

APPENDIX L

MODEL PR SEVENTY-FIVE PRINTING REPERFORATOR



## APPENDIX L

### 1. INTRODUCTION

This appendix provides maintenance, lubrication and adjustment instructions and parts list for the Printing Reperforator version of the Creed Model Seventy-five Teleprinter.

### 2. MAINTENANCE INSTRUCTIONS

Routine maintenance of the Printing Reperforator version of the Model Seventy-five should be carried out, where applicable, in accordance with the instructions given in Part 3, pages 1 – 10. Additional maintenance instructions, applicable only to a printing reperforator, are given below.

SHORT TERM	1000 hours of operation at 50 bauds, or 2400 operation counter units
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#### 1 Perforator Unit

1.1 Examine the surface of the platen for wear and, if necessary, renew the platen as follows:—

- (a) Disconnect the five springs securing the selector levers, Fig.L.1. to the selector cable block.
- (b) Remove the two screws securing the cable block to the selector frame. Hold the frame securely in position, gently ease out the cable block and then immediately refit the outer screw back into the frame, as shown in the figure. This is to ensure that the trunnion blocks and spacers inside the frame remain in their correct positions.
- (c) Disconnect the spring between the pin on the punch shaft and the anchor pin on the main base.
- (d) Remove the screw securing the punch shaft to its spindle and withdraw the spindle together with its collar.
- (e) Carefully slide the punch shaft away from the selector frame.
- (f) Remove the two screws securing the punch block to the unit casting. Withdraw the punch block together with the selector frame assembly away from the platen.
- (g) Remove and discard the circlip securing the platen and take off the platen.
- (h) Insert a new platen and secure it with a new circlip

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- (j) Refit the punch block and selector frame assembly and secure the block with its two screws.
  - (k) Slide the punch shaft into position. Insert the punch shaft spindle into the shaft and secure the shaft to the spindle with its screw.
  - (l) Re-connect the spring between the pin on the punch shaft and the anchor pin on the main base.
  - (m) Hold the selector frame in position and withdraw the screw temporarily inserted for this purpose. Refit the selector cable block to the frame and secure it with its two screws.
  - (n) Re-connect the five springs securing the selector levers to the selector cable block.
- 1.2 Inspect the punches for wear. If the tips are slightly rounded, remove the punches and sharpen them with a lapping block (Creed Part No. TA 1301) and oilstone (Creed Part No. 16816). If the tips show excessive wear, renew the punches as follows:—
- (a) Disconnect the five springs securing the selector levers, Fig L 1, to the selector cable block.
  - (b) Remove the two screws securing the cable block to the selector frame. Hold the frame securely in position, gently ease out the cable block and then immediately refit the outer screw back into the frame, as shown in the figure. This is to ensure that the trunnion blocks and spacers inside the frame remain in their correct positions.
  - (c) Disconnect the spring between the pin on the punch shaft and the anchor pin on the main base.
  - (d) Remove the screw securing the punch shaft to its spindle and withdraw the spindle together with its collar.
  - (e) Carefully slide the punch shaft away from the selector frame.
  - (f) Slacken the two screws securing the cuttings chute and take off the chute.
  - (g) Remove the capstan-headed screw securing the feed link, Fig.L 10, to the punch block and take off the link.
  - (h) Remove the two screws securing the punch block, Fig.L 1, to the unit casting. Withdraw the punch block together with the selector frame assembly.
  - (j) Remove the two screws securing the punch cover plate, Fig L.2, and take off:—
    - (i) the cover plate
    - (ii) two die plates
    - (iii) tape guide plate, and
    - (iv) four die plates

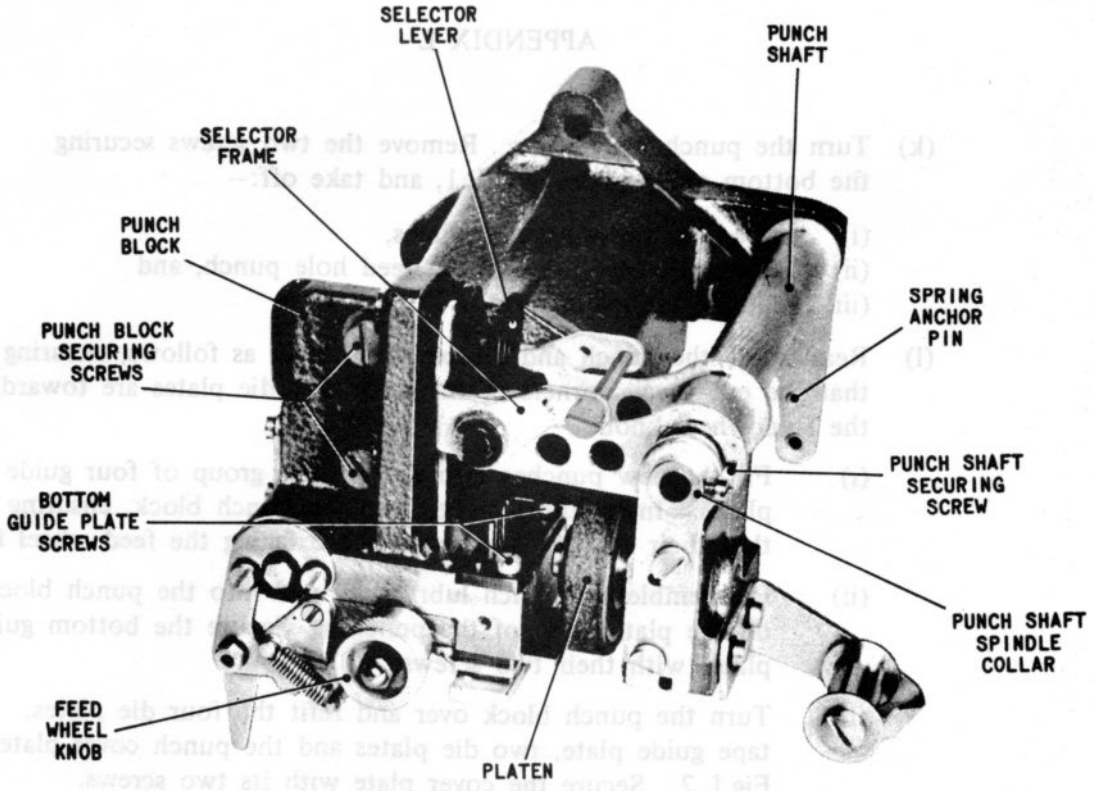


FIG.L.1 SELECTOR LEVERS ASSEMBLY

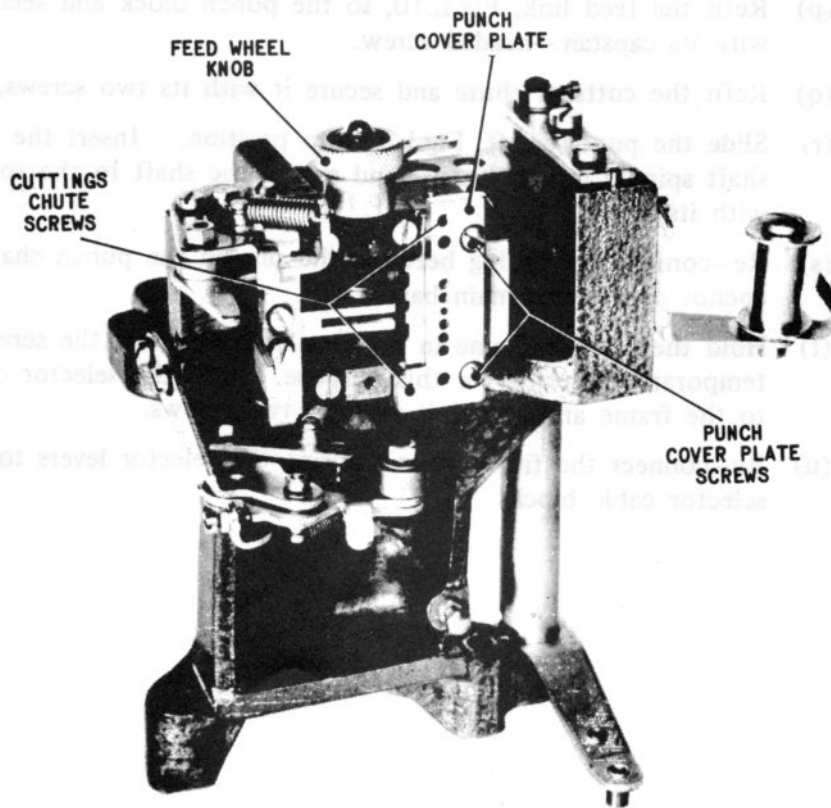


FIG.L.2 PERFORATOR UNIT

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- (k) Turn the punch block over. Remove the two screws securing the bottom guide plates, Fig.L.1, and take off:–
  - (i) the four bottom guide plates,
  - (ii) five code punches and the feed hole punch, and
  - (iii) punch lubrication pad.
- (l) Reassemble the punch and die plate assembly as follows, ensuring that the cut-away corners of the guide and die plates are towards the feed wheel knob.
  - (i) Fit the new punches into the bottom group of four guide plates. Insert the punches into the punch block, ensuring that their flat cut-out surfaces are facing the feed wheel knob.
  - (ii) Reassemble the punch lubrication pad into the punch block on the platen side of the punches. Secure the bottom guide plates with their two screws.
  - (iii) Turn the punch block over and refit the four die plates, tape guide plate, two die plates and the punch cover plate, Fig.L.2. Secure the cover plate with its two screws.
- (m) Check that the punches are free to move in the punch block.
- (n) Refit the punch block and selector frame assembly and secure the block with its two screws.
- (p) Refit the feed link, Fig.L.10, to the punch block and secure it with its capstan-headed screw.
- (q) Refit the cuttings chute and secure it with its two screws, Fig.L.2.
- (r) Slide the punch shaft, Fig.L.1, into position. Insert the punch shaft spindle into the shaft and secure the shaft to the spindle with its screw.
- (s) Re-connect the spring between the pin on the punch shaft and the anchor pin on the main base.
- (t) Hold the selector frame in position and withdraw the screw temporarily inserted for this purpose. Refit the selector cable block to the frame and secure it with its two screws.
- (u) Re-connect the five springs securing the selector levers to the selector cable block.

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3. LUBRICATION INSTRUCTIONS

Periodic lubrication of the Printing Reperforator version of the Model Seventy-five should be carried out, where applicable, in accordance with the pictorial lubrication instructions given in Part 3, pages 11 – 32. Additional lubrication points, applicable only to a printing reperforator, are given below.

