

## KEYS

98, 188, 272, 406, 424, 464, 479, 498, 501, 514, 526, 529, 531, 532, 540, 557, 558,  
586, 6009, 6011, 6013, A1, B1, B2, B9, B20, C1, C3, AND G1 TYPES

## REQUIREMENTS

(CONDENSED SECTION FOR 032-702-701, 030-709-701 AND 032-714-701)

### 1. REQUIREMENTS — PLUNGER - TYPE KEYS (Also See Section 020-012-711)

#### 1.01 *Plunger Movement*

- (a) Operate freely and restore without sluggishness.
- (b) Contacts shall not operate by any side thrust of plunger.

#### 1.02 *Slide Plate Operating Spring Tension:*

This is the pressure of the slide plate operating spring against the pin in the slide plate with all plungers normal.

##### (a) *514 and 6009 Keys*

*Test* — Min 105 grams  
— Max 200 grams

*Readjust* — Min 115 grams  
— Max 170 grams

Use the No. 79C gauge.

##### (b) *6011 Keys*

*Test* — Min 130 grams  
— Max 200 grams

*Readjust* — Min 140 grams  
— Max 200 grams

Use the No. 79C gauge.

#### 1.03 *Plunger Release*

- (a) *514, 6009, and 6011 Keys:* A plunger in locked position shall release when any other plunger is depressed.
- (b) *6011 Keys:* Locking plunger shall lock reliably and release when nonlocking plunger is fully depressed.
- (c) *92, 188, 424, and 464 Keys:* From locked position — 100 grams (Readjust — 115 grams).

1.04 *Flexible Contact Spring Position:* Rest on stop spring, at least on end nearest contact, when spring is unoperated for normally open contacts or operated for normally closed contacts.

1.05 *Plunger Spring Position — 272-, 406-, 498-, 6013-, B2-, B9-, and B20-type Keys:* Both plunger springs rest against plunger in unoperated position.

#### *Exception*

*406A Key* — There shall be a slight clearance between plunger and plunger springs.

#### 1.06 *Contact Separation*

- (a) 0.014 inch (Readjust — 0.016 inch).
- (b) *On Make-Before-Break and Make-Make Combinations:* 0.010 inch (Readjust — 0.012 inch).
- (c) *514, 6009, and 6011 Keys Only:* 0.008 inch (Readjust — 0.010 inch).
- (d) *272F and 272G Keys:* 0.022 inch (Readjust — 0.025 inch).

#### 1.07 *Spring Clearance*

- (a) Between springs designed never to make contact and between spring and frame — 0.014 inch (Readjust — 0.016 inch).
- (b) Between springs designed to make contact — 0.008 inch, except at contact points.
- (c) *92, 188, 424, and 464 Keys:* Without plunger retaining screw or clip — 0.030-inch clearance between crimps of plunger springs with plunger removed.
- (d) *514, 6009, and 6011 Keys:* With plunger normal, provide clearance between plunger spring and plunger in one position of plunger.

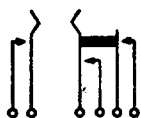


Fig. 1

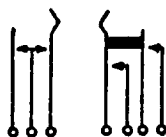


Fig. 2

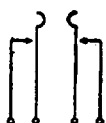


Fig. 3



Fig. 4

Illustrating Contact Separation

### 1.08 Contact Pressure

(a) 50 grams (Readjust — 55 grams).

Use the No. 68B gauge.

(b) **406A Key:** 155 grams (Readjust — 170 grams).

Use the No. 62B gauge.

### 1.09 Contact Follow

(a) 0.008 inch (Readjust — 0.010 inch).

#### Exceptions

**92W, 92AA, 92AL, 406J, and 527B Keys:** Need not apply to normally closed contacts.

**92AW Key:** Need not apply to the normally closed contact of the make-before-break contacts.

(b) **Rotating Plunger-type Keys:** Inside contacts — 0.005 inch.

