CLEANING EQUIPMENT FRAMES BY MEANS OF COMPRESSED AIR CROSSBAR OFFICES GENERAL

1. GENERAL

1.01 This section covers general information applicable to the cleaning of crossbar equipment frames by means of compressed air in all crossbar offices.

1.02 This section is reissued to add the KS-21231 L1 compressor to the tool list and to make other changes as required. This reissue does not affect the Equipment Test List.

1.03 Specific instructions for cleaning particular types of crossbar offices are covered in the following sections:

SECTION	TITLE
069-703-802	No. 1 Crossbar and Crossbar Tandem Offices
069-703-803	No. 5 Crossbar Offices
069-703-804	No. 4A and 4M Toll Switching Systems
▮069-703-805	No. 3 Crossbar System▮

1.04 It is assumed that the cleaning procedures described in the associated sections will supplement the usual approved housekeeping procedures.

1.05 Before pressure cleaning an office, the duct discharge vents and outside surfaces of the ventilating system should be vacuum cleaned.

1.06 It is important to first vacuum clean or pressure clean those portions of a frame which collect the greatest quantities of dust as specified hereafter.

1.07 It is desirable that all equipment in a line of frames between two cross-aisles be cleaned before progressing to the next line of frames. The initial frame selected for cleaning should be at one end of the lineup.

1.08 Consideration should be given to the direction of the air stream from ventilating ducts when determining the order in which frames are to be cleaned.

1.09 Cable runs and superstructure above the space to be enclosed by the curtains shall be cleaned with a vacuum cleaner before any pressure cleaning is done.

1.10 Reference should be made to the appropriate sections in Division 161 for information covering the compressor units and exhauster sets.

1.11 In compliance with specifications, as outlined by the Occupational Safety and Health Act (OSHA), compressed air for cleaning shall be reduced to less than 30 PSI and then shall be used only with chip guarding and personal protective equipment. ▮To meet this objective when using the KS-14758 or De Vilbiss DG-514-2 duster gun, it should be equipped with a KS-14758 L10 booster nozzle.▮

1.13 The air nozzle shall be held as close as possible to the equipment being cleaned, except where otherwise noted, and long enough to

dislodge all loose particles of dust. Quick motions result in superficial cleaning which may lead to excessive contact failures and to the necessity of cleaning more frequently.

1.14 When cleaning flat-type resistors having mica insulation, care shall be taken not to damage the insulation. When cleaning relays with covers removed, exercise care that adjustments are not affected.

1.15 Care shall be exercised not to damage or displace paper or other materials which are used on relay armatures or cores.

1.16 To prevent lubricants or deposits from being sprayed or deposited on adjacent equipment, observe the following methods.

(a) Do not direct the air stream against apparatus to which quantities of free lubricant have been applied.

(b) Remove any deposits such as graph-alloy dust on vertical drive shaft bearings, on interrupter frames, or deposits accumulated on magnetic shields or similar surfaces located under the hinge point of U-type relays or other equipment. Any such deposits shall be removed by using a KS-14668 impregnated cleaning cloth or vacuum cleaner before air from the air nozzle is applied to either the wiring or apparatus side of the equipment.

1.17 The curtains shall be handled with care in the switchroom to reduce the tendency for dust and lint to be released from their surfaces. Curtains should be folded so they can be attached to the sash cords with a minimum of agitation. Loose dust shall be removed from the curtains before they are brought into the switchroom.

1.18 When curtains are dry-cleaned or laundered, reflameproofing is required.

1.19 Small tears in the curtain fabric or in the exhauster filter bag shall be repaired by cementing a patch over the torn area. Material for the patches can be obtained by cutting a KS-14666 cloth to the desired size and cementing the patch to the torn area using Kuhls elastic PATCHLAST*. Instructions for using this adhesive appear on the container. Torn areas requiring a large patch shall be repaired by sewing a patch in place.

> ***Note:*** Since solvents used in the dry-cleaning process may dissolve the adhesive, no cemented patches shall be applied immediately before the curtains are dry-cleaned.

*Registered trademark of the H. B. Fred Kuhls Company.

1.20 Subscriber line registers shall not be cleaned with compressed air.

1.21 Plant and traffic registers may be pressure cleaned, but the cover caps shall not be removed.

2. SAFETY PRECAUTIONS

2.01 When glass wool filter cells are replaced in D-97067 exhauster sets, heavy leather gloves should be worn and care should be exercised in handling the filter cells because of the presence of glass particles. For convenience in handling, the cells should be grasped at diagonally opposite corners.

2.02 A filter respirator and goggles should be worn as a precaution against dust and other foreign particles while working inside the curtain enclosure. Approved types are listed under Part 3 of this section.

