

2008 Mazda CX-9 Grand Touring

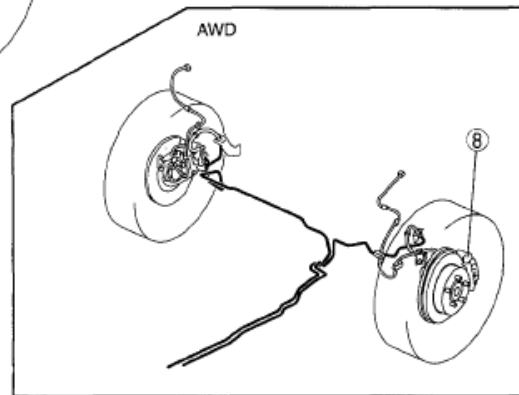
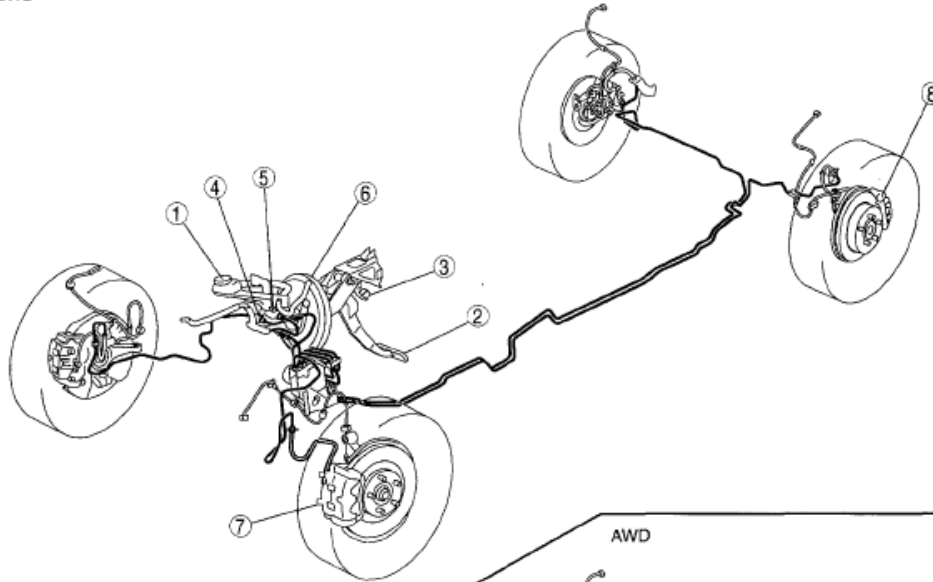
2008 BRAKES Conventional Brake System - Mazda CX-9

2008 BRAKES

Conventional Brake System - Mazda CX-9

CONVENTIONAL BRAKE SYSTEM LOCATION INDEX

2WD



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1	Brake fluid reserve tank (See 04-11-3 AIR BLEEDING.)
2	Brake pedal (See 04-11-4 BRAKE PEDAL INSPECTION.) (See 04-11-6 BRAKE PEDAL REMOVAL/ INSTALLATION.)
3	Brake switch (See 04-11-9 BRAKE SWITCH INSPECTION.)
4	Master cylinder (See 04-11-10 MASTER CYLINDER REMOVAL/ INSTALLATION.)
5	Brake fluid level sensor (See 04-11-11 BRAKE FLUID LEVEL SENSOR INSPECTION.)
6	Power brake unit (See 04-11-12 POWER BRAKE UNIT INSPECTION.) (See 04-11-14 POWER BRAKE UNIT REMOVAL/ INSTALLATION.)

7	Front brake (disc) (See 04-11-15 FRONT BRAKE (DISC) INSPECTION.) (See 04-11-18 FRONT BRAKE (DISC) REMOVAL/ INSTALLATION.) (See 04-11-19 DISC PAD (FRONT) REPLACEMENT.) (See 04-11-20 CALIPER (FRONT) DISASSEMBLY/ ASSEMBLY.)
8	Rear brake (disc) (See 04-11-21 REAR BRAKE (DISC) INSPECTION.) (See 04-11-24 REAR BRAKE (DISC) REMOVAL/ INSTALLATION.) (See 04-11-26 DISC PAD (REAR) REPLACEMENT.) (See 04-11-27 CALIPER (REAR) DISASSEMBLY/ ASSEMBLY.)

Fig. 1: Identifying Conventional Brake System Parts Location

Courtesy of MAZDA MOTORS CORP.

AIR BLEEDING

CAUTION:

- Brake fluid will damage painted surfaces. Be careful not to spill any on painted surfaces. If it is spilled, wipe it off immediately.

NOTE:

- Keep the fluid level in the reserve tank at 3/4 full or more during the air bleeding.
- Begin air bleeding with the brake caliper that is furthest from the master cylinder.

Brake fluid type SAE J1703, FMVSS 116 DOT-3

1. Remove the bleeder cap on the brake caliper, and attach a vinyl tube to the bleeder screw.
2. Place the other end of the vinyl tube in a clear container and fill the container with fluid during air bleeding.
3. Working with two people, one should pump the brake pedal several times and depress and hold the pedal down.
4. While the brake pedal is depressed, the other should loosen the bleeder screw using a commercially available flare nut wrench, drain out any fluid containing air bubbles, and tighten the bleeder screw.

Tightening torque

Front: 5.9-9.8 N.m {61-99 kgf.cm, 53-86 in.lbf}

Rear: 6.9-9.8 N.m {71-99 kgf.cm, 61-86 in.lbf}

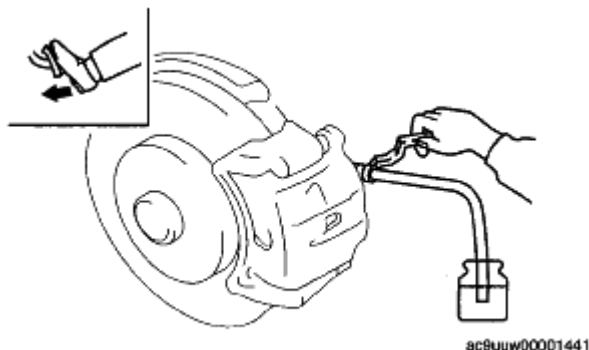


Fig. 2: Checking Brake Pedal

Courtesy of MAZDA MOTORS CORP.

5. Repeat Steps 3 and 4 until no air bubbles are seen.

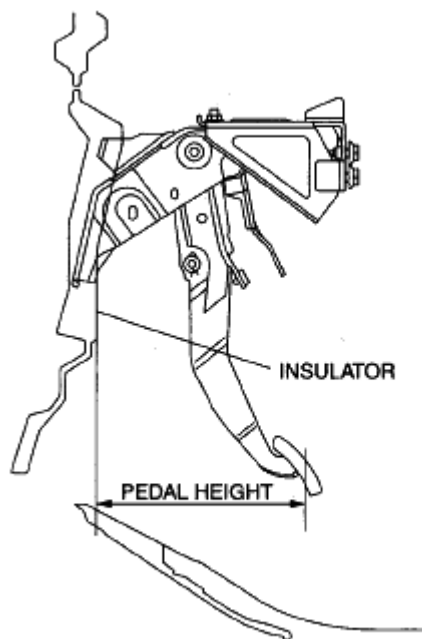
6. Perform air bleeding as described in the above procedures for all brake calipers.
7. After air bleeding, inspect the following:
 - Brake operation
 - Fluid leakage
 - Fluid level

BRAKE PEDAL INSPECTION

PEDAL HEIGHT INSPECTION

1. Measure the distance from the center of the upper surface of the pedal pad to the insulator and verify that it is as specified.
 - If not within the specification, inspect the following items and repair or replace the applicable part if there is any malfunction.
 - Power brake unit installation condition
 - Deformation of or damage to the power brake unit fork
 - Brake pedal installation condition
 - Clevis pin wear
 - If there is no malfunction in the above items, replace the brake pedal.

Brake pedal height (reference value) 206.3 mm {8.122 in}



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Fig. 3: Identifying Pedal Height
Courtesy of MAZDA MOTORS CORP.

PEDAL PLAY INSPECTION

1. Pump the pedal several times to release the vacuum in the power brake unit.
2. Gently depress the pedal by hand and measure the pedal play.
 - If not within the specification, inspect the wear of the clevis pin. Replace it if there is any malfunction.

Brake pedal play 2-5 mm {0.08-0.19 in}

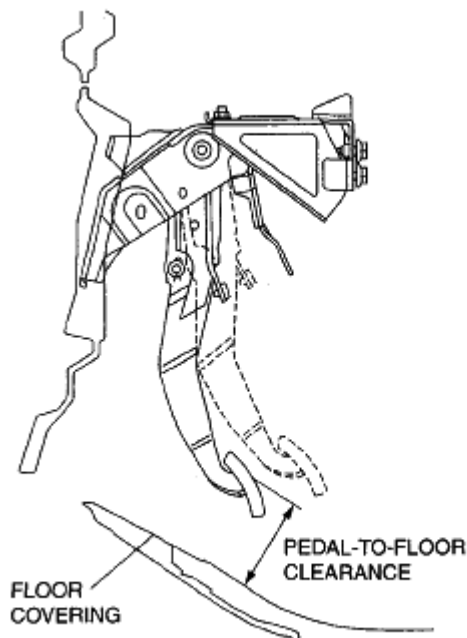
NOTE:

- If there is no malfunction in the clevis pin, there is a possibility that the power brake unit has some malfunction. Verify that there are no malfunctions, and replace it if necessary.

