

## KS-16363 L1 WIRE-WRAPPING TOOL AND ASSOCIATED BITS AND STATIONARY SLEEVES REQUIREMENTS AND ADJUSTING PROCEDURES

### 1. GENERAL

**1.01** This section covers the KS-16363 L1 wire-wrapping tool and associated wrapping bits and stationary sleeves. The wrapping tool with bit and sleeve is shown in Fig. 1.

**1.02** This section is reissued to revise the information on the bits and sleeves associated with the KS-16363 L1 wire-wrapping tool.

**1.03** The identification and use of wrapping bits and stationary sleeves are covered in the section describing the method of making and removing wrapped connections. Bits and sleeves having the same color code as indicated by a painted band on the bit or a plastic band on the sleeve are used together with the following exception. †The KS-20963 L3 (yellow sleeve) is used with the KS-16903 L1 (green) bit.‡

**1.04** Reference shall be made to Section 020-010-711 covering general requirements and definitions for additional information necessary for proper application of the requirements listed herein.

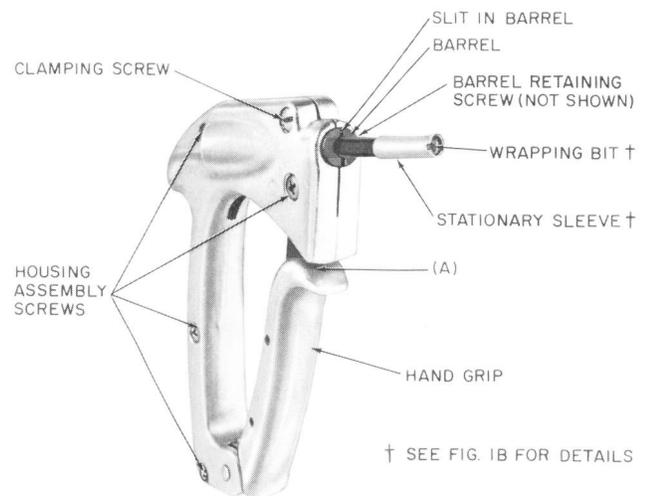
**1.05** *One drop of KS-7470 oil* for the purpose of this section is the amount of oil discharged from the nozzle of the 486A oil can when the sides are depressed until a drop is released.

**1.06** *One discharge of KS-7471 grease* for the purpose of this section is a column of grease approximately 1/8 inch long discharged from the nozzle of the 353C grease gun.

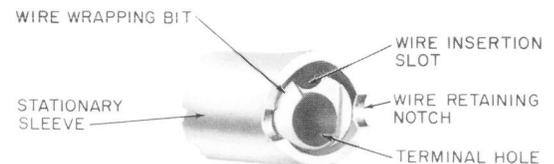
**1.07** *The normal position of the hand grip* is that position in which the hand grip rests against the normal stop in the housing. This stop may be observed through the slot between the two halves of the housing when the hand grip is partially operated.

**1.08** *The fully operated position of the hand grip* is that position in which the hand grip

has moved the bumper spring against the bumper-spring stop in the housing. In this position the inner edge of the hand grip is approximately 1/16 inch from the inner end of the slot between the two halves of the housing.



1A - WRAPPING BIT AND STATIONARY SLEEVE MOUNTED IN WIRE WRAPPING TOOL



1B - END VIEW OF WRAPPING BIT AND STATIONARY SLEEVE

**Fig. 1—KS-16363 L1 Hand Wire-Wrapping Tool and Associated Wrapping Bit and Stationary Sleeve**

**2. REQUIREMENTS**

**2.01 Cleaning and Verification of Wrapping Bit and Stationary Sleeve**

(a) The terminal hole and wire insertion slot of the wrapping bit shall be free of accumulations of foreign matter.

Gauge by eye and feel.