SHORT TERM	1000 hours of operation at 50 bauds, or 2400 operation counter units
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Lubricant	Lubrication Point and Quantity	Reference
Creed No. 2	<p>(1) Lightly lubricate all pivots, friction faces, bearings, couplings and felts, paying special attention to the following:—</p> <p style="padding-left: 40px;">Perforator Unit</p> <p style="padding-left: 40px;">(a) Retention lever pivot and roller</p> <p style="padding-left: 40px;">(b) Feed pawl pivot</p> <p style="padding-left: 40px;">(c) Back space lever pivot</p> <p style="padding-left: 40px;">(d) Back space pawl pivot</p> <p style="padding-left: 40px;">(e) Throwout lever pivot</p> <p style="padding-left: 40px;">(f) Selector levers pivot pin</p> <p style="padding-left: 40px;">(g) Slot in selector assembly bearing plate</p> <p style="padding-left: 40px;">Selector Cables Unit</p> <p style="padding-left: 40px;">(h) Transfer lever spindle</p> <p style="padding-left: 40px;">(j) Selector cables lubricating pad</p> <p style="padding-left: 40px;">Main Base</p> <p style="padding-left: 40px;">(k) All couplings, pivots and felts of punch link assembly</p> <p style="padding-left: 40px;">(l) All couplings, pivots and felts of feed link assembly</p> <p style="padding-left: 40px;">(m) All bearings, pivots, felts, cams and rollers of run out shaft assembly</p> <p style="padding-left: 40px;">(n) All bearings, pivots and detents of run out trip levers assembly</p> <p style="padding-left: 40px;">(p) Pivots of run out connecting link</p>	<p>AN, Fig.L.48</p> <p>AW, Fig.L.49</p> <p>AD, Fig.L.48</p> <p>AH, Fig.L.49</p> <p>AF, Fig.L.49</p> <p>T, Fig.L.47</p> <p>E, Fig.L.47</p> <p>M, Fig.L.42</p> <p>O, Fig.L.27</p> <p>T, Fig.L.32</p> <p>BR, Fig.L.30</p> <p>AD, Fig.L.30</p> <p>BM, Fig.L.30</p> <p>BV, Fig.L.30</p>

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Lubricant	Lubrication Point and Quantity	Reference
Creed No. 2	Translator Unit	
	(q) Run Out disablement pin pivot and felt washer	AA, Fig.L.34
	(r) Bearings and felts of tape feed suppression shaft	D, Fig. L.34
	Selector Unit	
	(s) Starter trip lever pivot	AG, Fig.L.27
	General	
	(t) Pivots of all tape guide rollers	
	(u) All spring anchors	
	(2) Fill all oil cups and oil holes, paying special attention to the following:-	
	Perforator Unit	
	(a) Bearing blocks of tape feed spindle	U, Fig.L.48
	(b) Punches	
	(c) Bearings of punch shaft	BG, Fig.L.47
Selector Cables Unit		
(d) Selector Cable block (translator end)	C, Fig.L.42	
(e) Selector Plunger block (perforator end)	A, Fig.L.42	
Main Base		
(f) Bearings at each end of run-out shaft	AD, Fig.L.30	
(g) Bearings of compensator cam lever	BF, Fig.L.30	

4. ADJUSTMENT INSTRUCTIONS

The adjustments necessary for the Printing Reperforator version of the Model Seventy-five teleprinter comprise:-

- (a) those adjustments to a standard Model Seventy-five teleprinter which also apply to the Reperforator.
- (b) those adjustments which have the same designation as those of a standard Model Seventy-five teleprinter but which have a slightly different context applied to the Reperforator, and
- (c) additional adjustments which apply only to the Reperforator.

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A Key, based on the Contents List of Part 4, is given below and will identify (a) above. Adjustments classified in (b) and (c) will be found immediately following the Key.

### KEY

- |   |   |                |
|---|---|----------------|
| 1. Armature Stop Bracket                  | } | As for Part 4  |
| 2. Centralising Springs                   |   |                |
| 3. Clutch Trigger Backstop Clearance      |   |                |
| 4. Clutch Abutment Engagement             |   |                |
| 5. Function Bar Reset                     |   |                |
| 6. Print Release Lever                    |   |                |
| 7. Case Shift Lever – Vertical Position   |   |                |
| 8. Case Shift Lever – Horizontal Position |   |                |
| 9. Non-Print Hook                         |   |                |
| 10. Letter Feed Latch                     | } | Not Applicable |
| 11. Carriage Return Latch                 |   |                |
| 12. Selector Drive Shaft End-Play         | } | As for Part 4  |
| 13. Starter Switch-Operating Link         |   |                |
| 14. Starter Switch Spindle                |   |                |
| 15. Starter Switch Hold-out Lever         |   |                |
| 16. Starter Switch Hold-out Bush          |   |                |
| 17. Corrector Backstop                    |   |                |
| 18. Governor Contacts Clearance           |   |                |
| 19. Governor Contact Assembly Location    |   |                |
| 20. Keybar/Combination Bar Clearance      |   |                |
| 21. Trip Lever Pivot                      |   |                |
| 22. Push Rod Lift                         |   |                |
| 23. Contact Springs                       |   |                |
| 24. Latch Trip Lever                      |   |                |
| 25. Lag Disc Clearance                    |   |                |
| 26. Release Lever Lift                    |   |                |
| 27. Release Lever Trip Arm Engagement     |   |                |
| 28. Translator Clutch                     |   |                |
| 29. Pin-Box Traverse Multiplying Lever    |   |                |
| 30. Pecker Retention Arm                  |   |                |



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- |   |   |                |
|---|---|----------------|
| 31. Selector Detent Clearance                   | } | As for Part 4  |
| 32. Selector Camshaft Retention Lever           |   |                |
| 33. Selector Clutch                             |   |                |
| 34. Selector Rockshaft End-Play                 |   |                |
| 35. Translator Trip Operating Lever Stop        |   |                |
| 36. Translator Clutch Trip                      |   |                |
| 37. Starter Trip from Electromagnet             |   |                |
| 38. Starter Trip from Translator Clutch         |   |                |
| 39. Pecker/Code Selection Pin Clearance         |   |                |
| 40. Pecker Traverse                             |   |                |
| 41. Carriage Return Pawl Lift                   | } | Not applicable |
| 42. Line Feed Lever Stop Plate                  |   |                |
| 43. Friction Feed Platen                        |   |                |
| 44. Sprocket Feed Platen                        |   |                |
| 45. Paper Guide Retainers                       |   |                |
| 46. Line Feed Pawl Overthrow Stops              |   |                |
| 47. Platen Retention Pawl                       |   |                |
| 48. Typehead Carriage End-Play                  |   |                |
| 49. Typehead Carriage Stop Screw and Pawl Latch |   |                |
| 50. Feed and Retention Pawl Height              |   |                |
| 51. Typehead Carriage Feed Link                 |   |                |
| 52. Carriage Return Spring                      |   |                |
| 53. Dashpot                                     |   |                |
| 54. Print Spring                                |   |                |
| 55. Typehead/Platen Clearance                   | } | As for Part 4  |
| 56. Print Beam Stop Screw                       |   |                |
| 57. Typehead Corrector                          |   |                |
| 58. Typehead Corrector Track Rail               |   | Not applicable |
| 59. Typehead Height-Initial Setting             | } | As for Part 4  |
| 60. No.5 Aggregate Motion Lever                 |   |                |
| 61. No.4 Aggregate Motion Lever                 |   |                |
| 62. No.1 Aggregate Motion Lever                 |   |                |
| 63. No.3 Aggregate Motion Lever                 |   |                |
| 64. Typehead Height-Preliminary Setting         |   |                |
| 65. Ribbon Spool Damping                        |   |                |
| 66. Ribbon Spool Clearance                      |   |                |
| 67. Ribbon Unit Pawls                           |   |                |
| 68. Ribbon Jumper Arm                           |   | Not applicable |

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69. Keyboard Combination Bar Reset	}	As for Part 4
70. Keyboard Trip Lever Pivot-Dynamic Check		
71. Selector Bar/Selection Pin Alignment		
72. Selector Bar/Selection Pin Clearance		
73. Lag Weight Release Lever Stop		
74. Lag Weight Trip		
75. Lag Weight Movement		
76. Translator Trip from Lag Weight		
77. Send-Receive Delay Lever Clearance		
78. Send-Receive Switch Contacts		
79. Send-Receive Contact Delay		
80. Send-Receive Contact Delay-Dynamic Check		
81. Motor Speed		
82. Transmitter Contacts and Signals Length (TDMS)		
83. Transmitter Contacts and Signals Length (Timing Disc)		
84. Lag Weight Transit Timing	}	Not applicable
85. Typehead Height-Final Setting	}	As for Part 4
86. Carriage Return Button	}	Not applicable
87. Dashpot-Dynamic Check		
88. Line Length Operating Stop		
89. Starter Switch Timing	}	As for Part 4
90. Bell and WRU Contacts		
91. Operation Counter		
92. Selector Bar/Punch-Vertical Clearance	}	Not applicable
93. Selector Bar/Punch-Horizontal Clearance		
94. Punch Withdrawal Plate		
95. Feed Hole Pitch-Initial Setting		
96. Feed Pawl Height		
97. Feed Pawl Engagement		
98. Reperforator Control Knob		
99. Reperforator Control Lever Stop Screw		
100. Reperforator Suppression from Bell and WRU		
101. Throwout Lever Reset Chopper		
102. Tape Feed Latch		
103. Feed Hole Pitch-Final Setting		

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104. Tape Exhaust Alarm	}	As for Part 4
105. Keyboard Suppression		
106. Trip from Keyboard		
107. Vertical Trip Link		
108. Trip from Function Bar		
109. Transfer Lever Bracket		
110. Trip Link Stop Screw		
111. Feed Pawl		
112. Feed Pawl Stop		
113. Trip Mechanism		
114. Line Length		Not applicable
115. Operating Check and Setting-Up Procedure		As for Part 4

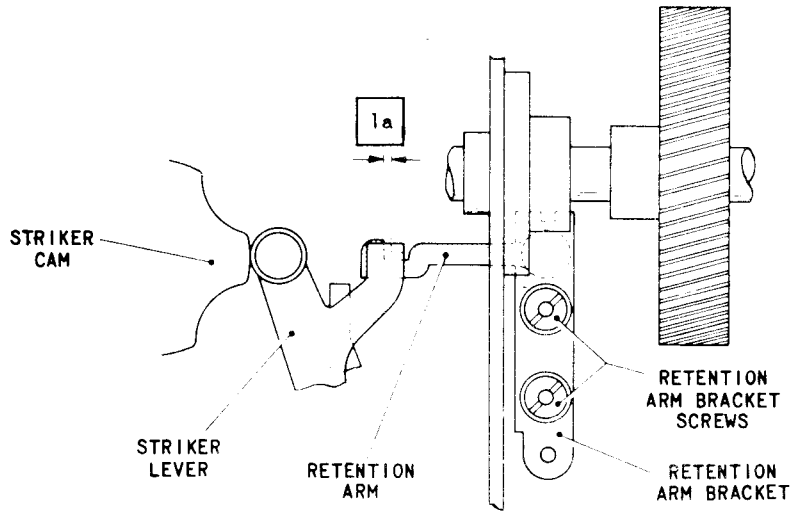
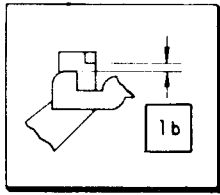


FIG.L.3 PECKER RETENTION ARM MECHANISM

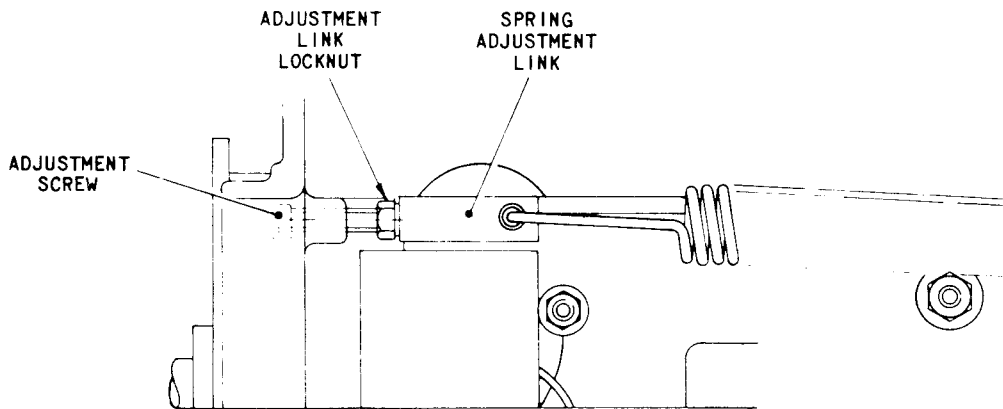


FIG.L.4 PRINT SPRING MECHANISM

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### 1. Pecker Retention Arm

#### (a) Horizontal Position

##### Check

- 1.1 Move the electromagnet armature to the space position so that the selector clutch detent, Fig.4.28, is released. Turn the machine by hand until the striker lever, Fig.L.3, is on one of the high points of the striker cam. Check that there is now a horizontal clearance of  $.005 - .010$  in. (dimension 'la') between the hook on the retention arm and the engagement face of the striker lever.

