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## ADJUSTMENT INSTRUCTIONS

### 1. INTRODUCTION

The adjustment instructions for the Model 444 teleprinter are presented in a logical sequence for adjusting a machine after it is dismantled, overhauled and assembled. If however the machine requires only one or two functional adjustments to remedy a fault condition, or a new component is fitted, it is not always necessary to follow the sequence.

The instructions are divided into two sections: Unit Adjustments and Machine Adjustments. Unit Adjustments instructions are for a particular unit, that are more easily carried out before the unit is assembled to the main base. Machine Adjustments are functional or inter-unit adjustment instructions that are carried out either as the individual units are assembled to the main base or after the machine is completed.

In the following instructions, unless otherwise stated, the machine is assumed to be in the rest condition, in which —

- (a) the electromagnet armature rests against the mark stop screw,
- (b) all clutches are engaged and, where applicable, latched up against the detents and located by the retention levers.

In some adjustments it is necessary to set up a particular character or function and then to turn the mechanism over by hand, either to a specific position or through a complete cycle. To do this, carry out the following procedure.

- (a) Depress the appropriate sequential lever in the selector unit for each mark element in the particular code combination required (number 1 element is on the extreme right, number 2 next to it, and so on).
- (b) Engage box spanner TA 1559 with the extension at the right-hand end of the main camshaft.
- (c) Release the selector trip lever latch. This frees the main clutch detent and thus the main camshaft.
- (d) Turn the box spanner counter-clockwise to rotate the mechanism to the required position.

Note that when returning the mechanism to its rest position it may be necessary to assist the camshaft through the last few degrees of rotation.

Some adjustments have the symbol † against their numerical headings. This symbol denotes that the adjustment is carried out in one of two rest positions of a half-cycle camshaft. For these adjustments,

therefore, repeat the checks with the camshaft turned to the other rest position and, if necessary, refine the adjustment until a correct setting is obtained in both rest positions.

The adjustment ranges given are the maximum possible for the machine to function satisfactorily. When setting any adjustment, therefore, it is best to aim for the middle of the range.

### 2. SAFETY PRECAUTIONS

- (a) Whenever possible UNPLUG THE EXTERNAL MOTOR LEAD before carrying out any of the following instructions. This is to ensure that the motor is not started by accidental pressure on the LETTERS key.
- (b) If it is necessary to carry out a functional adjustment with the power switched on, as adjustment number 118 (Motor Speed), always remember that, when the machine is connected to line and power is switched on, an incoming signal from the distant station starts the machine. Before attempting any adjustment under power that requires putting one's fingers near moving parts, therefore, UNPLUG THE SIGNALS LEAD.

### 3. TOOLS AND GAUGES

It is assumed that the tools and gauges listed and illustrated in Part 6, Appendix C, are available to aid adjustments.

### 4. MACHINE SPEED CONVERSION

If the machine speed is converted from 50 to 75 bauds, it is necessary upon conversion to check the following machine adjustments of Section 2:

- (a) print suppression member — paragraph 97,
- (b) line feed link height — paragraph 118,
- (c) motor pinion/layshaft gear mesh — paragraph 117,
- (d) feed hole pitch — paragraph 143,
- (e) feed pawl clearance — paragraph 144, and
- (f) transmitter bias — paragraph 147.

Any machine settings that have shifted outside the given adjustment range unnoticed at 50 bauds operation may not escape notice at 75 bauds operation.

## SECTION 1 – UNIT ADJUSTMENTS

## A FUNCTION UNIT

## 1. SHIFT CAM ROLLER/CAM CLEARANCE

*Check*

- 1.1 Locate the pin on the shift cam segment, Fig. 4.1, in the front recess of the jockey lever.
- 1.2 Check that there is now a clearance of 0.002–0.004 inch (dimension 'a') between the shift cam roller and the shift cam.

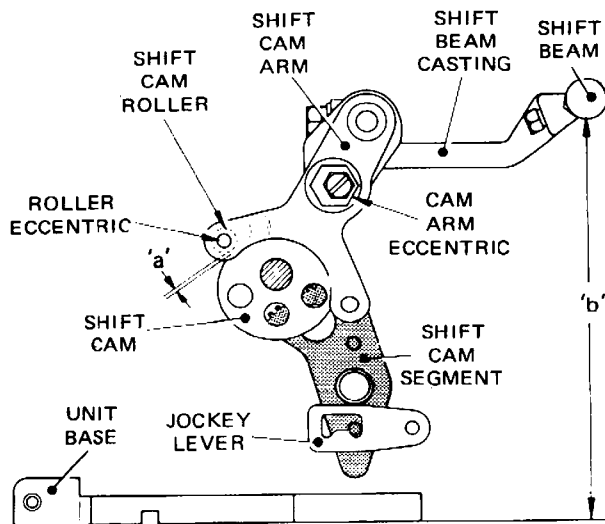


Fig. 4.1 SHIFT CAM MECHANISM (LEFT-HAND SIDE VIEW)

*Action*

- 1.3 To adjust, slacken the nut securing the roller eccentric and turn the eccentric until the clearance is obtained. Tighten the nut.

## 2. SHIFT BEAM HEIGHT

*Check*

- 2.1 Set up the unit as in Check 1.1 above. Using gauge TA 1487A, check that there is a clearance of 3.086–3.096 inch (dimension 'b') between the underside of the shift beam, Fig. 4.1, and the unit base. If a flat surface is not available use the machine base.

*Action*

- 2.2 To adjust, slacken the screw securing the cam arm eccentric and turn the eccentric until the clearance is obtained. Tighten the screw.

## 3. SHIFT BEAM CASTING POSITION

*Check*

- 3.1 Check that there is a clearance of 0.015–0.025 inch (dimension 'c') between the shift cam roller retainer, Fig. 4.2, and the shift cam segment, ensuring that the retainer is straight and is pressing on the roller.

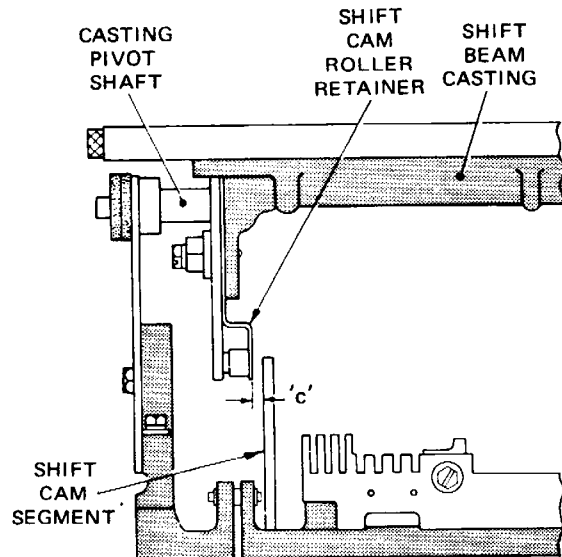


Fig. 4.2 SHIFT MECHANISM (REAR VIEW)

*Action*

- 3.2 To adjust, slacken the two screws (one used also as a spring anchor pin) securing the shift beam casting to its pivot shaft and move the casting along the shaft until the clearance is obtained. Tighten the screws.

## B ELECTROMAGNET UNIT

## 4. ARMATURE GAP AND FORCE

It is assumed that the armature is free of residual magnetism. To remove any residual magnetism, energise the electromagnet by a 20-milliampere alternating supply, slowly reduce the current to zero, and finally move the armature by hand from pole to pole five times.

*Check*

- 4.1 Hold the springs away from the armature by spring retainer TA 1497A, as shown in inset 1 of Fig. 4.3, and check that the total travel of the armature at the stop screws (dimension 'd' of inset 2) is 0.029–0.033 inch.

- 4.2 Note the force required at the top of the armature at F1 to lift the armature off each stop screw. Check that the two forces do not differ by more than 7 grams, and are within the range 60–90 grams.
- 4.3 Ensure that there is an air gap between the armature and the laminations for both positions of the armature.

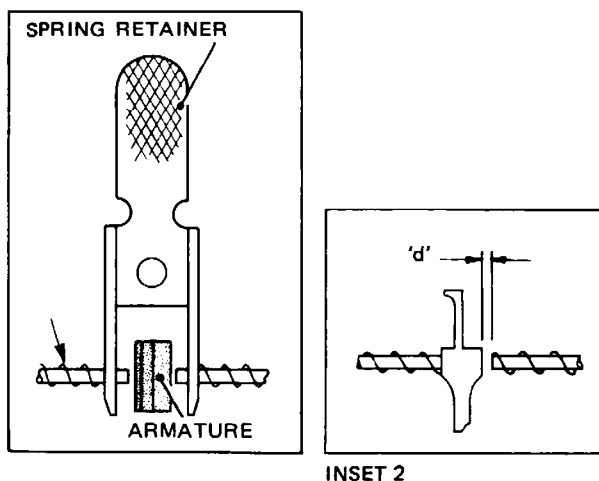
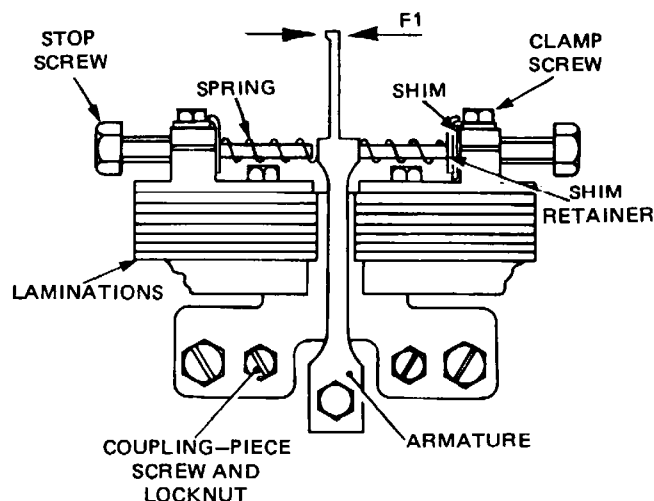


Fig. 4.3 ELECTROMAGNET UNIT

#### Action

- 4.4 Slacken the clamp screws so that the stop screws are friction tight, and adjust the stop screws to obtain both the correct travel and the allowable difference in forces F1.
- 4.5 If the forces are not within the allowable range, slacken the coupling-piece locknuts so that the screws are friction tight, and adjust the screws as necessary. Keep the coupling piece in contact with the ends of the screws, tapping the piece very lightly if necessary.

#### Check

- 4.6 Remove the spring retainer and note the new force required to lift the armature off each stop screw. Check that the two forces still do not differ by more than 7 grams, but are now within the range 20–45 grams.

#### Action

- 4.7 If the force difference exceeds 7 grams, transfer or add one or more shims to the appropriate stop screw, behind the shim retainer, both to obtain the allowable force difference and to retain the allowable forces. If necessary, refine action 4.5 above.
- 4.8 When all adjustments are satisfactory, tighten the clamp screws, lock the coupling-piece screws, and repeat the checks. For new units, ensure that adjustments are well within the limits to allow for settling.

## C CODE CONTROL UNIT

### 5. SHIFT BAR POSITION

#### Check

- 5.1 Set up the space combination (SSMSS) on the combination bars, Fig.4.4, so that the control lever drops into its slot in the control lever rack. Position the shift bar cam sector so that the pin on the shift bar is at the end of the slot in the sector, as shown in the inset.
- 5.2 Check that there is now a clearance of 0.010–0.015 inch (dimension 'e') between the step on the shift bar and the side of the control lever.

#### Action

- 5.3 To adjust, slacken the screw clamping the cam sector eccentric pin and turn the pin until the clearance is obtained. Tighten the screw.

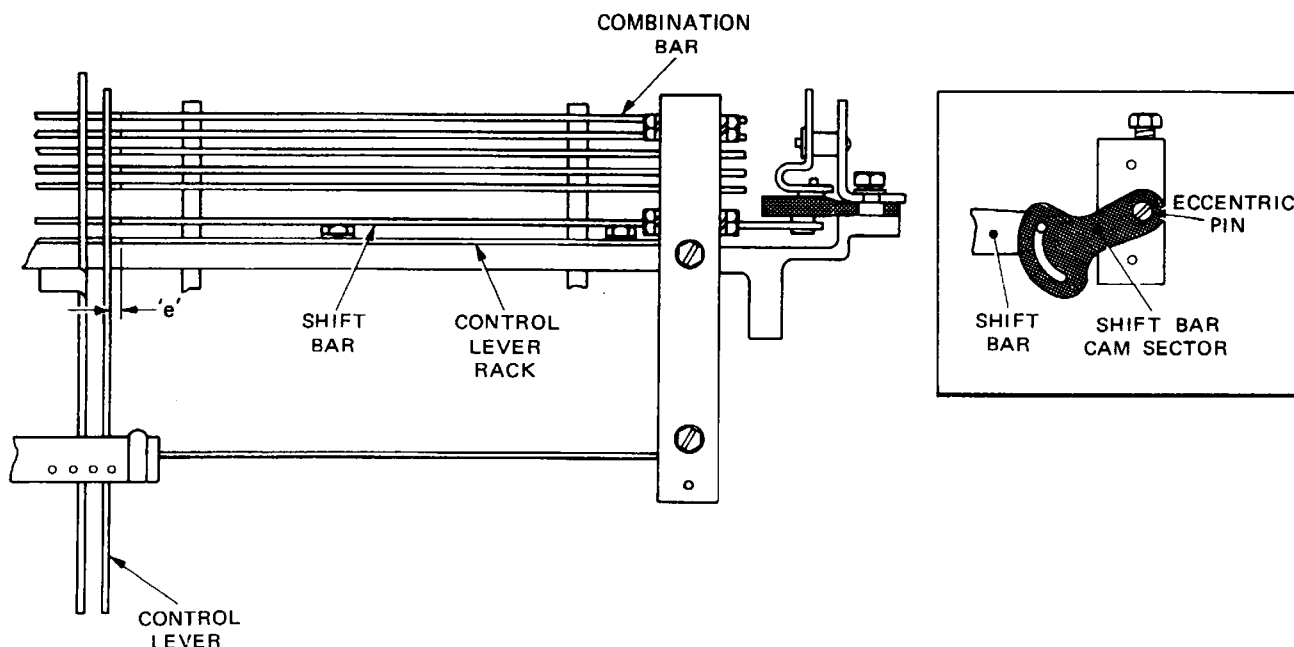


Fig. 4.4 CODE CONTROL UNIT (UNDERSIDE VIEW)

## D FEED UNIT

### †6. FEED PAWLS

If a 0.118 inch slip gauge is available, proceed to Check 6.3, otherwise proceed to Check 6.1.

#### Check

- 6.1 If a 0.118 inch slip gauge is not available, note the maximum overlap of one feed pawl over the other (dimension 'f' of Fig. 4.5). Check that the two overlaps for both half cycles of the main camshaft are equal.

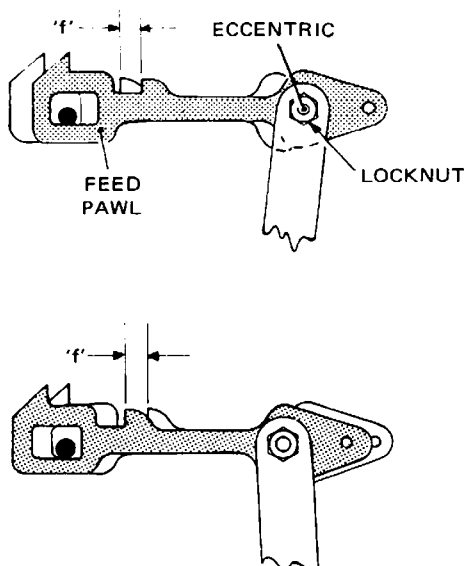


Fig. 4.5 FEED PAWLS (FRONT VIEW)

#### Action

- 6.2 To adjust, unlock the eccentric, adjust the eccentric for equal overlaps, ensuring that the setting of the throw is toward the base, and lock the eccentric.

#### Check

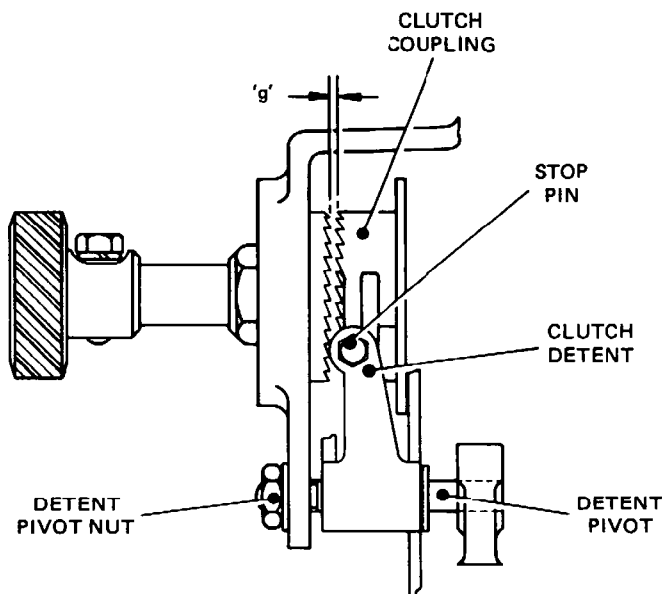
- 6.3 If a 0.118 inch slip gauge is available, set the feed unit camshaft in either rest position, lift the lower cam follower and insert the slip gauge under the follower as shown in Fig. 4.5. Check that the feed pawls are exactly in line at the teeth.

*Action*

- 6.4 To adjust, unlock the eccentric, adjust the eccentric until the feed pawl teeth are in line (ensuring that the setting of the throw is toward the base), and relock the eccentric.

**†7. CLUTCH DETENT POSITION***Check*

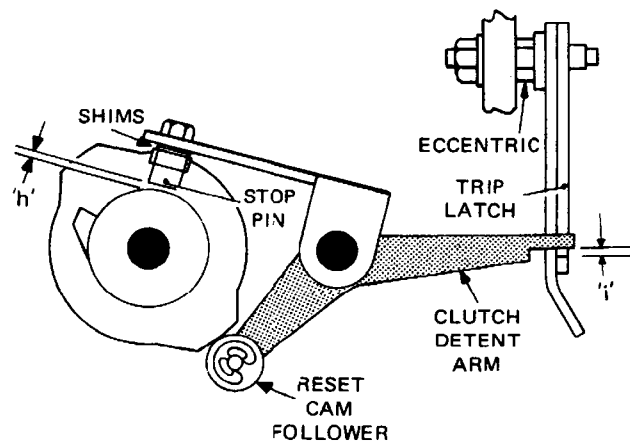
- 7.1 With the camshaft in the rest position and the stop pin of the feed clutch detent, Fig. 4.6, held against the stop, check that there is a clearance of 0.004–0.016 inch (dimension 'g') between the two ratchet faces of the clutch coupling.

**Fig. 4.6 FEED CLUTCH MECHANISM (PLAN VIEW)***Action*

- 7.2 To adjust, slacken the nut securing the detent pivot and turn the pivot by the screwdriver slot until the clearance is obtained. Tighten the nut.

**†8. CLUTCH DETENT CLEARANCE***Check*

- 8.1 Turn the main camshaft until the reset cam follower on the feed unit is on a peak of the cam, as shown in Fig. 4.7. Check that the gap between the stop pin and the cam (dimension 'h') is 0.002–0.015 inch.

**Fig. 4.7 CLUTCH DETENT MECHANISM (REAR VIEW)***Action*

- 8.2 To adjust the gap, remove the screw securing the stop pin whilst holding the stop pin with a spanner, change the number of shims behind the stop pin to give the correct gap, and secure the stop pin. Set the gap as near to the lower limit as possible.

**†9. CLUTCH DETENT LATCH***Check*

- 9.1 With the reset cam follower on a peak of the cam as before, check that the gap between the clutch detent arm and the trip latch (dimension 'i' of Fig. 4.7) is 0.002–0.008 inch.

*Action*

- 9.2 To adjust the gap, loosen the nut securing the eccentric, turn the eccentric to obtain the correct clearance, and tighten the nut.

**E TYPE CARRIAGE AND RIBBON UNIT****10. TYPEBAR CASTING ALIGNMENT***Check*

- 10.1 Lift the typebar casting, Fig. 4.8, until it is stopped by the circlip on each casting guide pin. Check by eye that the upper surface of the casting is now flush with the lower surface of each circlip.

*Action*

- 10.2 To adjust, slacken the screws securing the typebar bearing bracket and move the bracket

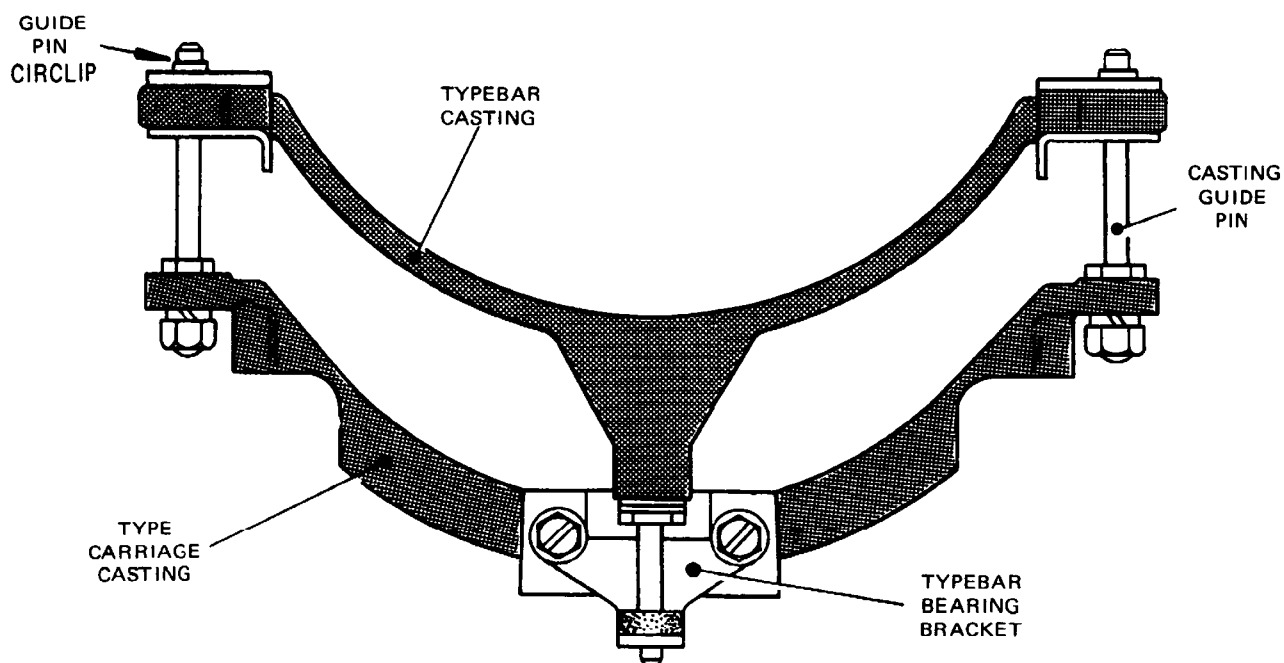


Fig. 4.8 TYPEBAR MECHANISM (REAR VIEW)

horizontally until the condition is satisfied.  
Tighten the screws.

## 11. TYPE CARRIAGE ROLLERS END-PLAY

### Check

- 11.1 Check that both type carriage rollers, Fig. 4.9, are free to rotate and that their end-play does not exceed 0.004 inch.

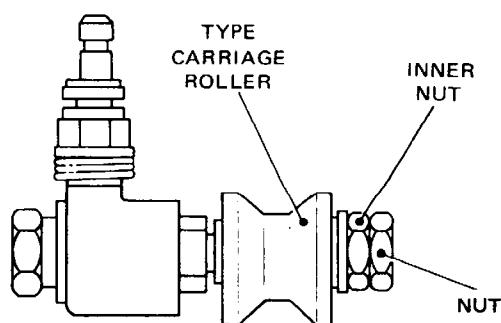


Fig. 4.9 LEFT-HAND TYPE CARRIAGE ROLLER ASSEMBLY

### Action

- 11.2 To adjust, slacken the outer nut and turn the inner nut securing the roller until both conditions are satisfied. Clamp the inner nut in this position with its locknut.

## 12. SHIFT BEAM CLEARANCE

### Check

- 12.1 Insert the function unit shift beam, Fig. 4.10, between the shift skid and the typebar guide bracket. Check that the clearance between the beam and the skid does not exceed 0.004 inch (dimension 'j').

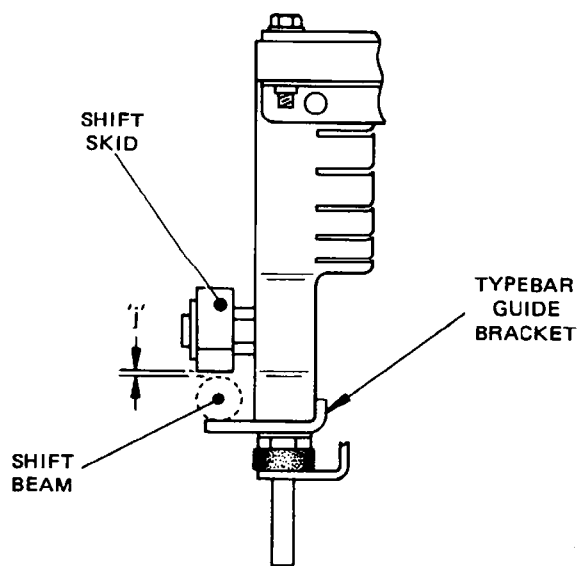


Fig. 4.10 TYPEBAR MECHANISM (LEFT-HAND SIDE VIEW)

*Action*

- 12.2 To adjust, slacken the screw securing the shift skid eccentric pivot and turn the pivot until the condition is satisfied. Tighten the screw.

**13. SECTOR STOPS***Check*

- 13.1 Set the code sectors in space and mark positions so that a single-width slot in each is in a common line across the sectors, and press sector gauge TA 1514 lightly into these slots, as shown in Fig. 4.11, to hold the alignment. Where the standard code is cut, use the second slot from the left-hand side, where all code sectors except number 4 are set to the mark position.

- 13.2 Check that the gap under each sector stop plate to the sectors (dimensions 'k' and 'l') is not greater than 0.002 inch.

*Action*

- 13.3 To adjust, remove the screws securing the sector stop plates and spacers, change the number of 0.004 inch shims on each side to leave the correct gap, fit the spacers and sector stop plates, and secure.

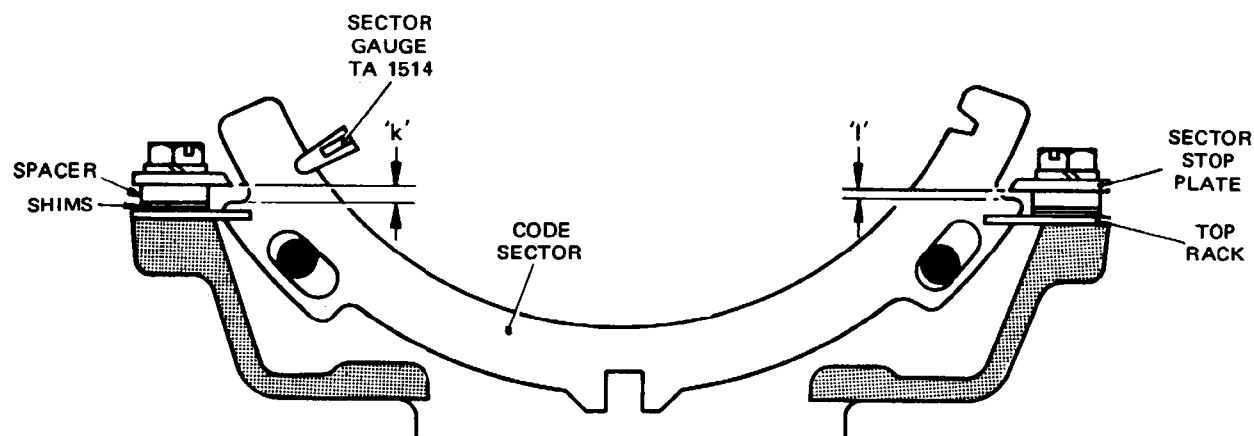


Fig. 4.11 SECTOR STOPS

**F PLATEN UNIT****14. FEED PAWL STOP POSITION***Check*

- 14.1 Set the feed mechanism, Fig. 4.12, so that the centre of the feed pawl pivot and the centre of the retention lever pivot are about 0.75 inch apart, ensure that the feed pawl and the retention lever roller are fully engaged with the ratchet wheel, and check that the gap between the feed pawl and the pawl eccentric stop (dimension 'm') is 0.002–0.012 inch.

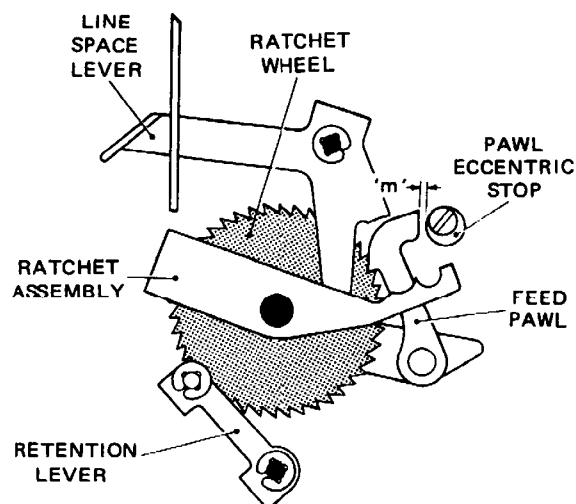


Fig. 4.12 RATCHET FEED MECHANISM

*Action*

- 14.2 To adjust, slacken the screw securing the eccentric stop and turn the stop until the clearance is obtained. Tighten the screw.

## 15. PRESSURE ROLLER POSITION

### Check

- 15.1 Lift the pressure roller key, Fig. 4.13, and check that the pressure roller moves away from the platen by 0.030–0.050 inch (sufficient for the insertion of ten thicknesses of paper).

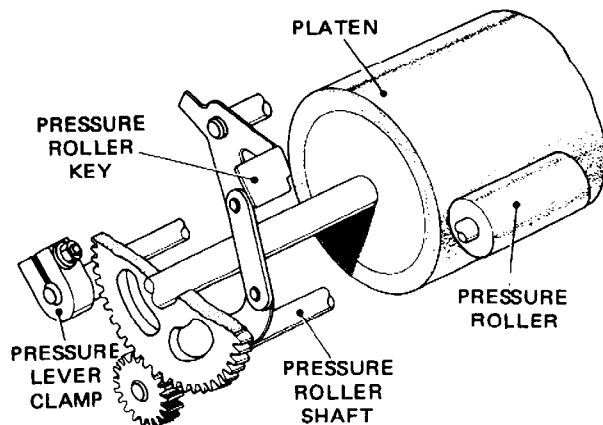


Fig. 4.13 PRESSURE ROLLER MECHANISM

### Action

- 15.2 To adjust, slacken the pressure lever clamp screw and move the pressure roller shaft until the condition is satisfied. Tighten the screw.

## 16. TEAR-OFF PLATE CLEARANCE

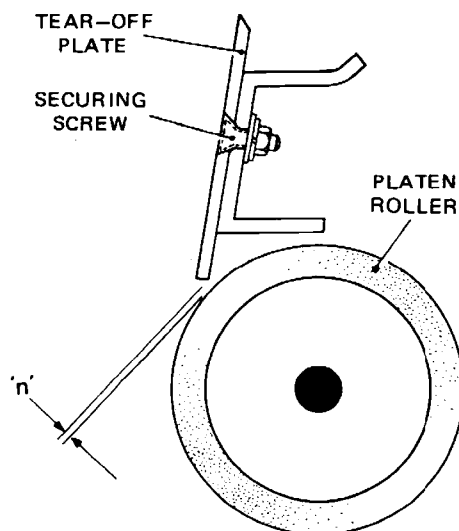


Fig. 4.14 TEAR-OFF PLATE (END VIEW)

### Check

- 16.1 Check that there is a clearance of 0.016–0.039 inch between the tear-off plate and the platen roller (dimension 'n' of Fig. 4.14).
- 16.2 Check visually that the clearance is the same at both ends of the plate and roller.

### Action

- 16.3 To adjust, slacken the screws securing the tear-off plate, set the plate for the correct clearance, and tighten the screws.

## 17. SPROCKET FEED LEVER

This adjustment is applicable to sprocket-feed platen units only.

### Check

- 17.1 Turn the platen and engage the left-hand sprocket feed lever (Fig. 4.15) with the notch in the cam. Turn the platen to retract the sprocket pins, and check that the clearance between the face of the plunger boss and the side of the lever (dimension 'o') is 0.004–0.012 inch. Repeat the check for the right-hand sprocket feed lever.

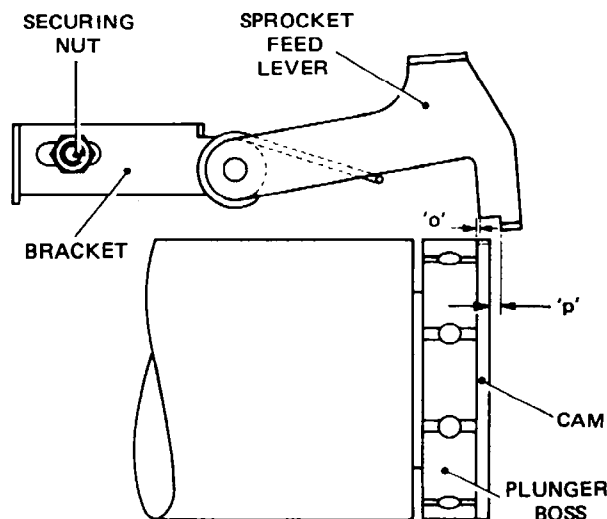


Fig. 4.15 SPROCKET-FEED LEVER MECHANISM (REAR VIEW)

### Action

- 17.2 To adjust, slacken the nut securing the bracket, temporarily set dimension 'o' to zero, measure the gap between the cam face and the lever (dimension 'p'), and enlarge this gap by 0.004–0.012 inch to correct gap 'o'. Tighten the nut.

## G TRANSMITTER AND ANSWER-BACK UNIT

### Precaution

To ensure that during the course of adjustment the striker lever of the striker sub-unit is not set high enough to inhibit camshaft rotation, slacken the nut securing the eccentric pivot of the striker lever (Fig. 4.26), turn the pivot clockwise as far as it goes, and secure the pivot. The pivot is set at adjustment 27.

### 18. SELECTION LEVER ASSEMBLY

#### Check

- 18.1 Check that the code selection levers are central in the sequential lever rack, Fig. 4.16, and are still free when the unit is fitted to the machine and engaged with the keyboard.

#### Action

- 18.2 To adjust, slacken the two clamp screws and the collar screw, slide the code selection lever assembly along to the correct position, tighten the two clamp screws, position the collar against the casting, and tighten the collar screw.

