# BRAKE SYSTEM

**4115-07/4221-02/4810-01/4810-09/4825-14/4830-01/
4830-02/4841-01/4841-02/4850-00/4850-02/4850-03/
4910-01/9210-04/**



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# BRAKE SYSTEM 4850-01

## GENERAL INFORMATION

### 1. SPECIFICATIONS

| Category | Item | Specifications |
|---|---|---|
| Front brake | Type | Ventilated disc |
| | Disc diameter | Ø298 mm |
| | Caliper cylinder bore diameter | Ø57.2 |
| | Disc thickness | 23 mm (Wear limit: 21.4 mm) |
| | Brake pad area | 53.5 cm² or more |
| | Pad wear indicator | Mechanical |
| Rear brake | Type | Solid disc |
| | Disc diameter | Ø284 mm |
| | Caliper cylinder bore diameter | Ø33.96 |
| | Disc thickness | 10 mm (Wear limit: 8.4 mm) |
| | Brake pad area | 26.8 cm² or more |
| | Pad wear indicator | Mechanical |
| Brake booster | Type | Vacuum assisted booster type |
| | Size | Single 10" |
| | Booster ratio | 9 : 1 |
| Master cylinder | Type | Tandem type |
| | Cylinder bore diameter | Ø22.22 |
| Brake pedal | Max. actuation travel | 150 ± 3 mm |
| | Pedal proportion | 3 : 1 |
| | Free play | 4 to 6 mm |
| Brake fluid | Specification | DOT 4 |
| | Capacity | Approx. 0.7L |

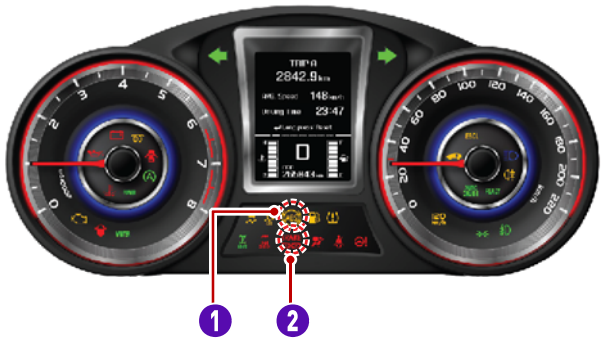
**NOTE**

Change brake fluid: every 2 years

**What are DOT ratings?**

Ratings of brake fluid classified by US Department Of Transportation for proper quality and usage of brake fluid. Also called "USDOT".

## 2. BRAKE SYSTEM WARNING LIGHT

| Supervision instrument cluster | Standard instrument cluster |
|---|---|
|  |  |

1. ABS warning lamp
2. Parking brake operating indicator (EBD warning lamp: both parking brake operating indicator and ABS warning lamp come on at the same time)

| Warning lamps | Color | Indicator | Operating conditions |
|---|---|---|---|
| ABS warning lamp | Amber |  | ON: Faulty ABS function |
| Parking brake indicator | Red |  | ON: Parking brake applied |
| EBD warning lamp | Amber + Red |  | ON: Faulty EBD function |

## 3. SPECIAL TOOLS

| Part number and name | Special Tool | Usage: |
|---|---|---|
| **Part no.:** X9948 0052A<br><br>**Name:**<br>Rear brake piston fitting tool<br><br>**Usage:**<br>Used to fit the brake piston when installing the rear brake pad. |  |  |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# 4. TROUBLESHOOTING

| Symptom | Cause | Action |
|---|---|---|
| Noise from brakes or vehicle vibrations | Backing plate or caliper installed improperly | Repair |
| | Loosened bolt of backing plate or caliper | Retighten |
| | Uneven wear of brake disc | Replace |
| | Fouled brake pad | Clean or replace |
| | Brake pad stuck to contact surface | Replace |
| | Worn or stiff brake pad | Replace |
| | Excessive clearance between caliper and pad | Repair |
| | Poor contact of brake pad | Repair |
| | Lack of lubrication on moving parts | Lubricate |
| | Caliper malfunction | Replace |
| | Brake dust cover out of position | Repair |
| | Loosened bolt of brake caliper | Retighten |
| Uneven braking | Tire pressure different between left and right wheels | Adjust |
| | Poor contact of brake pad | Repair |
| | Oil or grease on brake pad | Replace |
| | Scratches, abnormal wear, distortion on brake disc | Replace |
| | Brake pad installed improperly | Repair |
| | Faulty automatic clearance adjuster | Repair |
| | Cracks or distortion on brake pad | Replace |
| Insufficient braking force | Brake fluid leaks or contamination | Repair or replace |
| | Air in brake line | Bleeding |
| | Faulty brake booster | Repair |
| | Poor contact of brake pad | Repair |
| | Oil or grease on brake pad | Replace |
| | Faulty automatic clearance adjuster | Repair |
| | Clogged brake line | Repair |
| | Faulty proportioning valve | Repair |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

| Symptom | Cause | Action |
|---|---|---|
| Increased brake pedal travel | Air in brake line | Bleeding |
| | Brake fluid leaks | Repair |
| | Worn brake pad | Replace |
| | Excessive gap between push rod and master cylinder | Adjust |
| | Worn or damaged piston seal | Replace |
| Brake drag | Parking brake unreleased | Disengage |
| | Parking brake out of adjustment | Adjust |
| | Brake pedal free play out of adjustment | Adjust |
| | Faulty master cylinder | Replace |
| | Lack of lubrication on moving parts | Lubricate |
| | Faulty brake booster (vacuum leaks) | Repair |
| Poor braking of parking brake | Worn or poor contact of brake pad | Replace |
| | Oil or grease on brake pad | Repair or replace |
| | Damaged or stuck brake cable | Replace |
| | Excessive brake lever travel | Adjust notch |
| Excessive parking brake lever travel | Stretched parking brake cable. | Adjust or replace |
| | Parking brake cable out of adjustment | Adjust the clearance and cable |
| | Completely worn lining | Replace lining |
| Burnt odor around tires | Repeatedly use of brake at high speed | Avoid excessive use of foot brake/Use engine brake properly |
| | Use only foot brake when driving downhill | |
| | Driving with left foot on brake pedal | |
| | Accumulation of mud or sand | Replace: caliper, wheel cylinder, master cylinder, return spring |
| | Parking brake cable out of play adjustment | Adjust |
| | Defective wheel or wheel cover (improper heat release) | Replace wheel or wheel cover |





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

### ▶ Brake operation and noise

The following is a description of the noise symptoms which can occur when the brake system is operated. Compare actual fault symptoms with the following symptoms to take a proper measure.

- **Noise and its cause**

Symptom 1. Depressing the brake pedal makes a "screeching" noise when the engine is cold, and the noise disappears as the vehicle is driven over a period of time.

This mostly occurs in the morning; The vehicle windows are covered with frost as the temperature drops. For the case of brake discs as well, moisture can be formed on the brake disc due to condensation. The water on the brake disc oxidizes the iron in the brake disc and pad to produce ferric particles (invisible rust) on the disc surface. When the driver depresses the brake pedal with the invisible rust formed on the disc surface, a noise generated by the friction of the rust can be heard. After braking several times, the noise usually disappears because of the warmed up disc and the rust stripped off. The sound becomes louder when depressing the brake pedal slightly and smaller when depressing the pedal firmly, depending on the driving conditions. This is just caused by a physical phenomenon, not the fault of the brake system. This is called "morning effect". This is not a fault and is quite a common occurrence.

Symptom 2. "Screeching" noise or brake drag after replacing the brake pad.

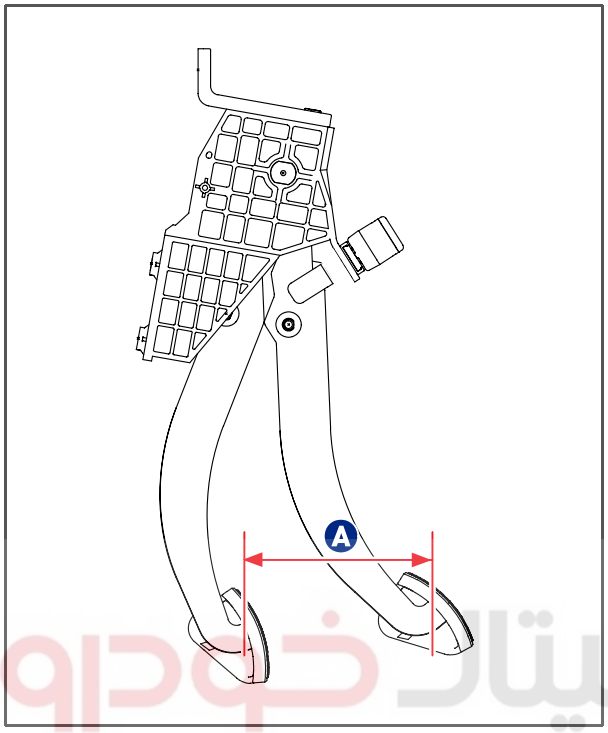
This can often occur when the "bed-in" is not performed properly. The "bed-in" is the process of deposing an even layer of brake compound from the brake pad on the rubbing surface of the rotor. The even formation of the brake compound layer provides the full contact of brake pad with the rotor which results in proper braking and reduced noise. This normally happens after the vehicle is driven about 300 km. Therefore, the driver may encounter the problems, such as reduction of braking force or noise (abnormal sound) due to uneven contact of brake pad for some time after renewing the brake disc or pad.

Symptom 3. "Groaning" sound when releasing the brake pedal slightly or depressing gently in order to start off the vehicle at a low speed (for a vehicle with A/T).

The vehicle with M/T as well as the one with A/T can make a noise called as "creep groan" when releasing the brake pedal slightly, for example, on the downhill slope or in neutral. This noise can often occur at a low brake pressure and low speed. This may be because the adhesion and slip are occurred repeatedly between the brake disc and friction material when braking with a low force at low speed, which causes the friction force to fluctuate momentarily. This physical phenomenon is not a fault and does not have anything to do with the braking performance.

# 5. SYSTEM CHECK

▶ **Checking brake pedal maximum travel**




Check the brake pedal travel in the following sequence:

1. Start the engine.
2. Depress and release the brake pedal 3 times.
3. Depress the brake pedal with a force of about 30 kg and measure the travel distance (A) of the brake pedal.
4. If the measured value is out of the specified range, perform the service procedures according to the table below.

| Specification (A) | 150 ± 3 mm |
|---|---|

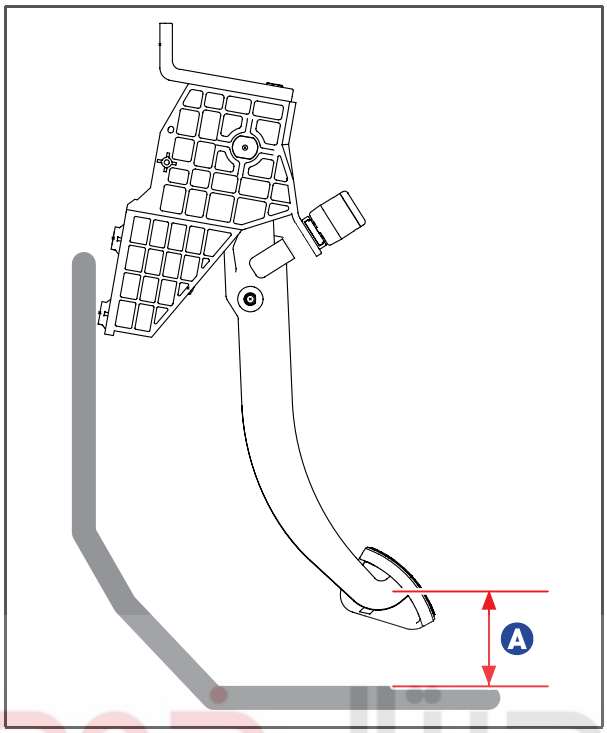
**Above the specification**

| Cause | Action |
|---|---|
| Worn brake pad | Replace |
| Air in brake system | Bleeding |
| Leaks in brake system | Repair or replace |

**Below specification**

| Cause | Action |
|---|---|
| Water in brake fluid | Replace or adjust |
| Faulty brake booster | Replace |

## ▶ Checking brake pedal height




Check the brake pedal height in the following sequence:

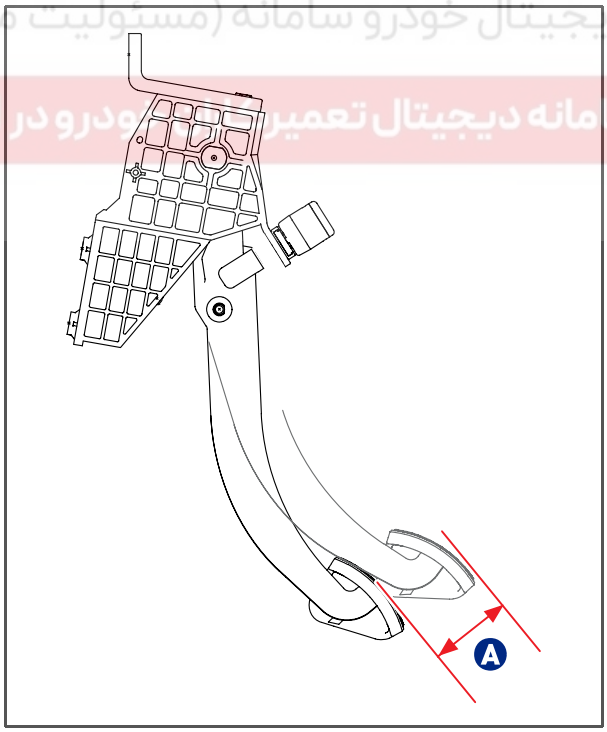
1. Measure the distance (A) between the floor mat and the pedal with the engine running.

| Specification (A) | 156 mm |
|---|---|

**NOTE**

The specified brake pedal height is a reference which is not adjustable.

## ▶ Checking brake pedal free play




Check the brake pedal free play in the following sequence:

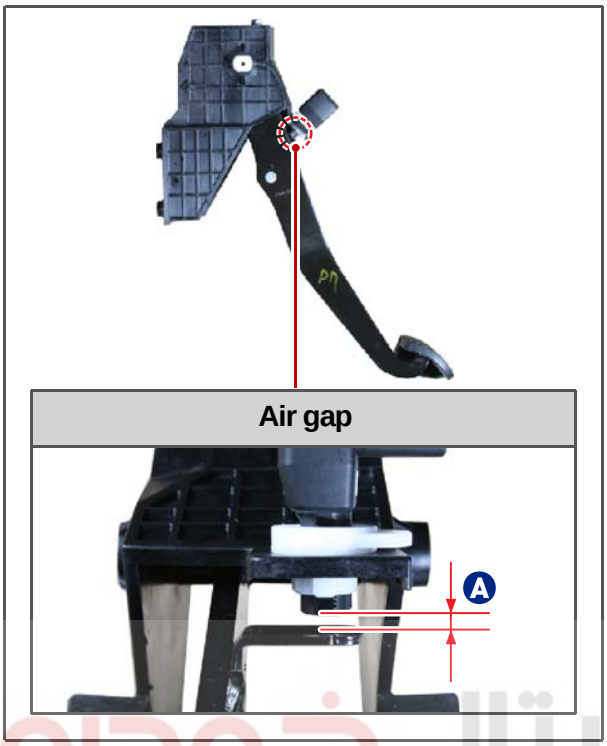
1. Turn off the engine.
2. Depress the brake pedal several times so that there is no vacuum present in the booster. Depress the brake pedal until resistance is felt.
3. Measure the travel distance (A) of the brake pedal.

| Specification (A) | 4 to 6 mm |
|---|---|

**NOTE**

The specified brake pedal free play is a reference which is not adjustable.

### ▶ Checking air gap of brake switch

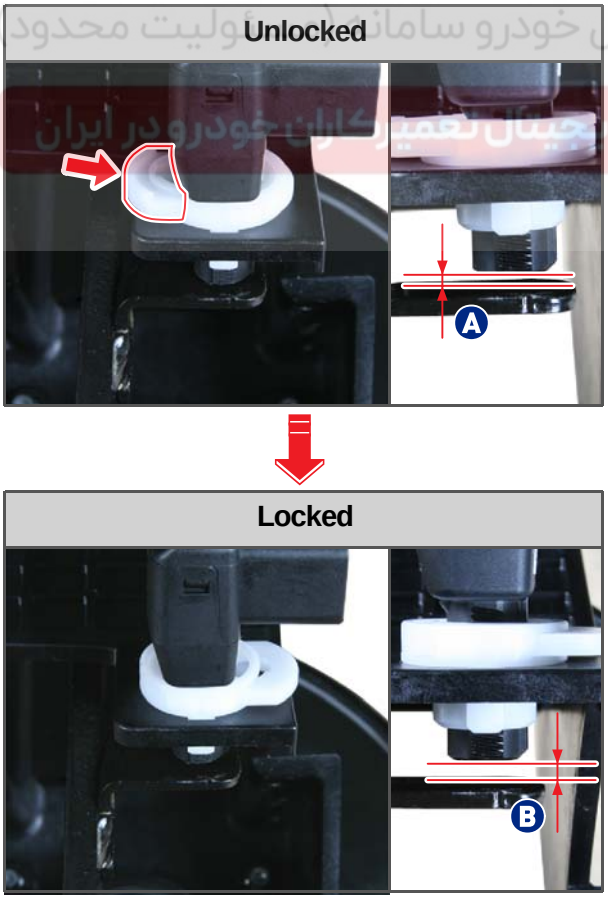



Check the brake switch air gap in the following sequence:

1. Measure the air gap of brake switch with the brake pedal released using a feeler gauge.

| Specification (A) | 2.5 mm |
|---|---|

### ▶ Adjusting air gap of brake switch




1. Install the brake switch with the brake pedal released.
2. Adjust the brake switch air gap to about 1.0 mm (A).
3. Secure the brake switch by pushing the switch holder in the direction of the arrow.

**NOTE**

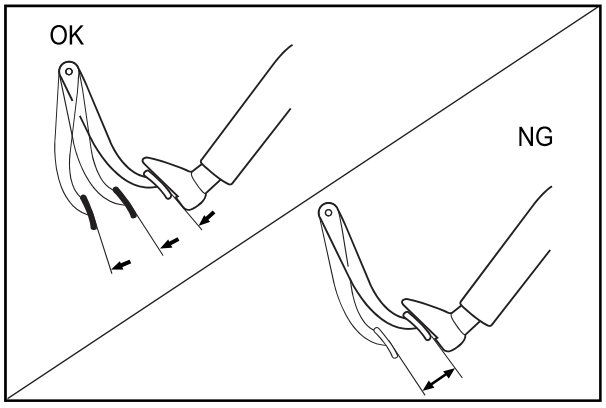
Additional air gap (1.5 mm) is created when locking the brake switch holder in place.

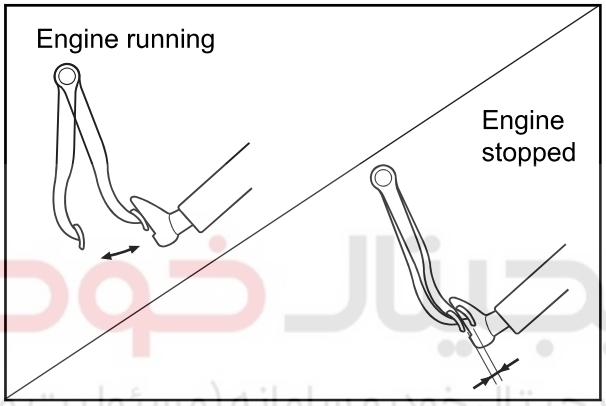
4. Measure the air gap of brake switch (B).



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Checking brake booster



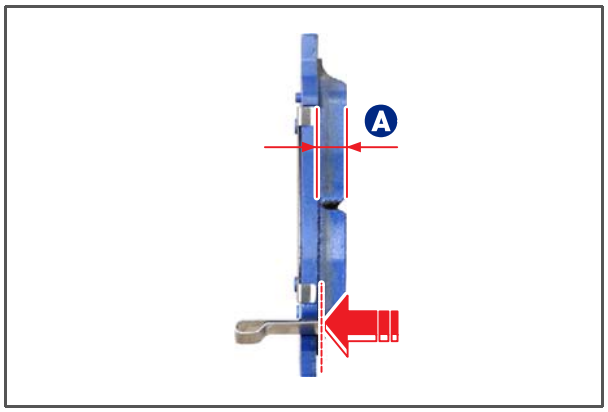

1. Let the engine run for 1 to 2 minutes and stop it. Depress the pedal with normal force. If the pedal travel of the first brake application is long and becomes shorter with subsequent applications, the system is normal. If there is no change in pedal travel, the system is defective.
2. Depress the brake pedal several times with the engine turned off. Turn the engine on with the brake pedal depressed. If the brake pedal moves down slightly, the system is normal. Otherwise, the system is defective.
3. Depress the brake pedal when the engine is running. Turn off the engine in this state. If the brake pedal height does not vary for 30 seconds, the system is normal. If the pedal moves up, the system is defective.

When all results are OK, the system is normal. If any of the above 3 conditions are not satisfied, check the parts such as check valve, vacuum hose, brake booster, etc.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Checking front brake



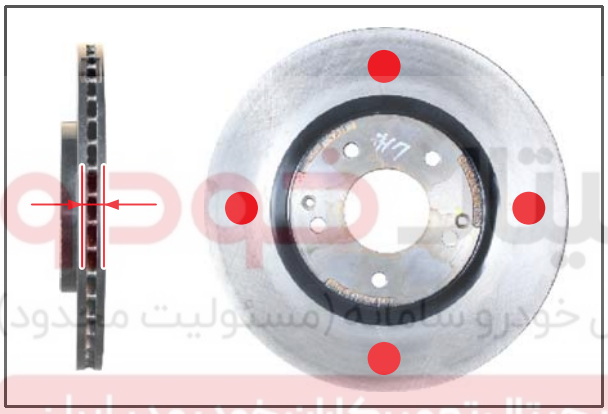

1. Front brake pad thickness

- Measure the front brake pad thickness (A). If the value is below the wear limit, replace the brake pad.

| Thickness of new pad | Wear limit |
|---|---|
| 11 mm | 2 mm |

**NOTE**

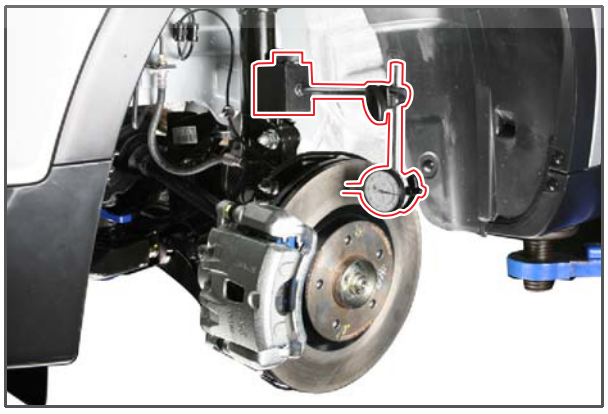
Wear limit of front brake pad



2. Front brake disc thickness

- Measure the disc thickness at over four points on the disc.
- If any of measured points is below the wear limit, replace the brake disc with a new one.

| Thickness of new disc | Wear limit |
|---|---|
| 23 mm | 21.4 mm |



3. Front brake disc run-out

- Install a dial gauge on the side of brake disc and measure the run-out while rotating the brake disc.
- If the measured value exceeds the limit, replace the brake disc with a new one. Otherwise, it may cause the pedal vibrations and shimmy when braking.

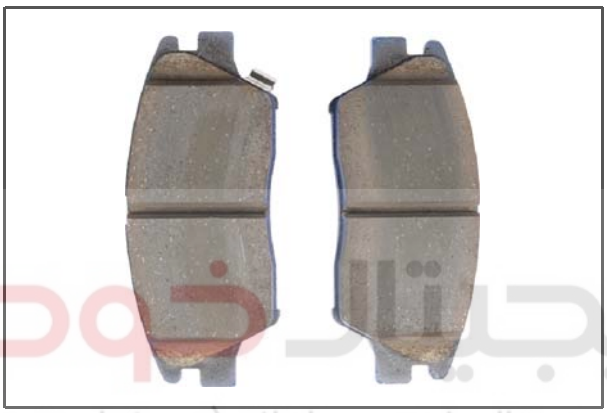
| Run-out limit | 0.035 mm (when installed) |
|---|---|



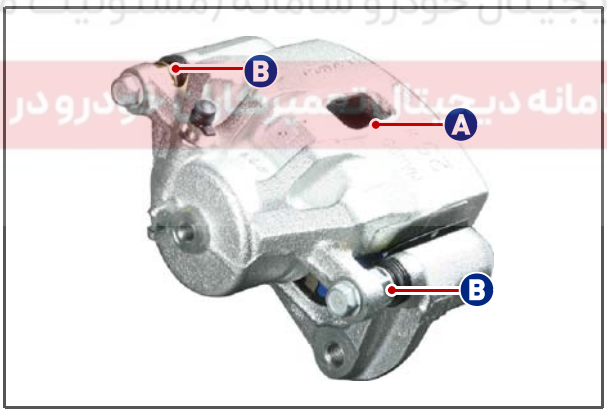
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

Clean the disassembled parts and visually check the followings (for front/rear):

4. Check the caliper piston boot for damage and tears.



5. Check the brake pad for uneven wear or oil deposits.



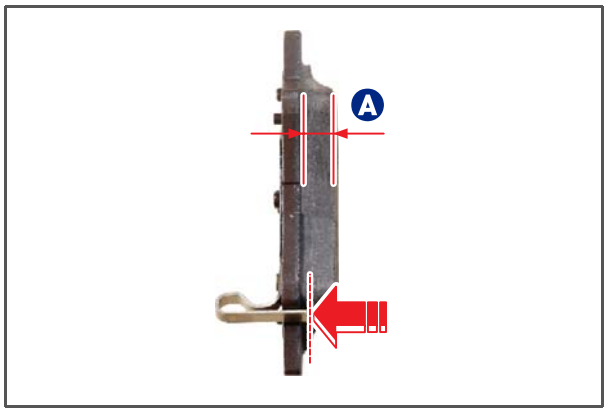

6. Check the caliper body (A) for damage or cracks and the guide pin (B) for damage or wear.

7. Wear, rust and damage on the cylinder and piston
8. Scratches on or warpage of the disc plate



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Checking rear brake



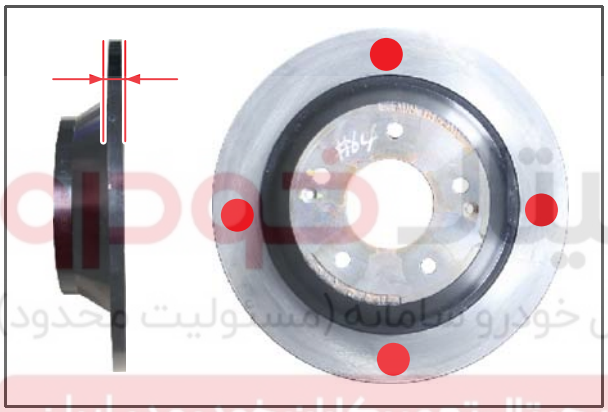

1. Rear brake pad thickness

- Measure the rear brake pad thickness (A). If the value is below the wear limit, replace the brake pad.

| Thickness of new pad | Wear limit |
|---|---|
| 10 mm | 2 mm |

**NOTE**

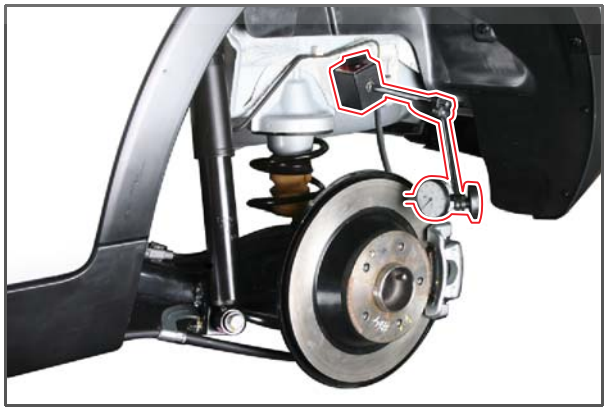
Wear limit of rear brake pad



2. Rear brake disc thickness

- Measure the disc thickness at over four points on the disc.
- If any of measured points is below the wear limit, replace the brake disc with a new one.

| Thickness of new disc | Wear limit |
|---|---|
| 10 mm | 8.4 mm |



3. Rear brake disc run-out

- Install a dial gauge on the side of brake disc and measure the run-out while rotating the brake disc.
- If the measured value exceeds the limit, replace the brake disc with a new one. Otherwise, it may cause the pedal vibrations and shimmy when braking.

| Run-out limit | 0.065 mm (when installed) |
|---|---|



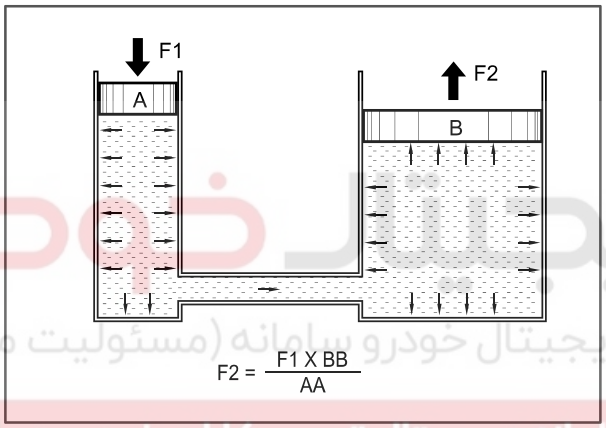
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# OVERVIEW AND OPERATING PROCESS

## 1. OVERVIEW

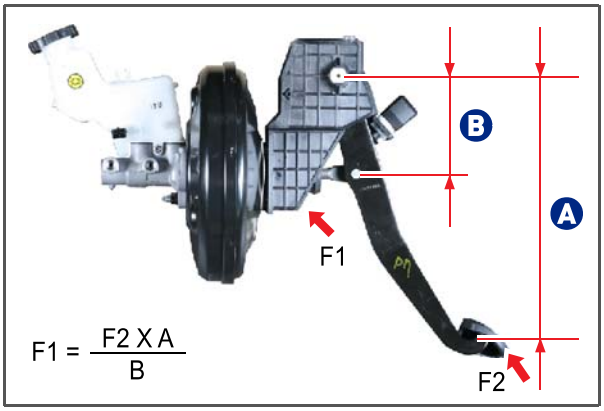
If the power is cut while the vehicle is being driven, the vehicle will keep on moving for some distance without stopping because of inertia. Therefore, the brake system is very important to reduce the vehicle speed or stop the vehicle. The friction type brake system is typically used. This brake system converts the kinetic energy to the thermal energy and uses the friction force for braking.
The brake system mainly consists of front and rear disc brakes, parking brake (mechanical), master cylinder (for generating hydraulic pressure), brake pedal, feed lines (pipes and hoses), and brake pads.

