

## LOW CLUTCH CLEARANCE MEASUREMENT/ADJUSTMENT

id051700664500

### Preparation Before Servicing

1. Print out the measurement/adjustment value input sheet. (See MEASUREMENT/ADJUSTMENT VALUE INPUT SHEET.)

#### Note

- When performing the measurement/adjustment, input the measured and calculated values into the measurement/adjustment value input sheet.
- If the measurement/adjustment value input sheet has already been printed out for the other measurements/adjustments, use the sheet.

### Low Clutch Clearance Measurement

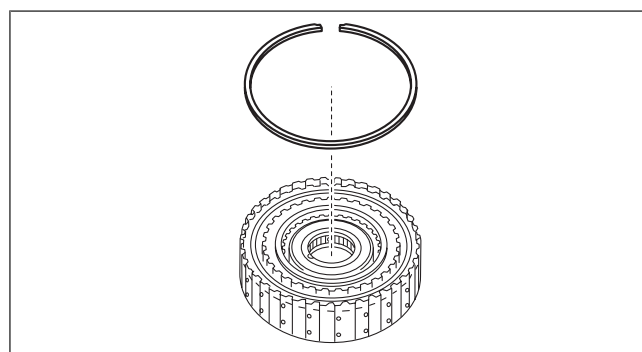
1. Assemble the snap ring to the position shown in the figure.

#### Caution

- Assemble so that the end gap of the snap ring is positioned diagonally opposed to the end gap of the snap ring for the high clutch.
- After assembling the snap ring, verify that the snap ring is securely inserted into the bottom of the snap ring groove.

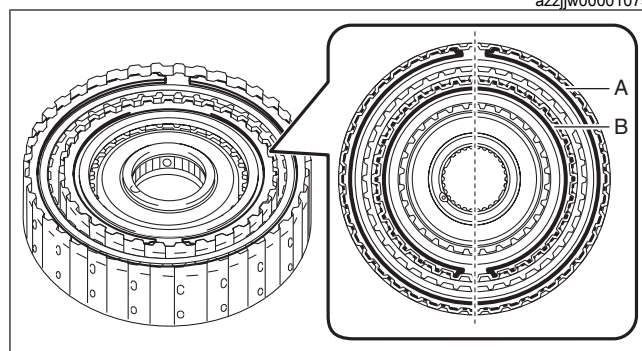
#### Note

- Snap ring size: Outer diameter approx. 189.3 mm {7.453 in}



azzjw00001075

- A : Snap ring (low clutch)  
B : Snap ring (high clutch)



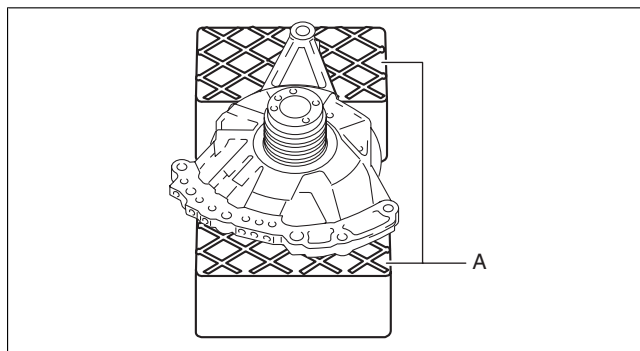
azzjw00001076

2. Set the oil pump on the workbench as shown in the figure.

#### Caution

- To reduce error during the low clutch clearance measurement, use the rubber plates to adjust the alignment surface of the oil pump with the transaxle case so that it is level.

A : Rubber plate



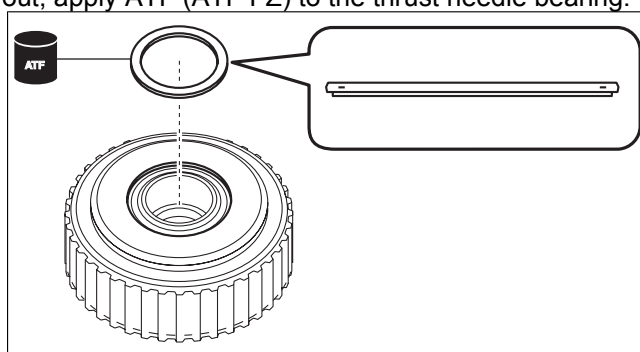
azzjiw00001077

3. Assemble the thrust needle bearing to the clutch component using the following procedure:

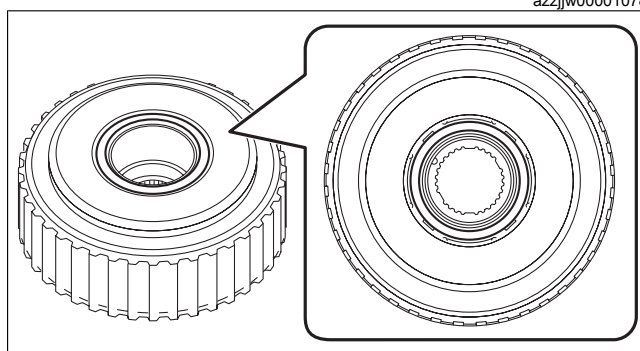
**Note**

- Thrust needle bearing size: Outer diameter approx. 76.7 mm {3.02 in}

- (1) To prevent the thrust needle bearing from dropping out, apply ATF (ATF FZ) to the thrust needle bearing.
- (2) Assemble the thrust needle bearing.