To check this requirement, insert a length of uninsulated No. 24 gauge wire to the bottom of the hole (approximately 3/4 inch) and the inner end of the slot (approximately 2 inches) and then withdraw the wire. Note whether the wire enters freely to the full length (approximately 2 inches) and whether any particles of foreign matter are removed as the wire is withdrawn.

(b) The outer end of the stationary sleeve and wrapping bit shall be free of corrosion and shall not be appreciably worn or deformed. The radial surface at the outer end of the wire insertion slot of the wrapping bit shall be bright and shall be free from pits, excessive wear, and patches of metallic particles deposited during wire-wrapping operations (Fig. 2).

Requirements (a) and (b) shall be checked once a month.

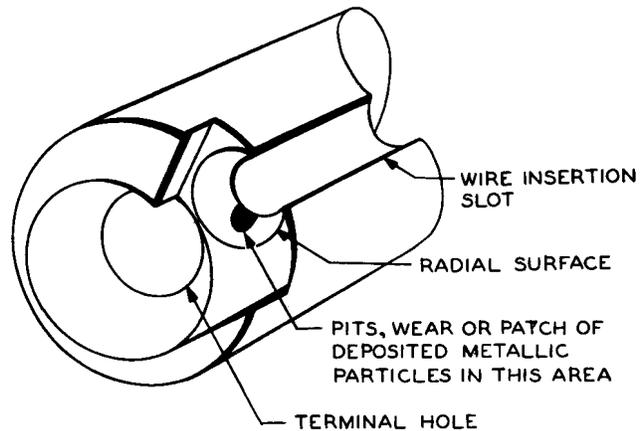
Gauge by eye using the KS-2632 reading glass.

(c) The wrapping bit shall be returned to the Western Electric Company distributing house, as covered by local instructions, for verification after each 6 months of use.

The monthly check of requirement (b) is relied on to provide the first warning that the parts may have deteriorated so their further use is undesirable. Verification requirement (c) is necessary to insure the ability of the tool to produce wrapped connections of the proper tightness to maintain satisfactory electrical contact over a long period of time.

**2.02 Cleaning Wire-Wrapping Tool:** Parts of the tool shall be cleaned when necessary.

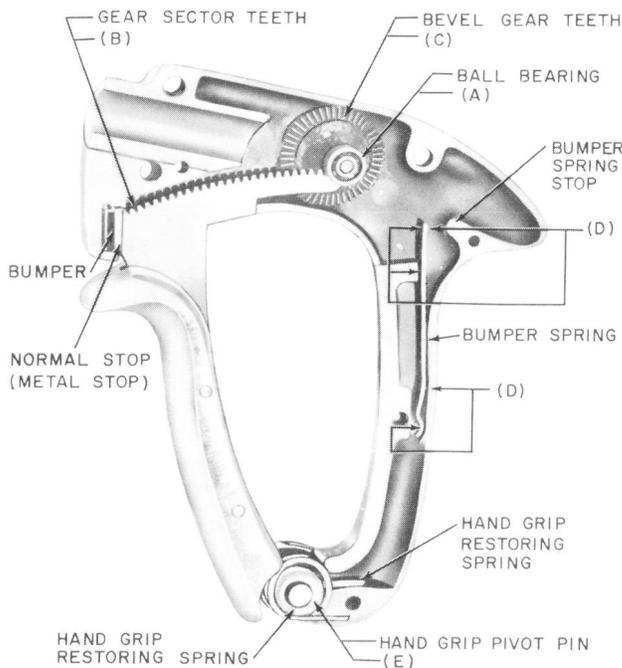
**2.03 Lubrication**



**Fig. 2—Outer End of Wrapping Bit—Conditions Which May Occur on Radial Surface**

(a) The following parts shall be adequately lubricated. When lubrication is necessary, the lubricant and the amounts to be applied are as follows.

