5024" (12.760 mm) for outer spring.

#### Reassembly

To reassemble, reverse disassembly procedure. Ensure clip is fully seated on governor weight shaft and governor valve moves smoothly.



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**Fig. 14: Exploded View Of Governor Assembly**  
Courtesy of ISUZU MOTOR CO.

## OIL PUMP ASSEMBLY

### Disassembly

1. Remove thrust bearing and race from rear of reaction shaft support. Remove seal rings from reaction shaft support. Remove "O" ring from pump body. Remove reaction shaft support-to-oil pump body bolts. Remove reaction shaft support from oil pump body. See **Fig. 15**.
2. Place reference mark on pump drive and driven gears for reassembly reference to ensure gears are installed in original direction. Remove pump drive and driven gears from oil pump body. Remove oil seal

from oil pump body.

### Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure inside diameter of bushings on oil pump assembly. Replace components if bushing inside diameter exceeds specification. See the **OIL PUMP SPECIFICATIONS** table.
3. Install pump drive and driven gears in oil pump body. Using feeler gauge, measure pump driven gear-to-oil pump body clearance. Replace components if clearance is not within specification.
4. Using feeler gauge, measure gear tip clearance between tip of tooth on pump drive and driven gears and crescent-shaped part of oil pump body. Replace components if clearance is not within specification.
5. Place straightedge on oil pump body, above both pump gears. Using feeler gauge, measure pump gear side clearance between each pump gear and the straightedge. Replace components if clearance is not within specification.

### OIL PUMP SPECIFICATIONS

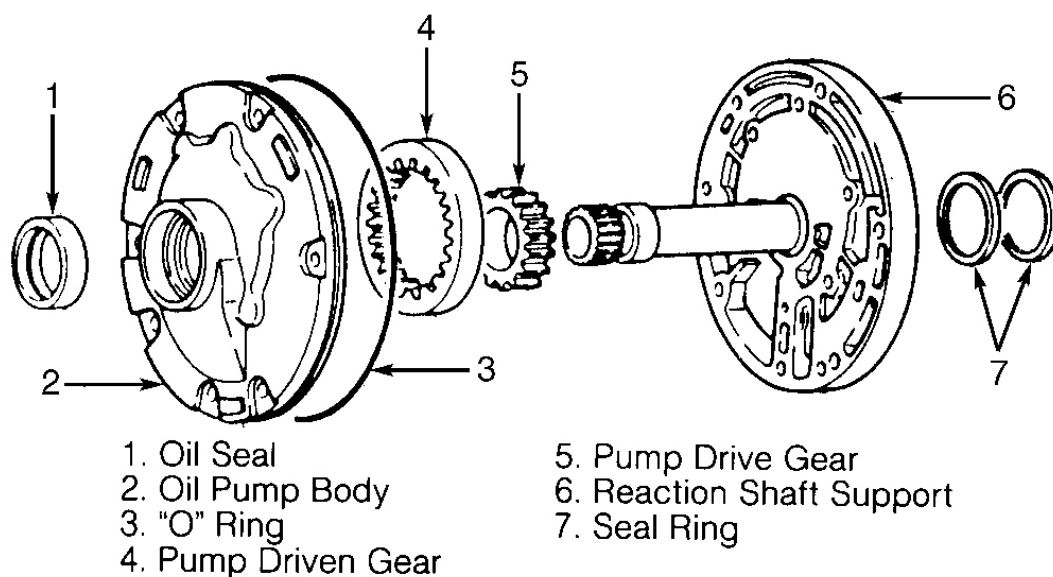
Application	In. (mm)
Bushing Inside Diameter	1.5035 (38.188)
Gear Tip Clearance	
Standard	.0043-.0055 (.110-.140)
Wear Limit	.0120 (.300)
Pump Driven Gear-To-Oil Pump Body Clearance	
Standard	.0028-.0059 (.070-.150)
Wear Limit	.0120 (.300)
Pump Gear Side Clearance	
Standard	.0008-.0020 (.020-.050)
Wear Limit	.0039 (.100)

### Reassembly

1. Using oil seal installer, install NEW oil seal in oil pump body. Coat all components with Dexron-IIIE ATF.
2. Install pump drive and driven gears in oil pump body. If installing original pump gears, ensure pump gears are installed in original positions using reference marks made during disassembly.
3. Install reaction shaft support on oil pump body with reaction shaft support-to-oil pump body bolts finger tight. Install Oil Pump Band (J-25280) on oil pump assembly. See **Fig. 16**.
4. With the oil pump band tightened, tighten reaction shaft support-to-oil pump body retaining bolts to specification. Refer to the **TORQUE SPECIFICATIONS** table.
5. After tightening reaction shaft support-to-oil pump body bolts, ensure pump gears rotate freely. Remove oil pump band.

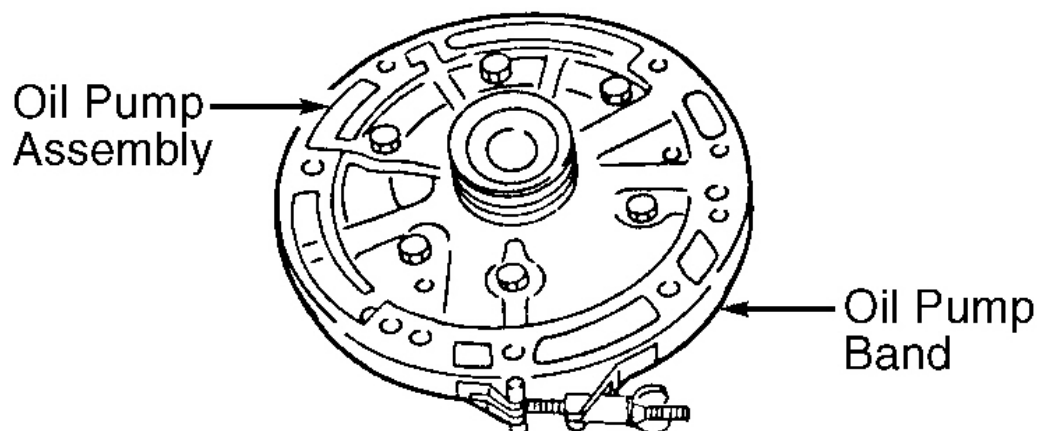


6. Install NEW "O" ring on outside circumference of oil pump body. Install thrust bearing and race on rear of reaction shaft support. Install NEW seal rings on reaction shaft support.



95H20427

**Fig. 15: Exploded View Of Oil Pump Assembly**  
Courtesy of ISUZU MOTOR CO.



95I20428

**Fig. 16: Installing Oil Pump Band**

Courtesy of ISUZU MOTOR CO.

## INPUT SHAFT & OVERDRIVE CLUTCH ASSEMBLY

### Disassembly

1. Remove thrust washer from rear of overdrive planetary gear. See **Fig. 17** .
2. Remove clutch assembly from overdrive planetary gear. Remove snap ring No. 2 and brake hub.
3. Remove snap ring No. 3 and one-way clutch retainer. Note direction of one-way clutch assembly installation for reassembly reference.

**NOTE:** One-way clutch assembly may be referred to as overdrive one-way clutch assembly.

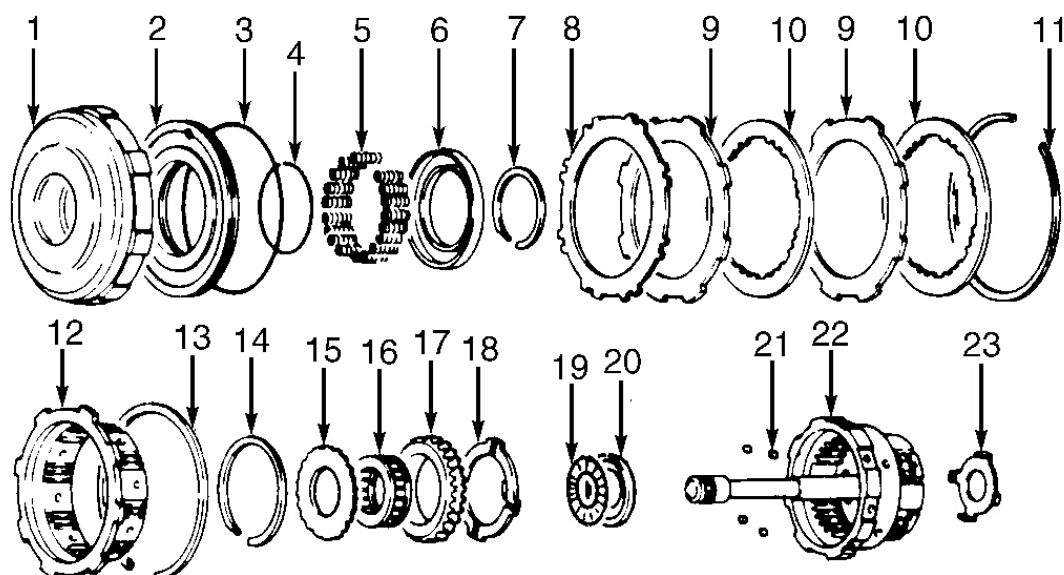
4. Remove one-way clutch assembly, one-way clutch outer race and thrust washer from overdrive planetary gear. Remove snap ring No. 1, clutch discs, clutch plates and cushion plate for overdrive clutch from clutch drum.
5. Using spring compressor, compress return springs. Remove snap ring from center of clutch drum. Release and remove spring compressor. Remove spring retainer and return springs.

**CAUTION:** When removing clutch piston from clutch drum, DO NOT apply excessive air pressure on oil passage on oil pump assembly.

6. Install clutch drum on oil pump assembly. Carefully apply air pressure on oil passage on oil pump assembly to remove clutch piston from clutch drum. See **Fig. 18** . Remove "O" rings from clutch piston.

### Cleaning & Inspection

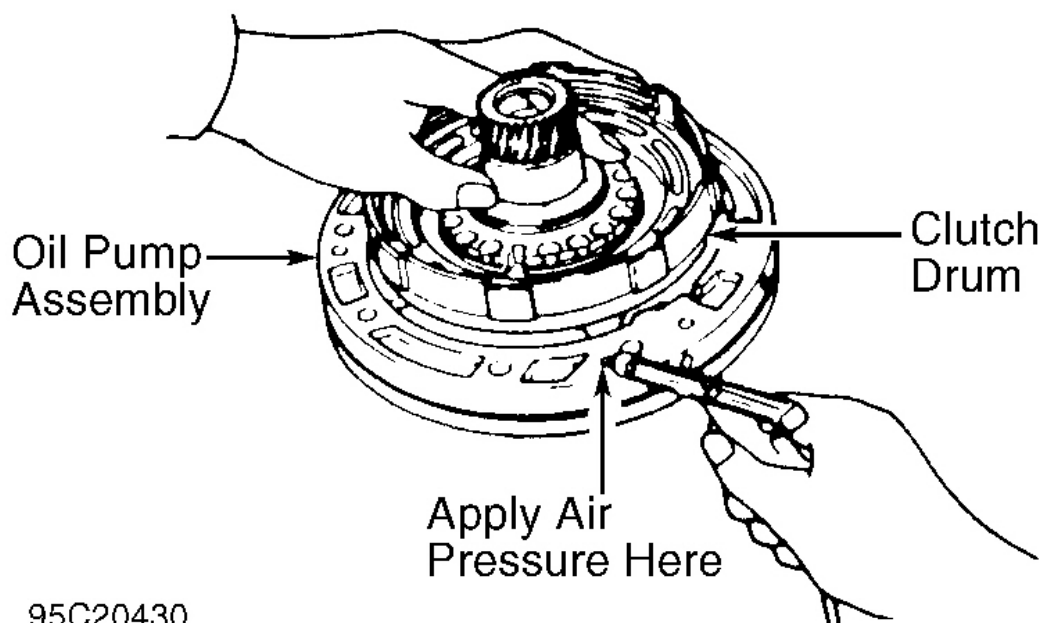
1. Clean metal components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs. Replace return spring if free length is not .579-.594" (14.70-15.10 mm). Using caliper, measure thickness of clutch discs and clutch plates. Replace clutch disc or clutch plate if thickness is less than .083" (2.10 mm).
3. Shake clutch piston to ensure check ball movement exists. Check ball is located in clutch piston. Apply air pressure on check ball area on rear of clutch piston. Ensure no air flows past the check ball and into oil passage on clutch piston. Replace clutch piston if air flows past check ball.



- |                     |                               |
|---------------------|-------------------------------|
| 1. Clutch Drum      | 13. Snap Ring No. 2           |
| 2. Clutch Piston    | 14. Snap Ring No. 3           |
| 3. "O" Ring         | 15. One-Way Clutch Retainer   |
| 4. "O" Ring         | 16. One-Way Clutch Assembly   |
| 5. Return Spring    | 17. One-Way Clutch Outer Race |
| 6. Spring Retainer  | 18. Thrust Washer             |
| 7. Snap Ring        | 19. Thrust Bearing            |
| 8. Cushion Plate    | 20. Thrust Bearing Race       |
| 9. Clutch Plate     | 21. Plug                      |
| 10. Clutch Disc     | 22. Overdrive Planetary Gear  |
| 11. Snap Ring No. 1 | 23. Thrust Washer             |
| 12. Brake Hub       |                               |

95J20429

**Fig. 17: Exploded View Of Input Shaft & Overdrive Clutch Assembly**  
 Courtesy of ISUZU MOTOR CO.



95C20430

**Fig. 18: Removing Clutch Piston On Overdrive Clutch**  
 Courtesy of ISUZU MOTOR CO.

#### Reassembly

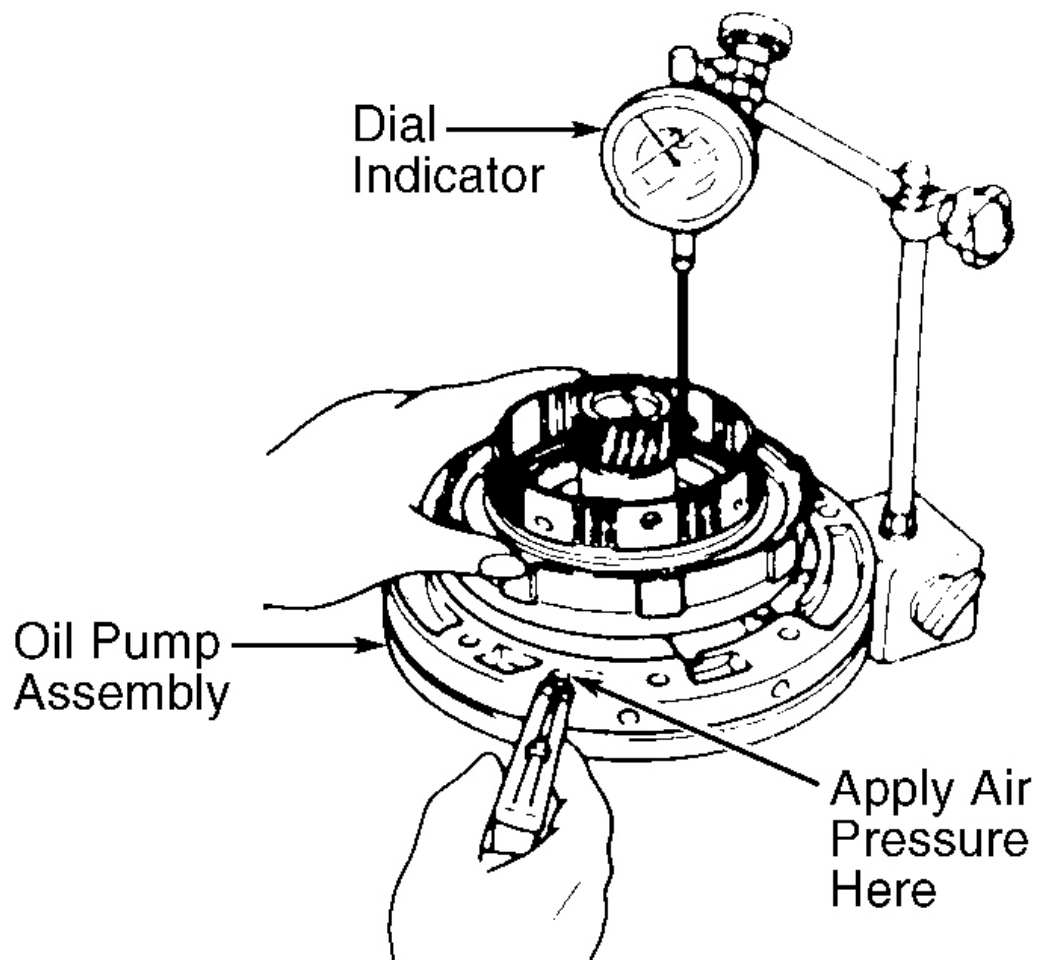
1. Install NEW "O" rings on clutch piston. Lubricate all components with Dexron-IIIE ATF. Install clutch piston in clutch drum, using care not to damage "O" rings.
2. Install return springs and spring retainer. Using spring compressor, compress return springs. Install snap ring. Remove spring compressor.
3. Install cushion plate, clutch plate, clutch disc, clutch plate, clutch disc and snap ring No. 1 in clutch drum. Install clutch hub and snap ring No. 2 in clutch drum.
4. Overdrive clutch clearance is determined by measuring clutch piston travel. Install clutch drum on oil pump assembly. Position dial indicator with stem resting against clutch piston. See **Fig. 19**.
5. Carefully apply 57-114 psi (4.0-8 kg/cm<sup>2</sup>) air pressure on oil passage on oil pump assembly and note clutch piston travel. Clutch piston travel should be .077-.115" (1.96-2.93 mm).
6. If clutch piston travel exceeds specification, replace clutch discs and clutch plates. If clutch piston travel is less than specified, check for improperly assembled components. Remove dial indicator and clutch drum from oil pump assembly.