##### Action

- 1.2 If this is not so, slacken the two screws securing the retention arm bracket until it is friction tight. Using the screwdriver slot in the top of the bracket, lever the retention arm sideways until the correct clearance is present. Tighten the bracket screws.

#### (b) Vertical Position

##### Check

- 1.3 Move the electromagnet armature to the mark position and continue to turn the machine by hand until the striker lever locates in one of the recesses in the striker cam. Check that this movement causes the lever to pass over the retention arm with an estimated vertical clearance of  $.010 - .020$  in. (dimension 'lb' inset).

##### Action

- 1.4 To adjust, ensure that the electromagnet armature is still in the mark position, slacken the rockshaft stop arm screw, Fig.4.28, and the two screws securing the armature link pivot bracket N, Fig.7.14, and position the bracket until the correct clearance is achieved. Secure the bracket in this position with its two screws, reposition the rockshaft stop arm Fig.4.28, and tighten the stop arm screw.

### 2. Print Spring

##### Check

- 2.1 Stand the machine on its back and check that a force of approximately 3 lb (1.36 kg), applied to the print beam, Fig.4.47, at and in the direction of the arrow, just moves the beam.

##### Action

- 2.2 To adjust, slacken the locknut of the spring adjustment link, Fig. L.4, and turn the adjustment screw until the correct tension is present. Tighten the locknut.

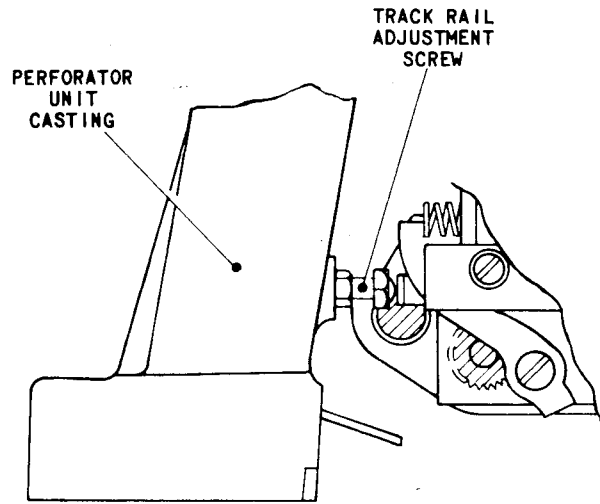


FIG.L.5 CORRECTOR TRACK RAIL ADJUSTMENT MECHANISM

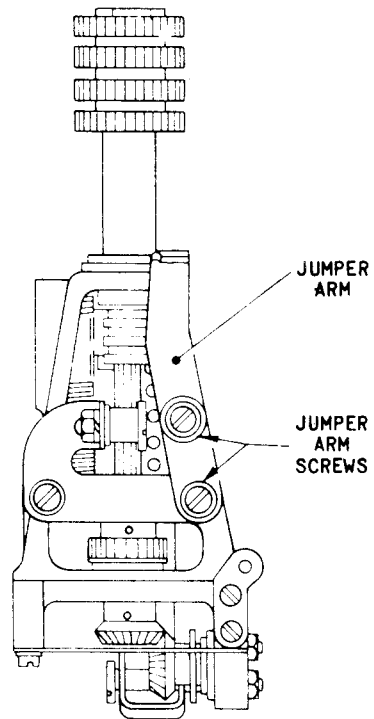


FIG.L.6 RIBBON JUMPER ARM

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### 3. Typehead Corrector Track Rail

#### Check

- 3.1 Depress the letter 'X' Key or, if the machine has no Keyboard, set up the letter 'X' combination (MSMMM) on the pins. Lift the translator clutch abutment and turn the machine by hand until the typehead moves forward to print. Press the typehead casting forward so that the typehead moves towards the platen. Using slip gauge TA 1337, check that when the corrector lever, Fig.4.49, is fully engaged with the corrector wheel the typehead is within .100 - .125 in. of the platen.

#### Action

- 3.2 If this condition is not present, slacken the locknut securing the track rail adjustment screw, Fig.L.5 (located on the perforator unit casting) and adjust this screw until the condition is satisfied. Tighten the locknut.

### 4. Ribbon Jumper Arm

#### Check

- 4.1 Depress any printing Key or, if the machine has no Keyboard, set up any printing combination on the pins. Lift the translator clutch abutment and turn the machine by hand until the printing action has taken place. Press the typehead casting so that the typehead is held against the platen and check that the upper edge of the ribbon is approximately .030 in. above the type face which is in contact with the platen.

#### Action

- 4.2 If this is not so, slacken the two screws securing the jumper arm, Fig.L.6, and adjust the arm until the above condition is satisfied. Tighten the arm screws.

### 5. Punch Link Setting

#### Check

- 5.1 With the machine in the rest position, check that the two punch link rollers, Fig.L.7, are touching their respective cams.

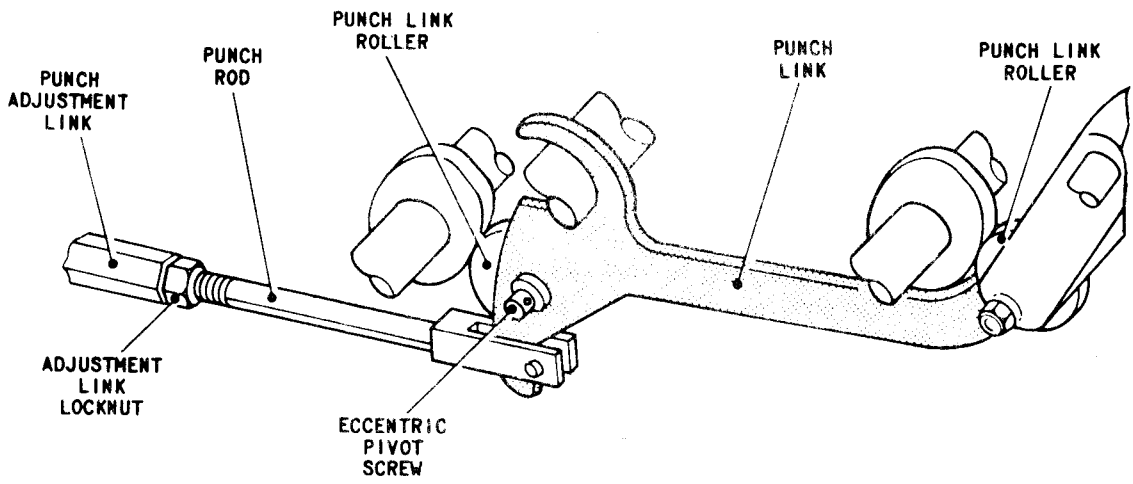


FIG. L.7 PUNCH LINK MECHANISM

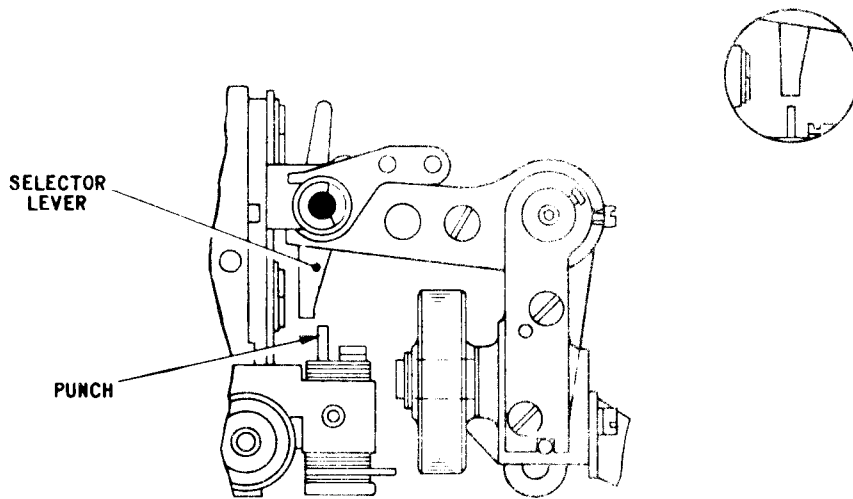


FIG. L.8 PUNCH SELECTOR MECHANISM



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### Action

- 5.2 If this is not so, stand the machine on its back, slacken the nut behind the left-hand roller (accessible through a hole in the base casting) and turn the eccentric pivot screw until the correct condition is obtained. Tighten the nut.

### 6. Punching—Initial Setting

#### Check

- 6.1 With the machine in the rest position, check that the endwise movement of the punches, Fig.L.8, is between .003 - .030 in. Check also that all the slack movement in the punch rod, Fig.L.7, is taken up by the punch retraction spring.

#### Action

- 6.2 To adjust, slacken the locknut securing the punch adjustment link and unscrew the link until it is slack and the punches, Fig.L.8, have little or no endwise movement. Slowly retighten the link, Fig.L.7, until the slack is just taken up and then tighten by a further half-turn. Secure the link in this position with its locknut.

### 7. Selector Levers

#### Check

- 7.1 With the machine in the rest position, check that the selector cable adjusting blocks, Fig. L.9, are located against the transfer lever spindle. Depress the letter 'T' Key or, if the machine has no Keyboard, set up the letter 'T' combination (SSSSM) on the pins. Lift the translator clutch abutment and turn the machine by hand through approximately half a revolution of the translator camshaft and check that the fifth element punch selector, Fig.L.8, just covers its punch, as shown in the inset.
- 7.2 Repeat Check 7.1 for the other four selector levers in turn, setting-up the appropriate code combination on the pins.

#### Action

- 7.3 To adjust, slacken the socket-headed grub screw in the appropriate cable adjusting block, Fig.L.9, and slide the corresponding cable sleeve in or out until the cable is correctly adjusted. Tighten the screw.