### ▶ Hydraulic brake




This brake system uses the Pascal's principle and leverage effect. When the driver depresses the brake pedal, the brake pedal pressure is increased by the brake booster and delivered to the master cylinder which converts the pedal pressure to hydraulic pressure.
The hydraulic pressure travels to the caliper through the brake pipe or hose. Then, the pad is pressed against the disc by the pressure sent to the caliper pad to provide the braking force.

### ▶ Brake pedal




The brake pedal increases the force applied to the master cylinder in order to achieve the large braking force using the leverage effect.

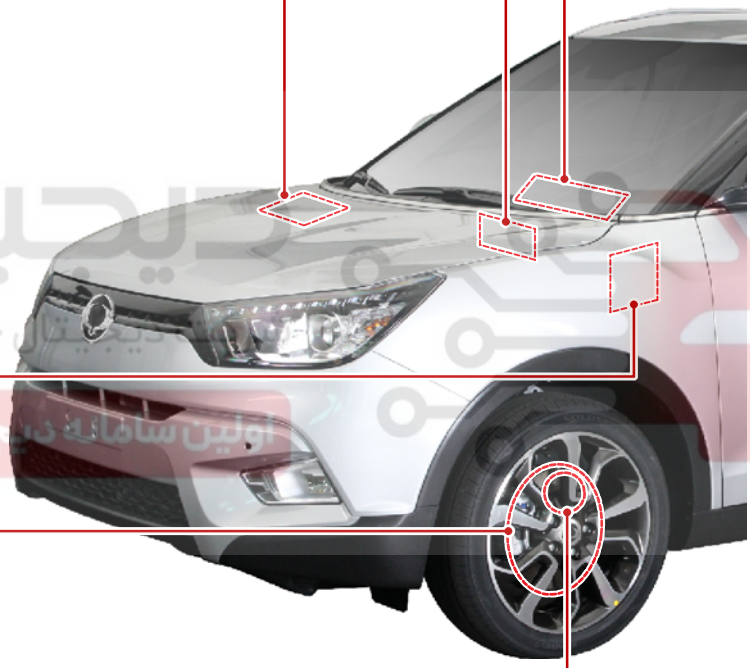


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# 2. COMPONENTS

**master cylinder with booster**

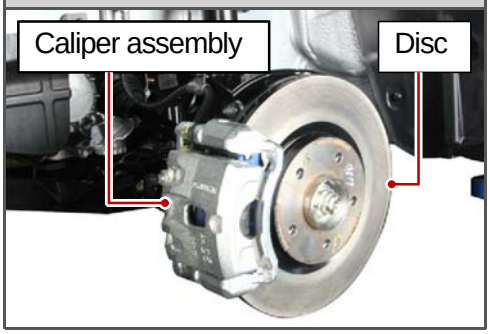
**HECU**



**Brake pedal**

| For a vehicle with M/T | For a vehicle with A/T |
|---|---|
|  |  |

**Front brake assembly**




**Front wheel speed sensor**



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

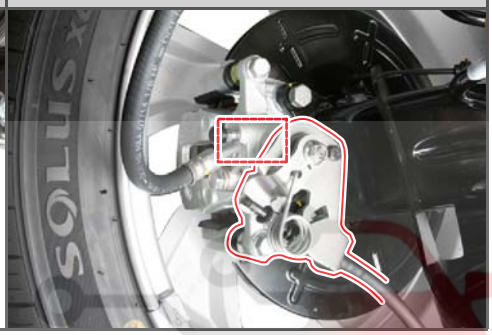
## Indicator lamp on instrument cluster


## Parking brake lever

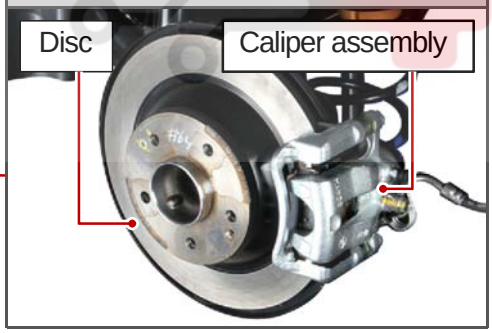
## Parking brake

### AWD(Shoe type)

### 2WD(Ball-in-Ramp type)

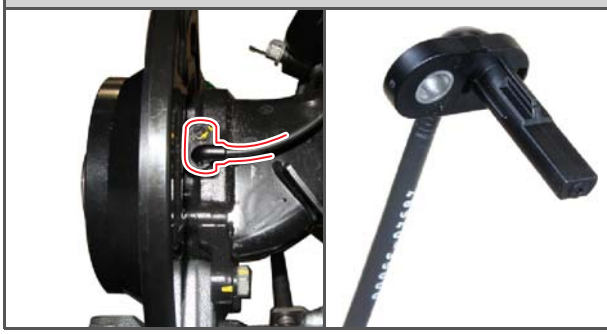


## Rear brake assembly




## Rear wheel speed sensor

### 2WD

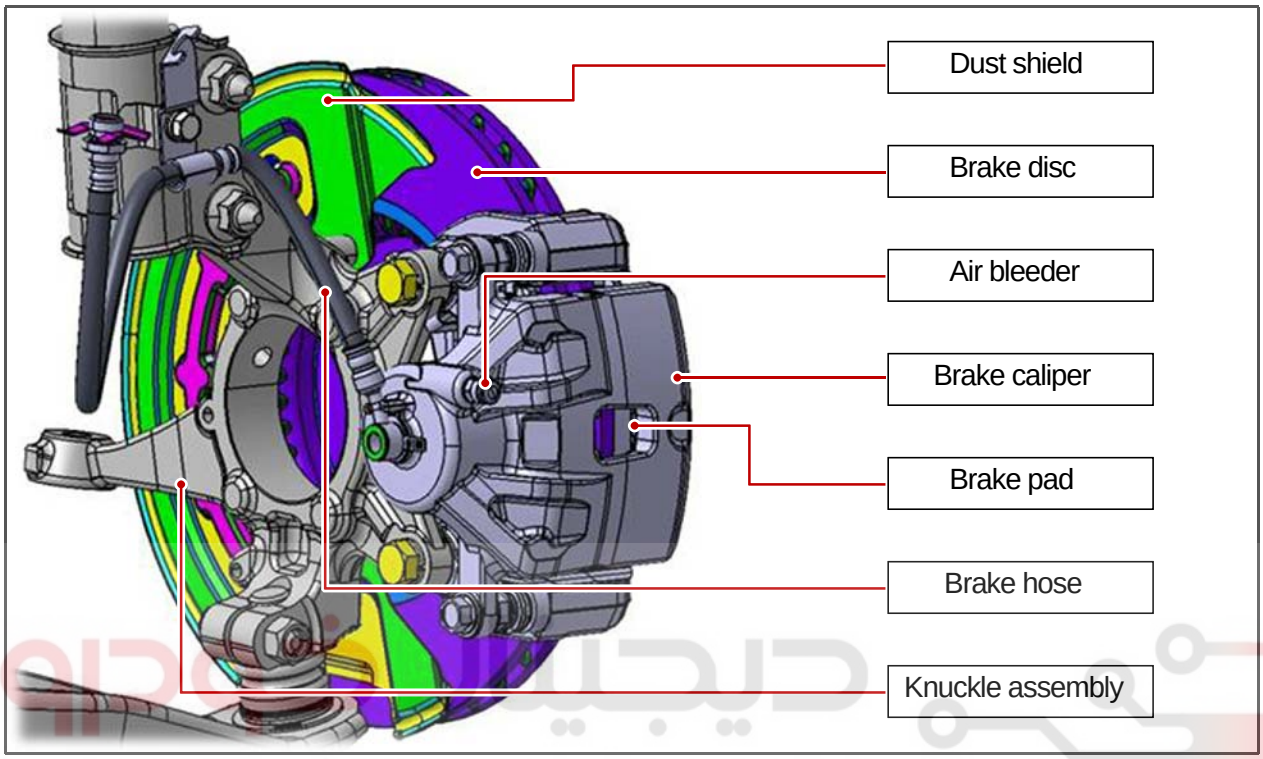


### AWD

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

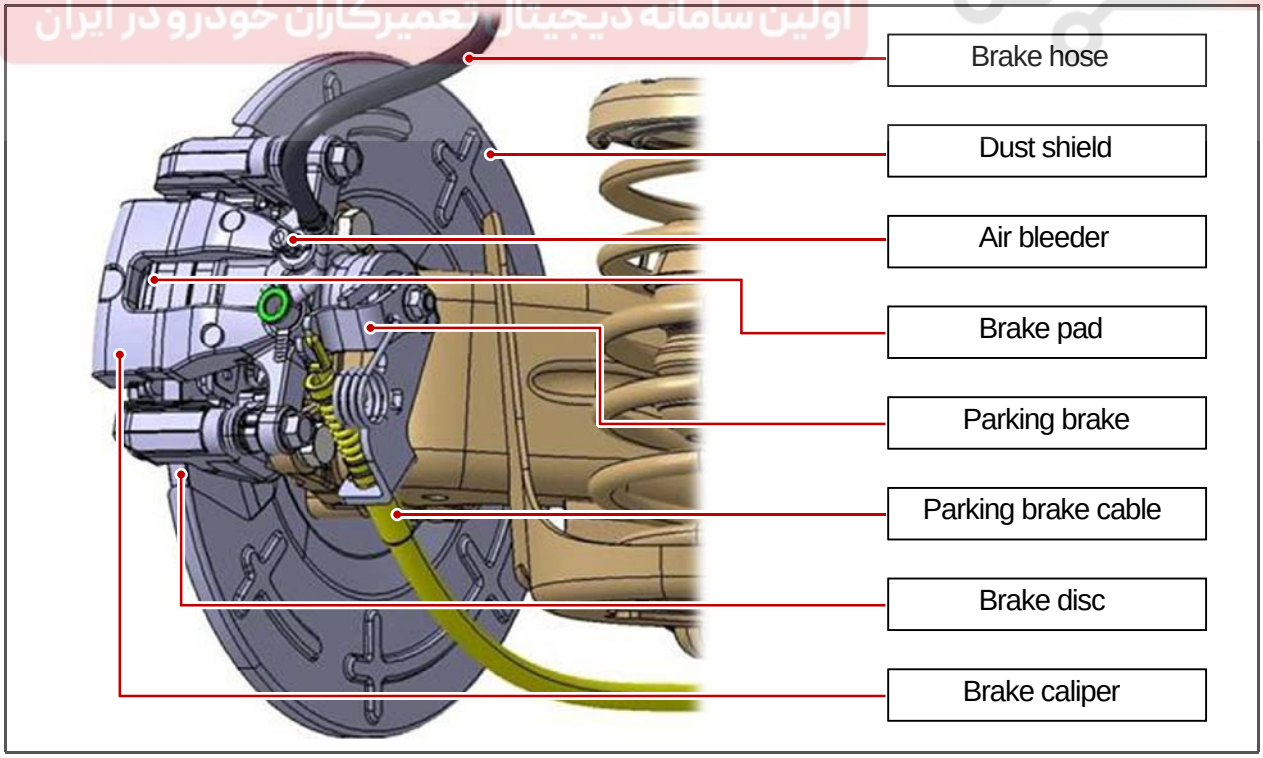
# 3. STRUCTURE

▶ **Front brake**





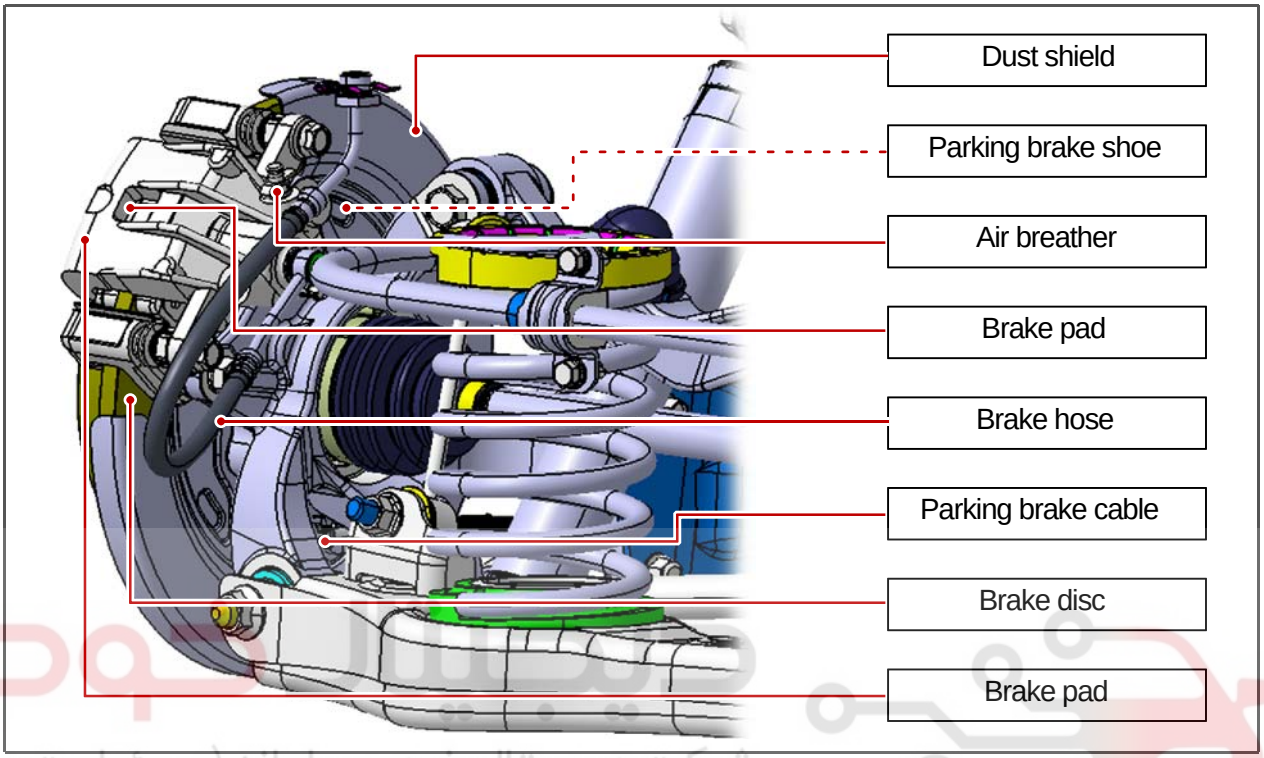

▶ **Rear brake**






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

▶ **Rear brake (AWD)**

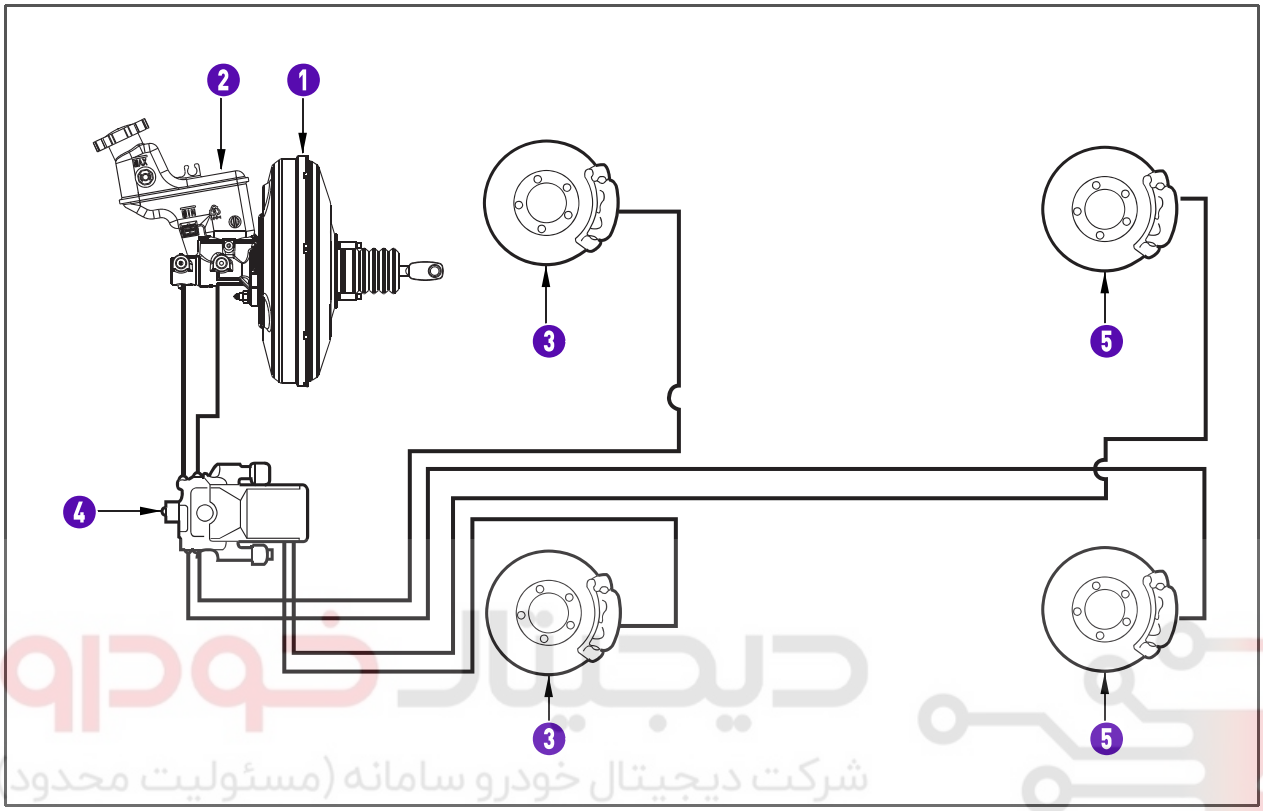





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# 4. BRAKE HYDRAULIC LINE

▶ **Hydraulic line**

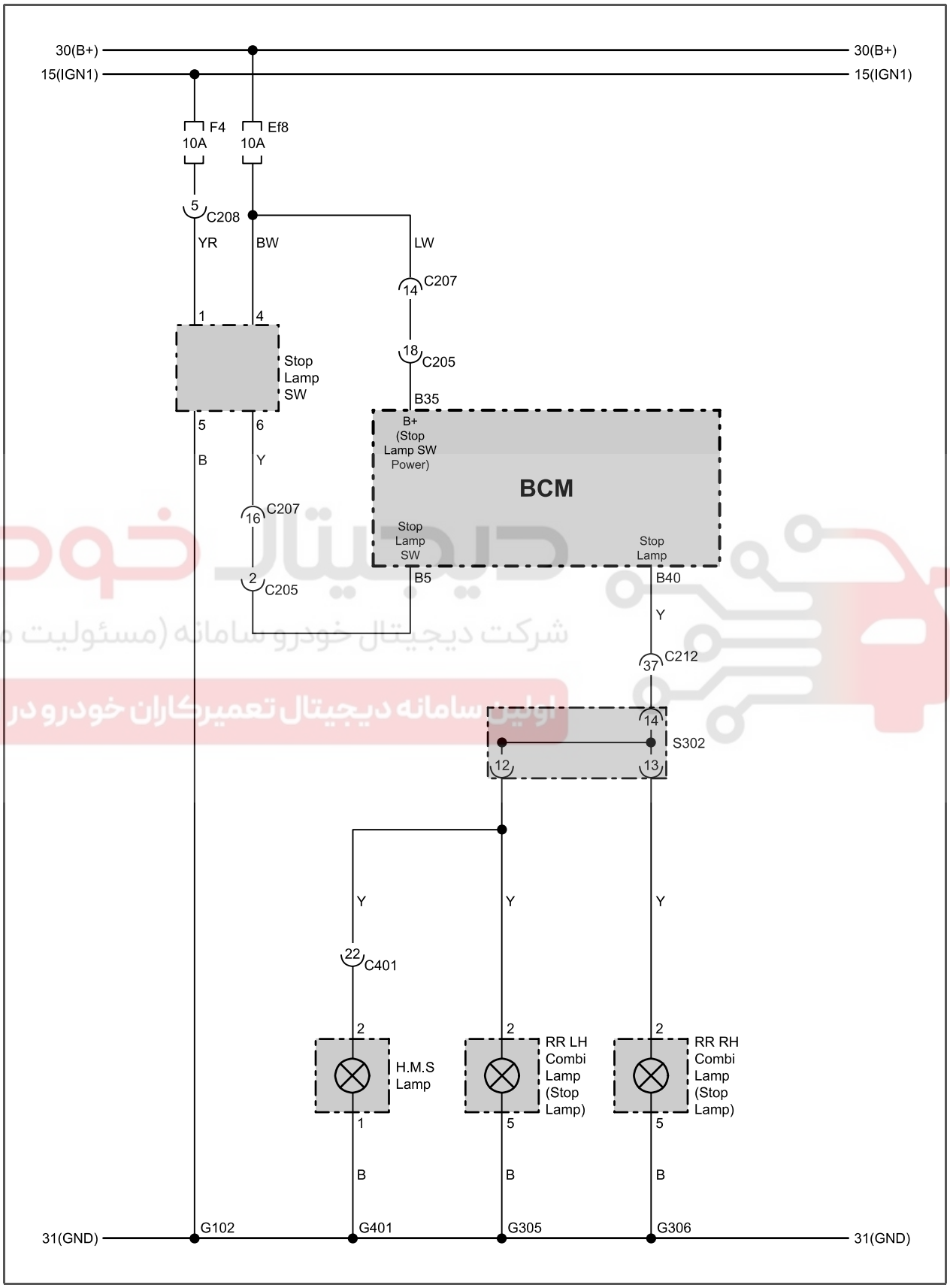



1. Brake booster
2. Brake master cylinder with brake reservoir
3. Front disc brake with caliper
4. HECU (Hydraulic & Electric Control Unit)
5. Rear disc brake with caliper



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# 5. STOP LIGHT CIRCUIT DIAGRAM

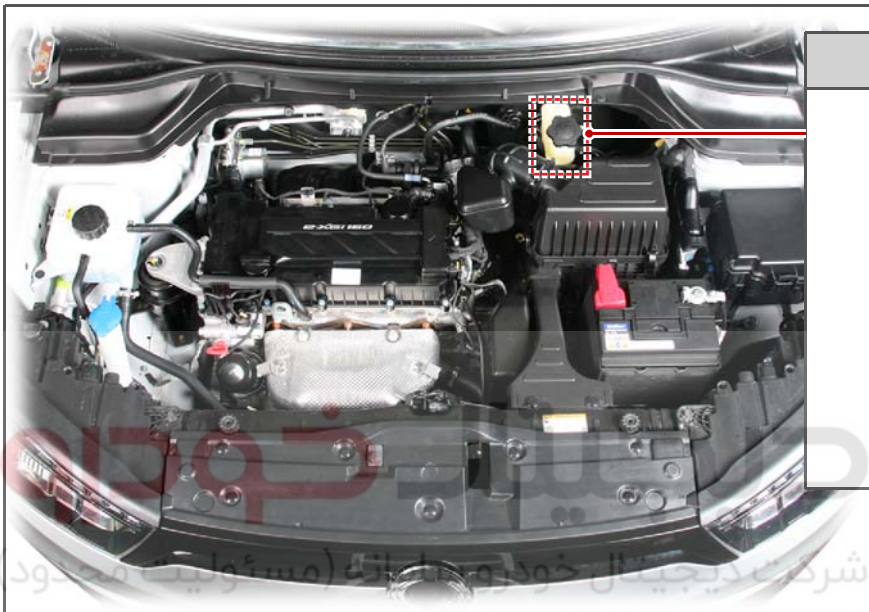



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

# CONFIGURATION AND FUNCTIONS

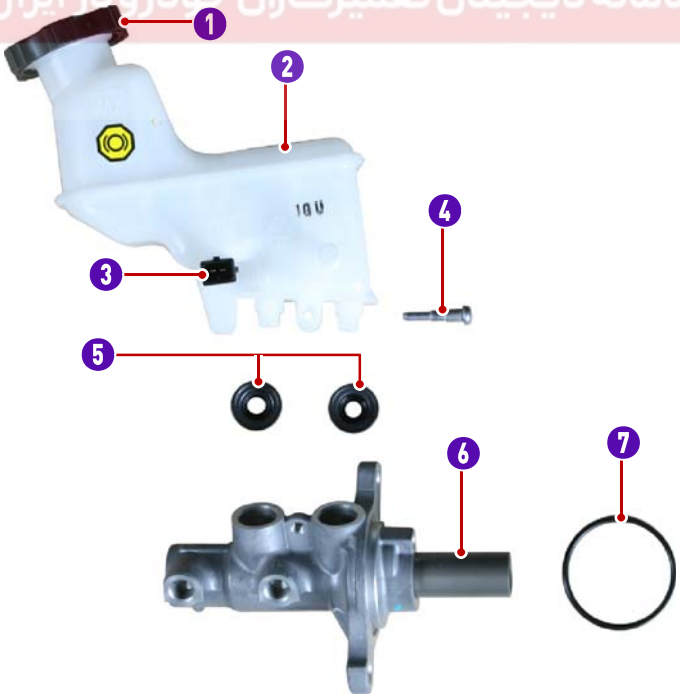
## S.G.N. 4850-03 BRAKE MASTER CYLINDER ASSEMBLY

The brake master cylinder is installed to the brake booster located in the engine compartment, in front of the driver's seat.
This assembly delivers the force from the brake pedal to the master cylinder through the brake booster for building up the hydraulic pressure.



**Brake master cylinder**



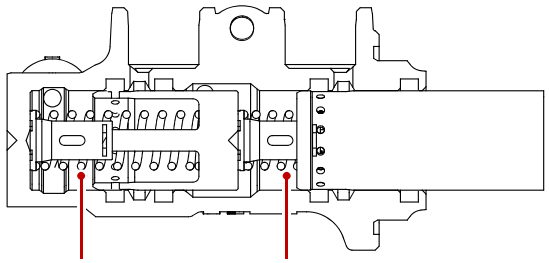



1. Reservoir cap
2. Reservoir tank
3. Brake fluid level switch
4. Mounting screw
5. Grommet
6. Master cylinder body
7. O-ring



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Master cylinder




The master cylinder converts the force applied to the brake pedal to high hydraulic pressure. The master cylinder used in this system is a tandem type cylinder in which 2 pistons are connected in series.

The pistons in the tandem master cylinder are essential components which generate the hydraulic pressure. The piston cups are installed to the piston to form an air-tight seal and prevent leaks. Usually, the hydraulic pressure generated from the primary piston goes to the front side and the pressure from the secondary piston goes to the rear side.



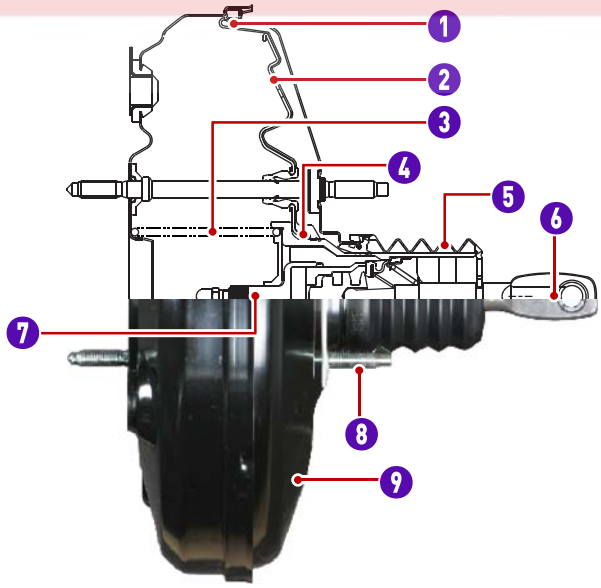
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N.
# 4850-02 BRAKE BOOSTER ASSEMBLY

The brake booster is installed in the engine compartment, in front of the driver's seat.
This is to supplement the brake system, since it is impossible to generate the sufficient braking force only by the driver's maneuver.
It boosts the force applied to the master cylinder using the negative pressure of the vacuum pump when the driver depresses the brake pedal.

