

CRADLE SWITCH ASSEMBLIES

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1 GENERAL DESCRIPTION

1.1 These cradle switch assemblies are used on the 700 Series of compact desk telephones. Each assembly consists of a spring loaded operating arm, pivoted on a bearing which is molded into the same plastic block as the contact springs, mounted with two sets of contacts on each side of the insulating actuator block which is riveted to the center part of the operating arm. The coiled spring holds the operating arm in a position which operates two of the sets of contacts when the arm is in the raised or off-hook position. These two sets of contacts are released and the opposite two sets are operated when the arm is moved to the on-hook position.

1.2 Separate flexible wire leads are provided for each contact spring to connect them to the other components in the telephone instrument. The leads are joined to the contact springs inside the molded portion of the assembly.

1.3 The complete assembly is mounted to the base of the telephone instrument by means of three rivets through its bracket, which is molded into the same block as the contact springs, so that placing the handset in the cradle depresses the plungers against the extremities of the operating arm to actuate the contact springs.

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of the cradle switch are identified in Fig. 2-1.

2.2 To disassemble the unit, first remove the coil spring holding the operating arm in the raised position, then lift the arm carefully from between the sets of contact springs. Reassemble the parts by placing the operating arm over its pivot pin and between the sets of contact springs. Then hook the loops of the coiled spring over the lugs on the arm and the assembly mounting bracket. Make sure that the operating arm functions freely and is securely pivoted in the groove of the bearing pin.

2.3 The spring nest assembly can not be taken apart. In the event of damage to the contacts, springs or leads the complete spring nest assembly must be replaced. Note that the 703 type telephone instruments do not require the use of one set of make contacts. It may be possible, therefore, to use certain damaged assemblies from 701 type instruments in 703 type instruments.

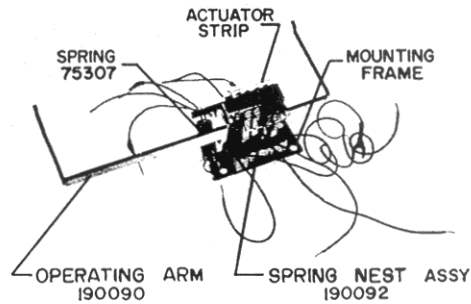


Fig. 2-1 TYPICAL CRADLE SWITCH

3 TEST AND ADJUSTMENT

3.1 The operating arm, and the insulated actuator strip mounted on it, must move freely between the sets of contact springs.

3.2 The normal position of the assembly is with the operating arm fully released and the operated position is with the arm fully depressed.

3.3 SPRING ADJUSTMENTS

Adjust the contact springs of the assembly to meet the requirements detailed in the following paragraphs.

3.3.1 Spring Pressures

The pressure between each pair of closed contacts must be within the range of 10 to 20 grams. This is measured at each tip of the break springs on the side of the assembly where the springs are in contact with the actuator strip and at each tip of the lever springs on the opposite side of the assembly, when the operating arm is in the normal position. The same conditions must be satisfied when measuring at each tip of the lever springs on the side of the assembly where the springs are NOT in contact with the actuator strip, when the operating arm is in the fully operated position. With the

operating arm in either position, each spring not making electrical contact must be tensioned against a buffer spring or the central insulating block.

3.3.2 Spring Clearances

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least .020".

There must be a perceptible clearance between any buffer spring and the contact spring which rests on it, in either position of the operating arm, when the contact spring is in electrical contact with another spring, in the other position of the operating arm.

3.3.3 Contact Sequence and Alignment

The contacts in each assembly must operate in the sequence shown by the circled numbers in Fig. 3-1 when the operating arm is moved from the normal position. Contacts marked with the same number should function at approximately the same time.

The two contacts of each mating pair of springs must make and break simultaneously.

The bar contacts must mate approximately on centers.

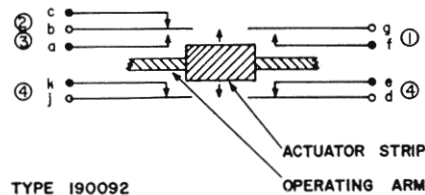


Fig. 3-1 CONTACT ARRANGEMENTS

4 LUBRICATION

4.1 Any existing lubricant must be cleaned off with a good quality, non-filming commercial solvent. Using a small camel hair brush, apply a small

amount of high quality lubricant, such as ITTK dial lubricant 79946, to each of the two bearing points of the bearing pin. Avoid excessive lubrication.

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1 GENERAL DESCRIPTION

1.1 Each cradle switch assembly consists of a spring loaded operating arm pivoted on a frame so that movement of the arm is imparted to the lever springs of a spring nest assembly which is mounted on the lower part of the same frame. Each contact spring is provided with a flexible wire lead to connect to the other components in the telephone instrument.

1.2 The cradle switch assembly is mounted in the telephone so that placing the handset in the cradle presses the plungers against the extremities of the operating arm to actuate the contact springs.

1.3 Several different contact arrangements are available to meet the requirements of the various telephone instrument circuits (see paras. 3 and 5).

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of a typical cradle switch assembly are identified in Fig. 2-1.

2.2 To disassemble the unit, first remove the coil spring holding the operating arm in the raised position, then slide out the pivot pin. Disengage the end of the operating bar from the slot in the operating arm and remove the arm. Reassemble the parts in the reverse order. Make sure that the grooves in the pivot pin rest in the elongated holes of the operating arm and mounting frame.

2.3 The spring nest assembly should only be removed from the mounting frame if it is necessary to replace a contact spring or lead. The cover is removed by squeezing the sides, to clear the lugs on its rear edge through the locking slots in the frame, and lifting. Removal of the operating and positioning bars is accomplished by disengaging the keying section from one of the springs, rotating

the bar one quarter turn and lifting it out. Reassembly is a reversal of these procedures. Refer to Table 5-1 for the order of assembly of the parts of the spring nest.

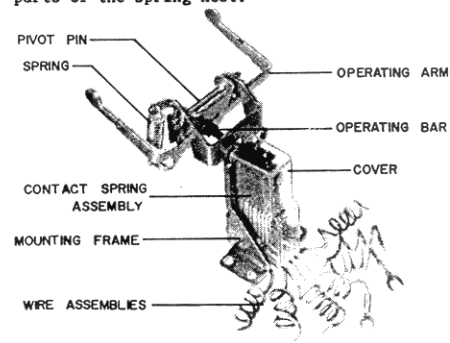


Fig. 2-1 TYPICAL CRADLE SWITCH

3 TEST AND ADJUSTMENT

3.1 The operating and positioning bars must move through the springs without binding. Realign the spring nest as necessary to obtain this condition.

3.2 The normal position of the assembly is with the operating arm fully released and the operated position is with the arm fully depressed.

3.3 SPRING ADJUSTMENTS

Adjust the contact springs of the assembly to meet the requirements detailed in the following paragraphs.

3.3.1 Spring Pressures

The pressure between each pair of closed contacts must be within the range of 20 to 35 grams. This is measured at each tip of the break springs with the operating arm in the normal position and at each tip of the lever springs with the arm in the fully operated position. With the operating arm in either position, each spring not making electrical contact must be tensioned against a shoulder of the operating or positioning bar.

3.3.2 Spring Clearances

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least .020".

There must be a perceptible clearance between any break or lever spring, when it is in electrical contact with another spring, and the shoulder of the bar on which it rests in the other position of the operating arm.

There must be a clearance of at least 1/32" between springs not designed to make electrical contact when the assembly is normal or operated.

3.3.3 Contact Sequence and Alignment

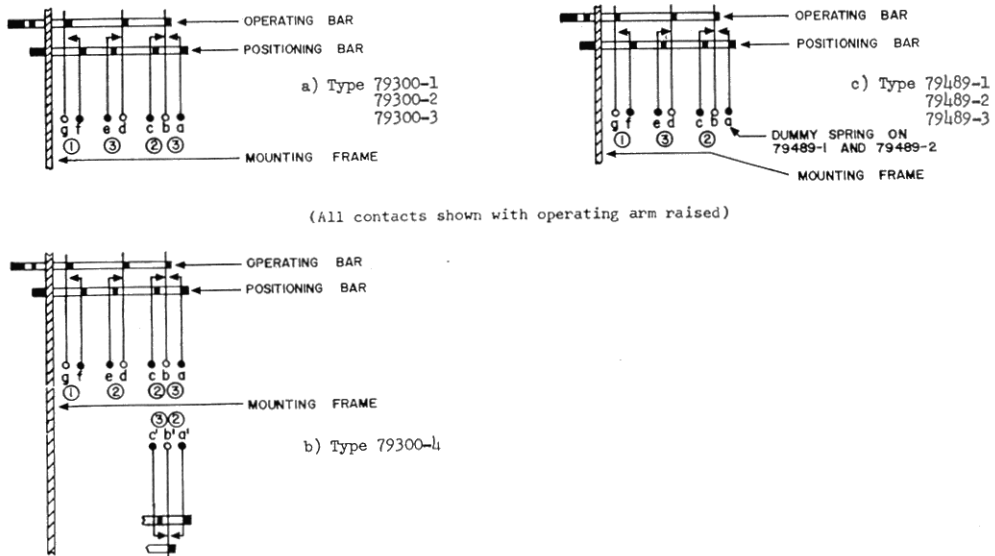
The contacts in each assembly must operate in the sequence shown by the circled numbers in Fig. 3-1 when the operating arm is moved from the normal position. Contacts marked with the same number should function at approximately the same time.

The two contacts of each mating pair of springs must make and break simultaneously.

The bar contacts must mate approximately on centers.

3.4 OPERATING FORCE

With the cradle switch assembly mounted so that the contact springs are vertical, a force between 7 and 9 ounces must fully actuate the operating arm when it is applied to either tip of the arm in a direction parallel to the length of the contact springs.



(All contacts shown with operating arm raised)

Fig. 3-1 CONTACT ARRANGEMENTS

4 LUBRICATION

4.1 Any existing lubricant must be cleaned off with a good quality, non-filming commercial solvent. Using a small camel hair brush, apply a small

amount of high quality lubricant, such as ITTK dial lubricant 79946, to each of the four bearing points of the pivot pin.

5 REPLACEABLE PARTS

5.1 The component parts of the various cradle switch assemblies are listed in Table 5-1. The position numbers (noted in brackets) show the order of assembly, starting from the mounting frame, of the parts of the spring nest for each type of cradle switch.

