

**BELL SYSTEM PRACTICES**  
**Teletypewriter Stations**

**SECTION P31.119**  
**Issue 2, February, 1957**  
**AT&TCo Standard**

# **INSTALLATION AND MAINTENANCE OF PAPER WINDERS ON 15 TELETYPEWRITER COVERS AND 28A, 28B, 28C, 28D AND 28E TELETYPEWRITER CABINETS**

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**INSTALLATION AND MAINTENANCE  
OF PAPER WINDERS ON  
15 TELETYPEWRITER COVERS  
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TELETYPEWRITER CABINETS**

## 1. GENERAL ↖

1.01 This section gives installation instructions, requirements, and adjusting and lubricating procedures for 15-type paper winders used with 15 teletypewriter covers and 28A, 28B, 28C, 28D and 28E teletypewriter cabinets. It also contains information on sets of parts that adapt the winders for specific purposes.

1.02 The section is reissued:

- (a) To add the TP129428\*\* and TP153901\*\* modification kits.
- (b) To revise Figs. 1, 2, and 3 and to add Figs. 4 and 5.
- (c) To include the paper-spindle-cylinder regulating bushing.
- (d) To remove references to old part numbers and to list new part numbers and names where necessary.
- (e) To add a list of associated Bell System Practices.
- (f) To revise the title of this section to show the addition of new information.

Marginal arrows are used to indicate changes.

1.03 Although the 28A, 28B, 28C, 28D and 28E teletypewriter cabinets are normally furnished in gray-green, they can also be furnished in other finishes to meet the customer's needs. The 15-type paper winders are available in the same finishes as the 15 teletypewriter cover or the 28A, 28B, 28C, 28D and 28E teletypewriter cabinet on which a winder is to be mounted.

1.04 The double asterisk (\*\*) designates a 2-letter (Teletype Corporation) or 2-digit (Bell System) suffix which indicates the finish. The meaning of finish suffixes is given in Section P36.101. ↙

## 2. INSTALLATION AND WIRING

### A. On 15 Teletypewriter Covers

#### Spacer Bushings

2.01 If narrow paper is used, the pressure rollers that do not bear on the paper should be removed and replaced in accordance with Paragraphs 2.02 and 2.03 by the TP104473 bushings that are furnished with the paper winder. ←

#### 2.02 Preparation

- (1) Remove the typebar carriage from the typing unit.
- (2) Unhook the line-feed detent-lever spring from its spring post.
- (3) Back off the three setscrews, located in the right-hand hub of the platen, that hold the platen to its shaft.

- (4) Withdraw the platen shaft and remove the platen.
- (5) Unhook the two tape-chute springs from their spring posts.
- (6) Loosen the pressure-roller release-lever-shaft setscrews and withdraw the shafts sufficiently to release the paper chute; remove the chute.
- (7) Remove from their shafts, the front and rear pressure rollers that do not bear on the paper, and discard them.

**2.03 Installation:** Position the TP104473 bushings on the pressure-roller shafts and then reassemble the parts referred to in Paragraph 2.02(1) to 2.02(6), inclusive, in the reverse order of their removal.

**Note:** The outer ends of the pressure-roller release-lever shafts should not project more than 1/32 inch beyond the outer surfaces of the paper chute.

**2.04 Pressure-roller-spring Tension:** The pressure-roller spring should have a tension as described in Section P36.610 for the case where a paper winder is used.

#### **Paper Winder**

**Note:** The necessary two each of the nuts, flat washers, TP3900 bushings, lockwashers, and thumbscrews used for mounting the paper winder are furnished with the winder.

#### **2.05 Preparation and Installation**

- (1) The 15 teletypewriter cover on which the paper winder is to be mounted must be drilled in accordance with Fig. 1.
- (2) In the drilled holes, secure the TP3900 bushings, using the nuts, washers, and lockwashers. Care should be taken not to tighten the nuts too much, as excessive tightening may distort the bushings.
- (3) Mount the paper winder on the top of the cover, with the motor to the left, by means of the two thumbscrews that are furnished; and before tightening the thumbscrews, position the paper winder so that the spindle lines up with the paper as it leaves the platen. Care should be taken in tightening the thumbscrews, as excessive tightening may possibly buckle the mounting plate and bind the paper spindle.
- (4) Feed the paper under the paper-winder slack bar and then fold back the leading corners of the paper to form a dart and insert it in the paper-spindle slot. Turn the spindle by hand one turn in the direction in which the paper

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is to be wound until the next turn of the paper, as is winds on the cylinder, overlaps the paper-spindle slot.

