

## PART 2

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## PART 2

### A. INSTALLATION INSTRUCTIONS

#### 1. UNPACKING AND PRE-INSTALLATION PREPARATION

- 1.1 Open the packing case in accordance with the instructions attached to the outside of the case. Further instructions on unpacking the machine, plugs and cables will be found inside the case.
- 1.2 Ensure that the table or stand on which the machine is to be operated is sufficiently strong and rigid to support its weight.
- 1.3 Certain components and assemblies on the machine have been secured by string, wire or padding to minimise the danger of damage occurring in transit. Where applicable, ensure that the following instructions are carried out before attempting to install the machine.
  - (a) Tear off the adhesive tapes securing the cover flaps and the rubber strip along the platen. Remove the rubber strip. Remove the four cover fixing screws and lift off the cover.
  - (b) Remove the string securing each end of the paper roll holder.
  - (c) Remove the wire or padding around the transmitter lag weight (see warning label attached).
  - (d) Remove the string securing the platen pressure roller release lever.
  - (e) Remove the wire securing the carriage return lever (see warning label attached).
  - (f) Remove the wire securing the pawls of the operation counter (see warning label attached).
  - (g) Remove the wires securing the answer-back feed pawl lever and the 'Here Is' trip lever (see warning label attached).
  - (h) Untie and remove the linen bags containing the spare motor brushes and gears.
  - (j) Fit the end-of-line indicator lamp into its socket.
  - (k) Remove the adhesive tape from the tape drawer handle and the adhesive tape securing the tape drawer to the keyboard mask.
  - (l) Turn the machine on its side, unscrew the four rubber feet and take off the two metal bracing strips. Refit the rubber feet. Stand the machine up again, pull out the tape drawer and untie both the tape low arm and the tape reel holder.
  - (m) Remove the adhesive tape securing the reperforator chad chute lid.
  - (n) Screw the platen winder knob on to the platen spindle.
- 1.4 Inspect the mechanism and ensure that no part(s) has been damaged or worked loose in transit.
- 1.5 If the ink ribbon is not already fitted, remove it from its container and load it in the manner recommended in the Model Seventy-five Operator's Handbook.

- 1.6 Inspect the mechanism and ensure that it is adequately lubricated. All machines are fully lubricated before leaving the factory but, if the machine has been stored for a long period before use, there is a possibility that some oil may have been lost. When installing a machine that has been in storage for over six months, carry out the Lubrication Instructions given in Part 3.

2. INSTALLING A DOUBLE-CURRENT MACHINE

- 2.1 Ensure that the machine is set up for double-current operation. A visual check that the electromagnet biasing springs are disconnected will normally be sufficient evidence of this condition. If in any doubt, however, carry out the conversion instructions given on page 7.
- 2.2 If the machine is a single-speed model supplied with a set of alternative motor gears, refer to the following table and check that the correct set of gears is fitted for the required operating speed. If necessary, change the gears as described in the instructions given on page 11, paragraphs 5.2 to 5.4.

Baud Speed	Motor Pinion	Driven Gear	Colour Identification
45	GR 2199	4009/93A	Green
50	GR 2198	4009/94A	Yellow
75	GR 2201	4009/95A	Blue

- 2.3 If the machine is fitted with a gear-box, check that both the speed- and gear-change levers are correctly set for the required operating speed. If necessary, reposition them in accordance with the instructions given on page 10.
- 2.4 Load the paper in the manner recommended in the Model Seventy-five Operator's Handbook.
- 2.5 Ensure that all parts of the mechanism are free to move without evidence of binding. Depress a printing key or, if no keyboard is fitted, set up a printing character in the pin-box and turn the machine by hand until the mechanism has passed through a complete cycle. Repeat this operation, inspecting the mechanism for smooth performance.
- 2.6 Unwrap the signal and motor cords and connect them to their respective chassis-mounted plugs at the rear of the machine main base. Push the connexions firmly home to ensure good contact and screw up the outer locking rings.
- 2.7 Ensure that the electrical connexions under the main base and in the signal cord are suited to the line circuit. Two typical circuits suitable for double-current operation are provided in Part 1, Figs. 1.12 and 1.13.
- 2.8 Ensure that the power supply corresponds to that specified on the motor. If it does not, refer to Part 1, Fig. 1.10, and carry out such corrections as may be necessary. Connect the motor cord to the supply. Check that the main base is now earthed. Switch on the power supply to the motor and check the motor speed in the manner recommended in Adjustment No. 81 (Part 4, page 60).
- 2.9 The machine may now be tested in 'local' before connecting the signal cord to the line circuit. During this test, check the operation of all printing characters and machine functions. Check that the length of the printing line is suitable for the circuit on which the machine is to be used and, if necessary, re-adjust the line length as recommended in Adjustment No. 88 (part 4, page 70). Check the operation of the end-of-line indicator and, if necessary, re-adjust this unit as described in Adjustment No. 113 (Part 4, page 90).