Table 5-1 REPLACEABLE PARTS

Item	Description	Number	Quantity per Assembly							
			75300-1	75300-2	75300-3	75300-4	79489-1	79489-2	79489-3	
1a	Mounting Frame	75301	1	1		1				
b	Mounting Frame	75301-2			1					
c	Mounting Frame	79484					1			
d	Mounting Frame	79484-2								1
e	Mounting Frame	190172-1						1		
2a	Operating Arm	75302	1		1	1				
b	Operating Arm	79602		1						
c	Operating Arm	79491					1			
d	Operating Arm	190173-1							1	1
3	Grommet	75303	1	1	1	1	1	1	1	1
4	Pivot Pin	75308	1	1	1	1	1	1	1	1
5	Spring	75307	1	1	1	1	1	1	1	1
6	Cover	75306	1	1	1	1	1	1	1	1
7	Operating Bar	75305	1	1	1	1	1	1	1	1
8	Positioning Bar	75304	1	1	1	1	1	1	1	1
9a	Bushing	75322	2	2	2		2	2		
b	Bushing	75322-3				2				
c	Bushing	75322-5								2
10a	Rd. Hd. Mach. Screw	59031	2	2	2		2	2	2	2
b	Rd. Hd. Mach. Screw	84796-1				2				
11	Nut	75323	1(24)	1(24)	1(24)	1(24)	1(23)	1(23)	1(24)	
12	Insulator	75321	5(1,5,11,17,20,23)	6(1,5,11,17,20,23)	6(1,5,11,17,20,23)	4(5,11,11,33)	6(1,5,11,17,20,22)	6(1,5,11,17,20,22)	6(1,5,11,17,20,23)	
13	Insulator	75321-3	3(2,8,11)	3(2,8,14)	3(2,8,14)	2(1,8)	3(2,8,14)	3(2,8,14)	3(2,8,14)	
14	Insulator	75321-4				5(2,17,20,26,29)				
15	Insulator	84778-1				1(23)				
16	Contact Spring Assy.	75315	1(21)	1(21)	1(21)					1(21)
17	Contact Spring Assy.	75316	1(18)	1(18)	1(18)					
18	Contact Spring Assy.	75317	1(3)	1(3)	1(3)		1(3)	1(3)		
19	Contact Spring Assy.	75318	2(9,15)	2(9,15)	2(9,15)	1(13)	2(10,16)	2(10,16)	1(15)	
20	Contact Spring Assy.	75319	1(12)	1(12)	1(12)	1(7)	2(13,19)	2(13,19)	1(12)	
21	Contact Spring Assy.	75320	1(6)	1(6)	1(6)		1(7)	1(7)	1(6)	
22	Contact Spring Assy.	84788-1				1(24)				
23	Contact Spring Assy.	84789-1				1(4)				1(3)
24	Contact Spring Assy.	84790-1				1(22)				
25	Contact Spring Assy.	84791-1				1(10)				1(9)
26	Contact Spring Assy.	84792-1				1(19)				
27	Contact Spring Assy.	84793-1				1(16)				
28	Contact Spring Assy.	84794-1				1(28)				
29	Contact Spring Assy.	84795-1				1(32)				
30	Contact Spring Assy.	86373-1								1(18)
31	Spring	75310					1(22)	1(22)		
32	Spring	84786-1				1(30)				
33	Wire Assembly (SL)	75326-1	1(22)	1(22)	1(22)					1(22)
34	Wire Assembly (SL-YL)	75326-2	1(19)	1(19)	1(19)					
35	Wire Assembly (SL-GR)	75326-3	1(13)	1(13)	1(13)					
36	Wire Assembly (SL-WH)	75326-4	1(10)	1(10)	1(10)	1(9)	1(11)	1(11)	1(19)	
37	Wire Assembly (SL-BK)	75326-5	1(4)	1(4)	1(4)	1(3)	1(4)	1(4)	1(4)	
38	Wire Assembly (SL-BN)	75326-6	1(16)	1(16)	1(16)		1(17)	1(17)	1(10)	
39	Wire Assembly (SL-RD)	75326-7	1(7)	1(7)	1(7)	1(6)	1(8)	1(8)	1(7)	
40	Wire Assembly (SL-YL)	75326-74					1(20)	1(20)	1(13)	
41	Wire Assembly (SL-GR)	75326-75				1(12)	1(14)	1(14)	1(16)	
42	Wire Assembly (BN)	75326-148				1(15)				
43	Wire Assembly (SL)	75326-149				1(18)				
44	Wire Assembly (YL)	75326-150				1(21)				
45	Wire Assembly (SL-YL)	75326-151				1(25)				
46	Wire Assembly (SL-BN)	75326-152				1(27)				
47	Wire Assembly (BL)	75326-153				1(31)				

HOOK SWITCH ASSEMBLIES

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1 GENERAL DESCRIPTION

1.1 Each hook switch assembly consists of a cast metal hook and a spring loaded operating arm which are interlocked and pivoted on a common frame. Movement of the hook and arm is imparted to the lever springs of a spring nest assembly mounted on the lower part of the frame. Each contact spring is provided with a flexible wire lead to connect to the other components in the telephone instrument.

1.2 The hook switch assembly is mounted in a wall type telephone so that hanging the handset in the hook causes the contact springs to be actuated.

1.3 Several different contact and mechanical arrangements are available to meet the requirements of the various telephone instrument circuits (see paragraphs 3 and 5).

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of a typical hook switch assembly are identified in Fig. 2-1.

2.2 To disassemble the unit, first remove the coil spring(s) holding the operating arm and cradle hook in the raised position then slide out the pivot pin and remove the cradle hook. Note that the lift-to-talk version of the assembly has two flat washers between the right hand side of the cradle hook and the mounting frame. Disengage the end of the operating bar from the slot in the operating arm and remove the arm. Reassemble the parts in the reverse order; make sure that the grooves in the pivot pin rest in the elongated holes of the operating arm and mounting frame.

2.3 The spring nest assembly should only be removed from the mounting frame if it is necessary to replace a contact spring or lead. The cover is removed by squeezing the sides, to clear the lugs on its rear edge through the locking slots in the frame, and lifting. Removal of the operating and positioning bars is accomplished by disengaging the

keying section from one of the springs, rotating the bar one quarter turn and lifting it out. Reassembly is a reversal of these procedures. Refer to Table 5-1 for the order of assembly of the parts of the spring nest.

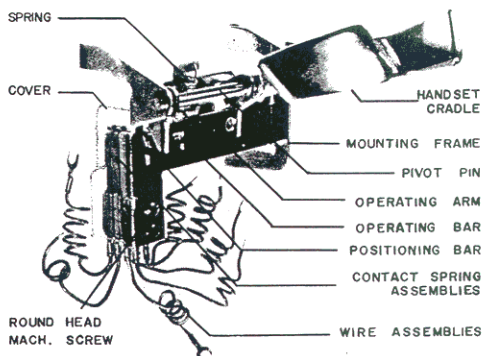


Fig. 2-1 TYPICAL HOOK SWITCH

3 TEST AND ADJUSTMENT

3.1 The operating and positioning bars must move through the springs without binding. Realign the spring nest as necessary to obtain this condition.

3.2 The normal position of the assembly is with the operating arm fully released and the operated position is with the arm fully depressed.

3.3 SPRING ADJUSTMENTS

Adjust the contact springs of the assembly to meet the requirements detailed in the following paragraphs.

3.3.1 Spring Pressures

The pressure between each pair of closed contacts must be within the range of 20 to 35 grams. This is measured at each tip of the break springs with the operating arm in the normal position and at each tip of the lever springs with the arm in the fully operated position. With the operating arm in either position, each spring not making electrical contact must be tensioned against a shoulder of the operating or positioning bar.

3.3.2 Spring Clearances

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least .020".

There must be a perceptible clearance between any break or lever spring, when it is in electrical contact with another spring, and the shoulder of the bar on which it rests in the other position of the operating arm.

There must be a clearance of at least 1/32" between springs not designed to make electrical contact when the assembly is normal or operated.

3.3.3 Contact Sequence and Alignment

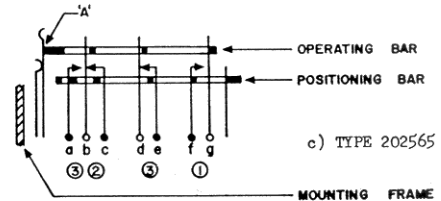
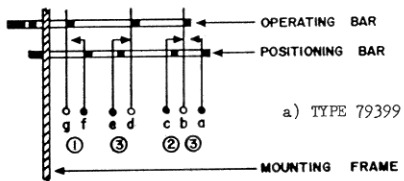
The contacts in each assembly must operate in the sequence shown by the circled numbers in Fig. 3-1 when the operating arm is moved from the normal position. Contacts marked with the same number should function approximately at the same time. On the "lift-to-talk" type assembly, the contact marked with a number in a double circle must operate before the arm of the cradle hook comes to rest against the stop on the frame. Moving the cradle hook to the side must then allow it to rise completely and operate the remaining contacts in the order shown.

The two contacts of each mating pair of springs must make and break simultaneously.

The bar contacts must mate approximately on centers.

3.4 OPERATING FORCE

With the hook switch assembly mounted so that the contact springs are vertical, a force of 4 ounces must not fully depress the cradle hook and a force of 8 ounces must fully depress the hook. The forces should be applied by using type 65-C handset shells which have been weighted at the transmitter end. The cradle hook of the "lift-to-talk" assembly must slide freely on the pivot pin.



Insertion of .025" shim between spring and operating bar at point "A" with cradle hook depressed must not operate any contacts.

(ALL CONTACTS SHOWN WITH CRADLE HOOK RAISED)

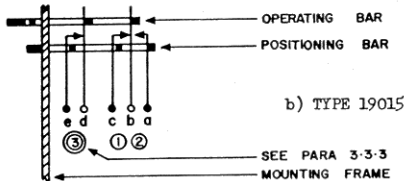


Fig. 3-1 CONTACT ARRANGEMENTS

4 LUBRICATION

4.1 Any existing lubricant must be cleaned off with a good quality, non-filming commercial solvent. Using a small camel hair brush, apply a small amount of high quality lubricant, such as ITTK dial

lubricant 79946, to each of the bearing points of the pivot pin, to the bearings of the cradle hook and to the rubbing surfaces of the arms at the rear of the cradle hook.

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5 REPLACEABLE PARTS

5.1 The component parts of the various hook switch assemblies are listed in Table 5-1. The position numbers (noted in brackets) show the order of assembly, starting from the mounting frame, of the parts of the spring nest for each type of hook switch.

