

emitted from brake drums, disc brakes and clutches of vehicles operating under real conditions. Hopefully the situation will be more clearly understood at the end of those studies.

Emission Control Techniques

Emission at Overhaul - To avoid blowing the accumulated dust into the atmosphere at the time of overhaul devices have been suggested for extraction of the dust from brake and/or clutch housings by suction. Of the devices tried, a simple hand-held vacuum cleaner has proven to be the most flexible unit. Changes to the original design have been limited to the addition of a disposable paper bag inserted in the original cloth bag. The paper bag may be easily sealed before removal to prevent emission.

Substitution - Beyond the adaptation of better cleaning practices during brake and clutch maintenance, as mentioned above, additional controls seem to be limited to improve design of brake and clutch assemblies and/or substitution of other materials for asbestos.

The high temperature properties and exceptional tensile strength of asbestos have resulted in very compact and economical design. These same unique properties which make asbestos applicable to friction materials also make the application of substitute materials very difficult. The tensile strength and modulus of rigidity of asbestos as compared to several candidate substitute materials follows:

<u>Tensile Strength lb/in.²</u>		<u>Modulus of Rigidity lb/in.²</u>
Asbestos	550,000	30,000,000
Fiber yarns	180,000	3,000,000
Steel wool	50,000	100,000
Mineral wool	25,000	60,000

There is no doubt that substitution of other materials for asbestos is possible, but the design changes required to accommodate the stresses and temperatures involved would result in-

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