CONTENTS

LIST OF ILLUSTRATIONS

INTERIOR OF MODEL 444 TELEPRINTER

DISMANTLING/ASSEMBLING INSTRUCTIONS

1. GENERAL

The dismantling and assembling instructions are divided into four sections of consecutive procedures:

Section A – Dismantling the Machine,
Section B – Dismantling the Units,
Section C – Assembling the Units,
Section D – Assembling the Machine.

When removing and refitting units for a major overhaul, a convenient order of removal and refitment is that followed in Sections A and D. When removing and refitting a unit for repair or replacement, any adjoining units to be removed beforehand and refitted subsequently are those shown in the table overleaf. It is assumed that the machine cover and base tray are removed beforehand, though it may be sufficient after removing the cover to release the machine from the base tray and to elevate the machine by returning its lock plates to the locking position and balancing the plates on top of the base tray guide dowels.

An assembled unit requires unit adjustments before the unit is refitted to the machine, and the assembled machine requires machine adjustments before the motor is energised. The units must be mounted in contact with their abutments on the machine. Machine adjustments that must be carried out during assembly of the units to the machine are mentioned in the text.

To avoid loss or misfitting of screws, washers, shims and springs, refit screws and washers to their locations immediately after the unit or part is removed, note the number and exact location of shims removed, and hook and twist the springs into a strip of paper with a reference written alongside. Note that the instructions make no mention of washers.

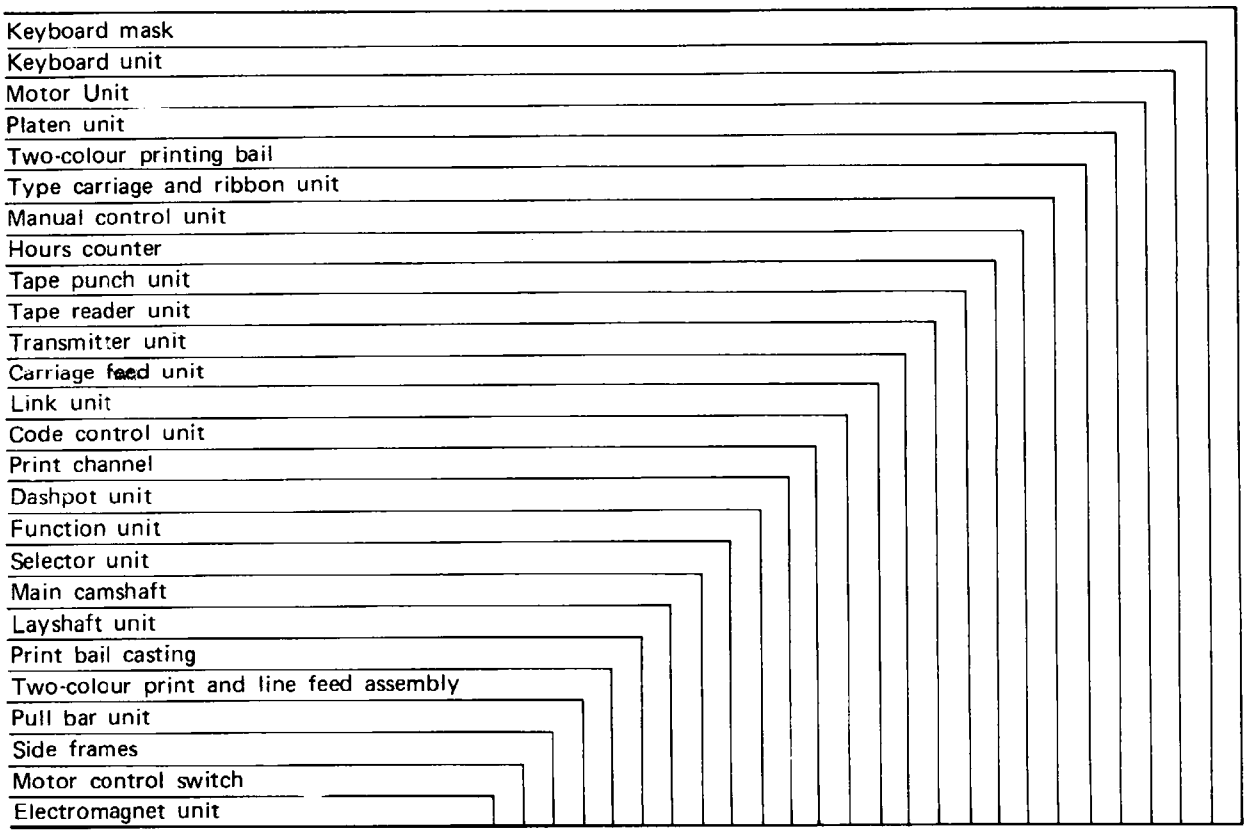
The terms 'left', 'right', 'front' and 'rear' refer to the unit sides as they appear on the assembled machine from the normal operating position. This position is indicated in the illustrations by an arrow, which is black for a downward view and white for an upward view.

The term 'rest condition' refers to a camshaft with the clutch coupling disengaged. This condition is obtained by holding down the clutch detent lever and turning the camshaft against the lever until the cams cease to turn. To set the machine to the rest condition, set the electromagnet armature toward the front to allow the trip lever to drop, set the armature toward the rear, engage box spanner TA 1559 with the right-hand end of the main camshaft, and turn the box spanner counter-clockwise until the cams cease to turn.

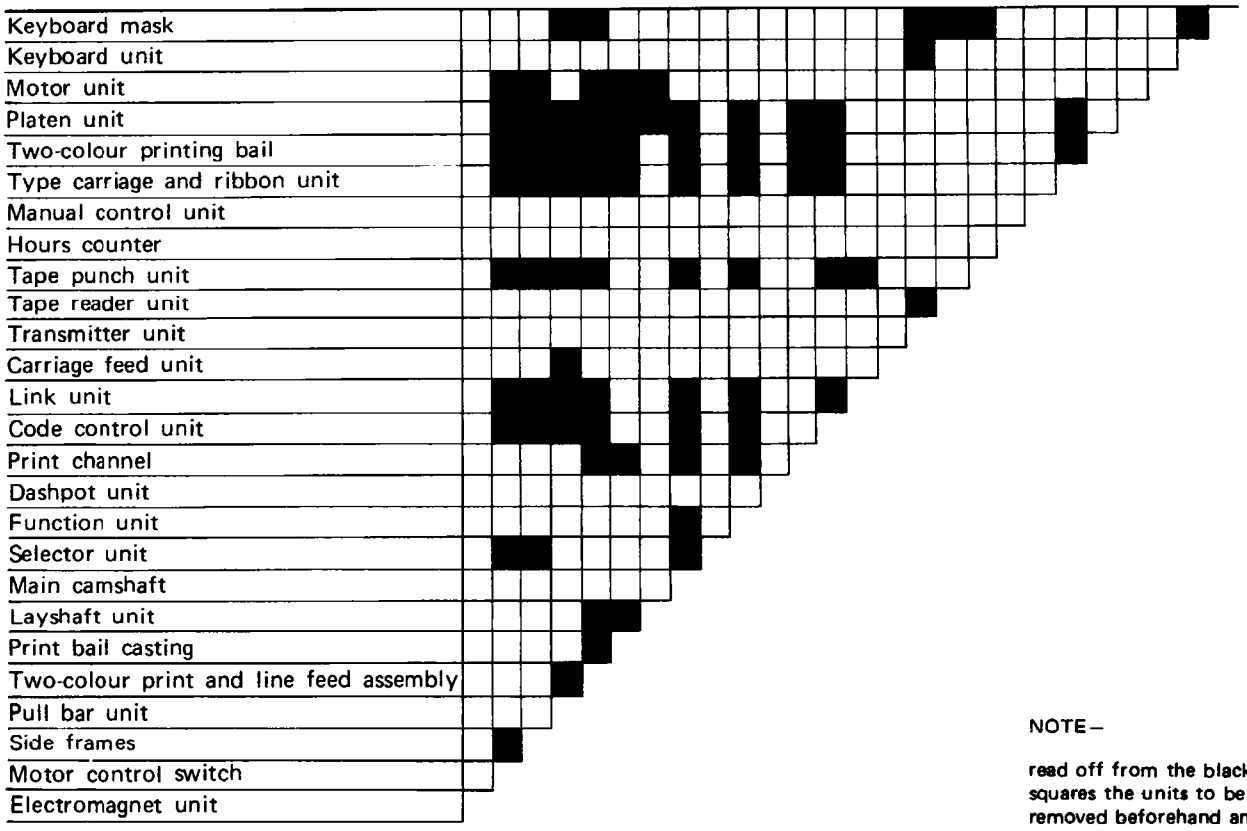
2. CAUTION

Before dismantling the machine, switch off the signal and power supplies and remove the signal and power plugs from the external sockets.

UNIT REQUIRED TO BE REMOVED
AND REFITTED



UNIT TO BE REMOVED BEFOREHAND
AND REFITTED SUBSEQUENTLY



NOTE–

read off from the black squares the units to be removed beforehand and refitted subsequently.

SECTION A – DISMANTLING THE MACHINE

1. MACHINE COVER Fig. 5.1, 5.3

1.1 If the machine is fitted with a tape punch, remove the cuttings box.

1.2 Raise the hinged lid and pull off the platen knob.

1.3 Free the cover from the base tray, by undoing a quarter-turn the Oddie stud on each side of the cover, and lift the cover away.

2. BASE TRAY Fig. 5.2, 5.3, 5.4

2.1 Free the machine from the base tray on each side in turn, by pressing down the side frame against a compression spring and sliding the lock plate out of engagement with the guide dowel.

2.2 Free the signal and mains sockets of the securing clips, and withdraw the sockets from the machine plug box.

2.3 Grip the machine by the handle on each side frame, and lift the machine out of the base tray from behind.

3. KEYBOARD MASK Fig. 5.4, 5.5

3.1 Depress the FIGURES bar to free the rear row of keys.

3.2 Remove the two securing screws at the rear of the mask.

3.3 Disconnect the plug of the amber indicator lamp from the socket on the transmitter unit, partially depress some of the keys in the rear row to free the mask of the keys, and lift the mask complete with lamp from the machine.

4. KEYBOARD UNIT Fig. 5.4, 5.6

4.1 Turn the machine over onto the motor unit.

4.2 Hold the keyboard casting and remove the two securing screws at each end of the casting.

4.3 Disengage the ends of the code selector bars from the transmitter selection levers, and withdraw the keyboard unit from the machine base.

4.4 Turn the machine the right way up.

5. MOTOR UNIT Fig. 5.3, 5.5

5.1 Remove the screw securing the gear guard to the rear of the layshaft unit, and remove the guard.

5.2 Ensure that the unit abutment screw is set against the post on the machine base casting.

5.3 Undo the captive securing screw on each side of the motor unit base, and withdraw the unit from the machine main base.

6. PLATEN UNIT Fig. 5.4

6.1 Free the bottom end of the line-feed link from the lever pin at the rear of the two-colour and line-feed assembly, by rotating the spring clip, and slide the link off the pin.

6.2 Remove the securing screw at each end of the platen unit.

6.3 Position the type carriage and ribbon unit about five line feeds along the platen from the left-hand end, and lift off the platen unit.

7. TWO–COLOUR PRINTING BAIL Fig. 5.4, 5.7, 5.9

7.1 Free the top end of the bail connecting arm from the bail lever by rotating the spring clip, and slide the arm pin out of the lever.

7.2 Hold the bail and slacken the special screw pivoting the bail shaft to the left-hand side frame.

7.3 Withdraw the bail shaft from the special screw in the right-hand side frame, and remove the bail from the machine.

8. TYPE CARRIAGE AND RIBBON UNIT Fig. 5.4, 5.8, 5.10, 5.14

8.1 Depress the MANual CARriage RETurn key, and unhook the carriage-return spring from the anchor plate on the carriage.

8.2 Slide the carriage away from the left-hand side frame, and unhook the carriage-return spring from the anchor pin on the side frame.

8.3 Depress the MANual CARriage RETurn key again, to disengage the carriage feed pawls, and set the link unit to the all-mark (latched) condition.

8.4 Ensuring that the locknuts remain locked, remove the carriage over-travel stop screw from the right-hand side frame.

8.5 Remove the two securing screws at the ends of the type carriage support bar.

8.6 Slide the carriage to the extreme right of the code slats and carefully disengage the five carriage bellcranks from the slats.

8.7 Support the carriage and withdraw the bar from the right-hand end.

8.8 Whilst supporting the carriage, withdraw the carriage to disengage the rear roller, the type bail roller and the shift skid and bracket.

9. MANUAL CONTROL UNIT Fig. 5.9

9.1 Remove the two screws securing the manual control unit to the main base, and lift off the unit.

10. HOURS COUNTER Fig. 5.4

10.1 Remove the two screws securing the hours counter to the main base, and lift off the unit.

11. TAPE PUNCH UNIT Fig. 5.4, 5.9

11.1 Remove the three screws securing the tape reel holder to the left-hand side frame, and withdraw the holder.

11.2 Set the machine to the rest condition, re-engage the main clutch, and turn the main camshaft counter-clockwise by the box spanner through 90 degrees to raise the punch drive arm to its maximum height.

11.3 Disengage the code reading bars and punch suppression bars by pulling out and turning the white hexagonal knob until the double-striped flat is uppermost, then push in the knob.

11.4 Remove the two screws securing the handle to the left-hand side of the main base, remove the rear screw securing the tape punch, and undo the two captive screws securing the tape punch.

11.5 Pull out the punch unit sufficiently to disengage the plug and drive arm, then withdraw the unit from the link unit.

11.6 Remove the three screws securing the drive arm assembly, turn the main camshaft slightly to free the assembly, and then withdraw the assembly.

12. TAPE READER UNIT Fig. 5.4

12.1 Set the machine to the rest condition.

12.2 Remove the three screws securing the tape reader unit to the top of the main base.

12.3 Lift the unit sufficiently to disengage the plug, the send/receive link, the transmitter delay trip lever and the keyboard inhibit lever.

12.4 Slightly turn the unit clockwise in a horizontal plane, remove the drive belt from the transmitter pulley, and withdraw the unit.

13. TRANSMITTER UNIT Fig. 5.4

13.1 Remove the three screws securing the transmitter unit to the main base.

13.2 Lift the unit off the main base to disengage the transmitter plug, and withdraw the unit.

14. CARRIAGE FEED UNIT Fig. 5.4

14.1 Remove the two screws securing the carriage feed unit.

14.2 Free the gear, by engaging the main clutch and turning the main camshaft counter-clockwise by the box spanner until the print bail is in the rearmost position.

14.3 Withdraw the unit to disengage the gear from the main camshaft, then lift the unit off the machine.

15. LINK UNIT Fig. 5.10, 5.11

15.1 At the selector unit, hold the end of the torsion spring out of engagement with the knurled head of the drive pin, and withdraw the pin.

15.2 Allow the transfer levers to fall away from the storage latches, and re-insert the drive pin.

15.3 Latch the transfer bars on the link unit by pressing them in until the latches engage.

15.4 Remove the securing screw at the top of the link unit.

15.5 Move the unit so that the end of its shift bar falls off the rear end of the shift bar bellcrank peg of the code control unit.

15.6 Move and withdraw the link unit so that the ends of its transfer bars pass under the combination bar bellcranks of the code control unit.

16. CODE CONTROL UNIT Fig. 5.3, 5.12, 5.13

16.1 Release the end of the function unit torsion spring from the anchor pin on the power bail, and lower the bail taking care not to lose the felt lubricating washer.

16.2 Remove the two screws securing the code control unit to the side frames.

16.3 Withdraw the unit enough to disengage the plug from the socket, lower the unit to clear the control levers of the function unit, and lift the code control unit clear of the machine.

17. PRINT CHANNEL Fig. 5.13, 5,14

17.1 Remove the print bail spring from its anchors.

17.2 Remove the two screws securing the print channel to the print bail casting, and withdraw the channel.

18. DASHPOT UNIT Fig. 5.11

18.1 Remove the screw securing the dashpot lever, and remove the lever.

18.2 Remove the three screws and plastic clamps securing the dashpot unit, and withdraw the unit.

19. FUNCTION UNIT Fig. 5.13

19.1 Remove the four screws securing the function unit.

19.2 Lift the unit from the location pins, move the unit to withdraw the function bars from under the camshaft, and remove the unit.

20. SELECTOR UNIT Fig. 5.11, 5.14, 5.44

20.1 Disconnect the plug from the electromagnet socket.

20.2 Remove the three screws securing the selector unit front-plate to pillars, and withdraw the front-plate.

20.3 Secure the reading lever away from the cam by engaging the wire link, normally suspended from the top rear pillar, with the opening at the top of the lever.

20.4 Loosen the screw securing the sequential lever rack to the unit back-plate, and slide the rack toward the front of the machine to clear the levers from the selector cams.

20.5 Depress the driving link out of engagement with the cam lever on the inside of the side frame.

20.6 Remove the three screws securing the unit back-plate to the side frame.

20.7 Remove the two special screws securing the selector unit to the main cam housing, complete with a felt lubricating strip.

20.8 Hold the main camshaft trip latch lever out of engagement by pressing the lever to the front of the machine, and withdraw the selector unit complete with electromagnet unit from the camshaft.

21. MAIN CAMSHAFT Fig. 5.14

21.1 Remove the clutch detent spring from its anchors.

21.2 Remove the screw securing the detent assembly to the left-hand side frame, lift off the detent rack and withdraw the pivot arm from the side, removing the felt lubricating washers and detent as they are freed.

21.3 Remove the screw securing the plastic gear

wheel to the right-hand end of the main camshaft, and withdraw the gear wheel.

21.4 Loosen the two screws securing the clamp over the right-hand roller bearing.

21.5 Remove the spring from the camshaft retention lever under the camshaft, and allow the lever to drop clear of the cam.

21.6 Remove the spring from the storage latch reset lever.

21.7 Free the code-read cam lever by sliding the camshaft to the right and rotating the camshaft, and swing the lever clear of the camshaft.

21.8 Slide the camshaft through the left-hand side frame.

22. LAYSHAFT UNIT Fig. 5.14

22.1 Ensure that the abutment screw on the right-hand side of the layshaft unit is set against the post.

22.2 Remove the three screws securing the unit, and lift the unit off the main base.

23. PRINT BAIL CASTING Fig. 5.14

23.1 Remove the circlip from the left-hand pivot bracket.

23.2 Slide the print bail casting to the right to disengage the pivots, and remove the casting.

24. TWO-COLOUR PRINT AND LINE FEED ASSEMBLY Fig. 5.14

24.1 Remove the three screws securing the assembly by its bearing brackets.

24.2 Lift off the assembly.

25. PULL BAR UNIT Fig. 5.14

25.1 Remove the two screws securing the pull bar unit.

25.2 Lift the unit off the main base.

26. SIDE FRAMES Fig. 5.3, 5.14

26.1 Remove the two nuts securing the tie rod to the top of the side frames.

26.2 Remove the two circlips from the rod.

26.3 Slide the rod out of the frames.

26.4 Remove the two screws securing the left-hand side frame to the main base, and lift off the frame.

26.5 Remove the two screws securing the right-hand side frame to the main base, and remove the frame complete with the right-hand machine handle.

27. MOTOR CONTROL SWITCH Fig. 5.14

27.1 Remove the two screws securing the motor control switch to the left-hand side frame.

27.2 Remove the switch.

28. ELECTROMAGNET UNIT Fig. 5.11

28.1 If the selector unit is not removed from the machine, disconnect the plug from the electromagnet unit socket.

28.2 Remove the two nuts securing the unit by the adjustment bracket to the selector unit back-plate, and withdraw the electromagnet unit.

SECTION B – DISMANTLING THE UNITS

1. SYNCHRONOUS MOTOR UNIT Fig. 5.15

1.1 Undo the captive screw securing the cover of the motor unit, and lift off the cover.

1.2 Remove the two screws securing the motor strap at each end of the motor, and remove the straps.

1.3 Remove the remaining screw securing the earth connector to the right-hand side of the unit, and remove the connector.

1.4 Remove the four screws securing the base plate to the bottom of the unit, and remove the plate.

1.5 Remove the four screws and nuts securing the two plugs to the plug mounting plate, and withdraw the plugs from behind.

1.6 Remove the half-nut from the pushbutton microswitch on the front of the base, and withdraw the microswitch from behind.

1.7 Remove the three screws securing the components panel assembly to the base.

1.8 Lift out the motor and the components panel assembly, complete with the plugs, microswitch and interconnecting leads.

1.9 Remove the spire nut securing the motor fan, and slide the fan off the motor shaft.

1.10 Remove the screw securing the motor pinion, and slide the pinion off the shaft.

1.11 Remove a rubber mounting collar from each end of the motor.

1.12 Remove the three screws securing the plug mounting plate, and withdraw the plate from the unit dowel and the socket-plate dowel.

2. SYNCHRONOUS MOTOR Fig. 5.16

2.1 Remove the two screws securing each switch final assembly to the switch-end motor cover, and withdraw both switches from the cover.

2.2 Remove the three screws securing the bearing cap to the switch-end motor cover and bearing clamp plate, and withdraw the cap.

2.3 Remove the two nuts securing the drive-end casting to the stator assembly and switch-end motor cover, and withdraw the casting complete with rotor from the assembly. If necessary, tap the left-hand end of the rotor shaft with a mallet to free the ball bearing from the motor cover.

2.4 Withdraw the switch-end motor cover complete with two tie bars from the stator.

2.5 Remove the three screws securing the bearing cap to the drive-end casting and bearing clamp plate, and withdraw the cap and the pre-load waved washer.

2.6 Tap the right-hand end of the rotor shaft with a mallet to free the ball bearing from the casting, and remove the rotor complete with ball bearing from the casting.

2.7 Extract the ball bearing from each end of the shaft, by means of bearing extractor type TA1492, and withdraw the two bearing clamp plates.

2.8 Remove the screw securing the switch mechanism and withdraw the mechanism from the shaft.

3. GOVERNED MOTOR UNIT Fig. 5.17

3.1 Undo the captive screw securing the cover of the motor unit, and lift off the cover.

3.2 Remove the two screws securing the motor strap at each end of the motor, and remove the straps.

3.3 Remove the remaining screw securing the earth connector to the right-hand side of the unit, and remove the connector.

3.4 Remove the four screws securing the base plate to the bottom of the unit, and remove the plate.

3.5 Remove the four screws and nuts securing the two plugs to the plug mounting plate, and withdraw the plugs from behind.

3.6 Remove the half-nut from the pushbutton microswitch on the front of the base, and withdraw the microswitch from behind.

3.7 Remove the two screws securing the components panel cover, and lift off the cover.

3.8 Remove the three screws securing the components panel assembly to the base.

3.9 Lift out the motor and the components panel assembly, complete with the plugs, microswitch and interconnecting leads.

3.10 Remove the screw securing the governor assembly, and slide the governor off the shaft.

3.11 Remove the screw securing the motor pinion and the screw securing the strobe disc, and slide the pinion and disc off the shaft.

3.12 Remove a rubber mounting collar from each end of the motor.

3.13 Remove the three screws securing the plug mounting plate, and withdraw the plate from the unit dowel and the socket-plate dowel.

4. GOVERNED MOTOR Fig. 5.18

4.1 Remove the knurled screw securing the brush and slip-ring cover, and lift off the cover.

4.2 Remove the two screws and spacers securing each bracket of the governor brush mounting plate to the left-hand motor casting, and lift off the governor brush assembly.

4.3 Remove the end of the brush spring from the top of each motor brush, loosen the screw securing each brush lead, and remove each brush from its box.

4.4 Remove the two screws and nuts securing each brush box, disconnect the leads and remove the boxes from the brush mounting plate.

4.5 Remove the three screws securing the bearing cap to the left-hand motor casting and bearing clamp plate, and remove the cap.

4.6 Remove the two nuts securing the left-hand motor casting to the field magnet and right-hand motor casting.

4.7 Tap the left-hand end of the armature shaft with a mallet to free the left-hand casting from the shaft, and withdraw the casting.

4.8 Withdraw the two tie bars from the right-hand motor casting, and withdraw the field magnet from the armature assembly and motor casting.

4.9 Remove the three screws securing the bearing cap to the right-hand motor casting and bearing clamp plate.

4.10 Remove the circlip from the right-hand end of the shaft, by means of circlip pliers type TA1490.

4.11 Withdraw the bearing cap and pre-load waved washer from the shaft, and tap the shaft with a mallet to free it from the casting.

4.12 Extract the ball bearing from each end of the shaft, by means of bearing extractor type TA1492, and withdraw the two bearing clamp plates.

4.13 Note the angular position of the brush mounting plate in relation to the left-hand motor casting, remove the two nuts securing the plate to the casting, and remove the plate.

5. KEYBOARD UNIT Fig. 5.19, 5.20

5.1 Compare the keyboard layout with those in the figure, and note any differences from either one.

5.2 Remove the two screws securing the stop strip to the keybar rack at the front of the keyboard casting.

5.3 Starting with the left-most keybar in the back row and working row-by-row to the right-most keybar in the front row, unhook the rear of the keybar from the keybar pivot and withdraw the keybar without distorting it.

5.4 Remove the two screws securing the overtravel stop to the keybar rack at the front of the keyboard casting, and remove the stop.

5.5 Remove the remaining two screws securing the keybar rack, and remove the rack, the letters frame assembly, the space frame assembly and the figures frame assembly.

5.6 Unhook the two key levers on the left and the key lever on the right from the keyboard pivot, and withdraw the levers.

5.7 Remove the circlip from one end of the keybar pivot, and slide out the pivot.

5.8 Turn the keyboard unit upside down and –

(a) unhook the trip spring from the right-hand pressure plate,
(b) remove the two screws securing the toggle spring to the pressure plate and remove the spring,
(c) remove the remaining screw securing the pressure plate to the casting and remove the plate,
(d) remove the two screws securing the left-hand pressure plate, and remove the plate,
(e) lift off the trip selector bar and the six selector bars,

(f) return the unit to its upright position.

5.9 Remove the two screws and clamp plates securing the lever pivot rod at each side of the casting.

5.10 Lift off the code bar assembly complete with the lever pivot rods.

5.11 Turn the unit upside down, remove the two screws securing each of the seven keybar springs, and remove the keybar springs, the figures and space spring, the space frame spring and the letters spring.

5.12 If a motor control switch is fitted –

(a) remove the circlip at each end of the link rod, and withdraw the link rod from the latch trip lever and the lever rod,
(b) unlock and loosen the centre pivot screw on one side of the casting, and withdraw the lever rod.

5.13 Return the unit to the upright position, remove the five screws securing the keybar rack, and remove the rack.

5.14 Remove the two screws securing each pivot location plate, and remove the plates, the stop plate and the right-hand code bar rack.

5.15 Remove the two screws securing the left-hand code bar rack, and remove the rack.

6. PLATEN UNIT Fig. 5.21

6.1 Remove the two screws securing the paper jockey to the platen frame, and remove the jockey.

6.2 Remove the screw securing a paper guide to each end of the platen frame, and remove the guides.

6.3 Remove the pivot screw securing a guide arm at each end of the guide wires to the platen frame, and remove each torsion spring and the guide assembly.

6.4 Remove the two screws securing the tear-off plate to the platen frame, and lift off the plate.

6.5 Remove the screw securing the platen gear wheel to the left-hand end of the platen mainshaft, and slide off the gear wheel.

6.6 Unhook the tension spring from the pressure roller lever and the left-hand side of the platen frame, and remove the screw and nut securing the lever to the pressure roller shaft.

6.7 Remove the circlip holding the pressure roller key to the left-hand side of the platen frame, and withdraw the pressure roller lever complete with pressure roller key and link.

6.8 Remove the screw securing the platen pinion to the pressure-roller spindle, and slide the pinion off the spindle.

6.9 Move the pressure roller shaft to the right, away from the side of the platen frame, remove the three washers from the end of the shaft, and withdraw the shaft and pressure roller spindle from the paper guide.

6.10 Unhook the retaining lever spring from the lever and the right-hand side of the platen frame, remove the circlip holding the retaining lever to the side of the frame, and withdraw the retaining lever and spring.

6.11 Unhook the ratchet lever spring from the anchorage on the right-hand side of the platen frame, remove the screw securing the ratchet wheel to the right-hand end of the platen main-shaft, remove the two half-nuts and the collar from the end of the main-shaft, and withdraw the ratchet wheel, the ratchet lever assembly with spring, the shim and the masking lever from the end of the shaft.

6.12 Unhook the jockey lever spring from the anchorage on the right-hand side of the platen frame, remove the circlip holding the jockey lever to the side of the frame, and withdraw the lever complete with spring.

6.13 Remove the shouldered pin and screw securing the right-hand end of the platen frame tie, and the flanged pin and screw securing the left-hand end, and withdraw the tie.

6.14 Remove the screw securing the platen to the main-shaft at the right-hand end, withdraw the main-shaft from the left-hand end, and remove the platen from the frame.

7. SPROCKET–FEED PLATEN Fig. 5.22

7.1 At one end of the platen, turn the cam to retract the sprocket pins, and wrap adhesive tape around the plunger boss to hold the pins in place.

7.2 Remove the circlip holding the cam, and withdraw the cam whilst retaining the plunger boss in place.

7.3 Slowly unwrap the tape to catch each sprocket pin in turn, and drop out each uncovered spring.

7.4 Repeat steps 7.1 to 7.3 at the other end of the platen.

8. PAPER LOW ASSEMBLY Fig. 5.23

8.1 Unhook the latch lever spring from the spring anchor pin, remove the circlip holding the latch

lever on the pivot pin, and withdraw the latch lever.

8.2 Unhook the paper-low arm spring and the switch lever spring from the spring anchor pin, remove the circlip holding the arm and lever to the pivot pin, and withdraw the arm, lever and spacer.

8.3 Remove the two screws and clamp plate securing the microswitch to the plate, and remove the two spacers and the microswitch insulator.

8.4 Remove the screw and nut securing the plug to the plate, and remove the plug and microswitch from the plate.

9. TYPE CARRIAGE AND RIBBON UNIT

Fig. 5.24, 5.25

Ribbon Jumper Assembly

9.1 Remove the two screws securing the ribbon jumper pivot bracket at the rear of the unit.

9.2 Disconnect the jumper arm bail spring from the bail and the rear rack spring anchorage.

9.3 Remove the circlip from one end of the pivot pin at the rear of the ribbon jumper arm, withdraw the pin with two felt washers, and remove the pivot bracket.

9.4 Carefully lift the ribbon jumper off the guide on the typebar casting, slide the jumper arm bail out of the front and the rear rack, and remove the ribbon jumper arm, complete with jumper, stop arm and bail.

Code Seeker Bars

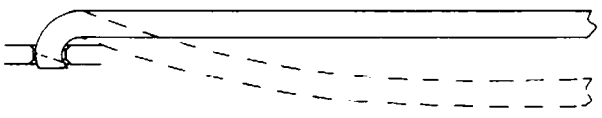
9.5 Remove the three screws and retaining clips securing the rear rack to the rear of the type carriage casting, and remove the rack.

9.6 Beginning at the right-hand side and working to the left-hand side –

(a) unhook the code seeker bar tension spring from the bar and from the spring anchor plate,

(b) withdraw the code seeker bar slightly from the front rack, and carefully unhook the type wire from the bar whilst bowing the wire inward as shown below,

(c) withdraw the code seeker bar from the front rack, and unhook the other end of the type wire from the typebar.



Typebars

9.7 Remove the two screws securing the typebar casting bearing bracket to the underside of the type carriage casting, and remove the bracket and felt washer.

9.8 Remove the two screws securing the typebar rest to the front of the unit, and remove the rest.

9.9 Remove the two screws securing the left-hand and the right-hand keep plate to the top of the typebar casting, remove the circlip from the top of each typebar casting guide pin, and lift off the plates.

9.10 Remove the nut securing each guide pin to the typebar casting, withdraw the pins from the holes, and remove the left-hand and right-hand type supports, bushes and felt washers.

9.11 Manoeuvre the typebar casting and jumper assembly clear of the type carriage casting, and remove the guide pins.

9.12 Note the order in which the typebars are secured to the typebar casting and jumper assembly.

9.13 Press down the left-hand end of the pivot wire to slide it to the right and to release each typebar in turn, and lift out each typebar and lay it to one side in the order of removal.

Code Selectors

9.14 Remove the screw securing each sector stop plate and top rack to the top rear of the type carriage casting, and remove the stop plates, spacers, shims and top rack.

9.15 Disconnect each of the five jockey lever springs, at the rear right-hand side, from the bellcrank and the spring anchor plate.

9.16 Note the order in which the code sectors are secured at the rear of the type carriage casting, by observing the shape of the left-hand end of each sector.

9.17 Withdraw the two print bail guide spindles from the rear of the type carriage casting, lift out each code sector and lay it to one side in the order of removal.

9.18 Remove the two screws securing the spring anchor plate, and remove the plate and the five jockey levers.

9.19 Remove the two screws securing the spring anchor plate and front rack to the type carriage casting, and lift off the plate and rack complete with two spacers.

9.20 Withdraw the type carriage shaft and remove the long felt washer.

9.21 Remove the screw securing the code sector rack to the bottom of the type carriage casting, and lift out the rack complete with the five code selector bellcranks.

9.22 Free the forked ends of the two ribbon feed levers from the top of the print bail casting by removing the pivot pins, and remove the casting.

Right-hand Ribbon Mechanism

9.23 Unhook the ribbon-feed link spring from the link and the ribbon feed lever.

9.24 Remove the pivot screw securing the ribbon feed lever to the bottom of the type carriage casting, remove the circlip holding the ribbon feed link to the ribbon feed lever, and remove the lever.

9.25 Remove the two screws securing the ribbon platform and the drive shaft bearing plate to the top of the type carriage casting, and remove the platform.

9.26 Unhook the tension lever spring from the lever and the anchor pin, remove the circlip holding the clutch band to the tension lever, and disconnect the clutch band from the lever.

9.27 Unhook the upper ribbon feed changeover lever spring from the lever and from the type carriage spring anchor plate, and unhook the lower changeover lever spring from the lever and the ribbon feed link.

9.28 Hold down the ratchet wheel and lift the ribbon feed drive shaft from the type carriage casting, complete with tension lever and ribbon feed changeover lever.

9.29 Lift the spacing washer and ratchet wheel off the bellcrank, remove the circlip holding the ribbon feed link to the bellcrank, remove the feed link, and lift off the bellcrank (complete with pawl and torsion spring) and spacing washer from the pivot pin.

Left-hand Ribbon Mechanism

9.30 Follow the procedure for the right-hand ribbon mechanism, given in steps 9.24 to 9.29 above, but omit step 9.27 as there is no changeover lever on the left-hand mechanism.

9.31 Remove the circlip holding the changeover ratchet to the stud on the type carriage casting, and remove the ratchet.

9.32 Unhook the ribbon changeover link spring from the link and from the anchorage on the type carriage casting, remove the circlip holding each end of the link to a stud, and lift off the link.

Type Carriage Feed

9.33 Remove the two screws securing each retaining plate to the front of the type carriage casting, and remove the plates complete with end-of-line indicator roller plate and right-hand stop lever.

9.34 Remove the two screws and one nut securing the feed rack to the front of the type carriage casting, and remove the rack.

9.35 Remove the nut and locknut securing each type carriage roller to a support spindle, and withdraw each roller.

9.36 Remove the nut from the rear of the right-hand support spindle, and remove the type carriage spring anchor plate and the support spindle.

9.37 Remove the two screws securing the lever return spring assembly (Fig. 5.24) to the front of the type carriage casting, and remove the assembly.

10. TAPE PUNCH UNIT Fig. 5.26 to 5.30

Cuttings Chute Assembly Fig. 5.28 top and Fig. 5.29 bottom

10.1 Remove the two screws securing the cuttings chute assembly to the top of the punch block, and the screw, deflector, spacer and cable clip securing the tube to the button unit frame, and withdraw the assembly.

Button Unit Assembly Fig. 5.28 top

10.2 Remove the two screws securing the button unit assembly frame to the underside of the casting, disengage the BACK SPACE key and the retention release lever of the TAPE RLSE key, and withdraw the assembly.

Pressure Roller Bracket and Tape Guide Assemblies Fig. 5.28 bottom

10.3 Remove the nut securing the pivot pin of the pressure roller bracket assembly to the inside front of the cover plate, and withdraw the assembly.

10.4 Remove the two screws securing the bracket of the tape guide assembly to the front of the cover plate, and withdraw the assembly.

Cover Plate Assembly Fig. 5.28 bottom

10.5 Remove the two screws securing the bracket of the microswitch to the rear of the casting, and remove the screw securing the cable clip to the rear of the casting.

10.6 Unhook the spring of the on/off control lever assembly from the assembly and the anchor pin.

10.7 Loosen the reset arm of the on/off control lever assembly from the drive arm shaft at the rear of the cover plate, remove the circlip retaining the on/off remote control lever of the assembly to the pivot, and withdraw the assembly.

10.8 Remove the nut securing the feed lever pivot to the cover plate.

10.9 Remove the four screws securing the cover plate assembly to the casting pillars and the punch block mounting frame, and withdraw the assembly from the casting and five shafts.

10.10 Withdraw the felt washer from the feed shaft.

Retention Lever Assembly Fig. 5.30 top

10.11 Unhook the retention lever spring from the lever and the anchor pin, remove the screw securing the retention lever assembly to the outside of the casting, and remove the washer, lever and eccentric bush.

Code Reading Bars Fig. 5.29 top

10.12 Unhook a spring from the bottom of each punch suppression lever and from the spring anchor plate.

10.13 Remove the screw securing the aluminium alloy rack to the casting, turn the rack to disengage the code reading bars and the punch suppression levers, and withdraw the rack.

10.14 Remove the two screws securing the transfer bar rack to the back of the casting, disengage the rack from the code reading bars and punch suppression levers, and withdraw the rack.

10.15 Ensure the manual on/off control knob at the rear of the casting is set with the single-grooved hexagonal flat uppermost, remove the screw, special washer and spring securing the knob, and withdraw the knob.

10.16 Remove the circlip retaining the code reading bars to the pivot, and carefully withdraw from the pivot –

(a) two felt washers,
(b) code reading bar number 1, unhooking its spring from the anchor pin,
(c) code reading bar number 2, unhooking its spring from the pin,
(d) a punch suppression lever,
(e) code reading bar number 3, unhooking its spring from the pin,
(f) code reading bar number 4, unhooking its spring from the pin,
(g) a punch suppression lever,
(h) code reading bar number 5, unhooking its spring from the pin,
(i) a felt washer.

Roller Bracket Assembly Fig. 5.30 top

10.17 Remove the screw securing the roller bracket assembly to the top of the casting, unlock and unscrew the lower roller spindle from the casting, and withdraw the assembly.

Interchangeable Punch Block Assembly Fig. 5.29 bottom and Fig. 5.30 bottom

10.18 Unhook the spring from the punch withdrawing bracket and the spring anchor plate, and remove the spring anchor plate from the feed lever pivot.

10.19 Remove the two screws securing the punch block mounting frame to the top of the casting, and remove the frame complete with the interchangeable punch block assembly.

10.20 Remove the two screws securing the assembly to the frame, and remove the assembly.

Clutch and Punch Lever Assembly Fig. 5.30 top

10.21 Unhook the spring from the punch lever and the spring anchor plate.

10.22 Remove the half-nut securing the clutch shaft of the clutch and punch lever assembly to the bottom of the casting, disengage –

(a) the drive arm spigot from the trunnion block in the end of the drive arm,
(b) the punch lever slot from the feed lever roller,
(c) the punch lever roller from the slot at the bottom of the anvil bar assembly,

and withdraw the assembly.

Anvil Bar and Feed Lever Assemblies
Fig. 5.30 top and bottom

10.23 Remove the half-nut securing the punching frame pivot to the casting, withdraw the anvil bar and the feed lever assemblies, and withdraw the anvil bar assembly from the arms of the feed lever assembly.

Suppression Frame and Latch Assemblies
Fig. 5.29 top

10.24 Unhook the spring from the bottom of the suppression latch and from the spring anchor plate, remove the half nut securing the pin of the suppression latch assembly to the casting, and withdraw the assembly.

10.25 Unhook the spring from the suppression frame assembly reset frame and the anchor pin at the rear of the casting, remove the half nut securing the pivot of the assembly to the inside of the casting, and withdraw the assembly.

Suppression Reset Bail Assembly Fig. 5.29 top

10.26 Remove the circlip retaining a felt washer on the pin of the reset frame, withdraw the felt washer, remove the circlip retaining the reset link assembly on the pin, and withdraw the assembly.

10.27 Remove the half nut securing the pivot of the suppression reset bail assembly to the top rear of the casting, and remove the assembly.

Drive Arm Fig. 5.29 top

10.28 Remove the circlip retaining the reset link assembly to the pin of the drive arm, and remove the assembly.

10.29 Withdraw the drive arm from the inside of the casting.

Feed Shaft Fig. 5.30 top

10.30 Remove the half-nut from the right-hand end of the feed shaft, and remove the retention wheel and the back-feed ratchet from the shaft.

10.31 Remove the special screw and the locating plate retaining the feed shaft, and withdraw the feed shaft.

Back Space Pawl Assembly Fig. 5.30 top

10.32 Remove the circlip retaining the pawl lever to its pivot, and withdraw the lever complete with back-feed pawl and spring.

10.33 Remove the screw securing the pawl guide to the outside of the casting, and withdraw the guide from the spring anchor pin.

11. TAPE READER UNIT Fig. 5.31 to 5.34

Drive Belt Only Fig. 5.31 and Fig. 5.32

Use the following procedure to limit the disturbance of unit adjustments, if it is necessary to remove the drive belt only.

11.1 Remove the two screws and backing plate securing the cam lubricator to the bracket at the rear of the main housing casting, and withdraw the lubricator.

11.2 Remove the screw from the rear end of the camshaft, and withdraw –

(a) a circular cam spacer,
(b) the striker cam,
(c) a hexagonal cam spacer,
(d) the delay disc cam,
(e) a circular cam spacer,
(f) the send/receive cam,
(g) a hexagonal cam spacer.

11.3 Remove the two screws securing the bearing clamp to the mounting bracket casting, and withdraw the clamp.

11.4 Remove the key from the keyway, withdraw the rear bearing, and withdraw the drive belt.

Contact Block Cover Fig. 5.32

11.5 Remove the knurled nut securing the contact block cover, and withdraw the cover.

11.6 Remove the two screws securing the contact cover bracket and the radio interference suppression assembly to the top of the contact mounting plate, and withdraw the bracket and assembly.

Tape Deck Assembly Fig. 5.33 top

11.7 Remove the three screws securing the tape

deck assembly to the top of the main housing casting, and withdraw the assembly from the peckers.

Striker Lever Shaft Assembly Fig. 5.32

11.8 Remove the circlip retaining the send/receive link assembly to the switch cam lever, and withdraw the link assembly from the lever and an upper projection of the bracket casting.

11.9 Unhook the delay trip lever spring and the switch cam lever spring from the spring anchor pins.

11.10 Remove the two screws and clamp plates securing the striker lever shaft, and remove the six circlips retaining the levers to the shaft.

11.11 Withdraw the striker lever shaft from the levers, and withdraw the switch cam lever and the trip lever from the bracket casting.

Belt Tensioner Assembly Fig. 5.34

11.12 Remove the screw securing the belt tensioner assembly to the top left-hand side of the housing casting, and withdraw the assembly from the start trip lever.

Contact Mounting Plate Assembly Fig. 5.32, 5.34

11.13 Remove the two screws and backing plate securing the cam lubricator to the housing casting rear bracket, and remove the cam lubricator.

11.14 Unhook the striker lever spring and the changeover lever spring from the anchor pins on the bracket casting.

11.15 Slacken the screw securing the changeover lever to the rear end of the bail shaft, and slide the lever up to the shaft bearing.

11.16 Remove the capstan screw and slacken the tie rod both securing the contact mounting plate to the front of the bracket casting, disengage the carrier from the changeover lever, and withdraw the contact mounting plate assembly.

11.17 Slide the changeover lever off the rear end of the bail shaft.

Key Bracket Assembly Fig. 5.31

11.18 Remove the two screws securing the tape-on microswitch to the right-hand side of the key bracket, and withdraw the microswitch.

11.19 Remove the two screws securing the key bracket to the rear of the housing casting, unhook the stop-reset lever from the slot in the link at the rear end of the sequential shaft assembly, and withdraw the key bracket assembly.

Alarm Switch and Magnet Bracket Assemblies Fig. 5.34

11.20 Remove the two screws securing the plate of the alarm switch assembly to the left-hand side of the housing casting, and withdraw the assembly.

11.21 Remove the two screws securing the bracket of the magnet bracket assembly to the bottom right-hand side of the housing casting, disengage the magnet lever from the bracket slot, and withdraw the assembly.

Mounting Bracket Assembly Fig. 5.32

11.22 Remove the two screws and bearing clamp retaining the camshaft rear bearing to the casting.

11.23 Remove the screw and bearing retainer retaining the bail shaft rear bearing, and withdraw the bearing.

11.24 Remove the three screws securing the bracket casting to the housing casting, and withdraw the bracket casting.

Pecker Carrier Assembly – 1 Fig. 5.34

11.25 Remove the belt from the camshaft clutch sprocket.

11.26 Remove the two inner screws and the clamp plate securing the four pecker spring blades to the right-hand side of the housing casting, and remove the blades.

11.27 Remove the two screws and plate securing the peckers rack, and withdraw the rack from the peckers.

11.28 Withdraw the link of the pecker carrier assembly from the pin of the link lever.

11.29 Unhook the spring between the oil felt spring and the front spring anchor pin at the bottom of the casting.

Tape Feed Wheel Assembly Fig. 5.33 bottom

11.30 Remove the two screws securing the bracket of the tape feed wheel assembly to the left-hand side of the housing casting, disengage the pin of the pawl carrier from the forked end of the feed lever assembly, and remove the tape feed wheel assembly.

Pecker Carrier Assembly – 2 Fig. 5.34

11.31 Remove the nut securing the shouldered pin of the pecker carrier assembly to the front of the housing casting, and withdraw the assembly complete with oil felt, rotating the camshaft if the assembly is not free.

Alarm Trip Lever Assembly – 1 Fig. 5.34

11.32 Unhook the springs of the magnet lever and lever clamp from the rear spring anchor pin at the bottom of the housing casting.

