

Original ATE brake calipers and remanufactured calipers

Thermal stability and maximum decelerating power





ATE brake calipers

- ▶ As developers for the world's biggest vehicle manufacturers, Continental produces innovative brake equipment, including fixed and fist calipers in the state-of-the-art materials aluminum and nodular cast iron
- ▶ Continental is Number One in the world in hydraulic brake systems, and in particular also in brake calipers. In this area we are market leaders in Europe too
- ▶ Continental supplies almost all renowned automakers in the world
- ▶ The replacement parts range features a comprehensive selection of fixed and fist calipers in OE quality, along with other brake products
- ▶ As an alternative we offer an equally reliable variant: the ATE remanufactured caliper





Qualities and advantages of ATE brake calipers

Brake calipers as new parts:

- Continental produces more than 165,000 calipers daily
- More than every third car from European production operates with hydraulic brake components or systems from Continental

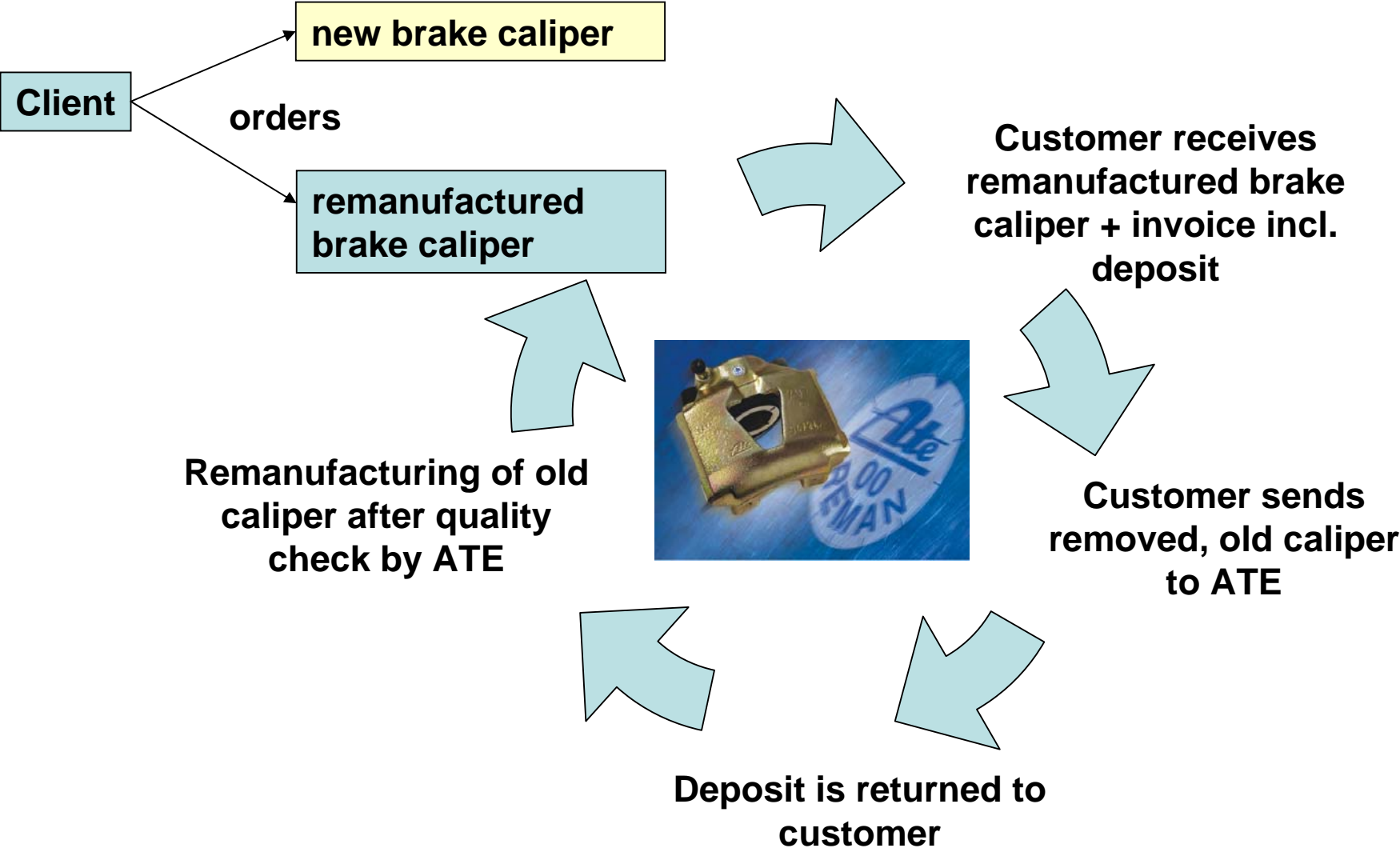
Remanufactured brake calipers – Advantages are:

- Conservation of resources and protection of our environment through recycling
- Same quality standards as for new parts
- Special specification for reprocessing
- Remanufactured calipers are supplied ready for installation. Rear axle calipers with integrated parking brake are mostly prefilled and preadjusted.

Applicable to both calipers:

- Checked for play and knock-back
- Repair kits for individual calipers available
- 24-month warranty

Remanufactured brake caliper cycle

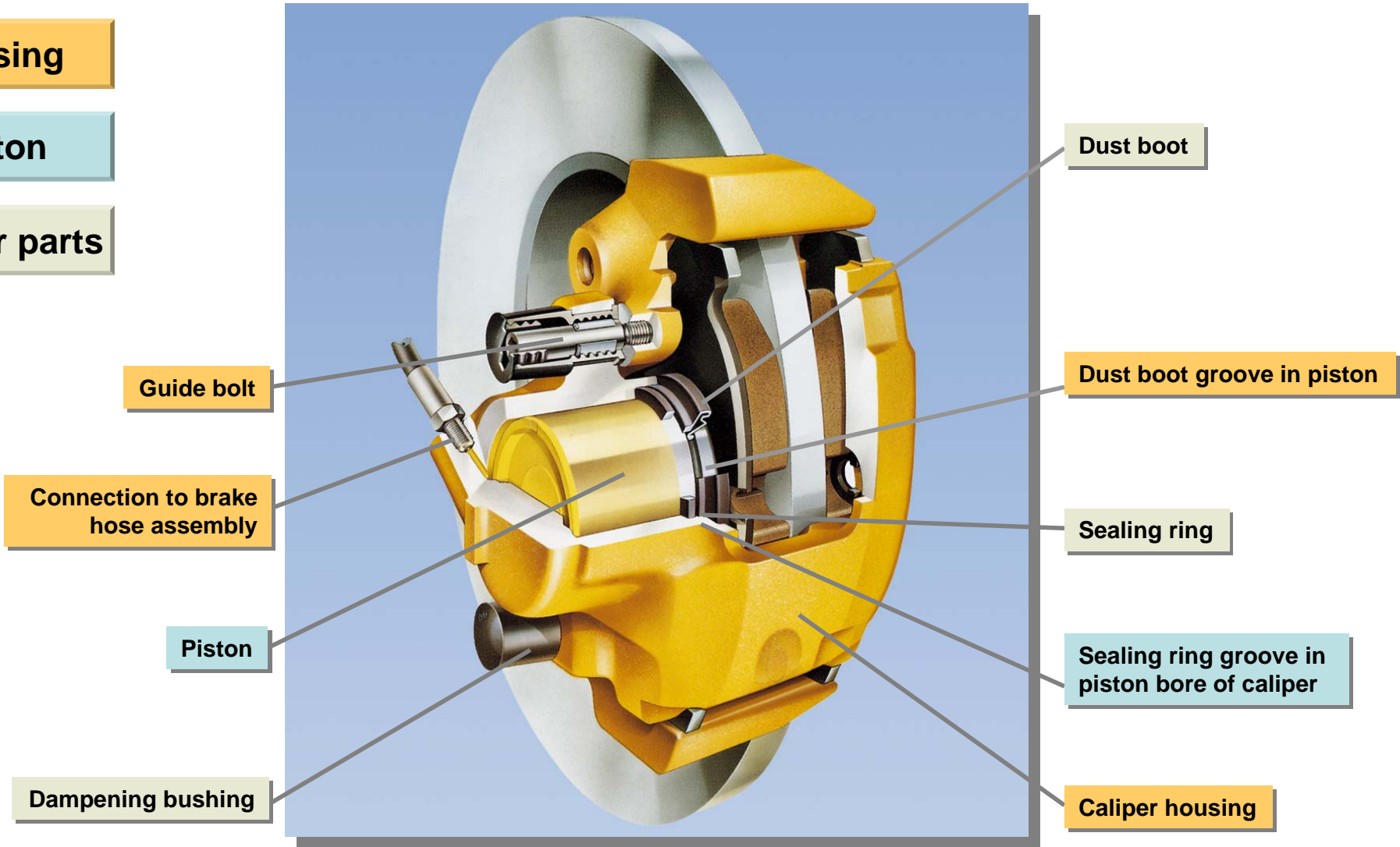


Caliper design (based on an ATE fist caliper)

Housing

Piston

Rubber parts



Replace or repair brake caliper?

When is it necessary to replace brake calipers?

- ▶ When inspection on the brake test bench shows that even with the brake released, braking torque still is present. The piston is stiff and will seize very soon
- ▶ The piston has seized
- ▶ Housing and/or piston show heavy corrosion
- ▶ Brake pads are no longer movable
- ▶ If moisture has penetrated between housing and piston and rust has formed as a consequence of a defective dust boot and defective sealing ring. As a result the piston no longer properly retracts
- ▶ If the temperature of the brake disc is always relatively high. This is an indication that the caliper is no longer in full working order. The pads are wearing
- ▶ Defective parking brake adjustment mechanism of combined caliper

A check of the caliper must be made or caliper accessories replaced in the following cases:

- ▶ Increased disc and pad wear
- ▶ Corroded surface protection of pad and housing
- ▶ Porous collar

As long as the housing, piston and guide elements are movable, the rubber parts and dust boot are okay, and no major corrosion is externally recognizable, replacement is not necessary



Original ATE brake caliper quality

Good handling

- ▶ Easy to fit and remove

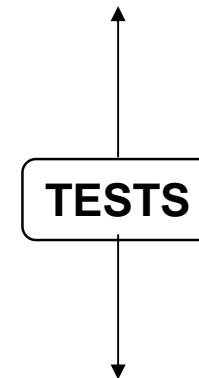
Ensured basic functions

- ▶ Tightness of hydraulic system
- ▶ Function of piston dust boot
- ▶ Piston clearance function (roll-back)
- ▶ Piston reset function (knock-back)
- ▶ Function of housing/pad guides
- ▶ Piston stroke pressure
- ▶ Piston displacement force