<u>PART</u>	<u>LUBRICANT AND AMOUNT</u>
Ball Bearings, Fig. 3(A)	Space between inner and outer races of both ball bearings filled with KS-7471 grease
Teeth on Gear Sector, Fig. 3(B)	Five discharges of KS-7471 grease from the 353C grease gun distributed over the teeth
Teeth on Bevel Gear, Fig. 3(C)	Eight discharges of KS-7471 grease distributed over the teeth
Bumper Spring, Fig. 3(D)	One discharge of KS-7471 grease distributed over the five contacting surfaces indicated
Hand-Grip Pivot Pin, Fig. 3(E)	One drop of KS-7470 oil



**Fig. 3—KS-16363 L1 Hand Wire-Wrapping Tool—Interior View Showing Gearing and Associated Parts**

- (b) **Recommended Lubrication Intervals:** Parts shall be lubricated at annual intervals. This interval may be extended if periodic inspections have indicated and local conditions are such as to insure that the parts will be adequately lubricated during the extended interval.

**2.04 Alignment of Wrapping Bit:** With the hand grip in the normal position, the wire insertion slot of the wrapping bit shall be approximately in line with the top slit in the barrel.

Gauge by eye.

To check this requirement, fully operate the hand grip several times allowing it to return unretarded to the normal position. The requirement shall be met after each operation.

**2.05 Position and Alignment of Stationary Sleeve**

- (a) When using the older type of sleeve, the shoulder of the stationary sleeve shall seat against the barrel. If using the new KS-20963 type sleeve, insert the sleeve into the barrel

chuck with the flared portion of the sleeve in the "12 o'clock" or top position. Make sure the sleeve does not restrict the rotation of the bit as no shoulder is provided on these sleeves.

Gauge by eye.

- (b) The stationary sleeve shall be held firmly in the barrel.

Gauge by feel.

- (c) The center of the wire insertion notch in the KS-16363 stationary sleeve shall be approximately in line with the center of the wire insertion slot in the wrapping bit. If using the new KS-20963 wire-wrapping sleeve, make sure the wire insertion slot in the wrapping bit is approximately in line with the top or flared portion of the sleeve.

Gauge by eye.

**2.06 Freedom of Operation:** With the wrapping bit and stationary sleeve mounted in the tool, the hand grip shall operate and release smoothly and without bind when it is moved slowly to the fully operated position and then allowed to return slowly to the normal position.

**Note:** Fig. 1—Before tightening the slotted head clamping screw, hold the sleeve and operate the hand grip a few times to relieve any potential binding between the sleeve and the tong of the bit. *This is very important.*

Gauge by feel.

**2.07 Hand-Grip Pull**

- (a) Fig. 1(A)—The pull required to just move the hand grip from the normal position shall be

Min 600 grams  
Max 1000 grams

Use the 79B gauge applied to the hand grip adjacent to the housing.

- (b) As the hand grip is pulled slowly to its fully operated position, there shall be an appreciable increase in the resistance to pull when the hand

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grip is approximately 1/4 inch from the fully operated position.

Gauge by feel.

To check this requirement, proceed as follows. With the hand grip in the fully operated position, mark a pencil line on the housing in line with the outer edge of the portion of the grip which enters the housing. Then mark another line on the housing, 1/4 inch from the first line toward the unoperated position of the hand grip. Hold the tool between the thumb and two fingers with the fingers on the upper portion of the hand grip. Slowly operate the hand grip and note the point at which the increased resistance occurs with respect to the mark on the housing toward the unoperated position. The increased resistance to hand-grip pull is due to engagement of the hand grip with the bumper spring in the housing.

