Automotive Rear Brake Caliper Repair Kit Instruction Manual

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1. Product Overview

The automotive rear brake caliper repair kit is a professional maintenance accessory specially designed for the rear brake caliper of passenger vehicles, light-duty trucks and SUVs. It is used to repair and maintain the rear brake caliper that has problems such as oil leakage, loose piston, abnormal noise, poor braking performance or aging of sealing parts, so as to restore the normal working performance of the rear brake caliper. As a key component of the vehicle braking system, the rear brake caliper is responsible for converting hydraulic pressure into mechanical force, pushing the brake pads to rub against the brake disc (or brake drum), so as to realize the deceleration or parking of the vehicle superscript:2. This repair kit integrates all necessary replacement parts and auxiliary accessories for rear brake caliper maintenance, with standardized specifications, high compatibility and reliable quality, which can effectively solve common faults of rear brake calipers, avoid the cost of replacing the entire caliper, and ensure the safety and stability of the vehicle braking system.

The product adopts high-quality materials, strictly complies with automotive braking system accessory standards, has good wear resistance, corrosion resistance and sealing performance, adapts to the harsh working environment of the rear brake caliper (such as high temperature, humidity, road dust and brake fluid erosion), and ensures long-term stable operation after repair. It is widely used in automotive maintenance shops, 4S stores and personal maintenance scenarios, providing convenient and efficient solutions for rear brake caliper maintenance.

2. Scope of Application & Core Specifications

2.1 Scope of Application

Suitable for most conventional fuel vehicles, hybrid electric vehicles and pure electric vehicles equipped with disc brake systems (partial drum brake rear calipers are applicable to matching models), covering family sedans, SUVs, MPVs, light-duty pickup trucks and other models. It is divided into models according to the specifications of the rear brake caliper (such as piston diameter, caliper type), and is compatible with most mainstream vehicle brands and models. It is specially used for the maintenance of rear brake calipers, including the replacement of sealing parts, piston repair, dust prevention and rust prevention, and fault elimination. It is prohibited to use on special engineering vehicles, heavy commercial vehicles, modified vehicles with non-standard brake systems, or rear brake calipers with serious deformation, cracks or irreparable damage (such vehicles need to replace the entire brake caliper instead of using this repair kit)superscript:2.

2.2 Core Specifications

Condition: Aftermarket, 100% Brand New, unused and undamaged, passed strict quality inspection before leaving the factory

Material Standard: Sealing parts (oil seal, dust cover) adopt high-temperature resistant, oil-resistant nitrile rubber or fluorine rubber; piston (if included) adopts high-precision aluminum alloy or cast iron (consistent with original vehicle specifications), with anti-corrosion coating; springs, pins and other metal accessories adopt high-strength carbon steel, with anti-rust treatment

Working Temperature: -40℃ to 200℃, adapting to the high-temperature environment generated during vehicle braking

Compatibility: Matching the rear brake caliper specifications of mainstream vehicle models, with clear model distinction (please confirm the vehicle model, caliper type and piston diameter before use)

Sealing Performance: Sealing parts meet automotive brake fluid resistance standards, no oil leakage after installation, and can withstand the hydraulic pressure of the braking system (0.8-1.2MPa)

Service Life: After correct installation and use, the service life of the repair kit parts is not less than 30,000 kilometers (or 2 years), subject to the actual use environment and maintenance conditions

3. Product Components & Functions

3.1 Product Components

The repair kit is equipped with all necessary parts for rear brake caliper maintenance (the specific configuration varies slightly according to the model, please refer to the product packaging list):

- Main Sealing Parts: Piston oil seal (1-2 pieces, matching the piston diameter), dust cover (1-2 pieces), used to prevent brake fluid leakage and dust, water and other impurities from entering the caliper interior, ensuring the sealing performance of the caliper.
- Piston (optional): High-precision piston, used to replace the original piston that is worn, scratched, corroded or deformed, ensuring the smooth movement of the piston in the caliper cylinder.
- Metal Accessories: Guide pins, return springs, retaining clips, fixing screws, etc., used to fix the caliper, ensure the flexible movement of the caliper bracket, and prevent abnormal noise during braking.
- Auxiliary Accessories: Brake caliper lubricating grease (high-temperature resistant, anti-corrosion), cleaning agent (for cleaning the caliper interior and piston), gloves (for operation protection), and product installation manual.

