Four Wheel — Brakes The Newest Automotive Idea — Applied to Fords

A Discussion of This Braking Method and a Review of Front Wheel Brakes for the Ford Car

By Murray Fahnstock

Front wheel brakes were the subject of an interesting discussion at a recent meeting of the Society of Automotive Engineers, and it was evident that such brakes were receiving the very serious consideration of practically all the engineers in the automobile industry. It was clear that some of the cars equipped with front wheel brakes were practically forced to fit them. When the car ahead stops quickly, one must either stop quickly or run into the car ahead. But numerous examples are on record that mean the safety of the car and the car ahead, which is not a pleasant proposition.

An incident illustrates this. A recent tour, the writer examined a Duesenberg (fitted with front wheel brakes) in front of the hotel where we stopped for lunch. That afternoon, we saw the same Duesenberg ahead of us and, knowing that the Duesenberg had front wheel brakes and better control than we had, we were worried over the course of several miles, watchful waiting for an opportunity to slip by. In the meantime, one of the Fords (passed by the Duesenberg) seemed to consider this as a challenge, and chased right along as fast as it could go, keeping only some few feet in back of the Duesenberg. When the car was stopped at a stop sign, the Duesenberg’s front wheel brakes were engaged and it coasted to a stop, the Fords being too close for comfort. The driver of the Duesenberg, who was quite calm, said: "Don’t worry, the brakes are in working order; I’ve had several miles of practice after that Ford’s rear end." Rapid acceleration makes a car pleasant to drive — but it’s relatively unimportant, as a test of safety. While rapid acceleration must depend on quick and effective non-skid brakes for safety on the other hand.

The general adoption and proven utility of front and rear bumpers proves that there is still much lacking in the precision control of automobiles in traffic. The majority of cars have brakes that will slide the rear wheels, which proves that the limit in rear wheel braking is being approached. One of the reasons that hindered the development of front wheel brakes is their greater complication, due to the fact that the front wheels are pivoted and the brake linkage must

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Four wheel brakes are coming!

On many other-than-Ford cars they are already here. The announcement of front wheel brakes for cars as of the outstanding features of the new Packard single eight and on the latest Rickenbacker and Buick cars, shows the trend of engineering design, and indicates future probabilities.

Only the Ford Motor Company knows when — if ever — front wheel brakes will be fitted to Ford cars as factory equipment. Probably we are not hazard the guess, until the design of the entire Ford car is radically changed. However, it is now possible to buy front wheel brakes for Fords. This article describes these brakes and their principles.

Four Wheel Brakes for Fords

A more interesting development to Ford owners is the McNerney Four Wheel Brakes for Ford cars, which have been perfected and patented by Charles J. McNerney, well known inventor, and are sold by the McNerney Products Corporation of San Francisco, California. The McNerney brake system is thoroughly demonstrated and thoroughly tested by many of the leading automobile engineers in the country and approved by them. They have been adopted as standard equipment by a large number of the manufacturers in the standard higher class and expensive cars.

The McNerney four wheel brake equipment is of the external contracting type and consists of 4-1/2" steel drums — front and rear, with 13½" brake bands, and best standard lining, which give an expenditure of 0.15 square inches of braking surface, and provides the drive at all times with a simple, positive, and efficient mode of control.

The McNerney brakes are connected through the front wheel brake actuating arm, by means of a shaft on the equalizer connected on the three short housing welded on the bell shaft. The whole assembly is rigidly mounted on the bell shaft and is located by an independent suspension system.

The construction of the operating mechanism of the McNerney front wheel brake is such that it is in operation automatically reinforces the front axle. The installation of the equipment is very simple, and it requires no machine drilling to install.
The text content on the page is not fully legible due to the image quality. However, it appears to discuss automotive engineering, specifically focusing on brake systems and how they work. The text mentions the importance of maintaining brakes, including tightening the brake drums to ensure they run true, and using the correct tools and techniques to adjust the brake system.

The text also touches on the performance and reliability of different brake systems, with a particular emphasis on the design and assembly of brake assemblies. The tone of the text suggests a technical and practical approach to discussing automotive engineering, aimed at both professionals and enthusiasts in the field.

Overall, the page seems to be an excerpt from a technical manual or an engineering publication, providing detailed information on brake system maintenance and performance.
by the foot pedal. The brake cam and shaft are supported by brackets, which are bolted to the front axle, requiring only two holes to be drilled at each end. The brake shown in the cut is attached to a Timken axle, but the same principles are used for brakes applied to Ford axles.

