

**GENERAL DESCRIPTION, INSTALLATION, AND ADJUSTMENTS FOR THE 173881
AND 178415 FIVE LEVEL PARALLEL CODE READING CONTACTS MODIFICATION KITS**

1. GENERAL

a. The 173881 (or 178415) Modification Kit is designed for Model 28 Typing Units except those for use in wall mounted and skin-tight covers. It provides a multi-contact switch which operates once each function cycle in a manner determined by the positions of the typing unit code bars. A code bar in the marking or spacing causes its associated switch to be marking or spacing. It then delivers this information, in parallel, once during each cycle as a group of open and/or closed circuits. The 173881 Modification Kit differs from the 178415 Modification Kit only in that it contains a Universal Contacts Modification Kit (163146). For information on this kit, refer to Specification 5804S.

b. The kits contain a switch assembly. The switch assembly contains five switches which enable all five code bars to be sensed, or any combination of the five code bars. When a requirement is such that all five code bars are not to be sensed, the corresponding switches can be disabled in one of two ways. First, the proper bell crank(s) can be removed. Second, the proper switch(s) need not be wired into the receiving equipment.

c. The Modification Kits consist of:

<u>Qty.</u>	<u>Part No.</u>	<u>Description</u>	<u>173881</u>	<u>178415</u>
12	2191	Washer, Lock	X	X
1	3598	Nut	X	X
2	3606	Nut	X	X
4	3640	Washer, Lock	X	X
6	7002	Washer, Flat	X	X
1	110743	Washer, Lock	X	X
2	121245	Cable Clamp	X	X
3	125011	Washer, Flat	X	X
1	151630	Screw	X	X
5	151631	Screw	X	X
4	151637	Screw	X	X
3	151722	Screw	X	X
3	151880	Nut	X	X
1	152893	Screw	X	X
3	155753	Sleeve, Insulating	X	X
1	156632	Screw	X	X
1	163146	Mod. Kit - Universal Contacts	X	-
1	173882	Stud	X	X
1	173883	Bracket, Mounting	X	X
1	173884	Plate, Mounting	X	X
1	173885	Bracket, Mounting	X	X

1	192566	Link, Drive (Left)	X	X
1	192567	Link, Drive (Right)	X	X
1	173887	Post, Pivot	X	X
1	173889	Post, Spring	X	X
1	173890	Pin, Stop	X	X
5	173891	Bell Crank	X	X
5	173892	Spring	X	X
1	173901	Cable Assembly, Electrical	X	X
16	173902	Spring, Compression	X	X
1	173903	Bracket	X	X
1	176299	Screw, Shoulder	X	X
1	178395	Cable Assembly, Electrical	X	X
1	178600	Cover	X	X
1	4258WD	Wiring Diagram	X	X

2. INSTALLATION (Figures 10 and 11)

a. General - Both the 173881 and the 178415 Modification Kits consist of the necessary parts placed in individual envelopes, and packed in a carton. Keep the individual parts in their respective envelopes until actually used in the installation to avoid confusion in part numbers. Before installing the contact assembly, perform the adjustments described in Para. 3.

b. Installation

(1) Remove the typing unit from the printer set.

(2) Remove and retain the screws and lockwashers holding the 150293 Retainer Plates to the 152572 Code Bar Detent Bracket. Replace the 150535 Detent Springs with the (16) 173902 Springs.

(3) Replace the 150293 Retainer Plates, screws and lockwashers removed in step (2) above.

(4) Remove and discard the upper 151442 or 151659 Screw which secures the left vertical position lever. Retain the nut and lockwasher.

(5) Remove and discard the lower 151657 Screw used to secure the left stunt box bracket in place.

NOTE

If the printer is equipped with a 163183 Modification Kit (DC Magnet Operated Print Suppression), remove its associated bracket and stud. Remove and discard the magnet assembly mounting screw (1118). When remounting the magnet assembly on the new bracket, use the 176299 Shoulder Screw.

(6) Install the 173882 Stud in the hole vacated in step (4) above, using the retained nut and lock washer.

- (7) Install the 173883 Mounting Bracket in place, and secure the rear portion with a 2191 Lock Washer and a 151631 Screw. Fasten the front end of the bracket to the 173882 Stud with a 7002 Washer, 2191 Lock Washer and 151631 Screw.
- (8) Assemble the 173884 Mounting Plate to the 173885 Mounting Bracket with a 2191 Lock Washer and 151722 Screw, and a 125011 Flat Washer, 3640 Lock Washer and 152893 Screw.
- (9) Assemble the 173887 Pivot Post to the 173884 Mounting Plate with a 2191 Lock Washer and 3606 Nut.
- (10) Assemble the 173889 Spring Post to the 173884 Mounting Plate with a 3640 Lock Washer and 151880 Nut.
- (11) Assemble the 173890 Stop Pin to the 173884 Mounting Plate with a 3640 Lock Washer and 151880 Nut.
- (12) Insert the five 173891 Bell Cranks into the slots associated with the 1, 2, 3, 4, and 5 code bars. Install five 173892 Springs to hold the 173891 Bell Cranks on the 173887 Pivot Post. Fasten the springs between the hole in each bell crank and the 173889 Spring Post.
- (13) Assemble the 173884 Mounting Plate and the 173903 Bracket to the 173883 Mounting Bracket with two 7002 Flat Washers, two 2191 Lock Washers and two 151631 Screws.
- (14) If the 173881 Modification Kit is being installed, add the 163146 Modification Kit (Universal Contacts) as per Specification 5804S. Cover the contact terminals with three pieces of 155753 Insulating Sleeve, after soldering.
- (15) Install the contact assembly of the 173901 Cable Assembly with (2) 2191 Lock Washers and (2) 151722 Screws to the 173885 Mounting Bracket. Mount the cable to the 173903 Bracket and to the printer side frame. After completing the adjustments (Para. 3), adjust the cable in the cable clamps for minimum strain on the switch and tighten the cable clamp screws.
- (16) If printer is to be installed in an ASR set, install 178395 Electrical Cable Assembly and connect in accordance with wiring diagram 4258WD.
- (17) After all adjustments have been completed, assemble the 178600 Cover to the 173887 Pivot Post, engaging the slot in the 173885 Bracket. Secure it in place with a 3640 Lock Washer and a 151880 Nut.
- (18) If the typing unit has the 153331 and 153332 Shift Slide Drive Links, it will be necessary to replace them with the 192566 and 192567 Drive Links (See Figure 11).
- (19) Remove and retain the 150598 Printing Track and its mounting hardware.

