

Model A Brakes and Oversize Drums

Why do my brakes not work well after the drums are turned?

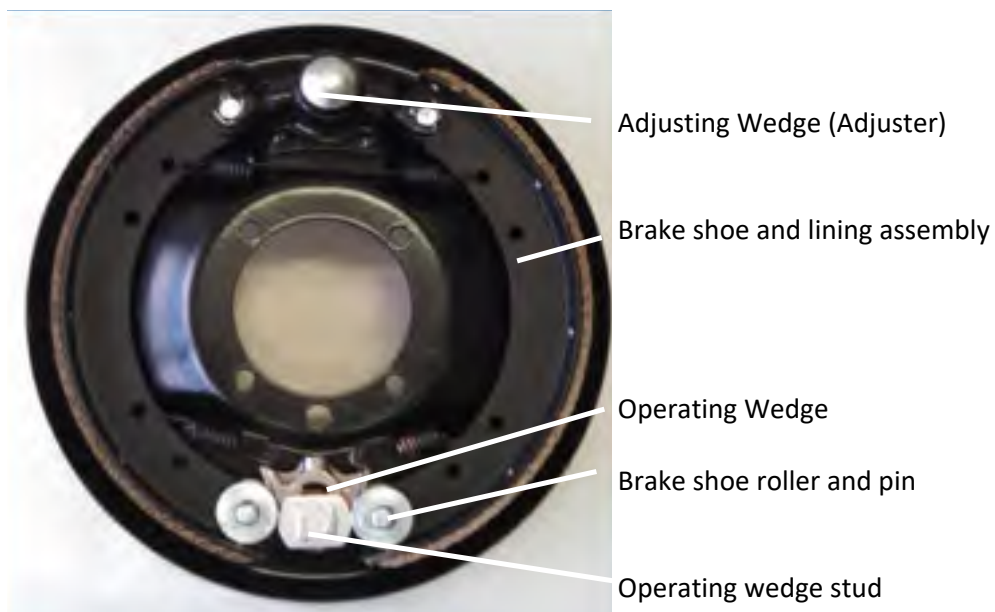
Model A brakes work very well when all the components are restored to exactly how they were designed. But problems occur when some components are not within original specifications. Good quality replacement parts are available including brake shoes and linings, operating wedges, rollers, pins, adjusting shafts (upper shoe links) and drums. Now that good quality cast iron drums have been in use for many years and as cars with these drums have been driven enough miles, brake linings will wear and have to be replaced. When doing so, it is customary to also “turn” the drums to make the drums absolutely round again and restore the finish of the lining contact surface. The result of this is a drum that is “oversize” or slightly larger than what Henry original specified. Oversized drums can cause two problems.

The first problem is the radius of the drum is now slightly larger than the radius of the linings and the linings will no longer have full contact with the drum. Only the center of the shoe will have contact and the ends of the lining will not be touching the drum when the brakes are applied which will result in very poor brake performance. This can be easily corrected by having the shoes ground or “arced” so the surface of the lining is the same radius as that of the drum. A special machine is used to perform this process but with time and patience, the arcing procedure can also be performed by the hobbyist.

Now for the second problem. As originally designed, when the brakes are assembled and adjusted, there should only be a very small clearance (apx. 0.010 of an inch) between the lining and the drum. To understand the importance of maintaining this clearance, let’s first consider the design of the front brakes of the Model A and we will easily see how it becomes a problem.

Now that the drums are larger, when the newly arced shoes are installed, there is too much initial clearance between the lining and the drum. The clearance at the upper end of the lining can be corrected by moving the shoe closer to the drum using the brake adjusting wedge (adjuster). The only way to move the lower end of the shoe closer to the drum is to move the operating wedge down which will push the lower end of the shoes out closer to the drum. This is accomplished by adding shims or “pills” to the operating wedge to initially position the wedge down further when the brakes are released. The operating wedge however has a limited amount of extra travel available because of the length of the slot in the center of the wedge and the size of the wedge anchor stud (See Illustration 2). If the operating wedge is positioned too far down when the brakes are released, the operating wedge will not have enough available travel and will bottom out on the wedge anchor stud before the brakes are fully applied. When this happens, under heavy braking you will sense the brake pedal has become firm and the wheels should start to lock up but you find the car only slows down a bit. This is because the operating wedge has bottomed out and you are not actually fully applying the brakes.

