

# Brake System

GENERAL

BRAKE SYSTEM

FRONT DISC BRAKE  
REAR DISC BRAKE

# GENERAL

## SPECIFICATIONS

EEBA56FA

Item	Specification	
Master cylinder · Type · I.D. mm(in) · Piston stroke mm(in) · Output port(ABS/ESP) · Fluid level warning sensor	Tandem type 25.4/(1.0) 31(1.22) 2port Provided	
Brake booster · Type · Effective dia. mm(in.) · Boosting ratio	Vacuum 8+9 in 9:1	
Front brake(Disc) · Type · Disc O.D. · Disc I.D. · Disc thickness · Pad thickness · Cylinder type · Cylinder I.D.	2.0 L, 2.4 L	3.3 L
	Floating type with ventilated disc 280 mm (11.02 in) 172 mm (6.77 in) 26 mm (1.02 in) 11 mm (0.43 in) single piston 57.2 mm (2.25 in)	Floating type with ventilated disc 300 mm (11.8 in) 186 mm (7.32 in) 28 mm (1.1 in) 11 mm (0.43 in) single piston 60 mm (2.36 in)
Rear brake(Drum) · Type · Drum I.D. · Lining width · Brake offset	Leading trailing drum 228.6 mm (9.0 in) 42 mm (1.65 in) 29.6 mm (1.17 in)	
Rear brake(Disc) · Type · Disc O.D. · Parking Brake Drum I.D. · Disc thickness · Pad thickness · Cylinder type · Cylinder I.D.	2.0 L, 2.4 L	3.3 L
	Floating type with solid disc 262 mm (10.31 in) 168 mm (6.61 in) 10 mm (0.39 in) 10 mm (0.39 in) single piston 34 mm (1.34 in)	Floating type with solid disc 284 mm (11.18 in) 168 mm (6.61 in) 10 mm (0.39 in) 15 mm (0.59 in) single piston 34 mm (1.34 in)
Parking brake · Actuation · Cable arrangement	Mechanical brake acting on rear wheels Lever	

O.D=Outer Diameter

I.D=Inner Diameter



### NOTE

ABS : Anti-lock Brake System

ESP : Electronic Stability Program

## SERVICE STANDARD

EB16BBBA

	Standard value	Service limit
Brake pedal height	184.5 mm(7.264 in)	
Brake pedal full stroke	128 mm (5.04 in)	
Adjust Brake pedal adjusting stroke	76.2 mm(3 in)	
Brake pedal free play	3~8 mm(0.11~0.31 in)	
Stop lamp switch outer case to pedal stopper clearance	0.5~1.0 mm (0.02~0.04 in)	
Booster push rod to master cylinder piston clearance	0 (at 500 mmHg vacuum)	
Parking brake lever stroke when lever assembly is pulled with 196N (20Kgf, 44lb force)	8 clicks	
Front disc brake pad thickness	11 mm (0.43 in)	4 mm (0.16 in)
Front disc thickness	26 mm (1.024 in) - 2.0 L, 2.4 L 28 mm (1.10 in) - 3.3 L	24.4 mm ( 0.961 in) - 2.0 L, 2.4 L 26.4 mm (1.04 in) - 3.3 L
Front disc runout		Max.0.03 mm ( 0.001 in)
Front disc thickness variation		Max.0.005 mm (0.0002 in)
Rear drum brake lining width	42 mm (1.65 in)	
Rear drum brake drum I.D.	228.6 mm (9 in)	Max.230.6mm (9.079 in)
Rear disc brake pad thickness	10 mm (0.394 in) - 2.0 L, 2.4 L 15 mm (0.59 in) - 3.3 L	3 mm (0.12 in)
Rear disc brake disc thickness	10 mm (0.394 in)	8.4 mm (0.33 in)
Rear disc runout		Max.0.05 mm ( 0.002 in)
Rear disc thickness variation		Max.0.01 mm ( 0.0004 in)

## TIGHTENING TORQUE

	Nm	Kgf-cm	lb-ft
Master cylinder to booster mounting nut	7.84~11.76	80~120	5.9~8.9
Brake booster mounting nut	12.74~15.68	130~160	9.6~11.8
Bleeder screw	6.86~12.74	70~130	5.2~9.6
Brake tube nut, brake hose	13.72~16.66 (M10) 18.62~22.54 (M12)	140~170 (M10) 190~230 (M12)	10.326~12.54 (M10) 14.01~16.964 (M12)
Caliper assembly to knuckle	78.4~9.8	800~1000	59.0~73.8
Brake hose to front caliper	24.5~29.4	250~300	18.4~22.1
Brake hub flange nut	196~254.8	2000~2600	147.5~191.8
Push rod locking nut	15.68~21.56	160~220	11.8~16.2
Caliper guide rod bolt	21.56~31.36	220~320	16.2~23.6
Stop lamp switch mounting nut	7.84~9.8	80~100	5.9~7.38

