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DIVISION OF SAFETY AND HYGIENE
INDUSTRIAL COMMISSION OF OHIO
General Counsel, Governor
244 N. High St., Col., O. 43215

August 28, 1985

Ms. Judy Spencer
Legal Section
Industrial Commission of Ohio
246 North High Street
Columbus, Ohio 43215

RE: Claim #OD 23209-22
Ronald Miller, Claimant
General Motors
Corporation
Lordstown Plant
P.O. Box 1406
Warren, Ohio 44482

Dear Ms. Spencer:

As you have requested, this occupational disease claim report has been prepared based on the information obtained from the facsimile file which you have provided. In addition, on June 6 and 11, 1985, visits were made to the offices of the General Motors Corporation, Lordstown Plant, for the purpose of determining the working conditions of the above-named claimant.

The claimant, Mr. Ronald Miller, alleges to be suffering from chest pains and shortness of breath which he believes have been caused by exposures to excessive MIG welding fumes.

During the visits on June 6 and 11, 1985, to the General Motors Corporation, Lordstown Plant, Mr. Carmen Pompeii, industrial hygienist, was contacted and supplied information for this occupational disease claim investigation.

Following is the claimant's work history with the General Motors Corporation as furnished by the company:

The claimant's seniority date is listed as June 16, 1972.

From October 1, 1979, until March 3, 1981, he worked in the body shop at the passenger plant adjusting and hanging doors.

The claimant was on sick leave from March 5, 1981, until April 20, 1981.

On August 3, 1981, the claimant moved to performing general repairs at the passenger plant.

The claimant was on sick leave from August 31, 1981, until September 10, 1981.

He was laid off from March 2, 1982, until February 21, 1983.

On August 3, 1983, he became a gas and arc welder at the passenger plant.

On March 26, 1984, he transferred to the van plant (Department #26) as a gas and arc welder.

He was on sick leave from July 18, 1984, until August 6, 1984.

On November 13, 1984, the claimant became an assembler at the van plant.

As a gas and arc welder in Department 26 of the van plant, the claimant's particular work location would have been ladder built station 103. In this operation, four employees perform MIG welding on the van frames (spring hangers) as they pass along the automatic line. Specifically, the claimant was the #3 MIG welder, working on the right side of the van frame. Local exhaust ventilation in the form of a large canopy hood exists over the entire welding operation. In addition, air diffusers, which are located behind all the welders at this work location, exist to move air into the exhaust ventilation system and to provide a more comfortable environment for these employees. This MIG welding of the van frames operation (ladder built station 103) is not located in close proximity to the van paint line.

The silicon bronze welding rod that the claimant mentions in the facsimile file is believed to be a copper-coated welding wire used at ladder built station 103. This silicon bronze wire had replaced wire containing lead which was used to seal the seams on the vans and cars. It was estimated that since at least January 1, 1985, this copper-coated wire has not been used at this work station. It is believed that no other significant changes have occurred at the ladder built station 103 since the claimant worked there. Respirators are not required at this work station; however, a NIOSH-approved, single-use respirator would be made available to any employee upon request. The inert gas used at this work station is carbon dioxide. The van frames are not passed through a degreaser (which may contain chlorinated solvents) before they reach this particular work station.

During the visit on June 11, 1985, representative, time-weighted average, breathing-zone, air samples for metal fumes and dusts and also welding fume/total particulate were obtained on the employees working at ladder built station 103 in department 26 at the van plant. Mr. Carmen Pompeii, industrial hygienist with GMAC, conducted his own air monitoring and duplicated the air sampling conducted by this writer.

The samples for metal fumes and dusts were collected on mixed cellulose ester filters contained in cassettes which were attached to the employees' collars and located under the welding helmets. The cassettes were connected by Tygon tubing to Bendix Model BDX 55/56 HD permissible air-sampling pumps which were worn on the workers' belts. The pumps were calibrated to pull air at a flow rate of 1.5 liters per minute. The pumps were inspected periodically during sampling to ensure that the flow rate was maintained.

