

# ISUZU 3080-LE

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*CAUTION: ATSG service manuals are intended for use by professional, qualified technicians. Attempting repairs or service without the proper training, tools and equipment could cause injury to you or others and damage to the vehicle that may cause it not to operate properly.*

January, 2000

# SERVICE INFORMATION

## GENERAL TROUBLESHOOTING

Problem	Possible cause	Remedy
No. lock-up in 2nd, 3rd or OD	Electronic control faulty Valve body faulty Solenoid valve faulty Transmission faulty	Inspect electronic control Inspect valve body Inspect valve body Disassemble and inspect transmission
Harsh down-shift	Throttle cable out of adjustment Throttle cable and cam faulty Accumulator pistons faulty Valve body faulty Transmission faulty	Adjust throttle cable Inspect throttle cable and cam Inspect accumulator pistons Inspect valve body Disassemble and inspect transmission
No down-shift when coasting	Valve body faulty Solenoid valve faulty Electronic control faulty	Inspect valve body Inspect solenoid valve Inspect electronic control
Down-shift occurs too quickly or too late while coasting	Throttle cable out of adjustment Throttle cable faulty Valve body faulty Transmission faulty Solenoid valve faulty Electronic control faulty	Adjust throttle cable Inspect throttle cable Inspect valve body Disassemble and inspect transmission Inspect solenoid valve Inspect electronic control
No OD-3, 3-2 or 2-1 kickdown	Solenoid valve faulty Electronic control faulty Valve body faulty Throttle cable out of adjustment	Inspect solenoid valve Inspect electronic control Inspect valve body Adjust throttle cable
No engine braking in "2" or "L" range	Solenoid valve faulty Electronic control faulty Valve body faulty Transmission faulty	Inspect solenoid valve Inspect electronic control Inspect valve body Disassemble and inspect transmission
Vehicle does not hold in "P"	Manual linkage out of adjustment Parking lock pawl cam and spring faulty	Adjust linkage Inspect cam and spring
No 2H-4H, 4H-4L, 4L-4H or 4H-2H change gear position of transfer	Transfer linkage out of adjustment Electronic control faulty Transfer valve body faulty Transfer faulty	Adjust linkage Inspect electronic control Inspect valve body Disassemble and inspect transfer

## TIME LAG TEST

If the shift lever is shifted while the engine is idling, there will be a certain time elapse or lag before the shock can be felt. This is used for checking the condition of the OD clutch, front clutch, rear clutch and No. 3 brake.

- Note:** (1) Perform the test at normal operation fluid temperature (50 — 80°C or 122 — 176°F).  
 (2) Be sure to allow a one minute interval between tests.  
 (3) Make three measurements and take the average value.

### MEASURE LAG TIME

- 1) Fully apply the parking brake.
- 2) Shift the transfer shift lever to the "2H" position.
- 3) Start the engine.

Check idling speed (A/C OFF)

"N" range	850 — 950 rpm
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- 4) Shift the shift lever from "N" to "D" range. Using a stop watch, measure the time it takes from shifting the lever until the shock is felt.

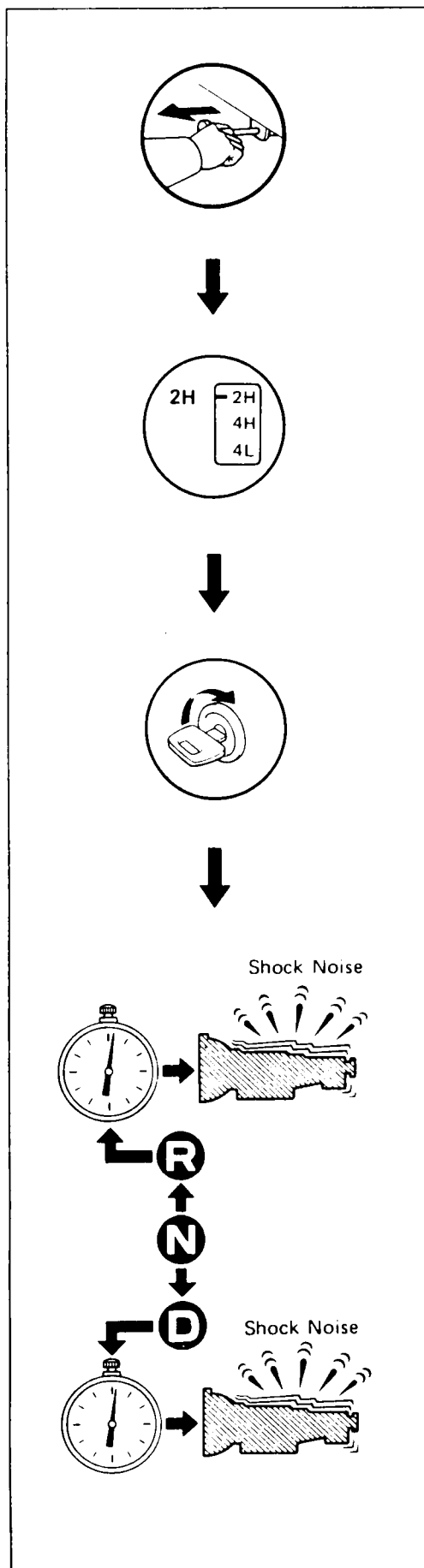
Lag time	Less than 1.2 seconds
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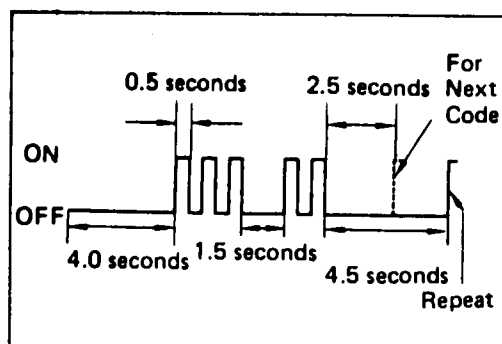
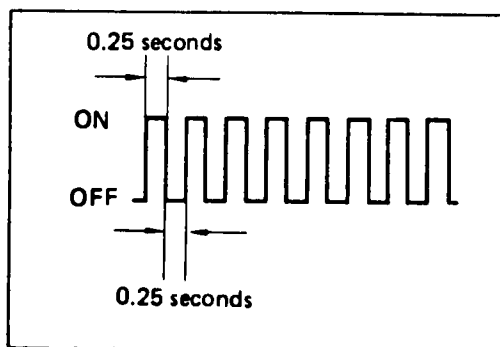
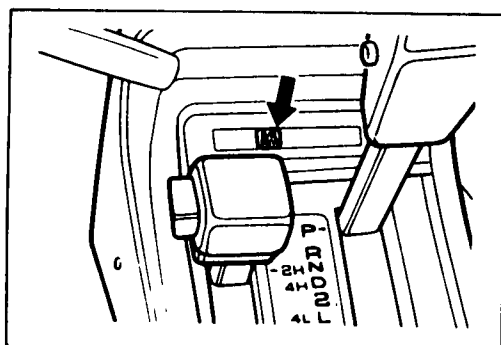
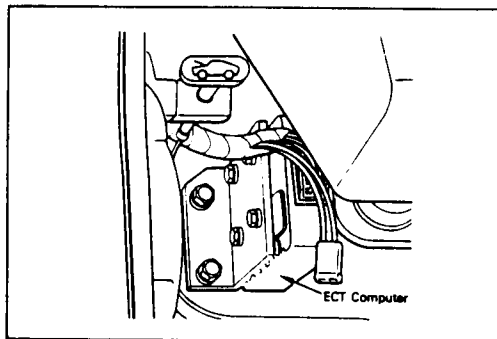
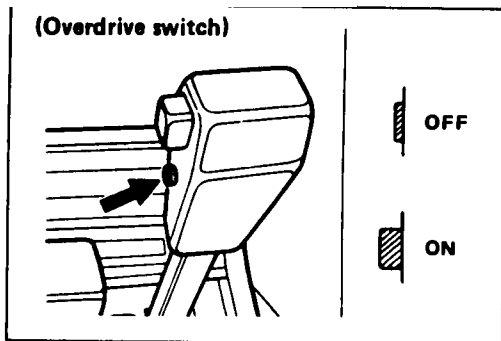
- 5) In same manner, measure the time lag for "N" → "R".

