



# MAINTENANCE

**E 1 GENERAL DIRECTIONS FOR  
MECHANICS**  
Page 850

**E 2 KNOWLEDGE OF ELECTRICITY  
FOR MECHANICS**  
Page 860

**E 3 MECHANICAL HANDBOOK  
S-Z-T-EL-EZ-EA**  
Page 900

**ELNA JUNIOR**  
Page 980

**ELNA INDUSTRIAL**  
Page 1000

E1

**CENERAL DIRECTIONS  
FOR MECHANICS**

## GENERAL DIRECTIONS FOR MECHANICS

This manual has been compiled for the use of the technical personnel that takes care of the after-sales and repair service for our ELNA sewing machines. It is mainly intended to be of

### practical and useful help

to the ELNA mechanic in his daily work.

The perfect maintenance of our ELNA sewing machines requires a general basic training as a mechanic. We are today represented in more than 100 countries, where well-trained chief mechanics and mechanics are available, who can be considered experts in repairing our machines. A basic training of new mechanics can thus be given under very favourable conditions.

We have therefore refrained from publishing complete instructions for assembling our different models, but have preferred only to work out

### Instructions for Maintenance.

They contain all essential details, however, concerning assembling and regulating our various types of machines, but do not eliminate the need for a general basic knowledge and an introductory training by a chief mechanic. The ELNA tool kit and the spare parts catalogue are the mechanics' most important equipment. All the spare parts are faithfully reproduced in the catalogue, in their exact position and with their design numbers.

We have taken care to illustrate the instructions for maintenance as completely as possible. All the parts are shown as they have to be built into the machine. The text is as short as possible. We have confined ourselves to mentioning in a logical sequence how the spare parts for ELNA sewing machines are to be assembled and more detailed information is only given for details that do not strike the eye. To dismantle the machines, simply proceed in the opposite sense. Certain repairs, on which the perfect functioning of the machine particularly depends, are dealt with separately at the end of the instructions for each model.



We recommend that you follow the prescribed sequence when assembling the machine. This makes it possible for you to assemble or dismantle all the parts in the easiest way and in a minimum of time. This is particularly important

when removing only a limited number of parts

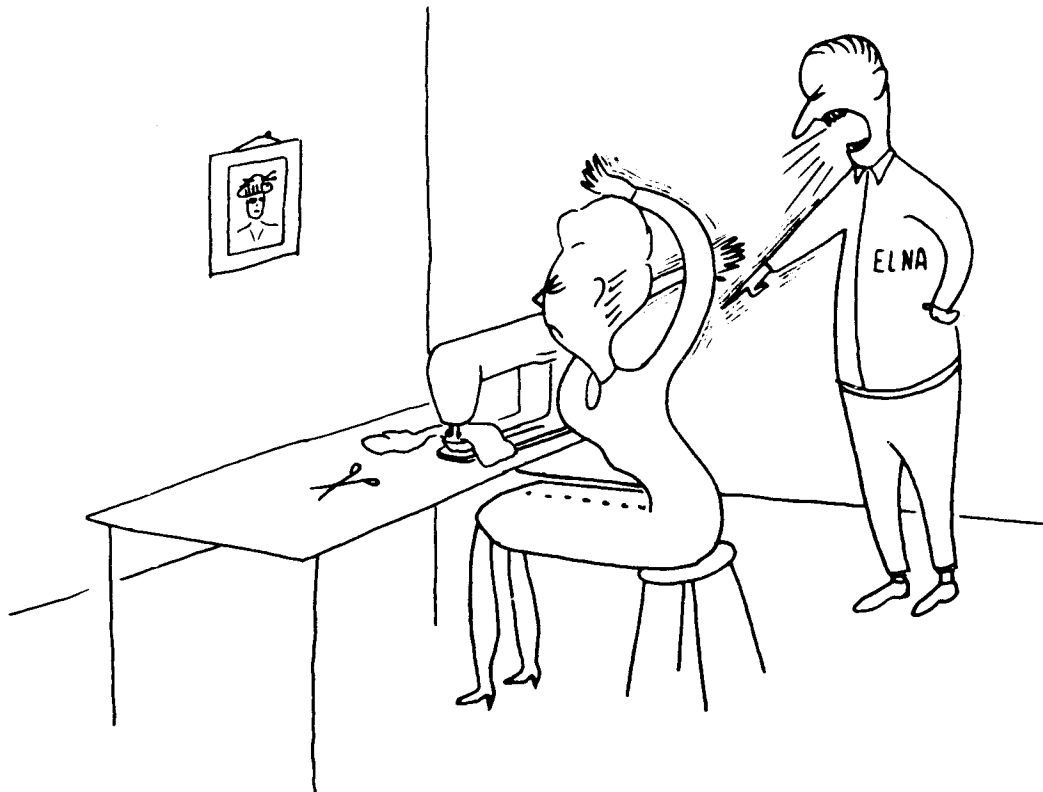
for repair purposes. The different parts are logically grouped, according to their purpose and aim. If not more parts than absolutely necessary are removed, time is saved and repair costs lowered.

When assembling and regulating the ELNA sewing machines, it is indispensable for you to be in possession of the appropriate tools and necessary gauges.

### Special Hints

Every mechanic must be in a position, after a quick examination of the machine, to say with certainty, whether the machine is working properly or, if necessary, what repair is needed. The way how to proceed is explained in detail in our manual "Introduction to Minor Repairs".

Often a mechanic is asked to call on customers and finds that the ELNA is working perfectly and that the complaint is only due to non-observation of a certain passage of the instruction booklet. Therefore, if the defect is not obvious, the customer should be asked to operate the machine and then watch, to see



- whether a correct needle (system and size) is used and whether it is properly inserted,
- whether the upper and lower threads are correctly chosen and threaded,
- whether the different adjustments have been made properly,
- whether the thread tensions are set at the correct values.

By proceeding in this manner, it is in most cases possible to find out whether the customer's complaint was justified or not. Every mechanic must know that it is often of serious consequence, if a customer has to send her machine in for repair. If this should happen repeatedly, the ELNA's reputation will surely suffer. Difficulties that are due to a customer's insufficient knowledge should therefore serve to instruct her further and better. In cases of genuine complaints, it goes without saying that they have to be remedied

with the greatest possible care and reliability.

Before taking any work in hand, make sure that the work bench is absolutely clean so that no dust or filings get into the machine and provoke disorders in the course of assembly.

The parts of the machine, especially those which are painted, chromium-plated or nickel-plated, must under all circumstances be handled very carefully.

The parts have to be assembled in such a manner, that the entire mechanism turns as freely as its function requires. Therefore, after fitting every moving part, check to see whether it turns freely. If hard spots are noticed, you must find out what they are due to, without exception. They are then to be remedied.

#### Greasing the Machine

For lubricating the machine Multifak No.2 grease (Caltex Oil Co.) is used. If Multifak No. 2 is not available, "BRB" 1 grease (Vacuum Oil Company) will also be suitable.

#### Oiling the Machine

To oil the machine, "Arctic Oil Light", supplied by the Vacuum Oil Co., should be used. If it is not available, the following other brands can be used:

1. S/V White Oil 309; suppliers: Vacuum Oil Co.
2. Caltex Home Lubricant; suppliers: Caltex Oil Co.
3. Capella Oil AA; suppliers: Caltex Oil Co.
4. Sphinxoline; suppliers: M.L. Paris

Self-lubricating bearings must not come into contact with kerosene or any other detergents but only with oil. Be particularly careful when cleaning with kerosene. Before assembling the machine, the bearings should be soaked in oil again. (Exception: the bobbin winder - it must never be oiled).

With the exception of the thumb screw No. 711'137 (for the fixation of the foot) of the cloth presser bar and the threaded holes on the cover of the free arm and the base plate of the flat bed models (for the fixation of special accessories) which have English threads, the metric system is used for all the screws and threaded holes.

### Sewing Samples after a Repair Job

Before giving the machine back to a customer, every mechanic should make sure that the machine is in perfect running order. Only after a sample has been sewn to your full satisfaction with the repaired machine, is it to be considered as properly repaired. The following samples should be sewn:

#### a. On all Models:

1. Thread the machine with darning thread and darn a hole on ordinary material.
2. Sew a few straight seams forwards and backwards with ordinary sewing thread.
3. Try the particular job the customer complained about.
4. Check the bobbin winder.

#### b. On Zig Zag Machines:

5. Sew a satin stitch at widths "2" and "4".
6. Make a buttonhole.

#### c. On Supermatic Machines:

7. Turkish Hemstitch with Elna-disc 101 at widths "2" and "4" on single and double material.
8. Sew pattern No. 107.
9. Make a buttonhole with the buttonhole disc, provided the machine is equipped with it, otherwise with Elna-disc 03.

d. On Automatic Machines:

10. Sew a scallop stitch (Elna-disc 05) at widths "2" and "4".
11. Make a buttonhole with Elna-disc 03.

Important !

Due to the fact that we are continuously improving our ELNA sewing machines, certain alterations are bound to occur from time to time. They are brought to our sales organizations' attention in our "Technical Information Bulletins", which are published periodically. Please always make a note of these alterations.

Every mechanic is to a great extent and decisively responsible for a good customer service. Let us not forget that the ELNA's good name depends first and foremost on a

Perfect Customer Service.

We must therefore endeavour to execute the jobs we are entrusted with very exactly and conscientiously. A job that is well done also gives us greater satisfaction. The instructions that follow are intended to help you to reach this objective.



**ELNA**

**E<sub>2</sub>**

**KNOWLEDGE OF  
ELECTRICITY FOR MECHANICS**

**TAVARO S.A.**

**AUGUST 1962**

**GENEVA**

**PRINTED IN SWITZERLAND**

## GENERAL EXPLANATIONS

Below you will find a few indications that deal with the maintenance of, the repairs to and changing the voltage of the various motors :

1. TAVARO motors nos 500'890 and 500'958 with adjustable rheostat: These were used, starting with machine number 183'640, for our first ELNA and are divided into groups that have been given Roman numerals I to VII.

Since the motors no. 500'890 are equipped with ball bearings, their armature cannot be replaced. The armatures for the motors no. 500'958, however, have self-lubricating bearings and are interchangeable.

2. TAVARO motors no. 500'970 with adjustable rheostat : These motors were used on our first ELNA, beginning with machine number 338'000, and are divided into groups A to E. The armatures for these motors are easily interchangeable, as they also have self-lubricating bearings.
3. TAVARO motors for our 1952, 1958 and 1959 models, with free arm or flat bed, namely :
  - a. Transforma - Zig Zag - Supermatic (1952  
(Plana) (Plana Zig Zag) (Plana Supermatic) models)
  - b. ELNA - ELNA Zig Zag - ELNA Automatic (1958 and 1959  
models)

For the standard voltages from 110 to 250 volts, these motors can be used both with alternating as well as direct current. They are divided into five groups A to E. For the Group C motors, however, the upper voltage limit of 160 volts is only valid for alternating current, 42 cycles.

The electrical part of the motors for our 1952 models and for our 1958 and 1959 models is identical. These motors merely differ in respect of the motor support and the position of the condenser.

The motors for our flat bed models have no resistance and no contactor, since these parts are located in the foot control.

For our free arm models with knee control, we moreover supply special motors for the voltages 32, 24 and 20 volts, which are designated by the groups F, G and H, respectively.

In order to be able to distinguish the motors, the insulation for the short lead to the inductor coils has been given different colours (see tables below). The respective armatures can easily be replaced.

## MAINTENANCE

When cleaning or otherwise attending to a machine, the motor should also be checked as follows :

### A. Brushes

Check the wear of the carbon brushes and, if necessary, replace them. Make sure that the brush springs are not out of shape. On the first ELNA, excessive lubrication may cause the oil to run along the light wire into the motor. In such cases it is recommended to hold the carbon brushes over a flame, in order to burn the oil.

### B. Commutator

In order to avoid excessive wear of the brushes, the surface of the commutator must be very smooth. If the commutator should be a bit worn, it must be polished with a special "Arkansas" stone. Never use emery-cloth for this.

For cleaning the commutators, "Servisol" must be used. Simply dampen the felt at the end of the cleaning stick with it and then press the felt slightly against the commutator with the motor running. With the piece of leather fastened to the other end of the cleaning stick the "Servisol-film" is then dried and the commutator polished.

It may sometimes occur, in a few rare instances, that the commutator of a motor 500'890 or 500'958 is grey (not merely dirty). It is then not enough to clean it with "Servisol". In such cases only, the glass fibre brush may be used for cleaning the commutator, followed by the above "Servisol" cleaning.

### C. Self-Lubricating Bearings

The bearing felts of the self-lubricating bearings are to be moistened with a few drops of oil.

## REPAIRS

Motor defects are most frequently to be attributed to damage to the armature or inductor coils. These consist of a prescribed number of loops of a very fine wire, insulated with a thin layer of enamel. If, for any reason whatsoever, an overload of electric

current passes through the coils, the wire becomes overheated and the enamel layer cracks. The wire loops then come into contact with each other, thus producing short-circuits, which may considerably modify the resistance of the coils. This may even result in the wire melting, whereby the current is interrupted. A short-circuit can also be caused by defective insulating material.

#### A. Checking the Motor in the Machine

If the machine no longer attains the prescribed number of r.p.m., it is often possible to determine a defective motor by holding the flywheel back by hand. If you feel that the motor is dead at certain positions, when one or two positions of the contactor are in play, the defect is generally to be attributed to a short-circuited or interrupted armature, provided, of course, that no fault has been found in the mechanical part of the machine beforehand.

#### B. Checking the Motor with the Test Lamp

The test lamp described in the TIB no. 11 will enable you to determine interruptions in the coils of the motor or any short-circuits with the mass of the motor. This test is to be carried out as follows :

##### 1. With Motor Fitted

Check between points A and K of the motor (see drawing page 865), but in doing so, make sure that all the blades of the contactor are connected with the knee lever. If the bulb of the test lamp does not light up, the electric circuit of the motor has been interrupted at a certain point that still has to be determined. For this purpose the motor casing of the first ELNA or the motors of our 1952, 1958 and 1959 models must be removed from the machine.

##### 2. With Motor Removed

- a. Place one contact pin at point A and touch the points B, C, D etc., in turn, with the other contact pin, until the bulb no longer lights up. The interruption will be found between the last point where the bulb lights up and the first point where it remains out.
- b. Check for a possible short-circuit with the mass. For this purpose one contact pin is to be placed on the iron part of the armature (M) and the other contact pin at points A, B, C etc. During this test the bulb

should not light up. If it does, the motor is short-circuited with the mass, i.e. a wire with defective insulation has come in contact with the metal part of the motor. By removing the carbon brushes, it is then possible, using the test lamp, to find out whether the short-circuit is in the armature or the inductor.

#### C. Control of the Inductor Coils by Means of the Ohmmeter

If it should not have been possible to determine an interruption or short-circuit with the mass on a defective motor by using the test lamp, the armature and the inductor coils are to be checked by means of the Ohmmeter.

##### 1. Armature

- a. Mark one of the sectors of the commutator, and starting at this point measure the ohmic resistance between every two consecutive contact plates. The resistances observed should correspond to the following tables.
- b. If the resistances thus measured are normal, measure the resistance of the entire armature between the brushes by touching the brush carriers with the contact pins, turning the armatures slowly by hand. The deviations measured should not exceed 15 % of the normal resistance.

##### 2. Inductor Coils

Measure the ohmic resistance of the inductor coils between the two leads. The values measured correspond to the indications contained in our tables.

If, when testing the armature as described under "a", or when checking the inductor coils, it is found that one or more of the resistances measured are nil, or are considerably below the figures given in our tables, this means that the coil or the respective coils are short-circuited. If the resistance measured is considerably higher, the respective coil or coils are ruptured.

#### D. Intermittent Break-Downs and Irregular Speeds

It may occur that the speed of a motor varies after it has been in use for some time. It may also change abruptly for no apparent reason. This can be caused by a temporary short-circuit in one of the inductor coils or in the armature, provided no cause for this can be found in the mechanical part. Such short-circuits are very hard to find out with the Ohmmeter. In these rare instances, it is best to look for the cause of the defect by first changing the armature; if this does not help, the inductor coils must be changed one after the other.

### CHANGING THE VOLTAGE

The following tables may be consulted for changing the voltage. They show which parts have to be exchanged. The armatures can be used for various motor groups (example : armature no. 722'101 for our 1952, 1958 and 1959 models can be used for groups A and B). This also holds good for the rheostat, which in the two above-mentioned cases has a resistance of 126 and is marked in yellow. In such cases it is only necessary to replace the inductor coils or the complete inductor for changing the voltage.

### TESTING THE MOTORS

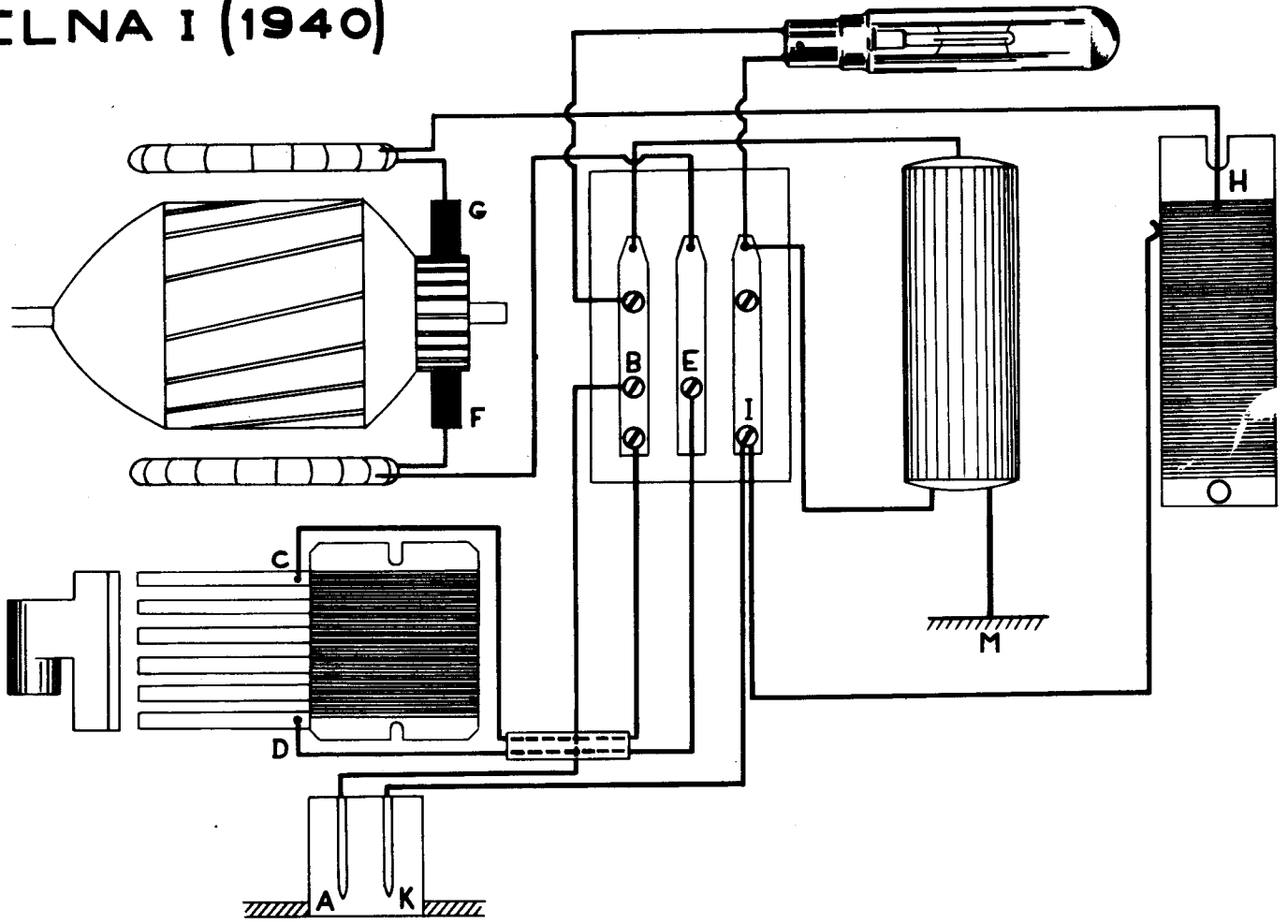
For testing the motor of a first ELNA, the motor pinion should be replaced by a turbine 12'002. To test a motor for our 1952, 1958 and 1959 models, a turbine 12'023 should be fitted in place of the friction wheel.

After the motor being tested has been allowed to run for five minutes at the nominal voltage of its group, it should attain at least the following speed :

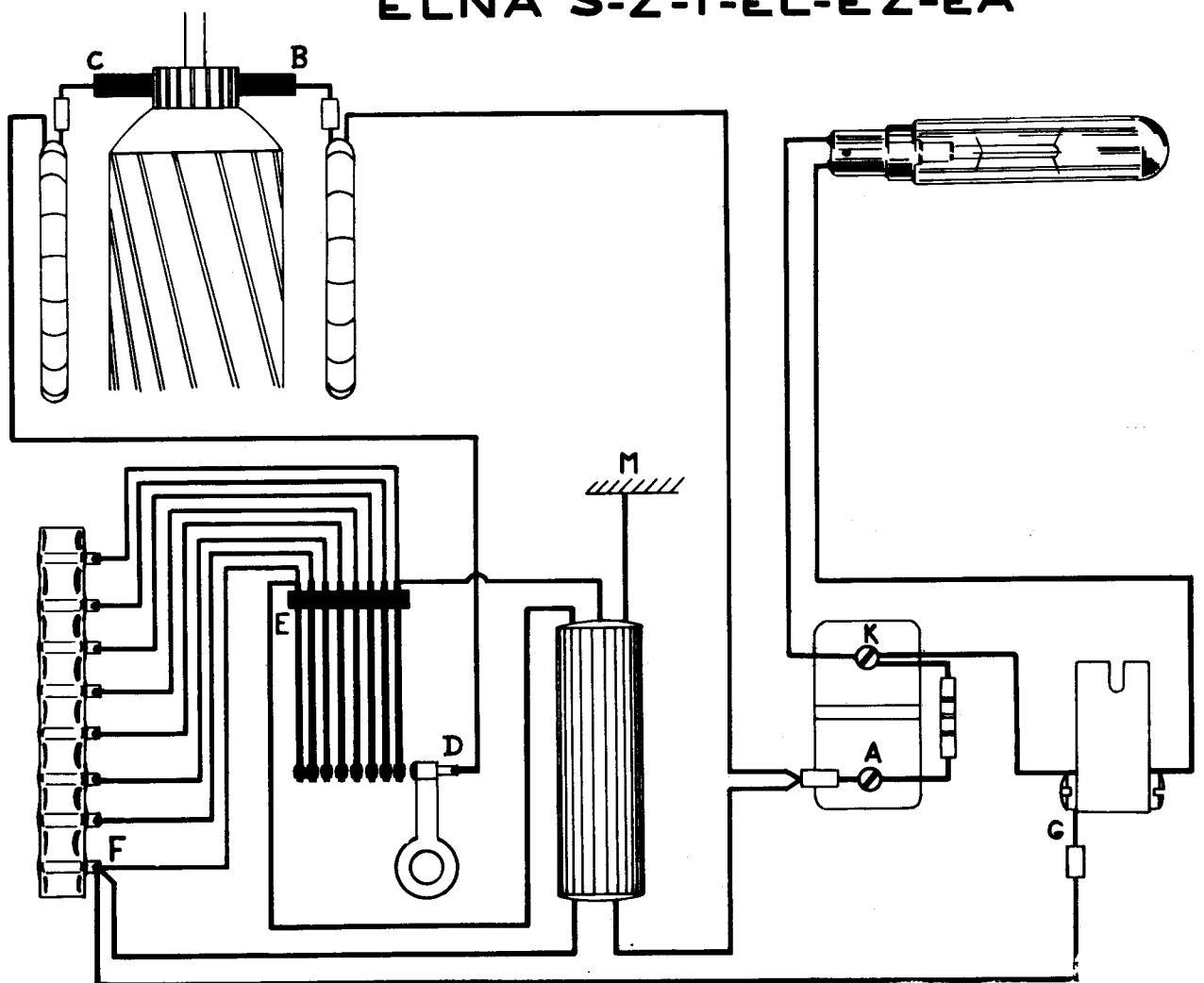
TAVARO motors	500'890	)	
	500'958	)	6000 r.p.m.
	500'970	)	

TAVARO motors		)	
for models 1952, 1958		)	6500 r.p.m.
and 1959		)	

# ELNA I (1940)



# ELNA S-Z-T-EL-EZ-EA



Motors for ELNA I - Groups I to VII

Group	Voltage	Armature	Inductor	Colour short insul.	Rheostat	Colour	Adjustable Rheostat	Colour
I	110-125/~/	Drawing no. 500'899 Resistance 9,5-15 Ω	Drawings nos. 500'550 & 500'560 Resistance 22-24Ω	brown	Drawing no. 500'940 Resistance 200 Ω	not marked	Drawing no. 500'957 Resistance 300 Ω	not marked
II	110/= 120-130/~/	Drawing no. 500'899 Resistance 9,5-15 Ω	Drawings nos. 500'551 & 500'561 Resistance 36-38Ω	yellow	Drawing no. 500'941 Resistance 250 Ω	not marked	Drawing no. 500'957 Resistance 300 Ω	not marked
III	200-250/~/	Drawing no. 500'899 Resistance 9,5-15 Ω	Drawings nos. 500'553 & 500'563 Resistance 112-120 Ω	red	Drawing no. 500'942 Resistance 600 Ω	red	Drawing no. 500'961 Resistance 600 Ω	red
IV	220-250/= 230/25	Drawing no. 500'899 Resistance 24-35 Ω	Drawings nos. 500'554 & 500'564 Resistance 158-164 Ω	blue	Drawing no. 500'943 Resistance 1250 Ω	blue	Drawing no. 500'961 Resistance 600 Ω	red
V	120-130/= 145-160/~/	Drawing no. 500'899 Resistance 9,5-15 Ω	Drawings nos. 500'552 & 500'562 Resistance 50-54 Ω	green	Drawing no. 500'942 Resistance 600 Ω	red	Drawing no. 500'957 Resistance 300 Ω	not marked
VI	220/~/= 220/~/	Drawing no. 500'899 Resistance 24-35 Ω	Drawings nos. 500'553 & 500'563 Resistance 112-120 Ω	red	Drawing no. 500'944 Resistance 900 Ω	green	Drawing no. 500'961 Resistance 600 Ω	red
VII	220/~/	Drawing no. 500'899 Resistance 9,5-15 Ω	Drawings nos. 500'555 & 500'565 Resistance 87-91,5 Ω	ochre	Drawing no. 500'944 Resistance 900 Ω	green	Drawing no. 500'961 Resistance 600 Ω	red



Motors for EINA I - Groups A to E

Group	Voltage	Armature	Inductor	Colour short insul.	Rheostat	marked	Adjustable Rheostat	marked
A	110-120/~/=	Drawing no. 500'963 Resistance 10-15 $\Omega$	Drawings nos. 500'973 & 500'974 Resistance 19-21 $\Omega$	brown	Drawing no. 500'975 Resistance 300 $\Omega$	A	Drawing no. 500'976 Resistance 300 $\Omega$	A
B	125-130/~/=	Drawing no. 500'963 Resistance 10-15 $\Omega$	Drawings nos. 500'973 & 500'974 Resistance 38-41 $\Omega$	yellow	Drawing no. 500'975 Resistance 350 $\Omega$	B	Drawing no. 500'976 Resistance 350 $\Omega$	B
C	135-160/~/=	Drawing no. 500'963 Resistance 10-15 $\Omega$	Drawings nos. 500'973 & 500'974 Resistance 53-55 $\Omega$	green	Drawing no. 500'975 Resistance 400 $\Omega$	C	Drawing no. 500'976 Resistance 400 $\Omega$	C
D	220/~/=	Drawing no. 500'963 Resistance 24-36 $\Omega$	Drawings nos. 500'973 & 500'974 Resistance 112-120 $\Omega$	red	Drawing no. 500'975 Resistance 1000 $\Omega$	D	Drawing no. 500'976 Resistance 950 $\Omega$	D
E	225-250/~/=	Drawing no. 500'963 Resistance 24-36 $\Omega$	Drawings nos. 500'973 & 500'974 Resistance 124-130 $\Omega$	blue	Drawing no. 500'975 Resistance 1000 $\Omega$	E	Drawing no. 500'976 Resistance 950 $\Omega$	E

Motors for 1952, 1958 and 1959 Models with Knee Lever

Group	Voltages	Armature	Inductor	Colour short insul.	Rheostat	Colour
A	110-120/~/=	Drawing no. 722'101 Resistance 4-6 Ω	4,5-6 Ω	brown	6 x 21 = 126 Ω	yellow
B	125-130/~/=	Drawing no. 722'101 Resistance 4-6 Ω	8,5-10 Ω	yellow	6 x 21 = 126 Ω	yellow
C	135-160/~/=	Drawing no. 722'102 Resistance 8-11 Ω	9-11 Ω	green	6 x 36 = 216 Ω	green
D	220/~/=	Drawing no. 722'103 Resistance 15-25 Ω	21-24 Ω	red	6 x 85 = 510 Ω	red
E	225-250/~/=	Drawing no. 722'103 Resistance 15-25 Ω	25-28 Ω	blue grey	6 x 85 = 510 Ω	red
F	32/=	Drawing no. 722'104	Drawing no. 772'146	black	6 x 1,7 = 10,2 Ω	black
G	24/=	Drawing no. 722'105	Drawing no. 772'147	green black	6 x 1 = 6 Ω	white
H	20/=	Drawing no. 722'105	Drawing no. 772'148	white	6 x 1 = 6 Ω	white

**Motors for 1952, 1958 and 1959 Models with Foot Control**

Group	Voltages	Armature	Inductor	Colour of short of short insul.
A	110-120/~/=	Drawing no. 722'101 Resistance 4-6 Ω	4,5-6 Ω	brown
B	125-130/~/=	Drawing no. 722'101 Resistance 4-6 Ω	8,5-10 Ω	yellow
C	135-160/~/=	Drawing no. 722'102 Resistance 8-11 Ω	9-11 Ω	green
D	220/~/=	Drawing no. 722'103 Resistance 15-25 Ω	21-24 Ω	red
E	225-250/~/=	Drawing no. 722'103 Resistance 15-25 Ω	25-28 Ω	blue grey

E3

MECHANICAL  
HANDBOOK

S-Z-T-EL-EZ-EA

# CONTENTS

Printed in  
Switzerland

INTRODUCTION	901
DISORDERS      Electrical-Mechanical-Sewing-Faulty suppression	903
REPLACEMENT OF: Rotary hook pinion	907
Driving belt	908
Check spring	909
Thread take-up lever	910
Stitch width knob S	911
Stitch width knob Z	912
Stitch width knob EZ	913
CONVERSION:      Transforma - Supermatic	914
Zig Zag - Supermatic	917
REPAIR OF MOTOR	921
CONNECTIONS	923
ADJUSTMENTS:      Needle clearance S-Z-T      Needle bar swing S-Z-EA 1- 4      Centering S-Z      Centering T-EL	950
5- 8      Timing      Height of needle bar Orient. of needle bar      Release cam S-Z-T	951
9-12      Guard ring stop S-Z-T      Guard ring escap. S-Z-T Feed dog      Presser bar orientation	952
13-16      Stitch length S      Stitch length Z-EL-EZ Stitch length T      Stitch length EA	953
17-20      Elna-disc drive S-Z-EA      Automatic cloth feed S Buttonhole disc S      Bobbin winding S-Z-T	954
21-24      TENSIONS:      upper - lower normal and universal	955
25-28      Feed gear	956
29-32      Needle clear. EL-EZ-EA      Cam gear EZ Needle bar swing EZ      Centering EZ-EA	957
33      Stitch width EZ	958
<div style="display: flex; justify-content: space-between;"> <div> S = Supermatic Z = Zig Zag T = Transforma </div> <div> EL = ELNA EZ = ELNA Zig Zag EA = ELNA Automatic </div> </div>	

July 1960

## INTRODUCTION

This chapter is intended as a memory-aid for the technical staff.