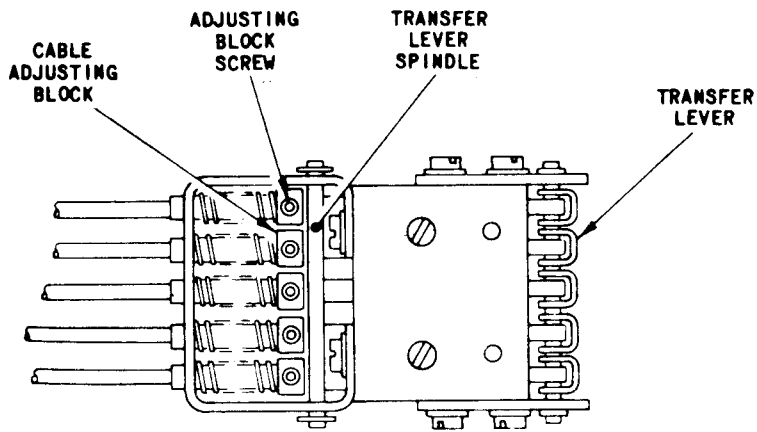


FIG.L.9 SELECTOR CABLES

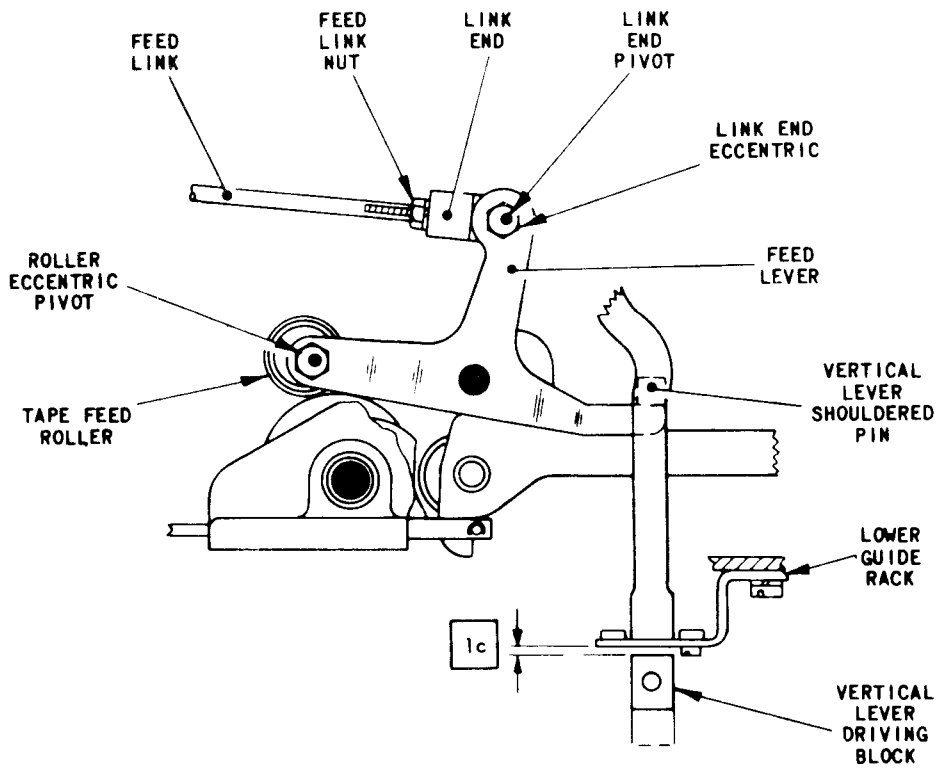


FIG.L.10 FEED LEVER MECHANISM

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### Check

- 7.4 With the machine in the rest position and the All Space code (SSSSS) set up on the pins, lift the translator clutch abutment and turn the machine by hand until the selector levers, Fig.L.8, have moved to the limit of their excursion towards the front of the machine. Check that the levers are now clear of their punches by approximately  $\cdot 030$  in. This ensures that the selector cables are moving freely.

### Action

- 7.5 If necessary, free the cables and refine Adjustments 7.1 to 7.4 inclusive until all the conditions are satisfied. Secure the cables.

## 8. Tape Feed Lever

### Check

- 8.1 With the machine in the rest position, hold the tape feed roller, Fig. L.10, down on to its cam. Press the vertical lever shouldered pin against the feed lever and check that there is now a clearance of up to  $\cdot 005$  in. (dimension 'lc') between the vertical lever driving block and the lower guide rack.

### Action

- 8.2 To adjust, slacken the locknut securing the roller eccentric pivot and turn the pivot until dimension 'lc' is obtained. Secure the pivot in this position with its locknut.

## 9. Tape Feed

### Check

- 9.1 With the machine in the rest position, hold the vertical lever driving block, Fig.L.11, against the lower guide rack. Check that there is an estimated clearance of  $\cdot 020$  -  $\cdot 035$  in. (dimension 'ld') between the feed lever and the feed lever latch.

### Action

- 9.2 To adjust, slacken the screw securing the driving block and reposition the block until dimension 'ld' is satisfied. Tighten the screw.

### Check

- 9.3 Check that the throwout lever, Fig.L.12, is clear of the feed pawl by approximately  $\cdot 060$  in.

### Action

- 9.4 To adjust, slacken the locknut securing the throwout lever adjustment screw and turn the screw clockwise to obtain this condition. Tighten the locknut.

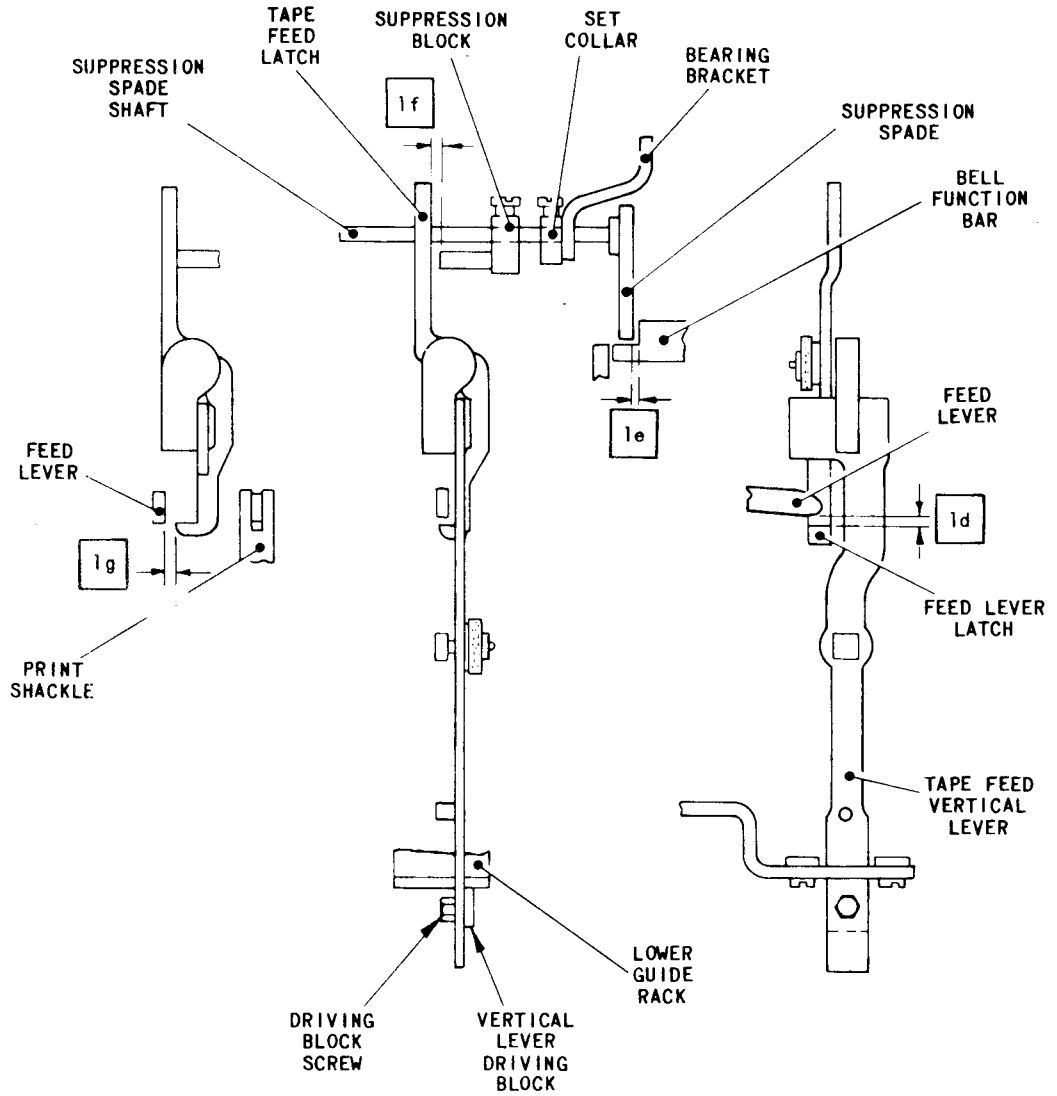


FIG.L.II TAPE FEED LINKAGE AND FEED SUPPRESSION MECHANISM

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Check

9.5 Check that the back space pawl is clear of its ratchet.

Action

9.6 If necessary, slacken the nut securing the stop pin and adjust the pin in its slot until the condition is satisfied. Tighten the nut.

Check

9.7 With the machine in the rest position, check that the capstan-headed screw securing the Feed link end is directly behind the feed spindle centre line, as shown in Fig.13. This ensures that the feed pawl, Fig.L.12, is operating in the correct tooth.

Action

9.8 If the pawl is operating in the wrong tooth, slacken the nut securing the link end eccentric, Fig.L.10, and turn the eccentric to its top mid-position. Tighten the nut. Remove the circlip securing the link end on its pivot and slide off the end together with the feed link. Slacken the nut securing the feed link to the link end and screw the end along the thread to obtain the required setting, taking care that there is at least 1/8 in. of thread left in the link end. Refit the link end on its pivot and secure it with its circlip. Tighten the feed link nut carefully, ensuring that the link end moves freely on its pivot.

Check

9.9 Feed a length of punched tape into the perforator. With the machine in the rest position, turn the feed wheel knob, Fig.L.13, counter-clockwise until resistance is felt. This movement should be approximately equal to 1/4 of a feed hole diameter and it can be checked by sighting at position 'X'.

Action

9.10 To adjust , slacken the nut securing the link end eccentric, Fig.L.10, and turn the eccentric (using the top half of its throw) to obtain the required setting. Tighten the nut.

Check

9.11 Set up any feeding combination on the pin-box. Lift the translator clutch abutment and turn the machine by hand until the feed lever has moved fully to the right. Turn the feed wheel knob, Fig.L.13, and check that the tape feed spindle has turned through one feed hole pitch only. Turn the knob in the opposite direction and check that there is some backward movement present. Return the machine to the rest position. Repeat the check using the run out shaft instead of the translator shaft.