**CAUTION: Thrust washer must be installed in overdrive planetary gear with oil groove on thrust washer facing toward shaft end of overdrive planetary gear.**

7. Install thrust bearing, thrust bearing race and thrust washer in overdrive planetary gear. Ensure thrust washer is installed with oil groove on thrust washer facing toward shaft end of overdrive planetary gear.

**CAUTION: One-way clutch must be installed in overdrive planetary gear with arrow mark on one-way clutch toward shaft end of overdrive planetary gear. See Fig. 20 .**

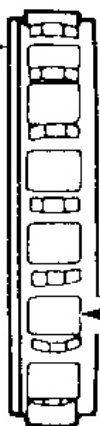
8. Install one-way clutch in one-way clutch outer race. Install one-way clutch with one-way clutch outer race in overdrive planetary gear. Ensure one-way clutch is installed in proper direction with arrow mark on one-way clutch toward shaft end of overdrive planetary gear. See Fig. 20 .
9. Install one-way clutch retainer and snap ring No. 3. Install clutch assembly on overdrive planetary gear.
10. To check one-way clutch operation, hold clutch drum and rotate input shaft clockwise. See Fig. 21 . Input shaft should rotate clockwise and lock when rotated counterclockwise. Install thrust washer on rear of overdrive planetary gear.



95D20431

**Fig. 19: Measuring Overdrive Clutch Clearance**  
Courtesy of ISUZU MOTOR CO.

This Side Faces  
Away From  
Overdrive Planetary  
Gear

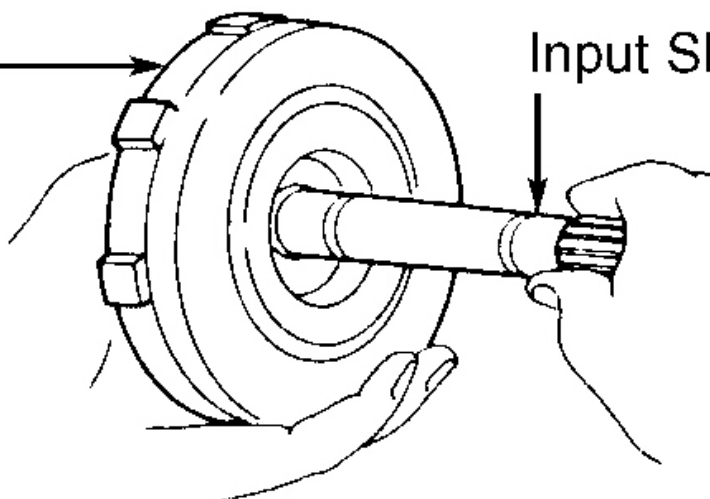


One-Way Clutch  
Assembly

95E20432

**Fig. 20: Installing One-Way Clutch In Overdrive Planetary Gear**  
Courtesy of ISUZU MOTOR CO.

Clutch  
Drum



Input Shaft

95F20433

**Fig. 21: Checking One-Way Clutch Operation**  
Courtesy of ISUZU MOTOR CO.

## OVERDRIVE CASE & OVERDRIVE BRAKE ASSEMBLY

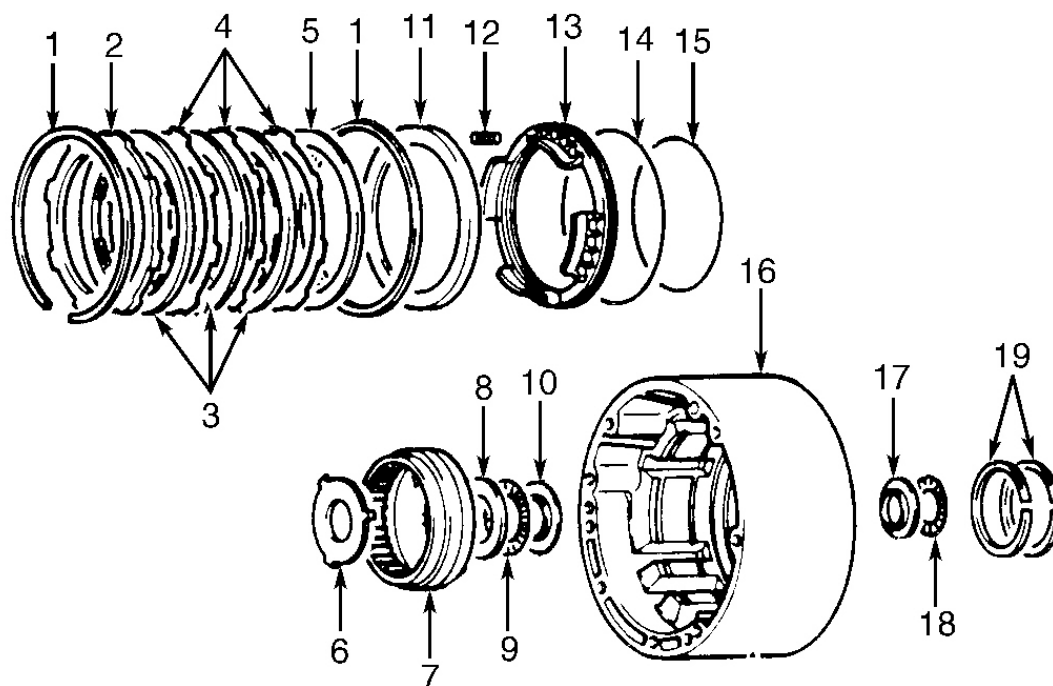
**Disassembly**

1. Remove thrust bearing and thrust bearing race from rear of overdrive case. See **Fig. 22** .
2. Remove snap ring, backing plate, brake discs and brake plates. Note direction of cushion plate installation for reassembly reference. Remove cushion plate.
3. Remove thrust washer, planetary ring gear, thrust bearing races and thrust bearing from front of overdrive case. See **Fig. 22** .

**CAUTION: When removing brake piston from overdrive case, DO NOT apply excessive air pressure on oil passage on overdrive case.**

4. Compress return springs. Remove snap ring that retains spring retainer. Remove spring retainer and return springs. Apply air pressure on oil passage on rear of overdrive case to remove brake piston. See **Fig. 23** . Remove "O" rings from brake piston. Remove seal rings from rear of overdrive case.

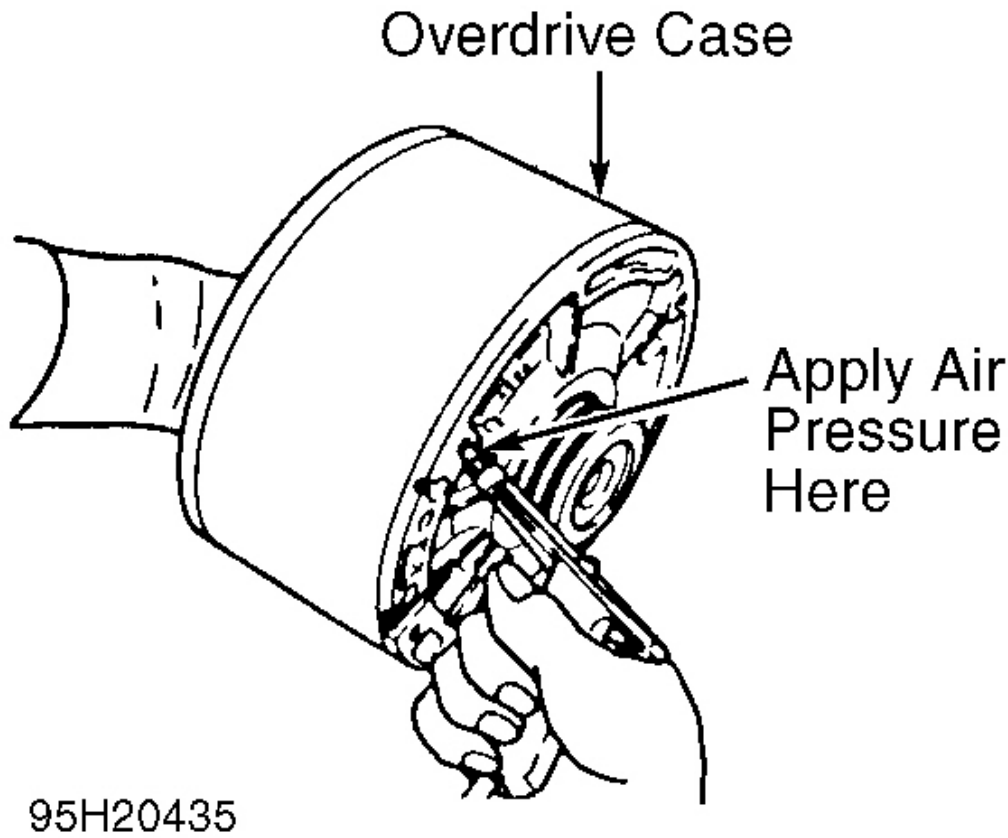




- |                         |                         |
|-------------------------|-------------------------|
| 1. Snap Ring            | 11. Spring Retainer     |
| 2. Backing Plate        | 12. Return Spring       |
| 3. Brake Disc           | 13. Brake Piston        |
| 4. Brake Plate          | 14. "O" Ring            |
| 5. Cushion Plate        | 15. "O" Ring            |
| 6. Thrust Washer        | 16. Overdrive Case      |
| 7. Planetary Ring Gear  | 17. Thrust Bearing Race |
| 8. Thrust Bearing Race  | 18. Thrust Bearing      |
| 9. Thrust Bearing       | 19. Seal Ring           |
| 10. Thrust Bearing Race |                         |

95G20434

**Fig. 22: Exploded View Of Overdrive Case & Overdrive Brake Assembly**  
 Courtesy of ISUZU MOTOR CO.



**Fig. 23: Removing Brake Piston From Overdrive Case**  
Courtesy of ISUZU MOTOR CO.

#### Cleaning & Inspection

1. Clean metal components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs. Replace return spring if free length is not .618-.635" (15.70-16.12 mm).
3. Using caliper, measure thickness of brake discs and brake plates. Replace brake disc if thickness is less than .059" (1.50 mm). Replace brake plate if thickness is less than .079" (2.00 mm).

#### Reassembly

1. Install NEW seal rings on rear of overdrive case. Install NEW "O" rings on brake piston. Lubricate all components with Dexron-IIe ATF.

2. Install brake piston in overdrive case, using care not to damage "O" rings. Install return springs and spring retainer.
3. Compress return springs. Install snap ring to retain spring retainer. Ensure snap ring is properly seated in overdrive case.
4. Install thrust bearing race, thrust bearing and thrust bearing race on inside of overdrive case. Install planetary ring gear and thrust washer in overdrive case.

**CAUTION: Cushion plate must be installed in overdrive case with dished side on cushion plate facing upward, toward the brake plate.**

5. Install cushion plate in overdrive case with dished side on cushion plate facing upward, toward the brake plate. Install brake plates, brake discs, backing plate and snap ring. Ensure components are installed in correct sequence. See **Fig. 22**.
6. Overdrive brake clearance must be checked. Position dial indicator with stem resting on surface of snap ring. Zero dial indicator.
7. Move dial indicator so stem extends downward to raised surface on backing plate. Note reading on dial indicator. This is the overdrive brake clearance. Overdrive brake clearance is the clearance between snap ring and backing plate. Overdrive brake clearance should be .026-.087" (.65-2.21 mm).
8. If overdrive brake clearance exceeds specification, replace brake discs and brake plates. If overdrive brake clearance is less than specified, check for improperly assembled components.
9. Remove dial indicator. Install thrust bearing race and thrust bearing on rear of overdrive case.

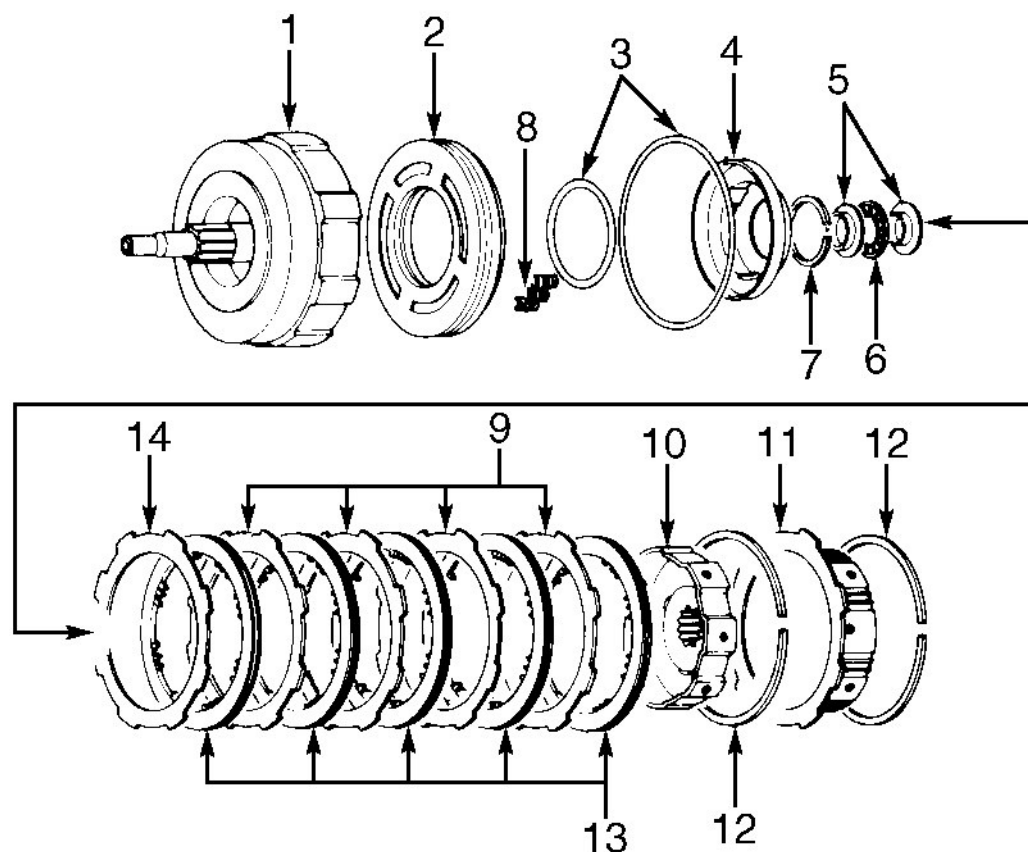
## **FORWARD CLUTCH ASSEMBLY**

### **Disassembly**

1. Remove snap ring, direct clutch hub and forward clutch hub from clutch drum. See **Fig. 24**. Remove thrust bearing races and thrust bearing from clutch drum.
2. Remove snap ring, clutch discs and clutch plates. Note direction of component installation for reassembly reference and that clutch plate "A" is thinner than all other clutch plates. See **Fig. 24**.
3. Using spring compressor, compress return springs. Remove snap ring from center of clutch drum. Remove spring compressor. Remove spring retainer and return springs.

**CAUTION: When removing clutch piston from clutch drum, DO NOT apply excessive air pressure on oil passage on overdrive case.**

4. Place clutch drum on overdrive case. Apply air pressure on oil passage on overdrive case to remove clutch piston from clutch drum. See **Fig. 25**. Remove "O" rings from clutch piston.

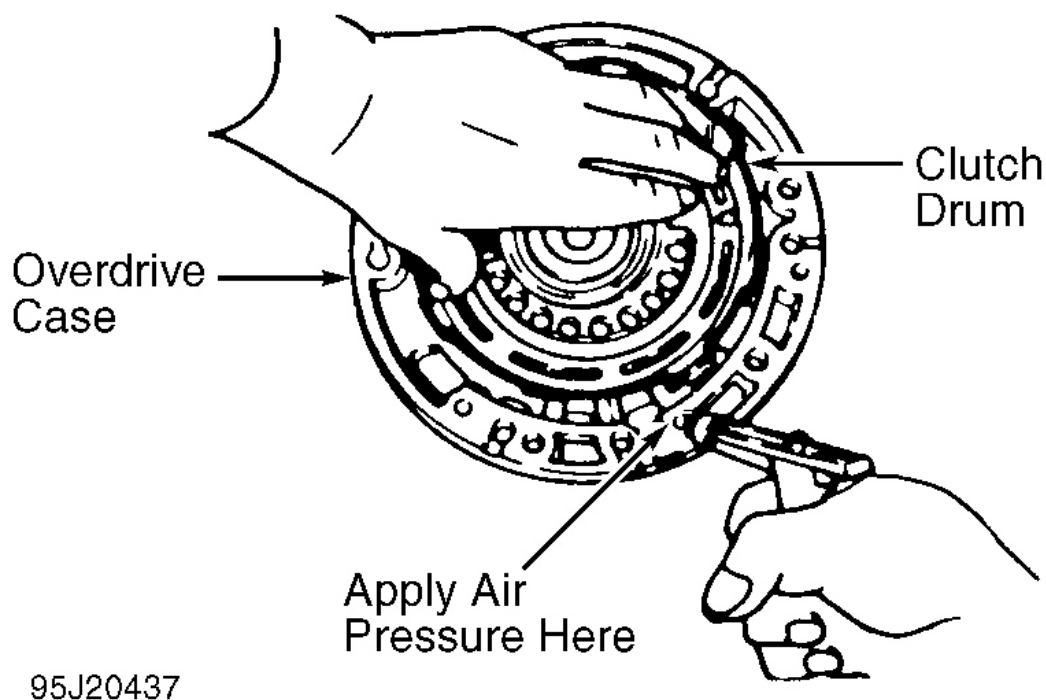


- |                        |                        |
|------------------------|------------------------|
| 1. Clutch Drum         | 8. Return Spring       |
| 2. Clutch Piston       | 9. Clutch Plate        |
| 3. "O" Ring            | 10. Forward Clutch Hub |
| 4. Spring Retainer     | 11. Direct Clutch Hub  |
| 5. Thrust Bearing Race | 12. Snap Ring          |
| 6. Thrust Bearing      | 13. Clutch Disc        |
| 7. Snap Ring           | 14. Clutch Plate "A"   |

NOTE: Clutch plate "A" is  
.055" (1.40 mm) thick  
and all others are  
.079" (2.00 mm) thick.