Lag time	Less than 1.5 seconds
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### EVALUATION

- 1) If "N" → "D" time lag is longer than specified:
  - Line pressure too low
  - Forward clutch worn
  - OD one-way clutch not operating properly
- 2) If "N" → "R" time lag is longer than specified:
  - Line pressure too low
  - Direct clutch worn
  - No. 3 brake worn
  - OD one-way clutch not operating properly





### READING DIAGNOSTIC CODE

#### TURN IGNITION SWITCH AND OD SWITCH TO ON

Do not start the engine.

**Note:** Warning and diagnostic code can be read only when the overdrive switch is ON. If Off the overdrive light will light continuously and will not blink.

#### SHORT DG TERMINAL CIRCUIT

Using a service wire, short the DG terminal and body ground.

#### READ DIAGNOSTIC CODE

Read the diagnostic code as indicated by the number of times the OD "OFF" light flashes.

#### DIAGNOSTIC CODE

- 1) If the system is operating normally, the light will blink 2 times per second.

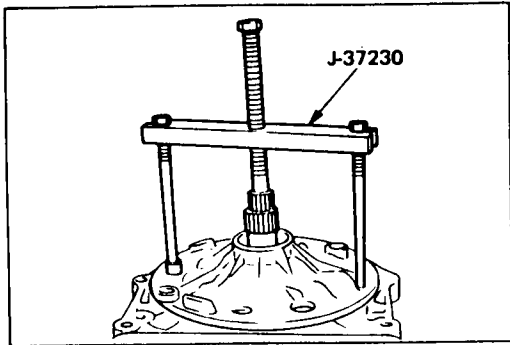
- 2) In the event of a malfunction, the light will blink once a second. The number of blinks will equal the first number and, after 1.5 second pause, the second number of the two digit diagnostic code. If there are two or more codes, there will be a 2.5 second pause between each.

**Note:** In the event of several trouble codes occurring simultaneously, indication will begin from the smaller value and continue to the larger.

- 3) Remove the service wire from the DG terminal.

## Service Information AW30-80LE

### Important operations

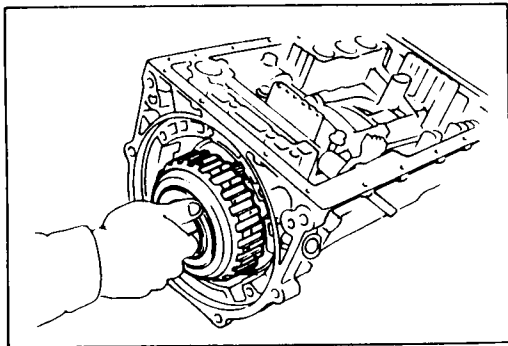


#### Oil pump

Remove seven bolts fixing the oil pump to the transmission case.

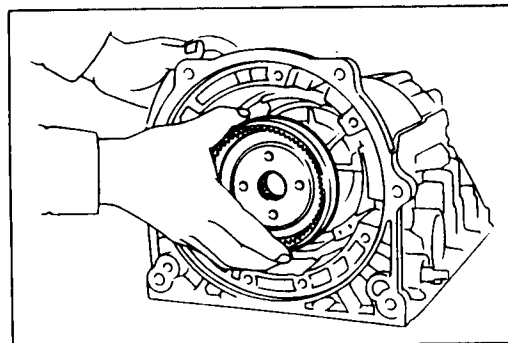
Then using special tool, remove the oil pump.

Puller : J-37230



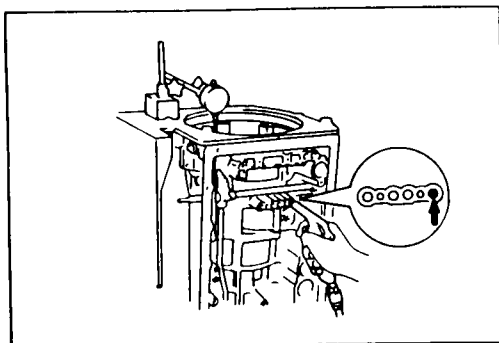
#### OD planetary gear and OD direct clutch

Remove the overdrive planetary gear and overdrive direct clutch with thrust needle bearing from the transmission case.



#### OD planetary ring gear

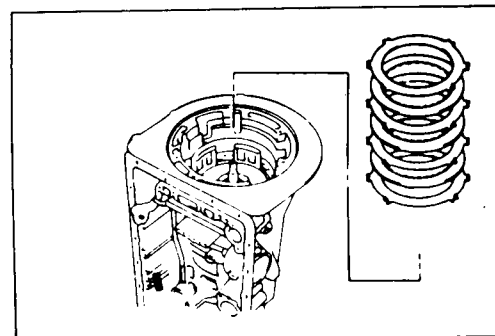
Remove the overdrive planetary ring gear from the transmission case.



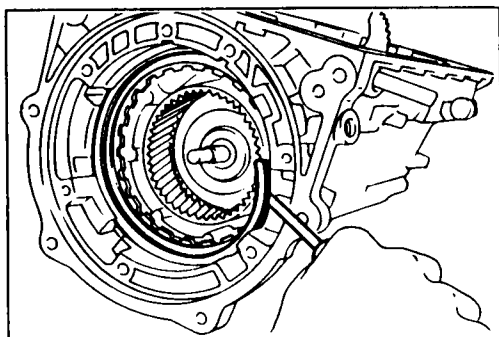
Measure the stroke applying and releasing the compressed air (4 — 8 kg/cm<sup>2</sup>, 57 — 114 psi or 392 — 785 kPa) as shown in the figure.

Piston stroke	mm(in.)	1.32 — 1.62 (0.0520 — 0.0638)
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If the values are nonstandard, replace the disc or flange.



Remove two flanges, two plates and three discs.



