

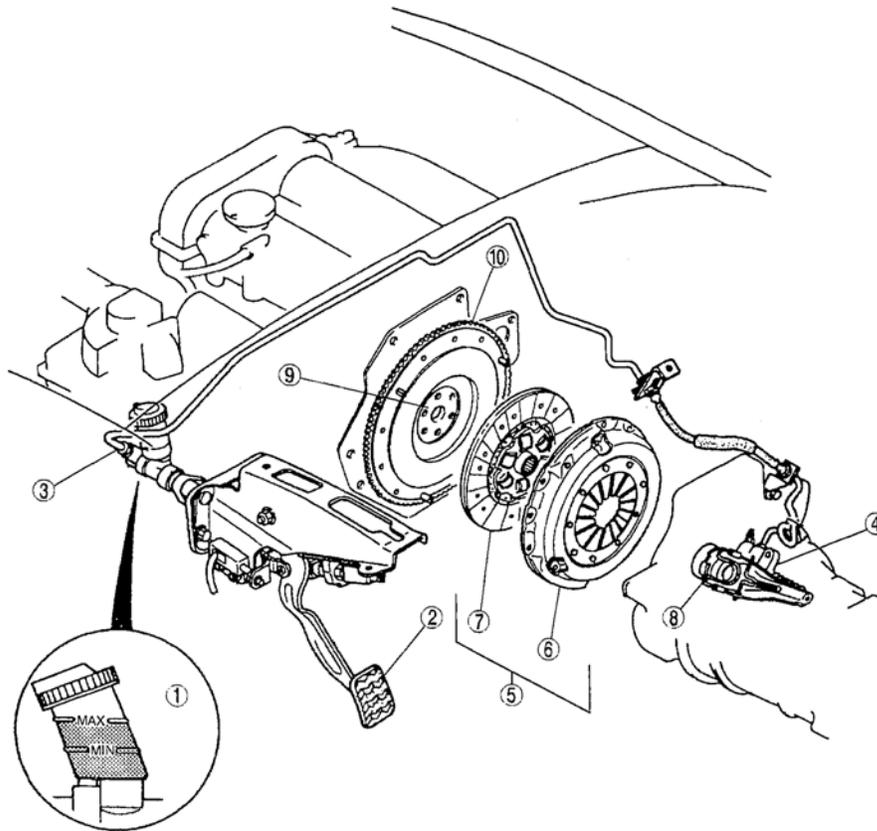
2005 Mazda MX-5 Miata

2005 TRANSMISSION Clutch - MX-5 Miata

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Clutch - MX-5 Miata

CLUTCH COMPONENT LOCATION INDEX



1	Clutch fluid (See CLUTCH FLUID INSPECTION) (See CLUTCH FLUID REPLACEMENT) (See CLUTCH FLUID AIR BLEEDING)
2	Clutch pedal (See CLUTCH PEDAL INSPECTION) (See CLUTCH PEDAL ADJUSTMENT) (See CLUTCH PEDAL REMOVAL/ INSTALLATION)
3	Clutch master cylinder (See CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION) (See CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY)
4	Clutch release cylinder (See CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION) (See CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY)

5	Clutch unit (See CLUTCH UNIT REMOVAL/ INSTALLATION)
6	Clutch cover (See CLUTCH COVER INSPECTION)
7	Clutch disc (See CLUTCH DISC INSPECTION)
8	Clutch release collar (See CLUTCH RELEASE COLLAR INSPECTION)
9	Pilot bearing (See PILOT BEARING INSPECTION)
10	Flywheel (See FLYWHEEL INSPECTION)

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

GENERAL PROCEDURES (CLUTCH)

PRECAUTION

Clutch pipe

- If any clutch pipe has been disconnected anytime during the procedure, add brake fluid, bleed the air, and inspect for leakage after the procedure has been completed.
- If removing the clutch pipe, remove it using the **SST** (49 0259 770B).
- If installing the clutch pipe, change the clutch pipe tightening torque to allow use of a torque wrench-**SST** (49 0259 770B) combination, and then tighten the clutch pipe using the **SST** (49 0259 770B). (See **TORQUE FORMULAS** .)

CLUTCH FLUID INSPECTION

1. Check the fluid level is between MIN and MAX of the reservoir.
 - If the fluid level is not between MIN and MAX, fill up or drain the fluid.

CLUTCH FLUID REPLACEMENT

- CAUTION:**
- Clutch fluid will damage painted surfaces.
 - If clutch fluid does get on a painted surface, wipe it off immediately.

- NOTE:**
- Do not mix different brands of fluid.
 - Do not reuse the clutch fluid that was drained.

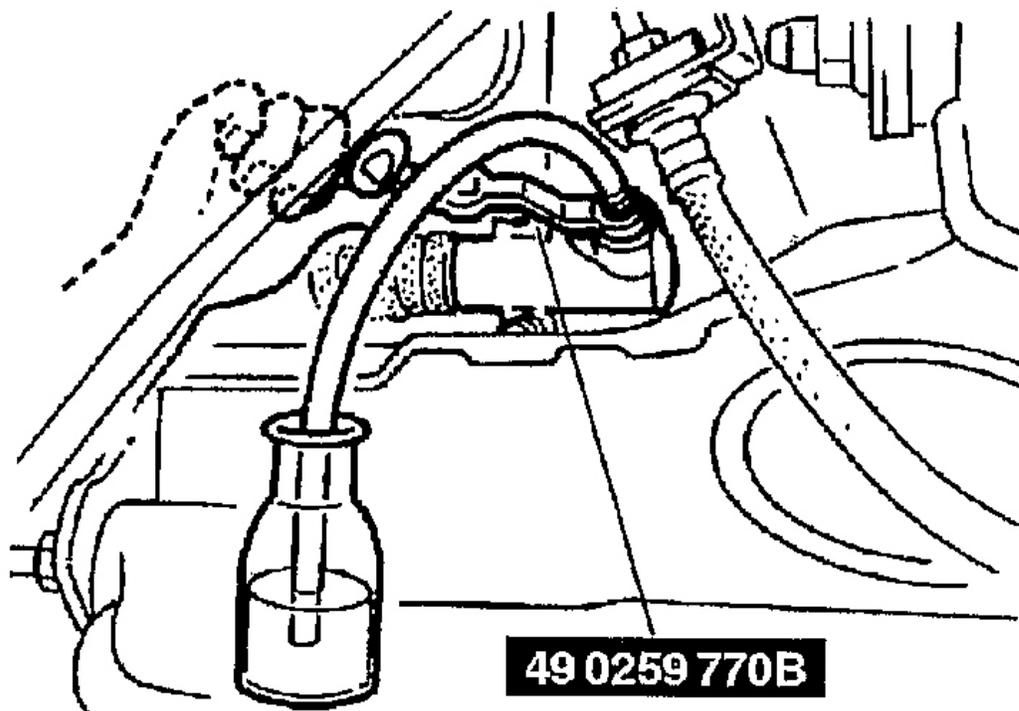
1. Drain the fluid from the reservoir using a suction pump.
2. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder screw.
3. Insert the other end of the vinyl hose into a clear container.
4. Loosen the bleeder screw using the **SST**.
5. Have an assistant slowly pump the clutch pedal and drain the fluid from the clutch system.
6. Repeat Step 5 until all the fluid is drained.
7. Calculate the bleeder screw tightening torque to allow use of a torque wrench-**SST** combination.

(See **TORQUE FORMULAS** .)

8. Tighten the bleeder screw using the **SST**.

Tightening torque

5.9-8.8 N.m {60-90 kgf.cm, 53-78 in.lbf}



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Fig. 2: Tightening Bleeder Screw Using SST
Courtesy of MAZDA MOTORS CORP.

9. Fill the reservoir to MAX with new fluid of the specified type.
10. Bleed the air from the clutch. (See **CLUTCH FLUID AIR BLEEDING**.)
11. Verify correct clutch operation.
12. Verify that there is no fluid leakage.

CLUTCH FLUID AIR BLEEDING

- CAUTION:**
- Clutch fluid will damage painted surfaces.
 - If clutch fluid does get on a painted surface, wipe it off immediately.

- NOTE:**
- Do not mix different brands of fluid.
 - Do not reuse the clutch fluid that was drained.

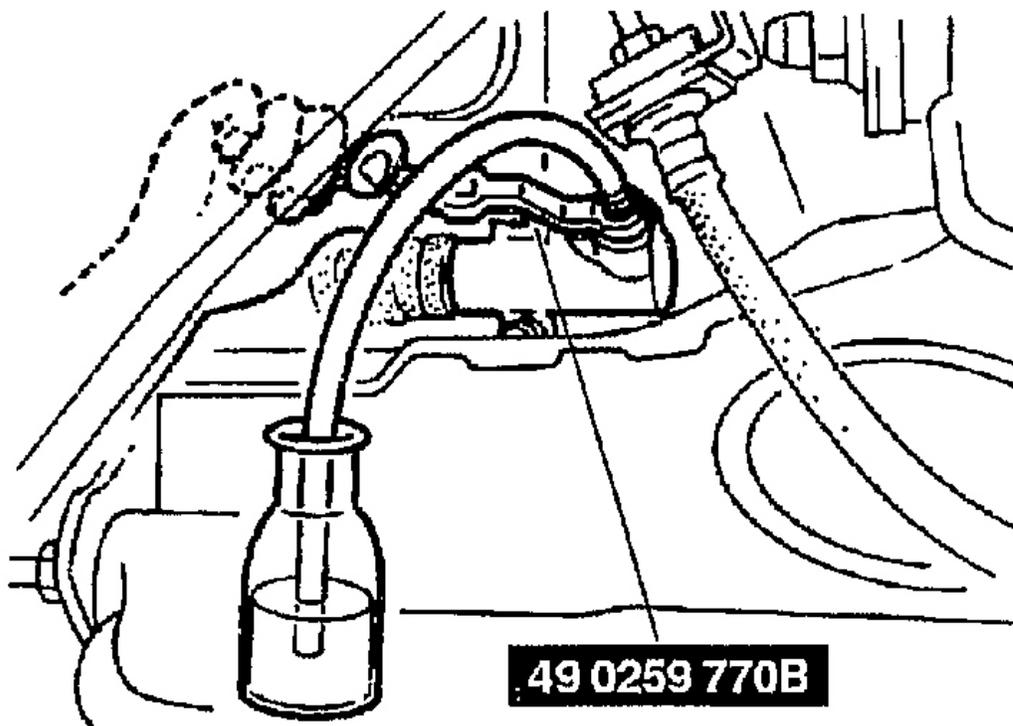
1. Remove the bleeder cap from the clutch release cylinder and attach a vinyl hose to the bleeder plug.
2. Place the other end of the vinyl hose in a clear container.
3. Slowly pump the clutch pedal several times.
4. With the clutch pedal depressed, loosen the bleeder screw using the **SST** to let the fluid escape. Close the bleeder screw using the **SST**.
5. Repeat Steps 3 and 4 until only clean fluid is seen.
6. Calculate the bleeder screw tightening torque to allow use of a torque wrench-**SST** combination.

(See **TORQUE FORMULAS** .)

7. Tighten the bleeder screw using the **SST**.

Tightening torque

5.9-8.8 N.m {60-90 kgf.cm, 53-78 in.lbf}



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Fig. 3: Tightening Bleeder Screw Using SST

Courtesy of MAZDA MOTORS CORP.

