HYUNDAI Technical Service Bulletin	GROUP **BRAKES**	NUMBER **21-BR-002H**
	DATE **MARCH 2021**	MODEL(S) **ALL**

SUBJECT: BRAKE SERVICE BEST PRACTICE RECOMMENDATIONS

This TSB supersedes 10-BR-001 to include new grease recommendations and brake service best practices.

Description: This bulletin provides best practice recommendations when performing brake service procedures.

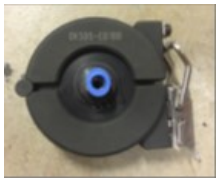
Applicable Vehicles: All Hyundai vehicles

Table of Contents:

Circulate To: General Manager, Service Manager, Parts Manager, Warranty Manager, Service Advisors, Technicians, Body Shop Manager, Fleet Repair

Warranty Information:
Normal warranty applies.

Recommended Tools:

NAME	PART NUMBER	PHOTO	REMARK
On-car Brake Lathe PFM 9.0 or higher version by PRO-CUT	Contact Bosch		• Tool is available through Bosch: 1-866-539-4248
Air Bleeding Tool	09580-3D100		• Use as directed in the vehicle's shop manual or TSB(s). • Previously provided to all dealers as essential tools. • To order a replacement contact Bosch: 1-866-539-4248
Active Hydraulic Boost (AHB) Brake Air Bleeding Tool Adapter	09580-3D200		
Brake Cleaner	00232-19077	-	• Dealer provided. Non-reimbursable shop supplies.
Brake Fluid, **DOT 3** 12 oz (354.9 mL)	00232-19033	-	• Use fluid as specified in the vehicle's shop manual.
Brake Fluid, **DOT 4** 12 oz (355 mL)	00232-19053	-	
Copper Anti-Seize Brake Lube 3M 08945	00232-19086	-	• Use as directed in the vehicle's shop manual or TSB(s). • Dealer provided. Non-reimbursable shop supplies.
Silicone Paste 3M 08946	00232-19087	-	• Silicone lubricant specified for caliper slide pins. • Use as directed in the vehicle's shop manual or TSB(s). • Dealer provided. Non-reimbursable shop supplies.

Service Procedure:

Refer to the applicable vehicle shop manual or TSBs for service details.

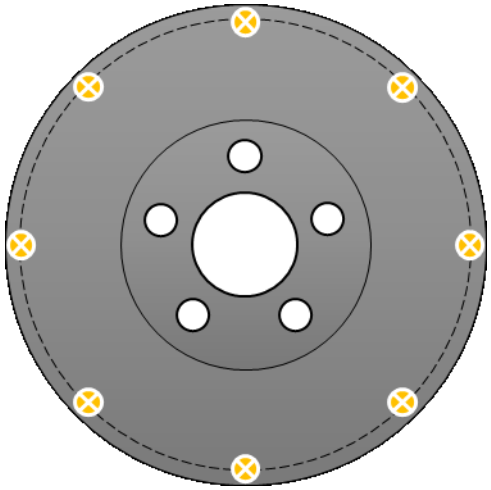
Front and Rear Brake Rotors

NOTICE

- Always follow the brake lathe manufacturer's recommendations for proper machining.
- It is recommended to use an "on-car" brake lathe.
- For more information on brake rotor service, refer to the applicable vehicle shop manual.

1. Measure rotor thickness **BEFORE** and **AFTER** machining to ensure the brake rotor is within specification.

   - Refer to the applicable vehicle shop manual for minimum thickness.
   - When measuring the brake rotor for minimum service thickness and runout, remove all surface contamination and corrosion to ensure an accurate measurement.
   - Measure the thickness at 8 points (every 45 degrees) around the rotor, 5-10mm or 0.2-0.4" inboard of the outer edge. Record these measurements on the repair order sheet.



Measurement locations around rotor

2. After machining, re-install the rotor (if removed) and caliper. Then, inspect the rotor runout.
   - Refer to the applicable vehicle shop manual for recommended runout tolerance.
   - Mount a dial indicator on the brake rotor 5-10mm or 0.2-0.4" inboard of the outer edge. Record this measurement on the repair order sheet.
3. Verify that the rotor is free of grease or other contamination. Clean with brake cleaner if necessary.
4. When re-installing the wheels, tighten the lug nuts in a star pattern to the torque specification in the appropriate vehicle shop manual. This reduces runout from occurring.
5. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**
6. After installing the machined rotors or installing new rotors, perform a brake burnishing procedure.
   1. Drive the vehicle and accelerate to 50 mph. Apply the brakes using moderate force (about 0.3g deceleration rate), and slow the vehicle to 10 mph. This action will take approximately 6 seconds.
   2. With as little cooling time as possible, repeat this braking event 10 times.

Front Brake Calipers/Pads: FLOATING TYPE ONLY

NOTICE

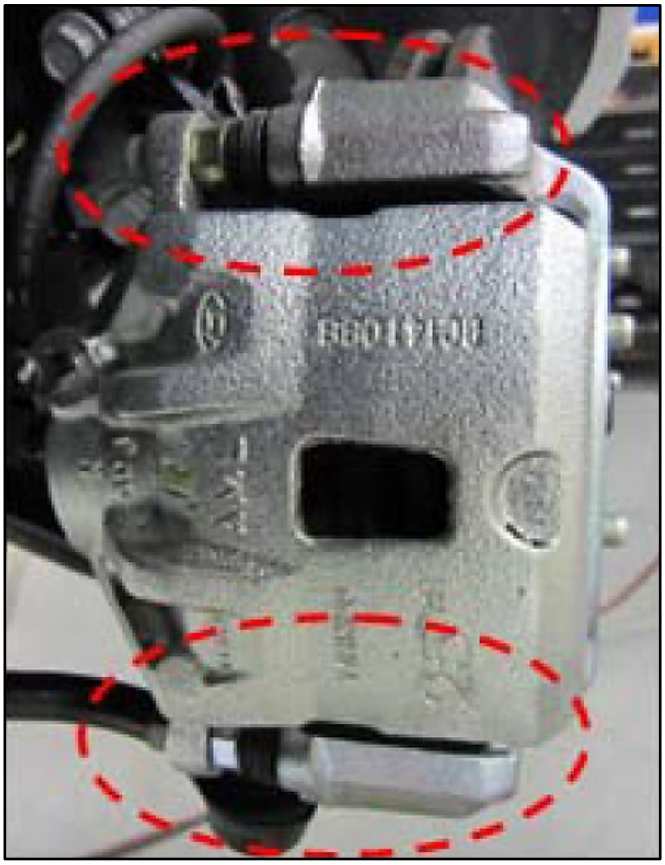
- For more information regarding brake caliper and pad service, refer to the applicable vehicle shop manual.