2.03 Due to the relatively high pressure and velocity of the air from the nozzle, it is imperative that the air stream shall not be directed toward the eyes, ears, nose, or mouth, or any other portion of the body.

2.04 Compressed air should not be employed in any manner to blow dust from hands, hair, or clothing, or to produce a cooling sensation. Failure to observe these precautions may result in serious injury.

2.05 The air hose should be inspected periodically to insure that it is sound and strong and that couplings and connections are securely made.

2.06 A periodic check of all equipment should be made to insure that all tools and materials are in good condition.

2.07 ◗Compressed air used for cleaning shall be pressure regulated to less than 30 PSI.◖

3. LIST OF TOOLS AND MATERIALS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
KS-14410 L2 or	Vacuum cleaner (or equivalent)
KS-14377 L5, L6	
KS-14426 L5	Exhauster sets (2 required) (or the replaced KS-8038, KS-8430, or D-97067)
KS-14514 L2 or	Compressor set (Manufacture Discontinued) (or the replaced KS-7491 compressor set)
◗KS-21231 L1	Compressor set◖
KS-20306 L1	Curtains
	Note: A curtain extension B-122331 (6-foot by 10-inch strip with an enclosed length of metal chain), to be sewed in place below exhauster opening, is available for curtains not equipped with this extension.
—	Heavy leather gloves
—	Respirator, Mine Safety Appliance Co, Pittsburgh, Pa, ◗461683◖ (or equivalent)
—	Facelets, CM-15484 (for use with respirator)
—	Filters, ◗Mine Safety Appliance Co, 457486 (package of 5) or 457485 (package of 50) (as required)◖
—	◗Goggles, American Optical 484B Chemical or Bausch and Lomb W90 Bal-Guard Fog Ban◖
—	Make-busy plugs (as required)
MATERIALS	
KS-14666	Cleaning cloths (unimpregnated)
KS-14668	Polishing cloths (impregnated) identified by black tracer woven in salvage edge.
—	Sash cords (length as required) (2 required)
—	2-1/2 inch pulleys (2 required)
—	Closed curtain hooks (2-1/2 inch commercial shower curtain hooks) (as required)
—	Open-type "S" hooks made locally (as required)
—	Special hooks, made locally, from steel with sherardized finish (4 required) (See Fig. 1.)
—	6-inch binder clips or spring clothespins (as required)
—	Kuhls elastic PATCHLAST

4. PREPARATION

4.01 Fasten a special hook (Fig. 1) to one end of each of the two sash cords. Attach the hooks to some convenient member of the superstructure immediately over the equipment aisles, one on each side of the line of frames to be cleaned, preferably at an end cross-aisle, in such a way as to obtain the maximum space between the curtains and the line of frames to be cleaned.

4.02 Fasten a special hook to each of the two pulleys. Attach the hooks and associated pulleys at points on the superstructure or cable rack at the next end cross-aisle in the direction the cleaning is to progress. These points should be in approximate alignment with the points at which the sash cords were attached in 4.01.

4.03 If the distance between end cross-aisles is too great for the convenient suspension of the sash cords, the hooks and associated pulleys may be attached at some intermediate cross-aisle or frame.

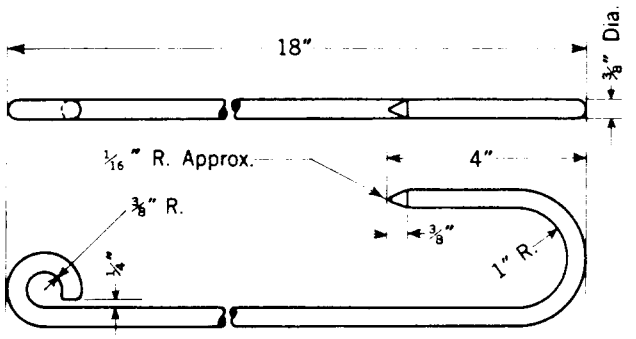

Fig. 1—Special Hooks

4.04 Pass the free ends of the sash cords through the pulleys, and then temporarily fasten the cord ends so that the cords will assume the position displayed in Fig. 2. Attach the curtains to the sash cords by means of shower curtain hooks connected to the eyelets in the center sections of the curtains. Locate the curtains so that the openings for the two exhauster sets will be at the end opposite to the one where the cleaning will start.

4.05 Raise the curtains in place by pulling the sash cords through the pulleys. When the curtains have been raised to their maximum height, fasten the sash cord ends to some convenient points on the framework in order to hold the curtains suspended.

4.06 A rolling ladder shall be placed within the curtain enclosure on each side of the frame to be cleaned. (See Fig. 3.)