# BRAKE SYSTEM

## INSPECTION E501E76F

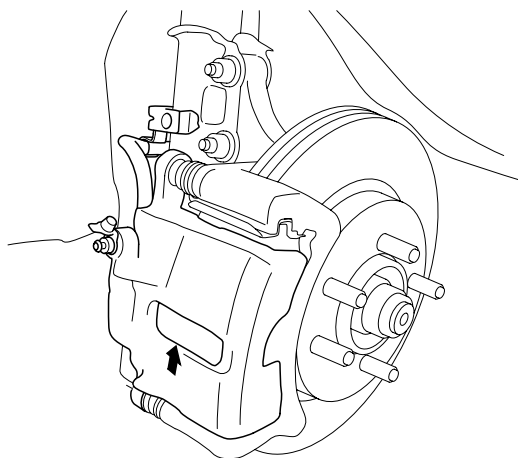
### INSPECTION OF FRONT DISC BRAKE PAD

1. Check the brake pad thickness through the caliper body inspection hole.

Pad thickness

Standard value : 11.0 mm ( 0.43 in)

Service limit : 4.0 mm (0.16 in)



KJQE050H



#### CAUTION

- If the pad lining thickness is out of specification, left and right pads must be replaced as a complete set.
- When the thickness difference between the left pad and right pad is large, check the sliding condition of the piston and the guide rod.

### INSPECTION OF REAR DISC BRAKE PAD

1. Check the rear disk brake pad thickness through the caliper body inspection hole.

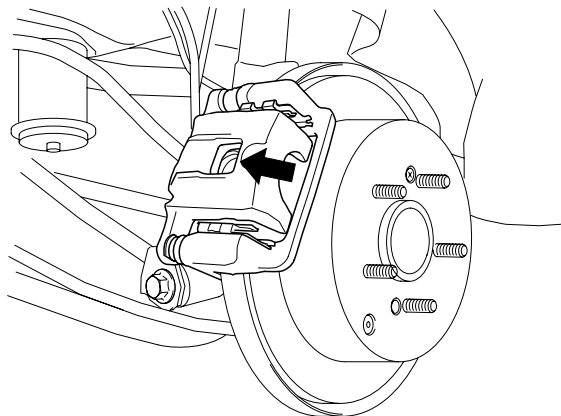
Pad thickness

Standard value :

10.0 mm (0.39 in) - 2.0 L, 2.4 L

15.0 mm (0.59 in) - 3.3 L

Service limit : 3.0 mm (0.12 in)



