

---

# BASIC BRAKE SYSTEM

## CONTENTS

<b>SERVICE SPECIFICATIONS</b> .....	<b>2</b>	4. Disc Brake Pad Check and Replacement <EVOLUTION-IV> .....	4
<b>LUBRICANTS</b> .....	<b>2</b>	5. Disc Brake Pad Check and Replacement <EVOLUTION-V> .....	4
<b>SEALANT</b> .....	<b>3</b>	6. Brake Disc Thickness Check .....	6
<b>SPECIAL TOOLS</b> .....	<b>3</b>	7. Brake Drum I.D. Check .....	6
<b>ON-VEHICLE SERVICE</b> .....	<b>3</b>	8. Lining to Brake Drum Contact Check ...	6
1. Brake Booster Operation Check .....	3	<b>FRONT BRAKE</b> .....	<b>7</b>
2. Proportioning Valve Function Test .....	3	<b>REAR BRAKE</b> .....	<b>8</b>
3. Bleeding <EVOLUTION-V> .....	4		



## SERVICE SPECIFICATIONS

### <EVOLUTION-IV>

Items		Standard value	Limit
Brake booster nonboosting action test generated fluid pressure kPa {kgf/cm <sup>2</sup> }	Pedal force 98 N {10 kgf}	49 {0.5} or more	–
	Pedal force 294 N {30 kgf}	1,177 {12} or more	–
Brake booster boosting action test generated fluid pressure kPa {kgf/cm <sup>2</sup> }	Pedal force 98 N {10 kgf}	2,354 – 3,334 {24 – 34}	–
	Pedal force 294 N {30 kgf}	6,963 – 9,414 {71 – 96}	–
Proportioning valve	Split point kPa {kgf/cm <sup>2</sup> }	2,697 – 3,187 {27.5 – 32.5}	–
	Output fluid pressure kPa {kgf/cm <sup>2</sup> } (input fluid pressure kPa {kgf/cm <sup>2</sup> })	4,658 {47.5} (9,807 {100})	–
Front disc brake drag force N {kgf}		51 {5.2}	–
Rear disc brake	Brake pad thickness mm	10.0	2.0
	Brake disc thickness mm	20.0	18.4
	Brake drag force N {kgf}	69 {7.0}	–
	Brake drum I.D. mm	168.0	169.0

### <EVOLUTION-V>

Same as EVOLUTION-IV except for followings.

Items		Standard value	Limit
Front disc brake	Brake pad thickness mm	10.0	2.0
	Brake drag force N {kgf}	69 {7.0}	–
Rear disc brake	Brake pad thickness mm	10.0	2.0
	Brake drag force N {kgf}	69 {7.0}	–

## LUBRICANTS

Items	Specified lubricant	Quantity
Brake fluid	MITSUBISHI GENUINE DIA QUEEN BRAKE FLUID SUPER	As required
Piston boot, piston seal	Repair kit grease	
Guide pin, lock pin		
Pin boot, guide pin sleeve		
Piston, wheel cylinder body		
Packing plate	CHUO YUKA AKB100	
Shoe & lining assembly		
Auto adjuster assembly		

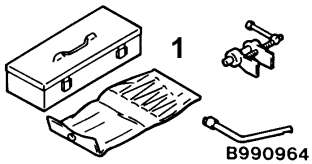
## SEALANT

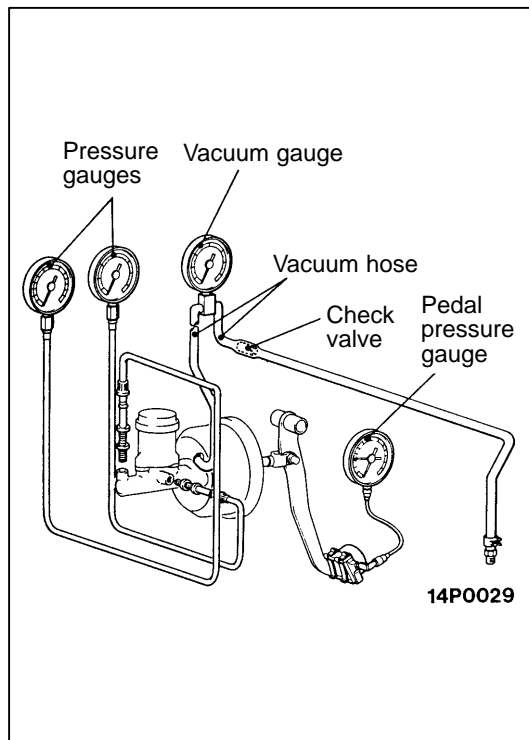
Items	Specified sealant
Fitting	Semi-drying sealant: THREEBOND 1104 [0110207]
Vacuum switch	HELMESEAL 101Y [MZ100022 (containing 100 g)], [MZ100023 (containing 500 g)] HELMESEAL 201-52B [0110511 (containing 100 g)], [0110512 (containing 500 g)]

### NOTE

Given in [ ] are the genuine part numbers.