1. When performing the brake service on floating type calipers, always remove, clean, and inspect the caliper slide pins and boots.

   Apply **Silicone Paste, P/N 00232-19087** to the caliper slide pins before reinstallation.

NOTICE

- This procedure **does not** apply to fixed-type calipers.
- Use caliper slide pin recommended lubricant.
- Do not over-lubricate the slide pins.
- If too much lubricant is applied to the slide pins, air can be trapped at the end of the pin creating an “air spring”. This condition causes the caliper/pad assembly to drag on the rotor.



⚠ CAUTION

Do not hang the caliper with the brake hose.

2. Remove the pads, and clean the pad backing plate and insulators/shims of debris.

   Never reuse shims on new pads.

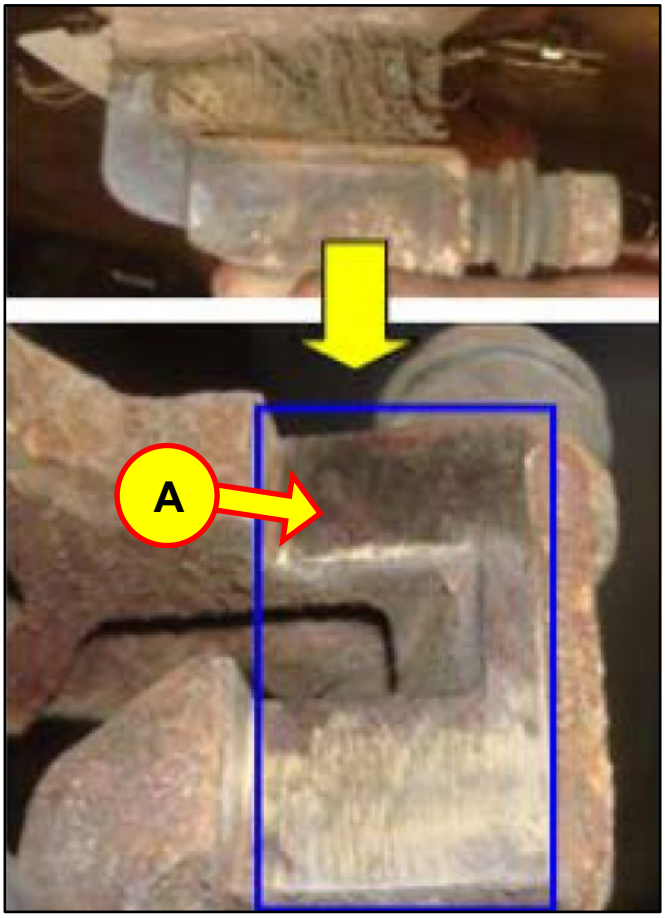
   Inspect the pad friction surface for even wear and pad thickness. Refer to the applicable vehicle shop manual for service limits.

   Grease should not be applied to the pad backing plate unless instructed by the shop manual or TSB(s), as it could trap debris, and increase the chance of noise or dragging.

3. Remove the pad retainers, and clean the contact surface of the caliper from debris and corrosion. Use a wire brush if necessary. Apply a light coat of **Copper Anti-Seize Brake Lube, P/N 00232-19086,** (A) to prevent further corrosion.

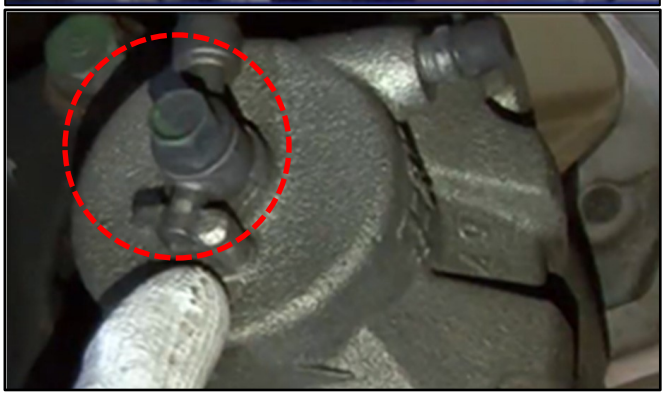
   Clean and inspect the retainers if the pads are reused. Discard damaged retainers.

   Always use the retainers included with the new pads.