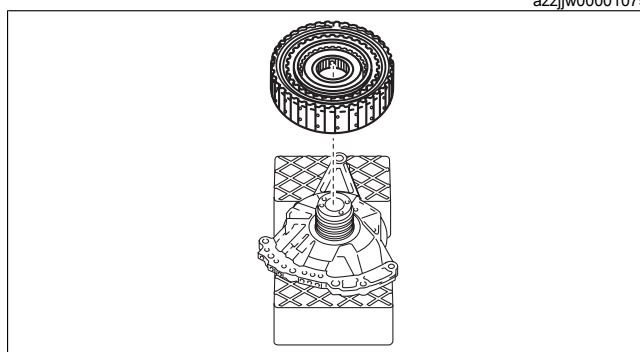


azzjiw00001078

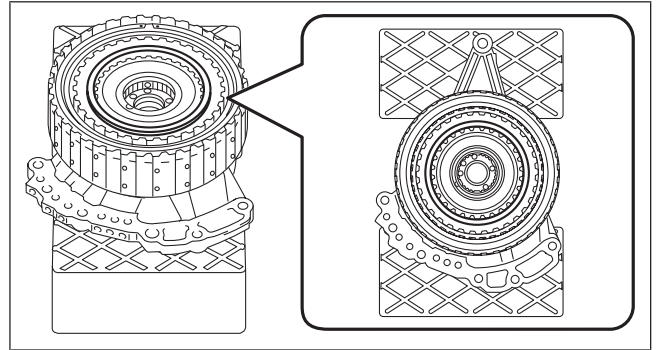


azzjiw00001079

4. Assemble the parts assembled together in Step 3 to the oil pump.

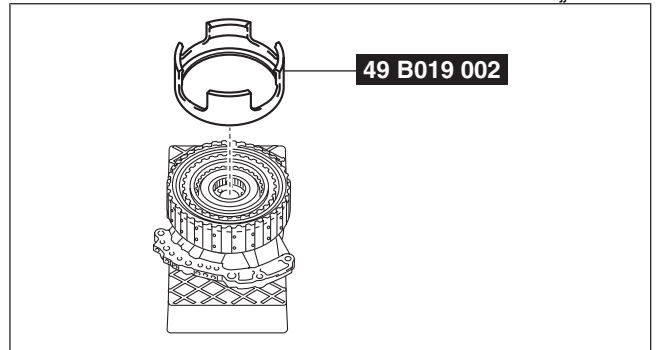


azzjiw00001080

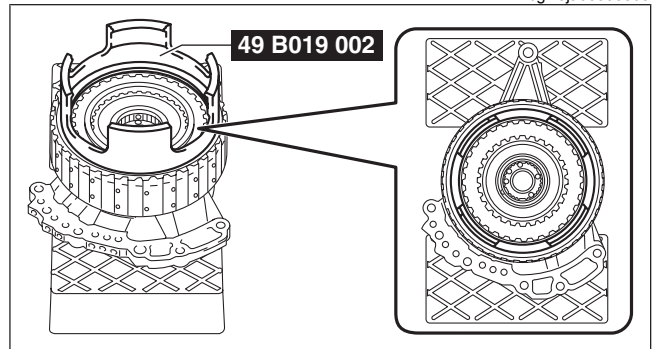


azzjw00001081

5. Install the SST.



bgw3ja00000563



bgw3ja00000564

6. Place a 98—196 N {10.0—19.9 kgf, 23.0—44.0 lbf} weight on the SST using the following procedure:

**Note**

- Use a V-block as a weight.

- (1) Measure the weight of the weight placed on the SST.
- (2) Input the measured weight into the measurement/adjustment value input sheet.
- (3) Place the measured weight on the SST.

**Caution**

- To reduce error during the low clutch clearance measurement, place the weight near the center of the SST.