**3. ADJUSTING PROCEDURES**

**3.001 List of Tools, Gauges, and Materials**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
353C	Grease gun (equipped with 570A straight nozzle)
486A	Oil can
KS-2632	Reading glass
KS-2663	File
R-2969	Brush
—	4-inch E screwdriver
—	No. 1 Phillips-type screwdriver
—	No. 2 Phillips-type screwdriver
<b>GAUGES</b>	
79B	Gauge (0-1000 gram push-pull tension gauge)

CODE OR SPEC NO.	DESCRIPTION
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**MATERIALS**

KS-2423	Cloth
KS-7470	Oil
KS-7471	Grease
KS-7860	Petroleum spirits

**3.01 Cleaning and Verification of Wrapping Bit and Stationary Sleeve (Reqt 2.01)**

(1) To free the wrapping bit terminal hole and wire insertion slot from accumulations of foreign matter, proceed as follows. Using a 5-inch length of clean, straight, uninsulated 24-gauge wire, insert the wire without forcing it into the wire insertion slot to the full length of the slot (approximately 2 inches). Hold the exposed length of wire with the fingers at a point approximately 2 inches from the end of the bit. Hold the tool so the bit faces downward and fully operate and release the hand grip three times. Remove the wire. Repeat this procedure to clean the terminal hole using a 5-inch length of clean, straight, uninsulated 24-gauge wire inserted approximately 3/4 inch to the bottom of the hole.

(2) If the stationary sleeve and/or wrapping bit do not meet requirements covered in (b), replace the part.

(3) Return the wrapping bit to the Western Electric Company distributing house for verification after each 6 months of use. Ship the bit in a container of the type in which it was received.

**3.02 Cleaning Wire-Wrapping Tool (Reqt 2.02)**

**3.03 Lubrication (Reqt 2.03)**

(1) In order to clean and lubricate the wire-wrapping tool, first separate the halves of the housing and remove parts, as covered in (2) through (4).

(2) Place the tool on a flat surface. Remove the clamping screw using the 4-inch regular screwdriver. Remove the four housing assembly screws using the No. 2 Phillips-type screwdriver.

Do not remove the barrel retaining screw (Fig. 1). Remove the wrapping bit and stationary sleeve.

(3) Carefully separate the two halves of the housing. If necessary, gently pry them apart with the 4-inch E screwdriver at the sections adjacent to the clamping screw hole and near the pivot pin. Take care not to burr the edges of the housing. If a burr should be formed, remove it using the KS-2663 file. As the two halves are separated, take care not to lose parts which may drop from the housing (stop, bumper, and bumper spring shown in Fig. 4).

(4) Remove the metal stop, bumper, and bumper spring. Swing the hand grip aside sufficiently to clear the bevel gear and pinion and remove the gear, pinion, and ball-bearing assembly.

(5) Clean the interior of both halves of the housing and the gears using a KS-2423 cloth moistened with KS-7860 petroleum spirits. Then wipe the parts with a clean, dry cloth. Clean the grease from both ball bearings with an R-2969 brush and petroleum spirits.

(6) Apply grease to both ball bearings using the 353C grease gun equipped with the 570A nozzle.

(7) Remount the bevel gear, pinion, and ball-bearing assembly, as covered in (8).

(8) Position the gear, pinion, and ball-bearing assembly in the portion of the housing that does not contain the barrel retaining screw with the face of the gear upward, as shown in the right half of Fig. 4. This positioning of the gear is necessary in order that the wrapping bit will rotate in the proper direction (counterclockwise as viewed from the outer end of the wrapping bit) when the hand grip is operated. Swing the hand grip so its gear sector is engaged with the pinion teeth of the gear and pinion.

(9) Mount the metal stop and bumper making sure the stop is toward the end of the gear sector on the hand grip, as shown in Fig. 4. Mount the bumper spring, as shown in Fig. 4.