INSTALLATION INSTRUCTIONS

2.10 The machine is now ready for an operational test with a distant station. During this test, the line-up procedure described below should be carried out. Check also that the line current does not fall below 20 mA.

Double-current line-up procedure

(a) Connect the signal cord to line and ask the distant station to transmit 'Y' (MSMSM) continuously. Slacken the knurled knob at the right-hand end of the orientation scale, Fig.2.2, and push the knob slowly to the left. Determine the earliest setting for which the receiver correctly registers two lines of 'Y's. Record this setting and call it 'a'.

★ Each small division on the orientation scale is equivalent to 5% of a signal element length.

(b) Move the orientation scale slowly to the right. Determine the latest setting for which the receiver correctly registers two lines of 'Y's. Record this setting and call it 'b'.

(c) Set the orientation scale to the mid-point of the range obtained above, i.e.  $\frac{1}{2}(a + b)$ . Tighten the knurled knob. Carry out an operational message test with the distant station.

2.11 If the operational test cannot be carried out with the distant station but another Model Seventy-five teleprinter known to be in working order is available, treat this second machine as a test set and link it up to the machine to be installed. All units of the machine to be installed can be tested and an approximate line-up obtained by carrying out the procedure outlined in paragraphs 2.10(a) to (c) above, with the second machine acting as the distant station. If this method of testing is used, the line-up procedure may need to be refined when the machine is finally connected to the distant station.

2.12 If the operational test cannot be carried out with the distant station and no other Model Seventy-five teleprinter is available, all units of a keyboard machine can be tested and an approximate line-up obtained by carrying out the following procedure.

'Self-test' line-up method

(a) Construct a 12-way plug and socket adaptor as shown in Fig.2.1 and connect it between the machine external 12-way plug and the signal socket. Ensure that there is no line voltage from any other machine on the signal socket.

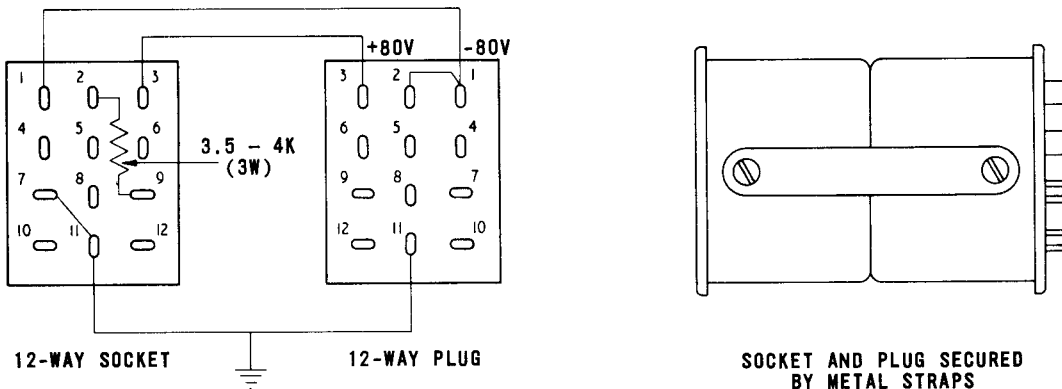


Fig. 2.1 12-WAY PLUG AND SOCKET ADAPTOR

INSTALLATION INSTRUCTIONS

(b) Connect the power supply plug and press the 'Y' (MSMSM) key on the keyboard. The machine will now run-out 'Y's until it is stopped by turning the rock-shaft stop arm, Fig.2.2, in a clockwise direction and so arresting the clutch. During this run-out operation, carry out the line-up procedure outlined in paragraphs 2.10(a) to (c) above. Remove the adaptor.

