

**BELL SYSTEM PRACTICES**  
Teletypewriter and Manual  
Telegraph Station and P.B.X.  
Installation and Maintenance

**SECTION P40.461**  
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## **INSTALLATION OF MOTOR CONTROL PARTS ON NO. 26 TELETYPEWRITERS**

### **1. GENERAL**

1.01 This section furnishes information for the installation on No. 26 teletypewriters of motor control parts which operate from signals sent over the signaling line circuit. It supersedes Specification S-5229 which has been used heretofore. Two types of motor control are covered here, the 98070M complete electrical unit with associated "H" contacts which mounts entirely within the machine, and the "H" contact arrangement alone (see pars. 5.02 and 5.03) which mounts in the typing unit and may be used in certain cases with an external relay motor control circuit. With either arrangement the contact which causes stopping of the motor operates on the combination shift, H. Control arrangements stopping on Shift, Blank, H or arrangements using a separate control wire with a control relay are not covered here.

1.02 The 98070M Set of Motor Control Parts consists of the parts needed at a closed line station (line current .060 ampere) to provide for starting of the teletypewriter motor on a make-after-break in the line current, and stopping the motor on the upper-case H selection. Connection drawings in the P-91 series are available to cover the cases either with or without line relays.

1.03 Where motor control contacts alone are required in the teletypewriter, to operate with some external relay arrangement to provide for the starting and stopping of the motor, these contacts merely provide a momentary open (or momentary close) on the upper-case H selection. No circuit connections have been prepared, however, for this type of operation but the connections may be engineered locally where desired.

1.04 Wherever break lock parts are referred to in this section, it should be understood that transmitter-distributor control contacts (91909M) can also be used if required.

## **2. COMPOSITION OF 98070M MOTOR CONTROL PARTS**

2.01 These parts are suitable for use primarily in private wire services. They may be employed on a machine equipped with a signal bell or on a machine equipped with the "break lock" feature. They cannot be used on machines equipped with both bell and break lock.

2.02 All the parts required for this type of operation are designated "98070M Set of Motor Control Parts" and they consist of the following main assemblies:

1—98454M Set of Parts (upper-case H contact mechanism for typing unit)

1—98455M Set of Parts (motor control parts for teletypewriter base)

2.03 The 98454M Set of Parts for the typing unit consists of the following:

2—1038M Screws

2—2191M Lock Washers

1—90431M Lock Washer

1—90561M Pawl

1—90611M Contact Operating Lever

2—90615M Return Springs

1—90772M Contact Bracket (Assembly)

1—90895M Cable (Complete)

1—91923M Motor Stop Function Arm

1—93766M Terminal Block (Assembly)

2.04 The 98455M Set of Parts for the base consists of the following:

2—1038M Screws

2—2191M Lock Washers

2—2669M Lock Washers

2—6810M Screws

2—74992M Bushings

1—74670M Strap

1—78011M Condenser

1—82514M Motor Control Unit (Assembly)

1—98071M Motor Control Unit Bracket

2—98072M Screws

1—98073M Cable (Complete)

### **3. INSTALLATION OF 98070M PARTS ON MACHINE NORMALLY EQUIPPED WITH SIGNAL BELL**

- 3.01 Remove the typing unit from the base. Remove the 90435M bushing (nut) at the lower end of the function pawl pivot. Install the 90561M function pawl, furnished with the parts, at the lower end of the function pawl pivot and replace the nut. Install the 90615M function pawl return spring, hooking it between the function pawl and the spring post.
- 3.02 Remove the carriage return lever latch assembly (90623M latch parts) by removing the 90622M stud (mounting post) and remove the 90595M spring post to the right of it (facing the rear of the machine).
- 3.03 Install the 90611M contact operating lever, furnished with the parts, at level No. 1 (lowest level) of the function pawl latch pileup and install the 90615M spring between the lever and the spring post. Replace the 90595M spring post and the carriage return lever latch post assembly (90622M stud) and adjust the latch post.
- 3.04 Install the 90772M contact bracket assembly, furnished with the parts, on the 90590M lever plate at its extreme right end (when looking at the back of the machine), using the two 1038M screws and 2191M lock washers.
- 3.05 Remove the function arm assembly from the lower end of the typewheel shaft and install the 91923M motor stop function arm in level No. 1 (nearest the gear). Replace the old 90431M lock washer with the new washer of the parts and tighten the assembly securely. Replace the assembly on the typewheel shaft and make the normal adjustment for end play.
- 3.06 Mount the 93766M terminal block assembly to the under side of the casting of the typing unit to the right of the terminal block regularly furnished on the unit, and using the 90895M cable, connect the contacts installed in 3.04 above to terminals 21 and 23 of the terminal block. (The terminal block terminals become terminals 21 to 26.)
- 3.07 Mount the 98071M motor control unit bracket at the rear left corner of the base using the two (#10-32) tapped holes already in the casting and the 6810M screws and 2669M lock washers furnished with the parts.
- 3.08 Using the 74670M strap, 98072M screws, and 74992M bakelite bushings furnished with the parts, mount the 78011M condenser on the right side of the motor control unit bracket, with the condenser terminals upward.

3.09 Mount the 82514M motor control unit to the left side of the bracket, using the 1038M screws and the 2191M lock washers furnished.

