FILE NAME: Ford (FD)

DATE: 1971 Sept 2

DOC#: FD113

DOCUMENT DESCRIPTION: Memo - Meeting with Bendix Research RE Asbestos from Brakes

Intra Company

September 2, 1971

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Subject: Meeting with Bendix Research re - Asbestos from Brakes

On August 24, a meeting was held with representatives of Bendix Research — at their request — to discuss experimental techniques for generating and sampling airborne brake lining wear dust, and for examining the samples for asbestos fibers. Attending from Bendix were M. G. Jacko, W. M. Spurgeon and R. DuCharme; Ford participants were A. E. Anderson, R. L. Gealer, C. Melvin and J. W. Sprys. We described the dynamometer set-up, test conditions, and air sampling procedure we used for our lining wear dust experiments using Pinto disc brakes, after which Bendix discussed what they intend to do in connection with their EPA supported contract for the measurement of emissions from brakes and clutches.

Bendix intends generally to follow the scope of work outlined in EPA's Request for Proposal, of which I have a copy. They plan to collect all wear products (particulates and gases) generated by front disc brakes, rear drum brakes, and manual transmission clutch during various operating conditions on a moving vehicle by appropriate shrouding of the brake or clutch. We pointed out difficulties they may have in cooling the disc brakes, in handling the required volume of air in their sampling system, and in rapid loading up of their filters in their attempt to collect all of the emissions. The stopping conditions to be used for the brake dust generation will include burnish stops, a Detroit traffic test route, the Federal Test Cycle (developed for emissions testing) adapted to the road, and an SAE fade test. They will test a variety of original equipment and aftermarket linings.

We then discussed methods of sample examination for asbestos fibers. We indicated that the initial inspection of our filter samples was done by direct transmission electron microscope examination of carbon shadowed dust samples (freed of filter material by dissolution), but that there was a reasonable probability that many asbestos fibers were not seen because of concealment by other dust particles and that some fibers counted as asbestos may not have been. Therefore, we are in the process of examining samples by the technique developed at Mt. Sinai School of Medicine at City University of New York, which involves the destruction by low temperature ashing of the filter and any organic particles, followed by the breaking up and dispersion of particle

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agglomerates and fiber bundles by mashing between glass surfaces. This method offers the advantage of improving the uniformity of dispersion and eliminating obscuring matter, allowing a true assessment of total mass of asbestos fibers; however, it has the disadvantage of destroying the original particle size distribution. We also described an electron diffraction method of absolute identification of individual chrysotile asbestos fibrils seen in the electron microscope.

Bendix Research prefers to use sample preparation procedures which preserve the original particle size distribution without breaking up fiber bundles into individual fibrils. They are not yet clear on how to do this without risking overlooking concealed fibers, but they intend to try such methods as low temperature ashing of the filter sample without mashing, followed by scanning and/or transmission electron microscope examination. Bendix brought up the possibility of our laboratories trading samples for examination — we indicated we might be receptive to such a plan and would keep the suggestion in mind.

Bendix plans to have four or five individuals working on this program on and off — they did not reveal the total man-effort involved. They plan to start vehicle testing by the first week in September 1971 and to complete the work to the point of completing a rough draft of the project report by April 1972. We will attempt to keep informed of the status of their program.

Roy L. Gealer

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