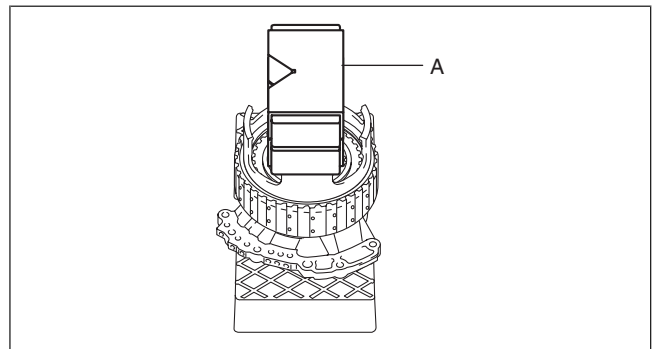
A : Weight (V-block)

7. Perform the following calculation to calculate the correction value for the low clutch clearance.

**Note**

- Because a wave spring is included in the low clutch, a correction value is required for the low clutch clearance according to the weight of the weight used during the low clutch clearance measurement.

**Correction value of low clutch clearance (weight of unit is N) =  $(A - 89 \text{ N}) \times 0.00105 \text{ mm}$  {0.0000413**



bgw3ja00000565

in}

A: Weight of weight

#### Note

#### Example

A: Weight of weight is 150 N

Correction value of low clutch clearance =  $(150 \text{ N} - 89 \text{ N}) \times 0.00105 \text{ mm} \{0.0000413 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

**Correction value of low clutch clearance (weight of unit is kgf) =  $(A - 9.08 \text{ kgf}) \times 0.01030 \text{ mm} \{0.0004055 \text{ in}\}$**

A: Weight of weight

#### Note

#### Example

A: Weight of weight is 15.30 kgf

Correction value of low clutch clearance =  $(15.30 \text{ kgf} - 9.08 \text{ kgf}) \times 0.01030 \text{ mm} \{0.0004055 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

**Correction value of low clutch clearance (weight of unit is lbf) =  $(A - 20.01 \text{ lbf}) \times 0.00467 \text{ mm} \{0.0001839 \text{ in}\}$**

A: Weight of weight

#### Note

#### Example

A: Weight of weight is 33.72 lbf

Correction value of low clutch clearance =  $(33.72 \text{ lbf} - 20.01 \text{ lbf}) \times 0.00467 \text{ mm} \{0.0001839 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

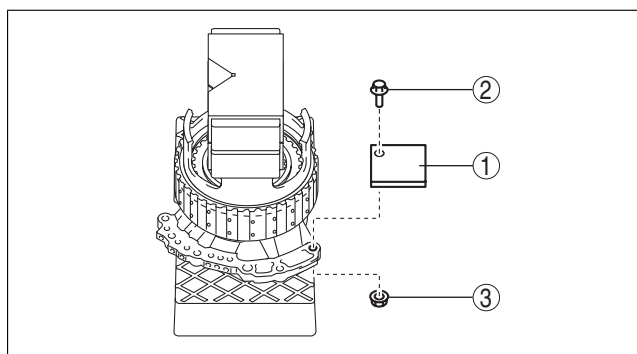
8. Input the calculated correction value of the low clutch clearance into the measurement/adjustment value input sheet.
9. Set the measuring instrument to the oil pump using the following procedure:
  - (1) Install an appropriate steel plate for securing the magnetic stand used in the procedure shown in the figure.

#### Caution

- If the bolt and nut are tightened with excessive force when installing the steel plate, the alignment surface of the oil pump with the transaxle case could be damaged. Tighten the bolt and nut so that the steel plate does not move during low clutch clearance measurement.

#### Note

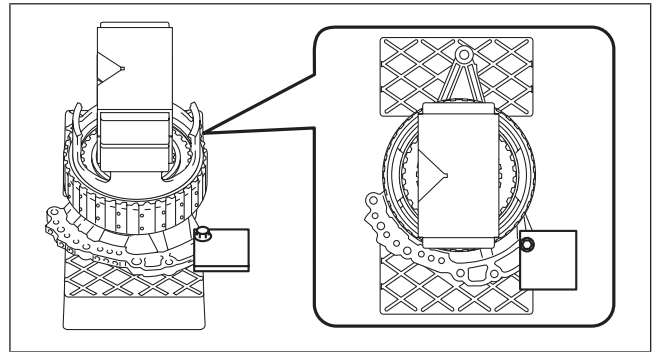
- When installing the steel plate to the oil pump, use an M8 bolt and nut.



bgw3ja00000566

**Steel plate installation bolt tightening torque**  
**15 N·m {1.5 kgf·m, 11 ft·lbf} or less (tighten so**  
**that steel plate does not move during low**  
**clutch clearance measurement)**

1	Steel plate (for securing magnetic stand)
2	Bolt (M8)
3	Nut (M8)



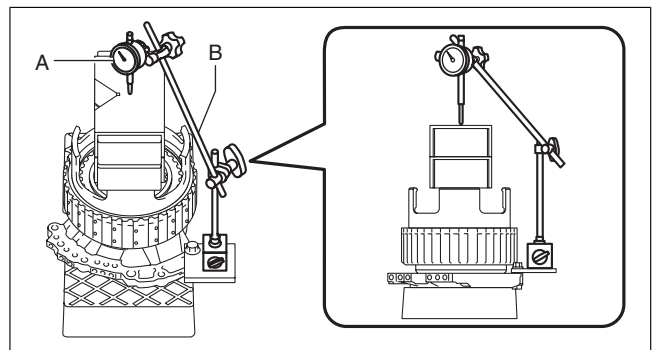
bgw3ja00000567

(2) Set the dial gauge and magnetic stand as shown in the figure.

