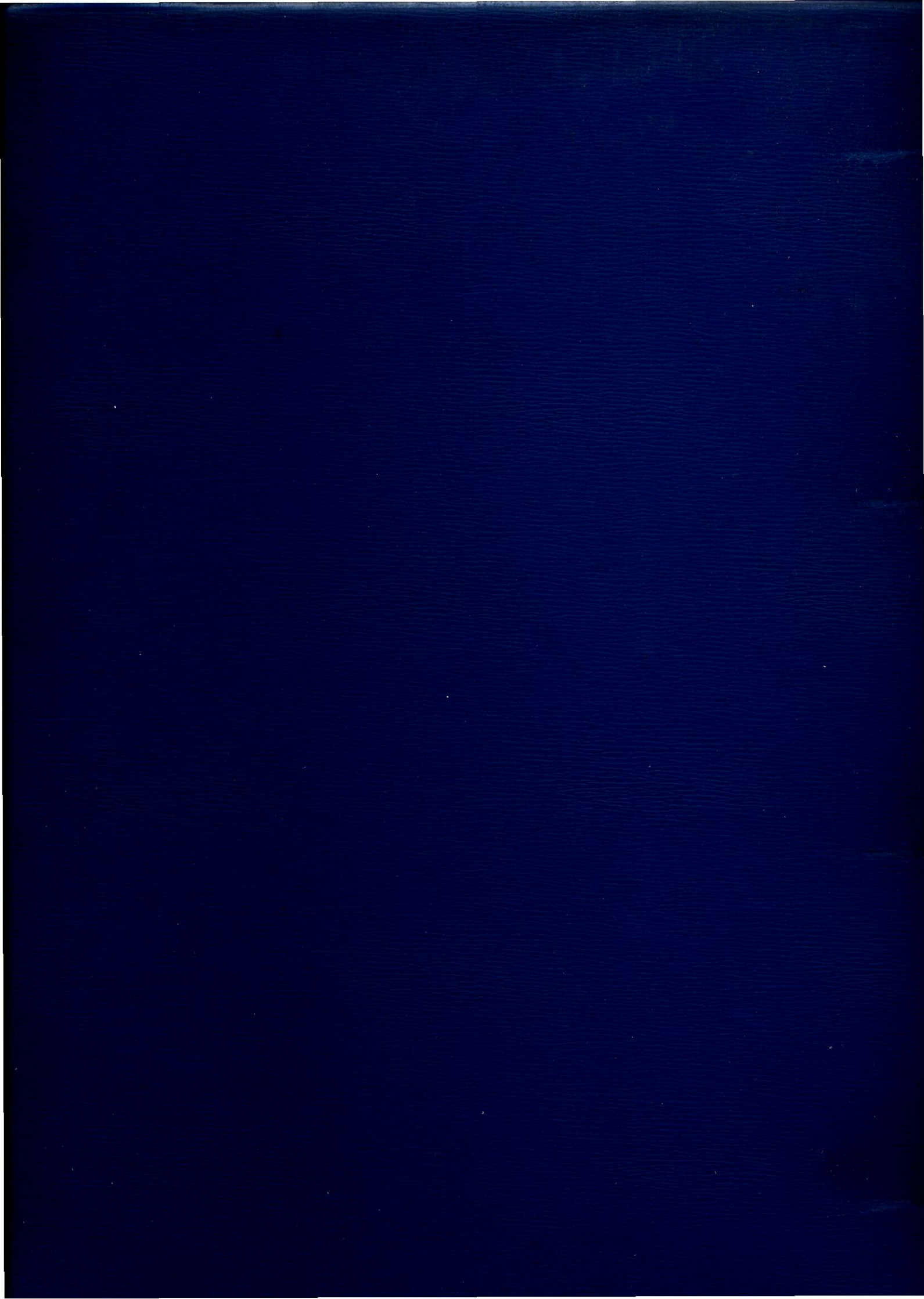




**SIEMENS**









# TELEPRINTER 100

Service Manual  
Ba TApp 100 BY engl  
June 1963

SIEMENS & HALSKE AKTIENGESELLSCHAFT  
WERNERWERK FÜR TELEGRAFEN- UND SIGNALTECHNIK · MÜNCHEN

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## GENERAL INFORMATION









## 1. GENERAL INFORMATION

This manual contains operating and adjustment instructions (Indexes II—XI), maintenance instructions (Index XII) and the parts lists (Index XIII) for the basic version of the Teleprinter 100 and for the following companion devices and special versions:

Protective cover	(Index III)
Copy clamp for protective cover or floor-type cabinet	(Index IV)
Mechanically controlled two-color printing device	(Index V)
Reperforator attachment	(Index VI)
Tapetransmitter attachment	(Index VII)
Mechanical remote control switch	(Index VIII)
Standard form printing attachment (Sprocket-feed attachment)	(Index IX)
Paper supply and storage bins for fan-fold paper	(Index X)
Version for telegraph speeds of 45.5; 74.23; and 75.0 bauds	(Index XI)

The indexes II to XI are complete in themselves. Unless otherwise explicitly stated, all figure and paragraph numbers as well as adjustments mentioned in this manual refer to the index in which they occur.

A detailed functional description of the basic version as well as of the companion devices and special versions listed above is contained in Description Bs T App 100 BY.

For ordering parts use Parts List Es T App 100.

Companion devices and special versions not found in this manual are covered by separate manuals.

Illustrations and text in this manual may show slight departures from the equipment actually supplied. However, they affect neither the removal and replacement of parts nor the adjustment and maintenance operations.

### 1.1. Re: Text

In the text, the parts are denoted by consecutive numbers. The associated figure number is given behind the oblique stroke following the consecutive number.

Example: Platen 7/4 (Index II) has the consecutive number 7 and is shown in Fig. 4 (Index II). If two or more figure numbers, separated by commas, are given behind the oblique stroke, the associated part is shown in each of these figures. If a figure number is missing, the number last mentioned in the text will apply.

Note: The consecutive numbers of the parts given in the text and figures must not be used for ordering parts. Spare parts should only be ordered with the help of the order numbers listed in the parts list (Index XIII).

All the operations to be performed on the machine should be carried out in the sequence in which they are listed in this manual.

Where paragraph numbers have been enclosed in parentheses, no adjustments can be performed. The information contained in them is merely intended to discover any deviations from the specified adjustment values and to trace the trouble source.

### 1.2. Re: Illustrations

Reference lines with consecutive numbers are used to denote the parts in the illustrations.

Additional numbers on reference lines refer to parts which are not visible. Additional numbers in parentheses (...) refer to parts which, in certain special versions, replace the part shown on the figure.

Reference lines with arrow heads pointing up to the respective part refer to assemblies which can be disassembled. Reference lines with arrow heads not pointing up to the respective part refer to the complete assembly shown.

Adjustment values as well as the points where the adjustment should be made are, as far as possible, marked in red in the illustrations and connected by red reference lines. The red A-numbers refer to the paragraph in which the adjustment has been described.

**1.3. Legend of Symbols**


≈ approx.; 25 per cent deviation permissible from specified value

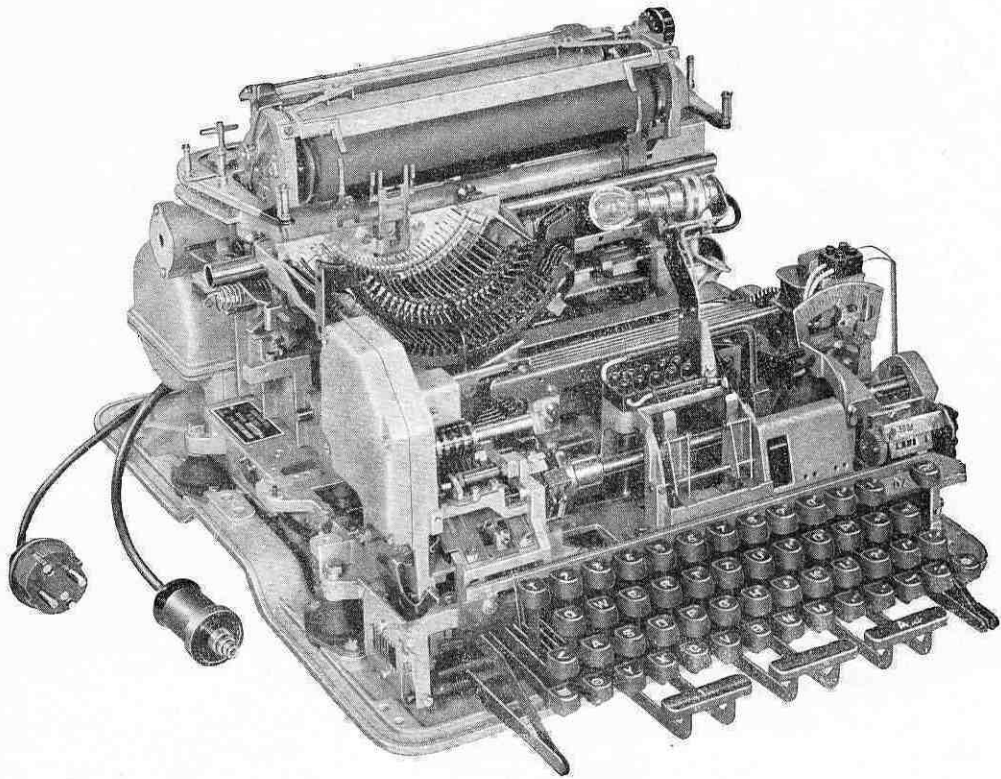
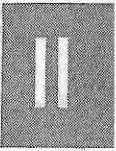
> larger than

< smaller than

▼ point of contact

|| parallel

 adjusting point (bending)



**BASIC VERSION**  
**50 BAUDS**  
for Teleprinters from  
Serial No. 2537673 onwards

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## 1. GENERAL

This Index covers the basic version of the Teleprinter 100 with answerback unit from Serial No. 2S 37673 onwards, operating on neutral current and in accordance with the International Telegraph Code No. 2.

## 2. INSTALLATION SERVICING

Before placing the machine in service it must be carefully re-oiled as described in Index XII.

### 2.1. External circuits of the teleprinter

#### 2.1.1. Test circuit

Check the printer in a test circuit as shown in Fig. 231 or with the aid of Connecting Unit 9T bk 13a.

#### 2.1.2. Telegraph current source

A DC voltage of 60 v to 120 v is normally required for operation.

The machine has been designed for a telegraph current of 40 ma. The current is adjusted in the telegraph office when the machine is connected to the Telex network. Where a local telegraph current source is employed (e. g. test circuit, point-to-point circuit), adjust with the aid of a variable resistor (3 kilohms, up to 5 w).

#### 2.1.3. Wiring of telegraph socket

The most common wiring arrangements are shown in Figs. 232 and 233.

### 2.2. Internal circuits of the teleprinter

The basic version of Teleprinter 100 is equipped with a 220 v AC commutator motor connecting to a 220 v AC/40...60 cps power network.

The speed of the commutator motors is kept constant by a centrifugal contact governor which is adjusted for 3750 rpm.

Commutator motors for other voltages or synchronous motors can be installed upon special request.

To protect their windings, the AC motors are provided with a thermo-contact switch. This switch interrupts the motor circuit when the motor becomes excessively hot and closes the circuit again when the motor has cooled down.

The coil of the selector magnet has been rated for 75 ohms and for an inductance of about 1 Henry. It is connected in series with an additional inductance coil of about 125 ohms (inductance about 2.5 Henry).

The machine is provided with a high-grade RF suppressor. RF suppression is better than grade "K" of VDE C375 Specifications (VDE = Association of German Electrical Engineers), e. g., at 10 mc: 24 v; in die VHF range of from 30—300 mc: 40  $\mu$  v/m.

### 2.3. Connection

Insert telegraph plug 1/1 into the telegraph socket. Adjust for a line current of 40 ma. This adjustment is performed in the telegraph exchange when your machine is connected to the public Telex network.

Before connecting the equipment to commercial power compare the data on the name plate located on the base plate with those of the commercial power network to make sure that voltage and type of current are the same. If so, insert power plug 2/1 into the grounded safety socket.

#### Note:

The commutator motor of the teleprinter is fitted with automatic disconnect type carbon brushes. If the motor stops despite un-interrupted power supply (power socket live), the carbon brushes might be worn to a point where they automatically switch off the motor (see para. 4.6.).

## 2.4. Operation

### 2.4.1. Function keys and meaning of the symbols printed on them:

Keys arranged in the keyboard

- 1... figures shift
- A... letters shift
- space bar (unlettered)
- < carriage return
- ≡ line feed
- 🔔 bell
- \* who-are-you? (release of answerback unit in distant machine)
- ⊖ code combination 32 (this key is locked by a wire clip)

Keys arranged in the special function key assembly (with metal cover and floor-type cabinet)

- ..... run-out (repeat) key
- ◇ (here is) release of answerback unit in the home machine
- 💡 internal illumination

### 2.4.2. Installing the type basket carriage 48/2

Removal and replacement of the type basket carriage is easiest on the complete machine, with the motor running and line current flowing through the selector magnet.

Replacement: Press figures shift key "1...". Push all code bars which are accessible from the right-hand side of the keyboard into their extreme left-hand position. Momentarily press the first key (counted from the left) in the special function key assembly (run-out key). Hook one end of carriage return spring 592/2 to eccentric pin 101 and the other to the spring suspension plate of the type basket carriage. Force the pusher to the rear in the direction of the ribbon lifter, applying pressure to rollers 106. Install the type basket carriage in such a way that its rollers "s" and ball bearings 78 glide onto bail 99 and roller 104 comes to rest against rail 105. When installing the carriage, rollers 106 glide along printer bail 107. Guide pin 108 engages guide bar 109, and the U-shaped ends of the five bellcranks 110 grasp the bent upper edges of the five transfer bars 111.

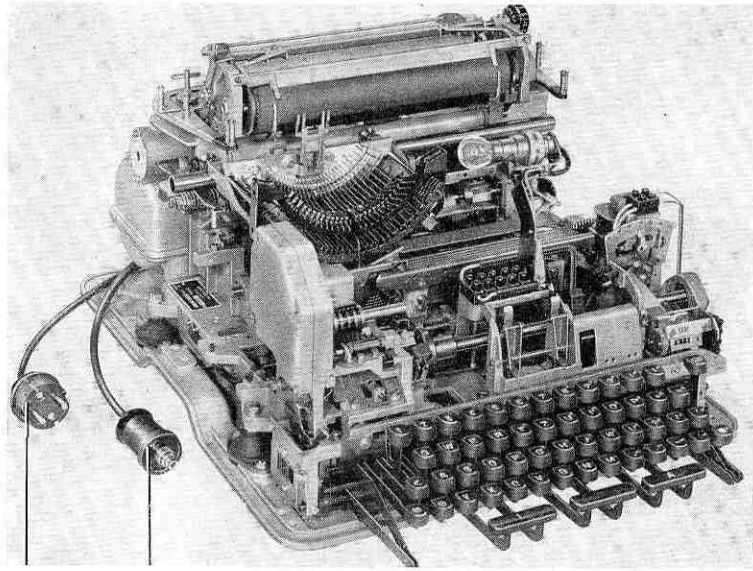
Engage brake lever 97 in brake cylinder of shock absorber 98, press pin 96 upwards through the bore in the brake lever and engage lock 95 from above in the recess in pin 96. Press letters shift key "A...". Detach the front eye of carriage return spring 592 from eccentric pin 101 and engage it in spring suspension plate 112. Then thread the ink ribbon through ribbon lifter 539 as shown in Fig. 5.

Removal: Press letters shift key "A...". Disengage the ink ribbon from ribbon lifter 539/2. Bring the type basket carriage into the beginning-of-line position by depressing lever of parallel guide 16a/4. Detach carriage return spring 592/2 from spring suspension plate 112 and hook it to eccentric pin 101 of type basket carriage 48. Depress figures shift key "1...". Switch off the motor. Turn lock 95 somewhat in a clockwise sense and remove it from the recess in pin 96. Depress pin 96 and disengage brake lever 97 from the brake cylinder of shock absorber 98.

Depress lever of parallel guide 16a/4 and remove type basket carriage 48 from the printer towards the left.

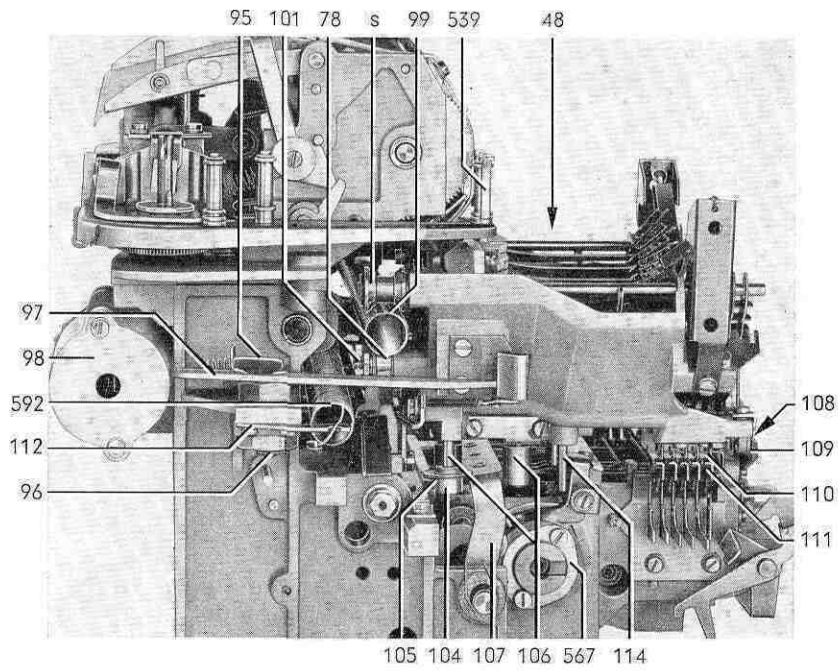
### 2.4.3. Inserting the paper (Fig. 3)

Slide the paper roll onto paper roll axle 3/3 so that pin "b" is on the left-hand side (seen from the front). The paper roll must rest against this pin "b" and the paper must feed out to the rear. The annular extension "a" of the paper roll axle must engage in the groove of the left-hand-paper roll carrier 5 of the metal cover or of the floor-type cabinet. (The annular extension "a" must engage in the front groove when installing paper rolls with a diameter of 120 mm, and in the rear groove in the case of paper rolls having a diameter of 170 mm.)



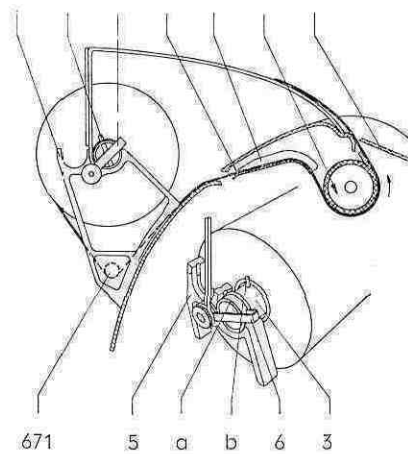
2 1

1

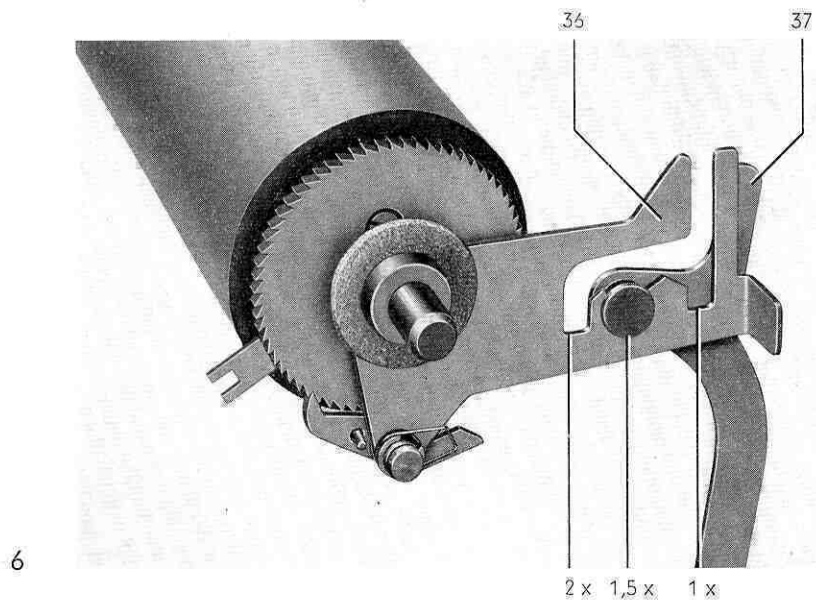
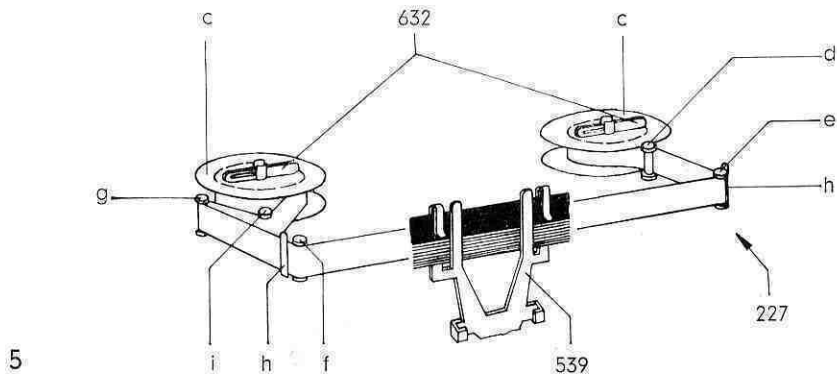
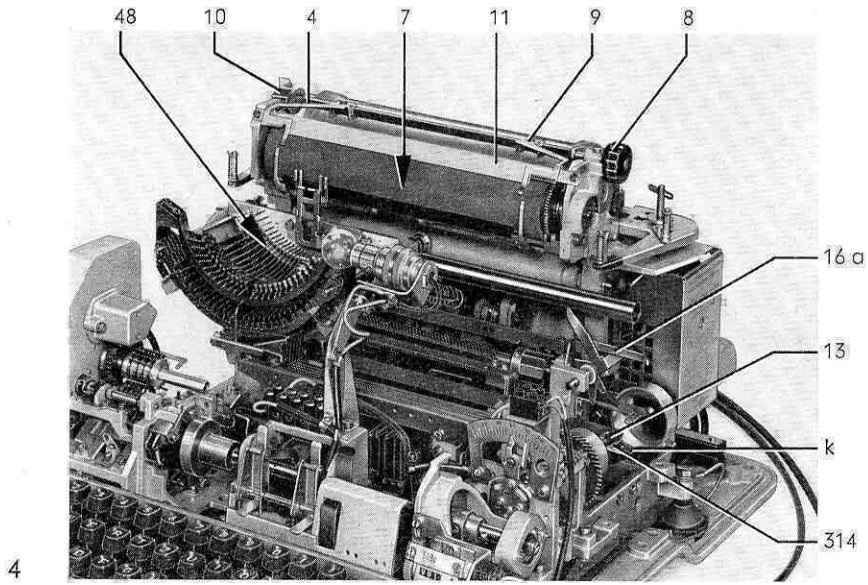


2

5 b 6 510 593 7 12



3





In the case of the metal cover, open the lid and insert the paper in the slot between the lid and the cover. Now swing the two levers 6/3 over paper roll axle 3. Fold the beginning of the paper so as to obtain a sharp crease (this is to ensure that the paper will be fed uniformly round platen 7/3,4 when knob 8/4 is turned). The paper is guided around tube 671/3 so that the pull on the paper is equalized. Then the paper underneath rod 593/3 of paper saddle 510. Swing the two levers 4/4 and 9 upwards before the paper emerges from under the platen to the front. Continue to turn the platen knob. In doing so, the paper passes in front of tear-off plate 11. Restore the two levers 4 and 9 which will hold the paper against the platen.

In order to align the paper, swing lever 10 to the rear. Do not forget to restore this lever, since paper feed will otherwise be prevented. Now tear the paper off along the upper edge of tear-off plate 11. Swing lid of metal cover of floor-type cabinet downwards. In the case of line feed, the paper now automatically passes out through the slot in the lid of the metal cover or the floor-type cabinet and can be torn off along glass plate 12/3.

Use teleprinter paper corresponding to the German Standard DIN 6720, Sheet 1, standard. Please write for address of suppliers if paper of equivalent properties cannot be obtained from local sources.

The printing impact has been factory-adjusted for operation with single-ply paper. It can be increased for multi-copy working by loosening screw 13/4 and turning lever "k" of impact adjuster 314 (see also adjustment A189).

2.4.4. Installing the ink ribbon (Fig. 5)

Attach the beginning of the ink ribbon to an empty spool. Slide both ribbon spools "c" onto the drivers of spool carrier 227 and insert the ribbon in the ribbon lifter 539. Then run it around rollers "d", "e", "f", "g" and "i" and thread the ribbon through ribbon guides "h".

Secure the ribbon spools by retaining plates 632 on the right and the left side of the drivers of spool carrier 227.

2.4.5. Line spacing (Fig. 6)

Depress lever 36 and engage the pin of pull bar 37 in one of the notches marked

- 1 x for single line spacing
- 1.5 x for 1½ line spacing
- 2 x for double line spacing.

2.4.6. Moving the type basket carriage 48/4

The type basket carriage can be released by depressing lever of parallel guide. It is pulled towards the left by its carriage return spring.



2.4.7. Range finder (Fig. 7)

Under normal line conditions pointer 525/7 can be set to graduation mark 60 of range finder scale 32, and adjusting plate 33 can be so positioned that its lowest mark is approximately level with the mark on the receiver frame (minimum tension of armature spring).

To adapt the selector mechanism to existing line and circuit conditions, the distant station must be requested to transmit characters R and Y in alternate succession. After loosening screw 34, turn pointer 525, with the Teleprinter printing, to either side until a wrong character is printed. In the event of poor line conditions it may be necessary to repeat this adjusting process with different armature spring tensions (by lowering adjusting plate 35 from graduation mark to graduation mark). Then fix plate 33 in that position which affords the widest receive margin.

Set pointer 525 to the center position of the receive margin thereby determined, e. g. to 65, if the range was found to lie between 40 and 90. This adjustment of the receiver will serve its purpose only in point-to-point circuits, i. e. where the receiver of the machine remains connected to the same line. If the machine is connected to the public Telex network, this adjustment must be performed in co-operation with the telegraph office.

2.4.8. Coding the answerback drum

If the answerback drum has not yet been coded, proceed as follows:

2.4.8.1. Removing answerback drum 327/7

Depress lever "i" and pull the drum off the transmitter.

2.4.8.2. Code combs 326/8 of answerback drum 327

The combs installed in answerback drum 327 (viewed in direction A, Fig. 8) are counted from pin m/8 of the answerback drum in a counter-clockwise sense (see Fig. 9).

The teeth of each comb [the 2.5 mm wide nose (Fig. 10) must point to the left] are counted from left to right, i. e. from 1 to 5 according to the five code elements of the 5-unit Telegraph Code No. 2 (Fig. 11).

To obtain the desired character, remove those teeth representing a current pulse (●) in the telegraph code table (Fig. 11). The teeth can be removed with the combs inserted in the drum. Fig. 10 shows a comb prepared for character "S", i. e.

● ○ ● ○ ○ .

Principally, the first three combs must be coded as follows:

Comb 1: carriage return	( < )	○ ○ ● ○
Comb 2: line feed	( ≡ )	○ ● ○ ○ ○
Comb 3: letters shift	( <b>A...</b> )	or figures shift ( <b>1...</b> ), depending on the first character of the text.

The remaining 15 code combs are available for composing the station identification code. Be sure to remove the teeth of the combs which are not used for the identification code.

The first and the last signal automatically transmitted is always the letters shift combination (**A...**) because, in the rest position, no comb is in engagement with the code levers of the transmitter.

Fig. 9 shows, as an example, the arrangement of the code combs for the identification code "Siemens Berlin". If the station identification code is composed both of letters and figures, make sure that no code comb for letters shift is interposed between the code comb for symbols/figures shift and the following symbols or figures.

2.4.8.3. Replacing individual code combs 326/8

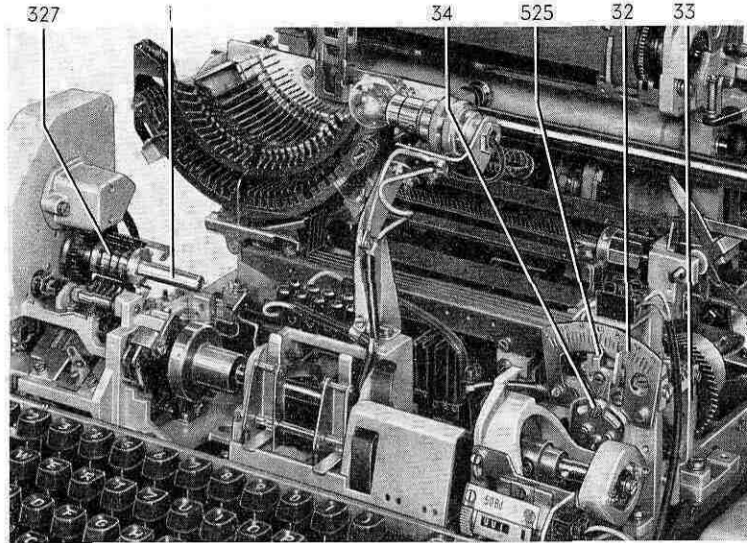
If individual code combs have to be replaced for some reason or other, remove retainer plate 540. The code combs can be taken out individually after removing washer 561 from their noses.

When installing the new code combs, be sure to insert them in such a way that their 2.5 mm wide noses are on that side of the answerback drum on which pin (m) is provided.

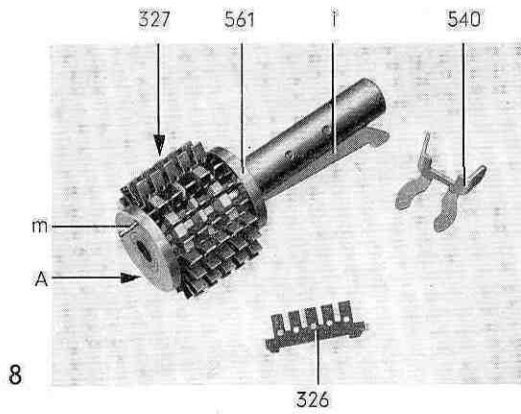
Press washer 561 over the noses of the code combs and replace retainer plate 540. For coding the combs, proceed as described in para. 2.4.8.2.

2.4.8.4. Installing the answerback drum 327/8

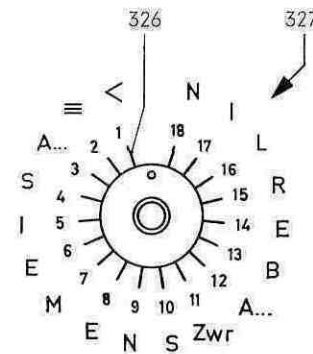
Slide the front of the answerback drum onto the answerback drum shaft of the transmitter and turn it until pin "m" engages the slot of the answerback drum drive. The answerback drum is latched in this position by lever "i".



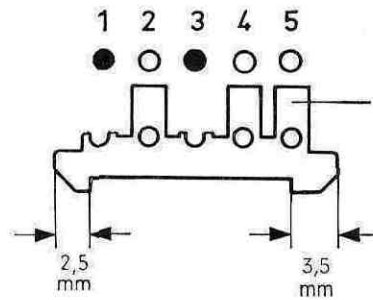
7



8



9

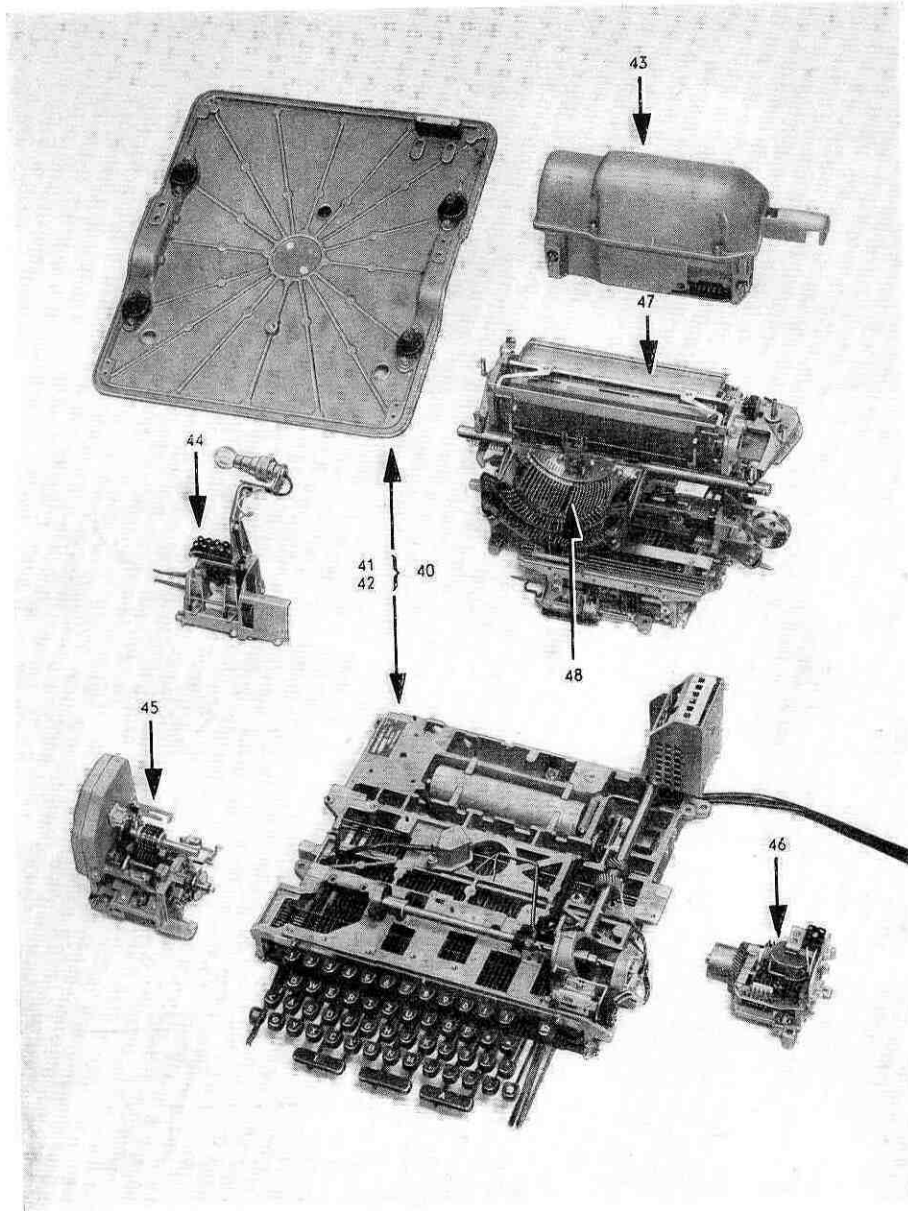


10

Nr.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32		
Buchstabenreihe	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z								
Zeichenreihe	-	?	+	×	3		8	9	(	)	.	,	9	0	1	4	'	5	7	=	2	/	6	+	<	≡	A...	1...	ZWR					
Anlaufschritt																																		
5er Schrittgruppe	1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	5	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sperrschritt 1½ foch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

- Pausenschritt } bei Einfachstrombetrieb
- Stromschritt
- Wagenrücklauf
- Zeilenvorschub
- War da?
- Frei für den internen Betrieb eines jeden Landes, aber im zwischenstaatl. Verkehr nicht zugelassen.
- Klingel
- 1... Zifferumschaltung
- A... Buchstabenumschaltung
- ZWR Zwischenraum

11





**3. REMOVAL AND REPLACEMENT  
OF MAJOR ASSEMBLIES**

Prior to starting work pull the power and telegraph plugs from their wall outlets. If possible, do not loosen the lacquer-coated parts since adjustments are altered and full interchangeability of the subassemblies is no longer ensured.

The Teleprinter consists of the following major assemblies (see Fig. 12):

Base plate	40
(consisting of bottom plate 41 and keyboard 42)	
Bottom plate	41
Keyboard with drive and wiring	42
Motor with casing	43
Special function key assembly	44
Transmitter	45
Receiver	46
Printer with type basket carriage	47
Type basket carriage	48

**3.1. Special function key assembly 44/13**

Removal: Detach cable 66 from terminal block 67. Remove the two fillister head screws 56a and lift out special function key assembly 44.

Replacement: Install special function key assembly 44 from above. Push its front up against the stop edge of base plate 40 and force it to the right against pin St/222. Tighten screws 56a/13 and connect cables 66 to terminal block 67.



### **3.2. Motor with casing 43/13**

Removal: Unscrew the two recessed-neck screws 591 (not removable) from base plate 40. Pull motor with casing 43 off the pivot of base plate 40.

Replacement: Slide the motor with casing 43 onto the pivot of the base plate and screw in recessed-neck screw 591 to the point where the motor can still be turned. Turn motor with casing 43 round the pivot until helical gear 61 and 62/229 are in proper mesh, and the lower half 54 of the motor casing rests against stop 590. Tighten recessed-neck screws 591.

#### **3.2.1. Motor 49/13**

Removal: Turn the four non-removable recessed-neck screws 60 out of lower half 54. Remove cover 59. Detach cables "a" from the terminal block. Remove fillister head screw 13 and detach grounding wire 330.

Remove four fillister head screws 56b and take the motor 49 together with the two bearing caps 55 and the rubber rings out of lower half 54.

Replacement: Reverse the above procedure.  
Observe the adjustments A171 and A172.

#### **3.2.1.1. Carbon brushes 350/13 (automatic-disconnect type)**

Changing: Loosen screw 24, swing lever "v" of brush holder bridge 117 downward and change carbon brushes 350. When inserting them, make sure that connecting cord "u" can easily be introduced into the slot provided at the side of the brush holder. Attach the cable shoe of the connecting cord "u" in such a manner that the connecting cord points in the direction of the governor.

#### **3.2.2. Governor 28/13**

Removal: Remove the motor or unscrew governor cap when the motor is installed. Remove fillister head screw 224 and take governor 28 off the motor.

Replacement: Reverse the above procedure.  
Observe the adjustments A172 and A173.

#### **3.2.2.1. Governor carbon brushes 323/13**

Changing: Loosen screws 331 and remove the governor carbon brushes.

#### **3.2.2.2. Governor spring 351/13**

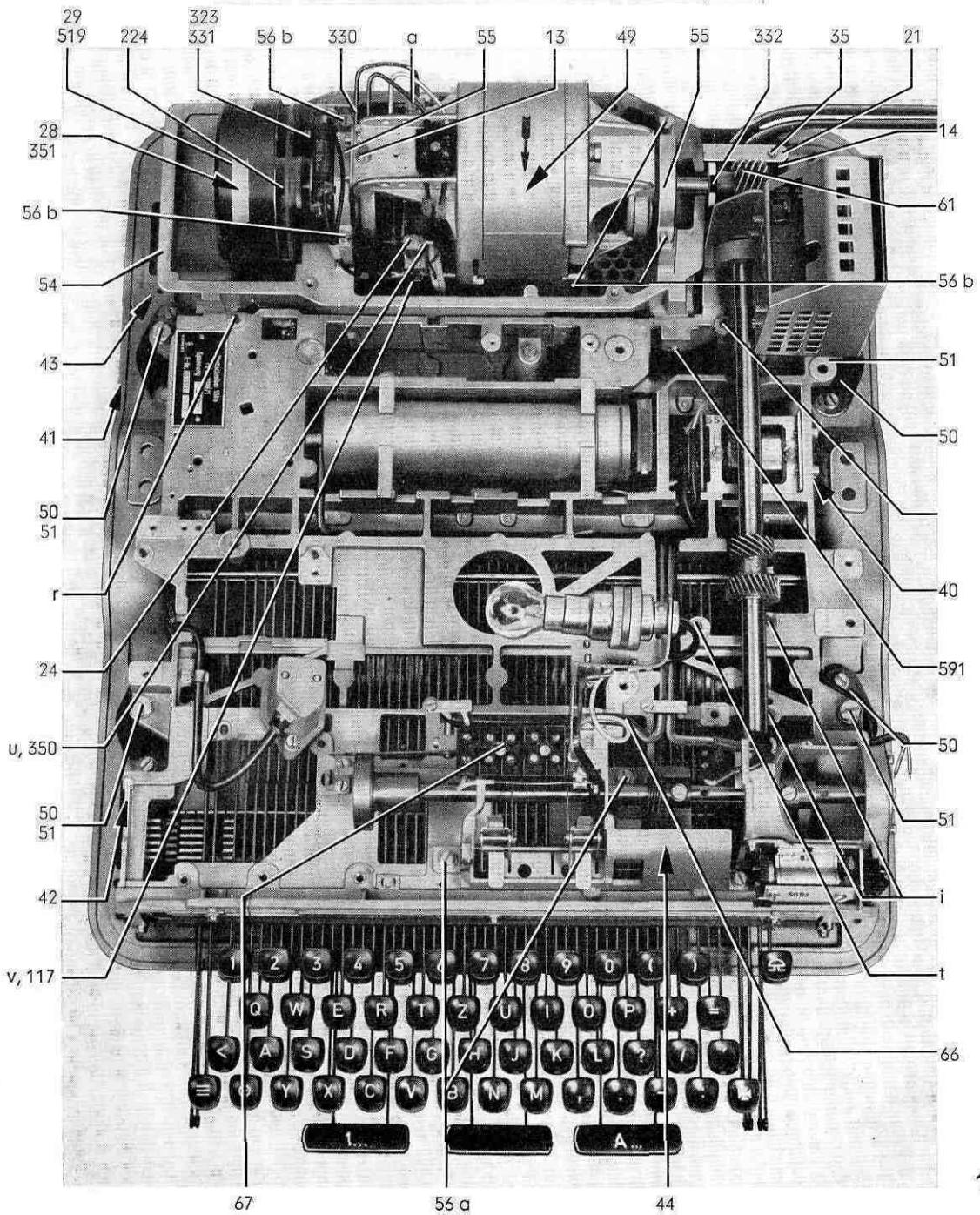
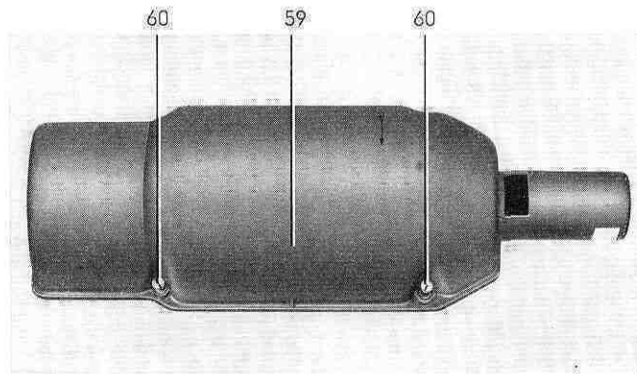
Removal: Loosen recessed-neck screws 519 and remove cover 29. When exchanging the governor spring relax it slowly.

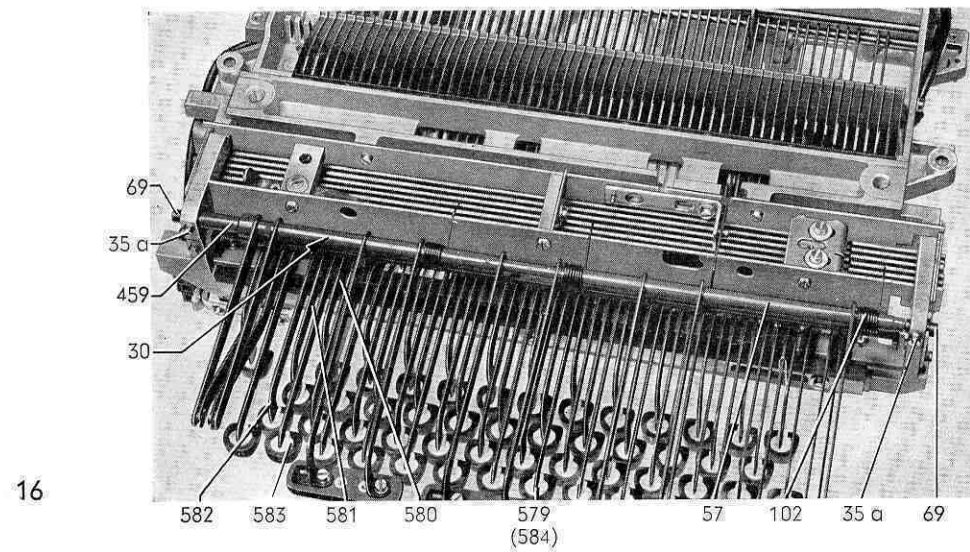
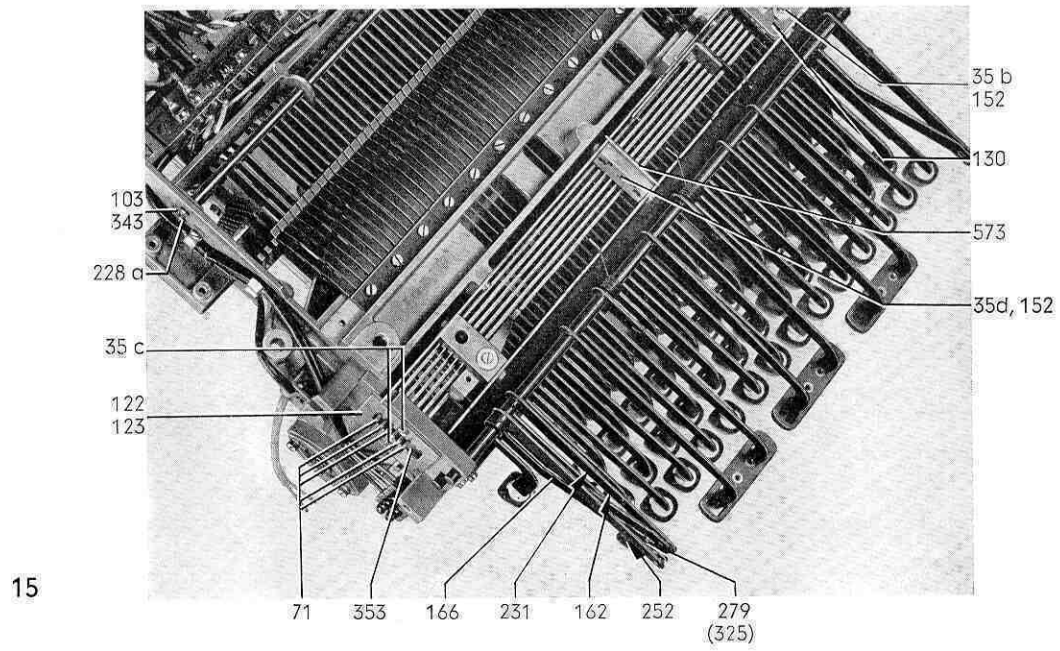
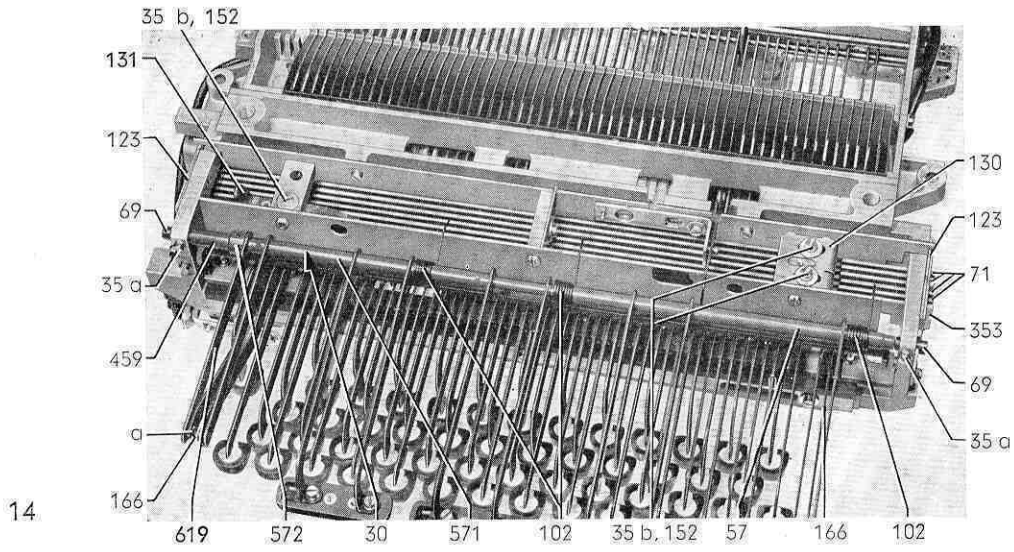
Replacement: Reverse the above procedure.  
Observe the adjustment A177

### **3.3. Bottom plate 41/13**

Removal: Remove fillister head screws 35. Lift covering plate 21 and plate 14 off the two spacers 594 (invisible) and take out the power and telegraph cables. Remove the four screws 51 and lift keyboard 42 off shock mounts 50 of bottom plate 41. Use a wrench for removing the screw underneath the receiver.

Replacement: Reverse the above procedure.







### 3.4. Keyboard

Remove and replace the keyboard in accordance with para. 3.3.  
Consecutive numbers in parentheses (...) refer to parts of the condensed keyboard.

#### 3.4.1. Key lever set 30/14, key lever with tube 57 and 571

Removal: Remove the two fillister head screws 35a. Remove bolts 69 provided on either side of the machine. Remove tube 459, key lever set 30 together with key lever with tube 57, and torsion spring 102 towards the front.

Key lever with tube 57 can easily be pulled off key lever set 30; the second torsion spring 102 becomes free.

Drive tapered pin 572 out of key lever set 30. Pull off lever 619 and key lever with tube 571 together with the third torsion spring 102.

In the case of a condensed keyboard, remove key lever set (587) with torsion spring (588) after pulling out bolts 69.

Replacement: Reverse the above procedure.

When replacing key lever set 30, make sure that the three guide pins "a" engage in key levers 166.

#### 3.4.2. Code bars 71/14 and locking bar 353

Removal: Remove the three fillister head screws 35b together with washers 152. Remove bracket 130 and, for removing the locking bar, also detent 131. Pull code bar 71 (or locking bar 353) to be exchanged carefully out of the mounting frame.

Replacement: Push code bar 71 (or locking bar 353) into the mounting frame. Take care that it comes to lie in the proper slots of comb 123 mounted on either side of the mounting frame.

Then proceed by reversing the procedure of removal.

Observe the adjustments A4, A5, A10, A11.

#### 3.4.3. Key levers 162/15, 231, 252, 279 (325)

Removal: Remove fillister head screws 35b together with washers 152. Remove bracket 130. Remove code bars and locking bar as described in para. 3.4.2.

Remove fillister head screw 103 with washer 343. Pull out rod 228a and then key levers 162, 231, 252, 279 or (325) to be replaced. When the key levers are locked, disengage wire clips 329/17.

Replacement: Reverse the above procedure.

Observe the adjustments A4 to A11.

#### 3.4.4. Key levers 166/15

Removal: After removing the two fillister head screws 35a/16, pull out bolts 69 and remove key lever set 30 with key lever 57, torsion spring 102 and tube 459 simultaneously.

Remove all further parts as described in para. 3.4.3.

After pulling out rod 228a/15, key levers 162, 231, 252, 279 (325) and key levers 166 can be exchanged.

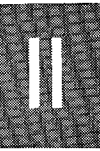
Replacement: Reverse the above procedure.

Observe the adjustments A1, A4 to A11.

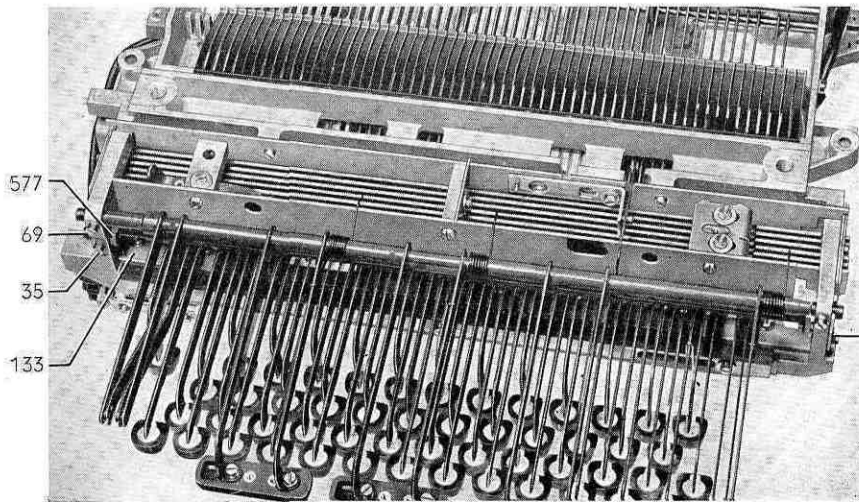
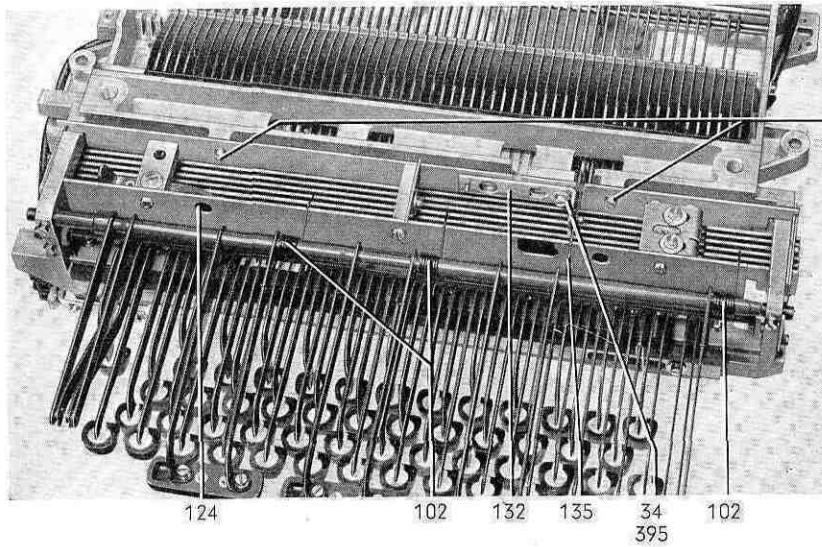
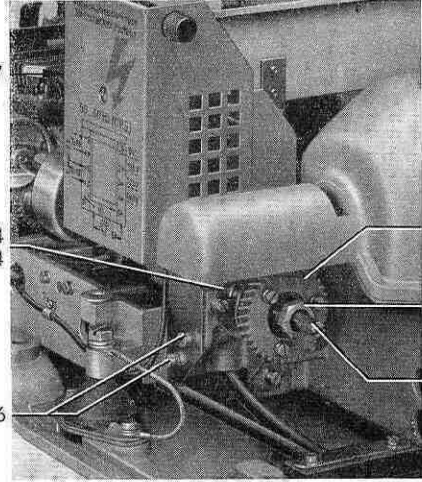
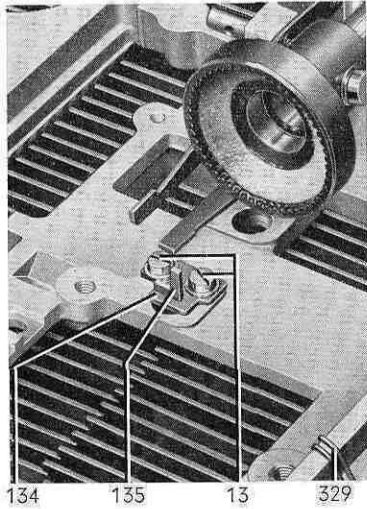
#### 3.4.5. Key button 579 (584)/16

Removal: Pull key button 579 (584) by hand off the respective key levers 580, 581, 582, 583.

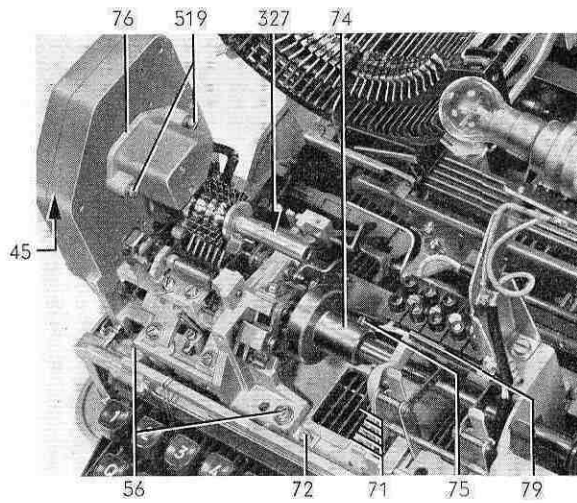
Replacement: Place the new key button 579 (584/16) on the key lever 580, 581, 582 or 583 (which must previously be supported) and install it on the key lever by tapping it slightly with a wooden or rubber hammer.



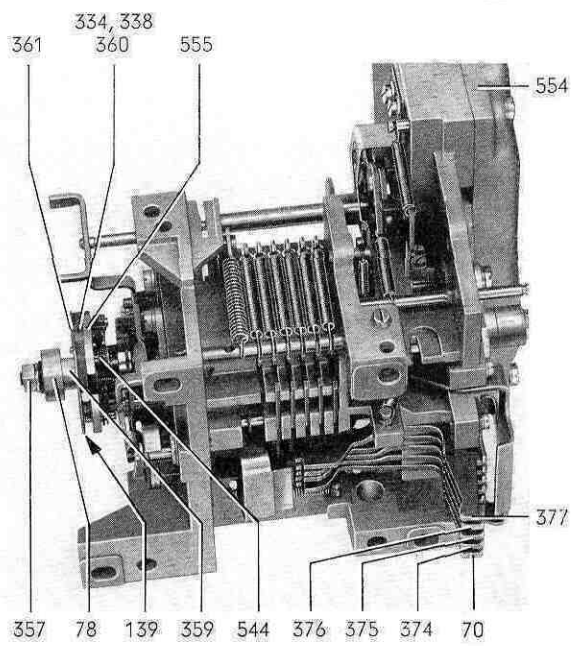
- 3.4.6. Release lever 135/18, bracket with pin 132
- Removal: Remove fillister head screw 34/18 with washer 395. Pull off bracket with pin 132. Withdraw release lever 135 from guide plate 134/17 and take it out.
- Replacement: Make sure that the vertical arm of release lever 135 engages the guide plate 134. Then proceed by reversing the procedure of removal. Observe the adjustments A6 to A8.
- 3.4.7. Guide plate 134/17
- Removal: Remove the two fillister head screws 13 and lift guide plate 134 off the mounting frame.
- Replacement: Place guide plate 134 on the mounting frame so that the vertical arm of release lever 135 engages the slot of guide plate 134 and secure it with the two fillister head screws 13. Observe the adjustment A6.
- 3.4.8. Comb guide 124/18
- Removal: Remove release lever 135 and bracket with pin 132 in accordance with para. 3.4.6. Remove the two fillister head screws 35a, disengage the three torsion springs 102 and remove comb guide 124 from the mounting frame.
- Replacement: When installing comb guide 124 in the mounting frame make sure that the key levers are properly inserted in the slots of comb guide 124. Then proceed by reversing the procedure of removal. Observe the adjustments A2 to A8 and A10.
- 3.4.9. Start bail 133/19
- Removal: Remove fillister head screw 35. Withdraw bolt 69 from the mounting frame. Felt washer 577 will thus become free. Pull start bail 133 off plate with rivet 333 and remove it from the mounting frame.
- Replacement: Reverse the above procedure. Observe the adjustment A7.
- 3.4.10. Power supply unit 657/17a
- Removal: Remove cable 661 of power supply unit as per Fig. 235 from the solder terminal block of the base plate and from the terminal block of the special function key assembly and loosen associated cable clamps. Remove hexagon nut 488/17a. Remove fillister head screw 75 (not visible) from gear sleeve 487 and pull gear sleeve off the intermediate shaft 83. Remove fillister head screw 34 (on the right-hand side — not visible) from cover 484. Loosen fillister head screws 56 and remove the power supply unit 657 from the keyboard.
- Replacement: Attach the power supply unit 657 to the keyboard by means of the two fillister head screws 56 and of fillister head screw 34 (not visible). Push gear sleeve 487 onto intermediate shaft 83 and tighten hexagon nut 488. Secure gear sleeve on the intermediate shaft by means of fillister head screw 75.
- Solder in cable 661 according to 235.



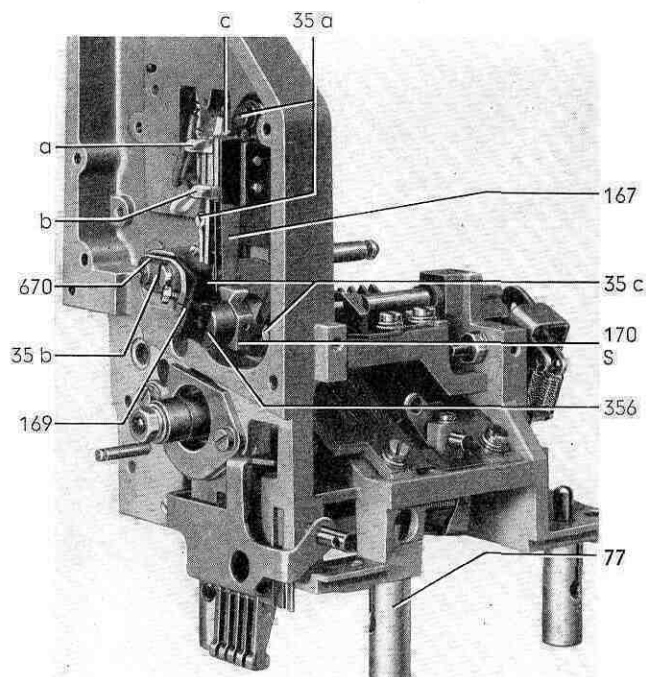
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### 3.5. Transmitter 45/20

Removal: Pull out plug connector 76 after retracting the two recessed-neck screws 519 (not removable). Remove fillister head screw 75 and shift clutch drum 74 on shaft 79 to the right. Remove the three fillister head screws 56 and lift off transmitter 45. Three plug-in feet 77/22 (in accessory box) serve for setting up the transmitter 45.

Replacement: Push code bars 71/20 to their extreme left-hand position. Install transmitter 45 so that its front rests against the ribs in the base plate; its right-hand side must rest against stop bracket 72. While the transmitter is being lowered, the bellcranks 374 to 377/21 and 70 will automatically engage in the recesses in code bars 71/20. Secure the transmitter by means of the three fillister head screw 56. Slide clutch drum to the left onto clutch member 139/21 as far as it will go and secure it with fillister head screw 75/20. Insert plug connector 76 and secure it.

#### 3.5.1. Contact spring set 167/22 and contact switching assembly 170

Removal: Remove cover 554/21 with the four recessed-neck screws (not removable). Unsolder the two wires from contact terminals "a/22" and "b". Remove the two fillister head screws 35a and lift contact spring set 167 off pin "c". Remove the three leaf springs 169 and plate 670 with fillister head screw 35b and take off brake disc. 356. Remove the two fillister head screws 35c and withdraw contact switching assembly 170.

Replacement: Reverse the above procedure.

Be sure to loosely screw on three leaf springs 169 and plate 670. Manually press in the leaf springs so that they are properly centered in the notch in brake disc 356 and tighten fillister head screw 35b.

Observe the adjustments A36, A39 to A42.

#### 3.5.2. Clutch member 139/21, pawl 388 and star wheel 334

Removal: Remove hexagon nut 357. Pull ball bearing 78, spacer 359, washer 361 and clutch member 139 together with the three pawls 338, the three washers 360 (not visible) and star wheel 334 off camshaft 140/14. Unhook omega spring 236/21 (not visible) and remove the three pawls 338 with washers 360 and star wheel 334 from cam sleeve 555.

Replacement: Reverse the above procedure.

Make sure that torsion springs 554 properly rest on the pins of pawls 338/21, 113 and that clutch member 139/21 is properly installed in accordance with adjustment A14.

Observe the adjustments A37 and A38.



3.5.3. Lever with shaft 142/23 and lever 141

Removal: Remove clutch member 139 in accordance with para. 3.5.2. Unhook tension spring 165 from lever with release pawl 151. Remove retainer 362 and pull off locking lever 150. Unhook tension spring 158. Loosen two fillister head screws 13, pull out lever with shaft 142, take out lever 141.

Replacement: Reverse the above procedure.  
Observe the adjustments A14, A15, A23, A24 and A31.

3.5.4. Release bail 149/25, lever with bushing 68 and bearing pin 545

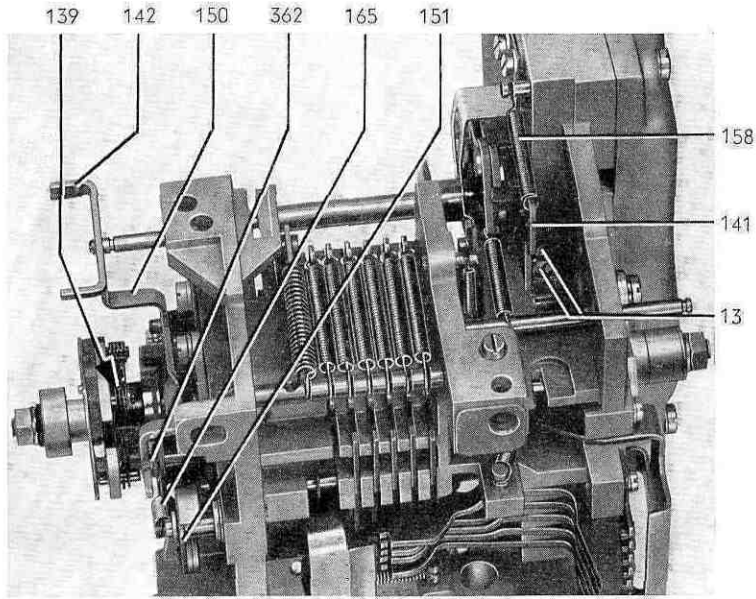
Removal: Remove clutch member 139 in accordance with paragraph 3.5.2. Unhook tension spring 154/24 from release bail 149/25, tension spring 546/24 from lever with bushing 68/25, and tension spring 160 (not visible) from bail 159. Remove retainer 407 from bearing pin 545. Remove release bail 149, lever with bushing 68, and the two felt washers 365. Remove hexagon nut 357b/24 from bearing pin 545 and pull out bearing pin 545.

Replacement: Reverse the above procedure.  
Observe the adjustments A14, A26 and A35.

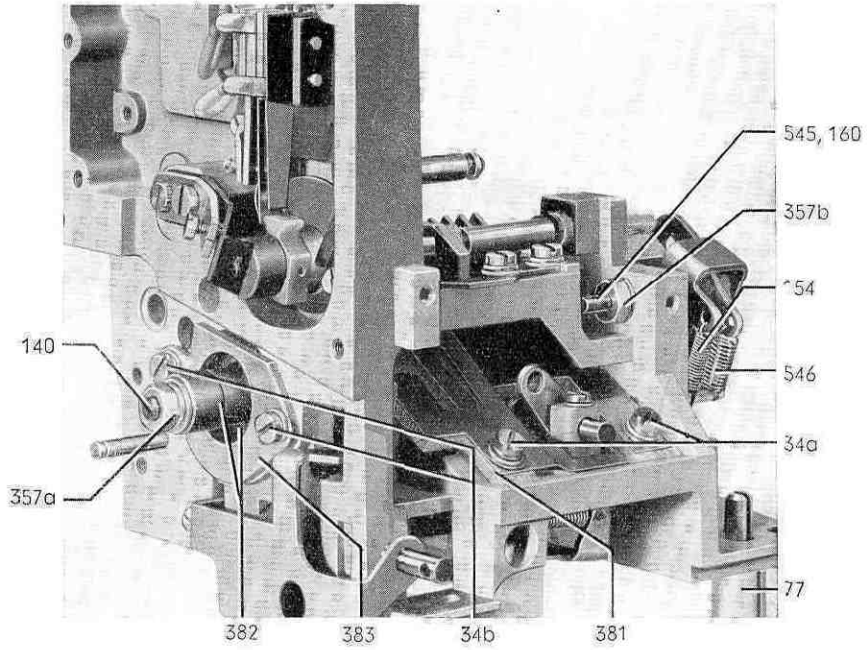
3.5.5. Camshaft 140/25

Removal: Remove answerback drum 327/20. Unhook tension spring 154/24 of release bail 149/25 and tension spring 546/24 from lever with bushing 68/25. Remove clutch member 139 in accordance with para. 3.5.2. Unhook tension spring 165/23 from lever with release pawl 151. Unhook tension spring 158a/25. Remove lubricating assembly 380 by loosening fillister head screw 34, and lubricating assembly 381/24 by removing two fillister head screws 34a. Remove hexagon nut 357a and pull the two spacers 382 off the camshaft. Unhook tension spring 161/25, 156, six tension springs 158b, and tension spring 154a in this sequence. Remove two fillister head screws 34b/24 and take off supporting plate 383. Pull out camshaft 140 together with the two ball bearings 388 (not visible) by turning it slightly in both directions on the send contact side.

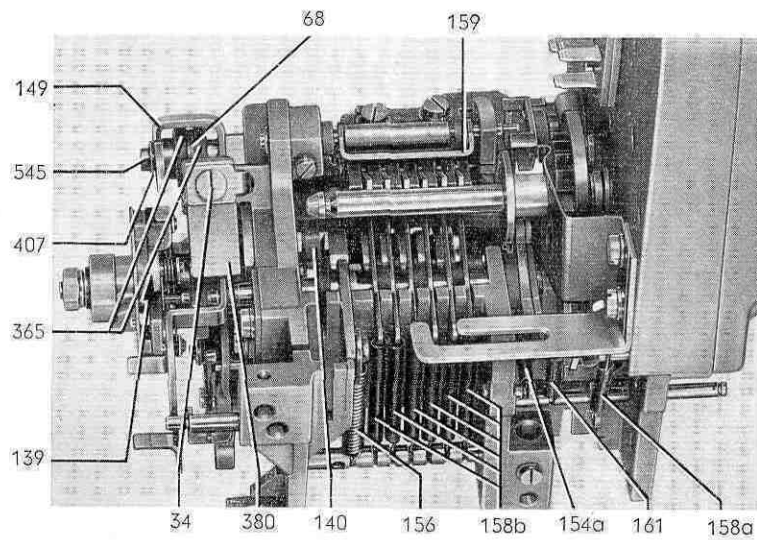
Replacement: Reverse the above procedure.  
Observe the adjustments 4.2., A14 to A16, A19 to A22.



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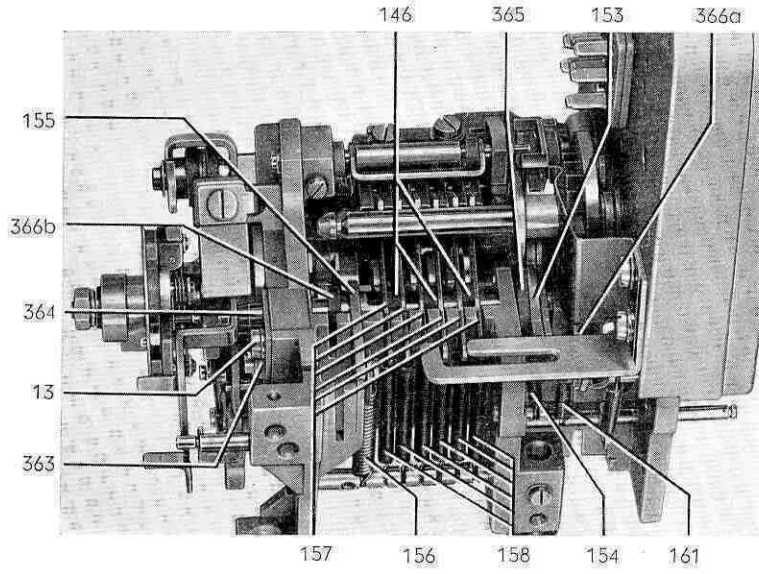


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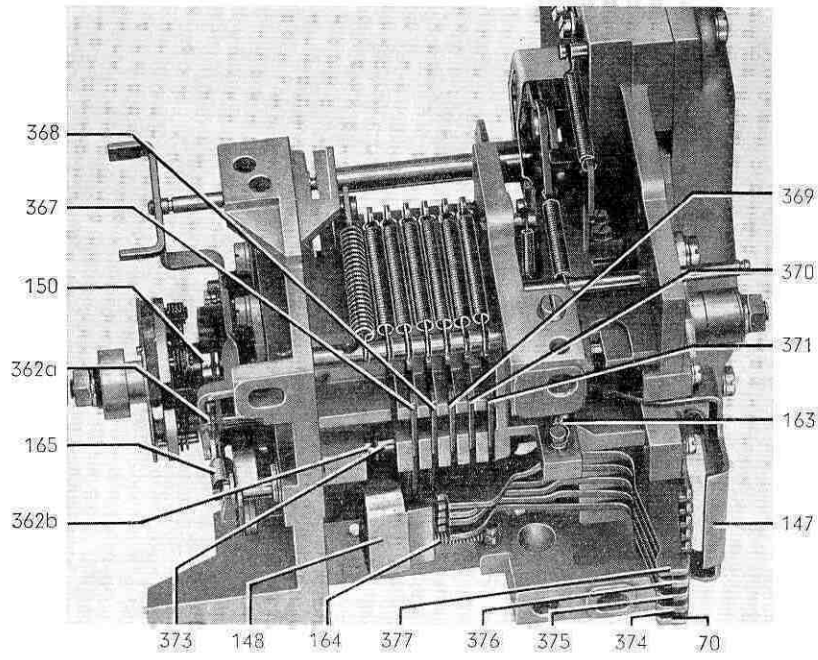


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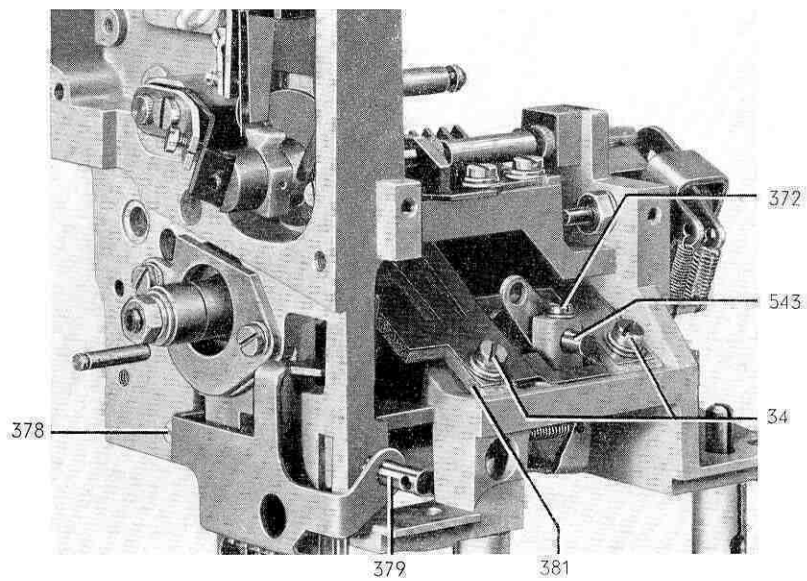




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- 3.5.6. Zero-setting lever 155/26, code lever 157, contact switching lever 153, feed lever 146.

Removal: Remove lever with shaft 142/23 and lever 141 in accordance with para. 3.5.3. Pull off answerback drum 327/20. Unhook tension springs 161/26, 156, 158 and 154. Remove fillister head screw 13 and take off retaining plate 363. Pull out in turn tube 364 and feed lever 146, lever 153 with felt washer 365, six code levers 157 with three felt washers 366a, zero-setting lever 155 and felt washer 366b.

Replacement: Reverse the above procedure.

Observe the adjustments A12, A14, A15, A20 to A28, A30 and A31.

- 3.5.7. Levers 367 to 371/27

Removal: Unhook tension spring 165. Remove retainer 362a and pull off locking lever 150. Remove retainer 362b, withdraw axle 373 slowly and take out levers 367 to 371.

Replacement: Reverse the above procedure.

Observe the adjustment A34.

- 3.5.8. Reposition bail 147/27, levers 70, 374 to 377

Removal: Unhook tension spring 163. Remove fillister head screw 378/28. Pull axle 379 out slowly. Take out levers 70/27, 374 to 377 and reposition bail 147 and take care of the four intermediate felt washers 669 (not visible).

Replacement: Reverse the above procedure.

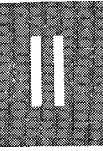
Observe the adjustments A13, A17 to A19 and A32.

- 3.5.9. Locking bail 148/27

Removal: Unhook tension spring 164. Take out fillister head screw 372/28 and the two screws 34. Lift lubricating assembly 381 and pull out axle 543. Take locking bail 148/27 out of the transmitter.

Replacement: Reverse the above procedure.

Observe the adjustments A19 and A33.



3.5.10. Locking lever 150/29, lever with release pawl 151

Removal: Remove clutch member 139 as described in para. 3.5.2. Unhook tension spring 165. Pull the two retainers 362 off pins "a" and "b". Remove locking lever 150 and lever with release pawl 151 from pins "a" and "b".

Replacement: Slide lever with release pawl 151 onto pin "a", making sure that the release pawl of lever 151 rests in the slot of the transmitter frame.

Then proceed by reversing the procedure of removal.

Observe the adjustments A14, A23, A24 and A34.

3.5.11. Bail 159/30

Removal: Unhook tension spring 160 (not visible) of bail 159. Remove retainer 362 from axle 548. Remove fillister head screw 331. Pull out axle 548 and take out bail 159, the two felt washers 549 and spacer 550.

Replacement: Slide axle 548 through the bore in the transmitter frame, through felt washer 549, bail 159 (making sure that the extension of bail 159 rests in the opening in the rocker of lever 153 [see Fig. 100]), through spacer 550, felt washer 549, bail 159, and the second bore of the transmitter frame.

Then proceed by reversing the procedure of removal.

Observe the adjustment A29.

3.5.12. Drive 551/32

Removal: Pull off answerback drum 327/20. Remove the two fillister head screws 13/31. Take off bracket 5330 and leaf spring 552. Unhook tension spring 158. Swing feed lever 146 away from ratchet 144/32. Turn drive 551 in such a way that the recess in drive 551 comes to rest above fillister head screw 103 of lever 153. Pull drive 551 off the axle.

Replacement: Reverse the above procedure.

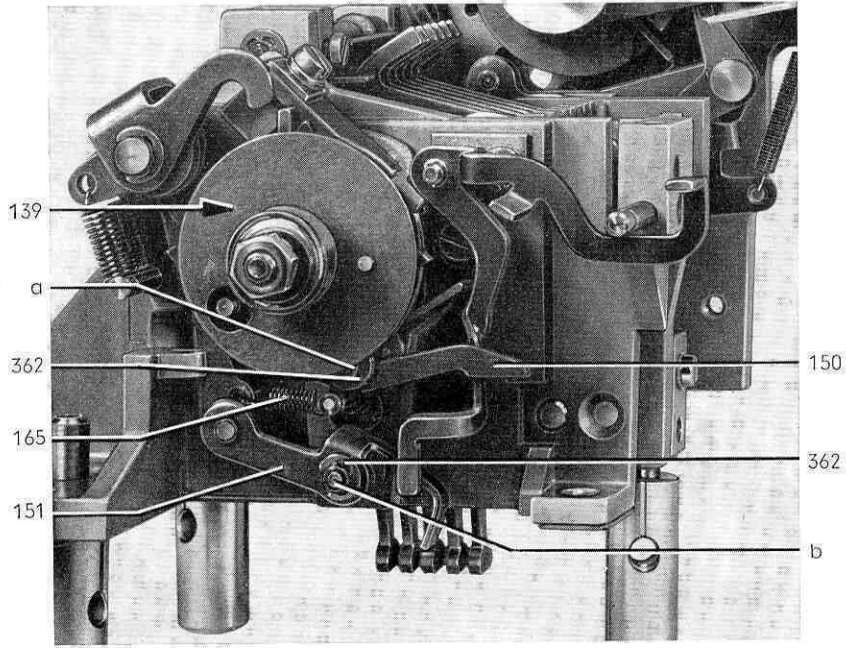
Observe the adjustments A16 to A18.

3.5.13. Locking lever 553/31

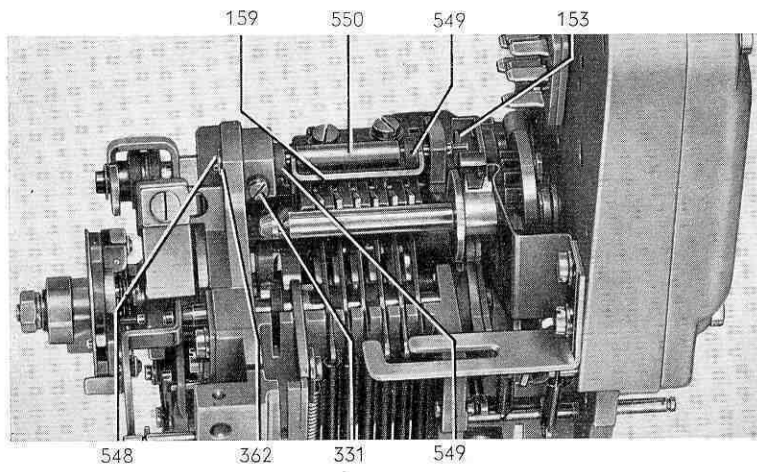
Removal: Remove drive 551 as described in para. 3.5.12. Unhook tension spring 161 from locking lever 553. Pull retainer off the pin of control disc 143 and remove locking lever 553.

Replacement: Reverse the above procedure.

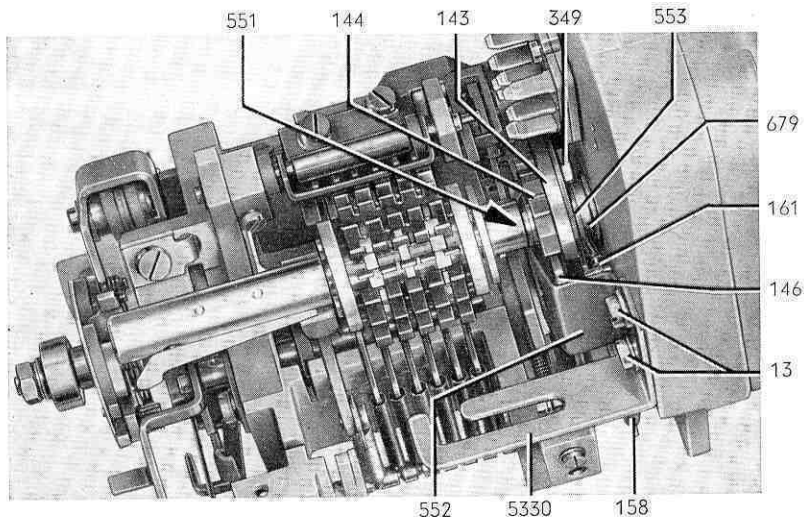
Observe the adjustments A16 to A18.



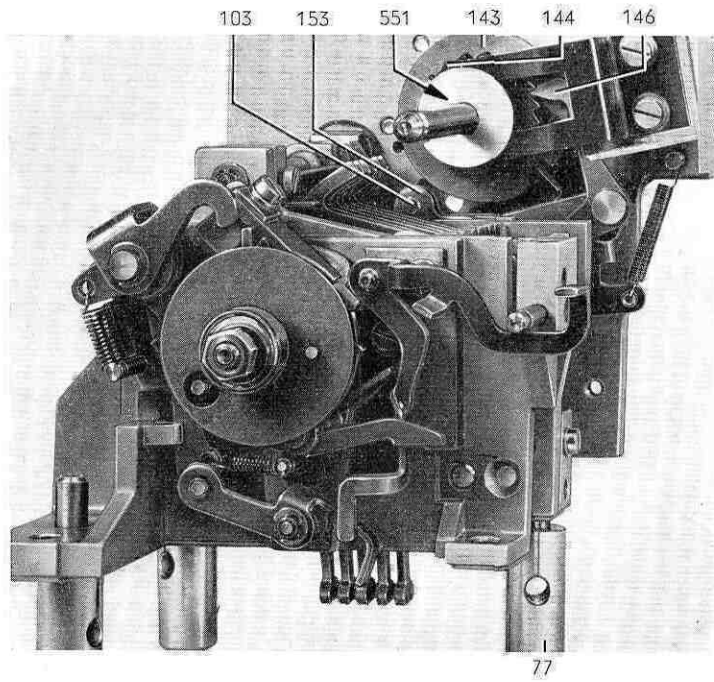
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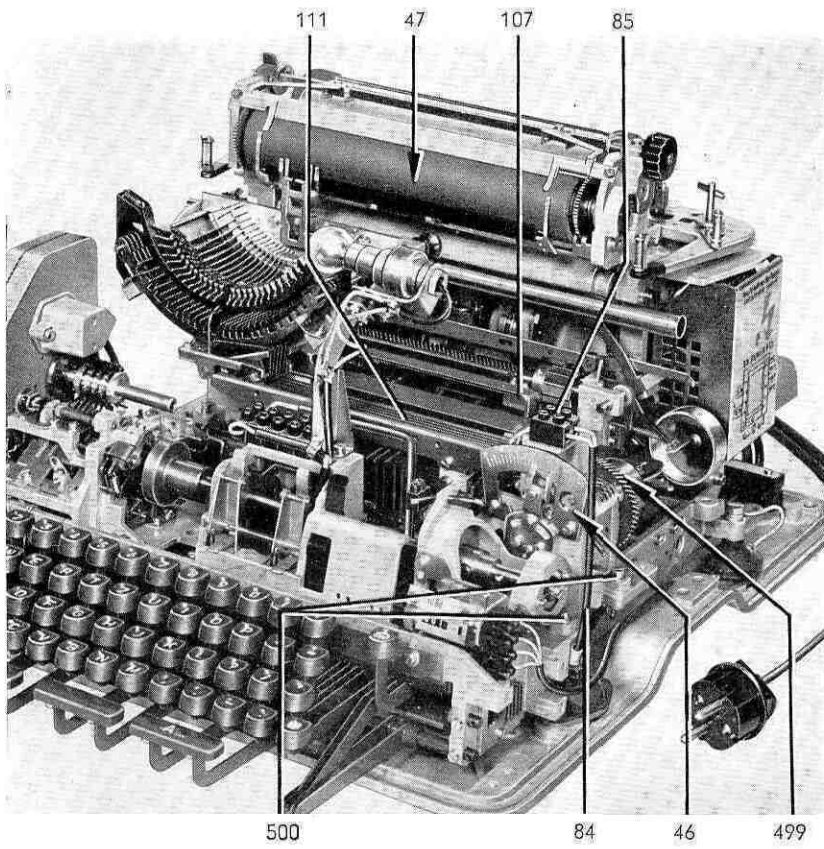
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3.5.14. Ratchet 144/32 and control disc 143

Removal: Remove drive 551 as described in para. 3.5.12. Unhook tension spring 161/31 and pull off retainer 679.

Remove hexagon screw 349 and take off ratchet 144/32 and control disc 134.

Replacement: Reverse the above procedure.

Observe the adjustments A16 to A18.

**3.6. Receiver 46/33**

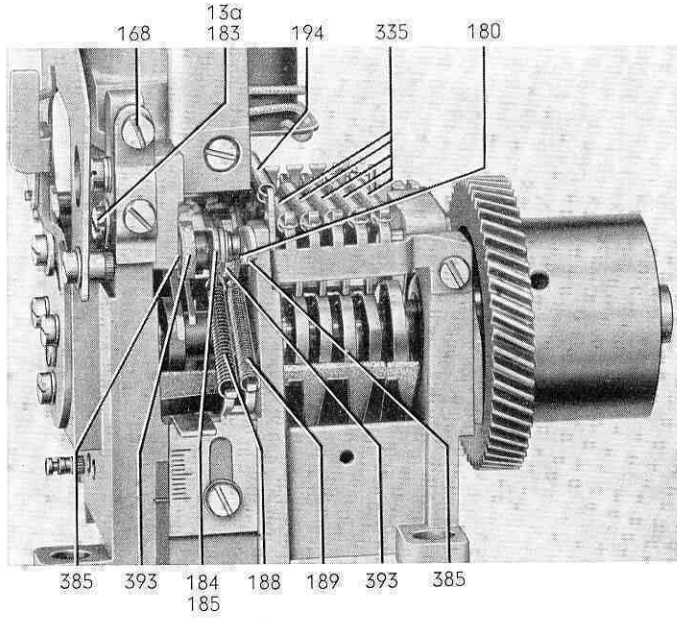
Removal: Detach lead 84/33 from terminal block 85. Move printer bail 107 into its rearmost position (rest position of the printer) and move all transfer bars 111 by hand into their upper position. Turn friction clutch 499 in the direction of the arrow until all five code levers with sword 504/35 are in their lowest position. Remove fillister head screws 500/33 and 501 (not visible) and lift out receiver 46 towards the right.

Replacement: Move printer bail 107/33 into its rearmost position (rest position of the printer) and raise all transfer bars 111 by hand into their upper position. Turn friction clutch in the direction of the arrow (Fig. 34) until the five code levers with sword 504/35 are in their lowest position. Push receiver 46/33 to the left against the two pins i/13 and to the front so that plate 82/35 rests against the pin E1/222 of printer 47/33. Take care that release lever 92/69 of the printer lies between lever 88/35 and lever 89 of the receiver. Secure receiver 46/33 with fillister head screws 500 and 501 (not visible) and connect lead 84/33 to terminal block 85 (for adjustment, see Fig. 222).

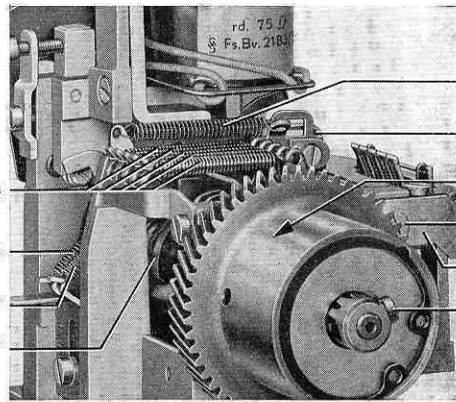
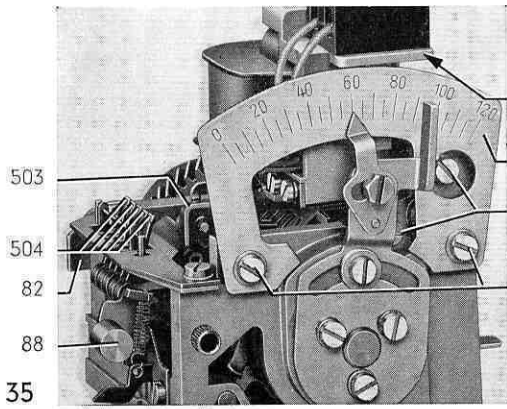


- 3.6.1. Magnet assembly with residual plate 181/35  
Removal: Remove two fillister head screws 224 and take off magnet assembly with residual plate 181.  
Replacement: Place magnet assembly 181 on axle 183/34, force it against fillister head screw 168 and secure it.  
When installing a new magnet assembly, observe the adjustments A45, A46, A49 and A50.
- 3.6.2. Start-stop armature 184/34 with lever 185 and selector armature 180  
Removal: Unhook the five tension springs 335 of levers with sword 504/35, tension spring 194/34 of selector lever 503/35, and tension springs 188/34 and 189 of the two armatures. Remove two fillister head screws 13/35 and take off scale 32. Remove fillister head screw 13a/34 and withdraw axle 183 slowly; remove washer 385, selector armature 180, lubricating washer 393, start stop armature 184, lubricating washer 393, and washer 385 in this sequence.  
Replacement: Reverse the above procedure.  
Observe the adjustments A46 to A50, A53, A54 and A62.
- 3.6.3. Camshaft 172/36  
Removal: Loosen fillister head screw 35 and remove friction clutch 499. Unhook tension springs 188, 189, 194 and the five tension springs 335. Take out the two countersunk screws 387 and remove cover plate 82. Withdraw camshaft 172 with ball bearing 388 (not visible), giving special attention to the armature and the lever. Ball bearing 389 and lock washer 390 will now become free (the two parts are not visible).  
Replacement: Reverse the above procedure  
When installing camshaft 172, lift the armatures and the levers.  
Observe the adjustments A44, A46 to A51 and A62.
- 3.6.4. Selector lever 503/37, guide plate with pin 391, code lever with sword 504 and tension spring 516  
Removal: Remove fillister head screw 35/36 and take off friction clutch 499. Unhook tension spring 194 and the five tension springs 335. Remove the two countersunk screws 387 and take off cover plate 82. Loosen the two fillister head screws 35/37 and remove stop plate with pin 177. Pull out axle 392. Take out the parts which have now become free: selector lever 503, guide plate 391, the five levers with sword 504, two lubricating washers 393 (only one is visible) and four lubricating washers 386.  
Replacement: Reverse the above procedure.  
Observe the adjustments A44, A47, A48, A49, A58 and A59.
- 3.6.5. Lever 88/37, lever 89 and tension spring 195  
Removal: Unhook tension spring 195. Remove fillister head screw 13 and take off guide plate 174. Remove fillister head screw 103 and pull out axle 394; take out lever 89 and two lubricating felt washers 393a (only one visible). Turn friction clutch 499/36 until code levers with sword 504/37 are in their upmost position. Pull out lever 88 while depressing selector lever 503.  
Replacement: Reverse the above procedure.  
Observe the adjustments A43 and A60.

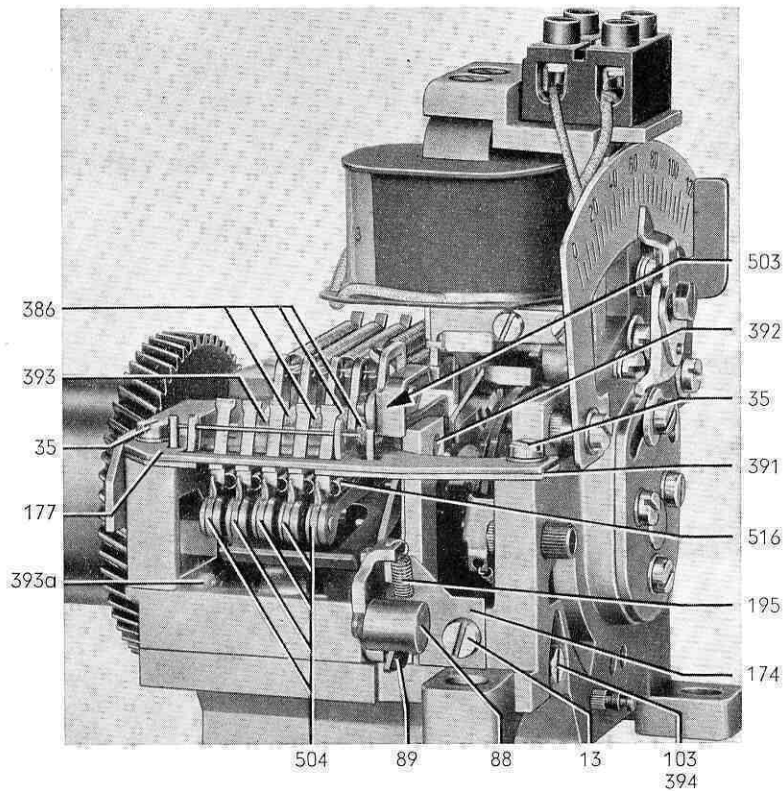




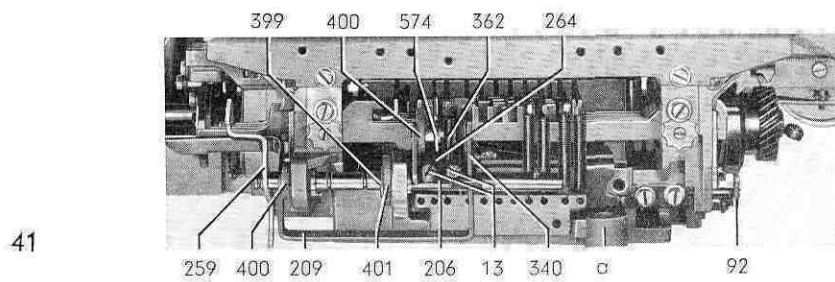
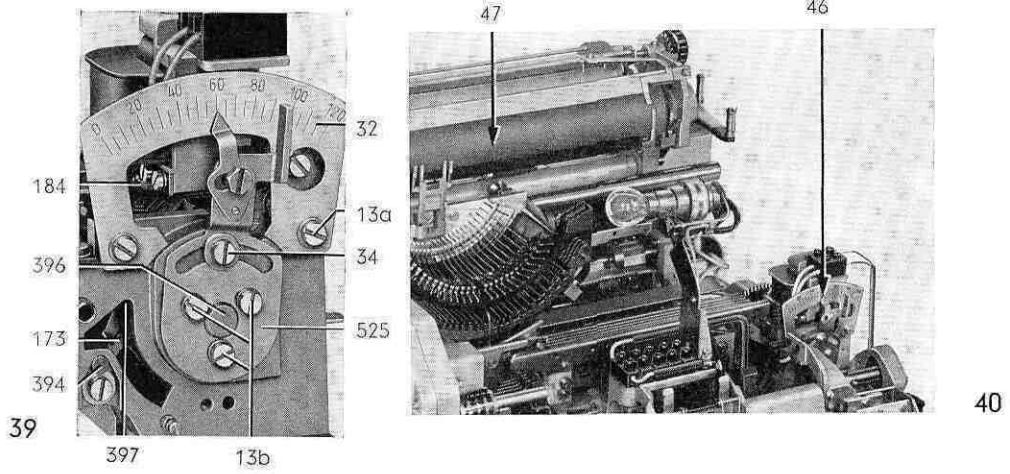
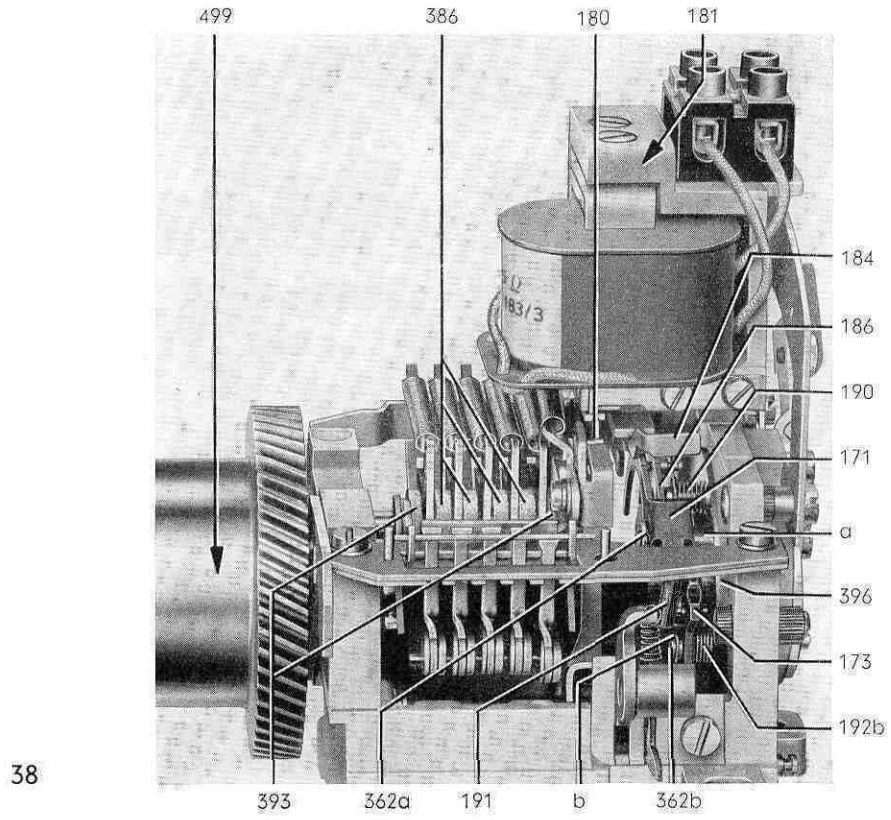
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3.6.6. Lever with bushing 186/38 and release lever 171

Removal: Remove magnet assembly with residual plate 181 as described in para. 3.6.1. Unhook tension springs 188, 189/36 and 191/38. Swing start-stop armature 184 and selector armature 180 to the rear. Remove fillister head screw 13a/39 of scale 32. Loosen fillister head screw 34. Swing pointer 525 carefully in clockwise sense. Pull retainer 362/38 off pin "a" of adjusting disc 396. Pull lever with bushing 186 and release lever 171 as well as lubricating felt washer 393 (not visible) off pin "a".

Replacement: Reverse the above procedure.  
Make sure that torsion spring 190 properly rests on lever 186.  
Observe the adjustments 4.3., A49, A50, A55, A56 and A62.

3.6.7. Locking lever 173/38 and torsion spring 192b

Removal: Unhook tension spring 191. Loosen fillister head screw 34/39 and turn pointer 525 in a counter-clockwise sense. Force retainer 362b/38 off pin "b" of adjusting disc 396. Pull locking lever 173 with torsion spring 192b off pin "b".

Replacement: Reverse the above procedure.  
Observe the adjustment instructions given in para. 4.3, A56 and A57.

3.6.8. Adjusting disc 396/39 and slack take-up spring 397

Removal: Remove magnet assembly with residual plate 181/38 according to paragraph 3.6.1., start-stop armature 184 and selector armature 180 according to paragraph 3.6.2., and camshaft 172/36 according to paragraph 3.6.3. Remove fillister head screw 34/39. Turn pointer 525 until pin a/38 points upwards. Remove three fillister head screws 13b/39 and pointer 525. Force adjusting disc 396 out of the bearing and lift it out. Slack take-up spring 397 will now also become free.

Replacement: Reverse the above procedure. With the pointer set to graduation mark 60, start-stop armature 184 must rest about on the center of release lever 171/38.  
Observe the adjustments A45 to A51 and A62.

3.6.9. Friction clutch 499/38

When installing a new friction clutch do not fail to observe the adjustments A44 and A61.

**3.7. Printer 47/40**

Removal: Remove three fillister head screws 502 (not illustrated) in the lugs a/41 and lift out printer 47/40.

Replacement: Place printer 47 on the base plate 40/13 and slide it to the rear against the two pins "r"/13 and to the right against pin "t". Secure printer 47/40 with the three fillister head screws 502 (not illustrated).

When installing printer 47, take care that the swords of receiver 46 are in their lowest position and that release lever 92/41 is positioned between lever 88/35 and lever 89 of receiver 46/40.

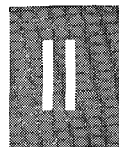
When installing a new printer, loosen the mounting screws of receiver 46/40, slide the printer to the right and the rear against pin t/13 and "r" and secure it. Slide the receiver 46 to the left and the front against the printer pin and secure it.

Remove and replace the type basket carriage as described in para. 3.7.39.

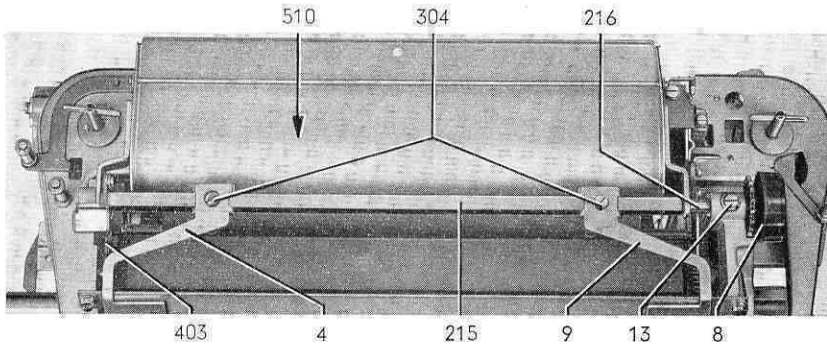
3.7.1. Shaft with lever 259/41, bail 209, lever 206

Removal: Unhook tension springs 264 and 340. Remove retainers 362 and 399. Remove the two fillister head screws 13 and pull lever 206 together with felt washer 400 out of push rod 574. Pull shaft with lever 259 to the left out of the printer frame, simultaneously removing felt washer 401, felt washer 400 and bail 209.

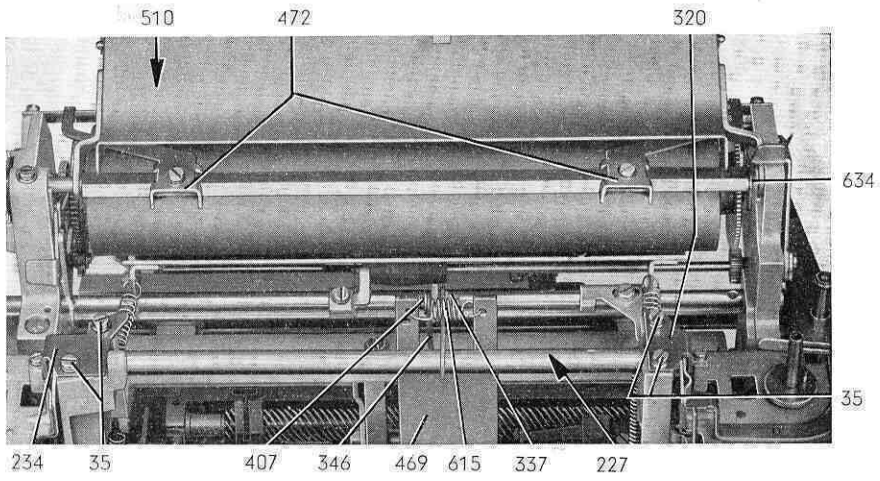
Replacement: Reverse the above procedure.  
When installing lever 206 take care that bail 209 rests in the slot of lever 206.  
Observe the adjustments A76, A77, A124, A183 to A185.



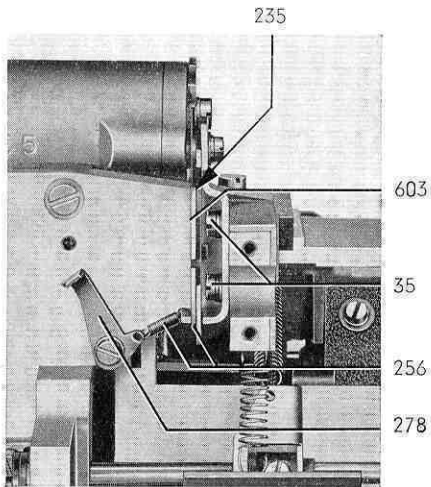
- 3.7.2. Axle 215/42, paper saddle 510, levers 4 and 9, axle 216
- Removal: Unhook tension spring 403. Remove fillister head screw 13. Pull axle 216 out of axle 215 and turning knob 8. Axle 215, paper saddle 510, washer 634/43 and turning knob 8/42 will then become free. Remove the two fillister head screws 304 and pull levers 4 and 9 with leaf springs 472/43 off axle 215/42.
- Replacement: Slide lever 4/42 with leaf spring 472/43 and lever 9/42 with leaf spring 472/43 onto axle 215/42 and secure them with fillister head screws 304 (install fillister head screw 304 of lever 9 in the inner bore located towards the center). Place axle 215 with washer 634/43 and paper saddle 510 into the left-hand side of the printer frame. Slide axle 216/42 through turning knob 8 into axle 215 and secure it with fillister head screw 13. Install tension spring 403. Observe the adjustments A80, A81 and A85.
- 3.7.3. Spool carrier 227/43
- Removal: Remove the ink ribbon and tilt paper saddle 510 upwards. Unhook tension spring 615 from plate 469. Remove retainer 407 and ribbon feed linkage 346 from bearing pin 337. Remove the four fillister head screws 35 of brackets 234 and 320 and take out spool carrier 227.
- Replacement: Reverse the above procedure.
- When installing the spool carrier 227 take care that pawls 277/45, 278/44 are turned in a clockwise sense and that their tips engage the ratchets to ensure proper stepping.
- Observe the adjustments A88 to A94.
- 3.7.4. Pawl 277/45, supporting plate 600
- Removal: Remove spool carrier 227/43 as described in para. 3.7.3. Unhook tension spring 256/45. Remove fillister head screw 35; washer 395, pawl 277 and supporting plate 600 will now become free.
- Replacement: Reverse the above procedure.
- Observe the adjustments A90, A95 and A138.
- 3.7.5. Lever 235/44
- Removal: Remove spool carrier 227/43 as described in para. 3.7.3. Unhook tension springs 256/44. Tilt the two levers 602 and 603 upwards and remove the two fillister head screws 35. Remove lever 235.
- Replacement: Reverse the above procedure.
- Observe the adjustments A90 to A94 and A145.
- 3.7.6. Bearing pin 337/43
- After exchanging bearing pin 337 observe the adjustment A91.
- 3.7.7. Lever with axle 662/46, paper guide 276., bracket with bushing 625 and lever with bushing 218
- Removal: Remove spool carrier 227/43 as described in para. 3.7.3. Unhook the two tension springs 241/46 and tension spring 275. Remove two fillister head screws 13 from lever with axle 622. Push lever with bushing 218 to the left. This will free axle with pressure roller 217. Pull lever with axle 622 out of paper guide 276, lever with bushing 218, bracket with bushing 625 and remove these parts.
- Replacement: Reverse the above procedure.
- Bracket "c" of paper guide 276 must rest in the slot of bracket with bushing 625. Observe the adjustments A82, A83 and A90.



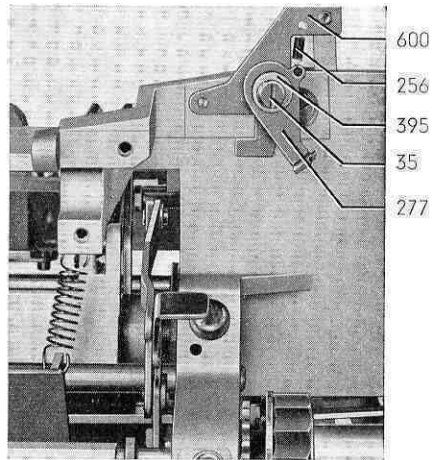
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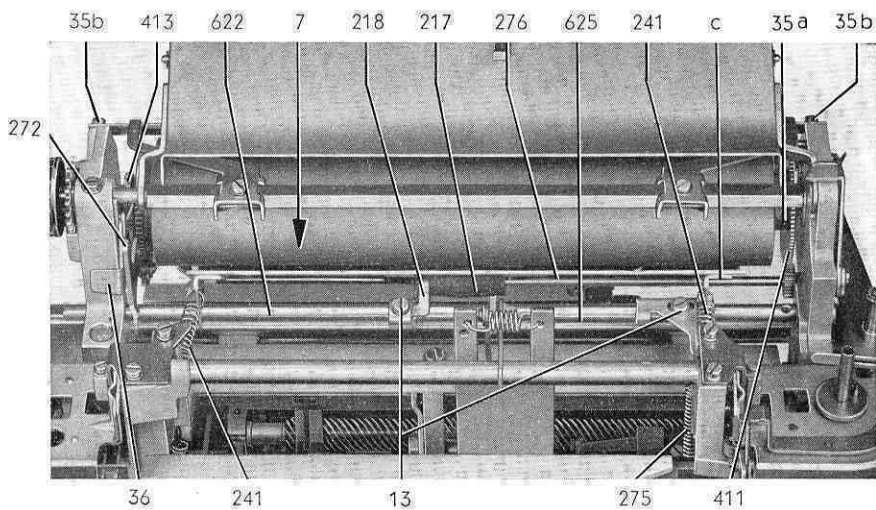
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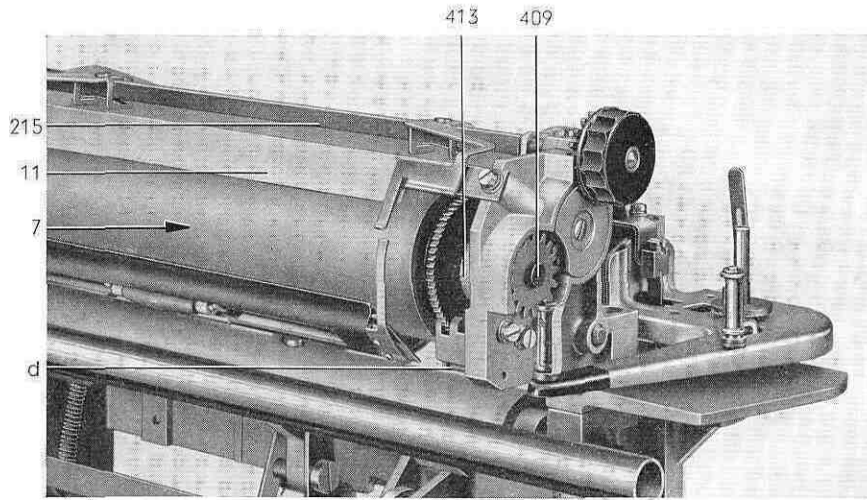


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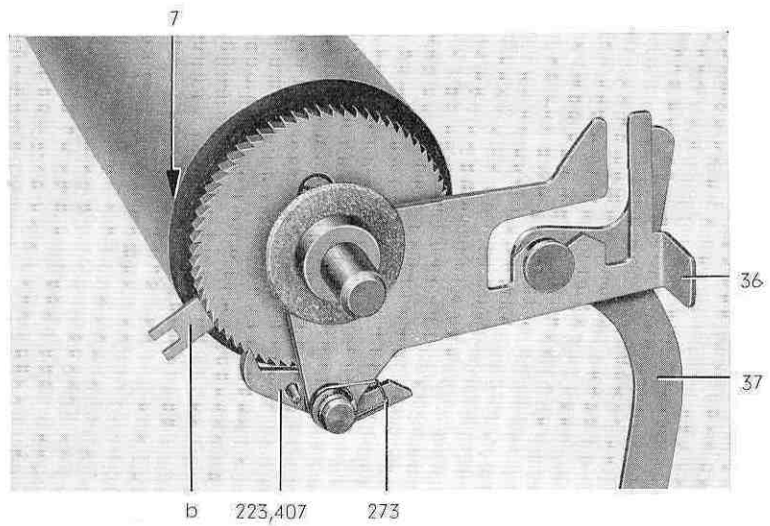


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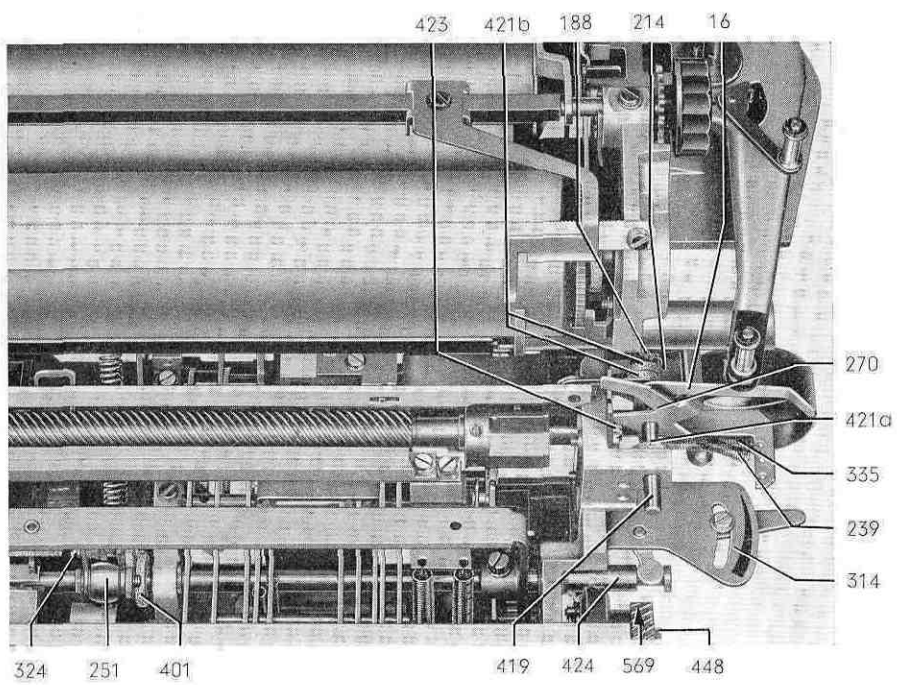




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3.7.8. Platen 7/48, lever 36 and pawl with pin 223

Removal: Remove the two fillister head screws 35b/46 and lift tear-off plate 11/47 off the printer. Unhook tension spring 272/46. Loosen fillister head screw 35a and pull axle with spur gear 409/47 out of felt washer 411/46, platen 7, lever 36 with felt washer 413/47 and felt washer 410 on spur gear (not visible). Swing axle 215 upwards, lift pull bar 37/48 out of lever 36 and remove the latter together with platen 7 from the printer.

