ADDENDUM TO SPECIFICATION 5804S, ISSUE 8, DATED MARCH, 1964 COVERING MODIFICATION KITS 154785 AND 163146

1. Make the following changes in Specification 5804S:

a. On Page 2, Paragraph 1.d. add 2-90790 Washer, Flat.

b. On Page 6, Paragraph 2.b.(7)(a)2. Add the following to the paragraph: and insert one 90790 Lock Washer between the 163158 Bracket and the left stunt box bracket.

c. On Page 6, Paragraph 2.b.(8) add the following new sentence: For LP Units only: insert a 90790 Flat Washer between the 163158 Bracket and the left stunt box bracket.

d. On Figure 1, Bracket 163158, in the holes marked (B) and for parts 7002, 2191, and 151346 add the following: For LP Units only: use 90790 Flat Washer. (See Paragraphs 2.b.(7)(a)2. and 2.b.(8).

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Specification 5804S
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INSTRUCTIONS FOR INSTALLING THE 154785 OR 163146 MODIFICATION KIT ON A MODEL 28 TYPING UNIT OR SEQUENCE SELECTOR UNIT TO ADD A UNIVERSAL CONTACT

1. GENERAL

a. The 154785 Modification Kit when installed on a Model 28 Typing Unit provides a make-before-break universal contact that operates during each function cycle. The contact operates each time a character is printed or a function is performed by the Typing Unit. This operation utilizes the angular rotation of the shift lever drive shaft which in turn moves the universal contact shift lever drive arm. The movement of the universal contact shift lever drive arm imparts an up and down motion to the universal contact link and in turn causes the universal contact arm to first, pivot on the normally closed contact, second, close the normally open contact, third, pivot on the normally open contact and open the normally closed contact, fourth, close the normally closed contact, fifth, pivot on the normally closed contact and open the normally open contact. When an idle printing telegraph signal (steady mark) is applied to the typing unit selector magnets, the normally closed side (lower (front) contact) of the universal contact remains closed. Until a start-stop printing telegraph signal is received, the universal contact remains in the normally closed position. The normally open contact closes approximately 90 degrees after the code bar clutch trips. The contact may remain closed up to approximately 200 degrees or 55 ms. @ 100 wpm, 73 ms. @ 75 wpm, and 91 ms. @ 60 wpm. The code bar clutch trips approximately 282 degrees after the start pulse begins.

b. The 163146 Modification Kit when installed on the stunt box of a Model 28 Typing Unit LP6 and up or a Model 28 Sequence Selector Unit LS1 provides a set of heavy duty make-break universal contacts which operate every function cycle. In normal operation the 153295 Stripper Blade Shaft is rotated in an oscillatory manner by the function clutch. With the 163146 Modification Kit, a latch cam, a drive cam and a trip cam are mounted on the shaft. The drive cam and trip cam are adjustably clamped to the shaft with the latch cam free to rotate between them. With the function clutch latched, the contacts are in the unoperated condition. After the function clutch operates, the shaft rotates and the drive cam engages the stud of the latch cam. The latch cam is driven against the insulator of the contact spring thus opening the normally closed contacts and closing the normally open contacts. After the latch cam has operated the contacts, the latch lever falls into a cutout on the latch cam. When the shaft has reached the limit of its rotation, its direction is reversed. Thus the drive cam is moved away from the latch cam. Since the latch cam is engaged with the latch lever it cannot rotate back and as a result the contacts stay operated until the latch lever is moved away from the latch cam. As the shaft returns to its original position the trip cam rotates and engages the latch lever out of engagement with the latch cam. This allows the latch cam and the contacts to return to the unoperated position. The shortest possible pulse length has its beginning at approximately the same time as the beginning of the stunt box contact. It has a length of approximately one half the length of the stunt box contact or 21 milli-seconds at 100 wpm. This pulse length is achieved by adjusting the drive cam for the latest possible contact closure and by removing the latch

lever from operation. The end of this pulse can be extended up until a time of approximately six milliseconds after the end of the stunt box contact or any intermediate point. This is accomplished by adjusting the latch cam for the desired unlatching time.

c. The 154785 Modification Kit consists of:

1	2191	Washer, Lock	1	151721	Screw
1	153442	Screw	1	152441	Washer, Flat
1	8330	Washer, Flat	1	154373	Shield, Oil
2	80342	Screw	6	155751	Sleeve, Insulating
2	110743	Washer, Lock	1	155789	Cable Assembly
3	121243	Clamp, Cable	1	155790	Contact Assembly
2	125011	Washer, Flat	1	155791	Link
1	125126	Screw	1	155792	Arm w/Stud
1	130696	Washer, Felt	1	155793	Bracket
2	150711	Washer, Flat	2	155795	Plate, Insulator
1	151182	Washer, Insulating	1	155796	Shaft Assembly
1	151629	Nut, Special	1	156663	Insulator Assembly
2	151687	Screw			

d. The 163146 Modification Kit consists of:

3	2191	Washer, Lock	1	163147	Contact Assembly
1	4703	Spring	1	163148	Shaft
3	7002	Washer, Flat	2	163150	Collar
2	110743	Washer, Lock	1	163152	Cam w/Stud
1	119652	Ring, Retaining	1	163153	Cam, Trip
1	121473	Post	1	163157	Cam, Drive
2	151637	Screw	1	163159	Lever w/Stud
1	151722	Screw	1	179802	Cover, Dust

e. For part numbers referred to and for parts ordering information see Teletype Model 28 Printer Parts Bulletin 1149B.

2. INSTALLATION

a. 154785 MODIFICATION KIT (Figure 2)

(1) Remove the typing unit from the printer set in accordance with standard practice.

(2) Remove and retain the 151657 Screw and 2191 Lock Washer from the bottom hole in 150525 Bracket.

(3) Remove and retain the 150055 Stud, 2191 Lock Washer, 3598 Nut and 151222 Felt Washer from the arm of the 150453 Shaft.

(4) Loosen the 151721 Screw on the 150447 Arm.

(5) Remove and retain the 119652 Retainer Ring from the stud on the 150451 Link.

(6) Remove and retain the 150447 Arm from the 150453 Shaft.

(7) Remove and retain the 150990 Felt Washer from the stud on the 150451 Link.

(8) Remove and retain the two 151631 Screws and 2191 Lock Washers that secure the 150452 Bearing Assembly.

(9) Remove and retain the 150452 Bearing Assembly.

(10) Remove and discard the 150453 Shaft and replace with 155796 Shaft.

(11) Reverse above procedure (Paragraphs 2a(2) through (10))for reassembly of parts.

(12) Remove the 3598 Nut and 2191 Lock Washer from the front side of the 150471 Shift Lever Mounting Stud and assemble the 154373 Oil Shield over the stud with the one and one quarter inch shelf projecting away from the stud and fasten with the same 2191 Lock Washer and 3598 Nut removed from the 150471 Stud.

(13) Check and adjust the 150447 Arm for proper operation and the scissors operating arm adjustment in accordance with standard practice.

(14) Remove the two 151630 Screws (retain one) and 2191 Lock Washers (retain two) that secure top of dashpot to front plate.

(15) Place the 155793 Mounting Bracket behind the front plate and fasten to the front plate by means of one 151630 Screw and 2191 Lock Washer removed. Place this screw in the upper right-hand hole and align the other mounting hole with the upper left-hand hole in front plate.

(16) Install one 155751 Insulating Sleeving on each 2-1/2 inch lead of the 155789 Cable Assembly. Solder white-green lead to 155799 Terminal. Solder blue lead with 2-1/2 inch length to one terminal of the 155798 Block and solder white-purple lead with 2-1/2 inch length to other terminal of the 155798 Block.

(17) Insert a 151687 Screw, 110743 Lock Washer and 125011 Flat Washer in each of the holes in one of the 155795 Insulator Plate as shown in Figure 2.

(18) Place the 155790 Universal Contact Assembly on the 151687 Screws and 155795 Insulator Plate, so that contacts on the 155797 Arm are visible through insulator plate, and W-P lead is on the upper contact of the assembly.

(19) Place the other 155795 Insulator Plate on the 151687 Screws in the same manner.

(20) Fasten the two insulator plates and universal contact assembly (has W-P lead) to the 155793 Mounting Bracket using the two 151687 Screws. Be certain that the 155797 Arm Extension is above the bend of the 150451 Link.

(21) Bend the 155789 Cable Assembly to the left and rear and pass cable over dashpot and front plate. Place the 2191 Lock Washer previously removed, and a 150711 Flat Washer on the 80342 Screw. Place a 121243 Cable Clamp around large plastic cable tubing in such a manner that the cable clamp mounting holes are to the left of the cable. Insert the 80342 Screw, 2191 Lock Washer, and 150711 Flat Washer through the cable clamp mounting holes and fasten to same point that held the 151630 Screw. Before tightening the 80342 Screw,position cable so that parts in typing unit will not rub against the cable; also make certain that in bending the cable no undue strain has been exerted on the 155799 Terminal and 155788 Spring. The cable should pass under the 150452 Bearing Assembly.

