

**2007 Mazda MX-5 Miata Sport**

2007 TRANSMISSION Clutch - MX-5 Miata

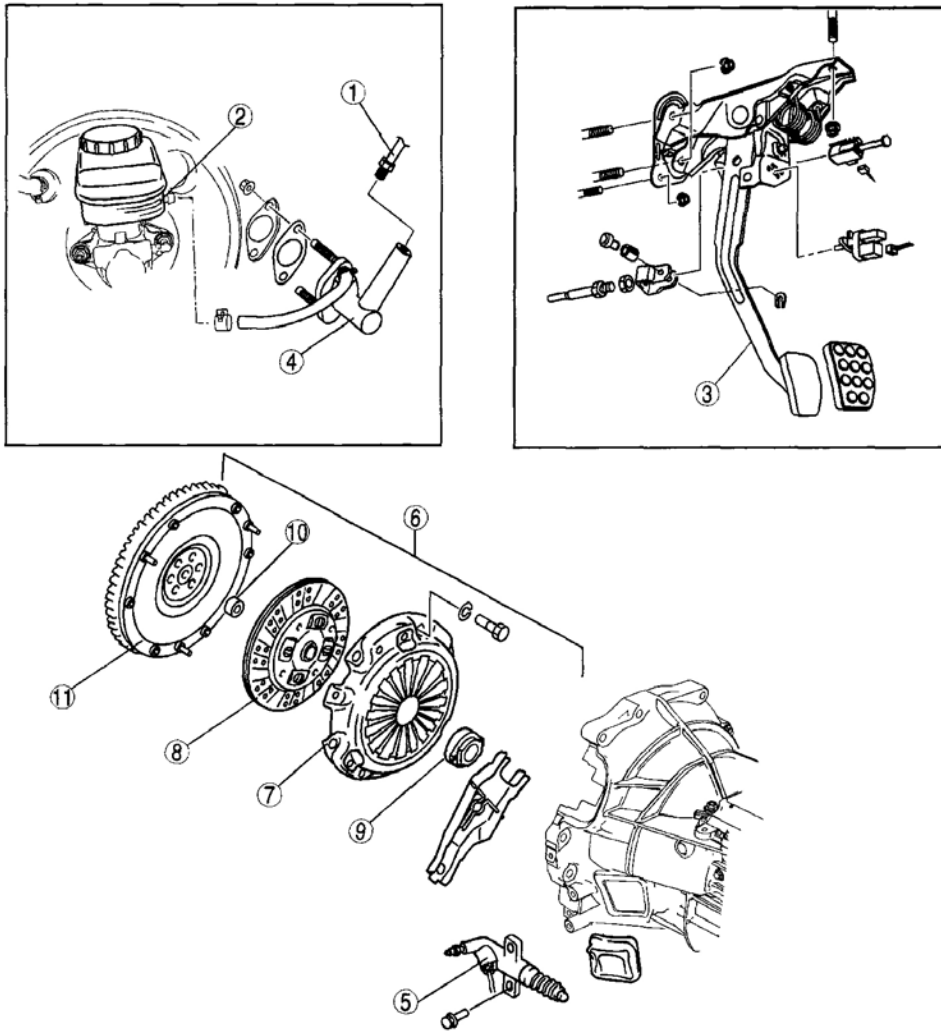
**2007 TRANSMISSION**

**Clutch - MX-5 Miata**

**CLUTCH LOCATION INDEX**

# 2007 Mazda MX-5 Miata Sport

## 2007 TRANSMISSION Clutch - MX-5 Miata



1	Clutch pipe
2	Brake fluid reservoir tank
3	Clutch pedal
4	Clutch master cylinder
5	Clutch release cylinder
6	Clutch unit
7	Clutch cover
8	Clutch disc
9	Clutch release collar
10	Pilot bearing
11	Flywheel

E5U510ZW5001

**Fig. 1: Identifying Location Of Clutch Components**  
Courtesy of MAZDA MOTORS CORP.

## GENERAL PROCEDURES (CLUTCH)

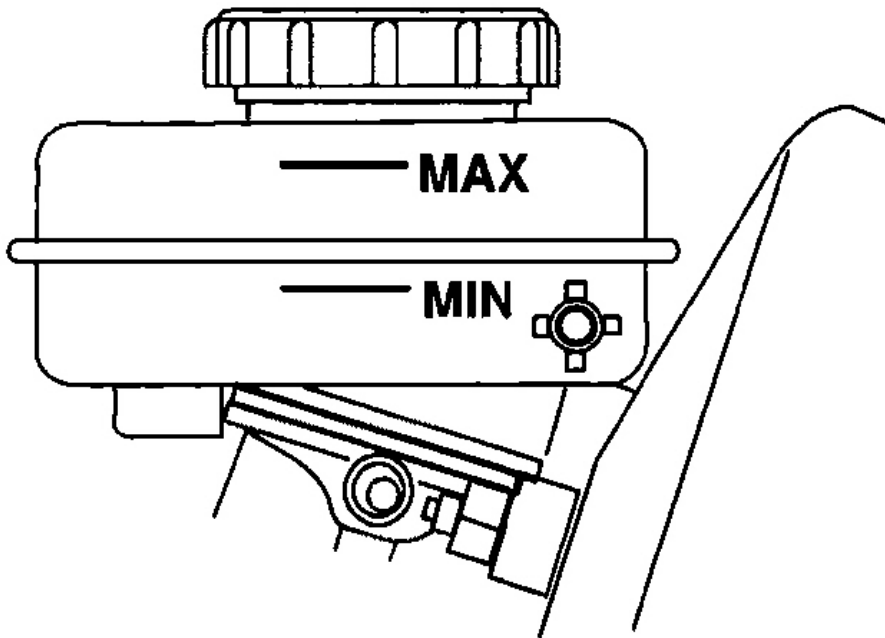
- CAUTION:**
- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.

- NOTE:**
- If any hydraulic related parts of the clutch system are removed during the procedure, add brake fluid, bleed the system and inspect for leakage after the procedure has been completed.

1. Remove the clutch pipe using the SST (49 0259 770B).
2. Install the clutch pipe using a torque wrench and the SST (49 0259 770B).

## CLUTCH FLUID INSPECTION

1. Inspect whether the fluid level in the brake fluid reservoir tank is between MIN and MAX.



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**Fig. 2: Inspecting Clutch Fluid Level**  
Courtesy of MAZDA MOTORS CORP.

## CLUTCH FLUID REPLACEMENT

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- CAUTION:**
- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.
  - Keep the fluid level in the reserve tank at 3/4 full or more during air bleeding.

- NOTE:**
- When replacing the fluid, drain the old fluid, fill the reserve tank with new fluid and then perform Steps 1 thru 6 below.

### Clutch fluid

#### SAE J1703, FMVSS 116 DOT-3

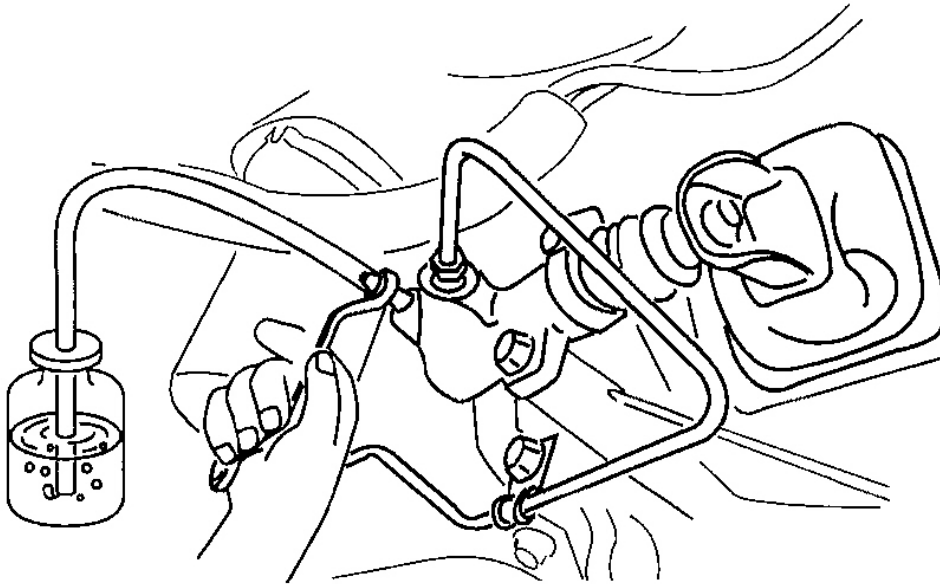
1. Remove the bleeder cap from the clutch release cylinder, and connect a vinyl hose to the bleeder plug.
2. Place the other end of the vinyl tube in a clear container, and fill fluid in the container during air bleeding.
3. Working with two people, one should depress the clutch pedal a few times and then depress and hold the pedal down.
4. While the clutch pedal is being held down, the other person should loosen the bleeder screw, and bleed any fluid containing air bubbles. Once completed, tighten the bleeder screw.
5. Continue to perform Steps 3 and 4 until no air comes from the vinyl hose.
6. Tighten the bleeder screw.

#### Tightening torque

**5.9-8.8 N.m**

**{61-89 kgf.cm, 53-77 in.lbf}**

7. Fill the reserve tank to MAX with the recommended fluid.
8. Perform the following inspections:
  - Brake operation
  - Fluid leakage
  - Fluid level



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**Fig. 3: Identifying Clutch Bleeding**  
Courtesy of MAZDA MOTORS CORP.