**Brake booster**

**Structure**




1. Diaphragm
2. Diaphragm plate
3. Return spring
4. Valve body assembly
5. Rubber boot
6. Brake pedal push rod
7. Master cylinder push rod
8. Booster mounting bolt
9. Brake booster



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

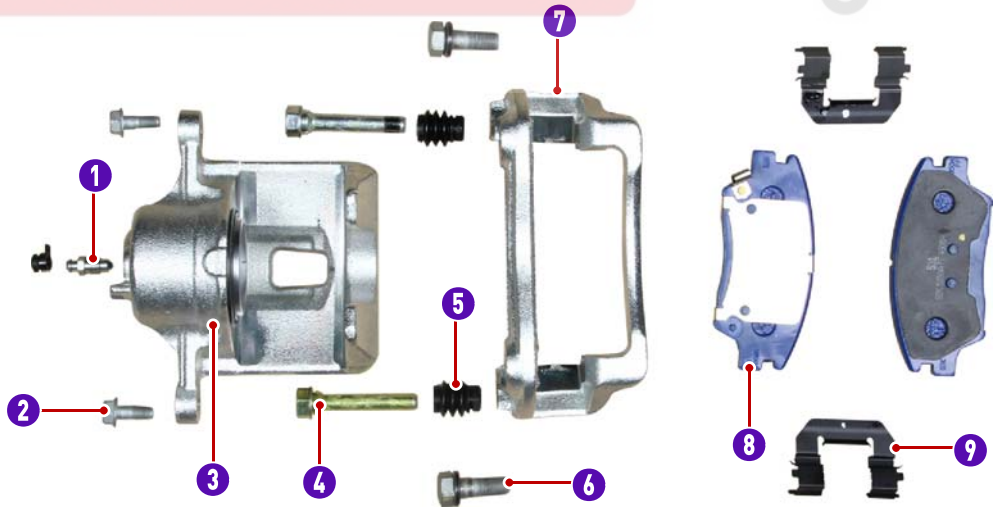
S.G.N. 4830-01

# FRONT BRAKE CALIPER ASSEMBLY

The floating type front brake caliper has the brake cylinder (piston) on only one side of the caliper. When the hydraulic pressure is generated from the brake master cylinder, the piston pushes the pad against the disc. At this time, a repulsive force moves the caliper, which causes the pad in the opposite side to be pushed against the disc to provide the braking force.

**Front brake caliper**

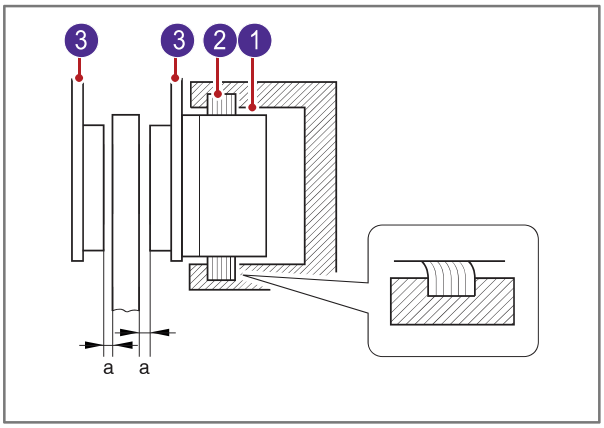
**Front brake caliper**




1. Eye bolt
2. Caliper assembly mounting bolt
3. Caliper housing
4. Carrier guide pin
5. Carrier guide pin boot
6. Carrier mounting bolt
7. Carrier
8. Brake pad
9. Caliper clip

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Clearance adjustment




1. Piston
2. Piston seal
3. Pad

a. Clearance

When the hydraulic pressure is applied to the piston, the piston pushes the pad against the disc. At this time, the piston seal contacting with the piston moves along the piston.
The piston seal becomes deformed as it moves because part of that seal is fixed to the groove of the cylinder (see the left figure).
If the applied hydraulic pressure is released, the piston returns to the rest position by the elasticity and restoring force of the piston seal.
If a large amount of clearance is created between the brake disc and the brake pad because of the worn pad, the piston can travel a longer distance but the deformation amount of the piston seal is limited.
Therefore, the piston always returns to its original position after traveling a distance corresponding to the deformation amount of the seal. This keeps the clearance value unchanged.





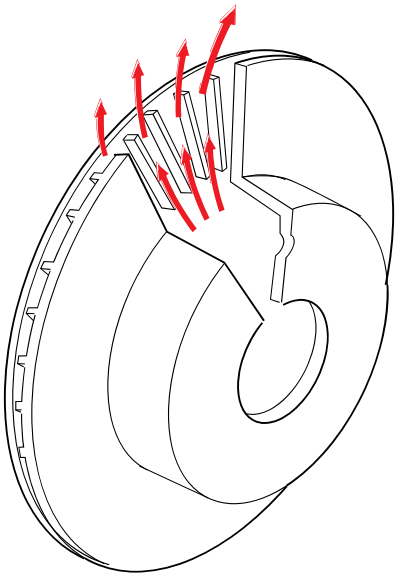
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4115-07

# FRONT BRAKE DISC

When the brake pedal is depressed, the piston in the caliper pushes the brake pad against the brake disc to provide braking force.
The front brake disc is a ventilated disc.


## Ventilated Disc Brake

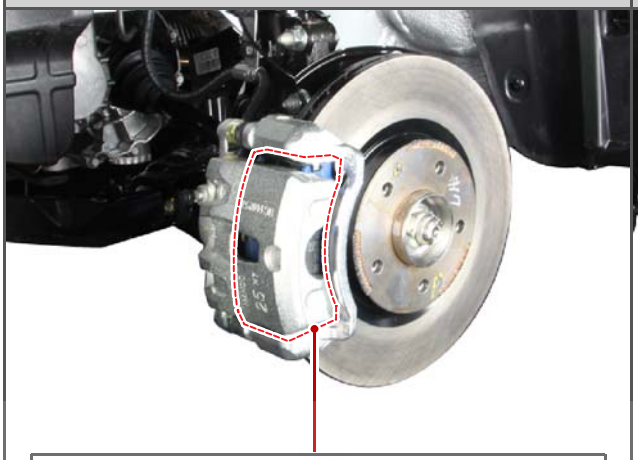
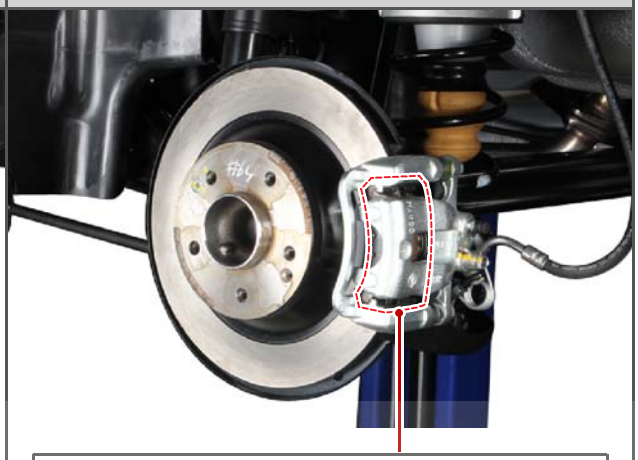
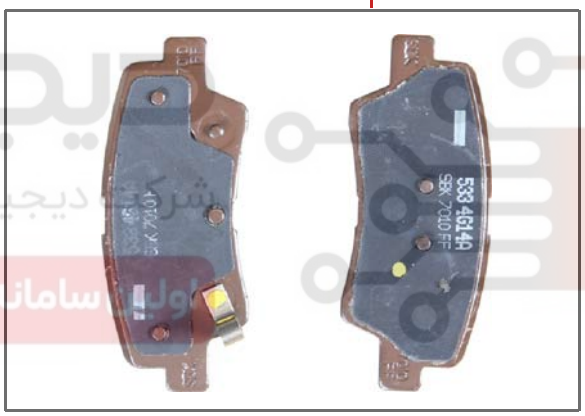


The heat is a major factor affecting the braking force. A ventilated disc provides high heat dissipation efficiency.
This type of disc has many holes on the disc surface as shown in the picture. The holes increase the surface area facilitating the heat dissipation, which improves the cooling effect of the disc brake.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N.
# 4830-02 FRONT AND REAR BRAKE PADS

When the hydraulic pressure is applied to the brake, the brake pad is pushed against the brake disc to provide the braking force. If the hydraulic pressure is relieved, it returns to the original position. The brake pad is built in the caliper.

| Front brake pad | Rear brake pad |
|---|---|
|  |  |
|  |  |

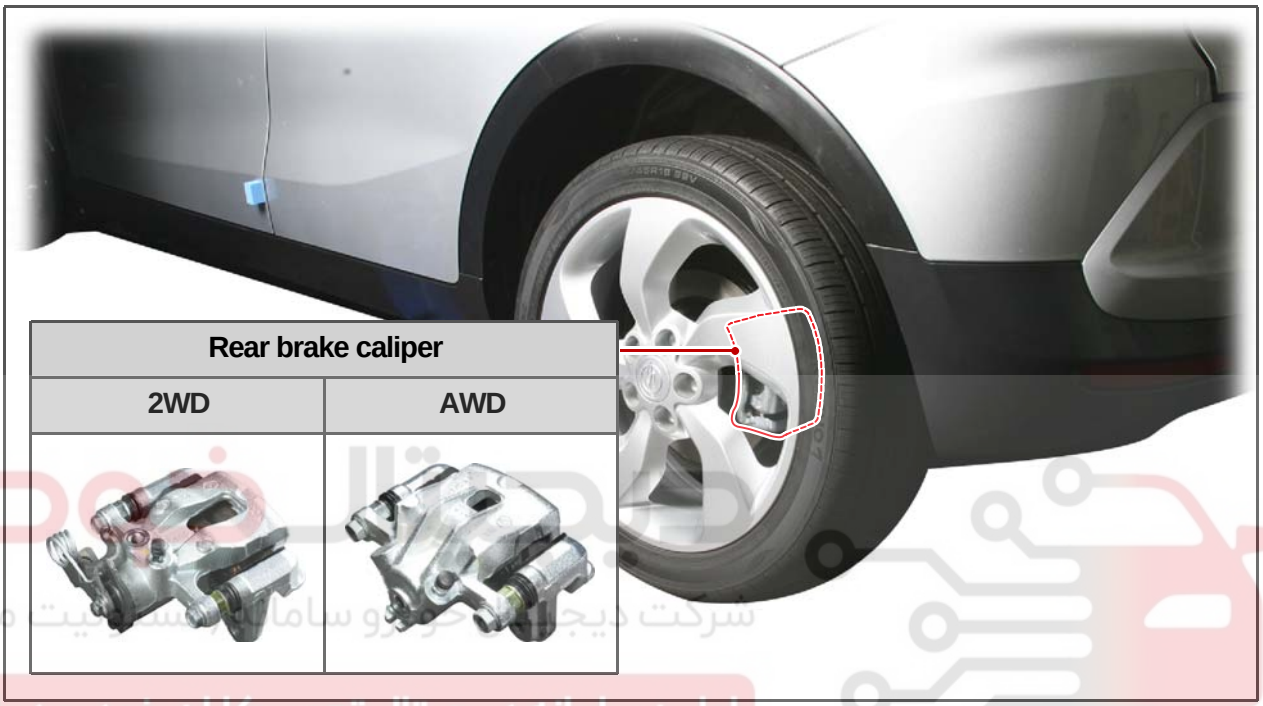


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4841-01

# REAR BRAKE CALIPER ASSEMBLY

The rear brake caliper is also a floating type and has the brake cylinder (piston) on only one side of the caliper, just like the front brake caliper. When the hydraulic pressure is generated from the brake master cylinder, the piston pushes the pad against the disc. At this time, a repulsive force moves the caliper, which causes the pad in the opposite side to be pushed against the disc to provide the braking force.



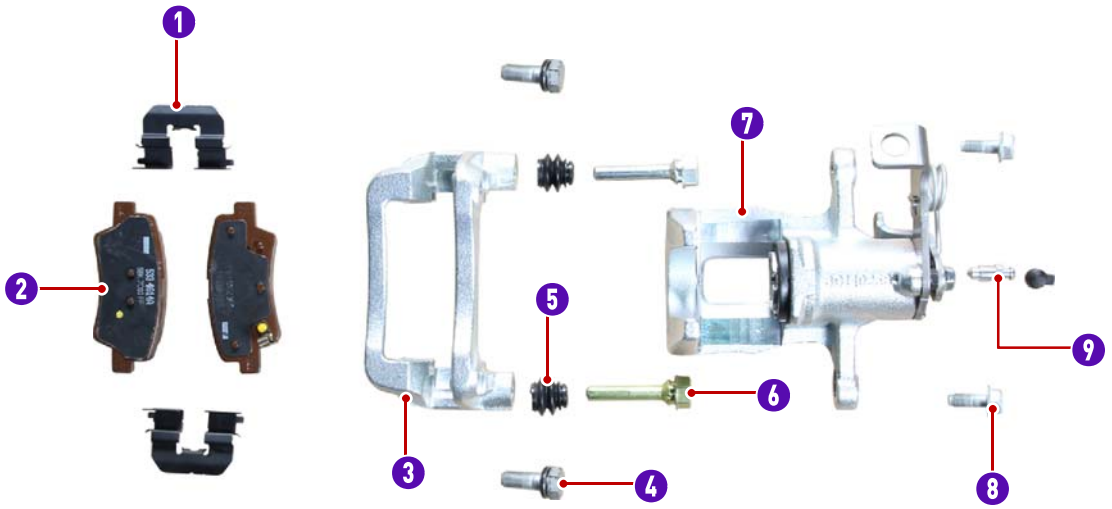
| Rear brake caliper | |
|---|---|
| 2WD | AWD |
|  |  |





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

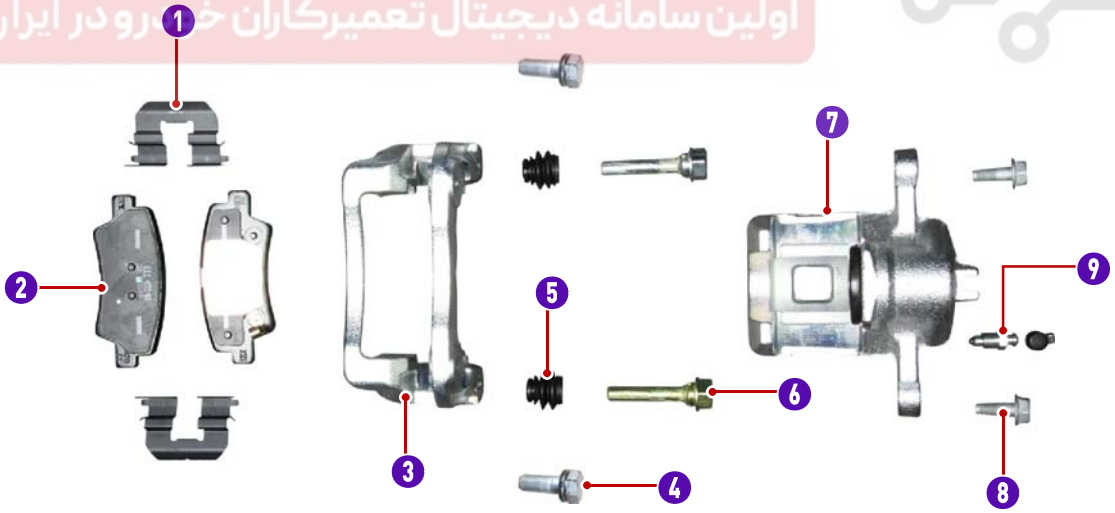
## Rear brake caliper(2WD)




1. Caliper clip
2. Brake pad
3. Carrier
4. Carrier mounting bolt
5. Carrier guide pin boot
6. Carrier guide pin
7. Caliper housing
8. Caliper assembly mounting bolt
9. Eye bolt



## Rear brake caliper(AWD)



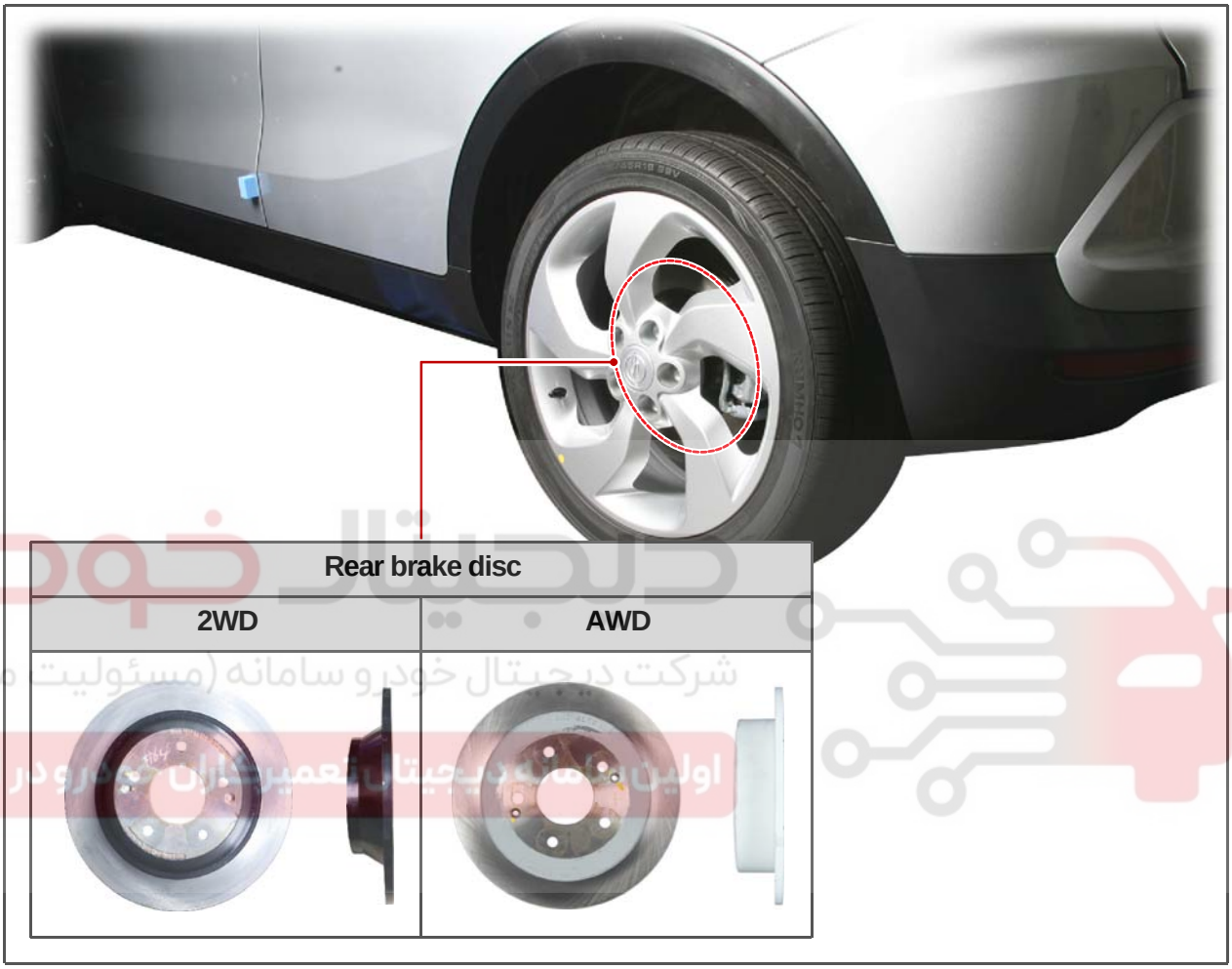

1. Caliper clip
2. Brake pad
3. Carrier
4. Carrier mounting bolt
5. Carrier guide pin boot
6. Carrier guide pin
7. Caliper housing
8. Caliper assembly mounting bolt
9. Eye bolt



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N.
# 4221-02 REAR BRAKE DISC

When the brake pedal is depressed, the piston in the caliper pushes the brake pad against the brake disc to provide braking force.
The rear brake disc is a solid disc.



| Rear brake disc | |
|---|---|
| 2WD | AWD |
|  |  |



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4910-01

# PARKING BRAKE ASSEMBLY

The parking brake assembly is a mechanical device which keeps the vehicle in the stationary state. When the parking brake lever is pulled up, the rear caliper is operated by the cable between the parking brake lever and PIC type rear brake caliper. The rear caliper pushes the brake pad against the brake disc to keep the vehicle in stationary state.

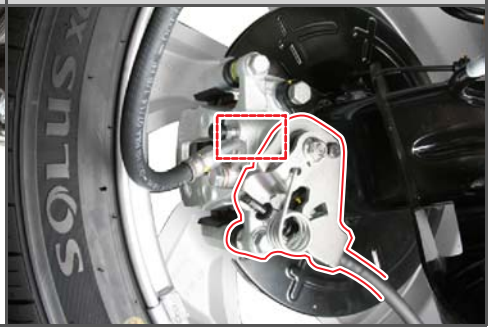
**Parking brake lever**

**Center brake cable**

**Indicator lamp on instrument cluster**


**Rear parking brake cable**

**Parking brake**

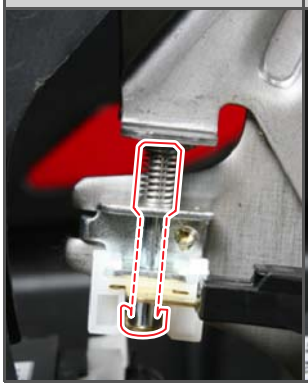
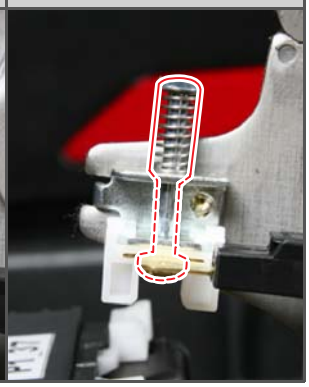
| AWD(Shoe type) | 2WD(Ball-in-Ramp type) |
|---|---|
|  |  |



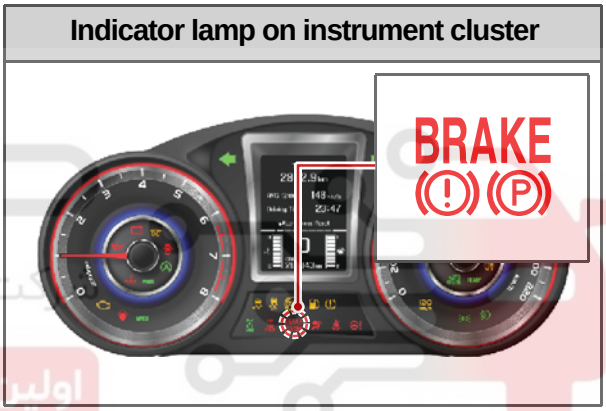
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## 1) Parking Brake Switch and Indicator Lamp

Pulling up the parking brake lever with the ignition switch ON activates the switch on the lever and turns on the parking brake indicator on the instrument cluster.

| Applied | Released |
|---|---|
|  |  |

Indicator lamp on instrument cluster







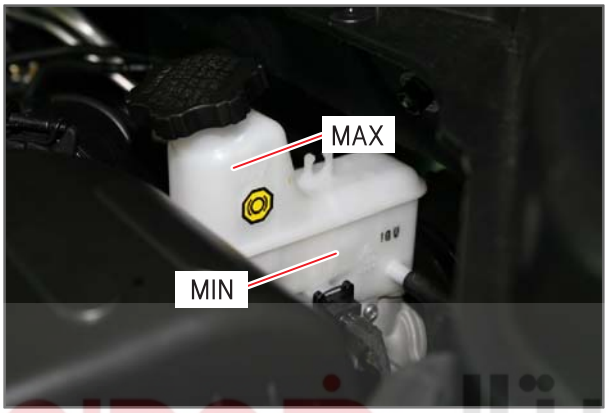

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

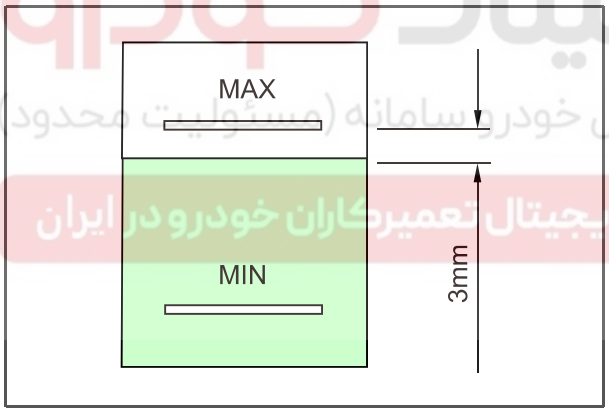
# REMOVAL AND INSTALLATION

## S.G.N. 9210-04 BRAKE FLUID CHECK

**NOTE**

- Change interval: every 2 years
- Specified oil: DOT4




### ▶ Checking brake fluid level

The brake fluid level should be between the MAX and MIN marks on the brake fluid reservoir tank. If the level is below MIN mark, check the brake pad and brake system for oil leaks and add up the brake fluid.

**CAUTION**

- If the level is below MIN mark, worn brake pad may be the cause.
- For a vehicle with M/T, check if the clutch pedal is returned completely to its original position.

**CAUTION**

Avoid mixing different brake fluids. It may cause the brake system damage.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

### ▶ Checking brake system for oil leaks

When the oil level in the brake reservoir tank is low, check the brake system lines for oil leaks and add up the brake fluid or replace the corresponding part.

### ▶ Checking brake fluid contamination level

You can determine the level of brake fluid contamination by checking its color visually. The color changes in the order of Light gold, Brown and Black according to the contamination level. Replace the brake fluid according to the change interval or contamination level.

### ▶ Checking for water in brake fluid

- The water in the brake system is fatal; If there is 3% of water in the brake fluid, the boiling point for brake fluid drops by about 25%, which results in the frequent vapor lock.
- It is normal that the brake fluid has moisture of about 3% approx. 18 months after the first use, while the one used for several years has moisture of about 7 to 10%.
- The water circulates the brake lines along with the brake fluid and causes corrosion in the lines and deformation or aging of the master cylinder, various rubbers in the brake lines, brake calipers and parts of the pistons.

# S.G.N. 9210-04 BRAKE FLUID CHANGE

**NOTE**

- Change interval: every 2 years
- Specified oil: DOT4
- The brake fluid is exposed to high temperature repeatedly. Long-term usage of the brake fluid may affect the braking performance due to discoloration and viscosity change. Always change the brake fluid every 2 years to achieve reliable braking force.

**CAUTION**

- Do not re-use the drained brake fluid.
- Avoid mixing different brake fluids and use only the specified brake fluid. It may cause the brake system to be damaged.
- After finishing the service work, make sure that the brake fluid level is between MAX and MIN marks on the reservoir tank (0.7 to 0.8 liters).
- Make sure that no foreign materials get into the system when changing the brake fluid and working with the brake system.
- Avoid getting brake fluid on your body or other vehicle parts. In case of contact, rinse with plenty of water.
- Apply the parking brake firmly prior to starting the work.
- Two people are needed to carry out this work.



1

1. Open the cap of the brake fluid reservoir tank and drain the brake fluid completely using an oil pump.

2

2. Fill the brake fluid reservoir tank with the brake fluid to the MAX mark.




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

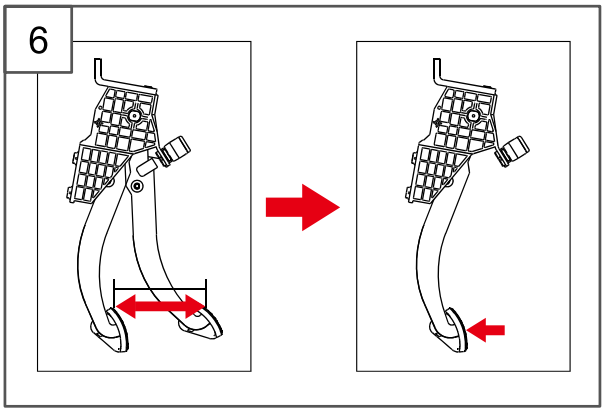
3. Start the vehicle and install the diagnostic device.
4. Under the start-up screen, click on "Air Bleeding" in the "Vehicle Name" → "System" → "ESP Diagnosis".



5. Select "Rear right path" in the Diagnostics menu, unscrew the caliper air bleeder screw at the rear right hand side, and connect the transparent hose.

