5- 12-, AND 14-TYPE REGISTERS
PROCEDURES FOR CLEANING

1. GENERAL

1.01 This section covers procedures for cleaning 5-, 12-, and 14-type plant, traffic, and line registers.

1.02 This section is reissued to:

- Incorporate the information contained in the Addendum, dated June 1964.
- Revise Fig. 2.
- Include a new Fig. 3.
- Include a new Fig. 4.
- Cover an alternate method of cleaning 14-type registers using the KS-20516 interrupter to facilitate the cleaning of the number wheels.
- Add KS-20516 Interrupter and associated cords, M2EL and W1BH to List of Tools and Materials.
- Add 770B tool to List of Tools and Materials.

1.03 In the case of line registers, the cleaning procedures in this section should be followed only when specifically authorized by the supervisor.

1.04 Where the D-96123 cleaning gun is available, it should be used for cleaning the operating pawl bearing on 5-type registers not equipped with balanced pawl armatures.

1.05 The balanced pawl armature referred to in this section was introduced on 5-type registers and is used on all 12-type registers. This armature provides two bearings for the operating pawl instead of the single bearing initially used on 5-type registers and shown in Fig. 1.

2. LIST OF TOOLS AND MATERIALS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
46	3/8-inch Single-end Socket Wrench
90	Cap Remover
KS-6320	Orange Stick
KS-6854	Screwdriver
*D-96123	Cleaning Gun
D-96238	Armature Holder
D-96239	Backstop Rod Cleaning Tool
—	4-inch C Screwdriver
♦770B♦	Test Connector
♦KS-20516♦	Interrupter
♦W1BH♦	Cord
♦M2EL♦	Cord
MATERIALS	
KS-7438	Cleaning Paper
**KS-7439	Absorbent Board
KS-19578,L1	Trichloroethane
KS-16601,L1	Paper
—	Medicine Dropper
—	Pipe Cleaner
**—	Qualitative Filter Paper (Commercial)
—	Toothpicks, Hardwood, Flat at One end and Pointed at the Other

* The D-96123 cleaning gun had a limited distribution and can no longer be procured.

** These materials are used only in conjunction with the D-96123 cleaning gun.

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3. 5- AND 12-TYPE REGISTERS

GENERAL

3.01 Record the reading of each register before and after cleaning. Remove register covers using the No. 90 cap remover. After cleaning, remount the covers. If the register was removed from its mounting, or the strip of registers moved forward, as covered in 3.03, remount the register or strip making sure that the register mounting and alignment requirements covered in Sections 030-330-701 and 030-330-702 are met.

3.02 When using trichloroethane for cleaning parts of the register, take care to avoid getting the trichloroethane on the register winding or winding connections. In order to use trichloroethane, place some in a small bottle. To moisten a pipe cleaner with the trichloroethane, dip the pipe cleaner into the trichloroethane and remove excess moisture by rubbing the pipe cleaner against the side of the bottle. When the trichloroethane appears dirty in the bottle, discard the trichloroethane and clean the bottle before refilling it.

> ***Caution: Take care to avoid using excessive amounts of trichloroethane. If a considerable amount of trichloroethane is to be used in one location, use a fan to dissipate the resulting fumes. Position the fan so that it will direct a current of air toward the parts being cleaned. Trichloroethane fumes are heavier than air and tend to move downward. Therefore, in order to avoid inhaling the fumes, keep the head above the tools and containers in which trichloroethane is being used.***

3.03 It may be necessary, in order to gain access to parts of the register for cleaning, to move the strip of registers forward or to remove the register from its mounting. To move the strip of registers forward, remove the register mounting plate screws with the 4-inch regular screwdriver and draw the strip of registers forward until the spoolheads are in line with the front of the strip of registers above and below. Do not pull the register mounting plate further forward as this may damage the skinners. If the register is mounted on a mounting plate which is fastened inside of the framework channel or if the length of the leads is not sufficient to permit the strip of registers to be moved forward, unsolder the leads, remove the register mounting nut with the No. 46 wrench or the mounting screws with the 4-inch regular screwdriver, and remove the register from the mounting plate.