11.33 Loosen the screw securing the start inhibit lever clamp to the rear end of the alarm lever shaft, and withdraw the lever and clamp.

Sequential Shaft Assembly – 1
Fig. 5.32 and 5.33 bottom right

11.34 Unhook the three upper springs of the sequential levers from the spring anchor pin on the left-hand side of the casting, remove the circlip retaining the pin to the stop lever rack, and withdraw the pin from the front of the casting.

11.35 Remove the two screws and clamp plate securing the stop lever rack, and withdraw the rack from the clutch stop lever arm (Fig. 5.31).

11.36 Unhook the feed lever assembly spring and the three lower sequential lever springs from the front spring anchor pin at the bottom of the casting.

11.37 Remove the two screws securing the rack to the bottom left-hand side of the casting, and withdraw the rack from the sequential levers.

Clutch Trip Lever Assembly and Camshaft Assembly Fig. 5.31

11.38 Unhook the spring of the clutch stop lever from the sequential lever shaft.

11.39 Remove the screw securing the shouldered pin of the clutch trip lever assembly and any shims to the left-hand side of the spacer and end cover assembly, and withdraw the lever assembly.

11.40 Remove the two screws securing the belt guide plate to the end cover and the rear of the casting, and remove the plate.

11.41 Remove the screw securing the flanged bush to the front end of the alarm lever shaft, withdraw the bush and allow the shaft to drop.

11.42 Remove the remaining screw securing the end cover to the casting, and withdraw the camshaft from the rear of the casting.

Sequential Shaft Assembly – 2 Fig. 5.33 bottom right and Fig. 5.34

11.43 Remove the two screws and clamp plates securing the sequential shaft assembly to the grooves in the left-hand side of the casting, and withdraw the assembly complete with two links.

Bail Shaft Assembly Fig. 5.34

11.44 Remove the screw securing the flanged bush at the front end of the bail shaft, and withdraw the bush.

11.45 Withdraw the bail shaft assembly from the front of the casting, then from the rear of the casting, and remove the assembly.

Alarm Trip Lever Assembly – 2 Fig. 5.34

11.46 Remove the screw securing the flanged bush at the rear end of the alarm lever shaft, and withdraw the bush.

11.47 Withdraw the alarm lever shaft from the front and rear bearing apertures in the casting, and remove the alarm trip lever assembly.

Camshaft Assembly – 2 Fig. 5.31

11.48 Remove the screw from the rear end of the camshaft, and withdraw from the end –

(a) a circular spacer,
(b) the striker cam,
(c) a hexagonal cam spacer,
(d) the delay-disc cam,
(e) a circular spacer,
(f) the send/receive cam,
(g) a hexagonal cam spacer, then remove the key from the keyway,

(h) a ball journal bearing,
(i) the spacer and end cover assembly,
(j) the thrust bearing.

11.49 Remove the circlip retaining the clutch to the camshaft, and withdraw from the rear end –

(a) the felt washer,
(b) the clutch (complete with two needle bearings, four retaining washers and intervening felt strip inside and felt washer outside),
(c) the clutch friction flange,
(d) the ratchet clutch,
(e) the larger-diameter compression spring,
(f) the smaller-diameter compression spring.

11.50 Remove the screw from the front end of the camshaft, and withdraw the ball journal bearing.

11.51 Be prepared to catch the two retaining half rings covered by the camsleeve, withdraw the camsleeve from the front end of the camshaft, and remove the half rings from the camshaft.

11.52 Remove the key from the keyway.

12. TRANSMITTER UNIT Fig. 5.36 to 5.39

Striker Sub Unit Fig. 5.35, 5.37

12.1 Remove the knurled nut securing the contact block cover to the contact block, and withdraw the cover.

12.2 Remove the two shouldered screws securing the off-normal switch bracket complete with plug to the left-hand side of the casting, and lift off the bracket.

12.3 Remove the two nuts securing the gear cover to the bearing clamp studs and withdraw the cover.

12.4 Remove the four screws securing the striker sub unit to the back of the casting, and lift off the sub unit.

To gain access to one of the securing holes, rotate the latch at the rear of the casting.

Answer-back Sub Unit Fig. 5.36

12.5 Press the tab at the top of the latch to the left, to release the drum assembly, and withdraw the assembly from the drum spindle.

12.6 Remove the three screws securing the sub unit to the front of the casting, and lift off the sub unit.

Key Assembly Fig. 5.39

12.7 Unhook the key springs from the spindle, remove the two circlips securing the spindle, withdraw the spindle from the casting projections, and withdraw the spacer from the key pivot between the keys.

12.8 Unhook the bottom end of the RUN OUT key link from the pin of the run-out crank, slide out the key pivot and withdraw the keys.

Lever Assemblies Fig. 5.39

12.9 Unhook –

(a) the common frame spring from the bottom of the frame and the anchor pin underneath the casting,
(b) the WRU inhibiting lever spring from the middle of the lever extension and the anchor hole in the casting base,
(c) the inhibiting lever front arm spring from the arm and the end of the WRU inhibiting lever extension,
(d) the inhibiting lever rear arm spring from the arm and the latch adjacent to the bearing housing,
(e) the torsion spring from the latch.

12.10 Remove the circlip retaining the latch to the pivot, and withdraw the latch.

12.11 Remove the screw and clamp plate securing the spindle of the answer-back trip inhibiting lever assembly to the casting, and lift off the assembly.

12.12 Unhook the torsion spring from the detent operating lever, and remove the screw and special nut securing the lever.

12.13 Remove the circlip retaining the answer-back trip shaft to the front of the casting and, whilst sliding out the shaft from the rear, withdraw the detent operating lever and the torsion spring.

Send/Receive Lever Assembly Fig. 5.39 top

12.14 Unhook the torsion spring from the send/receive lever, remove the circlip retaining the spacer to

the pivot, and withdraw the spring, the spacer and the lever.

12.15 Remove the screw securing the assembly pivot to the casting, and withdraw the pivot.

Detent, Trip and Retention Lever Assemblies Fig. 5.39

12.16 Unhook the spring from the retention lever and the spring anchor plate and detent guide, and unhook the spring from the trip lever and the plate and guide.

12.17 Unhook the spring from the trip latch and the detent lever pivot.

12.18 Remove the screw securing the spring anchor plate and detent guide to the casting and the detent lever assembly pivot, lift off the plate and guide, and withdraw the assembly.

12.19 Remove the two nuts securing the retention and trip lever assemblies to the casting, and withdraw the assemblies.

Camshaft Assembly – 1 Fig. 5.35, 5.39 bottom

12.20 Remove the screw and special washer securing the transmitter pulley to the front of the camshaft, withdraw the pulley, and refit the washer and screw.

12.21 Remove the two screws securing the keep plate to the front of the casting, and withdraw the plate.

12.22 Hook the lower ends of the sequential levers under the upper ends of the code selection levers.

12.23 Remove the two nuts securing the rear bearing clamp, lift off the clamp and carefully withdraw the camshaft assembly.

Lock Frame and Sequential Lever Rack Fig. 5.39 bottom

12.24 Unhook a spring from the keyboard lock bail and the front end of the lock frame spindle.

12.25 Remove the two screws securing the sequential lever rack to the casting, and withdraw the rack.

12.26 Unhook a torsion spring from the lock frame, and withdraw the spring from the lock frame spindle.

12.27 Remove the two circlips retaining the spindle to the rear bearing lug, and whilst sliding out the spindle, withdraw three felt washers and the lock frame.

Code Selection Lever and Run-out Assemblies Fig. 5.39 bottom

12.28 Remove the two screws and clamps securing the code selection lever assembly spindle to the underside of the casting, and withdraw the assembly.

12.29 Unhook the run-out lever spring from the guide on the front right-hand side of the casting.

12.30 Withdraw the run-out crank from the front location bush, and the lever and lever adjustment plate from the guide.

12.31 Remove the two screws securing the guide to the casting, and withdraw the guide.

Sequential Lever Assembly Fig. 5.39 bottom

12.32 Unhook a spring from the WRU inhibiting lever and the anchor hole in the casting.

12.33 From underneath the casting remove a screw securing each location bush, disengage the ends of the sequential lever assembly spindle from the two bushes, and withdraw the assembly.

12.34 Withdraw the two location bushes from the casting.

12.35 Remove the two screws securing the plastic rack to the inside of the casting, and lift out the rack.

Camshaft Assembly – 2 Fig. 5.38

12.36 Remove the screw and special washer from the front end of the camshaft, and withdraw the transmitter pulley and the front ball bearing.

12.37 Remove the screw securing the gear wheel to the rear end of the camshaft, and withdraw the gear wheel and the rear ball bearing.

12.38 Remove the two nuts and clamp plate securing the rear end of the clutch band to the adjustable clamp, and withdraw the band and a spacer from the clamp.

12.39 Remove the screw securing the clutch dog to the rear end of the camshaft, and withdraw –

(a) the clutch dog,
(b) the compression spring,
(c) a clutch plate,
(d) the delay disc,
(e) a clutch plate,
(f) the thrust bearing,
(g) the camsleeve complete with needle cage bearing, washer and bearing seal.

12.40 Remove the nut securing the front end of the clutch band to the moving arm, and disengage the band from the arm.

12.41 Remove the circlip retaining the moving arm to the front end of the camshaft, withdraw the moving arm, and withdraw the clutch band from the drum.

13. FEED UNIT Fig. 5.40

Unit Assembly

13.1 Press the withdrawal lever latch on top of the unit to the left to release the tension in the lever spring on the left-hand side.

13.2 Remove the two circlips holding the link strip to the lever plate and the withdrawal lever, and remove the strip.

13.3 Remove the two circlips holding the lever and the lever spring to the pivot pin, and withdraw the lever and spring.

13.4 Unhook the two feed pawl springs from the pawls and from the feed levers.

13.5 Remove the two screws securing the feed plate assembly to the top of the feed unit casting, and withdraw the assembly from the casting and feed pawls.

13.6 Remove the nut securing the feed lever pivot, unhook the two feed lever springs from the spring anchor screw, and withdraw the pivot complete with the feed lever assembly.

13.7 Turn the feed levers in opposite directions, and withdraw the feed pawls.

13.8 Unhook the clutch detent spring and the trip latch spring from their anchorages on the left-hand side of the feed unit casting.

13.9 Remove the circlip securing the trip arm and latch to the eccentric pin on the left-hand side of the feed unit casting, and withdraw the felt washer and the trip arm and latch.

13.10 Remove the lock nut holding the clutch detent pivot pin to the rear of the casting and remove two circlips from the pin.

13.11 Unscrew the pin from the casting, and remove the three felt washers, the thrust washer and the clutch detent.

13.12 Remove the screw securing the counter pinion to the front of the camshaft, and withdraw the sleeve and pinion from the camshaft.

13.13 Remove the two screws securing the front bearing housing and any shims to the casting, tap the rear of the camshaft with a mallet to free the rear ball bearing from its housing, and withdraw the camshaft assembly from the front of the casting.

Camshaft Assembly

13.14 Remove the bearing clamp nut from the front of the camshaft, and withdraw the —

(a) ball bearing and bearing housing,
(b) clutch coupling feed mechanism,
(c) compression spring,
(d) two friction plates and interposing felt washer.

13.15 Bend back the tag of the clamp nut locking washer at the rear of the camshaft, remove the clamp nut, and withdraw the —

(a) locking washer,
(b) rear ball bearing,
(c) clutch coupling,
(d) cam sleeve thrust bearing and thrust washer.

13.16 Remove the cam sleeve nut (secured by Loctite), and withdraw the two feed cams and interposing spacer.

13.17 Withdraw the clutch coupling and clutch compression spring from the cam sleeve, and remove the cam sleeve from the camshaft.

14. LINK UNIT Fig. 5.41

14.1 Pull off the spring cover. Unhook the ten springs from the spring anchor plate and from the transfer bars and latch-release bars.

14.2 Remove the two circlips securing the pivot pin to the stop bracket and, whilst withdrawing the pin, remove the five latches and two rack retaining springs.

14.3 Remove the stop bracket and the rack.

14.4 Note the order in which the transfer bars are positioned in the link unit frame (number 1 to the rear and number 5 to the front).

14.5 Remove the two circlips securing each guide pin to the frame and, whilst withdrawing the pins, remove the —

(a) five transfer bars,
(b) five spacing washers,
(c) spacing collar,
(d) five latch-release bars,
(e) shift bar.

15. CODE CONTROL UNIT Fig. 5.42

15.1 Remove the cable clip on the unit casting and on the switch mounting plate at the rear of the unit.

15.2 Remove the two screws securing the plug mounting plate to the right-hand end of the unit casting, and remove the plate complete with plug.

15.3 Remove the remaining five screws securing the switch mounting plate to the unit casting, and remove the plate complete with contact sets, cableform and code control plug.

15.4 Remove the screw and clamp plate securing each end of the control lever spindle, and loosen the nut and hook bolt securing the middle of the control lever spindle.

15.5 Counting from the left-hand end, note the slot numbers of the rear control lever rack in which the three kinds of control levers are fitted, and note the positions of the felt washers on the control lever spindle.

15.6 Withdraw the control lever spindle from the unit casting, and remove the felt washers.

15.7 Disconnect the control lever springs from the spring anchor plate only.

15.8 Remove the two screws securing the spring anchor plate to the unit, and remove the plate and the eight code control levers complete with springs.

15.9 Remove the two screws securing the shift slide bracket to the right-hand end of the unit casting, and withdraw the shift slide assembly taking care not to lose the two special washers between the bracket and the casting.

15.10 Remove the screw on top of the unit casting securing the eccentric pin, and withdraw the eccentric pin from the casting and the shift bar cam sector from the shift bar.

15.11 Remove the screw on top of the casting securing each of three special pins, and withdraw the pins from the rear of the unit casting.

15.12 Remove the screw on top of the casting securing each of two special parallel pins.

15.13 Whilst withdrawing the left-hand special parallel pin remove the bellcranks, and whilst withdrawing the right-hand special parallel pin remove the code slats, combination bars and shift bar.

15.14 Loosen the three screws securing the rear typehead guide to the top of the unit casting, and lift off the guide.

15.15 Remove the two screws securing each combination bar auxiliary rack to the right-hand side of the two combination bar supports, and remove the racks.

15.16 Remove the two screws securing each combination bar rack to the left-hand side of the two combination bar supports, and remove the racks.

15.17 Remove the four screws securing each control lever rack, one at the front of the unit casting and one at the rear, and remove the two racks.

15.18 Remove the two screws securing the combination bar support at each end of the unit casting, and remove the two supports.

16. FUNCTION UNIT Fig. 5.43

16.1 Remove the screw securing the shift lever to the right-hand end of the shift beam pivot.

16.2 Unhook the top of the shift beam spring from the anchor pin at the rear of the shift beam casting.

16.3 Remove the circlip from each end of the shift beam pivot, and slide a felt washer from the right-hand end and two felt washers and collar from the left-hand end.

16.4 Remove the nut securing the power bail pivot to each side frame.

16.5 Unhook the end of the torsion spring from the stud on the power bail adjustment plate.

16.6 Remove the two screws securing a side frame to each side of the function unit main base, and withdraw the right-hand side frame.

16.7 Unhook the power bail torsion spring from the bottom edge of the left-hand side frame, and whilst holding the shift beam casting withdraw the side frame.

16.8 Remove the shift beam assembly and the power bail assembly from the unit.

16.9 Remove the two screws securing the horizontal back guide rack to the rear of the unit main base, and remove the rack.

16.10 Unhook the function reset lever spring from the lever and the anchor plate on the function bar guide shaft.

16.11 From the bottom of the unit, unhook the carriage-return lever spring and the carriage-feed trip lever spring from the levers and the front guide rack.

16.12 Unhook the print-suppression lever spring from the lever and the anchorage on the left-hand side of the unit main base.

16.13 Remove the four screws and three shaft clamp plates securing the main bearing shaft to the unit main base, and carefully lift out the shaft complete with function reset lever assembly.

16.14 Remove the two screws securing the retaining strip to the rear of the unit main base, and remove the strip and the vertical back guide rack.

16.15 From the bottom of the unit, unhook the four springs from the spring anchor rack.

16.16 Remove the two screws and shaft clamp plates securing the function bar guide shaft to the front of the unit main base, and lift off the shaft complete with function bars and shift gear segment.

16.17 Unhook the gear segment jockey lever spring from the lever and from the anchor pin on the left-hand side of the unit main base, remove the circlip holding the jockey lever pivot, withdraw the pivot and remove the lever.

17. SELECTOR UNIT Fig. 5.44

17.1 Remove the three screws securing the front plate to pillars, and withdraw the front plate.

17.2 To dismantle the front plate assembly –

(a) remove the circlip holding the orientation knob, and withdraw the knob and the orientation pointer plate,
(b) remove the screw securing the clamp plate, and withdraw the orientation plate assembly from the front plate.

17.3 Remove the two nuts securing the pivot frame to the unit back plate, and withdraw the transfer levers assembly complete with two locating screws.

17.4 Free the drive pin of the torsion spring, and withdraw the pin.

17.5 Remove the two screws securing the rack to the bottom of the pivot frame, and remove the rack and nut plate.

17.6 Remove a circlip from the pivot pin at the bottom of the transfer levers, and withdraw the pin and the transfer levers.

17.7 Unhook the pivot pin of the two long springs from the drive link, unhook the short spring from the drive link, and withdraw the drive link from the driving frame.

17.8 Remove three circlips from the drive link anchor pin, leaving one on each side of the torsion spring, and unhook the torsion spring from the driving frame.

17.9 Whilst withdrawing the drive link anchor pin complete with torsion spring, remove the five felt washers and the long tension spring, then remove the driving frame.

17.10 Unhook the lock lever spring and the read bail spring from the uppermost pillar.

17.11 Remove the nut securing the flanged pin of the read bail assembly to the back plate, and withdraw the read bail assembly.

17.12 Remove the screw securing each of the two lower pillars to the back plate, and remove the pillars.

17.13 Remove the nut securing the uppermost pillar to the back plate, and remove the pillar.

17.14 Loosen the nut securing the storage latch rack to the top of the back plate, and set the rack horizontally.

17.15 Unhook the spring from storage latch number 5, lift the associated sequential lever from the sequential lever rack plate, withdraw the latch complete with lever and interconnecting spring, and withdraw the felt washer from the sequential lever rack pin.

17.16 Repeat step 17.15 above to remove the remaining four storage latches and associated sequential levers.

17.17 Unhook the trip lever spring from the lever and the anchor screw on the back plate, remove the pivot screw (secured by Loctite) and nut plate securing the trip lever and latch to the back plate, and remove the lever and latch.

18. MAIN CAMSHAFT Fig. 5.45

18.1 Withdraw the oil tube from its hole in the bearing housing.

18.2 Unscrew the friction plate (left-hand thread) from the left-hand end of the camshaft, and withdraw the –

(a) shim,
(b) felt washer,
(c) selector cam sleeve assembly,
(d) left-hand and right-hand friction plates and intervening felt washer,
(e) compression spring.

Do not dismantle the selector cam sleeve assembly, as a jig is required for assembling.

18.3 Remove the screw securing the main shaft gear wheel to the right-hand end of the camshaft, if the gear wheel is still in place, and withdraw the gear wheel.

18.4 Remove the bearing clamp nut from the right-hand end of the camshaft, and withdraw the ball journal bearing and clamp washer.

18.5 Remove the screw securing the feed unit pinion to the camshaft, and withdraw the –

(a) pinion,
(b) compression spring,
(c) right-hand and the left-hand friction plates and intervening felt washer,
(d) cam sleeve assembly, leaving behind the clutch coupling and clutch compression spring.

18.6 To dismantle the cam sleeve assembly, ensure that a torque spanner is available for retightening the cam sleeve nut to about 30 lb. ft, remove the cam sleeve nut (secured by Loctite) and withdraw –

(a) a cam spacer (about 0.09 inch),
(b) the function selection cam,
(c) five WRU two-colour cams,
(d) the carriage-return cam,
(e) a cam spacer (about 0.34 inch),
(f) the carriage-feed trip cam,
(g) a cam spacer (about 0.38 inch),
(h) the print cam,
(i) a cam spacer (longest),
(j) the power bail cam,
(k) a cam spacer (about 0.22 inch),
(l) reperforator cam one,
(m) a cam spacer (about 0.18 inch),
(n) reperforator cam two,
(o) a cam spacer (about 0.15 inch),
(p) the code-read and latch-reset cam.

18.7 Withdraw from the right-hand end of the camshaft the –

(a) clutch compression spring,
(b) right-hand clutch coupling,
(c) thrust washer and cam-sleeve thrust bearing.

18.8 Remove the bearing clamp nut (left-hand thread) and washer, and withdraw the bearing housing, complete with the ball journal bearing, and the left-hand clutch coupling.

19. LAYSHAFT UNIT Fig. 5.46

19.1 Remove the screw securing the motor pinion to the rear of the layshaft, and withdraw the pinion,

19.2 Remove the screws securing the transmitter pinion and mainshaft pinion to the front of the layshaft, and withdraw the pinions.

19.3 Remove the large circlip from the front side of the rear ball journal bearing.

19.4 Tap the rear end of the layshaft with a hide mallet to break the Loctite bearing seals and to free the ball journal bearings from the layshaft bearing casting, and withdraw the layshaft complete with bearings.

19.5 Remove the remaining rear-bearing circlip, and

withdraw the bearings by hand, tapping the end of the layshaft to free the bearings from the seals if necessary.

20. PULL BAR UNIT Fig. 5.47

20.1 Unhook the carriage-return bar spring from the bar and the support shaft.

20.2 Unhook the trip-bar spring from the bar and the spring anchor bar.

20.3 Remove the two circlips holding the support shaft at the left-hand end, and remove the –

(a) support shaft,
(b) two felt washers,
(c) carriage-return bar.

20.4 Remove the two circlips holding the support pin at the left-hand end, and remove the –

(a) support pin,
(b) felt washer,
(c) trip bar.

20.5 Remove the two circlips holding the spring anchor bar at the left-hand end, and withdraw the bar.

21. MOTOR CONTROL SWITCH Fig. 5.48

21.1 Unhook the pawl trip plate spring from the plate and the link plate, unhook the link plate spring from the plate and the motor control switch bracket, and withdraw the link plate.

21.2 Remove the circlip retaining the adjustment lever to the pivot pin at the side of the switch bracket, and slide off the lever complete with retaining pawls.

21.3 Unhook the keyboard trip lever spring from the lever and the switch bracket, remove the circlip holding the lever to the shouldered pin on the right-hand side, and withdraw the lever.

21.4 Move the pawl trip plate to the rear of its slots, and withdraw it from the right-hand side of the switch bracket.

21.5 Remove the screw securing the ratchet stop plate to the left-hand side of the switch bracket, and remove the plate.

21.6 Remove the six circlips from the pawl-release lever pin at the front of the switch bracket and, whilst withdrawing the pin, remove the –

(a) pawl-release lever complete with extension,
(b) special washer,
(c) three felt washers,
(d) ratchet cam drive lever,
(e) reset trip lever.

21.7 Unhook the pawl lever spring from the lever and the switch bracket, remove the two circlips holding the ratchet pivot pin to the right-hand side of the bracket and, whilst withdrawing the pin, remove the –

(a) pawl lever assembly and felt washer,
(b) drive ratchet,
(c) driven ratchet,
(d) torsion spring,
(e) spring collar.

21.8 Remove the two shouldered screws holding the cut-out lever to the base of the switch bracket, and remove the lever.

22. ELECTROMAGNET UNIT Fig. 5.49

22.1 Remove the two screws securing the adjustment bracket to the right-hand side of the casting and lamination assembly, and withdraw the bracket from the armature pivot.

22.2 Remove the screw securing the plug-mounting bracket to the left-hand side of the casting and lamination assembly, and remove the bracket complete with plug.

22.3 Remove the two screws securing the laminated core assembly to the top of the casting and lamination assembly, and remove the two special washers and the assembly complete with electromagnet coil and plug.

22.4 Remove the magnet retaining spring from inside the casting and lamination assembly, and remove the magnet adjacent to the spring. Do not subject the magnet to shock. (It is not necessary to use a keeper.)

22.5 Loosen the screw clamping each stop screw on top of the casting and lamination assembly and, whilst unscrewing each stop screw, remove the associated shim retainer, shim and compression spring.

22.6 Remove the nut securing the armature pivot at the right-hand end to the bottom of the casting and lamination assembly, and withdraw the

armature pivot complete with armature assembly from the left-hand side.

23. SIMPLE UNITS Fig. 5.50 to 5.54

The extent to which the simple units may be dismantled is shown in the following figures:

Fig. 5.50 – manual control unit,

Fig. 5.51 – hours counter,

Fig. 5.52 – dashpot assembly,

Fig. 5.53 – print bail assembly,

Fig. 5.54 – two-colour and line-feed assembly.

SECTION C – ASSEMBLING THE UNITS

1. SYNCHRONOUS MOTOR UNIT Fig. 5.15

1.1 Ensure that the unit dowel is secured to the front of the motor unit base by a screw above, and that the socket-plate dowel is secured to the front of the base by a screw below.

1.2 Slide the plug mounting plate over the two dowels and up to the front of the base, and secure the plate by three screws.

1.3 Fit a rubber mounting collar to each end of the motor.

1.4 Slide the motor pinion, boss first, onto the right-hand end of the motor shaft, and secure the pinion by one screw.

1.5 Fit the spire nut to the motor fan and press the fan, nut outermost, onto the left-hand end of the motor shaft and up to the end of the shaft flat.

1.6 Ensure that the motor and the components panel assembly are intact, and seat them on the motor unit base whilst positioning approximately the plugs, pushbutton microswitch and interconnecting leads.

1.7 Secure the components panel assembly by three screws, secure the two plugs to the plug mounting plate with four screws and nuts, and secure the pushbutton microswitch to the front of the unit base by a half-nut.

1.8 Fit the base plate to the bottom of the unit, and secure the plate by four screws.

1.9 Place one motor strap over the right-hand rubber mounting collar, secure the strap to the unit base by two screws and at the same time secure one end of the earth connector over the rear foot of the strap.

1.10 Secure the other end of the earth connector to the motor casting.

1.11 Place the other motor strap over the left-hand rubber mounting collar, and secure the strap to the unit base by two screws.

1.12 Place the cover over the unit, and secure the cover to the components panel by the captive screw.

2. SYNCHRONOUS MOTOR Fig. 5.16

2.1 Slide the switch mechanism, boss first, onto the left-hand end of the shaft, and secure by one screw.

2.2 Clean the ball bearing seat at each end of the rotor assembly with a degreasing agent (carbon tetrachloride), then apply Loctite 'bearing fit' to the seats.

2.3 Place a bearing clamp plate over each end of the rotor shaft, clean the bore of the bearings, then slide a ball bearing along each end of the shaft, over the bearing seat and up to the shoulder.

If necessary, tap the bearings into position using a soft-metal tubular drift in contact with the inner cylinder of the bearing.

2.4 Place the drive-end casting over the right-hand end of the shaft, slide the bearing aperture over the bearing, place the pre-load waved washer over the outside of the bearing, then the bearing cap, and secure the cap to the casting and bearing clamp plate by three screws.

2.5 Slide the stator assembly, connections last, over the rotor, and pass the two tie bars through their holes in the drive-end casting and the stator assembly.

2.6 Place the switch-end motor cover over the left-hand end of the shaft, slide the bearing aperture over the bearing and the tie bar holes over the tie bars and, whilst ensuring that the motor cover and the drive end casting are correctly seated on the stator assembly, secure the whole by a nut on each end of each tie bar.

2.7 Place a bearing cap over the switch-end motor cover and secure the cap to the cover and bearing clamp plate by three screws.

2.8 Secure each switch final assembly to the switch-end motor cover by two screws.

3. GOVERNED MOTOR UNIT Fig. 5.17

3.1 Ensure that the unit dowel is secured to the front of the motor unit base by a screw above, and that the socket-plate dowel is secured to the front of the base by a screw below.

3.2 Slide the plug mounting plate over the two dowels and up to the front of the base, and secure the plate by three screws.

3.3 Fit a rubber mounting collar to each end of the motor.

3.4 Slide the strobe disc, black/white sectors outermost, onto the right-hand end of the motor shaft, and secure the disc by one screw.

3.5 Slide the motor pinion, boss first, onto the right-hand end of the motor shaft, and secure the pinion by one screw.

3.6 Slide the governor assembly, boss first, onto the left-hand end of the shaft, and secure the assembly by one screw.

3.7 Ensure that the motor and the components panel assembly are intact, and seat them on the motor unit base whilst positioning approximately the plugs, pushbutton microswitch and interconnecting leads.

3.8 Secure the components panel assembly by three screws, secure the two plugs to the plug mounting plate with four screws and nuts, and secure the pushbutton microswitch to the front of the unit base by a half-nut.

3.9 Fit the components panel cover over the panel, and secure the cover by two screws.

3.10 Fit the base plate to the bottom of the unit, and secure the plate by four screws.

3.11 Place one motor strap over the right-hand rubber mounting collar, secure the strap to the unit base by two screws and at the same time secure one end of the earth connector over the rear foot of the strap.

3.12 Secure the other end of the earth connector to the motor casting.

3.13 Place the other motor strap over the left-hand rubber mounting collar, and secure the strap to the unit base by two screws.

3.14 Place the cover over the unit, and secure the cover to the components panel by the captive screw.

4. GOVERNED MOTOR Fig. 5.18

4.1 Clean and degrease the bearing seat at each end of the armature assembly, then apply Loctite 'bearing fit' to the seats.

4.2 Place a bearing clamp plate over each end of the armature shaft, clean and degrease the bore of each ball bearing, slide a ball bearing along each end of the shaft, over the bearing seat and up to the shoulder.

If necessary, tap the bearing into position using a soft-metal tubular drift in contact with the inner cylinder of the bearing.

4.3 Place the right-hand motor casting over the right-hand end of the shaft, slide the bearing aperture over the bearing, place the pre-load waved washer over the outside of the bearing, then the bearing cap, and secure the cap to the casting and the bearing clamp plate by three screws.

4.4 Fit the circlip, open end outermost, to the right-hand end of the shaft.

4.5 Slide the field magnet assembly, connections last, over the armature, and pass the two tie bars through their holes in the right-hand motor casting and then the field magnet assembly.

4.6 Fit the brush mounting plate inside the left-hand motor casting, turn to the correct angular position in relation to the casting, and secure the plate to the casting by two nuts.

NOTE The brush boxes are positioned on the brush mounting plate to give a clearance between the inner edge of the box and the surface of the commutator of 0.015–0.025 inch.

4.7 Place the left-hand motor casting over the left-hand end of the shaft, slide the bearing aperture over the bearing, the brush boxes over the commutator and the tie bar holes over the tie bars and, whilst ensuring that both motor castings are correctly seated on the field magnet assembly, secure the whole by a nut on each end of each tie bar.

4.8 Place a bearing cap over the left-hand motor casting and secure to the casting and the bearing clamp plate by three screws.

4.9 Insert the brushes into the brush boxes, in such a way (if the brushes are not new) as to contact the commutator fully, secure each brush lead to the brush box, and retain each brush by the end of the brush spring.

4.10 Secure the governor brush assembly by the brackets to the left-hand motor casting with four screws above the brackets and four spacers below.

4.11 Fit the brush and slip-ring cover over the motor casting, and secure the cover with the knurled screw.

5. KEYBOARD UNIT Fig. 5.19, 5.20

5.1 Fit the left-hand code bar rack to the top of the keyboard casting, and secure the rack by two screws.

5.2 Fit the right-hand code bar rack, fit the two pivot location plates, secure the right-hand end of the plates to the rack and the casting by two screws, and secure the left-hand end of the plates to the casting by two screws.

5.3 Fit the keybar rack to the top of the casting, and secure the rack by five screws.

5.4 Turn the keyboard casting upside down.

5.5 If a motor control switch is fitted –

(a) insert the lever end of the lever rod into the centre pivot screw on the left-hand side of the casting, and screw up and lock the unlocked centre pivot screw to secure the rod so that it just rotates freely,
(b) fit the link rod to the lever-rod lever and the latch trip lever, and secure the rod to each lever by a circlip.

5.6 Fit to the left-hand side of the casting –

(a) a keybar spring (with the foolproofing slot on the right-hand side),
(b) the figures and space spring (with the foolproofing slot on the left-hand side),
(c) the space frame spring (with the foolproofing slot on the left-hand side).

5.7 Secure the three springs to the casting by two screws whilst ensuring that the springs are aligned with the keybar rack.

5.8 Fit to the right-hand side of the casting –

(a) a keybar spring (with the foolproofing slot on the right-hand side),
(b) the letters spring (with the foolproofing slot on the right-hand side.

5.9 Secure the two springs to the casting by two screws whilst ensuring that the springs are aligned with the keybar rack.

5.10 Fit the remaining five keybar springs to the rear of the casting (with the foolproofing slot on the right-hand side), and secure each by two screws whilst ensuring that it is aligned with the keybar rack.

5.11 Turn the keyboard casting the right way up, fit the two pivot location plates and the stop plate (under the front location plate) and secure each location plate by two screws.

5.12 If the code bar assembly is dismantled, assemble on each of the two lever pivot rods from the front –

(a) the rear WRU suppression bar,
(b) a code bar lever and the front WRU suppression bar,
(c) code bar number 5B (which has cut-outs as shown by the black squares in Figure 5.19),
(d) a code bar lever and code bar number 5A (which has cut-outs for keybar positions everywhere code bar number 5B has not),
(e) each of the remaining four pairs of code bars and intervening code bar levers,
(f) the trip lever spacer,
(g) the trip lever and trip slat blank,
(h) the lock bar,
(i) the letters/figures code bar,
(j) the shift bar lever and the figures/letters code bar.

5.13 Mount the code bar assembly to the code bar racks on top of the keyboard casting, and engage the lever pivot rods of the assembly with the slots in the pivot location plates.

5.14 Secure the pivot rods to the pivot location plates, stop plate and the keyboard casting by four screws and clamp plates, and ensure that the bars remain free to move.

5.15 Turn the keyboard casting upside down and –

(a) fit the trip selector bar in the front slot of each code bar rack, with the bellcrank to the right,
(b) fit the six selector bars in the remaining slots of the code bar racks, with the bellcranks to the right,
(c) fit a pressure plate over each end of the bars, with the lug to the right and pointing toward the casting,
(d) secure the left-hand pressure plate to the casting with two screws,
(e) partially secure the right-hand pressure plate to the casting with one screw at the rear,
(f) hook the trip spring to the anchorage on the right-hand pressure plate and the trip selector bar,
(g) place the toggle spring over the right-hand pressure plate, and secure the spring and plate with two screws,
(h) turn the casting the right way up.

5.16 Slide the keybar pivot through its holes at the rear of the casting, and retain by a circlip at each end.

5.17 Hook the three key levers to the keybar pivot, so that they seat in the second, third and right-most slot of the front and rear keybar racks (positions 1, 2 and 62 in the figure).

5.18 Fit the letters frame, space frame and figures frame assemblies to the front of the casting, engaging the front end of the frames with the forked ends of their key levers, and secure the frames pivot to the slots in the casting by the keybar rack and two screws, one at each end of the rack. Ensure that the frames are free to move.

5.19 Secure the overtravel stop to the front of the keybar rack and the castirg by two screws.

5.20 Starting with the rightmost keybar of the front row and working row-by-row to the left-most keybar of the back row, hook the rear of the keybar to the keybar pivot and lower the front of the keybar into the appropriate slot of the front and rear keybar racks, as shown in the figure. Do not distort the keybars.

5.21 Fit the stop strip to the front of the front keybar rack, above the keybars, and secure the strip by two screws.

6. PLATEN UNIT Fig. 5.21

6.1 Place the platen in the platen frame with the platen boss to the right, slide the platen main-shaft through the platen frame bearing apertures and the platen with the main-shaft thread to the right, align the hole in the boss with the hole in the main-shaft, and secure the platen to the main-shaft by one screw.

6.2 Slide the platen gear wheel, boss first, onto the left-hand end of the platen main-shaft, align the securing holes, secure the gear wheel by one screw, and ensure that the platen rotates freely.

6.3 Fit the platen frame tie to the platen frame, and secure the left-hand side by the flanged pin (foremost) and a screw, and the right-hand side by the shouldered pin (rearmost) and a screw.

6.4 Slide the jockey lever onto the pin on the right-hand side of the platen frame, with the indented edge uppermost, and retain the lever by a circlip.

6.5 Hook the jockey lever spring to its anchorage on the lever and the platen frame.

6.6 Slide the masking lever, mask outermost, and the shim onto the right-hand end of the platen main-shaft.

6.7 Slide the line-space change lever, lever outermost, onto the upper shouldered pin, engage the lever stud with the masking lever slot, and retain the line-space change lever by a circlip.

6.8 With the ratchet wheel between the arms of the ratchet lever assembly and the ratchet wheel boss outermost, slide the ratchet lever assembly and the ratchet wheel onto the right-hand end of the platen main-shaft, align the securing holes and secure the ratchet wheel by one screw.

6.9 Slide the collar over the right-hand end of the platen main-shaft, and retain the collar by two half-nuts.

6.10 Hook the ratchet lever spring to its anchorage on the inside of the lever and the second anchorage down on the side of the platen frame.

6.11 Slide the retaining-lever spring, ends uppermost, and then the retaining lever onto the lower shouldered pin on the right-hand side of the platen frame, and retain the spring and lever by a circlip.

6.12 Hook the retaining lever spring to the bottom of the lever and the bottom of the platen frame side, and ensure that the parallel pin of the retaining lever sits firmly on the ratchet wheel.

6.13 Fit the pressure roller key (with the link and pressure roller lever attached) over the flanged pin on the left-hand side of the platen frame, with the link outermost, and retain the key by a circlip.

6.14 Slide a torsion spring over each end of the pressure roller shaft, so that the 45-degree end of each spring is nearest to the circlip groove of the shaft.

6.15 Fit the pressure roller shaft into the paper guide, so that –

(a) the pressure roller drops into the cut-out in the paper guide,
(b) the 90 degree end of each spring presses on the rear of the paper guide,
(c) the 45 degree end of each spring pokes through a hole near the edge of the paper guide.

6.16 Place the paper guide to the rear of the platen frame, slide the right-hand end of the pressure roller shaft into its bearing hole in the end of the platen frame.

6.17 Slide a special washer onto the left-hand end of the pressure roller shaft, slide this end of the shaft and the end of the pressure roller spindle into their bearing holes in the end of the platen frame, and fit a circlip to the pressure roller shaft within the paper guide.

6.18 Slide two special washers onto the left-hand end of the pressure roller shaft, then the pressure roller lever, and secure the lever to the shaft by a nut and bolt.

6.19 Slide the platen pinion boss-first onto the pressure-roller spindle, so that it engages with the platen gear wheel, align the securing screw with the flat on the shaft, and tighten the screw.

6.20 Place the tear-off plate, with the inscriptions to the front, on the platen frame tie, engaging the slots with the pressure roller key and the line-space change lever, and secure the plate to the tie by two screws.

6.21 Place a torsion spring over the boss of each guide arm, so that the straight end of each spring –

(a) points downward,
(b) is on the inside,
(c) is behind the foot at the bottom of the arm.

6.22 Slide a pivot screw through the boss of each guide arm, place the guide arms (with the two guide wires inserted) in front of the platen, secure each pivot screw to a side of the platen frame, and hook the bent end of each torsion spring to the bottom edge of a side of the frame.

6.23 Place a paper guide over each end of the platen frame so that the 30-degree bend is at the rear

and points outward, and secure each guide by one screw.

6.24 Place the paper jockey to the rear of the jockey frame, with the support lugs lowermost and to the front, and secure the jockey to the frame by two screws.

7. SPROCKET–FEED PLATEN Fig. 5.22

7.1 At one end of the platen, insert a spring and sprocket pin, with the head of its cross pin outermost, into a radial hole and slot of the plunger boss, and temporarily hold the pin in place with one end of a length of adhesive tape.

7.2 Insert in turn the remaining eight springs and pins into the plunger boss, and hold each pin in place by wrapping the tape part of the way around the boss.

7.3 Slide a cam over the end cap so that the cam slots appear to spiral outward in the normal direction of paper feed around the platen, engage the cam with the sprocket-pin cross pins and the cam seat of the plunger boss, and retain the cam by a circlip.

7.4 Unwrap the tape, rotate the cam to ensure freedom of sprocket pin movement, and clean off any adhesive.

7.5 Repeat steps 7.1 to 7.4 at the other end of the platen.

8. PAPER–LOW ASSEMBLY Fig. 5.23

8.1 Place the plug, pins downward, on the left-hand side of the plate, and secure the plug to the plate by one screw and nut.

8.2 Place the microswitch, actuator downward, on the right-hand side of the plate, and secure the microswitch and insulator to the plate by two screws and spacers and the clamp plate.

8.3 Slide the switch lever, spacer and paper-low arm onto the pivot pin above the spring anchor pin, and retain the lever, spacer and arm by a circlip.

8.4 Hook the switch lever and the paper-low arm springs to the lever and arm respectively and to the spring anchor pin.

8.5 Slide the latch lever onto the top rear pivot pin, and retain the lever by a circlip.

8.6 Hook the latch lever spring to the lever and the spring anchor screw.

9. TYPE CARRIAGE AND RIBBON UNIT
Fig. 5.24, 5.25

Type Carriage Feed

9.1 Position the lever return spring assembly (Fig. 5.24) at the front of the type carriage casting, and secure the assembly to the casting by two screws.

9.2 Fit the right-hand support spindle to the type carriage casting from the front, fit the type carriage spring anchor plate to the rear of the support spindle, and secure the plate and spindle by one nut, ensuring that the securing slot in the plate is aligned with the feed-rack securing hole in the casting.

9.3 Fit a type carriage roller to each support spindle, and retain each roller by a locknut and a nut, ensuring that the rollers are free to rotate.

9.4 Fit the feed rack to the front of the type carriage casting, with the teeth lowermost and pointing to the left, and secure the rack and the spring anchor plate by two screws.

9.5 Fit the left-hand retaining plate to the front of the casting, and secure the plate by two screws.

9.6 Fit the right-hand retaining plate, complete with end-of-line indicator roller plate and right-hand stop lever, and secure the plate to the casting by two screws.

Right-hand Ribbon Mechanism

9.7 Fit the ribbon changeover link, ends uppermost and facing forward, to the two studs at the front of the type carriage casting, and retain each end of the link by a circlip.

9.8 Ensure that the changeover link moves freely from side to side without touching the type carriage rollers, and hook the changeover link spring to the anchorage under the link and under the casting.

9.9 Fit the changeover ratchet, cam uppermost, over the right-hand stud holding the changeover link, and retain the ratchet to the stud by a circlip.

9.10 Drop a spacing washer over the pivot pin on the right-hand side of the casting, then the right-hand bellcrank (complete with pawl and torsion spring), with the boss uppermost.

9.11 Fit the slot of the right-hand ribbon feed link over the bellcrank pivot pin, and retain the link

to the bellcrank by a circlip.

9.12 Place the right-hand ratchet wheel (teeth pointing counter clockwise), collar uppermost, over the pivot pin whilst holding away the retention pawl, place a spacing washer over the ratchet wheel, and press the lower end of the ribbon feed drive shaft (complete with tension lever, ribbon feed changeover lever and bearing plate) into the centre of the spacing washer and the ratchet wheel.

9.13 Wrap the clutch band (the right-hand clutch band is marked by a red spot) round the collar of the ratchet wheel, hook the end of the band to the anchorage on the underside of the tension lever, and retain the end by a circlip.

9.14 Hook the upper ribbon feed changeover lever spring to the lever and to the top of the type carriage spring anchor plate, and hook the lower changeover lever spring to the lever and the end of the ribbon feed link.

9.15 Hook the tension lever spring to the lever and the anchor pin securing the retention pawl.

9.16 Secure the ribbon platform and drive shaft bearing plate to the top of the casting by two screws.

9.17 Engage the pivot of the ribbon-feed lever with the rear end of the ribbon-feed link from above, retain the link to the lever by a circlip, and secure the lever to the bottom of the casting by a pivot screw.

9.18 Hook the ribbon-feed link spring to the link and the ribbon-feed lever.

Left-hand Ribbon Mechanism

9.19 Follow the procedure for the right-hand ribbon mechanism, given in steps 9.10 to 9.17 above, but omit step 9.14 as there is no changeover lever on the left-hand mechanism.

Code Selectors

9.20 Underneath and at the rear of the type carriage casting, fit the five jockey levers, spring anchorages outermost, into the right-hand side, fit the spring anchor plate over the jockey rollers and secure the plate to the casting by two screws.

9.21 Place the print bail casting, type bail rearmost, in the type carriage casting, hold the print bail casting in place, and turn the type carriage casting upside down.

9.22 Fit the code sector rack to the bottom of the casting, and secure the rack to the left-hand side of the casting by one screw.

9.23 Fit the five code selector bellcranks to the code sector rack, leaving the rearmost of six positions empty.

9.24 Insert the rollerless end of the type-carriage shaft into the hole at the rear of the casting, slide the shaft through the bellcranks and into the hole at the rear of the print bail casting, fit the long felt washer inside the casting, and slide the shaft through the washer, the casting, and the type-carriage casting, and turn the casting the right way up.

9.25 Place the forked end of each ribbon feed lever over a pivot hole of the print bail casting, secure each lever to the casting by a pivot pin, and slide the casting along the shaft to ensure free lever action.

9.26 Place the spring anchor plate in the middle of the type-carriage casting, and engage it in the groove of the type-carriage shaft.

9.27 Place two spacers at the front of the spring anchor plate, in alignment with the securing holes, place the front rack in front of the spacers and in engagement with the type-carriage shaft, and secure the plate, spacers and rack to the type-carriage casting by two screws.

9.28 Slacken the screw securing the code sector rack, fit the rear rack to the rear of the type-carriage casting and in engagement with the type-carriage shaft, and secure the rack and type-carriage shaft by three screws and retaining clips. (The outer retaining clips do not secure the print bail guide spindles at this stage.)

9.29 Whilst holding both ends of the code sector rack in contact with the rear rack, resecure the code sector rack.

9.30 To the top of the type-carriage casting on each side, fit a top rack (slots inward), shim, spacer and sector stop plate, in that order, hold the rack in contact with the rear rack, and secure these by a screw.