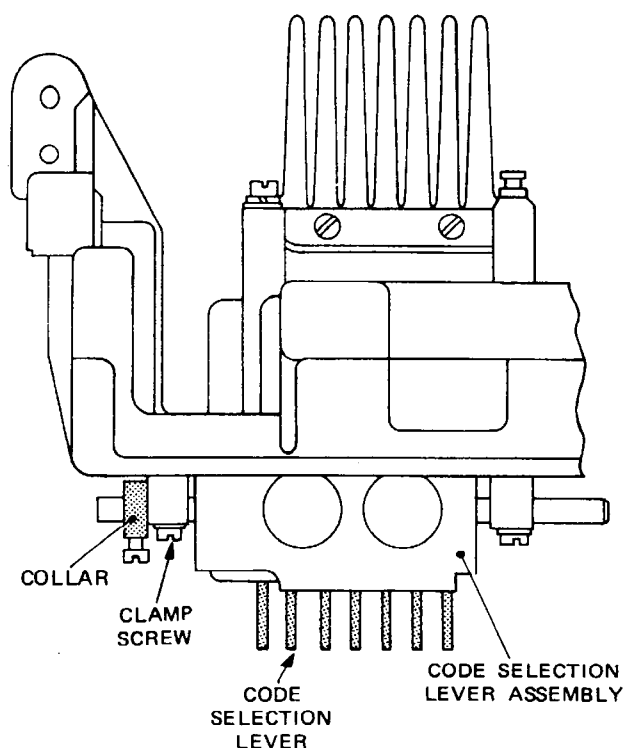


Fig. 4.16 SELECTION LEVER ASSEMBLY

#### Check

- 18.3 Set the camshaft to the rest position, and check that the force  $F_2$  (Fig. 4.17 inset) required at the tip of each sequential lever to oppose the spring is 120–150 grams. Check that the levers operate smoothly.

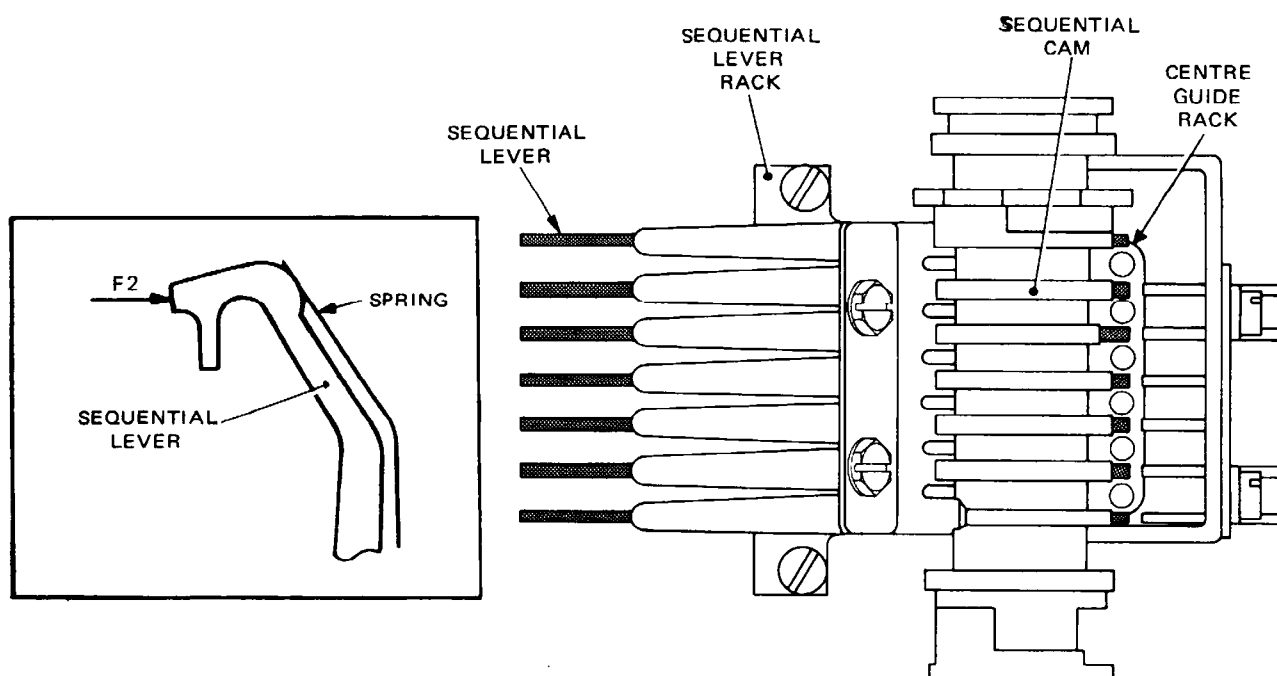


Fig. 4.17 SEQUENTIAL LEVER RACK AND SPRING ASSEMBLY

*Action*

- 18.4 To adjust, set the spring blade to give the correct force.

**19. SEQUENTIAL LEVERS/CAMS ENGAGEMENT***Check*

- 19.1 Check that the sequential levers, Fig. 4.17, are fully engaged with their cams. Check also that the levers are free to move within the sequential lever rack and centre guide rack.

*Action*

- 19.2 To adjust, slacken the screws securing the sequential lever rack and move the sequential lever assembly until both conditions are satisfied. Tighten the screws.

**20. TRIP LEVER POSITION***Check*

- 20.1 Release the clutch detent, Fig. 4.18, and turn the camshaft until the detent is on the highest point of the cam. Check that there is now a clearance of 0.006–0.012 inch (dimension 'q') between the detent arm and the step on the trip lever.

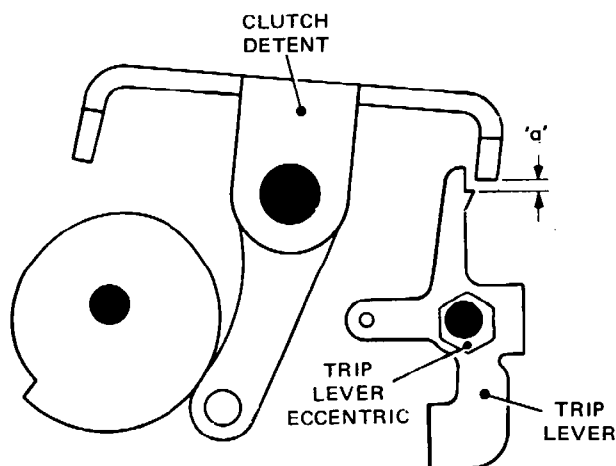


Fig. 4.18 TRANSMITTER TRIP LEVER

*Action*

- 20.2 To adjust, slacken the nut securing the trip lever eccentric, and turn the eccentric until the clearance is obtained. Tighten the nut.

**21. LOCK FRAME BLADE***Check*

- 21.1 Set the unit to the rest condition, and check that the gap between the blade and the code selection levers (dimension 'r' of Fig. 4.19) is 0.008–0.016 inch.

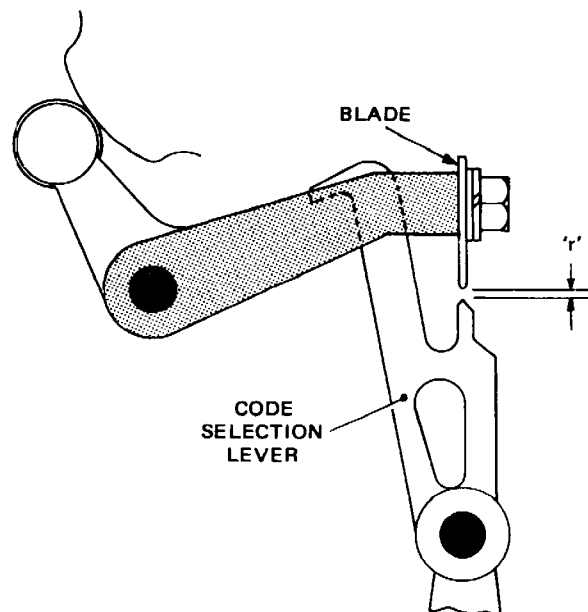


Fig. 4.19 LOCK FRAME BLADE

*Action*

- 21.2 To adjust, slacken the blade securing screws, slide the blade up or down to correct the gap, and secure the blade.

## 22. STRIKER SUB-UNIT – CONTACT BLOCK

### Check

- 22.1 Check that the two gaps between the stop pin and the contact block (dimensions 's' of Fig. 4.20) do not differ by more than 0.004 inch.

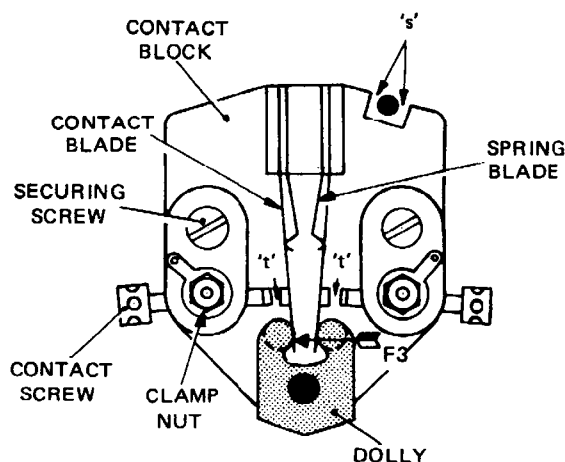


Fig. 4.20 MARK/SPACE CONTACT BLOCK

### Action

- 22.2 To adjust, slacken the two screws securing the contact block, swing the block to correct the dimensions, and secure the block.

## 23. STRIKER SUB-UNIT – ROCKER STOP PLATE, CONTACT TRANSIT GAP AND CARRIER STOP

### Check

- 23.1 Unhook the jockey arm spring from the anchor pin, raise the striker lever so that both arms are fully engaged with the rocker, as shown in Fig. 4.21, and check that the two gaps between the rocker and rocker stop do not differ by more than 0.004 inch.

### Action

- 23.2 To adjust the gaps, slacken the securing screw, set the rocker stop appropriately, and secure the rocker stop.

### Check

- 23.3 With the jockey arm spring unhooked and the striker lever fully engaged with the rocker, as shown in Fig. 4.21, check that the gaps between the contact screws and the blade contacts, Fig. 4.20, are 0.003–0.004 inch (dimensions 't').

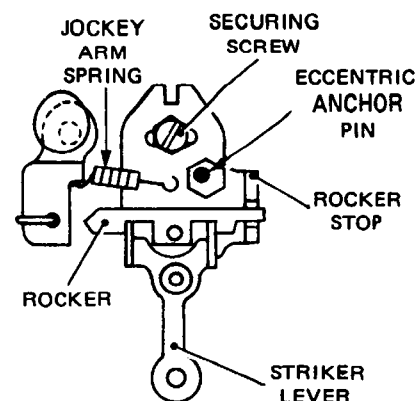


Fig. 4.21 ROCKER STOP PLATE (REAR VIEW)

### Action

- 23.4 To set a gap, slacken the contact screw clamp nut, turn the contact screw appropriately, and clamp the contact screw.

### Check

- 23.5 With the jockey arm spring unhooked and the striker lever fully engaged with the rocker, as shown in Fig. 4.22, check that the two gaps between the carrier and the stop lever pin (dimensions 'u') do not differ by more than 0.004 inch. Hook the jockey arm spring, Fig. 4.21, onto the anchor pin.

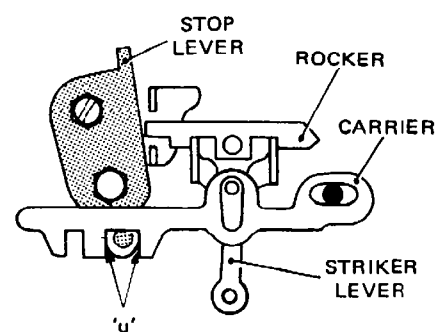


Fig. 4.22 CARRIER STOP

### Action

- 23.6 To adjust the gaps, slacken the stop lever nut and screw, set the stop lever appropriately, and secure the stop lever.

## 24. STRIKER SUB-UNIT – CONTACT PRESSURE

Before this adjustment is checked, it is necessary to check adjustment 23 (Contact Transit Gap).

*Check*

- 24.1 Set the dolly, Fig. 4.20, to one side to close the right-hand contacts and, observing the contacts under good lighting, check that the force required to just separate the contacts is 100–120 grams.

- 24.2 Set the dolly to the other side, and check that the force required to just break the left-hand contacts is also 100–120 grams.

*Action*

- 24.3 To reduce the contact pressure, carefully insert a knife blade or a limb of a pair of tweezers between the contact blade and the spring blade, and ease the spring blade away appropriately whilst maintaining full contact between the pair of blades to avoid twisting the contact blade.
- 24.4 To increase the contact pressure, renew the spring blade and check that the contact pressure is correct. Do not reform a spring blade to give higher contact pressure as the adjustment may be unstable.

- 24.5 Check that the transit gap adjustment is still correct.

## 25. STRIKER SUB-UNIT – JOCKEY ROLLER AND SPRING

*Check*

- 25.1 Apply a gram gauge to the inside of one contact blade adjacent to the dolly fork, as at F3 of Fig. 4.20, and check that the force required to set the dolly in the opposite position is 150–200 grams.
- 25.2 Apply the gauge to the other blade, and check that the force required to return the dolly is also 150–200 grams.

*Action*

- 25.3 To adjust the two forces if one is high and the other is low, slacken the nut securing the eccentric pivot, Fig. 4.23, turn the pivot to correct the difference, ensuring that the throw of the eccentric is toward the rocker stop plate as shown, and secure the pivot.
- 25.4 To adjust the two forces if both are too high or both are too low, slacken the nut securing the eccentric anchor pin, turn the pin to correct the forces, and secure the pin.

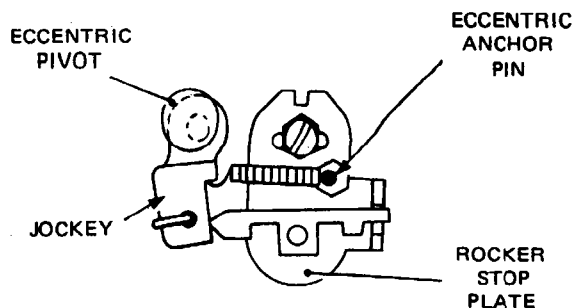


Fig. 4.23 JOCKEY MECHANISM (REAR VIEW)

## 26. COMMON FRAME BLADE POSITION

Before this adjustment is checked, it is necessary to check adjustment 23 (Carrier Stop).

*Check*

- 26.1 With the unit in the rest condition, check that there is a parallel clearance of 0.025–0.035 inch (dimension 'v' of Fig. 4.24) between the common frame blade and the sequential levers, along the whole length of the blade.

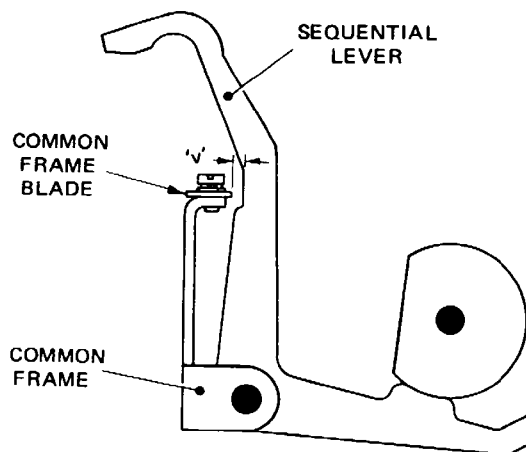


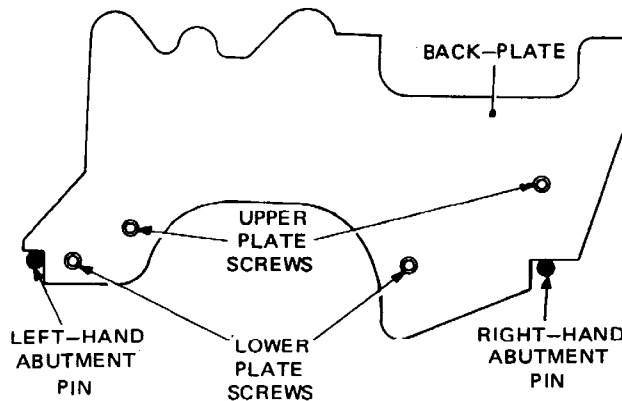
Fig. 4.24 COMMON FRAME MECHANISM

*Action*

- 26.2 To adjust, proceed as follows.

- Remove the two upper screws and slacken the two lower screws securing the transmitter back-plate, Fig. 4.25, to the main casting.
- Slide the back-plate to the right against its right-hand abutment pin and temporarily tighten the two lower screws.
- Slacken the screws securing the common frame blade, Fig. 4.24, and position the blade so that it just touches the sequential levers along the whole of its length. Tighten the blade screws.

- (d) Slacken the two lower back-plate screws again and slide the back-plate, Fig. 4.25, to the left against its left-hand abutment pin. Secure the back-plate in this position with the four screws.

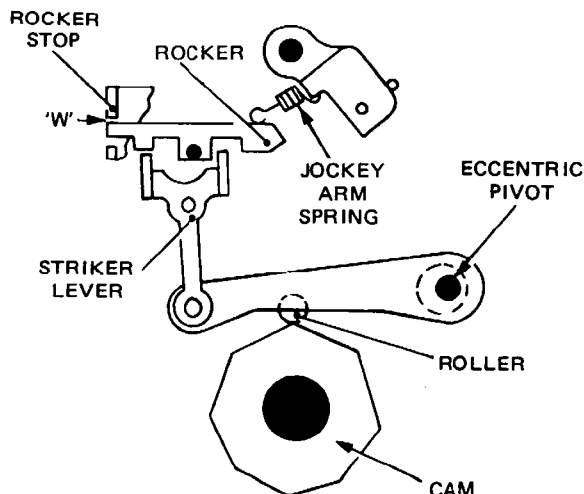


**Fig. 4.25 TRANSMITTER STRIKER AND CONTACT BLOCK ASSEMBLY**

## 27. STRIKER LEVER HEIGHT

### Check

- 27.1 Unhook the jockey arm spring from the anchor pin, depress the RUN OUT key, turn the camshaft until the striker lever roller, Fig. 4.26, is on a peak of the cam, and check that the upper gap between the end of the rocker and the rocker stop (dimension 'w') is 0.002–0.006 inch. Make this check for both mark and space positions of the striker lever. Hook the jockey arm spring to the anchor pin, but not before the gap is correct.



**Fig. 4.26 STRIKER LEVER MECHANISM**

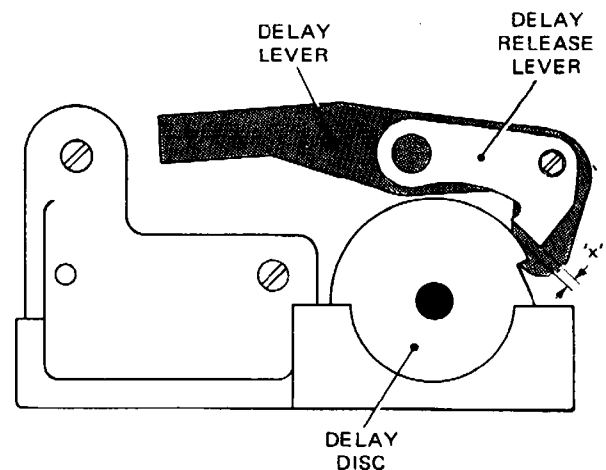
### Action

- 27.2 To adjust the gap, slacken the nut securing the eccentric pivot, turn the pivot clockwise until the throw is to the right and, with the striker lever roller still on a peak of the cam, turn the eccentric pivot counter-clockwise until the gap is correct, and secure the pivot.

## 28. SEND/RECEIVE SWITCH – DELAY RELEASE

### Check

- 28.1 Depress the RUN OUT key and turn the camshaft until the send/receive delay lever, Fig. 4.27, is lifted to its highest point, as shown. Check that there is now a clearance of 0.002–0.010 inch (dimension 'x') between the delay release lever and the delay disc.



**Fig. 4.27 SEND/RECEIVE DELAY LEVER MECHANISM (REAR VIEW)**

### Action

- 28.2 To adjust, slacken the screw securing the delay release lever and move this lever relative to the delay lever to correct the clearance. Tighten the screw.

## 29. SEND/RECEIVE SWITCH – TRANSIT GAP

Before this adjustment is checked, it is necessary to check adjustment 22 (Contact Block) and 24 (Contact Pressure).

### Check

- 29.1 Depress the RUN OUT key and turn the camshaft 90–180 degrees from the rest position to the position shown in Fig. 4.28, and check that the sides of the send/receive lever are parallel to the sides of the contact block. Use a straight edge or an 8BA spanner.

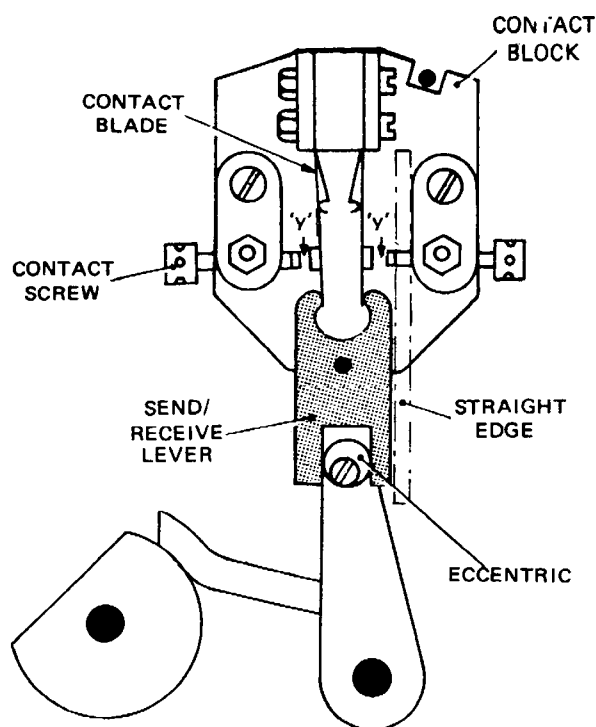


Fig. 4.28 SEND/RECEIVE SWITCH

*Action*

- 29.2 To secure parallelism, slacken the screw securing the send/receive lever eccentric, set the eccentric appropriately, and secure the eccentric.

*Check*

- 29.3 Check that the gap between the contact screw and the contact blade (dimension 'y'), on each side of the switch, is 0.002–0.004 inch.

*Action*

- 29.4 To adjust the gap, slacken the nut clamping the contact screw, turn the contact screw appropriately, and clamp the screw.

**30. SEND/RECEIVE SWITCH – DELAY CAM LEVER***Check*

- 30.1 Depress the RUN OUT key and turn the camshaft slowly until the delay lever drops alongside the send/receive lever, as shown in the inset of Fig. 4.29, and check that the horizontal clearance between the two levers (dimension 'z') is 0.002–0.006 inch. The following adjustments are easier to make if this adjustment is set near the lower limit.

*Action*

- 30.2 To adjust the clearance, carefully bend the tip of the delay lever to the left or right, taking care not to bend the tip up or down.

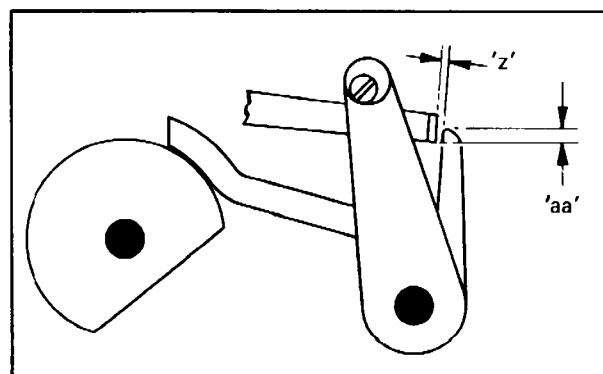
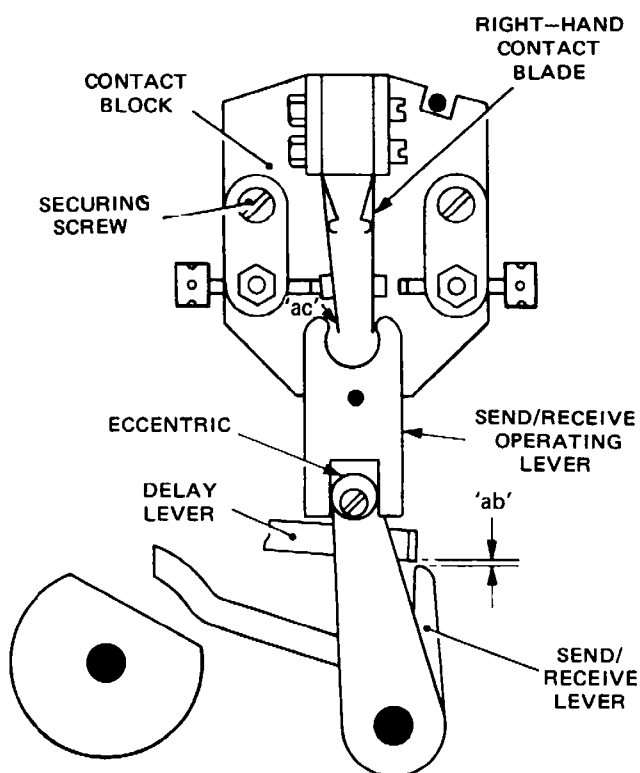


Fig. 4.29 SEND/RECEIVE SWITCH

*Check*

- 30.3 Check that the vertical engagement of the delay lever and the send/receive lever (dimension 'aa' in the inset) is at least 0.016 inch.
- 30.4 Turn the camshaft to the rest position, to raise the delay lever above the send/receive lever, and check that the vertical clearance between the two levers (dimension 'ab') is at least 0.006 inch.

*Action*

- 30.5 To adjust the clearances, carefully bend the tip of the delay lever up or down, taking care not to bend the tip to the left or right.

**31. SEND/RECEIVE SWITCH – CONTACTS GAP***Check*

- 31.1 Depress the RUN OUT key and turn the camshaft slowly until the send/receive lever rests against the delay lever, and check that the gap between the left-hand contact blade and the send/receive operating lever (dimension 'ac' of Fig. 4.29) is at least 0.003 inch.

- 31.2 Whilst turning the camshaft to the rest position, check that the above condition is maintained.

- 31.3 With the camshaft at the rest position, check that the gap between the right-hand contact blade and the send/receive operating lever is at least 0.004 inch.

*Action*

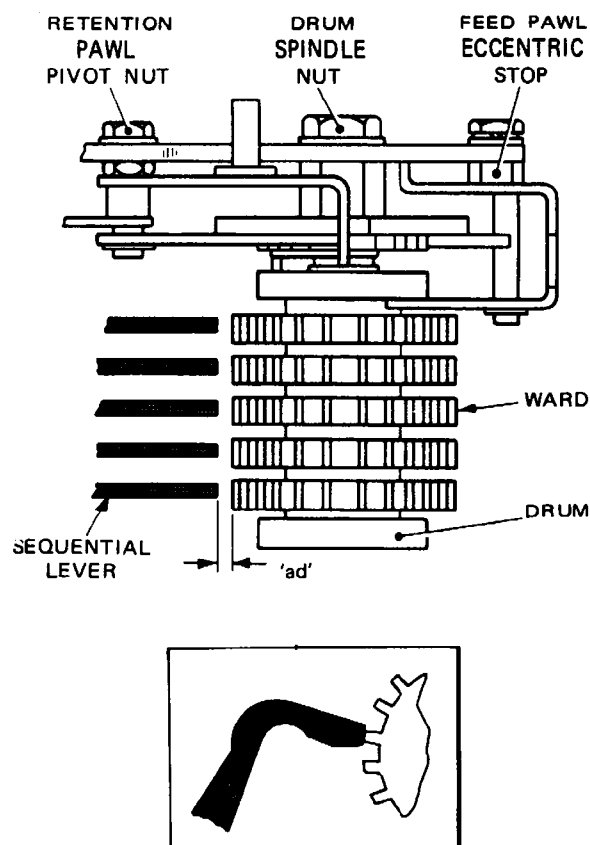
- 31.4 To adjust the gap, slacken the screw securing the eccentric, set the eccentric ensuring that the throw is upward, and secure the eccentric. If the eccentric does not give sufficient adjustment, slacken the two screws securing the contact block, swing the block in the appropriate direction, secure the block, and repeat the adjustment.

**32. ANSWER-BACK WARDS/SEQUENTIAL LEVERS CLEARANCE***Check*

- 32.1 Depress the HERE IS key and turn the answer-back drum, Fig. 4.30 until the wards are in horizontal alignment with the sequential levers. Check that there is now a clearance of 0.030–0.040 inch (dimension 'ad') between each ward and its sequential lever.

*Action*

- 32.2 To adjust, slacken the nut securing the drum spindle and position the drum to correct the clearance. Tighten the nut.



**Fig. 4.30 ANSWER-BACK FEED AND RETENTION MECHANISM (PLAN VIEW)**

**33. ANSWER-BACK WARDS/SEQUENTIAL LEVERS ALIGNMENT***Check*

- 33.1 Depress the HERE IS key. Turn the camshaft and check by eye that, as each sequential lever, Fig. 4.30, moves to the left and strikes its ward in turn, the lever is centrally disposed about the ward, as shown in the inset.

*Action*

- 33.2 To adjust, slacken the nut securing the feed pawl eccentric stop and, using only the half of the eccentric throw furthest from the drum, turn the eccentric to satisfy the condition. Tighten the nut.

### 34. RETENTION PAWL/RATCHET WHEEL CLEARANCE

#### Check

- 34.1 Depress the HERE IS key and turn the camshaft until the feed pawl, Fig. 4.31, is in contact with its eccentric stop. Check that there is now a clearance of at least 0.005 inch (dimension 'ae') between the retention pawl and a tooth in the ratchet wheel.

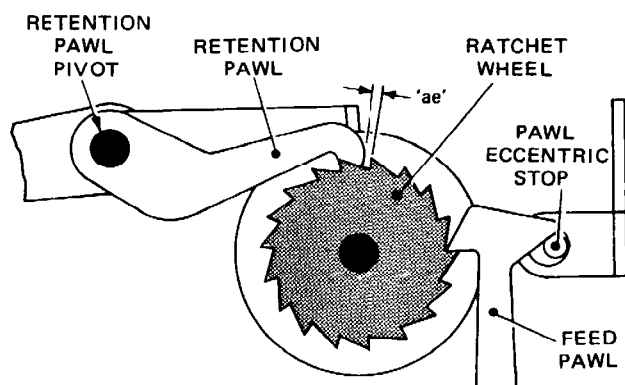


Fig. 4.31 ANSWER-BACK RATCHET FEED MECHANISM (REAR VIEW)

#### Action

- 34.2 To adjust, slacken the nut securing the retention pawl pivot and move the pivot until the clearance is obtained. Tighten the nut.

### 35. DRUM DETENT POSITION

#### Check

- 35.1 Depress the HERE IS key and turn the feed disc, Fig. 4.32, by the ratchet wheel by hand away from the rest position, as shown. Depress the right-hand end of the drum detent so that the lock lever is engaged with its latch and the detent eccentric is in contact with the lock lever. Check that there is now a vertical clearance of 0.010–0.030 inch (dimension 'af') between the detent and the feed disc.
- 35.2 Continue to turn the ratchet wheel and check that the lock lever latch releases the lock lever as the detent drops into its slot in the feed disc.

#### Action

- 35.3 To adjust, slacken the nut securing the detent eccentric and, using only the half of the eccentric throw furthest from the feed disc,

turn the eccentric to satisfy the conditions. Tighten the nut.

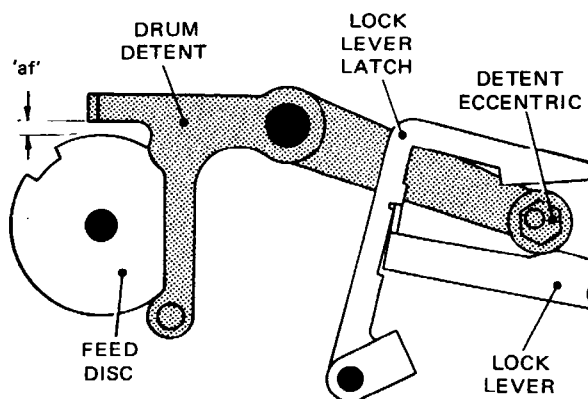


Fig. 4.32 DRUM DETENT/FEED DISC – VERTICAL CLEARANCE

### 36. RUN-OUT LEVER POSITION

#### Check

- 36.1 Depress the HERE IS key and turn the ratchet wheel by hand away from the rest position, as shown in Fig. 4.33. Lift the lock lever latch so that it releases the lock lever, and allow the drum detent to rest on the periphery of the feed disc.
- 36.2 With the detent eccentric in contact with the lock lever, check that there is a clearance of 0.006–0.012 inch (dimension 'ag') between the transmitter clutch detent and the trip lever.

#### Action

- 36.3 To adjust, slacken the screw clamping the run-out lever adjustment plate and reposition the lever by slowly depressing the RUN-OUT key. When the correct clearance is obtained, hold the key in this position and tighten the screw.

### 37. FEED PAWL LATCH STOP PLATE POSITION

#### Check

- 37.1 Remove the answer-back ward drum. Depress the HERE IS key and turn the ratchet wheel, Fig. 4.34, by hand until the retention pawl drops into the nineteenth tooth. Turn the camshaft slowly until the next feed action has taken place and check that the feed pawl latch

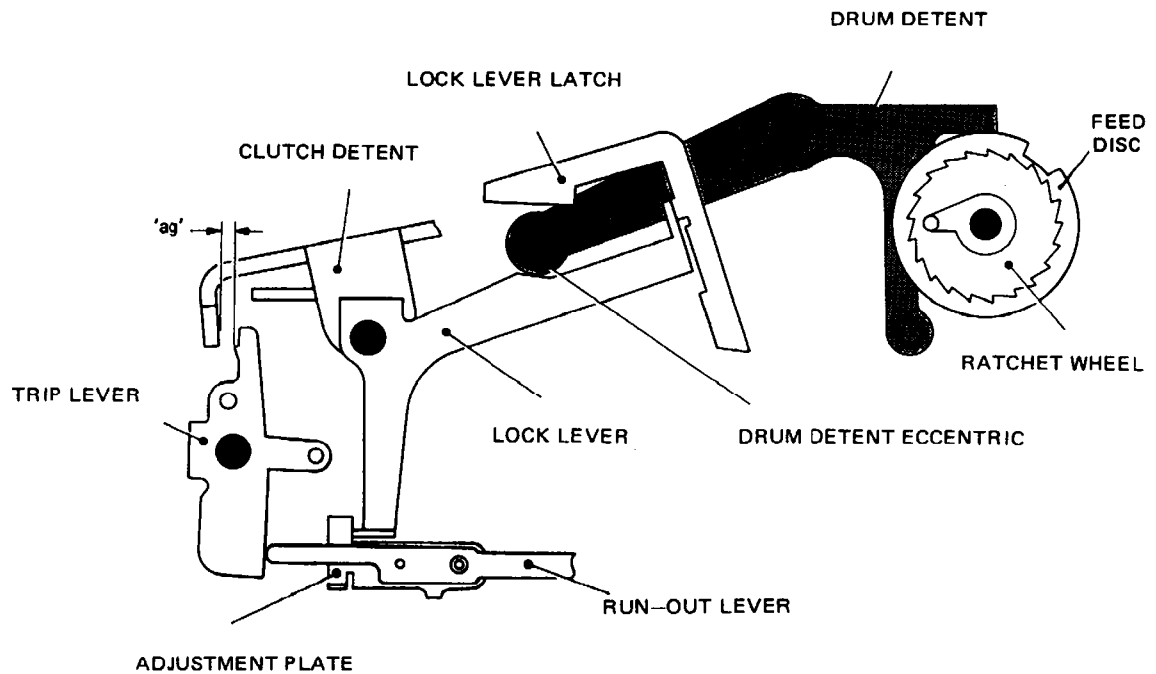


Fig. 4.33 RUN-OUT PUSH ROD MECHANISM (REAR VIEW)

is positioned just underneath the peg on the ratchet wheel, as shown.

