

33 KEYBOARD  
 ADJUSTMENTS

CONTENTS	PAGE
1. GENERAL. . . . .	1
2. BASIC UNIT . . . . .	5
BREAK keylever spring. . . . .	12
Contact block spring. . . . .	10
Contact wires . . . . .	6
Contact wire spring . . . . .	10
CTRL contact wire. . . . .	8, 9
CTRL keylever spring. . . . .	12
Distributor trip linkage. . . . .	19
HERE IS keylever spring. . . . .	12
Keylever spring. . . . .	11
Keylever springs (SPACE, BLOCK, hyphen, or O keytops). . . . .	13
Latchlever spring. . . . .	20
Left shift contact wire. . . . .	7
Nonrepeat lever spring . . . . .	17
REPT keylever spring. . . . .	12
Reset bail spring . . . . .	14
Shift codebar spring . . . . .	16
Spacebar spring. . . . .	11
Universal lever spring . . . . .	18
Universal link . . . . .	5
Universal link spring . . . . .	15

1. GENERAL

1.01 This section provides adjustment information for 33 keyboards which are mechanically reset by an H-plate and the distributor trip linkage shown in 2.14. It is reissued to include information only on 33 keyboards. Also, this issue updates information and adds new information on the auxiliary contact mechanism used on parity keyboards and keylever springs used on numeric-type keyboards. Since this is a general revision, marginal arrows ordinarily used to indicate changes and additions are omitted.

Note: Adjustment information for solenoid-reset keyboards is found in another section.

1.02 In the adjustments covered in this section, location of clearances, position of parts, and point and angle of scale applications are

illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings. Tools necessary to maintain 33 Teletypewriter Sets are shown in Maintenance Tools Section 570-005-800TC.

1.03 The sequence in which the adjustments appear is that which should be followed when a complete readjustment of the keyboard is undertaken. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.

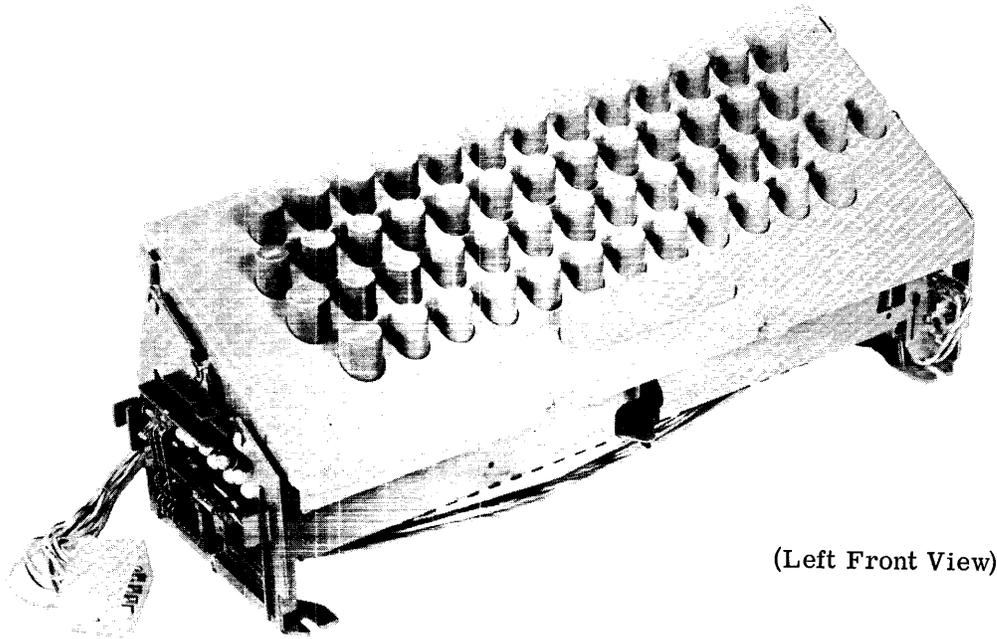
Note: Disconnect the keyboard from any voltage source prior to inspection, minor repair, extensive maintenance, or a complete readjustment.

1.04 References to left, right, front, rear, etc consider the keyboard to be viewed from a position where the spacebar (Figure 3) faces up and the contact mechanism is located to the viewer's right.

1.05 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.

1.06 When the keyboard is removed from the subbase to facilitate the making of an adjustment and subsequently replaced, recheck any adjustments that may have been affected. Also, if parts are removed from the keyboard to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustment that may have been affected by the removal of parts.

1.07 Related adjustments are listed with some of the adjustment texts and are primarily intended to aid in troubleshooting the equipment. As an example, suppose that in searching for a trouble it is discovered that Part (2) of CONTACT WIRES adjustment does not meet its requirement. Under Related Adjustment it is indicated that Part (2) of this adjustment is affected by Part (1). Check Part (1) to see if it is the basic



(Left Front View)

Figure 1 - 33 Keyboard (Parity)

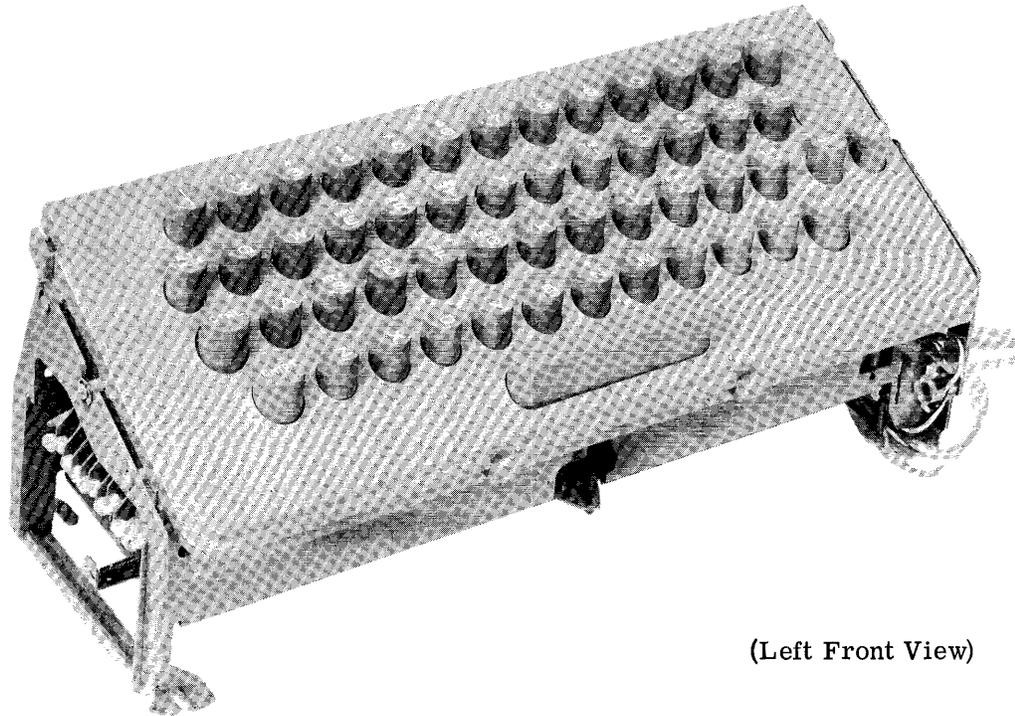
cause of the trouble. Also, note that certain adjustments affect other adjustments. For example, see the DISTRIBUTOR TRIP LINKAGE adjustment. Note that this adjustment affects the TRIP LEVER ENGAGEMENT adjustment. (See the appropriate typing unit section.) If the former adjustment is changed, check the latter adjustment.

1.08 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is important that spring tensions be measured by spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements should be replaced by new ones. Only those springs that directly affect

the operation of the keyboard are measured, however, others may be measured indirectly in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then, if the requirement is not met, any springs that are indirectly measured in the procedure should be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use only spring scales which are recommended by the manufacturer. These spring scales are listed in Maintenance Tools Section 570-005-800TC.

Note 2: The spring tensions may be checked in any sequence.



(Left Front View)

Figure 2 - 33 Keyboard (Nonparity)

1.09 With the keyboard and typing unit assembled together on the subbase, adjustment procedures may specify that the typing unit be placed in the stop condition. It is in the stop condition when the selector armature is in its attracted (frontward) position and all clutches are disengaged. Furthermore, when the typing unit is in the stop condition the keyboard will be latched --- universal lever down and blocked from upward movement by an associated latch-lever.

Note: The keyboard is tripped when the universal lever is in its up position.

1.10 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Manually rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches by positioning a screwdriver to the associated stop-lug. Push the clutch disc in the normal direction of main shaft rotation until the corresponding latchlever seats in its clutch disc notch. This permits the clutch shoes to release their tensions on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any dragging of the clutch shoes.