**NOTE**

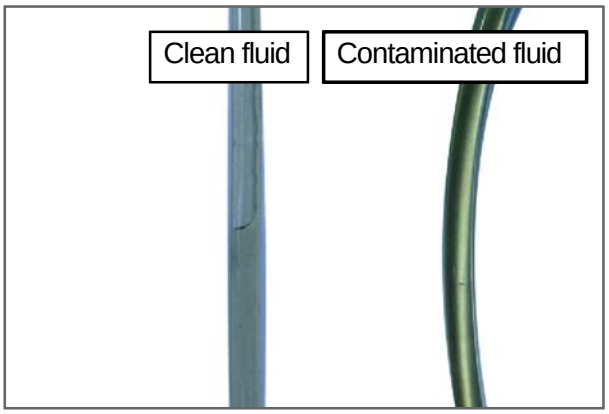
Brake fluid change order: 1. rear right → 2. front left → 3. rear left → 4. front right




6. The mechanic A should depress the brake pedal repeatedly while the mechanic B drains the brake fluid by removing the brake air bleeder screw until the contaminated fluid is drained completely, and tighten the screw.

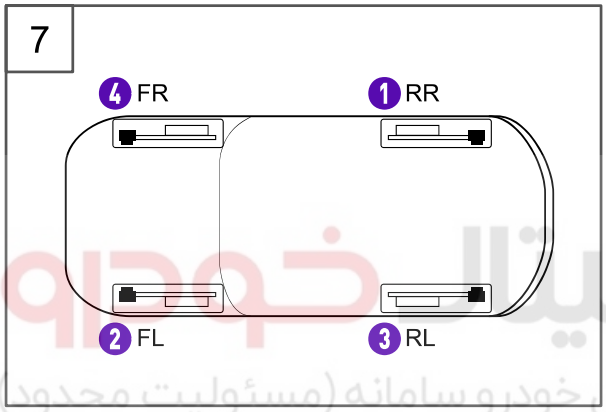
**CAUTION**

Carry out the brake fluid change while adding up the brake fluid so that the reservoir tank does not run out of fluid.

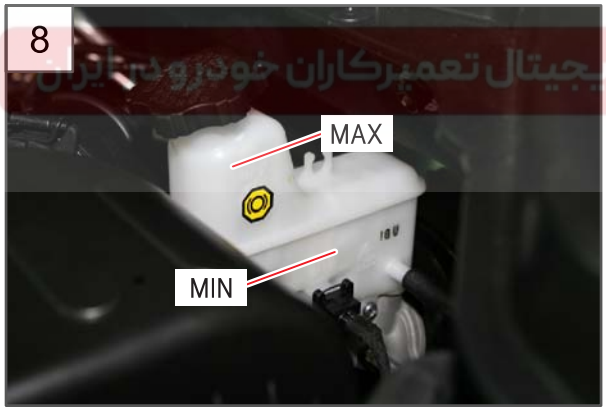



**NOTE**

You can visually check the contamination of the brake fluid drained through the transparent hose.




7. Change the brake fluid for the rest of the wheels in the order shown in the figure (1. rear right → 2. front left → 3. rear left → 4. front right) using the method described above.




8. After finishing the service work, visually check the brake operation and oil leaks, and fill the brake reservoir tank with the brake fluid level between the MIN and MAX marks on the tank.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4850-00

# BLEEDING BRAKE SYSTEM

**NOTE**

**When the brake system needs to be bled,**

- When replacing and removing/installing the brake caliper
- When replacing and removing/installing the brake hydraulic pipe and hose
- When replacing and removing/installing the brake master cylinder
- When removing/installing the ABS/ESP HECU

**CAUTION**

- Do not re-use the drained brake fluid.
- Avoid mixing different brake fluids and use only the specified brake fluid. It may cause the brake system to be damaged.
- After finishing the service work, make sure that the brake fluid level is between MAX and MIN marks on the reservoir tank (0.7 to 0.8 liters).
- Make sure that no foreign materials get into the system when bleeding and working on the brake system.
- Avoid getting brake fluid on your body or other vehicle parts. In case of contact, rinse with plenty of water.
- Apply the parking brake firmly prior to starting the work.
- Two people are needed to carry out this work.



1

2


1. Fill the brake fluid reservoir tank with the brake fluid to the MAX mark.

**NOTE**

**Oil specification**

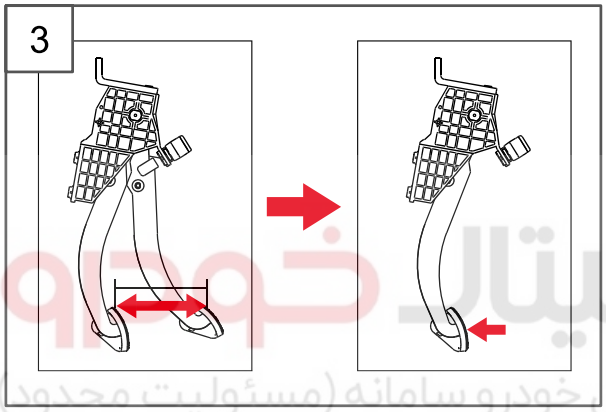
DOT4

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |


2. Connect the transparent hose to the caliper air bleeder screw at the rear right hand side.

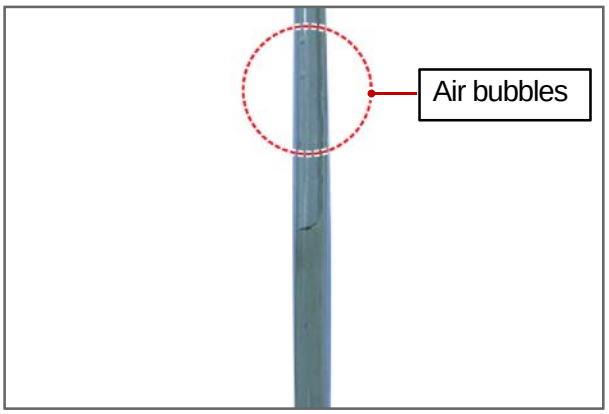
**NOTE**

Order of bleeding brake system:
1. rear right → 2. front left → 3. rear left → 4. front right




3. The mechanic A depresses and releases the brake pedal 3 to 5 times and holds the pedal depressed.


4. While the mechanic A depresses the brake pedal, the mechanic B should remove the air bleeder screw for bleeding, and tighten the screw.



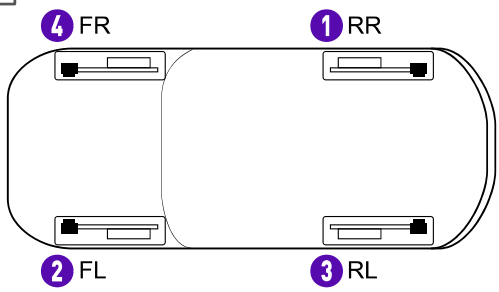

**CAUTION**

- Repeat the procedures above until the fluid comes out of the transparent hose without air bubbles.
- Carry out the brake fluid bleeding while keeping filling with the brake fluid so that the reservoir tank does not run out of fluid.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

5

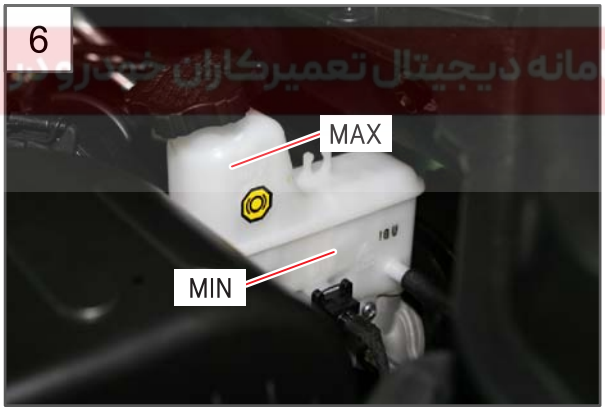



5. Carry out brake bleeding for the rest of the wheels in the order shown in the figure (1. rear right → 2. front left → 3. rear left → 4. front right) using the method described above.


**NOTE**

When replacing the master cylinder and master cylinder reservoir tank, carry out bleeding by removing the connection nut (A) for the brake pipe connected to the master cylinder and bleed the air at each caliper.

6




6. After finishing the service work, visually check the brake operation and oil leaks, and fill the brake reservoir tank with the brake fluid level between the MIN and MAX marks on the tank.

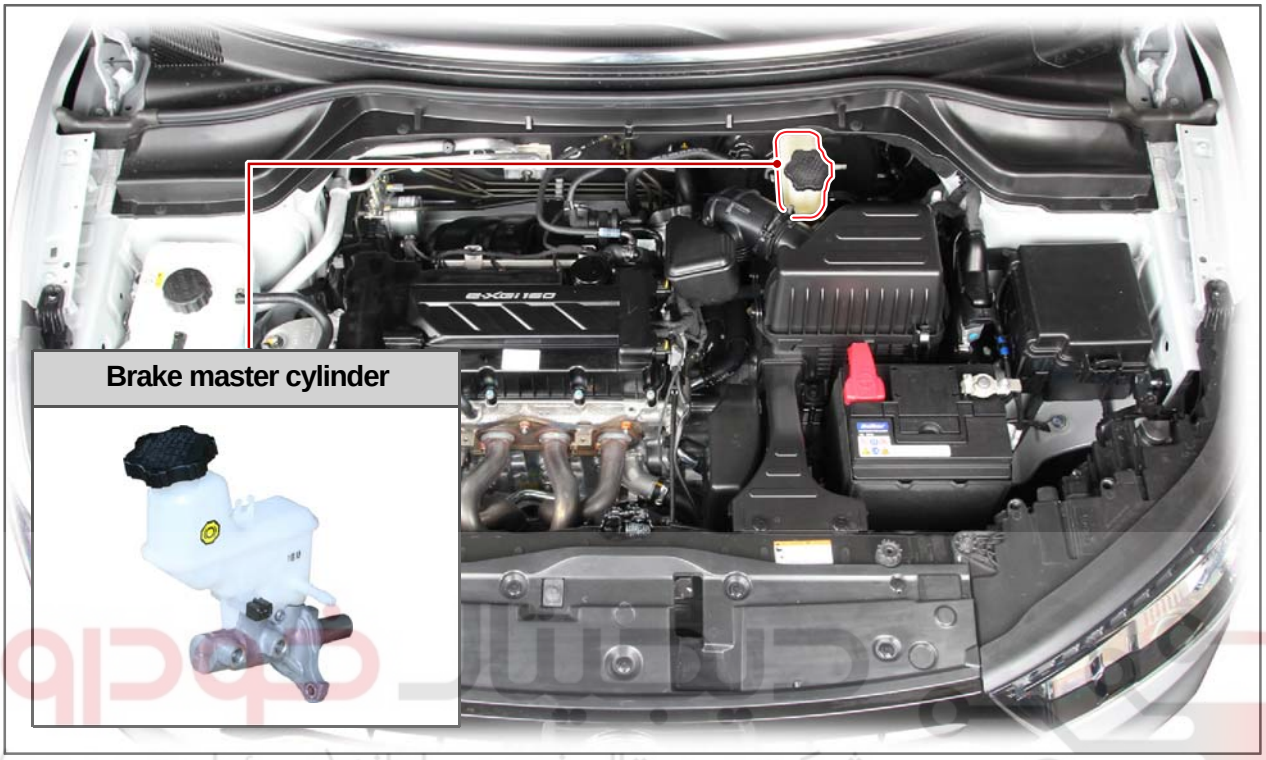


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4850-03

# BRAKE MASTER CYLINDER

Preceding work - Disconnect the negative battery cable.



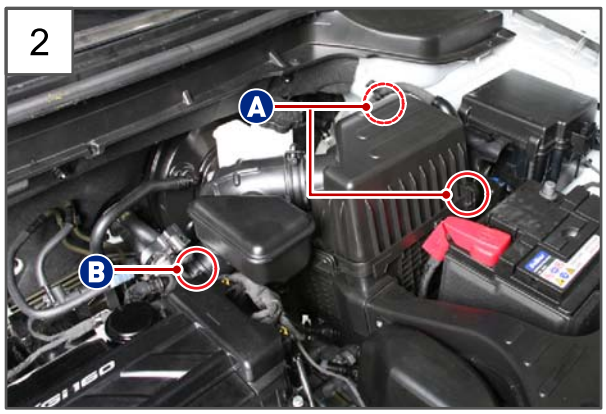




1. Collect the brake fluid from the brake fluid reservoir tank using an oil pump.

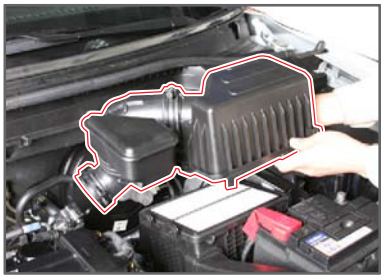
**CAUTION**

Make sure that the brake fluid does not come into contact with the vehicle body or skin.




2. Remove the retaining clips (A) on the air cleaner upper cover and the spring clamp (B, 10 mm) of the air cleaner hose.

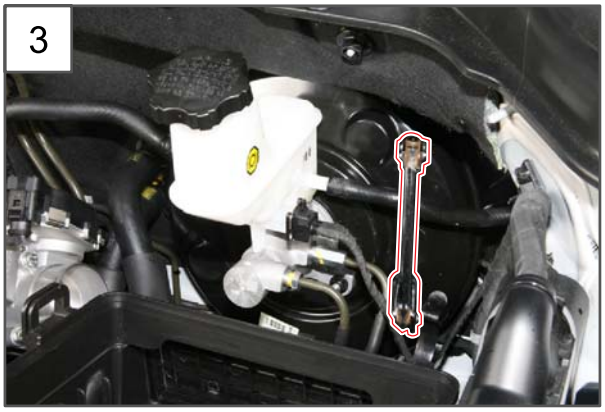
**Tightening torque (B) 6 to 7 Nm**





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3



4

5

6

3. For a vehicle with M/T, fit a special tool (hydraulic pressure shut-off clamp) to the hose connected from the brake fluid reservoir tank to the clutch master cylinder to block the flow of brake fluid.

4. Disconnect the brake fluid level switch connector.

5. Disconnect the 2 brake pipes (12 mm) to the master cylinder.

**Tightening torque** 18.7 to 22.6 Nm

**CAUTION**

Make sure that the remaining brake fluid does not come into contact with the vehicle body or your skin.

6. Unscrew the 2 mounting nuts (12 mm) for the brake master cylinder.

**Tightening torque** 12.8 to 16.7 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

7

7. Remove the brake master cylinder.

8

8. Install in the reverse order of removal.

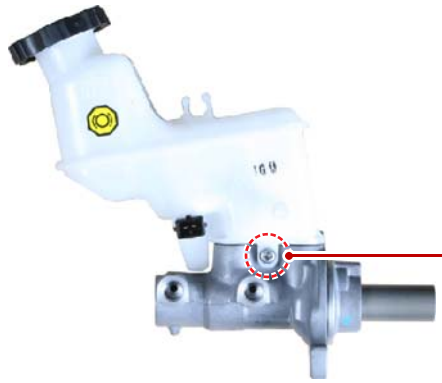




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

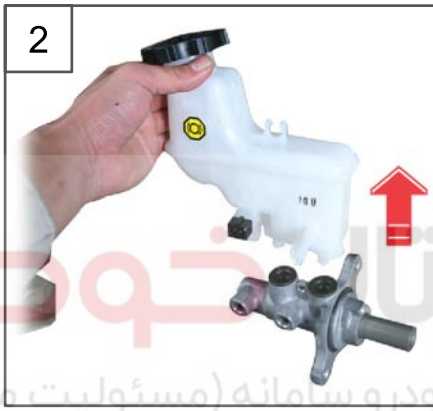
## ▶ Disassembling brake fluid reservoir tank

1



1. Unscrew the mounting screw for the brake fluid reservoir tank from the removed master cylinder.

2



2. Separate the brake fluid reservoir tank from the master cylinder.

3

3. Install in the reverse order of removal.

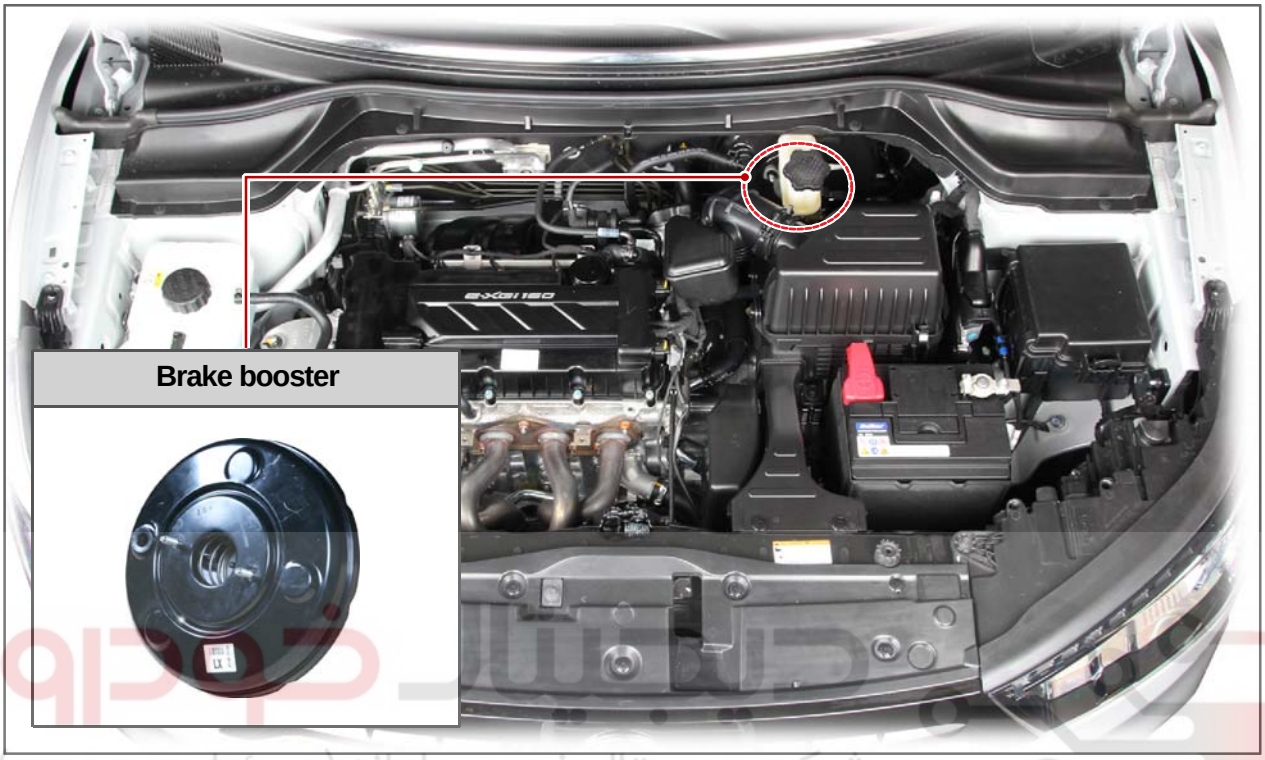


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4850-02

# BRAKE BOOSTER

Preceding work - Disconnect the negative battery cable.



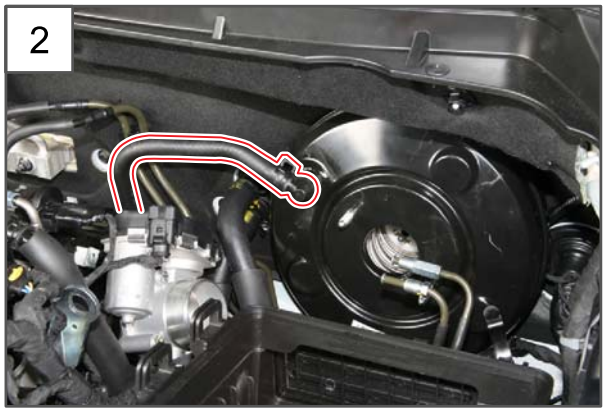




1. Remove the brake master cylinder.

**NOTE**

Refer to "BRAKE MASTER CYLINDER" under "REMOVAL AND INSTALLATION" subsection of "BRAKE SYSTEM" section in "CHASSIS" chapter.

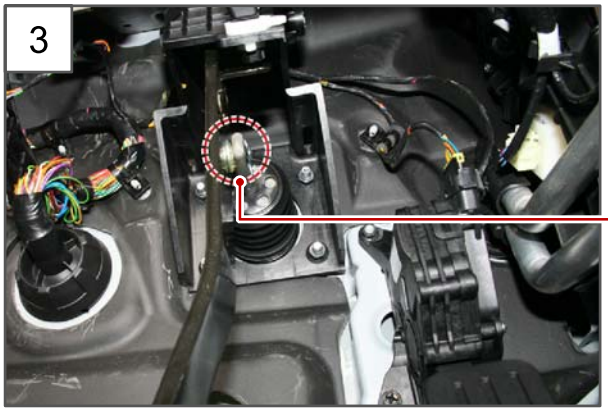



2. Disconnect the vacuum hose connected to the brake booster.

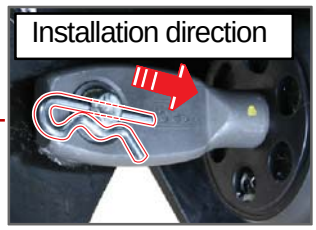


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3

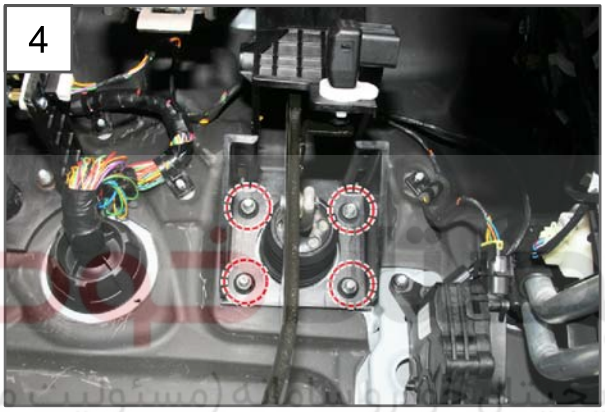


3. Remove the split pin which connects the brake pedal and booster push rod.




**CAUTION**
When installing the split pin, pay close attention to the installation direction.

4



4. Unscrew the 4 mounting nuts (12 mm) securing the booster on the brake pedal bracket.

**Tightening torque** 17.6 to 21.6 Nm

5

5. Remove the brake booster.

6

6. Install in the reverse order of removal.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

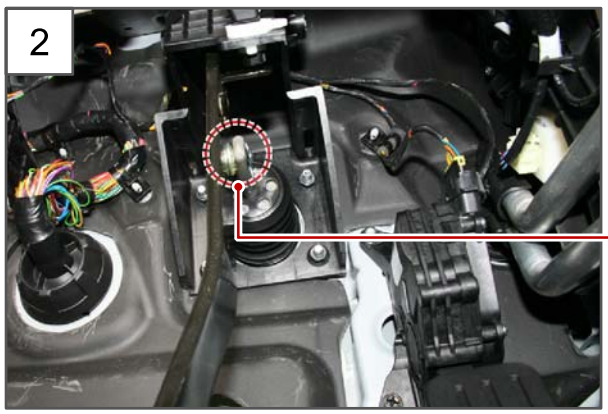
S.G.N. 4810-01

# BRAKE PEDAL

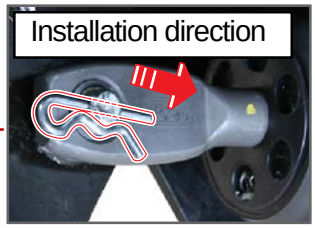
Preceding work - Disconnect the negative battery cable.



1. Disconnect the stop light switch connector.




2. Remove the split pin which connects the brake pedal and booster push rod.



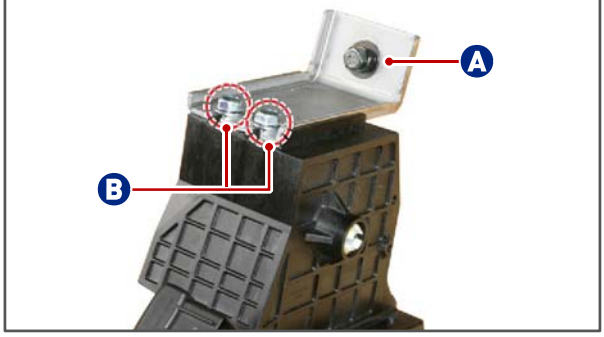

**CAUTION**

When installing the split pin, pay close attention to the installation direction.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3



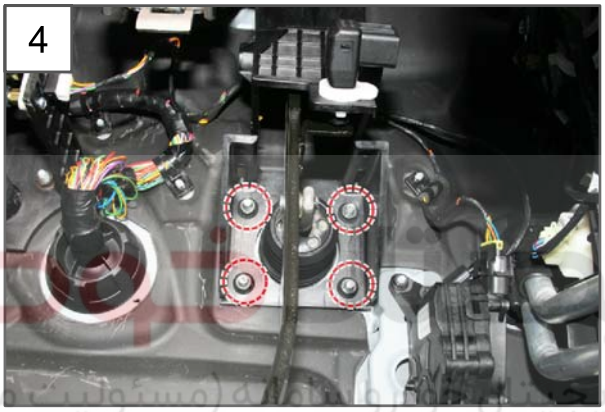

3. Unscrew the mounting bolt (12 mm) on the upper side of the brake pedal bracket.

**Tightening torque** 17.6 to 21.6 Nm

**CAUTION**

Do not remove the mounting bolts (B) on the lower side of the brake pedal bracket.

4



4. Unscrew the 4 mounting nuts (12 mm) securing the booster on the brake pedal bracket to remove the brake pedal assembly.

**Tightening torque** 17.6 to 21.6 Nm

5

5. Install in the reverse order of removal.





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

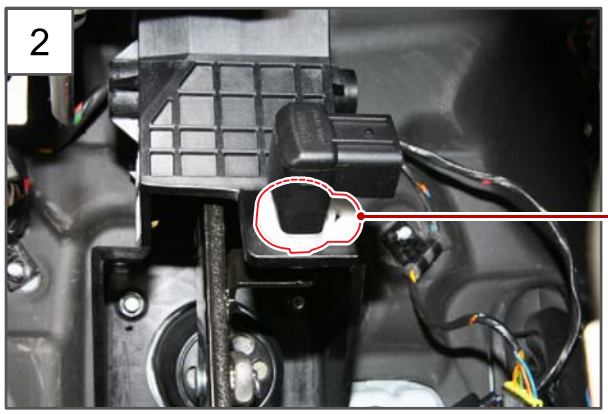
S.G.N. 4810-09

# STOP LAMP SWITCH

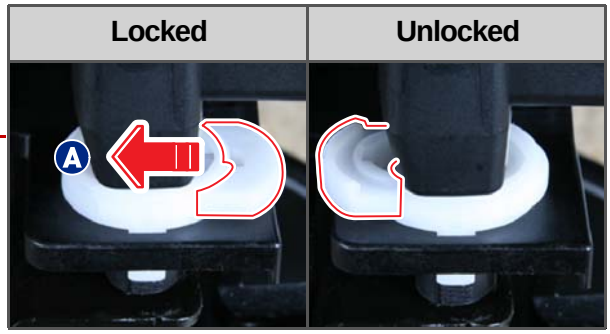
Preceding work - Disconnect the negative battery cable.