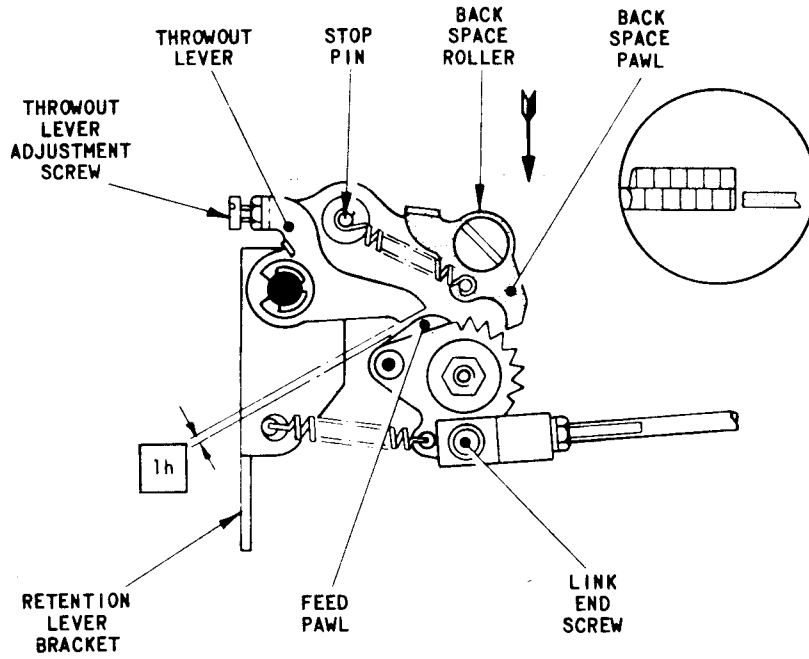


FIG. L.12 TAPE FEED MECHANISM

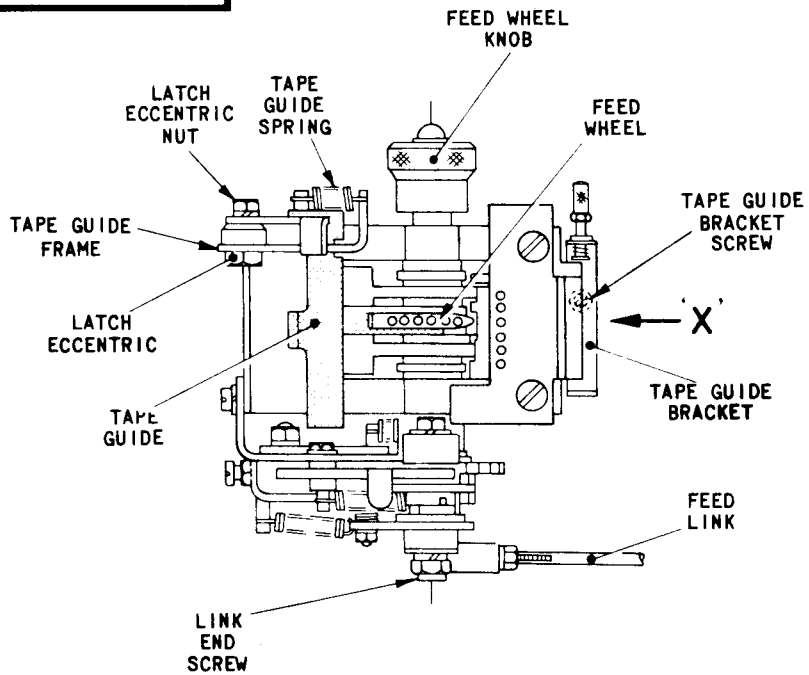
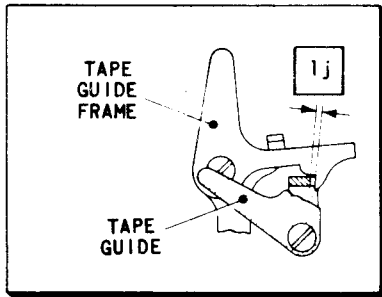


FIG. L.13 LATERAL TAPE GUIDE AND LATCH MECHANISM

## APPENDIX L

### Action

9.12 If either condition in Check 9.11 is not satisfied, refine Adjustment 9.10.

## 10. Tape Feed Suppression

### Check

10.1 Turn the machine to the rest position. Move the shift lever, Fig. 4.53, to the Letters position, i.e. to the left looking from the rear of the machine. Set up a combination on the pins which will suppress the tape feed action in Figures shift only, i.e. Bell (MMSMS). Lift the translator clutch abutment and turn the machine by hand until the Bell function bar, Fig.L.11, has moved as far as possible towards the rear of the machine. With set collar against the bearing bracket, check that there is a clearance of .005 – .010 in. (dimension 'le') between the suppression spade and the Bell function bar.

### Action

10.2 To adjust, slacken the screw securing the set collar and move the collar along the suppression spade shaft until the required clearance is obtained. Tighten the screw, taking care that its head is clear of the bracket.

### Check

10.3 With the machine set up as in Check 10.1, check that there is a clearance of .002 – .010 in. (dimension 'lf') between the pin on the suppression block and the tape feed latch.

### Action

10.4 To adjust, slacken the screw securing the suppression block and, holding the set collar against the bearing bracket, move the block along the suppression spade shaft until dimension 'lf' is obtained. Tighten the screw.

### Check

10.5 With the machine set up as in Check 10.1, move the shift lever, Fig. 4.53, to the Figures position and check that the feed lever clears the tape feed latch by more than .010 in. (dimension 'lg'). Check also that the feed lever does not foul the print shackle.

### Action

10.6 If necessary, refine Adjustment 10.4.

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### 11. Back Space

#### Check

- 11.1 Press lightly on the back space roller, Fig.L.12, to bring the back space pawl into contact with its ratchet. Check that the tip of the pawl lies in the middle of the ratchet tooth, as shown in the inset.

#### Action

- 11.2 To adjust, set the retention lever bracket until the required condition is obtained.

#### Check

- 11.3 Feed a length of punched tape into the perforator. Slacken the locknut securing the throwout lever adjustment screw and turn the screw counter-clockwise until the throwout lever moves the feed pawl out of engagement with the ratchet. Press the back space roller towards the rear of the machine until it is hard against its stop. Hold the roller in this position and turn the feed wheel knob, Fig.L.13, clockwise until resistance is felt. This movement should be approximately equal to half a feed hole diameter and it can be checked by sighting at position 'X'.

#### Action

- 11.4 If necessary, slacken the nut securing the stop pin, Fig.L.12, and adjust the pin in its slot until the condition is satisfied. Tighten the nut.

#### Check

- 11.5 With the back space lever in the rest position, check that the back space pawl is clear of its ratchet. This can be checked by turning the feed wheel knob, Fig.L.13, in a clockwise direction. If the knob can turn, the pawl is clear of its ratchet.

#### Action

- 11.6 If the feed wheel knob cannot be turned, refine Adjustment 11.4.
- 11.7 With the machine in the rest position, slacken the locknut securing the throwout lever adjustment screw, Fig.L.12, and turn the screw clockwise until there is a clearance of .005 – .015 in. (dimension 'lh') between the throwout lever and the feed pawl. Tighten the nut.

#### Check

- 11.8 Press the back space roller several times in the direction of the arrow. Check that each time the roller is pressed, the tape feed spindle is rotated counter-clockwise by one complete pitch and then located securely by the retention lever, roller, Fig.L.14.



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### Action

11.9 If necessary, refine Adjustment 11.4 and 11.7.

## 12. Lateral Tape Guide

### Check

12.1 Perforate a length of tape with an All Mark (MMMMM) combination.

12.2 If the machine is to be used on communications work, check by eye that the code holes are disposed centrally across the tape.

12.3 If the machine is to be used on data processing systems, check by using tape gauge TA 1443 that the distance between the feed hole and the reference edge of the tape is .389 – .395 in.

### Action

12.4 To adjust, slacken the screw securing the tape guide bracket, Fig. L.13, and move the bracket until the lateral position of the tape is satisfied. Tighten the screw.

## 13. Tape Feed Latch

### Check

13.1 Check that the slot between the tines of the tape guide, Fig.L.13, is centrally disposed about the teeth of the feed wheel.

13.2 Insert a length of tape punched with feed holes into the perforator and check, by carrying out the following procedures, that the tips of the tines are just touching the tape.

- (a) Lift the retention lever, Fig.L.14, out of engagement with the retention wheel
- (b) Lift the tape guide, Fig.L.13, and turn the feed wheel knob, noting the force required to do so.
- (c) Lower the guide on to the tape and turn the feed wheel knob again. Check that there is no discernible difference in the force required to turn the knob. Check also that there is no visible gap between the tips of the tines and the tape.

### Action

13.3 If either of these checks is not satisfied, remove the tape guide spring, Fig. L.13, slacken the nut securing the latch eccentric and turn the eccentric until there is a clearance (dimension 'lj' – inset) between the hook on the latch and the tape guide frame.

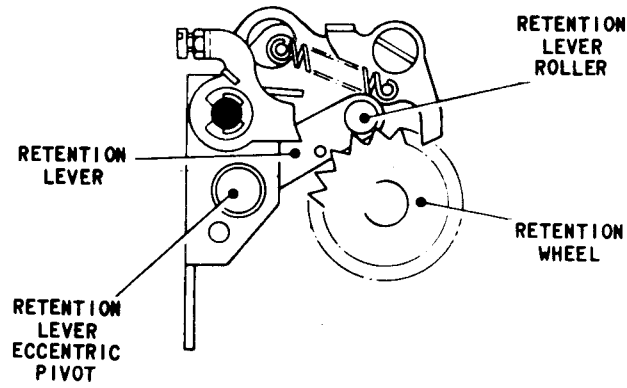


FIG.L.14 RETENTION LEVER MECHANISM

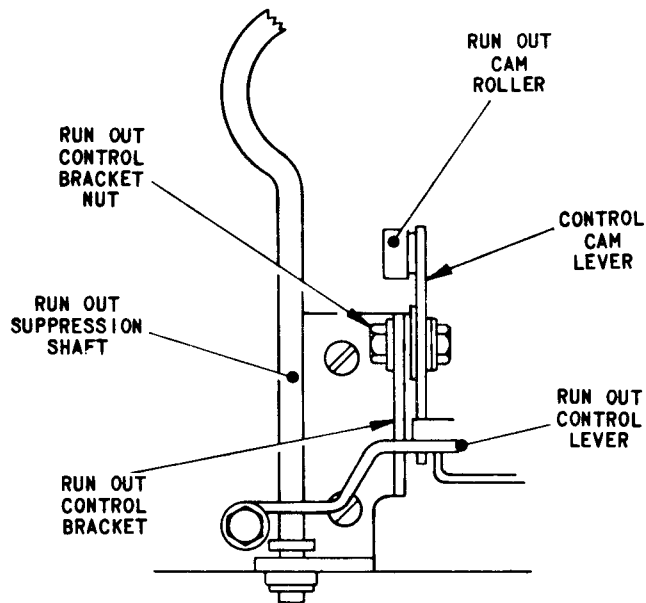
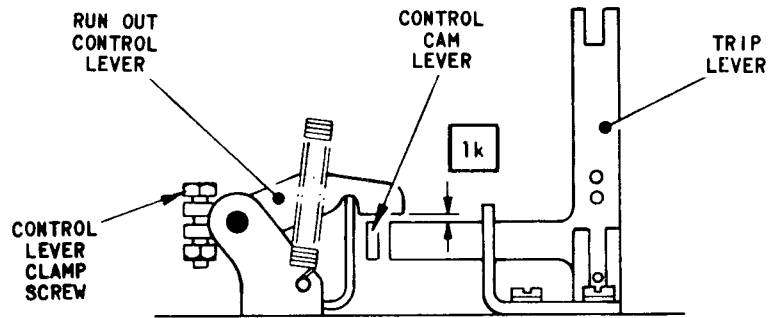


FIG.L.15 RUN OUT CONTROL MECHANISM

## APPENDIX L

- 13.4 Slacken the screws securing the tape guide to the tape guide frame and, pressing the tape lightly on to the rollers by means of the tape guide, slide the guide backwards and forwards until its curved underside is positioned concentrically with the rollers, ensuring that the slot in the guide remains centrally disposed about the teeth of the feed wheel. Tighten the tape guide screws.
- 13.5 Refit the tape guide. Insert two thicknesses of tape punched with feed holes into the perforator. Adjust the latch eccentric until, with the tape guide resting on the tape, the hook on the latch is just touching the engagement face of the tape guide frame, i.e. dimension 'lj' is no longer present. Clamp the eccentric with its locknut.
- 13.6 Remove one thickness of tape. Slacken the tape guide screws again and move the guide towards the guide frame until the tips of the tines on the guide just touch the tape. Ensure that the slot in the guide is still centrally disposed about the teeth of the feed wheel and tighten the tape guide screws.