4.07 ▶Add insulated "S" hooks as necessary to prevent excessive sagging.◀ The tops of the curtains should be as close as possible to the underside of the overhead cable racks or superstructure in order to minimize the possibility of loosened dust escaping outside the enclosure. (See Fig. 4.)

4.08 With the curtains raised in position, as in 4.05, use the excess at the curtain ends to extend the enclosure around the frame to be cleaned. This may be done by attaching the excess, by means of "S" hooks, to the ladder track or other superstructure over the aisles. Tuck the ends of the curtains around the vertical frame members and associated cable supports to complete the enclosure. Binder clips or spring clothespins may

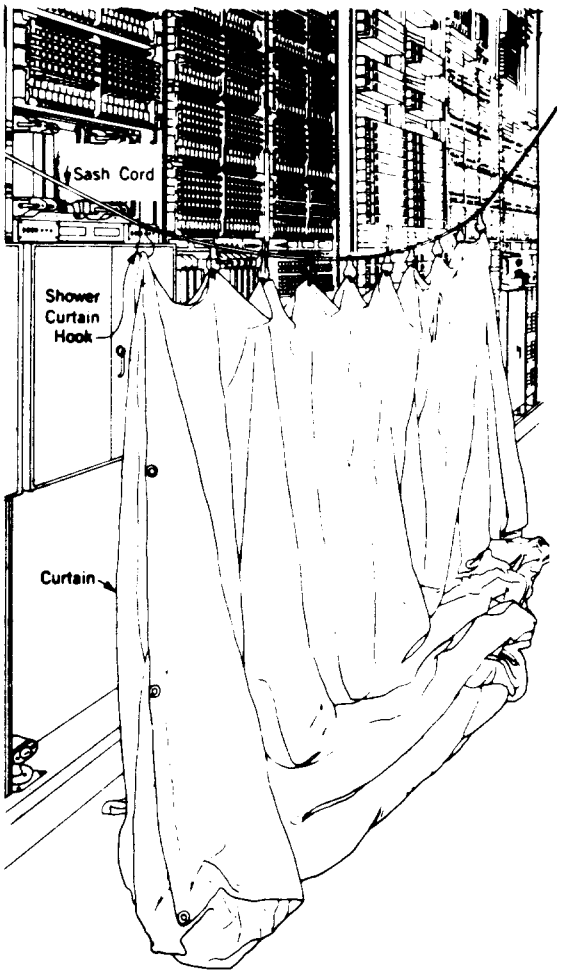

Fig. 2—▶Curtain Hung at Crossbar Frame◀

be used advantageously in some cases to hold these ends securely in place. (See Fig. 3 and 4.)

4.09 Locate an exhauster set in the aisle on each side of the frame to be cleaned and at the end of the curtain enclosure which has the exhaust openings. (See Fig. 4.)

4.10 It is important to attach the curtains to the frame vertical members and exhauster sets in such a way as to reduce air leakage at these points to a minimum.

4.11 Attach the curtains to the exhauster sets with the intake side of the exhauster inside the enclosure. The draw string should hold the curtains securely attached to the exhauster. (See Fig. 4.) The removable length of metal chain shall be in place in the hem at the bottom of the curtain