Table 5-1 REPLACEABLE PARTS

Item	Description	Number	Quantity per Assembly		
			79399	190154	202565
1a	Mounting Frame	79297	1		
b	Mounting Frame	190152		1	
c	Mounting Frame	26899-3			1
2	Operating Arm	79307	1	1	
3a	Handset Cradle	79417	1		
b	Handset Cradle	190153		1	
c	Handset Cradle	81564			1
4	Pivot Pin	79304	1	1	
5	Spring	75307	1	1	
6	Cover	75306	1	1	
7a	Operating Bar	75305	1	1	
b	Operating Bar	81566			1
8	Positioning Bar	75304	1	1	1
9a	Bushing	75322	2	2	
b	Bushing	75322-4			2
10a	Rd. Hd. Mach. Screw	59031	2	2	
b	Rd. Hd. Mach. Screw	81584-2			2
11	Spring	190155		1	
12	Spring	46029-2			1(3)
13	Spring	75310-2			1(29)
14	Spring	81565			1(5)
15	Flat Washer	37445		2	
16a	Nut	75323	1(24)	1(22)	
b	Clamping Plate	79750-2			1(30)
17	Insulator	75321	6(1,5,11,17,20,23)	5(1,9,15,18,21)	6(4,6,10,13,19,25)
18	Insulator	75321-2		2(4,5)	
19	Insulator	75321-3	3(2,8,14)	4(2,3,6,12)	6(1,2,7,16,22,28)
20	Contact Spring Assy.	75315	1(21)	1(19)	1(9)
21	Contact Spring Assy.	75316	1(18)	1(16)	
22	Contact Spring Assy.	75317	1(3)		1(27)
23	Contact Spring Assy.	75318	2(9,15)	2(7,13)	2(15,21)
24	Contact Spring Assy.	75319	1(12)	1(10)	1(18)
25	Contact Spring Assy.	75320	1(6)		1(24)
26	Contact Spring Assy.	81567			1(12)
27	Wire Assembly (SL)	75326-1	1(22)	1(20)	1(8)
28	Wire Assembly (SL-YL)	75326-2	1(19)	1(17)	1(11)
29	Wire Assembly (SL-GR)	75326-3	1(13)	1(11)	1(17)
30	Wire Assembly (SL-WH)	75326-4	1(10)	1(8)	1(20)
31	Wire Assembly (SL-BK)	75326-5	1(4)		1(26)
32	Wire Assembly (SL-BN)	75326-6	1(16)	1(14)	1(14)
33	Wire Assembly (SL-RD)	75326-7	1(7)		1(23)

PLUNGER SWITCH ASSEMBLIES

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1 GENERAL DESCRIPTION

1.1 Each plunger switch assembly consists of a spring nest mounted on a bracket which is loosely held to a second bracket by a spring. The assembly is mounted in a desk type telephone by a clamping screw which holds the second bracket to the cradle switch bracket of the instrument.

1.2 The spring mounting bracket has two locating tabs at each end. These engage a web inside the telephone housing and correctly locate the spring

nest assembly with respect to the left hand plunger in the housing. This plunger is of special design such that it operates normally when the handset is lifted but may then be raised further in order to operate the plunger switch spring assembly. When the handset is replaced, the plunger automatically depresses completely to release the switch contacts.

1.3 The contact springs are provided with wire leads, terminal lugs or screw terminals, as needed.

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of a typical plunger switch are identified in Fig. 2-1.

2.2 Loosen the clamping screw in the mounting bracket and lift the locating tabs out of the slot in the cradle switch bracket in order to remove the assembly from the telephone. Unhook the retaining spring to allow the spring and bracket assembly to be lifted off the lugs of the mounting bracket. Reassembly is simply a reversal of these processes.

2.3 The contact spring assembly should only be disassembled from its mounting bracket, by removing the two round head screws, if it is necessary to replace a part of the assembly. Refer to Table 4-1 for the order of assembly of the various parts of the spring assembly.

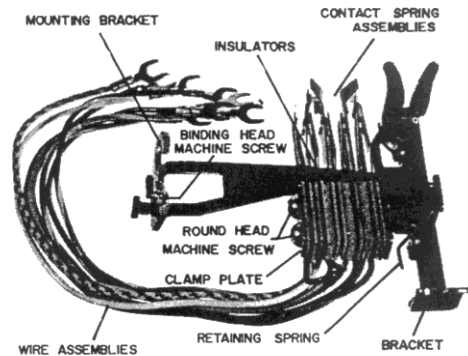


Fig. 2-1 TYPICAL PLUNGER SWITCH

3 TEST AND ADJUSTMENT

3.1 The special plunger in the housing assembly must pass between the innermost lever springs of the assembly and operate all contacts correctly. This may be checked by removing the spring and bracket assembly (Section 2.2) and placing it in position inside the inverted housing. Take care in

replacing the housing over the telephone as the end of the plunger must pass between the lever springs of the assembly. See also Section 3.3.

3.2 The normal position of the spring assembly is with the plunger NOT lifted.

3.3 SPRING ADJUSTMENTS

Adjust the contact springs of the assembly to meet the requirements detailed in the following paragraphs.

3.3.1 Spring Pressures

The pressure between each pair of closed contacts must be within the range noted in Fig. 3-1. This is measured at each tip of the make springs with the spring nest operated (see also paragraph 3.3.2) and at each tip of the break springs with the spring nest normal.

3.3.2 Spring Clearances and Alignment

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least .025".

There must be a clearance of not more than .005" between the tip of each buffer spring and its associated make or break spring when the latter is in electrical contact with a lever spring.

There must be a clearance of at least 1/32" between springs not designed to make electrical contact when the assembly is normal or operated.

While adjusting the spring pressures and clearances, the dimensions shown in Fig. 3-1,

between the tips of the innermost lever springs and between the center lines of the spring nest assembly and the notches in the mounting bracket, must be obtained.

It will be helpful to place a small block, .430±.005" thick, between the lever springs, in order to simulate the plunger operation of the spring nest, while adjusting the make contacts. The tips of the lever springs must spread equally about the center line of the spring nest in the operated condition.

3.3.3 Contact Sequence and Alignment

The contacts on each assembly must operate in the sequence shown by the circled numbers in Fig. 3-1 when the plunger is lifted. Contacts marked with the same number should function at approximately the same time.

The two contacts of each mating pair of springs must make and break simultaneously.

The bar contacts must mate approximately on centers.

All make and break springs must follow the lever springs for a distance of at least .010" before the contacts open.

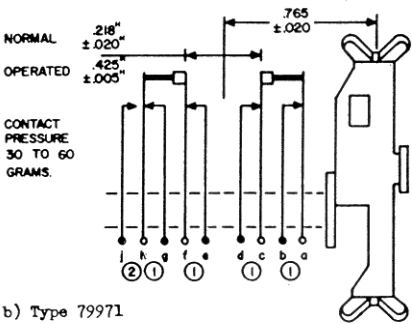
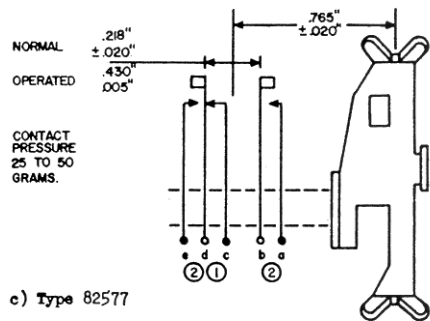
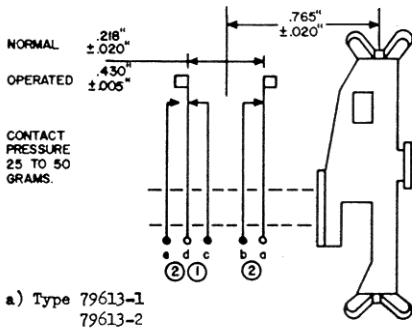


Fig. 3-1 CONTACT ARRANGEMENTS

5 REPLACEABLE PARTS

5.1 The component parts of the various plunger of assembly, starting with the clamp plate, of the switch assemblies are listed in Table 5-1. The parts of the spring nest for each type of plunger position numbers (noted in brackets) show the order switch.

Table 5-1 REPLACEABLE PARTS

Item	Description	Number	Quantity per Assembly			
			79613-1	79613-2	79971	82577
1	Mounting Bracket	79605	1	1	1	1
2	Bind. Hd. Mach. Screw	69020-3	1	1	1	1
3	Retaining Spring	79624	1	1	1	1
4a	Bracket	79604	1	1		1
b	Bracket	79969			1	
5a	Bushing	75322-2	2	2		2
b	Bushing	75322-3			2	
6a	Rd. Hd. Mach. Screw	66849	2	2		2
b	Rd. Hd. Mach. Screw	79980-2			2	
7a	Clamp Plate	79615	1(1)	1(1)	1(1)	1(1)
8	Insulator	75321	6(2,5,7, 10,14,16)	6(2,5,7 10,14,16)	8(2,5,7,12 15,19,24,26)	4(2,5,7,13)
9	Insulator	75321-2				1(16)
10	Insulator	75321-3	1(11)	1(11)	3(9,15,20)	2(10,11)
11	Buffer Spring	79620	2(8,13)	2(8,13)	5(4,8,13 18,23)	2(8,14)
12	Contact Spring Assy.	79618	3(3,9,12)	3(3,9,12)	5(3,9,14 17,22)	3(3,9,15)
13	Contact Spring Assy.	79621-1	1(6)	1(6)	1(11)	1(6)
14	Contact Spring Assy.	79621-2	1(15)	1(15)	1(20)	
15	Contact Spring Assy.	79621-3				1(12)
16	Contact Spring Assy.	79968-1			1(6)	
17	Contact Spring Assy.	79968-2			1(25)	
18	Terminal Spring	79617	1(4)	1(4)		1(4)
19	Bind. Hd. Mach. Screw	69020-3	1	1		1
20	Wire Assy. (RD-YL)	75326-85	1			
21	Wire Assy. (GR-YL)	75326-86	1		1	
22	Wire Assy. (WH)	75326-87	1	1	1	
23	Wire Assy. (BL)	75326-88	1		1	
24	Wire Assy. (BK)	75326-89	1			
25	Wire Assy. (BK)	75326-97			1	
26	Wire Assy. (GR-RD)	75326-98			1	
27	Wire Assy. (BK-WH)	75326-99			1	
28	Wire Assy. (BK-RD)	75326-100			1	
29	Wire Assy. (BN-RD)	75326-101			1	
30	Wire Assy. (BL)	75326-106				1
31	Wire Assy. (RD-YL)	75326-107				1
32	Wire Assy. (WH)	75326-108				1
33	Wire Assy. (BK)	75326-109				1

TURN AND PUSH KEY ASSEMBLIES

CONTENTS

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2 DISASSEMBLY AND ASSEMBLY	1	3-1 CONTACT ARRANGEMENTS	2
3 TEST AND ADJUSTMENT	1	Table	
4 REPLACEABLE PARTS	3	4-1 REPLACEABLE PARTS	3

1 GENERAL DESCRIPTION

1.1 Each of the various types of turn and push keys consists of a bracket and plunger assembly in which the plunger is free to slide and rotate in a bushing on the upper part of the bracket. Either one or two spring nest assemblies may be independently mounted on the lower part of the bracket; one is actuated by depressing the plunger and the other by rotating the plunger one quarter turn. The rotary action is locking in both positions while the push action is non-locking. A lucite knob is fitted to the top of the plunger.

