

KEYS

517, 530, A21, B13, C4, C9, C10, AND C11 TYPES
REQUIREMENTS AND ADJUSTING PROCEDURES

1. GENERAL

1.01 This section covers 517, 530, A21, B13, C4, C9, C10, and C11 type keys.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 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.

1.04 Requirements are marked with an asterisk (*) when to check for them would necessitate the dismantling or dismantling of apparatus, or would affect the adjustment 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 The normal (unoperated) position of the lever is that position in which the lever is perpendicular to the key top with all normally open contacts open and all normally closed contacts closed.

1.06 The operated position of the lever is that position in which the lever is thrown either to the extreme front or rear with all normally open contacts closed and all normally closed contacts open.

2. REQUIREMENTS

2.01 Cleaning: Contacts and other parts shall be cleaned, when necessary, in accordance with approved procedures.

*2.02 Lever Movement - Fig. 1 (A): The rollers and cam shall turn freely in their bearings. Gauge by eye and by feel.

*2.03 Spring Clearance - Fig. 1 (B) and 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. .014"
Gauge by eye.

2.04 Lever Locking Position - C10 Type Key: The lever operating bar shall lock in any of its three positions so that it will not be possible to move it sufficiently to

open the closed contacts or close the open contacts without releasing the latch. Gauge by eye and by feel.