3.10 By means of the 98073M cable connect the motor control unit according to the wiring diagram which applies in the P91 Sections of Bell System Practices. The two short black wires are for connecting terminals 55 and 56 to the condenser mounted in par. 3.08. The cable includes one red and one white wire to replace the wires which normally connect terminals 22 and 23 to the motor connector. These wires of the new cable should be used in place of the wires normally in the machine to simplify the connections. The old red wire and the white wire should be removed from the connector and taped. (The drawings will be reissued to show this.) The cable should be positioned so as to avoid possibility of damage when the typing unit is placed on the base. (The two wires shown connected between the break lock contacts and terminals 24 and 25 will not be run. These wires are not furnished with the parts.)

3.11 With the parts installed as above, additional contacts to cause operation of a remote signal bell on the upper case S selection may be added to the 90772M bracket assembly. When installed, these contacts are operated by the bell operating lever and have to be wired out through a separable connector to the remote bell.

#### **4. INSTALLATION OF 98070M PARTS ON MACHINE EQUIPPED WITH BREAK LOCK PARTS**

4.01 When the machine is equipped with the break lock mechanism to short-circuit the keyboard contacts on reception of a break signal, the bell signal in the machine (and any external bell operated by bell contacts) will have to be given up in order to install the motor control parts. The motor control contacts will then be made to operate by the bell operating lever, but on the motor control selection. Accordingly, the 90629M gong hammer should be removed to avoid sounding the bell on each motor stop selection.

4.02 Since the addition of the break lock has already equipped the typing unit with the 90639M contact bracket of the 90772M contact bracket assembly furnished with the motor control parts, the contact pileup of 90772M assembly furnished should be removed and installed on the contact bracket already in the typing unit, in the vacant position at the extreme left (when looking at the machine from the rear). Using the 90895M cable connect these contacts to terminals 21 and 23 of the terminal block already installed for the break lock

parts. (The terminal block furnished with the motor control parts should not be needed.)

4.03 The function arm for the bell signal<sup>1</sup> should be removed from level No. 2 of the function arm assembly and replaced by the 91923M function arm furnished with the motor control parts. (The break lock function arm will be on level 1.) The new 90431M lock washer should be used in place of the old washer when reassembling the function arm assembly.

4.04 Install the motor control unit on the base as outlined above in paragraphs 3.07 to 3.09 inclusive.

4.05 Make the connections outlined in paragraph 3.10 above according to the wiring diagram of the P91 section to be used. (The wires between the break lock contacts and terminals 24 and 25 will not have to be run since they will have been previously provided with the break lock connections.)

## **5. CONTACT PARTS TO PROVIDE A MOMENTARY OPEN (OR MOMENTARY CLOSE) ON THE UPPER CASE H SELECTION FOR USE WITH EXTERNAL MOTOR CONTROL CIRCUITS**

5.01 As in the case of the 98070M set of parts, the upper case H parts listed below cannot be used on a machine equipped with both the bell parts and the break lock parts. Two sets of parts are, therefore, available, one for use on machines with bell parts and the other for use on machines with break lock parts. The installation procedure is also different for these two cases. Since the contact arrangement with external motor control circuits has not as yet been used to any great extent, no drawings showing the connections have been prepared. The connections, however, are briefly described below.

5.02 For a machine as furnished from the factory equipped with a signal bell the following parts will be required:

- 1—93725M Set of Stop Contact Parts
- 2—1038M Screws
- 2—2191M Lock Washers
- 1—93766M Terminal Block
- 1—Separable Connector

5.03 For a machine equipped with break lock parts, the following will be required:

- 1—91722M Set of Stop Contact Parts
- 1—Separable Connector

## **6. INSTALLATION OF MOMENTARILY OPERATED CONTACT PARTS ON MACHINE EQUIPPED WITH SIGNAL BELL**

6.01 The parts covered here are those listed in paragraph 5.02. Two sets of contacts are furnished with the parts, one (91909M) to open momentarily on the upper case H selection and the other (90772M) to close momentarily. (These contacts are the same as those used for the break lock mechanism.)

6.02 The 91909M contacts of the 93725M parts should be mounted on the 90772M contact bracket assembly in the middle position provided for mounting contacts, adjacent to the contacts already on the bracket.

6.03 The motor stop contact parts should be installed on the typing unit in accordance with paragraphs 3.01 to 3.05 inclusive. The 93766M terminal block should be mounted in accordance with paragraph 3.06. The 90895M cable should connect between the contacts which are to be used and terminals 21 and 24 of the block (terminals 21 and 23 if connection to grounded power is desired.) By connecting the separable connector to terminals 21 and 24 the circuit to the "H" contacts may be brought out of the machine. The remark in paragraph 3.11 also applies here.

## **7. INSTALLATION OF MOMENTARILY OPERATED CONTACT PARTS ON MACHINE EQUIPPED WITH BREAK LOCK**

7.01 The parts covered here are those listed in paragraph 5.03. A transfer contact (91724M) is furnished with the parts. By connecting to the proper contact terminals either a momentary open or a momentary close may be obtained on the upper case H selection.

7.02 The 91724M transfer contact assembly should be installed on the 90772M contact bracket assembly of the break lock parts in the machine in the vacant position (at the left when looking at the back of the typing unit).

7.03 The 91923M motor stop function arm should be installed on level No. 2 of the function arm assembly in place of the bell function arm. The transfer contact will then be operable from the pawl previously associated with the signal bell. Since the signal bell would now operate on the motor stop selection, the 90629M gong hammer should be removed to avoid sounding the bell on this selection.

7.04 Where this arrangement is employed, it will be necessary to run out the connections from the typing unit through a separable connector.