

KEYS

547, 552, 576, 579, 582, 583 AND 585 TYPES

REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers 547-, 552-, 576-, 579-, 582-, 583-, and 585-type keys.

1.02 This section is reissued to revise a procedure for plunger movement. Detailed reasons for reissue will be found at the end of the section.

1.03 Reference shall be made to Section 020-010-711 covering additional information necessary for the proper application of the requirements listed herein.

*1.04 **Asterisk:** Requirements are marked with an asterisk (*) when to check for them would necessitate the dismantling or dismounting of apparatus, or would affect the adjustments involved or other adjustments. No check need be made for these requirements unless the apparatus or part is made accessible for other reasons, or its performance indicates that such a check is advisable.

†1.05 Where a requirement is marked with both a dagger (†) and an asterisk (*) it means that 1.04, covering the use of the asterisk, does not apply to the 582- and 583-type keys.

1.06 **The normal (unoperated) position of a push-button-type key** is that position in which the plunger is at the top of the stroke and the normally open contacts are open and the normally closed contacts are closed.

1.07 **The operated position of a push-button-type key** is that position in which the plunger is depressed to the limit of its stroke and the normally open contacts are closed and the normally closed contacts are open.

1.08 **The operated position of a rotating plunger-type key** is that position in which the plunger is rotated to the locked position. In this position, the normally closed contacts are open and the normally open contacts are closed.

2. REQUIREMENTS

*2.01 Cleaning

- (a) Contacts shall be cleaned, when necessary, in accordance with Section 022-186-811.
- (b) Other parts shall be cleaned, when necessary, in accordance with approved procedures.

2.02 Plunger Movement

- (a) **547-, 576-, 579-, 582-, and 583-type Keys:** The plunger shall move freely in its bearing and when released unrestrained from the operated position shall return to the normal position with a snap.

Gauge by eye and feel.

- (b) **552- and 585-type Keys:** Fig. 5(A)—The plunger rod shall turn freely in the sleeve of the frame.

- * (c) **547-, 552-, and 585-type Keys:** It shall not be possible to operate the contacts by any side thrust of the plunger.

Gauge by eye.

- *2.03 **Contact Alignment:** Fig. 1(A)—The contacts shall line up so that the point of contact falls wholly within the boundary of the opposing contact disc at all times during contact.

Gauge by eye.

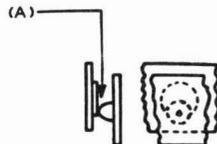


Fig. 1—Contact Alignment Showing Maximum Permissible Misalignment

†*2.04 Spring Clearance

- (a) Fig. 2(A)—There shall be a clearance between springs designed never to make contact and between any spring and the frame whether in the operated or unoperated position of the key of

Min 0.015 inch

Gauge by eye.

The thickness of the contact spring is 0.020 inch.

- (b) Fig. 6(A)—There shall be a clearance between springs designed to make contact whether in the operated or unoperated position of

Min 0.008 inch

except at the contact points.

Gauge by eye.

- (c) **576-, 579-, 582-, and 583-type Keys:** Fig. 3(A)—With the plunger in the normal position there shall be a clearance between the plunger spring and the plunger in at least one position of the plunger as the plunger is rotated.

Gauge by eye.

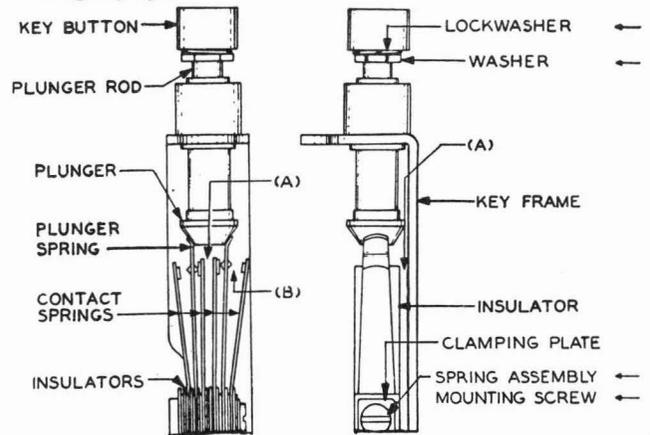
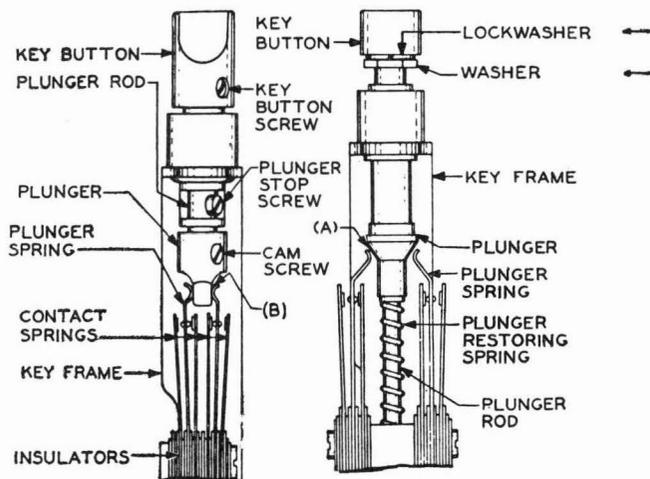