(22) Remove lower rear 151630 Screw and 2191 Lock Washer that secure the 152400 Plate to the 150479 Stud. Discard the 151630 Screw but retain the 2191 Lock Washer. If unit is equipped with a selector cam lubricator, remove, and then replace it after the cable clamp has been place in position. Place a 150711 Flat Washer and the retained 2191 Lock Washer on a 80342 Screw. Place the 121243 Cable Clamp over the cable with the clamp mounting holes toward the front of the typing unit and secure the clamp by means of the 80342 Screw. 150711 Flat Washer and 2191 Lock Washer at the same point that held the 151630 Screw.

(23) Before adding the last 121243 Cable Clamp, solder the three leads to the appropriate connector terminals as follows: BL from normally closed contacts to Terminal 12, W-G from contact armature to Terminal 13, W-P from normally open contact to Terminal 18.

(24) Remove the 151606 or 6745 Screw and the 2669 Lock Washer that secures the 151627 Rod to the right side frame. Retain the 6745 Screw and 2669 Lock Washer. Place a 121243 Cable Clamp around the cable assembly with the mounting holes toward the front of the typing unit. Place the 2669 Lock Washer and the 152441 Flat Washer on the 6745 Screw (a 6745 Screw is furnished in the kit). Insert the screw through the clamp mounting holes, the hole in the right side frame and secure the 151627 Rod.

(25) Apply a light film of grease, to the metal sleeve of the 156663 Insulator Assembly and both faces of 155797 Arm near pivot hole; insert the 156663 Insulator Assembly into the 155797 Arm from the right side. Insert the 125126 Screw from the right side into the 156663 Insulator Assembly. Place the 151182 Insulating Washer on the 125126 Screw. Fasten the 155791 Link to the universal contact assembly by means of the 125126 Screw; be certain that the bend in the 155791 Link is toward the right.

(26) Place a 130696 Felt Washer on stud of the 155792 Arm and place the arm on the 155796 Shaft so that the stud on the 155792 Arm passes through the hole in the 155791 Link. Place a 2191 Lock Washer and a 8330 Flat Washer on a 151721 Screw. Insert the

151721 Screw and Washers in the 155792 Arm in the same manner as the screw and washers are in the 150447 Arm on the 155796 Shaft. Fasten the 151721 Screw and Washer in place by means of a 151629 Nut (for assembly see the 150447 Arm). Adjust the 155792 Arm, see Paragraph 3.

(27) After replacing the typing unit in the Model 28 Set, rotate the motor shaft by hand and make certain that the rotating parts of the motor do not rub against the 155789 Cable Assembly.

b. 163146 MODIFICATION KIT (Figure 1)

CAUTION NOTE

On the new 163147 Contact Assembly, the 82547 Insulator originally installed at the bracket end has been removed and installed under the clamp plate at the mounting screw head end of the assembly. All old style contact assemblies must be reassembled to conform with Figure 4.

(1) Remove the typing unit or sequence selector unit in accordance with standard practice.

(2) Remove the stunt box from the typing unit, in accordance with standard practice.

(3) Remove and discard the 153295 Shaft; retain all associated parts.

(4) Assemble 163153 Trip Cam, 163152 Latch Cam, 163157 Drive Cam, two 163150 Collars, two 151637 Screws, and two 110743 Lock Washers to the 163148 Shaft. Refer to Figure 5.

(5) Assemble 163148 Shaft to function box in reverse order of removal of 153295 Shaft.

(6) Assemble 163159 Lever w/Stud to 163147 Contact Assembly with 119652 Retaining Ring.

NOTE

Make the contact adjustment before installing the contact assembly.

(7) Installation of contact bracket on stunt box:

(a) For LP Unit:

1. Remove and retain the 151739 Hex Head Screw (with lettering) from the left side of the stunt box.

2. Mount the 163158 Universal Contact Bracket to the stunt box with the 121473 Hex Post, 2191 Lock Washer and 7002 Flat Washer through the upper hole of the bracket.

3. Replace the 151692 Screw at the right side of the handle with the 151739 Screw previously removed from the left side.

(b) For LS Unit:

1. Remove and discard the 151657 Screw at the left side of the handle which holds the 157213 R-Y Mechanism Bracket to the unit.

2. Mount the 157213 R-Y Mechanism Bracket between the 163158 Universal Contact Bracket and the left stunt box bracket with the 121473 Hex. Post, 2191 Lock Washer and 7002 Flat Washer through the upper hole of the universal contact bracket.

(8) Replace the stunt box in the typing unit in accordance with standard practice using one retained 151692 and 2191 Lock Washer at the right side and one 151346 Screw with 2191 Lock Washer and 7002 Flat Washer at left side.

(9) Install the 4703 Spring between the 163159 Lever and the 163158 Contact Bracket.

(10) Wiring is to be provided by the customer with wires from the contact terminals to any available terminals on the typing unit or auxiliary connector.

(11) Install the 179802 Dust Cover on the 121473 Hex Post with the 151722 Screw, 7002 Flat Washer and 2191 Lock Washer. See that the cover safely clears all moving parts of the universal contact mechanism and that the upper mounting screw head of the contact assembly is located in the open slot of the cover.

3. ADJUSTMENTS AND LUBRICATION

a. For standard adjustment and lubrication procedures other than given in this specification Refer to Teletype Bulletin 217B, or 236 B. Bell System refer to standardized information.

b. For the adjustment of the 154785 Modification Kit, refer to Figure 3. The lubrication procedure can be found in Figure 12.

c. 163146 Modification Kit Adjustments and Timing Procedure

NOTE

The timing adjustment procedure of the 163146 Modification Kit will be different when used in special applications. The general adjustment procedure is given first below followed by two paragraphs (Paragraph 3.c.(9) and 3.c.(10)) if special application adjustments are required. Follow the appropriate timing adjustment procedure for your use.

(1) Contact Adjustment

NOTE

All contact springs were pretensioned in the factory to give a higher than required tension. They must be readjusted for the specified tensions. If it is necessary to increase the tension, it is advisable to remove the contact spring and increase its curvature. When adjusting the stiffeners in the assembly, do not damage the associated contact springs. It is recommended that the following adjustments should be made before installation of the contact assembly on the unit:

(a) The contact springs and stiffeners should be mounted vertically on the bracket and the contact points of the springs should be in alignment; gauge by eye. Adjust by means of the pile-up mounting screws and tighten the screws. Also refer to Par. (10)b.(2).

(b) The stiffeners should be parallel with the contact bracket as judged by eye. To adjust, bend the stiffeners. Also refer to Par. (10)b.(2).

(c) The contact springs should rest with the swinger held away, against the top edge of their associated stiffeners for the full width of the contact spring. To adjust, bend the top, formed section of the stiffener and, if necessary, bend the spring.

(2) Spring Tension - Normally Closed Contact (Figure 7)

Requirement

It should require 2 to 3 ozs. (applied perpendicularly just below the contact point) to just move the contact spring away from the stiffener. Hold swinger contact out of way. Bend contact spring.

(3) Spring Tension - Normally Open Contact (Figure 7)

Requirement

It should require 2 to 3 ozs. (applied perpendicularly just below the contact point) to move the normally open contact spring away from its stiffener. Also refer to Par. (10)b.(2).

To Adjust

Bend spring.

(4) Normally Open Contact Gap (Figure 7)

Requirement

With the normally closed contacts made, there should be .020 to .025 inch normally open contact gap. Also refer to Par. (10)b.(2).

To Adjust

Bend stiffener.

(5) Swinger Spring Tension (Figure 7)

Requirement

It should require 4 to 6 ozs. (applied perpendicularly at the contact point) to separate the swinger contact from the normally closed contact, with the normally open contact spring held away.

To Adjust

Bend swinger spring.

NOTE

If the contact mounting screws were loosened to obtain any of the preceding requirements, they must be retightened and the gap and tension values must be rechecked.

(6) Drive Cam Position (Preliminary)

Requirement

Rotate the drive cam to its extreme counterclockwise position (view from left side, facing front of unit from operator's position.)

(7) Trip Cam Position (Preliminary)

Requirement

Rotate the trip cam to its extreme clockwise position.

NOTE

The following general application adjustments are made with the contact assembly installed on the stunt box.

NOTE

The following information will be helpful when making the timing adjustments.

(1) Rotating the drive cam counterclockwise when viewed from the left side:

(a) Delays the start of the normally open contact marking pulse (contacts close later).

(b) Delays the end of the normally closed contact marking pulse (contacts open later).

(2) Rotating the trip cam counterclockwise.

(a) Advances the end of the normally open contact marking pulse (contacts open sooner).

(b) Advances the start of the normally closed contact marking pulse (contacts close sooner).

(8) General Application Adjustments

(a) Contact Bracket Position (Figure 6) (Preliminary)

Requirement

With the drive link in its lowermost position, locate the contact bracket so that there is from .055 to .065 inch clearance between the top of the swinger insulator and the cut-out section of the latch cam. The latching surface of the latch lever should cover the width of the trip cam and latch cam. See Figure 4. (This clearance should be from .035 to .045 inch for LS Units with R-Y Mechanism.)

(b) Drive Cam Adjustment (Figure 9) (Preliminary)

Requirement

With the drive link in its uppermost position, rotate the drive cam clockwise until there is from .010 to .015 inch clearance between the normally open contact spring and the upper end of its stiffener.