REGISTERS NOT EQUIPPED WITH BALANCED PAWL ARMATURES

Operating Pawl Bearings

Cleaning Bearings Using D-96123 Cleaning Gun

3.04 ***General:*** If the D-96123 cleaning gun is used, it is recommended that the registers be cleaned in groups, each "group" to consist only of those registers on one mounting plate which are to be cleaned. If registers on a number of mounting plates are to be cleaned, begin with the group associated with the lowest mounting plate and work upward, completely cleaning each group of registers, in turn, before starting on the next group. It is recommended that the operator keep his head above the level of the gun to avoid inhaling trichloroethane fumes which are heavier than air and tend to move downward. (See 3.02.)

3.05 ***Preparation of D-96123 Cleaning Gun***

(1) In order to prevent foreign matter that may be present in the trichloroethane from clogging the nozzle of the gun, filter the trichloroethane through filter paper before filling the gun.

(2) To prepare the cleaning gun for use, manually unscrew the cap on top of the gun reservoir. Fill the reservoir with filtered trichloroethane, taking care not to spill the trichloroethane. Remount the cap. Operate and release the trigger of the gun several times making sure that trichloroethane is discharged each time the trigger is operated. Repeat this check before starting the cleaning operation on each group of registers.

(3) If trichloroethane is not discharged each time the trigger is operated, it is an indication that the nozzle of the gun is clogged. Remove the three nozzle guard mounting screws with the KS-6854 screwdriver and remove the guard. Then, unscrew and remove the nozzle and blow out the obstructing matter. Remount the parts of the gun in the reverse order of removal.

(4) After completing cleaning, remove the cap from the gun reservoir, drain the reservoir, and remount the cap. Operate and release the trigger several times to expel the trichloroethane from the gun. Leaving trichloroethane in the gun might cause corrosion of parts.

3.06 ***Cleaning Procedures***

(1) Remove the covers from the registers in and directly above the group of registers to be cleaned.

(2) Place a strip of KS-7439 absorbent board on top of the registers directly below those to be cleaned to catch trichloroethane that will drip down during the cleaning operation.

(3) Prepare the cleaning gun for use as covered in 3.05. Make sure that the nozzle of the gun is properly positioned to apply trichloroethane to the pawl bearing. If necessary turn the nozzle to the proper position. Do not bend the nozzle. Place the portion of the gun corresponding to the register cover over the first register in the group to be cleaned. Push the gun inward as far as possible.

(4) Fully operate and release the trigger five times, not faster than one operation per second. Each time the trigger is operated and released, trichloroethane is applied to the bearing while the operating pawl is moved up and down slightly several times to work the trichloroethane into the bearing.

(5) Clean the operating pawl bearings of the remaining registers in the group as covered in (3) and (4). Clean the registers successively, starting from one end of the group.

(6) After cleaning several groups of registers, check whether the KS-7439 absorbent board has been saturated with trichloroethane. Substitute a dry board before the one in use reaches the dripping point in order to avoid the possibility of the trichloroethane dripping on the registers below. The board may be re-used after the trichloroethane has completely evaporated.

Caution: Avoid inhaling trichloroethane fumes from a saturated board. (See 3.02.)

Cleaning Bearings Using Medicine Dropper

3.07 Using the medicine dropper, apply two drops of trichloroethane to the operating pawl bearing. Move the operating pawl up and down several times with the KS-6320 orange stick to work the trichloroethane into the bearing. Repeat the cleaning operation.

Armature Backstop Rod

Cleaning Backstop Rod Using D-96239 Backstop Rod Cleaning Tool and D-96238 Armature Holder

3.08 If the D-96239 backstop rod cleaning tool and the D-96238 armature holder are available, use these tools as covered in 3.09 and 3.10.