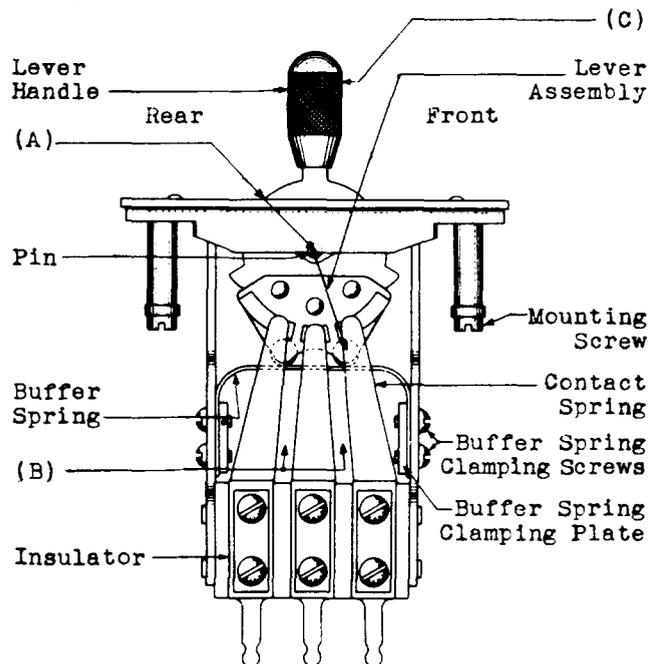


Fig. 1 - C4 Type Key

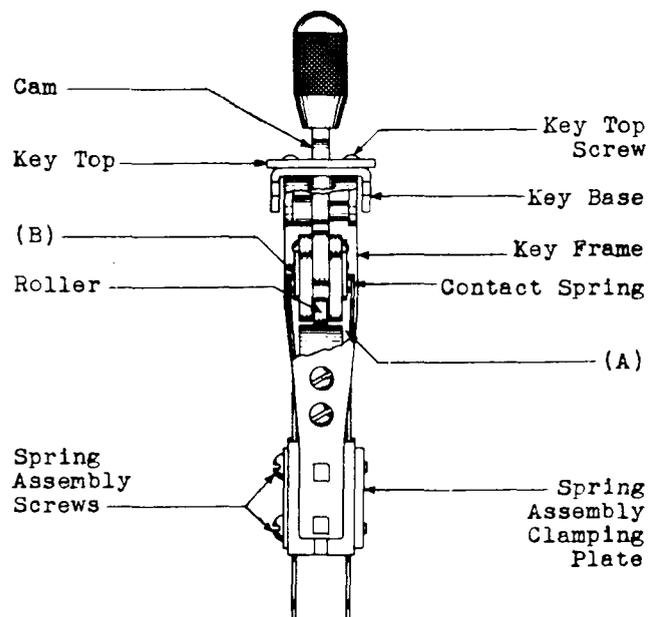


Fig. 2 - C4 Type Key

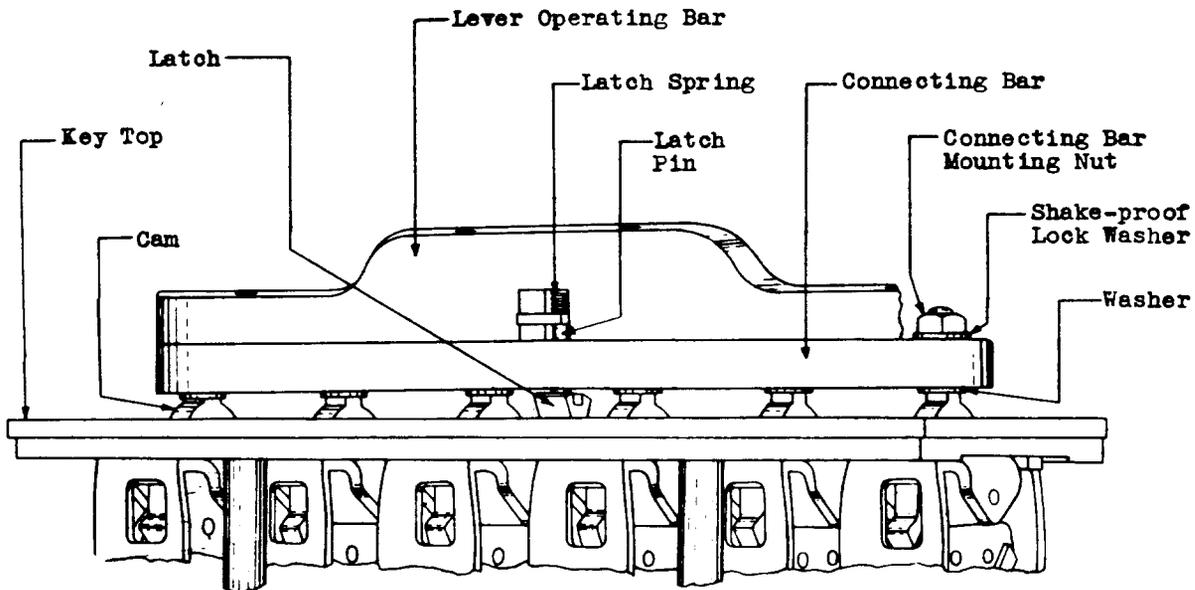


Fig. 3 - C-10 Type Key

***2.05 Contact Pressure - Fig. 2 (B)**

- (a) There shall be a pressure between all closed contacts of:
- Test - Min. 150 grams
Max. 300 grams
 - Readjust - Min. 165 grams
Max. 300 grams

Use the No. 79B gauge to check the maximum and the No. 79C gauge to check the minimum requirements.

- (b) The faces of the contact discs on the springs shall rest approximately flat against the contacts on the lever assembly. Gauge by eye.

2.06 Lever Operate Pressure - Fig. 1 (C)

- (a) Unless otherwise specified, the pressure required to operate the lever from the normal to the operated position shall be:

- Test - Min. 200 grams
Max. 475 grams
- Readjust - Min. 225 grams
Max. 475 grams

Use the No. 79B gauge.

- (b) C9 Type Keys: The pressure required to operate the lever from the normal to the operated position shall be:

- Test - Min. 425 grams
Max. 925 grams
- Readjust - Min. 450 grams
Max. 925 grams

Use the No. 79B gauge.

- (c) In checking this requirement, the pressure shall be applied at a point approximately 1/4" from the top of the

straight portion of the handle and perpendicularly to it.

- (d) The lever operate pressure requirement does not apply to the C10 type keys.

3. ADJUSTING PROCEDURES

3.001 List of Tools, Gauges and Materials

<u>Code No.</u>	<u>Description</u>
<u>Tools</u>	
43	Wrench 3/16" and 1/4" Hex. Open Double-End Flat
-	R-1572 Hammer - 4 oz.
-	KS-2993 Cleaning Brush
-	KS-6015 Duck-Bill Pliers
-	KS-6854 Screwdriver - 3-1/2"
-	3" Cabinet Screwdriver
-	Pin Punch, 4-3/8" 1/16" Point
<u>Gauges</u>	
62B	0-700 Gram Gauge
68B	70-0-70 Gram Gauge
79B	0-1000 Gram Push-Pull Tension Gauge
79C	0-200 Gram Push-Pull Tension Gauge