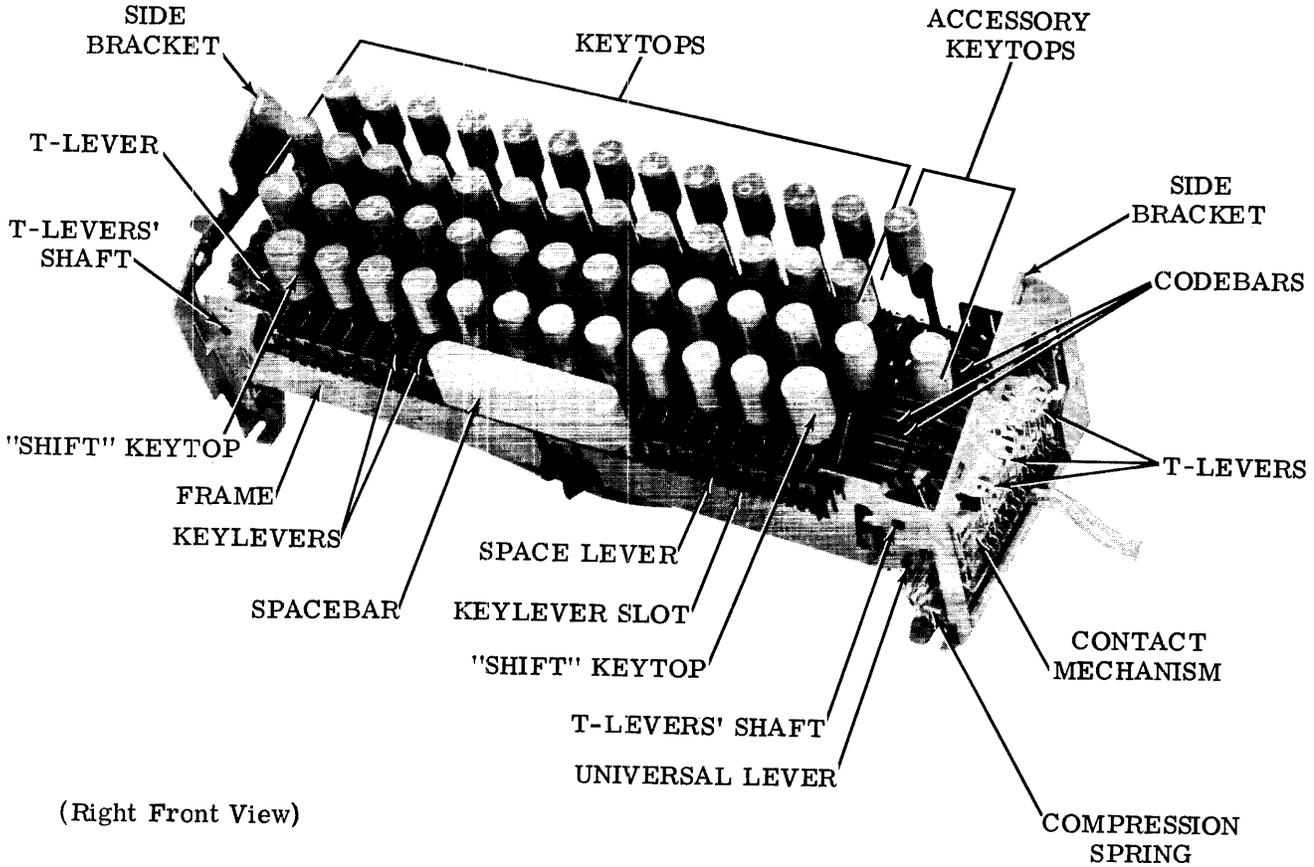


Figure 3 - Keyboard (Cover Removed)

Note 1: A stop position is that position where a shoe lever contacts a trip lever.

Note 2: The distributor clutch will not disengage unless the keyboard is latched and the answer-back drum is in its home position. The answer-back home position is the position where the control lever is fully detented into the indent on the answer-back drum.

1.11 A clutch is tripped by moving a trip lever up and away from contact with a shoe lever. When moved up, a trip lever no longer holds a shoe lever in its stop position. When the clutch is tripped, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch becomes engaged. The clutch shoes wedge against the drum so that when the shaft is turned the clutch assembly will turn in unison with it.

1.12 General Maintenance Principles

- (a) Lubrication instructions and intervals are given in the appropriate lubrication sections.
- (b) To maintain the operational effectiveness of the equipment, it is recommended that certain parts be replaced at intervals based upon the speed and operating hours, as indicated below:

Operating Speed (Words per Minute)	Recommended Overhaul Interval (Hours*)	Estimated Service Life (Hours*)
100	1500	4500

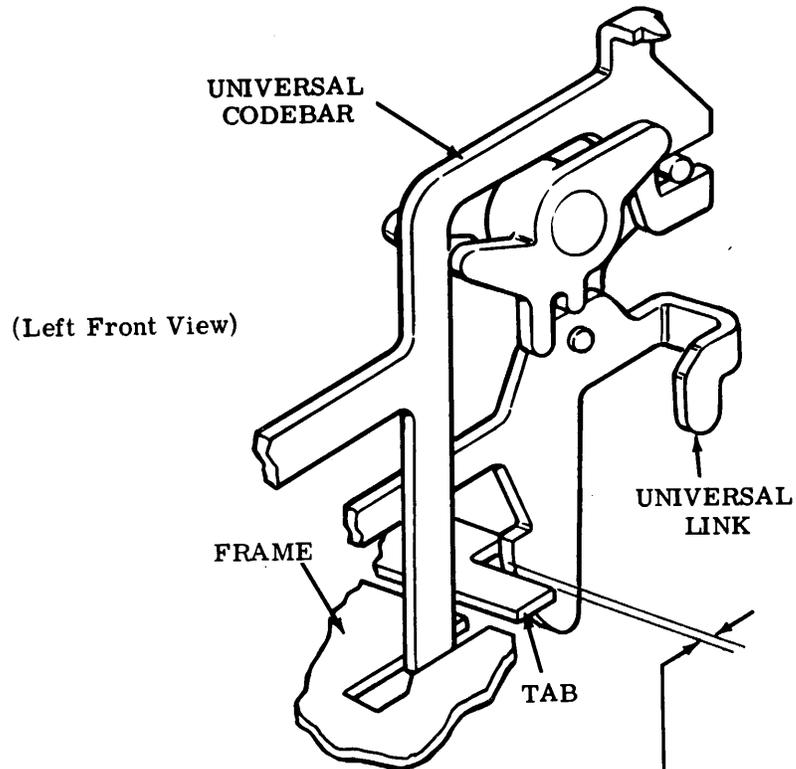
\*Typing unit operating hours

Replacement parts are available in overhaul kits.

2. BASIC UNIT

2.01 Universal Link

Note: Remove keyboard and call control unit from subbase to facilitate the making of the following adjustments. For disassembly instructions, see the appropriate keyboard section.



UNIVERSAL LINK

To Check  
Push universal lever down until latched by latchlever.

Requirement  
Min 0.089 inch---Max 0.103 inch  
between universal link and frame.

To Adjust  
Place screwdriver through opening in front of frame and bend tab.

2.02 Contact Wires

CONTACT WIRES

Note: Part (1) of this adjustment applies to contact wires actuated by the reset bail. Part (2) applies to contact wires which have two camming surfaces and are operated by a T-lever and the reset bail.

(1) To Check

Push universal lever down until latched by latchlever. Place T-levers down in marking position. As each contact wire is checked, take up its play in an upward direction.

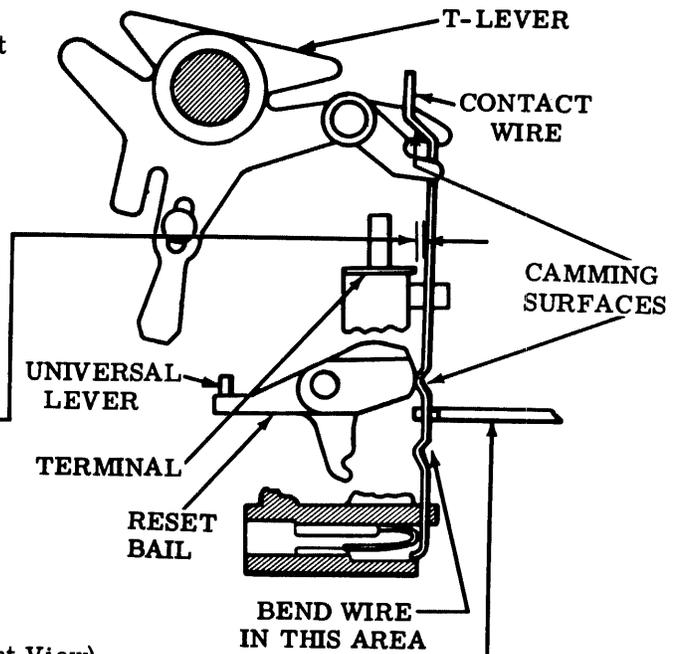
Requirement

Min 0.012 inch---Max 0.027 inch between terminal and each contact wire.