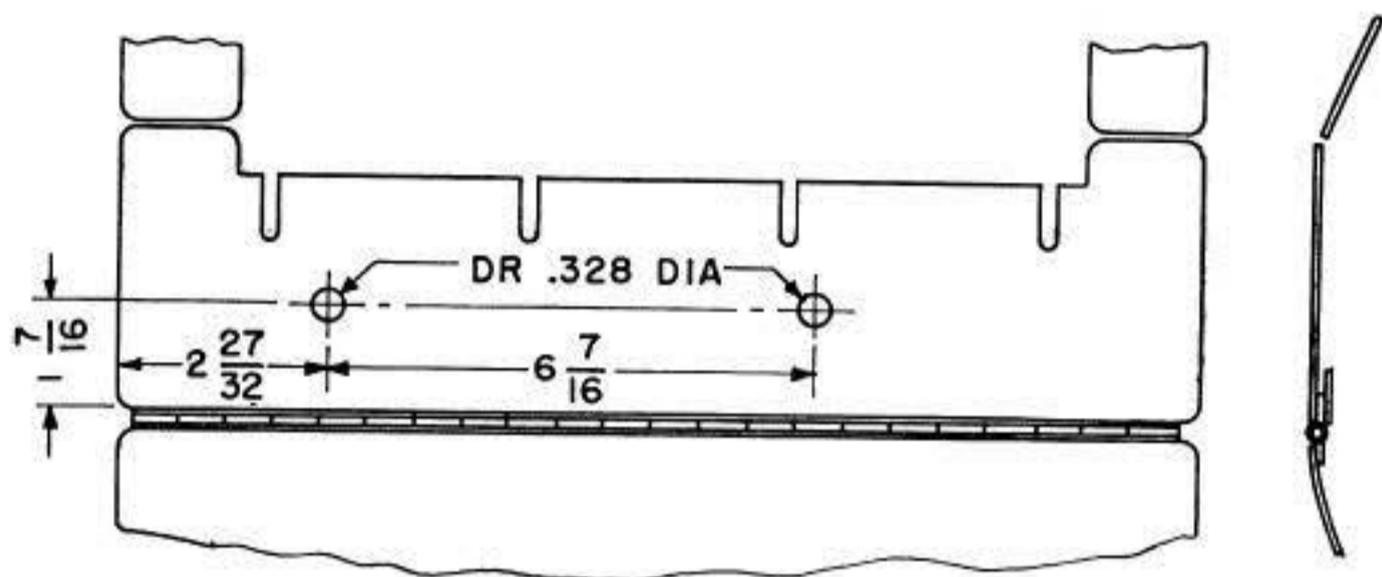