The samples for metal fumes and dusts were subsequently submitted to a laboratory accredited by the American Industrial Hygiene Association (AIHA) where they were analyzed by atomic absorption spectrophotometry. The results of these samples, as reported by the laboratory, can be found in Table A located at the back of this report.

The samples for welding fume/total particulate were collected on pre-weighed, 5.0-micron, polyvinyl-chloride filters contained in cassettes which were attached to the employees' collars and located under the welding helmets. The cassettes were connected by Tygon tubing to Bendix Model BDX 55-56 HD permissible air sampling pumps which were worn on the workers' belts. The pumps were calibrated to pull air at a flow rate of 1.5 liters per minute. The pumps were inspected periodically during sampling to ensure that the flow rate was maintained.

The samples for welding fume/total particulate were subsequently submitted to a laboratory accredited by the American Industrial Hygiene Association (AIHA) where they were analyzed gravimetrically for particulate weight and by x-ray diffraction for crystalline silica. Sample results, as reported by the laboratory, can be found in Table A located at the back of this report.

Before reviewing the results from Table A, it should be mentioned that the laboratory indicated that each of the total dust air samples contained less than 25 micrograms of quartz (SiO_2). Therefore, the higher ACGIH threshold limit value of 5.0 mg/ M^3 for total welding fume was used in Table A. In addition, the ACGIH threshold limit values used in Table A are for zinc and manganese fume.

A review of the results from Table A indicates concentrations of metal fumes and dusts and total welding fume which are below the threshold limit values suggested by the ACGIH.

Enclosed in the facsimile file are the results of air monitoring conducted by representatives of the General Motors Corporation on September 16, 1983, at Mr. Ronald Miller's work location (Department 26, van plant, MIG welder-spring hanger). These results are reproduced as follows:

<u>Job Description</u>	<u>Contaminant</u>	<u>Result</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>
MIG weld--rear spring hanger	Copper fume	0.007 mg/M ³	0.1 mg/M ³	0.2 mg/M ³
	Iron oxide	1.5 mg/M ³	10.0 mg/M ³	5.0 mg/M ³
	Zinc oxide	0.1 mg/M ³	5.0 mg/M ³	5.0 mg/M ³
MIG weld #2 spring hanger	Copper fume	0.004 mg/M ³	0.1 mg/M ³	0.2 mg/M ³
	Iron oxide	0.6 mg/M ³	10.0 mg/M ³	5.0 mg/M ³
	Zinc oxide	0.1 mg/M ³	5.0 mg/M ³	5.0 mg/M ³

A review of these preceding results indicates that the MIG welders-spring hangers (Department 26-van plant) were exposed to concentrations of copper fume, iron oxide, and zinc oxide which were below OSHA permissible exposure limits and the threshold limit values suggested by the ACGIH.

In addition, Mr. Pompeii verbally provided the results of air monitoring for lead conducted by the General Motors Corporation in Department 26, MIG welding operations. A summary of these airborne lead exposures as provided by the company, is as follows:

<u>Date</u>	<u>Job Description</u>	<u>Contaminant</u>	<u>Result</u>
12/8/83	Spot and MIG Welder	Lead	None detected
12/8/83	Spot and Welder	Lead	Less than 1 microgram/M ³
12/8/83	Spot Welder	Lead	None detected
12/8/83	Spot Welder	Lead	None detected
3/21/85	MIG Welder	Lead	None detected
3/21/85	MIG Welder	Lead	3 micrograms/M ³

These results indicate concentrations of airborne lead which were below the OSHA permissible exposure limit of 50 micrograms/M³.