## SPECIAL TOOLS

Tool	Number	Name	Use
	MB990964 1: MB991008 (F)	Brake tool set	Installation of rear drum brake piston cup



## ON-VEHICLE SERVICE

### 1. BRAKE BOOSTER OPERATION CHECK

The conventional procedures apply except for the following standard value.

#### Nonboosting action test

**Standard value:**

**Fluid pressure generated kPa {kgf/cm<sup>2</sup>}**

Pedal force 98 N {10 kgf}: 49 {0.5} or more

Pedal force 294 N {30 kgf}: 1,177 {12} or more

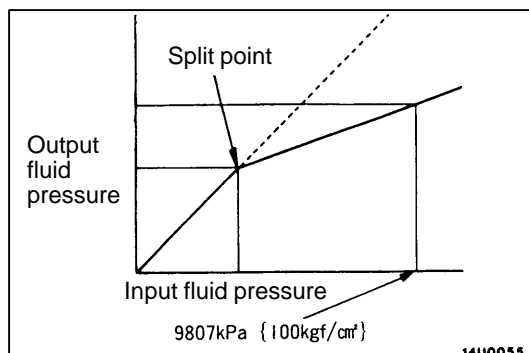
#### Boosting action test

**Standard value:**

**Fluid pressure generated kPa {kgf/cm<sup>2</sup>}**

Pedal force 98 N {10 kgf}: 2,354 – 3,334 {24 – 34}

Pedal force 294 N {30 kgf}: 6,963 – 9,414 {71 – 96}

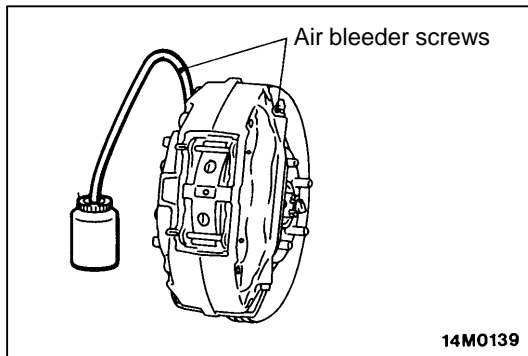


### 2. PROPORTIONING VALVE FUNCTION TEST

The conventional procedures apply except for the following standard value.

**Standard value:**

Input fluid pressure kPa {kgf/cm <sup>2</sup> }	Output fluid pressure kPa {kgf/cm <sup>2</sup> }
Split point	2,697 – 3,187 {27.5 – 32.5}
9,807 {100}	4,658 {47.5}



### 3. BLEEDING <EVOLUTION-V>

Connect a vinyl tube to the outer end of the air bleeder screw to bleed the circuit of air. Then, connect the vinyl tube to the inner end and bleed the circuit of air. Except for these, the conventional procedures shall be followed. After the circuit has been bled of air, tighten both air bleeder screws to the specified torque.

### 4. DISC BRAKE PAD CHECK AND REPLACEMENT <EVOLUTION-IV>

#### 4-1 FRONT BRAKE

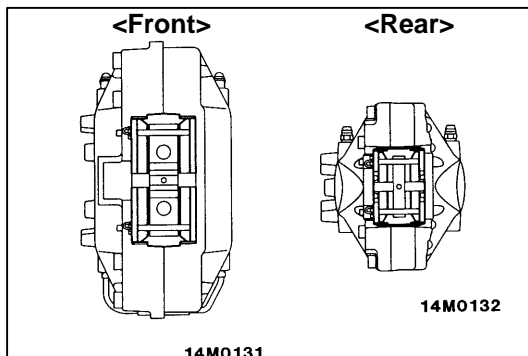
Use the same procedure as that for the 2-pot type disc brake.

#### 4-2 REAR BRAKE

The conventional procedures apply except for the following standard value for the brake pad thickness.

**Standard value (brake pad thickness): 10.0 mm**

**Limit: 2.0 mm**



### 5. DISC BRAKE PAD CHECK AND REPLACEMENT <EVOLUTION-V>

#### NOTE

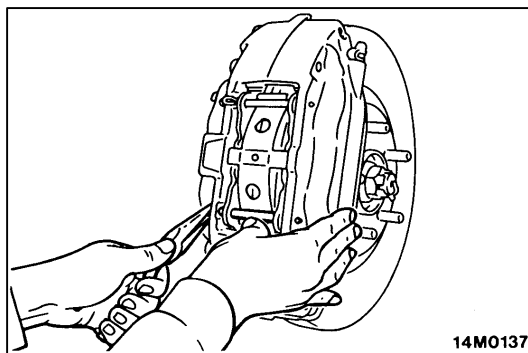
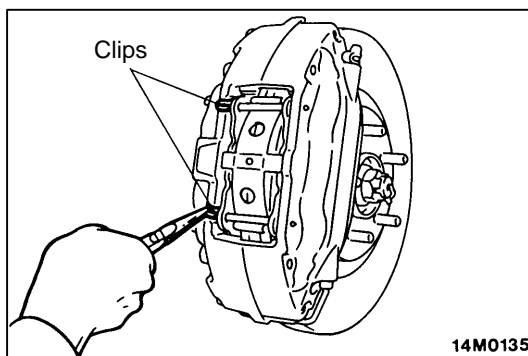
The wear indicator contacts the brake disc to squeak when the pad thickness becomes about 2 mm, warning the driver that the pad needs replacement.