Replacement: Reverse the above procedure.

When installing the platen make sure that lever b/48 of platen 7 straddles pin a/47.

Observe the adjustment instructions given in paras. 4.4.18 to 4.4.22, 4.4.66 to 4.4.68.

3.7.9. Pawl with pin 223/48

Removal: Remove lever 36 as described in para. 3.7.8.

Force retainer 407 (not visible) off the pin of lever 36 and remove the pawl.

Replacement: Reverse the above procedure.

When installing pawl 223 take care that torsion spring 273 properly rests on the pawl.

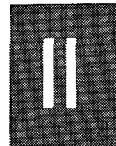
Observe the adjustments A87 and A134.

3.7.10. Parallel guide 16/49, lever 214 and lever 270

Removal: Unhook tension spring 335a/50. Remove fillister head screw 13 and pull out axle 420. Unhook tension springs 188, 335 and 239/49. Loosen fillister head screw 35b/60 and pull axle 419/49 out of lever 270, a washer, parallel guide 16, lever 214 and the two felt washers 421b. When removing the parts, take care of felt washer 421a.

Replacement: Reverse the above procedure.

Observe the adjustments A78, A79, A82, A129, A131, A163 and A164.



3.7.11. Feed screw 18/50 and sleeve with ratchet 20

Removal: Remove fillister head screw 423/49 of feed screw 18/50. Loosen the two fillister head screws 35 of sleeve with ratchet 20. Pull out feed screw 18 with ball bearing 78 to the left and remove sleeve with ratchet 20. Remove hexagon nut 357 from feed screw 18. Remove ball bearing 78.

Replacement: Reverse the above procedure.  
Observe the adjustments A148 to A150.

3.7.12. Printer bail 107/50, cam roller 251/49 and axle 424

Removal: Unhook tension springs 250/50 and 559. Remove fillister head screws 423 and 426. Remove pressure piece 427. Remove the two fillister head screws 35a/60 and swing impact adjuster 314/49 out of the undercut in axle 424/50. Pull axle 424 out of the printer. In doing so, take care of the two wire clips 605 and the two felt washers 401/49, 50. Remove printer bail 107/50 with cam roller 251. Cam roller 251 can be removed from printer bail 107 by unscrewing fillister head screw 324 (lacquer coated).

Replacement: Reverse the above procedure.  
Observe the adjustments A91, A111 and A159.

3.7.13. Camshaft 17/51

Removal: Unhook tension springs 250 and 559 from bracket 457/53, the two tension springs 250a/51 from bracket 606, and tension spring 339 from lever 255. After loosening hexagon nut 598 and the fillister head screw 529, pull cam sleeve 567 off camshaft 17. Remove fillister head screw 13 and pull lever 255 with the two felt washers 366 off pin "b". Clutch 569/49 becomes free by loosening hexagon nut 488.

Remove the two fillister head screws 35a/51. Lift off the parts still resting against the cams and pull washer 491, ball bearing 450, snap ring 489 and camshaft 17 out of the printer.

Replacement: Reverse the above procedure.

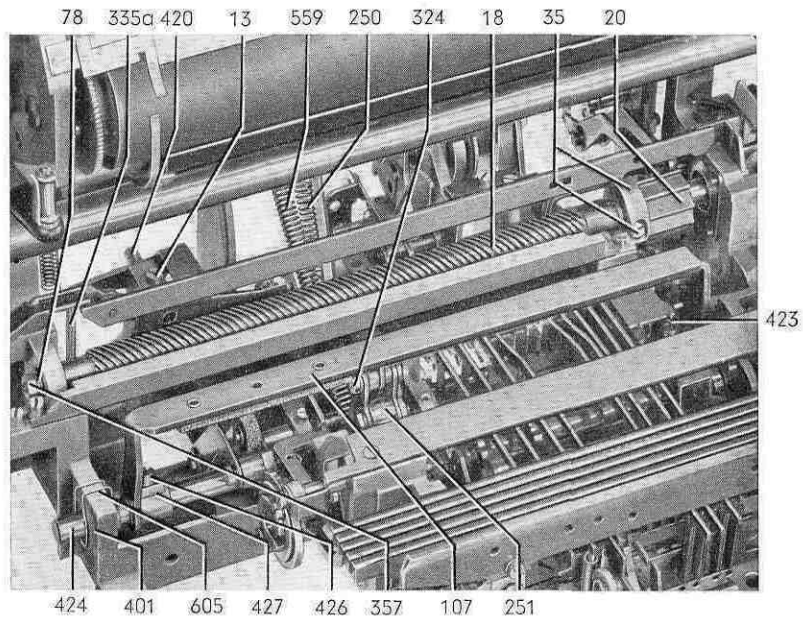
When installing washer 491 take care that the bent nose bears against the outer race of the ball bearing, and that camshaft and sleeve rest against the ball bearing. Lever 255 must engage the slot of latching lever 254.

Observe the adjustment instructions given in paras. 4.4., A63, A65, A66, A76, A96, A101 and A159.

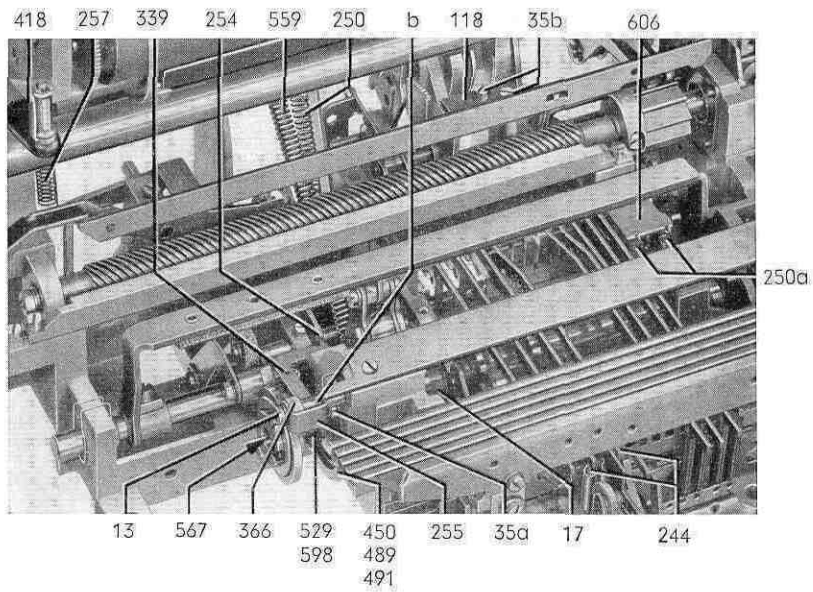
3.7.14. Comb 118/51

Removal: Unscrew the two fillister head screws 35b and remove comb 118.

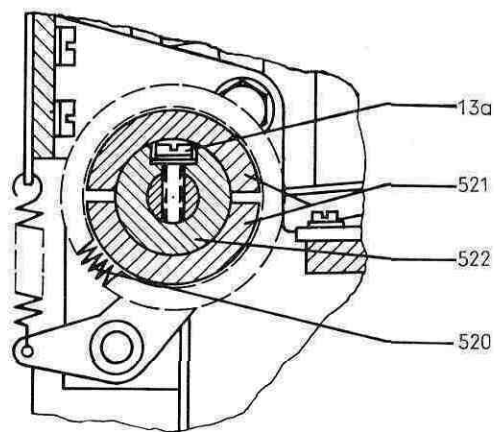
Replacement: Reverse the above procedure.  
Observe the adjustment A70.



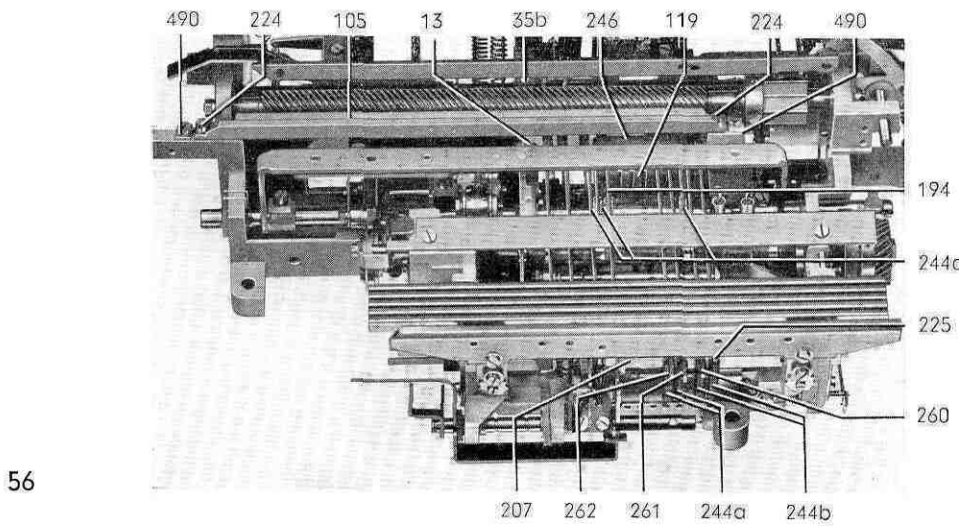
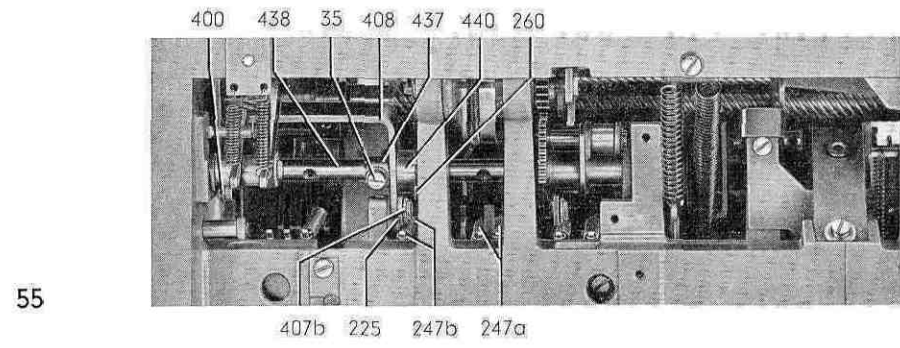
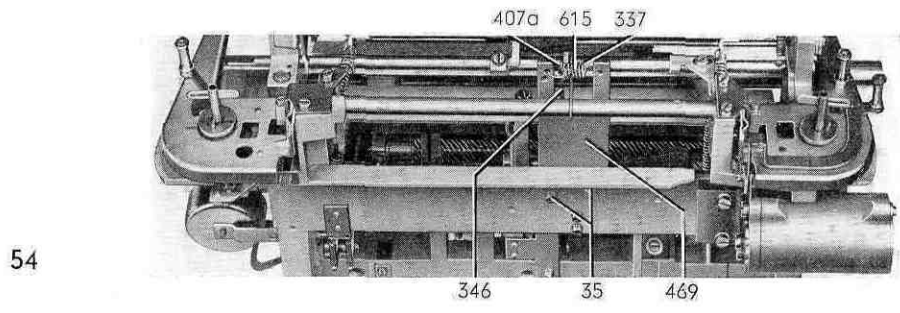
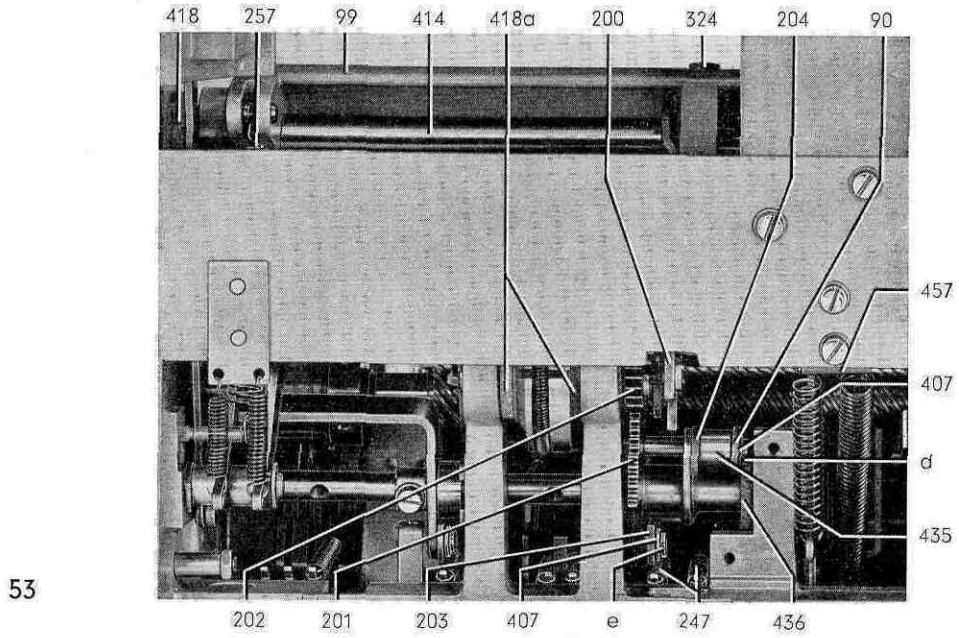
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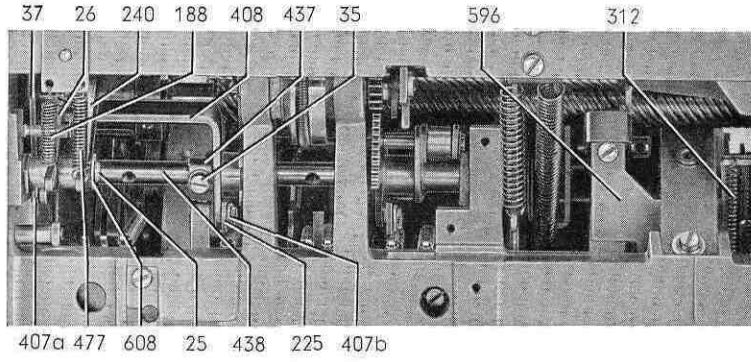


- 3.7.15. Pinion with eccentric 202/53 and the two sliding weights 521/52
- Removal: Remove tension spring 520 with the two sliding weights 521 from bushing 522. Remove fillister head screw 13a of bushing 522. Unhook the two tension springs 257/51, 53 from bail 99/53. Loosen fillister head screw 324 and pull axle 414 out of bail 99. In doing so, take care of the two felt washers 418/51, 53. Take out bail 99/53 with fork 200 and pull pinion with eccentric 202 out of the two felt washers 418a and bushing 522/52.
- Replacement: Reverse the above procedure.  
Observe the adjustments A72 and A102.
- 3.7.16. Pull bars 90, 204, 203/53
- Removal: Remove detent with bracket 258/68 and plate 434 installed behind as well as case shift rack 201/53 as described in para. 3.7.36. Unhook tension springs 244/51 and 247/53 from pull bars 203 and 204. Remove pull bars 90, 203, 204 and roller 435.
- Replacement: Reverse the above procedure.  
Make sure that felt washer 436 rests against the bearing point of the casting.  
Observe the adjustments A65, A66, A74, A75, A117 and A119.
- 3.7.17. Pull bar 207 (✱), 262 (⊕), 261 (⊖)/56 (2 pull bars 261 [F, H], pull bar 263 [G] will be installed only when required) and bail 246.
- Removal: Unhook tension springs 247a/55, 244a/56, 194 and 244c. Remove the two fillister head screws 224 and take off supporting rail 105. Do not loosen the lacquer-coated fillister head screws of stops 490. After loosening fillister head screw 13 pull out axle 441 (not visible, below the supporting rail) to the left. Bail 246, felt washers 421 (not visible) and pull bars 207, 262, 261 (2 pull bars 261, pull bar 263, if installed) will thus become free.
- Replacement: Slide axle 441 (not visible) through the first bearing bore, bail 246, felt washer 421 (not visible), pull bar 207 (engaging the first slot of comb 119), felt washer 421 (not visible), pull bar 261, 263; felt washer 421 (not visible), pull bar 261 (if installed), through pull bar 262 (the pin of lever 271/60 engages the slot in pull bar 262/56), through felt washer 421 (not visible), pull bar 261, felt washer 421 (not visible) bail 246, and through the second printer bore. Tighten fillister head screw 13 and install the tension springs. Push rail 105 against the lacquer-protected stops 490 and secure it in position with the two fillister head screws 224.  
Observe the adjustments A65, A66, A76, A117 to A119, A121 and A122.
- 3.7.18. Pull bars 260/56 (<) and 225 (≡)
- Removal: Unhook tension spring 615/54. Remove the two fillister head screws 35 from the printer frame and remove plate 469. Remove retainer 407a and ribbon feed linkage 346 from bearing pin 337 and push ribbon feed linkage 346 against the wall of the casting. Unhook tension springs 244b/56 and 247b/55 from pull bars 225 and 260. Pull retainer 407b and pull bar 225 off the pin of bail 408. Remove fillister head screw 35 of adjusting plate 437 from axle 438 and remove adjusting plate 437. Remove fillister head screw 35b/56 and pull axle 438/55 out of felt washer 400, bail 408, ring 440 and pull bar 260. Remove the two pull bars from the printer.
- Replacement: Reverse the above procedure.  
Observe the adjustments A67, A99, A117, A119 and A120.

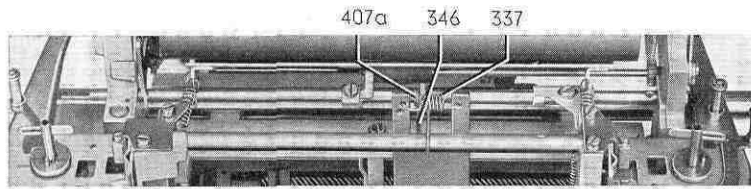


- 3.7.19. Bail 408/57
- Removal: Pull retainers 407a and 407b off the pins of bail and remove pull bars 37 and 225. Remove fillister head screw 35 and take adjusting plate 437 off axle 438. Remove fillister head screw 35b/56 and pull axle 438/57 out of felt washer 400 (not visible) and bail 408 to the right. Remove bail 408 from the printer.
- Replacement: Reverse the above procedure.  
Observe the adjustment A99.
- 3.7.20. Lever 240/57
- Removal: Unhook tension spring 477. Remove retainer 608 from eccentric pin 25. Remove lever 240.
- Replacement: Reverse the above procedure.  
Observe the adjustment A104.
- 3.7.21. Detent 26/57 and eccentric pin 25
- Removal: Unhook tension springs 477 and 188. Pull retainer 608 off eccentric pin 25. Remove lever 240 and detent 26. After removing hexagon nut 609/69, eccentric pin 25/57 is free.
- Replacement: Reverse the above procedure.  
Observe the adjustments A63 and A103.
- 3.7.22. Ribbon feed linkage 346/58
- Removal: Unhook tension springs 250/59 and 312/57. Pull retainer 407/58 and ribbon feed linkage 346 off bearing pin 337. Remove fillister head screw 35/59, pull out axle 597 to the left until ribbon feed linkage 346 becomes free. Remove ribbon feed linkage 346 from the printer frame.
- Replacement: Reverse the above procedure.  
Observe the adjustments A91 and A144.
- 3.7.23. Roller lever 530/59
- Removal: Unhook tension spring 312/57 from plate 596. Pull retainer 399/59 and then roller lever 530 off axle 597.
- Replacement: Reverse the above procedure.  
Observe the adjustments A101 and A146.
- 3.7.24. Cam sleeve 567/59, cam disc 527
- Removal: After loosening hexagon nut 598 and fillister head screw 529 (without surface treatment), pull cam sleeve 567 off camshaft 17. After removing the two fillister head screws 13 remove washer 599 and cam disc 527 from sleeve 528.
- Replacement: Reverse the above procedure.  
Observe the adjustment A101.
- 3.7.25. Lever 211/60
- Removal: Unhook tension spring 239 on lever 211. Loosen fillister head screw 13a and remove plate 442. Pull out axle 443 and remove two rings 444 and lever 211 which have thus become free.
- Replacement: Reverse the above procedure.  
Observe the adjustments A78, A79 and A130.
- 3.7.26. Lever 271/60
- Removal: Unhook tension spring 243. Remove fillister head screw 13/62 and pull out axle 445/60. Lift pin of lever 271 out of pull bar 262/56 and lift lever 271/60 out of the printer frame.
- Replacement: Reverse the above procedure.  
Observe the adjustment A121.

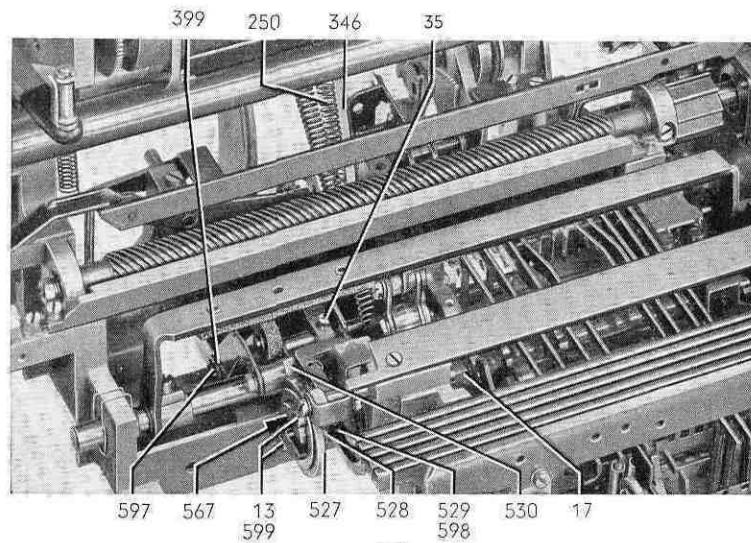




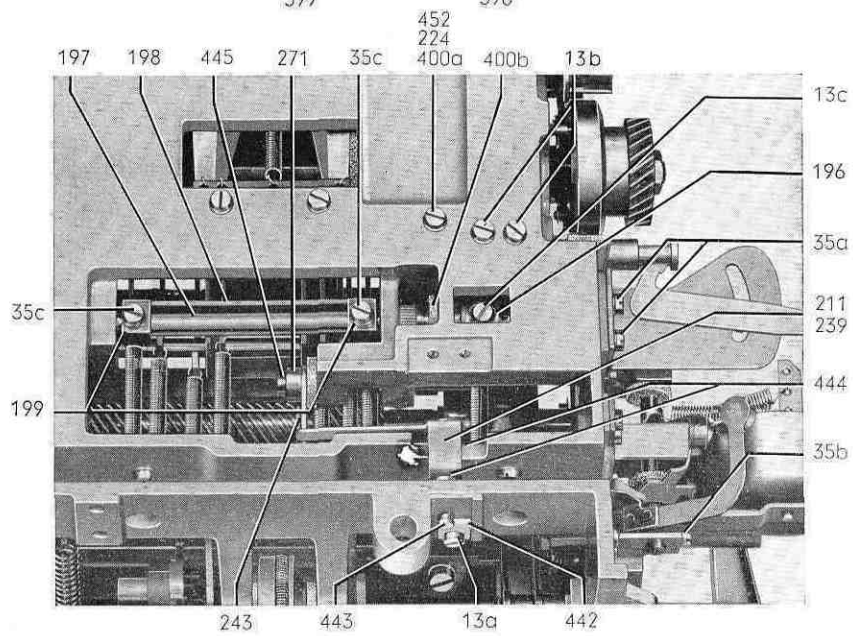
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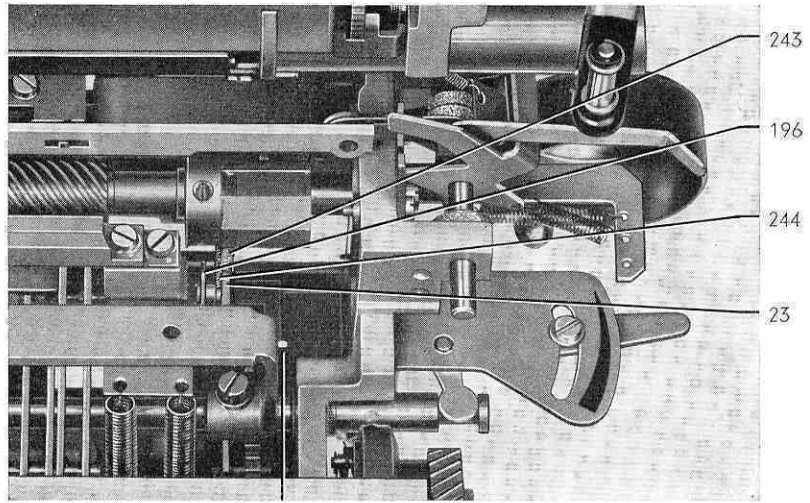


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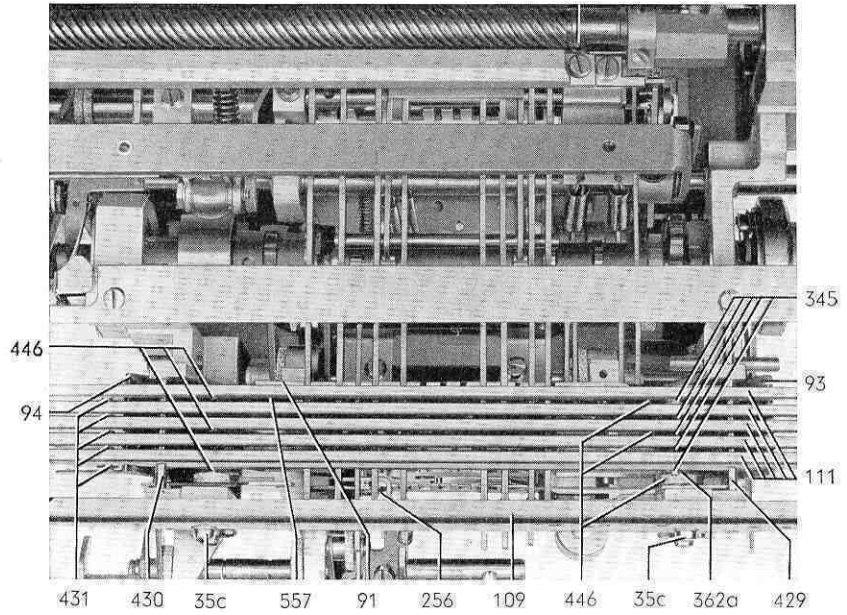


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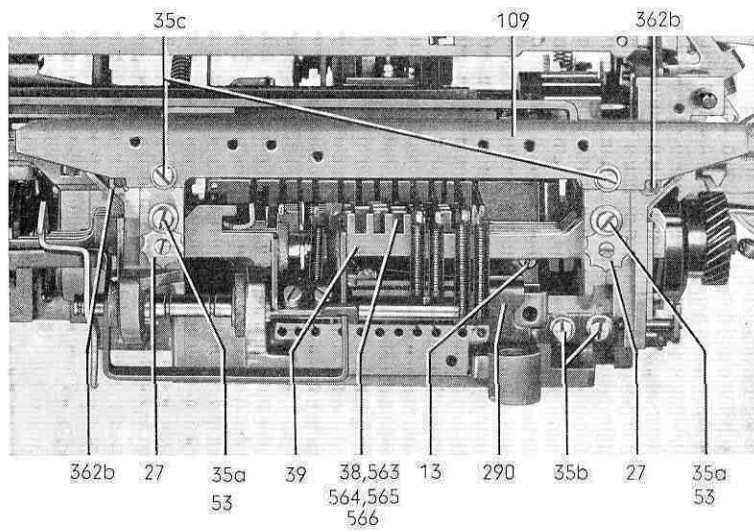
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3.7.27. Carriage feed lever 23/61

Removal: Unhook tension springs 243 and 244. Remove fillister head screw 224/60, pull axle 452 (not visible) to the right and take out felt washer 400a (not visible). Loosen the two fillister head screws 13b. Remove carriage feed lever 23/61 from the printer after displacing guide comb 120.

Replacement: Insert carriage feed lever 23 in the first slot of guide comb 120 and secure the latter with the two fillister head screws 13b/60. In addition, insert carriage feed lever 23/61 in the slot of bar with lever 196. Then proceed by reversing the procedure of removal.

Observe the adjustments A63, A105, A106, A148, A149 and A150.

3.7.28. Bar with lever 196/60, lever comb 198

Removal: Remove fillister head screw 13c and the two fillister head screws 35c. Withdraw axle 197 to the right from lever comb 198 and bar with lever 196. Lever comb 198, two squares 199, a felt washer 400b and bar with lever 196 will thus become free.

Replacement: Reverse the above procedure.

Depending on whether or not carriage feed suppression is to be avoided upon depression of a special function key, the teeth of lever comb 198 must be removed accordingly.

Observe the adjustments A71 and A122.

3.7.29. Guide bar 109/62, transfer bars 111, levers 345 and 431

Removal: Remove the two fillister head screws 35c and detach guide bar 109. Pull out axles 429 and 430 and remove the five transfer bars 111 with the five levers 345 (the levers are connected to the transfer bars 111 by one retainer 362a each) and the five levers 431 from the printer.

Replacement: Insert the five transfer bars 111 with one lever 345 each (connected to transfer bar 111 by a retainer 362a on the right-hand side) and one lever 431 each (left-hand side) in the slots of combs 93 and 94. The lower part of the levers must engage code bars 38, 563, 564, 565, 566/63. Slide the two axles 429/62 and 430 through transfer bars 111 and levers 345 and 431, until retainers 362b/63 come to rest against the printer frame. Place guide bar 109 on the protruding axle ends so that the retainers rest between the guide bar and the printer frame and secure it with fillister head screws 35c.

Observe the adjustments A64, A155 and A156.

3.7.30. Locking bar 39/63, code bars 38, 563, 564, 565, 566, detent bracket 290, combs 93/62, 94 and comb 91

Removal: Remove guide bar 109 and transfer bars 111 with levers 345 and 431 as described in para. 3.7.29. Unhook tension spring 256/62. Remove the two fillister head screws 35a/63 with bushings 53. Pull out the two eccentrics 27 to the front. Locking bar 39, code bars 38, 563, 564, 565, 566 (note: this sequence for later replacement) and the six felt washers 446/62 will thus become free.

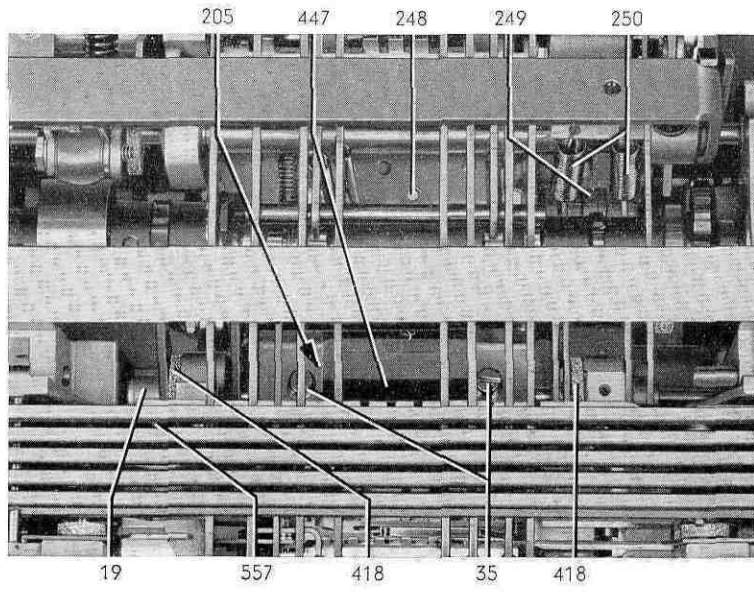
After loosening fillister head screws 35 (not visible), remove combs 93 and 94. Remove fillister head screws 35b/63 and take detent bracket 290 out of the printer. Unhook tension spring 557/62. Loosen fillister head screw 13/63 and remove comb 91/62.

Replacement: Reverse the above procedure.

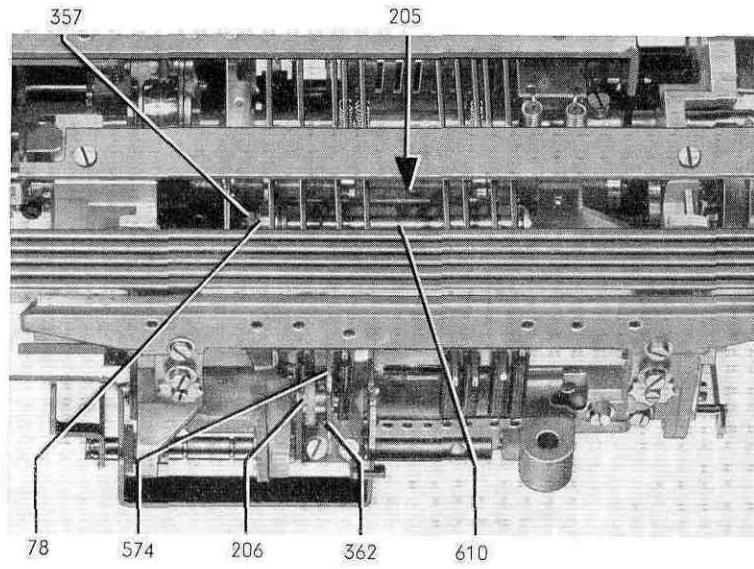
Observe the adjustments A64 to A66, A68, A116, A155 and A156.



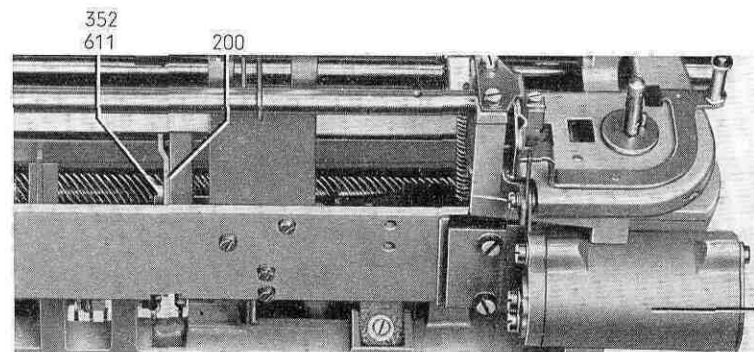
- 3.7.31. Special function axle 447/64 and anti-bounce pawl 19  
Removal: Unhook tension springs 557, 248 as well as the two tension springs 250. Remove the two fillister head screws 35. Pull special function axle 447 to the left out of compensating roller 249, special function bail 205, the two felt washers 418 and anti-bounce pawl 19. Remove anti-bounce pawl 19.  
Replacement: Reverse the above procedure.  
Observe the adjustments instructions given in paras. 4.4., A97 and A107.
- 3.7.32. Special function bail 205/64 and compensating roller 249  
Removal: Remove code bars 38, 563, 564, 565, 566/63 and comb 91/62 as described in para. 3.7.30, and special function axle 447/64 as described in para. 3.7.31.  
Pull retainer 362/65 and push rod 574 off the pin of lever 206. Remove special function bail 205/64 and compensating roller 249 from the printer frame.  
Replacement: Reverse the above procedure.  
Observe the adjustments A64, A74 to A76, A109 and A110.
- 3.7.33. Push rod 574/65  
Removal: Pull retainer 362 and push rod 574 off the pin of lever 206. Remove hexagon nut 357. Pull ball bearing 78 and one washer off axle 610. Withdraw axle 610 from special function bail 205 to the right until push rod 574 becomes free.  
Remove push rod 574 from the printer.  
Replacement: Reverse the above procedure.  
Observe the adjustment A76.
- 3.7.34. Shock absorber 98/66  
When replacing the shock absorber 98, observe the adjustments A96, A143, A149 and A150.
- 3.7.35. Bail 99/68 and fork 200  
Removal: Unhook two tension springs 257. Remove fillister head screw 324. Pull axle 414 out of the two felt washers 418 and bail 99 with fork 200 and remove the parts. Fork 200/66 will become free by removing eccentric screw 352 and slotted nut 611.  
Replacement: Reverse the above procedure.  
Observe the adjustments A73, A144 and A158.



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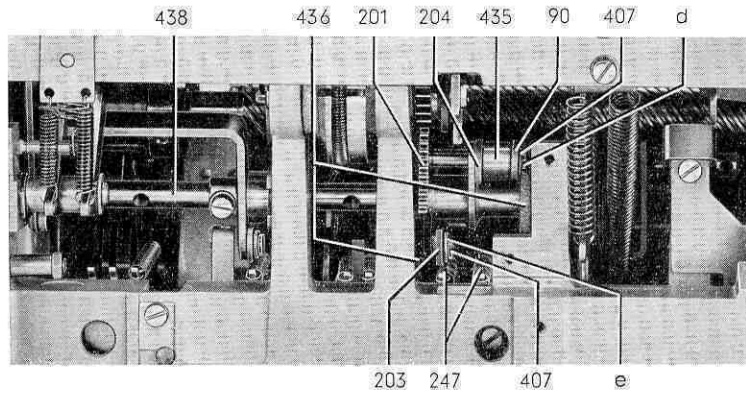


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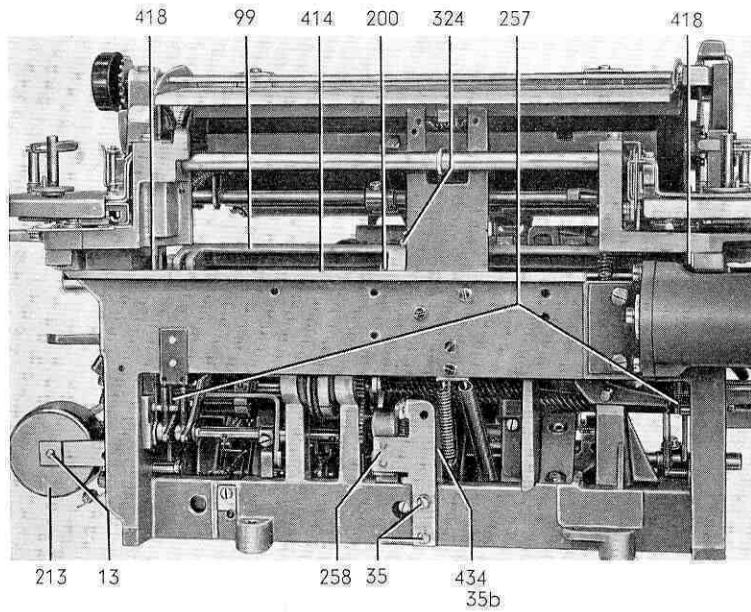


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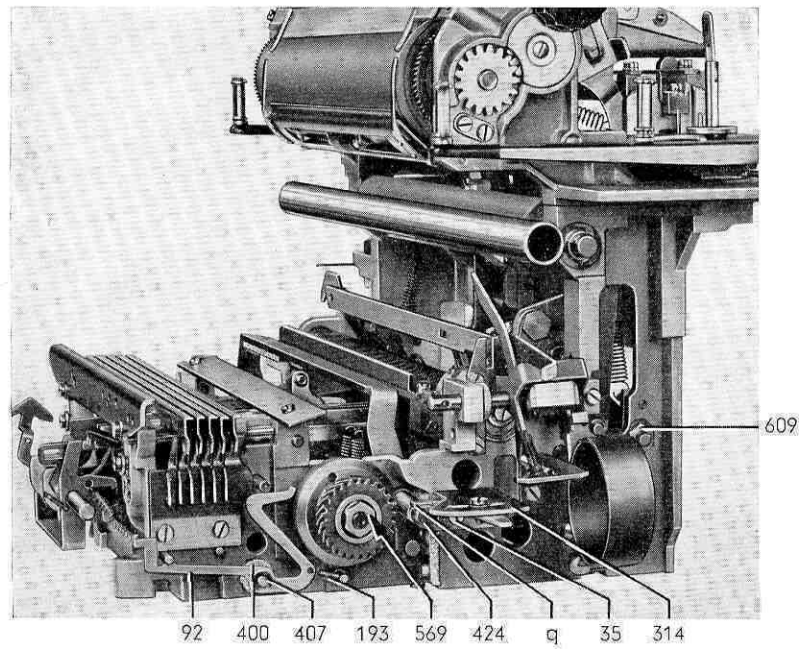
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3.7.36. Case shift rack 201/67, detent with bracket 258/68

Removal: Unscrew the two fillister head screws 35 and remove detent with bracket 258. Then remove fillister head screw 35b and take out plate 434. Unhook tension springs 247/67 from pull bars 203 and 204. Force the two retainers 407 off pins "d" and "e" of case shift rack 201. Unscrew fillister head screw 13/68 and remove bell dome 213.

Remove fillister head screw 35/65. Pull axle 438/67 to the left out of felt washer 436, case shift rack 201 and the second felt washer 436. Remove pull bars 90 and 204 together with roller 435 from pin "d" and pull bar 203 from pin "e" of case shift rack 201. Remove the parts.

Replacement: Reverse the above procedure.  
Observe the adjustments A72 to A75, A78 and A79.

3.7.37. Release lever 92/69

Removal: Unhook tension spring 193. Pull off retainer 407 and remove release lever 92 with felt washer 400 from the pin.

Replacement: Reverse the above procedure.  
Observe the adjustments A98 and A125.

3.7.38. Impact adjuster 314/69

Removal: Remove the two fillister head screws 35 and detach impact adjuster 314.

Replacement: Make lever "q" of impact adjuster 314 engage with its full width in the slot in axle 424. Secure impact adjuster 314 with the two fillister head screws 35.

Observe the adjustment A189.





3.7.39. Type basket carriage 48/71

Remove type basket carriage 48/71 with the printer removed or the motor switched off.

Removal: Remove the ink ribbon. Bring bail 99/70 into its upper position by moving case shift rack 201 in the direction of the arrow. Bring printer bail 107/71 into its rear position (rest position of printer) by turning clutch 569/69 by hand. Detach carriage return spring 592/71 from spring suspension plate 112 and hook it to eccentric pin 101. Turn lock 95 somewhat and remove it from the recess of pin 96. Depress pin 96 and pull brake lever 97 out of brake cylinder of shock absorber 98. Depress lever 16a/4 of parallel guide and pull the type basket carriage to the left out of the printer.

Replacement: Push case shift rack 201/70 in the direction of the arrow to bring bail 99 into its upper position. Move the five transfer bars 111/71 by hand into their upper position. Printer bail 107 must be in its extreme rear position (next to supporting rail 105; turn clutch 569/69 by hand).

Press rollers 106/71 of the type basket carriage backwards in the direction of the ribbon lifter. Install the type basket carriage in such a way that its rollers "s" and ball bearings 78 glide on bail 99, and roller 104 comes to rest against rail 105. When installing the type basket carriage, rollers 106 glide on both sides along printer bail 107. Guide pin 108 engages guide bar 109, and the U-shaped ends of the five bellcranks 110 grasp the bent edges of the five transfer bars 111. Engage brake lever 97 in the shock absorber 98, press pin 96 upwards through the bore in the brake lever and engage lock 95 from above in the recess in pin 96.

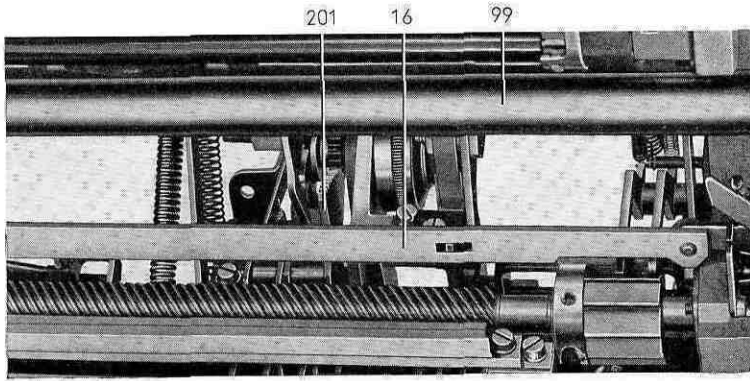
It is convenient to bring the type basket carriage in the beginning-of-line position. Detach the front loop of carriage return spring 592 from eccentric pin 101 and hook it to spring suspension plate 112. Thread the ink ribbon through ribbon lifter 539/71 as shown in Fig. 5.

3.7.40. Push rod 629/72

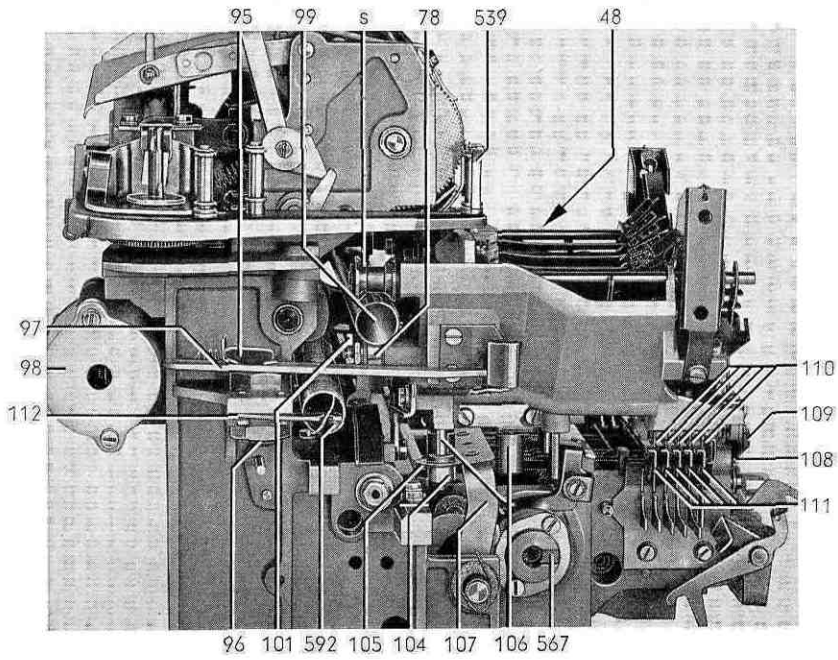
Removal: Remove fillister head screw 13. Pull out axle 453, so that felt washer 366 and washer 634 become free. After loosening fillister head screw 304/73 (lacquer coated), remove ribbon lifter 539. Pull push rod 629/72 off the pin of lever 454 and remove it.

Replacement: Screw ribbon lifter 539/73 onto push rod 307/72, using fillister head screw 304/73. Slide push rod 629 with ribbon lifter 539/73 along type bar guide 308/72 and push it into the type basket carriage. Slide axle 453 through the bore in type basket 292, felt washer 366, washer 634 and the bore of push rod 629, and pass pull bar 311 through the slot in the axle. Secure axle 453 with fillister head screw 13.

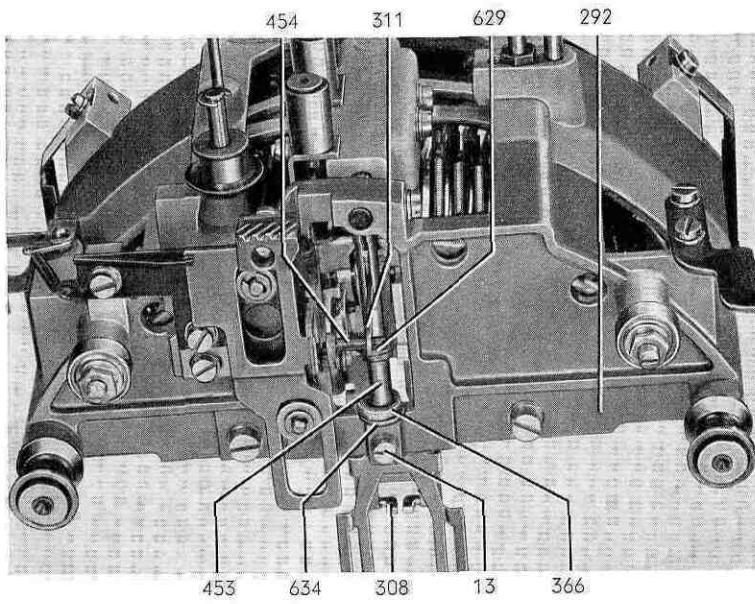
Observe the adjustments A163 and A164.



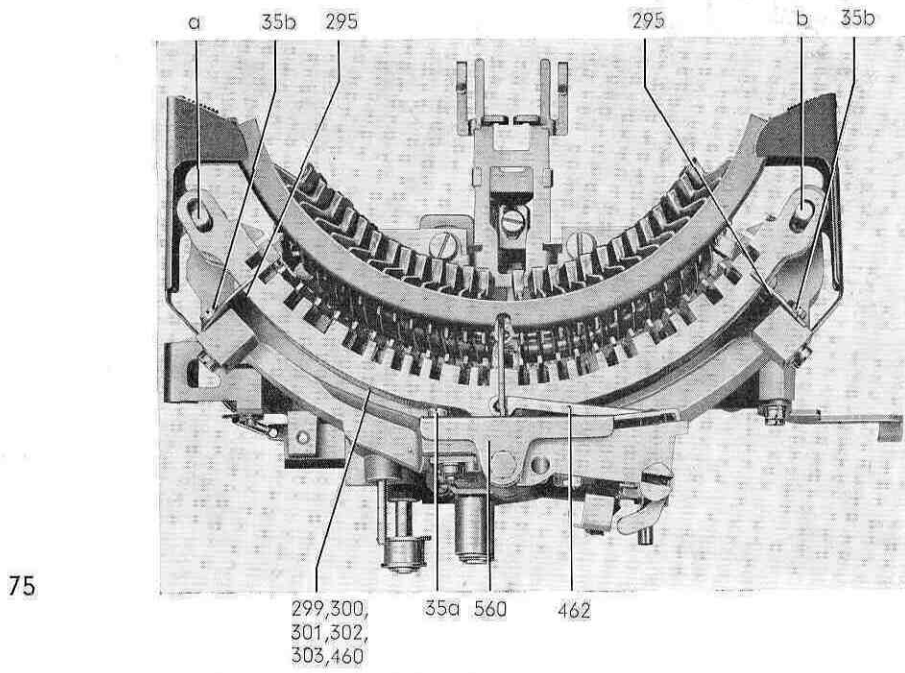
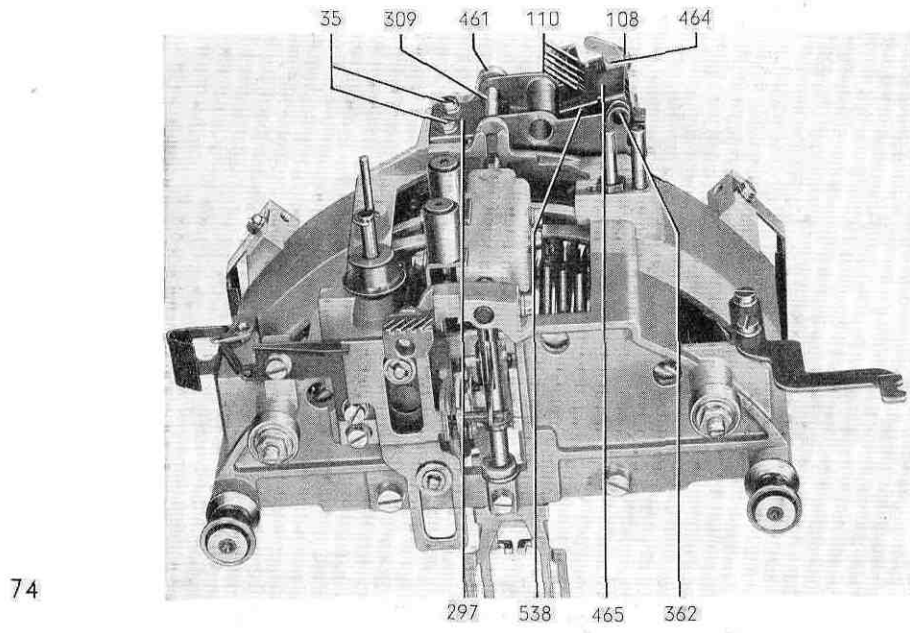
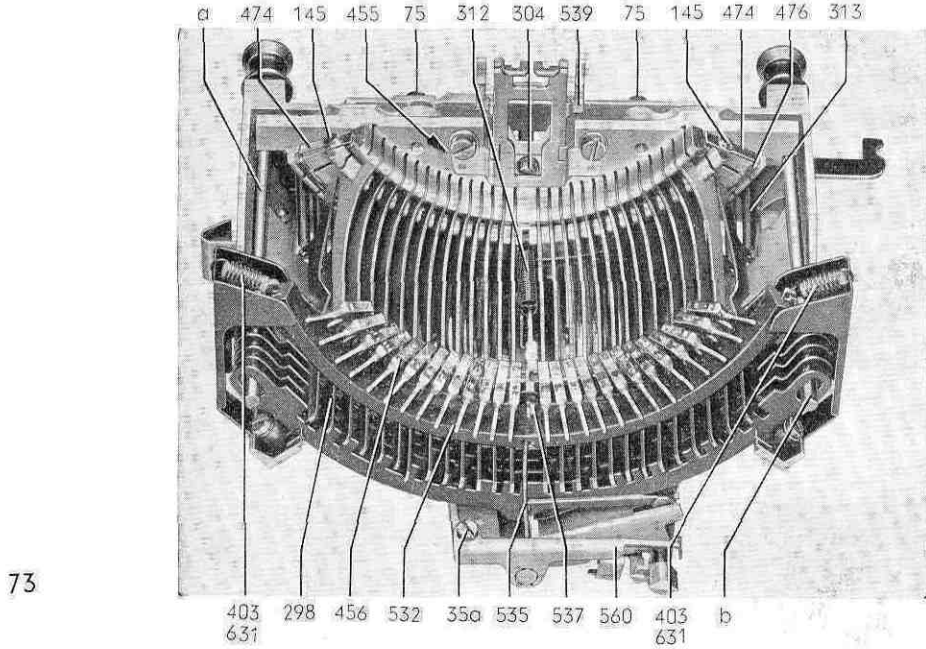
70



71



72



- 3.7.41. Segment with type bar 455/73, type bar rest 532
- Removal: Remove ribbon lifter 539 after unscrewing fillister head screw 304. Unhook tension spring 312 and the two tension springs 403. Remove fillister head screw 35a. Remove bracket 560 and suspension bracket 535 together with type bar rest 532. In doing this, make sure that the eccentric pin does not turn. Unscrew the two fillister head screws 75 and remove segment with type bar 455.
- Replacement: Prior to installation, lace pull bars 298 as well as type bars 456 together. Attach segment with type bar 455 by means of the two fillister head screws 75. (See to it that the segment properly rests on axles "a" and "b"). Insert pull bars 298/73 in the associated slots of guide comb 537. Then proceed by reversing the procedure of removal.
- Observe the adjustments A153, A155 and A156.
- 3.7.42. Type bar 456/73 and pull bar 298
- Removal: Remove fillister head screws 145. Remove retaining plates 474 and unhook tension springs 313. Pull type bar hinge bow 476 out of type bar 456 or out of the type bar of the pull bar to be replaced 298. To facilitate removal, insert type bar replacing tool 475 (not visible) as far as the respective type bar. Pull out type bar and pull bar.
- Replacement: Make sure that the teeth of the type bar properly engage the pull bar and that the protruding ends of the pull bars are equally long. Then proceed by reversing the procedure of removal.
- Observe the adjustment A168 and, if necessary, align the type bars (use auxiliary tools as per brochure Fs Übs 2100/60).
- 3.7.43. Pull bar 311/72
- Removal: Remove segment with type bar 455/73 as described in para. 3.7.42. Pull out axle 453/72 after loosening fillister head screw 13. Draw pull bar 311 out of bracket 306/77 and off the pin of lever 454/72 and remove it.
- Replacement: Reverse the above procedure.
- Observe the adjustments A153 and A167.
- 3.7.44. Code segments 299 to 303/75, locking segment 460 (will be installed on request only)
- Removal: Remove bracket 560 by unscrewing fillister head screw 35a. Force retainer 451/74 off axle 309. Pull out axle 309 with ring. Unscrew guide comb 297 by removing the two fillister head screws 35. Disengage links 462/75 from code segments 229 to 303 and remove bail 538/74. Remove two fillister head screws 35b/75 and detach guide combs 295. Pull locking segment 460 (not visible) and the five code segments 299 to 303 off the two axles "a" and "b".
- Replacement: Slide code segments 299 to 303 and locking segment 460 (only installed upon request) onto axles "a" and "b". Make sure that the parts number is at the front left. Secure the two guide combs 295 by means of fillister head screws 35b (see adjustment A151). Apply guide comb 297/74, support the five links 462/75 in code segments 299 to 303 and fix them in position by securing guide comb 297/74 by means of fillister head screws 35. Then proceed by reversing the procedure of removal.
- Observe the adjustments A154 to A157, A160 and A161.
- 3.7.45. Bail 538/74, five bellcranks 110
- Removal: Pull retainer 326 off guide pin 108. Pull out guide pin 108; in doing so, five bellcranks 110, comb 465, and pressure spring 464 become free. Unscrew fillister head screw 35a/75 and remove bracket 560. Force retainer 461/74 off axle 309. Pull out axle 309, thus freeing bail 538.
- Replacement: Slip pressure spring 464 over guide pin 108, slide the latter through bail 538, the first bellcrank 110, comb 465, the second to the fifth bellcrank 110, comb 465, bail 538, and secure it with retainer 362. Swing bellcranks 110 out of the comb of bail 538, connect them with the other ends of links 462/75, then swing them back into comb 465/74 and fix them by sliding axle 309 through the type basket, the ring and bail 538. Secure axle 309 by means of retainer 461. Secure bracket 560/75 using fillister head screw 35a.
- Observe the adjustments A155 to A157.



3.7.46. Guide 285/76, feed rack 284, threaded block 470

Removal: Unhook tension spring 243. Remove retainer 362. Remove the two fillister head screws 35. Remove guide 285 with feed rack 284. Remove fillister head screw 426 and pull threaded block 470 off feed rack 284.

Replacement: Reverse the above procedure.

When installing new parts observe the adjustments A147 to A150 and A166, otherwise only A147.

3.7.47. Guide comb 537/77

Removal: Remove segment with type bar 455/73 as described in para. 3.7.41, and code segments 299 to 303/75 as described in para. 3.7.44.

Remove the four hexagon nuts 614/77 and remove guide comb 537 together with fillister head screws 103.

Replacement: Reverse the above procedure.

Observe the adjustment A153.

3.7.48. Pusher 315/77, axle 467/76, roller carrier 305, pusher segment 291/77

Removal: Remove segment with type bar 455/73 as described in para. 3.7.41, and pull bar 311/72 as described in para. 3.7.43.

Remove the four fillister head screws 304/77, tilt pusher segment 291 and take it out of type basket 292. Remove fillister head screw 224/76, pull out axle 467 and lift out pusher 315/77.

Loosen the two fillister head screws 34/77 and remove roller carrier 305/76.

Replacement: Reverse the above procedure.

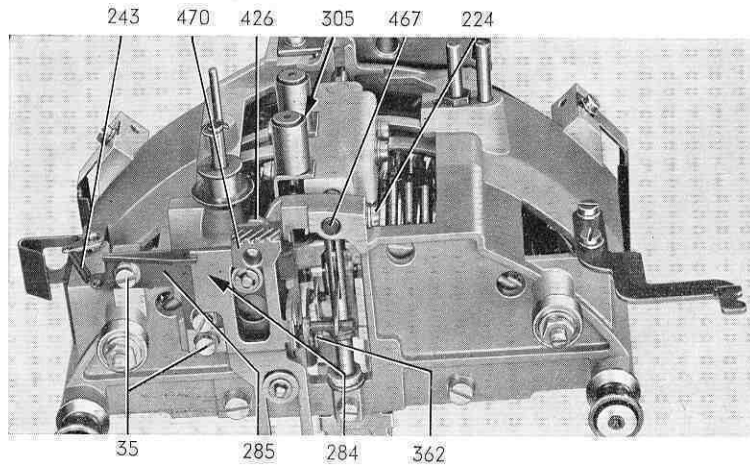
Observe the adjustments A152, A153, A160 and A161.

3.7.49. Eccentric pin 101/78

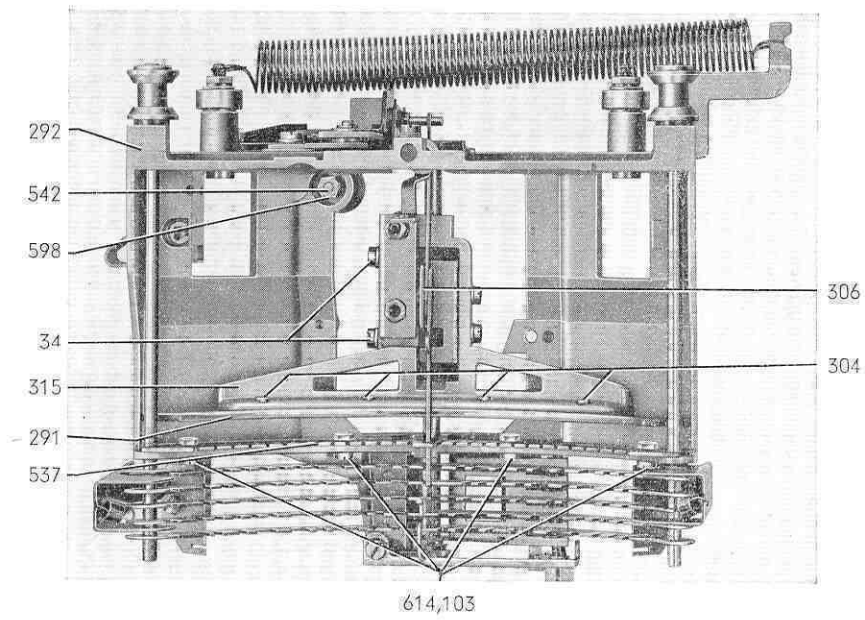
Removal: Remove hexagon nut 468. Pull ball bearing 78 with washer off eccentric pin 101. Press the eccentric pin through type basket 292 and remove it.

Replacement: Reverse the above procedure.

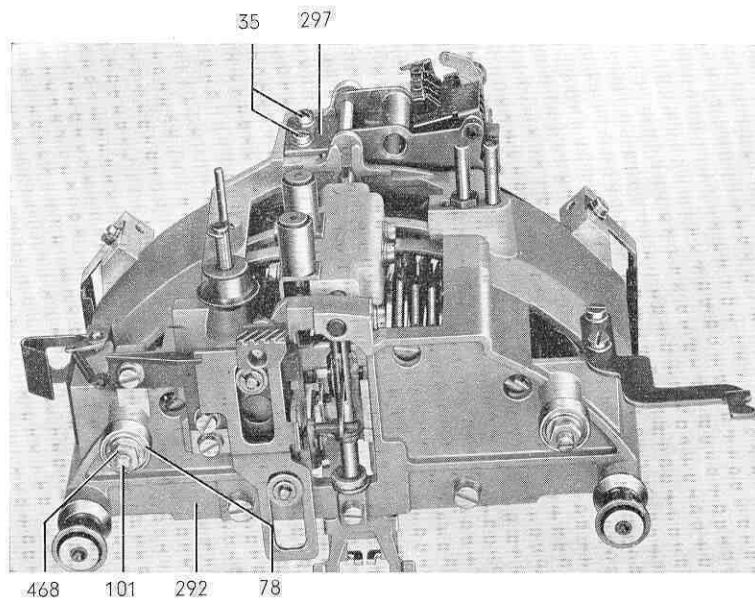
Observe the adjustment A163.



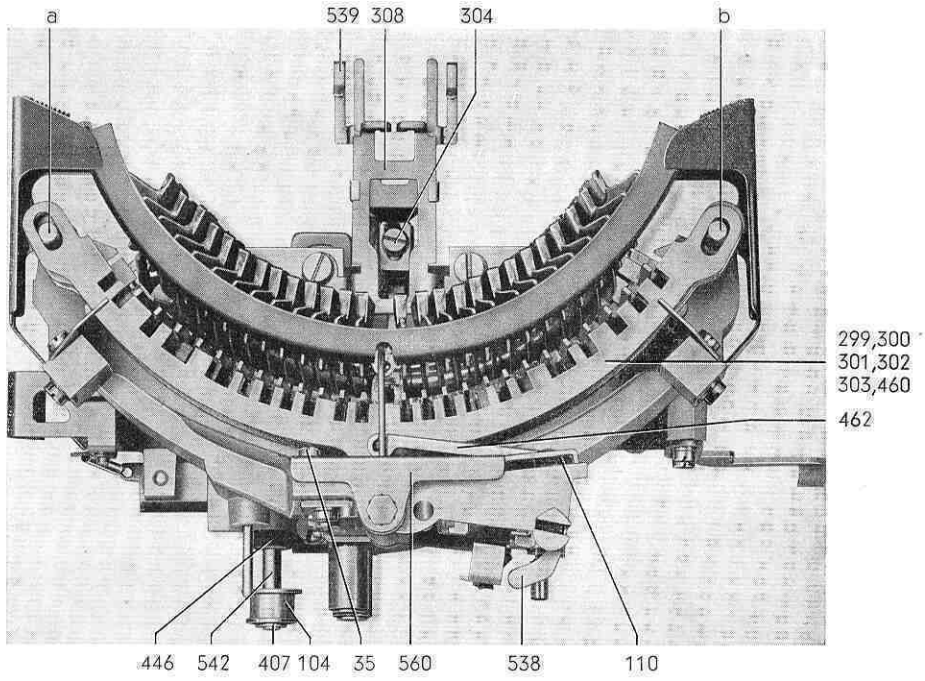
76



77



78



79



3.7.50. Links 462/79

Removal: Remove bail 538 and the five bellcranks 110 as described in para. 3.7.45. Remove guide comb 297/78 by unscrewing the two fillister head screws 35. Disengage the five links 462/79 from the code segments 299 to 303.

Replacement: Reverse the above procedure.  
Observe the adjustments A155 and A156.

3.7.51. Bracket 560/79

Removal: Unscrew fillister head screw 35 and take off bracket 560.

Replacement: Reverse the above procedure.  
Observe the adjustments A155 to A157.

3.7.52. Ribbon lifter 539/79

Removal: Remove fillister head screw 304/73 and pull ribbon lifter 539/79 off type bar guide 308.

Replacement: Reverse the above procedure.  
Observe the adjustments A163 and A164.

3.7.53. Roller 104/79, bolt 542

Removal: Pull off retainer 407 and remove roller 104 with felt washer 446. Remove segment with type bar 455/73 as described in para. 3.7.41. Loosen the lacquer-coated hexagon nut 598/77 and pull out bolt 542.

Replacement: Reverse the above procedure.  
Install the type basket carriage in the printer and turn bolt 542/79 until axles "a" and "b" are in horizontal position when judged by eye.  
Observe also the adjustments A158 and A159.



#### 4. ADJUSTMENTS

Prior to starting work pull the power and telegraph plugs from their wall outlets. Gears should mesh with little but still noticeable backlash.

Do not attempt to adjust springs and contact spring sets.

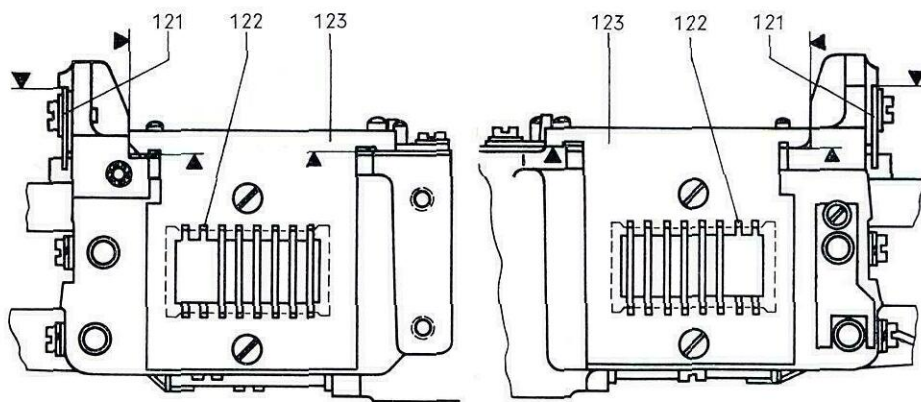
Replace springs and contact spring sets which are damaged or do no longer meet the specified adjustment values.

Lacquer-coated parts are factory-adjusted. If such parts are loosened, full interchangeability of constructional units cannot always be guaranteed without re-adjustment.

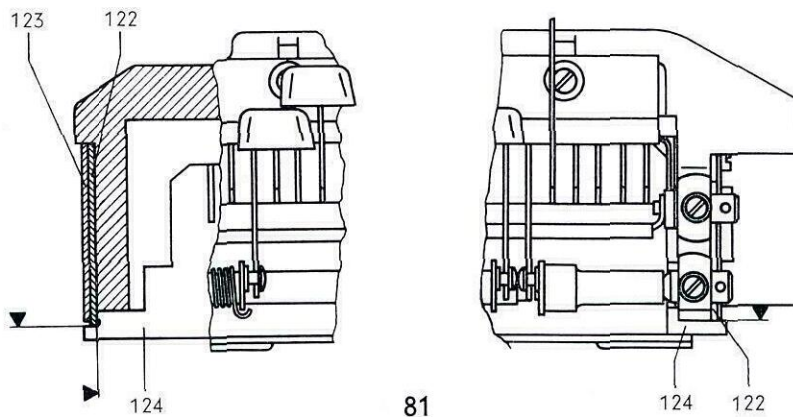
##### 4.1. Keyboard

Adjustment instructions and part numbers refer to teleprinters with standard keyboard or condensed keyboard. In case the parts for the two keyboards are different, the part numbers of the parts for the condensed keyboard are enclosed in brackets ( ).

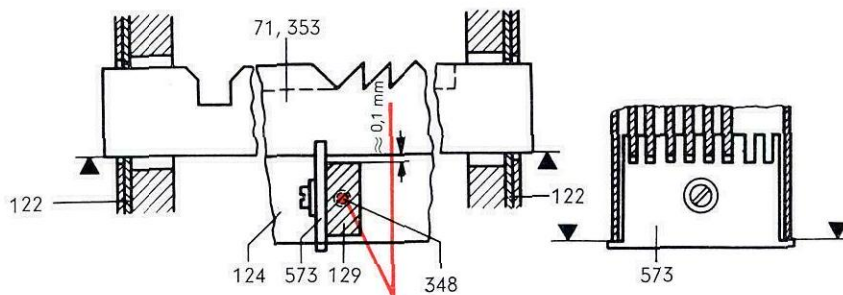
- A1 Stop bar 121/80, frames 122, 80, 81, combs 123  
Stop bar 121, frames 122 and combs 123 provided at either side of the mounting frame must make contact at the designated points.
- A2 Comb guide 124/81  
The comb guide 124/81 should rest against frame 122 at the designated points.
- A3 Spacer 129/82, comb 573  
There should be a gap of approx. 0.1 mm between spacer 129, comb guide 124 and code bars 71 as well as locking bar 353. Make sure that the parts properly rest on frame 122.  
Adjustment: Loosen mounting screws 348 (lacquer-coated) and shift spacer 129. Comb 573 must rest against the designated points.
- A4 Bracket 130/83, 84  
With detent 131/86 lifted off, hold key "R" depressed. The distances between the code bars 71/84 and bracket 130 should be approximately equal on either side ( $e \approx f$ ).  
Adjustment: Loosen screw 35/83, 84 on bracket 130 and tighten it in the position determined by code bars 71. The bracket must rest against comb guide 124. The moving range of the bars should be for all keyboards  $\geq 2.2$  mm.



80

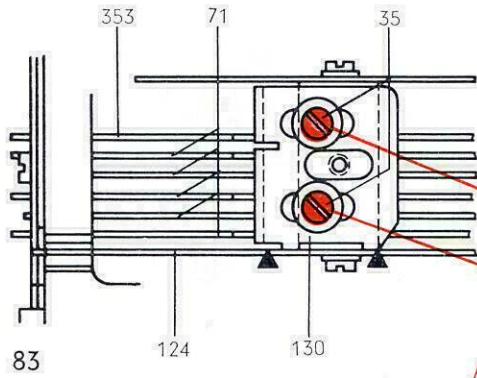


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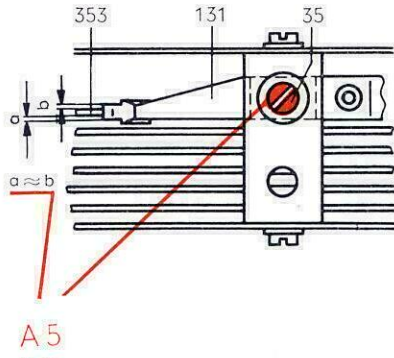


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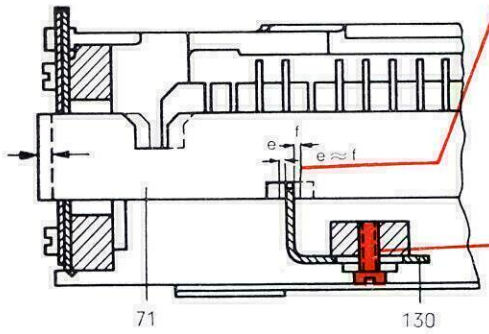
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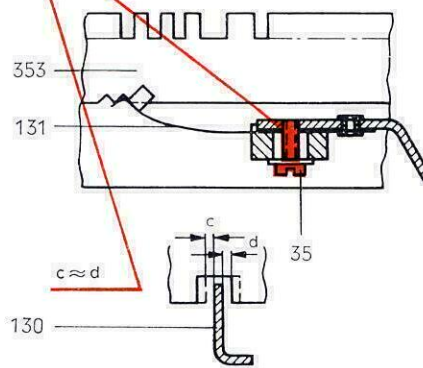
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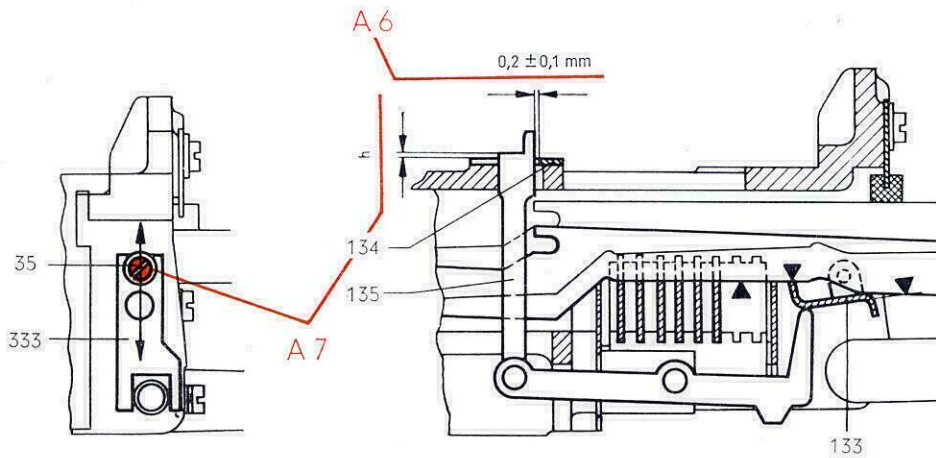
85



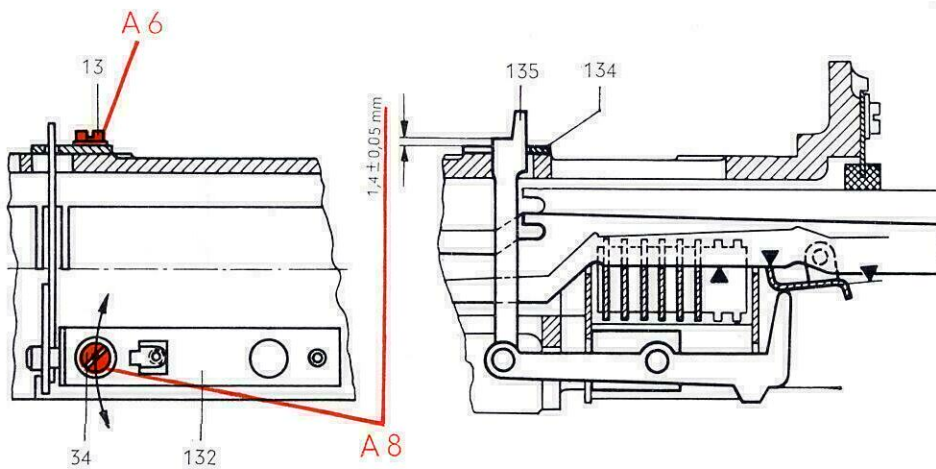
84



86



87



88

- A5 Detent 131/85, 86  
Detent 131 should be properly centered on locking bar 353 (distance  $a \approx b$ ). When keys "A..." and "1..." are slowly depressed in succession, the clearances between the code bars and the stop of bracket 130/86 should be about equal ( $c \approx d$ ).  
Adjustment: Loosen fillister head screw 35/86 and displace the detent 131/85, 86.
- A6 Guide plate 134/87  
There must be a gap of  $0.2 \pm 0.1$  mm between guide plate 134 and release lever 135. The release lever should not jam in the guide plate.  
Adjustment: Loosen mounting screws 13/88 and displace guide plate 134.
- A7 Start bail 133/87  
Depress the extreme right-hand key lever with a force of about 170. Repeat the same with the extreme left-hand key lever. In both cases the travel "h" of release lever 135 should be equal.  
Adjustment: Loosen screw 35 (lacquer protected) and displace plate with rivet 333 in the direction of the arrow until travel "h" of release lever 135 is equal in the two positions illustrated.
- A8 Release lever 135/88  
With the key lever depressed, the travel of release lever 135 to the upper edge of guide plate 134 should be  $1.4 \pm 0.05$  mm.  
Adjustment: Loosen screw 34 of the bracket with pin 132 and turn it until the value  $1.4 \pm 0.05$  mm has been obtained.



Spring forces:

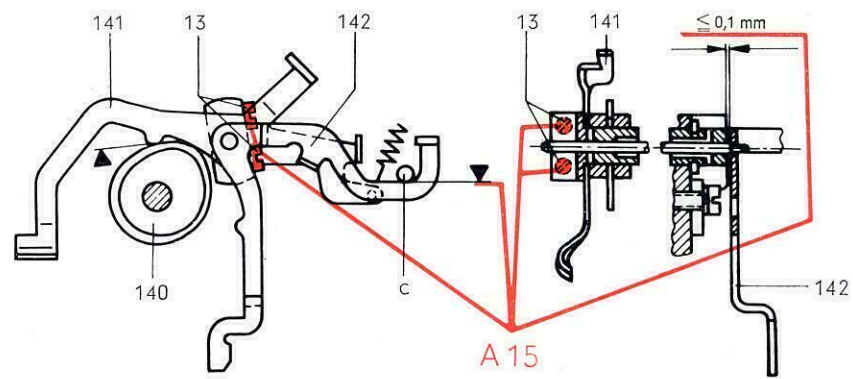
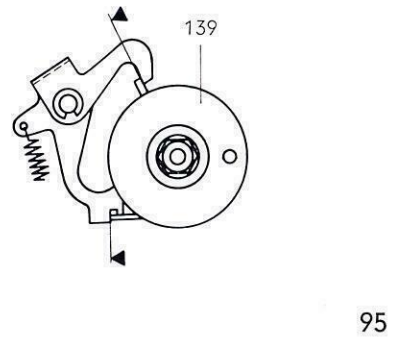
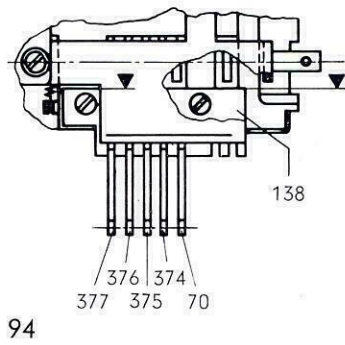
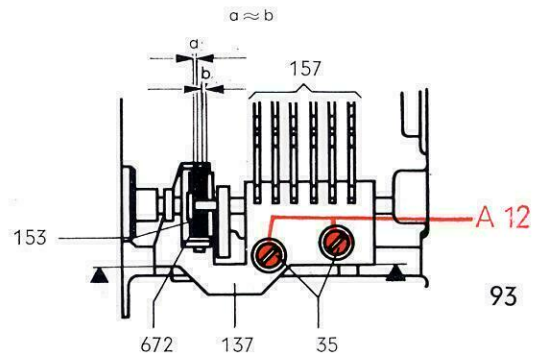
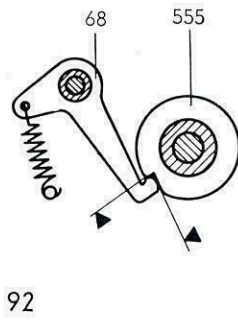
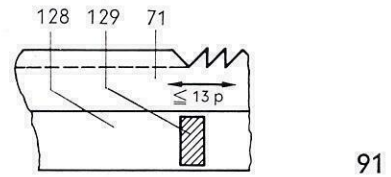
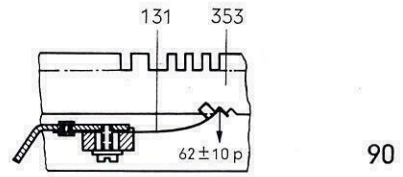
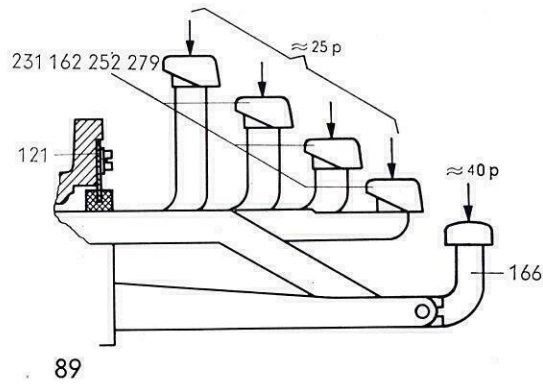
- (A9) Key levers 162, 166, 231, 252, 279/89  
A force of approximately 25 p should be required to lift key levers 162, 231, 252, 279 off stop bar 121.  
A force of approximately 40 p should be required to lift key lever 166 off stop bar 121.  
Strike every key lever once before taking the measurements.
- (A10) Detent 131/90  
Detent 131 should engage locking bar 353 at the designated point with a force of  $62 \pm 10$  p.
- (A11) Code bar 71/91  
A force of  $\leq 13$  p should be required for displacing a code bar 71.

#### 4.2. Transmitter

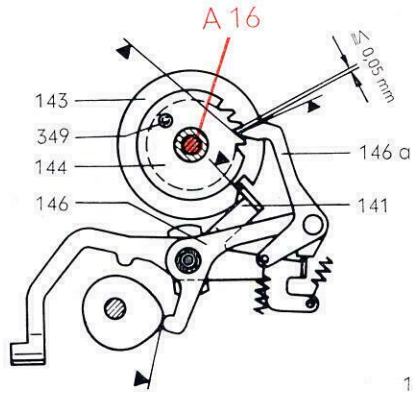
Rest position (Fig. 92)

The rest position can be obtained by turning clutch member 139/95 in a clockwise sense to the point where anti-bounce cam of cam sleeve 555/92 rests against lever with bushing 68.

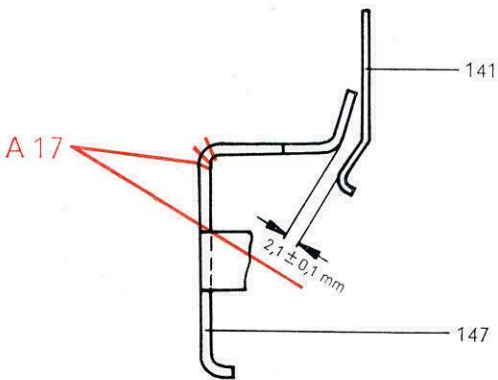
- A12 Guide comb 137/93  
Move guide comb 137 and tighten it with fillister head screws 35 in such a way that rocker 672 of contact switching assembly lever 153 has an equal distance on either side ( $a \approx b$ ) in the slot.  
While turning the cam shaft, rocker 672 of contact switching assembly lever 153 and the code levers 157 must not jam in the slots of guide comb 137. Code levers 157 should rest with their full width on the cam of camshaft 140/96.  
Adjustment: Loosen mounting screws 35/93 and shift guide comb 137.
- A13 Guide comb 138/94  
Guide comb 138 should rest at the designated point against the mounting frame. Bellcranks 70, 374, 375, 376, 377 must easily move in the slots of the guide comb.
- A14 Clutch member 139/95  
Turn camshaft 140/99 until locking bail 148 rides on the highest part of the cam. Clutch member 139/95 should be installed with the camshaft in the rest position represented.
- A15 Lever with shaft 142/96  
Transmitter in rest position.  
When lever 141 rests on the cam of camshaft 140, lever with shaft 142 must rest against pin "c". The axial clearance of lever with shaft 142 should then be  $\leq 0.1$  mm.  
Adjustment: Loosen fillister head screws 13 and move lever with shaft 142.



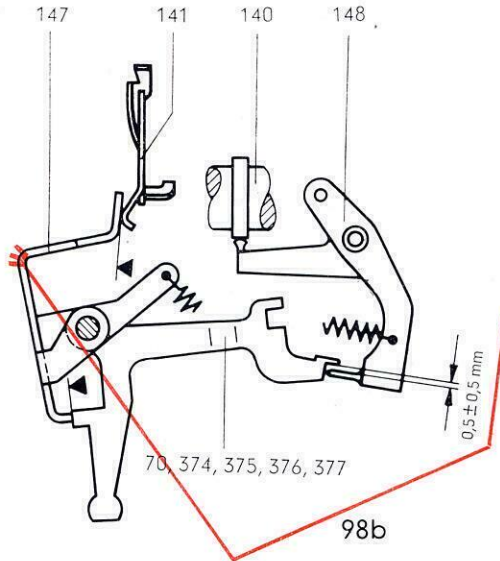




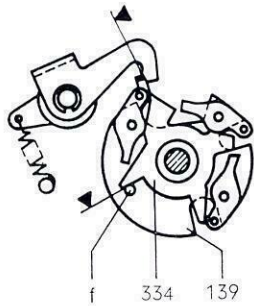
97



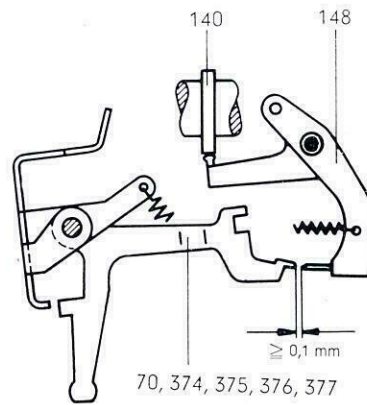
98a



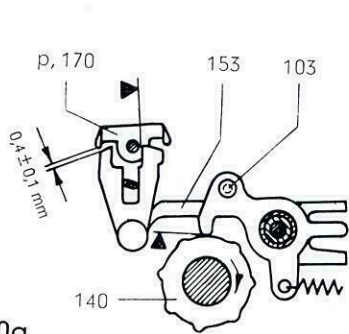
A 18



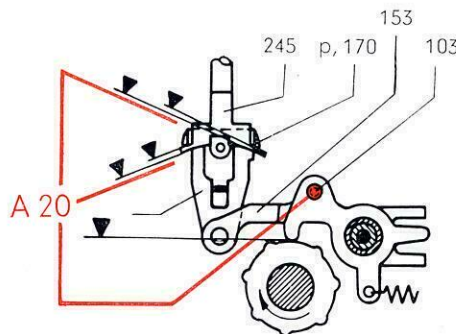
99a



99b




100a

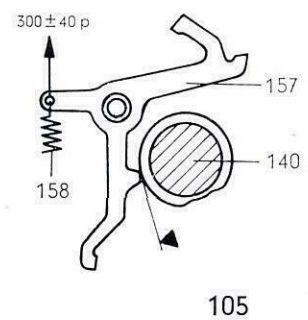
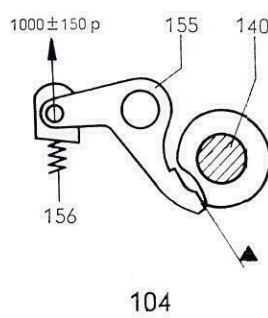
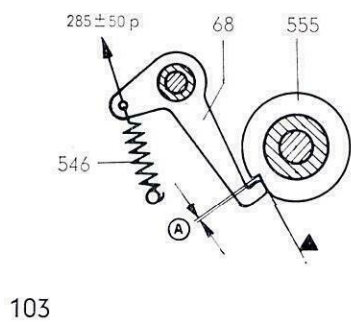
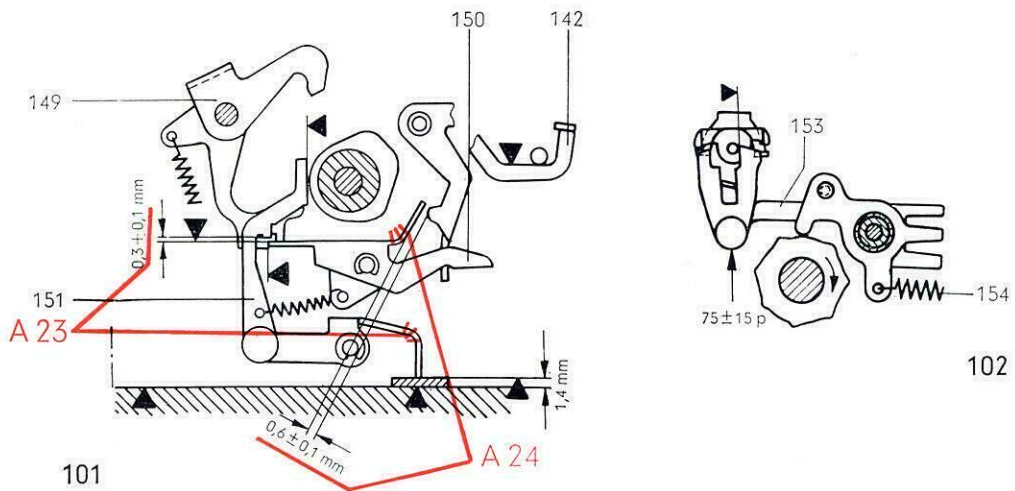
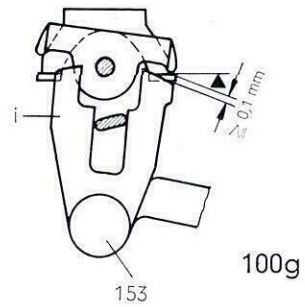
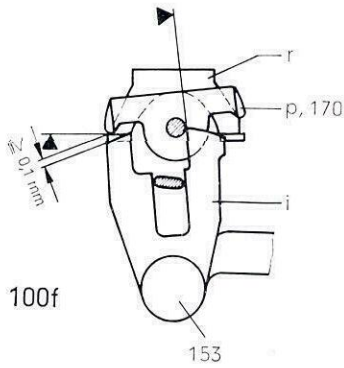
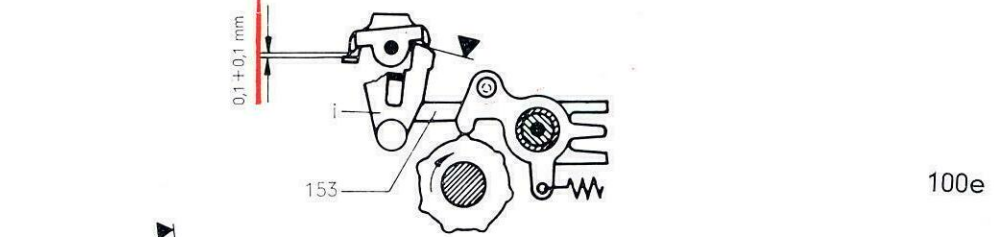
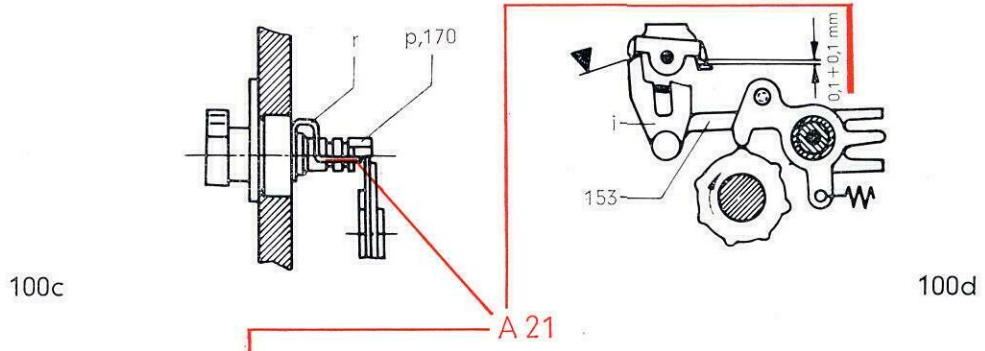


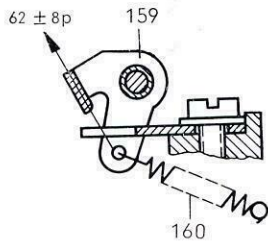
100b

- A16 Control disc 143/97 (answerback drum removed)  
Turn the camshaft until feed lever 146 rides on the highest part of the cam. Lever 141 must then rest on the inside edge of the slot of control disc 143, and the clearance between the tooth of ratchet 144 and feed pawl 146a should be  $\leq 0.05$  mm.  
Adjustment: Loosen hexagon screw 349 and turn ratchet 144.
- A17, A18 Releasing answerback drum (Fig. 98)
- A17 Transmitter in rest position. There should be a clearance between lever 141/98a and resetting bail 147 of  $2.1 \pm 0.1$  mm.  
Adjustment: Bend on designated point of resetting bail 147.
- A18 With the transmitter in rest position, turn lever 141/98b to release the answerback drum. Turn camshaft 140 until locking bail 148 has engaged (bail on highest part of cam). A gap of  $0.5 \pm 0.5$  mm should then exist between the tips of bellcranks 70, 374, 375, 366, 377 and locking bail 148.  
Adjustment: Bend on designated point of resetting bail 147.
- (A19) Bellcranks 70, 374, 375, 376, 377/99 and locking bail 148  
Transmitter in rest position. Turn camshaft 140 until pin "i" of clutch member 139 rests against star wheel 334. A gap of  $\geq 0.1$  mm must now exist between locking bail 148 and the tips of bellcranks 70, 374 to 377.
- A20 to  
A22 Send contact control (Fig. 100)
- A20 Contact control of lever 153/100a, b  
Transmitter in rest position. There should be a gap of  $0.4 \pm 0.1$  mm between the arm of switching shaft "p" of contact switching assembly 170 and the rocker of contact control lever 153.  
Adjustment: Loosen screw 103 and insert adjusting gauge 245/100b contact control lever 153 as shown in Fig. 100b.  
Adjust the contact control lever in such a way that rocker "i" and switching shaft "p" rest against the adjusting gauge.  
Tighten fillister head screw 103.

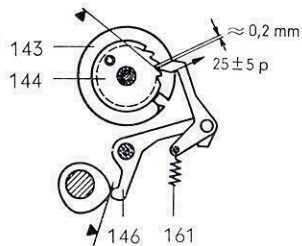


- A21 Bracket r/100c of contact switching assembly 170  
Turn camshaft until contact control lever 153/100d,e rides on a cam lobe. Turn rocker "i" by hand into its extreme right-hand and then into its extreme left-hand position. There should be a gap of  $0.1 \pm 0.1$  mm between the arm of the switching shaft p/100c and the extension of bracket "r" of contact switching assembly 170. At the same time, the other arm of switching shaft "p" must rest on the associated prong of rocker i/100d,e.  
Adjustment: Bend the extensions of bracket r/100c of contact switching assembly 170.
- (A22) Contact switching assembly 170/100 f  
Transmitter in rest position. Turn switching shaft "p" until one arm rests on bracket "r". A gap of at least 0.1 mm should remain between the arm of switching shaft "p" and the prong of rocker "i" of lever 153.  
With rocker "i" and switching shaft "p" in the opposite position and the other arm resting on brocket "r", check for the same gap.
- A23, A24 Release the transmitter (Fig. 101)
- A23 Transmitter in rest position. Release bail 149 is latched by locking lever 150. There should be a gap of  $0.3 + 0.1$  mm between locking lever 150 and lever with release pawl 151 at the designated point when the release pawl has been raised 1.4 mm above the supporting face.  
Adjustment: Bend lever with release pawl 151 at the designated point.
- A24 There should be a gap of  $0.6 \pm 0.1$  mm between lever with shaft 142 and the extension of locking lever 150.  
Adjustment: Bend the extension of locking lever 150.
- Spring forces (measured with the transmitter in its rest position):
- (A25) Lever 153/102 with tension spring 154  
Unhook tension spring 160/106 from bail 159.  
A force of  $75 + 15$  p should be required to lift lever 153/102 off the rocker at the designated point.
- (A26) Lever with bushing 68/103 with tension spring 546  
A force of  $285 \pm 50$  p, applied at the designated point, should be required to lift lever with bushing 68 off cam sleeve 555.  
Observe gap 
- (A27) Zero-setting lever 155/104 with tension spring 156  
A force of  $1000 \pm 150$  p, applied at the spring suspension point, should be required to lift the zero-setting lever.
- (A28) Code lever 157/105 with tension spring 158  
A force of  $300 \pm 40$  p, applied at the spring suspension point, should be required to lift code lever 157 off the camshaft 140.

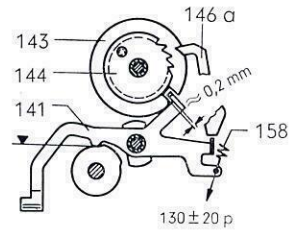




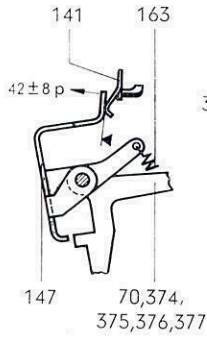
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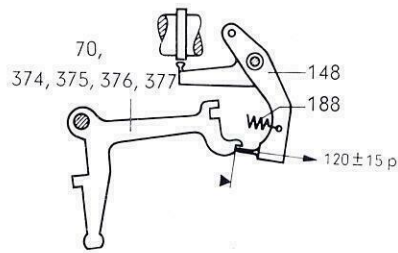
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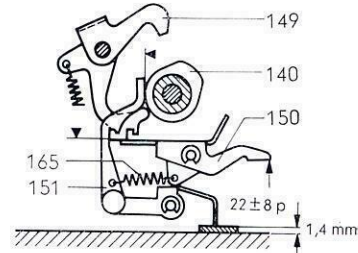
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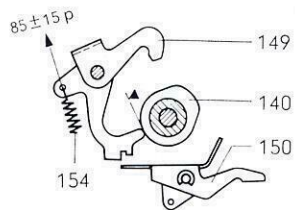
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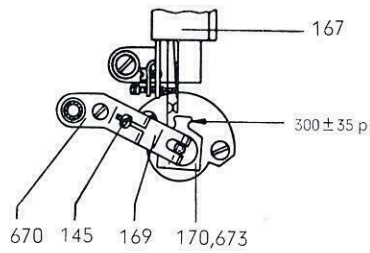
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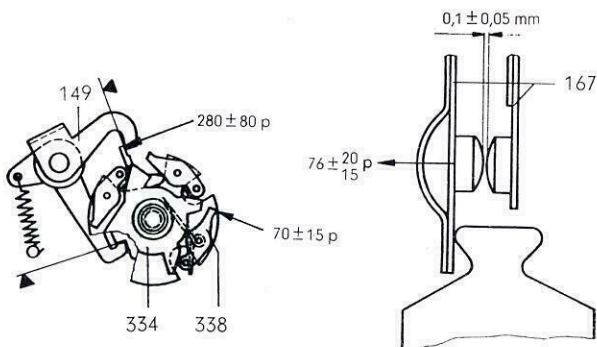
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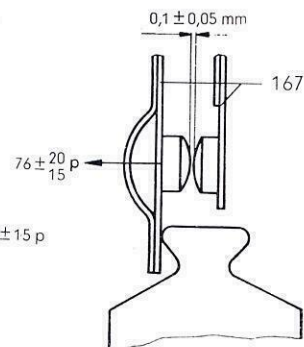
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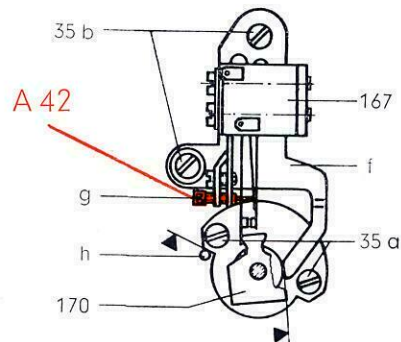
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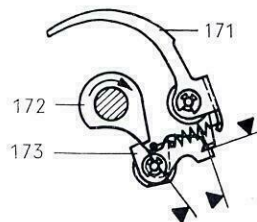
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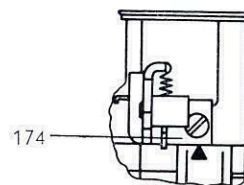
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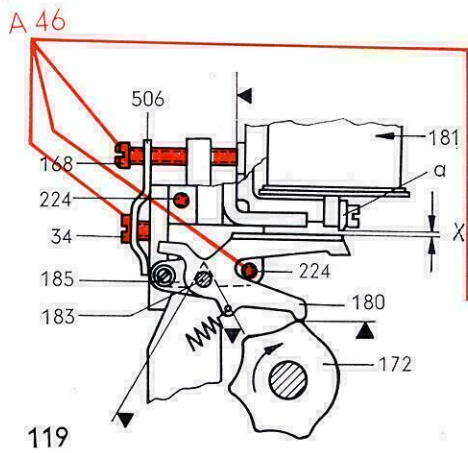
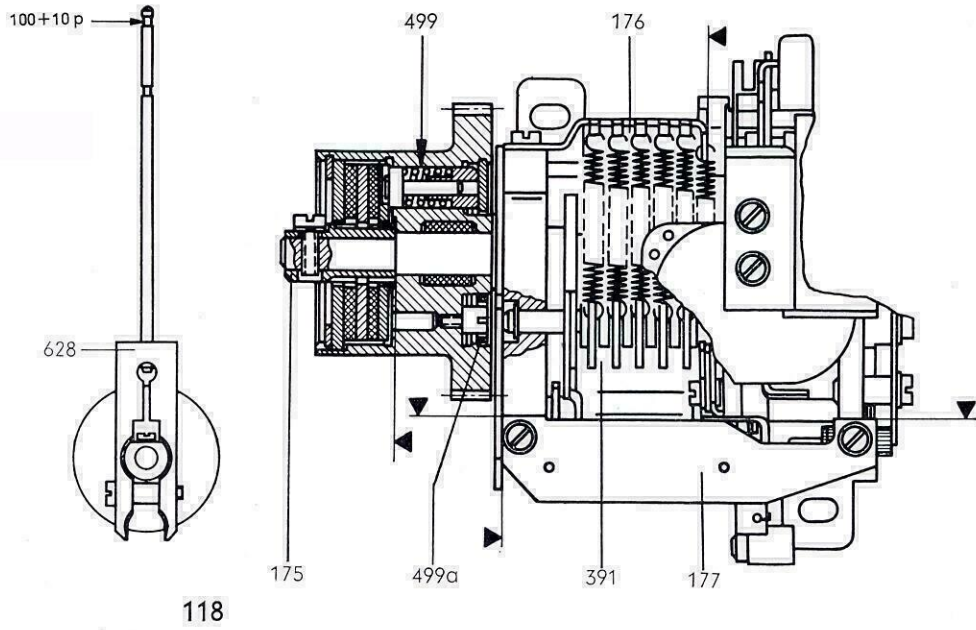
117

- (A29) Bail 159/106 with tension spring 160  
A force of  $62 \pm 8$  p should be required to raise bail 159 by its extension.
- (A30) Feed lever 146/107 with tension spring 161  
Answerback drum released.  
Feed lever 146 on high part of cam. Turn ratchet 144 until there is a gap of about 0.2 mm between the tooth and the feed pawl.  
A force of  $25 \pm 5$  p, applied at the designated point, should be required to raise the pawl.
- (A31) Lever 141/108 with tension spring 158  
Disengage feed pawl 146a from ratchet 144.  
Turn control disc 143 to that a gap of about 0.2 mm remains between the extension of lever 141 and the slot in control disc 143. The spring should now exert a force of  $130 \pm 20$  p (measured in the direction of the longitudinal axis of the spring).
- (A32) Resetting bail 147/109a with tension spring 163  
Release the answerback drum and raise bellcranks 70, 374, 375, 376, 377. A force of  $42 \pm 8$  p should be required to raise bail 147, at its upper edge, off lever 141.
- (A33) Locking bail 148/109b with tension spring 188  
A force of  $120 \pm 15$  p should be required to lift locking bail 148 off bellcranks 70, 374, 375, 376, 377.
- (A34) Locking lever 150/110 with tension spring 165  
Transmitter released. A force of  $22 \pm 8$  p, applied at the designated point, should be required to raise locking lever 150.
- (A35) Release lever 149/111 with tension spring 154  
Transmitter released. Locking lever 150 is raised off release lever 149. A force of  $85 \pm 15$  p, applied at the designated point, should be required to lift release lever 149 off the camshaft 140.
- (A36) Contact switching assembly 170/112 with leaf springs 160 and plate 670  
A force of  $300 \pm 35$  p, applied at the designated point, should be required to turn the switching plate of contact switching assembly 170.
- A37, A38 Star wheel 334/113 and pawls 338
- (A37) A force of  $280 \pm 80$  p should be required to turn the latched star wheel 334 clear of release bail 149.
- (A38) A force of  $70 \pm 15$  p, applied at the designated point, should be required to move the pawls.
- (A39) Contact spring set 167/114  
With a contact gap of  $0.1 \pm 0.05$  mm, a force of  $76 \begin{smallmatrix} +20 \\ -15 \end{smallmatrix}$  p, applied at the designated point, should be required to move the contact spring with control spring.
- (A40) Contact switching assembly 170/115  
The plate of contact switching assembly 170 should rest against pin "h".
- A41, A42 Contact spring set 167/115
- (A41) Contact spring set 167 should rest with its bracket "f" against the bearing sleeve of contact switching assembly 170.
- A42 Adjustment of contact make time  
Remove plug connector 76/20 from transmitter 45. Connect the line tester to terminals 3 and 6 of the blade terminal block. Insert adjusting gauge 245/100b as described by adjustment A20. Adjust spring set 167/115 so that its contact just makes.  
Adjustment: Turn screw "g" accordingly. Clockwise turning of this screw will open the contact.
- 4.3. Receiver**  
Rest position (Fig. 116)  
The receiver is brought into its rest position described in the text when, with start-stop armature 184/123 applied to the magnet, camshaft 172/116 is turned until it comes to rest against locking lever 173 which is latched by release lever 171.
- A43 Guide plate 174/117  
Guide plate 174 must make contact at the designated point.

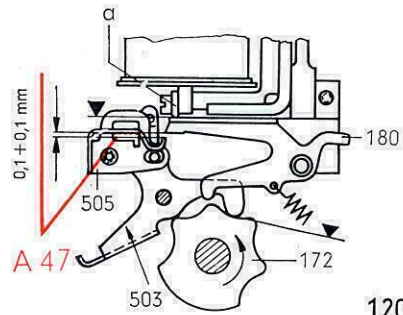


- A44 Bushing 175/118, comb 176, stop plate with pin 177 and guide plate 391  
Bushings 175, comb 176, stop plate with pin 177 and guide plate 391 must make contact at the designated points.
- A45 Fillister head screw 168/119  
Attach plate 506 by means of fillister head screw 34 so that a value of  $M_d \leq 3$  cmkg on the torque wrench is obtained when inserting fillister head screw 168 in the plate and the bearing frame.
- A46 Magnet assembly with residual plate 181/119  
The prismatic support of magnetic assembly 181 must make contact with axle 183. When camshaft 172 is being turned, a visible gap "x" ( $\leq 0.03$  mm) should remain between selector armature 180 and residual plate "a" of magnet assembly 181, when the lower extension of the armature rides on a cam lobe. The gap of the remaining cam lobes must not exceed 0,1 mm.  
Adjustment: By means of screw 168, after loosening screws 224 and 34. Secure screw 168 in position by means of screw 34 after having made the adjustment.
- A47 Selector lever 503/120  
Apply selector armature 180 to residual plate "a" of the magnet assembly. With adjusting plate 505 positioned below selector armature 180, a gap of  $0.1 \pm 0.1$  mm must remain between the adjusting plate and the selector armature.  
Adjustment: Bend adjusting plate 505.
- A48 Selector lever 503/121, 122  
With the receiver in its rest position, the gap existing between adjusting plate 503/121 and selector armature 180 (in the illustrated position) should be  $0.3 \pm 0.05$  mm.  
Adjustment: Loosen fillister head screw 372 and displace adjusting plate 505. With the adjustments A46 and A47 completed and selector lever 503 bearing against the released selector armature 180/122, the extension of selector lever 182 should overlap the armature by  $\geq 0.5$  mm.
- A49 Start-stop armature 184/123  
Lever with sleeve 186 on the high part of the cam. With the pointer of the range finder (Fig.135) set to the graduation mark 60, there should be a gap of  $\leq 0.03$  mm between start-stop armature 184 and residual plate "a".  
Adjustment: Loosen fillister head screw 145 and turn lever 185 resting on lever with sleeve 186 towards start-stop armature 184.

