

United States
Provisional
Patent Application

Title:

**Modification in Hydraulic Disk Brake Assembly
to Improve Sliding Pin Function**

Inventor

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Abstract of the Disclosure

Described herein is a method and means for encouraging the routine lubrication of the bores and slide pins that are associated with the floating caliper disk brake assembly. It is common knowledge that brake assembly slide pins and their bores are prone to accumulating dirt and debris, which leads to seized or "sticky" slide pins resulting in premature brake wear and unreliable braking performance. The method and means described herein largely eliminates malfunctioning slide pins due to a lack of lubrication.

Field of the Disclosure: This disclosure relates to disk brake calipers used for wheel brakes on a variety of motor vehicles. In a disk braking system, the car's wheels are attached to metal disks, called rotors, that spin in concert with the wheels. The purpose of the caliper assembly is to slow the car's wheels by creating friction on the rotors.

The brake caliper fits over the rotor like a clamp. Within the caliper is a pair of metal plates bonded with friction material called brake pads. Outboard brake pads are positioned near the outside of the rotors, near the curb side, and the inboard brake pads are near the inside of the rotor, toward the interior of the vehicle.

When the driver applies the brakes, brake fluid from a master cylinder creates hydraulic pressure on one or more pistons in the brake caliper urging the pads against the rotor.

One kind of disk brake caliper is the "floating caliper." Floating calipers move in and out relative to the rotor and have one or two pistons only on the inboard side of the rotor. The piston(s) pushes the entire caliper when the brakes are applied creating friction from the brake pads on both sides of the rotor, one pad being urged directly by the cylinder piston and the other by a yoke attached to the cylinder body and extending around the disk. The cylinder body is mounted on the vehicle frame by two cylindrical slide pins.

Floating calipers no longer "float" if the slide pins begin to stick or seize. When one or both of the slide pins become seized, the pressure applied to the piston causes only the inboard side brake pad to contact the rotor. Uneven or one-sided pressure applied to the rotor results in poor braking performance and rapid wear to one pad and rotor face. This condition is not easily discovered because the piston side pad is usually the inboard pad. cursory visual inspection is usually confined to the outboard pad, which is easier to see and in a caliper assembly with seized slide pins, the outboard pads can appear to be new condition while the inboard pads are severely worn.

Currently, the only method or means to prevent seized or sticking slide pins is to maintain pin/bore lubrication by fully disassembling the wheel and caliper assembly thus permitting access to and removal, cleaning and lubrication of the slide pin and bore.

Brief Description of the Drawing: Picture 1 is an exploded view of a disk brake caliper assembly for a Ford truck. Picture 2 is a caliper mount bracket with Zerk grease fittings installed. Picture 3 illustrates the easy access to a caliper mount bracket with Zerk fittings. And Picture 4 is a schematic depicting an access hole drilled in the caliper mounting bracket to permit fluid communication with the pin/bores.

Description of the Disclosed Invention: Applicant experienced a seized slide pin on the caliper disk brakes of a 2008 Ford F-250. With reference to Picture #1, the pin HB1 was seized within caliper mounting bracket 2B292 and resisted removal by normal means. The caliper mounting bracket houses the bore for the slide pin, so the bracket was drilled and tapped to allow high pressure hydraulic fluid to be introduced into the housing in an effort to force the removal of the seized pin. Notwithstanding the application of 10,000 psi hydraulic fluid being urged against the seized pin within the bore of the drilled bracket, the seized pin could not be removed and a new caliper mounting bracket and slide pin was ordered and installed.

While the immediate problem (seized caliper pin) was solved by the installation of the new caliper mounting bracket and slide pin, future problems of the same or similar nature can be prevented. Realizing that a hole could be drilled in the caliper mounting bracket to access the slide pin bore to attempt a removal of the slide pin, Applicant reasoned that a similar hole could be drilled to access and lubricate an unseized, normally functioning slide pin and that periodic lubrication would prevent future seizing.

Accordingly, then, Applicant drilled directly into the caliper mounting bracket (Picture #4) accessing the distal end of the pin bores, then tapped the access holes with a 1/8" NPT and installed grease Zerks or fittings on each access hole. (There are two slide pins per caliper assembly.) The Zerk fittings allow the pins and their bores to be lubricated at regular intervals. Lubrication can be effected by accessing the Zerk fittings through the wheels (see Picture #3) without dismounting the wheel.

To reiterate, implementation of the disclosed method and means permits routine lubrication of the caliper disk brake slide pins and bore and greatly reduces the likelihood of seized caliper slide pins, providing a safer and more reliable brake assembly while increasing pad, rotor and caliper life.