NOTE

The final timing adjustments of the drive cam and trip cam are very critical, it is, therefore, advisable to use a wrench over the flat surfaces of these cams.

(c) Contact Bracket and Drive Cam Position (Figure 9 and 10) For stunt boxes other than those referred to in the Special Timing Adjustments

Requirement

With the drive link in its uppermost position, adjust the bracket so that the latching surface of the latch cam overtravels the latch lever by .003 to .008 inch and that the latch lever latching surface covers the width of the trip cam and latch cam. Continue to rotate the main shaft until the latch cam rests firmly on the latch lever. In this position, there should be from .005 to .010 inch clearance between the normally open contact spring and the upper end of its stiffener.

To Adjust

Reposition the contact bracket, and, if necessary, refine the drive cam adjustment.

(d) Contact Bracket and Drive Cam Position (Final) - Use DXD or similar equipment - see Paragraph (12). Refine the Drive Cam (and, if necessary, the Bracket) adjustment within the limits of Paragraph (C) so that the normally open Universal Contacts close within ± 5 milli-seconds of the normally open Stunt Box Contact closure.

NOTE

Use the "BLANK" Character Stunt Box Contact in Slot No. 36 as reference for the preceding and following adjustment.

(e) Trip Cam Adjustment (Final) - Use DXD or similar equipment - see Paragraph (12). Position the Trip Cam on the shaft so that the normally open Universal Contacts open within -5 +0 milli-seconds of the Normally Open Stunt Box Contact opening. With the drive link in its lowermost (Stop) position, there should be at least .003 clearance between the front edge of the latch lever latching surface and the high part of the latch cam at the closest point when the play in the stripper shaft is taken up to make this clearance a minimum.

NOTE

The following procedure provides the latest possible closure of the normally open contacts.

(f) Contact Bracket and Drive Cam Position (Figure 9 and 10) (Final)

Requirement (Refering to Fig. 9 use these values for special)

With the drive link in its uppermost position, adjust the bracket so that the latch lever just engages the latching surface of the latch cam and that it covers the width of the trip cam and latch cam. Continue to rotate the main shaft until the latch cam rests firmly on the latch lever. In this position there should be from .005 to .010 inch clearance between the normally open contact spring and the upper end of its stiffener. Unlatch the latch cam and repeat this check several times to obtain safe latching of the latch cam with the least amount of overtravel (latch cam-latch).

To Adjust

Reposition the contact bracket, and if necessary refine the drive cam adjustment.

(g) Trip Cam Adjustment (Figure 8)

Requirement

With the drive link in its lowermost position the latch lever should rest on the lower end of the high section of the trip cam. There should be at least .003 inch clearance between the front edge of the latch lever latching surfaces and the high part of the latch cam at the closest point when the play in the stripper shaft is taken up to make this clearance a minimum. (This adjustment provides for latest

possible opening of the normally open contacts.)

To Adjust
Loosen screw holding trip cam to shaft, and rotate cam counterclockwise to proper position. Tighten screw.

NOTE

As a check to see that the trip cam is not installed 180° out of place, the main shaft should be rotated so that the stripper shaft drive link moves downward. The latch lever should then come to rest against the trip cam.

(h) Upon completion of the final timing adjustments, the requirements outlined in Par. 3.c.(11) should be checked.

(i) Latch Lever Spring Tension (Figure 8)

Requirement
With the latch cam unlatched and the latch lever resting on the trip cam when the latch cam is free, apply an 8 oz. spring scale horizontally just below the formed portion of the latch lever. It should require 1/2 oz. to 2 ozs. to just move the lever away from the trip cam.

(9) Special Timing Adjustments for LP and LS Units operating at 100 WPM in 83B2 Switching System.

(a) Timing Requirements

1. The normally closed contacts should close within 50 to 80 divisions after the start of the "Stop" impulse.

2. The normally open contacts should close prior to the end of No. 3 pulse.

3. The normally open contacts should remain closed for at least 238 divisions (100 WPM DXD with 742 scale divisions).

NOTE

The relation between the normally closed universal contact marking pulse and the "Stop" impulse of the received signal varies with the range scale setting of the unit.

(b) With the contact assembly removed follow the procedure of Paragraph 3.c.(1) through (7).

(c) Contact Bracket Position (Figure 6) (Preliminary)

Requirement

With the drive link in its lowermost position (Stop), locate the bracket so that there is from .045 to .055 inch clearance between the top of the swinger insulator and the cut-out section of the latch cam. The latch lever latching surface should cover the width of the trip cam and latch cam. See Figure 4. (This clearance should be from .030 to .040 inch for LS Units with R-Y Mechanism).

(d) Drive Cam Adjustment (Figure 9) (Preliminary)

Requirement

With the drive link in its uppermost position, rotate the drive cam clockwise until there is from .010 to .015 inch clearance between the normally open contact spring and the upper end of its stiffener.

(e) Contact Bracket and Drive Cam Adjustment (Figure 9 and 10) (Final)

Requirement

With the drive link in its uppermost position, adjust the bracket so that there is from .003 to .008 inch overtravel of the latch cam over the latch lever and so that, in the fully latched position, there is a minimum of .005 inch clearance between the normally open contact spring and the upper end of its stiffener. It may be necessary to refine the drive cam adjustment to obtain these requirements.

(f) Trip Cam Adjustment (Figure 8) (Preliminary)

Requirement

With the drive link in its lowermost position (Stop) rotate the trip cam counterclockwise until the lower end of the high section of the trip cam overtravels the lower latching surface of the latch lever by approximately .035 inch.

(g) Final Timing Adjustments

(It is recommended that a DXD or similar equipment be used - see Par. 12)). Refine the drive cam, trip cam, and, if necessary, the bracket position adjustments to meet the timing requirements of Paragraph 3.c.(9)(a). After these adjustments have been satisfied, the following requirements must also be met:

1. The requirements of Paragraph 3.c.(11).

2. In the latched position the trip cam must not interfere with the safe latching of the latch cam.

(10) Special Timing Adjustments for LP and LS Units operating at 100 WPM and used in "Delta" and "United Airlines" System.

(a) Timing Requirements for Normally Closed Contacts

With the normally open contacts are not used, the normally closed contacts should remain open for 53.88 milliseconds or 400 ± 15 DXD divisons.

NOTE

To prevent excessive flexing of the swinger the normally open contact spring stiffener must be bent to hold the spring away from the swinger with the drive link is in its uppermost position.

(b) With the contact assembly removed from the unit, follow procedure of Par. 3.c.(1) to (7) except:

1. The normally closed contact stiffener should be parallel with the contact bracket as judged by eye. To adjust, bend the normally closed contact stiffener.

2. The normally open contact spring tension need not be checked. The stiffener should be bent to obtain a contact gap of .075 to .085 inch with the swinger resting against the normally closed contact. See Figure 7.

(c) Contact Bracket Position (Figure 6) (Preliminary)

Requirement

With the drive link in its lowermost position (Stop) locate the bracket so that there is from .060 to .070 inch clearance between the top of the swinger insulator and the cut-out section of the latch cam. The latch lever latching surface should cover the width of the trip cam and latch cam. See Figure 4. (This clearance should be .035 to .045 inch for LS Units with R-Y Mechanism).

(d) Drive Cam Adjustment (Figure 9) (Preliminary)

Requirement

With the drive link in its uppermost position, rotate the drive cam clockwise until the latch cam latching surface overtravles the latching surface of the latch lever by .045 to .050 inch. (This clearance should be .065 to .075 inch for LS Units with R-Y Mechanism.)

(e) Contact Bracket and Drive Cam Position (Figure 10) (Final)

Requirement

Refine the drive cam position and/or if necessary the bracket position

so that there is from .015 to .025 inch gap between the normally closed contact and swinger contact in the fully latched position of the latch cam.

(f) Trip Cam Adjustment (Figure 8) (Preliminary)

Requirement

With the drive link in its lowermost position (Stop) rotate the trip cam counterclockwise until there is from .003 to .008 inch clearance between the front edge of the latch lever latching surface and the high section of the latch cam. The latch lever should rest on the tip of the lower high part of the trip cam to obtain the latest unlatching of the latch lever.

(g) Final Timing Adjustments

(It is recommended that a DXD or similar equipment be used - see Par. (12)). Refine the drive cam, trip cam, and, if necessary, the bracket adjustments to meet the timing requirements of Paragraph 3.c.(10)(a). After these adjustments have been satisfied, the following requirements must also be met:

1. The requirements of Paragraph 3.c.(11)(a),3,c,(11)(d),3.c.(11)(e), and 3.c.(11)(g).

2. The normal .003 to .008 inch overtravel of the latch cam over the latch lever with the drive link in its uppermost position must be increased to decrease the normally closed contact gap in the latched position of the latch cam. This prevents bouncing of the contacts when the latch is released.

3. With the latch cam in its latched position there should be a .015 inch minimum contact gap between the normally closed contacts. Refer to Figure 10.

(11) Upon completion of the final timing adjustments, it is important that the following requirements be met:

(a) With the drive link in its uppermost position, the latch cam shall not overtravel or hang up on the swinger insulator.