95I20436

**Fig. 24: Exploded View Of Forward Clutch Assembly**  
Courtesy of ISUZU MOTOR CO.



**Fig. 25: Removing Clutch Piston From Clutch Drum On Forward Clutch Assembly**  
 Courtesy of ISUZU MOTOR CO.

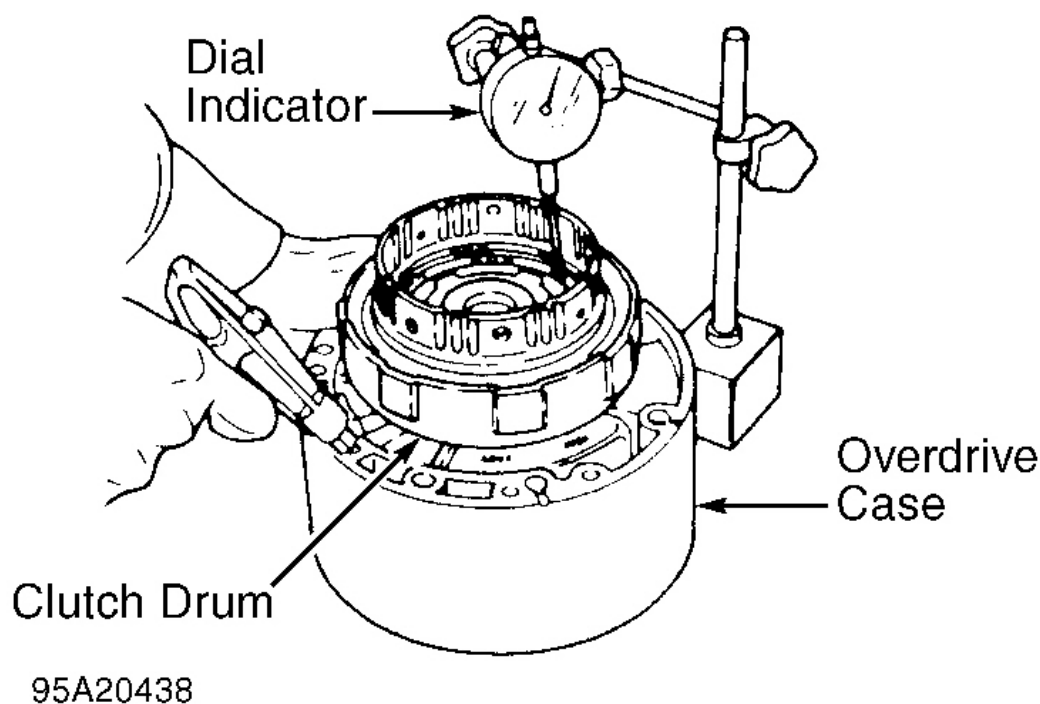
#### Cleaning & Inspection

1. Clean metal components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs. Replace return spring if free length is not .579-.594" (14.70-15.10 mm).
3. Using caliper, measure thickness of clutch discs and clutch plates. Replace clutch disc or clutch plate if thickness is less than .071" (1.80 mm).
4. Shake clutch piston to ensure check ball movement exists. Check ball is located in clutch piston. Apply air pressure on check ball area on rear of clutch piston. Ensure no air flows past the check ball and into oil passage on clutch piston. Replace clutch piston if air flows past check ball.

#### Reassembly

1. Install NEW "O" rings on clutch piston. Lubricate all components with Dexron-IIe ATF.
2. Install clutch piston in clutch drum, using care not to damage "O" rings. Install return springs and spring retainer.
3. Using spring compressor, compress return springs. Install snap ring at center of clutch drum. Remove spring compressor. Ensure snap ring is properly seated in clutch drum.

4. Install clutch plates, clutch discs and snap ring in clutch drum. Ensure components are installed in correct sequence. See **Fig. 24** . Ensure .055" (1.40 mm) thick clutch plate is installed next to clutch piston. All other clutch plates are .079" (2.0 mm) thick.
5. Install thrust bearing races and thrust bearing in clutch drum. Ensure components are installed in proper direction. Install forward clutch hub, direct clutch hub and snap ring in clutch drum.
6. Forward clutch clearance is determined by measuring clutch piston travel. Install clutch drum on overdrive case. Position dial indicator with stem resting against clutch piston. See **Fig. 26** .
7. Carefully apply 57-114 psi (4.0-8 kg/cm<sup>2</sup>) air pressure to oil passage on overdrive case and note clutch piston travel. Clutch piston travel should be .056-.115" (1.43-2.93 mm).
8. If clutch piston travel exceeds specification, replace clutch discs and clutch plates. If clutch piston travel is less than specified, check for improperly assembled components. Remove dial indicator and clutch drum from overdrive case.



**Fig. 26: Measuring Forward Clutch Clearance**  
Courtesy of ISUZU MOTOR CO.

## DIRECT CLUTCH ASSEMBLY

### Disassembly

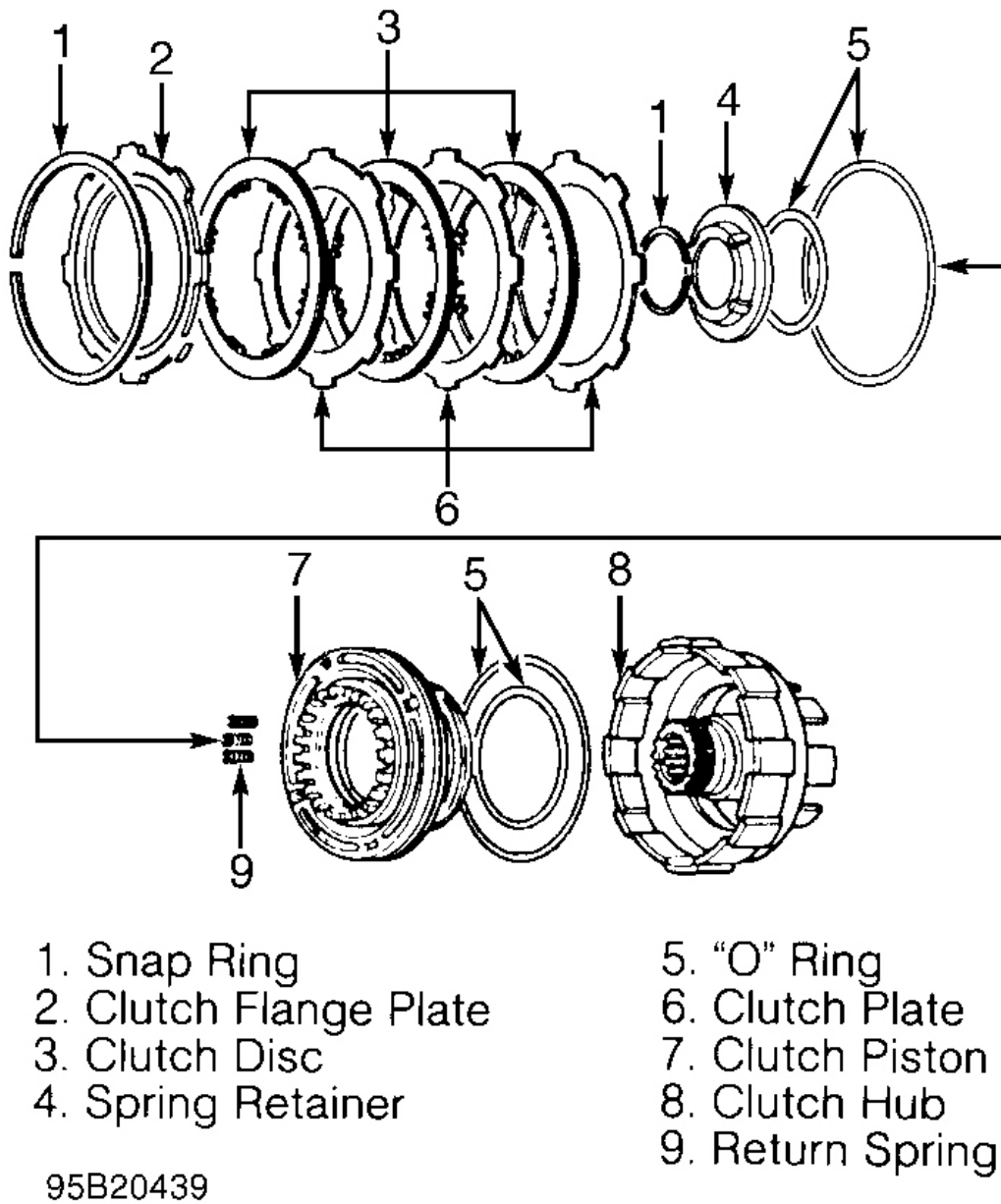
1. Remove snap ring, clutch flange plate, clutch discs and clutch plates from clutch hub. See **Fig. 27** . Note

direction of component installation for reassembly reference.

2. Using spring compressor, compress return springs. Remove snap ring from center of clutch hub. Remove spring compressor. Remove spring retainer and return springs.

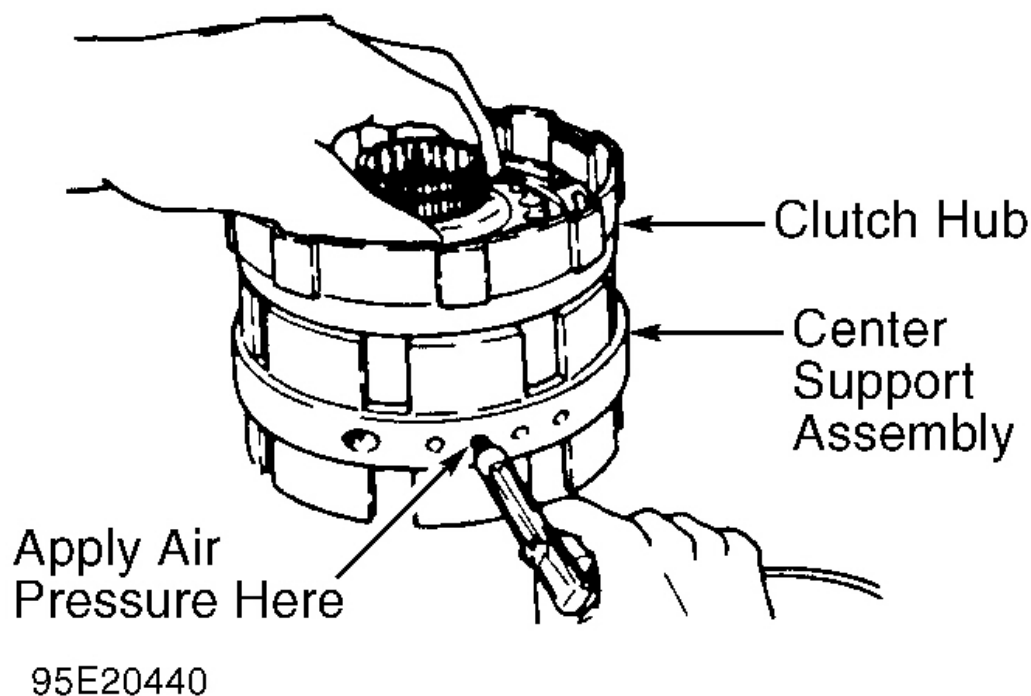
**CAUTION: When removing clutch piston from clutch hub, DO NOT apply excessive air pressure on oil passage on center support assembly.**

3. Place clutch hub on center support assembly. Apply air pressure on oil passage on center support assembly to remove clutch piston from clutch hub. See **Fig. 28** . Remove "O" rings from clutch piston.



**Fig. 27: Exploded View Of Direct Clutch Assembly**  
 Courtesy of ISUZU MOTOR CO.





**Fig. 28: Removing Clutch Piston From Clutch Hub On Direct Clutch Assembly**  
Courtesy of ISUZU MOTOR CO.

#### Cleaning & Inspection

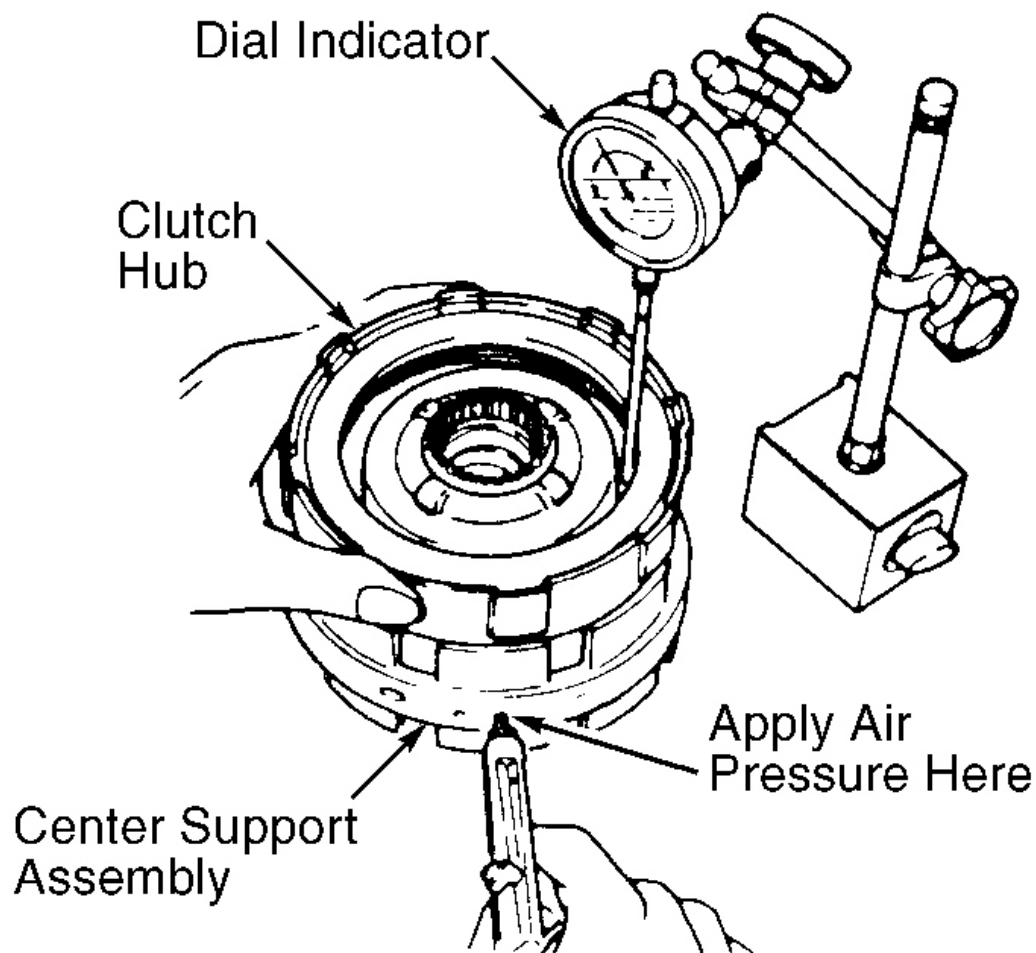
1. Clean metal components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs. Replace return spring if free length is not .579-.594" (14.70-15.10 mm).
3. Using caliper, measure thickness of clutch discs and clutch plates. Replace clutch disc if thickness is less than .083" (2.10 mm). Replace clutch plate if thickness is less than .079" (2.00 mm).
4. Shake clutch piston to ensure check ball movement exists. Check ball is located in clutch piston. Apply air pressure on check ball area on rear of clutch piston. Ensure no air flows past the check ball and into oil passage on clutch piston. Replace clutch piston if air flows past check ball.

#### Reassembly

1. Install NEW "O" rings on clutch piston. Lubricate all components with Dexron-II E ATF.
2. Install clutch piston in clutch hub, using care not to damage "O" rings. Install return springs and spring retainer.
3. Using spring compressor, compress return springs. Install snap ring at center of clutch hub. Remove

spring compressor. Ensure snap ring is properly seated in clutch hub.

4. Install clutch plates, clutch discs, clutch flange plate and snap ring. Ensure components are installed in correct sequence and clutch flange plate is installed with flat side against clutch disc. See **Fig. 27**.
5. Direct clutch clearance is determined by measuring clutch piston travel. Install clutch hub on center support assembly. Position dial indicator with stem resting against clutch piston. See **Fig. 29**.
6. Carefully apply 57-114 psi (4.0-8 kg/cm<sup>2</sup>) air pressure on oil passage on center support assembly and note clutch piston travel. See **Fig. 29**. Clutch piston travel should be .032-.068" (.80-1.73 mm).
7. If clutch piston travel exceeds specification, replace clutch discs and clutch plates. If clutch piston travel is less than specified, check for improperly assembled components. Remove dial indicator and clutch hub from center support assembly.



95F20441

**Fig. 29: Measuring Direct Clutch Clearance**

Courtesy of ISUZU MOTOR CO.

## DIRECT CLUTCH SPECIFICATIONS

Application	In. (mm)
Return Spring Free Length	.579-.595 (14.70-15.10)
Clutch Disc Thickness (Minimum)	.079 (2.00)
Clutch Piston Travel	.038-.068 (.80-1.73)

## CENTER SUPPORT ASSEMBLY

### Disassembly

1. Remove snap ring, planetary sun gear and one-way clutch assembly from center support assembly. See **Fig. 30**.

**NOTE:** One-way clutch assembly may be referred to as No. 1 one-way clutch assembly.

2. Remove snap ring from front of center support assembly. Snap ring retains clutch backing plates, clutch discs and clutch plates for second coast brake (front brake) in center support assembly. See **Fig. 30**.
3. Note direction of clutch backing plate installation for reassembly reference. Remove clutch backing plates, clutch discs and clutch plates for second coast brake from front of center support assembly.
4. Using spring compressor, compress return spring assembly on second coast brake piston. Remove snap ring from center of center support assembly. Remove spring compressor. Remove return spring assembly.