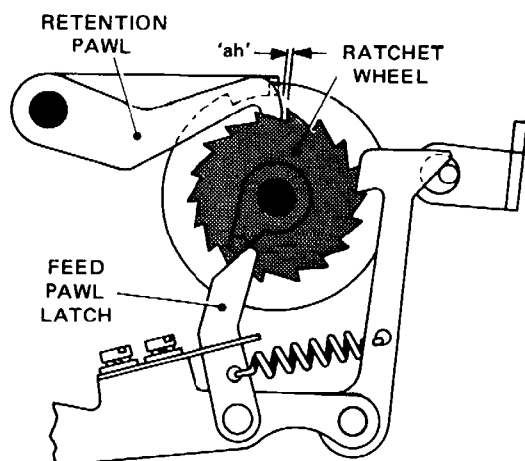


Fig. 4.34 FEED PAWL LATCH MECHANISM (REAR VIEW)

**Action**

- 37.2 To adjust, refine the setting obtained in Action 33.2 until the condition is satisfied.

**Check**

- 37.3 Check that the gap between the retention pawl and a tooth on the ratchet wheel (dimension 'ah' of Fig. 4.34) is 0.003–0.007 inch.

**Action**

- 37.4 To adjust the gap, carry out Action 34.2.

**Check**

- 37.5 Continue to turn the camshaft slowly and check that the latch feeds the ratchet wheel fully to its twenty-first tooth. Check also that there is a clearance of at least 0.004 inch between the drum detent and the side of the slot in the feed disc (dimension 'ai' of Fig. 4.35) when the latch is in its highest position. If no adjustment is required, fit the ward drum.

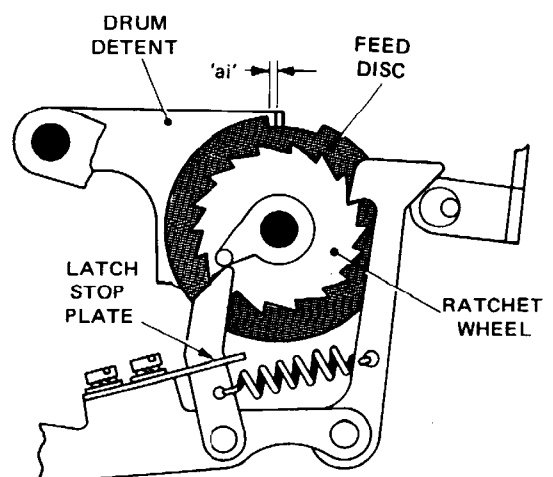


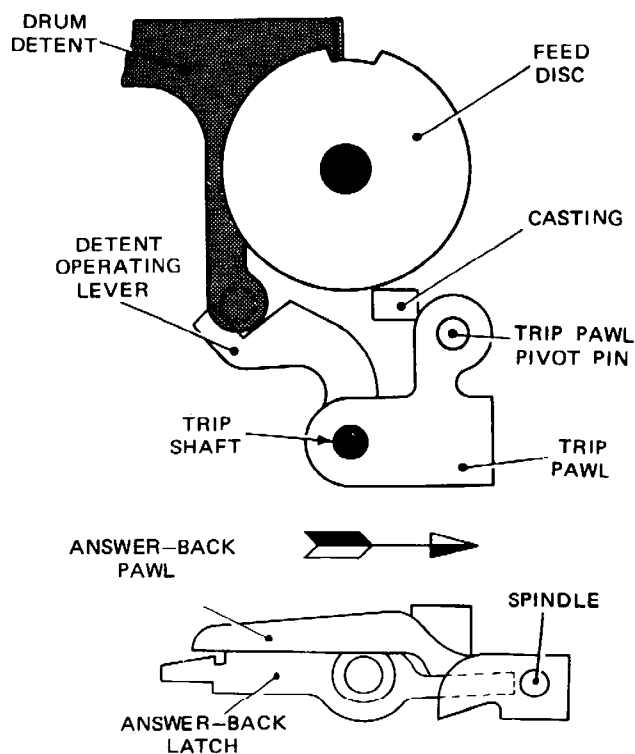
Fig. 4.35 DRUM DETENT/FEED DISC - HORIZONTAL CLEARANCE

*Action*

- 37.6 To adjust, slacken the screws securing the latch stop plate and move the plate to satisfy the conditions. Tighten the screws and fit the ward drum.

**38. DETENT OPERATING LEVER POSITION***Check*

- 38.1 Set the unit in the rest condition, move the answer-back pawl in the direction shown in Fig. 4.36 until the spindle rests against the end of the answer-back latch as also shown, and check that when the lock lever latch, Fig. 4.32, is moved away from the lock lever and released it returns freely to engage the lock lever.



**Fig. 4.36 ANSWER-BACK DETENT AND TRIP MECHANISMS (REAR VIEW)**

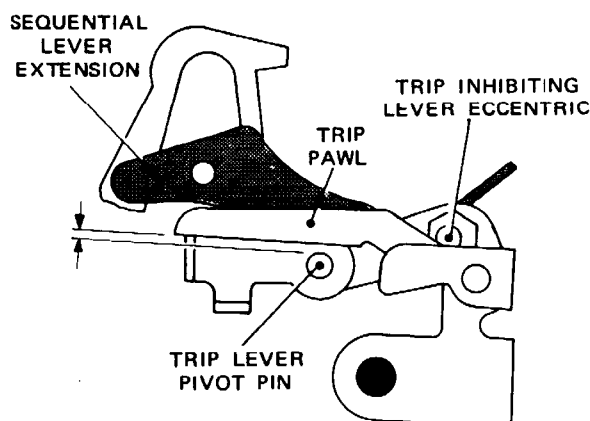
- 38.2 Check that the vertical clearance between the latching faces of the lock lever and latch is not greater than 0.005 inch.

*Action*

- 38.3 To adjust, slacken the screw clamping the detent operating lever and position the lever to satisfy the condition. Tighten the screw.

**39. WRU INHIBITION***Check*

- 39.1 With the unit in the rest condition, the trip pawl pivot pin located against the left-hand face of the main casting, Fig. 4.36, and the sequential lever extension in contact with the trip inhibiting lever eccentric, Fig. 4.37, check that there is a clearance of 0.004–0.008 inch (dimension 'aj') between the trip pawl and the trip lever pivot pin.



**Fig. 4.37 ANSWER-BACK TRIP MECHANISM (REAR VIEW)**

*Action*

- 39.2 To adjust, slacken the nut securing the trip inhibiting lever eccentric and turn the eccentric to correct the clearance. Tighten the nut.

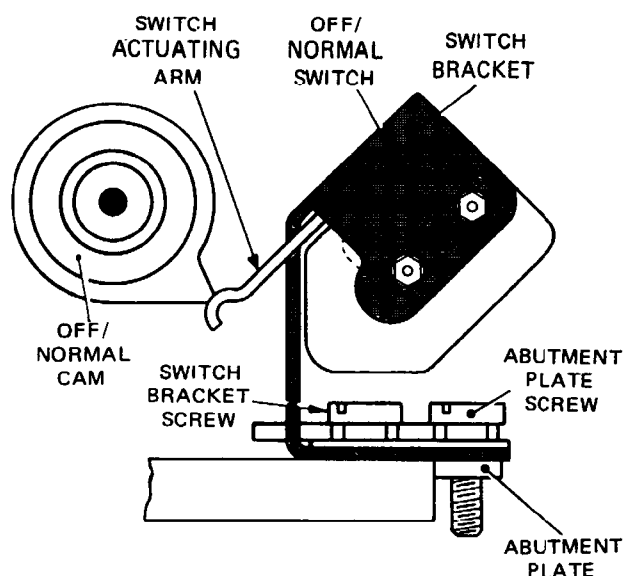
**40. OFF/NORMAL SWITCH ALIGNMENT***Check*

- 40.1 With the answer-back unit in the rest condition, check visually that the nose of the off/normal switch actuating arm, Fig. 4.38, is in alignment with the peak of the off/normal cam.

*Action*

- 40.2 To adjust, proceed as follows.

- Slacken the two inner screws securing the switch bracket to the casting and the two outer screws securing the abutment plate to the bracket.
- Position the bracket to align the actuating arm correctly, and secure the bracket to the casting by the two inner screws.
- Slide the abutment plate against the face of the casting, and secure the plate to the bracket by the two outer screws.



**Fig. 4.38 OFF/NORMAL SWITCH MECHANISM  
(REAR VIEW)**

#### 41. OFF/NORMAL SWITCH OPERATION

##### *Check*

- 41.1 Depress the HERE IS key and turn the ratchet wheel, Fig. 4.33, by hand until the twentieth feed action has taken place. Check that the off/normal cam, Fig. 4.38, has not yet operated the off/normal switch.
- 41.2 Turn the camshaft slowly and check that the cam operates the switch as the last feed action occurs. Check also that the actuating arm has a possible 0.005–0.015 inch of overtravel after the cam has operated the switch.

##### *Action*

- 41.3 To adjust, slacken the nuts securing the switch and move the switch to satisfy the conditions. Tighten the nuts.

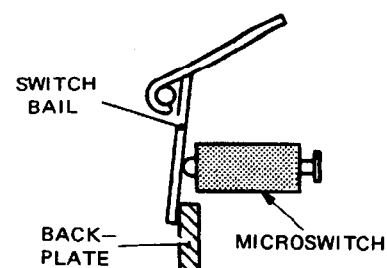
#### 42. END-OF-LINE-INDICATOR SWITCH

##### *Check*

- 42.1 With the end-of-line switch bail resting on the back-plate at the right-hand end of the unit, Fig. 4.39, check that the microswitch is fully operated.

##### *Action*

- 42.2 To adjust, slacken the screws securing the microswitch, position the microswitch to satisfy the conditions, and secure the microswitch.



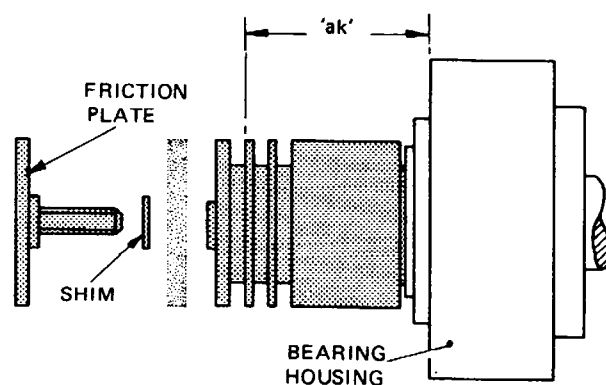
**Fig. 4.39 END-OF-LINE SWITCH**

### H CAMSHAFT UNIT

#### 43. SELECTOR CAMS POSITION

##### *Check*

- 43.1 Check that the distance from the left-hand face of the camshaft bearing housing to the left-hand face of the second cam from the clutch (dimension 'ak' of Fig. 4.40) is 1.100–1.110 inch. If this distance cannot be satisfactorily measured, check at the machine adjustment stage that the cams are in alignment with the cam followers.



**Fig. 4.40 SELECTOR CAM ASSEMBLY**

##### *Action*

- 43.2 To adjust, screw off the friction plate (left-hand thread), alter the number of shims to correct the distance, and screw on and tighten the friction plate.

## I KEYBOARD UNIT

## 44. KEYBAR STOP STRIP HEIGHT

*Check*

- 44.1 Depress the LETTERS pad and check that each locked (figures) key can be depressed, before being stopped by the shift lock bar, by 0.010–0.060 inch (dimension 'al' of Fig. 4.41).
- 44.2 Depress the FIGURES pad and check that each locked (letters) key can be depressed, before being stopped by the shift lock bar, by 0.010–0.060 inch (dimension 'al').

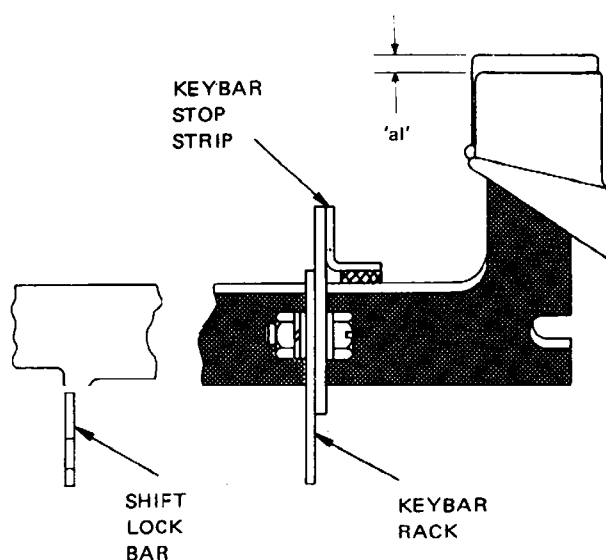


Fig. 4.41 KEYBAR STOP STRIP  
(LEFT-HAND SIDE VIEW)

*Action*

- 44.3 To adjust, slacken the screws clamping the keybar stop strip to the keybar rack, and raise or lower the strip to satisfy the conditions. Tighten the screws.

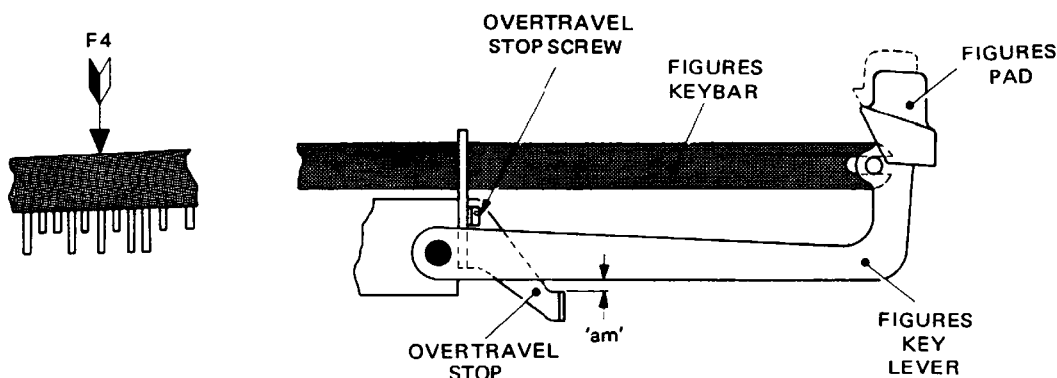


Fig. 4.43 OVERTRAVEL STOP (LEFT-HAND SIDE VIEW)

## 45. SPACE PAD ALIGNMENT

*Check*

- 45.1 Check that the upper face of the Space pad, Fig. 4.42, is level with the upper faces of the Letters and Figures pads.

*Action*

- 45.2 To adjust, slacken the nut clamping the space key lever and move the lever to satisfy the condition. Tighten the nut.

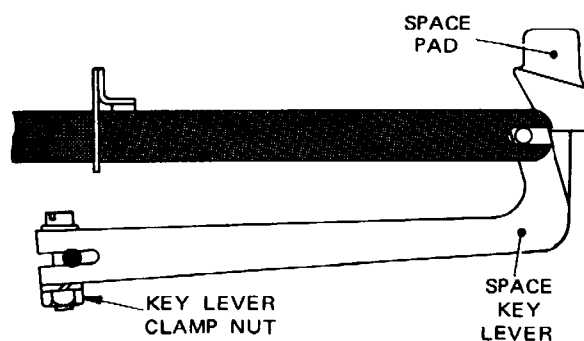
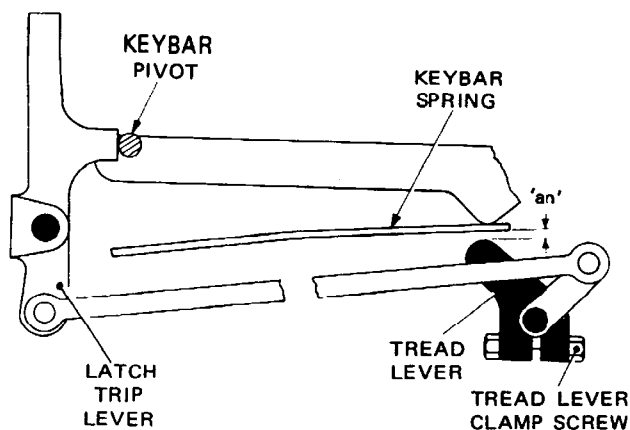


Fig. 4.42 SPACE KEY LEVER  
(LEFT-HAND SIDE VIEW)

## 46. OVERTRAVEL STOP POSITION

*Check*

- 46.1 Depress the FIGURES keybar at F4, Fig. 4.43, as far as it can go. Check that there is now a clearance of 0.025–0.035 inch (dimension 'am') between the figures key lever and the overtravel stop.



**Fig. 4.44 AUTO-START LATCH MECHANISM  
(LEFT-HAND SIDE VIEW)**

- 46.2 Depress the LETTERS keybar at the same place and check that there is a similar clearance between the letters key lever and the stop.

*Action*

- 46.3 To adjust, slacken the two screws securing the overtravel stop and raise or lower the stop to correct both clearances. Tighten the screws.

## 47. TREAD LEVER POSITION

This adjustment is applicable only to machines fitted with the auto-start facility.

*Check*

- 47.1 Hold the latch trip lever, Fig. 4.44, against the keybar pivot, depress the LETTERS pad fully and check that there is a clearance of 0.005–0.010 inch (dimension 'an') between the tread lever and the keybar spring.

- 47.2 Release the LETTERS pad and check that the tread lever is positioned centrally on the spring.

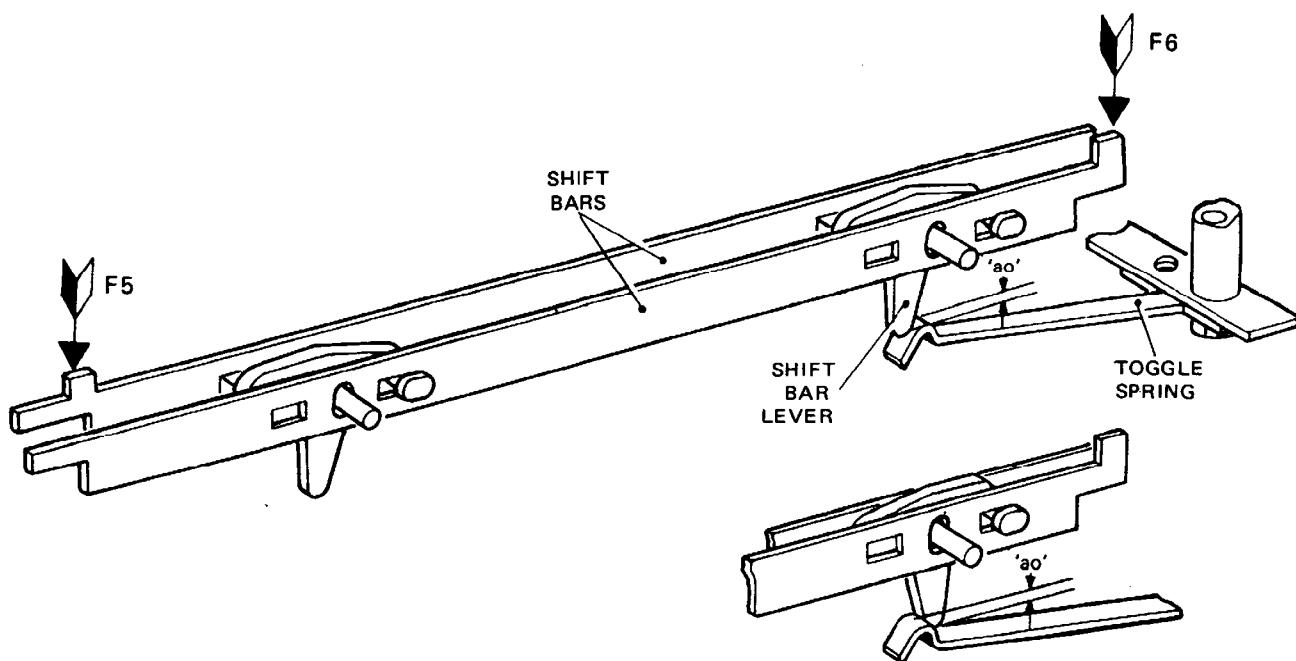
*Action*

- 47.3 To adjust, slacken the screw clamping the tread lever, and move the lever to satisfy the conditions. Tighten the screw.

## 48. TOGGLE SPRING SETTING

*Check*

- 48.1 Check that the force required to press down each shift bar in turn, at F5 and F6 in Fig. 4.45, is 2–8 ounces (57–227 grams).



**Fig. 4.45 SHIFT BAR TOGGLE MECHANISM**

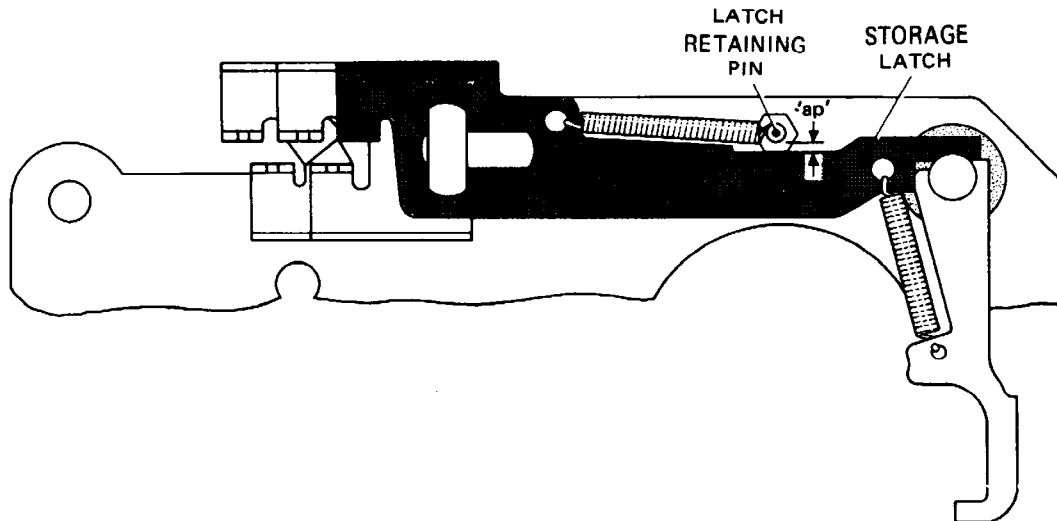


Fig. 4.46 STORAGE LATCH MECHANISM

*Action*

48.2 Check that the forces required to press down the shift bars alternately do not differ by more than 2 ounces (57 grams).

48.3 Check that the toggle spring is in line with the shift bar lever.

*Action*

48.4 If the check is not satisfied, loosen the screws securing the toggle spring, set the spring so that its nose rises to the same extent (dimension 'ao') on each side of the shift bar lever, ensuring that the spring is in line with the lever, and tighten the screws.

49.2 To adjust, slacken the nut securing the retaining pin and turn the pin to satisfy the conditions. Tighten the nut.

**K TAPE READER UNIT****Turning the Camshaft**

Whenever it is necessary to release the tape reader clutch and turn the unit camshaft over by hand, either to a specific position or through a complete revolution, carry out the following procedure.

- (a) Hold down the left-hand end of the tape-out lever and depress the TAPE TRANSMITTER ON key.
- (b) Using a screwdriver in the slot in the rear camshaft screw, turn the shaft in a clockwise direction (do not use the front camshaft screw to turn the shaft counter-clockwise as this may slacken the screw).
- (c) At the end of the camshaft revolution, reset the key latch mechanism by depressing the TAPE TRANSMITTER OFF key.

**J SELECTOR UNIT****49. STORAGE LATCH/RETAINING PIN CLEARANCE***Check*

49.1 Check that the maximum clearance between the highest storage latch, Fig. 4.46, and its eccentric retaining pin is not more than 0.005 inch (dimension 'ap'), at the same time ensuring that all the latches are free to slide horizontally.

**Stop and Start Conditions**

Where the following adjustments require the unit to be set to the stop or start condition, obtain the condition by the following procedure.

To secure the stop condition —

- (a) depress and hold down the tape-out lever,
- (b) depress the TAPE TRANSMITTER OFF key fully,
- (c) depress the TAPE TRANSMITTER ON key,
- (d) release the tape-out lever,
- (e) turn the camshaft until it is brought to rest by the engagement of the stop lever with the clutch dog.

To secure the start condition —

- (a) secure the stop condition,
- (b) depress the TAPE TRANSMITTER OFF key fully.

## 50. CLUTCH SPINDLE POSITION

*Check*

- 50.1 Check that the clearance between the detent lever pin and the main casting (dimension 'aq' of Fig. 4.47) is 0.002–0.006 inch.

*Action*

- 50.2 To adjust, slacken the three screws securing the end cover to the main casting, reposition the end cover to obtain the correct clearance, and secure the end cover.

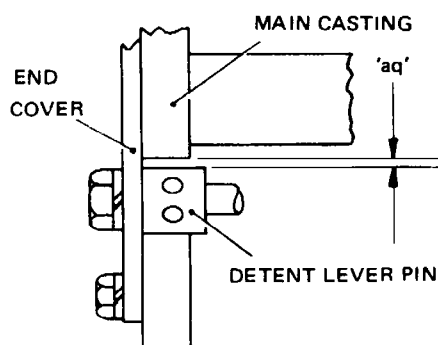


Fig. 4.47 CLUTCH SPINDLE

## 51. TAPE GATE CLEARANCE

Carry out this adjustment before fitting the contact block and the tape deck to the unit.

*Check*

- 51.1 Check that the gap between the gate and the tape guide on the right-hand side of the gate (dimension 'ar' of Fig. 4.48) is 0.010–0.014 inch.

- 51.2 Check that the gap between the gate and the tape deck across the front of the gate (dimension 'as'), if there is one, is parallel within 0.002 inch.

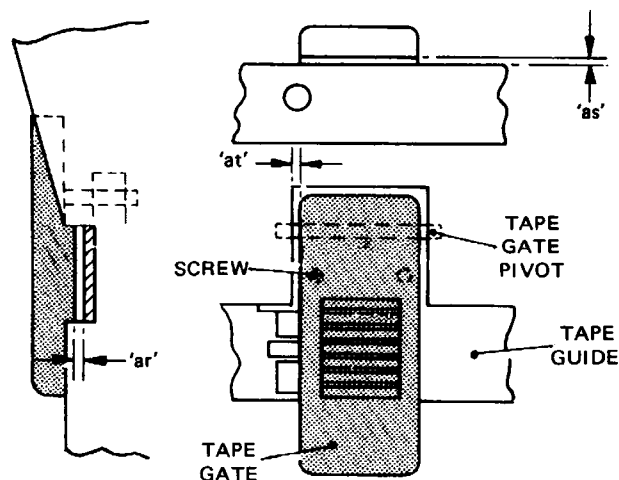


Fig. 4.48 TAPE GATE

*Action*

- 51.3 To adjust the gaps, unscrew the two screws under the tape deck so that they do not project above the tape deck, close the tape gate, screw in the right-hand screw to correct gap 'ar' and screw in the left-hand screw to correct gap 'as'.

NOTE: These screws are locked by Loctite (grade screwlock).

*Check*

- 51.4 Check that the side play of the tape gate on the pivot is only just discernible (not more than 0.005 inch) and that, with three thicknesses of tape under the gate, the tape is only just held by the gate.

*Action*

- 51.5 To adjust —

- (a) remove any shims on the tape gate pivot and assemble the gate,
- (b) insert three thicknesses of tape under the gate,
- (c) slide the gate gently from left to right until the tape is just held,
- (d) measure the clearance between the gate and the tape deck on the left-hand side (dimension 'at' of Fig. 4.48),
- (e) insert shims PW 5803 (0.005 inch) between gate and tape deck at the left-hand end of the pivot to give the measured clearance, and

- (f) insert shims at the other end of the pivot to give an only just discernible side play.

## 52. CLUTCH CLEARANCE

Carry out this adjustment before fitting the tape deck to the unit.

### Check

- 52.1 Set the unit to the start condition, and check that the gap between the clutch teeth (dimension 'au' of Fig. 4.49) is 0.010–0.015 inch.

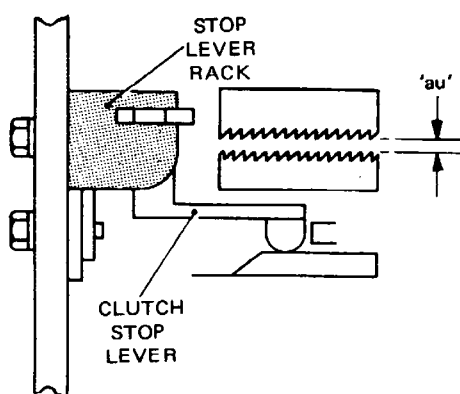


Fig. 4.49 STOP LEVER RACK (PLAN VIEW)

### Action

- 52.2 To adjust, unhook the sequential lever springs from the spring anchor pin, slacken the screws securing the stop lever rack, slide the rack backward or forward to correct the gap, secure the rack, and hook the springs.

## 53. CLUTCH RESET LEVER PRESSURE

Carry out this adjustment before fitting the tape deck to the unit.

### Check

- 53.1 With the unit in the start condition, turn the alarm stop lever, Fig. 4.51, counter-clockwise as far as it can go. Holding the stop lever in this position, apply a spring tension gauge to the top of the clutch reset lever at F7 and check that the pressure needed to depress the reset lever against the detent lever is 240–280 grams.

### Action

- 53.2 To adjust, slacken the screw securing the detent lever pin, Fig. 4.50, and turn the pin to correct the pressure. Tighten the screw.

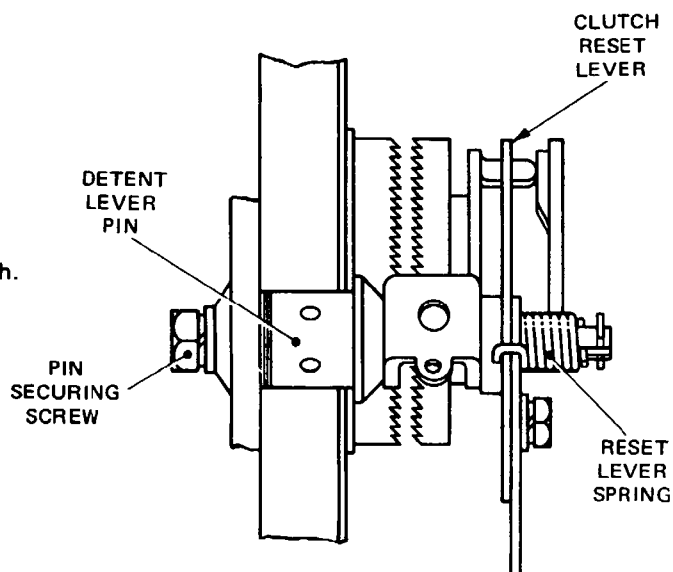


Fig. 4.50 CLUTCH DETENT LEVER MECHANISM (LEFT-HAND SIDE VIEW)

## 54. ALARM SWITCH POSITION

Carry out this adjustment before fitting the tape deck to the unit.

### Check

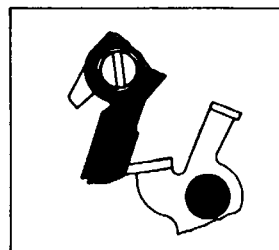
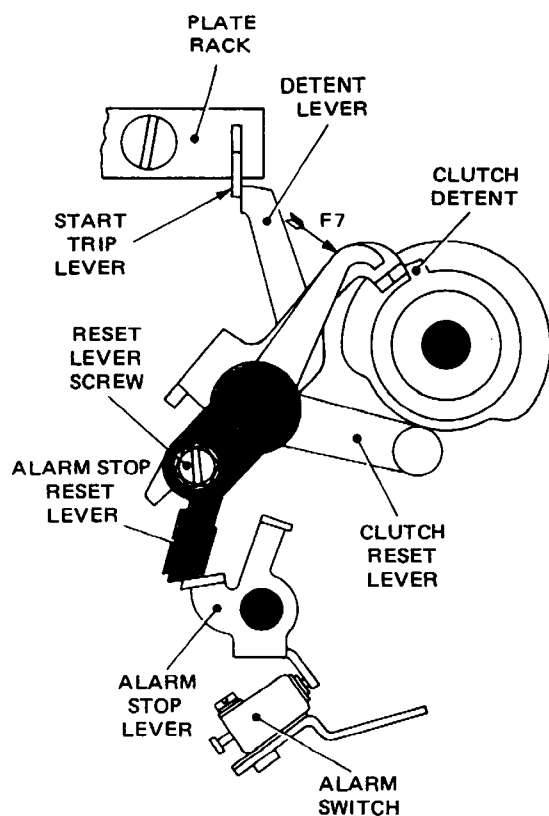
- 54.1 Release the clutch and turn the camshaft through a complete revolution so that the clutch detent, Fig. 4.51, is held against its detent lever. Check that the alarm stop lever is now in contact with its reset lever, as shown in inset 1.

### Action

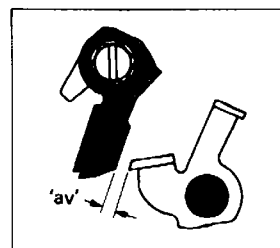
- 54.2 To adjust, slacken the screws securing the alarm switch and move the switch to satisfy the condition. Tighten the screws.

## 55. ALARM STOP RESET LEVER POSITION

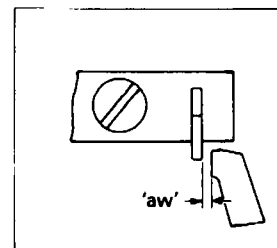
Carry out this adjustment before fitting the tape deck to the unit.



INSET 1



INSET 2



INSET 3

Fig. 4.51 CLUTCH RESET MECHANISM

**Check**

- 55.1 Release the clutch and turn the camshaft until the roller on the clutch reset lever, Fig. 4.51, is on the peak of the cam. Check that there is now a clearance of 0.008–0.012 inch (dimension 'av') between the alarm stop lever and its reset lever, as shown in inset 2.

**Action**

- 55.2 To adjust, slacken the screw securing the alarm stop reset lever and move this lever relative to the clutch reset lever to correct the clearance. Tighten the screw.

## 56. DETENT LEVER/START TRIP LEVER CLEARANCE

Carry out this adjustment before fitting the tape deck to the unit.

**Check**

- 56.1 Release the clutch and turn the camshaft through a complete revolution. With the alarm stop lever, Fig. 4.51, in contact with its reset lever as shown in inset 1, check that there is a horizontal clearance of 0.008–0.012 inch (dimension 'aw')

of inset 3) between the detent lever and the start trip lever.