Nevertheless, we can but recommend to all who have to do with these questions:

TO STOP AND THINK FIRST AND TO ACT AFTERWARDS!

The opposite only very seldom leads to good results.

In other words, one should always try to LOCALIZE the defect, keeping in mind that very often it is the customer who is to blame for it, or even the instructress.

It is in fact useless to "repair" the machine, if the customer persists in using it the wrong way. In many cases, it is preferable to ask the customer to sit down at her machine and to show her a better way of using it. This avoids unpleasant call-backs.

As a general rule, no machine should be brought to the workshop before an instructress or even a salesman has localized the defect. This enables the specialist to intervene efficiently.

Only in quite exceptional cases, is the machine dismantled completely such as for: repainting the casings, cleaning a machine gummed up by the use of an inadequate oil, etc..

As a rule, repairs will be of a rather local nature, i.e. Elnagraph, mechanism of needle bar and thread take-up lever or rotary hook, on the other hand, motor and sewing light or also cloth feed and thread tensions.

As a consequence, it is in such cases often only necessary to dismantle partially, which generally amounts almost to nothing, if one knows how to tackle the problem properly. The purpose of this guide is precisely to explain this in a general way.

On the other hand, please remember that the sequence of assembly corresponds in principle, to the reverse dismantling sequence.

The dismantling operations are numbered with light figures and those for reassembling with dark figures.

For adjustments which refer to the various models of our machines, the following abbreviations have been used:

S	=	Supermatic
Z	=	Zig Zag
T	=	Transforma
EL	=	ELNA
EZ	=	ELNA Zig Zag
EA	=	ELNA Automatic

Practical experience has shown that it is preferable to check all adjustments of the machine after a repair, instead of confining oneself to those, which one considers to be necessary.

One never knows!

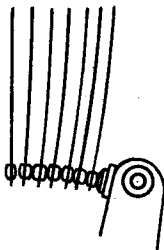
The following examples are not introduced to replace the portion of the instruction book entitled "Minor Disorders and Remedies", but rather to complement it.

# ELIMINATION OF MINOR DISORDERS

Printed in  
Switzerland

October 1959

Repairs

<p>MACHINE SLOW</p>	<p>CHECK:</p> <p>Tension of machine and electricity supply</p> <p>Commutator and carbon brushes</p> <p>Free running</p> <p>Oiling. Bad oil</p> <p>Hard points</p> <p>Swelling of old nylon gears</p> <p>Rotary hook - cleanliness</p> <p>Contactor - contact on all blades</p> <p>Driving belt too tight</p> <p>Slipping of friction wheel</p>
<p>MACHINE TOO FAST</p>	<p>CHECK:</p> <p>Tension of machine and electricity supply</p> <p>Contactor: disconnect last (one before last) blade by changing position of Phillips screw on contact lever</p> 
<p>MACHINE STARTS TO RUN TOO LATE AND VERY FAST</p>	<p>CHECK:</p> <p>Rheostat, by testing the motor with the bobbin winder in action</p> <p>Possible hard point</p> <p>Slippage of the coupling</p> <p>When sewing heavy or stiff material, it is more important than ever to start the machine with the thread take-up descending</p>
<p>MOTOR RUNS IRREGULARLY</p>	<p>CHECK:</p> <p>The motor only starts to run in certain angular positions:</p> <p>The armature is probably shorted</p> <p>Hard point in the Elnagraph: (adjust play of Elnagraph pinion)</p> <p>Whether coupling slips</p>



# ELIMINATION OF MINOR DISORDERS

Printed in  
Switzerland

October 1959

Repairs

MOTOR DOES NOT RUN	<p>CHECK:</p> <p>Whether the current reaches the machine</p> <p>Electric cord and connections</p> <p>Whether the sewing light functions</p> <p>Motor alone</p> <p>Motor connections</p> <p>Carbon brushes and commutator</p> <p>Possible shorting of inductor or armature</p>
SEWING LIGHT DOES NOT FUNCTION	<p>CHECK:</p> <p>Whether current reaches machine</p> <p>Switch</p> <p>Connections</p> <p>Bulb</p> <p>Contacts</p>
MACHINE NOISY	<p>CHECK:</p> <p>Maintenance - oiling</p> <p>Rotary hook</p> <p>Localize noise in order to eliminate it, in most cases by reducing clearances</p>
MACHINE BLOCKED OR HARD POINT	<p>CHECK:</p> <p>Rotary hook</p> <p>Foreign bodies in the machine</p> <p>Adjustment of plays</p>
THREAD BREAKAGE	<p>CHECK:</p> <p>Threading</p> <p>Needle</p> <p>Tensions</p> <p>Rotary hook</p> <p>Upper and lower threads (thread passages)</p> <p>Choice and quality of threads</p> <p>Faulty compensating spring</p> <p>Needle plate - darning plate</p>

Printed in  
Switzerland

October 1959

## Repairs

905

# ELIMINATION OF MINOR DISORDERS

Printed in  
Switzerland

October 1959

Repairs

## FAULTY SUPPRESSION

a. Radio

b. Television

### CHECK:

Whether no other domestic appliance is at fault

Condenser

Wave lengths used

Contacts

Self on connections

Commutator

Distortion of the picture

Sound

Fitting of self

Carbon brushes - commutator

# REPLACEMENT OF ROTARY HOOK PINION

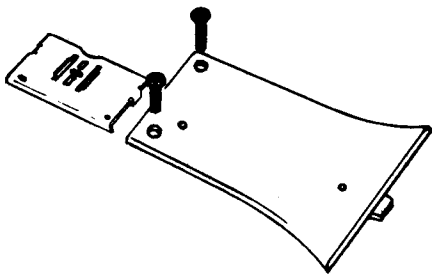


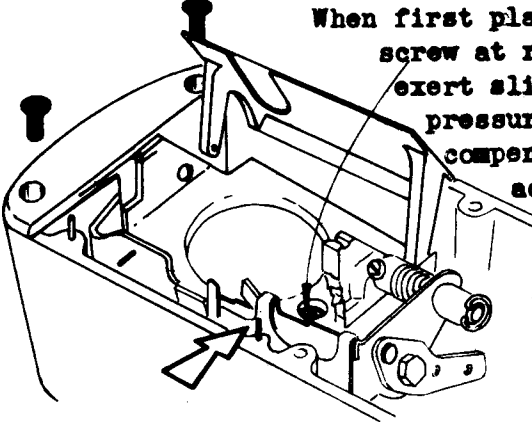
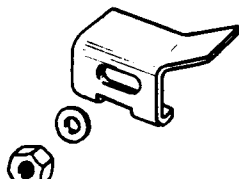
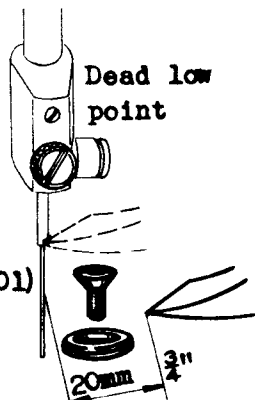
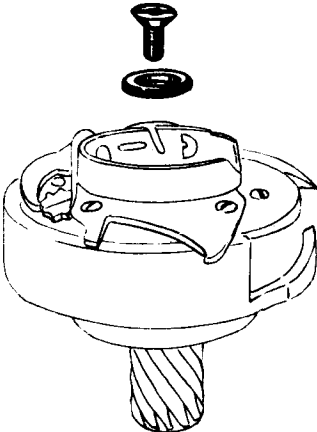
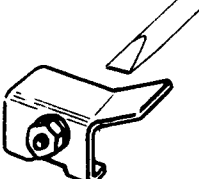
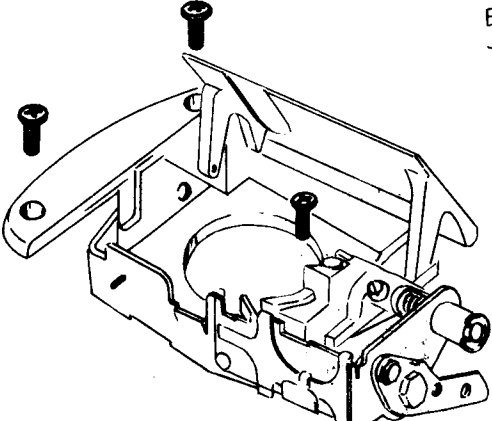
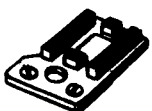

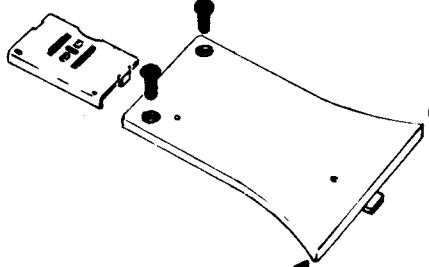
## DISMANTLING

## ASSEMBLY

Printed in  
Switzerland

October 1959

Repairs

 <p>1</p>	 <p>1</p>
 <p>2</p> <p>Support feed dog with screw-driver to unscrew</p>	 <p>2</p> <p>When first placing screw at right, exert slight pressure to compensate action of release spring</p>
 <p>3</p>	 <p>3</p> <p>Insert hook Turn point so that it is just behind gauge Mesh hook and lodge guard ring beak Refit washer(s) and screw TIMING: ADJUSTMENT 5</p> <p>Dead low point</p> <p>Gauge 11'001 (607'801)</p> <p>20mm 3/4"</p>
 <p>4</p>	 <p>4</p> <p>Hold SCREW with screw-driver to tighten ADJUSTMENTS 9-10</p>
 <p>5</p>	 <p>5</p> <p>Support FEED DOG with large screw-driver to tighten screws ADJUSTMENT 11</p>
 <p>6</p> <p>To facilitate assembly, first note position of hook pinion</p> <p>Timing position will thus be more easily located</p>	 <p>6</p> <p>Before fastening cover, take care that it fits upper casing</p>

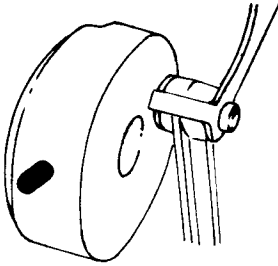
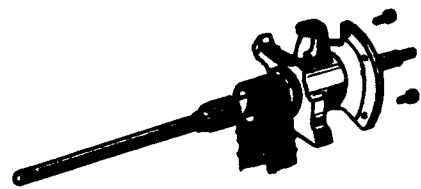
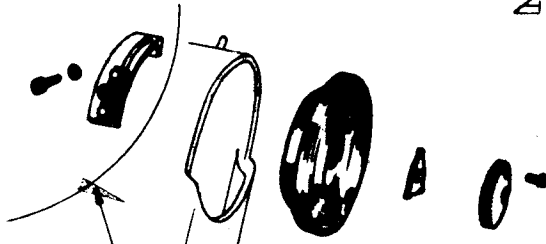
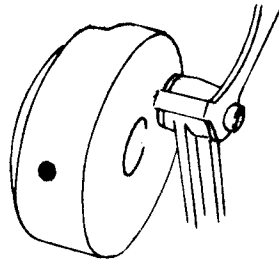
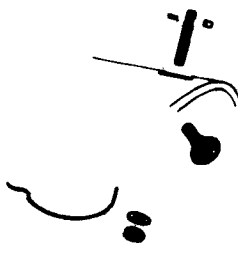
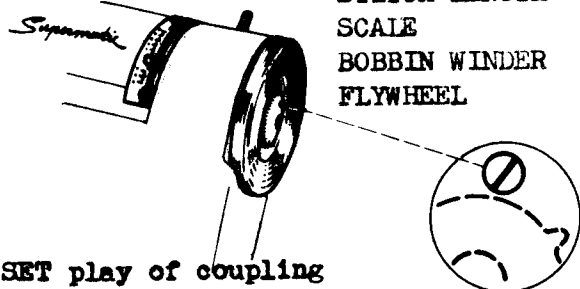
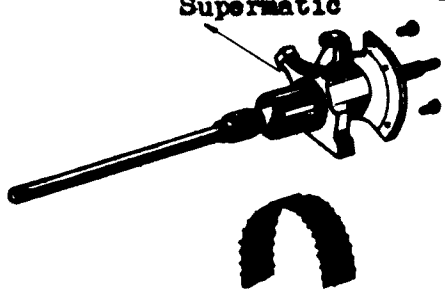
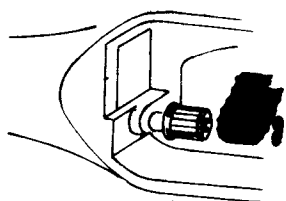
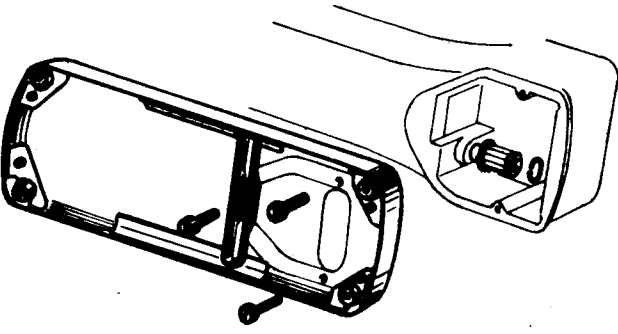
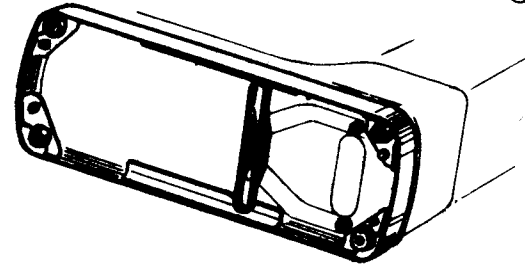
# REPLACEMENT OF DRIVING BELT DISMANTLING

## ASSEMBLY

Printed in  
Switzerland

October 1959

Repairs

<p>1</p>  <p>Loosen COUNTER-WEIGHT SCREW</p>	<p>1</p> 
<p>2</p>  <p>Supermatic only</p>	<p>2</p>  <p>The tip of the COUNTERWEIGHT SCREW should be lodged in the hole in the upper shaft Tighten</p>
<p>3</p> 	<p>3</p>  <p>Fix: STITCH LENGTH SCALE BOBBIN WINDER FLYWHEEL</p> <p>SET play of coupling</p>
<p>4</p>  <p>Supermatic</p>	<p>4</p> <p>NEEDLE BAR down FEED GEAR SEE 25 or 26 or 27 or 28</p> 
<p>5</p> 	<p>5</p> <p>TIMING OF HOOK: ADJUSTMENT 5</p>  <p>CHECK: ADJUSTMENT 18</p>

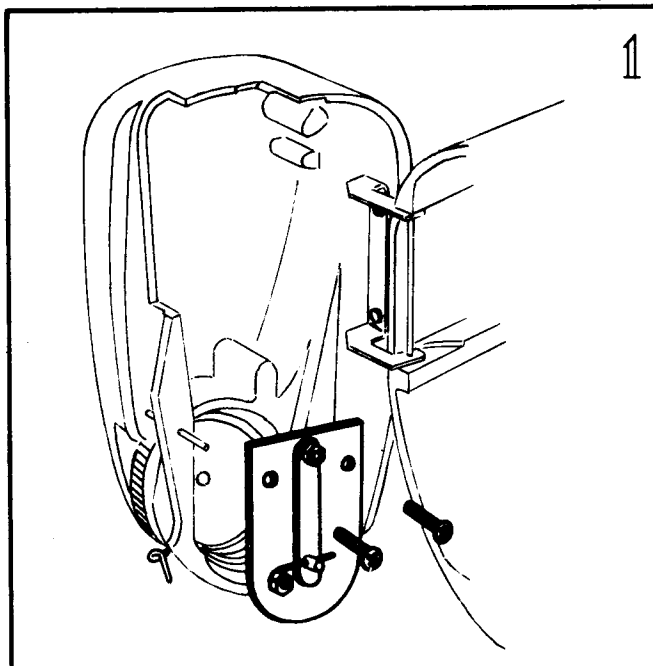
# REPLACEMENT OF CHECK SPRING UPPER TENSION DISMANTLING

ASSEMBLY

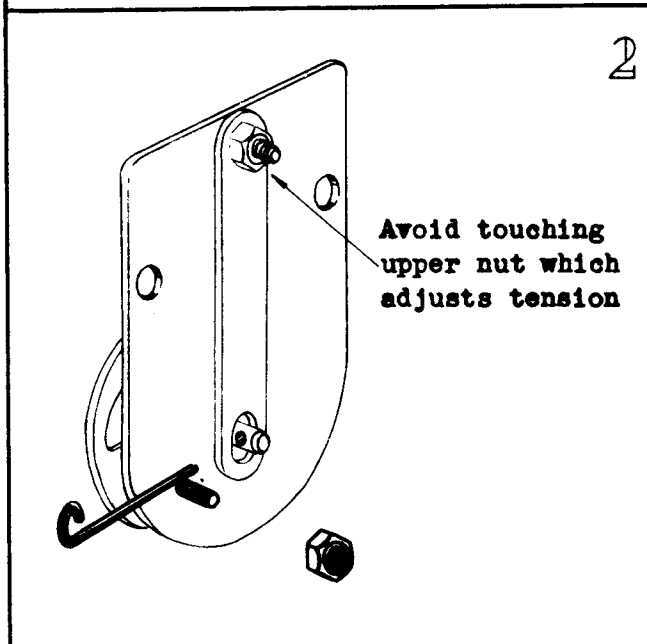
Printed in  
Switzerland

October 1959

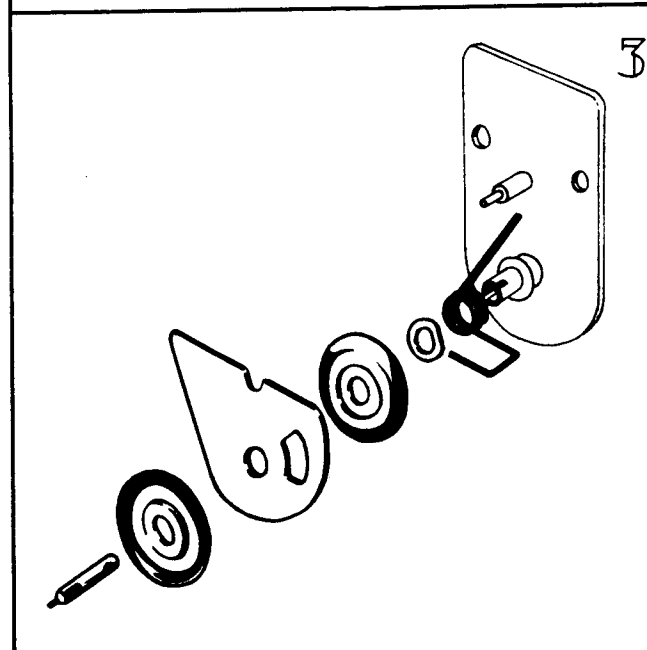
Repairs



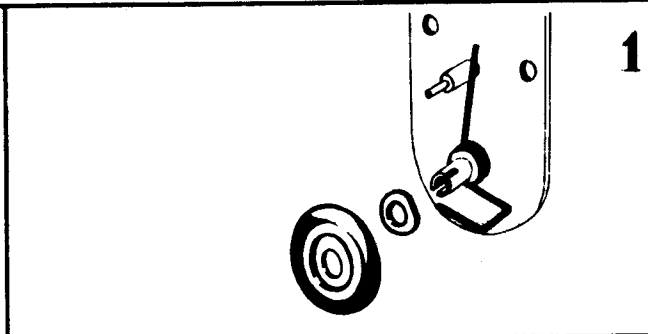
1



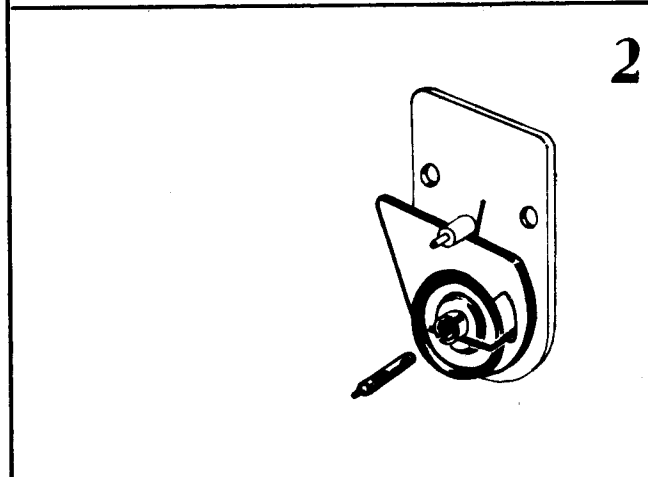
2



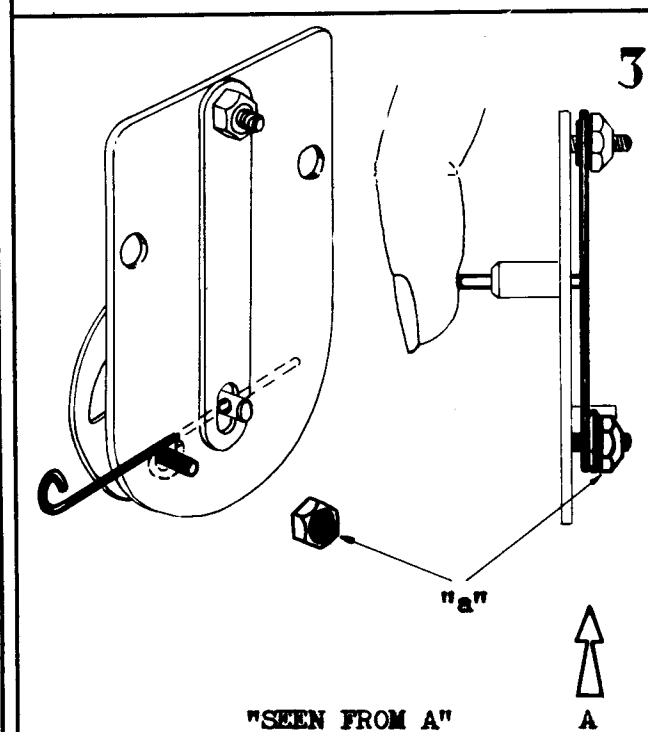
3



1



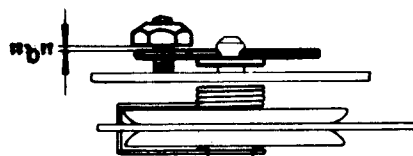
2



3

"SEEN FROM A"

Tighten nut "a" to  
obtain MINIMUM PLAY "b"



CHECK 21 or 23

# REPLACEMENT OF THREAD TAKE-UP LEVER

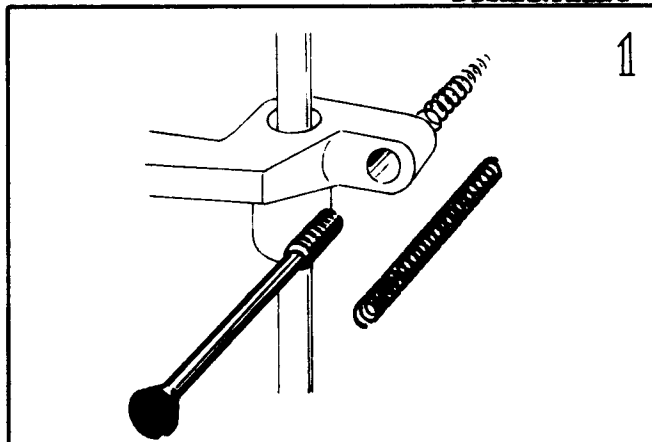
## DISMANTLING

## ASSEMBLY

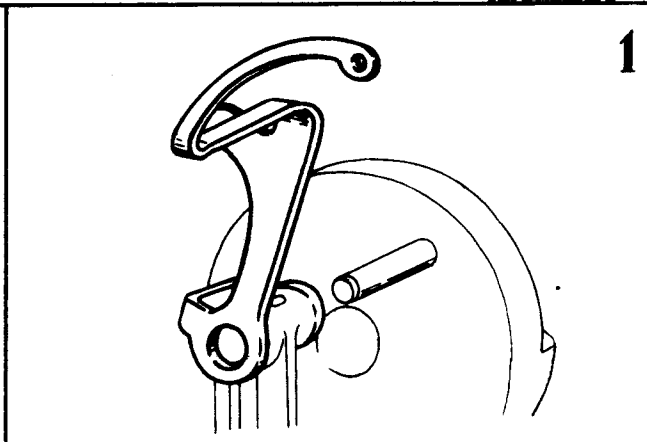
Printed in  
Switzerland

October 1959

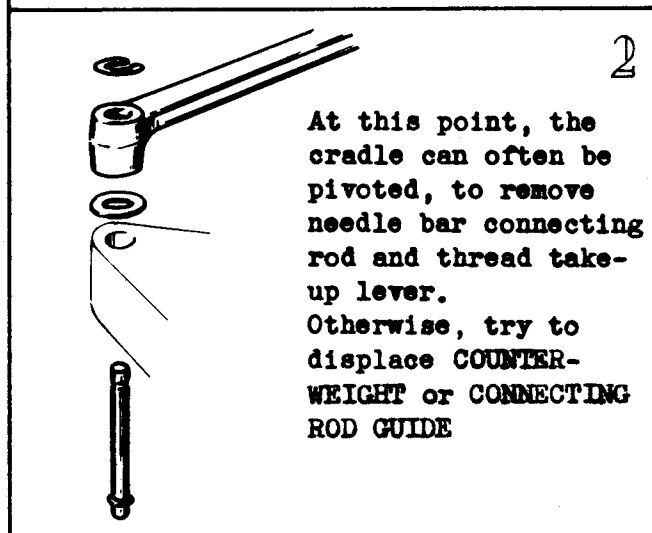
Repairs



1

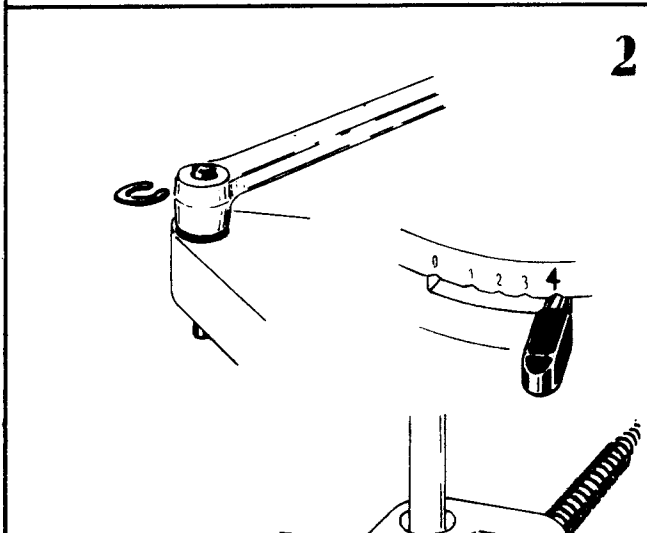


1



2

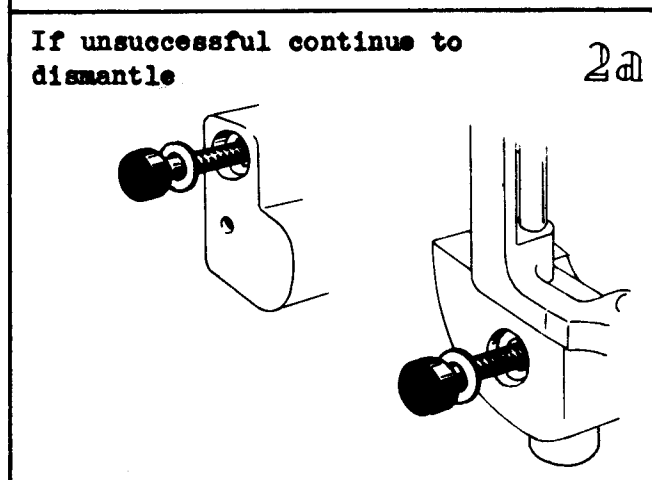
At this point, the cradle can often be pivoted, to remove needle bar connecting rod and thread take-up lever. Otherwise, try to displace COUNTER-WEIGHT or CONNECTING ROD GUIDE



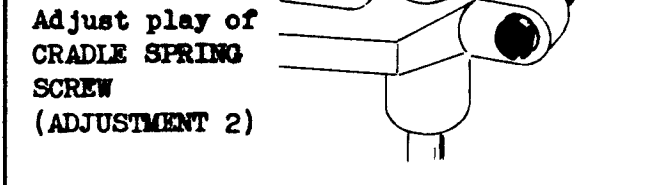
2

If unsuccessful continue to dismantle

2a

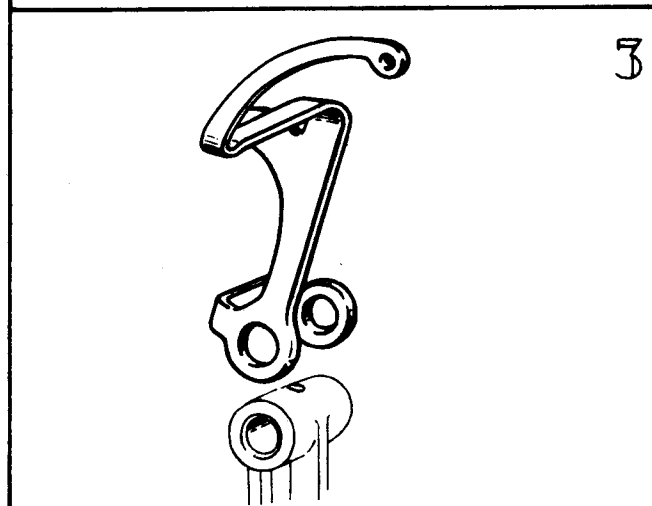


Adjust play of CRADLE SPRING SCREW (ADJUSTMENT 2)