- (20) Remove and retain the 86835 Horizontal Positioning Lock Lever Spring.
- (21) Remove and retain the 150751 Guide Block, 150750 Plate, and Mounting hardware.
- (22) Remove and retain the 150776 Horizontal Positioning Lock Lever.
- (23) Remove and retain the two 3599 Nuts and two 110743 Lock Washers that secure the 153335 Plate. Remove the plate.
- (24) Remove and discard the 153331 and 153332 Shift Slide Drive Links.
- (25) Install the 192566 and 192567 Shift Slide Drive Links.
- (26) Reinstall the parts removed in Paragraphs (19) thru (23).
- (27) If Paragraph (18) was necessary, the following adjustments found in Bulletin 217B (Bell System see standardized information) will have to be checked and remade if necessary.

- (a) Printing Track adjustment.
- (b) Reversing slide bracket adjustment.

(28) Make the revised Horizontal Positioning Drive Linkage Adjustment given in the attached figure. (See Figure 6)

3. ADJUSTMENTS AND LUBRICATION (Figures 1 through 9)

- a. The following adjustments and spring tensions are in the proper sequence to be followed. If any adjustment is changed, related adjustments must be rechecked.
- b. Location of clearances, and point and angle of scale applications are illustrated. Requirements and procedures are contained in the text accompanying the illustrations.
- c. The spring tensions given are indicated values and should be checked with proper spring scales.

<u>Scale</u>	<u>Teletype Part Number</u>
8 ozs.	110443
70 grams	152223

- d. Reference made to left or right, up or down, front or rear, apply to the unit in its normal operating position as viewed from the operator's position in front of the unit.

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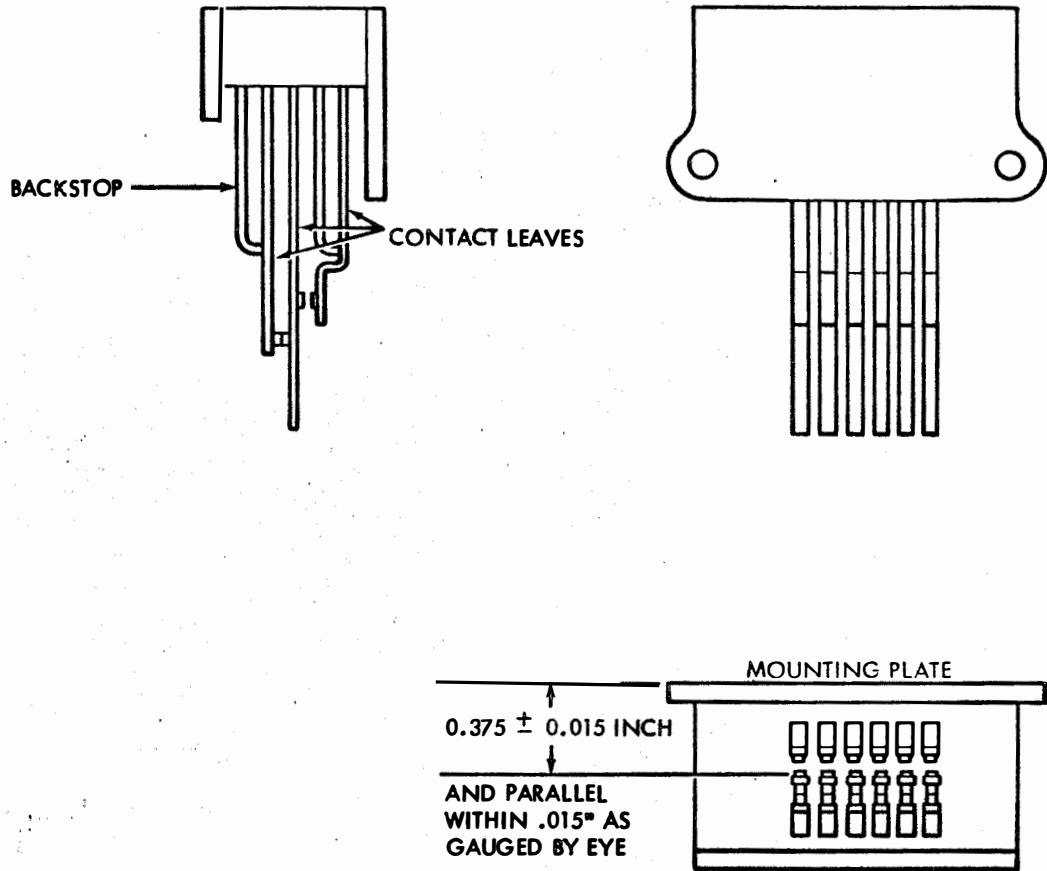
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NOTE: PERFORM THE FOLLOWING ADJUSTMENTS BEFORE INSTALLATION OF THE CONTACT ASSEMBLIES. FOR EACH ADJUSTMENT, START WITH THE CONTACT PILE-UP FARTHEST FROM THE HANDLE OF THE BENDING TOOL (PART NUMBER 156170).

BACKSTOP - NORMALLY CLOSED CONTACT
REQUIREMENT

FIVE CONTACT LEAVES MUST BE 0.375 ± 0.015 INCH FROM MOUNTING PLATE, IN LINE AND PARALLEL WITH EACH OTHER AS GAUGED BY EYE.



TO ADJUST
BEND BACKSTOP TO MEET REQUIREMENT.

FIGURE 1. CODE READING CONTACT ADJUSTMENT.