**Action**

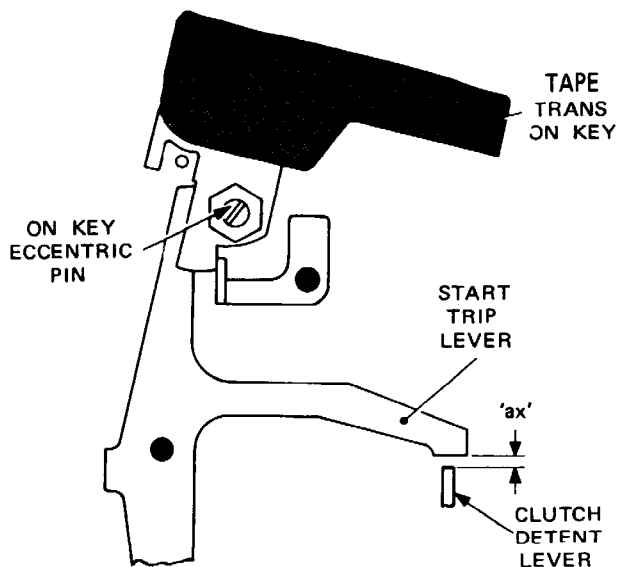
- 56.2 To adjust, slacken the screw securing the plate rack and move the rack to correct the clearance. Tighten the screw. It may be necessary to slacken temporarily the nut securing the switch lever, Fig. 4.54, to free the shaft.

## 57. TAPE TRANSMITTER ON KEY LATCH MOVEMENT

Carry out this adjustment before fitting the tape deck to the unit.

**Check**

- 57.1 Hold down the left-hand end of the tape-out lever, depress the TAPE TRANSMITTER ON key, Fig. 4.52, and check that there is a vertical clearance of 0.008–0.012 inch (dimension 'ax') between the start trip lever and the clutch detent lever.



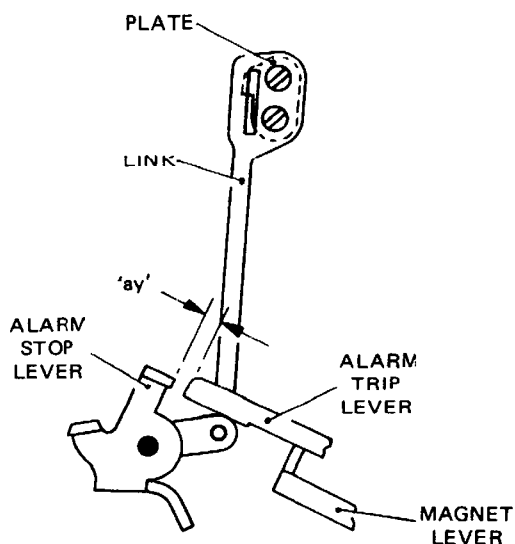
**Fig. 4.52 TAPE TRANSMITTER ON KEY LATCH MECHANISM**

*Action*

- 57.2 To adjust, slacken the nut securing the TAPE TRANSMITTER ON key eccentric pin and turn the pin by its screwdriver slot to correct the clearance. Tighten the nut.

**58. TAPE TRANSMITTER OFF KEY LATCH MOVEMENT**

Carry out this adjustment before fitting the tape deck to the unit.



**Fig. 4.53 TAPE TRANSMITTER OFF KEY LATCH MECHANISM**

*Check*

- 58.1 Set the unit to the stop position and, whilst holding down the tape-out lever, depress the TAPE TRANSMITTER OFF key and check visually that the gap between the alarm trip lever and the stop lever (dimension 'ay' of Fig. 4.53) is 0.030–0.080 inch. Ensure that the magnet lever is latched by the magnet latch lever.

*Action*

- 58.2 To adjust the gap, slacken the screws securing the plate to the link, set the plate for the correct clearance and secure the plate.

**59. TAPE TRANSMITTER ON KEY INHIBITION**

Carry out this adjustment before fitting the tape deck to the unit.

*Check*

- 59.1 Set the unit to the stop position, depress the TAPE TRANSMITTER OFF key gently until the TAPE TRANSMITTER ON key is released, and check that the gap between the start trip lever and the start inhibit lever (dimension 'az' of Fig. 4.54) is 0.008–0.012 inch.

*Action*

- 59.2 To adjust the gap, slacken the nut securing the switch lever and, whilst pressing in the microswitch plunger by means of the switch lever, set the start trip lever for the correct clearance, and secure the switch lever. Ensure that the switch lever does not bind on the key bracket.

*Check*

- 59.3 Check adjustment 56.

**60. PECKER ALIGNMENT**

*Check*

- 60.1 Trip the camshaft and, whilst turning the camshaft slowly, check that each pecker, Fig. 4.55, moves freely in a tape guide slot of the tape deck.

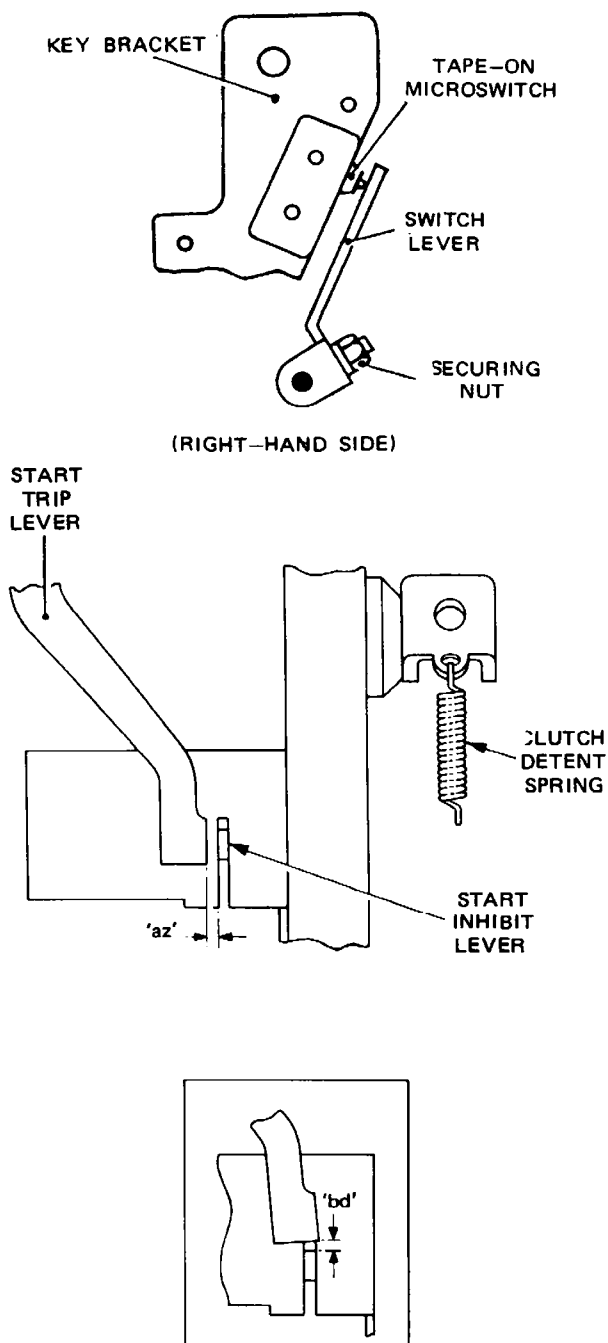


Fig. 4.54 START INHIBIT LEVER CLEARANCES

*Action*

- 60.2 To free the peckers, remove the nut securing the shouldered pin, change the number of shims under the shoulder appropriately, and secure the shouldered pin.

**61. PECKER SPRING FORCE***Check*

- 61.1 Set the camshaft to the rest position, and check that the force necessary to lift both spring

blades off each pecker (force F8 of Fig. 4.55) is 24–32 grams.

*Action*

- 61.2 To adjust the spring force, set the pair of blades equally to correct the force, ensuring that the pair lie together.

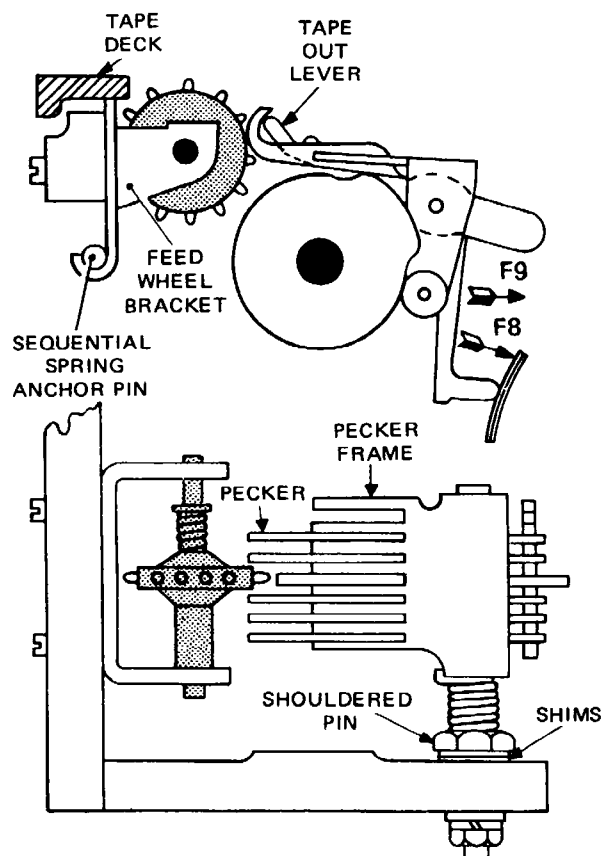


Fig. 4.55 FEED MECHANISM

**62. PECKER FRAME PRESSURE***Check*

- 62.1 Set the unit to the start condition, depress and hold down the tape-out lever, Fig. 4.55, depress the TAPE TRANSMITTER ON key and turn the camshaft until the peckers just rise to the maximum height, but before the sequential levers are lowered. Check that the force F9 required to move the pecker frame is 380–420 grams.

*Action*

- 62.2 To adjust the force, slacken the nut securing the shouldered pin, turn the shouldered pin to correct the force, and secure the pin.

### 63. MAGNET ARMATURE POSITION

#### Check

- 63.1 Depress the magnet armature, Fig. 4.56, by hand and check that there is a clearance of 0.008–0.012 inch (dimension 'ba') between the magnet latch lever and the magnet read lever.

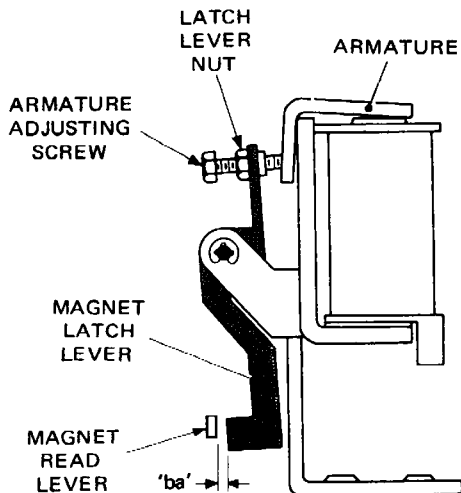


Fig. 4.56 MAGNET LATCH MECHANISM

#### Action

- 63.2 To adjust, slacken the latch lever locknut and, holding down the armature, turn the armature adjusting screw to correct the clearance. Tighten the locknut.

### 64. TAUT-TAPE SPRING

This adjustment is applicable only if a taut-tape arm is fitted to the tape deck.

#### Check

- 64.1 With the magnet read lever resting on the arm of the magnet latch lever, as shown in Fig. 4.58, check that the gap between the taut-tape leaf spring (Fig. 4.57) and the open armature (dimension 'bb') is 0.005–0.012 inch.

#### Action

- 64.2 To adjust, remove the tape deck, set the end of the leaf spring to correct the gap, and fit the tape deck.

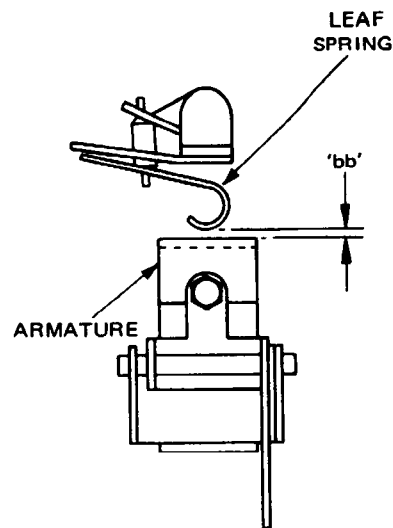


Fig. 4.57 TAUT-TAPE LEAF SPRING

### 65. ALARM TRIP LEVER POSITION

#### Check

- 65.1 Load a short length of all-mark tape into the unit. With the unit in the rest condition, ensure that the magnet read lever, Fig. 4.58, is fully latched up by the magnet latch lever. Check that there is now a clearance of 0.005–0.015 inch (dimension 'bc') between the alarm trip lever and the magnet read lever.

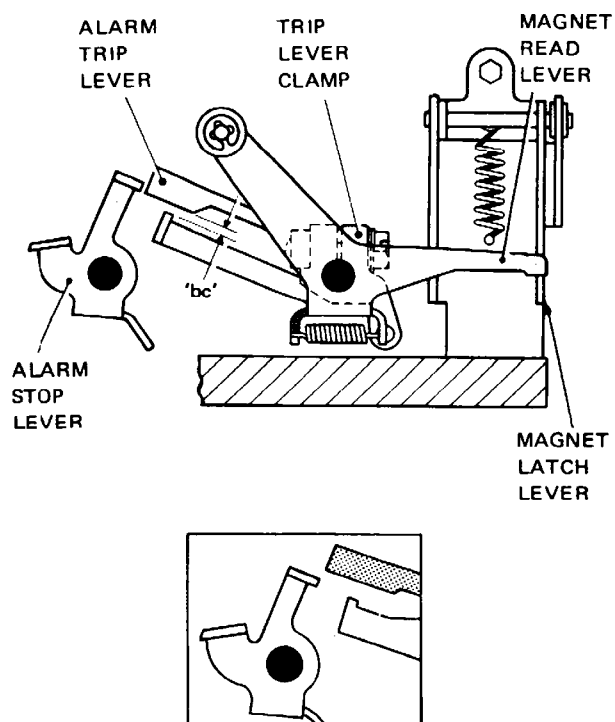


Fig. 4.58 ALARM TRIP LEVER MECHANISM

*Action*

- 65.2 To adjust, slacken the screw securing the alarm trip lever clamp and move the clamp to correct the clearance. Tighten the screw.

*Check*

- 65.3 Check that the alarm trip lever is in full engagement with the alarm stop lever, as shown. Remove the tape and check that the trip lever is now clear of the stop lever by 0.010 inch, as shown in the inset.

*Action*

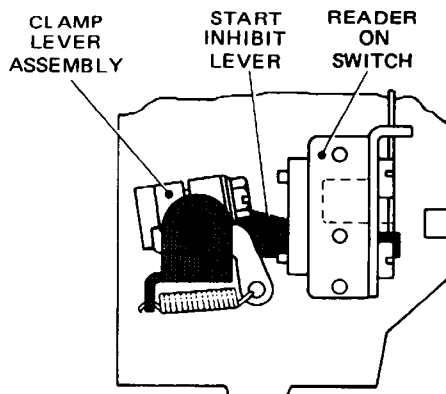
- 65.4 To adjust, refine the setting obtained in adjustment 65.2 to satisfy the condition.

**66. TAPE-OUT LEVER HEIGHT***Check*

- 66.1 Set the unit to the stop condition, gently press the TAPE TRANSMITTER OFF key to release the TAPE TRANSMITTER ON key only, load all-mark tape and, depressing the TAPE TRANSMITTER ON key so that the start trip lever passes over the start inhibit lever, Fig. 4.54, check that the gap between the levers (dimension 'bd' in the inset) is 0.008–0.020 inch.

*Action*

- 66.2 To adjust the gap, slacken the nut securing the clamp lever assembly, Fig. 4.59, turn the start-inhibit lever to correct the gap, ensure that the clamp is centrally placed between the ears of the lever, and secure the clamp.



**Fig. 4.59 START INHIBIT LEVER MECHANISM (REAR VIEW)**

**67. FEED WHEEL ALIGNMENT***Check*

- 67.1 Check that the feed wheel is centrally placed in the tape guide slot of the tape deck.

*Action*

- 67.2 To position the feed wheel centrally, remove the sequential spring anchor pin, Fig. 4.55, slacken the two screws securing the feed wheel bracket, slide the bracket sideways to correct the positioning whilst at the same time maintaining the bracket in contact with the underside of the tape deck, and secure the bracket. Ensure that the feed wheel teeth protrude above the tape deck correctly.

**68. TAPE FEED PITCH AND STOP***Check*

- 68.1 Load a short length of tape perforated with the all-mark code, release the clutch, turn the camshaft until the feed wheel engages one tooth and, whilst turning the camshaft further, check that the peckers are entering the code holes centrally.

*Action*

- 68.2 To adjust –
- remove the sequential springs and anchor pin,
  - slacken the screw securing the feed pawl stop lever, Fig. 4.60,
  - turn the lever fully counter-clockwise,
  - slacken the nut securing the eccentric,
  - turn the eccentric to move the feed lever relative to the feed cam lever and thus to correct the pitch (dimension 'bf'),
  - secure the eccentric,
  - set the unit to the start condition,
  - gently move the feed pawl stop lever clockwise until it contacts the feed pawl,
  - secure the lever,
  - turn the camshaft and ensure that the feed pitch is correct, and
  - fit the anchor pin and the sequential springs.

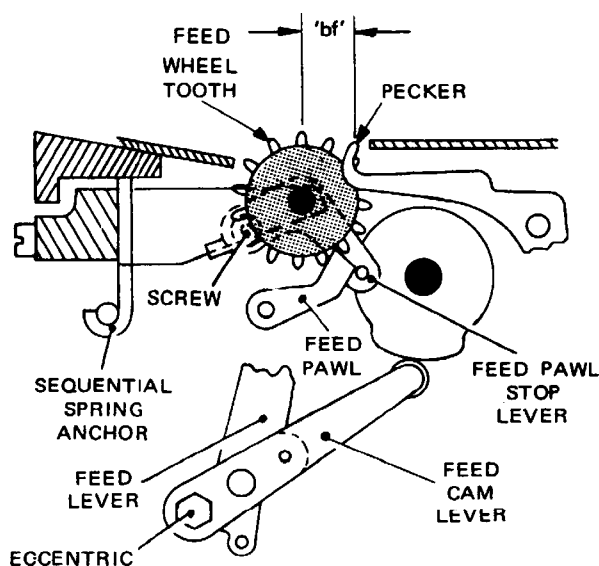


Fig. 4.60 TAPE FEED PITCH

## 69. CONTACT BLOCK

### Check

- 69.1 Measure the gap between each side of the stop pin and the contact block slot (dimensions 'bg' of Fig. 4.61), and check that these do not differ by more than 0.004 inch.

### Action

- 69.2 To adjust the gaps, slacken the two contact block securing screws, swing the block to equalise the gaps, and secure the block.

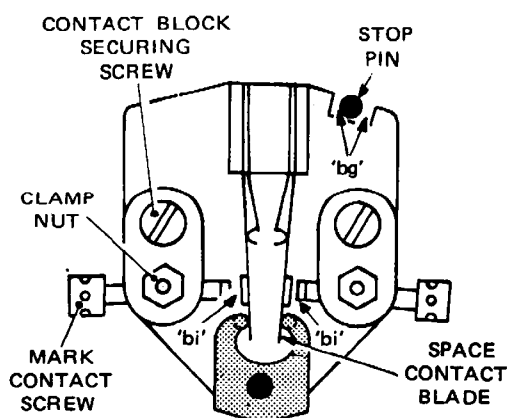


Fig. 4.61 CONTACT BLOCK

## 70. ROCKER STOP PLATE AND STRIKER LEVER HEIGHT – TEMPORARY ADJUSTMENTS

Before making further adjustments, remove the radio interference suppressor assembly, and unhook the jockey arm spring, Fig. 4.62, from its anchor pin. After the final adjustments of rocker stop plate and striker lever height, adjustment 72, hook the spring to the pin, and fit the suppressor assembly.

### Caution

If the mounting plate setting or the rocker stop plate setting is disturbed, the camshaft can be jammed by the cam lever and rocker. To prevent jamming, make the following temporary adjustments.

### Action

- 70.1 Slacken the screw securing the rocker stop plate, Fig. 4.63, set the carrier midway between the mark and space positions, raise the cam lever to insert both ends of the striker lever arms in the rocker, as shown in Fig. 4.62, set the stop plate to equalise the gaps 'bh', and secure the stop plate.

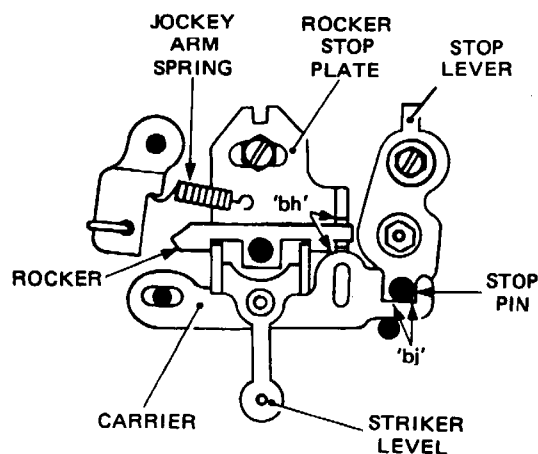


Fig. 4.62 MARK/SPACE SWITCH MECHANISM

- 70.2 Slacken the screw securing the mounting plate, Fig. 4.63, slacken the nut securing the eccentric and, whilst holding the mounting plate against the casting, set the eccentric to provide visible clearance between the end of the rocker and both sides of the stop-plate gap for both the mark and space positions of the carrier. Secure the mounting plate and the eccentric.

## 71. CONTACT TRANSIT GAP AND CARRIER STOP

Before making any check, unhook the jockey arm spring from the anchor pin if this action is not already taken. After adjustment 72 hook the spring to the pin.

### Check

- 71.1 Check that the gap between each contact screw and blade contact (dimension 'bi' of Fig. 4.61) is 0.003–0.004 inch.

### Action

- 71.2 To adjust the gap, slacken the clamp nut, set the contact screw for the correct gap, and clamp the screw.

### Check

- 71.3 Measure the gap between each side of the stop pin and the carrier slot (dimension 'bj' of Fig. 4.62), and check that the gaps do not differ by more than 0.004 inch.

### Action

- 71.4 To adjust the gaps, slacken the screw and nut securing the stop lever, set the lever to equalise the gaps, and secure the lever.

## 72. STRIKER LEVER HEIGHT AND ROCKER STOP PLATE – FINAL ADJUSTMENTS

Before making adjustments, remove the radio interference suppressor assembly and unhook the jockey arm spring, Fig. 4.63, from its anchor pin, if these actions are not already taken. After making the adjustment hook the spring to the pin, and fit the suppressor assembly.

### Check

- 72.1 Secure the start condition, hold the carrier in the space position as shown in Fig. 4.63, trip the clutch and turn the camshaft until the cam lever is on a peak of the cam. The rocker moves to the position shown.
- 72.2 Rotate the cam slowly to the next peak, and measure the gap between the upper side of the rocker and rocker stop plate (dimension 'bk'). Repeat this measurement for each peak, note the peak giving the smallest gap and check that the smallest gap is 0.002–0.004 inch.

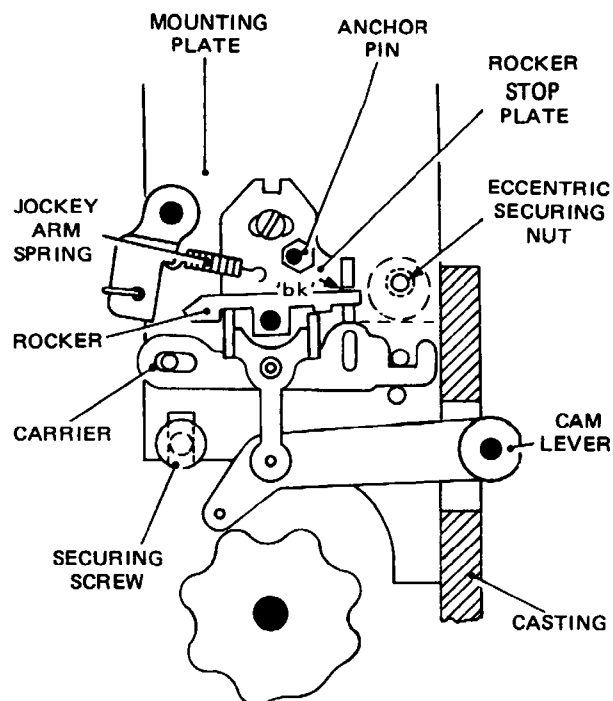


Fig. 4.63 SWITCH MOUNTING PLATE (FRONT VIEW)

### Action

- 72.3 To adjust the gap, slacken the screw securing the mounting plate and the nut securing the eccentric, hold the mounting plate against the casting and turn the eccentric to secure the correct gap. Secure the mounting plate and the eccentric.

### Check

- 72.4 Repeat check 72.2, but check instead that the maximum gap is not greater than 0.010 inch.

### Action

- 72.5 Refine action 72.3 if necessary.

### Check

- 72.6 Repeat checks 72.1 and 72.2, but hold the carrier in the mark position and measure the gap beneath the rocker instead.

### Action

- 72.7 Refine action 72.3 if necessary.

### Check

- 72.8 Repeat check 72.2, but check instead that the maximum gap beneath the rocker for the mark position is not greater than 0.010 inch.

*Action*

72.9 Refine action 72.3 if necessary.

*Check*

72.10 Rotate the cam to the peak that gave the minimum gap 'bk' for the space position of the carrier, and check that the lower gap for the mark position does not differ from gap 'bk' measured in check 72.2 by more than 0.004 inch.

*Action*

72.11 To adjust, slacken the screw securing the rocker stop plate, set the stop plate to reduce the gap difference sufficiently, and secure the stop plate.

*Check*

72.12 If action 72.11 is taken, repeat all foregoing checks 72.1, 72.2, 72.4, 72.6, 72.8, and 72.10, and take appropriate action where necessary.

*Action*

72.13 Refine action 72.11 is necessary.

### 73. CONTACT PRESSURE

Before the adjustment is carried out, it is necessary to carry out adjustment 71 (Contact Transit Gap).

*Check*

73.1 Set the dolly to one side to close the right-hand contacts as shown in Fig. 4.64. Observing the contacts under good lighting check that the force necessary to open the contacts without the aid of the dolly is 100–120 grams.

73.2 Set the dolly to the other side, and check that the force necessary to open the other contacts is also 100–120 grams.

*Action*

73.3 To lower the contact pressure, carefully insert a knife blade or a limb of a pair of tweezers between the contact blade and the spring blade and, whilst holding the contact and spring blades together over the full width to prevent twisting, ease the spring blade away to correct the pressure.

73.4 To raise the contact pressure, renew the spring blade and repeat the adjustment. Do not re-form

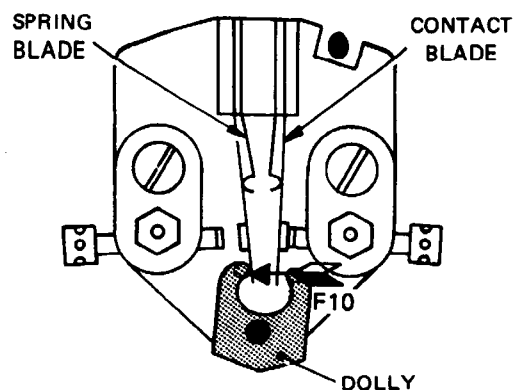


Fig. 4.64 MARK/SPACE CONTACT BLOCK

the spring blade as the adjustment would be unstable.

*Check*

73.5 If either of the foregoing actions is taken, re-check adjustment 71 (Contact Transit Gap).

### 74. JOCKEY ROLLER AND SPRING

*Check*

74.1 Apply a gram gauge to the contact blade at F10, Fig. 4.64, and check that the force required to set the dolly in the other position is 150–200 grams.

74.2 Check that the force required to return the dolly is also 150–200 grams.

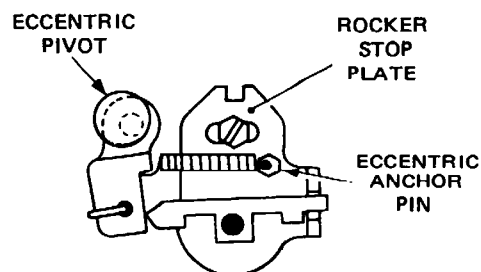


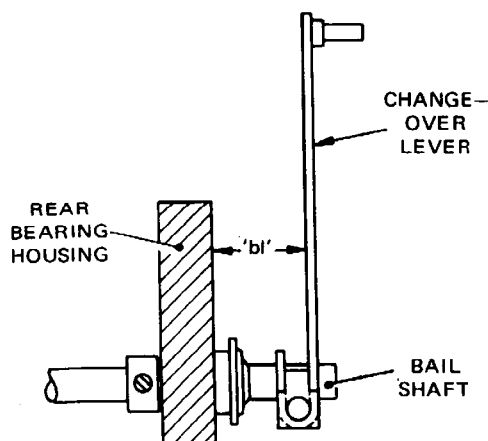
Fig. 4.65 JOCKEY ROLLER AND SPRING

*Action*

74.3 To adjust the two forces if one is high and the other is low, slacken the nut securing the eccentric pivot, Fig. 4.65, set the pivot to equalise the forces whilst ensuring that the throw is toward the bracket as shown, and secure the pivot.

- 74.4 To adjust the two forces if both are too high or both are too low, slacken the nut securing the eccentric anchor pin, turn the pin to correct the forces, and secure the pin.

## 75. CHANGE-OVER LEVER POSITION



**Fig. 4.66 CHANGE-OVER LEVER  
(RIGHT-HAND SIDE)**

### Check

- 75.1 Check that, when the change-over lever is gently pulled away from the rear bearing housing to take up the end float of the bail shaft, Fig. 4.66, the distance between the lever and the casting (dimension 'bl') is 0.548–0.572 inch.

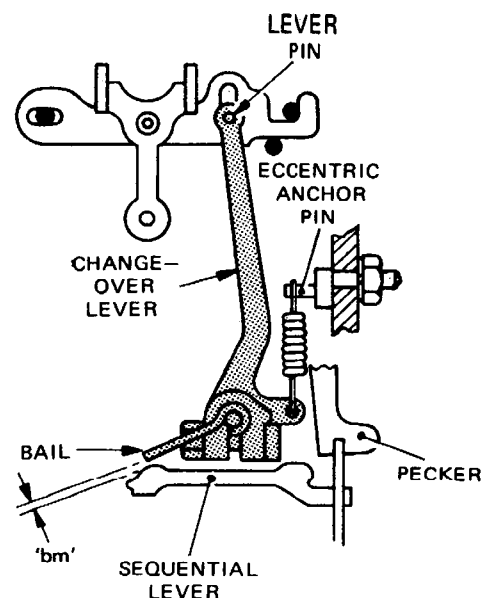
### Action

- 75.2 To adjust, slacken the change-over lever clamp screw, slide the lever along the bail shaft to correct the distance, and clamp the lever.

## 76. BAIL POSITION

### Check

- 76.1 Set the unit to the start condition, depress the tape-out lever and the TAPE TRANSMITTER ON key, turn the camshaft until the front sequential lever is lifted out fully as shown in Fig. 4.67 (with the striker follower on the peak of the stop element) but not to the point where the start sequential lever at the rear drops in, and check that the gap between the bail and the sequential lever (dimension 'bm') is 0.030–0.040 inch.



**Fig. 4.67 BAIL AND SEQUENTIAL LEVER**

### Action

- 76.2 To adjust the gap, slacken the screw clamping the change-over lever, turn the bail and shaft relative to the lever to correct the clearance, and clamp the lever.

### Check

- 76.3 Turn the camshaft through another revolution until the pecker draws away from the sequential lever, and check that the sequential lever does not drop sufficiently to touch the bail.

### Action

- 76.4 To prevent touching, refine the adjustment of gap 'bm'.

## 77. CHANGE-OVER LEVER SPRING FORCE

### Check

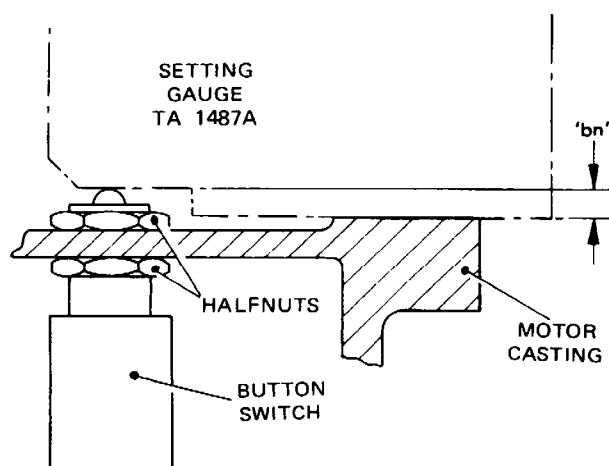
- 77.1 Set the unit to the start condition, depress the tape-out lever and the TAPE TRANSMITTER ON key, turn the camshaft until the front sequential lever is lifted out fully as shown in Fig. 4.67, before the start sequential lever at the rear drops in, and check that the force required to move the change-over lever to the right, when applied to the lever pin, is 60–70 grams.

*Action*

- 77.2 To adjust the force, slacken the nut securing the eccentric anchor pin, turn the pin to correct the force, and secure the pin.

**L MOTOR UNIT****78. SWITCH POSITION***Check*

- 78.1 Check that, when the switch button is depressed until it operates with an audible click, using gauge TA 1487A as shown in Fig. 4.68, the projection of the button from the rear of the motor casting (dimension 'bn') is 0.120–0.130 inch.



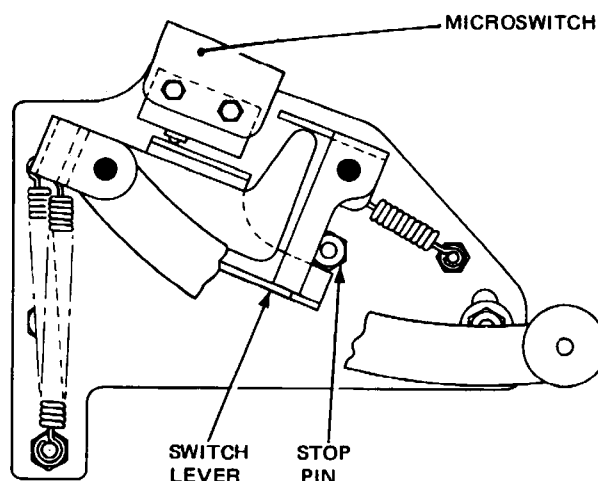
**Fig. 4.68 MOTOR SWITCH (PLAN VIEW)**

*Action*

- 78.2 To adjust, slacken the outer halfnut of the switch, set the inner halfnut for the correct projection, and tighten the outer halfnut.

**M PAPER LOW SWITCH UNIT****79. PAPER LOW WARNING***Check*

- 79.1 Check that, as the switch lever is allowed to rise to the stop pin as shown in Fig. 4.69, the microswitch is just operated.



**Fig. 4.69 PAPER LOW SWITCH**

*Action*

- 79.2 To adjust, slacken the two screws securing the microswitch, move the microswitch to satisfy the condition, and secure the microswitch.