9.31 Identifying the code sectors by their left-hand end, insert each code sector in its slots in the top racks and the code sector rack, and engage the bottom of the code sector with its code selector bellcrank and the jockey lever.

9.32 Insert a print bail guide spindle into the rear of the type-carriage casting on the left-hand side,

push it through each code sector and finally into the casting, and secure the spindle by the screw and retaining clip already securing the rear rack.

9.33 Insert the second print bail guide spindle into the rear of the type-carriage casting on the right-hand side, but before pushing it through each code selector, align the forked ends of the jockey lever with the slot in the code selector so that the lever is pivoted on the spindle as the spindle is pushed through to the casting.

9.34 Secure the spindle by the screw and retaining clip already securing the rear rack.

9.35 Hook the five jockey lever springs to the levers and the spring anchor plate.

Typebars

9.36 Fit the rightmost typebar in the slot next to the rightmost slot of the typebar casting, and retain the typebar by sliding the pivot wire along the groove in the casting (from the right-hand end) and through the hole in the typebar.

9.37 Fit and retain the remaining typebars in their slots, in reverse order of removal, leaving the leftmost slot empty.

9.38 Place the left-hand type support under the left-hand side of the typebar casting, place the bush and felt washer into the side of the casting from above, place the left-hand keep plate over the side of the casting, and secure the keep plate to the casting and the type support by two screws.

9.39 Repeat step 9.38 above for the right-hand side of the casting.

9.40 Unlock and tighten the pivot wire securing screw, on the inner edge of the right-hand keep plate, until the pivot wire is firmly seated in its groove, lock the securing screw by the half-nut, and check that the typebars are free to pivot.

9.41 Slide a typebar casting guide pin through each typebar support and keep plate of the typebar casting from beneath, and retain each pin by a circlip at the top end.

9.42 Fit the typebar rest under the front of the typebars, and secure the rest to the outside of each type support by one screw.

9.43 Secure the typebar bearing bracket, bearing hole rearmost, to the bottom of the type carriage casting by two screws.

9.44 Manoeuvre the typebar casting into the front of the type carriage casting, slide the felt washer over the central guide pin beneath the casting, insert the left-hand and the right-hand guide pins into the holes in the sides of the typebar casting, and the central guide pin into the typebar bearing bracket, and secure the left-hand and the right-hand guide pins to the sides of the typebar casting by a nut.

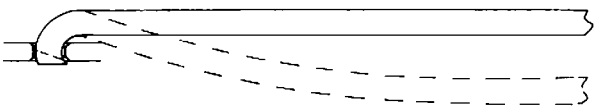
9.45 Ensure that the gap between the typebar casting and the type carriage casting on each side is the same, readjusting the position of the bearing bracket if necessary, and ensure that the typebar casting is free to rise and fall.

Code Seeker Bars

9.46 Beginning at the left-hand side of the type carriage casting and working to the right-hand side –

(a) pass the type wire through the front rack and hook one end into the typebar,
(b) insert the blunt end of the code seeker bar into its slot in the front rack, spring anchorage downward, and slide the other end of the bar into its slot in the rear rack,
(c) lift up the typebar and carefully hook the type wire into the upper hole of the code seeker bar from the outside, whilst bowing the wire inward as shown below,
(d) hook the code seeker bar tension spring into the bar and the spring anchor plate.

Note that the leftmost and rightmost slots of the rear rack and front rack are not used. Note also that the type wire is inserted into the other side of the typebar and code seeker bar after the half-way stage, so that all type wires are on the outside.



9.47 Ensure that each typebar pivots freely.

Ribbon Jumper Assembly

9.48 Fit the pivot bracket to the ribbon jumper arm, pass the pivot pin through the bracket, arm and two felt washers within the arm, and retain the pin by a circlip.

9.49 Hook the jumper arm bail spring into the

anchorage at the front of the rear rack.

9.50 Carefully slide the rear end of the jumper arm bail, with the ribbon jumper arm attached, through the hole at the top of the rear rack and the slot in the pivot bracket, and lower the ribbon jumper onto the guide on the typebar casting whilst at the same time sliding the front end of the jumper arm bail through the slot in the centre of the front rack.

9.51 Secure the pivot bracket to the rear rack by two screws and nuts, and hook the jumper arm bail spring into the bail.

10. TAPE PUNCH UNIT Fig. 5.26 to 5.30

Back Space Pawl Assembly Fig. 5.30 top

10.1 Fit the pawl guide to the outside of the punch casting, engaging the guide with the spring anchor pin in the casting, and secure the guide by one screw.

10.2 Fit the pawl lever, complete with back-feed pawl and spring, to the pawl lever pivot, engage the back-feed pawl with the slot in the pawl guide, and retain the pawl lever by a circlip.

Feed Shaft Fig. 5.30 top

10.3 Fit the squared end of the feed shaft into the bearing at the front of the casting, and retain the shaft by the special screw and the locating plate.

10.4 Fit the back-feed ratchet, teeth pointing counter clockwise, and the retention wheel to the squared end of the feed shaft, and secure the ratchet and wheel by the locknut.

Drive Arm Fig. 5.29 top

10.5 Fit the drive arm to the inside of the casting, and slide the spigot into the bearing aperture.

10.6 Fit the front end of the reset link assembly to the pin of the drive arm, and retain the assembly by a circlip.

Suppression Reset Bail Assembly Fig. 5.29 top

10.7 Fit the pivot of the suppression reset bail assembly to the top rear of the casting, and secure the assembly by a half-nut.

10.8 Fit the rear end of the reset link assembly to the pin of the reset frame, retain the assembly by a circlip, fit a felt washer to the pin, and retain the washer by a circlip.

Suppression Frame and Latch Assemblies Fig. 5.29 top

10.9 Fit the pivot of the punch suppression frame assembly to the inside of the casting, and secure the assembly by a half-nut.

10.10 Hook the suppression frame spring to the reset frame and the anchor pin at the rear of the casting, and check that the arm of the frame engages the latch reset ring on the drive arm.

10.11 Fit the pin of the suppression latch assembly to the casting, just below the drive arm bearing hole, and secure the assembly by a half-nut.

10.12 Hook the suppression latch spring to the bottom of the latch and to the spring anchor plate.

Anvil Bar and Feed Lever Assemblies Fig. 5.30 top and bottom

10.13 Place the anvil bar assembly between the arms of the feed lever assembly, fit the slotted end of the feed lever pivot into the casting, fit the punching frame pivot of the anvil bar assembly to the casting, and secure the assembly by a half-nut.

Clutch and Punch Lever Assembly Fig. 5.30 top

10.14 Ensure the trunnion block is fitted into the end slot of the drive arm, from the left-hand side.

10.15 Insert the clutch shaft of the clutch and punch lever assembly into the hole in the bottom of the casting, whilst at the same time engaging the —

(a) punch lever roller with the slot at the bottom of the anvil bar assembly,
(b) punch lever slot with the feed lever roller,
(c) drive arm spigot with the trunnion block in the end of the drive arm,

and secure the assembly by a half-nut.

10.16 Hook the punch lever spring to the lever roller spigot and to the spring anchor plate.

Interchangeable Punch Block Assembly
Fig. 5.29 bottom and Fig. 5.30 top

10.17 Fit the interchangeable punch block assembly to the punch block mounting frame, and secure the block to the frame by two screws.

10.18 Fit the frame complete with block to the top of the casting, ensure that the flats on the punches contact the punch withdrawing bracket on the anvil bar assembly, and secure the frame to the casting by two screws.

10.19 Fit the spring anchor plate to the left-hand end of the feed lever pivot, and hook the punch withdrawing bracket spring to the bracket anchor pin and to the plate.

Roller Bracket Assembly Fig. 5.30 top

10.20 Fit the roller bracket assembly to the top of the casting, and secure the assembly by one screw, whilst at the same time screwing the lower roller spindle through the bracket and into the casting.

10.21 Screw the lower roller spindle into the casting until the roller is centrally disposed behind the tape guide in the punch block, and secure the spindle by the lock-nut.

Code Reading Bars Fig. 5.29 top

10.22 Slide a felt washer onto the reading bar pivot and then –

(a) code reading bar number 5 (shortest) complete with spring, and hook the spring onto the spring anchor pin,
(b) a punch suppression lever,
(c) code reading bar number 4 complete with spring, and hook the spring onto the pin,
(d) code reading bar number 3 complete with spring, and hook the spring onto the pin,
(e) a punch suppression lever,
(f) code reading bar number 2 complete with spring, and hook the spring onto the pin,
(g) code reading bar number 1 (longest) complete with spring, and hook the spring onto the pin,
(h) two felt washers.

10.23 Retain the assembly on the reading bar pivot by a circlip.

10.24 Align the lower end of the code reading bars with their slots in the rack of the anvil bar assembly, and the lower end of the punch suppression levers with their slots in the suppression latch roller.

10.25 Slide the manual on/off control knob, with the single-grooved hexagonal flat uppermost, onto its shaft at the rear of the casting, between the code reading bars and the punch suppression levers, and retain the knob by a spring, a special washer and a screw.

10.26 Fit the transfer bar rack to the back of the casting, align the code reading bars and the punch suppression levers with their slots in the rack, align a corner of the rack with the machined faces at the rear of the casting, and secure the rack by two screws.

10.27 Fit the aluminium rack to the casting, engage the rack slots with the code reading bars and the punch suppression levers, set the top side of the rack parallel with the top of the levers, and secure the rack by one screw.

10.28 Hook a punch suppression lever spring to the bottom of each lever and to the spring anchor plate at the bottom of the casting.

Retention Lever Assembly Fig. 5.30 top

10.29 Ensure that a helicoil is fitted in the retention lever securing hole in the casting.

10.30 Fit the eccentric bush into the right-hand side of the retention lever, fit the washer to the left-hand side, fit the assembly to the outside of the casting so that the retention lever roller engages with the retention wheel of the feed shaft, and secure the assembly to the casting by a screw.

10.31 Hook the retention lever spring to the lever and the anchor pin protruding from the pawl guide.

Cover Plate Assembly Fig. 5.28 bottom

10.32 Fit a felt washer to the feed shaft.

10.33 Fit the cover plate assembly to the casting pillars and the punch block mounting frame, engage holes in the plate with the five shafts, and secure the plate to the casting and frame by four screws.

10.34 Secure the feed lever pivot to the cover plate by a nut.

10.35 Fit the reset arm of the on/off control lever assembly to the drive arm shaft at the rear of the cover plate, and at the same time the on/off remote control lever of the assembly to

the pivot on the cover plate.

10.36 Secure the reset arm by a screw and nut, retain the on/off remote control lever by a circlip, and hook the assembly spring to the lever and the anchor pin on the cover plate.

10.37 Fit the bracket of the microswitch to the top rear of the casting, secure the bracket by two screws, and secure the cableform to the rear of the casting by a cable clip and screw.

Tape Guide and Pressure Roller Bracket Assemblies Fig. 5.28 bottom

10.38 Fit the bracket of the tape guide assembly to the inside front of the cover plate, engage the two slotted prongs at the top of the tape guide with the sprocket teeth of the feed shaft, and secure the bracket to the plate by two screws.

10.39 Fit the pivot pin of the pressure roller bracket assembly to the inside front of the cover plate, engage the small-diameter part of the roller with the prongs of the tape guide, and secure the assembly to the plate by a nut.

Button Unit Assembly Fig. 5.28 top

10.40 Fit the button unit assembly to the front of the unit and at the same time engage –

(a) the rear of the BACK SPACE key with the pin on the pawl assembly lever,
(b) the end of the retention release lever of the TAPE RELEASE key with the roller pivot of the retention lever,

set the buttons parallel to the cover plate, and secure the bracket of the assembly to the underside of the casting by two screws.

Cuttings Chute Assembly Fig. 5.28 top and Fig. 5.29 bottom

10.41 Fit the cuttings chute assembly to the top of the punch block, and secure the assembly by two screws.

10.42 Secure the assembly tube to the left-hand side of the button unit frame by a deflector, cable clip, spacer and screw.

11. TAPE READER UNIT Fig. 5.31 to 5.34

Drive Belt Only Fig. 5.31, 5.32

Use the following procedure if its is necessary to refit the drive belt only.

11.1 Fit the drive belt over the clutch sprocket at the rear of the main bearing housing.

11.2 Slide the rear bearing over the camshaft and into the bearing seat, and fit the key to the keyway.

11.3 Slide over the rear end of the camshaft as far as they go –

(a) a hexagonal cam spacer,
(b) the send/receive cam, with inscription 1 rearmost,
(c) a circular cam spacer,
(d) the delay disc cam, with inscription 2 rearmost,
(e) a hexagonal cam spacer,
(f) the striker cam, with inscription 3 rearmost,
(g) a circular cam spacer,

and retain the assembly on the camshaft by a screw in the end of the camshaft.

11.4 Fit the bearing clamp over the rear bearing, and secure the clamp to the bracket casting by two screws.

11.5 Fit the cam lubricator to the right-hand side of the bracket at the rear of the housing casting, and secure the lubricator by two screws and the backing plate.

Camshaft Assembly – 1 Fig. 5.31

11.6 Fit the key to the long keyway at the front end of the camshaft, slide the cam sleeve (dog-teeth first) over the front end of the camshaft and up to the first groove, fit the retaining half-rings into the groove, and slide the cam sleeve over the half-rings as far as it goes.

11.7 Slide a ball journal bearing over the front end of the camshaft, and retain the cam sleeve and bearing by a screw in the end of the camshaft.

11.8 Slide over the rear-end of the camshaft –

(a) the smaller-diameter compression spring up to the retaining half-rings,
(b) the larger-diameter compression spring up to the first cam of the cam sleeve,
(c) the ratchet clutch up to and into engagement with the cam sleeve dog-teeth,
(d) the clutch friction flange into the ratchet clutch, ensuring that the clutch friction

flange and the ratchet clutch slide separately and freely under spring pressure,

(e) the clutch (complete with two needle bearings, four retaining washers and intervening felt strip inside and felt washer at the front) up to and into engagement with the ratchet clutch teeth,

(f) the felt washer,

and retain the assembly on the camshaft by a circlip.

11.9 Slide over the rear end of the camshaft –

(a) the thrust bearing up to the front end of the clutch,

(b) the spacer and end cover assembly, spacer first,

(c) a ball journal bearing, then fit the key to the keyway,

(d) a hexagonal cam spacer,

(e) the send/receive cam, with inscription 1 rearmost,

(f) a circular cam spacer,

(g) the delay-disc cam, with inscription 2 rearmost,

(h) a hexagonal cam spacer,

(i) the striker cam, with inscription 3 rearmost,

(j) a circular cam spacer,

and retain the assembly on the camshaft by a screw in the end of the camshaft.

Alarm Trip Lever Assembly – 1 Fig. 5.34

11.10 Fit the alarm lever shaft complete with link lever (frontmost), magnet lever, alarm trip lever, their springs and two circlips, to the inside of the main housing casting, and fit the ends of the shaft to the lowest bearing apertures in the ends of the casting.

11.11 Fit a flanged bush to each end of the alarm lever shaft from the outside of the casting, and secure each bush by a screw.

Bail Shaft Assembly Fig. 5.34

11.12 Fit the long end of the bail shaft assembly (complete with bush) into the large aperture in the rear of the casting, fit the short end into the middle bearing aperture at the front of the casting, and rest the long end of the shaft in the cut-out of the large aperture with the bush behind the casting.

11.13 Fit a flanged bush to the front end of the bail shaft from the outside of the casting, and secure the bush by a screw.

Sequential Shaft Assembly – 1 Fig. 5.33 bottom right and Fig. 5.34

11.14 Ensure that a spring is hooked to each of the six sequential levers, to the upper and lower anchor holes alternately of successive levers, and ensure that the link is engaged with the alarm stop lever at the rear.

11.15 Ensure that a spring is hooked to the short end of the sequential lever.

11.16 Fit the shaft of the assembly (complete with feed lever assembly) to the grooves in the left-hand side of the casting, with the shaft flats outermost and the link vertical and rearmost, and secure the shaft by two screws and clamp plates.

Camshaft Assembly and Clutch Trip lever Assembly Fig. 5.31

11.17 Remove the flanged bush holding the front end of the alarm trip assembly, and allow the assembly to drop.

11.18 Pass the front end of the camshaft through the large aperture in the rear of the casting, seat the front bearing in the front bearing housing, and secure the spacer and end cover assembly to the rear of the casting by a screw in the bottom hole only.

11.19 Refit the flanged bush to the front end of the alarm lever shaft, and secure the bush by a screw.

11.20 Fit the bell guide plate to the end cover, and secure the plate to the end cover and casting by two screws, sandwiching two standard washers between the plate and cover.

11.21 Fit the shouldered pin of the clutch trip lever assembly, complete with any shims, to the left-hand side of the end cover, and secure the pin by a screw from behind the cover.

11.22 Hook the spring of the clutch stop lever to the sequential shaft, between the arms of the alarm stop lever.

Sequential Shaft Assembly – 2 Fig. 5.32 and 5.34 bottom right

11.23 Fit the rack to the bottom left-hand side of the casting, engaging the sequential levers and feed lever with the rack slots, and secure the rack by two screws.

11.24 Hook the three lower sequential lever springs to the front spring anchor pin at the bottom of the casting, hook the feed lever assembly spring to the same pin, and hook the alarm stop lever torsion spring over the lever arm and under the rear spring anchor pin at the bottom of the casting.

11.25 Fit the stop lever rack to the left-hand side of the casting from the inside, engage the rack slot with the rearmost clutch stop lever arm (Figure 5.32), and secure the rack by two screws and clamp plate.

11.26 Slide the spring anchor pin, narrow-end first, through the left-hand hole at the front of the casting, engage the end with the stop lever rack, and retain the pin to the rack by a circlip.

11.27 Hook the three upper springs of the sequential levers to the spring anchor pin.

Alarm Trip Lever Assembly – 2 Fig. 5.31, 5.34

11.28 Slide the start inhibit lever, complete with lever clamp, onto the rear end of the alarm lever shaft, engage the lever with the slot in the bracket, and secure the lever clamp by a screw and special nut.

11.29 Ensure that the start inhibit lever spring is hooked to the lever and the lever clamp.

11.30 Hook the springs of the magnet lever and clamp lever to the rear spring anchor pin at the bottom of the casting.

Pecker Carrier Assembly – 1 Fig. 5.34

11.31 Ensure that the short clip of the oil felt is hooked to the pin of the pecker carrier assembly.

11.32 Fit the shouldered pin of the pecker carrier assembly to the front of the casting at the top right-hand corner, rotating the camshaft if necessary, place the felt over the camshaft cam sleeve, and secure the assembly to the casting by a full nut.

11.33 Hook the oil felt spring between the long clip of the felt and the front spring anchor pin at the bottom of the casting.

Tape Feed Wheel Assembly Fig. 5.33 bottom

11.34 Fit the bracket of the tape feed wheel assembly to the left-hand side of the casting, engage the pin of the pawl carrier with the forked end of the feed lever assembly, and secure the bracket by two screws.

Pecker Carrier Assembly – 2 Fig. 5.34

11.35 Fit the link of the pecker carrier assembly to the pin of the link lever.

11.36 Fit the peckers rack to the right-hand side of the casting, engaging the rack slots with the sequential levers, the pecker levers and the link, and secure the rack by a plate and two screws through the outermost holes of the plate.

11.37 Position the two four-tined pecker spring blades on the plate, and then two two-tined blades, and secure the blades by the clamp plate and two screws, ensuring that the tines are aligned with the pecker levers.

11.38 Fit the belt around the camshaft clutch sprocket.

Mounting Bracket Assembly Fig. 5.32

11.39 Fit the mounting bracket casting to the main housing casting, engaging –

(a) the lower hole in the bearing seat of the bracket casting with the bail shaft,
(b) the bearing seat with the camshaft rear bearing, ensuring that the belt remains on the clutch sprocket,
(c) the slot in the bracket casting with the pin in the right-hand side of the housing casting,

and secure the bracket casting by three screws on the right-hand side.

11.40 Slide the self-aligning bearing onto the rear end of the bail shaft, and retain the bearing to the bracket casting by a screw and bearing retainer.

11.41 Retain the camshaft rear bearing to the bearing seat by two screws and bearing clamp, ensuring that the front bearing is against its retaining plate.

Magnet Bracket and Alarm Switch Assemblies Fig. 5.34

11.42 Fit the magnet bracket assembly to the bottom right-hand side of the housing casting, engaging

the slot in the magnet bracket with the magnet lever of the alarm trip lever assembly, and secure the bracket by two screws.

11.43 Fit the plate of the alarm switch assembly to the left-hand side of the housing casting from below, and secure the plate by two screws.

Key Bracket Assembly Fig. 5.31

11.44 Fit the bracket of the key bracket assembly to the rear of the housing casting, placing the lower end of the start trip lever to the left-hand side of the housing casting rear bracket and to the side of the start inhibit lever, and hooking the stop reset lever into the slot at the top of the link at the rear end of the sequential shaft assembly, and secure the key bracket by two screws, with the shorter screw uppermost.

11.45 Fit the tape-on microswitch complete with insulator to the right-hand side of the key bracket, engage the microswitch actuator with the switch lever, and secure the microswitch by two screws.

Contact Mounting Plate Assembly
Fig. 5.32, 5.34

11.46 Slide the changeover lever vertically over the rear end of the bail shaft and up against the shaft bearing.

11.47 Fit the plate of the contact mounting plate assembly to the front of the bracket casting, engaging —

(a) the striker lever with the top of its cam,
(b) the vacant slot in the carrier with the pin of the changeover lever,
(c) the right-hand edge of the plate with the machined edge of the bracket casting,

and secure the plate by a capstan screw on the left-hand side and an eccentric bush, tie rod and two nuts on the right-hand side.

11.48 Slide the changeover lever along the bail shaft until the lever pin is flush with the rear side of the carrier, and secure the lever to the shaft by a screw and special nut.

11.49 Hook the changeover lever spring to the lever and the eccentric anchor pin on the bracket casting, and hook the striker lever spring to the lever and the anchor pin just below the eccentric anchor pin.

11.50 Fit the cam lubricator (Figure 5.31) to the housing casting rear bracket, and secure the lubricator by two screws and backing plate.

Belt Tensioner Assembly Fig. 5.34

11.51 Fit the plate rack of the belt tensioner assembly to the top left-hand side of the housing casting, engaging the rack slot with the horizontal arm of the start trip lever, and secure the rack by one screw.

Striker Lever Shaft Assembly Fig. 5.32

11.52 Slide the striker lever shaft (groove first) through the front arms of the send/receive switch cam lever and the transmitter delay trip lever, fit the assembly to the right-hand side of the bracket casting so that the arms of the transmitter delay trip lever enclose the striker lever, and slide the striker shaft through the striker lever and the rear arms of the first two levers.

11.53 Retain each of the three levers to the striker lever shaft by two circlips, engage the front arms of the levers with their cams, and secure the shaft to the casting by two clamp plates and two screws.

11.54 Hook the switch cam lever spring to the front arm of the lever and the bottom anchor pin of the bracket casting, and hook the delay trip lever spring to the front arm of the lever and the top anchor pin of the bracket casting.

11.55 Fit the pin of the send/receive link assembly to the rear arm of the switch cam lever, from the front, and retain the assembly by a circlip.

11.56 Engage the slotted end of the link assembly with the pin in an upper projection of the bracket casting.

Tape Deck Assembly Fig. 5.33 top

The following unit adjustments have to be carried out before the tape deck assembly is fitted.

Tape gate clearance
Clutch clearance
Clutch reset lever pressure
Alarm switch position
Alarm stop reset lever position
Detent lever/start trip lever clearance
Tape transmitter On key latch movement
Tape transmitter Off key latch movement
Tape transmitter On key inhibition

11.57 Place the tape deck assembly on top of the

housing casting, engaging the slots in the tape guide with the peckers, the tape-out lever and the tape feed wheel, and secure the assembly by three screws.

Contact Block Cover Fig. 5.32

11.58 Fit the contact cover bracket and then the radio interference suppression assembly to the top front of the contact mounting plate, and secure the bracket and assembly to the plate by two screws.

11.59 Fit the contact block cover to the contact cover bracket, and secure the cover by the knurled nut.

12. TRANSMITTER UNIT Fig. 5.35 to 5.39

Camshaft Assembly — 1 Fig. 5.38

12.1 Ensure that a circlip is fitted to the centre of the camshaft and drum assembly, fit the clutch band to the drum, slide the moving arm over the front end of the camshaft and into engagement with the drum, and retain the arm by a circlip.

12.2 Engage the front end of the clutch band with the clamp screw on the moving arm, and secure the band by a nut.

12.3 Slide over the rear end of the camshaft —

(a) the camsleeve complete with needle cage bearing, washer and bearing seal, and engage the roller end of the camsleeve with the drum,
(b) the thrust bearing,
(c) the clutch plate, dog teeth last,
(d) the delay disc, and slide over the dog teeth,
(e) the clutch plate, and engage the plate with the dog teeth,
(f) the compression spring,
(g) the clutch dog,

engage the clutch dog with the dog teeth of the clutch plate, align its securing hole with the threaded hole in the camshaft, and secure the clutch dog by a screw.

12.4 Fit the rear end of the clutch band between the screws of the adjustable clamp, hook the band to one of the screws, fit a spacer to the other screw, and secure the band and spacer by the clamp plate and two full nuts.

12.5 Slide a ball bearing over the rear end of the camshaft, then the transmitter gear wheel, boss first, align the gear wheel securing hole with the threaded hole in the camshaft, and secure the gear wheel by a screw.

12.6 Slide a ball bearing over the front end of the camshaft and up to the circlip, then the spacer (or the transmitter pulley if the spacer is not available), and temporarily secure by a screw and special washer in the end of the shaft.

Sequential Lever Assembly Fig. 5.39 bottom

12.7 Fit the plastic rack to the inside of the transmitter casting, and secure the rack by two screws.

12.8 Insert the two-holed location bush (threaded hole first) into the front of the casting, on the left-hand side, and the slotted location bush (slotted end last) into the rear of the casting.

12.9 Fit the sequential lever assembly to the inside of the casting, engage the ends of the assembly spindle with the two location bushes, align the threaded holes of the bushes with the securing holes in the casting, and secure each bush by one screw from below.

12.10 Ensure that the sequential lever assembly pivots freely, and hook the WRU inhibiting lever spring to the lever and the anchor hole in the casting.

Run-out Lever and Code Selection Lever Assemblies Fig. 5.39 bottom

12.11 Secure the run-out lever guide to the inside front of the transmitter casting by two screws, engage the run-out crank pin with the front location bush and engage the run-out lever and lever adjustment plate with the right-hand end of the guide.

12.12 Hook the run-out lever spring from the adjustment plate to the left-hand end of the guide.

12.13 Fit the code selection lever assembly to the right-hand side of the casting from underneath, seating the ends of the assembly spindle in the slots, and secure the spindle to the slots by two screws and clamps (the longer screw at the front).

Lock Frame and Sequential Lever Rack Fig. 5.39 bottom

12.14 Place the lock frame inside the casting, with the roller rearmost, and from the front of the casting slide the two-groove end of the lock frame spindle through —

(a) the front bearing lug inside the casting,
(b) two felt washers,
(c) the front arm of the lock frame,
(d) the rear bearing lug inside the casting,
(e) the rear arm of the lock frame,
(f) one felt washer.

12.15 Retain the spindle and the lock frame to the

rear bearing lug by two circlips on the spindle, and ensure the frame pivots freely.

12.16 Slide the torsion spring, hooked end first, onto the rear end of the spindle, hook one end under the roller arm of the lock frame and lodge the other end against the casting so that the lock frame is held down.

12.17 Fit the sequential lever rack (complete with spring, felt and clamp) to the middle of the casting, engaging the rack slots with the sequential levers at the top and bottom, ensure that the sequential levers and the code selection levers are in alignment, and secure the rack to the casting by two screws.

12.18 Ensure that the sequential levers are free to move in the rack, and hook the keyboard lock bail spring to the bail (of the code selection lever assembly) and to the front end of the lock frame spindle.

Camshaft Assembly – 2 Fig. 5.35 top and Fig. 5.39 bottom

12.19 Remove the spacer or the transmitter pulley from the camshaft assembly.

12.20 Hook the lower ends of the sequential levers under the upper ends of the code selection levers.

12.21 Insert the pulley end of the camshaft into the front bearing aperture from the rear, seat the front and rear bearings, place the rear bearing clamp the correct way round over the rear bearing, and secure the clamp by two nuts and studs.

12.22 Fit the keep plate to the rear of the front camshaft bearing, and secure the plate to the casting by two screws at the front.

12.23 Ensure that the camshaft rotates freely, and that the sequential levers are aligned with the cams.

12.24 Fit the transmitter pulley, boss first, to the front end of the camshaft, and loosely secure by the screw and special washer in the end of the shaft.

12.25 Apply to the screw a tightening torque of 10–12 pound-inches.

Trip, Retention and Detent Lever Assemblies Fig. 5.39

12.26 Fit the eccentric pin of the trip lever assembly to the extreme right-hand side of the casting front, and secure the pin by a nut at the front.

12.27 Fit the pivot pin of the retention lever assembly to the casting adjacent to the trip lever assembly, and secure the pin by a nut at the front.

12.28 Slide the detent lever pivot, grooved end first, through –

(a) the front end of the detent lever,
(b) the double torsion spring, ends uppermost,
(c) the rear end of the detent lever,
(d) the answer-back lock lever, and retain the lever with a circlip.

12.29 Fit the assembly pivot to the casting above the retention lever assembly, place the spring anchor plate and detent guide over the hair-pin end of the torsion spring and over the casting flat above the pivot, align the tapped hole in the pivot with the hole in the casting flat, and secure the plate and guide and the pivot by one screw.

12.30 Ensure that the levers pivot freely, and hook the trip latch spring to the latch and the groove in the end of the detent lever pivot.

12.31 Hook the trip lever spring to the lever and the anchor hole in the spring anchor plate and detent guide, and hook the retention lever (thicker) spring to the lever and to the base of the rearmost slot in the spring anchor plate and detent guide.

Send/Receive Lever Assembly Fig. 5.39 top

12.32 Slide the assembly pivot, grooved end first, through –

(a) the hole in the rear right-hand side of the casting, from the rear,
(b) the send/receive lever,
(c) the torsion spring, straight end both last and projecting through the window in the right-hand side of the casting.

12.33 Align the threaded hole in the pivot with the securing hole in the casting, and secure the pivot by a screw.

12.34 Slide the spacer over the end of the pivot and inside the torsion spring, retain the spacer by a circlip, and hook one end of the spring into the lever and rest the other end on the bottom edge of the casting window.

Answer-back Trip Shaft and Inhibiting Lever Assemblies Fig. 5.39 top

12.35 Slide the shaft, complete with the answer-back trip shaft assembly, through –

(a) the hole in the rear left-hand side of the casting, from the rear,
(b) the torsion spring, straight end first,
(c) the detent operating lever, arm last, whilst the lever is placed over the channel near the front of the casting.
(d) the hole in the front left-hand side of the casting,

fit the felt washer to the front end of the shaft, and retain the shaft by a circlip.

12.36 Secure the detent operating lever to the shaft by a screw and special nut, and hook one end of the torsion spring over the special nut, and lay the straight end on the base of the casting.

12.37 Place the spindle (complete with the answer-back trip inhibiting lever assembly) to its seat in the casting above the answer-back trip shaft, fitting the latch immediately behind the stop lever and the eccentric pin under the WRU inhibiting lever, and secure the spindle by the clamp plate and screw.

12.38 Fit the latch complete with torsion spring to the pivot adjacent to the bearing housing, with the ball arm rearmost and horizontal, and retain the latch by a circlip.

12.39 Hook one end of the torsion spring over the ball arm and lay the other end on the casting.

12.40 Hook –

(a) the inhibiting lever rear arm spring to the arm and the latch above,
(b) the inhibiting lever front arm spring to the arm and the end of the WRU inhibiting lever extension above,
(c) the WRU inhibiting lever spring to the middle of the lever extension and the anchor hole in the casting base,
(d) the common frame spring to the bottom of the frame and the anchor pin underneath the casting.

Key Assembly Fig. 5.39

12.41 Hook –

(a) the link to the rearmost hole of the RUN OUT key from the right-hand side,
(b) the RUN OUT key spring to the rear of the key,
(c) the HERE IS key spring to the rear of the key.

12.42 Slide the key pivot through –

(a) the upper hole in the front left-hand projection of the casting,
(b) the HERE IS key,
(c) the RUN OUT key,
(d) the right-hand projection of the casting,

and hook the bottom end of the link to the pin of the run-out crank.

12.43 Engage the forked end of the spacer with the key pivot, between the keys, slide the spindle through the casting projections and the bottom end of the spacer, and retain the spindle to the casting by two circlips.

12.44 Ensure that the keys are free to move, and hook the key springs into the grooves of the spindle.

Answer-back Sub Unit Fig. 5.36

12.45 Lower the back plate of the answer-back sub unit into the channel in the left-hand side of the casting, engage –

(a) the slots in the back plate with the pin in the casting and the answer-back trip shaft,
(b) engage the lower pin of the answer-back drum detent with the vee slot in the end of the detent operating lever (Figure 5.39 top),
(c) the upper pin of the detent with the top of the HERE IS key arm,

and secure the unit to the front of the casting by three screws.

12.46 Press the tab at the top of the latch to the left, slide the drum assembly, sleeve end first, onto the drum spindle, engage the hole in the drum sleeve with the spigot of the feed ratchet, and release the latch to retain the drum by the sleeve.

Striker Sub Unit Fig. 5.35 and 5.37

12.47 Fit the striker sub unit to the rear of the casting, engage the end of the carrier with the top of the common frame (Figure 5.39 bottom), and the forked end of the send/receive lever with the eccentric of the

send/receive lever assembly (Figure 5.39 top).

12.48 Press the sub unit firmly downward to seat the back plate with the two studs in the casting, and secure the sub unit to the back of the casting by four screws from the rear.

Rotate the latch at the rear of the casting to gain access to one of the securing holes.

12.49 Fit the gear cover to the bearing housing studs (Figure 5.35) and secure the cover by two nuts.

12.50 Fit the off-normal switch bracket assembly complete with plug to the left-hand side of the casting, and secure to the casting by two shouldered screws.

12.51 Fit the contact block cover to the contact block and secure the cover to the fixing stud by the knurled nut.

13. FEED UNIT Fig. 5.40

Camshaft Assembly

13.1 Slide along the rear end of the camshaft the –

(a) clutch coupling feed mechanism,
(b) rear ball bearing,
(c) locking washer,
(d) clamp nut.

13.2 Screw up the clamp nut, and lock the nut by bending over a tag of the locking washer.

13.3 Slide along the front end of the camshaft the –

(a) cam sleeve thrust bearing,
(b) thrust washer,
(c) clutch coupling, teeth first,
(d) larger compression spring over the front of the clutch coupling,
(e) cam sleeve, keyways last, into the clutch coupling.

13.4 Remove the old Loctite compound from the threads of the cam sleeve and the cam sleeve nut, and degrease the threads.

13.5 Slide along the front end of the cam sleeve the –

(a) feed cam located in one keyway and with its inscription facing the front,
(b) feed cam spacer with its hole aligned with the hole in the cam sleeve,
(c) feed cam located in the other keyway and with its inscription facing the front.

13.6 Apply Loctite 'nut lock' to the threads of the cam sleeve, and screw the nut onto the sleeve to secure the cams, whilst ensuring that the hole in the feed cam spacer and the sleeve are aligned.

13.7 Slide along the front end of the cam sleeve the –

(a) friction plate with its lug facing rearward to engage the end of a keyway in the sleeve,
(b) felt washer,
(c) friction plate with its two dog teeth outermost,
(d) smaller compression spring.

13.8 Slide along the front end of the camshaft the –

(a) dog clutch feed mechanism to engage with the dog teeth of the friction plate,
(b) front ball bearing and the bearing housing, with the keep plate innermost.

13.9 Screw the bearing clamp nut onto the front end of the camshaft to secure the ball bearing and clutches, and check that the rearmost clutch disengages and engages freely as the clutch coupling is pushed against its spring and then released.

Unit Assembly

13.10 Slide the counter pinion onto the front of the camshaft, align the securing holes, and secure the pinion to the camshaft by a screw.

13.11 Slide the feed unit gear wheel, boss first, onto the rear end of the camshaft, align the securing holes, and secure the gear wheel to the camshaft.

13.12 Fit the camshaft assembly to the unit casting, by seating the rear ball bearing into its housing at the rear of the casting, insert any previously removed shims between the casting and the front bearing housing, and secure the front bearing housing to the casting by two screws.

13.13 Fit the clutch detent, with its roller downward, to the left-hand side of the casting to engage the clutch coupling at the rear of the camshaft, fit three felt washers and thrust washer (foremost) between the lug and lever of the detent.

13.14 Insert the detent pivot, thread first, into the unit casting from the front and through the clutch detent and washers, screw the pivot into the rear of the casting and lock the pin by a half-nut.

13.15 Fit two circlips onto the detent pivot, one immediately in front of the clutch detent and the other immediately behind the thrust washer.

13.16 Fit the trip arm complete with trip latch to the eccentric pin on the left-hand side of the casting, fit a felt washer and retain by a circlip.

13.17 Hook the clutch detent spring and the trip latch spring to their anchorages on the levers and the unit casting.

13.18 Slide feed lever number 1 and feed lever number 2, with their bushes inside and their bosses facing inward, onto the feed lever pivot, and retain the levers by a circlip.

13.19 Bring the rollers together, turn the levers in opposite directions, fit the rear and front feed pawls to the feed lever eccentric pins, spring anchorages outermost and teeth uppermost, and bring the rollers together again, ensuring freedom of the levers and pawls to move.

13.20 Secure the feed lever pivot to the front of the casting by a nut, and ensure that the feed lever rollers contact their cams.

13.21 Hook the two feed lever springs into the bottom of the levers and onto the spring anchor screw, and hook the two feed pawl springs onto the anchorages on the pawls and into the feed levers.

13.22 Slide the withdrawal lever onto its pivot on the front of the feed plate, and retain the lever by a circlip.

13.23 Slide the latch spring, long end first, and then the withdrawal lever latch onto their pivot on the front of the feed plate, retain the lever and spring by a circlip, and hook the spring under the plate and under the latch.

13.24 Fit the feed plate (complete with feed pawl rack) to the top of the unit casting from the front, engaging the feed pawl rack with the feed pawls whilst at the same time –

(a) engaging the feed pawl rack with the feed pawls,
(b) passing the withdrawal pin of the withdrawal lever through the rectangular hole in each feed pawl.

13.25 Press the feed plate downward and rightward to engage the unit casting abutments, and secure the plate to the casting by two screws.

13.26 Fit the lever (complete with lever plate) to the long pivot pin at the front of the casting, inserting the lever spring, ends leftmost, onto the pin and in between the ends of the lever.

13.27 Place the lower end of the lever spring behind the pin at the front of the unit casting, and the upper end against the front edge of the lever, so that the lever is sprung counter-clockwise, and retain the lever and lever spring with two circlips.

13.28 Fit one end of the link strip to the pivot pin on the withdrawal lever and the other end to the pivot pin on the lever plate, and retain each end by a circlip.

14. LINK UNIT Fig. 5.41

14.1 Fit the ungrooved end of the two guide pins into the front side of the unit frame and, whilst sliding the pins through to the rear side of the frame, fit –

(a) transfer bar number 5,
(b) a spacing washer on the left-hand guide pin,
(c) a latch-release bar,
(d) transfer bar number 4,
(e) a spacing washer on the left-hand guide pin,
(f) a latch-release bar,
(g) transfer bar number 3,
(h) a spacing washer on the left-hand guide pin,
(i) a latch-release bar,
(j) transfer bar number 2,
(k) a spacing washer on the left-hand guide pin,
(l) a latch-release bar,
(m) transfer bar number 1,
(n) a spacing washer on the left-hand guide pin,
(o) a latch-release bar,
(p) a spacing collar on the left-hand guide pin,
(q) a shift bar.

14.2 Slide the two guide pins through the rear side of the frame, retain each pin by two circlips at the front end, and check the freedom of all bars to move from side to side.

14.3 Fit the rack (slots to the left) to the bottom

of the unit frame and into engagement with the pivot pin securing lugs, and fit the stop bracket (securing hole uppermost) onto the frame from the rear.

14.4 Fit one end of the pivot pin into the front of the stop bracket and the unit frame, place a torsion spring (ends uppermost) inside the frame and against the front side, and slide the pin through the spring.

14.5 Fit a latch (forked end uppermost) into the foremost slot in the rack and into engagement with the foremost latch-release bar, and slide the pin through the latch.

14.6 Repeat step 14.5 above for the remaining four latches.

14.7 Place a torsion spring (ends uppermost) inside the frame and against the rear side, and slide the pin through the spring, the rear of the frame, and the stop bracket.

14.8 Retain the pin by two circlips on the inside of the two springs.

14.9 Hook the five transfer bar (the smaller) springs to the top of their transfer bars and to the top of the spring anchor plate. Do not use the rearmost anchorage on the plate.

14.10 Hook the five latch-release bar (the larger) springs to the left-hand ends of their latch-release bars and to the bottom of the spring anchor plate. Do not use the rearmost anchorage on the plate.

14.11 Slide the ears of the spring cover down between the arms of the link unit frame.

14.12 Check the freedom of action by pressing the left-hand end of each transfer bar into the latched position, and pressing the left-hand end of each latch-release bar to release the corresponding transfer bar.

15. CODE CONTROL UNIT Fig. 5.42

15.1 Fit a combination bar support, ledge lowermost, to the bottom of the unit casting at each end, and secure each support by two screws.

15.2 Fit a control lever rack to the front and to the rear of the unit casting, so that each engages with the combination bar supports and the end cut-out is on the left-hand side, and secure each rack by four screws.

15.3 Fit a combination bar rack to the left-hand side of each combination bar support and onto the support ledge, end projection rearmost, and secure each rack by two screws.

15.4 Fit a combination bar auxiliary rack to the right-hand side of each combination bar support and onto the support ledge, end projection rearmost, and secure each rack by two screws.

15.5 Fit the rear typehead guide to the top and front of the unit casting, slide the three screws into the slots, and secure by the screws.

15.6 Ensure that the code bars and the code slats are straight.

15.7 Insert a special parallel pin, tapped hole rearmost, into each end of the unit casting from the rear and, whilst sliding the pins through the casting, fit –

(a) the shift bar to the first (rearmost) slot in the combination bar racks, with the straight edge of the bar uppermost and the studded end to the right,
(b) the shift bellcrank over the left-hand end of the bar, seating the ball of the bellcrank into the cut-out of the bar,
(c) combination bar number 1 to the third slot in the combination bar racks, with the inscribed number to the left and on the front side,
(d) the left-hand (T-shaped) bellcrank to the left-hand (rounded) end of a code slat, straight edge uppermost, engaging the stud on the bellcrank with the slot in the code slat from the rear,
(e) the right-hand (L-shaped) bellcrank to the right-hand (extended) end of the code slat, engaging the stud of the bellcrank with the elongated hole in the code slat from the rear,
(f) the code slat complete with bellcranks to the third slot in the combination bar racks, seating the ball of each bellcrank into an end cut-out of the combination bar,
(g) repeat steps (c) to (f) above for combination bars number 2 to 5 in the remaining four slots of the combination bar racks,
(h) press each special parallel pin fully into the unit casting, align the tapped hole in each pin with the securing hole in the casting, and secure each pin by a screw.

15.8 Insert the three special pins bevelled end first into the unit casting from the rear, slide the pins through the casting and the holes in the code slats, align the end of each pin with the front of the casting, and secure each pin by a screw.

15.9 Fit the shift bar cam sector to the right-hand

side of the unit casting, engaging the slot in the sector with the stud on the end of the shift bar, retain the sector with the eccentric pin, and secure the eccentric pin by a screw in the top of the casting.

15.10 Position the shift slide assembly in front of the shift bar cam sector, engage the shift slide with the stud on the sector, and secure the assembly to the casting by two screws and intervening special washers.

15.11 Fit the spring anchor plate to the front side of the rear control lever rack, spring anchorage holes rearmost and lowermost, and secure the plate to the rack by two screws.

15.12 Slide the bevelled end of the control lever spindle through its grooves underneath the casting, from the right-hand end, and through the hook bolt.

15.13 Whilst sliding the spindle further fit the three kinds of control levers to slots number 8 to 18 of the rear control lever rack counting from the left-hand end, and fit the felt washers on the spindle, in the order noted before removal.

15.14 Hook the control lever springs to the spring anchor plate.

15.15 Centralise the control lever spindle, tighten the hook bolt, fit a clamp plate over each end of the spindle, and secure each plate by a screw.

15.16 Fit the switch mounting plate to the rear of the unit casting, and secure the plate to the unit by five screws that do not secure the cable clip.

15.17 Fit the plug and mounting plate to the right-hand side of the unit casting, and secure the plate to the casting by two screws.

15.18 Secure the contact set cableform to the switch mounting plate and to the top of the unit casting by a cable clip and screw.

16. FUNCTION UNIT Fig. 5.43

16.1 Insert the uncountersunk end of the gear segment jockey lever into its slot at the front and left-hand side of the unit main base, slide the jockey lever pivot through the slot and lever, and retain the pivot by a circlip.

16.2 Hook the gear segment jockey lever spring into the lever and the anchor pin at the rear of the unit main base.

16.3 Fit the function bar guide shaft, complete with function bars and shift gear segment, to the front of the unit main base, engage the pin of the gear segment with the slot of the gear segment jockey lever, and secure each end of the shaft to the base by a screw and clamp plate.

16.4 Fit the vertical back guide rack to the rear of the unit main base, so that the function bars enter slots number 2, 3, 4 and 6 from the left-hand end, and secure the rack by two screws and the short retaining strip, ensuring that the bars move freely in their slots.

16.5 Hook the function bar springs into the bars and the spring anchor rack below the unit main base.

16.6 Fit the main bearing shaft, complete with shift cam gear and function reset lever assembly, to the top of the unit main base, align the mark on the shift cam gear with the mark on the shift gear segment, and secure the shaft to the main base by four screws and three clamps.