- (1) Visually check for the brake pad thickness through the inspection hole in the caliper body.

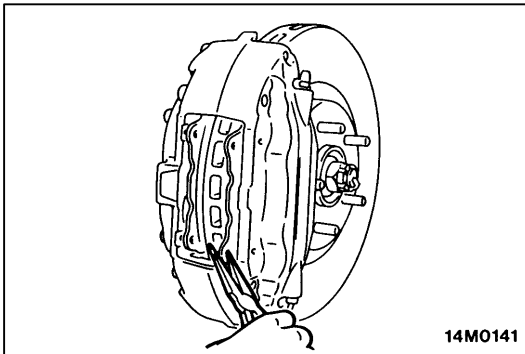
**Standard value: 10.0 mm**

**Limit: 2.0 mm**

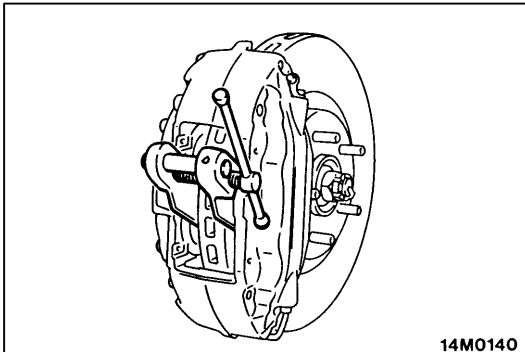
- (2) If the brake pad thickness is less than the limit, follow steps (3) and onward to replace the brake pads on both sides with new ones as a set.
- (3) Remove clips from the pins.



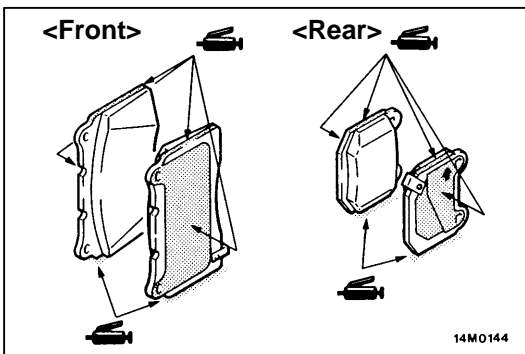
- (4) Holding the cross spring with one hand, pull the pin out of the caliper.



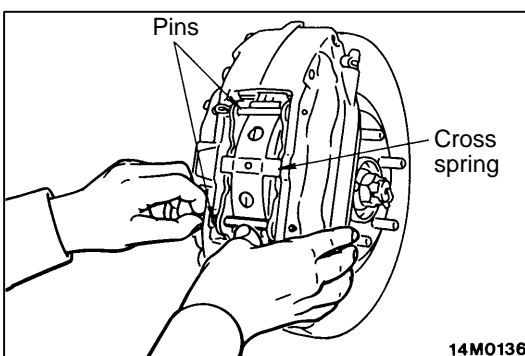
- (5) Remove the pad from the caliper.
- (6) To measure brake drag force after new pads have been installed, use a spring balance to measure the turning sliding resistance of the hub with the pads removed.



- (7) Clean the piston and, using the special tool, push the piston into the cylinder.

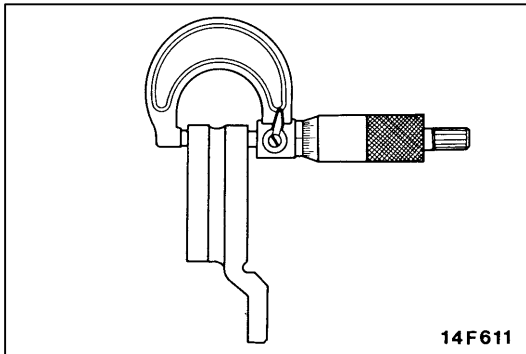


- (8) Apply repair kit grease to the portions of the pads indicated on the left. At this time, make sure that the grease will not be applied to any other surfaces.
- (9) Mount the pad to the caliper so that its side with the wear indicator is on the outside of the vehicle. With the rear pad, ensure that the arrow on the pad faces in the same direction as the brake disc turns when the vehicle moves forward.



- (10) Holding the cross spring with one hand, fit pins in the caliper.
- (11) Mount clips to the pins.
- (12) Using a spring balance, measure the turning sliding resistance of the hub in the forward direction.
- (13) Find the brake disc drag force [the difference in measurements taken in step (6) and in step (12)].