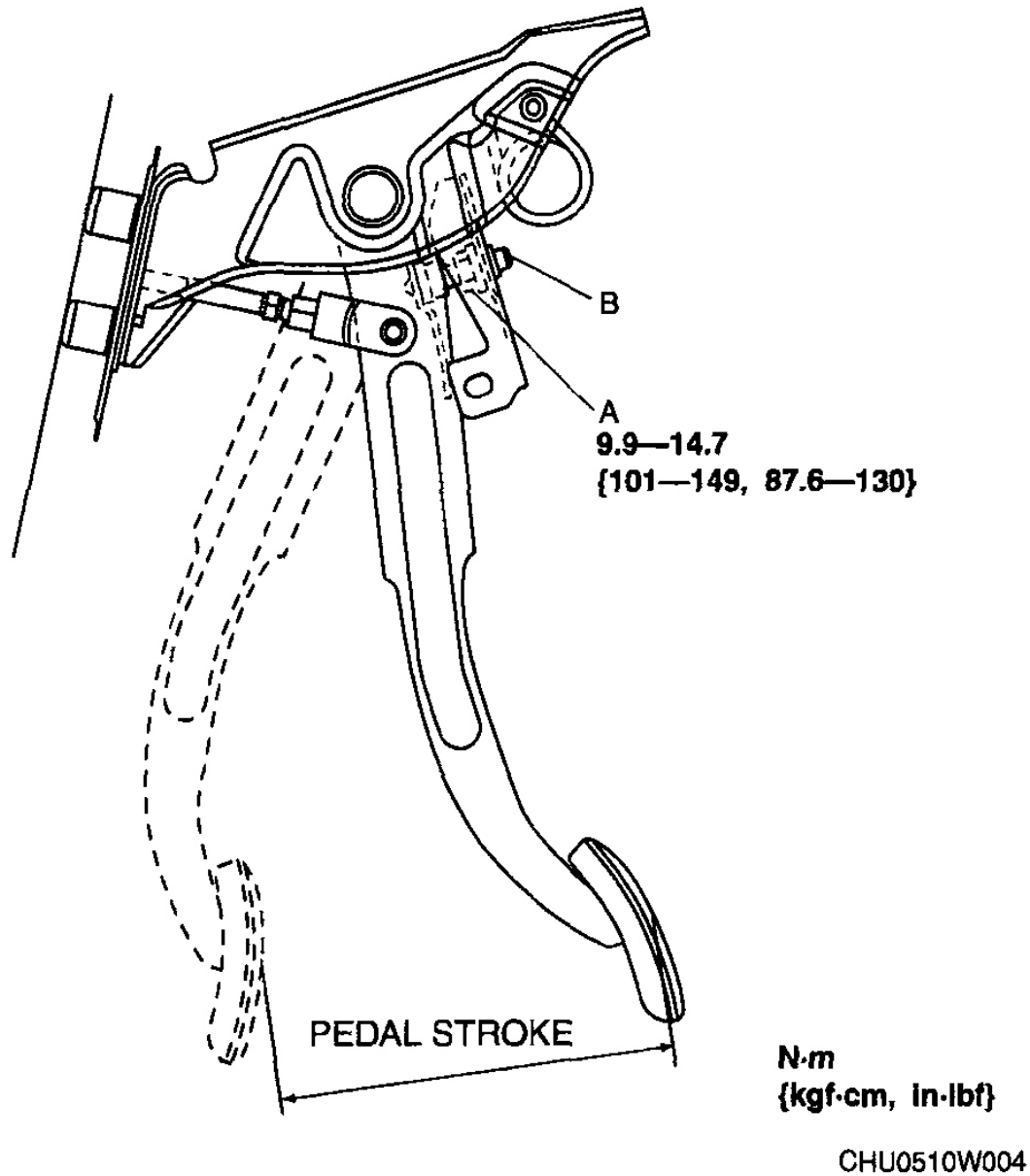
## CLUTCH PEDAL ADJUSTMENT

### CLUTCH PEDAL STROKE INSPECTION/ADJUSTMENT

1. Measure the clutch pedal stroke.
  - If there is any malfunction, loosen locknut A and adjust the pedal stroke by adjusting bolt B. Tighten locknut A after adjustment.

**Clutch pedal stroke**

**130 mm {5.12 in}**



**Fig. 4: Adjusting Clutch Pedal (With Torque Specifications)**  
Courtesy of MAZDA MOTORS CORP.

#### CLUTCH PEDAL PLAY INSPECTION/ADJUSTMENT

1. Lightly depress the clutch pedal by hand until clutch resistance is felt and then measure the pedal play.

**Clutch pedal play**

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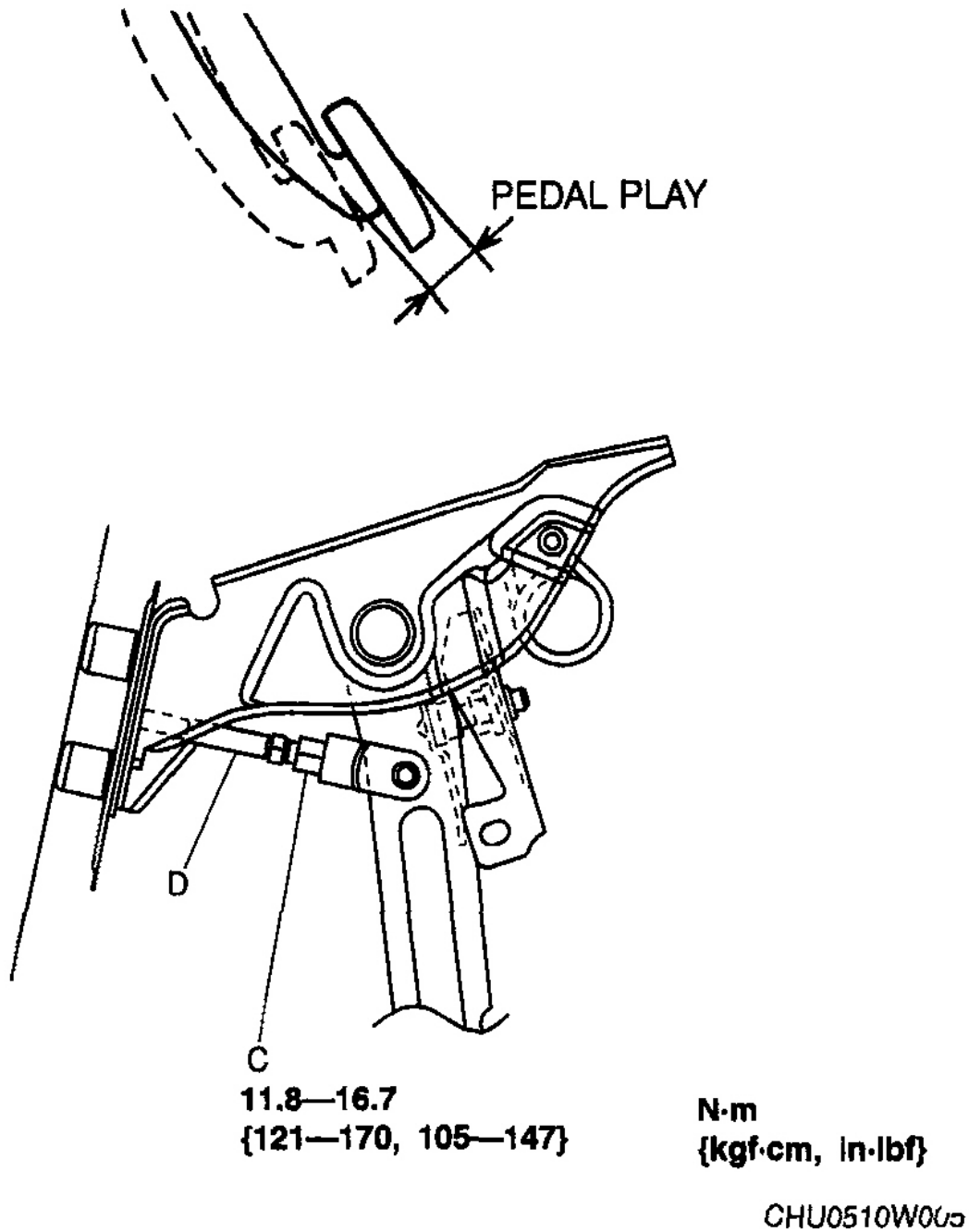
**5-15 mm {0.20-0.59 in}**

### **Clutch pedal push rod play**

**At push rod setting line: 0.1-0.5 mm {0.004-0.020 in} (Reference value)**

**At pedal pad: 0.5-2.7 mm {0.020-0.106 in}**

- 
2. If it is not within the specification, loosen locknut C and turn push rod D to adjust the pedal play.
3. Remeasure the pedal play and, if it is within the specification, tighten locknut C.



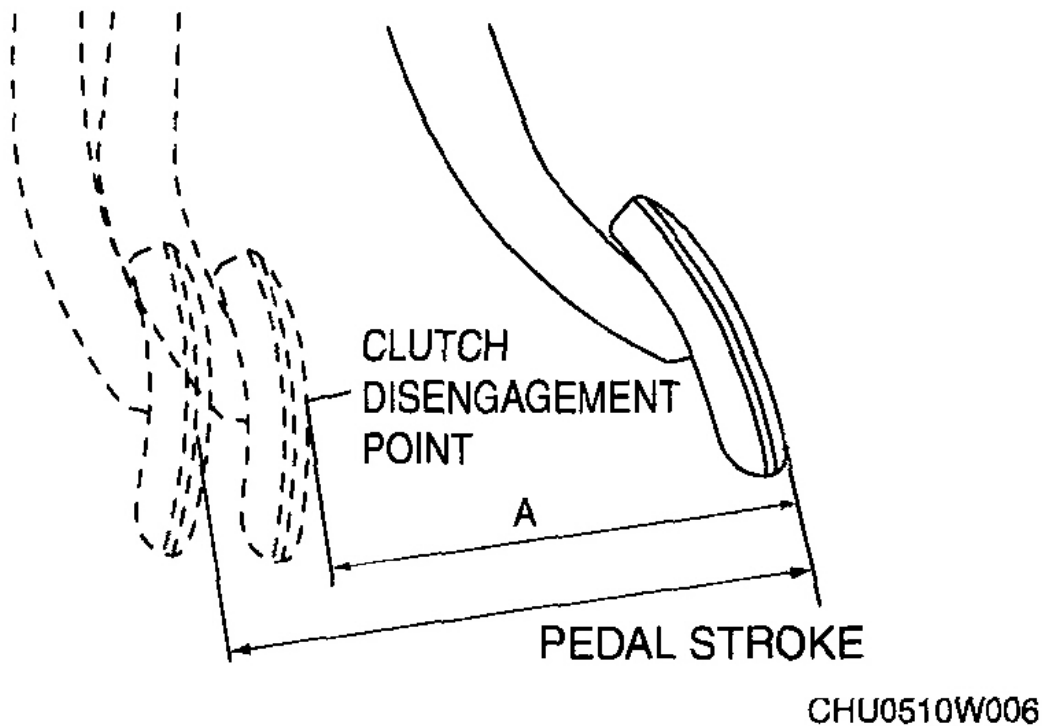
**Fig. 5: Inspecting Clutch Pedal Play (With Torque Specifications)**  
Courtesy of MAZDA MOTORS CORP.



