

PART 3

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PART 3

A. MAINTENANCE INSTRUCTIONS

1. GENERAL

Maintenance of the Model Seventy-five Teleprinter should be carried out at the periods shown below in the Maintenance Summary. It must be appreciated, however, that the frequency at which maintenance attention will be required depends on the following variable factors.

- (a) Baud speed of operation.
- (b) Traffic loading.
- (c) Environmental conditions of operation.

The teleprinter can be equipped with an operation counter which registers one unit for every ten thousand revolutions of the translator camshaft. It will be seen, therefore, that the maintenance attention may be based either on the hours of operation of the machine or the readings on the operation counter. Both these alternative arrangements are shown in the Maintenance Summary, and an Operations/Time Conversion Graph is provided at Fig. 3.1. Of these alternatives, however, the operation counter readings give a more reliable guide to the actual amount of mechanical effort carried out by the machine, since the operation counter automatically takes into account the first two variable factors which help to determine the frequency of maintenance.

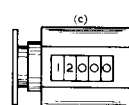
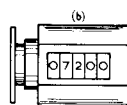
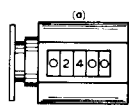
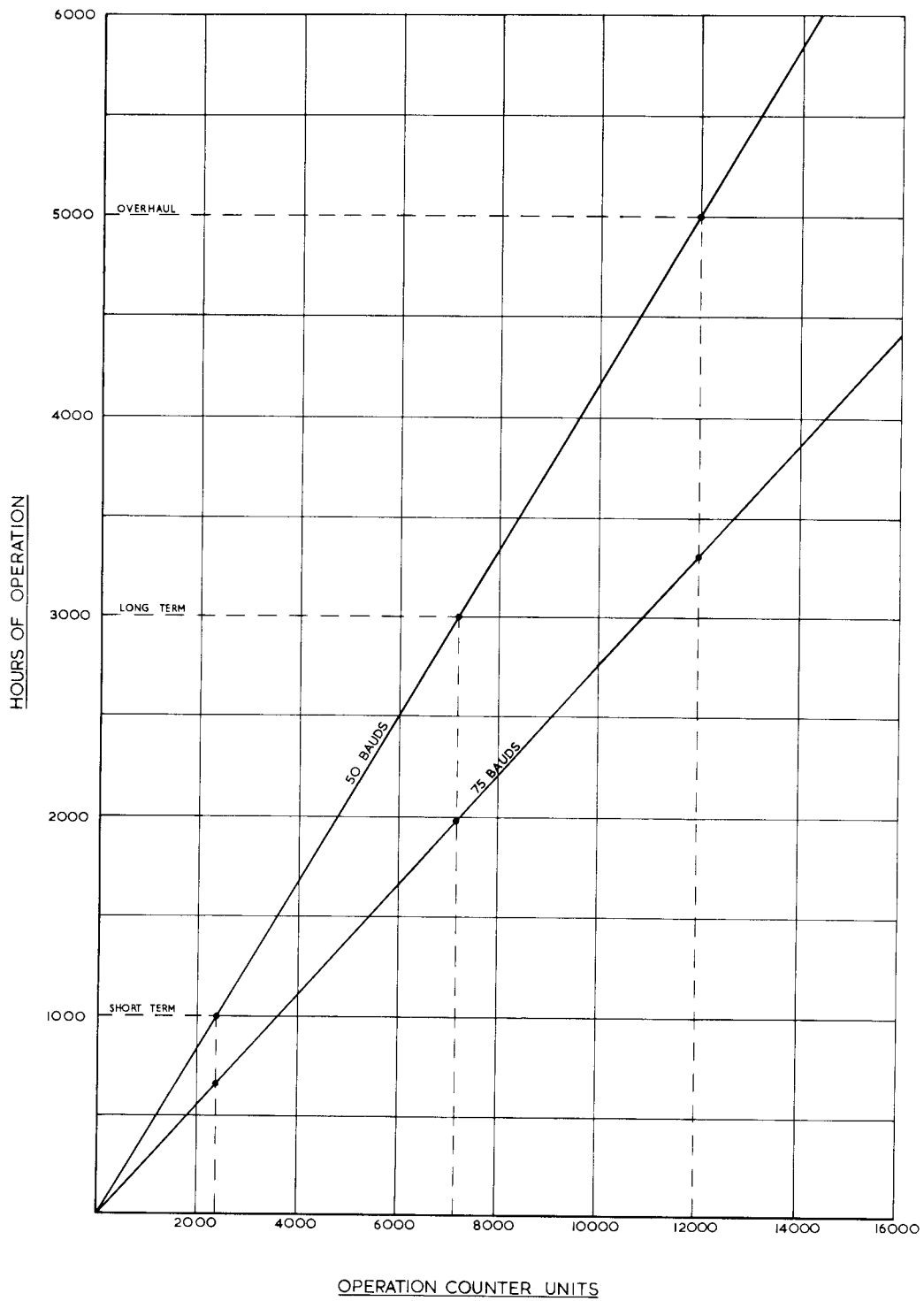
★ Note that since the operation counter only records the number of revolutions of the translator camshaft, the counter readings will not check the running hours of the motor, particularly if the auto-start facility is removed or inhibited.

MAINTENANCE SUMMARY

Attention	Hours of Operation at 50 bauds	Operation Counter Reading
'Running In' Check	50	120
Short Term	1000	2400
Long Term	3000	7200
Overhaul	5000	12000

With the third variable factor, i.e. environmental conditions of operation, it can only be left to the discretion of the individual customer to extend or shorten the periods of maintenance attention as required. As a general guide, however, a machine operated in a hot climate will tend to require maintenance and lubrication attention at shorter intervals than one operated under ideal climatic conditions.

MAINTENANCE INSTRUCTIONS



Operation Counter Readings for:-
 (a) Short Term
 (b) Long Term
 (c) Overhaul

Fig. 3.1 OPERATIONS/TIME CONVERSION GRAPH

2.

'RUNNING IN' CHECK	50 hours of operation at 50 bauds, or 120 operation counter units
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2.1 After an initial 'running in' period, carry out a thorough functional check, preferably with the co-operation of a distant station. Test the operation of all keys and any special facilities that may be fitted, such as answer-back, end-of-line indicator, two-colour printing or reperforating attachment. If any character fails to print, or any facility fails to operate correctly, inspect the relevant parts and check their adjustments.

★ Remember that, because of the design features that provide for mechanical production of the local record, the operation of the transmitter, selector unit and electromagnet can only be checked if the machine under test is linked to another machine.

2.2 Ensure that the operator is familiar with all the controls and special facilities, and is using them in the correct manner. Check that the operator can replace paper and ribbon correctly (see Model Seventy-five Operator's Handbook).

3.

SHORT TERM	1000 hours of operation at 50 bauds, or 2400 operation counter units
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General

3.1 Remove the signal and power plugs from the rear of the machine main base. Take off the machine cover and inspect the mechanism for the following points.

- (a) Visual damage.
- (b) Excessive wear of mechanical components.
- (c) Lubrication failure, as indicated by the presence of a red powdery substance.
- (d) Corrosion.
- (e) Charring, overheating or tracking of electrical components.
- (f) Faulty insulation or poor termination of wiring.
- (g) Loose fixing screws, locknuts or circlips.

3.2 Using a soft brush, remove all traces of paper fluff, dust and tape cuttings from the machine. Clear the typefaces with a stiff brush, paying particular attention to those with small closed loops, e.g. A, %, P.

3.3 Check the carriage return tape for fraying and renew as necessary.

3.4 Inspect the ink ribbon for wear and renew if necessary.

3.5 Carry out the Lubrication Instructions given on page 11. After lubrication, use a dry cloth to remove any lubricant that may have spread from the points of application. In particular, ensure that the transmitter contact assembly, platen, platen pressure rollers, ribbon guides and reperforator tape guides are free from all traces of lubricant.

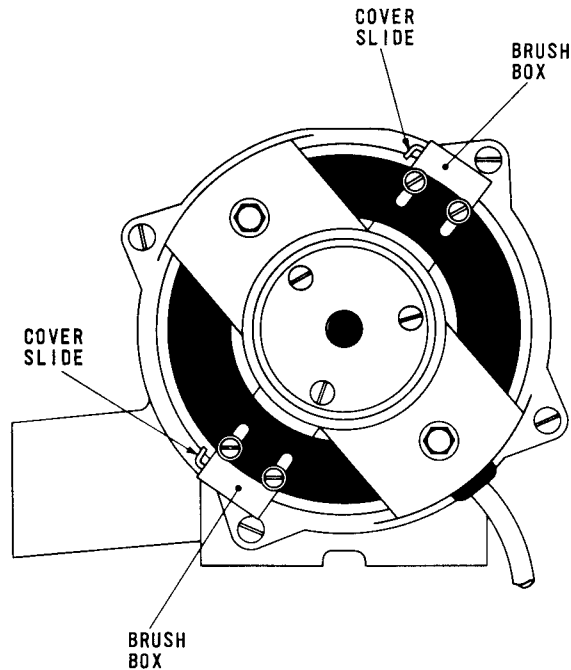


Fig. 3.2 GOVERNED MOTOR — LEFT-HAND END

Motor and Governor

3.6 Remove the motor from the machine main base in the manner recommended in Part 5, page 3. Take off the cover over the commutator end of the motor, exposing the commutator and brushes. Examine the length of the brushes as seen through the slot in the side faces of the brush boxes, Fig.3.2, and note whether any coils of the brush springs can be seen. If so, fit a new brush and spring assembly in the following manner.

- (a) Hold down the circular brass cap of the spring to prevent the cap from springing out, and remove the brush slide from the brush box.
- (b) Withdraw the old brush, spring and cap.
- (c) Insert a new brush assembly, press the brass cap fully home in its seating and refit the brush slide.

★ If there is any wear on the commutator, the expected life of each new set of motor brushes is likely to become progressively less than that of its preceding set. It is recommended that after each set of brushes has been replaced, the periodic inspection of brush length is carried out at progressively more frequent intervals.

3.7 Using a soft brush, remove all carbon dust from the accessible parts of the motor and governor contact assembly. Clean the commutator with a dry cloth and remove all carbon dust from the commutator slots with a stiff brush. If there is a smooth black glaze on the commutator surface, do not attempt to remove it in any way. Refit the commutator cover.

