

July-Dec. 1971
A. E. Anderson

R-120 R

FRICTION MATERIALS AND SYSTEMS

1. New Materials

Laboratory testing of both wet and dry-mix disc brake formulations indicated that dry-mix formulations would be the most suitable for vehicle usage. Based on this result, dry-mix formulations were selected for dynamometer testing. A formulation containing 3% lithium fluoride showed excellent performance for high energy stops on the dynamometer test; however, recently processed disc brake pads of the same formulation showed high wear of the cast iron rotors and about twice the lining wear of the earlier samples.

It was subsequently discovered that the more recent lining samples were made from a newer supply of Johns-Manville 5K30 grade asbestos. This asbestos was found to contain about 6% magnetite in large pencils, enough in quantity and form to account for the observed high cast iron wear rates. Contact with the asbestos supplier revealed that most brake lining vendors are now using the more highly processed 5K04 grade asbestos in their disc brake formulations because 5K30 asbestos which is low in magnetite content is no longer available. The added processing to produce the 5K04 grade breaks apart the asbestos crudes and permits removal of the large magnetite pencils.

Additional samples of our experimental linings were made using new 5K04 grade asbestos. This substitution eliminated the cast iron wear problem but dynamometer tests showed unsatisfactory fade recovery characteristics and lining wear rates above those expected from the earlier tests of this formulation with the old 5K30 grade asbestos. It is believed that the less crudy (fine fiber) 5K04 grade asbestos does not provide enough lining permeability to permit rapid recovery from fade testing and it does not provide enough coulomb damping to

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