1. Start the engine.
2. Without depressing the clutch pedal, move the shift lever slowly to the reverse position until gear noise is heard and hold the lever in that position.
3. Slowly depress the clutch pedal and hold at the point where the gear noise stops (clutch disengagement point).
4. Measure distance A (from pedal not depressed to clutch disengagement point) and verify that it is within the specification.

**Clutch disengagement stroke (Reference value)**

**A: 80-110 mm {3.15-4.33 in}**



**Fig. 6: Inspecting Clutch Disengagement Point**  
Courtesy of MAZDA MOTORS CORP.

**CLUTCH SWITCH INSPECTION**

1. Remove the engine cover.
2. Remove the battery cover.

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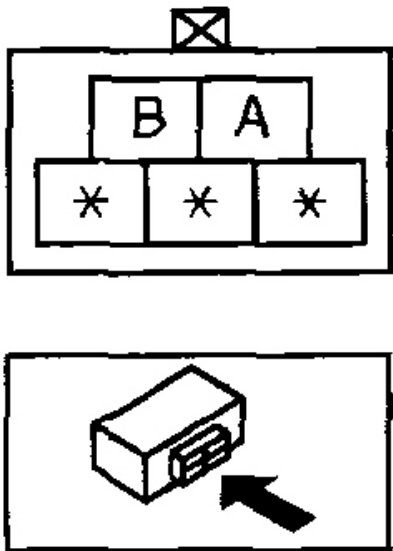
- 3. Disconnect the negative battery cable.
- 4. Disconnect the clutch switch connector.
- 5. Verify continuity as indicated in **Fig. 7**.

○—○ : Continuity

Condition	Terminal	
	A	B
Clutch pedal depressed	○—○	○—○
Clutch pedal released		

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**Fig. 7: Clutch Switch Continuity Table**  
Courtesy of MAZDA MOTORS CORP.



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**Fig. 8: Identifying Clutch Switch Connector**  
Courtesy of MAZDA MOTORS CORP.

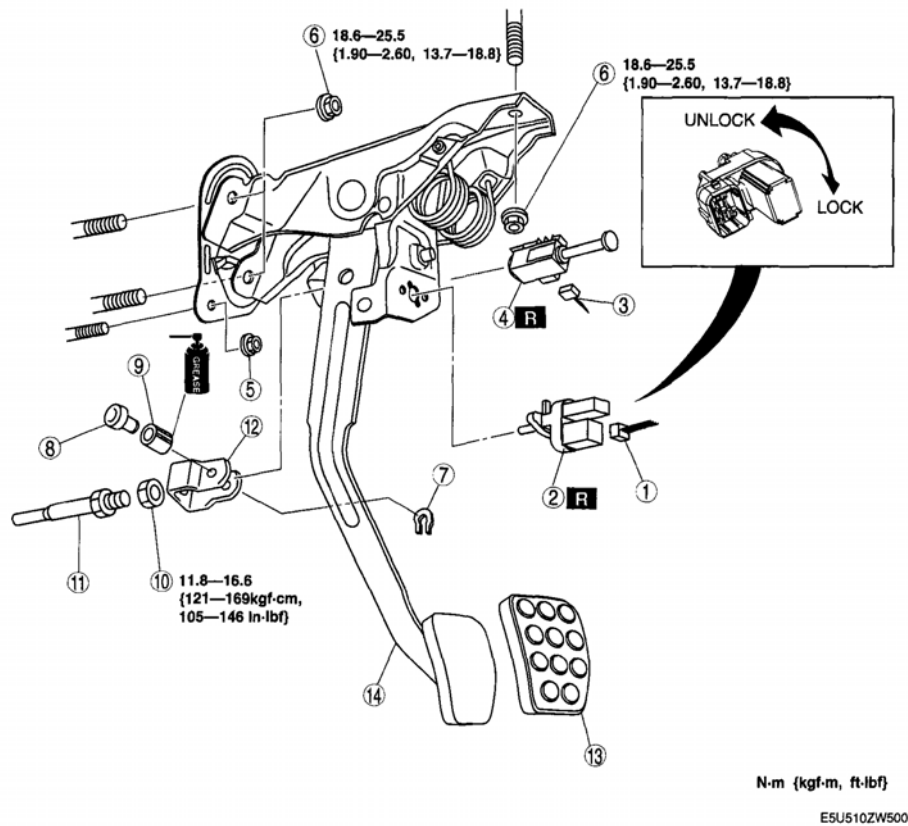
- If there is any malfunction, replace the clutch switch.

## **CLUTCH PEDAL REMOVAL/INSTALLATION**

1. Remove in the order indicated in **Fig. 9**.
2. Install in the reverse order of removal.
3. Inspect and adjust the clutch pedal. (See **CLUTCH PEDAL ADJUSTMENT** .)

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1	Clutch switch connector
2	Clutch switch
3	Starter interlock switch connector
4	Starter interlock switch
5	Nut cap
6	Nut

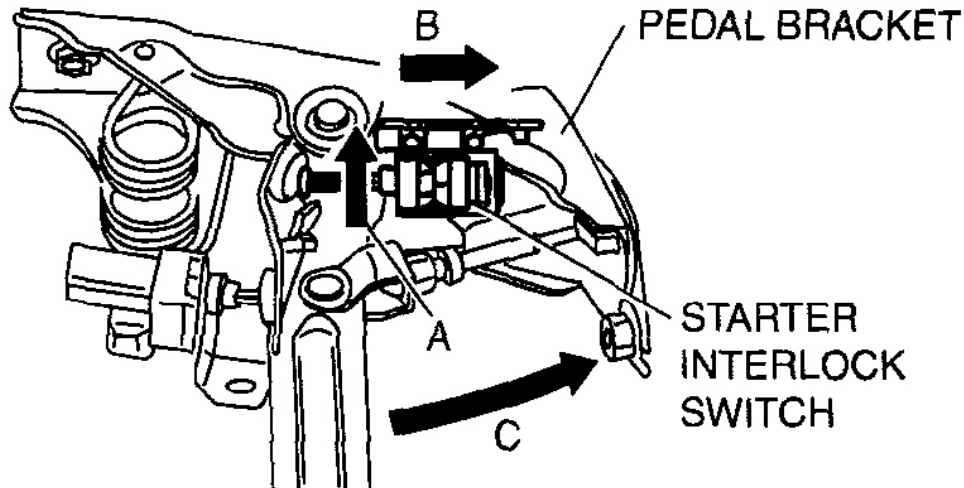
7	Retaining ring
8	Joint pin
9	Bush
10	Nut
11	Push rod
12	Fork
13	Pedal pad
14	Clutch pedal component

**Fig. 9: Identifying Clutch Pedal Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

#### STARTER INTERLOCK SWITCH INSTALLATION NOTE

**CAUTION:** • If the rod is pushed in, it may not operate properly. Be careful not to push the rod in when installing the starter interlock switch.

1. Insert a new starter interlock switch into the pedal bracket hole in direction A.
2. While pushing the starter interlock switch in direction A, slide it in direction B until it locks securely.
3. Move the clutch to a fully open stroke in direction C and securely fit the terminal of the starter interlock switch.



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**Fig. 10: Identifying Starter Interlock Switch And Pedal Bracket**  
Courtesy of MAZDA MOTORS CORP.

## CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

**CAUTION:** • Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If it is spilled, wipe it off immediately.

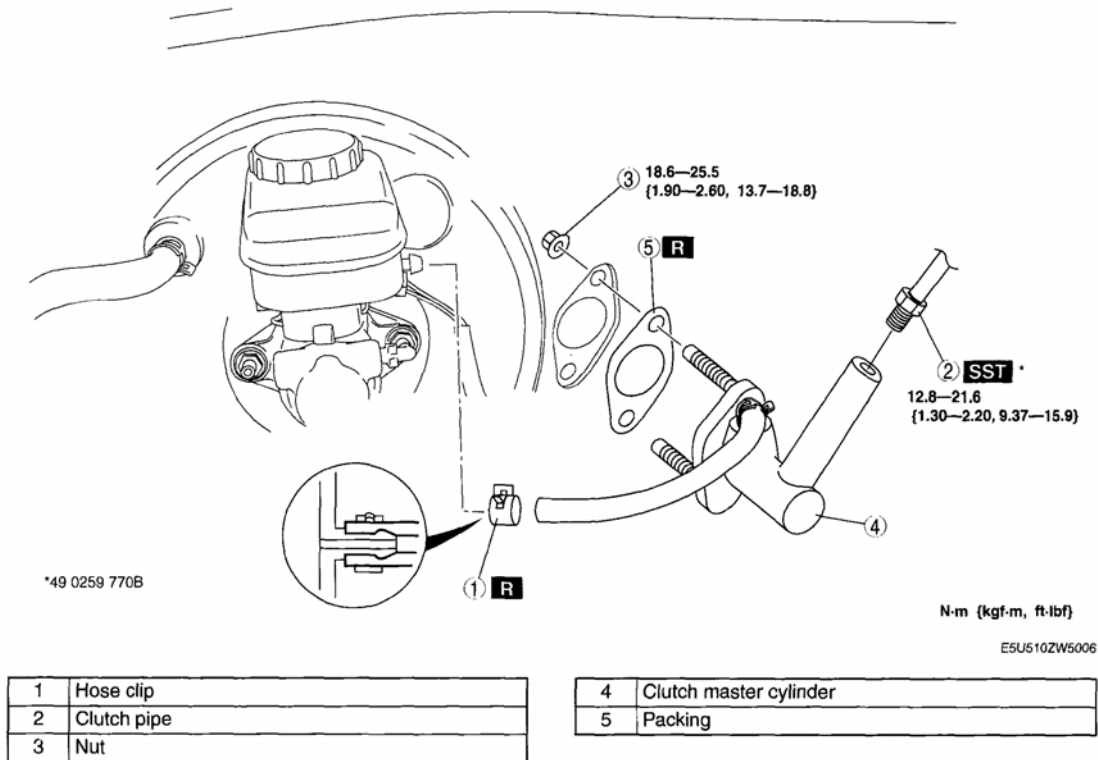
1. Remove in the order indicated in **Fig. 11** .
2. Install in the reverse order of removal.
3. Bleed the air from the system.