16.7 Hook the –

(a) carriage feed trip lever spring to the lever and the front guide rack,
(b) carriage return lever spring to the lever and the front guide rack,
(c) function reset lever spring to the lever and the anchor plate on the function bar guide shaft,
(d) print suppression lever spring to the lever and the anchorage at the rear of the unit main base.

16.8 Fit the horizontal back guide rack to the rear of the unit main base, and secure the rack by two screws whilst holding the front end of the rack against the base.

16.9 Place a side frame at the right-hand side of the unit main base, fit the right-hand end of the shift beam assembly pivot to the top hole in the side frame, and engage the rollers on the shift cam arm with the shift cam gear on the left-hand main bearing shaft.

16.10 Engage the locating pin on the main base with the hole in the side frame, and secure the side frame by two screws.

16.11 Fit the power bail assembly pivot to the bottom hole in the other side frame, ensuring that the torsion spring is fitted to the end of the pivot. Do not lose the felt washer on the power bail.

16.12 Place the side frame complete with power bail assembly to the left-hand side of the unit main base, and at the same time insert the end of the power bail assembly pivot into the bottom hole of the right-hand side frame and the end of the shift beam assembly pivot into the top hole of the left-hand side frame.

16.13 Engage the locating pin on the main base with the hole in the side frame, and secure the side frame by two screws.

16.14 Hook the end of the torsion spring into the cut-out in the left-hand side frame, and secure each end of the power bail assembly pivot to a side frame by a nut.

16.15 Slide the spacing collar and then two felt washers over the left-hand end of the shift beam assembly pivot, slide a felt washer over the right-hand end of the pivot, and retain the washers by circlips.

16.16 Hook the shift beam spring to the anchorage on the shift beam casting and to the spring anchor plate on the right-hand main bearing shaft.

16.17 Fit the shift lever to the right-hand end of the shift beam pivot, with the arm rearmost and the pin outermost, and secure the lever by a screw and nut.

16.18 Loosen the screws securing the vertical and horizontal guide racks, slide the racks against the left-hand side frame, and tighten the screws.

17. SELECTOR UNIT Fig. 5.44

NOTE The front-plate is here considered to be on the left-hand side, and the back-plate on the right-hand side.

17.1 Clean and degrease the trip lever pivot screw, apply Loctite 'screw lock' to the screw, and retain the trip lever and latch to the back-plate by the pivot screw and nut plate.

17.2 Hook the trip lever spring to the bottom of the lever and to the anchor screw on the back-plate.

17.3 Fit storage latch number 1 (the largest), complete with a sequential lever and interconnecting spring, to the back-plate, engaging—

(a) the slot in the latch with the second groove of the storage latch rack from the rear,
(b) the hooked end of the lever with the second slot of the sequential lever rack plate,
(c) the forked end of the lever with the second slot of the sequential lever rack pin.

17.4 Hook the spring on the storage latch to the second groove of the spring anchor pin, and slide a felt washer over the sequential lever rack pin.

17.5 Repeat steps 17.3 and 17.4 above to fit the remaining four storage latches and associated sequential levers to the remaining positions in the racks.

17.6 Set the storage latch rack vertically, and tighten its securing nut.

17.7 Fit the two lower (hexagonal-ended) pillars to the back-plate and secure each by a screw, and fit the upper (circular) pillar to the back-plate and secure it by a nut.

17.8 Fit the read bail assembly to the centre of the back-plate, secure the flanged pin of the assembly with a nut, and hook the lock lever spring and the real bail spring to the upper pillar.

17.9 Fit the drive link anchor pin, complete with torsion spring and adjacent circlips, into the central hole in the rear side of the driving frame and, whilst sliding the pin through to the other side of the frame, fit onto the pin —

(a) three felt washers,
(b) the two long tension springs,
(c) another two felt washers.

17.10 Fit three circlips to the pin, one each side of the two springs and one on the inside of the driving frame rear side, and hook the torsion spring to the edge of the driving frame.

17.11 Fit the driving frame (complete with adjustment arms) to the pivot frame, fit the pivot pin into a side of the pivot frame and the driving frame and, whilst sliding the pin through to the other side of the frames, fit onto the pin —

(a) a code transfer lever with a low slot,
(b) a code transfer lever with a high slot,
(c) the remaining three code transfer levers so that the slot positions of consecutive levers alternate.

17.12 Retain the pivot pin by a circlip at each end.

17.13 Fit the rack to the bottom of the pivot frame, engage it with the five code transfer levers, and secure by two screws below and nut plate above.

17.14 Fit the drive link (forked ends first) through the right-hand side of the pivot frame, engage the ends with the drive link anchor pin, between the circlips, and hook the anchor pin (with the two long springs attached) into the sides of the drive link.

17.15 Hook the short spring into the drive link from below, pass the spring through the slot in the link, and hook the other end of the spring to the pivot frame.

17.16 Align the holes in the code transfer levers with the hole in each adjustment arm of the driving frame, insert the drive pin through the holes from the rear side, and engage the straight end of the torsion spring with the groove of the pin to retain it.

17.17 Fit the transfer levers assembly to the back plate, passing the end of the drive link through the rectangular cut-out in the back plate, and secure the assembly by two screws on the left and two nuts on the right.

17.18 To assemble the front plate assembly –

(a) fit the bush of the orientation plate assembly into the hole in the front plate from the right-hand side, fit the clamp plate on the left-hand side of the front plate, engaging the cut-out with the special nut of the trip reset lever assembly, and loosely secure the clamp plate to the front plate and orientation plate by a screw,

(b) pass the orientation knob pinion through the pointer side of the orientation pointer plate, through the hole in the front plate from the left-hand side, and into engagement with the gear arc of the orientation plate,

(c) fit the orientation pointer plate over the bush on the left-hand side of the front plate, centre the slot in the pointer plate over the nearest securing hole of the front plate, pass the orientation knob pinion through the pointer plate and the front plate, and engage the pinion with the centre of the orientation plate gear arc whilst the orientation knob points at 60 on the orientation pointer plate,

(d) retain the knob to the front plate by a spring washer, washer and circlip, in that order,

(e) check that the knob turns freely, point it to 60 on the plate, and tighten the clamp plate securing screw.

17.19 Fit the front plate assembly to the three pillars, engaging the roller on the trip reset lever with the forked end of the trip lever, and secure the plate to the pillars by three screws.

18. MAIN CAMSHAFT Fig. 5.45

18.1 Slide the left-hand clutch coupling, teeth first, over the left-hand (small diameter) end of the camshaft, and engage the coupling with the keyways of the camshaft.

18.2 Slide the bearing housing assembly, bearing first, over the left-hand end of the camshaft, and secure the bearing by the bearing clamp washer and bearing clamp nut (left-hand thread).

18.3 Slide over the right-hand end of the camshaft the –

(a) cam sleeve thrust bearing,
(b) cam sleeve thrust washer,
(c) right-hand clutch coupling,
(d) clutch compression (largest) spring.

18.4 To assemble the cam sleeve assembly, clean, degrease and apply Loctite 'nut lock' to the two keyways, slide over the threaded end of the camsleeve –

(a) the code-read and latch-reset cam, large diameter first,
(b) a cam spacer (about 0.15 inch),
(c) reperforator cam two, inscription 3A outermost,
(d) a cam spacer (about 0.18 inch),
(e) reperforator cam one, inscription 3 outermost,
(f) a cam spacer (about 0.22 inch), aligning the spacer hole with the sleeve hole,
(g) the power bail cam, inscription 4 outermost,
(h) a cam spacer (longest),
(i) the print cam, inscription 5 outermost,
(j) a cam spacer (about 0.38 inch), aligning the spacer hole with the sleeve hole,
(k) the carriage-feed trip cam, inscription 6 outermost,
(l) a cam spacer (about 0.34 inch),
(m) the carriage-return cam, inscription 7 outermost,
(n) the five WRU two-colour cams, with the steps facing the clockwise direction as viewed from the threaded end of the sleeve,

and with all cams in alignment,

(o) the function selection cam, with the steepest slopes facing the clockwise direction as viewed from the threaded end of the sleeve,

(p) a cam spacer (about 0.09 inch),

clean, degrease and apply Loctite 'nut lock' to the threads of the cam sleeve and cam sleeve nut, screw the nut onto the sleeve and tighten the nut to a torque of 30 pound-feet.

18.5 Slide over the right-hand end of the camshaft –

(a) the cam sleeve assembly, engaging the slots in the sleeve with the dog teeth of the right-hand clutch coupling,

(b) the left-hand friction plate, engaging the lug with the slot in the shoulder of the cam sleeve,

(c) the felt washer (largest),

(d) the right-hand friction plate, dog teeth outermost,

(e) the compression spring (larger of the remaining two) up to the friction plate,

(f) the feed unit pinion, engaging it with the friction plate dog teeth,

align the pinion securing hole with the threaded hole in the camshaft, and secure the pinion by a screw.

18.6 Slide the clamp washer over the right-hand end of the camshaft, then the ball journal bearing, and secure the bearing by the bearing clamp nut.

18.7 Slide the main shaft gear wheel, boss innermost, onto the right-hand end of the camshaft, align the gear wheel securing hole with the threaded hole in the camshaft, and secure the gear wheel to the shaft by a screw.

18.8 Slide over the left-hand end of the shaft –

(a) the compression spring,

(b) the right-hand friction plate, aligning the dog teeth with the slots in the bearing clamp nut,

(c) a felt washer,

(d) the left-hand friction plate.

18.9 Push the selector cam sleeve assembly onto the left-hand end of the camshaft, engage the dog teeth of the assembly with the slots in the left-hand friction plate, add a felt washer and then the shim to the camshaft, and secure the assembly to the shaft by the friction plate (left-hand thread).

18.10 Fit the oil tube into its hole in the bearing housing.

19. LAYSHAFT UNIT Fig. 5.46

19.1 Clean, degrease and apply Loctite 'bearing fit' to the bearing seats on the layshaft and in the layshaft bearing casting.

19.2 Push one ball bearing onto the front end of the layshaft (with the two tapped holes) and up to the circlip.

19.3 Push the other ball bearing onto the rear-end of the layshaft and past the circlip groove, fit a circlip, and pull the ball bearing up to the circlip.

19.4 Push the layshaft and bearing assembly, front end first, through the layshaft bearing casting from the rear side, fit the large circlip to the front of the rear bearing housing, and push the layshaft until the rear ball bearing contacts the circlip.

19.5 Slide the main shaft pinion over the front end of the layshaft, boss last, and then the transmitter pinion, boss first, align the securing holes in the pinions with the tapped holes in the layshaft, and secure each pinion by a screw.

19.6 Slide the motor pinion, boss first, over the rear end of the layshaft, align the securing hole in the pinion with the tapped hole in the layshaft, and secure the pinion by a screw.

20. PULL BAR UNIT Fig. 5.47

20.1 Slide the plain end of the spring anchor bar through its bearing holes in the middle of the rack tray, from the left-hand side, and secure the bar by two circlips at the left-hand end.

20.2 Fit the trip bar into each pull bar rack, in the second slot from the right, so that the trip bar lugs are uppermost and the spring anchoring hole is at the front.

20.3 Slide the plain end of the support pin through its bearing holes at the rear of the rack tray, from the left-hand side, through a felt washer and finally through the trip bar.

20.4 Secure the support pin by two circlips at the left-hand end.

20.5 Fit the carriage-return bar into each pull bar rack, in the rightmost slot, so that the spring anchoring pin is at the front and to the right.

20.6 Slide the plain end of the support shaft through its left-hand bearing hole at the front of the rack tray, and through the trip bar, two felt washers, the carriage-return bar and the right-hand bearing hole.

20.7 Secure the support shaft by two circlips at the left-hand end.

20.8 Hook the trip bar spring into the bar and onto the spring anchor bar.

20.9 Hook the carriage-return bar spring onto the bar pin and the spring anchor bar.

21. MOTOR CONTROL SWITCH Fig. 5.48

21.1 Fit the cut-out lever, upturned end rearmost, to the base of the switch bracket, and secure by two shouldered screws and spring washers with the lever fully to the front (auto-start operation) or rear (auto-start inhibition).

21.2 Insert the grooved end of the ratchet pivot pin into the centre hole in the left-hand side of the switch bracket and, whilst sliding the pin through to the right-hand side, fit onto the pin the –

(a) spring collar, flange first,
(b) torsion spring up to the collar flange, so that both ends of the spring point upward and the left-hand end hooks the end of the slot in the switch bracket,
(c) driven ratchet wheel, stud first, up into the spring collar, and hook the torsion spring onto the stud,
(d) drive ratchet wheel, collar first,
(e) pawl lever assembly and the felt washer, spring anchoring hole rearmost.

21.3 Secure the ratchet pivot pin to the right-hand side of the switch bracket by two circlips, and hook the pawl lever spring to the lever and to the base of the switch bracket.

21.4 Fit the ratchet stop plate to the left-hand side of the switch bracket, engaging the end of the bracket with the underside of the driven ratchet stud, and secure the plate by a screw.

21.5 Slide the adjustment lever complete with retaining pawls over the pivot pin at the left-hand side of the bracket, engaging the two pawls with the two ratchet wheels.

21.6 Hook the short end of each pawl spring to the top of its pawl, and the long end to the top of the pivot pin.

21.7 Insert the pawl-release lever pin, double-grooved end first, into the front hole in the switch bracket left-hand side and, whilst sliding the pin through to the right-hand side, fit onto the pin –

(a) the reset-trip lever,
(b) the ratchet cam drive lever, inside the reset-trip lever, with the right-hand arm over the pawl lever,
(c) two felt washers,
(d) the pawl-release lever complete with extension, placing the extension over and between the ratchet wheels,
(e) the special washer between the right-hand sides of the reset-trip lever and ratchet cam drive lever,
(f) a felt washer.

21.8 Retain the levers and pin by six circlips.

21.9 Fit the link plate to the two bushes on the left-hand side of the switch bracket, with the spring anchorage tags lowermost and the front of the plate engaging the bottom of the reset trip lever.

21.10 Hook the link plate spring to the rear of the plate and the bottom of the switch bracket.

21.11 Slide the pawl trip plate, forked end first and dimples downward, through the slot in the right-hand side of the switch bracket, ensuring that the arms of the reset trip lever are behind the plate.

21.12 Hook the pawl trip plate spring to the pawl trip plate and the link plate.

21.13 Fit the keyboard trip lever to the shouldered pin on the right-hand side of the plate, with the horizontal arm under the end of the pawl trip plate, and hook the lever spring to the lever and the spring anchor screw on the switch bracket.

22. ELECTROMAGNET UNIT Fig. 5.49

22.1 Slide the armature pivot, complete with armature assembly, through the bottom left-hand side of the casting and lamination assembly, and secure the pivot to the casting by a nut at the right-hand end.

22.2 Screw the two stop screws into the top of the casting and lamination assembly, mounting on each stop screw a shim, a shim retainer and a compression spring.

22.3 Retain each stop screw by tightening its clamp screw.

22.4 Fit the magnet, red dot uppermost and facing left, into the casting and lamination assembly, and then fit the magnet retaining spring. Do not subject the magnet to shock.

22.5 Fit the laminated core assembly to the top of the casting and lamination assembly with the leads rearmost, interpose a special washer between each end of the core and the top of the casting, and secure the core to the casting by two screws.

22.6 Fit the plug mounting bracket, complete with plug, to the left-hand side of the casting and lamination assembly, and secure the bracket to the casting by a screw.

22.7 Fit the adjustment bracket to the right-hand side of the casting and lamination assembly with the abutment arm rearmost, engage the hole in the middle of the bracket with the end of the armature pivot, and ensure that the magnet retaining spring is seated in the casting and the coil lead runs between the bracket and casting.

22.8 Secure the bracket to the casting by two screws.

23. SIMPLE UNITS Fig. 5.50 to 5.54

The location of parts on simple units and the way in which the parts are secured are shown in the following figures.

Fig. 5.50 – manual control unit
Fig 5.51 – hours counter
Fig. 5.52 – dashpot assembly
Fig. 5.53 – print bail assembly
Fig. 5.54 – two-colour and line-feed assembly

SECTION D – ASSEMBLING THE MACHINE

The unit adjustments have to be carried out before the units are assembled to the machine.

1. MOTOR CONTROL SWITCH Fig. 5.14

1.1 Fit the motor control switch to the inside of the left-hand side frame, to the lower rear part.

1.2 Secure the switch to the side frame by two screws.

1.3 Carry out the following adjustments.

Motor control switch – retention pawl clearance
Motor control switch – switch-off link
Motor control switch – ratchet release

2. SIDE FRAMES Fig. 5.3, 5.4

2.1 Fit the left-hand side frame to the main base, and secure by two screws.

2.2 Fit the right-hand side frame and handle to the main base, and secure both by two screws.

2.3 Slide the tie rod through the holes in the top of the side frames, and fit two circlips to the rod inside the frames.

2.4 Secure the tie rod by a nut at each end.

3. PULL BAR UNIT Fig. 5.14

3.1 Fit the pull bar unit over the two locating pins on the main base, and slide the unit forward until the front rack contacts the front locating pin.

3.2 Secure the unit by two screws, ensuring that the front rack contacts the front locating pin.

4. TWO–COLOUR PRINT AND LINE FEED ASSEMBLY Fig. 5.14

4.1 Fit the assembly over the two locating pins on the main base.

4.2 Secure the assembly by three screws, ensuring that the spring anchoring tag is secured under the front right-hand screw.

5. PRINT BAIL CASTING Fig. 5.14

5.1 Fit the print bail casting to the two pivot brackets on the main base.

5.2 Secure the left-hand pivot of the casting to the bracket by a circlip.

6. LAYSHAFT UNIT Fig. 5.14

6.1 Fit the layshaft unit over two locating pins on the main base, and slide it to the right until the abutment screw contacts the abutment pin on the main base.

6.2 Secure the unit by three screws, ensuring that the abutment screw and pin are in contact.

7. MAIN CAMSHAFT Fig. 5.14

7.1 Give access to the main camshaft by turning the code read cam lever counter-clockwise and ensuring that the camshaft retention lever is down.

7.2 Pass the camshaft through the bearing aperture in the left-hand side frame.

7.3 Rotate the cylindrical bearing housing at the left-hand end of the shaft, until the plastic lubrication tube fits just forward of the uppermost casting projection of the left-hand side frame.

7.4 Push the bearing housing in as far as it goes, and position the code read lever to its cam, turning the camshaft in order to do so.

7.5 Keeping the code read lever to its cam, withdraw the camshaft slightly until the outside of the cylindrical bearing housing is flush with the outer machined surface of the side frame, and tighten the two screws securing the roller bearing clamp.

7.6 Fit the main camshaft gear wheel to the right-hand end of the camshaft and secure by its screw.

7.7 Fit the camshaft retention lever spring and storage latch reset spring to their anchorages.

7.8 Rotate the camshaft and ensure that it moves freely and that the retention lever, code read lever and storage latch reset lever function correctly.

7.9 Fit the pivot pin to the clutch detent lever, together with the felt lubricating washers.

7.10 Fit the detent assembly to the left-hand side frame, together with the detent lever guide.

7.11 Align the threaded hole in the pivot pin with the hole in the side frame, and secure the pin by passing the screw through the guide and side frame and screwing it into the pin.

7.12 Fit the clutch detent spring to its anchorages, and ensure that the detent lever functions correctly.

7.13 Carry out the following adjustment.

Answer-back release mechanism

8. SELECTOR UNIT Fig. 5.11, 5.14, 5.44

8.1 Ensure that the wire link, normally hanging from the top rear pillar, is hooked into the read cam lever, and that the sequential lever rack is set fully away from the cam assembly.

8.2 Fit the unit to the left-hand side frame, by pressing the trip latch lever to the front and positioning the unit back plate against the cylindrical bearing housing and over the locating pin on the side frame, and loosely secure to the side frame by three screws.

8.3 Secure the unit to the cylindrical bearing housing by the two special screws.

8.4 Fit the felt lubricating strip over the rear special screw so that the strip lies on the cams.

8.5 Ensure that the trip latch lever engages the main clutch detent assembly, and then tighten the three unit securing screws to the side frame.

8.6 Unhook the wire link from the read cam lever, and allow the wire to hang from the pillar.

8.7 Shift the sequential lever rack fully toward the cam assembly, and then tighten the rack securing screw.

8.8 Depress the drive link, engage the code read lever pivot pin (with lubricating felt washer) into the slotted hole in the end of the driving link, press the link upward to complete the engagement and secure by a circlip.

8.9 Fit the selector unit front-plate to the three pillars, and at the same time insert the trip lever stud into the hole in the front-plate and engage the trip lever fork with the roller of the trip reset lever on the front-plate.

8.10 Ensure that the front-plate is firmly seated, and secure the plate to the pillars by three screws.

8.11 Carry out the following adjustments.

Clutch detent/trip lever latch clearance
Clutch detent position
Storage latch position

9. ELECTROMAGNET UNIT Fig. 5.11

9.1 Fit the electromagnet unit to the selector unit back-plate so that the two threaded pins on the back-plate enter the holes in the unit adjustment bracket.

9.2 Seat the adjustment bracket extension on top of the abutment plate, and secure the unit by two nuts.

9.3 Connect the plug to the unit socket.

9.4 Carry out the following adjustments.

Electromagnet armature height
Electromagnet armature balance
Read bail height
Trip lever/reset lever setting

10. FUNCTION UNIT Fig. 5.13, 5.14

10.1 Fit the function unit onto the two locating pins on the main base, ensuring that the shorter function bar at the front engages with the line feed lever and the longer function bar engages with the answer-back bellcrank lever of the two-colour and line feed assembly.

10.2 Slide the unit to the left until it contacts the machined projection on the side frame.

10.3 Ensure that the answer-back shaft of the two-colour and line feed assembly is free to move, by pushing the end of the shaft inward from the bottom of the right-hand side frame.

10.4 Secure the unit by four screws, ensuring that the unit is against the side frame and that the answer-back shaft is still free.

10.5 Carry out the following adjustment.

Power bail position

11. DASHPOT UNIT Fig. 5.11

11.1 Slide the dashpot unit into the top of the left-hand side frame from the outside, and rotate until the cut-out in the plunger is uppermost and the two slots are in line with the machined top of the dashpot lever post on the side frame.

11.2 Slide the ball end of the dashpot lever into the plunger cut-out, so that the ball end points toward the machine.

11.3 Fit the special washer between the lever and the lever post, and secure the lever and washer by the special screw.

11.4 Rotate the dashpot slightly so that the lever enters the slot centrally, and secure the dashpot by three screws and plastic clamps.

11.5 Ensure that the lever moves the plunger in and out freely, and set the lever with the plunger out so that the carriage return is buffered.

12. PRINT CHANNEL Fig. 5.13, 5.14

12.1 Fit the print channel to the two locating pins on top of the print bail casting, and engage the print suppression tongue under the print suppression lever.

12.2 Secure the channel with two screws.

12.3 Fit the print spring to its anchors on the print bail casting and spring lever anchor standing on the main base.

13. CODE CONTROL UNIT Fig. 5.3, 5.12, 5.13

13.1 Fit the code control unit to the rear of the two side frames and ensure that the levers and linkages are positioned to satisfy the conditions below.

(a) The foot on the bottom of the carriage-return control lever stands on top of the horizontal pull-bar link.
(b) The five vertical control levers fit freely into the slots of the function-unit guide rack.
(c) The lug on the bottom of each vertical control lever engages under a horizontal function bar.
(d) The slotted end of the shift slide on the right-hand end of the code slats engages the stud on the shift lever of the function unit.

13.2 Fit the locating pin, running along the bottom of the code control casting, to the grooves in the side frames.

13.3 Engage the unit plug with the socket of the right-hand side frame.

13.4 Slide the unit toward the left until the casting contacts the abutment washer on the left-hand side frame, and secure the unit by two screws.

13.5 Raise the function unit power bail, ensure that the felt lubricating washer is on the power bail pin, and engage the pin in the power bail link.

13.6 Secure the link by engaging the end of the torsion spring with the machine-front side of the pin.

13.7 Carry out the following adjustments.

Shift slide position
Bell and WRU contacts setting

14. LINK UNIT Fig. 5.10, 5.11

14.1 Release and remove the knurled drive pin from the selector unit, and allow the transfer levers to fall away.

14.2 Latch the transfer bars of the link unit by pressing them inward until the latches engage.

14.3 Fit the link unit to the left-hand side frame, and at the same time pass the ends of the transfer bars through the side frame and hook them to the plastic bellcranks on the left-hand end of the code control unit, by passing the ends under the bellcrank pins. Allow the shift bar to pass behind the shift-bar bellcrank.

14.4 Move the link unit so that the end of its shift bar engages with the shift bar bellcrank of the code control unit.

14.5 Secure the unit at the top by one screw.

14.6 Engage the top of the transfer levers with corresponding storage latches, and insert the knurled drive pin through the transfer frame and transfer levers.

14.7 Secure the drive pin by engaging the end of the torsion spring behind the groove in the pin, outside the transfer frame.

14.8 Carry out the following adjustments.

Code transfer levers alignment
Code transfer levers clearance

15. CARRIAGE FEED UNIT Fig. 5.4

15.1 Ensure access to the carriage feed unit gear wheel, by engaging the main clutch and turning the main camshaft until the print bail casting is in its rearmost position.

15.2 Fit the unit over two locating pins on the main base, and ensure that the unit gear wheel meshes with the relevant gear wheel on the main camshaft.

15.3 Ensure that the lever on the left-hand side of the unit engages, from behind, the carriage-return pull bar of the pull bar unit.

15.4 Secure the unit by two screws, and at the same time press the unit backward so that the front of the unit contacts the front locating pin.

16. HOURS COUNTER Fig. 5.4

16.1 Fit the hours counter to the main base so that the gear wheel of the counter is in mesh and in alignment with the worm gear wheel on the carriage feed unit.

16.2 Secure the counter by two screws.

17. MANUAL CONTROL UNIT Fig. 5.9

17.1 Fit the manual control unit to the main base, and ensure that the manual carriage return bar engages, at the front, the carriage-return pull bar of the pull bar unit.

17.2 Secure the unit by three screws.

18. TRANSMITTER UNIT Fig. 5.4, 5.14

18.1 Set the machine to the rest condition.

18.2 Fit the transmitter unit to the main base so that its rear edge contacts the two location pins, and at the same time engage the unit plug with the base socket and the unit gear wheel with the layshaft unit gear wheel.

18.3 Slide the unit to the left so that the code selector lever spindle contacts the machined lug on the underside of the main base, and secure the unit by three screws.

18.4 Carry out the following adjustments.

Layshaft/transmitter gear mesh

19. TYPE CARRIAGE AND RIBBON UNIT Fig. 5.4, 5.8, 5.10, 5.12, 5.14

19.1 Set the machine to the rest condition.

19.2 Raise the code control unit slats to the mark condition, by depressing the transfer bars of the link unit.

19.3 Set the shift bail to the letters condition, by pulling out the ltters bar at the back of the function unit. This bar is the first of the five from the left-hand side of the machine.

19.4 Remove the carriage stop-screw on the right-hand side frame, ensuring that the lock nuts remain locked.

19.5 Raise the code selector bellcranks underneath and at the rear of the type carriage and ribbon unit.

19.6 Hold the unit in correct relation to the machine, and fit to the right-hand end of the machine by engaging –

(a) the rear roller at the rear of the unit with the typehead guide channel on the code control unit,
(b) each code selector bellcrank to the channel of its slat on the code control unit, by sliding on from the end of the slat and not by forcing over the top,
(c) the type bail roller, under the print bail casting, with the print channel of the function unit,
(d) the shift skid, under the type bar casting, with the shift beam tube of the function unit.

19.7 Gently move the unit to the left to ensure that the bellcranks ride correctly in the code slats.

19.8 Slide the type carriage support bar under the two type carriage rollers, at the front but underneath the unit, and seat the ends of the bar on the side frames.

19.9 Secure the bar to the side frames by two screws.

19.10 Slide the unit fully to the left, and fit the carriage-return spring to its anchors on the unit and the left-hand side frame.

19.11 Refit the carriage over-travel stop screw to the right-hand side frame.

19.12 Carry out the following adjustments.

Print channel setting
Print suppression member
Carriage rear guide height

20. TWO–COLOUR PRINTING BAIL Fig. 5.4, 5.7, 5.9

20.1 Fit the two-colour printing bail between the two special screws in the side frames, and do up the left-hand screw to secure the bail.

20.2 Check that the bail pivots freely with a minimum of end play, readjusting the right-hand screw and locknut if necessary.

20.3 Engage the top of the two-colour printing link with the bail lever and fasten by rotating the spring clip to the locking position.

21. MOTOR UNIT Fig. 5.3

21.1 Fit the motor unit to the rear of the machine, so that the two locating pins engage the two locating holes in the main base socket plate and the two plugs engage the two sockets.

21.2 Push and hold down the unit on the left-hand side of the machine so that the abutment screw contacts the locating pin on the main base, and secure the unit to the main base with the two captive screws.

21.3 Fit the gear guard to the rear of the layshaft unit, and secure by one screw.

22. KEYBOARD UNIT Fig. 5.4, 5.6

22.1 Stand the machine on the motor unit.

22.2 Set the code selector bars of the keyboard unit to the mark condition (to the left).

22.3 Fit the unit to the underside of the main base, and engage the code selector bars with the corresponding code levers below the transmitter unit.

22.4 Slide the unit toward the rear of the main base until each end of the keybar pivot contacts a machined lug of the main base.

22.5 Secure the unit with four screws, ensuring that the keybar pivot contacts the machined lugs.

22.6 Stand the machine on its feet.

23. PLATEN UNIT Fig. 5.4

23.1 Move the type carriage above one-third of the way along from the left-hand side frame.

23.2 Fit the platen unit over the two locating pins on top of the side frames, so that the platen spindle extension is close to the platen knob support.

23.3 Secure the unit by two screws.

23.4 Engage the bottom end of the line feed link to the lever of the two-colour and line feed assembly (Figure 5.54), and fasten by rotating the spring clip to the locking position.

23.5 Engage the line feed shaft lever of the platen unit with the link, and fasten by rotating the spring clip to the locking position.

23.6 Carry out the following adjustments.

Carriage stop screws setting
Ribbon jumper height
Two-colour printing bail position

24. TAPE READER UNIT Fig. 5.4, 5.32

24.1 Hold the camshaft belt of the tape reader unit in position, so that the belt is positioned over its sprocket wheel and placed wholely over the tension roller.

24.2 Fit the unit to the right-hand side of the main base and —

(a) engage the two locating pins at the ends of the plug with the locating holes at the ends of the socket in the main base,
(b) hook the send/receive link over the send/receive lever eccentric of the transmitter unit,
(c) place the transmitter delay trip lever over the tape reader delay lever of the transmitter unit,
(d) place the start trip lever over the detent lever of the transmitter unit.

24.3 Pass the free end of the drive belt over the pulley wheel on the transmitter unit.

24.4 Push the unit against the transmitter unit, and secure by three screws.

25. TAPE PUNCH UNIT Fig. 5.4, 5.9

25.1 Fit the drive arm assembly to the inside of the left-hand side frame, engage the rollers with the relevant cam on the main camshaft, and engage the centre pivot with the hole in the side frame.

25.2 Secure the assembly to the side frame by three screws.

25.3 Set the tape punch unit to the off condition, by pulling out and turning the white hexagonal knob until the flat with two stripes is uppermost.

25.4 Fit the unit to the outside of the left-hand side casting and engage —

(a) the code and suppression levers with the link unit,
(b) the drive pin to the bush on the drive arm assembly,
(c) the plug and socket,

(d) the locating hole, just below the rear securing hole of the casting, with the locating pin on the side frame.

25.5 Secure the unit by two captive screws and one free screw.

25.6 Fit the tape reel holder to the left-hand side frame, and position the switch operating arm of the tape-out lever above the tape-out switch.

25.7 Secure the holder by three screws.

25.8 If the tape guide and snatch roller are removed, secure the tape guide bracket behind the platen spindle knob bracket, using the same two screws, and secure the snatch roller by two screws to the side frame just below the tape guide.

25.9 Secure the left-hand machine handle by two screws to the projections on the left-hand side of the main base.

26. KEYBOARD MASK Fig. 5.5, 5.4

26.1 Fit the keyboard mask to the main base, so that the control keys and field keys project through the mask.

26.2 Secure the mask by two screws at the rear.

26.3 Engage the plug of the end-of-line warning lamp with the socket on the transmitter unit.

27. BASE TRAY Fig. 5.2, 5.4, 5.14

27.1 Raise the machine by its handles, and lower the machine onto the base tray so that the lock plate on each side of the main base engages the guide dowel on each side of the base tray.

27.2 Press down the right-hand side frame, and slide the lock plate forward and into engagement with the groove in the guide dowel.

27.3 Press down the left-hand side frame, and slide the lock plate backward and into engagement with the groove in the guide dowel.

27.4 Engage the mains and signal sockets of the base tray with the mains and signal plugs at the rear of the machine, and lock the sockets into position.

28. MACHINE COVER Fig. 5.1, 5.2, 5.3

28.1 Ensure that the platen knob is removed from the machine.

28.2 Place the machine cover, with the lid closed, over the machine and squarely onto the base tray.

28.3 Raise the lid, and ensure that the Oddie stud on each side of the cover is in alignment with the hole in the cover securing bracket on the base tray.

28.4 Turn each Oddie stud so that the head slot is parallel with the side of the cover, and press each stud downward against the spring until it clicks into the securing bracket.

28.5 Fit the platen knob to the left-hand extension of the platen spindle, and lower the lid.

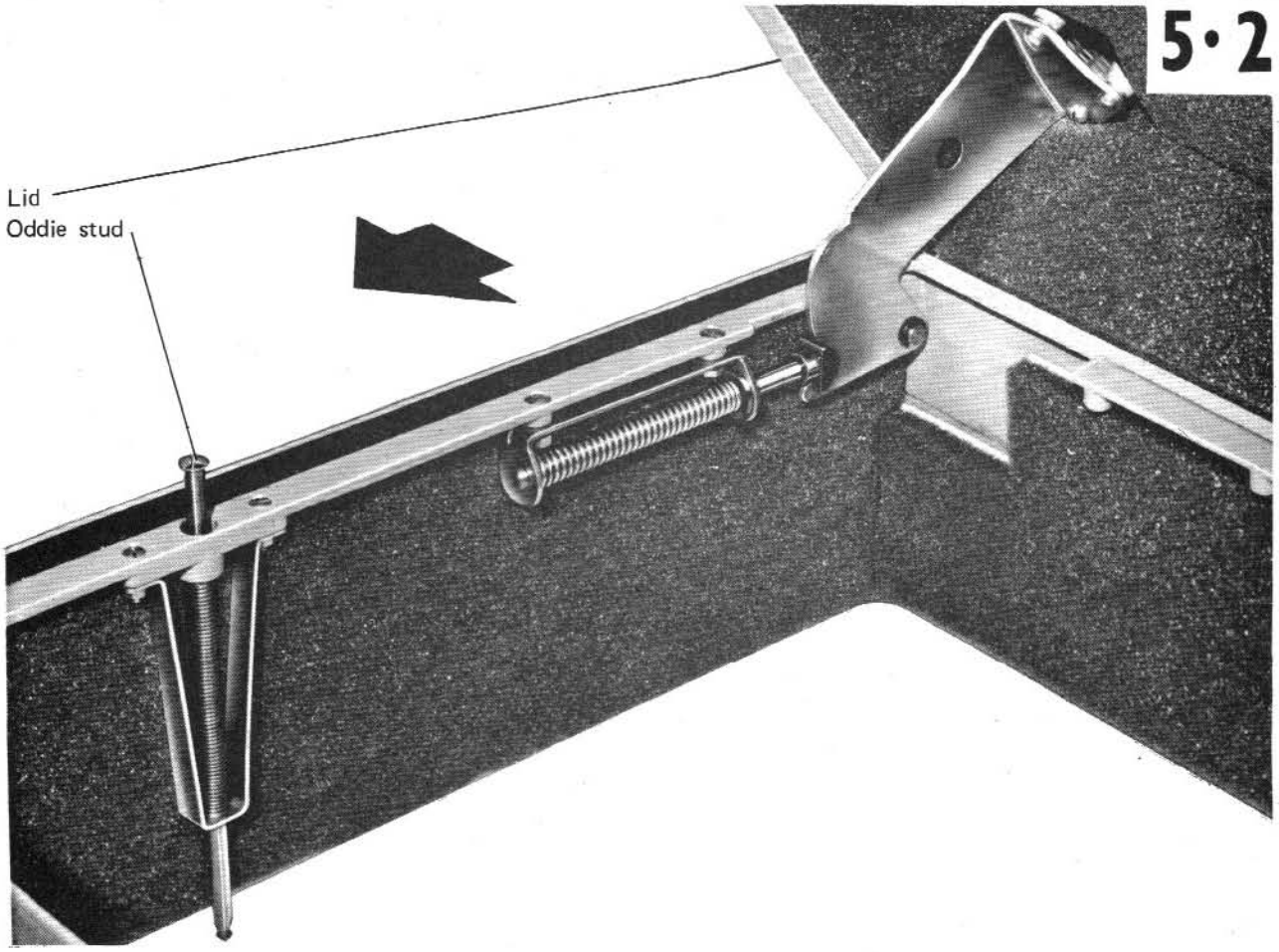


Fig 5.1 MACHINE COVER

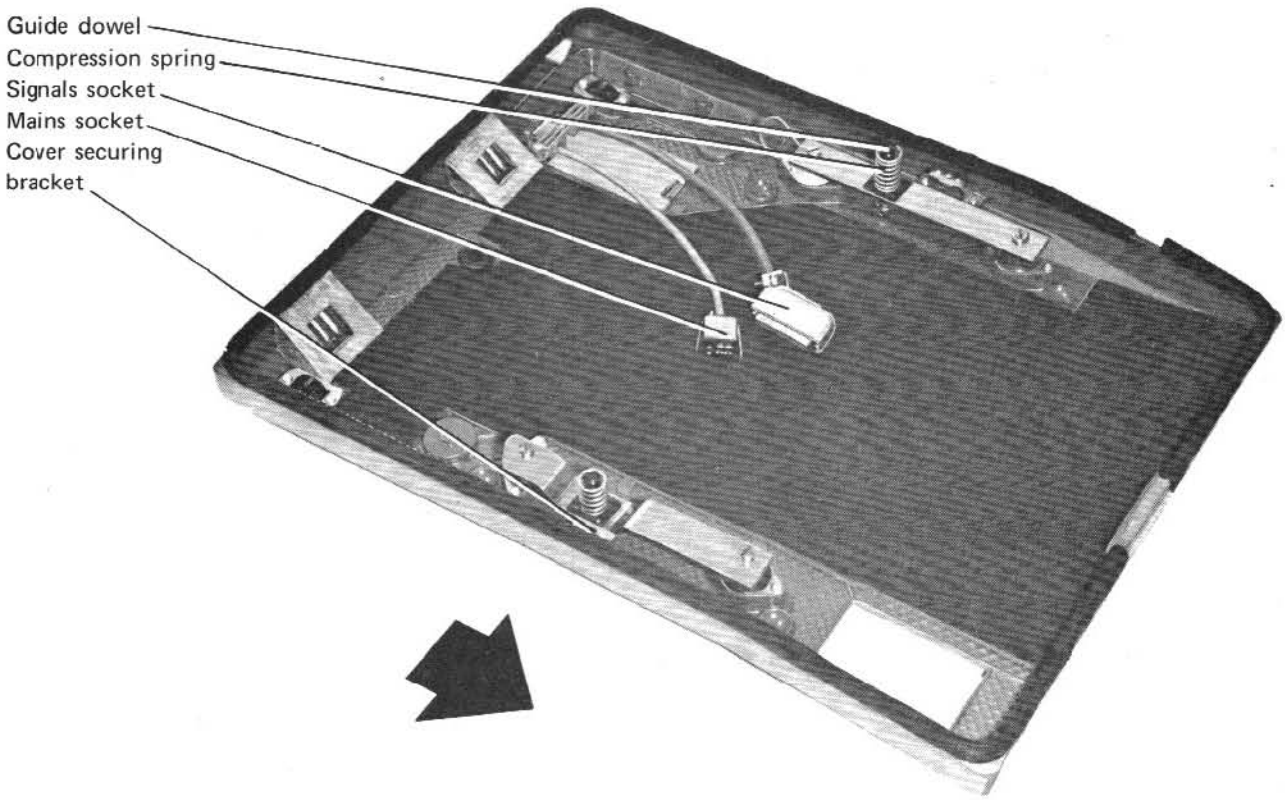


Fig. 5.2 BASE TRAY

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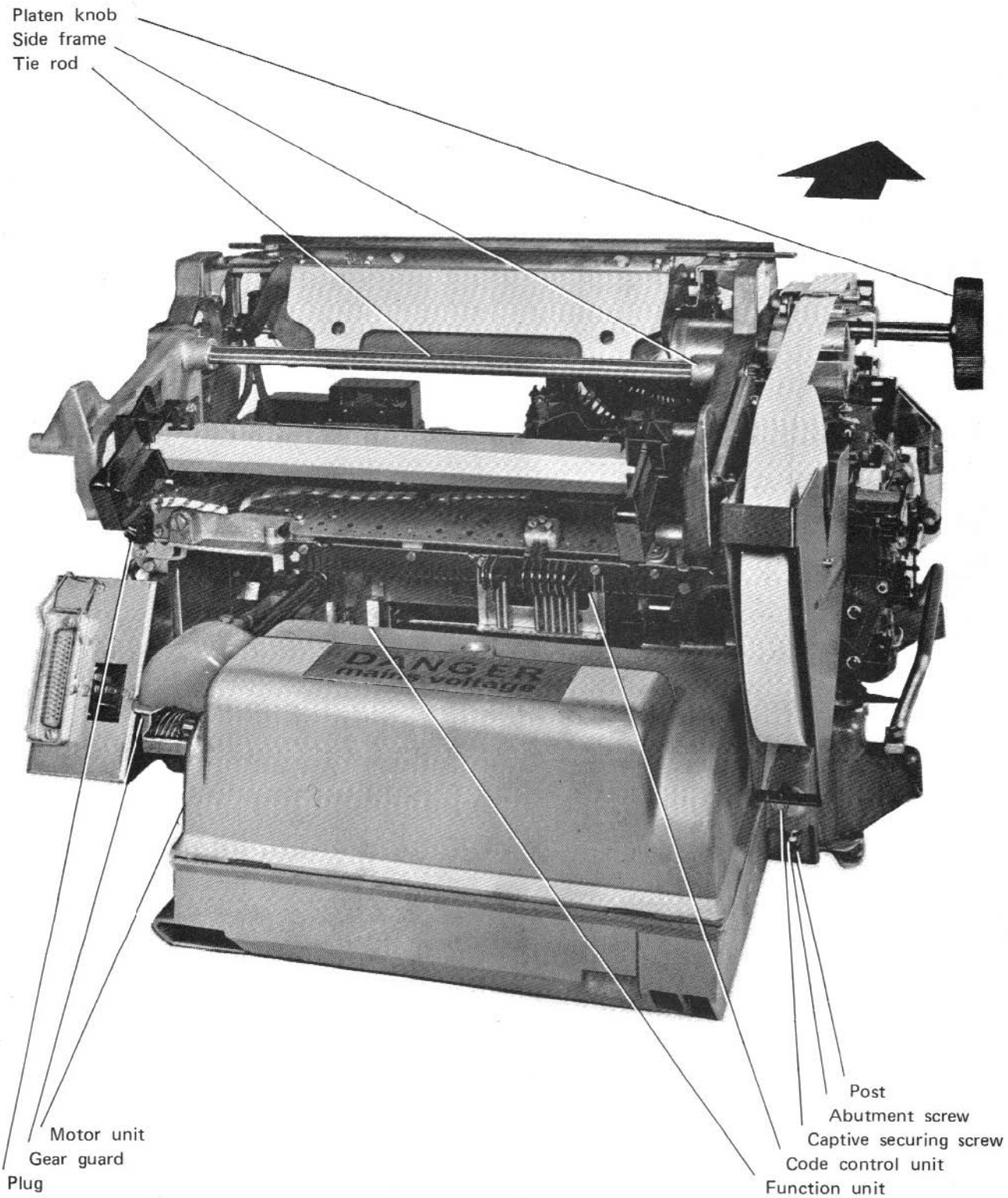