3.001 (Continued)

<u>Code No.</u>	<u>Description</u>
<u>Materials</u>	
D-98063 or KS-2423	Cloth
KS-6232	Oil
KS-7860	Petroleum Spirits
-	Toothpicks - Hardwood, Flat at One End and Pointed at Other

3.01 Cleaning (Rq.2.01)

(1) To obtain access to the parts to be cleaned remove the key top as outlined in 3.02 (2) and the key unit as outlined in 3.02 (9). Remove each of the spring assembly screws with the 3" cabinet screwdriver and remove all the contact springs. Exercise care not to lose any of the insulators or spring assembly clamping plates.

(2) Clean the contacts in accordance with approved procedures. Clean the hard rubber studs with a D-98063 cloth which has been slightly moistened with petroleum spirits. Then polish the contacts and stud with a clean, dry D-98063 cloth. Do not use an abrasive cloth or a burnisher as these will tend to roughen the contacting surfaces thereby increasing the tendency to pick up hard rubber particles from the surfaces of the key cam. Clean other parts as covered in 3.02 (6), (7) and (8). Make adjustments as covered in 3.02 (12) and reassemble the key.

3.02 Lever Movement (Rq.2.02)

(1) If the key is equipped with a hard rubber key top see whether it is cracked, warped or broken as this may cause the lever to bind and prevent or delay the release of the lever. In this case remove the key top as follows.

(2) On keys other than the C10 type, remove the lever handles and, on the C9 type keys, also remove the shakeproof lock washers, connecting block and washers. Remove the key top screws with the KS-6854 screwdriver and remove the key top. On the C10 type keys remove the lever operating bar screws with the 3" cabinet screwdriver and remove the lever operating bar. Then remove the latch spring and latch pin. Remove the connecting bar mounting nuts with the No. 43 wrench and remove the shakeproof lock washers, connecting bar and washers. Then remove the key top screws with the KS-6854 screwdriver and remove the key top. If the key top is not readily removable push it up from the bottom with the screwdriver.

(3) Loose or missing screws in the hard rubber key top may cause it to move and bind the lever. Replace missing screws and tighten all screws with the KS-6854 screwdriver.

(4) Examine the contact springs and note if the pressure exerted on both sides of the lever assembly is approximately equal. If the tension on both sides of the cam varies excessively it will produce a torque effect causing the cam to bind on the key top. Correct as necessary by readjusting the contact springs as outlined in 3.05.

(5) Smooth bright spots on the cam caused by rubbing are an indication that the cam binds on the key top. In some cases, it may be possible to correct by loosening the key top screws and shifting the key top as required. However, when this is not possible due either to proximity to other keys or to no side play in the key top, it will be necessary to enlarge the slot.

(6) A foreign deposit on the surface of the buffer spring over which the rollers ride will prevent smooth operation of the lever. If necessary, clean the buffer spring with a toothpick which has been dipped in petroleum spirits. Do not use the same toothpick for more than one cleaning operation. When cleaning the buffer spring operate the lever first to one side and then to the other and clean the opposite part of the buffer spring.

(7) At this time clean the rollers if necessary. Remove any foreign matter that may have collected on the rollers with a toothpick which has been dipped in petroleum spirits. Do not use the same toothpick for more than one cleaning operation.

(8) If the bind is not removed by the above methods, remove the key top as outlined in (2). Examine the cam and the slots in the key frame and key base for dirt. Clean the parts if necessary with the KS-2993 brush.

(9) If the cam binds on its bearing pin, the following procedure will usually rectify the trouble. Where a key is equipped with a key top remove it as outlined in (2). Observe whether the cam is tight in the key frame by moving it from side to side. If it is tight, remove the key from its mounting by removing the mounting screws with the 3" cabinet screwdriver. If the key is of a type other than the 517 or 530 types it will also be necessary to remove the screws holding the key unit to the key base using the 3" cabinet screwdriver. Drive out the pin by means of the R-1572 hammer and pin punch. Wipe off the cam

3.02 (Continued)

and the pin with a KS-2423 cloth. Then lubricate the pin sparingly with KS-6232 oil and wipe it off again with the cloth. Replace the pin in the cam. This is usually sufficient to remove the bind.