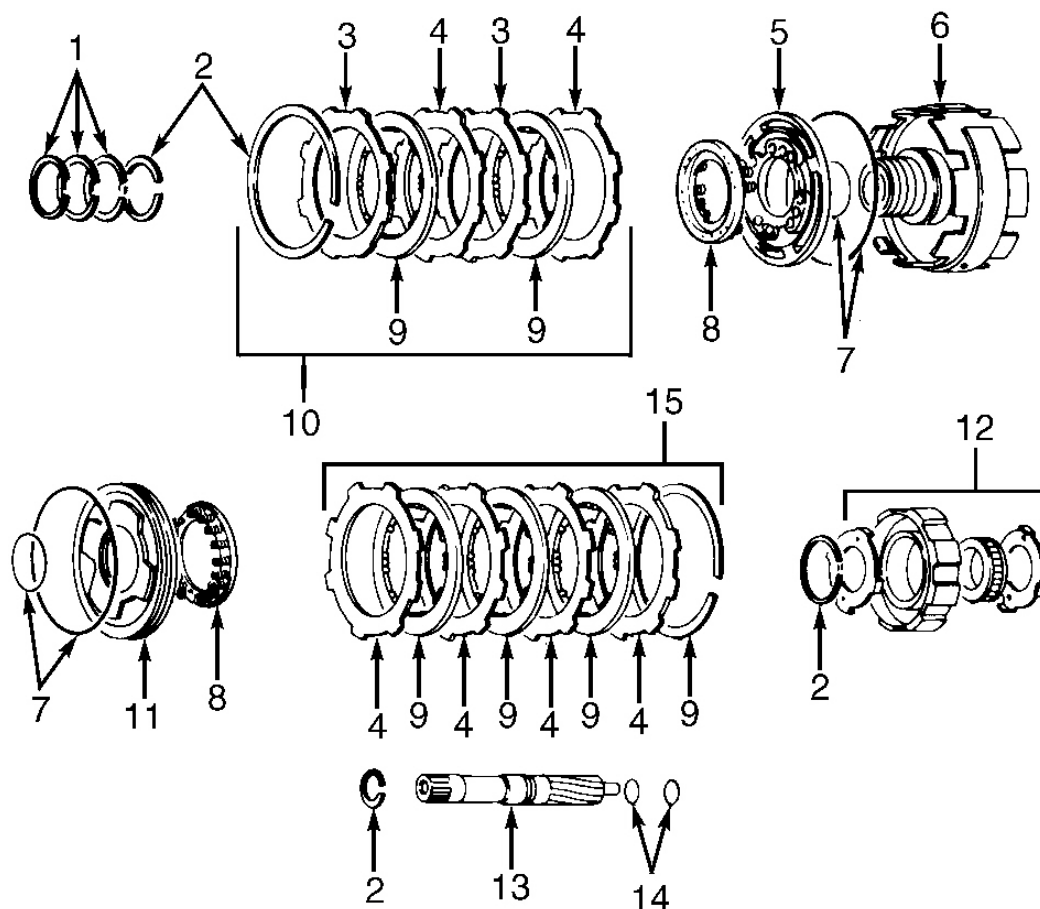
**CAUTION:** When removing second coast brake piston from center support, DO NOT apply excessive air pressure on oil passage on center support assembly.

5. Apply air pressure on oil passage on center support assembly to remove second coast brake piston from center support assembly. See **Fig. 31**. Remove "O" rings from second coast brake piston. Remove seal rings from center support assembly.
6. Remove snap ring from rear of center support assembly. Snap ring retains clutch plates and clutch discs for second brake (rear brake) in center support assembly. See **Fig. 30**.
7. Remove clutch plates and clutch discs for second brake from rear of center support assembly. Note location and thickness of clutch plates for reassembly reference.
8. Using spring compressor, compress return spring assembly on second brake piston. Remove snap ring from center of center support. Remove spring compressor. Remove return spring assembly.

**CAUTION:** When removing second brake piston from center support, DO NOT apply excessive air pressure on oil passage on center support assembly.

9. Apply air pressure on oil passage on center support assembly to remove second brake piston from center support assembly. See **Fig. 31**. Remove "O" rings from second brake piston. Remove seal rings from

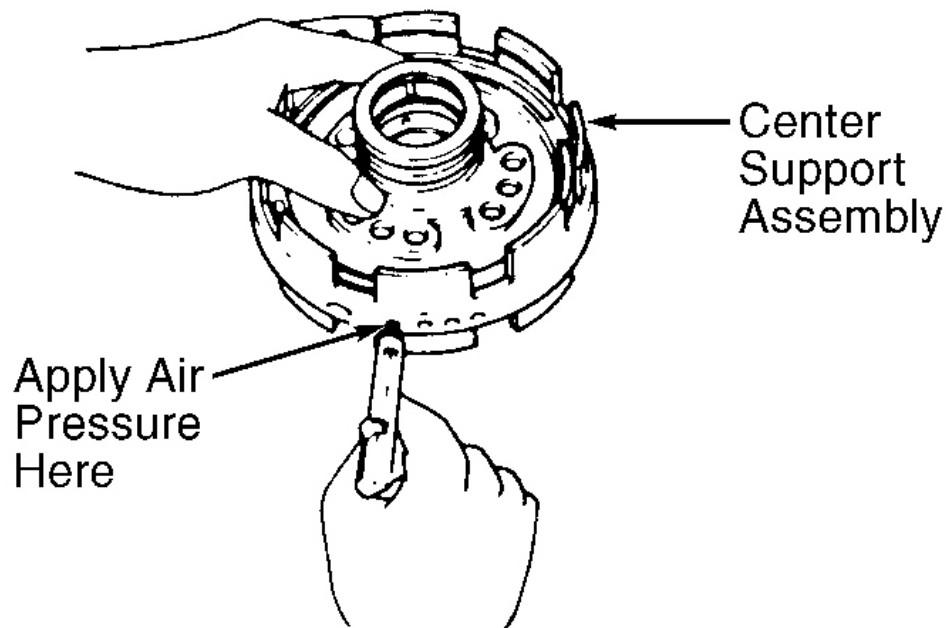
planetary sun gear.



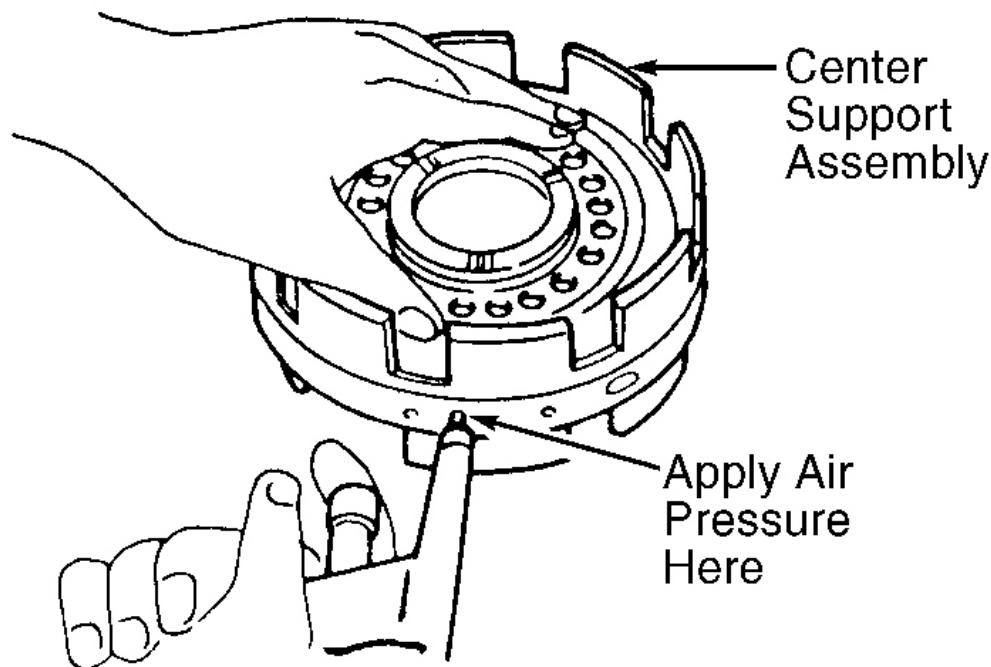
- |                              |                             |
|------------------------------|-----------------------------|
| 1. Seal Ring                 | 9. Clutch Disc              |
| 2. Snap Ring                 | 10. Second Coast Brake      |
| 3. Clutch Backing Plate      | 11. Second Brake Piston     |
| 4. Clutch Plate              | 12. One-Way Clutch Assembly |
| 5. Second Coast Brake Piston | 13. Planetary Sun Gear      |
| 6. Center Support Assembly   | 14. Seal Ring               |
| 7. "O" Ring                  | 15. Second Brake            |
| 8. Return Spring Assembly    |                             |

95G20442

**Fig. 30: Exploded View Of Center Support Assembly**  
Courtesy of ISUZU MOTOR CO.



## REMOVING SECOND COAST BRAKE PISTON



## REMOVING SECOND BRAKE PISTON

95H20443

**Fig. 31: Removing Brake Pistons From Center Support Assembly**  
Courtesy of ISUZU MOTOR CO.

### Cleaning & Inspection

1. Clean metal components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs on return spring assembly. Free length is measured between end of return spring and top surface on spring retainer. Replace return spring assembly if free length is not .675" (17.15 mm).
3. Using caliper, measure thickness of clutch discs. Replace clutch disc if thickness is less than .083" (2.10 mm) on second coast brake or .071" (1.80 mm) on second brake.

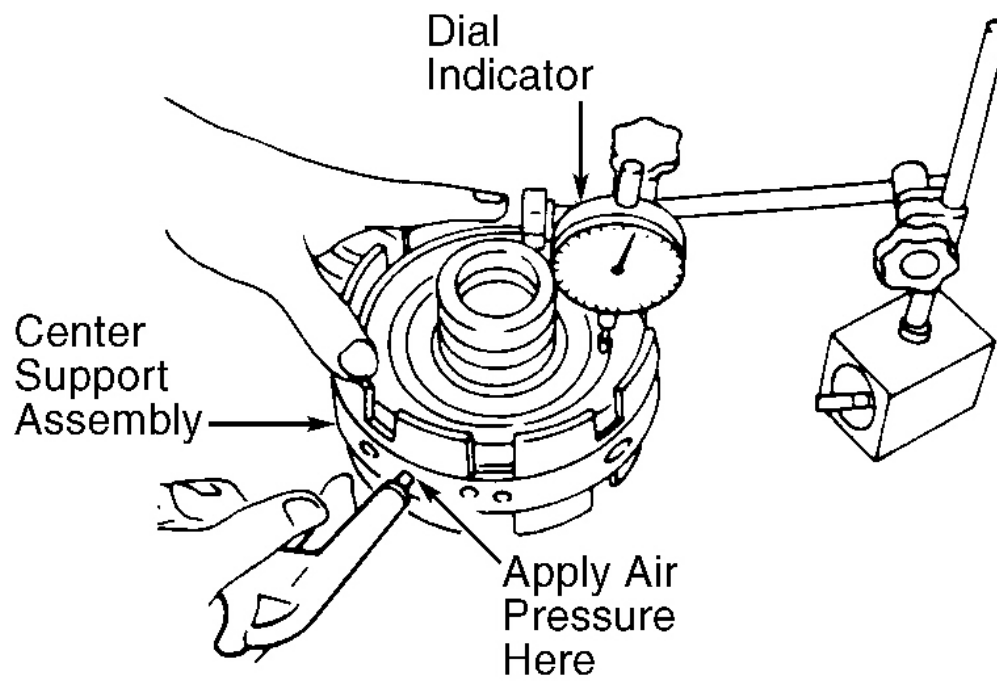
### Reassembly

1. Install NEW "O" rings on brake pistons. Lubricate all components with Dexron-III ATF.
2. Install second coast brake piston in center support assembly, using care not to damage "O" rings. Install return spring assembly.
3. Using spring compressor, compress return spring assembly on second coast brake piston. Install snap ring at center of center support assembly. Remove spring compressor. Ensure snap ring is properly seated in center support assembly.

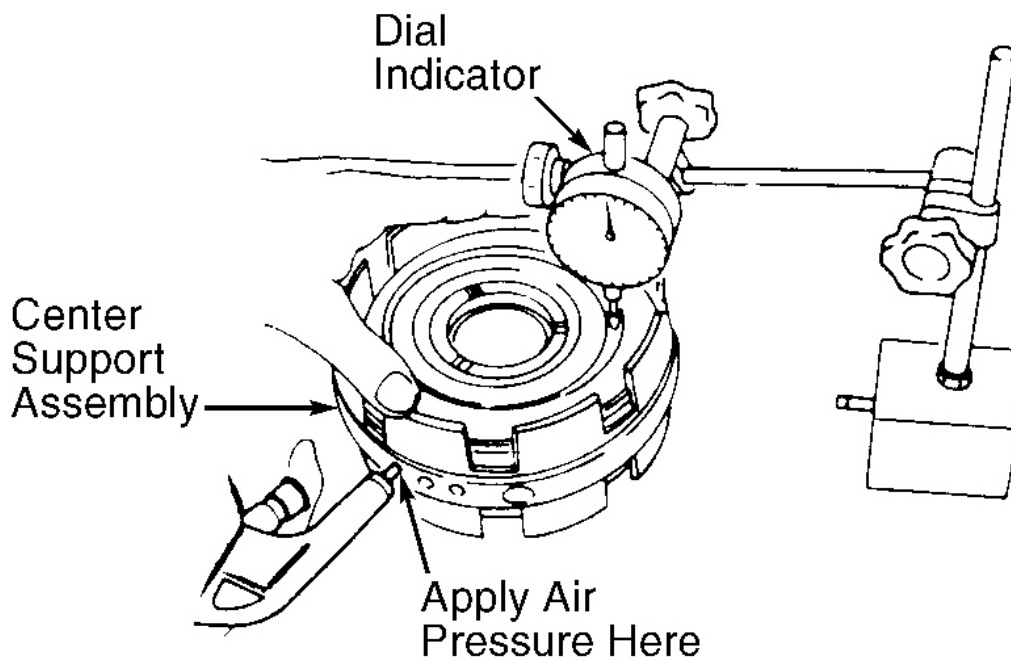
**CAUTION: Clutch backing plates on second coast brake must be installed in center support assembly so arrow on clutch backing plate is facing inward, toward center support assembly. Arrow is stamped on edge of tang on clutch backing plate.**

4. Install clutch discs, clutch backing plates and clutch plates for second coast brake in proper sequence in front of center support assembly. See **Fig. 30** . Ensure clutch backing plates are installed in center support assembly so arrow on clutch backing plate is facing inward, toward center support assembly. Arrow is stamped on edge of tang on clutch backing plate.
5. Install snap ring on front of center support assembly. Second coast brake clearance is determined by measuring second coast brake piston travel. Position dial indicator with stem resting against second coast brake piston. See **Fig. 32** .
6. Carefully apply 57-114 psi (4.0-8 kg/cm<sup>2</sup>) air pressure on oil passage on center support assembly and note second coast brake piston travel. Second coast brake piston travel should be .032-.068" (.80-1.73 mm).
7. If second coast brake piston travel exceeds specification, replace clutch discs and clutch plates. If second coast brake piston travel is less than specified, check for improperly assembled components. Remove dial indicator.
8. Install seal rings on center support assembly. Install second brake piston in center support assembly, using care not to damage "O" rings. Install return spring assembly.
9. Using spring compressor, compress return spring assembly on second brake piston. Install snap ring at center of center support assembly. Remove spring compressor. Ensure snap ring is properly seated in center support assembly.

10. Install clutch discs and clutch plates for second brake in sequence on rear of center support assembly. Install snap ring on rear of center support assembly.
11. Second brake clearance is determined by measuring second brake piston travel. Position dial indicator with stem resting against second brake piston. See **Fig. 32** .
12. Carefully apply 57-114 psi (4.0-8 kg/cm<sup>2</sup> ) air pressure to oil passage on center support assembly and note second brake piston travel. Second brake piston travel should be .040-.089" (1.01-2.25 mm).
13. If second brake piston travel exceeds specification, replace clutch discs and clutch plates. If second coast brake piston travel is less than specified, check for improperly assembled components. Remove dial indicator.
14. Install NEW seal rings on planetary sun gear. Install one-way clutch assembly in center support assembly. Ensure groove in hub on one-way clutch assembly aligns with tang on clutch discs.
15. Install planetary sun gear in center support assembly. Install snap ring on planetary sun gear.



SECOND COAST BRAKE



SECOND BRAKE

95I20444



**Fig. 32: Measuring Second Coast & Second Brake Clutch Clearance**  
 Courtesy of ISUZU MOTOR CO.

### CENTER SUPPORT BRAKE NO. 1 SPECIFICATIONS

Application	Dimension In. (mm)
Clutch Disc Thickness	.083 (2.10)
Piston Travel Distance	.033-.068 (.83-1.73)

### CENTER SUPPORT BRAKE NO. 2 SPECIFICATIONS

Application	In. (mm)
Clutch Disc Thickness	.083 (2.10)
Piston Travel Distance	.040-.089 (1.01-2.25)

### BRAKE NO. 3 SPECIFICATIONS

Application	In. (mm)
Return Spring Free Length	.619-.635 (15.70-16.12)

## FRONT PLANETARY GEAR & ONE-WAY CLUTCH ASSEMBLY

### Disassembly

1. Remove thrust washer from rear of front planetary gear. See **Fig. 33** . Remove inner race plate and snap ring from front planetary gear.
2. Note direction of one-way clutch assembly installation in front planetary gear for reassembly reference. Remove one-way clutch assembly and remaining thrust washer from front planetary gear.

### Cleaning & Inspection

Clean components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.