Fig. 5.3 GENERAL VIEW SHOWING MOTOR UNIT

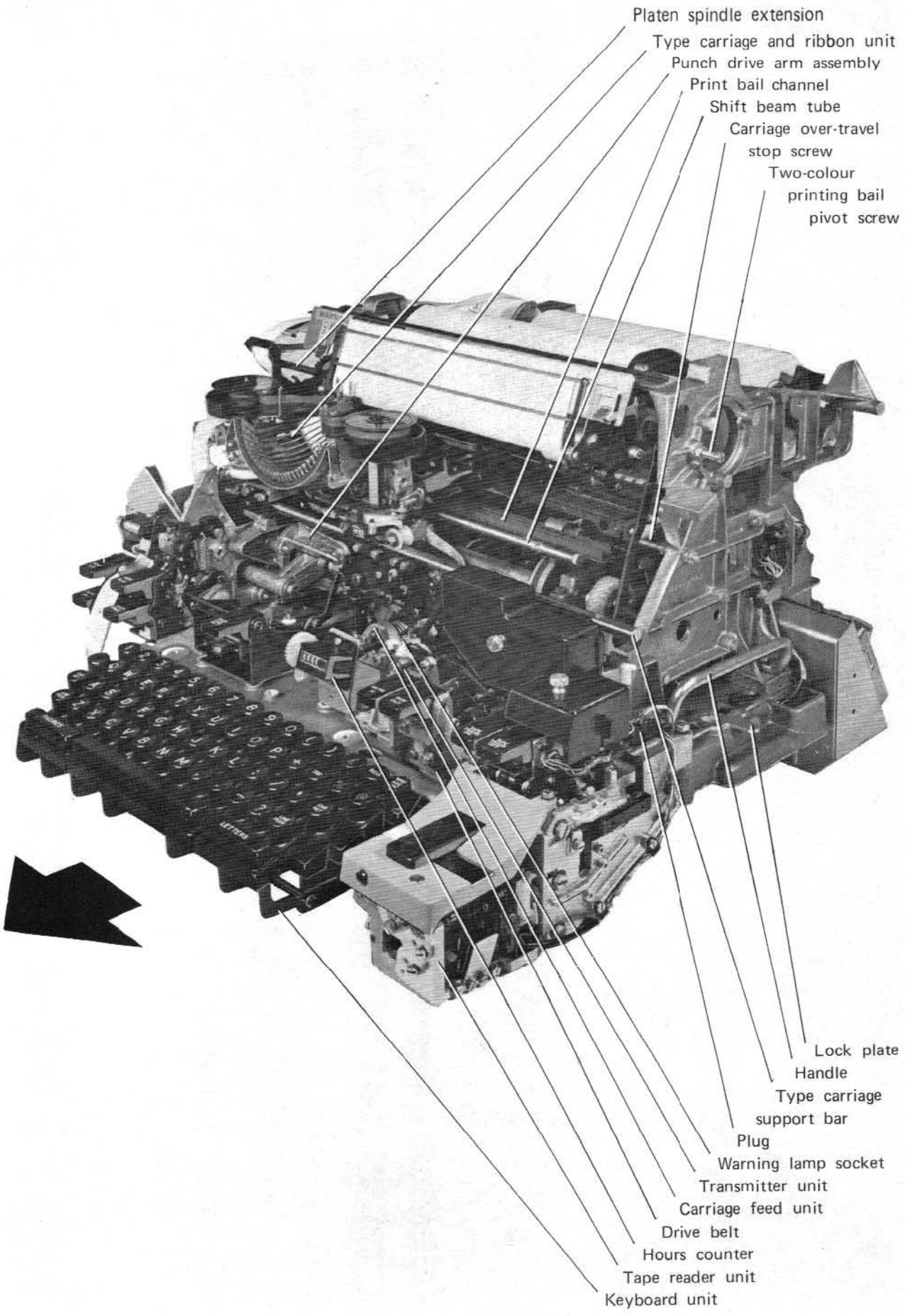

Fig. 5.4 GENERAL VIEW SHOWING TAPE READER UNIT

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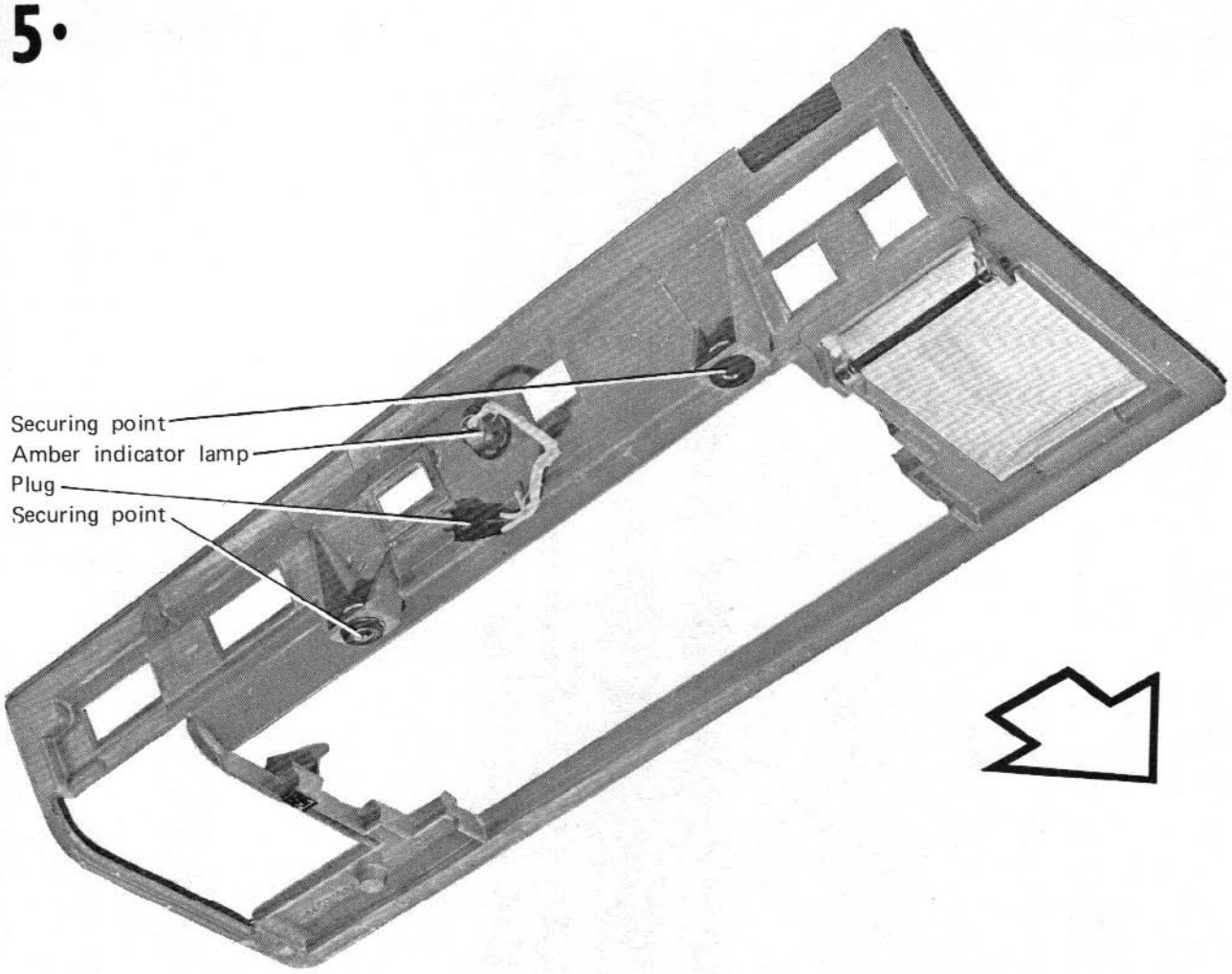

Fig. 5.5 KEYBOARD MASK

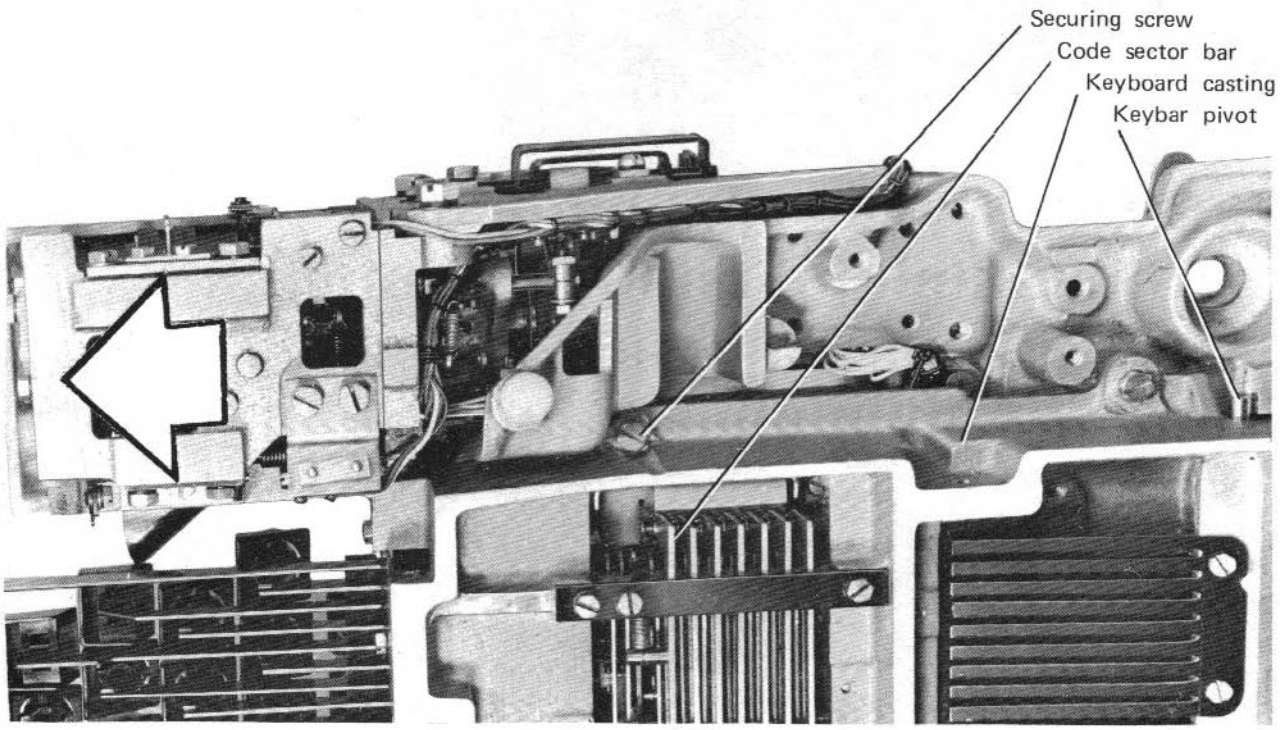

Fig. 5.6 KEYBOARD UNIT

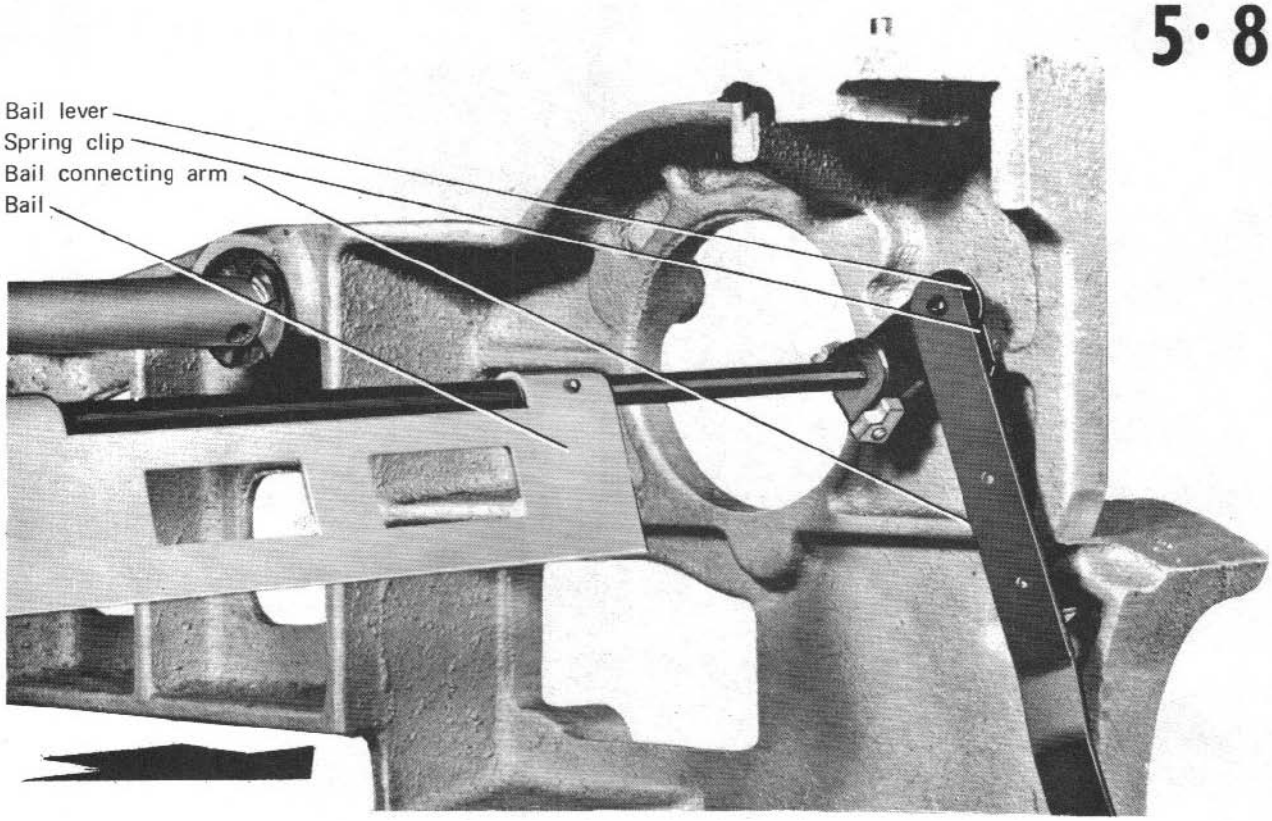

Fig. 5.7 TWO–COLOUR PRINTING BAIL

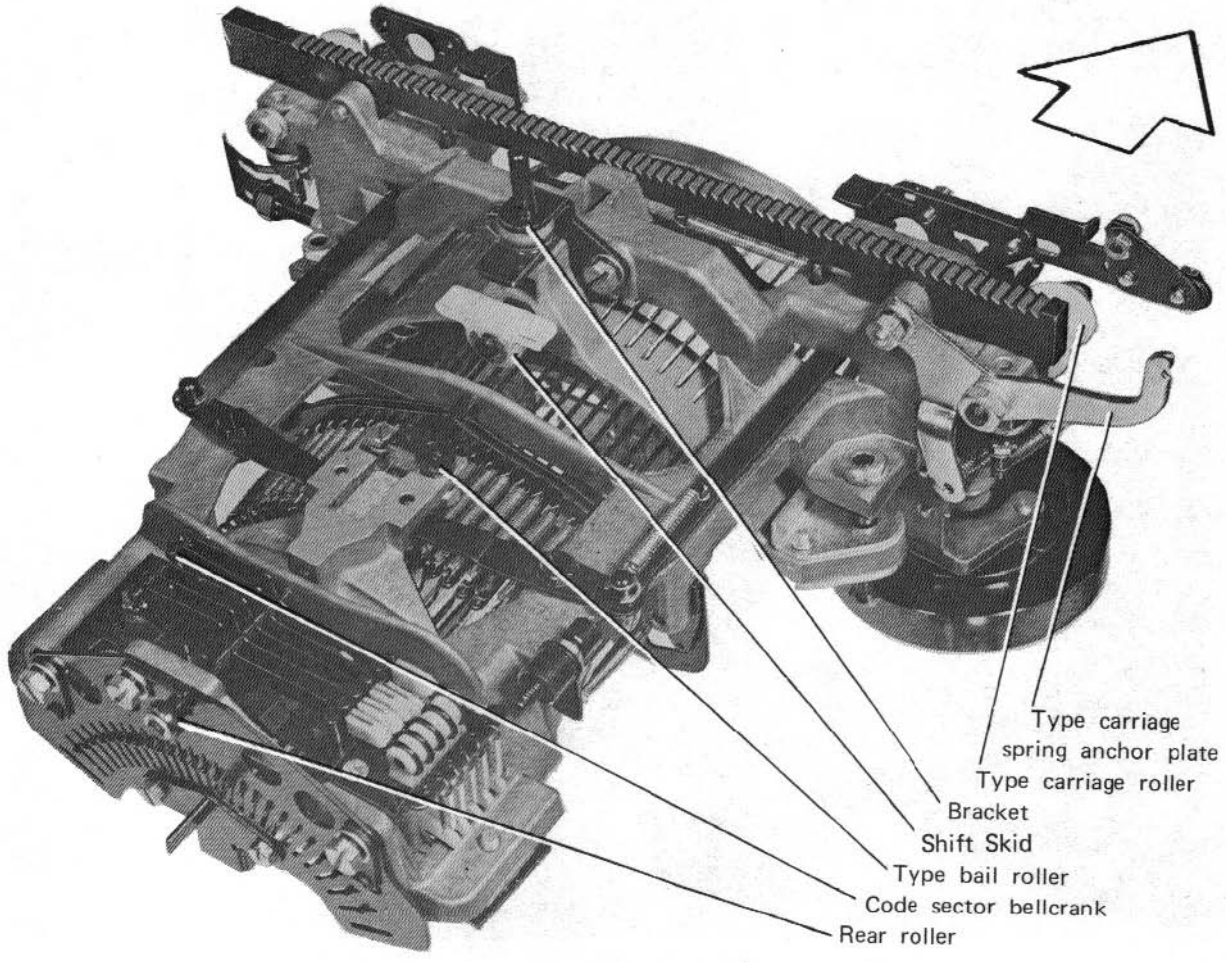

Fig. 5.8 TYPE CARRIAGE AND RIBBON UNIT

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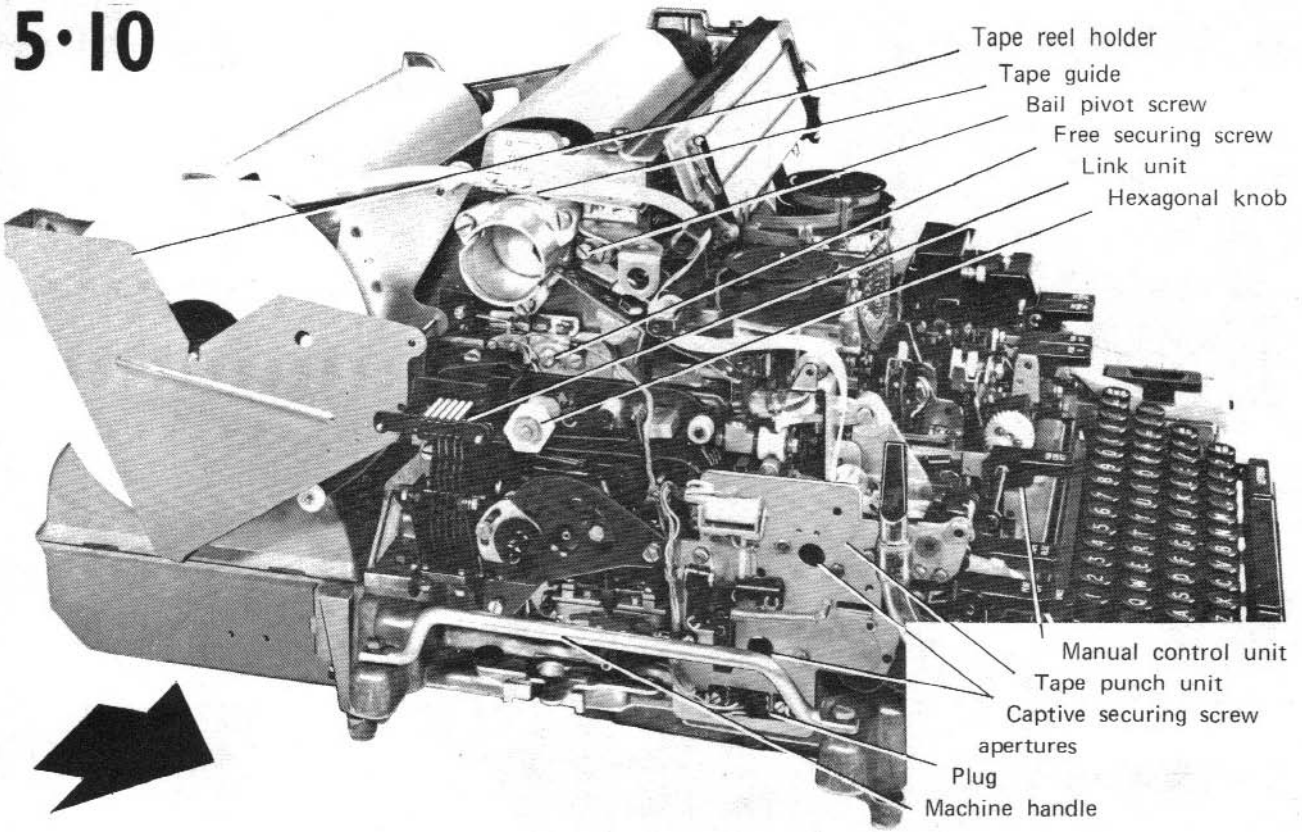

Fig. 5.9 GENERAL VIEW SHOWING TAPE PUNCH UNIT

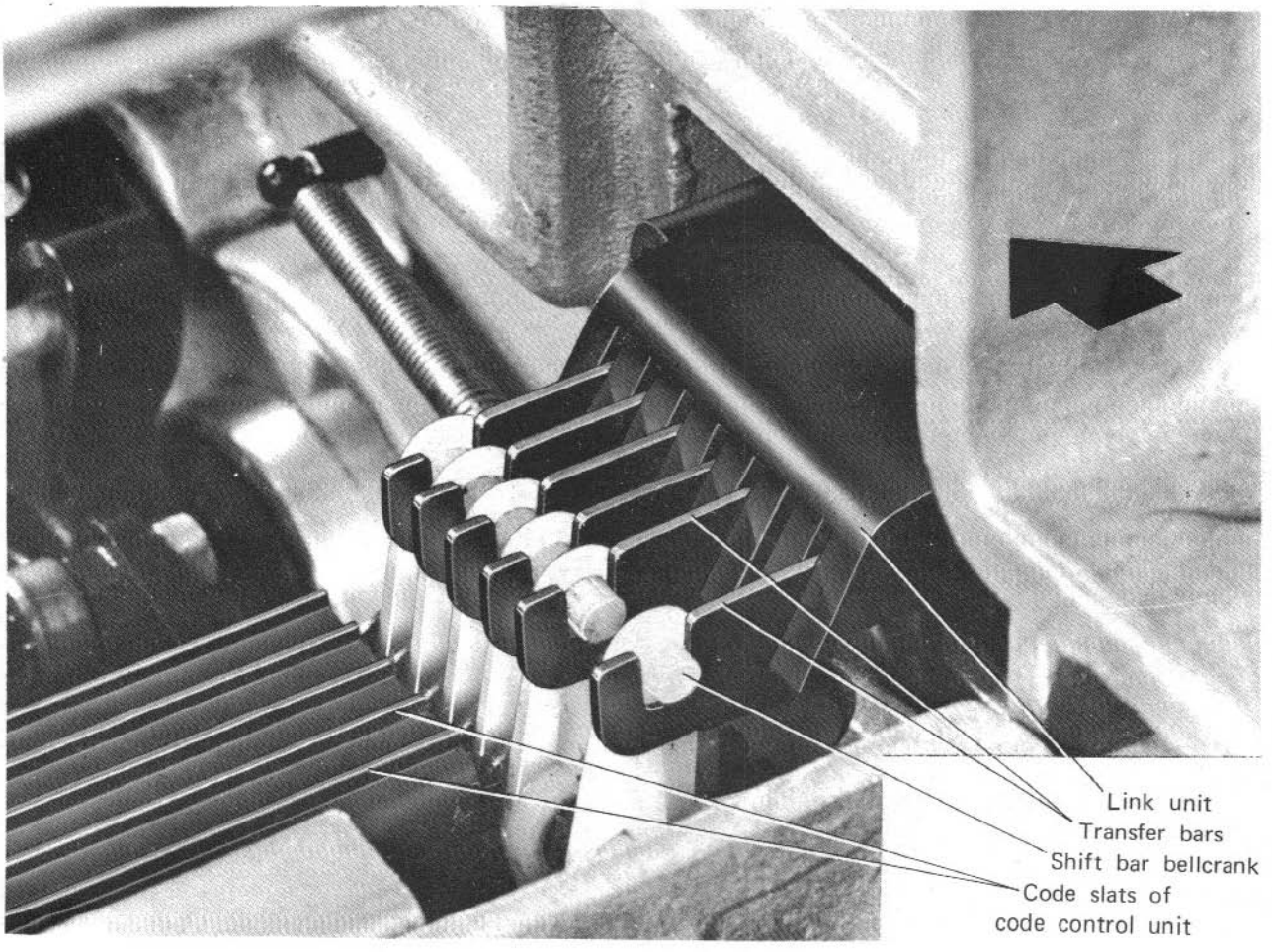

Fig. 5.10 LINK UNIT AND CODE SLATS

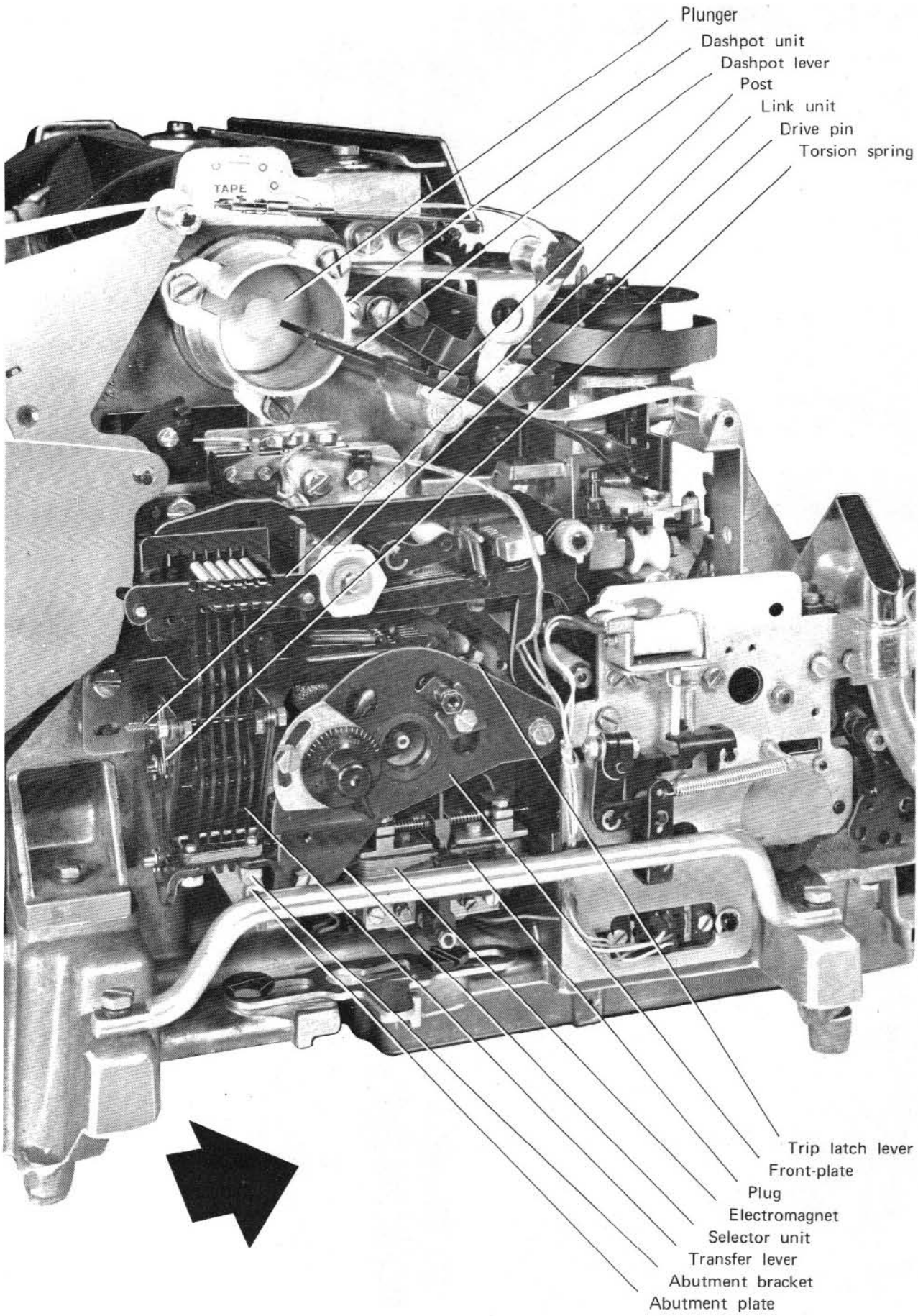

Fig. 5.11 SELECTOR UNIT AND DASHPOT UNIT

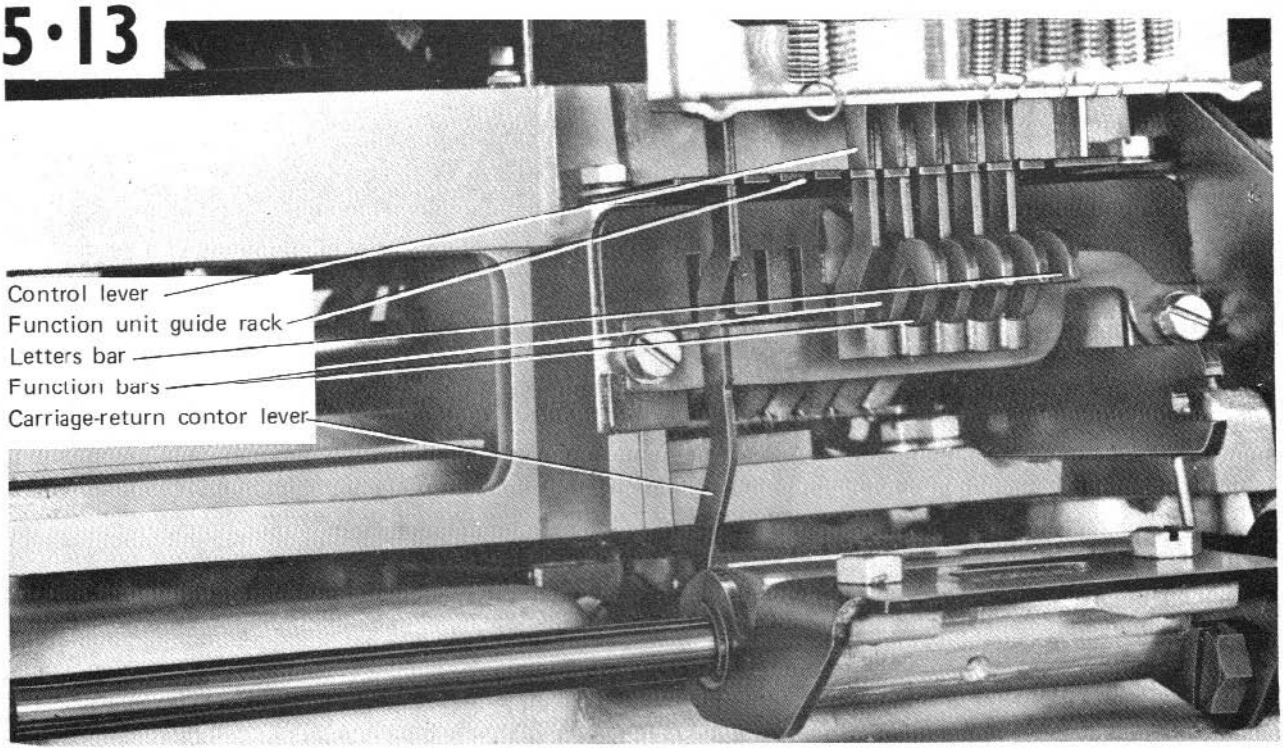

Fig. 5.12 FUNCTION UNIT (CLOSE–UP)

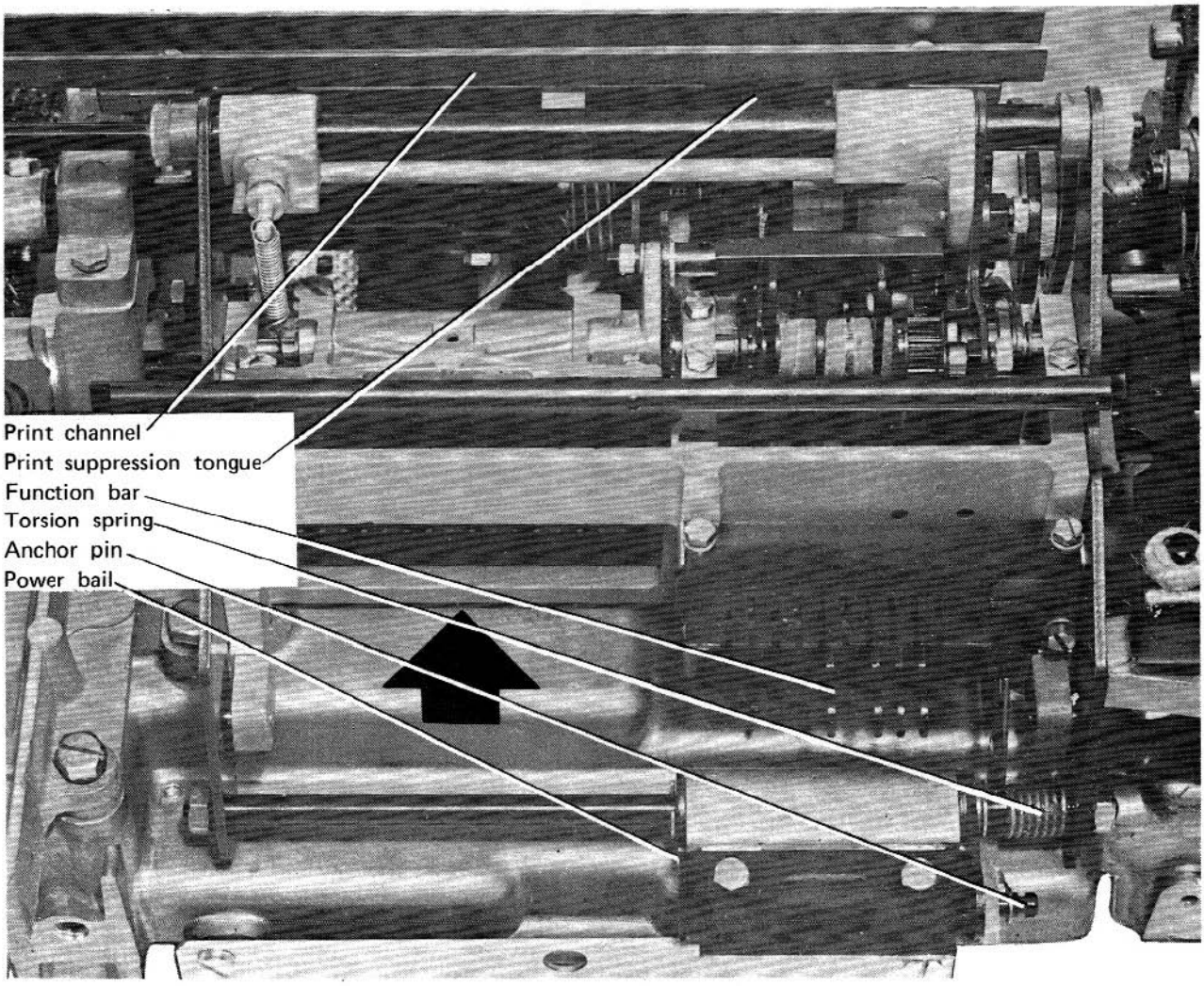

Fig. 5.13 FUNCTION UNIT

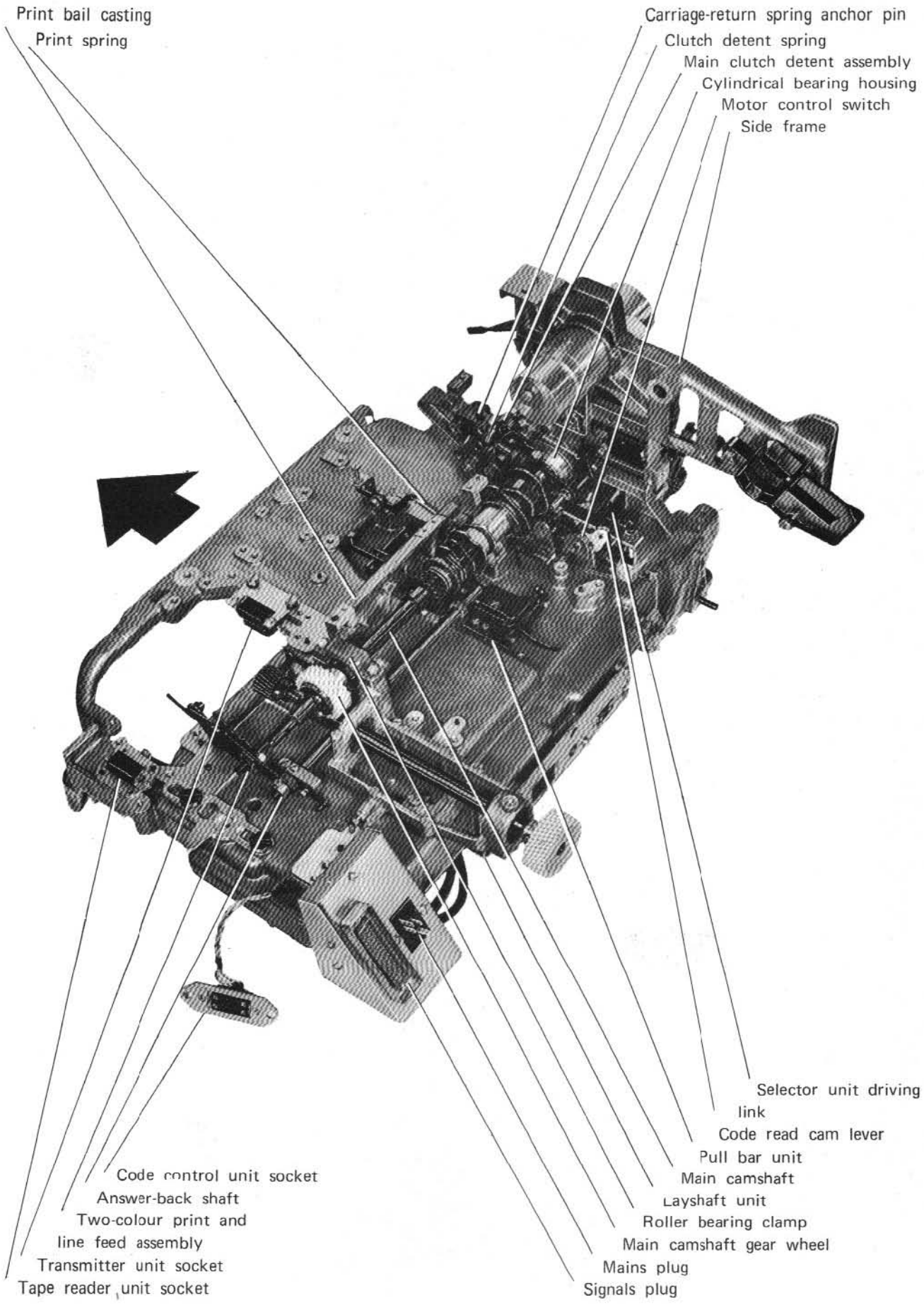

Fig. 5.14 MAIN BASE

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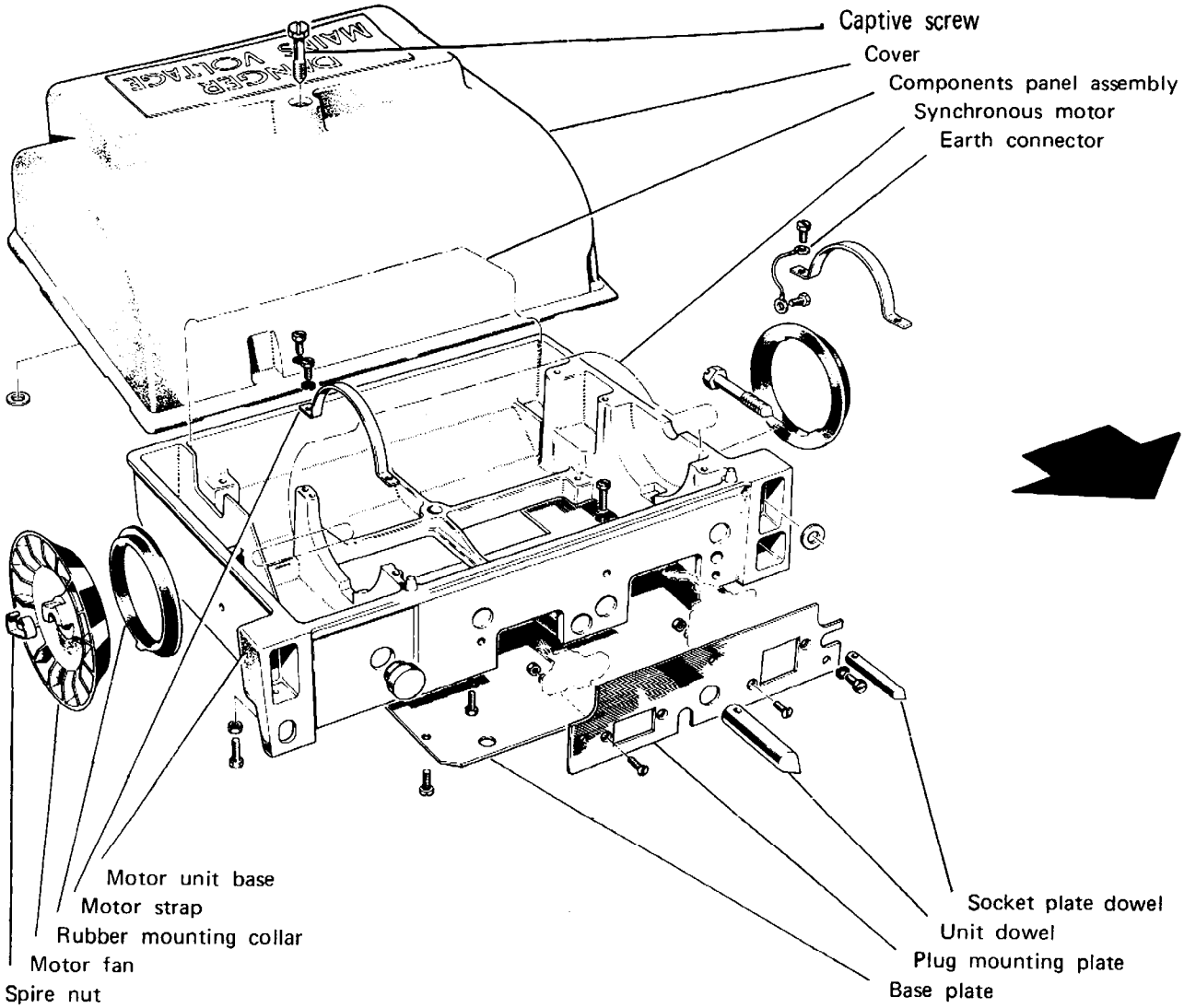