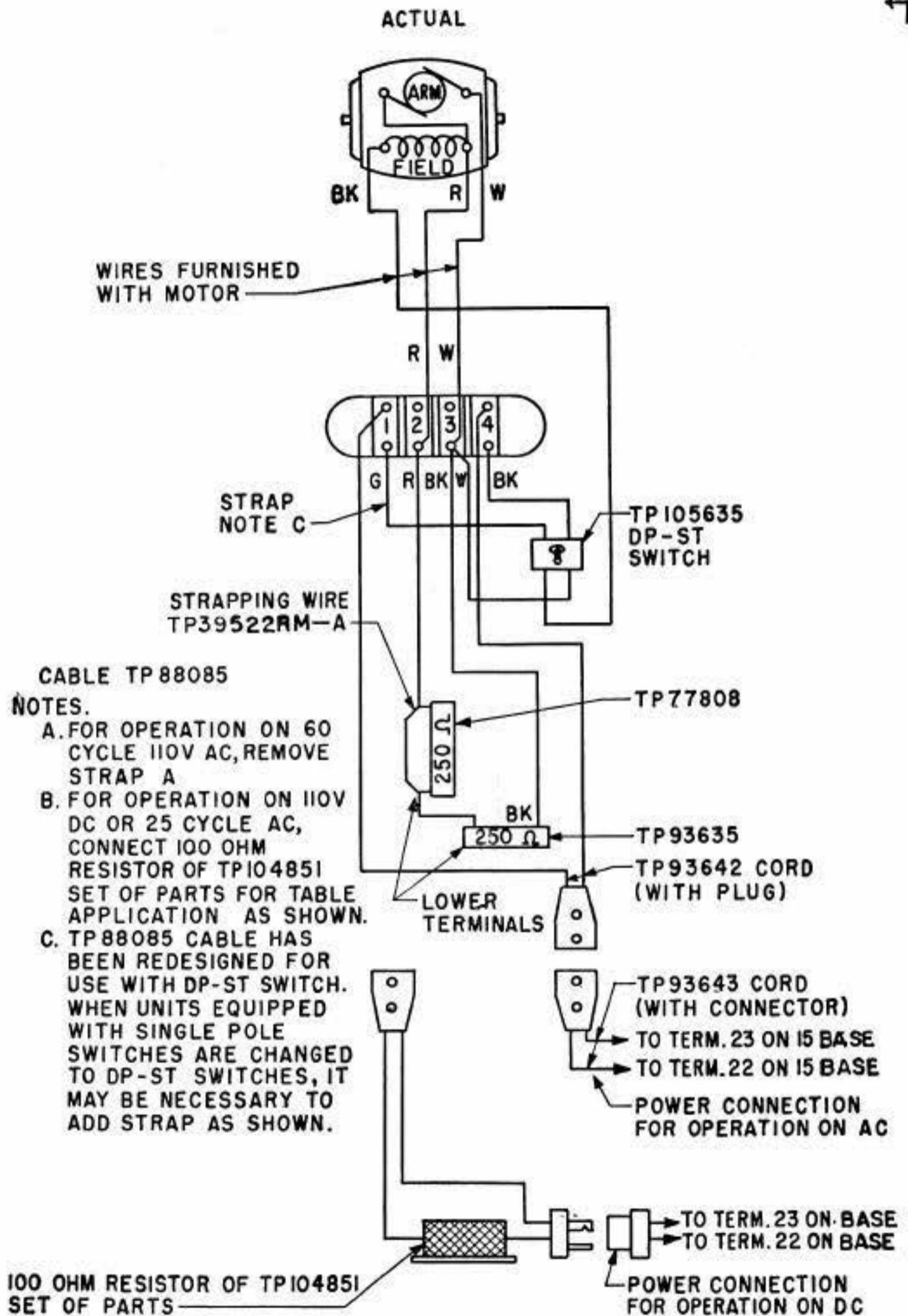