3.8 Check the operation of the governor contacts and inspect the nylon contact peg for wear. If the peg is worn, remove the governor contact assembly from the sub-base of the motor unit and fit a new peg (Creed Part No.4018/30). Refit the governor contact assembly to the sub-base and hold the assembly against its abutment before tightening the fixing screw.

- 3.9 Refit the motor unit to the machine main base and re-connect the signal and power plugs. Switch on the motor and check its speed in the manner recommended in Adjustment No.81 (Part 4, page 60).

Functional

- 3.10 Carry out a thorough functional check as described in paragraph 2.1 above.

4.

LONG TERM

3000 hours of operation
at 50 bauds, or
7200 operation counter units

General

- 4.1 Remove the signal and power plugs from the rear of the machine main base. Take off the machine cover and inspect the mechanism for the following points.
- (a) Visual damage.
 - (b) Excessive wear of mechanical components.
 - (c) Lubrication failure, as indicated by the presence of a red powdery substance.
 - (d) Corrosion.
 - (e) Charring, overheating or tracking of electrical components.
 - (f) Faulty insulation or poor termination of wiring.
 - (g) Loose fixing screws, locknuts or circlips.
- 4.2 Using a soft brush, remove all traces of paper fluff, dust and tape cuttings from the machine. Clean the typefaces with a stiff brush, paying particular attention to those with small closed loops, e.g. A, %, P.
- 4.3 Check the carriage return tape for fraying and renew as necessary.
- 4.4 Inspect the ink ribbon for wear and renew if necessary.
- 4.5 Carry out the Lubrication Instructions given on page 11. After lubrication, use a dry cloth to remove any lubricant that may have spread from the points of application. In particular, ensure that the transmitter contact assembly, platen, platen pressure rollers, ribbon guides and reperforator tape guides are free from all traces of lubricant.
- 4.6 Check all drive shaft bearings for end-play and side-play, paying particular attention to the adjustments listed below.
- (a) Selector Drive Shaft End-Play - Adjustment No.12 (Part 4, page 9).
 - (b) Selector Rockshaft End-Play - Adjustment No.34 (Part 4, page 28).
 - (c) Typehead Carriage End-play - Adjustment No.48 (Part 4, page 37).

Motor and Governor

- 4.7 Remove the motor from the machine main base in the manner recommended in Part 5, page 3. Take off the cover over the commutator end of the motor, the governor cover and the governor contact assembly cover.

MAINTENANCE INSTRUCTIONS

- 4.8 Examine the length of the brushes as seen through the slot in the side faces of the brush boxes, Fig.3.2, and note whether any coils of the brush springs can be seen. If so, fit a new brush and spring assembly as described in paragraphs 3.6(a) to (c) above.
- 4.9 Rotate the armature shaft slowly by hand and check for tight spots or excessive end-play.
- 4.10 Using a dry cloth and a stiff brush, remove all carbon dust which may have accumulated inside the motor body, on the end castings, the armature windings or the commutator slots. Examine the surface of the commutator for wear or pitting and, if necessary, reface it in the manner described in paragraph 5.8 below. If there is a smooth black glaze on the commutator surface, however, do not attempt to remove it in any way.
- 4.11 Using a soft brush, remove all carbon dust which may have accumulated in the governor contact assembly, particularly between the contact blades. Examine the governor contacts for pitting and burnish or renew as necessary. Inspect the nylon contact peg for wear. If the peg is worn, remove the governor contact assembly from the sub-base of the motor unit and fit a new peg (Creed Part 4018/30). Refit the governor contact assembly to the sub-base and hold the assembly against its abutment before tightening the fixing screw.
- 4.12 Refit the commutator cover, the governor cover and the governor contact assembly cover. Refit the motor to the machine main base and re-connect the signal and power plugs. Switch on the motor and check its speed in the manner recommended in Adjustment No.81 (Part 4, page 60).

Select and Translator Units

- 4.13 Check the following adjustments and correct where necessary.
 - (a) Translator Clutch - Adjustment No.28 (Part 4, page 23).
 - (b) Pin-Box Traverse Multiplying Lever - Adjustment No.29 (Part 4, page 23).
 - (c) Pecker Retention Arm - Adjustment No.30 (Part 4, page 24).
 - (d) Selector Detent Clearance - Adjustment No.31 (Part 4, page 25).
 - (e) Selector Camshaft Retention Lever - Adjustment No.32 (Part 4, page 26).
 - (f) Selector Clutch - Adjustment No.33 (Part 4, page 27).
 - (g) Translator Trip Operating Lever Stop - Adjustment No.35 (Part 4, page 28).
 - (h) Translator Clutch Trip - Adjustment No.36 (Part 4, page 28).
 - (j) Starter Trip from Electromagnet - Adjustment No.37 (Part 4, page 29).
 - (k) Starter Trip from Translator Clutch - Adjustment No.38 (Part 4, page 29).
 - (l) Pecker/Code Selection Pin Clearance - Adjustment No.39 (Part 4, page 30).
 - (m) Pecker Traverse - Adjustment No.40 (Part 4, page 31).

Carriage Return, Dashpot, Line and Letter Feed Mechanisms

- 4.14 Check the operation of the dashpot and the carriage return spring drum. Check the vertical carriage return and line feed levers for positive action from their function bars.

4.15 Check the following adjustments and correct where necessary.

- (a) Carriage Return Pawl Lift - Adjustment No.41 (Part 4, page 32).
- (b) Line Feed Lever Stop Plate - Adjustment No.42 (Part 4, page 32).
- (c) Line Feed Pawl Overthrow Stops - Adjustment No.46 (Part 4, page 37).
- (d) Typehead Carriage Stop Screw and Pawl Latch - Adjustment No.49 (Part 4, page 38).
- (e) Feed and Retention Pawl Height - Adjustment No.50 (Part 4, page 39).
- (f) Typehead Carriage Feed Link - Adjustment No.51 (Part 4, page 39).
- (g) Carriage Return Spring - Adjustment No.52 (Part 4, page 40).
- (h) Dashpot - Adjustment No.53 (Part 4, page 41).

Printing Mechanism

4.16 Inspect the typefaces for wear and check the type alignment. Check the surfaces of the platen and the platen pressure rollers for wear and renew as necessary.

4.17 Check the operation of the ink ribbon control mechanism, and the action of the ribbon changeover mechanism at each end of the ribbon traverse.

4.18 Check the following adjustments and correct where necessary.

- (a) Friction Feed Platen - Adjustment No.43 (Part 4, page 33).
- (b) Sprocket Feed Platen - Adjustment No.44 (Part 4, page 34).
- (c) Paper Guide Retainers - Adjustment No.45 (Part 4, page 36).
- (d) Platen Retention Pawl - Adjustment No.47 (Part 4, page 37).
- (e) Print Spring - Adjustment No.54 (Part 4, page 41).
- (f) Typehead/Platen Clearance - Adjustment No.55 (Part 4, page 42).
- (g) Print Beam Stop Screw - Adjustment No.56 (Part 4, page 43).
- (h) Typehead Corrector - Adjustment No.57 (Part 4, page 43).
- (j) Typehead Corrector Track Rail - Adjustment No.58 (Part 4, page 44).
- (k) Ribbon Unit Pawls - Adjustment No.67 (Part 4, page 49).
- (l) Ribbon Jumper Arm - Adjustment No.68 (Part 4, page 50).
- (m) Typehead Height-Final Setting - Adjustment No.85 (Part 4, page 69).

Keyboard and Transmitter

4.19 Inspect the transmitter code, sequential and send-receive contacts and burnish as necessary.

4.20 Check the operation of the run out keybar for positive action.

4.21 Check the following adjustments and correct where necessary.

- (a) Contact Springs - Adjustment No.23 (Part 4, page 16).

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- (b) Keyboard Combination Bar Reset - Adjustment No.69 (Part 4, page 51).
- (c) Selector Bar/Selection Pin Alignment - Adjustment No.71 (Part 4, page 52).
- (d) Selector Bar/Selection Pin Clearance - Adjustment No.72 (Part 4, page 52).
- (e) Lag Weight Release Lever Stop - Adjustment No.73 (Part 4, page 53).
- (f) Lag Weight Trip - Adjustment No.74 (Part 4, page 54).
- (g) Lag Weight Movement - Adjustment No.75 (Part 4, page 55).
- (h) Translator Trip from Lag Weight - Adjustment No.76 (Part 4, page 55).
- (j) Send-Receive Delay Lever Clearance - Adjustment No.77 (Part 4, page 56).
- (k) Send-Receive Switch Contacts - Adjustment No.78 (Part 4, page 57).
- (l) Send-Receive Contact Delay - Adjustment No.79 (Part 4, page 57).

4.22 Check the operation of the transmitter code contacts. Check the signals length and position of the sequential start, stop and code contacts using either a TDMS (Adjustment No.82 - Part 4, page 60) or a timing disc (Adjustment No.83 Part 4, page 64).

Reperforating Attachment

- 4.23 Check the punches for wear and renew as necessary.
- 4.24 Check that the reperforator control knob, feed wheel knob and back space key operate correctly.
- 4.25 Check that the reperforator tape punching and feeding actions are inhibited on the operation of the Bell, WRU? and 'Here Is' signals.
- 4.26 Check the correct operation of the tape exhaust alarm - Adjustment No.104 (Part 4, page 85) refers.
- 4.27 Perforate a test message consisting of all keyboard characters, symbols and functions. Inspect the test message for accuracy and tape pitch. If any character fails to punch or the tape pitch is faulty, inspect the relevant parts and check their adjustments.

Answer-Back Unit

- 4.28 Depress the 'Here Is' key and check that the answer-back unit operates correctly.
- 4.29 Depress the WRU? key and check that this action inhibits the answer-back unit and operates the local WRU? alarm.

Functional

- 4.30 Carry out a thorough functional check as described in paragraph 2.1 above.

5.

OVERHAUL

5000 hours of operation
at 50 bauds, or
12000 operation counter units

General

- 5.1 Dismantle all the units from the machine main base in the manner recommended in Part 5, pages 2 to 6.

- 5.2 Dismantle the following individual units as described in Part 5, pages 12 to 21. Discard all lubricating felts and circlips as they are taken off the units.

Keyboard
 Function Bar Unit
 Translator Unit
 Selector Unit
 Aggregate Motion Unit
 Typehead Carriage Unit
 Platen Unit
 Ribbon Unit
 Reperforating Attachment
 Answer-Back Unit
 Operation Counter

- 5.3 Using trichlorethylene and a soft brush, remove all traces of old lubricant from the dismantled parts. Thoroughly examine all working components for wear or damage and renew as necessary.