To Adjust

Bend contact wire with TP185829 bending tool as shown.

(Front View)



(2) To Check

Push universal lever down until latched by latchlever. Place T-levers up in spacing position. Trip keyboard by depressing universal codebar. As each contact wire is checked, take up its play in an upward direction.

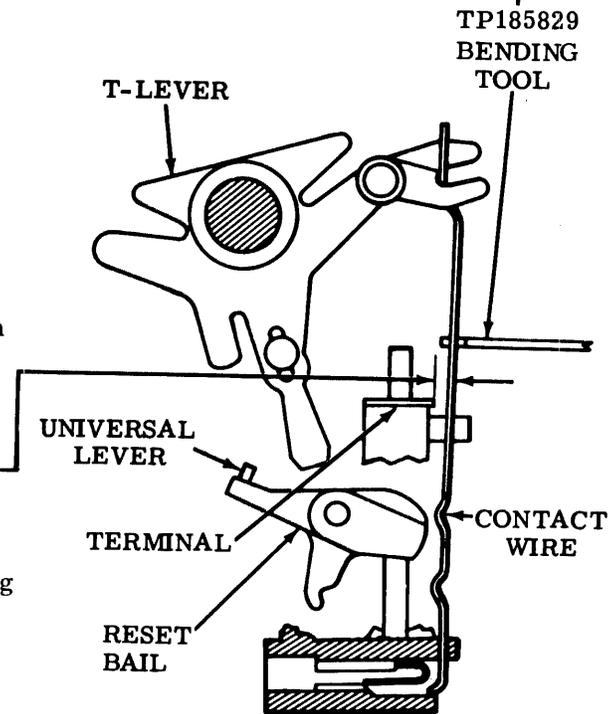
Requirement

Min 0.020 inch---Max 0.040 inch between terminal and each contact wire.

To Adjust

Bend contact wire with TP185829 bending tool as shown.

(Front View)



Related Adjustment

Affected by

Part (2) of this adjustment is affected by Part (1).

2.03 Contact Wires (continued)

LEFT SHIFT CONTACT WIRE

**Note 1:** This adjustment applies only to parity keyboards equipped with a TP180076 T-lever at right side of SHIFT codebar mechanism.

**Note 2:** Contact wires on auxiliary contact block on left side of parity keyboards are designated A, B, C, and D from rear to front.

- (1) To Check  
 Push universal lever down, until latched by latchlever. Trip keyboard by depressing universal codebar. Insert a 0.090 inch gauge diagonally into third keylever (SHIFT) slot in frame from left. Depress left SHIFT keylever until it bottoms on top of gauge.

Requirement

- (a) Min some clearance between D contact wire and camming surface of its associated T-lever.  
 (b) Min 0.020 inch---Max 0.055 inch between C contact wire and SHIFT terminal.

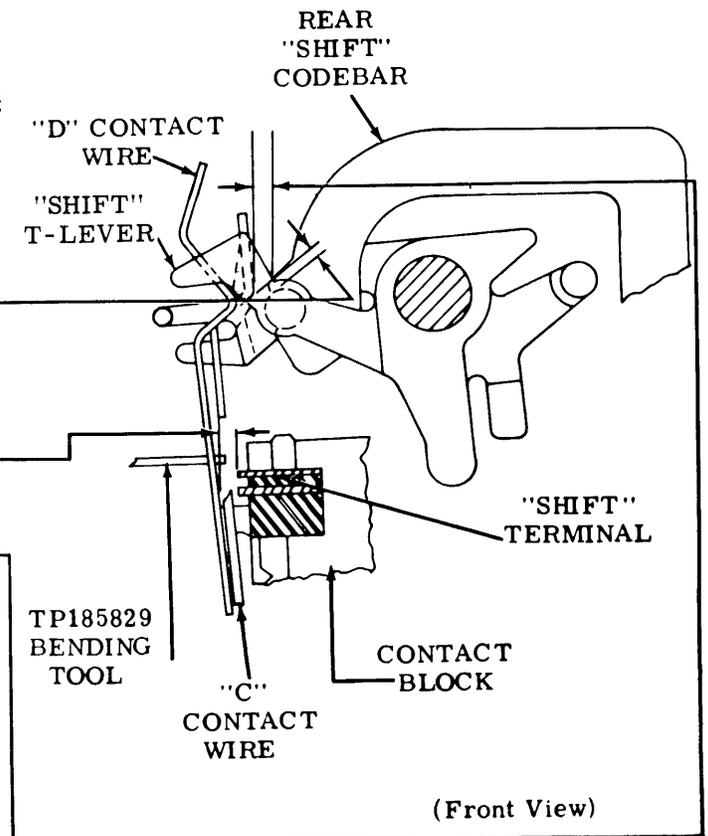
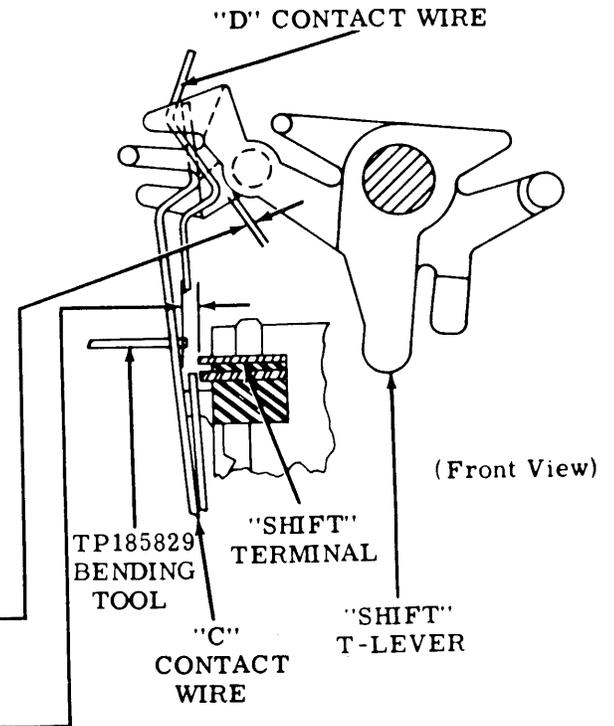
- (2) To Check  
 Push universal lever down until latched by latchlever. Hold right SHIFT keylever fully depressed. Trip keyboard by depressing universal codebar. Release SHIFT keylever. Lightly take up play in contact block towards right.

Requirement

- (a) Min 0.004 inch between C contact wire and camming surface of SHIFT T-lever with all contact block play lightly taken up toward right.  
 (b) Min 0.015 inch between D contact wire and SHIFT terminal.  
 (c) Min 0.025 inch between C contact wire and rear SHIFT codebar at closest point of travel.

To Adjust

Bend contact wire(s) using TP185829 bending tool.



2.04 Contact Wires (continued)

"CTRL" CONTACT WIRE

Note 1: This adjustment applies only to parity keyboards equipped with TP185780 CTRL keylever spring but without TP186049 blocking lever and TP186051 tie link.

Note 2: Contact wires on auxiliary contact block on left side of parity keyboards are designated A, B, C, and D from rear to front.

(1) To Check

With the CTRL keytop unoperated, lightly take up play in contact block towards left to make clearance between the B contact wire and CTRL terminal a minimum. Check Requirement (a). Lightly take up play in contact block towards right to make clearance between B contact wire and CTRL terminal a maximum. Check Requirement (b).

(2) To Check

Fully depress the CTRL keytop and hold it depressed. Lightly take up play in contact block towards left to make clearance between the A contact wire and CTRL terminal a minimum. Check Requirement (c). Lightly take up play in contact block towards right to make clearance between A contact wire and CTRL terminal a maximum. Check Requirement (d).

**Requirement**

(a) Min 0.008 inch \_\_\_\_\_  
between B contact wire and CTRL terminal.