1. Disconnect the stop light switch connector.

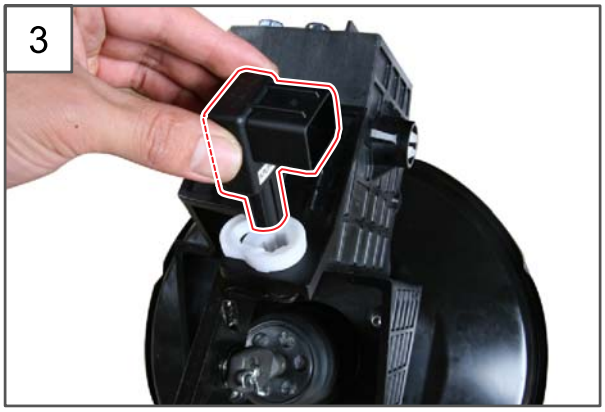



2. Push the stop light switch holder in the direction of the arrow (A) shown in the picture.





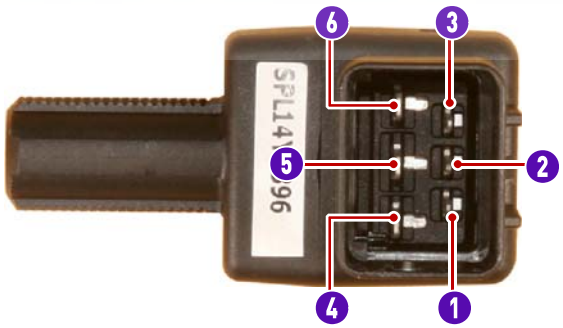

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |




3. Lift up and remove the stop light switch.

4. Install in the reverse order of removal.

**Stop light switch**




| Pin No. | Function |
|---|---|
| 1 | Cruise control |
| 2 | - |
| 3 | IGN 1 signal |
| 4 | Stop light and shift lock |
| 5 | Ground |
| 6 | Power supply B+ |

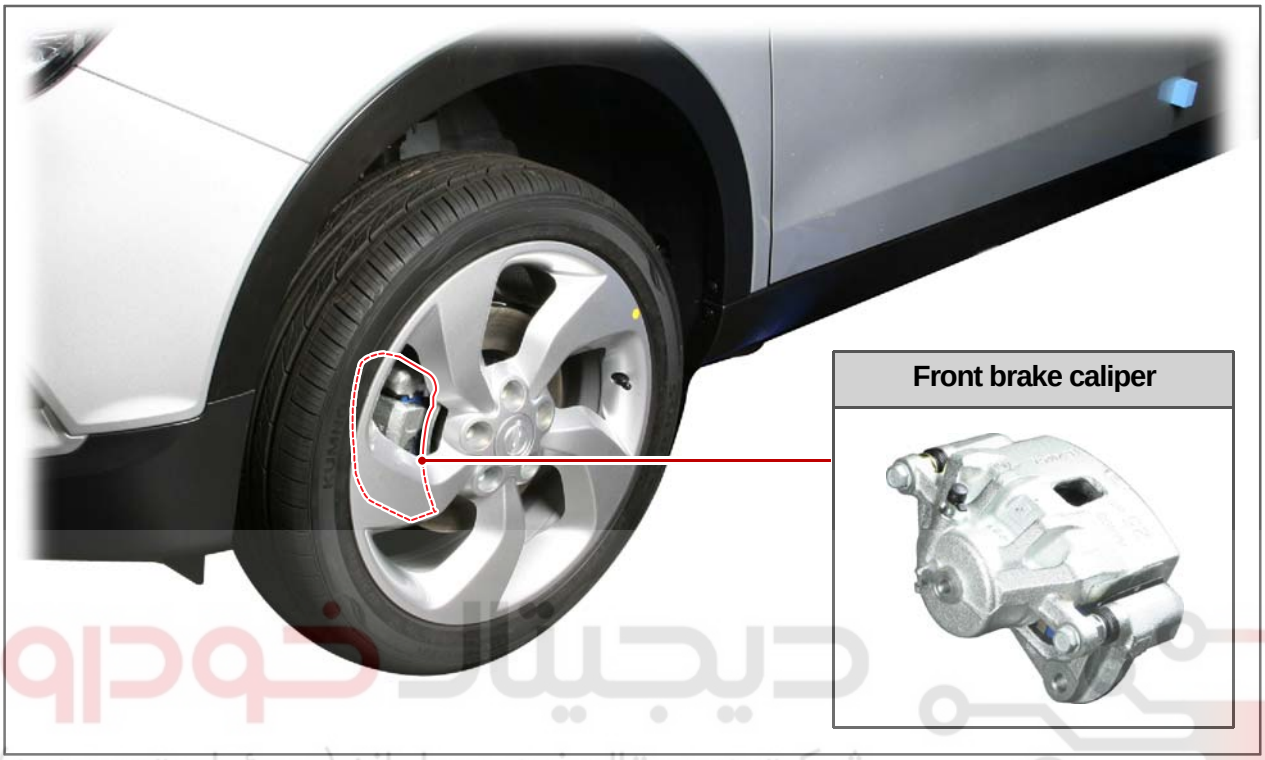


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4830-01

# FRONT BRAKE CALIPER

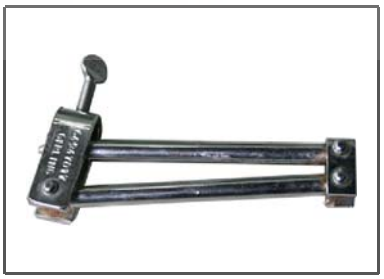
Preceding work - Remove the front wheel.



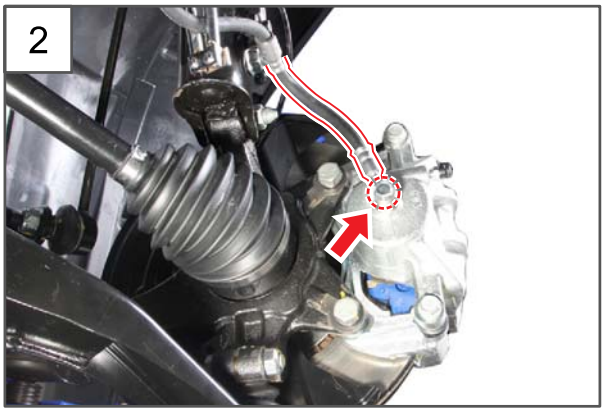



1

1. Fit the hydraulic pressure shut-off clamp to the brake hose so that no more brake fluid comes out.



2



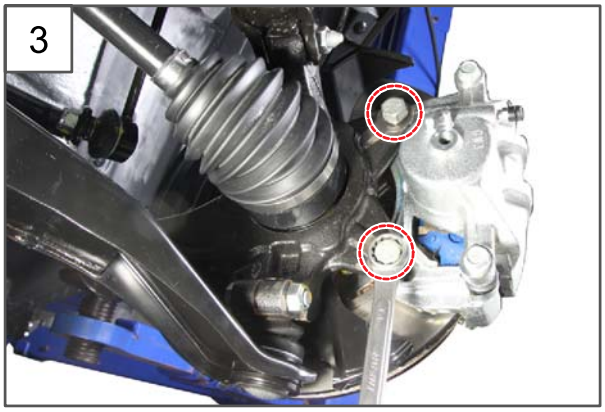
2. Unscrew the front brake hose mounting eye bolt (12 mm) to disconnect the brake hose from the caliper.

Tightening torque 19.6 to 29.4 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

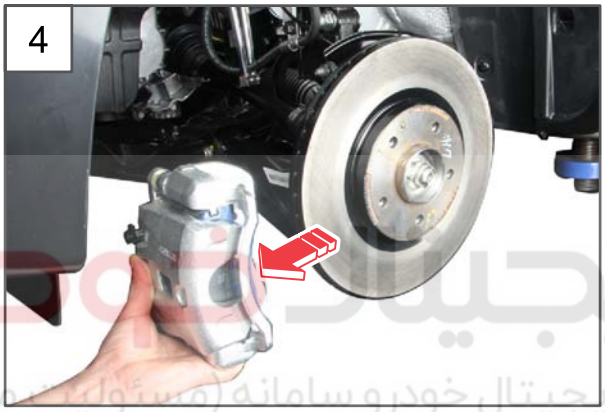
3



3. Unscrew the 2 upper mounting bolts (19 mm) on the brake caliper.

**Tightening torque** 83.3 to 102.9 Nm

4



4. Remove the front brake caliper assembly.

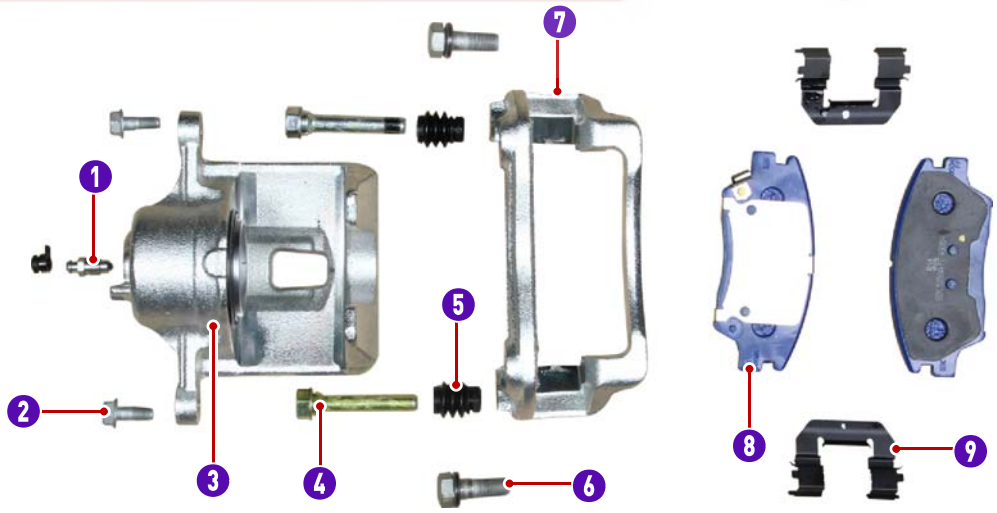
**CAUTION**

Always perform air bleeding after installing the brake caliper.

5. Install in the reverse order of removal.



**Front brake caliper**



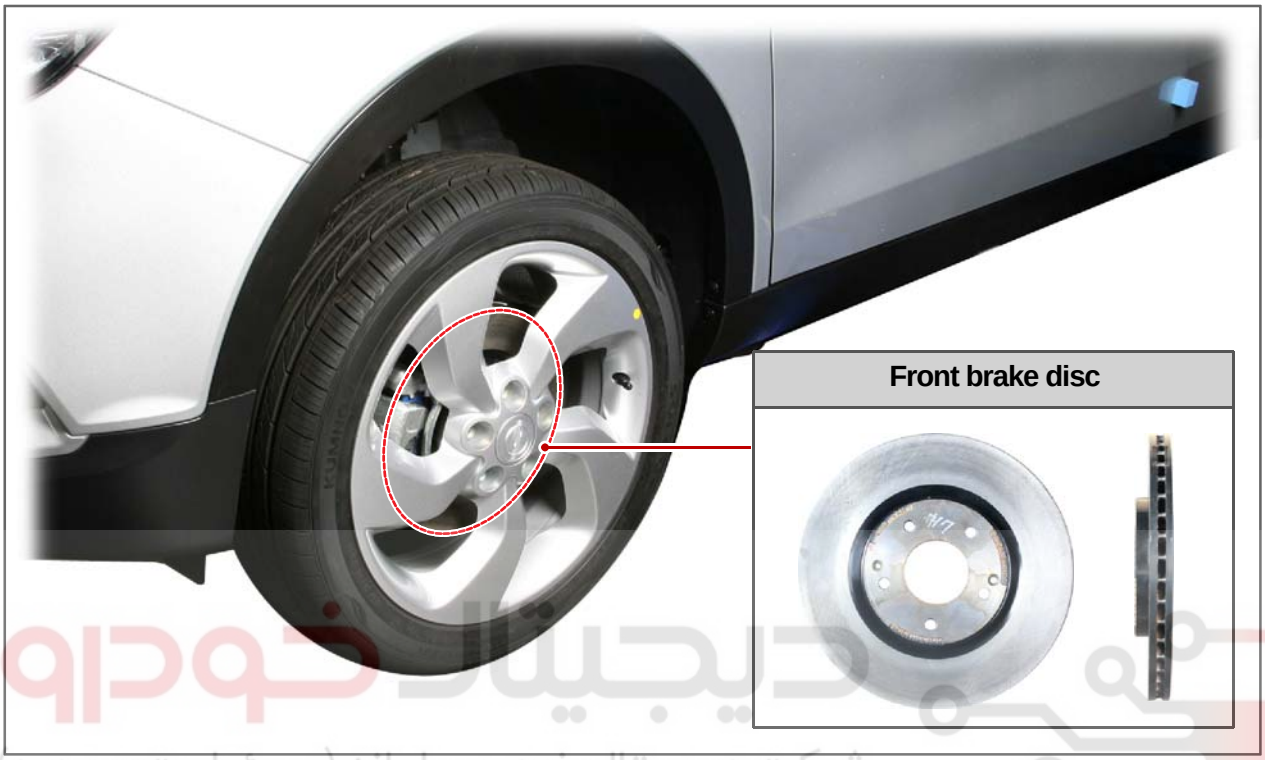

1. Eye bolt
2. Caliper assembly mounting bolt
3. Caliper housing
4. Carrier guide pin
5. Carrier guide pin boot
6. Carrier mounting bolt
7. Carrier
8. Brake pad
9. Caliper clip

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4115-07

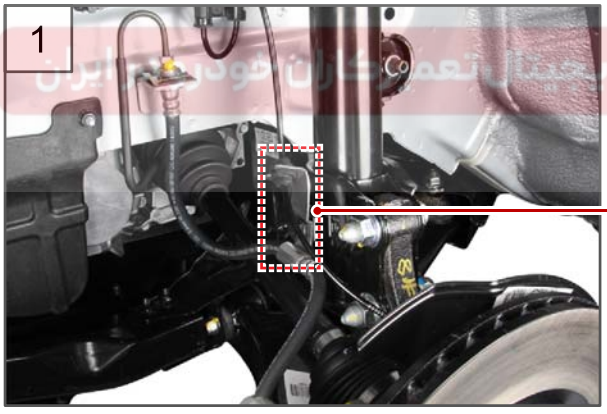
# FRONT BRAKE DISC

Preceding work - Remove the front wheel.

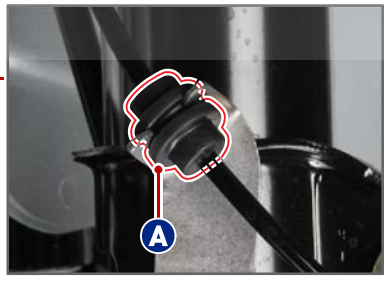




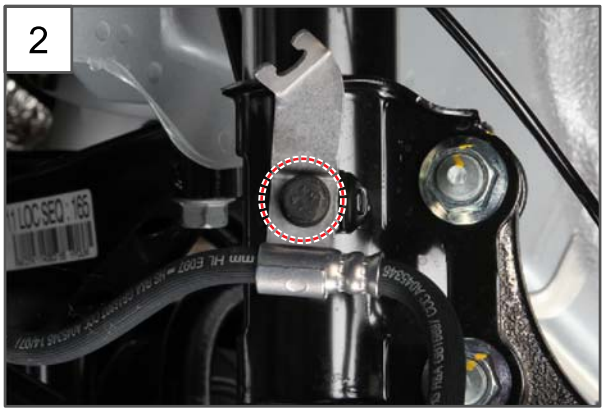

1



1. Free the mounting for the front wheel speed sensor (A).




2



2. Unscrew the mounting bolt (12 mm) for the brake hose bracket.

Tightening torque 9.8 to 12.7 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3

3. Unscrew the 2 mounting bolts (19 mm) on the front brake caliper.

**Tightening torque** 83.3 to 102.9 Nm

4

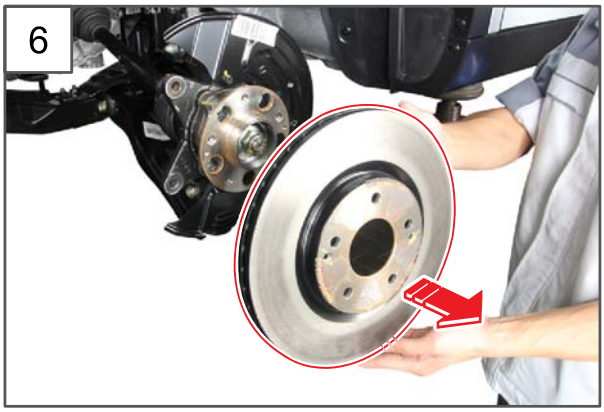
4. Detach the front caliper assembly and secure it to the vehicle body.

5

5. Unscrew the 2 front brake disc mounting screws.

**Tightening torque** 4.9 to 6.8 Nm

6



6. Remove the front brake disc.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

7

7. Install in the reverse order of removal.



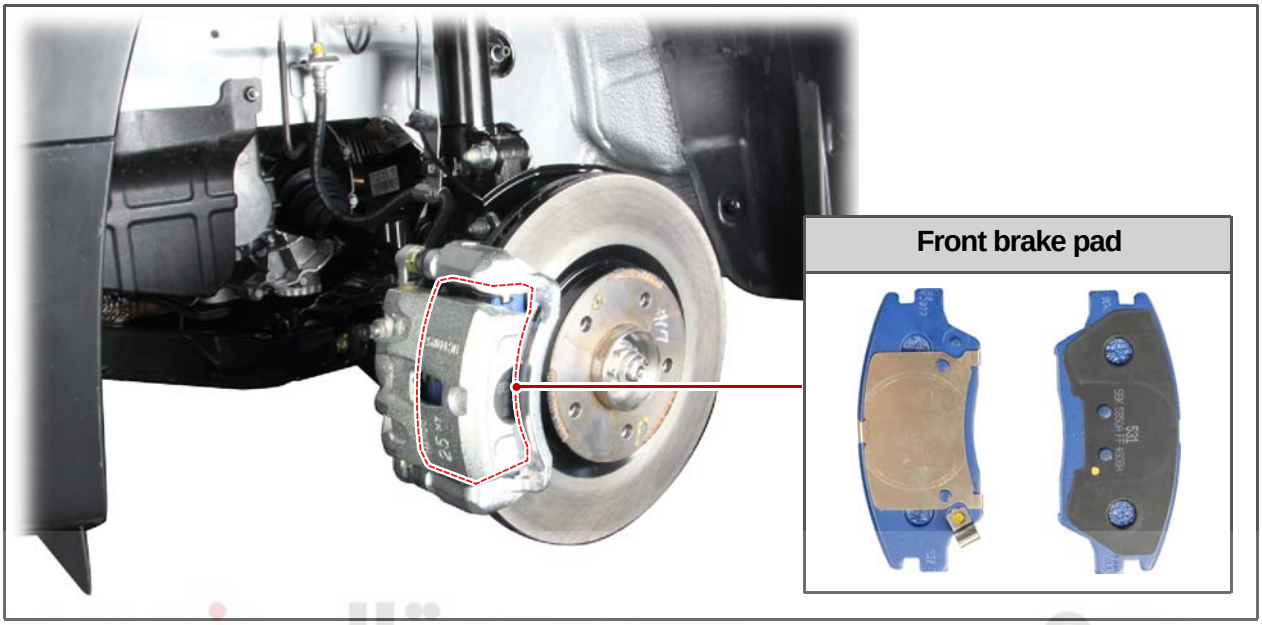


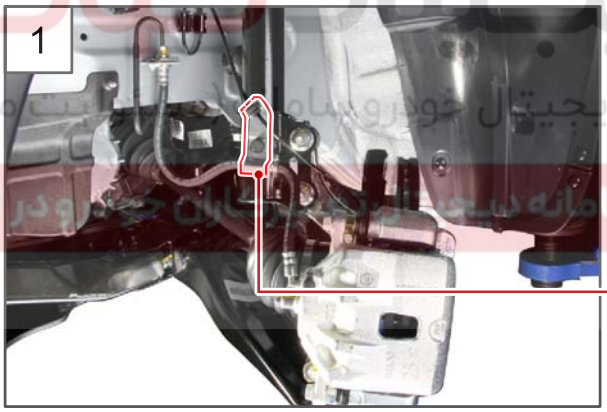
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4830-02

# REPLACING FRONT BRAKE PAD

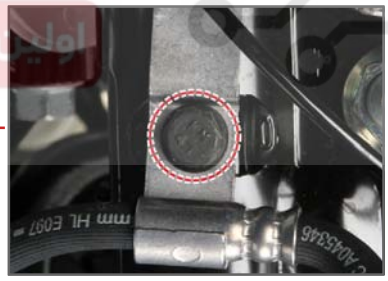
Preceding work - Remove the front wheel.




1. Unscrew the mounting bolt (12 mm) for the brake hose bracket.

Tightening torque 9.8 to 12.7 Nm

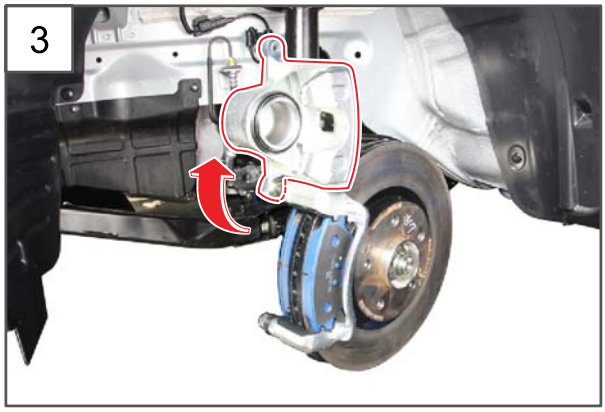



2. Unscrew the lower mounting bolt (14 mm) for the brake caliper cylinder.

Tightening torque 25.4 to 30.4 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

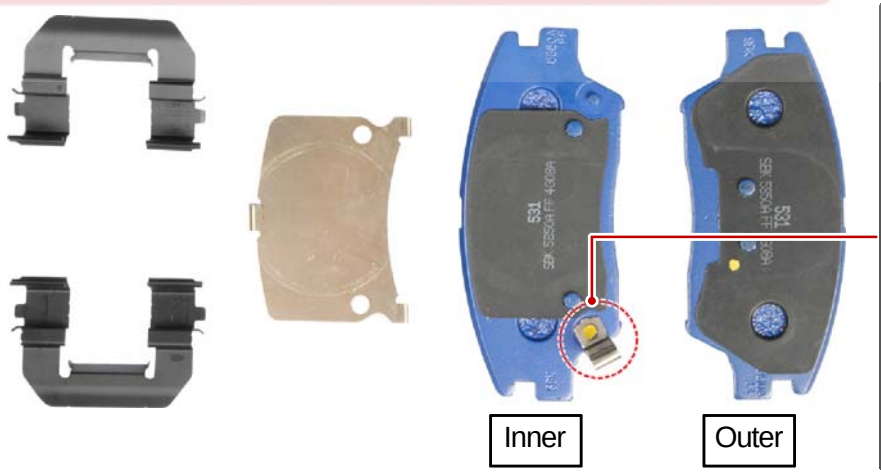



3. Lift up the brake caliper cylinder in the direction of the arrow shown in the picture.

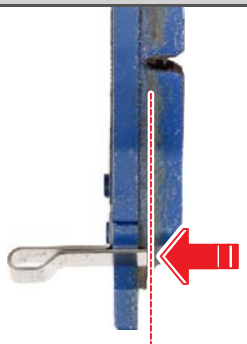

4. Remove the brake pad and replace it with a new one.

5. Install in the reverse order of removal.

**Front brake pad**



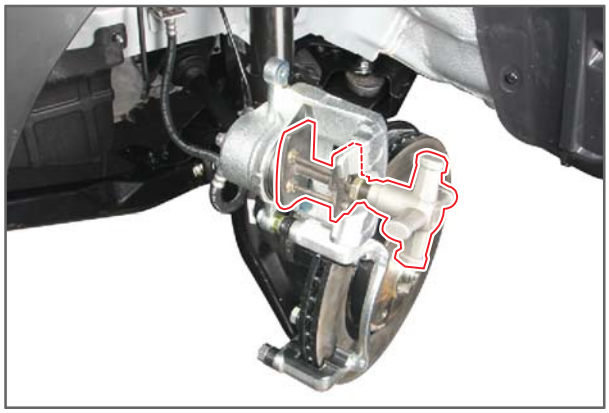

**Brake pad wear limit**





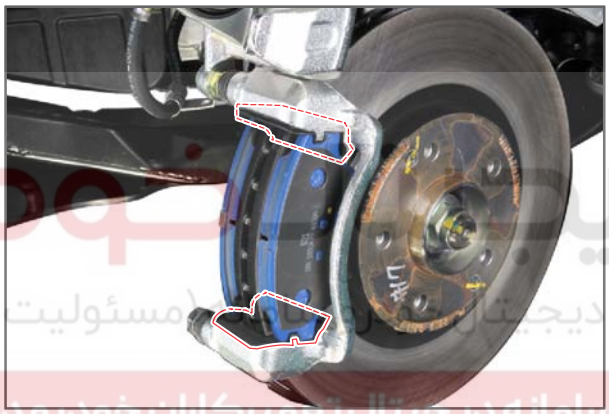
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## Cautions for installation of front brake pad

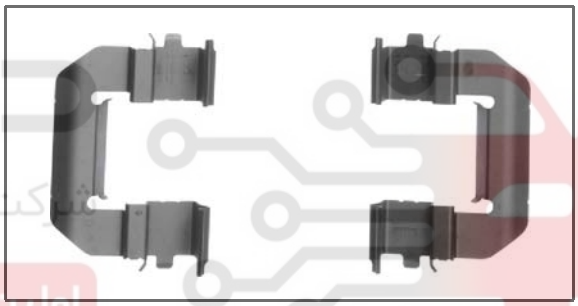


Install a special tool on the caliper cylinder to hold the piston.

**CAUTION**
Make sure that the piston rubber boot on the side of the piston is not damaged.



Caliper clip must be installed before installing the brake pad.



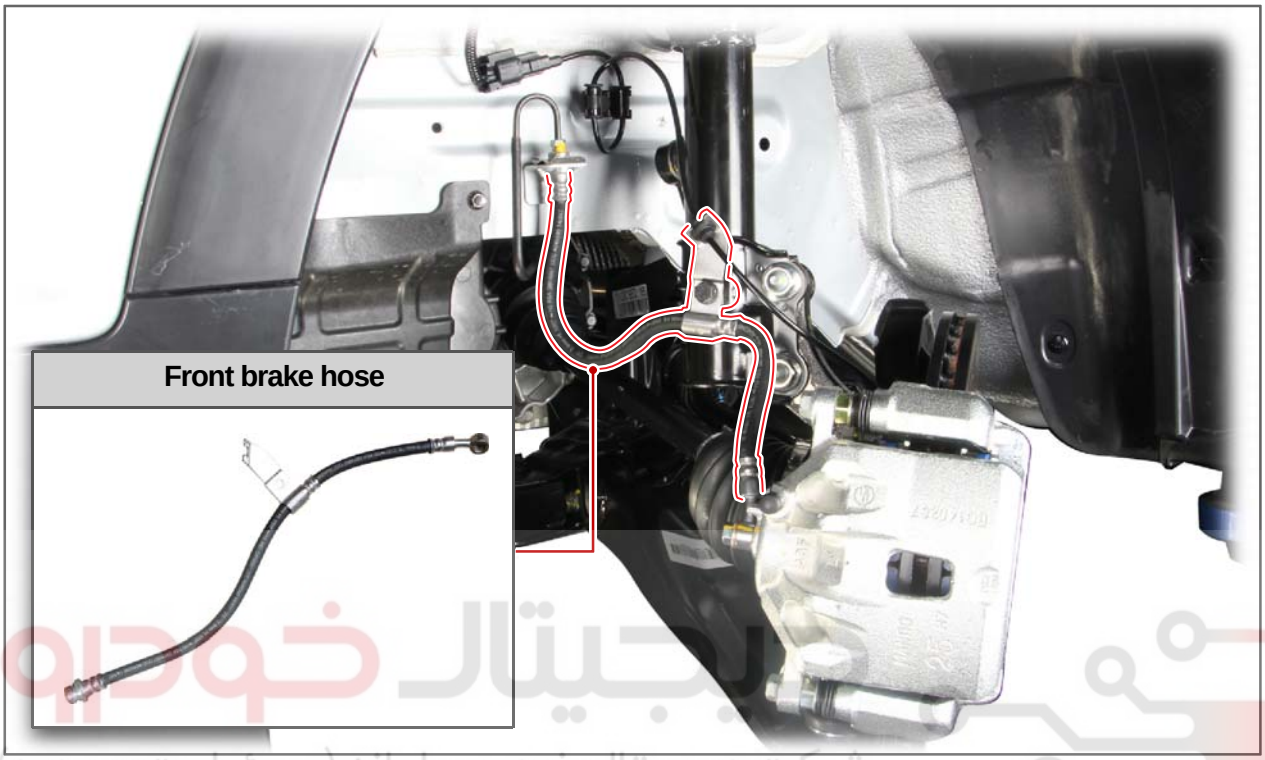
Fit the brake caliper cylinder, and tighten the mounting bolts to the specified torque.
Depress the brake pedal 2 or 3 times to check the operation of the brake system.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4825-09

# FRONT BRAKE HOSE

Preceding work - Remove the front wheel.

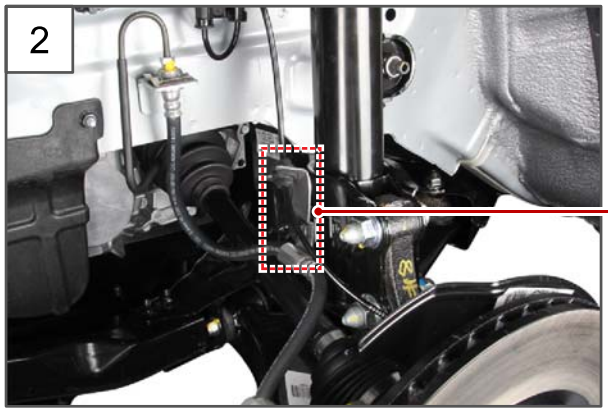




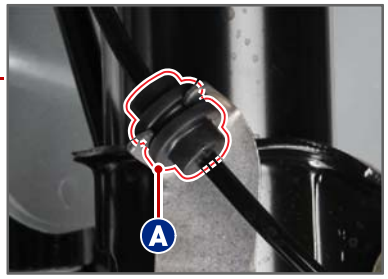

1

1. Open the cap of the brake fluid reservoir tank and drain the brake fluid completely using an oil pump.

2



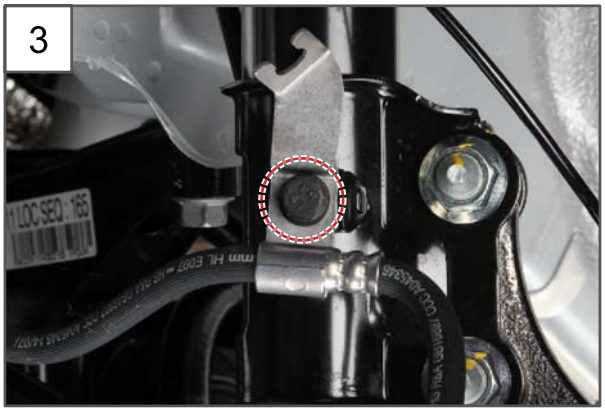
2. Free the mounting for the front wheel speed sensor (A).