1.2 The turn and push keys are mounted to the base of either the desk or wall type telephones so that the lucite knob projects through the housing. Various types of contact assemblies are available to meet the requirements of the various types of telephone circuits.

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of a typical assembly are identified in Fig. 2-1.

2.2 Disassembly of the turn and push key will not normally be required unless it is necessary to replace the plunger. First remove the small screw holding the knob in place and then the knob. Remove the turn spring nest assembly, the push spring nest assembly and then the plunger.

2.3 Reassemble the unit in the reverse order to that described above. If the spring nests have been taken apart refer to Table 4-1 for the order of assembly of the various items. Note that the knob must be fitted to the plunger so that the top thin portion is in line with the stop tab on the plunger for all types except 79453-2 where the top of the knob must be at right angles to the stop tab. Replace the plunger if binding is observed.

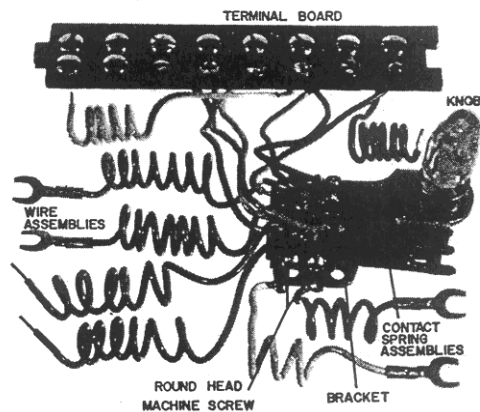


Fig. 2-1 TYPICAL TURN AND PUSH KEY

3 TEST AND ADJUSTMENT

3.1 When the assembly is installed on a telephone base, the housing of the instrument must pass over the stem of the turn and push key without binding. The shoulder mounting screws allow slight lateral movement of the assembly for alignment purposes.

3.2 The normal position of the turn key is with the narrow dimension of the end of the plunger in line with the length of the contact springs. The normal position of the push button is with the plunger in the raised position.

3.3 SPRING ADJUSTMENTS

Adjust the contact springs of the assembly to meet the requirements detailed in the following paragraphs.

3.3.1 Spring Pressures

The pressure of the lever springs of the turn key, against the broad, flat faces of the plunger, must be within the range of 100 to 200 grams, measured at the tips of the springs.

The pressure of the lever spring of the push key, against the end of the plunger, must be such that the plunger will be fully depressed by a force within the range of 1.1/4 to 2.1/4 pounds applied to the knob.

The pressure between each pair of closed contacts must be within the range of 35 to 65 grams. This is measured at each tip of the make springs with the turn or push key operated and at each tip of the break springs with the key in the normal position.

3.3.2 Spring Clearances

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least .020" for the turn key spring nest and at least .035" for the push key spring nest.

There must be a clearance of not more than .005" between the tip of each buffer spring and its associated make or break spring when the

latter is in electrical contact with a lever spring.

There must be a clearance of at least 1/32" between springs not designed to make electrical contact when the assembly is normal or operated.

3.3.3 Contact Sequence and Alignment

The contacts in each assembly must operate in the sequence shown by the circled numbers in Fig. 3-1 when the plunger is operated from the normal position. Contacts marked with the same number should function at approximately the same time.

The two contacts of each mating pair of springs must make and break simultaneously.

The bar contacts must mate approximately on centers.

All make and break springs must follow the lever springs for a distance of at least .010" before the contacts open.

3.4 PLUNGER

The plunger must operate freely and return fully to the normal position when released slowly from the rotated and depressed positions.

A side pressure against the flat end of the plunger, in either the normal or operated condition of the turn key, must not cause any open contacts to close or any closed contacts to open.

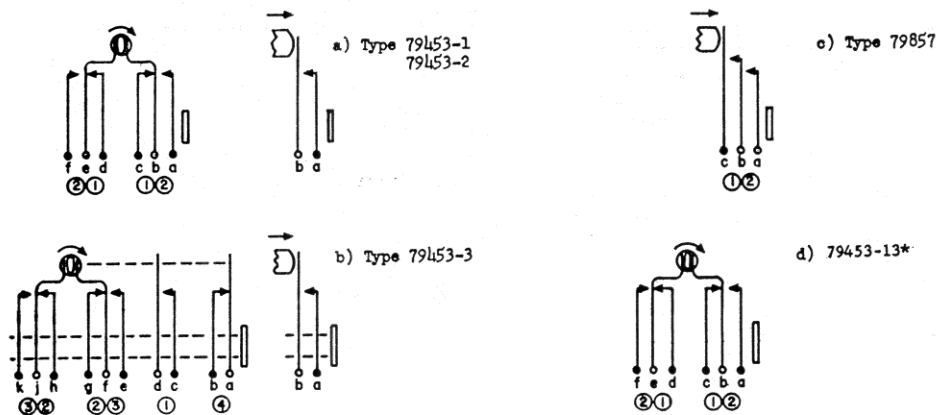


Fig. 3-1 CONTACT ARRANGEMENTS

*was 82870-1

4 REPLACEABLE PARTS

4.1 The component parts of the various turn and push key assemblies are listed in Table 4-1. The position numbers (noted in brackets) show the order of assembly, starting with the clamp washer, of the parts of the spring nest for each type of turn and push key.

Table 4-1 REPLACEABLE PARTS

Item	Description	Number	Quantity per Assembly			
			79453-1	79453-3	79857	79453-13*
1	Bracket	79446	1	1	1	1
2	Plunger	79449	1	1	1	1
3	Knob	79452	1	1	1	1
4	Flat Fil. Hd. Mach. Screw	79451	1	1	1	1
5	Bind. Hd. Mach. Screw	190332-2	2			2
6	Rd. Hd. Mach. Screw	82580-3		2		
7	Clamping Washer	79426	2(1,19)	2(1,29)		2(1,19)
8	Bushing	29219	2			2
9	Bushing	47008		2		
10	Insulator	79422	7(2,5,7,10,13,15,18)	11(2,4,7,10,12,15,17,20,23,25,28)		7(2,5,7,10,13,15,18)
11	Contact Spring Assy.	79425-3	1(6)			1(6)
12	Contact Spring Assy.	79425-2	1(14)	1(24)		1(14)
13	Contact Spring Assy.	79425-3		1(16)		
14	Contact Spring Assy.	79428	2(9,17)	3(6,19,27)		2(9,17)
15	Contact Spring Assy.	79430	2(3,11)	3(8,13,21)		2(3,11)
16	Contact Spring Assy.	83211-1		1(3)		
17	Contact Spring Assy.	83211-2		1(11)		
18	Buffer Spring	79423	4(4,8,12,16)	6(5,9,14,18,22,26)		4(4,8,12,16)
19	Bind. Hd. Mach. Screw	79437-2	2			
20	Bind. Hd. Mach. Screw	79868-2			2	
21	Clamping Washer	79426	1(1)		1(1)	
22	Bushing	47004-3	2			
23	Bushing	47004-4			2	
24	Insulator	79431	2(2,4)		2(2,4)	
25	Insulator	79431-2			1(6)	
26	Insulator	79454	1(6)		1(8)	
27	Contact Spring Assy.	79433	1(5)			
28	Contact Spring Assy.	79435	1(3)			
29	Contact Spring Assy.	79435-2			1(3)	
30	Contact Spring Assy.	79435-3			1(7)	
31	Contact Spring Assy.	79859			1(5)	

NOTE: Items 5 thru 18 are turn key spring nest parts and items 19 thru 31 are push key spring nest parts.

Note: 79453-6 includes 79453-1 plus terminal board and wiring.
 Note: Parts required to adapt turn and push key for use in K-2500
 Tel-Touch Desk Telephones:
 88474-1 Spacer -1
 79451-1 Screw -1
 88475-1 Bracket -1

*was 82870-1

KEY SWITCH ASSEMBLY

CONTENTS

Section		Page	Figure		Page
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2	DISASSEMBLY AND ASSEMBLY	1	3-1	CONTACT AND WIRING ARRANGEMENTS	2
3	TEST AND ADJUSTMENT	1			
4	LUBRICATION	3	Table		Page
5	REPLACEABLE PARTS	4	5-1	REPLACEABLE PARTS	4

1 GENERAL DESCRIPTION

1.1 Each key switch assembly consists of a diecast frame, containing the plungers, restoring springs and interlocking and restoring slides, mounted on a bracket which carries the contact spring assemblies below a common terminal board. Mounting holes are provided on each assembly for the separate lamp strip, and plunger and retainer assemblies. The contact springs are wired to the terminals of the terminal board or provided with flexible wire leads for connection to other components in the telephone.

1.2 The assemblies are mounted to the base of the 500 type key telephones, by means of three screws, so that the terminal board locates directly underneath the dial and the plungers project through the holes at the front of the housing assembly.

1.3 Several different versions of key switch assemblies are available to meet the requirements of the different types of key telephone instrument circuits (see sections 3 and 5).

2 DISASSEMBLY AND ASSEMBLY

2.1 The various parts of a typical key switch assembly are identified in Fig. 2-1.

the assembly it is desired to remove. Reassemble the parts in the reverse order, referring to Fig. 3-1 to reconnect the various leads.

2.2 Disassembly of the key switch units should not normally be required unless dirt or dried lubricant is causing the key mechanism to stick. The plunger housing assembly is removed from the bracket assembly by removing the two round head screws and spring washers from underneath the items. The various plungers and slide plates may then be lifted out of the plunger housing. TAKE CAREFUL NOTE OF THE POSITIONS OF THE VARIOUS ITEMS SO THAT REASSEMBLY WILL BE FACILITATED. Reassemble the items in the reverse order, placing the plungers in position first, then the restoring springs (if fitted) and finally the various slide plates. Replace the plunger housing on the bracket and then insert the mounting screws and spring washers.