(b) With the drive link in its uppermost position there shall be at least .003 inch clearance between the latching surface of the latch cam and the latching surface of the latch lever. See Figure 9. (This does not apply to Paragraph 3.c.(8) (f)).

(c) With the drive link in its uppermost position the clearance between the normally open contact spring and its stiffener shall not exceed .025 inch. See Figure 9.

(d) With the drive link in its lowermost position (Stop) the top of the swinger insulator must clear the cut-out section of the latch cam. See Figure 6.

(e) With the drive link in its lowermost position (Stop) there shall be at least .003 inch clearance between the front edge of the latch lever latching surface and the high part of the latch cam. See Figure 8.

(f) With the latch cam in its latched position there shall be at least .005 inch clearance between the normally open contact spring and the upper end of its stiffener. See Figure 10.

(g) The latching surface of the latch lever shall cover the width of the trip cam and latch cam. See Figure 4.

(12) Timing Adjustment When Using the 197673 Modification Kit

(a) See Specification 50215S for installation of the 197673 Modification Kit.

(b) Lock the selector armature in the mark position.

(c) Rotate main shaft until all the clutches are latched and manually select the blank.

(d) Place an ohmmeter across the normally open "Blank" contact in Slot 36 of the function box.

(e) Rotate the main shaft until the pointer is at 0 on the indicator disc.

(f) Trip the code bar clutch, rotate the main shaft and note the indicator disc reading when the function box contact closes.

(g) When the indicator disc reaches 0, retrip the code bar clutch and note when the contact opens.

(h) Place the ohmmeter across the normally open universal contact and repeat the above procedure; noting when the universal contacts close and re-open.

(i) The static relationship between the operation of the function box contact and the universal contact should meet the requirements outlines in the adjustment section of this specification.

(13) LUBRICATION - Refer to Figure 11.

(a) Light film of grease to be applied to the following:

1. Contact insulator.

2. Operating surfaces of cams.

3. Latching surface of latch lever.

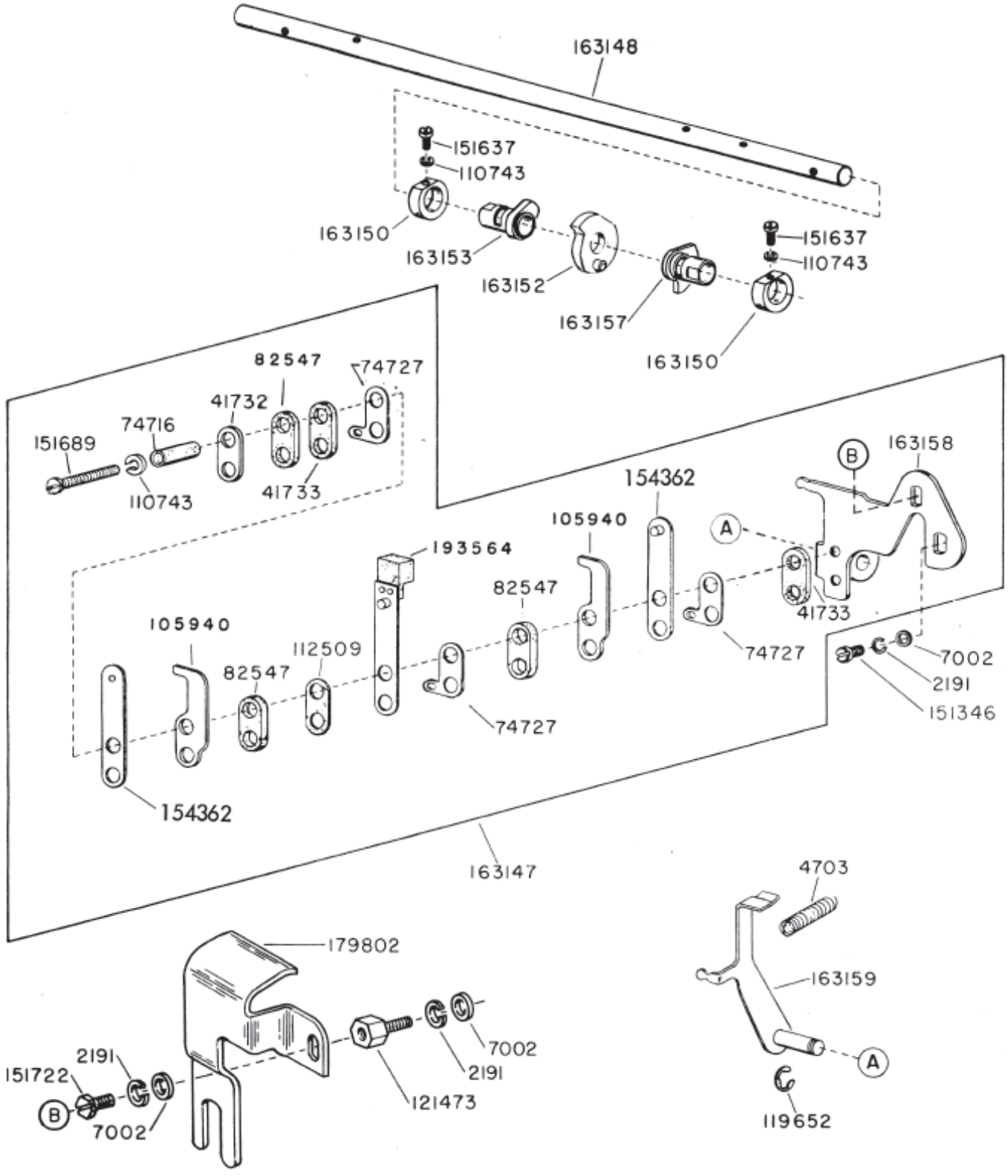
(b) Oil to be applied to the following.

1. Shaft, where latch cam rotates.

2. Latch lever stud.

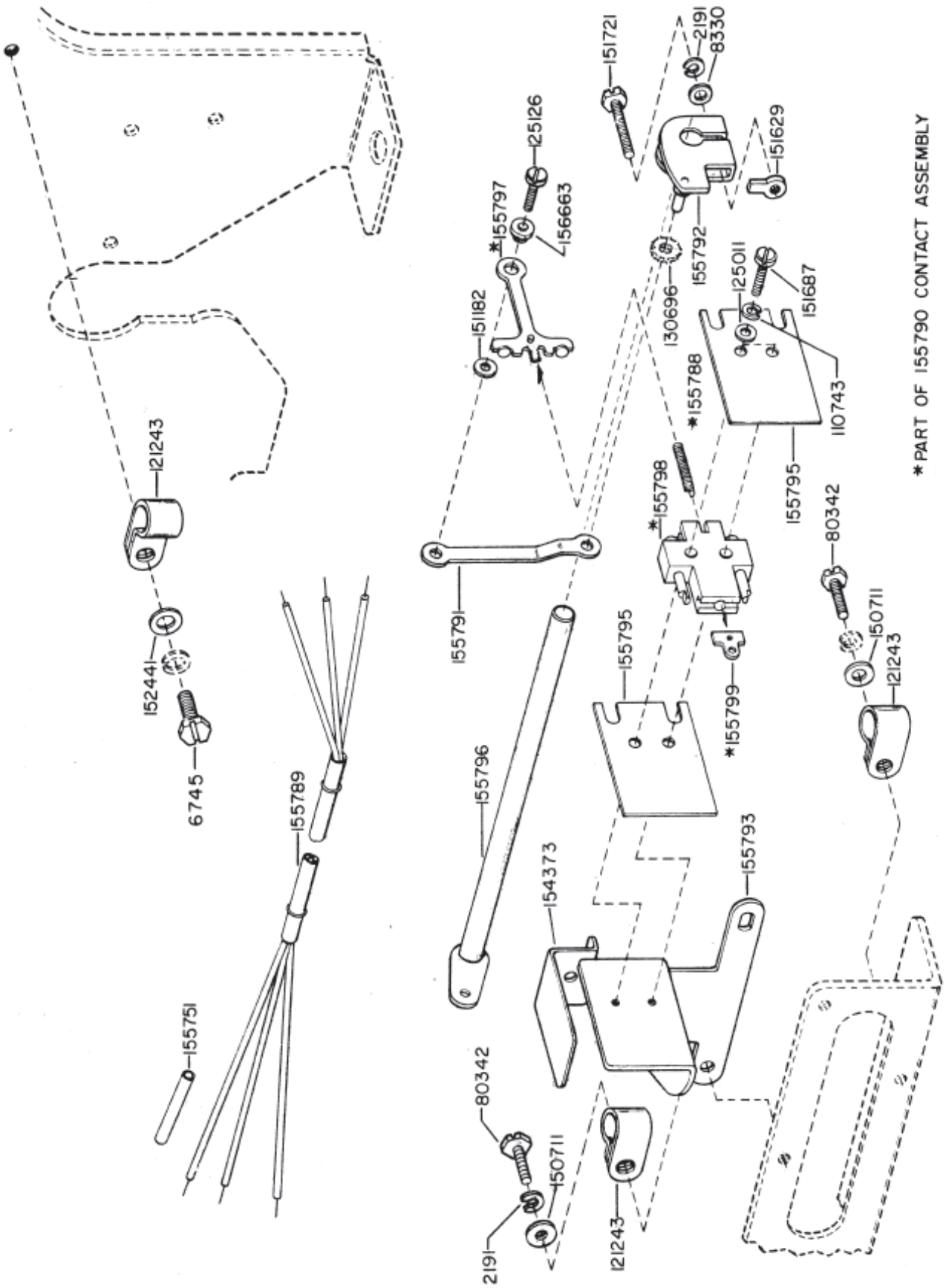
3. Springs.

