ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT
MAINTENANCE INSTRUCTION

IMPINGEMENT-TYPE CARBODY AIR FILTERS

DESCRIPTION

The central air system for motor and generator cooling, engine fuel combustion, and air compressor intake is supplied by air drawn into the carbody (hood) of the locomotive, Fig. 1. The air is cleaned when entering the carbody through the use of impingement-type filters mounted in frames on the hood doors adjacent to the motor and generator blowers, and compressor air intake. These primary filters are designed to remove harmful air-borne contaminants such as dust, dirt, and sand.

General information for construction of tanks suitable for filter cleaning, adhesive application, and draining are provided in this Instruction.

FILTER ELEMENT CONSTRUCTION AND OPERATION

The impingement-type carbody air filters are constructed of specially formed wire mesh which is coated with an adhesive gel. The coated mesh is enclosed within a steel frame, and protected by a coarse screen, Fig. 2.

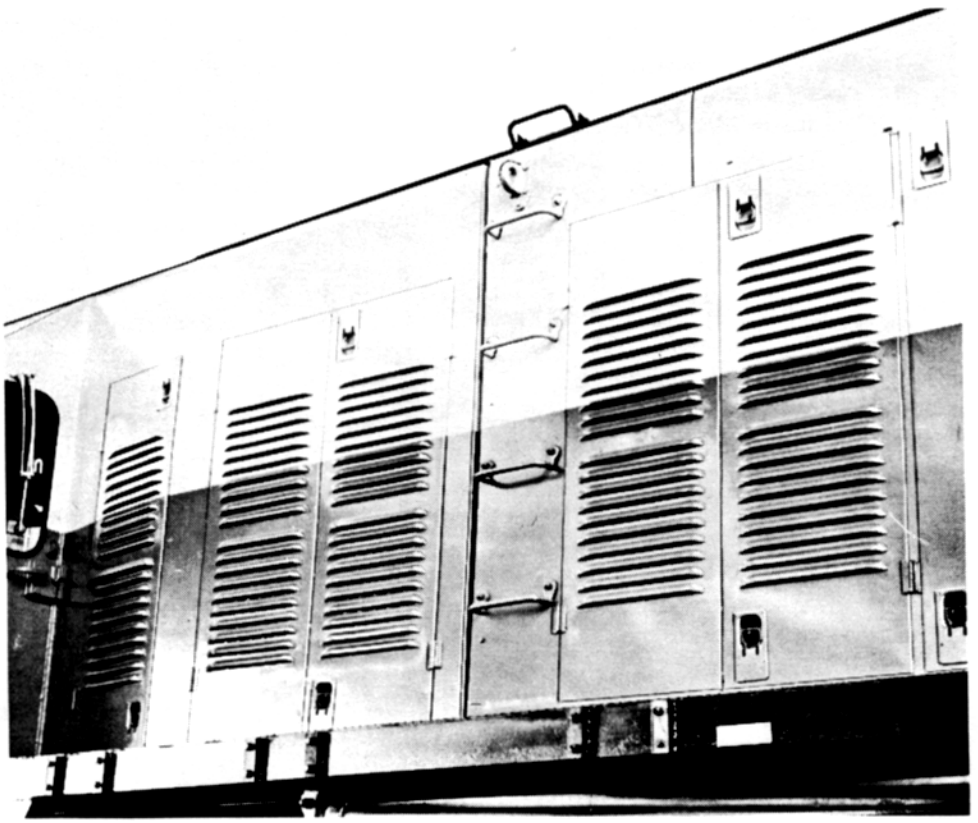

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Fig. 1 – Filter Location

*This bulletin is revised and supersedes previous issues of this number.

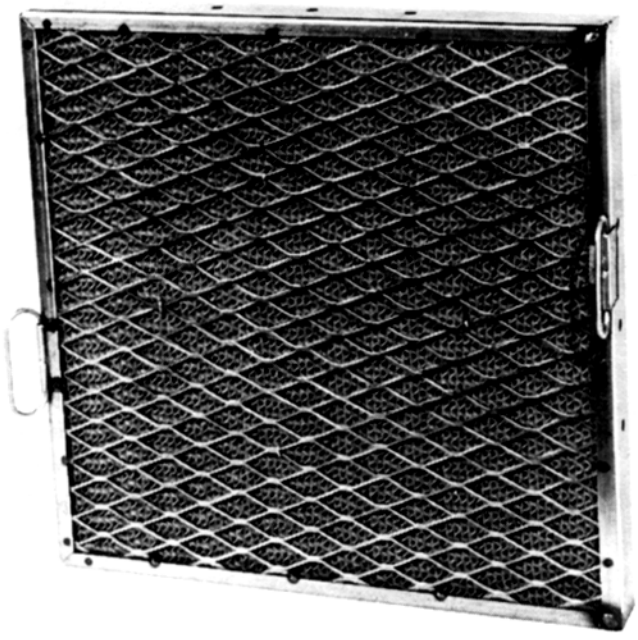

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Fig. 2 - Framed Impingement Type Carbody Filter

As air flows through the filter it changes direction many times. This movement of air causes air-borne contaminants to impinge upon the adhesive mesh surfaces allowing the clean air passage through the filter. This filtering action will continue until the mesh adhesive becomes overloaded with contaminants. Therefore, to retain filter efficiency it is necessary to maintain the filters frequently enough to prevent particulate overloading.