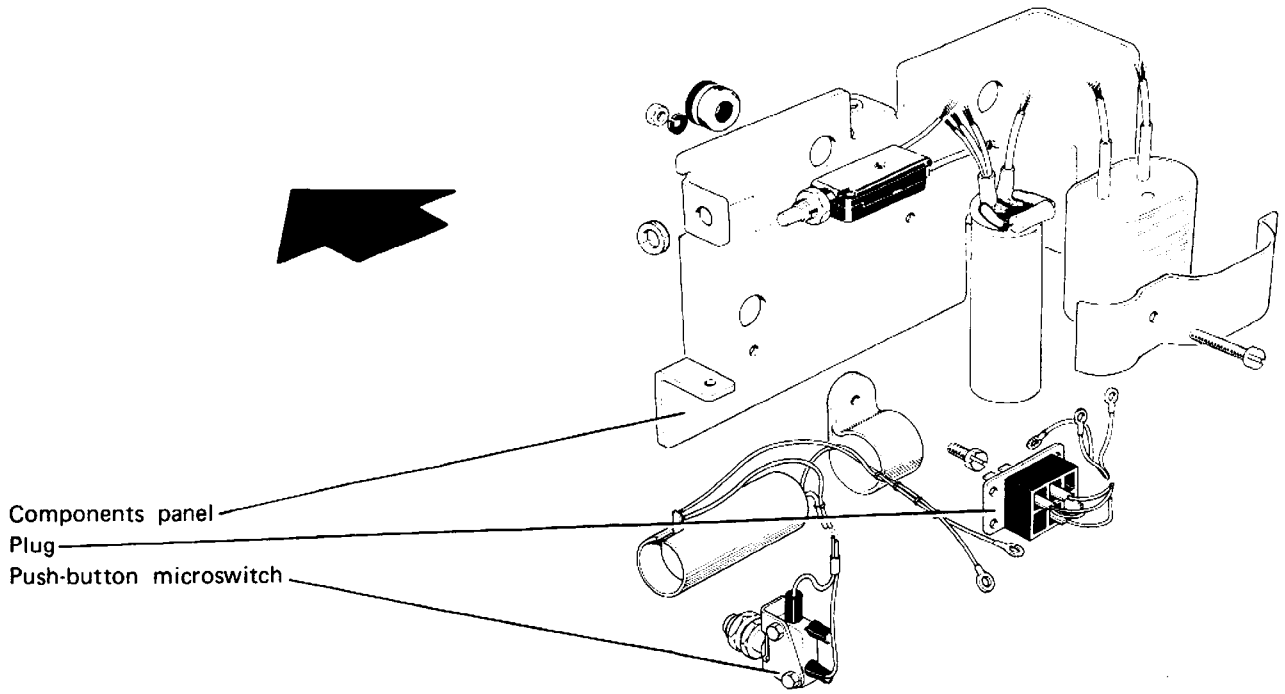

Fig. 5.15 SYNCHRONOUS MOTOR UNIT

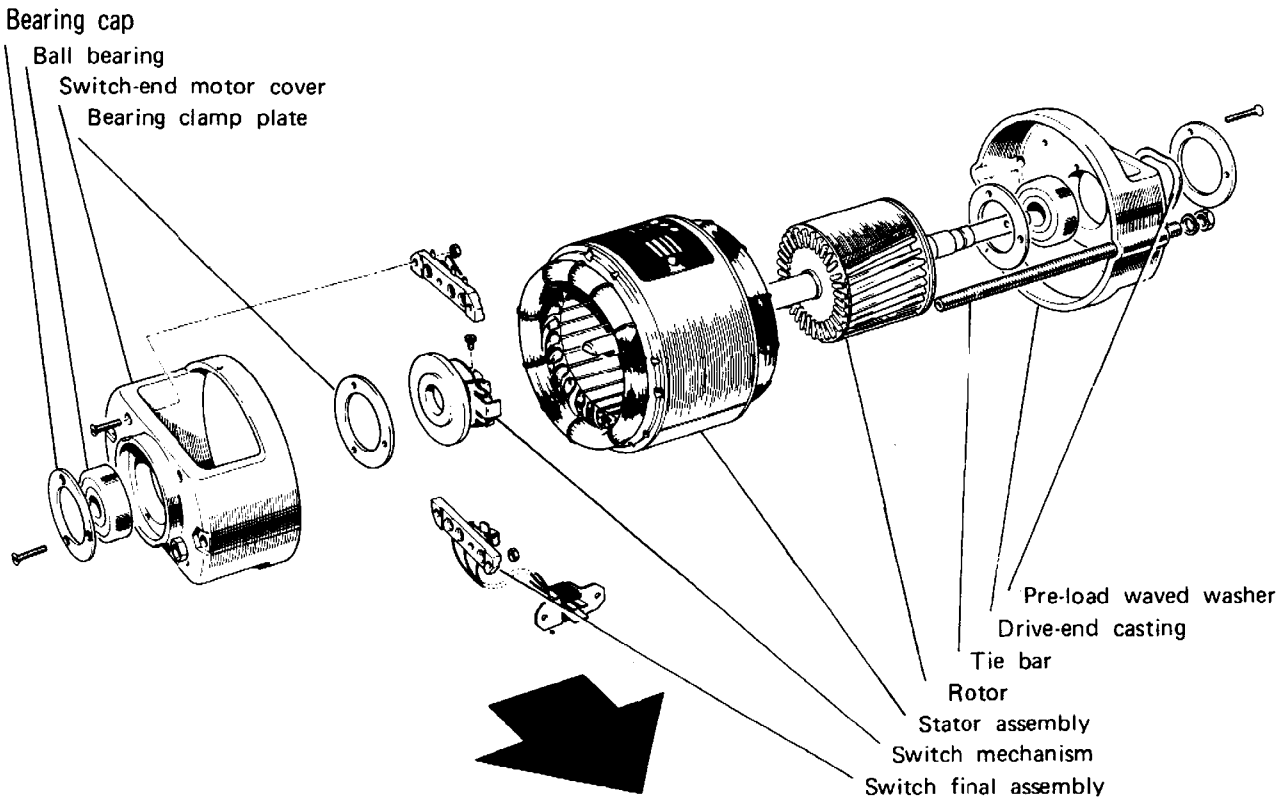

Fig. 5.16 SYNCHRONOUS MOTOR

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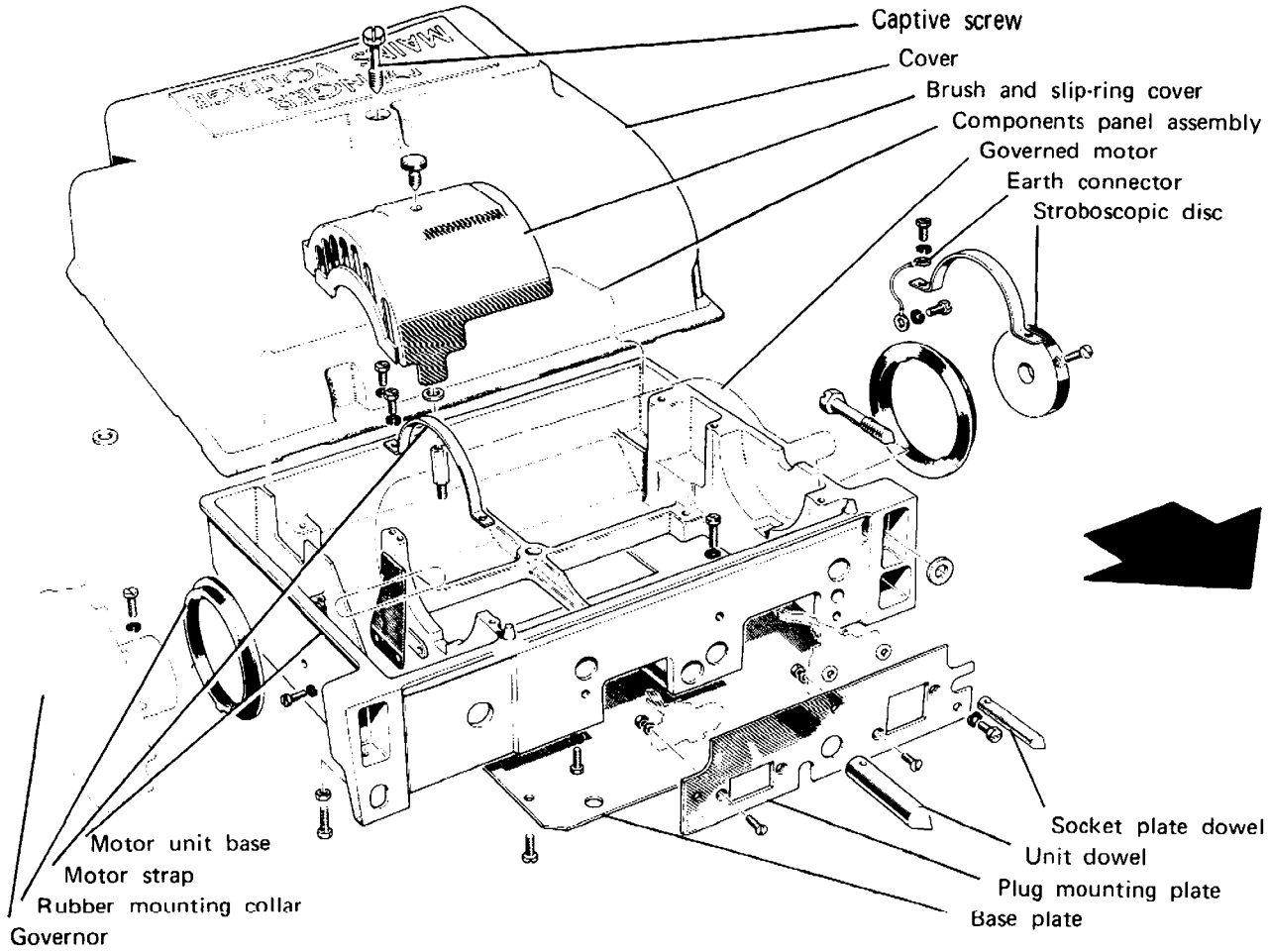

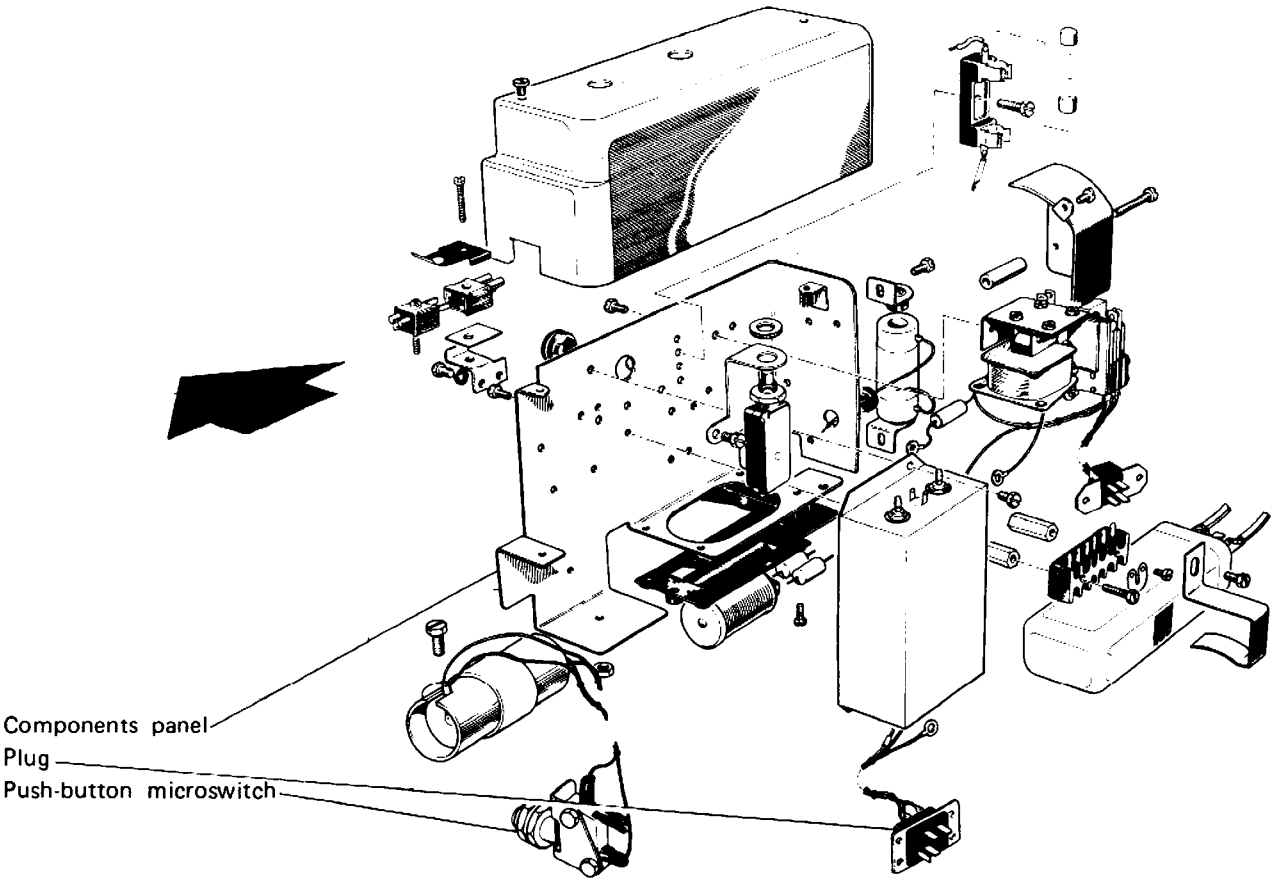

Fig. 5.17 GOVERNED MOTOR UNIT

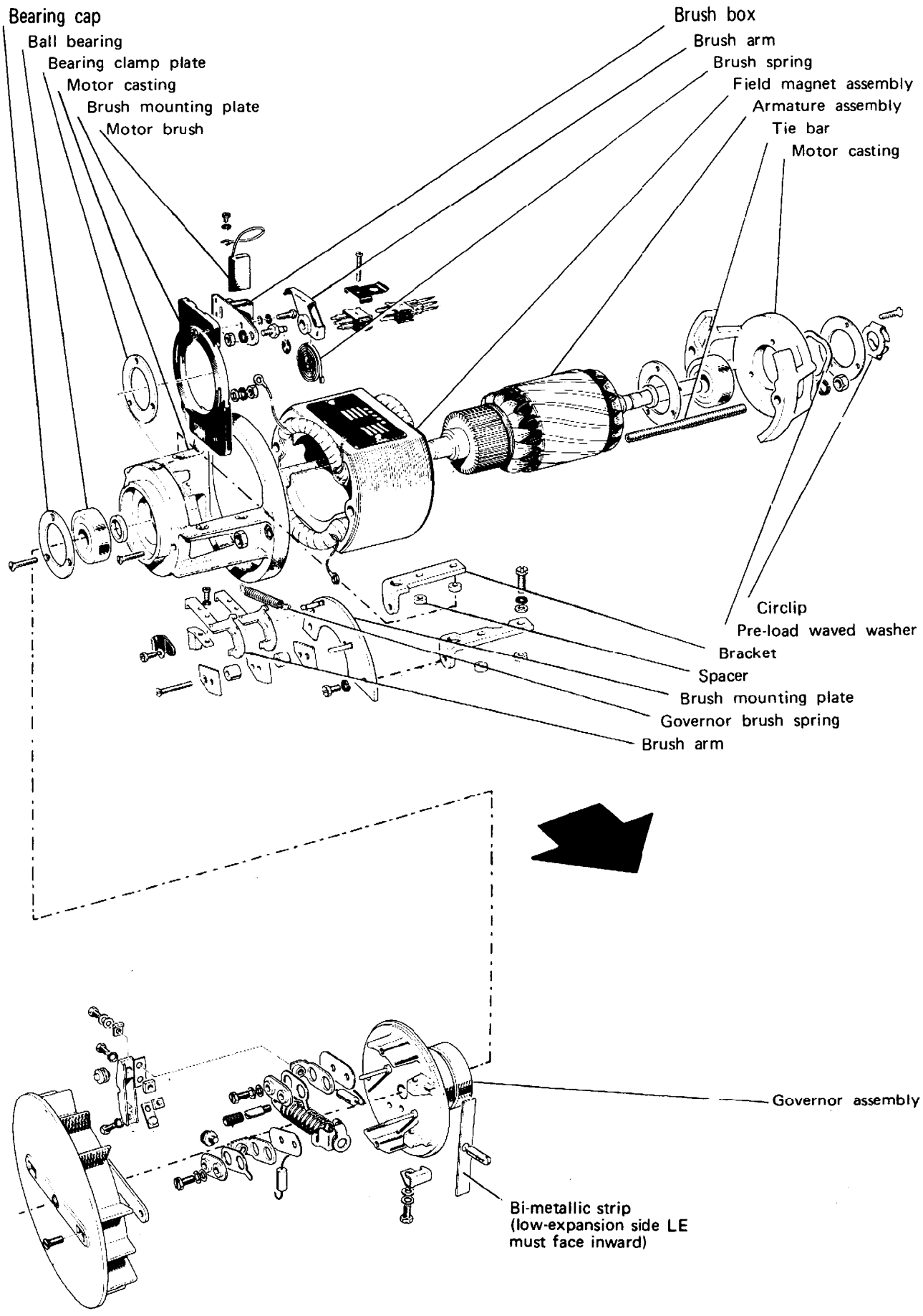

Fig. 5.18 GOVERNED MOTOR

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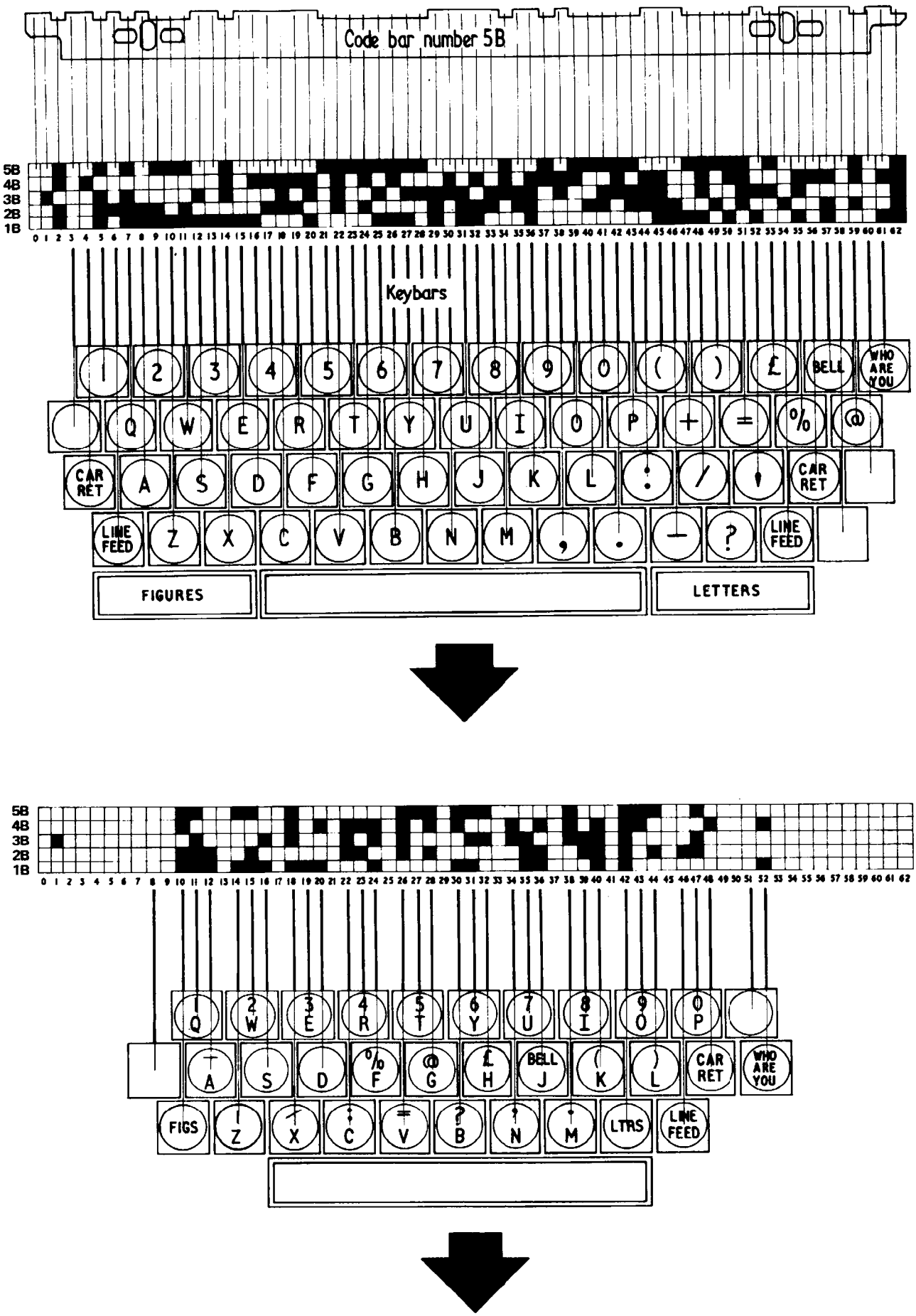

Fig. 5.19 KEYBOARD UNIT KEYBARS AND CODE BARS

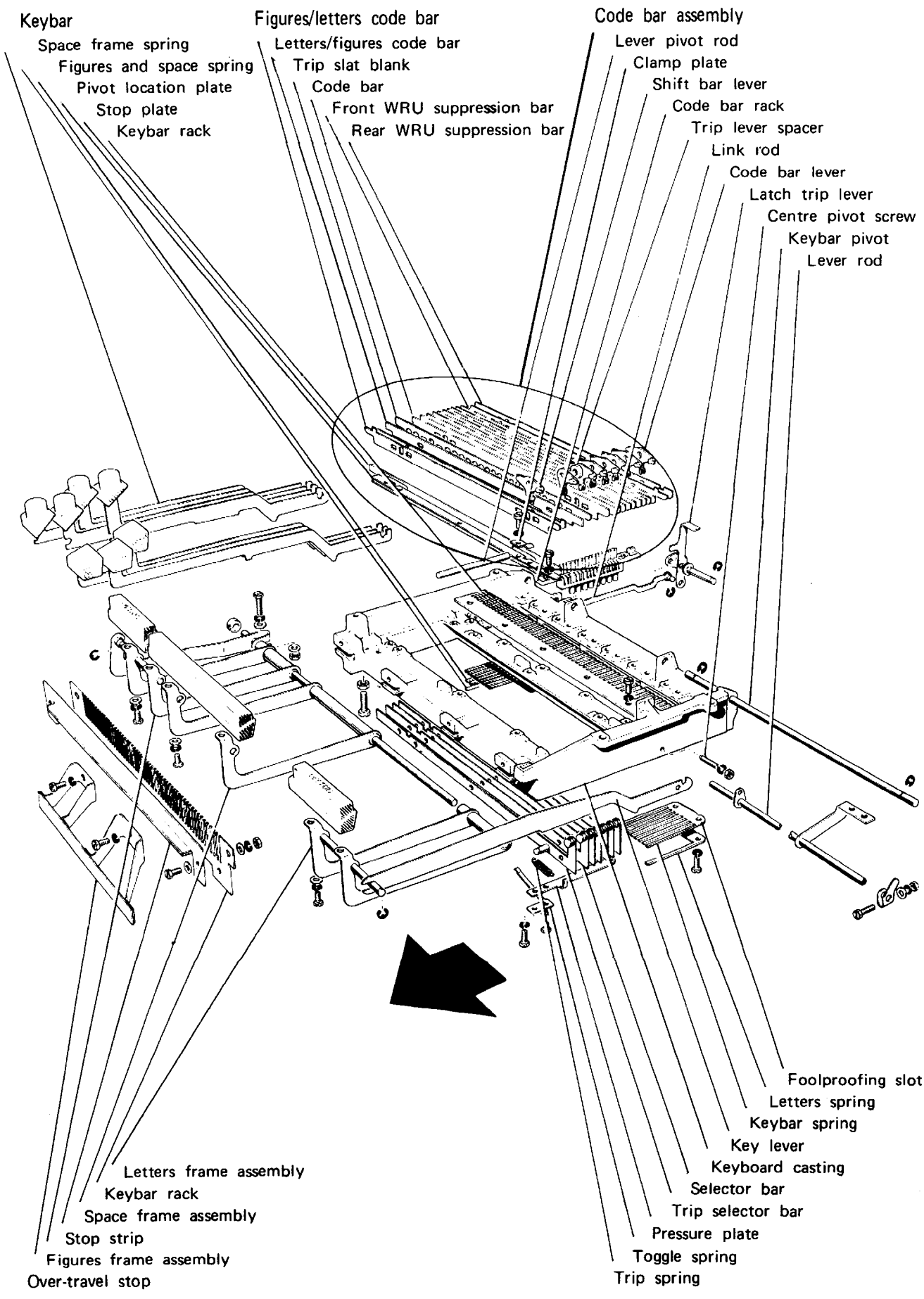

Fig. 5.20 KEYBOARD UNIT

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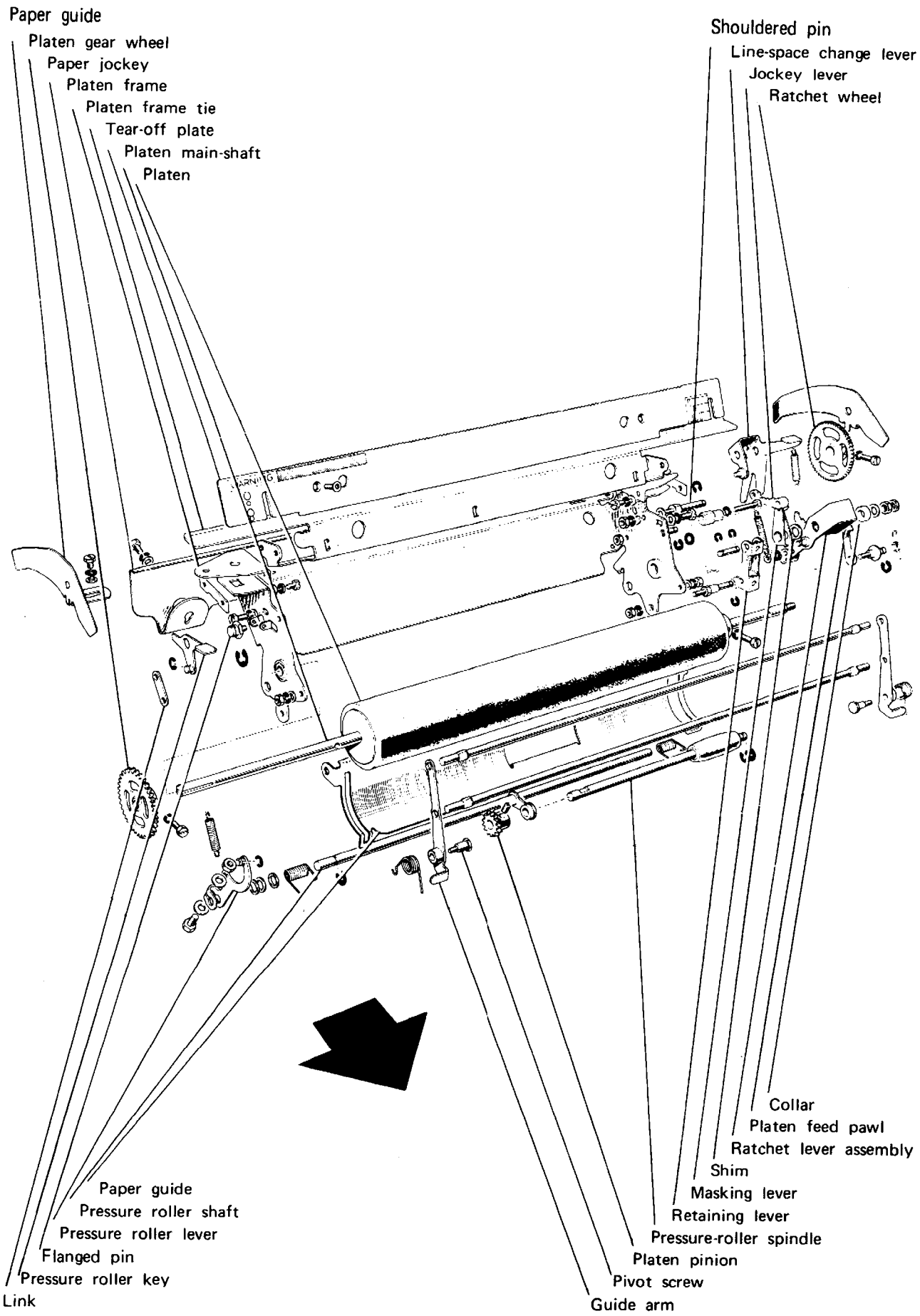

Fig. 5.21 PLATEN UNIT WITH FRICTION–FEED PLATEN

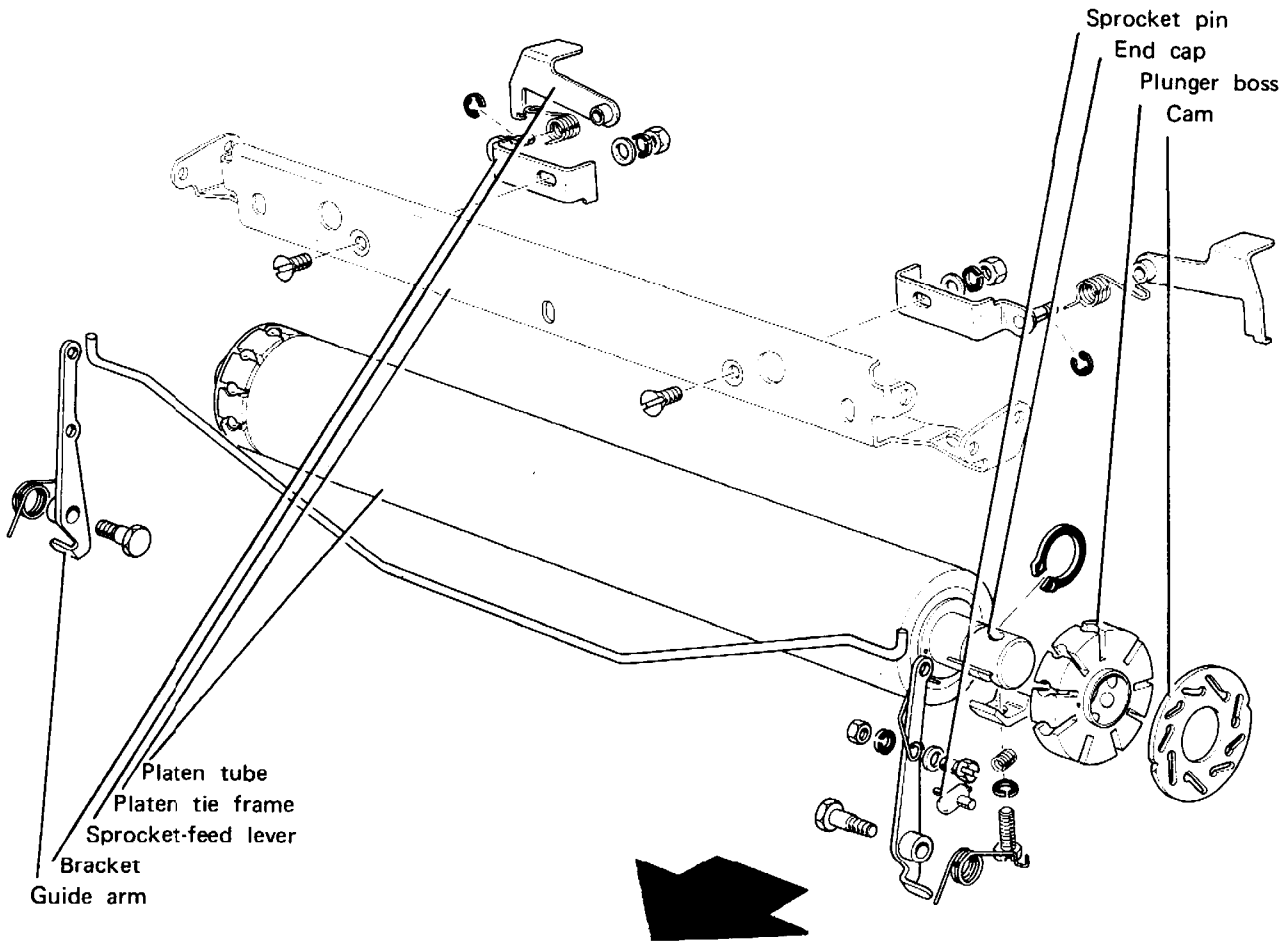

Fig 5.22 SPROCKET–FEED PLATEN

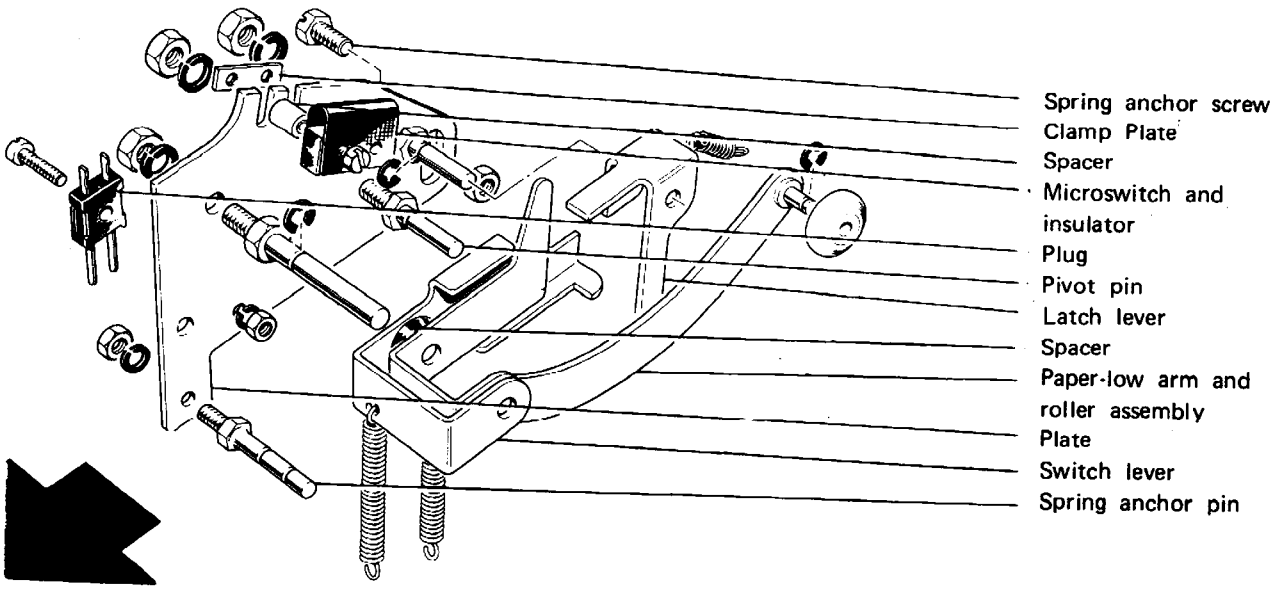

Fig. 5.23 PAPER LOW ASSEMBLY

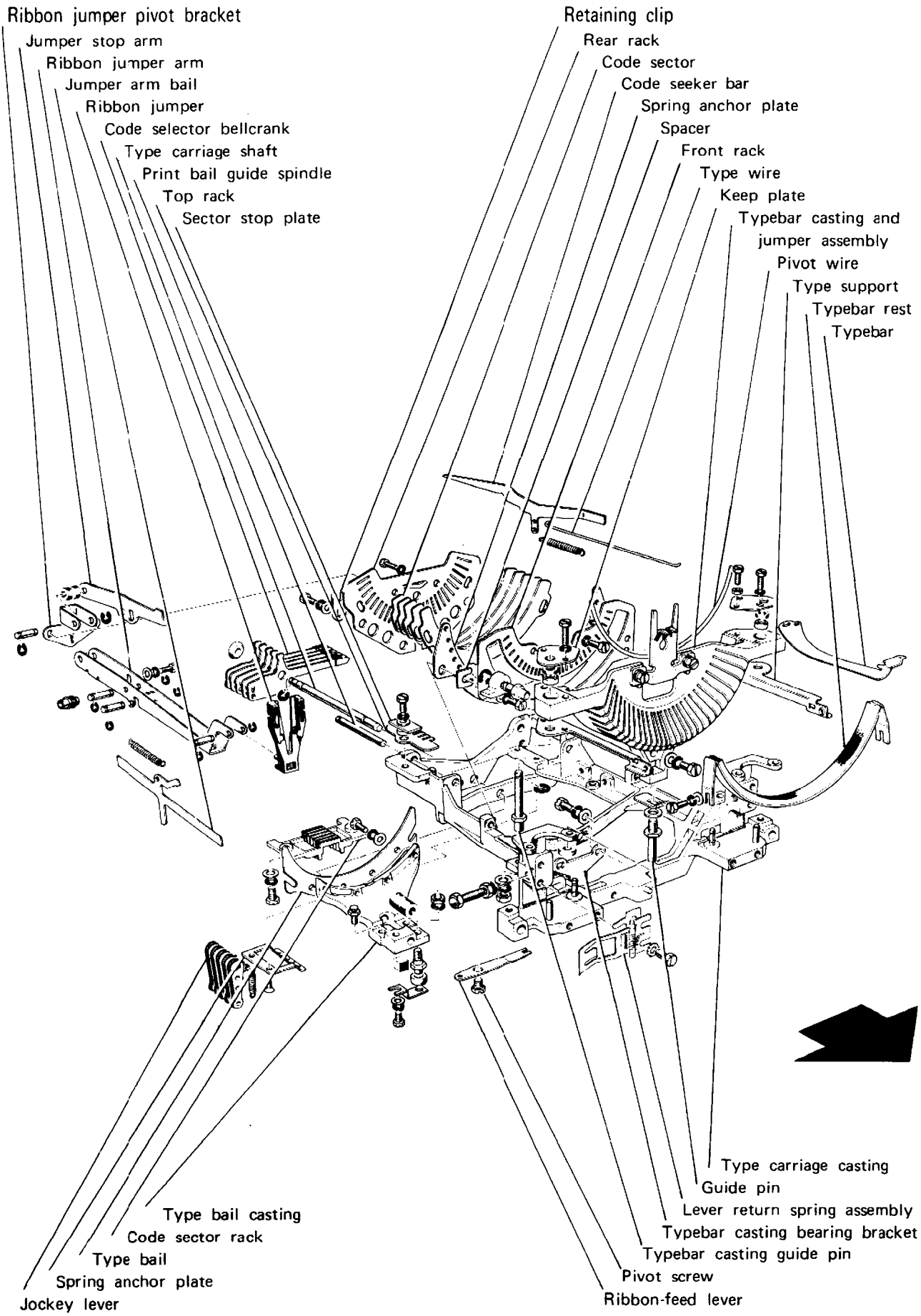

Fig. 5.24 TYPE CARRIAGE AND RIBBON UNIT TYPE BASKET AND CODE SECTORS

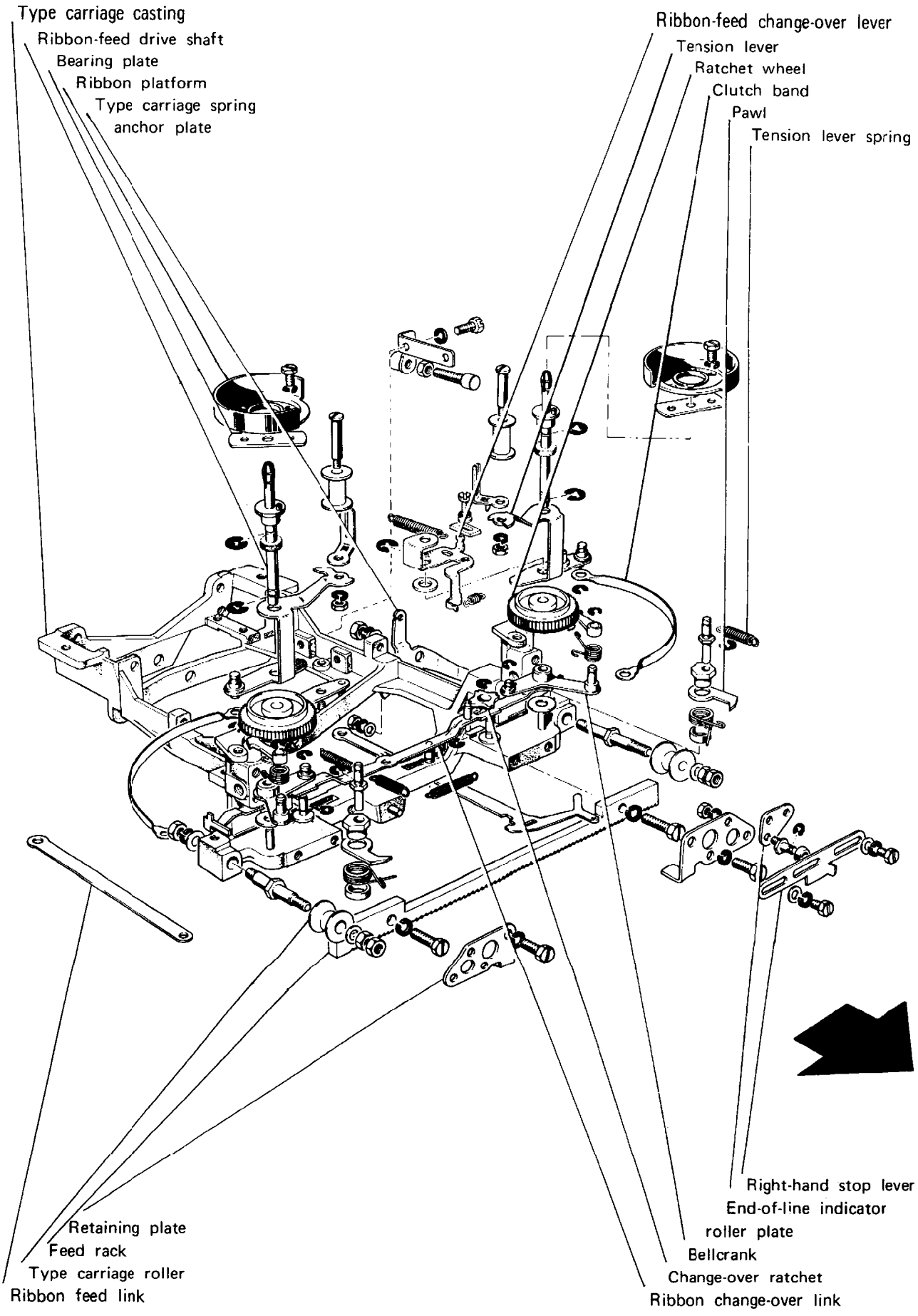

Fig. 5.25 TYPE CARRIAGE AND RIBBON UNIT FEED AND RIBBON MECHANISMS

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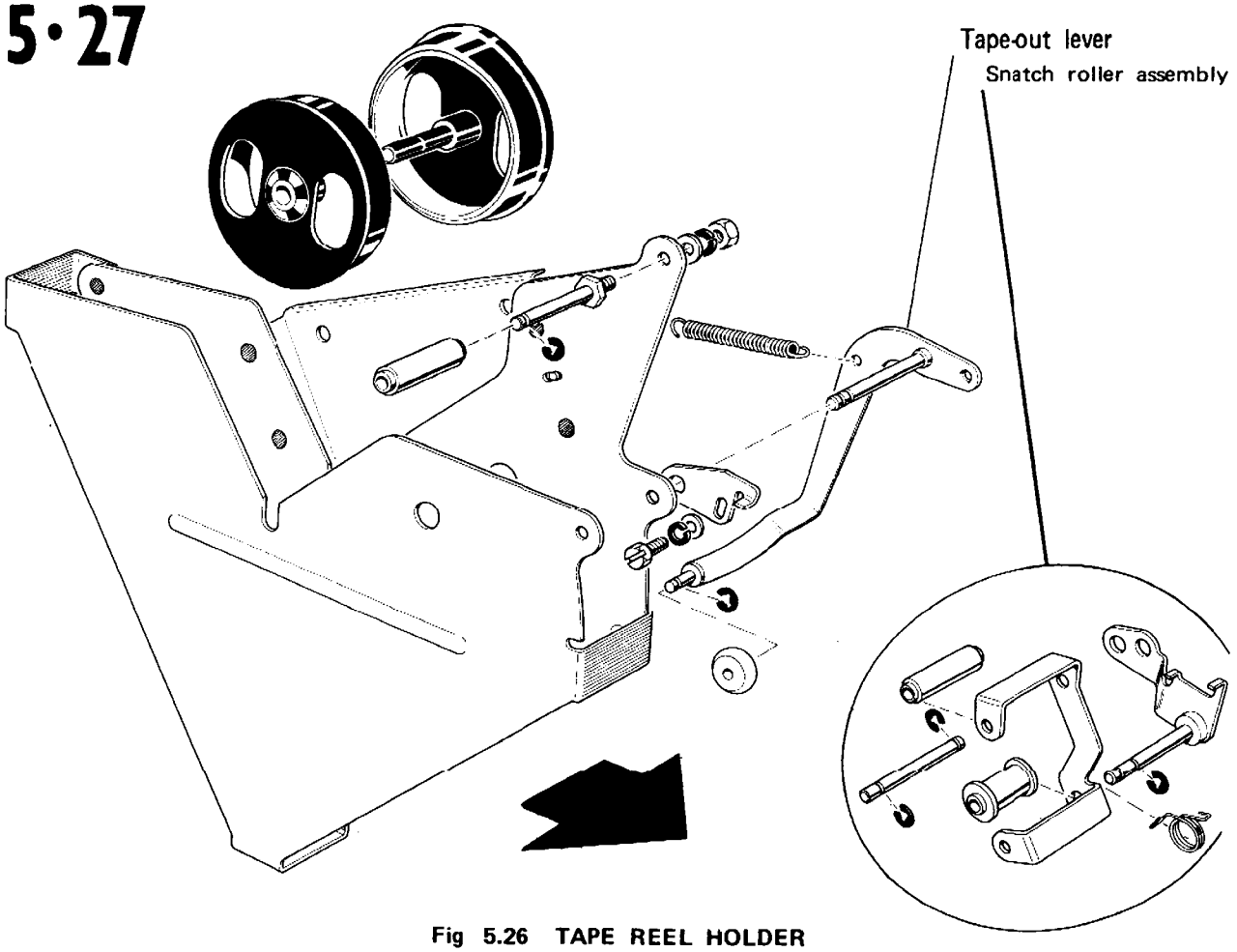


Fig 5.26 TAPE REEL HOLDER

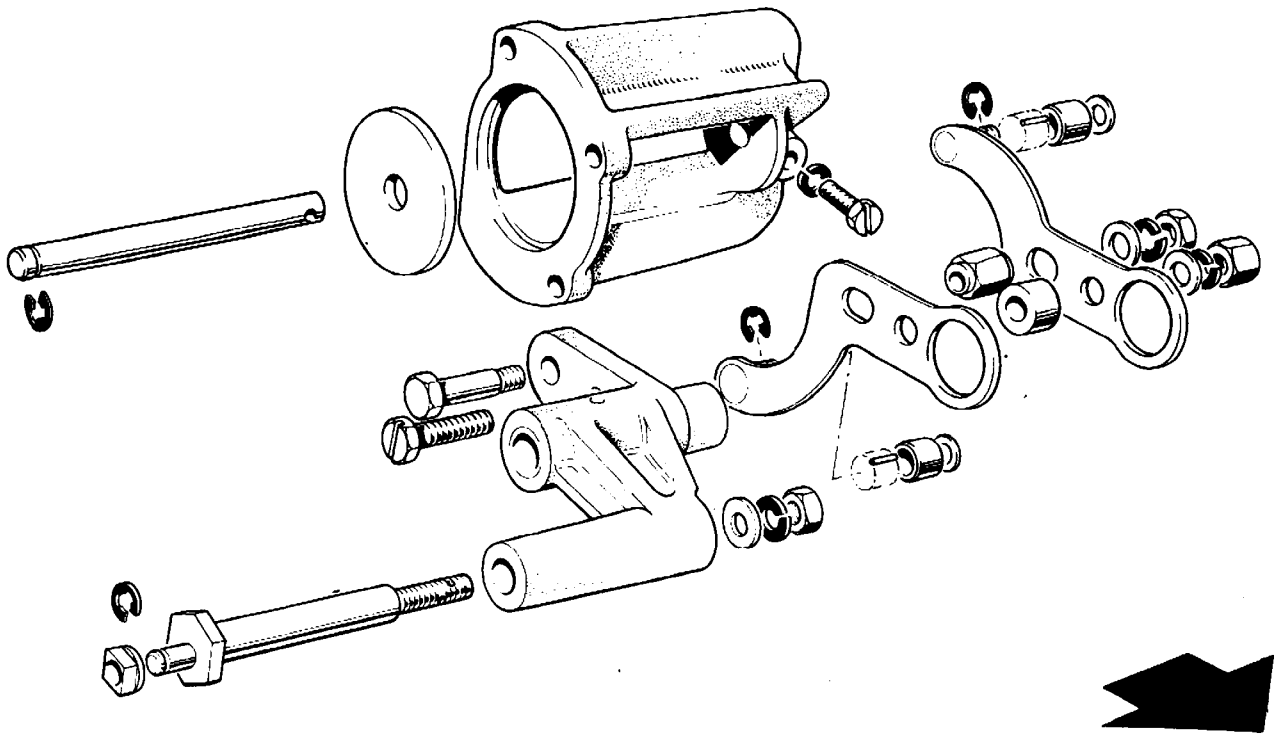
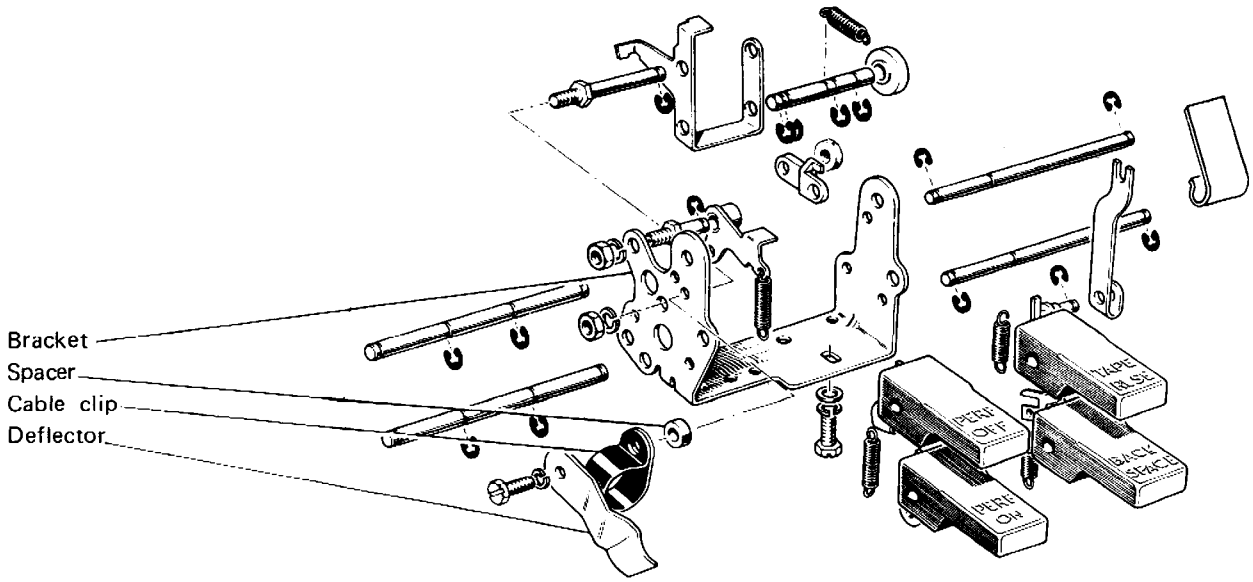