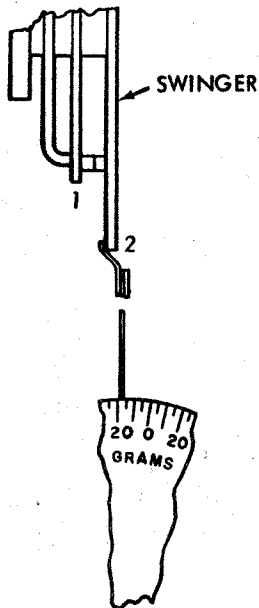
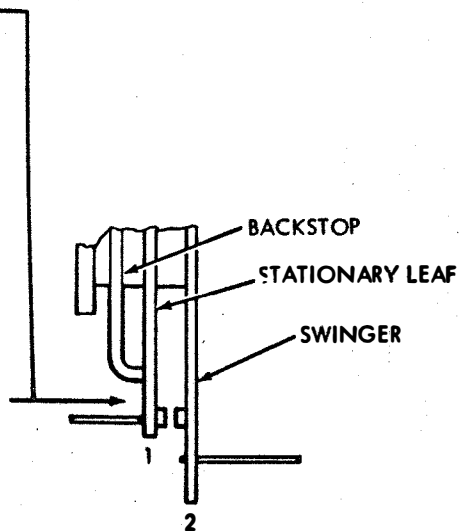
SPRING TENSION - NORMALLY CLOSED CONTACT AGAINST BACKSTOP REQUIREMENT

WITH SWINGER HELD AWAY FROM NORMALLY CLOSED CONTACT IT SHALL REQUIRE
2 OZ. MIN. --- 6 OZ. MAX.

TO SEPARATE STATIONARY LEAF FROM BACKSTOP.

TO ADJUST

BEND STATIONARY LEAF OF NORMALLY CLOSED CONTACT TO MEET REQUIREMENT. TO INCREASE TENSION OF LEAF AGAINST BACKSTOP, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM CONTACT LEAF, FORM CONTACT LEAF TO INCREASE TENSION, AND REPOSITION BACKSTOP TO MEET REQUIREMENT OF PREVIOUS FIGURE.



NORMALLY CLOSED CONTACT SPRING TENSION REQUIREMENT

15 GRAMS MIN. ---- 20 GRAMS MAX.
APPLIED JUST BELOW CONTACT POINT
TO OPEN NORMALLY CLOSED CONTACT.

TO ADJUST

BEND SWINGER TO MEET REQUIREMENT.

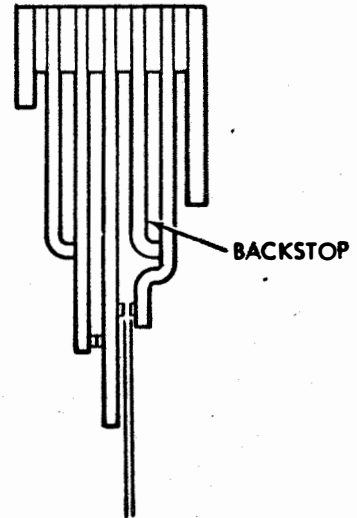
FIGURE 2. CODE READING CONTACT ADJUSTMENTS

NORMALLY OPEN CONTACT GAP
REQUIREMENT

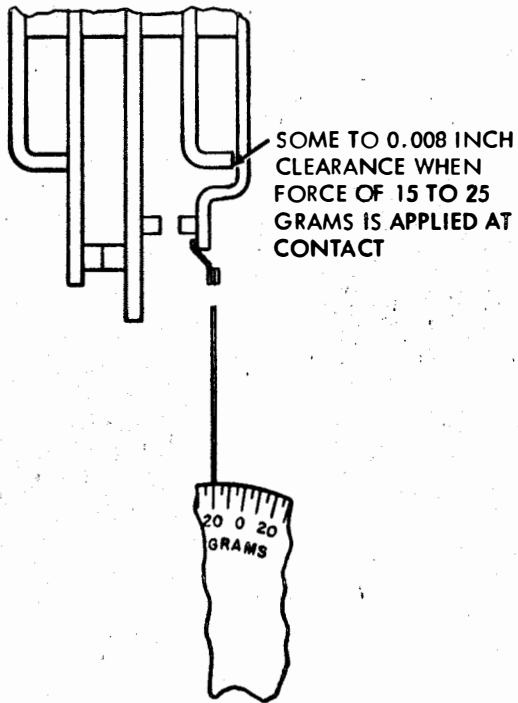
0.010 INCH MIN. --- 0.015 INCH MAX.

TO ADJUST

BEND NORMALLY OPEN CONTACT
BACKSTOP TO MEET REQUIREMENT.



NORMALLY OPEN CONTACT SPRING TENSION



REQUIREMENT

15 GRAMS MIN. ---- 25 GRAMS MAX.
APPLIED JUST BELOW CONTACT POINT
TO MOVE NORMALLY OPEN CONTACT
SPRING AWAY FROM BACKSTOP.

TO ADJUST

BEND NORMALLY OPEN CONTACT TO
MEET REQUIREMENT. TO INCREASE
TENSION, IT MAY BE NECESSARY TO
BEND BACKSTOP AWAY FROM CONTACT
LEAF, FORM CONTACT LEAF TO IN-
CREASE TENSION, AND REPOSITION
BACKSTOP TO MEET REQUIREMENT OF
ABOVE FIGURE.