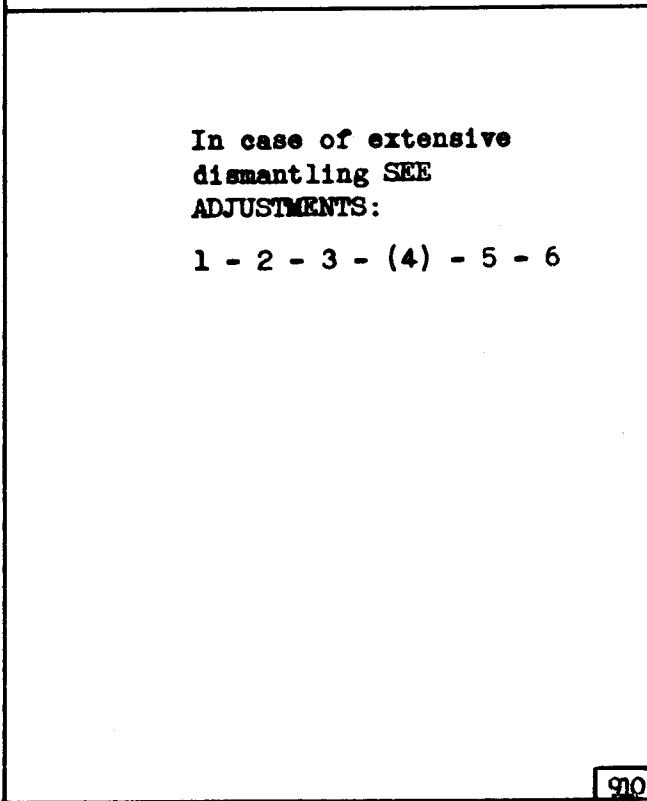


In case of extensive dismantling SEE ADJUSTMENTS:

1 - 2 - 3 - (4) - 5 - 6



3



# REPLACEMENT OF STITCH WIDTH KNOB S

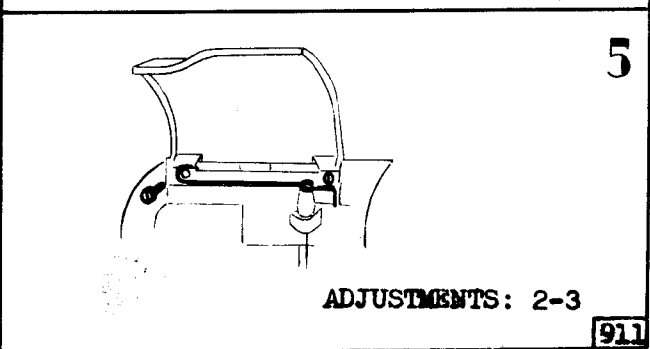
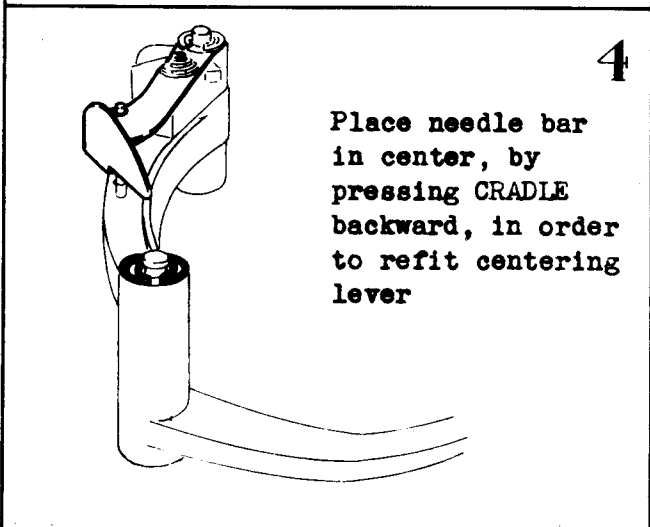
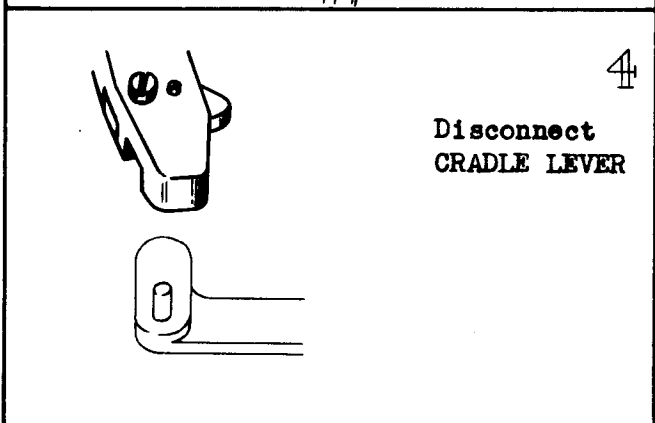
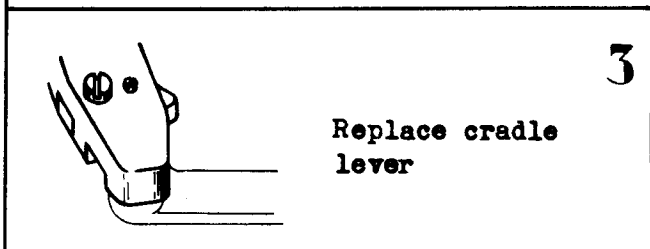
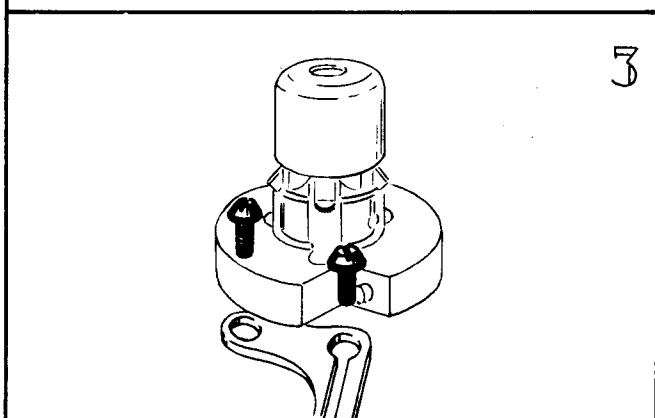
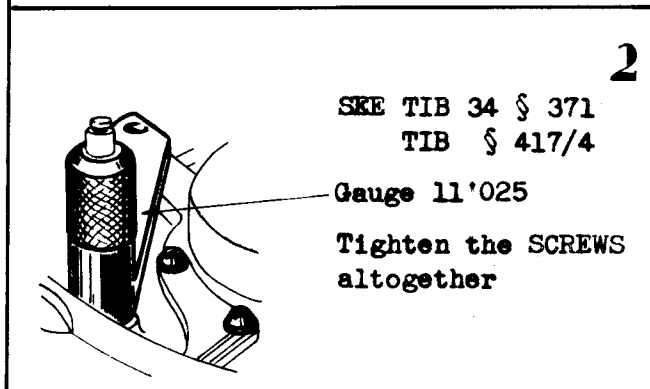
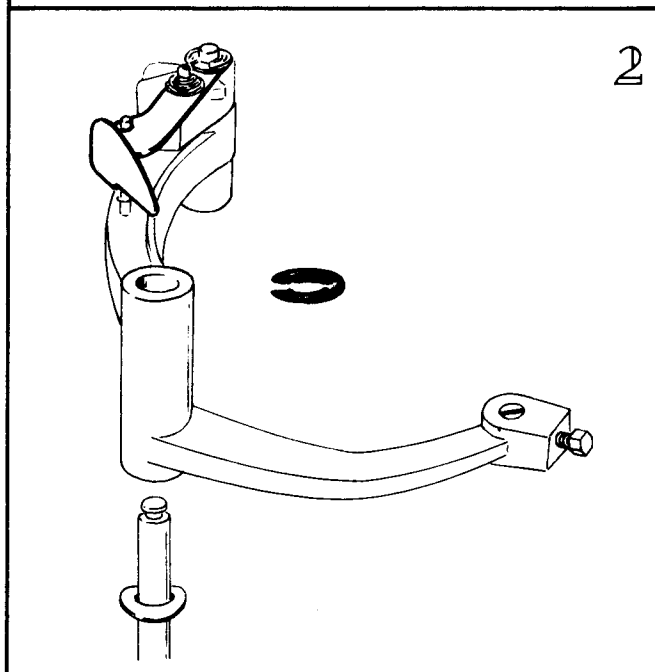
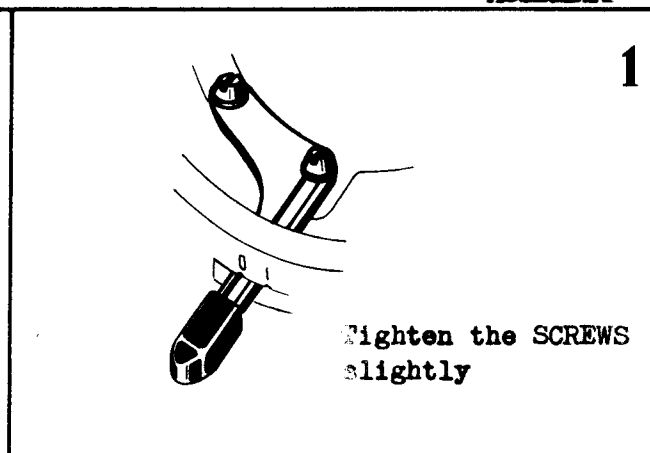
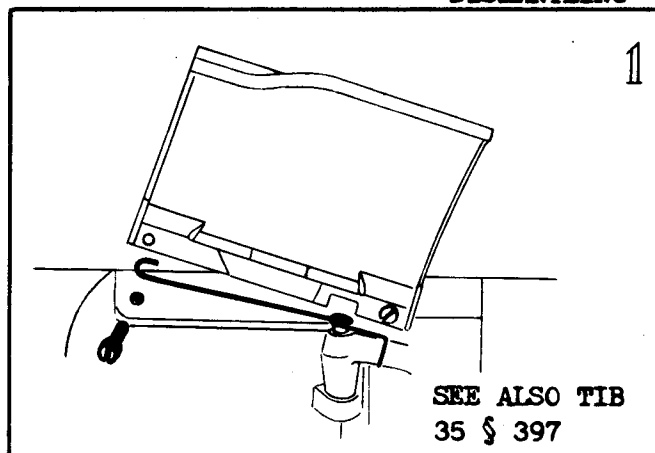
## DISMANTLING

## ASSEMBLY

Printed in  
Switzerland

October 1959

Repairs





# REPLACEMENT OF STITCH WIDTH KNOB 2

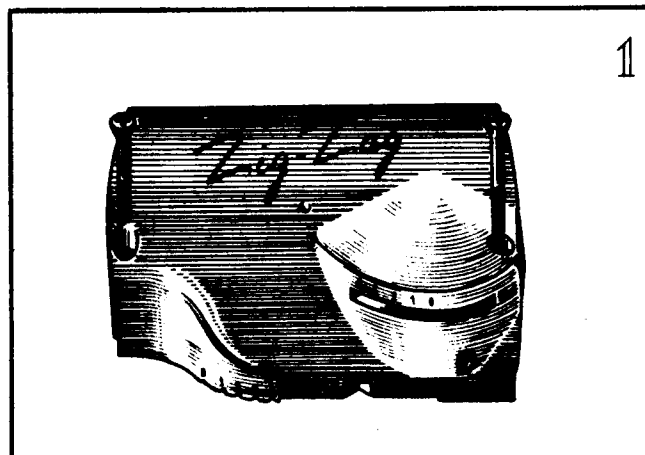
## DISMANTLING

## ASSEMBLY

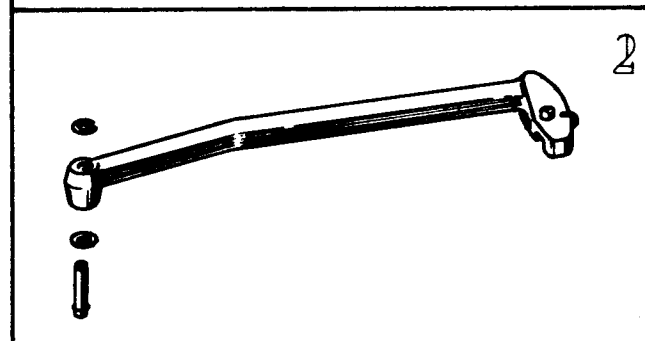
Printed in  
Switzerland

October 1959

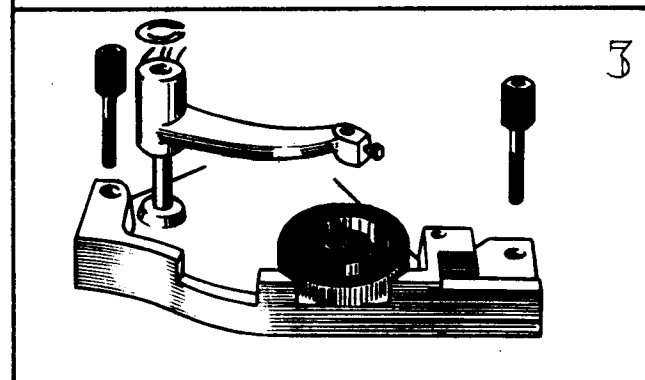
Repairs



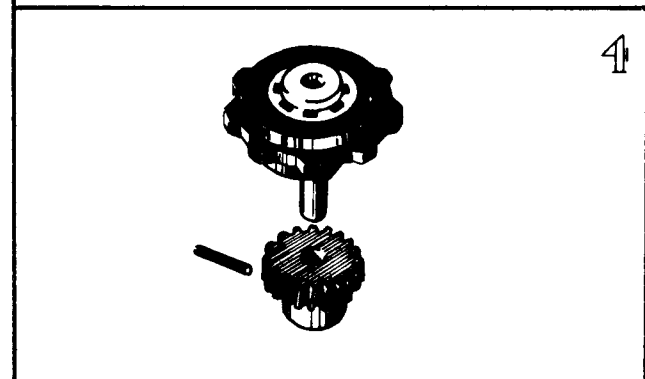
1



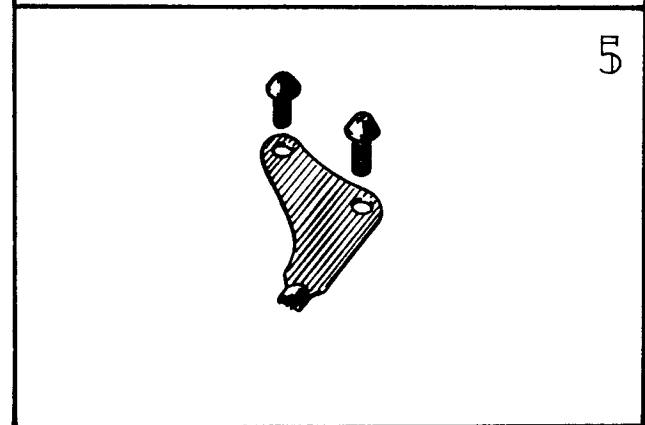
2



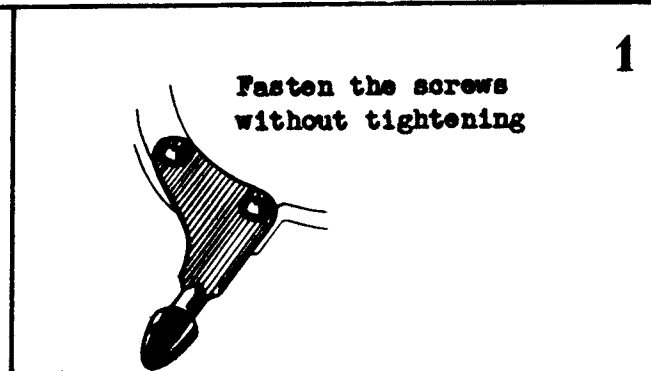
3



4

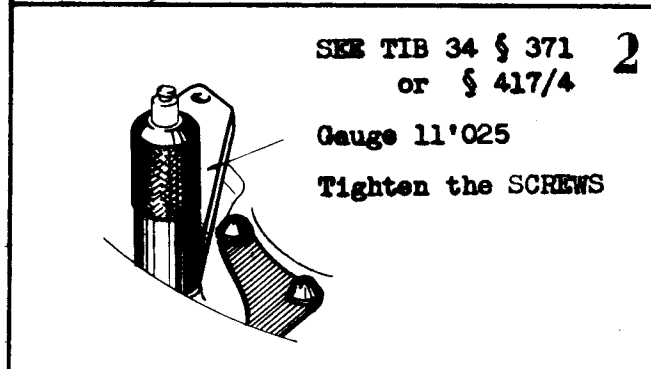


5



1

Fasten the screws  
without tightening

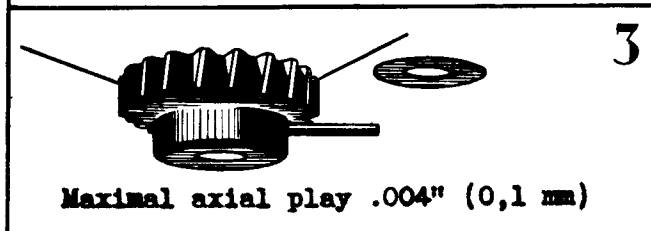


2

SEE TIB 34 § 371  
or § 417/4

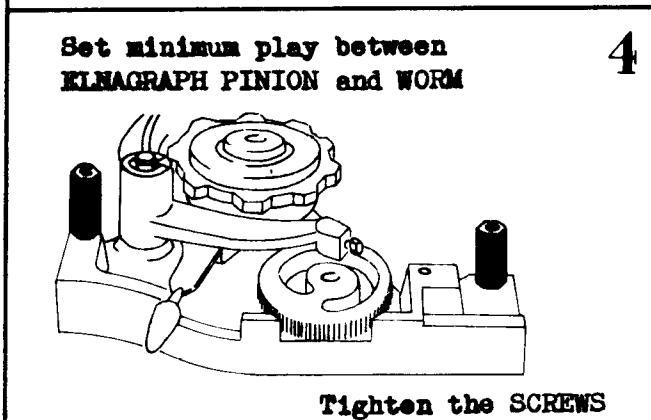
Gauge 11'025

Tighten the SCREWS



3

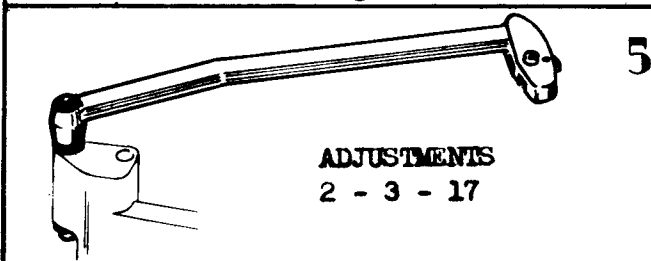
Maximal axial play .004" (0,1 mm)



4

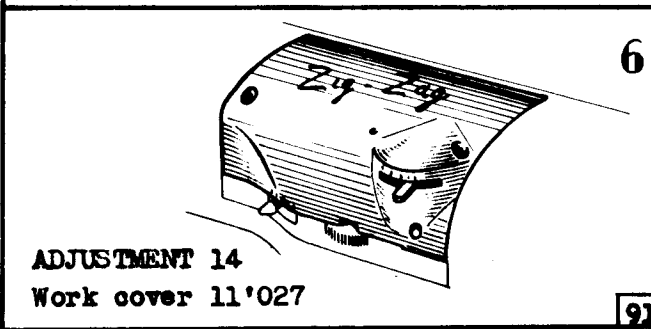
Set minimum play between  
KLNAGRAPH PINION and WORM

Tighten the SCREWS



5

ADJUSTMENTS  
2 - 3 - 17



6

ADJUSTMENT 14  
Work cover 11'027

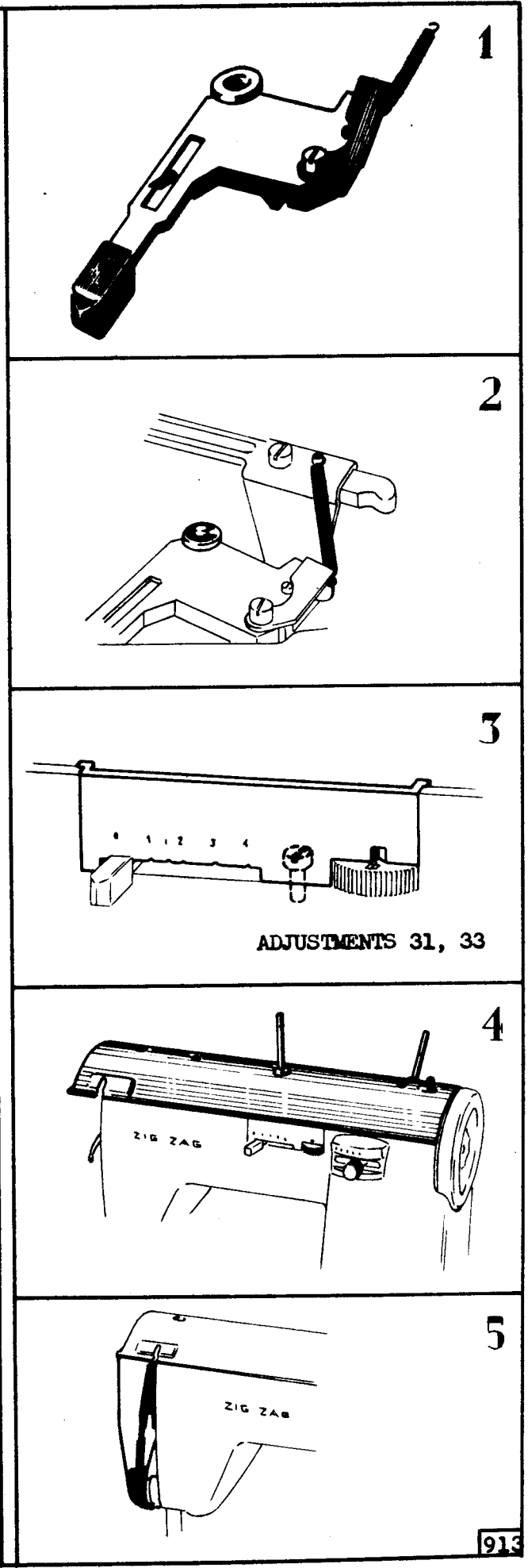
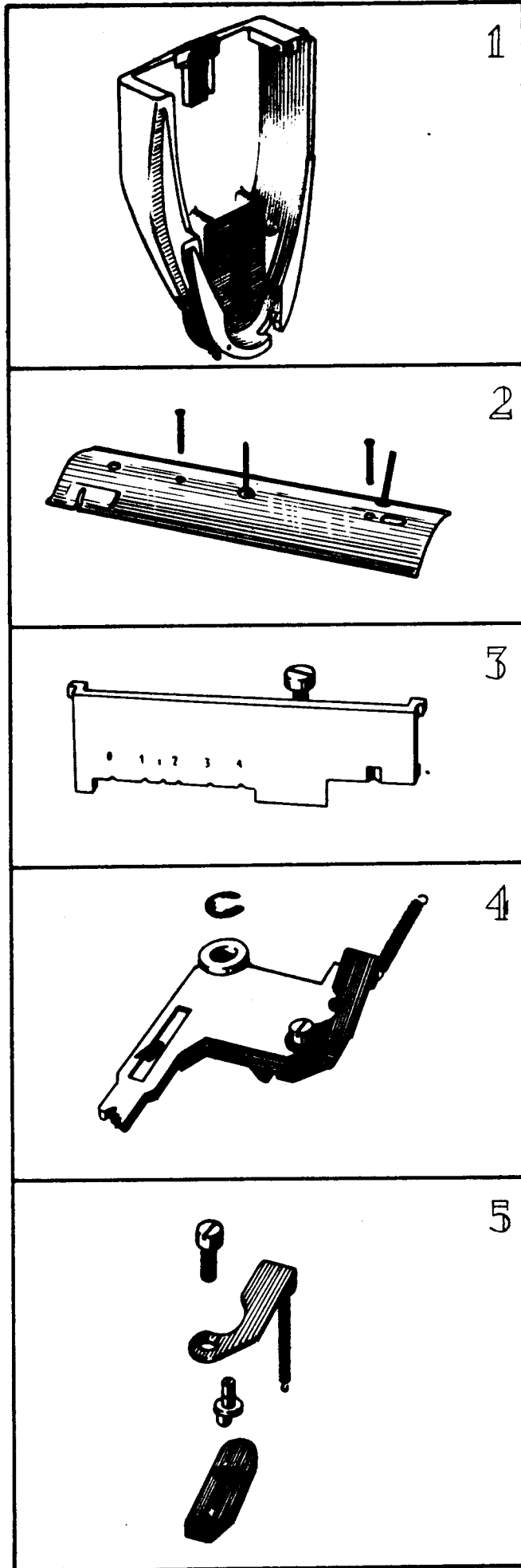
# REPLACEMENT OF STITCH WIDTH LEVER EZ DISMANTLING