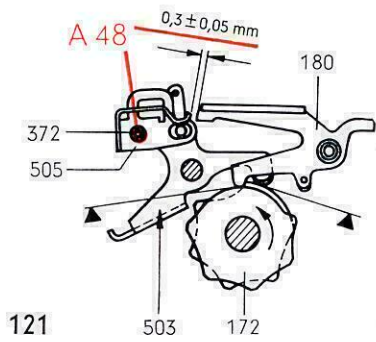




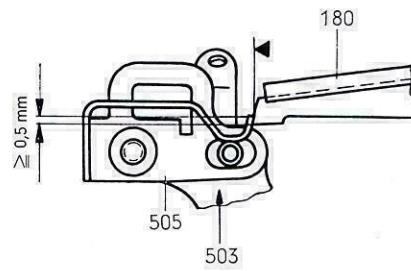
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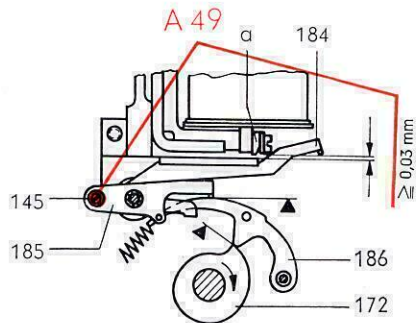
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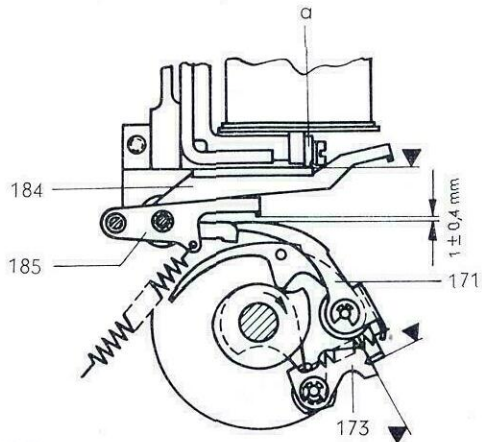
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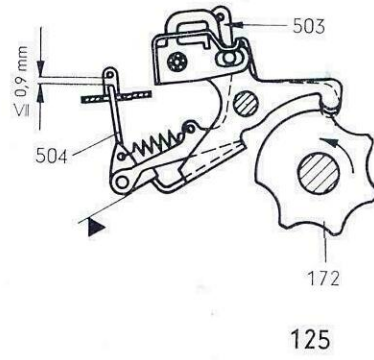
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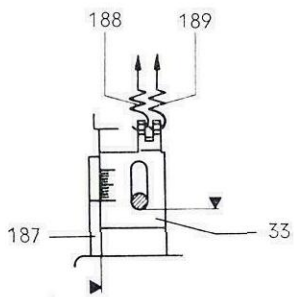
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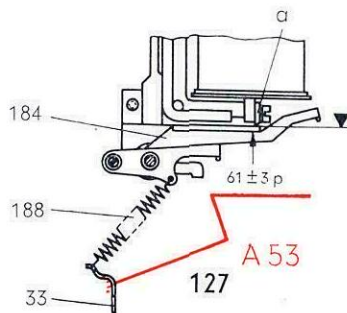
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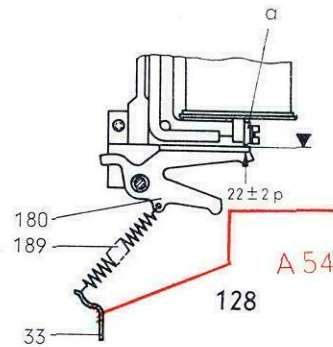
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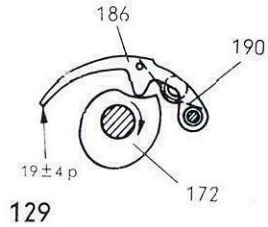
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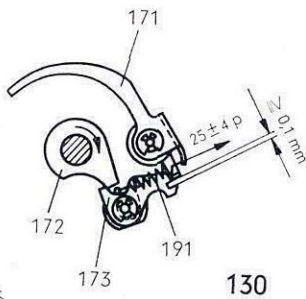
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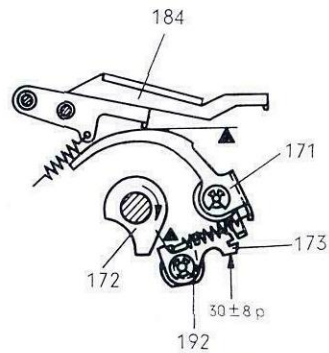
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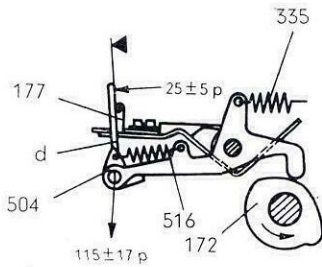
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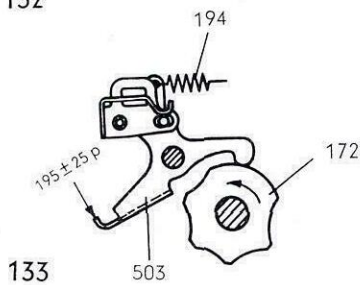
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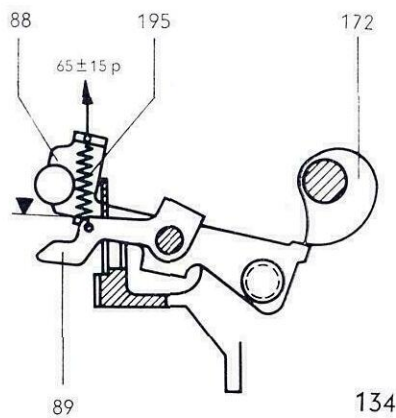
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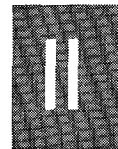


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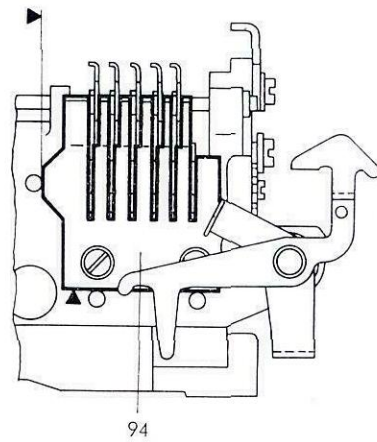
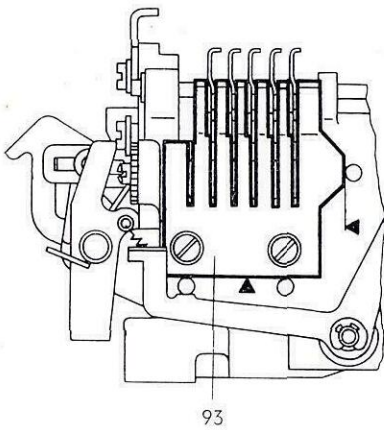
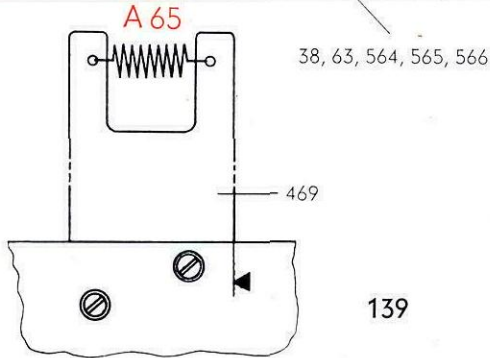
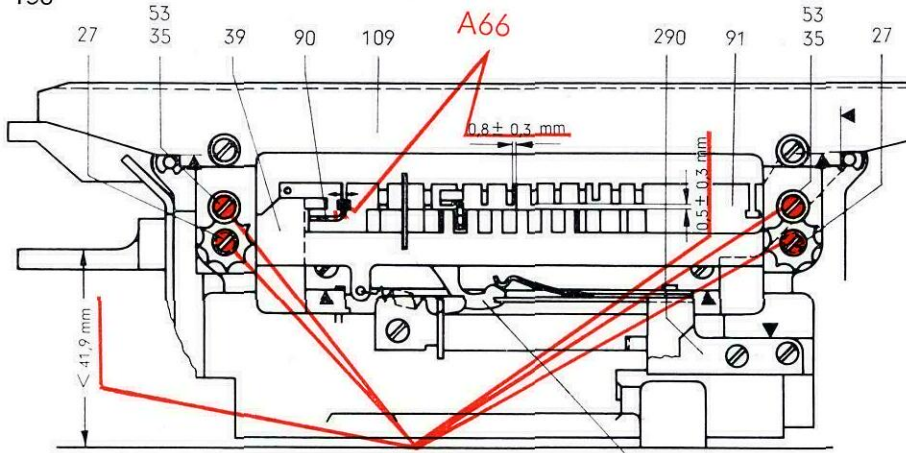
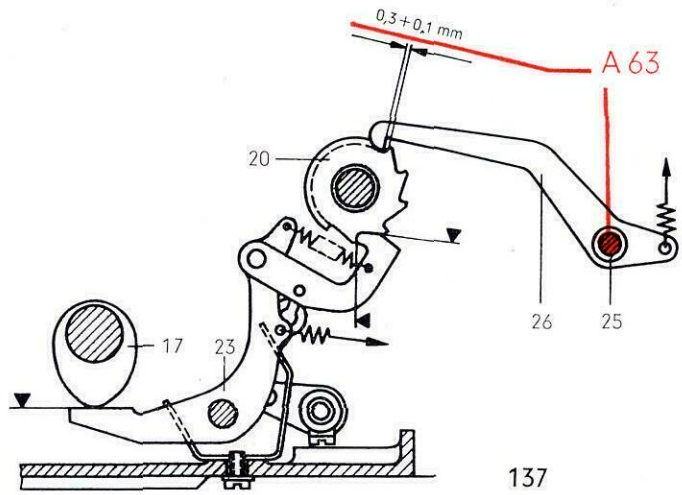
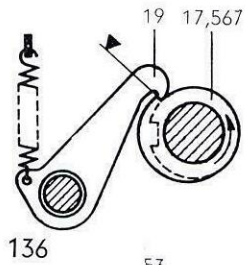
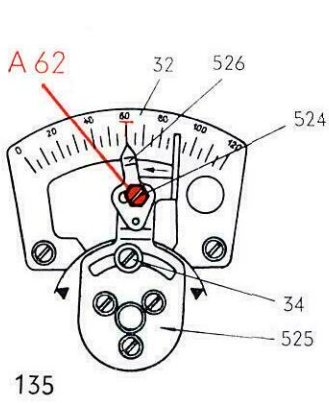


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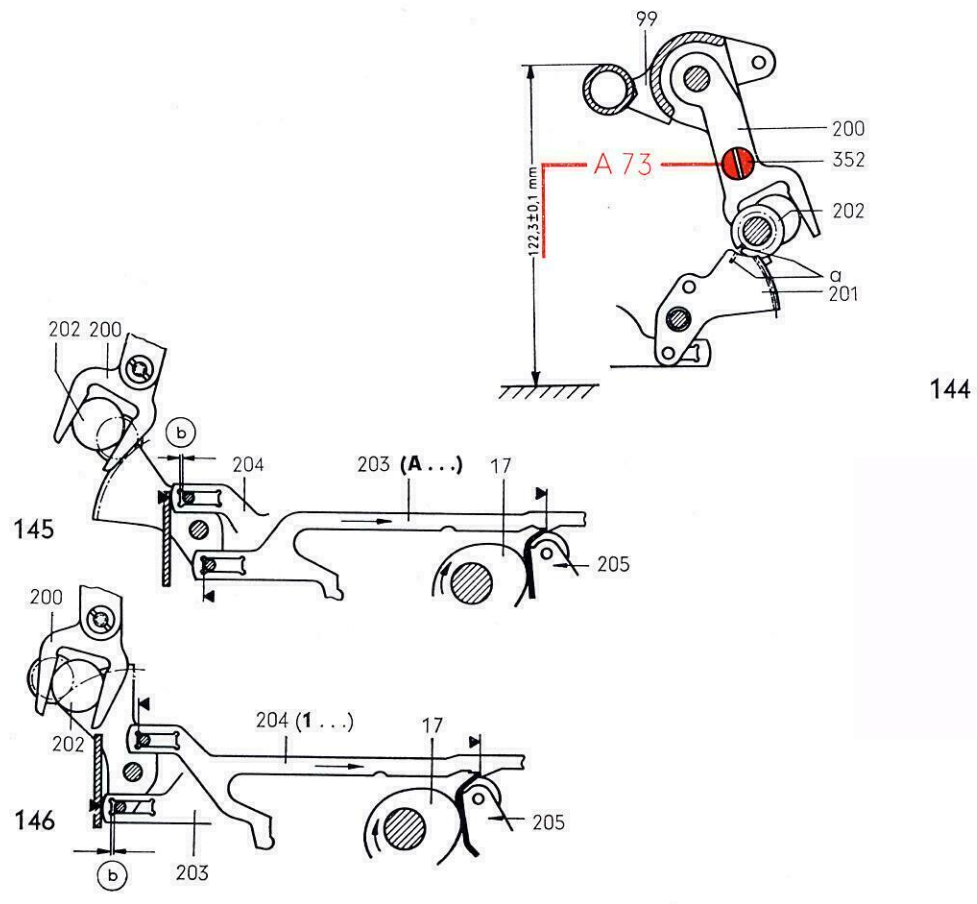
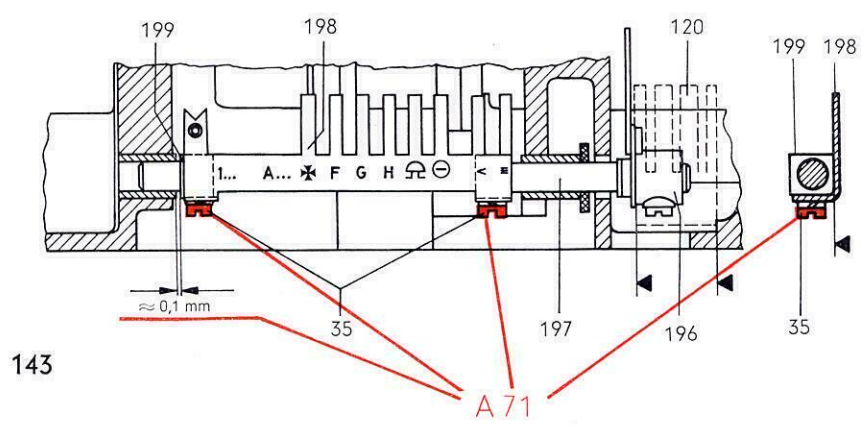
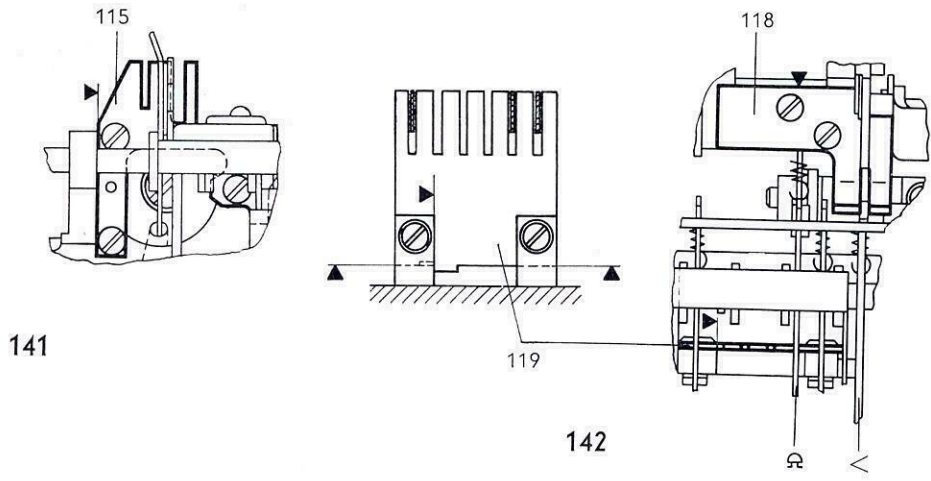
- (A50) Release lever 171/124  
Receiver in rest position. With start-stop armature 184 resting against residual plate "a", there should be a gap of  $1.0 \pm 0.4$  mm between release lever 171 and lever 185.
- (A51) Code lever with sword 504/125  
Apply selector armature 180/121 to residual plate a/124. When the camshaft 172/125 is being turned, a gap of  $\leq 0.9$  mm should remain between the points of the swords of code levers 504 and the needle when the swords swing below that needle.
- A52 Adjusting plate 33/126  
Adjusting plate 33 must rest against mounting frame 187 at the designated points. The lowest mark of the scale on adjusting plate 33 should approximately register with the mark on mounting frame with sleeve 187.  
Observe para. 4.2.7.
- Spring forces:
- A53 Start-stop armature 184/127 with tension spring 188  
Apply start-stop armature 184 to residual plate "a". The spring must exert a force of  $61 \pm 3$  p at the designated point.  
Adjustment: Bend adjusting plate 33.
- A54 Selector armature 180/128 with tension spring 189  
Apply selector armature 180 to residual plate "a". The tension spring must exert a force of  $22 \pm 2$  p at the designated point.  
Adjustment: Bend adjusting plate 33.
- (A55) Lever with sleeve 186/129 with torsion spring 190  
Set lever with sleeve 186 to the low portion of the cam. With start-stop armature 184/127 raised, a force of  $19 \pm 4$  p should be required to lift off lever 186/129 at the designated point.
- (A56) Release lever 171/130 with tension spring 191  
Turn camshaft 172 until it has almost reached the rest position, so that a gap of  $\geq 0.1$  mm exists between release lever 171 and the nose of locking lever 173. With start-stop armature 184/127 disengaged, a force of  $25 \pm 4$  p should be required to raise release lever 171/130 at the designated point.
- (A57) Locking lever 173/131 with torsion spring 192  
Start-stop armature 184 rests against release lever 171. Turn camshaft 172 to a point just behind the rest position. A force of  $30 \pm 8$  p should be required to raise locking lever 173.
- (A58) Code lever with sword 504/132 and tension springs 516 and 335  
With selector armature 180/128 pressed to the magnet, turn camshaft 172/132 once until it is again in its rest position. A force of  $115 \pm 17$  p, exerted at the designated point, should be required to raise swords 504 off the camshaft. The points "d" of the swords rest against the needles of stop plate 177, and a force of  $25 \pm 5$  p should be required to pull them away.
- (A59) Selector lever 503/133 with tension spring 194  
Receiver in rest position. A force of  $195 \pm 25$  p exerted in the indicated direction should be required to lift selector lever 503 off the cam of camshaft 172.
- (A60) Lever 88/134 with tension spring 195  
Set lever 88 to the high portion of the cam. A force of  $65 \pm 15$  p should be required at the designated point to raise lever 88.
- A61 Friction clutch 499/36, 118  
Unhook tension springs 335/132, 194/133, 198/128 and 188/127.  
Turn clamping lever 628/118 on camshaft so that it assumes a vertical position. Move type basket carriage to end-of-line position. After an operating period of 10 minutes, a force of  $100 + 10$  p should be measured at the designated point. (Md =  $1000 + 100$  cmp).  
Adjustment: Turn threaded disc 499a in the friction clutch.



- A62     Pointer 525/135  
In order to adjust the scale, the receiver must be installed on the base plate as shown in Fig. 222.  
Turn setting plate 526/135 to the left (in the direction of the arrow) and tighten hexagon screw 524. Loosen fillister head screw 34. Turn pointer 525 in the direction of graduation mark zero (0) on scale 32 and determine the lower limit of the receive margin by transmitting permanently the characters "R" and "Y" with the run-out-key. Then turn pointer 525 in the direction of graduation mark 120 on scale 32 and determine the upper limit of the receive margin by transmitting the above characters individually. Now set pointer 525 to the center of the receive margin obtained in this way and tighten fillister head screw 34. Loosen hexagon screw 524 and move setting plate 526 to graduation mark 60 on scale 32 by turning it within the oblong hole.
- 4.4.     Printer**  
Rest position (Fig. 136)  
The rest position described in the text can be reached by turning clutch 569/69. When the printer is in its rest position locking cam of camshaft 17/136 rests against anti-bounce pawl 19. The recess in cam sleeve 567, intended to drive the reperforator attachment, should then point in the direction of anti-bounce pawl 19. Make sure that camshaft 17 and sleeve 567 firmly rest against the ball bearing.
- A63     Detent 26/137  
Set carriage feed lever 23 to the high portion of the cam. Turn sleeve with ratchet 20 until it engages the pawl of carriage feed lever 23. There should be a gap of  $0.3+0.1$  mm between ratchet 20 and detent 26.  
Adjustment: Turn eccentric pin 25.
- A64     Guide bar 109/138, comb 91, detent bracket 290  
Guide bar 109, comb 91 and detent bracket 290 should make contact at the designated points.
- A65, A66   Code bars 38, 563, 564, 565, 566/138 and locking bar 39
- A65     Camshaft 17/137 in rest position. Move bail 99/144 of the case shift mechanism into the figures position (upper end position). There should be a gap of  $0.5\pm 0.3$  mm between locking bar 39/138 and the pull bars arranged above and a gap of  $\geq$  mm between the code bars and the pull bars arranged above.  
Adjustment: Turn eccentric pin 27; secure eccentric pin 27 by means of fillister head screws 35 and bushings 53, observing the dimension  $< 41.9$  mm.
- A66     Type basket carriage in figures position  
There should be a gap of  $0.8\pm 0.3$  mm between the pull bars and the sides of the teeth in locking bar 39 arranged below.  
Adjustment: Bend pull bar 90.
- A67     Plate 469/139  
Plate 469 must rest against toe rib of the casting.
- A68     Combs 93/140 and 94  
Combs 93 and 94 should make contact at the designated points.





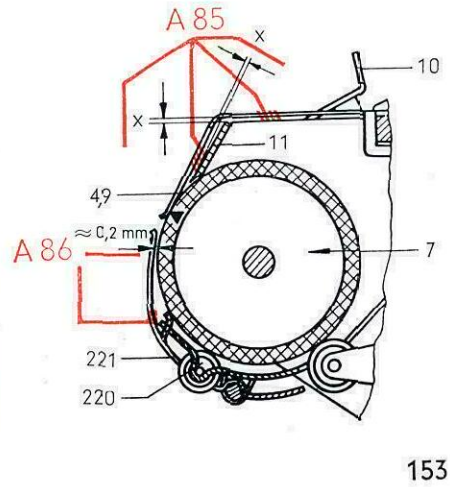
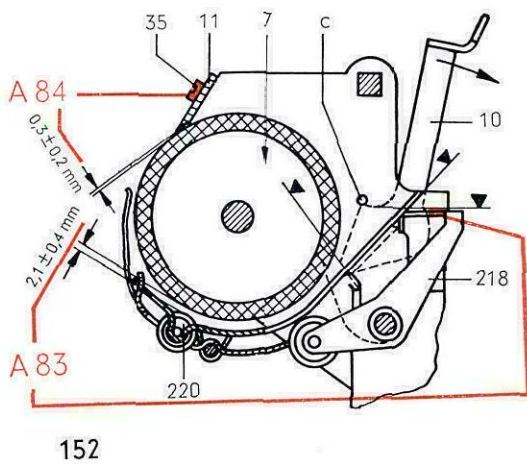
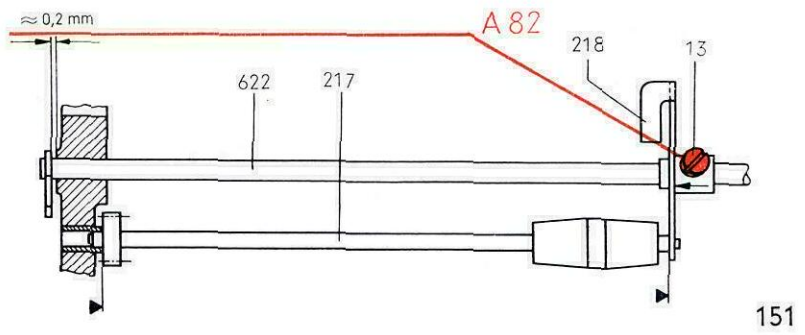
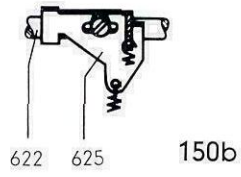
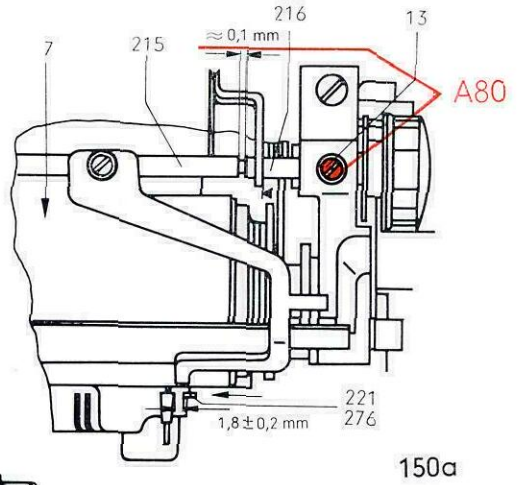
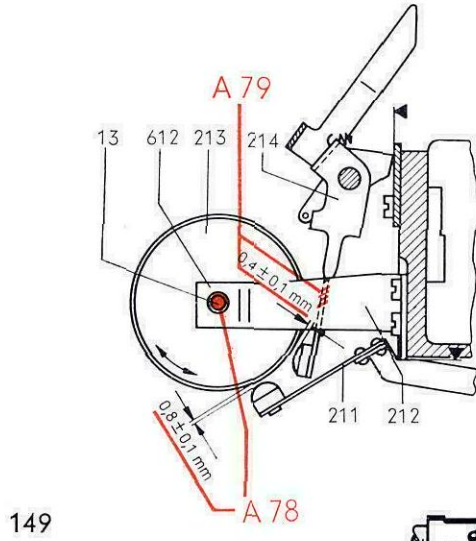
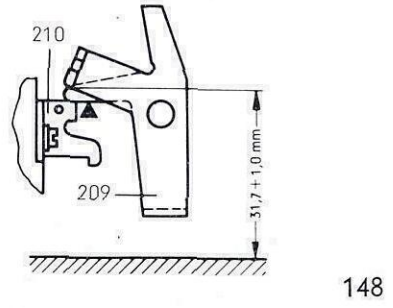
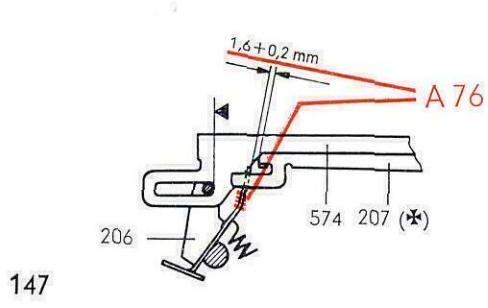


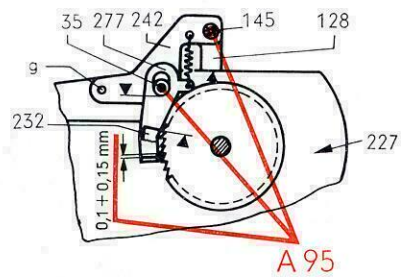
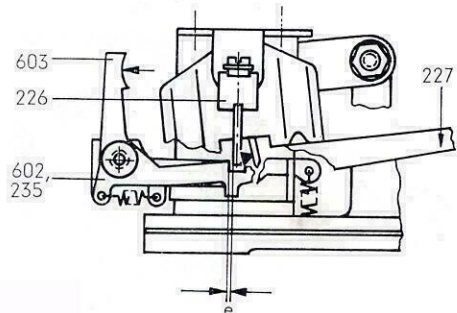
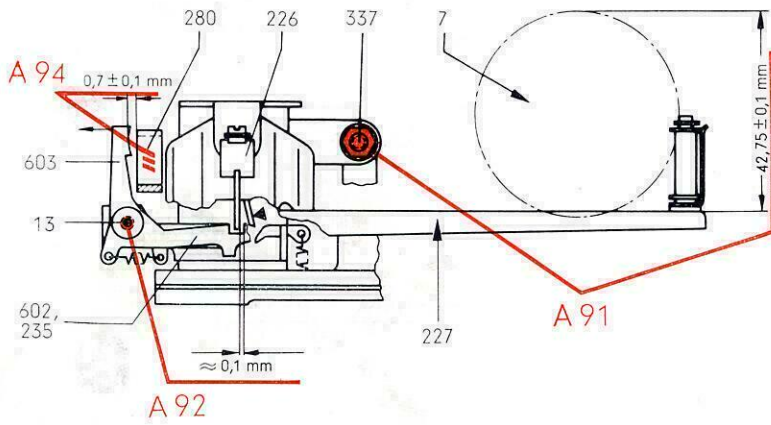
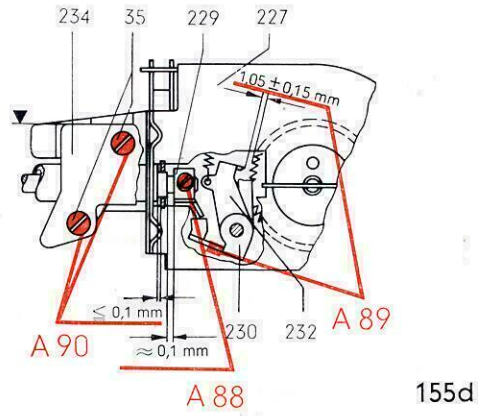
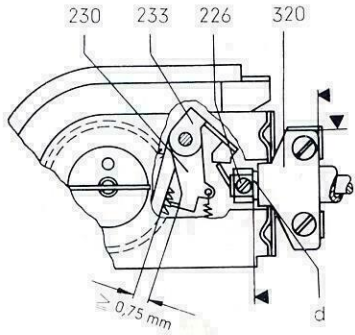
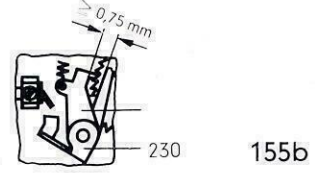
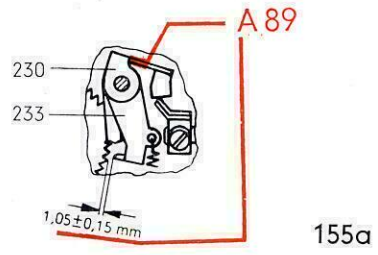
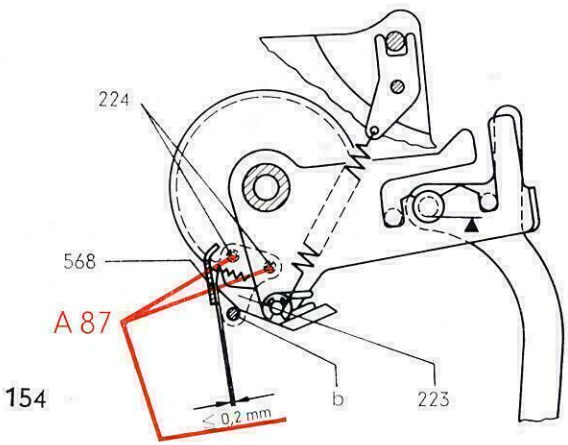
- A69 Plate 115/141  
Plate 115 (on the right-hand side of the printer) must make contact at the designated side.
- A70 Comb 118/142, comb 119 and comb 120/143
- A71 Lever comb 198 (Fig. 143: printer, bottom view)  
Apply bar with lever 196/143 to the right-hand side of the guide comb 120. A gap of about 0.1 mm should remain between square 199 with lever comb 198 and the sleeve.  
Adjustment: Loosen screw 35 and displace square 199 on axle 197.  
The special function pull bars must, when judged by eye, rest on the centers of the teeth or lever comb 198. Lever comb 198 must rest against the squares 199.
- A72 Case shift mechanism (Fig. 144)  
Install pinion with eccentric 202/144 in such a manner that, with case shift rack in the illustrated letters shift position (bail 99 in lower position), mark "a" on case shift rack 201 is facing mark "a" on pinion 202 and that fork 200 rests with its full surface on the pinion with eccentric 202.
- A73 Bail 99/144  
There must be a clearance of  $122.3 \pm 0.1$  mm between the upper edge of bail 99 and the mounting surface of the printer.  
Adjustment: Turn eccentric screw 352 (lacquer-coated).
- (A74) Pull bar 203/145 for letters (**A...**)  
Bail 99/144 in figures position (upper position).  
Adjust transfer bars (111/62) for code combination "**A...**" (5 x current) (all transfer bars in their lower positions). Turn camshaft 17/145 until pull bar 203 has reached its extreme front position (special function bail 205 rides on the high part of the cam). A noticeable gap  $\textcircled{b}$  must now remain at the designated point of pull bar 204.
- (A75) Pull bar 204/146 for figures and symbols (**1...**)  
Bail 99/144 in letters position (lower position).  
Adjust transfer bars 111/62 for code combination "**1...**" (third transfer bar raised). Turn camshaft 17/146 until pull bar 204 is in its extreme front position (special function bail 205 rides on the high part of the cam).  
A noticeable gap  $\textcircled{b}$  must then remain at the designated point of pull bar 203. Combs 118, 119/142 and 120/143 must rest against the illustrated points. Shift comb 118/142 so that carriage return pull bar easily moves in the slot of comb 118.





- A76      Lever 206/147  
Turn the camshaft so that push rod 574 reaches its foremost position. A gap of  $1.6 \pm 0.2$  mm should remain between pull bar 207 and the extension of lever 206.  
Adjustment: Bend lever 206.
- (A77)      Bail 209/148  
Printer in rest position. With bail 209 resting against bracket 210, there should be a clearance of  $31.7 + 1.0$  mm between the mounting surface of the printer and the designated end of the bail.
- A89, A79      Bell 612/149
- A78      With lever 211 making contact with the printer frame, a gap of  $0.8 \pm 0.1$  mm should remain between bell dome 213 and tapper of lever 211.  
Adjustment: Loosen fillister head screw 13 and turn the bell dome.
- A79      With lever 214 making contact with the printer frame, the gap remaining between the tapper of lever 214 and bell dome 213 should be  $0.4 \pm 0.1$  mm.  
Adjustment: Bend lever 214.
- A80, A81      Axle 215/150a
- A80      Axle 215 should have an axial play of about 0.1 mm.  
Adjustment: Displace axle 216 lengthwise after loosening fillister head screw 13.
- A81      Move type basket carriage to end-of-line position. Push paper guide 276 in the direction of the arrow and lift any one type as far as platen 7. The clearance between the type and guide plate 221 must be  $1.8 \pm 0.2$  mm.  
Adjustment: Displace bracket 625/150b on the lever with axle 622.
- A82      Lever with axle 622/151  
The lever with axle 622 should have an axial play of approx. 0.2 mm.  
Adjustment: Displace the lever with axle 622 sideways after loosening fillister head screw 13.
- A83      Pressure roller 220/152  
Force lever 10 backwards until it comes to rest against pin "c".  
A gap of  $2.1 \pm 0.4$  mm should now exist between pressure roller 220 and platen 7.  
Adjustment: Bend the extension of lever with sleeve 218.
- A84      Tear-off plate 11/152  
A gap of  $0.3 \pm 0.2$  mm must exist between tear-off plate 11 and platen 7.  
Adjustment: After loosening fillister head screws 35 shift tear-off plate 11.
- A85      Levers 4/153 and 9  
There should be a clearance "x" between tear-off plate 11 and levers 4 and 9 both at the side of, and above, the tear-off plate. The free ends of levers 4 and 9 should rest on platen 7.  
Adjustment: Bend levers 4 and 9.
- A86      Guide plate 221/153  
Lever 10 in its foremost position, pressure roller 220 rests against platen 7. There should be a gap of about 0.2 mm between the free ends of guide plate 221 and platen 7.  
Adjustment: Bend the free ends of guide plate 221.



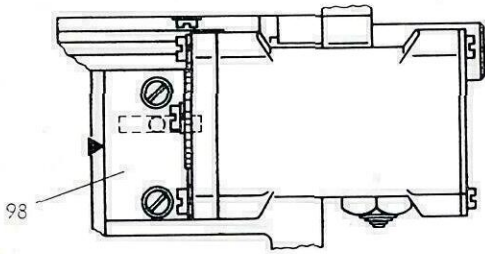


- A87 Guide stop 568/154  
Set transfer bars 111/62 for code combination  $\equiv$  and adjust for 1.5 x normal line spacing. Turn the camshaft of the printer until pull bar 225/56 has been pulled into its extreme front position.  
There should be a visible gap of  $\leq 0.2$  mm between guide stop 568/154 and pawl 223.  
Adjustment: Turn guide stop 568 after loosening fillister head screw 224.
- A88 Reversing bars 226/155c and 229/155d  
Reversing bars 226/155c and 229/155d of spool carrier 227 should have an axial play of about 0.1 mm.  
Adjustment: With reversing bar 226/155c contacting sleeve "d", displace reversing bar 229/155d sideways.
- A89 Detents 232/155d and 233/155c  
When detents 232/155d and 233/155c are disengaged from the ratchets (reversing bar 226 in its front position and rear position, respectively), a gap of  $1.05 \pm 0.15$  mm must remain between the ratchet and the detent.  
Adjustment: Bend lever 230/155a at the designated point after removing the spool carrier 227/156a.  
When the detents have engaged the respective ratchets, there should be a gap of  $\geq 0.75$  mm between the detent and their levers 230/155c at the designated point
- A90 Brackets 234/155d and 324/155d  
Brackets 234/155d and 320/155c should make contact at the designated points. There should be a gap of  $\leq 0.1$  mm between bracket 234/155d and spool carrier 227.  
Adjustment: Loosen fillister head screws 35 shift support bracket 234.
- A91 Spool carrier 227/156a  
Camshaft in its rest position. The distance between the left arm of spool carrier 227 and the upper edge of platen 7 should be  $42.75 \pm 0.1$  mm. (Arms of spool carrier 227 in horizontal position.)  
Adjustment: Turn the bearing pin 337 (lacquer coated).
- A92 to  
A94 Ribbon shift mechanism
- A92 Lever 602/156a (lever 235)  
Camshaft in its rest position. Reversing bar 226 in its foremost position. Press lever 603 in the direction of the arrow. There must be a gap of about 0.1 mm between reversing bar 226 and lever 602 of lever 235.  
Adjustment: Displace lever 602 after loosening fillister head screw 13.
- (A93) Lever 602/156b (lever 235)  
Turn the camshaft until spool carrier 227 is in its upper end position. Reversing bar 226 in its rear latching position. Press lever 603 in the direction of the arrow. A noticeable gap  $\textcircled{b}$  must exist at the designated point between lever 602 and reversing bar 226.
- A94 Lever 603/156a (lever 235)  
Camshaft in its rest position. There should be a gap of  $0.7 \pm 0.1$  mm between lever 603 of lever 235 and reversing lever 280.  
Adjustment: Bend reversing lever 280.
- A95 Pawl 277/157  
With the camshaft in its rest position and detent 232 engaging a tooth of the ratchet, there should be a gap of  $0.1 + 0.15$  mm between pawl 277 and the tooth of the ratchet. Stop 128 must rest against the printer frame.  
Adjustment: Loosen fillister head screws 35, 145 and turn supporting plate 242 round pin "g" until the specified value has been obtained.  
Then tighten screw 35, move stop 128 against the printer frame and secure it with screw 145.

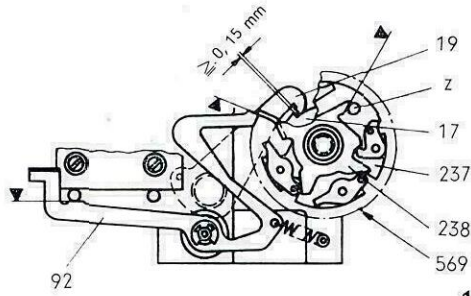


- A96 Shock absorber 98/158  
Shock absorber 98 should rest against the printer frame at the designated point.
- (A97) Clutch 569/159a  
With star wheel 238 resting against cylindrical pin "z" of clutch 237 and release lever 92, there must be a gap of at least 0.15 mm between anti-bounce pawl 19 and the catch of the locking cam on camshaft 17.
- A98 Release lever 92/159b  
Disengage release lever 92 and move it up against the extension of star wheel 238 in accordance with Fig. 159b. A gap of  $0.9 \pm 0.1$  mm must then remain between pin "f" and the release lever.  
Adjustment: Bend release lever 92.
- A99 Adjusting plate 437/160  
There should be a gap of about 0.1 mm between adjusting plate 437 and bail 408.  
Adjustment: Displace adjusting plate 437 after loosening fillister head screw 35.
- A100 Plate 596/161  
Plate 596 should rest against the printer frame at the designated point.
- A101 Cam disc 527/162a of sleeve 528  
Turn the camshaft until star wheel 238/163 of the clutch rests against release lever 92 and the pawls are positively disengaged.  
Adjustment: Turn the camshaft until the pawls just leave the teeth of the clutch drum and then depress release lever 92 so that star wheel 238 is disengaged.
- Loosen fillister head screws 13/162a and turn cam disc 527 until roller lever 530 is positioned in the center of the valley in that cam disc.
  - Ascertain the dimensions "x" between the outside diameter of cam disc 527 and the extension of roller lever 530.
  - Adjust to the measure of  $y = x + 0.8$  mm between the outside diameter of cam disc 527/162b and the extension of roller lever 530.
  - Turn cam disc 527 in the direction of the arrow until the roller makes contact.  
Tighten fillister head screws 13.
- Spring forces (measured with the printer in rest position unless otherwise stated):
- (A102) Tension spring 520/164 of sliding weights 521  
A force of  $105 \pm 40$  p should be required to turn sliding weights 521 round bushing 522.
- (A103) Detent 26/165 with tension spring 188  
Turn sleeve with ratchet 20 so that a gap of about 0.2 mm remains between the tooth of the ratchet and the locking nose of the detent. A force of  $230 \pm 30$  p, applied at the designated point, should be required to disengage detent 26 from sleeve with ratchet 20.
- (A104) Lever 240/166 with tension spring 477  
A force of  $935 \pm 150$  p, applied at the spring suspension point, should be sufficient to raise zero-setting lever 240 off sleeve with ratchet 20.
- (A105) Feed pawl of carriage feed lever 23/167 with tension spring 243  
The force exerted by tension spring 243 should suffice to hold the feed pawl of carriage feed lever 23 safely against the bottom of a tooth in sleeve with ratchet 20.

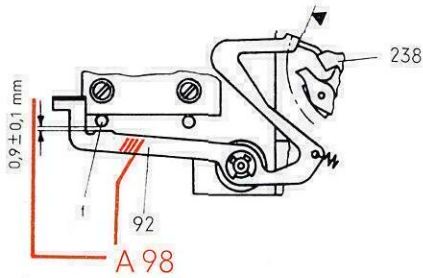




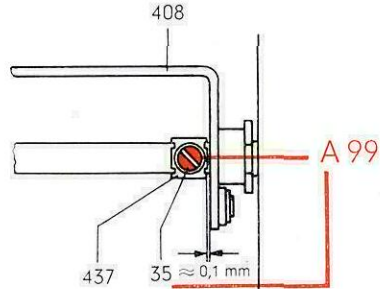
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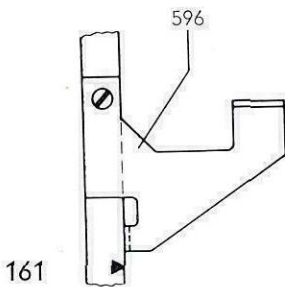
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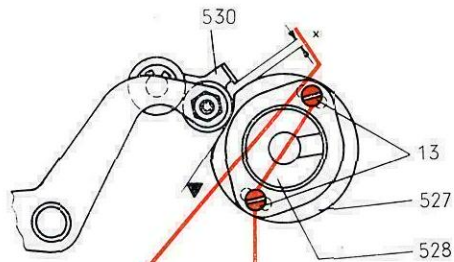
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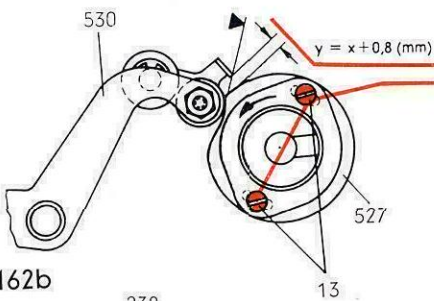
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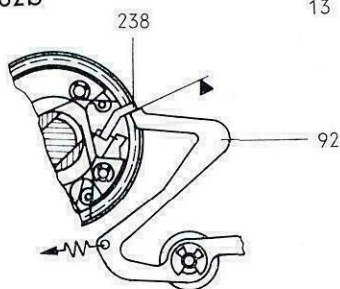
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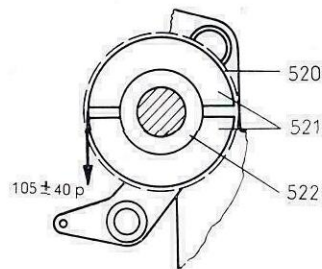
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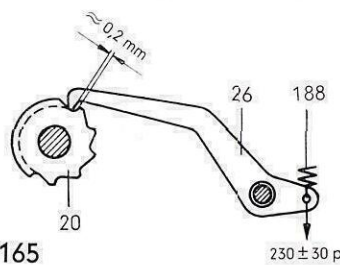
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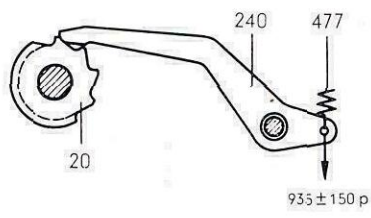
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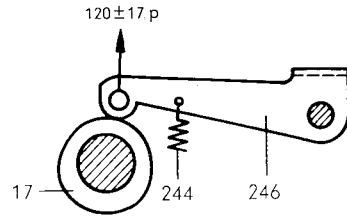
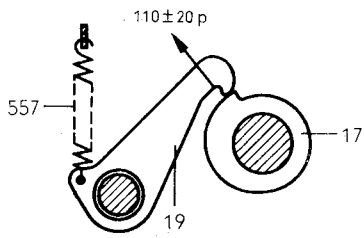
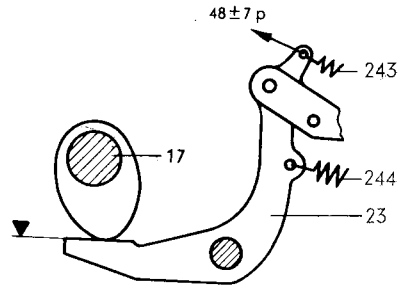
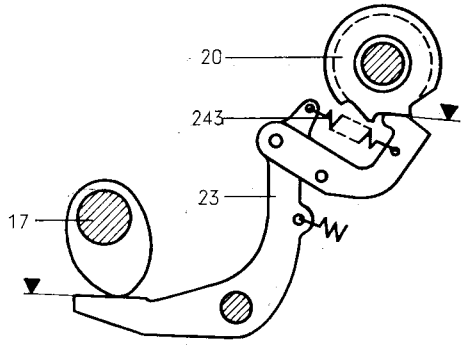
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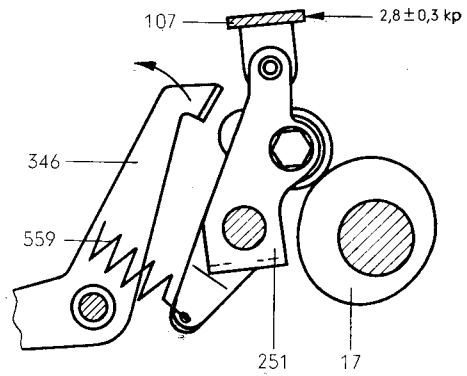
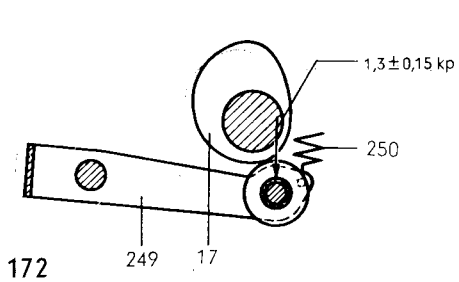
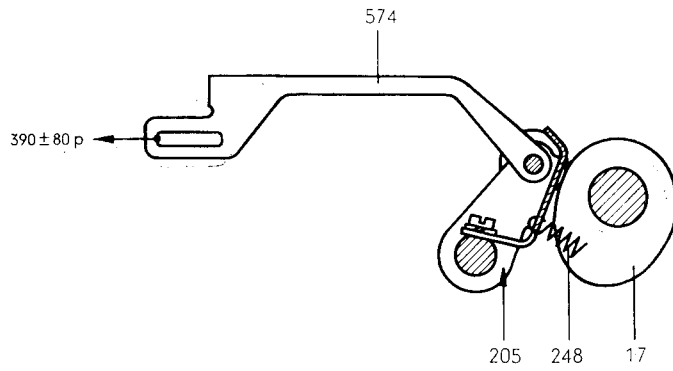


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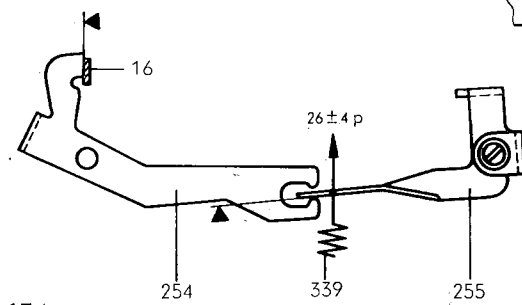
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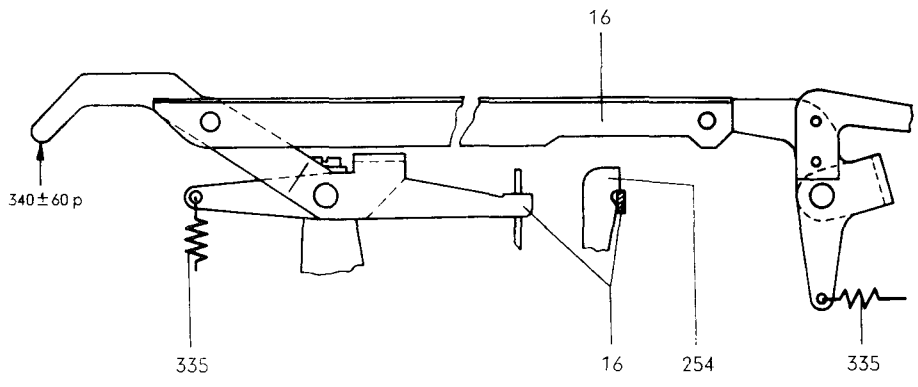
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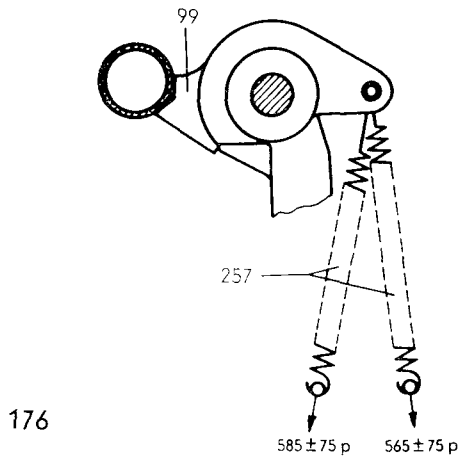
- (A106) Carriage feed lever 23/168 with tension spring 244  
With tension spring 243 disengaged, a force of  $48 \pm 7$  p should be required at the designated point to raise carriage feed lever 23 from camshaft 17.
- (A107) Anti-bounce pawl 19/169 with tension spring 557  
Turn camshaft until anti-bounce pawl 19 rides on the high part of the cam. A force of  $110 \pm 20$  p, exerted at the designated point, should be required to raise the pawl.
- (A108) Bail 246/170 with tension spring 244  
Turn camshaft until bail 246 rides on the low portion of the cam. A force of  $110 \pm 17$  p, exerted at the designated point, should be required to raise the tension spring 257 should be  $585 \pm 75$  p, the force of the right-hand one  $565 \pm 75$  p. Move bail 99 into its figures position (upper position). The force of the left-hand bail from the camshaft 17.
- (A109) Special function bail 205/171 with tension spring 248  
A force of  $390 \pm 80$  p, exerted at the designated point, should be required to disengage push rod 574 from camshaft 17; to this end, swing lever 259/186 to the front.
- (A110) Compensating roller 249/172 with tension springs 250  
A force of  $1.3 \pm 0.15$  kp should be required to raise the compensating roller 249 from camshaft 17.
- (A111) Roller 251/173 with tension spring 559  
Turn sideways lever with sleeve of ribbon feed linkage 346. A force of  $2.8 \pm 0.3$  kp, exerted at the designated point, should be required to lift roller 251 off camshaft 17.
- (A122) Lever 255/174 with spring 339  
With latching lever 254 resting against the parallel guide 16, a force of  $26 \pm 4$  p should be required to raise lever 255.



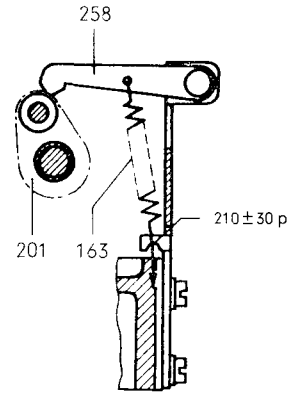
- (A113) Parallel guide 16/175 with tension springs 335  
With the lever of parallel guide 16 engaged as shown in the drawing, a force of  $340 \pm 60$  p, exerted at the designated point, should suffice to raise this lever.
- (A114) Bail 99/176 with tension springs 257
- (A115) Detent with bracket 258/177 with tension spring 163  
Tension spring 163 should exert a pull of  $210 \pm 30$  p on detent with bracket 258.
- (A116) Locking bar 39/178 with tension spring 256  
When in the figures position, a force of  $63 \pm 8$  p should be required to shift locking bar 39.
- (A117) Pull bars 203/179 (A...)  
204 (1...)  
225 (≡)  
260...263 (< ; ⊖; (F; H; G;)) with tension springs 244).  
Lever comb moved aside. A force of  $75 \pm 8$  p, exerted at the spring suspension points (front), should be required to raise the pull bars.
- (A118) Pull bar 207/180 (✱) with tension springs 194, 247  
With lever comb 198 disengaged, a force of  $98 \pm 12$  p, exerted at the designated point, should be required to raise the pull bar, and a force of  $40 \pm 5$  p to pull it forward.



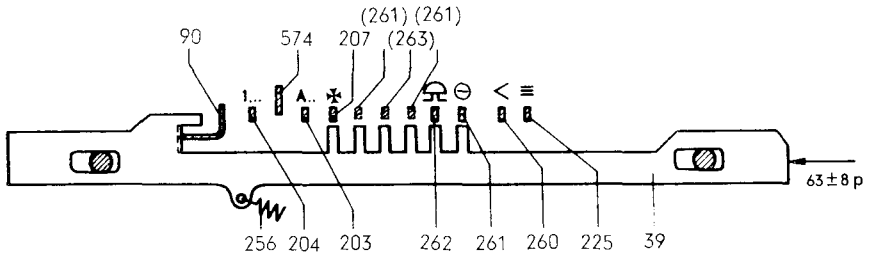
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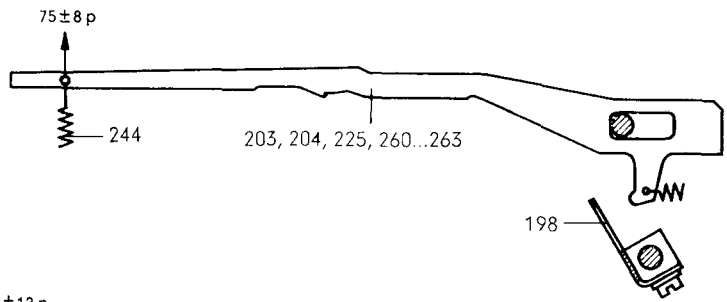
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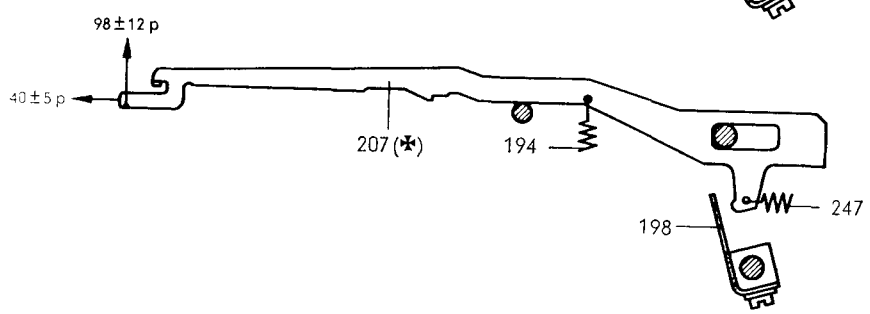
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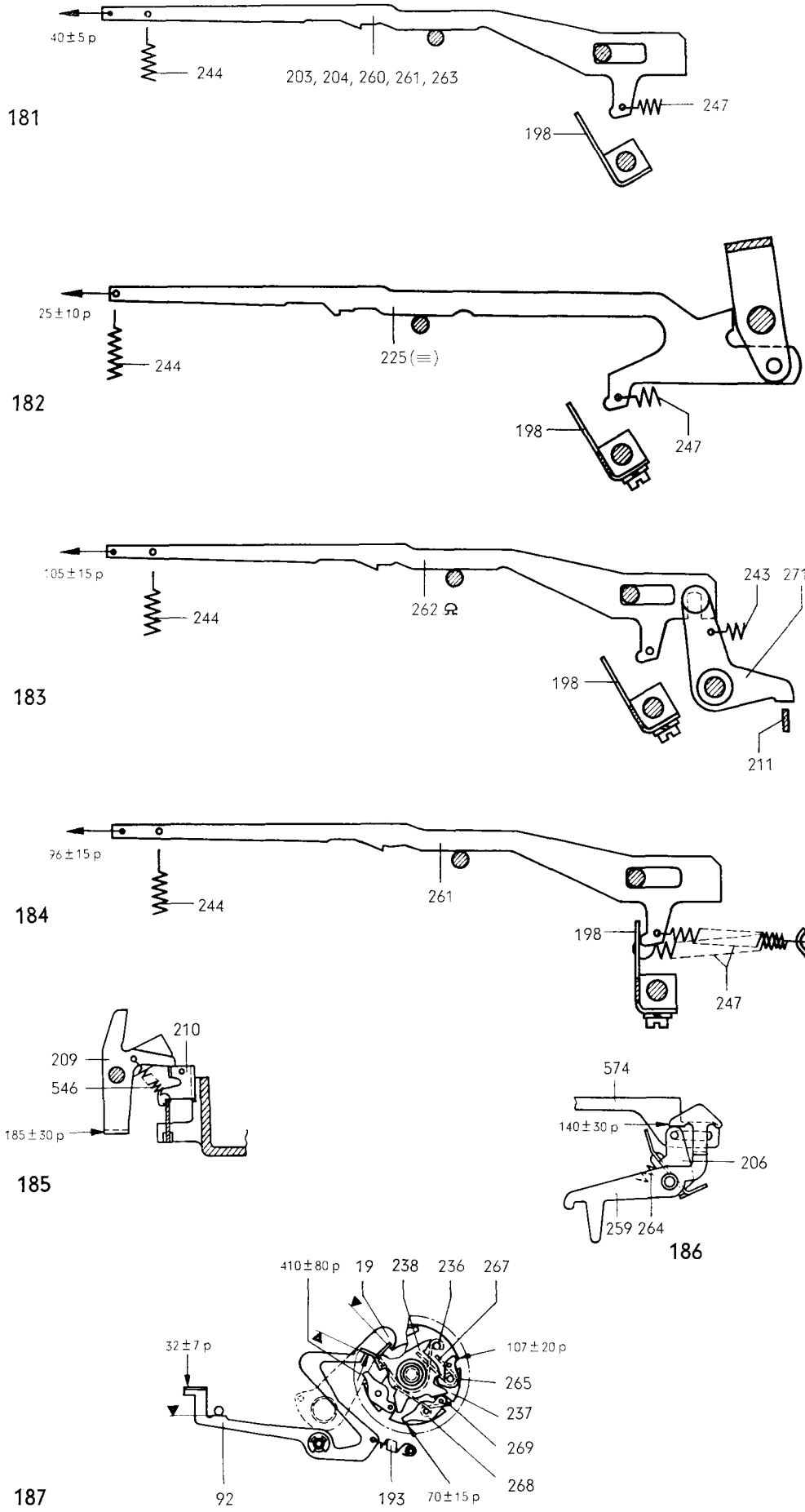
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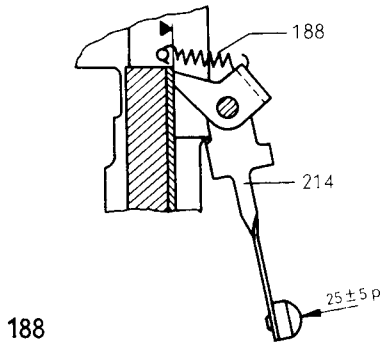
- (A119) Pull bars 203/181 (A...)  
204 (1...)  
260 (< )  
261 (⊖; F; H;)  
263 (G) } with tension springs 247

Unhook tension springs 244 at the front ends, lever comb 198 is turned aside. A force of  $40 \pm 5$  p should be required to pull each of the pull bars to the front.

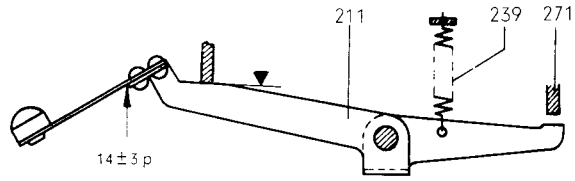
- (A120) Pull bar 225/182 ( $\equiv$ ) with tension spring 247  
With tension spring 244 (front end) unhooked, lever comb 198 turned aside and lever 36/191 in its lowest position, a force of  $25 \pm 10$  p should be required to draw pull bar 225/182 to the front.
- (A121) Pull bar 262/183 ( $\curvearrowright$ ) with tension spring 243  
Unhook tension spring 244, move aside lever comb 198, lift off lever 211. A force of  $105 \pm 15$  p should be required to pull out pull bar 262 with lever 271.
- (A122) Pull bars 261/184 ( $\ominus$ ; F; H;) with tension springs 247  
Unhook tension spring 244; a force of  $96 \pm 15$  p should be required to pull the pull bar 261 with lever comb 198 to the front.
- (A123) Bail 209/185 with tension spring 546  
A force of  $185 \pm 30$  p, exerted at the designated point, should be required to lift bail 209 off bracket 210.
- (A124) Shaft with lever 259/186 and tension spring 264  
Rotate the camshaft until push rod 574 reaches its extreme front position. A force of  $140 \pm 30$  p, exerted at the designated point, should be required to raise shaft with lever 259.
- (A125) Release lever 92/187 with tension spring 193  
Release lever should disengage with a pressure of  $32 \pm 7$  p applied at its other end.
- (A126) Star wheel 238/187 with omega spring 236  
A force of  $410 \pm 80$  p should be required to disengage the extension of the star wheel 238 from the release lever.
- (A127) Detent 265/187 with torsion spring 267  
Detent 265 should disengage from the star wheel when a force of  $107 \pm 20$  p is applied at its other end.
- (A128) Pawls 268/187 with torsion springs 269  
With a force of  $70 \pm 15$  p applied at the locking tips of pawls 268.



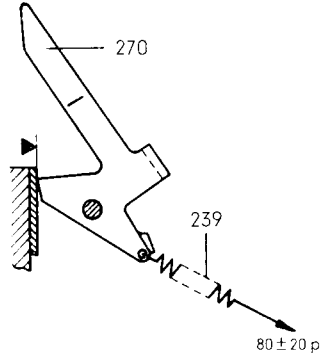
- (A129) Lever 214/188 with tension spring 188  
A force of  $25 \pm 5$  p, applied to the tapper, should be required to move bell lever 214 out of its rest position.
- (A130) Lever 211/189 with tension spring 239  
Raise lever 271. A force of  $14 \pm 3$  p should then be required at the designated point to force lever 211 against the stop plate.
- (A131) Lever 270/190 with tension spring 239  
Spring 239 should exert a pull of  $80 \pm 20$  p on lever 270.
- (A132) Friction of platen 7/191  
Raise pawl with pin 223. Turn lever 10/152 to disengage pressure roller 220. The friction of platen 7/191 should be  $400 \pm 100$  p when measured on the periphery of ratchet 321.
- (A133) Lever 36/191 with tension spring 272  
Disengage pawl with pin 223. A force of  $50 \pm 7$  p should be required at the designated point to depress lever 36.
- (A134) Pawl with pin 223/192 and torsion spring 273  
Pawl with pin 223 should rest safely against the bottom of a tooth in ratchet 321.
- (A135) Lever with bushing 218/193 and tension spring 275  
A force of  $1000 \pm 150$  p, applied at the designated point, should be required to raise lever with bushing 218 from platen 7.
- (A136) Paper guide 276/194 with tension spring 241  
Paper guide 276 should be tilted with a force of  $700 \pm 100$  p applied at the designated edge.
- (A137) Feed pawl 278/195 with tension spring 256  
A force of about 10 p should be required to disengage feed pawl 278 from the ratchet.
- (A138) Feed pawl 277/196 with tension spring 256  
A force of about 10 p should be required to disengage feed pawl 277 from the ratchet.
- (A139) Detents 232, 233/197 with tension spring 256  
A force of  $16 \pm 5$  p should be required to disengage detents 232 and 233 from their ratchets.
- (A140) Ratchets n/198 of spool carrier 227  
Disengage detents 232 and 233 from their ratchets "n". The force required to turn the ratchets should be  $17 \pm 3$  p, measured on the arm of metering lever "m" with  $r=50$  mm. Thus disc 680 is secured by pawl 681.



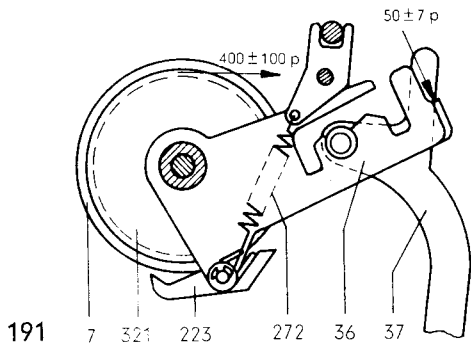
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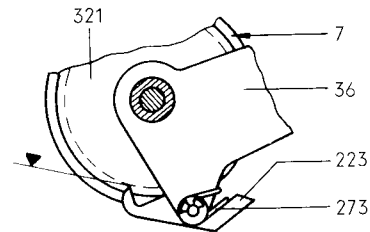
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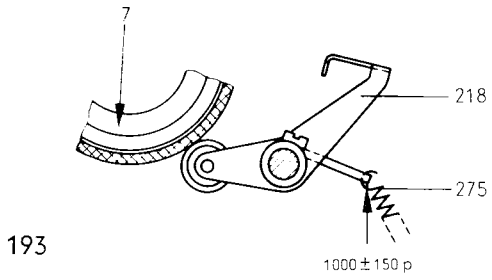
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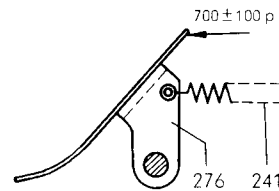
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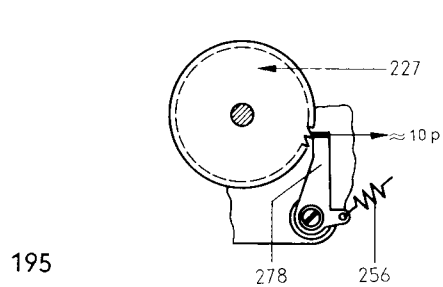
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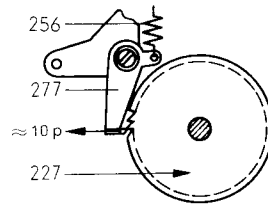
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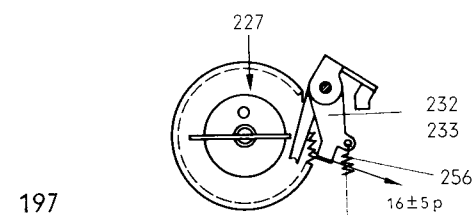
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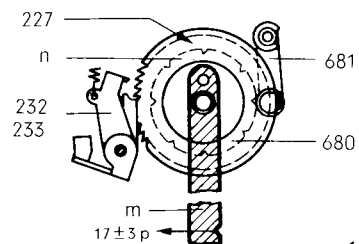
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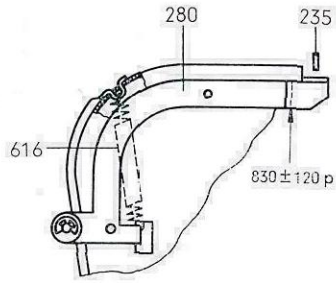
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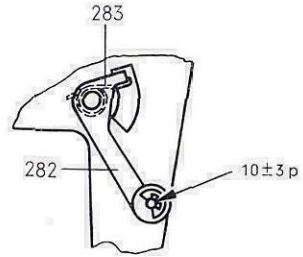
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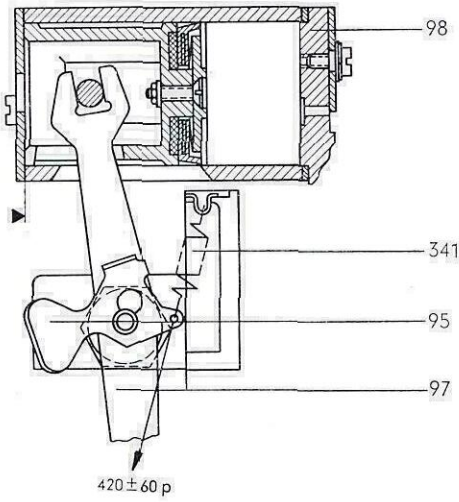




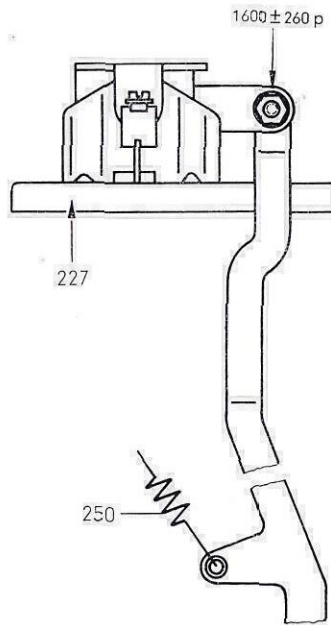
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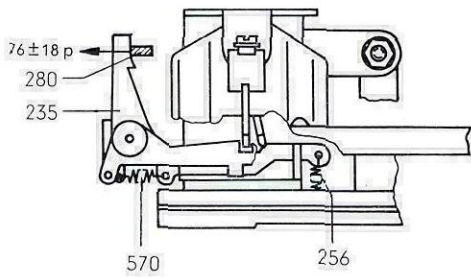
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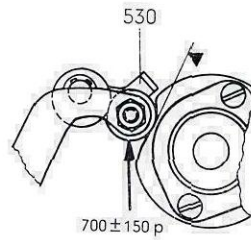
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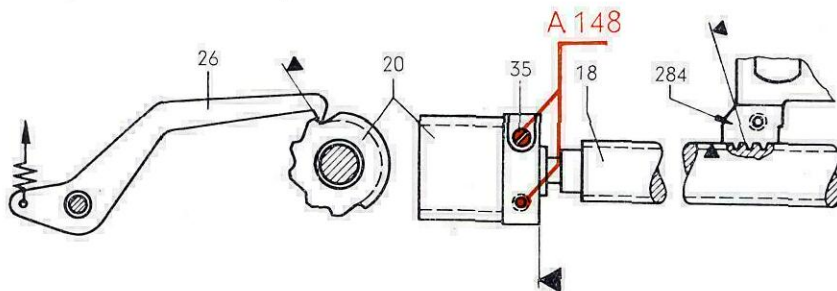
202



203



204



205

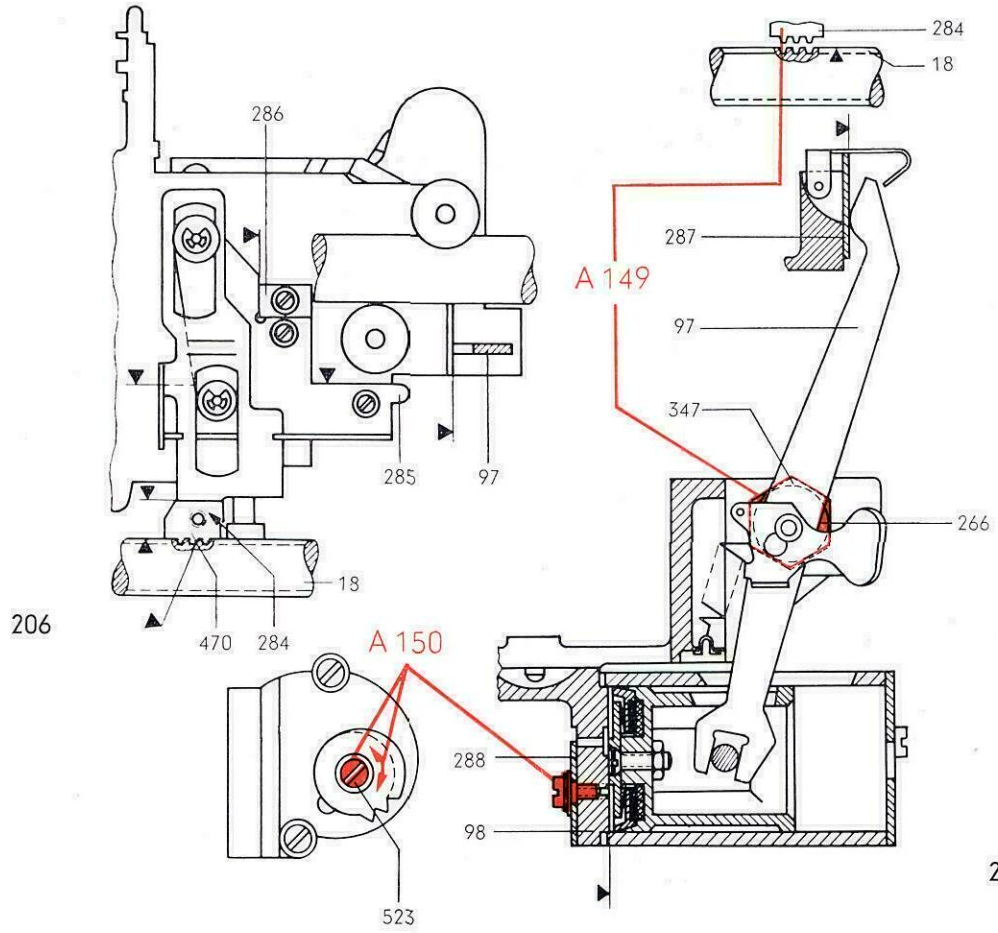
- (A141) Reversing lever 280/199 with tension spring 616  
Disengage lever 235. A force of  $830 \pm 120$  p, applied at the designated point, should be required to move reversing lever 280 out of its rest position.
- (A142) Tensioning lever 282/200 with torsion spring 283  
A force of  $10 \pm 3$  p should be required at the designated point to move the tensioning lever out of its rest position.
- (A143) Lock 95/201 with tension spring 341  
Move brake cylinder of shock absorber 98 into the illustrated end position. Tension spring 341 exerts a pull of  $420 \pm 60$  p at the suspension point on lock 95.
- (A144) Spool carrier 227/202 with tension spring 250  
The hollow shaft of the spool carrier should turn when a pressure of  $1600 \pm 260$  p is applied.
- (A145) Lever 235/203 with tension spring 570  
A force of  $76 \pm 18$  p should be required to raise lever 235 off reversing lever 280.
- (A146) Roller lever 530/204 with tension spring 312/57  
A force of  $700 \pm 150$  p should be required to lift roller lever 530/204 off the cam.

#### 4.5. Printer with type basket carriage

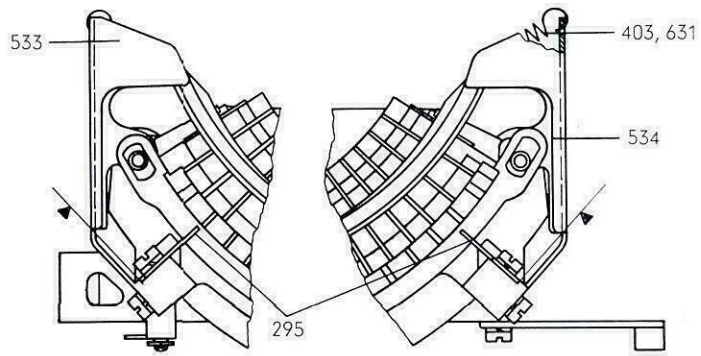
- A147 Guide 285/206  
Guide 285 of the type basket carriage and sliding block 470 of feed rack 284 should make contact at the designated points (the adjustment of stop 286 is protected by a lacquer coating).
- A148 Bushing with ratchet 20/205  
Install the type basket carriage as described in para. 3.7.39. Then move the type basket carriage to a point just ahead of the line end and turn the intermediate shaft by hand. Print the last few characters by manually striking any one type bar against the platen. The spacing between the last two characters must be identical with that between the other characters.  
Adjustment: Loosen fillister head screws 35 (protected with lacquer coating) and turn feed screw 18, while fillister head ratchet 20 rests against detent 26. Tighten fillister head screws 35.  
(Detent 26 must be adjusted as described by adjustment A63).



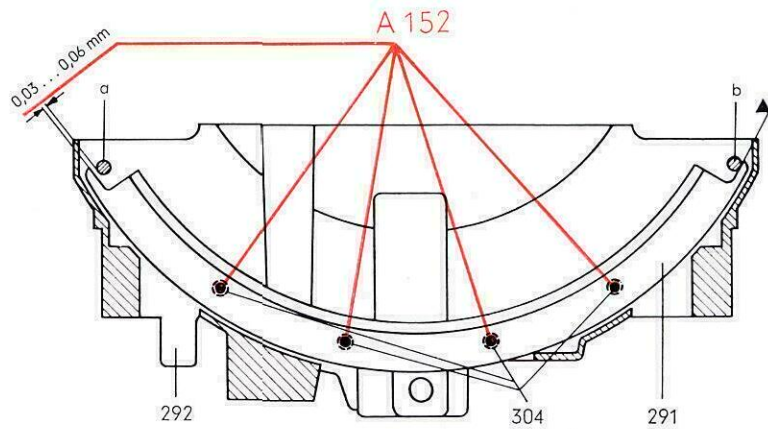
- A149 Shock absorber 98/207  
Move the type basket carriage into the beginning-of-line position. Brake lever 97 will now rest against stop 287 of the type basket carriage and the piston will be in its extreme right-hand position. Depress lever 16a/4 to lift feed rack 284/207 and to reinsert it in the thread. The teeth of feed rack 284 must be properly centered on feed screw 18.  
Adjustment: Loosen hexagon nut 347 (protected with lacquer coating) and turn eccentric bushing 266.
- A150 Eccentric disc 288/207  
Hold lever 16a/4 of parallel guide by hand in its lowest position, move the type basket carriage by hand into the end-of-line position and release lever 16a. The type basket carriage must now move into the beginning-of-line position without bouncing. At the same time, bushing with ratchet 20/205 must rest against detent 26.  
Adjustment: Turn eccentric disc 288/207 after loosening shoulder screw 523.
- A151 Guide combs 295/208, suspension plates 533 and 534  
Both guide combs 295 and suspension plates 533 and 534 should make contact as shown in the illustration.
- A152 Pusher segment 291/209  
When pusher segment 291 rests against one of the two axles "a" or "b" of the type basket 292, a visible gap of 0.03 . . . 0.06 mm must remain on the other side between the pusher segment and the axle.  
Adjustment: Remove segment with type bar 455/73 in accordance to 3.7.41.  
Loosen the four fillister head screws 304/209 and shift pusher segment 291.



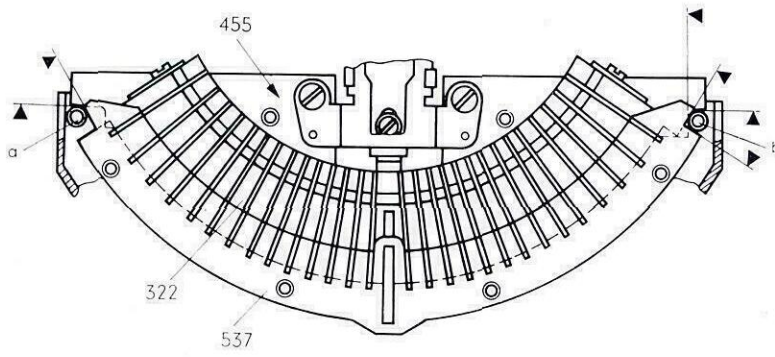
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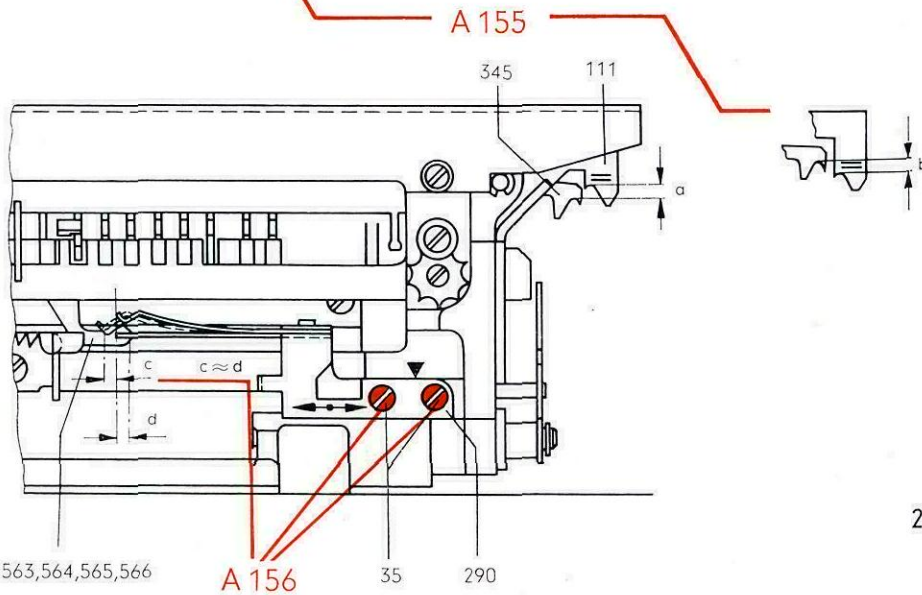
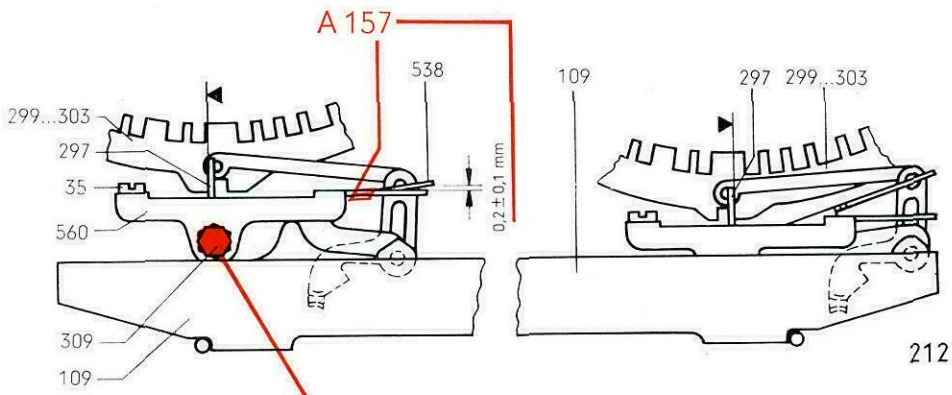
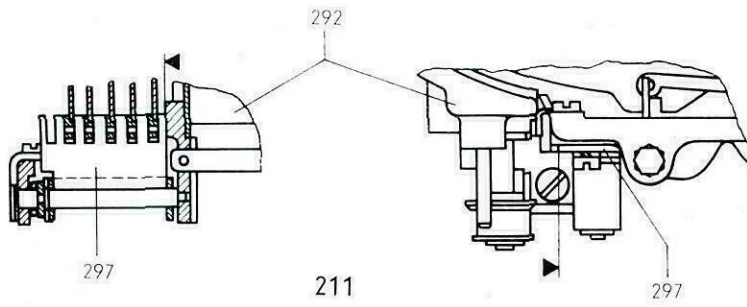
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209



210

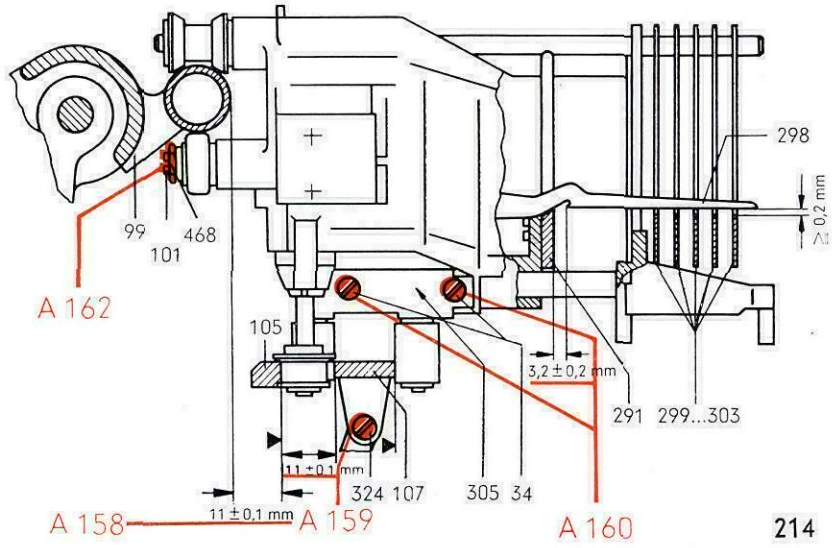


- A153 Type bar segment 322/210, guide comb 537  
Type bar segment 322 and guide comb 537 should rest against axles "a" or "b" of type basket 292/209.
- A154 Guide comb 297/211  
Guide comb 297 must make contact at the designated points of type bar basket 292.
- A155, A156 Eccentric axle 309/212, detent bracket 290/213
- A155 Move transfer bars 111 into their upper and then into their lower position. In doing so, code segments 299 to 303/212 will rest either at the right or the left on guide comb 297. With the code segments in these two extreme positions, the gap between the transfer bars 111/213 and levers 345 should be the same in either case (visual check,  $a \approx b$ ).
- Adjustment:* Move the type basket carriage to the center-of-line position. Remove bracket 560/212 after loosening fillister head screw 35 (lacquer coated). Turn the eccentric axle 309 until, with code segments 299 to 303 resting against guide comb 297, the gaps between transfer bars 111/213 and levers 345 are about equal ( $a \approx b$ ). Replace bracket 560/212. In doing so, take care that bail 538 easily moves on axle 309.
- Adjustment:* If necessary, pull out axle 309 slightly.
- A156 The upper end of detent bracket 290/213 must rest against the printer frame. Move transfer bars 111 into their upper and then into their lower position. Code bars 38, 563, 564, 565, 566 should travel about the same distance to the left and the right of the bend in the spring of detent bracket 290 ( $c \approx d$ ).
- Adjustment:* Loosen fillister head screws 35/213 (lacquer coated) and displace detent bracket 290 laterally until "c" is about equal to "d". Tighten screws 35 and protect them by a lacquer coating.
- A157 Bracket 560/212  
Move type basket carriage into the figures position. There should be a clearance of  $0.2 \pm 0.1$  mm at the designated point between bracket 560 and bail 538.
- Adjustment:* Bend bracket 560.

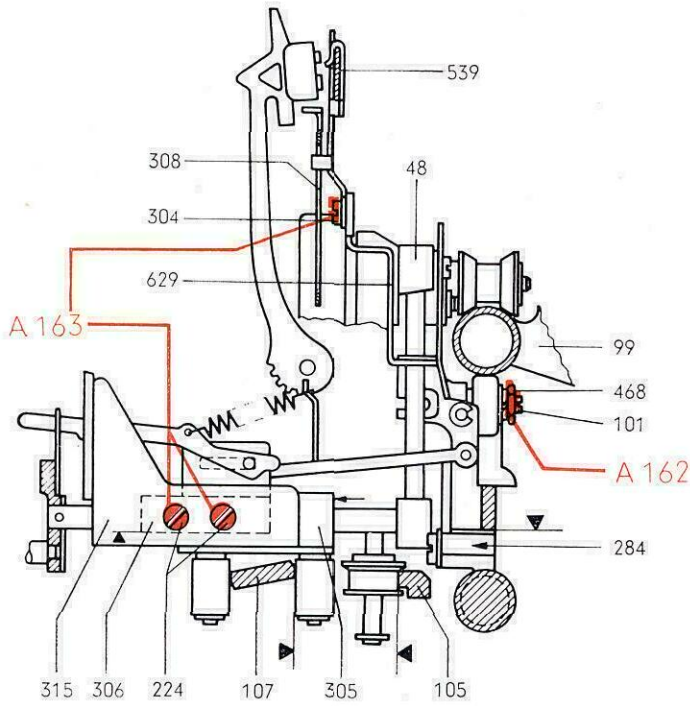


- A158 Rail 105/214  
There must be a gap of  $11 \pm 0.1$  mm between the front edge of bail 99 and the gliding surface of rail 105.  
Adjustment: Displace rail 105 after loosening the mounting screws and retaining plates (lacquer coated).
- A159 Printer bail 107/214  
Bring the camshaft of the printer into its rest position (Fig. 136) and move type basket carriage into the center-of-line position. A gap of  $11 \pm 0.1$  mm must then exist between printer bail 107 and rail 105.  
Adjustment: After loosening fillister head screw 324 (lacquer coated) shift printer bail 107.
- A160,  
A161 Roller carrier 305/214
- A160 Move bail 99 of the case shift mechanism into its upper position and type basket carriage into the center-of-line position. The gap remaining between the noses of the two outer pull bars 298 and the pusher segment 291 must be  $3.2 \pm 0.2$  mm. Printer shaft in rest position.  
Adjustment: Displace roller carrier 305 after loosening fillister head screws 34 (lacquer coated).
- (A161) With pull bars 298 in the position described in A169, a gap of at least 0.2 mm should exist between code segments 299 to 303 and pull bars 298.
- A162 Eccentric pins 101/214, 215a  
It should be possible to displace the type basket carriage easily on bail 99. The ball bearings should have only a small radial play with respect to bail 99.  
Adjustment: Turn eccentric pin 101 after loosening hexagon nut 468.
- A163,  
A164 Ribbon lifter 539/215a, feed pawl 284/215b
- A163 Move type basket carriage into the lower position (letters position). Turn camshaft, until printer bail 107 with roller carrier 305 is in its extreme front position (ribbon lifter in top position). Depress any one key. The type must properly be centered on the ink ribbon.  
Adjustment: After loosening screw 304 (lacquer coated) displace ribbon lifter 539. If the oblong hole does not suffice for the adjustment, first make a coarse adjustment after loosening screws 224 (lacquer coated).
- A164 Move feed pawl 284/215a into its lowest position. Pressure pawl 676 should rest against type basket carriage and lower end of stop 677 against pull bar 678. When feed pawl 284 is now raised, it should fall back by its own weight.  
Adjustment: Bend stop 677.
- A165 Lever 255/216  
With the type basket carriage in the beginning-of-line position, a gap of  $0.2 \pm 0.1$  mm must exist between lever 254 and parallel guide 16.  
Adjustment: Bend lever 255.  
Spring forces (measured with type basket carriage in horizontal position):
- (A166) Pawl 310/217 with tension spring 243  
Pawl 310 should be tipped with a pressure of  $120 \pm 20$  p applied at the designated edge.

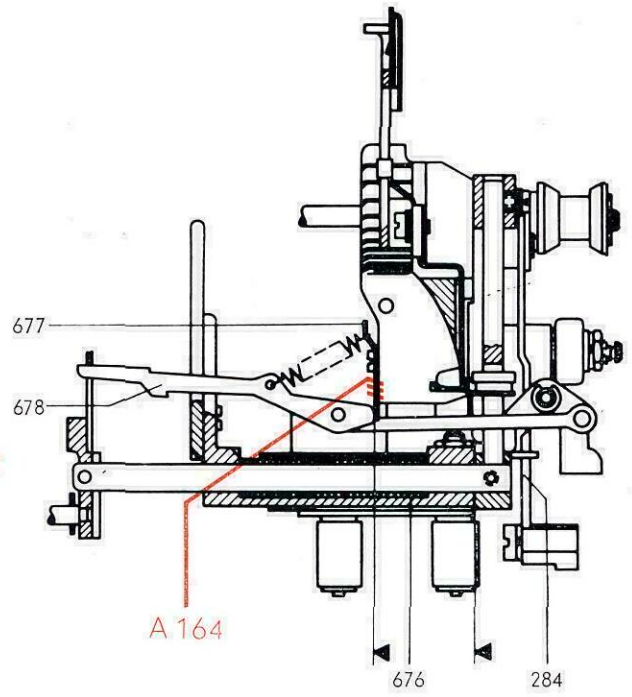




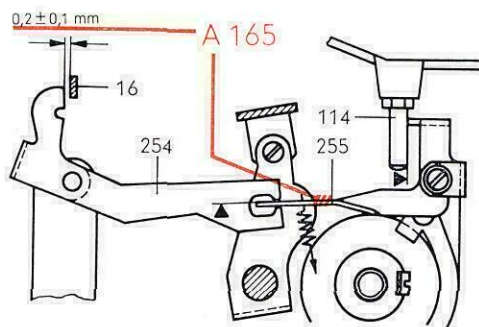
214



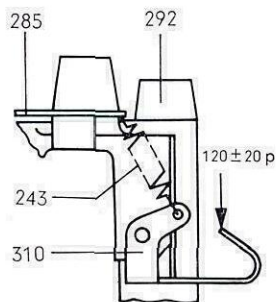
215a



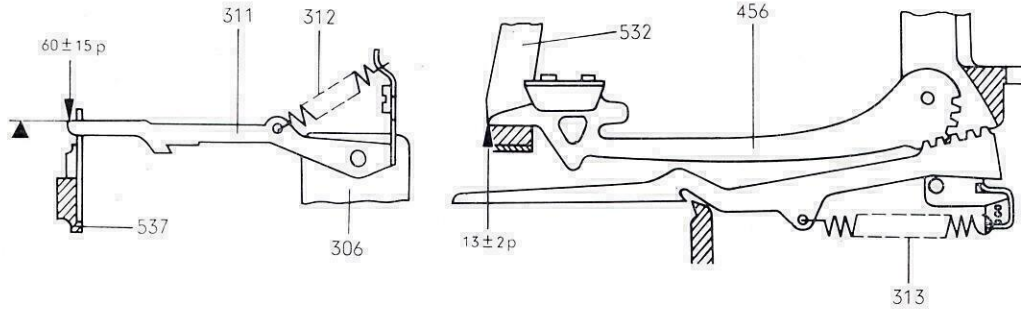
215b



216

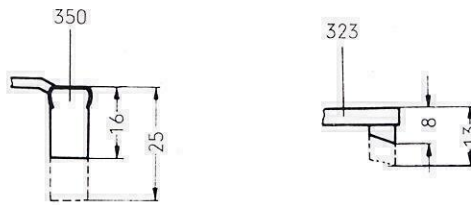
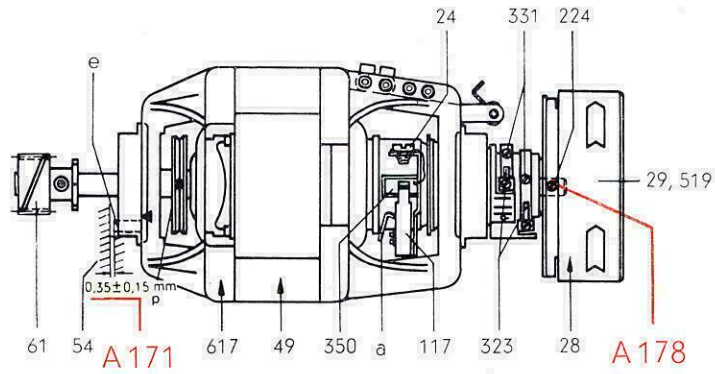


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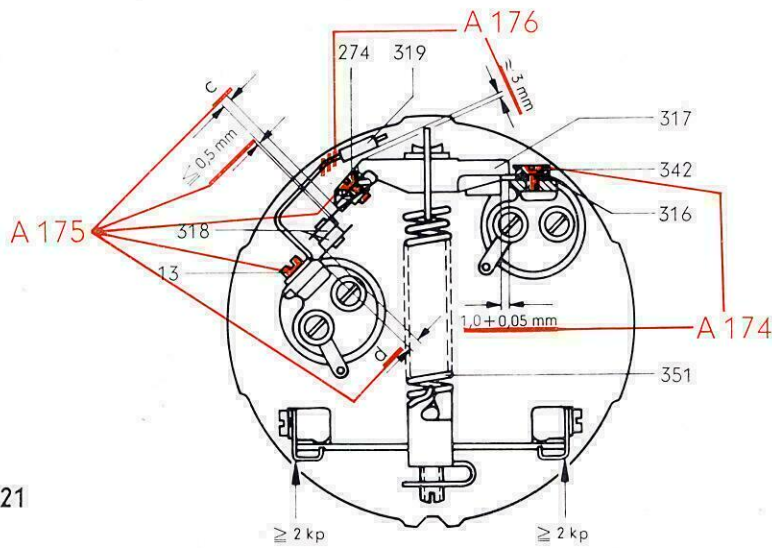


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219



220

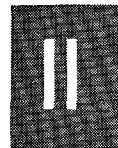


221

- (A167) Pull bar 311/218 with tension spring 312  
The pull bar 311 exerts a pressure of  $60 \pm 15$  p on stop of guide comb 537.
- (A168) Type bar 456/219 with tension spring 313  
A force of  $13 \pm 2$  p should be required to lift the type bars 456 off type bar rest 532.
- (A169) Gliding force of type basket carriage.  
The force required for moving the type basket carriage, outside the range of the lubricating felt of printer bail 107/215 and with the return spring disengaged, must not exceed 400 p (to be measured on the assembled machine in rest position and with the type basket carriage in the LTRS position).
- (A170) Type basket carriage, carriage return spring 592/2  
When the type basket carriage is in the beginning-of-line position, the force of the tension spring 592 must be  $475 \pm 80$  p. This applies to telegraph speeds of up to 56.8 bauds.

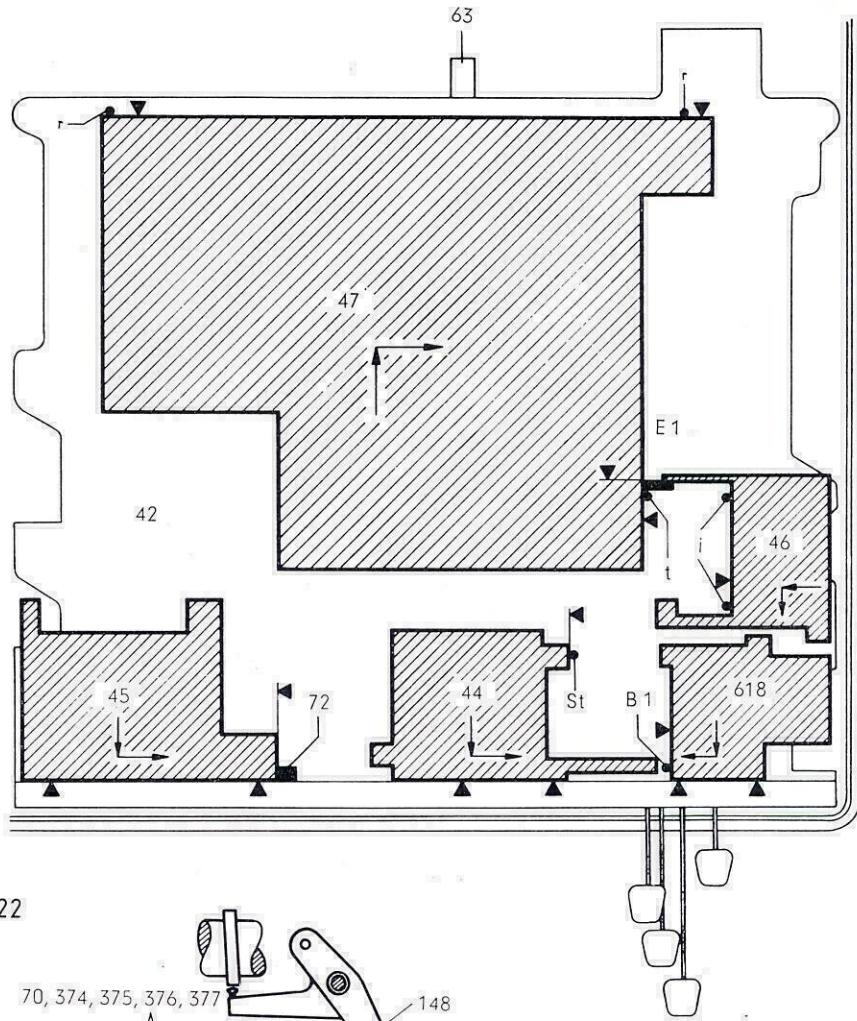
#### 4.6. Motor with contact governor

- A171 Motor with contact governor 617/220  
With the motor with governor 617/220 touching pin "e", a gap of  $0.35 \pm 0.15$  mm must exist between the other end of the pin and the lower half of motor casing 54.  
Adjustment: Loosen the motor mounting. Press motor with governor 617 lengthwise towards the governor.
- A172 Motor 49/220  
The red-colored mark "p" on the balancing disc of motor 49 must be in alignment with the tapped bores on the stud ends of the motor shaft. It thereby designates the positions of the heads of the screws used for mounting helical gear 61 and governor 28.
- A173 Governor 28/220  
Remove governor 28 as described in para. 3.2.2 and remove cover 29 after loosening recessed-neck screws 519.
- A174 Contact arm 317/221  
A gap of  $1.0 \pm 0.05$  mm should exist between pressure plate 316 and contact arm 317.  
Adjustment: Displace contact arm 317 after loosening countersunk screw 342.
- A175 Contact springs 318/221  
With no pressure applied, the contacts of contact springs 318 should rest flat upon each other. The free lengths "c" and "d" should be equal and the lateral misalignment of the contacts must not exceed 0.5 mm.  
Adjustment: Displace contact springs 318 after loosening countersunk screw 274 and fillister head screw 13.
- A176 Stop 319/221  
With no pressure applied to the contacts, the gap between contact arm 317 and stop 319 should be about 3 mm.  
Adjustment: Bend the bracket of stop 319.
- A177 Governor spring 351/221  
When exchanging the governor spring, observe the following:  
Relax the governor spring slowly. Press down bi-metal (black painted side pointing to the observer) retainer springs at the designated points with a force of  $\geq 2$  kp and tighten the screws.  
Take care to keep the governor contact clean of grease etc. Slightly grease governor spring.
- A178 Governor carbon brushes 323/220  
The governor carbon brushes 323 should slide with their full width on the slip rings of governor 28.  
Adjustment: Displace governor 28 on the motor shaft after loosening fillister head screw 224.

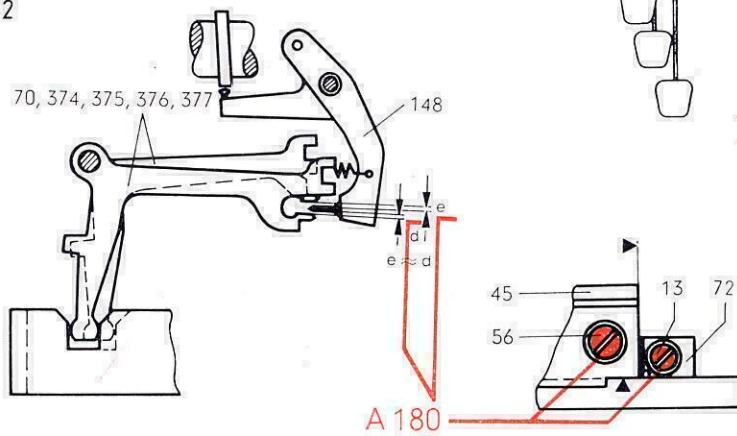


#### 4.7. Complete Teleprinter

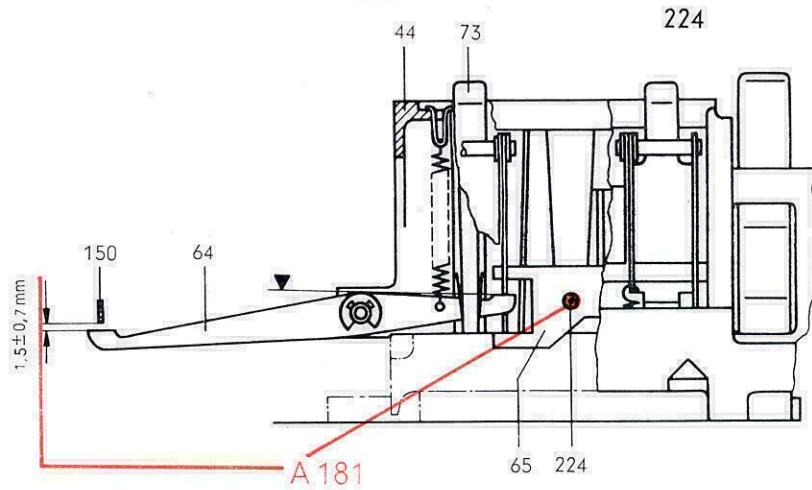
- A179 Installing the functional assemblies on the base plate with keyboard 42/222  
Move the individual assemblies (mounting frame 618, special function key assembly 44, transmitter 45, receiver 46 and printer 47 with type basket carriage) in the directions indicated by the arrows up against the stops on the mounting base with keyboard 42 and tighten the screws. Slide motor with casing 43/229 onto pivot 63/222.
- A180 Stop bracket 72/224  
Bracket 72 determines the correct position of transmitter 45 (para. 4.2) on base plate 42.  
Adjustment: Loosen fillister head screw 13 of stop bracket 72. Place the transmitter against the front edge of the mounting base after turning the transmitter shaft into its rest position, and shift it axially until, while depressing keys "R" and "Y" successively, the blade of locking bail 148/223 is centered between the tips of bellcranks 70, 374, 375, 376, 377 (e≈d; this adjustment can be judged by eye).  
Tighten screws 56/224 to fix the transmitter 45 in its position. Slide stop bracket 72 against the transmitter and secure it with fillister head screw 13. This adjustment can be retained whenever removal and replacement of the transmitter becomes necessary.
- A181 Lever 64/225  
With bail 73 not operated, a gap of  $1.5 \pm 0.7$  mm should exist between lever 64 and locking lever of the transmitter.  
Adjustment: Vertically displace plate 65 after loosening fillister head screws 224.



222

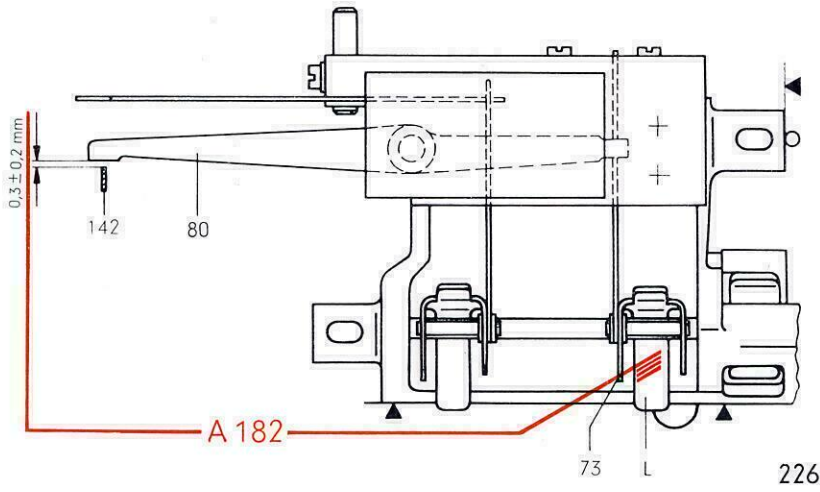


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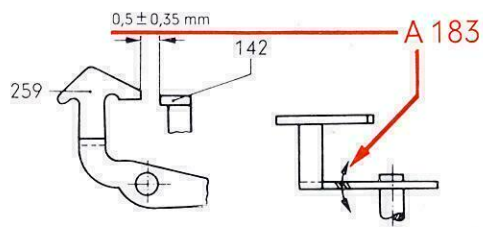


225

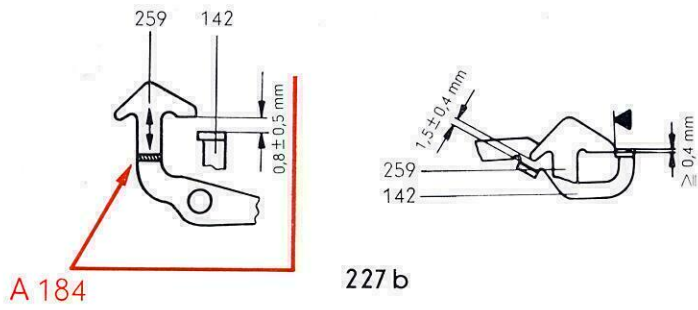




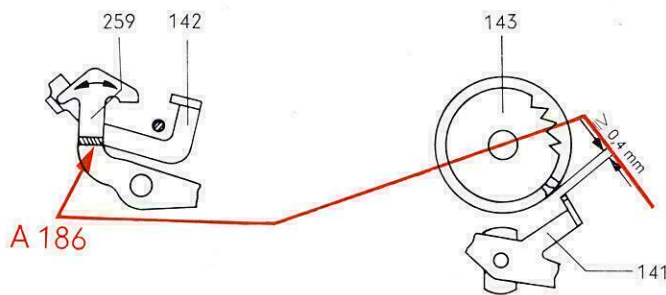
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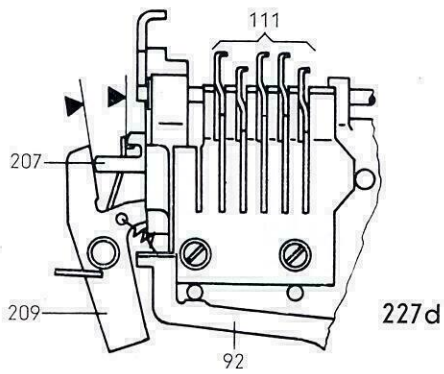
227a



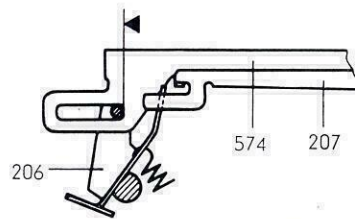
227b



227c



227d



227e

- A182    Lever 80/226  
With bail 73 not operated, a gap of  $0.3 \pm 0.2$  mm should exist between lever 80 and lever with shaft 142 of the transmitters.  
Adjustment: Bend the extension "L" of bail 73.
- A183 to  
A185    Release of answerback drum
- A183    Lever 259/227a  
Transmitter in rest position. Move push rod 574/227e into the front position. A gap of  $0.5 \pm 0.35$  mm must exist between shaft with lever 259/227a and lever with shaft 142.  
Adjustment: Bend lever 259.
- A184    Printer in rest position  
Turn the transmitter shaft until lever 141/227c rides on the high part of the cam. (Check the adjustment A15). A gap of  $0.8 \pm 0.5$  mm must exist between shaft with lever 259/227b and lever with shaft 142.  
Adjustment: Bend lever 259.
- (A185)    Printer and transmitter in rest position. Lever 259/227b and 142 must overlap by at least 0.4 mm. On the other side, there must be a clearance of  $1.5 \pm 0.4$  mm.
- A186    Lever 141/227c, control disc 143  
Transmitter in rest position. Press case shift rack 201 in the direction of the arrow to move bail 99/70 into the upper position (Figures position).  
Set transfer bars 111/227d for code combination "Who-are-you" (✱); (1st and 4th transfer bars, counted from rear, in their lower positions), turn the camshaft until answerback pull bar 207 is in its front position. A gap of  $\geq 0.4$  mm must exist between lever 141/227c and the engaged locking lever of control disc 143.  
Adjustment: Bend lever 259. In case it is necessary to make this adjustment, check the adjustments A192 and A193.

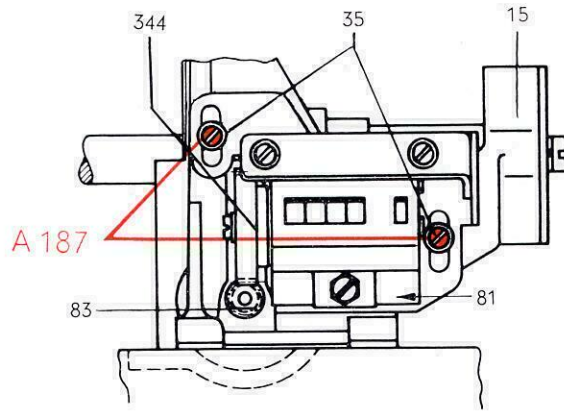




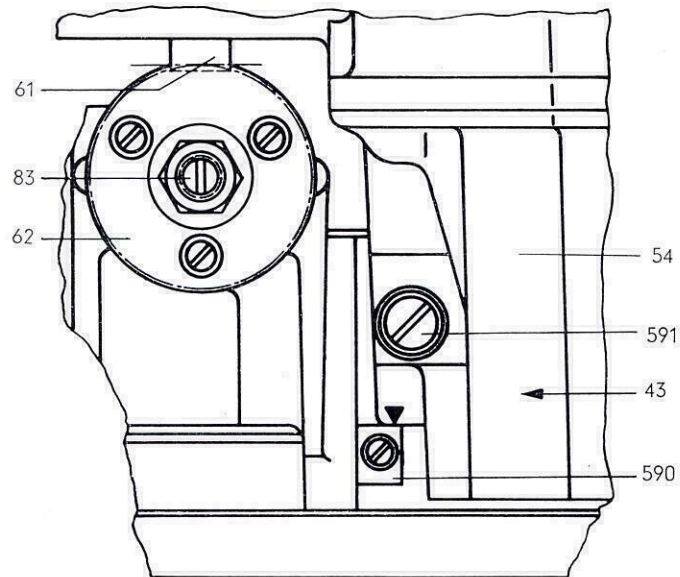
- A187      Operating hour counter 81/228  
Helical gear 344 of the operating hour counter 81 should mesh with the gear in the intermediate shaft 83 with small but still noticeable backlash.  
Adjustment: Displace operating hour counter 81 vertically after loosening fillister head screw 35.
- A188      Motor with casing 43/229  
With motor 43/229 placed on pivot 63/222, a small but still noticeable backlash should exist between helical gear 61 of the motor and gear 62 of intermediate shaft 83.  
Adjustment: Turn the motor round pivot 63/222. Then tighten mounting screws 591/229, place stop against the motor and screw it down. Check backlash again in several positions around the periphery of the gear.  
Whenever the motor must be removed and replaced, proper adjustment is obtained by turning the motor against stop 590.
- A189      Impact adjuster 314/230  
The pointer of impact adjuster 314 should be so set that a sufficiently clear print is obtained with an ink ribbon nearing the end of satisfactory service.

## **5.      C I R C U I T   A N D   W I R I N G   D I A G R A M S**

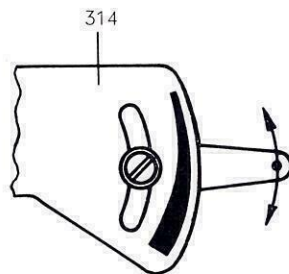
- 5.1.      Test circuit of the teleprinter
- 5.2.      Wiring options for telegraph socket
- 5.3.      Circuit diagram of teleprinter with commutator motor
- 5.4.      Wiring diagram of teleprinter without motor
- 5.5.      Wiring diagram of teleprinter with commutator motor



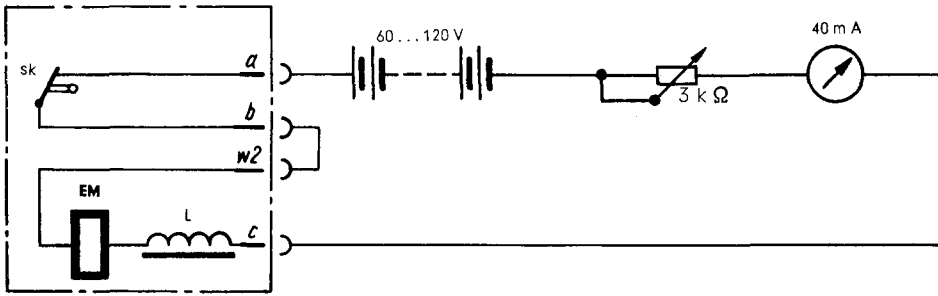
228



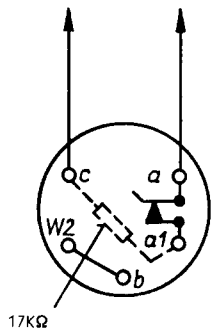
229



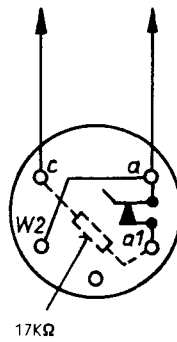
230



231



232



233

**5.1. Test circuit (telegraph circuit) for checking the teleprinter**

Fig. 231

- ① Teleprinter
  - sk      Send contact
  - EM      Selector magnet
  - L        Additional choke



**5.2. Wiring options for telegraph socket**

Figs. 232 and 233

Fig. 232      For complete teleprinter

Fig. 233      For receive-only machine (without keyboard)

Resistor 17 kilohms installed only when the machine is connected to the Telex network.

When the teleprinter is to be connected to the Telex network, the telegraph socket will be wired and connected by the mechanics of the telegraph office.

**5.3. Circuit diagram of teleprinter with commutator motor**

Fig. 234

① Base plate

FL 1	Spark suppressor (transmitter)
C 6	Charging capacitor
C 7	} Lead-through capacitor
C 8	
L 7	RF suppressor choke
L 9	Additional choke
R 6	Carbon resistor
Tr 2	Transformer
x	Intended for tapetransmitter attachment

② Motor

M	Commutator motor
Th	Thermal contact
m	Governor contact
C 1	} MP capacitor
C 2	
C 3	} Lead-through capacitor
C 4	
C 5	Paper capacitor
L 1	} RF suppressor choke
L 2	
L 5	Siferrit shell core coil
R 1	} Resistor
R 2	

③ Special function key assembly

La 1	Lamp
Lk	Lamp contact

④ Transmitter

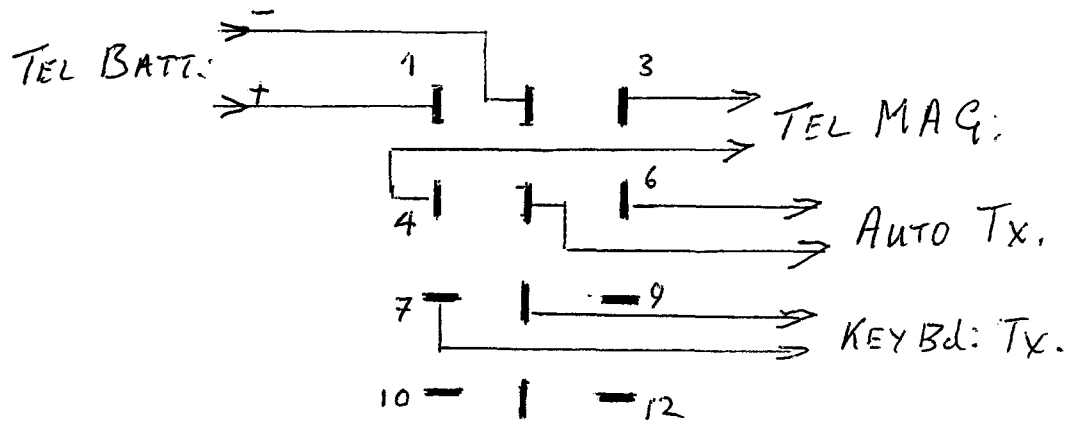
Sk	Send contact
— — —	Strap in receiving-only teleprinter in place of transmitter

⑤ Receiver

EM	Selector magnet
----	-----------------

⑥ Bottom plate

INSERTED PAGE



REAR VIEW OF TELEGRAPH SOCKET  
FRONT VIEW OF TELEGRAPH PLUG

LINK 2 to 3 with a 330Ω resistor for 40mA magnet current.