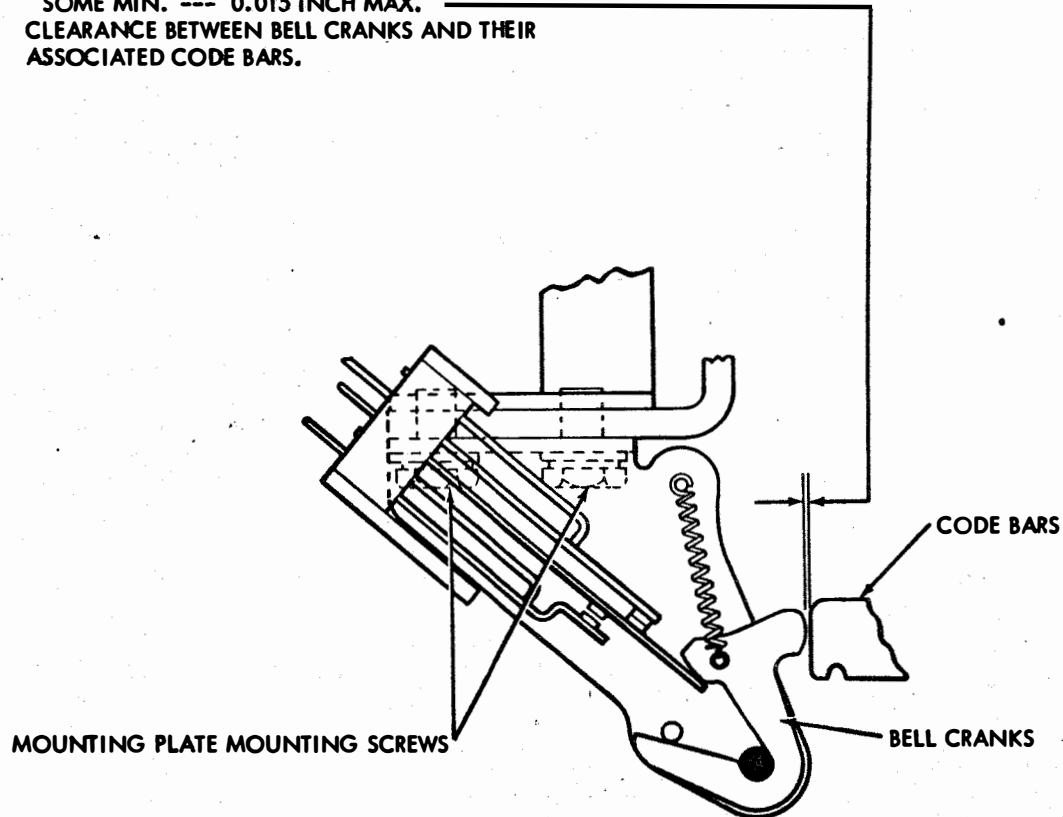
FIGURE 3. NORMALLY OPEN CONTACT

NOTE: PERFORM THE FOLLOWING ADJUSTMENTS WITH THE CODE READING CONTACTS MOUNTED ON THE UNIT WITH THE CONTACT ASSEMBLY APPROXIMATELY CENTERED IN ITS ADJUSTMENT RANGE.

MULTI-CONTACT MOUNTING PLATE
REQUIREMENT

ALL CODE BARS IN SPACING POSITION, AND SWINGERS HELD OR POSITIONED AWAY FROM THEIR ACTUATING SURFACES.

SOME MIN. --- 0.015 INCH MAX.
CLEARANCE BETWEEN BELL CRANKS AND THEIR ASSOCIATED CODE BARS.



TO ADJUST
LOOSEN TWO MOUNTING PLATE MOUNTING SCREWS AND SHIFT PLATE TO MEET REQUIREMENT.

NOTE: MAKE CERTAIN BELL CRANKS ARE IN VERTICAL ALIGNMENT WITH THE ENDS OF THE CODE BARS.

FIGURE 4. MULTI-CONTACT MOUNTING PLATE

CONTACT ASSEMBLY POSITION
REQUIREMENT

CODE BARS IN MARKING POSITION
SOME ----- 0.006 INCH MAX.
CLEARANCE BETWEEN NORMALLY OPEN
CODE READING CONTACT SPRING AND
ITS ASSOCIATED BACKSTOP.

TO ADJUST
LOOSEN CONTACT ASSEMBLY BRACKET
MOUNTING SCREWS AND ROTATE
BRACKET TO MEET REQUIREMENT.