PEDAL-TO-FLOOR CLEARANCE INSPECTION

1. Start the engine and depress the brake pedal with a force of 147 N {15.0 kgf, 33.0 lbf}.
2. Measure the distance from the center of the upper surface of the pedal pad to the floor covering and verify that it is as specified.
 - If it is less than the specification, inspect for air in the brake line.

**Brake pedal-to-floor clearance (Brake pedal when depressed at 147 N {15.0 kgf, 33.0 lbf})
97.6 mm {3.84 in} or more**



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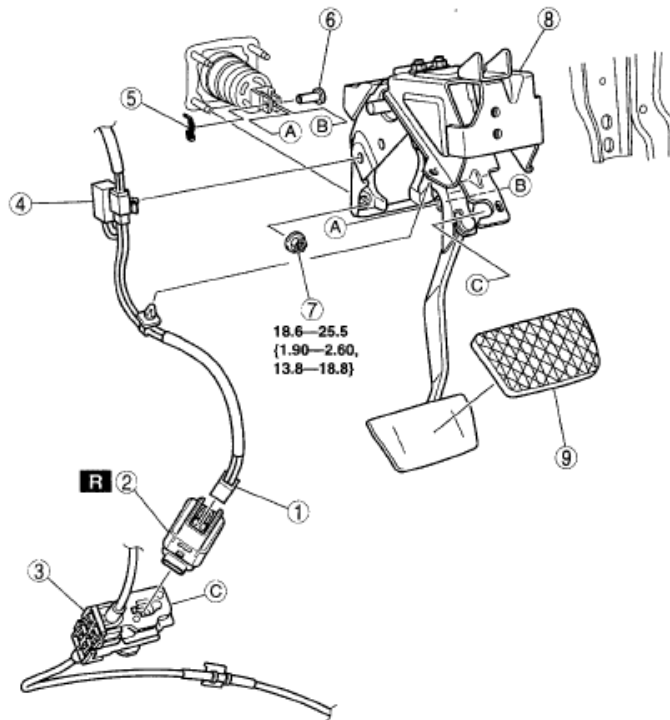
Fig. 4: Identifying Pedal-To-Floor Clearance
Courtesy of MAZDA MOTORS CORP.

BRAKE PEDAL REMOVAL/INSTALLATION

CAUTION:

- The clearance between the brake switch and the brake pedal is automatically adjusted to the correct amount when the brake switch is inserted into the installation hole on the brake pedal and rotated to fix in place. If the brake switch is not properly installed, the clearance may be incorrect, causing a brake light malfunction. Therefore, always verify that the brake pedal is properly installed and fully released before installing the brake switch to the pedal.
- Once the brake switch clearance has automatically been adjusted, it cannot be adjusted again. Therefore, replace the switch with a new one when replacing the power brake unit or the pedal, or performing any procedure that changes the pedal stroke.

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



N-m (kgf-m, ft-lbf)

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1	Brake switch connector (See 04-11-9 Brake Switch Connector Installation Note.)
2	Brake switch (See 04-11-9 Brake Switch Installation Note.)
3	Interlock cable (See 05-18-3 INTERLOCK CABLE ADJUSTMENT.)

4	Noise filter
5	Snap pin
6	Clevis pin
7	Nut
8	Brake pedal (See 04-11-7 Brake Pedal Removal Note.)
9	Pedal pad

Fig. 5: Identifying Brake Pedal Components & Torque Specifications

Courtesy of MAZDA MOTORS CORP.

BRAKE PEDAL REMOVAL NOTE

1. Remove the windshield wiper arm and blade. (See WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION .)
2. Remove the cowl grille. (See COWL GRILLE REMOVAL/INSTALLATION .)
3. Remove the windshield wiper motor. (See WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION .)
4. Remove the cowl panel. (See COWL PANEL REMOVAL/INSTALLATION .)
5. Remove the decoration panel. (See DECORATION PANEL REMOVAL/INSTALLATION .)
6. Remove the front console box mat. (See FRONT CONSOLE BOX MAT REMOVAL/INSTALLATION .)
7. Remove the indicator panel. (See INDICATOR PANEL REMOVAL/INSTALLATION .)
8. Remove the front console box. (See FRONT CONSOLE BOX REMOVAL/INSTALLATION .)
9. Remove the dashboard under cover. (See DASHBOARD UNDER COVER REMOVAL/INSTALLATION .)
10. Remove the side wall. (See SIDE WALL REMOVAL/INSTALLATION .)
11. Remove the console panel. (See CONSOLE PANEL REMOVAL/INSTALLATION .)
12. Remove the console cover. (See CONSOLE COVER REMOVAL/INSTALLATION .)
13. Remove the console. (See CONSOLE REMOVAL/INSTALLATION .)
14. Remove the front scuff plate inner. (See FRONT SCUFF PLATE REMOVAL/INSTALLATION .)
15. Remove the front side trim. (See FRONT SIDE TRIM REMOVAL/INSTALLATION .)
16. Remove the hood release lever. (See HOOD LATCH AND RELEASE LEVER REMOVAL/INSTALLATION .)
17. Remove the lower panel. (See LOWER PANEL REMOVAL/INSTALLATION .)
18. Remove the Glove Compartment. (See GLOVE COMPARTMENT REMOVAL/INSTALLATION .)
19. Remove the a-pillar trim. (See A-PILLAR TRIM REMOVAL/INSTALLATION .)
20. Remove the dashboard installation bolts as shown in the figure.

CAUTION:

- Bolt A cannot be removed from the body. For this reason, a front obstructed by the bolt when the door is opened could cause it to scratched. When opening a front door, verify that bolt A is insert

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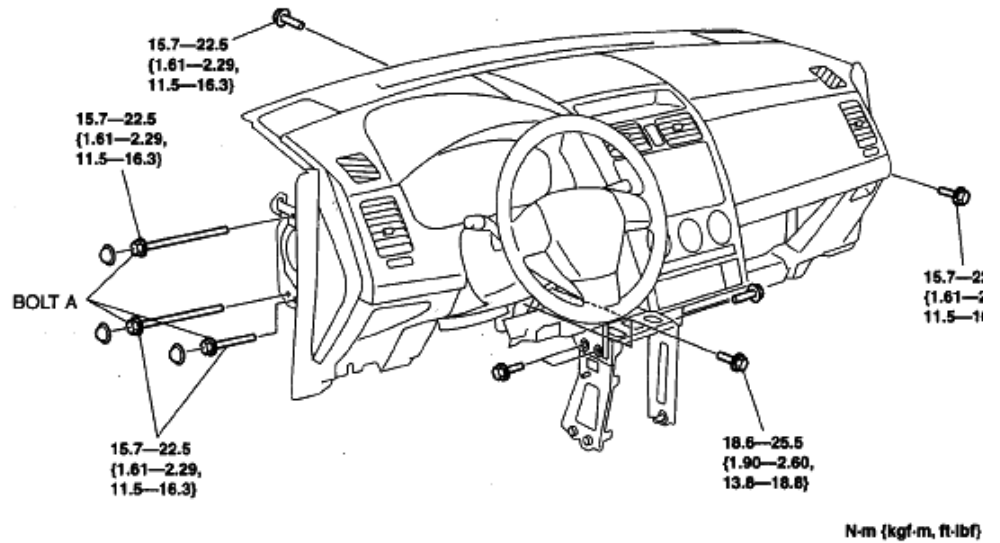
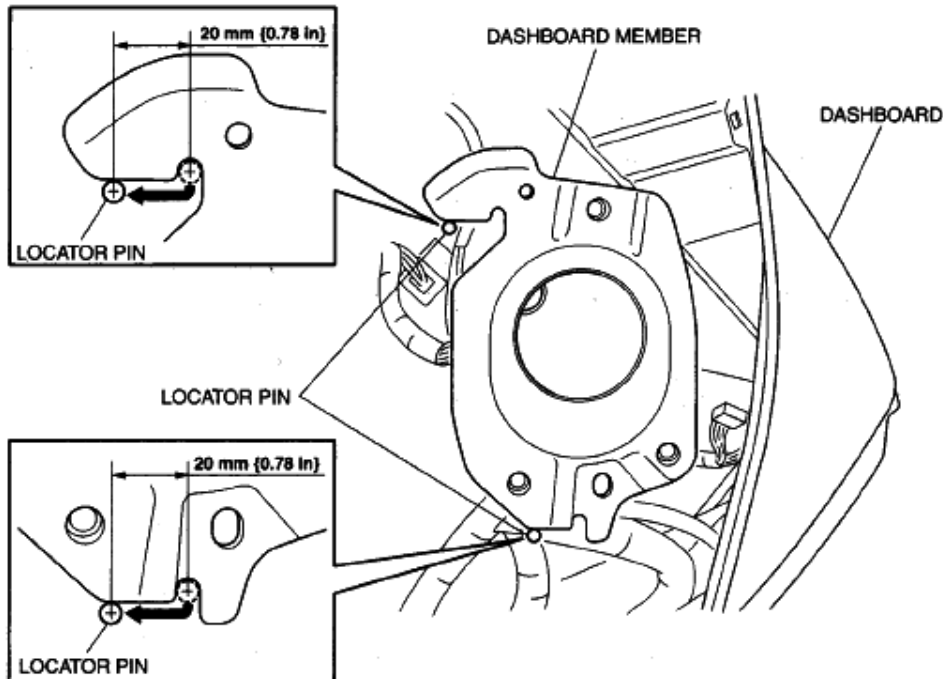


Fig. 6: Identifying Dashboard Bolts & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

21. Lift the dashboard upward and move it 20 mm {0.78 in} to the rear of the vehicle after the locator pin for the dashboard member is in the position shown in the figure.