Fig. 5.27 TAPE PUNCH UNIT DRIVE ARM



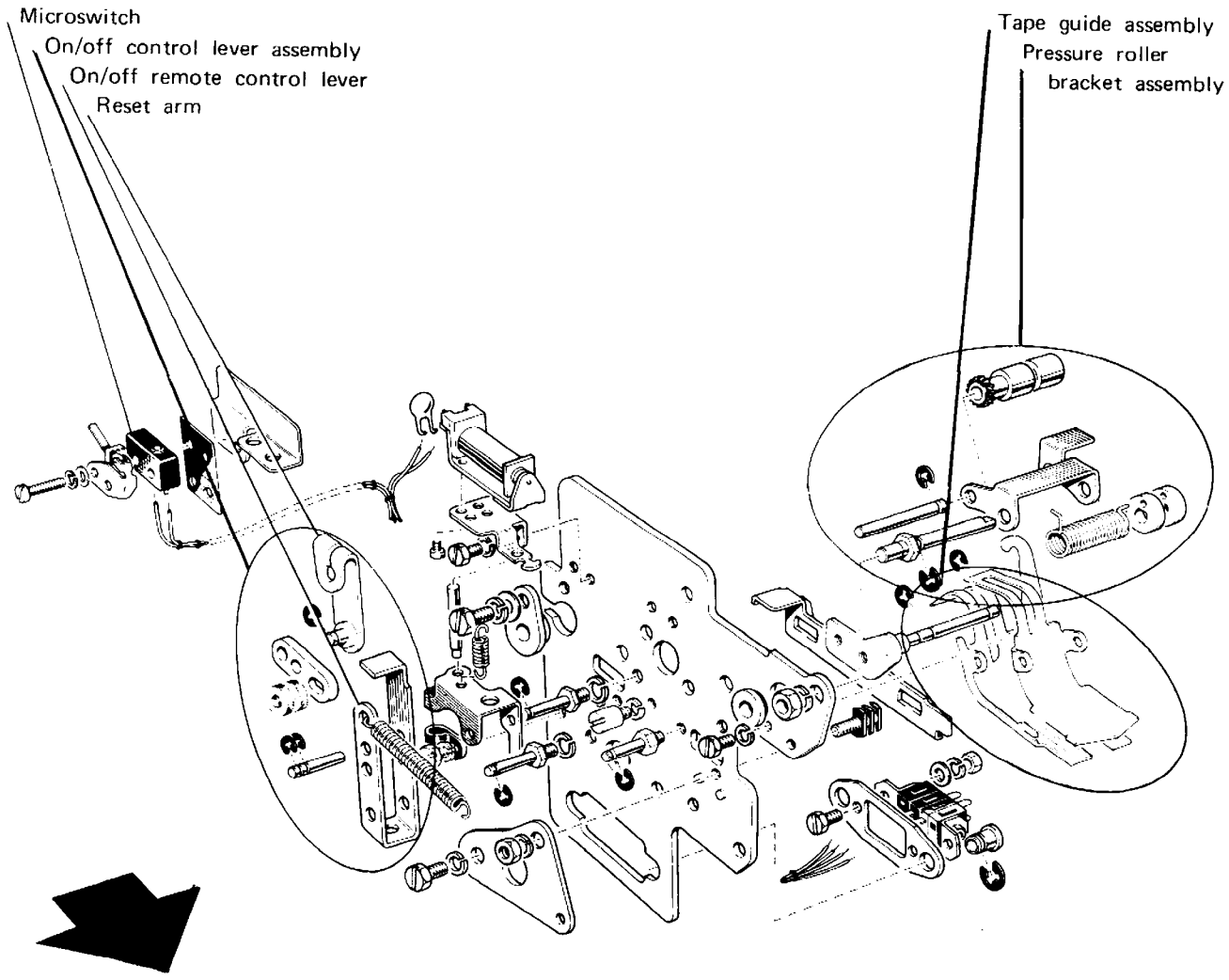


Fig. 5.28 TAPE PUNCH UNIT BUTTON AND COVER PLATE ASSEMBLIES

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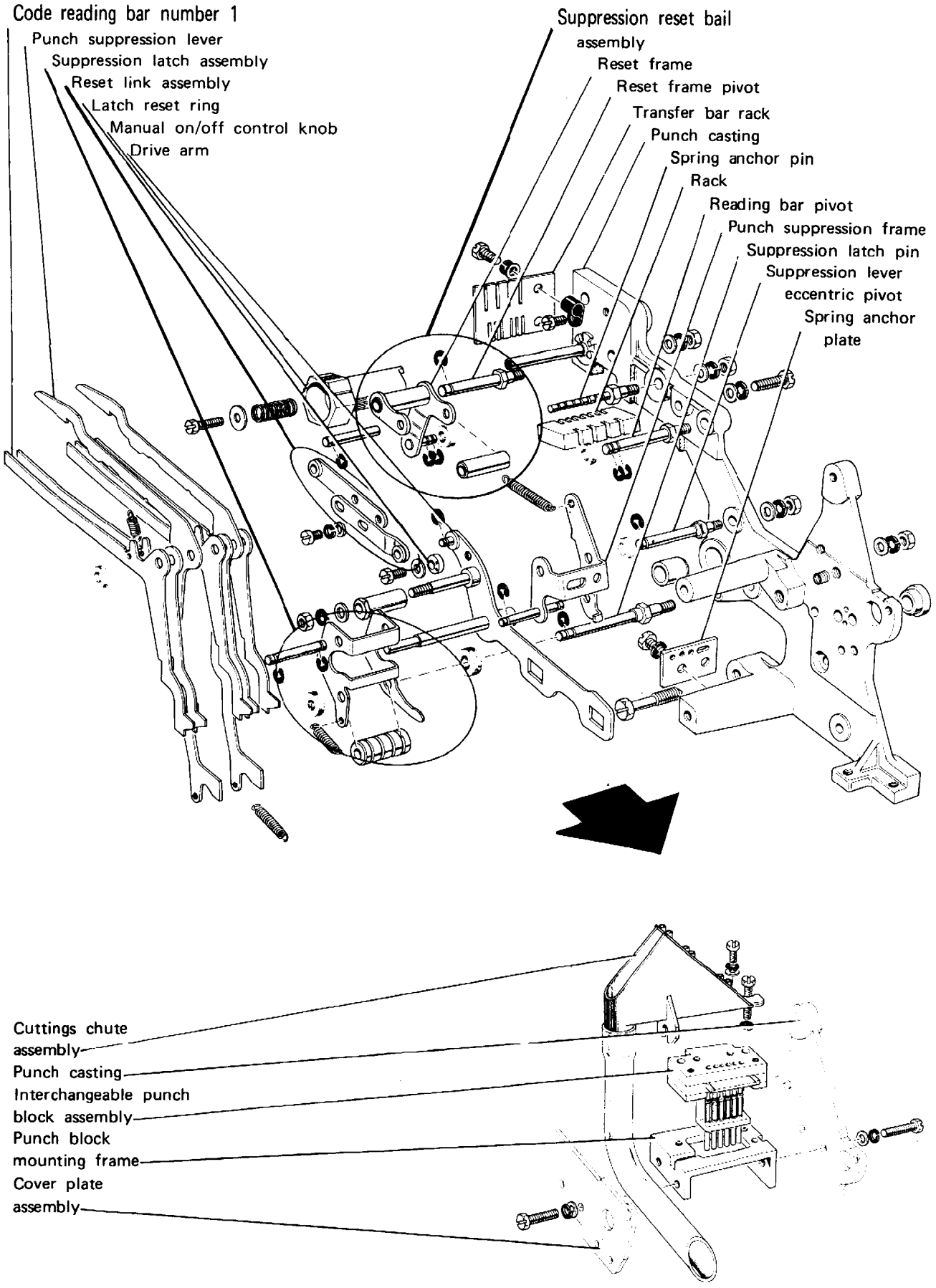

Fig. 5.29 TAPE PUNCH UNIT PARTIAL AND PUNCH–BLOCK ASSEMBLIES

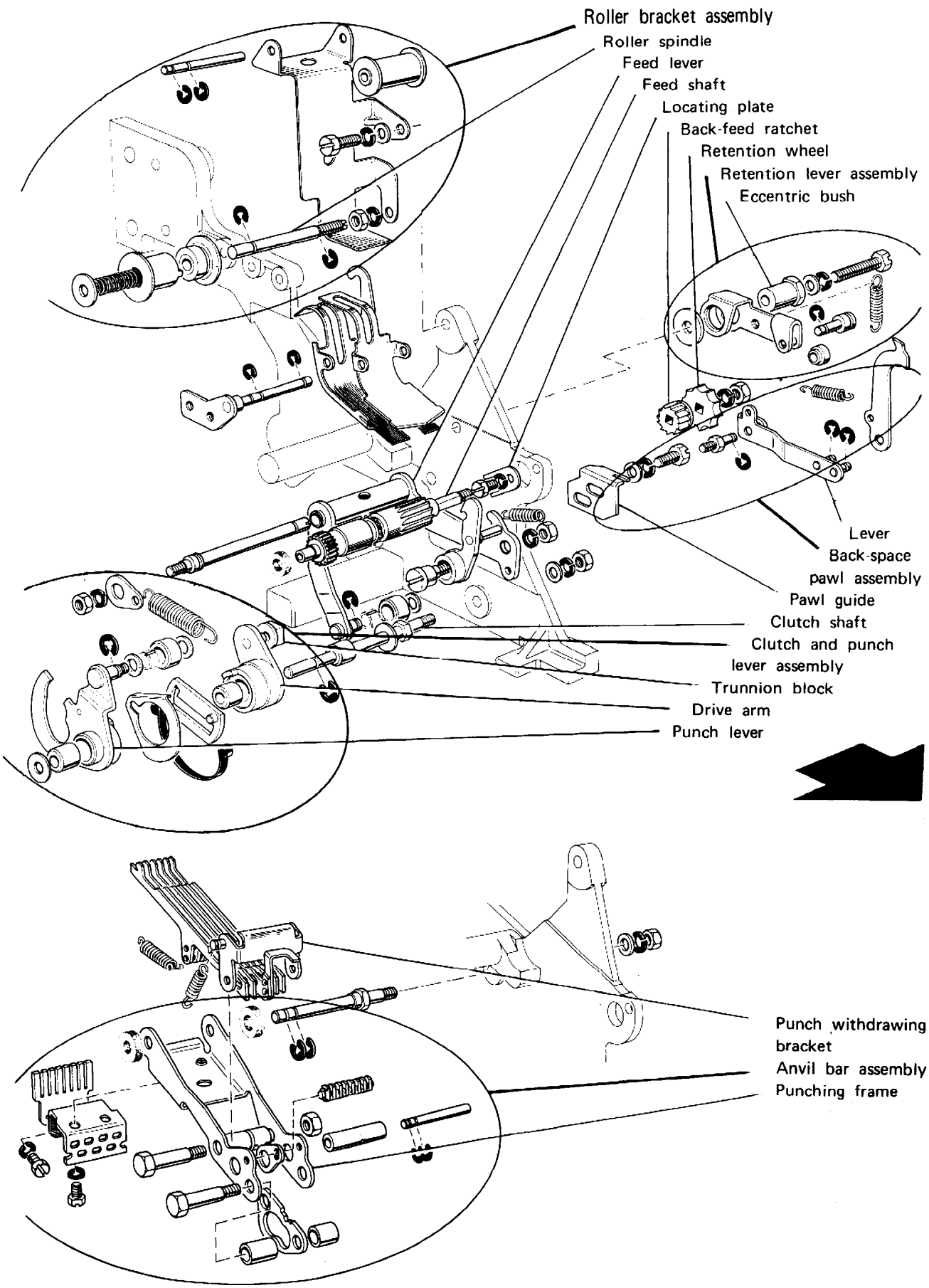

Fig. 5.30 TAPE PUNCH UNIT FEED AND PUNCH MECHANISMS

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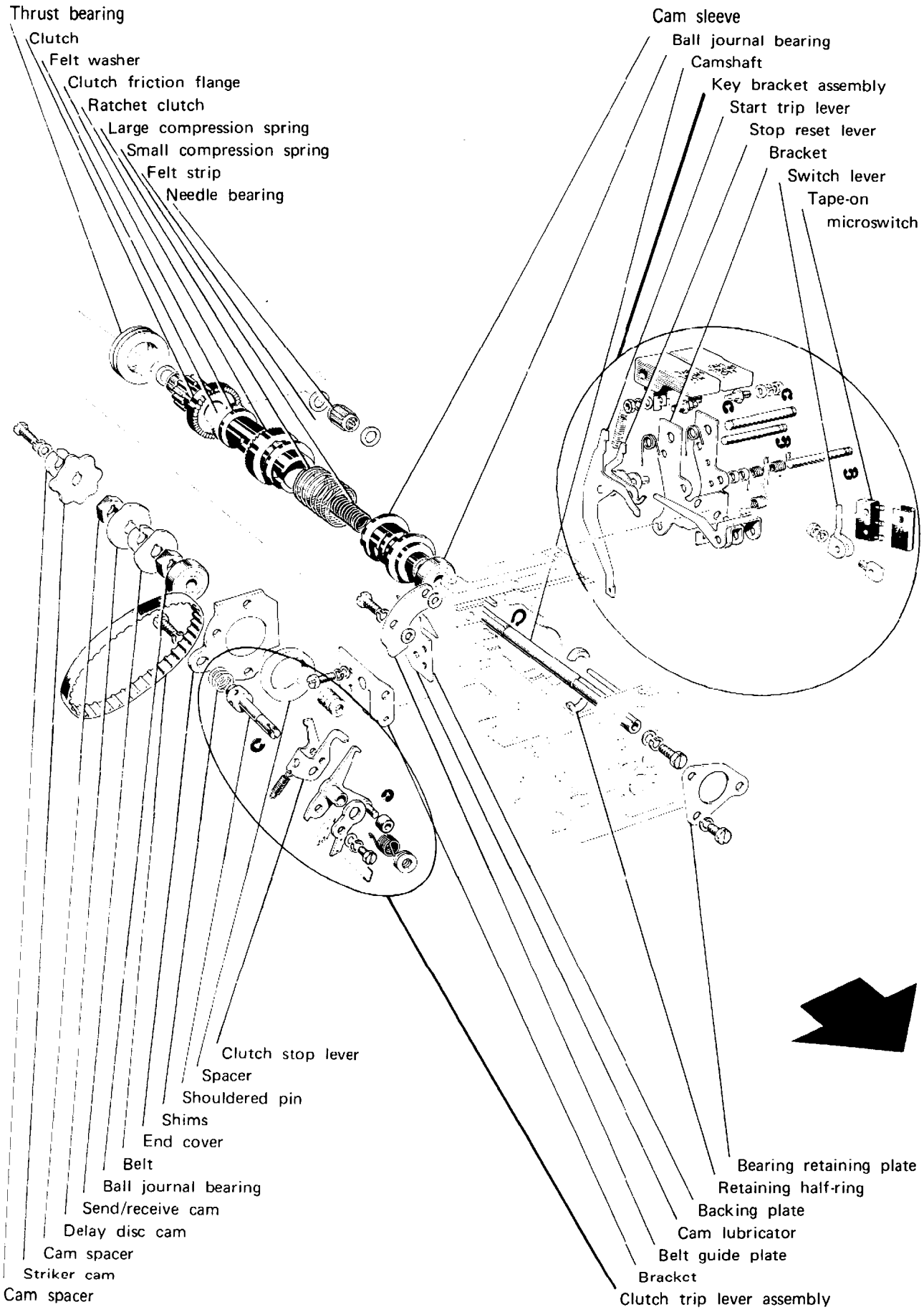

Fig. 5.31 TAPE READER KEY–BRACKET AND CAMSHAFT ASSEMBLIES

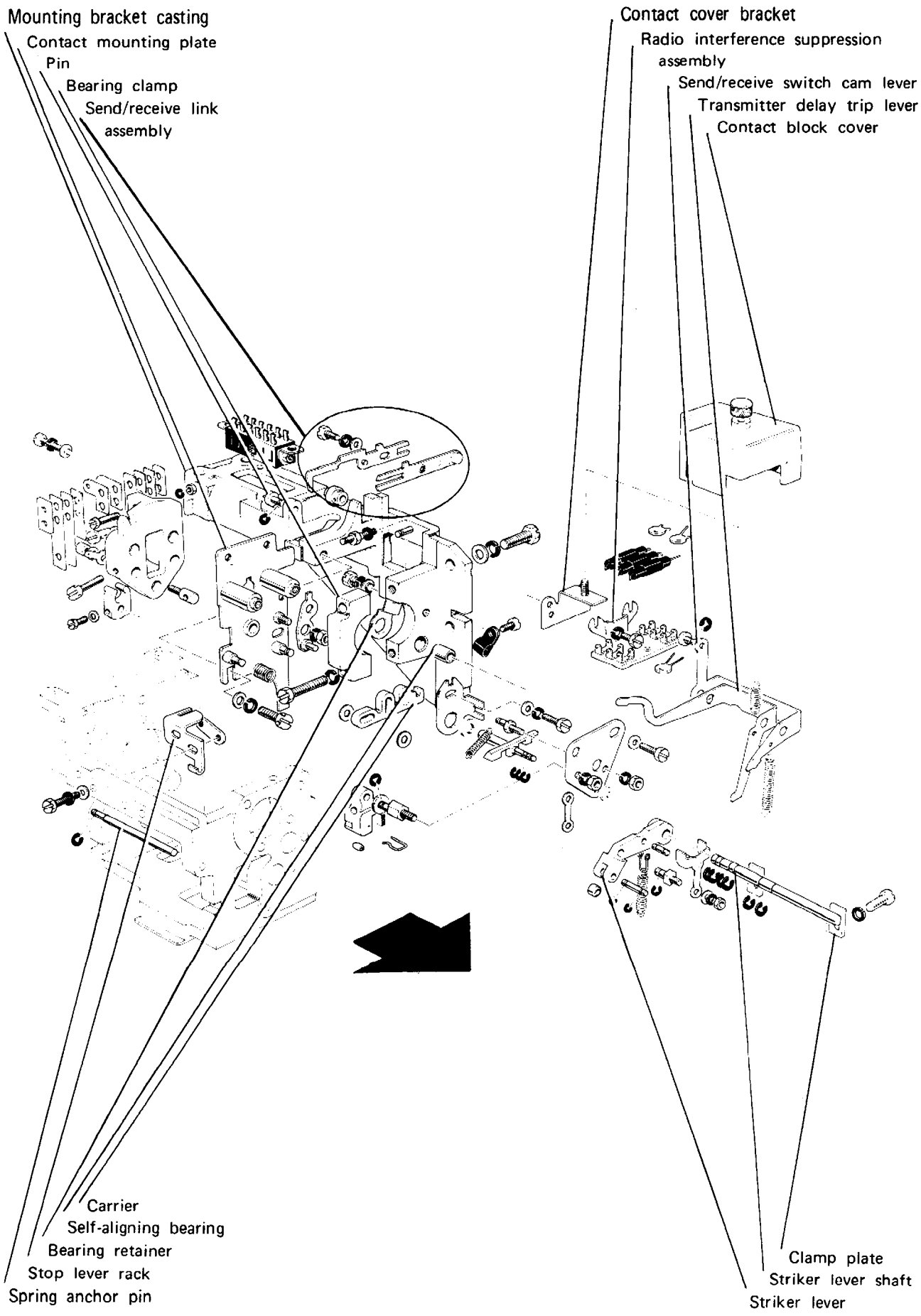

Fig. 5.32 TAPE READER CONTACT BLOCK

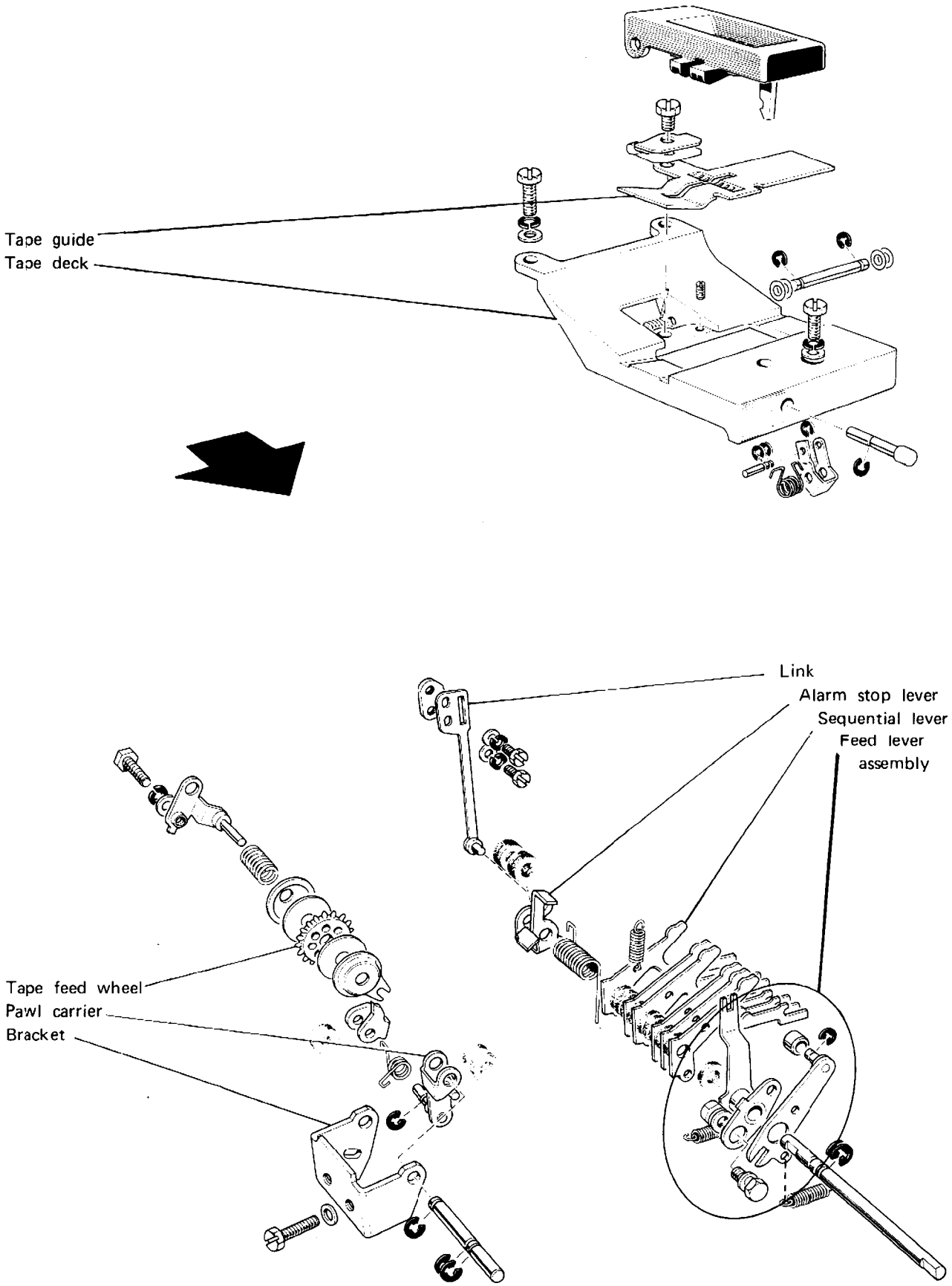

Fig. 5.33 TAPE READER TAPE DECK, FEED WHEEL AND SEQUENTIAL SHAFT ASSEMBLIES

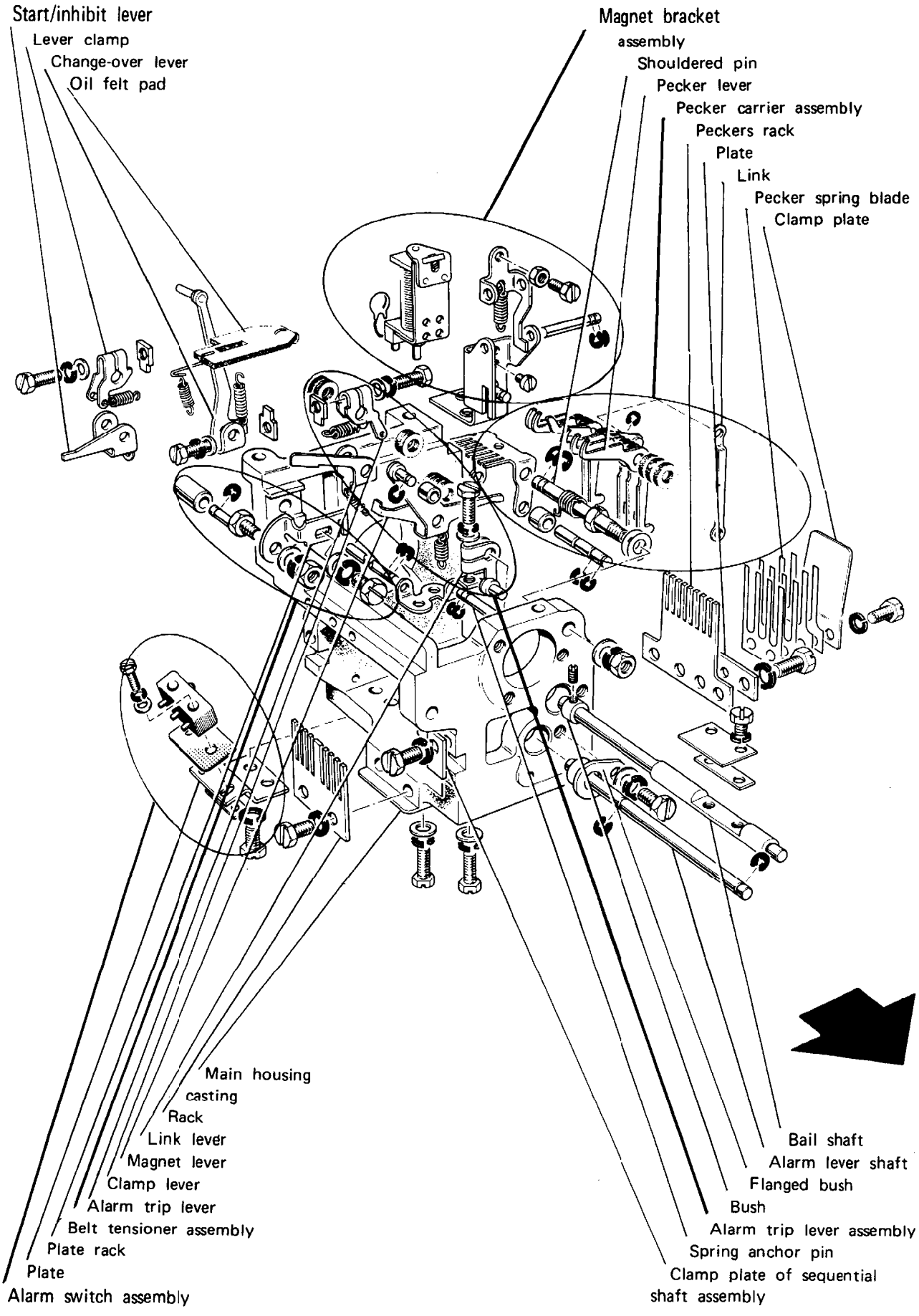

Fig. 5.34 TAPE READER MAIN HOUSING

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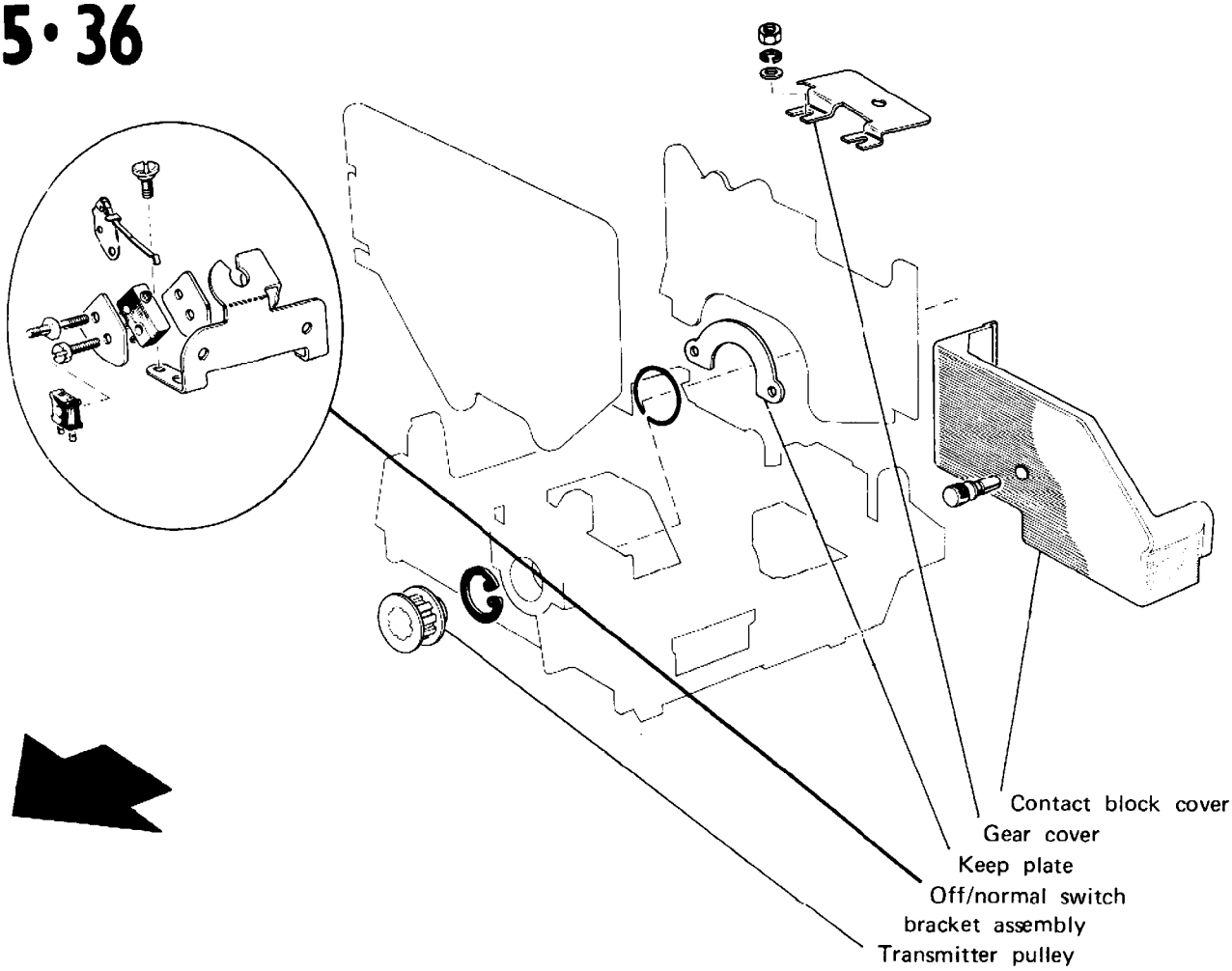

Fig. 5.35 TRANSMITTER FINAL ASSEMBLY

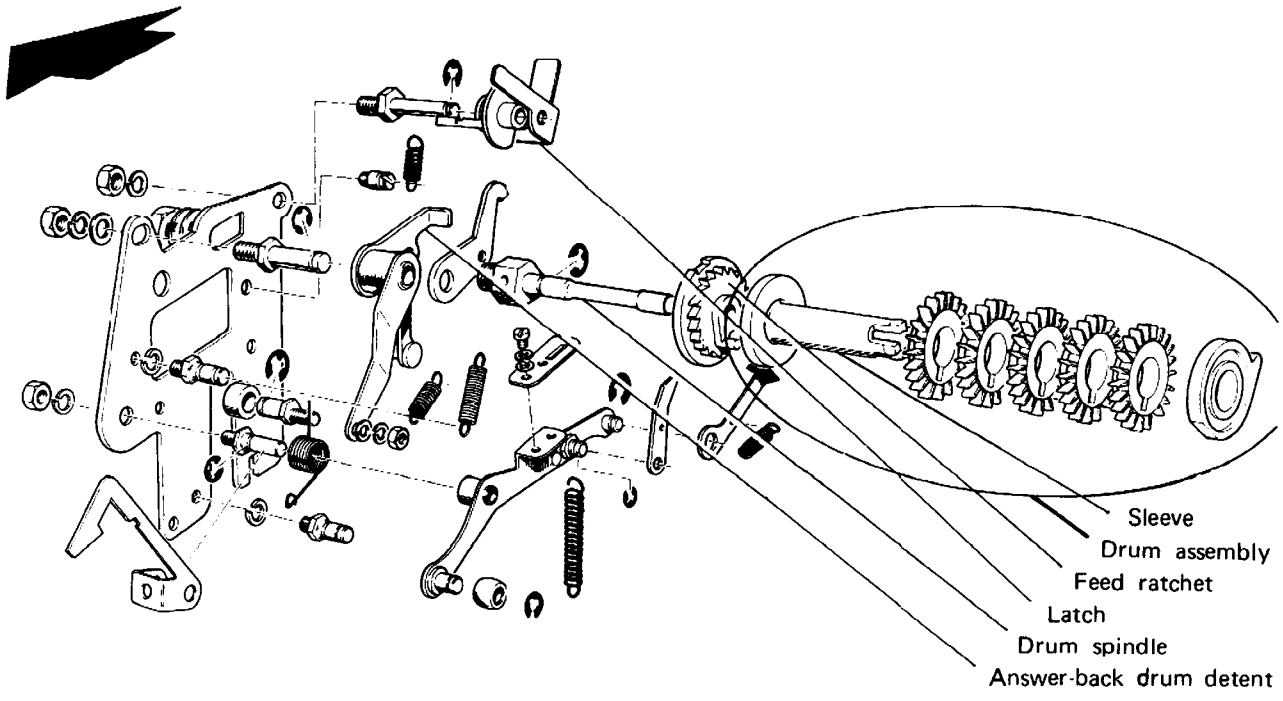

Fig. 5.36 TRANSMITTER ANSWER–BACK SUB UNIT

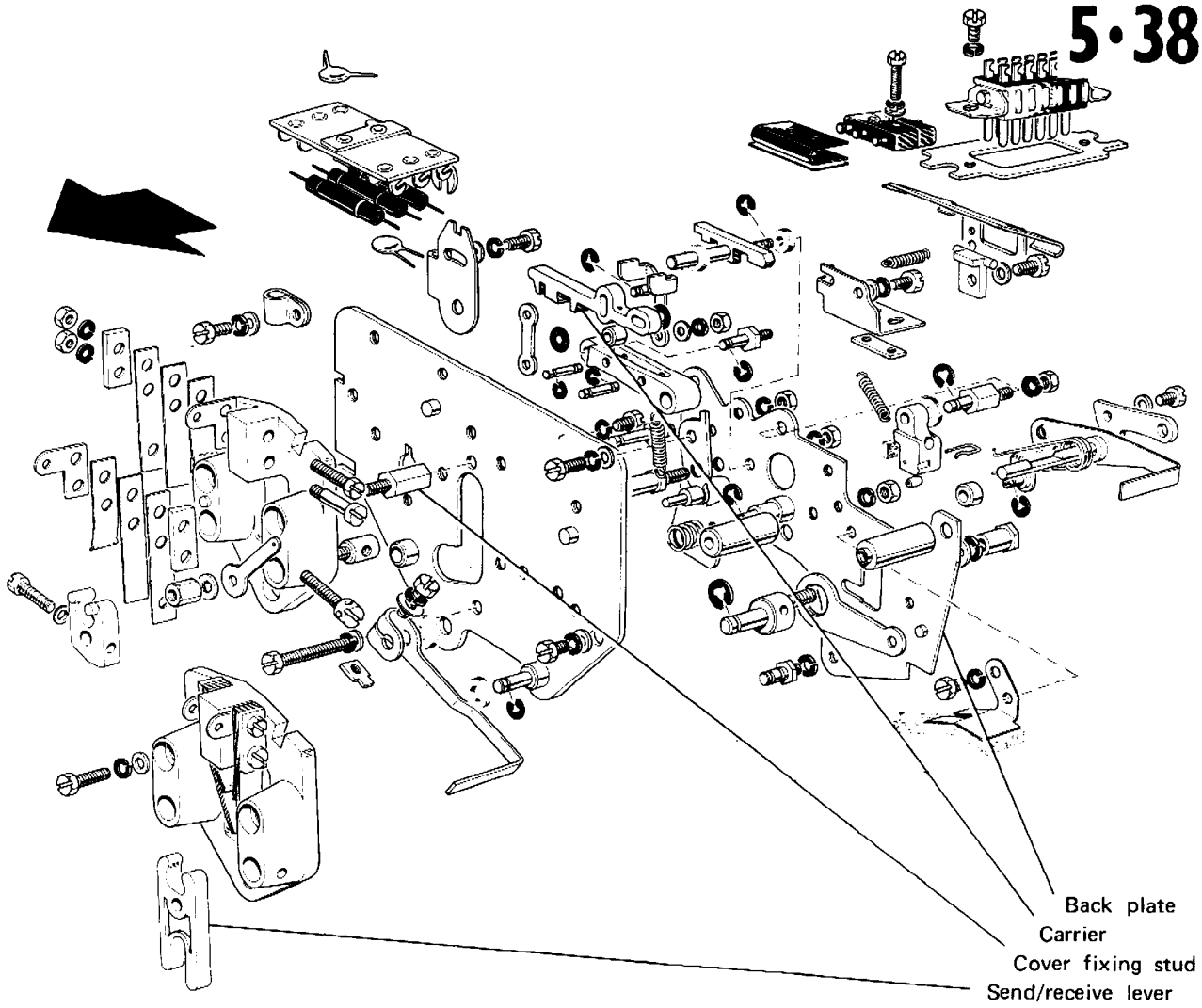

Fig. 5.37 TRANSMITTER STRIKER SUB UNIT

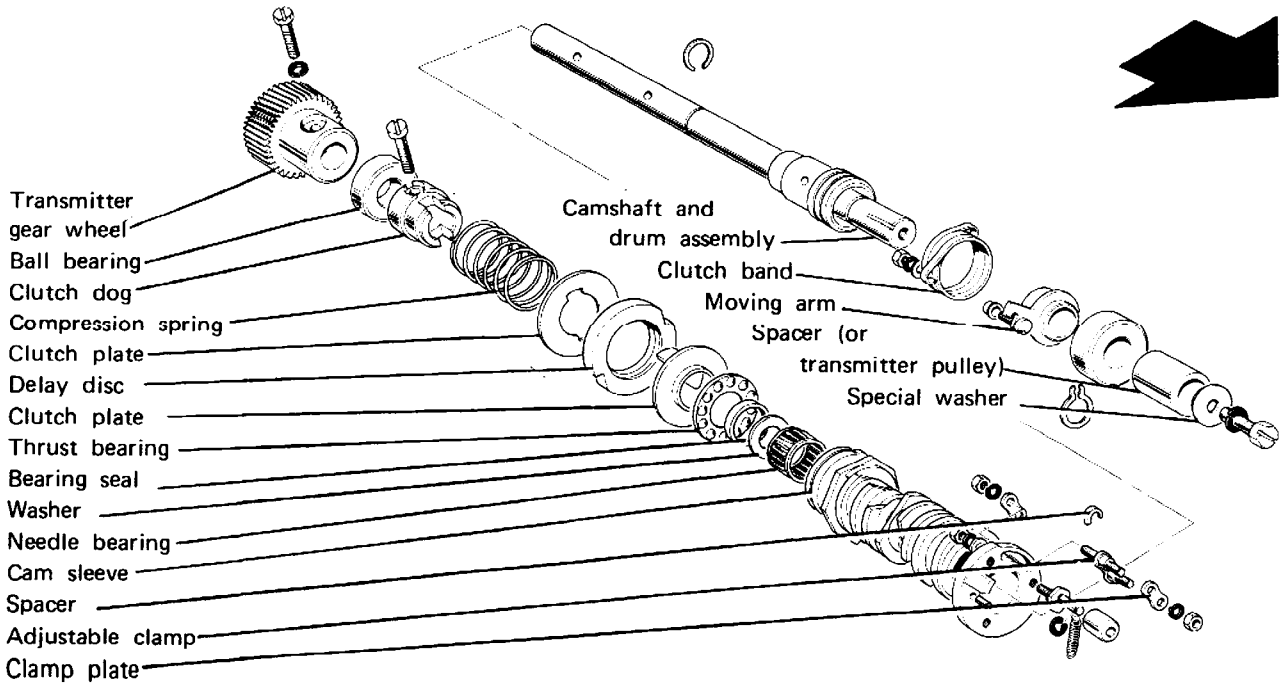

Fig. 5.38 TRANSMITTER CAMSHAFT ASSEMBLY

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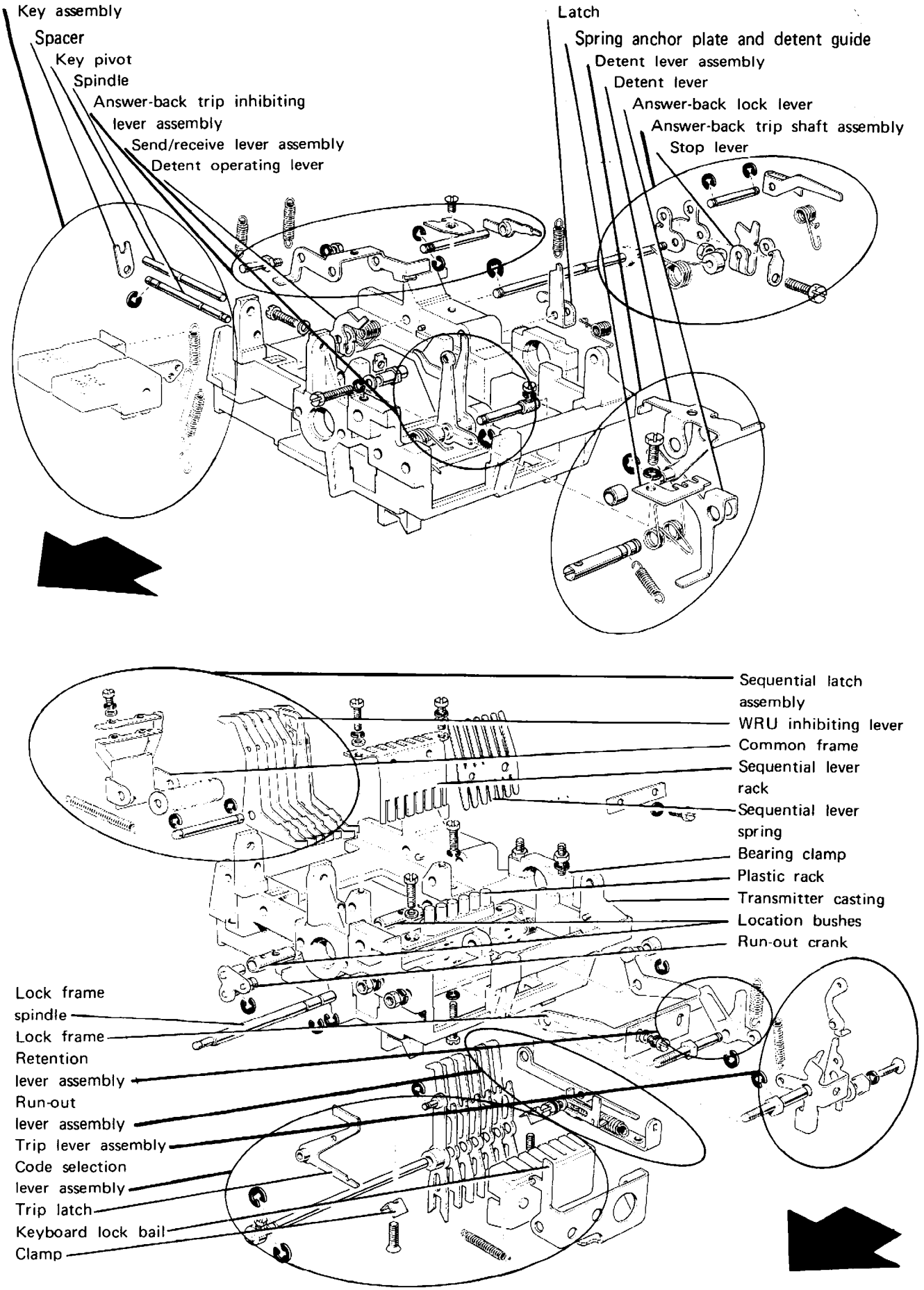

