

Ford Motor Company

Intra-Company Communication March 11, 1965

TO: Mr. E. D. Marande ✓

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FROM: S. Gratch and T. H. Risk

SUBJECT: Brake Lining Program -- February 1965

Evaluation of Current Materials

The screening rig was used to re-examine a current production secondary lining (Raybestos-Manhattan dry mix R3488-1) which had shown large variations in friction properties in August 1964. At that time marked differences both in friction and wear rates were observed in both hard and soft samples and between hard and soft sections of the same sample. The samples of current material were much more consistent in properties and in addition they did not exhibit the composition and structure defects which had been observed last August.

Three samples each of 1963 Lincoln primary and secondary linings were tested. The laboratory results indicated that all of the primary samples were satisfactory. However, among the secondary linings, sample 106 delaminated readily, had a lower specific gravity, and wore out much more rapidly than the other two samples particularly after the first 0.020 inches were removed. Sample 98 appeared to be the best material and was found by chemical tests to be of different organic composition than 106 and 118.

A second screening rig is being built in order to accelerate the program.

Friction Studies

Analytical studies have been started to determine the distribution of load and temperature for drum brake linings under different conditions of operation. These studies should provide direction for the optimization of physical and frictional properties of brake linings.

Detailing work on the friction research test machine is progressing as scheduled.

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Application Studies

Chemical characterization of the current non-slip differential friction material (R-16984) have been completed. The various components of interest were tested for possible attack by M2C57 hypoid gear lubricant to determine what changes in the friction material would be required to prevent attack by this fluid. It was found that metallic lead and aluminum and probably crocidolite asbestos are unaffected. Preparations are being made to use an Amsler friction machine for the study of modified friction materials based on these resistant components.

An investigation was undertaken to determine the feasibility of reducing the squeal level of a noisy brake shoe lining by using a rubber interlayer between the lining and the shoe. Initial tests showed that the interlayer magnified the squeal instead of reducing it; therefore, work along these lines was discontinued.

Dry Clutch Friction

A test sequence was devised for rating engagement smoothness, wear, and friction level of clutch facings. Four materials have been tested to date. A program for more extensive testing is being developed in co-operation with the Engineering Methods Development and with Ford Division personnel.

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