INSPECTION AND MAINTENANCE

Clean air quality is entirely dependent upon the ability of the adhesive gel to hold impurities. As these coated surfaces become dirt laden, improperly filtered air is allowed through the filter. It is also possible for the filters to become overloaded to the degree that they actually become plugged. This condition, causing a reduction in air supply to the blowers, could result in damage to motors and generators due to overheating.

The filters should be checked frequently to ensure high filter efficiency. Remove, clean, and recoat filters at necessary intervals, or at intervals given in the applicable Scheduled Maintenance Program.

The filters are retained in their frames by spring clips and are easily removed, Fig. 3.

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Fig. 3 - Removal Of Filters

EQUIPMENT REQUIRED

The following drawing is available upon request: File Print 519 showing construction details of the tanks, and view of filter adapter.

NOTE: The use of a 1/4 ton jib crane or monorail over tanks is recommended.

The filter cleaning general arrangement shown in Fig. 4 should be applicable to most shops. The size of the tanks will provide adequate facilities for total immersion of filters. Schematic piping diagram, Fig. 5, illustrates a suggested method for piping the tanks shown in Fig. 4.

Prior to immersing filters in Tank No. 1, it is necessary to thoroughly wash filters with pressurized hot water. A nozzle equipped hose is suitable for this purpose. Water pressure between 103.4 to 275.8 kPa (15 to 40 psi) is also required.

After washing, filters should be allowed to drain. A drain table or overhead suspension facility may be desirable for this purpose. However, drain feature is optional and, therefore, left to the shop's discretion.

A compressed air line to facilitate filter element drying after cleaning is recommended. The drying process can also be hastened by placing filters in an oven which also prepares them for application of the adhesive coating. Steam coils or other controllable source of heat should be incorporated into the oven (hood) to provide the necessary 93° C (200° F) adhesive application temperature.