(See **CLUTCH FLUID REPLACEMENT** .)

4. Inspect and adjust the clutch pedal. (See **CLUTCH PEDAL ADJUSTMENT** .)

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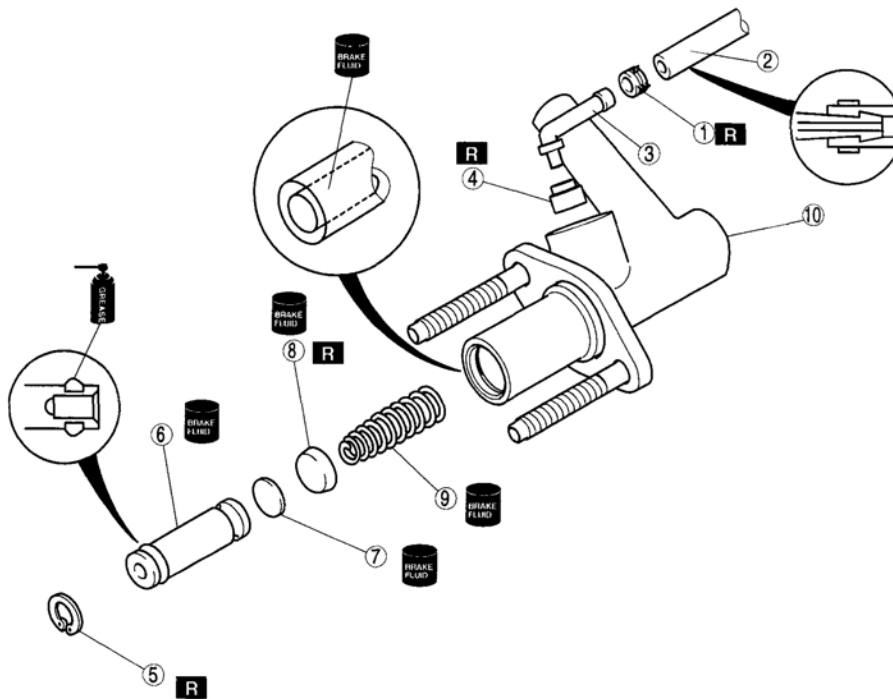
**Fig. 11: Identifying Clutch Master Cylinder Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

## CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in **Fig. 12** .
2. Assemble in the reverse order of disassembly.

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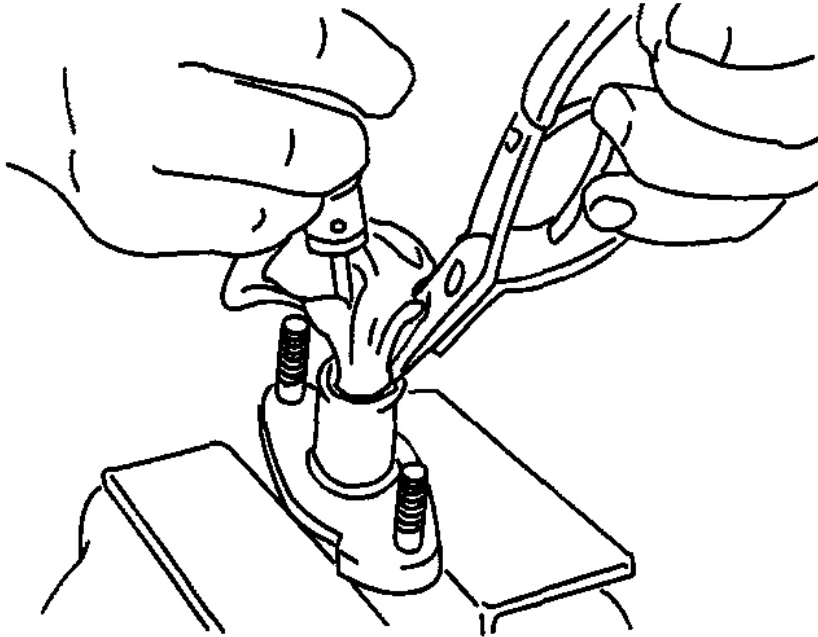
1	Hose clip
2	Reserve tank hose
3	Joint
4	Bushing
5	Snap ring

6	Piston, secondary cup component
7	Spacer
8	Primary cup
9	Return spring
10	Clutch master cylinder body

**Fig. 12: Exploded View Of Clutch Master Cylinder Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

#### SNAP RING DISASSEMBLY/ASSEMBLY NOTE

1. While pressing the piston in with a cloth-wrapped pin punch to protect the push rod contacting surface, remove/install the snap ring.



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**Fig. 13: Removing Snap Ring**  
Courtesy of MAZDA MOTORS CORP.

## CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

- CAUTION:**
- Fluid will damage painted surfaces. Be careful not to spill any fluid on painted surfaces. If fluid does get on painted surfaces, wipe it off immediately.

1. Remove in the order indicated in **Fig. 14**.
2. Install in the reverse order of removal.
3. Bleed the air from the system.

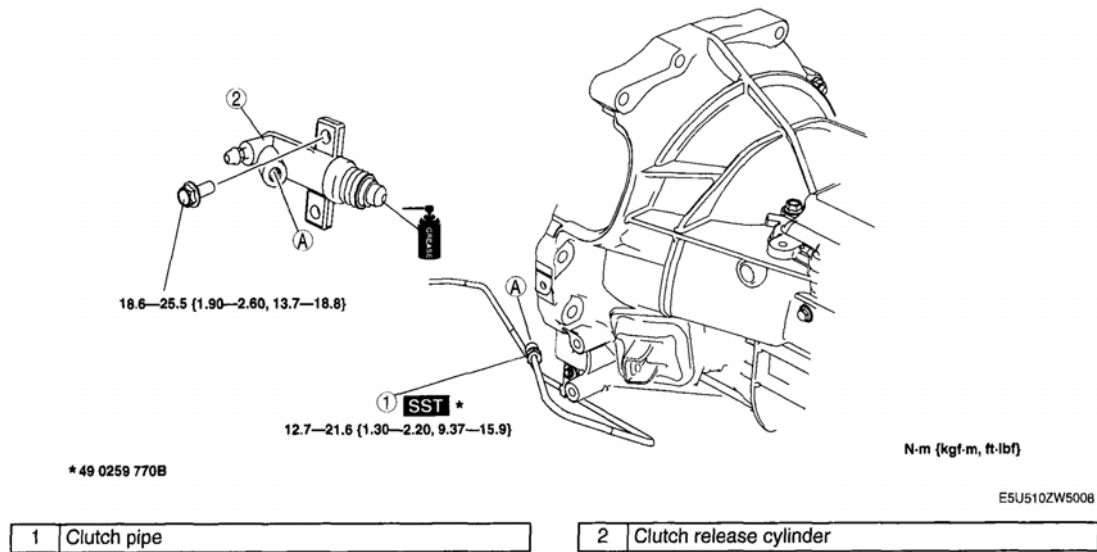
(See **CLUTCH FLUID REPLACEMENT** .)

4. Inspect and adjust the clutch pedal. (See **CLUTCH PEDAL ADJUSTMENT** .)



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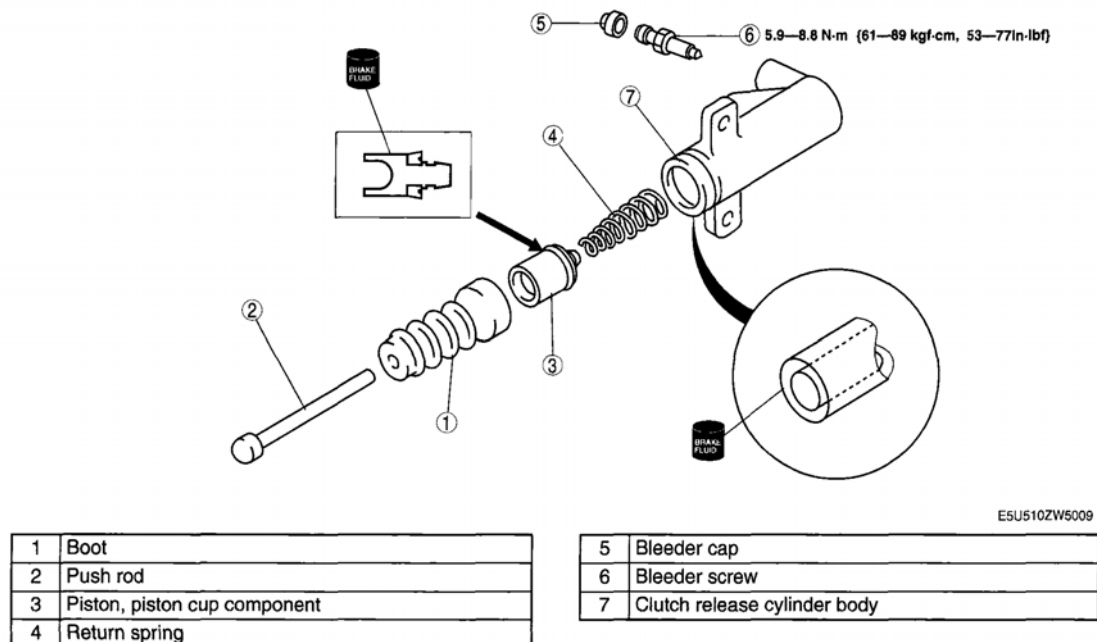
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**Fig. 14: Identifying Clutch Release Cylinder Components (With Torque Specifications)**  
 Courtesy of MAZDA MOTORS CORP.

### CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in **Fig. 15** .
2. Assemble in the reverse order of disassembly.

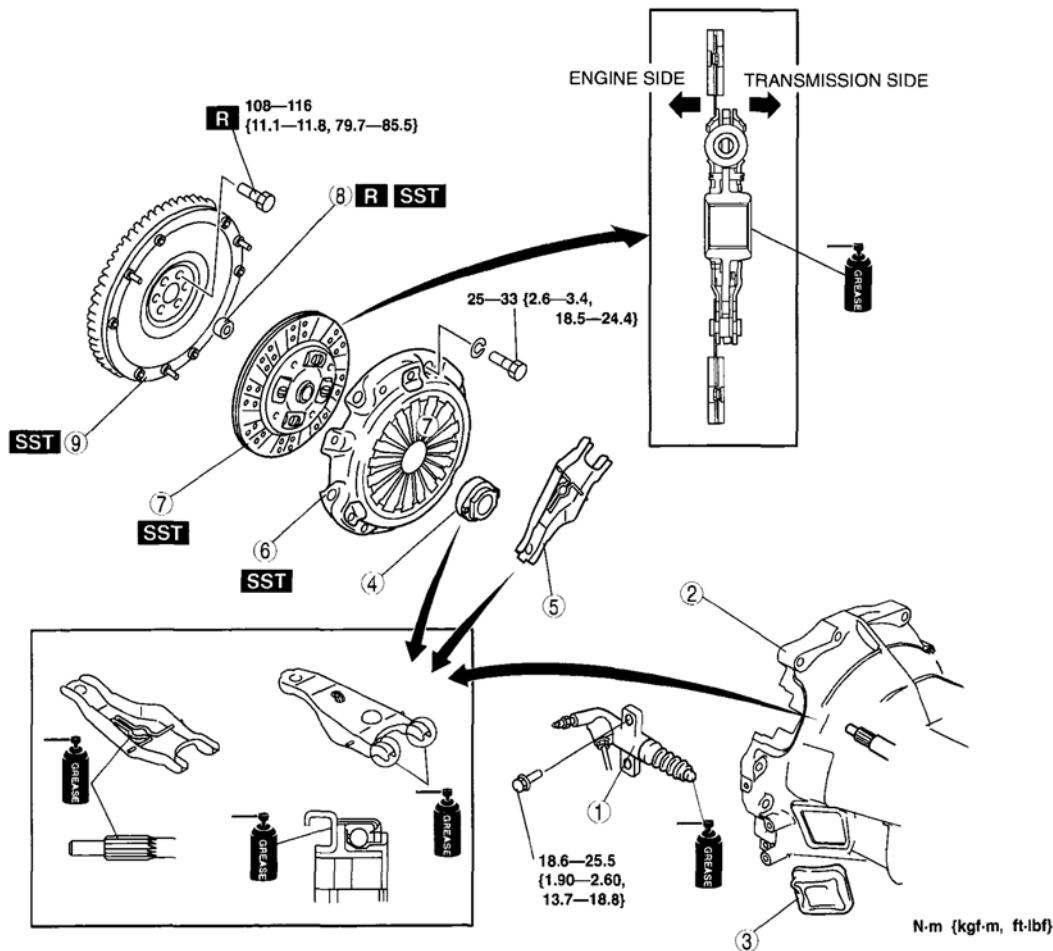


**Fig. 15: Exploded View Of Clutch Release Cylinder Components (With Torque Specifications)**

Courtesy of MAZDA MOTORS CORP.

## CLUTCH UNIT REMOVAL/INSTALLATION

1. Remove in the order indicated in **Fig. 16**.
2. Install in the reverse order of removal.



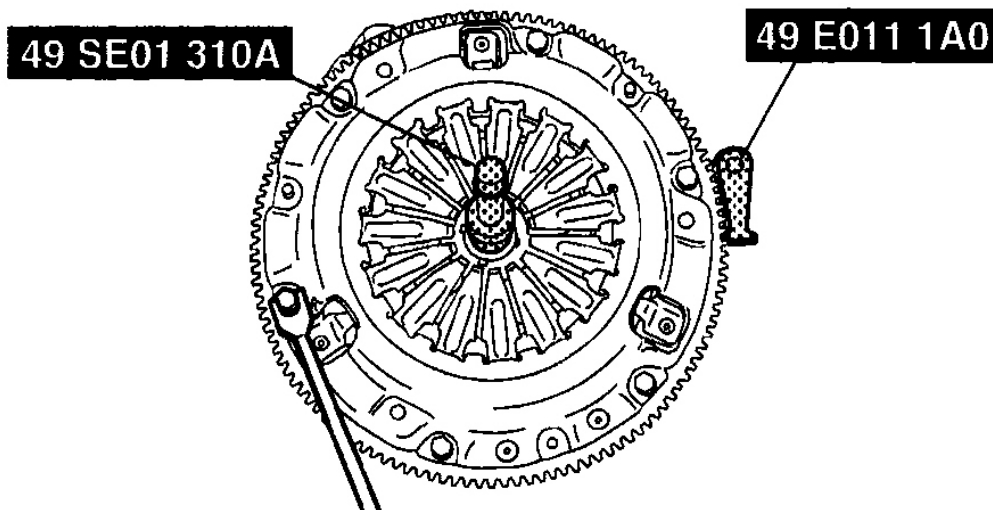
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1	Clutch release cylinder
2	Manual transmission
3	Boot
4	Clutch release collar
5	Clutch release fork
6	Clutch cover
7	Clutch disc
8	Pilot bearing
9	Flywheel

**Fig. 16: Identifying Clutch Unit Components (With Torque Specifications)**  
Courtesy of MAZDA MOTORS CORP.

**CLUTCH COVER AND DISC REMOVAL NOTE**

1. Install the SSTs.
2. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.
3. Remove the clutch cover and disc.



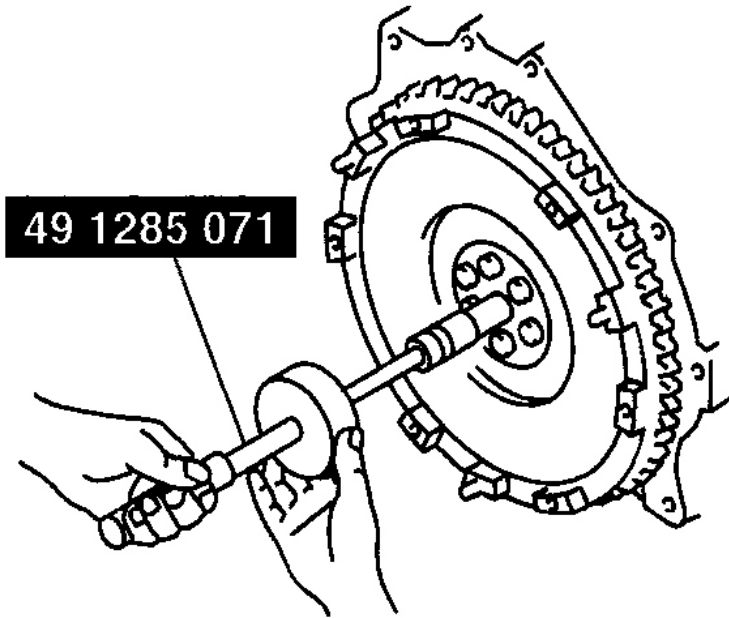
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**Fig. 17: Identifying SSTs**  
Courtesy of MAZDA MOTORS CORP.

**PILOT BEARING REMOVAL NOTE**

**NOTE:**                      • The pilot bearing does not need to be removed unless you are replacing it.

1. Use the SST to remove the pilot bearing.



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**Fig. 18: Removing Pilot Bearing Using SST**  
Courtesy of MAZDA MOTORS CORP.

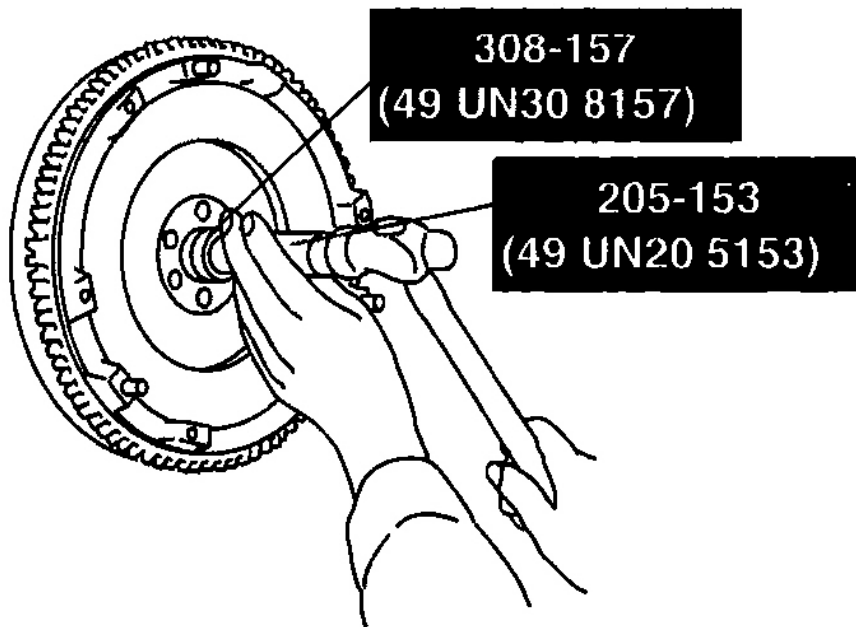
**PILOT BEARING INSTALLATION NOTE**

1. Install the pilot bearing using the corresponding 20mm {0.79} side of a Snap-on brand millimeter size bushing driver set A160M adapter A160M7 (20-22 mm {0.79-0.86 in}) or substitution tool.