LINK 4 to 5 for Auto transmitter

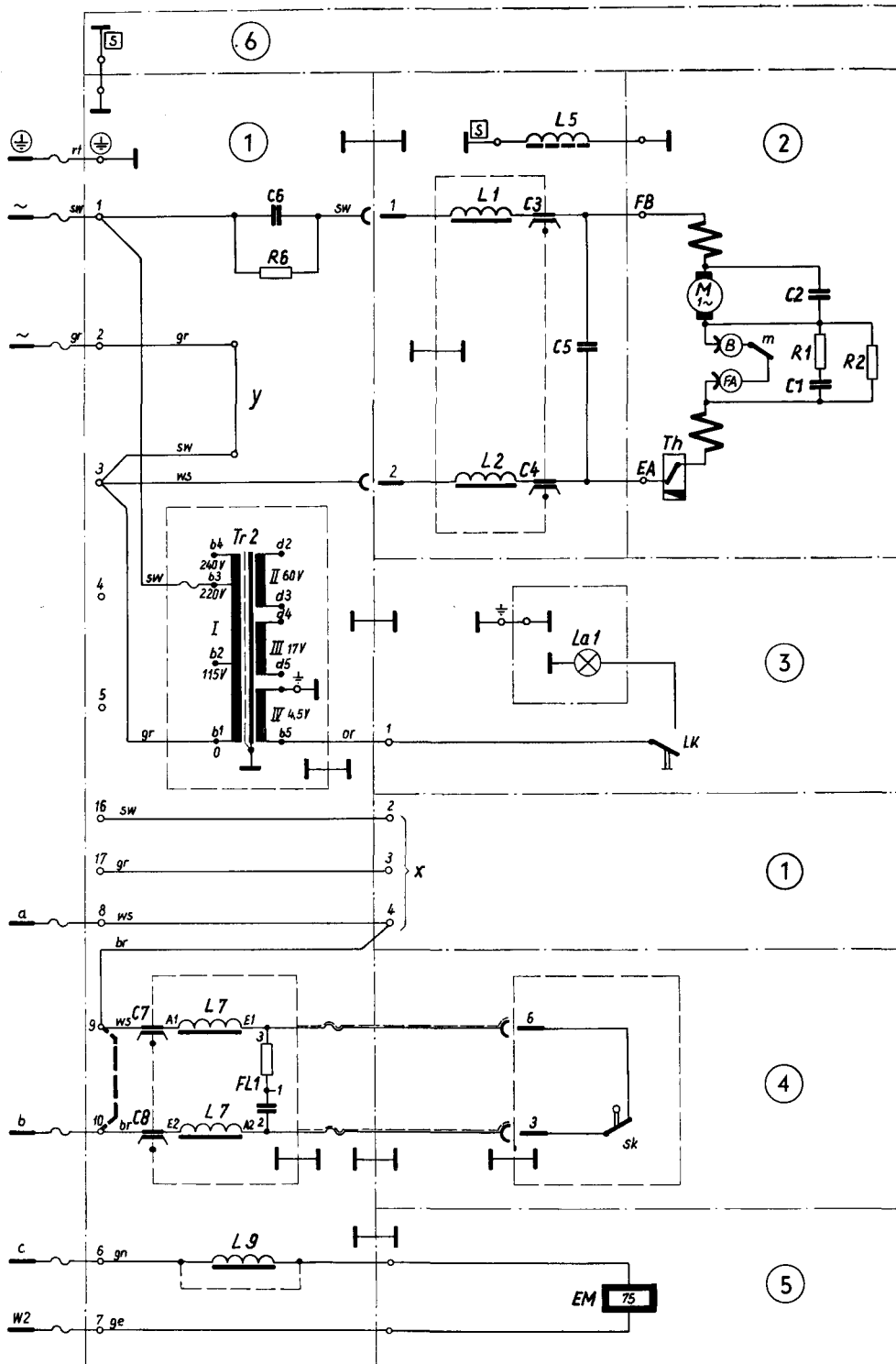
LINK 7 to 6 for Keyboard transmitter

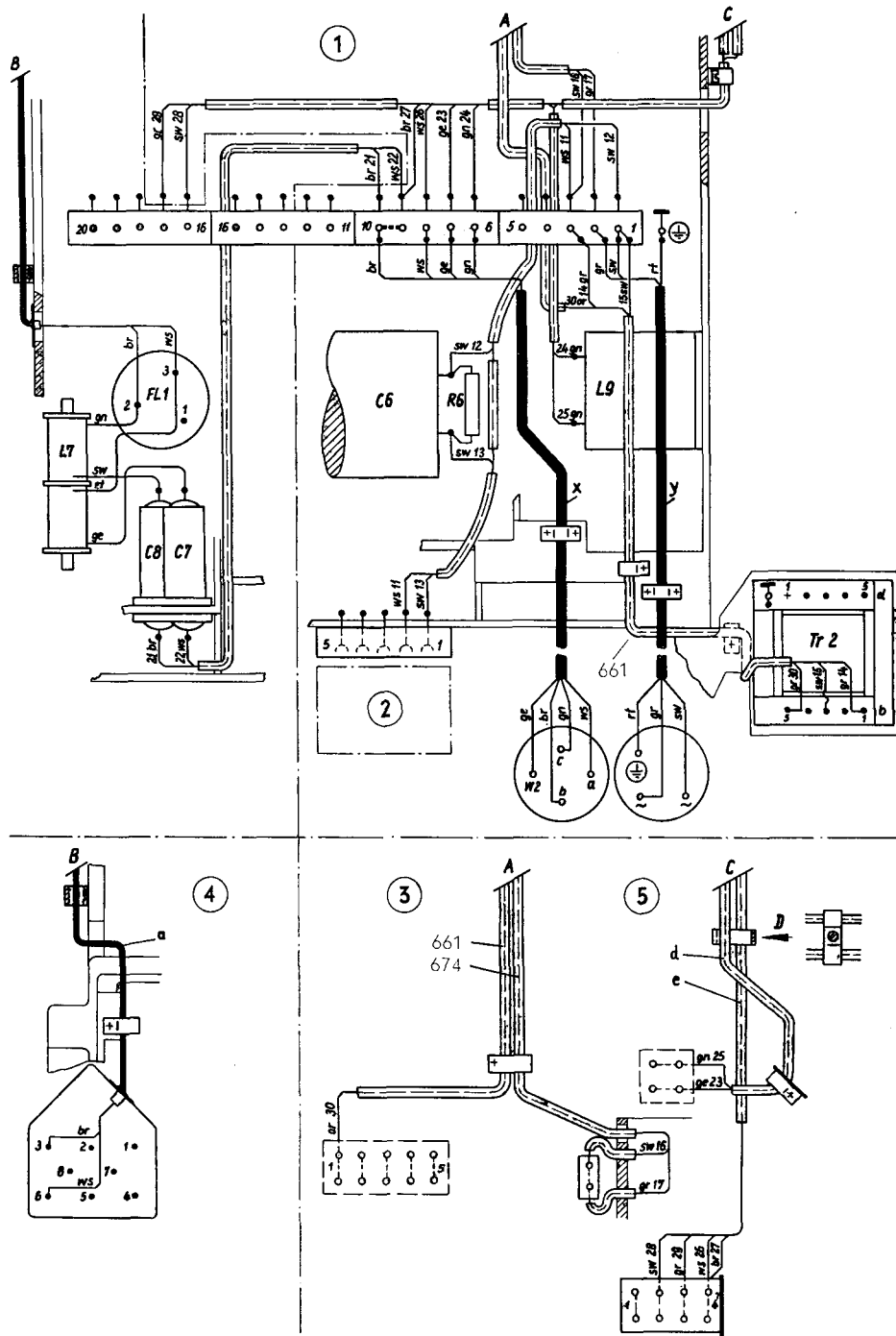
LINK 1 to 8 for all facilities.

*Rayley*









**5.4. Wiring diagram of teleprinter without motor**  
Fig. 235

x Telegraph line  
y Power line

- ① Base plate / bottom plate removed  
Bottom view  
FL 1 Spark suppressor (transmitter)  
C 6 Charging capacitor  
C 7 }  
C 8 } Lead-through capacitor  
L 7 RF suppressor choke  
L 9 Additional inductance coil  
R 6 Resistor  
Tr 2 Transformer  
661 Cable of power supply unit

② Motor

- ③ Special function key assembly  
661 Cable of power supply unit  
674 Remote control switch line

- ④ Transmitter  
a Transmitter cable

- ⑤ Receiver  
d Receiver line  
e Tapetransmitter attachment line

**Color code**

br	brown	or	orange
ge	yellow	rt	red
gn	green	sw	black
gr	grey	ws	white



**5.5. Wiring diagram of teleprinter with commutator motor**

Fig. 236 (Section)

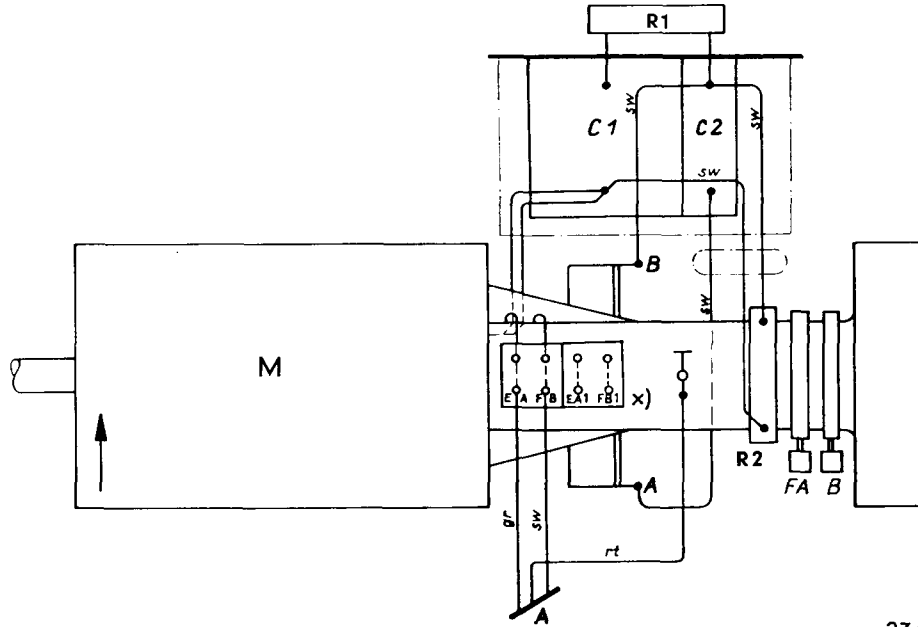
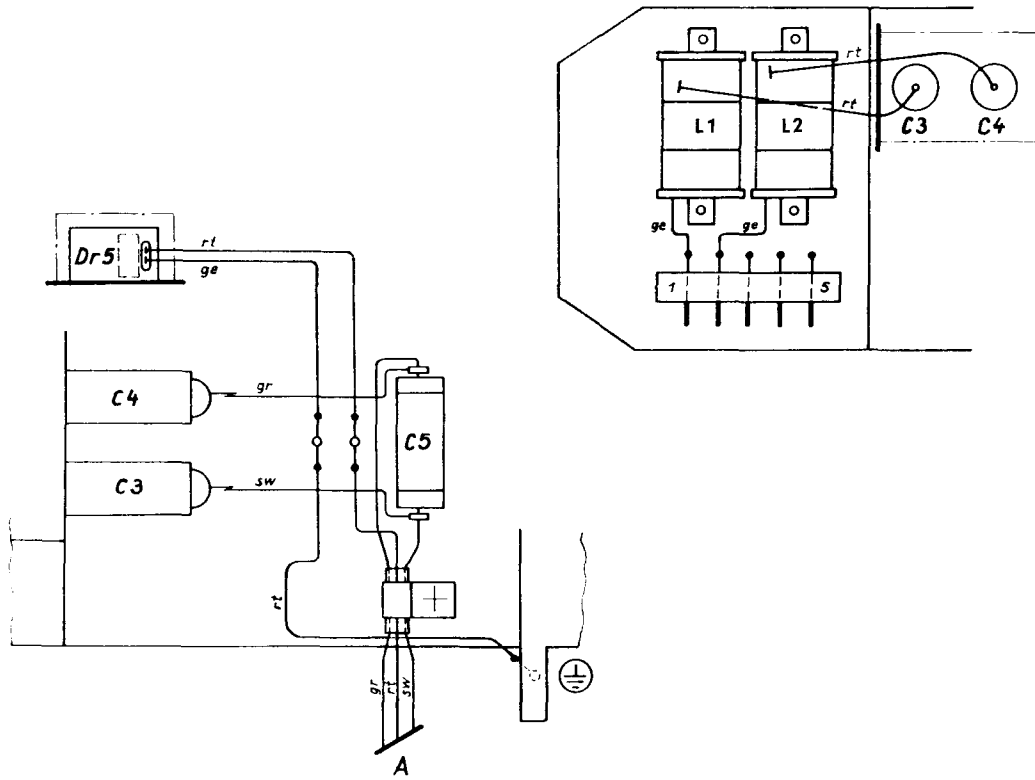
C 3, 4 C 5 L 1, 2 L 5	}	Electrical components in lower half of motor housing for RF suppressor
M		Motor
C 1, 2 R 1, 2	}	Electrical components on motor (spark suppressor, governor resistor)

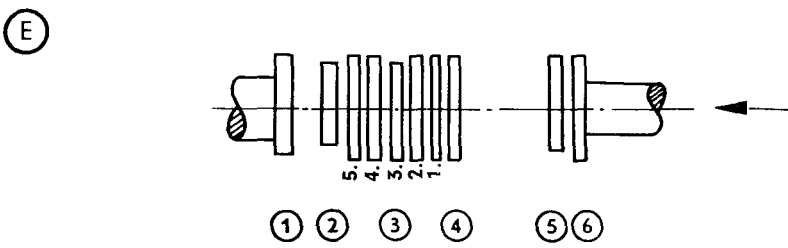
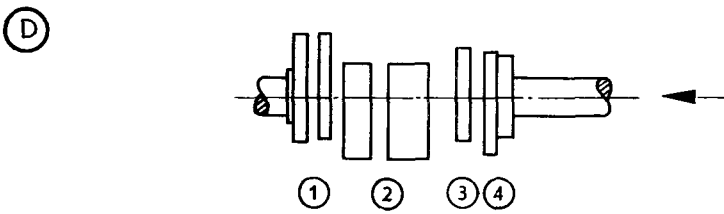
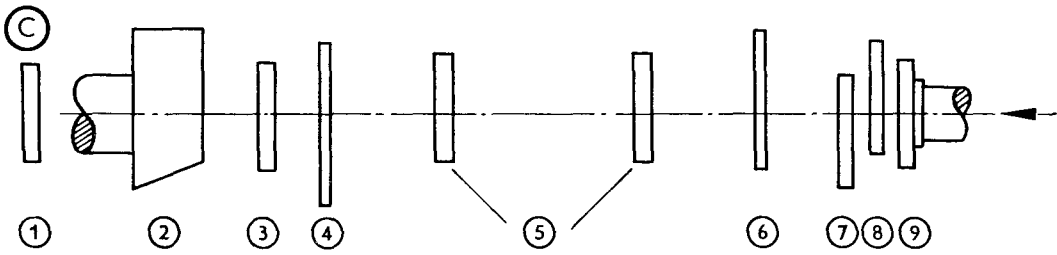
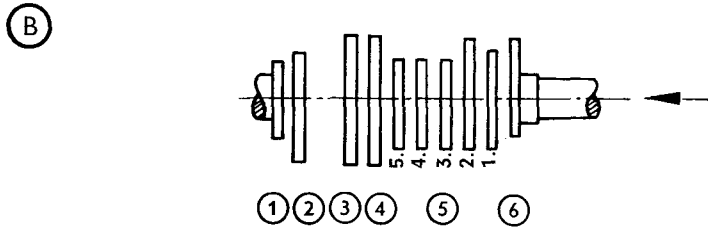
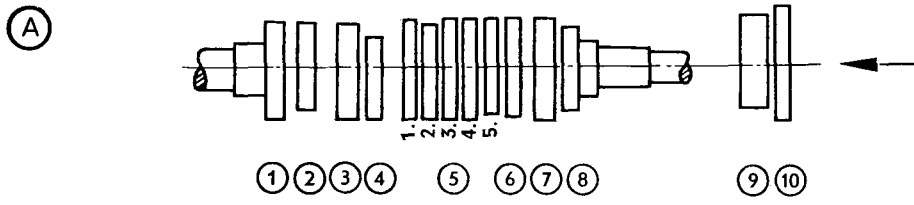
With motors rated for 220 v AC/110 v DC:

connect cable a gr to EA 1,  
sw to FB 1

Bypass capacitor C 6

(Note: the thermal contact is made ineffective)





**6. CAM ASSIGNMENT OF TELEPRINTER 100  
WITH PERFORATED TAPE ATTACHMENTS**  
(Fig. 237)



**Transmitter**

- ① Who-are-you suppression
- ② Answerback drum feed pawl
- ③ Rocker (contact control)
- ④ Locking bail
- ⑤ Code lever
- ⑥ Start pulse and stop pulse
- ⑦ Zero-setting lever
- ⑧ Home record suppression
- ⑨ Release bail restoration
- ⑩ Anti-bounce lever

**Receiver**

- ① Locking lever
- ② Armature restoring lever
- ③ Selector armature
- ④ Selector lever
- ⑤ Code lever
- ⑥ Starting the printer

**Printer**

- ① Zero-setting lever
- ② Impact adjustment
- ③ Anti-bounce lever
- ④ Special function bail
- ⑤ Disengagement of special function pull bars
- ⑥ Torque adjustment
- ⑦ Carriage feed
- ⑧ Vacant
- ⑨ Two-color printing

**Reperforator attachment**

- ① Punching lever
- ② Punch setting lever
- ③ Tape puller
- ④ Feed lever and zero-setting lever

**Tapetransmitter attachment**

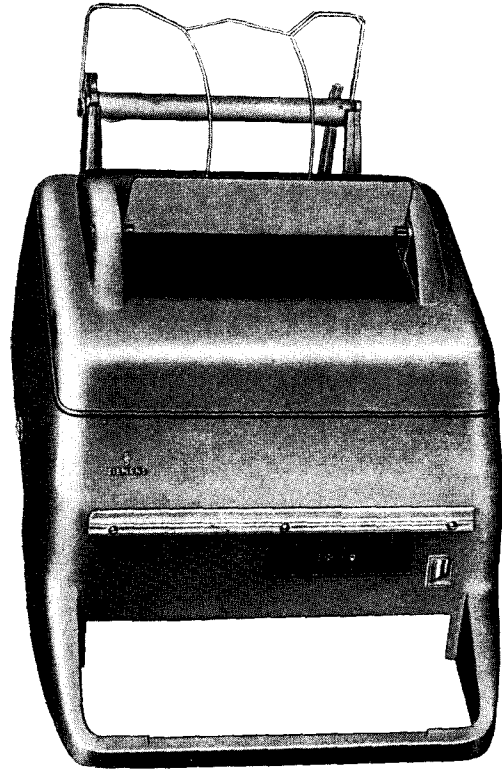
- ① Contact control
- ② Feed lever
- ③ Code lever
- ④ Start pulse and stop pulse
- ⑤ Zero-setting lever
- ⑥ Automatic break feature



**Drive side**







PROTECTIVE COVER

<b>CONTENTS</b>		Page
1.	General . . . . .	2
2.	Operation . . . . .	4
3.	Installation and removal of the protective cover . . . . .	4
4.	Removal and installation of major assemblies . . . . .	4
5.	Adjustments . . . . .	7
6.	Attachement to all protective cover types . . . . .	7

**1. GENERAL**

The protective cover protects the Teleprinter 100 from dust and reduces the low noise level of the machine.

For mounting the protective cover on the Teleprinter 100  
1 set of parts E18a\* of Fs Sk 2186/1  
is required.

Available for special versions of the teleprinter:

For receiving-only teleprinters (protective cover without keyboard bracket, but with cover)  
1 set of parts E18b\* of Fs Sk 2186/1

For teleprinters with 8-point plug-type connector (protective cover with enlarged cable lead-through at the rear)  
1 set of parts E18c\* of Fs Sk 2186/1

For receiving-only teleprinters with 8-point plug-type connector (protective cover without keyboard bracket, but with cover and enlarged cable lead-through at the rear)  
1 set of parts E18e\* of Fs Sk 2186/1

For teleprinters with key for carriage return and line feed functions (protective cover with key in the protective cover lid)  
1 set of parts E18\* of Fs Sk 2186/1

For teleprinters with 26-point plug-type connector and with provision for a key for carriage return and line feed functions (protective cover with enlarged cable lead-through at the rear; the bore for the key in the protective cover lid is covered)

1 set of parts E18g\* of Fs Sk 2186/1

For receiving-only teleprinters with 26-point plug-type connector and with provisions for a key for carriage return and line feed functions (protective cover without keyboard bracket, but with cover; with enlarged cable lead-through at the rear. The bore for the key in the protective cover lid is covered)

1 set of parts E18h\* of Fs Sk 2186/1

For teleprinters with single-form printing device

1 set of parts E18i\* of Fs Sk 2186/1

For teleprinters with 26-point plug-type connector (protective cover with enlarged cable lead-through at the rear)

1 set of parts E18n\* of Fs Sk 2186/1

For teleprinters with 20-point plug-type connector (protective cover with enlarged cable lead-through at the rear)

1 set of parts E18p\* of Fs Sk 2186/1

For teleprinters with numeric keyboard (protective cover with keyboard protection plate)

1 set of parts E18r\* of Fs Sk 2186/1

For teleprinters with numeric keyboard and 8-point plug-type connector (protective cover with keyboard protection plate and enlarged cable lead-through at the rear)

1 set of parts E18sa\* of Fs Sk 2186/1

In order to reduce still further the operating noise of the Teleprinter 100, it is possible to paste a sound-absorbent lining to the inside of the protective cover and to apply a lining to the tapetransmitter attachment. This lining is contained in the teleprinters and tapetransmitter attachments delivered from mid-July 1964 onwards. Further it is possible to paste this sound-absorbent lining to machines which have already been supplied before this date.

For this purpose the following parts are required:

For the teleprinter

1 set of parts T Fs 72-07080

For the tapetransmitter attachment

1 set of parts T Fs 72-07081

Detailed instructions on the installation of the sound-absorbent lining are contained in the Installation Instructions Fs Ea 2186/12.

\* Implies that the desired color shade of the protective cover and the assignment of keys in the special function key assembly should be stated.



## **2. OPERATION**

### **2.1. Opening and closing lid 2007/1**

To open lid 2007 depress the two pushbuttons 2008 provided on the right and left sides and lift lid 2007 up to its stop. Lid 2007 is held in this position. For closing lift lid 2007 up to its stop position and push lid bracing bar 2009 backward. Tilt lid 2007 down, slightly depress until catches 2010 of pushbuttons 2008 engage in latch plates 2011.

### **2.2. Paper roll carrier 5/1**

For inserting the paper roll consult Index II or operating instructions Fs Wa 2186/1 EV. Relevant instructions are also found inside lid 2007 of the protective cover.

### **2.3. Vizer 2013/1**

Vizer 2013 is pivot-mounted on pins 2014 and 2015 and can be set according to the prevailing light conditions.

## **3. INSTALLATION AND REMOVAL OF METAL COVER 2000/250**

Prior to starting work pull the power and telegraph plugs from their wall outlets.

Installation: Install the two cover mounting blocks 2003/2 using two fillister head screws 426 each, washers and lock washers. If it is intended to interchange the protective covers, dimensions specified in Fig. 3 must be observed when installing mounting blocks 2003. Both cover mounting blocks 2003/2 are provided with solder tags to which one cable 2005 each is to be soldered. Place the cable shoes of each cable 2005 under the hexagon screws 51 of the mounting base and screw them down (protective ground of protective cover). Pull sealing ring 2002 over bottom plate 41. Make sure that the adhesive stress is evenly distributed.

Mount protective cover 2001/1, and screw in onto cover mounting blocks 2003/2 by means of the two recessed-neck screws 2006 making sure that it is centered on the bottom plate. Insert the power and telegraph plugs into their associated sockets. Check whether special function keys for RUN OUT (...), release of answerback unit (◇) and internal illumination ( ) function properly.

Removal: Loosen both recessed-neck screws 2006/1 and detach protective cover 2001. All other parts remain in place.

## **4. REMOVAL AND REPLACEMENT OF MAJOR ASSEMBLIES**

Prior to starting work pull the power and telegraph plugs from their wall outlets.

### **4.1. Vizer 2013/4**

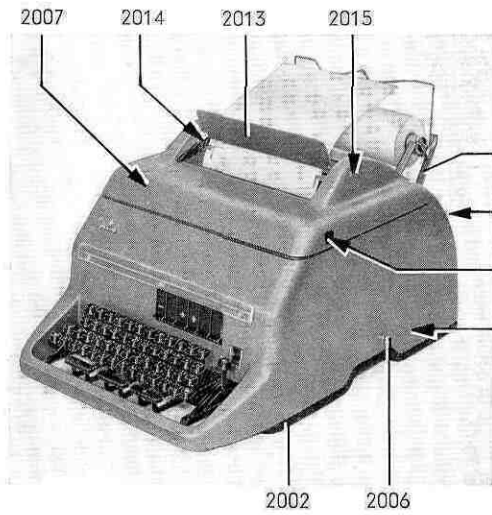
Removal: Push left bearing pin 2014 into lid 2007 and pull vizer 2013 out of the two bearing pins 2014 and 2015.

Replacement: Grooves of bearing pins 2014 and 2015 must be in alignment with each other. Press left bearing pin into lid 2007, and replace vizer 2013.

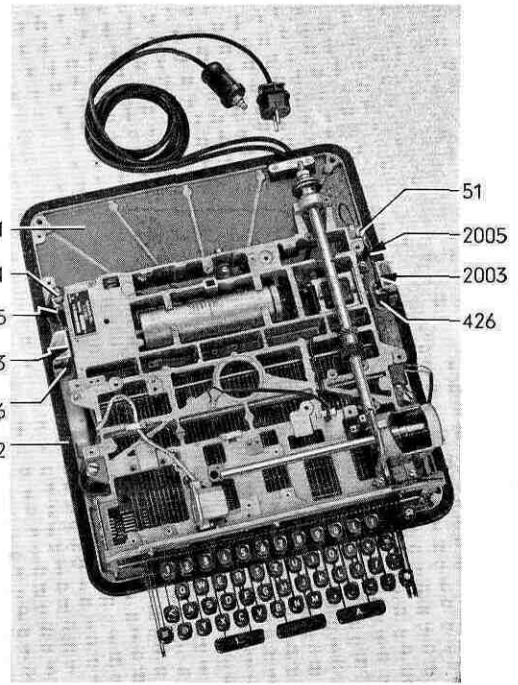
### **4.2. Paper Guide 2023/4**

Removal: Loosen the knurled nuts of clamping members 52 on both sides of the paper roll support 2012 and pull paper guide 2023 downward and out.

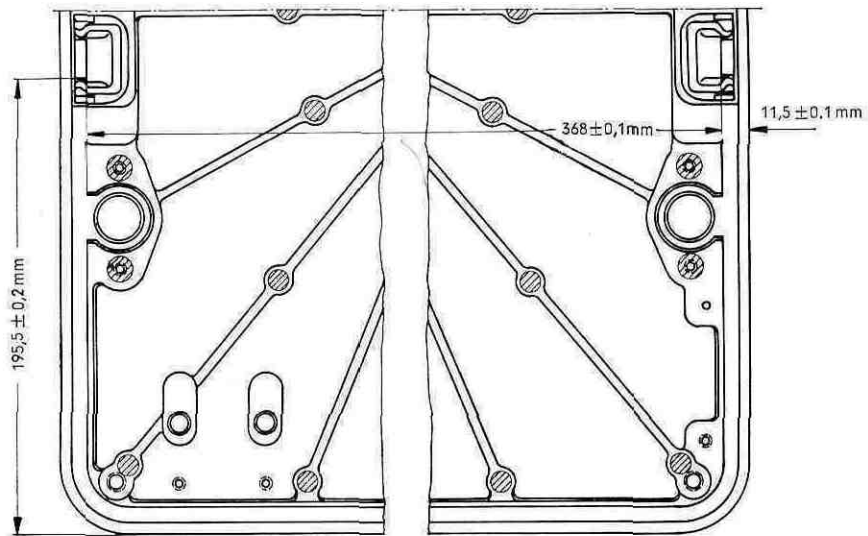
Replacement: Mount paper guide 2023 from below on the extensions of clamping members 52 and tighten with knurled nuts.



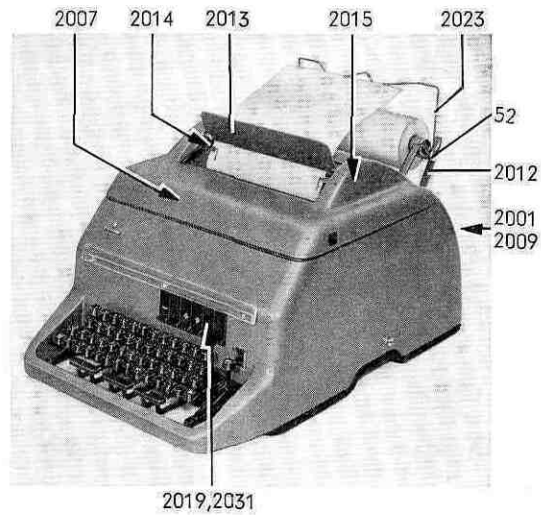
1



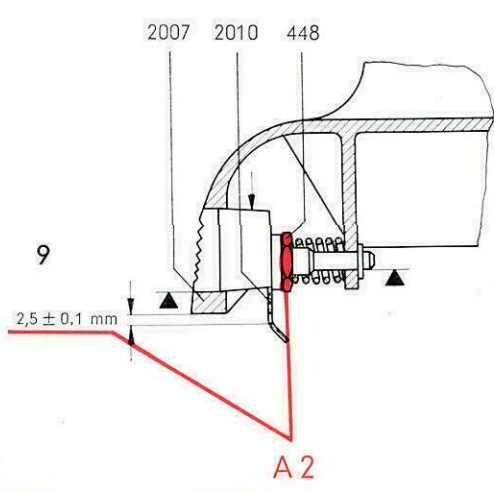
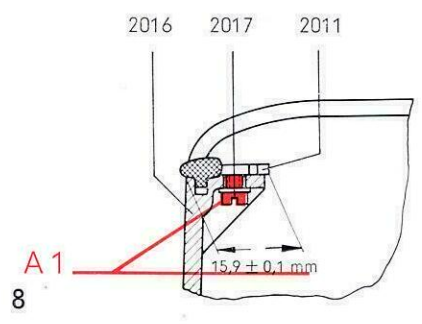
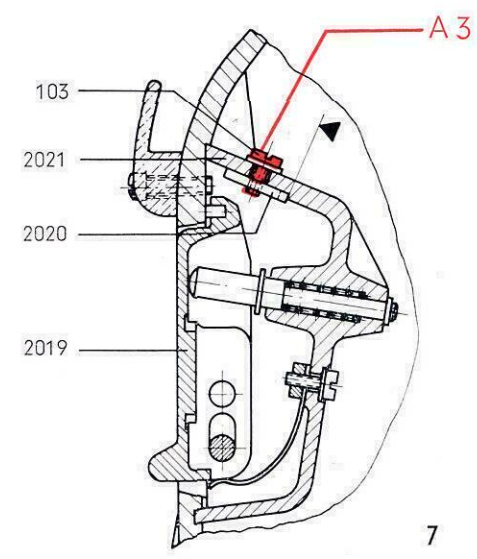
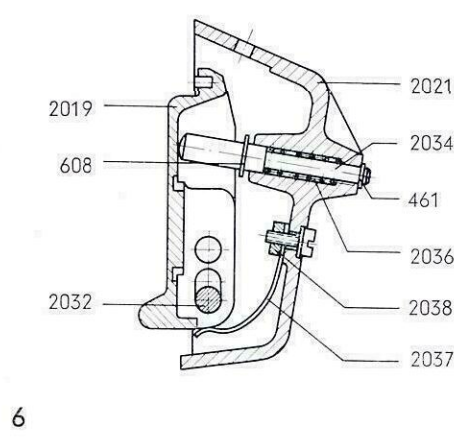
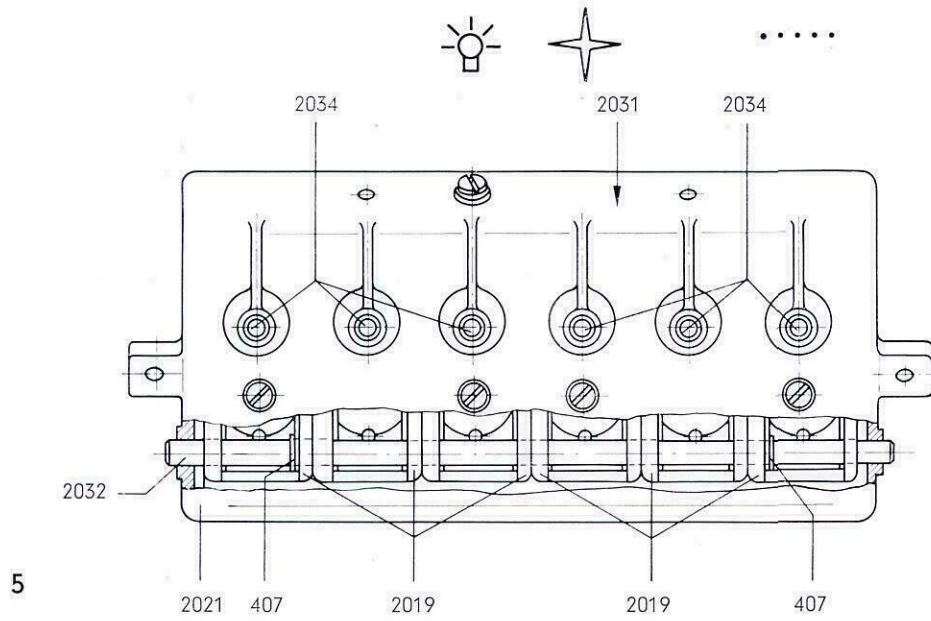
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4

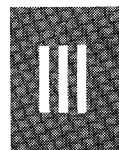


10

#### 4.3. **Keys 2019/5**

Removal: Remove mounting screws for special function key assembly 2031 from protective cover 2001/4. Lift special function key assembly 2031/5 off the cutout of protective cover. Remove keys 2019 with shaft 2032 from key frame 2021. Keys 2019 can be exchanged by pulling off retainers 407 and pulling out shaft 2032. Pin 2034/6 can be pulled out of key frame 2021 together with retainer 608 and pressure spring 2036 after pulling off retainer 461. Detach spring 2037 after removing rail 2038.

Replacement: Slide keys 2019/5 onto shaft 2032 and secure with retainers 407. If a key 2019/6 is to be blocked, pin 2034 pressing against key 2019 must be provided with a retainer 608. (Pins 2034 resting against a key that is unblocked must not be provided with a retainer 608). Press shaft 2032 with keys 2019 into the guide of key frame 2021. To place keys 2019 properly into their position, pin 2034 is kept in position by retainer 461.



### 5. **ADJUSTMENTS**

Prior to starting work pull the power and telegraph plugs from their wall outlets.

#### A1 Latch 2011/8

The dimension between latch plate 2011 and the outer edge of cover 2016 should be  $15.9 \pm 0.1$  mm.

Adjustment: Displace latch plate 2011 after loosening fillister head screws 2017.

#### A2 Catch 2010/9

The clearance between the cutout in catch 2010 and the bottom edge of lid 2007 should be  $2.5 \pm 0.1$  mm.

Adjustment: Loosen nuts 448 and displace catch 2010.

#### A3 Latching of key 2019/7

Retainer plate 2020 is provided to latch a fixed key 2019. It should rest against the cast-iron edge of the key frame.

Adjustment: Place retainer plate 2020 against the edge of key frame 2021 and tighten fillister head screw 103.

### 6. **ATTACHMENTS TO ALL PROTECTIVE COVER TYPES**

#### **Paper deflecting plate 2039/10**

Removal and replacement as with paper guide 2023/4, para. 4.2.







COPY CLAMP FOR  
PROTECTIVE COVER OR  
FLOOR-TYPE CABINET

**1. GENERAL**

The Copy Clamp, a wire bail the design of which is dependent on the type of housing, is intended to press the copy on the sloping front of the cover.

**2. ATTACHING COPY CLAMP TO PROTECTIVE COVER OR FLOOR-TYPE CABINET**

For field installation of the copy clamp the following parts are required:

For the protective cover or the "floor-type cabinet 195"

1 copy clamp 2105	E22 with U1
-------------------	-------------

For the "floor-type cabinet 202" (without side compartment)

1 copy clamp 2106	E22 with U2
-------------------	-------------

For the „floor-type cabinet 189" (with side compartment)

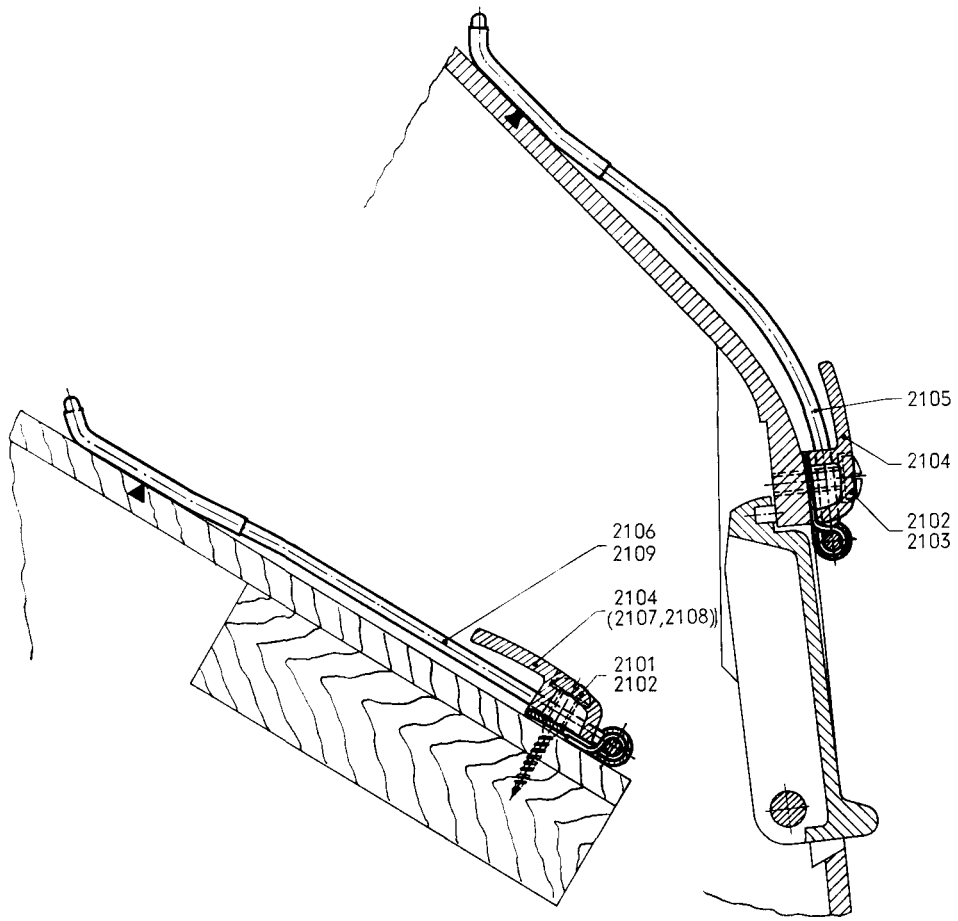
1 copy clamp 2109	E22 with U3
-------------------	-------------

The reference letters "E" and "U" refer to Fs Sk 2186/1.

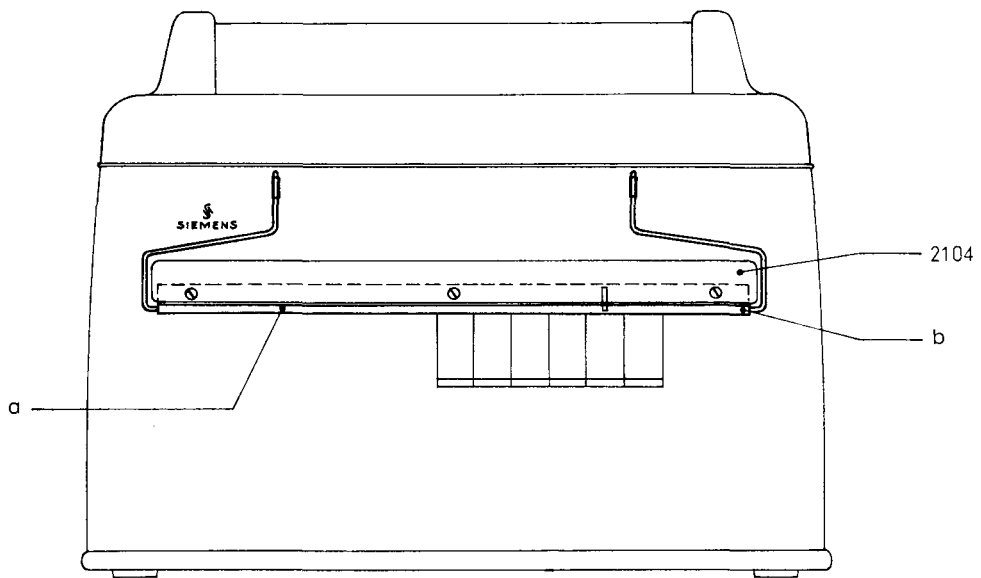
Loosen mounting screws 2103/1 with washers 2102 or half round wood screw 2101 and remove plastic strip 2104/1, 2 or 2107, 2108/1. Turn bail of copy clamp 2105 (for protective cover and "floor-type cabinet 195") or 2106 (for "floor-type cabinet 189") or 2109 (for "floor-type cabinet 202") four times by 360° so that the copy clamp 2105, 2106 or 2109 is tensioned. Make sure that the eye of the torsion spring is placed round pin a/2 and that this pin engages in the left slot in plate "b".

Slide plate "b" below strip 2104 and secure both together with the screws. The free end of the torsion spring must be held in the recess in plate "b" provided for this purpose to ensure correct positioning of strip 2104.

The two rubber-bonded ends of the bail must rest against the protective cover or against the floor-type cabinets to hold the copy safely in place.

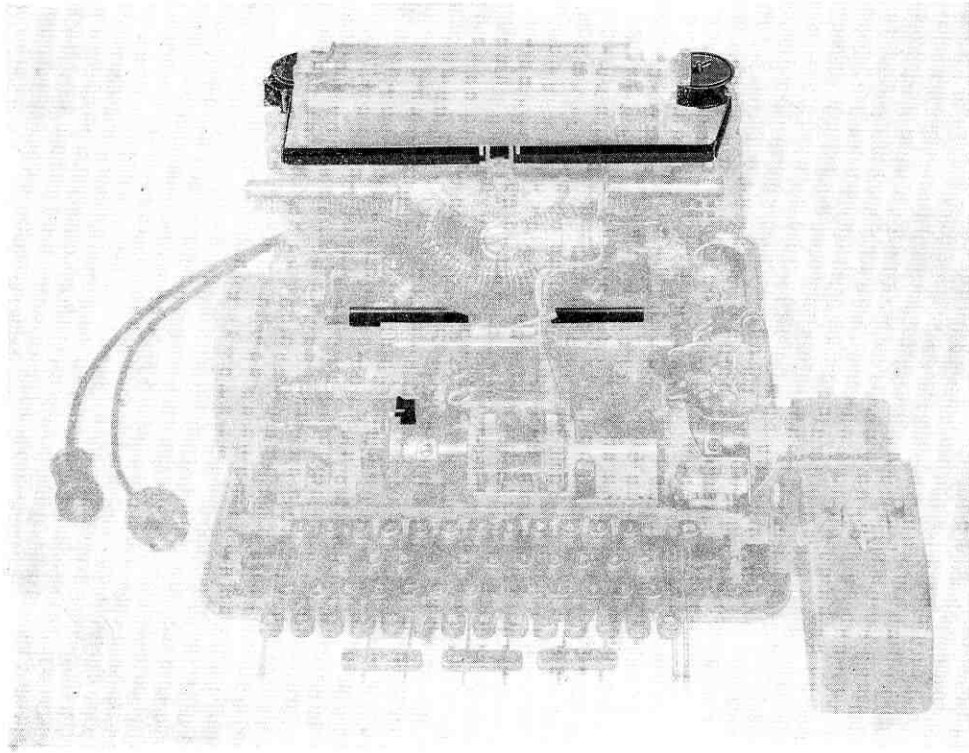


1



2





V

TWO-COLOR PRINTING DEVICE

**C O N T E N T S**

	Page
<b>1. General</b> . . . . .	3
<b>2. Installation and Removal of Parts</b> . . . . .	4
2.1. Installation of the mechanically controlled two-color printing device	4
2.2. Removal of mechanically controlled two-color printing device .	4
2.3. Magnetic control of two-color printing device . . . . .	7
<b>3. Adjustments</b> . . . . .	11
<b>4. Circuit and Wiring Diagrams</b> . . . . .	17

**1. GENERAL**

The two-color printing device has been designed to record outgoing messages in red and incoming ones in black. This offers special advantages in question-and-answer traffic. At a glance the operator is able to distinguish between outgoing and incoming messages.

Usually the two-color printing device is controlled by the keyboard transmitter of the teleprinter (mechanically controlled two-color printing device). In special applications these control functions are taken over by an additionally installed control magnet (magnetic control of the two-color printing device).

For installing the mechanically controlled two-color printing device the following parts are required:

For a Teleprinter 100 (basic version)  
1 set of parts E30

For a Teleprinter 100 with storage transmitter  
1 set of parts E30 with U2

For installing the magnetic control the following parts are required:

For a Teleprinter 100 with tapetransmitter attachment  
1 set of parts E30 with U1

For a Teleprinter 100 in combination with a self-contained or externally controlled tapetransmitter or for connexion to an earlier remote control unit  
1 set of parts E30 with U1 and U3

For a Teleprinter 100 (receive-only version), connected by means of the free transmitter wires a and b of the telegraph line  
1 set of parts E30 with U1 and U5

For a Teleprinter 100 in combination with a self-contained tapetransmitter, connected to a remote control unit "N" or "NL"  
1 set of parts E30 with U1 and U7

For a Teleprinter 100 in combination with a data processing system  
1 set of parts E30 with U1 and U8

The reference letters "E" and "U" refer to the Fs Sk 2186/1.





## 2. INSTALLATION AND REMOVAL OF PARTS

Prior to starting work pull the power and telegraph plugs from their wall outlets.

### 2.1. Installation of the mechanically controlled two-color printing device

To install the parts for two-color printing, the printer must be removed. Then the type basket carriage must be removed from the printer (see Index II).

#### 2.1.1. Printer

Remove guide bar 109/2 and rail 113. Pull axle 429/1 approx. 10 mm forward. Push a felt washer 446a/1 on each axle a, b/1, 2. Hook up control bar 2137/1, 2, 3 with tension spring 546/1 (engaged at the right) at the ends "a", "b" of the axle. Then push back axle 429, so that it engages control bar 2137 from the right. Screw on lever 2138/1, 2 and pawl 2142 with fillister head screw 372 (lacquer-coated), push it with a felt disk 446b on the axle c and secure with retainer 362/1. Mount end of tension spring 546 on pawl 2142.

Fasten locking bracket 2145/1 at point "d" (Fig. 13) to the bearing frame of the printer by means of fillister head screw 11/3. The free end of the bracket must point downwards, if the two-color printing device is operative. Screw on again guide bar 109/2 and rail 113.

Push lever 2151/3 (2160 if a storage transmitter is used) on the left stub-end of the shaft with lever 259 and secure with retainer 399. Engage tension spring 243 between lever 2151 (2160) and shaft with lever 259.

#### 2.1.2. Type basket carriage

Unhook springs from the pull bars in the type basket carriage, loosen type bar support and type bar segment from the type basket (see Index II).

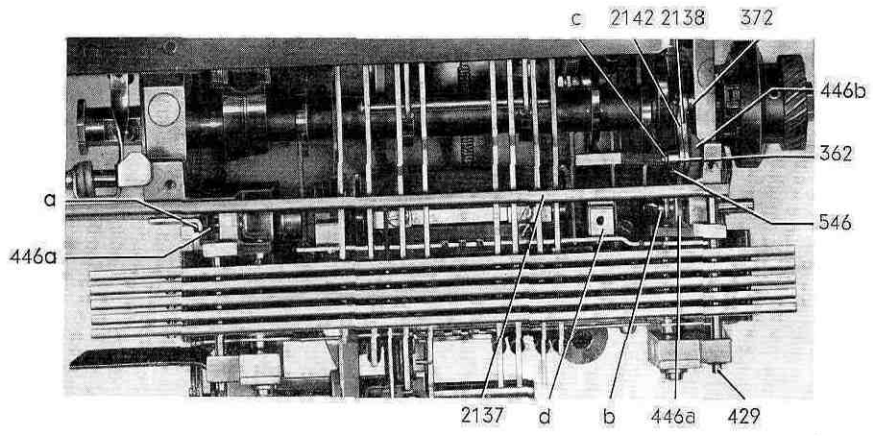
Remove fastening screw (not visible) of axle 467/4, 12, push axle slightly back and mount lever 2136 with pin 2139 (not visible) on the axle. Push axle back and screw tight. Then replace type bar support and type bar segment into the type basket and install springs.

Fasten again printer with type basket carriage to the mounting frame (see Index II).

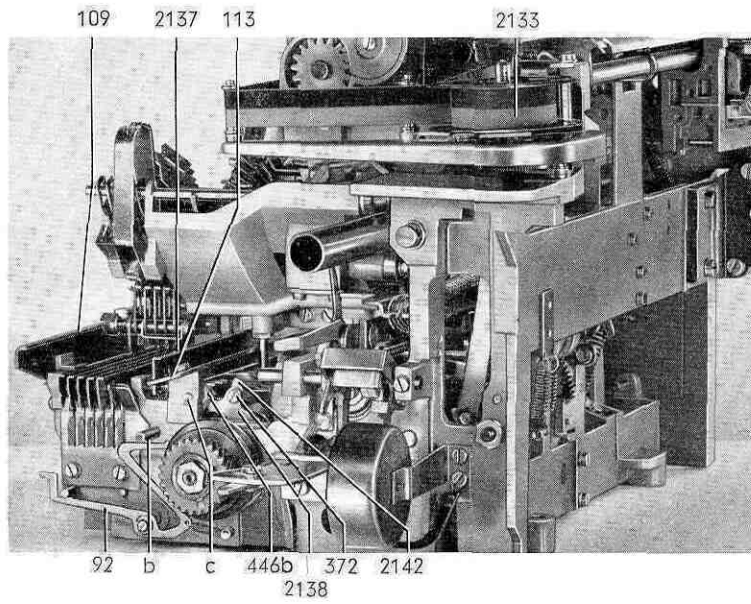
Observe adjustment A4.

### 2.2. Removal of mechanically controlled two-color printing device

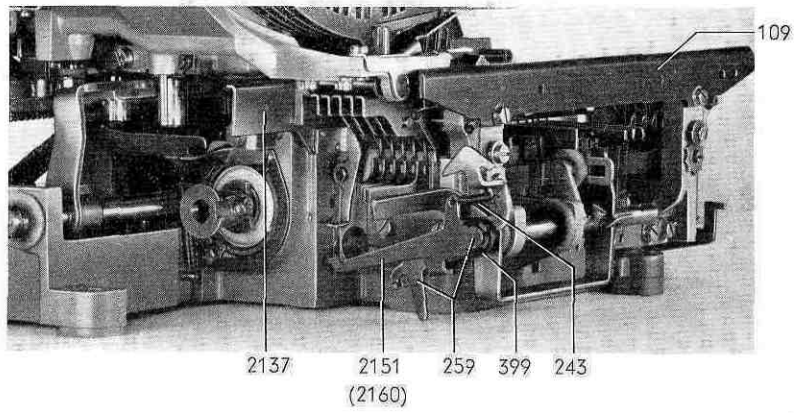
Reverse the above procedure.



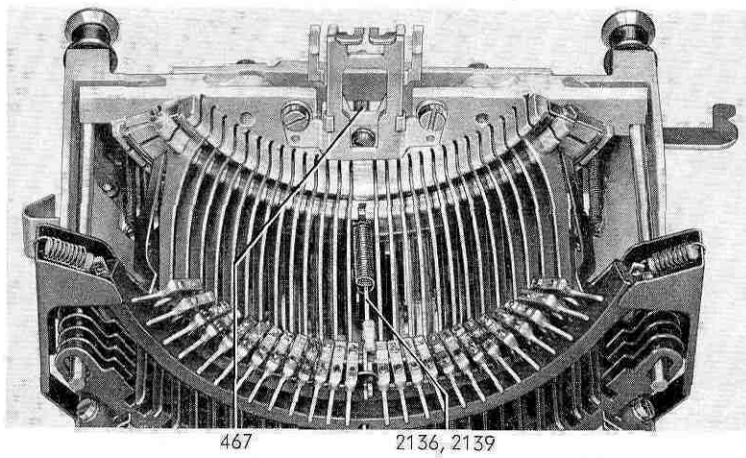
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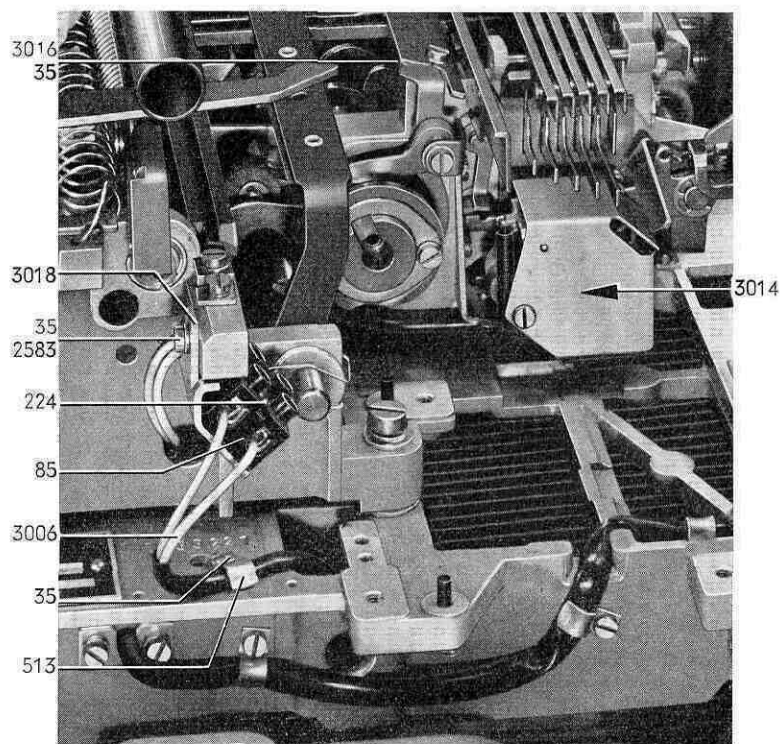
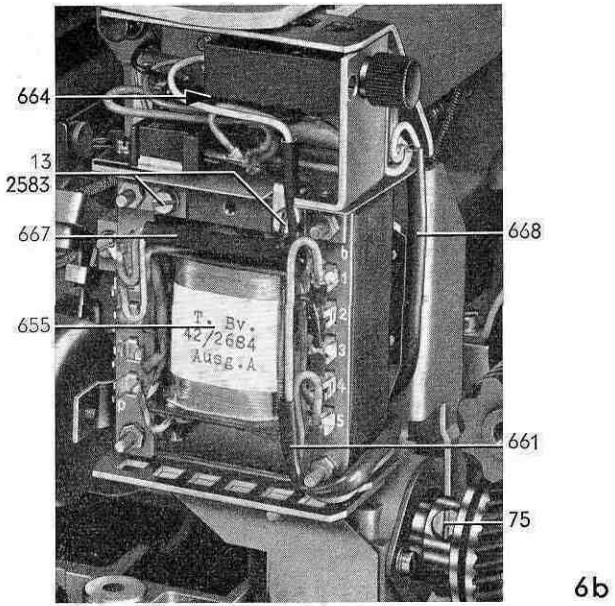
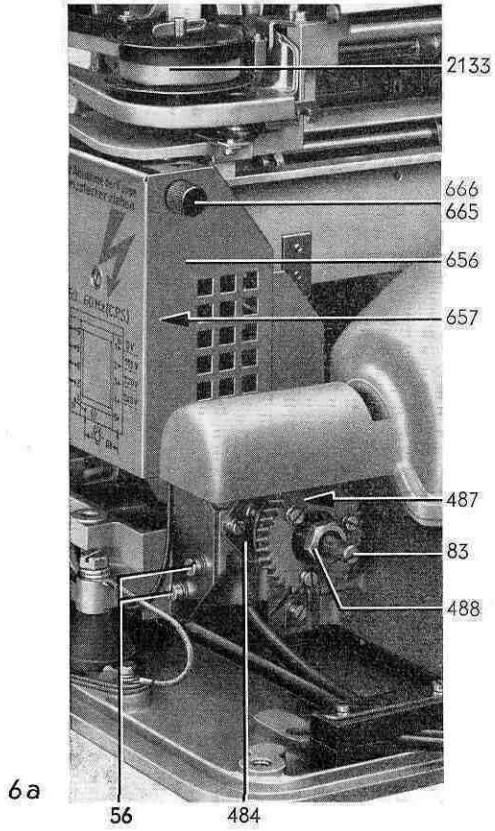
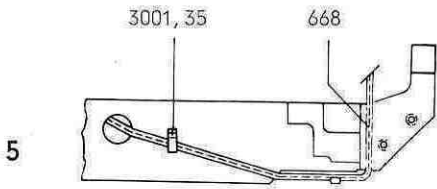


3



4





### 2.3. Magnetic control of two-color printing device

For installing the magnetic control of the two-color printing device remove the printer (see Index II).

#### 2.3.1. For teleprinters with tapetransmitter attachment (U1)

##### 2.3.1.1. Insert 664/6b in power supply unit 657/6a

Remove hexagon nut 488 and fillister head screw 75/6b and pull gear sleeve 487/6a with flange off transfer shaft 83. Loosen fillister head screw 34 (not visible) on the right side of cover 484, the two fillister head screws 56 and take power supply unit 657 off the keyboard.

Remove cap 656 of power supply unit 657. Fasten insert 664/6b with two fillister head screws 13 and two lock washers 2583 on transformer 655. Connect cable 668 to insert 664 as shown in Fig. 27 (K1 in Fig. 27) and fix it together with cable 661 (K7 in Fig. 27) by means of cable clamp 658/27 onto the mounting bracket. (When installing the insert for the first time, cable clamp 658 will be used additionally instead of cable clamp 2422 (not illustrated). Connect cable 667/6b to insert 664/6b and to the transformer as shown in Fig. 27 (K2 in Fig. 27).

Fix cap 656/6a again onto power supply unit 657 and screw in fuse 665 with screw cap 666. Fasten power supply unit 657 again on the base plate by means of the two fillister head screws 56. Place cable 668/5 as shown in Fig. 5, fix it onto the mounting bracket by means of fillister head screw 35 and cable clamp 3001 and connect it to the keyboard according to Fig. 27. Mount cover 484/6a with fillister head screw 34 (not visible). Push gear sleeve 487 with flange onto transfer shaft 83 and tighten hexagon nut 488. Then fix gear sleeve with fillister head screw 75 on the transfer shaft.

##### 2.3.1.2. Magnet assembly 3014/7 (two-color magnet)

Installation: Place magnet assembly 3014 against the printer so that pin b/18 engages below lever h.

Screw magnet assembly 3014/7 on the threaded plate 3016 resting against the printer frame, with two fillister head screws 35 (not visible), two lock washers 2583 (not visible) and two washers 2592 (not visible).

Observe the adjustments A12 to A16.

Connect cable 3006/7 according to Fig. 27 (K3 in Fig. 27).

Removal: Reverse the above procedure.

##### 2.3.1.3. Terminal block 85/7

Installation: Mount bracket 3018 by means of fillister head screw 35 and lock washer 2583 onto the printer frame. Place terminal block 85 against bracket 3018 and fix it by means of fillister head screw 224. Install the electrical connexions according to Fig. 27.

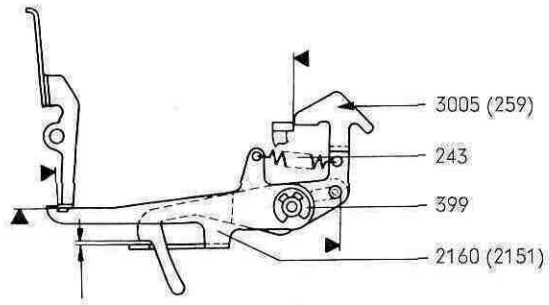
Removal: Reverse the above procedure.

##### 2.3.1.4. Tapetransmitter attachment (not shown)

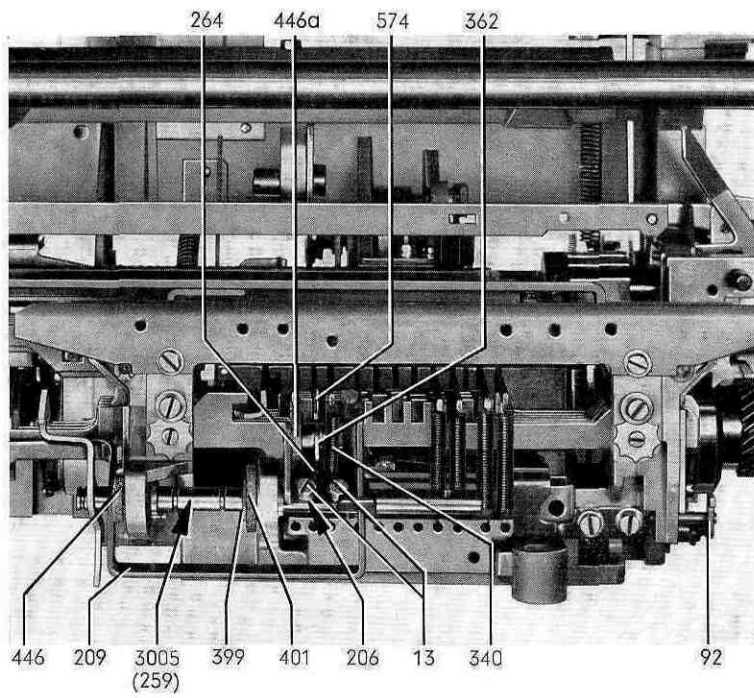
Install and remove the tapetransmitter attachment to the Teleprinter 100 according to the Installation Instructions Fs Ea 2187/3 DW. For the electrical connexions see Fig. 26.



- 2.3.2. For teleprinters equipped for interoperation with self-contained or externally controlled tapetransmitter or for connection to an earlier remote control unit (U3).  
In such case, the 2-wire connecting line 3003/28 (K25) with plug is used additionally; it is screwed onto terminals 16 and 17 of the keyboard.
- 2.3.3. For receive-only teleprinters connected by means of the free transmitter wires a and b of the telegraph line c/29 (U5).  
Instead of the connecting line 3003/28 specified under Item U3, one strap 3004/29 (II) each is soldered between solder terminals 16—9 and 17—10. The remaining wiring corresponds to U1.
- 2.3.4. For teleprinters designed for interoperation with a self-contained tapetransmitter connected to a remote control unit "N" or "NL" (U7).  
A 4-wire connecting line is connected to solder terminals 16, 17, 19, 20 according to Fig. 28.
- 2.3.5. For teleprinters designed for interoperation with a data processing system (U8).  
Shaft with lever 259/3 in the printer is exchanged by release shaft with lever 3005/9.  
Disengage tension springs 264 and 340. Remove retainers 362 and 399. Loosen the two fillister head screws 13 and pull lever 206 with felt washer 446a off feed rack 574. Slowly remove shaft with lever 259 from the printer frame, pulling it out the left and, in doing so, take off the following parts: Felt washers 446, 401 and bracket 209.  
Install release shaft with lever 3005 in the reverse sequence as the removal of shaft with lever 259.  
Push lever 2151/8 in position and fasten it with retainer 399. Install magnet assembly 3014/7 according to para. 2.3.1.2.  
Observe the adjustments A3, A17 and A18.

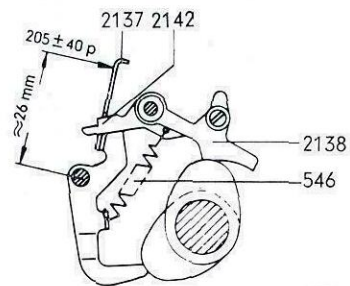
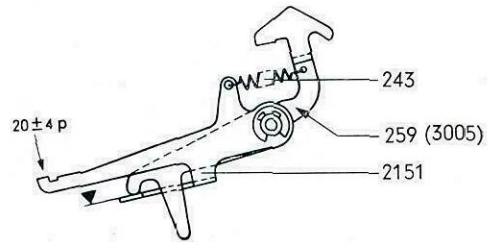
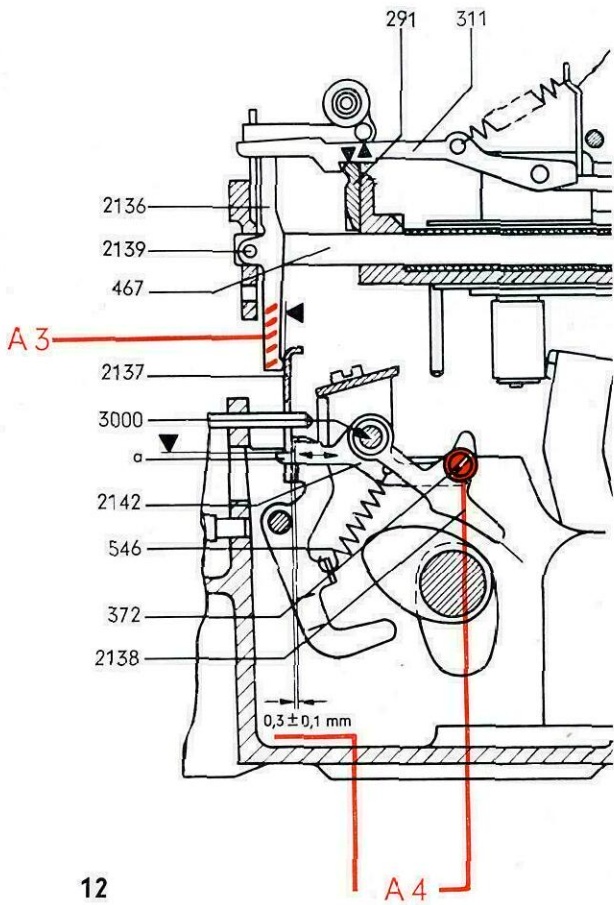
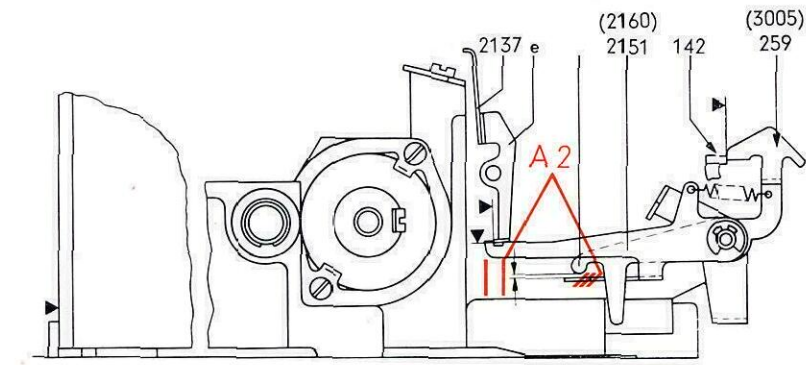
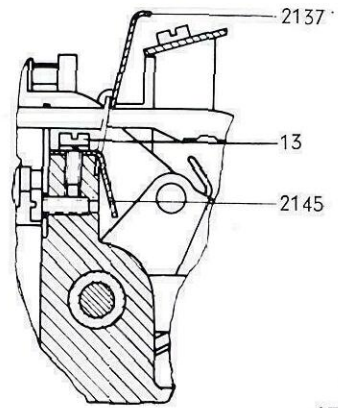
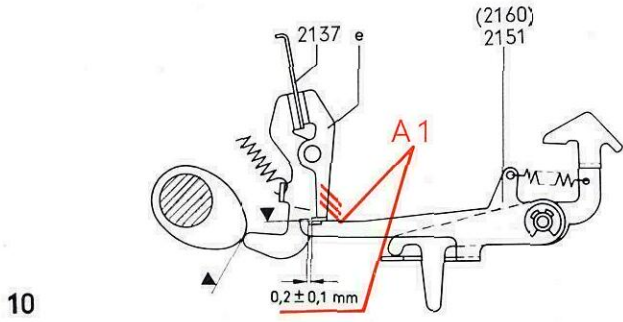


8



9





### 3. ADJUSTMENTS

Prior to starting the adjustments pull the power and telegraph plugs out of their wall outlets.

A1 to A10 Mechanically controlled two-color printing device

- A1 Control bar 2137/10  
When the right lever of control bar 2137 is in its highest cam position, i. e. the control bar is in its rearmost position, the clearance between the left lever e of control bar 2137 and the lever 2151 (2160) pushed against it should be  $0.2 \pm 0.1$  mm.  
Adjustment: Bend lever e at the designated point.
- A2 Lever 2151/11  
With the transmitter and the printer in rest position and shaft with lever 259 (3005) placed against lever 142, the distance between lever 2151 (2160) and the protruding end f of shaft with lever 159 (3005) should be  $2.1 + 0.1$  mm, while lever e of control bar 2137 and lever 2151 (2160) are engaged.  
Adjustment: Bend lever 2151 (2160) at the designated point.
- A3 Lever 2136/12  
Printer in rest position and camshaft resting against anti-bounce lever. Disengage lever e/11 of control bar 2137 and lever 2151 (2160) so that lever 2136/12 presses pull bar 311 on pusher segment 291. The control bar 2137 resting against lever 2136 should be in a vertical position (visual check).  
Adjustment: Bend lever 2136 at the designated point. Take care that there is a visible gap between the protruding end a of pawl 2142 and control bar 2137 in horizontal position.
- A4 Lever with pawl 3000/12  
Lever with pawl 3000 is composed of lever 2138 and pawl 2142. With the type basket carriage in beginning-of-line and end-of-line position, the clearance between pawl 2142 — being in the same position as described under A2 — and control bar 2137 should be  $0.3 \pm 0.1$  mm. The carriage should be in its Figures position. Lever 2136 should be in vertical position and support control bar 2137.  
Adjustment: Loosen fillister head screw 372 and shift lever 2142.
- A5 Locking bracket 2145/13  
The free end of locking bracket should point downwards when the two-color printing device is switched on.  
If the two-color printing device is to be switched off for some time, remove fillister head screw and place locking bracket upwards to the position marked with a broken line in the figure. Thereby control bar 2137 is maintained in its rear position.  
  
Spring forces
- (A6) Tension spring 243/14  
Support lever 259 (3005) from below. The force of the tension spring should be  $20 \pm 4$  p at the designated point of lever 2151 (2160).
- (A7) Tension spring 546/15  
Turn camshaft until control bar 2137 reaches its rearmost position. The force of the tension spring should be  $205 \pm 40$  p at the designated point of control bar 2137.





A8 to A10 Ink ribbon lifter 22/16, 17

(A8) Control of the two-color printing device

After having inserted the black-and-red ink ribbon 2153/6a (red half downwards), operate teleprinter by using home and external transmitters (Q and A traffic). Then the following characters must be printed clearly in red (when sent by the home transmitter) and in black (when arriving from the external transmitter):

3 4 5 6 7 9 / ' , ( ) f g j y l

When printing red, the top of the last character l may be positioned a little higher and therefore be printed black. If necessary readjust the ink ribbon lifter 22/16, 17 (adjustments A9 and A10).

In order to print in black without using the external transmitter release the printer by release lever 92/9.

In this case, however, the character to be printed must first be transmitted by the home transmitter.

A9 Red printing position

After having inserted the black-and-red ink ribbon, move type basket carriage to upper position and disengage control bar 2137/16. With pusher 315 in its foremost position the clearance between the imprints of the types "/" and "8" (keys depressed successively by hand) should be 0.3 to 0.6 mm (visual check), measured from the upper edge of the character to the lower edge of the black ink ribbon half.

Take care that lever 2136 be placed against pull bar 311 and pull bar 311 against pusher segment 291.

Adjustment: Remove fillister head screw 35 and shift ink ribbon lifter 22 towards feed rack e.

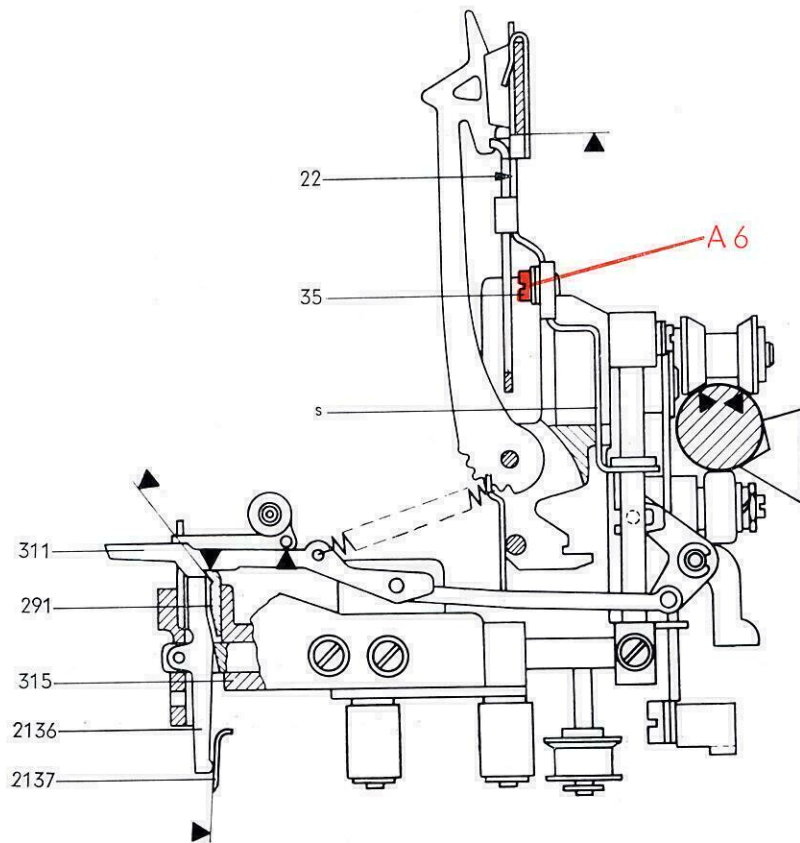
After the adjustment has been made, tighten fillister head screw 35 again.

A10 Black printing position

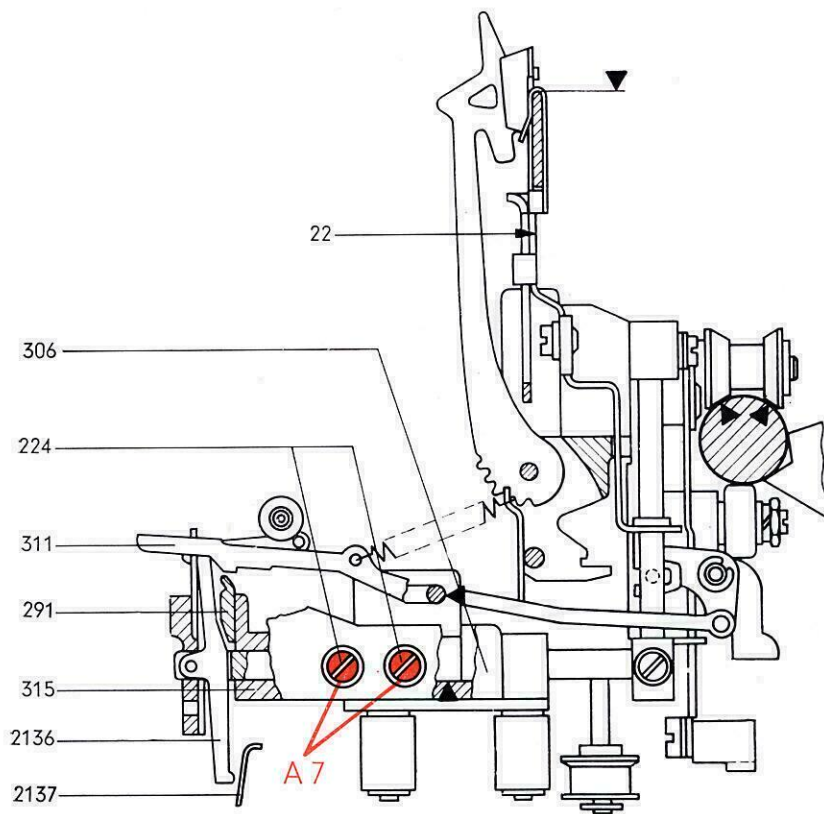
Position of ink ribbon and type basket carriage as described above.

Engage lever e/11 of control bar 2137 with lever 2151. Pull bar 311/17 is out of engagement with pusher segment 291. With the pusher 315 in its foremost position the imprints of the types "/" and "8" (keys depressed successively by hand) should be 0.3 to 0.6 mm below the upper edge of the black ink ribbon half (visual check), when the ink ribbon is tautly placed against the upper part of the lifter.

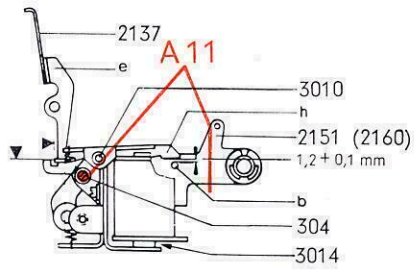
Adjustment: Loosen fillister head screws 224 and shift bracket 306 towards pusher 315. After the adjustment has been accomplished, tighten fillister head screws 224 again.



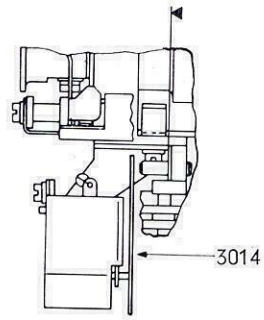
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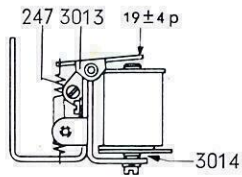
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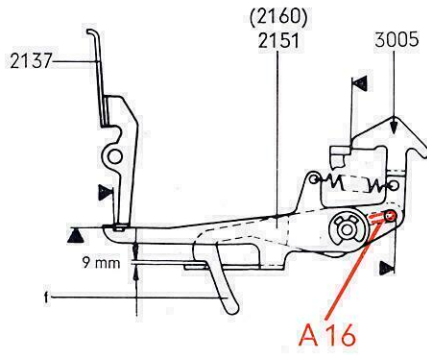
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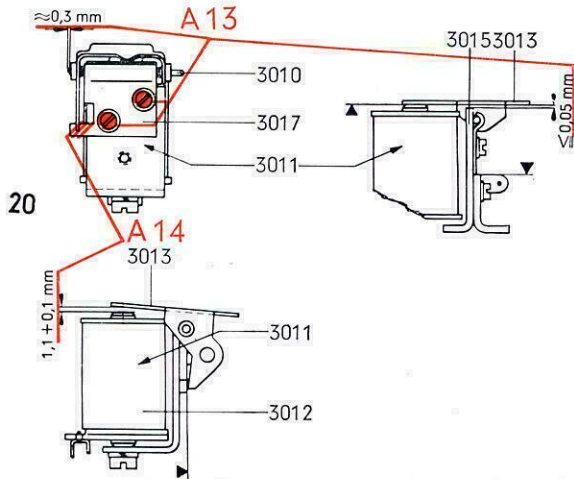
22



19

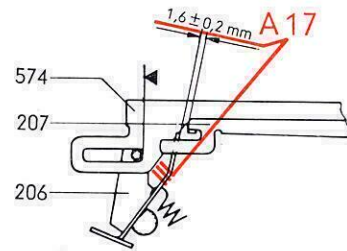


23

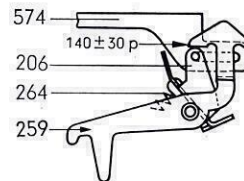


20

21



24



25

A11toA18 Magnetic control of the two-color printing device

A11 Two-color magnet (magnet assembly, complete) 3014/18, 19

The clearance between lever h/18 and pin b of lever 2151 (2160) should be  $1.2+0.1$  mm when the armature is released and the lever 2151 (2160) is engaged with the left lever e of control bar 2137.

Adjustment: Loosen fillister head screw 304 and tilt lever h about axle 3010.

(A12) Tension spring 247/19

Armature plate 3013 should at the designated point be lifted from its released position when applying a force of  $19\pm 4$  p.

A13toA15 Magnet assembly 3011/20, 21

The following adjustments have to be observed in case the magnet assembly 3011 is removed at a later time:

A13 With the armature attracted, the clearance between armature holding plate 3013/20 and magnet yoke 3015 should be  $\leq 0.05$  mm.

Adjustment: Loosen the two mounting screws of clamp 3017 and displace the clamp. Take care that axle 3010 protrudes over the armature holding plate by 0.3 mm approx.

A14 With the armature 3013/21 released, there should be a clearance of  $1.1+0.1$  mm between the armature and the core center of magnet coil 3012.

Adjustment: Bend clamp 3017/20 at the designated point.

(A15) The magnet assembly 3014/22 should rest against the printer at the designated point.

A16 Release shaft with lever 3005/23

If the two color printing device is to be taken out of service for some time (in case of keyboard transmission), the protruding end f of release shaft with lever 3005 should freely pass the end of lever 2151.

Adjustment: Shift the protruding end f of release shaft with lever 3005 in the oblong hole towards the right.

A17 Lever 206/24

Move feed rack 574 to its foremost position by turning the camshaft. There must be a clearance of  $1.6\pm 0.2$  mm between the pull bar 207 and the end of lever 206.

Adjustment: Bend lever 206 at the designated point.

(A18) Shaft with lever 259/25 and tension spring 264

Move feed rack 574 to its foremost position by turning the camshaft. The shaft with lever 259 should be lifted when applying a force of  $140\pm 30$  p at the designated point.





**4. CIRCUIT AND WIRING DIAGRAMS**

- 4.1. Circuit diagram of teleprinter (without receiver and motor) with tapetransmitter attachment and magnetically controlled two-color printing device, U1
- 4.2. Wiring diagram of the keyboard, the two-color magnet and the power supply unit
- 4.3. Circuit diagram of teleprinter with magnetically controlled two-color printing device for interoperation with self-contained or externally controlled tape transmitter or for connection to earlier remote control unit, U3.
- 4.4. Circuit diagram of teleprinter, designed as receiving-only teleprinter with magnetically controlled two-color printing device, connected by means of the free transmitter wires a and b of the telegraph line, U5



#### 4. CIRCUIT AND WIRING DIAGRAMS

##### 4.1. Circuit diagram of teleprinter (without receiver and motor) with tapetransmitter attachment and magnetically controlled two-color printing device, U1

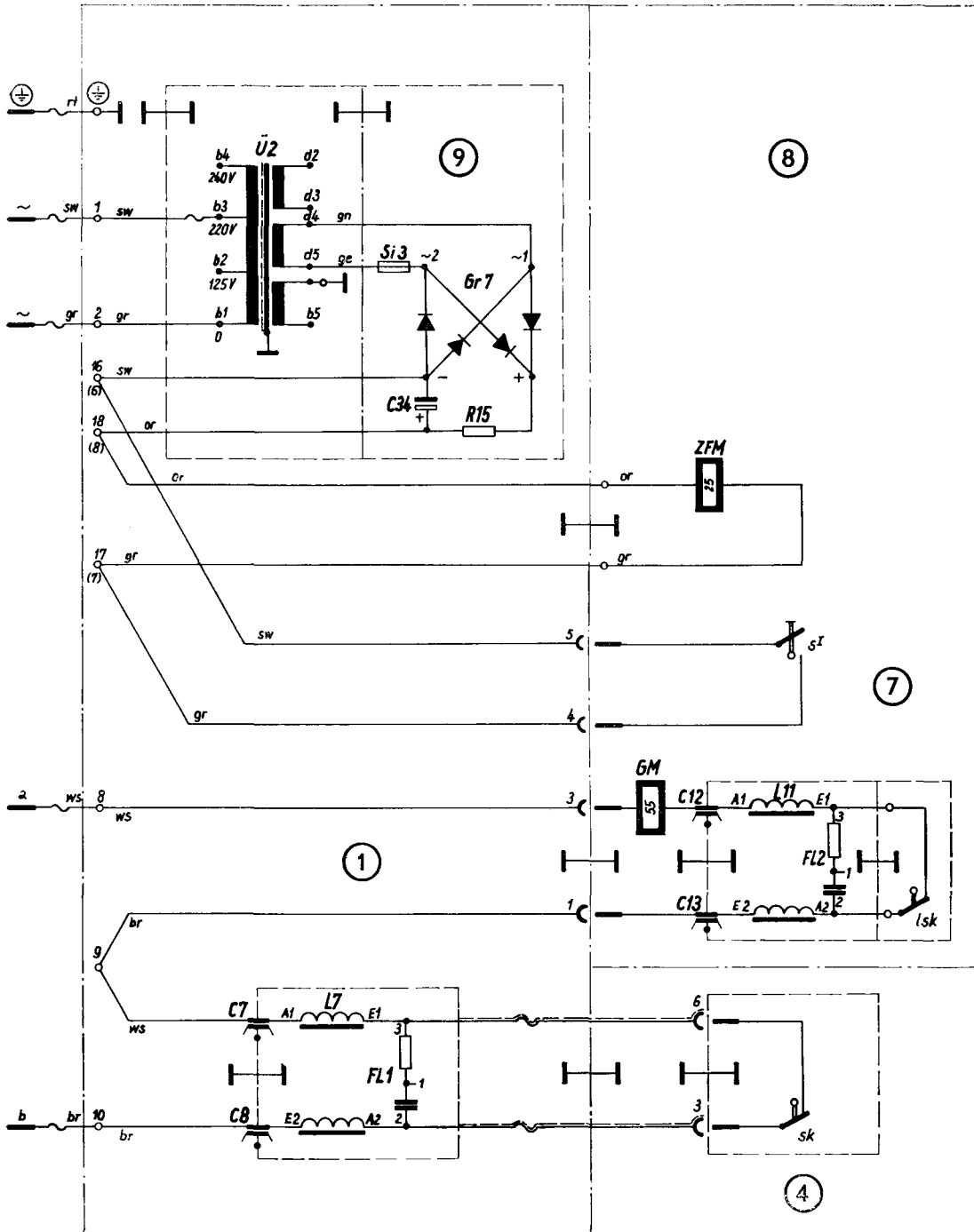
Figure 26

- ① Base plate of the teleprinter  
C7,8 Lead-through capacitor  
L7 RF suppressor choke  
F11 Spark suppressor  
⊖ Protective ground
  
- ④ Transmitter  
sk Send contact
  
- ⑦ Tapetransmitter attachment  
C12,13 Lead-through capacitor  
L11 RF suppressor choke  
F12 Spark suppressor  
GM Automatic break magnet  
sl Control contact of the tapetransmitter attachment  
Isk Send contact of the tapetransmitter attachment
  
- ⑧ Printer  
ZFM Two-color magnet (magnet assembly, consecutive No. 3011)
  
- ⑨ Power supply unit  
C34 Electrolytic capacitor (consecutive No. 3008)  
Gr7 Rectifier (consecutive No. 3007)  
U2 Transformer  
R15 Resistor (consecutive No. 3009)  
Si3 Fuse (consecutive No. 665)

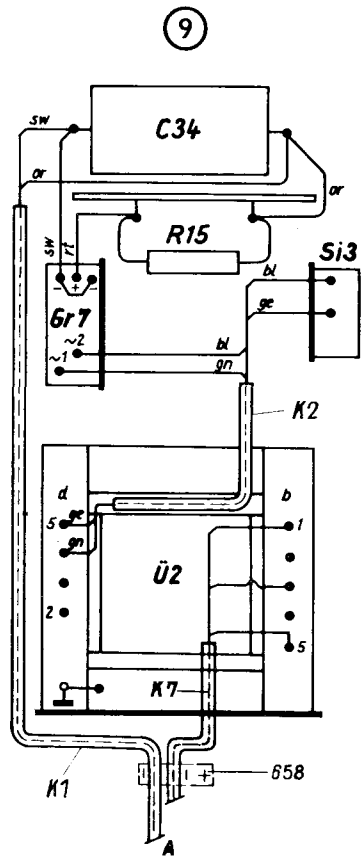
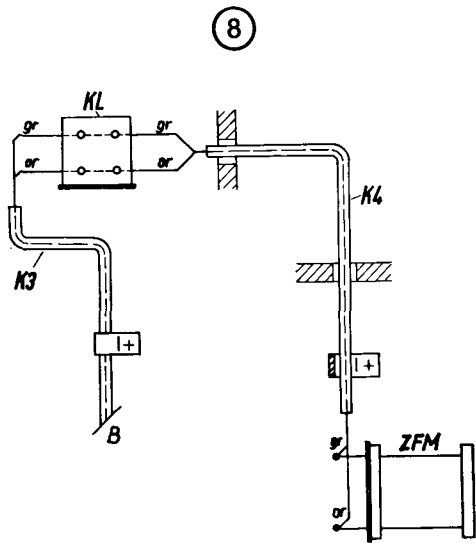
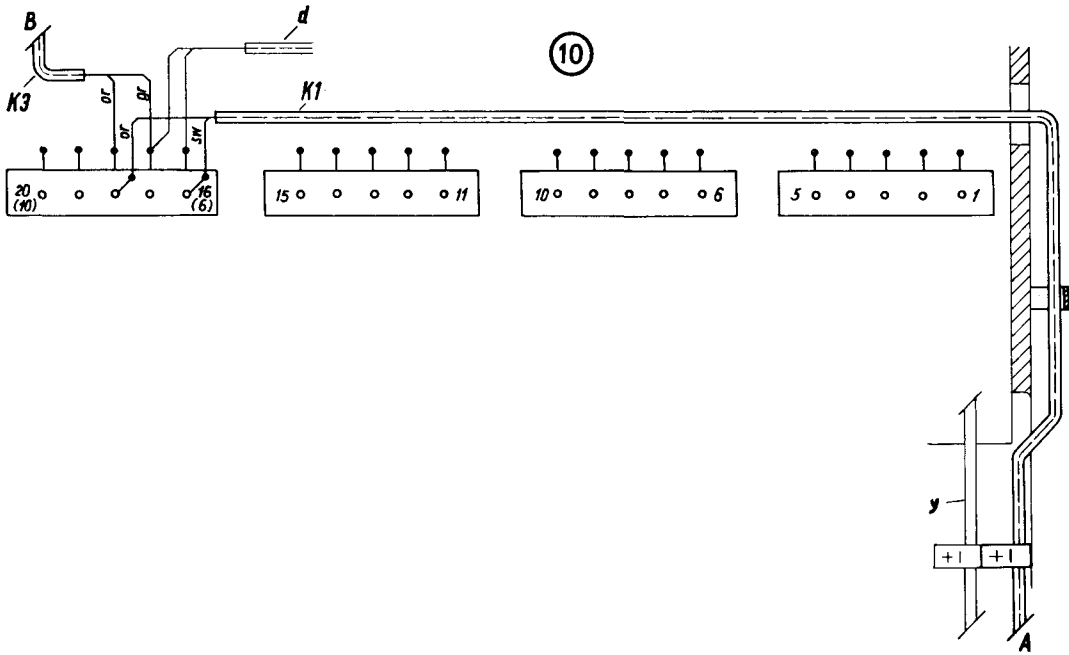
Numbers enclosed in brackets in the circuit diagram refer to connexions with additional solder terminals.

Color code:

br	brown
gr	gray
or	orange
rt	red
sw	black
ws	white







**4.2. Wiring diagram of the keyboard, the two-color magnet and the power supply unit**

Figure 27

y Power line

- ⑧ Printer
  - K3 Connecting cable to the two-color magnet (cable 3, consecutive No. 3006)
  - K4 Cable 4
  - KL Terminal block (consecutive No. 85)
  - ZFM Two-color magnet (magnet assembly, consecutive No. 3011)
  
- ⑨ Power supply unit
  - C34 Electrolytic capacitor (consecutive No. 3008)
  - Gr7 Rectifier (consecutive No. 3007)
  - K1 Cable 1 (consecutive No. 668)
  - K2 Cable 2 (consecutive No. 667)
  - K7 Cable 7 (consecutive No. 661)
  - U2 Transformer
  - R15 Resistor (consecutive No. 3009)
  - Si3 Fuse (consecutive No. 665)
  - 658 Cable clamp
  
- ⑩ Keyboard of the teleprinter (bottom view)
  - d to the tapetransmitter attachment
  - K1 Cable 1 (consecutive No. 668)
  - K3 Connecting cable to the two-color magnet (cable 3, consecutive No. 3006)

Numbers enclosed in brackets in the circuit diagram refer to connexions with additional solder terminals.

Color code:

- bl blue
- ge yellow
- gn green
- gr gray
- or orange
- rt red
- sw black



**4.3. Circuit diagram of teleprinter with magnetically controlled two-color printing device for interoperation with self-contained or externally controlled tape transmitter or for connection to earlier remote control unit, U3.**

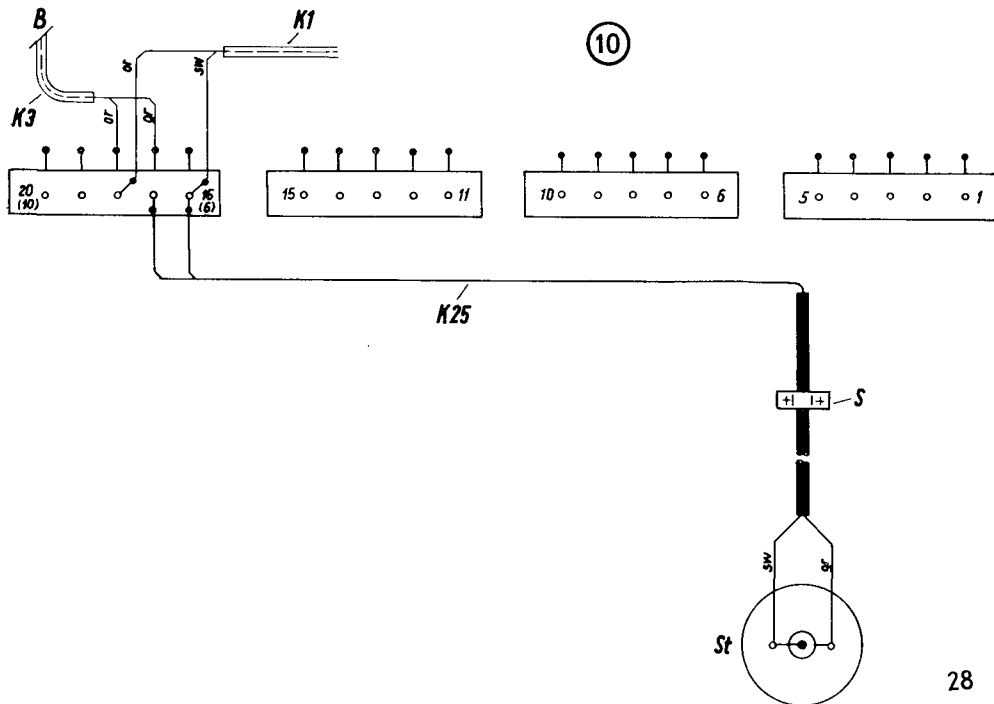
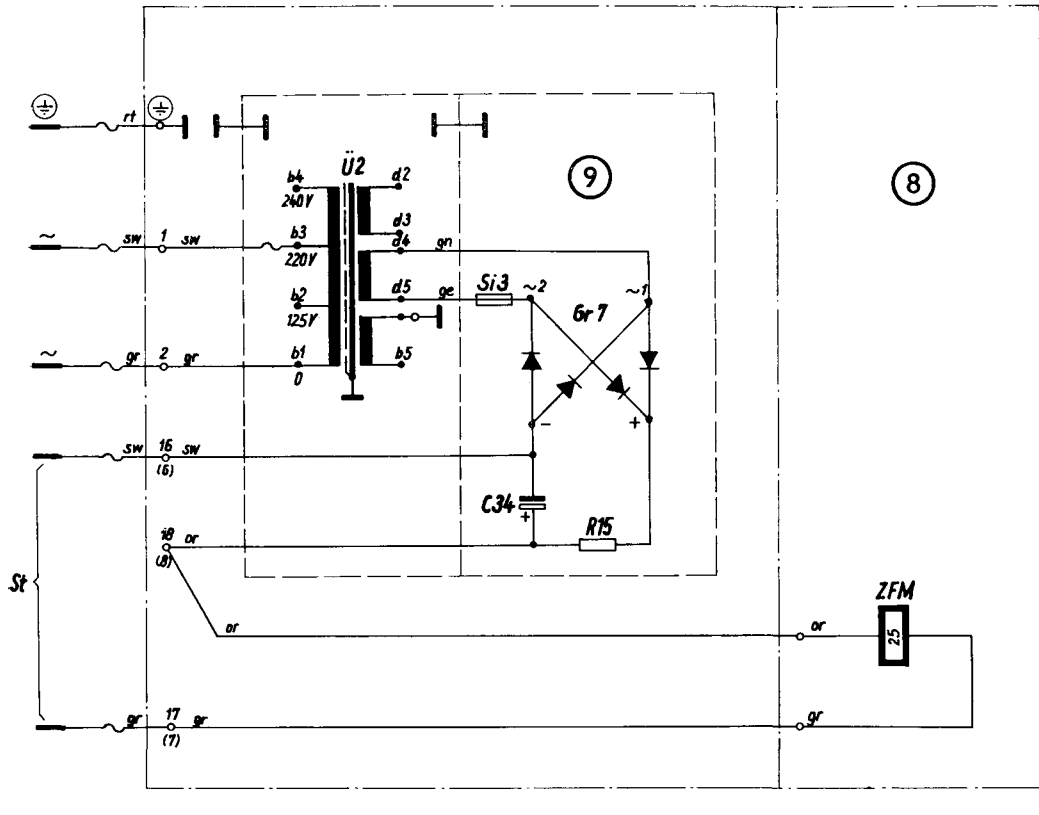
Figure 28

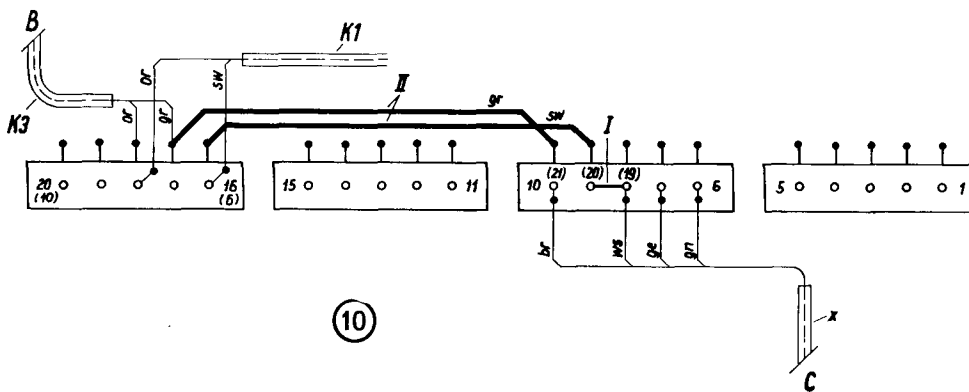
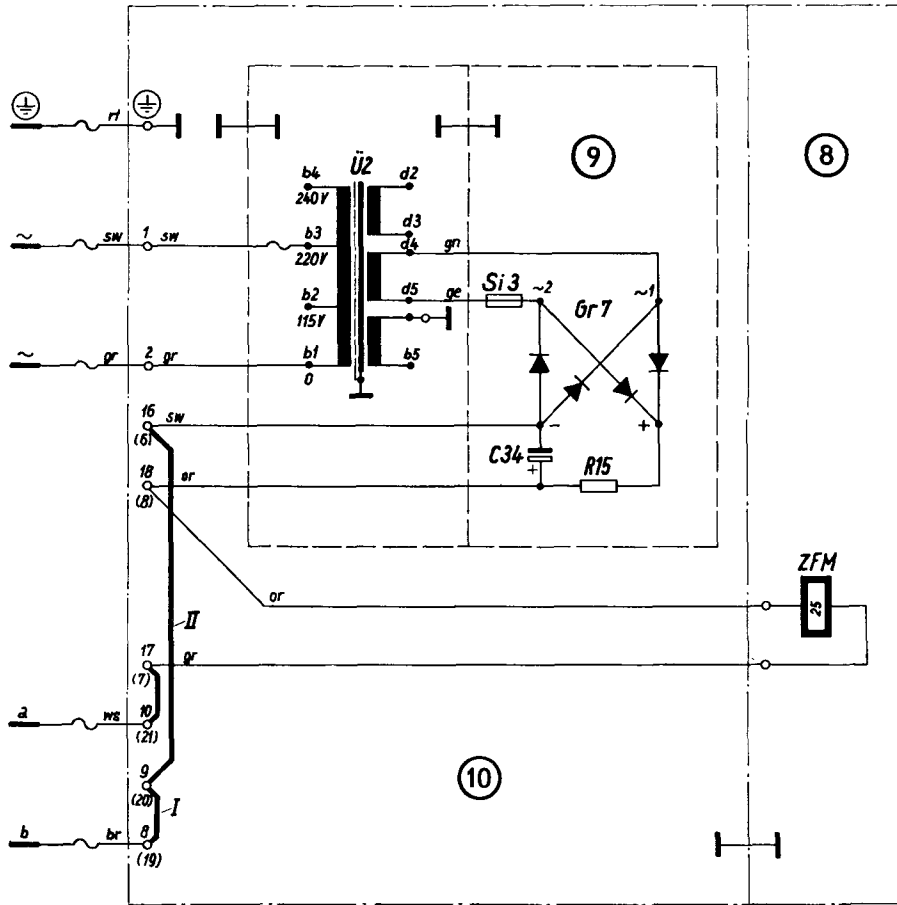
- ⑧ Printer  
ZFM Two-color magnet (magnet assembly, consecutive No. 3011)
  
- ⑨ Power supply unit  
C34 Electrolytic capacitor (consecutive No. 3008)  
Gr7 Rectifier (consecutive No. 3007)  
U2 Transformer  
R15 Resistor (consecutive No. 3009)  
Si3 Fuse (consecutive No. 665)  
St Plug (for connecting line K25)
  
- ⑩ Keyboard of the teleprinter (bottom view)  
K1 Cable 1 (consecutive No. 668)  
K3 Connecting cable to the two-color magnet  
(cable 3, consecutive No. 3006)  
K25 2-wire connecting line, red (consecutive No. 3003)  
S Cable clamp B5 (consecutive No. 3002)  
St Plug (for connecting line K25)  
⊕ Protective ground

Numbers enclosed in brackets in the circuit diagram refer to connexions with additional solder terminals.

Color code:

gr	gray
or	orange
rt	red
sw	black





**4.4. Circuit diagram of teleprinter, designed as receiving-only teleprinter with magnetically controlled two-color printing device, connected by means of the free transmitter wires a and b of the telegraph line, U5**

Figure 29

- x Telegraph line
- ⑧ Printer
  - ZFM Two-color magnet (magnet assembly, consecutive No. 3011)
- ⑨ Power supply unit
  - C34 Electrolytic capacitor (consecutive No. 3008)
  - Gr7 Rectifier (consecutive No. 3007)
  - U2 Transformer
  - R15 Resistor (consecutive No. 3009)
  - S13 Fuse (consecutive No. 665)
- ⑩ Keyboard of the teleprinter (bottom view)
  - K1 Cable 1 (consecutive No. 668)
  - K3 Connecting cable to the two-color magnet (cable 3, consecutive No. 3006)
  - I Strap instead of transmitter and RF suppressor
  - II Wire straps (consecutive No. 3004)
  - ⊕ Protective ground

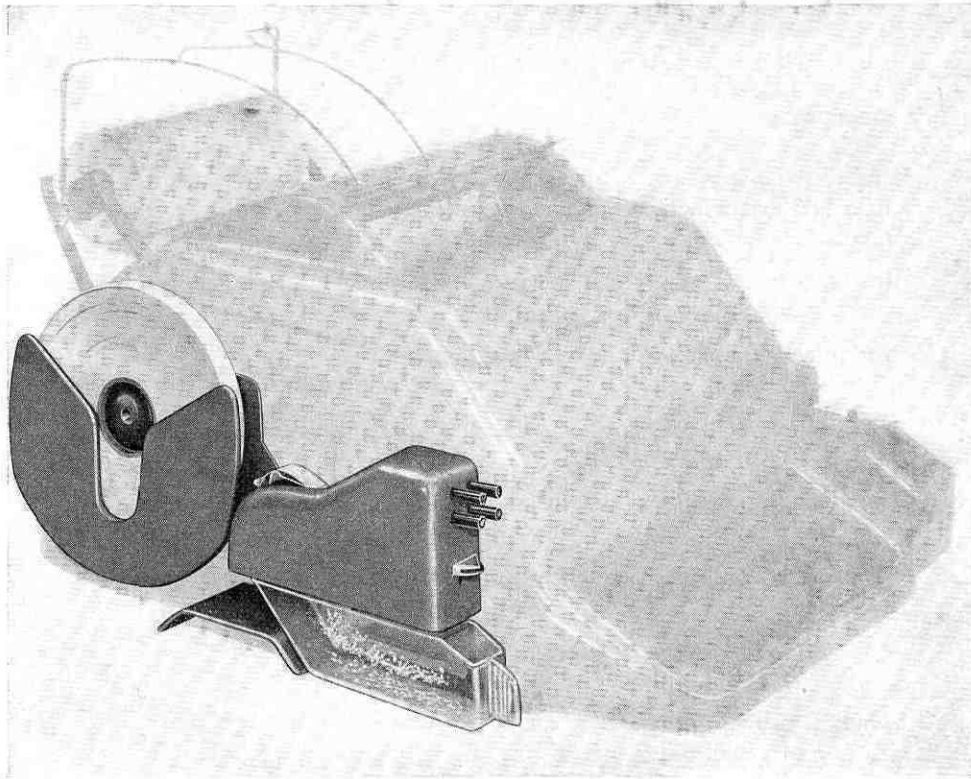


Numbers enclosed in brackets in the circuit diagram refer to connexions with additional solder terminals.

Color code:

- br brown
- gr gray
- or orange
- rt red
- sw black
- ws white





VI

**REPERFORATOR ATTACHMENT**  
From Serial No. 41 113 onwards



## CONTENTS

	Page
1. General . . . . .	2
2. Operation . . . . .	2
3. Installation and removal of reperforator attachment . . . . .	5
4. Removal and replacement of major assemblies . . . . .	6
5. Adjustments . . . . .	14

### 1. GENERAL

The message received or transmitted by the teleprinter can be punched into tape simultaneously by an attached reperforator in the form of 5-unit code hole groups.

For installing the reperforator attachment in the field the following sets of parts are required:

For Teleprinter 100 with "protective cover 175"

1 set of parts E23 with U1 (Fig. 1)

For Teleprinter 100 in "floor cabinet 189 or 202" (wooden floor cabinet)

1 set of parts E23 with U2 (Fig. 2)

For Teleprinter 100 in "floor cabinet 195" (metal floor cabinet)

1 set of parts E23 with U3

Additionally, the following devices are available for the reperforator attachment:

Adjunct for switching off the reperforator by magnet

1 set of parts U5 of E23

Adjunct for magnetic on/off control

1 set of parts U6 of E23

A perforator tape alarm contact

1 set of parts U7 of E23

A separate connecting lead

1 set of parts U9 of E23

The reference letters "E" and "U" refer to Fs Sk 2186/1.

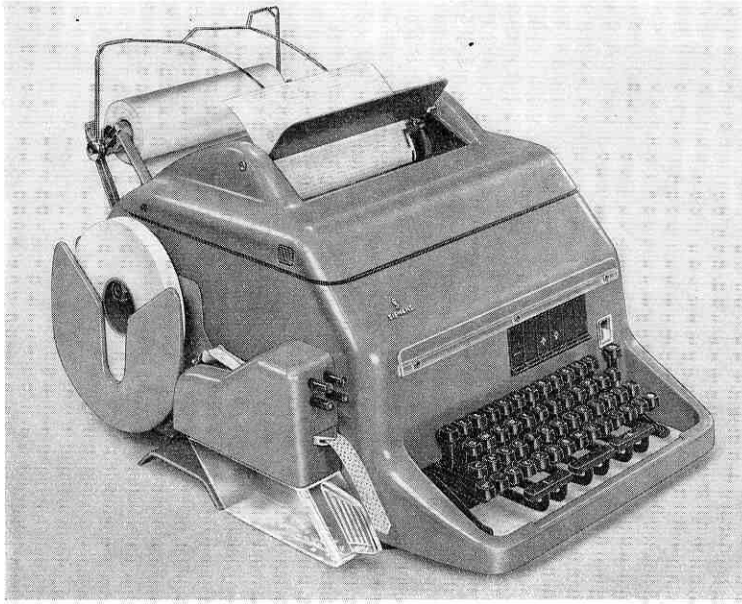
### 2. OPERATION

Before placing the reperforator attachment in service for the first time, recoil carefully the points indicated in para. "Maintenance" (Index XII).

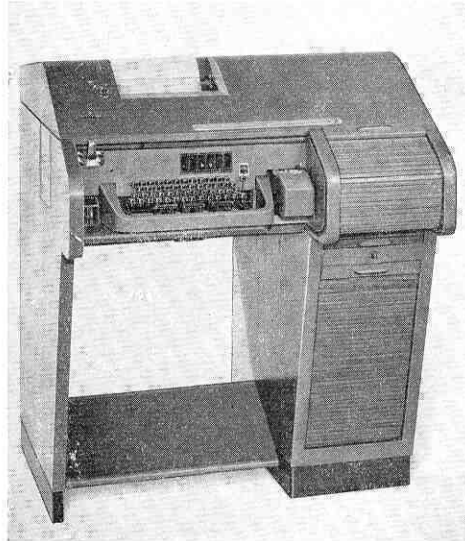
#### 2.1. Inserting the paper tape

Prior to inserting a new tape roll make sure that the reperforator attachment is in the rest position. Remove the chads from chad collector 2201/3 and pull core 2304 upwards and out of tape magazine 2202 as far as it will go.

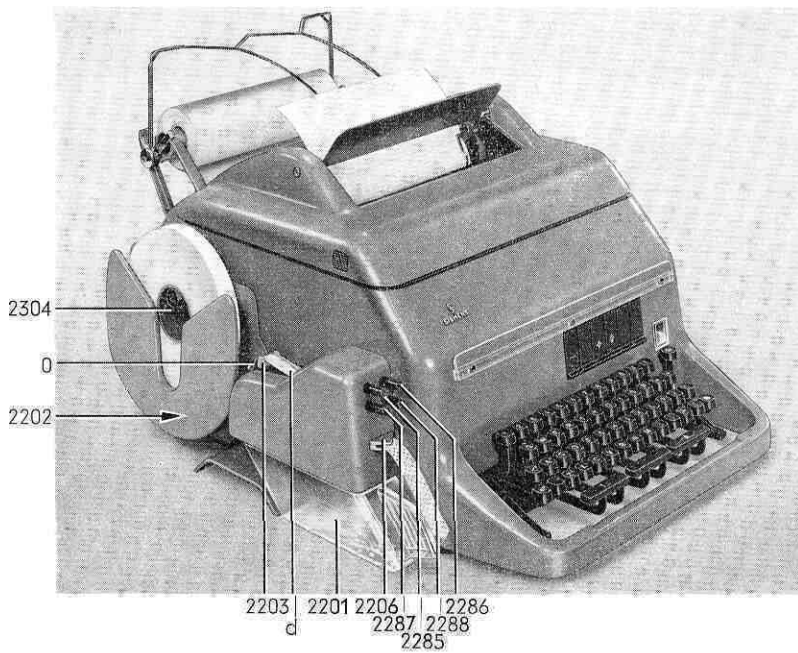
Place the new tape roll on core 2304 so that the tape feeds out from the underside of the roll and can be inserted in tape guide 2203. Thus the tape roll moves counterclockwise. Now press the tape roll with the core into the magazine as far as the lower stop. Thread the tape over cushioning plate "O", through tape guide 2203, and after depression of pushbutton 2286 ("L"), below roller "p" and push it further along until it emerges from the arrow-shaped exit 2206.



1

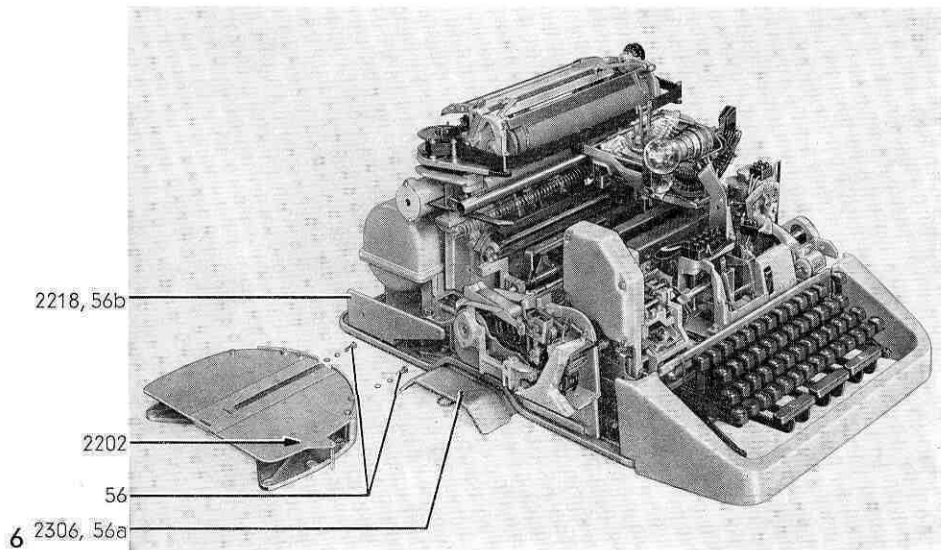
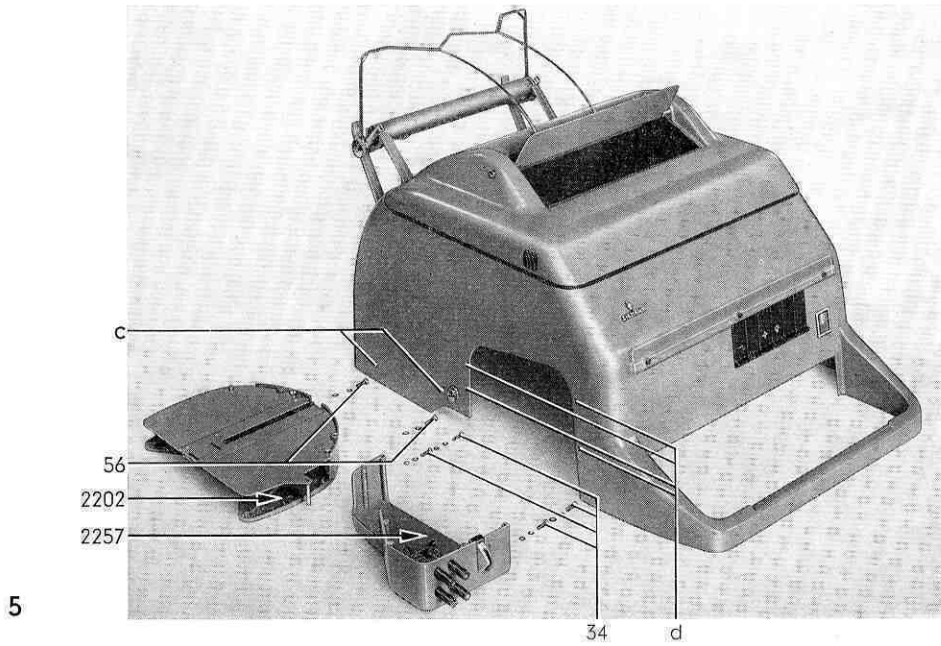
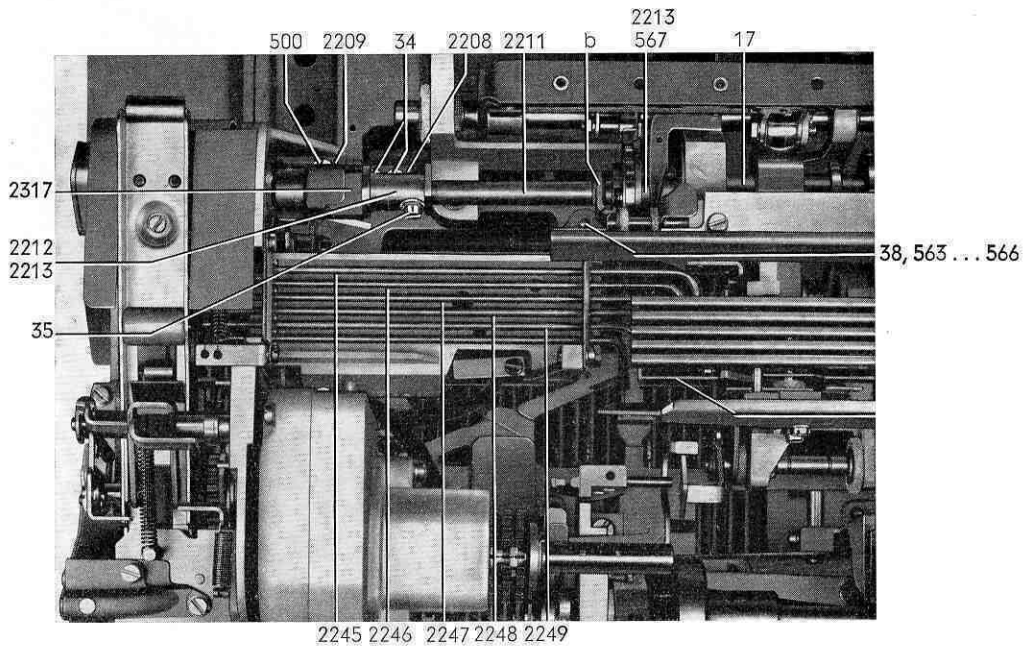


2



3

VI



### 3. INSTALLATION AND REMOVAL OF REPERFORATOR ATTACHMENT

Prior to starting work pull the power and telegraph plugs from their wall outlets.

#### 3.1. Reperforator

Installation: Turn printer into rest position and set the code bars for code combination No. 29 (5 current pulses).

(5 transfer bars in their lower position).

Rotate the camshaft of the reperforator until transfer levers 2245 to 2249/4 assume their lowest position.

Insert the oil-impregnated lubricating felts 2213 (not visible in the figure) into sleeves 567 and 2212. Insert transfer shaft 2211 with its driver "b" into sleeve 567 of camshaft 17 and push it to the right. Loosen fillister head screw 35. Hold the reperforator against the two stop pins on the mounting base of the teleprinter. Insert the three screws 500 (only one visible) (but do not tighten them) to hold the reperforator in place. Screw stop 2208 onto the mounting base by means of the two fillister head screws 34 but do not tighten yet. With a distance of 0.1 to 0.9 mm between transfer levers 2245 to 2249 and the ends of code bars 38, 563 to 566, tighten the three screws 500, push stop 2208 against the mounting frame 2209 and tighten its two screws 34. Set reperforator to rest position (see adjustment A16). With the code bars in the position "5 no-current periods" (5 transfer bars in their upper position), transfer levers 2245 to 2249 should rest with their full width at least over the code bars and have a distance of  $\geq 0.1$  mm from the latter.