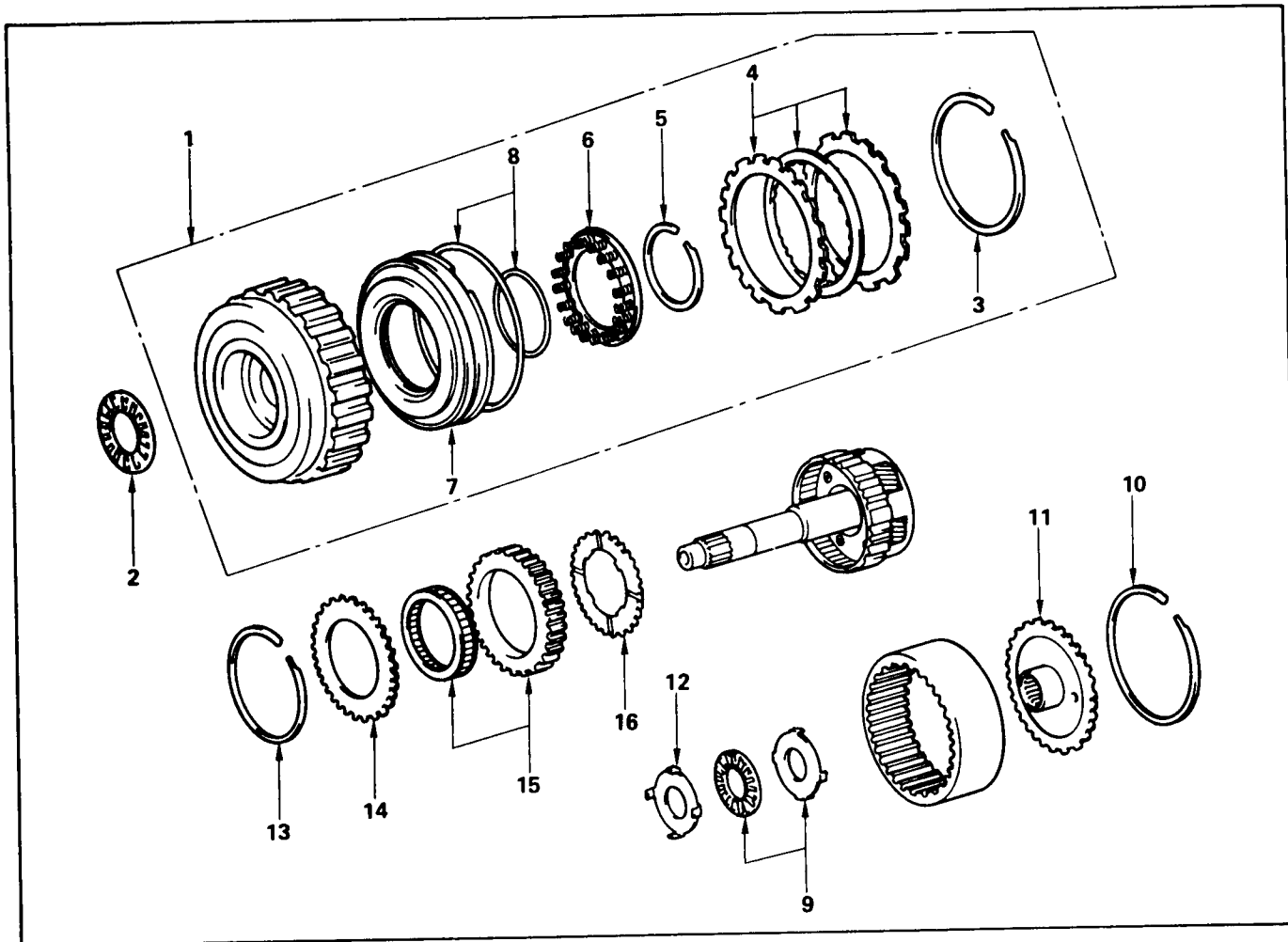
Remove the snap ring.

## Service Information AW30-80LE

### OD PLANETARY GEAR AND OD DIRECT CLUTCH ASSEMBLY (C-O)

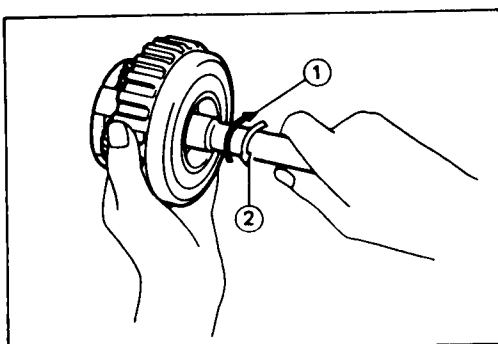
#### DISASSEMBLY

#### REASSEMBLY



#### Disassembly steps

- |   |                       |
|---|-----------------------|
| 1. OD direct clutch assembly              | 9. Thrust bearing     |
| 2. Thrust bearing                         | 10. Snap ring         |
| 3. Snap ring                              | 11. Ring gear flange  |
| 4. Flange, disc and plate                 | 12. Race              |
| 5. Snap ring                              | 13. Snap ring         |
| 6. Piston return spring                   | 14. Retaining plate   |
| 7. OD direct clutch piston<br>with O-ring | 15. OD one way clutch |
| 8. O-ring                                 | 16. Thrust washer     |



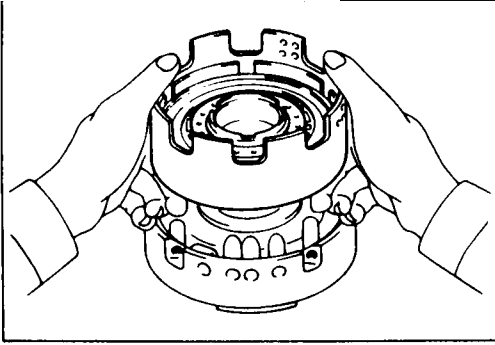
#### Important operations

##### Check operation of one-way clutch

Hold the OD direct clutch drum and turn the input shaft.  
The input shaft should turn freely clockwise and should lock counterclockwise.

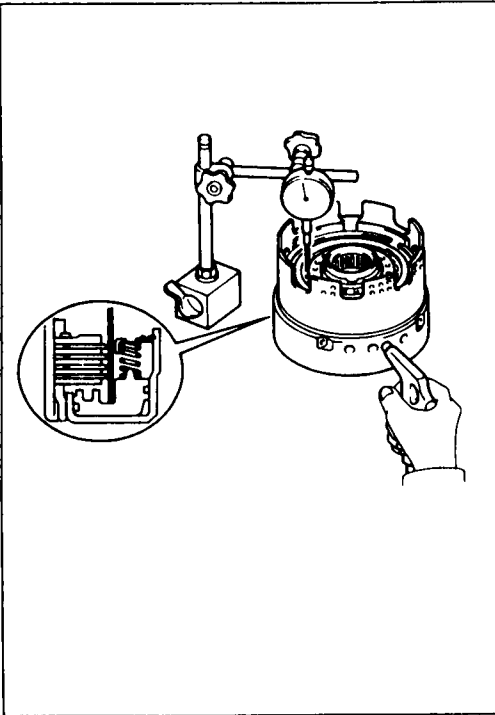
- ① : Free  
② : Lock

## Service Information AW30-80LE



### Check piston stroke of direct clutch (C-2)

Place the direct clutch assembly onto the OD support assembly.



Using a dial indicator, measure the direct clutch piston stroke by applying and releasing compressed air (4 – 8 kg/cm<sup>2</sup>, 57 – 114 psi or 392 – 785 kPa) as shown.

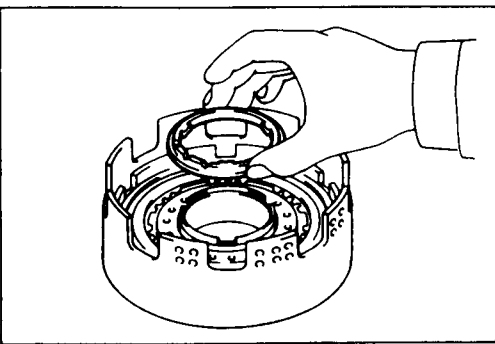
Piston stroke	mm(in.)	1.03 – 1.33 (0.0406 – 0.0524)
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If the piston stroke is not within specification, replace the discs and recheck the piston stroke.

If the piston stroke is non standard, select another flange.