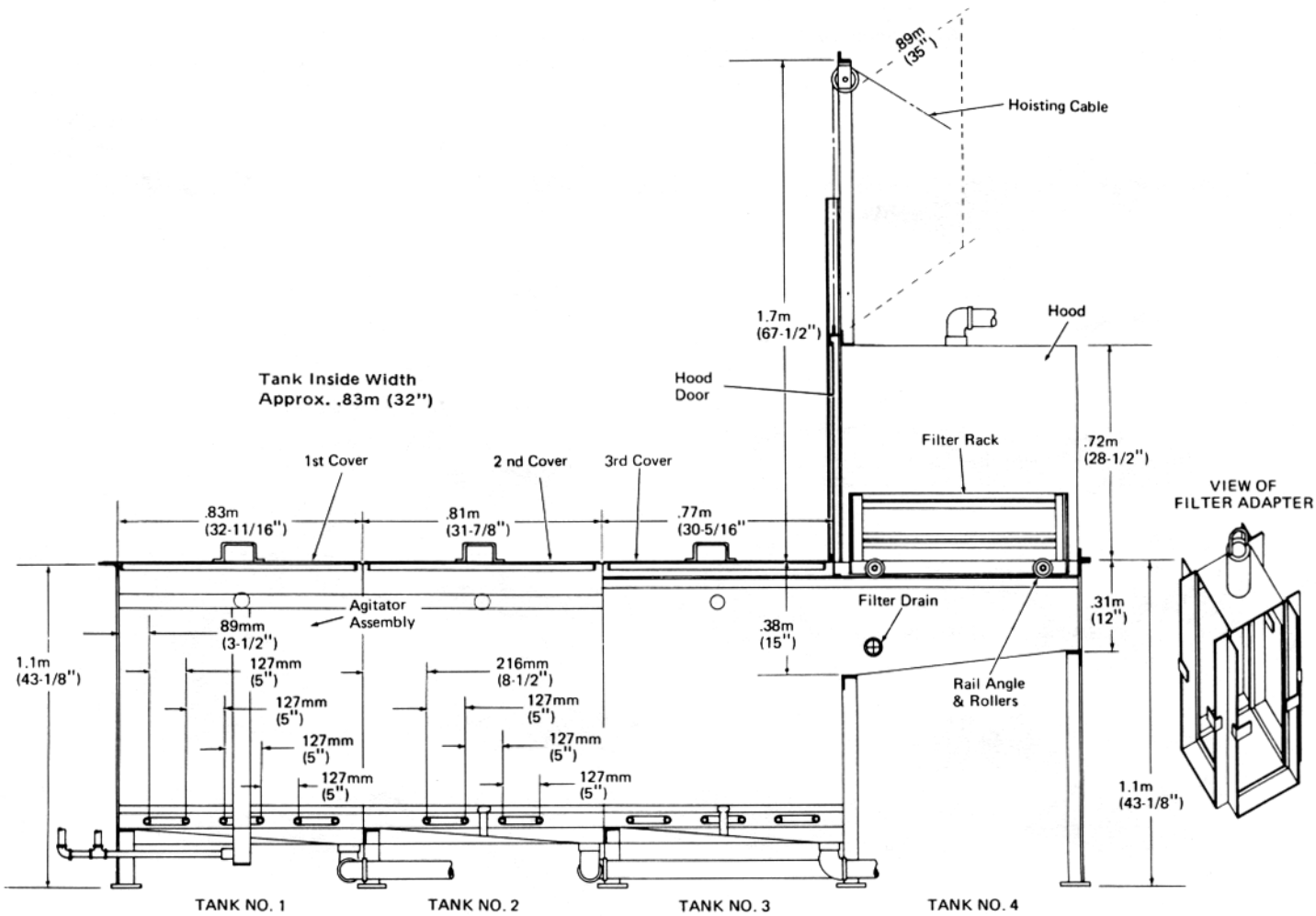

Fig. 4 – Filter Cleaning Facility General Arrangement And View Of Adapter

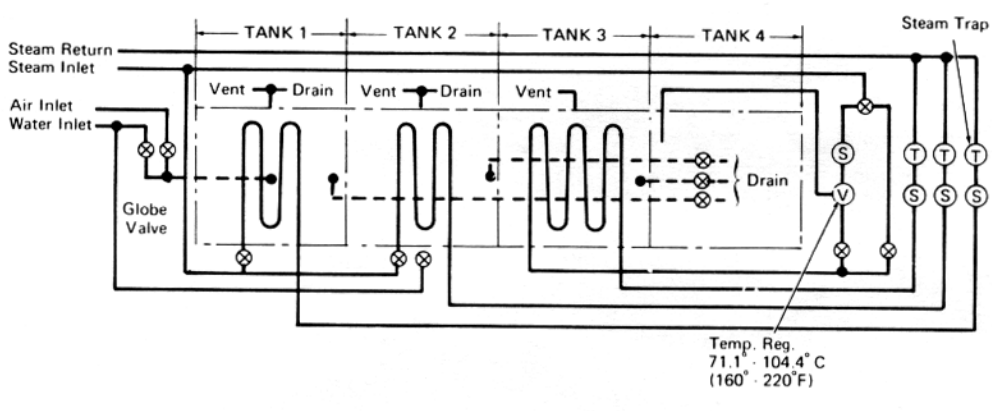

Fig. 5 – Impingement Air Filter Cleaning Facility - Schematic Piping Diagram

SOLUTIONS REQUIRED

1. **Tank No. 1**
   Tank No. 1 contains an alkaline or solvent type cleaner to loosen and remove impacted dirt. Many types of solvents are available that are suitable for filter cleaning. Upon request, the EMD Service Department will provide recommendations for cleaning solutions.

   Procedure
   Completely immerse filter in cleaning solution, and agitate solution continuously. Allow filter to remain immersed a sufficient period to loosen dirt deposits. When filter element is removed, it should be free of dirt.

2. **Tank No. 2**
   This tank contains plain hot water. To prevent soil build-up, it is recommended that this tank be allowed to overflow slightly.

WARNING: Care should be exercised when working with filter cleaning equipment because of high temperatures involved.

Procedure
Completely immerse filter element to ensure adequate rinsing.

NOTE: Blow and oven dry filter element before immersion in Tank No. 3.

3. **Tank No. 3.**
   This tank contains the adhesive solution. Gel-type saturants have been specifically developed for adhesive coating of filters. The use of these materials is strongly recommended. Upon request, the EMD Service Department will provide recommendations for gel-type saturants.

   Procedure
   Totally immerse hot, clean filters in the adhesive at 93° ± 6° C (200° ± 10° F).

4. **Tank No. 4.**
   This tank is a drain tank over which the filter rack and hood are constructed. To permit excess adhesive to drain from the filters and not be carried out of the tank, sufficient room should be allowed above the adhesive level for filter suspension during the draining period.

   Procedure
   Move filters on filter rack into hood. Allow coated filters to drain in the 93° C (200° F) atmosphere approximately 20 minutes.

The drain period should be adjusted to provide the following retention of adhesive:

Approximate Filter Size		Recommended Coating Retention
508mm x 508mm x 51mm	(20" x 20" x 2") thick	284g (10 ounces)
508mm x 508mm x 102mm	(20" x 20" x 4") thick	567g (20 ounces)
560mm x 230mm x 51mm	(22" x 9" x 2") thick	142g (5 ounces)
560mm x 230mm x 102mm	(22" x 9" x 4") thick	284g (10 ounces)
508mm x 230mm x 51mm	(20" x 9" x 2") thick	113g (4 ounces)
508mm x 508mm x 76mm	(20" x 20" x 3") thick	425g (15 ounces)
610mm x 381mm x 102mm	(24" x 15" x 4") thick	510g (18 ounces)

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