## SECTION 2 – MACHINE ADJUSTMENTS

## †80. ANSWER-BACK RELEASE SHAFT POSITION

Carry out this adjustment after the main camshaft and the motor control switch are assembled, but before any other units are assembled to the machine.

*Check*

- 80.1 Check that the answer-back release shaft, Fig. 4.70, and its associated answer-back and two-colour printing linkages are correctly positioned, as follows.
- (a) With the main camshaft in the rest position, check that it is not possible to insert a 0.002 inch feeler gauge between –
    - (i) the answer-back release arm and its abutment pin, and
    - (ii) the WRU bellcrank lever and the left-hand bearing bracket.
  - (b) Turn the main camshaft 90–180 degrees from the rest position, turn the trip lever to release the reset lever, Fig. 4.71, and check that it is not possible to insert a 0.005 inch feeler gauge between the answer-back release arm and the stop pin, Fig. 4.70.
  - (c) Turn the camshaft by hand until the answer-back release arm is lifted to its highest position. Check that there is now a minimum clearance of 0.070 inch (dimension 'bo') between the arm and its vertical stop pin, as shown in the inset.

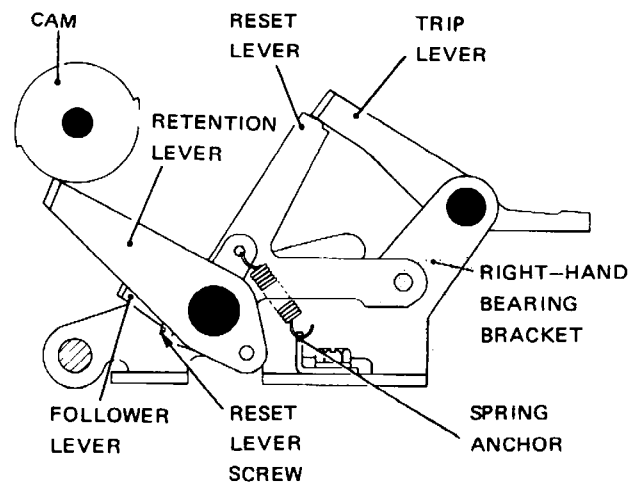
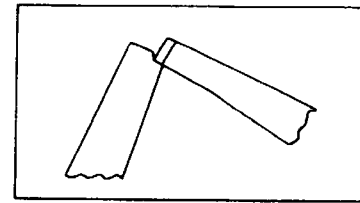


Fig. 4.71 TWO-COLOUR PRINTING LINKAGE

*Action*

- 80.2 If any of the above conditions is not satisfied, set the answer-back release shaft and its associated linkages, as follows.
- (a) Turn the camshaft about a quarter-turn away from its rest position, as shown in Fig. 4.71.

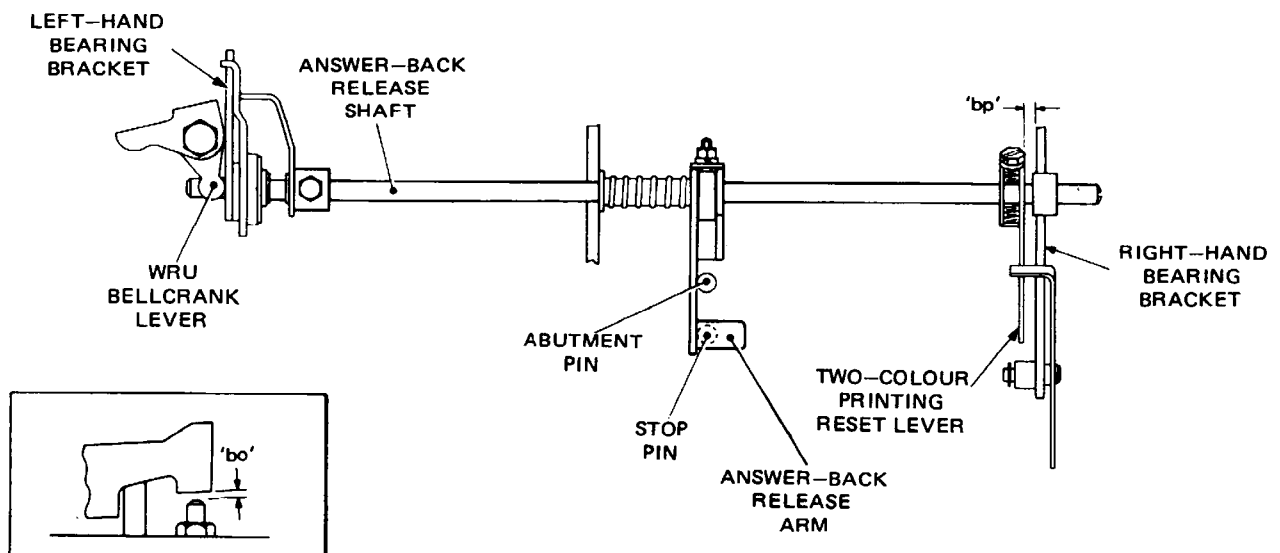


Fig. 4.70 ANSWER-BACK RELEASE MECHANISM

- (b) Slacken the nut securing the answer-back release arm and the screw securing the two-colour printing reset lever.
- (c) Secure the release arm, but first —
  - (i) lift the follower lever against the retention lever, pressing the retention lever against the root of the cam,
  - (ii) slide the answer-back release shaft to the right until the WRU bellcrank lever is drawn against the left-hand bearing bracket, and
  - (iii) slide the release arm against the abutment pin and rest it on the stop pin.
- (d) Secure the reset lever, but first —
  - (i) turn the camshaft until the answer-back release arm is lifted to its maximum height,
  - (ii) position the reset lever to give a gap 'bp', Fig. 4.70, of 0.039–0.055 inch between the lever and the right-hand bearing bracket, and
  - (iii) position the reset lever to make contact with the trip lever as shown in the inset of Fig. 4.71.

## 81. MOTOR CONTROL SWITCH – RETENTION PAWL POSITION

Carry out this adjustment after the motor control switch is assembled, but before any further units are assembled to the machine.

### Check

- 81.1 Turn the camshaft by hand until the drive lever, Fig. 4.72, is on the maximum throw of the eccentric cam as shown. Turn the ratchet wheel

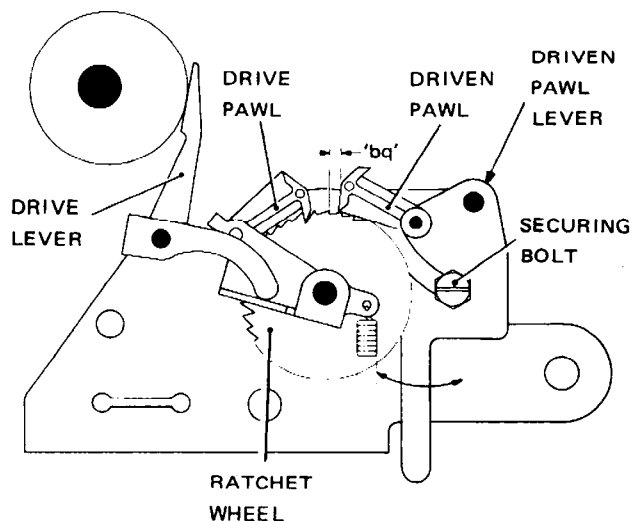


Fig. 4.72 MOTOR CONTROL SWITCH – RETENTION PAWL CLEARANCE

until the drive pawl drops into one of the deep teeth in the wheel and check that there is a clearance of 0.020–0.030 inch (dimension 'bq') between the driven pawl and the face of one of the shallow teeth.

### Action

- 81.2 To adjust, slacken the bolt securing the driven pawl lever and swivel the lever to correct the clearance. Tighten the bolt.

## 82. MOTOR CONTROL SWITCH – SWITCH-OFF LINK

Make this adjustment after fitting the motor control switch to the machine, and fitting the motor unit temporarily, but before fitting further units.

### Check

- 82.1 Feed the ratchet wheel until the driven pawl is against the face of the last or the last-but-one tooth, as shown in the inset of Fig. 4.73, and check that as this condition is attained the motor switch is heard to operate.

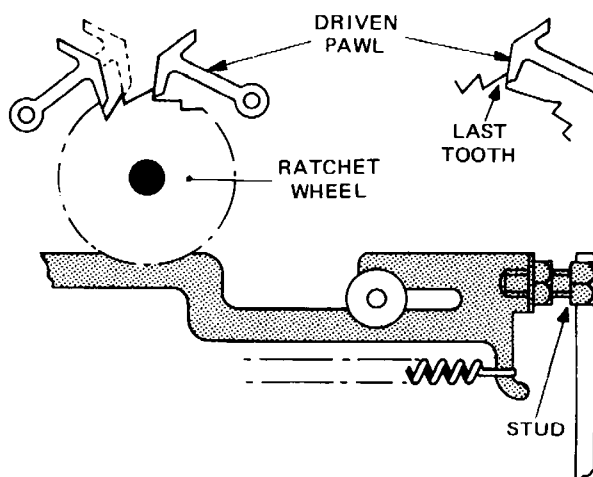


Fig. 4.73 MOTOR CONTROL SWITCH – SWITCH-OFF LINK

### Action

- 82.2 If the check is not satisfied, unlock the stud and screw it into the link, ensure that the driven pawl is against the face of the last tooth, unscrew the stud until the motor switch is heard to operate, unscrew the stud another one-and-a-half turns, and lock the stud.

### 83. MOTOR CONTROL SWITCH – RATCHET RELEASE

Make this adjustment after fitting the motor control switch to the machine, but before fitting further units.

#### Check

- 83.1 With the camshaft in the rest position turn the ratchet wheel, Fig. 4.72, to present a deep notch to the drive pawl, and check that the drive pawl of each ratchet wheel drops freely to the bottom of its notch.
- 83.2 Trip the main clutch and with the use of box spanner TA 1559 turn the camshaft until the lobe on the release-lever cam, Fig. 4.74, causes the drive and driven pawls to be lifted clear of the ratchet wheels. Check that the clearance is 0.010–0.020 inch.
- 83.3 Set the camshaft to the rest position, set the motor switch to the off condition as explained in check 82.1 above, and check that there is a gap of at least 0.004 inch (dimension 'br' of Fig. 4.74) between the beam and the tail of the release lever.
- 83.4 At the selector unit, hold both trip levers up and set the electromagnet armature to the space position. Let the trip lever drop slowly. Check that this action causes the pawls to be released and the unit to be set to the switched-on condition.
- 83.5 If checks 83.3 and 83.4 are not satisfied, check that there is only one tooth gap between the pawls, as shown in Fig. 4.73.

#### Action

- 83.6 If any of the foregoing checks is not satisfied, set the machine to the rest condition and loosen the release-lever screw so that the lever is friction tight. Set the motor switch to the off condition as explained in check 82.1, and turn the ratchet wheel until the drive pawl drops into a deep notch. Hold the drive pawl in the deep notch and the drive lever against the root of its cam. Push the pawl-release lever at the point indicated by the arrow (Fig. 4.74) until resistance is felt. Carefully separate the release lever from its cam for a gap of at least 0.004 inch.

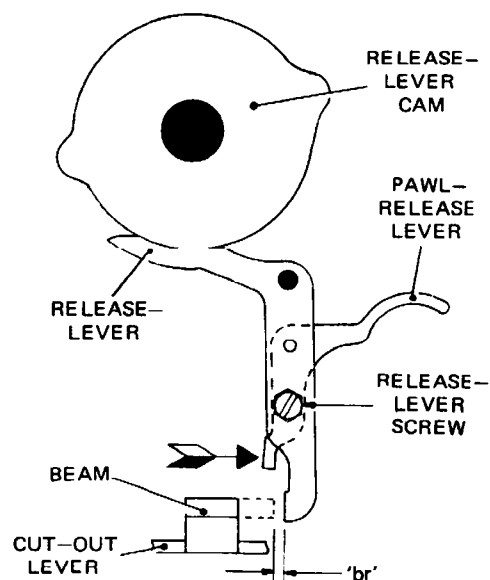


Fig. 4.74 MOTOR CONTROL SWITCH – RATCHET RELEASE

### 84. CUTTINGS TUBE ALIGNMENT

#### Check

- 84.1 Check that the cuttings tube, Fig. 4.75, is aligned with the deflector so that chads can be dispersed into two heaps in the chad box.

#### Action

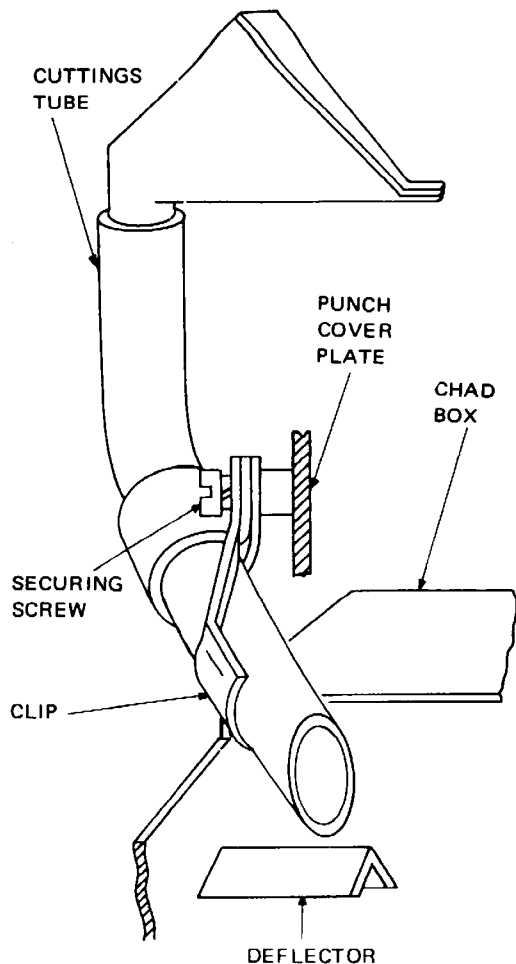
- 84.2 Loosen the screw securing the cuttings tube chute to the punch cover plate, raise, lower or twist the tube in the clip, and rotate the clip about the screw, so that chads can fall correctly onto the face of the deflector, and secure the clip.

### †85. CLUTCH DETENT/TRIP LEVER LATCH CLEARANCE

Carry out this adjustment after assembling the selector unit to the machine.

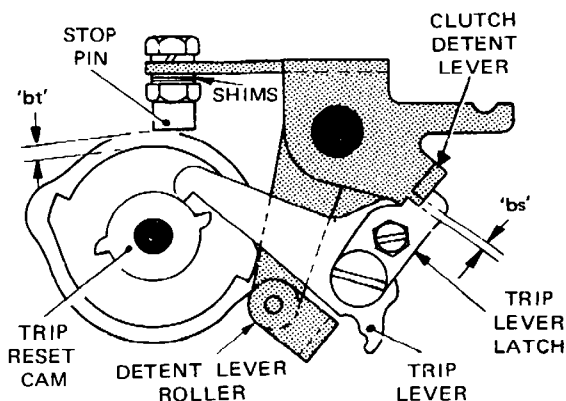
#### Check

- 85.1 Release the trip lever latch, Fig. 4.76, and turn the camshaft by hand until the roller on the clutch detent lever is on the peak of the cam. Check that the trip lever is now bearing on the root of the trip reset cam, and that there is a vertical clearance of 0.002–0.008 inch



**Fig. 4.75 CUTTINGS TUBE ALIGNMENT**

(dimension 'bs') between the detent lever and the trip lever latch.



**Fig. 4.76 MAIN CLUTCH MECHANISM  
(LEFT-HAND SIDE VIEW)**

#### Action

- 85.2 To adjust, slacken the screw securing the trip lever latch and, holding the latch against the side of the detent lever so that there is no horizontal clearance between them, slide the latch up or down to satisfy the conditions. Tighten the screw.

#### Check

- 85.3 With the camshaft in the same position, check that the gap between the stop pin and the cam (dimension 'bt') is 0.002–0.015 inch.

#### Action

- 85.4 To adjust, remove the screw securing the stop pin, change the number of shims under the stop pin to correct the clearance, setting the gap as near to the lower limit as practicable, and secure the stop pin.

### 86. CLUTCH DETENT POSITION

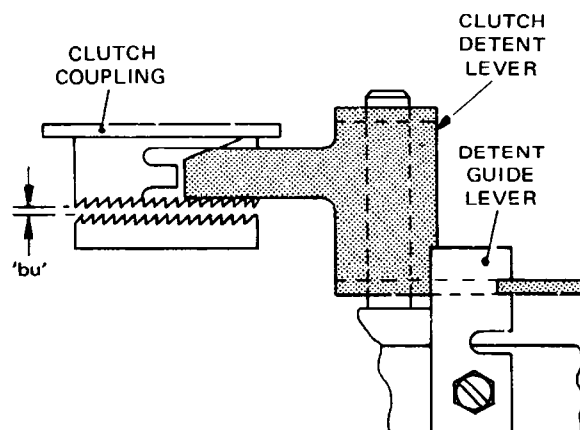
Carry out this adjustment after assembling the selector unit to the machine.

#### Check

- 86.1 With the machine in the rest condition, turn the camshaft against its normal direction of rotation until the retention mechanism can be felt to be retaining the camsleeve. Check that there is now a clearance of 0.004–0.016 inch (dimension 'bu') between the two ratchet faces of the clutch coupling, Fig. 4.77.

#### Action

- 86.2 To adjust, slacken the screw securing the detent lever guide and move the guide to correct the clearance. Tighten the screw.



**Fig. 4.77 MAIN CLUTCH MECHANISM  
(PLAN VIEW)**

## 87. STORAGE LATCH POSITION

Carry out this adjustment after assembling the selector unit to the machine.

### Check

- 87.1 With the machine in the rest condition, set up the letters (MMMMM) combination by depressing the sequential levers, Fig. 4.78. Check that there is now a minimum clearance of 0.002 inch (dimension 'bv') between each storage latch and the reset arm.

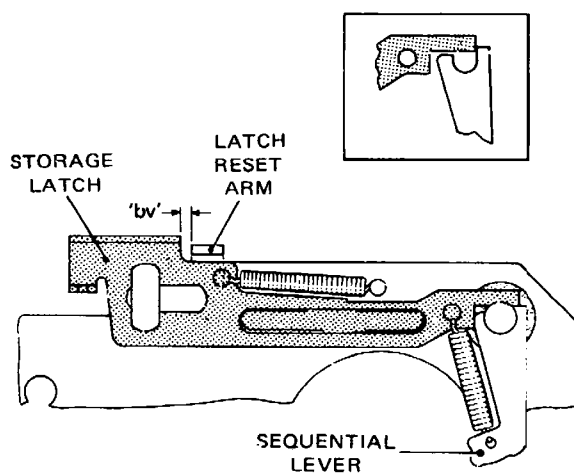


Fig. 4.78 STORAGE LATCH/RESET ARM CLEARANCE

- 87.2 Release the trip lever latch and turn the machine by hand through a complete revolution. During this revolution check that the storage latches and sequential levers are reset to the position shown in the inset.

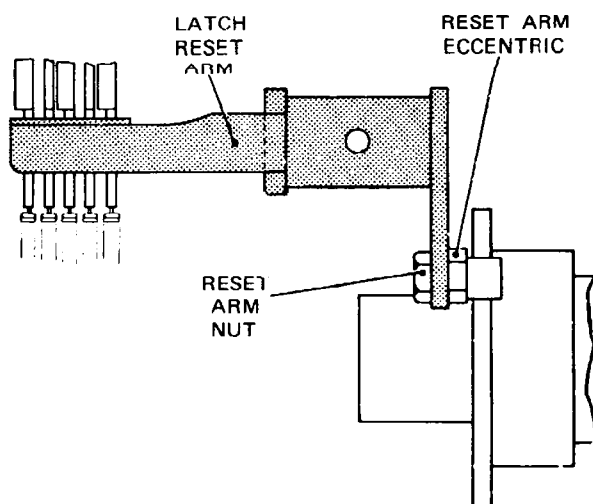


Fig. 4.79 STORAGE LATCH RESET MECHANISM

### Action

- 87.3 To adjust, slacken the nut securing the latch reset arm eccentric, Fig. 4.79, and turn the eccentric to satisfy both conditions. Tighten the nut.

## 88. CODE TRANSFER LEVERS ALIGNMENT

Carry out this adjustment after assembling the link unit to the machine.

### Check

- 88.1 With the machine in the rest condition, set up the letters (MMMMM) combination and check that the code transfer levers, Fig. 4.80, are in full engagement and correctly aligned with the respective transfer bars of the link unit. Ensure that the code transfer levers lie rearward in the slots of the storage latches.
- 88.2 Move the latch reset arm toward the rear of the machine until the storage latches are reset. Check that the transfer levers are now fully engaged and correctly aligned with the respective release bars.

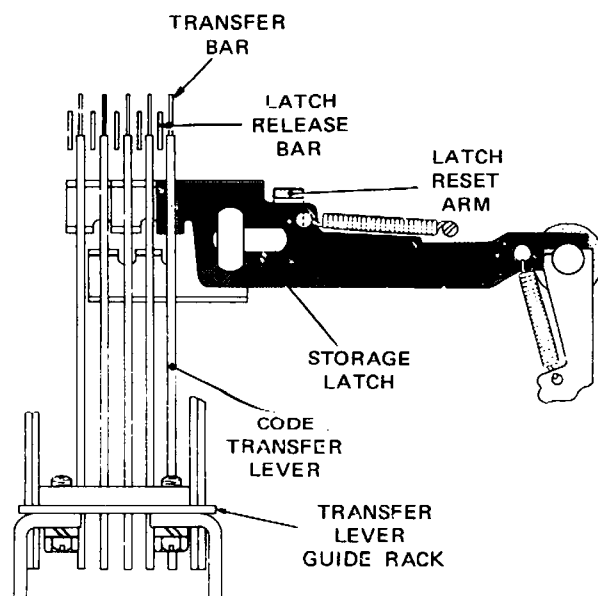


Fig. 4.80 CODE TRANSFER LEVERS MECHANISM

### Action

- 88.3 To adjust, slacken the screws securing the transfer lever guide rack and move the rack to satisfy both conditions. Tighten the screws.

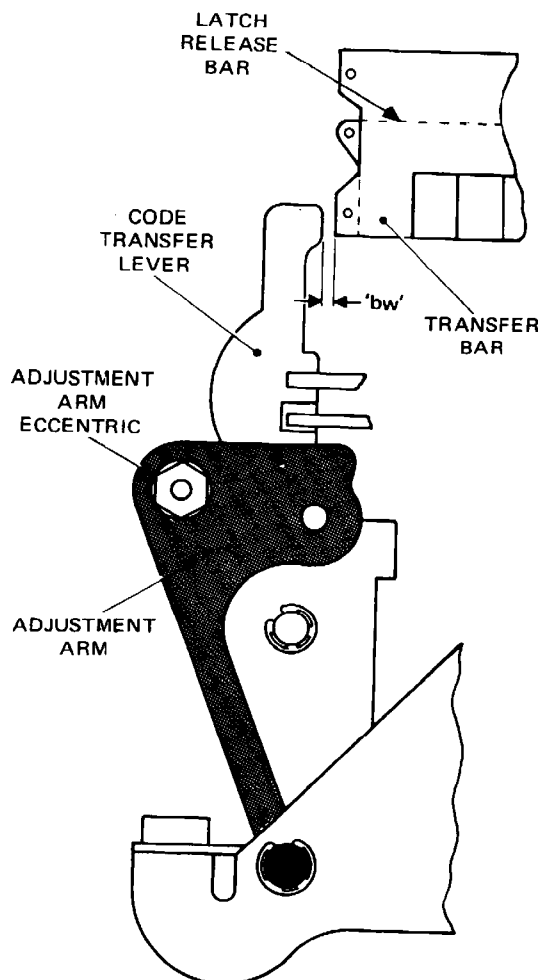
**†89. CODE TRANSFER LEVERS CLEARANCE**

Carry out this adjustment after assembling the link unit to the machine.

*Check*

89.1 With the machine in the rest condition, press the transfer bars, Fig. 4.81, inward until they are latched up. Lightly press the code transfer levers toward the link unit to take up any play and measure the clearance between each lever and the respective release bar (dimension 'bw'). Note the amount of each clearance.

89.2 Firmly press the transfer levers inward until the transfer bars are released, and set up the letters (MMMM) combination. Lightly press the transfer levers inward again and this time measure the clearance between each lever and its transfer bar. Again note the amount of each clearance.



**Fig. 4.81 CODE TRANSFER LEVERS CLEARANCE**

89.3 Disregard the larger of the two sets of measurements noted, but check that the clearances in the smaller set are parallel and within 0.005–0.010 inch.

*Action*

89.4 To adjust, slacken the nut securing each adjustment arm eccentric and turn the eccentrics to correct the clearances. Tighten the nuts.

**90. ELECTROMAGNET ARMATURE HEIGHT**

Carry out this adjustment after assembling the electromagnet and selector units to the machine.

*Check*

90.1 Move the electromagnet armature, Fig. 4.82, over to the space stop screw and turn the machine by hand until the toe of number 5 sequential lever has dropped in under the read bail and the bail is resting on top of the armature, as shown in inset 1. Lift the sequential lever and check that there is a clearance of 0.008–0.018 inch (dimension 'bx') between the bail and the sequential lever.

*Action*

90.2 To adjust, position the electromagnet adjustment bracket as follows.

- (a) Slacken the two nuts securing the adjustment bracket, and the screw securing the electromagnet abutment plate.
- (b) Swing the rear of the bracket up or down about its front pivot until the clearance is obtained, and tighten the nuts.
- (c) Position the abutment plate to bring it into contact with the underside of the bracket, and tighten the screw.

**91. ELECTROMAGNET ARMATURE BALANCE**

Carry out this adjustment after assembling the electromagnet and selector units to the machine.

*Check*

91.1 Move the electromagnet armature, Fig. 4.82, over to the space stop screw and turn the machine by hand until the lock lever drops down beside the armature, as shown in inset 2. Measure the horizontal clearance (dimension 'by')

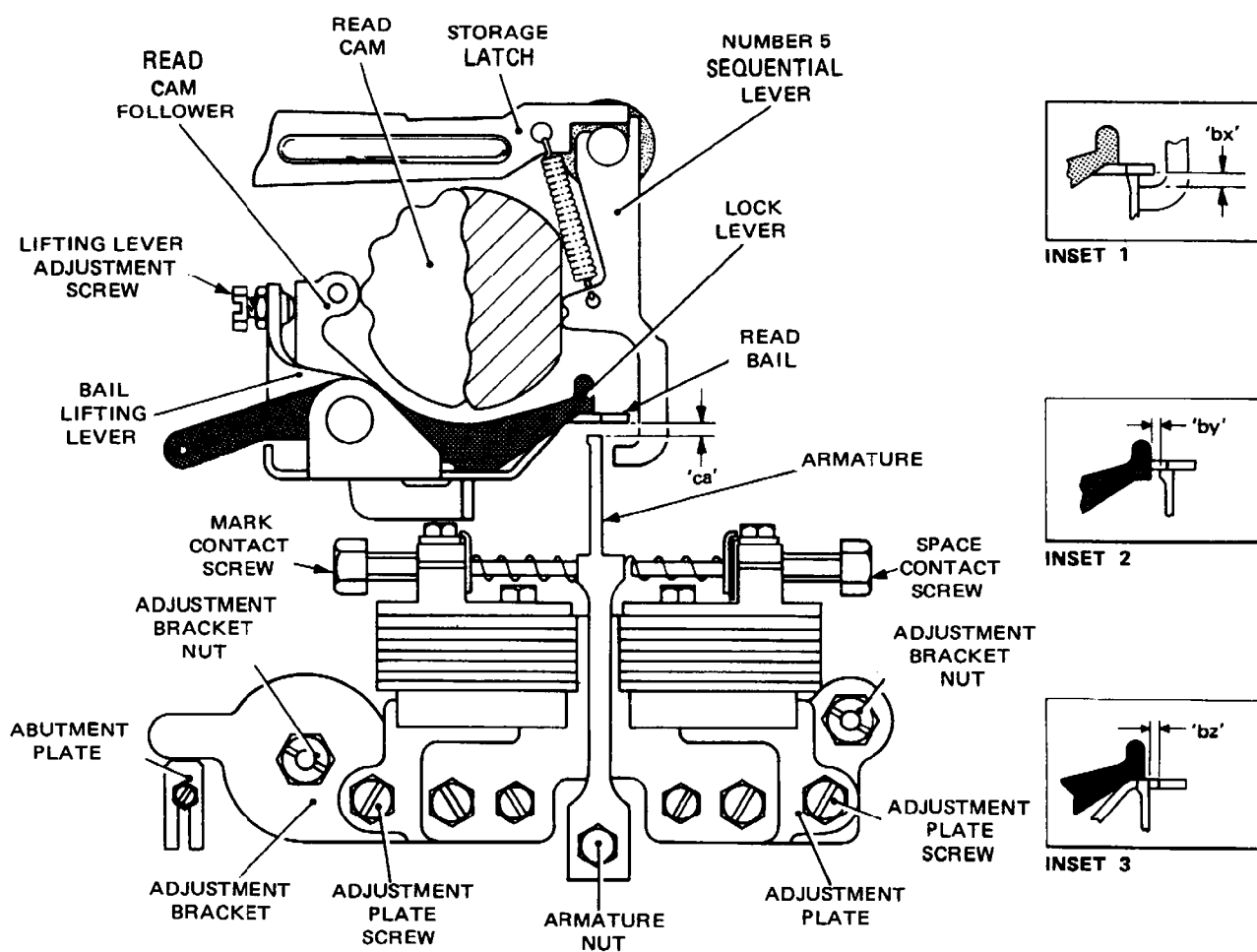


Fig. 4.82 ELECTROMAGNET ARMATURE/READ BAIL CLEARANCES

between the lock lever and the tip of the armature. Note the amount of this clearance.

- 91.2 Lift the lock lever and the read bail, and move the armature over to the mark stop screw so that the tongue on the bail drops down on the other side of the armature, as shown in inset 3. Measure the horizontal clearance (dimension 'bz') between the armature and the bail. Again note the amount of this clearance.

- 91.3 Check that the two clearances noted above do not differ by more than 0.006 inch.

#### Action

- 91.4 To adjust, slacken the screws securing the electromagnet adjustment plate and pivot the electromagnet unit about the armature nut to satisfy the conditions. Tighten the screws.

## †92. READ BAIL HEIGHT

Carry out this adjustment after assembling the electromagnet and selector units to the machine.

#### Check

- 92.1 With the machine in the rest condition and the read cam follower, Fig. 4.82, on one of the peaks of the cam, check that there is a vertical clearance of 0.036–0.046 inch (dimension 'ca') between the top of the armature and the underside of the read bail.

#### Action

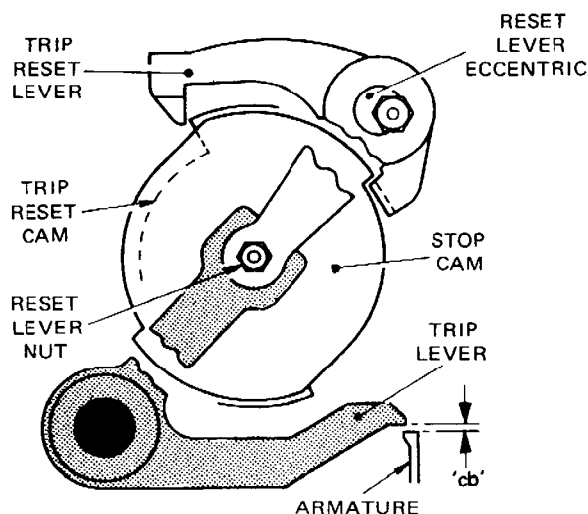
- 92.2 To adjust, slacken the locknut securing the bail lifting lever adjustment screw and turn the adjustment screw to correct the clearance. Secure the screw in this position by the locknut.

**†93. TRIP LEVER/TRIP RESET LEVER SETTING**

Carry out this adjustment after assembling the electromagnet and selector units to the machine.

*Check*

- 93.1 Move the electromagnet armature, Fig. 4.83, over to the space stop screw. Turn the machine slowly by hand and check that the latching face of the trip reset lever clears the stop cam by 0.006–0.012 inch.



**Fig. 4.83 SELECTOR UNIT TRIP MECHANISM**

*Action*

- 93.2 To adjust, slacken the nut securing the trip reset lever eccentric and turn the eccentric to correct clearance. Tighten the nut.

*Check*

- 93.3 Ensure that the orientation plate is in the centre of the adjustment range, and turn the orientation knob to setting 60.
- 93.4 Release the trip lever and turn the machine by hand until the trip reset lever is on the peak of its cam. Check that there is now a clearance (including backlash) of 0.006–0.020 inch (dimension 'cb') between the trip lever and the top of the armature.
- 93.5 Repeat check 93.4 with the orientation knob set at 0 and 120. The clearance may now be 0.006–0.024 inch.

*Action*

- 93.6 To adjust, slacken the nut securing the trip reset lever and move the pin in the slot of the trip lever to correct the clearances. Tighten the nut.

**†94. TRIP RESET LEVER ENGAGEMENT***Check*

- 94.1 With the machine in the rest condition, so that the trip lever rests on the armature, check that the front end of the trip reset lever (Fig. 4.83) is in full engagement with the stop cam and that the rear end clears the peak of the cam.

*Action*

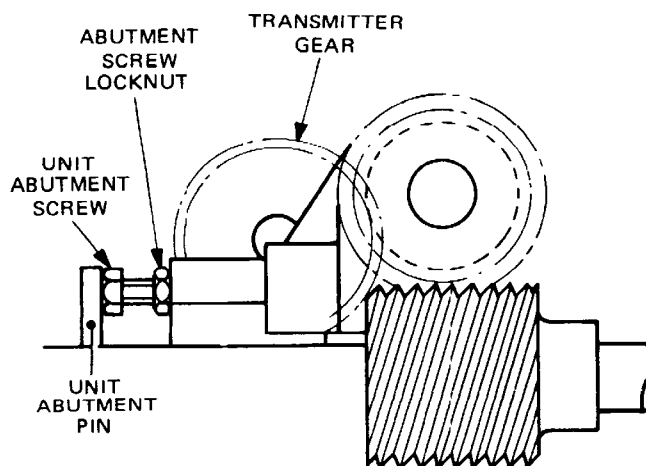
- 94.2 If the check is not satisfied, set the reset lever eccentric to the opposite throw.

**95. LAYSHAFT/TRANSMITTER GEAR MESH**

Carry out this adjustment after assembling the layshaft and transmitter units, but before assembling the code control unit, to the machine.

*Check*

- 95.1 With the layshaft unit abutment screw, Fig. 4.84, in contact with the abutment pin on the main base, check that the layshaft and transmitter gears mesh closely without any evidence of binding.



**Fig. 4.84 LAYSHAFT UNIT ABUTMENT (REAR VIEW)**

*Action*

95.2 To adjust, position the layshaft unit as follows.

- (a) Slacken the locknut securing the layshaft unit abutment screw and turn the screw inward as far as it can go.
- (b) Slacken the three screws securing the layshaft unit and move the unit to satisfy the condition. Tighten the screws.
- (c) Turn the abutment screw until it is in contact with its abutment pin, and tighten the locknut.