Shift sleeve 2212 of transfer shaft 2211 to the left until a gap of approx. 0.3 mm is obtained between clutch sleeve 2217 and sleeve 2212. Tighten screw 35.

Removal: Loosen three screws 500/4 and lift out the reperforator together with transfer shaft 2211 to the left.

#### 3.2. Handle 2306/6

Installation: Mount handle 2306 onto the mounting base by means of the two fillister head screws 56a (not visible).

Removal: Loosen two screws 56a.

#### 3.3. Teleprinter with "protective cover 175"

##### 3.3.1. Tape magazine 2202/5

Installation: Press out the two dummy plugs at the left-hand side of the teleprinter cover. Install tape magazine 2202, by means of two fillister head screws 56, from the inside of the cover through bores "c".

Removal: Loosen two fillister head screws 56.

##### 3.3.2. Reperforator cover 2257/5

Installation: Remove dummy plate on the left-hand side of the teleprinter cover after loosening the four countersunk screws and hexagon nuts. Install reperforator cover 2257 by means of four fillister head screws 34 inserted from the inside of the protective cover through bores "d".

Removal: Loosen four fillister head screws 34.

#### 3.4. Teleprinter in "floor cabinet 189 or 202"

##### 3.4.1. Tape magazine 2202/6

Installation: Screw tape magazine 2202 onto bracket 2218, using two fillister head screws 56. Mount bracket 2218 onto the mounting base of the teleprinter by means of two fillister head screws 56b (not visible in the figure).

Removal: Loosen two screws 56b of bracket 2218.



3.4.2. Pushbutton assembly 2219/7a

Installation: Remove left-hand dummy plate and the dummy plug on top from the front panel of the floor cabinet.

Install pushbutton assembly 2219 with plate 2220 and two countersunk screws 2221 in front panel of floor cabinet and adjust as per A37.

Removal: Reverse the above procedure.

**3.5. Teleprinter in "floor cabinet 195"**

3.5.1. Tape magazine 2202/6

Installation: Screw tape magazine 2202 onto bracket 2218 by means of two fillister head screws 56. Mount bracket 2218 onto the mounting base of the teleprinter, using two fillister head screws 56b.

Removal: Loosen two fillister head screws 56b of bracket 2218.

3.5.2. Pushbutton assembly 2307/7b.

Installation: Remove cover plate on the front panel of the floor cabinet. Screw pushbutton assembly 2307 with plate 2308 onto the front panel, using two countersunk screws 2221 and adjust as per adjustment A38.

Removal: Reverse the above procedure.

3.5.3. Tape channel 2309/44b

Installation: Screw tape channel 2309 onto the tape exit by means of two hexagon nuts 598 as per Fig. 44b so that the tape can pass smoothly.

Removal: Reverse the above procedure.

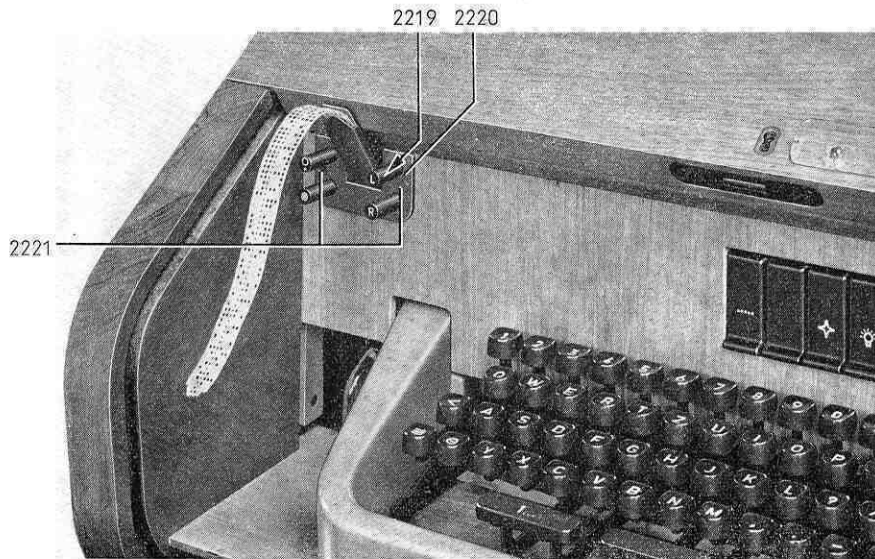
**4. REMOVAL AND REPLACEMENT OF MAJOR ASSEMBLIES**

Prior to starting work pull the power and telegraph plugs from their wall outlets. Set reperforator to rest position (see adjustment A16).

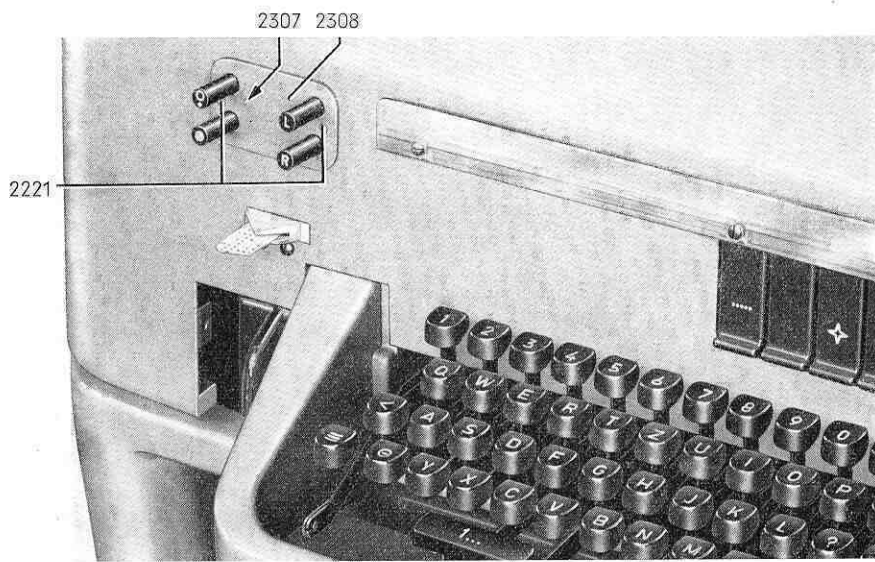
**4.1. Tape channel 2203/8**

Removal: Loosen fillister head screw 35. Pull tape channel 2203 out to the rear. This can be done only with the pressure roller raised.

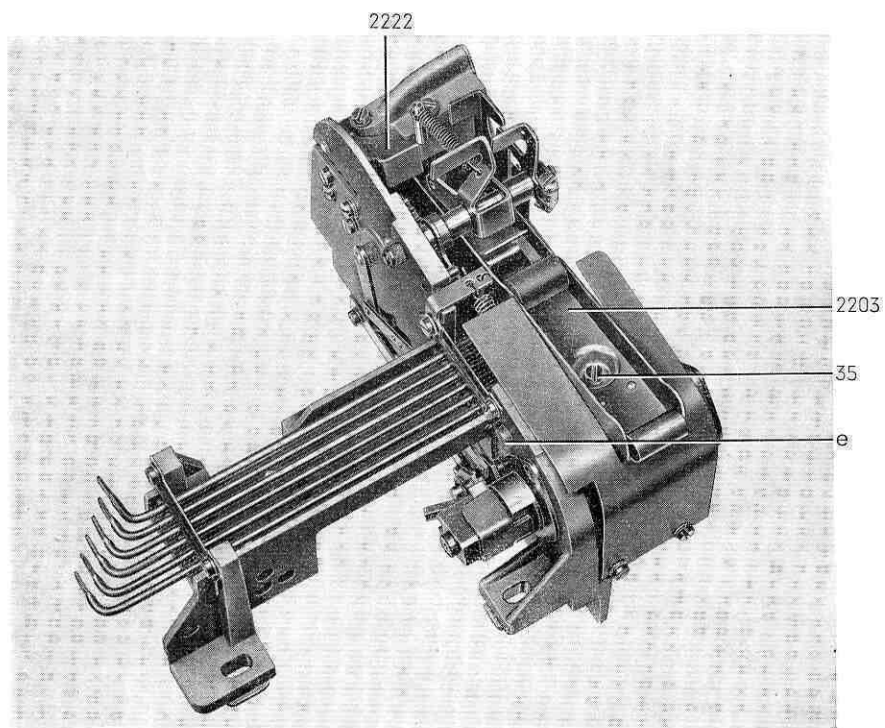
Replacement: Insert front end into punch guide 2222 and secure it on axle "e" by means of fillister head screw 35. For doing so, the pressure roller must be raised again.



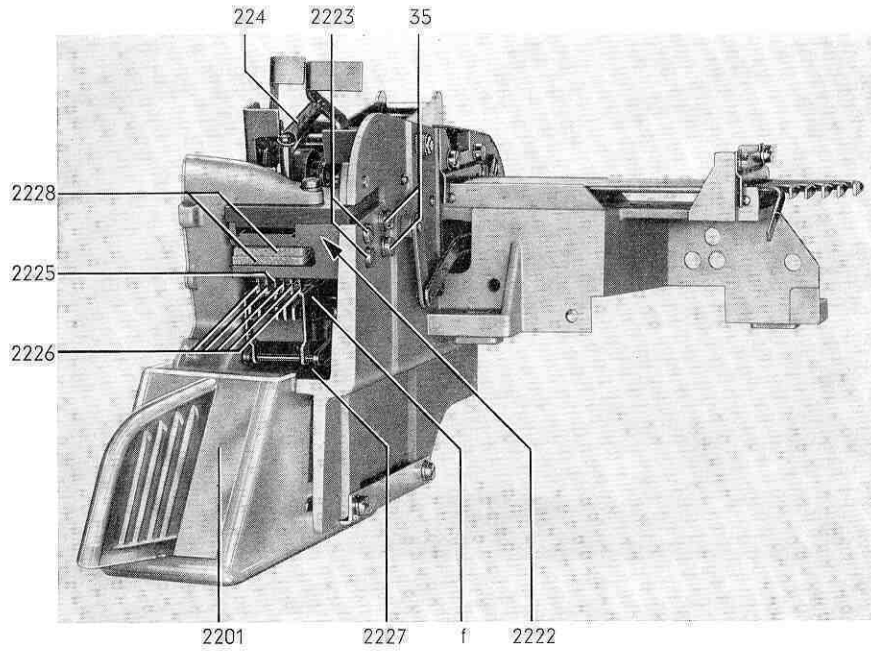
7a



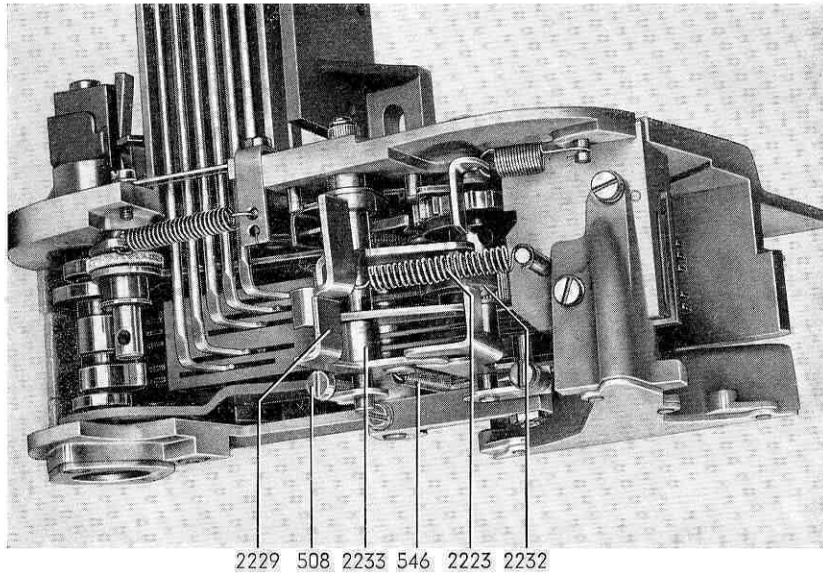
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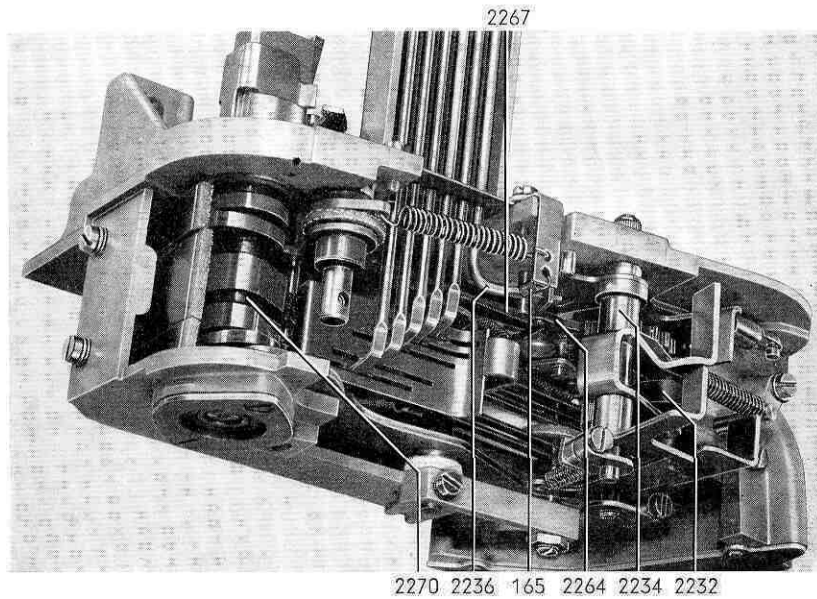




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**4.2. Punch guide 2222/9**

Removal: Unhook tension spring 2223. Pull out chad collector 2201. Remove punch guide 2222, after loosening the two screws 224, in the direction of tape feed.

Replacement: Introduce punches 2225 and 2226 into the slots of punch returning bracket "f" of lever 2227. Install punch guide 2222 so that the narrow faces of the mounting frame point to the front. Screw it down by means of screws 224. Observe adjustment A12.

**4.3. Punches 2225/9 and 2226**

Removal: Remove punch guide 2222 as per para. 4.2. Pull out punches 2225 and 2226.

Replacement: Reverse the above procedure.

**4.4. Lever 2229/10 (OFF)**

Removal: Unhook tension spring 546. Loosen fillister head screw 508 and remove lever 2229.

Replacement: Install lever 2229. Check for axial play of approx. 0.1 mm (see also adjustment A4), tighten screw 508 and engage tension spring 546.

**4.5. Pressure roller with lever 2232/10 (lifting)**

Removal: Remove lever 2229 (OFF) as described in para. 4.4 and tape channel 2203/8 as described in para. 4.1. Unhook tension spring 2223/10. Pull off spacer 2233 and pressure roller 2232.

Replacement: Reverse the above procedure.

**4.6. Lever with sleeve 2234/11**

Removal: Remove tape channel 2203/8 as per para. 4.1 and pressure roller with lever 2232/11 as per para. 4.5. Then unhook tension spring 165. Turn camshaft 2270 to move feed lever 2267 into its lowest position and press feed pawl 2264 to the rear. Pull lever with sleeve 2234 away for about 2 mm. Transfer lever 2236 follows this movement. Swing transfer lever 2236 out of the guide slot in lever 2234 and pull off lever with sleeve 2234.

Replacement: Reverse the above procedure.





**4.7. Lever 2237/12 (ON)**

Removal: Unhook tension spring 546, loosen fillister head screw 508 and pull off lever 2237.

Replacement: Install lever 2237, tighten screw 508 and install tension spring 546. Observe adjustments A3 and A16.

**4.8. Ratchet with sleeve 2297/13, segment 2239, felt washer 400, brake disc 2280**

Removal: Remove tape channel 2203 as per para. 4.1, lever 2237 as per para. 4.7 and guide 2222/9 as per para. 4.2. Remove pressure plate 2240/13 after removing fillister head screws 35/9.

Pull out ratchet with sleeve 2297/13 and segment 2239. Brake disc 2280 can be pulled off with backspacing pawl 2279/24 and pawl g/13, 24 (feed pawl) pressed to the rear.

Replacement: Reverse the above procedure.

**4.9. Backspacing lever with pawl 2242/287**

Removal: Remove punch guide 2222/9 as per para. 4.2 and ratchet with sleeve 2297/13, segment 2239 and brake disc 2280 as per para. 4.8.

Unhook tension spring 2243. Unhook tension spring 2230/38 from backspacing lever with pawl 2242/13. Turn camshaft until the feed pawl g is in its lowest position.

Turn backspacing lever with pawl 2242 so as to clear lever 2234/11 and pull to the front for about 2 mm. Turn backspacing lever with pawl 2242/13 so as to clear lever 2241 by approximately 120° in a counterclockwise sense and pull off.

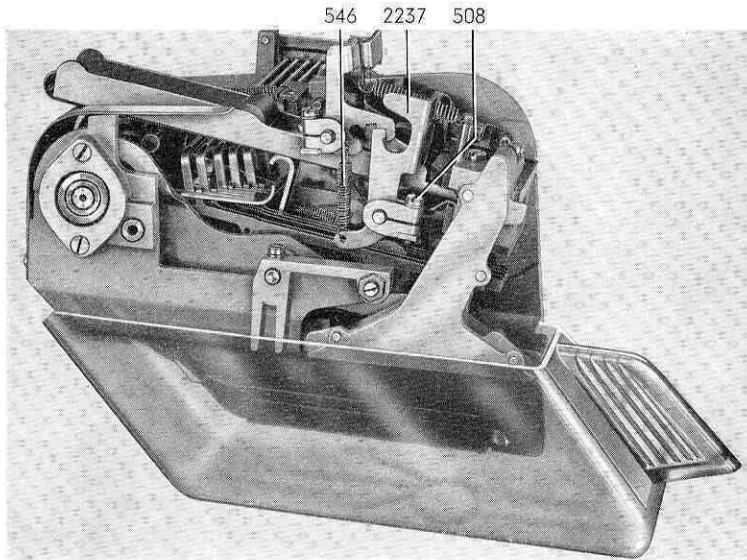
Installation: Reverse the above procedure.

**4.10. Transfer levers 2245 to 2249/14**

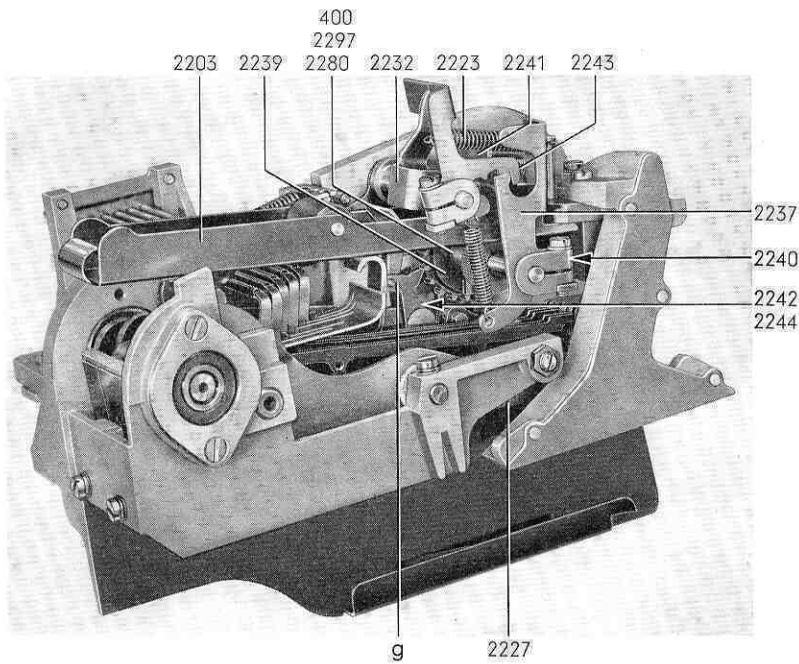
Removal: Remove tape channel 2203 as described in para. 4.1. Unhook tension springs 2223 and 165.

Remove comb 2250a after loosening the two fillister head screws 35a. Loosen fillister head screws 35b and 508 and remove bracket 2251, sleeve 2318 (not visible), bracket 2319 (not visible), washer 2591 (not visible), hexagon nut 598 (not visible) and comb 2250b. Lift out transfer levers 2245 to 2249.

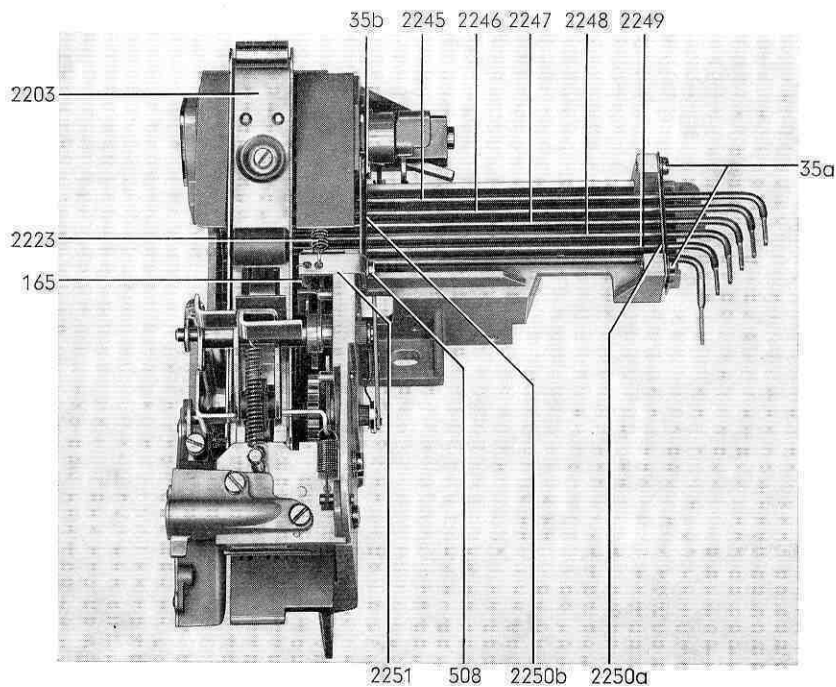
Replacement: Reverse the above procedure.  
Observe adjustment A15.



12

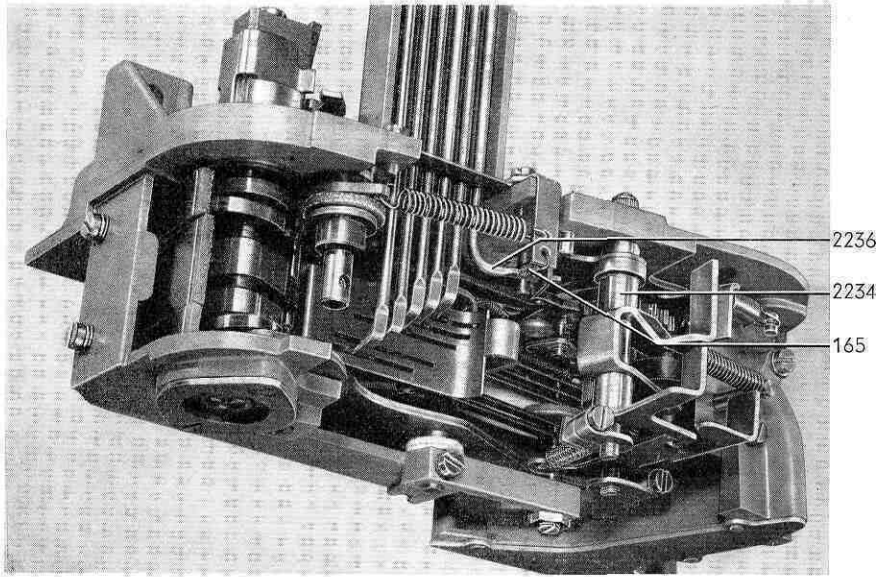


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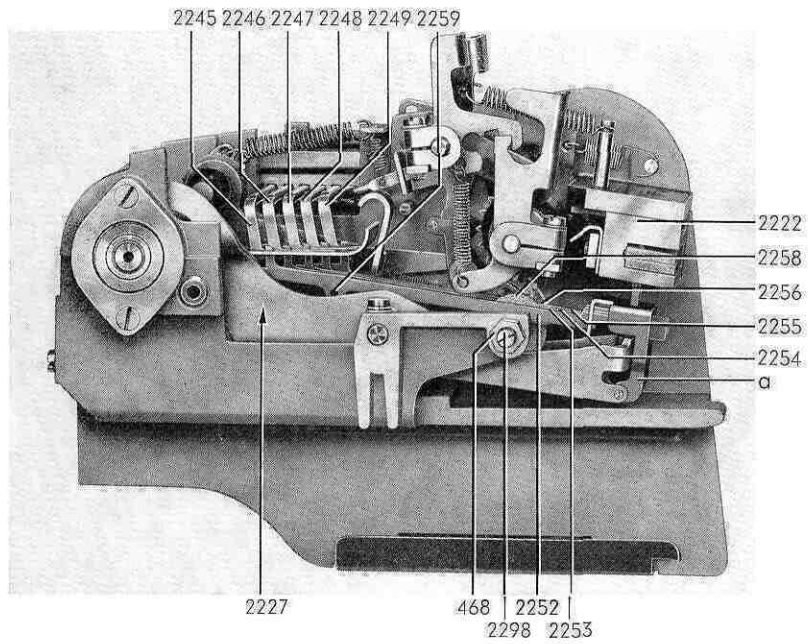


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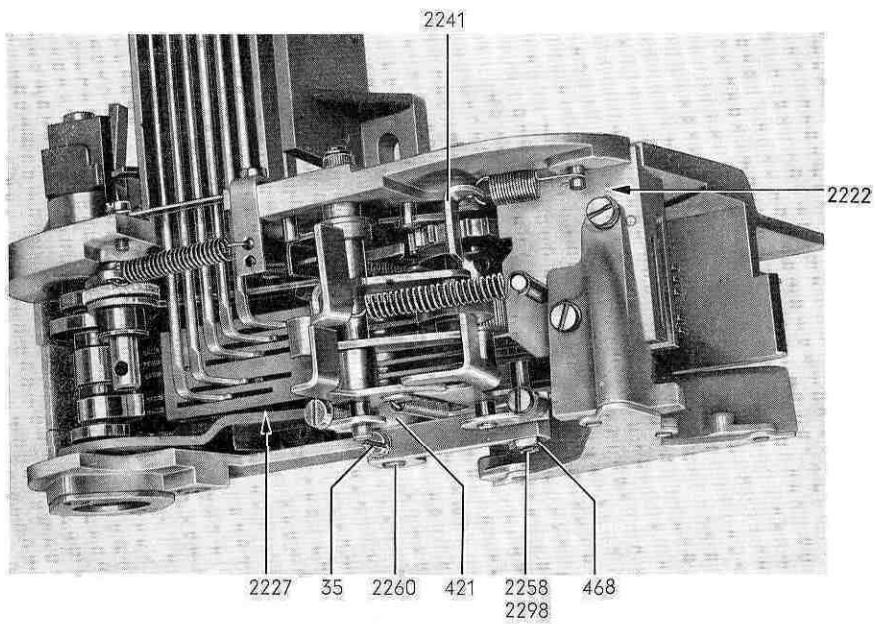




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**4.11. Transfer lever 2236/15**

Removal: Remove transfer levers 2245 to 2249/15 as described in para. 4.10. Pull transfer lever 2236/15 out of the slot in lever with sleeve 2234, after unhooking tension spring 165.

Replacement: Reverse the above procedure.

**4.12. Punch setting levers 2252 to 2256/16**

Removal: Remove punch guide 2222/9,16 as per para. 4.2. Tilt bracket a of lever 2227/16 down to the right. Unhook tension springs 2259 and pull out punch setting levers 2252 to 2256 by lifting transfer levers 2245 to 2249.

Replacement: Reverse the above procedure.  
Observe adjustment A21.

**4.13. Punching lever with bracket 2227/17**

Removal: Remove punch guide 2222/9,17 as per para. 4.2. Remove hexagon nut 468/16,17. Detach lock washer and plain washer. Force out eccentric axle 2298 together with felt washer 2258. Remove fillister head screw 35/17, axle 2260 with lubricating felt 421. Pull out punching lever with bracket 2227 to the front with punch setting lever 2252 to 2256/16 raised, in the direction of the tape feed.

Replacement: Reverse the above procedure.  
Observe adjustment A21.

**4.14. Lever 2241/17**

Removal: Remove the parts mentioned in paras. 4.1, 4.2, 4.7 to 4.9 and 4.13 in the sequence indicated. Allow the front ends of punch setting levers 2252 to 2256/16 to drop. Pull off lever 2241/17.

Replacement: Reverse the above procedure.  
Observe adjustment A21.



**4.15. Lever with sleeve 2262/18 (take puller)**

Removal: Loosen the two screws 224/18 and lift out guard plate 2271. Remove tape channel 2203/8 as described in para. 4.1 and transfer levers 2236/18 as well as 2245 to 2249 according to para. 4.11 and punching lever with bracket 2227/17 as per para 4.13.

Force out retainer 399/18, pull felt washer, 436 off axle of mounting frame 2209 and unhook tension spring 189/18, 35. Swing lever with sleeve 2262/18 upward and pull it off axle "e".

Replacement: Reverse the above procedure.

**4.15.1. Braking lever 2315/34b**

Removal: Remove lever with sleeve 2262/18 as per para. 4.15. Unhook tension spring 2223/34b and pull braking lever 2315 off axle e/18 of mounting frame 2209.

Replacement: Reverse the above procedure.

**4.16. Zero-setting lever 2265/18**

Removal: Remove lever with sleeve 2262 according to para. 4.15. Unhook tension spring 2223. Push punch setting levers 2252 to 2256 forward by way of transfer levers 2245 to 2249 and pull off zero-setting lever 2265 from axle "e".

Replacement: Reverse the above procedure.

**4.17. Feed lever 2267/18**

Removal: Remove punch setting levers 2252 to 2256 according to para. 4.12 and punching lever with bracket 2227/17 according to para. 4.13. Unhook tension springs 189/18 and 2230. Unscrew guide comb 2268 (the two screws 35 are not visible in the illustration). Pull feed lever 2267 off pin "h" and remove lubricating felt 446 (not visible in the illustration).

Replacement: Reverse the above procedure.

**4.18. Camshaft 2270/19**

Removal: Loosen the two fillister head screws 224 and lift guard plate 2271 off mounting frame 2209. Unhook springs 2223, 2230, 189/18. Remove connecting bar 2300/19 and pull bail 2277 from axle "i" after removing retainer 407. Remove cover plate 2273 with countersunk screw 387 and countersunk screw 2321 with eccentric 2316/34b and hexagon nut 614.

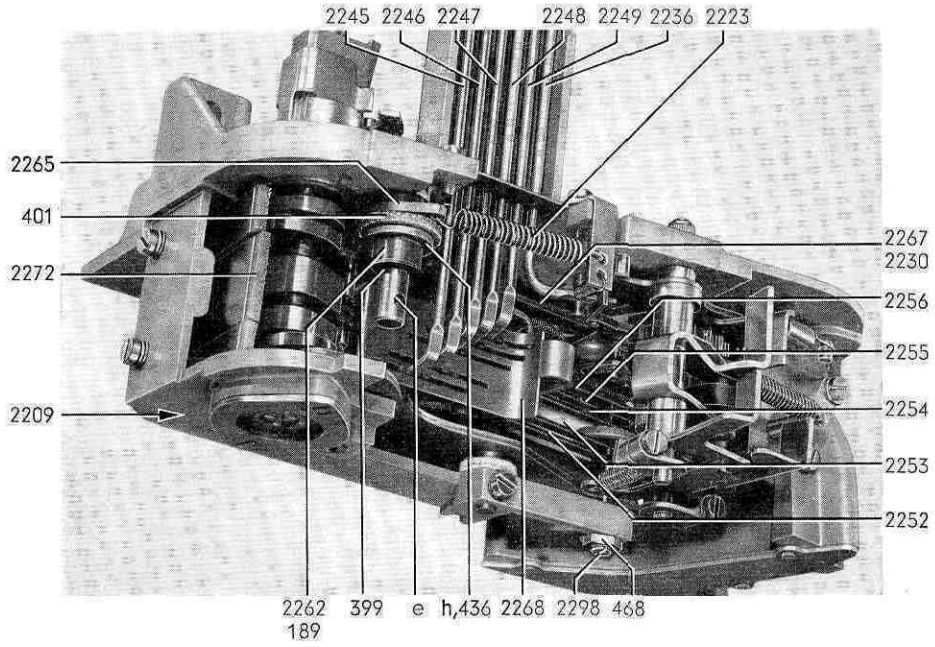
Force punch setting levers 2252 to 2256/18 to the front (exerting pressure on transfer levers 2245 to 2249) and pull out (at the same time turning it) camshaft 2270/19 together with ball bearing 388 (not visible in the illustration) in the direction of the opening left by the removed cover plate 2273.

Replacement: Reverse the above procedure.

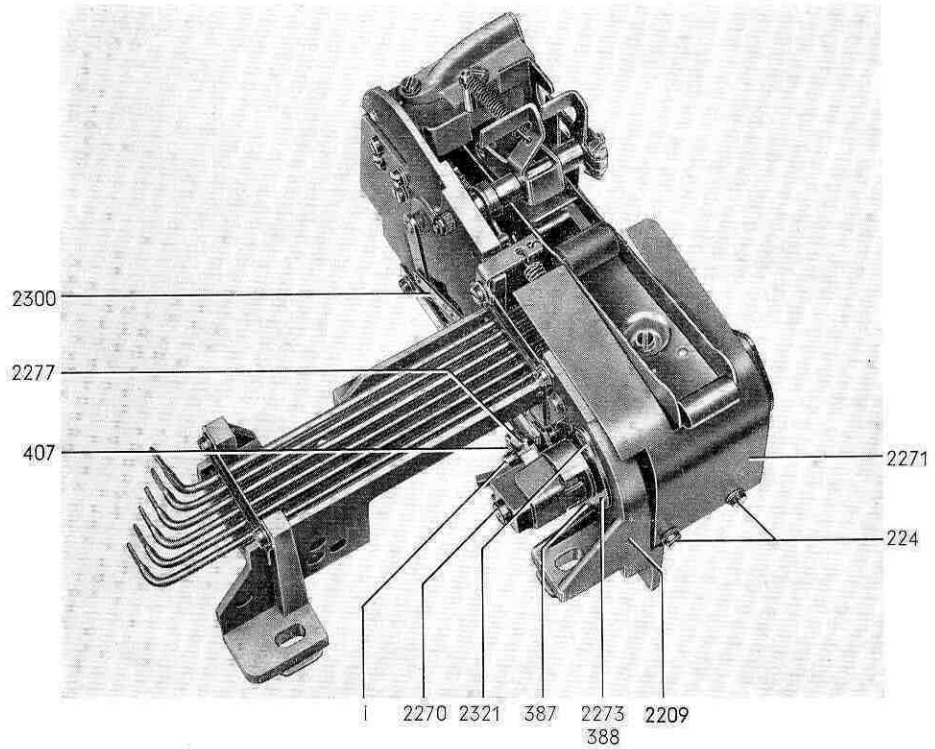
**5. ADJUSTMENTS**

Pror to starting work pull the power and telegraph plugs from their wall outlets. The adjustments A11 to A35 should be performed with the reperforator attachment removed while the adjustments A1 to A10 must be performed with the reperforator installed.

No attempt should be made to readjust any spring. Springs damaged or failing to meet the specified values must be replaced by new ones.

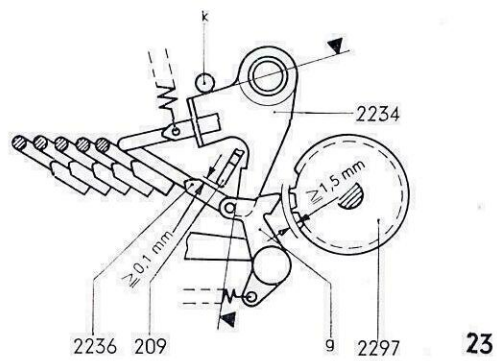
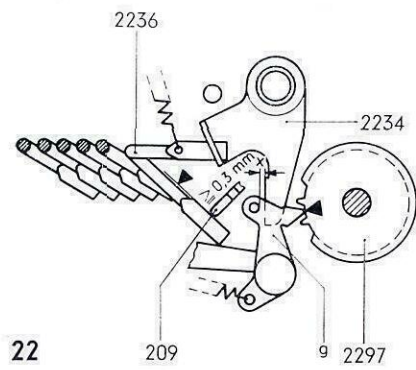
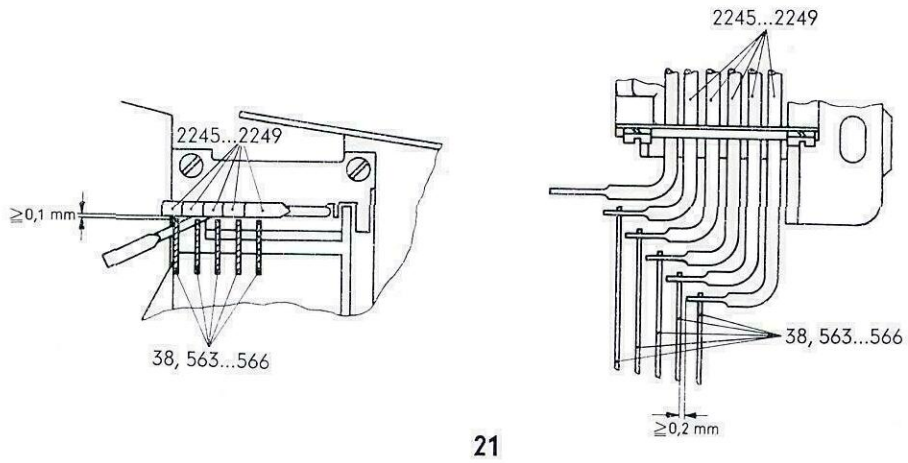
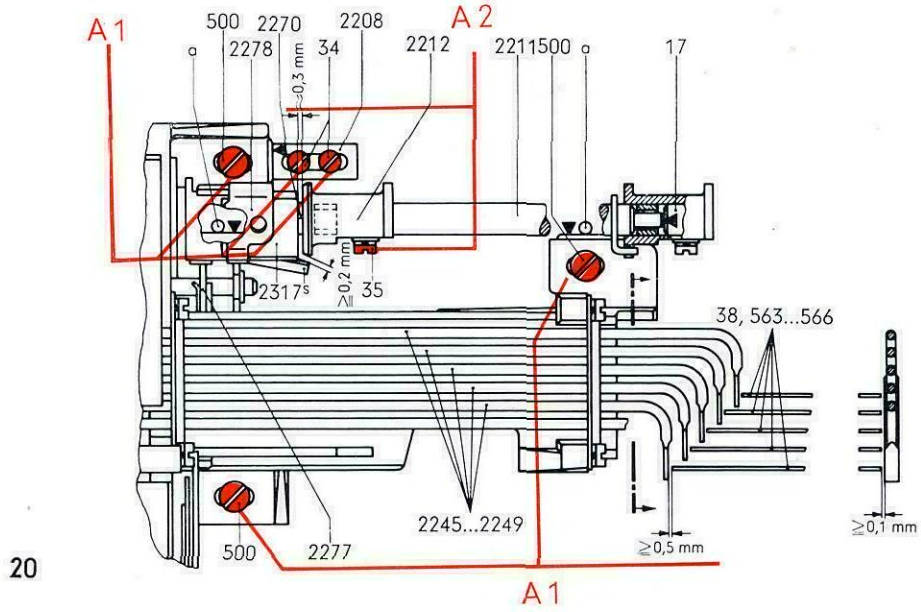


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- A1 Position of reperforator attachment on teleprinter mounting base  
Set the printer code bars 38, 563 to 566/20 of the teleprinter for code combination 29 (five current pulses), i. e. move the printer code bars to the right. Turn reperforator camshaft 2270 so that transfer levers 2245 to 2249 are in their lowest position.  
The reperforator must rest against the two pins "a" on the mounting base of transfer levers 2245 to 2249 and the extensions of code bars 38, 563 to 566 the teleprinter and on the previously adjusted stop 2208. The gap between must be  $\geq 0.5$  mm, while turning camshaft 2270, or the transfer levers must rest on the printer code bars with their full width.  
Adjustment: Loosen the three fillister head screws 500 on the reperforator as well as the two screws 34 on stop 2208. Shift the reperforator until the above specified value has been obtained. Tighten the three screws 500. Move stop 2208 up against reperforator and screw it down by means of two screws 34.
- A2 to A4 Drive of camshaft 2270/20
- A2 When transfer shaft 2211 rests against camshaft 17 of the printer, there should be a gap of approx. 0.3 mm between clutch sleeve 2317 of camshaft 2270 and sleeve 2212 of transfer shaft 2211.  
Adjustment: Loosen fillister head screw 35 and displace sleeve 2212. Tighten fillister head screw 35.
- (A3) When camshaft 2270/20 is turned, lever 2237/30 (ON) causes latching pawl "s"/20 to engage in sleeve 2212. Latching pawl "s" must engage so far into sleeve 2212 as its end support in clutch sleeve 2317 allows.
- (A4) Operation of lever 2229/30 (OFF) causes bail 2277/20 to come within reach of bail 2278 whose extension abuts against bail 2277 when camshaft 2270 is turned. At the same time latching pawl "s" is forced out of sleeve 2212. In the rest position (observe adjustment A16), there should be a gap of  $\geq 0.2$  mm between latching pawl "s" and sleeve 2212.
- A5, A6 Transfer levers 2245 to 2249/21  
(Set printer code bars 38, 563 to 566 for code combination No. 32 (5 no-current periods), i. e. all printer code bars shifted to the left).
- (A5) The gaps between the individual transfer levers 2245 to 2249/21 and the printer code bars 38, 563 to 566 should be  $\geq 0.1$  mm.
- (A6) With the reperforator in its rest position (see adjustment A16), the gap left between the face of a transfer lever 2245 to 2249/21 and the next following printer code bar 38, 563 to 566 must be  $\geq 0.2$  mm.
- A7 to A10 Transfer levers 2236/296, 297, 298
- (A7) Switch on reperforator attachment and rotate teleprinter set for code combination 29 (5 current pulses) by hand (all five transfer levers 2245 to 2249/21 are allowed to drop) until feed pawl g/22, 23 has reached its lowest position. The tip of feed pawl g/22 must now rest on the bottom of a tooth of ratchet with sleeve 2297. Now, there should be a visible gap "x" between the pin of feed pawl "g" and lever with sleeve 2234. If not, check adjustment of bail 209 (see Index II).
- (A8) Set the transfer bars of the printer or its code bars 38, 563 to 566/21 for code combination "Who-are-you" (●○○●○) and turn teleprinter by hand. There should be a gap of  $\geq 0.1$  mm between bail 209/23 of the printer and transfer lever 2236. Lever with sleeve 2234 should rest against pin "k" so that a gap of  $\geq 1.5$  mm remains between pawl "g" and ratchet with sleeve 2297. If not, check bail 209 for adjustment values stated in Index II.

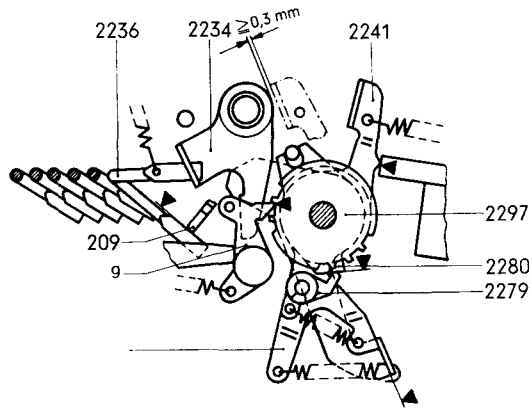




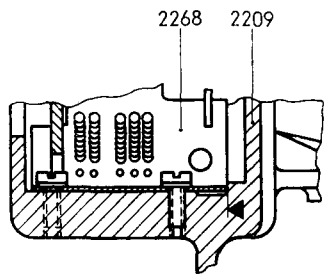
- (A9) Switch on reperforator attachment, set code bars of teleprinter for code combination No. 29 (5 current pulses) and turn teleprinter by hand until feed pawl g/24 has reached its topmost position. Backspacing pawl 2279 rests on brake disc 2280. Slowly depress backspacing lever 2241. This should cause feed pawl "g" to momentarily disengage from ratchet with sleeve 2297 so that the latter can be returned by one tooth. Feed pawl "g" must have again dropped before the backspacing movement has been completed as it is now to act as a limit stop. There should be a gap of  $\geq 0.3$  mm between backspacing lever 2241 and lever with sleeve 2234.
- (A10) Depress lever 2241/24. Rotate teleprinter by hand. Backspacing pawl 2279 should be forced out of engagement with ratchet with sleeve 2297 without jamming.

A11 to A15 Points of contact

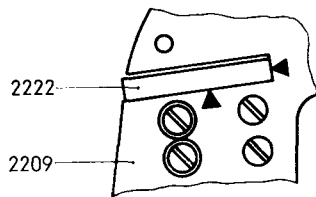
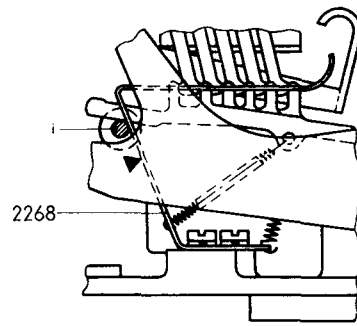
- A11 Guide comb 2268/25 must rest against the side of mounting frame 2209 and with its rear against the fixed axle "i".
- A12 Punch guide 2222/26 must bear against the bottom and the rear of the slot in mounting frame 2209.
- A13 Pressure plate 2240/27 must rest against the lower edge of punch die "q" of punch guide 2222.
- A14 Chad chute 2281/28 must rest against punch die "q" and against spring anchor pin "r".



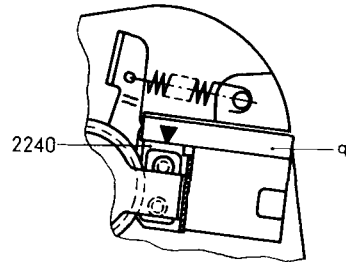
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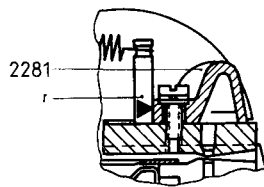
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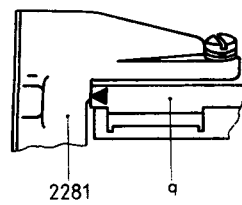
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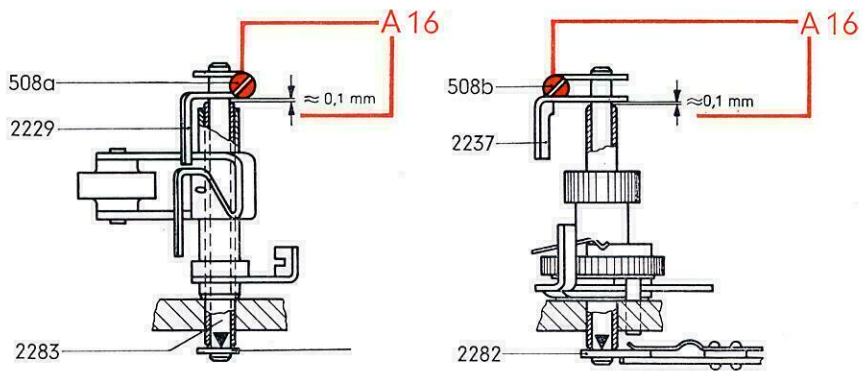
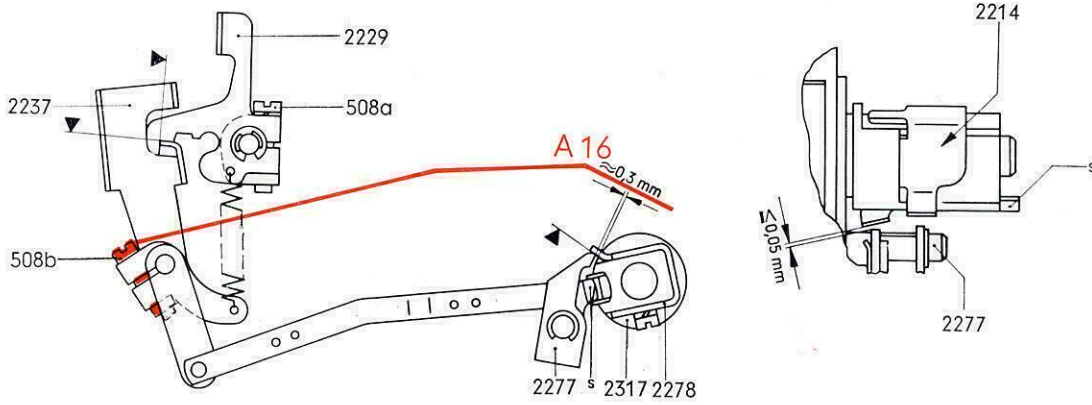
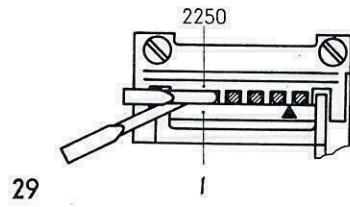


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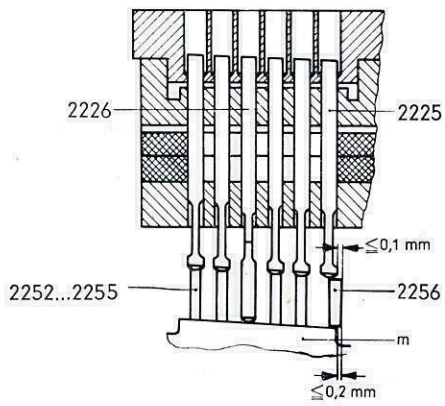


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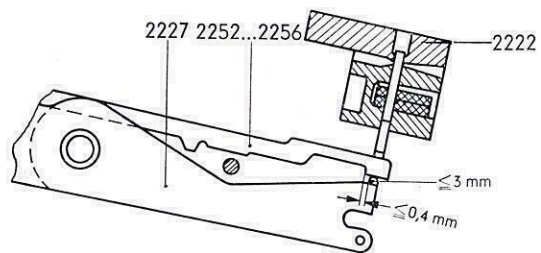




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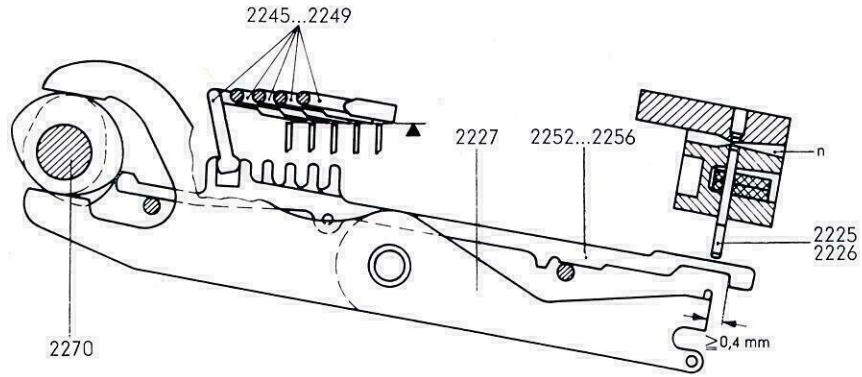


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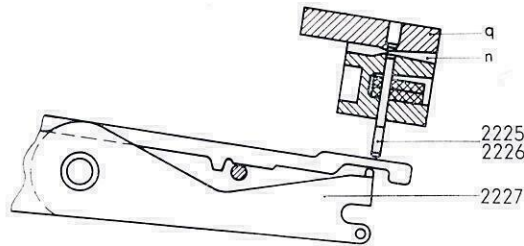
- A15 The two guide combs 2250/29 must rest on pin "i".
- A16 Rest position  
After lever 2229/30 (OFF) has been operated, it rests against lever 2237 (ON), whereas bail 2277 makes contact with bail 2278 and with the disengaged pawl "s". The clearance between bail 2277 and clutch sleeve 2317 should be about 0.3 mm. Axles 2282 and 2283 should have an endplay of about 0.1 mm.  
Adjustment: Loosen fillister head screw 508b of lever 2237 (ON) and, by turning bail 2277, adjust for a gap of about 0.3 mm between the operating edges of this bail on the one hand and clutch sleeve 2317 on the other. Then tighten fillister head screw 508b without altering the endplay of  $\approx 0.1$  mm of axle 2282.  
Check: When turning clutch 2214 to the ON-position, the clearance between pawl "s" and bail 2277 should be  $\leq 0.05$  mm. If necessary, repeat the above adjustment, altering the clearance from  $\approx 0.3$  mm to a maximum of 0.9 mm.
- A17toA22 Punching lever with bracket 2227/32, 33a, b
- (A17) Punch setting levers 2252...2256/31 may project beyond punches 2225 by a maximum of 0.1 mm. Punch setting lever 2256 may project beyond the actuating blade "m" by a maximum of 0.2 mm.
- (A18) Rotate camshaft 2270/33a until punching lever 2227/305 is in topmost position on punch guide 2222. Punch setting levers 2252... 2256 may project beyond lever with bracket 2227 by a maximum of 0.4 mm, i. e. in this position punch setting levers 2252... 2256 project forwards beyond punching lever with bracket 2227 by a maximum of 3 mm.



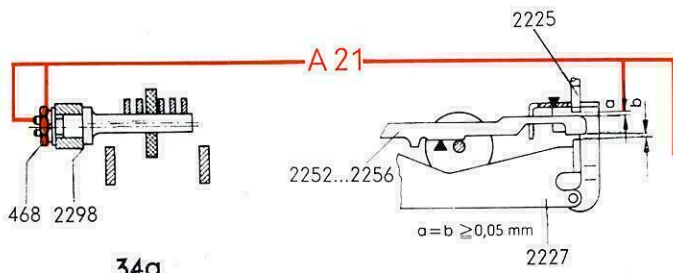
- (A19) With punching lever with bracket 2227 in its lowest position, punches 2225/33a and 2226/33a should be safely withdrawn from the tape channel "n".
- (A20) With code bars set for 5 no-current periods, transfer levers 2245...2249/33a positively hold punch setting levers 2252...2256 in their foremost position. The front edges of the recesses in punch setting levers 2252...2256 should project beyond punching lever with bracket 2227 by  $\geq 0.4$  mm. With punching lever with bracket 2227/33b in its topmost position, punches 2225 must not enter the tape channel "n". Feed hole punch 2226, however, should safely enter punch die "q".
- A21 Eccentric axle 2298/34a  
Rotate camshaft 2270/33a until punch setting levers 2252...2256/34a rest against the lowest section of the cam. The gap between punch setting levers 2252...2256 and punching lever with bracket 2227 as well as between punch setting levers and punches 2225 should be equal when judged by eye and be at least 0.05 mm.  
Adjustment: Loosen hexagon nut 468 of eccentric axle 2298 and rotate eccentric axle unit the specified dimensions are obtained. Tighten again hexagon nut 468.
- A22 Brake lever 2315/34b  
Reperforator in the rest position. There should be a gap of  $\geq 0.2$  mm between camshaft 2270 and brake lever 2315.  
Adjustment: Loosen hexagon nut 614 and rotate eccentric 2316 until the specified dimension is obtained. Tighten nut 614.
- Spring forces  
Unless otherwise explicitly stated, the following spring forces should be checked with the reperforator in the rest position.
- (A23) Tension spring 189/35 of lever with sleeve 2262 (tape puller)  
Measured at the bend of lever 2262:  $85 \pm 20$  p.
- (A24) Pressure spring 2284/36 of clutch sleeve 2317  
Reperforator in released condition, pawl "s" in engaged condition. Spring force measured at the clutch end of pawl "s":  $85 \pm 15$  p.
- (A25) Tension spring 2259/37 of punch setting levers 2252...2256.  
Measured in the direction of the arrow at the contact points of transfer levers 2245...2249:  $115 \pm 25$  p.
- (A26) Tension spring 165/37 of transfer lever 2236.  
Measured at the pressure point of transfer lever 2236:  $62 \pm 12$  p.  
(Lever with sleeve 2234 should be applied to pin "k")
- (A27) Tension spring 2230/38 of feed lever 2267.  
Measured at the rear of feed pawl "g" in upward direction:  $250 \pm 70$  p.  
(Feed pawl disengaged by lever with sleeve 2234.)



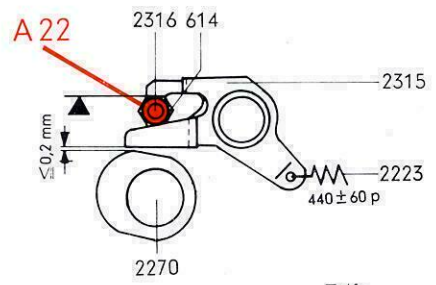
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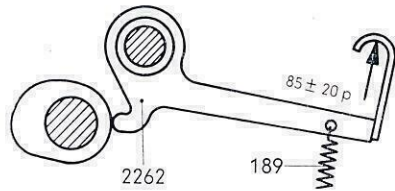
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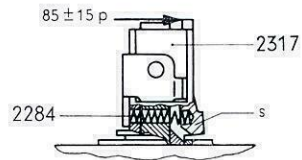
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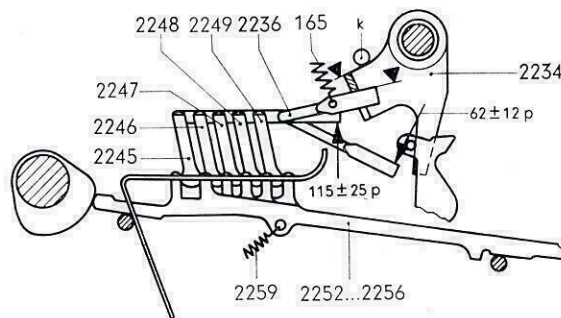
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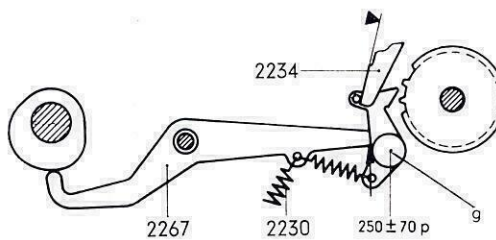
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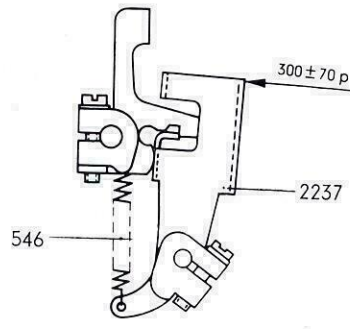
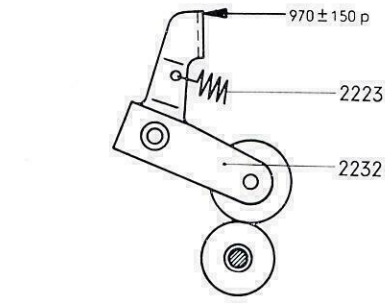
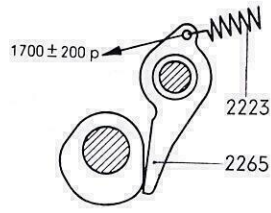
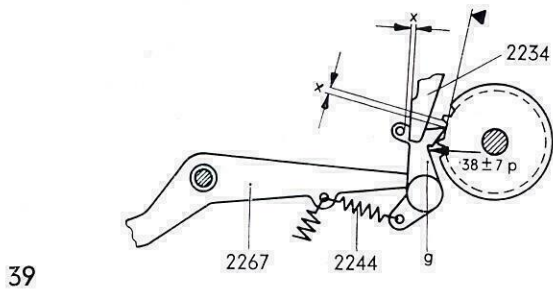


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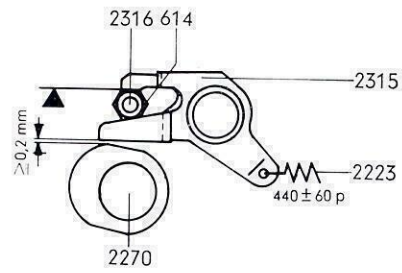
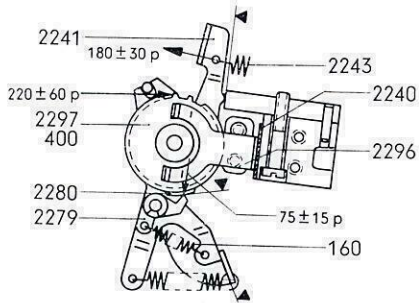
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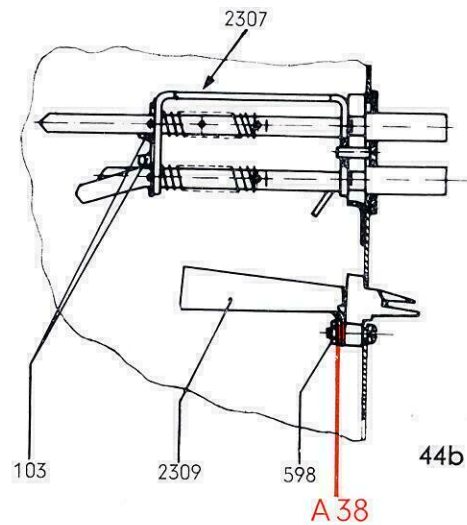
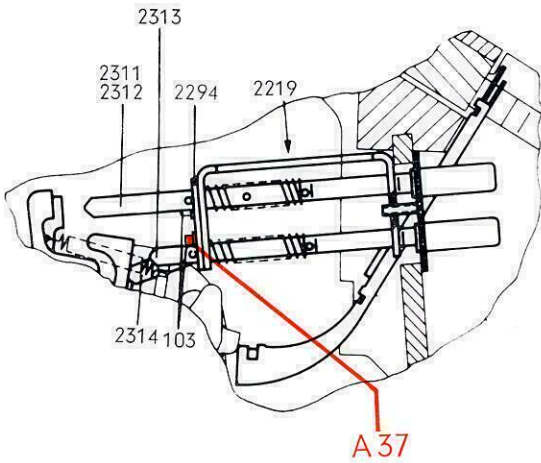
41

42



43a

43b



44a

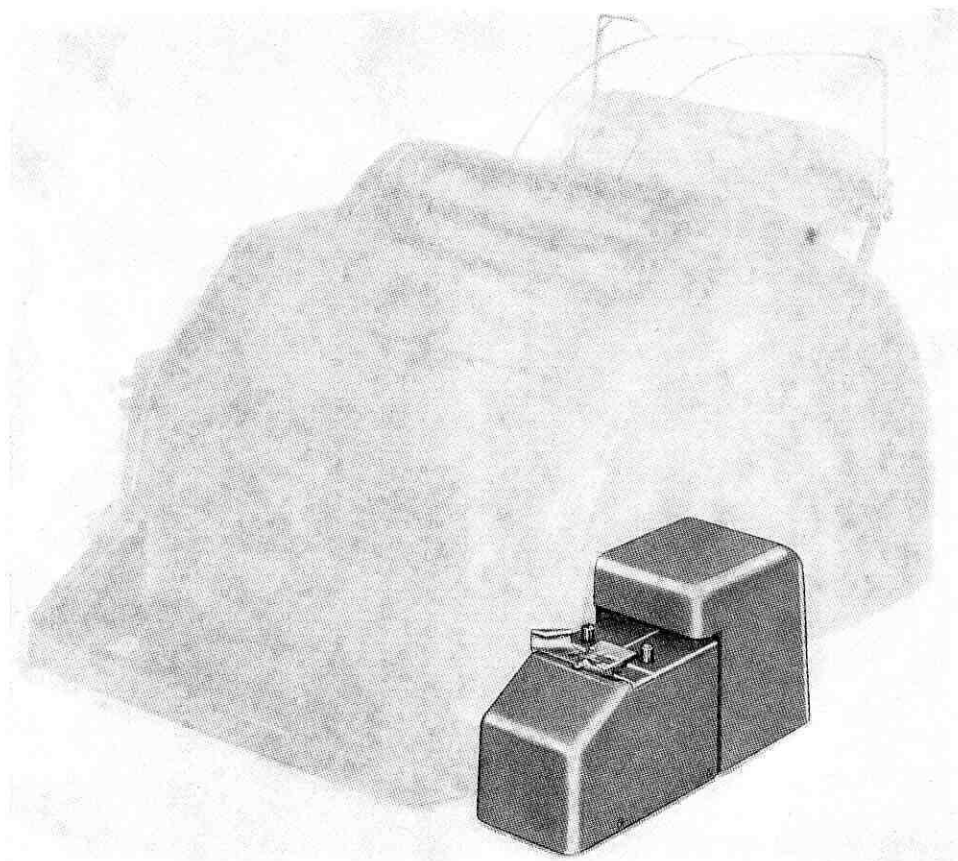
44b

- A28 Tension spring 2244/39 of feed pawl "g" of feed lever 2267.  
Measured at the designated point of feed pawl "g":  $38 \pm 7$  p. At the same time lever with sleeve 2234 is lifted off the feed pawl. (x=visible gap).
- A29 Tension spring 2223/40 of zero-setting lever measured in the direction of the axis of the spring:  $1700 \pm 200$  p.
- A30 Tension spring 2223/41 of pressure roller 2232.  
Measured at the top edge of the lever surface:  $970 \pm 150$  p.
- A31 Tension spring 546/42 of lever 2237 (ON)  
Measured at the top edge of the lever:  $300 \pm 70$  p.  
(With ON lever 2237 pressed in and latched in the illustrated position).
- A32 Tension spring 2243/43a of lever 2241 (backspacing lever).  
Measured at the suspension point:  $180 \pm 30$  p.
- A33 Tension spring 160/43a of backspacing pawl 2279.  
Measured downwards at the tip of pawl 2279, with the pawl resting on brake disk 2280:  $75 \pm 15$  p.
- A34 Spring 2296/43a of pressure plate 2240 (friction exerted on ratchet).  
Measured at the tooth of ratchet 2297:  $220 \pm 60$  p. At the same time pressure roller 2232/41 lifted off.
- A35 Tension spring 2223/43b of brake lever 2315.  
Rotate camshaft 2270 until brake lever 2315 comes to rest on eccentric 2316.  
The spring force measured at the point where the brake lever rests against the cam should be  $440 \pm 60$  p.
- A36toA38 Pushbuttons
- A36 Teleprinter with protective cover  
No adjustments required.
- A37 Teleprinter accommodated in „floor cabinet 189 or 202“ — pushbutton assembly 2219/44a.  
When the pushbuttons are depressed they must securely communicate this motion to the associated levers inside the reperforator.  
Adjustment: Displace adjusting plate 2294 after loosening the two fillister head screws 103 until pushbuttons ⊖, ⊙, R, L are centered on their levers.  
Tighten fillister head screws 103.
- A38 Teleprinter accommodated in "floor cabinet 195" — pushbutton assembly 2307/44b.  
The perforated tape must smoothly pass into tape channel 2206/3  
Adjustment: Loosen hexagon nut 598/44b and displace tape channel 2309 and make adjustment.









VII

**TAPETRANSMITTER ATTACHMENT**  
Tapetransmitter Attachments from  
Serial No. 12300 onwards

**C O N T E N T S**

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**1. GENERAL**

The tapetransmitter attachment has been designed to transmit messages stored in perforated tape in the form of 5-unit code perforations.

For installing the tapetransmitter attachment in the field the following parts are required for

- teleprinter with protective cover  
1 set of parts E24 with U1
- teleprinter with storage transmitter for 50 bauds  
1 set of parts E24 with U3
- teleprinter with higher dielectric strength  
1 set of parts E24 with U11
- teleprinter with storage transmitter for 50 and 75 bauds  
1 set of parts E24 with U25
- teleprinter with higher dielectric strength for duplex and/or polar current  
1 set of parts E24 with U26

The tapetransmitter attachment can additionally be equipped or used

- with separate 4-wire connecting cable  
1 set of parts U4 of E24
- with deactivated automatic break magnet  
1 set of parts U5 of E24
- for full-duplex operation with mechanical remote control switch  
1 set of parts U6 of E24
- for reading chadless tapes  
1 set of parts U7 of E24
- for polar current operation  
1 set of parts U8 of E24
- with latched ON button  
1 set of parts U12 of E24
- with keyboard transmitter short-circuited by contact s<sup>1</sup>  
1 set of parts U15 of E24
- with additional tape deflector ahead of tape guide  
1 set of parts U16 of E24
- with double-throw send contact  
1 set of parts U17 of E24
- with automatic break magnet separately connected through 8-conductor telegraph line  
1 set of parts U18 of E24
- with send contact for a telegraph voltage of 12 v  
1 set of parts U19 of E24
- with 10° tape deflector  
1 set of parts U21 of E24
- with separate 6-conductor connecting line  
1 set of parts U22 of E24

When ordering sets of parts for field installation state the Serial No. of the teleprinter.

The reference letters "E" and "U" refer to Fs Sk 2186/1.



## 2. INSTALLATION SERVICING

Prior to placing the machine in service reoil the points mentioned in Index XII. Directions for the operations with the tapetransmitter attachment installed:

- a) The ON-button 2404/3 (⊙) of the tapetransmitter attachment must **not** be depressed when the tape is inserted as otherwise false signals will be transmitted during the start-up period of the teleprinter (about 1 sec.).
- b) Do not operate the keyboard when tape transmission is in progress because the message will be mutilated.

### 2.1. Circuitry

Circuit and wiring diagrams of the tapetransmitter attachment are contained in section 7 of this Index.

For connecting the teleprinter with tapetransmitter attachment and for external circuits consult the applicable paragraphs of Index II.

The tapetransmitter is electrically connected to the teleprinter by a blade terminal strip. The send contact and the RF suppressor devices are installed inside a metal container in order to guarantee RF suppression grade K (as per VDE 0875 specifications) also within the VHF range of up to 300 mc.

### 2.2. Operation

#### 2.2.1. Threading the perforated tape

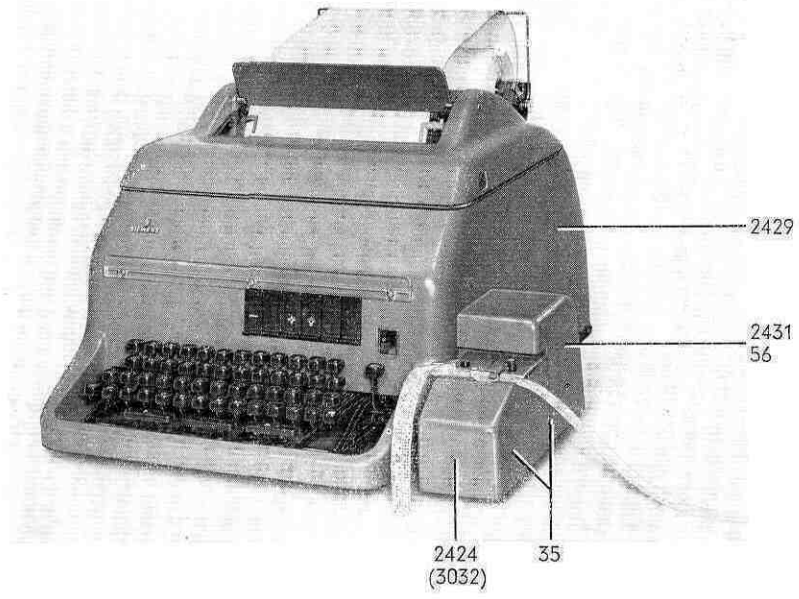
The perforated tape  $17.4 \pm 0.1$  mm wide passes through the transmitter from right to left and, after having passed the reading station, is deflected to the front (see Fig. 1). Depress tape lid latching lever 2402/3 until tape retainer lid 2403 springs open. Insert the perforated tape in such a way that the pins of the feed wheel properly engage the holes in the perforated tape and close tape retainer lid (the beginning end of tapes is arrow-shaped).

If transmission is to start with a certain code combination, place the respective row of perforations over the sensing levers.

#### 2.2.2. Switching on and off the tapetransmitter attachment

Before cutting in the transmitter establish a connection with the far-end station and switch on the tapetransmitter attachment by depressing the start button 2404/3 (⊙). The tapetransmitter attachment is switched off either manually by depressing the OFF-button 2405 (⊙) or automatically at the end of the tape by the end-of-tape lever.

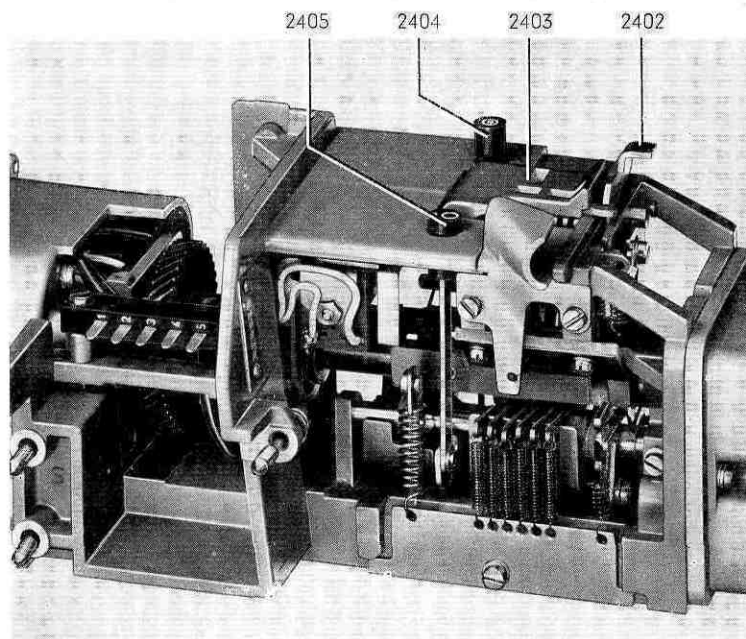
The receiving station can break an incoming transmission by duplexing, but the tapetransmitter attachment can only be switched off during the stop pulse. This ensures that a code combination is not transmitted in mutilated form.



1

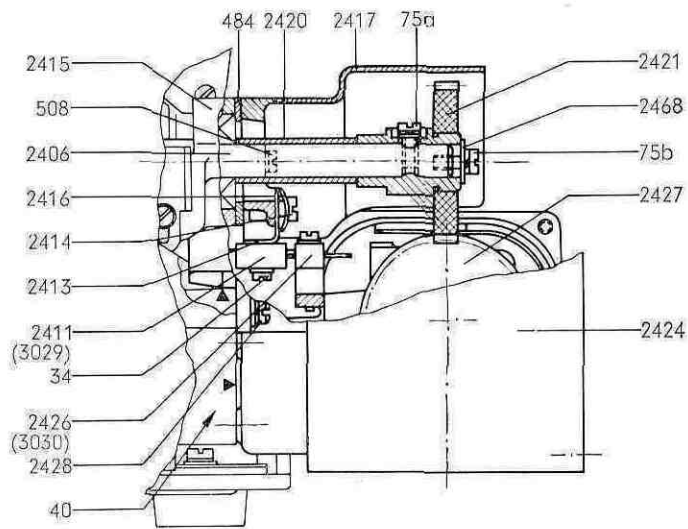
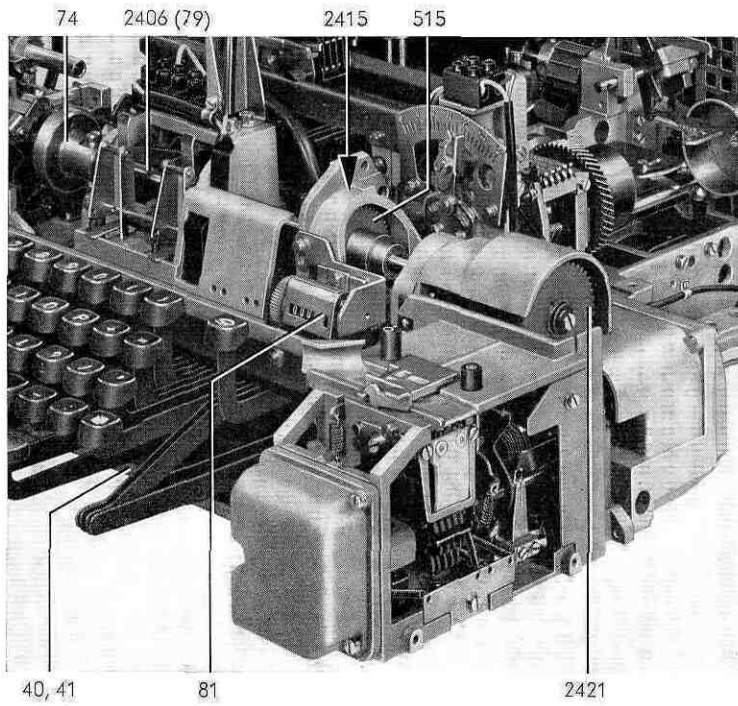


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### **3. INSTALLATION AND REMOVAL OF TAPETRANSMITTER ATTACHMENT**

Prior to starting work pull the power and telegraph plugs from their wall outlets. Bring the tapetransmitter attachment into rest position according to adjustment A1.

Installation: When installing the tapetransmitter attachment in the field, replace shaft 79/4 by shaft 2406. To do this, loosen mounting screws on cover 484/5, on clutch drum 74/4 and on helical gear 515. In teleprinters from serial number 37 673 onwards, shaft 79 is additionally provided with remote control switch pinion 2557 (not illustrated). To remove this pinion, loosen mounting screw 426 (not illustrated). Slide out shaft 79 in the direction of mounting frame 2415 and insert shaft 2406. Push helical gear 515, remote control switch pinion 2557 (not illustrated) and clutch drum 74 onto shaft 2406 and fix in position.

Secure cover 484/5 and cover 2417 on mounting frame 2415 using fillister head screw 508. Slide tube 2420 and helical gear 2421/4,5 onto shaft 2406. Mount helical gear 2421 loosely by means of fillister head screw 75a/5. Press helical gear 2421 with fillister head screw 75b and washer 2468 onto tube 2420 and then tighten fillister head screw 75a. Screw clip connector 2411 onto bracket 2413 by means of fillister head screw 34. Mount bracket 2413 with clip connector 2411 onto cover 2417 using shoulder screw 2414 and spring washers 2416.

Loosen cable K1 (Fig.52) of the tapetransmitter attachment attached to the terminal block (not illustrated) of the Teleprinter 100, and solder it to the clip connector 2411/5 as shown on Fig. 52. Prior to installing the tapetransmitter attachment, remove the 4-pole terminal block (not visible) mounted on the holding bracket of counter 81/4. Then loosen the two fillister head screws 35/1 and remove cap 2424/1,5 from the tapetransmitter.

Place the tapetransmitter attachment against the side of base plate 40/5. Blade terminal block 2426/5 should safely be plugged in clip connector 2411.

Slowly turn helical gear 2421/4,5 in order to ensure proper engagement in helical gear 2427/5. Mount tapetransmitter on base plate 40 using the three captive recessed neck screws 2428 (only one visible in Fig. 5).

Secure cap 2424/1,5 on the tapetransmitter attachment using fillister head screws 35/1.

Removal: Reverse the above procedure.

#### **3.1. Additional instructions for field installation**

##### **3.1.1. Teleprinter with protective cover**

When the tapetransmitter attachment is installed in the field remove the right cover plate of cap 2429/1 after loosening the three countersunk screws, then press right-hand dummy plug out of the cover and mount transmitter cap 2431 from the inside with the three fillister head screws 56.

##### **3.1.2. Teleprinter in the floor cabinet**

When the tapetransmitter attachment is installed in the field remove the right-hand dummy plate of the front of floor cabinet after loosening the three countersunk wood screws.





#### **4. REMOVAL AND REPLACEMENT OF MAJOR ASSEMBLIES**

Prior to starting work pull the power and telegraph plugs from their wall outlets and turn the tapetransmitter attachment into rest position (see adjustment A1).

##### **4.1. Contact switching assembly 2439/6**

Removal: Remove cover 2437 after loosening the three fillister head screws 224. Loosen fillister head screw 2438, pull down the three leaf springs 2517 with plate 2518 and fillister head screw 145.

Loosen the two fillister head screws 35b and remove contact spring set 167. Loosen fillister head screw 35a and pull out contact frame 2471.

Remove contact switching assembly 2439 after loosening the two fillister head screws 35c (only one visible in the figure).

Replacement: Reverse the above procedure.

Observe adjustments A5 and A13.

##### **4.2. Trailing lever 2443/7, sensing levers 2444, 2445, 2446, 2447, end-of-tape lever 2448**

Removal: Remove lubricating felt 2519, spring comb 2459 and guide comb 2458 after loosening the two fillister head screws 35/6.

Remove tape guide 2449 with countersunk screw 342a. Loosen fillister head screw 35d. Press retainer plate 2451 downwards out of bearing pin 2452 and axles 2453. Pull out bearing pin 2452. Unhook tension spring 2476/7 from end-of-tape lever 2448. Slowly pull out right-hand axle 2453/6. At the same time remove first felt washer 2455/7, 8, first sensing lever 2445, end-of-tape lever 2448, sensing lever 2446, second felt washer 2455/7, 8, second sensing lever 2445, third felt washer 2455, sensing lever 2444/7, trailing lever 2443 and torsion spring 2456.

Replacement: Reverse the above procedure. Mount guide comb 2458/6 in the direction of the tape guide.

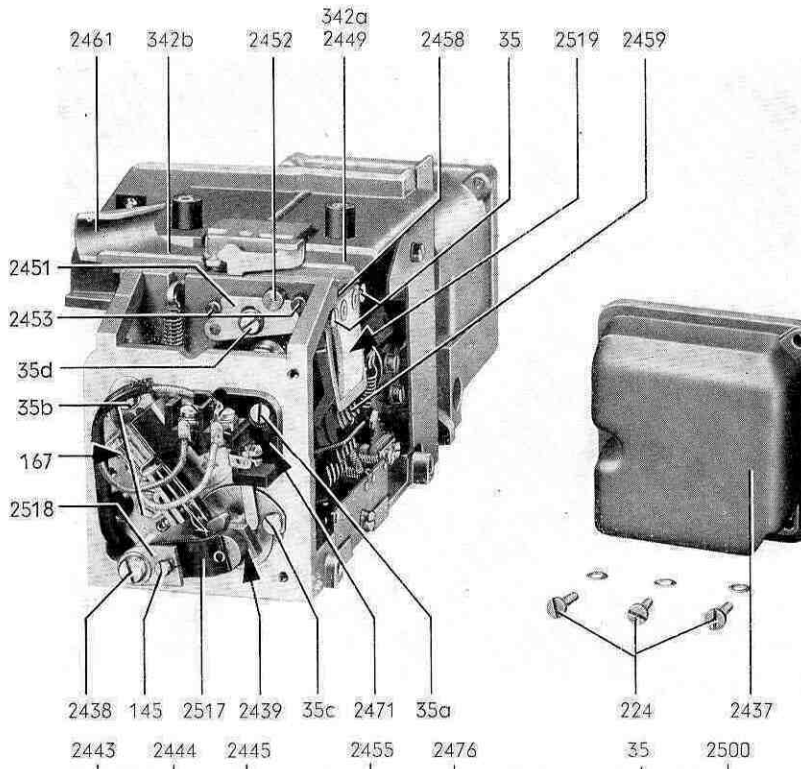
##### **4.3. Feed wheel 2457/8 and tape lid latching lever 2402**

Removal: Remove lubricating felt 2519, spring comb 2459 and guide comb 2458 after loosening the two fillister head screws 35/6. Remove tape guide 2449 and tape deflector 2461 by loosening countersunk screws 342a, b. Unscrew fillister head screw 35/8 and remove retainer plate 2451. Pull out pressure spring 2463 and remove brake shoe 2464.

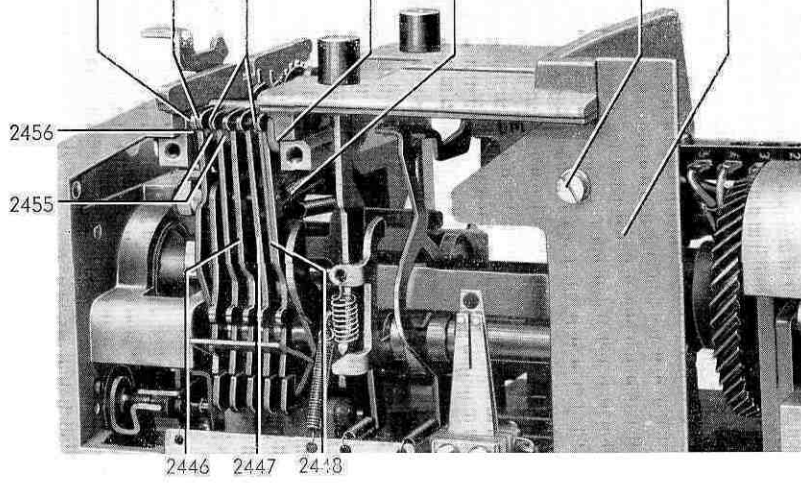
Unhook tension spring 2476/7 from end-of-tape lever 2448 and tension spring 403/8 from tape lid latching lever 2402. Pull slowly out axle 2453. At the same time carefully remove brake shoe 2465, guide plate 2466 with tension spring 2476/7 and lubricating felt 2467/8.

Replacement: Reverse the above procedure.

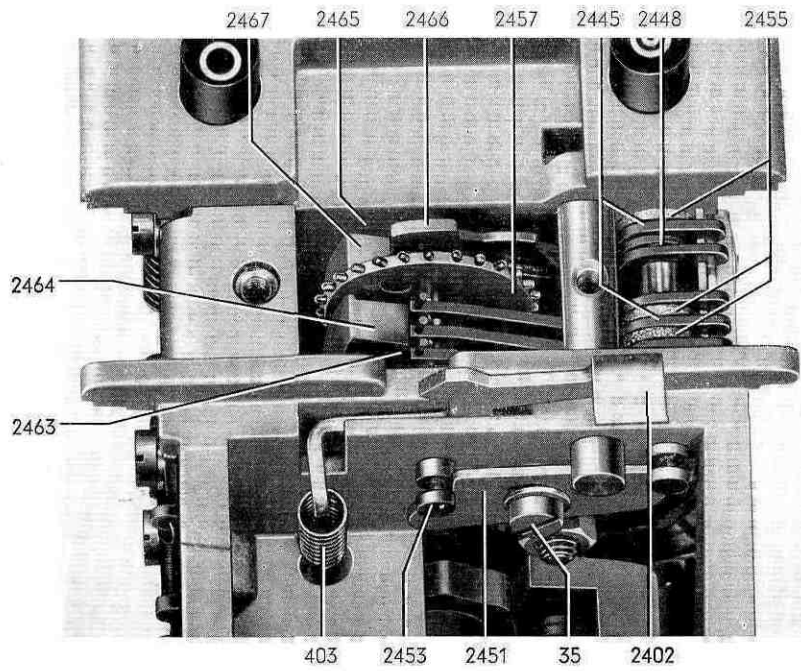
Observe adjustments A6, A8 to A10.



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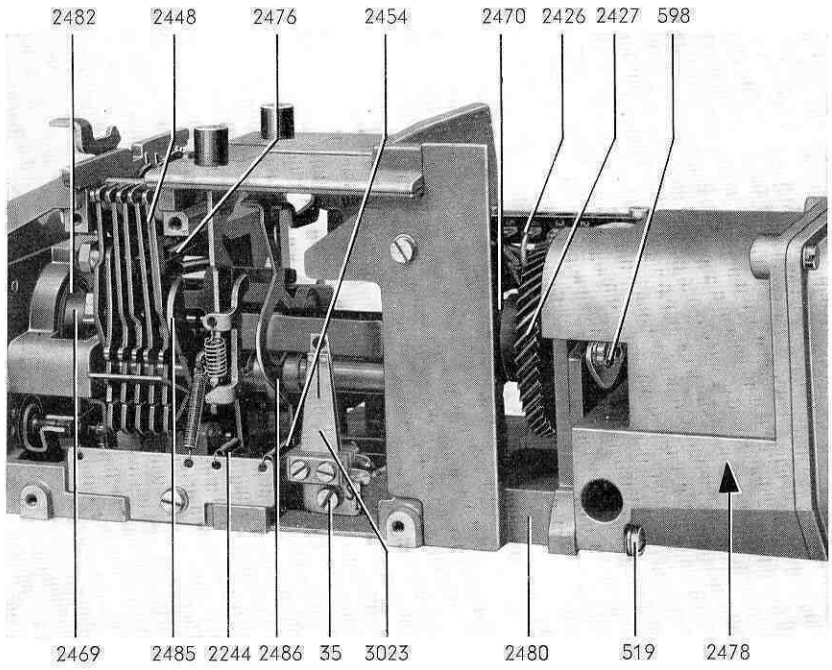


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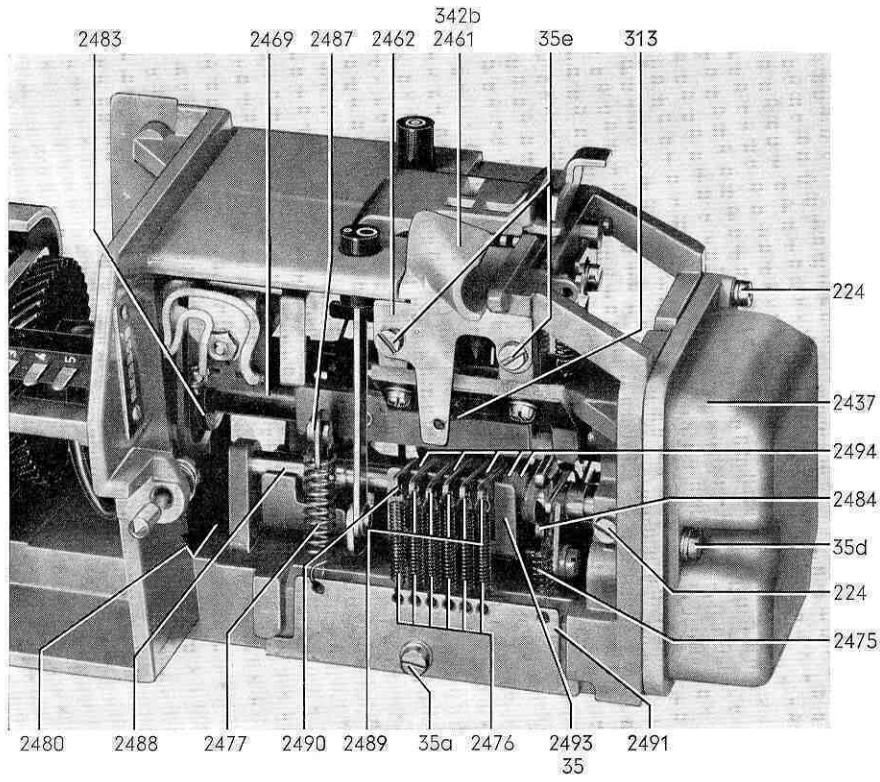


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**4.4. Camshaft 2469/9, clutch half 2470, helical gear 2427**

Removal: Remove cover 2437/10 with three fillister head screws 224 (only two visible in the Fig.). Remove contact spring set 167/6 with two fillister head screws 35b. Remove contact frame 2471 with fillister head screw 35a.

Squeeze and pull out snap ring 2472 (not visible) of the frontal ball bearing 2482/9.

Remove tape deflector 2461/10 with countersunk screw 342b. Unhook tension spring 313 from feed lever 2485/9 and remove bracket 2462/10 (with tension spring 313) with two fillister head screws 35e. Unhook tension spring 2475, six tension springs 2476, and tension spring 2477.

Remove by turning sideways R/F suppressor box 2478/9 with its two recessed-neck screws 519 (only one visible in the Fig.) from mounting frame 2480. Remove hexagon nut 598. Unhook tension spring 2476 from end-of-tape lever 2448. Pull out camshaft 2469 with front ball bearing 2482 and simultaneously remove in sequence helical gear 2427, clutch half 2470, and pressure spring 2483/10. For easy removal, but especially for the installation of camshaft 2469/9,10, make sure that contact lever 2484/10, feed lever 2485/9, sensing lever 2486, and zero-setting lever 2487/10 of camshaft 2469 have been turned aside.

Replacement: Reverse the above procedure.

Observe adjustments A1, A3 and A5.

**4.5. Contact control lever 2484/10, code levers 2489, 2490, zero-setting lever 2487**

Removal: Detach cover 2437 after loosening the three fillister head screws 224 (only two visible in the Fig.). Remove spring set 167/6 with two fillister head screws 35b. Unhook tension spring 2475/10, six tension springs 2476, and tension spring 2477 from levers 2484, 2489, 2490 and 2487. Remove spring suspension bracket 2491 with fillister head screw 35a.

Remove fillister head screw 35d from axle 2488 and carefully pull out axle forward, at the same time removing the first felt washer 2494 and zero-setting lever 2487. Remove the three fillister head screws 35 from guide comb 2493. Remove guide comb 2493 with code lever 2490, the five code levers 2489, and the second, third, and fourth felt washer 2494 and contact control lever 2484.

Replacement: Insert guide comb 2493/10 with code levers 2489 and 2490 under camshaft 2469. Slide axle 2488 forward through mounting frame 2480, through contact control lever 2484, and in the reverse sequence of the removal through felt washers 2494 and code levers 2489, 2490 and through zero-setting lever 2487, and finally through the second bearing of the mounting frame 2480 and fasten axle 2488 by means of fillister head screw 35d.

For further installation reverse the above procedure. Observe adjustments A2, A5, A12 and A13.



**4.6. Stop bail 2496/11, sensing lever 2486, trailing lever 2497, locking lever 2498, feed lever 2485**

Removal: Remove contact spring set 167/6 and contact switching assembly 2439 as per para. 4.1. Remove tape deflector 2461 by loosening countersunk screw 342b.

Remove cover 2500/7 after loosening fillister head screw 35. Remove bracket 2462/12 by loosening the two fillister head screws 35e. Unhook tension spring 2475, six tension springs 2476 and tension spring 2477. Loosen fillister head screw 35b of magnet yoke 2499, and remove fillister head screw 35d from axle 2488. Press axle 2488 **backwards** past the loosened magnet yoke 2499 until contact control lever 2484 can be pulled outwards.

Unscrew fillister head screw 35e/11 from axle 2495. Carefully pull axle 2495 forwards and out. Unhook tension spring 2454/9 and remove sensing lever 2486/11 with felt washer 365. Unhook tension springs 2244/9 and 403/11 and remove retainer 362/12 from rivet of trailing lever 2497. Pull out trailing lever 2497 from OFF button (⊖). Pull out axle 2488 to the front to a point where trailing lever 2497 can be removed. Remove stop button 2405 **upwards**. Press off retainer 362 from rivet of stop bail 2496/11. Pull stop bail 2496 out of ON button 2404 (⊕) and remove it. Pull out ON button 2404 **downwards**. Unhook tension spring 313/12 and remove locking lever 2498/11.

Remove guide comb 2458/6, spring comb 2459 and lubricating felt as per para. 4.2. Unhook tension spring 2476/11 from end-of-tape lever 2448. Pass feed lever 2485 along behind trailing lever 2443, sensing levers 2444 to 2447 and end-of-tape lever 2448 and remove it. Pawl 2430/39 can be pulled off the bearing pin by removing its retainer.

Replacement: Reverse the above procedure.

Observe the applicable adjustments given in para. 5.

**4.7. Bail 2504/11**

Removal: Remove contact control lever 2484/10, code levers 2489, 2490 and zero-setting lever 2487 as per para. 4.5.

Loosen fillister head screw 35f/11 on retainer plate 2505. Turn retainer plate 2505 from groove bearing. Pull out axle 2503 and remove bail 2504 as well as two felt washers 549, to the right and to the left of the bearing within bail 2504.

Replacement: Reverse the above procedure.

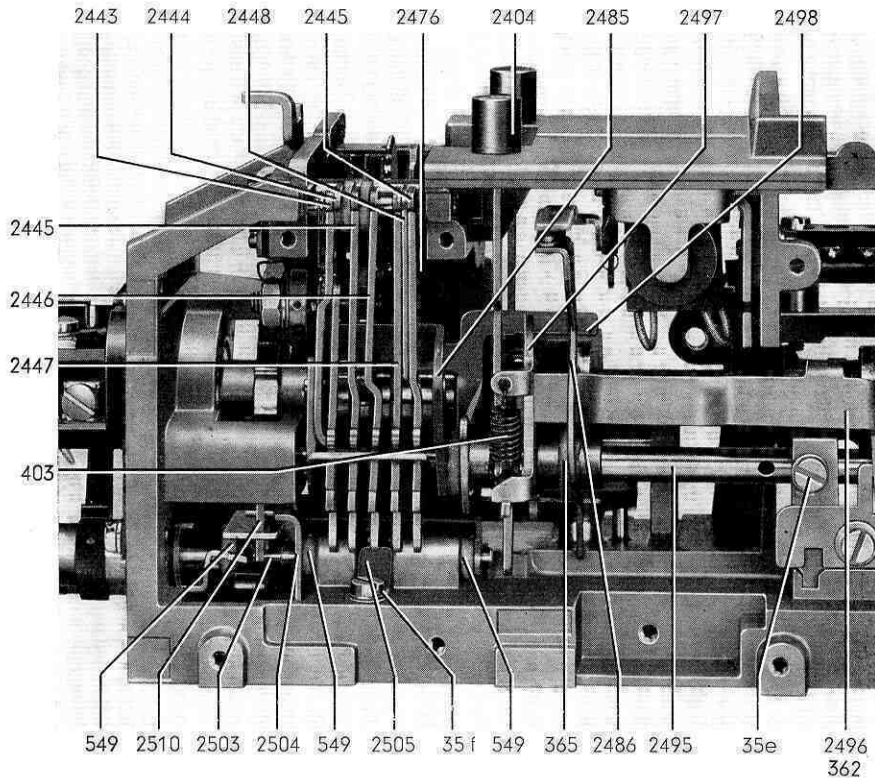
Observe adjustment A9.

**4.8. Contact spring set 3023/9**

Removal: Remove contact spring set 3023 after loosening head screw. Unsolder the gray (gr) and the black (sw) wire from control contact s1/57 (not visible) and from the blade connector 2426/12 (also see Fig. 57).

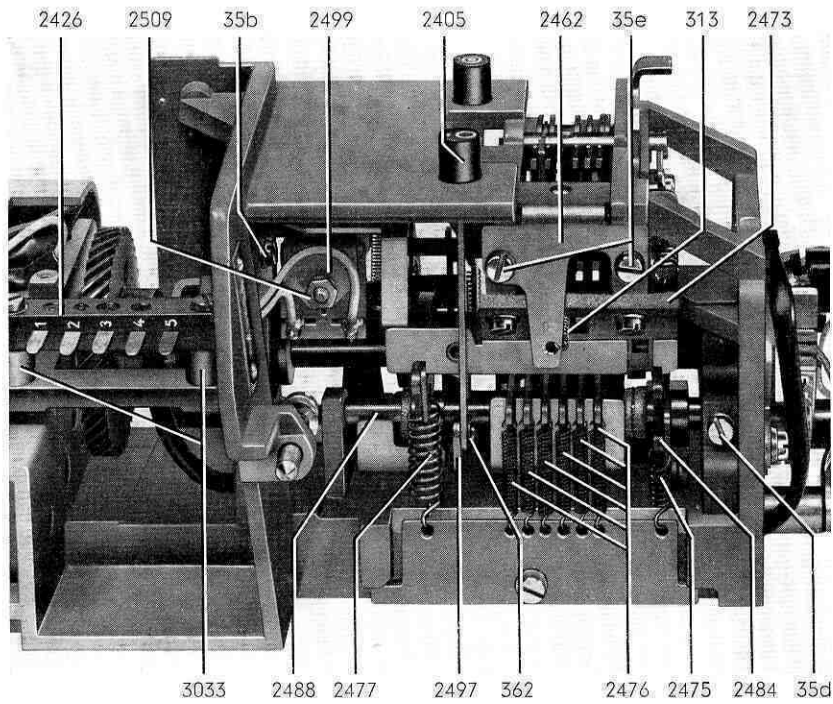
Remove the 2-conductor cable from the tapetransmitter attachment.

Replacement: Reverse the above procedure.

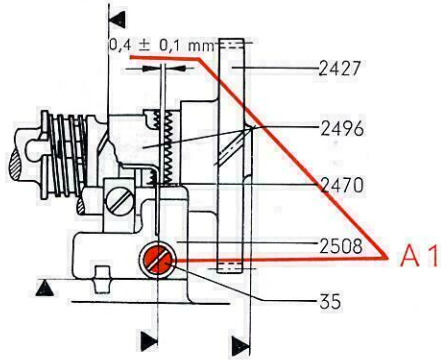


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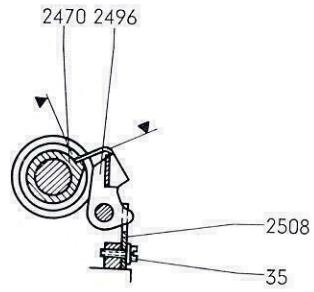
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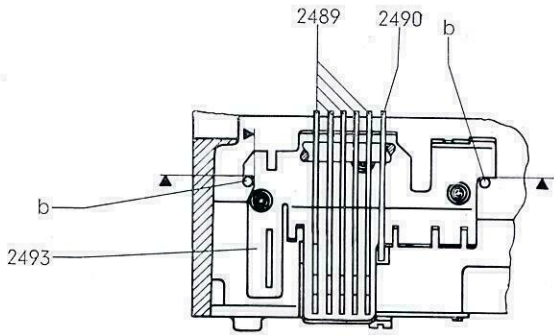
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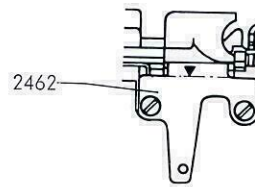
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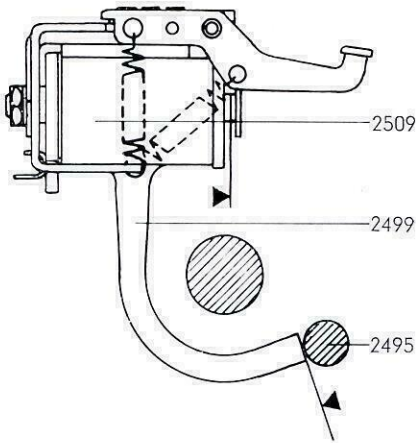
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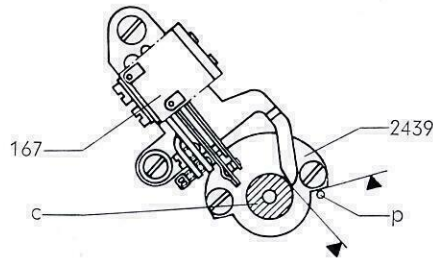
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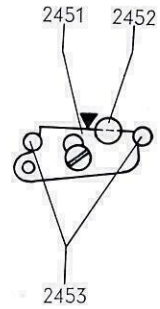
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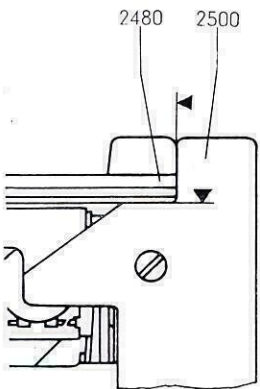
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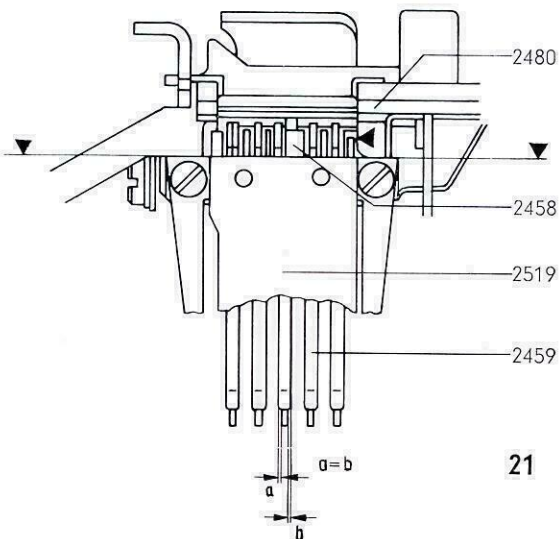
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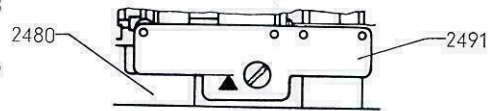
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## 5. ADJUSTMENTS

Prior to starting work pull the power and telegraph plugs from their wall outlets. It is recommended that the following adjustments be performed with the tapetransmitter detached.

Gears should mesh with a small but still noticeable backlash.

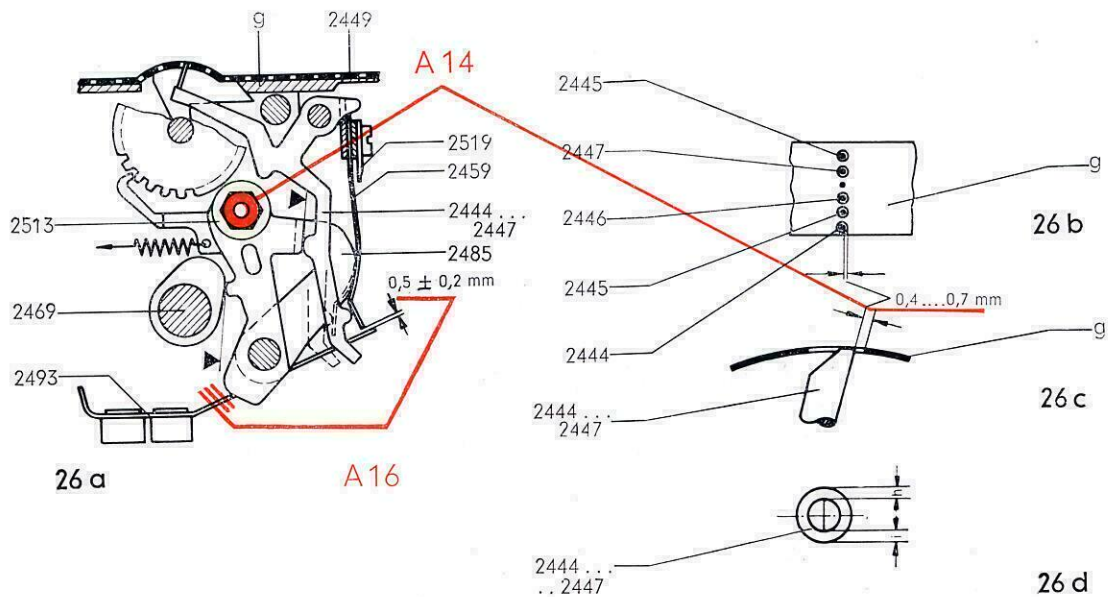
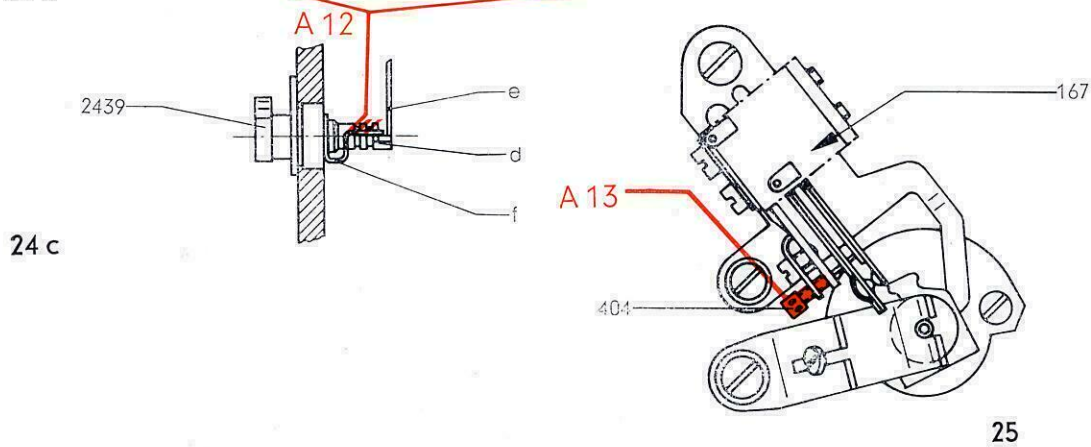
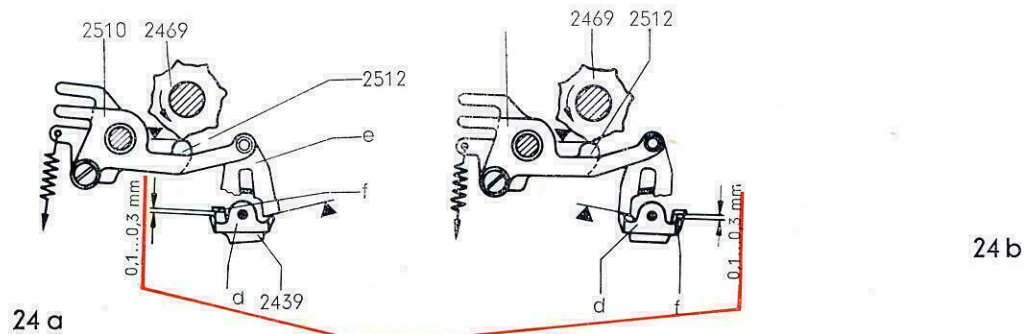
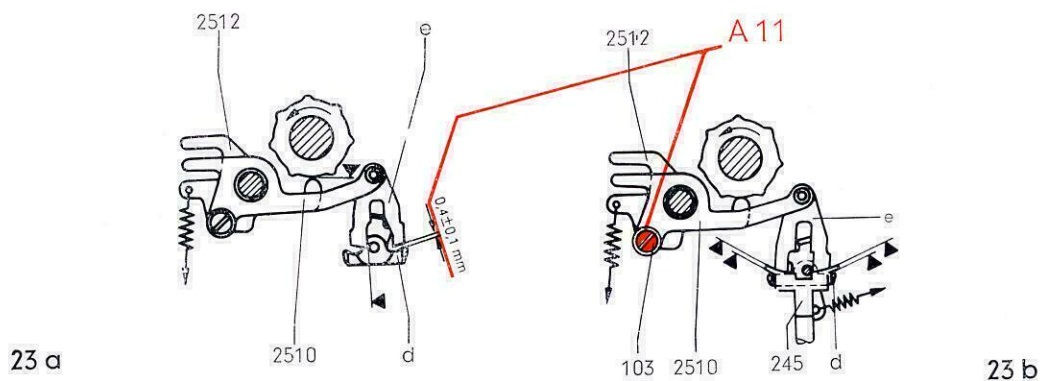
Do not bend or adjust springs and contact spring sets. Replace springs or contact spring sets which are damaged or fail to meet the specified adjustment values.

- A1 Stop bail 2496/13,14 and clutch half 2470  
With the tapetransmitter attachment in rest condition, the locking nose of clutch half 2470 rests against stop bail 2496. The gap between clutch half 2470 and helical gear 2427/13 should then be  $0.4 \pm 0.1$  mm.  
Adjustment: Loosen fillister head screw 37/13 and displace guide plate 2508 laterally.
- A2 to A10 Points of contact
- A2 Guide comb 2493/15  
Guide comb 2493 should contact the two pin "b" at the points marked. Code levers 2489, 2490 should move freely and easily in the guide comb.
- A3 Bracket 2462/16  
Bracket 2462 should be in contact with the mounting frame at the points marked.
- A4 Magnet yoke 2499/17  
Magnet yoke 2499 of magnet assembly 2509 should be in contact with axle 2495.
- A5 Contact spring set 167/18  
The arm of contact spring set 167 should be in contact with sleeve "c" of the contact switching assembly 2439. Contact switching assembly 2439 should rest on pin "p".
- A6 Retainer plate 2451/19  
Retainer plate 2451 should rest in the slot of bearing pin 2452 and protrude into the two recesses of axles 2453.
- A7 Cover 2500/20  
Cover 2500 should contact mounting frame 2480 at the points marked.
- A8 Guide comb 2458/21  
Guide comb 2458 should be in contact with the mounting frame 2480 at the point marked.
- A9 Spring comb 2459/21  
The extension of spring comb 2459 should contact the side of mounting frame 2480, and the arms of the springs must be properly centered upon the sensing levers ( $a \approx b$ ).
- A10 Spring suspension bracket 2491/22  
Spring suspension bracket 2491 should contact mounting frame 2480 at the points marked.

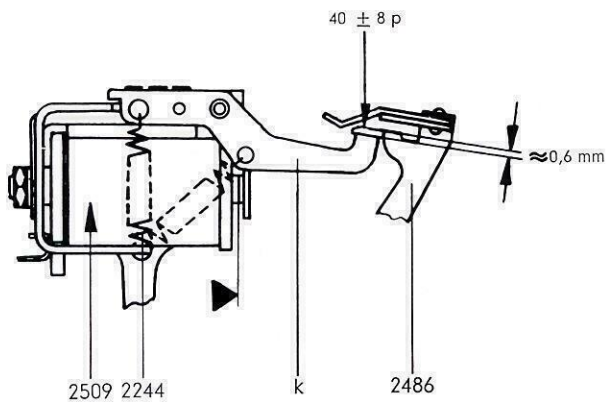
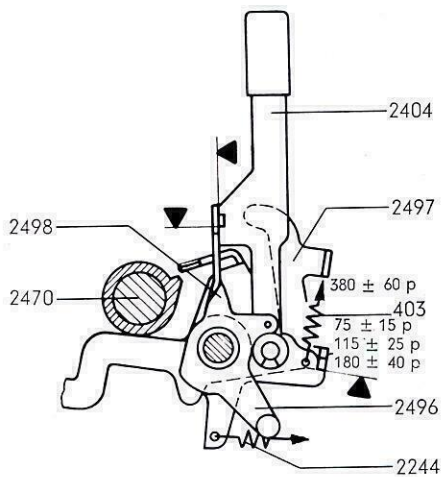
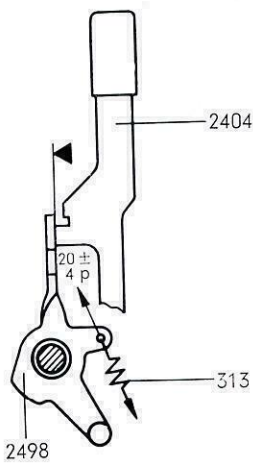
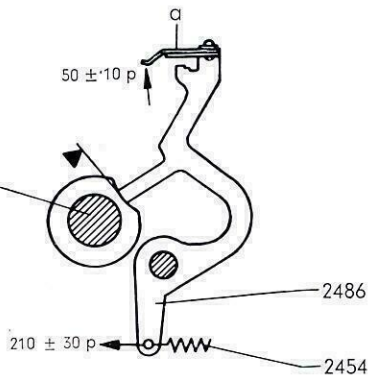
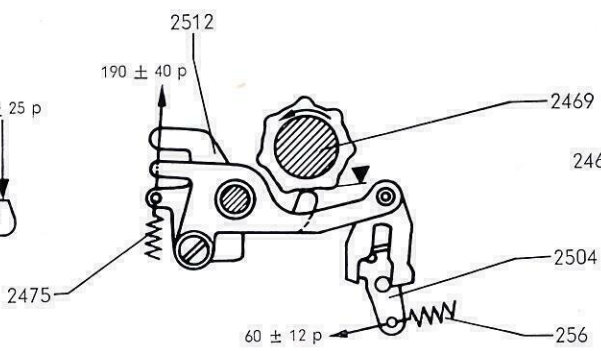
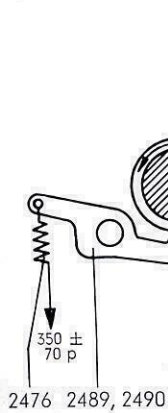
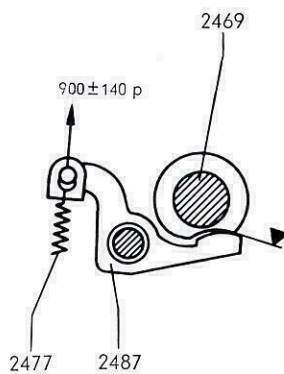
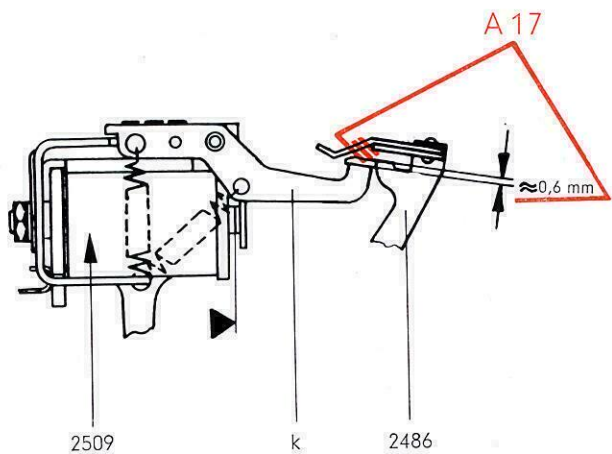




- A11 Lever with rocker 2510/23  
Tapetransmitter attachment in rest condition (see adjustment A1). The gap between switching shaft d/23a of the contact switching assembly and rocker "e" of lever with rocker 2510 must be  $0.4 \pm 0.1$  mm.  
Adjustment: Loosen fillister head screw 103/23b and insert adjusting gage 245 between switching shaft "d" and rocker "e". Turn lever with rocker 2510 with respect to control lever 2512 until switching shaft "d" and rocker "e" of lever with rocker 2510 contact adjusting gage 245 at the points marked. Tighten fillister head screw 103.
- A12, A13 Contact switching assembly 2439/24
- A12 Turn camshaft 2469/24a,b until control lever 2512 rides on the high part of the cam, and rocker "e" of lever with rocker 2510 is in the position shown. The pins of the sensing levers are prevented by a perforated tape (with feed holes only) from moving into the tape track.  
There should be a gap of 0.1 to 0.3 mm between switching shaft "d" and arm "f" of the contact switching assembly.  
Adjustment: Bend arm "f" (Fig. 24c).  
Remove inserted tapes rotate camshaft 2469/24b so that the pins of the sensing levers fully engage in the tape guide, and lever with rocker 2510 is on the high portion of the cam. There should be a clearance of 0.1 to 0.3 mm between switching shaft "d" and arm "f" of the contact switching assembly.  
Adjustment: Bend arm "f" (Fig. 24c).
- A13 Contact spring set 167/25 (adjusting the contact make time)  
Disconnect cable from the contact frame. Connect the line tester to the two solder tags of the contact spring set. Insert gage 245/23b as described in adjustment A11. The contacts of contact spring set 167/25 should be just make.  
Adjustment: Turn setting screw 404. When turning the screw clockwise, the contacts opens.
- A14, A15 Sensing levers 2444 to 2447/26 a to d
- A14 Insert a perforated tape g/26a with code combination "Ltrs shift A... (5 holes) in tape track 2449. Release the clutch by depressing the start button (⊖) and turn camshaft 2469 by one revolution. Release the clutch again and turn camshaft 2469 until the pins of the sensing levers 2444 to 2447 are level with the surface of perforated tape "g".  
The gap between the pins of sensing levers 2444 to 2447/26b, c and the perforations in the perforated tape should be 0.4 to 0.7 mm.  
Adjustment: Turn eccentric sleeve 2513/26 of feed lever 2485.
- (A15) The pins of the sensing levers 2444 to 2447/26d should, when judged by eye, be centered in the holes of perforated tape g/26b ( $h \approx i$ ).  
When camshaft 2469/26a is turned, the perforated tape should not be advanced before the pins of sensing levers 2444 to 2447 have been retracted below tape guide 2449.
- A16 Guide comb 2493/26a  
Release the clutch and turn camshaft 2469 until feed lever 2485 rides on the high part of the cam. There should be a gap of  $0.5 \pm 0.2$  mm between spring comb 2459 and guide comb 2493.  
Adjustment: Bend guide comb 2493.