### Reassembly

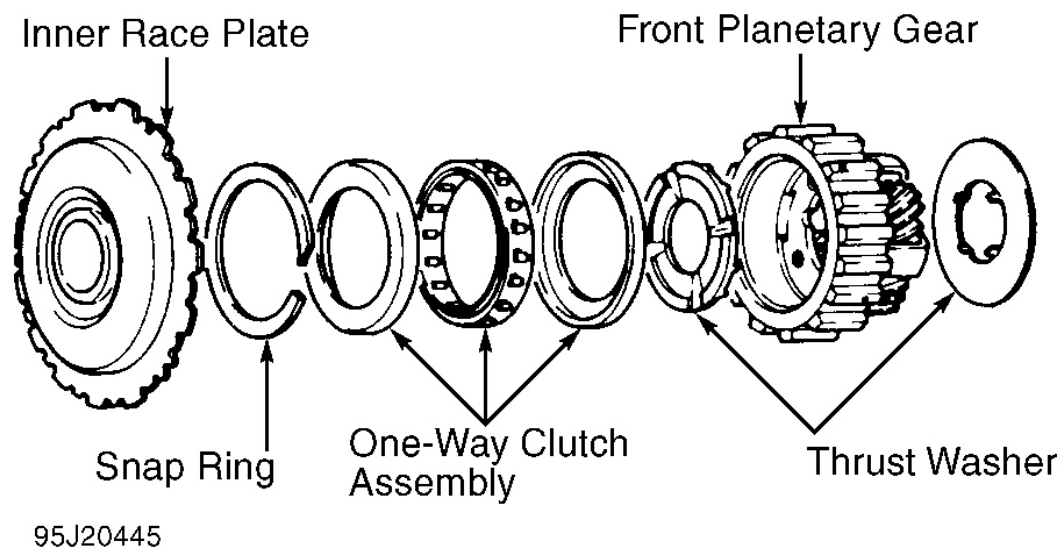
1. Lubricate all components with Dexron-IIIE ATF. Install thrust washer on front side of front planetary gear. Ensure tabs on thrust washer engage with grooves in front planetary gear.

**CAUTION: One-way clutch assembly must be installed in front planetary gear facing proper direction. See Fig. 34 . Arrow mark on one-way clutch assembly must point away from front planetary gear.**

2. Install one-way clutch assembly in front planetary gear. Ensure one-way clutch assembly is installed in proper direction with arrow mark on one-way clutch assembly pointing away from front planetary gear. See **Fig. 34** .
3. Install snap ring and inner race plate. To check one-way clutch assembly operation, hold inner race plate. Front planetary gear should rotate counterclockwise and lock clockwise.

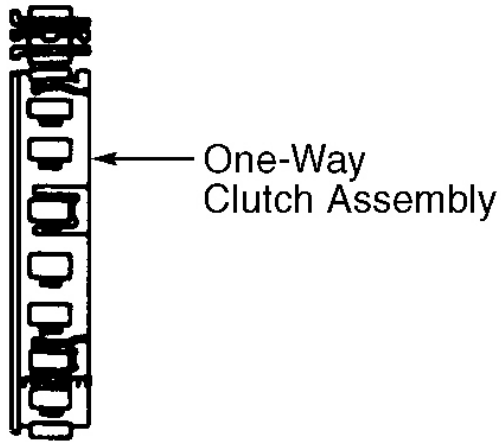
**CAUTION:** Ensure front planetary gear rotates counterclockwise and locks clockwise if one-way clutch assembly is properly installed.

4. Install thrust washer on rear of front planetary gear. Ensure tabs on thrust washer engage with grooves in front planetary gear.

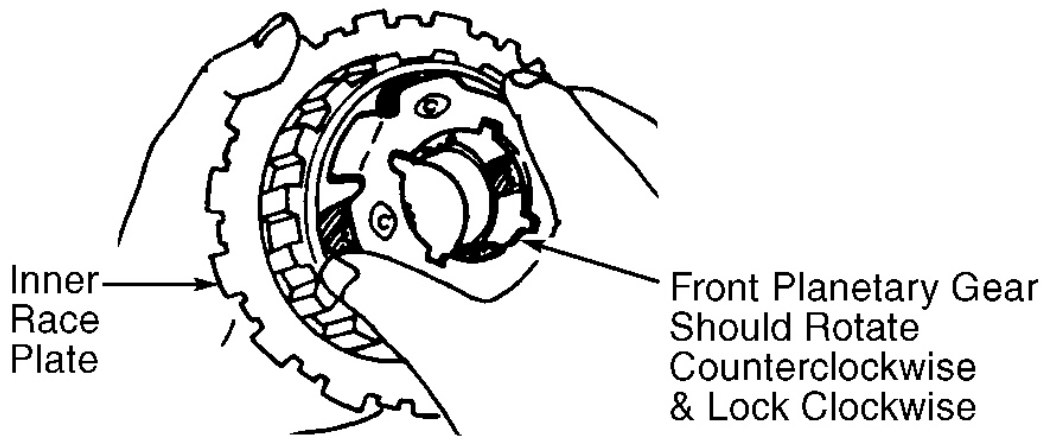


**Fig. 33: Exploded View Of Front Planetary Gear & One-Way Clutch Assembly**  
Courtesy of ISUZU MOTOR CO.

← AWAY FROM FRONT PLANETARY GEAR



INSTALLING ONE-WAY CLUTCH ASSEMBLY



CHECKING ONE-WAY CLUTCH ASSEMBLY OPERATION

95A20446

**Fig. 34: Installing One-Way Clutch Assembly & Checking One-Way Clutch Operation**  
Courtesy of ISUZU MOTOR CO.

## REAR PLANETARY GEAR & OUTPUT SHAFT

### Disassembly

1. Compress snap ring and remove front planetary ring gear from output shaft. See **Fig. 35** . Remove intermediate shaft assembly from output shaft. Remove thrust washer from front of rear planetary gear. Remove rear planetary gear.

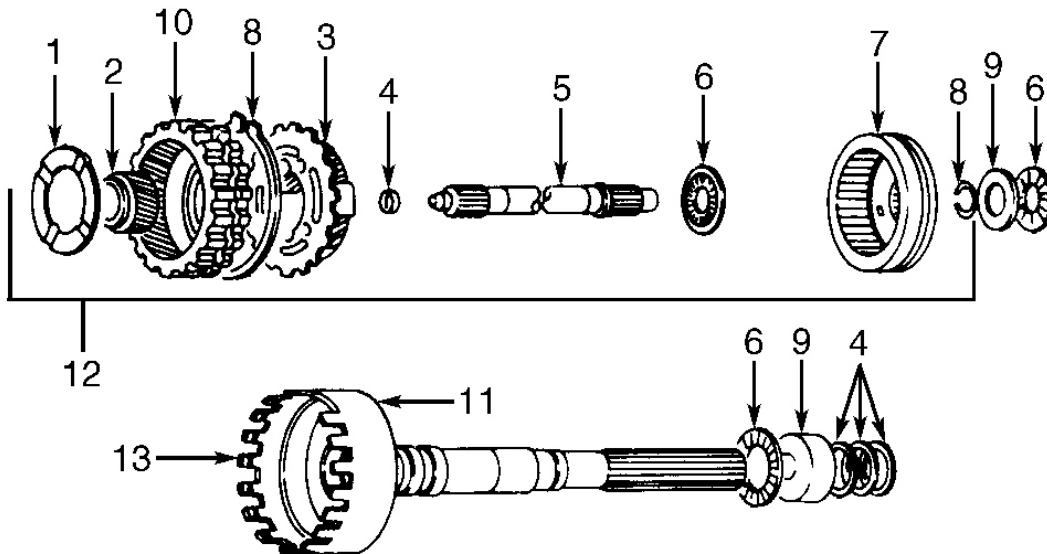
2. Remove planetary sun gear. Remove snap ring from end of intermediate shaft. Remove intermediate shaft from sub-ring gear. Remove thrust bearing from intermediate shaft. Remove remaining thrust bearing races, thrust bearings and seal rings.

**Cleaning & Inspection**

Clean components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required. Ensure oil passages in intermediate shaft and output shaft are not restricted.

**Reassembly**

1. Lubricate all components with Dexron-IIE ATF. Install NEW seal ring on intermediate shaft. Install thrust bearing on intermediate shaft with rollers on thrust bearing facing intermediate shaft. See **Fig. 35**.
2. Install sub-ring gear and snap ring on intermediate shaft. Install rear planetary gear on intermediate shaft. Install planetary sun gear on rear planetary gear. Ensure planetary sun gear is facing proper direction.
3. Install thrust washer on rear planetary gear. Ensure tab on thrust washer engages with groove on rear planetary gear. Install NEW seal rings on output shaft.
4. Install thrust bearing race and thrust bearing on end of intermediate shaft. Install intermediate shaft assembly on output shaft.
5. Install front planetary ring gear and snap ring on output shaft. Ensure ends of snap ring align with wide tab area on output shaft. See **Fig. 35**. Compress snap ring, and install front planetary ring gear on output shaft. Release snap ring. Ensure snap ring fully engages in output shaft.



- |                        |                                 |
|------------------------|---------------------------------|
| 1. Thrust Washer       | 8. Snap Ring                    |
| 2. Planetary Sun Gear  | 9. Thrust Bearing Race          |
| 3. Rear Planetary Gear | 10. Front Planetary Ring Gear   |
| 4. Seal Ring           | 11. Output Shaft                |
| 5. Intermediate Shaft  | 12. Intermediate Shaft Assembly |
| 6. Thrust Bearing      | 13. Tab Area                    |
| 7. Sub-Ring Gear       |                                 |

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**Fig. 35: Exploded View Of Rear Planetary Gear & Output Shaft**  
 Courtesy of ISUZU MOTOR CO.

## FIRST-REVERSE BRAKE PISTONS

### Disassembly

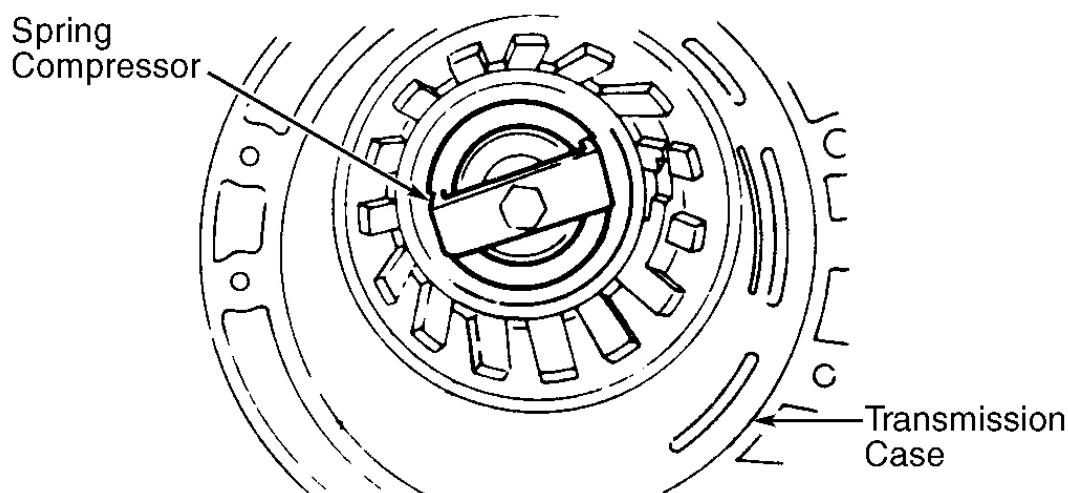
1. Using Spring Compressor (J-25048), compress return spring assembly in rear of transmission case. See **Fig. 36** . Remove snap ring from inside of transmission case.
2. Remove spring compressor. Remove return spring assembly. See **Fig. 37** .
3. Place finger over port "A" on transmission case. Apply air pressure to port "B" on transmission case to remove outer brake piston and reaction sleeve from transmission case.
4. Remove inner brake piston from transmission case. Remove all "O" rings from brake pistons and reaction sleeve.

### Cleaning & Inspection

1. Clean components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required.
2. Using caliper, measure free length of return springs on return spring assembly. Replace return spring if free length is not .618-.635" (15.70-16.12 mm).

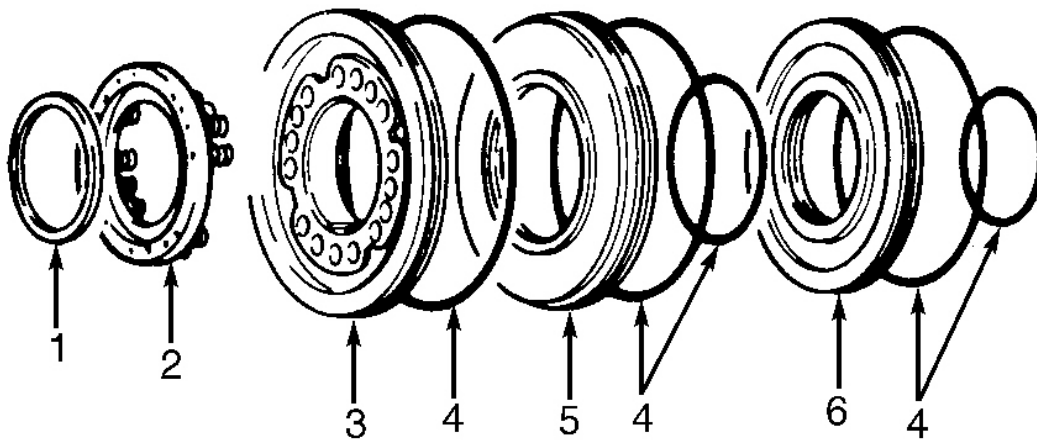
**Reassembly**

To reassemble, reverse disassembly procedure using NEW "O" rings. Lubricate all components with Dexron-II E ATF before reassembly. Use care when installing brake pistons and reaction sleeve as not to damage "O" rings. Ensure snap ring is fully seated in transmission case.



95C20448

**Fig. 36: Compressing Return Spring On First-Reverse Brake**  
Courtesy of ISUZU MOTOR CO.

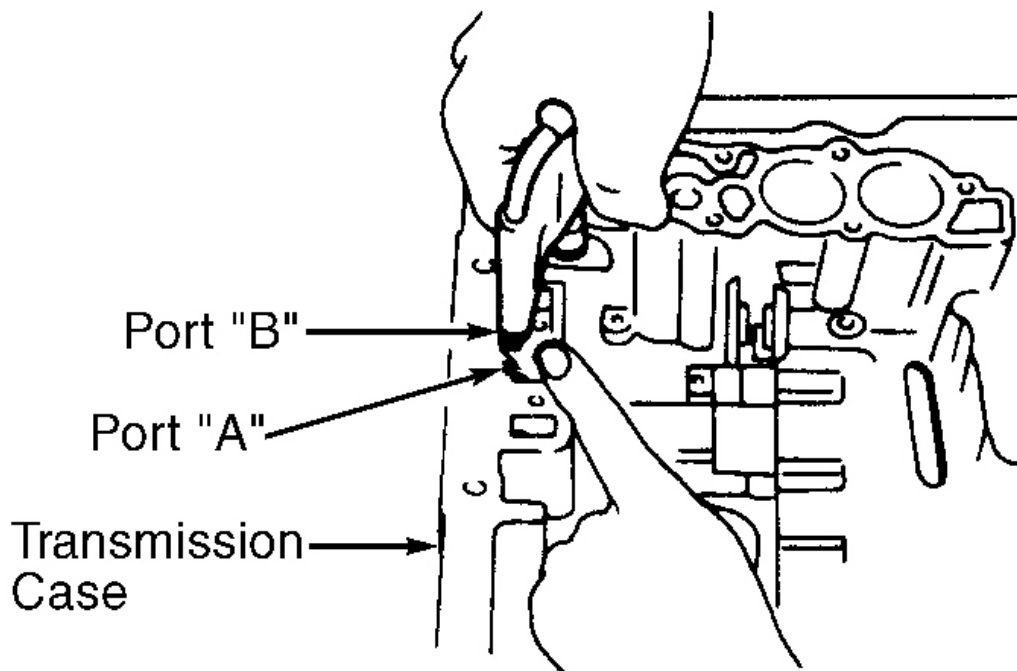


- 1. Snap Ring
- 2. Return Spring Assembly
- 3. Outer Brake Piston

- 4. "O" Ring
- 5. Reaction Sleeve
- 6. Inner Brake Piston

95D20449

**Fig. 37: Exploded View Of First-Reverse Brake Pistons**  
Courtesy of ISUZU MOTOR CO.



95H20450

**Fig. 38: Removing Outer Brake Piston & Reaction Sleeve For First-Reverse Brake Piston**  
Courtesy of ISUZU MOTOR CO.

## VALVE BODY ASSEMBLY

**NOTE:** Valve body assembly consists of front upper valve body, rear upper valve body and lower valve body assembly. See [Fig. 39](#) .

**CAUTION:** When disassembling valve bodies, place components in order and mark spring locations for reassembly reference. DO NOT use force to remove components from valve body.

### Disassembly

1. Remove manual valve from lower valve body assembly. See [Fig. 39](#) . Remove detent spring assembly and plate from lower valve body assembly.
2. Remove bolts, large cover and gasket from lower valve body assembly. Note location of rubber check balls in lower valve body assembly. See [Fig. 41](#) . Remove rubber check balls from lower valve body assembly.
3. Remove small cover and gasket from lower valve body assembly. Remove bolts and front upper valve



body assembly from lower valve body assembly. See **Fig. 39** .