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Fig. 7: Identifying Dashboard & Dashboard Member
Courtesy of MAZDA MOTORS CORP.

- CAUTION:**
- If the dashboard is moved towards the vehicle rear excessively, the wiring harness could be damaged. Mark the position and verify the distance when moving the dashboard.

- NOTE:**
- When verifying the position of the dashboard member, verify visually with the locator pin from the underside of the dashboard.

22. Move the power brake unit to the vehicle front where the power brake unit fork does not interfere with the brake pedal arm. dashboard
23. Remove the brake pedal. member

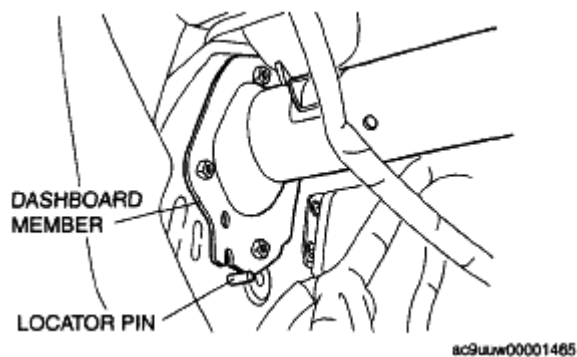


Fig. 8: Identifying Dashboard Member & Locator Pin
Courtesy of MAZDA MOTORS CORP.

BRAKE SWITCH INSTALLATION NOTE

1. Inspect the brake pedal. (See **BRAKE PEDAL INSPECTION.**)
2. With the brake pedal fully released, insert a new brake switch into the installation hole on the lock unit.
3. Secure the brake switch by turning it clockwise **45°**.

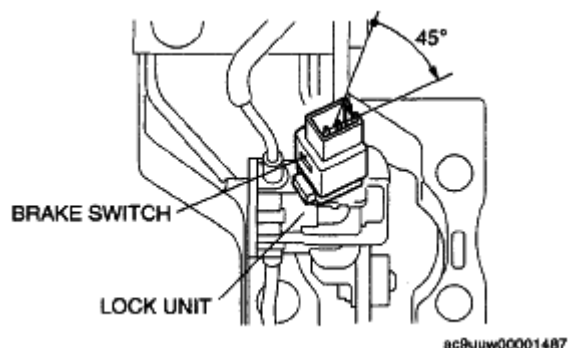


Fig. 9: Identifying Brake Switch & Lock Nut
Courtesy of MAZDA MOTORS CORP.

BRAKE SWITCH CONNECTOR INSTALLATION NOTE

1. Inspect the brake pedal. (See **BRAKE PEDAL REMOVAL/INSTALLATION**.)
2. With the brake pedal in its original position, install the brake switch to the brake switch connector.

BRAKE SWITCH INSPECTION

CAUTION:

- Inspect the brake switch with it installed to the brake pedal, otherwise the brake switch may not operate normally. If the brake switch is removed from the brake pedal, replace the brake switch with a new one.

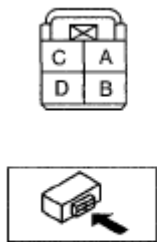
1. Disconnect the brake switch connector.
2. Verify that the continuity is as indicated in the table.
 - If not as indicated in the table, replace the brake switch.

○—○ : Continuity

Condition	Terminal			
	A	B	C	D
When the brake pedal is depressed		○—○		○—○
When the brake pedal is not depressed	○—○		○—○	

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Fig. 10: Connector Terminal Reference
 Courtesy of MAZDA MOTORS CORP.



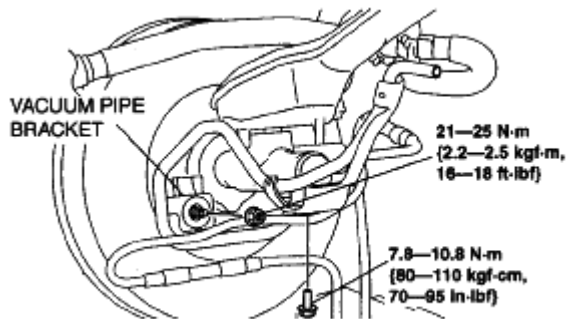
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Fig. 11: Identifying Brake Switch Connector
 Courtesy of MAZDA MOTORS CORP.

MASTER CYLINDER REMOVAL/INSTALLATION

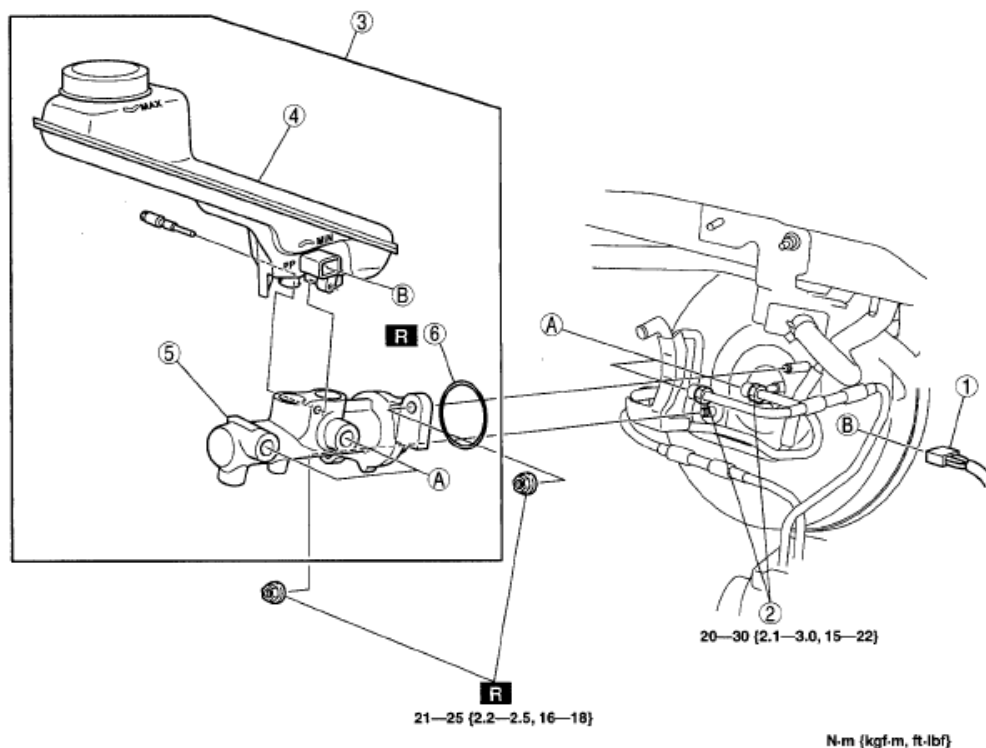
1. Remove the battery and battery tray. (See **BATTERY REMOVAL/INSTALLATION [MZI-3.7]** .)

2. Remove the resonance chamber. (See **INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7]** .)
3. Remove the bolt and nut as shown in the figure, and move the vacuum pipe bracket.
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See **AIR BLEEDING**.)



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Fig. 12: Identifying Vacuum Pipe Bracket, Bolt, Nut & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.



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1	Brake fluid level sensor connector
2	Brake pipe
3	Master cylinder component

4	Reserve tank
5	Master cylinder
6	O-ring

Fig. 13: Identifying Brake Fluid Level Sensor Connector, Brake Pipe, Master Cylinder Component, Reverse Tank, O-Ring & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

BRAKE FLUID LEVEL SENSOR INSPECTION

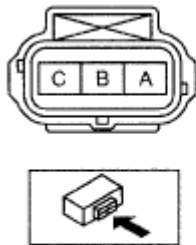
1. Disconnect the brake fluid level sensor connector from the master cylinder.
2. Inspect for continuity according to fluid level between the brake fluid level sensor terminals.
 - If not as indicated in the table, replace the No.1 reserve tank. (See **MASTER CYLINDER REMOVAL/INSTALLATION.**)

○—○: Continuity

Condition	Terminal	
	A	B
Above MIN	○—○	
Below MIN		

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Fig. 14: Connector Terminal Reference
 Courtesy of MAZDA MOTORS CORP.



ac9uuw0001418

Fig. 15: Identifying Brake Fluid Level Sensor Connector Terminal
 Courtesy of MAZDA MOTORS CORP.

POWER BRAKE UNIT INSPECTION

NOTE:

- The following inspection methods are simple inspection methods to judge the function of the power brake unit.
- If there is any malfunction in the power brake unit, replace the power brake unit as a single unit.

WITHOUT USING SST

Operation inspection

1. With the engine stopped, pump the pedal a few times.
2. With the pedal depressed, start the engine.
3. If the pedal moves down slightly immediately after starting the engine, the unit is normal.