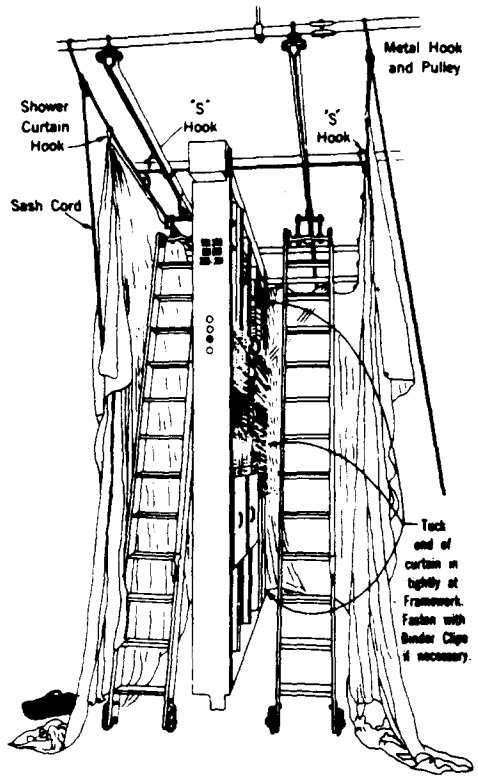

Fig. 3—Curtains With Rolling Ladders in Place

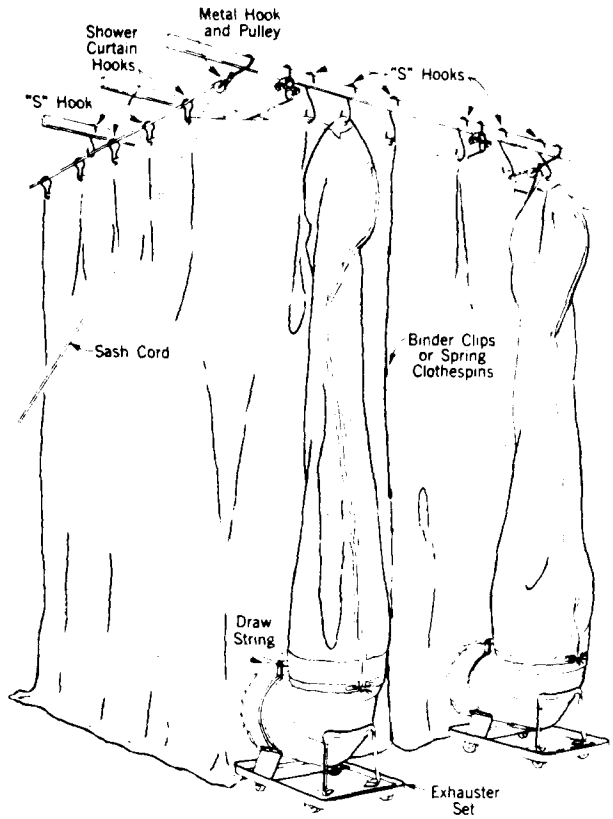

Fig. 4—Curtains With Exhauster Sets in Place

centrally located below the exhauster openings in order to weight this portion of the curtain to the floor.

> ***Note:*** Where the curtains are not sufficiently long, curtain extensions (B-122331) consisting of a strip of cloth weighted by a length of metal chain should be sewed on the curtain below the exhauster opening.

4.12 The curtains shall be free from slack at the intake side of the exhauster to avoid blocking the intake screens.

4.13 When KS-14426, KS-8038, or KS-8430 exhauster sets are employed, the associated filter bags shall be cleaned outside the switchroom as often as necessary to insure adequate air delivery through the bags.

4.14 When the D-97067 exhauster sets are used, each exhauster unit is equipped with two filter cells. The filter cells should be installed correctly with respect to the "top" and "air-flow" markings on them. The front of the cell should be nearest the fan.

4.15 Filter cells should be inspected periodically and changed as often as necessary to permit adequate passage of air through the filters. When the cell nearest the exhaust fan requires changing, the other cell should be moved into its place and a new cell inserted as the rear cell. The cell removed should be disposed of in accordance with local instructions.

4.16 Connect the exhauster sets to the 110-volt appliance outlets at the base of an equipment frame. Start each unit to insure that it operates and is exhausting air from the enclosure.

4.17 Connect the compressor motor to a 110-volt appliance outlet circuit other than that used in 4.16. To avoid overloading the line fuse when starting the motor of a KS-7491 compressor which is not equipped with a magnetic unloader, proceed as follows. Operate and hold the safety valve by

means of the finger ring provided. Operate the motor switch to the ON position. When the motor reaches running speed, release the safety valve ring.

4.18 No other equipment should be connected to the appliance outlet circuit to which the compressor motor is connected. The outlet circuit in this case will require a 15-ampere fuse to carry the starting current. If a 15-ampere fuse is not sufficient, a FUSETRON* may be used. ***Do not use a fuse or FUSETRON with greater than 15-ampere capacity.***

*Registered trademark of the Bussman Manufacturing Company, Division McGraw Edison Company.

4.19 ▶On tankless-type compressor sets, adjust the compressor bleed valve for compressor pressure of 60 PSI. ***The installation of a pressure regulator per 1.10, will reduce cleaning pressures to the required value of 29 PSI. On tank-type compressor sets, adjust the discharge pressure regulator to 29 PSI and lock in place.***◀

4.20 It is desirable to stop the compressor motor when the air nozzle is not used for an extended period.

4.21 The oil and water separators and the air storage tank, if furnished on the compressor, shall be drained off one at a time with the storage tank or discharge line under pressure with the compressor operating. This should be done before starting cleaning operations and at intervals to prevent the deposit of oil or moisture on the apparatus being cleaned. Drainage is accomplished by opening the associated T valves for several minutes. If excess oil is experienced making frequent drainage necessary, consult the section covering the type of compressor set being used.

> ***Note:*** When necessary during periods of high humidity, moisture may be removed continuously by leaving the drain valves open slightly during operation to allow the excess moisture collected in the condensers to discharge on some absorbent material such as a cloth or into a container.

5. METHOD

5.01 With the curtains in place and the apparatus set up as covered in Part 4, proceed in accordance with the section for pressure cleaning the particular type of crossbar office involved.