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

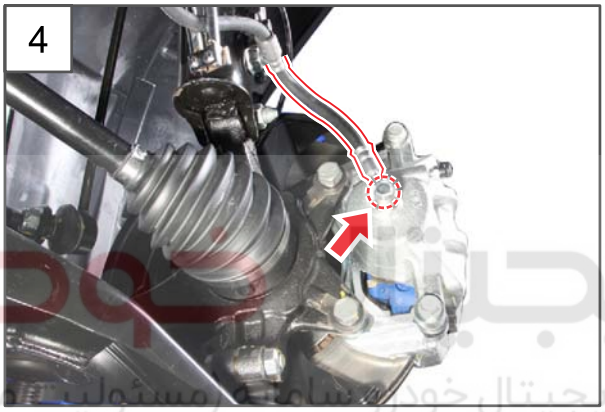
3



3. Unscrew the mounting bolt (12 mm) for the brake hose bracket.

**Tightening torque** 9.8 to 12.7 Nm

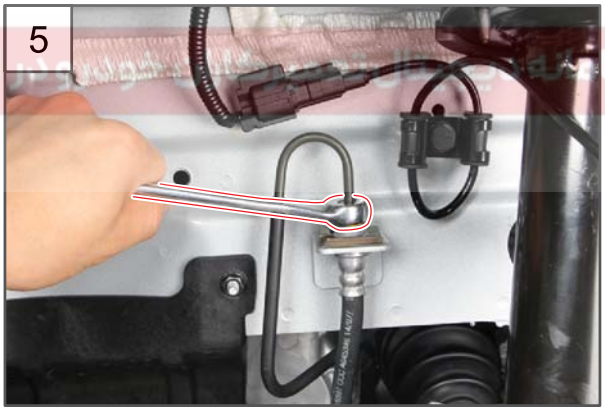
4



4. Unscrew the front brake hose mounting eye bolt (12 mm) to disconnect the brake hose from the caliper.

**Tightening torque** 19.6 to 29.4 Nm

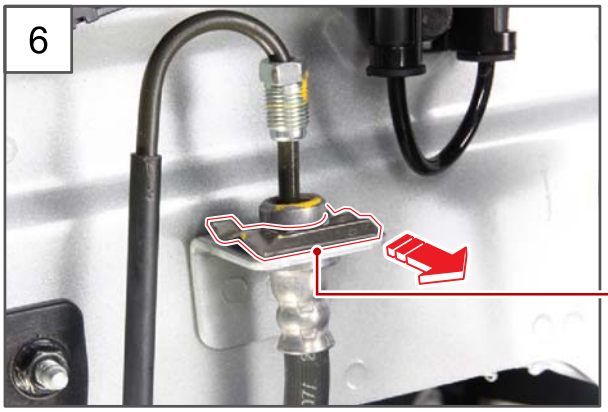
5



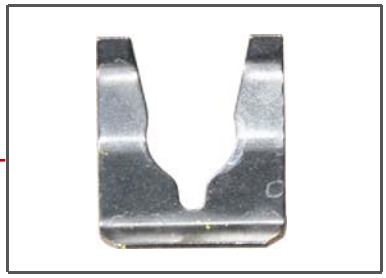
5. Unscrew the front brake hose mounting nut (12 mm).

**Tightening torque** 12.7 to 16.7 Nm

6

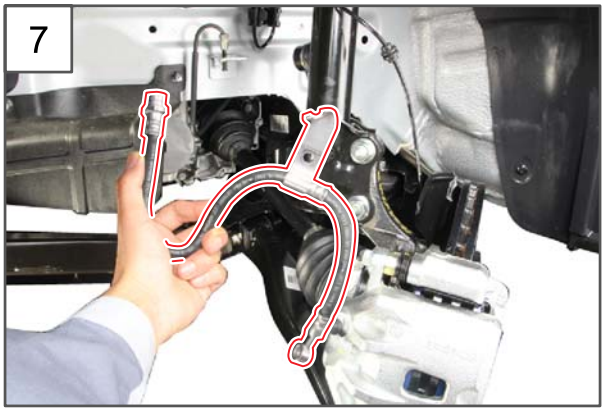


6. Remove the front brake hose holder clip by pulling it out in the direction of the arrow shown in the picture.



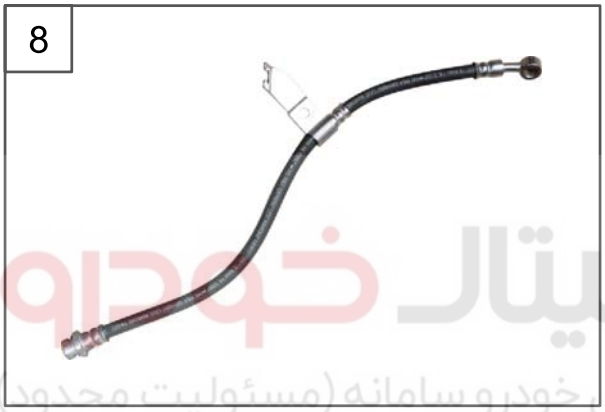
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

7



7. Remove the front brake hose.

8



8. Install in the reverse order of removal.

**CAUTION**

Always perform air bleeding after installing the front brake hose.





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4841-01

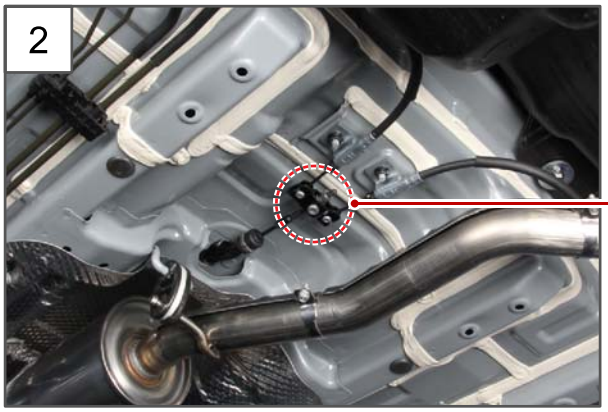
# REAR BRAKE CALIPER (2WD)

Preceding work - Remove the rear wheel.

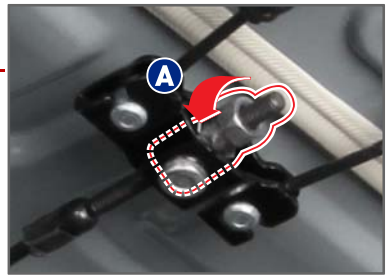

1

1. Prior to removing the equalizer nut, make the installation mark at the front, under the vehicle.

2



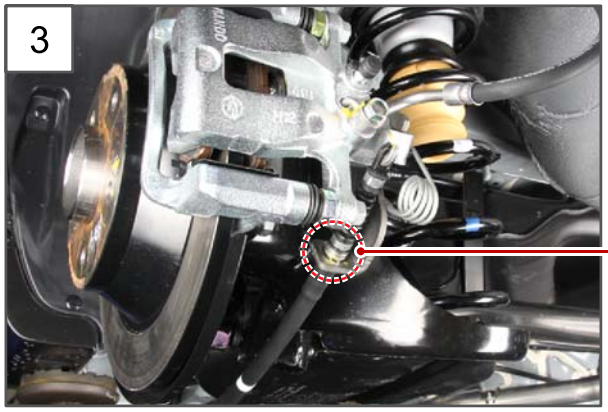
2. Loosen the equalizer nut (12 mm) completely by rotating it counterclockwise to loosen the parking brake cable.






| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

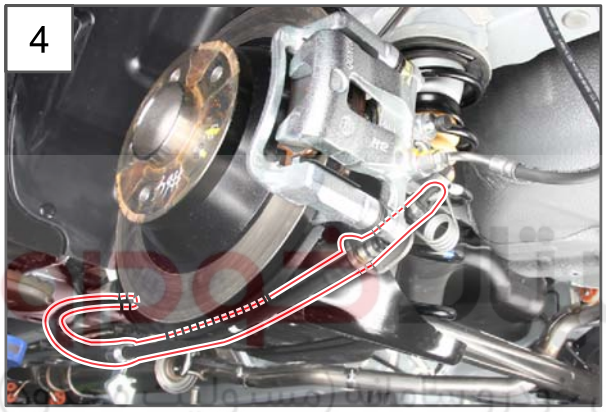
3



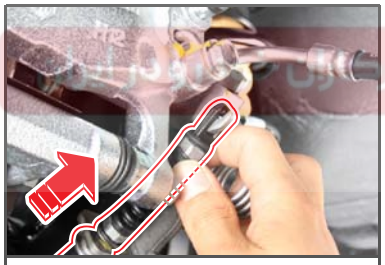
3. Remove the retaining pin for the rear parking brake cable.

| Retaining pin |
| --- |
|  |

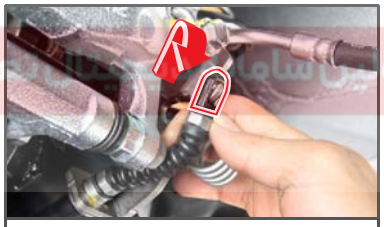
4



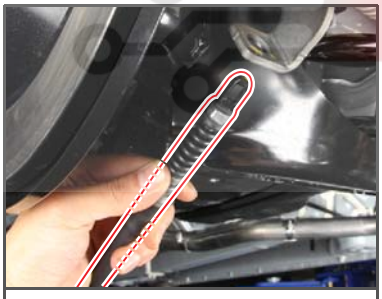
4. Remove the rear parking brake cable from the rear brake caliper.



Pull on the rear parking brake cable in the direction of the arrow.

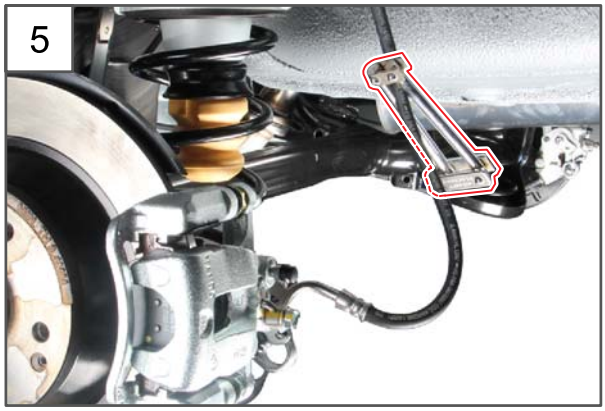


Free the end of rear parking brake cable by moving it in the direction of the arrow.



Remove the rear parking brake cable.

5

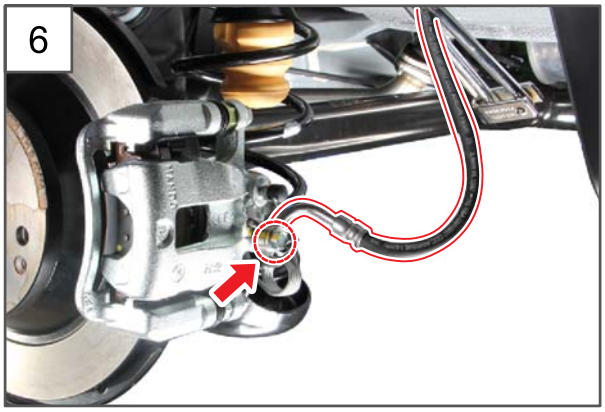


5. Fit the hydraulic pressure shut-off clamp to the brake hose so that no more brake fluid comes out.



| | |
| --- | --- |
| Modification basis | |
| Application basis | |
| Affected VIN | |

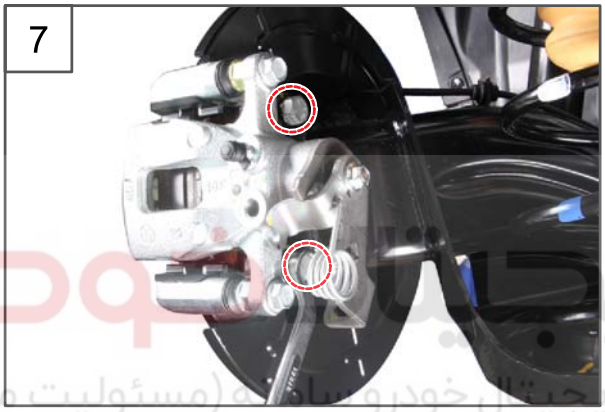
6



6. Unscrew the front brake hose mounting eye bolt (12 mm) to disconnect the brake hose from the caliper.

**Tightening torque** 19.6 to 29.4 Nm

7



7. Unscrew the 2 mounting bolts (19 mm) on the rear brake caliper.

**Tightening torque** 53.9 to 63.7 Nm

8

8. Remove the rear brake caliper assembly.

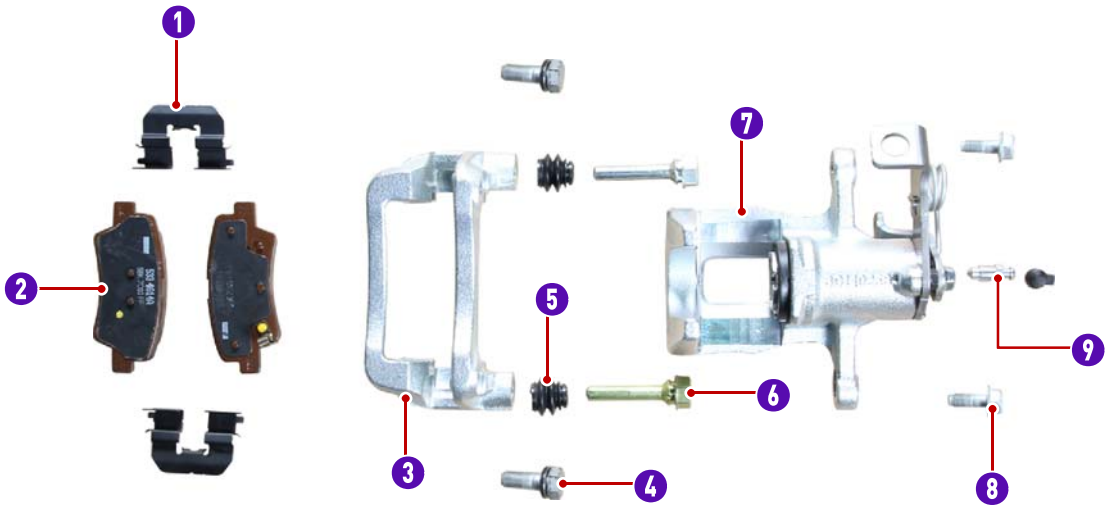
**CAUTION**

Always perform air bleeding after installing the brake caliper.

9. Install in the reverse order of removal.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## Rear brake caliper (2WD)




1. Caliper clip
2. Brake pad
3. Carrier
4. Carrier mounting bolt
5. Carrier guide pin boot
6. Carrier guide pin
7. Caliper housing
8. Caliper assembly mounting bolt
9. Eye bolt



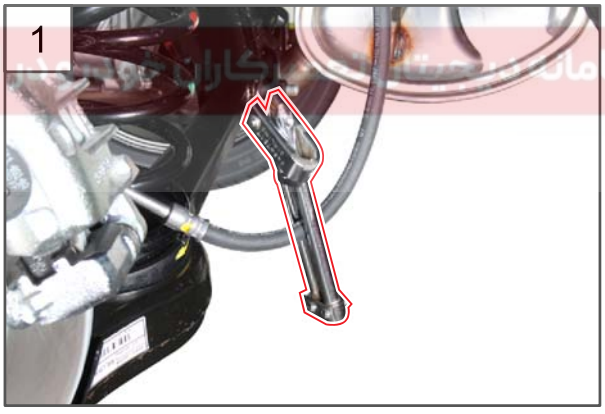


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

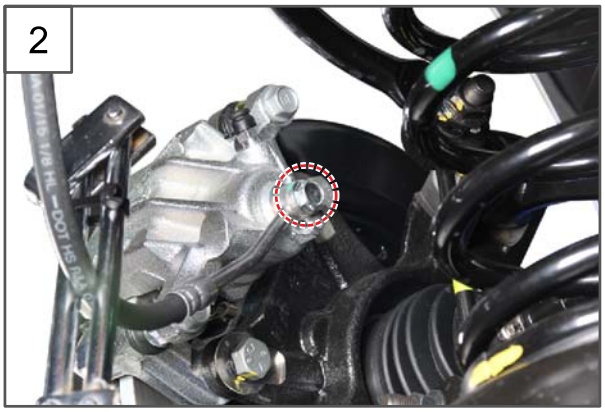
S.G.N. 4841-01

# REAR BRAKE CALIPER (AWD)

Preceding work - Remove the rear wheel.


1. Fit the hydraulic pressure shut-off clamp to the brake hose so that no more brake fluid comes out.




2. Unscrew the front brake hose mounting eye bolt (12 mm) to disconnect the brake hose from the caliper.

Tightening torque 19.6 ~ 29.4Nm

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3

3. Unscrew the 2 mounting bolts (17 mm) on the rear brake caliper.

**Tightening torque** 53.9 ~ 63.7Nm

4

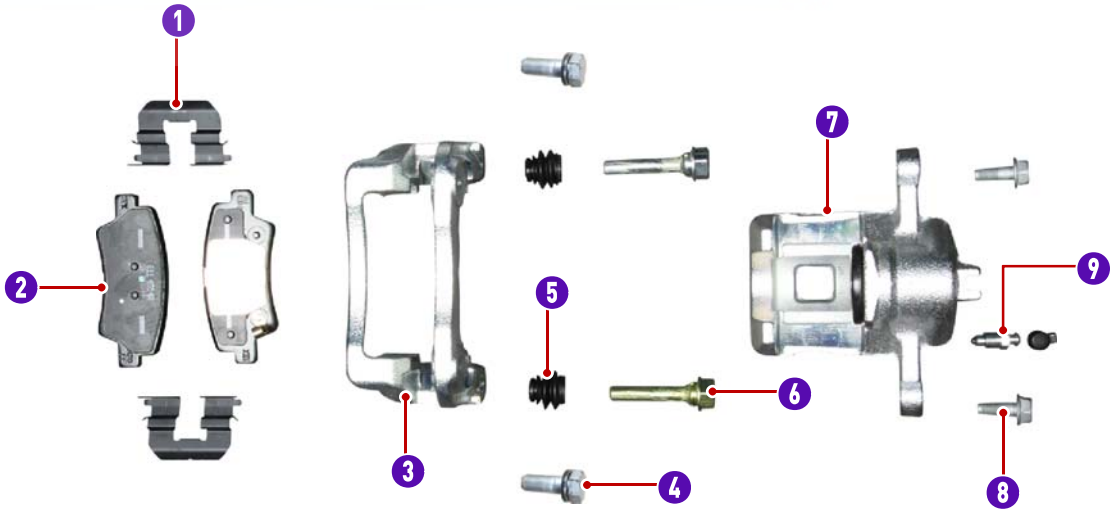
4. Remove the rear brake caliper assembly.

**CAUTION**

Always perform air bleeding after installing the brake caliper.

5. Install in the reverse order of removal.

**Rear brake caliper (AWD)**




1. Caliper clip
2. Brake pad
3. Carrier
4. Carrier mounting bolt
5. Carrier guide pin boot
6. Carrier guide pin
7. Caliper housing
8. Caliper assembly mounting bolt
9. Eye bolt

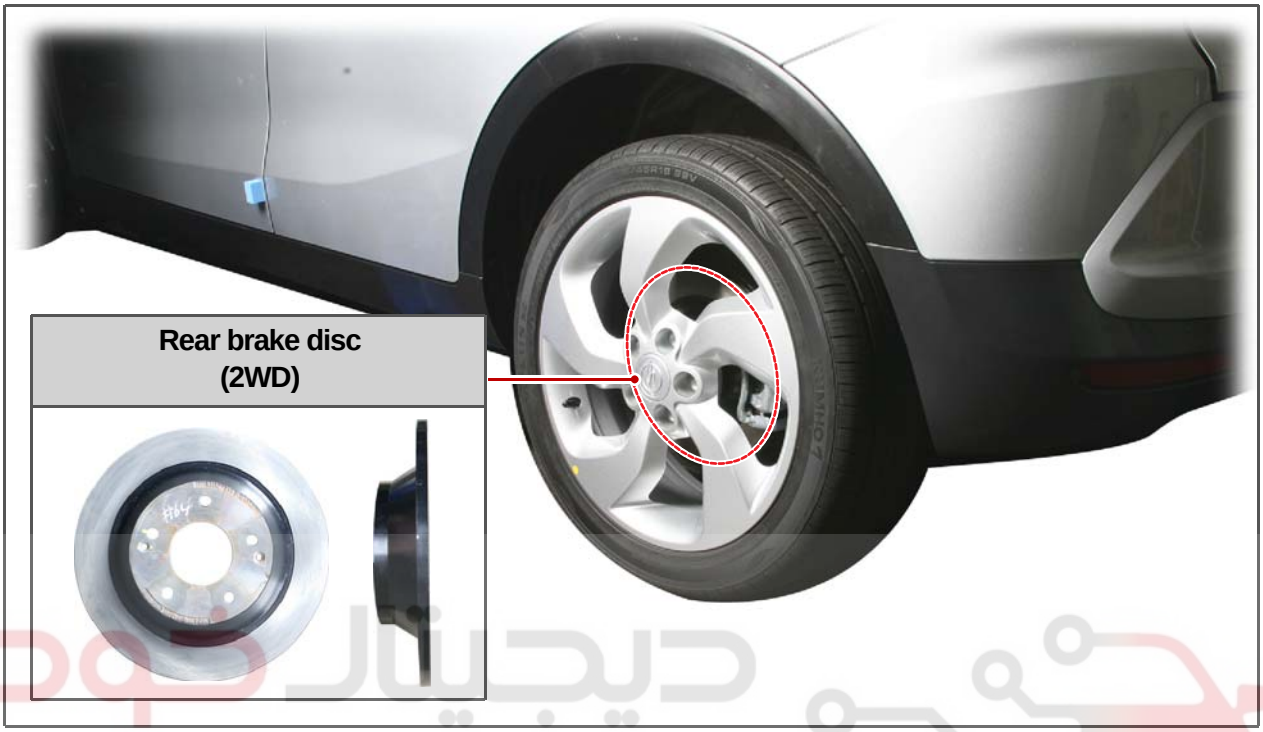


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4221-02

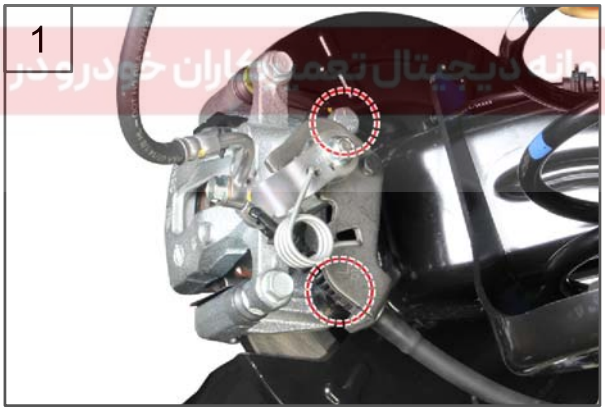
# REAR BRAKE DISC (2WD)

**Preceding work** - Remove the rear wheel.






1



1. Unscrew the 2 mounting bolts (19 mm) on the rear brake caliper.

**Tightening torque** 53.9 to 63.7 Nm

2

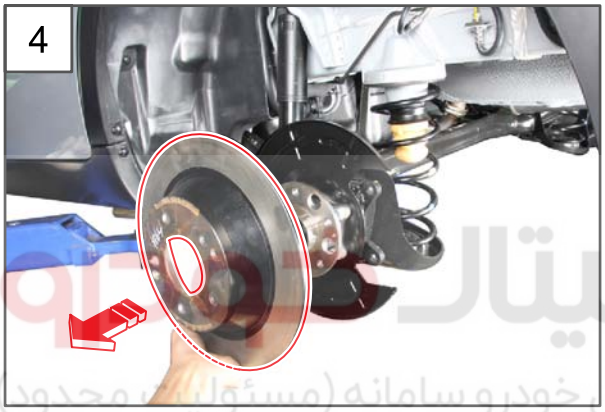
2. Detach the rear caliper assembly and secure it to the vehicle body.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3

3. Unscrew the front brake disc mounting screw.

4



4. Remove the rear brake disc.

5

5. Install in the reverse order of removal.



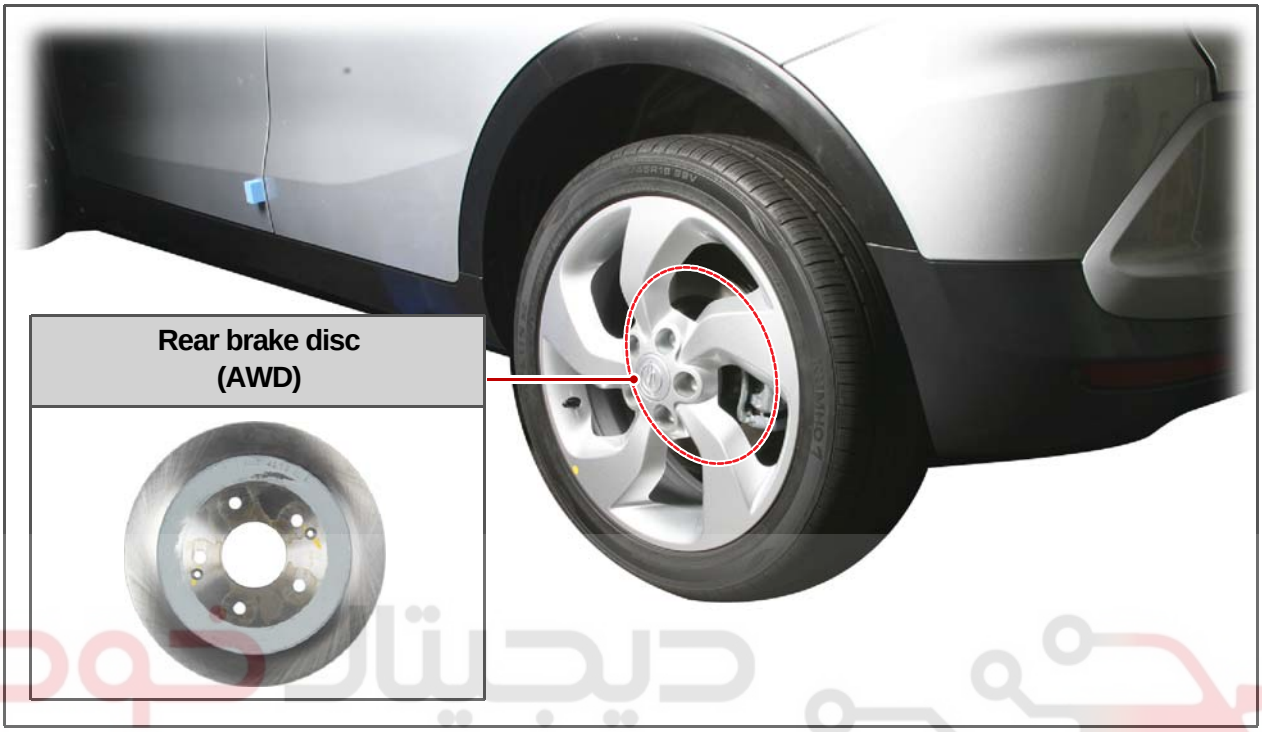


| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4221-02

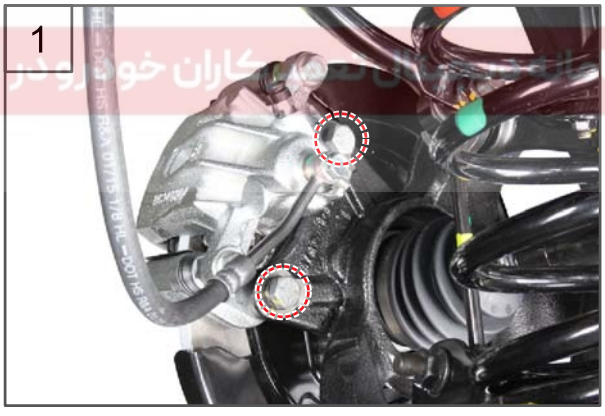
# REAR BRAKE DISC (AWD)

Preceding work - Remove the rear wheel.