8. Add fluid to the MAX mark.

CLUTCH PEDAL INSPECTION

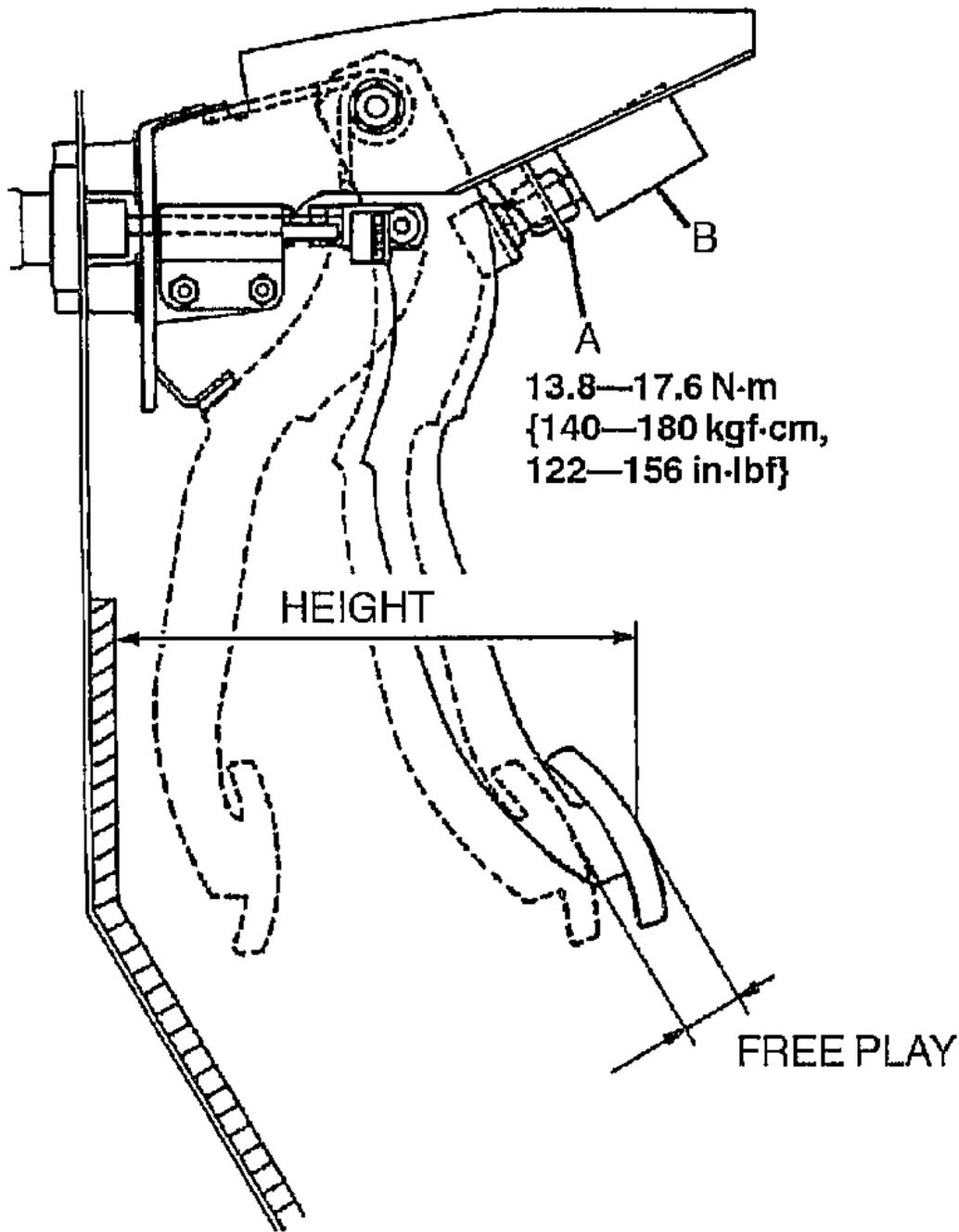
CLUTCH PEDAL HEIGHT INSPECTION

1. Measure the distance from the upper surface of the pedal pad to the cabin carpet.

Pedal height

175-180 mm {6.89-7.08 in} (With carpet)

2. Adjust the height if necessary.



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Fig. 4: Inspecting Clutch Pedal Height & Free Play
Courtesy of MAZDA MOTORS CORP.

CLUTCH PEDAL FREE PLAY INSPECTION

1. Depress the clutch pedal by hand until clutch resistance is felt.

Free play

0.6-3.1 mm {0.03-0.12 in}

Total free play

5-13 mm {0.20-0.51 in}

2. Adjust the free play if necessary. (See **CLUTCH PEDAL FREE PLAY ADJUSTMENT**.)

CLUTCH PEDAL ADJUSTMENT

CLUTCH PEDAL HEIGHT ADJUSTMENT

1. Disconnect the clutch switch connector.
2. Loosen locknut A and turn clutch switch B until the height is correct.
3. Tighten locknut A.

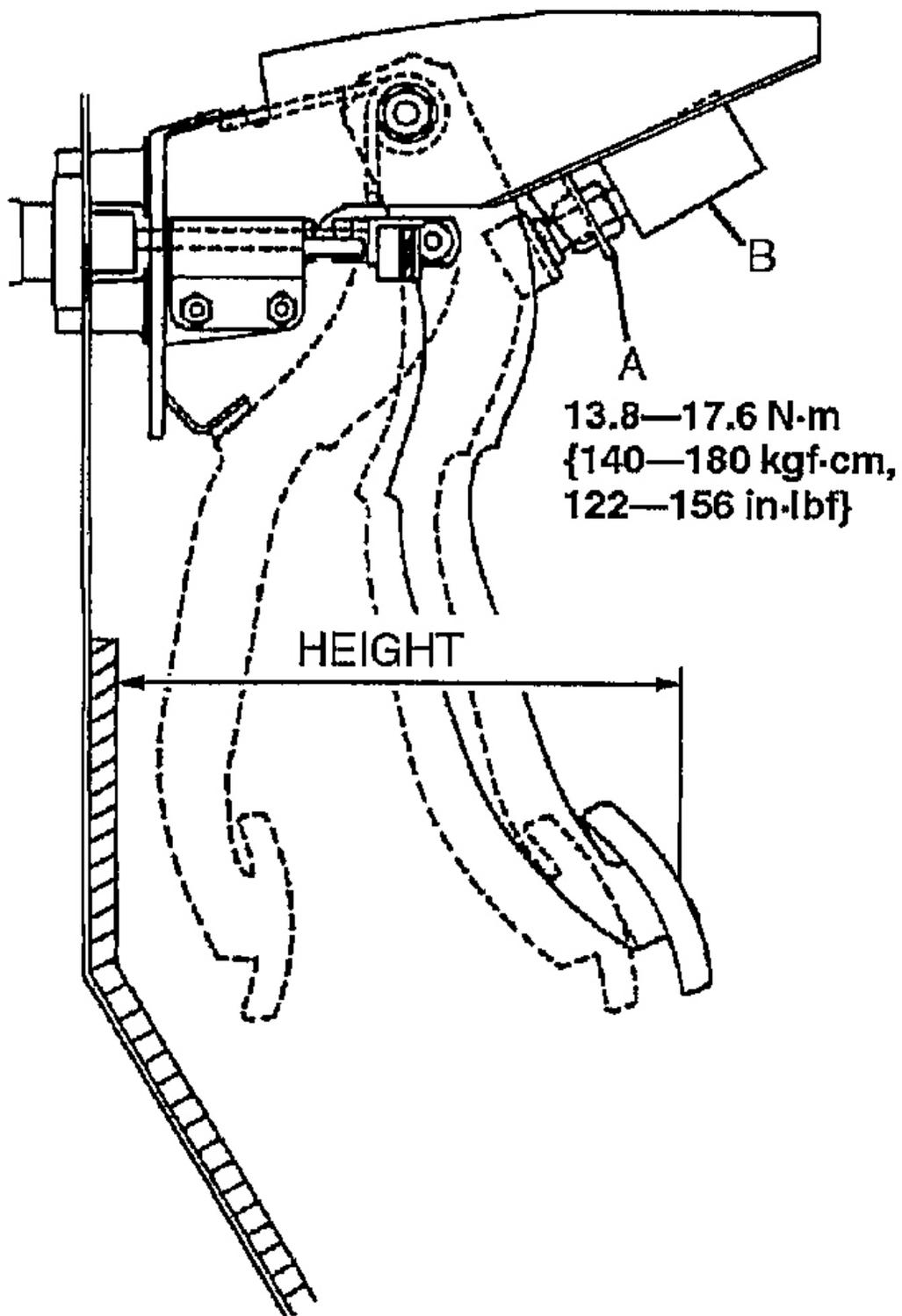
Tightening torque

13.8-17.6 N.m {140-180 kgf.cm, 122-156 in.lbf}

4. After adjustment, inspect the free play.

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Fig. 5: Adjusting Clutch Pedal Height
Courtesy of MAZDA MOTORS CORP.

CLUTCH PEDAL FREE PLAY ADJUSTMENT

1. Loosen locknut C and turn push rod D until the free play is correct.
2. Verify that the disengagement height as measured from the upper surface of the pedal pad to the carpet is correct when the pedal is fully depressed.

Minimum disengagement height

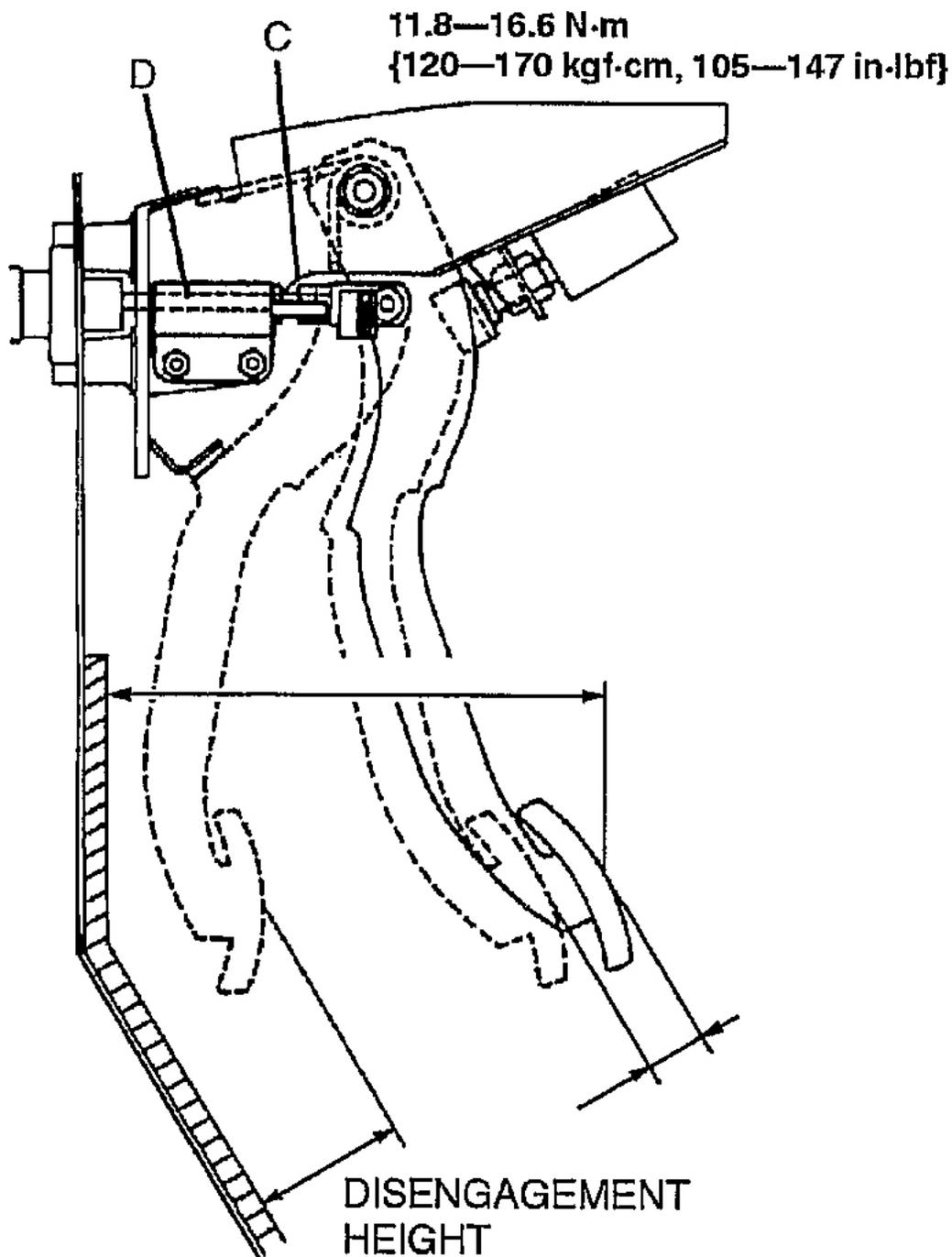
68 mm {2.68 in} (With carpet)