### †96. PRINT CHANNEL SETTING

Carry out this adjustment after assembling the function unit and the type carriage unit to the machine.

*Check*

96.1 With the machine in the rest condition and in figures shift (pull the second function bar from the left, Fig. 4.89, toward the rear of the machine to achieve this condition), locate gauge TA 1487A in the left-hand end of the print channel, Fig. 4.85, and allow the other end of the gauge to rest on the type carriage support bar. Ensure that the gauge is square with the bar and measure the clearance (dimension 'cc') between the bar and the projection on the gauge.

96.2 Release the trip lever latch and turn the machine by hand until the camshaft is in the alternative rest position. Measure the clearance between the bar and the gauge again and check that the larger of these two clearances does not exceed 0.005 inch.

*Action*

96.3 To adjust, position the print beam casting as follows.

- (a) Slacken the nut securing the print beam adjusting bracket.
- (b) Slacken the locknut securing the casting adjustment screw and turn the knurled adjustment nut to satisfy the condition. Tighten the adjustment screw locknut and the adjustment bracket nut.
- (c) Repeat checks 96.1 and 96.2, and if necessary refine action (b) above.

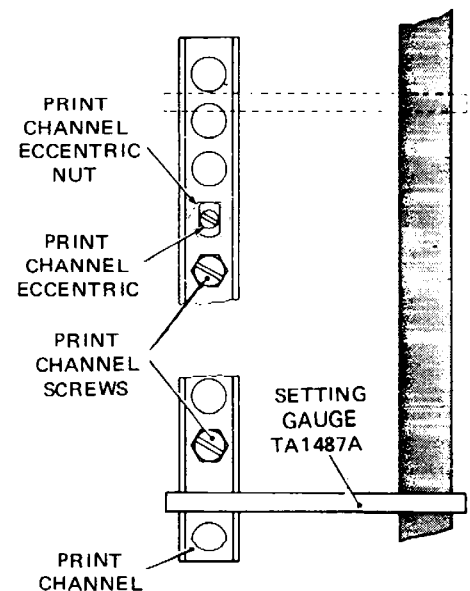
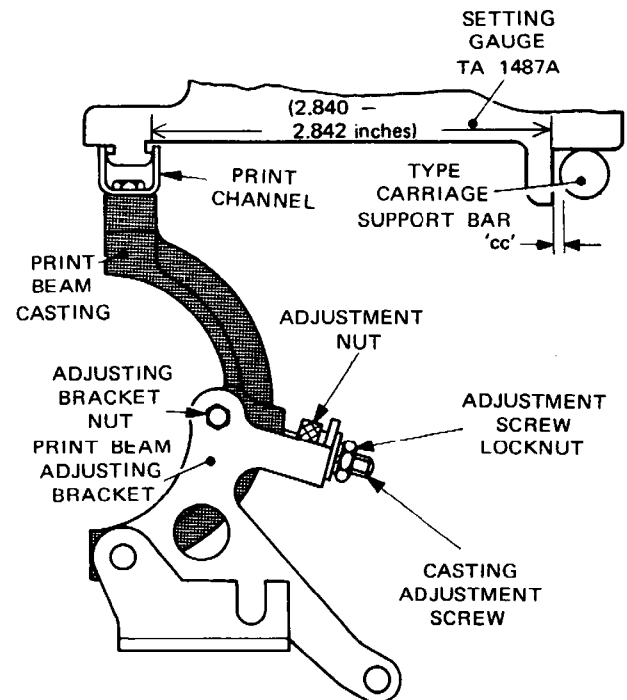


Fig. 4.85 PRINT BEAM CASTING AND PRINT CHANNEL

*Check*

- 96.4 Repeat checks 96.1 and 96.2, this time with the gauge located in the right-hand end of the print channel. Check that the larger of the two clearances measured again does not exceed 0.005 inch.

*Action*

- 96.5 To adjust, position the print channel as follows.

- (a) Slacken the screws securing the print channel.
- (b) Slacken the nut securing the print channel eccentric and turn the eccentric to satisfy the condition. Tighten the nut and the print channel screws.

lever and the suppression member (dimension 'cd') is 0.030–0.042 inch.

*Action*

- 97.2 To adjust, slacken the two screws securing the suppression member, set the member to correct the gap, and secure the member.

*Check*

- 97.3 Set up the D or J code on the combination bars, Fig. 4.86, turn the machine by hand until the control lever rises into the combination bar slots and contacts the shift bar, and check that the control lever almost touches the suppression lever, leaving the smallest discernible gap 'ce'. Check that there is a clearance by raising the rear of the control lever to the rest position, dropping the lever, and observing that the suppression lever is not moved.

## †97. PRINT SUPPRESSION MEMBER

Carry out this adjustment after assembling the code control unit, but before doing so carry out adjustment 96 (Print Channel Setting).

*Check*

- 97.1 Set the machine to the rest condition, move the suppression lever, Fig. 4.86, so that the front goes downward, and using pin gauges TA 1551 and TA 1552 check that the gap between the

- 97.4 Repeat check 97.3 for the other code.

*Action*

- 97.5 To adjust, slacken the nut locking the suppression member adjusting screw, turn the screw until the suppression lever just touches the control lever, turn the screw another half turn clockwise, and re-lock the screw.

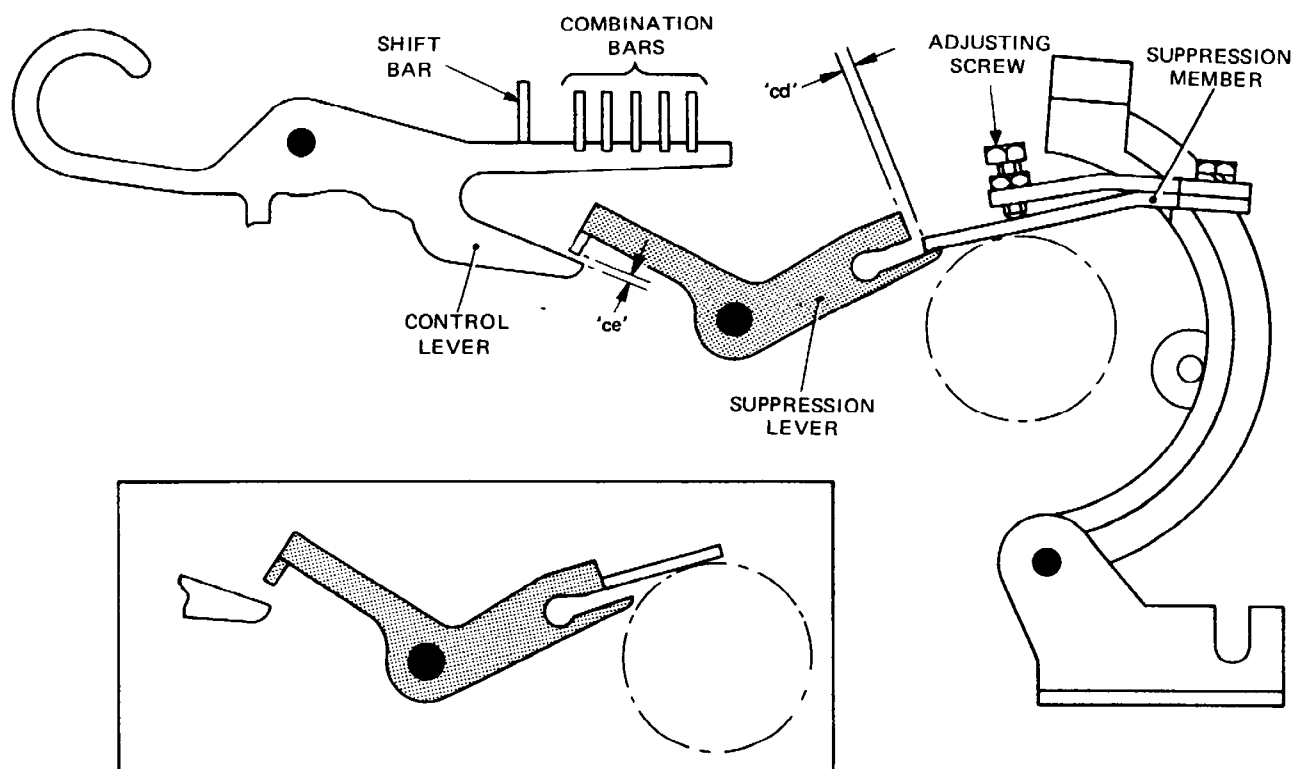


Fig. 4.86 PRINT SUPPRESSION MECHANISM

*Check*

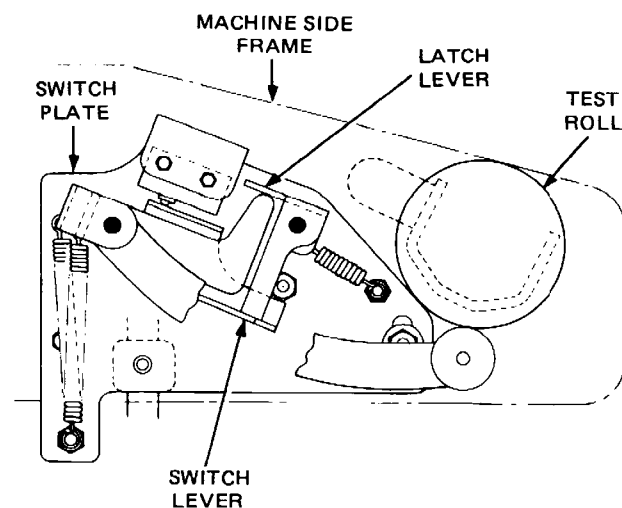
- 97.6 Set up a non-printing character and turn the machine by hand until suppression occurs, and check that the suppression member engages the suppression lever to the full thickness of the member as shown in Fig. 4.86 inset.

*Action*

- 97.7 To adjust, refine action 97.5.

**98. PAPER LOW WARNING***Check*

- 98.1 Remove the roll of paper, rest the switch lever on the latch lever, Fig. 4.87, carefully insert a test roll of paper with an overall diameter of  $1\frac{11}{32}$ – $1\frac{13}{32}$  inch, and check that the latch lever just comes out of engagement with the switch lever. Load the original roll of paper, but not until correct operation is verified.



**Fig. 4.87 PAPER-LOW SWITCH  
(RIGHT-HAND VIEW)**

*Action*

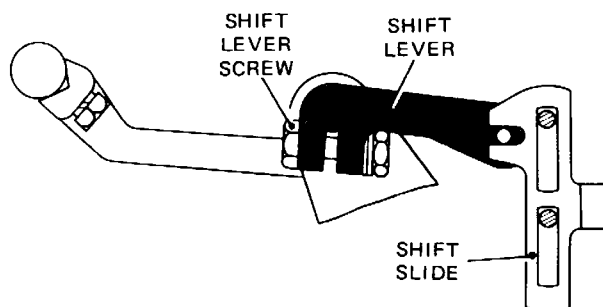
- 98.2 To adjust, slacken the two nuts securing the switch plate to the pillars on the side frame, turn the plate fully clockwise, rest the switch lever on the latch lever, carefully turn the plate counter-clockwise until the latch is just operated by the test roll, and secure the plate in that position.

**99. SHIFT SLIDE POSITION**

Carry out this adjustment after assembling the code control unit, but before assembling the type carriage unit, to the machine.

*Check*

- 99.1 Pull the extreme left-hand function bar, Fig. 4.89, toward the rear of the machine to put the function mechanism into letters shift. Check that the pin on the shift lever, Fig. 4.88, is engaged centrally in the fork of the shift slide, and that the slide is depressed as far as it can go.
- 99.2 Change the case shift a number of times and check that the shift slide operates the shift bar in the code control unit each time without any evidence of binding.



**Fig. 4.88 SHIFT MECHANISM  
(RIGHT-HAND SIDE VIEW)**

*Action*

- 99.3 To adjust, set the shift mechanism as follows.
- Ensure that the mechanism is in letters shift.
  - Slacken the screw securing the shift lever and position the lever so that its pin is engaged centrally in the fork of the shift slide.
  - Depress the slide as far as it can go, and tighten the screw.

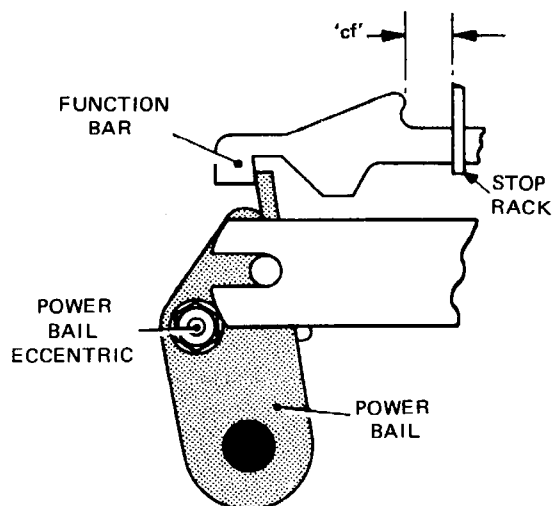
**100. POWER BAIL POSITION**

Carry out this adjustment after assembling the function unit, but before assembling the motor unit, to the machine.

*Check*

- 100.1 Set up the letters (MMMMM) combination, release the trip lever latch and turn the machine slowly by hand until the power bail, Fig. 4.89, has moved to its rearmost position. Hold the extreme left-hand (letters) function bar in contact with the bail and, using gauge TA 1496A, check that there is a clearance of

0.220–0.230 inch (dimension 'cf') between the bar and the stop rack.



**Fig. 4.89 POWER BAIL MECHANISM (LEFT-HAND SIDE VIEW)**

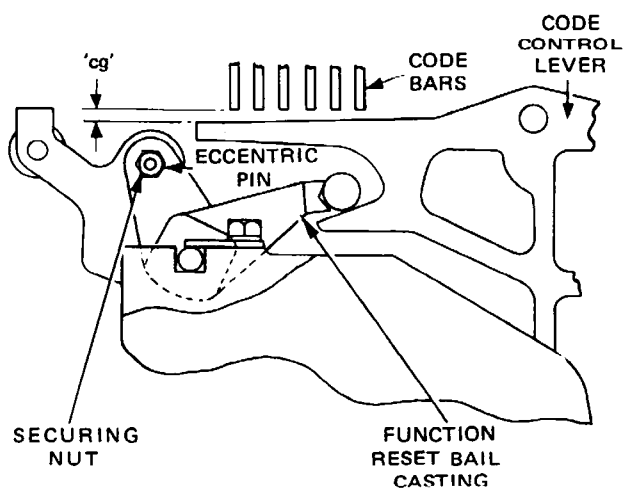
#### Action

- 100.2 To adjust, slacken the nut securing the power bail eccentric and turn the eccentric to correct the clearance. Tighten the nut.

### 101. FUNCTION RESET BAIL SETTING

#### Check

- 101.1 With the machine in the rest condition, check that there is a clearance of 0.015–0.045 inch between the front code bar, Fig. 4.90, and the code control levers (dimension 'cg').



**Fig. 4.90 FUNCTION RESET MECHANISM**

#### Action

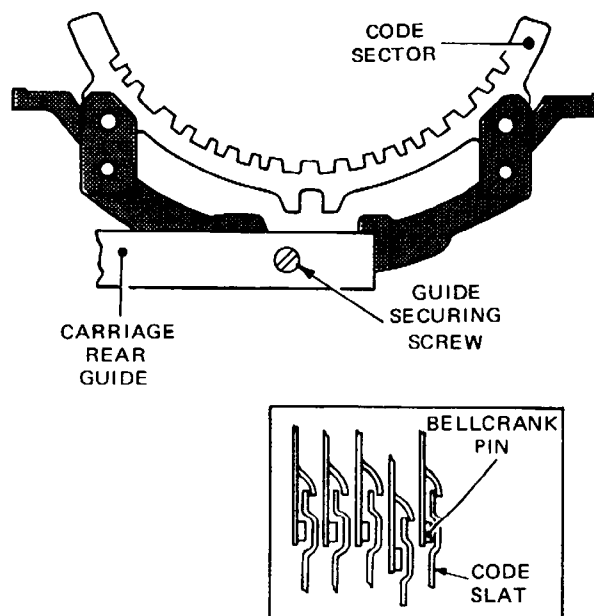
- 101.2 To adjust, slacken the nut securing the eccentric pin, and turn the pin by a tommy pin to correct the gap. Tighten the nut, and check that the gap is still correct.

### 102. CARRIAGE REAR GUIDE HEIGHT

Carry out this adjustment after assembling the type carriage unit and the feed unit, but before assembling the platen unit, to the machine.

#### Check

- 102.1 Operate the CARRIAGE RETURN key. With the machine in the rest condition, set up the all-mark and all-space combinations alternately and check that the code sector bellcrank pins, Fig. 4.91 inset, are not touching the top or bottom of the code slat channels.
- 102.2 Repeat check 102.1 with the carriage at its centre and extreme right-hand positions.



**Fig. 4.91 TYPE CARRIAGE REAR GUIDE**

#### Action

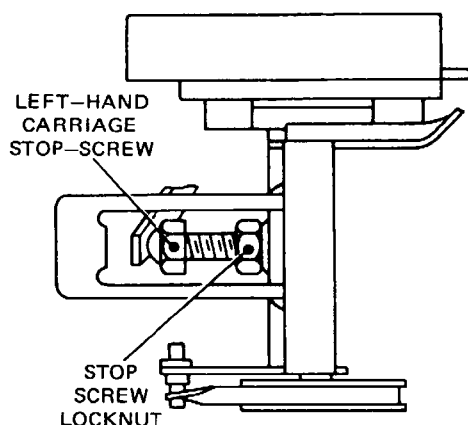
- 102.3 To adjust, slacken the three screws securing the carriage rear guide, Fig. 4.91. Slide the guide up or down in its slots to satisfy the condition, and tighten the guide screws.

**†103. CARRIAGE STOP SCREWS SETTING**

Carry out this adjustment after assembling the platen unit and the feed unit to the machine.

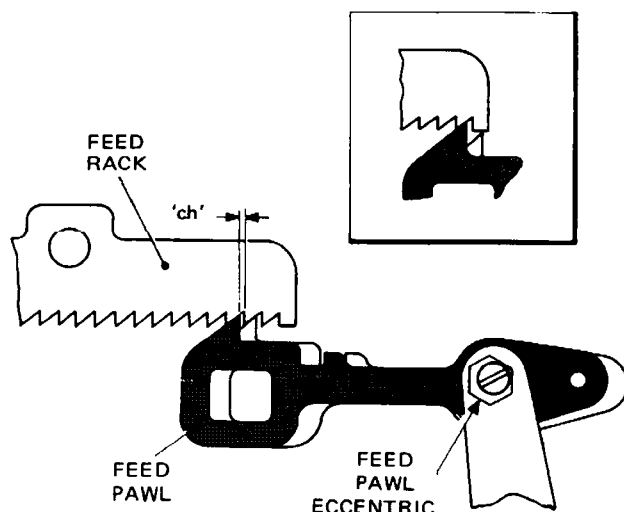
*Check*

- 103.1 Operate the CARriage RETurn key. With the carriage against its left-hand stop screw, Fig. 4.92,



**Fig. 4.92 LEFT-HAND CARRIAGE STOP SCREW MECHANISM**

and the machine in the rest condition, check that the feed pawls, Fig. 4.93, are engaged with the correct teeth of the feed rack for both the number of characters in the line and the left-hand margin required. For a 69-character line and 0.75 inch margin the correct location is shown in Fig. 4.93, and for a 75-character line and 0.55 inch margin the correct location is shown in the inset.



**Fig. 4.93 CARRIAGE FEED MECHANISM**

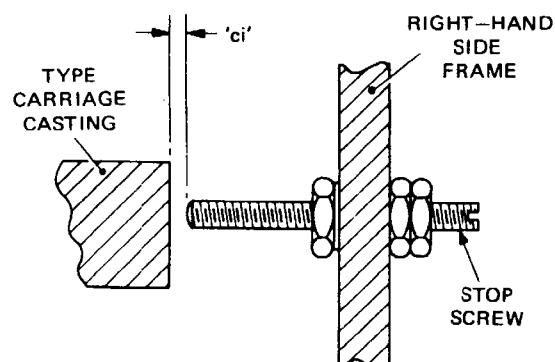
- 103.2 Feed the carriage a short distance along its traverse and operate the CARriage RETurn key again. Release the key and check that both feed pawls engage the teeth with an estimated minimum clearance of 0.005 inch (dimension 'ch').

*Action*

- 103.3 To adjust, slacken the locknut securing the left-hand stop screw, Fig. 4.92, and turn the screw to satisfy the conditions. Secure the screw in this position by its locknut.

*Check*

- 103.4 Feed the carriage to the last character and check that there is now a clearance of 0.040–0.080 inch (dimension 'ci' of Fig. 4.94) between the carriage casting and the right-hand stop screw.



**Fig. 4.94 END-OF-LINE CARRIAGE STOP**

*Action*

- 103.5 To adjust, slacken the locknuts securing the right-hand stop screw and turn the screw in the third nut to correct the clearance. Tighten the locknuts.

**104. TYPE CARRIAGE MOVEMENT***Check*

- 104.1 With the type carriage approximately in the centre of its traverse, check that there is a maximum clearance of 0.004 inch (dimension 'cj') between the underside of the carriage support bar, Fig. 4.95, and the two carriage retaining plates.

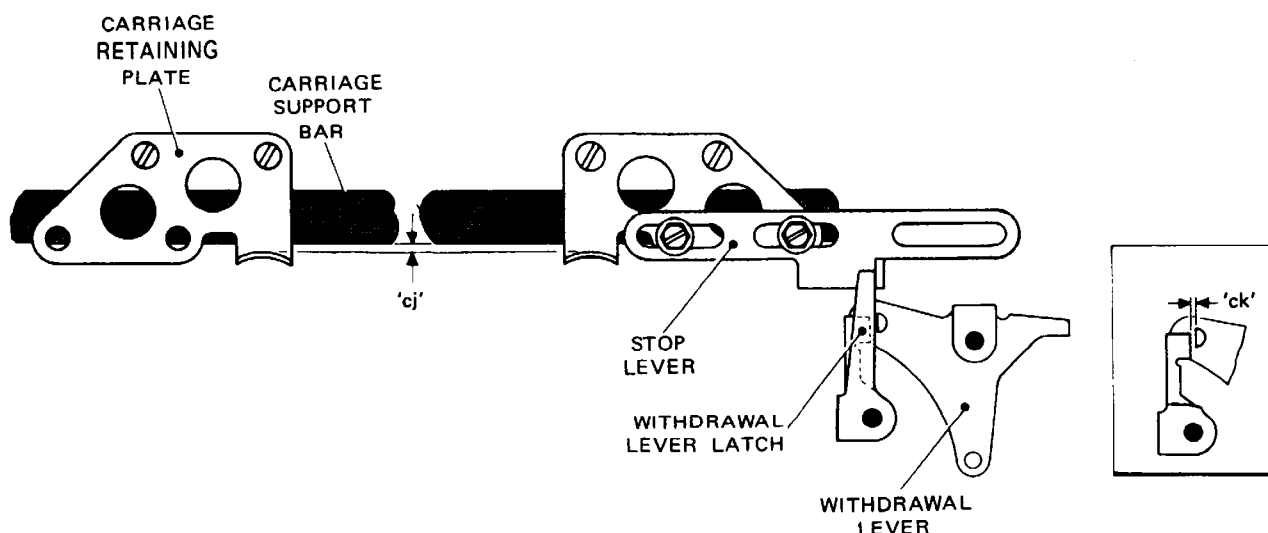


Fig. 4.95 CARRIAGE RESET MECHANISM

104.2 Feed the carriage to various points along its traverse, operate the CARRIAGE RETURN key, and check that carriage travel in both directions is smooth and without any evidence of binding.

#### Action

104.3 To adjust, slacken the screws securing the retaining plates and raise or lower the plates to satisfy the conditions. Tighten the screws.

machine by hand until the printing action takes place. Check that the printing character strikes the centre of the lower (black) half of the ink ribbon, Fig. 4.96.

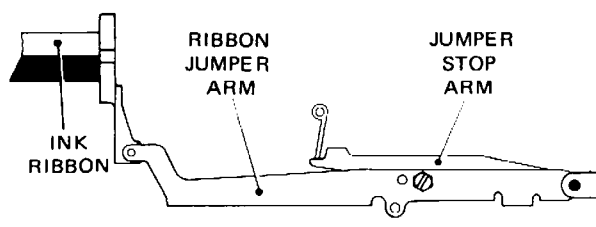


Fig. 4.96 RIBBON JUMPER MECHANISM

## 105. CARRIAGE STOP LEVER POSITION

#### Check

105.1 With the type carriage resting against its stop screw, Fig. 4.92, check that there is a clearance of 0.005–0.050 inch (dimension 'ck') between the rear arm of the withdrawal lever latch, Fig. 4.95 inset, and the pin on the withdrawal lever.

#### Action

105.2 To adjust, slacken the screws securing the stop lever and move the lever to correct the clearance. Tighten the screws.

#### Action

106.2 To adjust, set the ribbon jumper mechanism as follows.

- (a) Feed the type carriage to its extreme right-hand position.
- (b) Using a screwdriver inserted through the right-hand side frame, slacken the screw securing the ribbon jumper arm and move the arm relative to the jumper stop arm to satisfy the condition. Tighten the screw.

## 106. RIBBON JUMPER HEIGHT

Carry out this adjustment before assembling the platen unit to the machine.

#### Check

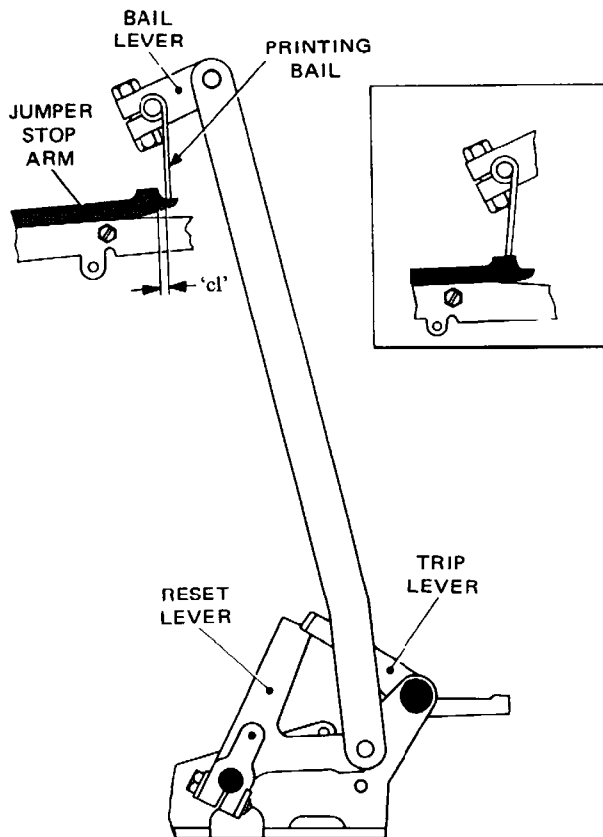
106.1 Set up any printing character on the sequential levers, release the trip lever latch and turn the

## 107. TWO-COLOUR PRINTING BAIL POSITION

Carry out this adjustment after assembling the platen unit to the machine.

*Check*

- 107.1 Set up any printing character, release the trip lever latch and turn the machine by hand until the printing action takes place.



**Fig. 4.97 TWO-COLOUR PRINTING BAIL MECHANISM**

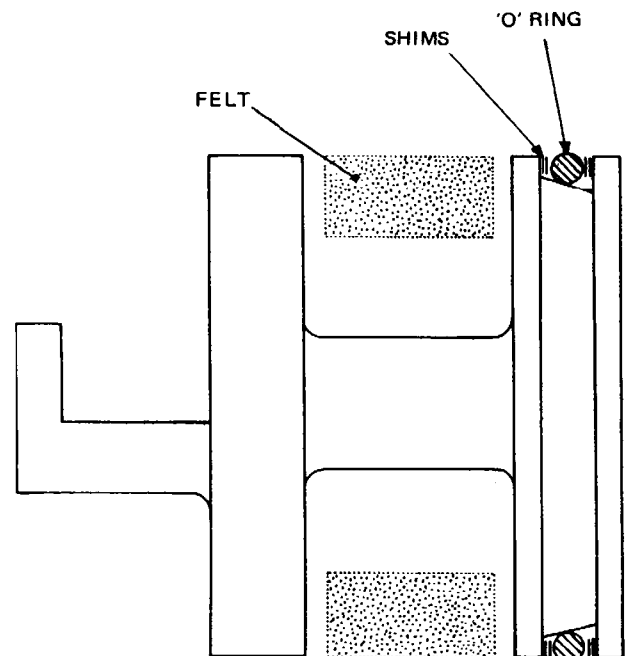
- 107.2 With the two-colour printing reset lever latched by its trip lever as shown in Fig. 4.97, check that there is a clearance of at least 0.020 inch (dimension 'cl') between the two-colour printing bail and the step on the jumper stop arm.
- 107.3 Return the machine to the rest condition, depress the front arm of the trip lever so that the reset lever is released, and repeat check 107.1. Check that the bail is now fully engaged with the jumper stop arm as shown in the inset.

*Action*

- 107.4 To adjust, slacken the screw securing the bail lever and position the bail to satisfy the conditions. Ensure that the bail lever is as close as possible to the right-hand side frame without causing the mechanism to touch the frame, and tighten the screw.

**108. CARRIAGE-RETURN DAMPING***Check*

- 108.1 Check that the force required to move the piston of the dashpot unit, Fig. 4.98, from the normal outermost position (about 0.25 inch in from the end of the cylinder) to the innermost position is 4–16 ounces.



**Fig. 4.98 DASHPOT UNIT PISTON (FRONT VIEW)**

*Action*

- 108.2 To adjust the force, remove the dashpot lever, withdraw the piston from the cylinder, transfer one or more split-ring shims from one side of the 'o' ring to the other (so that the 'o' ring is shifted down the conical seat for reduced force or is shifted up the conical seat for increased force), insert the piston and fit the dashpot lever.

*Check*

- 108.3 Move the piston to the normal outermost position, cover up the three ports, and check that the piston cannot be pushed to the innermost position.

*Action*

- 108.4 If the piston slides inward, ensure that the oil felt does not have excessive friction and that the piston is not tight, and refine action 108.2.

**109. RIBBON FEED***Check*

109.1 Set up any printing combination, release the trip lever latch and turn the machine by hand until the print channel, Fig. 4.85, has fully operated. Measure the clearance between the feed pawl, Fig. 4.99, and a tooth in the feed ratchet wheel (dimension 'cm' of inset 1). Note the amount of this clearance.

109.2 Continue to turn the machine until the ratchet wheel has fully fed. Measure the clearance between the retention pawl and another tooth in the ratchet wheel (dimension 'cn' of inset 2). Note the amount of this second clearance.

109.3 Check that the two clearances noted above are approximately equal.

109.4 Repeat checks 109.1–109.3 for the other ribbon feed mechanism, which can be brought into operation manually as follows.

- (a) Set up any printing character, release the trip lever latch and turn the machine until the ratchet wheel is fully fed.
- (b) Turn the changeover cam through 45 degrees.

*Action*

109.5 To adjust, slacken the screw securing the retention pawl eccentric and turn the eccentric to satisfy the conditions. Tighten the screw.

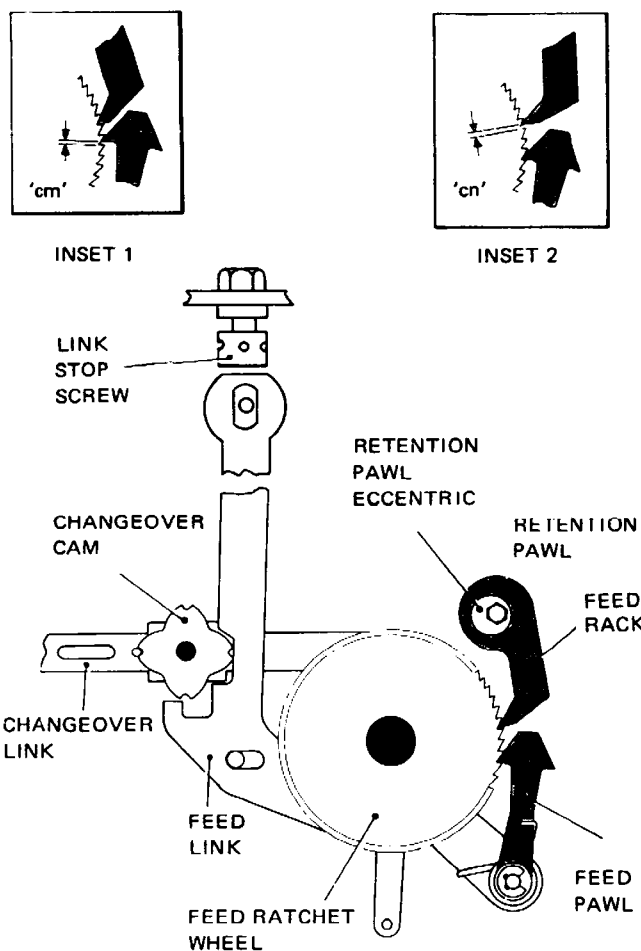
*Check*

109.6 With the machine in the rest condition, check that the feed link stop screw is clear of the feed link.

*Action*

109.7 To adjust, set the stop screw mechanism as follows.

- (a) Push the right-hand guide pulley rearward and hold it in the changeover position. Turn the machine by hand until a peak on the changeover arm is engaged with the pin on the changeover link, and the print bail is in its maximum forward position.
- (b) Turn the screw until the changeover link pin is central in the groove in the changeover cam, and secure the screw by its locknut.



**Fig. 4.99 RIGHT-HAND RIBBON FEED MECHANISM**

*Check*

109.8 Turn the machine through a complete revolution and check that the feed and retention paws fully engage when feeding, with a minimum clearance of 0.010 inch between the extension on the changeover link and the paws. Check also that there is a minimum clearance of 0.015 inch between the paws and the ratchet teeth when the paws on the other spindle are feeding.

*Action*

109.9 To adjust, set the ends of the changeover link to satisfy the conditions.

**110. RIBBON CHANGEOVER STOP***Check*

110.1 Whilst the machine is running, observe that the ribbon changeover operation is satisfactory, neither hesitant nor prone to early changeover.

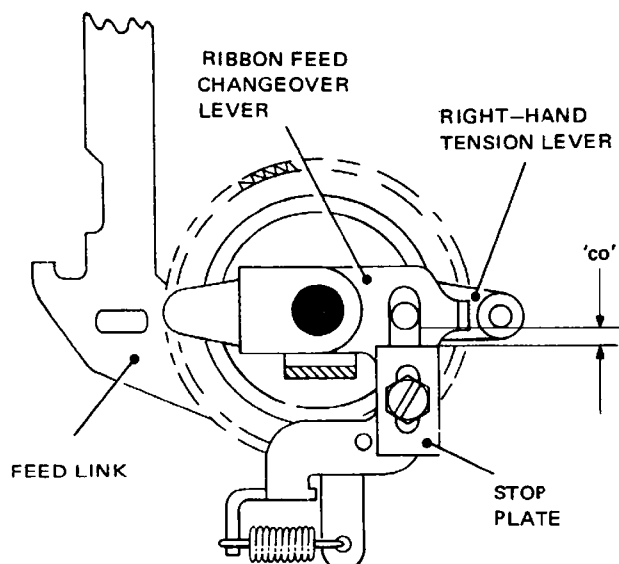


Fig. 4.100 RIBBON CHANGEOVER STOP

*Action*

- 110.2 To adjust, with the machine at rest and the ribbon free of tension, loosen the stop-plate securing screw, Fig. 4.100, set the stop plate for a gap between stop plate and tension lever pin (dimension 'co') of 0.015–0.030 inch, and tighten the screw. (An increase in the gap makes operation less prone to early changeover, and a decrease makes operation less hesitant.)

