



PAGID

BRAKE SYSTEMS

| PRACTICAL SERVICE TIPS



Installation notes for brake repairs

Installation notes for brake repairs

Hella Pagid Brake Systems count on reliability and quality - starting with product development. Based upon our OE expertise, we only offer our engineered products with the highest quality and performance: our products are distinguished by up to 200,000 miles of road testing and 1,000 hours of lab testing.

However, please observe that only properly installed brake pads can function without problems.

Hella Pagid Brake Systems recommend the replacement of the Brake Disc Rotor when replacing brake pads for optimal performance and wear. Replacing the “friction couple” ensures the original engineered design of the brake system and protects from contamination.

For this reason, each brake pad packaging includes general assembly instructions by VRI (German Association of the Friction Product Industry) and/or FEMFM (Federation of European Manufacturers of Friction Materials). In addition, this brochure offers useful tips regarding brake system maintenance and repair. Further information regarding service and technology can be found on our website www.hella.com/brakesystems



9 Steps for a Professional Disc Brake Repair

1



Brake repair start

Brake discs and/or brake pads reached the wear limit.

Prior to starting the brake repair all relevant components in the axle area and the hydraulic system must be checked.

→ **Defective parts are to be replaced.**



2



Determine brake disc thickness

Determine the brake disc thickness using a suitable measurement tool.

→ **Please note the specifications of the respective vehicle manufacturer.**

Brake rotors must not reach minimum thickness before wear life of replacement brake pad. New rotors are recommended.

Wheel bearings not in specifications, or not torqued correctly could have an adverse affect on the Antilock Brake System (ABS) wheel speed sensor, causing system fault codes.

3



Derusting of the contact face and the wheel hub

After the old brake discs are removed, contact surface and wheel hub edge are to be cleaned using suitable tools (e.g., wire brush, abrasive paper, wire cup brush).

→ **Caution: Do not damage the wheel hubs!**

The caliper, which is still connected with the hydraulic system, must be fixed such that no tensile load is applied to the brake hose.



9 Steps for a Professional Disc Brake Repair



Cleaning of contact face and wheel hub

Clean derusted, metallic bright contact faces using Hella Pagid Brake Systems brake cleaner.

We recommend checking the cleaned wheel hub using a suitable measurement tool (dial indicator gage with tripod) for possible axial run-out deviation.

Clean and check brake carrier for damage.



Derusting of the carrier guide shafts and the caliper bracket

Depending on the design, remove rust and residues from the guide shafts of the dismantled caliper bracket using a wire brush and/or caliper file.

→ **Caution: Do not damage the caliper bracket!**

Visually inspect the carrier bracket for damage.



Greasing of the guide surfaces and the caliper bracket

Grease the cleaned guide surfaces on the caliper bracket using a non-conductive, heat-resistant agent without solids (metal-free) (Hella Pagid Brake Systems Permanent Grease).

→ **Do not use copper paste!**



9 Steps for a Professional Disc Brake Repair



Assembly of the brake disc

Fix the new brake disc on the wheel hub and fasten using retaining screws - depending on design and system.

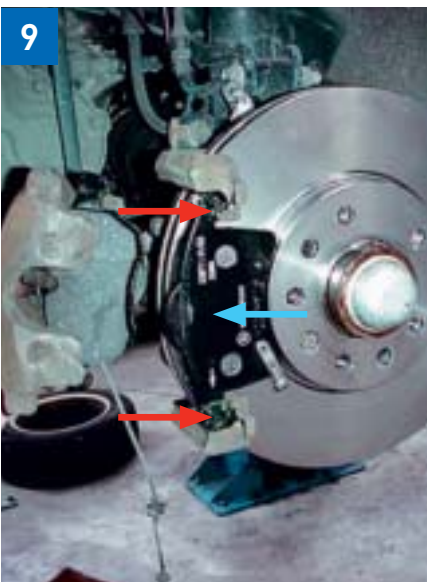
We recommend to measure the new brake discs for lateral run-out using a dial gauge approx. 15mm or 5/8 inch below the largest possible radius on the vehicle.



Resetting the brake piston

The brake piston should always be reset using suitable resetting tools in order to avoid skewing or twisting of the piston.

In this context, the different caliper and/or brake system versions as well as manufacturer-specific regulations and special tools are to be considered.



Greasing the contact points

Metal-free permanent lubricant is not required on the backing plates of pads with so-called secondary measures, such as damping lacquer coatings or dampening shims. Only grease the area around the pad contact points in the guide shafts.

Torques and specifications and/or guidelines of the vehicle and system manufacturers must be complied with during all steps of the repair process.

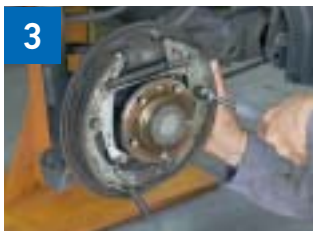
Steps for a Professional Drum Brake Repair and proper wheel installation.



1 Check brake drum for wear and damage. Determine the diameter. New dimension plus 0.5mm/.020 inch up to the maximum diameter can be used with oversize pads only.