Fig. 2—547-type Key



552 TYPE KEY
EQUIPPED WITH
3 PIECE PLUNGER

576 TYPE KEY

Fig. 3—552- and 576-type Keys

†*2.05 **Contact Separation**

(a) Fig. 2(B)—Except as specified below, the separation between any pair of contacts normally open or between any pair of contacts that are opened when the key is operated shall be

Min 0.016 inch

Gauge by eye.

The thickness of the contact spring is 0.020 inch.

(b) **552C and 552G Keys:** On make-before-break spring combinations (continuity), there shall be a separation of

Min 0.010 inch

Gauge by eye.

†*2.06 **Contact Pressure:** There shall be a pressure between all closed contacts of

Test —Min 50 grams

Readjust—Min 55 grams

Use the No. 70J gauge.

†*2.07 **Contact Follow:** There shall be a follow on all contacts of

Min 0.010 inch

Gauge by eye.

Note: On make-before-break combinations where a long thin spring makes contact with a short heavy spring, the heavy spring should not be considered as a follow spring.

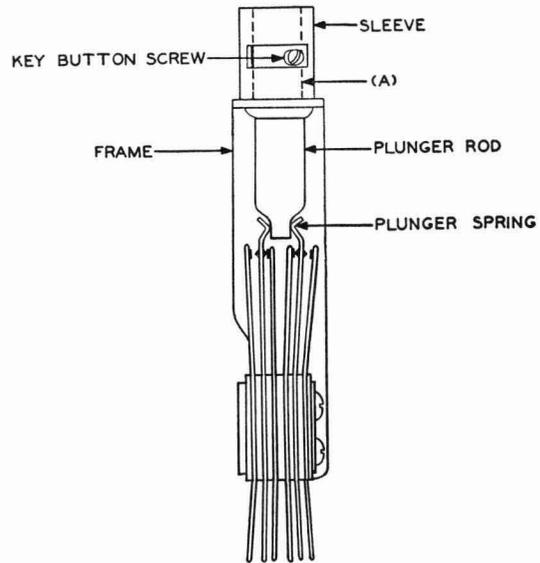


Fig. 5—585-type Key Equipped With One-piece Plunger

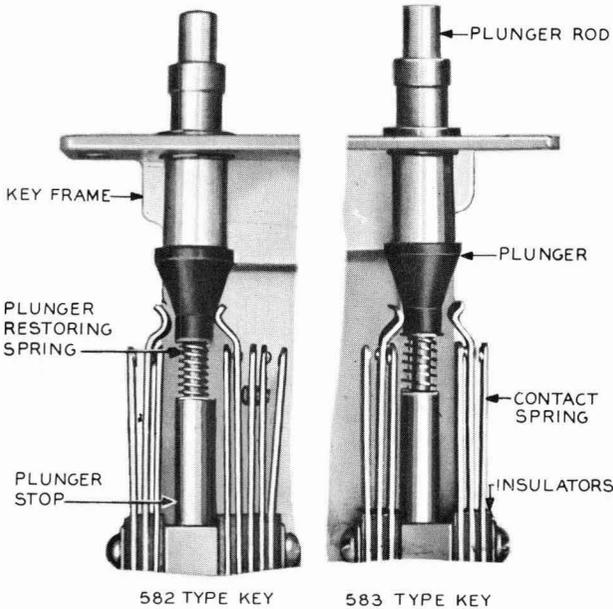


Fig. 4—582- and 583-type Keys

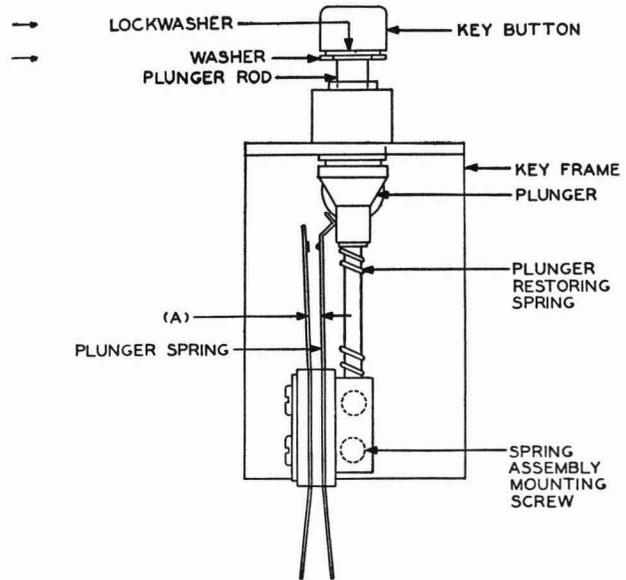


Fig. 6—579-type Key

†*2.08 **Contact Sequence—547-, 552-, and 585-type Keys**

(a) **Normal Contact Sequence—Break-Make Combinations:**

Unless otherwise specified, the normally closed contacts operated directly by a plunger spring of an individual spring assembly shall break before the normally open contacts of the same spring assembly directly associated with the plunger spring make by

Min 0.006 inch

Gauge by eye.

(b) **Cross Sequence—576-, 582-, and 583-type Keys:** All normally closed contacts operated by the depression of a plunger shall break before any of the normally open contacts make by