**Caution**

- To reduce error during the low clutch clearance measurement, set the dial gauge so that it is perpendicular to the alignment surface of the oil pump with the transaxle case.

A : Dial gauge  
 B : Magnetic stand



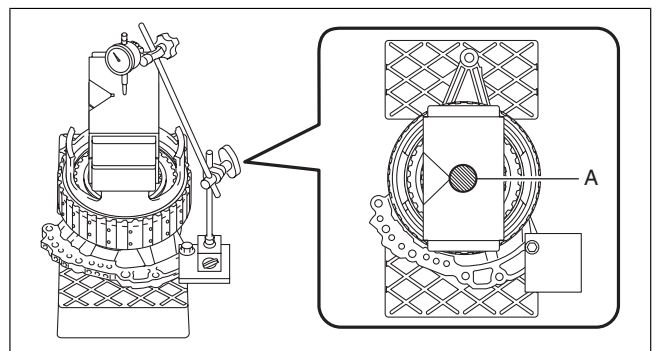
bgw3ja00000568

(3) Set the dial gauge end near the center of the weight.

**Caution**

- To reduce error during the low clutch clearance measurement, set the dial gauge end within the area shown in the figure.

A : Dial gauge end set area



bgw3ja00000569

10. Measure the low clutch clearance using the following procedure:

- (1) Blow compressed air into the oil passage shown in the figure to force the low clutch piston to stroke (approx. 3 times).

**Warning**

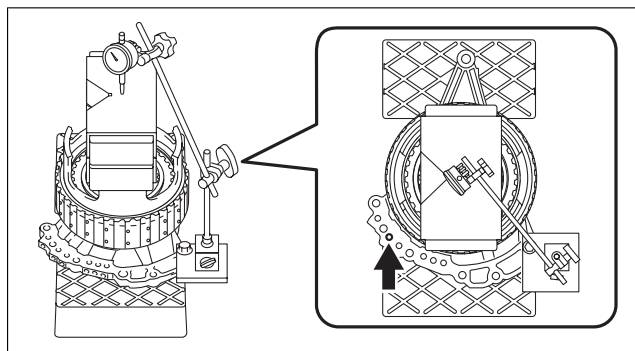
- Always wear protective eye wear when using the air compressor. Otherwise, ATF or dirt particles blown off by the air compressor could get into the eyes.

**Caution**

- To prevent damage to parts, always use an air compressor which is adjusted to the indicated pressure.

### Compressed air pressure

0.39—0.44 MPa {4.0—4.4 kgf/cm<sup>2</sup>, 57—63 psi}



bgw3ja00000570

- (2) Blow compressed air into the oil passage shown in the figure to operate the low clutch piston, and read the value when the dial gauge is stabilized.

### Warning

- Always wear protective eye wear when using the air compressor. Otherwise, ATF or dirt particles blown off by the air compressor could get into the eyes.

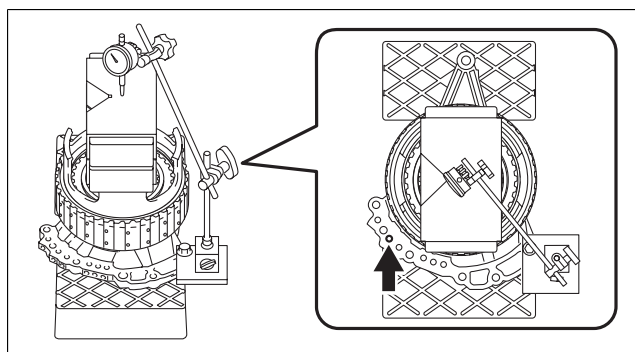
### Caution

- To prevent damage to parts, always use an air compressor which is adjusted to the indicated pressure.