4. Inspect the caliper for brake fluid leaks.

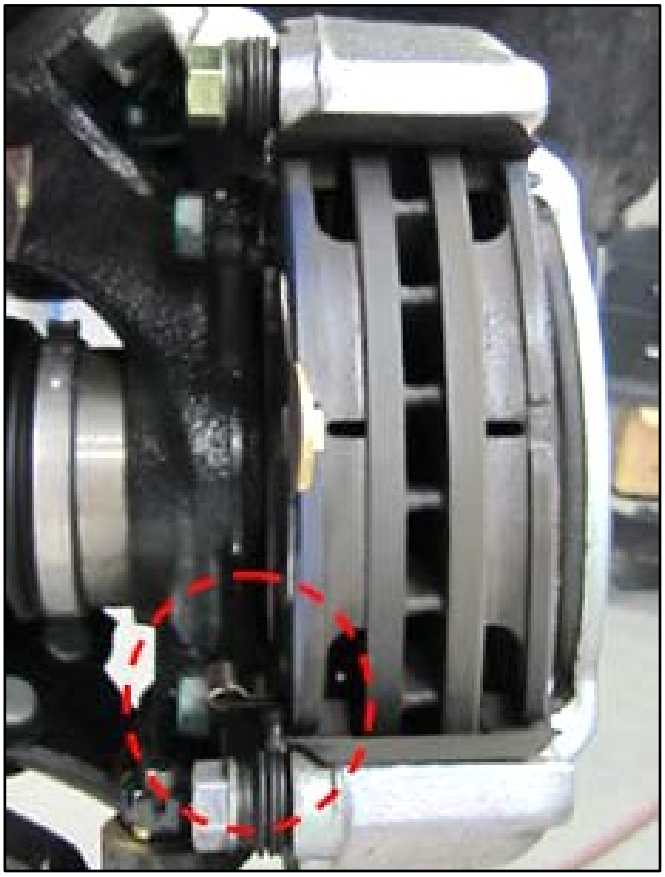
   Follow the **Brake Caliper Fluid Inspection** procedure on page 18.



NOTICE

If a fluid leak is found at the banjo bolt area between the brake line and the caliper, replace the copper washers on the banjo fitting.

5. When re-installing the brake pads, install the pad with the wear indicator on the inside, as shown.



6. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**

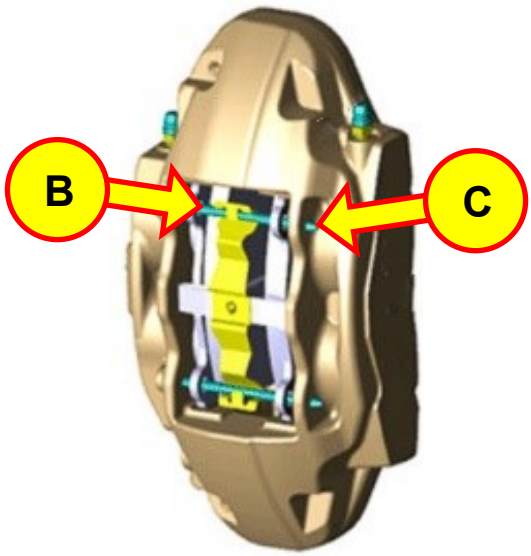
Front Brake Calipers/Pads: FIXED TYPE ONLY

NOTICE

- For more information regarding brake caliper and pad service, refer to the applicable vehicle shop manual.

1. When performing the brake service on fixed type calipers, always remove and clean the guide pins (B) and locking retainers (C) using a non-abrasive method.

   Inspect the pins for deformation or corrosion that would inhibit the pads from moving freely. It is not recommended to grease the pins unless instructed by the shop manual or TSB(s).



⚠ CAUTION

Do not hang the caliper with the brake hose.

2. Remove the pads, and clean the pad backing plate and insulators/shims of debris.

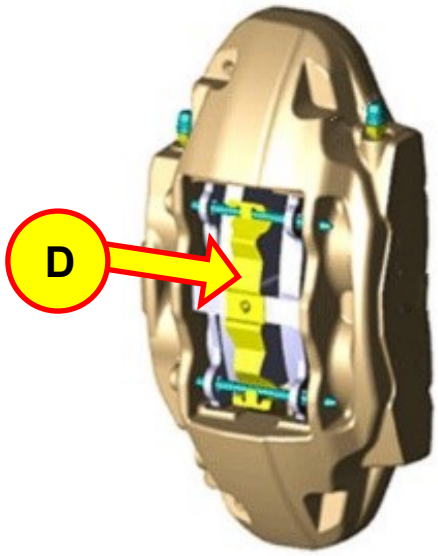
   Never reuse shims on new pads.

   Inspect the pad friction surface for even wear and pad thickness. Refer to the applicable vehicle shop manual for service limits.

   Grease should not be applied to the pad unless instructed by the shop manual or TSB(s), as it could trap debris, and increase the chance of noise or dragging.

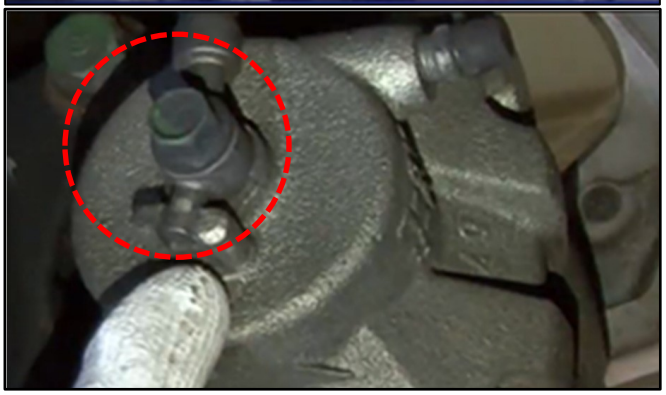
3. Clean and inspect the pad springs (D) if the pads are reused. Discard damaged springs.

   Always use the parts included with new pads.



4. Inspect the caliper for brake fluid leaks.

   Follow the **<u>Brake Caliper Fluid Inspection</u>** procedure on page 18.



NOTICE

If a fluid leak is found at the banjo bolt area between the brake line and the caliper, replace the copper washers on the banjo fitting.