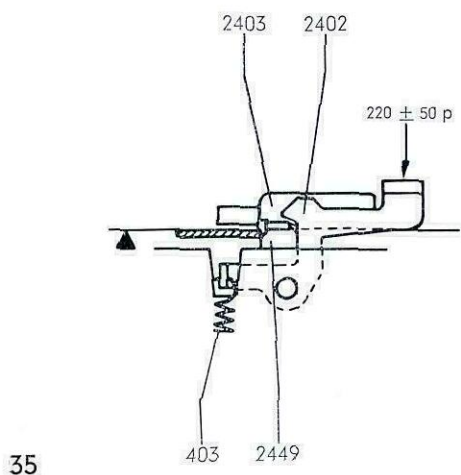
VII



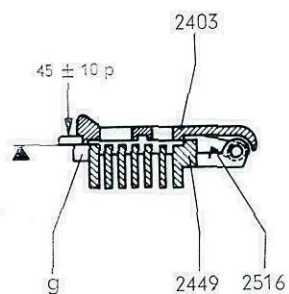
- A17 Sensing lever 2486/27 and magnet assembly 2509  
Sensing lever 2486 and the attracted armature "k" of magnet assembly 2509 overlap by approx. 0.6 mm.  
Adjustment: Bend sensing lever 2486.  
Spring forces: All tensions are measured with the tapetransmitter in rest condition, unless otherwise stated.
- (A18) Zero-setting lever 2487/28 with tension spring 2477  
Zero-setting lever 2487 is lifted off camshaft 2469 at the point marked by a force of  $900 \pm 140$  p.
- (A19) Code levers 2489, 2490/29 with tension spring 2476  
The code levers 2489, 2490 are lifted off camshaft 2469 at the point marked by a force of  $125 \pm 25$  p. Turn the camshaft until the sensing lever pins have moved into the tape track. Tension spring 2476 should exert force of  $350 \pm 70$  p on sensing levers 2489, 2490.
- (A20) Control lever 2512/30 and bail 2504 with tension springs 2475, 256  
Control lever 2512 must be lifted off camshaft 2469 at the point marked by a force of  $190 \pm 40$  p. Bail 2504 should be biased by a force of  $60 \pm 12$  p.
- (A21) Sensing lever 2486/31 with tension spring 2454  
Sensing lever 2486 is lifted off camshaft 2469 at the point marked by a force of  $210 \pm 30$  p. Leaf spring "a" should be lifted off its opposite position, applying a force of  $50 \pm 10$  p.
- (A22) Locking lever 2498/32 with tension spring 313  
The force of locking lever 2498 on start button 2404 must be balanced by a forced of  $20 \pm 4$  p. applied in the direction shown.
- (A23) Stop bail 2496/33 and trailing lever 2497 with tension springs 2244, 403  
Depress start button 2404 and latch with locking lever 2498. The following forces should act on stop bail 2496:  
75  $\pm$  15 p without contact s<sup>I</sup>  
115  $\pm$  25 p with contact s<sup>I</sup>  
180  $\pm$  40 p with contacts s<sup>I</sup> and s<sup>II</sup>  
Tension spring 403 of trailing lever 2497 should act in opposition to these forces with  $380 \pm 60$  p. Make sure that stop button 2405 is safely lifted.
- (A24) Magnet assembly 2509/34 with tension spring 2244  
Sensing lever 2486 lifted off. Armature "k" of magnet assembly 2509 is just held on the core of magnet assembly 2509 at the point marked by a force of  $40 \pm 8$  p.



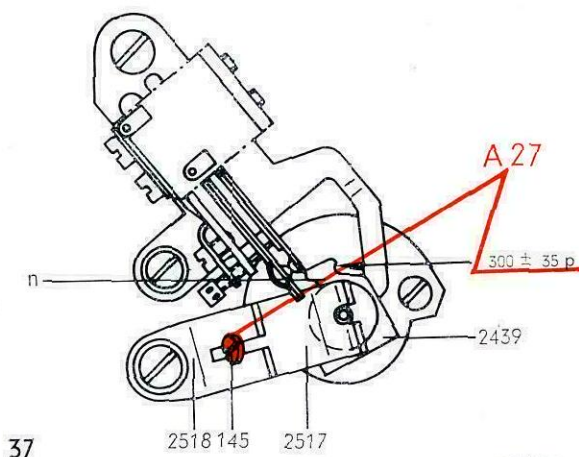
- (A25) Lid latching lever 2402/35 with tension spring 403  
With tape retainer lid 2403 of tape guide 2449 closed, the force exerted on lid latching lever 2402 is  $220 \pm 50$  p.
- (A26) Tape retainer lid 2403/36 with torsion spring 2516  
The tape retainer lid 2403 of tape guide 2449 is held on tape track "g" of tape guide 2449 by a force of  $45 \pm 10$  p.
- (A27) Contact switching assembly 2439/37 with leaf springs 251 and plate 2518  
A force of  $300 \pm 35$  p is required at the point marked to turn contact switching plate "n" of the contact switching assembly. This force may be adjusted by means of fillister head screw 145, if necessary.
- (A28) Clutch half 2470/38 with pressure spring 2483  
With a clutch clearance of  $0.4 \pm 0.1$  mm and start button 2404/33 depressed (stop bail 2496/38 does not rest against clutch half 2470), a force of  $200 \pm 60$  p. should act on clutch half 2470.
- (A29) Feed lever 2485/39 with tension spring 313  
Insert perforated tape with feed holes only and close tape retainer lid 2403/36. Turn camshaft 2469/39 until feed lever 2485 rides on the low part of the cam. Now there should be a noticeable gap between sensing levers 2444 to 2447 and feed lever 2485. The force exerted at the point marked should be  $50 \pm 18$  p. Important. Turn feed wheel 2457 in such a manner that pawl 2430 does not step on the feed wheel while measuring.
- (A30) Sensing levers 2444 to 2447/40 with spring comb 2459  
Release the tapetransmitter attachment and turn camshaft 2469 until the pins of sensing levers 2444 to 2447 are level with the tape.  $37 \pm 10$  p should suffice to keep sensing levers 2444 to 2447 in the tape track.
- (A31) End-of-tape lever 2448/41 with tension spring 2476  
Release the tapetransmitter attachment and turn camshaft 2469 until the pins of the sensing levers have fully dropped into the tape guide 2449.  $225 \pm 35$  p must be applied to move end-of-tape lever 2448 so that it is level with the tape.



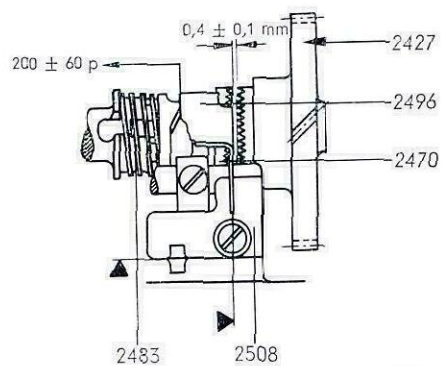
35



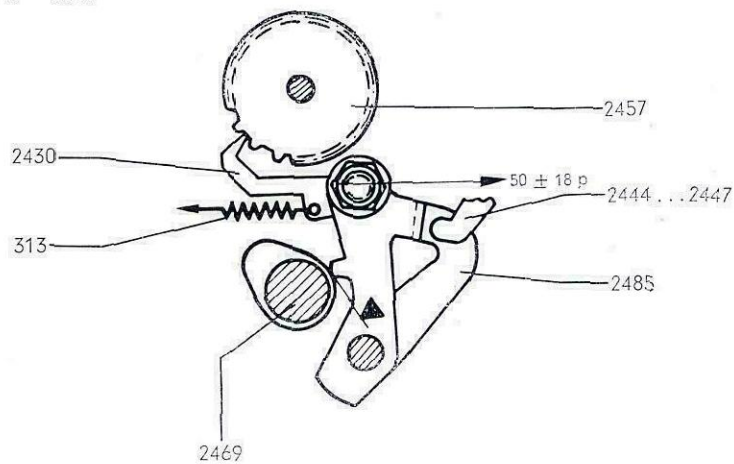
36



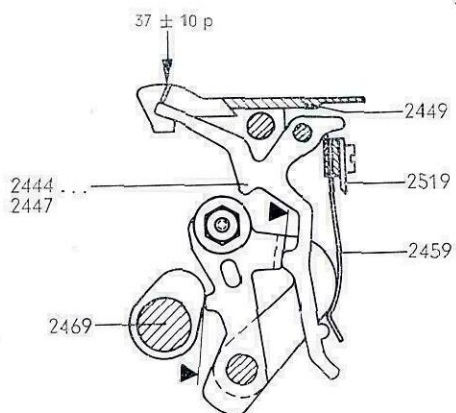
37



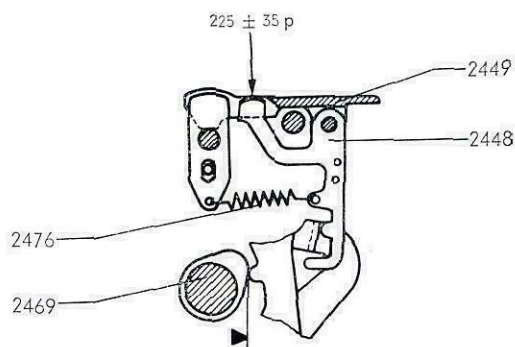
38



39



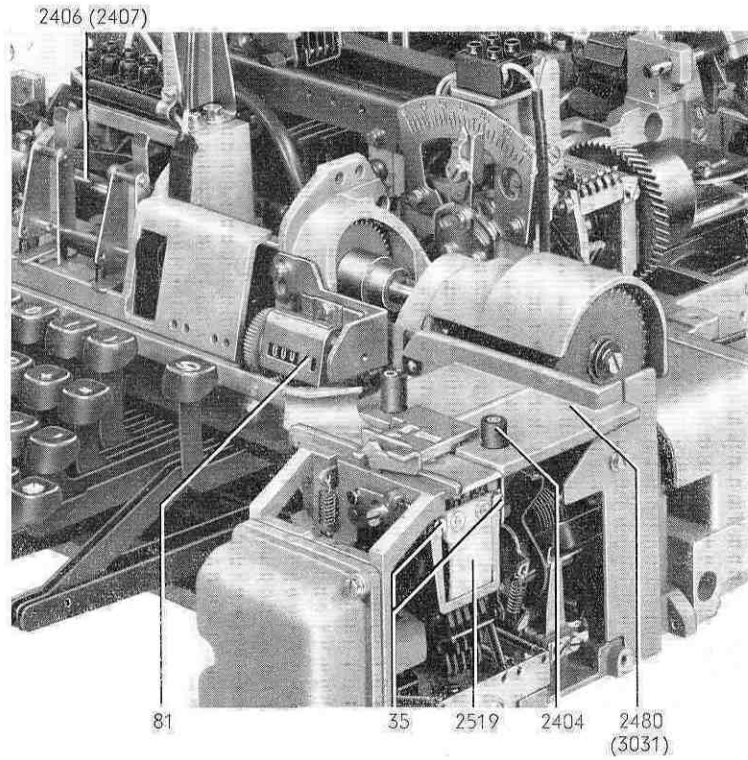
40



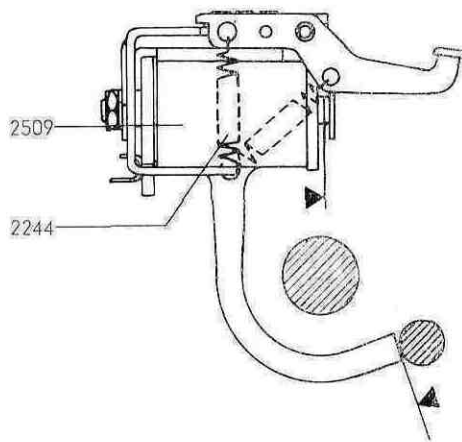
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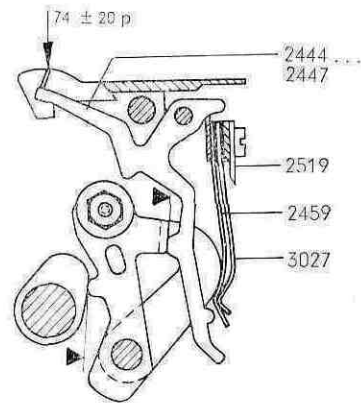




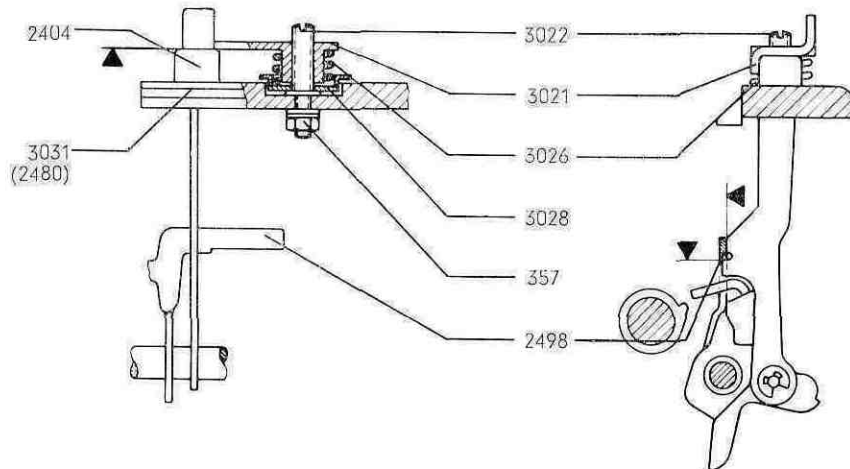
42



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45

## 6. SPECIAL VERSIONS AND ANCILLARY DEVICES

This section contains additional information on the removal and replacement as well as the adjustments for the special versions and ancillary devices of the tapetransmitter attachment mentioned in section 1.

### 6.1. Version used in conjunction with teleprinter with protective cover, U1

See para. 3.1.

### 6.2. Version used in conjunction with teleprinter with storage transmitter for 50 bauds, U3

Replace shaft 2406/42 of the teleprinter by shaft 2407/42 after removing the former according to the instructions given in section 3 for shaft 79/4.

### 6.3. Version with separate 4-conductor connecting cable, U4

Disconnect the brown (br) and the white (ws) lead of the 4-conductor cable K1/53 provided in the teleprinter from the clamp (not visible) next to operation time counter 81/42, solder together and insulate the cable ends. Loosen cable clamp p/53 (consecutive number 5261), push the two leads soldered together through the bore a/53 of base plate B and secure on the mounting frame B by means of cable clamp "p" as shown in Fig. 53. Remove the clamp (not visible).

Attach the separate connecting lead K2 to mounting frame B by means of cable clamps n (consecutive number 3001) and solder it to the clip connector of the teleprinter as shown in Fig. 53.

### 6.4. Version with deactivated automatic break magnet, U5

To deactivate magnet assembly 2509/12,43 used as automatic break magnet, bring tension spring 2244 into the position represented by a broken line in Fig. 43. Furthermore solder in strap D/52.

### 6.5. Version for full-duplex operation with mechanical remote control switch, U6

See Installation Instructions and Service Manual Fs Ea, Ba 2187/12.

### 6.6. Version for reading chadless tape, U7

Loosen fillister head screws 35/42, remove lubricating felt 2519. Place spring comb 3027 and the removed lubricating felt 2519 on the spring comb 2459/44 and secure by means of fillister head screws 35/6.

Sensing levers 2444 to 2447 should be kept in the tape track by a force  $74 \pm 20$  p. (See also adjustment A30).

### 6.7. Version for polar current operation, U8

See Installation Instructions and Service Manual Fs Ea, Ba 2187/12.

### 6.8. Version for teleprinters with higher dielectric strength, U11

Replace clip connector 2411/5 by clip connector 3029 and blade connector 2426/6 by blade connector 3030.

### 6.9. Version with latched ON button, U12

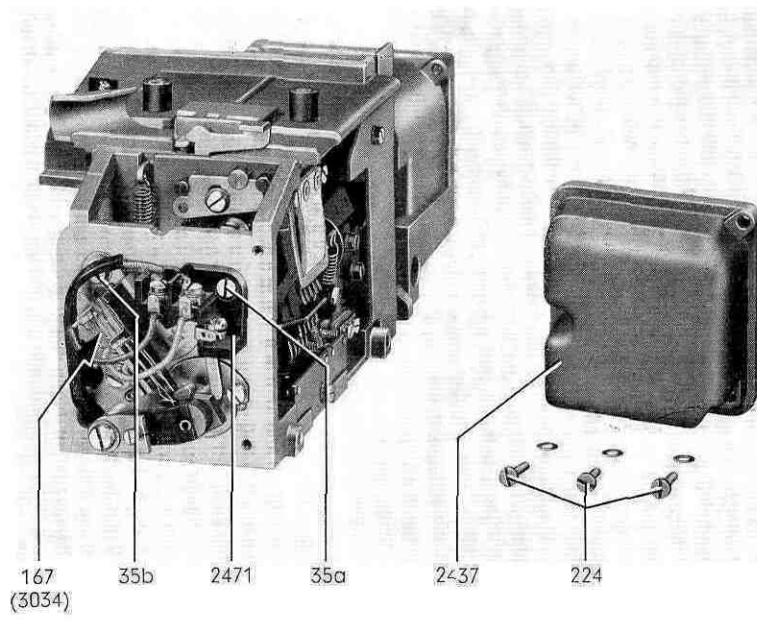
Replace mounting frame 2480/42,45 by mounting frame 3031 observing the instructions contained in paras. 4 and 5. Insert bearing pin 3022 with washer 3028 and pressure spring 3026 into the bore next to start button 2404/45. Secure bearing pin 3022 from below by means of hexagon nut 357, but do not yet tighten hexagon nut. Depress start button 2404 so that it latches with locking lever 2498.

Screw latching lever 3021 from above onto the bearing pin and then place it against the start button by turning the bearing pin. Tighten hexagon nut 357. The start button will not shake loose even during heavy machine vibrations and cannot switch off the tapetransmitter attachment.

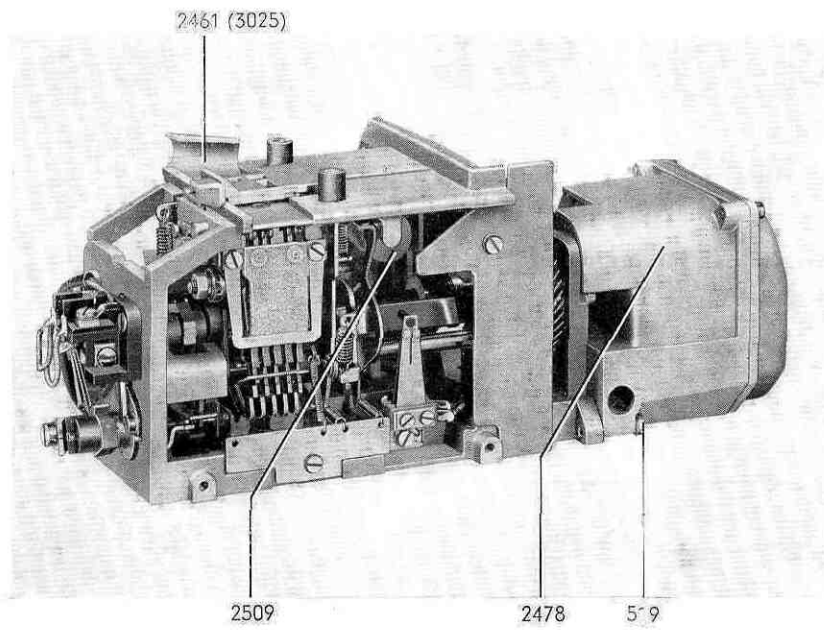




- 6.10. Version with keyboard transmitter short-circuited by contact s<sup>1</sup>, U15**  
Insert strap 1/55 as shown in Fig. 54 between terminals 10 and 16 in the keyboard of the teleprinter and solder strap II in between terminals 1 and 4 of the blade connector of the tapetransmitter attachment. Thus the keyboard transmitter of the teleprinter is short-circuited through contact s<sup>1</sup>.
- 6.11. Version with additional tape deflector ahead of tape guide, U16**  
Loosen fillister head screws 35/1, replace cap 2424 by cap with deflector 3032 and attach cap 3032 to the tapetransmitter attachment by means of fillister head screws 35.  
Proper passage of the tape into the tape guide is ensured by feeding the tape vertically from above over the tape deflector into the tapetransmitter attachment.
- 6.12. Version with double-throw send contact, U17**  
See Installation Instructions and Service Manual, Parts List Fs Ea, Ba, Es 2189/62.
- 6.13. Version with automatic break magnet separately connected through an 8-conductor telegraph lead U18**  
This version additionally requires one blade and one clip connector. Mount a second blade connector 2426 (not illustrated) below blade connector 2426/12, provided in the tapetransmitter attachment, spacer tubes 3033 are no longer required. Mount a second clip connector 2411 (not illustrated) above clip connector 2411/5, provided in the teleprinter. Electrical connections are to be made as shown in Fig. 55. Reconnect in the wiring of the keyboard A/55 the leads gray (gr) and black (sw) from solder terminals 16 and 15 to the solder terminals 20 and 19.
- 6.14. Version with send contact for a telegraph voltage of 12 v DC, U19**  
Remove cap 2424/1 after loosening fillister head screws 35. Remove cover 2437/46 after loosening fillister head screws 224. Disconnect electrical leads from contact frame 2471 and contact spring set 167. Loosen fillister head screws 35a and remove contact frame 2471. Loosen fillister head screws 35b and replace contact spring set 167 by contact spring set 3034 (not illustrated).
- 6.15. Version with 10° tape deflector, U21**  
Loosen countersunk screw 342b/10 and replace deflector 2461/47 by 10° tape deflector 3025 (not illustrated). The tape is now led back directly.

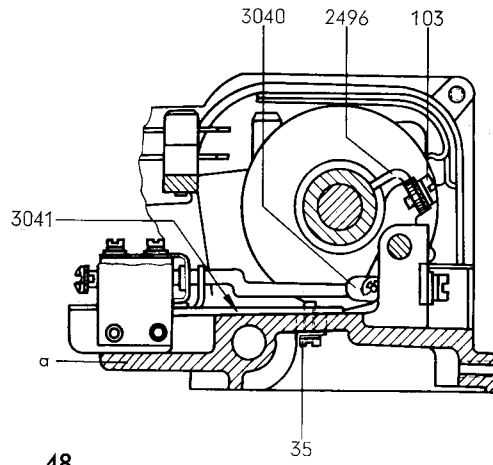


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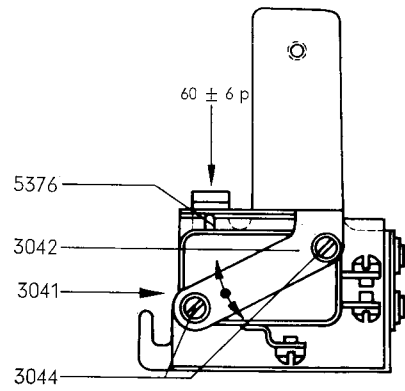


47

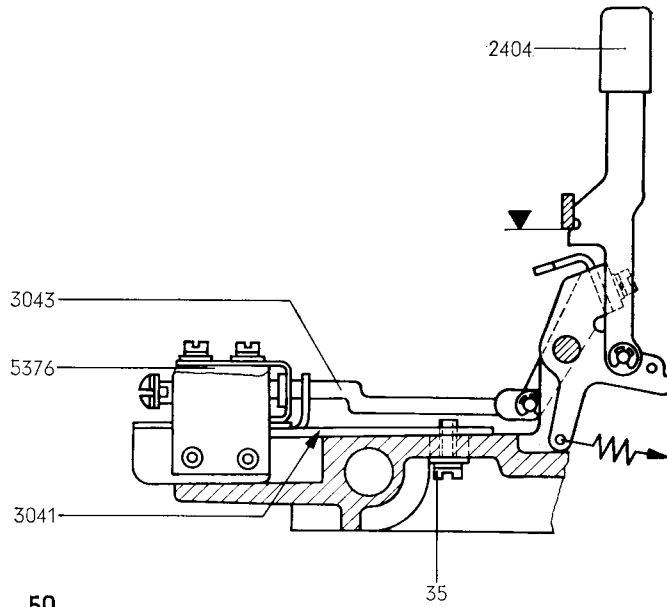
VII



48



49



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**6.16. Version with separate 6-conductor connecting cable, U22**

For this version one blade and one clip connector are additionally required. Mount a second blade connector below blade connector 2426/12 provided in the tapetransmitter attachment, the two spacer tubes being no longer required. Mount a second clip connector above clip connector 2411/5, provided in the teleprinter.

Solder cable K13/61 (consecutive number 3037) as shown in Fig. 57 on the additionally installed blade connector in the tapetransmitter attachment. Solder connecting cable "u" (consecutive number 3038) to the clip connectors in the teleprinter and attach it to the side of base plate B of the teleprinter by means of cover plate "d". Solder the shorting link "k" between solder terminals 8 and 9 in keyboard A. Connect the 4-wire cable K1 of the tapetransmitter attachment to the clip connectors of the teleprinter as shown in Fig. 57.

**6.16.1 Plate with switch 3041/48**

Removal: Remove plate with switch 3041 from mounting frame "a" after loosening fillister head screw 35.

Replacement: Reverse the above procedure.

A force of  $60 \pm 6$  p. should be required to operate micro-switch 5376/49 at the point marked.

Adjustment: Loosen fillister head screws 3044 and move spring lever 3042 inside the oblong holes.

**6.16.2 Bracket with slide 3040/48**

Removal: Remove bracket with slide 3040 from stop bail 2496 after loosening fillister head screw 103.

Replacement: Reverse the above procedure.

Bring start button 2404/50 into its latched position by depressing the button and insert perforated tape. The contact must have operated safely. Micro-switch 5376 should permit button 2404 to be pushed beyond the switching point by at least 0.3 mm.

Adjustment: Shift plate with switch 3041 towards slide 3043, after loosening fillister head screw 35.



## 7. CIRCUIT AND WIRING DIAGRAMS

### 7.1. Circuit diagram of the basic version of the tapetransmitter attachment

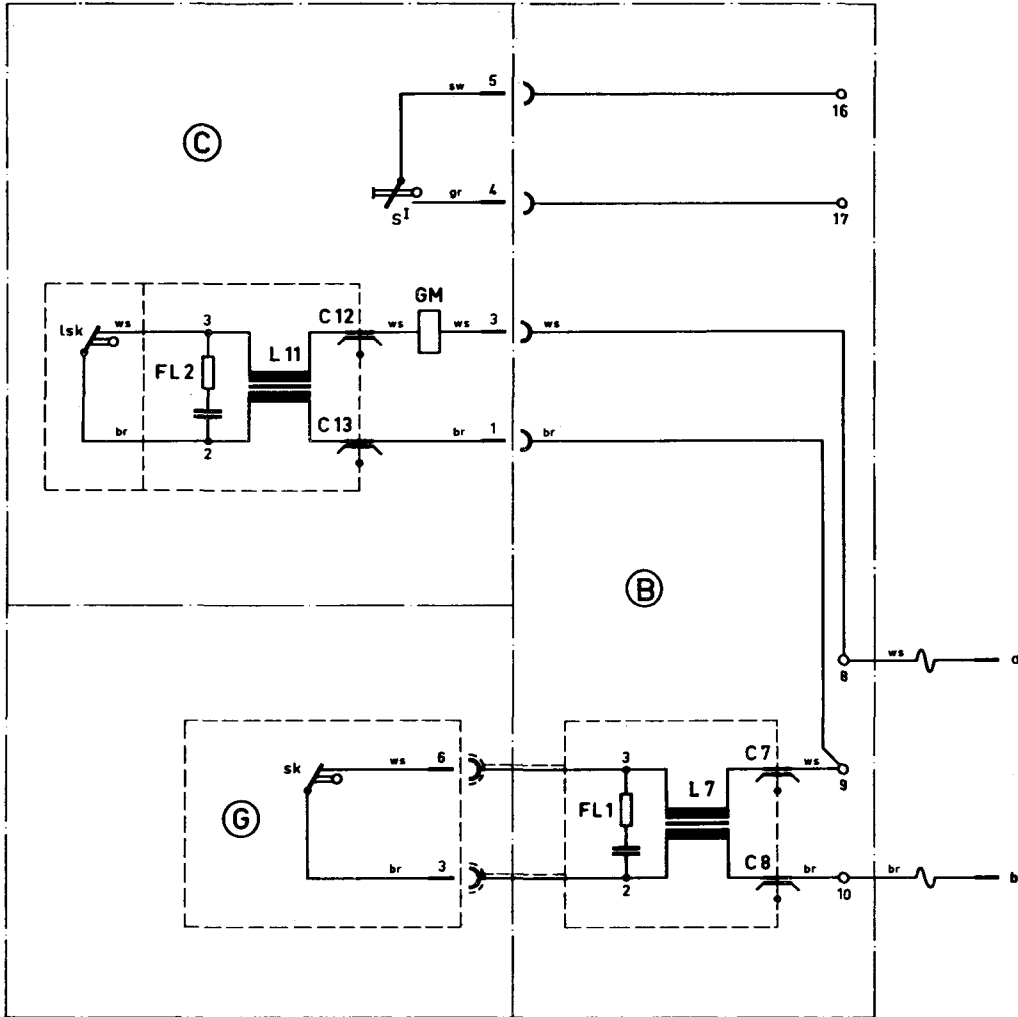
(Fs Str 2187/3A)

Fig. 51

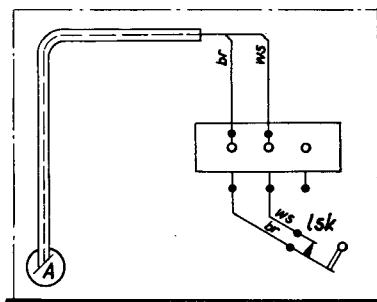
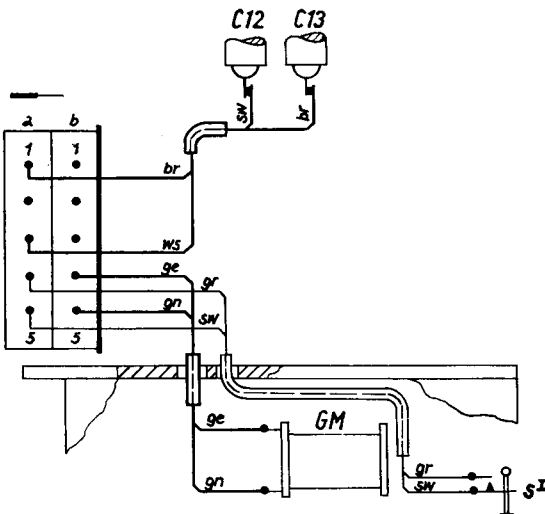
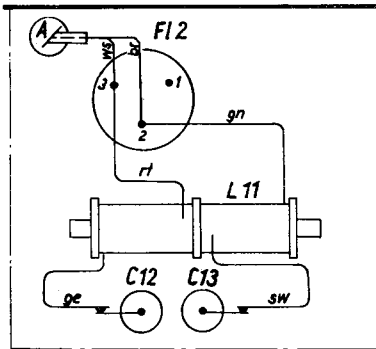
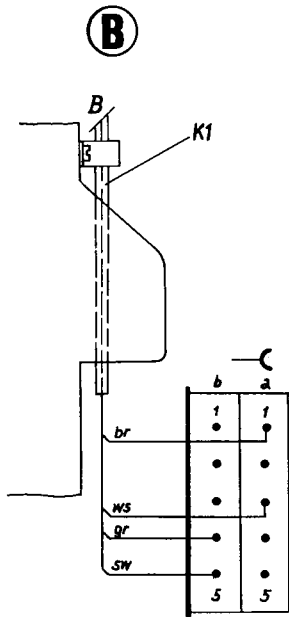
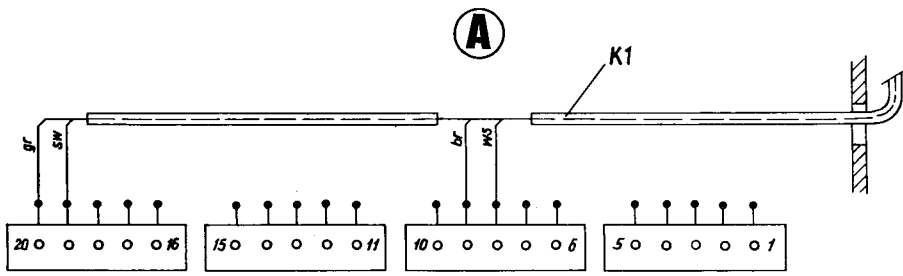
- Ⓑ Base plate of teleprinter
  - C Capacitor
  - Fl Spark suppressor
  - L Choke
  
- Ⓒ Tapetransmitter attachment
  - C Capacitor
  - Fl Spark suppressor
  - GM Automatic break magnet
  - L Choke
  - lsk Send contact of tapetransmitter attachment
  - s<sup>l</sup> Control contact
  
- Ⓓ Transmitter of teleprinter
  - sk Send contact of teleprinter

#### Color code:

- br brown
- gr gray
- sw black
- ws white



VII



**7.2. Wiring diagram of basic version of tapetransmitter attachment**

(Fs Ms 2187/3 A)

Fig. 52

- Ⓐ Keyboard of teleprinter, bottom view  
K1 Cable \*) for tapetransmitter attachment
- Ⓑ Base plate of teleprinter, top view  
K1 Cable \*) for tapetransmitter attachment
- Ⓒ Tapetransmitter attachment
  - C Capacitor
  - Fl Spark suppressor
  - GM Automatic break magnet
  - L Choke
  - Isk Send contact of tapetransmitter attachment
  - s<sup>l</sup> Control contact
  - l Strap, provided only in the version with disconnected automatic break magnet (U5)

**Color code:**

br brown  
gr gray  
rt red  
sw black  
ws white

\*) Provided in teleprinters from Serial No. 2R 25419 onwards.



**7.3. Wiring diagram of tapetransmitter attachment with separate 4-conductor connecting cable U4**

(Fs Ms 2187/3 B)

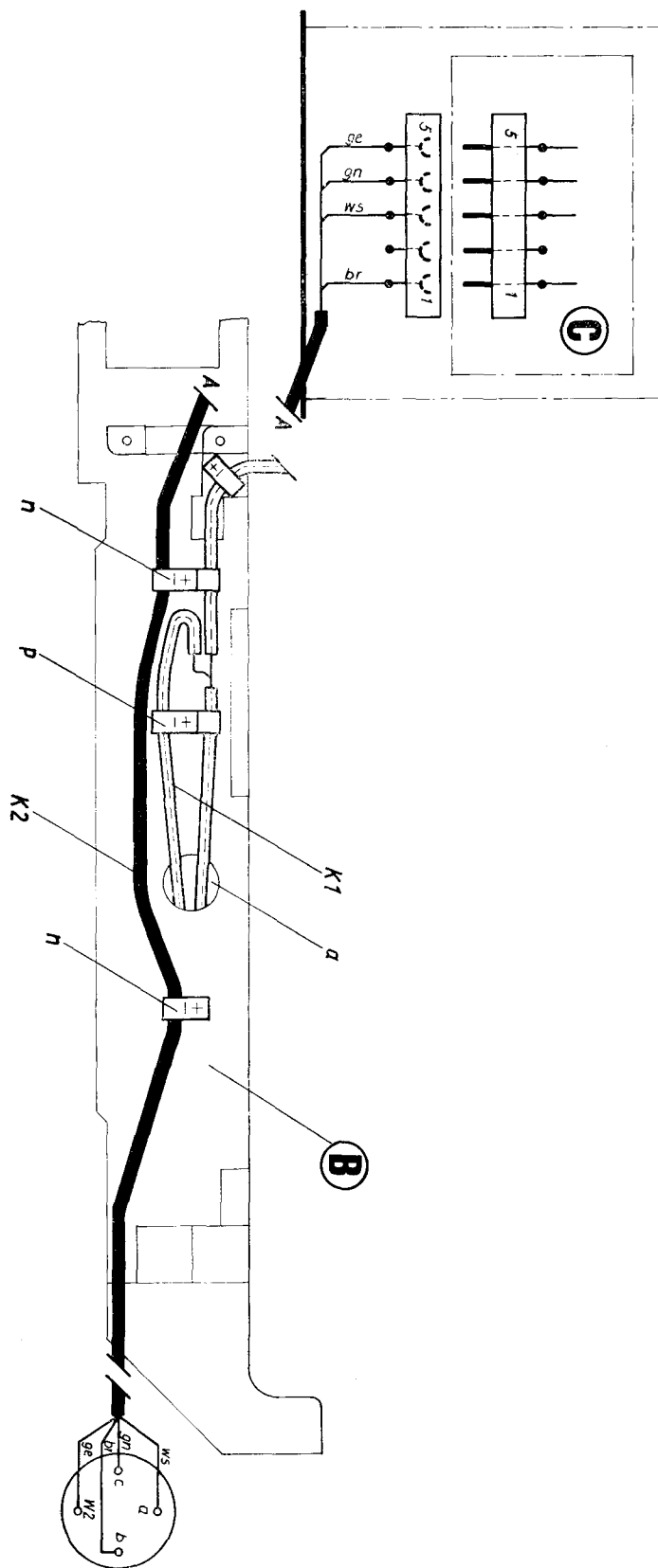
Fig. 53

- Ⓑ Base plate of teleprinter, viewed from right
  - a Bore in base plate of teleprinter
  - K1 Cable \*) for tapetransmitter attachment
  - n Cable clamp A6 (consecutive No. 3001)
  - p Cable clamp A4 (consecutive No. 5261)
  
- Ⓒ Tapetransmitter attachment
  - K2 4-conductor connecting cable

**Color code:**

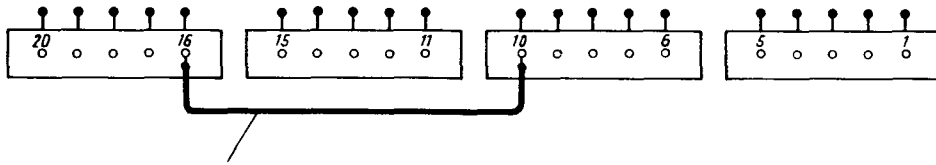
br brown  
ge yellow  
gn green  
ws white

\*) Provided in teleprinters from Serial No. 2 R 25419. Insulate cable ends and insert into bore a of base plate.

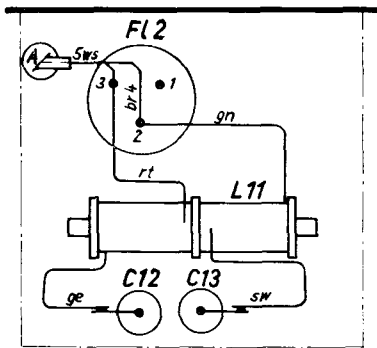
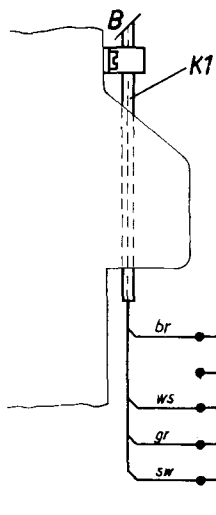


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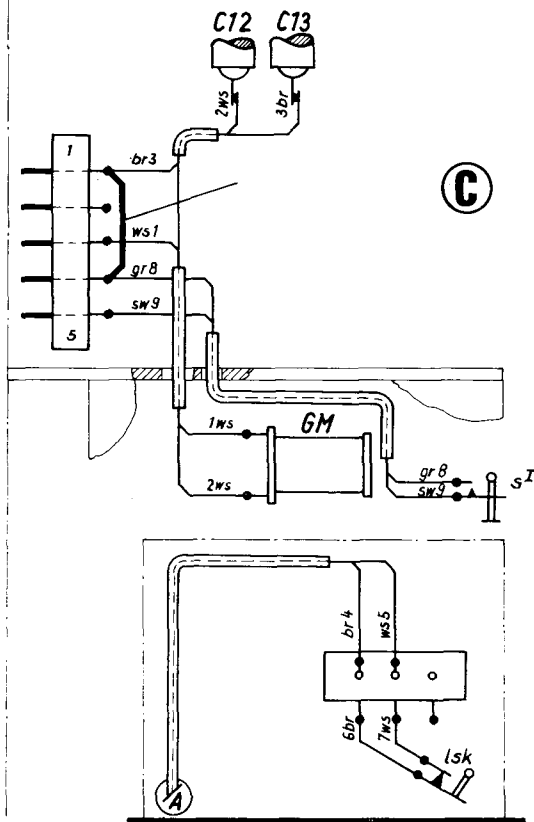
**A**



**B**



**C**



**7.4. Wiring diagram of tapetransmitter attachment with keyboard transmitter short-circuited by contact s<sup>1</sup>, U15**

(Fs Ms 2187/3 D)

Fig. 54

- Ⓐ Keyboard of teleprinter, bottom view  
I Strap in keyboard of teleprinter
- Ⓑ Base plate of teleprinter, top view  
K1 Cable \*) for tapetransmitter attachment
- Ⓒ Tapetransmitter attachment  
C Capacitor  
Fl Spark suppressor  
GM Automatic break magnet  
L Choke  
Isk Send contact of tapetransmitter attachment  
s<sup>1</sup> Control contact  
II Strap on clip connector of tapetransmitter attachment

**Color code:**

br brown  
ge yellow  
gn green  
rt red  
sw black  
ws white

\*) Provided in teleprinters from Serial No. 2R 25419 onwards.



**7.5. Wiring diagram of tapetransmitter attachment with automatic break magnet separately connected by means of 8-conductor telegraph lead, U18**

(Fs Ms 2187/3 F)

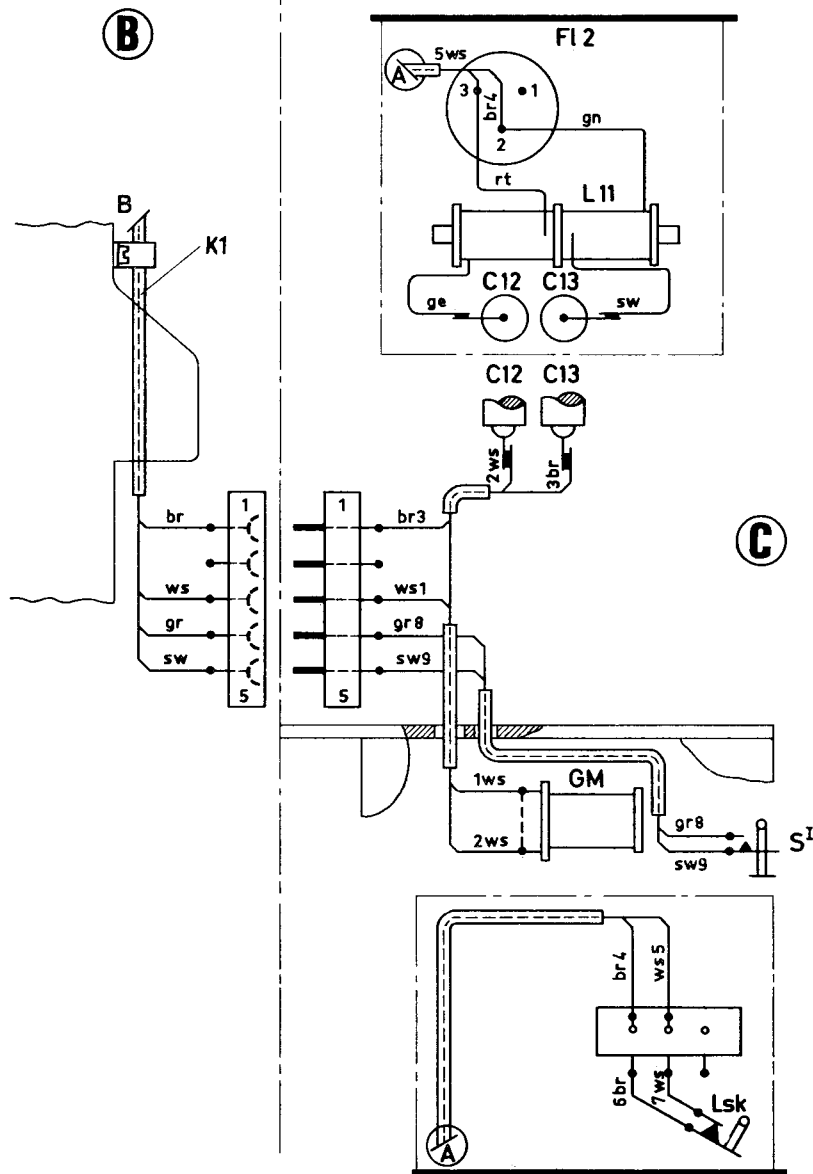
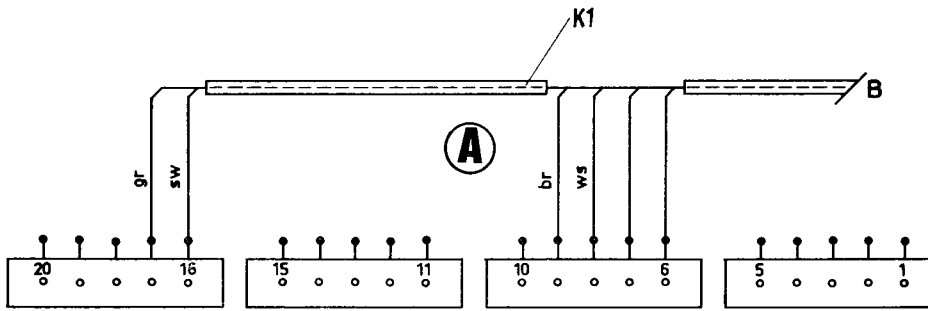
Fig. 55

- Ⓐ Keyboard of teleprinter, bottom view  
K1 Cable \*) for tapetransmitter attachment
  
- Ⓑ Base plate of teleprinter, top view  
K1 Cable \*) for tapetransmitter attachment
  
- Ⓒ Tapetransmitter attachment
  - C Capacitor
  - FI Spark suppressor
  - GM Automatic break magnet
  - L Choke
  - Isk Send contact of tapetransmitter attachment
  - s<sup>l</sup> Control contact

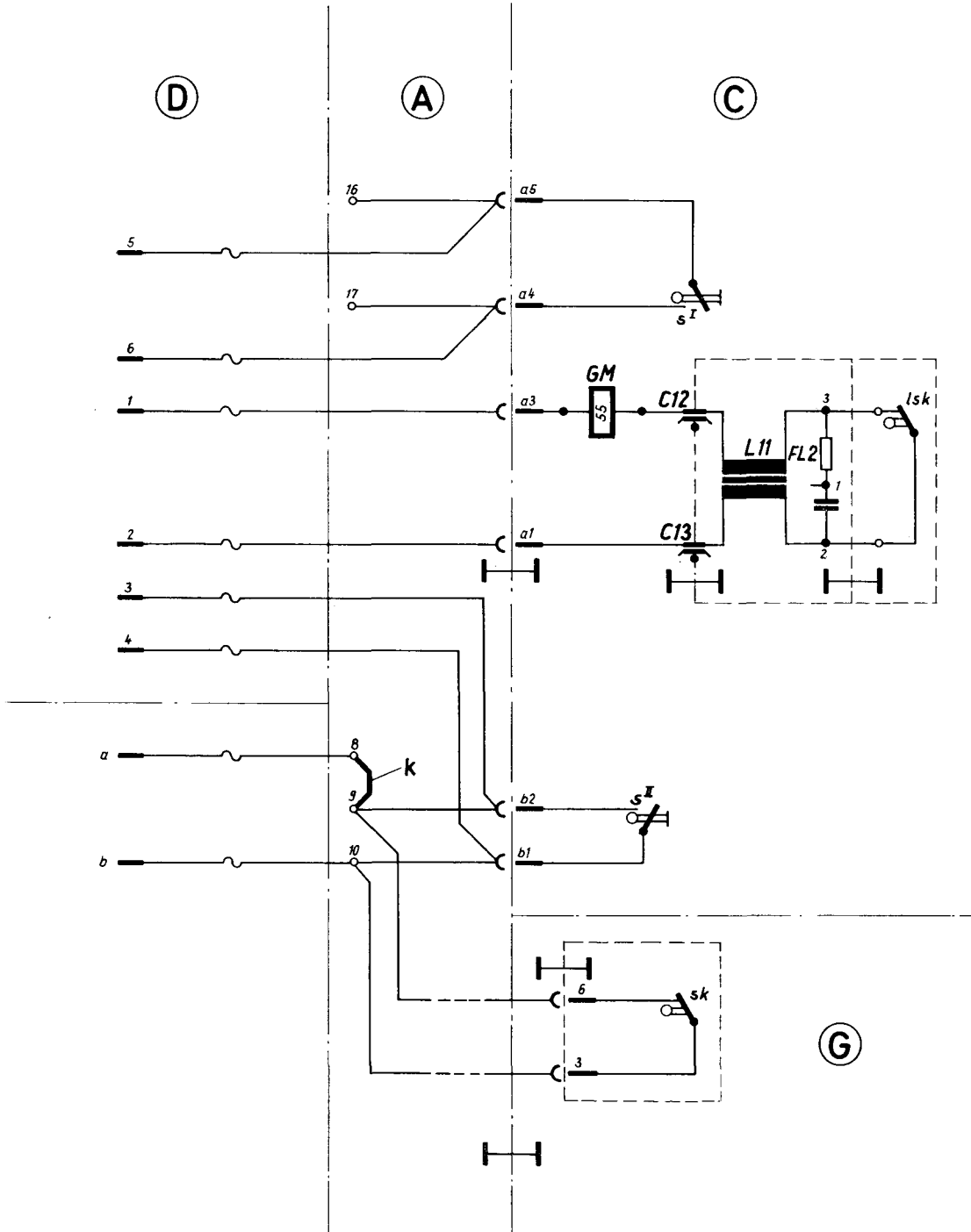
**Color code:**

br	brown
ge	yellow
gn	green
gr	gray
rt	red
sw	black
ws	white

\*) Provided in teleprinters from Serial No. 2R 25419 onwards.



VII



**7.6. Circuit diagram of tapetransmitter attachment with separate 6-conductor connecting cable, U22**

(Fs Str 2187/3 H)

Fig. 56

- Ⓐ Keyboard of teleprinter
  - k Shorting link (consecutive No. 635)
  
- Ⓒ Tapetransmitter attachment
  - C Capacitor
  - FI Spark suppressor
  - GM Automatic break magnet
  - L Choke
  - !sk Send contact of tapetransmitter attachment
  - s I Control contact
  - s II Send contact
  
- Ⓓ Tapetransmitter attachment
  - sk Send contact
  
- Ⓔ 6-conductor connecting cable with plug



**7.7. Wiring diagram of tapetransmitter attachment with separate 6-conductor connecting cable, U22**

(Fs Ms 2187/3 H)

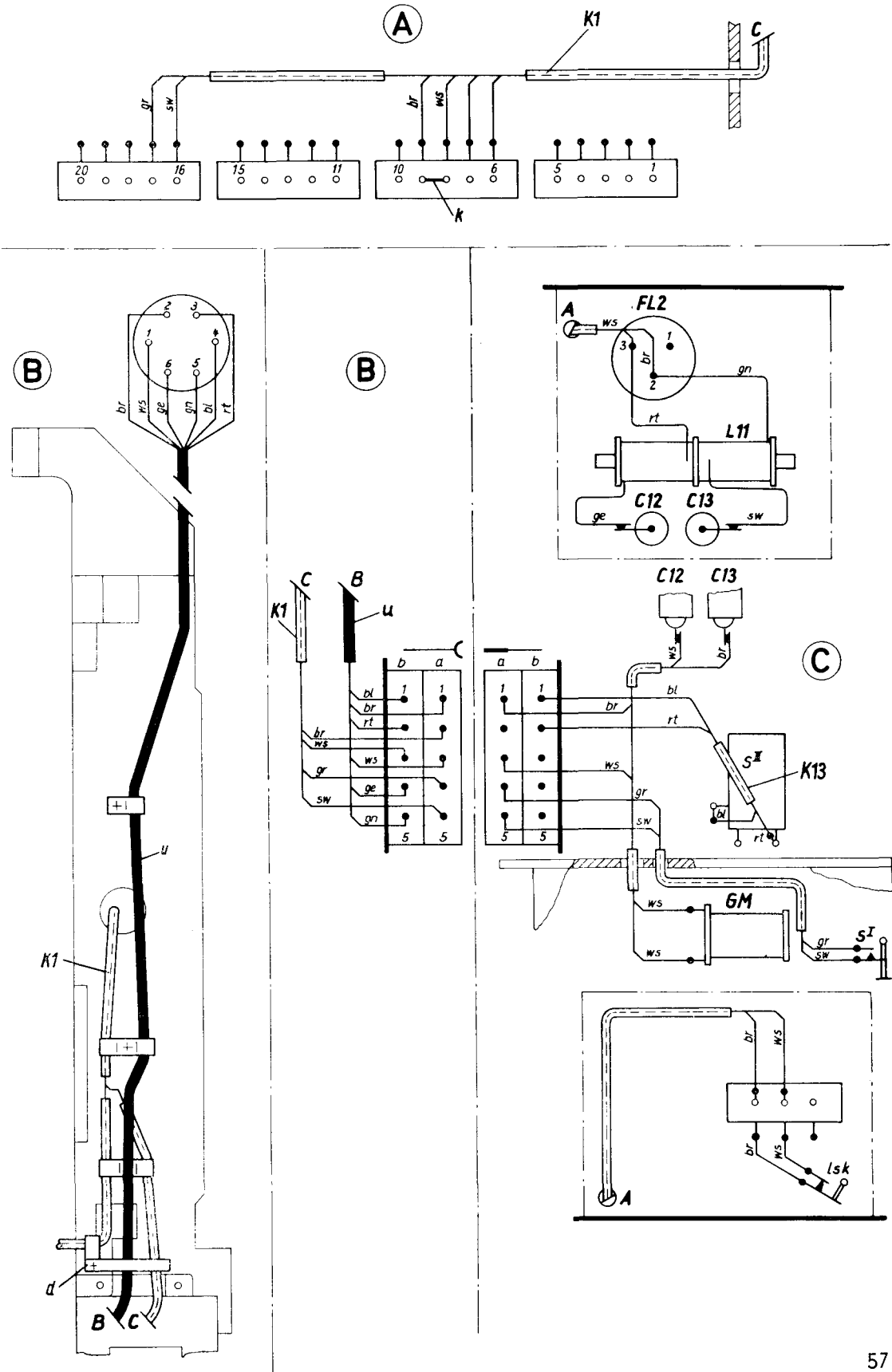
Fig. 57

- Ⓐ Keyboard of teleprinter, bottom view
  - K1 Cable \*) for tapetransmitter attachment
  - k Shorting link (consecutive No. 635)
  
- Ⓑ Base plate of teleprinter, viewed from right, top view
  - d Cover plate (consecutive No. 509)
  - K1 Cable \*) for tapetransmitter attachment
  - n 6-conductor connecting cable with plug (consecutive No. 3038)
  
- Ⓒ Tapetransmitter attachment
  - C Capacitor
  - Fl Spark suppressor
  - GM Automatic break magnet
  - K13 Cable 13 (consecutive No. 3037)
  - L Choke
  - Isk Send contact of tapetransmitter attachment
  - s I Control contact
  - s II Send contact

**Color code:**

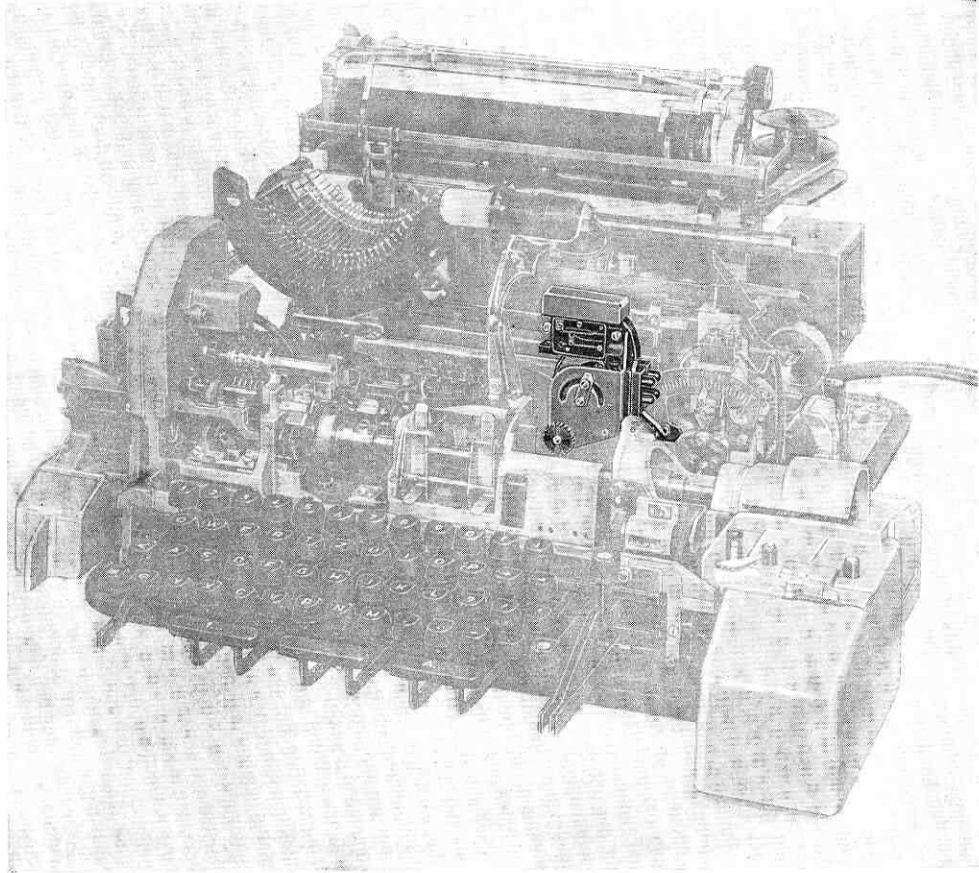
bl	blue
br	brown
ge	yellow
gn	green
gr	gray
rt	red
sw	black
ws	white

\*) Provided in teleprinters from Serial No. 2R 25419 onwards.



VII





VIII

**MECHANICAL  
REMOTE CONTROL SWITCH**  
for Teleprinters from  
Serial No. 2537673 onwards

**CONTENTS**

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2. Installation and removal of mechanical remote control switch . . . . .	2
3. Removal and replacement of major assemblies . . . . .	5
4. Adjustments . . . . .	6
5. Wiring diagram . . . . .	8

**1. GENERAL**

The mechanical remote control switch has been designed for on/off control of the motor of the teleprinter 100 in point-to-point circuits.

For the installation of the remote control switch the following parts are required:

Teleprinter 100 with storage device	
1 Set of parts	E 25 with U 1
Teleprinter 100 with standard keyboard	
1 Set of parts	E 25 with U 2
Teleprinter 100 with condensed keyboard and key <b>A...</b> in slot 44	
1 Set of parts	E 25 with U 3
Teleprinter 100 with condensed keyboard and key <b>A...</b> in slot 48	
1 Set of parts	E 25 with U 4
Teleprinter 100 for duplex operation	
1 Set of parts	E 25 with U 5
Teleprinter 100 with condensed keyboard and key <b>A...</b> in slot 40	
1 Set of parts	E 25 with U 6

The reference letters "E" and "U" refer to Fs Sk 2186/1.

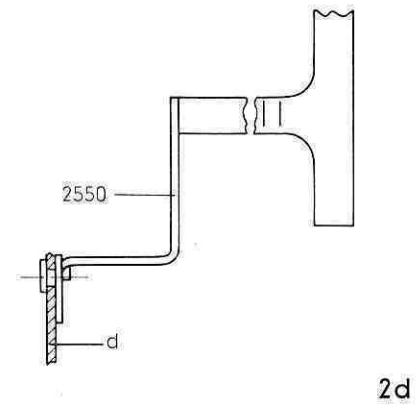
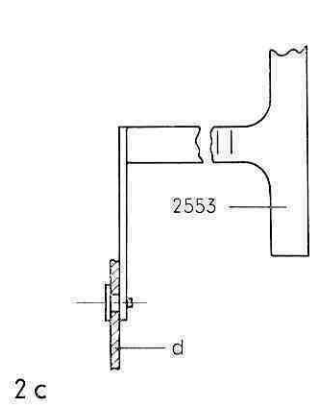
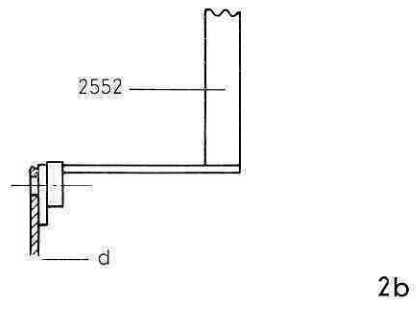
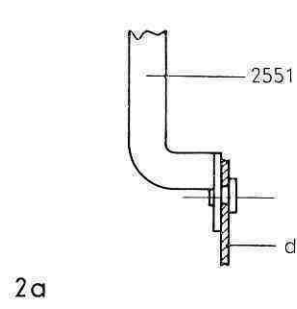
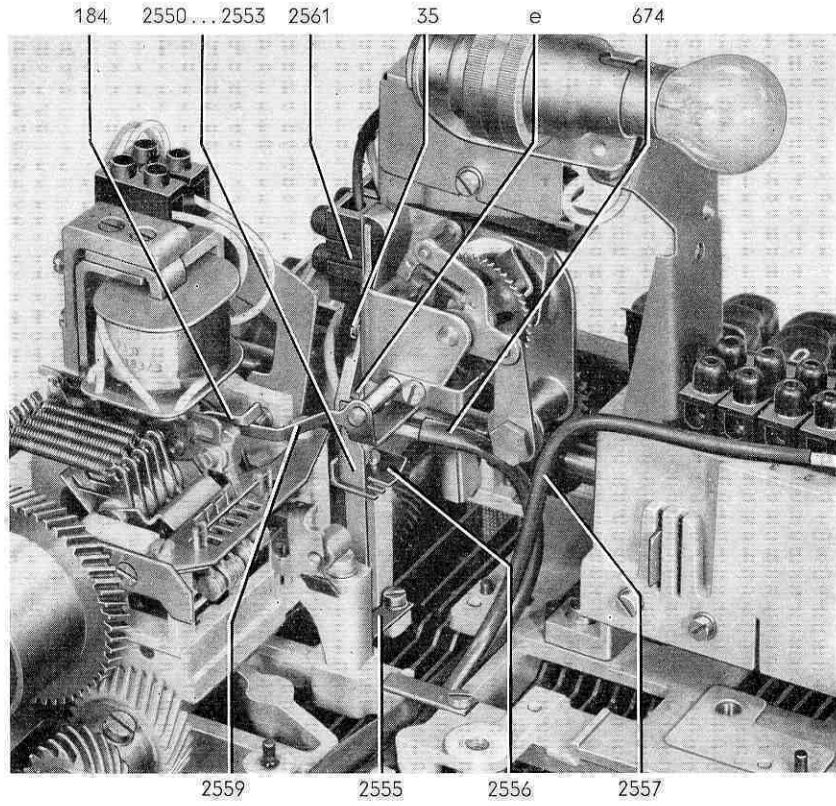
**2. INSTALLATION AND REMOVAL OF REMOTE CONTROL SWITCH**

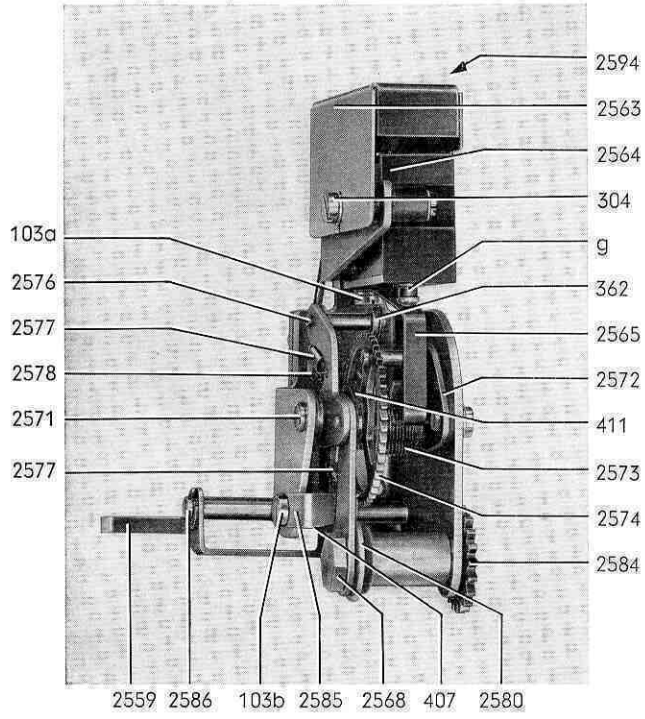
Installation: The basic version of the teleprinter 100 from Serial No. 2 S 37673 onwards is designed for the installation of the remote control switch, i.e. the teleprinter is supplied with the remote control switch cable 674/1, 12a, b and pinion 2557/1. When installing remote control switch 2594/3 in the field, insert one of the pull bars 2550 to 2553/1 into the cutout of the associated key lever d/2 for key "A..." (Ltrs. shift).

Figure 2a refers to the standard keyboard with pull bar 2551, Figure 2b to the condensed keyboard with key "A..." in 48th slot and pull bar 2552, Figure 2c to the condensed keyboard with key "A..." in 44th slot and pull bar 2553, and Figure 2d to the condensed keyboard with key "A..." in 40th slot and pull bar 2550. Mount guide plate 2555/1 and guide bracket 2556 so that depression of key "A..." causes pull bars 2550 to 2553 to move easily without any friction. Locate the remote control switch from above onto pinion 2557 so that release pawl 2559 comes to lie underneath the start-stop armature 184 on the receiver. Then place remote control switch against the two stop pins e and secure by means of the two fillister head screws (only one screw visible).

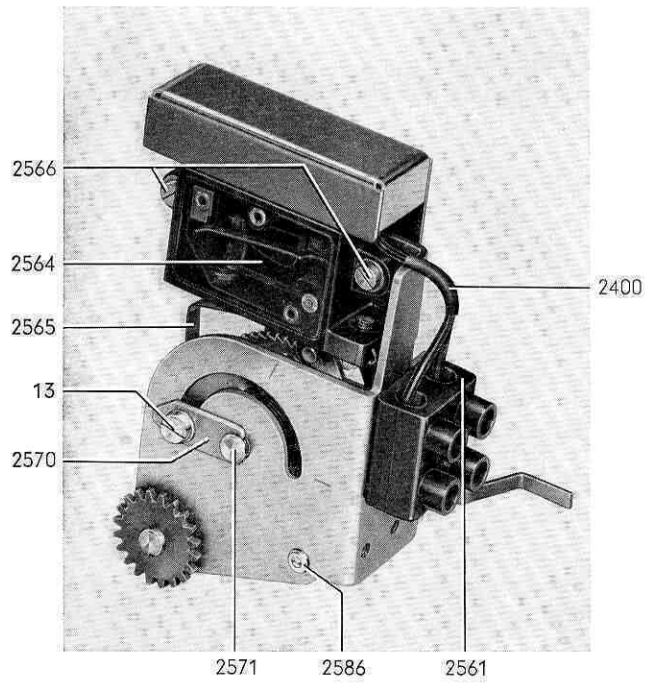
Remove the single-pole terminal block (shorting link, not illustrated) of the basic version of the teleprinter and the spaghettis on the ends of cable 674. Then connect cable 674 to the two-pole terminal strip 2561 of the remote control switch.

Removal: Remove cable 674/1, 12a, b from terminal strip 2561. Remove the two fillister head screws 35/1 and displace remote control switch laterally until release pawl 2559 is accessible. Then lift off remote control switch.





3



4

### **3. REMOVAL AND REPLACEMENT OF MAJOR ASSEMBLIES**

#### **3.1. Micro-switch 2564/3 and switching bail 2565**

Removal: Loosen fillister head screw 304, detach cover 2563. Unsolder connecting lead 2400/4 of micro-switch 2564/4 and remove from terminal strip 2561 and remove lead 2400. Remove two screws 2566. Detach switch 2564 with switching bail 2565. Loosen screw 103a/3 and remove switching bail 2565.

Replacement: Attach switch bail 2565/3 so that actuating pin "g" of micro-switch 2564 is located approximately in the middle of switching bail 2565. Reserve the above procedure for replacing micro-switch 2564. Observe adjustments A3 and A4.

#### **3.2. Ratchet 2574/3**

Removal: Detach micro-switch 2564 with switching bail 2565 as described in para. 3.1. Loosen screw 13/4 and pull out pointer 2570 from axle 2571. Push axle 2571 towards bail 2576/3 so that bail 2576 remains on axle 2571. Stop 2572, torsion spring 2573, ratchet 2574, and felt washer 411 can now be removed.

Replacement: Depress release pawl 2559/3, place felt washer 411 on the sleeve of bail 2576. Push torsion spring 2573 on the sleeve of ratchet 2574 so that the bent end of the torsion spring rests on the pin of ratchet 2574. Bias torsion spring 2573 so that the bent end of the spring is held by stop 2572. Install ratchet 2574 with torsion spring 2573 and stop 2572, and insert axle 2571. Keep axle 2571 in place by means of pointer 2570/13 and screw on with screw 4. Install micro-switch 2564 with switching bail 2565 as described in para. 3.1.

#### **3.3. Feed pawl 2578/3**

Removal: Remove micro-switch 2564/4 with switching bail 2565 as described in para. 3.1. Loosen screw 13 and pull off pointer 2570 from axle 2571. Pull out axle 2571 in the direction of pointer 2570 so that ratchet 2574/3 is kept in place. Unhook tension spring 2577 from feed pawl 2578 and remove lock washer 362 from the pin of bail 2576. Detach feed pawl 2578 from the pin.

Replacement: Reverse the above procedure.

#### **3.4. Shaft with gear 2584/3**

Removal: Hold gear 2584 in place and screw off eccentric 2568. Pull out gear with shaft 2584. At the same time eccentric 2568 and washer 2580 become free.

Replacement: Reverse the above procedure. Observe adjustment A1.

#### **3.5. Release pawl 2559/3**

Removal: Unhook tension spring 2577, loosen screw 103b and pull bracket 2585 out of axle 2586. Remove both lock washers 407 and pull out axle 2586/3, 4. Release pawl 2559/3 can now be removed.

Replacement: Reverse the above procedure





**4. ADJUSTMENTS**

It is advisable to make the following adjustments with the remote control switch removed from the teleprinter. The illustrated position (Fig. 5) should be observed: Feed pawl 2578/5 is positioned behind the last tooth of ratchet 2574, eccentric 2568 in its upper position. Contact c/6 of micro-switch is open.

Do not bend or adjust any steel tension springs, pressure springs or leaf springs.

A1 Micro-switch 2564/377  
When eccentric 2568 is turned and reaches its top and bottom dead centers, contact "c" of micro-switch 2564 should remain open.

Adjust by turning micro-switch 2564, after loosening screws 2566, so that contact "c" of the micro-switch positively opens. If necessary bend the mounting base at designated point (Fig. 5). Secure micro-switch by means of fillister head screws 2566/6. At the same time there should be an appreciable top clearance of contact pin "g".

A2 Timing  
By loosening screw 13/6 pointer 2570 can be turned, thus setting the cut-off time as follows:

A3 Switching bail 2565/7  
Switching bail 2565/378 should reach beyond the pin of ratchet 2574 by a visible gap "x". Pin of ratchet should enter the operating range of switching bail as judged by the naked eye.

Adjustment: Bend switching bail 2565.

A = minimum cut-off time  
B = medium cut-off time  
C = maximum cut-off time.

Telegraph speed	A	B	C
50 bauds	30 s	45 s	67 s
75 bauds	20 s	30 s	45 s

A4 Switching bail 2565/8  
A force of  $175 \pm 25$  p should be required to switch off micro-switch 2564. It should positively close when the force ceases to act on switching bail 2565.

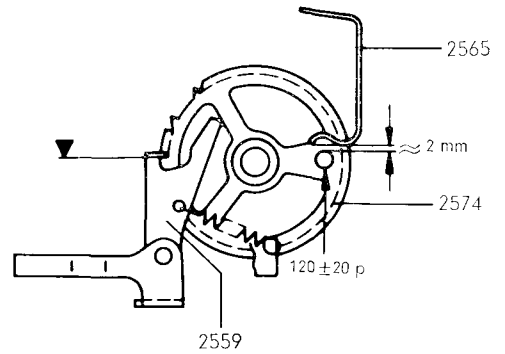
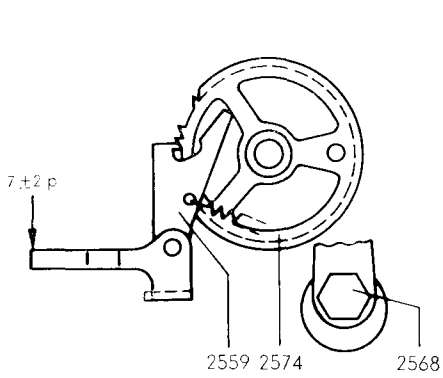
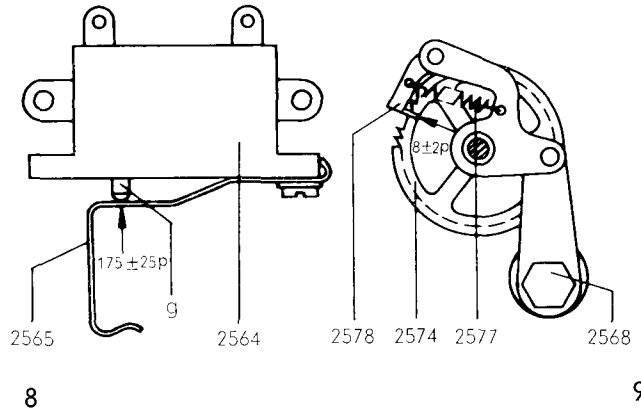
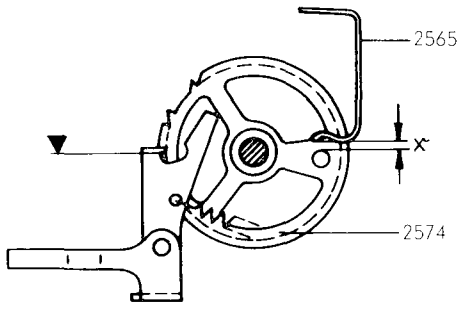
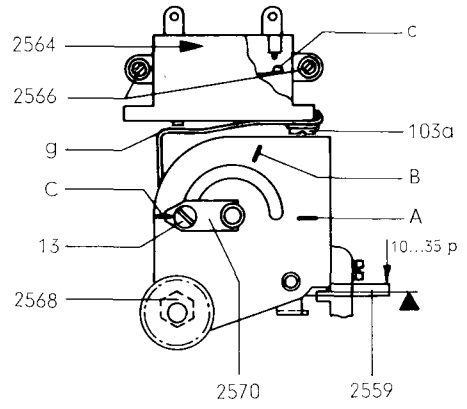
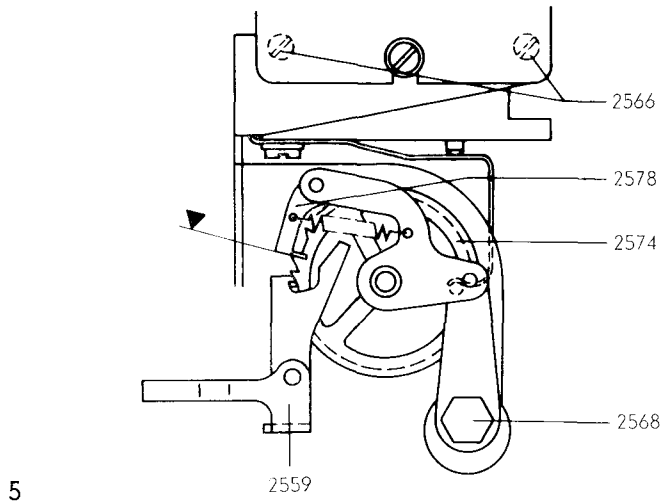
Adjustment: Bend switching bail 2565.

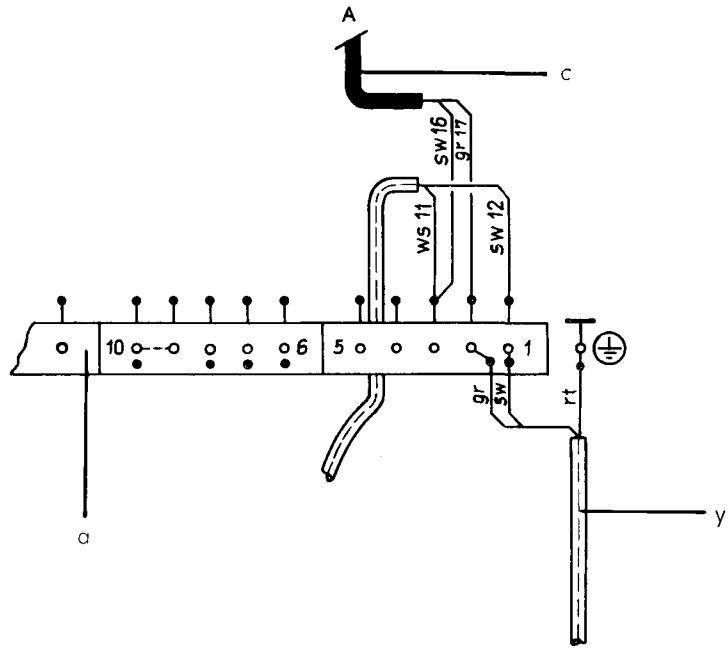
(A5) Release pawl 2559/6  
Release pawl should release in response to a force of 10 to 35 p with maximum cut-off time setting. The system should be in top dead center position and the switching contact be open.

(A6) Feed pawl 2578/9  
Feed pawl 2578 should press against ratchet 2574, under the action of tension spring 2577, with a force of  $8 \pm 2$  p. When eccentric 2579 is in bottom dead center position, the switch is open.

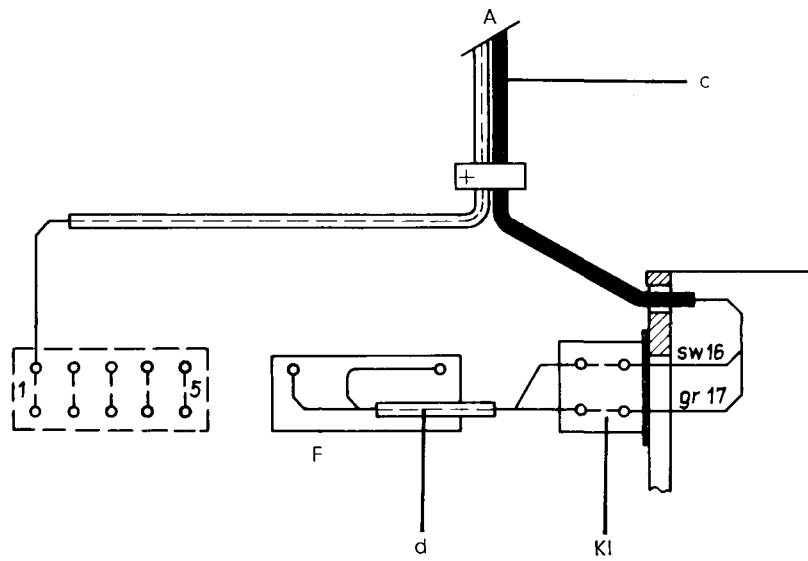
(A7) Release pawl 2559/10  
At the designated point, a force of  $7 \pm 2$  p should be required to lift the release pawl off ratchet 2574. Eccentric 2568 is in top dead center position (observe Fig. 10).

(A8) Ratchet 2574/11  
The force ratchet 2574 exerts on release pawl 2559, measured at the pin, should be  $120 \pm 20$  p with the switch set for a maximum cut-off time of 67 seconds and a gap of approx. 2 mm between pin of ratchet 2574 and switching bail 2565.





12 a



12 b

**5. WIRING DIAGRAM**

Fig. 12a

Base plate of teleprinter (bottom plate removed, bottom view)

- a Solder terminal strip
- c Connecting cable (consecutive No. 674)
- Ground terminal

Fig. 12b

Base plate of teleprinter (top view)

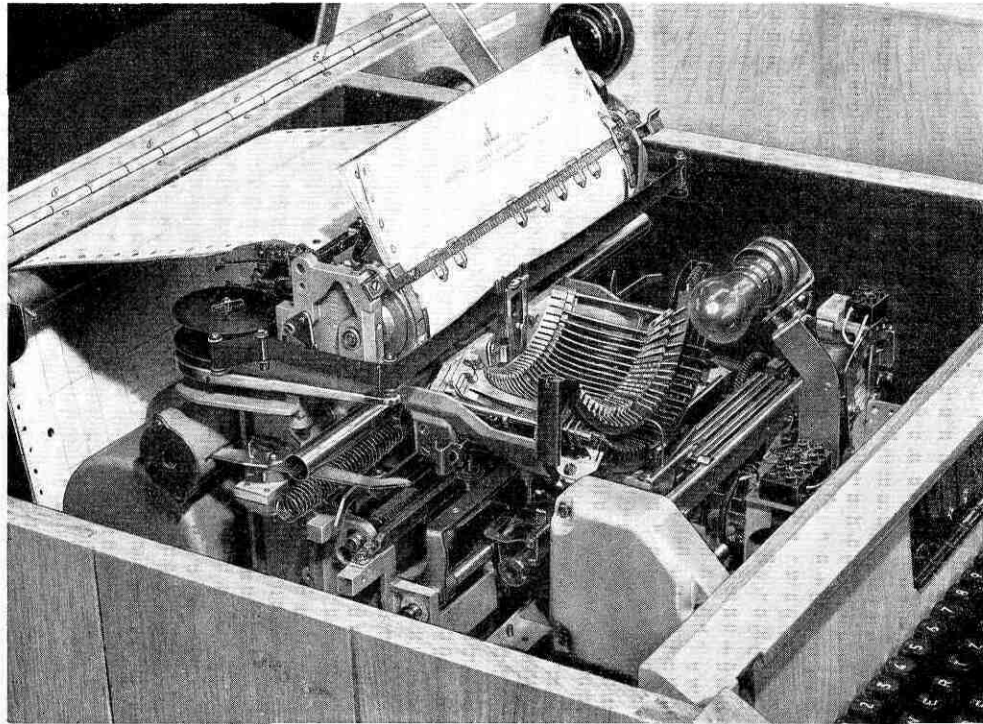
- c Connecting cable (consecutive No. 674)
- d Cable 2, connecting cable (consecutive No. 2400)
- F Remote control switch (consecutive No. 2594)
- KI Terminal strip (consecutive No. 2561)

**Wire colors**

- gr gray
- rt red
- sw black
- ws white







SPROCKET-FEED ATTACHMENT  
(STANDARD FORM PRINTING DEVICE)

**CONTENTS**

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5. Circuit and wiring diagrams of form position indicator contact . . . . .	19

**1. GENERAL**

The sprocket-feed attachment permits teleprinters to be employed for the line- and column-true transmission and reception of intelligence on standard forms. To retrofit the attachment to the Teleprinter 100, the following sets of parts are required:

To retrofit the attachment to the Teleprinter 100, the following sets of parts are required:

for 69 characters per line at a character spacing of 2.5 mm  
1 set of parts E43 with U1

for 72 characters per line at a character spacing of 2.5 mm  
1 set of parts E43 with U2

for 104 characters per line at a character spacing of 1.65 mm  
1 set of parts E43 with U3 and  
1 set of parts E62

for 69 characters per line with 1-inch character spacing for every 10 characters  
1 set of parts E43 with U4 and  
1 set of parts E63

In addition, the following parts sets are available:

form position indicator contact  
1 set of parts E43 with U7

The letters E and U refer to Fs Sk 2186/1.  
Important:

The form position indicator contact cannot be used in conjunction with the paper supervision device (E55 of Fs Sk 2186/1).

For machines with serial numbers below 2 Q 13780,

1 lever with axle T Fs 72-50298  
and 1 bracket T Fs 72-53907  
must be ordered separately.

**2. OPERATION**

For information refer to Index II.

After swinging lever 2671/4 upwards, the sprocket-feed platen can be rotated backwards.

**3. REMOVAL AND REPLACEMENT OF PARTS**

Before removing and replacing parts, pull the power and telegraph plugs from the wall outlets.

The consecutive numbers given in brackets designate parts which replace the part shown in the case of the versions for 71 and 104 characters per line as well as for 69 characters per line with 1-inch character spacing for every 10 characters.

Before removing and replacing the parts as outlined in Index II, it is advisable to unscrew the printer assembly from the base plate and to remove the type basket carriage.

To retrofit the sprocket-feed attachment to the teleprinter basic version, the following parts must be either replaced or added:

Tabulator rail, paper saddle	as per para. 3.1
Sprocket-feed platen, guide bracket	as per para. 3.2
Paper guide	as per para. 3.3
Sliding block	as per para. 3.4
Feed screw	as per para. 3.5
Form position indicator contact	as per para. 3.6





**3.1. Tabulator rail 2678 (2682 to 2684)/1**

Removal: Remove tabulator rail 2678 (for 69 characters per line); 2682 (for 71 characters per line); 2683 (for 104 characters per line); 2684 (for 69 characters per line with 1-inch character spacing for every 10 characters) by unscrewing fillister head screws 13a from axle 215. Slacken off oval head screw 2655 and remove pointer 2673. Threaded plate 2674 serves as a stop for the pointer, and should preferably not be unscrewed. Unhook tension spring 403 from the left-hand bearing pin. Unscrew fillister head screw 13b from axle 216 together with rotary button 8, and pull the axle to the right and out. Next remove axle 215 by pulling it out to the left to free paper saddle 2665.

Once fillister head screw 2655 has been removed from tabulator rail 2678 (2682, 2683, 2684), the tab can be exchanged; in doing so make sure that the pressure spring and the ball do not get lost.

Replacement: Push paper saddle 2665/1 together with axle 215 to the left and into the bore provided in the mounting frame. Push axle 216 together with rotary button 8 into the bore from the right and secure by tightening fillister head screw 13b. Hook tension spring 403 to left-hand bearing pin.

Continue the replacement by following the above instructions for removal in the reverse order.

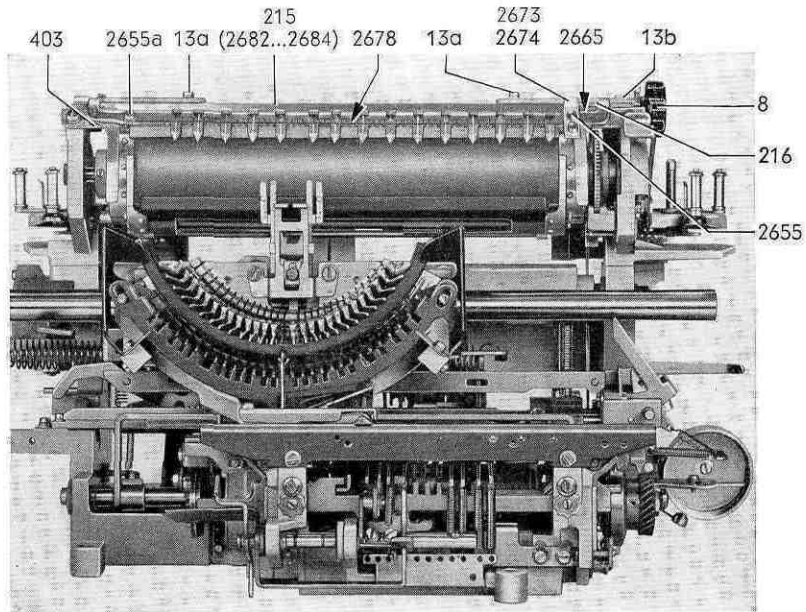
Observe adjustments A7, A15, A18 and A19.

**3.2. Sprocket-feed platen 2656/2 and guide bracket 2675, 2677**

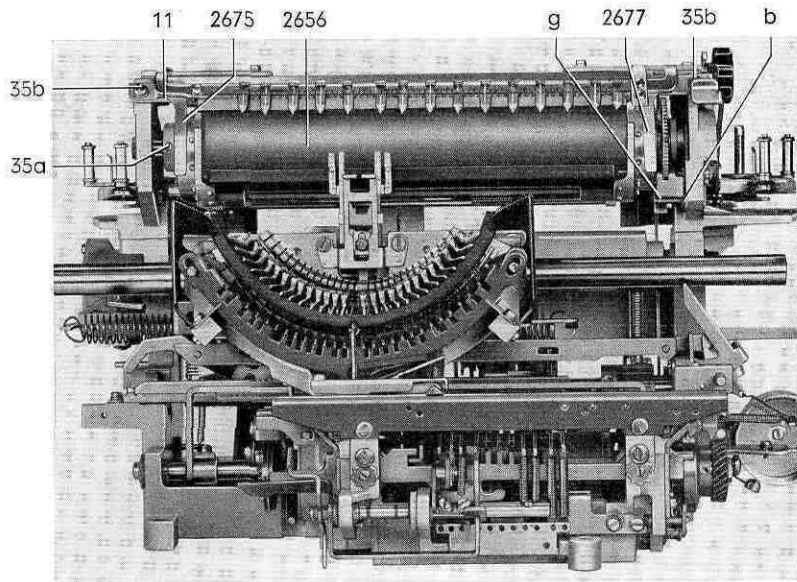
Removal: Slacken off the two fillister head screws 35b, and remove tear-off plate 11/2 and guide brackets 2675, 2677. Slacken off fillister head screws 35a of sprocket-feed platen 2656. Pull out axle with spur gear 409/3 to the right to a point where sprocket-feed platen 2656/2 can be removed without lever 36/3 sliding off the axle with spur gear 409.

Replacement: Push axle with spur gear 409/3 through sprocket-feed platen 2656/2 and farther to the left into the mounting frame. In doing so make sure that lever g of sprocket-feed platen 2656 engages the right-hand pin b of the printer. Secure the sprocket-feed platen by means of fillister head screw 35a.

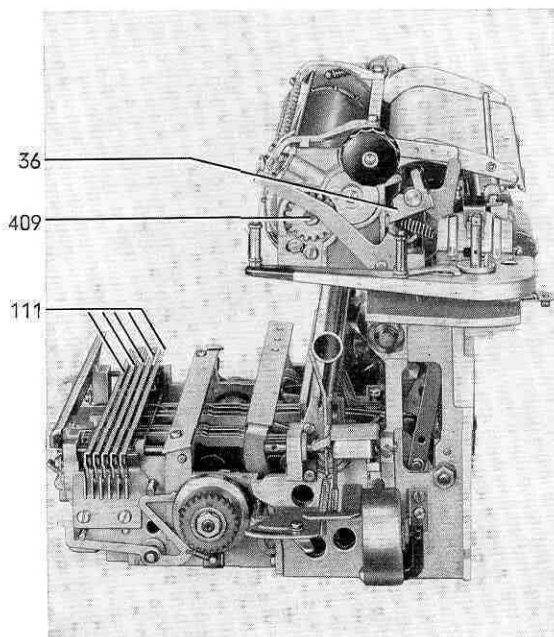
Attach tear-off plate 11 and guide bracket 2675 (left), 2677 (right) by means of the two fillister head screws 35b. In doing so, observe adjustments A11 to A14 and A16 to A23.



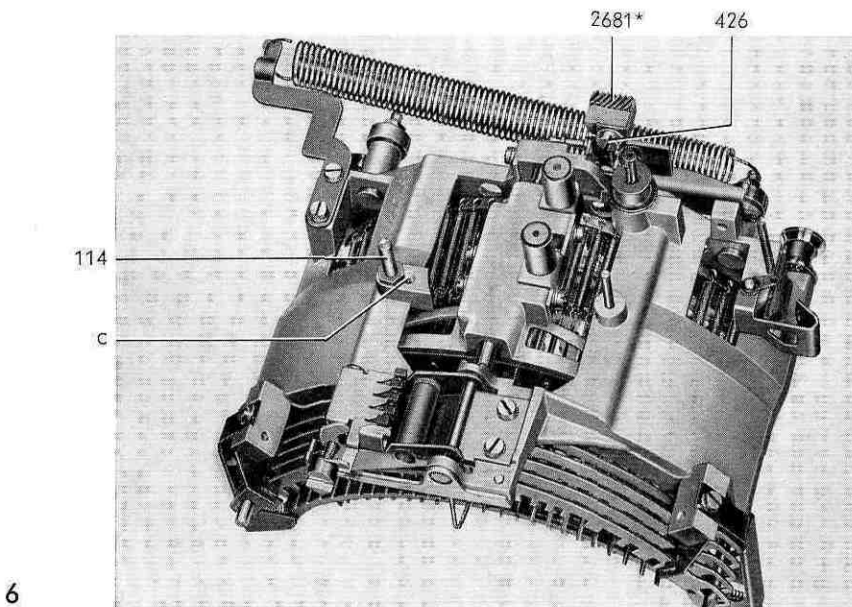
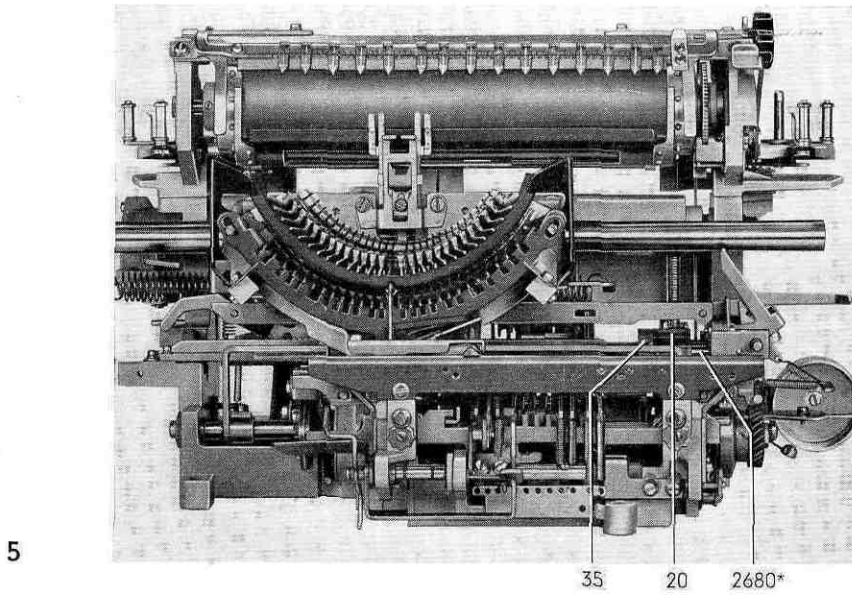
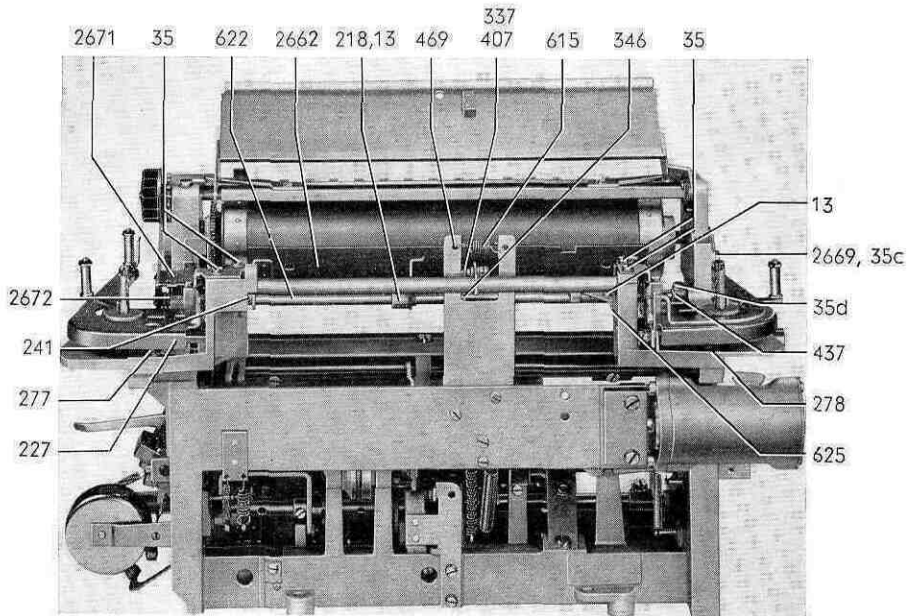
1



2



3



### 3.3. Paper guide 2662/4

Removal: Remove the ribbon from the ribbon lifter, and detach together with the spools.

Unhook tension spring 615 from plate 469. Detach retainer 407 and ribbon feed linkage 346 from bearing pin 337. Remove two fillister head screws 35 on either side and lift out spool carrier 227.

Unhook the two tension springs 241 (of which only one is visible).

Slacken off fillister head screw 35d, and remove adjusting plate 437. Slacken off fillister head screws 13, and remove bracket 625 as well as lever with bushing 218. Pull out lever with axle 622; this will free lever with bushing 218, paper guide 2662 and lever 2671 with torsion spring 672. Slacken off fillister head screw 35c and remove stop 2669.

Replacement: Push lever with axle 622/4 through paper guide 2662 and lever with bushing 218 into the mounting frame from the right, almost as far as the left-hand bore. Place lever 2671 on left plate, and install torsion spring 2672 in such a position that the U-shaped end of the spring rests against the lever arm and the straight end of the spring rests against the cast rib; in doing so hold lever 2671 in its bottom position. Next push lever with axle 622 into its extreme left-hand position.

Secure lever with bushing 218 by tightening fillister head screw 13.

Screw bracket 625 to lever with axle 622 by means of fillister head screw 13 so that paper guide 2662 projects into the right-hand slot. Attach adjusting plate 437 to lever with axle 622 on the right by means of fillister head screw 35d. Place spool carrier 227 on printer assembly and secure by means of two fillister head screws 35 on either side, making sure that the two feed pawls 277 and 278 are forced away against the action of their tension springs in order to ensure stepping of the ratchets. Mount ribbon feed linkage 346 with retainer 407 on bearing pin 337. Hook tension springs 615 and 241 in position. Screw down stop 2669 by means of fillister head screw 35c, making sure that the bearing pin projects through the right-hand bore and that lever with axle 622 makes contact.

Mount spools and re-insert ribbon in ribbon lifter.

Observe the adjustments A8 to A10, A13 and A24.

### 3.4. Sliding block 2681\*/6

Removal: Remove sliding block 2681\* of type basket carriage after loosening fillister head screw 426.

Replacement: Screw sliding block 2681\*/6 to the type basket carriage by means of fillister head screw 426. Pin 114 must engage bore "C" in the case of 69 characters per line at a character spacing of 2.5 mm.

Observe the adjustments A1 and A2.

### 3.5. Feed screw 2680\*/5

Removal: Unhook tension springs 477/9 and 188.

Loosen two fillister head screws 35/5 of sleeve with ratchet 20; remove fillister head screw 426/8 from the right-hand end of feed screw 2680\*/5. Force feed screw 2680\* out of the right-hand bearing by pushing it to the left. Remove the loosened sleeve with ratchet 20 and push feed screw 2680\* with left-hand ball bearing 78/7 all the way through the left-hand bore of the mounting frame.

Remove hexagon nut 357 from feed screw 2680\*/5. Detach ball bearing 78/7.

\* On version for 104 characters per line or 69 characters per line with a character spacing of 1 inch for every 10 characters, the parts of the special version (sliding block and feed screw) replace the parts mentioned.



Replacement: Shove ball bearing 78/7 onto feed screw 2680\*/5 and insert hexagon nut 357/7. Insert feed screw 2680\*/5 with left-hand ball bearing 78/7 through the left bore of the mounting frame to a point where sleeve with ratchet 20/5 together with the two loosened fillister head screws 35 can be slid onto the feed screw from the right. Slide feed screw 2680\* into the right-hand bore of the mounting frame and screw down at its right end by means of fillister head screw 426/8. Tighten two fillister head screws 35/5 of sleeve with ratchet 20. Install tension springs 477/9 and 188.

Locate sprinter assembly on base plate and screw in place. When replacing the type basket carriage as per Index II make sure that brake lever 2679/7 must be used for 69 characters per line and brake lever 97 for all other versions.

### **3.6. Form position indicator contact**

When the form position indicator contact is retrofitted paper guide 2662/9 must be replaced by paper guide 2685 and axle 215/10 by axle 2686.

Moreover, position indicator contact 2687/11 must be installed. Consecutive numbers with the suffix "+" denote parts that are no longer required when the form position indicator contact is retrofitted.

#### **3.6.1. Paper guides 2662+, 2685/9**

Remove paper guide 2662+ as outlined in para. 3.3, and replace by new paper guide 2685.

#### **3.6.2. Axle 215+, 2686/10**

Removal: Slacken off the two fillister head screws 13a, and remove tabulator rail 2678 (2682 to 2684) from axle 215+, 2686. Unhook tension spring 403 from left-hand bearing pin. Unscrew fillister head screw 13b, and withdraw axle 216 with rotary button 8 to the right. Follow up by pulling out axle 215+, 2686 to the left. Paper saddle 2665 will become accessible.

Replacement: Reverse the above procedure.

Observe adjustments A7, A15, A18 and A19.

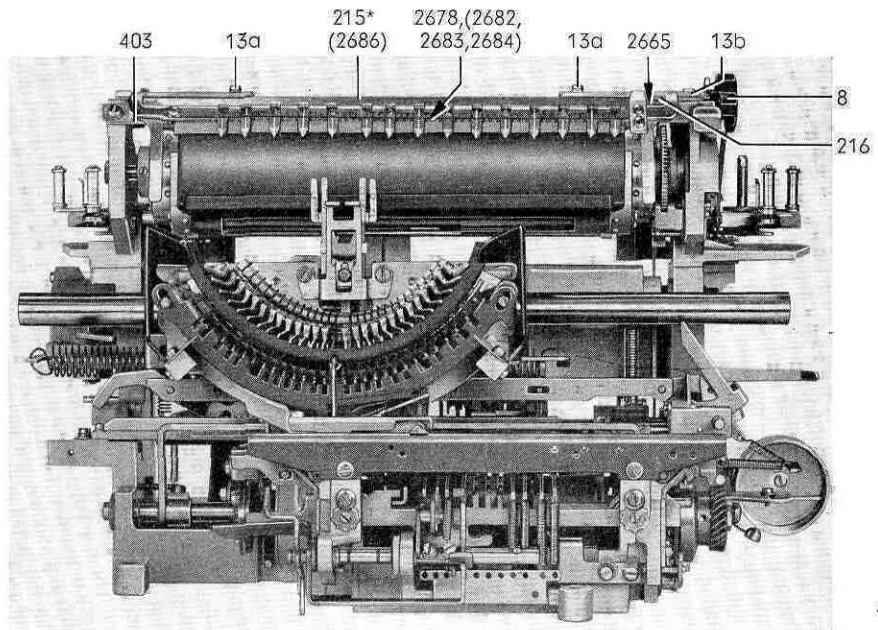
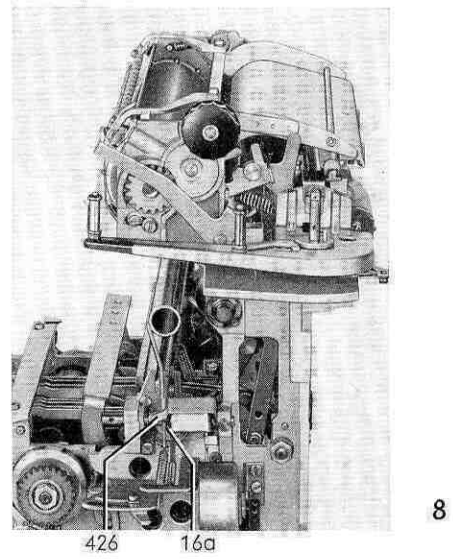
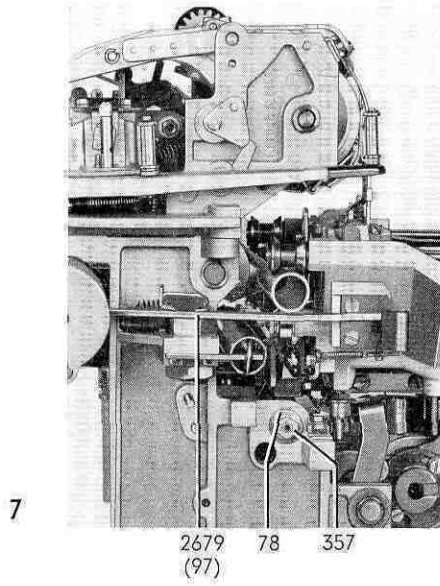
#### **3.6.3. Position indicator contact 2687/11**

Installation: Attach position indicator contact 2687 to the printer frame by means of the two fillister head screws 34. Install cables 2694 and 2695 as indicated in the circuit and wiring diagrams (Fig. 36).

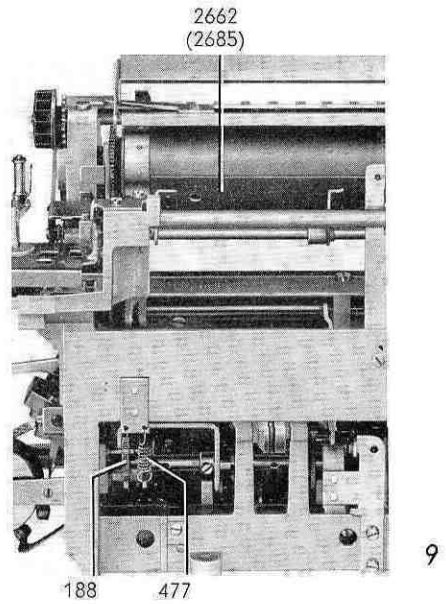
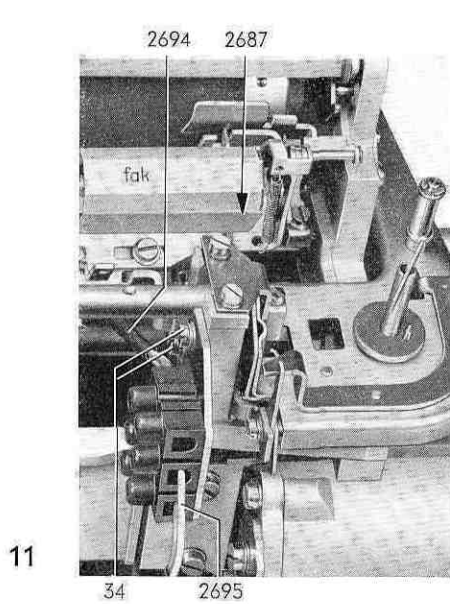
Observe adjustments A1 through A8.

Replacement: Reverse the above procedure.

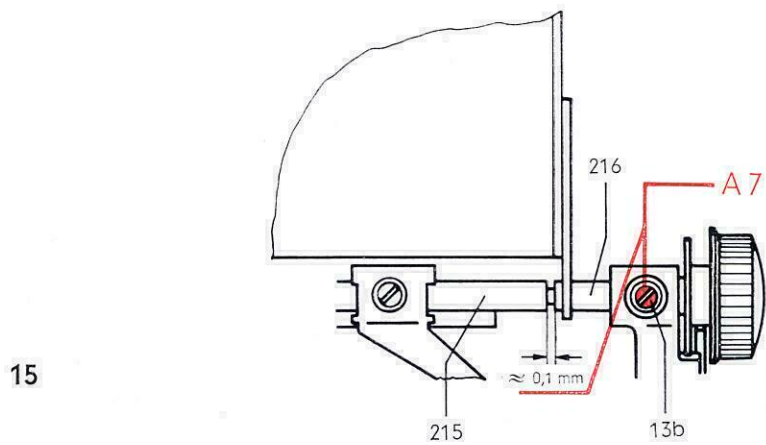
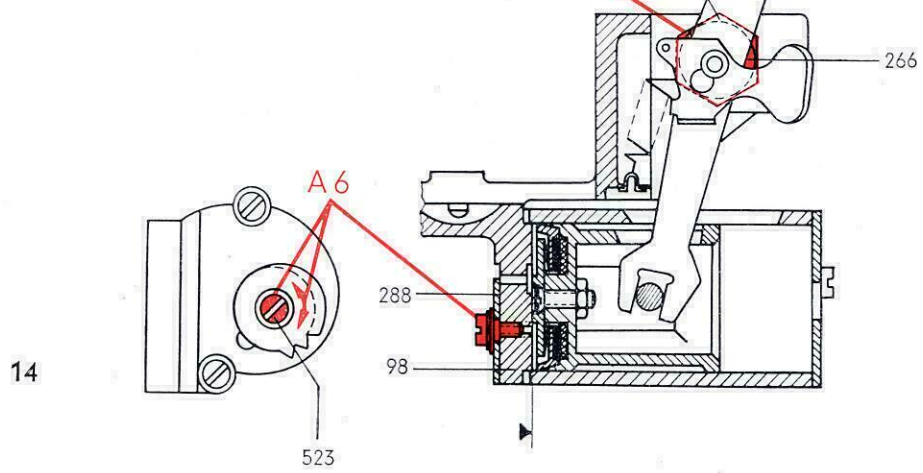
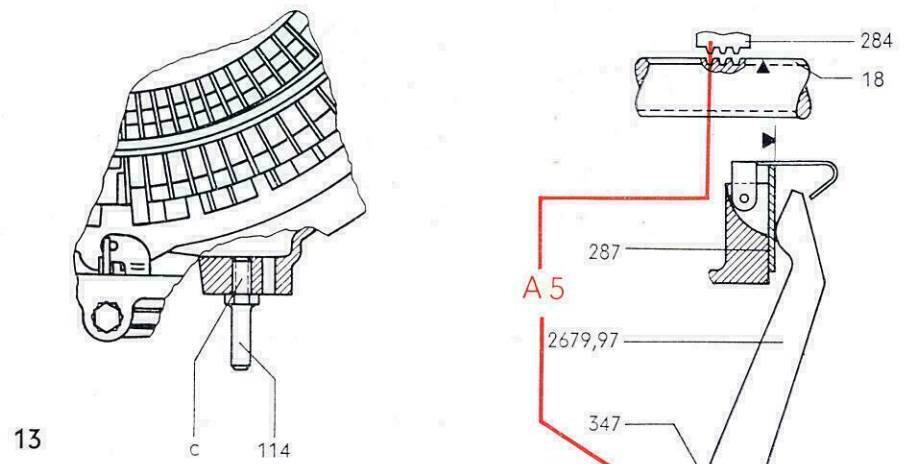
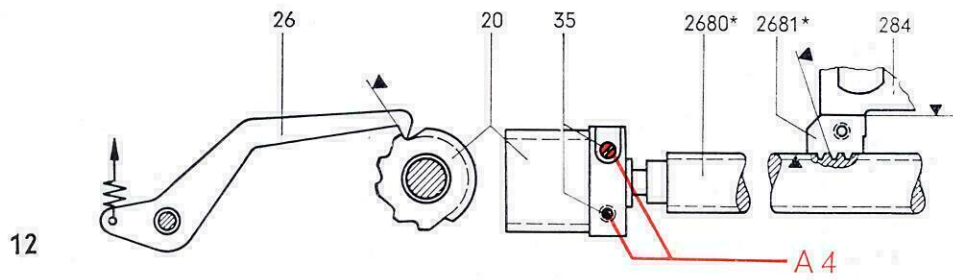
\* On version for 104 characters per line or 69 characters per line with a character spacing of 1 inch for every 10 characters, the parts of the special version (sliding block and feed screw) replace the parts mentioned.



IX







#### 4. ADJUSTMENTS

Prior to starting work pull the power and telegraph plugs from their wall outlets.

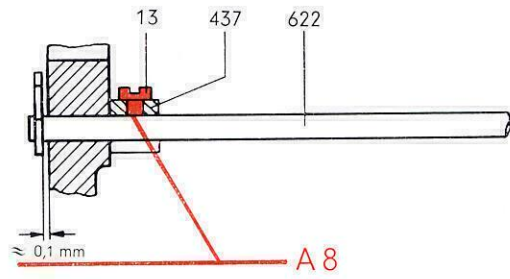
- A1 Sliding block 2681\*/12  
Sliding block 2681\* of feed rack 284 should make contact at the points designated in the drawing.
- A2 Pin 114/13  
Pin 114 must be screwed into the left bore "c", which is the one closer to the middle of the type basket carriage, only for operation with 69 characters per line and a character spacing of 2.5 mm.
- A3, A4 Sleeve with ratchet 20/12
- A3 Sleeve with ratchet 20 should abut against the collar of feed screw 2680\*.
- A4 Install type basket carriage as outlined in Index II and position it just ahead of the end of the line. Rotate teleprinter by hand and strike any one type bar against the sprocket-feed platen to print characters until the line end has been reached. The spacing of the last two characters should match the other character spacings (visual check).  
Adjust by loosening screws 35/12 (lacquer-coated) and turning feed screw 2680\* while sleeve with ratchet 20 rests against detent 26. Tighten screw 35 and coat them with lacquer.
- A5, A6 Shock absorber 98/14 and eccentric disk 288
- A5 Move type basket carriage into the beginning-of-line position. Brake lever 2679 (97) will now rest against stop 287 of the type basket carriage, and the piston of shock absorber 98 will bear against the point marked. Lift out feed rack 284 by depressing the lever of parallel guide 16a/8 and replace rack in threads of the feed screw, with the teeth of feed rack 284/14 symmetrically engaging the threads of feed screw 2680\*.  
Adjustment: Loosen hexagon nut 347/14 (lacquer-coated) and turn eccentric bushing 266, with sliding block 2681\*/12 of the type basket carriage resting against the marked face of feed screw 2680\*.
- A6 Eccentric disk 288/14  
Keep lever 16a/8 depressed into its lowest position; move the type basket carriage by hand into the end-of-line position and release.  
The type basket carriage must move bounce-free into the beginning-of-line position when judged by the naked eye, with ratchet 20/12 resting against detent 26.  
Adjust by turning eccentric disk 288 after loosening shoulder screw 523/14.
- A7 Axle 215/15  
Axle 215 should have an axial play of approx. 0.1 mm.  
Adjust by laterally displacing axle 216 after loosening screw 13b.