In addition to these air-monitoring results for lead, Mr. Pompeii also verbally provided results of the claimant's blood-lead-level determinations. A summary of these blood-lead-level determinations, as provided by Mr. Pompeii, is as follows:

<u>Date</u>	<u>Claimant's Blood-Lead Level (Micrograms/Decaliter)</u>
5/14/81	6 Micrograms/Decaliter
8/5/81	7 Micrograms/Decaliter
10/5/81	8 Micrograms/Decaliter
2/22/83	5 Micrograms/Decaliter

Table 29.18.2, "Categories of Biologic Response for Lead," in Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition, Volume 2A: Toxicology, George D. Clayton and Florence E. Clayton, Editors, John Wiley and Sons, Incorporated, New York, 1981, page 1694, states in part:

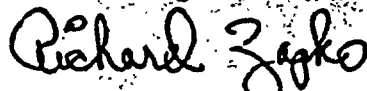
<u>Test</u>	<u>Normal</u>	<u>Acceptable</u>
Blood Test	< 40 micrograms/100 ml	40-80 micrograms/100 ml
	<u>Biologic TLV</u>	<u>Excessive</u>
	80 micrograms/100 ml	80-120 micrograms/100 ml
	<u>Dangerous</u>	
	> 120 micrograms/100 ml	

During the visit on June 11, 1985, several checks to determine concentrations of carbon monoxide and ozone were conducted via the use of a Draeger hand pump equipped with appropriate length-of-stain, direct-reading tubes. No ozone was detected, and carbon monoxide was found to exist at concentrations ranging from five to nine parts per million parts of air (ppm) in the ladder built station 103 (MIG welding) area. The current OSHA standard for carbon monoxide is 50 parts of carbon monoxide per million parts of air (ppm) averaged over an eight-hour work shift. The National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be reduced to 35 ppm averaged over a work shift of up to 10 hours per day, 40 hours per week, with a ceiling of 200 ppm.

In summary, the data from the air sampling conducted at the claimant's work location (van plant, Department 26, ladder built station 103-MIG welding of spring hangers) indicates that he has worked in an atmosphere having concentrations of welding fume/total particulate, lead, zinc, manganese, and iron oxide which were below the threshold limit values suggested by the ACGIH. According to the reference cited, the claimant's blood-lead concentrations appear to be in the normal range. Local exhaust ventilation, as well as an air diffusing system, exists for the ladder built station 103 area. As previously mentioned, the inert gas used in this MIG welding operation is carbon dioxide and the van frames do not pass through a degreasing operation before entering this area. No ozone was detected and carbon monoxide was determined to exist at concentrations ranging from 5 to 9 parts per million in the ladder built station 103 area.

Threshold limit values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. Because of wide variations in individual susceptibility, however, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit; a smaller percentage may be affected more seriously by aggravation of a pre-existing condition or by development of an occupational illness.

Sincerely,



Richard Zapko
Industrial Hygienist

RZ/klp

Enclosure

Claim OD 23209-22

Ronald Miller, Claimant

TABLE A

DATE	NAME	JOB/OPERATION	CONTAMINANT	EXPOSURE TWA (mg/M ³)	ACGIH TLV (mg/M ³)
6/11/85	William Piccuta	#3 MIG welder, ladder built station 103 (right side of van frame)	Lead Zinc Iron oxide Manganese	0.0018 0.0069 0.74 0.11	0.15 5.00 (fume) 5.00 1.00 (fume)
6/11/85	Art Humphries	#2 MIG welder, ladder built station 103 (left side of van frame)	Lead Zinc Iron oxide Manganese	0.0029 0.0044 0.56 0.071	0.15 5.00 (fume) 5.00 1.00 (fume)
6/11/85	Daniel Pritt	#2 MIG welder, ladder built station 103 (right side of van frame)	Total welding fume	3.8*	5.00
6/11/85	Virgil Walker	#3 MIG welder, ladder built station 103 (left side of van frame)	Total welding fume	2.4*	5.00

TWA Time-Weighted Average
TLV Threshold Limit Value
ACGIH American Conference of Governmental
Industrial Hygienists
* Occupational Safety and Health
Administration (OSHA)
** National Institute for Occupational Safety
and Health (NIOSH) TLV

ppm Parts per million parts of air
mg/M³ Milligrams per cubic meter of air
dBA decibels A-scale
ND None detected
(STEL) Short-Term Exposure Limit

*Less than 25 micrograms of quartz present