★ This method connects the send and receive sections of the machine together so allowing the transmitted signals to be regenerated at the receiver. Thus whatever code combination is inserted in the pin-box will print continuously until the mechanism is stopped. On machines which have no automatic carriage-return/line-feed facility, therefore, these functions will have to be operated independently during this test.

(c) If this method of testing is used, the line-up procedure may need to be refined when the machine is finally connected to the distant station.

2.13 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.

3. INSTALLING A SINGLE-CURRENT MACHINE

3.1 Ensure that the machine is set up for single-current operation. A visual check that the electromagnet biasing springs are connected will normally be sufficient evidence of this condition. If in any doubt, however, carry out the conversion instructions given on page 8.

3.2 If the machine is a single-speed model supplied with a set of alternative motor gears, refer to the following table and check that the correct set of gears is fitted for the required operating speed. If necessary, change the gears as described in the instructions given on page 11, paragraphs 5.2 to 5.4.

Baud Speed	Motor Pinion	Driven Gear	Colour Identification
45	GR 2199	4009/93A	Green
50	GR 2198	4009/94A	Yellow
75	GR 2201	4009/95A	Blue

3.3 If the machine is fitted with a gear-box, check that both the speed- and gear-change levers are correctly set for the required operating speed. If necessary, reposition them in accordance with the instructions given on page 10.

3.4 Load the paper in the manner recommended in the Model Seventy-five Operator's Handbook.

3.5 Ensure that all parts of the mechanism are free to move without evidence of binding. Depress a printing key or, if no keyboard is fitted, set up a printing character in the pin-box and turn the machine by hand until the mechanism has passed through a complete cycle. Repeat this operation, inspecting the mechanism for smooth performance.

3.6 Unwrap the signal and motor cords and connect them to their respective chassis-mounted plugs at the rear of the machine main base. Push the connexions firmly home to ensure good contact and screw up the outer locking rings.

3.7 Ensure that the electrical connexions under the main base and in the signal cord are suited to the line circuit. A typical circuit suitable for single-current operation is provided in Part 1, Fig.1.11.

3.8 Ensure that the power supply corresponds to that specified on the motor. If it does not, refer to Part 1, Fig.1.10, and carry out such corrections as may be necessary. Connect the motor cord to the supply. Check that the main base is now earthed.

## INSTALLATION INSTRUCTIONS

3.9 Keyboard Machines. Before any further local tests are carried out, ensure that the selector unit remains in the rest position. A convenient way to do this is to bias the electromagnet armature against the mark stop by slackening the screw clamping plate, Fig.2.2, and turning the bias adjustment screw in a counter-clockwise direction.

- ★ Use a pencil mark to indicate the original factory setting of the bias adjustment screw so that it can be restored after the completion of the tests in paragraph 3.11.

Receiver-only Machines. The procedure recommended above can only be applied to keyboard machines. Receiver-only machines must be tested by linking them either to another teleprinter which is fitted with a keyboard or to an automatic transmitter (tape reader), both of which must be set up for single-current operation.

3.10 Switch on the power supply to the motor and check the motor speed in the manner recommended in Adjustment No.81 (Part 4, page 60).

3.11 The machine may now be tested in 'local' before connecting the signal cord to the line circuit. During the test, check the operation of all printing characters and machine functions. Check that the length of the printing line is suitable for the circuit on which the machine is to be used and, if necessary re-adjust the line length as recommended in Adjustment No.88 (Part 4, page 70). Check the operation of the end-of-line indicator and, if necessary, re-adjust this unit as described in Adjustment No.113 (Part 4, page 90). Restore the bias adjustment screw to its original setting and secure it with its clamping plate.