3.2 Core Functions

Sealing Repair: Replace the aging, damaged or deformed oil seal and dust cover to solve the problem of brake fluid leakage of the rear brake caliper, avoid the reduction of braking hydraulic pressure and affect braking performance.

Piston Maintenance: Replace the worn or damaged piston, eliminate the stuck, inflexible movement or oil leakage caused by piston damage, ensure the piston can smoothly convert hydraulic pressure into mechanical force.

Abnormal Noise Elimination: Replace the loose or damaged return springs, guide pins and other accessories, lubricate the caliper moving parts, solve the abnormal noise (such as squeaking, rattle) during rear braking.

Performance Restoration: Through the replacement and maintenance of key parts, restore the normal working state of the rear brake caliper, ensure the consistency of braking force between the left and right rear wheels, and improve the braking stability and safety of the vehicle.

Rust Prevention and Protection: The equipped lubricating grease and anti-rust accessories can effectively prevent the caliper interior, piston and guide pins from rusting and corrosion, extend the service life of the rear brake caliper.

4. Pre-repair Preparation & Required Tools

4.1 Pre-repair Preparation

1. Vehicle Preparation: Park the vehicle on a flat, safe and well-ventilated area,

turn off the engine, pull up the handbrake (note: when disassembling the rear brake caliper, do not pull up the handbrake to avoid the caliper being stuck and unable to be removed)superscript:1, block the front wheels with wheel blocks to prevent the vehicle from sliding. Open the engine hood, find the brake fluid reservoir, and pump out 1/2 of the brake fluid (to avoid brake fluid overflow when disassembling the caliper and polluting the vehicle body).

2. Product Inspection: Unpack the repair kit, check all components according to the packaging list, confirm that there are no missing, damaged, deformed or mismatched parts (especially the oil seal and piston, which must match the rear brake caliper specifications of the vehicle). Check that the lubricating grease and cleaning agent are not leaking, and the auxiliary accessories are complete.

3. Caliper Inspection: Before disassembly, check the rear brake caliper for obvious cracks, deformation, serious rust or irreparable damage. If the caliper body is cracked or severely deformed, do not use this repair kit for maintenance, and replace the entire rear brake caliper instead.

4. Safety Preparation: Wear protective gloves and goggles to avoid brake fluid splashing on the skin and eyes (brake fluid is corrosive). Prepare a clean container to collect the leaked brake fluid, and avoid environmental pollution.

5. Tool Preparation: Prepare all required tools (see Section 4.2) and place them neatly for easy access. Clean the working area to avoid dust and impurities entering the caliper interior during maintenance.

4.2 Required Tools

Basic Tools: Socket wrench set (including 8-19mm sockets), combination screwdrivers, pliers (needle-nose pliers, diagonal pliers), torque wrench (for tightening screws according to standard torque).

Special Tools: Brake caliper piston compression tool (or piston return 专用 tool, especially for rear calipers with stepped thread piston, which cannot be reset by prying)superscript:1, brake caliper disassembly tool, wire brush (for cleaning rust and dirt), rag (for wiping).

Auxiliary Tools: Brake fluid (consistent with the original vehicle specification), cleaning agent (for cleaning caliper and piston), waste oil container, anti-rust spray (optional).

Note: Non-professional maintenance personnel are recommended to entrust professional automotive maintenance technicians to complete the repair work, so as to avoid improper operation leading to brake system failure, oil leakage or braking safety hazards.

5. Standard Disassembly & Repair Steps

1. Remove the Rear Wheel: Use a socket wrench to loosen the rear wheel bolts (do not remove them completely), jack up the vehicle (jack up at the designated

position of the vehicle body), place the jack stand to support the vehicle stably (ensure the vehicle is firm and does not shake), then remove the rear wheel bolts and take down the rear wheel.

2. Disassemble the Rear Brake Caliper: First, disconnect the brake hose from the caliper (loosen the connecting bolt gently, place the waste oil container under it to collect the leaked brake fluid, and avoid brake fluid splashing). Then, loosen the fixing bolts of the caliper bracket, take down the caliper from the bracket, and hang the caliper with a wire (do not let the caliper hang by the brake hose alone, so as to avoid damaging the hose).

3. Disassemble the Caliper Internal Components: Remove the brake pads from the caliper, take out the return springs, retaining clips and guide pins. Use a special tool to press out the piston from the caliper cylinder (for rear calipers with electronic handbrake, a computer is needed to reset the brake pad before disassembling the piston)superscript:1. Remove the old oil seal and dust cover from the caliper cylinder, and clean the caliper interior with a wire brush and cleaning agent to remove rust, dirt and old brake fluid.