2.3 The contact spring assemblies should only be removed from the bracket when it is necessary to replace damaged contacts. First remove the two screws holding the terminal board so that it may be moved up, to allow access to the spring assembly mounting screws, then remove the two screws holding

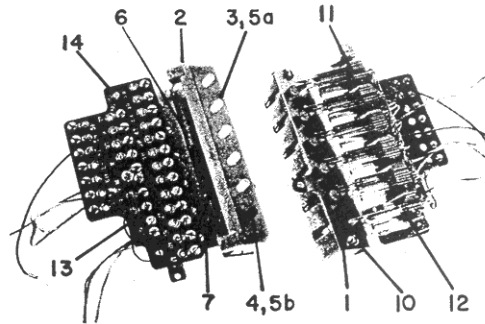
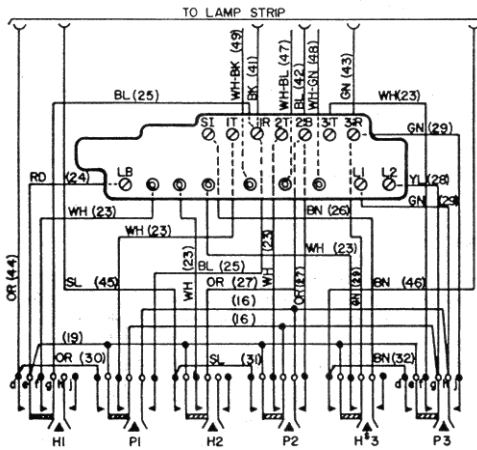


Fig. 2-1 TYPICAL KEY SWITCH

3 TEST AND ADJUSTMENT

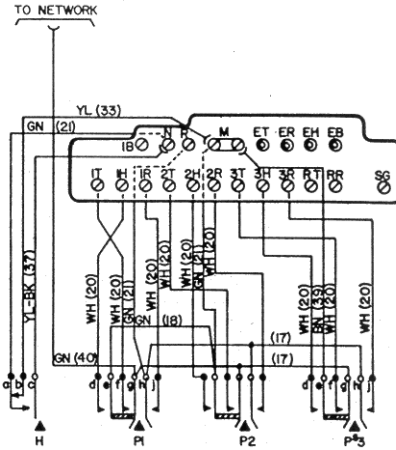
3.1 The normal position of the individual contact spring assemblies is with the respective plungers in the raised position and the operated position is with the plunger depressed. The normal position of the complete key switch assembly is with all the plungers in the raised position.

3.2 The interlocking arrangements between the plungers varies with the different assemblies. The arrangements are shown for each type in Fig. 3-1. Key switch assemblies 589(B)740 and 589(H)740 only differ in the type of terminal board fitted and are identical in contact and wiring arrangement.



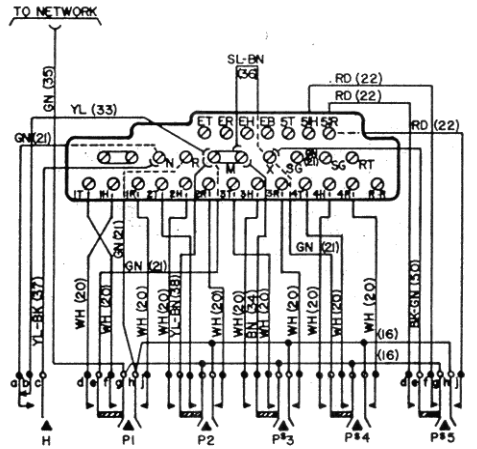
Keys interlocked in pairs. Operation of HOLD key releases interlocked PICK-UP key and vice versa. All PICK-UP keys interlocked to allow only one to be in operated position at any time. Any operated hold keys are automatically released when the handset is replaced in the cradle. Interlocking may be disabled on key HS3 to convert it to a non-locking interphone signalling key.

a) Type 508(B)740



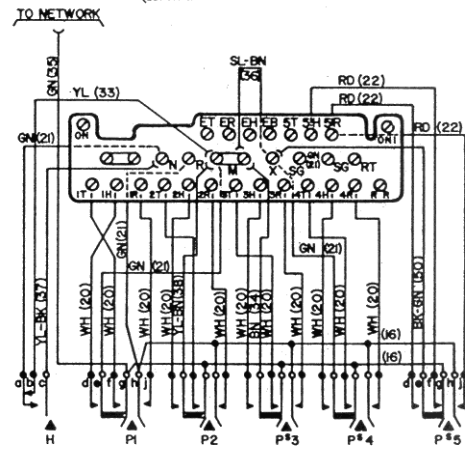
All PICK-UP keys interlocked to allow only one to be in operated position at any time. Operation and release of (non-locking) HOLD key releases any operated PICK-UP key. Interlocking may be disabled on key PS3 to convert it to a non-locking interphone signalling key.

b) Type 588(B)740
(Manufacture Discontinued)



All PICK-UP keys interlocked to allow only one to be in operated position at any time. Operation and release of (non-locking) HOLD key releases any operated PICK-UP key. Interlocking may be disabled on any or all of keys PS3, PS4 and PS5 to convert them to non-locking interphone signalling keys.

c) Type 589(B)740
(Manufacture Discontinued Superseded by 636)



All PICK-UP keys interlocked to allow only one to be in operated position at any time. Operation and release of (non-locking) HOLD key releases any operated PICK-UP key. Interlocking may be disabled on any or all of keys PS3, PS4 and PS5 to convert them to non-locking interphone signalling keys.

d) Type 589(H)740
(Manufacture Discontinued Superseded by 636)

Fig. 3-1 CONTACT AND WIRING ARRANGEMENTS

3.3 PUSH BUTTON ASSEMBLIES

The various slide assemblies in each plunger housing must operate freely, without binding, at any point. Replace any worn or damaged items and lubricate (Section 4) the assembly before making any adjustments to the complete unit.

3.3.1 Plunger Operating Pressures

The pressures, applied to the tip of the plunger and in line with the direction of travel, required to fully depress each plunger must be within the limits given in the following table. Check for dirty, worn or damaged parts if these pressures are not met.

		588(B)740
Switch Type:	508()740	589(B)740
		589(H)740

Pick-up Key:

Must Operate:	24 Ozs.	30 Ozs.
Non Operate:	6 Ozs.	8 Ozs.

Hold Key; with any Pick-up Key Operated:

Must Operate:	24 Ozs.	68 Ozs.
Non Operate:	6 Ozs.	40 Ozs.

Note: Pick-up key must release when Hold key:
Depressed Released

When any operated plunger is released it must return to its normal position with a snap.

3.3.2 Release Strip

Operation of the release strip must meet the conditions specified below, when the stated pressures are applied to the outside edge of the strip.

		588(B)740
Switch Type:	508()740	589(B)740
		589(H)740

Condition: With all hold keys depressed. All keys normal.

Action to be obtained: Release all hold keys. Move strip to opposite stop.

Must Operate:	6 Ozs.	170 Grams.
Non Operate:	2 Ozs.	120 Grams.

3.4 SPRING ADJUSTMENTS

Adjust the contact springs of each individual spring assembly to meet the requirements detailed in the following paragraphs.

3.4.1 Spring Pressures

The pressure between each pair of closed contacts must be at least 15 grams. This is measured at each tip of the make springs with the assembly in the operated position. The pressure between the break contacts of the make-before-break units is measured at each tip of the make springs with the assembly in the normal position.

3.4.2 Spring Clearances

The clearance between each pair of open contacts, in either the normal or operated condition, must be at least 1/64".

There must be a clearance of at least 1/64" between springs not designed to make electrical contact, when the assembly is normal or operated, and between all springs and the frame assembly.

3.4.3 Contact Sequence

All the make contacts of each individual multi-contact spring assembly must make at approximately the same time.

Release of any operated pick-up key by the operation of the hold key must not take place until the contacts of the hold key are fully operated and, in the case of all assemblies except the type 508()740, the hold key is allowed to rise.

3.4.4 Plunger Operation

The tip of each fully depressed plunger must overlap the ends of the lever springs by a distance of at least 5/32" but not more than 3/16".

3.5 CONVERSION TO SIGNALLING KEYS

Any of the convertible keys, noted in the diagrams of Fig. 3-1, may be arranged to be used as signalling keys instead of for their designated more usual function. First unscrew the special guide screw by 8 to 10 turns from the shank of the desired plunger. This prevents the plunger from operating the slides in the plunger housing. Then make the appropriate wiring changes as indicated on the circuit diagrams for the instrument. In the case of instruments using the 508()740 type key assemblies it is also necessary to add a special spring, type 86374, between the telephone baseplate and the loosened guide screw. This spring provides the necessary force to restore the plunger after it is operated.

4 LUBRICATION

4.1 For lasting, trouble-free operation it is essential that all dirty or caked lubricant is removed before fresh lubricant is added. When necessary, disassemble the plunger housing assembly and thoroughly clean all the parts with a good quality, non-filming commercial solvent, using a small brush with stiff bristles.

4.2 Lubricate the assembly, using a small camel hair brush, with a small amount of high quality lubricant, such as ITTK dial lubricant 79946, to each of the rubbing surfaces of the slides, release strip, bracket, plungers and plunger guide screws. AVOID EXCESSIVE LUBRICATION. Operate all the keys for a number of times to spread the lubricant.

5 REPLACEABLE PARTS

5.1 The component parts of the various key switch assemblies are listed in Table 5-1. The positions of the various wire assemblies may be determined from the diagrams of Fig. 3-1 where each lead is identified by the appropriate item number, from the table below, as well as its color.

Table 5-1 REPLACEABLE PARTS

Item	Description	Number	Quantity per Assembly			
			508() 740	588(B) 740	589(B) 740	589(H) 740
1	Bracket Assembly	79464	1			
2	Plunger Housing Assembly	79520-3	1			
3	Plunger Assembly	79420-2	6			
6	Release Strip	190161	1			
8	Lockout Slide	190165	2			
9	Lockout Slide	79413-2	3			
10	Rd. Hd. Lockwasher Screw	95777-1	2	2	2	2
11	Spring Assembly	79505	6	3	5	5
13	Terminal Board Assembly	190184	1			
14	Rd. Hd. Mach. Screw	71660	14	10	14	14
15	Wire Strap	3697-2	2		2	2
18	Wire Strap	3697-5	1			
22	Wire (WH)	190189-1	6			
23	Wire (RD)	190189-2	1			
24	Wire (BL)	190189-3	2			
25	Wire (BN)	190189-4	1			
26	Wire (OR)	190189-5	2			
27	Wire (YL)	190189-6	1			
28	Wire (GN)	190189-7	3			
29	Wire (OR)	190189-8	1			
30	Wire (SL)	190189-9	1			
31	Wire (BN)	190189-10	1			
40	Wire Assembly (BK)	75326-117	1			
41	Wire Assembly (BL)	75326-118	1			
42	Wire Assembly (GN)	75326-119	1			
43	Wire Assembly (OR)	75326-120	1			
44	Wire Assembly (SL)	75326-121	1			
45	Wire Assembly (BN)	75326-122	1			
46	Wire Assembly (WH-BL)	75326-132	1			
47	Wire Assembly (WH-GN)	75326-133	1			
48	Wire Assembly (WH-BK)	75326-134	1			

TYPE 636 KEY ASSEMBLY

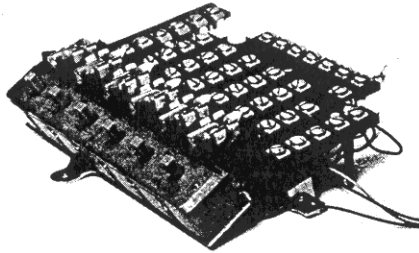


Figure IA. Type 636 Key Assembly, Top View

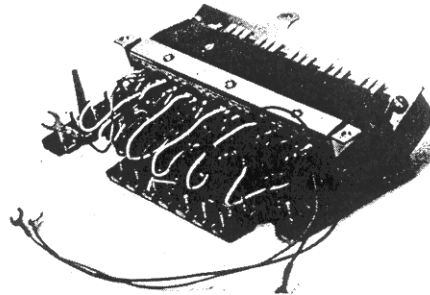


Figure IB. Type 636 Key Assembly, Bottom View

1. GENERAL INFORMATION

The 636 (A)740 Key assembly is used in all current production K-564 and K-565 Key telephones, and in all K-1564, K-2564, and K-2565 Key telephones.