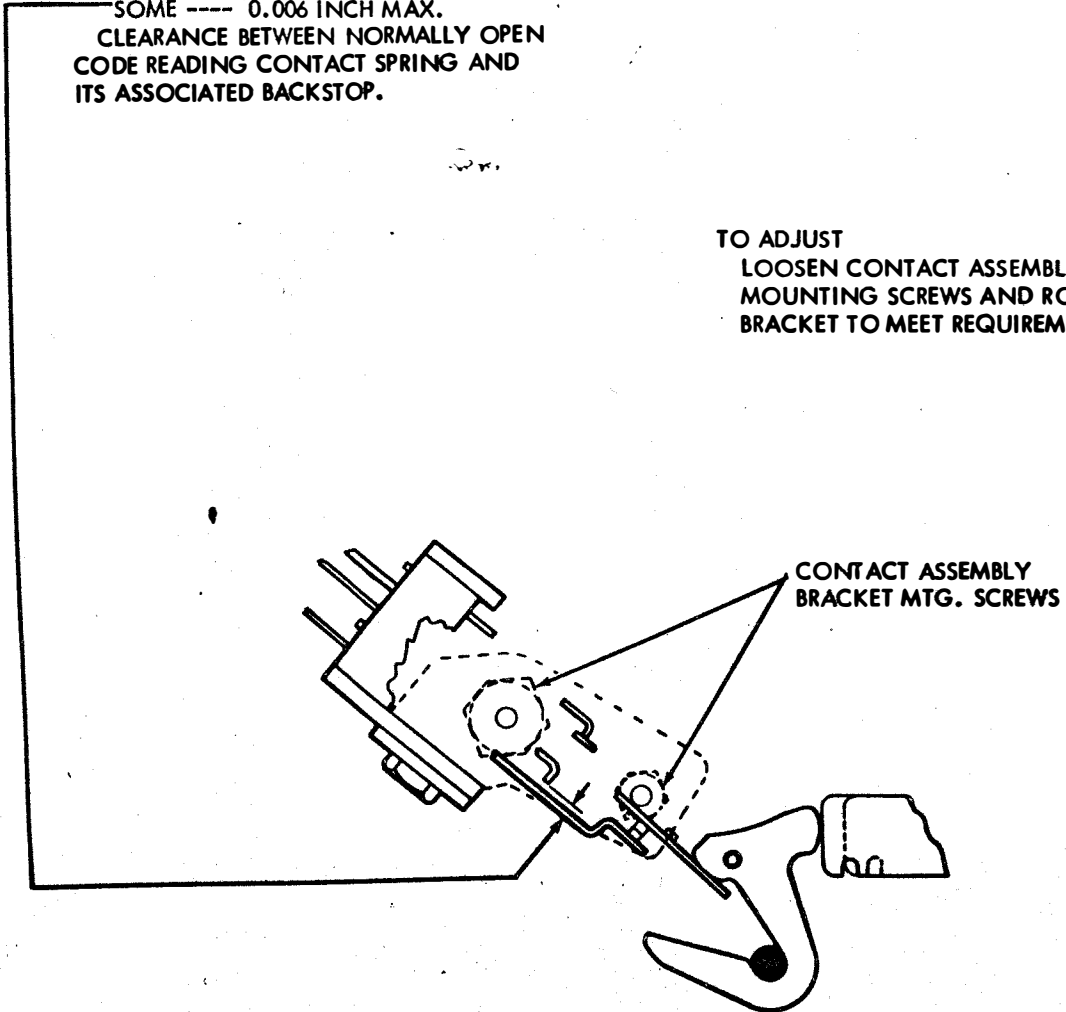


FIGURE 5. CONTACT ASSEMBLY POSITION

NOTE: THESE ADJUSTMENTS APPLY ONLY TO HORIZONTAL POSITIONING DRIVE MECHANISMS
EQUIPPED WITH TORSION SPRINGS.

HORIZONTAL POSITIONING DRIVE LINKAGE

REQUIREMENT

TYPE BOX CLUTCH DISENGAGED.

CODE BARS 4 AND 5 TO SPACING (RIGHT).

CLEARANCE BETWEEN EACH SIDE OF CENTER HORIZONTAL STOP SLIDE AND DECELERATING SLIDES,
ON SIDE WHERE KNEE LINK IS STRAIGHT SHOULD BE EQUAL (WITHIN 0.008 INCH)

MIN. 0.090 INCH

MAX. 0.110 INCH

TO ADJUST

LOOSEN BEARING STUD MOUNTING SCREWS AND CONNECTING STRIP MOUNTING SCREWS **FRICTION TIGHT**.
POSITION ONE OR BOTH BEARING STUDS ON THE CONNECTING STRIP TO PROVIDE 0.095
INCH TO .105 INCH BETWEEN THE CENTER HORIZONTAL SLIDE AND THE DECELERATING
SLIDE ON THE SIDE WHERE THE LINKAGE IS NOT BUCKLED. TIGHTEN THE TWO INNER
MOUNTING SCREWS. CHANGE POSITION OF REVERSING SLIDE AND CHECK OPPOSITE
CLEARANCE. EQUALIZE BY SHIFTING BOTH STUDS AND CONNECTING STRIP AS A UNIT.
HOLD THE DRIVE LINKAGE HUB AGAINST THE LOWER VERTICAL LINK OF THE DRIVE
LINKAGE. TIGHTEN THE TWO OUTER BEARING STUD MOUNTING SCREWS. CHECK THE
LINKAGE FOR FREENESS THROUGHOUT A COMPLETE CYCLE. THE TYPE BOX
CLUTCH DISK SHOULD HAVE SOME MOVEMENT IN THE NORMAL DIRECTION
OF ROTATION IN THE STOP POSITION.