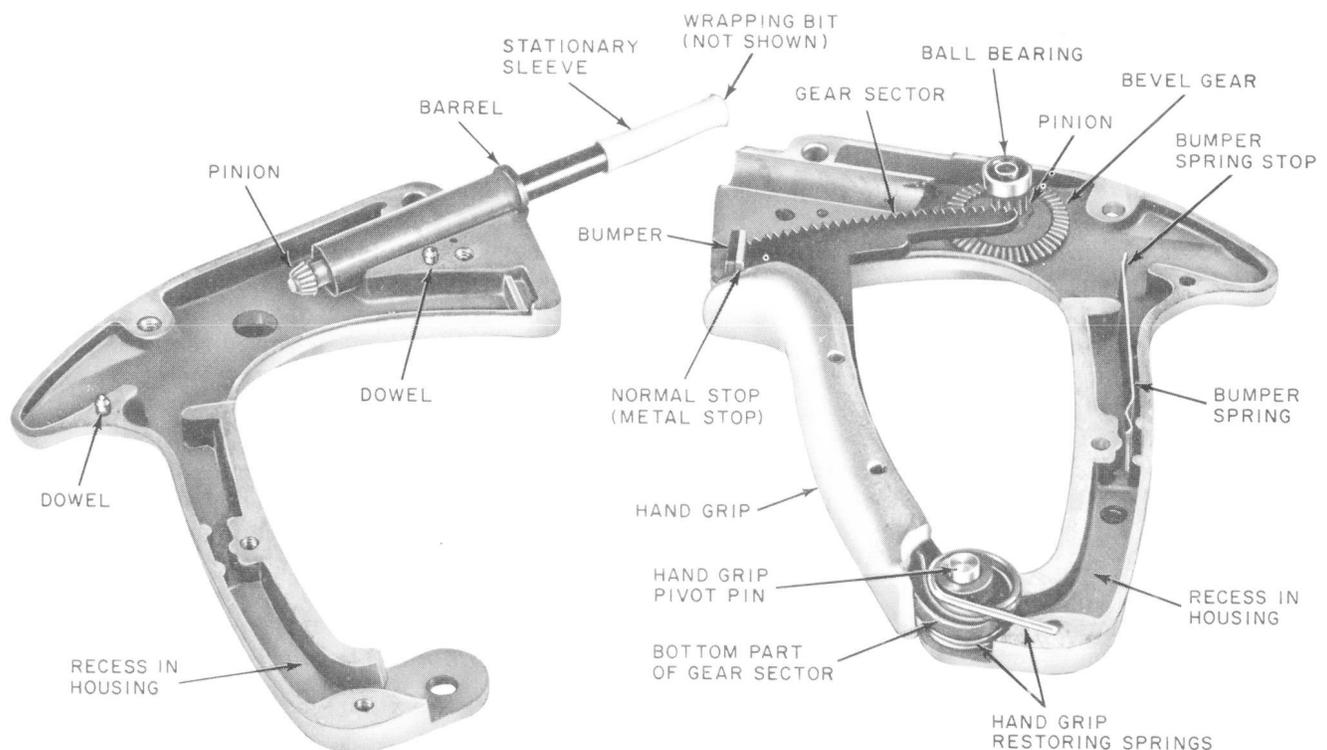


Fig. 4—KS-16363 L1 Hand Wire-Wrapping Tool—Interior View

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- (10) Apply grease to the teeth of the gear sector, the bevel gear, and bumper spring using the 353C grease gun and 570A nozzle.
- (11) Apply oil to the hand-grip pivot pin using the 486A oil can.
- (12) Place the right half of the housing (Fig. 4) on a flat surface. Make sure the hand-grip restoring springs are positioned on the hand grip at the pivot pin as follows. The slightly offset end of both springs should be in their respective recesses in the hand grip and should lie against the center section of the hand grip. The straight end of the inner restoring spring should be in the recess in the right half of the housing. With the other parts of the tool positioned, as covered in (8) and (9), hold the left half of the housing (Fig. 4) in a tilted position so the straight end of the outer restoring spring lies in the recess in this half. Then, keeping the end of the spring in the recess, carefully position this half of the housing on the other half so the hand-grip pivot pin fully enters its hole and the dowels in one half of the housing enter their holes in the other half. Insert and moderately tighten all of the housing screws and then securely tighten the screws. This is necessary since fully tightening one screw with the others loose may cause binding of the hand grip.