**Standard value: 69 N {7.0 kgf}**



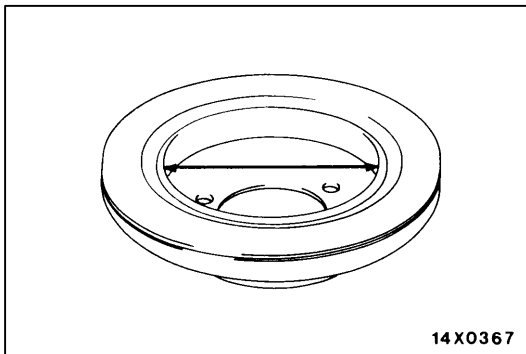
## 6. BRAKE DISC THICKNESS CHECK

- (1) Remove dirt and rust from the surface of the brake disc.
- (2) Measure the thickness of the disc, over which the pad slides, at 4 places or more.

**Standard value:** <Front> 24.0 mm  
<Rear> 20.0 mm

**Limit:** <Front> 22.4 mm  
<Rear> 18.4 mm

- (3) If any of the brake disc thickness measurements exceeds the limit, replace the brake discs and brake pads on both sides as a set.



## 7. BRAKE DRUM I.D. CHECK

- (1) Remove the rear brake assembly and support it with a wire.
- (2) Remove the brake disc.
- (3) Measure the I.D. of the brake drum at 2 places or more.

**Standard value:** 168.0 mm

**Limit:** 169.0 mm

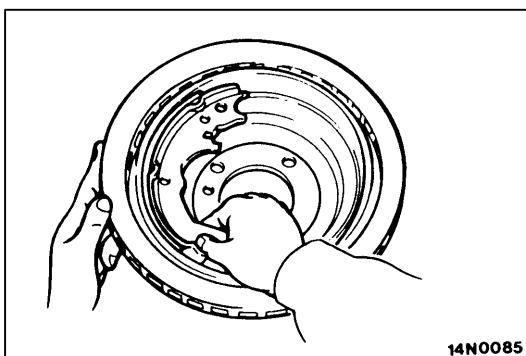
- (4) If the brake drum I.D. has worn to exceed the limit, or if an excessive eccentric wear is evident, replace the brake disc with a new one.

## 8. LINING TO BRAKE DRUM CONTACT CHECK

- (1) Remove the rear brake assembly and support it with a wire.
- (2) Remove the brake disc.
- (3) Remove the shoe & lining assembly. (Refer to GROUP 36.)
- (4) Apply chalk to the brake disc inner surface (brake drum) and rub the shoe & lining assembly against it.
- (5) If any irregular contact is evident, replace the shoe & lining assembly or brake disc.

### NOTE

Wipe the surfaces clean of chalk after the check has been completed.



## FRONT BRAKE

### REMOVAL AND INSTALLATION

Except for the followings, use the same procedure as that for conventional disc brake.

### INSTALLATION SERVICE POINT

#### ►A◄ DISC BRAKE ASSEMBLY INSTALLATION

Follow the conventional procedures except the standard value for the disc brake drag force.

**Standard value (disc brake drag force):**

51 N {5.2 kgf} <EVOLUTION-IV>

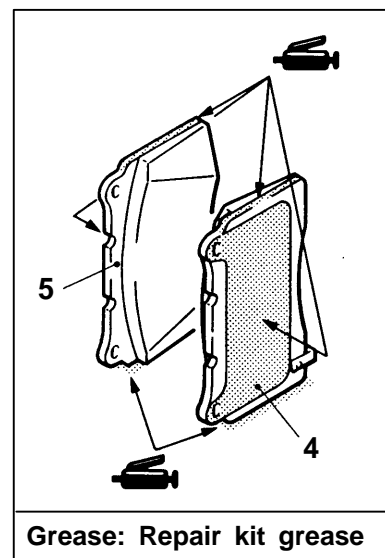
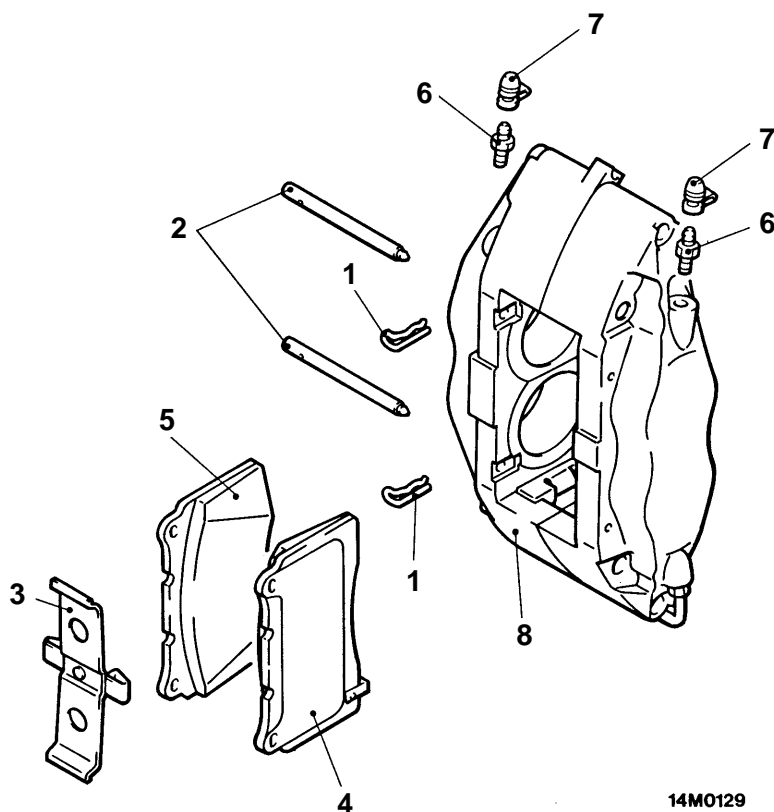
69 N {7.0 kgf} <EVOLUTION-V>