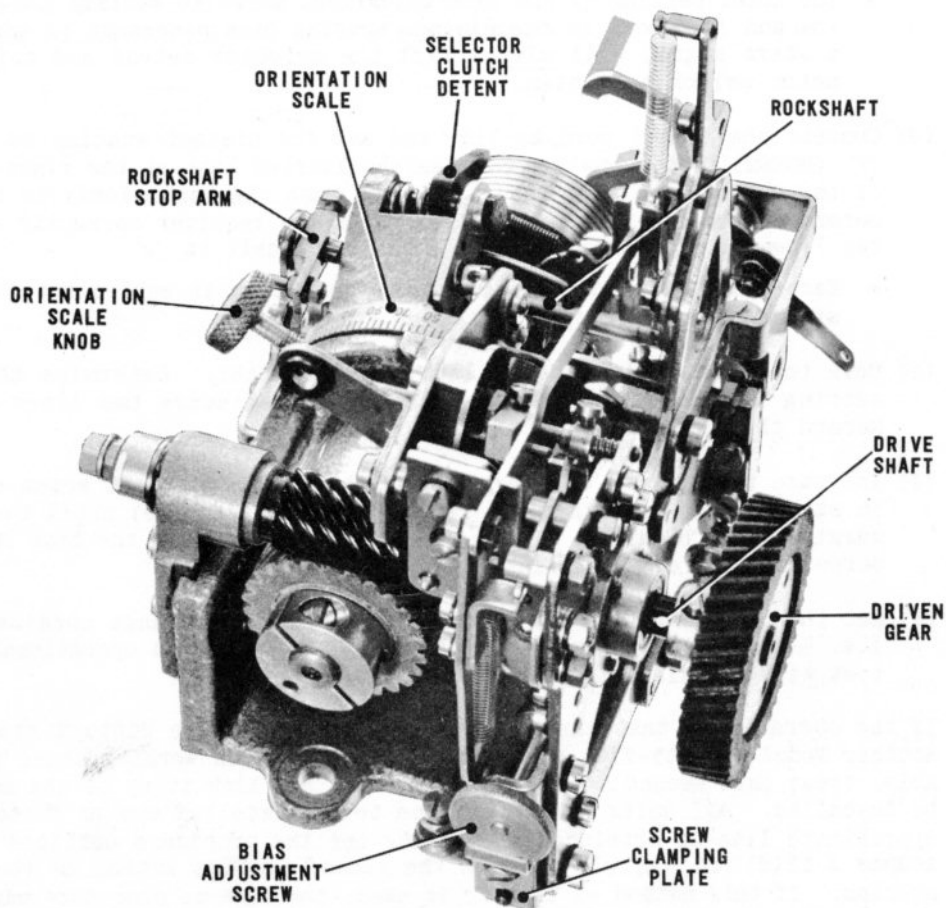


Fig. 2.2 SELECTOR UNIT—SINGLE-SPEED MODEL

- 3.12 The machine is now ready for an operational test with a distant station. During this test, the line-up procedure described below should be carried out. Check also that the line current does not fall below 35 mA.

Single-current line-up procedure

- (a) Switch on the motor, slacken the screw clamping plate, Fig.2.2, and turn the bias adjustment screw slowly in a clockwise direction until the selector clutch detent is disengaged from the trigger and the clutch rotates continuously.
- (b) Stop the clutch by applying finger pressure at each end of the rockshaft stop arm and turning the rockshaft gently in a clockwise direction. Remove the pressure from the stop arm and check that the spacing bias on the electromagnet armature is sufficient to lift the detent and release the clutch. Repeat this check a sufficient number of times to ensure that the detent release action is reliable. If the detent occasionally fails to release, increase the spacing bias slightly.
- (c) Turn the rockshaft stop arm in a clockwise direction to hold the detent down into the path of the selector clutch until the automatic start/stop switch has switched off the motor. This action may take up to 1½ minutes.

Release the detent and check that the spacing bias is sufficient both to trigger the motor switch mechanism and to release the selector clutch. Repeat the check a sufficient number of times to ensure that the motor switch and clutch release actions are reliable.

- ★ The ideal setting of the bias adjustment screw to satisfy the checks in (b) and (c) above is the minimum spacing bias necessary to ensure that a start signal will always lift the selector detent and trigger the motor switch mechanism.

