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PREFACE

Exposure to Asbestos during brake and clutch maintenance

THE PAPERS which follow were originally presented at a Conference held at the Central Office, Ford Motor Co., Brentwood, Essex, on 26 March 1969. The Chairman of the Conference was Dr G. H. Channing, Chief Medical Officer, Ford of Britain, who opened the proceedings by outlining the events which had led to the arranging of the Conference.

Publication of the proposed Asbestos Regulations by the Department of Employment and Productivity had raised queries within the motor industry as to whether clutch and brake maintenance activities, both at the manufacturers' premises and within the repair trade, would come within the requirements of the Regulations. There was a general desire that the subject should be investigated, and any necessary remedial measures sought, in advance of the legislation so that Dealers could be advised and servicing procedures modified where this might be necessary. Investigations had been made by the Industrial Hygiene Units of the British Motor Corporation, and of Ford of Britain, and their findings would be reported to the meeting. These would be preceded by papers on the medical aspects of exposure to asbestos, and later in the programme there would be papers indicating possible solutions to the problems involved.

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EXPOSURE TO ASBESTOS DURING BRAKE MAINTENANCE*

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EXPOSURE DURING CAR SERVICING

THERE is little maintenance of passenger vehicle brakes involved at the manufacturers' premises, and therefore an investigation was carried out at the Service Bay of a Ford Main Dealer in the Greater London area. This Dealer normally services 10–20 cars per day, but blowing-out of brake shoes and drums is not included in all routine services. It is the blowing-out procedure which is the subject of the study.

Air sampling was carried out using membrane filters, the sampling and subsequent assessment being in accordance with the technique described in the *Hygiene Standard for Chrysotile Asbestos Dust*, published by the British Occupational Hygiene Society (1968).

Static samples were taken by the side of the car (Fig. 1) and composite samples were also taken in the dust-cloud during the blowing-out procedure, continuing by the side of the car for the remainder of the sampling period. Normally the mechanic takes care to blow the dust away from himself, so this sampling procedure should over-estimate exposure. Two sampling periods of 45 minutes were used, and during the first period one Cortina Estate and one Anglia Van received brake blow-outs, and during the second period one Cortina car was dealt with. The results are shown in Table 1.

TABLE 1. ATMOSPHERE SAMPLES DURING CAR BRAKE SERVICE

Location of samples	Fibres/cm³ 1st period	2nd period	Time-weighted average
By car	1·12	1·42	1·25
Dust cloud then by car	1·71	3·62	2·55

An estimate of the daily exposure of the mechanic engaged on brake cleaning was obtained by a series of personal samples (Fig. 2), covering an entire workshift, during which brake servicing was carried out on 11 vehicles. The results are shown in Table 2.

*This paper was originally presented at a Conference on Exposure to Asbestos during Brake and Clutch Maintenance, held at Brentwood, Essex, March, 1969.

Table 2. Personal samples during car brake service

Sample	Concentration (fibres/cm³)
1	0·63
2	1·12
3	0·21
4	0·96
5	0·38
6	0·79
Time-weighted average	0·68

EXPOSURE DURING TRUCK SERVICING

Maintenance of truck brakes involves a somewhat different type of operator exposure as the servicing is more complex, and therefore the number of vehicles dealt with is less. The larger size of wheels and drums, on the other hand, makes it difficult for the operator to avoid the dust cloud produced, and personal exposure could be higher than that during car maintenance. Further sampling was therefore carried out in a large fleet workshop with equipment similar to that used for the passenger car tests.

Static samples, each of approximately 3 hr duration, were collected during the morning and afternoon periods at three positions; at the bay adjacent to the one at which brake cleaning was carried out, at the next bay, and in the centre of the garage.

Brakes were blown out during the morning, but not during the afternoon. The results are given in Table 3.

Table 3. General atmosphere samples during truck brake service

Location of sample		Concentration (fibres/cm³)
Adjacent bay	Morning	0·28
	Afternoon	0·07
2 Bays away	Morning	0·17
	Afternoon	0·07
Centre of garage	Morning	0·49
	Afternoon	0·11

Personal samples were obtained from two men—the man engaged on brake cleaning, and the man engaged on clutch repair work at the adjacent bay. The first period of 1·5–2 hr included the period of brake cleaning, and the second period of approximately 5 hr represented the remainder of the shift. The results are shown in Table 4.

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