**111. BELL AND WRU CONTACTS SETTING**

Carry out this adjustment after assembling the code control unit, but before assembling the motor unit, to the machine.

*Check*

- 111.1 With the machine in letters shift, set up the letter J (MMSMS) combination, release the trip lever latch and turn the machine by hand until the bell function control lever, Fig. 4.101, has fully operated. Check that there is now –
- a clearance of 0.010–0.020 inch (dimension 'cp') between the control lever and the tongue of the bell contact assembly, and
  - a clearance of 0.016–0.024 inch (dimension 'cq') between the tongue and the lower contact blade.
- 111.2 Return the machine to the rest condition and repeat check 111.1, this time setting up the letter D (MSSMS) combination and checking

the WRU function control lever and contact assembly.

- 111.3 Return the machine to the rest condition again and put the mechanism in figures shift. Set up the bell (MMSMS) combination, release the trip lever latch and turn the machine until the bell function control lever has again fully operated. Check that the bell contact tongue is now in contact with its lower contact blade, as shown in the inset.
- 111.4 Repeat check 111.3, this time setting up the WRU (MSSMS) combination and checking that the WRU contact tongue is in contact with its lower contact blade.

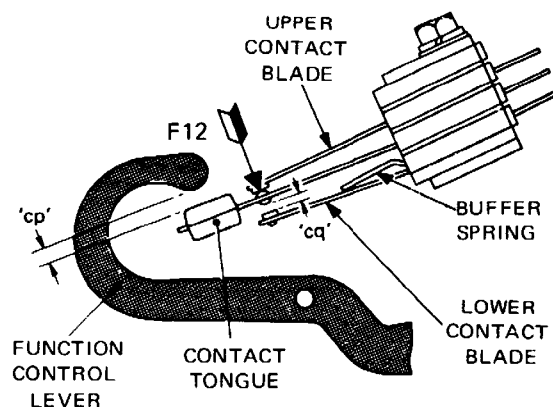
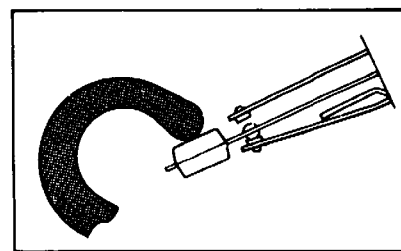


Fig. 4.101 BELL AND WRU CONTACTS

*Action*

- 111.5 If any of the above checks is not satisfied, set the relevant contact tongue to satisfy the conditions.
- 111.6 If an excessive set is required in either tongue to satisfy the checks, remove the complete contact block assembly and set the contacts as follows.
- Set the tongue with respect to the upper contact blade so that a force of 18–26 grams applied to the tongue at point F12 causes it to move away from the blade.

- (b) Set the buffer spring to obtain a clearance of 0.016–0.024 inch between the tongue and the lower contact blade.
- (c) Set the lower contact blade with respect to the buffer spring so that a force of 18–26 grams applied to the tip of the blade causes it to move away from the spring.

111.7 Fit the contact block assembly. Re-check dimension 'cp' and, if necessary, refine the setting of the relevant contact tongue to correct the clearance.

## †112. CARRIAGE RETURN LINK POSITION

As a precaution, disconnect the carriage-return spring before this adjustment, and connect it afterward.

### Check

- 112.1 Move the type carriage to the approximate centre of its travel. Set up the carriage-return (SSSMS) combination, release the trip lever latch and turn the machine by hand until the carriage-return pull bar, Fig. 4.102, has fully operated. Check that the inner arm of the withdrawal lever latch has now passed over the pin on the withdrawal lever by 0.003–0.015 inch (dimension 'cr').

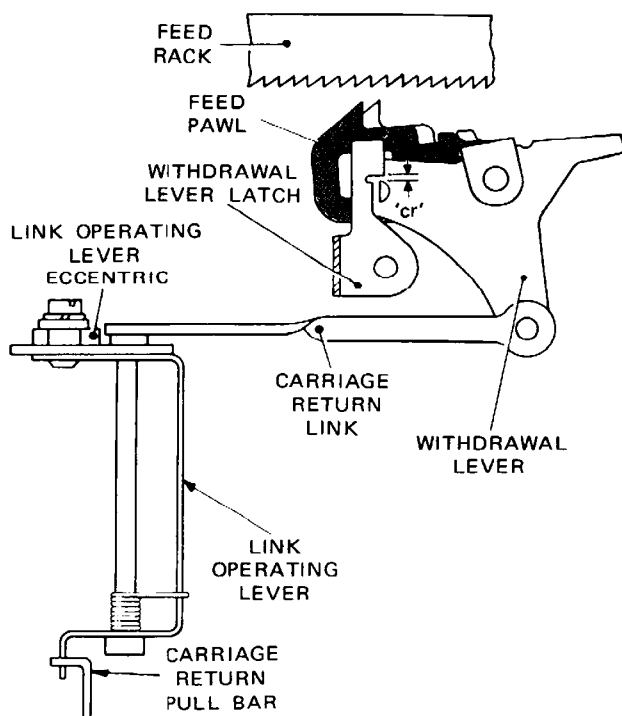


Fig. 4.102 CARRIAGE-RETURN OPERATING LINKAGE

- 112.2 Return the machine to the rest condition and check that both feed pawls fully engage the feed rack when the latch is withdrawn, and that a minimum gap of 0.002 inch exists between the lower side of the withdrawal lever pin and the edge of the slot in each feed pawl.

### Action

- 112.3 To adjust, slacken the screw securing the link operating lever eccentric and turn the eccentric to satisfy the conditions. Tighten the screw.

## †113. FEED UNIT TRIP LATCH POSITION

### Check

- 113.1 Set up any printing combination, release the trip lever latch and turn the machine by hand until the carriage feed trip bar has fully operated, as shown in Fig. 4.103. Check that there is now a minimum clearance of 0.010 inch (dimension 'cs') between the feed unit trip latch and the clutch detent.

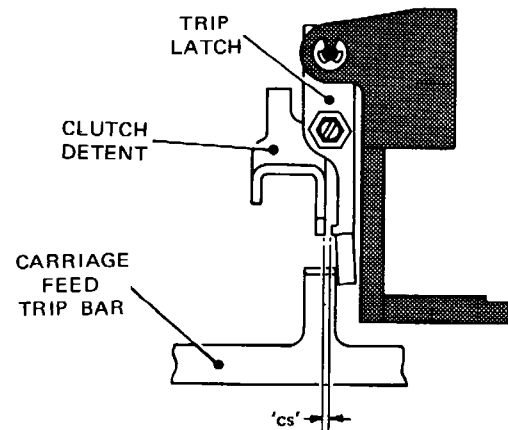
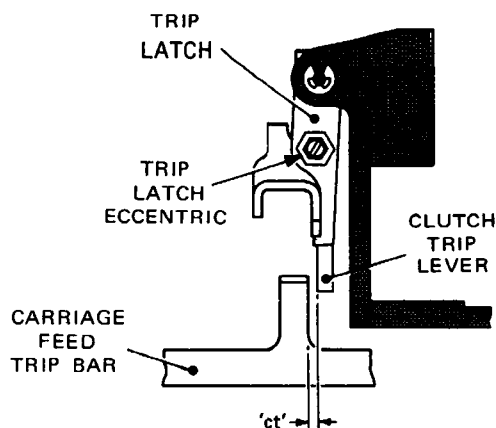


Fig. 4.103 FEED UNIT TRIP LATCH – OPERATED POSITION

- 113.2 Return the machine to the rest condition and check that there is now a minimum clearance of 0.005 inch (dimension 'ct' of Fig. 4.104) between the trip bar and the clutch trip lever.

### Action

- 113.3 To adjust, slacken the screw securing the trip latch eccentric and turn the eccentric to correct the clearances. Tighten the screw.



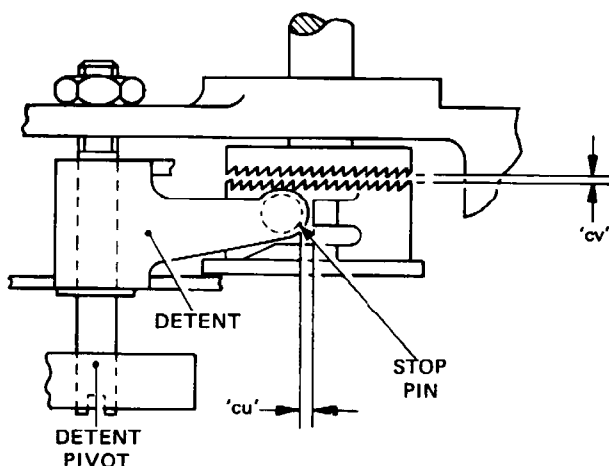
**Fig. 4.104 FEED UNIT TRIP LATCH - REST POSITION**

#### 114. FEED UNIT CLUTCH DETENT

This is applicable only to machines running at 50 bauds.

##### *Check*

- 114.1 Check that the gap between the stop on the clutch and the stop pin of the detent (dimension 'cu' of Fig. 4.105), that occurs when the machine comes to rest from 50-baud working, is not more than 0.062 inch.
- 114.2 Check that with the gap obtained, the gap between the ratchet teeth of the clutches (dimension 'cv') is 0.004–0.016 inch.



**Fig. 4.105 FEED UNIT CLUTCH DETENT**

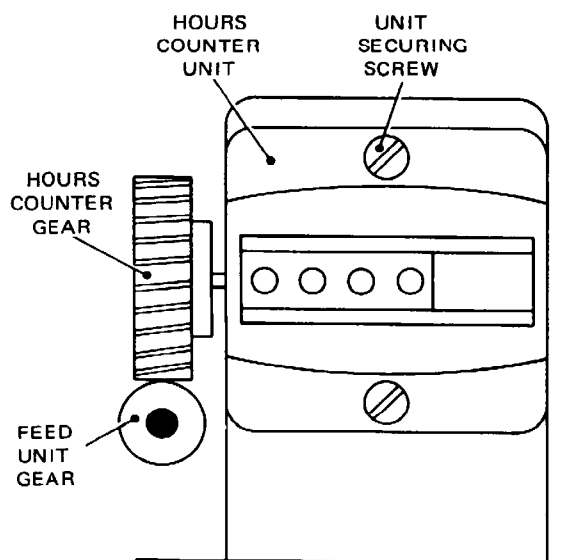
##### *Action*

- 114.3 To adjust, slacken the nut securing the detent pivot and turn the pivot by its screwdriver slot to correct the gap, and tighten the nut.

#### 115. FEED UNIT/HOURS COUNTER GEAR MESH

##### *Check*

- 115.1 Turn the machine by hand through a complete revolution of the hours counter gear, Fig. 4.106, and check that the feed unit and hours counter gears mesh closely without any evidence of binding.



**Fig. 4.106 HOURS COUNTER UNIT**

##### *Action*

- 115.2 To adjust, slacken the screws securing the hours counter unit and raise or lower the unit to satisfy the condition. Tighten the screws.

#### 116. LINE FEED LINK HEIGHT

##### *Check*

- 116.1 Depress the line space lever to the single-line feed position.
- 116.2 Set up the line feed (SMSSS) combination, release the trip lever latch and turn the machine by hand until the power bail, Fig. 4.89, has moved to its rearmost position. Check that there is now a clearance of 0.002–0.012 inch (dimension 'cw' of Fig. 4.107) between the platen feed pawl and its eccentric stop.
- 116.3 Return the machine to the rest condition, lift the line space lever to the double-line feed position, and repeat check 116.2.

*Action*

- 116.4 To adjust, slacken the nut securing the line feed link lever eccentric and turn the eccentric to correct the clearance on both feed positions. Tighten the nut.

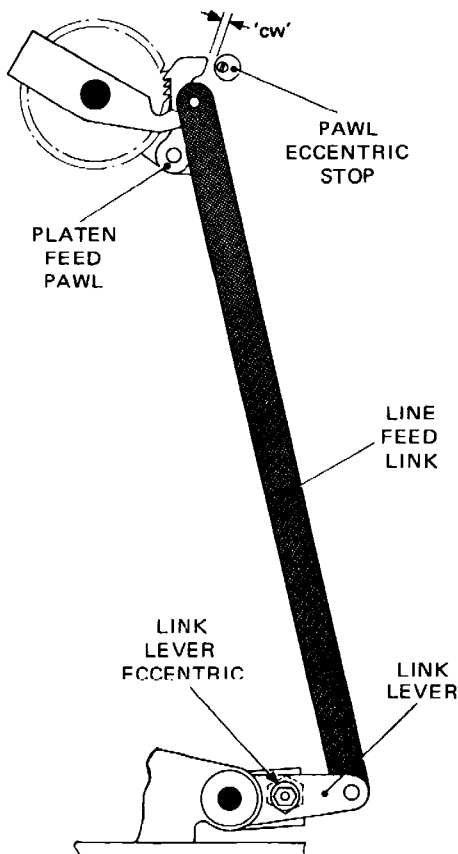


Fig. 4.107 LINE FEED LINKAGE

**117. MOTOR PINION/LAYSHAFT GEAR MESH***Check*

- 117.1 Turn the machine by hand and check that the motor pinion and layshaft gear, Fig. 4.108, mesh closely without any evidence of binding.

*Action*

- 117.2 To adjust, position the motor unit as follows.

- Slacken the locknut securing the motor unit abutment screw and turn the screw inward as far as it can go.
- Slacken the two screws securing the motor unit, and pivot the motor about its centre locating pin to satisfy the condition. Tighten the screws.

- Turn the abutment screw until it is in contact with its abutment pin, and tighten the locknut.

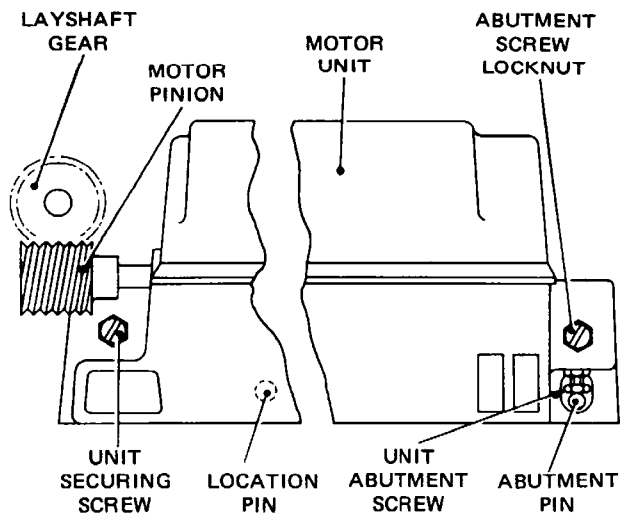


Fig. 4.108 MOTOR UNIT

**118. MOTOR SPEED**

This adjustment applies only to machines fitted with a governed motor.

*Check*

- 118.1 Remove the cover over the motor pinion and layshaft gear. Switch on the motor and, using a 125 dvns fork stroboscope, check that the white stripes on the stroboscope disc appear to be stationary. If they do, the speed is correct. Fit the pinion and gear cover. (If the stripes appear to drift in the direction of motor rotation, the speed is too high. If they appear to drift the other way, the speed is too low.)

*Action*

- 118.2 If the speed is incorrect, do not alter the adjustment of the motor governor until the following checks have been made.
- Measure the voltage of the supply. In cases where power is obtained from a mobile generating set, an error in motor speed is often due to excessive voltage fluctuation of the supply.
  - Check the electrical wiring and components of the governor.

If no fault can be located by this procedure, remove the motor unit cover and adjust the governor by means of the screw located between two vanes of the fan. Turn the screw

clockwise to increase speed or counter-clockwise to decrease speed. Fit the motor unit cover and the pinion and gear cover.

### 119. TRANSMITTER TRIP FROM KEYBOARD

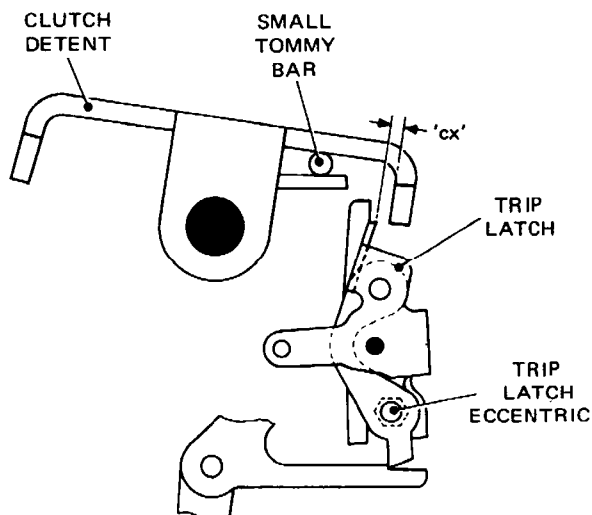


Fig. 4.109 TRANSMITTER CLUTCH DETENT/TRIP LATCH CLEARANCE

#### Check

- 119.1 With the machine in the rest condition, insert a small tommy bar underneath the transmitter clutch detent, as shown in Fig. 4.109. Depress a key on the keyboard and check that there is a clearance of at least 0.005 inch (dimension 'cx') between the detent and the trip latch.

- 119.2 Repeat check 119.1 for a random selection of keys at each end of the keyboard and in each row. Remove the tommy bar.

#### Action

- 119.3 To adjust, slacken the screw securing the trip latch eccentric, and turn the eccentric to correct the clearance for all selected keys. Tighten the screw.

### 120. SEND/RECEIVE DELAY FROM TAPE READER

#### Check

- 120.1 Load a length of tape into the tape reader, depress the TAPE TRANSMITTER ON key and turn the machine by hand until the trip delay lever (located on the tape reader), Fig. 4.110, has moved to its maximum counter-clockwise position. Check that the clearance (dimension 'cy') between the delay lever and the send/receive lever (located on the transmitter unit) is 0.002–0.006 inch.

#### Action

- 120.2 Refine action 30.2.

#### Check

- 120.3 Check that there is a clearance of 0.002–0.010 inch (dimension 'cz') between the delay release lever and the delay disc.

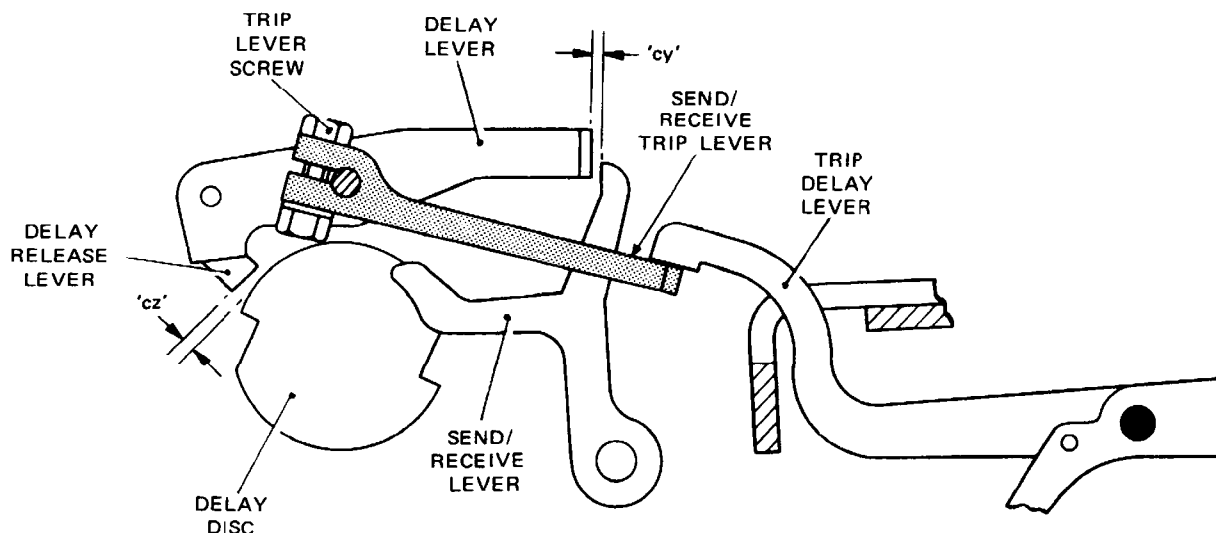


Fig. 4.110 SEND/RECEIVE DELAY MECHANISM

*Action*

- 120.4 To adjust, slacken the screw clamping the send/receive trip lever and pivot the lever around its shaft to correct the clearance. Tighten the screw.

*Check*

- 120.5 Turn the machine by hand until the send/receive adjustment link is fully to the left and the receive contact is closed (Fig. 4.111). Check that there is a clearance of at least 0.004 inch between the peg on the send/receive operating lever and the receive contact blade (clearance 'da').

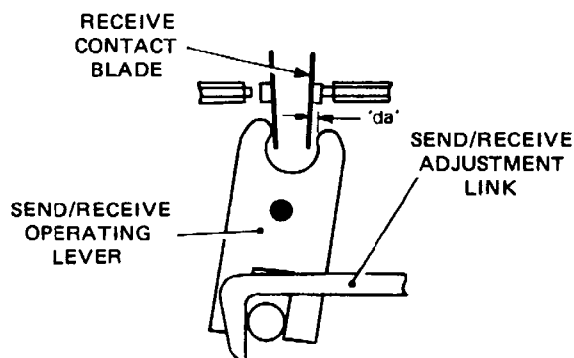


Fig. 4.111 SEND/RECEIVE OPERATING MECHANISM

- 120.6 Turn the machine by hand until the send/receive adjustment link is fully to the right and the send contact is closed (Fig. 4.112). Check that there is a clearance of at least 0.003 inch between the peg on the send/receive operating lever and the send contact blade (clearance 'db').

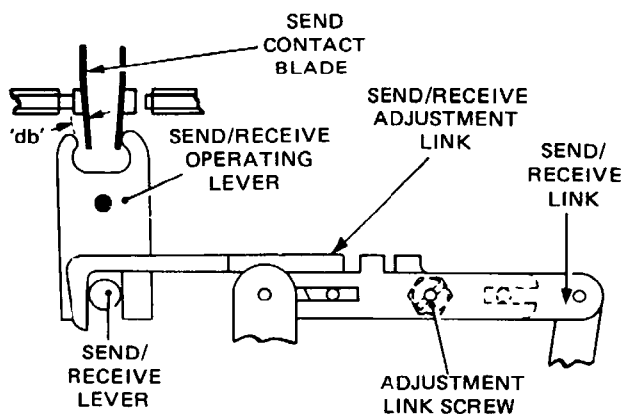


Fig. 4.112 SEND/RECEIVE OPERATING MECHANISM

*Action*

- 120.7 To adjust, slacken the screw securing the adjustment link and move this link relative to the send/receive link to correct the clearance. Tighten the screw.

**121. TAPE READER BELT TENSION***Check*

- 121.1 Apply a force of 200 grams to the drive belt at point F13, Fig. 4.113, and check that the deflection of the belt is 0.040–0.060 inch.

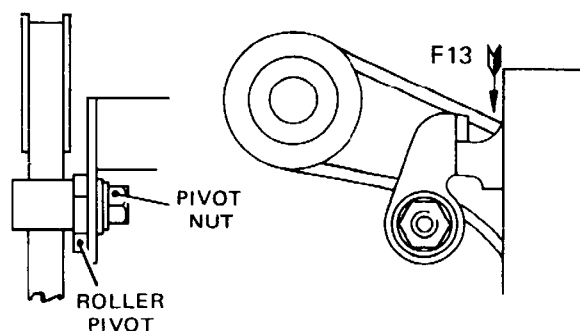


Fig. 4.113 TAPE READER DRIVE BELT

*Action*

- 121.2 To adjust, slacken the nut securing the eccentric roller pivot, turn the pivot to satisfy the condition, and tighten the nut. Ensure that the roller is free to rotate.

**122. TAUT-TAPE SPRING**

This adjustment is applicable only if a taut-tape arm is fitted to the tape deck.

*Check*

- 122.1 Run a long length of parchment tape, perforated with the ALL SPACE code (feed holes only), and check that when the tape is free the tape reader continues to run.

*Action*

- 122.2 Repeat adjustment 64, and increase the size of the gap between the magnet armature and taut-tape leaf spring.

*Check*

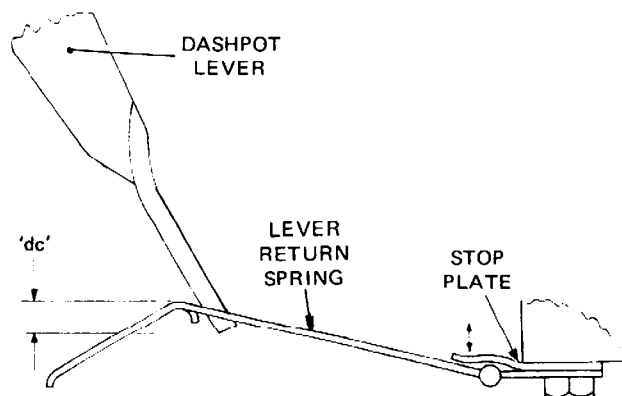
- 122.3 Run a length of tape, perforated with a message, and check that when the tape is held at a point six inches before the tape deck the tape reader switches off without misreading the last character.

*Action*

- 122.4 Repeat adjustment 64, and reduce the size of the gap between the magnet armature and taut-tape leaf spring.

**123. DASHPOT LEVER RETURN SPRING***Check*

- 123.1 (a) By a normal printing operation move the type carriage to the right-hand end of the line,  
 (b) whilst holding the type carriage against the carriage-return action, depress the **MANual CARriage RETurn** key and allow the carriage to return slowly to the beginning of the line,  
 (c) check that the depth of engagement of the dashpot lever with the lever return spring (dimension 'dc' of Fig. 4.114) is 0.06 inch.

**Fig. 4.114 DASHPOT LEVER RETURN SPRING***Action*

- 123.2 To adjust, carefully bend the unsupported end of the stop plate forward (for lesser engagement) or backward (for greater engagement), as shown by the arrow, to correct the engagement.

**124. END-OF-LINE INDICATOR LAMP OPERATION***Check*

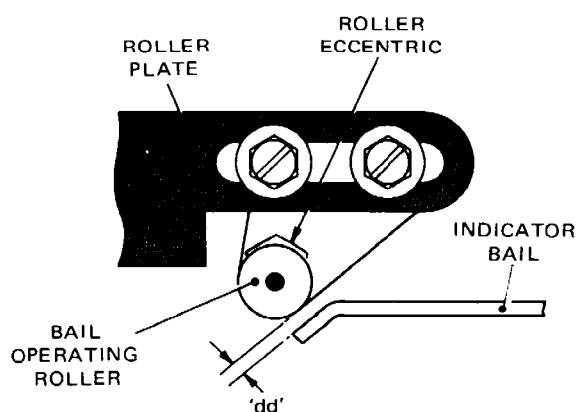
- 124.1 Switch on the motor, run out printing characters to the end of the line, and check that the lamp lights on completion of the fifty-fifth character and flickers for the remainder of the line.

*Action*

- 124.2 To adjust, slacken the nut securing the roller eccentric and turn the eccentric to correct the condition. Tighten the nut.

*Check*

- 124.3 Depress the CR key and run out fifty-four printing characters (for an indication on the fifty-fifth character). Check that there is now a clearance of 0.015–0.030 inch (dimension 'dd') between the end-of-line indicator bail, Fig. 4.115, and its operating roller. (Indication on the fifty-fourth or fifty-sixth character may be acceptable.)

**Fig. 4.115 END-OF-LINE INDICATOR OPERATING MECHANISM***Action*

- 124.4 To adjust, slacken the screws securing the roller plate and position the plate to correct the clearance. Tighten the screws.

**125. PAPER ROLL LOCATION***Check*

- 125.1 Load a roll of paper into the machine. Turn the platen knob and check that the roll can be unwound freely yet is located snugly between the left-hand and right-hand paper guides, Fig. 4.116.

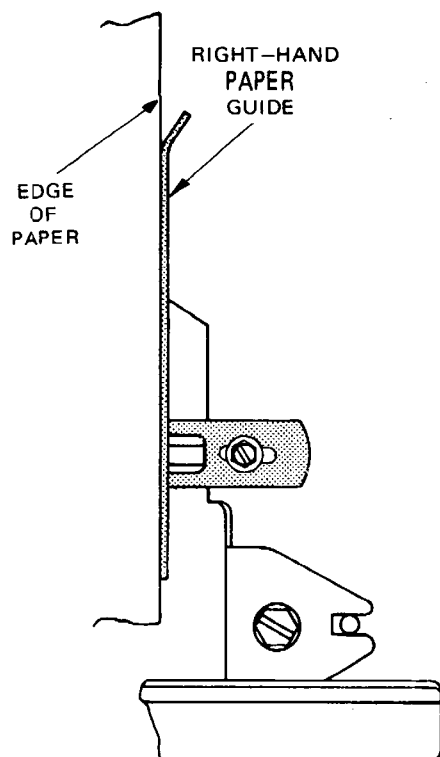


Fig. 4.116 RIGHT-HAND PAPER GUIDE

*Action*

- 125.2 To adjust, slacken the screw securing the right-hand guide and move the guide to satisfy the condition. Tighten the screw.

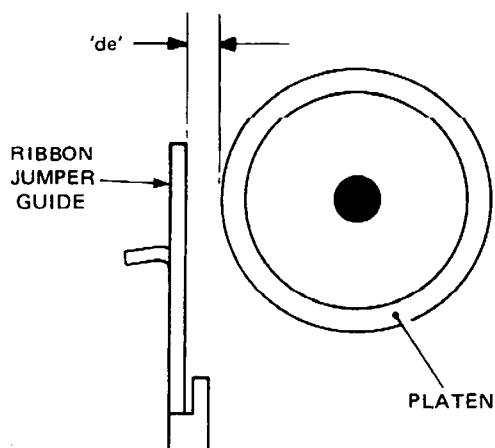
**126. PLATEN POSITION**

Fig. 4.117 PLATEN FRAME

*Check*

- 126.1 With type ribbon fitted, but with no paper over the platen, check that the gap between the ribbon jumper guide and the face of the platen (dimension 'de' of Fig. 4.117) is 0.157–0.177 inch at each end of the platen.

*Action*

- 126.2 Slacken the two adjusting screws and the securing screw at each end of the platen (Fig. 4.118) so that they are finger-tight, move the platen frame in relation to the securing bracket at each end to correct the gap, and tighten the securing screw and the two adjusting screws at each end of the platen.

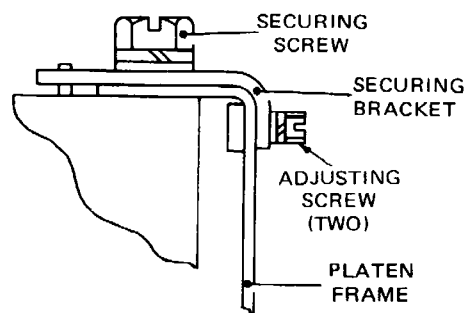


Fig. 4.118 PLATEN FRAME

**127. CHARACTER AND LINE POSITIONS**

This is applicable to sprocket-feed platens only.

*Check*

- 127.1 Check that the distance between the centre-line of the first printed character and the centre-line of the left-hand sprocket holes (dimension 'df' of Fig. 4.119) is 0.490–0.510 inch.

*Action*

- 127.2 To adjust –
- slacken the two screws securing the unit to the side frames,
  - position the unit midway between the left-most and right-most settings,
  - secure the unit,

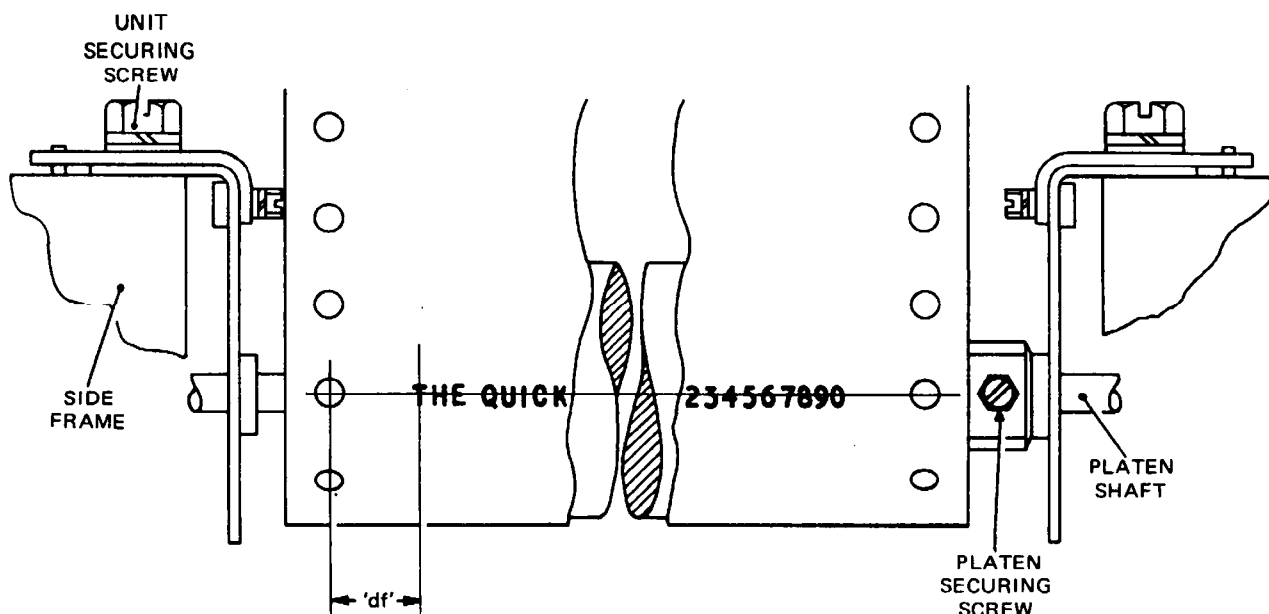


Fig. 4.119 SPROCKET-FEED PLATEN

- (d) refine adjustment 103.2–103.3 (carriage stop screw),
- (e) slacken the two screws securing the unit to the side frames,
- (f) set the unit to correct the distance, and
- (g) secure the unit.

*Check*

- 127.3 Check that the centre-line through a line of printing is within 0.020 inch of a centre-line through a sprocket hole on each side of the paper, as shown in Fig. 4.119.

*Action*

- 127.4 To adjust, slacken the screw securing the platen to the platen shaft, turn the platen on the shaft to correct the centre-line, and secure the platen tube.

counter-clockwise to decrease, the print density) to satisfy the condition. Secure the screw in this position by the locknut. Do not allow the spring tension to fall below 3½ pounds nor to exceed 4½ pounds.

