

March 25, 1964

Mr. L. E. Evans
Safety Engineer
Tarnstedt Division
General Motors Company
300 Georgeville Road
Columbus, Ohio

Dear Mr. Evans:

Attached please find the report of our safety engineer pertaining to the investigation made in your department & at the request of Mr. George W. Minkelsky, one of your employees.

Although the amount of dust being dispersed around grinders is well within the allowable range, your attention is called to items 6 and 7 of the report concerning closing up the face of the opening of the exhaust system at the belt and wheel in order to insure complete capture and disposal of the dust and to minimize the possibility of injury to hands at the belt and wheel.

Very truly yours,

John F. Hidenour
Chief, Engineering & Hygiene

JFR:dd
Attachment

cc: L. Field

DIVISION OF SAFETY AND HYGIENE
THE INDUSTRIAL COMMISSION OF OHIO
700 West Third Avenue
Columbus 12, Ohio

Inspected Division
General Motors Company
Coryville Road
Columbus, Ohio

March 17, 1964

On March 17, 1964, Dewitt Hoffman, Industrial Hygiene Engineer and Albert Sponable, Safety Engineer, both of the Division of Safety and Hygiene, visited the above mentioned plant to check on a dust collection problem at a grinding and polishing machine in department 8 in the grinding and polishing area. The request was made by Mr. George W. Distalder, an employee.

Mr. L. E. Evans, Safety Engineer, Mr. Carroll Lee, Senior Engineer (ventilation engineer), and Mr. Earl Kaiser, Inspector & Foreman were contacted at the plant. Mr. Bill Stuedi, Alternate Committeeman for the Union was also present at the test location.

The company manufactures "hardware" for General Motors automobiles. Door lock bolts and metal window frames are examples of the term "hardware". Some of the products manufactured are plated with, for example, chrome.

The operation with which this report is concerned is grinding off excess weld material from fabricated parts. Each grinding machine is called a polishing jack or sander. They are made by Knapen. There are four such jacks in a group and there are a number of such groups. Two groups were inspected. One group has the number 90 on two of the jacks and the number 91 on two. One jack in the second group was dismantled and inspected. It has the number 92. The operators spend most of their time at these machines.

The jacks have an opening for one belt sander and one grinding wheel both operating on the same shaft. Dust is collected below the sanders and wheels at the bottom of the machine in a plenum or housing chamber and conveyed away from the machines through 7" round ducts. Each jack is so equipped with its own local exhaust system.

All of the jacks have a belt sander but not all use a grinding wheel for any given operation. The type of piece being processed determines the need for the grinding wheel. The sander belt is identified by PA 100 x 86F Alcorite fast cut resin cloth. It is 14" wide and the sander wheel is 14" diameter. The grinding wheel is aluminum oxide, 16" diameter and about 3/8" thick. One of the two jacks numbered 90 had both a belt sander and a grinding wheel. The space between the faces was 1/4". On one of the two jacks numbered 92 the space between the faces measured 2-1/4".

A dust sample was collected using a rider impinger. This was done at the east jack numbered 91 at the breathing zone of a standing operator. A velocity reading was also made at this jack in the 7" duct leading away from the machine. Another velocity reading was taken in the 7" duct leading away from the east jack numbered 92. Small openings are provided in the ducts about 4' above floor level for inserting the velocimeter tube. Readings were tried in the jack opening, approximately 6" wide x 27" high. These readings were attempted alongside the wheel, at points under the wheel and slightly behind the wheel in the plenum chamber. The readings were unreliable. The velocity measured in each duct was 3500 fpm. This velocity in a 7" duct would account for a quantity of 1015 cfm of exhausted air. The dust velocity and quantity of exhausted air are both above the minimum requirements according to the American Conference of Governmental Industrial Hygienists recommended practices.

March 23, 1964

5. The collected dust sample indicated a concentration of 2.8 million particles of dust per cubic foot of air. This is well within the allowable range of 50 million particles of dust per cubic foot of air.
6. Since the dust count at breathing level is well within the allowable range, it could be assumed that the local exhaust system is operating satisfactorily. However, some improvements could be made to insure more complete capture and disposal of dust. The profile of the face opening at the wheel and belt is very irregular resulting in some turbulence and accounting for some dust deposit on the floor. If this profile could be made more regular and the bottom of the opening brought up closer to the belt, with the outer edge about 6" out from the belt to increase the effectiveness of the capture velocity, the turbulence should be greatly reduced. Illustrations of this idea are enclosed.
7. It is suggested that a minimum distance be established between faces of the belt and wheel to prevent possibility of injury to hands.

Albert E. Scheible
Safety Engineer

AES:dl

Enclosures - 5-61 and 5-62, Industrial Ventilation