Vacuum function inspection

1. Start the engine.
2. Stop the engine after driving the vehicle for **1-2 min.**
3. Depress the pedal with normal force.
4. If the first pedal stroke is long and becomes shorter with subsequent strokes, the unit is normal.
 - If a problem is found, inspect for, damage to or improper installation of the check valve and vacuum hose. After repairing, inspect again.

Vacuum loss function inspection

1. Start the engine.
2. Depress the pedal with normal force.
3. With the pedal depressed, stop the engine.
4. Hold the pedal depressed for **approx. 30 s**.
5. If the pedal height does not change during this time, the unit is normal.

USING SST

Pre-inspection preparation

1. Disconnect the brake pipe flare nut area using the commercially available flare nut wrench as shown in the figure.
2. Remove the clamp and disconnect the brake hose.

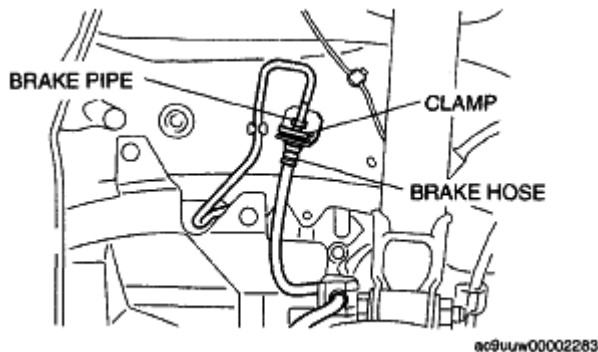


Fig. 16: Identifying Clamp, Brake Hose & Brake Pipe
Courtesy of MAZDA MOTORS CORP.

3. Install the **SST** to the brake pipe as shown in the figure.

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4. Bleed the brake line and the SSTs of air. Bleed the air from the SSTs using bleeder screw A.
5. Install the pedal force gauge to the brake pedal.
6. Connect the vacuum gauge to the vacuum line.

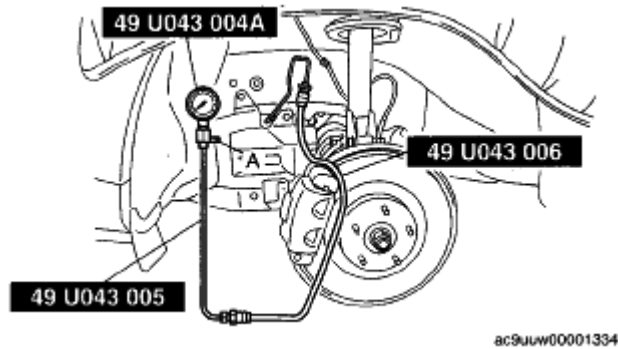


Fig. 17: Installing Brake Pipe To SST
Courtesy of MAZDA MOTORS CORP.

Vacuum loss inspection

1. Start the engine.
2. Depress the brake pedal with a force of **200 N {20.4 kgf, 44.9 lbf}**.
3. Stop the engine when the vacuum gauge reading reaches **68 kPa {510 mmHg, 20.1 inHg}** with the pedal depressed.
4. With the engine off, observe the vacuum gauge for **15 s**.
5. If the gauge has dropped **3.3 kPa {25 mmHg, 1.0 inHg}** or less, the unit is normal.

Lack of hydraulic pressure inspection

1. If the pedal force and fluid pressure correlation is within the specification with the engine stopped and a vacuum amount of **0 kPa {0 mmHg, 0 inHg}**, the system is normal.

Master cylinder fluid pressure

MASTER CYLINDER FLUID PRESSURE SPECIFICATION

Vacuum amount at 0 kPa {0 mmHg, 0 inHg}	
Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm ² , psi})
200 N {20.4 kgf, 44.9 lbf}	520 kPa {5.31 kgf/cm ² , 75.5 psi} or more

Hydraulic pressure inspection

1. Start the engine. Depress the brake pedal when the vacuum reaches **66.7 kPa {500 mmHg, 19.7 inHg}**.
2. At this time, apply the indicated pedal force and if the fluid pressure is within the specification, the unit is normal.

Master cylinder fluid pressure

MASTER CYLINDER FLUID PRESSURE SPECIFICATION

Vacuum amount at 66.7 kPa {500 mmHg, 19.7 inHg}	
Pedal force (N {kgf, lbf})	Fluid pressure (kPa {kgf/cm², psi})
200 N {20.4 kgf, 44.9 lbt}	9,000 kPa {91.78 kgf/cm ² , 1,306 psi} or more

After-inspection procedure

1. After the inspection, remove the SSTs, install the brake hose, clamp, and brake pipe to the original positions, and then bleed the air from the brake line.

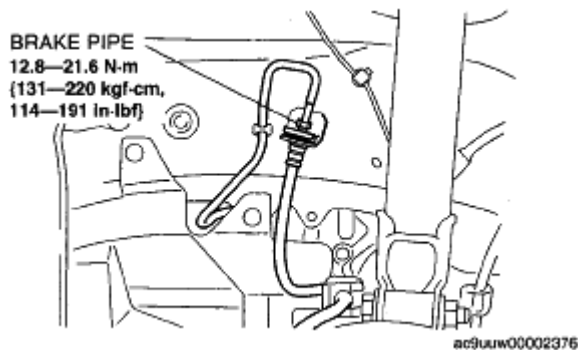


Fig. 18: Identifying Brake Pipe To Original Positions & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

POWER BRAKE UNIT REMOVAL/INSTALLATION

1. Remove the battery and battery tray. (See BATTERY REMOVAL/INSTALLATION [MZI-3.7] .)
2. Remove the resonance chamber. (See INTAKE-AIR SYSTEM REMOVAL/INSTALLATION [MZI-3.7] .)
3. Remove the windshield wiper arm and blade. (See WINDSHIELD WIPER ARM AND BLADE REMOVAL/INSTALLATION .)
4. Remove the cowl grille. (See COWL GRILLE REMOVAL/INSTALLATION .)
5. Remove the windshield wiper motor. (See WINDSHIELD WIPER MOTOR REMOVAL/INSTALLATION .)
6. Remove the cowl panel. (See COWL PANEL REMOVAL/INSTALLATION .)
7. Remove the master cylinder component. (See MASTER CYLINDER REMOVAL/INSTALLATION .)
8. Remove the nuts as shown in the figure, and move the front heater pipe.
9. Remove the brake pipe (DSC/RSC HU/CM-master cylinder). (See DSC/RSC HU/CM REMOVAL/INSTALLATION .).

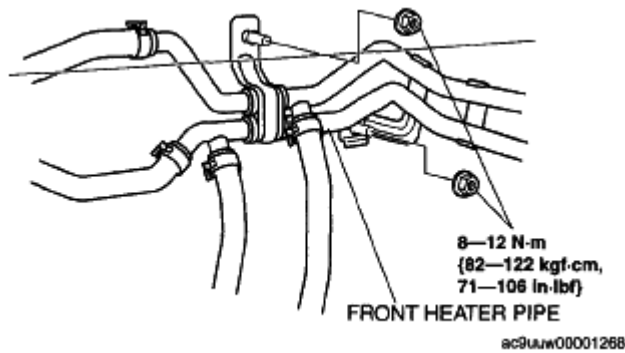


Fig. 19: Identifying Front Heater Pipe & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

10. Disconnect the brake pipe (DSC/RSC HU/CM side) as shown in the figure.
11. Remove in the order indicated in the table.
12. Install in the reverse order of removal.
13. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See **AIR BLEEDING.**)
14. Inspect the brake pedal. (See **BRAKE PEDAL INSPECTION.**)

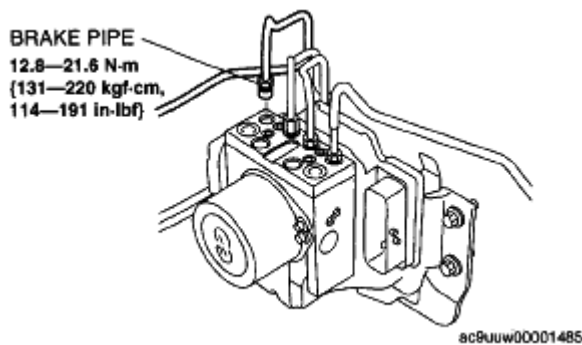


Fig. 20: Identifying Brake Pipe & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