3.09 Insert a length of KS-7438 cleaning paper into the D-96239 backstop rod cleaning tool so that the paper does not extend beyond the cutting edge of the tool. Then, insert the curved portion of the tool beneath the number wheels of the register and hook the lugs of the tool over the frame of the register as shown in Fig. 1. Feed the cleaning paper slowly through the cleaning tool until the end of the paper raises the operating pawl as shown in the figure.

3.10 Place the hooked end of the D-96238 armature holder over the armature, taking care not to operate the register or to unhook the retractile spring. Hold the armature against the cleaning paper with a light pressure. Hold the paper in the cleaning tool, between the thumb and forefinger, as shown in Fig. 1, and withdraw the paper and tool from the register. Tear off the used portion of the paper. Repeat the above operation as many times as necessary until the cleaning paper remains clean after it has been used. Tear off the used portion of the paper before proceeding to the next register.

Cleaning Backstop Rod Using Pipe Cleaner

3.11 To clean the contacting surfaces of the armature and the armature backstop with a pipe cleaner, proceed as follows. Moisten the pipe cleaner with trichloroethane, insert the pipe cleaner between the two parts, and move the pipe cleaner in and out to scrub the surfaces. Cleaning the surface adjacent to the operating pawl will be facilitated by inserting the pipe cleaner between the pawl and adjacent pole piece.

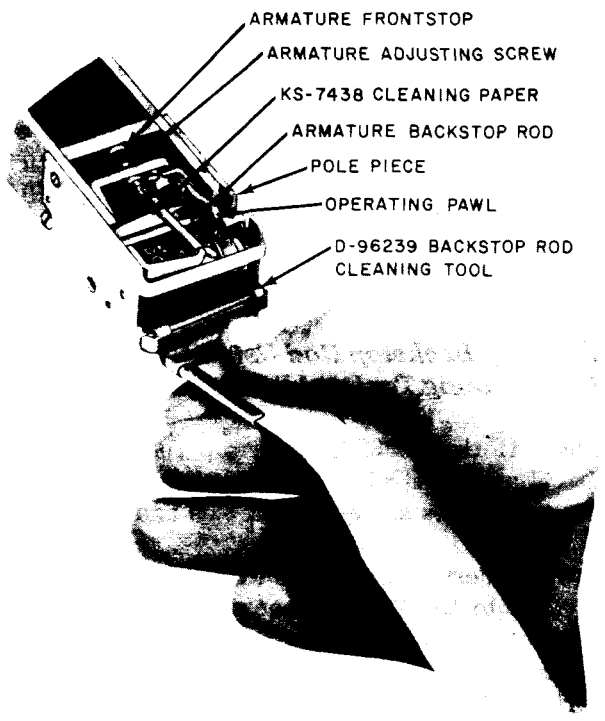


Fig. 1—Method of Cleaning Armature Backstop Rod on 5-Type Register Not Equipped with Balanced Pawl Armature

Armature Frontstop and Adjusting Screw (Registers Without Contacts)

3.12 Clean the contacting surfaces of the armature frontstop and adjusting screw using a pipe cleaner moistened with trichloroethane. Rub the pipe cleaner over both surfaces.

REGISTERS EQUIPPED WITH BALANCED PAWL ARMATURES

Operating Pawl Bearings

3.13 Using the medicine dropper, apply two drops of trichloroethane to each of the two operating pawl bearings. Move the operating pawl up and down several times with the KS-6320 orange stick to work the trichloroethane into the bearing. Repeat the cleaning operation.

Armature Backstop Rod

3.14 Clean the contacting surfaces of the armature and armature backstop using a pipe cleaner moistened with trichloroethane. Insert the pipe cleaner between the two parts and move the pipe cleaner in and out to scrub the surfaces. Rotate the backstop rod with the pipe cleaner and make sure that the entire circumference of the rod which contacts the armature is cleaned. If the rod binds in its bearings, apply trichloroethane to the bearings with the pipe cleaner until the rod rotates freely. Cleaning the surface adjacent in the operating pawl will be facilitated by inserting the pipe cleaner between the pawl and the adjacent pole piece.

