

Report 52/68

Exposure to Asbestos Dust during
Brake Maintenance Operations on
Commercial Vehicles, Fleet Repair
Garage, Dagenham

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I INTRODUCTION

This study was undertaken to assess the degree of exposure to fibrous dust in brake maintenance procedures on commercial vehicles and to provide comparative data relating to a previous study on operators working on passenger cars.

II INVESTIGATION

Air sampling took place in the garage on the 19th September 1968. Membrane filters, in conjunction with Casella personal samplers, suitably modified to provide a flow rate of 200 cm³/min. were used and the following sampling procedure adopted.

(a) Personal samples were collected from the "brake blow off" operator (Mr Croné) and the mechanic working in the adjacent bay (Mr Hillman) during the blowing-off operation. The filters were then changed and replaced to run for the rest of the shift.

(b) Static samplers were positioned at three points, A, B and C, about 20-25' from the source of dust generation and separate samples were collected for the morning and afternoon shifts.

The sampling positions are shown in Fig.1.

The collected samples were subsequently removed to the laboratory and, after preparation, examined by projection microscopy for the presence of fibres greater than 5µ. (A fibre is defined as having an aspect ratio equal to, or greater than, 3:1).

... III RESULTS

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III RESULTS

Table 1 shows the fibre counts per cm^3 for each sample collected.

IV DISCUSSION OF RESULTS

(i) Standards of dustiness

In a previous Report (41/68: Exposure to Asbestos during the servicing of brakes of passenger cars) reference was made to the Hygiene Standard for Chrysotile Asbestos Dust proposed by the British Occupational Hygiene Society. This standard suggested a Threshold Limit Value of 2 fibres/ cm^3 for an exposure period of 50 years. Categories of dustiness were proposed as follows:

<u>Dust Category</u>	<u>Concentration, fibres/cm^3</u> <u>(averaged over 3 months)</u>
Negligible	0 - 0.4
Low	0.5 - 1.9
Medium	2.0 - 10.0
High	10

(ii) Field Investigation

Static Samples

As the blowing-off operation took place in the early part of the morning shift, the concentrations obtained at the static positions during the afternoon shift (samples 8, 9, 10) probably represent the background contamination. Thus it can be seen that the generation of a dust cloud by blowing off dust from commercial vehicle brakes results in increased background contamination of 3 to 4 times the background level at any point within a radius of 20-25 ft.

The concentrations are all well below the TLV, and with one exception come within the "Negligible" dust category.

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Personal samples

The fibre concentrations for the mechanic engaged on the blowing-off task taken for the duration of the operation shows an exposure of nearly 4 times the TLV, while the concentration measured in the breathing zone of the mechanic working in the adjacent bay during the same period just exceeded the TLV.

The personal samples from the two mechanics taken over the remainder of the shift give similar results. When the samples for the two mechanics are calculated on the basis of time-weighted concentrations, the exposures are below the TLV and come within the "Low" dust category.

V

CONCLUSIONS

In the light of the environmental data, and of the irregular intervals at which brake-cleaning is carried out (it is not a daily procedure) it does not appear that a significant hazard to health should occur in the case studied.

Nevertheless, the conditions which obtain during the blowing-out operation are extremely unpleasant, and alternative methods of cleaning should be investigated, or measures adopted to minimise personal exposure, e.g. local ventilation, or use of a suitable respirator.

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Table 1. Results of Membrane Filter Counts

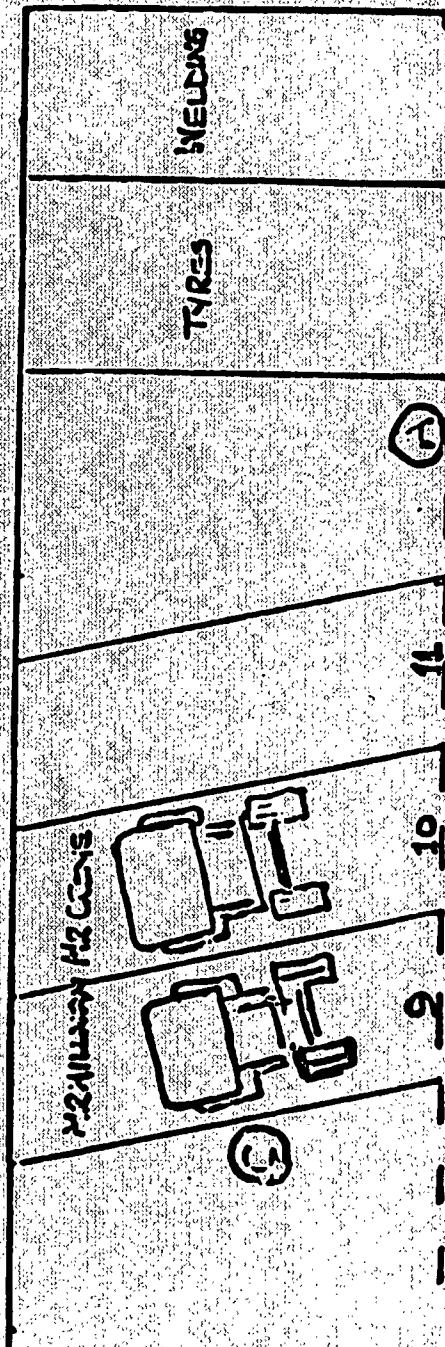
Sample No.	Description	Duration mins.	Flow Rate ml/min.	Concentration fibres/cm ³	Dust Category
1	Personal. Mr Crone. Brake maintenance. Front brakes blown out in this period	99	193	7.09	Medium
2	Personal. Mr Hillman. Clutch repair procedure at adjacent vehicle bay	127	207	2.25	Medium
3	Static. Position A.	190	232	0.17	Neg.
4	Static. Position B.	185	133	0.49	Neg/Low.
5	Static. Position C.	180	206	0.28	Neg.
6	Personal. Mr Crone. One rear brake assembly blown off at beginning of sampling period.	317	180	0.08	Neg.
7	Personal. Mr Hillman. Clutch repair procedure at adjacent vehicle bay.	278	148	0.11	Neg.
8	Static. Position A.	186	211	0.07	Neg.
9	Static. Position B.	186	170	0.11	Neg.
10	Static. Position C.	185	172	0.07	Neg.
Time-weighted average concentrations:					
Mr Crone				1.75	Low
Mr Hillman				0.79	Low

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SKETCH OF ARRANGEMENT OF
SAMPLING SCHEME AT REPAIR GARAGE
19 SEPTEMBER 1968

Fig 1



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