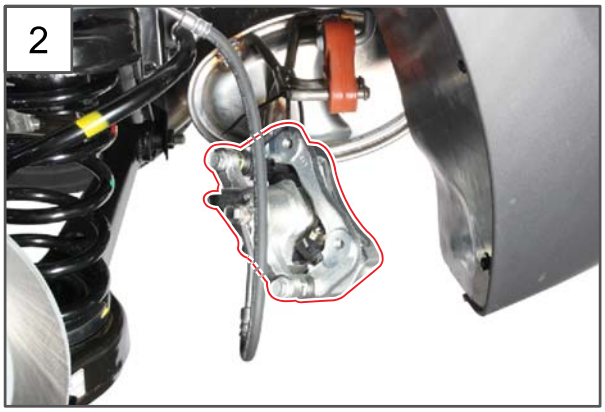

1



1. Unscrew the 2 mounting bolts (17 mm) on the rear brake caliper.

Tightening torque 53.9 ~ 63.7Nm

2



2. Detach the rear caliper assembly and secure it to the vehicle body.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3


3. Unscrew the 2 rear brake disc mounting screws.

4


4. Remove the rear brake disc.

5

5. Install in the reverse order of removal.



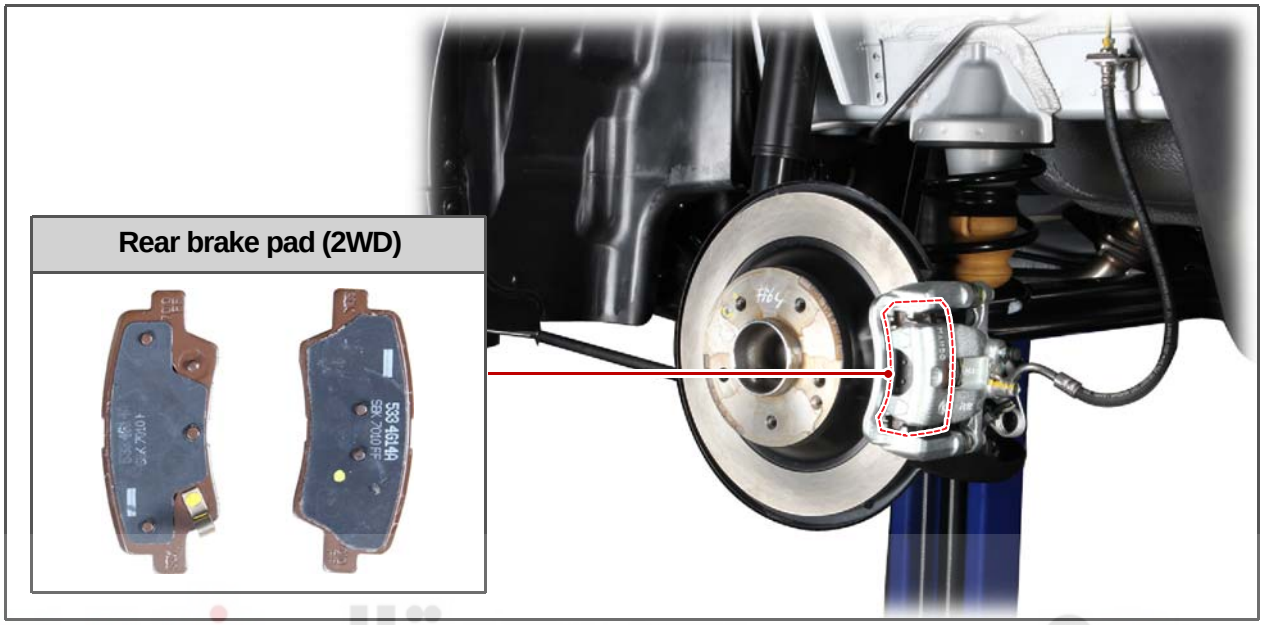


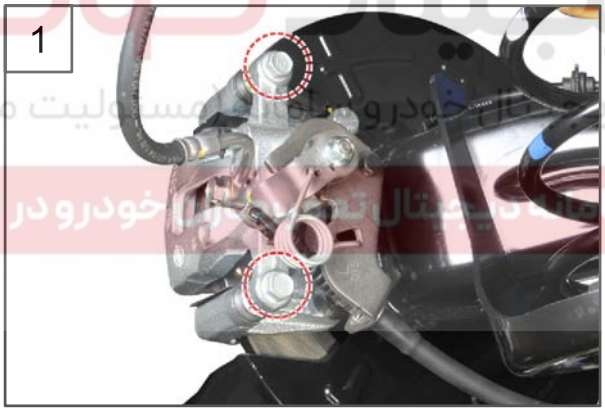
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4841-02

# REPLACING REAR BRAKE PAD (2WD)

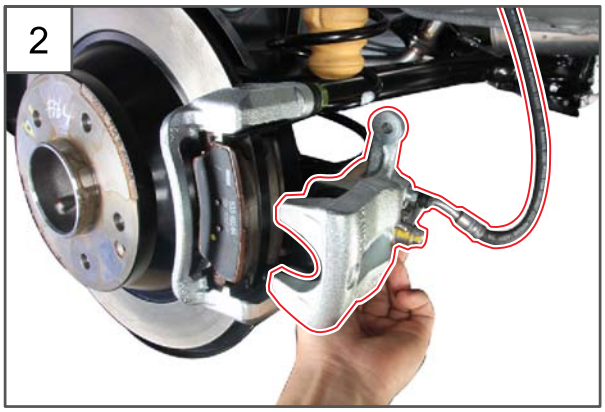
Preceding work - Remove the rear wheel.




1. Unscrew the 2 mounting bolts (14 mm) on the rear brake caliper cylinder.

Tightening torque 25.4 to 30.4 Nm

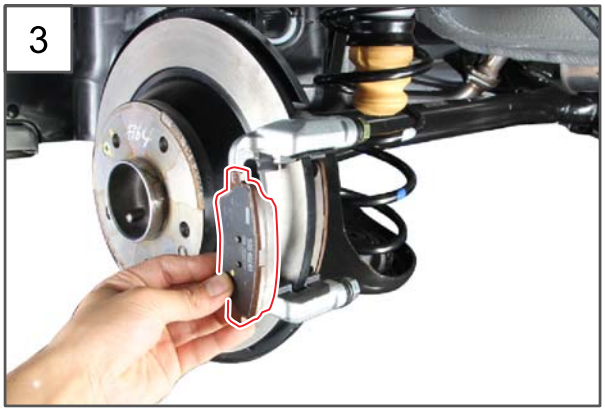



2. Detach the rear brake caliper and secure it to the vehicle body.



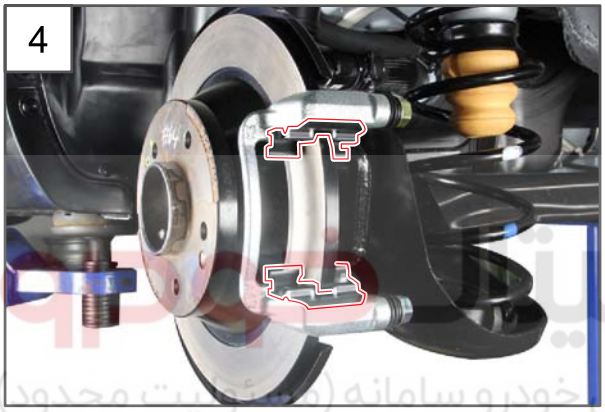
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3

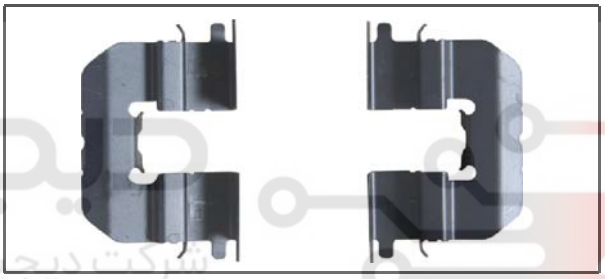


3. Remove the brake pad.

4

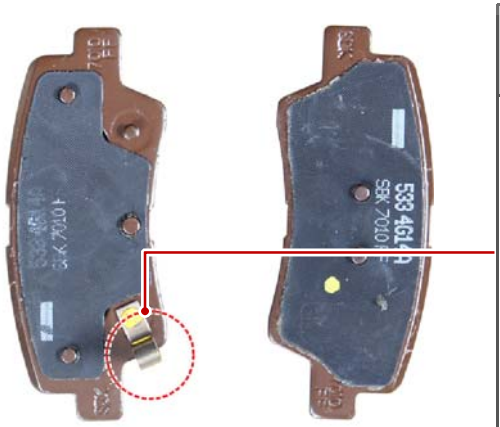


4. Remove the caliper clip.

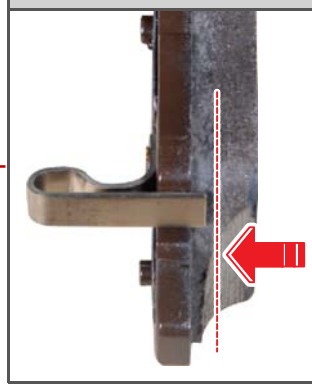


5. Install in the reverse order of removal.

**Rear brake pad**




**Brake pad wear limit**

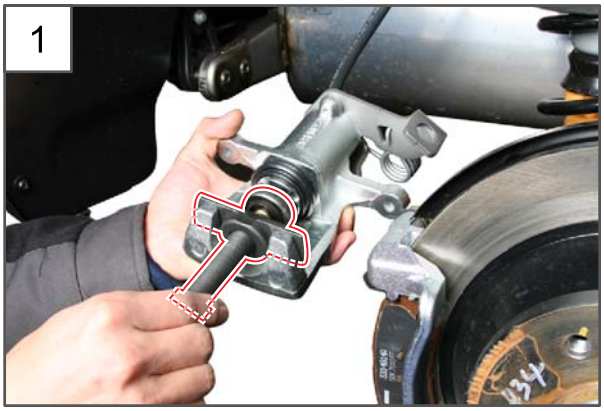




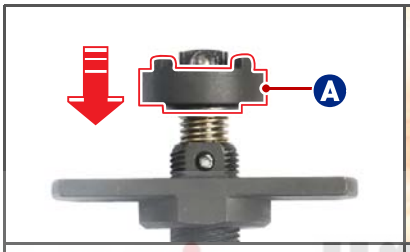
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## Cautions for installation (2WD)

1

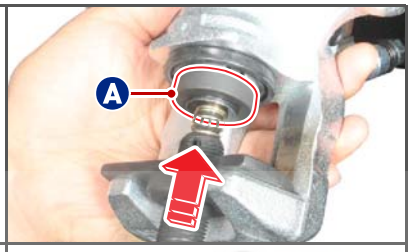


1. Install the rear brake piston installer as follows:



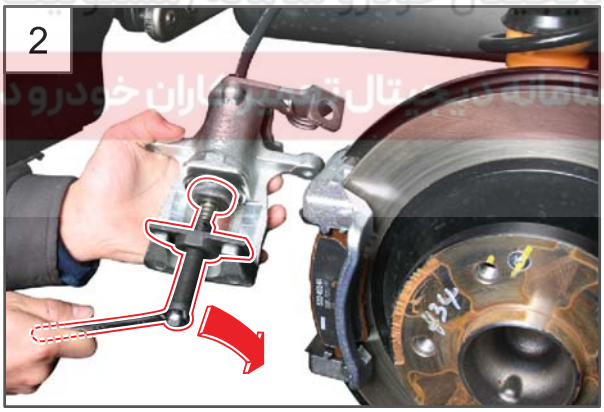

Press down on the special tool head (A), so that the head is locked by the locking ball.

Fit the special tool to the caliper.




Push in the special tool head (A) completely until it is seated on the piston groove.

2

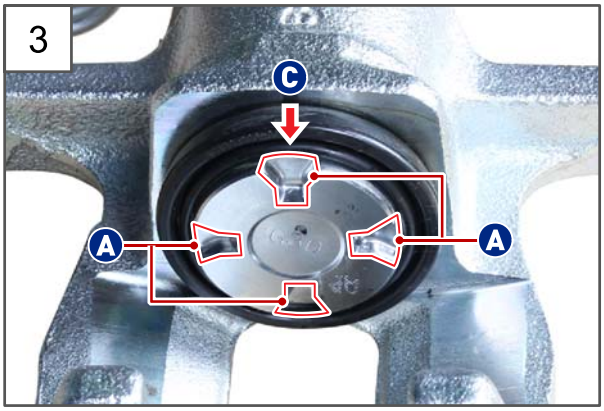


2. Screw in the piston completely with a special tool (14 mm) by rotating it clockwise.

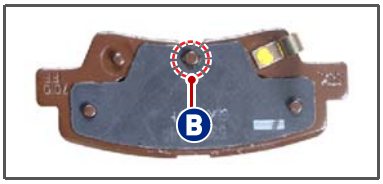
**CAUTION**

- Make sure that the piston rubber boot on the side of the piston is not damaged.
- Do not use a air tool.

3

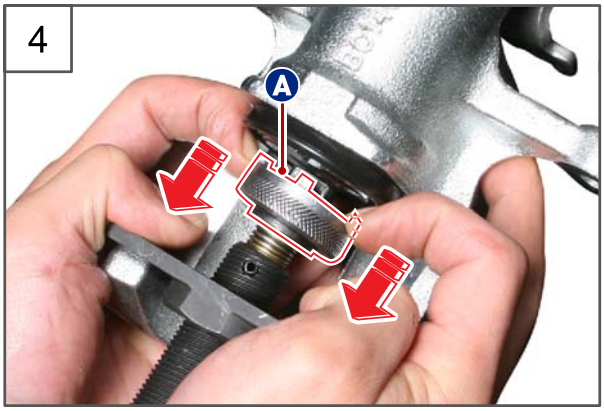



3. Position the piston at the center of the caliper (C) by turning the piston counterclockwise with a special tool, so that the one groove of the 4 grooves (A) of the piston fitted to the caliper cylinder aligns with the protrusion (B) on the inner surface of the brake pad.




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

4




4. Pull down on the part (A) of the special tool with even force applied to detach it from the rear brake piston.

5

5. Remove the rear brake piston installer.





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4841-02

# REPLACING REAR BRAKE PAD(AWD)




1

1. Unscrew the upper mounting bolt (14 mm) on the rear brake caliper cylinder.

**Tightening torque** 25.5 ~ 30.4Nm

2

2. Tilt back the rear brake caliper cylinder in the direction of the arrow shown in the picture.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |


3. Remove the rear brake pad.

4. Install in the reverse order of removal.

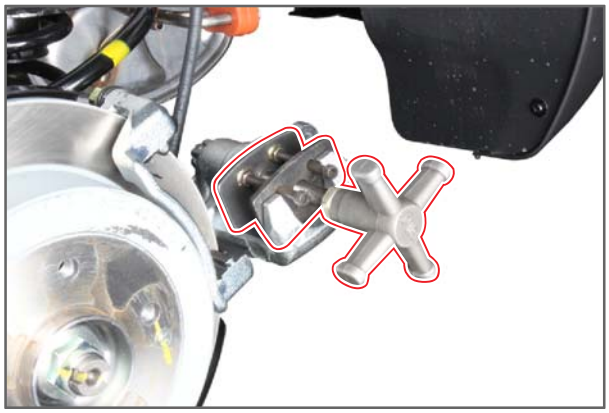
**Rear brake pad (AWD)**

**Wear limit of rear brake pad**



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

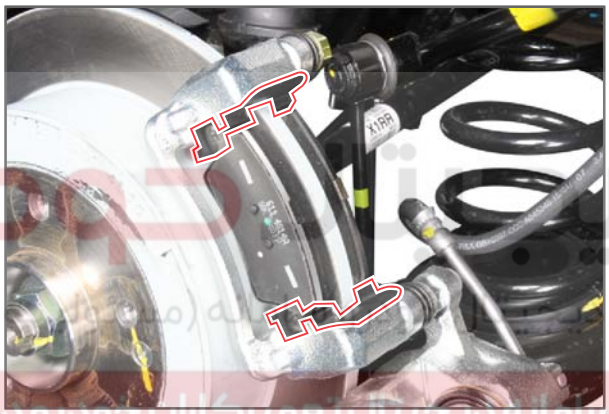
## Cautions for installation (AWD)



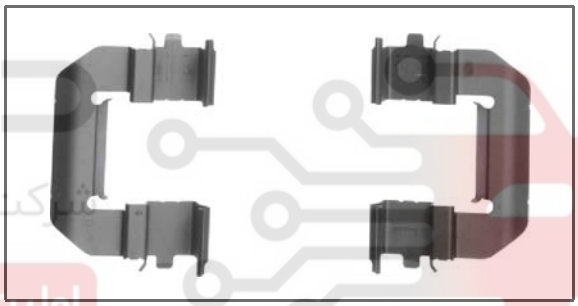
Install a special tool on the caliper cylinder to hold the piston.

**CAUTION**

Make sure that the piston rubber boot on the side of the piston is not damaged.



Caliper clip must be installed before installing the brake pad.



Fit the brake caliper cylinder, and tighten the mounting bolts to the specified torque.
Depress the brake pedal 2 or 3 times to check the operation of the brake system.

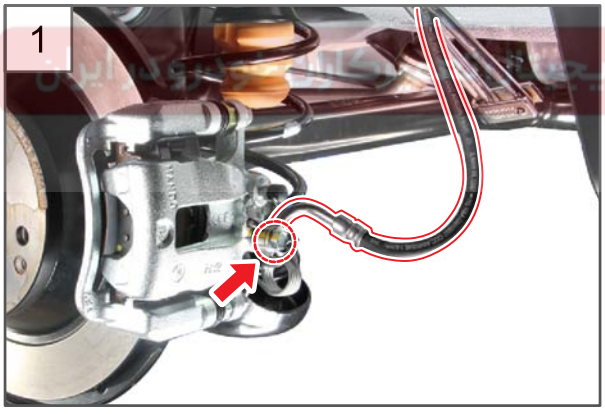
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4825-14

# REAR BRAKE HOSE

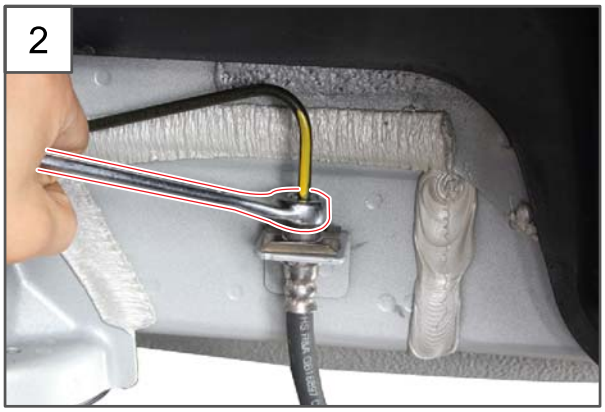
Preceding work - Disconnect the negative battery cable.




1. Unscrew the rear brake hose mounting eye bolt (12 mm) to disconnect the brake hose from the caliper.

Tightening torque 19.6 to 29.4 Nm



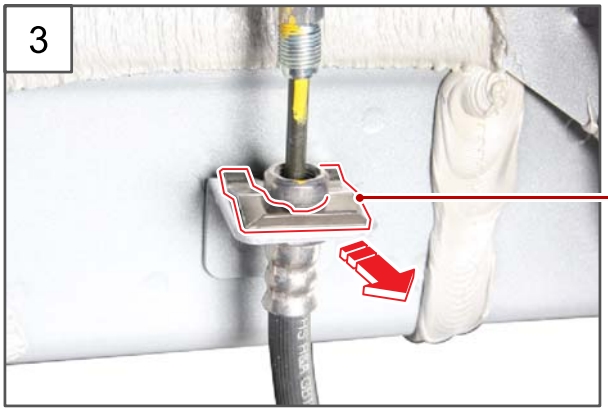

2. Unscrew the rear brake hose mounting nut (12 mm).

Tightening torque 12.7 to 16.7 Nm



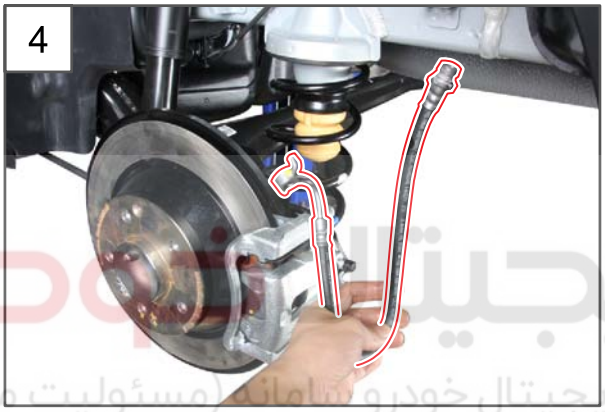
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3



3. Remove the rear brake hose holder clip by pulling it out in the direction of the arrow shown in the picture.

4



4. Remove the rear brake hose.

5

5. Install in the reverse order of removal.

**CAUTION**

Always perform air bleeding after installing the rear brake hose.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

S.G.N. 4910-01

# PARKING BRAKE ASSEMBLY

Preceding work
- Disconnect the negative battery cable.
- Remove the rear wheel.

**Parking brake lever**

**Center brake cable**

**Rear parking brake cable**

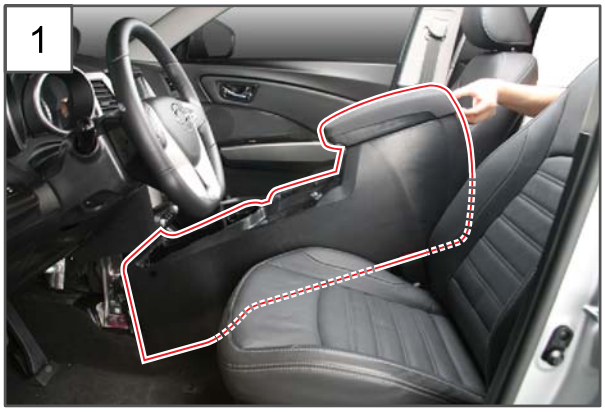




| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Parking brake lever

1



1. Remove the front console.

**NOTE**

Refer to "FRONT CONSOLE ASSEMBLY" under "REMOVAL AND INSTALLATION" subsection of "BODY INTERIOR" section in "BODY" chapter.

2

2. Disconnect the connector for the parking brake warning lamp switch.

3

3. Remove the parking brake lever split pin to free the parking brake cable.

4

4. Unscrew the 4 mounting nuts (10 mm) for the parking brake lever.

**Tightening torque** 9.8 ~ 12.7Nm

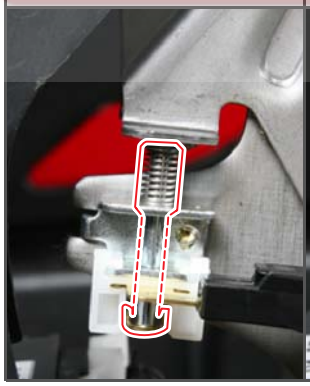
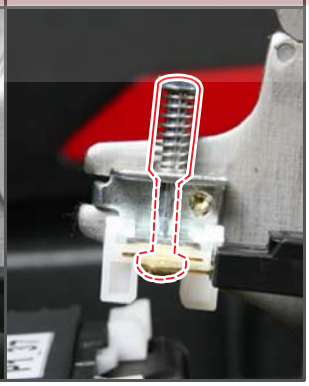
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

5

5. Remove the parking brake lever.

6

6. Install in the reverse order of removal.

| Parking brake switch | |
|---|---|
| Released | Applied |
|  |  |

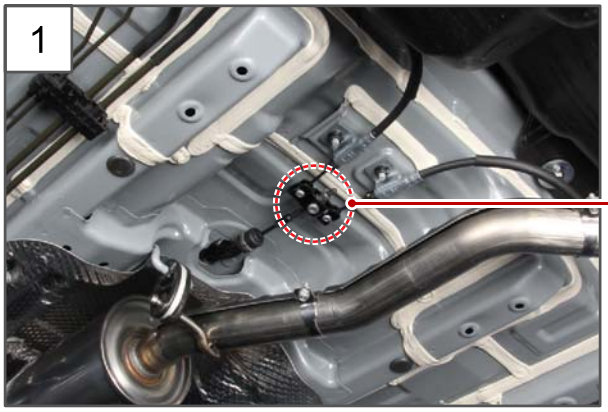




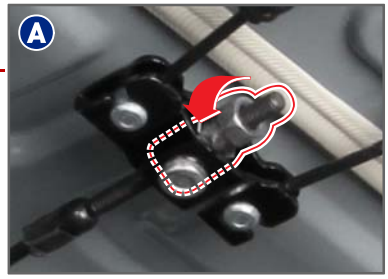
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Center brake cable

1



1. Loosen the equalizer nut (12 mm) completely by rotating it counterclockwise to separate the center parking brake cable.




2

2. Unscrew the 2 mounting nuts (10 mm) for the center parking brake cable from the inside of the vehicle.

**Tightening torque** 9.8 to 12.7 Nm

3

3. Remove the center parking brake cable.

4

4. Install in the reverse order of removal.

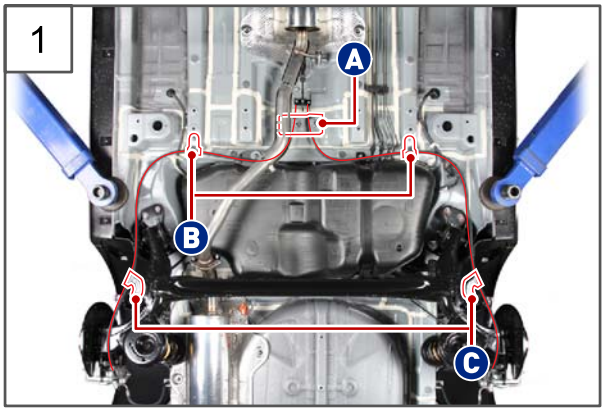
**NOTE**

After installing, perform the steps 6 and 7 stated under the "Checking parking brake".

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Rear parking brake cable(2WD)

1



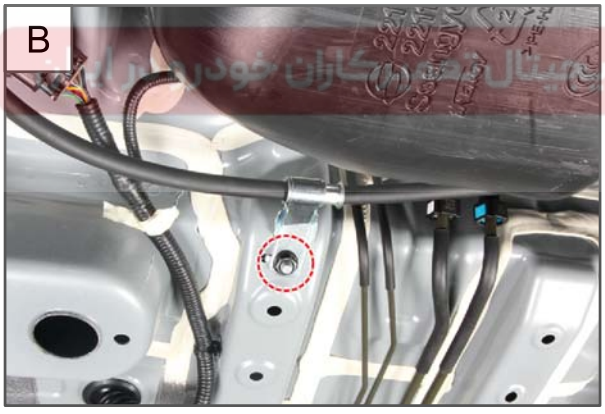

1. Unscrew the mounting bolts and nuts for the parking brake cable in sequence.

A

A. Rotate the nut (12 mm) for the equalizer counterclockwise from the underside of the vehicle to loosen the parking brake cable. Unscrew the mounting nuts (12 mm) for the left and right rear parking brake cables.

**Tightening torque** 9.8 to 12.7 Nm

B



B. Unscrew the mounting nuts (12 mm) for the LH and RH rear parking brake cables to the fuel tank side.

**Tightening torque** 9.8 to 12.7 Nm

C

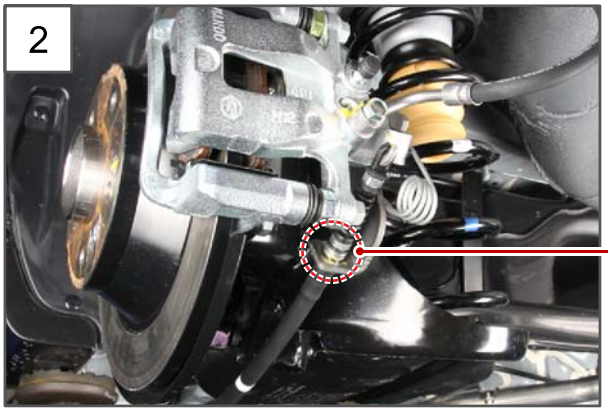
C. Unscrew the mounting bolts (12 mm) for the LH and RH rear parking brake cables to the rear trailing arm.

**Tightening torque** 9.8 to 12.7 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

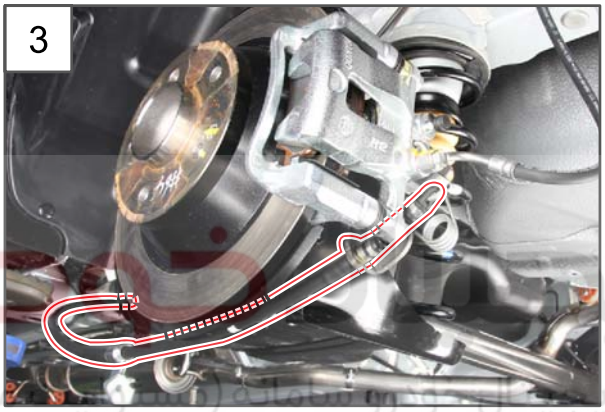
2



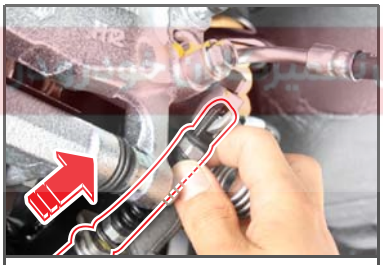
2. Remove the retaining pin for the rear parking brake cable.

**Retaining pin**

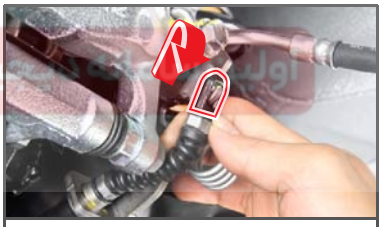
3



3. Pull out the rear parking cable from the operating lever.



Pull on the rear parking brake cable in the direction of the arrow.



Free the end of rear parking brake cable by moving it in the direction of the arrow.

Remove the rear parking brake cable.