EJRF800H

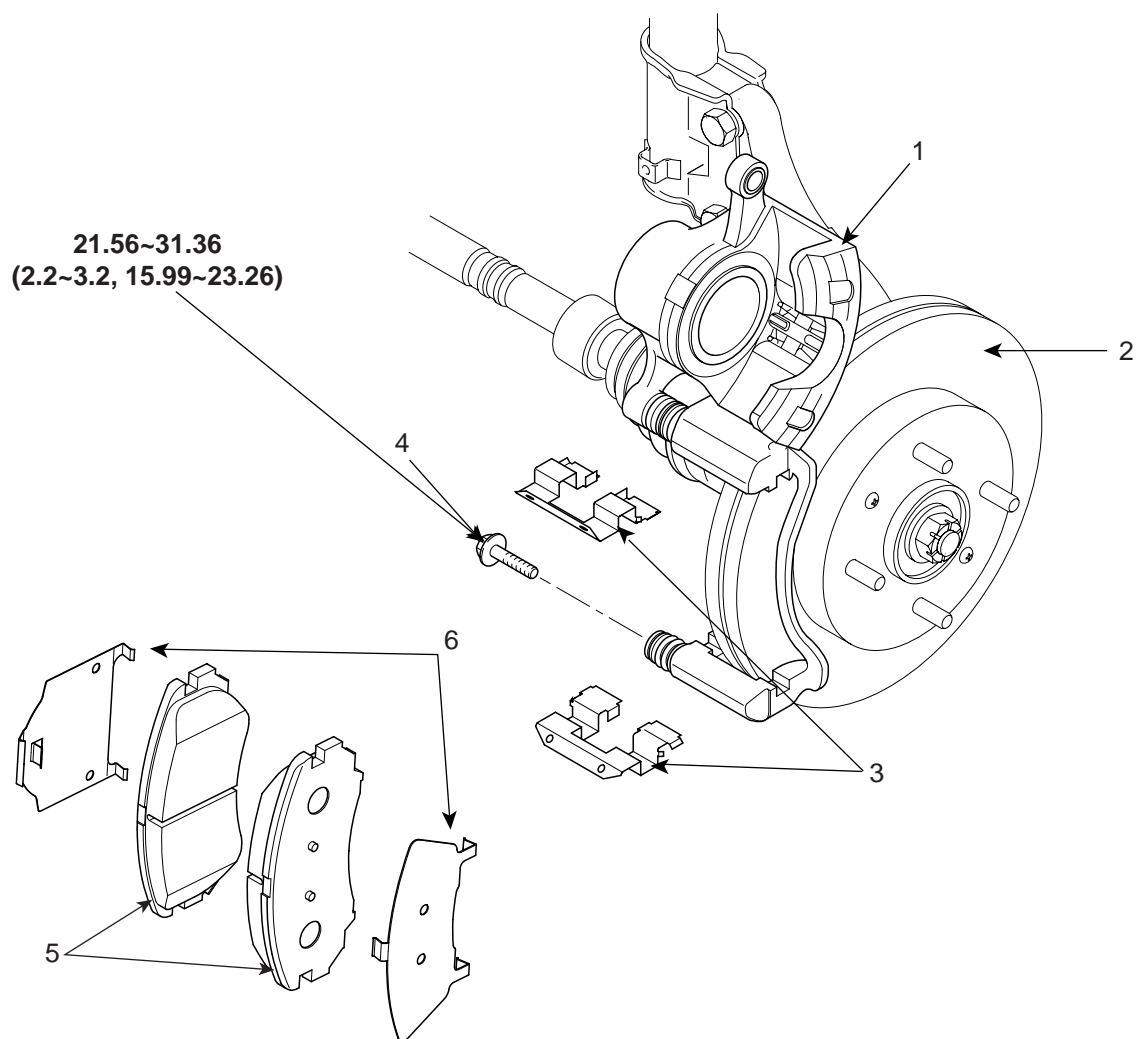


#### CAUTION

- If the pad thickness is out of specification, left and right pads must be replaced as a complete set.
- When the thickness difference between the left pad and right pad is large, check the sliding condition of the piston and the guide rod.

## FRONT DISC BRAKE

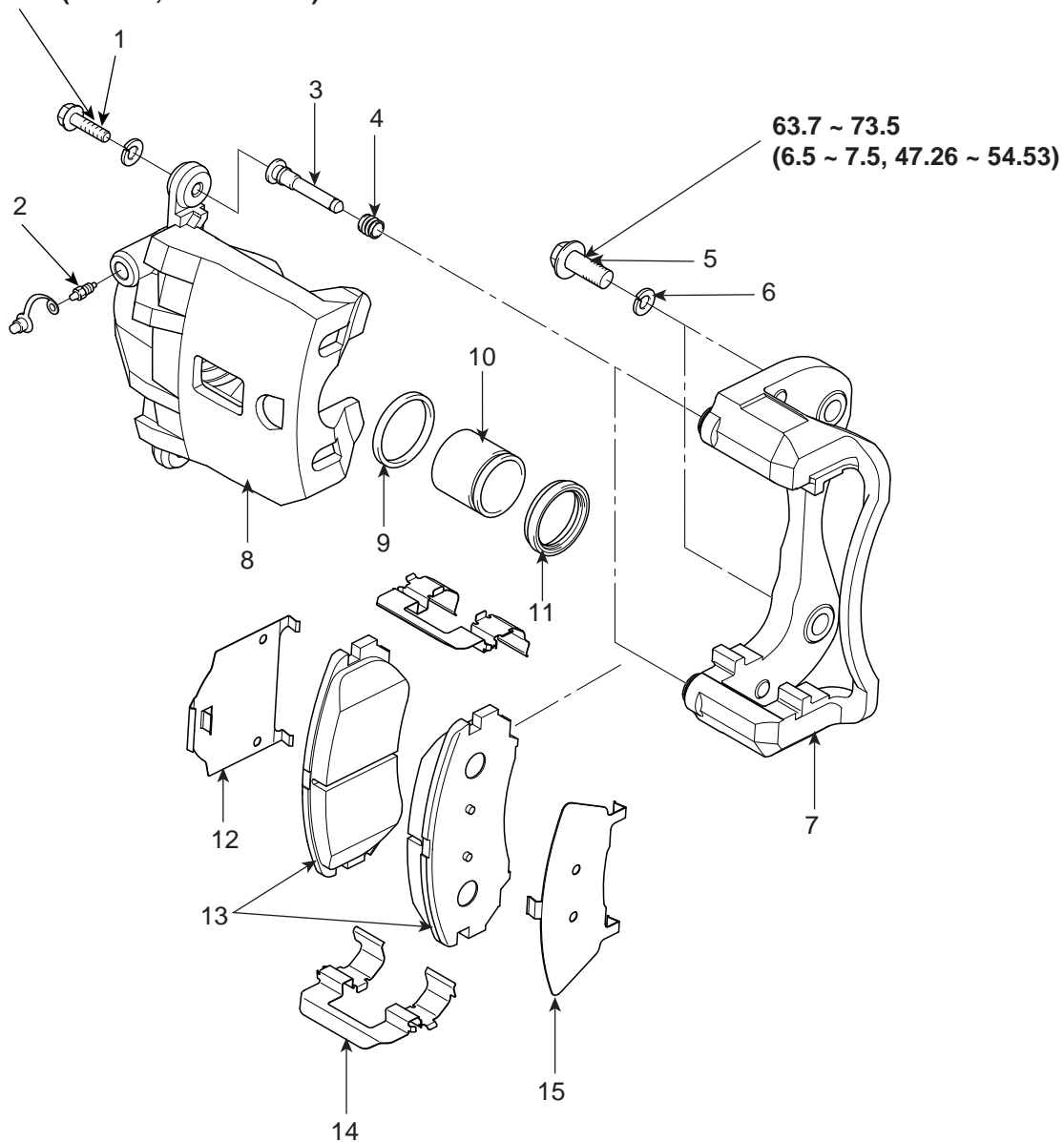
## COMPONENTS E083FAEF

**TORQUE: Nm (kgf.m, lb-ft)**

- 1. Brake caliper
- 2. Brake disc
- 3. Pad retainers

- 4. Guide rod bolt
- 5. Brake pad
- 6. Brake pad shim

21.56~31.36 (2.2~3.2, 15.99~23.26)