3. Tighten locknut C.

Tightening torque

11.8-16.6 N.m {120-170 kgf.cm, 105-147 in.lbf}

4. After adjustment, inspect the height.



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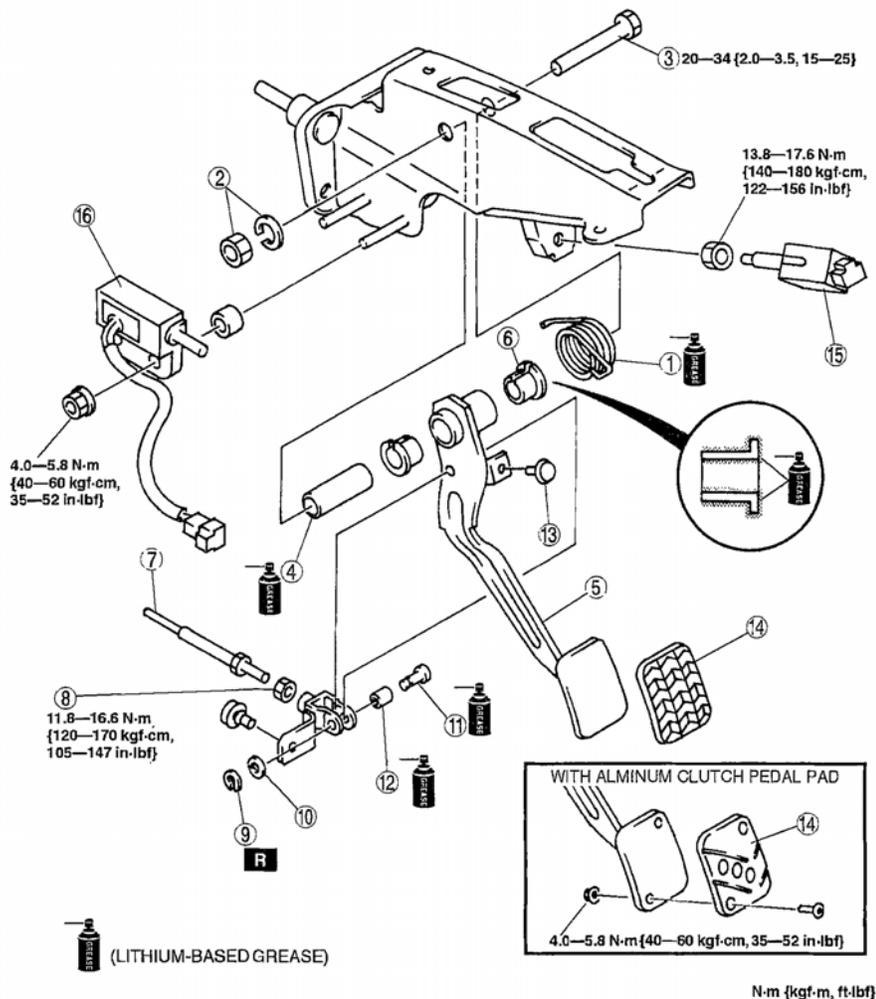
Fig. 6: Adjusting Clutch Pedal Free Play
Courtesy of MAZDA MOTORS CORP.

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CLUTCH PEDAL REMOVAL/INSTALLATION

1. Disconnect the negative battery cable.
2. Remove in the order indicated in the table.



1	Spring (See Spring Removal Note) (See Spring Installation Note)
2	Nut and lock washer
3	Bolt
4	Spacer
5	Clutch pedal
6	Bushing
7	Push rod

8	Nut
9	Clip
10	Wave washer
11	Pin
12	Spacer
13	Stopper
14	Pedal pad
15	Clutch switch
16	Starter interlock switch

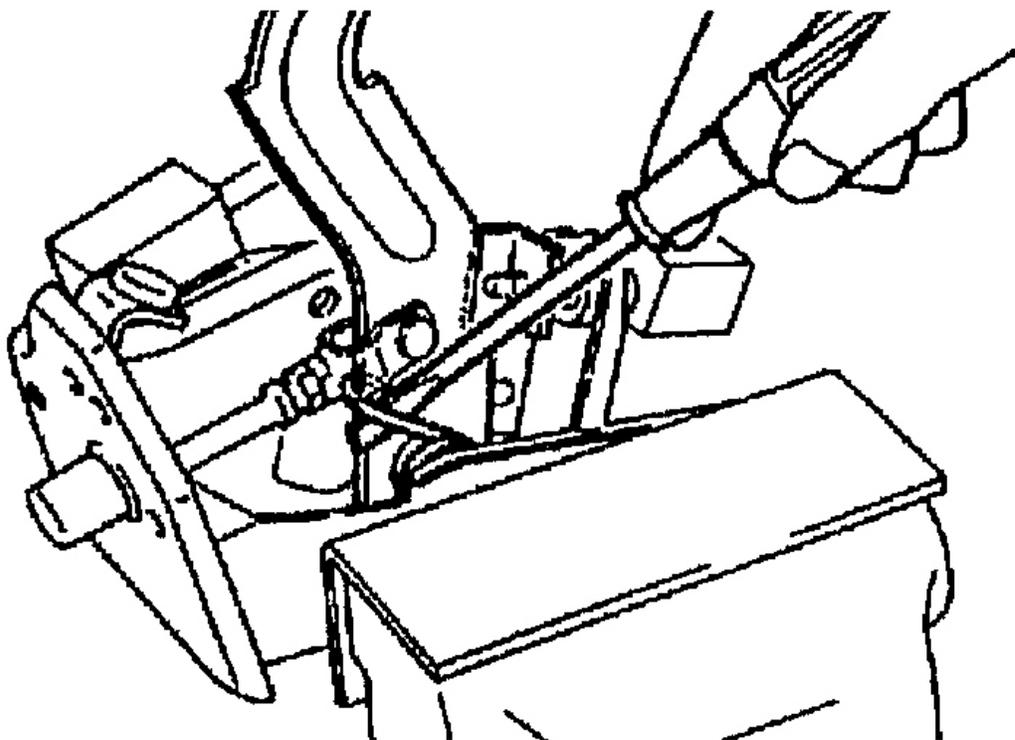
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Fig. 7: Removing Clutch Pedal
Courtesy of MAZDA MOTORS CORP.

3. Install in the reverse order of removal.

SPRING REMOVAL NOTE

1. Place the clutch pedal component in a vise.
2. Pry the spring off the clutch pedal as shown in **Fig. 8**.

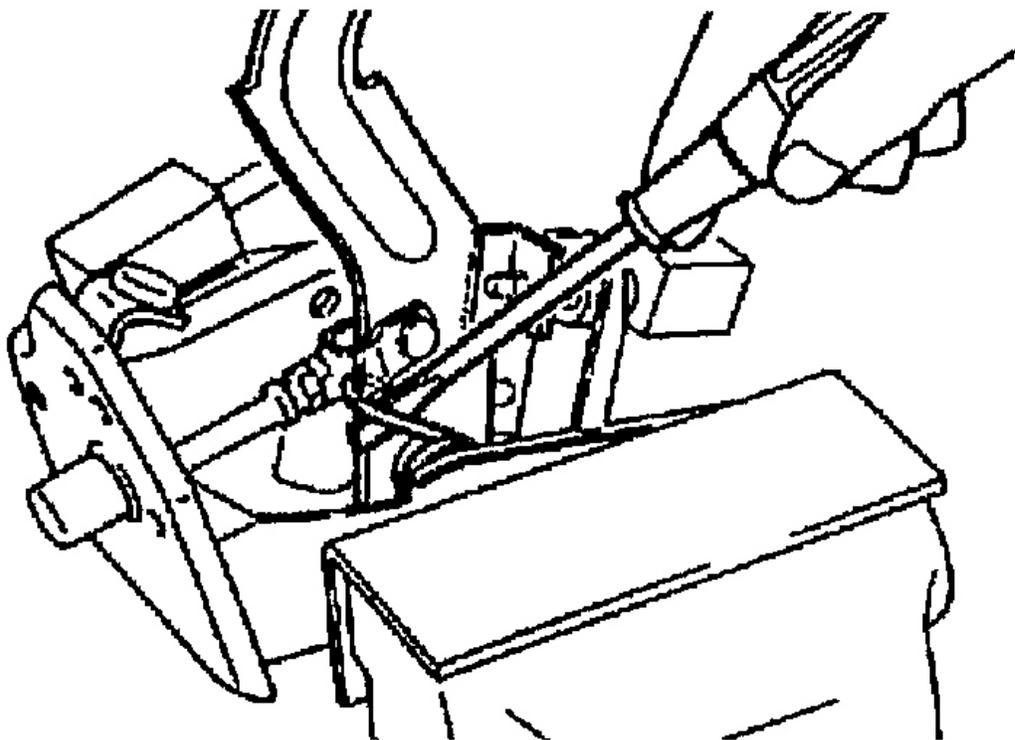


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Fig. 8: Prying Spring Off Clutch Pedal
Courtesy of MAZDA MOTORS CORP.

SPRING INSTALLATION NOTE

1. Place the clutch pedal component in a vise.
2. Install the spring onto the clutch pedal as shown in **Fig. 9**.



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Fig. 9: Installing Spring Onto Clutch Pedal
Courtesy of MAZDA MOTORS CORP.

3. Adjust the clutch pedal height and free play after installation.

CLUTCH MASTER CYLINDER REMOVAL/INSTALLATION

- CAUTION:**
- Clutch fluid will damage painted surfaces.
 - If clutch fluid does get on a painted surface, wipe it off immediately.