- (d) Connect the signal cord to line and ask the distant station to transmit 'Y' (MSMSM) continuously. Slacken the knurled knob at the right-hand end of the orientation scale, Fig.2.2, and push the knob slowly to the left. Determine the earliest setting for which the receiver correctly registers two lines of 'Y's. Record this setting and call it 'a'.

- ★ Each small division on the orientation scale is equivalent to 5% of a signal element length.

- (e) Move the orientation scale slowly to the right. Determine the latest setting for which the receiver correctly registers two lines of 'Y's. Record this setting and call it 'b'.

- (f) Increase the spacing bias by turning the bias adjustment screw clockwise in steps of 1/8 of a turn and repeat checks (d) and (e) until the receive margin (i.e. 'b' minus 'a') is at its maximum. Secure the bias adjustment screw with its clamping plate.

- (g) Set the orientation scale to the mid-point of the range obtained above, i.e.  $\frac{1}{2}(a + b)$ . Tighten the knurled knob. Carry out an operational message test with the distant station.

- 3.13 If the operational test cannot be carried out with the distant station but another Model Seventy-five teleprinter known to be in working order is available, treat this second machine as a test set and link it up to the machine to be installed. All units of the machine to be installed can be tested and an approximate line-up obtained by carrying out the procedure outlined in paragraphs 3.12(d) to (g) above, with the second machine acting as the distant station. If this method of testing is used, the line-up procedure may need to be refined when the machine is finally connected to the distant station.

- 3.14 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.



## B. OPERATION INSTRUCTIONS

### 1. CONVERTING FROM SINGLE- TO DOUBLE-CURRENT OPERATION

- 1.1 Remove the platen knob and the four cover securing screws. Lift off the cover and refit the platen knob.
- 1.2 Disconnect the biasing springs, Fig.2.3, from the electromagnet armature.
- 1.3 With the machine in the rest position, slacken the two screws (one at each end) clamping the knock-out lever, pull the armature knock-out link away from the central pin on the armature link arm and raise it until it is clear of the arm. Tighten the screws, ensuring that the end-play on the knock-out lever is kept to a minimum.
- 1.4 With the electromagnet armature in the mark position, check that the top edge of the break-in operating lever is just touching the break-in cam. If necessary, slacken the locknut and screw clamping the lever to the rockshaft and adjust the lever until the condition is satisfied. Tighten the screw and locknut.