**Substitution tool**

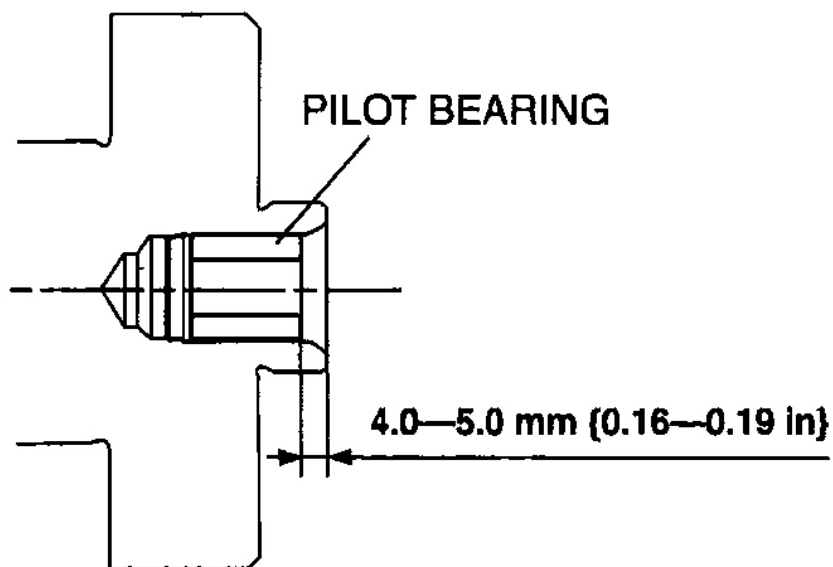
**Outer diameter: 21 mm {0.83 in}**

**Inner diameter: 19 mm {0.75 in}**



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**Fig. 19: Installing Pilot Bearing Using SSTs**  
Courtesy of MAZDA MOTORS CORP.

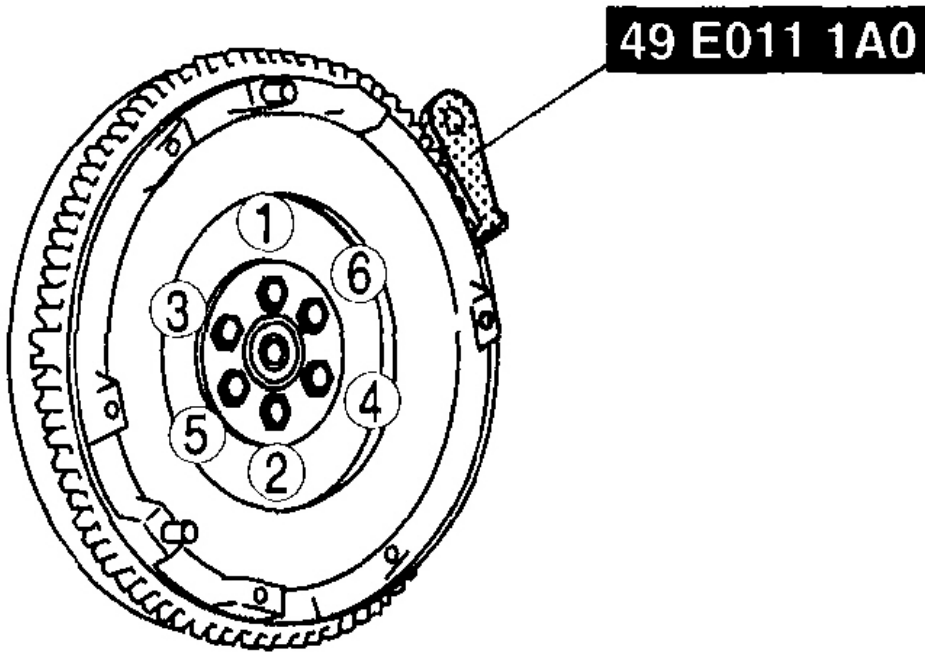


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**Fig. 20: Identifying Pilot Bearing Installation Dimension**  
Courtesy of MAZDA MOTORS CORP.

#### **FLYWHEEL REMOVAL NOTE**

1. Hold the flywheel using the SST.
2. Remove the bolts evenly and gradually in a crisscross pattern.



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**Fig. 21: Identifying Flywheel Bolts Removing Sequence**  
Courtesy of MAZDA MOTORS CORP.

3. Remove the flywheel.
4. Inspect for oil leakage from the crankshaft rear oil seal.
  - If there is any malfunction, replace the crankshaft rear oil seal. (See **REAR OIL SEAL REPLACEMENT [LF]** .)

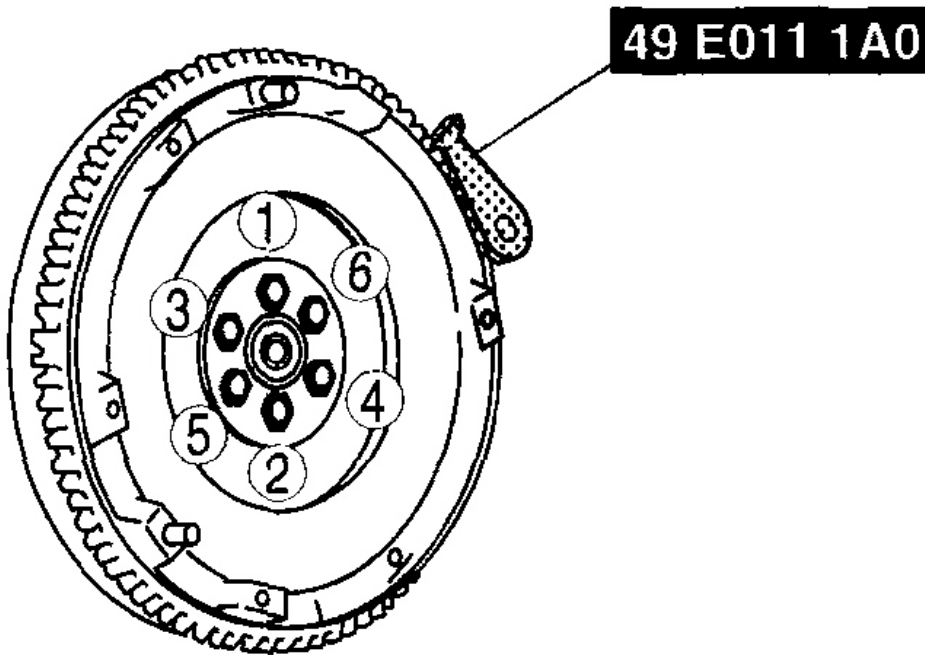
#### **FLYWHEEL INSTALLATION NOTE**

1. Clean the crankshaft thread holes.
2. Install the flywheel to the crankshaft.
3. Hand-tighten the flywheel lock bolts.
4. Install the **SST** to the flywheel.
5. Gradually tighten the flywheel lock bolts in a crisscross pattern.

**Tightening torque**

108-116 N.m

{11.1-11.8 kgf.m, 79.7-85.5 ft.lbf}



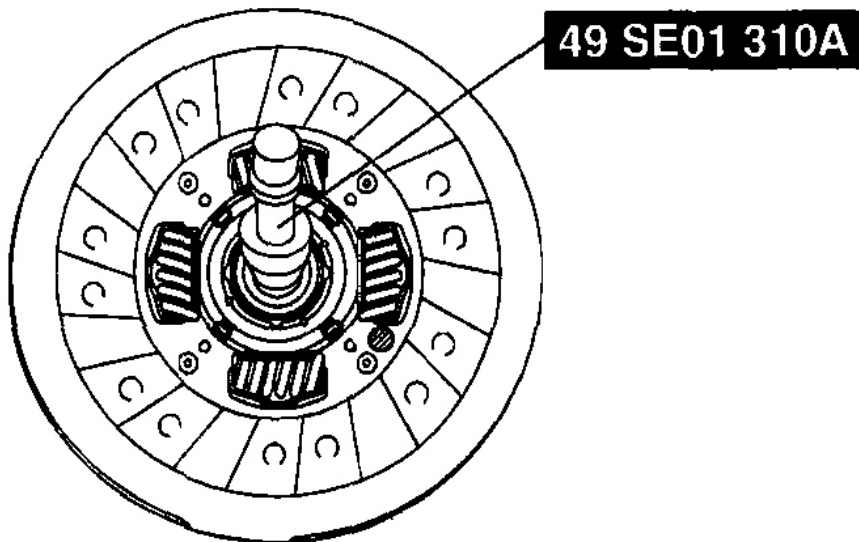
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**Fig. 22: Identifying Flywheel Bolts Tightening Sequence**  
Courtesy of MAZDA MOTORS CORP.

#### CLUTCH DISC INSTALLATION NOTE

1. Hold the clutch disc position using the SST.





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**Fig. 23: Holding Clutch Disc Position Using SST**  
Courtesy of MAZDA MOTORS CORP.