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

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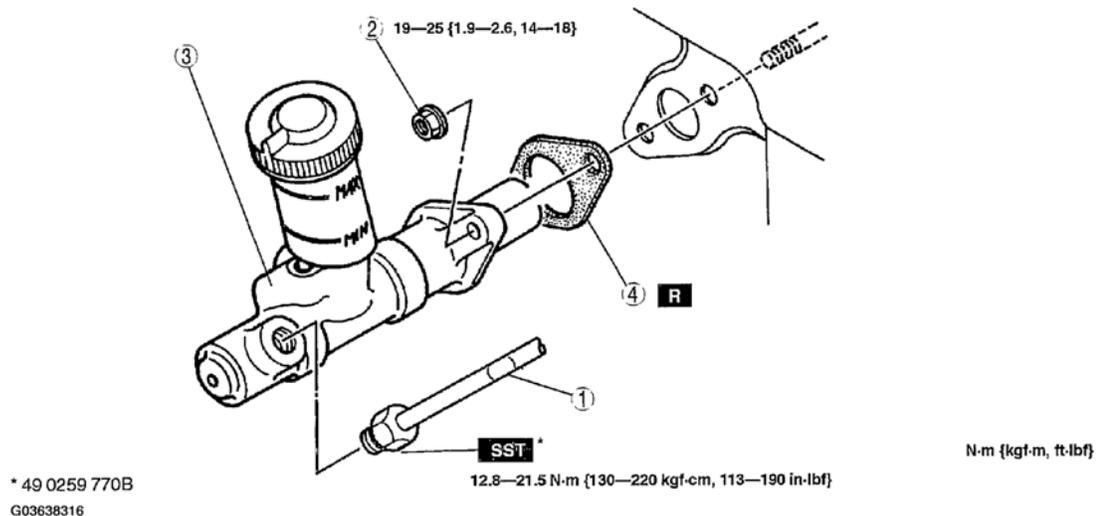
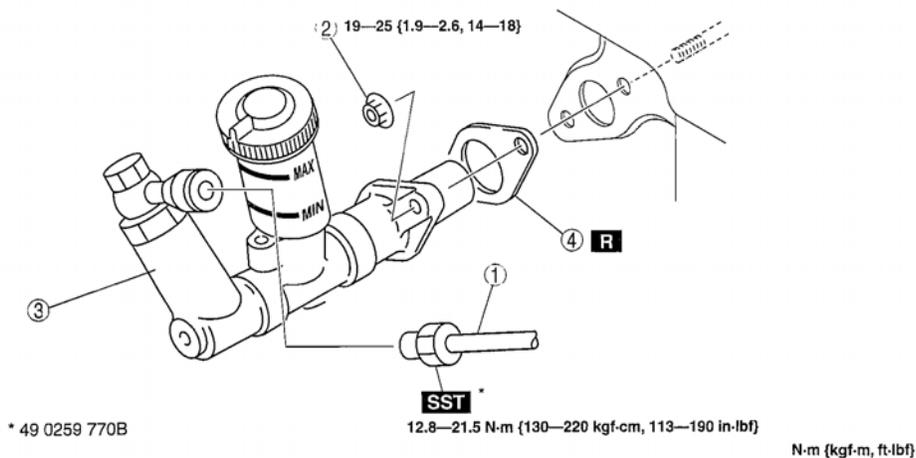


Fig. 10: Installing Clutch Master Cylinder (BP) - With Torque Specifications
Courtesy of MAZDA MOTORS CORP.

BP WITH TC



1	Clutch pipe
2	Nut

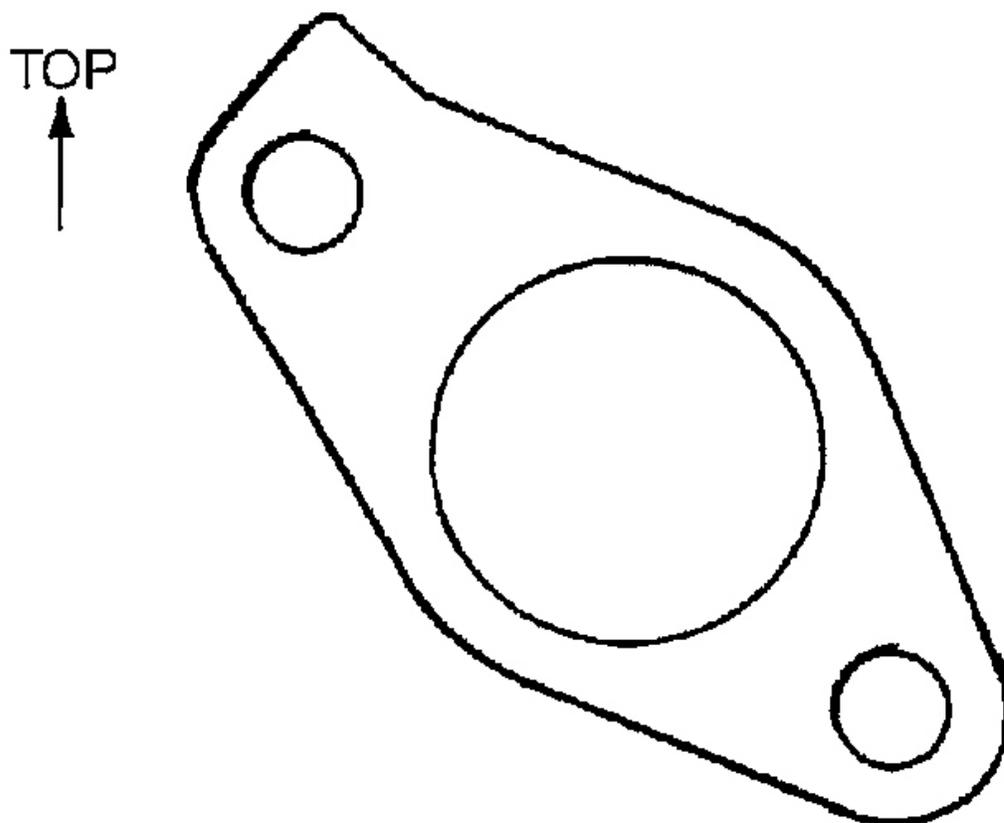
3	Clutch master cylinder
4	Gasket (See Gasket Installation Note)

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Fig. 11: Installing Clutch Master Cylinder (BP With TC) - With Torque Specifications
Courtesy of MAZDA MOTORS CORP.

GASKET INSTALLATION NOTE

1. Install the gasket as shown.



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Fig. 12: Identifying Gasket
Courtesy of MAZDA MOTORS CORP.

CLUTCH MASTER CYLINDER DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

WARNING:

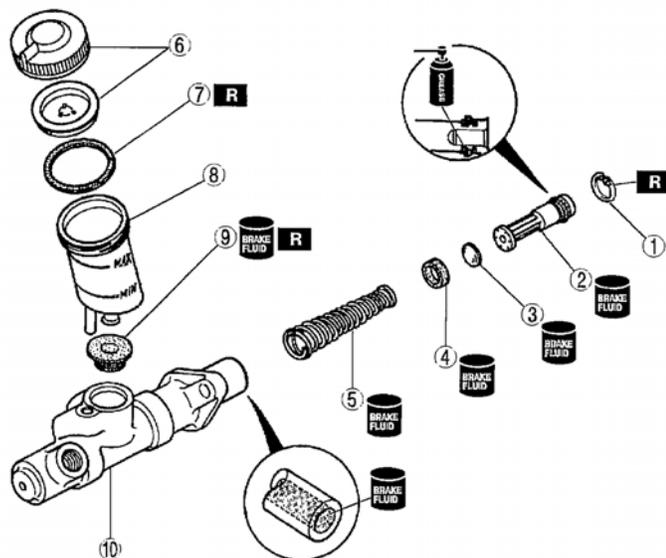
- Applying compressed air to the cylinder component can make the contents suddenly pop out, possibly causing injury. Hold a rag over the cylinder opening when using compressed air.

2. Wipe all parts, and use compressed air to clean all ports, passages, and inner parts.
3. Assemble in the reverse order of disassembly.

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BP



1	Snap ring (See Snap Ring Disassembly/Assembly Note)
2	Piston and secondary cup component
3	Space:
4	Primary cup

5	Return spring
6	Cap
7	Packing
8	Reservoir
9	Bushing
10	Master cylinder body

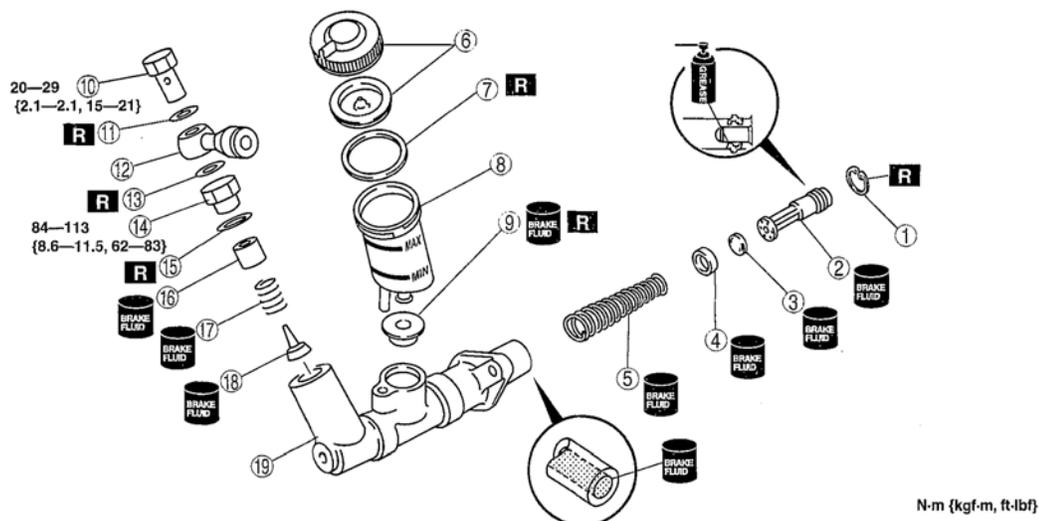
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Fig. 13: Disassembling Clutch Master Cylinder (BP)
 Courtesy of MAZDA MOTORS CORP.

BP WITH TC

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N-m {kgf-m, ft-lbf}

1	Snap ring (See Snap Ring Disassembly/Assembly Note)
2	Piston and secondary cup component
3	Spacer
4	Primary cup
5	Return spring
6	Cap
7	Packing
8	Reservoir
9	Bushing

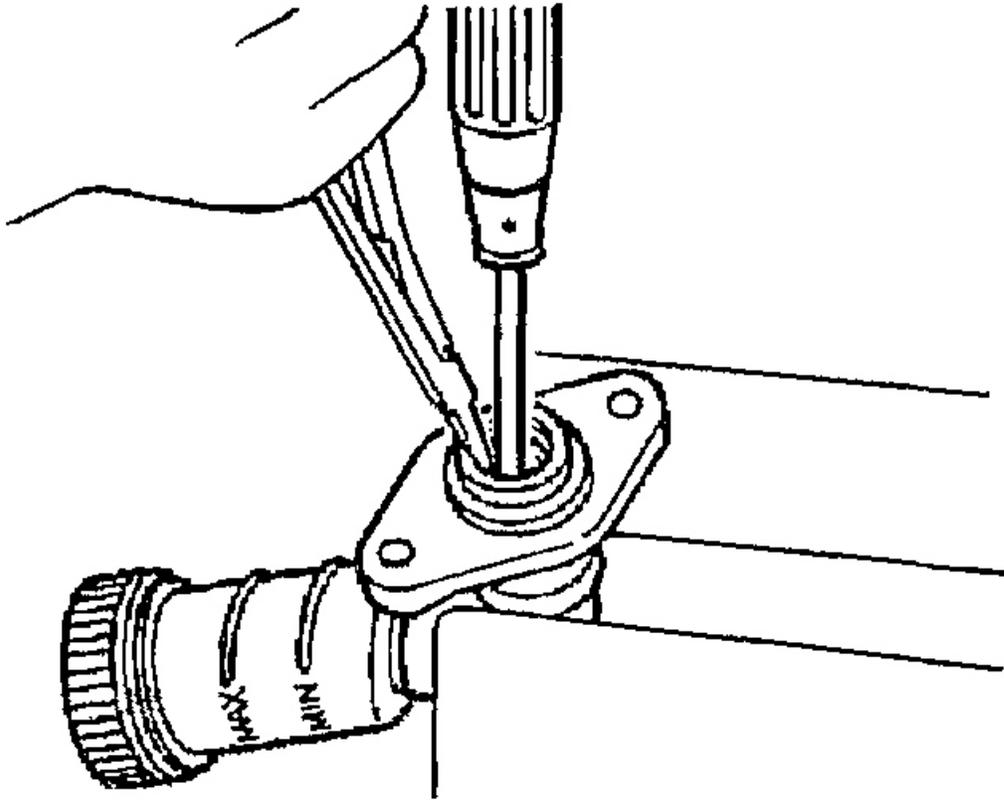
10	Bolt
11	Packing
12	Joint pipe
13	Packing
14	Joint bolt
15	Packing
16	One-way valve piston
17	Return spring
18	One-way valve pin
19	Master cylinder body

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Fig. 14: Disassembling Clutch Master Cylinder (BP With TC)
Courtesy of MAZDA MOTORS CORP.