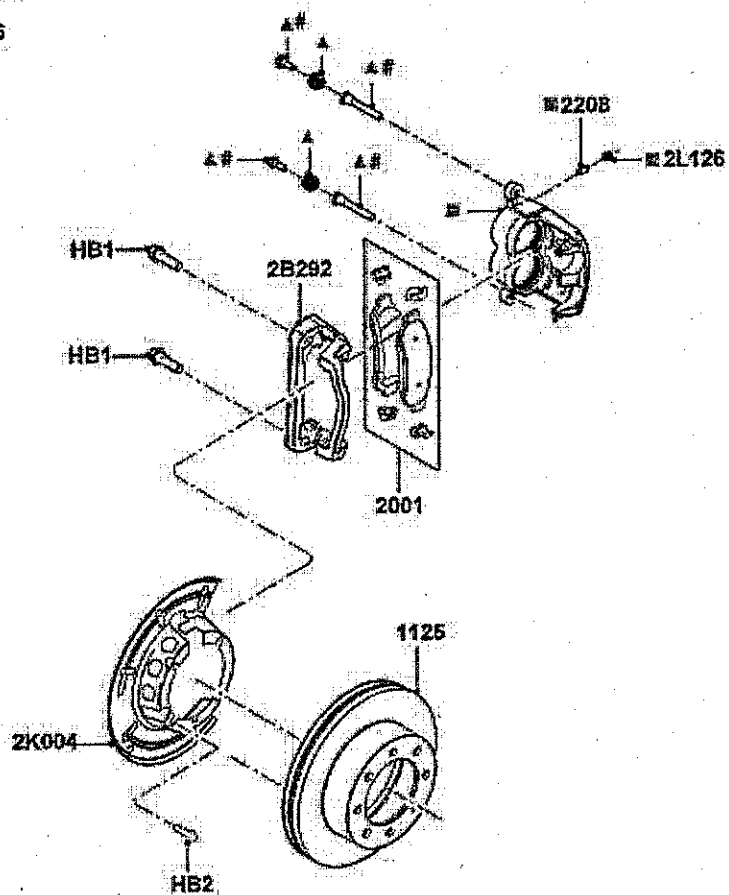
While the foregoing is a complete and detailed description of the preferred method for improving the performance of slide pins in a hydraulic brake caliper assembly by fitting said assembly with grease Zerks for lubricating the slide pins on a regular or routine schedule, it should be apparent that numerous variations of the disclosed caliper mounting bracket modification can be employed that would clearly be within the spirit of this disclosure. The sole purpose of this Provisional Application is to lay a firm and referable foundation for an even more detailed and complete disclosure in the form of a non-provisional application, which when filed and prosecuted, should result in a valid patent, said non-provisional application to be filed in due course and within the appropriate period of time.

Picture #1 (Ford Assembly Call Out)