### 3.04 *Alignment of Wrapping Bit* (Reqt 2.04)

### 3.05 *Position and Alignment of Stationary Sleeve* (Reqt 2.05)

- (1) If the wire insertion slot in the bit is not in alignment with the slit in the barrel, proceed as covered in (a) through (f).
  - (a) Loosen the clamping screw with the 4-inch E screwdriver and remove the bit and sleeve.
  - (b) Loosen the Phillips head screw directly below the clamping screw with the No. 2 Phillips-type screwdriver.
  - (c) Remove the barrel retaining screw with the No. 1 Phillips-type screwdriver and remove the barrel.

- (d) Hold the barrel pinion stationary, insert the bit in the barrel, and rotate the bit until the flat on the bit engages the corresponding flat on the pinion shaft. Facing the slit end of the barrel, hold the barrel so the retaining screw hole is at the right. Rotate the bit and pinion until the slot in the bit is in alignment with the slit at the top of the barrel. With the hand grip in the unoperated position and the slot in the bit in line with the slit in the barrel, fully insert the barrel in the housing so the pinion engages its mating gear.

- (e) While holding the bit firmly in place, align the barrel retaining screw hole with the corresponding hole in the housing. Insert and securely tighten the barrel retaining screw.

- (f) Mount the sleeve in the barrel, as covered in 2(b).

- (2) If the position and alignment of the stationary sleeve do not meet the requirements, proceed as covered in (a) and (b).

- (a) Loosen the clamping screw using the 4-inch E screwdriver.

- (b) Mount the sleeve in the barrel so the shoulder of the sleeve is against the barrel and the wire insertion notch in the sleeve is in alignment with the wire insertion slot in the bit. ♦If using the new KS-20963 wire-wrapping sleeve, make sure the wire insertion slot in the wrapping bit is approximately in line with the flared portion of the sleeve.♦ Tighten the Phillips head screw directly below the clamping screw and then tighten the clamping screw.

**Note:** ♦Before tightening the slotted clamping screw hold the sleeve and operate the hand grip a few times to relieve any potential binding between the sleeve and the tong of the bit.♦

### 3.06 *Freedom of Operation* (Reqt 2.06)

- (1) If bind occurs during operation of the hand grip, remove the bit and sleeve from the tool and examine both parts for damage or distortion. Rotate the bit in the sleeve to check

for distortion of the parts. Replace parts as required.

(2) If bind occurs during operation of the hand grip with the bit and sleeve removed, check for the following.

(a) Excessive tightening of housing screw adjacent to the hand-grip pivot. Slightly loosen the screw with the No. 2 Phillips-type screwdriver.

(b) Separate the halves of the housing, as covered in 3.02 and 3.03(2) and (3), and check for the following conditions: foreign material or lack of lubrication on the gears, worn teeth on barrel pinion, worn teeth on bevel gear and associated pinion, worn teeth on gear sector, worn ball bearings, distortion or damage to hand grip or housing. Clean and lubricate gears and bearings, as required, and replace defective parts, as required.

(3) If the halves of the housing have been separated, reassemble them as covered in 3.02 and 3.03(12).

### **3.07 Hand-Grip Pull (Reqt 2.07)**

(1) If this requirement is not met, check for freedom of operation covered by requirement 2.06.

(2) If the freedom of operation requirement is met but requirement (a) is not met, replace the restoring springs.

(3) If the freedom of operation requirement is met but requirement (b) is not met, separate the halves of the housing, as covered in 3.02 and 3.03(2) and (3). Check the position of the bumper spring and, if necessary, position it as shown in Fig. 4. If the requirement still is not met, replace the bumper spring. Assemble the two halves of the housing, as covered in 3.02 and 3.03(12).