### 14. Feed Hole Pitch

#### Check

- 14.1 Insert a length of tape punched with feed holes into the perforator and check with a tape pitch gauge TA 1385 that the pitch of the feed holes is either constant, or increases and decreases regularly so that the total change of pitch is not more than half a feed hole pitch in ten inches of tape.

#### Action

- 14.2 If the feed pitch is irregular, refine Adjustments 13.3 to 13.6.
- 14.3 If the feed hole pitch varies regularly but the cumulative variation over ten inches is more than half a feed hole pitch, slacken the nut securing the retention lever eccentric pivot, Fig.L.14, and turn the eccentric until the feed hole pitch is regular. Tighten the nut.
- 14.4 Repeat Check 14.1 and, if necessary, refine Adjustments 9 and 14.3 until the condition is satisfied.

### 15. Run Out Control Lever

#### Check

- 15.1 With the machine in the rest position, check that the trip lever Fig.L.15, and the run out control cam lever are each with .005 in. (dimension 'lk') of the underside of the run out control lever.

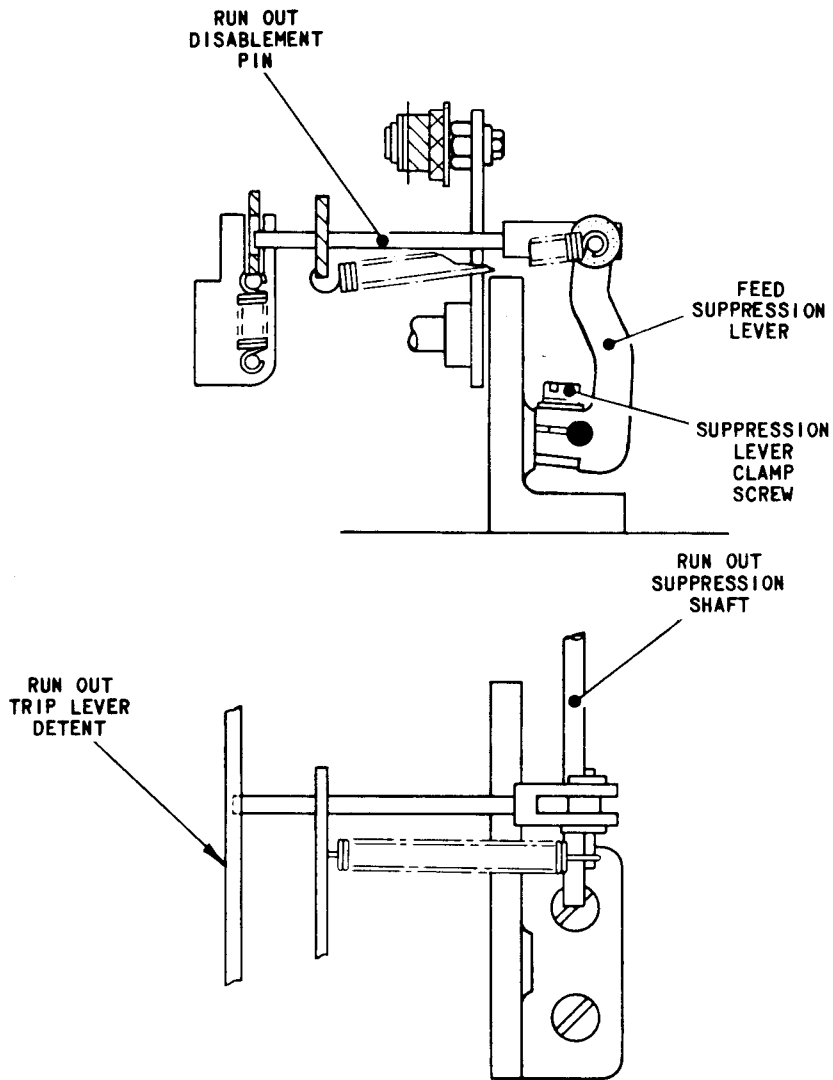


FIG.L.16 RUN OUT DISABLEMENT PIN POSITION

## APPENDIX L

### Action

15.2 To adjust, slacken the nut securing the run out control bracket and push the control cam lever and its screw down as far as they will go. Tighten the nut friction tight and, holding the run out cam roller down on to its cam, gently prise the control cam lever upwards until its tail is just touching the underside of the control lever. Fully tighten the bracket nut.

### Check

15.3 Lift the selector clutch detent and turn the machine by hand so that the control lever is lifted by the trip lever. Check that the bend in the run out suppression shaft does not foul any other component during its movement.

### Action

15.4 To adjust, slacken the control lever clamp screw and reposition the lever, on the shaft until the foul is cleared. Tighten the clamp screw.

## 16. Run Out Disablement Pin

### Check

16.1 With the machine in the rest position and all three clutches disengaged, check that the feed suppression lever, Fig.L.16, is so positioned axially along the run out suppression shaft that the disablement pin is approximately at right angles to the trip lever detent.

### Action

16.2 To adjust, slacken the screw clamping the feed suppression lever and move the lever along the shaft until the condition is satisfied.

### Check

16.3 Check that the engagement between the disablement pin and the trip lever detent is approximately half the thickness of the detent.

### Action

16.4 To adjust, hold the run out control lever, Fig.L.15, down on to the trip lever and the control cam lever, and position the feed suppression lever, Fig.L.16, on the suppression shaft to obtain the required condition. Tighten the suppression lever clamp screw.

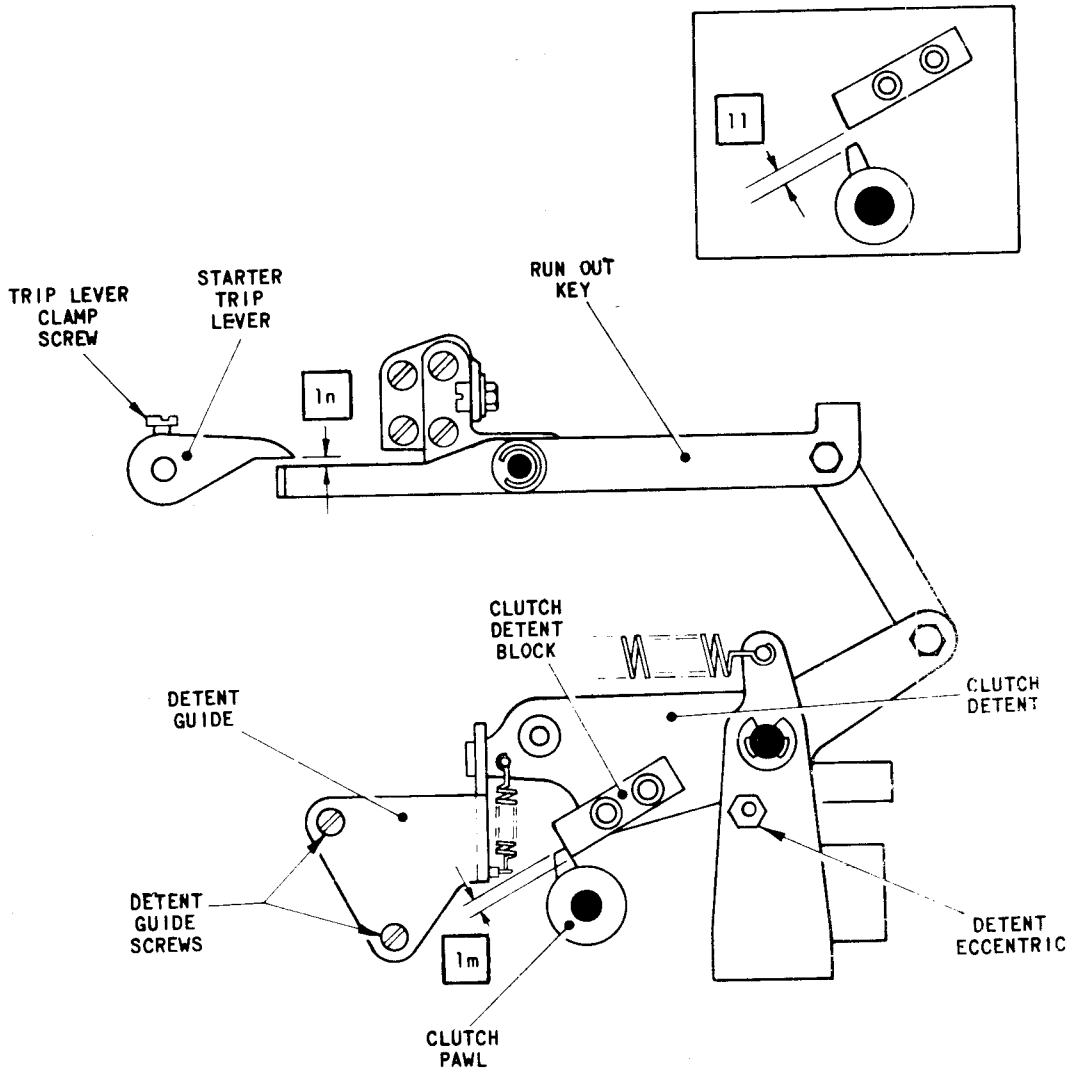


FIG.L.17 RUN OUT TRIP MECHANISM

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### 17. Run Out Clutch Detent

#### Check

- 17.1 With the run out shaft in the rest position, trip the run out clutch by depressing the run out key, Fig.L.17. Check that there is a clearance of  $.015 - .030$  in. (dimension 'll' – inset) between the clutch pawl and the block on the clutch detent.

#### Action

- 17.2 To adjust, slacken the nut securing the detent eccentric and turn the eccentric (accessible from the front of the machine) until dimension 'll' is obtained. Tighten the nut.

#### Check

- 17.3 Return the run out shaft to the rest position. Check that there is now an engagement of  $.045 - .060$  in. (dimension 'lm') between the clutch pawl and the block on the clutch detent.

#### Action

- 17.4 Remove the selector unit as described in Part 5, page 4. Slacken the two screws securing the detent guide and, ensuring that the clutch detent is resting on the bottom of its slot in the guide, ease the rack up or down until dimension 'lm' is satisfied. Tighten the guide screws and reassemble the selector unit as described in Part 5, page 8.

### 18. Motor Start

#### Check

- 18.1 Check that there is a clearance of more than  $.005$  in. (dimension 'ln') between the starter trip lever, Fig.L.17, and the tail of the run out key.
- 18.2 Depress the run out key and check that there is now a clearance of  $.005 - .015$  in. (dimension 'an') between the starter arm pin, Fig.4.32 and the worm wheel.

#### Action

- 18.3 To adjust, slacken the screw clamping the starter trip lever, Fig.L.17, and move the lever round its shaft until the clearances are obtained. Tighten the clamp screw.