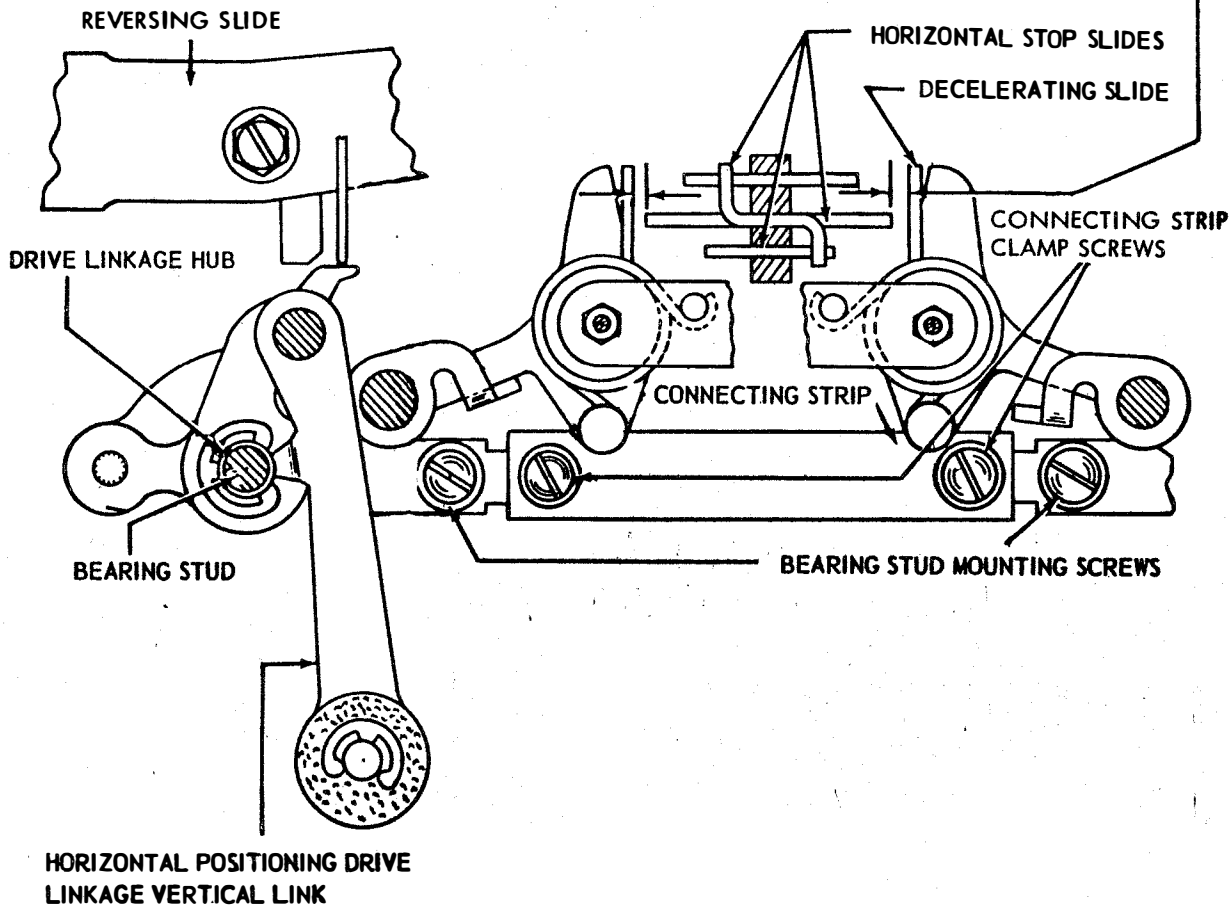


FIGURE 6

CODE BAR DETENT SPRING TENSION

NOTE

UNLESS THERE IS REASON TO BELIEVE THAT THESE SPRINGS ARE CAUSING OPERATING FAILURE DO NOT CHECK THIS REQUIREMENT.

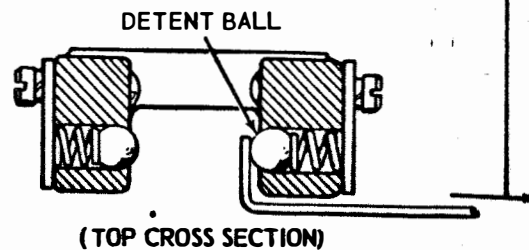
REQUIREMENT

CODE BAR DETENT BRACKET CAREFULLY REMOVED AND CODE BARS REMOVED FROM DETENT BRACKET. SCALE APPLIED TO DETENT BALL AND PULLED IN DIRECTION OF BALL TRAVEL

MIN. 3 ozs.

MAX. 6 ozs.

TO START BALL MOVING AGAINST COMPRESSION OF SPRING. CHECK EACH BALL



BELL CRANK SPRING TENSION

REQUIREMENT

CODE BARS IN SPACING POSITION AND ASSOCIATED SWINGERS HELD CLEAR OF BELL CRANKS.

SOME ----- 5 GRAMS
TO ROTATE BELL CRANK AWAY FROM
STOP PIN.

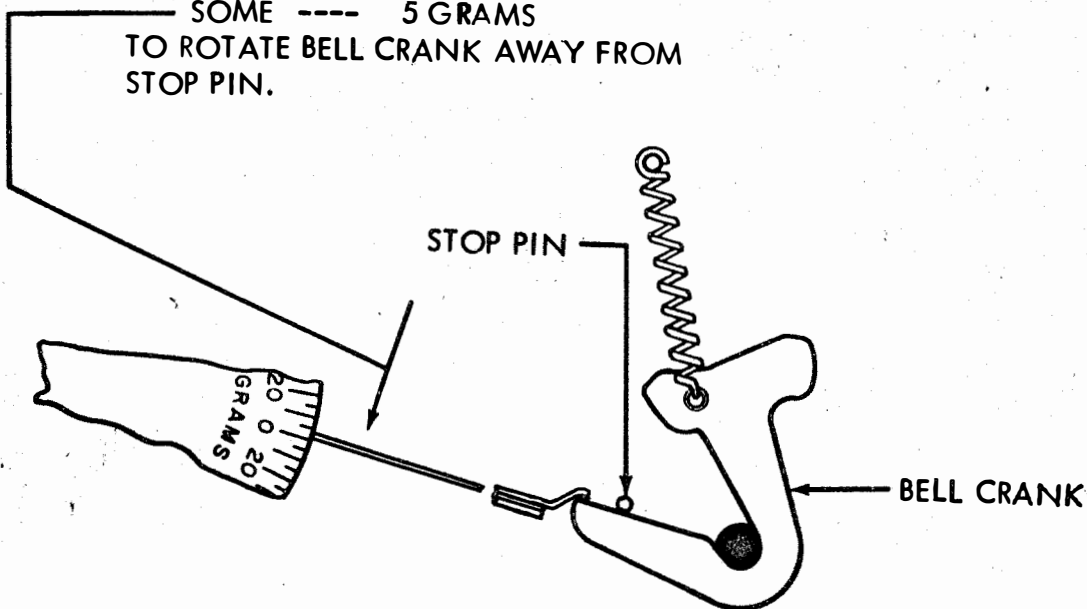


FIGURE 7

LUBRICATION

LUBRICATION INTERVAL IS TO BE CONSISTENT
WITH THE MODEL 28 TYPE LUBRICATION PROGRAM.