### Compressed air pressure

0.39—0.44 MPa {4.0—4.4 kgf/cm<sup>2</sup>, 57—63 psi}

- (3) Input the dial gauge value, which was read while the low clutch piston was operating, into the measurement/adjustment value input sheet.
- (4) Release the compressed air and read the dial gauge value while the low clutch piston is not operating.
- (5) Input the dial gauge value, which was read while the low clutch piston was not operating, into the measurement/adjustment value input sheet.
- (6) Perform the following calculation to calculate the low clutch clearance.



bgw3ja00000570

**Low clutch clearance = C - D - B**

B: Correction value for low clutch clearance

C: Dial gauge value while low clutch piston is operating

D: Dial gauge value while low clutch piston is not operating

### Note

#### Example

B: Correction value of low clutch clearance is 0.064 mm {0.00252 in}

C: Dial gauge value while low clutch piston is operating is 2.120 mm {0.08346 in}

D: Dial gauge value while low clutch piston is not operating is 0.595 mm {0.02342 in}

Low clutch clearance = 2.120 mm {0.08346 in} - 0.595 mm {0.02342 in} - 0.064 mm {0.00252 in} = 1.461 mm {0.05752 in}

- (7) Input the calculated low clutch clearance into the measurement/adjustment value input sheet.

- (8) Verify that the low clutch clearance satisfies the specification.

### Specification

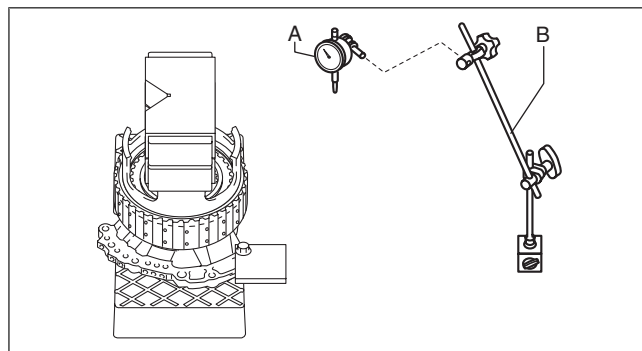
1.200—1.400 mm {0.04725—0.05511 in}

- If not within the specification, adjust the low clutch clearance. (See Low Clutch Clearance Adjustment.)

11. Remove the dial gauge and magnetic stand.

A : Dial gauge

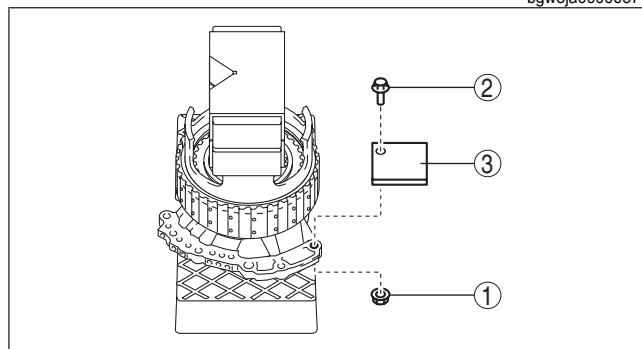
B : Magnetic stand



bgw3ja00000571

12. Remove the steel plate for securing the magnetic stand using the procedure shown in the figure.

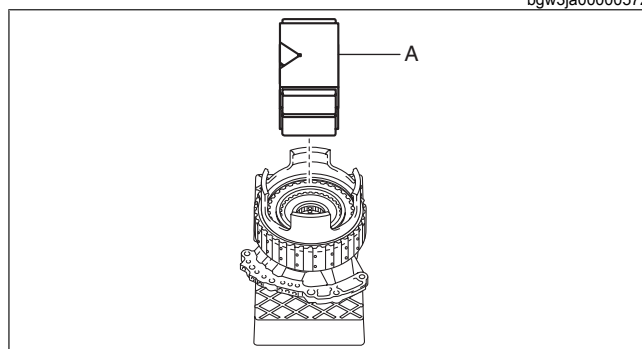
1	Nut (M8)
2	Bolt (M8)
3	Steel plate (for securing magnetic stand)



bgw3ja00000572

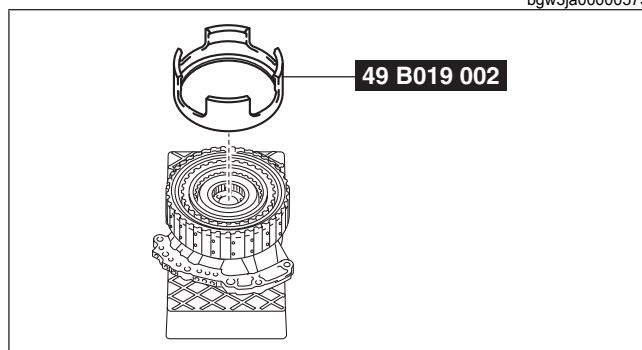
13. Remove the weight on the SST.