★ Note that all oil-impregnated bearings which have been treated with trichlorethylene must be re-soaked in lubricant for a minimum of 12 hours before reassembly.

- 5.4 Reassemble the individual units as described in Part 5, pages 23 to 34, refitting new lubricating felts and circlips in place of those previously discarded.

- 5.5 Carry out the Lubrication Instructions given on page 11.

Motor and Governor

- 5.6 Dismantle the motor unit as described in Part 5, page 12.

- 5.7 Soak the motor bearings in trichlorethylene and brush out all the old grease. Thoroughly examine the bearings for wear or damage and renew as necessary. If the bearings are sound and appear likely to last until the next overhaul period, repack them immediately with Creed Lubricant No. 4 (Aeroshell 6B).

- 5.8 Using a dry cloth and a stiff brush, remove all carbon dust which may have accumulated inside the motor body, on the end castings, the armature windings or the commutator slots. Examine the surface of the commutator. If this has a smooth black glaze do not attempt to remove it in any way. If, however, the surface is worn or pitted, reface it in the following manner.

- (a) Mount the armature in a lathe, skim the commutator surface with a sharp pointed tool, and then remove all burrs from the edge of the commutator slots.

★ Do not remove any more metal than is absolutely necessary. The minimum diameter to which the commutator may be safely reduced is 1.00 in.

- (b) Check that the insulation is now an estimated .031 - .036 in. below the surface of the commutator, and that the full depth of the undercut extends over the whole width of the brush track.

- (c) With a sharp pointed tool, undercut each slot that does not meet this requirement. Carefully remove all insulating material from the sides of any slot treated.

★ The width of the slot is .028 - .031 in., and the undercutting tool used for this operation should be selected with these limits in mind.

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(d) When all the slots are of the correct depth, take a light finishing cut over the commutator surface, remove all burrs and bring to a high polish with fine glass paper. **Do not use emery cloth for this operation.**

(e) Brush out all dust and metal fragments from the slots.

5.9 Refit new brush spring assemblies as described in paragraphs 3.5(a) to (c) above.

5.10 Brush out all dust from the governor contact assembly. Examine the governor contacts for pitting and burnish or renew as necessary.

5.11 Reassemble the motor unit as described in Part 5, page 23.

Reassembly

5.12 Carry out Section 1 of the Adjustment Instructions - Part 4, pages 3 to 22 refer.

5.13 Reassemble the following units to the machine main base.

Electromagnet
Translator and Function Bar Units
Selector Unit
Aggregate Motion Unit
Typehead Carriage Unit
End-of-Line Indicator and Carriage Return Spring Drum
Ribbon Unit
Motor Unit
Platen Unit

5.14 Complete Section 2 of the Adjustment Instructions - Part 4, pages 23 to 50 refer.

5.15 Reassemble the following units to the machine main base.

Keyboard
Selector Frames Unit
Answer-Back Unit

5.16 Complete Section 3 of the Adjustment Instructions - Part 4, pages 51 to 59 refer.

5.17 Reassemble the following units to the machine.

Transmitter Unit
Operation Counter

5.18 Complete Section 4 of the Adjustment Instructions - Part 4, pages 60 to 76 refer.

5.19 Reassemble the Reperforating Attachment to the machine main base.

5.20 Complete Section 5 of the Adjustment Instructions - Part 4, pages 77 to 95 refer.

Functional

5.21 Carry out a thorough functional check as described in paragraph 2.1 above.

B. LUBRICATION INSTRUCTIONS

1. GENERAL

Although all machines are fully lubricated before leaving the factory, there is a possibility that some oil may be lost in storage or in transit. Inspect the machine for lubrication before installation. If this inspection shows that some of the lubrication points have dried up, or if the machine is known to have been held in storage for a period of six months or over, re-lubricate the machine before putting it into service. Subsequent lubrication should be carried out at the intervals recommended in the Maintenance Instructions.

The colour of the spots and bands indicate the type of lubricant recommended. Place the lubricant at the exact point shown, unless specifically indicated otherwise by a note underneath the figure. After lubrication, use a dry cloth to remove any excess lubricant that may have spread from the points of application.

LUBRICANTS

● Creed No.2	-	Medium oil (SAE 30) Equivalents - Shell Talpa oil 30 Castrol XL
● Creed No.9	-	Thin oil (SAE 10) Equivalent - Shell Tellus oil 29
● Creed No.6	-	Molybdenum disulphide grease Equivalent - Rocal MT-LM
● Creed No.7	-	Soft grease Equivalents - Shell Alvania No.1 Castrol Spheerol AP.1

Clutch Drum and Bands

With the laminated clutch hands used on previous models of the Seventy-five teleprinter, special care had to be taken to ensure that the drum was always kept completely dry. On the helical-type clutch, however, the drum and bands should be fully lubricated on assembly and each subsequent 1000 hours, as follows:

(a) With the machine in the rest position, soak the drum and bands thoroughly with thin oil (Creed No.9).

(b) Switch on the motor and allow it to run for approximately 15 minutes.

* A small piece of paper inserted between the starter switch pin and its worm wheel will prevent the motor from switching off.

(c) Stop the motor and re-lubricate the drum and bands. Connect the machine to a source of signals, switch on the motor again and allow the machine to print out these signals for about 5 minutes. During this period the surplus oil will be thrown off the clutches and the margin will settle down to its normal working figure.