Armature Frontstop and Adjusting Screw (Registers Without Contacts)

3.15 Clean the contacting surfaces of the armature frontstop and adjusting screw using a pipe cleaner moistened with trichloroethane. Rub the pipe cleaner over both surfaces.

4. 14-TYPE REGISTERS

GENERAL

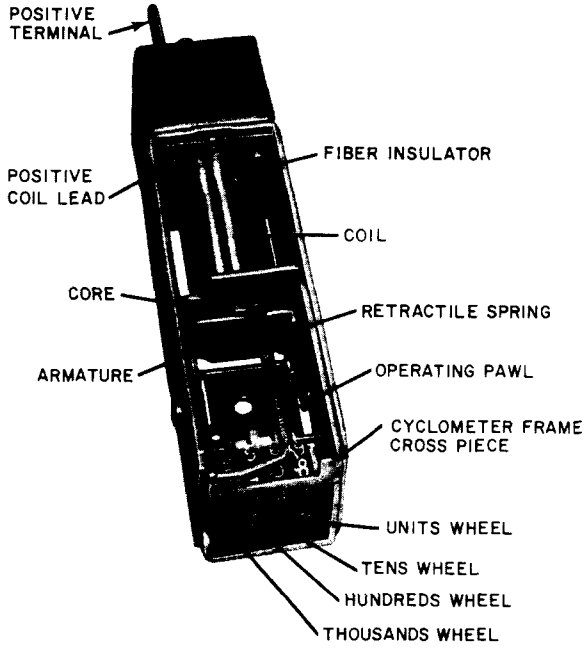
4.01 Record the reading of each register before and after cleaning. Remove the register covers using the No. 90 cap remover. After cleaning, remount the covers.

4.02 ***Preparation of KS-16601 L1 Paper:*** The KS-16601 L1 paper used for cleaning 14-type registers is furnished in sheets 18 inches square. For the purposes covered in this section, cut each sheet into four 9-inch squares. For procedures specifying the use of moistened paper, fold the 9-inch square sheet twice to provide four thicknesses of paper 4-1/2 by 4-1/2 inches. In these cases, immerse the four thicknesses of paper in water and, then squeeze the paper to remove excess moisture. In using dry paper, it is not necessary to fold the 9-inch square sheet.

NUMBER WHEELS

4.03 ***General:*** Clean all the numerals on the units and tens wheels, but only the numerals on the hundreds and thousands wheels which are accessible without operating and releasing the register. To manually operate and release the register, insert one end of a toothpick over the cyclometer frame crosspiece between the operating pawl and the retractile spring. Push the armature toward the core as far as possible and then remove the toothpick. This advances the units wheel one

step. ▶An alternate method of operating the register using a KS-20516 interrupter is described in 4.05 through 4.08. The 14-type register is illustrated in Fig. 2.◀



▶Fig. 2—14-Type Register w/Cover Removed◀

4.04 ***Cleaning Numerals***

(1) Moisten a folded sheet of KS-16601 L1 paper as covered in 4.02.

(2) Clean the accessible surfaces of all number wheels of the register by rubbing the moistened paper lightly on the surfaces with an up and down motion. Repeat this operation if necessary, using a clean surface of the moistened paper. When no dirt appears on the moistened paper, wipe the number wheels with a piece of clean, dry KS-16601 L1 paper.

(3) Operate and release the register twice. Clean the accessible surface of the units wheel using moistened and dry KS-16601 L1 paper following a similar procedure to that covered in (2). Repeat this procedure until the entire surface of the units wheel has been cleaned.

(4) Operate and release the register 20 times. Clean the accessible surface of the tens wheel using moistened and dry KS-16601 L1 paper as covered above. Repeat this procedure until the entire surface of the tens wheel has been cleaned.