A : Weight (V-block)



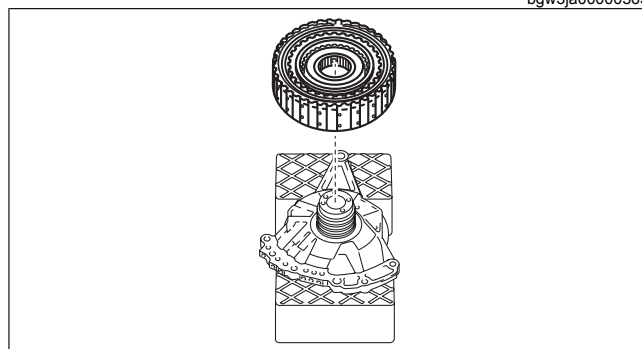
bgw3ja00000573

14. Remove the SST.



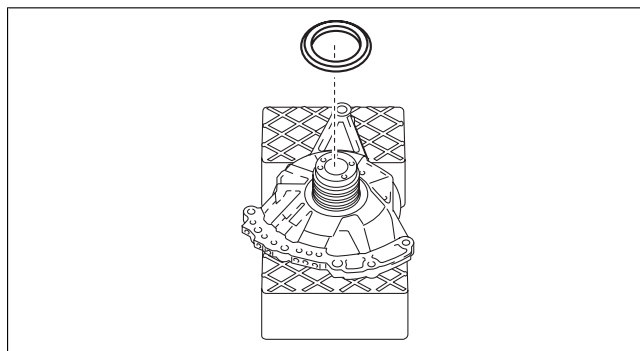
bgw3ja00000563

15. Remove the clutch component.



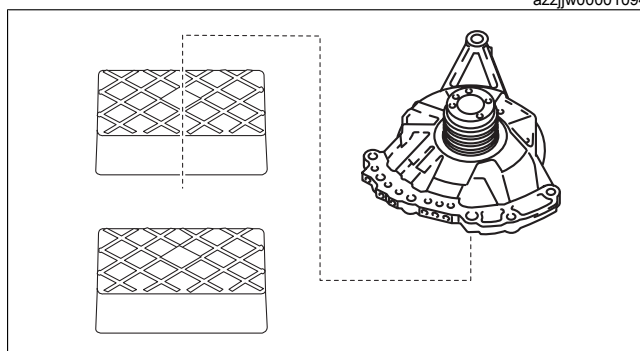
azzjjw00001093

16. Remove the thrust needle bearing.



azzjiw00001094

17. Take the oil pump off the rubber plates.



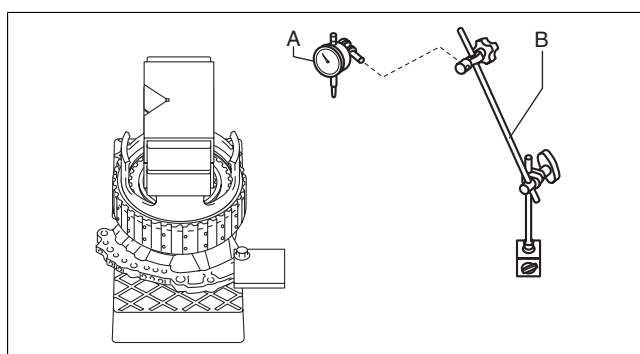
azzjiw00001095

### Low Clutch Clearance Adjustment

1. Remove the dial gauge and magnetic stand.

A : Dial gauge

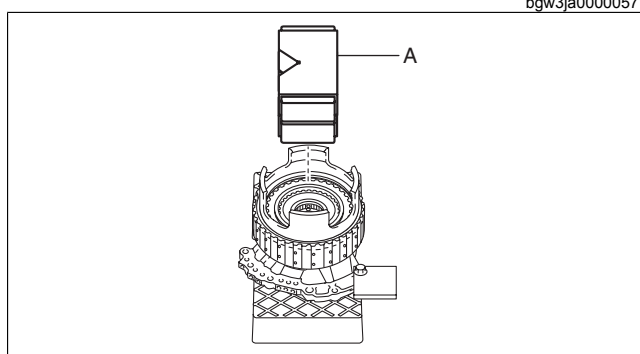
B : Magnetic stand



bgw3ja00000571

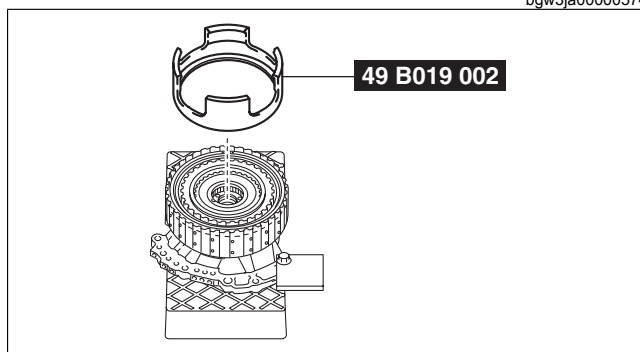
2. Remove the weight on the SST.