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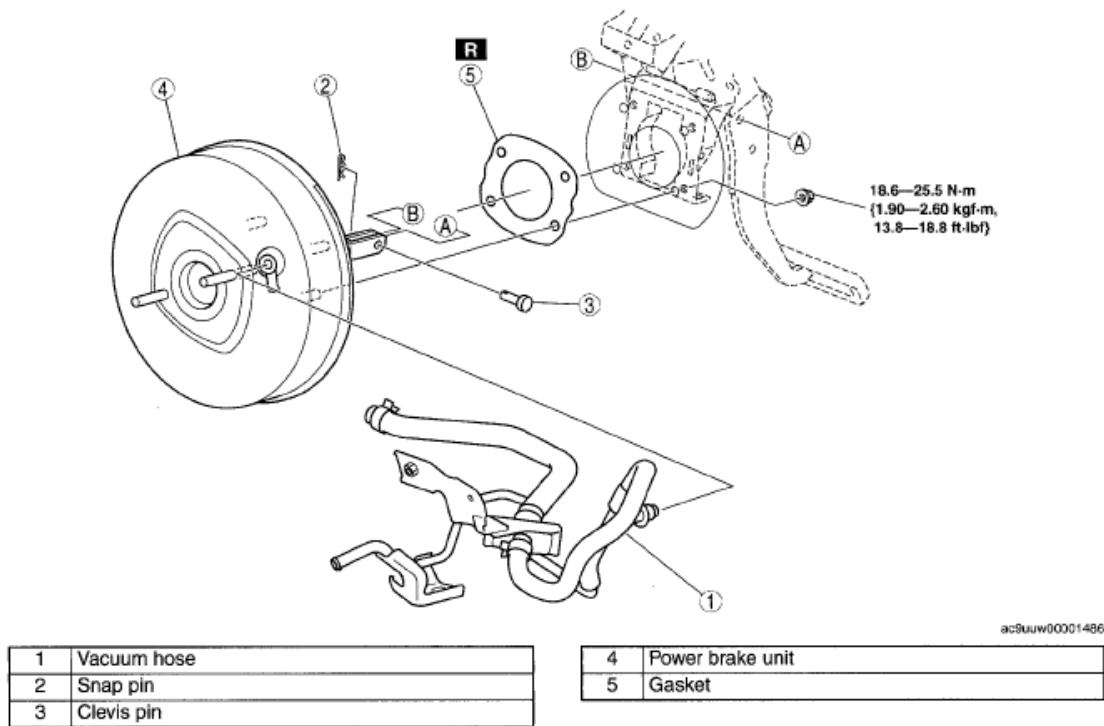


Fig. 21: Identifying Vacuum Hose, Snap Pin, Cleaves Pin, Power Brake Unit & Torque Specifications

Courtesy of MAZDA MOTORS CORP.

FRONT BRAKE (DISC) INSPECTION

BRAKE JUDDER REPAIR HINT

Description

Brake judder concern has the following three characteristics:

Steering wheel vibration

Steering wheel vibrates in the direction of its rotation. This characteristic is most noticeable when applying brakes at a vehicle speed of **100-140 km/h {62-87 mph}**.

Floor vibration

When applying brakes, the vehicle body shakes back and forth. The seriousness of shake is not influenced by vehicle speed.

Brake pedal vibration

When applying brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.

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The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of disc plate, the thickness of disc plate is uneven.

If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because of uneven pad/plate contact.

If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

The disc plate is deformed by heat.

Repeated panic braking may raise the temperature in some portions of disc plate by **approx. 1,000 °C {1,832 °F}**.

This results in deformed disc plate.

Due to corrosion, the thickness and friction coefficient of disc plate change.

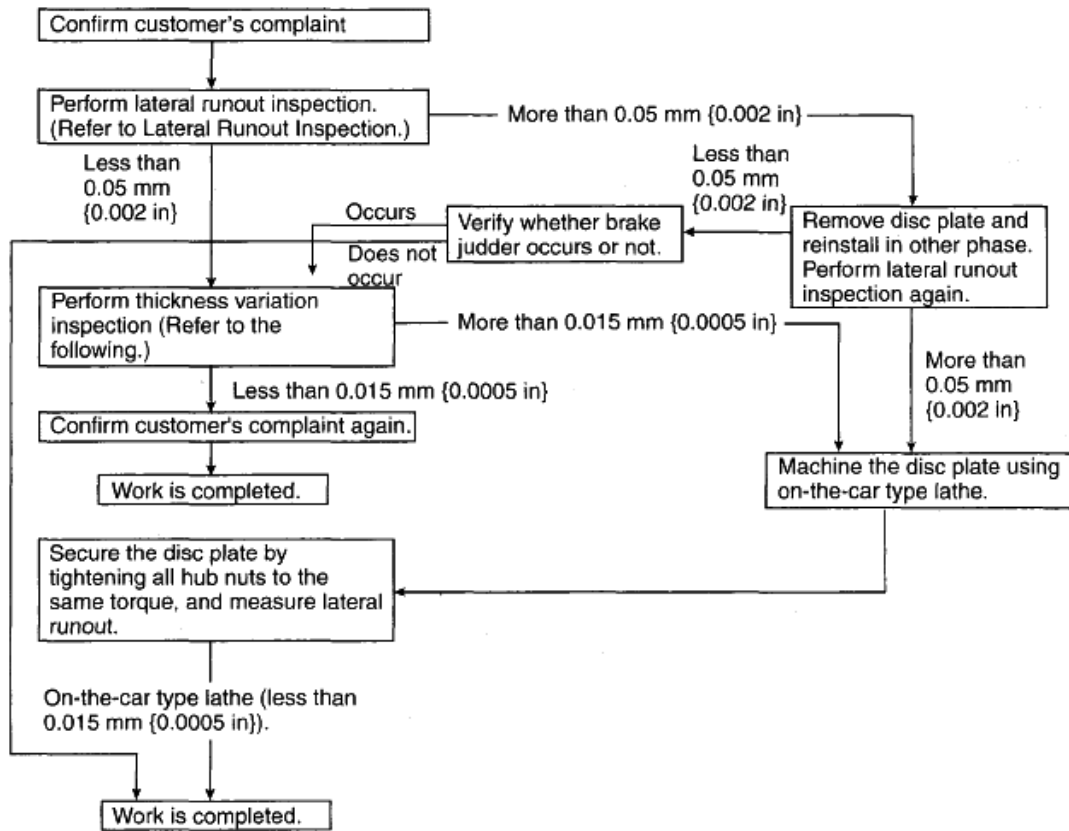
If a vehicle is parked under damp conditions for a long time, corrosion occurs on the friction surface of disc plate.

The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure

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Fig. 22: Inspection & Repair Procedure Diagram
Courtesy of MAZDA MOTORS CORP.

Lateral runout inspection

1. To secure the disc plate and the hub, tighten the hub nuts upside down or insert a washer (thickness **10 mm {0.39 in}**) with an inner diameter **more than 12 mm {0.47 in}**) between the hub bolt and the hub nut.

NOTE:

- The component parts of the SST (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Front disc plate runout limit 0.05 mm {0.002 in}

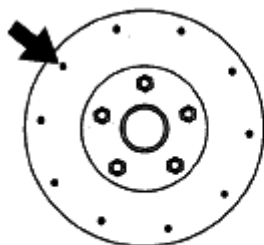
Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.

2. Measure the points indicated in the illustration using a caliper (micrometer)
3. Subtract the minimum value from the maximum.
 - If the result is not within specification, machine the disc plate using a lathe.

Thickness variation limit 0.015 mm {0.0005 in}

WARNING: • **Do not exceed minimum disc plate thickness.**



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Fig. 23: Identifying Disc Plate Points
Courtesy of MAZDA MOTORS CORP.

DISC PLATE THICKNESS INSPECTION

CAUTION: • **Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.**

1. Measure the thickness of the disc plate.
 - If the thickness is not within the specification, replace the disc plate.

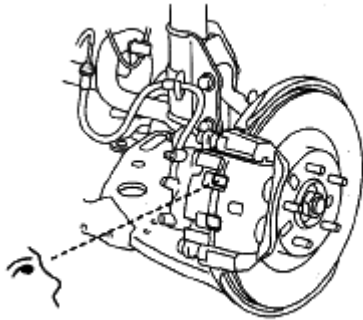
Minimum front disc plate thickness 26 mm {1.03 in}

Minimum front disc plate thickness after machining using a brake lathe on-vehicle 26.8 mm {1.06 in}

DISC PAD THICKNESS INSPECTION

1. Jack up the front of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Verify the remaining thickness of the pads.
 - Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.

Minimum front disc pad thickness 2.0 mm {0.08 in}



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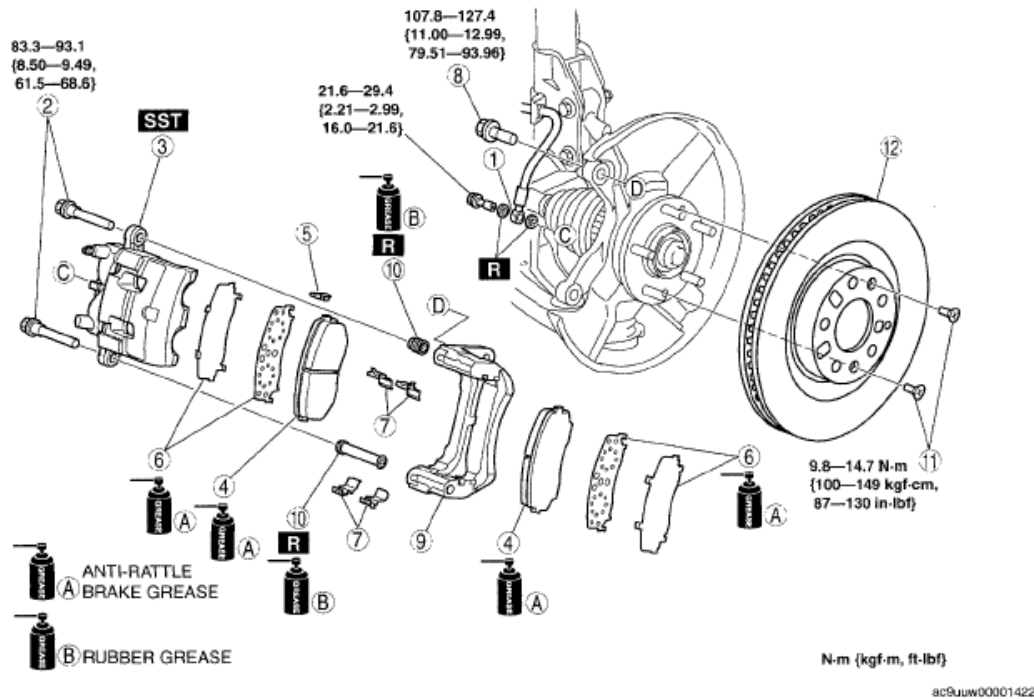
Fig. 24: Locating Disc Pad Thickness
Courtesy of MAZDA MOTORS CORP.