ASSEMBLY

Printed in  
Switzerland

October 1959

Repairs



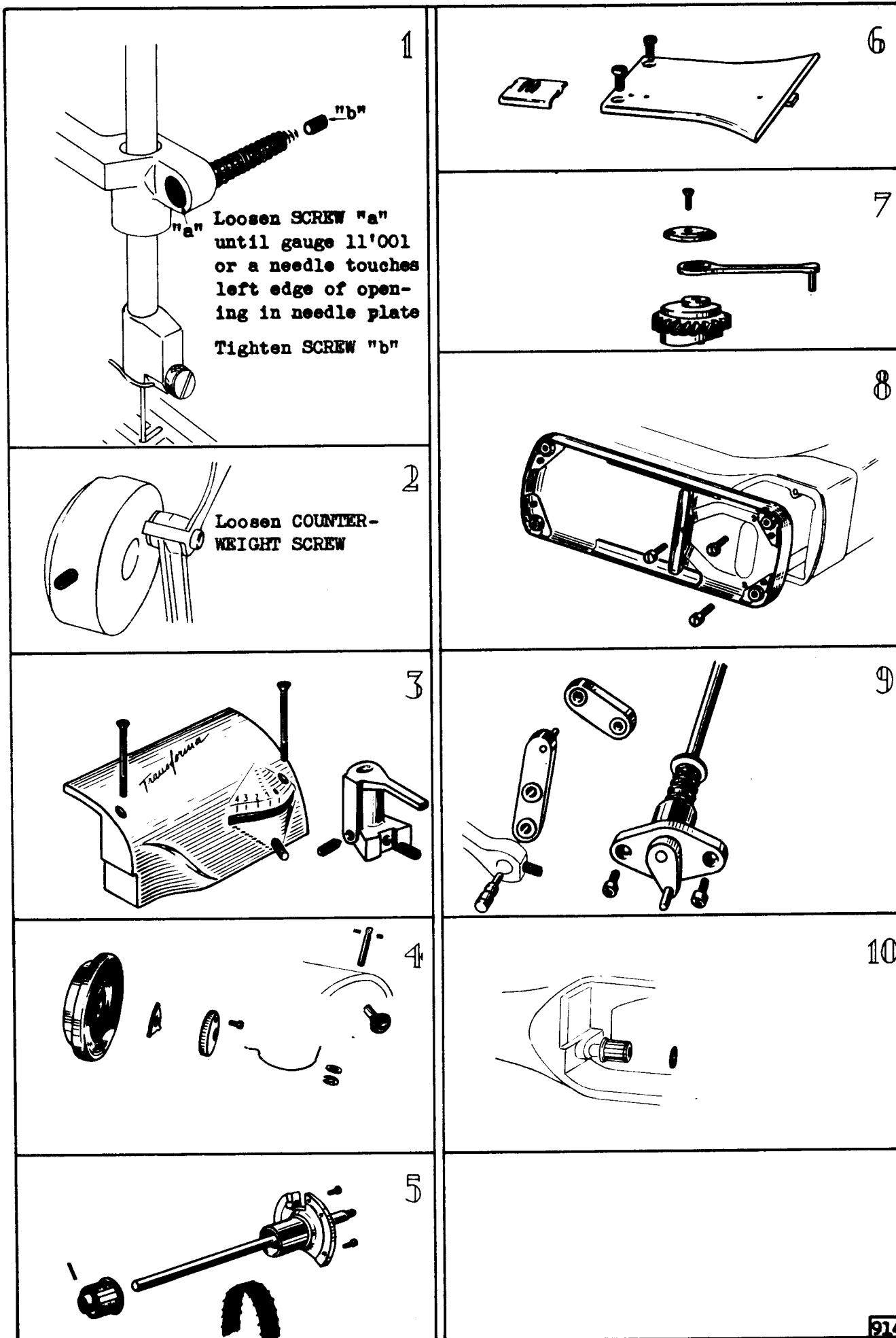
# CONVERSION TRANSFORMA-SUPERMATIC

## DISMANTLING

Printed in  
Switzerland

October 1959

Repairs



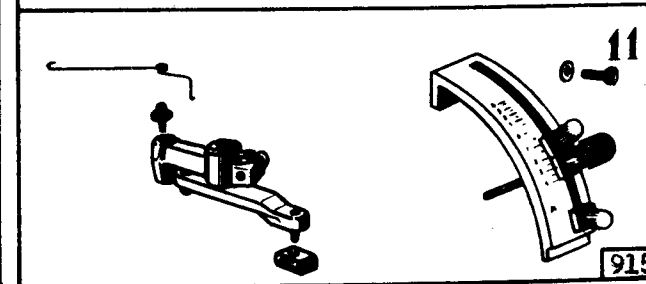
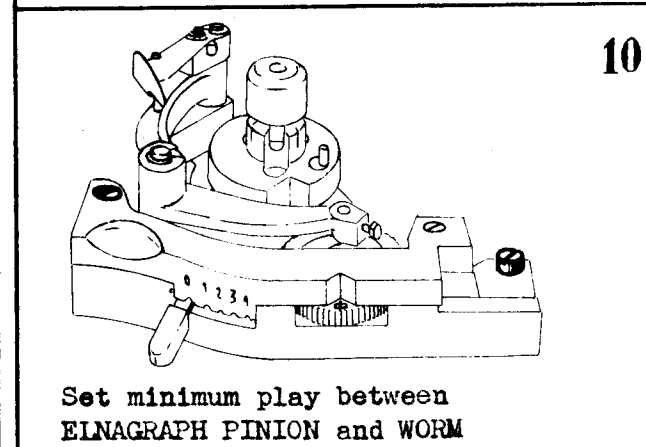
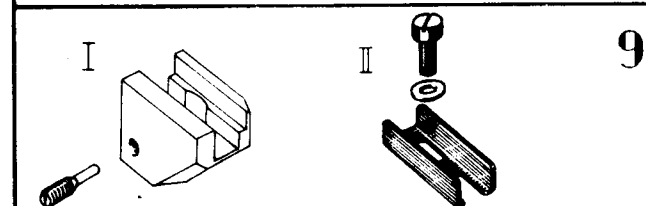
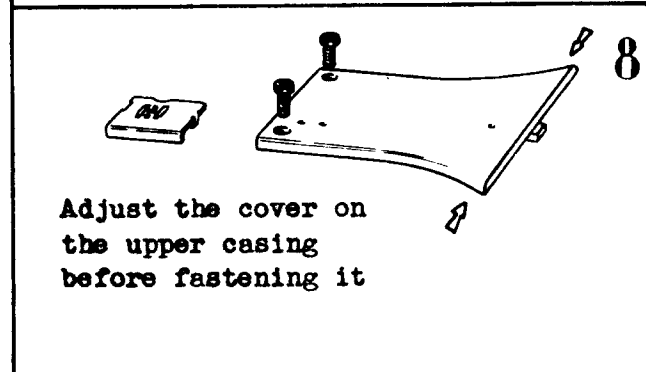
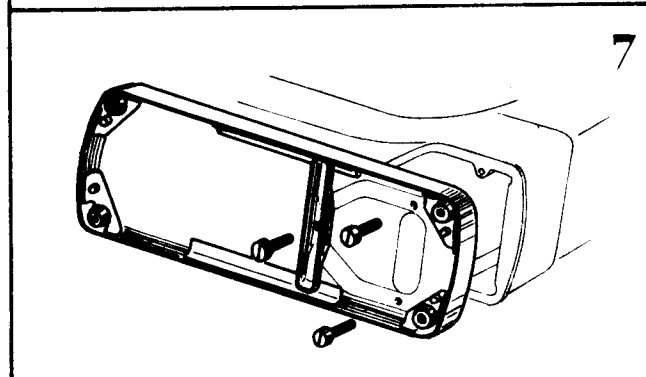
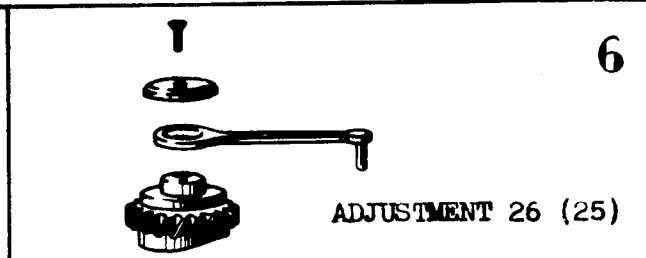
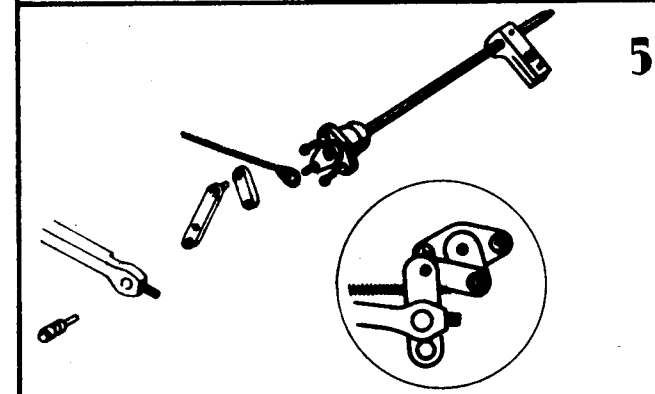
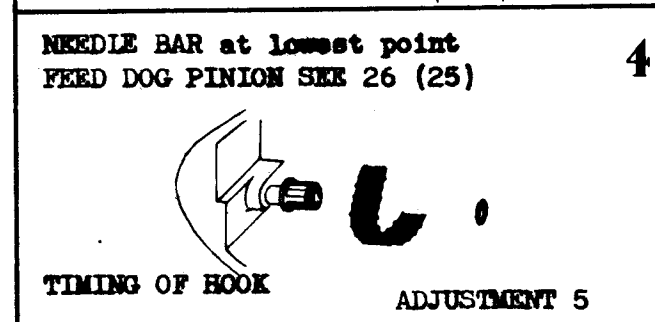
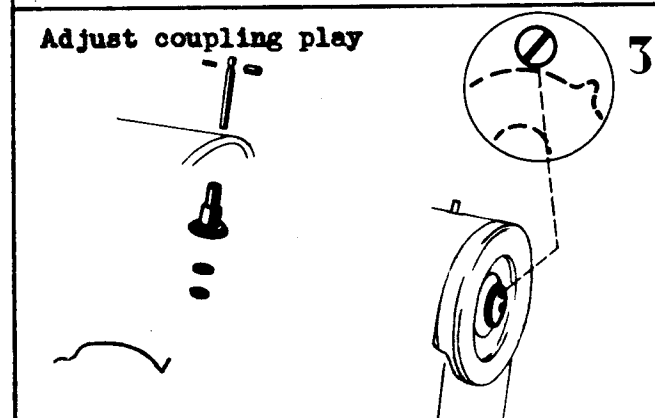
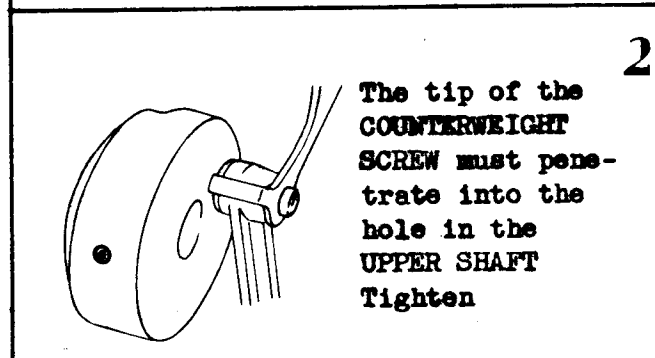
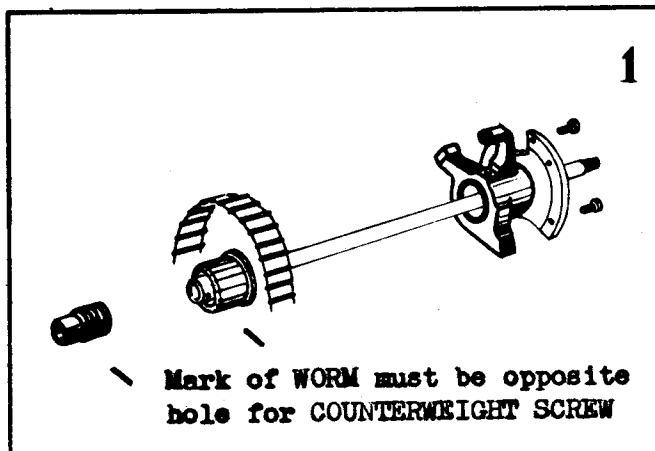
# CONVERSION TRANSFORMA-SUPERMATIC

ASSEMBLY

Printed in  
Switzerland

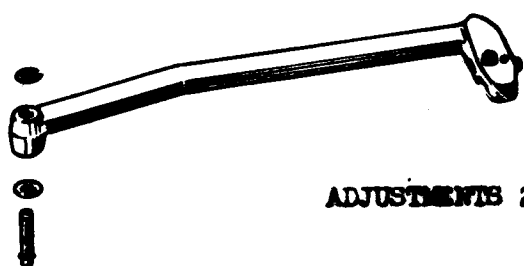
October 1959

Repairs



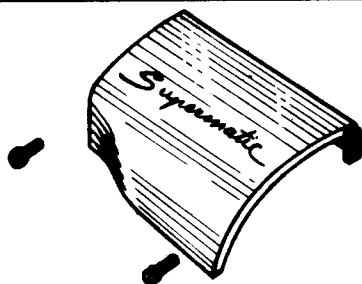
CONVERSION TRANSFORMA-SUPERMATIC ASSEMBLY

Printed in  
Switzerland



12

ADJUSTMENTS 2-3



13

MAKE ADJUSTMENTS

13 - 17 - 18 - 19

CHECK

1 - 5 - 6 - 7 - 9 - 10 - 11 - 12

14

October 1959

Repairs

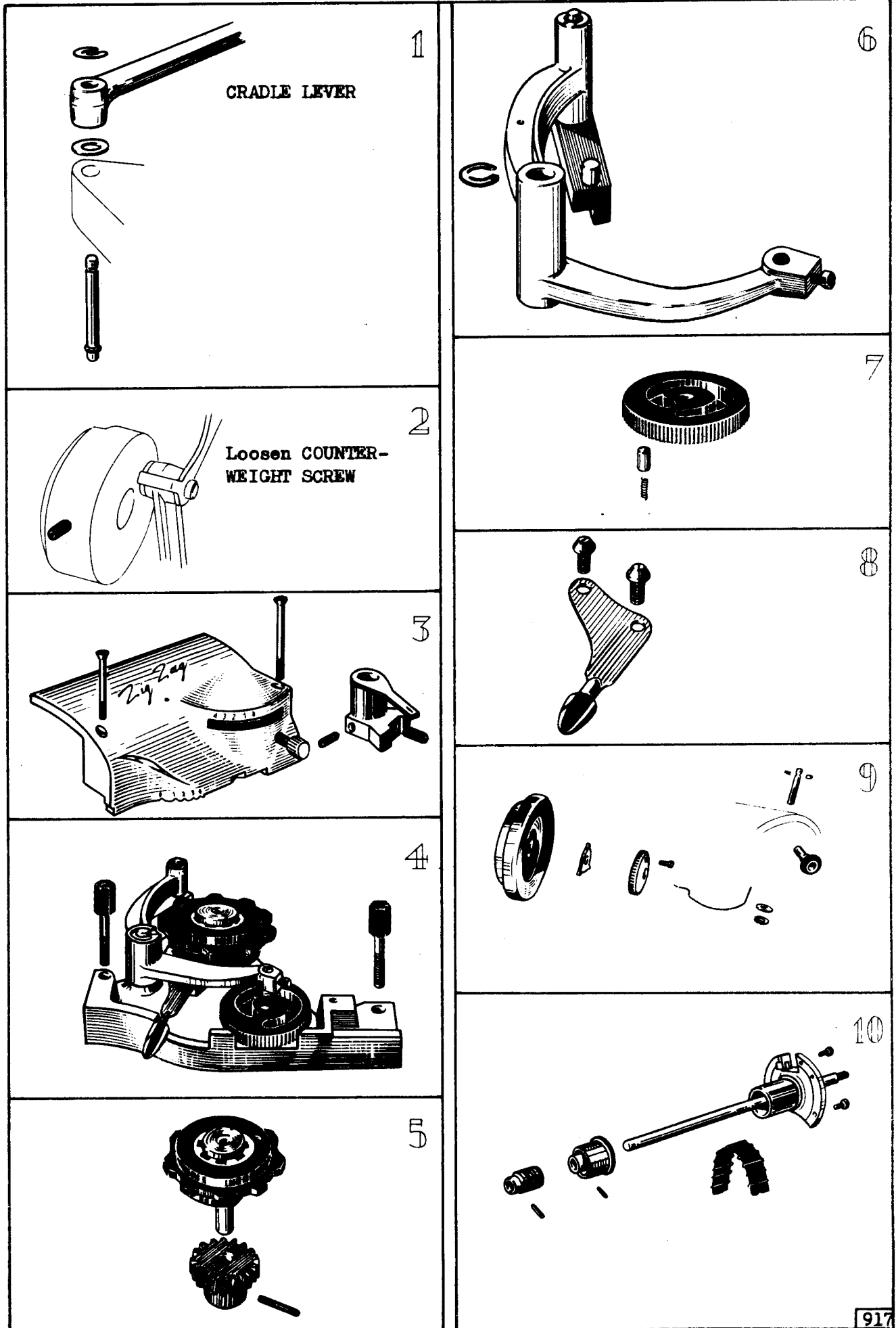
# CONVERSION ZIG-ZAG-SUPERMATIC

DISMANTLING

Printed in  
Switzerland

October 1959

Repairs



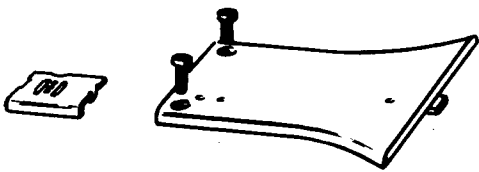
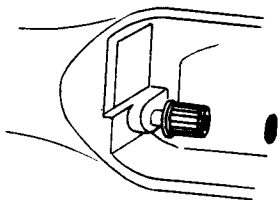
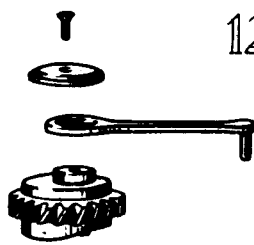
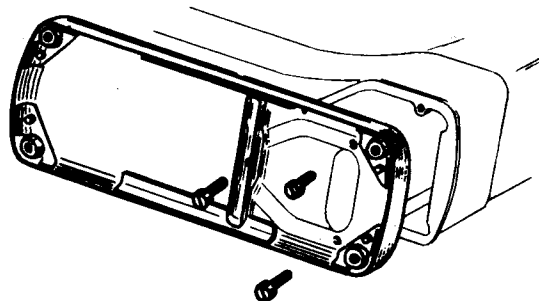
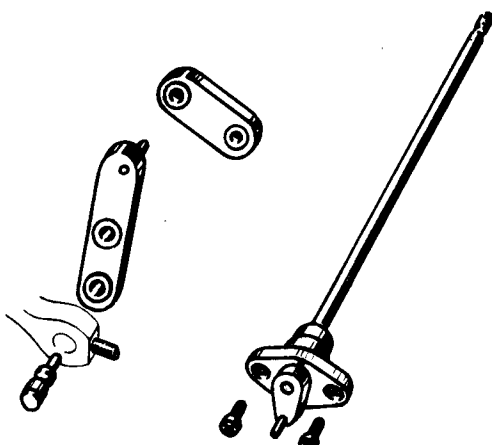
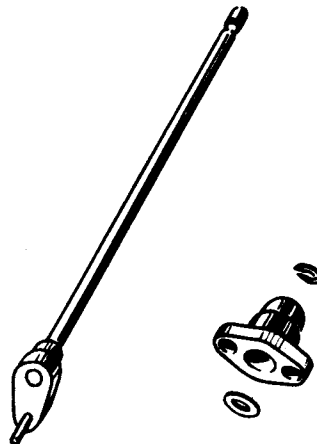
# CONVERSION ZIG-ZAG-SUPERMATIC

DISMANTLING

Printed in  
Switzerland

October 1959

Repairs

 <p>11</p>	 <p>16</p>
 <p>12</p>	
 <p>13</p>	
 <p>14</p>	
 <p>15</p>	

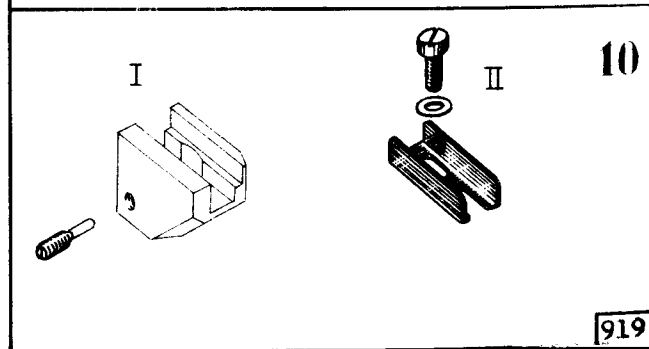
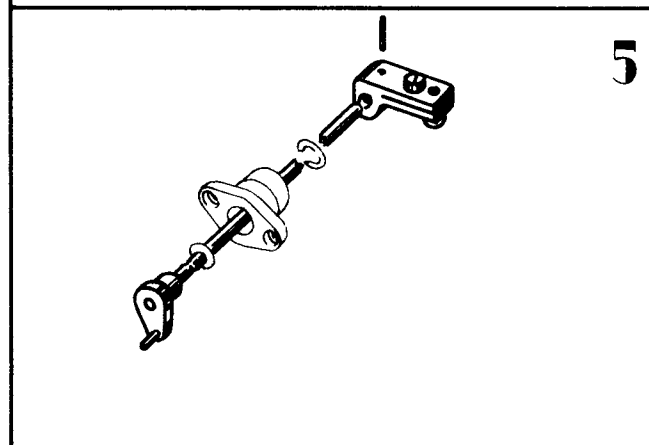
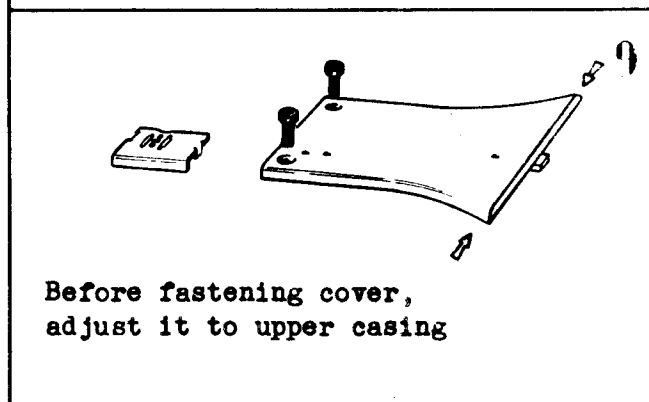
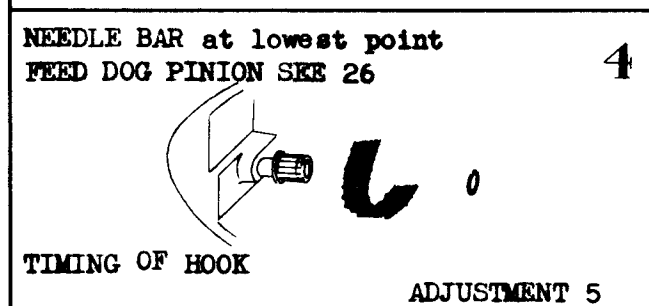
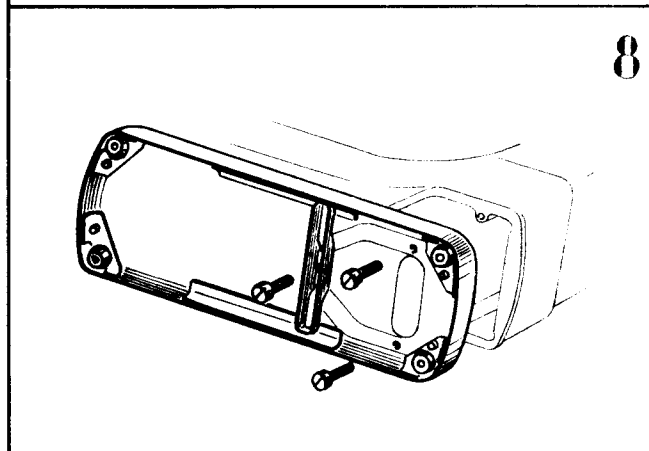
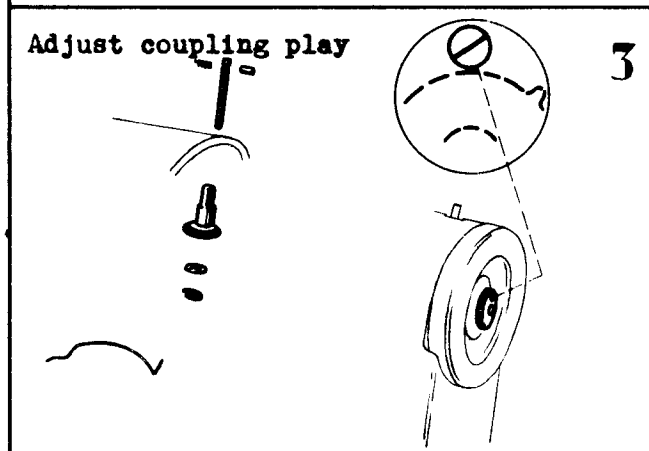
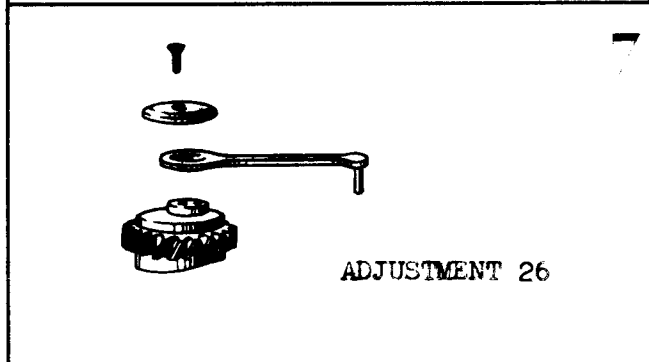
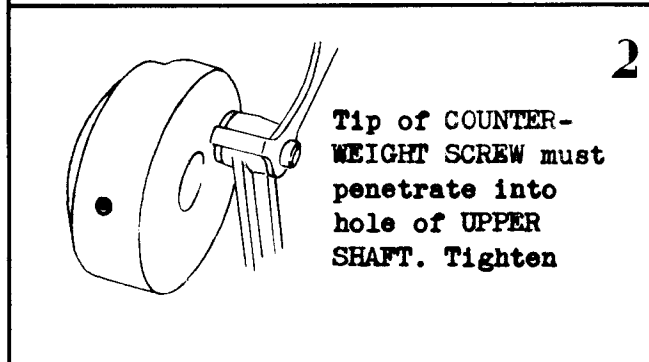
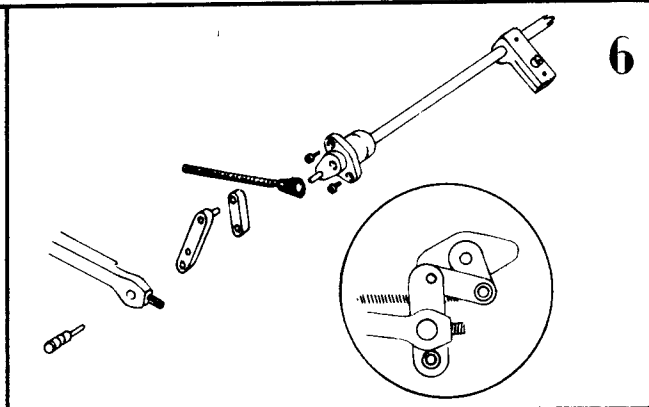
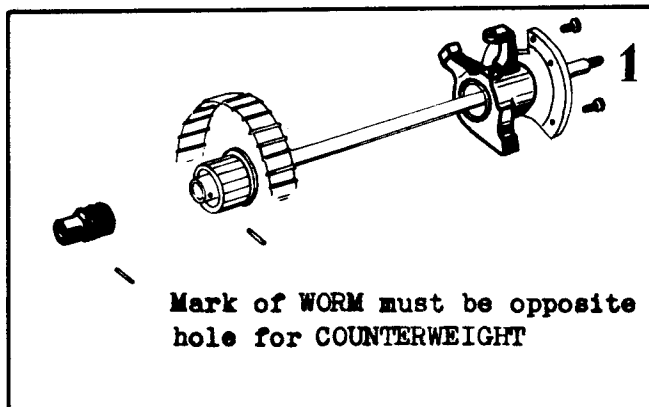
# CONVERSION ZIG-ZAG-SUPERMATIC

ASSEMBLY

Printed in  
Switzerland

October 1959

Repairs





# CONVERSION ZIG-ZAG-SUPERMATIC

## ASSEMBLY

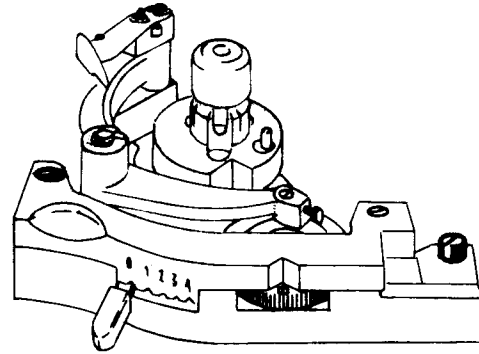
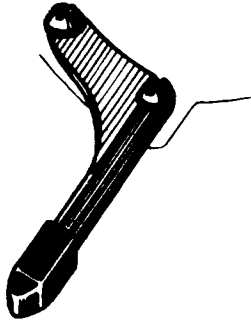
Printed in  
Switzerland

October 1959

Repairs

Slightly tighten the SCREWS

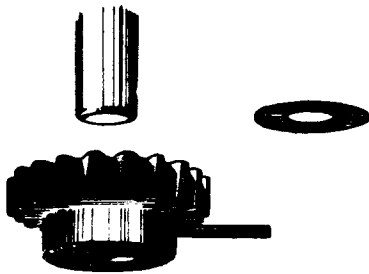
11



16

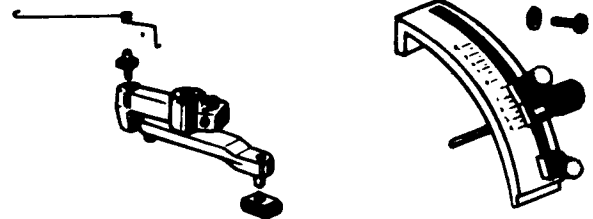
Adjust minimum play between  
EIMAGRAPH PINION and WORM

12

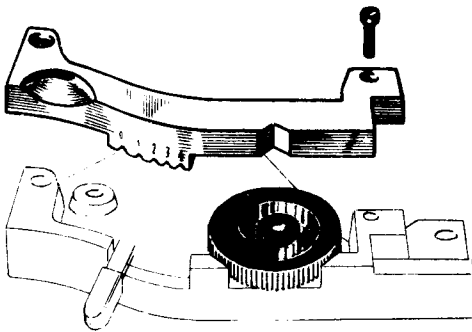


Maximum axial play .004" (0,1 mm)

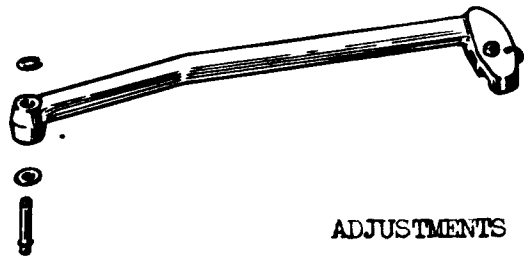
17



13



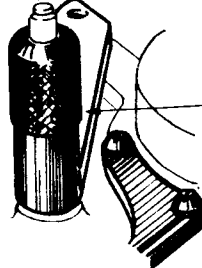
18



ADJUSTMENTS 2-3

SEE TIB 34 § 371  
TIB § 417/4

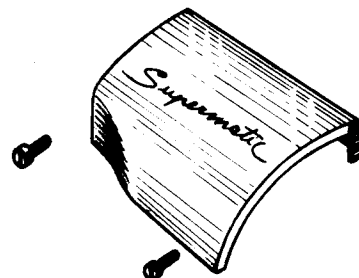
14



Gauge  
11'025

Tighten  
the SCREWS

19



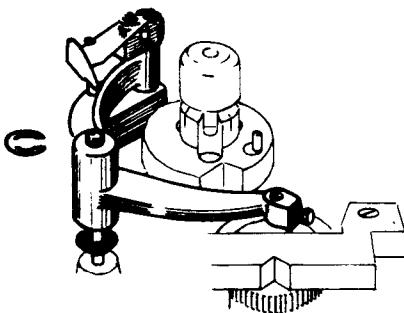
ADJUSTMENTS

13 - 17 - 18 - 19

CHECK

1 - 5 - 6 - 7 - 9 - 10 - 11 - 12

15



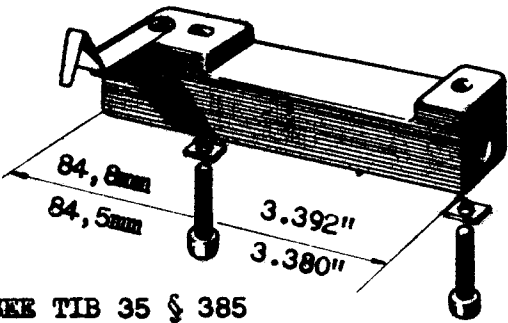
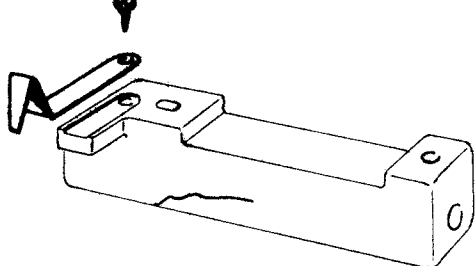
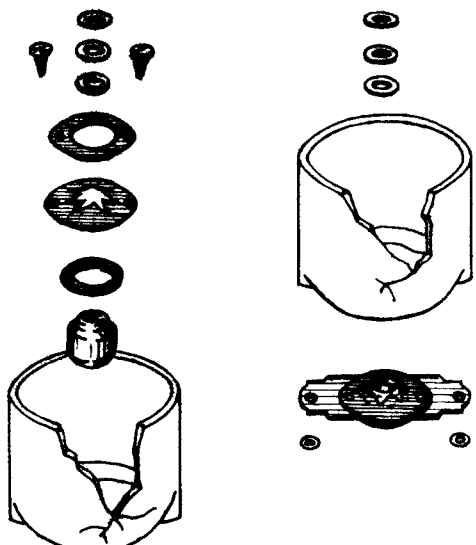
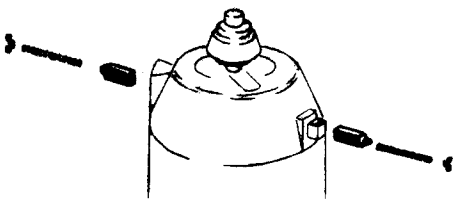
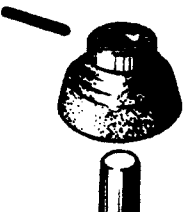
# REPAIR OF MOTOR

## DISMANTLING

Printed in  
Switzerland

May 1963

Repairs

<p><b>KNEE LEVER SEIZED</b></p>	<p>1</p>  <p>SEE TIB 35 § 385</p>
<p><b>REPLACEMENT OF MOTOR SUPPORT</b></p>	<p>2</p> 
<p><b>REPLACEMENT OF LOWER MOTOR CASING</b></p>	<p>3</p> 
<p><b>REPLACEMENT OF CARBON BRUSHES</b></p>	<p>4</p> 
<p><b>REPLACEMENT OF FRICTION WHEEL</b> Is sometimes possible without removing the motor</p>	<p>5</p>  <p>921</p>

# REPAIR OF MOTOR

DISMANTLING

Printed in  
Switzerland

October 1959

Repairs

## REPLACEMENT OF ARMATURE

1, 3 assembled,  
4, 5



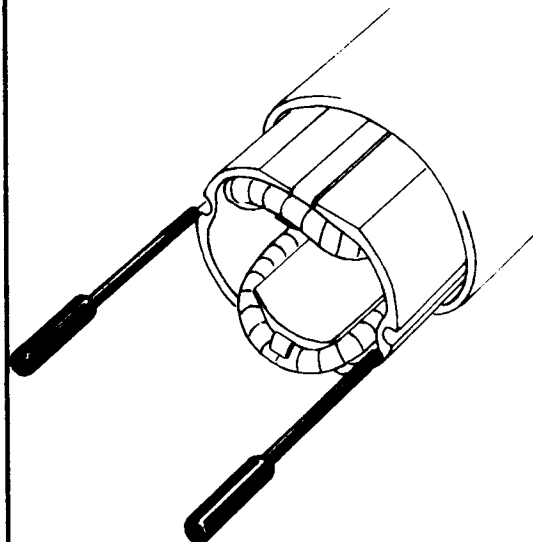
6

## REPLACEMENT OF INDUCTOR ASSEMBLED (Changing of voltage - short circuit)

1, 3 assembled,  
4, 5, 6

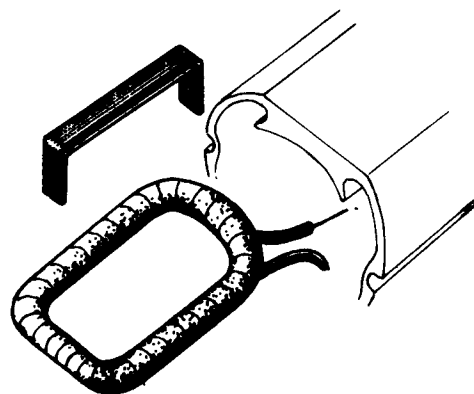
Unsolder 4 wires of inductor coils  
i.e.