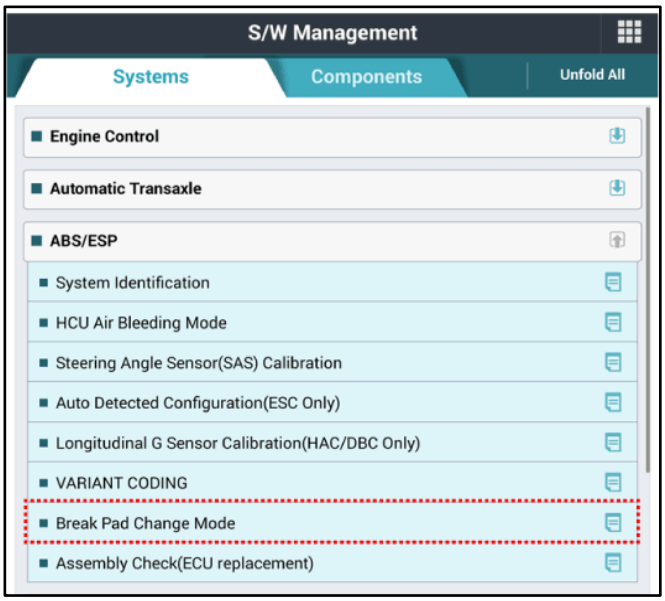
5. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**

Rear Brake Calipers/Pads

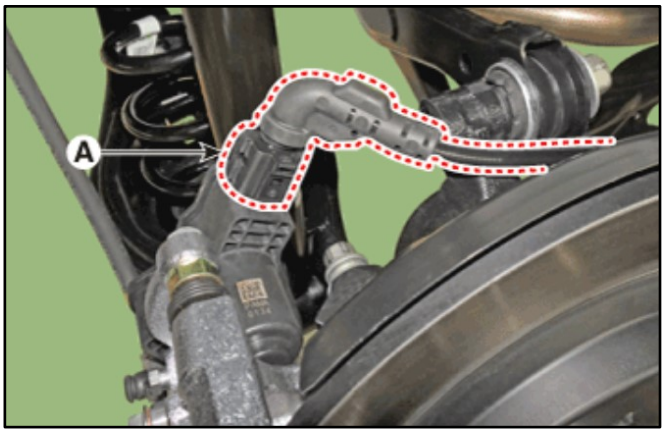
NOTICE

- For more information regarding rear brake service, refer to the applicable vehicle shop manual.

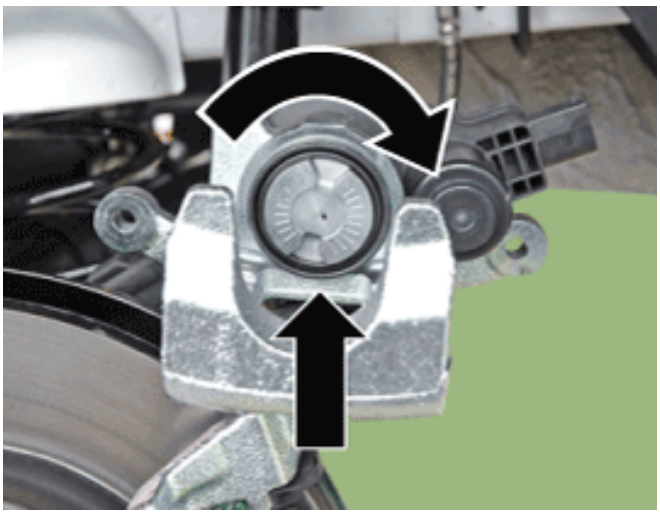
1a. When servicing rear brakes on vehicles equipped with an **Electronic Parking Brake** (EPB), the Brake Pad Change Mode function must be performed to release the rear calipers **before** the caliper is removed.



1b. Disconnect the EPB actuator (A) before removing the caliper from the bracket.



1c. If replacing the pads, retract the caliper piston by rotating it.

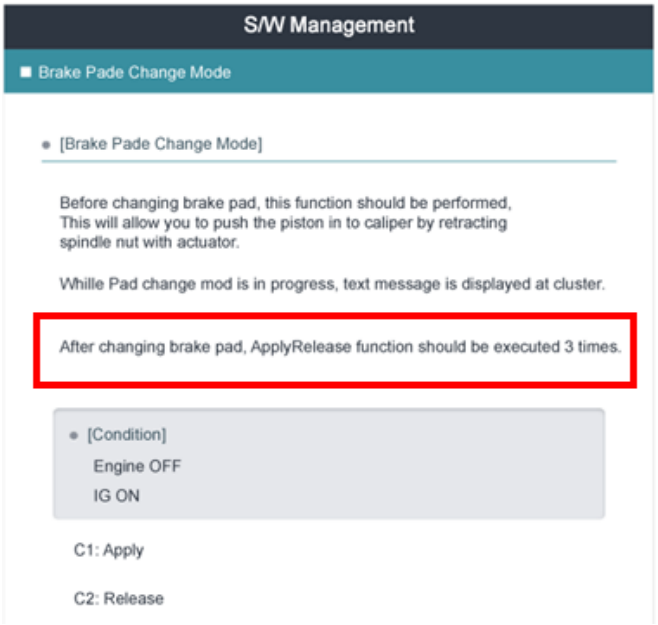


1d. Replace and reinstall parts in reverse order of removal.

NOTICE

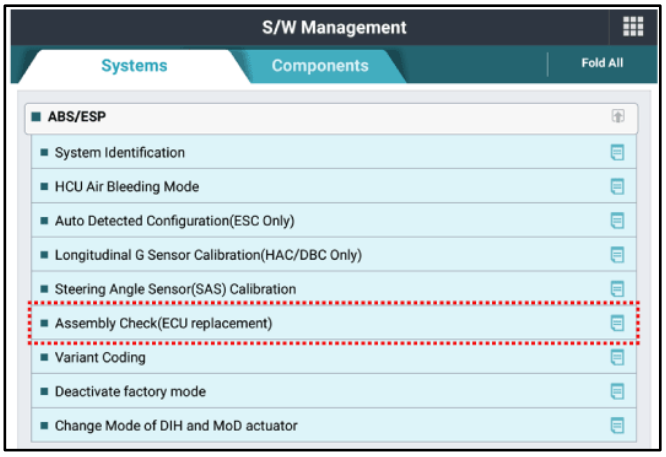
Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.