4. Clean and Inspect: Clean the piston (if not replaced) with cleaning agent, check for scratches, corrosion, deformation or wear; if the piston is damaged, replace it with a new piston in the repair kit. Clean the guide pins, caliper bracket and other metal accessories, check for rust, deformation or wear, and replace the damaged accessories if necessary.

5. Install New Components: Apply a thin layer of lubricating grease to the inner wall of the caliper cylinder, install the new oil seal and dust cover (ensure the oil seal is installed in place, without skew). Apply lubricating grease to the new piston (or cleaned original piston), and use a special tool to press the piston into the caliper cylinder slowly and evenly (do not skew or damage the oil seal).

6. Reassemble the Caliper: Install the return springs, retaining clips and guide pins (apply lubricating grease to the guide pins to ensure flexible movement), and install the new brake pads into the caliper (note that the outer brake pad should not fall to the ground to avoid lubricating grease adhering to dust)superscript:1. Reinstall the caliper to the bracket, tighten the caliper fixing bolts according to the standard torque (refer to the vehicle maintenance manual for the specific torque value).

7. Connect the Brake Hose: Reconnect the brake hose to the caliper, tighten the connecting bolt (do not over-tighten to avoid damaging the thread), and check for brake fluid leakage.

8. Bleed the Brake System: After the caliper is reinstalled, add new brake fluid to the brake fluid reservoir (fill to the standard scale). Ask an assistant to step on the brake pedal repeatedly until it is firm, then loosen the bleeder screw on the caliper to release the air and old brake fluid in the system (repeat until no air bubbles are discharged from the bleeder screw), then tighten the bleeder screw. During the bleeding process, keep adding brake fluid to avoid air entering the system.

6. Post-repair Inspection & Test

6.1 Post-repair Inspection

- Visual Inspection: Check whether all components of the rear brake caliper are installed in place, whether the bolts are tightened, whether the brake hose is intact and has no leakage, whether the oil seal and dust cover are installed correctly and have no skew.
- Fluid Leakage Inspection: Observe the caliper, brake hose and connecting parts for brake fluid leakage. If there is leakage, recheck the installation of the oil seal and the tightness of the connecting bolts, and troubleshoot in time.
- Movement Inspection: Manually push the caliper to check whether it moves flexibly, whether the guide pins slide smoothly, and whether there is jamming or abnormal resistance. Check whether the piston moves smoothly without jamming.

6.2 Test Run

1. Low-speed Test: Reinstall the rear wheel, tighten the wheel bolts (tighten them by hand first when the wheel is suspended, then tighten them with a torque wrench after the vehicle falls to the ground), remove the jack stand and wheel blocks. Start the vehicle, drive at a low speed (5-10km/h) in a safe area, step on the brake pedal several times to make the brake pads and brake disc fit closely (this step is very important, otherwise the first brake will be ineffective and may cause accidents)superscript:1.
2. Braking Performance Test: Drive at a speed of 20-30km/h, step on the brake pedal gently to check whether the braking is stable, whether the vehicle deviates, and whether the rear brake has abnormal noise. Step on the brake pedal firmly to check the braking force and braking distance, ensuring that the braking performance meets the safety requirements.
3. Post-test Inspection: After the test run, park the vehicle, turn off the engine, check the rear brake caliper for overheating (slight heat is normal, excessive heat indicates abnormal friction), check the brake fluid level (supplement if insufficient), and confirm that there is no brake fluid leakage.

7. Safety Warnings & Cautions

Important Safety Warning: The rear brake caliper is a key component of the vehicle braking system, and its maintenance quality is directly related to the safety of the driver, passengers and other road users. Improper disassembly, repair or installation may cause brake failure, oil leakage, vehicle deviation, braking distance increase and other serious safety hazards. Please strictly abide by the following requirements:

Before maintenance, the vehicle must be parked stably, the handbrake must not be pulled up when disassembling the rear caliper, the wheel blocks must be used to fix the vehicle, and the jack stand must be used to support the vehicle (it is strictly

prohibited to rely on the jack alone to support the vehicle during operation) to avoid the vehicle sliding and causing injury.