2 on carbon brushes  
1 on contactor  
1 on motor-condenser



7

## REPLACEMENT OF INDUCTOR COILS



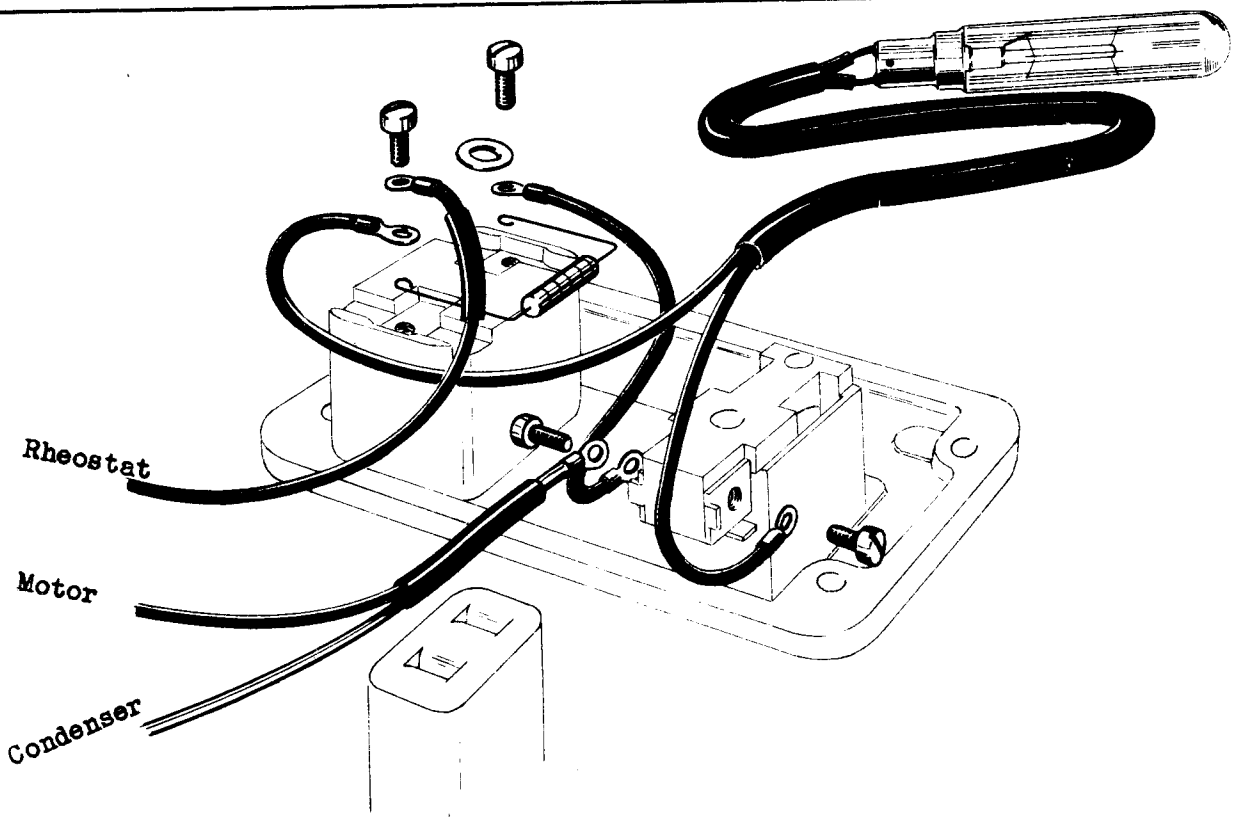
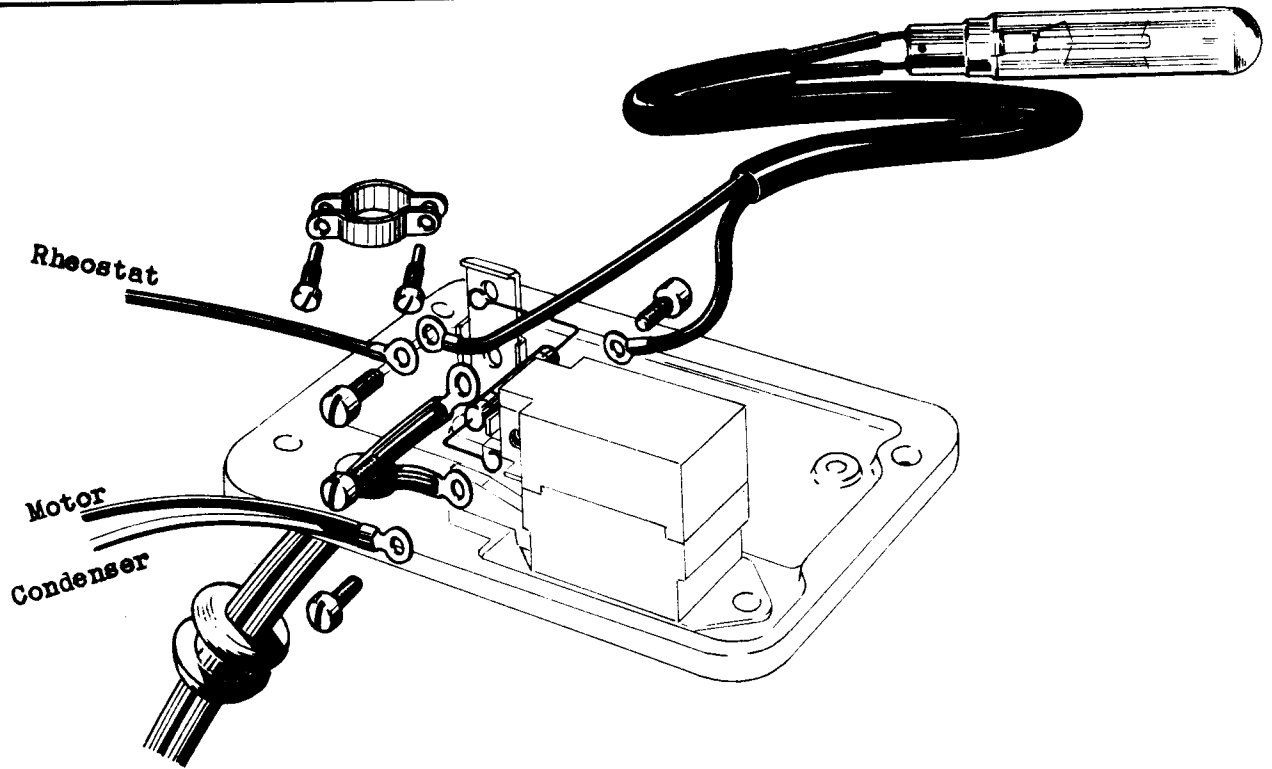
8

# SWITCH PLATE - CONNECTIONS S-Z-T

Printed in  
Switzerland

October 1959

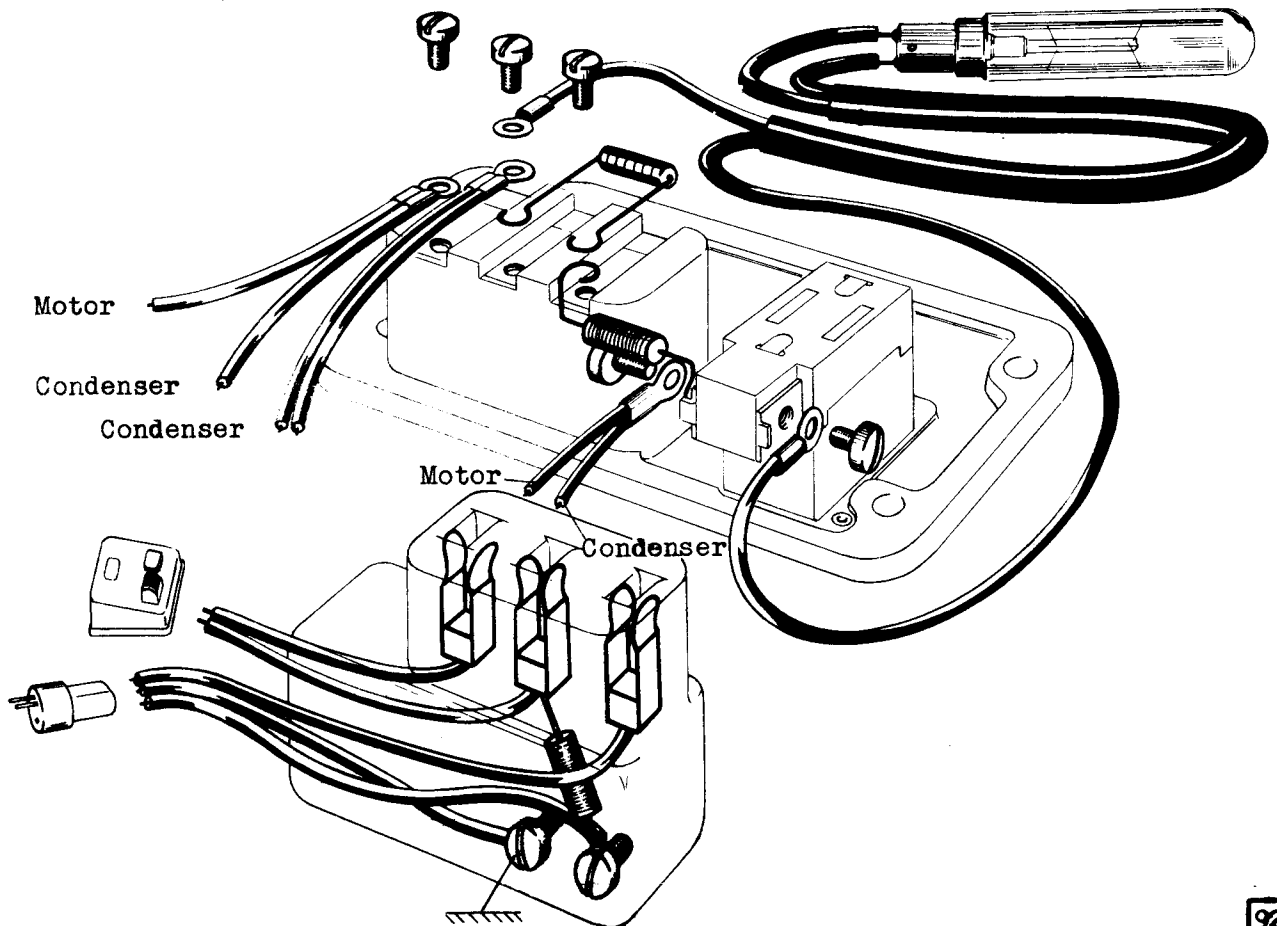
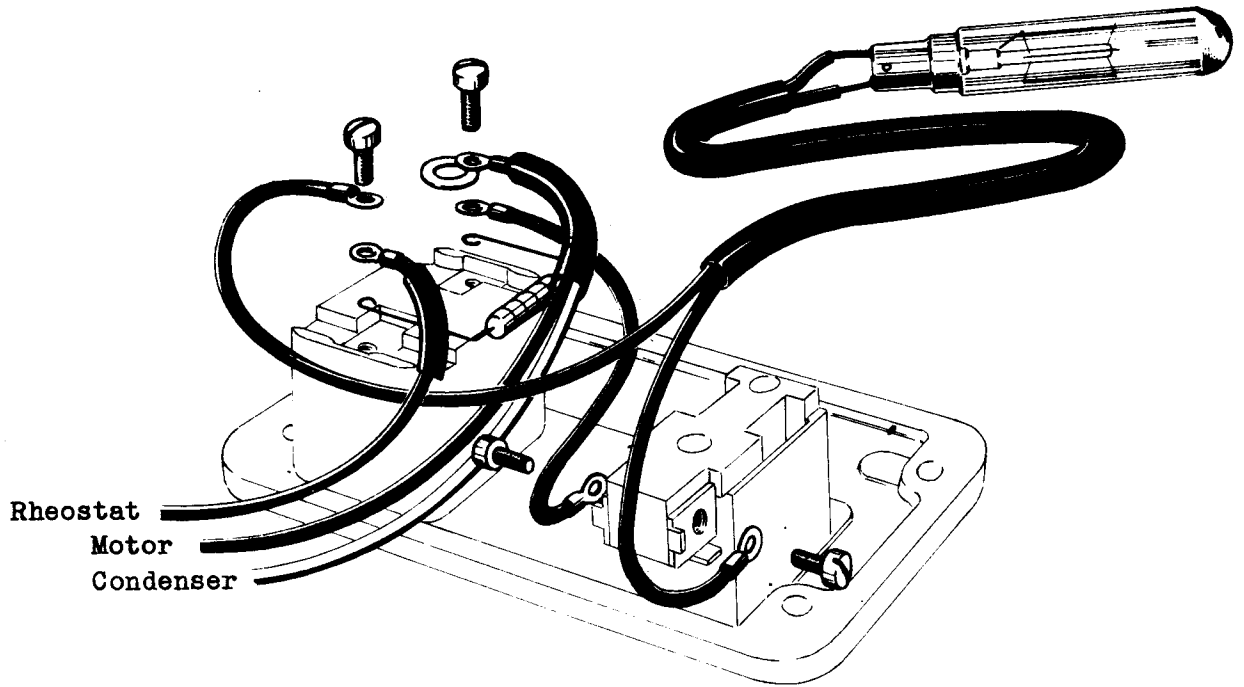
Repairs



# SWITCH PLATE - CONNECTIONS EL-EZ-EA

Printed in  
Switzerland

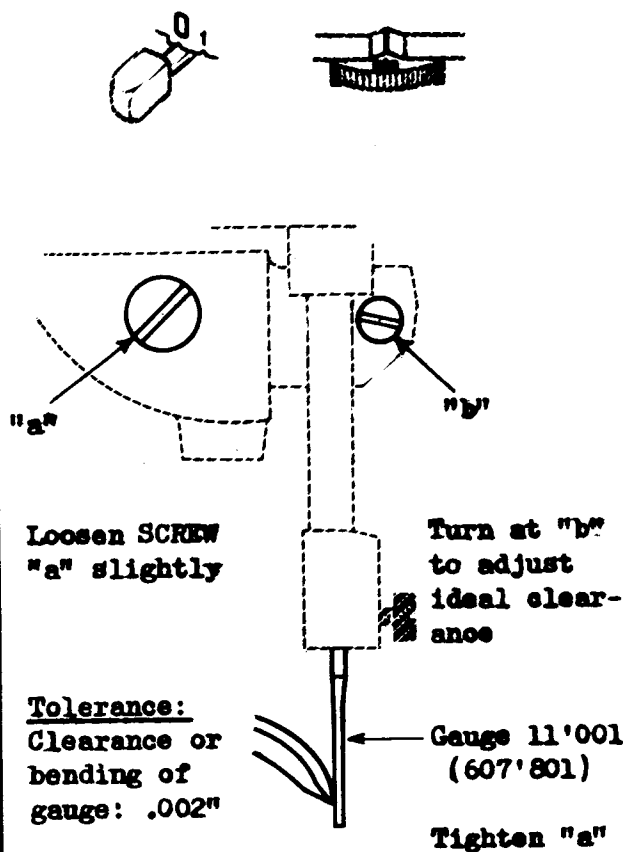
June 1960



Repairs

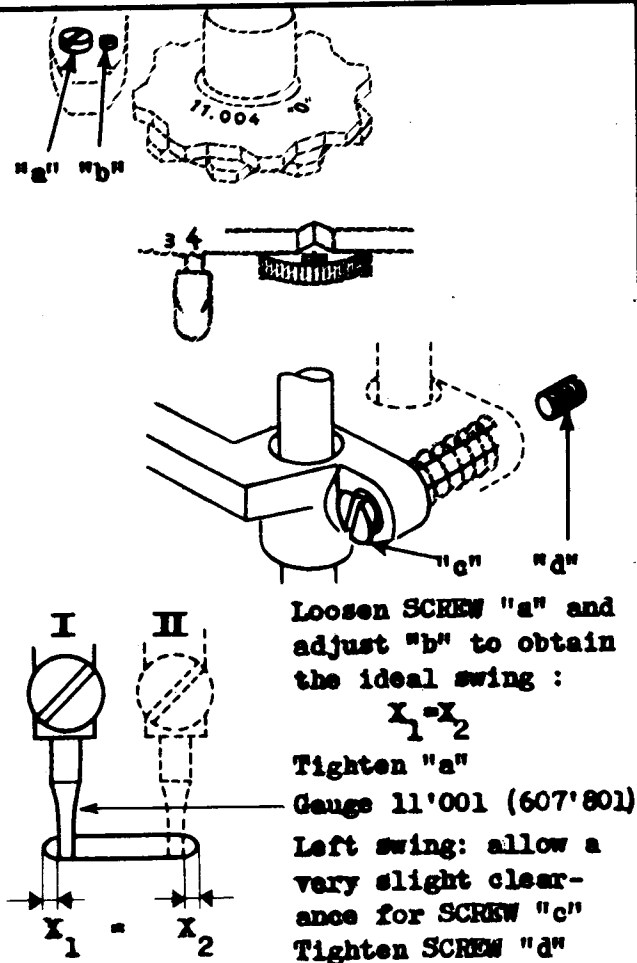
# NEEDLE CLEARANCE S-Z-T

1



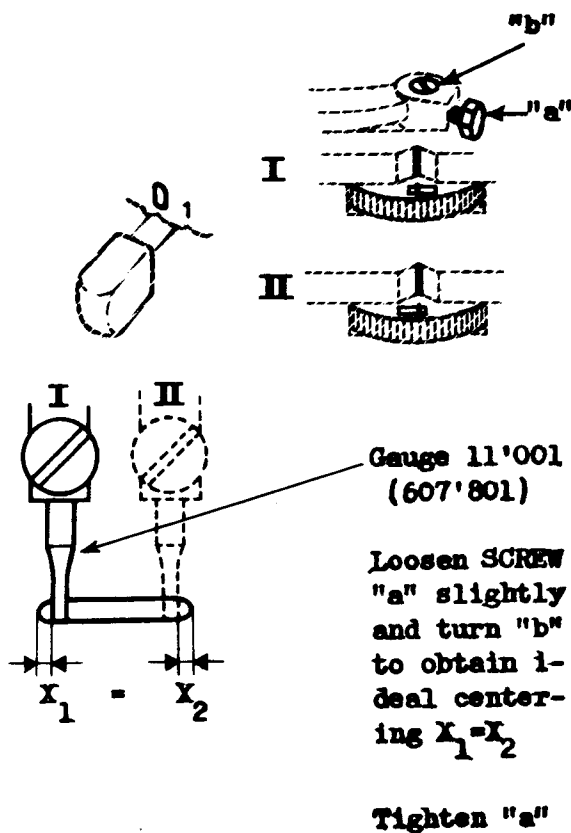
# NEEDLE BAR SWING S-Z-EA

2



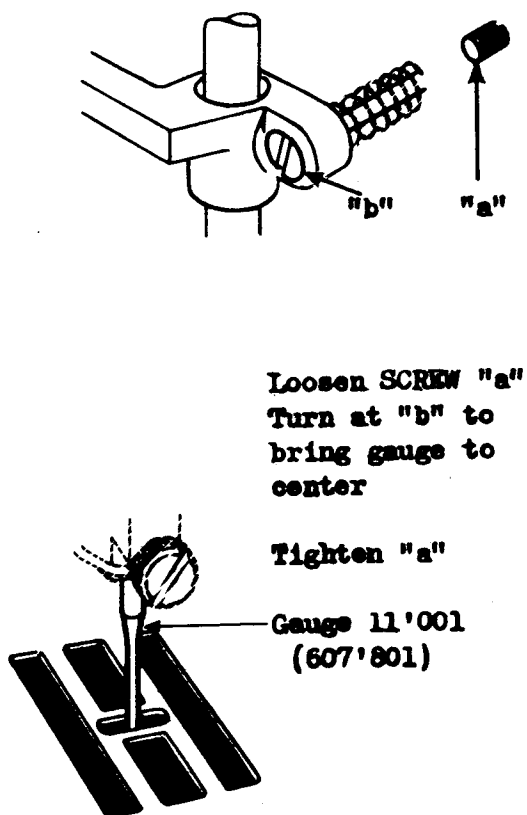
# CENTERING S-Z

3



# CENTERING T-EL

4

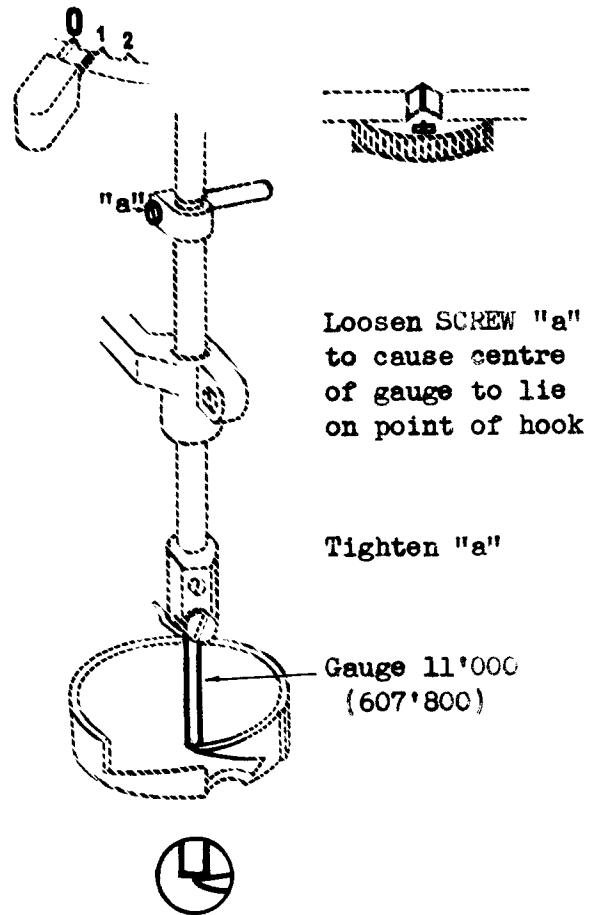
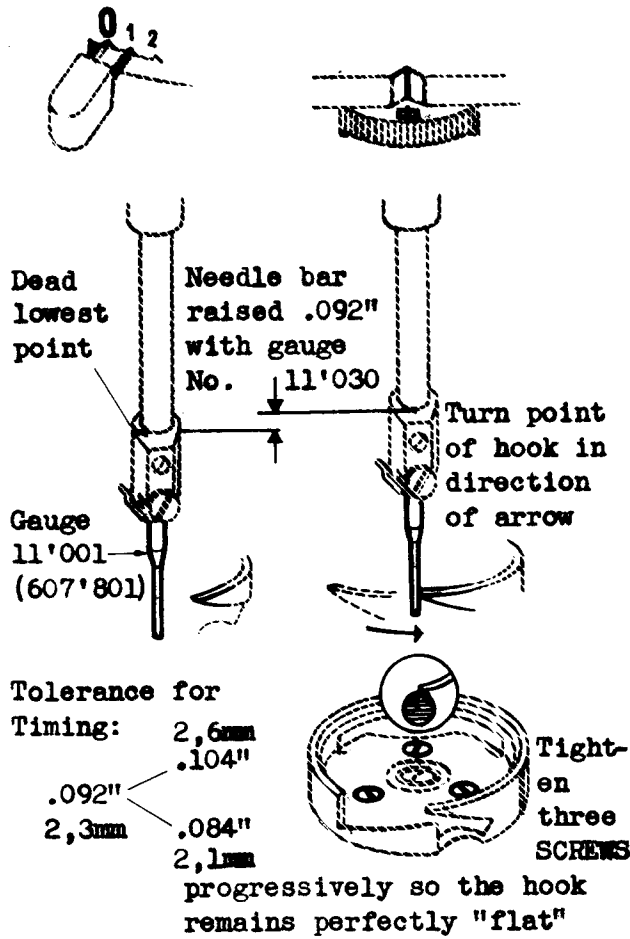


# TIMING

5

# HEIGHT OF NEEDLE BAR

6

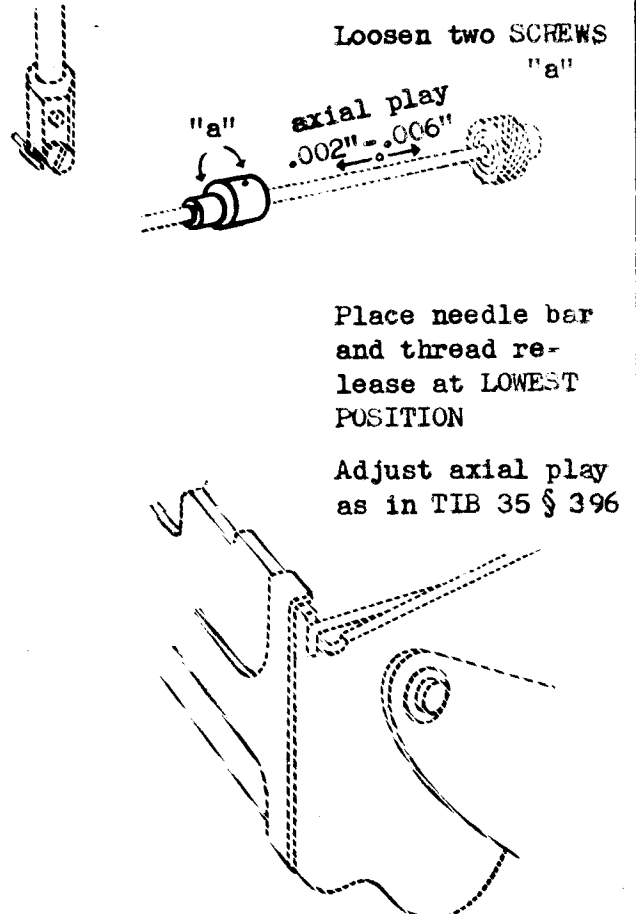
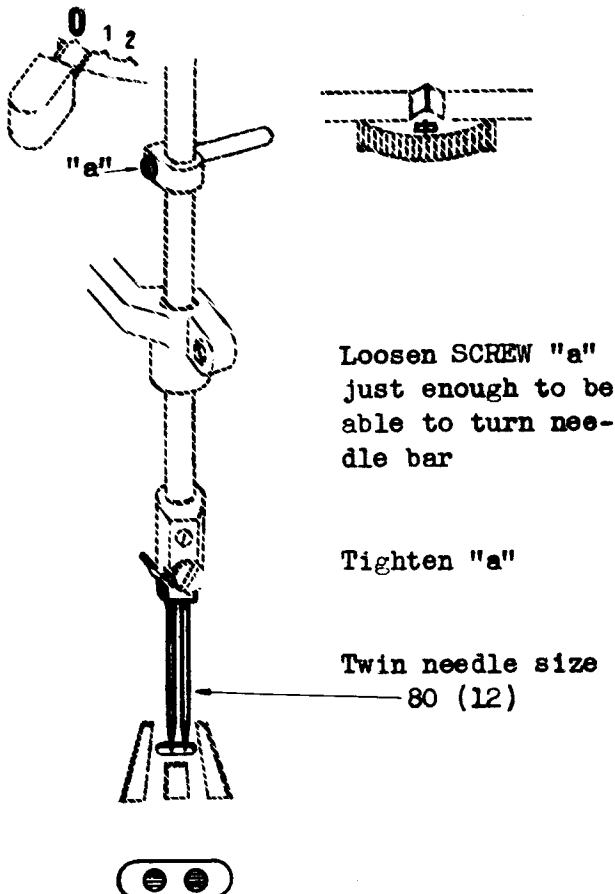


# ORIENTATION OF NEEDLE BAR

7

# RELEASE CAM S-Z-T

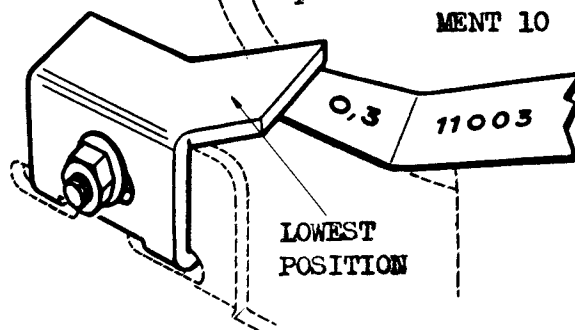
8



## GUARD RING STOP S-Z-T

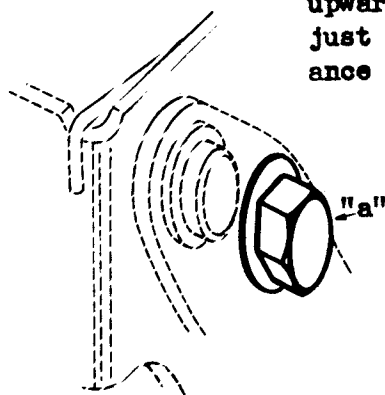
9

Set guard ring stop approximately in position ADJUSTMENT 10



Axial play thread release: Freely moving without play

Turn "a" so that thread release moves upwards to adjust clearance

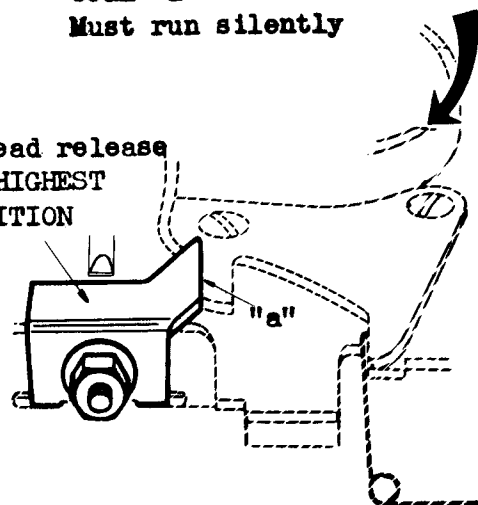


## GUARD RING ESCAPEMENT S-Z-T

10

Press guard ring in direction of arrow and move STOP until it is aligned with beak "a"  
Must run silently

Thread release in HIGHEST POSITION



Tighten nut without forcing holding screw with screwdriver

SEE TIB 24 § 218

## FEED DOG

11

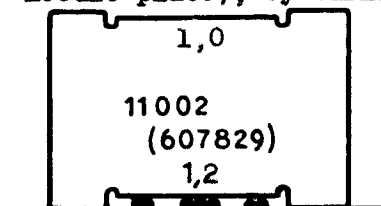


Work cover  
11'014

Fasten the two  
SCREWS after  
positioning

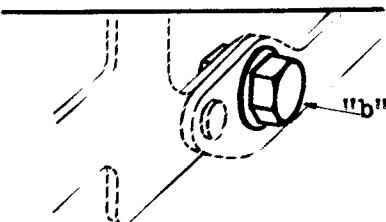
Support feed dog with  
screwdriver for tightening