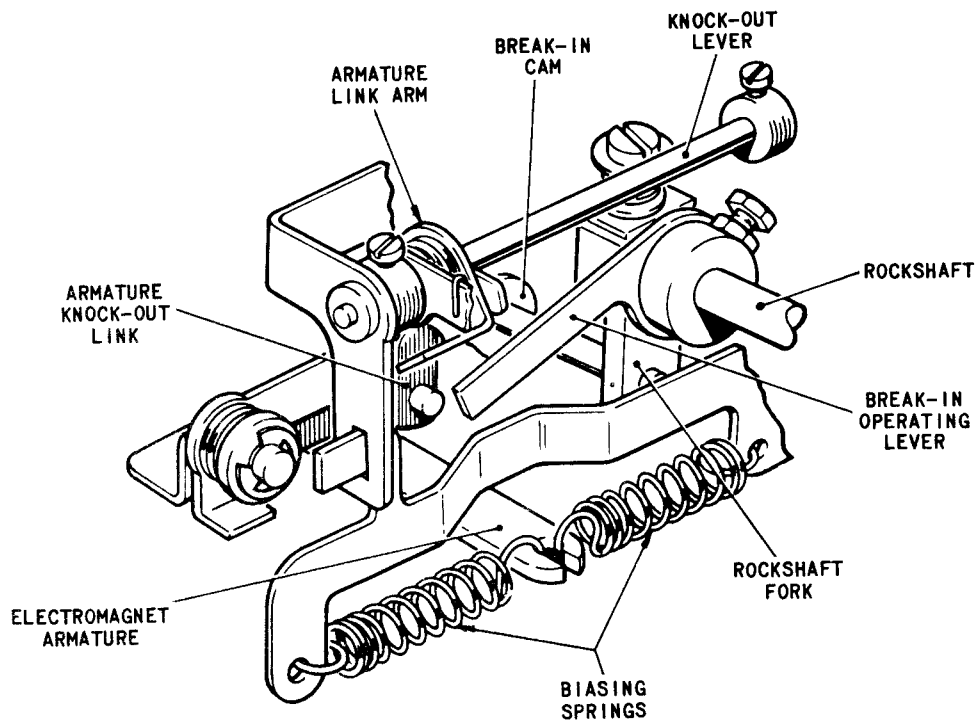


Fig. 2.3 ELECTROMAGNET/SELECTOR UNIT LINKAGE

- 1.5 Re-adjust the transmitter contacts as described in Adjustment Nos.82 or 83 (Part 4, pages 60 or 64).

## OPERATION INSTRUCTIONS

- 1.6 Refer to Part 1, Fig.1.7, and connect the spark quench unit across the electromagnet.
- 1.7 Carry out the line-up procedure given in paragraph 2.10 on page 3.
- 1.8 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.

### 2. CONVERTING FROM DOUBLE- TO SINGLE-CURRENT OPERATION

- 2.1 Remove the platen knob and the four cover securing screws. Lift off the cover and refit the platen knob.
- 2.2 With the machine in the rest position, slacken the two screws (one at each end) clamping the knock-out lever, Fig.2.3, and lower the armature knock-out link so that its hole locates over the central pin on the armature link arm. Position the knock-out link so that the pin on the end of the link arm is fully coupled to the rockshaft fork and tighten the knock-out lever screws, ensuring that the end-play on the lever is kept to a minimum.
- 2.3 With the electromagnet armature in the mark position, check that the top edge of the break-in operating lever is clear of the break-in cam by approximately .060 in. If necessary, slacken the locknut and screw clamping the lever to the rockshaft and adjust the lever until the condition is satisfied. Tighten the screw and locknut.
- 2.4 Re-adjust the transmitter contacts as described in Adjustment Nos.82 or 83 (Part 4, pages 60 or 64).
- 2.5 Refer to Part 1, Fig.1.7, and disconnect the spark quench unit from across the electromagnet.
- 2.6 Connect the biasing spring to the electromagnet armature.
- 2.7 Carry out the line-up procedure given in paragraph 3.12 on page 6.
- 2.8 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.

### 3. CONVERTING A DUAL-SPEED (45/50 BAUD) MACHINE TO 75 BAUD OPERATION

- 3.1 Switch off the motor power supply. Remove the platen knob and the four cover securing screws. Lift off the cover and refit the platen knob.
- 3.2 Remove the motor unit from the machine main base as described in Part 5, page 3.
- 3.3 Disconnect the gear lever spring, Fig.2.4. Remove the screw securing the gear lever and withdraw the lever. Slacken the two collar securing screws so that the collars are free to move on the shouldered pin.
- 3.4 Hold the nut which clamps the shouldered pin to the starter main plate and unscrew the pin until it is free from the plate. Remove the gear-change fork.
- 3.5 Remove the outer driven gear (50 bauds-Yellow) and the screw securing the driving dog. Withdraw the dog and the inner driven gear (45 bauds-Green), taking care not to lose the driving dog.

- 3.6 Slide the 75-baud driven gear (4009/95A-Blue) on to the drive shaft, boss innermost, engaging its slot with the driving key. Secure the gear by fitting the screw which formerly held the driving dog into the gear boss, and securing it into the innermost of the two tapped holes in the drive shaft.

