

Hudsonotes

Column of Mechanical Miscellany
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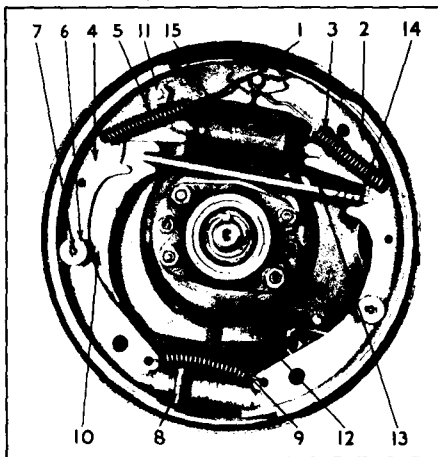
MORE ABOUT BRAKES (second in a series)

ONE QUESTION that remains controversial is: which are preferable—bonded brake linings or riveted ones? This writer tends to favor the riveted linings: they were original equipment on Hudsons, and hence if one is doing a "restoration" rather than just a "reconditioning" or patch-up job, they are the logical choice. Riveted linings also have less tendency to develop a squeal or other noise; however, this has seldom been a problem with Hudson brakes.

It is often pointed out that riveted linings can ruin brake drums if allowed to wear too far. This is entirely true; and the twin grooves cut into drum surface by exposed rivet heads are not a pleasant sight. Drums with most of their friction surface chewed beyond redemption, by contact with a bare steel shoe where bonded lining has worn away, are not a pleasant sight either . . . nor a particularly rare one in repair shops. The moral is that either type of lining *MUST* be replaced before it is worn down to bare metal. Bonded linings can provide some extra mileage, but if they are neglected, the damage to drums can be even worse than that caused by rivets. The traditional

safe limit of wear is about .060 or 1/16 inch, measured from surface of lining (where it is thinnest) to rivet heads—or to shoe surface, if linings are bonded.

Wear is usually most severe either at center of lining or at its upper end, so check these points with especial care. In most cases the secondary lining (the longer one, placed on rearward shoe) wears out before the primary, since it is made of slightly softer material and is also subject to the pushing or "servo" action of the primary shoe whenever brakes are



1. Brake anchor pin
2. Primary brake shoe
3. Primary brake shoe to anchor spring
4. Secondary brake shoe
5. Secondary brake shoe to anchor spring
6. Brake shoe hold-down spring pin
7. Brake shoe hold-down spring cup
8. Brake adjusting screw
9. Brake adjusting screw spring
10. Brake shoe cable lever
11. Brake shoe cable lever to shoe pin
12. Brake cable spring
13. Brake shoe cable lever strut
14. Brake shoe cable lever strut to shoe spring
15. Wheel cylinder.

applied while drum is rotating in forward direction. Purpose of the servo design, with one shoe free to move the other slightly at their lower ends, is to reduce required pedal effort somewhat.

Extreme heavy-duty (racing) linings often use riveting and bonding combined, of course—as do the pads on many modern disc brakes. But apart from this, either type of fastening, when properly done, is more than adequate. Many old-car owners prefer to buy the linings only (usually pre-drilled and countersunk), and rivet these themselves, or have them riveted. That's the traditional way; but it is essential that shoes be in good condition and also free of dirt, grease, old bonding cement, etc. before riveting. After riveting, it is especially important to check the fit of linings in drum, and to grind slightly if required.

Many shops—especially those doing truck work—have a riveting machine, and also one to drill and countersink rivet holes in blank lining. A few even have a curved press, electrically heated, for bonding linings to shoes. Such tools are especially useful when a ready-made lining in the proper quality and size cannot be found, and has to be made up. The press also helps in removing old bonded linings cleanly. Less common is a special tool for cutting brake lining material to size, but an ordinary hand saw—a hacksaw or a fine-toothed wood saw—will do very well if handled carefully.

MORE IMPORTANT, practically speaking, than whether the linings are bonded or riveted is the quality of the lining material itself. Equally important is the balance or match of linings between front and rear wheels, between primary and secondary at each wheel (and of course between

right and left sides of car, which must be identical).

The front wheels do about three-quarters of the work of stopping the car. Fraction varies with speed and load, but nearly always exceeds half. This is not due simply to forward weight bias (most Hudsons are comparatively well balanced front to rear), but to the forward transfer of weight which occurs when a vehicle is braked. One result of weight transfer is the usual pattern of brake lining wear; about twice as rapid at the front wheels.

Another result of transfer is the tendency of some ill-suspended Brand X's during panic stops to stand almost on their noses; and sometimes to "fishtail." When the rear end is forced to do more than its share of braking, with rear wheels locked and most weight taken from them while car is still moving, they will skid—and usually not in a straight line. One correction on some of these cars has been the use of much softer linings on the front wheels, which worsens the problem of unequal wear, but does improve brake balance . . . until the soft lining suddenly fades during a hard stop.

Hudsons frequently are better mannered than that, most models depending upon somewhat wider shoes and larger hydraulic cylinders, with just slightly softer linings, at the front wheels; plus a highly stable chassis design which includes the slightly narrower tread at rear. Many Brand X's have since changed to disc brakes (relatively fade-proof, whatever their other faults) at the front wheels; but the question of correct front/rear proportioning remains. Some models still suffer from severe rear-wheel lockup on hard stops, at least until rear brakes fade sufficiently to balance with front (!); and

some use a springloaded valve placed in rear brake line to help control the problem.

It can be seen why cars are difficult to stop in an emergency using rear brakes alone, either with Hudson safety linkage or with a modern tandem master brake cylinder (pioneered on AMC vehicles). This writer has found that, at in-town speeds, given clean pavement and a Hudson stepdown with studded tires, there is no great problem except the need for strong leg muscles and a few extra feet of space . . . but he has not had the privilege (?) of trying it at highway cruising speeds.

POOR OR MISMATCHED brake linings, however, obviously can ruin the road manners of any car, even a Hudson. Lining materials differ in many ways, but particularly in their "hardness" characteristic. Most inferior linings are too soft, though this is not merely because of cheapness. The soft composition also helps make them quiet, and able to stop the car with less pedal pressure. Those would be advantages except for relatively fast wear rates and a serious tendency to fade when hot.

With harder linings the usual objection is not squeal or noise—these can be controlled by proper mounting and careful installation—but that, without power assist, too much muscle may be required at brake pedal. However, this seldom becomes worse with heat: there is little tendency to fade. A few extra-hard types—the cerametallics—even improve when hot, though they may be leg-breakers around town. Hard linings of poor quality can also score and damage drums, but this is rare.

It is difficult to be specific about brand names. Much replacement lining, including some of fine quality, is made by small

firms, and some of these are also surprisingly patient about offering a varied stock to fit assorted older vehicles. Many of the Hudson factory replacement kits contained linings by Raybestos—still a respected name in the field—although possibly other brands were featured as well. Some companies, notably Grey-Rock, have made a point of offering "balanced" sets for all four wheels of a given car model, due allowance being made for weight distribution and other factors. Actual weight distribution, of course, varies with body style and with the load in trunk and rear seat, but on a full-size car without excessive rear overhang, such as Hudson, this is not overly critical provided a good compromise selection is made.

(Next time: Molded vs. woven linings. Resurfacing drums on lathe.)



"Nothing serious, officer. It's just that he likes to have the oil changed EXACTLY every 1,000 miles"

Atkins in Motor, June 1949