LUBRICATION INSTRUCTIONS

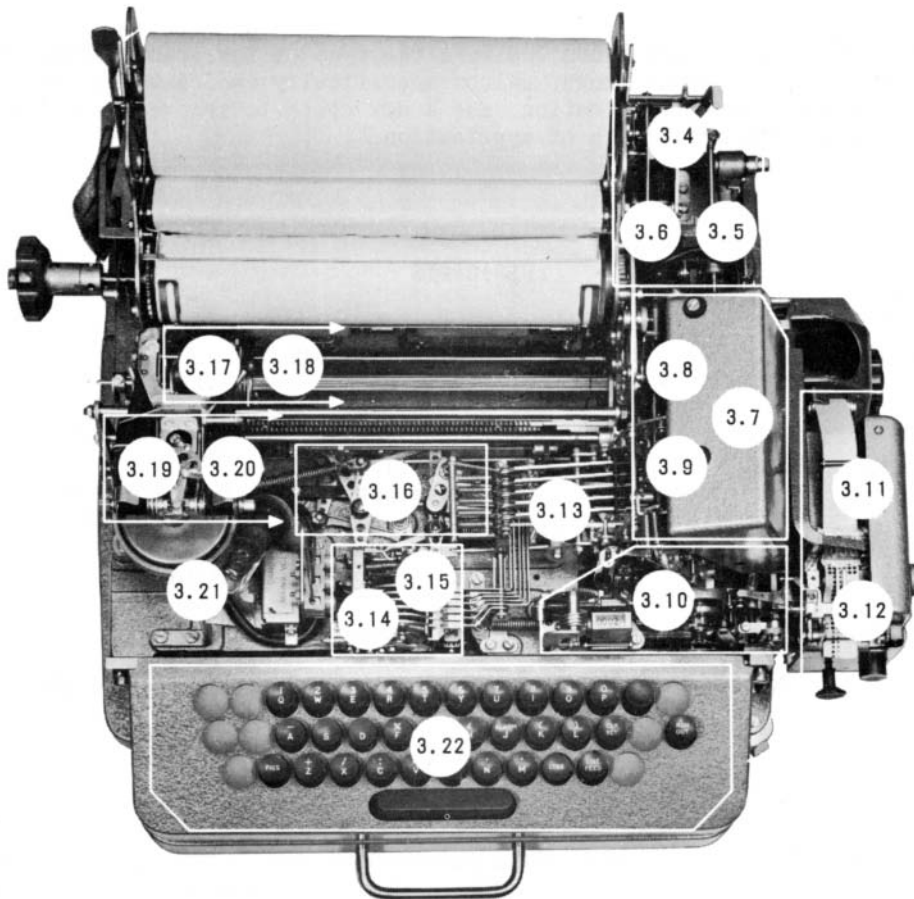


Fig. 3.3 LUBRICATION CHART

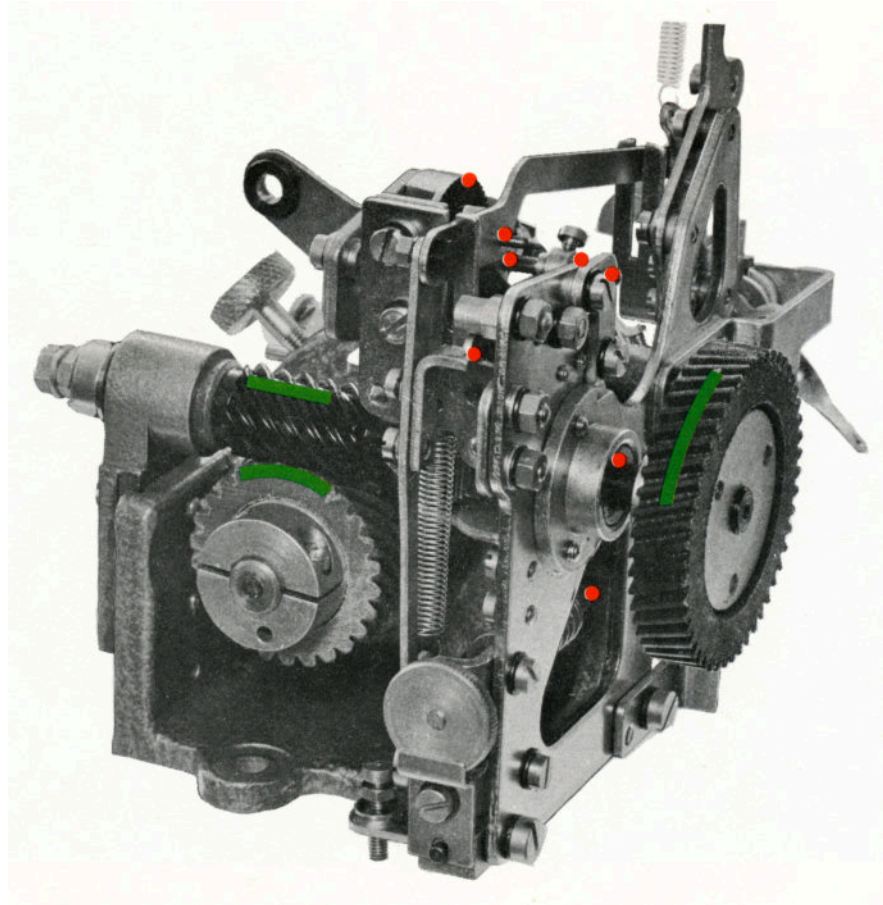


Fig. 3.4

LUBRICATION INSTRUCTIONS

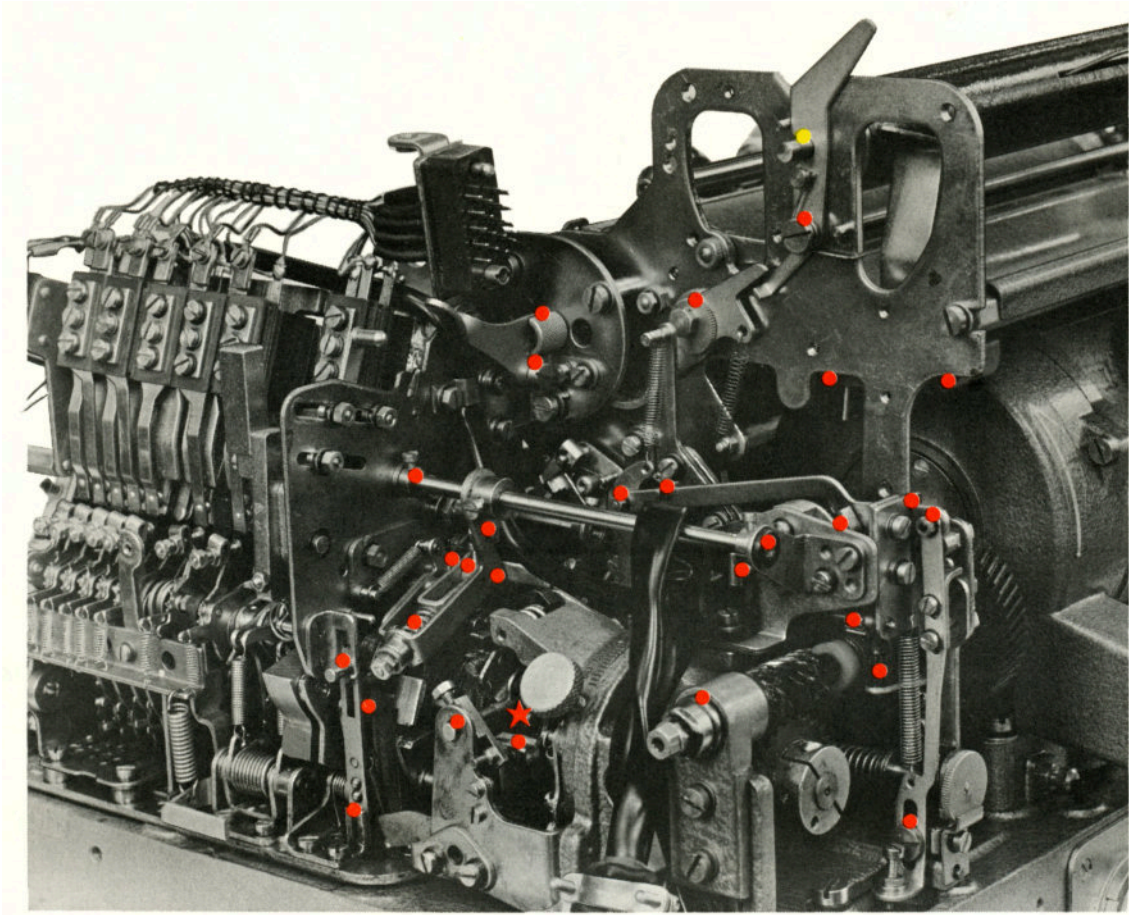


Fig. 3.5

★ Fill the oil hole (located under the yellow spring clip) and lubricate the felt surrounding the selector cam sleeve.