Adjust height at 1,2 (with  
needle plate), by turning



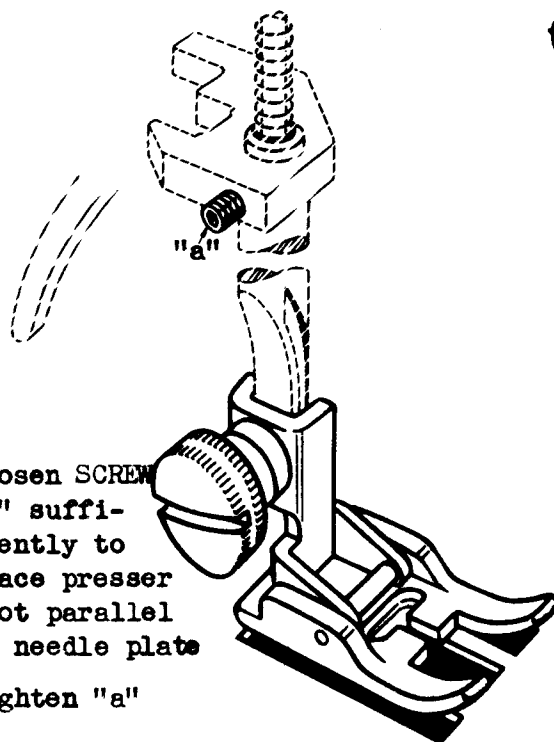
"b" so that  
feed dog moves  
upwards

Feed dog must  
not touch needle  
plate at  
4 FWD and 4  
REV



## PRESSER BAR ORIENTATION

12



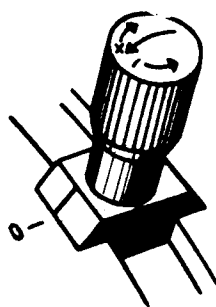
Loosen SCREW  
"a" suffi-  
ciently to  
place presser  
foot parallel  
to needle plate  
Tighten "a"

75

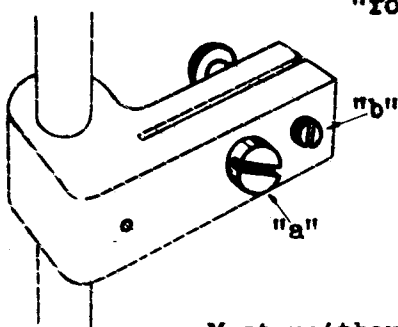


STITCH LENGTH S

13



shortens lengthens  
the  
"forward" stitch



Loosen "a",  
adjust "b"

Must neither feed for-  
ward nor backward at "0"

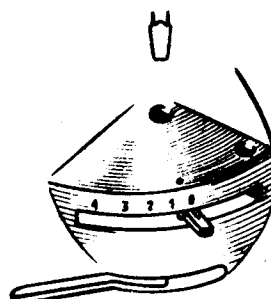
SEE TIB 18 § 107

Tighten "a"

STITCH LENGTH Z-EL-EZ

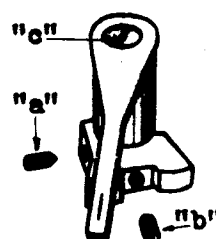
14

Work cover  
11'027



Loosen "a",  
tighten "b"

Turn at "c" to  
obtain no for-  
ward nor back-  
ward feed at "0"

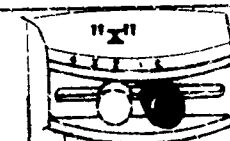


Tighten "b" and "a"

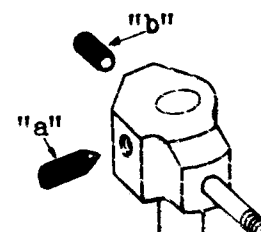
SEE TIB 417/5

Loosen "a", tighten  
"b"

Must neither feed  
forward nor back-



ward at "x"  
Loosen "b" to set  
lever at "0"

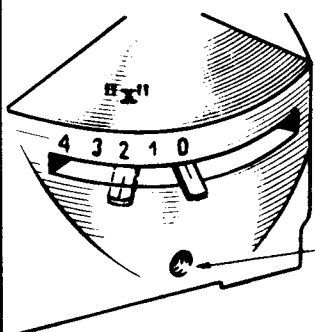


After obtaining  
adjustment at "0",  
tighten "b" and  
"a" and check

SEE TIB 463 § 8

STITCH LENGTH T

15



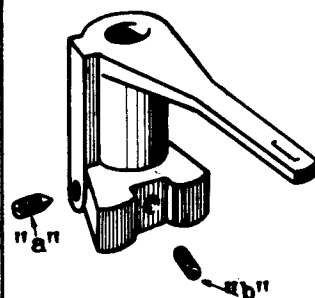
Remove cover  
to loosen  
"a"  
Replace  
cover with-  
out STOP  
SCREW

No forward  
or backward  
feed at "x"

Loosen "b"  
to set lever  
at "0"

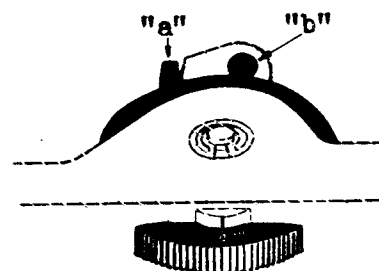
Tighten "b"

After ob-  
taining  
adjustment  
at "0",  
tighten "b"  
and "a"  
firmly and  
check



STITCH LENGTH EA

16



Must neither feed forward  
nor backward at "0"

Loosen "a", adjust "b"

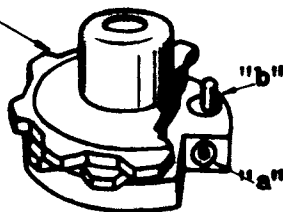
Tighten "a"

SEE TIB 515 B/1

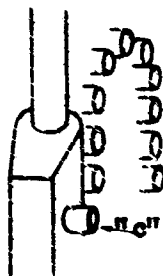
# ELNA-DISC DRIVE S-Z-EA

17

11'004  
(607'836)

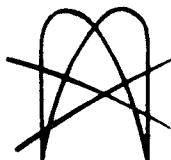


Run machine at full speed, observe reflection of light on stud "a"



Loosen "a",  
adjust "b"

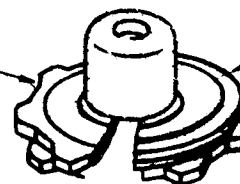
Tighten "a"



# AUTOMATIC CLOTH FEED S

18

11'004  
(607'836)  
up to  
machine  
1'104'935



11'029  
as from  
machine  
1'104'936



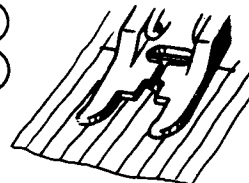
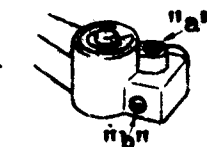
Loosen "a", adjust "b"  
to have neither for-  
ward nor backward feed  
at

Tighten "a"

Must advance at

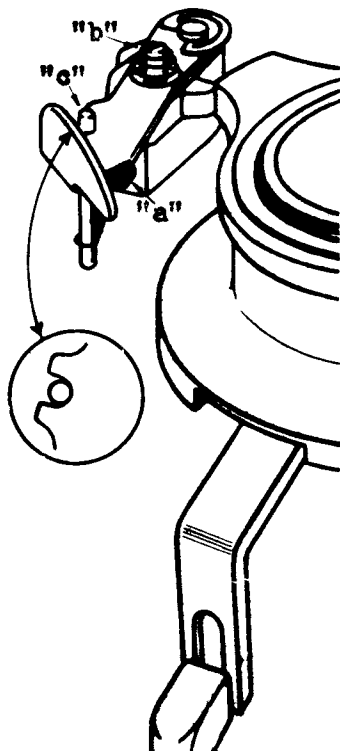
Must move back at

Advance and return  
practically equal



# BUTTONHOLE DISC S

19

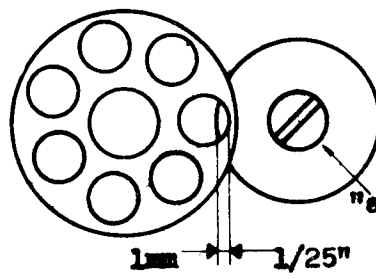


Loosen "a"  
adjust "b"  
until key  
lever presses  
from the right  
on pin "c"

Tighten "a"

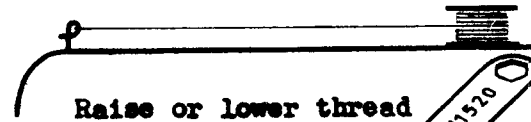
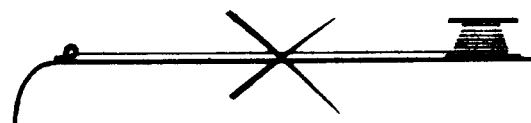
SEE TIB 33  
§ 1-2

# FLYWHEEL UNCOUPLED



Loosen "a"  
so stop  
edge is  
about 1/25"  
inside one  
bobbin hole

Tighten "a"



Raise or lower thread  
guide until ideal  
winding is achieved  
OLD TYPE WINDER:  
Use wrench 11'520

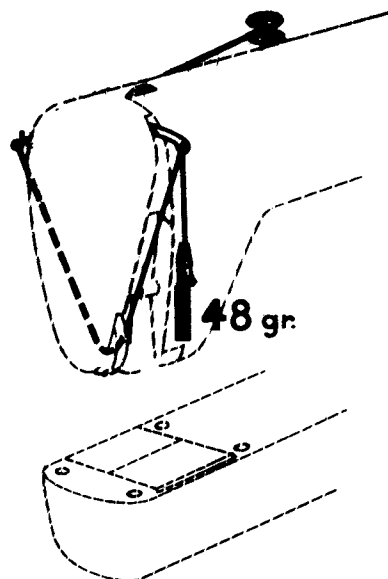
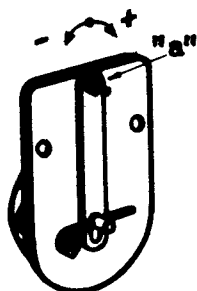
20

# BOBBIN WINDING S-Z-T

# UPPER TENSION S-Z-T

21

Darning thread  
UFAG 70 (120)  
or equivalent



$\frac{3}{4}$  : falls slowly

$1\frac{1}{4}$  : stops

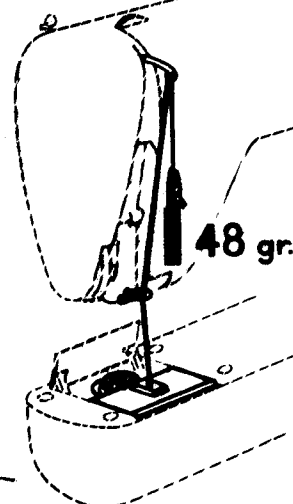
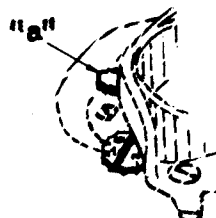
Turn nut "a" to adjust

SEE TIB 25 § 228 a C/3

# LOWER TENSION S-Z-T

22

Darning thread  
UFAG 70 (120)  
or equivalent



$\frac{3}{4}$  : falls slowly

1 : stops

Loosen guard ring beak  
to be able to turn low-  
er tension axle "a"

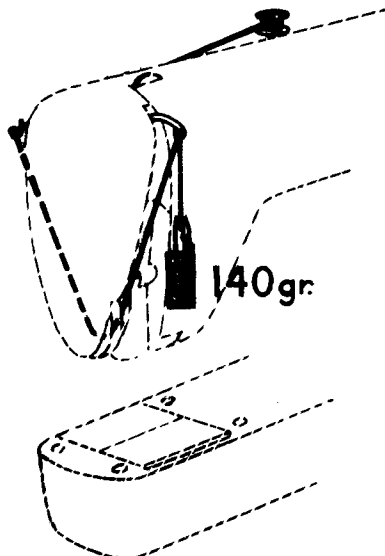
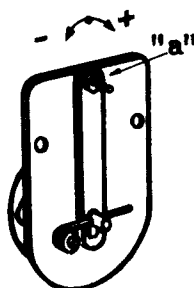
After adjustment, tight-  
en guard ring beak screws

SEE TIB 25 § 228 b C/3

# UPPER UNIVERSAL TENSION

23

Darning thread  
UFAG 70 (120)  
or equivalent



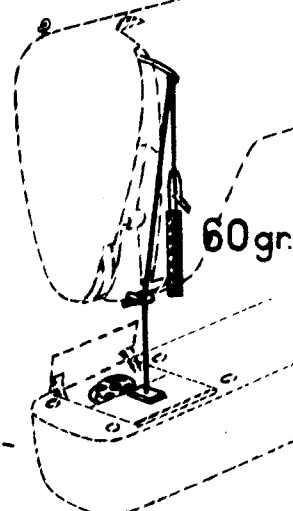
S-Z-T  
 $3\frac{1}{2}$  : falls slowly  
4 : stops

EL-EZ-EA  
 $4\frac{1}{2}$  : falls slowly  
5 : stops

Turn nut "a" to adjust

SEE TIB 418/2a C/3 515/b A/2

Darning thread  
UFAG 70 (120)  
or equivalent



S-Z-T  
 $\frac{1}{2}$  : falls slowly  
 $\frac{3}{4}$  : stops

EL-EZ-EA  
 $1\frac{1}{4}$  : falls slowly  
 $1\frac{1}{2}$  : stops

Loosen guard ring beak  
to be able to turn low-  
er tension axle "a"

After adjustment, tight-  
en guard ring beak screws

SEE TIB 418/2b C/3 515/b A/2

24

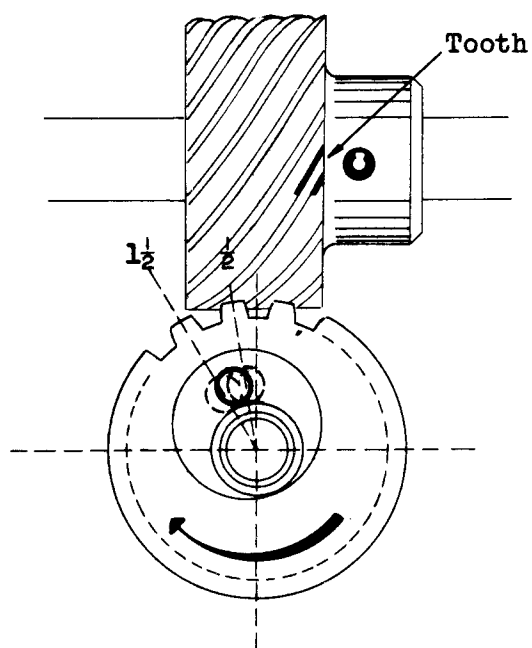
FEED GEAR S-T

25

FEED GEAR S-Z-T

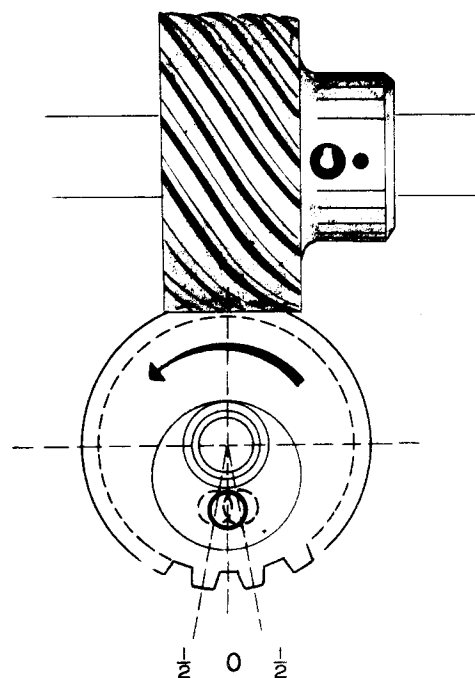
26

up to 866'040



SEE TIB § 103

as from 866'041



SEE TIB 35 § 395

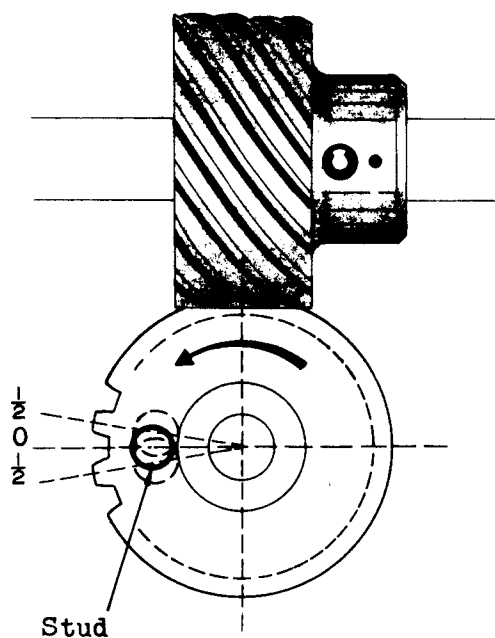
FEED GEAR S-EL-EZ-EA

27

FEED GEAR S-EL-EZ-EA

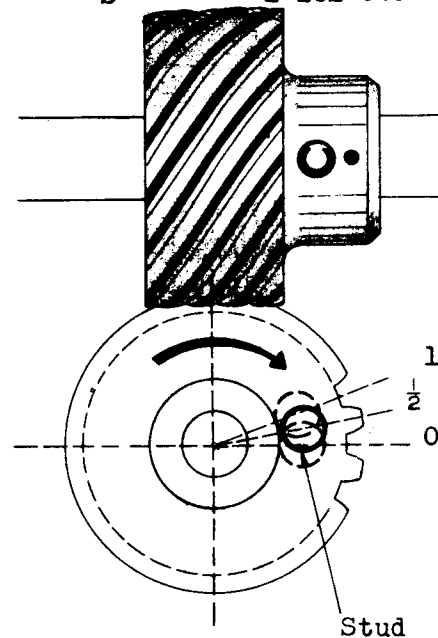
28

as from 1'104'936



SEE TIB § 463/4 A/2

as from EL-EZ-EA 1'170'040  
S 1'182'049



SEE TIB § 545 B/4  
§ 565 B/4

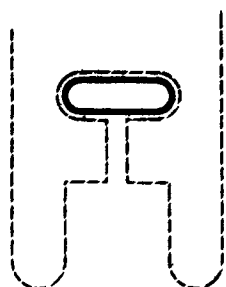
## NEEDLE CLEARANCE EL-EZ-EA

29

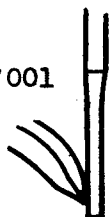
## CAM GEAR EZ

30

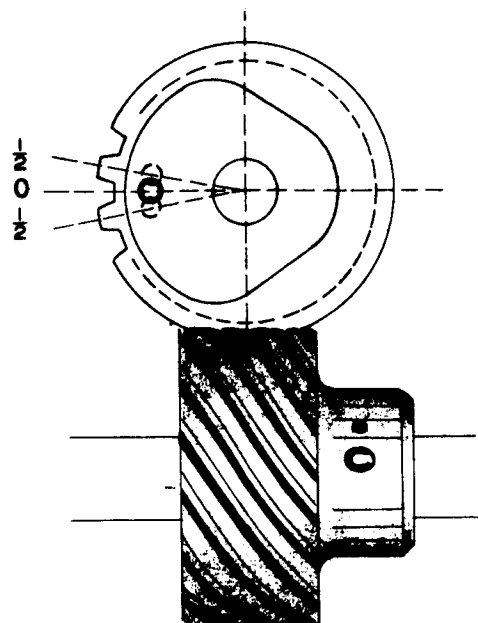
Slightly loosen CASING CONNECTING SCREWS to align slot in foot with needle plate hole by moving casings



Gauge 11'001 (607'801)



Adjust clearance as per ADJUSTMENT 1 and tighten the 4 CASING CONNECTING SCREWS



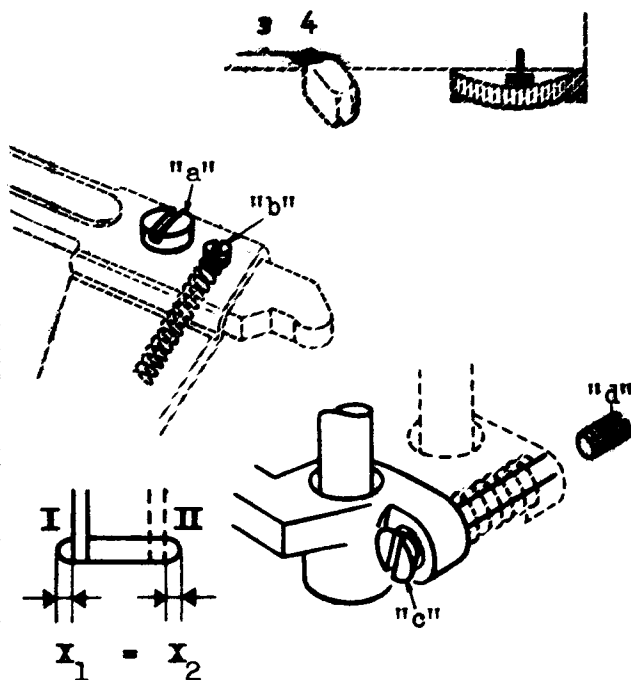
SEE TIB § 463 p.8/1 A/2

## NEEDLE BAR SWING EZ

31

## CENTERING EZ-EA

32

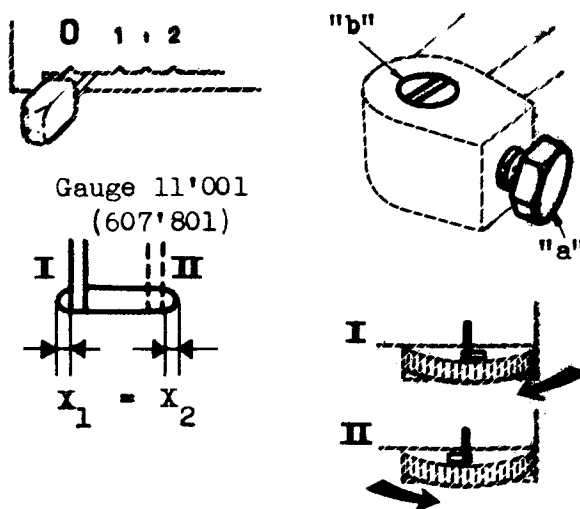


Loosen SCREW "a", turn "b" to obtain ideal swing:  $X_1 = X_2$

Tighten "a"

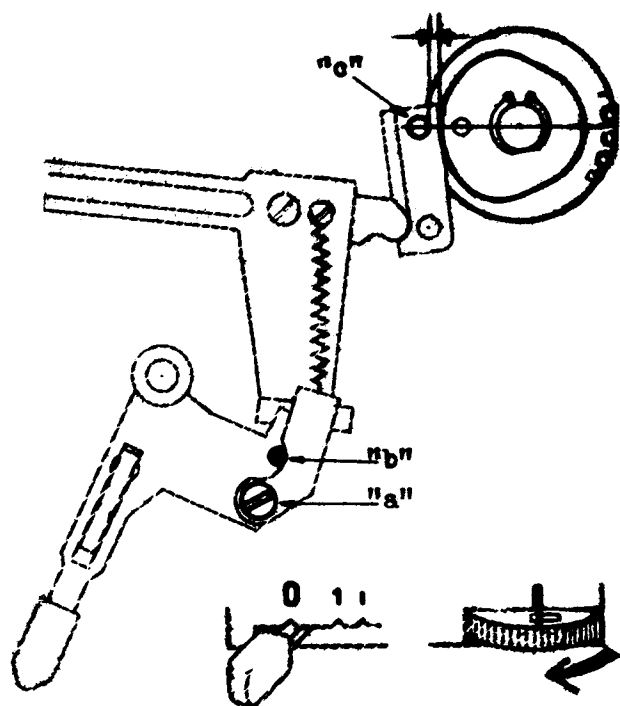
LEFT SWING: leave a slight clearance for SCREW "c"

Tighten "d"



Slightly loosen SCREW "a" and turn "b" to obtain ideal centering:  $X_1 = X_2$

Tighten "a"



Loosen SCREW "a", turn "b" to  
adjust a slight play between  
"c" and CAM GEAR

Tighten "a"

E3

MECHANICAL  
HANDBOOK

ELNA JUNIOR

Fig. 1



Assembly Sequence	Description of parts	Remarks
41	Stitch length knob axle	Place "42", "43" and "44" in turn on "41" and screw this subassembly fast in the casing
42	Stitch length knob	
43	Feed dog	
44	Washer 4	
45	Threaded pin M3	
46	Feed dog spring	
	C. Assembly of the Casings, Adjustments	Screw "45" tight in the casing. Place "46" on "45" so that its long end comes to lie against the casing and the short end against "42" (fig. 5), then bend the long end back behind the extension of the feed dog "43"
47	Screw M4	
48	Screw M4	
49	Screw M4	
50	Spool pin	
51	Screw M4	When assembling the casings "1" and "35", care must be taken that the fork of the feed dog "43" fits into cam "25". The whole unit is then fastened together with the screws "47", "48", "49" and "51" and the spool pin "50" is fastened with screw "51"
52	Spool pin felt	
It is now possible to proceed with the final adjustment of the timing and the needle clearance as follows :		
a. Place a straight needle no. 80 in the needle clamp "17".		
b. Loosen the screws "27" and "28".		
c. Place the point of the hook behind the needle.		
d. Turn the flywheel, until the point of the hook is only 1,5 mm above the eye of the needle (approximately 1,5 × height of eye).		
e. Displace the hook "26" inside of the lower shaft until its point grazes the needle.		
f. Tighten the hook "26" by means of the screw "27".		
g. Check the timing and needle clearance.		
h. After completing the assembly, tighten the screws "27" and "28" well and secure them by striking them on the rim with a punch.		
i. Loosen the screw M4 "47", in order to be able to separate the two casings at the end of the free arm.		
53	Needle plate	Separate the two casings slightly, insert "53" and center, so that the needle passes through the center of the slot. Fasten "54" and "55". When screwing on "55", make sure that the screw "56" at the same time holds the self-locking brake "23".
54	Rubber foot	
55	Base	
56	Screw M4	

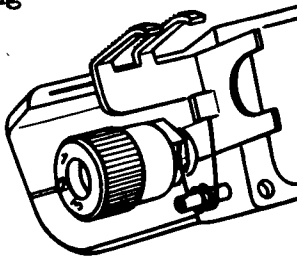


Fig. 5

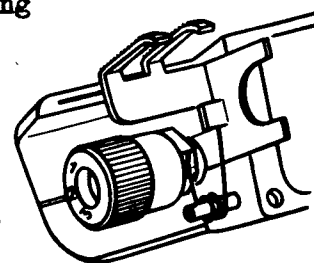
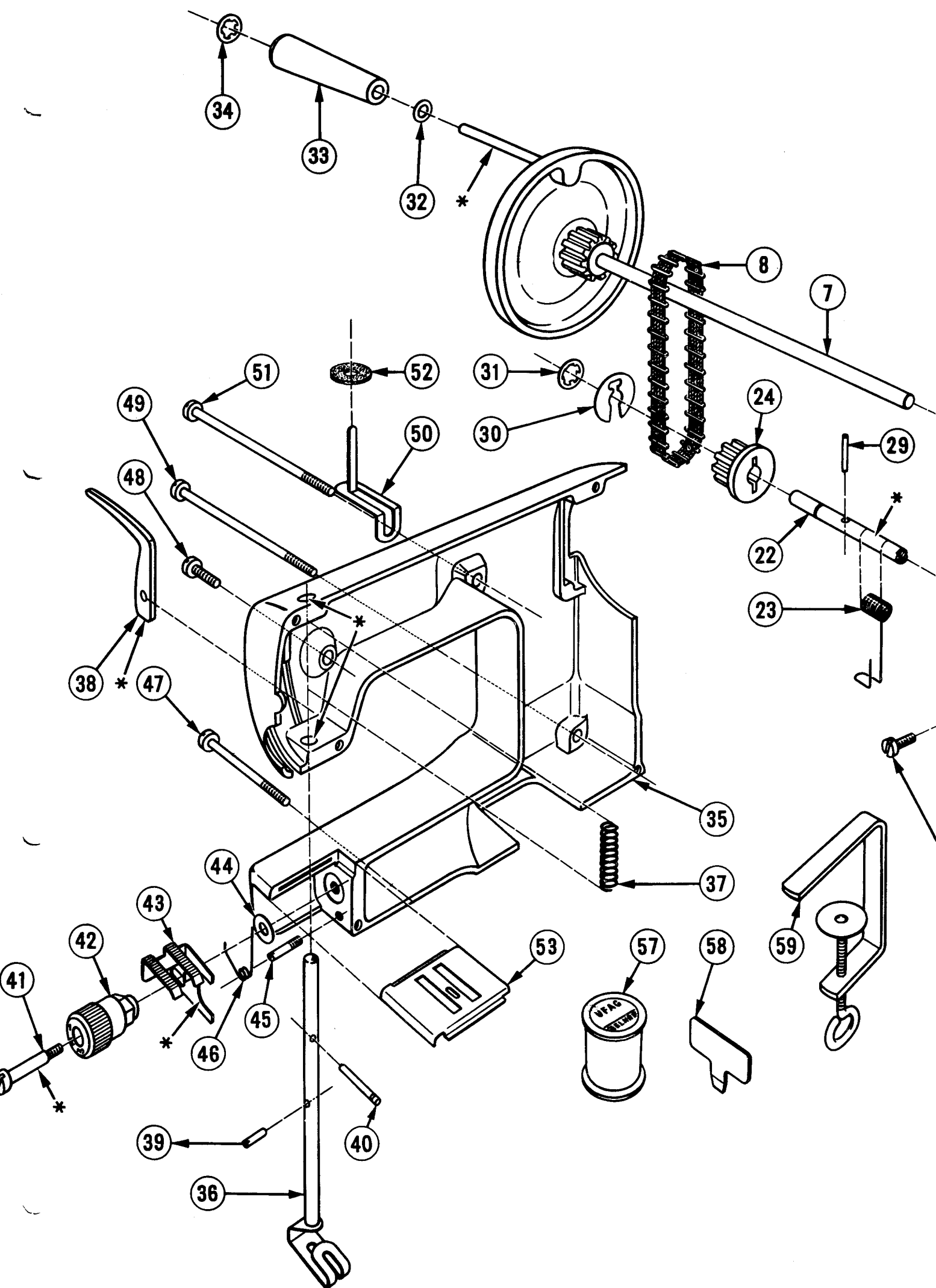
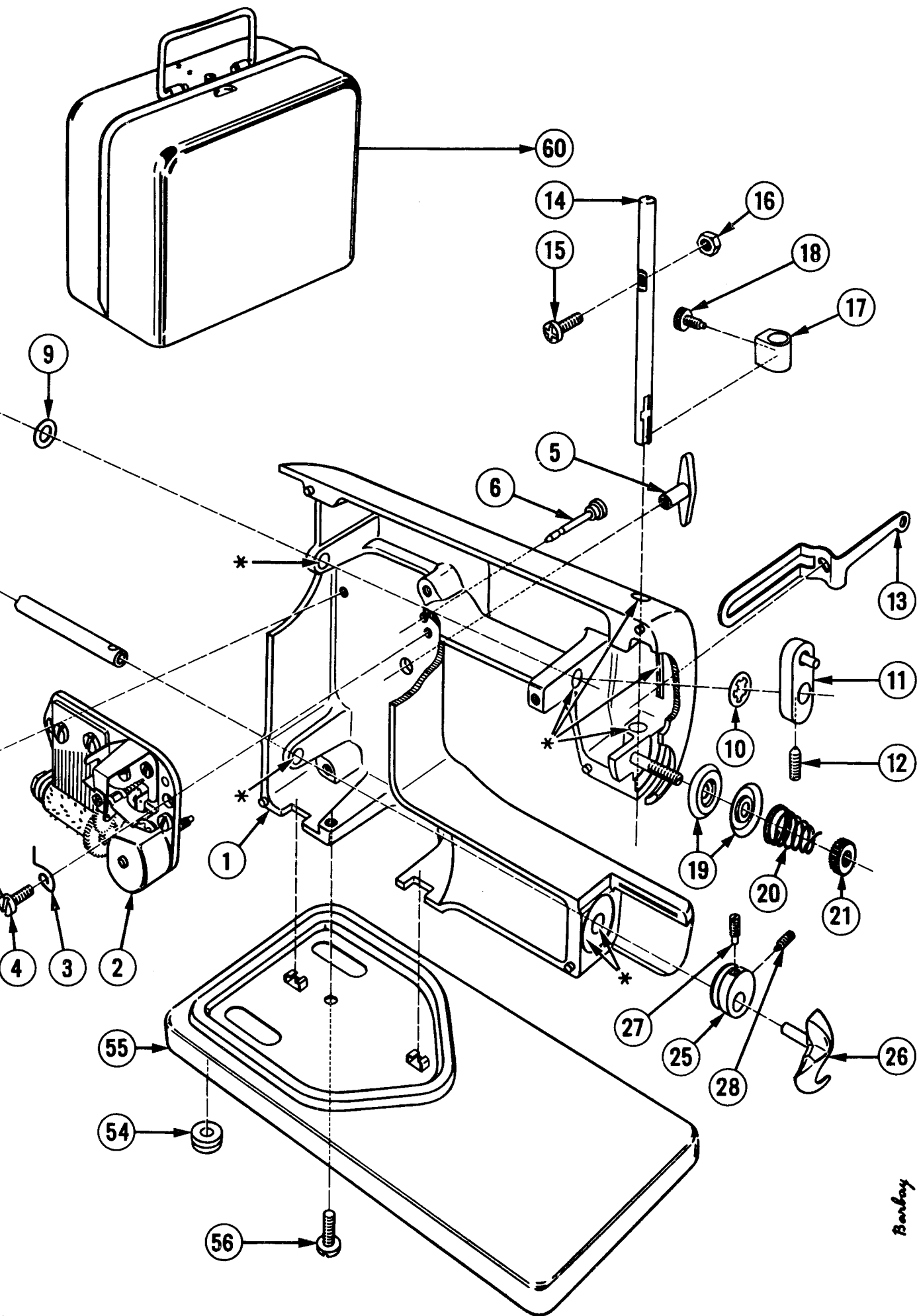


Fig. 5

For dismantling, simply proceed in the reverse order





## HOW TO ATTEND TO DISORDERS

Disorders on the ELNA Junior are mainly due to the machine having been taken apart by the customer, by it having been dropped or by individual parts having been lost.