Min 0.006 inch

Gauge by eye.

(c) **Other Contact Sequences:** When specified on the circuit requirement table or circuit drawing.

*2.09 **Plunger Spring Pressure**

(a) **552-type Keys:** Fig. 3(B)—Both plunger springs shall rest against the plunger in the unoperated position and it shall not be possible to break this contact between the plunger and the plunger springs by taking up the side thrust or backlash in the plunger.

Gauge by eye.

(b) **585-type Keys:** Fig. 3(B)—Both plunger springs shall rest against the plunger in the unoperated position.

Gauge by eye.

2.10 **Plunger Operate Pressure**

(a) **547-, 576-, and 579-type Keys:** The pressure required to depress the plunger to the limit of its stroke shall be

Min 650 grams

Max 1350 grams

Use the No. 79F gauge.

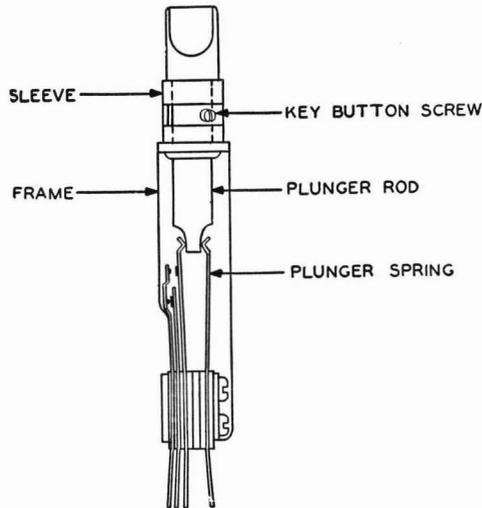


Fig. 7—552-type Keys Equipped With One-piece Plunger

- (b) **582- and 583-type Keys:** The pressure required to depress the plunger to the limit of its stroke shall be
 Min 650 grams
 Max 1120 grams
 Use the No. 79F gauge.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges, and Materials

Code or Spec No.	Description
Tools	
209	5/16-inch Hex. Open Single-end Offset← Wrench
211	Key Button Pliers ←
485A	Smooth Jaw Pliers
486A	Oil Can
KS-3093	Bristle Brush
KS-6320	Orange Stick
R-1005	Jeweler's Screwdriver
R-2959	Allen Socket Screw Wrench ←
—	3-inch Cabinet Screwdriver
—	4-inch Regular Screwdriver
Gauges	
70J	0-150 Gram Gauge
79F	0-6000 Gram Push-Pull Tension Gauge
Materials	
1A or 2A	Cushion (or equivalent tubing) ←
KS-2423 or KS-14666	Cloth
KS-7860	Petroleum Spirits
KS-8496	Lubricating Compound
—	Toothpicks—Hardwood, Flat on One End, Pointed at the Other