**Note:** There are eight flanges. mm(in.)

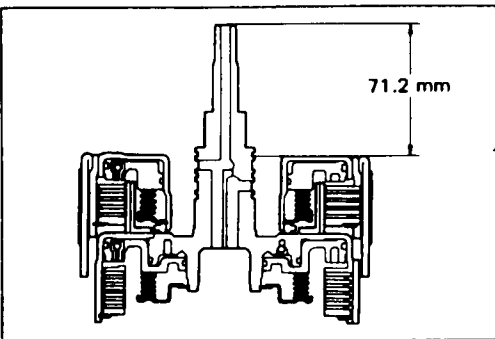
No.	Flange thickness	No.	Flange thickness
7	3.0 (0.118)	3	3.4 (0.134)
6	3.1 (0.122)	2	3.5 (0.138)
5	3.2 (0.126)	1	3.6 (0.142)
4	3.3 (0.130)		



### Clutch drum thrust washer (plastic)

Coat the thrust washer with petroleum jelly and install it onto the direct clutch.

**Note:** Make sure that the lugs fit into the cutout portions on the direct clutch.



### Install direct clutch assembly

Align the flukes of discs in the direct clutch.

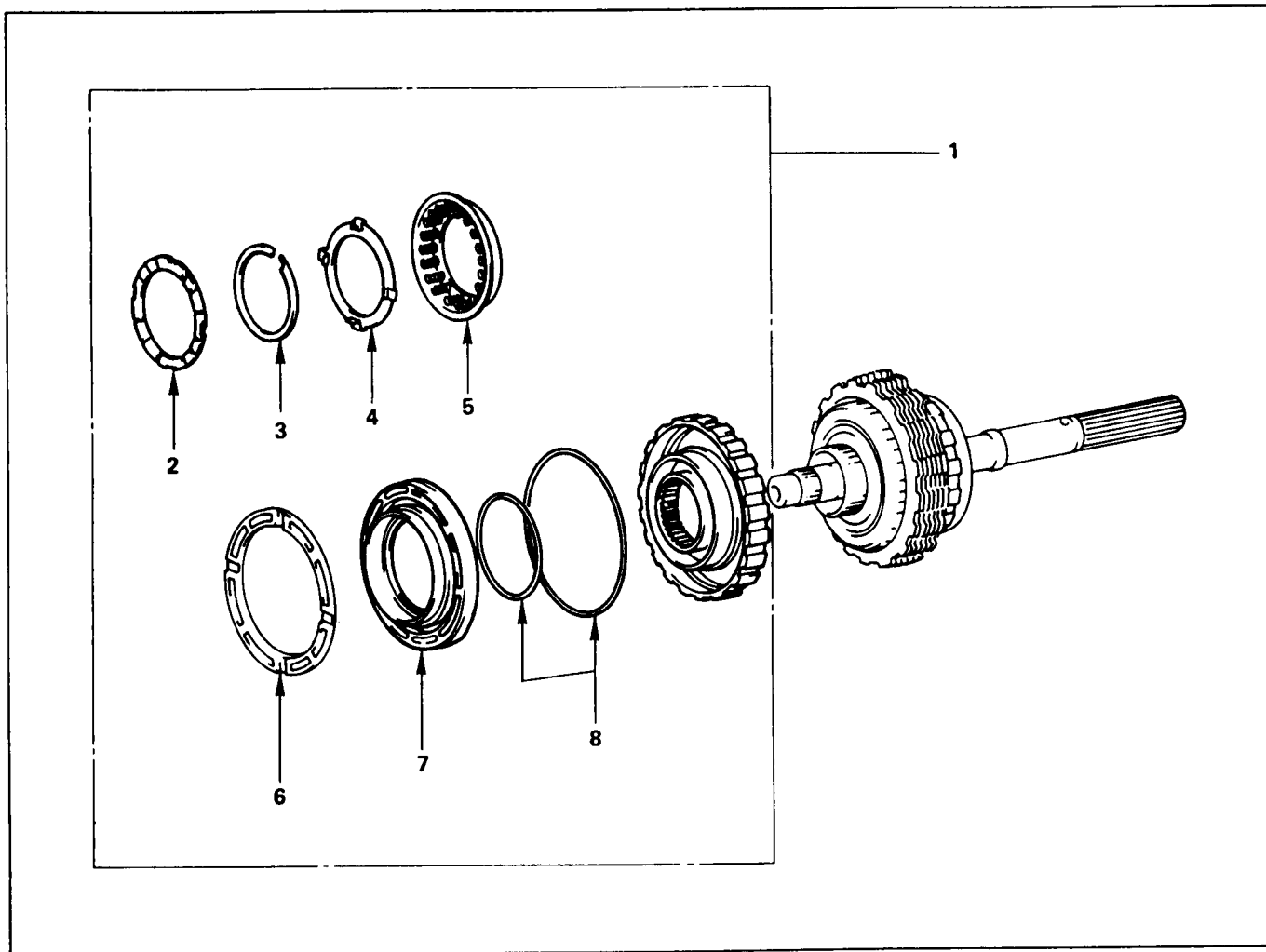
Install the direct clutch assembly onto the forward clutch assembly.

Check that the distance from the direct clutch end to the forward clutch end is 71.2 mm (2.803 in.).

## SECOND BRAKE ASSEMBLY (B-2)

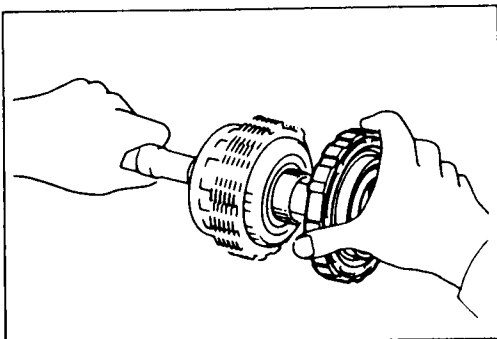
DISASSEMBLY

REASSEMBLY



### Disassembly steps

1. Second brake assembly
2. Thrust washer (Plastic)
3. Snap ring
4. Spring retainer
5. Piston return spring
6. Piston sleeve
7. Second brake piston
8. O-ring

