

One method of suppressing the brake noises is based on the principle that two bodies of different mass possess different characteristic frequencies, such that if the two bodies are bonded together and their masses are suitably matched, their vibration frequencies interfere with and impede one another in such a way as to dampen vibration. In accordance with this principle, a brake pad has been manufactured where a metallic carrier plate has a composition friction material on one side and a plastic or aluminum back plate which is bonded using a resin adhesive on the other side. Although good heat insulation can be achieved with the plastic back plate, the vibration damping is not effective.

It is also known to manufacture brake pads based on the principle of damping or absorbing vibration by interposing an elastic damping element between one surface which is vibrating and a second surface which is to be isolated from the vibration. According to this principle, a brake pad has been manufactured where the carrier plate is subdivided into two metal plates with a layer of an elastic, heat insulating material, such as rubber, interposed between the two plates. A problem with this type of pad is that it is extremely expensive to manufacture, and there is a significant reduction in the mechanical strength of the pad. A typical brake pad has a carrier plate which is approximately five millimeters thick. Consequently, even after the friction material has worn off the carrier plate, a portion of the carrier plate is retained in the brake housing during braking. In other words, a portion of the brake housing supports the carrier plate. However, in the case of a brake pad having a multi-layered plate of the type described above, also called a sandwiched lining, it is not desirable to increase the thickness of the carrier plate. This is because, if the carrier plate thickness is increased, the friction lining thickness must be decreased which results in shortening the working life of the pad. Consequently, the multi-part carrier plate must have a total thickness of approximately five millimeters. Each part of the carrier plate must be made two to three millimeters thick. However, after the friction lining has worn off, one part of the carrier plate is completely outside of the brake housing during braking. Only the second part is retained in the brake housing. As a result, the elastic bonding layer between the two parts is subjected to the high shear stress during braking. The layer cannot withstand the stress and one part of the carrier plate is displaced relative to the other, i.e., the part of the carrier plate which engages the disc and is out of the brake housing will be displaced relative to the other part. Under this condition, the part outside of the housing cannot retract into the housing after braking and the brake can no longer be released. In an extreme case, the protruding part of the carrier plate can lock the brake.

In another brake pad having a multi-part carrier plate, a relatively thin self-adhesive, plastic film has been used in place of rubber for the damping-elastic interlayer of the sandwich plate. This film is incapable of satisfactorily absorbing the above-described shear stresses and possesses the additional following disadvantages. If the parts of the carrier plate with the plastic film are placed in a mold in the manner initially described in order to simultaneously press the friction lining and bond the lining to the sandwich plate, the film softens and flows from between the parts of the carrier plate. This is because the plastic film is unable to withstand the temperature and pressure required to shape and cure the friction lining. It is possible to have friction lining first pressed onto one part of the carrier plate and the parts of the carrier plate subsequently bonded in a second die. However, this requires an additional working step which adds to the cost of the pad. Further, this requires an expensive die which accurately surrounds the parts of the carrier plate so that the metal plates are not mutually displaced when the film softens. Customarily, the finished pressed brake pads are ground to exact dimensions on their side faces and are then lacquered at an elevated temperature, in this procedure there is a risk of the film softening and the metal plates being mutually displaced.

In order to manufacture a brake pad which has a multi-part carrier plate in a single working step and which is capable of absorbing the shear forces generated during braking, a multi-part carrier plate has been made with a plurality of matching through bores and a layer of rubber interposed between the parts of the carrier plate. When the friction lining is pressed, the carrier plate bores are filled with lining composition which bonds the sandwiched layers of the carrier plate to one another in a method similar to