Fig. 1—15 Teletypewriter Cover—Layout of Holes

2.06 **Wiring:** The power cord with receptacle should be connected to the terminal blocks of the 15 teletypewriter base, and the proper strap should be removed from the motor resistors in accordance with Fig. 2. The schematic circuit is shown in Fig. 3.

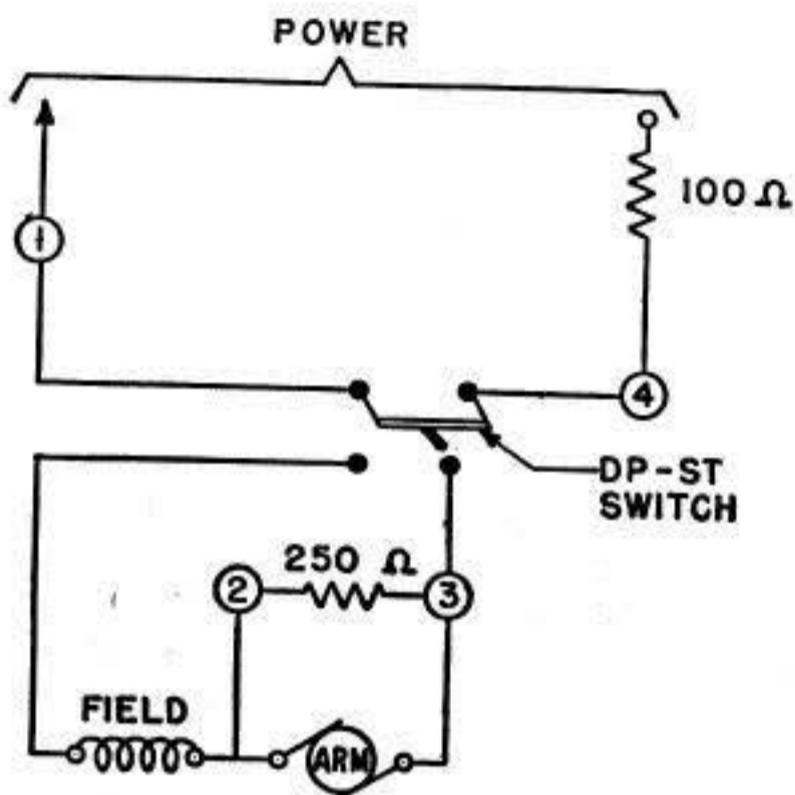
**Figs. 2 and 3**



**Fig. 2—15-type Paper Winders—Wiring Diagram**

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SCHEMATIC  
25 CYCLE 110V AC OR DC OPERATION



SCHEMATIC  
60 CYCLE 110V AC OPERATION

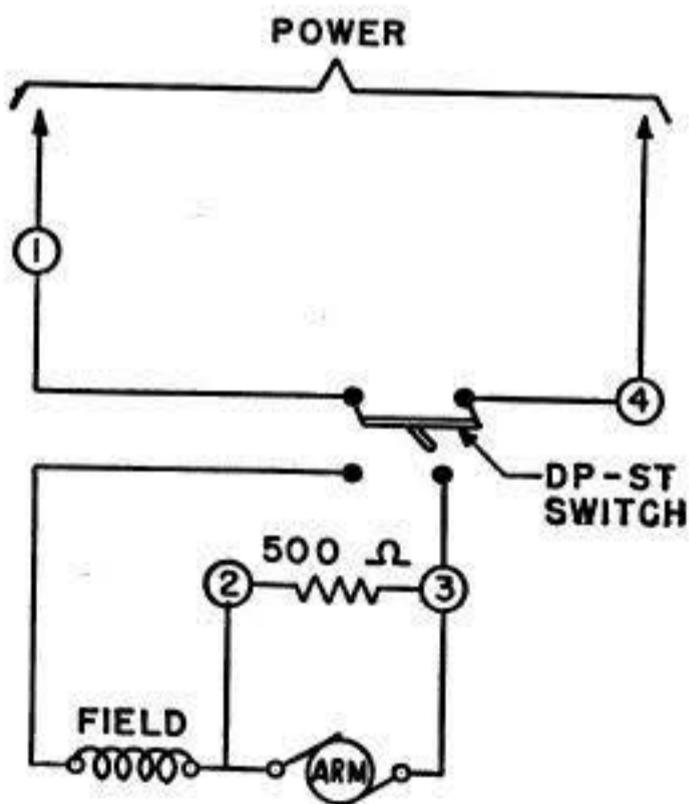


Fig. 3—15-type Paper Winders—Schematics

## TP104851 Resistor Set of Parts

2.07 The TP104851 resistor set of parts (100 ohms), which is furnished with 15C-type and 15D-type paper winders to adapt these winders for operation on 110 volts dc or 25 cycles ac, should be mounted as follows:

- (a) **Wooden Table:** Select an appropriate location on the table and mount the resistor and transite base, fastening them by means of the wood screws that are furnished.
- (b) **All-metal Table:** Select an appropriate location on the table and mount the resistor and transite base, fastening them by means of the machine screws, lockwashers, and nuts that are furnished.