### DISASSEMBLY AND REASSEMBLY

#### NOTE

On EVOLUTION-IV, follow the same procedure as conventional.

On EVOLUTION-V, disassemble in the order shown.



14M0129

#### Disassembly steps

1. Clip
2. Pin
3. Cross spring
4. Pad & wear indicator assembly

5. Pad assembly
6. Air bleeder screw
7. Cap
8. Disc brake caliper assembly

## REAR BRAKE

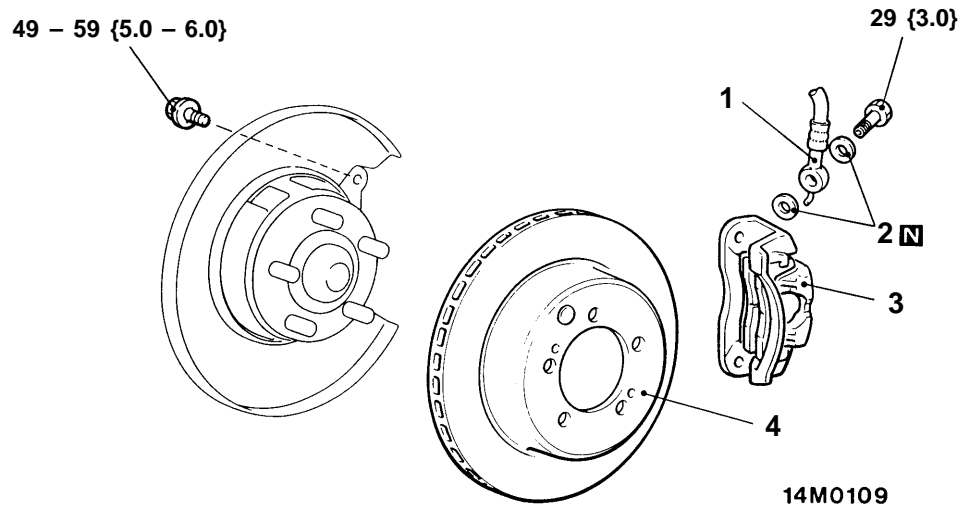
### REMOVAL AND INSTALLATION

#### Pre-removal Operation

- Brake Fluid Draining

#### Post-installation Operation

- Brake Fluid Refilling and Bleeding



Unit: Nm {kgf · m}

#### Removal steps

- A◄
1. Brake hose connection
  2. Gasket
  3. Rear brake assembly
  4. Brake disc

#### NOTE

Shown here is the illustration of rear brake for EVOLUTION-IV.