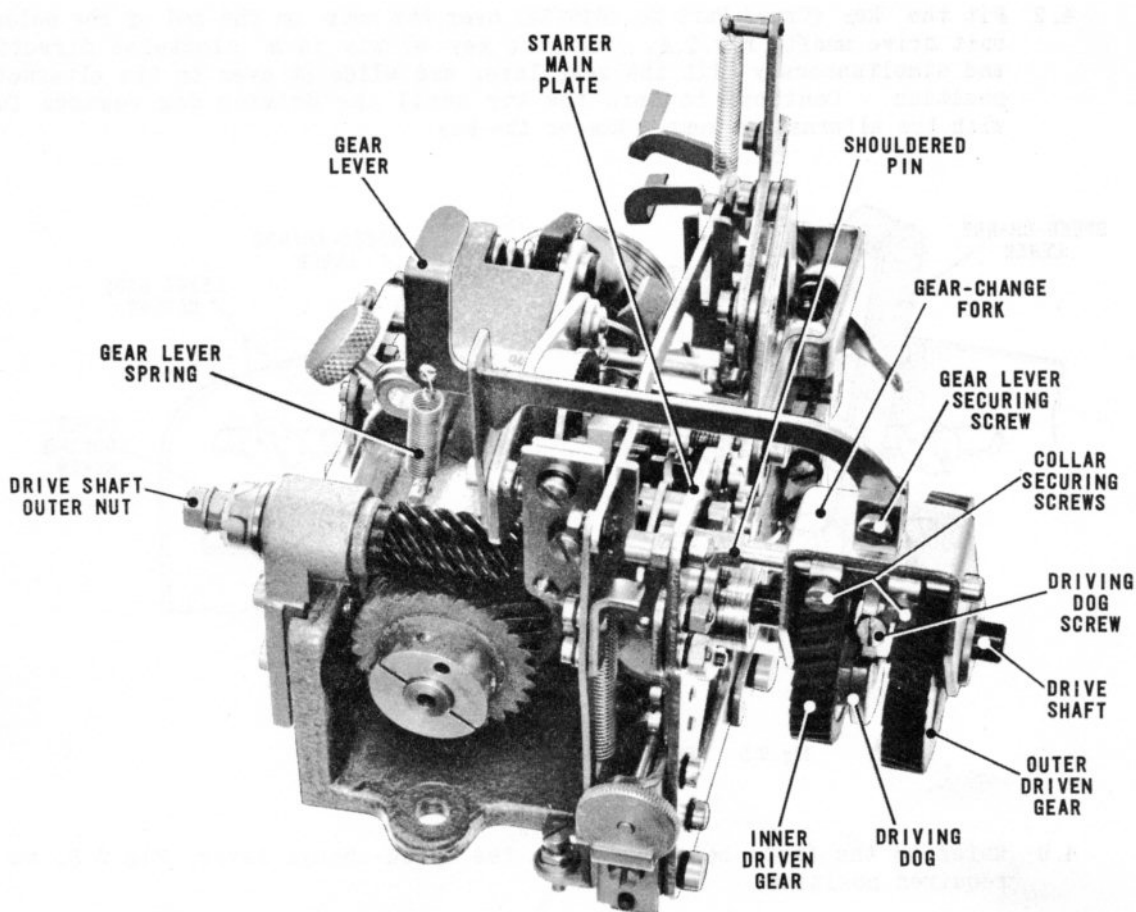


Fig. 2.4 SELECTOR UNIT FITTED WITH A GEAR-BOX

- 3.7 Remove the screw securing the two motor pinions and withdraw them from the motor. Fit the 75-baud motor pinion (GR2201-Blue) on to the motor shaft and secure it with its screw.
- 3.8 Reassemble the motor unit to the machine main base as described in Part 5, page 10.
- 3.9 Restore the power supply to the motor and carry out the appropriate line-up procedure, i.e. as described in paragraph 2.10 on page 3 for machines set up for double-current operation, or paragraph 3.12 on page 6 for single-current machines. Carry out Adjustment Nos.84 and 89 (Part 4, pages 68 and 71). To obtain optimum performance it may be necessary to refine the adjustment of the transmitter contacts after a speed change has been made. Adjustment Nos.82 or 83 refer (Part 4, pages 60 or 64).
- 3.10 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.

4. CHANGING SPEED ON A MACHINE FITTED WITH A GEAR-BOX

- 4.1 Switch off the motor power supply. Remove the platen knob and the four cover securing screws. Lift off the cover and refit the platen knob. Ensure that the selector and translator clutches are at rest against their respective detents.
- 4.2 Fit the key (Creed Part No.4019/54) over the nuts on the end of the selector unit drive shaft, Fig.2.4. Turn the key slowly in a clockwise direction, and simultaneously lift the gear lever and slide it over to its alternative position. Continue to turn the key until the driving dog engages fully with the alternative gear. Remove the key.