**Special Front Wheel Brake Axle**

One of the larger makers of front axles is now working on a special axle for Ford cars, in which the front wheel brakes will be a special feature of the axle. No cuts are as yet available of the front axle for Ford cars, but it will probably be made along the same general lines as the special front wheel brake axle shown in the cut. A lighter construction and spring perches will be made in order to use as many Ford wearing parts as possible.

Since the use of front wheel brakes will place a twisting or torsional stress on the front axle, it is probable that the axle will have wider webs than the usual Ford front axle. And some special provision may be made for a stronger radius rod.

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**Morton Front Wheel Brakes**

construction, to absorb the shocks when the front wheel brakes are used. It is evident, when front wheel brakes are used, that the impact of the front wheels against the bumps will be greater than when the wheels are free to roll over the bumps.

**Reduces Skidding**

One of the most important advantages of the four wheel brakes is the almost total elimination of skidding which they afford. "What is a skid?"

Isn’t it the attempt, when the brakes are applied, of the rear wheel to push themselves at the front part of the car? The reason being that it is the rear wheels which carry the brakes.

Now isn’t it a simple idea to put the wheels, which the brakes are applied, at the front of the car to begin with? Then there will be no attempt of the brakes-fitted wheels to swing to the front. Because—why, they are already there!

This fine idea can easily be proven by anyone in a few moments. Take a toy automobile and tie the rear wheels so that they will slide. Start this toy automobile down a board, and you will notice that, even though started down hill straight, the rear of the car will swing around and the toy car will reach the bottom of the hill rear end first. Try the same stunt with the rear wheels free to roll and the front wheels tied—and the toy car will slide down hill in a straight and orderly manner, without skidding at all.

"What is skidding?" It is a partial or complete locking of the wheel, and, when the wheel is locked against rotation, it is in effect no longer a wheel, and so slides with equal facility in any direction. It is only while actually rolling, that wheels have that sense of direction which is necessary for the control of a car.

In actual practice, however, we do not depend on front wheel brakes alone, for good rear wheel brakes are already available and might as well be used. Also, it is evident that a car can stop almost twice as quickly with both front and rear wheel brakes, as with either set alone.

Of course, front wheel brakes must not be used to lock the front wheels, as that would tend to cause a front wheel skid. And while front wheel skids are rare, the helpless feeling that such loss of control of a car control occasions will not allow such skids to be forgotten easily.

On many of the cars equipped with four wheel brakes, the adjustment (front and rear brakes) of the brake and rear brakes) is so made that the brake and rear brakes exert 40 per cent of the braking action, while the rear wheels 60 per cent. As a matter of fact, when the brakes are applied, the weight of the car tends to slide forward, so that is automatically taken care of.

The fear of skidding is the shadow that haunts the minds of many drivers, but with the danger of skidding practically removed by the fitting of front wheel brakes, driving will tend to become a greater all year pleasure. For driving a car is not really a pleasure to sensible people, unless it is also safe.

With the dangers of skidding eliminated, it will not be necessary to use chains on the tires to prevent skidding and give increased braking effect. And, as everyone knows, the use of tire chains seems to about double the wear and tear on the tires. Of course, there are times when, if the chains are really needed, they may reduce the tire wear by reducing slipping and sliding. But if we can eliminate the need for tire chains, then the wear of the tires will certainly be reduced.

**DON’T THINK THAT**

Morton Front Wheel Non-Skid Brakes is a new and untried idea. Several of the highest class and most expensive European cars have been for years past equipped with Front Wheel Brakes. They know their value. Dario Resta, Attkken, and other celebrated race drivers attribute their success very largely to front wheel brakes.

You’ve got to try these Brakes to realize the Wonderful Control they give.

"WE’VE GOT SOMETHING!"

The braking stresses are evenly distributed over FRONT and REAR, one-half being applied through the transmission, instead of entirely through it, as at present. This means reduction of wear and tear on transmission and rear tires.

It’s up to every dealer—every owner to investigate this remarkably simple yet wonderfully efficient attachment.

Write today for full particulars.

**Morton Brake Co. Inc.**

1222 First Nat’l Bank Bldg.
Milwaukee, Wis.
Those who used pedal bicycles, fitted with a brake acting on the front tire, will remember the total absence of skidding of such bicycles. When coaster brakes came into use, however, skidding became more general, because of the braking effect being applied to the rear wheels.