The 636 Key replaces either the 589(B)740 Key or the 589(H)740 Key, and also replaces the Lamp Strip Assembly and the Auxiliary Terminal Board Assembly used with the 589 keys.

2. IDENTIFICATION

The 636 Key is readily identified by the square plungers and the large terminal board assembly which includes the lamp strip. The Spring Bank Assembly (7, figure 2) is of secure one-piece construction. The design eliminates loose pile-up condition and reduces vibration of spring contacts. Most connections beneath the key are made by wire wrap method.

3. DESCRIPTION AND OPERATION

3.1 The key is equipped with one hold key and five pick-up, (line), keys. Three of the pick-up keys may be converted for signaling purposes, (PS3, PS4, and PS5). To convert key from locking to non-locking unscrew the plunger screw (2, figure 2) six or eight turns to clear the Lockout Slides, (12), and change key leads as shown on the circuit diagram of the instrument.

3.2 Any depressed pick-up plunger restores automatically when any other pick-up plunger is depressed. Any depressed pick-up plunger will remain depressed when the HOLD plunger is depressed and will restore when the HOLD plunger is released.

4. PLUNGER AND RELEASE STRIP OPERATING DATA

4.1 GENERAL

- (a) When any plunger is released from operated position, it should return to normal with a snap.
- (b) When the HOLD plunger is pressed slowly to its bottom position, the toggle pin, (in the plunger housing assembly), must return freely to top of its curved guide slot.

4.2 OPERATING PRESSURES, IN OUNCES

	MAX.	MIN.
Hold Plunger	68	40
Pick-up Plungers	30	8
Release Strip*	170	120

*Force required to move the Release Strip to its opposite stop when no plungers are in operated position.

5. CONTACT SPRING DATA

5.1 CLEARANCES AND CONTACT PRESSURE

- (a) Between contact spring and any frame member or between adjacent contact springs insulated from each other, minimum clearance is 1/64 inch.
- (b) Between all normally open contacts, contact separation should be 1/32 inch. Normally open contacts should have perceptible follow between "make" and plunger locking.
- (c) Pressure between closed contacts should be 15 grams, Minimum.

5.2 CONTACT SEQUENCE (Figure 3)

- (a) When HOLD plunger is depressed, contacts a and b should make before contacts c and d break.
- (b) Release of a locked pick-up plunger by operation of the HOLD plunger must not occur until contacts a and b make, and contacts c and d break. Normally open contacts of the released pick-up plunger must open before contacts c and d reclose.

Figure 2. 636 Key, Exploded View
(Parts are shown as viewed from bottom for convenience)

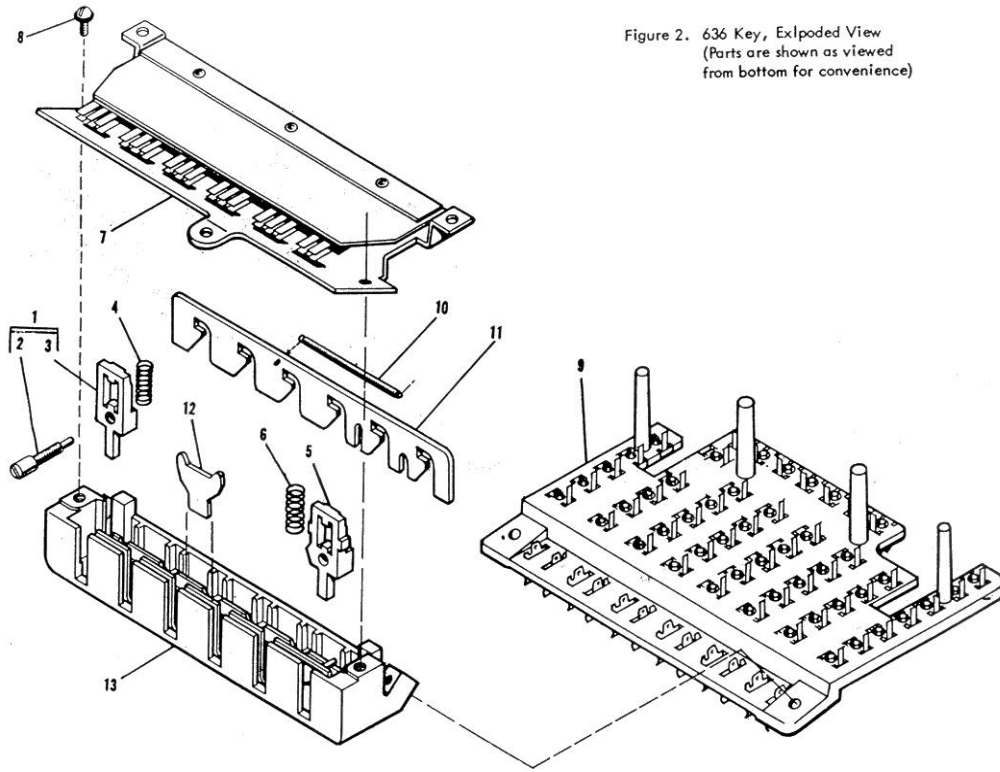


FIGURE NO.	INDEX NO.	PART NUMBER	NAME, Description (Indented items are included in the part under which they are indented)	QUANTITY USED ON:					
		TABLE I, REPLACEABLE PARTS LIST, 636(A)740 KEY ASSEMBLY		636					
2		636(A)740	KEY ASSEMBLY	1					
	1	88236-1	Plunger Assembly, (Line)	5					
	2	88220-1	Screw	1					
	3	88219-1	Plunger	1					
	4	95984-1	Spring, (Line Plunger)	5					
	5	88218-1	Plunger, (Hold)	1					
	6	95984-2	Spring, (Hold Plunger)	1					
	7	88234-1	Spring Bank Assembly	1					
	8	68200-1	Screw, (Spring Bank Assembly to Plunger Housing)	2					
	9	88292-1	Terminal Board Assembly, (Does not include screws)	1					
		79485-2	Screws, (Terminal)	49					
		66559-2	Screw, (Terminal Board to Plunger Housing)	2					
	10	95985-1	Spring, (Release Strip Return)	1					
	11	88296-1	Strip, Plunger Release	1					
	12	79413-1	Slide, Lockout, (Serves as Interlock Pawl)	4					
	13	79520-1	Plunger Housing Assembly	1					

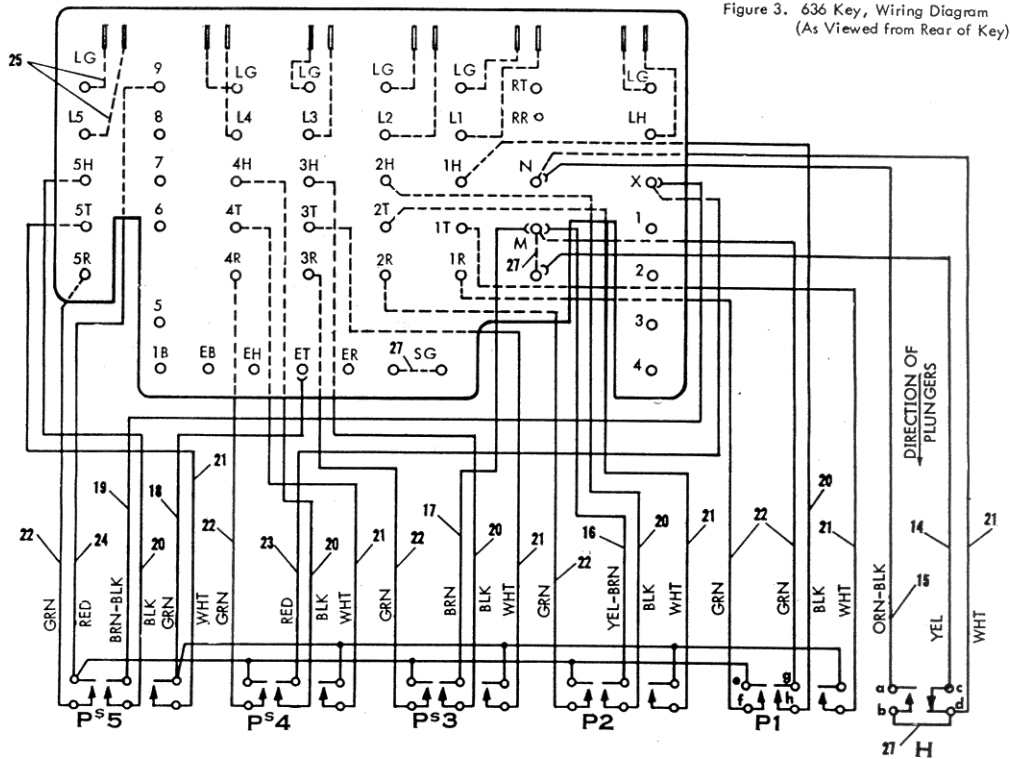


Figure 3. 636 Key, Wiring Diagram
 (As Viewed from Rear of Key)

FIGURE NO.	INDEX NO.	PART NUMBER	NAME, Description (Indented items are included in the part under which they are indented)	QUANTITY USED ON:					
		TABLE I. REPLACEABLE PARTS LIST, 636(A)740 KEY ASSEMBLY, (Continued)		636					
3		<u>636 Key Assembly, Continued</u>							
	14	190106-151	Wire Assembly, Yellow	1					
	15	190106-152	Wire Assembly, Orange - Black	1					
	16	190106-153	Wire Assembly, Yellow-Brown	1					
	17	190106-154	Wire Assembly, Brown	1					
	18	190106-155	Wire Assembly, Green	1					
	19	190106-156	Wire Assembly, Brown - Black	1					
	20	190189-15	Wire, Black	5					
	21	190189-16	Wire, White	6					
	22	190189-17	Wire, Green	6					
23	190189-18	Wire, Red	6						
24	190189-19	Wire, Red	1						
25	190189-20	Wire, Red (Lamp)	12						
26	180056	Strap, Ground	1						
27		Wire, 24 AWG, (.0201), Tinned Copper		As Required					

6. DISASSEMBLY AND REASSEMBLY

6.1 TO EXPOSE CONCEALED WIRING

- (a) Disassembly (Figure 2)
- (1) Remove the two screws that secure the Terminal Board (9) to the Plunger Housing (3).
 - (2) Pull terminal board back to expose concealed wiring.