### A. Machine Dismantled by Customer

Depending upon the extent to which it has been taken apart, the machine may be more or less dismantled and reassembled correctly. For this, use the drawings and the above explanations as a guide.

### B. Possible Repairs to a Machine that Has Been Dropped

#### a. Tension Pin, Thread Guide

If these parts should no longer be firmly lodged in the casing, they may be tightened with one or two blows with a punch. For the tension pin, this is to be done on the upper part of the thicker wall, above the pin, and for the thread guide on the wall thickness around it, on the inside of the rear casing.

#### b. Thread Take-Up Lever

If this part is bent or broken, it must be replaced.

#### c. Flywheel Handle

If this part is bent, it can be straightened with a pair of pliers, but by using a piece of material as a pad, in order not to damage it. If the handle axle is broken off, the whole upper shaft must be replaced.

#### d. Presser Foot Lever

If it is bent, first try to straighten it. Otherwise it must be replaced.

### C. Sewing

If the sewing is faulty, first make sure that the machine is properly threaded.

#### a. Failure to Form Stitches

Check the needle and, if necessary, replace it. Check the timing and clearance.

#### b. Skips Stitches

Check the needle and, if necessary, replace it. Check the timing and needle clearance.

#### c. The Thread Breaks

Check the needle and, if necessary, replace it. Check the tension device as well as the timing and needle clearance.

#### d. Tension is Too Weak

Verify, whether the tension device has been properly assembled.

#### e. Material Is Fed Unevenly

If the stitch length is irregular, verify whether the feed dog has been properly fitted (jamming). If the material is not fed in a straight line, check to see whether the presser foot presses properly on the feed dog.

### D. Music Box

If the winding key or the music knob touch the casing, loosen the fixation screws of the music box and center the winding key and music knob in their respective holes by displacing the music box inside the casing. Retighten the fixation screws and reassemble the machine.

List of Available Parts

Guide Number	Description	Drawing Number	Guide Number	Description	Drawing Number
3	Music knob brake	380'520	32	Washer	714'112
4	Screw M3	714'200	33	Handle	380'290
5	Winding key	380'900	34	Truarc locking ring 4	380'640
6	Music knob	380'510	36	Cloth presser bar	390'480
7	Flywheel	390'051	37	Presser spring	380'450
8	Driving belt	380'030	38	Presser foot lever	380'220
9	Washer 6	714'109	39	Foot lever pin	380'340
10	Truarc locking ring 6	380'650	40	Presser bar guide	380'470
11	Needle bar crank	390'150	41	Stitch length knob axle	380'130
12	Threaded pin	380'430	42	Stitch length knob	380'110
13	Thread take-up lever	380'141	43	Feed dog	380'080
14	Needle bar	380'171	44	Washer 4	380'350
15	Phillips screw M4	714'026	45	Threaded pin M3	380'590
16	Nut M4	714'050	46	Feed dog spring	380'120
17	Needle clamp	380'180	47	Screw M4	380'240
18	Needle clamp screw	711'089	48	Screw M4	380'250
19	Tension disc	380'190	49	Screw M4	380'230
20	Tension spring	380'200	50	Spool pin	380'320
21	Tension knob	380'210	51	Screw M4	380'230
22	Lower shaft	380'301	52	Spool pin felt	380'420
23	Self-locking brake	380'610	53	Needle plate	380'270
24	Driving pinion	380'310	54	Rubber foot	715'261
25	Feed cam	380'101	55	Base	380'040
26	Hook	380'091	56	Screw M4	380'250
27	Threaded pin M3	380'501	57	Spool of thread	390'580
28	Pointed set screw M3	380'630	58	Screwdriver	380'570
29	Pin 1,5 x 12	380'360	59	Fixation clamp	390'370
30	Belt retaining spring 6	380'620	60	Carrying case	390'700
31	Truarc locking ring 6	380'650			
2	Music box (only available in limited quantities for replacement of defective music boxes)	390'901			

List of Parts Not Supplied

1 | Front casing

|| 35 | Rear casing

E3

MECHANICAL  
HANDBOOK

ELNA INDUSTRIAL

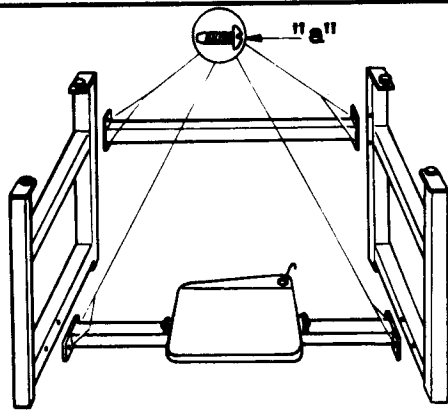


# ASSEMBLY OF WORK TABLE

Printed in Switzerland

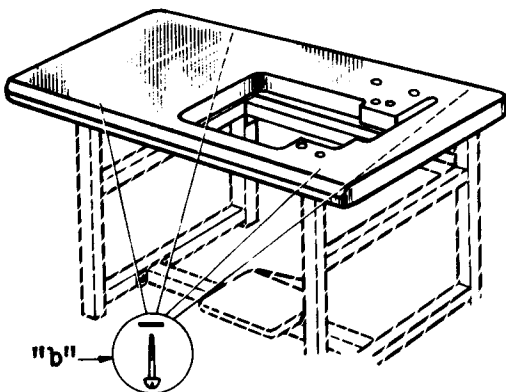
December 1960

Table Industrial



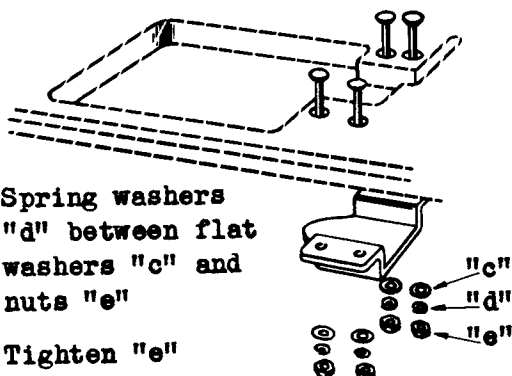
1

Tighten SCREWS "a" after having checked that table rests evenly on its 4 feet



2

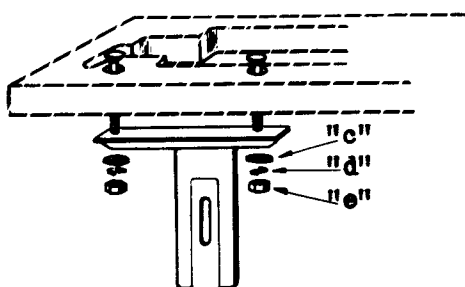
Pierce silentblocks with screw "b" in order to fix table plate



3

Spring washers "d" between flat washers "c" and nuts "e"

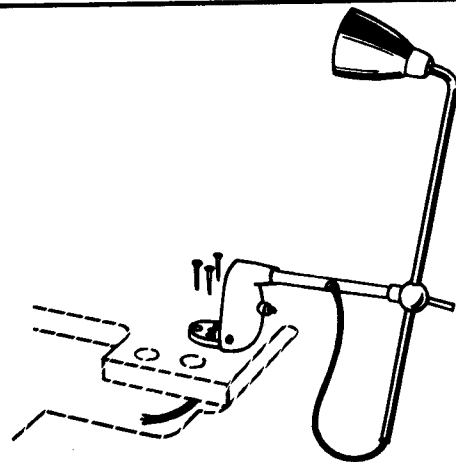
Tighten "e"



4

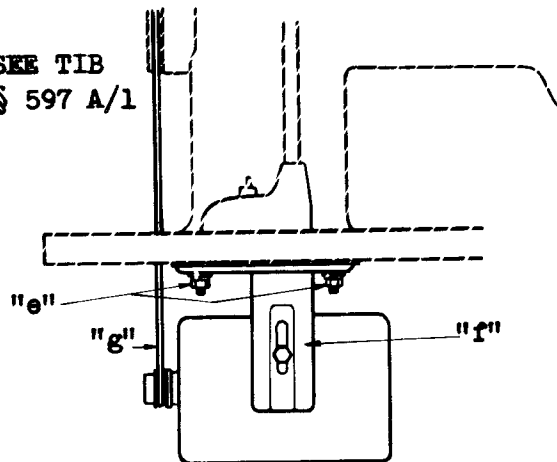
Spring washers "d" between flat washers "c" and nuts "e"

Do not tighten "e"



5

SEE TIB  
§ 597 A/1



6

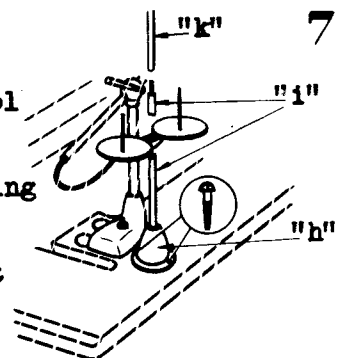
Slide motor support "f" laterally so that driving belt "g" is in correct position  
Tighten "e"

Fix "h"

Fit "i" with spool support in place

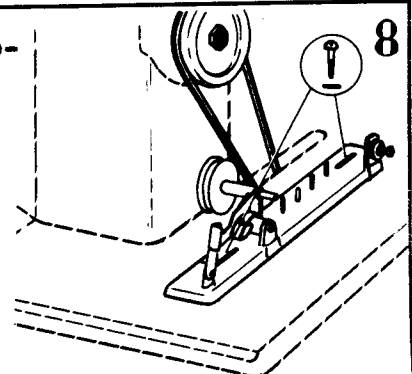
Press "k" on spring pin of "i"

Fasten support at desired height



7

Fasten the bobbin winder so that it does not touch the driving belt when disengaged and so that it is driven correctly when engaged



8



# REPLACEMENT OF ROTARY HOOK PINION

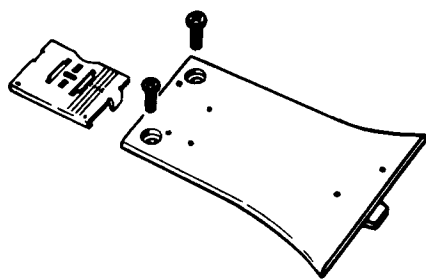
## DISMANTLING

## ASSEMBLY

Printed in Switzerland

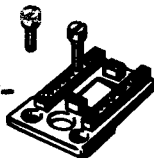
Oktober 1961

Repairs Industrial

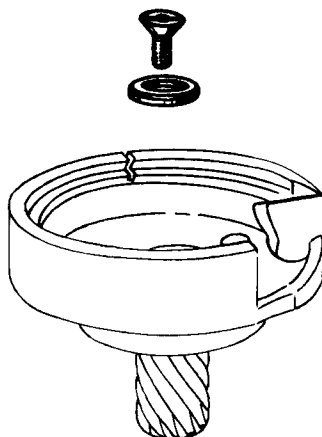


1

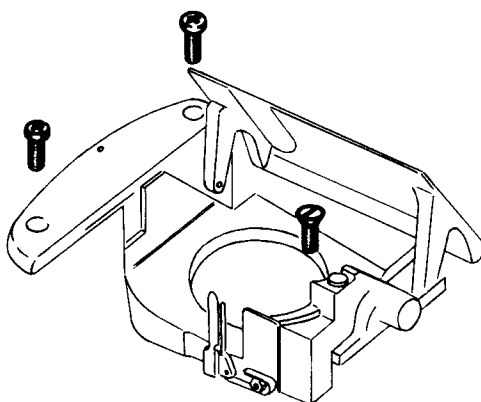
Support FEED  
DOG with screw-  
driver to un-  
screw



2



3



4

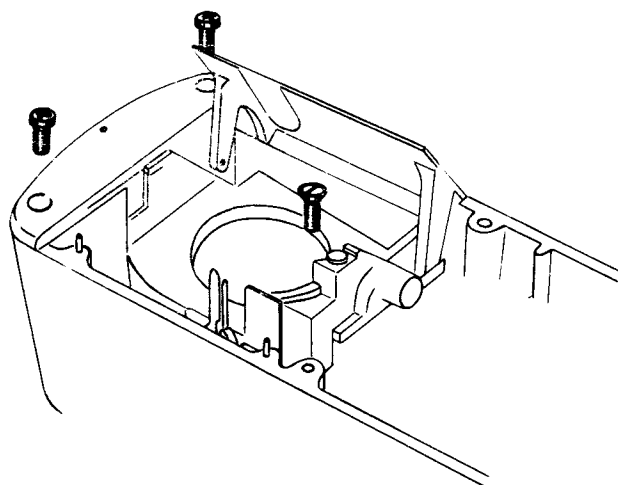
To facilitate assembly, first  
note position  
of hook pinion.  
Timing posi-  
tion will thus  
be more easily  
located.



5



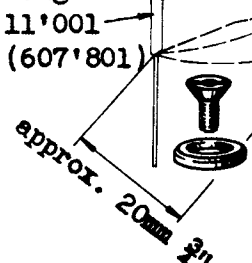
1



2

Insert hook  
Turn point so that it  
is just behind gauge  
Mesh hook and lodge  
guard ring beak

Dead  
low  
point  
Gauge  
11'001  
(607'801)



Refit washer(s)  
and screw

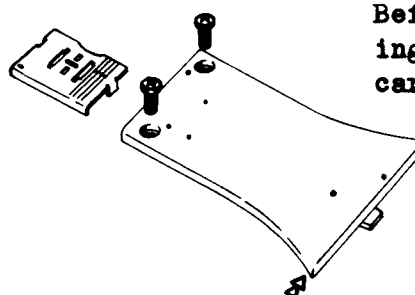
TIMING :  
ADJUSTMENT 4

3



Support FEED  
DOG with large  
screwdriver to  
tighten screws  
ADJUSTMENT 9

4



Before fasten-  
ing cover, take  
care that it fits  
upper  
casing

5

# REPLACEMENT OF DRIVING BELT

## DISMANTLING

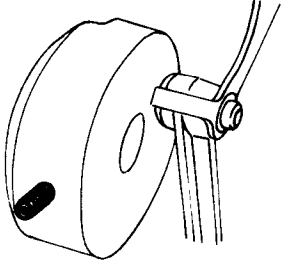
## ASSEMBLY

Printed in Switzerland

December 1960

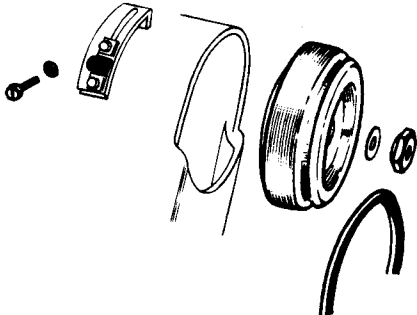
Repairs Industrial

1

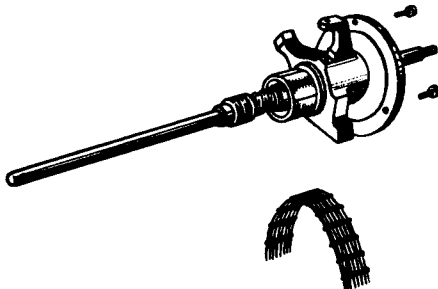


Loosen COUNTER-WEIGHT SCREW

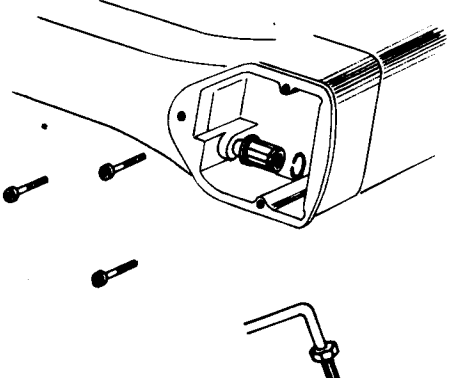
2



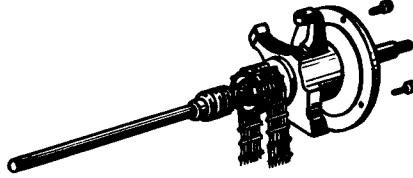
3



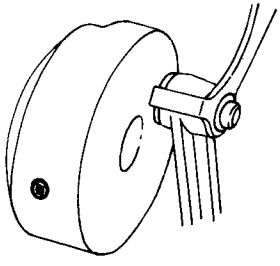
4



1



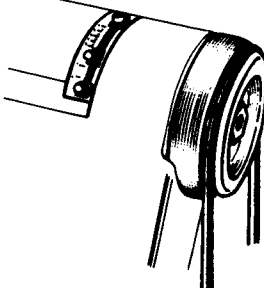
2



The tip of the COUNTERWEIGHT SCREW should be lodged in the hole in the upper shaft

Tighten

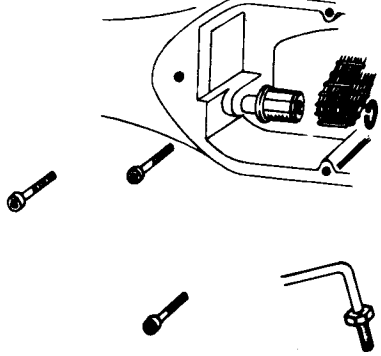
3



Fix :  
STITCH LENGTH SCALE  
FLYWHEEL

4

NEEDLE BAR down  
FEED GEAR SEE under ADJUSTMENT 8  
TIMING OF HOOK : ADJUSTMENT 4  
CONTROL : ADJUSTMENT 13



# REPLACEMENT OF CHECK SPRING UPPER TENSION

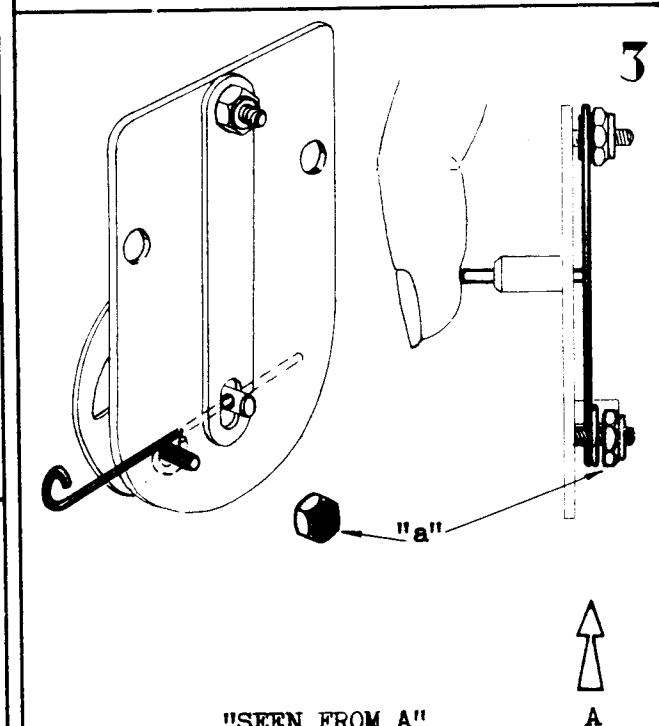
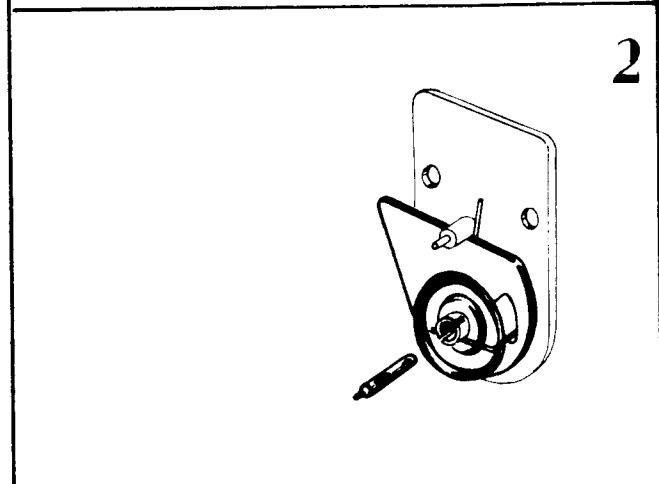
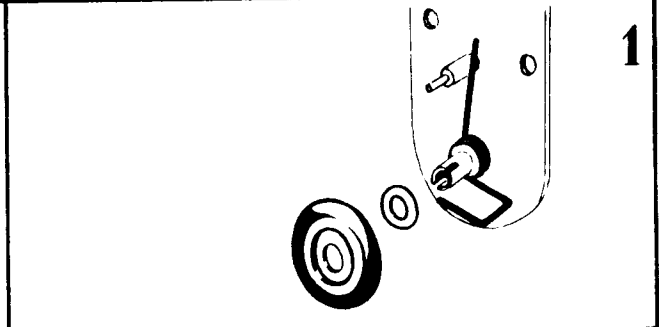
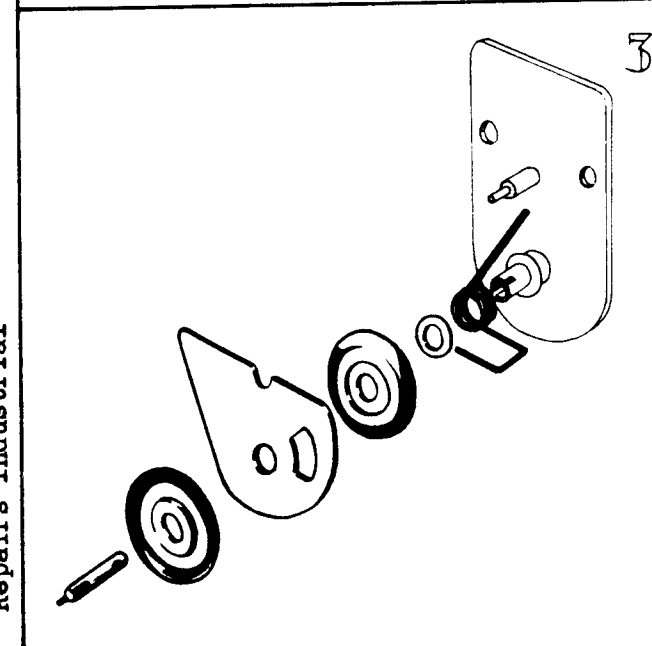
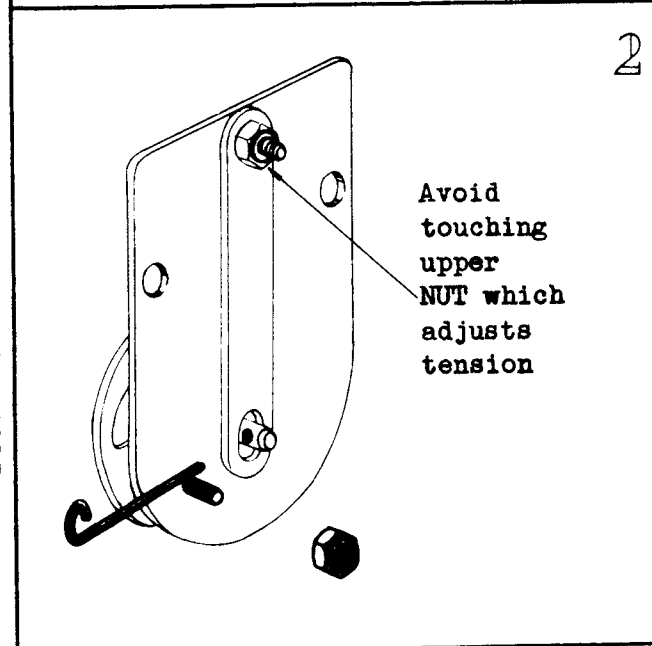
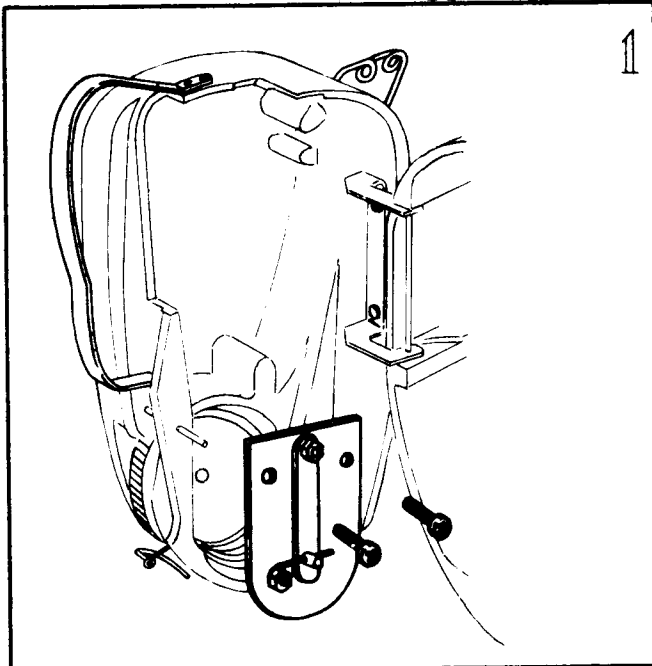
## DISMANTLING