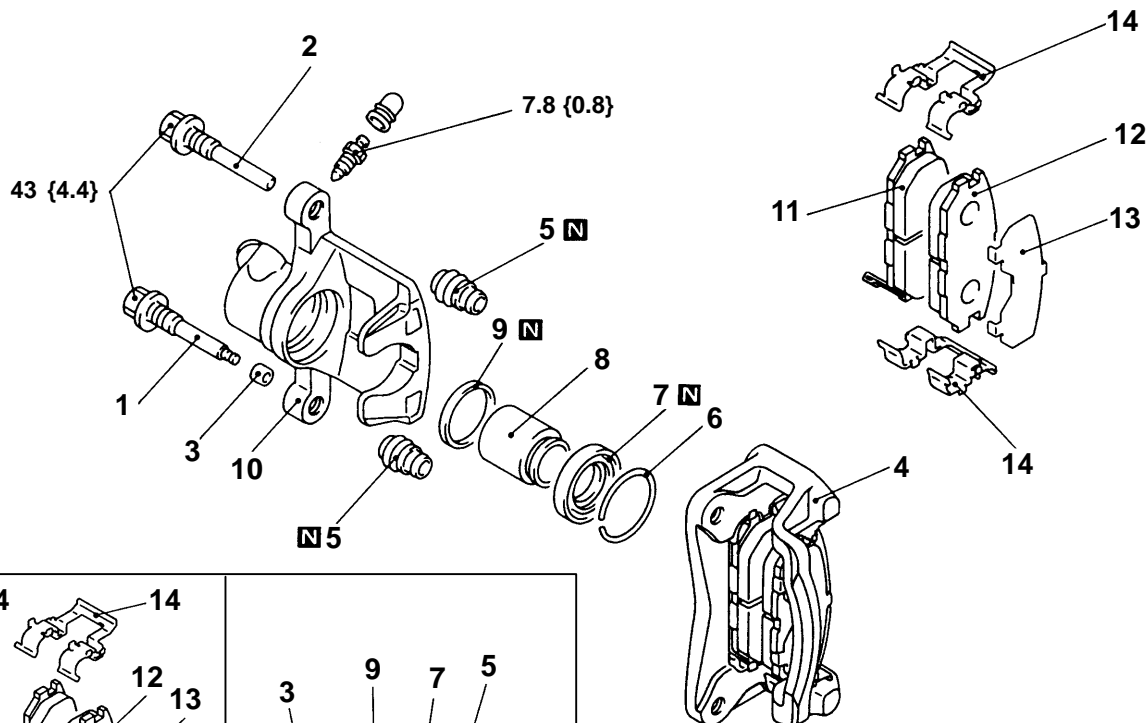
### INSTALLATION SERVICE POINT

#### ►A◄ DISC BRAKE ASSEMBLY INSTALLATION

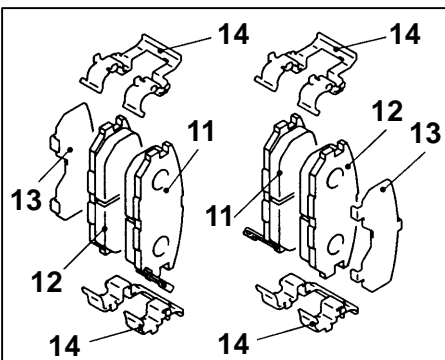
Follow the conventional procedures except the standard value for the disc brake drag force.

