

February 28, 1973

Bendix 7133 linings were used on the front disc brakes, a material which has been noted as non-scoring and very low on rotor wear rate. Our tests showed radial thermal stress rupture cracks over the central region of both rotors, a coning of the friction faces, and abnormally high iron wear rates on rubbing faces. The damage to the left rotor was more severe in all aspects. Scoring was primarily on the two inboard faces.

No abrasive action was found from FAST tests of surface or interior samples of the suspect linings. Tests by the Technical Services Department on scrapings from the rivet holes and lining edges revealed no suspect material. These scrapings were found to be only mildly abrasive and were non-scoring. Preliminary results from the Process Research Department revealed no substantial abnormalities in the cast iron.

The same test vehicle produced similar high lining wear, high rotor scoring after another 6000 CTM, using all new brake parts. Examination of these failed parts produced similar findings, except the rotor coning was less and surface cracks were not present.

Our conclusion was that the vehicle had experienced abusive usage which resulted in Forsterite formation on the rotors which subsequently imbedded in the linings and acted as a frangible abrasive to the rotors. Our past dynamometer tests have indicated rotor temperatures above 1100°F can produce this behavior.

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3. Wet Clutch Analysis

The previous theoretical analysis of the effects of surface roughness on the squeeze film behavior between two parallel annular discs has been further extended to consider the elastic deformation of the porous facing. Numerical

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