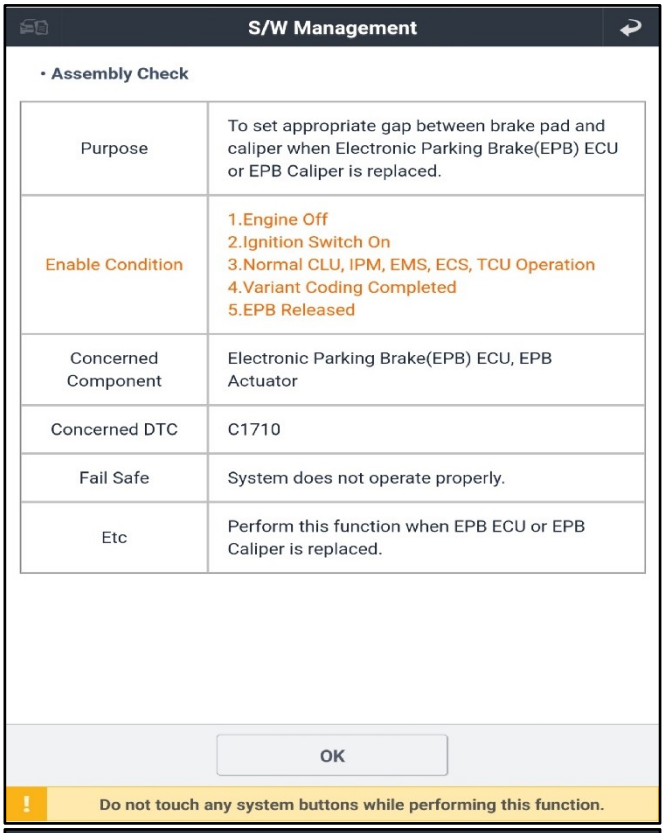
Use the Brake Pad Change Mode in the GDS-M to apply and release the EPB. Repeat the apply/release function three times.



1e. After completing the Brake Pad Change Mode, perform the Assembly Check (ECU replacement) function.

Also perform this function after replacing the rear pads, caliper, EPB actuator, or EPB ECU.





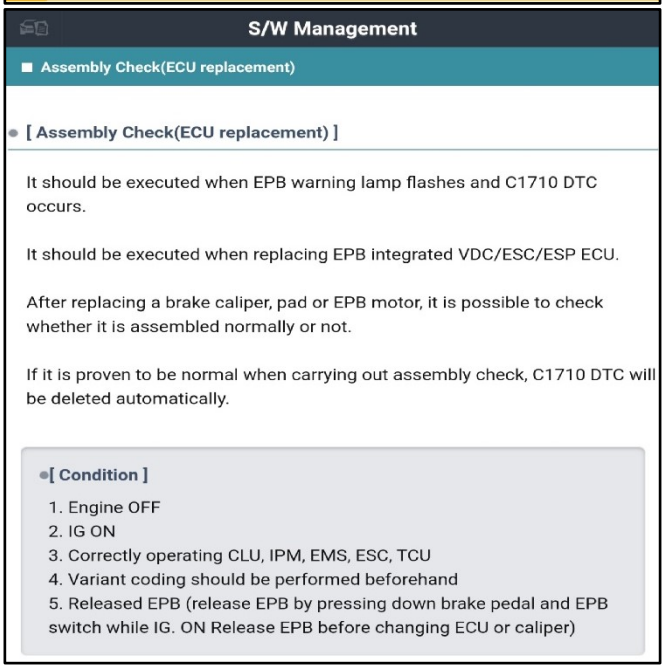
S/W Management

• Assembly Check

Purpose	To set appropriate gap between brake pad and caliper when Electronic Parking Brake(EPB) ECU or EPB Caliper is replaced.
Enable Condition	1.Engine Off 2.Ignition Switch On 3.Normal CLU, IPM, EMS, ECS, TCU Operation 4.Variant Coding Completed 5.EPB Released
Concerned Component	Electronic Parking Brake(EPB) ECU, EPB Actuator
Concerned DTC	C1710
Fail Safe	System does not operate properly.
Etc	Perform this function when EPB ECU or EPB Caliper is replaced.

OK

Do not touch any system buttons while performing this function.



S/W Management

■ Assembly Check(ECU replacement)

● [Assembly Check(ECU replacement)]

It should be executed when EPB warning lamp flashes and C1710 DTC occurs.

It should be executed when replacing EPB integrated VDC/ESC/ESP ECU.

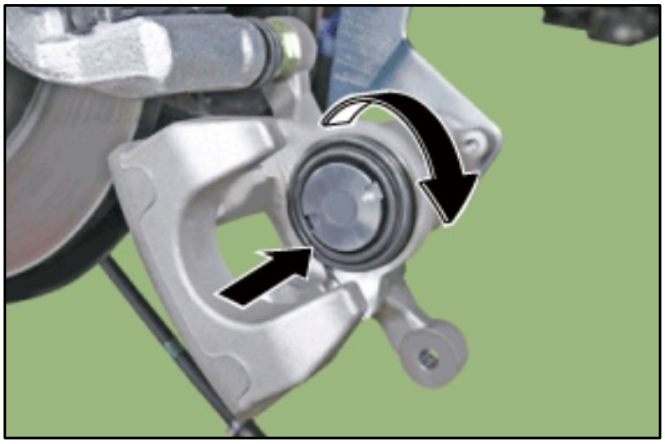
After replacing a brake caliper, pad or EPB motor, it is possible to check whether it is assembled normally or not.

If it is proven to be normal when carrying out assembly check, C1710 DTC will be deleted automatically.