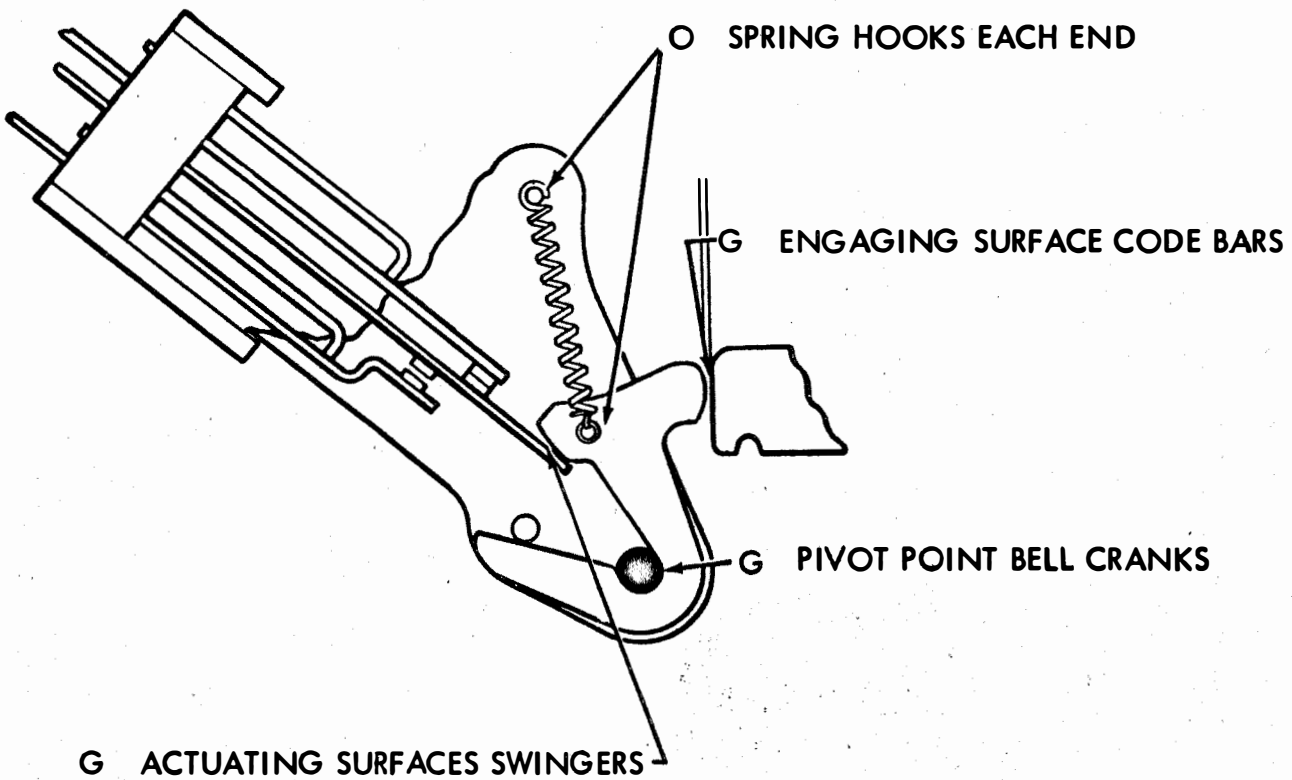
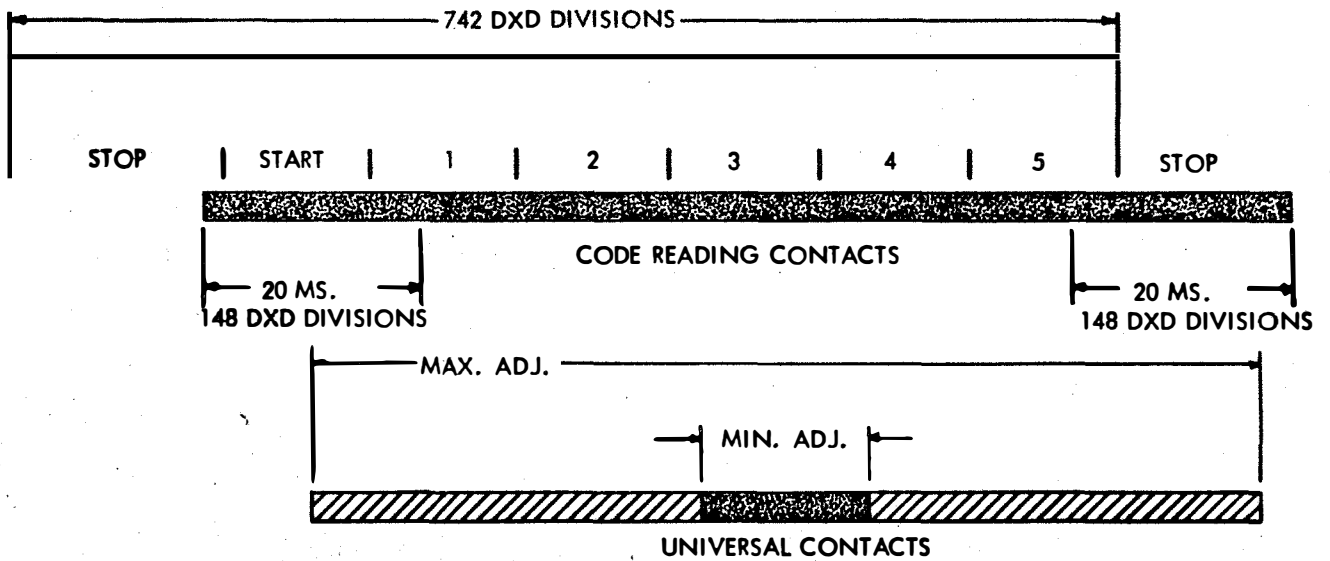