SNAP RING DISASSEMBLY/ASSEMBLY NOTE

1. While holding the piston down with a cloth-wrapped Phillips screwdriver, remove the snap ring.



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Fig. 15: Removing Snap Ring Using Screwdriver
Courtesy of MAZDA MOTORS CORP.

CLUTCH RELEASE CYLINDER REMOVAL/INSTALLATION

- CAUTION:**
- Clutch fluid will damage painted surfaces.
 - If clutch fluid does get on a painted surface, wipe it off immediately.

1. Remove in the order indicated in the table.

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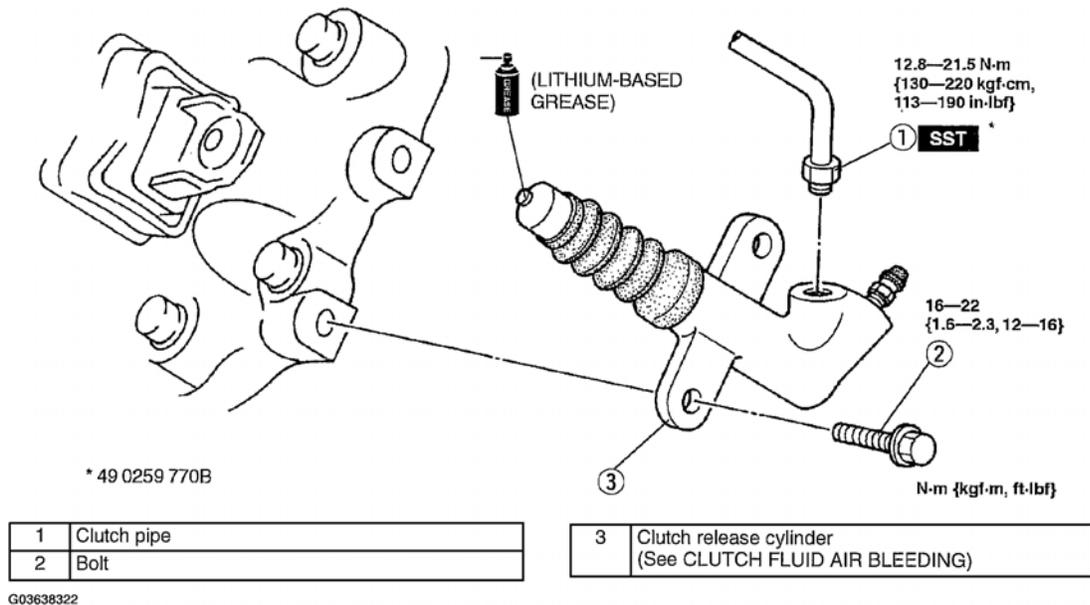


Fig. 16: Removing Clutch Release Cylinder
Courtesy of MAZDA MOTORS CORP.

2. Install in the reverse order of removal.

CLUTCH RELEASE CYLINDER DISASSEMBLY/ASSEMBLY

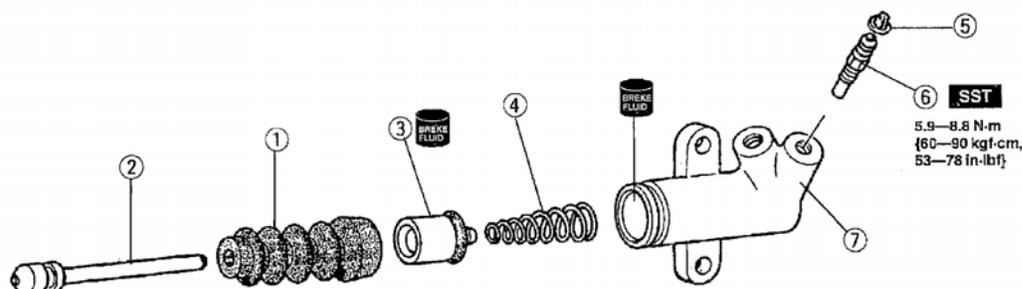
1. Disassemble in the order indicated in the table.

WARNING:

- Applying compressed air to the cylinder component can make the contents suddenly pop out, possibly causing injury. Hold a rag over the cylinder opening when using compressed air.

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* 49 0259 770B

1	Boot
2	Push rod
3	Piston and cup component
4	Spring

5	Bleeder cap
6	Bleeder screw
7	Release cylinder body

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Fig. 17: Disassembling Clutch Release Cylinder - With Torque Specifications
Courtesy of MAZDA MOTORS CORP.

2. Wipe all parts, and use compressed air to clean all ports, passages, and inner parts.
3. Assemble in the reverse order of disassembly.

CLUTCH UNIT REMOVAL/INSTALLATION

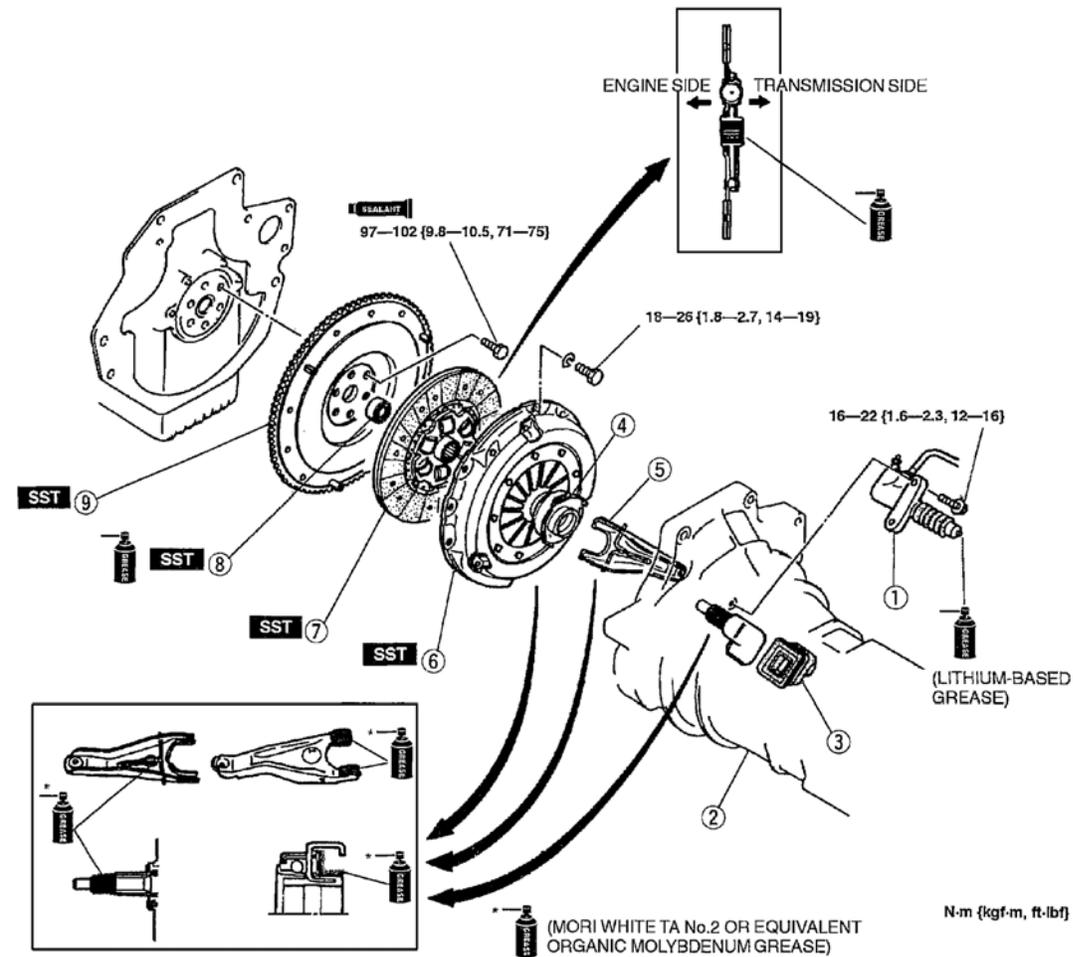
NOTE:

- The clutch release cylinder can be removed from the transmission with the clutch pipe connected.

1. Remove in the order indicated in the table.

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1	Clutch release cylinder
2	Transmission (See MANUAL TRANSMISSION REMOVAL/INSTALLATION [M15M-D]) (See MANUAL TRANSMISSION REMOVAL/INSTALLATION [Y16M-D])
3	Boot
4	Clutch release collar (See CLUTCH RELEASE COLLAR INSPECTION)
5	Clutch release fork

6	Clutch cover (See Clutch Cover, Clutch Disc Removal Note) (See Clutch Cover Installation Note)
7	Clutch disc (See Clutch Cover, Clutch Disc Removal Note) (See Clutch Disc Installation Note)
8	Pilot bearing (See Pilot Bearing Removal Note) (See Pilot Bearing Installation Note)
9	Flywheel (See Flywheel Removal Note) (See Flywheel Installation Note)

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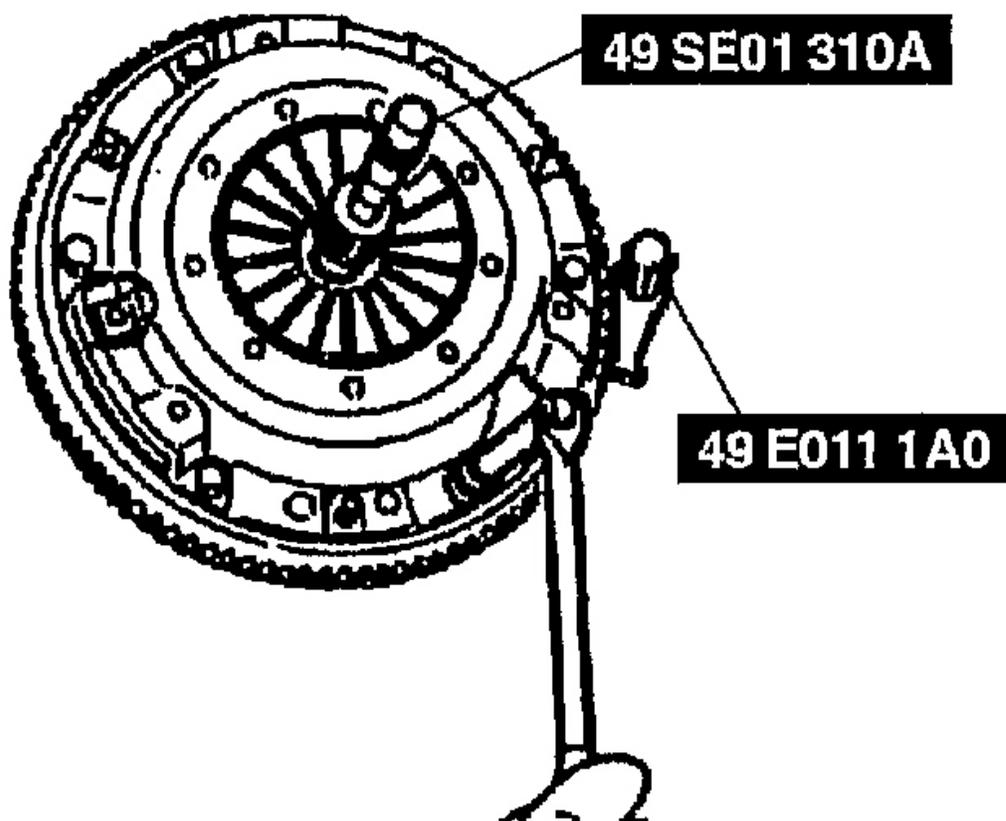
Fig. 18: Removing Clutch Unit
Courtesy of MAZDA MOTORS CORP.