A : Weight (V-block)



bgw3ja00000574

3. Remove the SST.



49 B019 002

bgw3ja00000575

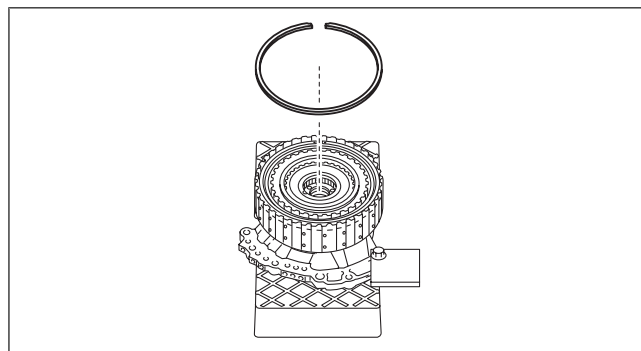


4. Remove the snap ring.
5. Measure the thickness of the removed snap ring.

**Note**

- Recommended measuring instrument:  
Micrometer

6. Input the measured snap ring thickness into the measurement/adjustment value input sheet.
7. Select the appropriate snap ring from the following table:



azzjjw00001098

Range*	Selected snap ring thickness
Exceeds 3.450 mm {0.13583 in}, 3.550 mm {0.13976 in} or less	2.1 mm {0.083 in}
Exceeds 3.350 mm {0.13189 in}, 3.450 mm {0.13583 in} or less	2.0 mm {0.079 in}
Exceeds 3.250 mm {0.12795 in}, 3.350 mm {0.13189 in} or less	1.9 mm {0.075 in}
Exceeds 3.150 mm {0.12402 in}, 3.250 mm {0.12795 in} or less	1.8 mm {0.071 in}
Exceeds 3.050 mm {0.12008 in}, 3.150 mm {0.12402 in} or less	1.7 mm {0.067 in}
Exceeds 2.950 mm {0.11614 in}, 3.050 mm {0.12008 in} or less	1.6 mm {0.063 in}
Exceeds 2.850 mm {0.11220 in}, 2.950 mm {0.11614 in} or less	1.5 mm {0.059 in}
Exceeds 2.750 mm {0.10827 in}, 2.850 mm {0.11220 in} or less	1.4 mm {0.055 in}
Exceeds 2.650 mm {0.10433 in}, 2.750 mm {0.10827 in} or less	1.3 mm {0.051 in}
Exceeds 2.550 mm {0.10039 in}, 2.650 mm {0.10433 in} or less	1.2 mm {0.047 in}

\* : The range is the sum of the low clutch clearance and the thickness value of the removed snap ring.

**Range = E + H**

E: Low clutch clearance

H: Thickness of removed snap ring

**Note**

**Example**

E: Low clutch clearance is 1.461 mm {0.05752 in}

H: Thickness of removed snap ring is 1.705 mm {0.06713 in}

Range = 1.461 mm {0.05752 in} + 1.705 mm {0.06713 in} = 3.166 mm {0.12465 in}, a snap ring of 1.8 mm {0.071 in} thickness should be selected.

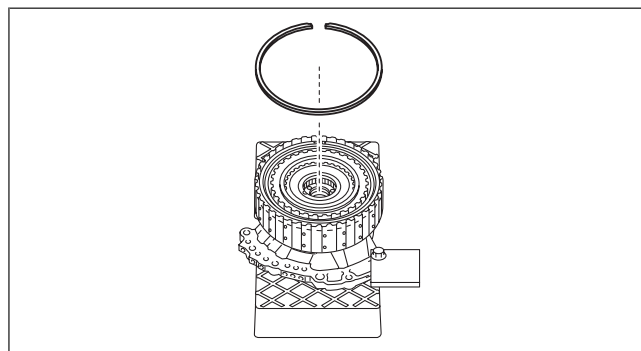
8. Assemble the selected snap ring to the position shown in the figure.

**Caution**

- Assemble so that the end gap of the snap ring is positioned diagonally opposed to the end gap of the snap ring for the high clutch.
- After assembling the snap ring, verify that the snap ring is securely inserted into the bottom of the snap ring groove.

