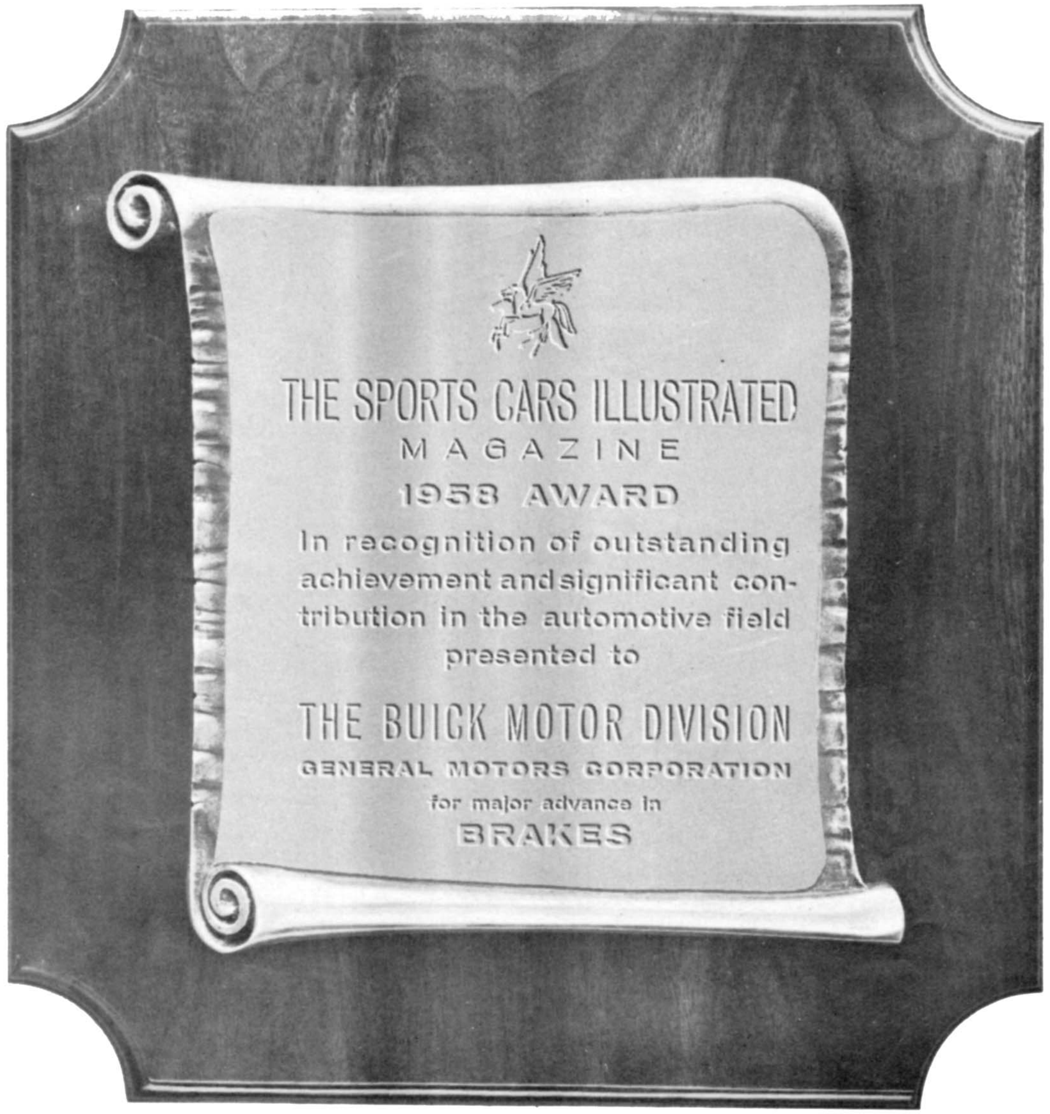


SPORTS CARS ILLUSTRATED has been accused—and rightly so—of being the sternest and most unforgiving critic of automotive brakes. Our brake test is designed to punish the brakes of our test cars and show them in their most unflattering light. And we have been almost the only voice that has continually called attention to the urgent need for improvement in this area, especially in the home-grown product. It is doubly appropriate, then, that we be the first to acknowledge the step that has been taken by Buick—and that we present them with the SCI Achievement Award for being pioneers in the production of safer, more efficient brakes for an American production automobile.

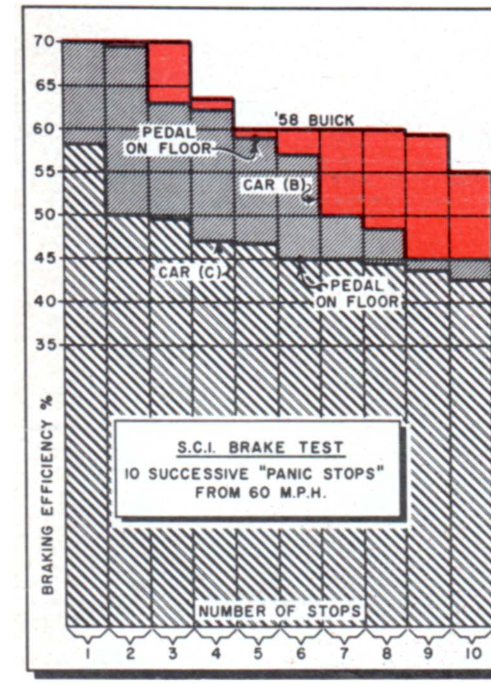
After testing a 1958 Century, one of four Buick series (all but the Special) equipped with new, deeply-finned aluminum front brake drums, it is our agreeable duty to report that these are the best brakes on a Detroit sedan by far that we have tested, and that they are, conservatively, a 100 per cent improvement over conventional Detroit brakes.