Fig. 5.39 TRANSMITTER SUB ASSEMBLY

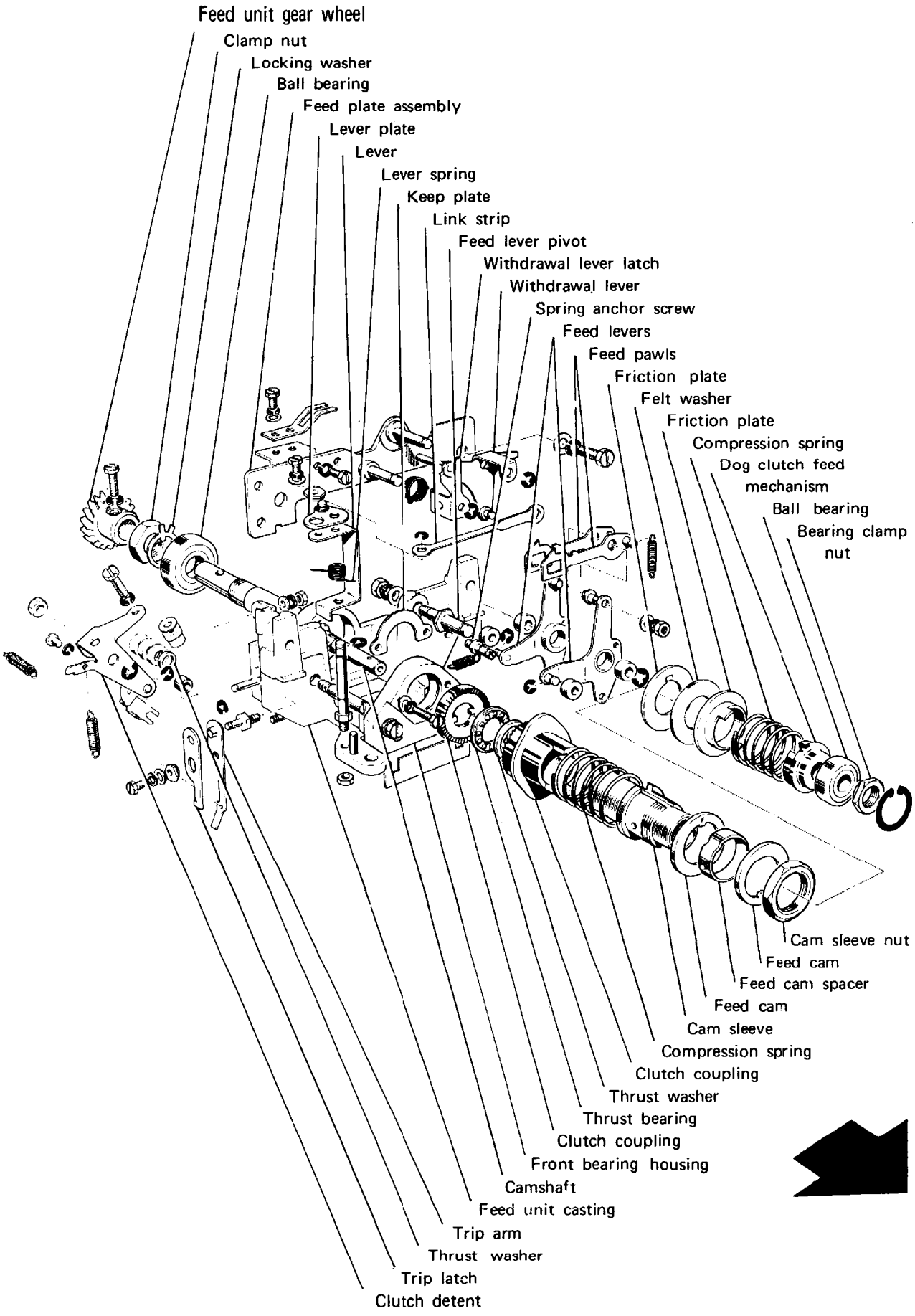

Fig. 5.40 FEED UNIT

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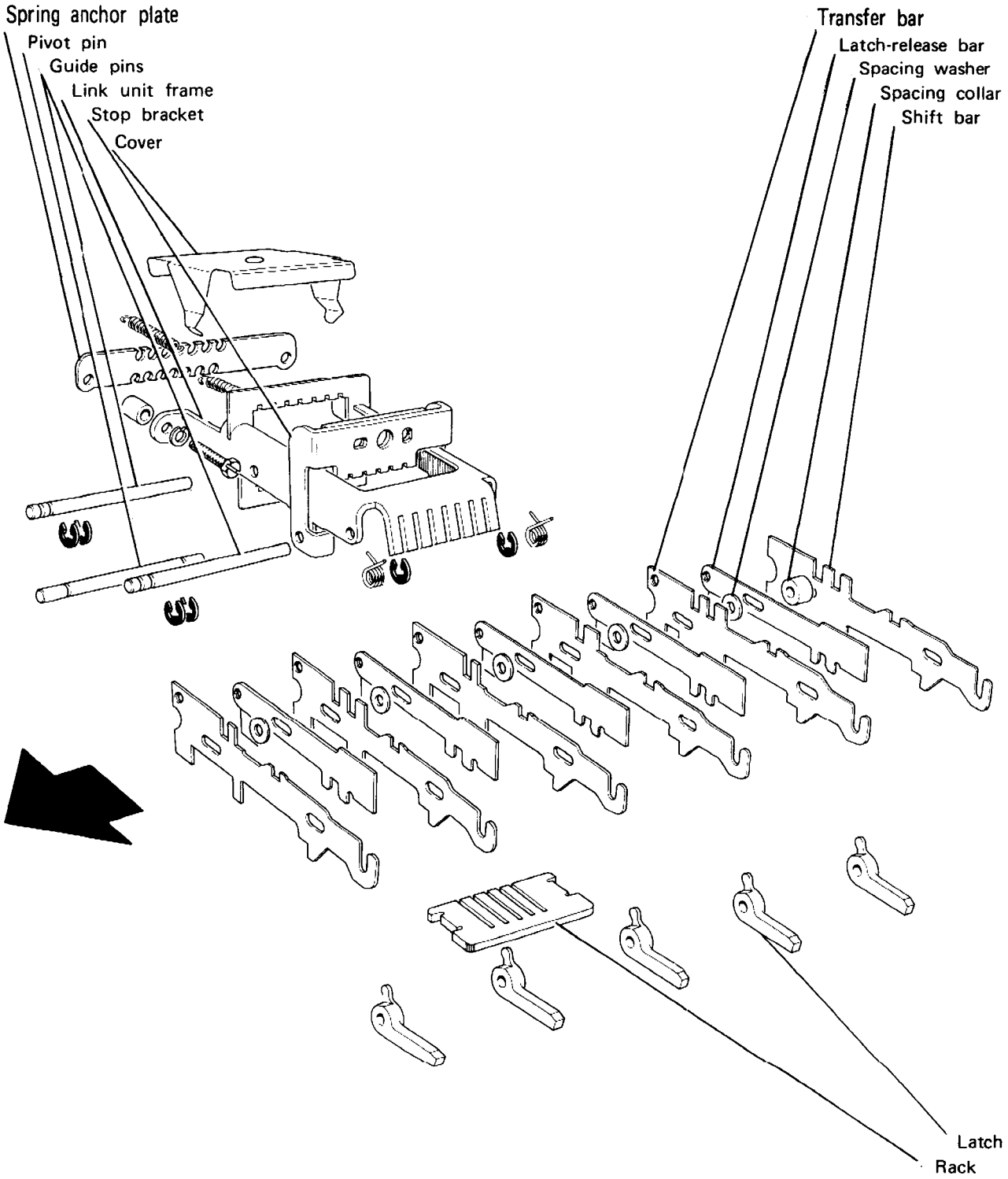

Fig. 5.41 LINK UNIT

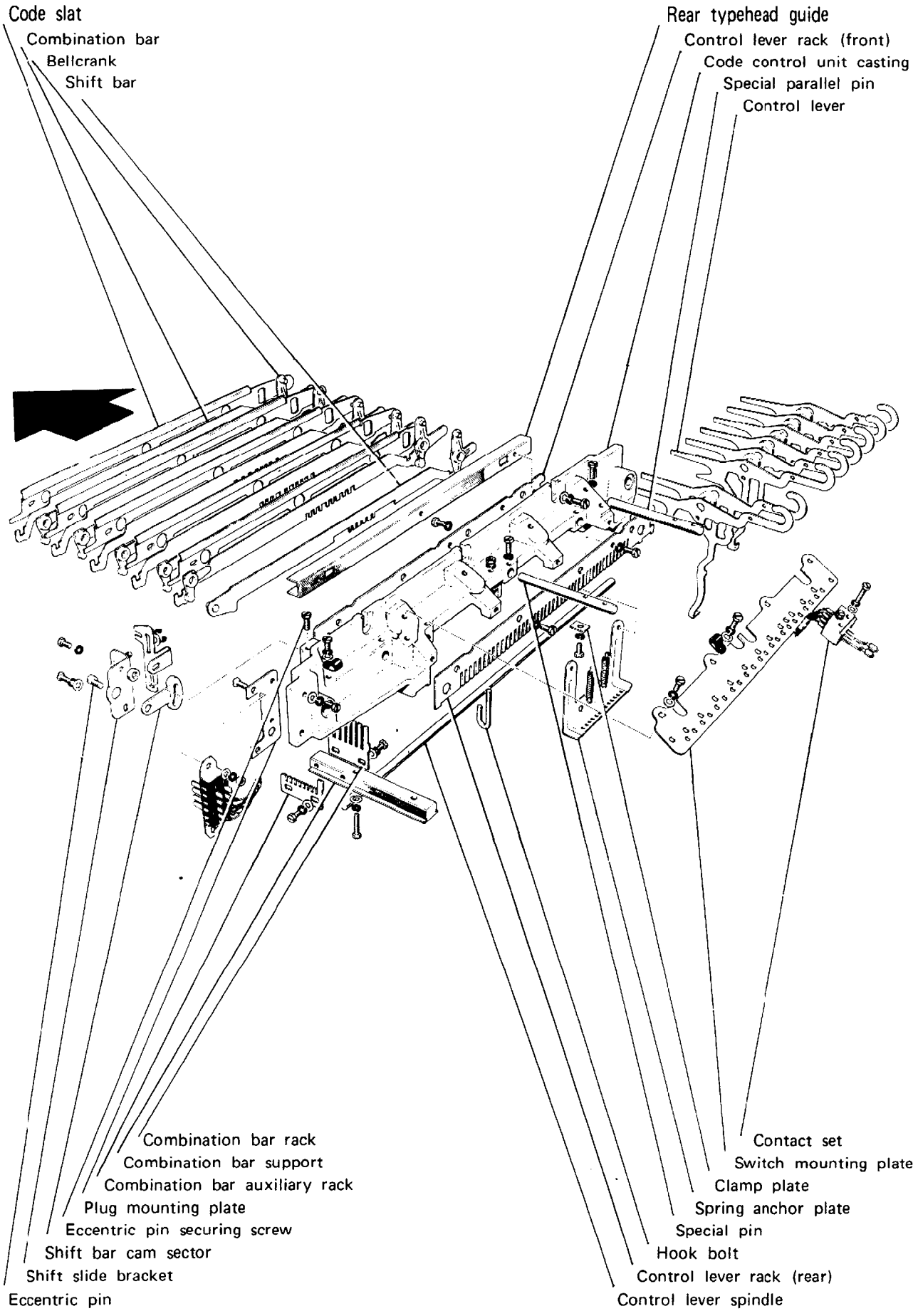

Fig. 5.42 CODE CONTROL UNIT

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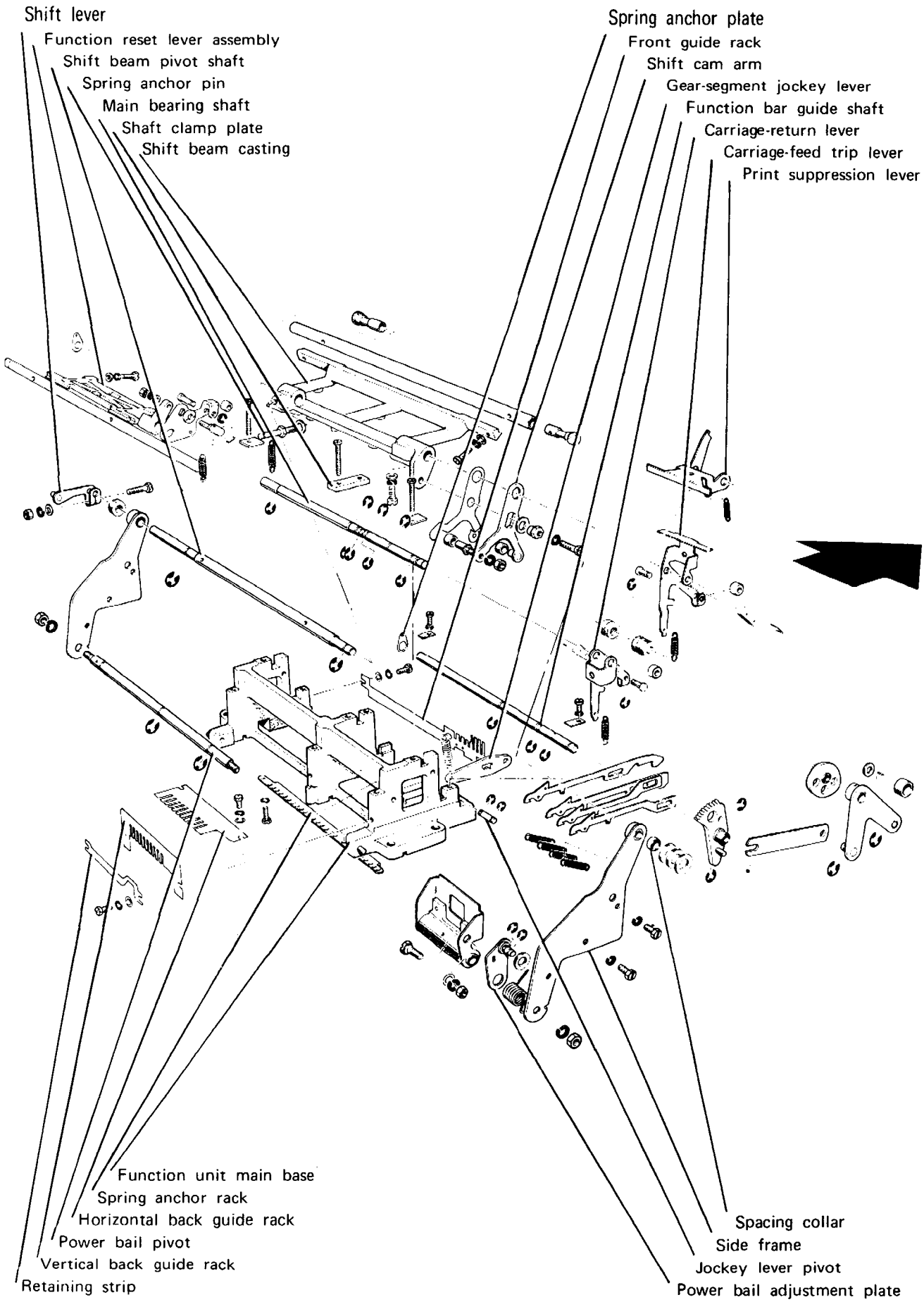

Fig. 5.43 FUNCTION UNIT

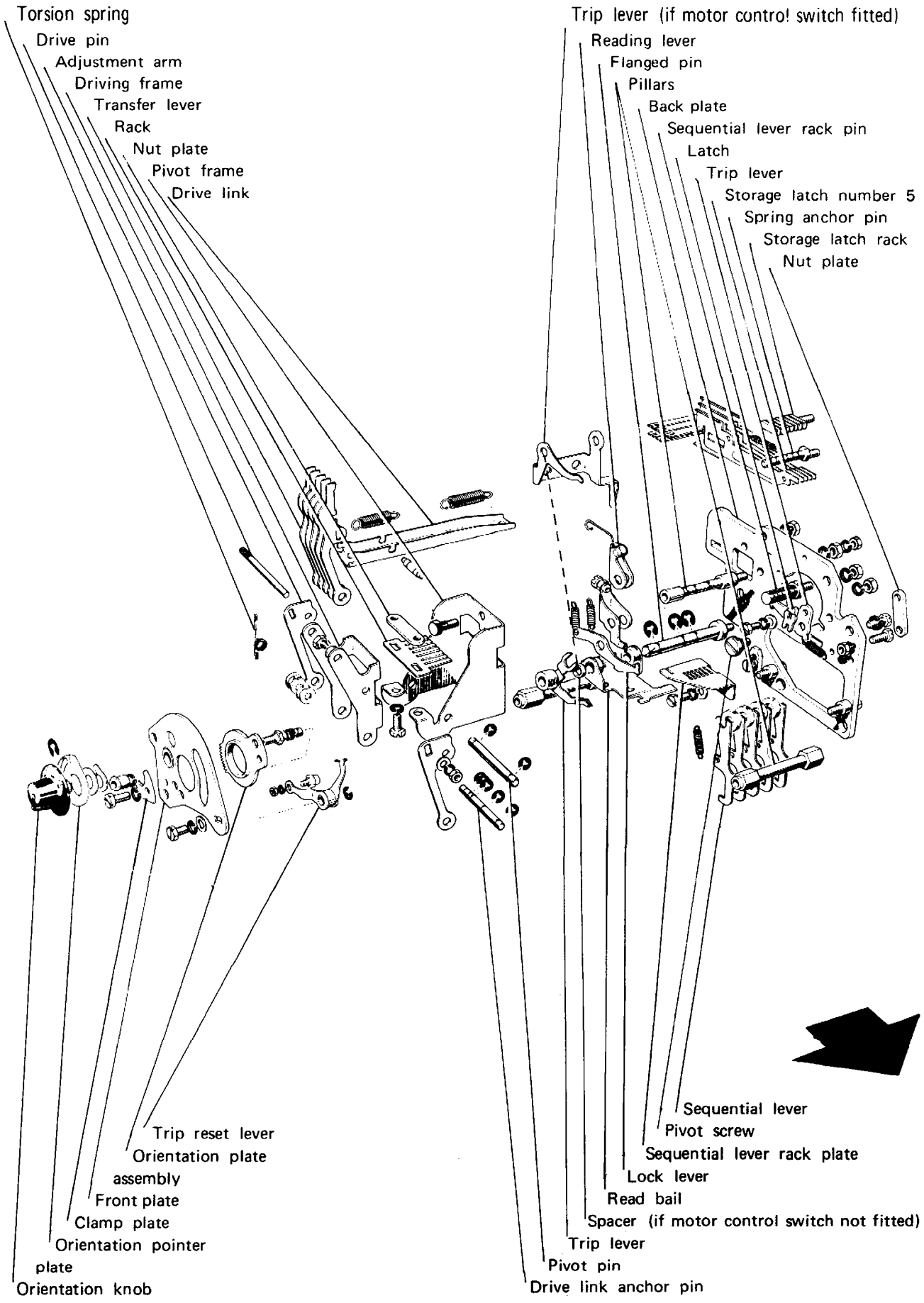

Fig. 5.44 SELECTOR UNIT

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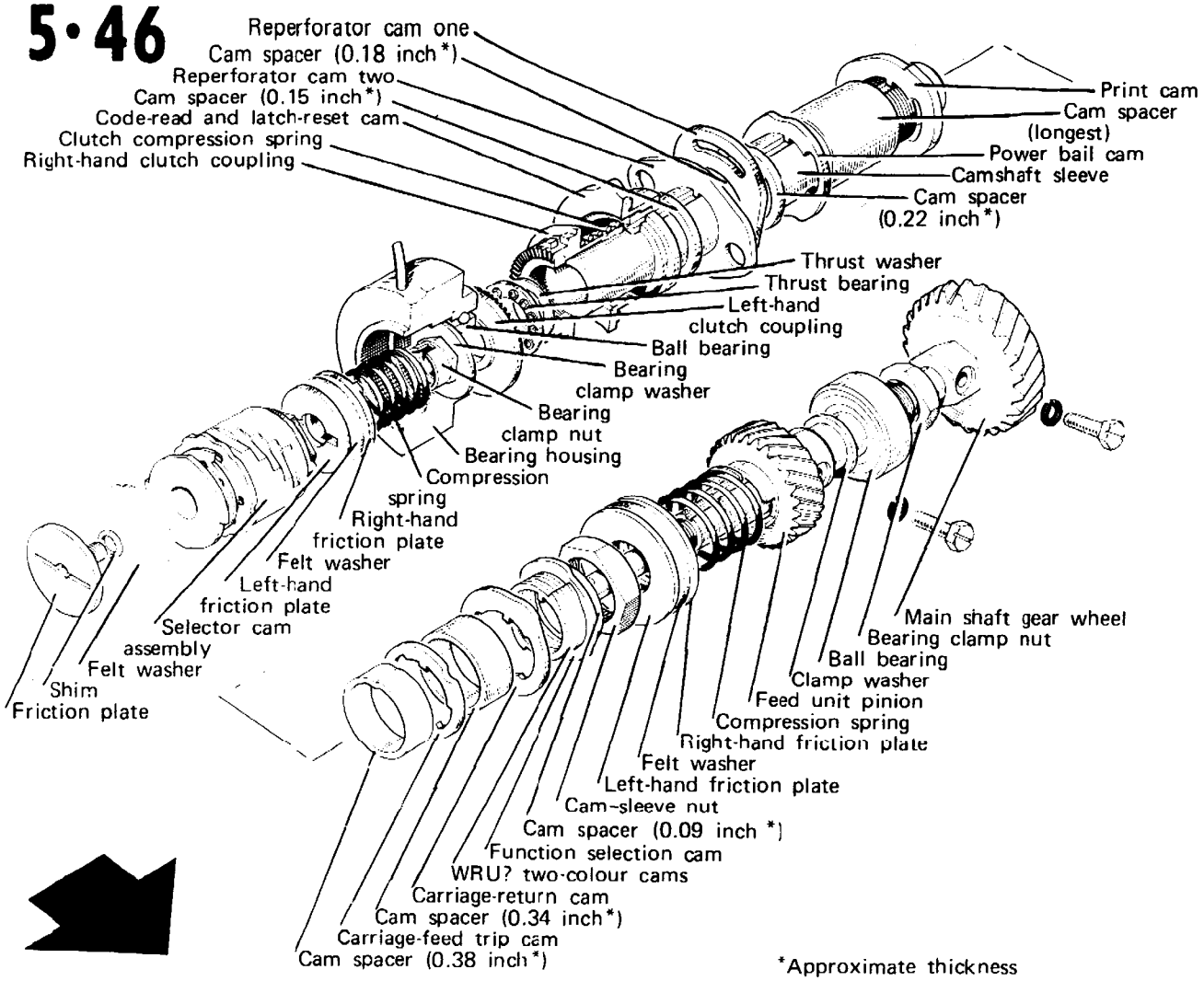

Fig. 5.45 MAIN CAMSHAFT

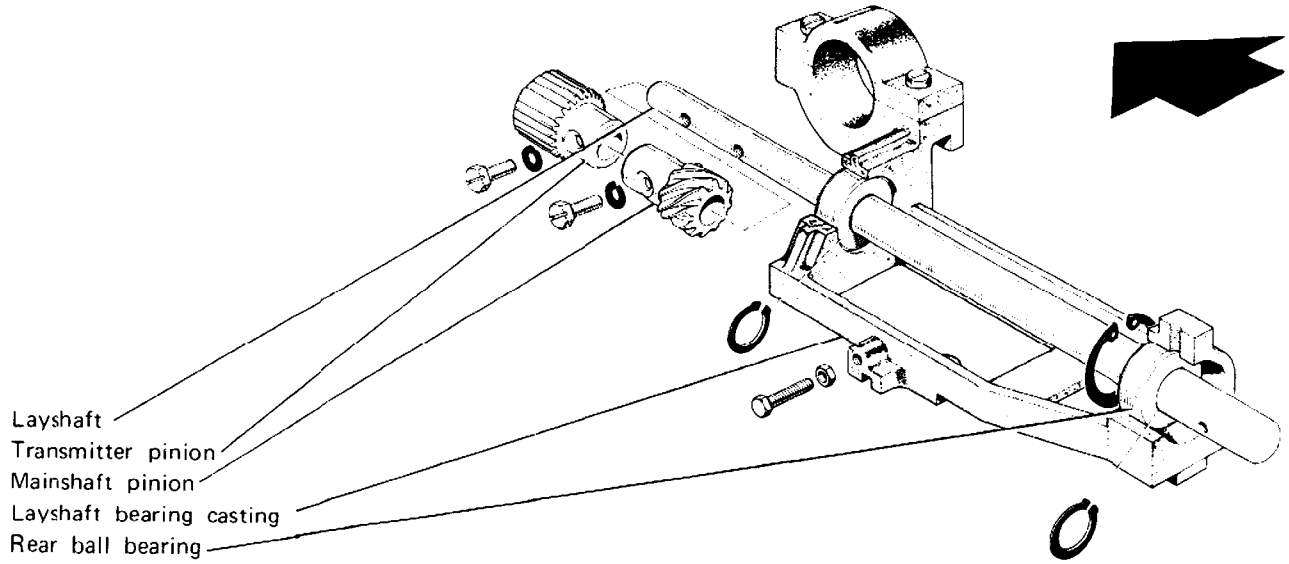

Fig. 5.46 LAYSHAFT UNIT

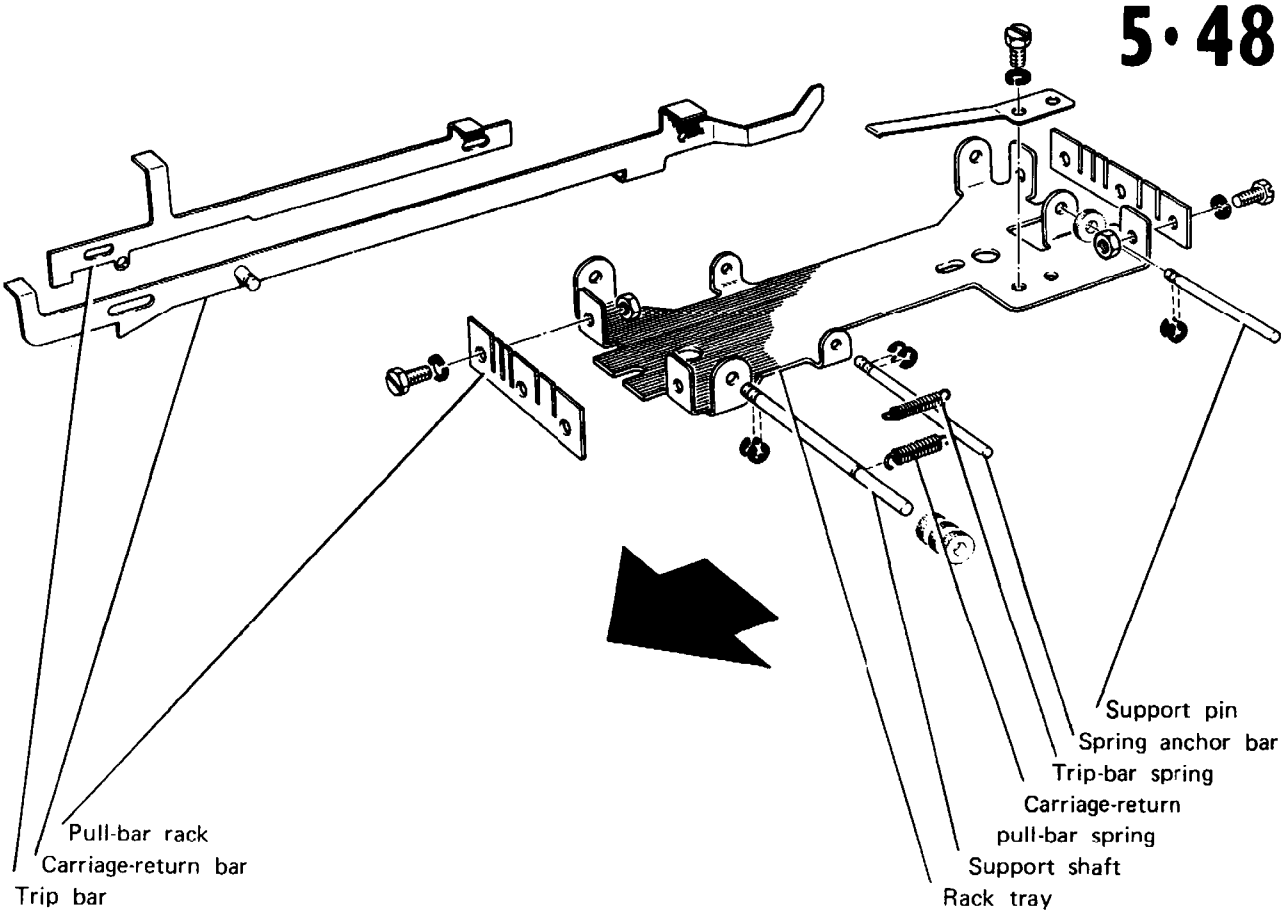

Fig. 5.47 PULL BAR UNIT

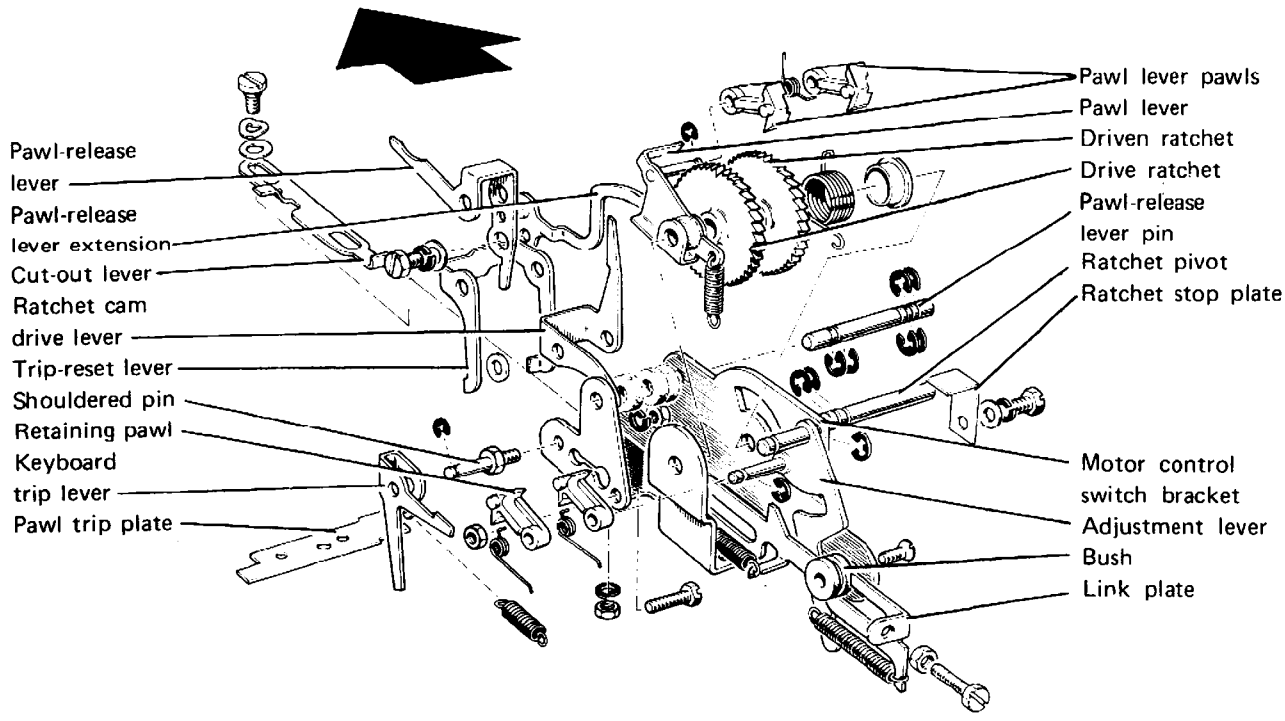

Fig. 5.48 MOTOR CONTROL SWITCH

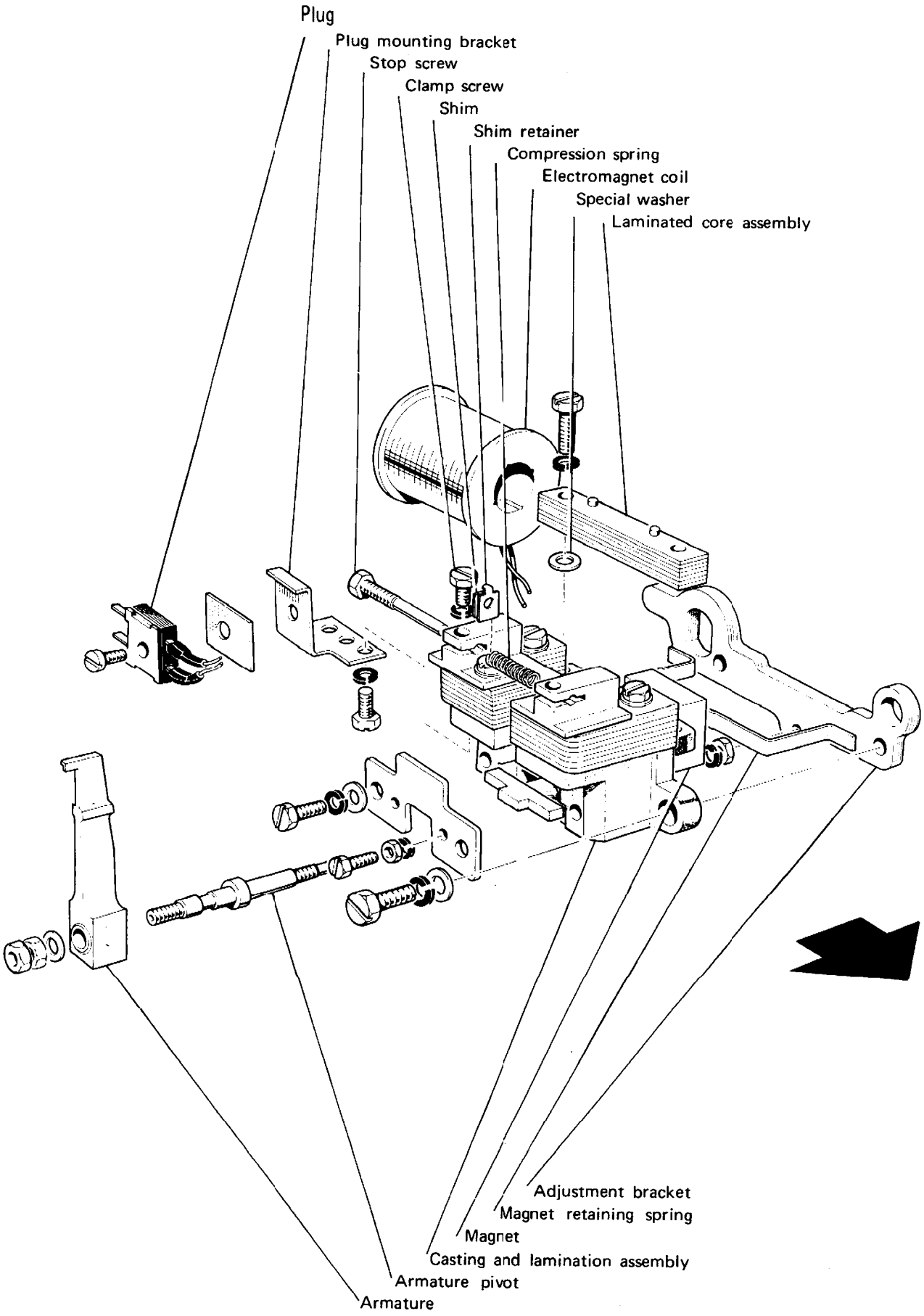

Fig. 5.49 ELECTROMAGNET UNIT

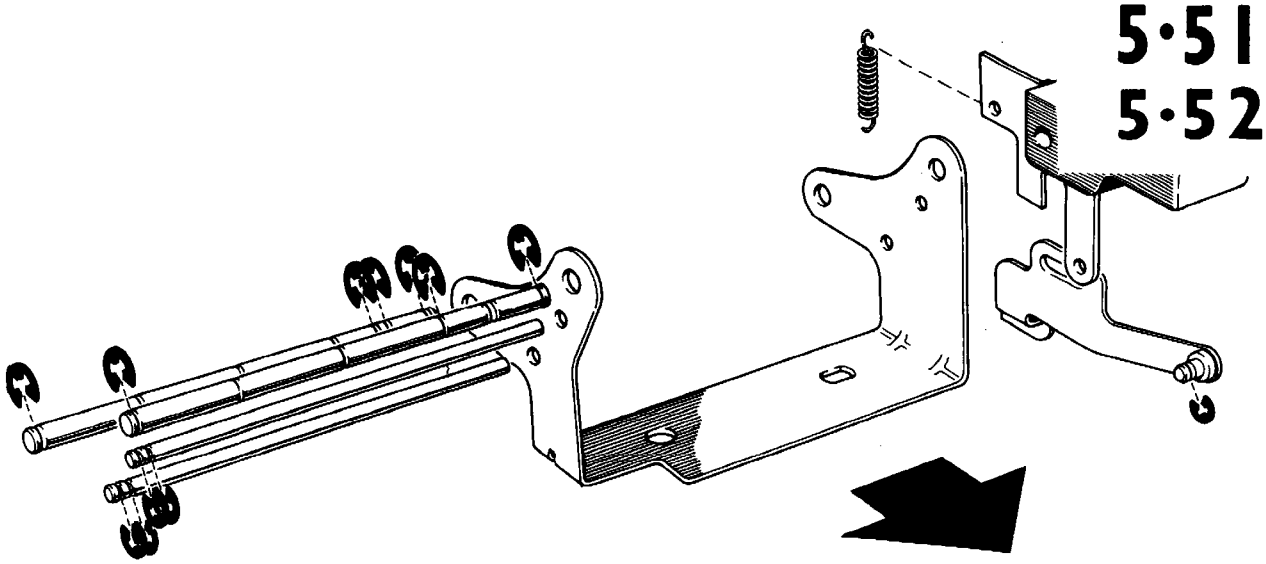

Fig. 5.50 MANUAL CONTROL UNIT

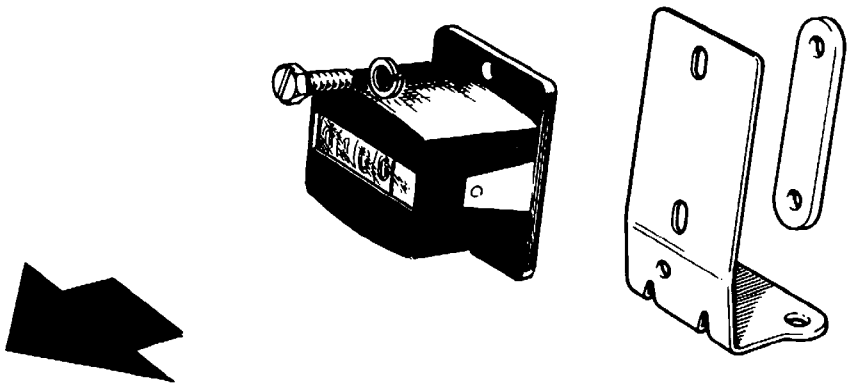

Fig. 5.51 HOURS COUNTER

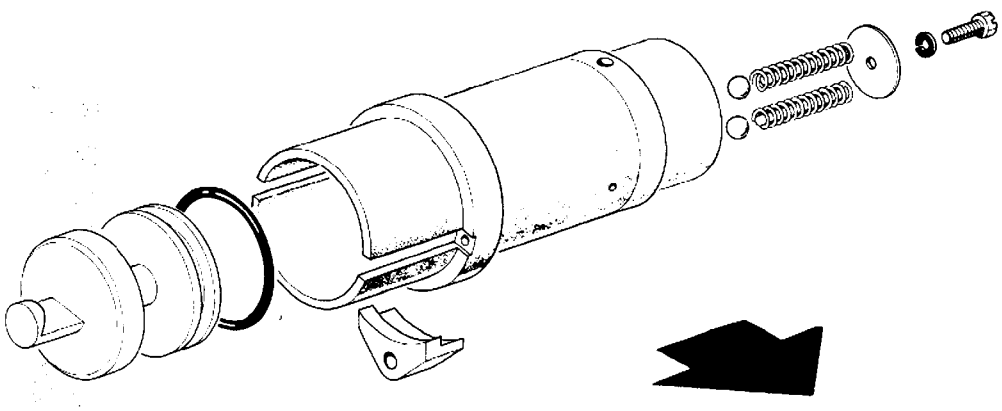

Fig. 5.52 DASHPOT ASSEMBLY

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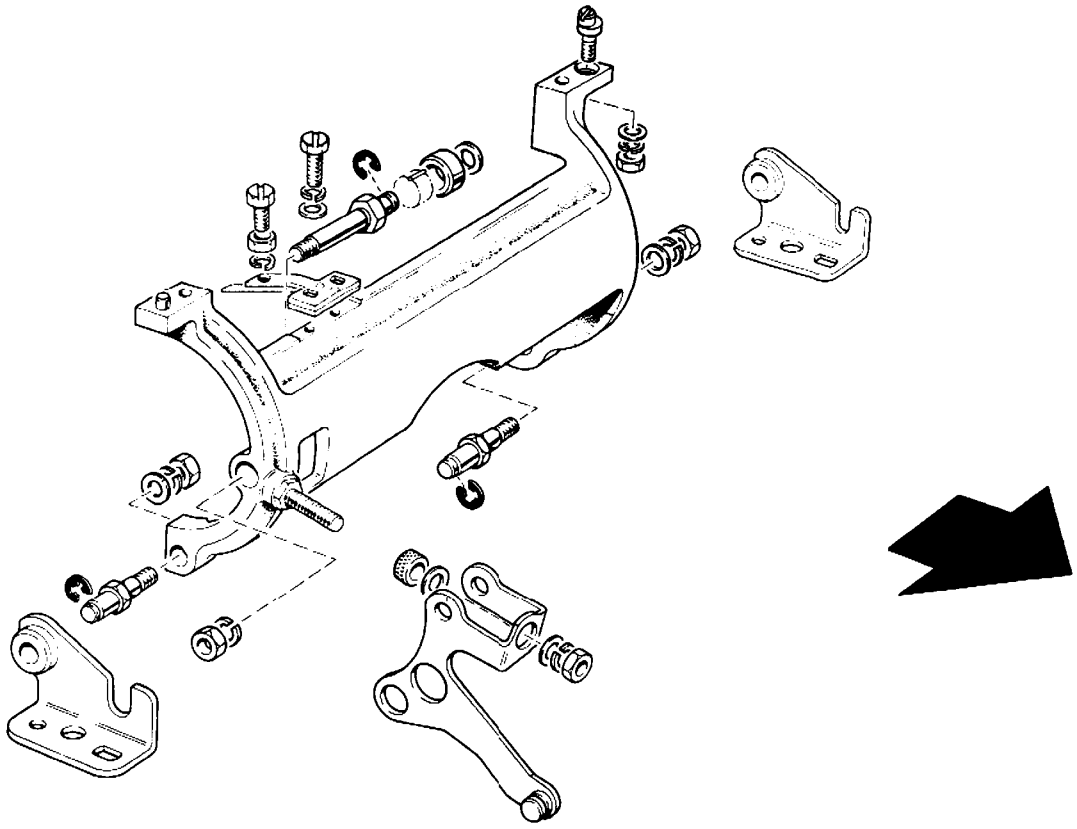

Fig. 5.53 PRINT BAIL ASSEMBLY

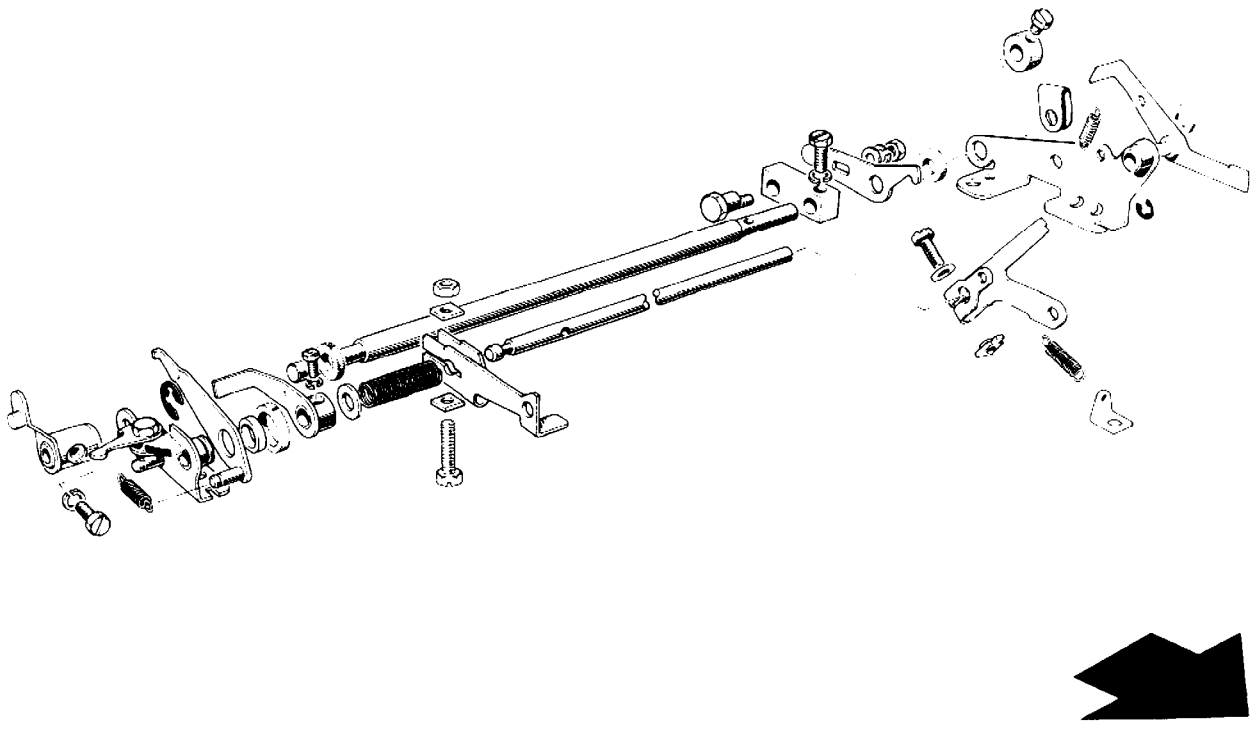

Fig. 5.54 TWO–COLOUR AND LINE–FEED ASSEMBLY