2.08 **Power Connections:** The resistor should be connected in series with one of the power leads of the paper winder as shown in Fig. 2. A suitable connector and 2-conductor No. 18 AWG cordage should be furnished by the installer. **Fig. 2**

## TP129428 Modification Kit

(SHOP INSTALLATION ONLY)

2.09 The TP129428 modification kit permits winding of the carbon copy, passing the carbon paper over the top of the winder into a container in the rear, and tearing off the original. The kit, which provides a means for reversing rotation of the paper winder mounted on a 15 teletypewriter cover, should be installed in accordance with Paragraphs 2.10 and 2.11.

### 2.10 Preparation

- (1) Disconnect the plug from the power supply.
- (2) Remove the paper winder cover by removing the screw from the rear of the paper winder and backing off the other two screws. (The cover has two slotted mounting holes.)
- (3) Depress the latch and remove the paper-winder spindle from its mounting to allow easier installation of the new parts.
- (4) Remove the four screws, flat washers, and lockwashers which hold the motor to the bracket, taking care not to loosen any electrical connections.
- (5) Remove the end thrust-screw, nut, and ball bearing from the gear housing, shown in Fig. 4, taking care not to mislay the bearing. **Fig. 4**

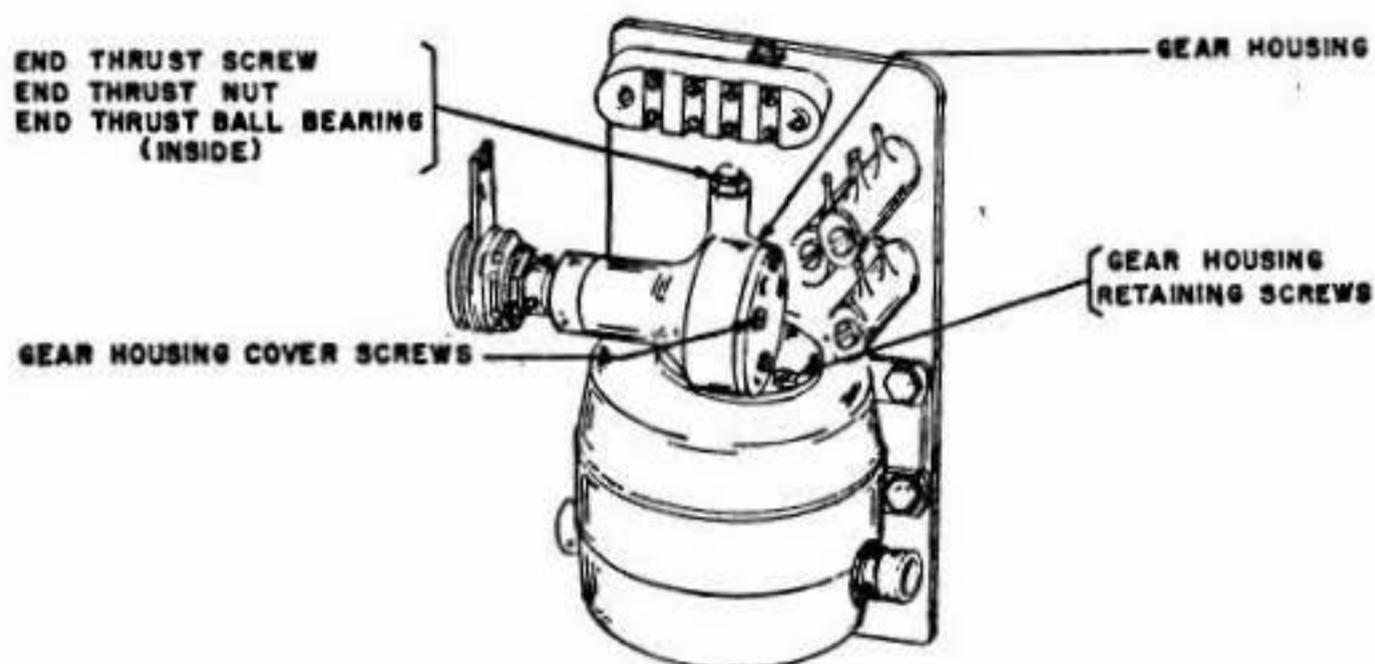


Fig. 4—Gear Housing Assembly

(6) Remove the gear housing from the motor-end bell by removing the three screws, shown in Fig. 4, taking care not to damage or mislay the gasket. Then remove all excess grease from the pinion and motor-end bell. **Fig. 4**

(7) Remove the gear housing cover by removing the three screws, shown in Fig. 4, taking care not to damage or mislay the gasket. Then remove all grease from the gear housing. **Fig. 4**

(8) Drive out and discard the pins that hold the pinion to the motor shaft and the fiber gear to the gear housing shaft. Remove and discard both the pinion and the fiber gear.