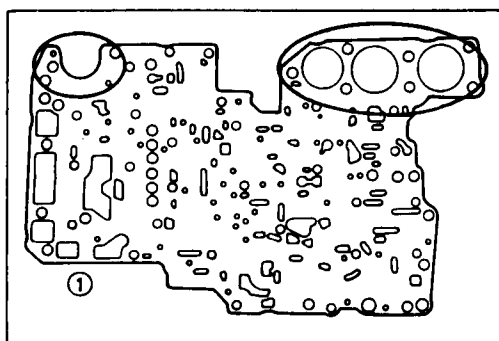
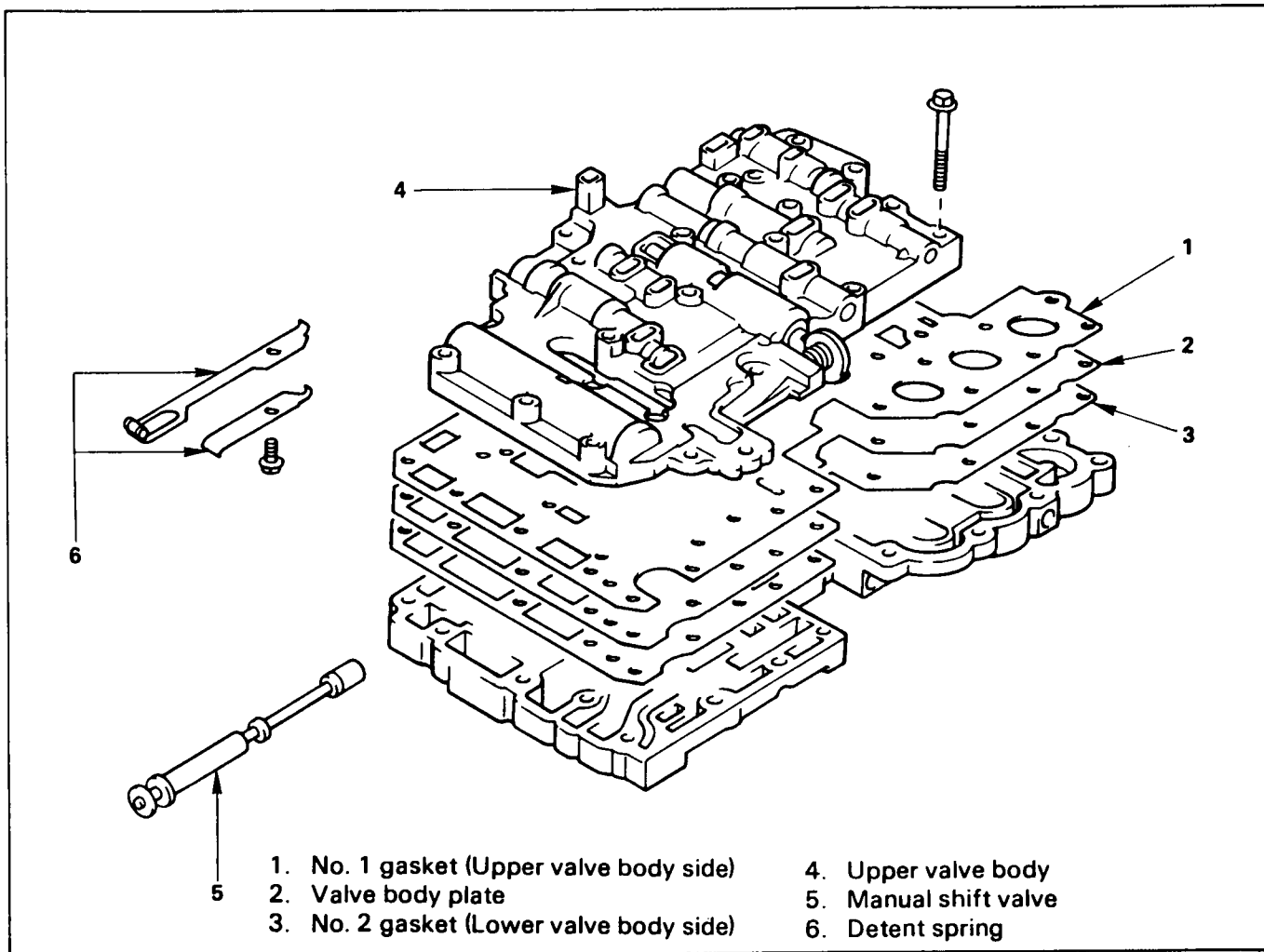


### Second brake assembly

Remove second brake assembly from output shaft.

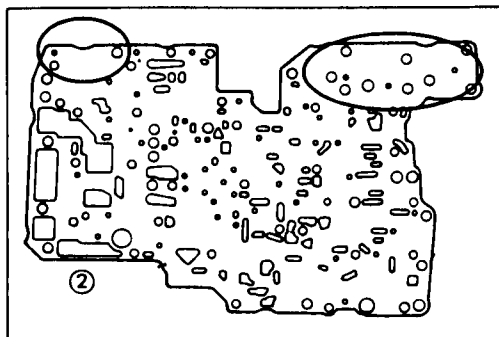


**TRANSMISSION VALVE BODY ASSEMBLY**



**No. 1 gasket (Upper valve body side)**

Position new No. 1 gasket ① on upper valve body.  
Align a new No. 1 gasket at each bolt hole.



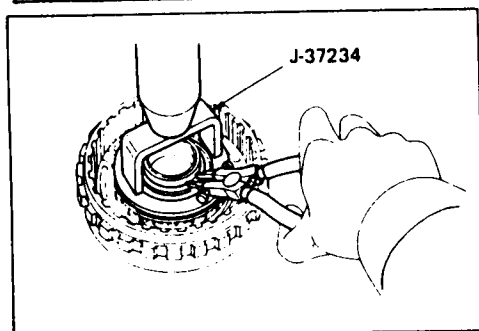
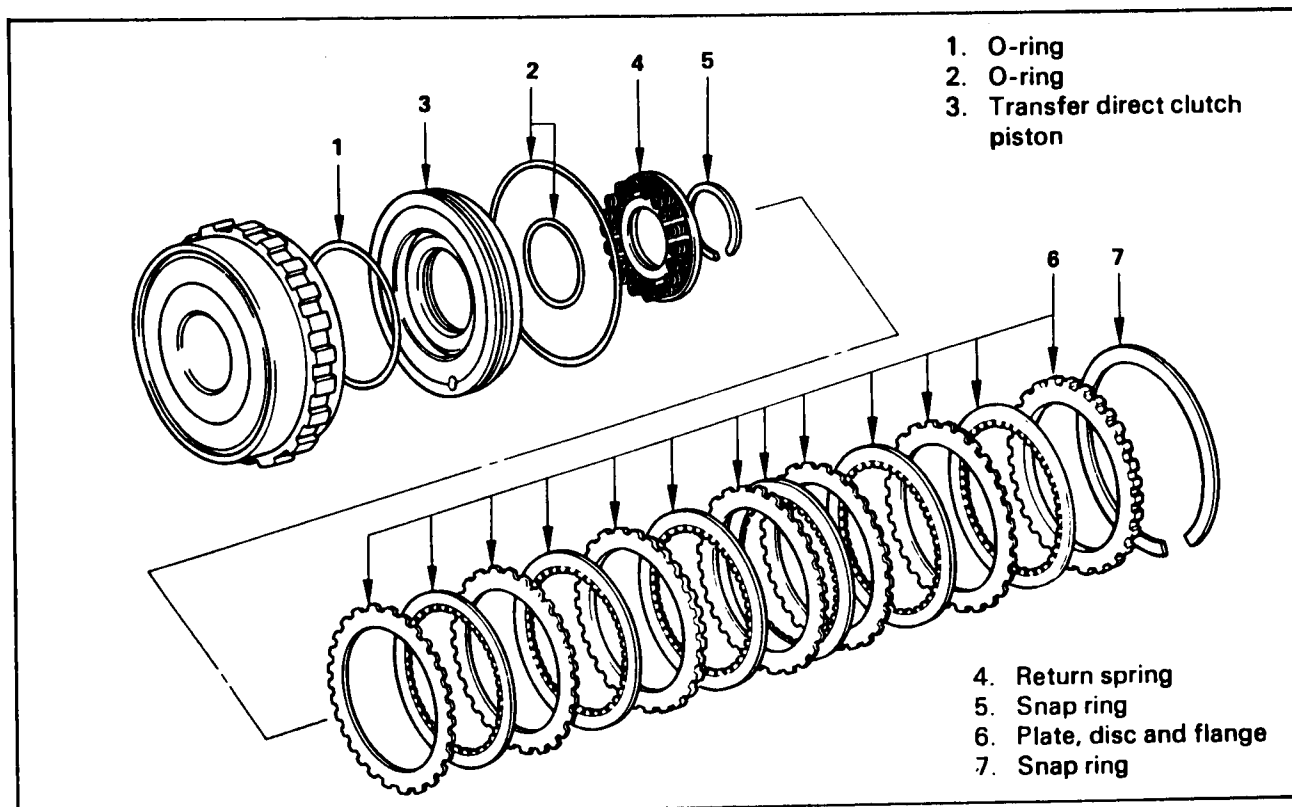
**Valve body plate**

Position valve body plate ② on No. 1 gasket.  
Align the plate at each bolt hole.