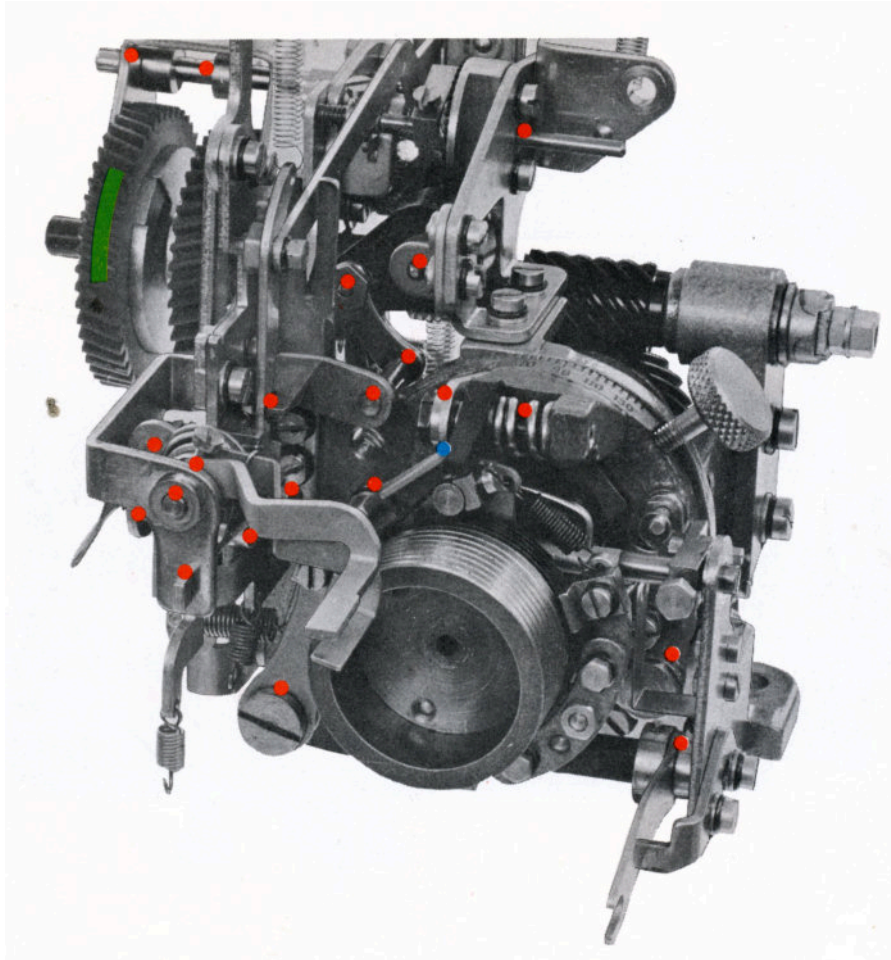


Fig. 3.6

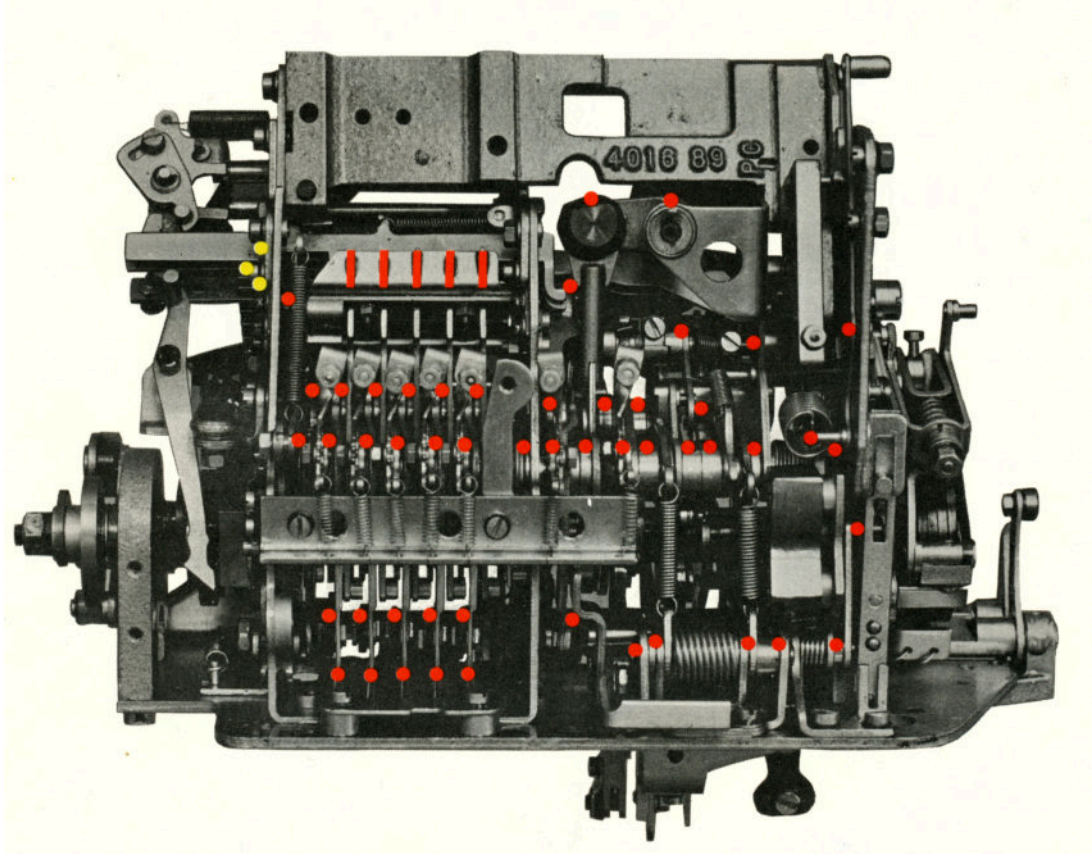


Fig. 3.7

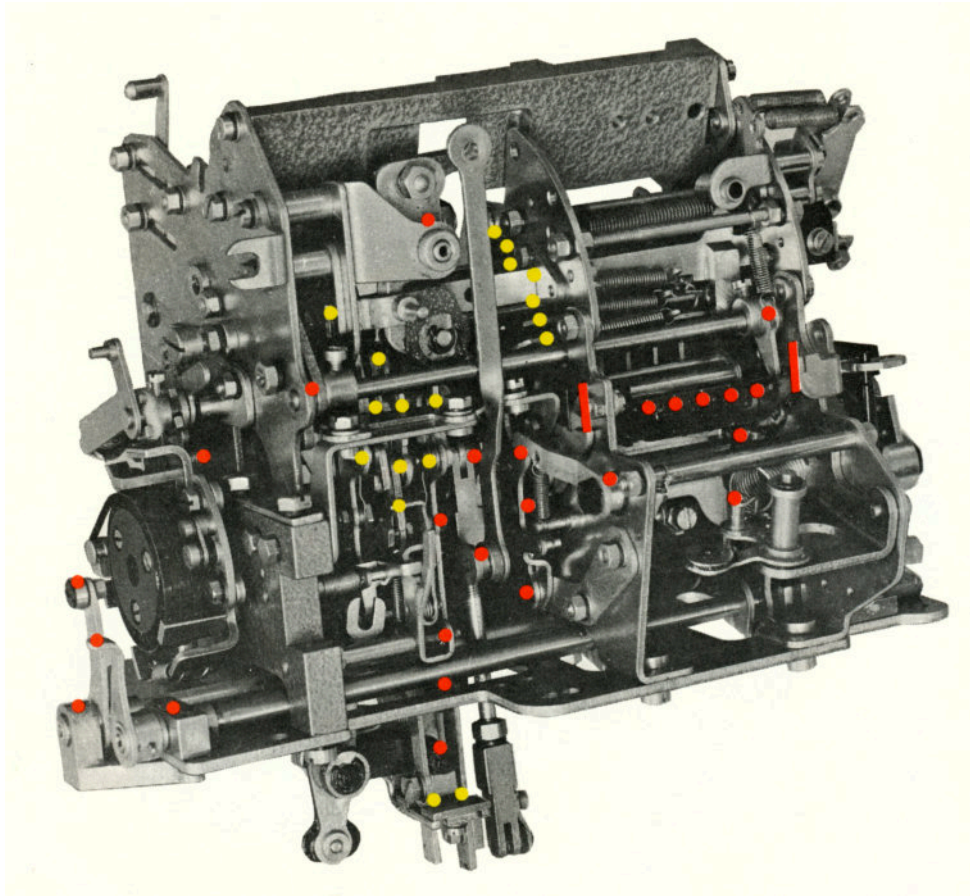


Fig. 3.8

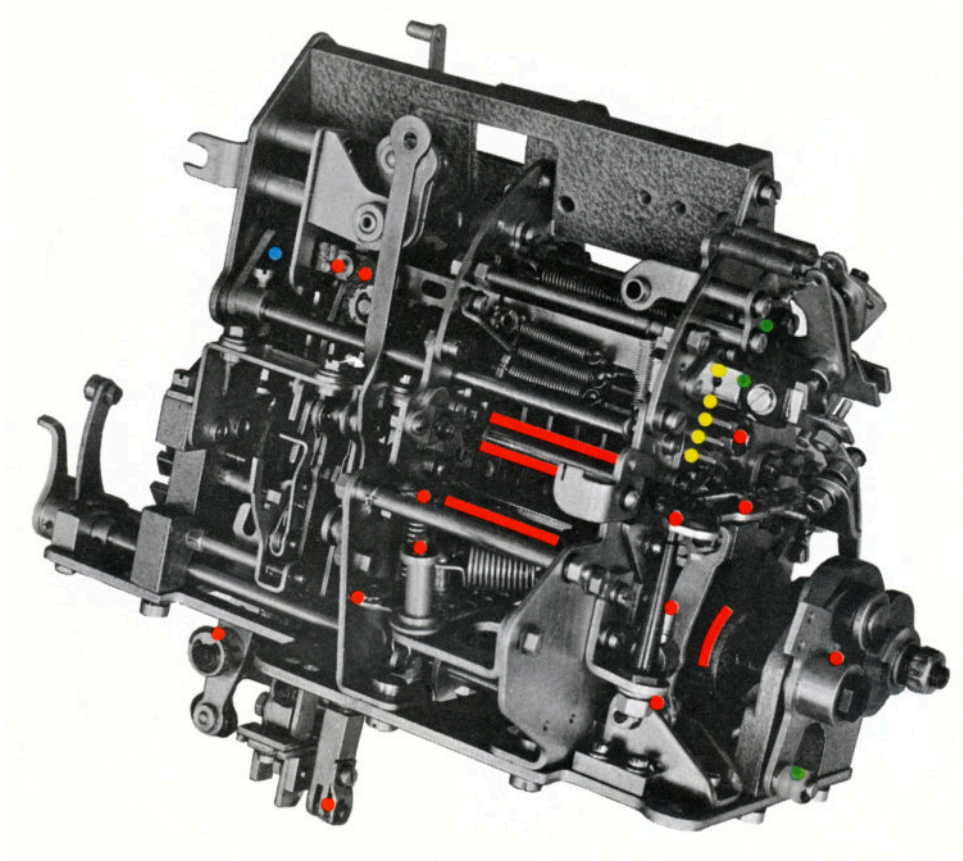


Fig. 3.9

LUBRICATION INSTRUCTIONS

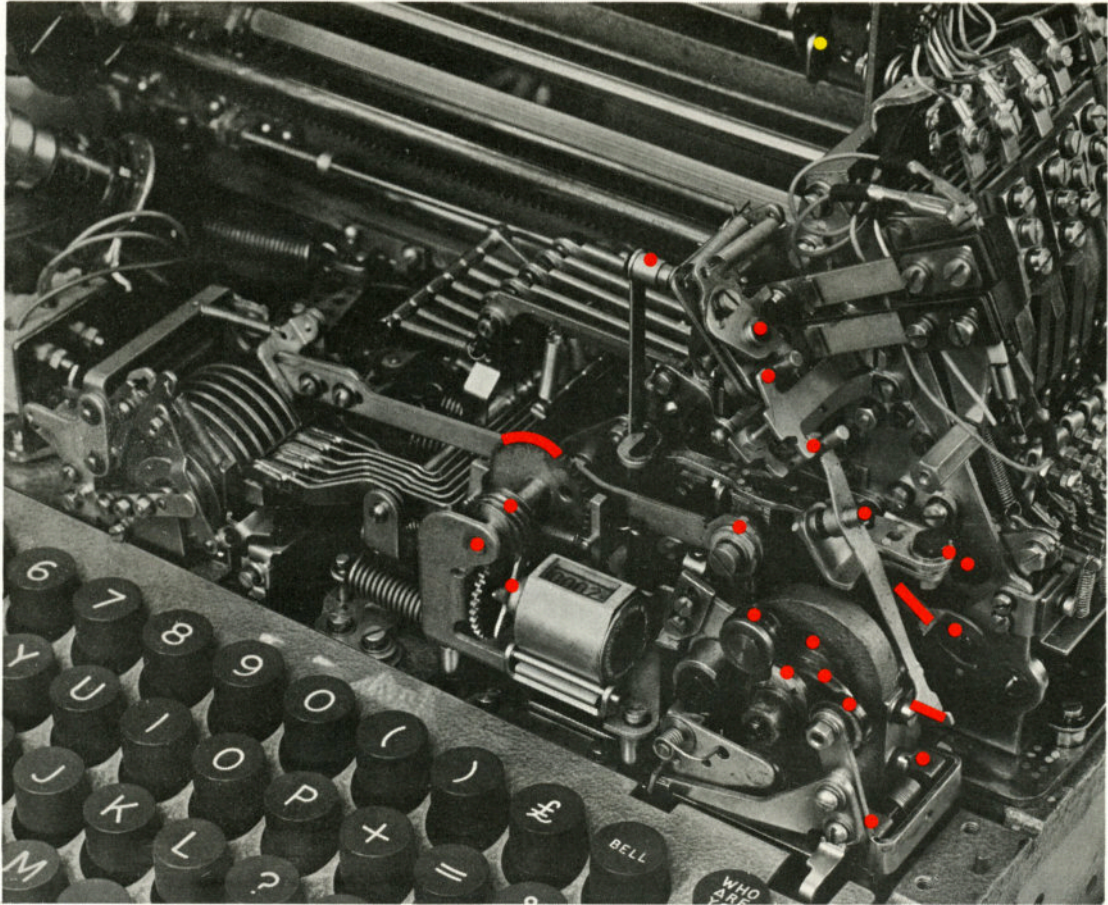


Fig. 3.10