### 2.11 Installation

(1) Install the fiber gear that is furnished, on the gear housing shaft, using the longer ( $3/16''$ ) setscrew of the two that are supplied. Do not tighten the setscrew fully at this time.

(2) Install the pinion that is furnished, on the motor shaft, using the remaining setscrew ( $1/8''$ ) that is also furnished. Do not tighten the setscrew fully at this time.

(3) Reinstall the gear housing and gasket on the motor-end bell.

(4) Reinstall the end thrust ball bearing, nut, and screw. Turn in the screw until the motor shaft has only  $1/32$ -inch endplay; then tighten the nut.

(5) Looking through the opening provided by the removal of the gear housing cover, position either the pinion or the fiber gear so that the teeth of the fiber gear engage the teeth located in the middle section of the pinion. Check to see that there are no binds. Line up the setscrew in the fiber-gear hub with the lubricating hole located on top of the housing casting, insert the longer section of a standard No. 8 Allen wrench through the hole, and tighten the setscrew of the fiber-gear hub. Tighten the pinion setscrew. Reinstall the gear housing cover and gasket.

(6) Remount and position the motor on the bracket so that the gear housing shaft is in line with the spindle cradle at the other end of the paper-winder bracket.

(7) Lubricate the gears as specified in Paragraph 4.01(a).

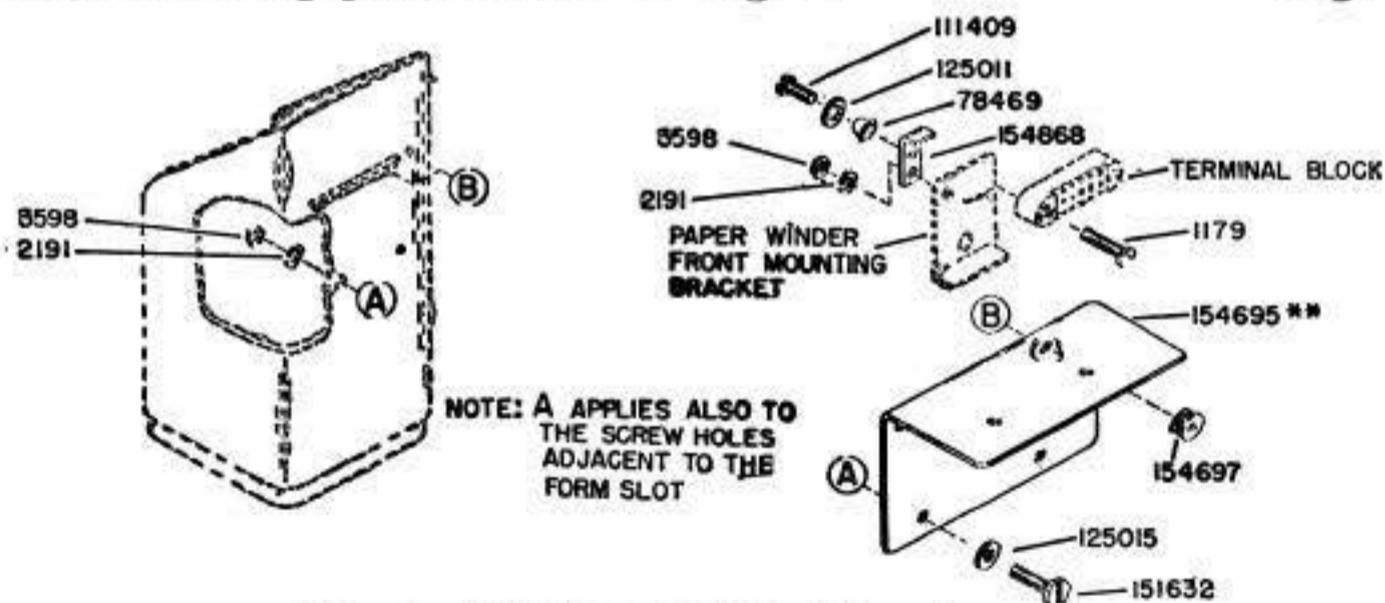
(8) Reinstall the spindle and check the alignment and the paper-spindle shaft endplay as specified in Paragraph 3.01.