3.002 Due to the method of mounting the 547-, 552-, 576-, 579-, and 585-type keys, it may not be practical to perform the adjustments specified herein unless the key is removed from its mounting. At the time the key is removed, brush all loose dust and dirt from the frame using the KS-3093 bristle brush. Inspect the entire key for possible faults and make any adjustment that may appear necessary.

3.003 If necessary to remove a 582- or 583-type key when it is mounted in a No. 555 PBX cord unit, remove the No. 348A plug from the connector. Loosen the two cowl fasteners, at the top and bottom of the cord unit, by turning them towards the left (counterclockwise) with the 4-inch regular screwdriver and remove the cord unit. Loosen the plunger block assembly setscrews that secure the plunger block on the push turn rod with the R-2959 Allen socket screw wrench. Remove the cotter pin that connects the push turn rod to the 580-type key and withdraw the push turn rod. Remove the two screws that secure the keyshelf to the cord unit frame with the 3-inch cabinet screwdriver, and remove the push turn rod bushing with the 4-inch regular screwdriver. Lift the keyshelf from the cord unit frame and remove the key mounting screws with the 3-inch cabinet screwdriver.

3.01 **Cleaning:** (Rq 2.01)—Clean the contacts in accordance with Section 022-186-811. Clean other parts as covered in 3.02(1) and (3).

3.02 Plunger Movement (Rq 2.02)

(1) **547-, 576-, 579-, 582-, and 583-type Keys:** If the plunger operates freely but fails to return to its normal position, inspect the hard rubber plunger and plunger rod and attempt to determine whether or not the keys have been lubricated. If the indications are that the key has not been previously lubricated or if the plunger and plunger rod appear gummy or dirty, wipe them off with a clean, dry KS-14666 cloth. Lubricate the plunger by applying one drop of KS-8496 lubricating compound to the surface of the plunger using the No. 486A oil can. After applying the lubricant to the plunger, rotate the plunger so that the lubricant is distributed evenly over the operating surface.

(2) **547-, 576-, 579-, 582-, and 583-type Keys:** If the key still fails to return to normal on the release of the plunger, check the tension of the plunger springs and make adjustments as required. If the key still fails to restore to normal, it is probably due to dirt, in which case clean the plunger and plunger rod as covered in (3). In the case of 576-, 579-, 582-, and 583-type keys, check that the plunger restoring spring is not broken or damaged.

(3) If the plunger rod binds in the bearing, remove the plunger from the key as follows:

(a) **547-type Keys:** Remove the spring assembly mounting screw nearest the key button and also slightly loosen the other spring assembly mounting screw using the 3-inch cabinet screwdriver. Tilt the spring assembly sufficiently to clear the plunger. Hold the washer with the No. 209 wrench and remove the key button with the fingers. If the key button cannot be removed with the fingers, hold the washer with the No. 209 wrench and with the No. 211 pliers, equipped with a No. 1A or 2A cushion or equivalent slid over each jaw, remove the key button by turning it in a counterclockwise direction. Remove the washer and lockwasher. Then withdraw the plunger rod from its bearing.

(b) **576-, 579-, 582-, and 583-type Keys:** Remove the spring assembly mounting screws and the spring assembly mounting and withdraw the plunger and plunger rod from its bearings.

(c) **552- and 585-type Keys Equipped With a One-piece Plunger:** Remove the key button screw with the R-1005 jeweler's screwdriver and remove the plunger rod from its bearing.

(d) **552- and 585-type Keys Equipped With a 3-piece Plunger:** Remove the key button screw with the R-1005 jeweler's screwdriver and remove the key button with the fingers. Remove the plunger stop screw and the cam screw with the R-1005 jeweler's screwdriver, withdraw the plunger rod from its bearing, and remove the plunger with the fingers.