Brake fluid is corrosive, please wear protective gloves and goggles during operation. Do not let brake fluid splash on the vehicle paint (if splashed, wipe it with a clean rag immediately). Collect the waste brake fluid in a dedicated container and dispose of it in accordance with environmental protection requirements (it is strictly prohibited to pour it into the ground or sewer).

Strictly select the repair kit that matches the vehicle model, caliper type and piston diameter. Do not use mismatched parts, otherwise it will cause oil leakage, piston jamming and other faults, affecting braking performance.

During the disassembly and assembly process, do not knock, hit or squeeze the caliper body and piston, so as to avoid deformation, cracks or scratches, which will lead to caliper damage and oil leakage.

The brake system must be bled after maintenance to ensure that there is no air in the system. Air in the brake system will reduce the braking force and lead to brake failure.

Do not reuse the old oil seal, dust cover and other sealing parts. The old parts have been aging and worn, and reusing them will cause brake fluid leakage.

After maintenance, the test run must be carried out. Do not drive on the road directly if the braking performance is not checked. If abnormal conditions (such as oil leakage, abnormal noise, poor braking) are found during the test run, stop the vehicle immediately and troubleshoot.

If the rear brake caliper has serious cracks, deformation, severe corrosion or irreparable damage, do not use this repair kit for maintenance, and replace the entire rear brake caliper in time.

Keep the repair kit components and tools away from children to avoid accidental ingestion, scratching or injury.

8. Maintenance & Storage

8.1 Daily Maintenance (After Repair)

Regularly check the rear brake caliper for brake fluid leakage, whether the guide pins are flexible, and whether the brake pads are worn normally (check once a month or every 5,000 kilometers).

Clean the surface of the rear brake caliper and brake disc regularly with a wire brush and rag to remove dust, rust and brake debris, avoid affecting the braking effect.

Check the brake fluid level regularly, and supplement the brake fluid that meets the original vehicle specification in time (do not mix different types of brake fluid).

Every 10,000 kilometers, check the lubrication of the guide pins, and apply high-temperature resistant lubricating grease if necessary to ensure flexible movement.

8.2 Storage Requirements (Unused Repair Kit)

Store the unused repair kit in a dry, cool, ventilated indoor environment, away from direct sunlight, high temperature, humidity, open flames and corrosive substances (such as brake fluid, gasoline), to avoid aging, deformation or corrosion of the components.

Keep the original packaging intact, and place the components in the packaging in an orderly manner to avoid collision, damage or loss. The lubricating grease and cleaning agent should be sealed and stored to avoid leakage and deterioration.

The storage temperature should be controlled between -10℃ and 40℃. If the repair kit is not used for a long time (more than 1 year), check the components before use to confirm that there is no aging, deformation or damage.

9. Troubleshooting

Fault Symptom	Possible Causes	Solutions
Rear brake caliper oil leakage after repair	Oil seal is not installed in place or skewed; oil seal is damaged; brake hose connection is not tight; caliper cylinder has scratches	Disassemble the caliper, re-install the oil seal or replace the damaged oil seal; tighten the brake hose connecting bolt; if the caliper cylinder has scratches, replace the entire caliper
Abnormal noise during rear braking	Return spring is loose or damaged; guide pins are not lubricated or stuck; brake pads are not installed in place; piston is stuck	Replace the loose or damaged return spring; lubricate the guide pins or replace the stuck guide pins; re-install the brake pads; check the piston and clean or replace it if necessary
Braking is weak, braking distance increases	There is air in the brake system; brake fluid is insufficient or deteriorated; piston is stuck; oil seal leaks	Bleed the brake system again; add new brake fluid that meets the specifications; check and repair the stuck piston; replace the leaking oil seal
Vehicle deviates during	Uneven braking force of	Check and adjust the left

braking	left and right rear calipers; guide pins are stuck; brake pads are worn unevenly	and right rear calipers; lubricate or replace the stuck guide pins; replace the unevenly worn brake pads
Piston cannot be pressed into the caliper cylinder	Piston or caliper cylinder has rust or dirt; oil seal is installed incorrectly; using improper tools (rear stepped thread piston is not reset with special tools)	Clean the piston and caliper cylinder; re-install the oil seal; use the correct special tool to reset the piston (electronic handbrake models need to reset with a computer)superscript:1
Brake caliper overheats after test run	Piston is stuck; guide pins are stuck; brake pads are not installed in place, causing abnormal friction	Disassemble the caliper, check and repair the stuck piston and guide pins; re-install the brake pads correctly