(9) Plug in and start the winder. Observe the operating characteristics, and check that there are no binds and that the motor runs quietly and does not overheat.

#### B. On 28A, 28B, 28C, 28D and 28E Teletypewriter Cabinets

2.12 The 15-type paper winders can be mounted on 28A, 28B, 28C, 28D and 28E teletypewriter cabinets by the use of the TP153901\*\* modification kit which contains the necessary mounting parts shown in Fig. 5.

**Fig. 5**



**Fig. 5—TP153901\*\* Modification Kit**

#### TP153901\*\* Modification Kit

##### 2.13 Preparation and Installation

(1) Remove the typing unit from the cabinet.

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- (2) Remove and discard the following parts which seal the paper-emission slot: two TP6345 nuts, two TP2191 lockwashers, two TP7002 washers, the TP152797 plate retainer, and the TP151532 cover and plate.

**Note:** The plate is located inside the console, below the cabinet terminal block.

- (3) Remove and discard the two TP103120 retainers and the two TP89515 screws located in the rear panel of the cabinet, just above the electrical service unit.

- (4) Mount the TP154695\*\* bracket on the back of the cabinet, using six each of the TP151632 screws, TP125015 flat washers, TP2191 lockwashers, and TP3598 nuts that are furnished.

**Fig. 5**

- (5) Remove the paper-winder cover by removing the screw from the rear of the paper winder and backing off the other two screws. (The cover has two slotted mounting holes.)

- (6) Viewing the paper winder from the rear, replace the left-hand mounting screw of the terminal block with the TP1179 screw that is furnished. Mount the TP154868 plate, using the remaining TP2191 lockwasher and TP3598 nut. Secure the TP78469 rubber foot to the TP154868 plate, using the TP111409 screw and TP125011 flat washer.

**Fig. 5**

- (7) Reinstall the paper-winder cover.

### **Paper Winder**

**Note:** The necessary two each of the nuts, flat washers, TP3900 bushings, lockwashers, and thumbscrews used for mounting the paper winder are furnished with the winder.

### **2.14 Installation**

- (1) Secure the two TP3900 bushings in the holes in the TP154695\*\* bracket, using the two lockwashers and nuts, taking care not to tighten the nuts too much, as excessive tightening will distort the bushings.

- (2) Mount the paper winder on the bracket (with the motor to the right, when viewing the cabinet from the rear) by means of the two thumbscrews and flat washers; and before tightening the thumbscrews, position the paper winder so that the spindle lines up with the paper as it leaves the platen. Care should be taken in tightening the thumbscrews, as excessive tightening may possibly buckle the mounting plate and bind the paper spindle.

- (3) Feed the paper under the paper-winder slack bar and then fold back the leading corners of the paper to form a dart and insert it in the paper-spindle slot. Turn the spindle by hand one turn in the direction in which the paper is to be wound until the next turn of the paper, as it winds on the cylinder, overlaps the paper-spindle slot.
- (4) Route the cord through the rubber grommet, through the large hole in the TP154695\*\* bracket, through the slot into the cabinet, and along the bottom of the terminal-block bracket to the right side of the console cabinet.
- (5) Insert the rubber grommet into the large hole in the TP154695\*\* bracket.
- (6) Connect the terminal lugs as follows:
  - (a) **On the 28A teletypewriter cabinet**, connect the terminal lugs to cabinet terminals 29 and 30.
  - (b) **On the 28B, 28C, 28D and 28E teletypewriter cabinets**, connect the terminal lugs to cabinet terminals 35 and 40.
- (7) Put the typing unit in the cabinet.
- (8) Coil the surplus length of electrical cord and tie it together.
- (9) Check that the paper-winder motor is controlled by the proper switch.
  - (a) **For the 28A teletypewriter cabinet**, the paper-winder motor should be controlled by the winder switch, since this cabinet does not have switched power.
  - (b) **For the 28B, 28C, 28D and 28E teletypewriter cabinets**, the motor should be controlled by the teletypewriter power switch when the paper-winder switch is turned on.