In all SCI road tests, the brakes are tested in a series of ten consecutive, simulated-emergency stops from 60 mph. The rate of deceleration is measured by a gravity decelerometer, the results being presented in terms of "braking efficiency", a bit of misnomer that has become traditional. One hundred per cent is equal to one "g" or 32.2 ft/sec², which is a high-falutin' way of saying that your speed drops 22 mph during each second of such fierce deceleration. Like most such standards, it is rarely, if ever, attained and 70% can be considered a superior figure indeed.

More important than a drop in braking efficiency during the brake test is loss of pedal. We find it the rule for Detroit sedans to brake quite efficiently for the first few stops, but then they deteriorate rapidly. It is not unusual for the driver to find he has the brake pedal pressed firmly against the floor during the last stops, indicated in the brake efficiency reading of only 40 or 50, no matter how hard the pedal is being pressed. At best, until they have cooled, which may be as many as 20 minutes later, the brakes are a pathetic shade of their former selves, and in fact, once faded, they will never again be as fade-resistant as they were originally, little as that was. Frequently during these punishing tests they develop squeaks and pull to one side or the other rather alarmingly.

The 1958 Buick Century's brake efficiency story is told in the accompanying chart. While two other Detroit cars tested recently by SCI ran out of brake pedal on the fifth and sixth stops, the Buick still had half its normal pedal travel after 22 crash stops from 60 mph. An eleventh stop attempted in one car was futile, braking capability was nil. While the Buick's efficiency had dropped considerably by the eleventh stop, it remained quite consistent for another eleven, with quick, small recoveries as the drums cooled slightly as the car was being turned around. This was by far the most severe test we ever have submitted a sedan's brakes to, but after it was over the Buick's brakes functioned perfectly. More pedal pressure was required because the linings had been fried, but there was no squeaking, chattering, grabbing, nor the slightest tendency for the brakes to pull to the side.

Our test Buick made twenty-two crash stops from 60 mph, and still had pedal. Superior heat dissipation characteristics of the bi-metallic drum start to become evident after only two stops, when the cars with cast-iron drums suffer fade due to heat build-up. After six stops, cast iron drums don't do the job.



The phenomenon involved in deceleration translates Kinetic Energy (mass times velocity squared) into Heat by means of friction between the brake lining and the drum. The rate at which this heat can be dissipated determines, in the long run, the rate at which the vehicle can continually decelerate.

Any braking system will stop a car *hard* once or twice, but in doing so the brake shoes and drums heat up to such a high temperature that the coefficient of friction will be seriously reduced. This is called brake fade. Continued effective braking depends on dissipation of the heat being generated in each stop. Normally, this drum-to-air heat transfer is too slow to permit further panic stops in a car whose brake system cannot absorb the additional heat that is being developed.

Buick's new alloy drum conducts heat through the drum faster. Heat conductivity of aluminum is three times that of the normally used cast iron, so heat flows through it three times faster to the radial cooling fins, themselves a fairly new concept in Detroit. These fins swirl air into contact with the extra large surface of the hot drum. Aluminum also dissipates heat into air more rapidly than iron, so here again an advantage is gained. Thus, because more heat can be carried off, more heat can be safely developed, and the system can continue to operate at high loads and yet keep the temperature of the brake lining below the sizzle point.

Bonded aluminum-steel brake drums are not exactly new, having been used on racing cars both here and abroad and on some of the sports cars as well. However, this is the first time that any U.S. manufacturer has applied them to a strictly production, drive-it-to-the-market passenger car as a matter of course on a mass production basis. Kudos are due as well to Jaguar for being the first in the world with four wheel disc brakes on a sedan, but frankly, we expect this sort of improvement from a sports car manufacturer of their integrity. Buick is now setting the pace in the brake improvement department for other American manufacturers—which is why SCI is presenting Buick with an award.

These are very good brakes on the Buick; they are as significant today as Oldsmobile's V-8 engine was in 1949. They definitely point the direction which the American industry will go; though not necessarily the route to be followed, as disc brakes cannot be ruled out. Whether disc or bonded drum, American brakes will surely be *better*.

Exterior of bi-metallic drum is aluminum alloy with fins moulded along the periphery. These fins stimulate turbulence in the cooling air and put more drum area in contact with this air. Cutaway shows aluminum alloy (with heat conductivity three times that of cast iron) moulded around ferrous friction surface, similar to the process used on the stoppers of the 1957 Sebring Corvette. Viewed from the inside, the alloy is moulded around and into holes drilled in the cast iron.