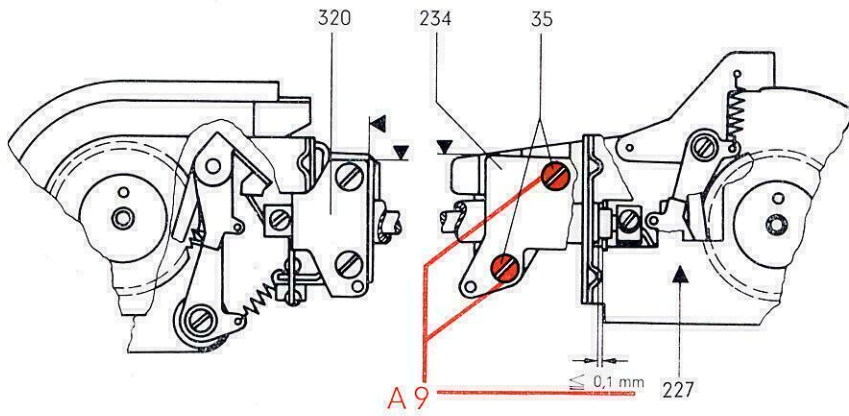
\* On version for 104 characters per line or 69 characters per line with a character spacing of 1 inch for every 10 characters, the parts of the special version (sliding block and feed screw) replace the parts mentioned.



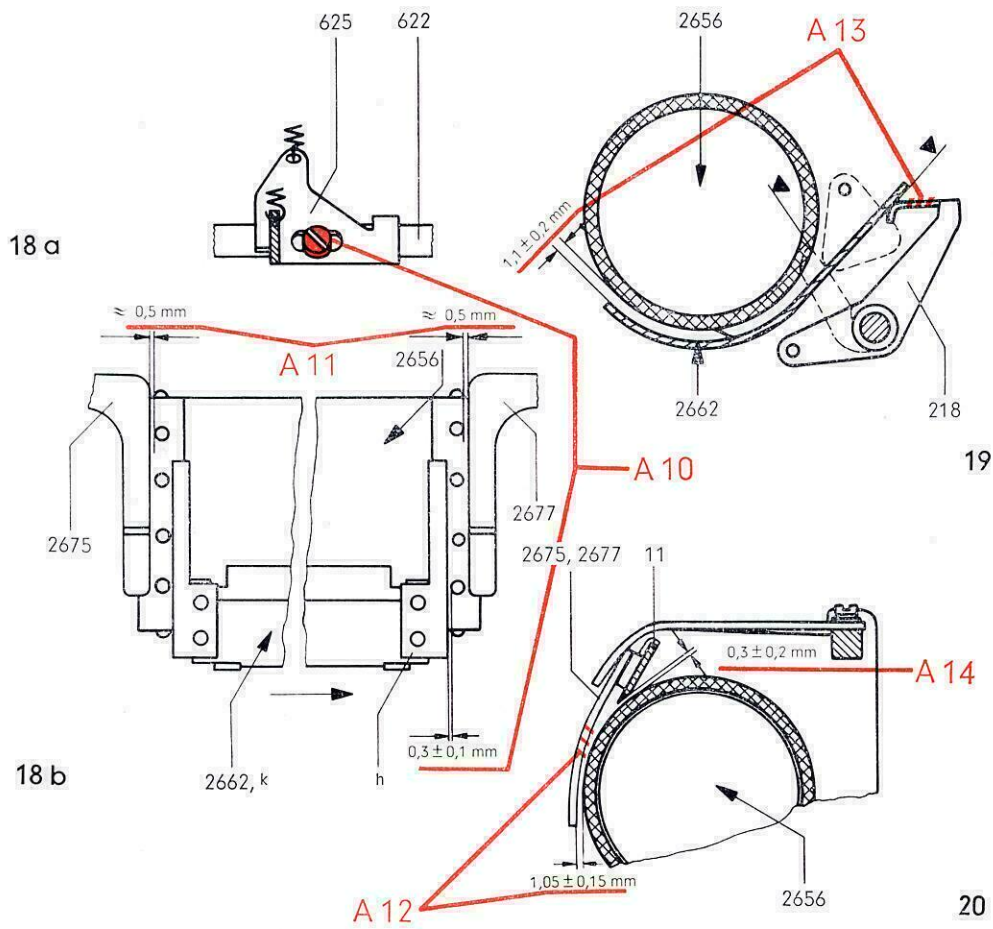
- A8      Lever with axle 622/16  
Lever with axle 622 should have an axial play of approx. 0.1 mm.  
Adjust by laterally displacing adjusting plate 437 after loosening screw 13.
- A9      Brackets 234/17 and 320  
Brackets 234 and 320 should make contact at the points designated. There must be a clearance of  $\leq 0.1$  mm between bracket 234 and spool carrier 227.  
Adjust by laterally displacing bracket 234 after loosening fillister head screw 35.
- A10     Guide plate h/180 of paper guide 2662  
Move guide plate "k" towards the paper bin, in the direction of the arrow. There must be a clearance of  $0.3 \pm 0.1$  mm between guide plate "h" and the pin of sprocket-feed platen 2656.  
Adjust by displacing bracket 625/18a along lever with axle 622.
- A11, A12 Guide brackets 2675/18b and 2677.
- A11     There must be a clearance of approx. 0.5 mm between the pins of sprocket-feed platen 2656 and guide brackets 2675 and 2677.  
Adjust by displacing guide brackets 2675 and 2677 within the margin afforded by their oblong bores.
- A12     There must be a clearance of  $1.05 \pm 0.15$  mm between guide brackets 2675/20 and 2677 and sprocket-feed platen 2656.  
Adjust by bending guide brackets 2675 and 2677.
- A13     Paper guide 2662/19  
There must be a clearance of  $1.1 \pm 0.2$  mm between paper guide 2662 and sprocket-feed platen 2656.  
Adjust by bending lever with bushing 218.
- A14     Tear-off plate 11/20  
There must be a clearance of  $0.3 \pm 0.2$  mm between tear-off plate 11 and sprocket-feed platen 2656.  
Adjust after loosening screws 35b/2.



16

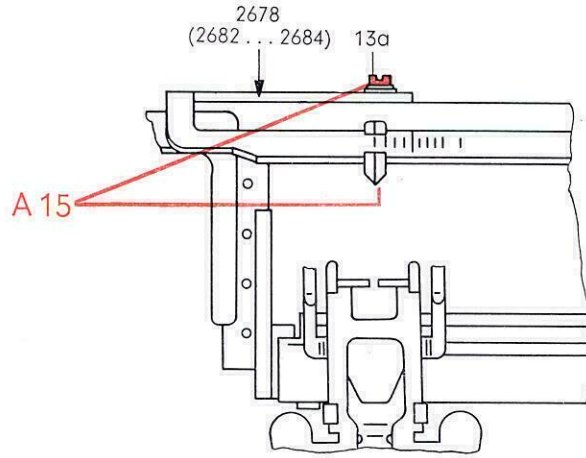


17

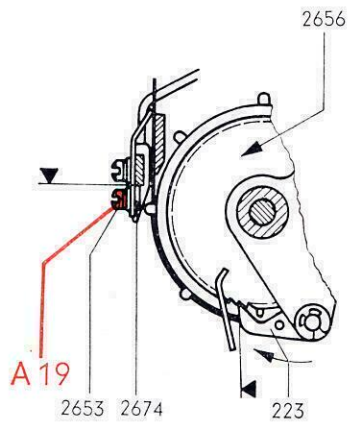


IX

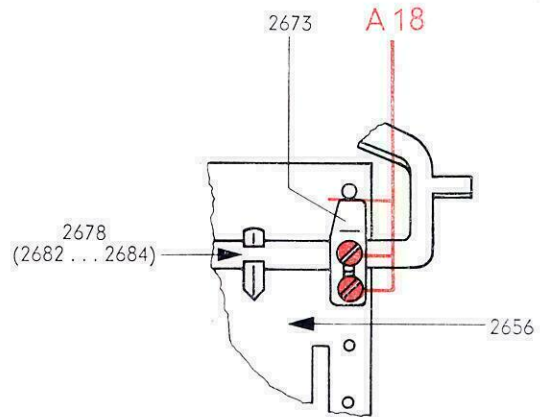
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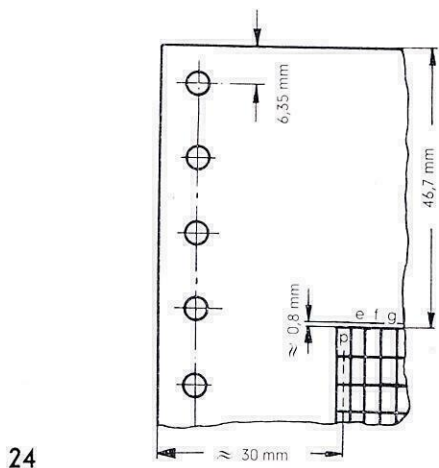
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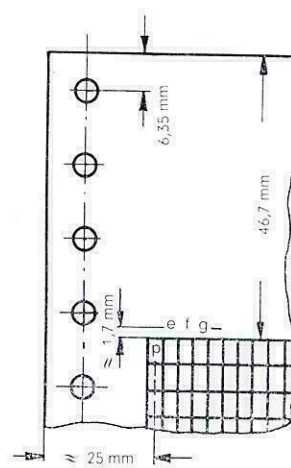
22



23



24



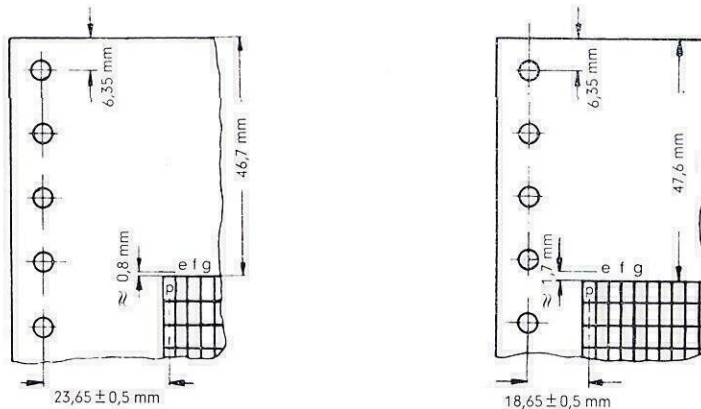
25

- A15      Tabulator rail 2678 (2682...2684)/21 with tab  
Move tab to first line graduation mark and type basket carriage into the beginning-of-line position. The tip of the tab must point to the middle of the first character.  
Adjust by displacing tabulator rail 2678 (2682, 2683, 2684) after loosening fillister head screw 13a.
- A16toA19 Inserting the standard form paper
- A16      Insert standard form paper and set transfer bars 111/3 of the printer assembly for code combination  $\equiv$  (line feed) (all transfer bars 111 in the upper position except the second from the rear).  
Rotate teleprinter by hand until pawl with pin 223/22 is in its foremost position or has traveled all the way in the direction of the arrow to rest against the sprocket-feed platen.
- A17      Sprocket-feed platen 2656/23  
All characters should be printed whenever possible in the middle of the grid sections into which the sprocket-feed paper is divided. When it is necessary to print outside the printing area of the form, take care that characters having no downward stroke are printed about 0.8 mm above the upper limit of the printing area (46.7 mm from the upper margin of the form), with a line spacing of 4.23 mm (Fig. 24). With line spacings of 6.35 mm and 8.46 mm, this clearance from the upper limit of the printing area (47.6 mm from the upper margin of the form) should be about 1.7 mm (Fig. 25).  
Adjust by turning sprocket-feed platen 2656/23.
- A18      Pointer 2673/23  
The tip of pointer 2673 must be level with the lower edge of the first feed hole in the standard form paper.  
Adjust by displacing pointer 2673 within the limits allowed by the oblong hole.
- A19      Threaded plate 2674/22  
The threaded plate must rest against tabulator rail 2678 (2682, 2683, 2684)/23.  
Adjust by moving threaded plate 2674/22 against tabulator rail 2678 (2682, 2683, 2684)/23. Protect oval head screw 2653/22 with a coat of lacquer.
- (A20)    Width of margin  
There should be a clearance of about 30 mm between the margin of the standard form and the middle of the first character with 69 characters per line, and one of about 25 mm with 71 or 104 characters per line or 69 characters per line at a character spacing of 1 inch for every 10 characters (Figs. 24 and 25).



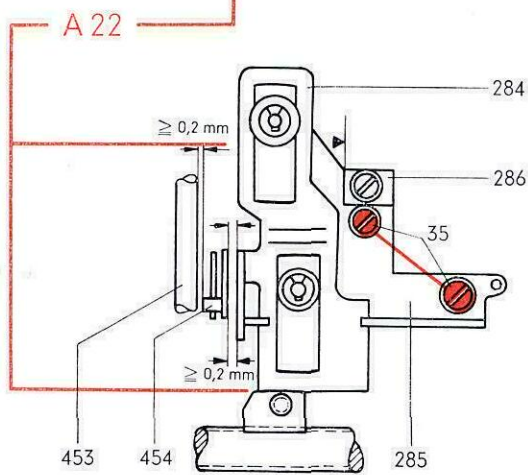
A21 to A23 Spacing between first character and feed holes

- A21 There must be a clearance of  $23.65 \pm 0.5$  mm between the middle of the first character and the middle of the feed holes with 69 characters per line and one of  $18.65 \pm 0.5$  mm with 71 or 104 or with 69 characters per line at a character spacing of 1 inch for every 10 characters (Figs. 26 and 28).  
If the  $\pm 0.5$  mm tolerance is exceeded, adjustments A22 and A23 must be made as follows:
- A22 After loosening the two fillister head screws 35/28, laterally displace guide 285 with feed rack 284 until the deviation in dimension is reduced to within the tolerance of  $\pm 0.5$  mm. Make sure that the minimum dimension of 0.2 mm, given on either side of lever 454 for the clearance from axle 453 and guide 285, is adhered to. Then bring stop 286 into contact with guide 285.
- A23 Check adjustments A4 to A6.
- (A24) When moving lever 2671/4 upward as far as it will go, the sprocket-feed platen should permit reverse rotation.

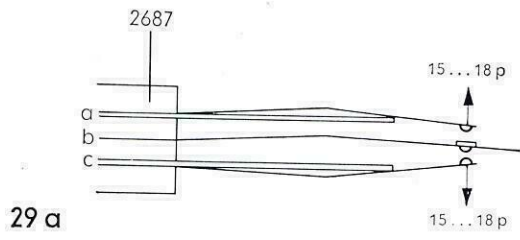


26

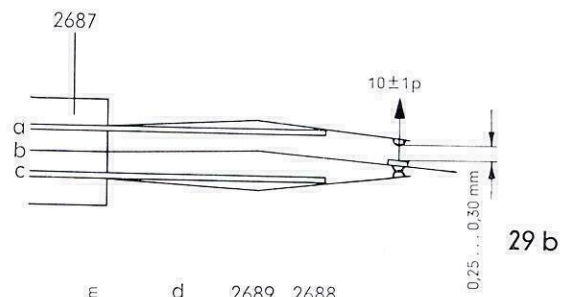
27



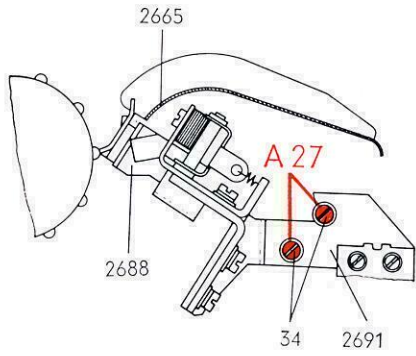
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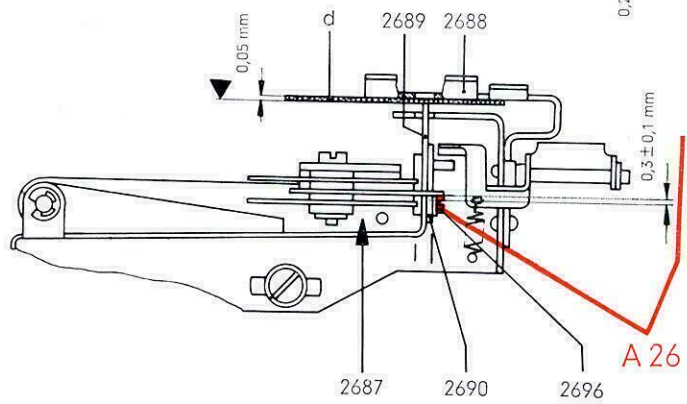
29 a



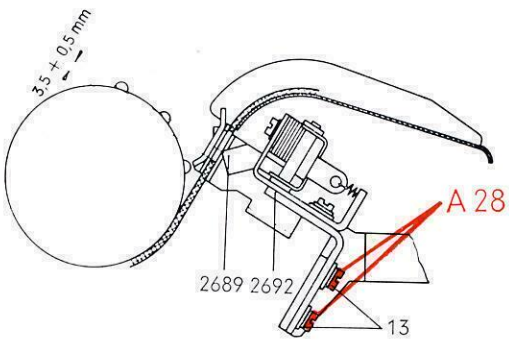
29 b



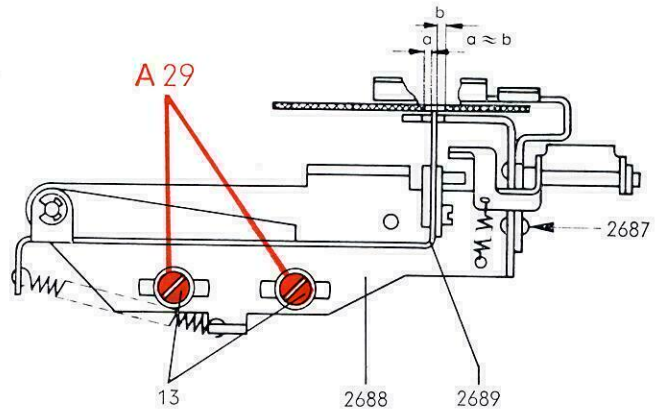
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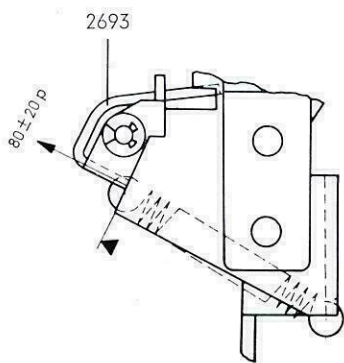
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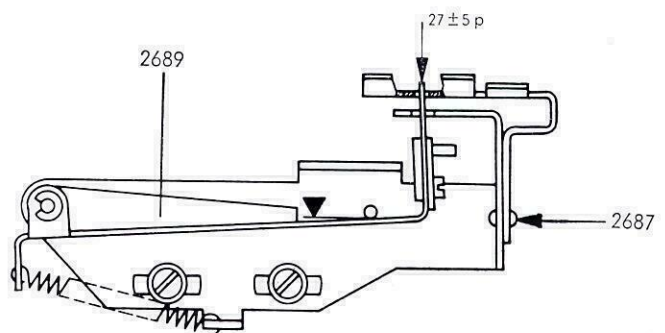
32



33



35



34

- A25      Position indicator contact 2687/29a,b  
Adjust preload of opposing springs a and c:  
With operating spring b/29a lifted off, the preload of the opposing spring should be 15 to 18 p.  
Adjust by bending opposing springs a and c.  
With normally closed contact b-c/29b closed, the preload of operating spring b should be  $10 \pm 1$  p.  
Adjust by bending opposing spring c.  
The travel of operating spring b should be 0.25 to 0.3 mm.  
Adjust by bending opposing spring a.
- A26      Lever 2689/30  
Adjust by placing a 0.05 mm thick spacer d into the paper guide of base plate 2688. Then loosen fillister head screw 2696. Bring lever 2689 to rest against spacer d. Adjust for a clearance of  $0.3 \pm 0.1$  mm between plate 2690 and the operating spring of the spring set. Tighten fillister head screw 2696. Remove spacer d. Once lever 2689 has dropped, position indicator contact 2687 should have transferred.
- A27      Base plate 2688/31  
Adjust by loosening fillister head screws 34 and by displacing bracket 2691 so that base plate 2688 comes into alignment with the base plate of paper saddle 2665.
- A28      Vertical adjustment of lever 2689/32  
The nose of lever 2689 is level with the paper. There should be a clearance of  $3.5 \pm 0.5$  mm between the end of the nose of lever 2689 and the contact hole front edge of the standard form paper.  
Adjust by loosening fillister head screws 13 and displacing adjusting bracket 2692 vertically. By the time the next line feed occurs the contact spring set should have transferred, i. e. have returned to normal position.
- A29      Horizontal position of lever 2689/33  
Adjust by loosening the two fillister head screws 13, and by adjusting base plate 2688 of position indicator contact 2687 so that lever 2689 (a approximately equal to b as determined by visual check) drops into the center of the contact hole, with lever 2689 being positioned level with the paper.  
Spring forces
- (A30)    The force for transferring position indicator contact 2687/34 on lever 2689 should be  $27 \pm 5$  p.
- (A31)    A force of  $80 \pm 20$  p should act on bail 2693/35.





## 5. **CIRCUIT AND WIRING DIAGRAM**

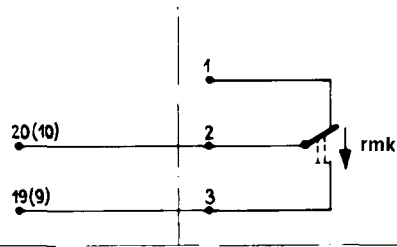
for form position indicator contact. (Fig. 36)

- ① Teleprinter, base plate/bottom plate removed, bottom view
  - C6 starting capacitor
  - K2 cable 2 (consecutive No. 2695)
- ② Printer, top view
  - rmk position indicator contact (consecutive No. 2687)
  - K1 cable 1 (consecutive No. 2694)
  - K2 cable 2 (consecutive No. 2695)
- ③ Circuit diagram for position indicator contact
  - rmk position indicator contact (consecutive No. 2687)

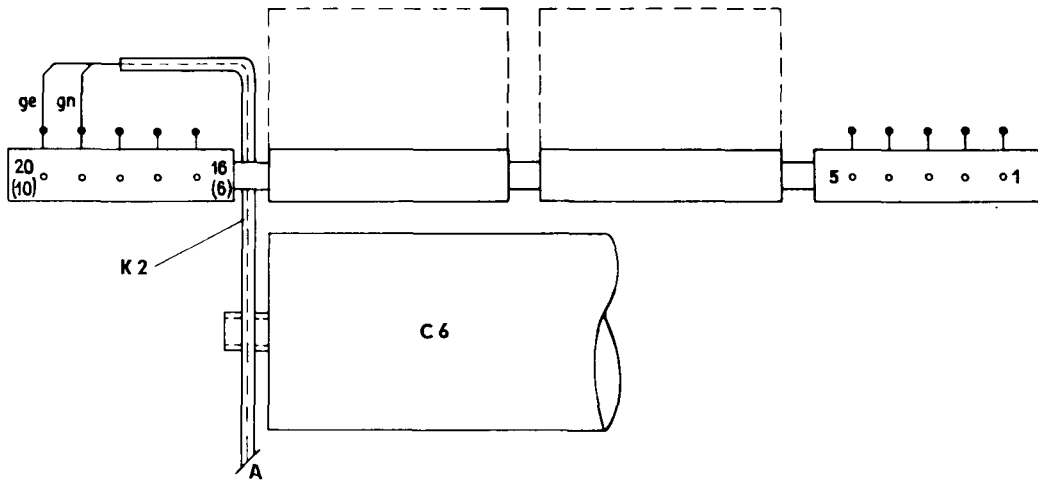
Wire code: ge=yellow  
gn=green  
or=orange

Bracketed figures in the circuit diagram refer to terminals of the asseccory „additional solder terminal blocks“ (E96 of Fs Sk 2186/1).

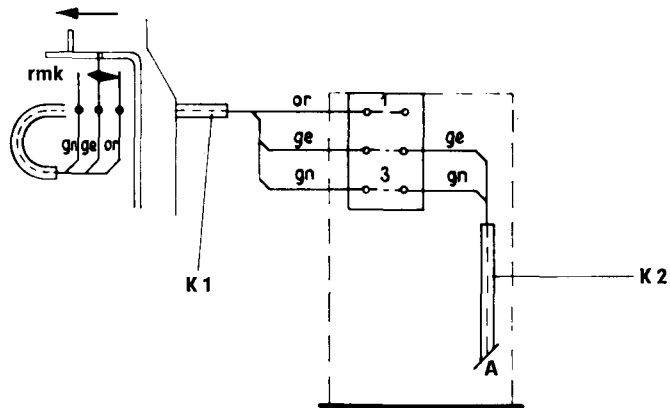
③



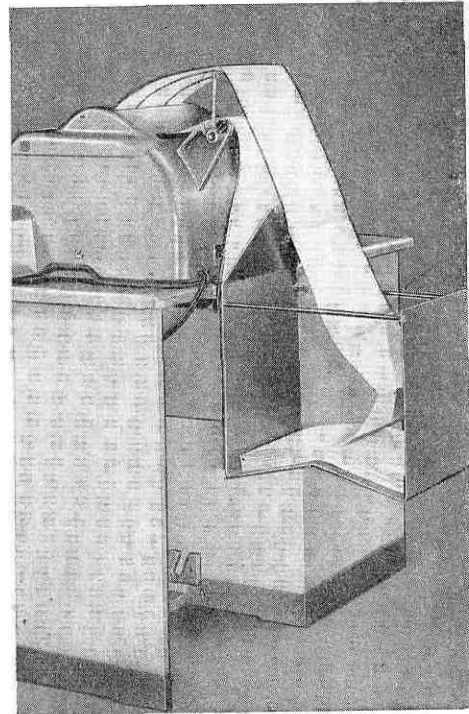
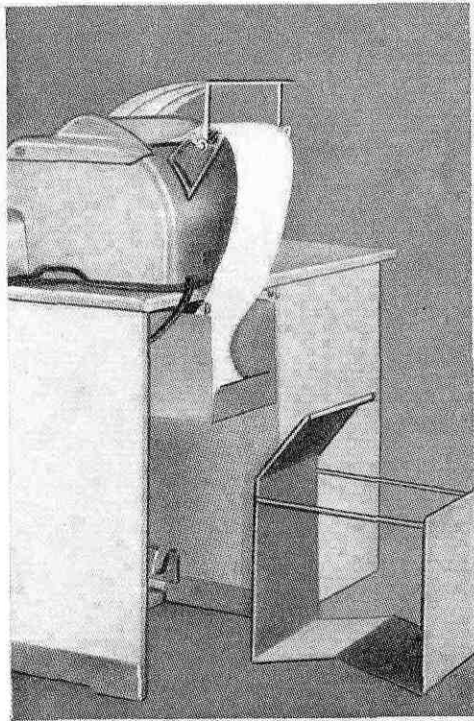
①



②







PAPER SUPPLY AND STORAGE BINS  
FOR FAN-FOLD PAPER

**CONTENTS**

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2.3. "Cover 175" . . . . .	4
2.4. "Floor cabinet 195" . . . . .	5

**1. GENERAL**

The paper supply and storage bins have been designed to accommodate the unprinted, fan-fold standard forms and to store the printed forms.

The following parts are required for attaching the accessories:

for "cover 175"

Paper supply bin:	1 set of parts	E124 with U1
Storage bin:	1 set of parts	E124 with U5 (DIN A4) E124 with U6 (DIN A5)

The storage bin for standard form printers with cover **can only be used in connection with a paper supply bin.**

for "floor cabinet 195"

Paper supply bin:	1 set of parts	E20, U39
Storage bin:	1 set of parts	E124 with U5 (DIN A4) E124 with U6 (DIN A5)

for "floor cabinet 189" (with side compartment)

Paper supply bin:	1 set of parts	E124 with U3
Storage bin:	1 set of parts	E124 with U5 (DIN A4) E124 with U6 (DIN A5)

The storage bin for floor cabinet 189 (with side compartment) **can only be used in connection with the paper supply bin.**

for "floor cabinet 202" (without side compartment)

Paper supply bin:	1 set of parts	E124 with U3
Storage bin:		E124 with U5 (DIN A4)
	1 set of parts	E124 with U6 (DIN A5)

The letters E and U refer to Fs Sk 2186/1.

**2. ATTACHING THE PAPER SUPPLY AND STORAGE BINS**

Prior to starting work pull the power and telegraph plugs from their wall outlets.

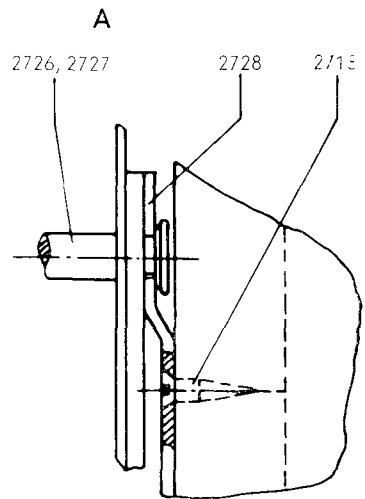
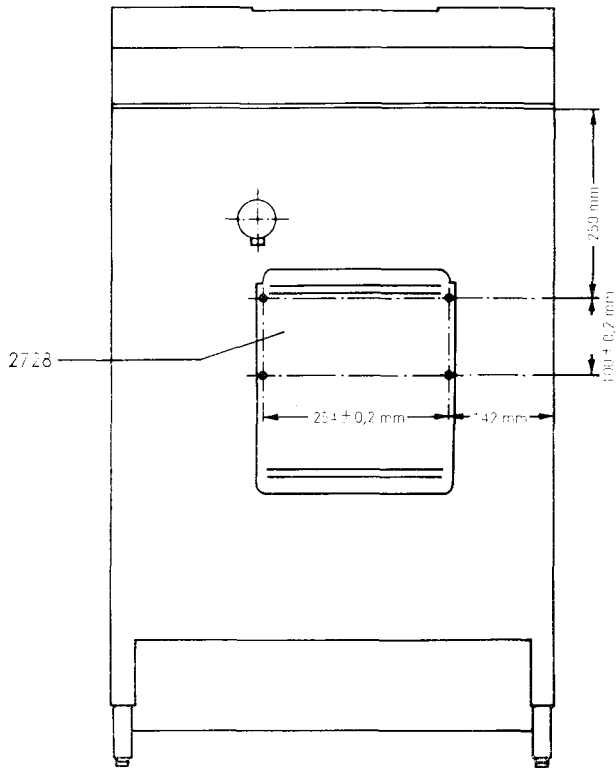
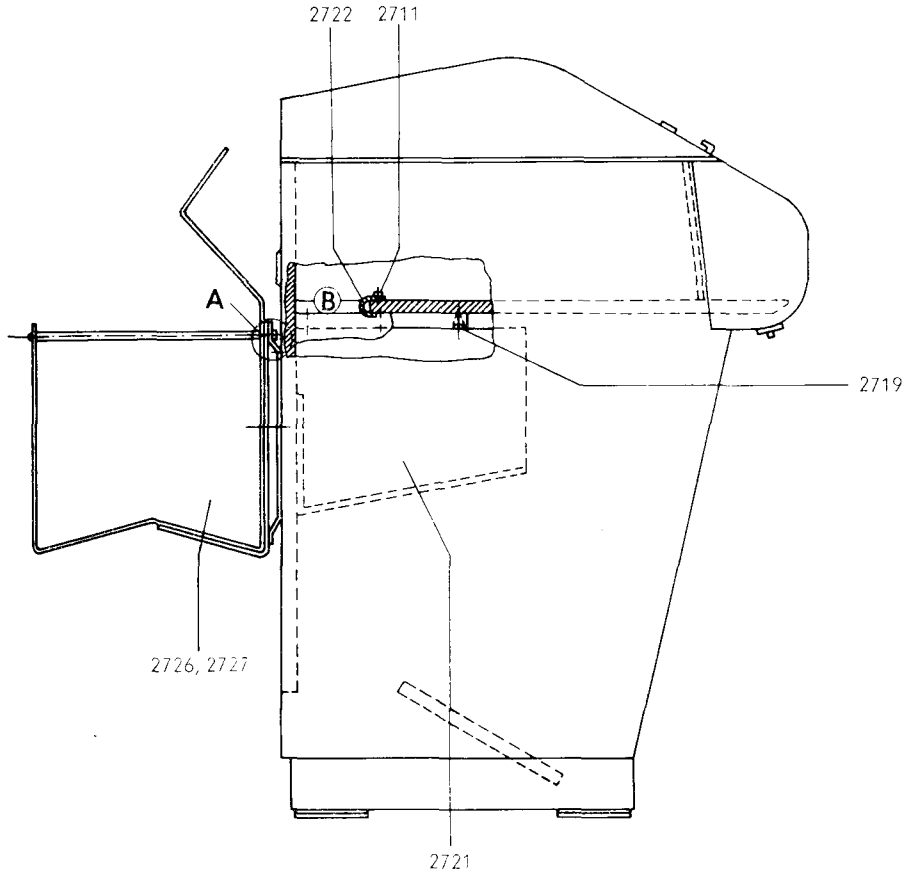
**2.1. "Floor cabinet 202" (without side compartment)**

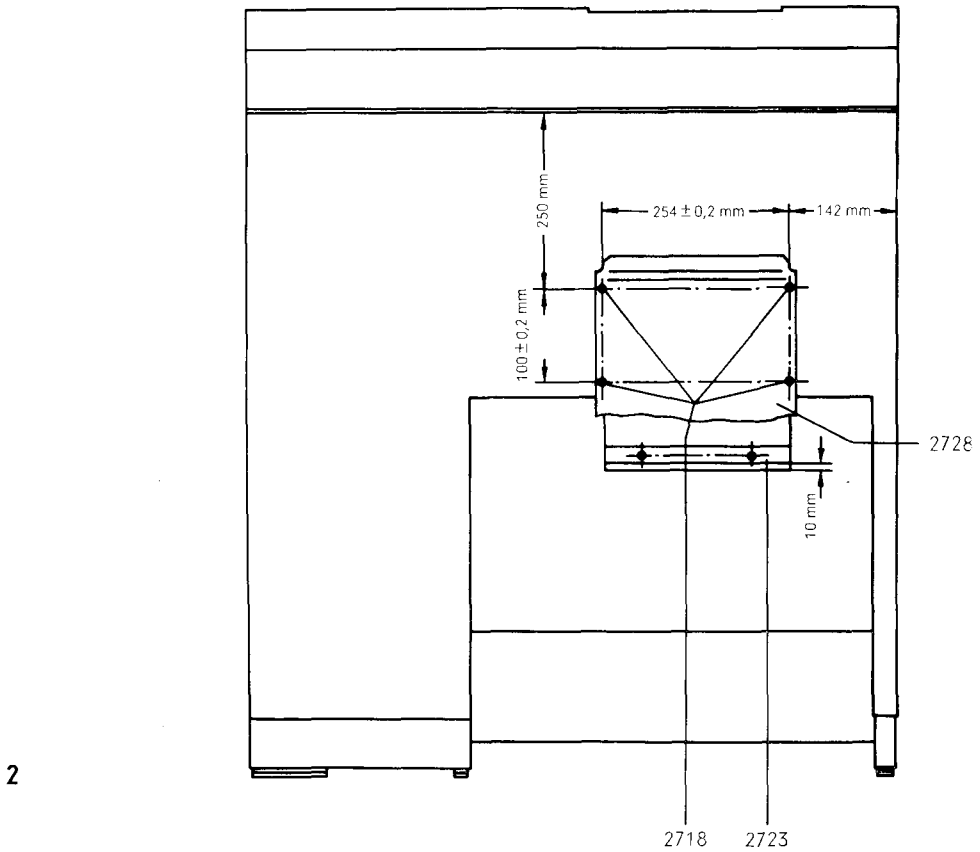
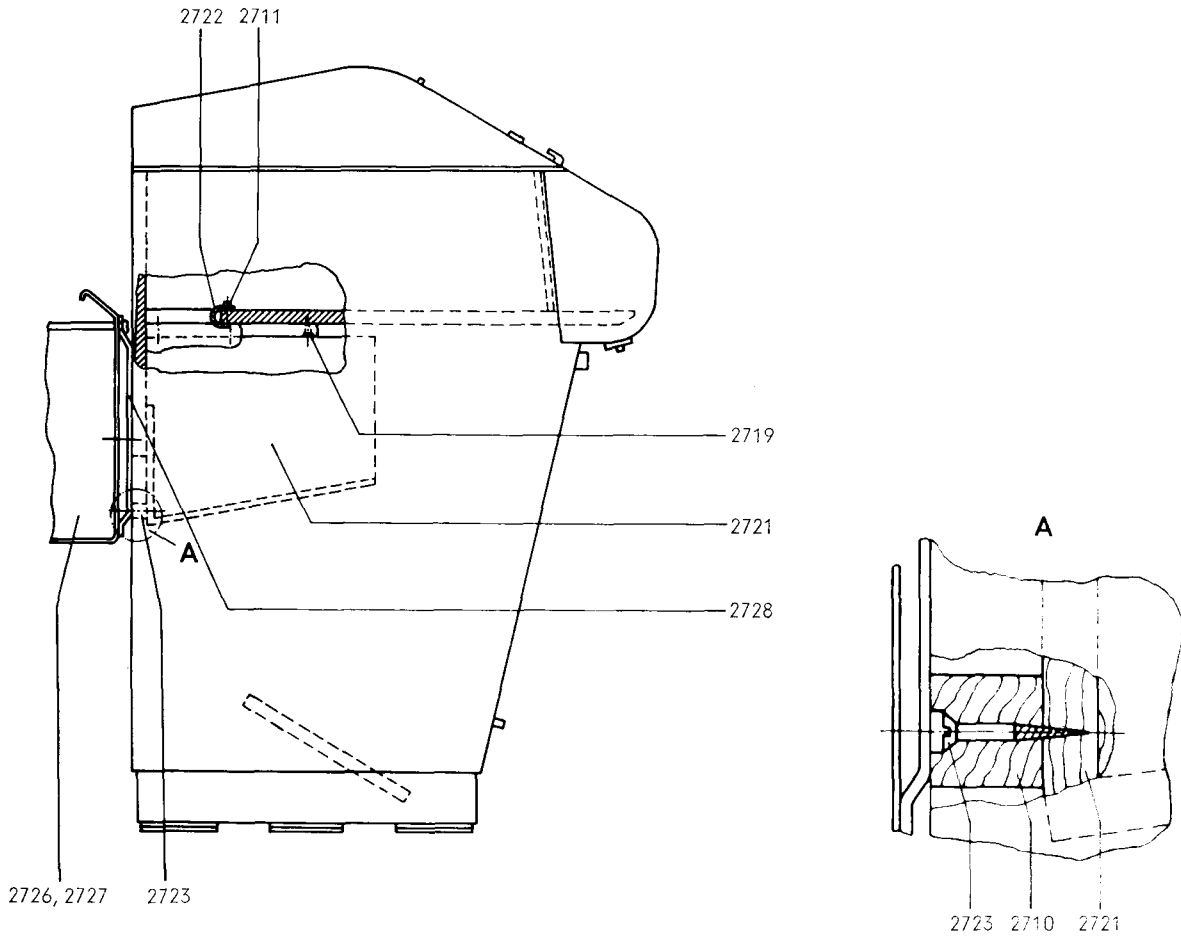
**2.1.1. Paper supply bin 2721/1**

After removing the 5 round head wood screws 2101 (not visible, point **B**) remove cover plate 2708 (not visible) from floor cabinet.

Screw paper supply bin 2721 on to the machine base board of the floor cabinet, using the 6 countersunk wood screws 2719. Attach guide plate 2722 to this board, using the three round head wood screws 2711.

Replace paper roll axle 3 (not visible) by tube 2720 (not shown). Feed paper from paper supply bin 2721 over guide plate 2722 and around tube 2720 (not visible) to the platen of the teleprinter.





2

- 2.1.2. Storage bin 2726/1 or 2727  
Using a prick punch, start the four bores of holding plate 2728 in the rear wall of the floor cabinet (observing the dimensions stated in Fig. 1). Attach holding plate 2728 by means of the four countersunk wood screws 2718, and hook storage bin 2726 or 2727 to holding plate 2728.

**2.2. "Floor cabinet 189" (with side compartment)**

- 2.2.1. Paper supply bin 2721/2  
Attach paper supply bin 2721 to "floor cabinet 189" (with side compartment) as outlined in para. 2.1.1.

- 2.2.2. Storage bin 2726/2 or 2727  
Storage bin 2726 or 2727 can be used only in conjunction with a paper supply bin 2721 (to be attached as outlined in para. 2.1.1.).  
Start the two bores of bar 2723 in the rear wall of the paper supply bin (noting the dimension), and attach bar 2723 to paper supply bin 2721 by means of two countersunk wood screws 2710.  
Start the bores of holding plate 2718 in the floor cabinet (noting the dimensions), and attach holding plate 2728 to floor cabinet by means of four countersunk wood screws 2718. Follow up by hooking storage bin 2726 or 2727 to holding plate 2728.





**2.3. "Floor cabinet 175"**

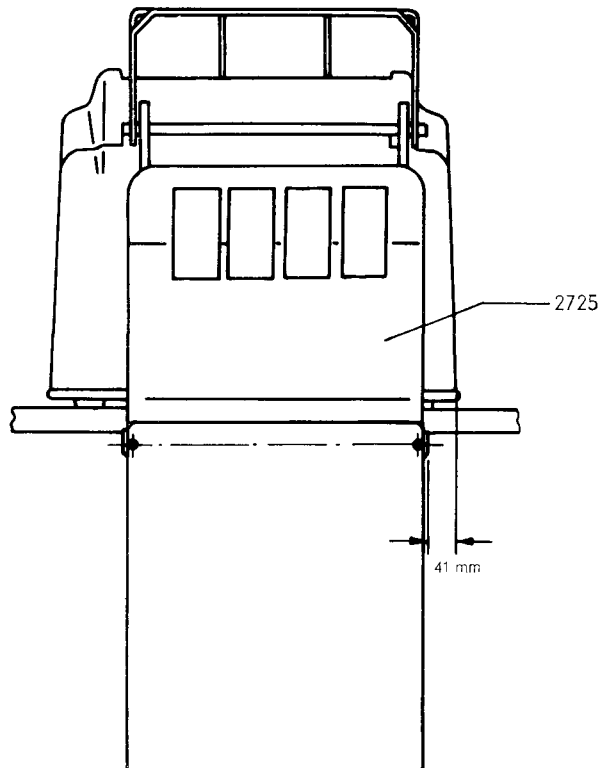
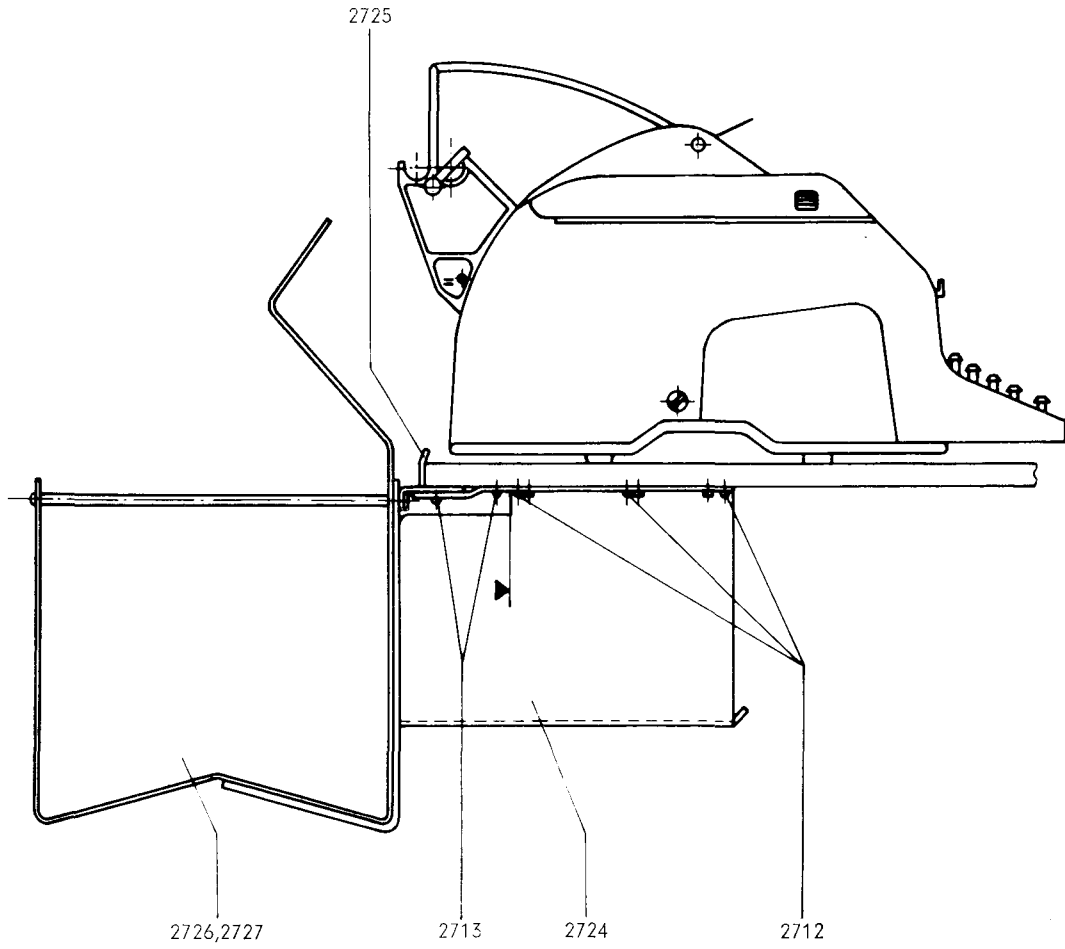
2.3.1. Paper supply bin 2724/3

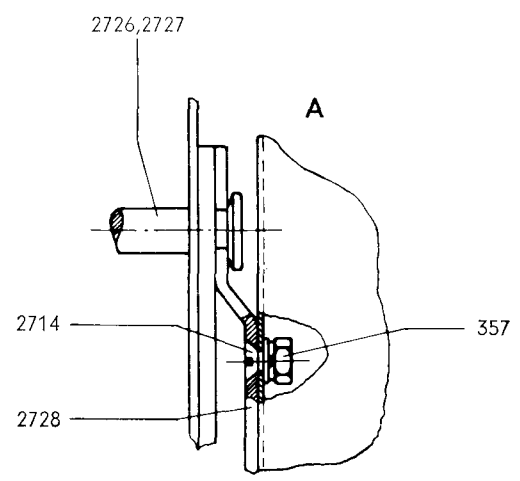
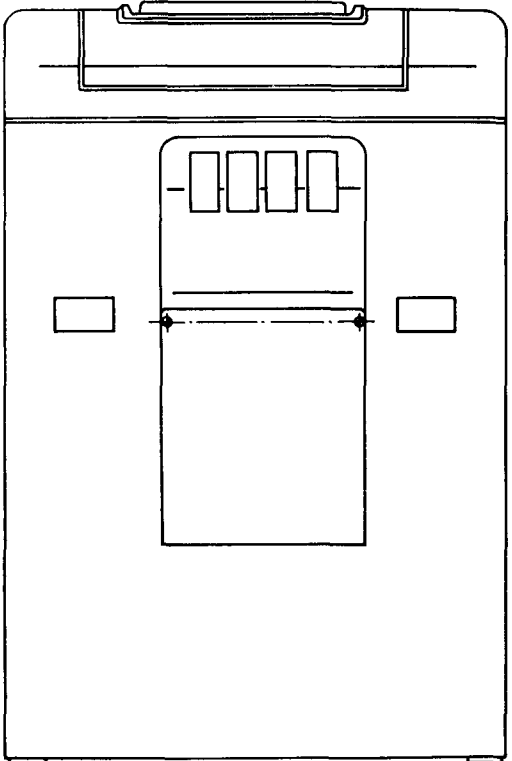
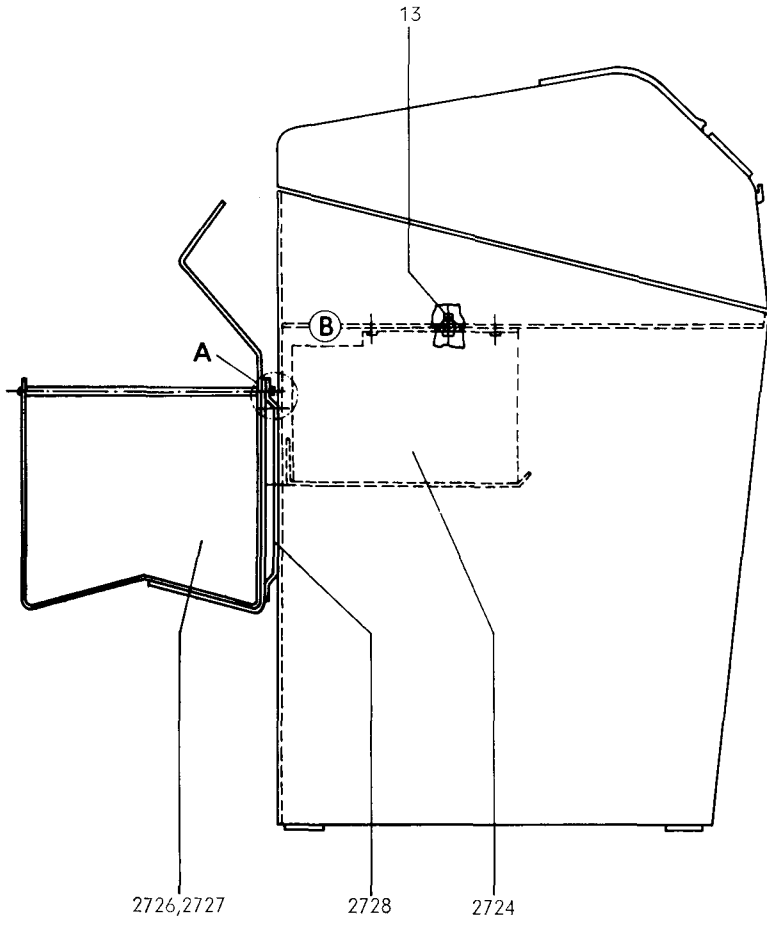
Observing the dimension (Fig. 3), push paper deflecting plate 2725 against the desk top. To attach paper deflecting plate 2725 by means of wood screws, start the bores and insert the four round head wood screws 2713.

Push paper supply bin 2724 against paper deflecting plate 2725, start the bores and attach paper supply bin 2724 to the desk top by means of six round head wood screws 2712.

2.3.2. Storage bin 2726/3 or 2727

Storage bin 2726 or 2727 can be used only in conjunction with paper supply bin 2724 (for attachment see para. 2.3.1.). Hook storage bin 2726 or 2727 to paper deflecting plate 2725.





**2.4. "Floor cabinet 195"**

2.4.1. Paper supply bin 2724/4

Slacken off the four fillister head screws 13 (not visible), and remove cover plate 2707 (not visible, point ⑧) from the floor cabinet.

Attach paper supply bin 2724 to the machine base board of the floor cabinet.

2.4.2. Storage bin 2726/4 or 2727

Screw holding plate 2728 to rear wall of floor cabinet by means of counter-sunk screws 2714 and hexagon nuts 357. Follow up by hooking storage bin 2726 or 2727 to holding plate 2728.





VERSION FOR TELEGRAPH SPEEDS OF  
45.5; 74.23; AND 75.0 BAUDS



**CONTENTS**

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1. General . . . . .	3
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**1. GENERAL**

This index covers the 45.5, 74.23 and 75.0 baud versions of the Teleprinter 100. (For versions working at 44.45, 46.0, 47.0, 53.5 and 56.85 bauds, please ask for manual Fs Ea, Es 2189/20).

To convert the Teleprinter 100 in the field to a telegraph speed of 45.5, 73.23 or 75.0 bauds, the following sets of parts are required:

for commutator motor (3750 rpm)

1 set of parts for 45.5 bauds	E39 with U3
1 set of parts for 74.23 bauds	E37 with U3
1 set of parts for 75.0 bauds	E38 with U3

for 50-cps (3000 rpm) synchronous drive

1 set of parts for 45.5 bauds	E39 with U1
1 set of parts for 74.23 bauds	E37 with U1
1 set of parts for 75.0 bauds	E38 with U1

for 60 cps (3600 rpm) synchronous drive

1 set of parts for 45.5 bauds	E39 with U2
1 set of parts for 74.23 bauds	E37 with U2
1 set of parts for 75.0 bauds	E38 with U2

The letters E and U refer to Fs Sk 2186/1.





## **2. REMOVAL AND REPLACEMENT OF PARTS**

Prior to starting work, pull the power and telegraph plugs from their wall outlets.

### **2.1. Helical Gear 2753\*/1 and Gear 2754**

Removal: Loosen the two captive recessed-neck screws 591 of motor casing 43. Loosen fillister head screws 35b of stop 590 and pull the motor with casing off the pivot. Then remove fillister head screw 35a of helical gear 2753 from the motor and pull the helical gear off the shaft. Remove the three fillister head screws 224 of gear 2754 from the sleeve and detach the gear.

Replacement: Locate gear 2754 on the centering stud of the sleeve, and secure by means of the three fillister head screws 224. Locate helical gear 2753 on the motor shaft, and secure by means of fillister head screw 35a. Locate motor with casing on the pivot, and turn to bring helical gear 2753 and gear 2754 into mesh. There must be a small but still noticeable backlash between the helical gear and the gear. Tighten the two fillister head screws 591 of the motor. Bring stop 590 to bear against the motor and tighten fillister head screw 35b.

After each removal and replacement without gear change, bring motor to bear against stop 590, and secure by means of the screws.

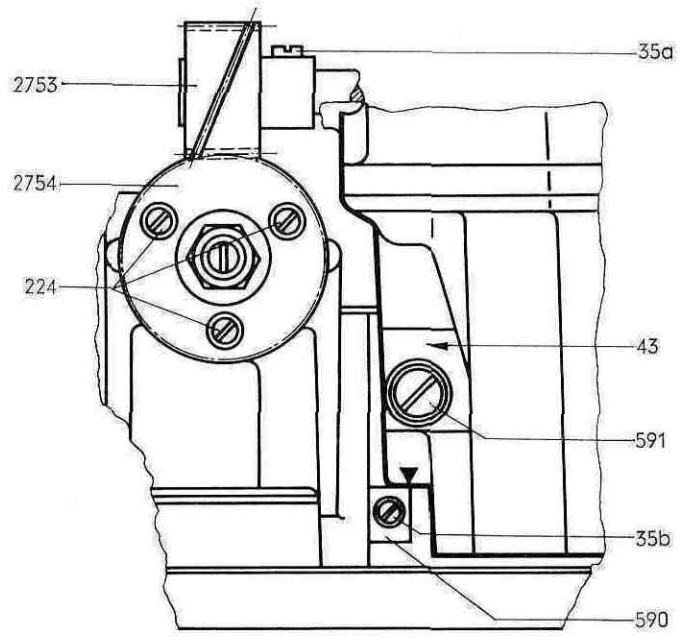
### **2.2. Tension springs 2751, 189/2 (only for 74.23 and 75.0 bauds)**

Unhook tension spring 189 from selector armature 180 and install tension spring 2751 in its place with the closed-loop end downwards.

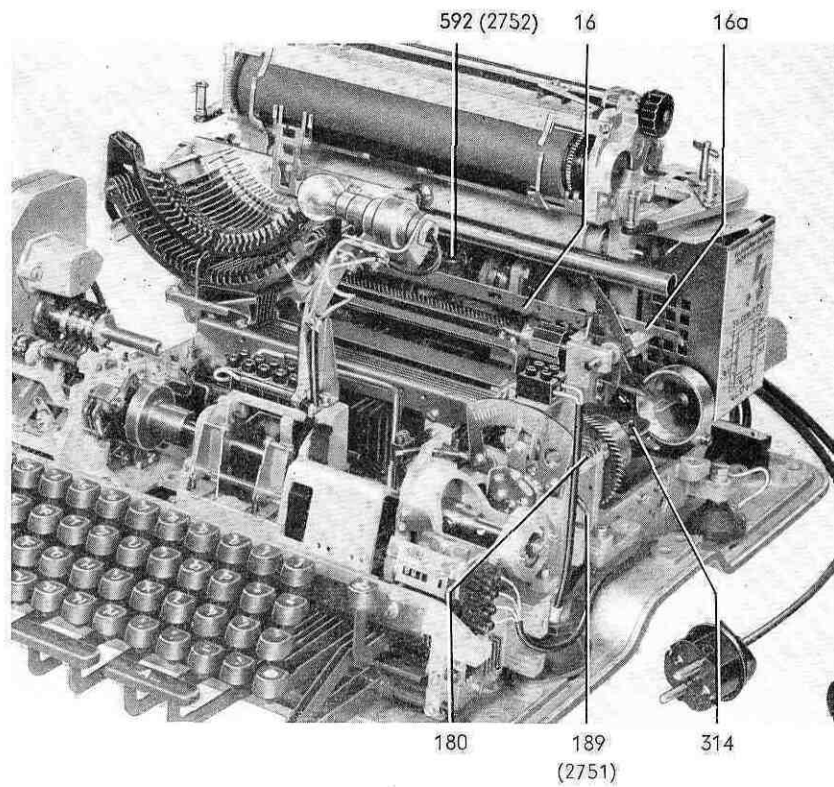
### **2.3. Carriage return springs 2752, 592/2 (only for 74.23 and 75.0 bauds)**

Unhook carriage return spring 592 and install tension spring 2752 in its place with the closed-loop end engaging the spring suspension point on the lower half of the printer. To install the tension spring, it is advisable to remove the type basket carriage from the printer as described in Index II.

\* For the order numbers of the helical gears and gears for 45.5, 74.23 and 75.0 bauds and commutator motor (3750 rpm) or synchronous motor (3000 rpm) and synchronous motor (3600 rpm), refer to consecutive numbers 2753 to 2770 in the parts list, Index XIII.

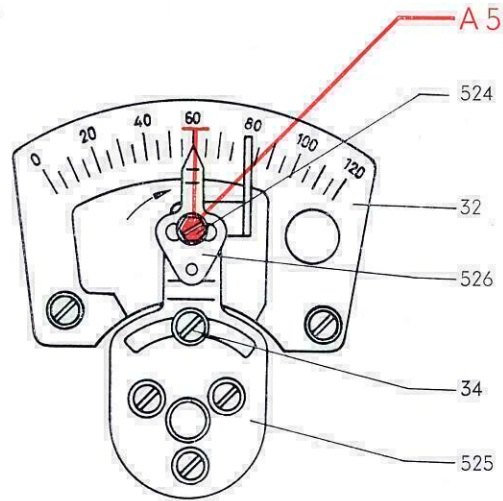
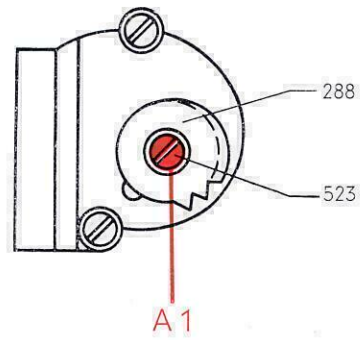
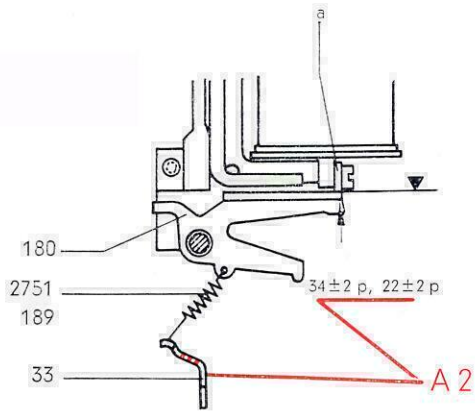
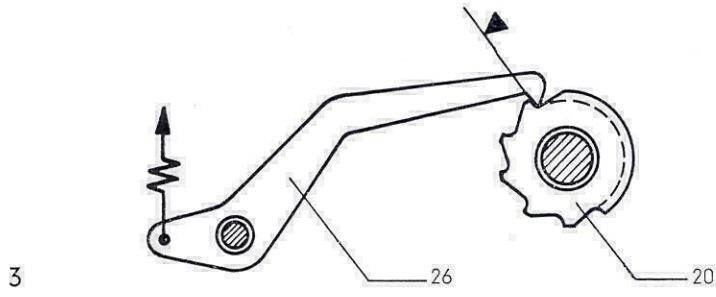


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XI



### 3. ADJUSTMENTS (only for 74.23 and 75.0 bauds)

Prior to starting work, pull the power and telegraph plugs from their wall outlets.

- A1 Eccentric disk 288/5  
Keep lever 16a/2 of parallel guide 16 in its lowest position. Move the type basket carriage by hand into the end-of-line position, and release. The type basket carriage must now move into the beginning-of-line position without visible bouncing. At the same time, sleeve with ratchet 20/3 must rest against detent 26.  
Adjust by turning eccentric disk 288/5 after loosening fillister head screw 523.
- A2 Tension spring 2751/4 (for neutral-current version), tension spring 189 (for polar-current version)  
Place selector armature 180 against residual plate "a". The spring force should amount to  $34 \pm 2$  p and  $22 \pm 2$  p respectively at the marked points.  
Adjust by bending adjusting plate 33.
- (A3) Carriage return spring 2752/2  
With the type basket carriage in the beginning-of-line position, the tension spring should exert a force of  $710 \pm 100$  grams.
- A4 to A6 Motor speed, pointer 526/6 and impact adjuster 314/2
- A6 With the Teleprinter 100 in operating condition, the following adjustments should be made:
- A4 Motor speed  
After the conversion, the motor speed must be checked and, if necessary, readjusted as described in Index XII.
- A5 Pointer 525/6  
Loosen hexagon screw 524 and turn setting plate 526 to the right in the direction of the arrow.  
Loosen fillister head screw 34. Move pointer 525 towards the zero mark on scale 32 and, during run-out transmission of code combinations "R" and "Y", determine the lower receive margin limit. Then move pointer 525 towards graduation mark 120 on scale 32 and, while keying individual characters, determine the upper receive margin limit. Set pointer 525 to the calculated center of the receive margin and tighten fillister head screw 34. Loosen hexagon screw 524 and move setting plate 526 within the oblong hole until it points to graduation mark 60 on scale 32.
- A6 Impact adjuster 314/2  
Set the pointer of the impact adjuster so that a sufficiently clear print is obtained with an ink ribbon nearing the end of satisfactory service.

**4. OPERATION** (only for 74.23 and 75.0 bauds)

**4.1. Range finder (Fig. 6)**

Under normal conditions pointer 525 with setting plate 526 should register with graduation mark 60 on scale 32. The lowest mark on adjusting plate 33/4 should be level with the mark on the receiver frame (minimum tension of armature spring).

To adjust the receiver to certain line or circuit conditions, request the distant station to transmit characters "R" and "Y" alternately. Loosen fillister head screw 34/6 and, with the teleprinter in operation, move pointer 525 to the left and right until a wrong signal is just printed. It may be necessary to repeat this adjustment with different armature spring tensions by moving adjusting plate 33/4 from setting mark to setting mark. The adjustment of plate 33 should be selected which provides maximum receive margin.

Set pointer 525/6 to the center of the margin for both reception and monitoring, e. g. in case of proper reception between graduation marks 40 and 90, set the pointer to 65. This adjustment applies only to lines and circuits over which the receiver is permanently operated. Where the teleprinter is connected to an exchange, adjustments have to be carried out in co-operation with the exchange personnel.

MAINTENANCE

XII



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5. Applying a film of oil repellent . . . . .	5
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## 1. GENERAL

Before starting maintenance operations be sure to pull the power and telegraph plugs from their wall outlets.

The lubrications specified below have proved eminently suitable for preventive maintenance. If these types of lubrications are not available, use equivalent ones:

 <b>Teleprinter oil K</b> ("PDP 61 A" of Messrs. Klüber, Munich/Germany)	Isoflex oil
Viscosity at 20° C	99 C St
50° C	37 C St
or	
<b>Teleprinter oil I</b> (Shell "BC 8")	pure mineral oil
Viscosity at 20° C	130 ... 140 C St
50° C	30 ... 35 C St
 <b>Teleprinter grease</b> (Shell "FL 2")	Grease on a lithium soap base Minimum drip point at 150° C
 <b>Shell "Retinax G" grease</b> (formerly called "Ambroleum")	

All machines from serial No. 2 S 41500 onwards are oiled with teleprinter oil K and not with teleprinter oil I. It may be used in place of teleprinter oil I.

To permit ready tracing of points to be lubricated they have been marked by colored dots in Figs. 1 to 24. The color indicates the lubricants to be used.

The teleprinter and its companion units are thoroughly oiled and greased before they leave our works.

**Prior to placing the equipment in service for the first time it should be carefully oiled in accordance with Figs. 1 to 3 (for the basic version) and 17 to 20, 22 to 24 (for companion units).**

**Further preventive maintenance of the teleprinter should then be regularly performed at intervals of 1000 maintenance units or after one year if the machine is little used.**

The number of maintenance units is determined by a built-in counting mechanism which directly indicates the units.

**After approximately 10,000 maintenance units the teleprinter and its companion units should be subjected to a general overhaul.**

## 2. CLEANING

Remove the dust depositing on and in the machine at adequate intervals using a dust cloth and a dust brush. Take care that no dirt is wiped on vital components and surfaces of the machine.

Clean the teleprinter types in the same way as those of a normal office typewriter. It is recommended not to use a brush but rather one of the available plastic type cleaners.

Use the chad remover (Fig. 21) to remove chads and paper fluff from the reperforator attachment.

## 3. ROUTINE MAINTENANCE

3.1. Remove excess oil, grease and dirt. Be careful not to wipe any dirt on to vital components and surfaces of the machine. It will be advisable to mask such spots for protection.

3.2. Check the commutator and the governor slip rings for sound condition. If the surface of the commutator or slip rings is found to be contaminated, i. e. if it is not smooth or fails to show a uniformly dark metallic lustre, clean these parts with a cloth wetted with a solvent, such as carbon tetrachloride. Be careful to wipe in axial direction to avoid clogging of the grooves between the segments.



Do not use emery paper or similar material.

If the surface turns out to be rough or pitted touch up the commutator in a lathe.

- 3.3. Check the motor carbon brushes (automatic break types 25 mm long) and the governor carbon brushes (approx. 13 mm long, inclusive of holder) at intervals of 1000 maintenance units. If the motor carbon brushes have been worn down to a length of about 16 mm, replace them to prevent the disconnect time from falling in between maintenance intervals.  
Replace the governor carbon brushes when they have been worn down to a length of about 8 mm (inclusive of holder).  
Clean the guides of the motor and governor carbon brushes as well as the commutator and governor carbon bridges from carbon dust and oil which may adhere to them.
- 3.4. Check governor contacts and, if found excessively pitted, replace them.
- 3.5. Oil and grease the spots indicated in the Figs. 2, 4 to 14, 17 to 20 and 22 to 24.  
In some cases assemblies are shown in removed condition for better visibility of the lubricating points. However, these assemblies need not be removed for performing routine maintenance operations.  
We advise against excessive oiling.  
For oiling it is advisable to dip a wire of about 1 mm diam. into oil about 5 mm deep. The droplet forming at the end of the wire is sufficient for one lubricating point.  
Whenever the machine has been oiled, clean the contacts, the armature, the residual plate and the magnet core of the magnet assemblies. Pull a lintfree paper strip (e.g. perforator tape) through between the contacts and between the pole plate and the pole shoes.  
Do not bend contact springs.
- 3.6. Use teleprinter oil K or I for oiling the lubricating felts as well as the felts disks provided in the felt clutches.  
Prior to installation put new lubricating felts and felt discs on oil until they are impregnated and begin to sink.
- 3.7. Use teleprinter oil K or I for oiling the friction, gliding and bearing surfaces as well as lubricating felts not specially indicated in the Figs. 4 to 14, 17 to 20 and 22 to 24.
- 3.8. Use teleprinter oil K or I for lubricating the suspension points of tension springs as well as the points of contact of pressure and torsion springs.  
In our works, Shell Grease "Retinax G" has been used for these points.
- 3.9. If the cutting edges of the holes in the perforator tape produced by the reperforator attachment are no longer sharp, it may be assumed that the guides of the punches have widened or that the punches are blunt. In such a case replace the punches 2225 and 2226 by the punches 2290 and 2291 (diameter larger by 0.03 mm) or punches 2292 and 2293 (diameter larger by 0.06 mm).
- 3.10. When oiling the shock absorber (Fig. 4), special care should be taken that the lubricating felt in the brake cylinder is soaked with teleprinter oil K or I.
- 3.11. With the commutator motor running, check the motor speed by means of a 125-cps tuning fork. Watch the stroboscopic pattern on the governor cover through the vibrating shutter of the 125-cps tuning fork with the motor running and the run-out key held depressed. If the speed is correct the stroboscopic marks appear to be stationary. If the speed is too high, the stroboscopic marks appear to wander away in the sense of the motor rotation. If it is too low they will wander in the opposite direction.

Adjustment for correct motor speed is made by turning the screw accessible through a bore in the periphery of the governor cover.

Speed too high:      Turn setting screw counter-clockwise.  
Speed too low:        Turn setting screw clockwise.

#### 4. GENERAL OVERHAUL

- 4.1. Remove all mechanical and electrical components and assemblies.  
With a view to saving time during general overhaul operations large maintenance shops are advised to procure a special washing device which eliminates the need for a complete disassembly of the machine. However, electrical components, such as magnet coils, motor etc., sleeves and all other rubber parts as well as the ball bearings must be removed previously. Please write for address of suppliers of washing devices and suitable cleaning agents.
- 4.2. Clean mechanical components with benzine with 5 per cent oil added. Check for wear and tear and replace the parts if necessary. Oil or spray the dry parts with teleprinter oil K or I.
- 4.3. Clean contact spring sets with chemically pure gasoline.
- 4.4. Always apply a film of oil repellent to the parts marked by a red dot. For more detailed information see para. 5.
- 4.5. Clean ball bearings with benzine and fill them with teleprinter grease up to one third of their diameter.  
Note:  
Only oil the ball bearings of the type basket carriage (with teleprinter oil K or I).
- 4.6. Replace the motor ball bearings.
- 4.7. Replace the spherical bushing of the gliding ball bearings. Take care that the bushing is embedded in teleprinter grease.
- 4.8. Grease the suspension points of tension springs as well as points of contact of pressure and torsion springs with Shell "Retinax G" grease.
- 4.9. Grease the friction surfaces marked in Figs. 15 and 16 with Shell "Retinax G" grease.
- 4.10. Unless heavy wear and tear justify replacement, lubricating felts should be washed with benzine, then dried and soaked with teleprinter oil K or I.
- 4.11. Assemble machine and observe the applicable adjustment instructions.
- 4.12. Perform routine maintenance operations as described in paras. 3.2. to 3.7. and 3.9. to 3.11.

**Do not switch on the machine before overhaul has been completed.**

#### 5. APPLYING A FILM OF OIL REPELLENT

Parts the smooth operation of which is likely to be affected by the tendency of oil to spread over surfaces, are to be treated with an oil repellent. These parts are marked in our works with a red dot.

The oil repellent is made up of

5 per cent stearic acid and  
95 per cent toluene.

Caution: The solvent is highly inflammable.

Owing to its high inflammability oil repellent is not supplied by our works. It can be obtained from appropriate shops (pharmacies, chemical dealers).

Application of a new film of oil repellent will become necessary as soon as proper functioning of the parts, such as contacts or selector magnet, is impaired by splash oil or by contamination or after these parts have been cleaned with a solvent.



### Application

Clean the parts from oil and dust, using benzine. Do not use carbon tetrachloride.

Pour the oil repellent into a glass or porcelain container and heat it up to 30 to 40° C in a water bath.

Dip the parts into this solvent and remove excess fluid with a cloth.

Dry the parts immediately with a clean woollen cloth or in pre-heated resinfree wooden chips (beech wood chips). Do not dry them in the air. Clean the contacts with a fuzzfree paper strip (e.g. perforator tape), pulling the tape through between the contacts.

Refill the fluid into the bottle and shut with a tight-fitting plug.

The colorless oil repellent forms a very thin film which sticks fast to clean metallic surfaces.

## 6. ACCESSORIES

### 6.1. The following material is supplied along with teleprinter in a polyethylene bag:

Cons. No.	Qty.	Nomenclature	Order No. TFs
1	1	Dust cloth	70-04138
2	1	Dust brush	70-04283
3	1	Type cleaner	70-05094

### 6.2. In place of the polyethylene bag an aluminium accessories box can be supplied on request:

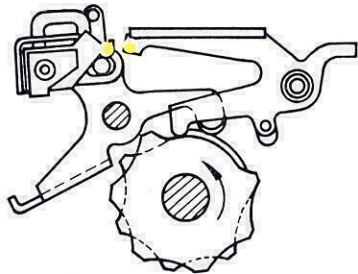
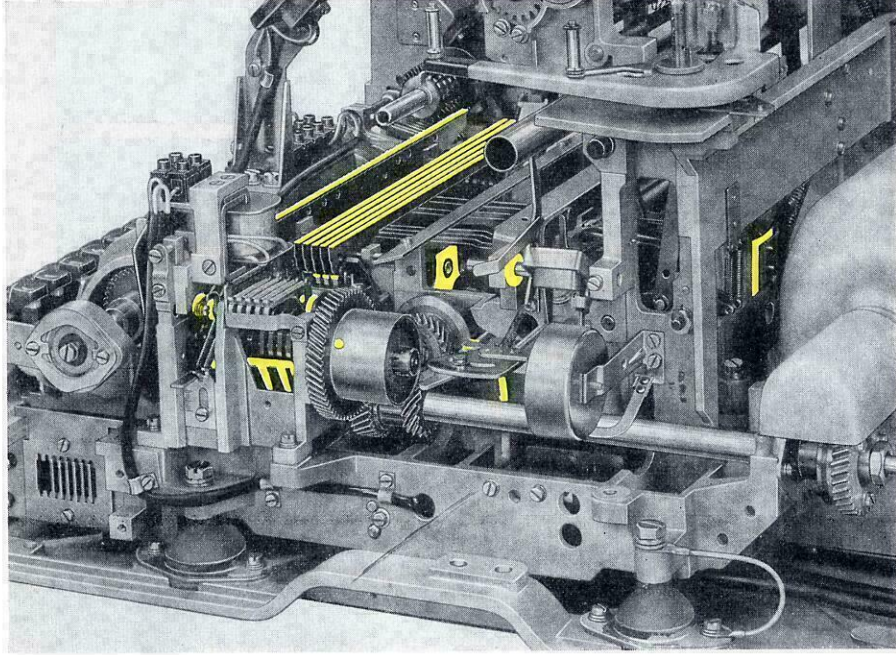
Cons. No.	Qty.	Nomenclature	Order No. TFs
1	1	Novodur oil squirter with teleprinter oil K	70-17796
2	1	Tube containing Shell "Retinax G" grease	70-17794
3	1	Dust cloth	70-04138
4	1	Dust brush	70-04283
5	1	Type cleaner	70-05094
6	2	Motor break carbon brush	27-99017
7	2	Governor carbon brush	70-02721
8	2	Governor contact	70-06021
9	3	Plug-in foot	72-23107
10	1	Ink ribbon (Perlon, with selvage)	00-08894

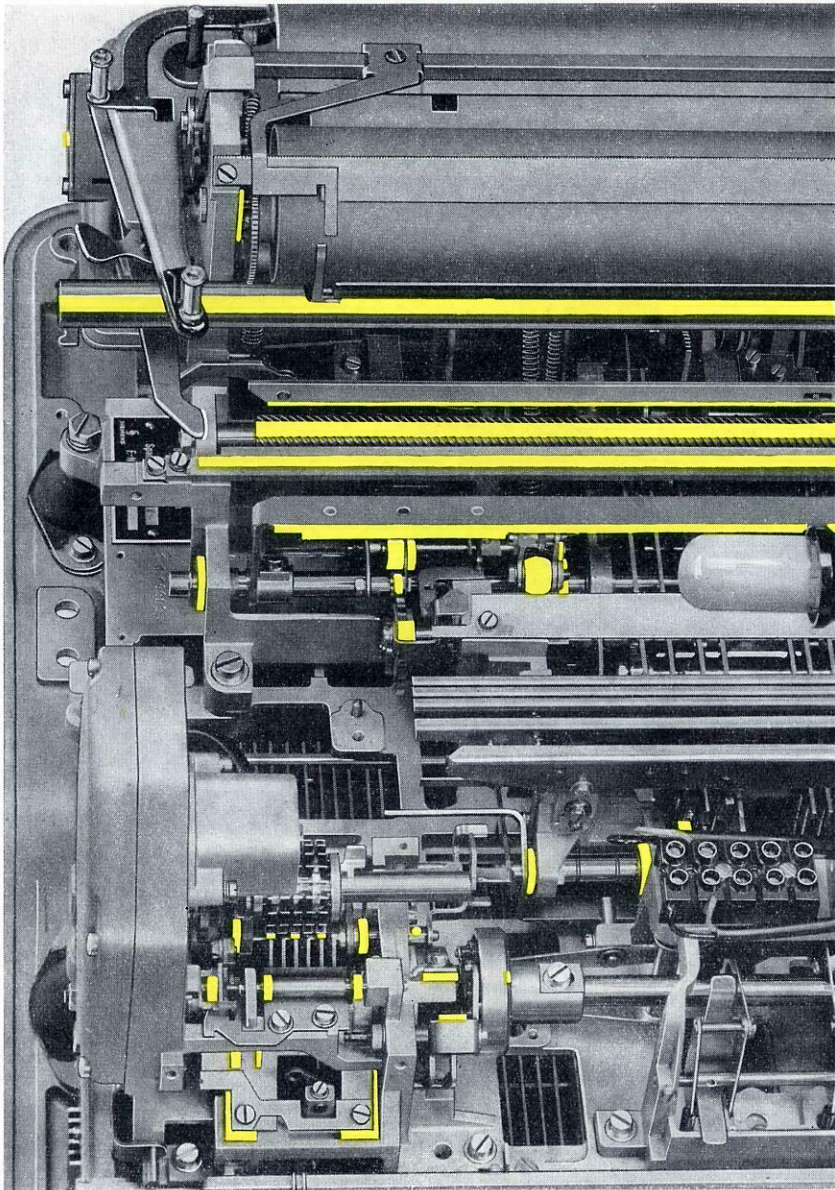
### 6.3. Supplied along with the reperforator attachment:

1	1	Chad remover	72-63196
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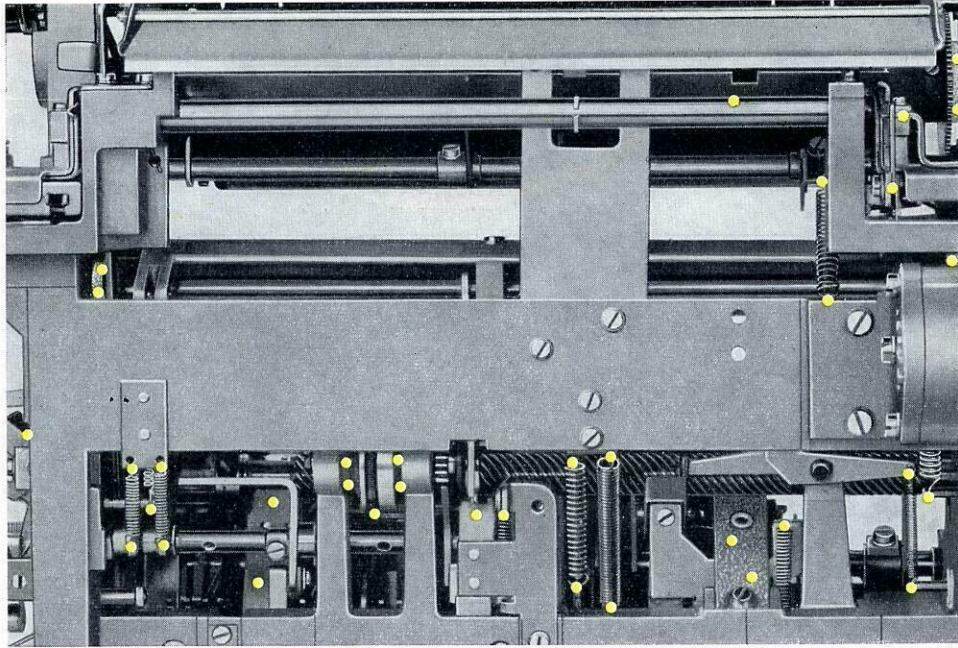
## 7. INFORMATION CONCERNING THE FIGURES

Figs. 1 to 16	cover the basic version of the teleprinter 100
Figs. 17, 18	cover the two-color printing device
Figs. 19 to 21	cover the reperforator attachment
Figs. 22, 23	cover the tapetransmitter attachment
Fig. 24	covers the mechanical remote control switch

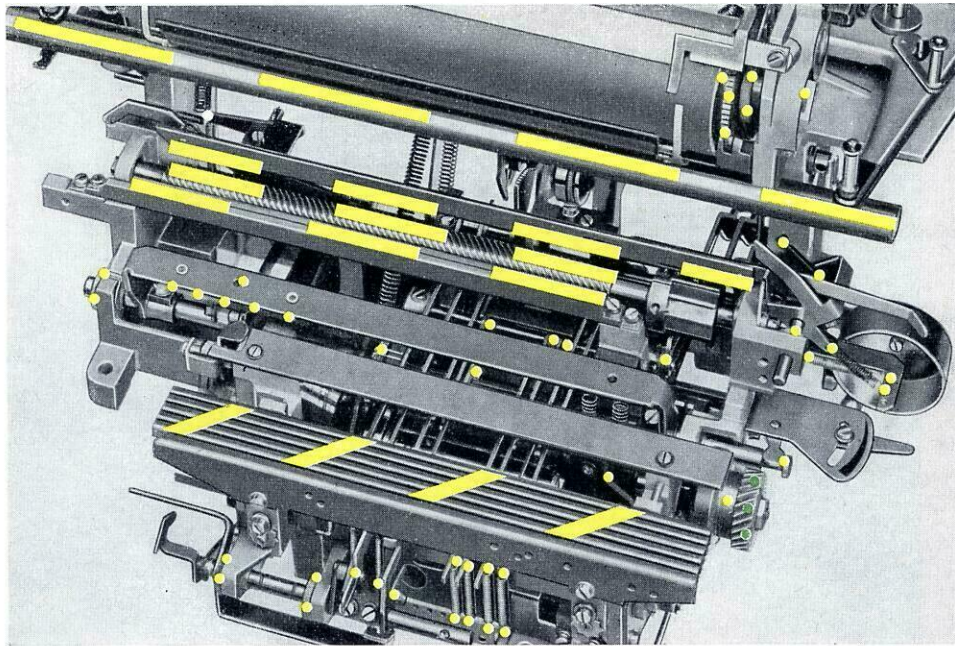




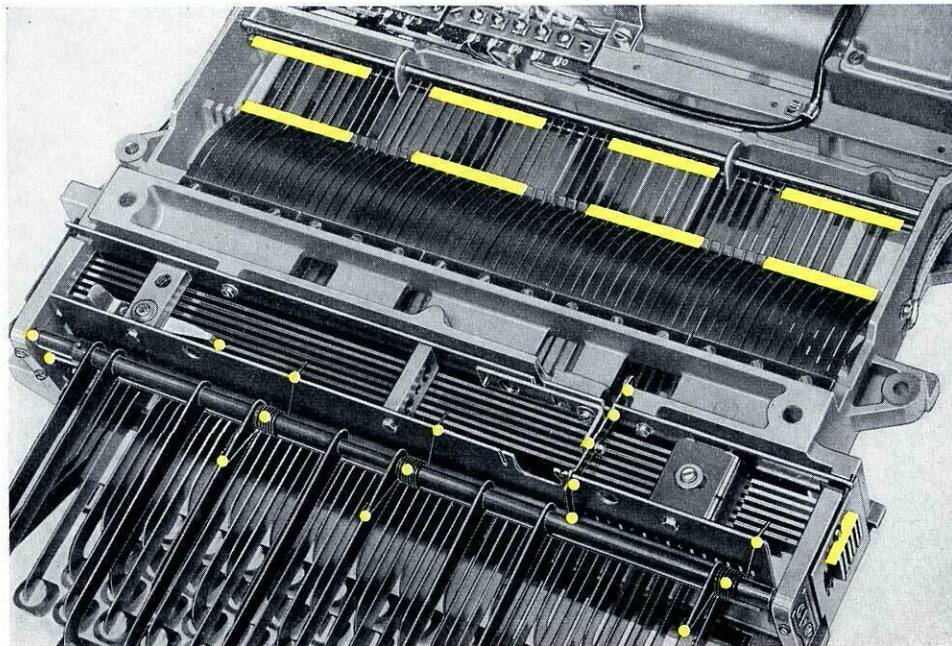




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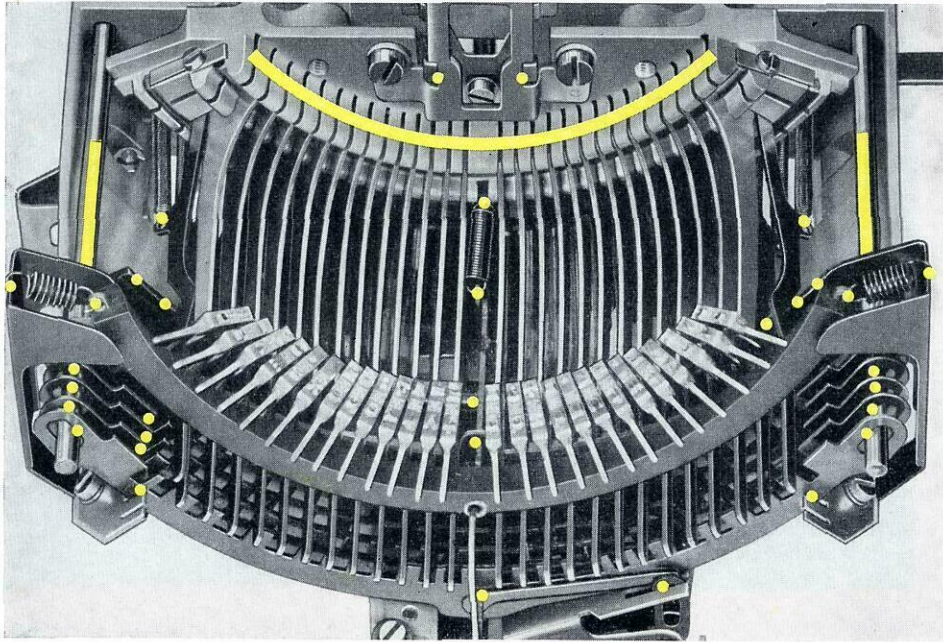


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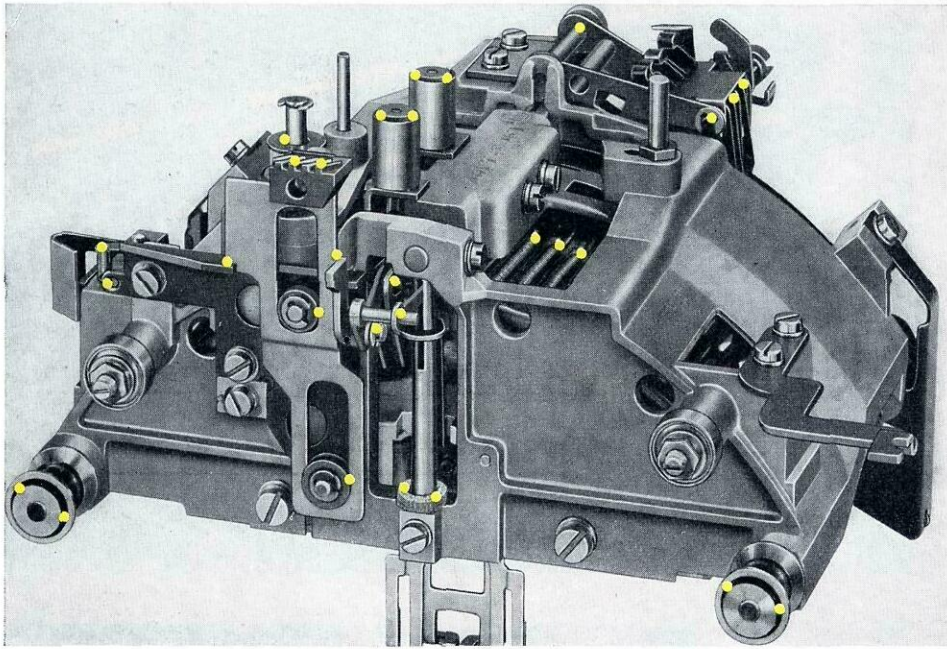


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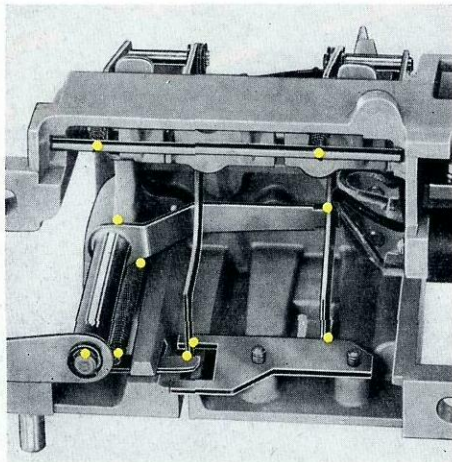




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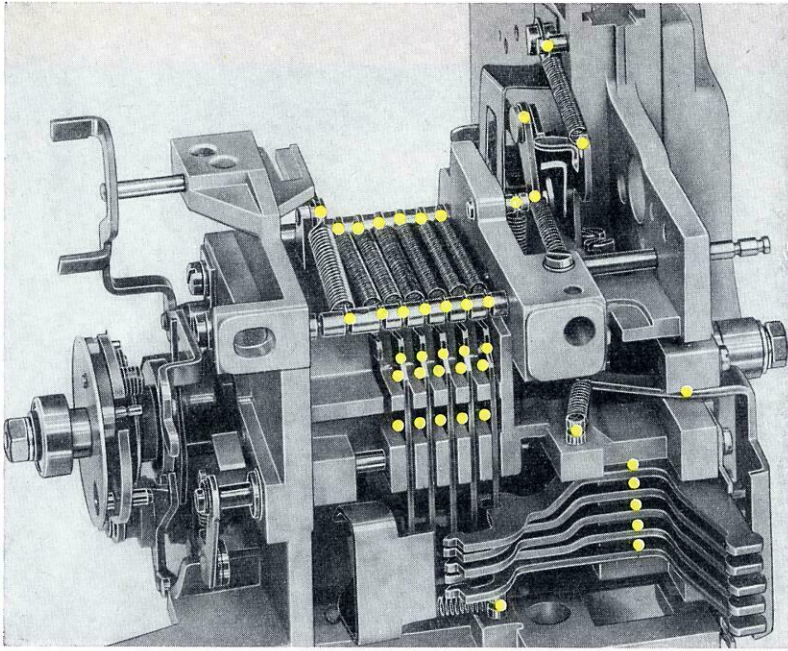


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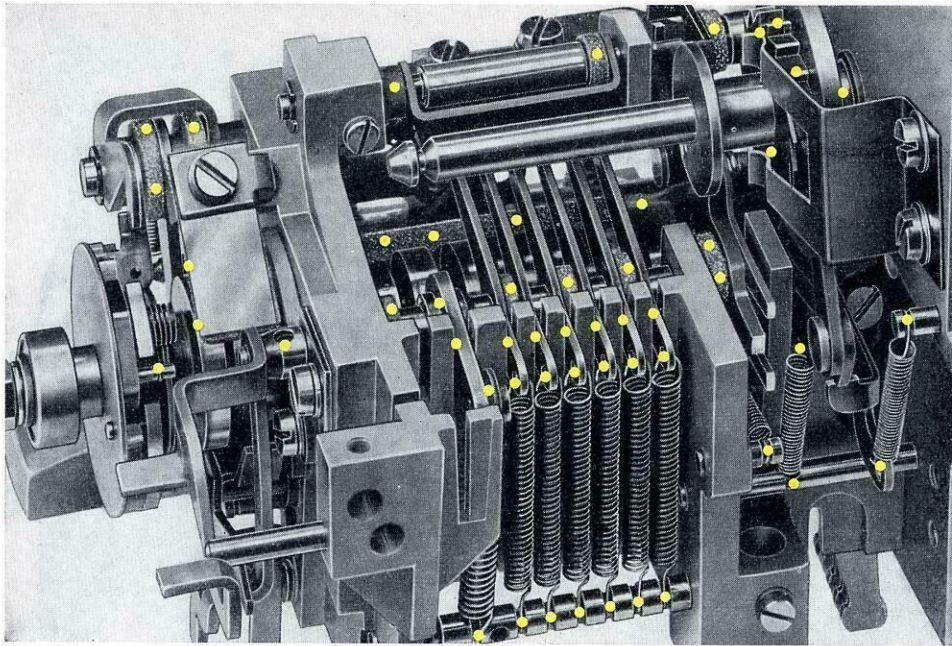


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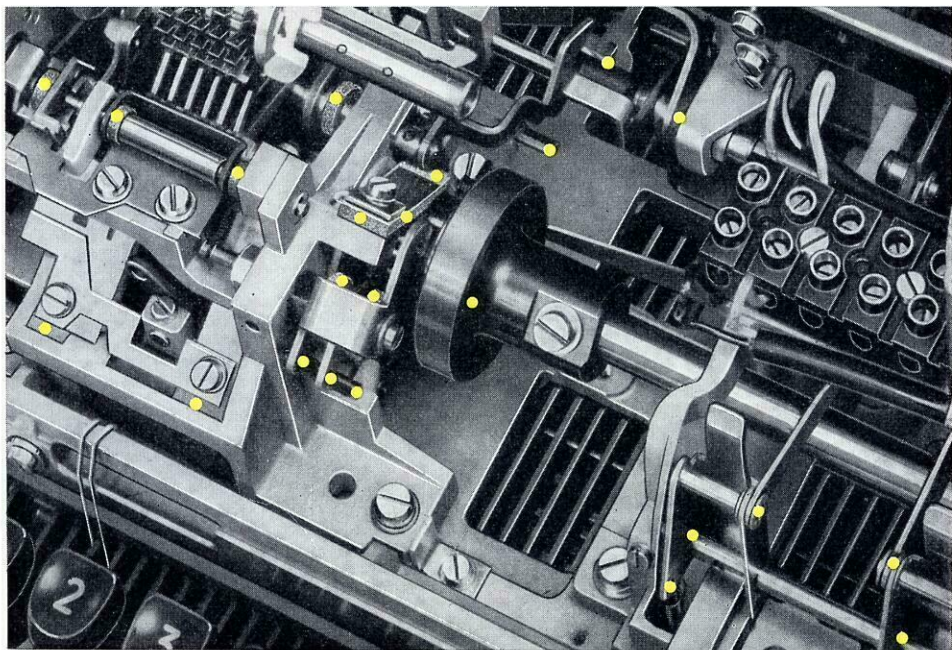




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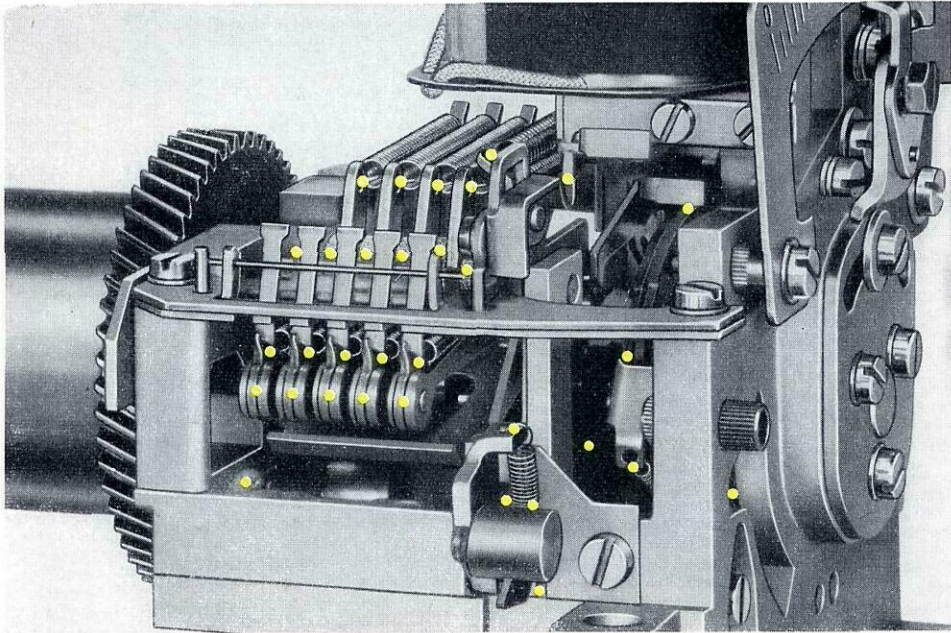


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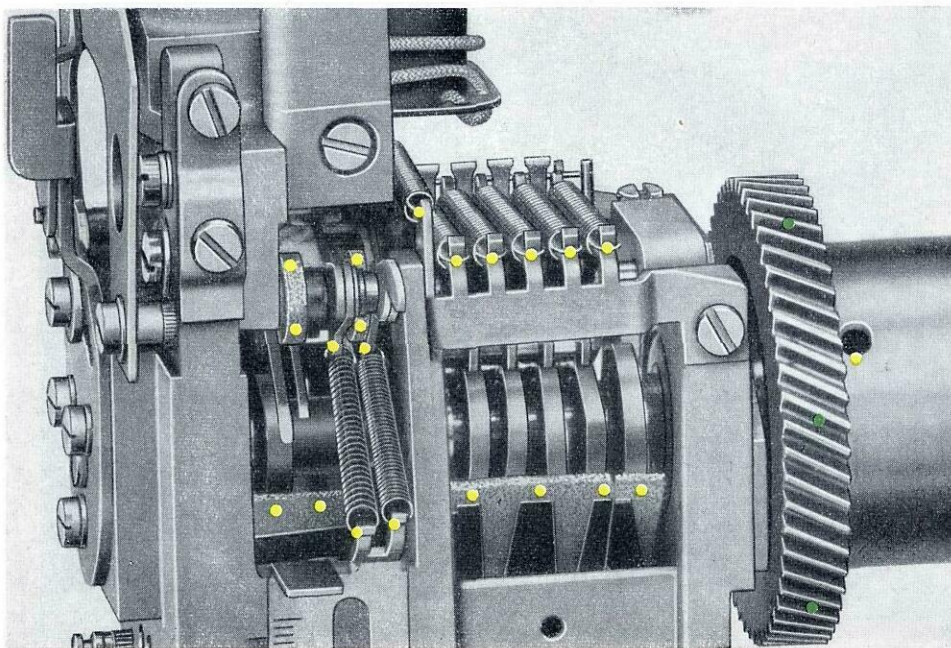


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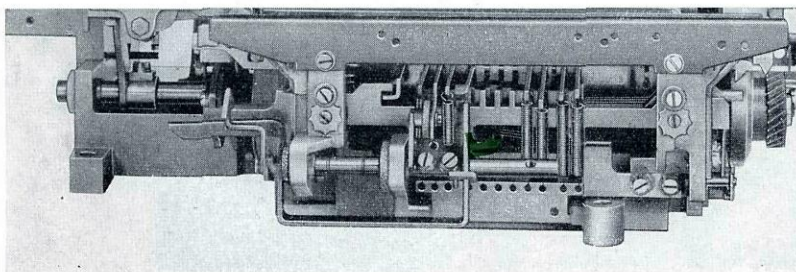




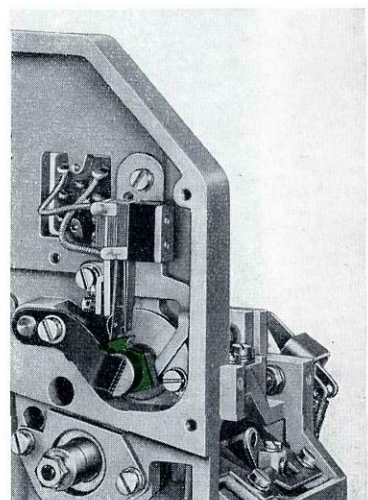
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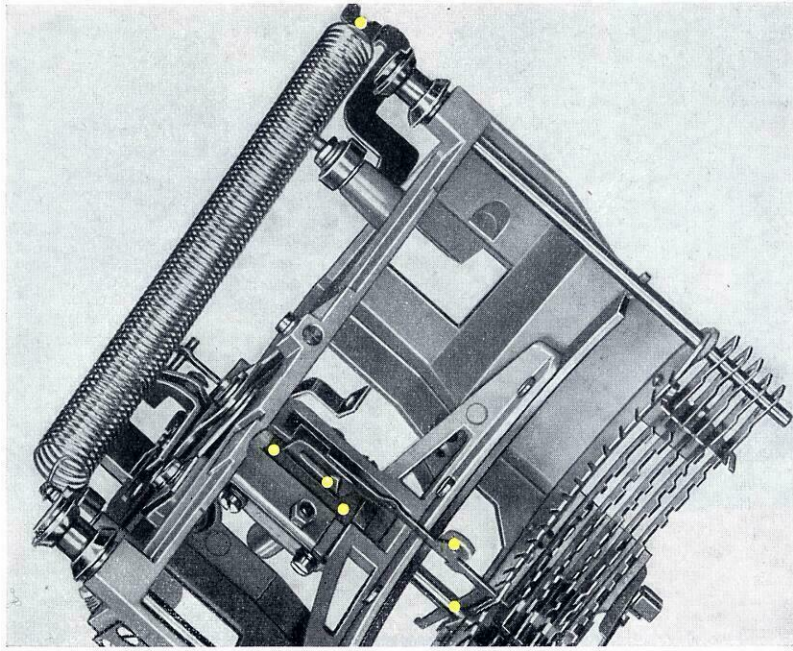


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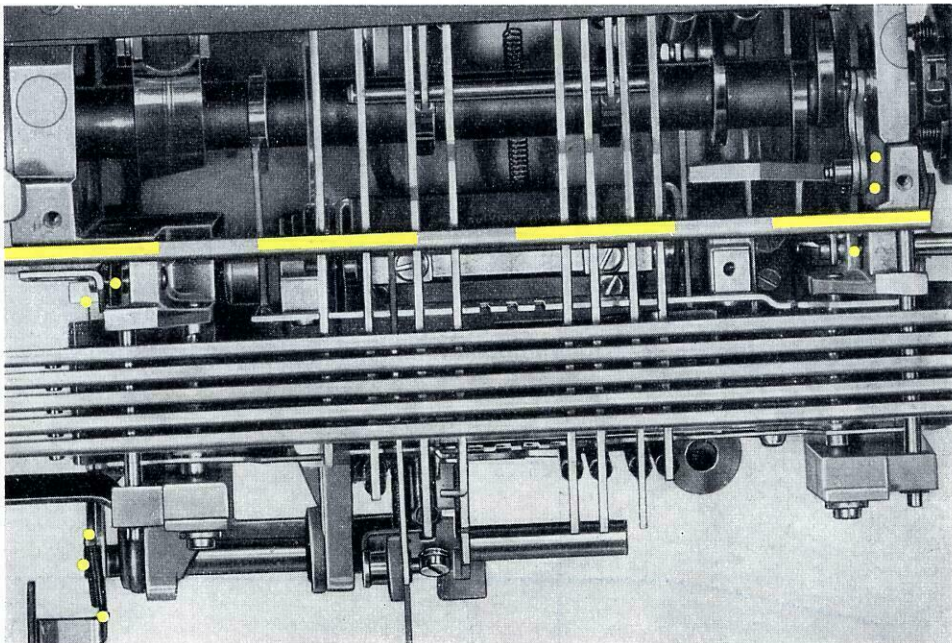


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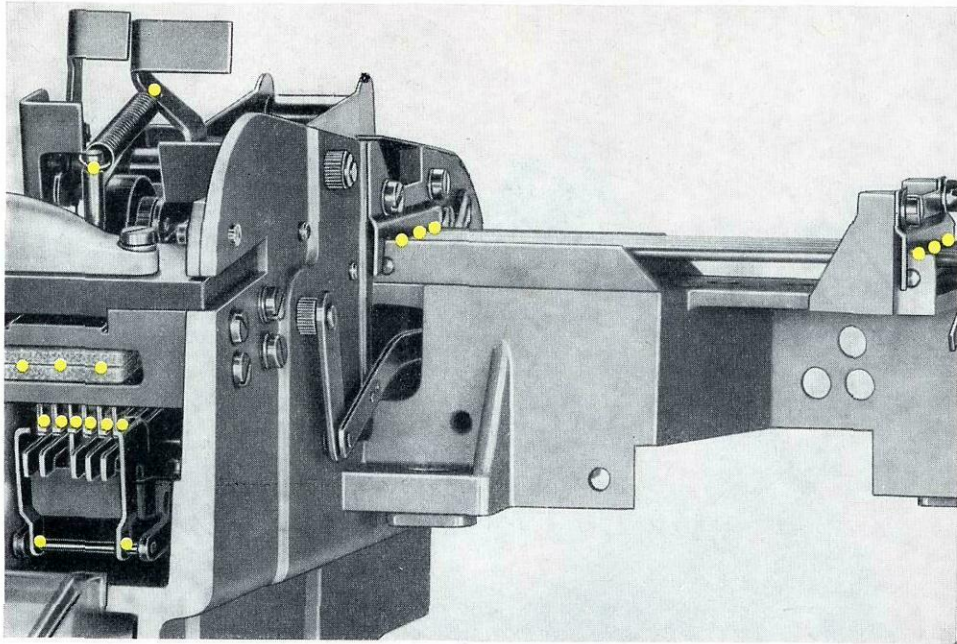


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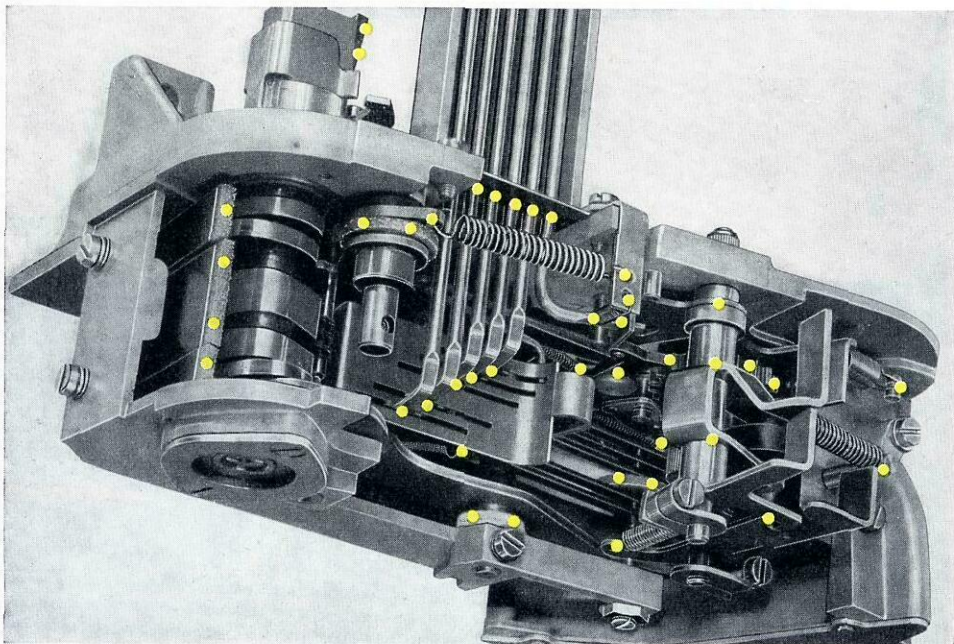


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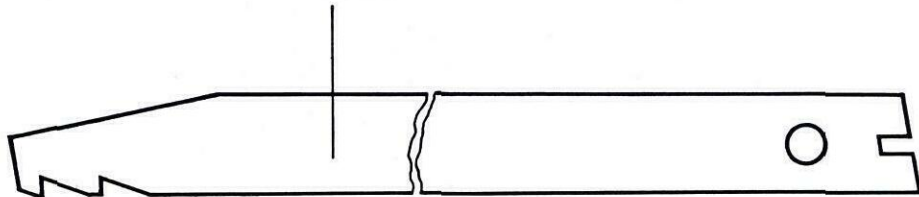


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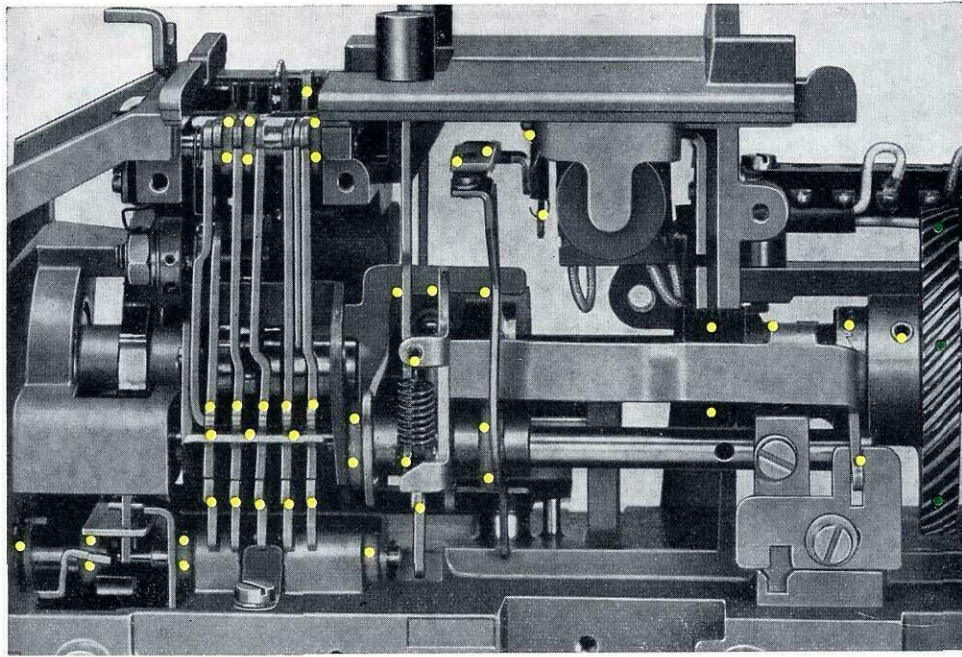
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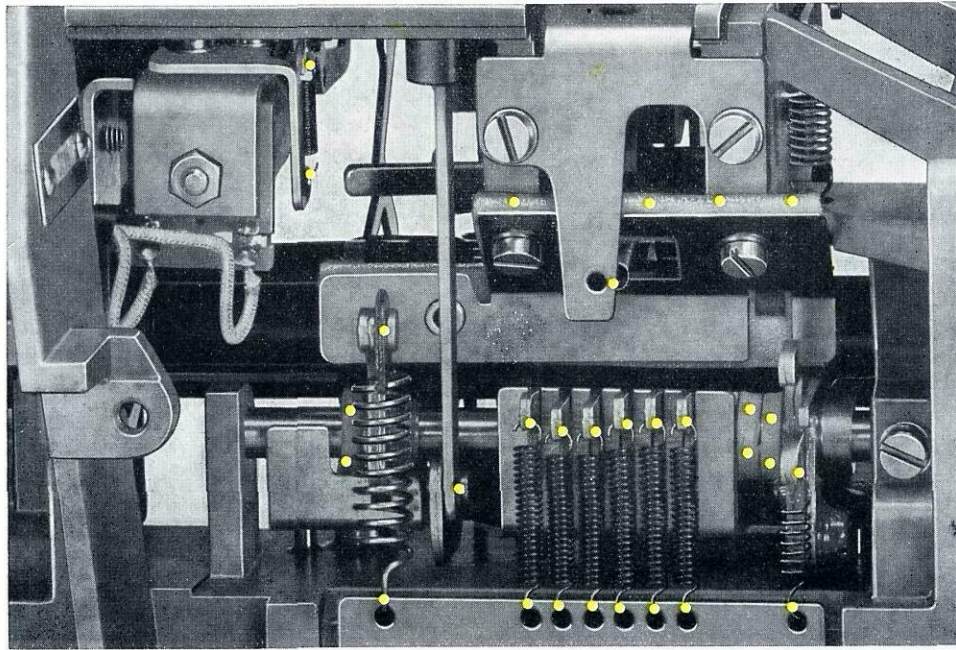


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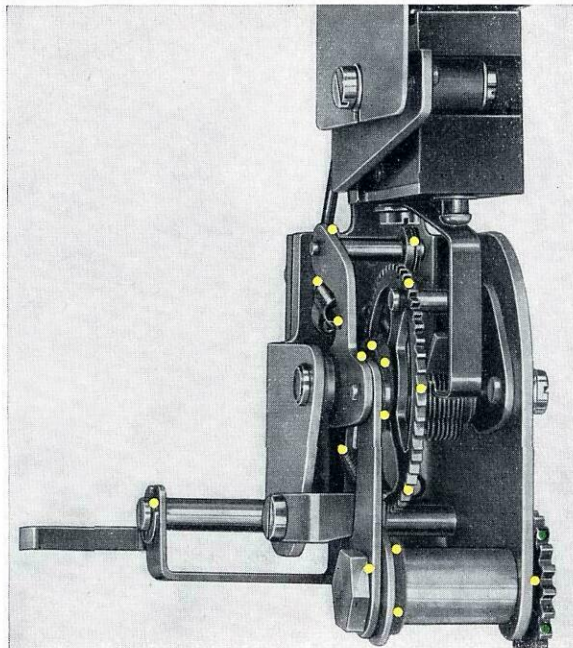




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PARTS LISTS

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1. General . . . . .	3
2. Parts list arranged according to consecutive numbers . . . . .	3
3. Parts list arranged according to order numbers . . . . .	23

**1. GENERAL**

The consecutive numbers given in the text and illustrations of this service manual are not order numbers.

The parts lists which follow contain a selection of parts of the basic version of the Teleprinter 100 and of the attachments and special versions dealt with in this manual. When ordering parts please refer to parts list Es T App 100 BY or to the order numbers specified in the parts lists.

An order number followed by an asterisk (\*) indicates that supplementary data are required when ordering this part, such as engraved designation, lettering, type of character desired in the case of type bars, motor voltage in the case of motors, factory serial number, etc.