●[Condition]

1. Engine OFF
2. IG ON
3. Correctly operating CLU, IPM, EMS, ESC, TCU
4. Variant coding should be performed beforehand
5. Released EPB (release EPB by pressing down brake pedal and EPB switch while IG. ON Release EPB before changing ECU or caliper)

2. When servicing rear brakes on vehicles with a **manual parking brake**, the piston may need to be retracted by rotating the piston.

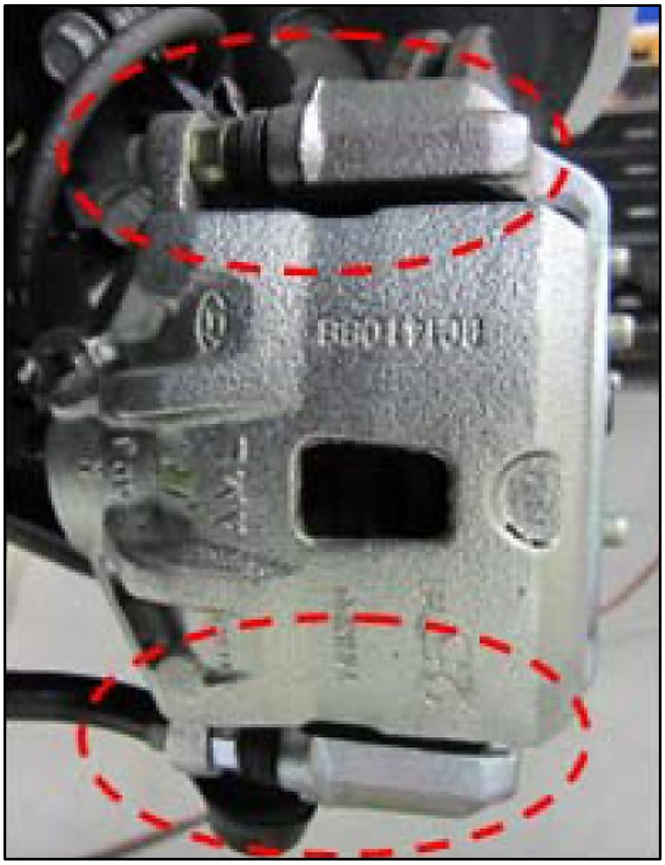


3. When performing the brake service, always remove, clean, and inspect the caliper slide pins and boots.

   Apply **Silicone Paste, P/N 00232-19087** to the caliper slide pins before reinstallation.

NOTICE

- This procedure **does not** apply to fixed-type calipers.
- Use caliper slide pin recommended lubricant.
- Do not over-lubricate the slide pins.
- If too much lubricant is applied to the slide pins, air can be trapped at the end of the pin creating an “air spring”. This condition causes the caliper/pad assembly to drag on the rotor.



⚠ CAUTION

Do not hang the caliper with the brake hose.

4. Remove the pads, and clean the pad backing plate and insulators/shims of debris.

   Never reuse shims on new pads.

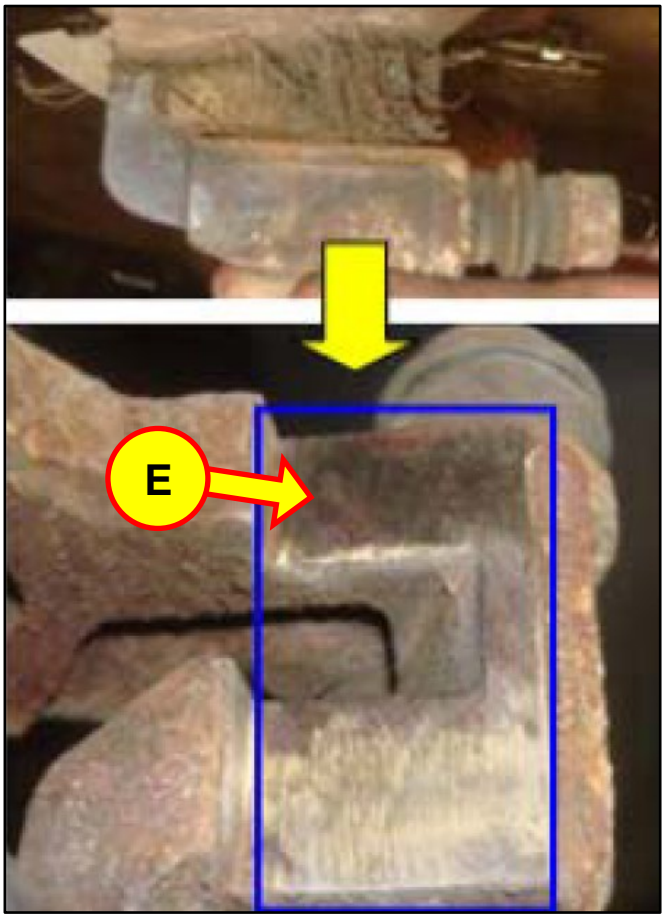
   Inspect the pad friction surface for even wear and pad thickness. Refer to the applicable vehicle shop manual for service limits.

   Grease should not be applied to the pad backing plate unless instructed by the shop manual or TSB(s), as it could trap debris, and increase the chance of noise or dragging.

5. Remove the pad retainers, and clean the contact surface of the caliper from debris and corrosion. Use a wire brush if necessary. Apply a light coat of **Copper Anti-Seize Brake Lube, P/N 00232-19086,** to prevent further corrosion (E).

   Clean and inspect the retainers if the pads are reused. Discard damaged retainers.

   Always use the retainers included with the new pads.