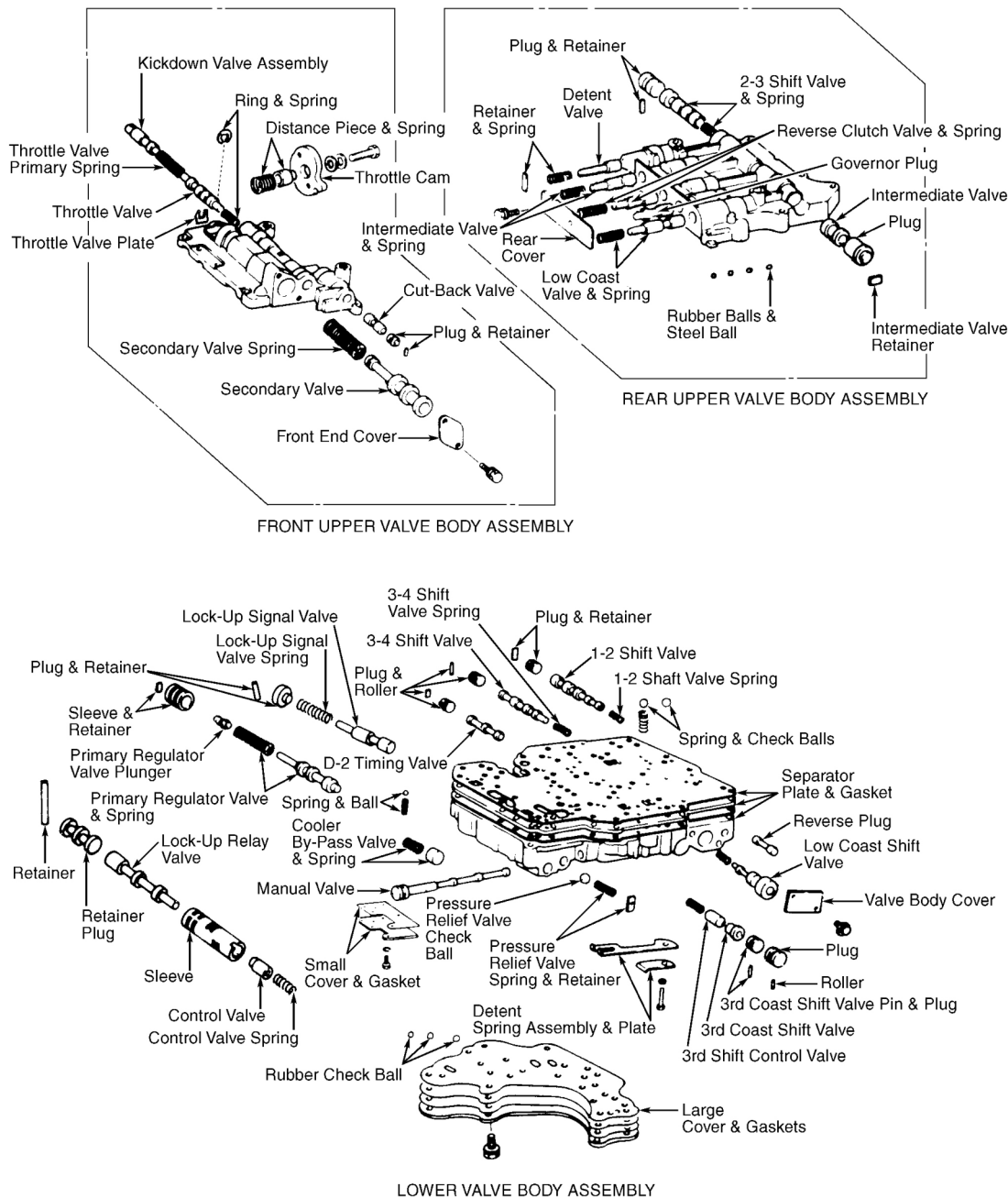
4. Remove bolts and rear upper valve body assembly from lower valve body assembly. Use care not to lose rubber and steel check balls from rear upper valve body assembly. See **Fig. 41** .
5. Remove separator plate and gaskets from lower valve body assembly. Note location of cooler by-pass valve, rubber check balls, plastic check ball and springs in lower valve body assembly. See **Fig. 40** .
6. Remove cooler by-pass valve, rubber check balls, plastic check ball and springs from lower valve body assembly. See **Fig. 40** . Remove components from lower valve body assembly. See **Fig. 39** . Use care when removing valve body cover, retainers and rollers, as components are under spring tension.
7. Remove components from front upper and rear upper valve body assemblies. See **Fig. 39** . Use care when removing covers and retainers, as components are under spring tension.

### **Cleaning & Inspection**

Clean components with solvent and dry with compressed air. Inspect components for damage or signs of wear. Replace components as required. Ensure valves slide freely in bores on valve body.

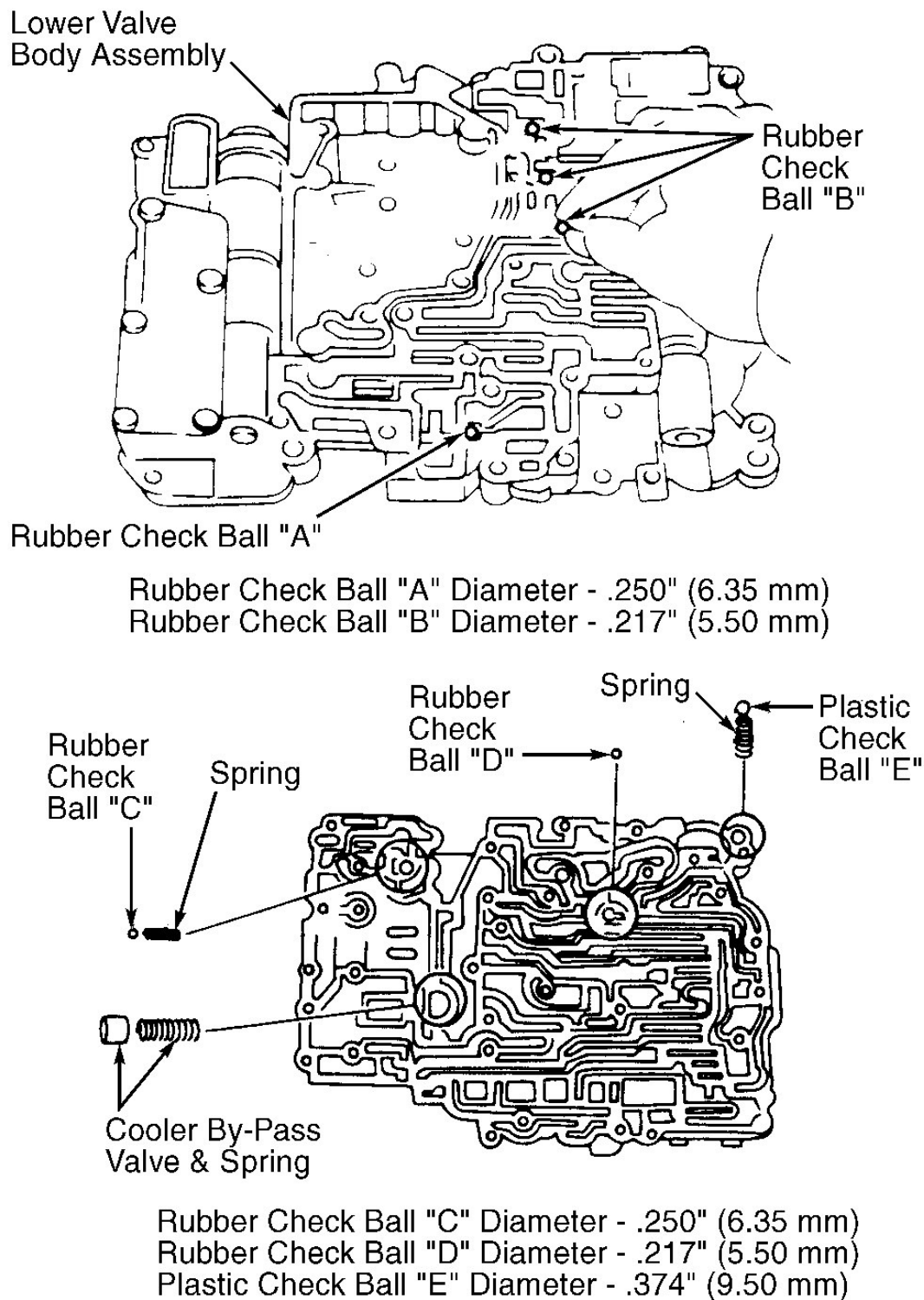
# 1990 Isuzu Pickup 1 Ton

## 1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul



95I20451

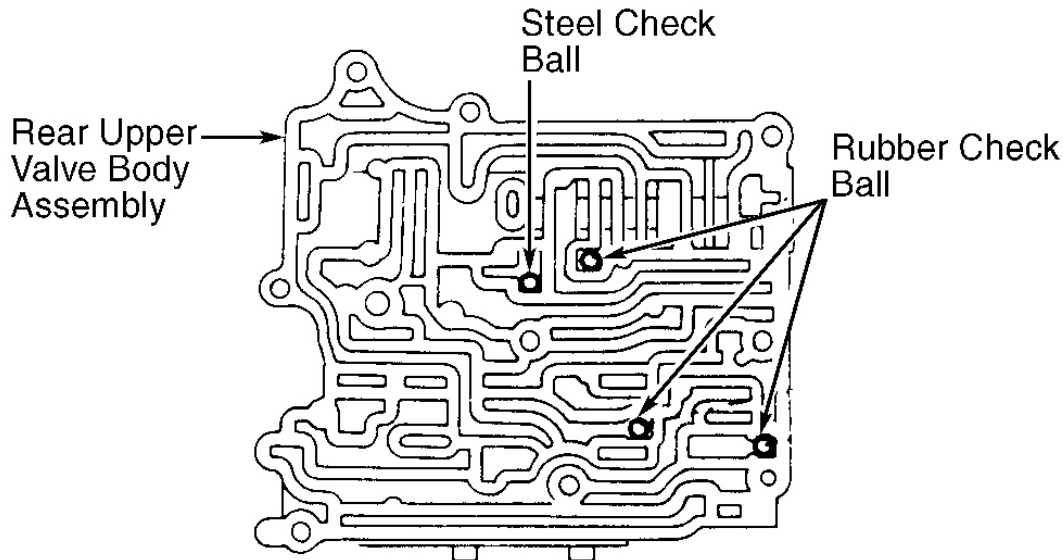
**Fig. 39: Exploded View Of Valve Body Assembly**  
Courtesy of ISUZU MOTOR CO.



95J20452

**Fig. 40: Check Ball Locations In Lower Valve Body Assembly**

Courtesy of ISUZU MOTOR CO.



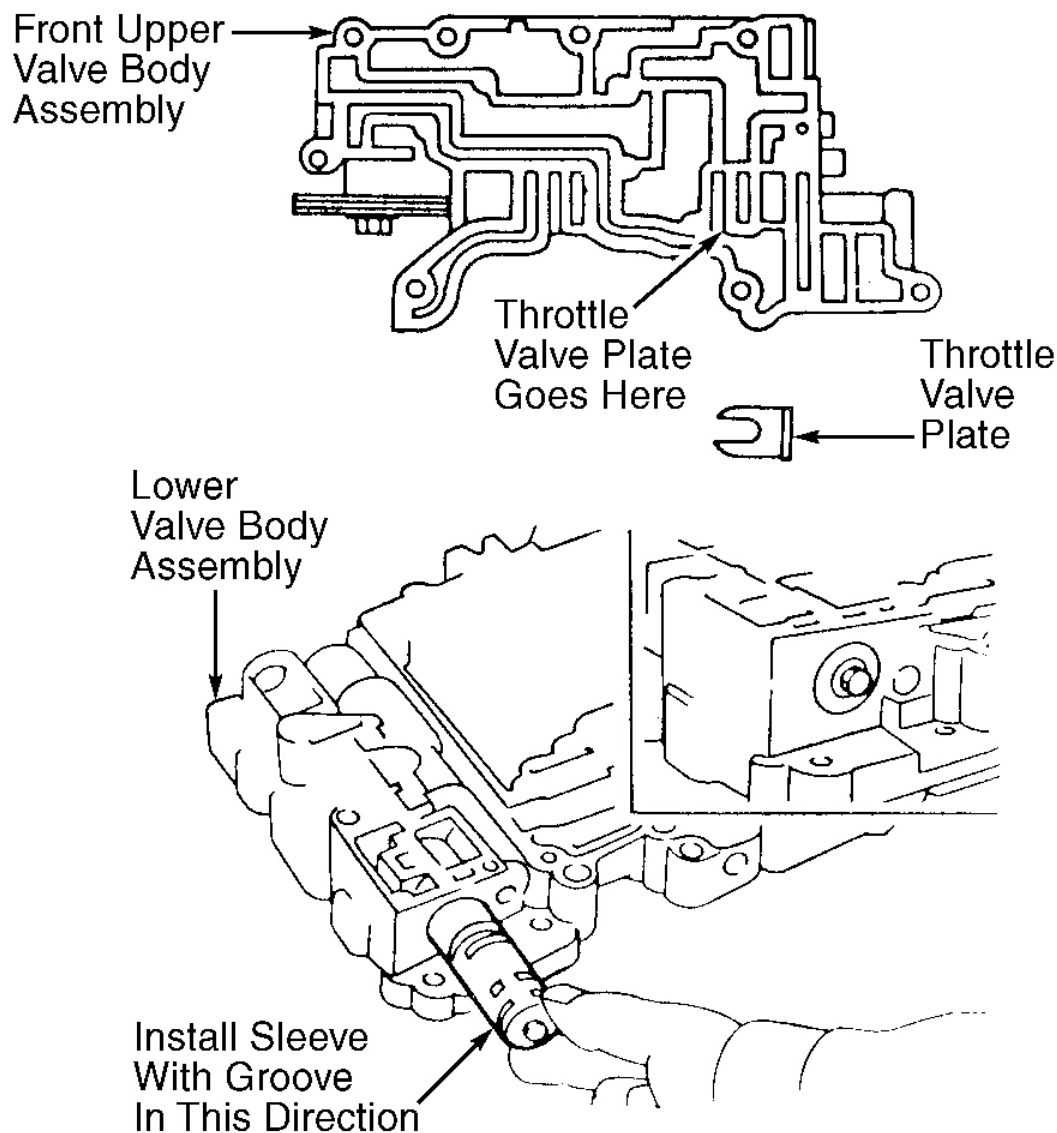
Steel Check Ball Diameter - .219" (5.55 mm)  
 Rubber Check Ball Diameter - .217" (5.50 mm)

95B20454

**Fig. 41: Check Ball Locations In Rear Upper Valve Body Assembly**  
 Courtesy of ISUZU MOTOR CO.

#### Reassembly

1. Lubricate all components with Dexron-IIIE ATF before reassembly. Install all components in rear upper valve body assembly. Ensure components are installed in correct location. See **Fig. 39** .
2. Install rear cover on rear upper valve body assembly. Install and tighten bolts to specification. See **TORQUE SPECIFICATIONS** . Install rubber and steel check balls in rear upper valve body assembly. See **Fig. 41** .
3. Install all components in front upper valve body assembly. Ensure components are installed in correct location. See **Fig. 39** .
4. Install front end cover on front upper valve body assembly. Install and tighten bolts to specification.
5. Install throttle cam with bolt finger tight. Hook end of spring into front upper valve body assembly. Tighten throttle cam bolt to specification. Ensure throttle cam operates smoothly.
6. Install throttle valve plate. Ensure throttle valve plate is installed in correct location. See **Fig. 42** .



95C20455

**Fig. 42: Installing Throttle Valve Plate & Sleeve In Lower Valve Body Assembly**  
Courtesy of ISUZU MOTOR CO.

7. Install all components in lower valve body assembly. Ensure components are installed in correct location. See **Fig. 39**.
8. Install valve body cover on lower valve body assembly. Install and tighten bolts to specification.
9. When installing sleeve with control valve in lower valve body assembly, install sleeve in lower valve body assembly with grooves in sleeve facing proper direction. See **Fig. 42**.
10. Install small cover and gasket on lower valve body assembly. Install and tighten bolts to specification.

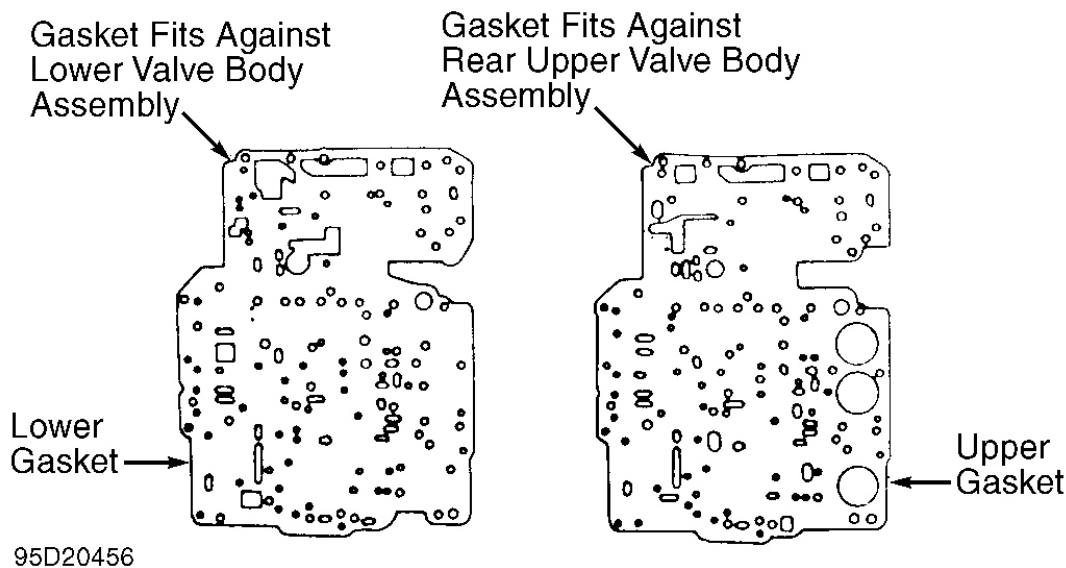
11. Install rubber check balls in lower valve body assembly. See **Fig. 40** . Install large cover and gaskets with bolts finger tight. Ensure gasket with long holes for check balls is against the lower valve body assembly.