▶CLEANING REGISTER USING KS-20516 INTERRUPTER◀

4.05 ▶The KS-20516 interrupter (Fig. 3) is designed to pulse one to three registers approximately five times a second during the cleaning process.◀

4.06 ▶The KS-20516 interrupter is connected to a 14-type register in the following manner:

(1) The socket end of the M2EL cord is plugged into the Jones plug on the front of the interrupter.

(2) The two clips on the M2EL cord are attached to the terminals off a 48 V dc source. Make sure the yellow lead is clamped on the positive (gnd) terminal. (See Fig. 4).

(3) The P-19E143 cord tip of the W1BH cord is inserted into the pin jack on the front of the interrupter.

(4) The short (90° offset) end of the 770B tool is inserted into the KS-19547 contact of the W1BH cord.

(5) The tip end of the 770B tool is inserted into the upper left hand coil lead hole (as viewed from the front) of the fiber insulator at the rear of the coil. See Fig. 2. It should make contact with the coil positive lead which is threaded through this hole.

Caution: The tip of the 770B tool should be inserted with care so as not to break the fine coil lead.

The lip of the catch sleeve of the 770B tool is slipped inside the cyclometer frame crosspiece. See Fig. 2. This will wedge the 770B tool in place.

(6) The other terminal of the register coil (diagonally opposite that shown in Fig. 2) must then be connected to the supply jack providing negative battery to the register. Grounding of the positive side of the battery