For Racing Cars
Strange as it may seem, four wheel brakes were first developed for racing use over European roads; where ability to slow down for turns in the road is almost as important as engine power and ability to pick up speed after the turn has been passed. Far racing on the Indianapolis Speedway, where the cars roll on and on at a nearly uniform high speed, four wheel brakes would be superfluous. And, it is possible that there would be no brake problem whatever in racing on mile dirt tracks. But, for half-mile dirt track racing, it would be interesting to see the idea tried—though driver would have to radically alter his present methods of driving—in that skidding around the turns would be eliminated. We would be glad to hear the results obtained by our readers with front wheel brakes in dirt track racing.

For general road racing use, where there are many bends in the road, it is probable that front wheel brakes would be of considerable advantage towards winning the race. For such racing use, we suggest the use of the special front radius rods, as shown on Ford-Fords, as the strains of racing car use are very severe.

Safety Front Wheel Braking

In order to more clearly illustrate the way in which the weight of a car is transferred, from the front to the rear wheels, by the directly downward forces, we have illustrated a Ford car (with an approximate weight of say 3,800 pounds) on a very steep hill. Let us say that the car is going up the hill, and that the distribution of weight is about 600 pounds on the front wheels and 1200 pounds on the rear wheels (the exact figures are immaterial). But if we place the same car on a steep grade, the center of gravity (with a line drawn directly downward) changes the proportions between the front and rear axles and, instead of having most of the weight on the rear wheels, we may have most of the weight on the front wheels, and an increase of weight on the front wheels of from 600 to 1000 pounds.

This is one reason why racing types of front and rear axles are so effective, because the front wheels are pressed more tightly against the ground, both by gravitation and by the fast turns, at those times when such pressure is most needed for effective braking effect.

Possible Disadvantages
Among the possible disadvantages of front wheel brakes, we might mention the greater complication and need of adjustment. If the Ford is used for commercial use (not fleet use), and never given any attention until something actually breaks; then it is possible that the greater complication and need of adjustment of front wheel brakes might be a disadvantage. But such Ford owners do not read our magazine, and we believe that the average reader of this magazine would be fully competent to make any front wheel brake adjustments as might be needed.

Since the braking wear, when front and rear wheel brakes are used, is distributed over four wheels and four brakes, instead of only through the rear wheels, it is probable that this would result in a considerable reduction in wear and tear in both the transmission brake lining, and in the gears and rear axle parts, so that these parts should not require as frequent adjusting, where only rear hub brakes were used. Also, the wear and tear on tires should be greatly reduced by distributing the sliding of the tires, which tears the rubber and causes cuts to appear.

The transfer of weight, and the need for stiffer front springs, when front wheel brakes are severely used, might mean less easy riding qualities of the front end of the car. But this fitting of shock absorbers or rebound snubbers.

As a matter of fact, by using only the front brakes, it is possible to get extra rear roll, which improves the handling effect, the need for stronger front springs, extra heavy radius rods and other precautions buy them off in the form of stiffer springs, which would be eliminated. Yet, by eliminating chattering and reducing skidding, the car performance would be greatly improved.

The possibility of the front wheel brakes causing additional wear of the spindle body bushings is very slight. This could be more than overcome by applying some special form of lubricating system to these spindle body bushings. Such wear is far more the result of lack of lubrication of the ball bearings, or grit; rather than the result of the additional pressure on the bushings, which would only be present when the front wheel brakes were in actual use.

The additional unsprung weight would have some effect on the ride qualities of the car. That is why front wheel brakes should be made as small and light as is consistent with proper strength and braking ability. By using front wheel brakes that are not quite as powerful as the rear wheel brakes, sufficient braking effect can be secured with the minimum of weight.

(Subject of rear hub brakes will probably be considered in detail in a future issue of this magazine.)

Brake Rods Anti-Rattler

After a little driving, there is often a rattle at the front ends of the hub brake pull rods, where they connect to the controller shaft under the floor boards. This annoying rattle can be completely and permanently removed by using two coil springs from Ford brake shoes, No. 2530B, listing at 3 cents each, if you wish to do the job yourself. This is the best solution, as there are always old brake shoes around, but cleaning the muck off old springs is worth the cost of new springs.