

## KEYS

### 513-TYPE

### REQUIREMENTS AND ADJUSTING PROCEDURES

#### 1. GENERAL

- 1.01 This section covers 513-type keys.
- 1.02 Reference shall be made to Section 020-010-711, covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.
- 1.03 Part 1 "General" and Part 2, "Requirements" form part of the Western Electric Co., Inc. Installation Department Handbook.

1.04 Requirements which cannot be checked for, due to the location of the apparatus, or where the application of the requirement would affect other adjustments, are marked with an asterisk (\*). These requirements need not be checked for unless the apparatus is made accessible for other reasons or its performance indicates that such a check is advisable.

1.05 *The operated position* is that position in which the lever is thrown to either the extreme front or rear position and the corresponding contacts are operated.

#### 2. REQUIREMENTS

2.01 *Lever Movement:* The steel roller, hard rubber rollers and cam shall turn freely in their bearings.

\*2.02 *Contact Alignment:* The point of contact shall fall wholly within the circumference of the opposing contact disc.  
Gauge by eye.

\*2.03 *Contact Separation:* There shall be a separation between open contacts of  
*Test* — Min. .008"  
*Readjust* — Min. .010"  
Gauge by eye.

\*2.04 *Contact Pressure:* There shall be a pressure between the plunger springs and the outer contact springs of  
*Test* — Min. 50 gs.  
*Readjust* — Min. 55 gs.  
Use the No. 68-B Gauge.

This value shall be determined by three consecutive measurements, the lever being operated before each measurement.

\*2.05 *Other Spring Pressures:* The outer contact springs shall be tensioned against the hard rubber studs in the key frame.

\*2.06 *Contact Sequences:* When specified on the circuit drawing.

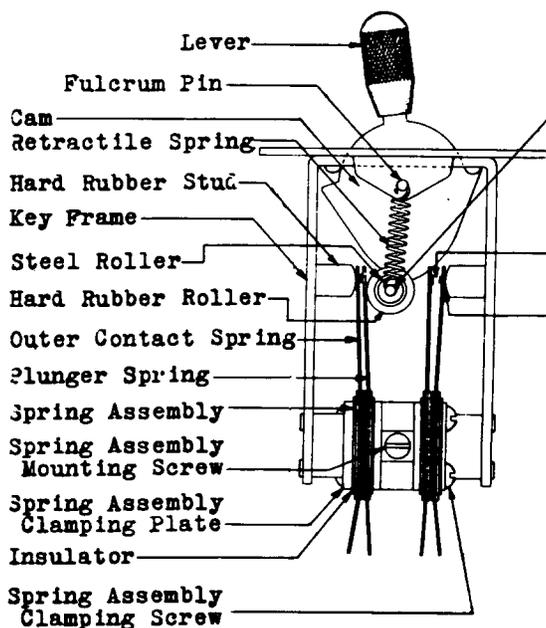


Fig. 1



Fig. 2

**SECTION 032-718-701**

**2.07 Cleaning:** Contacts should be cleaned in accordance with the section covering cleaning of key contacts. Other parts should be cleaned in accordance with approved procedures.

**3. ADJUSTING PROCEDURES**

CODE OR SPEC NO.	DESCRIPTION
<b>TOOLS</b>	
KS-6015	Duck-bill Pliers
R-1572	Small Hammer
—	Bell System Cabinet Screwdriver —3-1/2" per A.T.&T. Co. Drawing 46-X-40
—	Pin Punch 4-3/8" — 1/16" Point
—	Bell System P-Long Nose Pliers — 6-1/2" per A.T.&T. Co. Drawing 46-X-56
<b>GAUGES</b>	
68-B (or the re-placed 68)	70-0-70 Gram Gauge
<b>MATERIALS</b>	
KS-7860	Petroleum Spirits
KS-6232	Oil
KS-2423	Cloth
—	Toothpicks

**3.01 Lever Movement (Reqt 2.01)**

**M-1** The steel roller and hard rubber rollers should not bind in their bearings. In case any one or all of the parts mentioned bind, the following procedure will usually rectify the trouble.

**M-2** Check to see whether the cam is tight in the key frame. This can be done by moving it from side to side as in the test for side play. If it is tight, loosen and remove the screws holding the key to the keyshelf with the 3-1/2" cabinet screw-driver and remove the key. Then while holding the roller assembly firmly, carefully remove the springs which hold the roller assembly against the cam. Failure to hold the roller assembly firmly will permit the recoil of one spring to eject the roller assembly from the key when the other spring is removed.