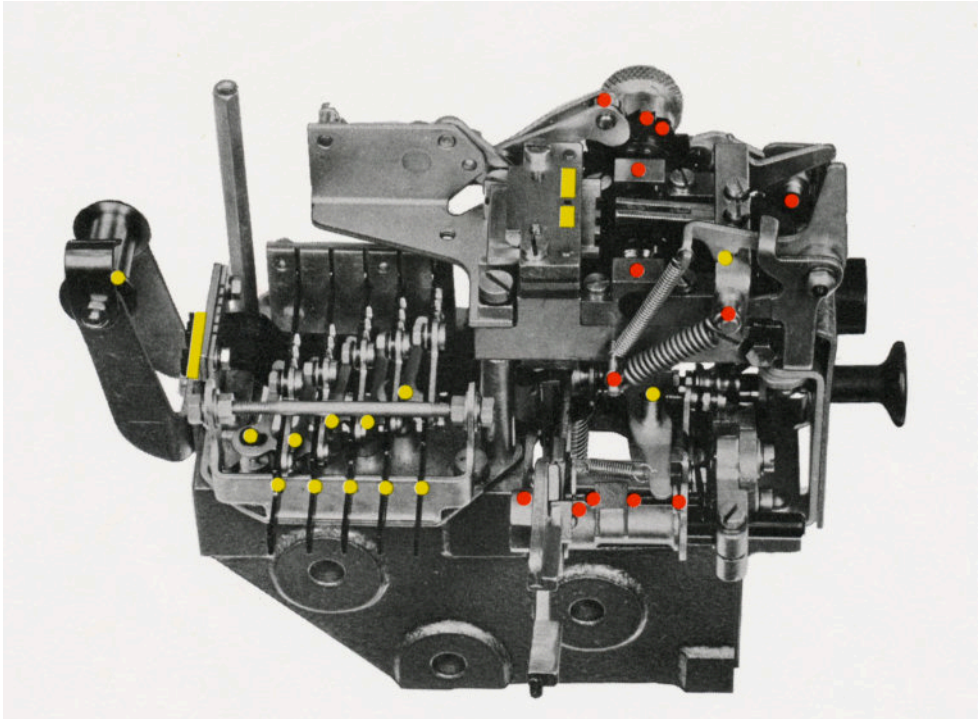


Fig. 3.11

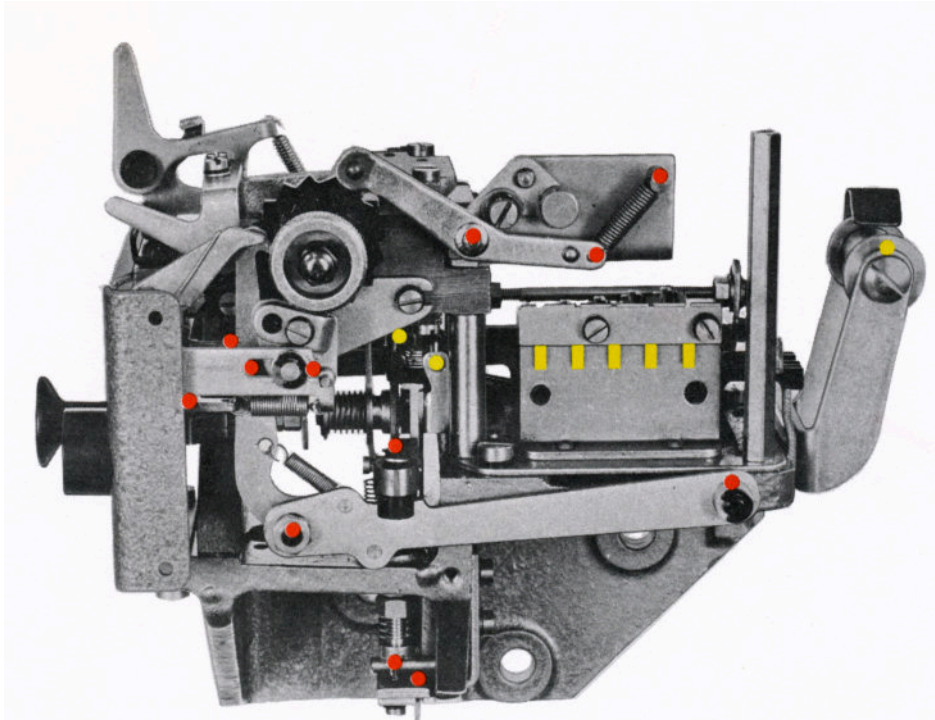


Fig. 3.12

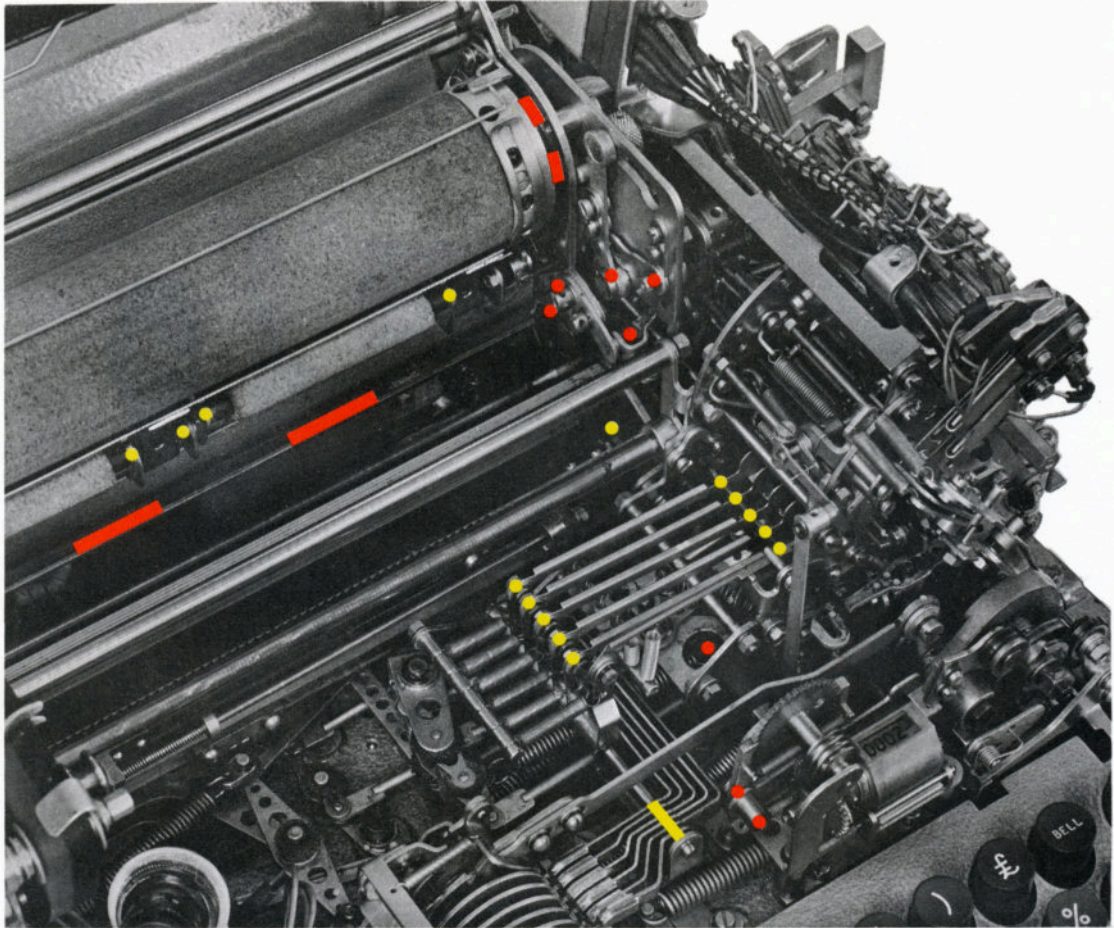


Fig. 3.13

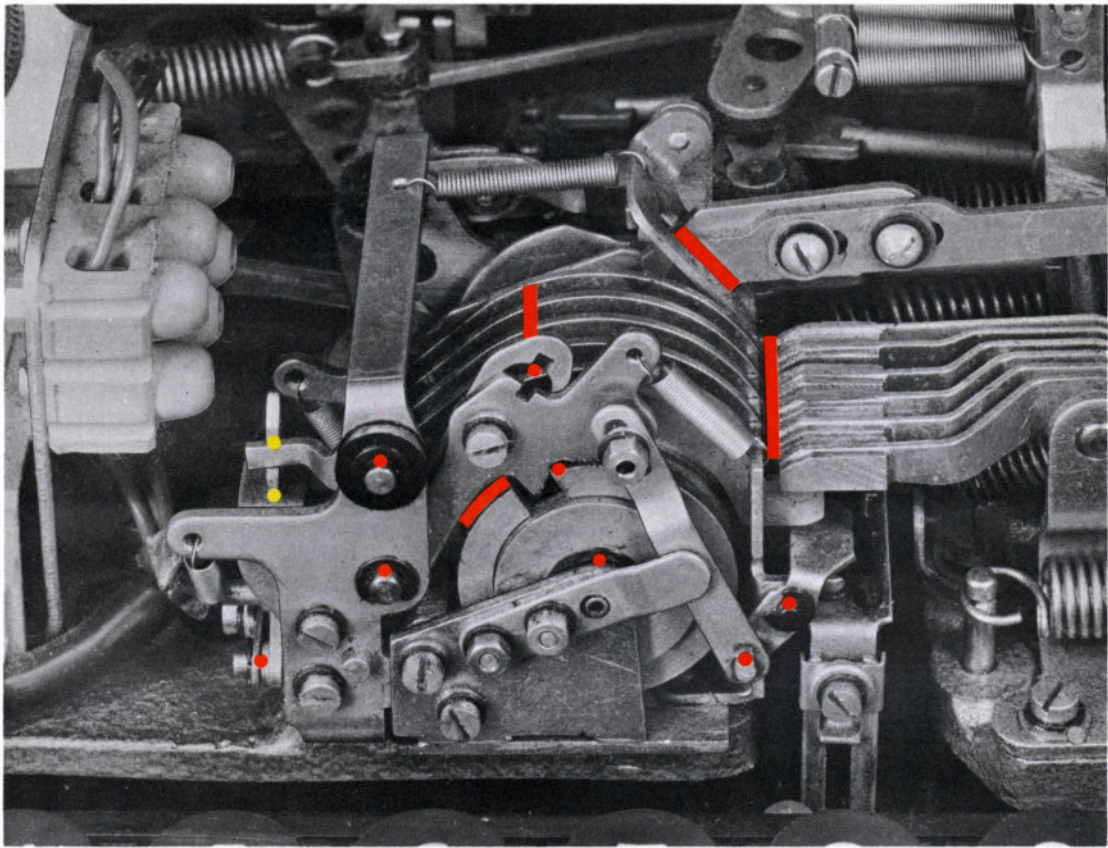


Fig. 3.14

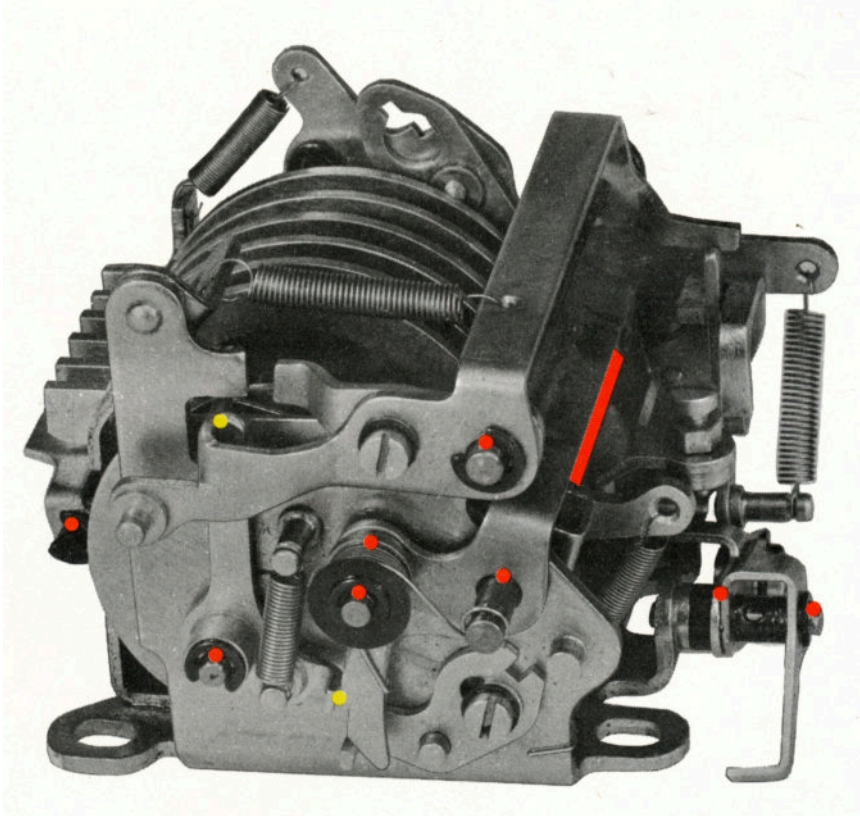


Fig. 3.15

LUBRICATION INSTRUCTIONS