2 Always use the proper brake tools for installation and disassembly of **return springs**
→ **Caution: Risk of injury!**



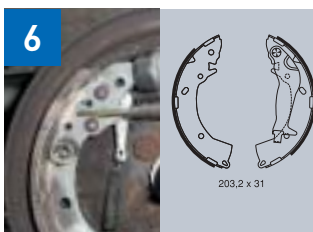
3 In order to avoid component damage, always use the proper brake tool for installing and disassembly of the retaining or "hold-down" springs.
→ **Caution: Risk of injury!**



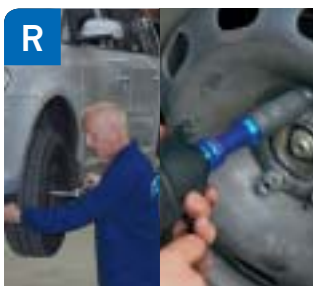
4 In order to avoid component damage, always use suitable special tools for installing and dismantling the **hand brake cable**.
→ **Caution: Risk of injury!**



5 Secure the wheel cylinder pistons using a suitable tool during brake shoe removal.



6 Check the automatic adjusting mechanisms for wear and damage as needed. In order to clearly assign the brake shoes (primary and secondary shoe), the rear left brake is always illustrated in the Hella Pagid Brake Systems catalogue.



R In order to prevent wheel hub damage and/or axial run-out deviation of the brake discs, wheel bolt and wheel nut must be tightened according to the manufacturer's specifications (sequence and tightening torque).

→ If an impact wrench is used, torque limiter must always be used. Then final assembly is realized using the torque wrench. Wheels must be mounted free from tension and without load.

Troubleshooting Tips

Check, determine and replace as needed: (Tips on how to avoid complaints)

	<p>→ Wheel bearing</p> <ul style="list-style-type: none"> ✓ Play/ damage <p>→ Wheel hub</p> <ul style="list-style-type: none"> ✓ Clean (metallic bright) ✓ Axial run-out deviation using dial gauge ✓ Detectible damage ✓ Corrosion protection (no solid constituents) 	<p>→ Axle nut</p> <ul style="list-style-type: none"> ✓ Strength and securing <p>→ Wheel bolt thread</p> <ul style="list-style-type: none"> ✓ Damage ✓ It must be easy to manually screw in the bolts
	<p>→ Transverse control arm bearing</p> <ul style="list-style-type: none"> ✓ Replace in the case of increased play or porosity 	<p>CAUTION!</p> <p>Depending on the axle design, an impermissible play can be difficult to determine.</p>
		<p>→ Load-bearing joint</p> <p>→ Tie rod end</p> <ul style="list-style-type: none"> ✓ Joint play ✓ Check sealing collar for porosity and leaks ✓ Fixing the joints (locking screws)
		<p>→ Brake caliper</p> <p>Piston</p> <ul style="list-style-type: none"> ✓ Leak-tight, smooth running <p>Dust boot</p> <ul style="list-style-type: none"> ✓ Leak-tight, porous <p>Caliper housing</p> <ul style="list-style-type: none"> ✓ Damage <p>Slide piece</p> <ul style="list-style-type: none"> ✓ Play, smooth running ✓ Sealing
	<p>→ Brake hose</p> <ul style="list-style-type: none"> ✓ Leak-tight, porous, chafing points ✓ Inner diameter (swollen) ✓ Screw connection ✓ Observe maximum design life 	
	<p>→ Spring strut</p> <ul style="list-style-type: none"> ✓ Leak-tight (detectable oil leakage) ✓ Damper performance test in advance ✓ Broken spring ✓ Damper mounting ✓ Fixing 	<p>CAUTION!</p> <p>Chassis changes impact effect and comfort of the brake system.</p>
	<p>→ Drive shaft bellow</p> <ul style="list-style-type: none"> ✓ Leak-tight, porous 	

HELLA KGaA Hueck & Co.

Rixbecker Straße 75
59552 Lippstadt, Germany
Tel.: +49 2941 38-0
Fax: +49 2941 38-7133
Internet: www.hella.com

HELLA Ireland Limited

Woodford Business Park
Santry, Dublin 17
Republic of Ireland
Tel.: +353 (1) 8620000
Fax: +353 (1) 8621133
E-mail: irlsales@hella.com
Website: www.hella.ie

© HELLA KGaA Hueck & Co., Lippstadt
922 999 133-578 KB/02.13/1.6
Printed in Germany

Notes and explanation

A basic prerequisite for every repair is cleaning of all components, followed by lubrication of all necessary spots in the area of the guide shafts or the brake pads and/or at the mounting points of the brake shoe using a non-conductive, high-temperature-resistant (metal-free) paste from our product range suitable for ABS vehicles.

→ **Do not use copper paste!**

All components, which were not assessed as OK, are to be strictly exchanged according to the guidelines of the vehicle, system and brake manufacturers.

Observance of the notes helps to avoid technical problems and complaints.

Important notes!

Observe the instruction leaflet in the Hella Pagid Brake Systems disk brake pad packages. Here you obtain notes to special installation instructions, such as

- Unidirectional disc brake pads
 - Colour marking of the backing plate and its meaning
 - Warnings regarding work on the electro-hydraulic brake system
 - Disc brake pads with removable foil on the rear plate for adhesive fixing, etc.
- **Caution! In the case of vehicles with an electro-hydraulic brake (e.g., SBC-Sensotronic-Brake-Control). Never perform brake pad replacement and brake fluid exchange at the same time! Work on the electronic brake system may be performed by trained personnel only.**

Please observe!

The regulations of vehicle and brake system manufacturers regarding repair and maintenance must absolutely be observed.