2. Install in the reverse order of removal.

CLUTCH COVER, CLUTCH DISC REMOVAL NOTE

1. Install the SST (49 SE01 310A).
2. Hold the flywheel using the SST (49 E011 1A0).
3. Loosen each bolt one turn at a time in a crisscross pattern until spring tension is released.

Then remove the clutch cover and disc.



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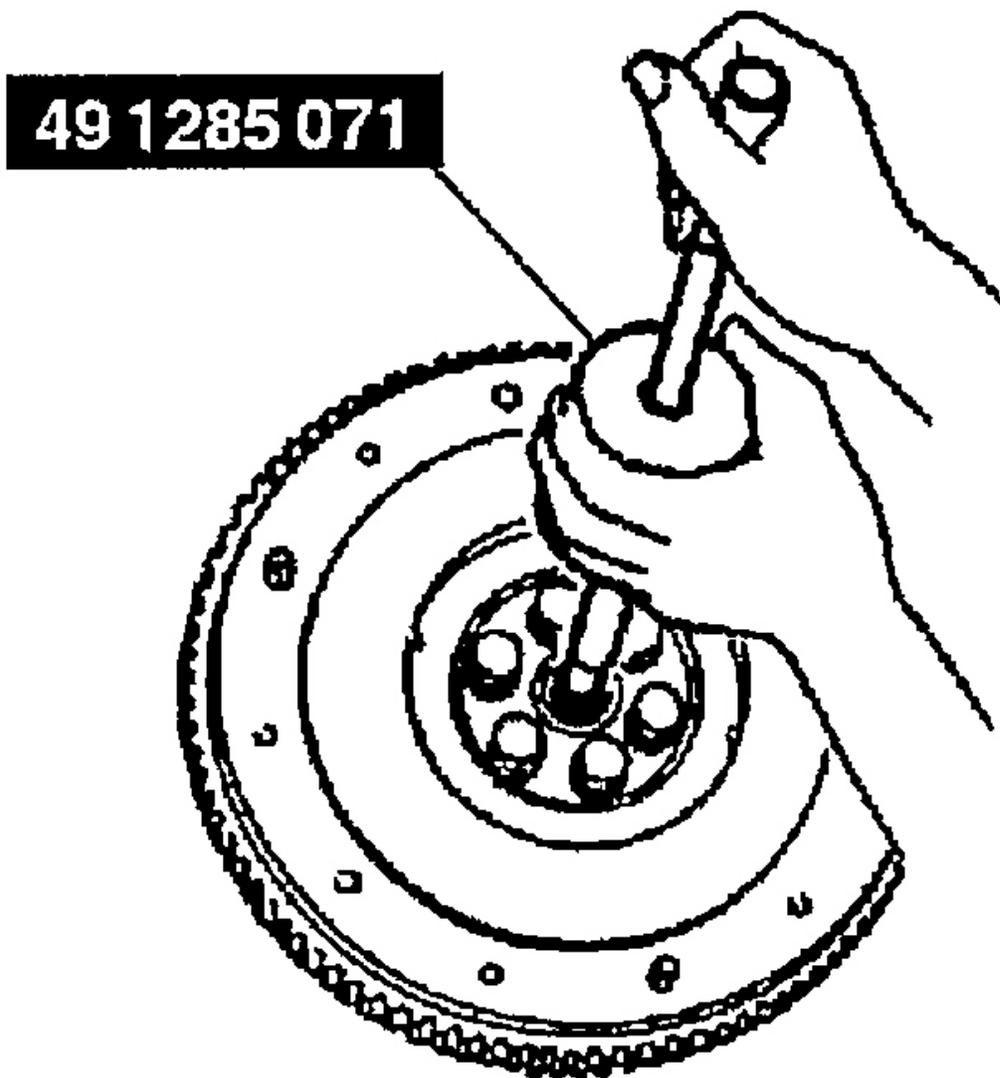
Fig. 19: Loosening Bolts
Courtesy of MAZDA MOTORS CORP.

PILOT BEARING REMOVAL NOTE

NOTE:

- The pilot bearing does not need to be removed unless you are replacing it.

1. Remove the pilot bearing using the SST.



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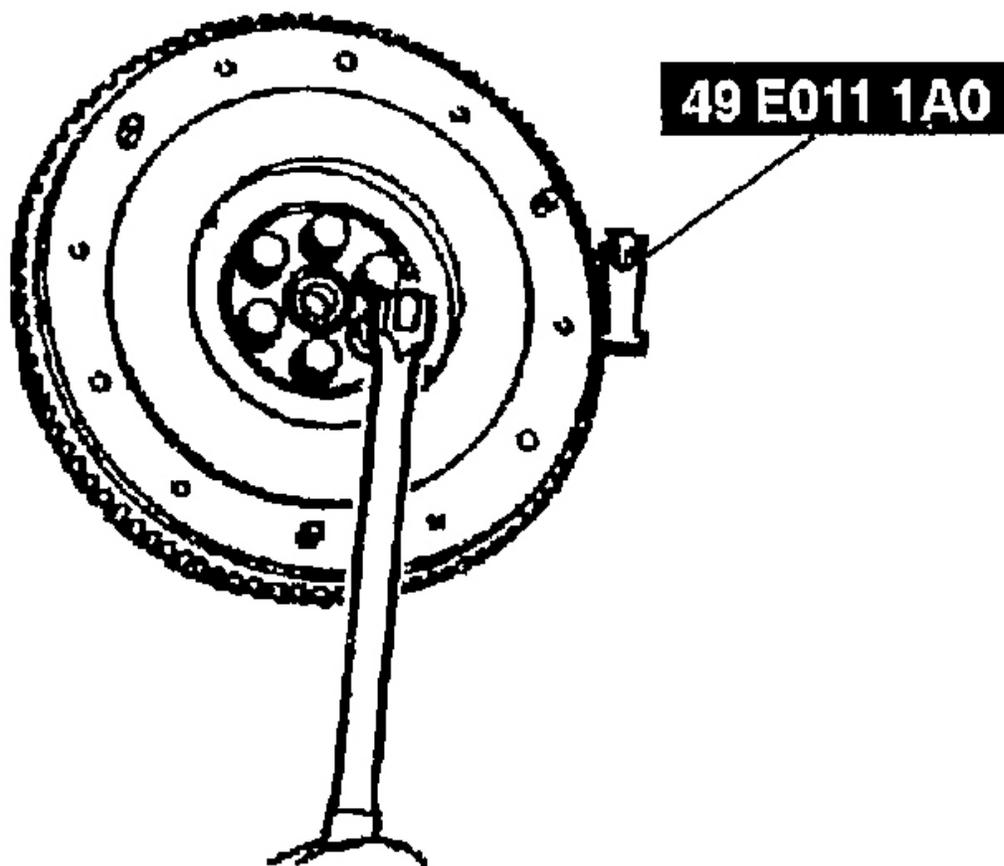
Fig. 20: Removing Pilot Bearing Using SST
Courtesy of MAZDA MOTORS CORP.

FLYWHEEL REMOVAL NOTE

1. Hold the flywheel using the SST.
2. Remove the flywheel.
3. Inspect for oil leakage from the crankshaft rear oil seal.

- If there is any leakage or if the oil seal is damaged, replace the crankshaft oil seal.

(See REAR OIL SEAL REPLACEMENT .)



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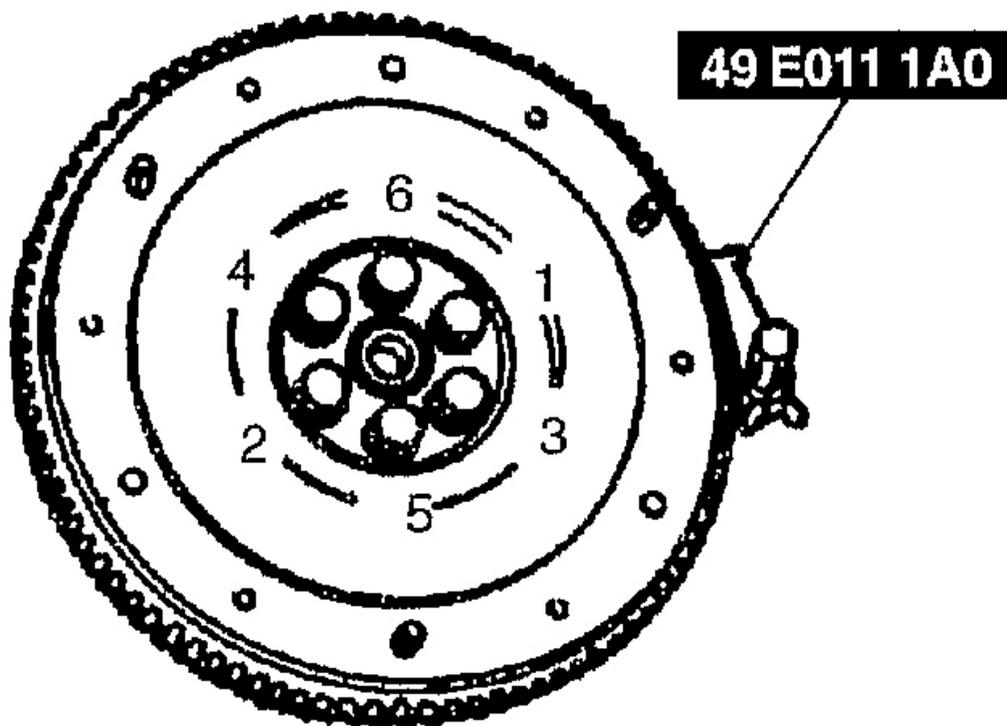
Fig. 21: Removing Flywheel
Courtesy of MAZDA MOTORS CORP.

FLYWHEEL INSTALLATION NOTE

1. Wipe the bolts clean, then apply sealant to the bolt threads.
2. Install the flywheel, and secure it using the SST.
3. Tighten the bolts in the pattern shown.