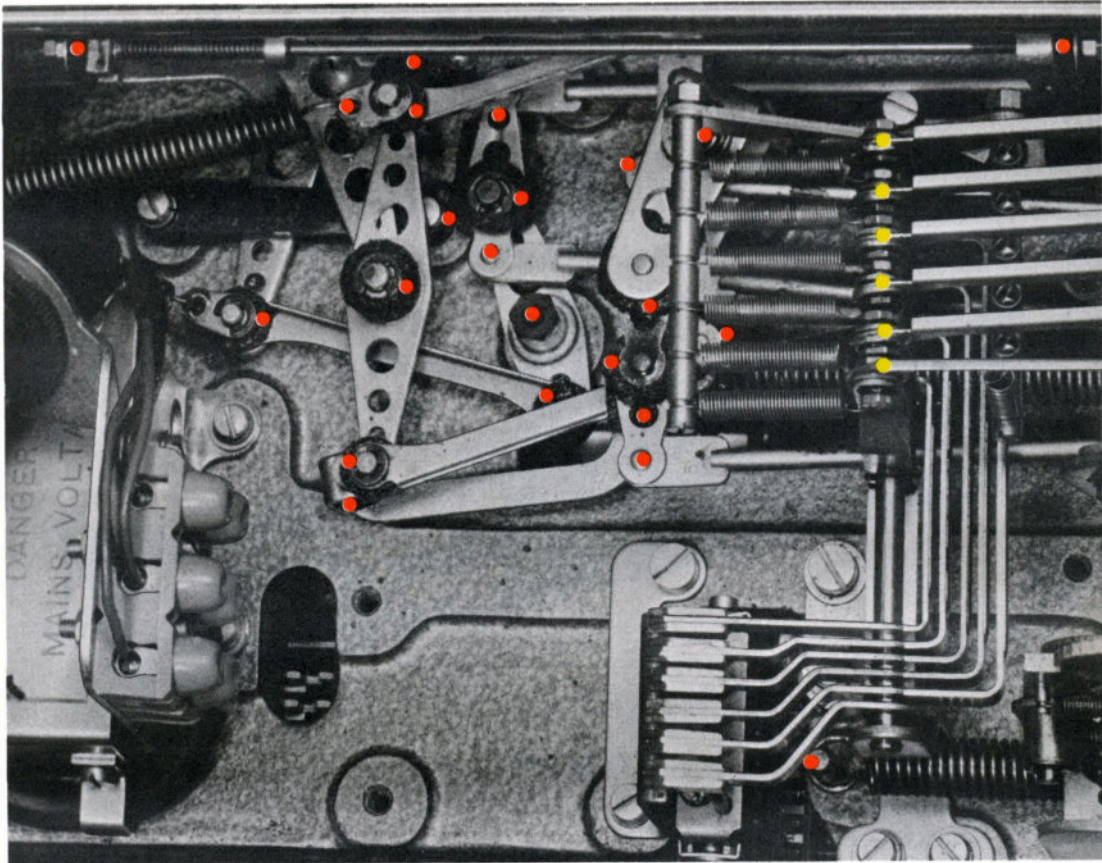


Fig. 3.16

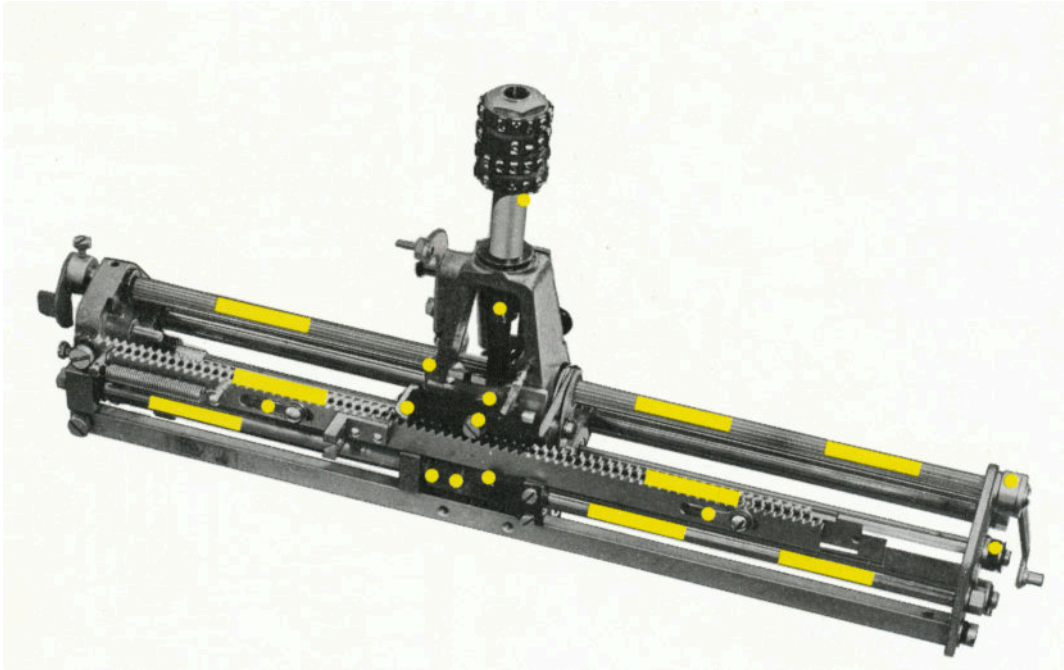


Fig. 3.17

LUBRICATION INSTRUCTIONS

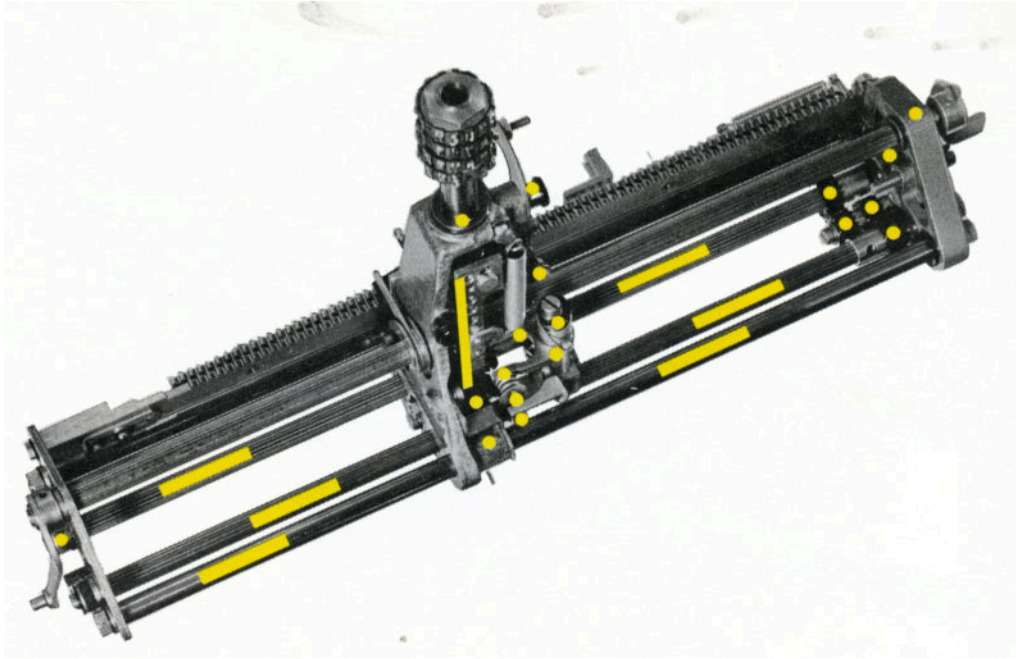


Fig. 3.18

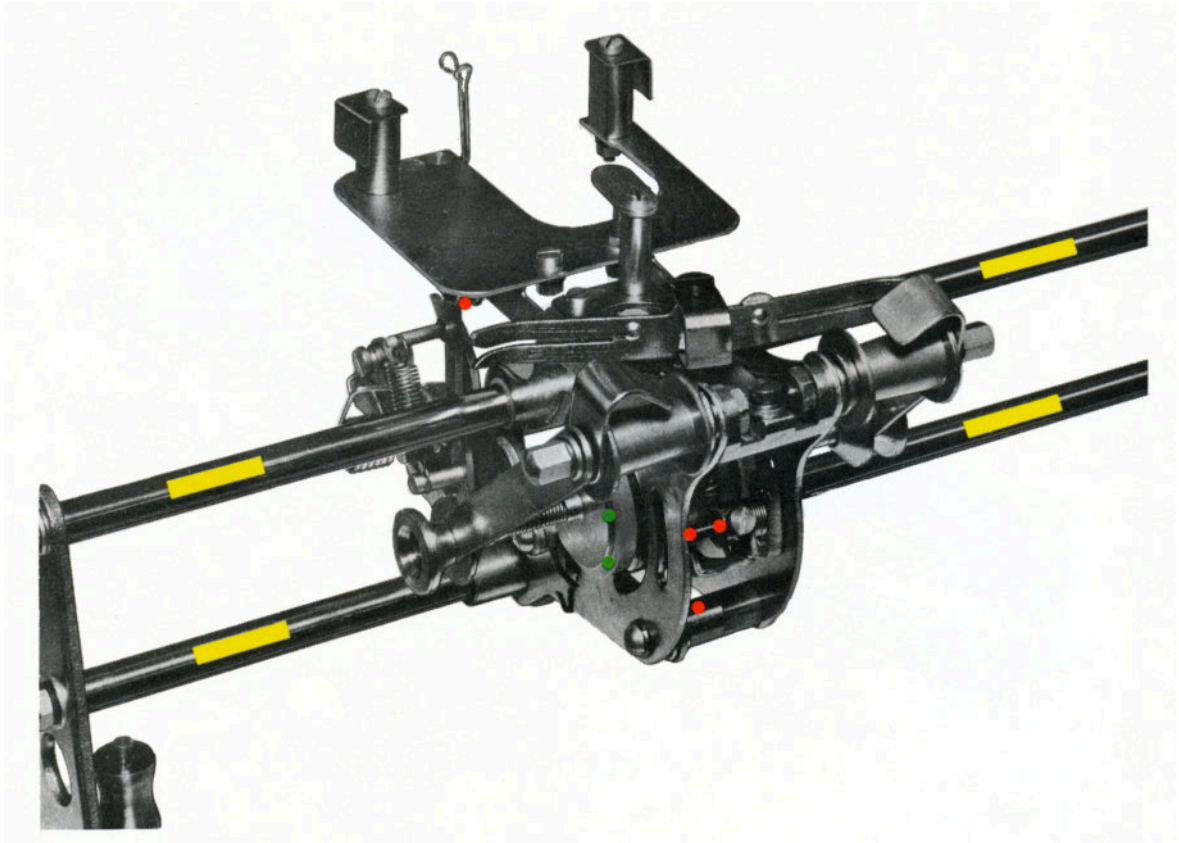


Fig. 3.19



Fig. 3.20

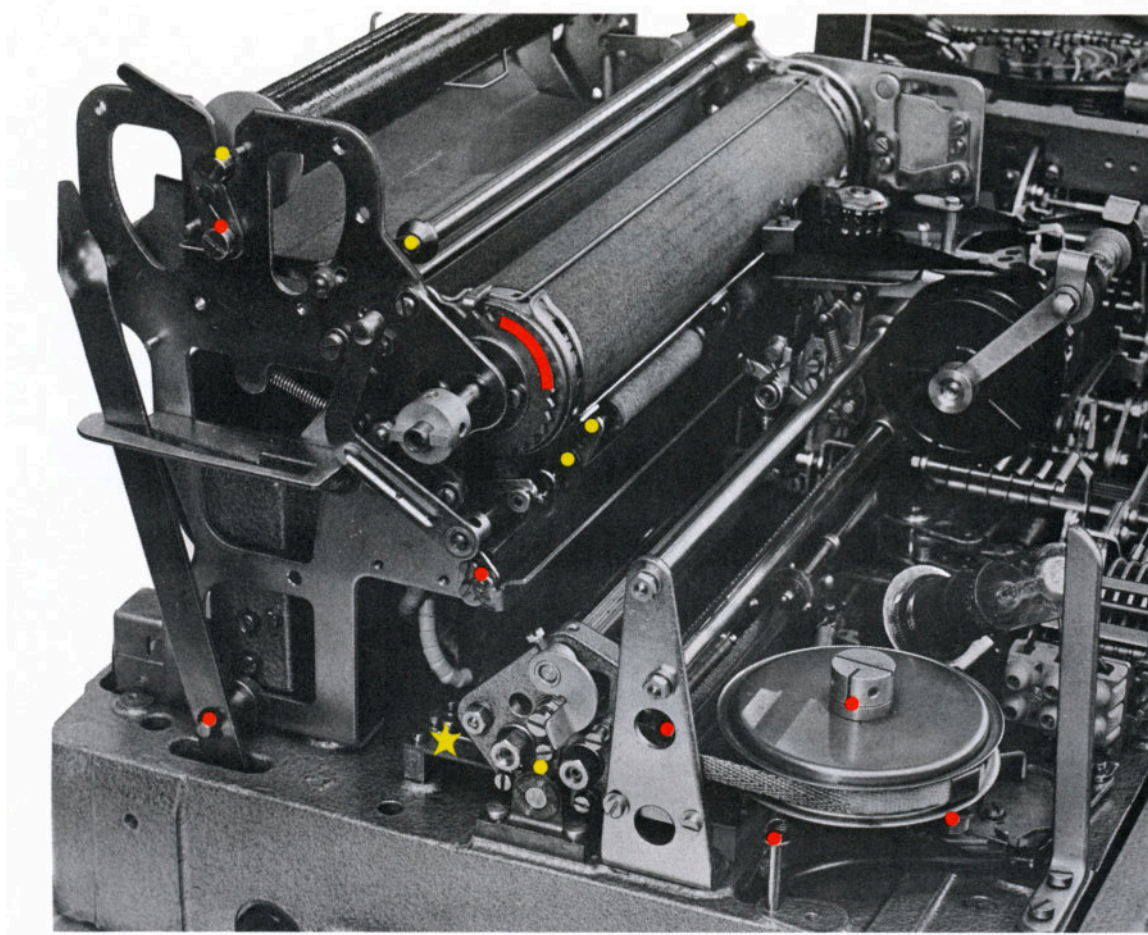