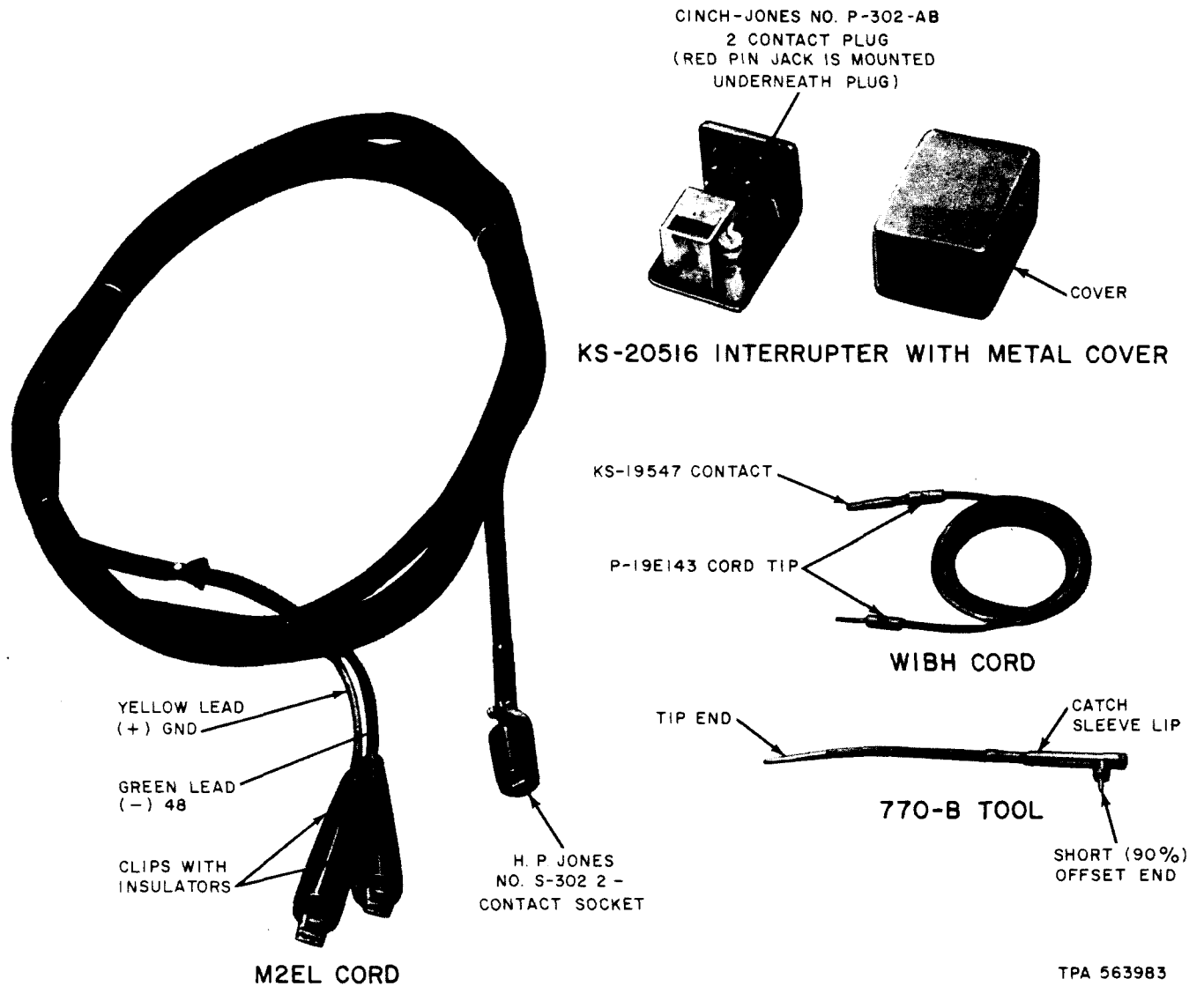


Fig. 3—KS-20516 L1 Interrupter with Associated Cords and 770B Tool

causes the register to pulse each time the interrupter contacts close-and-open the circuit to ground. (See Fig. 4)

4.07 During the cleaning process, hold the KS-2852 nozzle of the KS-14377 vacuum cleaner in front of the rotating number wheels to collect wear products and dirt.

4.08 Clean the numerals in the manner described in 4.04 (1) and (2).

WINDOW

4.09 ***Outer Surface of Window:*** To prevent loosening the window in the cover while cleaning the outer surface, press on the inner surface with a clean, dry KS-16601 L1 paper.

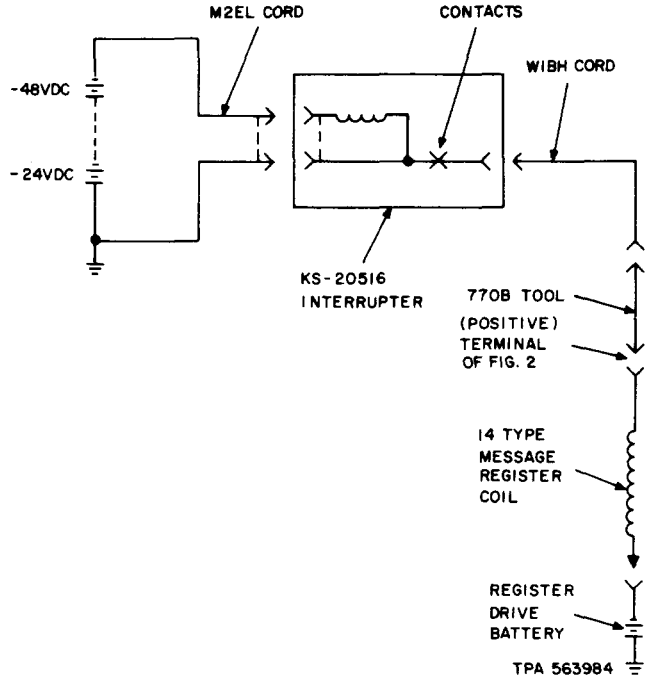


Fig. 4—Circuit Schematic for Pulsing 14-Type Message Registers

Using a light pressure, clean the outer surface of the window with a moistened piece of KS-16601 paper prepared as covered in 4.02. After cleaning, wipe the surface with a clean, dry KS-16601 paper.

4.10 ***Inner Surface of Window:*** Using a light pressure, clean the inner surface of the window with a moistened piece of KS-16601 L1 paper prepared as covered in 4.02. After cleaning, wipe the surface with a clean, dry KS-16601 paper.