Tightening torque

97-102 N.m {9.8-10.5 kgf.m, 71-75 ft.lbf}



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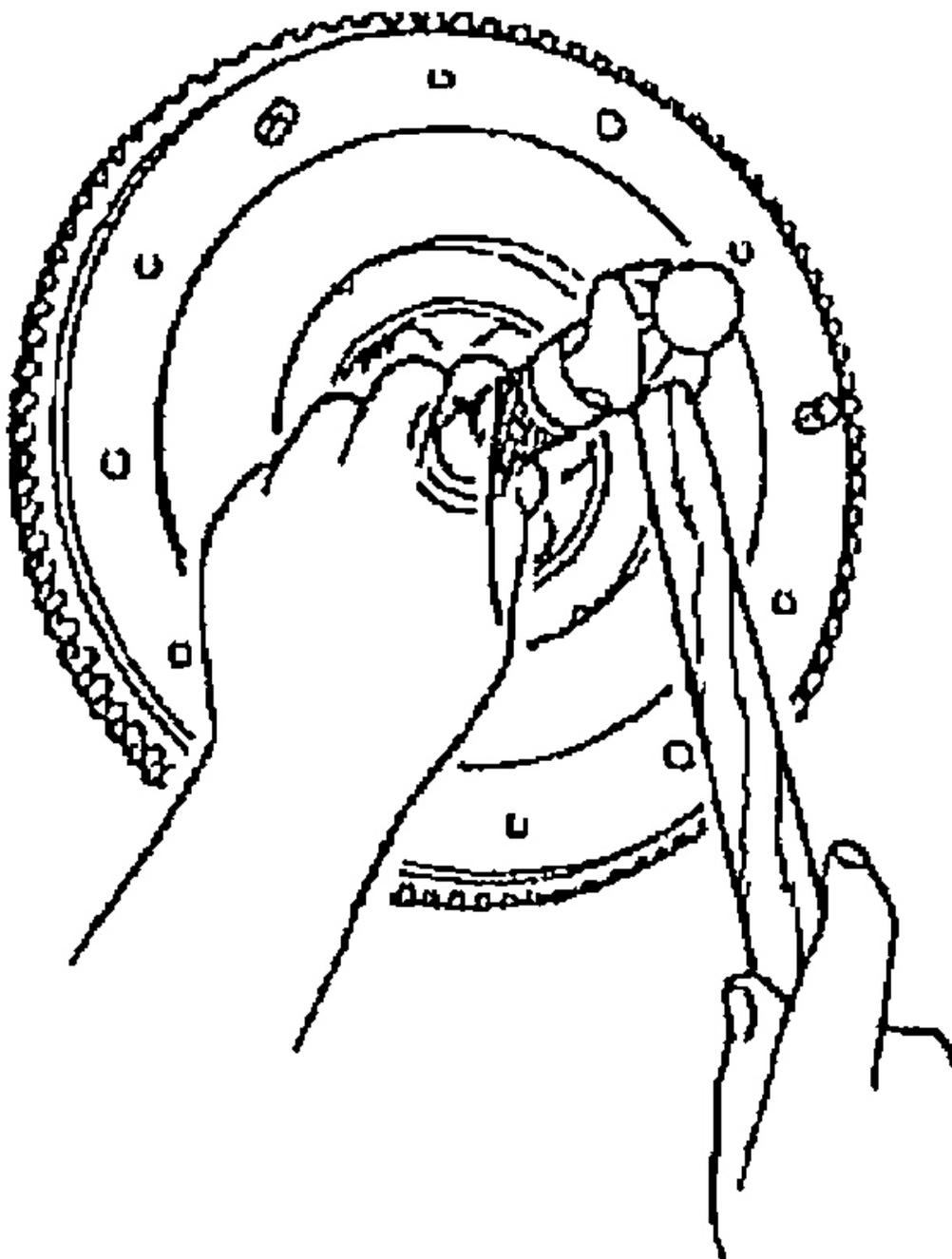
Fig. 22: Securing Flywheel Using SST
Courtesy of MAZDA MOTORS CORP.

PILOT BEARING INSTALLATION NOTE

1. Install a new pilot bearing using a suitable pipe.

Depth

0-0.4 mm {0-0.016 in}

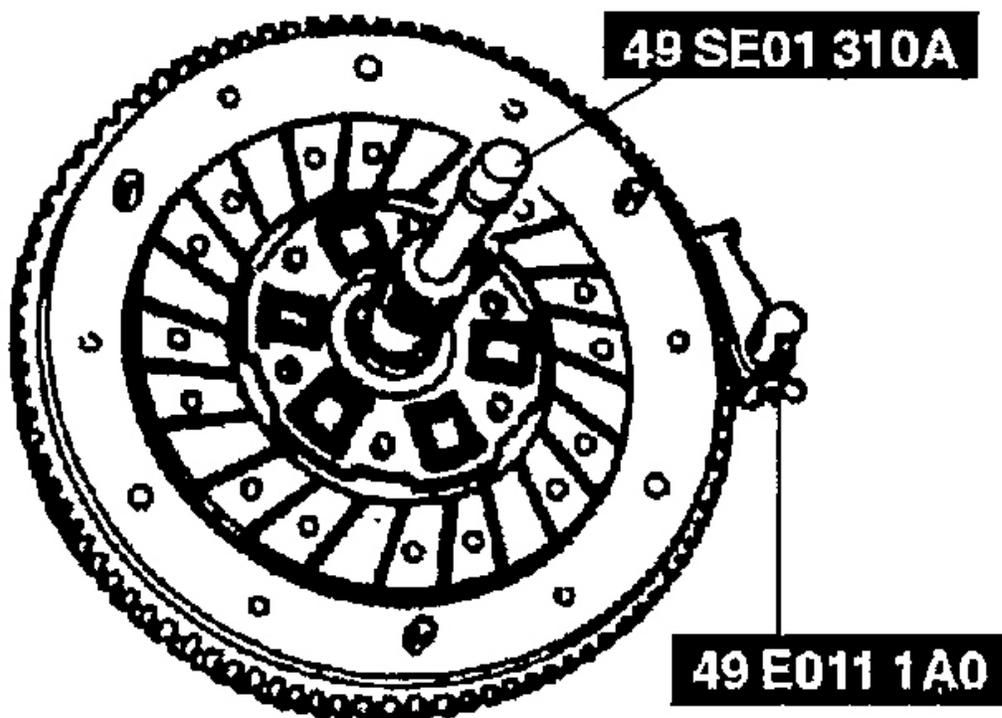


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Fig. 23: Installing Pilot Bearing Using Suitable Pipe
Courtesy of MAZDA MOTORS CORP.

CLUTCH DISC INSTALLATION NOTE

1. Clean the clutch disc splines and main drive gear splines, and apply Mori White TA No.2 or equivalent organic molybdenum grease.
2. Hold the clutch disc in position using the SST.



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Fig. 24: Holding Clutch Disc Position Using SST
Courtesy of MAZDA MOTORS CORP.

CLUTCH COVER INSTALLATION NOTE

1. Hold the flywheel using the SST.
2. Align the dowel holes with the flywheel dowels.
3. Tighten the bolts evenly and gradually in the pattern shown.

Tightening torque

18-26 N.m {1.8-2.7 kgf.m, 14-19 ft.lbf}

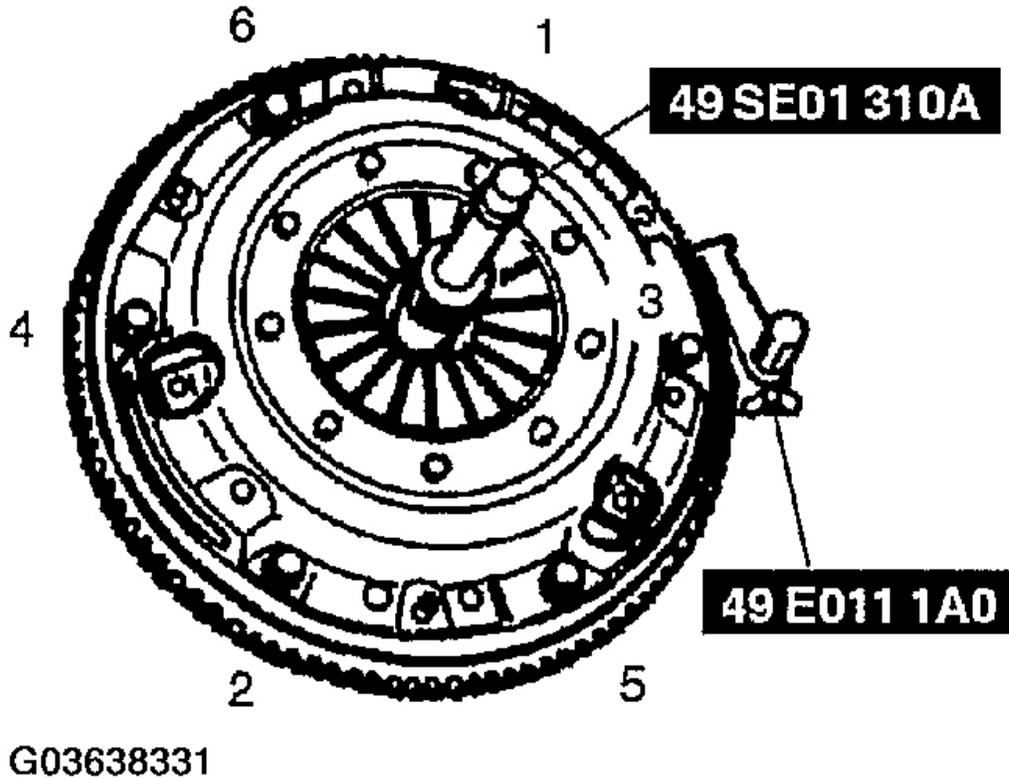


Fig. 25: Installing Clutch Cover
Courtesy of MAZDA MOTORS CORP.

CLUTCH COVER INSPECTION

1. Inspect the contact surface for scoring, cracks, and burning. Repair or replace if necessary.
2. Remove minor scoring or burning using emery paper. Repair if scoring or burning is major. Replace if cracked.
3. Inspect the tips of the diaphragm spring for wear and cracks.
 - If there is wear or cracks, replace the clutch cover.

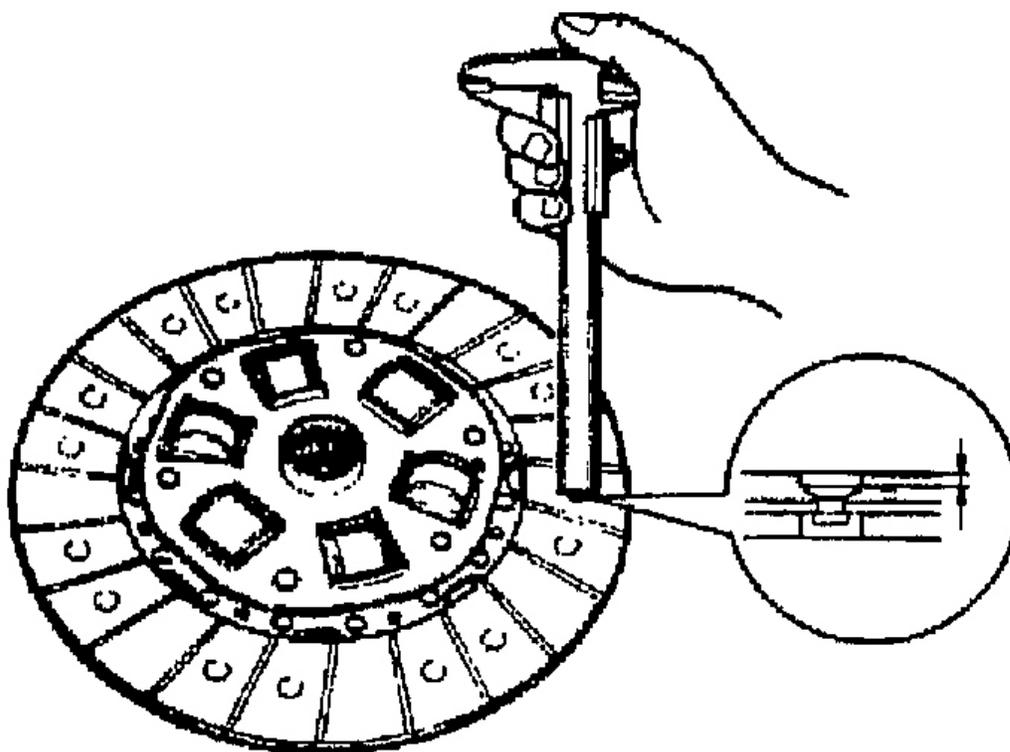
CLUTCH DISC INSPECTION

1. Inspect the lining surface for burning and oil contamination. Repair using sandpaper if the trouble is minor. Replace the clutch disc if it is badly burned or oil soaked.

2. Inspect for loose facing rivets or torsion dampers. Replace the clutch disc if any are loose.
3. Measure the thickness of the lining at a rivet head on both sides using vernier calipers. Replace the clutch disc if less than minimum.