Fig. 3.21

★ Lubricate the teeth on the typehead lift rack.

LUBRICATION INSTRUCTIONS

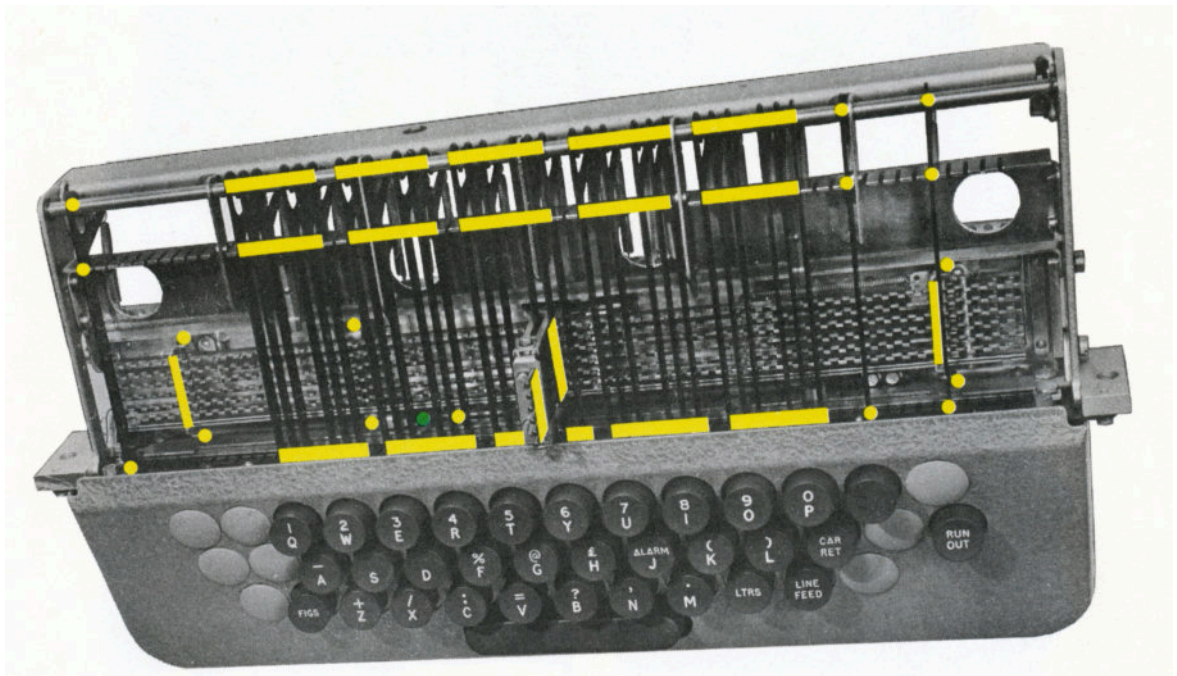


Fig. 3.22

LUBRICATION INSTRUCTIONS

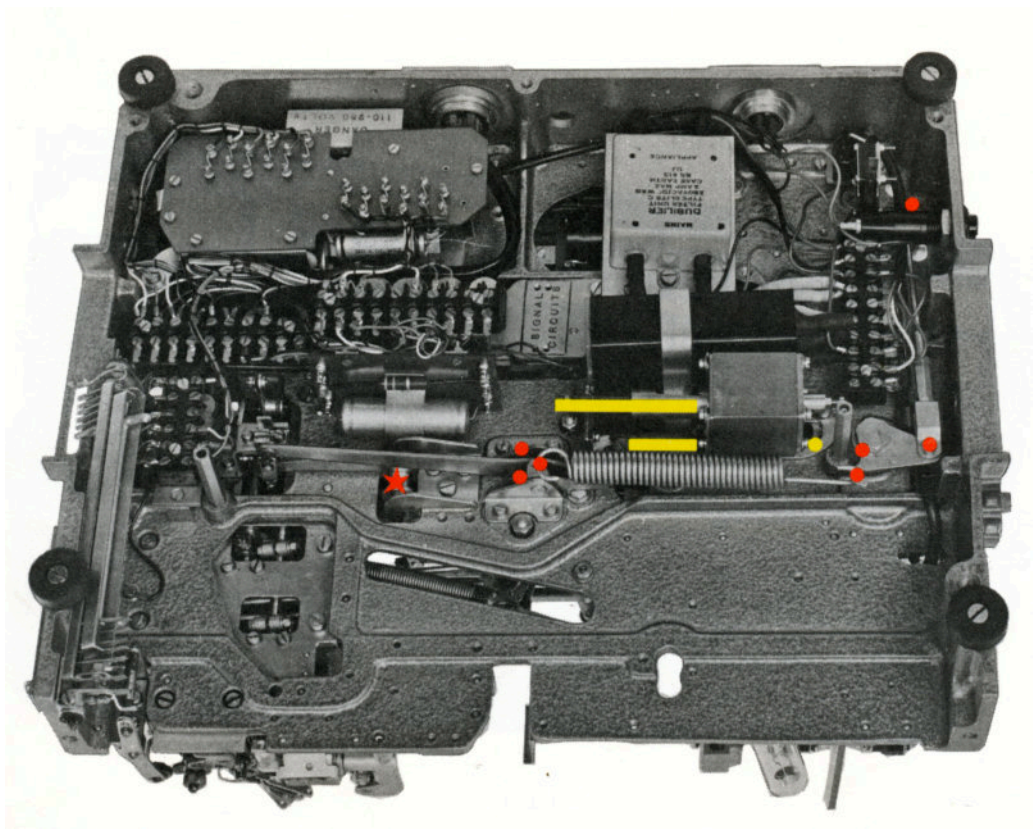


Fig. 3.23

★ Fill the oil hole in the top of the letter feed pivot.