NOTE:
Do not disassemble this unit any further unless a spare spring, 95985-1, (item 10, figure 2) is on hand, as this spring may be distorted.

- (b) REASSEMBLY (Reverse of disassembly)

6.2 PLUNGER HOUSING ASSEMBLY

(a) DISASSEMBLY OF PLUNGER HOUSING ASSEMBLY

- (1) (Remove Terminal Board as directed in "a" above.
- (2) Carefully remove spring (10)
- (3) Remove the two screws (8) that secure Spring Bank (7) to Plunger Housing (13). Lift off the Spring Bank, Terminal Board and wiring assembly.
- (4) Note positions of all parts and lift out the Release Strip (11), the four Lockout Slides (12) and the plunger and spring assemblies (1 through 5).

(b) REASSEMBLY OF PLUNGER HOUSING ASSEMBLY

- (1) Place the Plunger Housing (13) on a FA-190686-2 fixture assembly or on a suitable surface that will allow the square shanks of the plungers (1 and 5) to extend through their respective holes in the housing.
- (2) Refer to figure 2, and place each plunger and its captive spring in place in the housing.
- (3) Place the four Lockout Slides (12) in position between the screws (2).
- (4) Place the Release Strip behind the Plungers and observe that the Plunger Screws and the HOLD Plunger Toggle Pin are in place in their guides in the Release Strip.

- (5) If fixture No. FA-190686-2 is not used, the Spring Bank must be worked over the rectangular plungers as follows: Place the Spring Bank on the Plunger Housing and start one screw (8). Hold the assembly in the hands and grasping the square shank of the Plunger nearest the screw, work the parts until the Plunger slips through the rectangular hole in the Spring Bank. Work each Plunger into place in turn until the Spring Bank seats on the Plunger Housing. Install the two screws (8) and tighten.
- (6) Carefully install the Spring (10). (Insert one hook of the Spring into the hole in the Release Strip. Insert the opposite hook into the hole in the Spring Bank).
- (7) Install the Terminal Board as directed in 6.1 above.

7. CLEANING, INSPECTION AND REPAIR

7.1 CLEANING

- (a) When the key is disassembled, clean all parts of the Plunger Housing Assembly with a commercial solvent and wipe dry with a clean cloth. Be sure any caked lubricant is removed.

7.2 INSPECTION AND REPAIR

- (a) Inspect all springs for distortion - replace as required.
- (b) Inspect the Toggle Pin in the Plunger Housing. The Toggle Pin should remain at its uppermost (vertical) position in the curved guide slot. (Remember that you are observing from the bottom of the Plunger Housing.)
- (c) Be sure all caked lubricant is removed from all parts.
- (d) Be sure all sliding parts are free of burrs and are not warped.
- (e) Replace or repair any defective parts.

8. LUBRICATION

Before reassembly, lubricate each part lightly with ITT K-79946 Dial Lubricant. Wipe off any excess lubricant with a clean cloth.

9. CONVERSION FOR SIGNALLING

To convert Ps3, Ps4, or Ps5 to a non-locking signal button, unscrew the plunger screw (2, figure 2) 6 or 8 turns until it is free of the interlocking mechanism. Make wiring changes according to the appropriate telephone circuit label.

TYPES 598 AND 599 KEY ASSEMBLIES

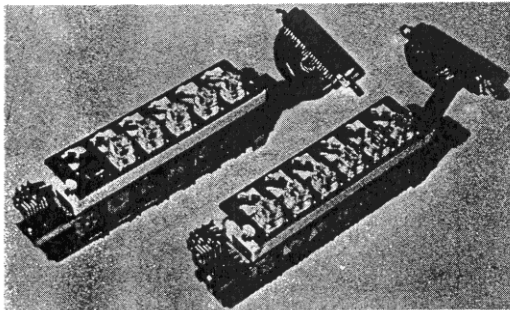


Figure 1. Type 599(X)740 Key Assembly. (Left)
 Type 598(X)740 Key Assembly. (Right)

1. GENERAL INFORMATION

The 598 and 599 keys are designed for use in various multi-key telephone subsets.

The 598(A) key has six pick-up buttons, (no "hold" button), and is equipped with a rigidly mounted quick-connect plug. Designed for use in conjunction with a 599(A) key in multi-key telephone subsets requiring the rigid plug.

The 598(X) key is identical to the 598(A) key except it is equipped with a flexibly connected quick-connect plug. Designed for use in conjunction with a 599(X) key in ITT Corinthian multi-key telephone subsets.

The 599(A) key has five pick-up buttons and one "hold" button. Otherwise similar to 598(A) above.

The 599(X) key has five pick-up buttons and one "hold" button. Otherwise similar to 598(X) above.

These keys have been manufactured with a light shield (29, figure 2). Keys of current manufacture do not include light shield. If light shield is desired, it must be ordered separately.

2. IDENTIFICATION

The 598 and 599 keys are identified by the code which is stamped in ink on the die cast frame. The 598 key has six clear buttons whereas the 599 key has five clear buttons and one red button.

3. OPERATION

Any depressed pick-up button will restore when any other pick-up button is depressed. When any two pick-up buttons are depressed simultaneously, neither will lock in nor operate the contacts of both keys at the same time. Any depressed pick-up button will remain depressed when the hold button is fully depressed and will restore when the hold button is released.

When the 598 and 599 keys are installed together, connecting linkage must be provided so that both keys operate as a unit. In ITT "Corinthian" multi-key telephones, a pivot bar assembly (180565-1), return spring (190329-1) and shoulder screw (190354-1) are used to interlink the two assemblies. The coil spring (16, figure 2) and pin (18) are discarded from both keys in this type installation.

4. TECHNICAL DATA

4.1 PLUNGER AND LATCH BAR OPERATING DATA

- (a) When any button (or plunger) is released from its operated position, it should return to normal with a snap.
- (b) When the hold button (or plunger) is pushed slowly to its bottom position, its toggle pin (A, figure 2) must return freely to the vertical portion of its guide slot.
- (c) Operating Forces

	Max.	Min.
Hold Button	88 oz.	40 oz.
Pick-up Buttons	30 oz.	8 oz.
Latch Bar *	375 g.	325 g.

* Force required to move the latch bar (19, figure 2) to its opposite stop when no buttons are in operated position.

4.2 CONTACT SPRING DATA

- (a) CLEARANCES AND CONTACT PRESSURE
 - (1) Between contact spring and any frame member, or between adjacent contact springs insulated from each other, minimum clearance is 1/64 inch.
 - (2) Between normally-open contacts, minimum contact separation is .01 inch. Normally-open contacts should have perceptible follow between "make" and plunger locking.
 - (3) Force between closed contact should be 15 grams, minimum.

4.3 CONTACT SEQUENCE (Figure 3)

- (a) When the hold-key plunger is depressed, the contacts of springs "a" and "c" shall make before contacts of springs "a" and "b" break and contacts "e" and "f" shall break before contacts "d" and "e" make.
- (b) Release of a locked plunger by operation of the hold plunger shall not occur until the normally made contacts of the hold combination have opened and the normally opened contacts have closed.
- (c) Release of a locked plunger by operation of the hold plunger shall open the normally open contacts of the locking combination before the normally closed contacts of the hold combination are closed.
- (d) When the plunger of any pick-up key is depressed, contacts of springs "g" and "h", "j" and "k" and "l" and "m" shall close simultaneously.
- (e) Chaining Switch

The normally closed contacts of the chaining pileup shall break when a pick-up key plunger is depressed and before the "make" contacts of the pick-up spring combination have made.