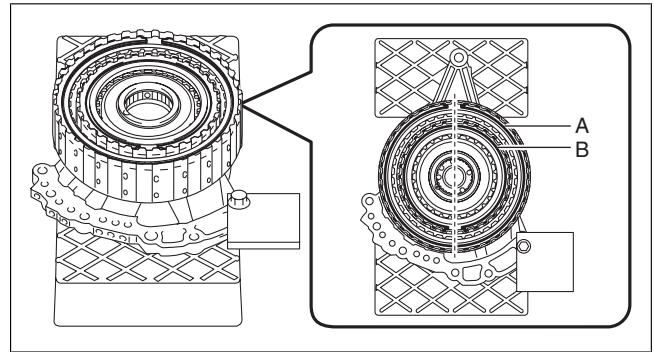
**Note**

- Snap ring size: Outer diameter approx. 189.3 mm {7.453 in}



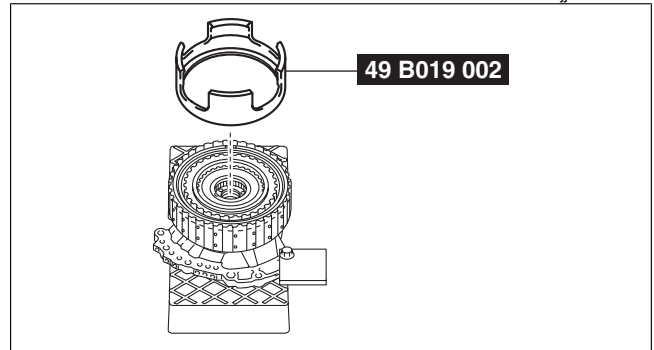
azzjjw00001098

A : Snap ring (low clutch)  
B : Snap ring (high clutch)

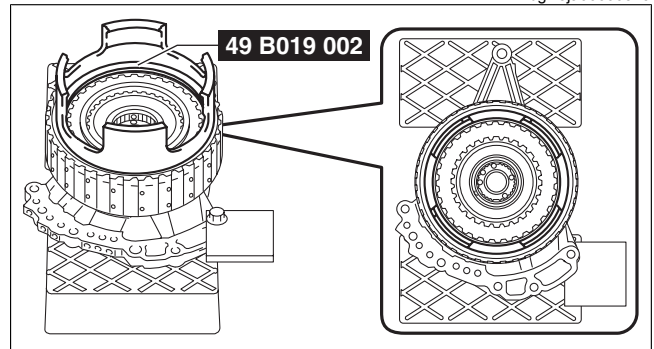


azzjw00001099

9. Install the SST.



bgw3ja00000575



bgw3ja00000576

10. Place a 98—196 N {10.0—19.9 kgf, 23.0—44.0 lbf} weight on the SST using the following procedure:

**Note**

- Use a V-block as a weight.

- (1) Measure the weight of the weight placed on the SST.
- (2) Input the measured weight into the measurement/adjustment value input sheet.
- (3) Place the measured weight on the SST.

**Caution**

- To reduce error during the low clutch clearance measurement, place the weight near the center of the SST.

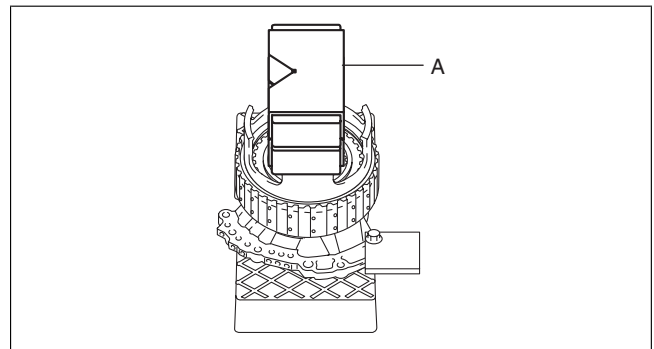
A : Weight (V-block)

11. Perform the following calculation to calculate the correction value for the low clutch clearance.

**Note**

- Because a wave spring is included in the low clutch, a correction value is required for the low clutch clearance according to the weight of the weight used during the low clutch clearance measurement.

**Correction value of low clutch clearance (weight of unit is N) = (A - 89 N) × 0.00105 mm {0.0000413**



bgw3ja00000577

---

in}

A: Weight of weight

**Note**

**Example**

A: Weight of weight is 150 N

Correction value of low clutch clearance =  $(150 \text{ N} - 89 \text{ N}) \times 0.00105 \text{ mm} \{0.0000413 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

**Correction value of low clutch clearance (weight of unit is kgf) =  $(A - 9.08 \text{ kgf}) \times 0.01030 \text{ mm} \{0.0004055 \text{ in}\}$**

in}

A: Weight of weight

**Note**

**Example**

A: Weight of weight is 15.30 kgf

Correction value of low clutch clearance =  $(15.30 \text{ kgf} - 9.08 \text{ kgf}) \times 0.01030 \text{ mm} \{0.0004055 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

**Correction value of low clutch clearance (weight of unit is lbf) =  $(A - 20.01 \text{ lbf}) \times 0.00467 \text{ mm} \{0.0001839 \text{ in}\}$**

in}

A: Weight of weight

**Note**

**Example**

A: Weight of weight is 33.72 lbf

Correction value of low clutch clearance =  $(33.72 \text{ lbf} - 20.01 \text{ lbf}) \times 0.00467 \text{ mm} \{0.0001839 \text{ in}\} = 0.064 \text{ mm} \{0.00252 \text{ in}\}$

12. Perform the low clutch clearance measurement from Step 9 (2). (See Low Clutch Clearance Measurement.)