**No. 2 gasket (Lower valve body side)**

Position new No. 2 gasket 2 on plate.  
Align a new No. 2 gasket at each bolt hole.

TRANSFER DIRECT CLUTCH ASSEMBLY (C-3)

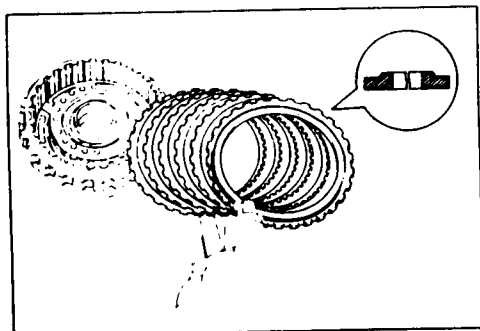


**Snap ring**

Place special tool on the spring retainer, and compress the springs.

Spring compressor : J-37234

Install the snap ring with a snap ring pliers. Be sure the end gap of snap ring is not aligned with the spring retainer claw.



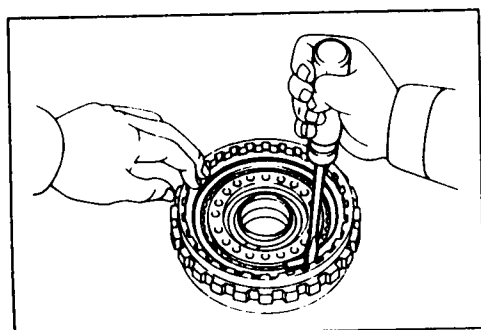
**Plate, disc and flange**

Install plates, discs and flange.

Install in order :

Thin plate - Disc - Thick plate - Disc - Thick plate - Disc - Thick plate - Disc - Thick plate - Disc - Thin plate - Disc

Then install the flange, with the flat side facing downward.



**Snap ring**

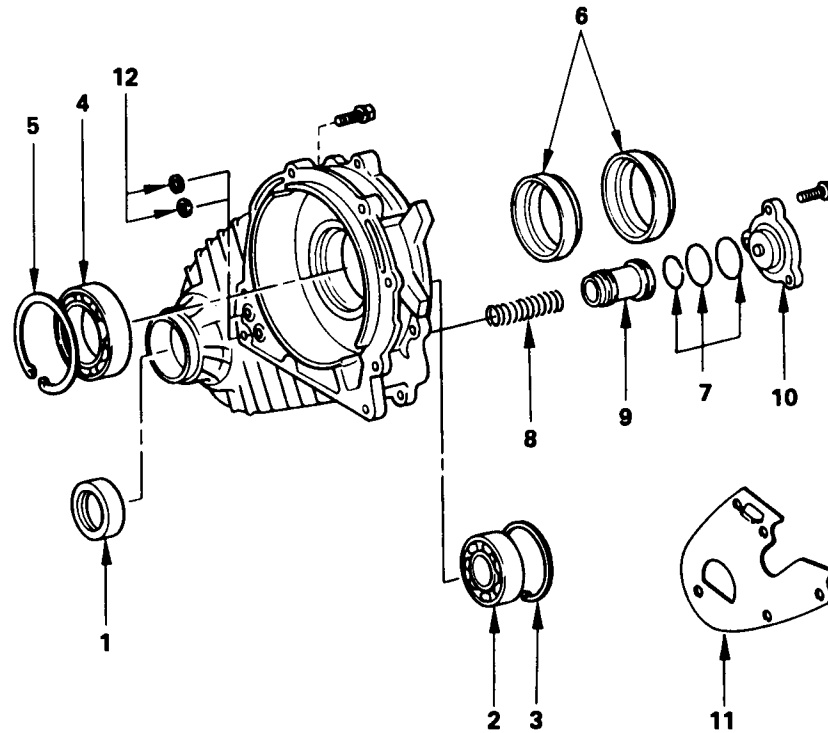
Install outer snap ring.

Check that the end gap of the snap ring is not aligned with one of the cutouts.

**Note:** There are four flange sizes

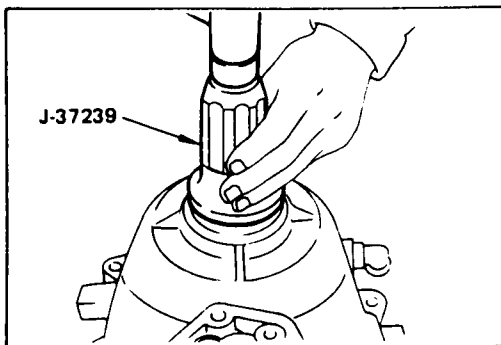
		mm(in.)
3.9 (0.154)		4.3 (0.169)
4.1 (0.161)		4.5 (0.177)

## TRANSFER CHAIN CASE



### Reassembly steps

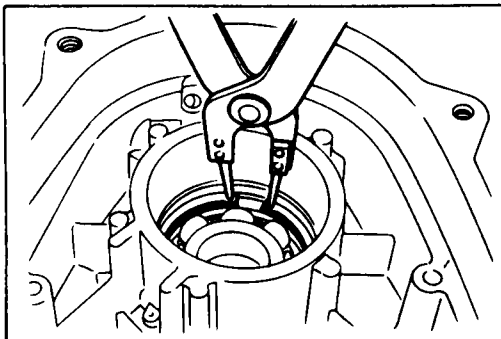
- |                              |                       |
|------------------------------|-----------------------|
| 1. Oil seal                  | 7. O-ring             |
| 2. Front drive shaft bearing | 8. Spring             |
| 3. Snap ring                 | 9. Accumulator piston |
| 4. Rear drive shaft bearing  | 10. Cover             |
| 5. Snap ring                 | 11. Reserve cover     |
| 6. Oil seal                  | 12. Apply gasket      |



#### Oil seal

Using a special tool and a hammer, drive in the front oil seal.