Minimum thickness

0.3 mm {0.012 in}



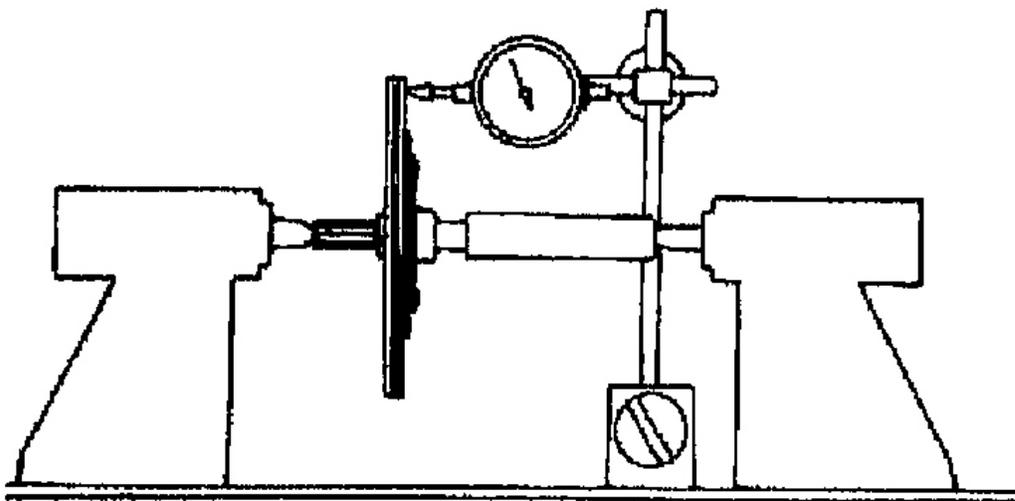
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Fig. 26: Measuring Thickness Of Lining At Rivet Head On Both Sides Using Vernier Calipers
Courtesy of MAZDA MOTORS CORP.

4. Measure the clutch disc runout using a dial indicator. Replace the clutch disc if runout is excessive.

Maximum runout

0.7 mm {0.028 in}



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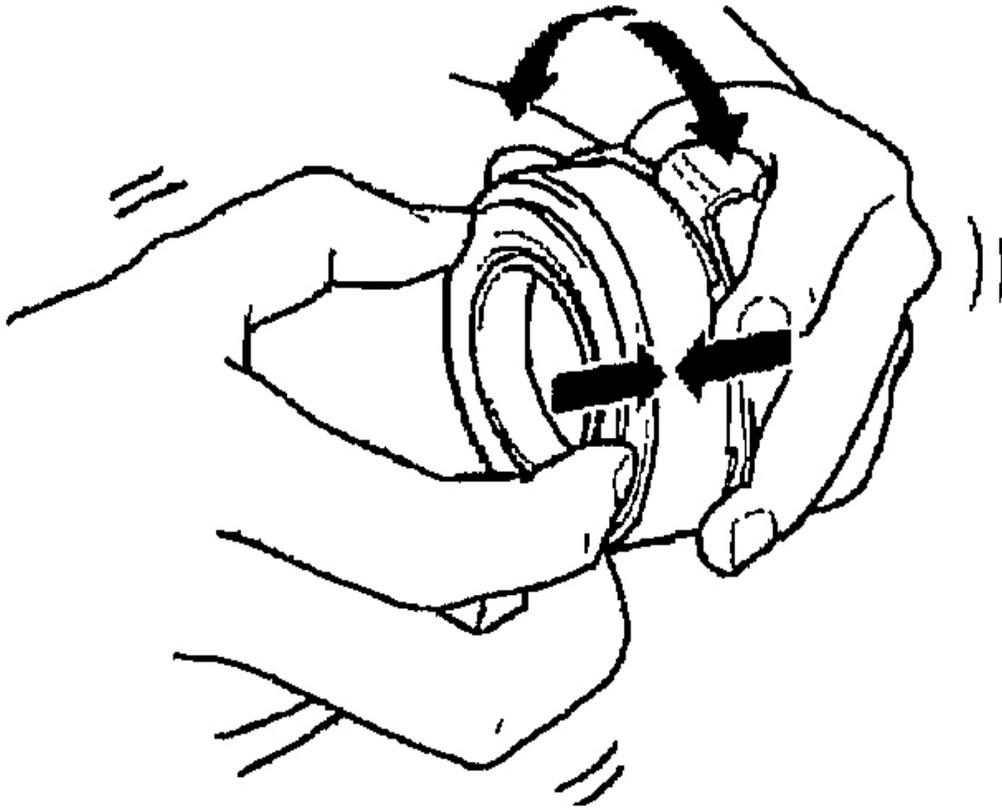
Fig. 27: Measuring Clutch Disc Runout Using A Dial Indicator
Courtesy of MAZDA MOTORS CORP.

CLUTCH RELEASE COLLAR INSPECTION

CAUTION:

- Cleaning the clutch release collar with cleaning fluids or a steam cleaner can wash the grease out of the sealed bearing.

1. Turn the collar while applying force in the axial direction.
 - If the collar sticks or has excessive resistance, replace it.

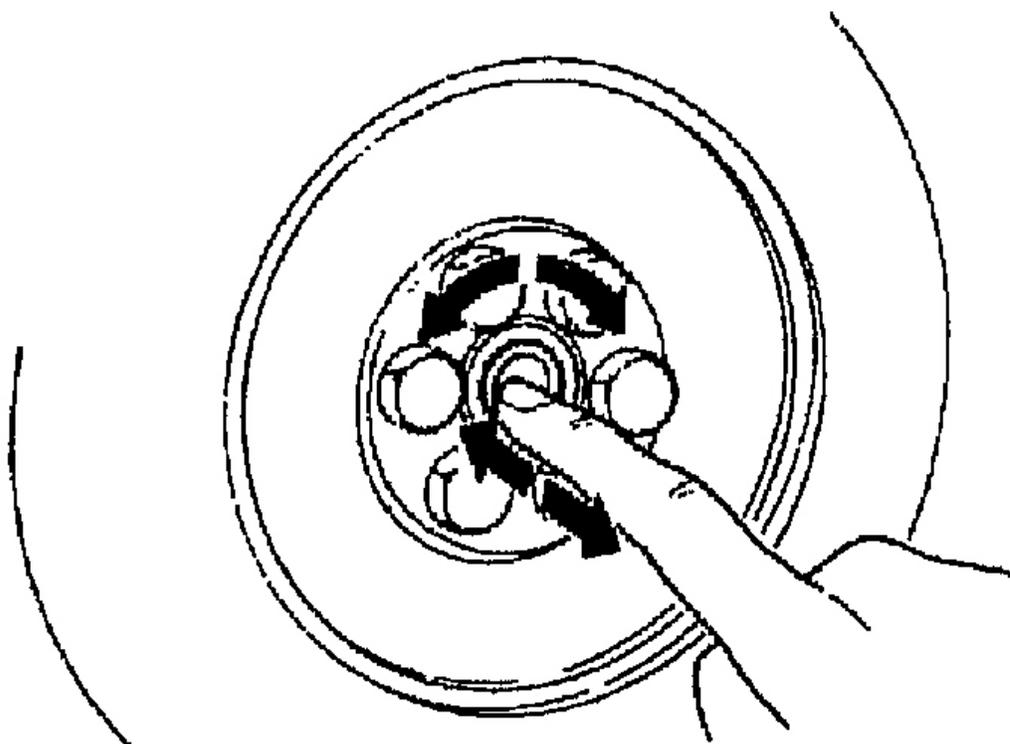


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Fig. 28: Turning Collar While Applying Force
Courtesy of MAZDA MOTORS CORP.

PILOT BEARING INSPECTION

1. Turn the bearing while applying force in the axial direction.
 - If the bearing sticks or has excessive resistance, replace it.



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Fig. 29: Turning Bearing While Applying Force
Courtesy of MAZDA MOTORS CORP.

FLYWHEEL INSPECTION

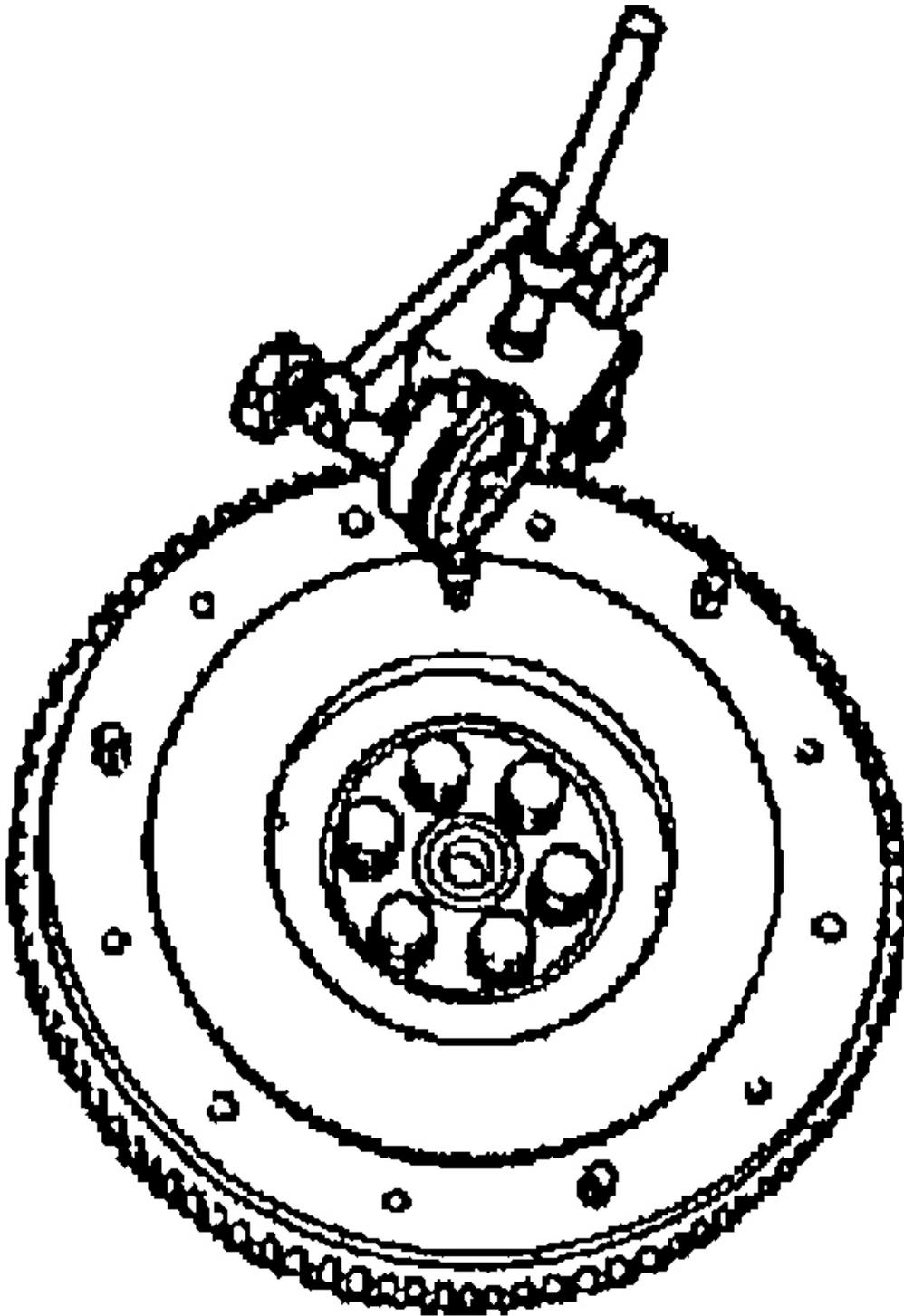
1. Inspect the contact surface for scoring, cracks, and burning.
2. Remove minor scoring or burning using emery paper. Repair if scoring or burning is major. Replace if cracked.
3. Inspect the ring gear teeth for wear or damage.
4. Measure the flywheel runout using a dial indicator. Replace the flywheel if runout is excessive.

Maximum runout

0.2 mm {0.008 in}

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Fig. 30: Measuring Flywheel Runout Using Dial Indicator
Courtesy of MAZDA MOTORS CORP.