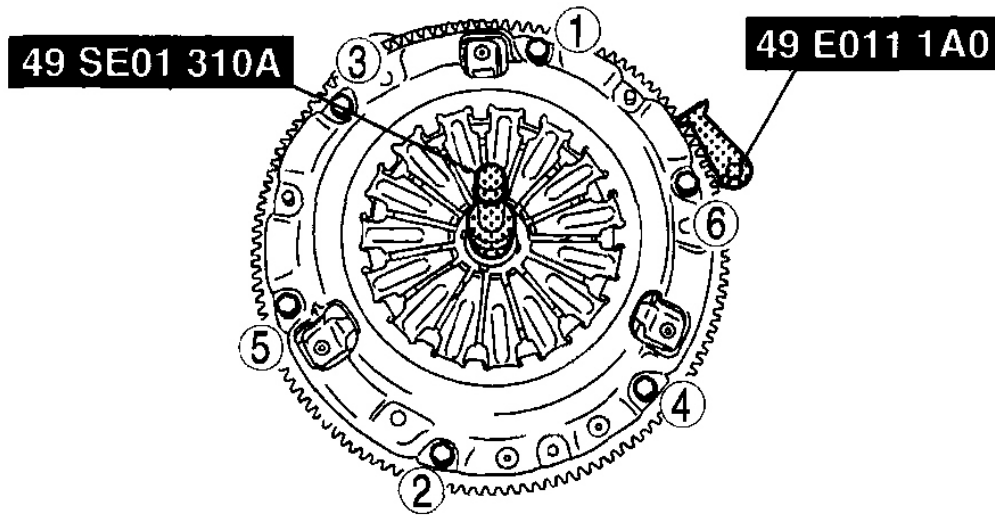
#### CLUTCH COVER INSTALLATION NOTE

1. Install the SSTs.
2. Tighten the bolts evenly and gradually in a crisscross pattern.

#### Tightening torque

25.0-33.0 N.m

{2.6-3.4 kgf.m, 18.5-24.4 ft.lbf}



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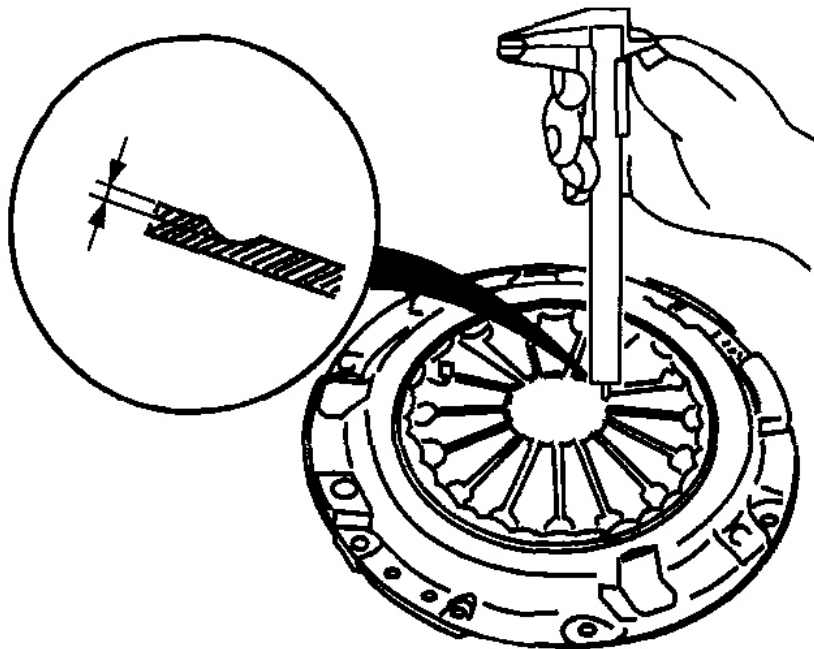
**Fig. 24: Identifying Clutch Cover Bolts Tightening Sequence**  
Courtesy of MAZDA MOTORS CORP.

## CLUTCH COVER INSPECTION

1. Measure the wear of the diaphragm spring fingers.
  - If it exceeds the maximum specification, replace the clutch cover.

**Clutch disc maximum depth**

**0.6 mm {0.024 in}**



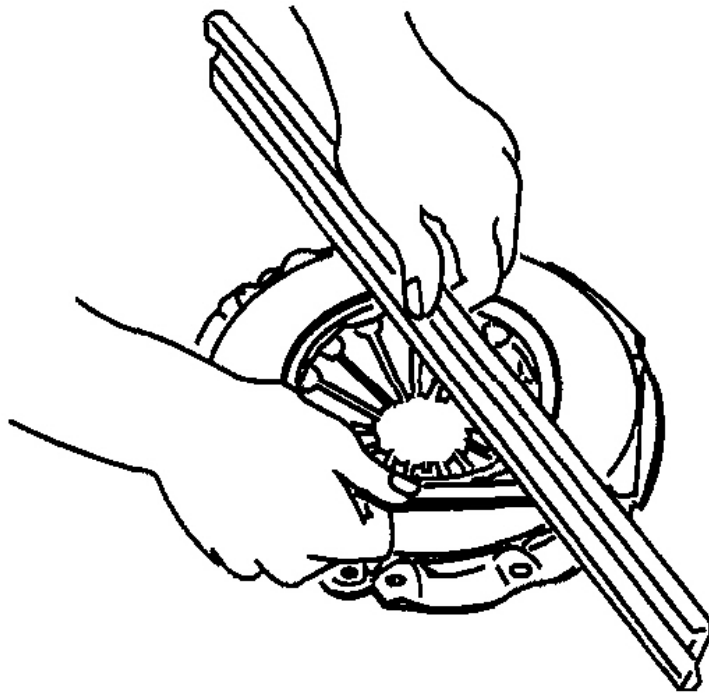
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**Fig. 25: Measuring Wear Of Diaphragm Spring Fingers**  
Courtesy of MAZDA MOTORS CORP.

2. Measure the flatness of the pressure plate with a straight edge and a feeler gauge.
  - If it exceeds the maximum specification, replace the clutch cover.

**Clutch cover maximum clearance**

**0.5 mm {0.020 in}**



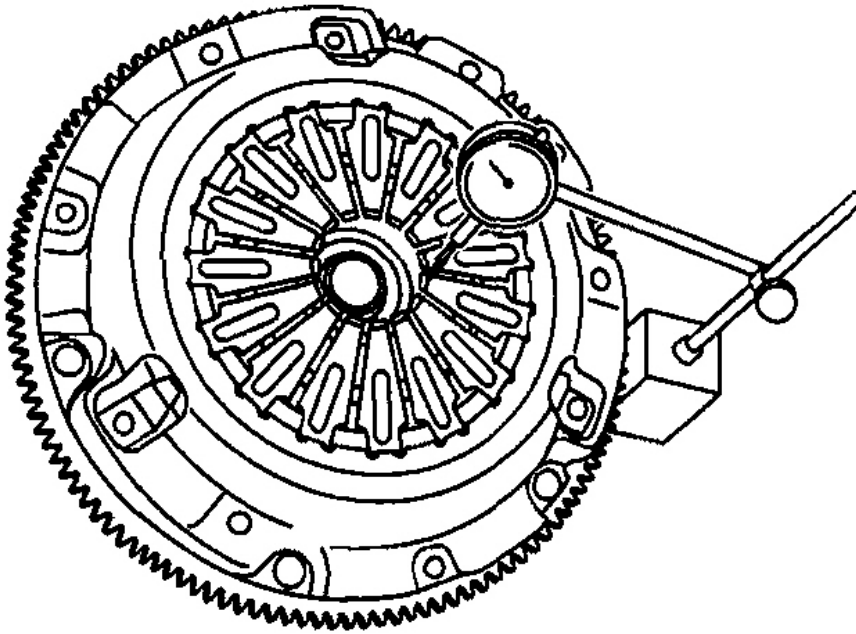
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**Fig. 26: Measuring Flatness Of Pressure Plate With Straight Edge & Feeler Gauge**  
Courtesy of MAZDA MOTORS CORP.

3. When checking the diaphragm spring fingers, mount a dial indicator on the cylinder block.
4. Rotate the flywheel and check for misaligned diaphragm spring fingers.
  - If it exceeds the maximum specification, replace the clutch cover.

**Clutch cover maximum height difference**

**1.0 mm {0.039 in}**



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**Fig. 27: Measuring Clutch Cover Height Difference**  
Courtesy of MAZDA MOTORS CORP.

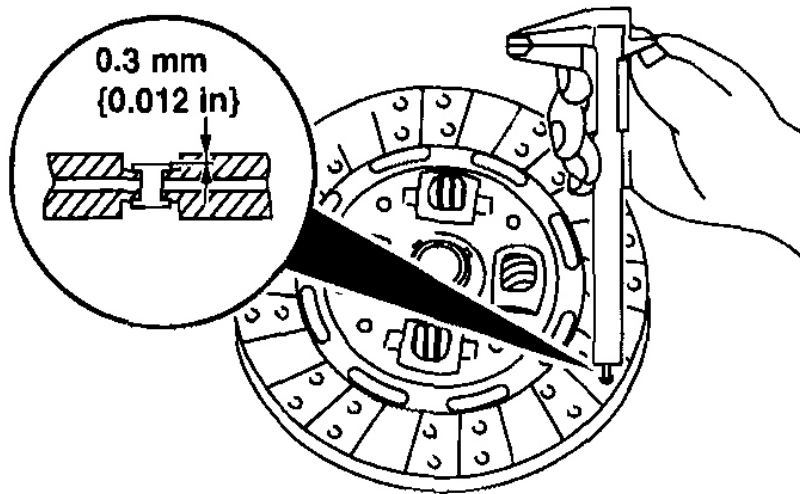
## CLUTCH DISC INSPECTION

1. Remove the clutch disc.
2. Inspect the lining surface for discoloration and grease/oil contamination.
3. Inspect the torsion spring for weakness and the rivet for looseness.
4. Using a vernier caliper, measure the depth between the lining surface and the rivet head.

### Clutch disc minimum depth

**0.3 mm {0.012 in}**

- If it is less than the minimum specification, replace the clutch disc.