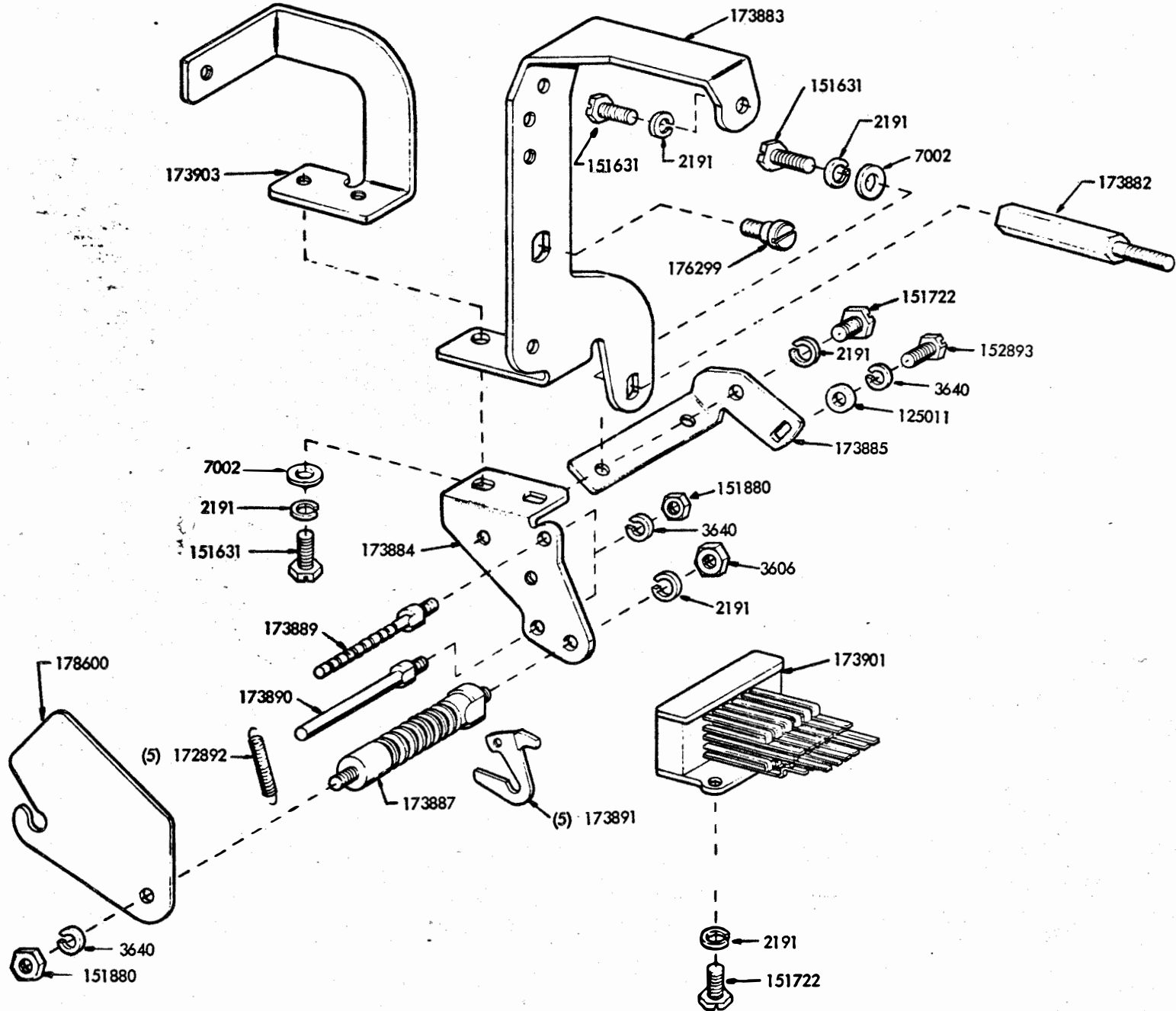
FIGURE 8



TIMING RELATIONSHIP BETWEEN 173881 CODE READING DISTRIBUTOR CONTACTS AND THE 163146 UNIVERSAL CONTACTS AT 100 W.P.M.

FIGURE 9

FIGURE 10



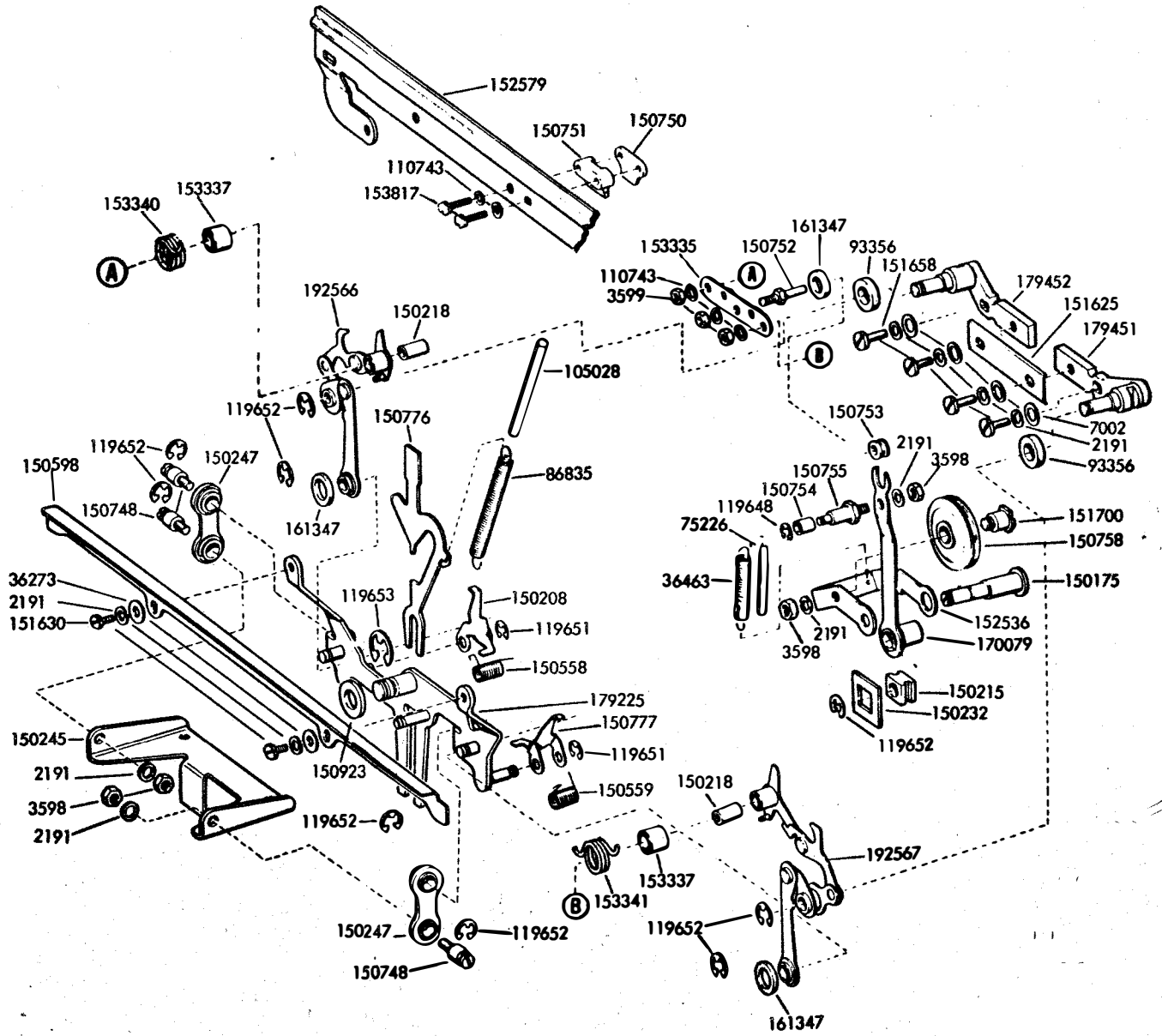


FIGURE 11