(e) After withdrawing the plunger and the plunger rod on any of the above keys, clean the surfaces using a KS-14666 cloth which has been slightly moistened with petroleum spirits. After cleaning with petroleum spirits, wipe the plunger and the plunger rod with a clean, dry KS-14666 cloth. Inspect the plunger rod for burrs or other irregularities which may cause bind. Clean the inner surfaces of the bearing with a piece of KS-14666

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cloth on the end of a KS-6320 orange stick. Follow this by wiping with a piece of clean, dry KS-14666 cloth. Reassemble the key and readjust to meet all requirements.

- (4) **547-, 552-, and 585-type Keys:** If the springs can be operated by a side thrust of the plunger, it is an indication of wear in the bearings in which case refer the matter to the supervisor.

- 3.03 **Contact Alignment** (Rq 2.03)
- 3.04 **Spring Clearance** (Rq 2.04)
- 3.05 **Contact Separation** (Rq 2.05)
- 3.06 **Contact Pressure** (Rq 2.06)
- 3.07 **Contact Follow** (Rq 2.07)
- 3.08 **Contact Sequence** (Rq 2.08)
- 3.09 **Plunger Spring Pressure** (Rq 2.09)

(1) In making these adjustments, consult the associated circuit drawing and requirement table and give consideration to the maintenance of any requirement for contact sequence which may be specified thereon. In adjusting springs, take care not to kink them. Do not straighten kinked springs unless the kink interferes with the proper adjustment of the key. Removing kinks tends to weaken the spring and shorten its life.

(2) **Contact Alignment and Spring Clearance:** Shift the springs by loosening the spring assembly screws with the 3-inch cabinet screwdriver and shifting the springs as required. Take care not to break or damage the spring assembly insulator when making this adjustment. In adjusting for contact alignment, see that the contact point lies wholly within the corresponding disc as near the center as possible. After the contacts are properly aligned and spring clearance is satisfactory, tighten the spring assembly screws securely.

(3) **Contact Separation:** If the separation between contacts on these keys is not satisfactory, adjust as required using the No. 485A pliers. Make adjustments close to the point where the spring leaves the clamping plate and insulator as indicated in Fig. 8.

(4) **Contact Pressure, Contact Follow, Contact Sequence, and Plunger Spring Pressure:** To adjust for contact pressure, contact follow, contact sequence, and plunger spring pressure, adjust the springs with the No. 485A pliers close to the point where the springs leave the clamping plate and insulators.

3.10 **Plunger Operate Pressure** (Rq 2.10)

(1) If a plunger fails to meet the maximum plunger pressure requirement, examine the plunger and plunger springs to determine whether a gummy substance has formed on them. If necessary, dismantle the key and clean the plunger

and plunger springs as outlined in 3.02. If after cleaning, the key still fails to meet the requirement, it may be necessary to reduce the tension of the contact or plunger springs with the No. 485A pliers.

(2) If the key fails to meet the minimum plunger operate pressure requirement, it is an indication that the plunger spring tension is insufficient. In this case, adjust the spring toward the center of the key using the No. 485A pliers as indicated in Fig. 8. Check that 2.04(c) is met.

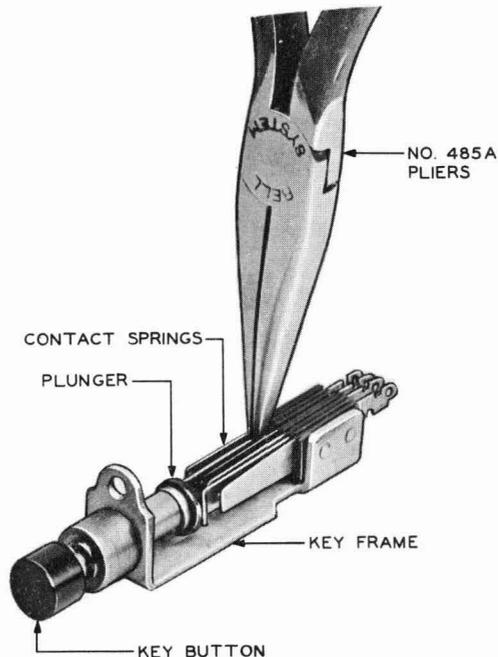


Fig. 8—Method of Adjusting Contact Springs

REASONS FOR REISSUE

1. To revise Fig. 2, 3, and 6. A change in the nomenclature of a part from plunger nut to washer has been included.
2. To revise the list of tools, gauges, and materials (3.001).
3. To revise the procedure for plunger movement on 547-type keys, 3.02(3)(a).