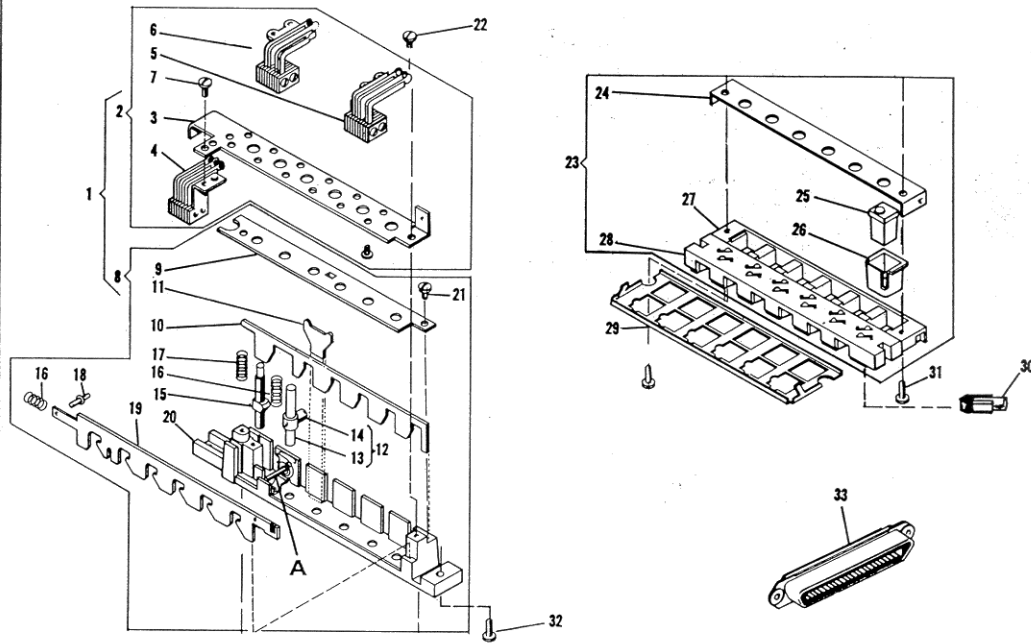


Figure 2. 598 and 599 Keys, Exploded View

FIGURE NO.	INDEX NO.	PART NUMBER	NAME, Description (Indented items are included in the part under which they are indented)	QUANTITY USED ON:			
				598 (A)	598 (X)	599 (A)	599 (X)
TABLE I. REPLACEABLE PARTS LIST K-598 and K-599 KEY ASSEMBLIES							
		598 (A) 740	KEY ASSEMBLY, 6-Line, (Rigid Connector)				
		598 (X) 740	KEY ASSEMBLY, 6-Line, (Flexible Connector)				
		599 (A) 740	KEY ASSEMBLY, 5-line with hold, (Rigid Connector)				
		599 (X) 740	KEY ASSEMBLY, 5-line with hold, (Flexible Connector)				
1		190420-1	PLUNGER AND SPRING ASSEMBLY, (Has hold plunger) (Includes items 2 thru 21)	-	-	1	1
1		190452-1	PLUNGER AND SPRING ASSEMBLY, (6 line plungers) (Includes items 2 thru 21 except items 6, 15, and 17)	1	1	-	-
2		190386-1	BASE PLATE AND SPRING ASSEMBLY	-	-	1	1
2		190451-1	BASE PLATE AND SPRING ASSEMBLY	1	1	-	-
3		190387-1	PLATE, Spring Base				
4		190390-1	SPRING ASSEMBLY, Position 1 (Chaining Switch) (Order of Assembly is shown in parenthesis)	1	1	1	1
		190411-1	BRACKET, Spring, (1)	1	1	1	1
		190417-2	INSULATOR, (3,5,7,9,11,13,15)	7	7	7	7
		79426-1	WASHER, Metal (16)	1	1	1	1
		190393-1	CONTACT SPRING ASSEMBLY, (14)	1	1	1	1
		190403-1	CONTACT SPRING ASSEMBLY, (4,8,12)	3	3	3	3
		190407-1	CONTACT SPRING ASSEMBLY, (10)	1	1	1	1
		190408-1	CONTACT SPRING ASSEMBLY, (6)	1	1	1	1
		32475-1	BUSHING (2)	2	2	2	2
		190485-2	SCREW (17)	2	2	2	2

FIGURE NO.	INDEX NO.	PART NUMBER	NAME, Description part under which they are indented)	QUANTITY USED ON:			
(Indented items are included in the)				598	598	599	599
(Cont'd)				(A)	(X)	(A)	(X)
TABLE I. REPLACEABLE PARTS LIST, K-598 and K-599 KEY ASSEMBLIES							
BASE PLATE AND SPRING ASSEMBLY (Cont'd)							
5		190389-1	SPRING ASSEMBLY, (Line Pickup) (Order of assembly is shown in parenthesis)	6	6	5	5
		190412-1	BRACKET, Spring, (1)	1	1	1	1
		190417-1	INSULATOR, (3,5,7,9,14)	5	5	5	5
		190417-3	INSULATOR, (11,12,16)	3	3	3	3
		79426-1	WASHER, Metal (17)	1	1	1	1
		190415-1	PLUNGER SPRING ASSEMBLY, (10)	1	1	1	1
		190416-1	PLUNGER SPRING ASSEMBLY, (13)	1	1	1	1
		190403-1	CONTACT SPRING ASSEMBLY, (15)	1	1	1	1
		190404-1	CONTACT SPRING ASSEMBLY, (4 and 8)	2	2	2	2
		190405-1	CONTACT SPRING ASSEMBLY, (6)	1	1	1	1
		29220-1	BUSHING (2)	2	2	2	2
		190485-4	SCREW (18)	2	2	2	2
6		190388-1	SPRING ASSEMBLY, "Hold" (Order of assembly is shown in parenthesis)	-	-	1	1
		190412-1	BRACKET, Spring, (1)	-	-	1	1
		190417-1	INSULATOR, (16, 18)	-	-	2	2
		190417-2	INSULATOR, (5,7,9,11,12,14)	-	-	6	6
		79426-1	WASHER, Metal; Thin (3, 19)	-	-	2	2
		79426-3	WASHER, Metal; Thick (4)	-	-	1	1
		190391-2	CONTACT SPRING ASSEMBLY, (15)	-	-	1	1
		190392-1	CONTACT SPRING ASSEMBLY, (17)	-	-	1	1
		190393-1	CONTACT SPRING ASSEMBLY, (6)	-	-	1	1
		190394-1	CONTACT SPRING ASSEMBLY, (8)	-	-	1	1
		190395-1	PLUNGER SPRING ASSEMBLY, (10)	-	-	1	1
		190396-1	PLUNGER SPRING ASSEMBLY, (13)	-	-	1	1
		29219-1	BUSHING (2)	-	-	2	2
		190485-6	SCREW (20)	-	-	2	2
7		69020-3	SCREW, SPRING ATTACHING	7	7	7	7
8		190419-1	FRAME AND PLUNGER ASSEMBLY, (Has hold plunger)	-	-	1	1
8		190453-1	FRAME AND PLUNGER ASSEMBLY	1	1	-	-
9		190431-1	PLATE	1	1	1	1
10		190432-1	BAR, Chaining	1	1	1	1
11		79413-1	SLIDE, Lockout	5	5	4	4
12		190495-1	PLUNGER ASSEMBLY, (Line Pickup)	6	6	5	5
13		190434-1	PLUNGER	6	6	5	5
14		190439-1	SCREW, Special	6	6	5	5
15		190438-1	PLUNGER, Hold	-	-	1	1
16		190433-1	SPRING, Line pickup plunger and latch bar	7	7	6	6
17		190433-2	SPRING, Hold plunger	-	-	1	1
18		190414-1	PIN, Latch Bar	1	1	1	1
19		190435-1	BAR, Latch	1	1	1	1
20		190426-1	FRAME, Bracket, Hairspring and Toggle pin assembly	1	1	1	1
21		79485-2	SCREW	2	2	2	2
22		79485-2	SCREW, (Same as Item 21)	2	2	2	2
23		190376-3	LAMP BLOCK ASSEMBLY	-	-	1	1
23		190376-4	LAMP BLOCK ASSEMBLY	1	1	-	-
24		190381-1	RETAINER, Plunger	1	1	1	1
25		190379-1	BUTTON, Clear	6	6	5	5
25		190379-2	BUTTON, Red	-	-	1	1
26		190378-1	COLLAR	6	6	6	6
27		190382-1	TERMINAL	12	12	12	12
28		190377-1	BLOCK, Lamp	1	1	1	1
29		190380-1	SHIELD, Light (Not Required)	1	1	1	1
30		51 (A) 745	LAMP	6	6	6	6
31		74909-2	SCREW, Lamp Block to Frame	2	2	2	2
32		95992-2	SCREW, Cabinet Lock, (Key Mounting)	2	2	2	2
33		190473	CONNECTOR	1	1	1	1
		67042-3	SCREW, Connector Mounting	2	2	2	2
34		190384-1	BRACKET, Key Mounting (Not Shown)	1	-	1	-
		63261-3	SCREW, Bracket to Key	1	-	1	-

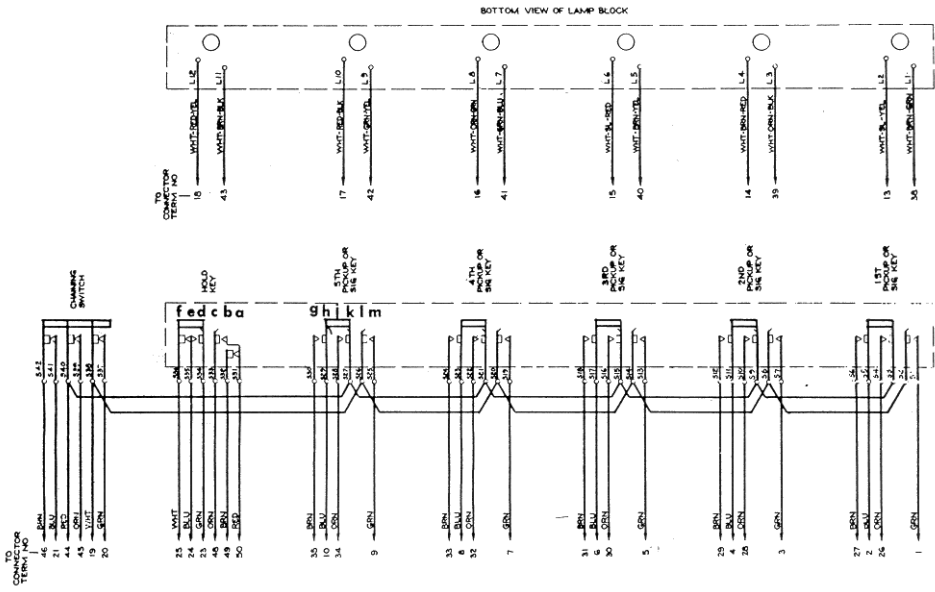


Figure 3. Schematic, 599 Key

To convert key to non-locking operation, remove the plunger screw from the key position involved and make wiring changes as shown on telephone circuit label.

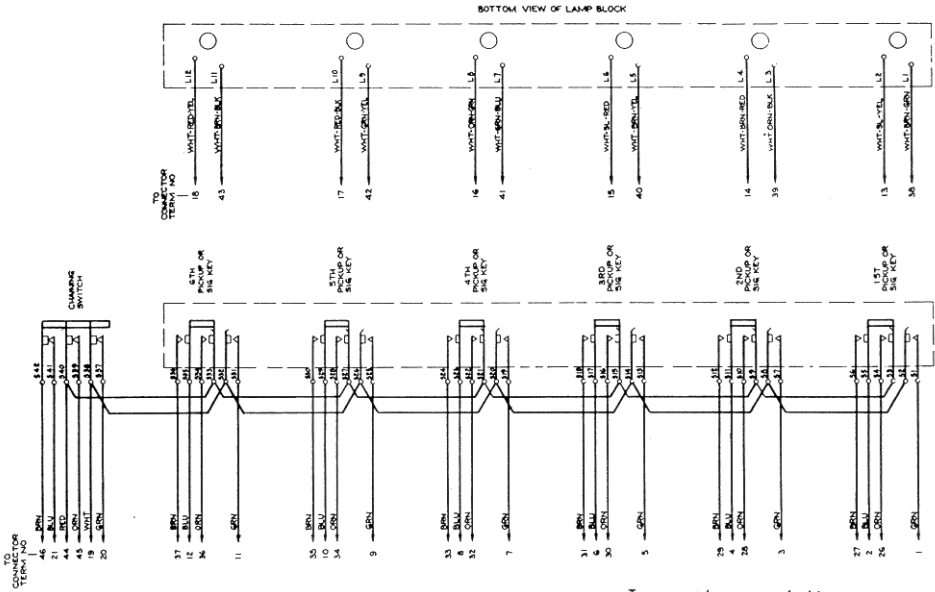


Figure 4. Schematic, 598 Key

To convert key to non-locking operation, remove the plunger screw from the key position involved and make wiring changes as shown on telephone circuit label.