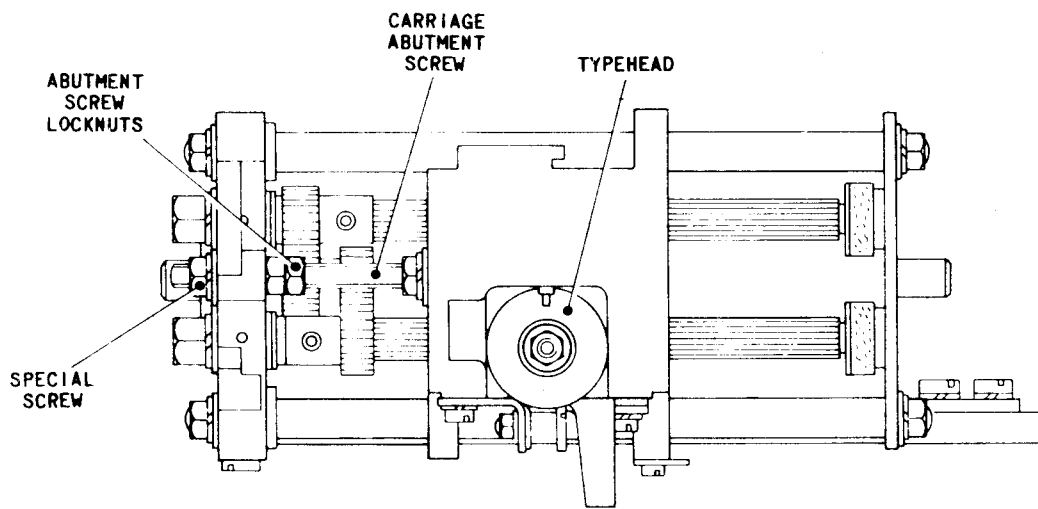


FIG. L. 18 TYPEHEAD CARRIAGE MECHANISM



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### 19. Punching – Final Setting

#### Check

- 19.1 Insert two thicknesses of tape into the perforator. Switch on the motor. Press the top end of the transfer levers, Fig.L.9, to the left to set up an All Mark condition in the punch block. Hold down the run out key, Fig.L.17 until about twelve inches of tape has been produced. Check that a regular series of clean, round holes has been perforated in each tape. Repeat this check using the translator shaft instead of the run out shaft.

#### Action

- 19.2 If the holes are not fully punched or the punches drag in their holes, refine Adjustment 6.2.

### 20. Printing Position

#### Check

- 20.1 Print and punch a sample of tape containing all the characters available and check that these characters are centrally disposed between the feed holes.

#### Action

- 20.2 If necessary, slacken the special screw securing the typehead carriage abutment screw, Fig.L.18, and adjust the locknuts along the abutment screw until the condition is satisfied. Tighten the locknuts and the special screw.

### 21. Run Out Keybar

#### Check

- 21.1. With the cover fitted and the lids closed, depress the run out button (located on the top of the cover) and check that it operates approximately .030 in. before reaching its bottom stop.

#### Action

- 21.2 If necessary, slacken the nut securing the run out lever, Fig. L.19, to the run out keybar and adjust the lever until the condition is satisfied. Tighten the locknuts and the special screw.

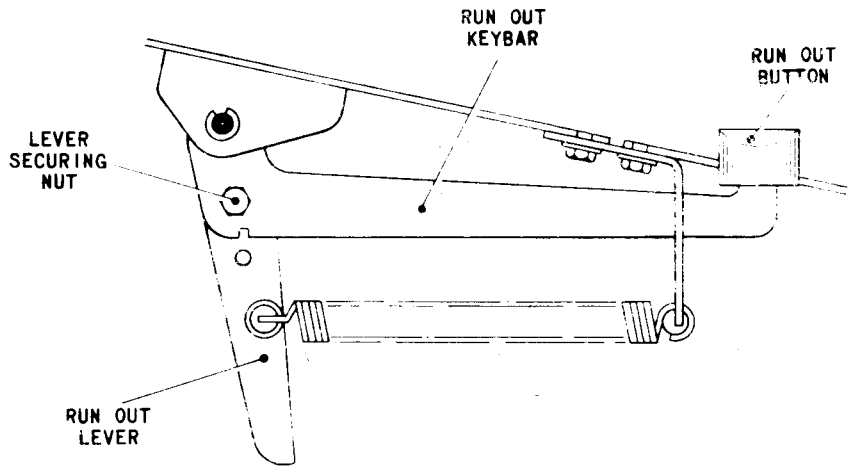


FIG. L.19 RUN OUT KEYBAR ASSEMBLY

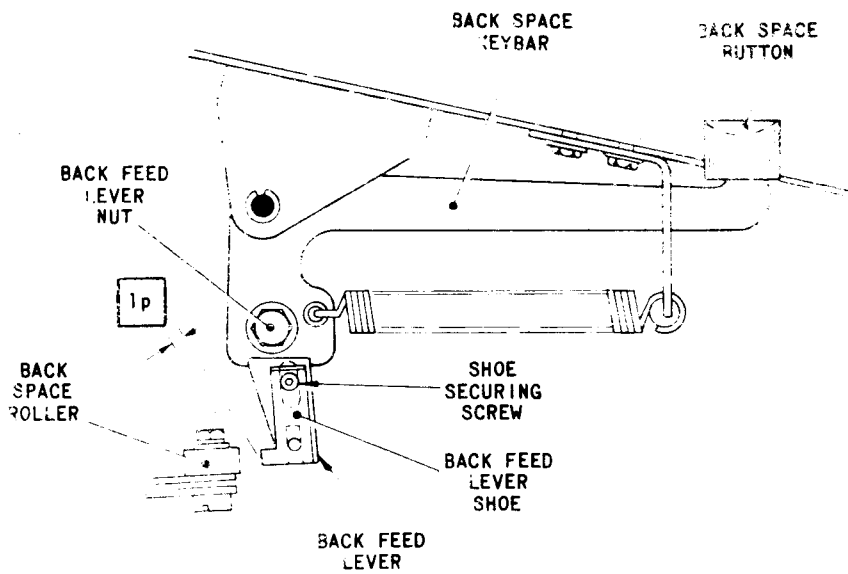


FIG. L.20 BACK FEED LEVER ASSEMBLY

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### 22. Back Space Lever

#### Check

22.1 Open and close the front cover lid and check that there is a clearance of .030 – .060 in. (dimension 'lp') between the back feed lever shoe, Fig.L.20, and the back space roller. Depress the back space button and check that the shoe engages the centre of the roller.

#### Action

22.2 If necessary, adjust the back feed lever shoe as follows:-

- (a) Vertical adjustment. Slacken the screw securing the shoe and move the shoe up or down in its slot. Tighten the screw.
- (b) Horizontal adjustment. Slacken the nut securing the back feed lever and swing the lever backwards and forwards until the condition is satisfied. Tighten the nut.

#### Check

22.3 Close the lid again, depress the back space button several times and check that the back space mechanism operates correctly each time.

#### Action

22.4 If necessary, refine Adjustment 22.2.

### 23. Lag Weight Transit Timing

- \* The anchor of the lag weight spring is on the tail of the speed-change lever, Fig.4.68. On dual-speed machines the lag weight transit timing, and thus the length of the Stop signal, should be set to suit the required speed of operation by positioning the speed-change lever against one of its two stop screws. The positions of the stop screws are set in the factory and will not normally require attention. If, however, a new lag weight spring is fitted at any time it may be necessary to reposition the stop screws by carrying out the following procedure.

#### Check

23.1 Switch on the motor and check its speed as recommended in Adjustment No.81.

23.2 On dual-speed machines, refer to Part 2, page 10 and check that the correct set of gears is engaged.

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- 23.3 Check that the speed-change lever is abutting against its appropriate stop screw for the required speed of operation, i.e.
- (a) For 45/50 baud operation, as shown in Fig.4.68(a).
  - (b) For 75 baud operation, as shown in Fig.4.68(b).
- 23.4 Remove the tape from the perforator. Mark the feed wheel knob with a pencil line and make a corresponding mark on the punch block casting.
- 23.5 Switch on the motor, run out Space from the Keyboard and check that the number of revolutions made by the feed wheel knob over a period of one minute is as follows:—
- (a) On 45 baud operation — 22  $\frac{3}{4}$  revolutions.
  - (b) On 50 baud operation — 25 revolutions.
  - (c) On 75 baud operation — 37  $\frac{1}{2}$  revolutions.

### Action

- 23.6 If the correct number of revolutions is not obtained, move the speed-change lever, Fig.4.68, towards the front of the machine so that it is freed from its stop screws. On single-speed machines, it may also be necessary to slacken the locking screw located in the bottom slot in the translator unit rear frame, and move the screw to one side so that the speed-change lever can be freely adjusted.

### Check

- 23.7 Move the speed-change lever slightly and repeat Check 23.5. Check whether it is now possible to approach the correct figure more closely without causing the translator clutch to cease tripping the machine.
- 23.8 If improvement appears to be possible, hold the speed-change lever in its new position and allow the machine to shut down under the action of the starter switch mechanism. Depress any key on the keyboard (except Run Out) and check that the translator clutch abutment lifts and the motor starts up.
- 23.9 On dual-speed machines, repeat the above procedure with the machine set to operate at its alternate speed.

### Action

- 23.10 Refine the position of the speed-change lever until all the above conditions are satisfied, and then secure the lever in its new position with its stop screws. On single-speed machines, return the locking screw to its position at the right-hand side of the lever.