* * *



163146 MODIFICATION KIT TO PROVIDE UNIVERSAL CONTACT

FIGURE 1



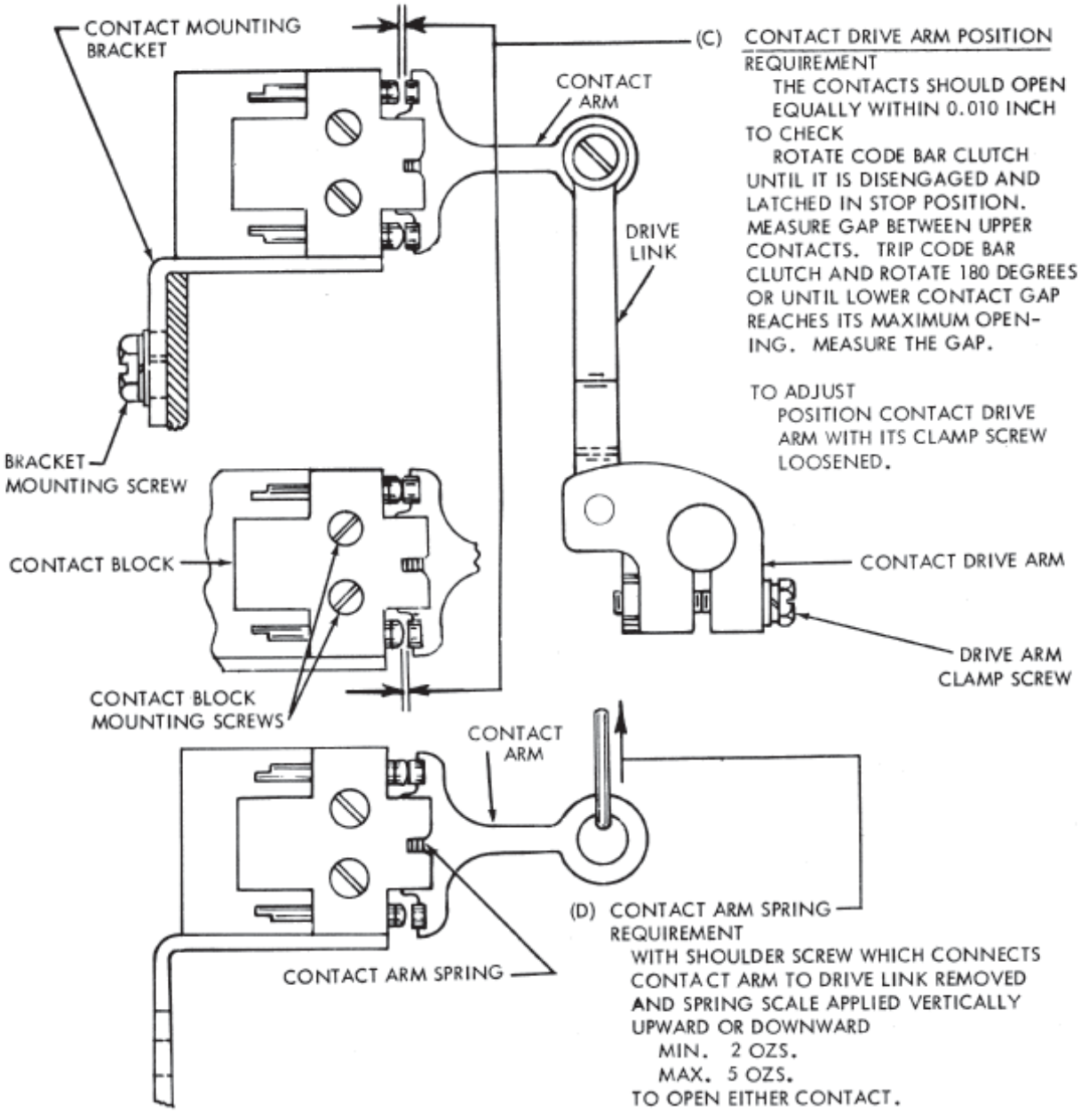
154785 MODIFICATION KIT TO PROVIDE UNIVERSAL CONTACTS

FIGURE 2

UNIVERSAL CONTACT (SELECTOR)

(A) CONTACT MOUNTING BRACKET
REQUIREMENT
THE DRIVE ARM LINKAGE SHOULD BE VERTICALLY ALIGNED TO PREVENT BINDS.
TO ADJUST
POSITION THE CONTACT MOUNTING BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

(B) CONTACT BLOCK
REQUIREMENT
THE CONTACT FACES SHOULD BE IN A VERTICAL STRAIGHT LINE
TO ADJUST
LOOSEN THE TWO CONTACT MOUNTING SCREWS. PRESS THE CONTACT BLOCK TOWARD THE REAR OF THE TYPING UNIT FIRMLY AGAINST THE SCREWS AND TIGHTEN THE SCREWS.



(C) CONTACT DRIVE ARM POSITION
REQUIREMENT
THE CONTACTS SHOULD OPEN EQUALLY WITHIN 0.010 INCH
TO CHECK
ROTATE CODE BAR CLUTCH UNTIL IT IS DISENGAGED AND LATCHED IN STOP POSITION. MEASURE GAP BETWEEN UPPER CONTACTS. TRIP CODE BAR CLUTCH AND ROTATE 180 DEGREES OR UNTIL LOWER CONTACT GAP REACHES ITS MAXIMUM OPENING. MEASURE THE GAP.

TO ADJUST
POSITION CONTACT DRIVE ARM WITH ITS CLAMP SCREW LOOSENED.

(D) CONTACT ARM SPRING
REQUIREMENT
WITH SHOULDER SCREW WHICH CONNECTS CONTACT ARM TO DRIVE LINK REMOVED AND SPRING SCALE APPLIED VERTICALLY UPWARD OR DOWNWARD
MIN. 2 OZS.
MAX. 5 OZS.
TO OPEN EITHER CONTACT.

FIGURE 3 TYPING UNIT, UNIVERSAL CONTACT (SELECTOR)