**CAUTION:** When installing large cover and gaskets on lower valve body assembly, ensure gasket with long holes for the rubber check balls is against the lower valve body assembly.

12. Install cooler by-pass valve, rubber check balls, plastic check ball and springs in lower valve body assembly. See **Fig. 40** .

**CAUTION:** When installing gaskets on lower valve body assembly, ensure correct gasket is installed in correct location. See **Fig. 43** .

13. Install gasket, separator plate and gasket on lower valve body assembly. The upper gasket with 3 large diameter circular holes fits against the rear upper valve body assembly. The lower gasket without the 3 large diameter circular holes goes on the lower valve body assembly. See **Fig. 43** .



**Fig. 43: Gaskets For Location On Lower Valve Body Assembly**  
Courtesy of ISUZU MOTOR CO.

14. Install rear upper valve body assembly on lower valve body assembly. Use care not to lose rubber and steel check balls from rear upper valve body assembly. Install bolts finger tight to hold rear upper valve body assembly in place.

**NOTE:** Ensure all bolts are installed in valve body assembly before tightening to specification.

15. Install front upper valve body assembly on lower valve body assembly. Install all bolts in valve body assembly. Once all bolts are installed on valve body assembly, tighten valve body assembly bolts to specification.
16. Install manual valve in lower valve body assembly. Install detent spring assembly and plate. Install and tighten detent spring assembly bolt to specification.

## TRANSMISSION REASSEMBLY

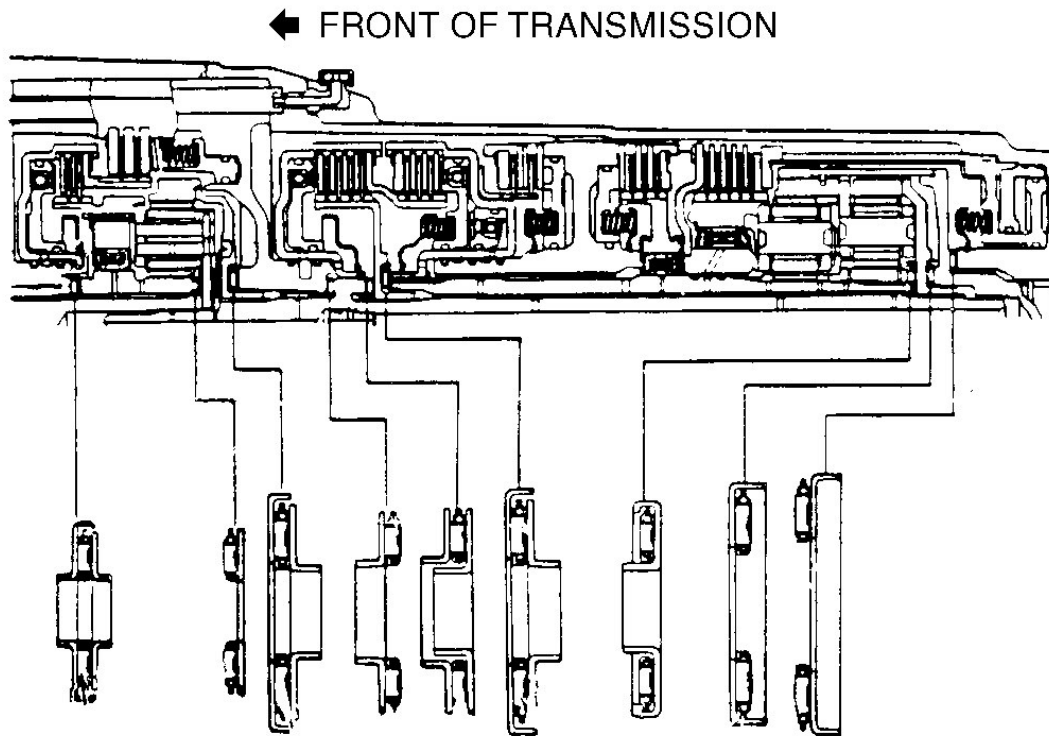
### VALVE BODY ASSEMBLY & INTERNAL COMPONENTS

**NOTE:** Lubricate all components with Dexron-IIe ATF before reassembly. Clutch and brake discs should be soaked in Dexron-IIe ATF for at least 2 hours before reassembly. Coat all thrust bearings, thrust bearing races and thrust washers with petroleum jelly before installing.

1. Install thrust bearing race and thrust bearing for output shaft in rear of transmission case. Flat side of thrust bearing race must face upward, toward front of transmission. See **Fig. 44**.
2. Install brake apply tube in transmission case. Ensure cutout area on brake apply tube aligns with correct area on transmission case. See **Fig. 45**. Ensure brake apply tube fully engages with brake piston for first-reverse brake.
3. Install planetary gear with output shaft in transmission case. Install pressure plate so pressure plate engages with brake apply tube. Perform STEP 1. See **Fig. 46**.

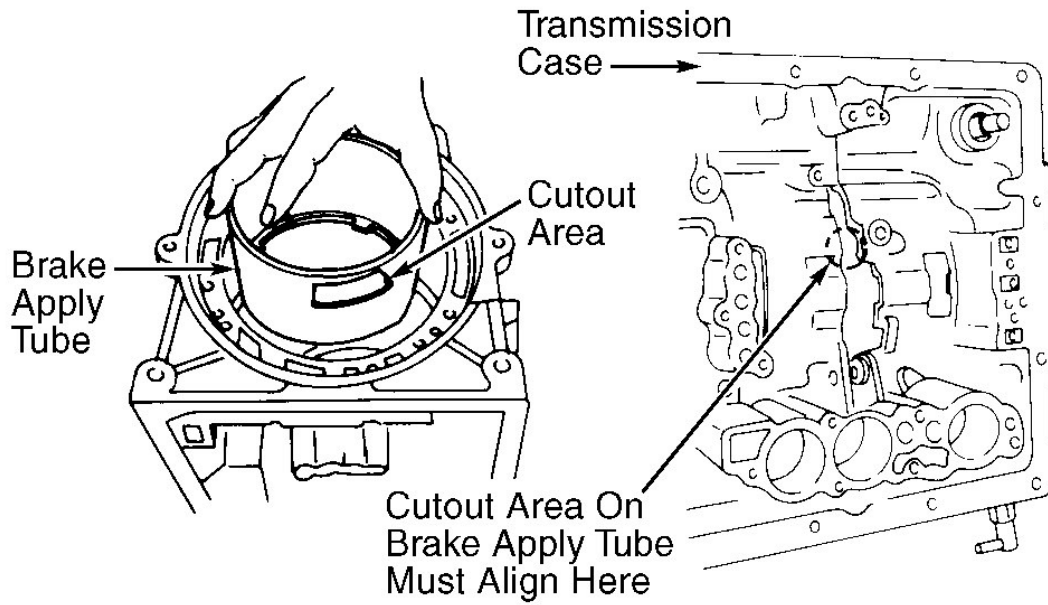
**NOTE:** Ensure brake discs are soaked in Dexron-IIe ATF for at least 2 hours before installing.

4. Install front planetary gear and one-way clutch assembly. Perform STEP 2. See **Fig. 46**. Install brake discs and brake plates for first-reverse brake in correct sequence starting with brake disc and alternating with brake plate. Perform STEP 3. See **Fig. 46**.
5. Using caliper, measure first-reverse brake clearance by measuring distance from protrusion on transmission case to the brake plate. Perform STEP 4. See **Fig. 46**. First-reverse brake clearance should be .029-.098" (.75-2.50 mm).
6. If first-reverse brake clearance exceeds specification, replace brake plates and brake discs. If first-reverse brake clearance is less than specified, check for improperly assembled components.
7. Install inner race plate in transmission case. Ensure cutout area on inner race plate aligns with specified area on transmission case. See **Fig. 47**. Inner race plate is correctly installed when snap ring groove above the plate is fully visible. Install snap ring in transmission case.



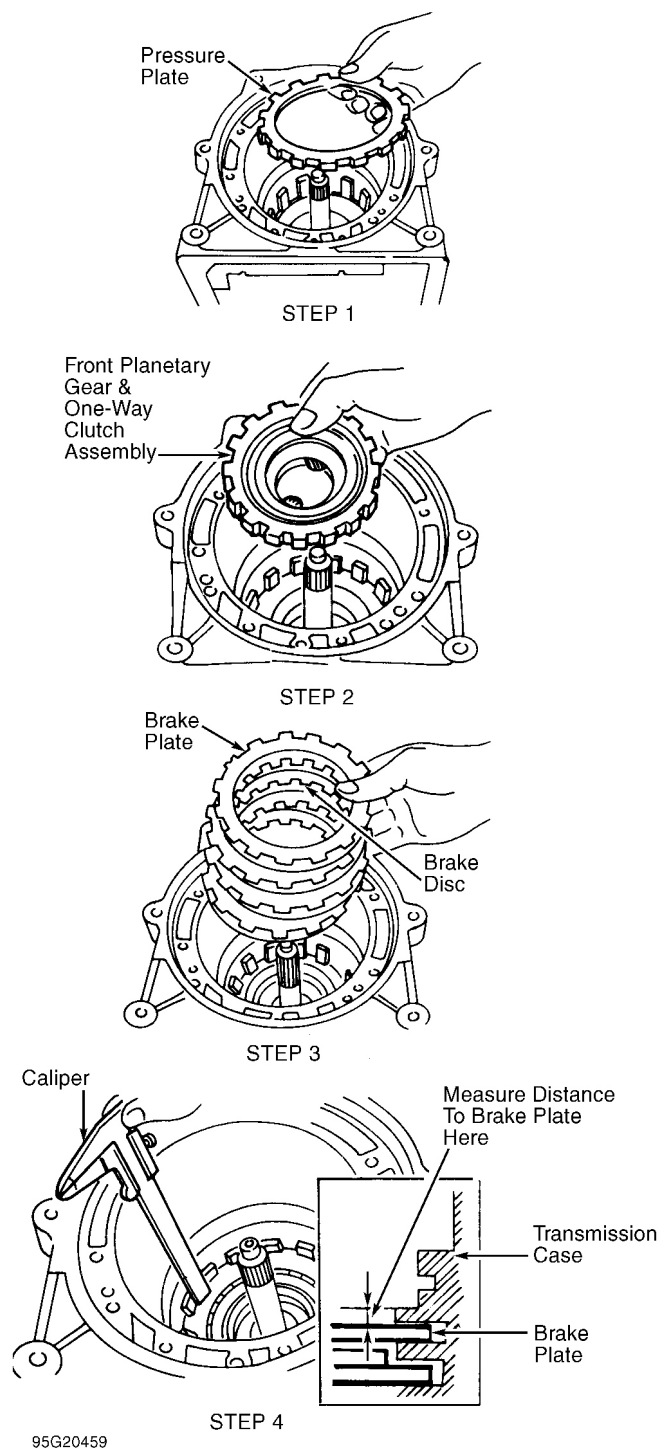
**Fig. 44: Positioning Thrust Bearings & Thrust Bearing Races**  
Courtesy of ISUZU MOTOR CO.



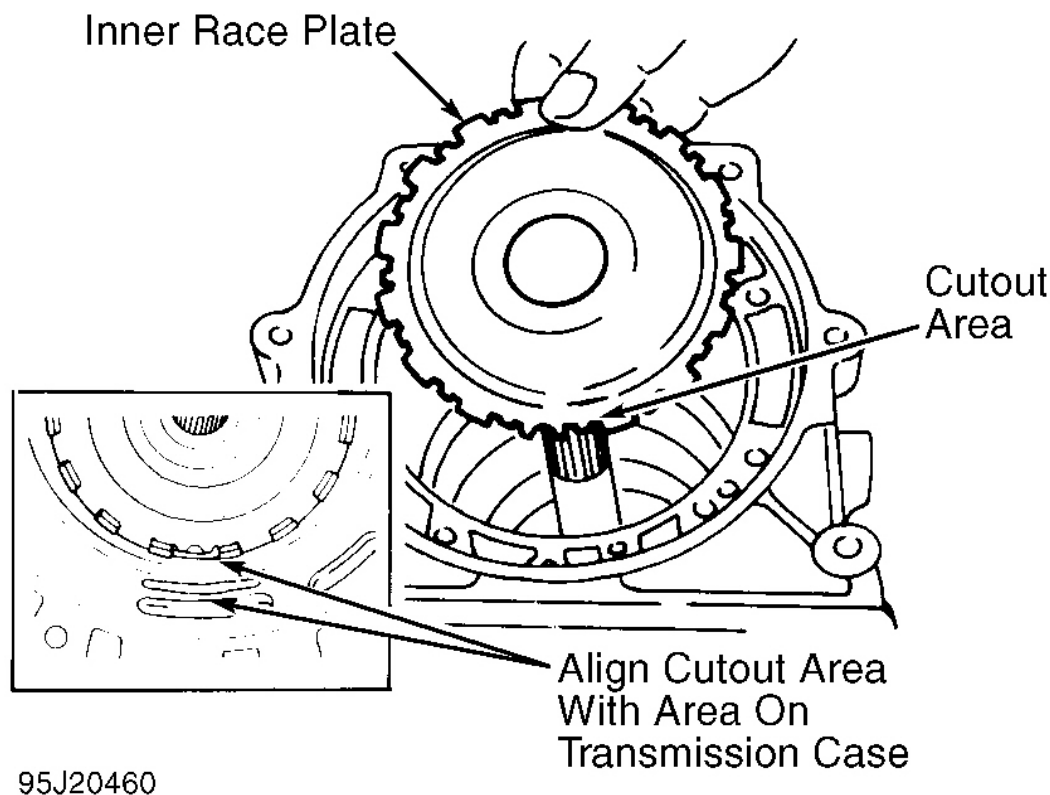


95F20458

**Fig. 45: Installing Brake Apply Tube**  
Courtesy of ISUZU MOTOR CO.

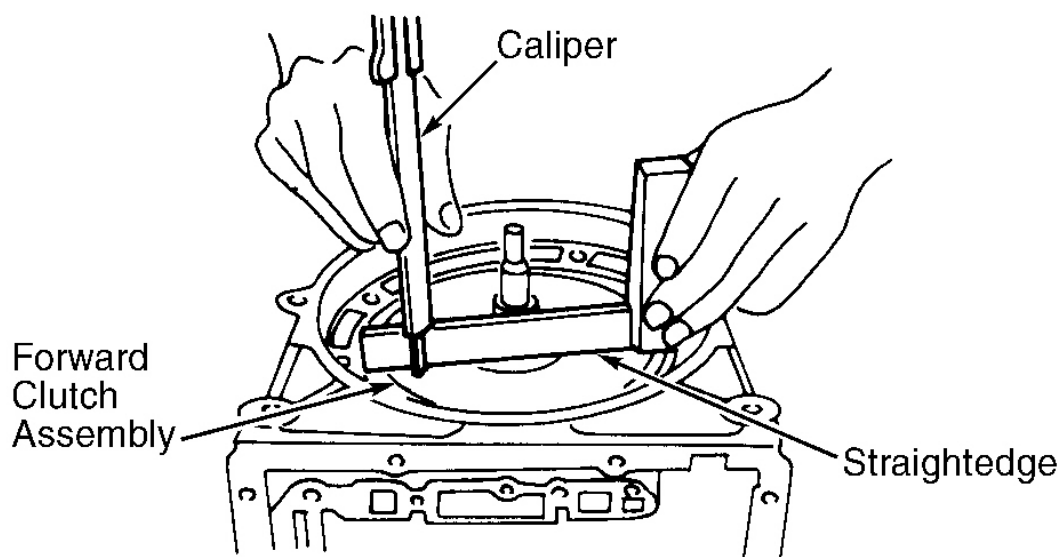


**Fig. 46: Installing Pressure Plate, Front Planetary Gear, First-Reverse Brake Components & Measuring First-Reverse Brake Clearance**  
 Courtesy of ISUZU MOTOR CO.



**Fig. 47: Installing Inner Race Plate**  
 Courtesy of ISUZU MOTOR CO.

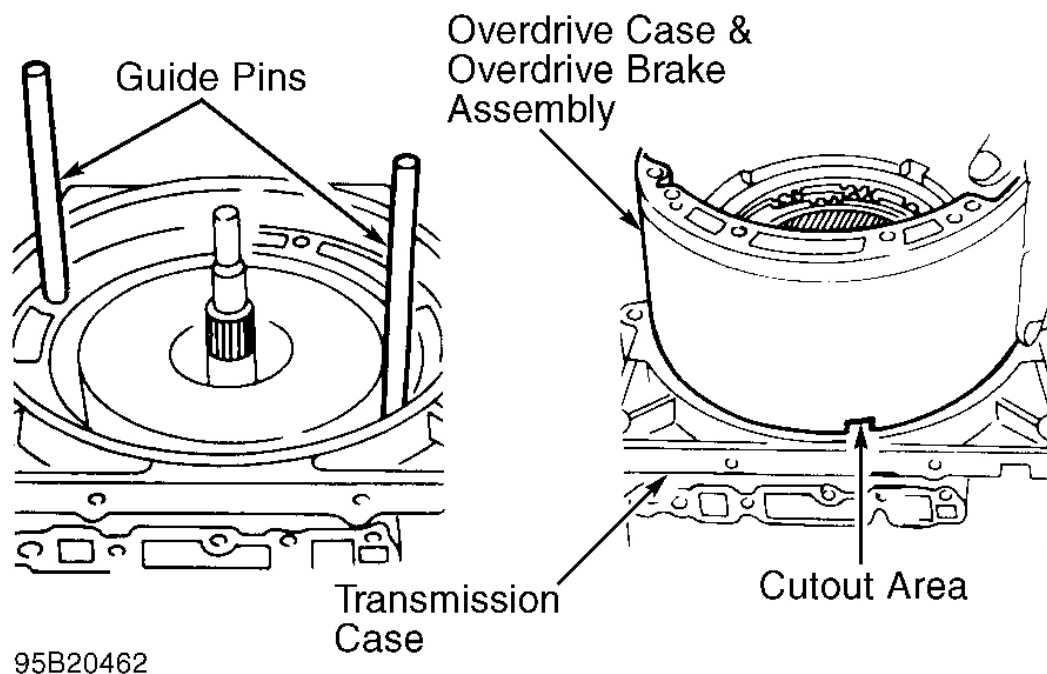
8. Install center support assembly in transmission case. To check operation of one-way clutch assembly on center support assembly, hold center support assembly stationary. Rotate planetary sun gear on center support assembly. Planetary sun gear should rotate freely counterclockwise and lock when rotated clockwise when viewed from oil pump end of transmission case.
9. Ensure oil passage in center support assembly is aligned with oil passage in transmission case. Install and tighten center support assembly bolts to specification.
10. Install direct clutch assembly. When direct clutch assembly is fully seated, splines on end of planetary sun gear should be even with top clutch disc on direct clutch assembly.
11. Install thrust bearing races and thrust bearing on front of direct clutch assembly. Ensure thrust bearing races and thrust bearing are installed in proper direction. See **Fig. 44**.
12. Install forward clutch assembly. To ensure forward clutch assembly is fully seated, using straightedge and caliper, measure forward clutch assembly depth from bottom of straightedge to surface on forward clutch assembly. See **Fig. 48**.
13. Forward clutch assembly installation depth should be approximately .118" (3.00 mm). If forward clutch assembly installation depth is not as specified, check for improperly seated components.