### 3. REQUIREMENTS AND ADJUSTING PROCEDURES

**Note:** The paper winders are completely adjusted at the factory. The adjustment information that follows should be used by the installer for checking purposes, however, and will be required in connection with subsequent maintenance.

#### 3.01 Paper-spindle-shaft Endplay

- (a) **Requirement:** There should be approximately 1/32-inch clearance between the shoulder on the shaft and the friction-drive assembly when all the play of the shaft has been taken up in the direction away from the motor unit. The left end of the shaft should touch the wick in the friction-drive assembly.

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- (b) **Adjustment:** Position the bearing bracket by means of its elongated mounting holes to obtain the required clearance.

### 3.02 Slack-bar-lever Spring

- (a) **Requirement:** A tension of minimum 19 ounces, maximum 23 ounces should be required to start each lever moving when pull is applied under each slack-bar lever at the spring hole and in line with the spring.

**Note:** Care should be taken that the motor resistors are wired for proper voltage in accordance with the instructions shown in Fig. 2 before running the motor. Fig. 2

### 3.03 Friction-clutch Torque

- (a) **Requirement:** After the paper winder has been running with the spindle held stationary for at least 10 minutes, a scale should be hooked in the slot of the paper spindle. A tension of Min 5 ounces, Max 7 ounces should be required to hold the paper spindle stationary against rotation by the motor.

- (b) **Adjustment:** Loosen the locknut and adjust the capstan nut to obtain the requirement. Tighten the locknut.

### 3.04 Paper-spindle-shaft-latch Spring

- (a) **Requirement:** With the paper spindle removed, a tension of Min 22 ounces, Max 30 ounces should be required to start the latch moving when a pull is applied over the spring post on the latch and horizontally toward the rear.

### 3.05 Paper-spindle-cylinder Regulating Bushing:

On new paper winders a TP119535 regulating bushing and a TP82440 setscrew have been added to the paper-spindle shaft, providing an adjustment feature to control the effort required to push the hub of the right-hand flange into the cylinder, or to remove it. The bushing is positioned at the factory. Older units may be equipped with this feature if so desired by the addition of the regulating bushing and setscrew. This bushing should be slipped over the shaft and into the split cylinder far enough so that when the hub is inserted into the cylinder there will be some clearance, not more than 1/4 inch, between the hub and the bushing. Then the setscrew should be tightened.

## 4. LUBRICATION

- 4.01 Apply one or two drops of oil at each of the following places unless the use of grease is specified.

- (a) Upper motor bearing and gear—Remove the screw that is flush with the gear housing and fill the housing with grease; then replace the screw.
- (b) Lower motor bearing—Saturate the wick.
- (c) Friction-clutch felt washers—Separate the discs and saturate the washers.
- (d) Friction-clutch-assembly wick—Saturate the wick.
- (e) Shaft bearing in bearing bracket.
- (f) Bearing-bracket latch shoulder screw.
- (g) Slack-bar bearings (two).
- (h) Slack-bar-lever shoulder screws (two).
- (i) Spindle driving pin—at point of contact with friction drive fork.

## 5. BSP REFERENCES ↖

5.01 The following Bell System Practices contain information applicable to the installation and maintenance of paper winders.

<b>Subject</b>	<b>Section</b>
Cleaning—General Requirements .....	P30.010
Tape and Paper Winders, Tape Unwinders and Rewinders—Coding and Descriptive Data .....	P31.116
Lubrication of TTY Apparatus—General Requirements	P30.011
Preparation of TTY Apparatus for Installation.....	P33.014
Requirements and Procedures—General Requirements	P30.012
TTY Tools and Maintenance Supplies .....	P30.301
15 TTY—List of Units and Auxiliary Features.....	P36.101
15 Typing Unit—Requirements and Procedures.....	P36.610 ↙