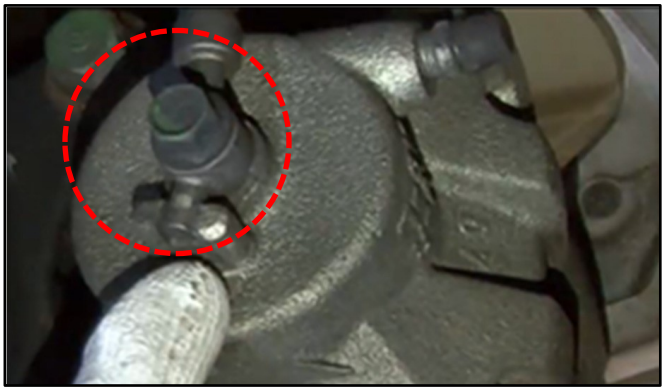


6. Inspect the caliper for brake fluid leaks.

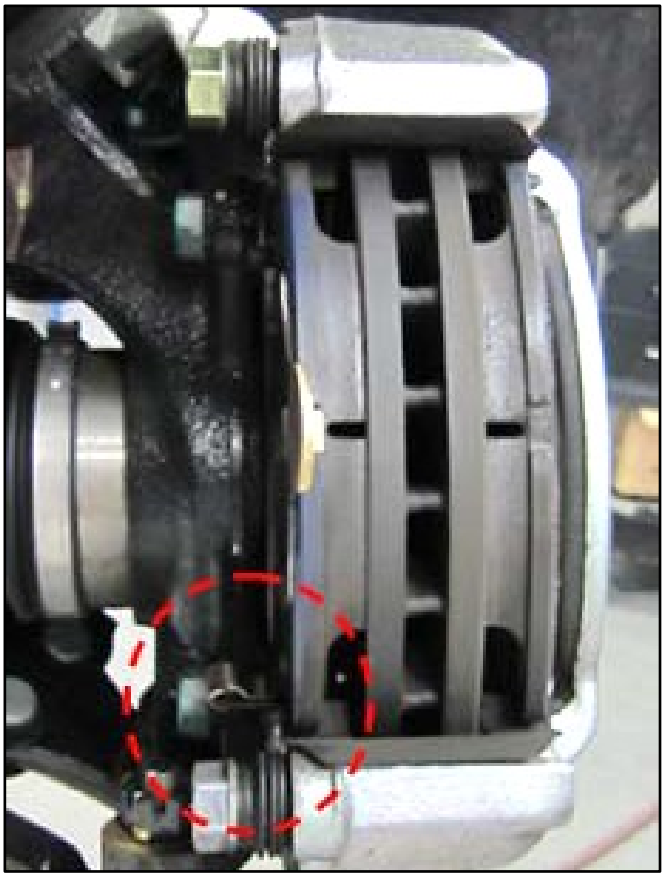
   Follow the **Brake Caliper Fluid Inspection** procedure on page 18.

NOTICE

If a fluid leak is found at the banjo bolt area between the brake line and the caliper, replace the copper washers on the banjo fitting.



7. When re-installing the brake pads, install the pad with the wear indicator on the inside, as shown.



8. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**

Rear Brake Drums/Shoes/Components

NOTICE

- Always follow the brake lathe manufacturer's recommendations for proper machining.
- For more information on brake drum service, refer to the applicable vehicle shop manual.

1. Measure the inside diameter and runout of the drum **BEFORE** and **AFTER** machining to ensure the brake rotor is within specification.

   - Refer to the applicable vehicle shop manual for service limits.
   - When measuring the drum, remove all surface contamination and corrosion to ensure an accurate measurement.

2. Clean all drum brake assembly components to inspect for wear and leaks.

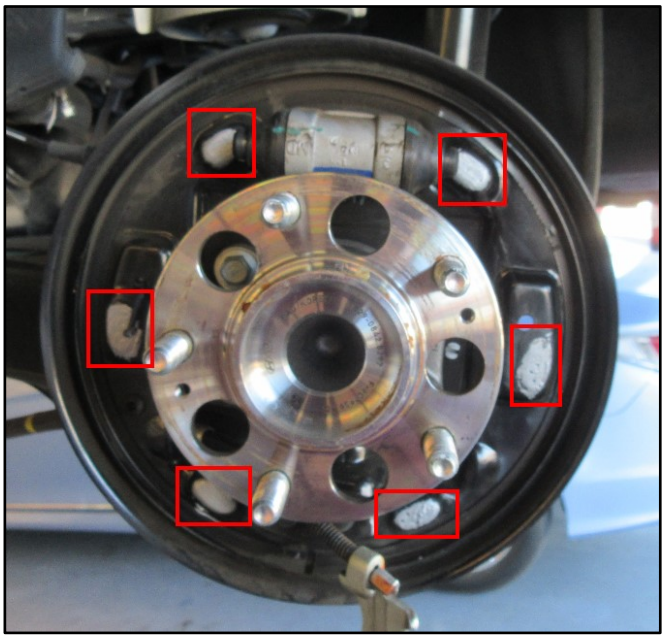
3. Debris on the wheel cylinder and boots is not an immediate indication that the wheel cylinder is leaking. Carefully inspect the wheel cylinder for leaks.

4. Inspect the shoe lining for even wear and thickness. Refer to the applicable vehicle shop manual for service limits.

5. Inspect the brake shoe springs. If any of the springs are broken, replace all brake shoe springs.

   During brake shoe replacement, it is also recommended to replace all shoe springs.

6. Refer to the applicable vehicle shop manual for locations regarding where to apply the **Copper Anti-Seize Brake Lube, P/N 00232-19086**, to the contact/sliding points between the shoes and brake components.



⚠ CAUTION

Prevent any grease from touching the shoe lining or drum friction surfaces.