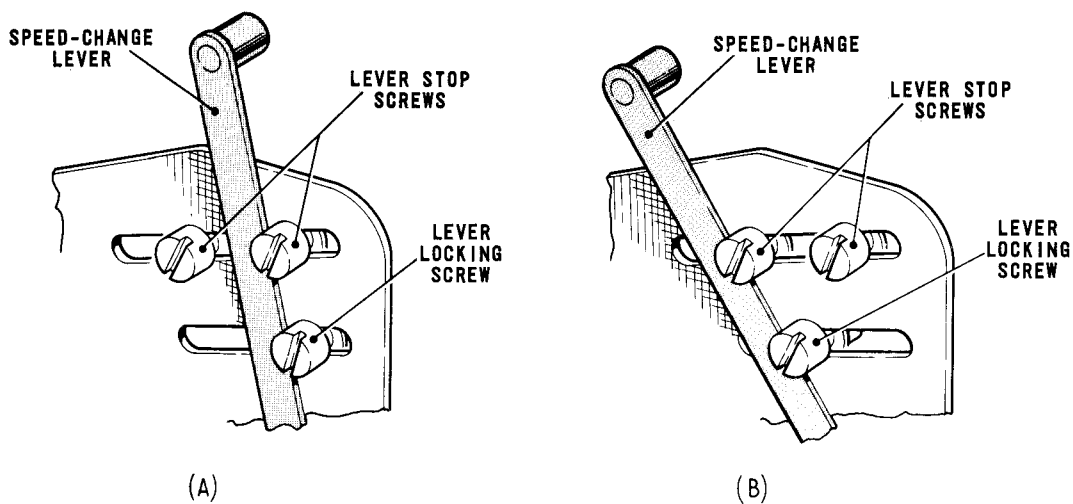


Fig. 2.5 SPEED-CHANGE LEVER POSITIONS

- 4.3 Refer to the table below and move the speed-change lever, Fig.2.5, to the required position;

Range	Baud Speed	Position of Speed-change Lever	Position of Gear Lever
45/50	45	as Fig.2.5(a)	Left
	50	as Fig.2.5(a)	Right
50/75	50	as Fig.2.5(a)	Right
	75	as Fig.2.5(b)	Left

- 4.4 Restore the power supply to the motor and carry out Adjustment Nos.84 and 89 (Part 4, pages 68 and 71). To obtain optimum performance it may be necessary to refine the adjustment of the transmitter contacts after a speed change has been made. Adjustment Nos.82 or 83 refer (Part 4, pages 60 or 64).
- 4.5 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.

5. CHANGING SPEED ON A MACHINE WITHOUT A GEAR-BOX

- 5.1 Switch off the motor power supply. Remove the platen knob and the four cover securing screws. Lift off the cover and refit the platen knob.

OPERATION INSTRUCTIONS

- 5.2 Remove the screw securing the driven gear, Fig.2.2, and withdraw the gear from its shaft.
- 5.3 Remove the screw securing the motor pinion to the motor shaft and withdraw the pinion.
- 5.4 Fit the spare pinion and driven gear to the motor and selector unit drive shafts respectively. Secure the pinion and gear with their screws.
- 5.5 Refer to the table below and move the speed-change lever, Fig.2.5, to the required position.

Baud Speed	Motor Pinion	Driven Gear	Colour Identification	Position of Speed-change Lever
45	GR 2199	4009/93A	Green	as Fig.2.5(a)
50	GR 2198	4009/94A	Yellow	as Fig.2.5(a)
75	GR 2201	4009/95A	Blue	as Fig.2.5(b)

- 5.6 Restore the power supply to the motor and carry out Adjustment Nos.84 and 89 (Part 4, pages 68 and 71). To obtain optimum performance it may be necessary to refine the adjustment of the transmitter contacts after a speed change has been made. Adjustment Nos.82 or 83 refer (Part 4, pages 60 or 64).
- 5.7 Remove the platen knob, assemble the cover to the machine and secure it with its four screws. Refit the platen knob to the platen spindle.