**TORQUE : Nm (kgf.m, lb-ft)**

1. Guide rod bolt
2. Bleeder screw
3. Guide rod
4. Boot
5. Caliper mounting bolt

6. Washer
7. Caliper bracket
8. Caliper body
9. Piston seal
10. Piston

11. Piston boot
12. Inner shim
13. Brake pad
14. Pad retainer
15. Outer shim

## REMOVAL

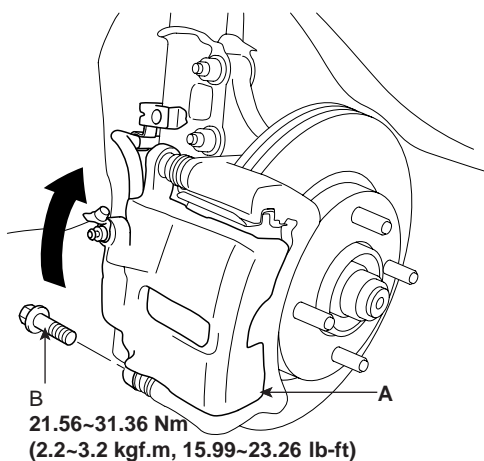
E8CE1A6A

**CAUTION**

**Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.**

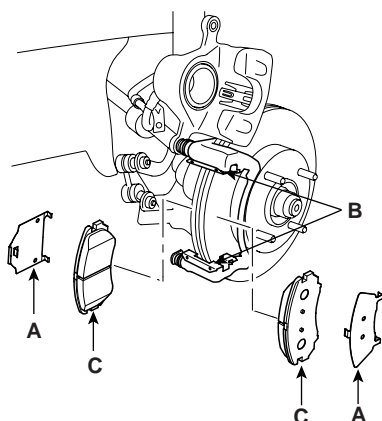
- **Avoid breathing dust particles.**
- **Never use on air hose or brush to clean brake assemblies.**

1. Loosen the front wheel nuts slightly. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the guide rod bolt(B), After raise the caliper assembly(A), support it with a wire.



EJRF800E

3. Remove pad shim(A), pad retainer(B) and pad assembly(C) in the caliper bracket.

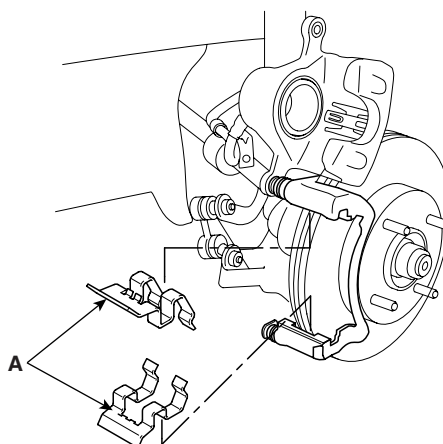


EJRF800B

## INSTALLATION

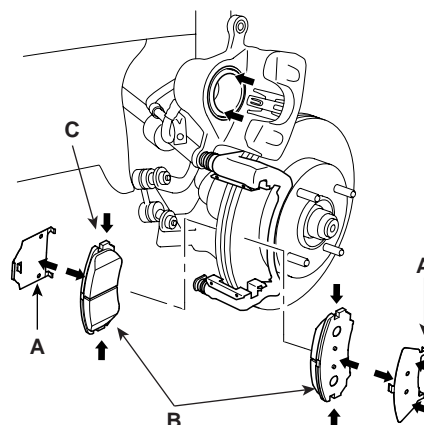
EB04FA4D

1. Install the pad retainers (A) on the caliper bracket.



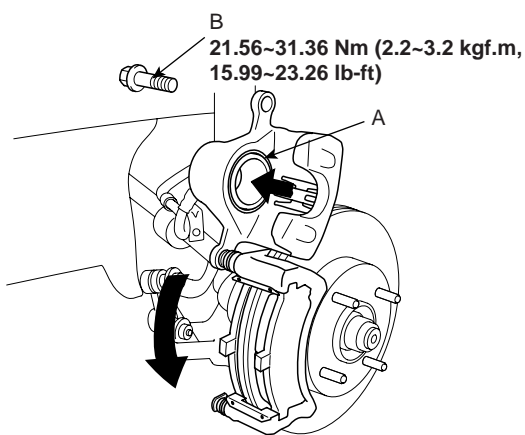
ARJE501M

2. Check the foreign material at the pad shims (A) and the back of the pads (B). Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.