**Standard value (disc brake drag force): 69 N {7.0 kgf}**

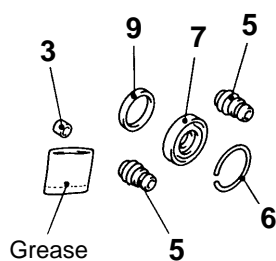




Unit: Nm {kgf · m}



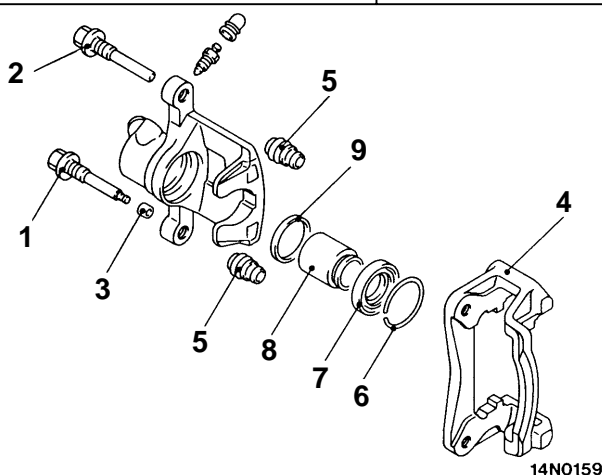
**14N0160**



14N0161

## Pad kit

## Seal & boot kit



14N0159

### Brake caliper kit



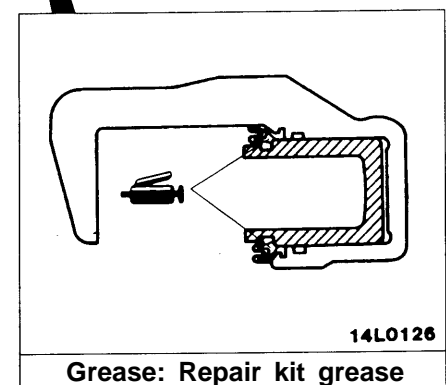
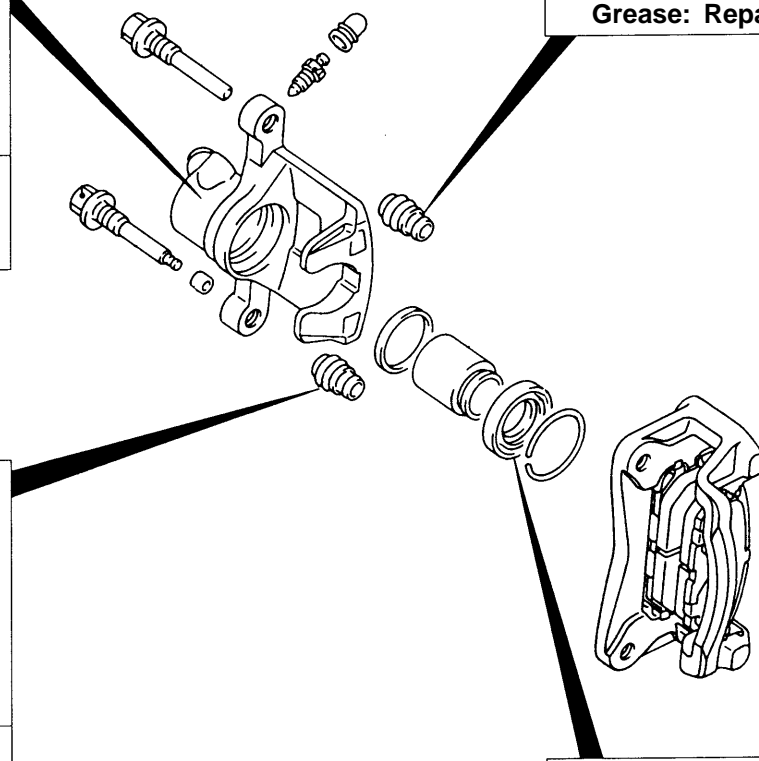
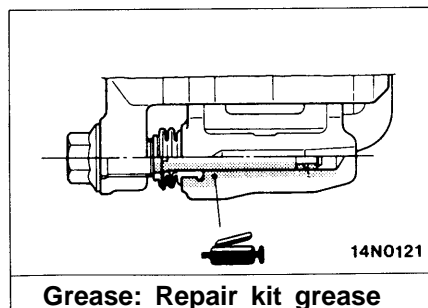
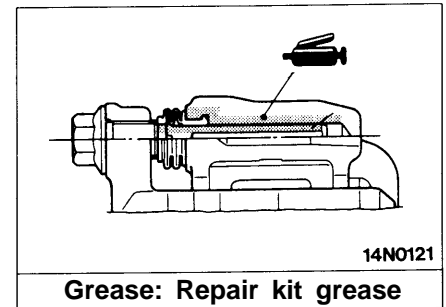
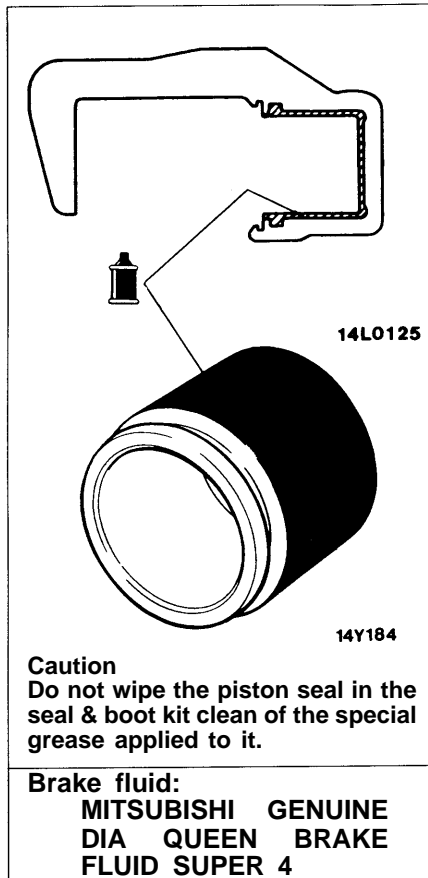
1. Lock pin
2. Guide pin
3. Bushing
4. Caliper support (pad, clip, shim)
5. Pin boot
6. Boot ring
7. Piston boot

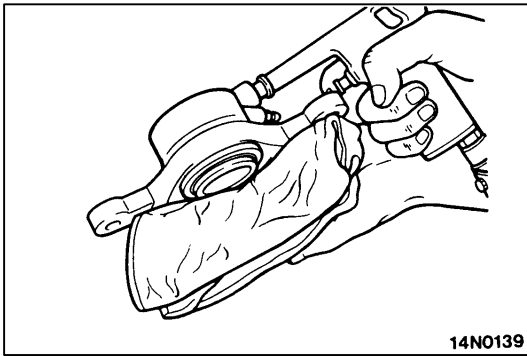


8. Piston
9. Piston seal
10. Caliper body
11. Pad & wear indicator assembly
12. Pad assembly
13. Outer shim
14. Clip



## LUBRICANT APPLICATION POINTS





## DISASSEMBLY SERVICE POINTS

### ◀A▶ PISTON BOOT / PISTON REMOVAL

Cover the outer end of the caliper body with a cloth. Blow compressed air through the brake hose connection to remove the piston and piston boot.

#### Caution

Do not send a sudden blast of air, as it causes the piston to rush out. Send a gentle, gradual blow of compressed air.

### ◀B▶ PISTON SEAL REMOVAL

- (1) Remove the piston seal with a finger tip.

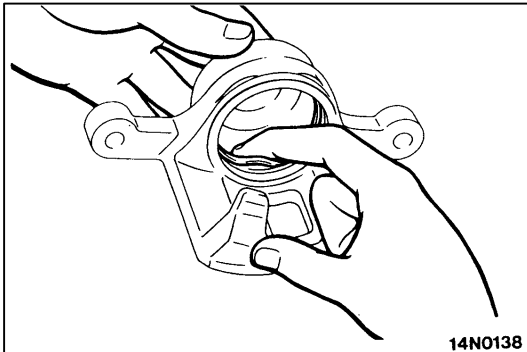
#### Caution

Do not use a flat-blade screwdriver or similar tool to prevent the cylinder inner surface from being damaged.