**2. PARTS LIST ARRANGED ACCORDING TO CONSECUTIVE NUMBERS**

	Order Number	Nomenclature	Index No./Fig. No.
1	T Fs 70-04405	Telegraph plug	II/1
2	C42334-F3-C10	Power plug	II/1
3	T Fs 16-98970	Paper roll axle	II/3
4	T Fs 72-53354	Lever	II/4, 42, 153
5	T Fs 16-99245	Paper roll carrier	II/3 III/1
6	T Fs 16-98974	Lever	II/3
7	T Fs 72-50180	Platen	II/3, 4, 46, 47, 48, 150, 152, 153, 156, 191, 192, 193
8	T Fs 72-50106	Rotary knob	II/4, 42 IX/1, 10
9	T Fs 72-53355	Lever	II/4, 42, 153
10	T Fs 72-54270	Lever	II/4, 152, 153
11	T Fs 72-53357	Tear-off plate	II/4, 47, 152, 153 IX/2, 20
12	T Fs 16-98971	Glass plate	II/3
13	T Fs 00-09151	Fillister head screw M 3x6	II/4, 13, 17, 23, 26, 31, 34, 35, 37, 39, 41, 42, 46, 50, 51, 52, 56, 59, 60, 62, 63, 68, 72, 88, 96, 149, 150, 151, 156, 162, 221, 224 V/6, 9, 13 VIII/4, 6 IX/1, 4, 10, 15, 16, 21, 32, 33 X/4
14	T Fs 72-33143	Plate	II/13
16	T Fs 72-50095	Parallel guide	II/4, 49, 70, 174, 175, 216 IX/8 XI/2
17	T Fs 72-53400	Cam shaft	II/51, 59, 136, 137, 145, 146, 159, 167, 168, 169, 170, 171, 172, 173 VI/4, 20
18	T Fs 72-53335	Feed screw	II/50, 205, 206, 207 IX/14
19	T Fs 72-50079	Anti-bounce pawl	II/64, 136, 159, 169, 187
20	T Fs 72-50096	Sleeve with ratchet	II/50, 137, 165, 166, 167, 205 IX/5, 12 XI/3
21	T Fs 72-33144	Covering plate	II/13
22	T Fs 72-50145	Ink ribbon lifter	V/16, 17
23	T Fs 72-50070	Carriage feed lever	II/61, 137, 167, 168
24	T Fs 00-09150 Ms	Fillister head screw M 3x5	II/13, 220
25	T Fs 72-53459	Eccentric pin	II/57, 137
26	T Fs 72-50098	Detent	II/57, 137, 165, 205 IX/12 XI/3
27	T Fs 72-50224	Eccentric	II/63, 138





Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
28	T Fs 31-98979	Contact governor	II/13, 220
29	T Fs 31-98971	Cover	II/13, 220
30	T Fs 72-10047	Key lever set	II/14, 16
32	T Fs 72-43108	Scale	II/7, 35, 39, 135 XI/6
33	T Fs 72-43062	Adjusting plate	II/7, 126, 127, 128 XI/4
34	T Fs 00-09155	Fillister head screw M 3x10	II/7, 17, 18, 24, 25, 28, 39, 77, 88, 119, 135, 214 V/6 VI/4, 5, 20 VII/5 IX/11, 31 XI/6
35	T Fs 00-09153	Fillister head screw M 3x8	II/13, 14, 15, 16, 18, 19, 22, 36, 37, 43, 44, 45, 46, 50, 51, 54, 55, 56, 57, 59, 60, 62, 63, 64, 68, 69, 73, 74, 75, 76, 78, 79, 83, 85, 86, 87, 93, 115, 138, 143, 152, 155, 157, 160, 205, 212, 213, 228 V/5, 7, 16 VI/4, 8, 9, 14, 17, 18 VII/6, 7, 8, 9, 10, 11, 12, 13, 14, 42, 46, 48, 50, 52 VIII/1 IX/2, 4, 5, 12, 17, 28 XI/1
36	T Fs 72-50197	Lever	II/6, 46, 48, 191, 192 IX/3
37	T Fs 72-50196	Pull bar	II/6, 48, 57, 191
38	T Fs 72-53141	Code bar	II/63, 138, 213 VI/4, 20, 21
39	T Fs 72-53146	Locking bar	II/63, 138, 178
40	T Fs 72-30000*	Mounting base	II/12, 13 VII/4, 5
41	T Fs 72-33065	Bottom plate	II/12, 13 III/2 VII/4
42	T Fs 72-10000-20000*	Keyboard	II/12, 13, 222
43	T Fs 72-07051	Motor with casing 240 v AC (40—60 cps)	II/12, 13, 229 XI/1
	T Fs 72-07061	Motor with casing 220 v AC (50 cps)/110 v DC	—
	T Fs 72-07062	Motor with casing 115 v AC (60 cps)	—
	T Fs 72-07065	Motor with casing 220 v AC (40—60 cps)	—
	T Fs 72-07073	Motor with casing 220 v DC	—
44	T Fs 72-00001	Special function key assembly	II/12, 13, 222, 225
45	T Fs 20000-10000	Transmitter	II/12, 20, 222, 224
46	T Fs 40000-10000	Receiver	II/12, 33, 40, 222
47	T Fs 72-50001*	Printer (without type basket carriage)	II/12, 33, 40, 222
48	T Fs 72-50120	Type basket carriage	II/2, 4, 12, 71, 215
49	T Fs 27-00009	Motor 220vAC (40—60 cps)	II/13, 220
	T Fs 27-00027	Motor 220 v AC	—

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		(60 cps) 110 v DC	—
	T Fs 27-00028	Motor 115 v AC (60 cps)	—
	T Fs 27-00029	Motor 220 v DC	—
	T Fs 27-00042	Motor 240 v AC (40—60 cps)	—
50	T Fs 72-30008	Shock mount	II/13
51	T Fs 00-08154 Sz	Hexagon screw M 6x20	II/13 III/2
52	T Fs 16-98960	Clamping piece	III/4
53	T Fs 72-53862	Bushing	II/63, 138
54	T Fs 27-00008	Lower half of motor casing	II/13, 220, 229
55	T Fs 27-00006	Bearing cap	II/13
56	T Fs 00-09200	Fillister head screw M 4x12	II/13, 17, 20, 224 V/6 VI/5, 6 VII/1
57	T Fs 72-10053	Key lever with tube	II/14, 16
59	T Fs 27-00007	Cover	II/13
60	T Fs 00-09490	Recessed neck screw M 4x22	II/13
61	T Fs 72-03052	Helical gear (50 bauds)	II/13, 220, 229
62	T Fs 72-03062	Gear (50 bauds)	II/229
63	T Fs 72-33028	Pivot	II/222
64	T Fs 72-03019	Lever	II/225
65	T Fs 72-03018	Plate	II/225
66	T Fs 72-08002	Cable	II/13
67	T Fs 72-03036	Terminal strip	II/13
68	T Fs 72-20007	Lever with bushing	II/25, 92, 103
69	T Fs 72-13116	Bolt	II/14, 16, 19
70	T Fs 72-23023	Lever	II/21, 27, 94, 98, 99, 109, 223
71	T Fs 72-13100	Code bars, 1st to 5th signal element	II/14, 15, 20, 82, 83, 84, 91
72	T Fs 72-33086	Bracket	II/20, 222, 224
73	T Fs 72-03024	Bail	II/225, 226
74	T Fs 72-23109	Clutch drum	II/20 VII/4
75	T Fs 00-09199	Fillister head screw M 4x10	II/17, 20, 73 V/6 VII/5
76	T Fs 72-00027	Plug connector	II/20
77	T Fs 72-23107	Plug-in foot	II/32
78	T Fs 00-08307	Ball bearing EL 4 zz	II/2, 21, 50, 65, 71, 78 IX/7
79	T Fs 72-30066	Shaft	II/20 VII/4
80	T Fs 72-00028	Lever	II/226
81	T Fs 72-00002	Operation time counter (counting mechanism)	II/228 VII/4, 42
82	T Fs 72-43027	Plate	II/35, 36
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84	T Fs 72-08005	Cable	II/33
85	T Fs 72-03079	Terminal strip	II/33 V/7, 27
88	T Fs 72-40028	Lever	II/35, 37, 134
89	T Fs 72-43107	Lever	II/37, 134
90	T Fs 72-53377	Pull bar	II/53, 67, 138, 178
91	T Fs 72-54328	Comb	II/62, 138
92	T Fs 72-50084	Release lever	II/41, 69, 159, 163, 187, 227 V/2, 9
93	T Fs 72-53153	Comb	II/62, 140

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96	T Fs 72-53776	Pin	II/2, 71
97	T Fs 72-53717	Brake lever	II/2, 71, 201, 206, 207 IX/7, 14
98	T Fs 72-50247	Shock absorber	II/2, 66, 71, 158, 201, 207 IX/14
99	T Fs 72-50028	Bail	II/2, 53, 68, 70, 71, 144, 176, 214, 215
101	T Fs 72-53622	Eccentric pin	II/2, 71, 78, 214, 215
102	T Fs 72-13108	Torsion spring	II/14, 16, 18
103	T Fs 00-09150	Fillister head screw M 3x5	II/15, 32, 37, 77, 100 III/7 VI/44 VII/23, 48 VIII/3, 6
104	T Fs 72-50198	Roller	II/2, 71, 79
105	T Fs 72-53449	Supporting rail	II/2, 56, 71, 214, 215
106	T Fs 72-50122	Pressure roller	II/2, 71
107	T Fs 72-50090	Printer bail	II/2, 33, 50, 71, 173, 214, 215
108	T Fs 72-50119	Guide pin	II/2, 71, 74
109	T Fs 72-53139	Guide bar	II/2, 62, 63, 71, 138, 212 V/2, 3
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111	T Fs 72-53161	Transfer bar	II/2, 33, 62, 71, 213, 227 IX/3
112	T Fs 72-53938	Spring suspension plate	II/2, 71
113	T Fs 72-53431	Rail	V/2
114	T Fs 72-53815	Pin	II/2, 216 IX/6, 13
115	T Fs 72-53222	Plate	II/141
117	T Fs 27-99014	Brush holder ring	II/13, 220
118	T Fs 72-54557	Comb	II/51, 142
119	T Fs 72-53385	Comb	II/56, 142
120	T Fs 72-53343	Guide comb	II/61, 143
121	T Fs 72-10021	Stop bar	II/80, 89
122	T Fs 72-13086	Frame	II/15, 80, 81, 82
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124	T Fs 72-10005	Guide comb	II/18, 81, 82, 83
128	T Fs 72-53976	Stop	II/91, 157
129	T Fs 72-13020	Spacer	II/82, 91
130	T Fs 72-13110	Bracket	II/14, 15, 83, 84, 86
131	T Fs 72-10046	Detent	II/14, 85, 86, 90
132	T Fs 72-10037	Bracket	II/18, 88
133	T Fs 72-13088	Start bail	II/19, 87
134	T Fs 72-13028	Guide plate	II/17, 87, 88
135	T Fs 72-10007	Release lever	II/17, 18, 87, 88
137	T Fs 72-23051	Guide comb	II/93
138	T Fs 72-23020	Guide comb	II/94
139	T Fs 72-20025	Clutch member	II/21, 23, 25, 29, 95, 99
140	T Fs 72-23013	Cam shaft	II/24, 25, 96, 98, 99, 100, 104, 105, 110, 111
141	T Fs 72-20045	Lever	II/23, 96, 97, 98, 108, 109, 227
142	T Fs 72-20103	Lever with shaft	II/23, 96, 101, 226, 227 V/11
143	T Fs 72-20042	Control disc	II/31, 32, 97, 107, 108, 227
144	T Fs 72-20044	Ratchet	II/31, 32, 97, 107, 108
145	T Fs 00-09108	Fillister head screw M 2.3x4	II/73, 112, 123, 157 VII/6, 37
146	T Fs 72-20006	Feed lever	II/26, 31, 32, 97, 107, 108
147	T Fs 72-23252	Resetting lever	II/27, 98, 109
148	T Fs 72-20105	Locking bail	II/27, 98, 99, 109, 223

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150	T Fs 72-20104	Locking lever	II/23, 27, 29, 101, 110, 111, 225
151	T Fs 72-20054	Leer with release pawl	II/23, 29, 101, 110
152	T Fs 70-06415	Washer	II/14, 15
153	T Fs 72-20004	Lever	II/26, 30, 32, 93, 100, 102
154	T Fs 72-23225	Tension spring	II/24, 25, 26, 102, 111
155	T Fs 72-20003	Zero-setting lever	II/26, 104
156	T Fs 72-20063	Tension spring	II/25, 26, 104
157	T Fs 72-23038	Code lever	II/26, 93, 105
158	T Fs 72-23194	Tension spring	II/23, 25, 26, 31, 105, 108
159	T Fs 72-23049	Bail	II/25, 30, 106
160	T Fs 72-23112	Tension spring	II/24, 106 VI/43
161	T Fs 72-23214	Tension spring	II/25, 26, 31, 107
162	T Fs 72-10009*	Key lever	II/15, 89
163	T Fs 72-53785	Tension spring	II/27, 109, 177
165	T Fs 72-23191	Tension spring	II/23, 27, 29, 110 VI/11, 14, 15, 37
166	T Fs 72-13107	Key lever	II/14, 15, 89
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170	T Fs 72-20019	Contact switching assembly	II/22, 100, 112, 115
171	T Fs 72-43023	Release lever	II/38, 116, 124, 130, 131
172	T Fs 72-43003	Cam shaft	II/36, 116, 119, 120, 121, 123, 125, 129, 130, 131, 132, 133, 134
173	T Fs 72-40005	Locking lever	II/38, 39, 116, 124, 130, 131
174	T Fs 72-43050	Guide plate	II/37, 117
175	T Fs 72-43069	Bushing	II/118
176	T Fs 72-43087	Comb	II/118
177	T Fs 72-40025	Stop plate with pin	II/37, 118, 132
180	T Fs 72-40008	Selector armature	II/34, 38, 119, 120, 121, 122, 128 XI/2, 4
181	T Fs 72-40020	Magnet with residual plate	II/35, 38, 119
183	T Fs 72-43028	Axle	II/34, 119
184	T Fs 72-40007	Start-stop armature	II/34, 38, 39, 123, 124, 127, 131 VIII/1
185	T Fs 72-43033	Lever	II/34, 119, 123, 124
186	T Fs 72-40006	Lever with bushing	II/38, 123, 129
187	T Fs 72-40001	Mounting frame with bushings	II/126
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193	T Fs 72-43132	Tension spring	II/69, 187
194	T Fs 72-43060	Tension spring	II/34, 36, 56, 133, 180
195	T Fs 72-43191	Tension spring	II/37, 134
196	T Fs 72-50071	Bar with lever	II/60, 61, 143
197	T Fs 72-53380	Axle	II/60, 143
198	T Fs 72-53382	Lever comb	II/60, 143, 179, 180, 181, 182, 183, 184
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202	T Fs 72-53704	Pinion with eccentric	II/53, 144, 145, 146
203	T Fs 72-53375	Pull bar	II/53, 67, 145, 146, 178, 179, 181
204	T Fs 72-53376	Pull bar	II/53, 67, 145, 146, 178, 179, 181
205	T Fs 72-50081	Bail	II/64, 65, 145, 146, 171
206	T Fs 72-50212	Lever	II/41, 65, 147, 186, 227 V/9, 24, 25
207	T Fs 72-53374	Pull bar	II/56, 147, 178, 180, 227 V/24
209	T Fs 72-53835	Bail	II/41, 148, 185, 227 V/9 VI/22, 23, 24
210	T Fs 72-53152	Bracket	II/148, 185
211	T Fs 72-50035	Lever	II/60, 149, 183, 189
212	T Fs 72-53224	Bracket	II/149
213	T Fs 43-60001	Bell dome	II/68, 149
214	T Fs 72-50055	Lever	II/49, 149, 188
215	T Fs 72-50052	Switching axle	II/42, 47, 150 IX/1, 10, 15
216	T Fs 72-53284	Axle	II/42, 150 IX/1, 10, 15
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220	T Fs 72-50046	Pressure roller	II/152, 153
221	T Fs 72-50239	Guide plate, compl.	II/150, 153
223	T Fs 72-50260	Line feed pawl with pin	II/48, 154, 191, 192 IX/22
224	T Fs 00-09157	Fillister head screw M 3x12	II/13, 35, 56, 60, 76, 119, 154, 215, 220, 225 V/7, 17 VI/9, 19 VII/6, 10, 46 XI/1
225	T Fs 72-53251	Pull bar	II/55, 56, 57, 178, 179, 182
226	T Fs 72-50187	Reversing bar	II/155, 156
227	T Fs 72-50181	Spool carrier	II/5, 43, 155, 156, 157, 195, 196, 197, 198, 202 IX/4, 17
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229	T Fs 72-50219	Reversing bar	II/155
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231	T Fs 72-10008	Key lever	II/15, 89
232	T Fs 72-50210	Detent	II/155, 157, 197, 198
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236	T Fs 72-54515	Spring	II/187
237	T Fs 72-50397	Clutch half	II/159, 187
238	T Fs 72-53694	Star wheel	II/159, 163, 187
239	T Fs 72-53503	Tension spring	II/49, 60, 189, 190
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245	T Fs 70-05990	Adjusting gage	II/100 VII/23

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248	T Fs 72-53473	Tension spring	II/64, 171
249	T Fs 72-50085	Compensating roller	II/64, 172
250	T Fs 72-53407	Tension spring	II/50, 51, 59, 64, 172, 202
251	T Fs 72-50091	Cam roller	II/49, 50, 173
252	T Fs 72-10010	Key lever	II/15, 89
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255	T Fs 72-53933	Lever	II/51, 174, 216
256	T Fs 72-43105	Tension spring	II/44, 45, 62, 178, 195, 196, 197, 203 VII/30
257	T Fs 72-53831	Tension spring	II/51, 53, 68, 176
258	T Fs 72-50105	Detent with bracket	II/68, 177
259	T Fs 72-50213	Shaft with lever	II/41, 186, 227 V/3, 8, 9, 11, 14, 25
260	T Fs 72-53370	Pull bar	II/55, 56, 178, 179, 181
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264	T Fs 72-53869	Tension spring	II/41, 186 V/9, 25
265	T Fs 72-50398	Locking pawl	II/187
266	T Fs 72-53367	Eccentric bushing	II/207 IX/14
267	T Fs 72-54372	Torsion spring	II/187
268	T Fs 72-50399	Pawl	II/187 VI/18
269	T Fs 72-54370	Torsion spring	II/187
270	T Fs 72-53218	Lever	II/49, 190
271	T Fs 72-50034	Lever	II/60, 183, 189
272	T Fs 72-53489	Tension spring	II/46, 191
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274	T Fs 00-09614	Countersunk screw M 2.3x3	II/221
275	T Fs 72-53820	Tension spring	II/46, 193
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277	T Fs 72-53977	Pawl	II/45, 157, 196 IX/4
278	T Fs 72-53760	Feed pawl	II/44, 195 IX/4
279	T Fs 72-10011	Key lever	II/15, 89
280	T Fs 72-50189	Reversing lever	II/156, 199, 203
282	T Fs 72-50200	Tensioning lever	II/200
283	T Fs 72-53805	Torsion spring	II/200
284	T Fs 72-50149	Feed rack	II/76, 205, 206, 207, 215 IX/12, 14, 28
285	T Fs 72-50218	Guide	II/76, 206, 217 IX/28
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292	T Fs 72-50121	Type basket	II/72, 77, 78, 209, 211, 217
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299	T Fs 72-53521	Code segment	II/75, 79, 212, 214
300	T Fs 72-53522	Code segment	II/75, 79, 212, 214
301	T Fs 72-53523	Code segment	II/75, 79, 212, 214
302	T Fs 72-53524	Code segment	II/75, 79, 212, 214
303	T Fs 72-53525	Code segment	II/75, 79, 212, 214
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306	T Fs 72-50015	Bracket	II/77, 215, 218 V/17
308	T Fs 72-53048	Type guide	II/72, 79, 215
309	T Fs 72-53517	Axle	II/74, 212
310	T Fs 72-53669	Pawl	II/217
311	T Fs 72-50217	Pull bar	II/72, 218 V/12, 16, 17
312	T Fs 72-53867	Tension spring	II/57, 73, 218
313	T Fs 72-53045	Tension spring	II/73, 219 VII/10, 12, 32, 39
314	T Fs 72-50087	Impact adjuster	II/4, 49, 69, 230 XI/2
315	T Fs 72-53494	Pusher	II/77, 215 V/16, 17
316	T Fs 70-06031	Pressure plate	II/221
317	T Fs 31-98988	Contact arm, compl.	II/221
318	T Fs 70-06021	Contact spring	II/221
319	T Fs 70-06026	Stop	II/221
320	T Fs 72-53758	Bracket	II/43, 155 IX/17
321	T Fs 72-53274	Feed ratchet	II/191, 192
322	T Fs 72-53533	Type bar segment	II/210
323	T Fs 70-02721	Governor carbon brush	II/13, 220
324	T Fs 00-09201	Fillister head screw M 4x15	II/49, 50, 53, 68, 214
325	T Fs 72-10012	Key lever	II/15
326	T Fs 70-12223	Code comb	II/8, 9, 10
327	T Fs 72-20048	Answerback drum	II/7, 8, 9, 20
329	T Fs 72-13115	Clip	II/17
330	T Fs 27-00021	Ground wire	II/13
331	T Fs 00-09111	Fillister head screw M 2.3x6	II/13, 30, 220
332	T Fs 27-00046	Stroboscopic disc	II/13
333	T Fs 72-10061	Plate with rivet	II/19, 87
334	T Fs 72-23160	Star wheel	II/21, 99, 113
335	T Fs 72-43137	Tension spring	II/34, 36, 49, 50, 132, 175
337	T Fs 72-53968	Bearing pin	II/43, 54, 58, 156 IX/4
338	T Fs 72-20034	Pawl	II/21, 113
339	T Fs 72-53935	Tension spring	II/51, 174
340	T Fs 72-53959	Tension spring	—
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343	T Fs 70-06445	Washer	II/15
344	T Fs 72-03057	Helical gear	II/228
345	T Fs 72-50073	Lever	II/62, 213
346	T Fs 72-50192	Ribbon feed linkage	II/43, 54, 58, 59, 173 IX/4
347	T Fs 00-09394	Hexagon nut, flat M 10	II/207 IX/14

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349	T Fs 00-09510	Hexagon screw M 3x6	II/31, 97
350	T Fs 27-99017	Motor carbon brush	II/13, 220
351	T Fs 31-98982	Governor spring	II/13, 221
352	T Fs 72-53183	Eccentric screw	II/66, 144
353	T Fs 72-13000/..*	Locking bar	II/14, 15, 82, 83, 85, 86, 90
356	T Fs 72-20090	Braking disc	II/22
357	T Fs 00-09425	Hexagon nut, high M 4	II/21, 24, 50, 65 VII/45 IX/7 X/4
359	T Fs 72-23201	Spacer	II/21
360	T Fs 70-53203	Washer	II/21
361	T Fs 72-23351	Washer	II/21
362	T Fs 00-08502	Retainer 2.3	II/23, 27, 29, 30, 38, 41, 62, 63, 65, 74, 76 V/1, 9 VII/11, 12 VIII/3
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364	T Fs 72-23034	Tube	II/26
365	T Fs 72-23039	Felt washer	II/25, 26 VII/11
366	T Fs 72-23035	Felt washer	II/26, 51, 72
367	T Fs 72-23029	Lever	II/27
368	T Fs 72-23030	Lever	II/27
369	T Fs 72-23031	Lever	II/27
370	T Fs 72-23032	Lever	II/27
371	T Fs 72-23033	Lever	II/27
372	T Fs 00-09110	Fillister head screw M 2.3x5	II/28, 121 V/1, 2, 12
373	T Fs 72-23028	Axle	II/27
374	T Fs 72-23024	Lever	II/21, 27, 94, 98, 99, 109, 223
375	T Fs 72-23025	Lever	II/21, 27, 94, 98, 99, 109, 223
376	T Fs 72-23026	Lever	II/21, 27, 94, 98, 99, 109, 223
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379	T Fs 72-23174	Axle	II/28
380	T Fs 72-20036	Lubricating assembly	II/25
381	T Fs 72-20050	Lubricating assembly	II/24, 28
382	T Fs 72-23114	Spacer	II/24
383	T Fs 72-23012	Supporting plate	II/24
385	T Fs 72-43029	Washer	II/34
386	T Fs 72-43056	Lubricating washer	II/37, 38
387	T Fs 00-09060	Countersunk screw M 3x8	II/36 VI/19
388	T Fs 00-09697	Ball bearing R 7	VI/19
389	T Fs 00-08535	Ball bearing EL 6	—
390	T Fs 70-05699	Lock washer	—
391	T Fs 72-40024	Guide plate with pin	II/37, 118
392	T Fs 72-43104	Axle	II/37
393	T Fs 72-43055	Lubricating washer	II/34, 37, 38
394	T Fs 72-43046	Axle	II/37, 39
395	T Fs 70-30676	Washer	II/18, 45
396	T Fs 72-40004	Adjusting disc	II/38, 39
397	T Fs 72-43025	Slack take-up spring	II/39
399	T Fs 00-08505	Retainer 5	II/41, 59 V/3, 8, 9 VI/18.
400	T Fs 72-53466	Felt washer	II/41, 55, 60, 69 VI/13, 43



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401	T Fs 72-53469	Felt washer	II/41, 49, 50 V/9 VI/18
403	T Fs 72-53921	Tension spring	II/42, 73, 208 VII/8, 11, 33, 35 IX/1, 10
404	T Fs 72-23092	Adjusting screw	VII/25
407	T Fs 00-08503	Retainer 3.2	II/25, 43, 48, 53, 54, 55, 57, 58, 67, 69, 79 III/5 VI/19 VIII/3 IX/4
408	T Fs 72-50195	Bail	II/55, 57, 160
409	T Fs 72-50054	Axle with spur gear	II/47 IX/3
410	T Fs 72-53468	Felt washer	—
411	T Fs 72-53467	Felt washer	II/46 VIII/3
413	T Fs 72-53463	Felt washer	II/46, 47
414	T Fs 72-53193	Axle	II/53, 68
418	T Fs 72-53470	Felt washer	II/51, 53, 64, 68
419	T Fs 72-53221	Axle	II/49
420	T Fs 72-53439	Axle	II/50
421	T Fs 72-53465	Felt washer	II/49 VI/17
423	T Fs 00-09195	Fillister head screw M 4x6	II/49, 50
424	T Fs 72-53408	Axle	II/49, 50, 69
426	T Fs 00-09197	Fillister head screw M 4x8	II/50, 76 III/2 IX/6, 8
427	T Fs 72-53787	Pressure piece	II/50
429	T Fs 72-53865	Axle	II/62 V/1
430	T Fs 72-53148	Axle	II/62
431	T Fs 72-50074	Lever	II/62
434	T Fs 72-53172	Plate	II/68
435	T Fs 72-53171	Roller	II/53, 67
436	T Fs 72-53513	Felt washer	II/53, 67 VI/18
437	T Fs 72-53345	Adjusting plate	II/55, 57, 160 IX/4, 16
438	T Fs 72-53344	Axle	II/55, 57, 67
440	T Fs 72-53347	Ring	II/55
441	T Fs 72-53378	Axle	—
442	T Fs 72-53226	Plate	II/60
443	T Fs 72-53216	Axle	II/60
444	T Fs 72-53217	Ring	II/60
445	T Fs 72-53346	Axle	II/60
446	T Fs 72-53464	Felt washer	II/62, 79 V/1, 2, 9
447	T Fs 72-50365	Special function axle	II/64
448	T Fs 00-09392	Hexagon nut, flat M6	II/49 III/9
450	T Fs 00-08537	Ball bearing 6200 ZZ	II/51
452	T Fs 72-53379	Axle	II/60
453	T Fs 72-53073	Axle	II/72 IX/28
454	T Fs 72-50016	Lever	II/72 IX/28
455	T Fs 72-50118	Segment with type bar	II/73, 210

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456	T Fs 72-50020*	Type bar with type (specify characters)	II/73, 219
457	T Fs 72-53429	Bracket	II/53
459	T Fs 72-13098	Tube	II/14, 16
460	T Fs 72-53526	Locking segment	II/75, 79
461	T Fs 00-08501	Retainer 1.9	II/74 III/6
462	T Fs 72-53043	Link	II/75, 79
464	T Fs 72-53945	Pressure spring	II/74
465	T Fs 72-53515	Comb	II/74
467	T Fs 72-53501	Axle	II/76 V/4, 12
468	T Fs 00-09390	Hexagon nut, flat M4	II/78, 214, 215 VI/16, 17, 18, 34
469	T Fs 72-53324	Plate	II/43, 54, 139 IX/4
470	T Fs 72-53681	Sliding block	II/76, 206
472	T Fs 52-53356	Leaf spring	II/43
474	T Fs 72-53076	Retaining plate	II/73
475	T Fs 70-05992	Type bar replacing tool	—
476	T Fs 72-53057	Type bar hinge bow	II/73
477	T Fs 72-03142	Tension spring	II/57, 166 IX/9
484	T Fs 72-33040	Cover	II/17 V/6 VII/5
487	T Fs 72-30041	Gear sleeve	II/17 V/6
488	T Fs 72-33109	Nut	II/17 V/6
489	T Fs 00-08662	Snap ring 30x1.2	II/51
490	T Fs 72-53450	Stop	II/56
491	T Fs 72-53398	Washer	II/51
499	T Fs 72-40058	Friction clutch	II/33, 36, 38, 118
500	T Fs 00-09203	Fillister head screw M 4x18	II/33 VI/4, 20
501	T Fs 00-09209	Fillister head screw M 4x30	—
502	T Fs 00-09221	Fillister head screw M 5x25	—
503	T Fs 72-40041	Selector lever	II/35, 36, 37, 120, 121, 122, 125, 133
504	T Fs 72-40043	Lever with sword	II/35, 37, 125, 132
505	T Fs 72-43142	Adjusting plate	II/120, 121, 122
506	T Fs 72-43131	Plate	II/119
508	T Fs 00-09159	Fillister head screw M 3x15	VI/10, 12, 30 VII/5
509	T Fs 72-33114	Plate	VII/57
510	T Fs 72-50354	Paper saddle	II/3, 42, 43
513	T Fs 00-08015	Cable clamp A3	V/7
515	T Fs 72-30025	Helical gear	VII/4
516	T Fs 72-43133	Tension spring	II/37, 132
519	T Fs 31-98992	Recessed neck screw	II/13, 20, 220 VII/9, 47
520	T Fs 72-54063	Tension spring	II/52, 164
521	T Fs 72-54062	Sliding weight	II/52, 164
522	T Fs 72-54061	Bushing	II/52, 164
523	T Fs 72-53713	Shoulder screw	II/207 IX/14 XI/5
524	T Fs 00-08081	Hexagon screw M 3x4	II/135 XI/6

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526	T Fs 72-43148	Plate	II/135 XI/6
527	T Fs 72-54167	Cam disk	II/59, 162
528	T Fs 72-54158	Bushing	II/59, 162
529	T Fs 00-09159-8 G	Fillister head screw M 3x15	II/51, 59
530	T Fs 72-50318	Roller	II/59, 162, 204
532	T Fs 72-50256	Type bar rest	II/73, 219
533	T Fs 72-53966	Suspension plate	II/208
534	T Fs 72-53967	Suspension plate	II/208
535	T Fs 72-53963	Bail	II/73
537	T Fs 72-53946	Guide comb	II/73, 77, 210, 218
538	T Fs 72-50286	Bail	II/74, 79, 212
539	T Fs 72-53987	Ribbon lifter	II/2, 5, 71, 73, 79, 215
540	T Fs 72-23242	Retainer	II/8
542	T Fs 72-53788	Bolt	II/77, 79
543	T Fs 72-23021	Axle	II/28
544	T Fs 72-23147	Torsion spring	II/21
545	T Fs 72-23052	Bearing pin	II/24, 25
546	T Fs 72-53866	Tension spring	II/24, 103, 185 V/1, 9, 12, 15 VI/10, 12, 42
548	T Fs 72-23210	Axle	II/30
549	T Fs 72-23048	Felt washer	II/30 VII/11
550	T Fs 72-23050	Spacer	II/30
551	T Fs 72-20043	Drive	II/31, 32
552	T Fs 72-23172	Leaf spring	II/31
553	T Fs 72-23213	Locking lever	II/31
554	T Fs 72-20074	Cover	II/21
555	T Fs 72-23105	Cam sleeve	II/21, 92, 103
557	T Fs 70-12034	Tension spring	II/62, 64, 169
559	T Fs 72-50259	Tension spring	II/50, 51, 173
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561	T Fs 70-12235	Washer	II/8
563	T Fs 72-53142	Code bar	II/63, 138, 213 VI/4, 20, 21
564	T Fs 72-53143	Code bar	II/63, 138, 213 VI/4, 20, 21
565	T Fs 72-53144	Code bar	II/63, 138, 213 VI/4, 20, 21
566	T Fs 72-53145	Code bar	II/63, 138, 213 VI/4, 20, 21
567	T Fs 72-50391	Cam sleeve	II/2, 51, 59, 71, 136 VI/4
568	T Fs 72-53722	Guide stop	II/154
569	T Fs 72-50500	Clutch	II/49, 69, 159
570	T Fs 72-53844	Tension spring	II/203
571	T Fs 72-10049	Key lever with tube	II/14
572	T Fs 00-09814	Taper pin	II/14
573	T Fs 72-13124	Comb	II/15, 82
574	T Fs 72-53392	Push rod	II/41, 65, 147, 171, 178, 186, 227 V/9, 24, 25
577	T Fs 72-13010	Felt Washer	II/19
579	T Fs 72-13036	Key button	II/16
580	T Fs 72-13031	Key lever	II/16
581	T Fs 72-13032	Key lever	II/16
582	T Fs 72-13033	Key lever	II/16
583	T Fs 72-13034	Key lever	II/16
584	T Fs 72-13038	Key lever	II/16

Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
587	T Fs 72-10054	Key lever set	—
588	T Fs 72-13109	Torsion spring	—
590	T Fs 72-33165	Stop	II/229 XI/1
591	T Fs 27-00044	Recessed neck screw	II/13, 229 XI/1
592	T Fs 72-53999	Carriage return spring	II/2, 71 XI/2
593	T Fs 72-53984	Rod	II/3
594	T Fs 72-33142	Spacer	—
596	T Fs 72-54164	Plate	II/57, 161
597	T Fs 72-54163	Axle	II/59
598	T Fs 00-09423	Hexagon nut, high M3	II/51, 59, 77 VI/44 VII/9
599	T Fs 72-54195	Washer	II/45
600	T Fs 72-50352	Supporting plate	II/44, 156
602	T Fs 72-53846	Lever	II/44, 156
603	T Fs 72-53756	Lever	II/50
605	T Fs 72-54287	Wire clip	II/51
606	T Fs 72-53406	Bracket	II/57
608	T Fs 00-08504	Retainer 4	III/6
609	T Fs 00-09426	Hexagon nut, high M5	II/69
610	T Fs 72-53390	Axle	II/65
611	T Fs 72-53774	Slotted nut	II/66
612	T Fs 72-50347	Bell	II/149
614	T Fs 00-09388	Hexagon nut, flat M3	II/77 VI/34, 43
615	T Fs 72-54239	Tension spring	II/43, 54 IX/4
616	T Fs 70-12226	Tension spring	II/199
617	T Fs 27-00020	Motor with governor, 220 v AC (40—60 cps)	II/220
	T Fs 27-00024	Motor with governor, 220 v AC (50 cps)/110 v DC	
	T Fs 27-00025	Motor with governor, 115 v AC (60 cps)	
	T Fs 27-00026	Motor with governor, 220 v DC	
	T Fs 27-00041	Motor with governor, 240 v AC (40—60 cps)	
618	T Fs 72-33050	Mounting frame	II/222
619	T Fs 72-10052	Lever	II/14
622	T Fs 72-50298	Lever with axle	II/46, 150, 151 IX/4, 16, 18
625	T Fs 72-53907	Bracket with bushing	II/46, 150 IX/4, 18
628	T Fs 70-27275	Clamping lever	II/118
629	T Fs 72-50297	Push rod	II/72, 215
631	T Fs 72-53322	Felt	II/73, 208
632	T Fs 72-54276	Plate	II/5
634	T Fs 00-09380	Washer, small 5.3	II/43, 72
650	T Fs 72-63196	Chad remover	XII/21
653	T Fs 70-02928	Shorting link	VII/56, 57
655	T Fs 45-28029	Transformer	V/6, 27
656	T Fs 72-30087	Cover, compl.	V/6
657	T Fs 72-30100	Power supply unit	II/17 V/6
661	T Fs 72-08114	Cable 7	II/235 V/6, 27

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664	T Fs 72-30098	R-f suppressor	V/6
665	T Fs 00-07301	Screw cap	V/6, 26, 27, 28, 29
666	T Fs 39-48604	Fuse	V/6
667	T Fs 72-08101	Cable 2	V/27
668	T Fs 72-08100	Cable 1	V/5, 26, 27, 28, 29
669	T Fs 72-23464	Felt washer	—
670	T Fs 72-23305	Plate	II/22, 112
671	T Fs 16-99241	Tube	II/3
672	T Fs 72-23041	Rocker	II/93
673	T Fs 72-23202	Switching member	II/112
674	T Fs 72-08118	Cable	II/235 VIII/1, 12
676	T Fs 72-50396	Pusher	II/215
677	T Fs 72-53857	Stop	II/215
678	T Fs 72-53070	Pull bar	II/215
679	T Fs 00-08507	Retainer	II/31
680	T Fs 72-54589	Washer	II/198
681	T Fs 72-54513	Pawl	II/198
2001	T Fs 16-99065*	Cover, compl. (basic version)	III/1, 4
2002	T Fs 72-33097	Sealing ring	III/1, 2
2003	T Fs 72-30017	Cover mounting block	III/2
2005	T Fs 72-30047	Lead	III/2
2006	T Fs 16-98936	Recessed-neck screw	III/1
2007	T Fs 16-99025*	Cover	III/1, 4, 9
2008	T Fs 16-98963	Push button	III/1
2009	T Fs 16-98965	Cover bracing bar	III/1, 4
2010	T Fs 16-98934	Catch	III/1, 9
2011	T Fs 16-98939	Latch plate	III/1, 8
2012		identical with consec. No. 5	III/4
2013	T Fs 16-99043*	Visor	III/1, 4
2014	T Fs 16-98964	Bearing pin	III/1, 4
2015	T Fs 16-98967	Bearing pin	III/1, 4
2016	T Fs 16-99016*	Cover for basic version (a)	III/1, 8
2017	T Fs 00-09152	Fillister head screw M 3x7	III/8
2019	T Fs 16-98966	Key	III/4, 5, 6, 7
2020	T Fs 16-98935	Retainer plate	III/7
2021	T Fs 16-98930	Key frame	III/5, 6, 7
2023	T Fs 16-98997	Paper guide	III/4
2031	T Fs 16-98901*	Special function key assembly	III/4, 5
2032	T Fs 16-98906	Shaft	III/5, 6
2034	T Fs 16-98914	Pin	III/5, 6
2036	T Fs 16-98907	Pressure spring	III/6
2037	T Fs 16-98904	Spring	III/6
2038	T Fs 16-98905	Metal strip	III/6
2039	T Fs 16-98895	Paper deflecting plate	III/10
2101	T Fs 00-08693	Round head wood screw	IV/1
2102	T Fs 00-09375	Washer	IV/1
2103	T Fs 00-09476	Oval head screw	IV/1
2104	T Fs 16-98915	Metal strip	IV/1, 2
2105	T Fs 72-00043	Copy clamp	IV/1
2106	T Fs 72-00044	Copy clamp	IV/1
2107	T Fs 70-05479	Metal strip	IV/1
2108	T Fs 70-05480	Metal strip	IV/1
2109	T Fs 72-00069	Copy clamp	IV/1
2133	T Fs 00-08895	Ink ribbon	V/2, 6
2136	T Fs 72-50017	Lever	V/4, 12, 16, 17
2137	T Fs 72-50221	Control bar	V/1, 2, 3, 10, 11, 12, 13, 15, 16, 17, 18, 23

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2138	T Fs 72-50222	Lever	V/1, 2, 12, 15
2139	T Fs 72-53068	Pin	V/4, 12
2142	T Fs 72-53851	Pawl	V/1, 2, 12, 15
2145	T Fs 72-53872	Locking bracket	V/13
2151	T Fs 72-50231	Lever	V/3, 8, 10, 11, 14, 18, 23
2160	T Fs 72-50233	Lever	V/3, 8, 10, 11, 18, 23
2161	T Fs 72-50223	Lever with shaft	—
2201	T Fs 72-63131	Chad collector	VI/3, 9
2202	T Fs 72-00161*	Tape magazine	VI/3, 5, 6
2203	T Fs 72-60014	Tape channel	VI/3, 8, 13, 14
2206	T Fs 16-98972	Tape exit	VI/3
2208	T Fs 72-33098	Stop	VI/4, 20
2209	T Fs 72-60001	Mounting frame with pins	VI/4, 18, 19, 25, 26
2211	T Fs 72-00024	Intermediate shaft	VI/4, 20
2212	T Fs 72-03149	Sleeve	VI/4, 20
2213	T Fs 72-03092	Felt	VI/4
2214	T Fs 72-60024	Clutch	VI/30
2218	T Fs 72-03091	Bracket	VI/6
2219	T Fs 16-98999	Pushbutton assembly	VI/7, 44
2220	T Fs 16-99000	Plate	VI/7
2221	T Fs 00-09064	Countersunk screw M 3x12	VI/7
2222	T Fs 72-60011	Punch guide	VI/8, 9, 16, 17, 26, 32
2223	T Fs 72-63064	Tension spring	VI/9, 10, 14, 18, 34, 40, 41, 43
2225	T Fs 72-63107	Punch, 1.80 dia.	VI/9, 31, 33, 34
2226	T Fs 72-63108	Punch, 1.20 dia.	VI/9, 31, 33
2227	T Fs 72-60031	Punch lever with punch returning bracket	VI/9, 13, 16, 17, 32, 33, 34
2228	T Fs 72-63043	Lubricating felt	VI/9
2229	T Fs 72-63073	"OFF" lever	VI/10, 30
2230	T Fs 72-63057	Tension spring	VI/18, 38
2232	T Fs 72-60016	Pressure roller (I)	VI/10, 11, 13, 41
2233	T Fs 72-63058	Spacer	VI/10
2234	T Fs 72-60006	Lever with sleeve	VI/11, 15, 22, 23, 24, 37, 38, 39
2236	T Fs 72-63049	Control lever	VI/11, 15, 18, 22, 23, 24, 37
2237	T Fs 72-63150	"ON" lever	VI/12, 13, 30, 42
2239	T Fs 70-11115	Segment	VI/13
2240	T Fs 72-60029	Pressure plate	VI/13, 27, 43
2241	T Fs 72-63017	Lever (backspacing)	VI/13, 17, 24, 43
2242	T Fs 72-60004	Backspacing lever with pawl	VI/13
2243	T Fs 72-63046	Tension spring	VI/13, 43
2244	T Fs 72-43049	Tension spring	VI/13, 39 VII/9, 33, 34, 43
2245	T Fs 72-63050	Transfer lever	VI/4, 14, 16, 18, 20, 21, 33, 37
2246	T Fs 72-63051	Transfer lever	VI/4, 14, 16, 18, 20, 21, 33, 37
2247	T Fs 72-63052	Transfer lever	VI/4, 14, 16, 18, 20, 21, 33, 37
2248	T Fs 72-63053	Transfer lever	VI/4, 14, 16, 18, 20, 21, 33, 37
2249	T Fs 72-63054	Transfer lever	VI/4, 14, 16, 18, 20, 21, 33, 37
2250	T Fs 72-63056	Comb	VI/14, 29
2251	T Fs 72-63055	Bracket	VI/14
2252	T Fs 72-63022	Punch setting lever	VI/16, 18, 31, 32, 33, 34, 37
2253	T Fs 72-63023	Punch setting lever	VI/16, 18, 31, 32, 33, 34, 37
2254	T Fs 72-63024	Punch setting lever	VI/16, 18, 31, 32, 33, 34, 37
2255	T Fs 72-63025	Punch setting lever	VI/16, 18, 31, 32, 33, 34, 37
2256	T Fs 72-63026	Punch setting lever	VI/16, 18, 31, 32, 33, 34, 37
2257	T Fs 16-99088*	Reperforator cover	VI/5
2258	T Fs 72-63089	Felt washer	VI/16, 17
2259	T Fs 72-63033	Tension spring	VI/16, 37
2260	T Fs 72-63038	Axle	VI/17
2262	T Fs 72-60050	Lever with sleeve	VI/18, 35
2264	T Fs 72-60003	Feed pawl	VI/11

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2265	T Fs 72-60048	Zero-setting lever	VI/18, 40
2267	T Fs 72-60002	Feed lever	VI/11, 18, 38, 39
2268	T Fs 72-63007	Comb	VI/25
2270	T Fs 72-63032	Cam shaft	VI/11, 19, 20, 33, 34, 43
2271	T Fs 72-63140*	Guard plate	VI/19
2272	T Fs 72-60009	Lubricating felt	VI/18
2273	T Fs 72-63031	Cover plate	VI/19
2277	T Fs 72-63096	Bail	VI/19, 20, 30
2278	T Fs 72-63095	Bail	VI/20, 30
2279	T Fs 72-63016	Pawl (backspacing)	VI/24, 43
2280	T Fs 72-63034	Washer	VI/13, 24, 43
2281	T Fs 72-60020	Chad chute	VI/28
2282	T Fs 72-60023	Lever with axle	VI/30
2283	T Fs 72-63139	Axle	VI/30
2284	T Fs 72-63090	Pressure spring	VI/36
2285	T Fs 16-98976	Stop button	VI/3
2286	T Fs 16-98977	"L" button	VI/3
2287	T Fs 16-98978	Start button	VI/3
2288	T Fs 16-98979	"R" button	VI/3
2290	T Fs 72-63109	Punch, 1.83 dia.	similar to cons. No. 2225
2291	T Fs 72-63111	Punch, 1.23 dia.	similar to cons. No. 2226
2292	T Fs 72-63110	Punch, 1.86 dia.	similar to cons. No. 2225
2293	T Fs 72-63112	Punch, 1.26 dia.	similar to cons. No. 2226
2294	T Fs 16-98929	Adjusting plate	VI/44
2296	T Fs 72-63037	Spring	VI/43
2297	T Fs 72-63035	Ratchet with sleeve	VI/13, 22, 23, 24, 43
2298	T Fs 72-63106	Eccentric axle	VI/16, 17, 18, 34
2300	T Fs 72-60013	Connecting bar	VI/19
2304	T Fs 72-03279	Core	VI/3
2306	T Fs 72-33100*	Handle	VI/6
2307	T Fs 16-99011	Key assembly	VI/7, 44
2308	T Fs 16-99013	Plate	VI/7
2309	T Fs 16-99012	Tape channel	VI/44
2311	T Fs 16-98886	Stop button	VI/44
2312	T Fs 16-98887	"L" button	VI/44
2313	T Fs 16-98888	Start button	VI/44
2314	T Fs 16-98889	"R" button	VI/44
2315	T Fs 72-60049	Brake lever	VI/34, 43
2316	T Fs 72-63155	Eccentric	VI/34, 43
2317	T Fs 72-63091	Clutch sleeve	VI/4, 30, 36
2318	T Fs 72-63157	Bushing	—
2319	T Fs 72-63156	Bracket	—
2321	T Fs 00-09065	Countersunk screw M 3x15	VI/19
2400	T Fs 72-08045	Cable	VIII/4, 12
2402	T Fs 72-83039	Lid latching lever	VII/3, 8, 35
2403	T Fs 72-83010	Cover	VII/3, 35, 36
2404	T Fs 72-80016	Start button	VII/3, 11, 32, 33, 42, 45, 50
2405	T Fs 72-80017	Stop button	VII/3, 12
2406	T Fs 72-30068	Shaft	VII/4, 5, 42
2407	T Fs 72-30069	Shaft (for signal storage)	VII/42
2411	T Fs 70-27085	Clip connector	VII/5
2413	T Fs 72-33107	Bracket	VI/5
2414	T Fs 71-53783	Shoulder screw	VII/5
2415	T Fs 72-30027	Mounting frame	VII/4, 5
2416	T Fs 00-09705	Spring washer	VII/5
2417	T Fs 72-33137	Cover	VII/5
2420	T Fs 72-33133	Tube	VII/5
2421	T Fs 72-30048	Helical gear	VII/4, 5
2424	T Fs 72-83102	Cover	VII/1, 5
2426	T Fs 10-47992	Blade connector	VII/5, 9, 12

Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
2427	T Fs 72-80011	Helical gear	VII/5, 9, 13, 38
2428	T Fs 72-83090	Recessed neck screw	VII/5
2429	T Fs 16-98961	Cover	VII/1
2430	T Fs 70-16103	Pawl	VII/39
2431	T Fs 16-98896	Transmitter cover	VII/1
2437	T Fs 72-83101	Cover	VII/6, 10, 46
2438	T Fs 00-09206	Fillister head screw M 4x25	VII/6
2439	T Fs 72-80026	Contact switching assembly	VII/6, 18, 24, 37
2443	T Fs 72-83047	Trailing lever	VII/7, 11
2444	T Fs 72-83048	Sensing lever	VII/7, 11, 26, 39, 40, 44
2445	T Fs 72-83050	Sensing lever	VII/7, 8, 11, 26, 39, 40
2446	T Fs 72-83051	Sensing lever	VII/7, 11, 26, 39, 40, 44
2447	T Fs 72-83052	Sensing lever	VII/7, 11, 26, 39, 40, 44
2448	T Fs 72-83053	End-of-tape lever	VII/7, 8, 9, 11, 41
2449	T Fs 72-80013	Tape guide	VII/6, 26, 35, 36, 41
2451	T Fs 72-80012	Retainer	VII 6, 8, 19
2452	T Fs 72-83054	Bearing pin	VII/6, 19
2453	T Fs 72-83038	Axle	VII/6, 8, 19
2454	T Fs 72-83060	Tension spring	VII/9, 31
2455	T Fs 72-83120	Felt washer	VII/7, 8
2456	T Fs 72-83049	Torsion spring	VII/7
2457	T Fs 72-10002	Feed wheel	VII/8, 39
2458	T Fs 72-83061	Guide comb	VII/6, 21
2459	T Fs 72-83062	Spring comb	VII/6, 21, 26, 40, 44
2461	T Fs 72-83103	Tape deflector	VII/6, 10, 47
2462	T Fs 72-80033	Bracket	VII/10, 12, 16
2463	T Fs 72-83045	Pressure spring	VII/8
2464	T Fs 72-83042	Brake shoe	VII/8
2465	T Fs 72-83041	Brake shoe	VII/8
2466	T Fs 72-83040	Guide plate	VII/8
2467	T Fs 70-16043	Lubricating felt	VII/8
2468	T Fs 70-20142	Washer	VII/5
2469	T Fs 72-83013	Cam shaft	VII/9, 10, 24, 26, 28, 29, 30, 31, 39, 40, 41
2470	T Fs 70-26695	Clutch half	VII/9, 13, 14, 33, 38
2471	T Fs 72-80027	Contact frame	VII/6, 47
2472	T Fs 00-08660	Snap ring	—
2473	T Fs 72-80014	Lubricating felt	VII/12
2475	T Fs 72-83059	Tension spring	VII/10, 12, 30
2476	T Fs 72-83093	Tension spring	VII/7, 9, 10, 11, 12, 29
2477	T Fs 72-80028	Tension spring	VII/10, 12, 28
2478	T Fs 12-98941	R-f suppressor case	VII/9, 47
2480	T Fs 72-80001	Mounting frame	VII/9, 10, 20, 21, 22, 42, 45
2482	T Fs 00-08540	Ball bearing	VII/9
2483	T Fs 70-26694	Pressure spring	VII/10, 38
2484	T Fs 72-80003	Contact control lever	VII/10, 12
2485	T Fs 72-80006	Feed lever	VII/9, 11, 26, 39
2486	T Fs 72-80010	Sensing lever	VII/9, 11, 27, 31, 34
2487	T Fs 72-80005	Zero-setting lever	VII/10, 28
2488	T Fs 72-83019	Axle	VII/10, 12
2489	T Fs 72-83023	Code lever	VII/10, 15, 29
2490	T Fs 72-83024	Code lever	VII/10, 15, 29
2491	T Fs 72-83081	Spring suspension bracket	VII/10, 22
2493	T Fs 72-80002	Guide comb	VII/10, 15, 26
2494	T Fs 72-83035	Felt washer	VII/10
2495	T Fs 72-83026	Axle	VII/11, 17
2496	T Fs 72-80008	Stop bail	VII/11, 13, 14, 33, 38, 48
2497	T Fs 72-80009	Trailing lever	VII/11, 12, 33
2498	T Fs 72-80007	Locking lever	VII/11, 32, 33, 45
2499	T Fs 72-83067	Magnet Yoke	VII/12, 17



Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
2500	T Fs 72-83089	Cover	VII/7, 20
2503	T Fs 72-83016	Axle	VII/11
2504	T Fs 72-83017	Bail	VII/11, 30
2505	T Fs 72-83018	Retainer plate	VII/11
2508	T Fs 72-83037	Guide plate	VII/13, 14, 38
2509	T Fs 72-80018	Magnet assembly	VII/12, 17, 27, 34, 43, 47
2510	T Fs 72-80004	Lever with rocker	VII/11, 23, 24
2512	T Fs 72-83022	Control lever	VII/23, 24, 30
2513	T Fs 72-83029	Eccentric sleeve	VII/26
2516	T Fs 72-83012	Torsion spring	VII/36
2517	T Fs 72-83172	Leaf spring	VII/6, 37
2518	T Fs 72-83164	Plate	VII/6, 37
2519	T Fs 72-80040	Lubricating felt	VII/6, 21, 26, 40, 42, 44
2550	T Fs 72-00051	Pull bar	VIII/1, 2
2551	T Fs 72-00019	Pull bar	VIII/1, 2
2552	T Fs 72-00056	Pull bar	VIII/1, 2
2553	T Fs 72-00052	Pull bar	VIII/1, 2
2555	T Fs 72-03081	Guide plate	VIII/1
2556	T Fs 72-03082	Guide bracket	VIII/1
2557	T Fs 72-03080	Pinion	VIII/1
2559	T Fs 72-73022	Release pawl	VIII/1, 3, 5, 6, 10, 11
2561	C22104-F1-C2	Terminal block	VIII/1, 4, 12
2563	T Fs 72-73025	Plate	VIII/3
2564	C22315-Z13-C12	Micro-switch	VIII/3, 4, 6, 8
2565	T Fs 72-73018	Switching bail	VIII/3, 4, 7, 8, 11
2566	T Fs 00-09115	Fillister head screw M 2.3x10	VIII/4, 5, 6
2568	T Fs 72-73007	Eccentric	VIII/3, 5, 6, 9, 10
2570	T Fs 72-73020	Pointer	VIII/4, 6
2571	T Fs 72-73021	Axle	VIII/3, 4
2572	T Fs 72-73019	Stop	VIII/3
2573	T Fs 72-73016	Torsion spring	VIII/3
2574	T Fs 72-70004	Ratchet	VIII/3, 5, 7, 9, 10, 11
2576	T Fs 72-70003	Bail	VIII/3
2577	T Fs 72-73017	Tension spring	VIII/3, 9
2578	T Fs 72-73012	Pawl	VIII/3, 5, 9
2580	T Fs 72-53271	Washer	VIII/3
2583	T Fs 00-09712	Lock washer B3	V/6, 7
2584	T Fs 72-70002	Shaft with gear	VIII/3
2585	T Fs 72-73024	Bracket	VIII/3
2586	T Fs 72-73023	Axle	VIII/3, 4
2591	T Fs 00-09355	Washer, small 3.2	—
2594	T Fs 72-70000-10000	Remote control switch	VIII/3, 12
2653	T Fs 00-09269	Oval head screw M 2.3x3	IX/22
2655	T Fs 00-09270	Oval head screw M 2.3x4	IX/1
2656	T Fs 72-50206	Sprocket-feed platen	IX/2, 18, 19, 20, 22, 23
2662	T Fs 72-50257	Paper guide	IX/4, 9, 18, 19
2665	T Fs 72-50496	Paper saddle	IX/1, 10, 31
2669	T Fs 72-53983	Stop	IX/4
2671	T Fs 72-54100	Lever	IX/4
2672	T Fs 72-54101	Torsion spring	IX/4
2673	T Fs 72-54151	Pointer	IX/1, 23
2674	T Fs 72-54152	Threaded plate	IX/1, 22
2675	T Fs 72-54251	Guide bracket	IX/2, 18, 20
2677	T Fs 72-54252	Guide bracket	IX/2, 18, 20
2678	T Fs 72-50446	Tabulator rail, compl. (69 characters per line, 2.5 mm character spacing)	IX/1, 10, 21, 23
2679	T Fs 72-53809	Brake lever	IX/7, 14
2680	T Fs 72-53905	Feed screw	IX/5, 12

Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
2681	T Fs 72-53906	Sliding block	IX/6, 12
2682	T Fs 72-50447	Tabulator rail, compl. (71 characters per line, 2.5 mm character spacing)	IX/1, 10, 21, 23
2683	T Fs 72-50448	Tabulator rail, compl. (104 characters per line, 1.65 mm character spacing)	IX/1, 10, 21, 23
2684	T Fs 72-50453	Tabulator rail, compl. (69 characters per line, 1 inch character spacing) for every 10 characters)	IX/1, 10, 21, 23
2685	T Fs 72-50464	Paper guide	IX/9
2686	T Fs 72-50481	Switching axle	IX/10
2687	T Fs 72-50457	Position indicator contact	IX/11, 29, 30, 33, 34, 36
2688	T Fs 72-50458	Mounting base	IX/30, 31, 33
2689	T Fs 72-54484	Lever	IX/30, 32, 33, 34
2690	T Fs 72-54489	Plate	IX/30
2691	T Fs 72-54487	Bracket	IX/31
2692	T Fs 72-54486	Adjusting bracket	IX/32
2693	T Fs 72-54533	Bail	IX/35
2694	T Fs 72-08120	Cable 1	IX/11, 36
2695	T Fs 72-08121	Cable 2	IX/11, 36
2696	T Fs 00-09097	Fillister head screw M 1.7x4	IX/30
2707	T Fs 16-99235	Cover plate	—
2708	T Fs 16-99236	Cover plate	—
2710	T Fs 00-08059	Countersunk wood screw 3x25	X/2
2711	T Fs 00-08065	Round head wood screw 3x10	X/1, 2
2712	T Fs 00-08066	Round head wood screw 4x15	X/3
2713	T Fs 00-08694	Round head wood screw 5x20	X/3
2714	T Fs 00-09074	Countersunk screw M 4x8	X/4
2718	T Fs 00-09676	Countersunk wood screw 4x20	X/1, 2
2719	T Fs 00-09683	Countersunk wood screw 3x30	X/1, 2
2720	T Fs 16-98910	Tube	—
2721	T Fs 16-99001	Paper supply bin	X/1, 2
2722	T Fs 16-99002	Guide plate	X/1, 2
2723	T Fs 16-99233	Bar	X/2
2724	T Fs 16-99234	Paper supply bin	X/3, 4
2725	T Fs 72-00109	Paper deflecting plate	X/3
2726	T Fs 72-00121	Storage bin (DIN A4 paper size)	X/1, 2, 3, 4
2727	T Fs 72-00131	Storage bin (DIN A5 paper size)	X/1, 2, 3, 4
2728	T Fs 72-03219	Retaining plate	X/1, 2, 4
2751	T Fs 72-43139	Tension spring	XI/2, 4
2752	T Fs 72-50392	Carriage return spring	XI/2
2753	T Fs 72-03051	Helical gear	} commutator motor } (3750 rpm)
2754	T Fs 72-03061	Gear	
2755	T Fs 72-03053	Helical gear	} synchronous motor } (3000 rpm)
2756	T Fs 72-03063	Gear	
2757	T Fs 72-03115	Helical gear	} synchronous motor } (3600 rpm)
2758	T Fs 72-03125	Gear	

XI/1  
XI/1  
45,5 Bd



Cons. No.	Order Number	Nomenclature	Index No./Fig. No.
2759	T Fs 72-03054	Helical gear	} commutator motor (3750 rpm)
2760	T Fs 72-03064	Gear	
2761	T Fs 72-03113	Helical gear	} synchronous motor (3000 rpm)
2762	T Fs 72-03123	Gear	
2763	T Fs 72-03118	Helical gear	} synchronous motor (3600 rpm)
2764	T Fs 72-03128	Gear	
2765	T Fs 72-03055	Helical gear	} commutator motor (3750 rpm)
2766	T Fs 72-03065	Gear	
2767	T Fs 72-03114	Helical gear	} synchronous motor (3000 rpm)
2768	T Fs 72-03124	Gear	
2769	T Fs 72-03119	Helical gear	} synchronous motor (3600 rpm)
2770	T Fs 72-03129	Gear	
3000	T Fs 72-50474	Lever	V/12
3001	T Fs 00-09753	Cable clamp A6	V/5 VII/53
3004		Wire strap 1x0.25	V/29
3005	T Fs 72-50441	Release shaft	V/8, 9, 11, 14, 23
3006	T Fs 72-08102	Cable 3	V/7, 27, 28, 29
3007	T Fs 17-80042	Rectifier (Gr 7)	V/26, 27, 28, 29
3008	T Fs 06-80754	Electrolytic capacitor (C34)	V/26, 27, 28, 29
3009	T Fs 04-14019	Resistor (R15)	V/26, 27, 28, 29
3010	T Fs 70-16184	Axle	V/18, 20
3011	T Fs 72-50228	Magnet assembly	V/20, 21, 26, 27, 28, 29
3012	T Fs 72-50230	Magnet coil	V/21
3013	T Fs 72-50236	Armature holding plate	V/19, 20, 21
3014	T Fs 72-50234	Magnet assembly, compl.	V/7, 18, 19, 22
3015	T Fs 72-53877	Magnet yoke	V/20
3016	T Fs 72-53880	Threaded plate	V/7
3017	T Fs 72-53897	Clamp	V/20
3018	T Fs 72-53915	Bracket	V/7
3021	T Fs 72-80041	Lever	VII/45
3022	T Fs 72-83137	Bearing pin	VII/45
3023	T Fs 72-80023	Contact spring set	VII/9
3024	T Fs 72-83189	Bolt	—
3025	T Fs 72-80101	10° tape deflector	VII/47
3026	T Fs 72-83138	Pressure spring	VII/45
3027	T Fs 72-83129	Comb	VII/44
3028	T Fs 72-83139	Washer	VII/45
3029	FT s 72-00067	Clip connector	VII/5
3030	T Fs 10-48005	Blade connector	VII/5
3031	T Fs 72-80051	Mounting frame	VII/42, 45
3032	T Fs 72-80071	Cover with tape deflector	VII/1
3033	T Fs 72-83110	Spacer	VII/12
3034	T Fs 72-20123	12-v contact	VII/47
3035	T Fs 72-83201	Bracket	—
3036	T Fs 72-83188	Plate	—
3037	T Fs 72-08115	Cable 13	VII/57
3038	T Fs 25-98992	Connecting cord	VII/57
3039	T Fs 22-00990	Socket	—
3040	T Fs 72-80037	Bracket with slide bar	VII/48
3041	T Fs 72-80036	Plate with switch	VII/48, 49, 50
3042	T Fs 72-83125	Lever	VII/49
3043	T Fs 72-83128	Slide bar	VII/50
3044	T Fs 00-09120	Fillister head screw M 2.3x15	VII/49
5260	T Fs 00-08008	Cable clamp B5	V/28
5261	T Fs 00-08017	Cable clamp A4	VII/53
5330	T Fs 72-23352	Bracket	II/31
5336	T Fs 25-98925	Connecting cable, red	V/28
5376	C22315-F1-C6	Micro-switch	VII/49, 50

**3. PARTS LIST ARRANGED ACCORDING TO ORDER NUMBERS**

Order Number	Cons. No.	Nomenclature	Index No./Fig. No.
C22104-F1-C2	2561	Terminal block	VIII/1, 4, 12
C22315-F1-C6	5376	Micro-switch	VII/49, 50
C22315-Z13-C12	2564	Micro-switch	VIII/3, 4, 6, 8
C42334-F3-C10	2	Power plug	II/1
	3004	Wire strap	V/29
T Fs 00-07301	665	Fuse	V/6, 26, 27, 28, 29
T Fs 00-08008	5260	Cable clamp B5	V/28
T Fs 00-08015	513	Cable clamp A3	V/7
T Fs 00-08017	5261	Cable clamp A4	VII/53
T Fs 00-08059	2710	Countersunk wood screw 3x25	X/2
T Fs 00-08065	2711	Round head wood screw 3x10	X/1, 2
T Fs 00-08066	2712	Round head wood screw 4x15	X/3
T Fs 00-08081	524	Hexagon screw M 3x4	II/135 XI/6
T Fs 00-08154 Sz	51	Hexagon screw M 6x20	II/13 III/2
T Fs 00-08307	78	Ball bearing EL 4 zz	II/2, 21, 50, 65, 71, 78 IX/7
T Fs 00-08308 Sz	348	Hexagon screw M 3x5	II/82
T Fs 00-08501	461	Retainer 1.9	II/74 III/6
T Fs 00-08502	362	Retainer 2.3	II/23, 27, 29, 30, 38, 41, 62, 63, 65, 74, 76 V/1, 9 VII/11, 12 VIII/3
T Fs 00-08503	407	Retainer 3.2	II/25, 43, 48, 53, 54, 55, 57, 58, 67, 69, 79 III/5 VI/19 VIII/3 IX/4
T Fs 00-08504	608	Retainer 4	II/57 III/6
T Fs 00-08505	399	Retainer 5	II/41, 59 V/3, 8, 9 VI/18
T Fs 00-08507	679	Retainer	II/31
T Fs 00-08535	389	Ball bearing EL 6	—
T Fs 00-08537	450	Ball bearing 6200 ZZ	II/51
T Fs 00-08540	2482	Ball bearing	VII/9
T Fs 00-08660	2472	Snap ring	—
T Fs 00-08662	489	Snap ring 30x1.2	II/51
T Fs 00-08693	2101	Round head wood screw	IV/1
T Fs 00-08694	2713	Round head wood screw 5x20	X/3

Order Number	Cons. No.	Nomenclature	Index No./Fig. No.
T Fs 00-08895	2133	Ink ribbon	V/2, 6
T Fs 00-09059	342	Countersunk screw M 3x6	II/221 VII/6, 10
T Fs 00-09060	387	Countersunk screw M 3x8	II/36 VI/19
T Fs 00-09064	2221	Countersunk screw M 3x12	VI/7
T Fs 00-09065	2321	Countersunk screw M 3x15	VI/19
T Fs 00-09074	2714	Countersunk screw M 4x8	X/4
T Fs 00-09097	2696	Fillister head screw M 1.7x4	IX/30
T Fs 00-09108	145	Fillister head screw M 2.3x4	II/73, 112, 123, 157 VII/6, 37
T Fs 00-09110	372	Fillister head screw 2.3x5	II/28, 121 V/1, 2, 12
T Fs 00-09111	331	Fillister head screw M 2.3x6	II/13, 30, 220
T Fs 00-09113	378	Fillister head screw M 2.3x8	II/28
T Fs 00-09115	2566	Fillister head screw M 2.3x10	VIII/4, 5, 6
T Fs 00-09120	3044	Fillister head screw M 2.3x15	VII/49
T Fs 00-09149	304	Fillister head screw M 3x4	II/42, 73, 77, 209, 215 V/18 VIII/3
T Fs 00-09150	103	Fillister head screw M 3x5	II/15, 32, 37, 77, 100 III/7 VI/44 VII/23, 48 VIII/3, 6
T Fs 00-09150 Ms	24	Fillister head screw M 3x5	II/13, 220
T Fs 00-09151	13	Fillister head screw M 3x6	II/4, 13, 17, 23, 26, 31, 34, 35, 37, 39, 41, 42, 46, 50, 51, 52, 56, 59, 60, 62, 63, 68, 72, 88, 96, 149, 150, 151, 156, 162, 221, 224 V/6, 9, 13 VIII/4, 6 IX/1, 4, 10, 15, 16, 21, 32, 33 X/4
T Fs 00-09152	2017	Fillister head screw M 3x7	III/8
T Fs 00-09153	35	Fillister head screw M 3x8	II/13, 14, 15, 16, 18, 19, 22, 36, 37, 43, 44, 45, 46, 50, 51, 54, 55, 56, 57, 59, 60, 62, 63, 64, 68, 69, 73, 74, 75, 76, 78, 79, 83, 85, 86, 87, 93, 115, 138, 143, 152, 155, 157, 160, 205, 212, 213, 228 V/5, 7, 16 VI/4, 8, 9, 14, 17, 18 VII/1, 6, 7, 8, 9, 10, 11, 12, 13, 14, 42, 46, 48, 50 VIII/1 IX/2, 4, 5, 12, 17, 28 XI/1

Order Number	Cons. No.	Nomenclature	Index No./Fig. No.
T Fs 00-09155	34	Fillister head screw M 3x10	II/7, 17, 18, 24, 25, 28, 39, 77, 88, 119, 135, 214 V/6 VI/4, 5, 20 VII/5 IX/11, 31 XI/6
T Fs 00-09157	224	Fillister head screw M 3x12	II/13, 35, 56, 60, 76, 119, 154, 215, 220, 225 V/7, 17 VI/9, 19 VII/6, 10, 46 XI/1
T Fs 00-09159	508	Fillister head screw M 3x15	VI/10, 12, 30 VII/5
T Fs 00-09159-8 G	529	Fillister head screw M 3x15	II/51, 59
T Fs 00-09195	423	Fillister head screw M 4x6	II/49, 50
T Fs 00-09197	426	Fillister head screw M 4x8	II/50, 76 III/2 IX/6, 8
T Fs 00-09199	75	Fillister head screw M 4x10	II/17, 20, 73 V/6 VII/5
T Fs 00-09200	56	Fillister head screw M 4x12	II/13, 17, 20, 224 V/6 VI/5, 6 VII/1
T Fs 00-09201	324	Fillister head screw M 4x15	II/49, 50, 53, 68, 214
T Fs 00-09203	500	Fillister head screw M 4x18	II/33 VI/4, 20
T Fs 00-09206	2438	Fillister head screw M 4x25	VII/6
T Fs 00-09209	501	Fillister head screw M 4x30	—
T Fs 00-09221	502	Fillister head screw M 5x25	—
T Fs 00-09269	2653	Oval head screw M 2.3x3	IX/22
T Fs 00-09270	2655	Oval head screw M 2.3x7	IX/1
T Fs 00-09355	2591	Washer, small 3.2	—
T Fs 00-09375	2102	Washer	IV/1
T Fs 00-09380	634	Washer, small 5.3	II/43, 72
T Fs 00-09388	614	Hexagon nut, flat M3	II/77 VI/34, 43
T Fs 00-09390	468	Hexagon nut, flat M4	II/78, 214, 215 VI/16, 17, 18, 34
T Fs 00-09392	448	Hexagon nut, flat M6	II/49 III/9
T Fs 00-09394	347	Hexagon nut, flat M10	II/207 IX/14

Order Number	Cons. No.	Nomenclature	Index No./Fig. No.
T Fs 00-09423	598	Hexagon nut, high M3	II/51, 59, 77 VI/44 VII/9
T Fs 00-09425	357	Hexagon nut, high M4	II/21, 24, 50, 65 VII/45 IX/7 X/4
T Fs 00-09426	609	Hexagon nut, high M5	II/69
T Fs 00-09476	2103	Oval head screw	IV/1
T Fs 00-09490	60	Recessed neck screw M 4x22	II/13
T Fs 00-09510	349	Hexagon screw M 3x6	II/31, 97
T Fs 00-09614	274	Countersunk screw M 2.3x3	II/221
T Fs 00-09676	2718	Countersunk wood screw M 4x20	X/1, 2
T Fs 00-09683	2719	Countersunk wood screw M 3x30	X/1, 2
T Fs 00-09697	388	Ball bearing R7	VI/19
T Fs 00-09705	2416	Spring washer	VII/5
T Fs 00-09712	2583	Lock washer B3	V/6, 7
T Fs 00-09753	3001	Cable clamp A6	V/5 VII/53
T Fs 00-09814	572	Taper pin	II/14
T Fs 04-14019	3009	Resistor (R15)	V/26, 27, 28, 29
T Fs 06-80754	3008	Electrolytic capacitor (C34)	V/26, 27, 28, 29
T Fs 10-47992	2426	Blade connector	VII/5, 9, 12
T Fs 10-48005	3030	Blade connector	VII/5
T Fs 12-98941	2478	R-f suppressor case	VII/9, 47
T Fs 16-98886	2311	Stop button	VI/44
T Fs 16-98887	2312	"L" button	VI/44
T Fs 16-98888	2313	Start button	VI/44
T Fs 16-98889	2314	"R" button	VI/44
T Fs 16-98895	2039	Paper deflecting plate	III/10
T Fs 16-98896	2431	Transmitter cover	VII/1
T Fs 16-98901*	2031	Special function key assembly	III/4, 5
T Fs 16-98904	2037	Spring	III/6
T Fs 16-98905	2038	Metal strip	III/6
T Fs 16-98906	2032	Shaft	III/5, 6
T Fs 16-98907	2036	Pressure spring	III/6
T Fs 16-98910	2720	Tube	—
T Fs 16-98914	2034	Pin	III/5, 6
T Fs 16-98915	2104	Metal strip	IV/1, 2
T Fs 16-98929	2294	Adjusting plate	VI/44
T Fs 16-98930	2021	Key frame	III/5, 6, 7
T Fs 16-98934	2010	Catch	III/1, 9
T Fs 16-98935	2020	Retainer plate	III/7
T Fs 16-98936	2006	Recessed neck screw	III/1
T Fs 16-98939	2011	Latch plate	III/1, 8

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T F 16-98960	52	Clamping piece	III/4
T Fs 16-98961	2429	Cover	VII/1
T Fs 16-98963	2008	Pushbutton	III/1
T Fs 16-98964	2014	Bearing pin	III/1, 4
T Fs 16-98965	2009	Cover bracing bar	III/1, 4
T Fs 16-98966	2019	Key	III/1, 4, 5, 6, 7
T Fs 16-98967	2015	Bearing pin	III/1, 4
T Fs 16-98970	3	Paper roll axle	II/3
T Fs 16-98971	12	Glass plate	II/3
T Fs 16-98972	2206	Tape exit	VI/3
T Fs 16-98974	6	Lever	II/3
T Fs 16-98976	2285	Stop button	VI/3
T Fs 16-98977	2286	"L" button	VI/3
T Fs 16-98978	2287	Start button	VI/3
T Fs 16-98979	2288	"R" button	VI/3
T Fs 16-98997	2023	Paper guide	III/4
T Fs 16-98999	2219	Pushbutton assembly	VI/7, 44
T Fs 16-99000	2220	Plate	VI/7
T Fs 16-99001	2721	Paper supply bin	X/1, 2
T Fs 16-99002	2722	Guide plate	X/1, 2
T Fs 16-99011	2307	Key assembly	VI/7, 44
T Fs 16-99012	2309	Tape channel	VI/44
T Fs 16-99013	2308	Plate	VI/7
T Fs 16-99016*	2016	Cover for basic version (a)	III/1, 8
T Fs 16-99025*	2007	Cover	III/1, 4, 9
T Fs 16-99043*	2013	Visor	III/1, 4
T Fs 16-99065	2001	Cover, compl. (basic version)	III/1, 4
T Fs 16-99088*	2257	Reperforator cover	VI/5
T Fs 16-99233	2723	Bar	X/2
T Fs 16-99234	2724	Paper supply bin	X/3, 4
T Fs 16-99235	2707	Cover plate	—
T Fs 16-99236	2708	Cover plate	—
T Fs 16-99241	671	Tube	II/3
T Fs 16-99245	5	Paper roll carrier	II/3
			III/1
T Fs 17-80042	3007	Rectifier (Gr. 7)	V/26, 27, 28, 29
T Fs 22-00990	3039	Socket	—
T Fs 25-98925	5336	Connecting cable, red	V/28
T Fs 25-98992	3038	Connecting cord	VII/57
T Fs 27-00006	55	Bearing cap	II/13
T Fs 27-00007	59	Cover	II/13
T Fs 27-00008	54	Lower half of motor casing	II/13, 220, 229
T Fs 27-00009	49	Motor 220 v AC, 40—60 cps	II/13, 220
T Fs 27-00020	617	Motor with governor, 220 v AC (40—60 cps)	II/220
T Fs 27-00021	330	Ground wire	II/13
T Fs 27-00024	(617)	Motor with governor	—



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T Fs 27-00025	(617)	220 v AC (50 cps)/110 v DC Motor with governor	—
T Fs 27-00026	(617)	115 v AC (60 cps) Motor with governor	—
T Fs 27-00027	(49)	220 v DC Motor 220 v AC (50 cps)/	—
T Fs 27-00028	(49)	110 v DC	—
T Fs 27-00029	(49)	Motor 115 v AC (60 cps)	—
T Fs 27-00041	(617)	Motor 220 v DC	—
T Fs 27-00042	(49)	Motor with governor	—
T Fs 27-00044	591	240 v AC (40—60 cps) Motor 240 v AC (40—60 cps)	—
T Fs 27-00046	332	Recessed neck screw	II/13, 229 XI/1
T Fs 27-99014	117	Stroboscopic disc	II/13
T Fs 27-99017	350	Brush holder ring	II/13, 220
T Fs 31-98971	29	Motor carbon brush	II/13, 220
T Fs 31-98979	28	Cover	II/13, 220
T Fs 31-98982	351	Contact governor	II/13, 220
T Fs 31-98988	317	Governor spring	II/13, 221
T Fs 31-98992	519	Contact arm, compl.	II/221
T Fs 39-48604	666	Recessed neck screw	II/13, 20, 220 VII/9, 47
T Fs 43-60001	213	Screw cap	V/6
T Fs 45-28029	655	Bell dome	II/68, 149
T Fs 52-53356	472	Transformer	V/6, 27
T Fs 70-02721	323	Leaf spring	II/43
T Fs 70-02928	653	Governor carbon brush	II/13, 220
T Fs 70-04405	1	Shorting link	VII/56, 57
T Fs 70-05479	2107	Telegraph plug	II/1
T Fs 70-05480	2108	Metal strip	IV/1
T Fs 70-05699	390	Metal strip	IV/1
T Fs 70-05990	245	Lock washer	—
T Fs 70-05992	475	Adjusting gage	II/100 VII/23
T Fs 70-06021	318	Type bar replacing tool	—
T Fs 70-06026	319	Contact spring	II/221
T Fs 70-06031	316	Stop	II/221
T Fs 70-06415	152	Pressure plate	II/221
T Fs 70-06445	343	Washer	II/14, 15
T Fs 70-10002	2457	Washer	II/15
T Fs 70-11115	2239	Feed wheel	VII/8, 39
T Fs 70-12034	557	Segment	VI/13
T Fs 70-12223	326	Tension spring	II/62, 64, 169
T Fs 70-12226	616	Code comb	II/8, 9, 10
T Fs 70-12235	561	Tension spring	II/199
T Fs 70-16043	2467	Washer	II/8
T Fs 70-16103	2430	Lubricating felt	VII/8
T Fs 70-16184	3010	Pawl	VII/39
		Axle	V/18, 20

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T Fs 70-26694	2483	Pressure spring	VII/10, 38
T Fs 70-26695	2470	Clutch half	VII/9, 13, 14, 33, 38
T Fs 70-27085	2411	Clip connector	VII/5
T Fs 70-27275	628	Clamping lever	II/118
T Fs 70-30676	395	Washer	II/18, 45
T Fs 70-53203	360	Washer	II/21
T Fs 71-53783	2414	Shoulder screw	VII/5
T Fs 72-00001	44	Special function key assembly	II/12, 13, 222, 225
T Fs 72-00002	81	Operation time counter	II/228 VII/4, 42
T Fs 72-00019	2551	Pull bar	VIII/1, 2
T Fs 72-00024	2211	Intermediate shaft	VI/4, 20
T Fs 72-00027	76	Plug connector	II/20
T Fs 72-00028	80	Lever	II/226
T Fs 72-00043	2105	Copy clamp	IV/1
T Fs 72-00044	2106	Copy clamp	IV/1
T Fs 72-00051	2550	Pull bar	VIII/1, 2
T Fs 72-00052	2553	Pull bar	VIII/1, 2
T Fs 72-00056	2552	Pull bar	VIII/1, 2
T Fs 72-00067	3029	Clip connector	VII/5
T Fs 72-00069	2109	Copy clamp	IV/1
T Fs 72-00109	2725	Paper deflecting plate	X/3
T Fs 72-00121	2726	Storage bin (DIN A4 paper size)	X/1, 2, 3, 4
T Fs 72-00131	2727	Storage pin (DIN A5 paper size)	X/1, 2, 3, 4
T Fs 72-00161*	2202	Tape maginze	VI/3, 5, 6
T Fs 72-00231	3046	Lead (U23)	VII/62
T Fs 72-03018	65	Lever	II/225
T Fs 72-03019	64	Plate	II/225
T Fs 72-03024	73	Bail	II/225, 226
T Fs 72-03036	67	Terminal strip	II/13 XI/1
T Fs 72-03051	2753	Helical gear, 45.5 bauds	} for machines with commutator motor (3750 rpm)
T Fs 72-03052	61	Helical gear, 50 bauds	
T Fs 72-03053	2755	Helical gear, 45.5 bauds	} for machines with synchronous motor (3000 rpm)
T Fs 72-03054	2759	Helical gear, 74.23 bauds	
T Fs 72-03055	2765	Helical gear, 75 bauds	} for machines with commutator motor (3750 rpm) II/228
T Fs 72-03057	344	Helical gear	
T Fs 72-03061	2754	Gear, 45.5 bauds	} for machines with commutator motor (3750 rpm) XI/1 II/229
T Fs 72-03062	62	Gear, 50 bauds	
T Fs 72-03063	2756	Gear, 45.5 bauds	} for machines with synchronous motor (3000 rpm)
T Fs 72-03064	2760	Gear, 74.23 bauds	
T Fs 72-03065	2766	Gear, 75 bauds	} for machines with synchronous motor (3750 rpm)

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T Fs 72-03079	85	Terminal strip	II/33 V/7, 27
T Fs 72-03080	2557	Pinion	VIII/1
T Fs 72-03081	2555	Guide plate	VIII/1
T Fs 72-03082	2556	Guide bracket	VIII/1
T Fs 72-03091	2218	Bracket	VI/6
T Fs 72-03092	2213	Felt	VI/4
T Fs 72-03113	2761	Helical gear, 74.23 bauds	} for machines with synchronous motor (3000 rpm)
T Fs 72-03114	2767	Helical gear, 75 bauds	
T Fs 72-03115	2757	Helical gear, 45.5 bauds	} for machines with synchronous motor (3600 rpm)
T Fs 72-03118	2763	Helical gear, 74.23 bauds	
T Fs 72-03119	2769	Helical gear, 75 bauds	
T Fs 72-03123	2762	Gear, 74.23 bauds	} for machines with synchronous motor (3000 rpm)
T Fs 72-03124	2768	Gear, 75 bauds	
T Fs 72-03125	2758	Gear, 45.5 bauds	} for machines with synchronous motor (3600 rpm)
T Fs 72-03128	2764	Gear, 74.23 bauds	
T Fs 72-03129	2770	Gear, 75 bauds	
T Fs 72-03142	477	Tension spring	II/57, 166 IX/9
T Fs 72-03149	2212	Sleeve	VI/4, 20
T Fs 72-03219	2728	Retaining plate	V/1, 2, 4
T Fs 72-03279	2304	Core	VI/3
T Fs 72-07051	43	Motor with casing, 240 v AC (40—60 cps)	II/12, 13, 229 XI/1
T Fs 72-07061	(43)	Motor with casing, 220 v AC (50 cps)/110 v DC	—
T Fs 72-07062	(43)	Motor with casing, 115 v AC (60 cps)	—
T Fs 72-07065	(43)	Motor with casing, 220 v AC (40—60 cps)	—
T Fs 72-07073	(43)	Motor with casing, 220 v DC	—
T Fs 72-08002	66	Cable	II/13
T Fs 72-08005	84	Cable	II/33
T Fs 72-08045	2400	Cable	VIII/4, 12
T Fs 72-08100	668	Cable 1	V/5, 26, 27, 28, 29
T Fs 72-08101	667	Cable 2	V/27
T Fs 72-08102	3006	Cable 3	V/7, 27, 28, 29
T Fs 72-08114	661	Cable 7	II/235 V/6, 27
T Fs 72-08115	3037	Cable 13	VII/57
T Fs 72-08118	674	Cable	II/235 VIII/1, 12
T Fs 72-08120	2694	Cable 1	IX/11, 36
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T Fs 72-08124	3045	Cable 14	VII/62
T Fs 72-10000- 20000*	42	Keyboard	II/12, 13, 222
T Fs 72-10002	2457	Feed wheel	VII/8, 39

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T Fs 72-10007	135	Release lever	II/17, 18, 87, 88
T Fs 72-10008	231	Key lever	II/15, 89
T Fs 72-10009*	162	Key lever	II/15, 89
T Fs 72-10010	252	Key lever	II/15, 89
T Fs 72-10011	279	Key lever	II/15, 89
T Fs 72-10012	325	Key lever	II/15
T Fs 72-10021	121	Stop bar	II/80, 89
T Fs 72-10037	132	Bracket	II/18, 88
T Fs 72-10046	131	Detent	II/14, 85, 86, 90
T Fs 72-10047	30	Key lever set	II/14, 16
T Fs 72-10049	571	Key lever with tube	II/14
T Fs 72-10052	619	Lever	II/14
T Fs 72-10053	57	Key lever with tube	II/14, 16
T Fs 72-10054	587	Key lever set	—
T Fs 72-10061	333	Plate with rivet	II/19, 87
T Fs 72-13000/..*	353	Locking bar	II/14, 15, 82, 83, 85, 86, 90
T Fs 72-13010	577	Felt washer	II/19
T Fs 72-13020	129	Spacer	II/82, 91
T Fs 72-13028	134	Guide plate	II/17, 87, 88
T Fs 72-13030	228	Rod	II/15
T Fs 72-13031	580	Key lever	II/16
T Fs 72-13032	581	Key lever	II/16
T Fs 72-13033	582	Key lever	II/16
T Fs 72-13034	583	Key lever	II/16
T Fs 72-13036	579	Key button	II/16
T Fs 72-13038	584	Key button	II/16
T Fs 72-13086	122	Frame	II/15, 80, 81, 82
T Fs 72-13087	123	Comb	II/14, 15, 80, 81
T Fs 72-13088	133	Start bail	II/19, 87
T Fs 72-13098	459	Tube	II/14, 16
T Fs 72-13100	71	Code bar, 1st to 5th signal element	II/14, 15, 20, 82, 83, 84, 91
T Fs 72-13107	166	Key lever	II/14, 15, 89
T Fs 72-13108	102	Torsion spring	II/14, 16, 18
T Fs 72-13109	588	Torsion spring	—
T Fs 72-13110	130	Bracket	II/14, 15, 83, 84, 86
T Fs 72-13115	329	Clip	II/17
T Fs 72-13116	69	Bolt	II/14, 16, 19
T Fs 72-13124	573	Comb	II/15, 82
T Fs 72-20000- 10000	45	Transmitter	II/12, 20, 222, 224
T Fs 72-20003	155	Zero-setting lever	II/26, 104
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T Fs 72-20006	146	Feed lever	II/26, 31, 32, 97, 107, 108
T Fs 72-20007	68	Lever with bushing	II/25, 92, 103
T Fs 72-20019	170	Contact switching assembly	II/22, 100, 112, 115
T Fs 72-20025	139	Clutch half	II/21, 23, 25, 29, 95, 99
T Fs 72-20027	167	Contact spring set	II/22, 112, 114, 115 VII/6, 18, 25, 46

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T Fs 72-20036	380	Lubricating assembly	II/25
T Fs 72-20042	143	Control disc	II/31, 32, 97, 107, 108, 227
T Fs 72-20043	551	Drive	II/31, 32
T Fs 72-20044	144	Ratchet	II/31, 32, 97, 107, 108
T Fs 72-20045	141	Lever	II/23, 96, 97, 98, 108, 109, 227
T Fs 72-20048	327	Answerback drum	II/7, 8, 9, 20
T Fs 72-20050	381	Lubricating assembly	II/24, 28
T Fs 72-20054	151	Lever with release pawl	II/23, 29, 101, 110
T Fs 72-20063	156	Tension spring	II/25, 26, 104
T Fs 72-20066	5314	Contact spring set	VII/51, 52
T Fs 72-20074	554	Cover	II/21
T Fs 72-20090	356	Braking disc	II/22
T Fs 72-20103	142	Lever with shaft	II/23, 96, 101, 226, 227 V/11
T Fs 72-20104	150	Locking lever	II/23, 27, 29, 101, 110, 111, 225
T Fs 72-20105	148	Locking bail	II/27, 98, 99, 109, 223
T Fs 72-20123	3034	12-v contact	VIII/47
T Fs 72-23012	383	Supporting plate	II/24
T Fs 72-23013	140	Cam shaft	II/24, 25, 96, 98, 99, 100, 104, 105, 110, 111
T Fs 72-23020	138	Guide comb	II/94
T Fs 72-23021	543	Axle	II/28
T Fs 72-23023	70	Lever	II/21, 27, 94, 98, 99, 109, 223
T Fs 72-23024	374	Lever	II/21, 27, 94, 98, 99, 109, 223
T Fs 72-23025	375	Lever	II/21, 27, 94, 98, 99, 109, 223
T Fs 72-23026	376	Lever	II/21, 27, 94, 98, 99, 109, 223
T Fs 72-23027	377	Lever	II/21, 27, 94, 98, 99, 109, 223
T Fs 72-23028	373	Axle	II/27
T Fs 72-23029	367	Lever	II/27
T Fs 72-23030	368	Lever	II/27
T Fs 72-23031	369	Lever	II/27
T Fs 72-23032	370	Lever	II/27
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T Fs 72-23034	364	Tube	II/26
T Fs 72-23035	366	Felt washer	II/26, 51, 72
T Fs 72-23038	157	Code lever	II/26, 93, 105
T Fs 72-23039	365	Felt washer	II/25, 26 VII/11
T Fs 72-23041	672	Rocker	II/93
T Fs 72-23047	363	Retaining plate	II/26
T Fs 72-23048	549	Felt washer	II/30 VII/11
T Fs 72-23049	159	Bail	II/25, 30, 106
T Fs 72-23050	550	Spacer	II/30
T Fs 72-23051	137	Guide comb	II/93
T Fs 72-23052	545	Bearing pin	II/24, 25
T Fs 72-23053	149	Release bail	II/25, 101, 110, 111, 113
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T Fs 72-23114	382	Spacer	II/24
T Fs 72-23147	544	Torsion spring	II/21
T Fs 72-23160	334	Star wheel	II/21, 99, 113
T Fs 72-23172	552	Leaf spring	II/31
T Fs 72-23174	379	Axle	II/28
T Fs 72-23191	165	Tension spring	II/23, 27, 29, 110 VI/11, 14, 15, 37
T Fs 72-23194	158	Tension spring	II/23, 25, 26, 31, 105, 108
T Fs 72-23201	359	Spacer	II/21
T Fs 72-23202	673	Switching member	II/112
T Fs 72-23206	169	Leaf spring	II/22, 112
T Fs 72-23210	548	Axle	II/30
T Fs 72-23213	553	Locking lever	II/31
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T Fs 72-23225	154	Tension spring	II/24, 25, 26, 102, 111
T Fs 72-23242	540	Retainer	II/8
T Fs 72-23252	147	Resetting lever	II/27, 98, 109
T Fs 72-23305	670	Plate	II/22, 112
T Fs 72-23351	361	Washer	II/21
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T Fs 72-23464	669	Felt washer	—
T Fs 72-30000*	40	Mounting base	II/12, 13 VII/4, 5
T Fs 72-30008	50	Shock mount	II/13
T Fs 72-30017	2003	Cover mounting block	III/2
T Fs 72-30023	83	Intermediate shaft	II/17, 228, 229 V/6
T Fs 72-30025	515	Helical gear	VII/4
T Fs 72-30027	2415	Mounting frame	VII/4, 5
T Fs 72-30041	487	Gear sleeve	II/17 V/6
T Fs 72-30047	2005	Lead	III/2
T Fs 72-30048	2421	Helical gear	VII/4, 5
T Fs 72-30066	79	Shaft	II/20 VII/4
T Fs 72-30068	2406	Shaft	VII/4, 5, 42
T Fs 72-30069	2407	Shaft (for signal storage)	VII/42
T Fs 72-30087	656	Cover, compl.	V/6
T Fs 72-30098	664	R-f suppressor	V/6
T Fs 72-30100	657	Power supply unit	II/17 V/6
T Fs 72-33028	63	Pivot	II/222
T Fs 72-33037	286	Stop	II/206 IX/28
T Fs 72-33040	484	Cover	II/17 V/6 VII/5

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T Fs 72-33065	41	Bottom plate	II/12, 13 III/2 VII/4
T Fs 72-33086	72	Bracket	II/20, 222, 224
T Fs 72-33097	2002	Sealing ring	III/1, 2
T Fs 72-33098	2208	Stop	VI/4, 20
T Fs 72-33100*	2306	Handle	VI/6
T Fs 72-33107	2413	Bracket	VII/5
T Fs 72-33109	488	Nut	II/17 V/6
T Fs 72-33114	509	Plate	VII/57
T Fs 72-33133	2420	Tube	VII/5
T Fs 72-33137	2417	Cover	VII/5
T Fs 72-33142	594	Spacer	—
T Fs 72-33143	14	Plate	II/13
T Fs 72-33144	21	Covering plate	II/13
T Fs 72-33165	590	Stop	II/229 XI/1
T Fs 72-40000- 10000	46	Receiver	II/12, 33, 40, 222
T Fs 72-40001	187	Mounting frame with bushings	II/126
T Fs 72-40004	396	Adjusting disc	II/38, 39
T Fs 72-40005	173	Locking lever	II/38, 39, 116, 124, 130, 131
T Fs 72-40006	186	Lever with bushing	II/38, 123, 129
T Fs 72-40007	184	Start-stop armature	II/34, 38, 39, 123, 124, 127, 131 VIII/1
T Fs 72-40008	180	Selector armature	II/34, 38, 119, 120, 121, 122, 128 XI/2, 4
T Fs 72-40020	181	Magnet with residual plate	II/35, 38, 119
T Fs 72-40024	391	Guide plate with pin	II/37, 118
T Fs 72-40025	177	Stop plate with pin	II/37, 118, 132
T Fs 72-40028	88	Lever	II/35, 37, 134
T Fs 72-40041	503	Selector lever	II/35, 36, 37, 120, 121, 122, 125, 133
T Fs 72-40043	504	Lever with sword	II/35, 37, 125, 132
T Fs 72-40044	525	Pointer	II/7, 39, 135 XI/6
T Fs 72-40058	499	Friction clutch	II/33, 36, 38, 118
T Fs 72-43003	172	Cam shaft	II/36, 116, 119, 120, 121, 123, 125, 129, 130, 131, 132, 133, 134
T Fs 72-43022	190	Torsion spring	II/38, 129
T Fs 72-43023	171	Release lever	II/38, 116, 124, 130, 131
T Fs 72-43024	191	Tension spring	II/38, 130
T Fs 72-43025	397	Slack tape-up spring	II/39
T Fs 72-43027	82	Plate	II/35, 36
T Fs 72-43028	183	Axle	II/34, 119
T Fs 72-43029	385	Washer	II/34
T Fs 72-43033	185	Lever	II/34, 119, 123, 124

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T Fs 72-43049	2244	Tension spring	VI/13, 39 VII/9, 33, 34, 43
T Fs 72-43050	174	Guide plate	II/37, 117
T Fs 72-43055	393	Lubricating washer	II/34, 37, 38
T Fs 72-43056	386	Lubricating washer	II/37, 38
T Fs 72-43060	194	Tension spring	II/34, 36, 56, 133, 180
T Fs 72-43062	33	Adjusting plate	II/7, 126, 127, 128 XI/4
T Fs 72-43063	189	Tension spring	II/34, 36, 126, 128 VI/18, 35 XI/2, 4
T Fs 72-43064	188	Tension spring	II/34, 36, 49, 57, 109, 126, 127, 165, 188 IX/9
T Fs 72-43069	175	Bushing	II/118
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T Fs 72-43095	192	Torsion spring	II/38, 131
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T Fs 72-43137	335	Tension spring	II/34, 36, 49, 50, 132, 175
T Fs 72-43139	2751	Tension spring	XI/2, 4
T Fs 72-43142	505	Adjusting plate	II/120, 121, 122
T Fs 72-43148	526	Plate	II/135 XI/6
T Fs 72-43191	195	Tension spring	II/37, 134
T Fs 72-50001*	47	Printer (without type basket carriage)	II/12, 33, 40, 222
T Fs 72-50015	306	Bracket	II/77, 215, 218 V/17
T Fs 72-50016	454	Lever	II/72 IX/28
T Fs 72-50017	2136	Lever	V/4, 12, 16, 17
T Fs 72-50020*	456	Type bar with type (specify characters)	II/73, 219
T Fs 72-50028	99	Bail	II/2, 53, 68, 70, 71, 144, 176, 214, 215
T Fs 72-50034	271	Lever	II/60, 183, 189
T Fs 72-50035	211	Lever	II/60, 149, 183, 189
T Fs 72-50043	276	Paper guide	II/46, 150, 194
T Fs 72-50045	218	Lever with bushing	II/46, 151, 152, 193 IX/4, 19



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T Fs 72-50047	217	Axle with pressure roller	II/46, 151
T Fs 72-50052	215	Switching axle	II/42, 47, 150 IX/1, 10, 15
T Fs 72-50054	409	Axle with spur gear	II/47 IX/3
T Fs 72-50055	214	Lever	II/49, 149, 188
T Fs 72-50070	23	Carriage feed lever	II/61, 137, 167, 168
T Fs 72-50071	196	Bar with lever	II/60, 61, 143
T Fs 72-50073	345	Lever	II/62, 213
T Fs 72-50074	431	Lever	II/62
T Fs 72-50075	290	Detent bracket	II/63, 138, 213
T Fs 72-50078	246	Control bail	II/56, 170
T Fs 72-50079	19	Anti-bounce pawl	II/64, 136, 159, 169, 187
T Fs 72-50081	205	Bail	II/64, 65, 145, 146, 171
T Fs 72-50084	92	Release lever	II/41, 69, 159, 163, 187, 227 V/2, 9
T Fs 72-50085	249	Compensating roller	II/64, 172
T Fs 72-50087	314	Impact adjuster	II/4, 49, 69, 230 XI/2
T Fs 72-50090	107	Printer bail	II/2, 33, 50, 71, 173, 214, 215
T Fs 72-50091	251	Cam roller	II/49, 50, 173
T Fs 72-50095	16	Parallel guide	II/4, 49, 70, 174, 175, 216 IX/8 XI/2
T Fs 72-50096	20	Sleeve with ratchet	II/50, 137, 165, 166, 167, 205 IX/5, 12 XI/3
T Fs 72-50098	26	Detent	II/57, 137, 165, 205 IX/12 XI/3
T Fs 72-50099	240	Lever	II/57, 166
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T Fs 72-50118	455	Segment with type bar	II/73, 210
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T Fs 72-50125	305	Roller carrier	II/76, 214, 215
T Fs 72-50145	22	Ink ribbon lifter	V/16, 17
T Fs 72-50149	284	Feed rack	II/76, 205, 206, 207, 215 IX/12, 14, 28
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T Fs 72-50181	227	Spool carrier	II/5, 43, 155, 156, 157, 195, 196, 197, 198, 202 IX/4, 17
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T Fs 72-50190	235	Lever	II/44, 156, 199, 203
T Fs 72-50192	346	Ribbon feed linkage	II/43, 54, 58, 59, 173 IX/4
T Fs 72-50195	408	Bail	II/55, 57, 160
T Fs 72-50196	37	Pull bar	II/6, 48, 57, 191
T Fs 72-50197	36	Lever	II/6, 46, 48, 191, 192 IX/3
T Fs 72-50198	104	Roller	II/2, 71, 79
T Fs 72-50200	282	Tensioning lever	II/200
T Fs 72-50206	2656	Sprocket-feed platen	IX/2, 18, 19, 20, 22, 23
T Fs 72-50210	232	Detent	II/155, 157, 197, 198
T Fs 72-50212	206	Lever	II/41, 65, 147, 186, 227 V/9, 24, 25
T Fs 72-50213	259	Shaft with lever	II/41, 186, 227 V/3, 8, 9, 11, 14, 25
T Fs 72-50217	311	Pull bar	II/72, 218 V/12, 16, 17
T Fs 72-50218	285	Guide	II/76, 206, 217 IX/28
T Fs 72-50219	229	Reversing bar	II/155
T Fs 72-50221	2137	Control bar	V/1, 2, 3, 10, 11, 12, 13, 15, 16, 17, 18, 23
T Fs 72-50222	2138	Lever	V/1, 2, 12, 15
T Fs 72-50223	2161	Lever with shaft	—
T Fs 72-50224	27	Eccentric	II/63, 138
T Fs 72-50228	3011	Magnet assembly	V/20, 21, 26, 27, 28, 29
T Fs 72-50230	3012	Magnet coil	V/21
T Fs 72-50231	2151	Lever	V/3, 8, 10, 11, 14, 18, 23
T Fs 72-50233	2160	Lever	V/3, 8, 10, 11, 18, 23
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T Fs 72-50236	3013	Armature holding plate	V/19, 20, 21
T Fs 72-50239	221	Guide plate, compl.	II/150, 153
T Fs 72-50247	98	Shock absorber	II/2, 66, 71, 158, 201, 207 IX/14
T Fs 72-50256	532	Type bar rest	II/73, 219
T Fs 72-50257	2662	Paper guide	IX/4, 9, 18, 19
T Fs 72-50259	559	Tension spring	II/50, 51, 173
T Fs 72-50260	223	Line feed pawl with pin	II/48, 154, 191, 192 IX/22
T Fs 72-50263	242	Supporting plate	II/157
T Fs 72-50286	538	Bail	II/74, 79, 212
T Fs 72-50297	629	Push rod	II/72, 215
T Fs 72-50298	622	Lever with axle	II/46, 150, 151 IX/4, 16, 18
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T Fs 72-50347	612	Bell	II/149
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T Fs 72-50392	2752	Carriage return spring	XI/2
T Fs 72-50396	676	Pusher	II/215
T Fs 72-50397	237	Clutch half	II/159, 187
T Fs 72-50398	265	Locking pawl	II/187
T Fs 72-50399	268	Pawl	II/187 VI/18
T Fs 72-50441	3005	Release shaft	V/8, 9, 11, 14, 23
T Fs 72-50446	2678	Tabulator rail, compl. (69 characters per line, 2.5 mm character spacing)	IX/1, 10, 21, 23
T Fs 72-50447	2682	Tabulator rail, compl. (71 characters per line, 2.5 mm character spacing)	IX/1, 10, 21, 23
T Fs 72-50448	2683	Tabulator rail, compl. (104 characters per line, 1.65 mm character spacing)	IX/1, 10, 21, 23
T Fs 72-50453	2684	Tabulator rail, compl. (69 characters per line, 1 inch character spacing for every 10 characters)	IX/1, 10, 21, 23
T Fs 72-50457	2687	Position indicator contact	IX/11, 29, 30, 33, 34, 36
T Fs 72-50458	2688	Mounting base	IX/30, 31, 33
T Fs 72-50464	2685	Paper guide	IX/9
T Fs 72-50474	3000	Lever	V/12
T Fs 72-50481	2686	Switching axle	IX/10
T Fs 72-50496	2665	Paper saddle	IX/1, 10, 31
T Fs 72-50500	569	Clutch	II/49, 69, 159
T Fs 72-53043	462	Link	II/75, 79
T Fs 72-53045	313	Tension spring	II/73, 219 VII/10, 12, 32, 39
T Fs 72-53048	308	Type guide	II/72, 79, 215
T Fs 72-53057	476	Type bar hinge bow	II/73
T Fs 72-53068	2139	Pin	V/4, 12
T Fs 72-53070	678	Pull bar	II/215
T Fs 72-53073	453	Axle	II/72 IX/28
T Fs 72-53076	474	Retaining plate	II/73
T Fs 72-53139	109	Guide bar	II/2, 62, 63, 71, 138, 212 V/2, 3
T Fs 72-53141	38	Code bar	II/63, 138, 213 IV/4, 20, 21
T Fs 72-53142	563	Code bar	II/63, 138, 213 VI/4, 20, 21
T Fs 72-53143	564	Code bar	II/63, 138, 213 VI/4, 20, 21
T Fs 72-53144	565	Code bar	II/63, 138, 213 VI/4, 20, 21
T Fs 72-53145	566	Code bar	II/63, 138, 213 VI/4, 20, 21

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T Fs 72-53148	430	Axle	II/62
T Fs 72-53152	210	Bracket	II/148, 185
T Fs 72-53153	93	Comb	II/62, 140
T Fs 72-53154	94	Comb	II/62, 140
T Fs 72-53161	111	Transfer bar	II/2, 33, 62, 71, 213, 227 IX/3
T Fs 72-53171	435	Roller	II/53, 67
T Fs 72-53172	434	Plate	II/68
T Fs 72-53182	200	Fork	II/53, 66, 68, 144, 145, 146
T Fs 72-53183	352	Eccentric screw	II/66, 144
T Fs 72-53193	414	Axle	II/53, 68
T Fs 72-53216	443	Axle	II/60
T Fs 72-53217	444	Ring	II/60
T Fs 72-53218	270	Lever	II/49, 190
T Fs 72-53221	419	Axle	II/49
T Fs 72-53222	115	Plate	II/141
T Fs 72-53224	212	Bracket	II/149
T Fs 72-53226	442	Plate	II/60
T Fs 72-53249	273	Torsion spring	II/48, 192
T Fs 72-53251	225	Pull bar	II/55, 56, 57, 178, 179, 182
T Fs 72-53270	10	Lever	II/4, 152, 153
T Fs 72-53271	2580	Washer	VIII/3
T Fs 72-53274	321	Feed ratchet	II/191, 192
T Fs 72-53284	216	Axle	II/42, 150 IX/1, 10, 15
T Fs 72-53322	631	Felt	II/73, 208
T Fs 72-53324	469	Plate	II/43, 54, 139 IX/4
T Fs 72-53334	244	Tension spring	II/51, 56, 61, 168, 170, 179, 181, 182, 183, 184
T Fs 72-53335	18	Feed screw	II/50, 205, 206, 207 IX/14
T Fs 72-53343	120	Guide comb	II/61, 143
T Fs 72-53344	438	Axle	II/55, 57, 67
T Fs 72-53345	437	Adjusting plate	II/55, 57, 160 IX/4, 16
T Fs 72-53346	445	Axle	II/60
T Fs 72-53347	440	Ring	II/55
T Fs 72-53354	4	Lever	II/4, 42, 153
T Fs 72-53355	9	Lever	II/4, 42, 153
T Fs 72-53357	11	Tear-off plate	II/4, 47, 152, 153 IX/2, 20
T Fs 72-53367	266	Eccentric bushing	II/207 IX/14
T Fs 72-53370	260	Pull bar	II/55, 56, 178, 179, 181
T Fs 72-53371	261	Pull bar	II/56, 178, 179, 181, 184
T Fs 72-53372	262	Pull bar	II/56, 178, 179, 183
T Fs 72-53373	263	Pull bar	II/178, 179, 181
T Fs 72-53374	207	Pull bar	II/56, 147, 178, 180, 227 V/24

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T Fs 72-53376	204	Pull bar	II/53, 67, 145, 146, 178, 179, 181
T Fs 72-53377	90	Pull bar	II/53, 67, 138, 178
T Fs 72-53378	441	Axle	—
T Fs 72-53379	452	Axle	II/60
T Fs 72-53380	197	Axle	II/60, 143
T Fs 72-53381	199	Square	II/60, 143
T Fs 72-53382	198	Lever comb	II/60, 143, 179, 180, 181, 182, 183, 184
T Fs 72-53385	119	Comb	II/56, 142
T Fs 72-53390	610	Axle	II/65
T Fs 72-53392	574	Push rod	II/41, 65, 147, 171, 178, 186, 227 V/9, 24, 25
T Fs 72-53398	491	Washer	II/51
T Fs 72-53400	17	Cam shaft	II/51, 59, 136, 137, 145, 146, 159, 167, 168, 169, 170, 171, 172, 173 VI/4, 20
T Fs 72-53406	606	Bracket	II/51
T Fs 72-53407	250	Tension spring	II/50, 51, 59, 64, 172, 202
T Fs 72-53408	424	Axle	II/49, 50, 69
T Fs 72-53429	457	Bracket	II/53
T Fs 72-53431	113	Rail	V/2
T Fs 72-53439	420	Axle	II/50
T Fs 72-53449	105	Supporting rail	II/2, 56, 71, 214, 215
T Fs 72-53450	490	Stop	II/56
T Fs 72-53459	25	Eccentric pin	II/57, 137
T Fs 72-53463	413	Felt washer	II/46, 47
T Fs 72-53464	446	Felt washer	II/62, 79 V/1, 2, 9
T Fs 72-53465	421	Felt washer	II/49 VI/17
T Fs 72-53466	400	Felt washer	II/41, 55, 60, 69 VI/13, 43
T Fs 72-53467	411	Felt washer	II/46 VIII/3
T Fs 72-53468	410	Felt washer	—
T Fs 72-53469	401	Felt washer	II/41, 49, 50 V/9 VI/18
T Fs 72-53470	418	Felt washer	II/51, 53, 64, 68
T Fs 72-53473	248	Tension spring	II/64, 171
T Fs 72-53488	247	Tension spring	II/53, 55, 67, 180, 181, 182, 184 V/19
T Fs 72-53489	272	Tension spring	II/46, 191
T Fs 72-53494	315	Pusher	II/77, 215 V/16, 17
T Fs 72-53501	467	Axle	II/76 V/4, 12
T Fs 72-53503	239	Tension spring	II/49, 60, 189, 190
T Fs 72-53513	436	Felt washer	II/53, 67 VI/18

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T Fs 72-53515	465	Comb	II/74
T Fs 72-53516	295	Guide comb	II/75, 208
T Fs 72-53517	309	Axle	II/74, 212
T Fs 72-53518	297	Guide comb	II/74, 78, 211, 212
T Fs 72-53519	291	Pusher segment	II/77, 209, 214 V/12, 16, 17
T Fs 72-53521	299	Code segment	II/75, 79, 212, 214
T Fs 72-53522	300	Code segment	II/75, 79, 212, 214
T Fs 72-53523	301	Code segment	II/75, 79, 212, 214
T Fs 72-53524	302	Code segment	II/75, 79, 212, 214
T Fs 72-53525	303	Code segment	II/75, 79, 212, 214
T Fs 72-53526	460	Locking segment	II/75, 79
T Fs 72-53533	322	Type bar segment	II/210
T Fs 72-53604	243	Tension spring	II/60, 61, 76, 167, 168, 183, 217 V/3, 8, 14
T Fs 72-53622	101	Eccentric pin	II/2, 71, 78, 214, 215
T Fs 72-53625	298	Pull bar	II/73, 214
T Fs 72-53667	287	Stop	II/207 IX/14
T Fs 72-53669	310	Pawl	II/217
T Fs 72-53670	110	Lever	II/2, 71, 74, 79
T Fs 72-53681	470	Sliding block	II/76, 206
T Fs 72-53694	238	Star wheel	II/159, 163, 187
T Fs 72-53704	202	Pinion with eccentric	II/53, 144, 145, 146
T Fs 72-53712	288	Eccentric disk	II/207 IX/14 XI/5
T Fs 72-53713	523	Shoulder screw	II/207 IX/14 XI/5
T Fs 72-53717	97	Brake lever	II/2, 71, 201, 206, 207 IX/7, 14
T Fs 72-53722	568	Guide stop	II/154
T Fs 72-53738	230	Lever	II/155
T Fs 72-53756	603	Lever	II/44, 156
T Fs 72-53758	320	Bracket	II/43, 155 IX/17
T Fs 72-53759	234	Bracket	II/43, 155 IX/17
T Fs 72-53760	278	Feed pawl	II/44, 195 IX/4
T Fs 72-53774	611	Slotted nut	II/66
T Fs 72-53776	96	Pin	II/2, 71
T Fs 72-53777	95	Lock	II/2, 71, 201
T Fs 72-53785	163	Tension spring	II/27, 109, 177
T Fs 72-53787	427	Pressure piece	II/50
T Fs 72-53788	542	Bolt	II/77, 79
T Fs 72-53795	241	Tension spring	II/46, 194 IX/4
T Fs 72-53805	283	Torsion spring	II/200
T Fs 72-53809	2679	Brake lever	IX/7, 14

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T Fs 72-53820	275	Tension spring	II/46, 193
T Fs 72-53821	403	Tension spring	II/42, 73, 208 VII/8, 11, 33, 35 IX/1, 10
T Fs 72-53831	257	Tension spring	II/51, 53, 68, 176
T Fs 72-53835	209	Bail	II/41, 148, 185, 227 V/9 VI/22, 23, 24
T Fs 72-53844	570	Tension spring	II/203
T Fs 72-53846	602	Lever	II/44, 156
T Fs 72-53851	2142	Pawl	V/1, 2, 12, 15
T Fs 72-53857	677	Stop	II/215
T Fs 72-53862	53	Bushing	II/63, 138
T Fs 72-53865	429	Axle	II/62 V/1
T Fs 72-53866	546	Tension spring	II/24, 103, 185 V/1, 9, 12, 15 VI/10, 12, 42
T Fs 72-53867	312	Tension spring	II/57, 73, 218
T Fs 72-53869	264	Tension spring	II/41, 186 V/9, 25
T Fs 72-53872	2145	Locking bracket	V/13
T Fs 72-53877	3015	Magnet yoke	V/20
T Fs 72-53880	3016	Threaded plate	V/7
T Fs 72-53897	3017	Clamp	V/20
T Fs 72-53905	2680	Feed screw	IX/5, 12
T Fs 72-53906	2681	Feed rack	IX/6, 12
T Fs 72-53907	625	Bracket with bushing	II/46, 150 IX/4, 18
T Fs 72-53915	3018	Bracket	V/7
T Fs 72-53932	254	Latching lever	II/51, 174, 175, 216
T Fs 72-53933	255	Lever	II/51, 174, 216
T Fs 72-53935	339	Tension spring	II/51, 174
T Fs 72-53938	112	Spring suspension plate	II/2, 71
T Fs 72-53940	341	Tension spring	II/201
T Fs 72-53945	464	Pressure spring	II/74
T Fs 72-53946	537	Guide comb	II/73, 77, 210, 218
T Fs 72-53959	340	Tension spring	V/340
T Fs 72-53963	535	Bail	II/73
T Fs 72-53966	533	Suspension plate	II/208
T Fs 72-53967	534	Suspension plate	II/208
T Fs 72-53968	337	Bearing pin	II/43, 54, 58, 156 IX/4
T Fs 72-53976	128	Stop	II/91, 157
T Fs 72-53977	277	Pawl	II/45, 157, 196 IX/4
T Fs 72-53981	560	Bracket	II/73, 75, 79, 212
T Fs 72-53983	2669	Stop	IX/4
T Fs 72-53984	593	Rod	II/3

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T Fs 72-53987	539	Ribbon lifter	II/2, 5, 71, 73, 79, 215
T Fs 72-53999	592	Carriage return spring	II/2, 71 XI/2
T Fs 72-54061	522	Bushing	II/52, 164
T Fs 72-54062	521	Sliding weight	II/52, 164
T Fs 72-54063	520	Tension spring	II/52, 164
T Fs 72-54100	2671	Lever	IX/4
T Fs 72-54101	2672	Torsion spring	IX/4
T Fs 72-54151	2673	Pointer	IX/1, 23
T Fs 72-54152	2674	Threaded plate	IX/1, 22
T Fs 72-54158	528	Bushing	II/59, 162
T Fs 72-54163	597	Axle	II/59
T Fs 72-54164	596	Plate	II/57, 161
T Fs 72-54167	527	Cam disk	II/59, 162
T Fs 72-54195	599	Washer	—
T Fs 72-54239	615	Tension spring	II/43, 54 IX/4
T Fs 72-54251	2675	Guide bracket	IX/2, 18, 20
T Fs 72-54252	2677	Guide bracket	IX/2, 18, 20
T Fs 72-54276	632	Plate	II/5
T Fs 72-54287	605	Wire clip	II/50
T Fs 72-54328	91	Comb	II/62, 138
T Fs 72-54370	269	Torsion spring	II/187
T Fs 72-54372	267	Torsion spring	II/187
T Fs 72-54484	2689	Lever	IX/30, 32, 33, 34
T Fs 72-54486	2692	Adjusting bracket	IX/32
T Fs 72-54487	2691	Bracket	IX/31
T Fs 72-54489	2690	Plate	IX/30
T Fs 72-54513	681	Pawl	II/198
T Fs 72-54515	236	Spring	II/187
T Fs 72-54533	2693	Bail	IX/35
T Fs 72-54557	118	Comb	II/51, 42
T Fs 72-54589	680	Washer	II/198
T Fs 72-60001	2209	Mounting frame with pins	VI/4, 18, 19, 25, 26
T Fs 72-60002	2267	Feed lever	VI/11, 18, 38, 39
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T Fs 72-60004	2242	Backspacing lever with pawl	VI/13
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