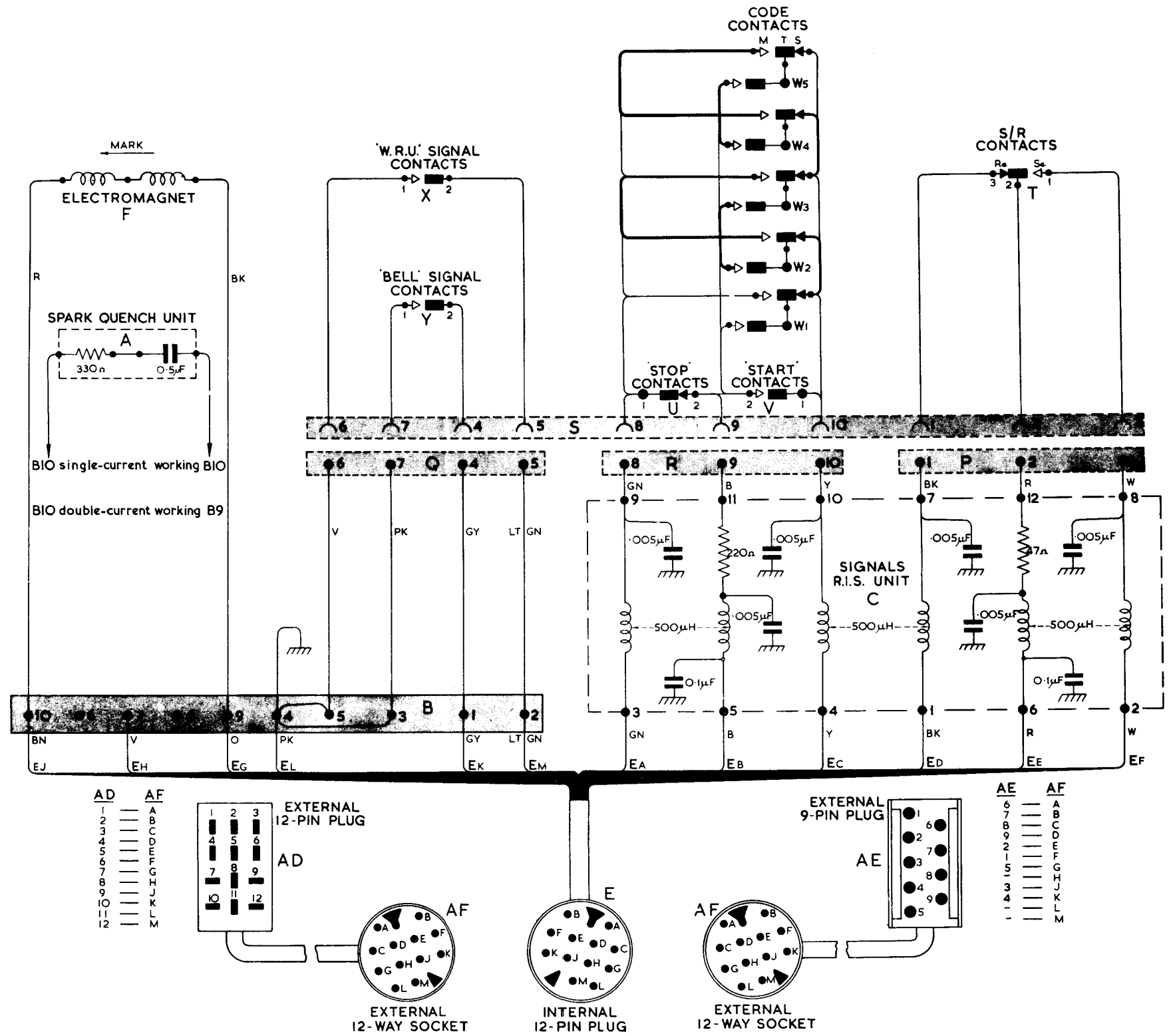


FIG. L.21 SIGNAL CIRCUIT



- D Automatic Motor Switch
- M Governor Resistor
- AB Governor Contacts
- AD End-of-Line Indicator

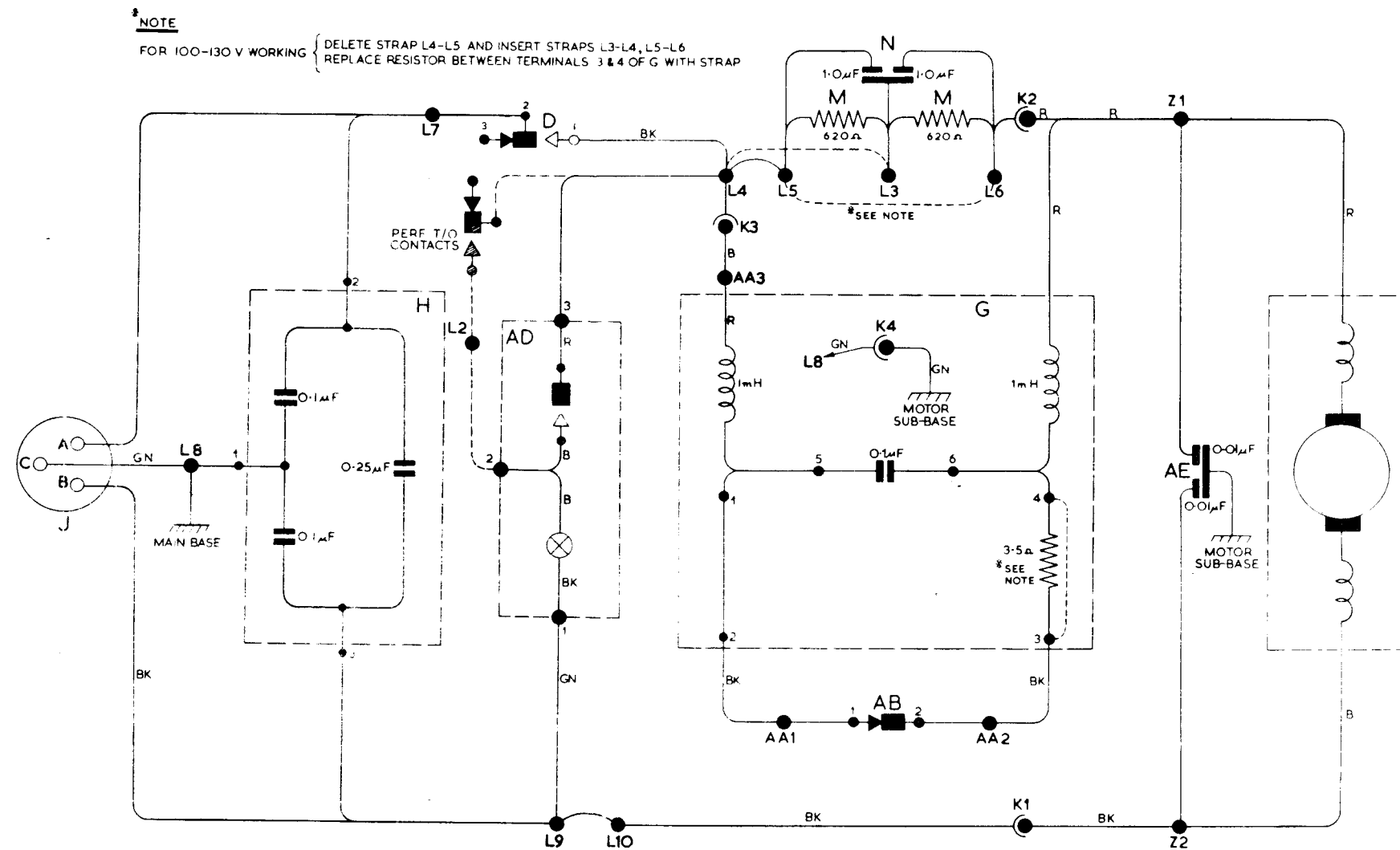
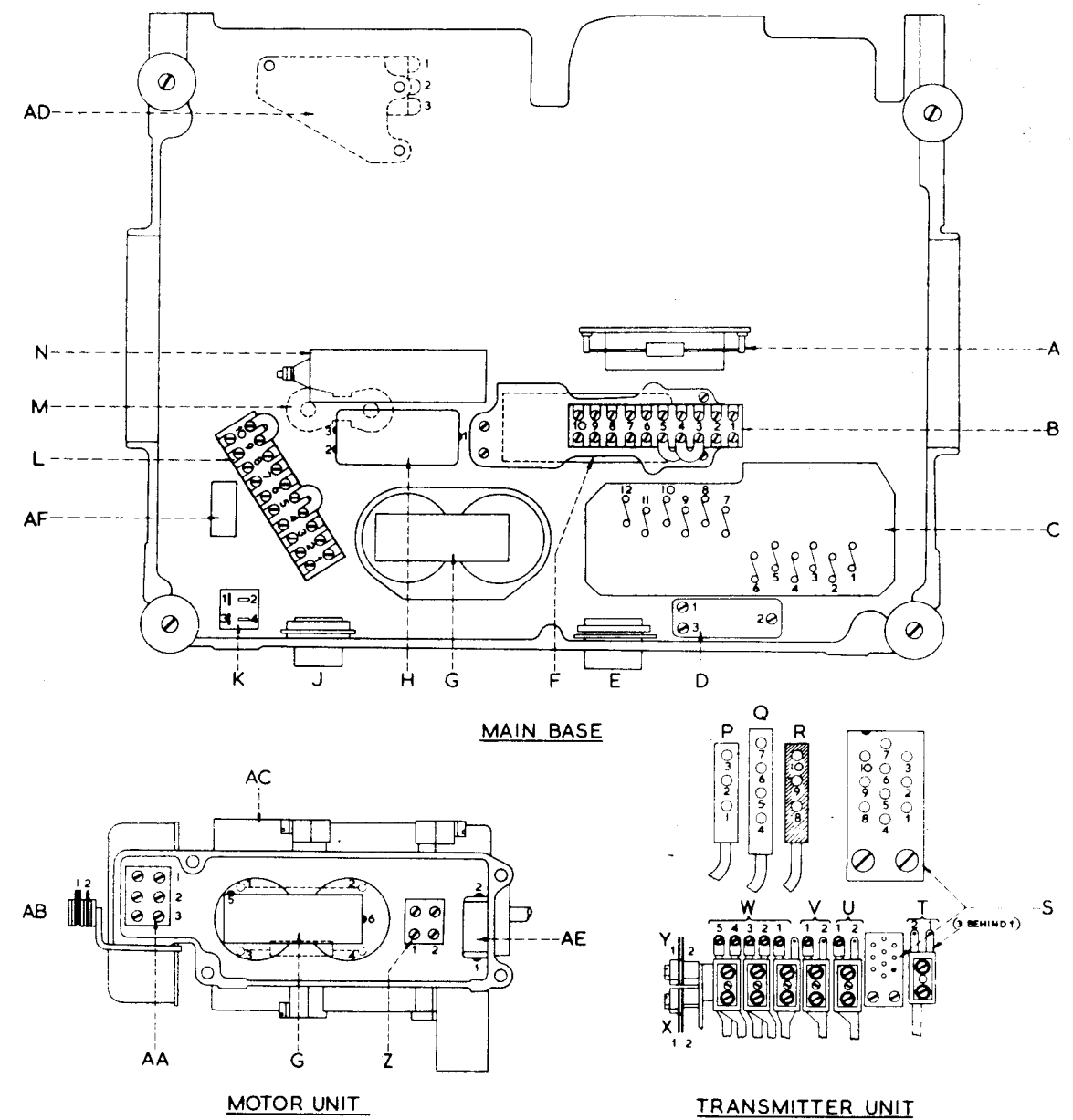


FIG. L.22 MOTOR CIRCUIT







A	ELECTROMAGNET SPARK QUENCH UNIT.	L	TERMINAL STRIP 10-WAY	W	SEQUENTIAL CODE CONTACTS
B	TERMINAL STRIP 10-WAY	M	GOVERNING RESISTORS	X	'WHO ARE YOU' SIGNAL CONTACTS
C	SIGNALS R.I.S. UNIT	N	CAPACITOR 1.0 $\mu$ F + 1.0 $\mu$ F.	Y	'BELL' SIGNAL CONTACTS
D	STARTER SWITCH	P	3-PIN PLUG	Z	TERMINAL BLOCK 2-WAY
E	12-WAY CHASSIS-MOUNTED PLUG	Q	4-PIN PLUG	AA	CONNECTING BLOCK 3-WAY
F	ELECTROMAGNET.	R	3-PIN PLUG	AB	GOVERNOR CONTACTS
G	MOTOR R.I.S. UNIT.	S	CONTACT BLOCK 10-WAY	AC	A.C. SERIES MOTOR
H	CAPACITOR 0.25 $\mu$ F. + 0.1 $\mu$ F. + 0.1 $\mu$ F.	T	SEND/RECEIVE SWITCH	AD	END-OF-LINE INDICATOR
J	3-WAY CHASSIS-MOUNTED PLUG	U	STOP CONTACTS	AE	CAPACITOR .01 + .01 $\mu$ F.
K	MOTOR CONNECTION SOCKET	V	START CONTACTS	AF	REPERFORATOR TAPE OUT SWITCH

FIG.L.23 COMPONENT LOCATION