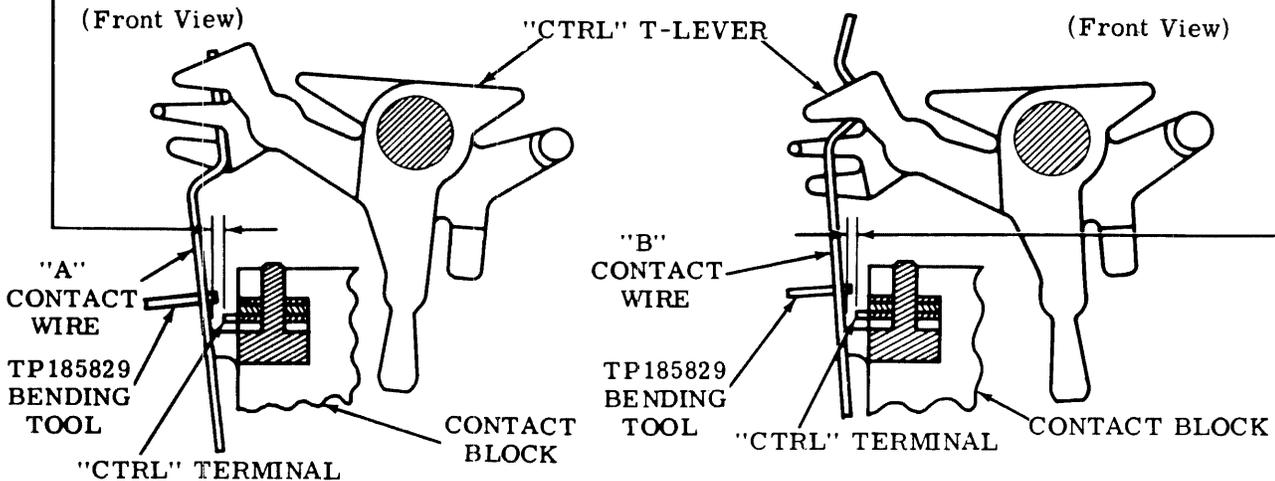
(b) Max 0.050 inch \_\_\_\_\_  
between B contact wire and CTRL terminal.

(c) Min 0.008 inch \_\_\_\_\_  
between A contact wire and CTRL terminal.

(d) Max 0.050 inch \_\_\_\_\_  
between A contact wire and CTRL terminal.

**To Adjust**

Bend contact wire(s) with TP185829 bending tool as shown.



2.05 Contact Wires (continued)

"CTRL" CONTACT WIRE

Note 1: This adjustment applies only to parity keyboards equipped with TP185780 CTRL key-lever spring and with TP186049 blocking lever and TP186051 tie link.

Note 2: Contact wires on auxiliary contact block on left side of parity keyboards are designated A, B, C, and D from rear to front.

(1) To Check

With the CTRL keytop unoperated, lightly take up all play in contact block towards the left.

Requirement

Min 0.025 inch---Max 0.035 inch  
between B contact wire and CTRL terminal.

(2) To Check

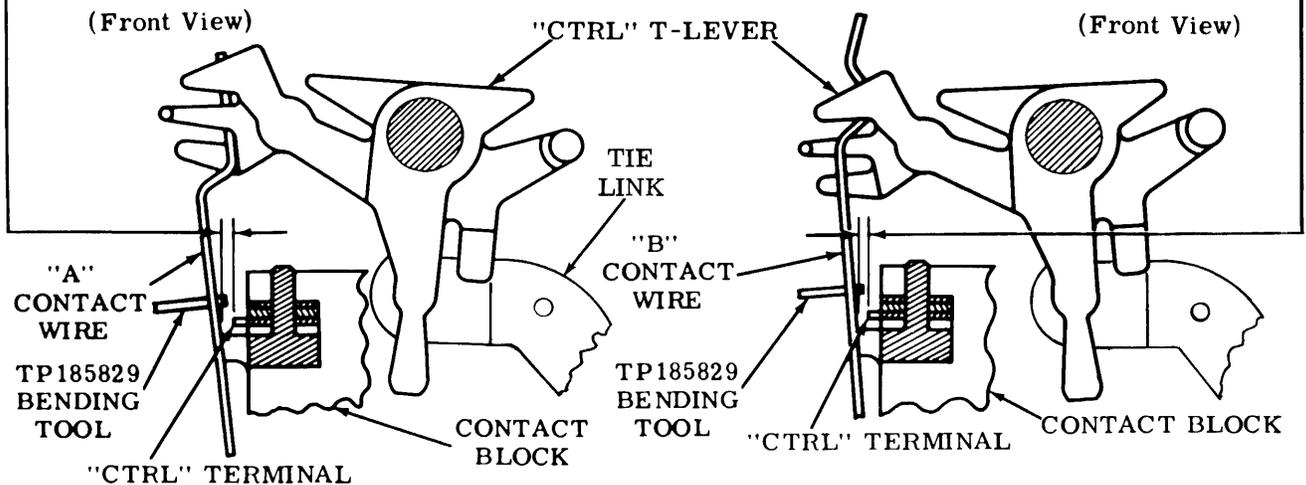
Fully depress the CTRL keytop and then trip the keyboard. Release the CTRL keytop. Lightly take up all play in contact block towards the left.

Requirement

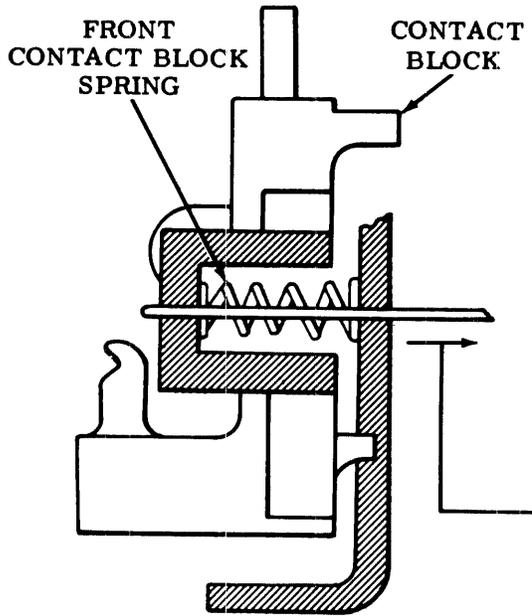
Min 0.015 inch---Max 0.030 inch  
between A contact wire and CTRL terminal.

To Adjust

Bend contact wire(s) with TP185829 bending tool as shown.



2.06 Contact Block Spring and Contact Wire Spring



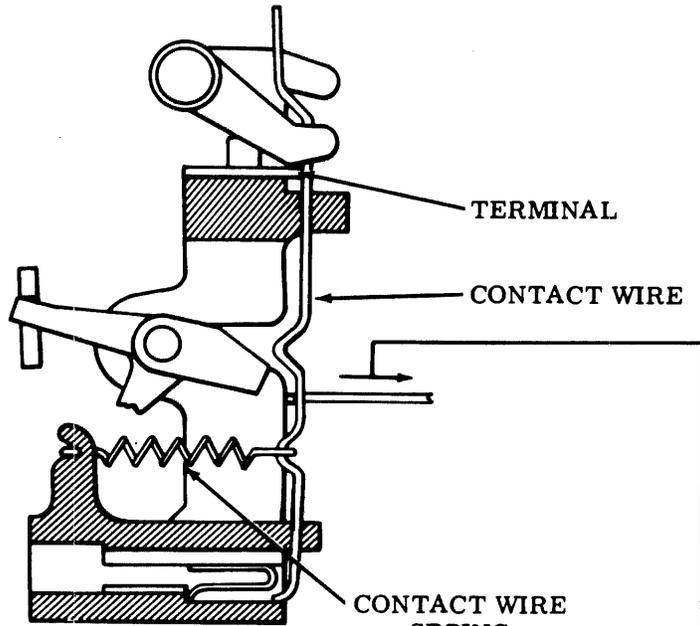
(Front View)

CONTACT BLOCK SPRING

Requirement

Min 18 oz---Max 42 oz  
to start contact block moving.

Note: Check both front and rear contact block springs.



(Front View)

CONTACT WIRE SPRING

To Check

Push universal lever down until latched by latchlever. Place T-levers down in marking position. Trip keyboard by depressing universal codebar.

Requirement

Min 3/4 oz---Max 1-1/4 oz  
to start each contact wire moving away from terminal.

2.07 Spacebar Spring and Keylever Spring

Note: The SPACEBAR SPRING and KEYLEVER SPRING adjustments do not apply to keylever springs associated with the SPACE, BLOCK, hyphen, or O keytops found on numeric-type keyboards.