Oil seal installer : J-37239

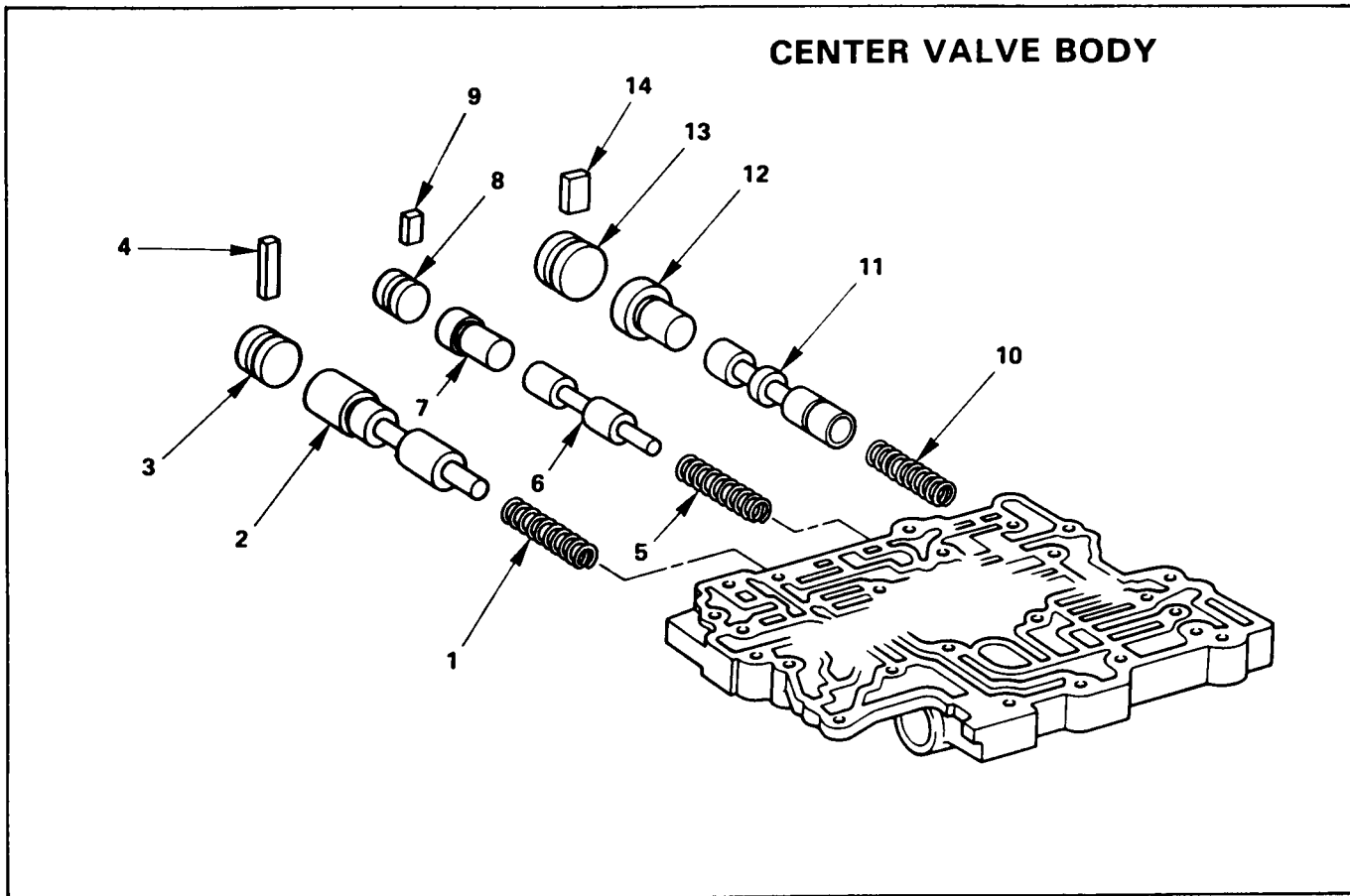


#### Front drive shaft bearing

Install the bearing to the transfer chain case.

#### Snap ring

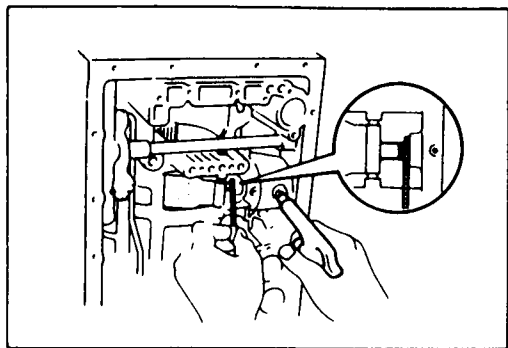
Install the snap ring to the transfer case.



**Reassembly steps**

- |                              |                     |
|------------------------------|---------------------|
| 1. Spring                    | 8. Plug             |
| 2. Accumulator control valve | 9. Retainer         |
| 3. Plug                      | 10. Spring          |
| 4. Retainer                  | 11. Low shift valve |
| 5. Spring                    | 12. Inhibitor valve |
| 6. Relay valve               | 13. Plug            |
| 7. Relay plunger             | 14. Retainer        |

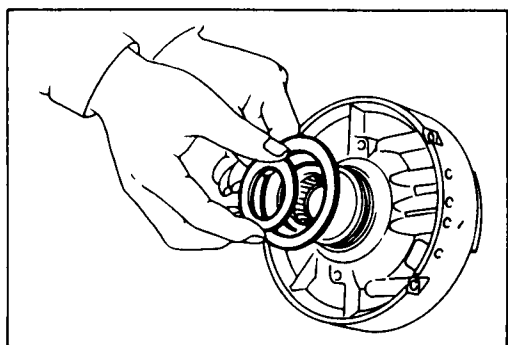
## Service Information AW30-80LE



Using wire gage, measure the stroke by applying the compressed air (4 – 8 kg/cm<sup>2</sup>, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

Piston stroke	mm(in.)	1.5 – 3.0 (0.059 – 0.118)
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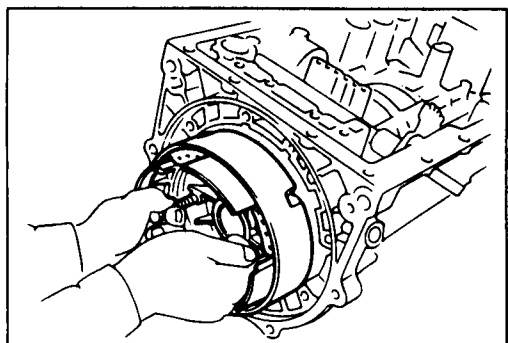
If the values are nonstandard, check for an improper installation.



### Race

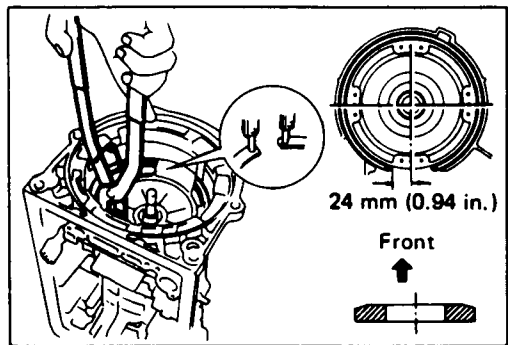
Coat the race with petroleum jelly and install it onto the overdrive support assembly.

	Race diameter (Reference) mm(in.)	
	Inside	Outside
Race	36.2 (1.425)	50.9 (2.004)



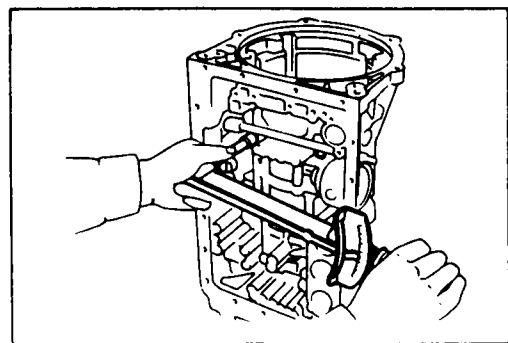
### OD support

Aim the bolt and oil holes of the overdrive support toward the valve hole side, and align them with the bolt hole of the transmission case and insert.