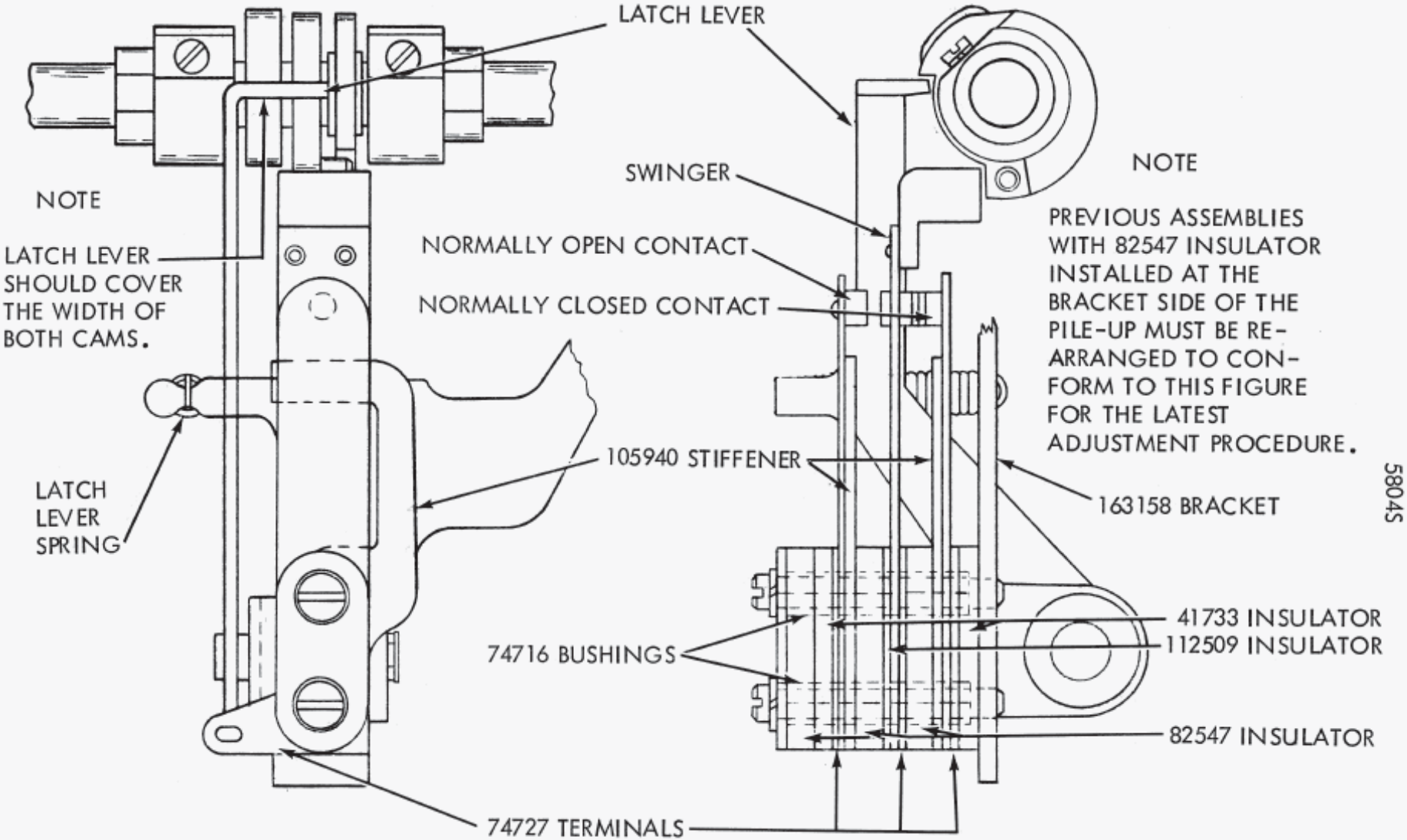

LATCH LEVER
NOTE
LATCH LEVER SHOULD COVER THE WIDTH OF BOTH CAMS.
LATCH LEVER SPRING
SWINGER
NORMALLY OPEN CONTACT
NORMALLY CLOSED CONTACT
105940 STIFFENER
74716 BUSHINGS
74727 TERMINALS
NOTE
PREVIOUS ASSEMBLIES WITH 82547 INSULATOR INSTALLED AT THE BRACKET SIDE OF THE PILE-UP MUST BE RE-ARRANGED TO CONFORM TO THIS FIGURE FOR THE LATEST ADJUSTMENT PROCEDURE.
163158 BRACKET
41733 INSULATOR
112509 INSULATOR
82547 INSULATOR
58045

FIGURE 4

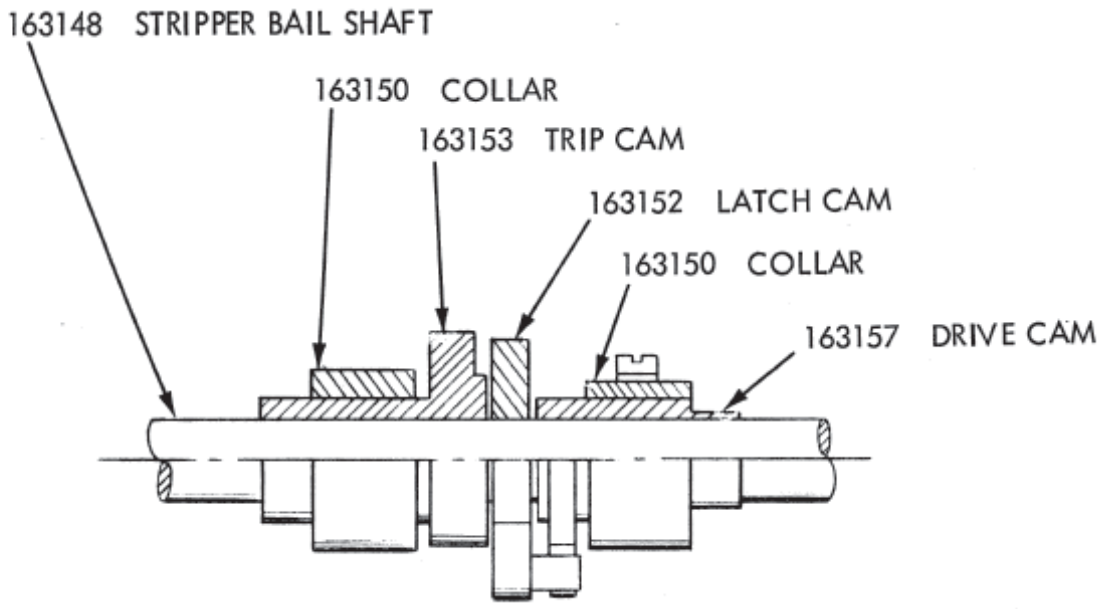


FIGURE 5

GENERAL APPLICATION

CONTACT BRACKET POSITION (PRELIMINARY)

REQUIREMENT
WITH DRIVE LINK IN ITS LOWERMOST POSITION
MIN .055
MAX .065

TO ADJUST
LOCATE CONTACT BRACKET

NOTE: FOR LS UNITS WITH R-Y MECHANISM THIS CLEARANCE SHOULD BE
MIN .035
MAX .045

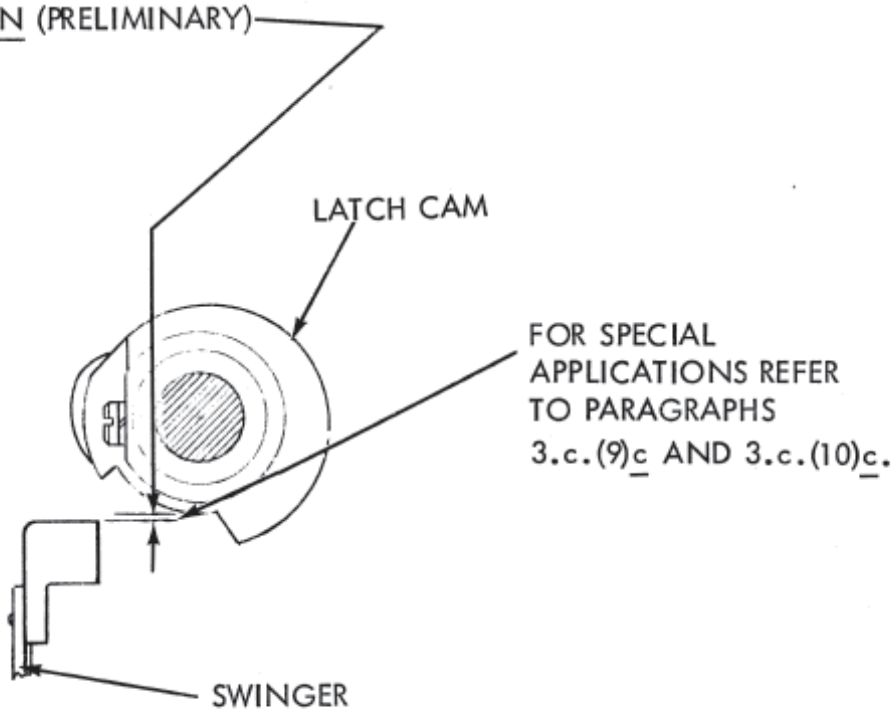
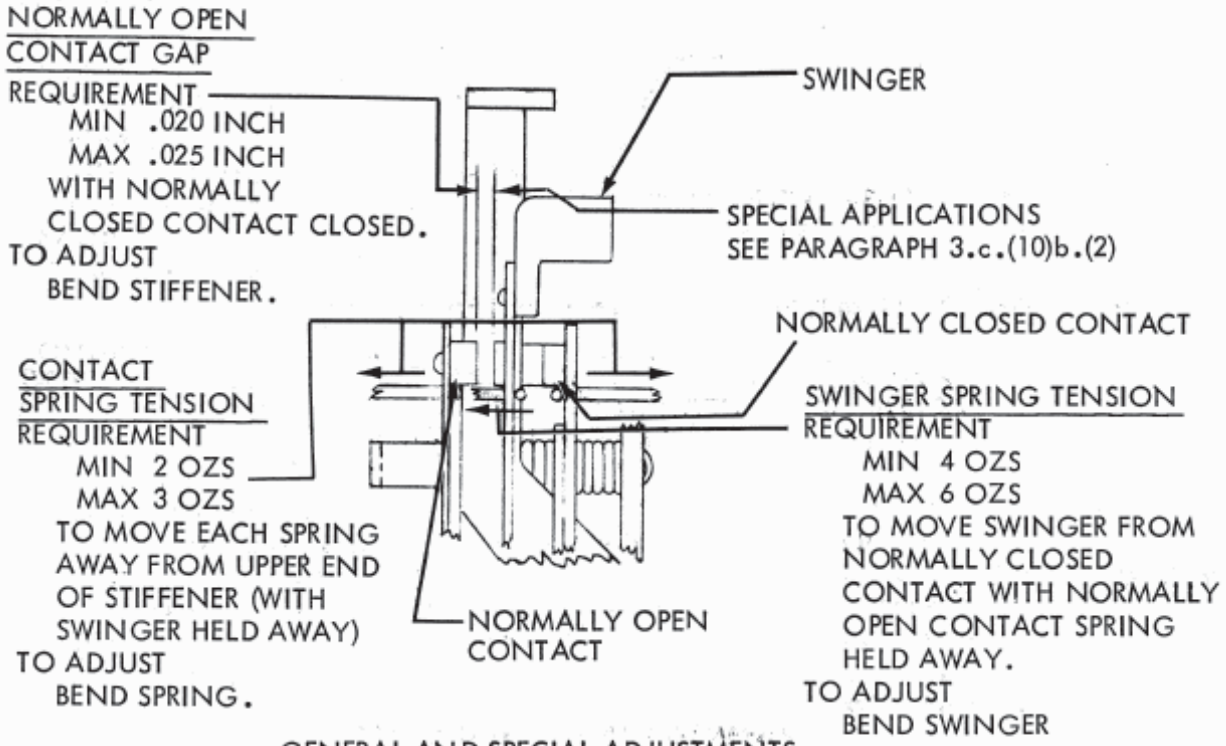
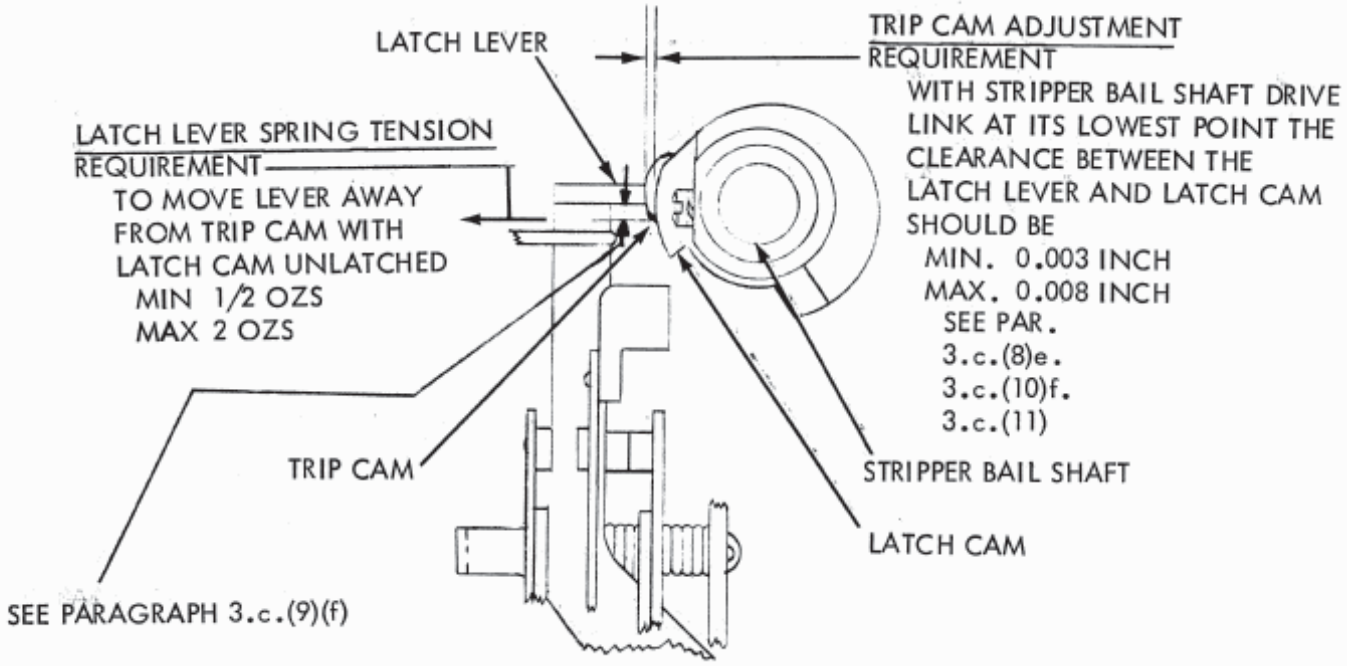