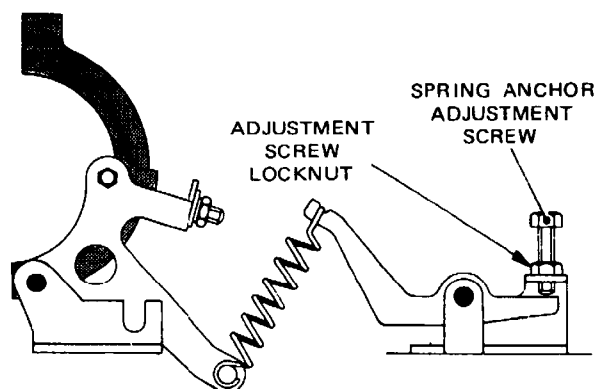


Fig. 4.120 PRINT SPRING MECHANISM

**128. PRINT DENSITY***Check*

- 128.1 Switch on the motor and run out a line of full stops (figures shift – SSMMM). Check that the density of the characters is sufficient for the number of copies required to be printed.

*Action*

- 128.2 To adjust, slacken the locknut securing the print spring anchor adjustment screw, Fig. 4.120, and turn the screw (clockwise to increase, or

**129. CHARACTER SPACING***Check*

- 129.1 Switch on the motor, run out a line of the letter M combination (SSMMM) and check that the printed characters are evenly spaced along the line.

*Action*

- 129.2 To adjust, slacken the screw securing the feed pawl eccentric, Fig. 4.93, and turn the eccentric until the condition is satisfied. Tighten the screw.

### 130. TRANSMITTER CLUTCH TRIGGER/ BACKSTOP CLEARANCE

Carry out this adjustment after the transmitter unit is exercised for a few hours following each assembly to the machine.

#### Check

- 130.1 With the machine in the rest condition, release the clutch detent and check that there is a clearance of 0.045–0.060 inch (dimension 'dg' of Fig. 4.121) between the clutch trigger and the backstop on the clutch body.

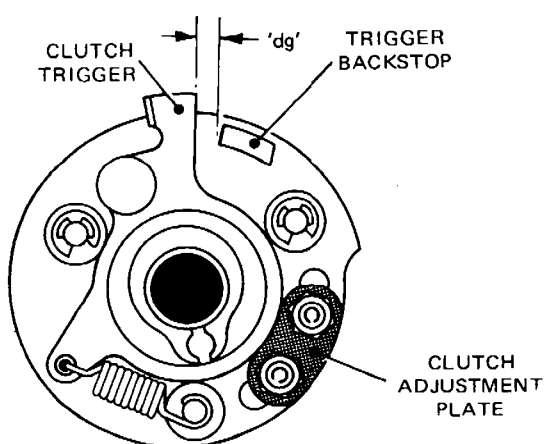


Fig. 4.121 TRANSMITTER CLUTCH

#### Action

- 130.2 To adjust, slacken the screws securing the clutch adjustment plate and move the plate to correct the clearance. Tighten the screws.

### 131. DRIVE ARM CLEARANCE

#### Check

- 131.1 Release the trip lever latch and turn the machine slowly by hand through a complete revolution. During the revolution, hold the roller on the upper drive arm, Fig. 4.122, down on its cam face and estimate the varying clearance (the dimension 'dh') between the roller on the lower drive arm and its cam face. Find the position of the revolution where the clearance is at its minimum, and check that it does not exceed 0.004 inch.

#### Action

- 131.2 To adjust, slacken the nuts securing the drive arms and turn the eccentric, Fig. 4.123, to correct the minimum clearance. Tighten the nuts.

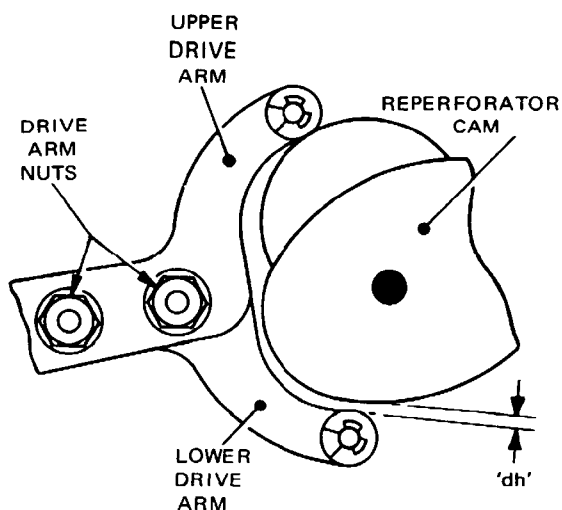


Fig. 4.122 DRIVE ARM/CAM CLEARANCE

### †132. DRIVE ARM POSITION

#### Check

- 132.1 Set the machine to the rest condition, and check that the PERForator ON and PERForator OFF keys can be operated easily.

#### Action

- 132.2 To make the keys operative, slacken the nut securing the eccentric, Fig. 4.123, set the eccentric temporarily to enable key operation, and secure the eccentric.

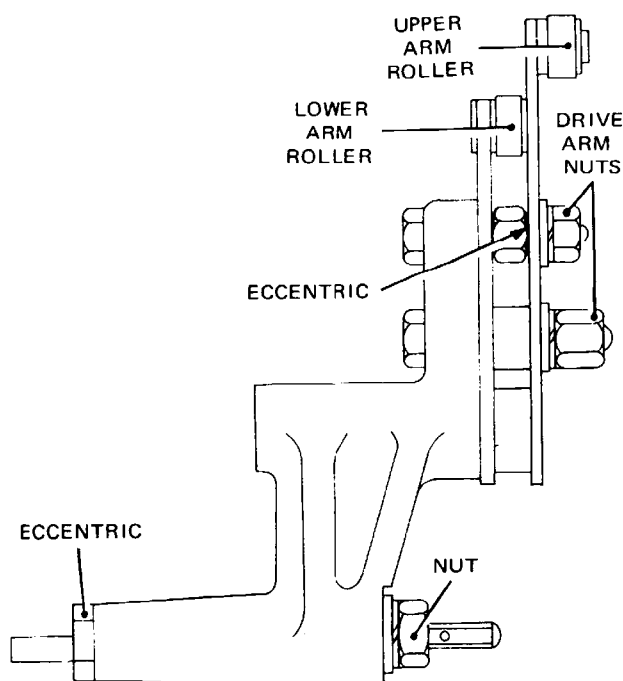
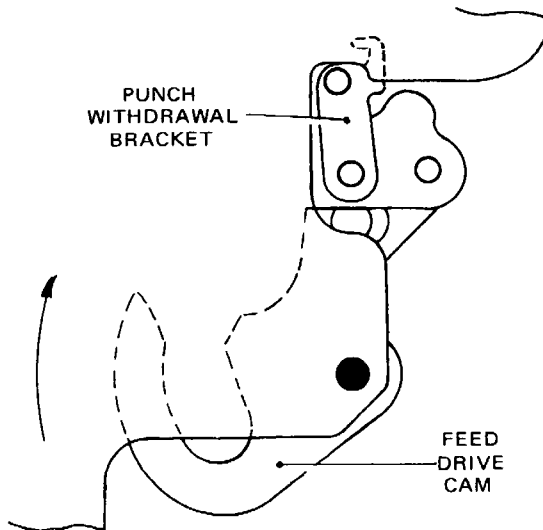


Fig. 4.123 DRIVE ARM ASSEMBLY (UNDERSIDE)

*Check*

- 132.3 Depress the PERForator ON key, turn the machine until the punch withdrawal bracket, Fig. 4.124, rises to its highest position, and check that the punch withdrawal bracket is not raised further as the feed drive cam is turned clockwise by hand.



**Fig. 4.124 DRIVE MECHANISM**

*Action*

- 132.4 To adjust, slacken the nut securing the drive arm eccentric, Fig. 4.123, turn the eccentric to prevent the further rise of the punch withdrawal bracket, and secure the eccentric.

*Check*

- 132.5 Set the machine to the rest condition, and check that the PERForator ON and PERForator OFF keys can be operated easily.

*Action*

- 132.6 To make the keys operate easily, slacken the nut securing the eccentric, turn the eccentric slowly until the keys are free, and secure the eccentric.

*Check*

- 132.7 Repeat check 132.3 and, if re-adjustment is required, repeat check 132.5 also.

### †133. SUPPRESSION—LEVER/TRANSFER—BAR GAP

*Check*

- 133.1 Set the machine to the rest condition, and check that the gap between the lowest code transfer

bar and the suppression levers (dimension 'di' of Fig. 4.125) is 0.015–0.025 inch.

*Action*

- 133.2 To adjust, slacken the two screws of the reset link assembly, move the reset frame to correct the gap, and tighten the two screws.

### †134. CODE READ LEVERS

*Check*

- 134.1 Set the machine to the rest condition, and check that the gap between the code transfer bars and the code read lever (dimension 'dj' of Fig. 4.125) is 0.015–0.035 inch.

*Action*

- 134.2 To adjust, slacken the nut securing the drive arm eccentric, turn the eccentric to correct the gap and secure the eccentric.

### 135. SUPPRESSION LEVER/LATCH CLEARANCE

*Check*

- 135.1 Select letter D or J and turn the machine until the suppression levers (Fig. 4.125) rest on the shift bar and, whilst holding the suppression latch pin, check that the gap between the pin and the suppression levers (dimension 'dk') is at least 0.004 inch.

- 135.2 Ensure that the punch suppression frame is latched by the suppression latch as shown in Fig. 4.125, select a character that operates the suppression mechanism, turn the machine by hand, and check that the suppression latch releases the punch suppression frame (and therefore that dimension 'dk' is not too large).

*Action*

- 135.3 To adjust the gap, slacken the nut securing the suppression lever eccentric pivot and, ensuring the throw of the eccentric is toward the rear as shown in Fig. 4.125, set the eccentric for the correct gap (using special feeler gauge TA 1518 for the minimum gap) and secure the pivot.

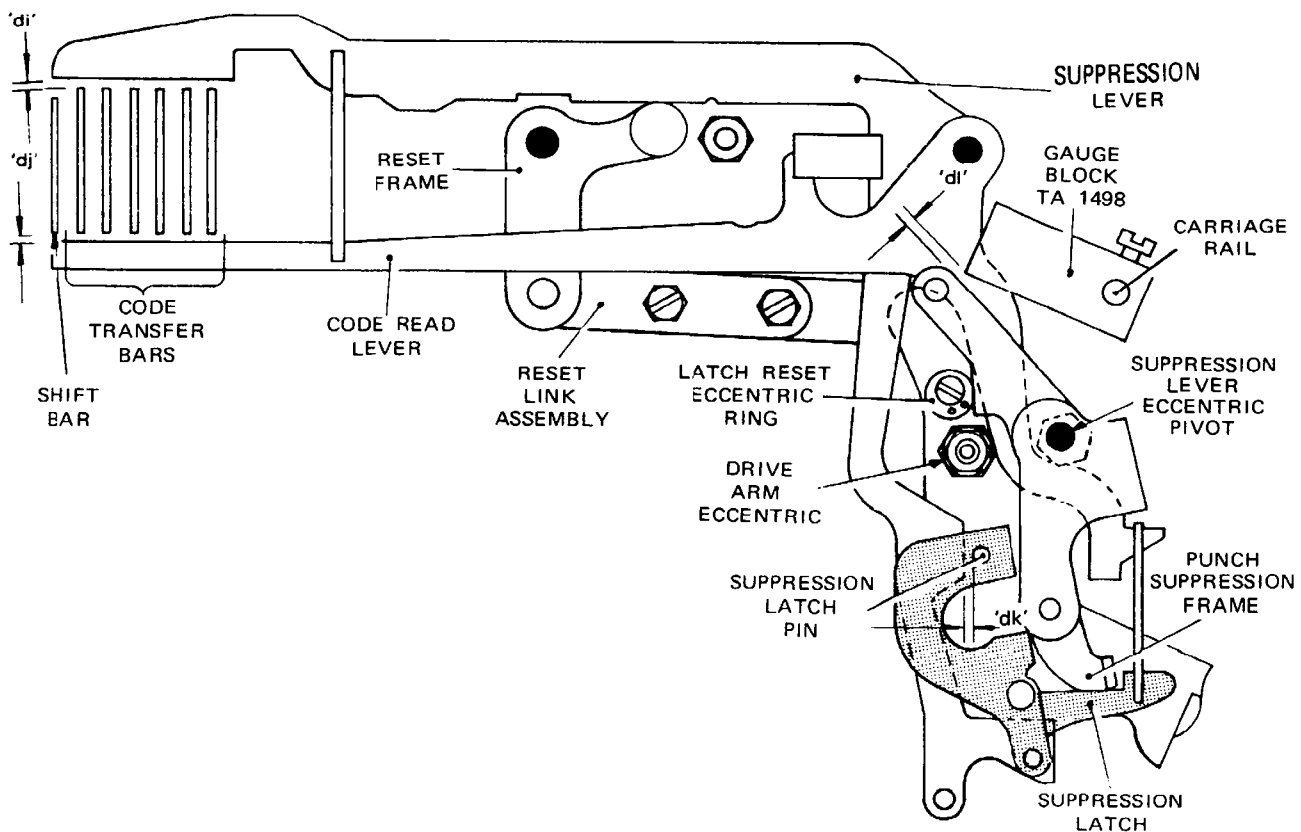


Fig. 4.125 SUPPRESSION MECHANISM

**†136. SUPPRESSION LATCH***Check*

- 136.1 (a) Set the machine to the rest condition,
- (b) fit gauge TA 1498 to the carriage rail (as shown in Fig. 4.125) so that it touches the tip of the punch suppression frame,
- (c) lightly secure the gauge to the rail by tightening the clamp screw.
- (d) taking care not to initiate a carriage-return action, set up a punching combination,
- (e) turn the machine by hand and check that the tip of the punch suppression frame moves away from the gauge by 0.008–0.016 inch (dimension 'dl'), and
- (f) unclamp and remove the gauge, but not before correct movement is verified.

*Action*

- 136.2 To adjust, slacken the screw securing the latch reset eccentric ring, whilst ensuring that the throw of the eccentric is downward (as shown in Fig. 4.125) set the eccentric to correct the movement, and secure the ring.

**†137. ON/OFF REMOTE CONTROL LATCH/LEVER CLEARANCES***Check*

- 137.1 With the machine in the rest condition, check that there is a clearance of 0.002–0.016 inch (dimension 'dm' of Fig. 4.126) between the ON/OFF remote control latch and the ON/OFF remote control lever.

*Action*

- 137.2 To adjust, slacken the nut securing the control lever reset arm and rotate the arm round its shaft to correct the clearance. Tighten the nut.

*Check*

- 137.3 Depress the magnet armature. Release the trip lever latch and turn the machine slowly by hand until the control lever passes over the latch, as shown in the inset. Check that the lever is now clear of the latch by 0.002–0.010 inch (dimension 'dn').

*Action*

- 137.4 To adjust, slacken the screws securing the magnet bracket and tilt the magnet assembly to correct the clearance. Tighten the screws.

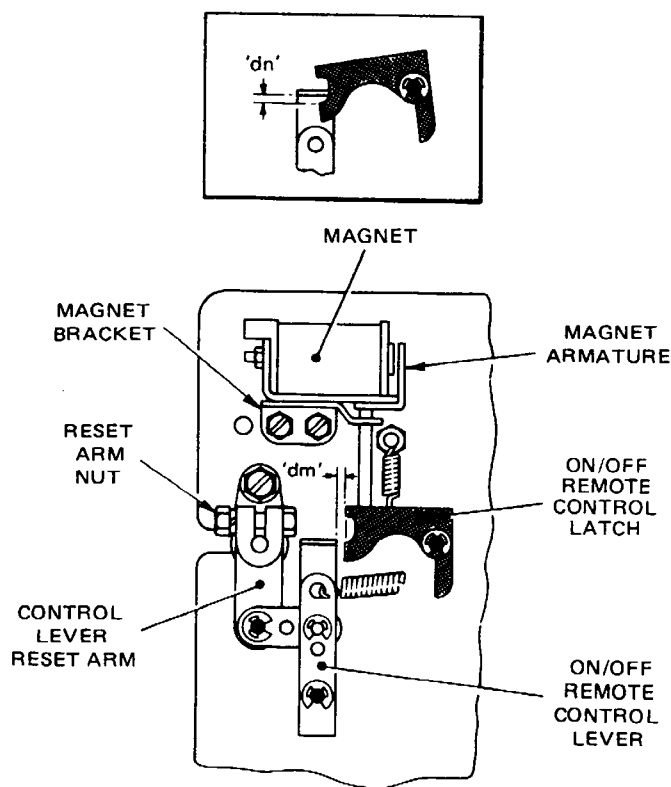


Fig. 4.126 ON/OFF REMOTE CONTROL LEVER ASSEMBLY

### 138. PRESSURE ROLLER

#### Check

- 138.1 By means of a tension gauge check that the force required to pull the pressure roller just clear (F14 of Fig. 4.127) is 750–1000 grams.

#### Action

- 138.2 To adjust, slacken the nut securing the eccentric bracket pivot, turn the pivot to correct the force, and secure the pivot.

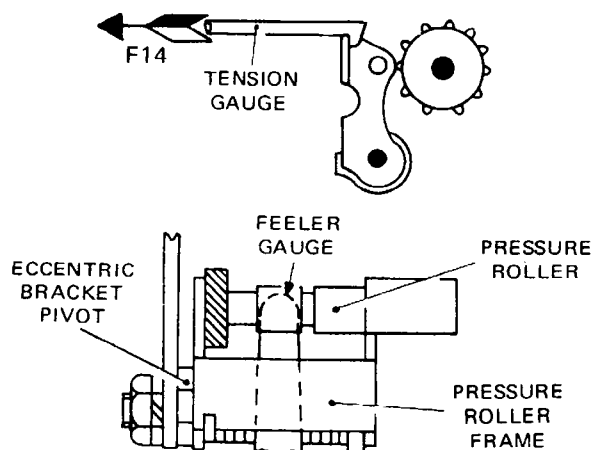


Fig. 4.127 PRESSURE ROLLER

#### Check

- 138.3 Check that a 0.002 inch feeler gauge cannot be inserted between the pressure roller and the feed spindle on each side of the feed teeth.

#### Action

- 138.4 To adjust, bend the pressure roller frame slightly to correct the alignment.

### 139. FRONT TAPE GUIDE ASSEMBLY

#### Check

- 139.1 Unclip the spring strip from the button pivot pins and check that the gap between the tape guide and the pressure roller (dimension 'do' of Fig. 4.128) is at least 0.002 inch.

#### Action

- 139.2 To adjust, slacken the two screws securing the tape guide bracket, set the tape guide to correct the gap, and secure the bracket.

#### Check

- 139.3 Check that the front of the tape guide is biased upward to ensure that the lower part of the guide clears the feed wheel teeth.
- 139.4 Check that the upper part of the guide does not drop below the level of the punch block, leaving a gap (dimension 'dp') of at least 0.015 inch.
- 139.5 Check that the horizontal and vertical clearances between the top of the tape guide assembly and the pressure roller bracket (dimensions 'dq' and 'dr') are at least 0.004 inch. Clip the spring strip to the button pivot pins, but not before correct clearances are verified.

#### Action

- 139.6 To adjust, refine action 139.2.

### 140. TAPE RELEASE KEY

#### Check

- 140.1 Engage the retention roller in the retention wheel and check that the gap between the pressure roller bracket and the roller pivot (dimension 'ds' of Fig. 4.128) is 0.042–0.062 inch.

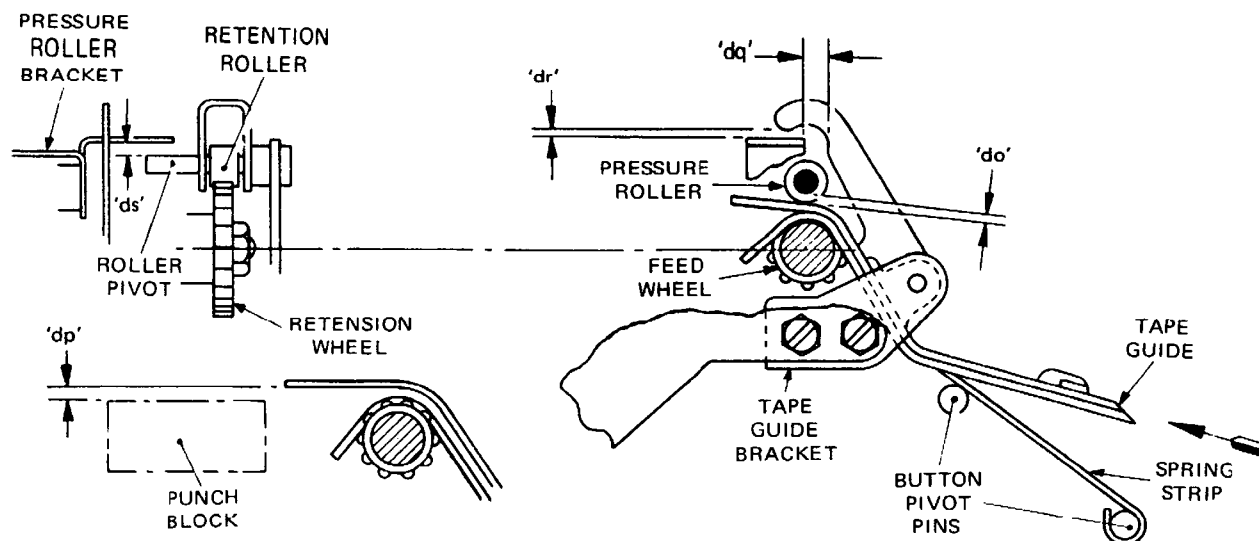


Fig. 4.128 TAPE GUIDE

*Action*

- 140.2 To adjust the gap, carefully bend the end of the pressure roller bracket appropriately.

*Check*

- 140.3 Depress and hold down fully the TAPE RLSE (release) key, and check that one thickness of tape can be passed freely through the tape guide assembly from the front.

*Action*

- 140.4 To adjust, refine action 140.2

*Check*

- 140.5 Depress and hold down firmly the TAPE RLSE key, and check that three thicknesses of tape can be passed freely through the lower part only of the tape guide assembly from the front.

*Action*

- 140.6 To adjust, refine action 140.2.

- 141.2 Check that the gap between the punches and the withdrawing frame (dimension 'dt' of Fig. 4.129) is not greater than 0.003 inch.

- 141.3 Check that the tops of the punches are just below the surface of the tape guide plate and that the withdrawing frame is free to move forward.

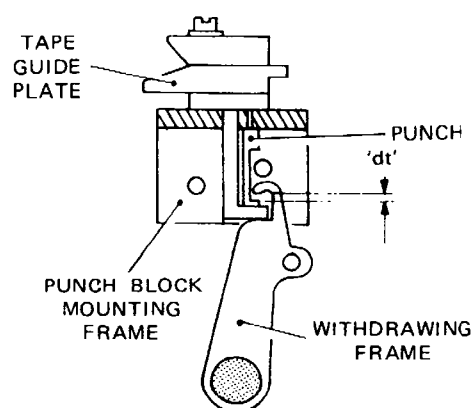


Fig. 4.129 PUNCH BLOCK (LEFT-HAND VIEW)

**†141. PUNCH BLOCK HEIGHT***Check*

- 141.1 Set the machine to the rest condition and thus the feed cam lever in the lower position, check that the punches are in their lowest position, and check that the flats of the punches face the withdrawing frame as shown in Fig. 4.129.

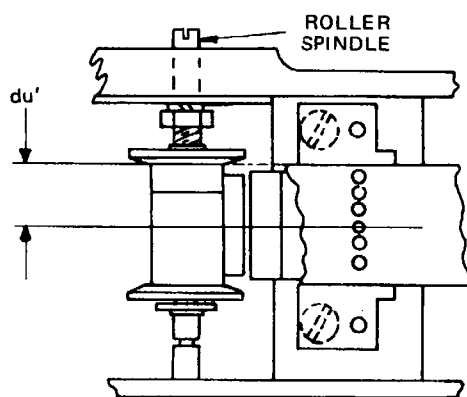
*Action*

- 141.4 To adjust, slacken the four screws securing the punch block mounting frame, move the punch block to satisfy the foregoing conditions, and secure the frame.

**142. LATERAL POSITION OF TAPE***Check*

- 142.1 Load the tape, and check that the distance between the right-hand edge of the tape and

the centre of the punch block feed hole (dimension 'du' of Fig. 4.130) is 0.389–0.395 inch. (This close tolerance is only necessary when non-mechanical tape readers are employed, but if this distance cannot be satisfactorily measured, check by use of tape checker TA 1443 (not part of tool kit) or commercially available tape gauge.)



**Fig. 4.130 LOWER PART OF ROLLER BRACKET ASSEMBLY (PLAN VIEW)**

#### Action

- 142.2 To adjust, slacken the nut securing the roller spindle, turn the spindle by a screwdriver to correct the distance, and secure the spindle.

### 143. FEED HOLE PITCH

#### Check

- 143.1 Set the machine to the rest condition, and check that the pitch between the feed punch and one of the teeth on the feed sprocket (dimension 'dv' of Fig. 4.131), when the retention roller is engaged with the retention wheel, is 0.7 inch.

#### Action

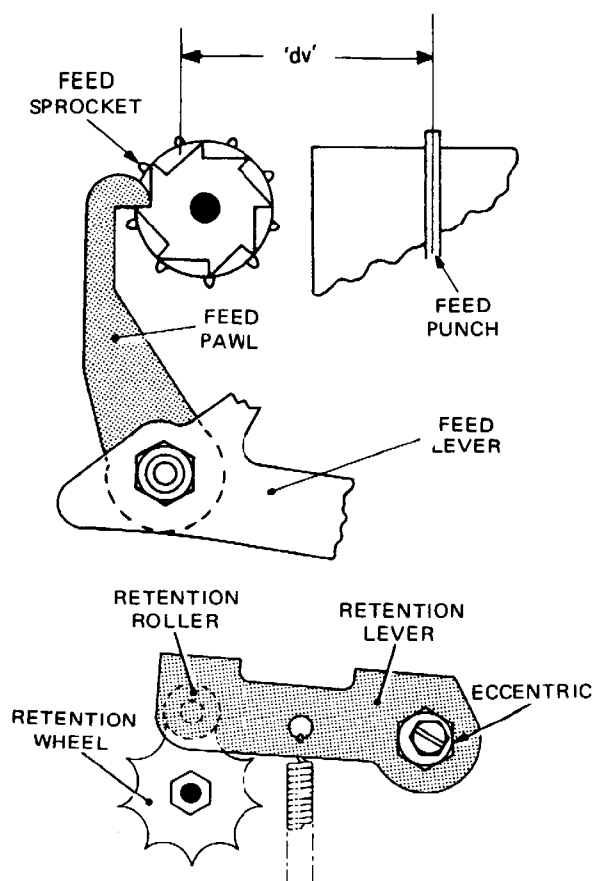
- 143.2 To adjust, slacken the screw securing the eccentric bush of the retention lever, set the bush for the correct pitch, and re-secure the bush.

#### Check

- 143.3 Run out tape from the machine whilst it is under power, and check that the pitch is correct.

#### Action

- 143.4 To adjust, refine action 143.2 above.



**Fig. 4.131 FEED DRIVE AND RETENTION LEVER ASSEMBLIES (RIGHT-HAND VIEW)**

### 144. FEED PAWL CLEARANCE

#### Check

- 144.1 Set the machine to the rest condition, ensure that the feed lever is in its lowest position, and check that the retention roller is fully engaged with the retention wheel.

#### Action

- 144.2 To adjust, slacken the nut securing the feed pawl eccentric, turn the eccentric until the retention roller begins to lift, turn the eccentric back slightly, and secure the eccentric.

#### Check

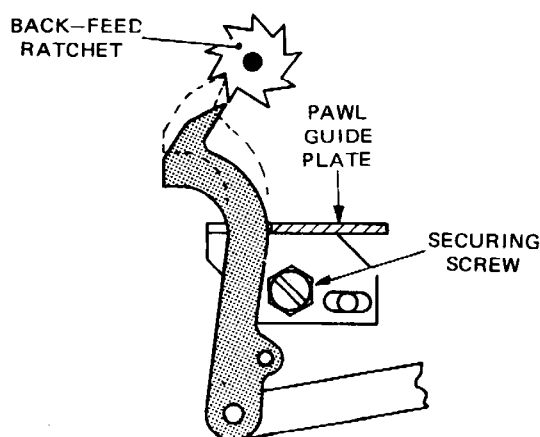
- 144.3 Turn the retention wheel against the feed pawl and check that backlash is just perceptible.
- 144.4 Run out tape from the machine whilst it is under power, and check that the pitch is consistent.

*Action*

144.5 To adjust, refine action 144.2 above.

**145. BACK SPACE KEY***Check*

145.1 Operate the BACK SPACE key several times and check that the back-feed ratchet, Fig. 4.132, is fed one tooth only each time.



**Fig. 4.132 BACK-FEED MECHANISM**

*Action*

145.2 To adjust, slacken the screw securing the pawl guide plate, set the plate to correct the action and ensure full engagement of pawl and tooth, and secure the plate.

**146. TAPE-OUT SWITCH OPERATION***Check*

146.1 Check that the tape-out operating arm, Fig. 4.133, operates the tape-out switch as the tape reel is reduced to the required diameter — usually  $2\frac{1}{2}$ – $2\frac{3}{4}$  inch (dimension 'dw').

*Action*

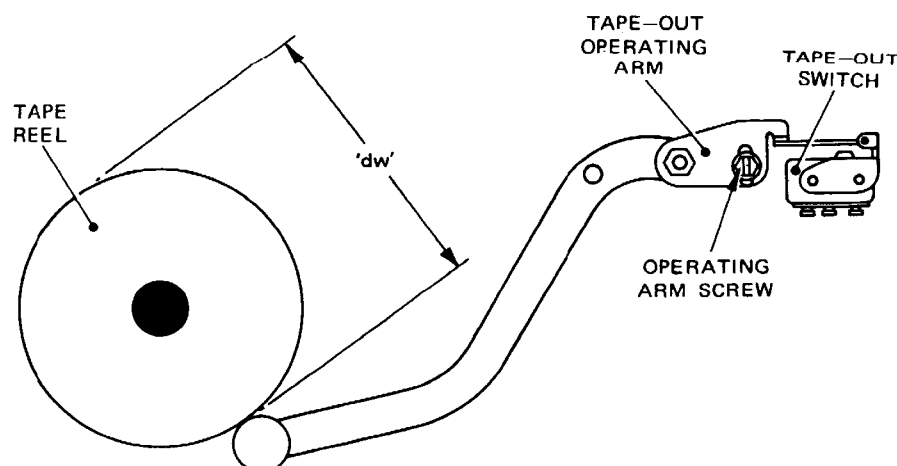
146.2 To adjust, slacken the screw securing the operating arm, and move the arm to satisfy the condition. Tighten the screw.

**147. TRANSMITTER BIAS**

Before carrying out this adjustment ensure that a telegraph distortion measuring set (TDMS) is available.

*Check*

- 147.1 (a) Connect the signal terminal of the TDMS to the tongue of the transmitter mark/space contact block (through a 5 kilohm resistor), Fig. 4.134.
- (b) Ensure that the earth terminal of the TDMS is connected to the signal earth of the teleprinter (the 0 volt terminal of 80–0–80 volt signal supply).
- (c) Set the TDMS timebase to correspond to the machine speed (50 or 75 bauds).



**Fig. 4.133 TAPE-OUT SWITCH MECHANISM**

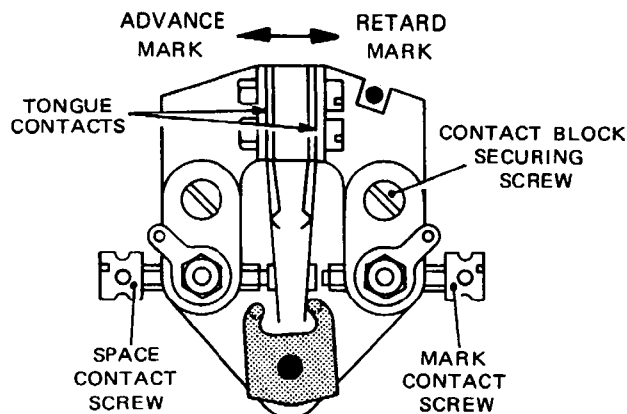


Fig. 4.134 MARK/SPACE CONTACT BLOCK

- (d) Run out letter Y on the page printer from the left-hand margin and at the same time check that the display points of successive signal element transitions cross the display lines in an approximately straight line without noticeable bias zigzagging, as shown in Fig. 4.135A. (There is a random distribution about a straight line due to other causes.)

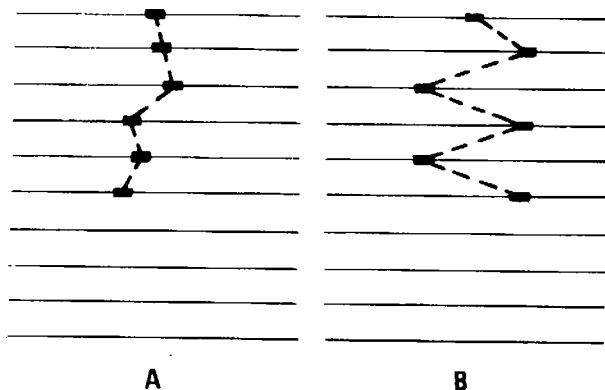


Fig. 4.135 PORTION OF TDMS DISPLAY

*Action*

- 147.2 If the display points form a distinct bias zigzag, as shown in Fig. 4.135B, slacken the two screws securing the contact block, swing the contact block to the left or right to render the zigzagging unnoticeable, and secure the contact block. If sufficient adjustment cannot be obtained, carry out adjustment 23 (Contact Transit Gap) and then repeat the above adjustment.

Do not correct the bias itself by setting the contact screws.

**148. COVER UNIT***Check*

- 148.1 Check that the gap between the tear-off strip and the platen tear-off plate (dimension 'dx' of Fig. 4.136) is 0.031–0.063 inch if single-ply stationery is used, or is of maximum width if multi-ply stationery is used.

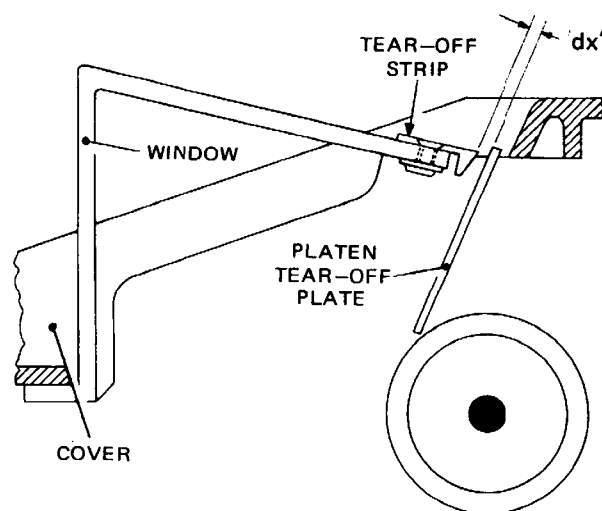


Fig. 4.136 TEAR-OFF STRIP (RIGHT - HAND SIDE)

- 148.2 Check that the gap is constant along the length of the strip.

*Action*

- 148.3 To adjust, slacken the four screws securing the tear-off strip, set the strip to correct the gap, and secure the strip.