EJRF800C

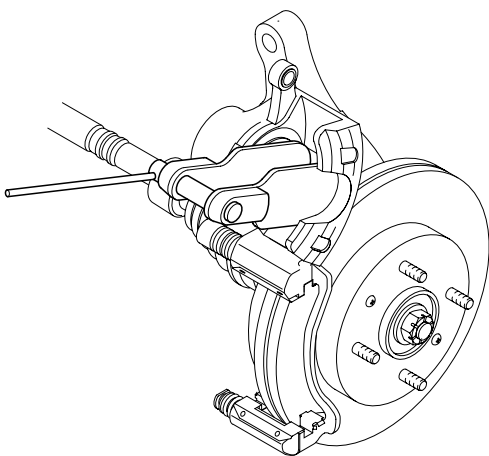
3. Install the brake pads (B) and pad shims (A) correctly. Install the pad with the wear indicator (C) on the inside.  
If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.
4. Push in the piston (A) so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.
5. Pivot the caliper down into position. Being careful not to damage the pin boot, install the guide rod bolt (B) and torque it to proper specification.



EJRF800F

**NOTE**

Insert the piston in the cylinder using the special tool (09581-11000).



EGGE700L

6. Depress the brake pedal several times to make sure the brakes work, then test-drive.

**NOTE**

Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake will restore the normal pedal stroke.

Be sure to do this before driving the vehicle.

7. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.



## INSPECTION E708FA5A

## FRONT BRAKE DISC THICKNESS CHECK

1. Remove all rust and contamination from the surface, and measure the disc thickness at 8 points, at least, of same distance (5mm) from the brake disc outer circle.

---

Front brake disc thickness

Standard value :

26.0 mm(1.024 in) - 2.0 L, 2.4 L

28 mm(1.1 in) - 3.3 L

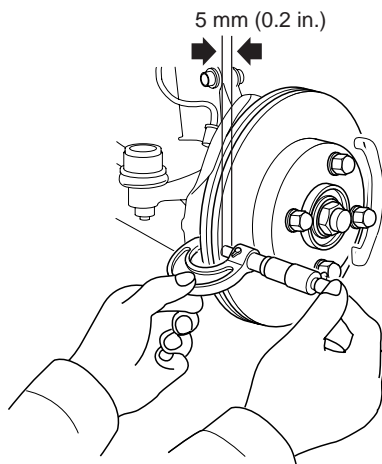
Limit :

24.4 mm(0.961 in)-2.0 L, 2.4 L

26.4 mm(1.04 in) - 3.3L

---

2. Thickness variation should not exceed 0.005mm (0.0002 in.) (circumference) and 0.01 mm (in.)(radius) at any directions.
3. If wear exceeds the limit, replace the discs and pad assembly left and right of the vehicle.



EJRF5020

## FRONT BRAKE PAD CHECK

1. Check the pad wear. Measure the pad thickness and replace it, if it is less than the specified value.

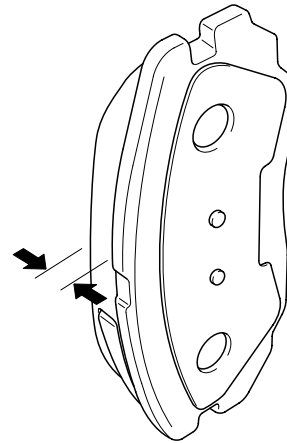
---

Pad thickness

Standard value : 11 mm (0.43 in)

Service limit : 4.0 mm (0.16 in)

---



KJRF500B

2. Check that grease is applied, to sliding contact points and the pad and backing metal for damage.

## FRONT BRAKE DISC RUN OUT CHECK

1. Place a dial gauge about 5mm (0.2 in.) from the outer circumference of the brake disc, and measure the run out of the disc.

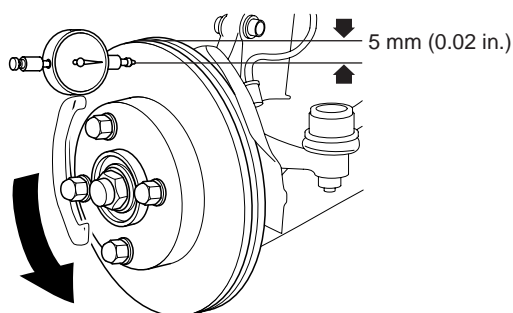
---

Brake disc run out

Limit : 0.04 mm (0.0016 in.) or less (new one)

---

2. If the run out of the brake disc exceeds the limit specification, replace the disc, and then measure the run out again.
3. If the run out does not exceed the limit specification, install the brake disc after turning it 180° and then check the run out of the brake disc again.
4. If the run out cannot be corrected by changing the position of the brake disc, replace the brake disc.



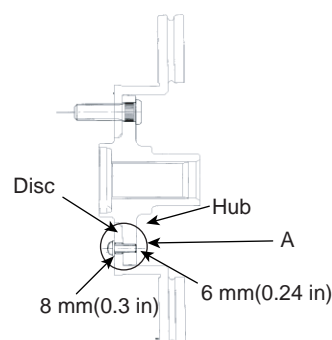
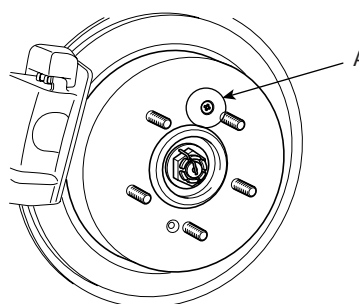
EJRF500T

## SEIZE OF FRONT BRAKE DISC

1. Remove the brake disc from hub using M8 screw(A) if the brake disc has been seized with the hub due to corrosion or overheat.