### Snap ring

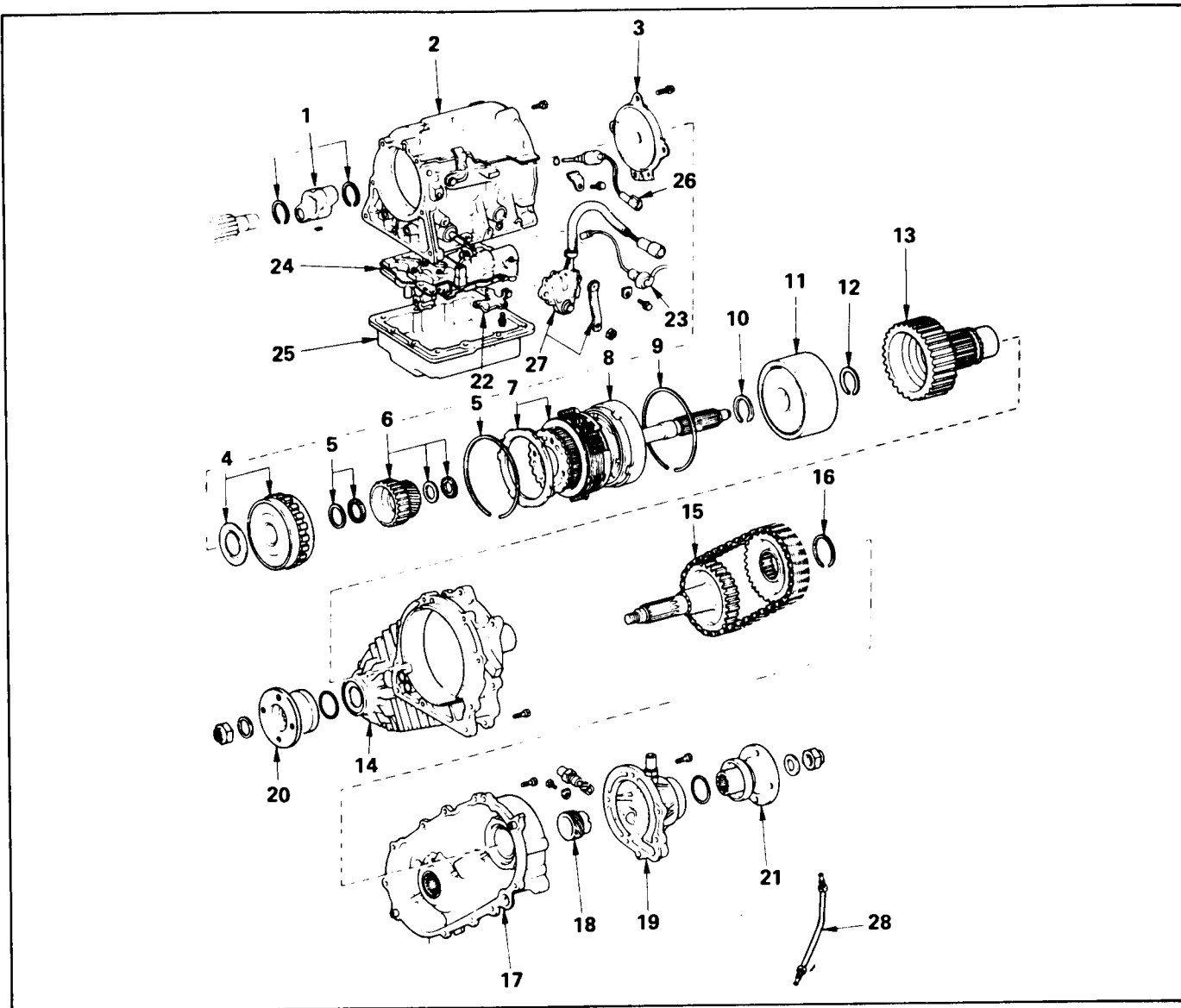
Using snap ring pliers, install the snap ring as shown in the figure.



Install and tighten the two bolts.

Torque	kg·m(ft.lbs.)	2.6 (19)
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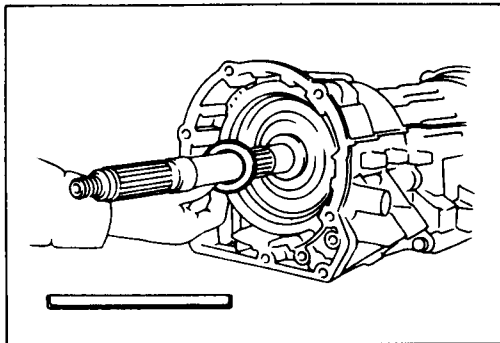
REASSEMBLY OF MAJOR COMPONENTS



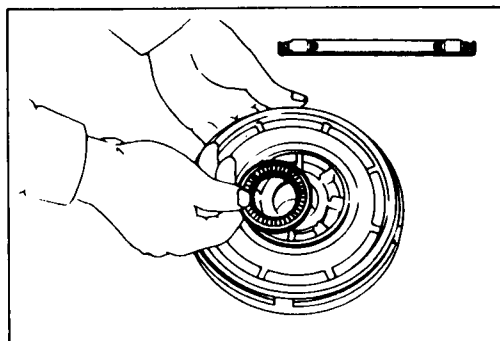
Reassembly steps

- |                                       |                                 |
|---------------------------------------|---------------------------------|
| 1. Speed sensor rotor                 | 15. Sprocket and driven shaft   |
| 2. Transfer case                      | 16. Snap ring                   |
| 3. Transfer front support             | 17. Transfer chain case cover   |
| 4. Transfer direct clutch             | 18. Speedometer drive gear      |
| 5. Snap ring and bearing              | 19. Extension housing           |
| 6. Sun gear                           | 20. Front companion flange      |
| 7. Transfer low speed brake (B-4)     | 21. Companion flange            |
| 8. Transfer center support            | 22. Parking lock pawl bracket   |
| 9. Snap ring                          | 23. No. 4 solenoid              |
| 10. Snap ring                         | 24. Transfer valve body         |
| 11. Transfer front drive clutch (C-4) | 25. Oil pan                     |
| 12. Snap ring                         | 26. Speed sensor                |
| 13. Front output shaft                | 27. Transfer position switch    |
| 14. Transfer chain case               | 28. Chain case oil cooler pipes |

## Service Information AW30-80LE

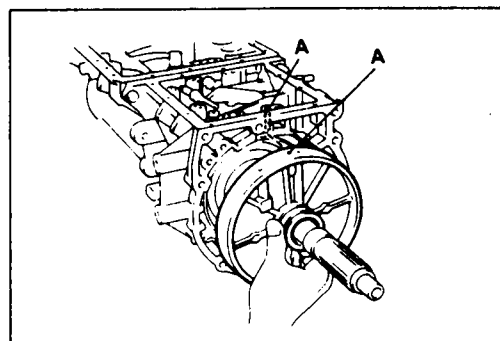


Install bearing race to the output shaft.



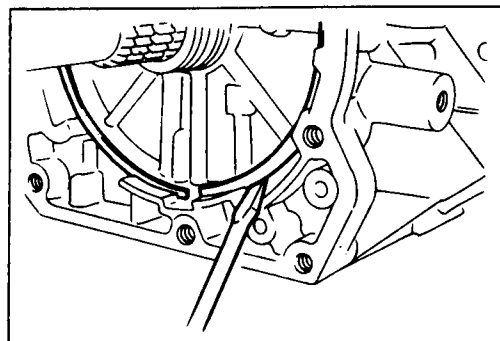
### Center support

Install bearing to the center support.



Align the center support hole (A) and transfer case hole (A).

Install center support.

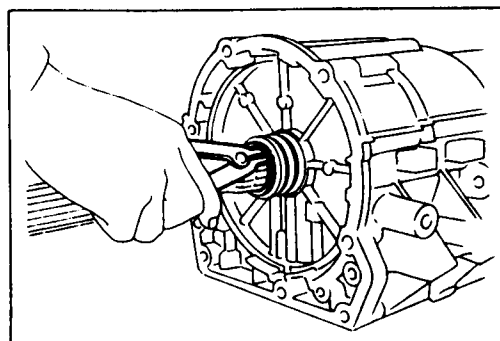


### Snap ring

Compress the center support and install snap ring.

### Snap ring (Reference)

Inside diameter	mm(in.)	178 (7.01)
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### Snap ring

Install the snap ring to the output shaft.

### Transfer front drive clutch

Install the front drive clutch.