FRONT BRAKE (DISC) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See **AIR BLEEDING.**)
4. After installation, depress the brake pedal a few times, rotate the wheel by hand, and verify that the brake does not drag.

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2008 BRAKES Conventional Brake System - Mazda CX-9



1	Brake hose
2	Slide pin bolt
3	Caliper (See 04-11-18 Caliper Installation Note.)
4	Disc pad
5	Pad wear indicator
6	Shim

7	Guide plate
8	Bolt
9	Mounting support
10	Dust boot
11	Screw
12	Disc plate

Fig. 25: Identifying Front Brake Components (Disc) & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

CALIPER INSTALLATION NOTE

1. Push the piston fully inward using the SST.
2. Install the caliper.

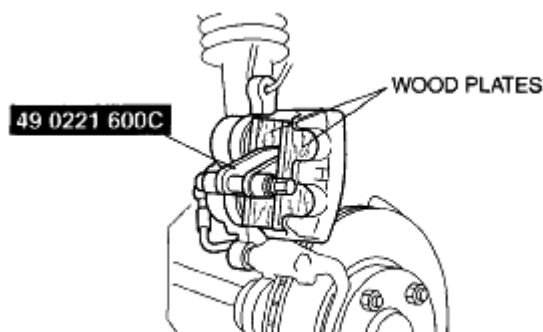


Fig. 26: Identifying Wood Plate With SST
Courtesy of MAZDA MOTORS CORP.

DISC PAD (FRONT) REPLACEMENT

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the brake pedal a few times, rotate the wheel by hand, and verify that the brake does not drag.

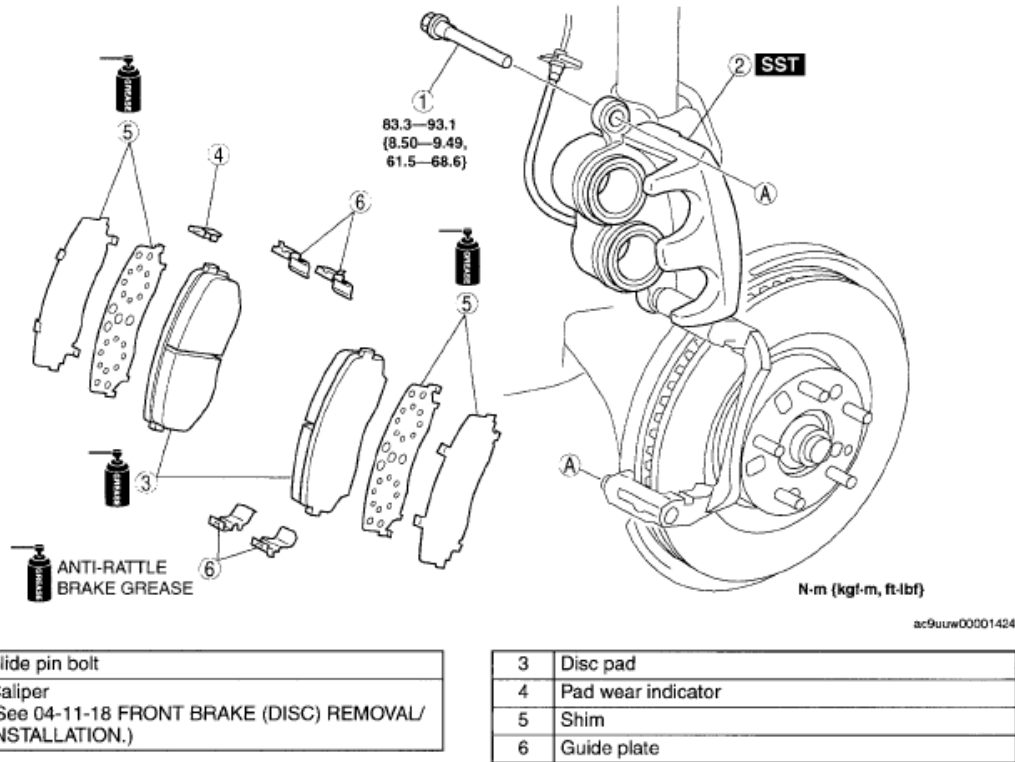


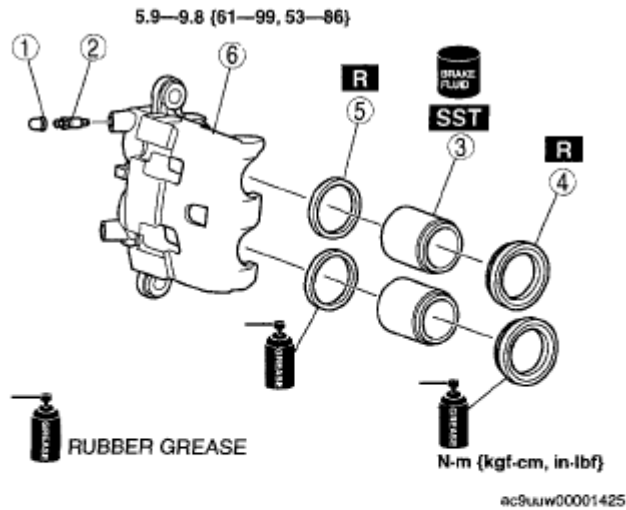
Fig. 27: Identifying Disc Pad Components (Front) & Torque Specifications
Courtesy of MAZDA MOTORS CORP.

CALIPER (FRONT) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.

2008 Mazda CX-9 Grand Touring

2008 BRAKES Conventional Brake System - Mazda CX-9



1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-20 Piston Disassembly Note.)
4	Dust seal
5	Piston seal
6	Caliper

Fig. 28: Identifying Caliper Components (Front) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

- Assemble in the reverse order of removal.

PISTON DISASSEMBLY NOTE

WARNING:

- When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.

CAUTION:

- The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.

- Place the SST in the caliper, then blow compressed air through the hole to force the piston out of the caliper.

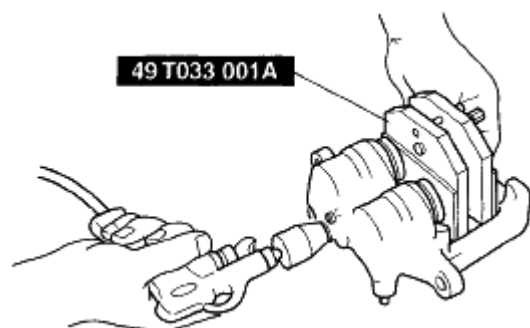


Fig. 29: Identifying SST In Caliper
Courtesy of MAZDA MOTORS CORP.

REAR BRAKE (DISC) INSPECTION

BRAKE JUDDER REPAIR HINT

Description

Brake judder concern has the following three characteristics:

Steering wheel vibration

Steering wheel vibrates in the direction of its rotation. This characteristic is most noticeable when applying brakes at a vehicle speed of **100-140 km/h {62-87 mph}** .

Floor vibration

When applying brakes, the vehicle body shakes back and forth. The seriousness of shake is not influenced by vehicle speed.

Brake pedal vibration

When applying brakes, a pulsating force tries to push the brake pad back. The pulsation is transmitted to the brake pedal.

The following are the main possible causes of brake judder:

Due to an excessive runout (side-to-side wobble) of disc plate, the thickness of disc plate is uneven.

If the runout is **more than 0.05 mm {0.002 in}** at the position **10 mm {0.39 in}** from the disc plate edge, uneven wear occurs on the disc plate because of uneven pad/plate contact.

If the runout is **less than 0.05 mm {0.002 in}**, uneven wear does not occur.

The disc plate is deformed by heat.