**NOTE**

*Be careful not to use the hammer. The disc can be damaged if you remove the disc from the hub by hammer.*

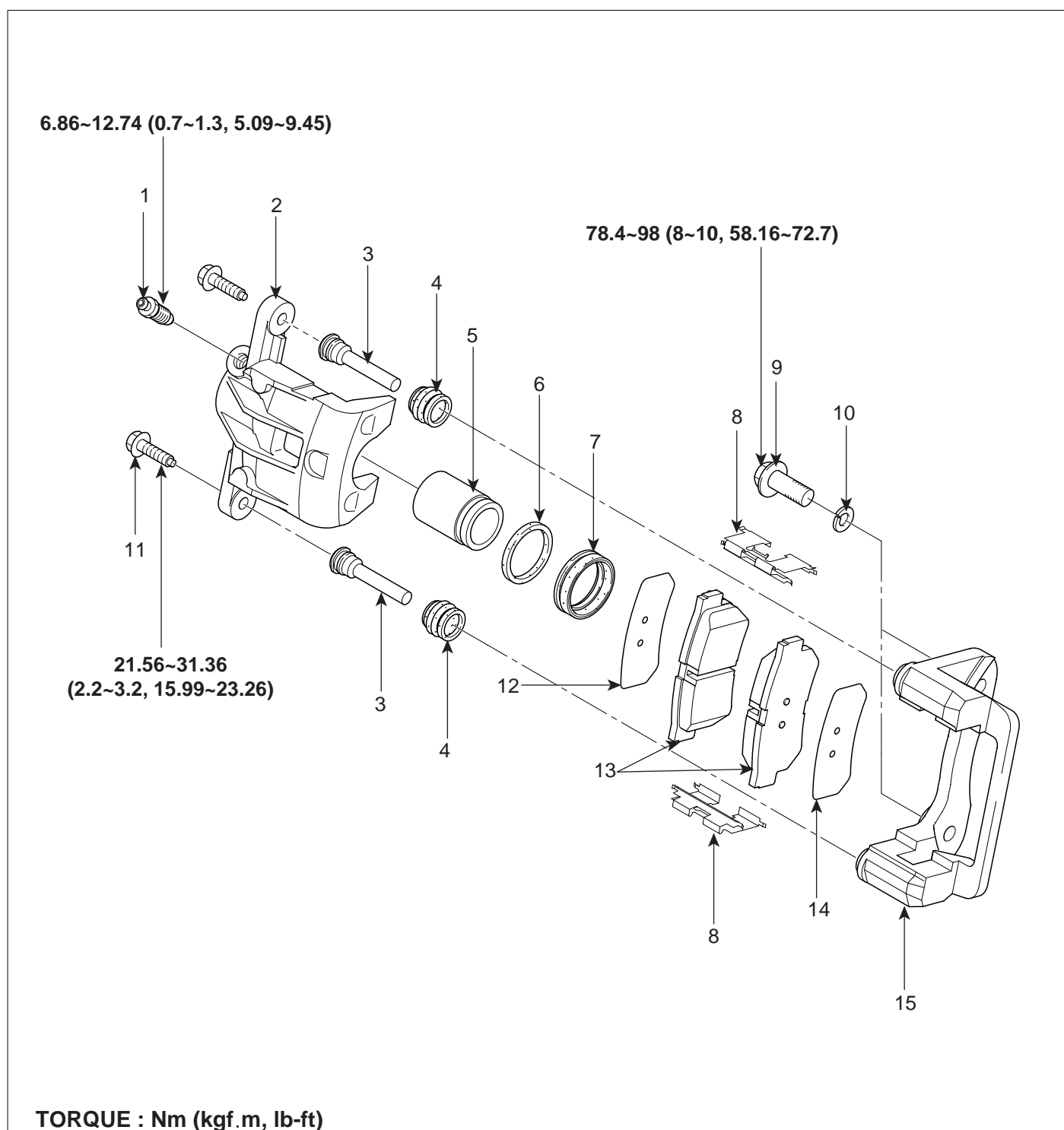


EJRF502R

## REAR DISC BRAKE

## COMPONENTS

E6D7B51B



1. Bleeder screw

2. Caliper body

3. Guide rod

4. Boot

5. Piston

6. Piston seal

7. Piston boot

8. Pad retainer

9. Caliper mounting bolt

10. Washer

11. Guide rod bolt

12. Inner shim

13. Brake Pad

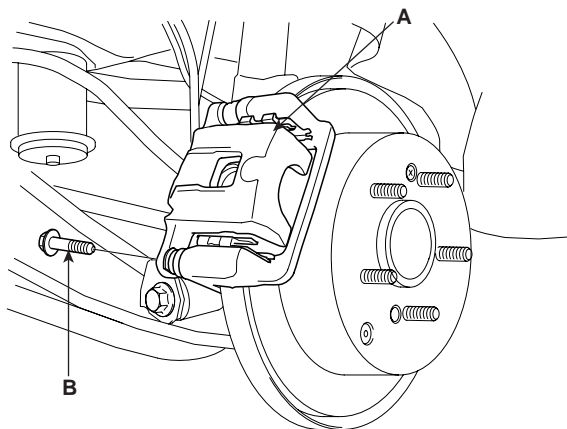
14. Outer shim

15. Caliper bracket

## REMOVAL

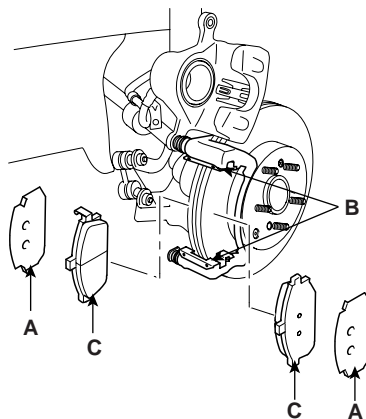
ECC47BD3

1. Raise the rear of the vehicle and make sure it is securely supported. Remove the rear wheel.
2. Remove the guide rod bolt(B), After raise the caliper assembly(A), support it with a wire.



EJRF800J

3. Remove pad shim(A), pad retainer(B) and pad assembly(C) in the caliper bracket.

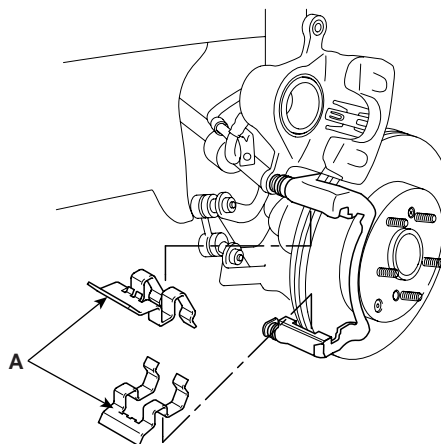


EJRF800K