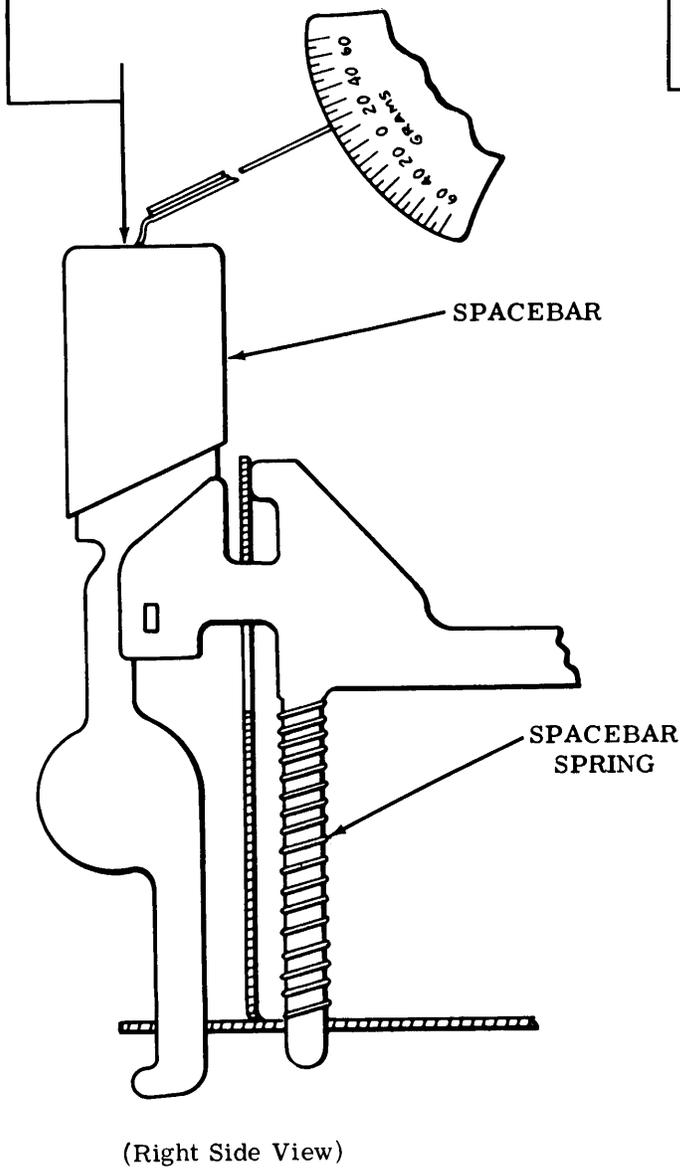
SPACEBAR SPRING

To Check

Push universal lever down until latched by latchlever. Depress spacebar and then release.

Requirement

Min 5 grams---Max 25 grams to start spacebar moving.



KEYLEVER SPRING

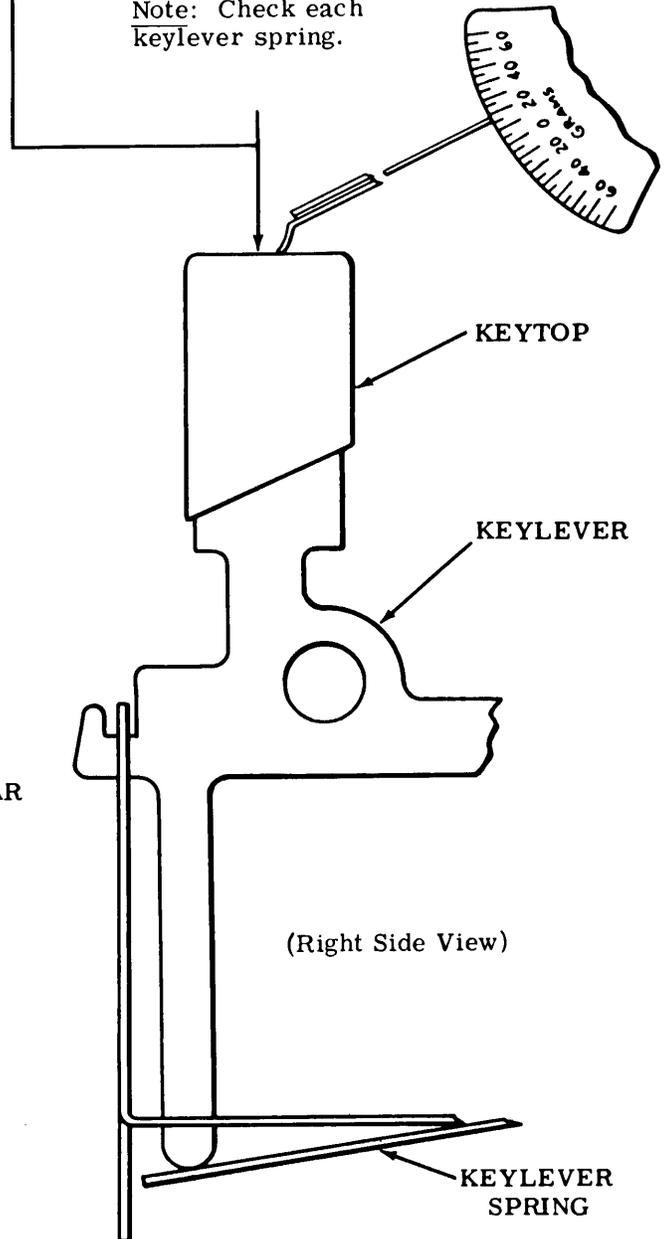
To Check

Push universal lever down until latched by latchlever. Select any keytop and depress. Release keytop.

Requirement

Min 5 grams---Max 30 grams to start selected keytop moving.

Note: Check each keylever spring.



2.08 HERE IS, BREAK, CTRL, and REPT Keylever Springs

"BREAK" KEYLEVER SPRING

Requirement

Min 4-1/2 oz---Max 10 oz  
to start keytop moving.

"CTRL" KEYLEVER SPRING

Requirement

Early design keyboards equipped with TP180102  
keylever spring:  
Min 1-1/2 oz---Max 3-1/2 oz  
to start keytop moving.

Late design keyboards equipped with TP185780  
keylever spring:  
Min 4-1/2 oz---Max 6-1/2 oz  
to start keytop moving.

"HERE IS" KEYLEVER SPRING

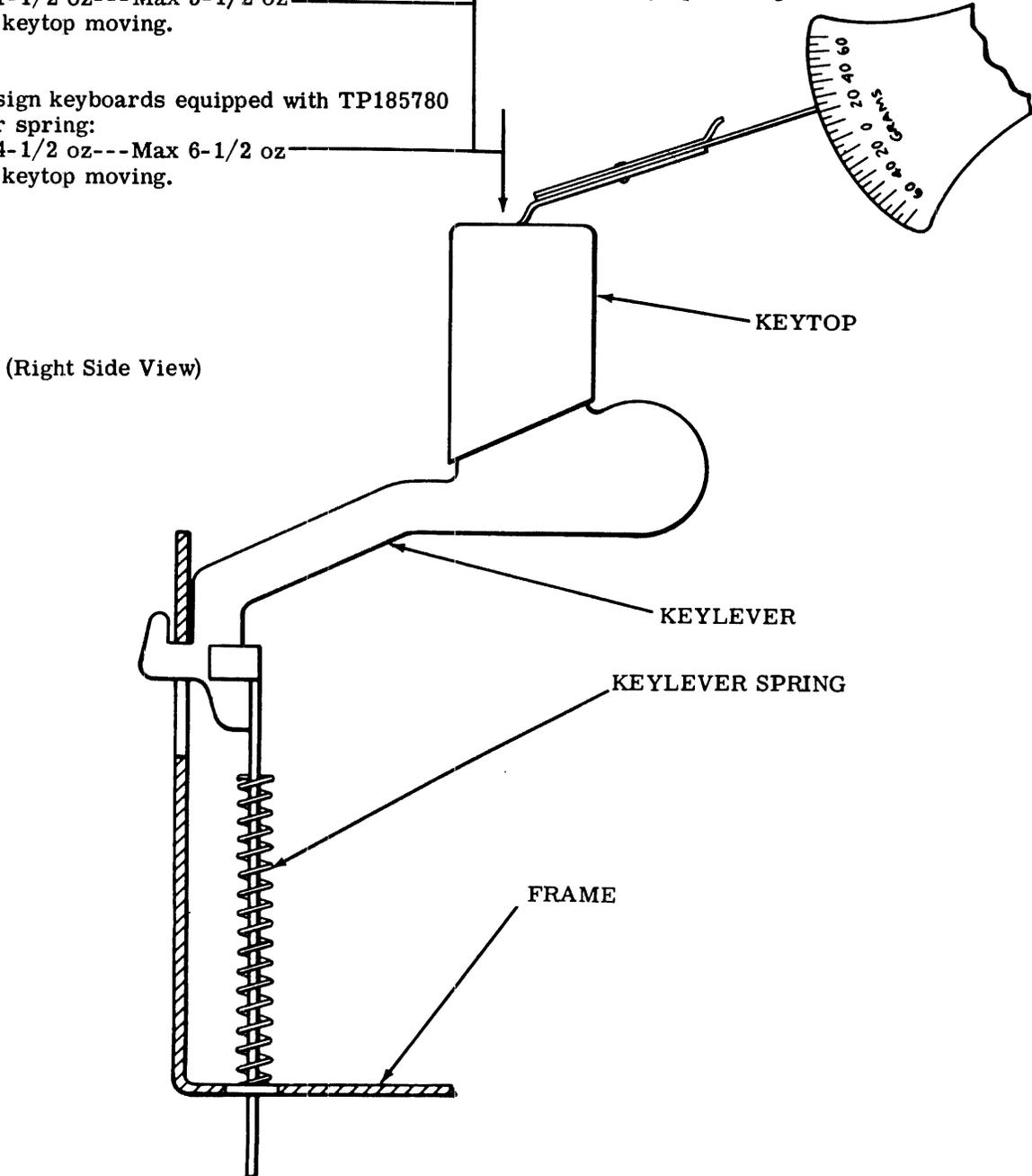
Requirement

Min 18 grams---Max 35 grams  
to start keytop moving.