#### Exceptions

**406J Key:** Need not apply.

**272G Key:** 0.010 inch.

### 1.10 Contact Sequence

(a) **Fig. 5(A) — Normal Contact Sequence Break-Make Combinations:** Closed contacts shall break before associated open contacts make by — 0.005 inch (Readjust — 0.006 inch).

#### Exceptions

**272G Key:** 0.015 inch.

(b) **Fig. 5(B) — Cross Sequence — Break-Make Combination on Ringing Spring Assemblies or When Specified on Circuit Drawing:** All closed contacts operated by a plunger shall break before any open contacts make by — 0.005 inch (Readjust — 0.006 inch).

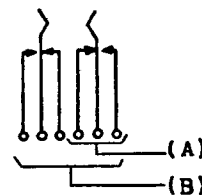


Fig. 5 — Illustrating Contact Sequence

### 1.11 Plunger Operate Pressure

TYPE OF KEY		Grams	
		Min	Max
514, 6009, and 6011	<b>Test</b>	—	2400
	<b>Readjust</b>	—	2300
92, 188, 424, and 464 (Nonlocking)	<b>Test</b>	575	2025
	<b>Readjust</b>	675	1825
92, 188, 424, and 464 (Locking)	<b>Test</b>	—	2250
	<b>Readjust</b>	—	2050

Use the No. 79B gauge for minimum values and the No. 79F gauge for maximum values.

### 1.12 Plunger Nonoperate Pressure (6009 and 6011 Types Only):

Plungers remain normal with — 180 grams (Readjust — 200 grams).

Use the No. 79B and 79C gauges.

## 2. REQUIREMENTS — LEVER - TYPE KEYS

(Also See Section 020-012-711)

### 2.01 Lever Movement

(a) Cam shall turn freely.

(b) Rollers shall turn freely.

### 2.02 Relation of Plunger Springs to Rollers and Cam

(a) **Keys Equipped With a Straight Lever:** On slow release, lever shall return to vertical position because of pressure of springs.

(b) **Keys Equipped With an Offset Lever:** When the lever is in the intermediate position, the centers of the rollers shall line up

approximately with the vertical centerline of the unit. On slow release, lever shall return to the intermediate position because of pressure of springs.

(c) With the lever in the vertical position where the key is equipped with a straight lever, or with the lever in the intermediate position where the key is equipped with an offset lever, the inclined part of the crook spring should preferably be against the vertical part. A slight airgap is satisfactory.

### 2.03 Relation of Plunger Springs to Cam and Key Frame

- (a) Plunger springs shall clear the cam by  $1/32$  inch.
- (b) Vertical centerline of each spring is approximately perpendicular to keytop.

### 2.04 Contact Separation

- (a) **Fig. 6(A)**: 0.014 inch (Readjust — 0.016 inch).

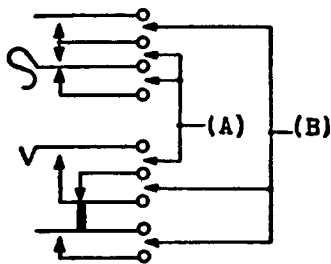


Fig. 6 — Illustrating Contact Separation

#### Exceptions

- (b) **Fig. 6(B)**: Contacts except those actuated by a plunger spring or by a spring actuated directly by a plunger spring by means of a stud — 0.010 inch (Readjust — 0.012 inch).
- (c) **Fig. 7(A)**: Plunger springs having make-before-break combinations on each side shall have contact separation for contacts which never touch the plunger spring of — 0.008 inch (Readjust — 0.010 inch).
- (d) **Fig. 8(A)**: For keys with an offset lever, the separation between contacts which are broken by a spring operated by plunger spring by means of a stud shall be — 0.010 inch (Readjust — 0.012 inch).