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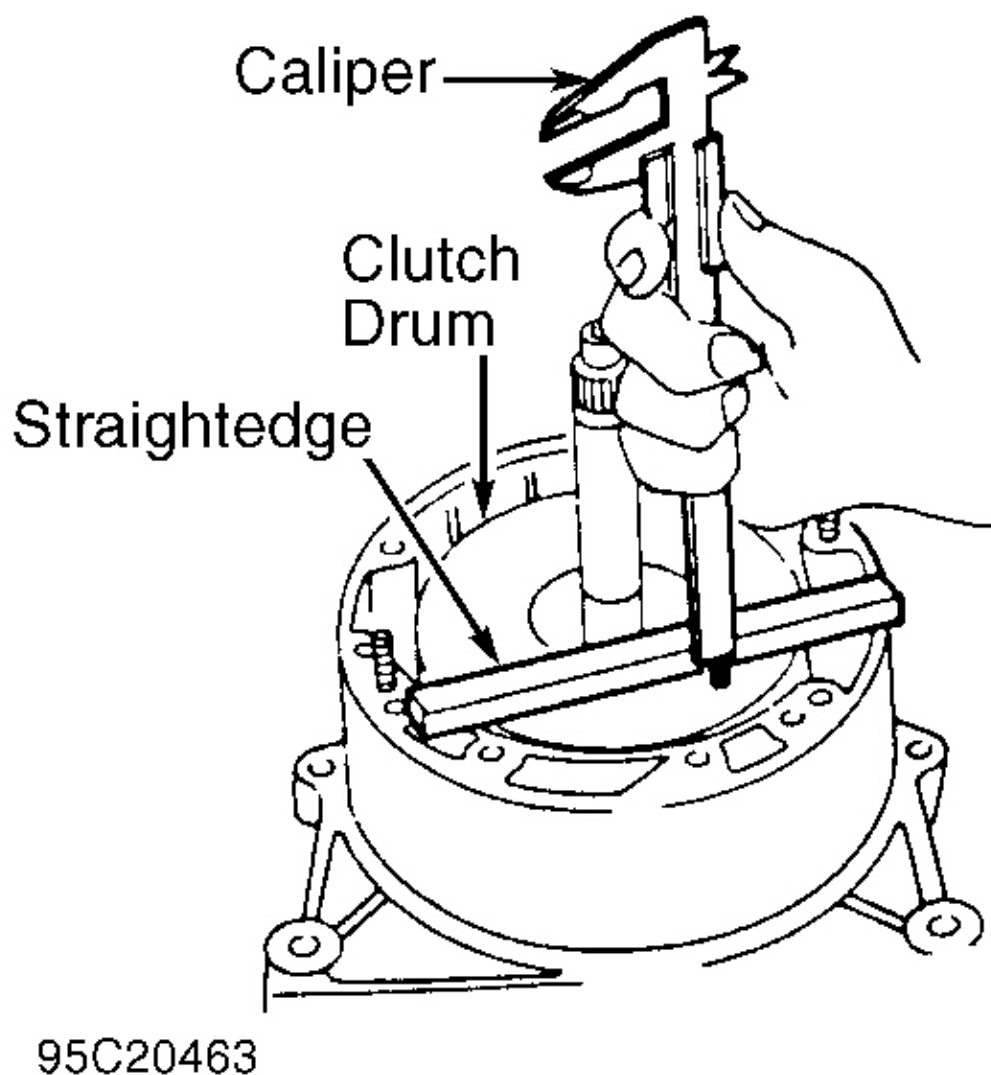
**Fig. 48: Measuring Forward Clutch Installation Depth**  
Courtesy of ISUZU MOTOR CO.

14. Install thrust bearing on front of forward clutch assembly. Install thrust bearing race on rear of overdrive case and overdrive brake assembly. Flat side of thrust bearing race must be away from rear of overdrive case. See [Fig. 44](#) .
15. Install guide pins in transmission case to aid in installation of overdrive case and overdrive brake assembly. See [Fig. 49](#) . Install overdrive case and overdrive brake assembly with cutout area toward transmission case. See [Fig. 49](#) .



**Fig. 49: Installing Overdrive Case & Overdrive Brake Assembly**  
 Courtesy of ISUZU MOTOR CO.

16. Install thrust washer on front side of planetary ring gear. See **Fig. 22** . Ensure tabs on thrust washer engage with grooves on planetary ring gear.
17. Install thrust washer on rear side of overdrive planetary gear. See **Fig. 17** . Ensure tabs on thrust washer engage with grooves in overdrive planetary gear.
18. Install input shaft and overdrive clutch assembly. To ensure input shaft and overdrive clutch assembly is fully seated, using straightedge and caliper, measure input shaft depth from bottom of straightedge to surface on clutch drum. See **Fig. 50** .
19. Input shaft depth at clutch drum should be approximately .079" (2.00 mm). If input shaft depth is not as specified, check for improperly seated components.



**Fig. 50: Measuring Input Shaft Depth**  
Courtesy of ISUZU MOTOR CO.

20. Using NEW "O" ring, install torque converter housing. Install and tighten bolts to specification.
21. Install thrust bearing race and thrust bearing on front of input shaft and overdrive clutch assembly. Flat side of thrust bearing race must face upward, toward front of transmission. See **Fig. 44** .
22. Install thrust bearing race on rear of oil pump assembly. Flat side of thrust bearing race must face toward thrust bearing on input shaft and overdrive clutch assembly. See **Fig. 44** .
23. Install NEW "O" ring on outside diameter of oil pump body. Install oil pump assembly. Remove guide

- pins. Install and tighten oil pump assembly bolts to specification. Ensure input shaft rotates smoothly.
24. Install manual shaft with parking rod in transmission case. Install pin in manual shaft. Stake pin in place.
  25. Install parking pawl, parking pawl spring, pivot pin and parking pawl bracket. See **Fig. 11** . Install and tighten parking pawl bracket bolts to specification.
  26. Install throttle control cable in transmission case. Use care not to damage "O" ring on throttle control cable.
  27. Using NEW seal rings, install springs and accumulator pistons in transmission case. Ensure proper components are installed in proper location. See **ACCUMULATOR PISTON & SPRING IDENTIFICATION** table. Also, see **Fig. 12** .

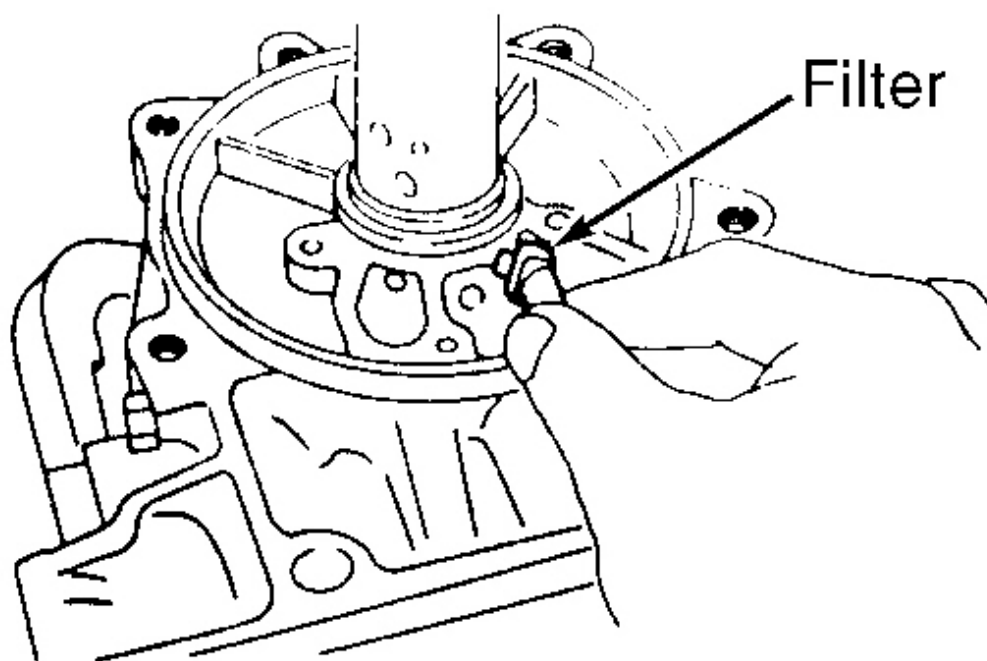
**ACCUMULATOR PISTON & SPRING IDENTIFICATION**

<b>Application</b>	<b>In. (mm)</b>
<b>Accumulator Piston Diameter</b>	
Forward Clutch & Direct Clutch	1.252-1.254 (31.80-31.85)
Second Brake	1.370-1.372 (34.80-34.85)
<b>Spring Free Length</b>	
Direct Clutch	2.172 (55.18)
Forward Clutch	2.546 (64.68)
Second Brake	2.625 (66.68)

28. Install throttle cable on throttle cam. Align manual valve on valve body assembly with detent lever in transmission case. Install valve body assembly on transmission case.
29. Install proper length valve body assembly-to-transmission case bolts in specified area. See **Fig. 8** . Tighten valve body assembly-to-transmission case bolts to specification.
30. Install NEW and oil strainer. Install and tighten oil strainer bolts to specification. Install oil pipes. Install magnets in oil pan. Ensure magnets are positioned so they do not interfere with the oil pipes.
31. Using NEW gasket, install oil pan. Install and tighten oil pan bolts to specification. Install and tighten drain plug to specification.
32. Using NEW "O" ring, install overdrive solenoid on transmission case. Install and tighten bolts to specification. Install filter in transmission case, near output shaft. See **Fig. 51** .
33. Install governor assembly on output shaft. Using screwdriver, raise governor retaining ring located at governor assembly. Align governor assembly with hole on output shaft. Release governor retaining ring. Install and tighten governor assembly bolts. Bend over tabs on bolt lock on governor assembly bolts.
34. Install speedometer drive gear and snap rings on output shaft. Using NEW gasket, install rear cover assembly. Install and tighten bolts to specifications.
35. Rotate manual shaft on transmission fully rearward toward rear of transmission. Rotate manual shaft back forward 2 notches to the Neutral position. Install neutral start switch on manual shaft. Install neutral start

switch retaining bolt, but DO NOT tighten at this time.

36. Install gasket, lock plate and retaining nut on neutral start switch. See **Fig. 2** . Tighten retaining nut to specification.
37. Align neutral line on neutral start switch with groove in selector shaft. See **Fig. 2** . Hold neutral start switch in position and tighten retaining bolt to specification. See **TORQUE SPECIFICATIONS** . Bend over tabs on lock plate.
38. Install torque converter. To ensure torque converter is fully seated, place straightedge across front of torque converter housing. Measure distance from surface on torque converter housing to surface on torque converter bolt mounting lug. Distance should be 1.220" (31.00 mm). If distance is not as specified, check for improperly seated torque converter.



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**Fig. 51: Installing Filter**

Courtesy of ISUZU MOTOR CO.

## TORQUE SPECIFICATIONS

### TORQUE SPECIFICATIONS



**1990 Isuzu Pickup 1 Ton**

1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul

<b>Application</b>	<b>Ft. Lbs. (N.m)</b>
Center Support Assembly Bolt	19 (26)
Drain Plug	15 (20)
Oil Pump Assembly Bolt	16 (22)
Rear Cover Assembly Bolt	25 (34)
Torque Converter Housing Bolt	
10-mm Bolt	25 (34)
12-mm Bolt	42 (57)
<b>INCH Lbs. (N.m)</b>	
Detent Spring Assembly Bolt	48 (5.4)
Front End Cover Bolt	48 (5.4)
Neutral Start Switch Retaining Bolt	108 (12.2)
Neutral Start Switch Retaining Nut	35 (4.0)
Oil Pan Bolt	40 (4.5)
Oil Strainer Bolt	48 (5.4)
Overdrive Solenoid Bolt	113 (12.8)
Parking Pawl Bracket Bolt	66 (7.5)
Reaction Shaft Support-To-Oil Pump Body Bolt	65 (7.3)
Rear Cover Bolt	48 (5.4)
Small Cover Bolt	48 (5.4)
Throttle Cam Bolt	66 (7.5)
Valve Body Assembly Bolt	48 (5.4)
Valve Body Assembly-To-Transmission Case Bolt	86 (9.7)
Valve Body Cover Bolt	48 (5.4)

**TRANSMISSION SPECIFICATIONS****TRANSMISSION SPECIFICATIONS**

<b>Application</b>	<b>Specification</b>
<b>Clutch &amp; Brake Clearances</b>	
Direct Clutch Clearance	.032-.068 (.80-1.73)
First-Reverse Brake Clearance	.029-.098 (.75-2.50)
Forward Clutch Clearance	.056-.115 (1.43-2.93)
Overdrive Brake Clearance	.026-.087 (.65-2.21)
Overdrive Clutch Clearance	.077-.115 (1.96-2.93)
Second Brake Clearance	.040-.089 (1.01-2.25)
Second Coast Brake Clearance	.032-.068 (.80-1.73)
<b>Oil Pump Assembly Clearances</b>	
Bushings Inside Diameter	1.5035 (38.188)
Gear Tip Clearance	
Standard	.0043-.0055 (.110-

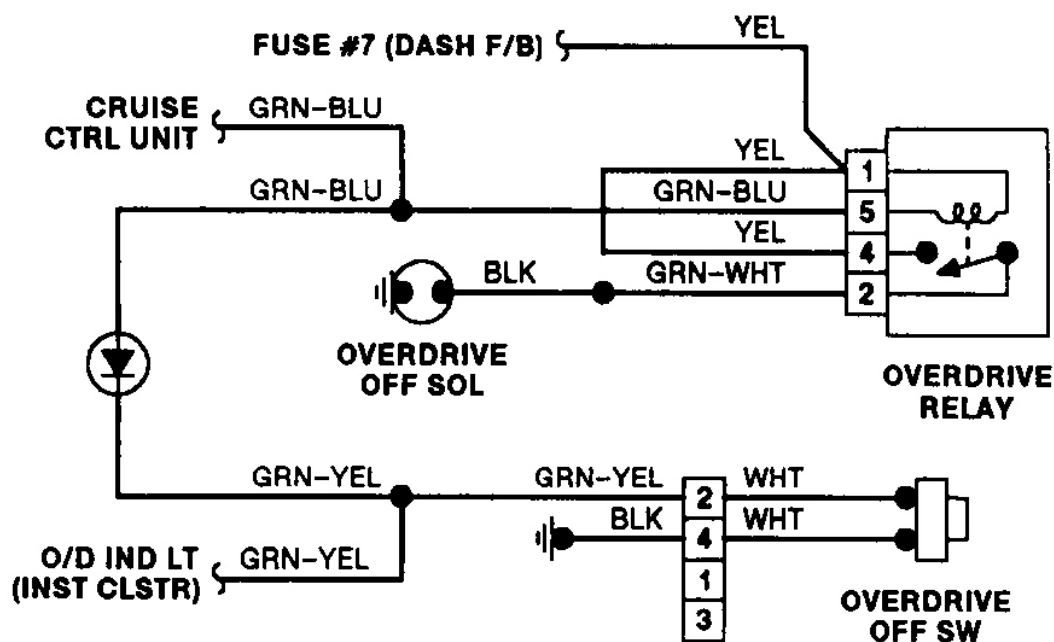
# 1990 Isuzu Pickup 1 Ton

1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul

	.140)
Wear Limit	.0120 (.300)
Pump Driven Gear-To-Oil Pump Body Clearance	
Standard	.0028-.0059 (.070-.150)
Wear Limit	.0120 (.300)
Pump Gear Side Clearance	
Standard	.0008-.0020 (.020-.050)
Wear Limit	.0039 (.100)

## WIRING DIAGRAMS

**NOTE:** Overdrive relay is located in fuse/relay box at passenger's side of engine compartment, near the battery.



ISUZU MODELS

93F22900

**Fig. 52: Transmission Schematic (1990-92 Amigo & Pickup)**

## 1990 Isuzu Pickup 1 Ton

1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul



**Fig. 53: Transmission Schematic (1993-94 Amigo & Pickup)**

## 1988-94 AUTOMATIC TRANSMISSIONS Isuzu AW03-72L Overhaul



**Courtesy of ISUZU MOTOR CO.**