"REPT" KEYLEVER SPRING

Requirement

Min 15 grams---Max 30 grams  
to start keytop moving.



2.09 SPACE, BLOCK, Hyphen, or O Keylever Springs

KEYLEVER SPRINGS ("SPACE," "BLOCK," HYPHEN, "O" KEYTOPS)

Note 1: This adjustment applies only to keylever springs associated with SPACE, BLOCK, hyphen, or O keytops found on numeric-type keyboards.

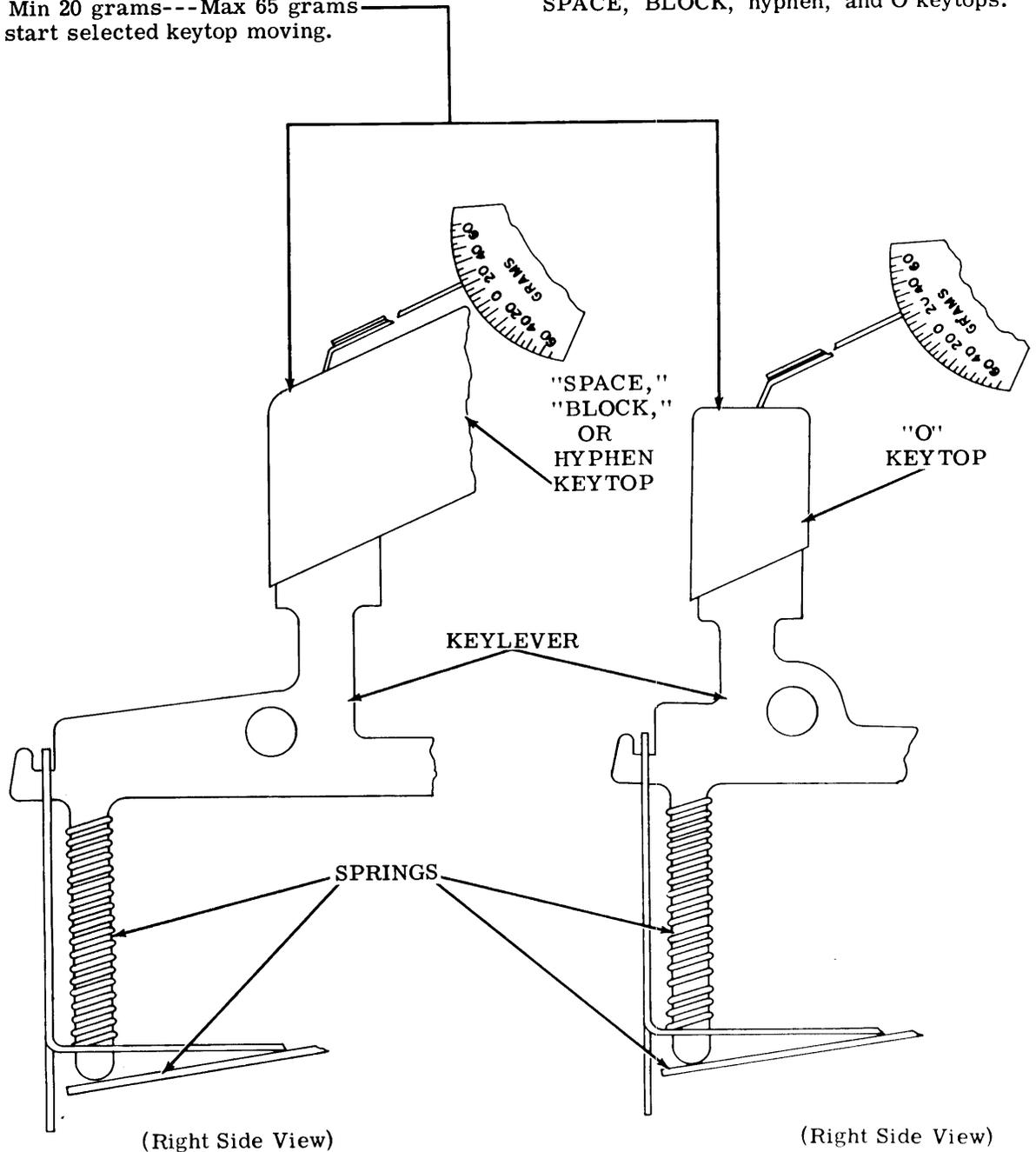
To Check

Push universal lever down until latched by latchlever. Depress either the SPACE, BLOCK, hyphen, or O keytop. Release selected keytop.

Requirement

Min 20 grams---Max 65 grams  
to start selected keytop moving.

Note 2: Repeat above procedure for each of the SPACE, BLOCK, hyphen, and O keytops.



2. 10 Reset Bail Spring

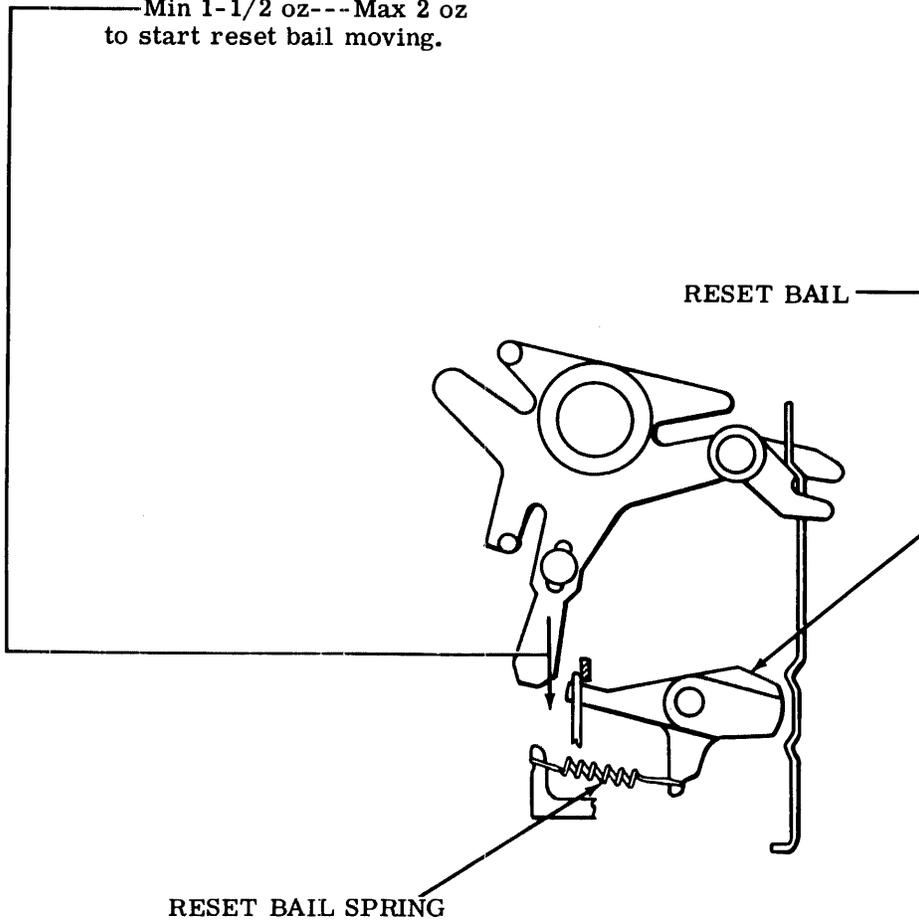
RESET BAIL SPRING

To Check

Push universal lever down until latched by latchlever. Trip keyboard by depressing RUB-OUT keytop.

Requirement

Min 1-1/2 oz---Max 2 oz  
to start reset bail moving.