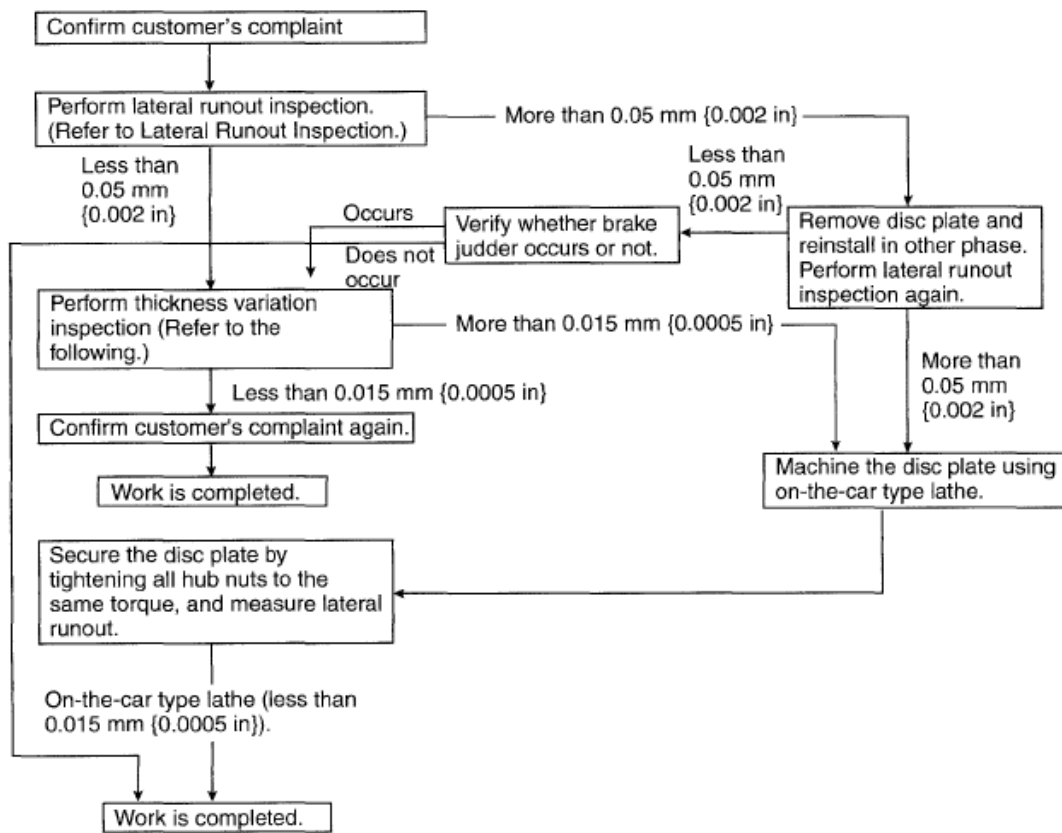
Repeated panic braking may raise the temperature in some portions of disc plate by **approx. 1,000 °C {1,832 ° F}**. This results in deformed disc plate.

Due to corrosion, the thickness and friction coefficient of disc plate change.

If a vehicle is parked under damp conditions for a long time, corrosion occurs on the friction surface of disc plate.

The thickness of corrosion is uneven and sometimes appears like a wave pattern, which changes the friction coefficient and causes a reaction force.

Inspection and repair procedure



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Fig. 30: Inspection & Repair Procedure Diagram
 Courtesy of MAZDA MOTORS CORP.

Lateral runout inspection

1. To secure the disc plate and the hub, tighten the hub nuts upside down or insert a washer (thickness **10 mm {0.39 in}**) with an inner diameter **more than 12 mm {0.47 in}**) between the hub bolt and the hub nut.

NOTE:

- The component parts of the SST (49 B017 001 or 49 G019 003) can be used as a suitable washer.

2. After tightening all the hub nuts to the same torque, put the dial gauge on the friction surface of disc plate **10 mm {0.39 in}** from the disc plate edge.
3. Rotate the disc plate one time and measure the runout.

Rear disc plate runout limit 0.05 mm {0.002 in}

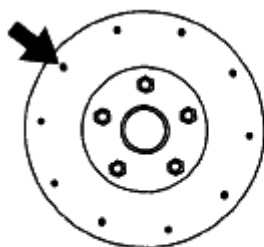
Thickness variation inspection

1. Clean the disc plate-to-pad friction surface using a brake cleaner.
2. Measure the points indicated in the illustration using a caliper (micrometer).
3. Subtract the minimum value from the maximum.
 - If the result is not within specification, machine the disc plate using a lathe.

Thickness variation limit 0.015 mm {0.0005 in}

WARNING:

- Do not exceed minimum disc plate thickness.



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Fig. 31: Identifying Disc Plate Points
Courtesy of MAZDA MOTORS CORP.

DISC PLATE THICKNESS INSPECTION

CAUTION:

- Excessive runout may result if the disc plate is removed from the vehicle then machined. Machine the disc plate while installed on the vehicle.

1. Measure the thickness of the disc plate.
 - If the thickness is not within the specification, replace the disc plate.

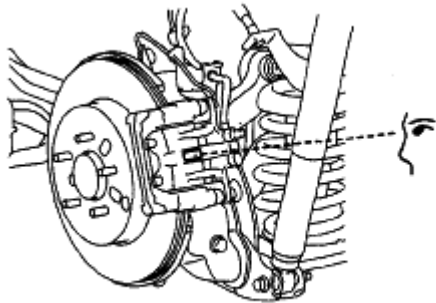
Minimum rear disc plate thickness 16 mm {0.63 in}

Minimum rear disc plate thickness after machining using a brake lathe on-vehicle 16.8 mm {0.66 in}

DISC PAD THICKNESS INSPECTION

1. Jack up the rear of the vehicle and support it with safety stands.
2. Remove the wheels.
3. Verify the remaining thickness of the pads.
 - Replace the pads as a set: right and left wheels, if either one is at or less than the minimum thickness.

Minimum rear disc pad thickness 2.0 mm {0.08 in}



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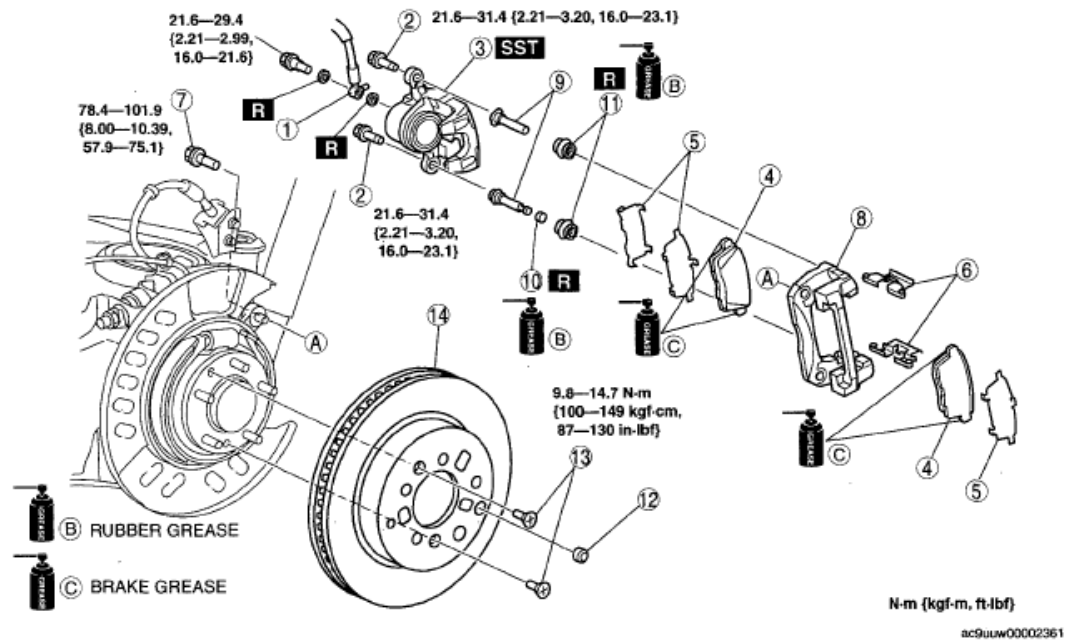
Fig. 32: Locating Disc Pad Thickness
Courtesy of MAZDA MOTORS CORP.

REAR BRAKE (DISC) REMOVAL/INSTALLATION

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, add brake fluid, bleed the air, and inspect for fluid leakage. (See **AIR BLEEDING.**)
4. After installation, do the following.
 1. Depress the brake pedal a few times. Then verify that the brakes do not drag.
 2. Inspect the parking brake pedal stroke. (See **PARKING BRAKE INSPECTION .**)

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2008 BRAKES Conventional Brake System - Mazda CX-9



1	Brake hose
2	Bolt
3	Caliper (See 04-11-26 Caliper Installation Note.)
4	Disc pad
5	Shim
6	Guide plate
7	Bolt
8	Mounting support

9	Slide pin
10	Bush
11	Dust boot
12	Plug
13	Screw (See 04-11-25 Disc Plate, Screw Installation Note.)
14	Disc plate (See 04-11-25 Disc Plate Removal Note.) (See 04-11-25 Disc Plate, Screw Installation Note.)

Fig. 33: Identifying Rear Brake Components (Disc) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

DISC PLATE REMOVAL NOTE

1. If any disc plate is difficult to remove, perform the following steps to remove it.
 1. Insert a flathead screwdriver into the service hole and turn the adjuster in the direction of the arrow to compress the parking brake shoe.
 2. Remove the disc plate.

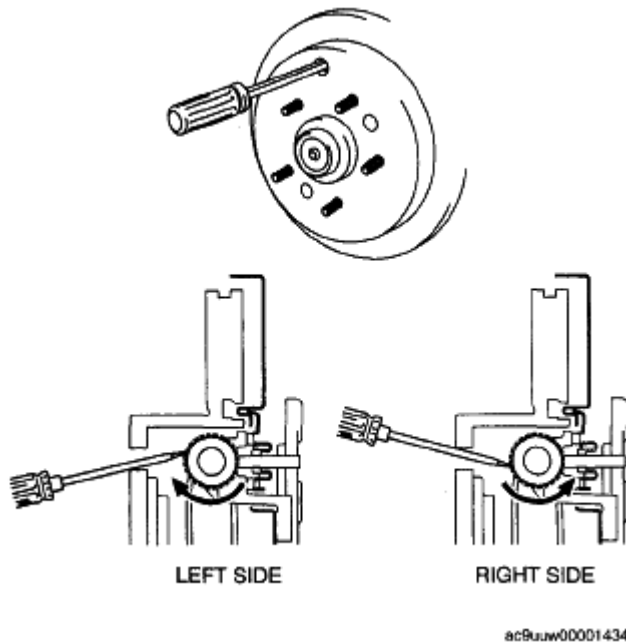


Fig. 34: Removing Disc Plate
Courtesy of MAZDA MOTORS CORP.