图号 2B120

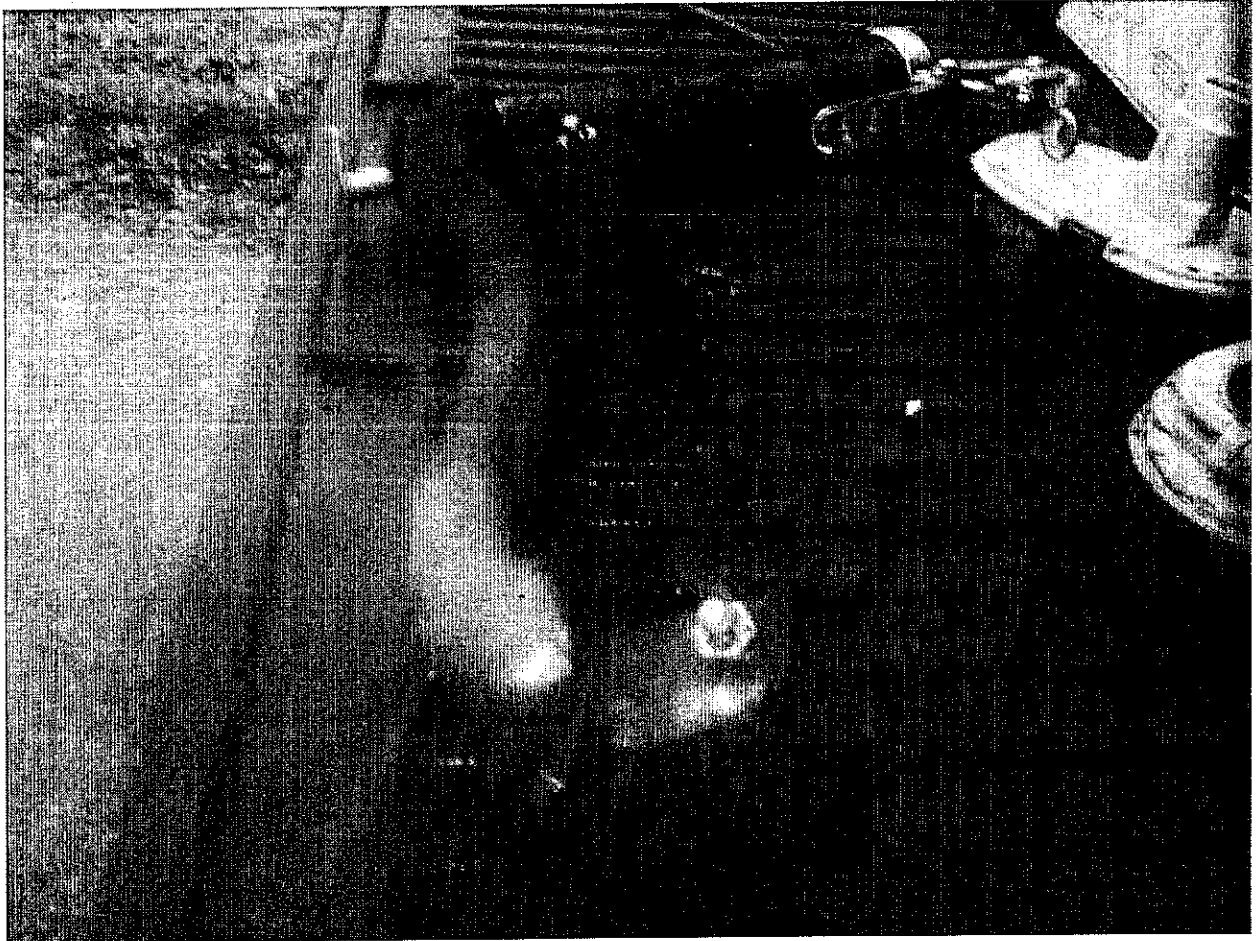
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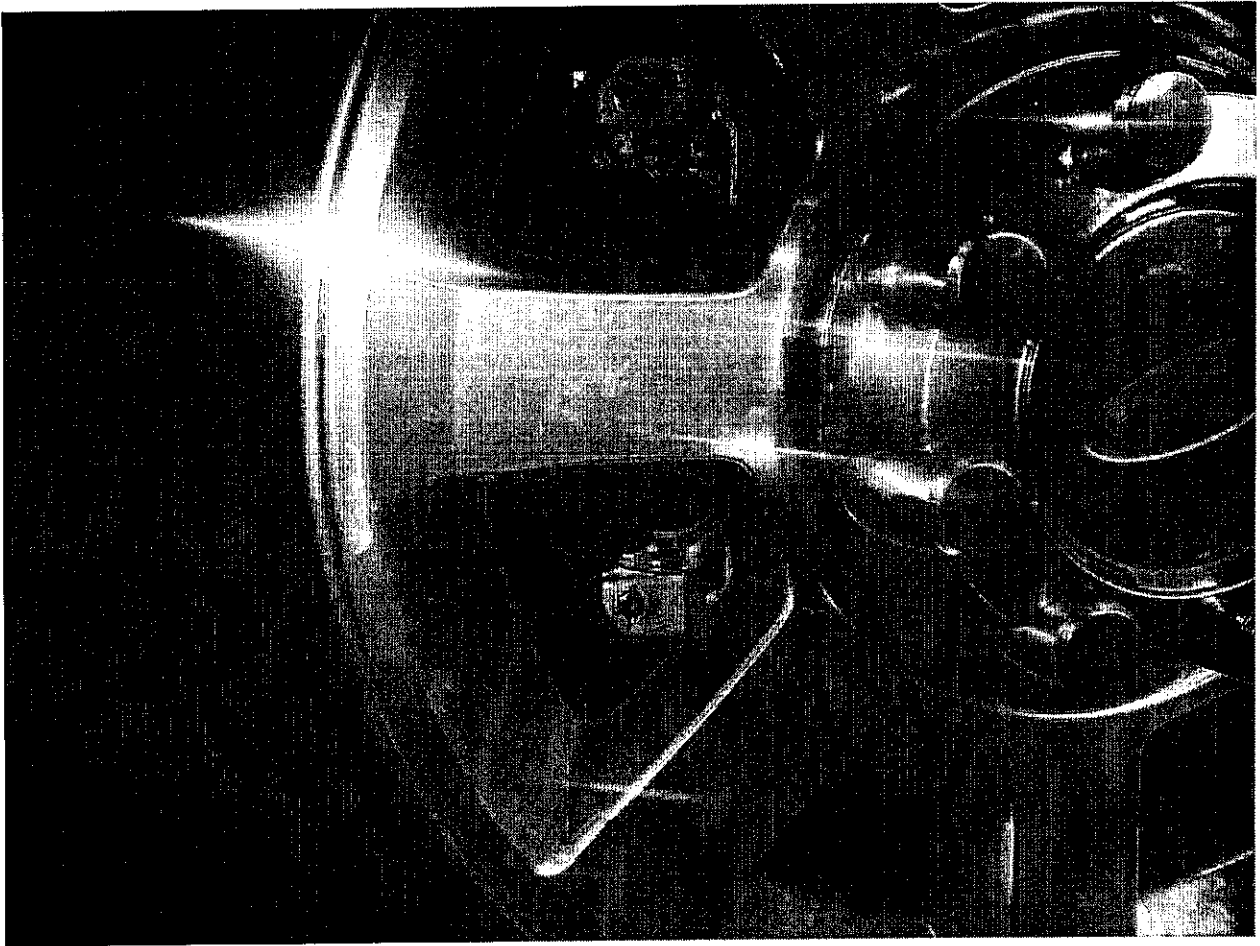
Picture #2

Caliper Mount Bracket with modification completed and grease zerks installed.



Picture #3

Injection zerks are easily assessable from outside without dismounting wheels. (2008 F-250)



Picture #4

Drawing of lubrication passages in communication with pin/bores.