(Front View)

2.11 Universal Link Spring

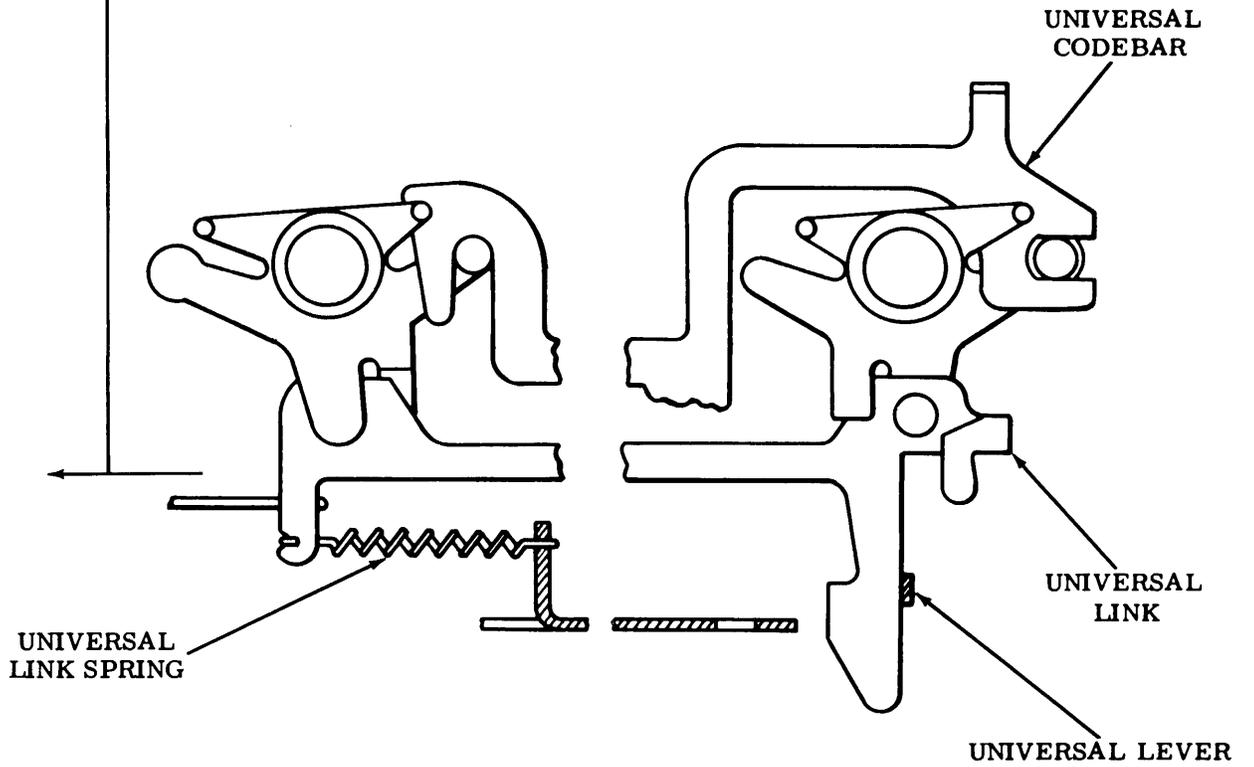
UNIVERSAL LINK SPRING

To Check

Push universal lever down until latched by latchlever. Trip keyboard by depressing universal codebar.

Requirement

Min 1/2 oz---Max 1-1/4 oz to start universal link moving.



(Front View)

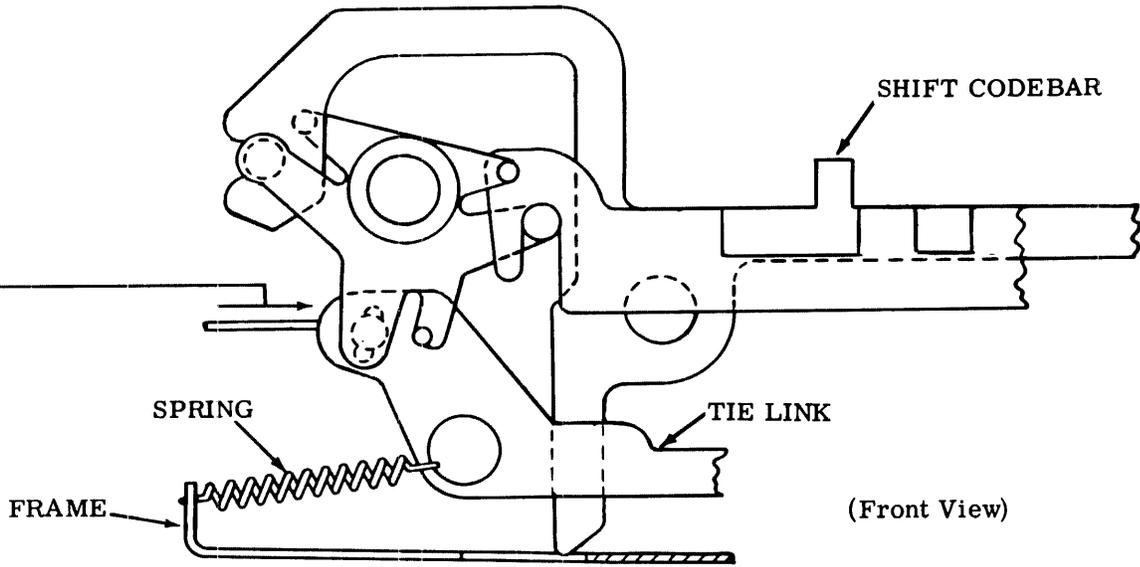
2.12 Shift Codebar Spring

SHIFT CODEBAR SPRING

Requirement

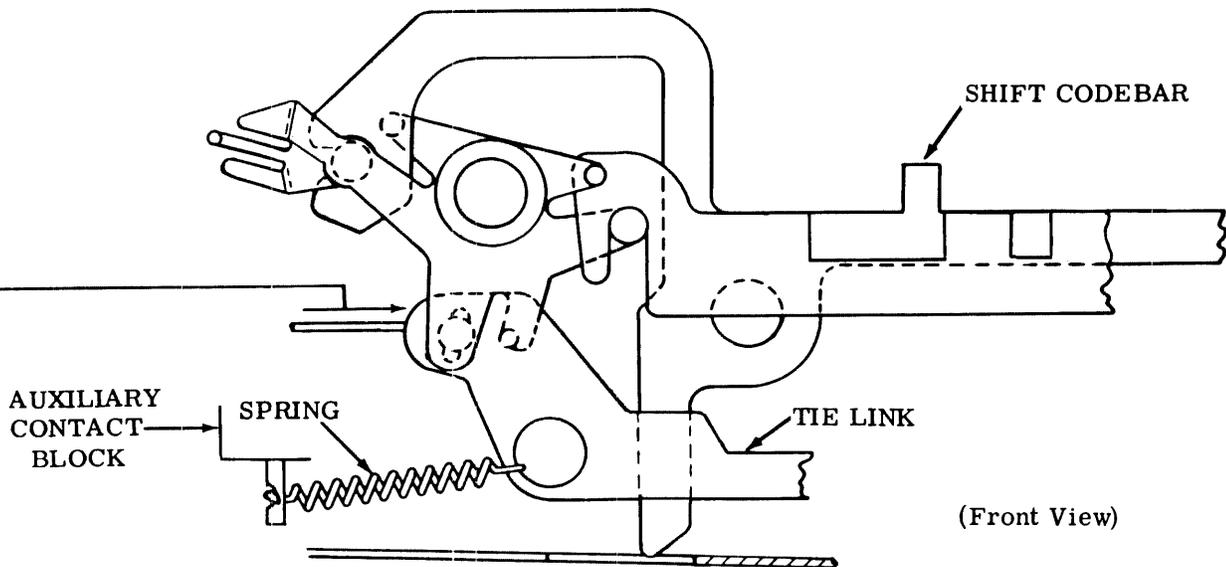
Nonparity keyboards:

—Min 1-1/4 oz---Max 2-1/2 oz  
to start shift codebar tie link moving.



Parity keyboards:

—Min 2 oz---Max 3-1/4 oz  
to start shift codebar tie link moving.



## 2.13 Nonrepeat Lever Spring

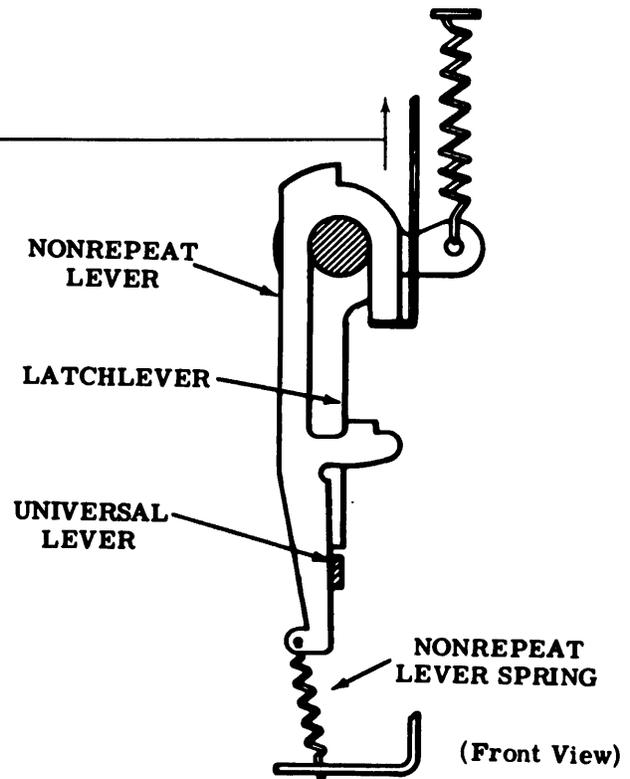
Note: Remove keyboard cover. For disassembly instructions, see appropriate keyboard section.

NONREPEAT LEVER SPRINGTo Check

Push universal lever down until latched by latchlever.

Requirement

Min 1/4 oz---Max 3/4 oz  
to start nonrepeat lever moving.