DISC PLATE, SCREW INSTALLATION NOTE

1. Install the disc plate and the screws.
2. Perform the following steps to adjust the shoe clearance after installing the disc plate and the screws.
 1. Insert a flathead screwdriver into the service hole and turn the adjuster in the direction of the arrow to expand the parking brake shoe until the disc plate cannot rotate.

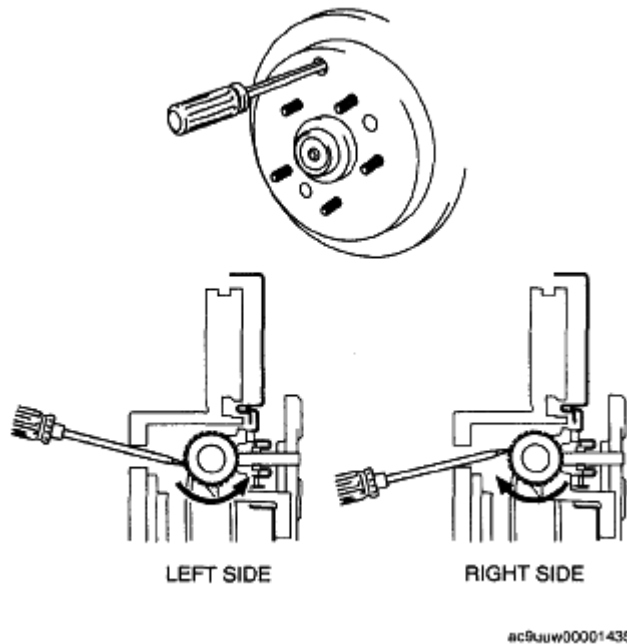


Fig. 35: Installing Disc Plate & Screws
Courtesy of MAZDA MOTORS CORP.

2. Return the adjuster **13-25 notches** in the direction of the arrow.

NOTE:

- Shoe clearance can be adjusted to 0.15 mm {0.006 in} by returning the adjuster **15 notches**.

3. Rotate the disc plate and make sure it does not drag.

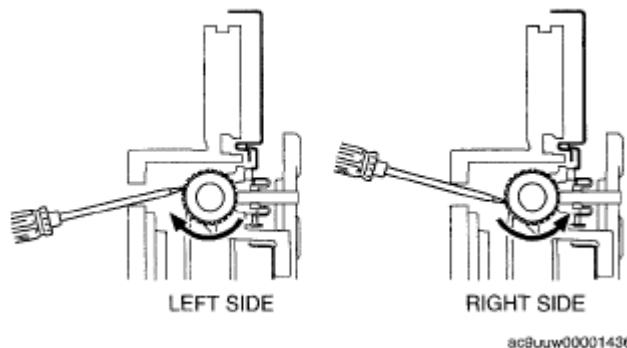


Fig. 36: Adjusting Adjuster
Courtesy of MAZDA MOTORS CORP.

CALIPER INSTALLATION NOTE

1. Push the piston fully inward using the SST.
2. Install the caliper.

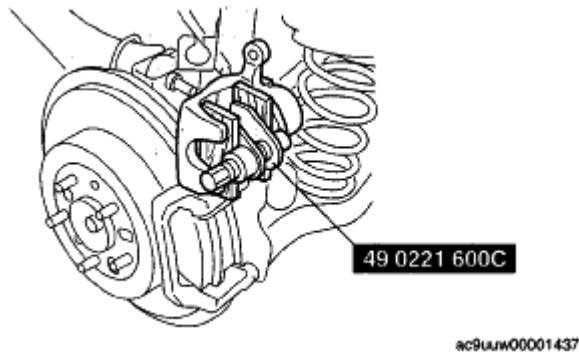
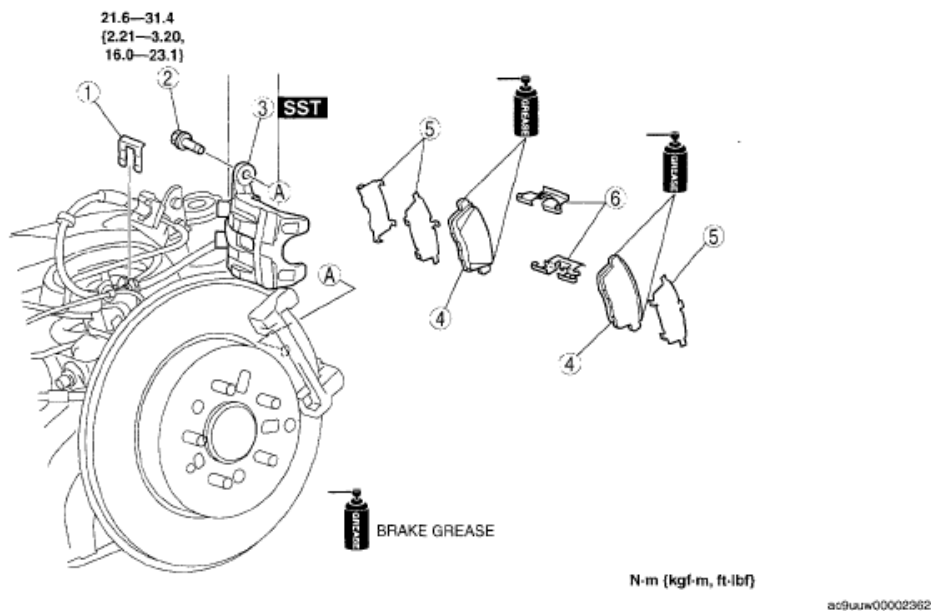


Fig. 37: Pushing Piston With SST
 Courtesy of MAZDA MOTORS CORP.

DISC PAD (REAR) REPLACEMENT

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.
3. After installation, depress the brake pedal a few times, rotate the wheel by hand, and verify that the brake does not drag.



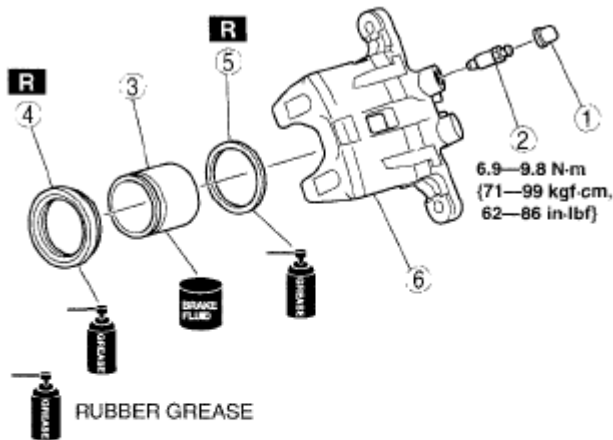
1	Clip
2	Bolt
3	Caliper (See 04-11-24 REAR BRAKE (DISC) REMOVAL/ INSTALLATION)

4	Disc pad
5	Shim
6	Guide plate

Fig. 38: Identifying Disc Pad (Rear) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

CALIPER (REAR) DISASSEMBLY/ASSEMBLY

1. Disassemble in the order indicated in the table.



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1	Bleeder cap
2	Bleeder screw
3	Piston (See 04-11-27 Piston Disassembly Note)
4	Dust seal
5	Piston seal
6	Caliper

Fig. 39: Identifying Caliper Sequence (Rear) & Torque Specifications
 Courtesy of MAZDA MOTORS CORP.

2. Assemble in the reverse order of removal.

PISTON DISASSEMBLY NOTE

WARNING:

- When compressed air is blown into the caliper body, injury to a finger or other part from pinching could result from the piston springing up. When blowing in compressed air, do not place your fingers between the piston and caliper body when performing the work.

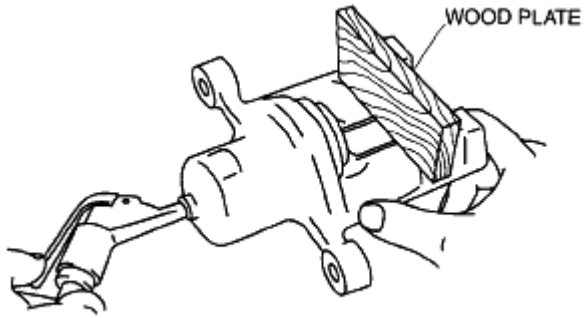
CAUTION:

- The piston could be damaged if blown out with great force. Blow the compressed air slowly to prevent the piston from suddenly popping out.

1. Place a piece of wood in the caliper, then blow compressed air through the hole to force the piston out of the caliper.

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2008 BRAKES Conventional Brake System - Mazda CX-9



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Fig. 40: Compressing Air Piston Of Caliper
Courtesy of MAZDA MOTORS CORP.