Operating stress simulation

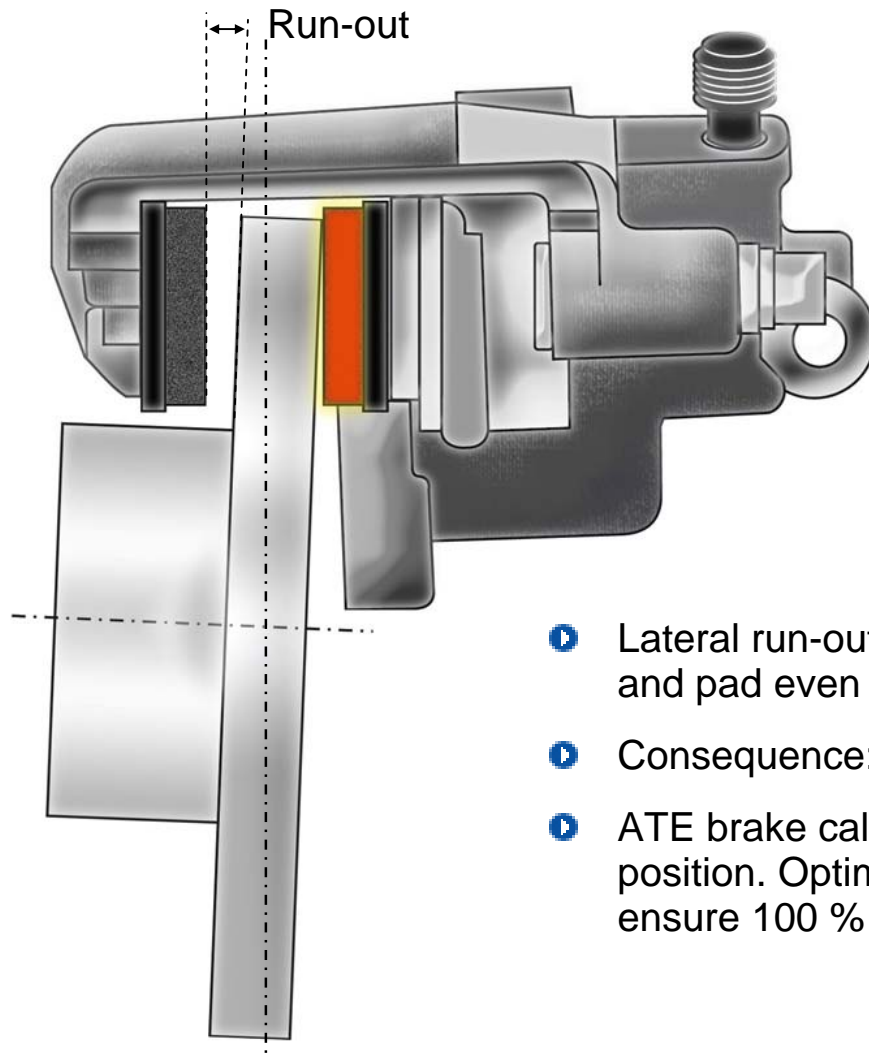
- ▶ Assembly, brake load, vibration, corrosion and wear



Vehicle simulation

- ▶ Driving modes and test routes, etc., are traced under test bench conditions on an inertia dynamometer

Run-out – no problem for ATE brake calipers



- ▶ Lateral run-out exceeding tolerances leads to contact between disc and pad even when the brakes are not applied
- ▶ Consequence: the disc hits the piston and knocks it back
- ▶ ATE brake calipers are designed so that the piston returns to its position. Optimum knock-back behavior and checked clearance ensure 100 % braking performance



Repair kits, tools and accessories

Under the brand name ATE, for brake servicing and repair Continental offers a complete assortment of brake replacement parts in original equipment quality, brake fluids for the most important DOT specifications, special tools, brake servicing equipment, and all aids needed for professional brake services:

Various Original ATE repair kits - available depending on model

- ▶ Brake caliper seal set, dampening bushing set, guide bolt set, installation kit and pad wear warning contacts.

Suitable tools

- ▶ Piston resetting device
- ▶ Piston resetting tool set – for resetting the pistons of combined calipers
- ▶ Other: piston turning pliers, piston, piston turning tools, brake pad impact extractor, etc.

Accessories

- ▶ ATE plastilube[®] to avoid brake noises.



Brake caliper and brake pad test systems

Examples of ATE test benches:

- ▶ Brake pad shearing device
- ▶ Rotary pulsator
- ▶ Holder deformation test bench
- ▶ Hydropulse test rig
- ▶ Combined caliper test bench
- ▶ Clearance measuring device
- ▶ Friction coefficient tester
- ▶ Caliper pulloff and bursting test bench
- ▶ Caliper endurance test rig
- ▶ Caliper performance test bench
- ▶ Caliper pulsation endurance test rig
- ▶ Wear simulation endurance test rig