2.14 Universal Lever Spring

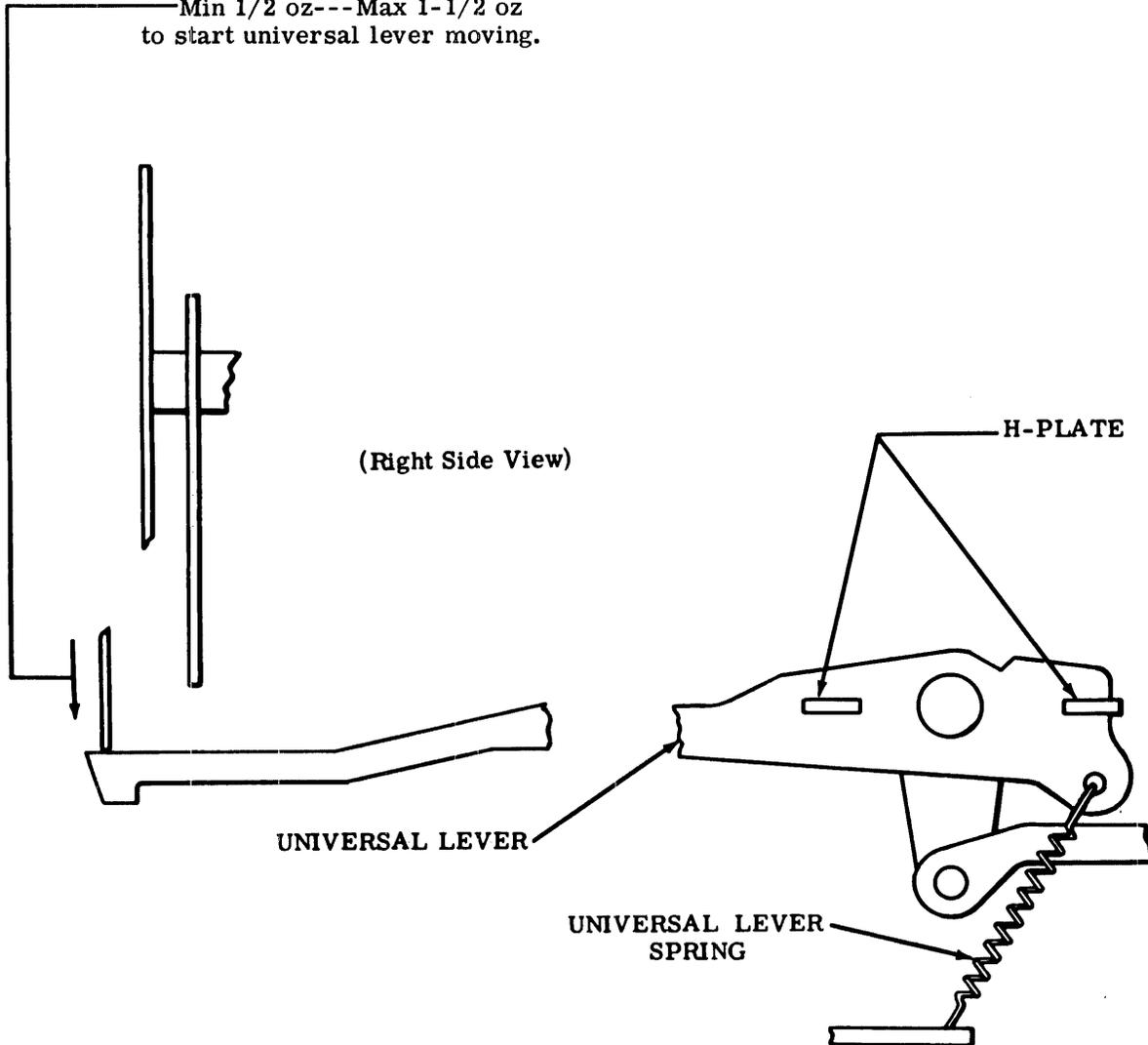
UNIVERSAL LEVER SPRING

To Check

Push universal lever down until latched by  
by latchlever. Hold reset bail away from  
universal lever.

Requirement

Min 1/2 oz---Max 1-1/2 oz  
to start universal lever moving.

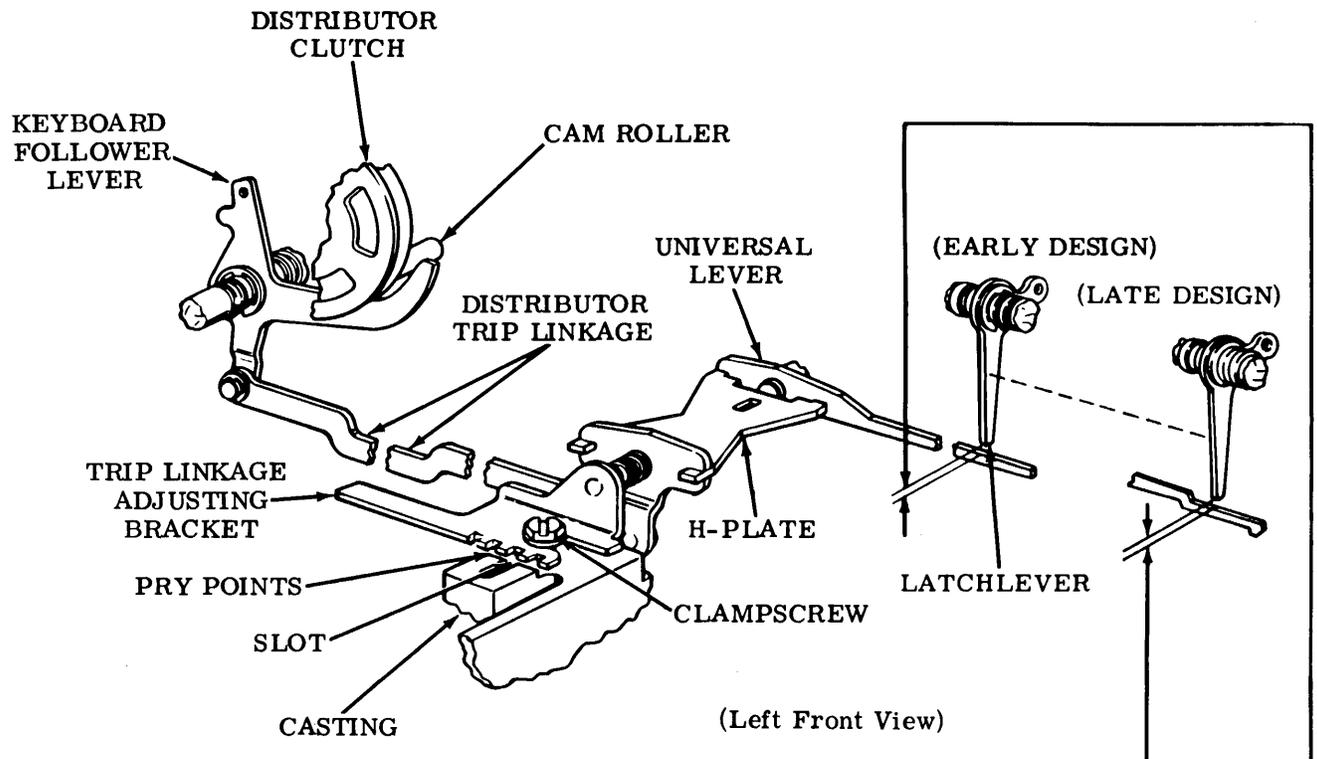


Note: Replace keyboard cover and reassemble keyboard (including H-plate)  
onto subbase. For reassembly instructions, see the appropriate keyboard  
section.

## 2.15 Distributor Trip Linkage

DISTRIBUTOR TRIP LINKAGE**To Check**

Place typing unit in stop condition. Depress RUB-OUT key to trip distributor clutch. Rotate main shaft until keyboard follower lever is moved to its lowest point by cam roller. Push against reset bail spring anchor with just enough force to slightly move reset bail up.

**Requirement**

Early design keyboards equipped with TP180086 universal lever:

Min 0.010 inch---Max 0.035 inch  
between latchlever and universal lever.

Late design keyboards equipped with TP182240 or TP185766 universal lever:

Min 0.010 inch---Max 0.040 inch  
between latchlever and universal lever.

**To Adjust**

Loosen clampscrew friction tight. Using pry points and slot in casting, position trip linkage adjusting bracket until requirement is met. Tighten clampscrew.

**Related Adjustment****Affects**

TRIP LEVER ENGAGEMENT (See appropriate typing unit section.)

2.16 Latchlever Spring

LATCHLEVER SPRING

To Check

Place typing unit in stop condition. Trip distributor clutch and rotate main shaft until keyboard follower lever is moved by cam roller to its lowest point.

Requirement

Min 1/2 oz---Max 1 oz  
to start latchlever moving.

Note: Replace call control unit onto subbase. For reassembly instructions, see appropriate keyboard section.