## INSTALLATION

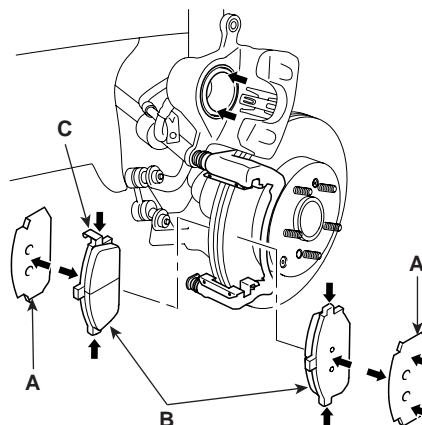
E502D47B

1. Install the pad retainers(A) on the caliper bracket.



EJRF800L

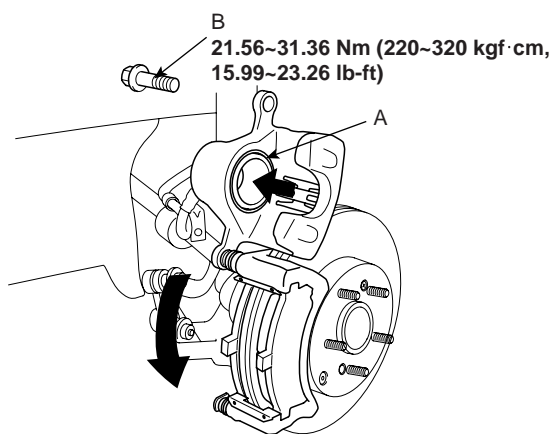
2. Check the foreign material at the pad shim (A) and the back of the pads (B).



EJRF800M

3. Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.
4. Install the brake pads (B) and pad shims (A) correctly. Install the pad with the wear indicator (C) on the inside.  
If you are reusing the pads, always reinstall the brake pads in their original position to prevent a momentary loss of braking efficiency.
5. Push in the piston (A) so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.

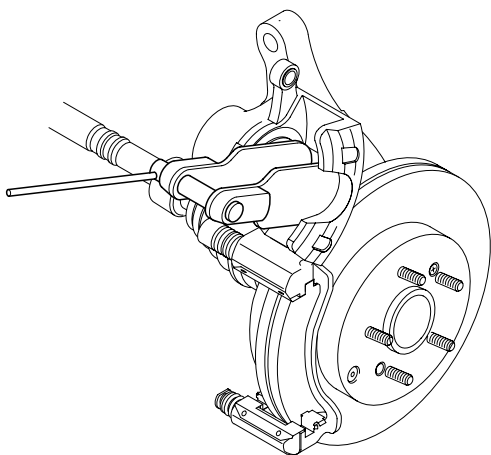
6. Pivot caliper down into position. Being careful not to damage the pin boot, install the guide rod bolt (B) and torque it to proper specification



EJRF800N

### NOTE

Insert the piston in the cylinder using the special tool(09581-11000).