(10) Now see whether the buffer spring is broken or distorted in any way. If it is found necessary to replace this spring, remove each of the spring assembly screws with the 3" cabinet screwdriver, and remove all the contact springs. Exercise care not to lose any of the insulators or spring assembly clamping plates. Then remove the buffer spring clamping screws with the screwdriver, and remove the buffer spring clamping plates and finally the buffer spring.

(11) See that there are no flat spots on the rollers.

(12) Before reassembling the key unit to the key base make any adjustment for spring clearance, lever locking position and contact pressure that may be necessary. Reassemble all parts in place and check for freedom of movement.

3.03 Spring Clearance (Rq.2.03)3.04 Lever Locking Position (Rq.2.04)3.05 Contact Pressure (Rq.2.05)

(1) Spring Clearance and Lever Locking Position: If a key fails to meet the specified clearance between the contact springs and the buffer spring, loosen the buffer spring clamping screws slightly with the 3" cabinet screwdriver and shift the buffer spring until the desired clearance is obtained. Then while holding the buffer spring in this position, retighten the buffer spring clamping screws.

(2) If the key fails to meet the specified clearance between adjacent contact springs or if the lever locking position requirement is not met, remove the key top as outlined in 3.02, (2). Then remove the key from its mounting and remove the key unit as outlined in 3.02, (9). Loosen the spring assembly screws with the 3" cabinet screwdriver and shift the springs. While holding the springs in their correct position firmly retighten the screws.

(3) 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 the life of the key. Adjust them so that there will be the specified clearance between springs designed never to make contact and between contact springs and the frame in both the operated and unoperated positions of the key. Straight-

ening the springs will usually rectify any trouble that may exist because of springs touching each other which are designed to clear at all times or in the case of C10 type keys causing the springs to operate improperly.

(4) Contact Pressure: To tension a contact spring, remove the key top as outlined in 3.02, (2) and the key unit as outlined in 3.02, (9). Remove the spring assembly screws with the 3" cabinet screwdriver and remove the spring taking care not to lose the insulators or clamping plates. Then tension the spring in the direction of the contact discs with the duck-bill pliers applied as shown in Fig. 4. Take care when adjusting a contact spring not to kink it.

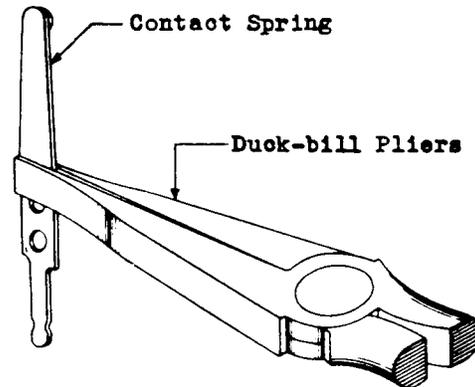


Fig. 4 - Method of Adjusting for Contact Pressure

(5) To reduce the spring tension, pull the spring out carefully away from the cam, then recheck its tension. Repeat this operation until the desired tension is obtained taking care not to reduce it too much. If the point of minimum tension is passed it will, of course, be necessary to remove the spring and retension it as described in (4).

(6) Note at this time that the faces of the contact discs rest approximately flat against the contacts on the lever assembly. If necessary remove the springs as described above, straighten them and reassemble the key.

3.06 Lever Operate Pressure (Rq.2.06)

(1) If the key fails to meet the maximum lever operate pressure requirement, check the key for bind. The cam should not bind in its bearings. In case it does bind, proceed as outlined in 3.02.

3.06 (Continued)

(2) The pressure of the contact spring against the cam assembly being either excessive or insufficient may prevent the lever from operating satisfactorily. Recheck the tension of the contact springs and if necessary increase or reduce this tension as outlined in 3.05, (4) and (5).

(3) If the lever still fails to operate properly, operate it to one side and examine the buffer spring to determine whether it is broken or distorted. If

necessary replace it with a new one as outlined in 3.02, (10).

(4) If the buffer spring is higher on one side than on the other, it may cause this trouble. In this case, loosen the buffer spring clamping screws with the 3" cabinet screwdriver and shift the spring slightly up or down as desired. Shifting this spring away from the rollers will tend to decrease the drag of the rollers. Do not attempt to adjust the buffer spring.