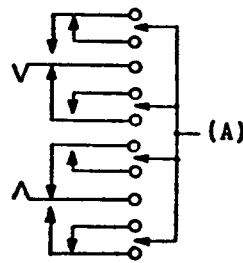


Fig. 7

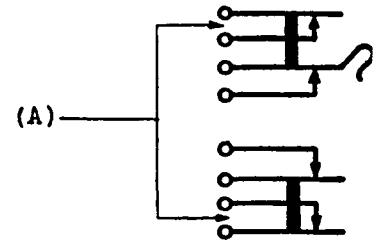


Fig. 8

### Illustrating Contact Separation

- (e) **526A, 526B, and 540E Keys**: 0.010 inch (Readjust 0.012 inch).

- (f) **B1KW, B1KY, and B1LA Keys**: For normally closed contacts of locking side when key is operated or for normally open contacts when key is normal — 0.010 inch (Readjust — 0.012 inch).

- (g) **557- and 558-type Keys**: For normally open contacts of the continuity when key is normal — 0.010 inch (Readjust — 0.012 inch).

### 2.05 Spring Clearance

- (a) For springs designed never to make contact and between any spring and the frame — 0.014 inch (Readjust — 0.016 inch).
- (b) Separators shall not rub on springs.
- (c) Between springs designed to make contact — 0.007 inch (Readjust — 0.008 inch) except at contact points.

### 2.06 Contact Pressure

- (a) Between all closed contacts — 50 grams (Readjust — 55 grams).

Use the No. 68B gauge.

#### Exceptions

- (b) **479AW and 540G Keys**: Normally open contacts making on plunger springs — 25 grams (Readjust — 30 grams).

Use the No. 68B gauge.

- (c) **540G Key**: Normally closed contacts of outside transfer contacts — 25 grams — (Readjust — 30 grams).

Use the No. 68B gauge.

**2.07 Other Spring Pressures**

- (a) **On Keys Equipped With Springs Mounted on Only One Side of the Roller and a One-way Lever:** The pressure of plunger springs against rollers shall be

Max 225 grams

Use the No. 62B gauge.

**2.08 Contact Follow**

- (a) 0.008 inch (Readjust — 0.010 inch).

**Exceptions**

- (b) In make-before-break combinations, where the long thin spring makes contact with the short heavy spring that acts as a stop spring, this requirement does not apply.
- (c) **586A Key:** All normally open contacts shall have a contact follow of — 0.005 inch (Readjust — 0.006 inch) or a contact pressure of — 37.5 grams (Readjust — 42.5 grams).
- Use the No. 68B gauge.

**2.09 Contact Sequence**

- (a) **Fig. 9(A) — Normal Contact Sequence Break-Make Combinations:** Normally closed contacts operated directly by a plunger spring of an individual spring assembly shall break before the normally open contacts of the same assembly directly associated with the plunger spring make by — 0.005 inch (Readjust — 0.006 inch).
- (b) **Fig. 10(A) — Cross Sequence — Break-Make Spring Combinations on Ringing Spring Assemblies or When Specified on Circuit Drawing:** All normally closed contacts

operated by the throw of the lever shall break before any of the normally open contacts make by — 0.005 inch (Readjust — 0.006 inch).

**2.10 Lever Release**

- (a) **Keys Equipped With a Straight Lever:** 50 grams (Readjust — 55 grams). Use the No. 68B gauge.

**Exceptions**

**586-type Keys:** Restore from locked position to normal position — 37.5 grams (Readjust — 42.5 grams).

Use the No. 68B gauge.

- (b) **Keys Equipped With an Offset Lever:** Restore from normal to intermediate position — 100 grams (Readjust — 110 grams).

Use the No. 79C gauge.

- (c) **Keys Equipped With an Offset Lever:** Restore from way-down to intermediate position — 50 grams (Readjust — 55 grams).

Use the No. 68B gauge.

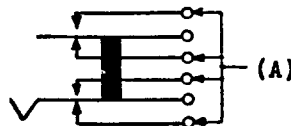


Fig. 9

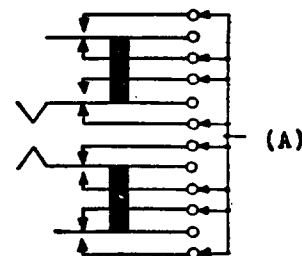


Fig. 10

Illustrating Contact Sequence