

S. Gratch

Ford Motor Company

PLAINTIFF'S EXHIBIT

FD-632

Intra-Company Communication

September 19, 1962

TO: Mr. L. Martin
cc: Mr. A. L. Haynes
/Mr. E. D. Marande

SUBJECT: Sintered Brake Linings

Ref: Communication from Mr. L. Martin dated August 16, 1962, regarding same subject.

At this time, no recommendations on a satisfactory sintered brake lining material can be made. Considerable work has been done in this area; however, no material has yet been evolved which had the desired frictional properties without objectionable noise.

The development program has included very extensive investigation of different formulations. Laboratory friction material tests have been used for general evaluation; in addition, both dynamometer and vehicle testing with both drum and shoe and disc brakes has been conducted on several of the more promising formulations.

Considerable progress can be reported even though the development work has not been completed. Formulations have been evolved having only about a $\pm 12\%$ variation in coefficient of friction with temperature range of 120°F to 550°F, rubbing velocity range of 216 ft/min. to 2205 ft/min., and contact pressure range of 25 psi to 200 psi. The practical ranges of the basic coefficient of friction appear to be .40 to .55 although lower and higher values have been achieved. Formulations have been created to show both increase and decrease in coefficient of friction with increasing temperature. Wear rate of the better formulations is about 14% to 25% of that exhibited by production organic brake linings. Assembly of the friction material in a brake has been accomplished by riveting, silver soldering, projection welding, and by using the friction material as its own structural support. The noise problem does not look to be insurmountable. Some formulations have been evolved which were quiet. The difficulty is simply that quiet operation has not yet been obtained along with the other required frictional properties.

The interest in incorporating a layer with squeal expressed in your letter can be answered affirmatively. The usual friction pad construction is a powder metallurgy lamination of the friction formulation on top of a layer

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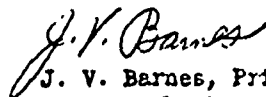
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of plain iron powder. This will achieve the desired squeal under controlled conditions (i.e., since the boundary between layers is not perfectly flat only small areas of plain iron powder reach the friction surface when replacement is desired).

It is regrettable that a positive recommendation cannot be made at this time. Information will be disseminated upon successful completion of the project.

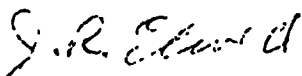


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