FIGURE 6



GENERAL AND SPECIAL ADJUSTMENTS
FIGURE 7



GENERAL AND SPECIAL ADJUSTMENTS

FIGURE 8

GENERAL AND SPECIAL ADJUSTMENTS

NOTE

THE ADJUSTMENTS BELOW ARE MADE WITH STRIPPER BAIL SHAFT DRIVE LINK IN ITS HIGHEST POSITION

CONTACT BRACKET AND DRIVE CAM ADJUSTMENT

1. REQUIREMENT
   THE CLEARANCE BETWEEN TOP OF LATCH LEVER AND LATCH CAM SHOULD BE
   MIN .003 INCH
   MAX .008 INCH
   TO ADJUST
   SEE PARAGRAPHS 3.c.(8)(c) & (d), 3.c.(9)(e), 3.c.(10)(d), AND 3.c.(11)(b).
2. REQUIREMENT
   CLEARANCE
   TO ADJUST
   SEE PARAGRAPHS 3.c.(8)(b), 3.c.(9)(d) AND 3.c.(11)(c).

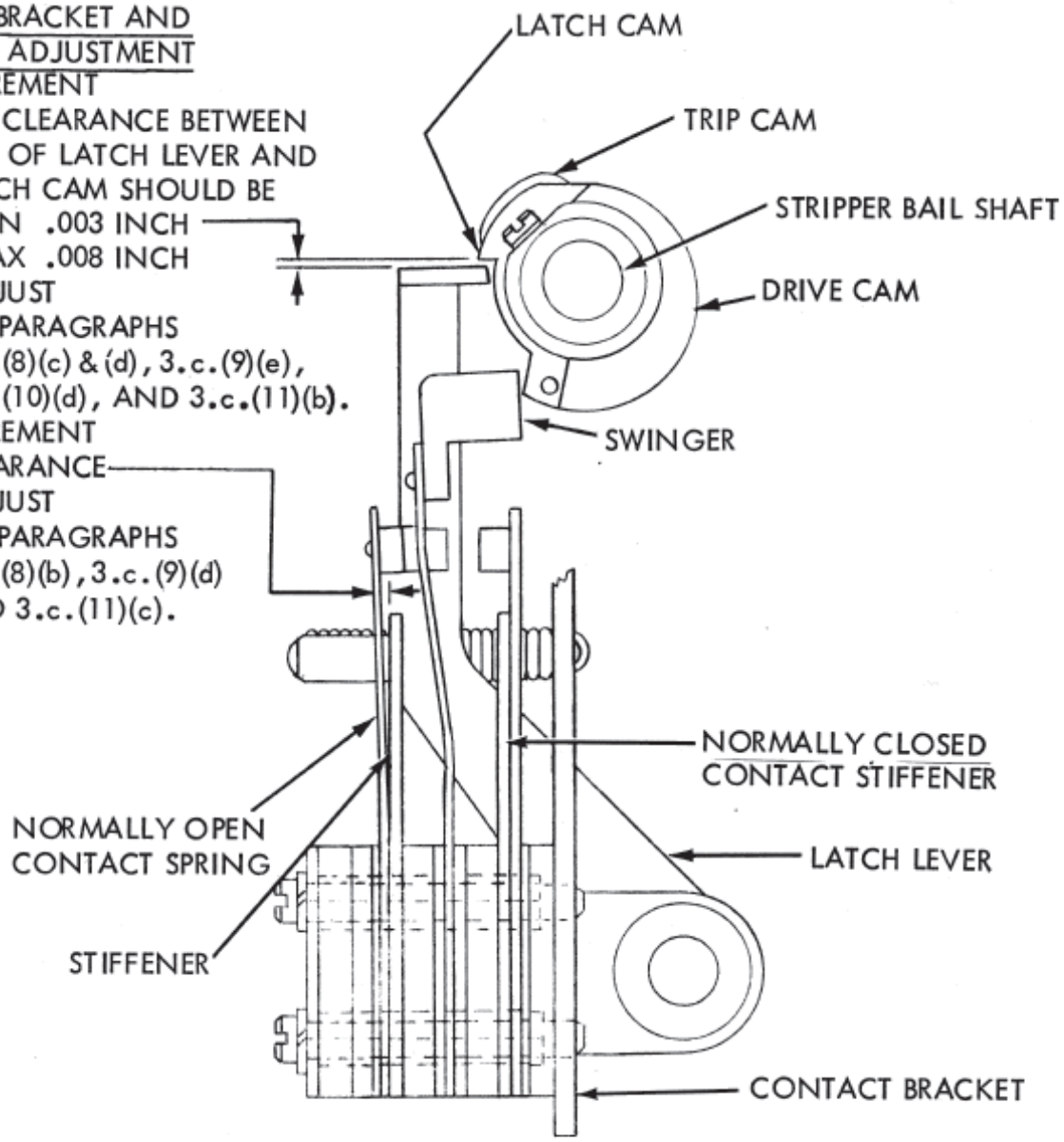


FIGURE 9

NOTE
CONTACT BRACKET & DRIVE CAM ADJUSTMENTS (FINAL)
WITH LATCH CAM FULLY LATCHED

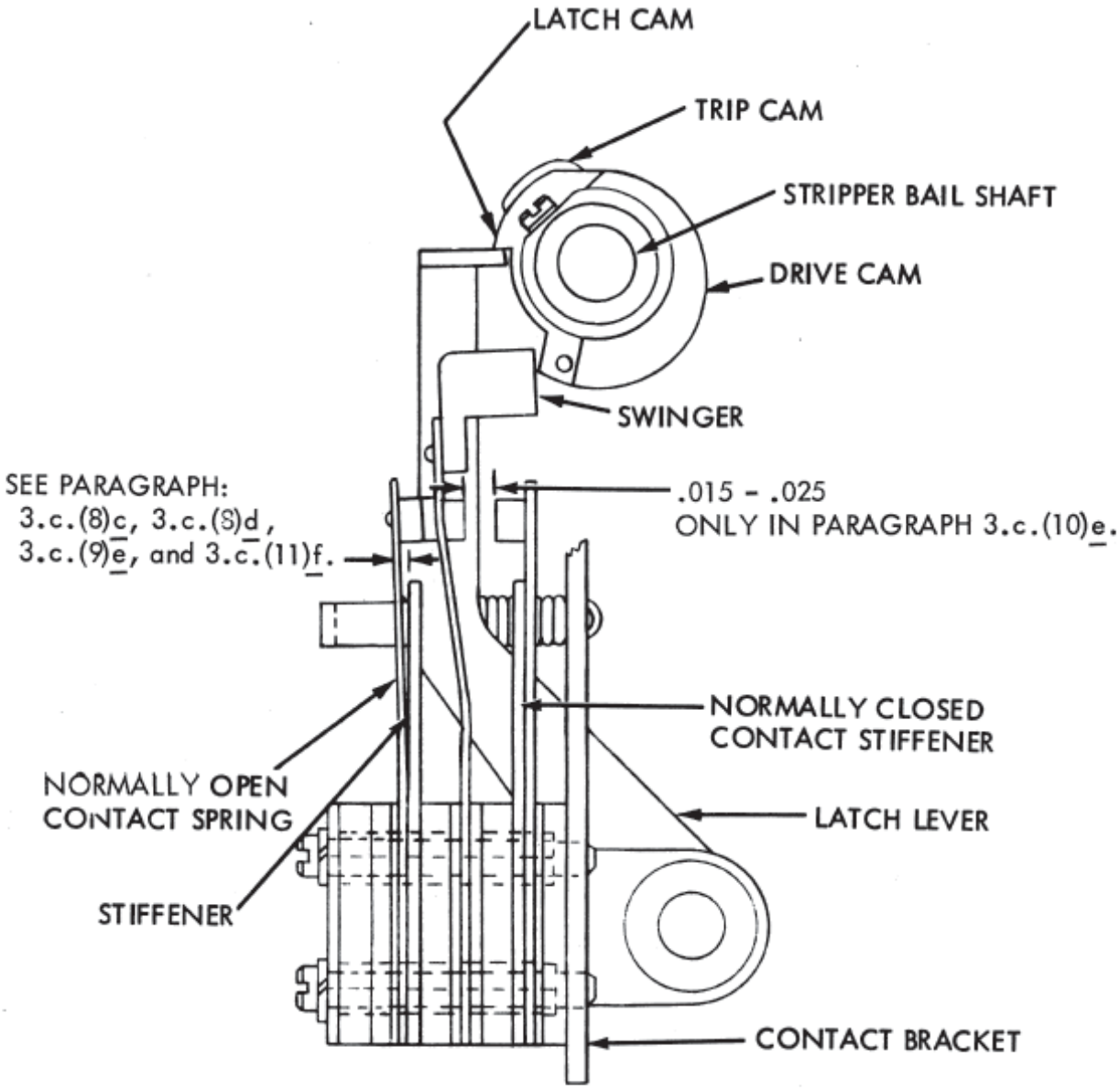


FIGURE 10

UNIVERSAL CONTACT MECHANISM

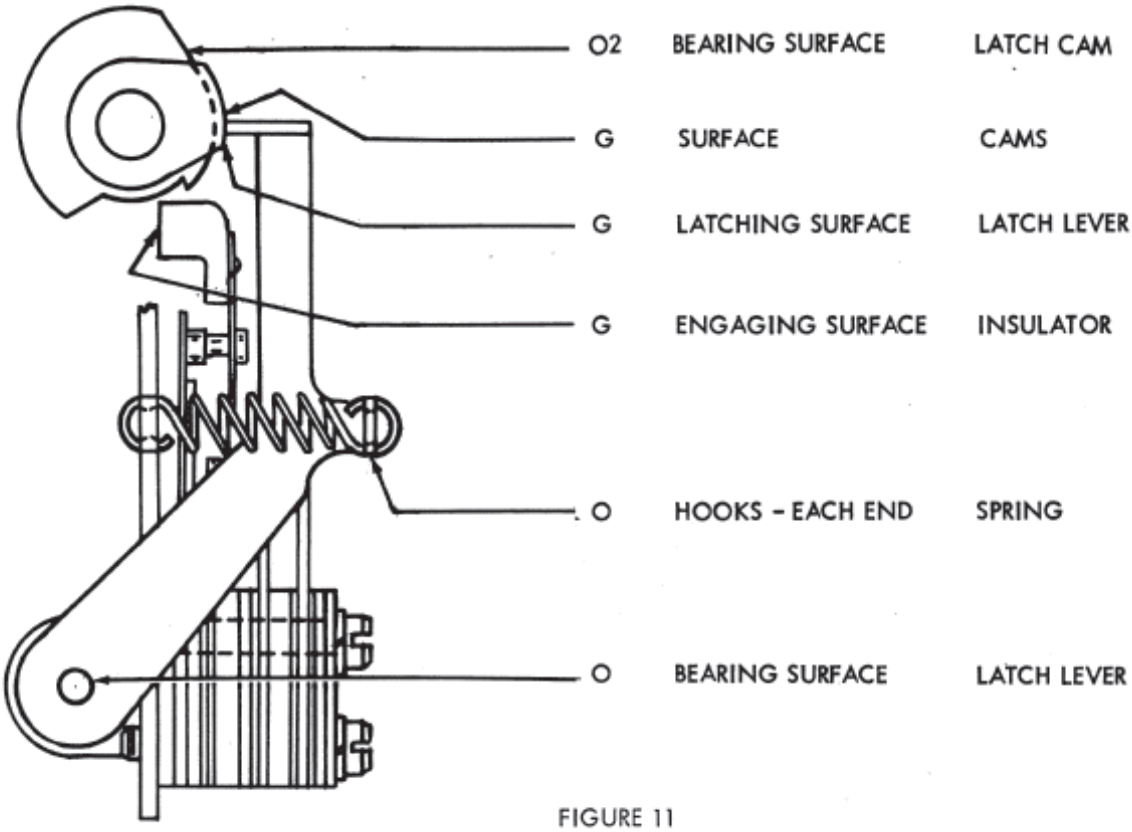
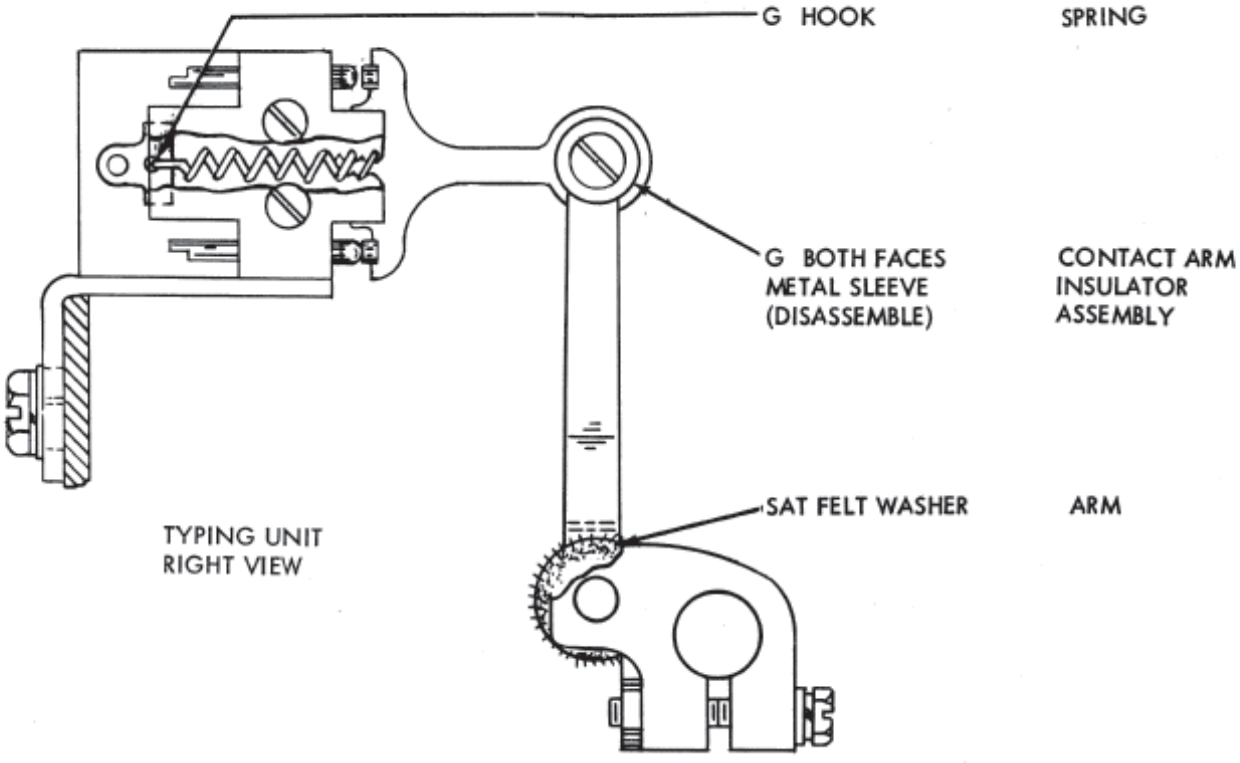


FIGURE 11

UNIVERSAL CONTACT MECHANISM (SELECTOR)



LUBRICATION CHART
FIGURE 12