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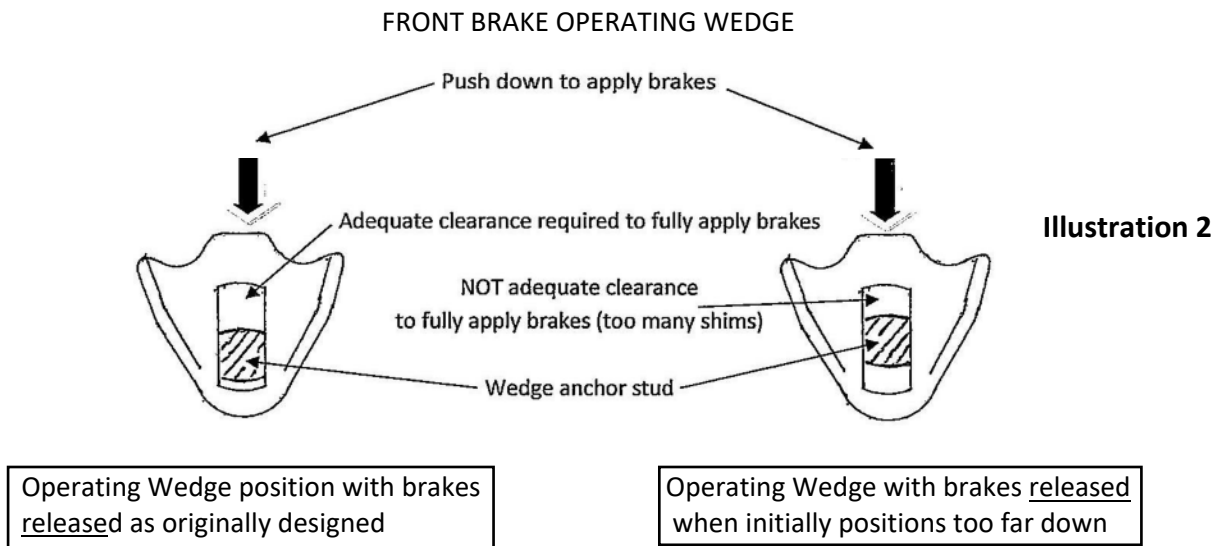
To correct this situation, it is necessary to re-establish the initial lining to drum clearance. This is accomplished by installing extra thick brake lining and grinding it to the correct thickness and radius that will compensate for the amount of oversize of the drum. Extra thick linings are available from most of the better Model A parts suppliers. As designed, Model A brake drums had a diameter of 11.000 inches and the linings were 3/16 inches thick. When using oversize drums, the correct radius of the lining is determined by the actual radius of the oversize drum.

The correct thickness of the lining is determined by adding the amount of increase of the drum radius to the original 3/16 inch design thickness of the lining material. For example, if the drums have been turned 0.060 inch oversize, that is an increase of 0.030 inches in the radius of the drum. The lining should now have a finished radius of 5.530 inches ($11.060 / 2$), and a thickness of 0.218 inches, ($3/16$ or $0.188 + .030$). Both the radius and thickness of the lining are critical for proper operating brakes.

If the radius is not correct, the linings will not have full contact with the drums. If the linings are too thin, there will be too much initial clearance between the lining and drum and the operating wedge may bottom out. If the linings are too thick you may not be able to install the drums.

Brake drums that are no more than about 0.020 inches oversize will usually not require extra thick lining but drums that are 0.030 to 0.060 inches oversize will usually require extra thick lining for good brake performance. For safety considerations, I would not recommend using drums that are more than 0.060 inches oversize.

Modern hydraulic brakes have enough adjustability built into the design that re-establishing the drum to lining clearance is not a problem but the Model A brakes will not function properly with oversize drums without taking into consideration the final radius and thickness of the lining.



Tech Tip

When doing brake repairs, it is not always necessary to turn the drums. When it is necessary, only remove as little material as possible. If the drums are round and smooth, you can “re-condition” the lining contact surface with 80 grit sand paper. Also, for best brake performance, always use the original type “woven” lining material. The modern “molded” lining material is too hard and has a much lower coefficient of friction than the original type woven Scandinavian lining.