7. To set the rear drum to shoe running clearance, refer to the applicable vehicle shop manual.
8. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**

Brake Fluid Service

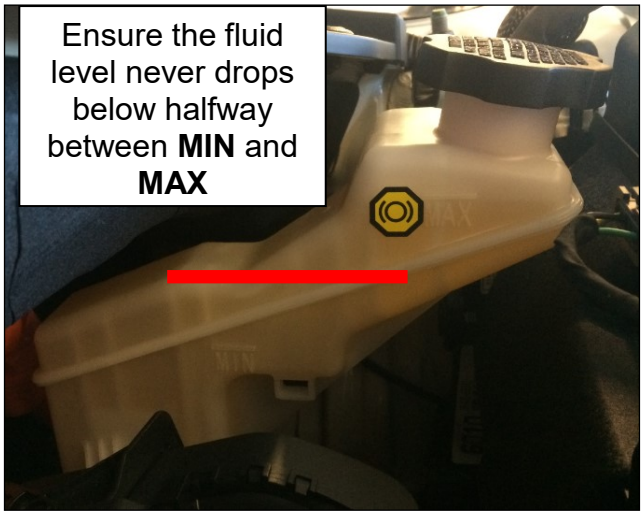
- Follow the applicable vehicle owner's or shop manual for brake fluid inspection and replacement intervals.
- For more information on brake fluid service, refer to the applicable vehicle shop manual or TSBs.

⚠ CAUTION

- **Do not reuse drained fluid.**
- **Always use genuine DOT3 or DOT4 brake fluid as recommended in the applicable vehicle shop manual. Using non-genuine DOT3 or DOT4 brake fluid can cause corrosion, and can decrease the life of the system.**
- **Verify dirt or other foreign matter does not contaminate the brake fluid.**
- **Do not spill brake fluid onto the vehicle. This may lead to paint damage. If brake fluid comes in contact with any paint surface, wash the surface off immediately with water.**
- **When bleeding air, ensure that the fluid level never drops below halfway between MIN and MAX in the reservoir.**

1. Ensure that the brake fluid reservoir level never drops below the halfway point between MIN and MAX.

   If the level drops below the halfway point, air may be introduced into the system, and the bleeding procedure must be restarted.



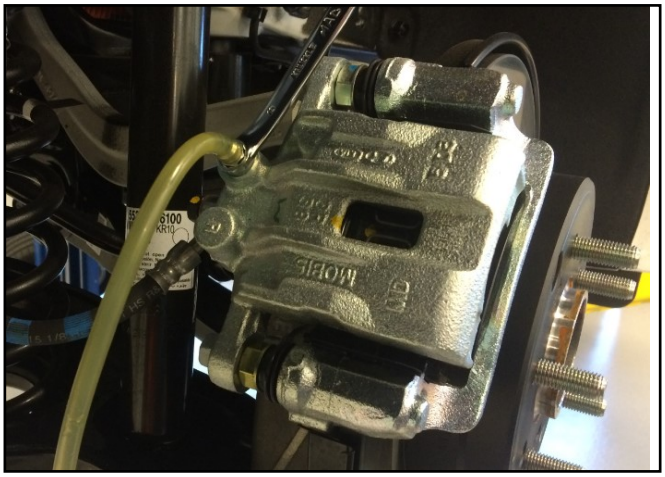
NOTICE

Use genuine DOT 3 or DOT 4 brake fluid as recommended in the applicable vehicle shop manual

2. Use a hose inserted into a partially filled container of clean brake fluid to catch the old brake fluid.

3. Follow the brake bleeding sequence for the model and brake system type.

4. After the bleeding procedure, ensure that the caliper bleeding nipple is torqued to specification.



Brake Bleeding Nipple Tightening Torque

lb-ft	•5.1-9.4
kgf.m	•0.7-1.3
N.m	•6.9-12.7

5. **Tighten all bolts to the torque specification recommended in the appropriate vehicle shop manual.**

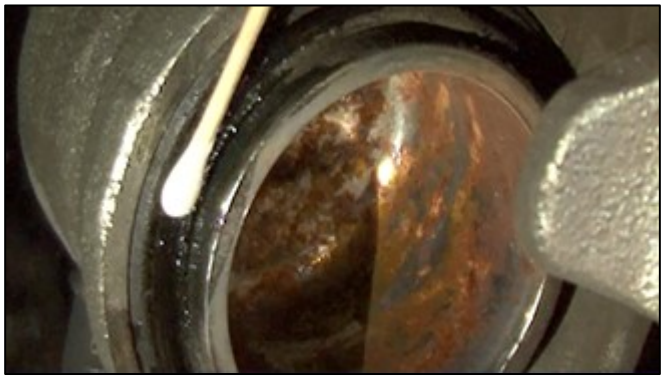
Brake Caliper Fluid Inspection

- If fluid appears around the brake caliper piston area, test the fluid to identify whether the fluid is brake fluid, or assembly oil per the service procedures below.

1. If oil/fluid is present on the brake caliper piston area, test the fluid to determine if it is brake fluid or assembly oil.

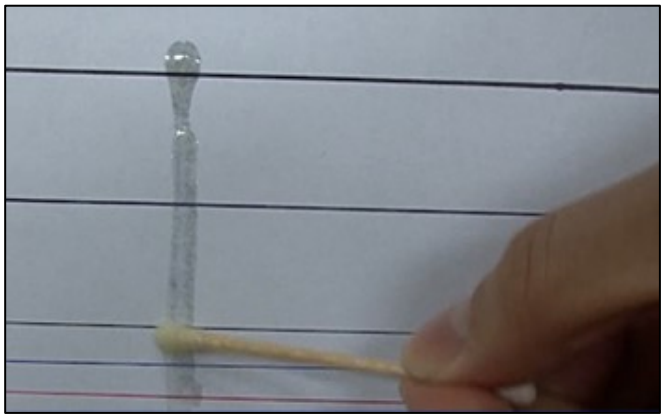
2. Use a cotton swab to carefully collect a sample of the fluid.

   Do not disturb the caliper boot.



3. Using an oil or water based ink pen, draw several horizontal lines on a sheet of paper.

   Wipe the collected fluid vertically down the ink lines.



4. If the ink does not smear, the fluid is not brake fluid and is likely to be assembly oil.
   - Wipe the excess oil using a clean shop towel.
   - Do not disturb the caliper boot.

   If the ink runs/smears, the fluid is likely to be brake fluid.
   - Continue to investigate and repair the source of the brake fluid.