**M-3** When the roller assembly has been removed make a recheck for the cam binding in the key frame. If it is tight, detach the spring assemblies from the key frame by removing the assembly mounting screw with the 3-1/2" cabinet screw-driver and drive out the fulcrum pin by means of the small hammer (R-1572 tool) and pin punch. Wipe off the fulcrum pin and roller pin with petroleum spirits and then when dry, lubricate the pins sparingly with KS-6232 oil and wipe them off again with a clean dry cloth per KS-2423.

**M-4** Advantage should also be taken at this time to clean the hard rubber rollers. This should be done by wiping them with a clean dry cloth per KS-2423.

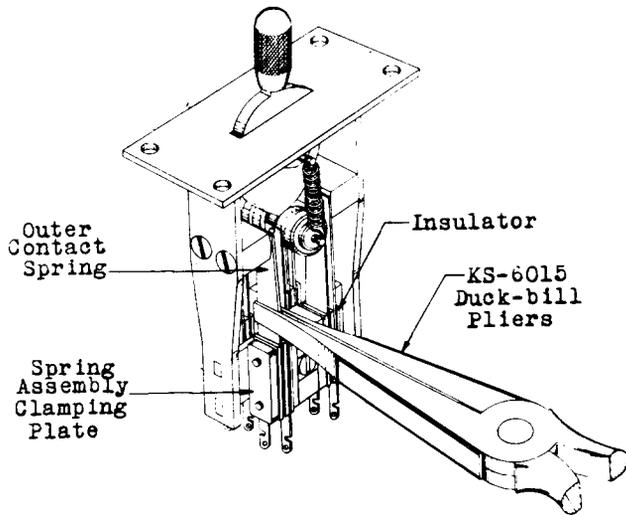
**M-5** At this time check to see that there are no flat spots on the steel roller or notches in the cam and see whether the springs which hold the roller assembly against the cam are broken or distorted in any way.

**M-6** After the cleaning has been completed reset all parts in place by holding the roller assembly in place with the thumb and forefinger of one hand and attaching the retractile spring by means of a pair of long nose pliers, and recheck for freedom of movement.

- 3.02 Contact Alignment (Reqt 2.02)**
- 3.03 Contact Separation (Reqt 2.03)**
- 3.04 Contact Pressure (Reqt 2.04)**
- 3.05 Other Spring Pressures (Reqt 2.05)**
- 3.06 Contact Sequences (Reqt 2.06)**

**M-1** Unless otherwise specified, adjust for contact separation, contact pressure and other spring pressures close to the points where the springs leave the clamping plates and insulators. Adjust all springs with the KS-6015 duck-bill pliers applied as shown on Figure 3.

**M-2** In readjusting a key to meet the requirements for contact separation, contact pressure and other spring pressures, consult the associated circuit drawing and give proper consideration to the maintenance of any requirement which may be specified thereon. Attempt no readjustment which will interfere with the proper contact sequence.



**Fig. 3 – Method of Adjusting for Contact Separation**

**M-3** Check the springs for alignment. If necessary to shift the springs, loosen the spring assembly screws slightly with the 3-1/2" cabinet screw-driver on that side of the key where the springs are out of alignment, then shift the springs so that they are all in alignment and tighten the screws securely. When mounted the center line of the springs should be approximately in line with the vertical center line of the rubber rollers and the contacts should rest wholly within the corresponding discs and as near the center as possible.

**M-4 Contact Separation and Contact Pressure:** When readjusting contact springs take care to adjust the springs in a line with

their movement and not to twist the contacts off center.

**M-5** Foreign matter wedged between the contact springs may prevent the springs from making contact when the lever is operated. Remove the foreign matter with a toothpick which has been dipped in petroleum spirits. Do not use the same toothpick for more than one operation.

**M-6 Other Spring Pressures:** See whether the outer springs are tensioned firmly against their respective hard rubber studs in the key frame. In cases where the key fails to meet this requirement loosen the screws holding the hard rubber stud to the key frame on that side where the spring fails to meet the requirement with the 3-1/2" cabinet screw-driver and remove the stud. Then tension the spring in a direction away from the rollers with the KS-6015 duck-bill pliers. Then reset the stud in the key frame.

**M-7 Contact Sequences:** To adjust for contact sequence, increase or decrease the contact separation, contact pressure, or other spring pressures as required, following the methods outlined above.

### 3.07 Cleaning (Req't 2.07)

**M-1** Clean the contacts in accordance with the section covering cleaning procedures for key contacts. Clean other parts in accordance with the procedure outlined in paragraphs 3.01, M-2, M-3 and M-4.