- (2) Clean the piston surface and cylinder inner surface with trichloroethylene, alcohol, or the specified brake fluid.

#### Brake fluid:

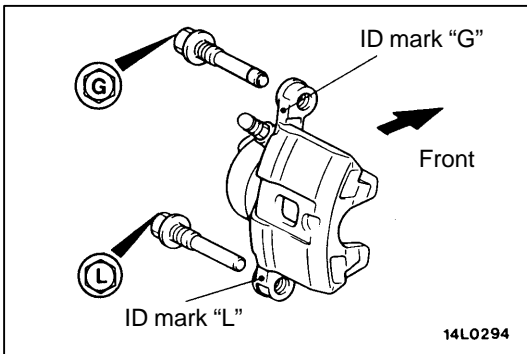
**mitsubishi GENUINE DIA QUEEN BRAKE FLUID  
SUPER 4**



## INSTALLATION SERVICE POINT

### ▶A◀ LOCK PIN / GUIDE PIN INSTALLATION

Install the guide pin and lock pin so that each head mark matches the ID mark indicated on the caliper body as illustrated on the left.



## INSPECTION

### PAD WEAR CHECK

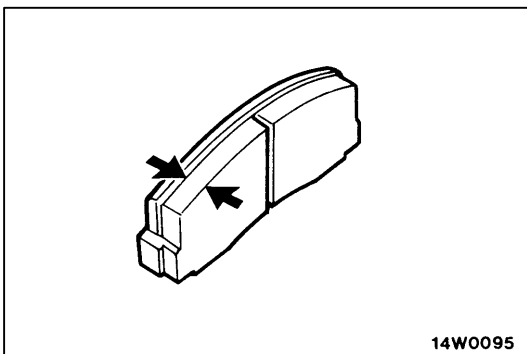
Measure the thickness at a location that wears most of the pad. If the thickness is less than the limit, replace the pad assembly.

**Standard value: 10.0 mm**

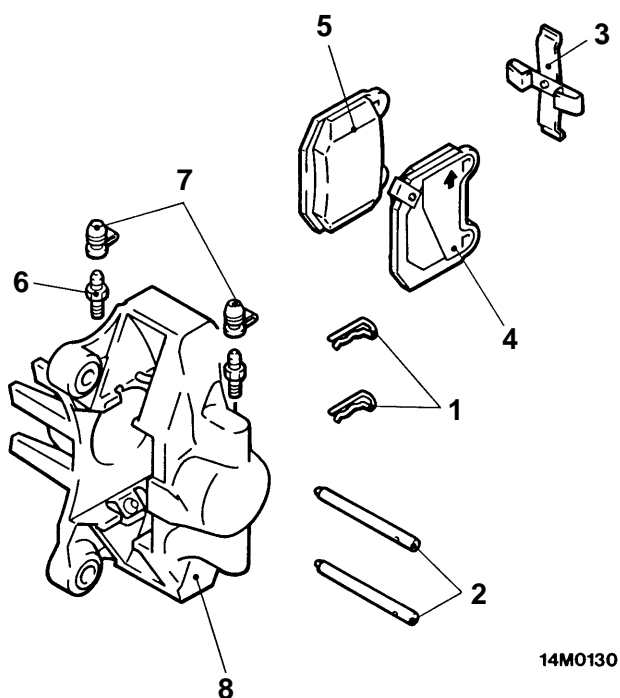
**Limit: 2.0 mm**

#### Caution

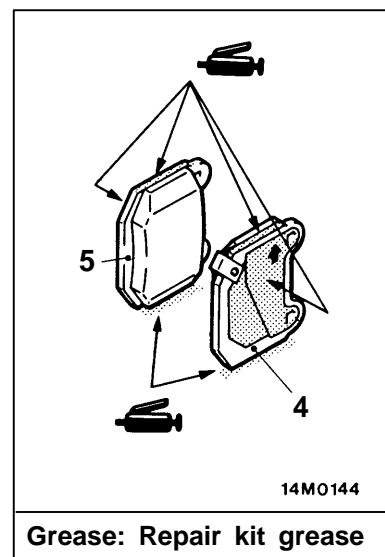
- (1) Whenever a pad is to be replaced with a new one, be sure to replace both right and left sides as a set.
- (2) If there is an excessive difference in pad thickness noted between the right and left ones, check the sliding mechanism.



# DISASSEMBLY AND REASSEMBLY <EVOLUTION-V>



14M0130



14M0144

Grease: Repair kit grease

## Disassembly steps

1. Clip
2. Pin
3. Cross spring
4. Pad & wear indicator assembly

5. Pad assembly
6. Air bleeder screw
7. Cap
8. Disc brake caliper assembly