EJRF800O

7. Depress the brake pedal several time to make sure the brakes work, then test-drive.

### NOTE

Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake will restore the normal pedal stroke.

8. After installaion, check for leaks at hose and line joints or connections, and retighten if necessary.

## INSPECTION EA29AA41

### REAR BRAKE DISC THICKNESS CHECK

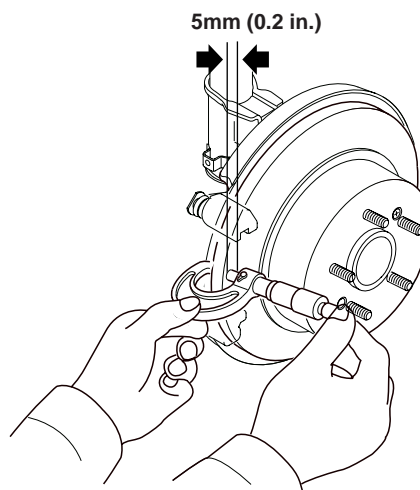
1. Remove all rust and contamination from the disc surface, and then measure the disc thickness at 8 points, at least, of the same distance (5mm) from the brake disk outer circle.

---

Rear brake disc thickness  
 Standard value : 10.0 mm (0.39 in)  
 Limit : 8.4 mm (0.33 in)

---

2. Thickness variation should not exceed 0.01 mm(0.0004 in.) (circumference) and 0.01 mm(0.0004 in.) (radius) at any directions.
3. If wear exceeds the limit, replace the discs and pad assembly for left and right of the vehicle.

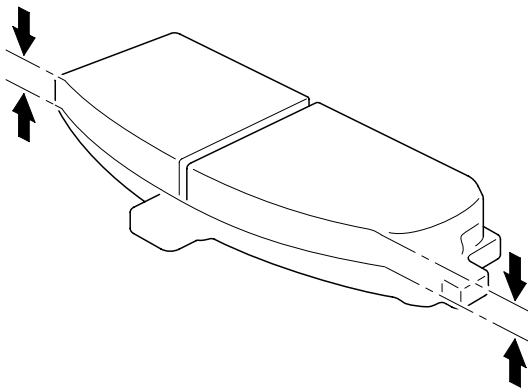


EJRF800P

REAR BRAKE PAD CHECK

- 1. Check the pad wear. Measure the pad thickness and replace it, if it is less than the specified value.

Pad thickness
Standard value :
10.0 mm ( 0.39 in) - 2.0 L, 2.4 L
15 mm (0.59 in) - 3.3 L
Service limit : 3.0 mm (0.12 in)



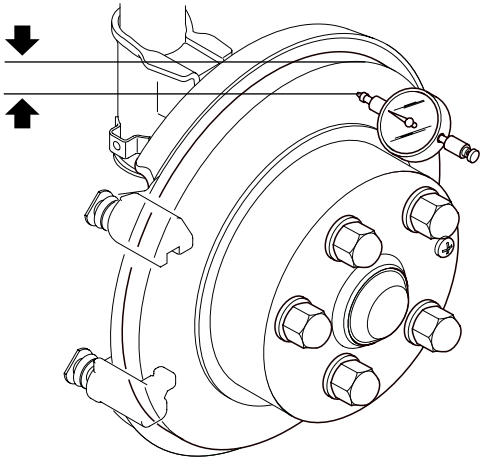
KJQE088A

- 2. Check that grease is applied, and the pad and backing metal for damage.

REAR BRAKE DISC RUN OUT CHECK

- 1. Place a dial gauge about 5 mm (0.2 in.) from the outer circumference of the brake disc, and measure the run out of the disc.

Brake disc run out
Limit : 0.05 mm (0.002 in.) or less (new one)



KJQE100E

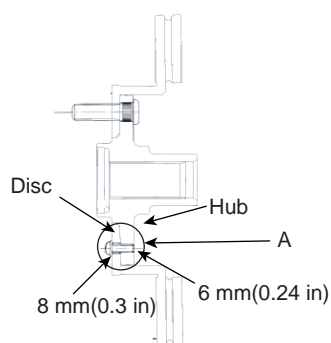
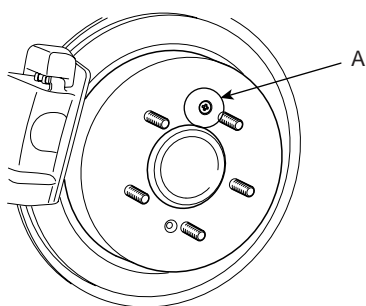
- 2. If the run out of the brake disc exceeds the limit specification, replace the disc, and then measure the run out again.
- 3. If the run out does not exceed the limit specification, install the brake disc after turning it 180° and then check the run out of the brake disc again.
- 4. If the run out cannot be corrected by changing the position of the brake disc, replace the brake disc.

## SEIZE OF REAR BRAKE DISC

1. Remove the brake disc from hub using M8 screw(A) if the brake disc has been seized with the hub due to corrosion or overheat.

**NOTE**

*Be careful not to use the hammer. The disc can be damaged if you remove the disc from the hub by hammer.*



EJRF800Q