4

4. Install in the reverse order of removal.

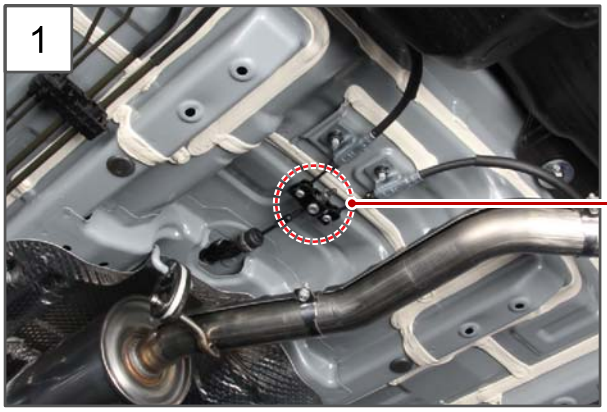
**NOTE**

After finishing the installation, adjust the parking brake cable (AWD) according to the next page.

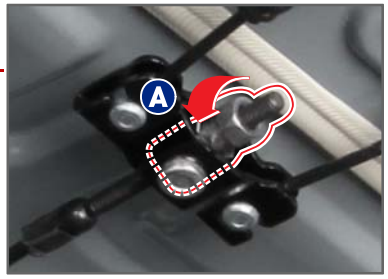
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

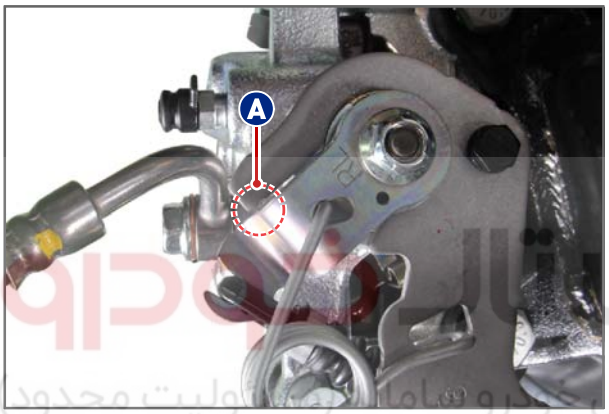
## ▶ Checking parking brake (Parking brake cable and caliper) (2WD)

1



1. Rotate the nut (12 mm) for the equalizer counterclockwise to loosen the parking brake cable.

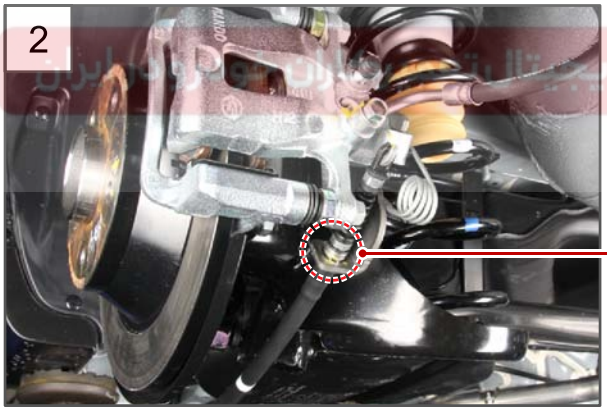



a. The operating lever and stopper should contact each other as shown in the picture (A). If the clearance of (A) is normal, perform the steps 6 and 7.

b. If the clearance of (A) is 2 mm or more, proceed as follows:

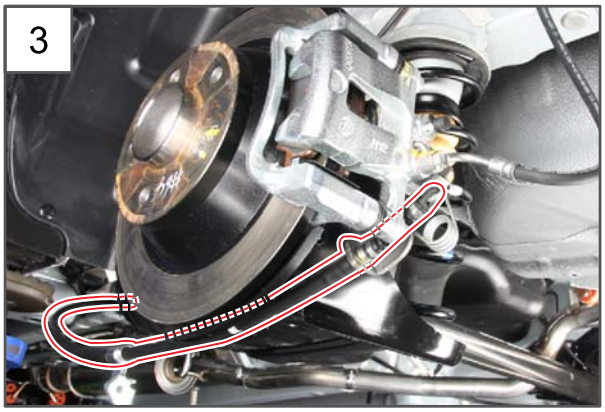
2



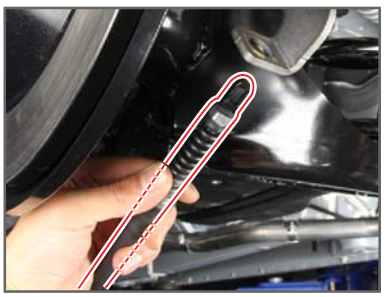
2. Remove the retaining pin for the rear parking brake cable.

| Retaining pin |
|---|
|  |

3



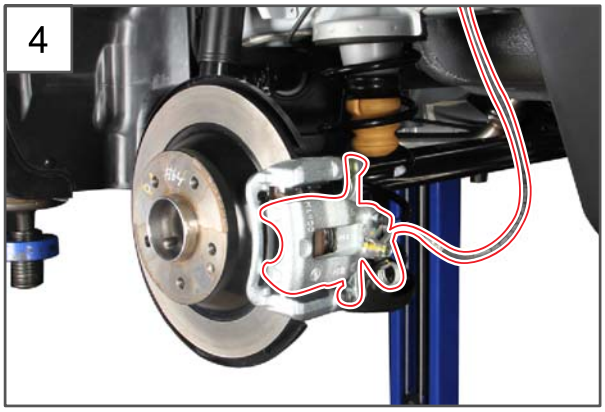
3. Remove the rear parking brake cable from the rear brake caliper.





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

4

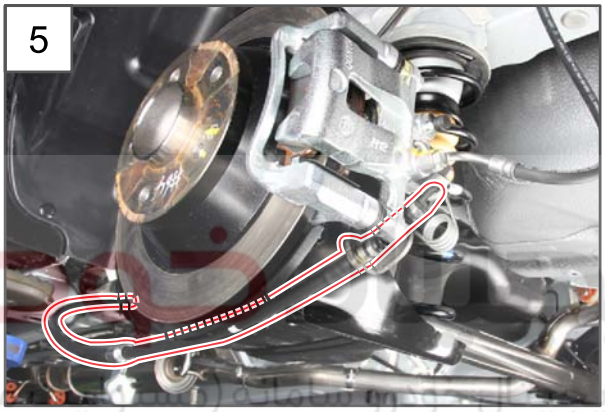


4. Remove the caliper to insert the piston and reinstall the caliper.

**NOTE**

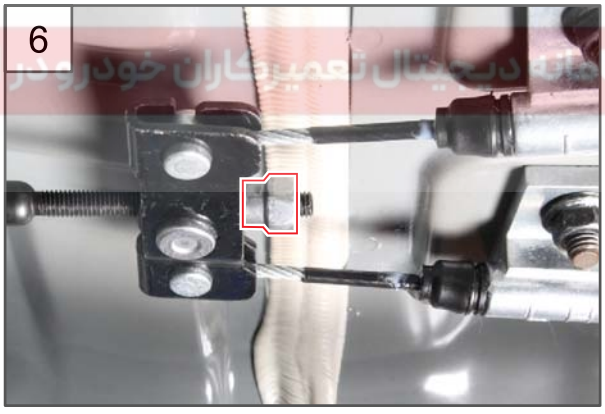
Refer to "REPLACING REAR BRAKE PAD" under "REMOVAL AND INSTALLATION" subsection of "BRAKE SYSTEM" section in "CHASSIS" chapter.

5



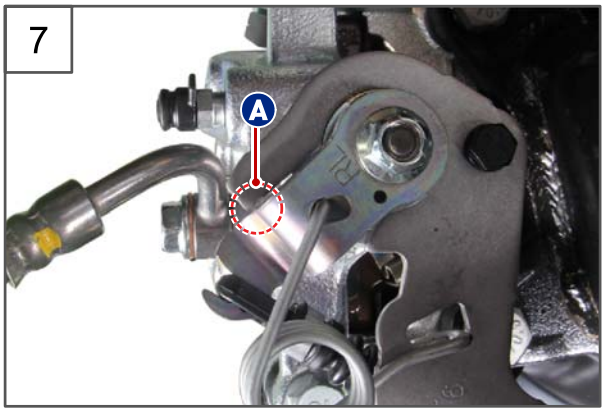
5. Start the engine and depress the brake pedal 5 times firmly to make the piston contact with the brake pad. Connect the parking brake cable to the caliper.

6



6. Screw on the equalizer nut without tightening it. Pull up and release the parking brake lever several times to stretch the parking brake cable.

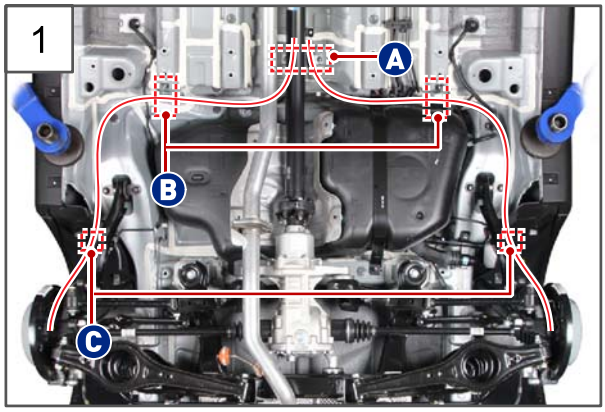
7




7. When adjusting the parking brake cable, stretch the cable (pull the lever 5 times fully) and set the gap (A) between the OP lever of the LH/RH calipers and the stopper to 0.5 ~ 2 mm by adjusting the equalizer nut so that the cable has a tension on it.

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

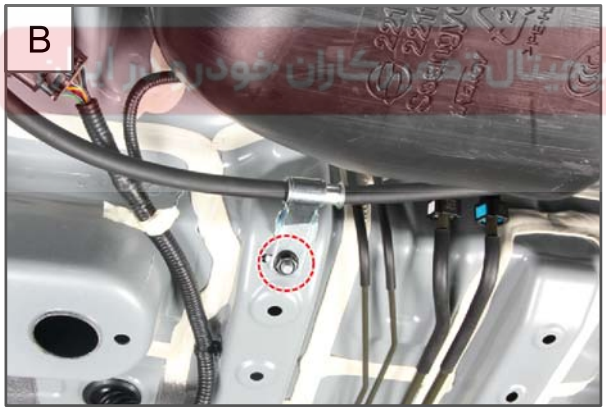
## ▶ Rear parking brake cable (AWD)




1. Unscrew the mounting bolts and nuts for the parking brake cable in sequence.


A. Rotate the nut (12 mm) for the equalizer counterclockwise from the underside of the vehicle to loosen the parking brake cable. Unscrew the mounting nuts (12 mm) for the left and right rear parking brake cables.

**Tightening torque** 9.8 to 12.7 Nm




B. Unscrew the mounting nuts (12 mm) for the LH and RH rear parking brake cables to the fuel tank side.

**Tightening torque** 9.8 to 12.7 Nm

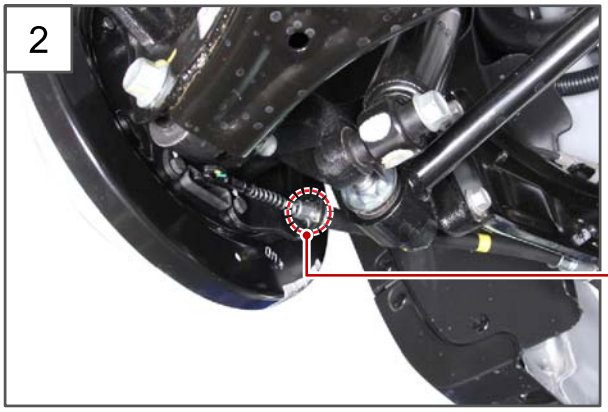

C. Unscrew the mounting bolts (12 mm) for the LH and RH rear parking brake cables to the rear trailing arm.

**Tightening torque** 9.8 to 12.7 Nm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

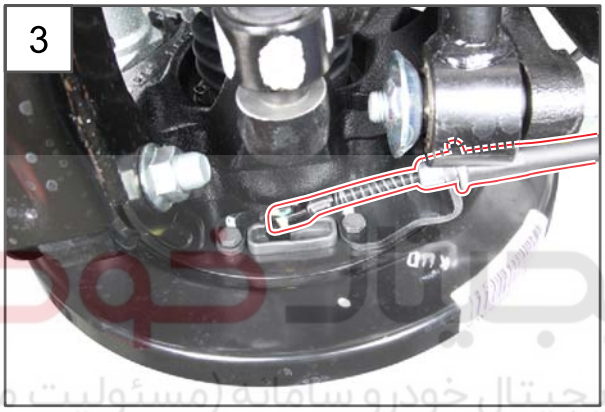
2



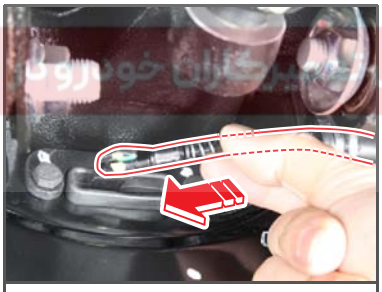
2. Remove the retaining pin for the rear parking brake cable.

**Retaining pin**

3

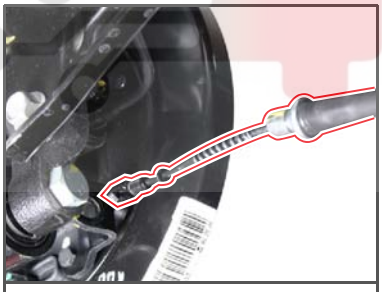


3. Pull out the rear parking cable from the operating lever.



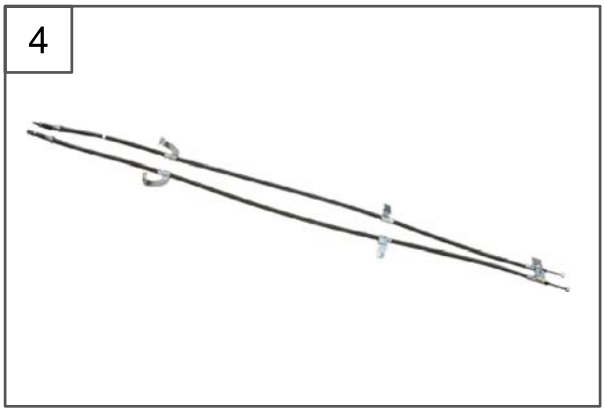
Pull on the rear parking brake cable in the direction of the arrow.

Separate the rear parking cable from the operating lever.



Remove the rear parking brake cable from the dust shield.

4



4. Install in the reverse order of removal.

**NOTE**

After finishing the installation, adjust the parking brake cable (AWD) according to the next page.

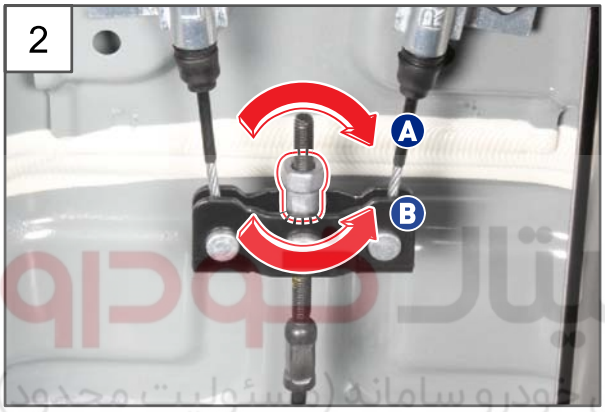
| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

## ▶ Parking brake cable adjustment (AWD)

1

1. Temporarily install the parking brake cable, apply and release the parking brake lever fully 5 times and release the parking brake.

2




2. Adjust the tension of the parking brake cable using an equalizer nut (12 mm).

| Specified value for applying parking brake lever | |
|---|---|
| 5 notches | 14±1 kgf |

- Turn in the direction of (A) to tension the parking brake cable
- Turn in the direction of (B) to loosen the parking brake cable





| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

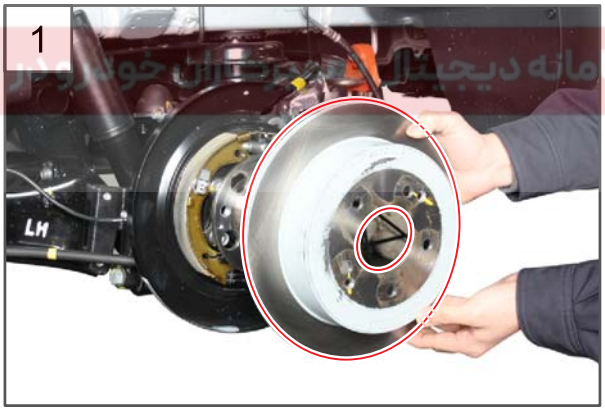
S.G.N. 4840-20

# PARKING BRAKE LINING (SHOE) (AWD)

Preceding work - Remove the rear wheel.




1

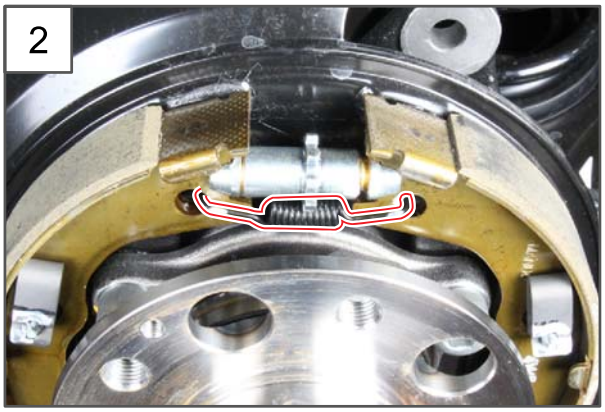



1. Remove the rear brake disc assembly.

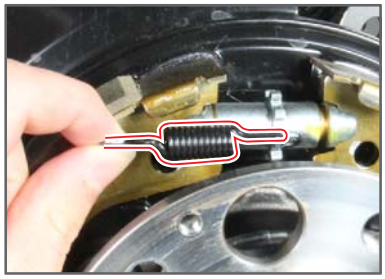
**NOTE**

See "REAR BRAKE DISC" under "REMOVAL AND INSTALLATION" subsection of "BRAKE SYSTEM" section in "CHASSIS" chapter.

2

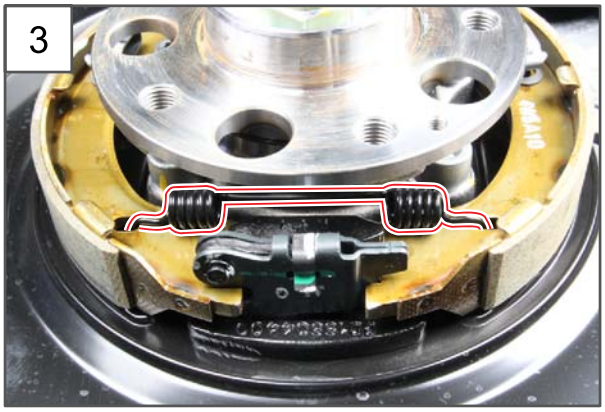


2. Remove the upper tension spring.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

3



3. Remove the lower tension spring.

4

4. Remove the adjuster.

5

5. Remove the operating lever.

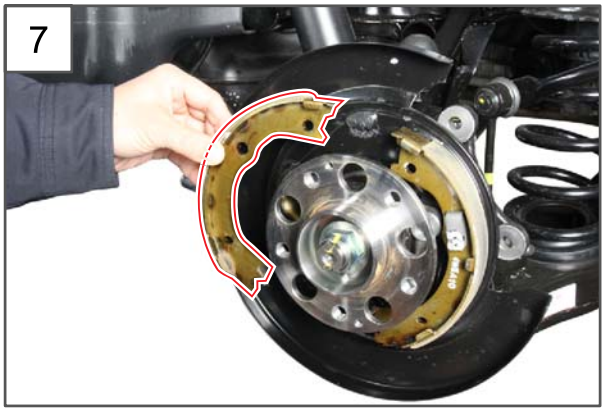
6

6. Remove the brake shoe retaining spring and fixing pin.



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

7



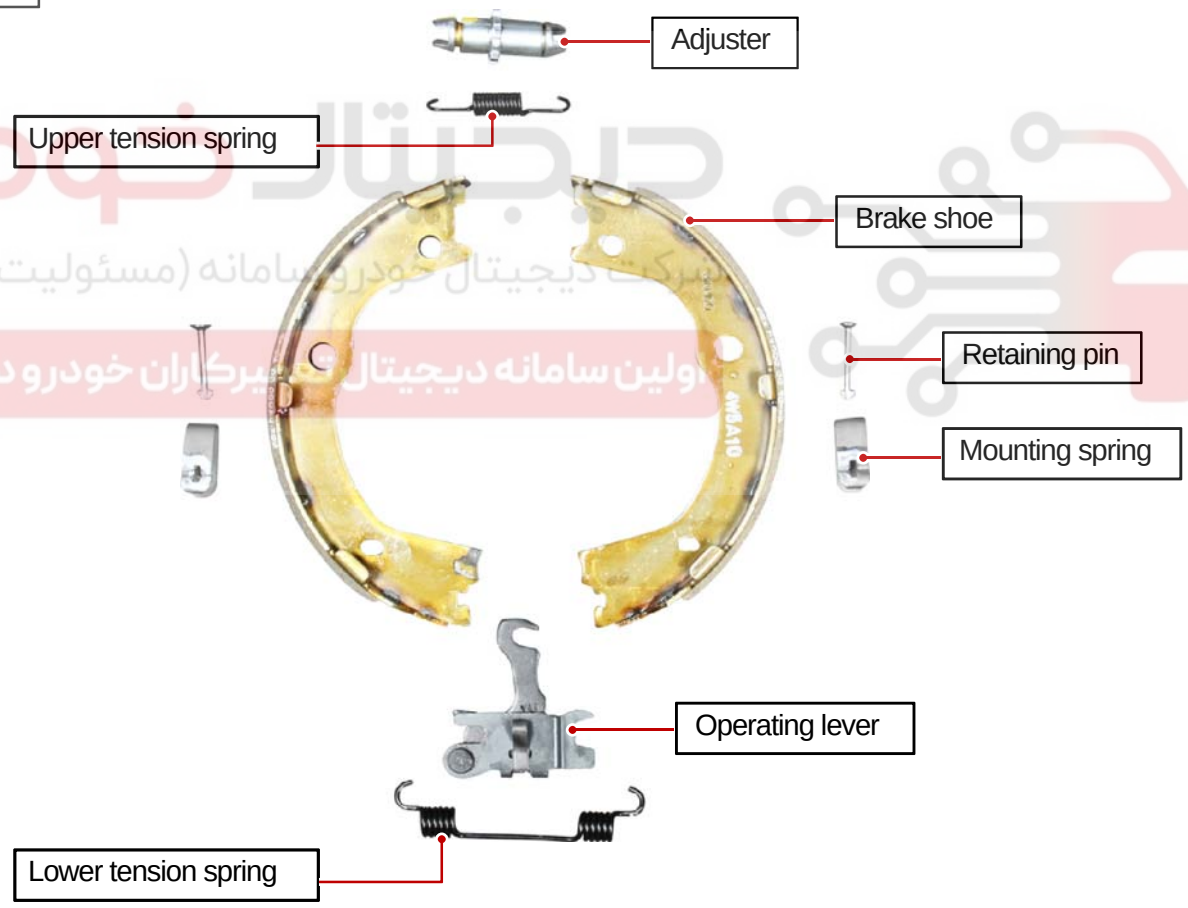
7. Remove the parking brake shoe.

8. Install in the reverse order of removal.

**NOTE**

After finishing the installation, adjust the parking brake shoe and cable (AWD) according to the next page.

8





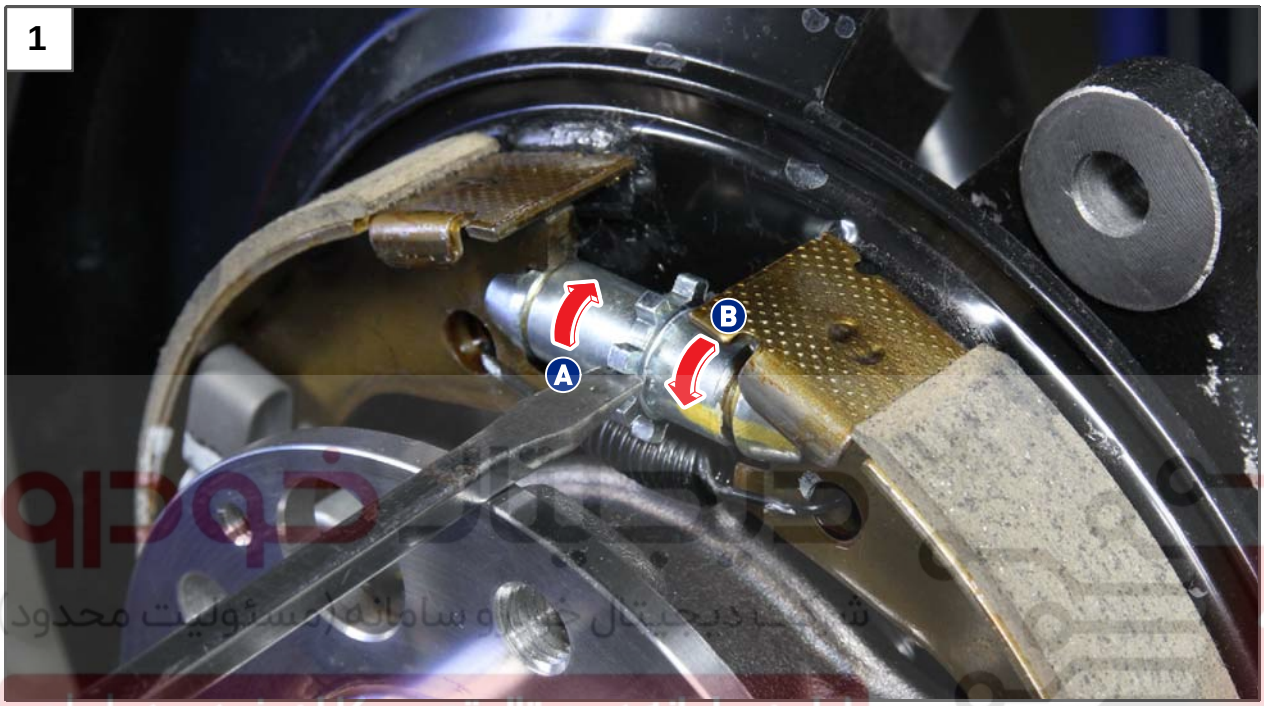

| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |

### ▶ Parking brake shoe adjustment (AWD)

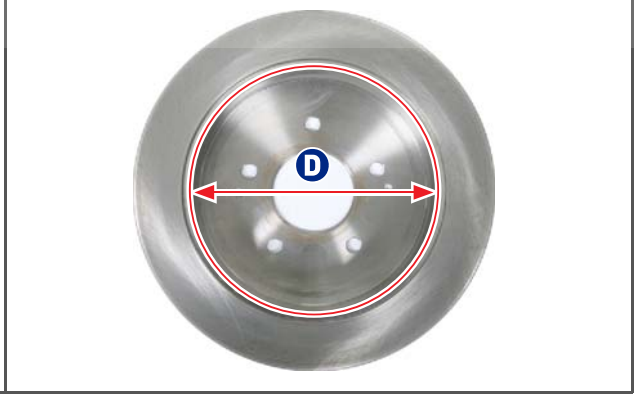
1. Adjust the brake adjuster using a flat-bladed screwdriver in the direction (A) or (B) so that the parking brake shoe is seated on the inner surface of the brake disc before installing the brake disc.

   - (A) direction: clearance between the disc decreases
   - (B) direction: clearance between the disc increases

1




Parking brake shoe and disc

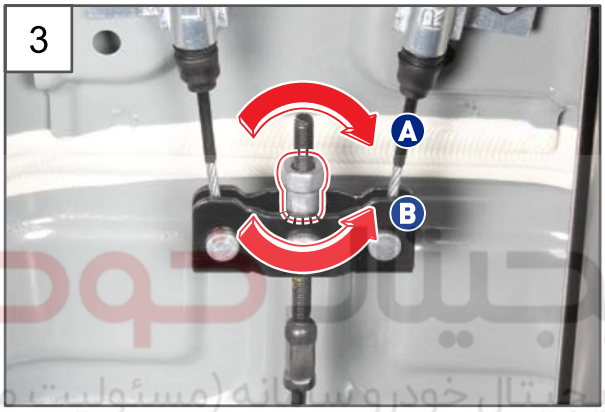

**NOTE**

- Parking brake shoe outer diameter (C) reference value : Ø189.5 to Ø189.8 mm
- Rear brake disc inner diameter (D) : Ø190 mm



| | |
|---|---|
| Modification basis | |
| Application basis | |
| Affected VIN | |


2. Temporarily install the parking brake cable, apply and release the parking brake lever fully 5 times and release the parking brake.




3. Adjust the tension of the parking brake cable using an equalizer nut (12 mm).

| Specified value for applying parking brake lever | |
|---|---|
| 5 notches | 14±1 kgf |

- Turn in the direction of (A) to tension the parking brake cable
- Turn in the direction of (B) to loosen the parking brake cable

## Memo