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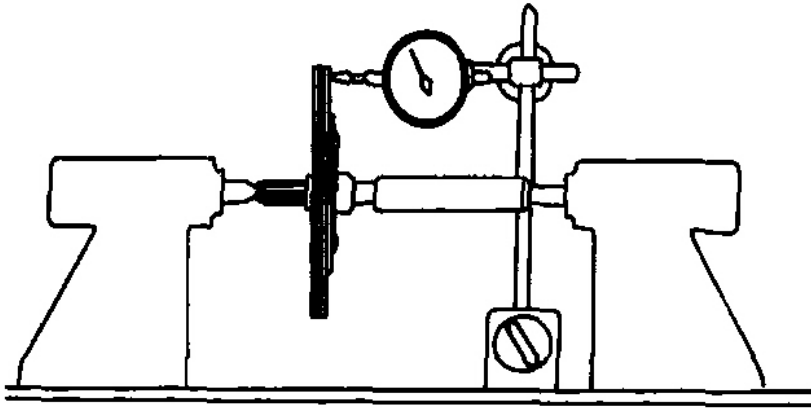
**Fig. 28: Measuring Clutch Disc Minimum Depth Using Vernier Caliper**  
Courtesy of MAZDA MOTORS CORP.

5. Measure the clutch disc runout using a dial gauge.

**Clutch disc maximum runout**

**0.7 mm {0.028 in}**

- If it exceeds the maximum specification, replace the clutch disc.



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**Fig. 29: Measuring Clutch Disc Maximum Runout Using Dial Gauge**  
Courtesy of MAZDA MOTORS CORP.

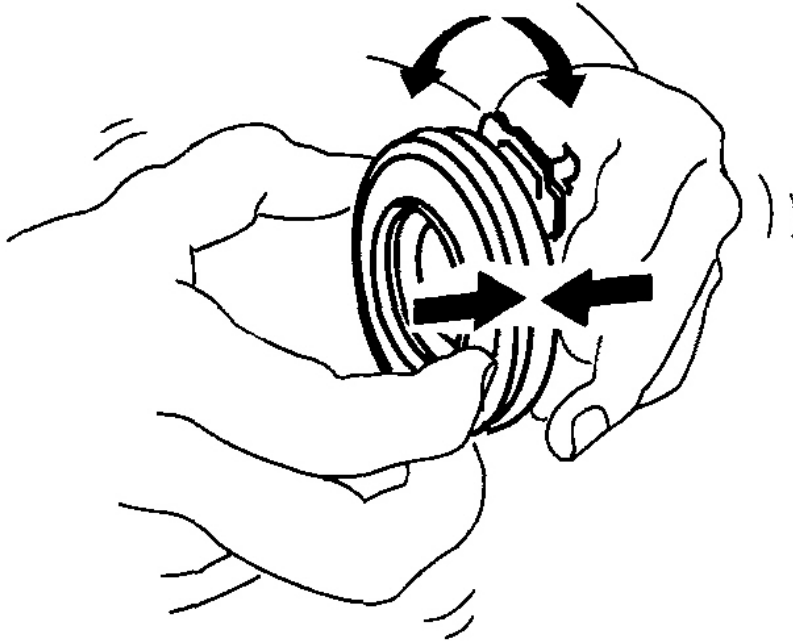
6. Install the clutch disc.

## CLUTCH RELEASE COLLAR INSPECTION

**CAUTION:**

- Do not clean the clutch release collar with cleaning fluids or a steam cleaner because it is filled with grease.

1. Remove the clutch release collar.
2. Turn the collar while applying force in the axial direction, and inspect for sticking, excessive resistance, and an abnormal noise.
  - If there is any malfunction, replace the clutch release collar.



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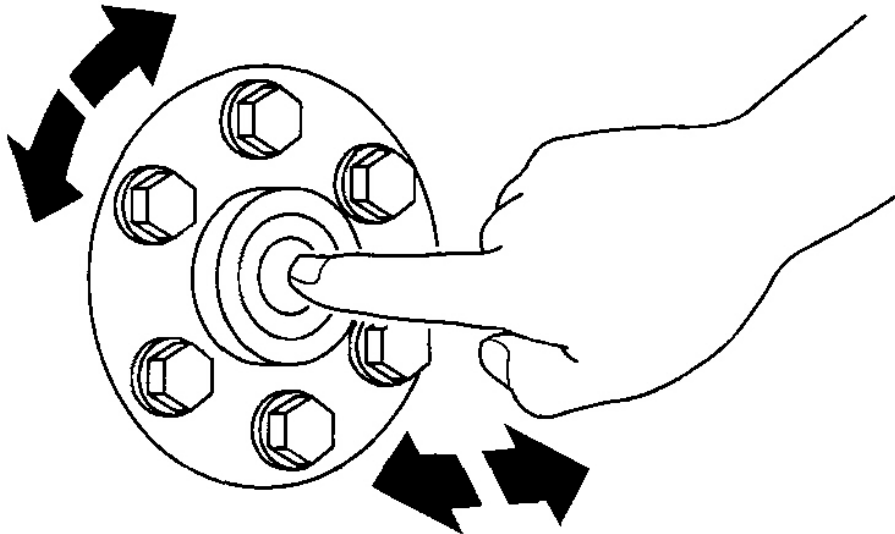
**Fig. 30: Inspecting Clutch Release Collar**  
Courtesy of MAZDA MOTORS CORP.

3. Install the clutch release collar.

## **PILOT BEARING INSPECTION**

1. Without removing the pilot bearing, turn the bearing while applying force in the axial direction.
  - If there is any malfunction, replace the pilot bearing.





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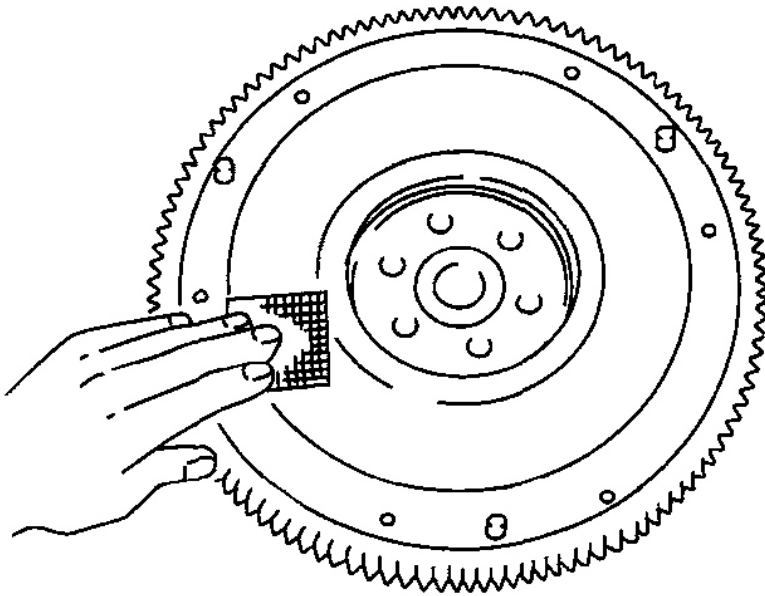
**Fig. 31: Inspecting Pilot Bearing**  
Courtesy of MAZDA MOTORS CORP.

## FLYWHEEL INSPECTION

1. Remove the flywheel.

**NOTE:**

- Correct slight scratches and discoloration using sandpaper.
- Inspect the runout of the surface that contacts the clutch disc with the flywheel installed to the crankshaft.



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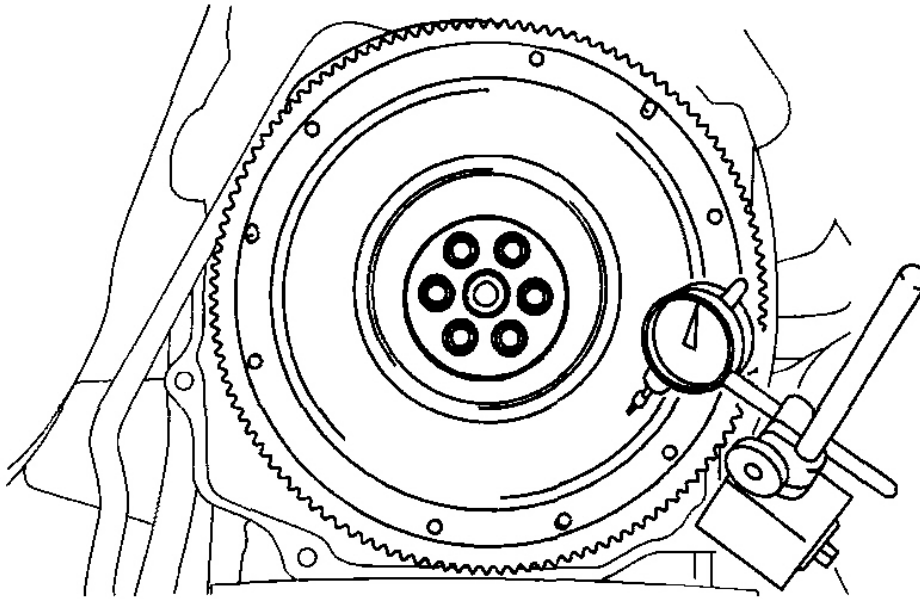
**Fig. 32: Correcting Slight Scratches Using Sandpaper**  
Courtesy of MAZDA MOTORS CORP.

2. Inspect the surface that contacts the clutch disc for scratches, nicks, and discoloration.
3. Inspect the ring gear teeth for damage and wear.
4. Install the flywheel.
5. Measure the runout of the surface that contacts the clutch disc using a dial gauge.

**Flywheel maximum runout**

**0.1 mm {0.004 in}**

- If it exceeds the maximum specification, replace the flywheel.



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**Fig. 33: Measuring Flywheel Maximum Runout Using Dial Gauge**  
Courtesy of MAZDA MOTORS CORP.