## ASSEMBLY

Printed in Switzerland

December 1960

Repairs Industrial



CHECK : ADJUSTMENT 15

# CHANGING OF THE ASSEMBLY COUNTERWEIGHT - THREAD TAKE-UP LEVER - NEEDLE BAR CONNECTING ROD

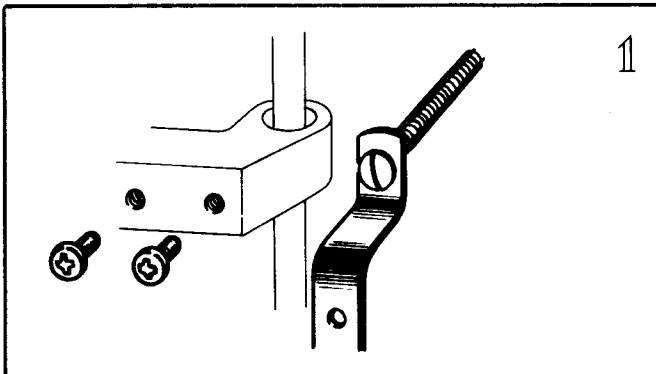
## DISMANTLING

## ASSEMBLY

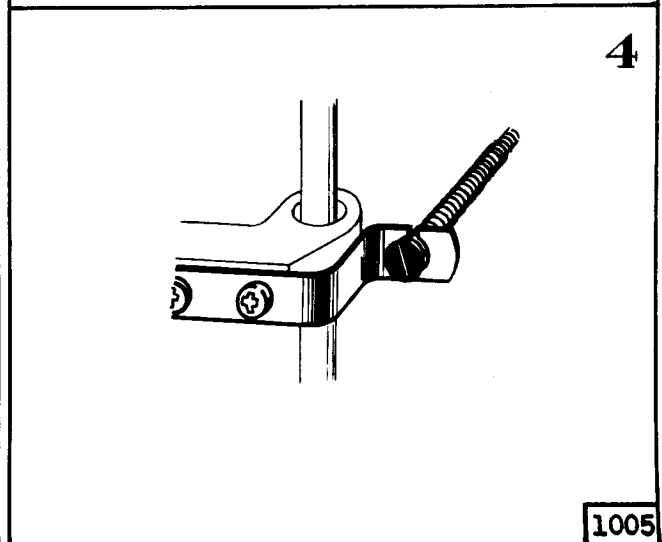
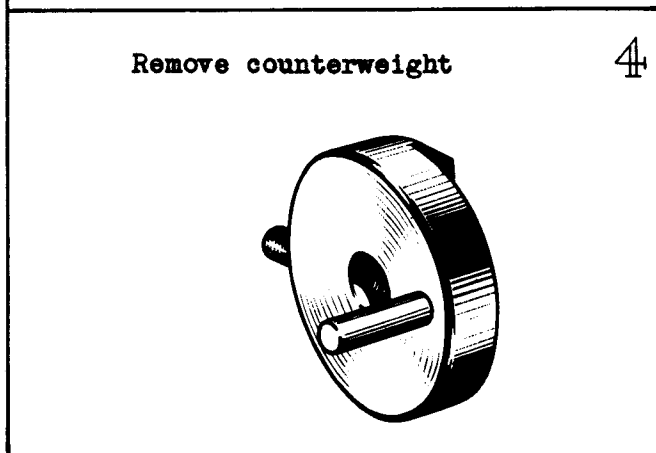
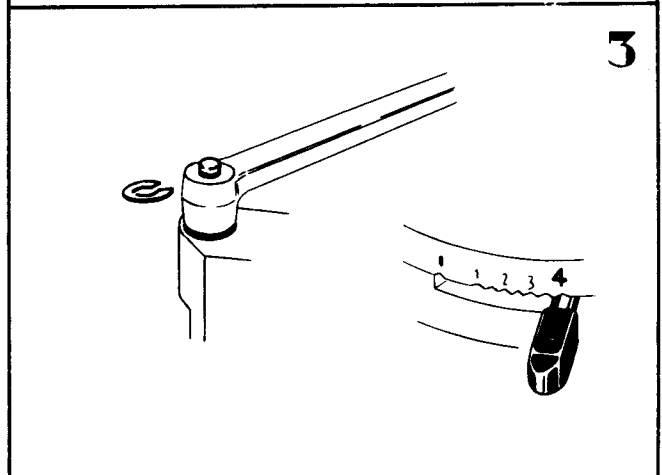
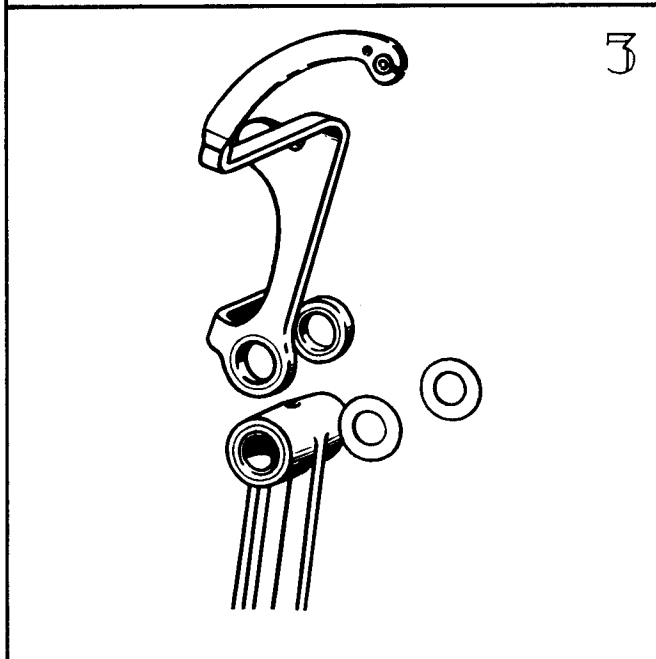
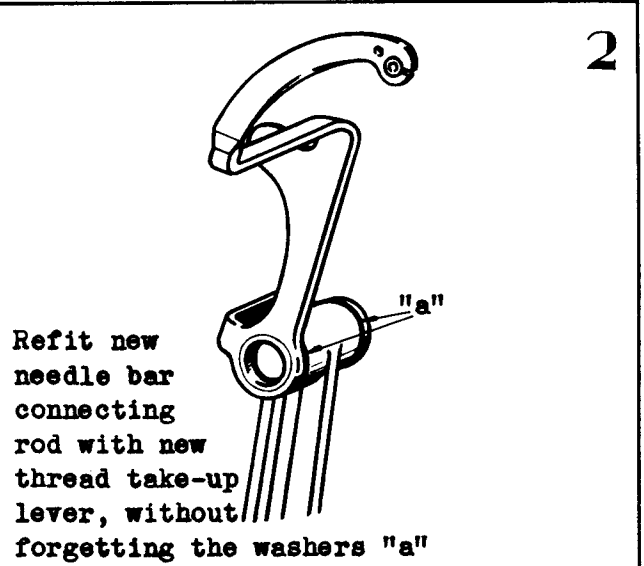
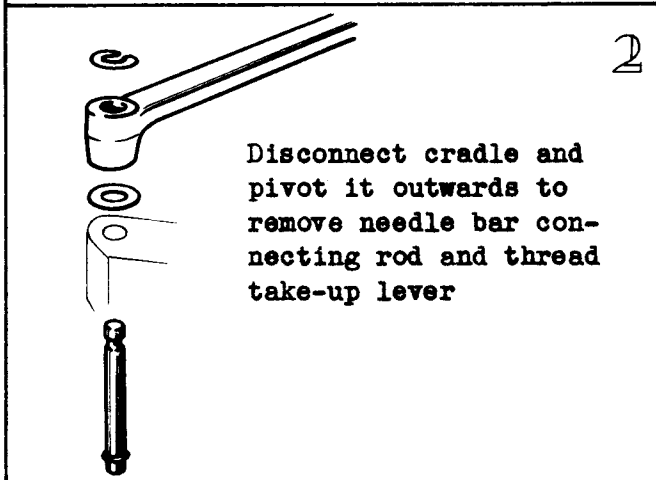
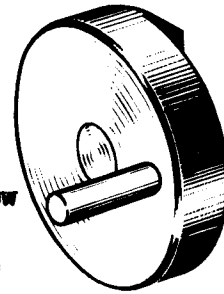
Printed in Switzerland

December 1960

Repairs Industrial



Refit new counterweight and block the counterweight screw within the hole in the upper shaft



# REPLACEMENT OF STITCH WIDTH KNOB

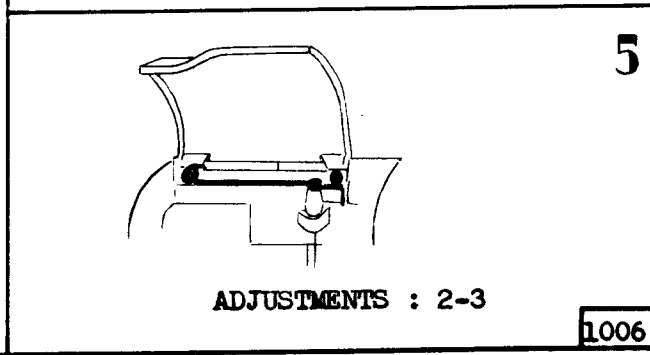
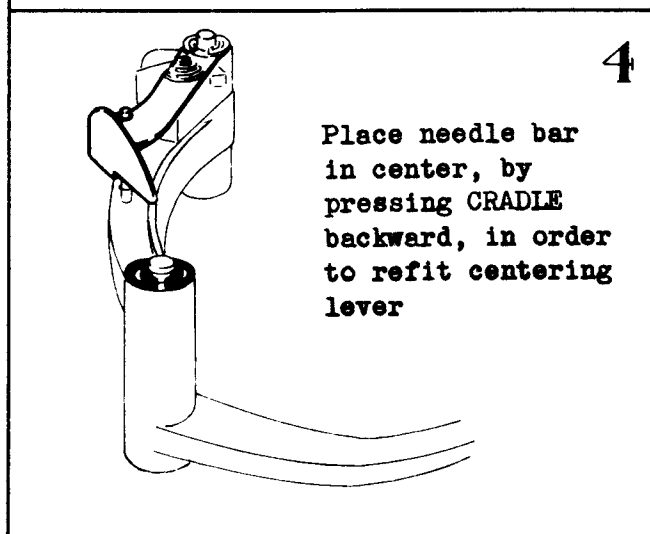
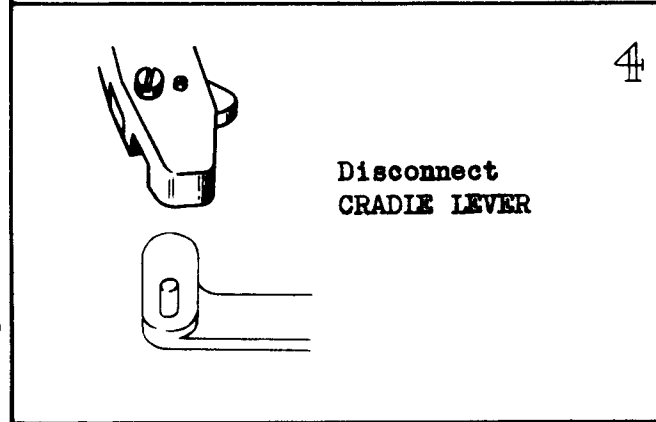
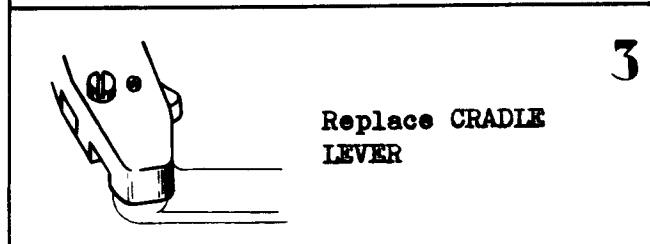
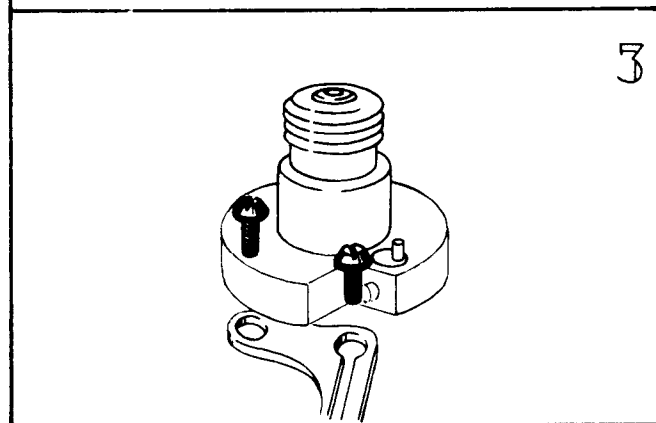
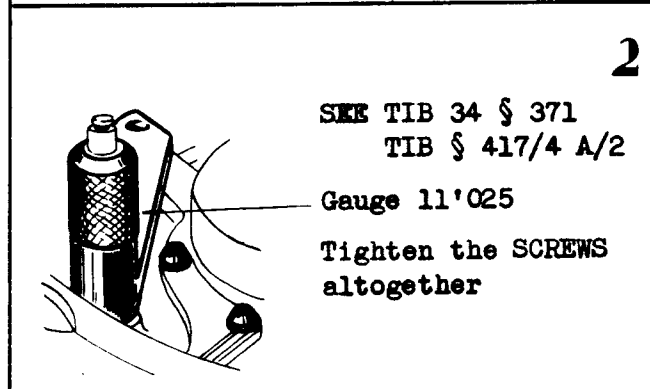
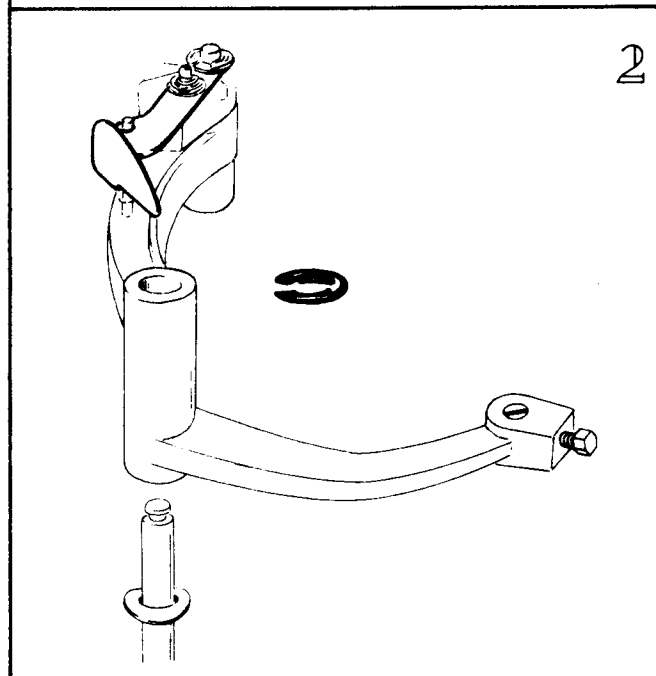
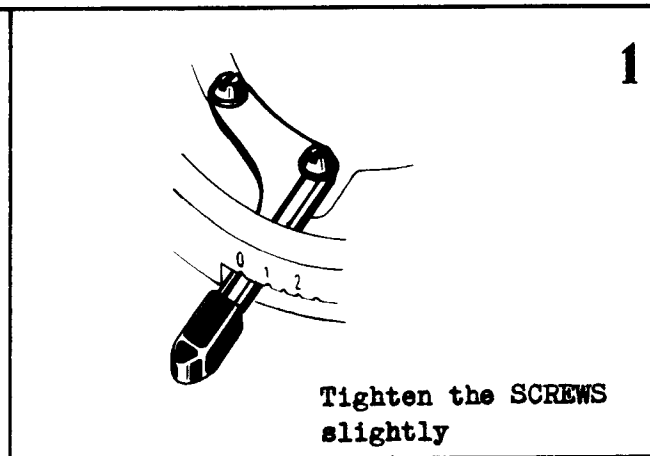
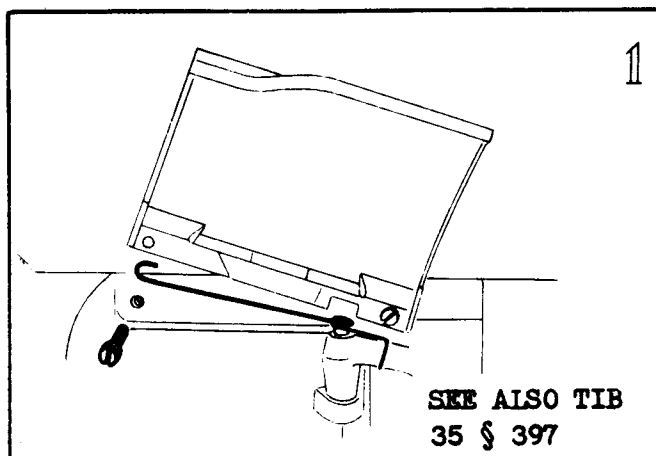
## DISMANTLING

## ASSEMBLY

Printed in Switzerland

December 1960

Repairs Industrial



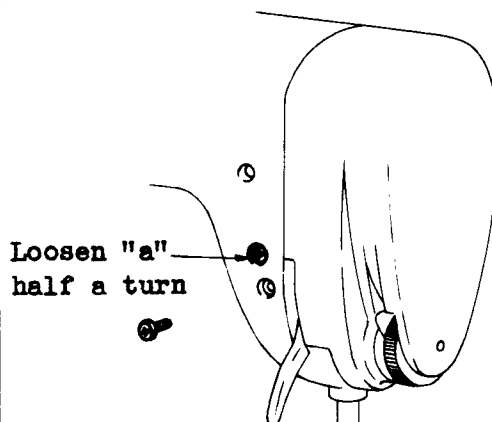
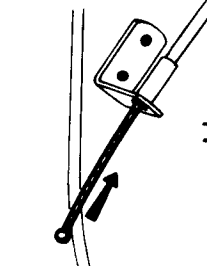

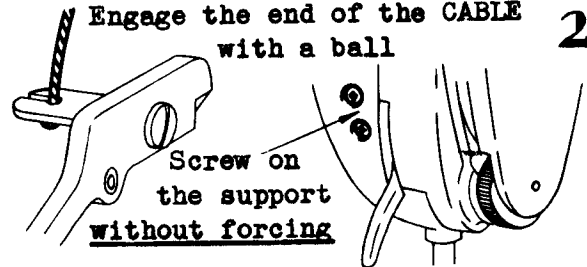
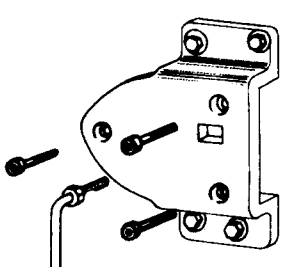
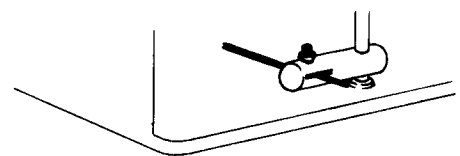
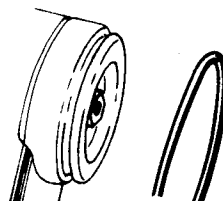
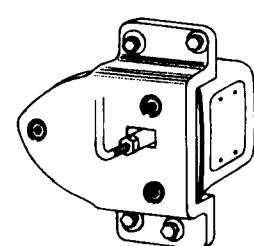
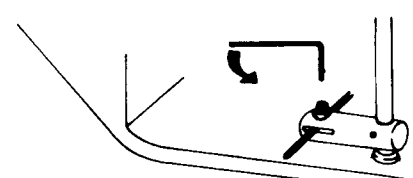
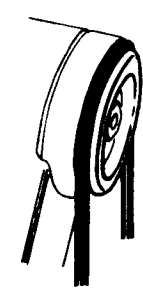
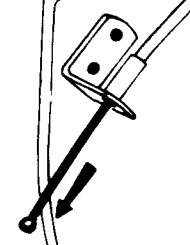
# REPLACEMENT OF THE CABLE OF THE PRESSER FOOT LEVER DISMANTLING

## ASSEMBLY

Printed in Switzerland

Oktober 1961

Repairs Industrial

<p>1</p>  <p>Loosen "a" half a turn</p>	<p>1</p>  <p>Insert the new CABLE</p>
<p>2</p>  <p>Free the CABLE and tilt the SUPPORT towards the outside</p>	<p>2</p>  <p>Engage the end of the CABLE with a ball</p> <p>Screw on the support <u>without forcing</u></p>
<p>3</p> 	<p>3</p>  <p>Insert the other end of the CABLE and adjust its length</p>
<p>4</p>  <p>Remove DRIVING BELT of the motor</p>	<p>4</p>  <p>Adjust the knee lever</p>
<p>5</p>  <p>Free end of the CABLE</p>	<p>5</p> <p>Put the DRIVING BELT of the motor in place again</p> 
<p>6</p>  <p>Pull out the CABLE</p>	

# REPLACEMENT OF THE CABLE OF THE PRESSER FOOT LEVER

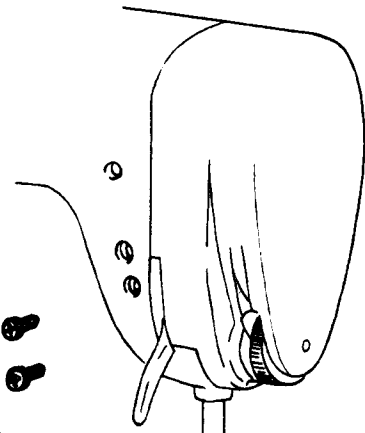
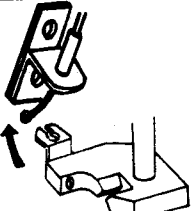
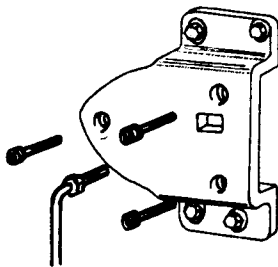
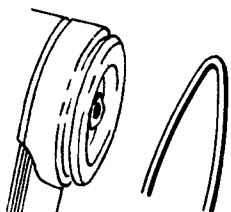
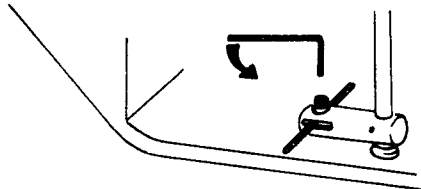
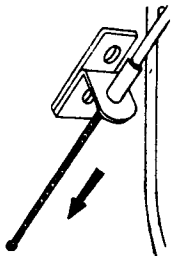
## DISMANTLING

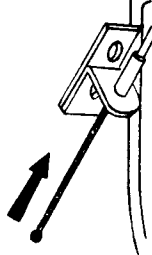
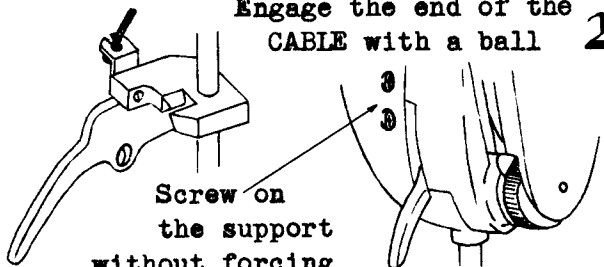
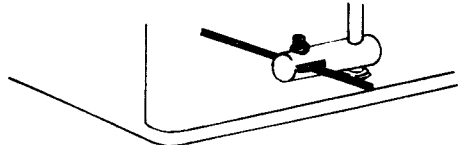
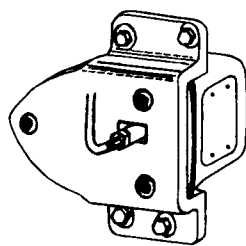

## ASSEMBLY

Printed in Switzerland

November 1961

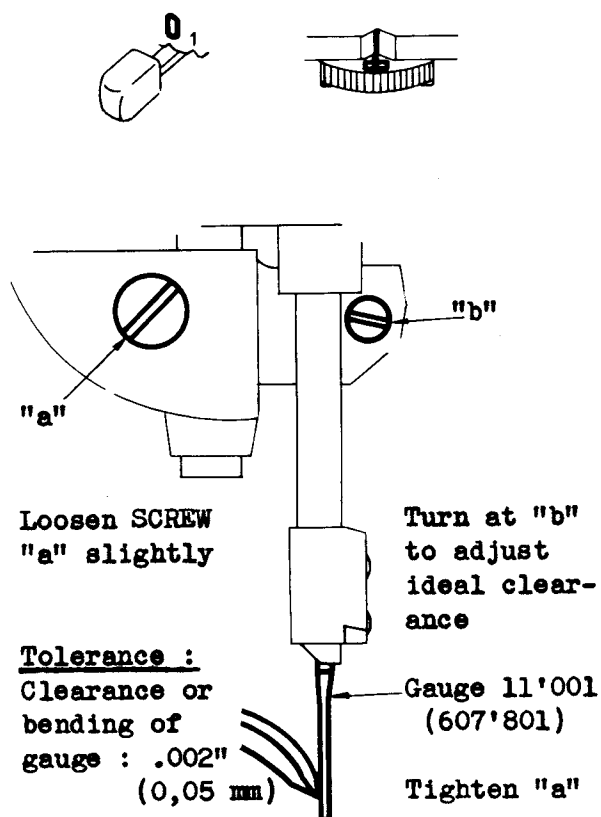
Repairs Industrial

	1
 <p>Free the CABLE and remove SUPPORT</p>	2
	3
 <p>Remove DRIVING BELT of the motor</p>	4
 <p>Free end of the CABLE</p>	5
 <p>Pull out the CABLE</p>	6

 <p>Insert the new CABLE</p>	1
 <p>Engage the end of the CABLE with a ball</p> <p>Screw on the support <u>without forcing</u></p>	2
 <p>Insert the other end of the CABLE and adjust its length</p>	3
 <p>Adjust the knee lever</p>	4
 <p>Put the DRIVING BELT of the motor in place again</p>	5

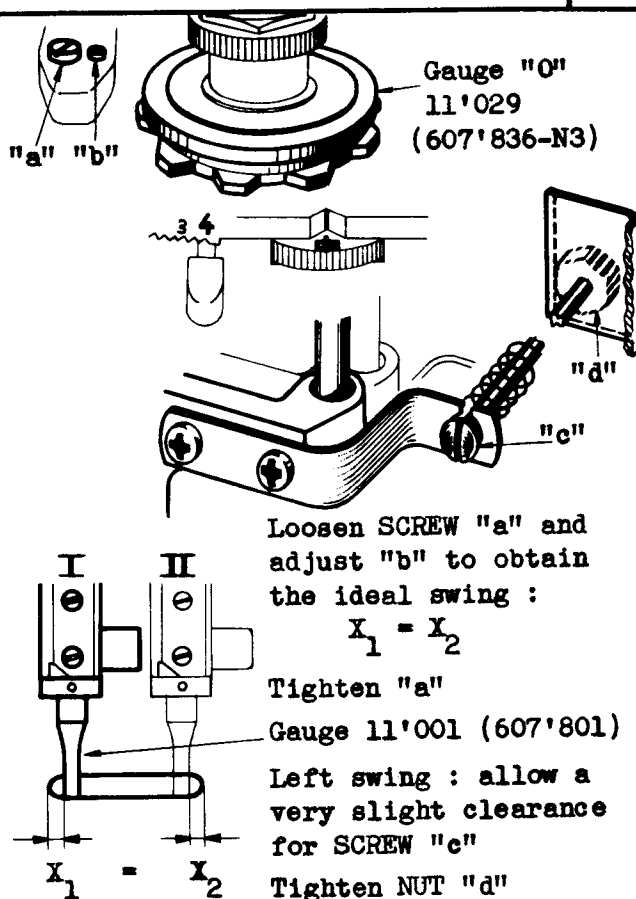
## NEEDLE CLEARANCE

1



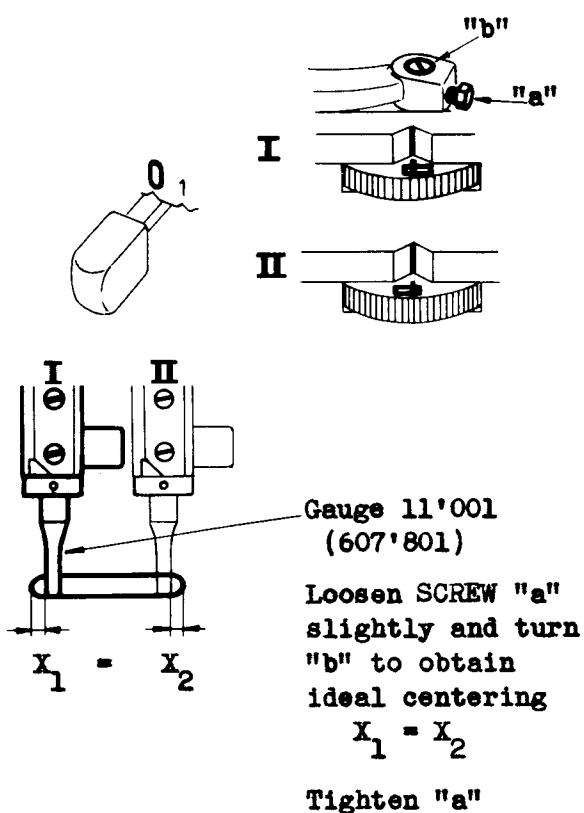
## NEEDLE BAR SWING

2



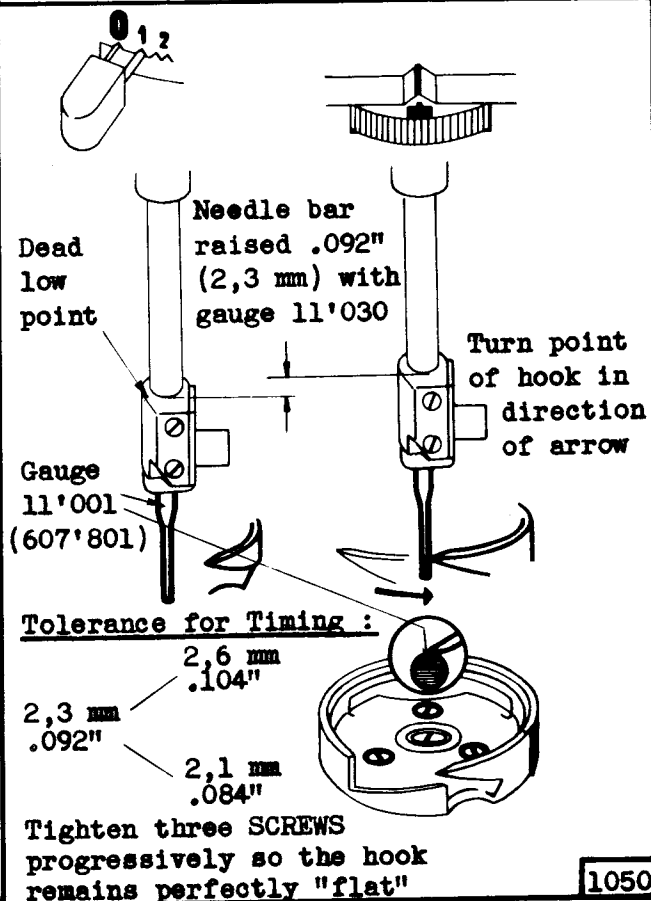
## CENTERING

3



## TIMING

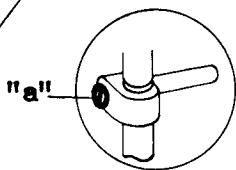
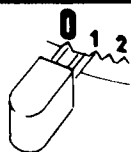
4



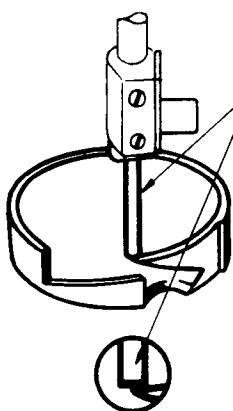


## HEIGHT OF NEEDLE BAR

5



Loosen SCREW "a"  
to cause centre  
of gauge to lie  
on point of hook

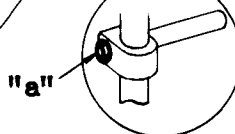
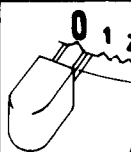


Tighten "a"

Gauge 11'000  
(607'800)

## ORIENTATION OF NEEDLE BAR

6



Loosen SCREW "a"  
just enough to be  
able to turn needle  
bar

Tighten "a"

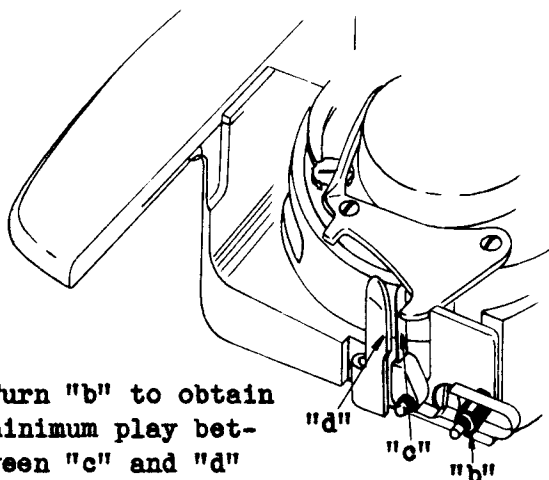
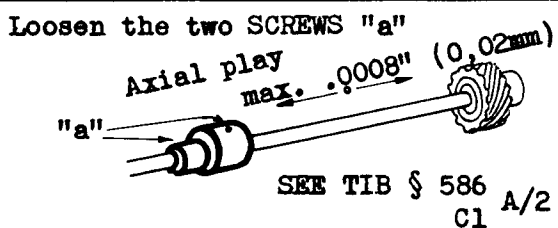


Twin needle clamp

Needles 80 (12) or  
gauges 11'001  
(607'801)

## STOP SPRING ADJ. / LOW.SHAFT

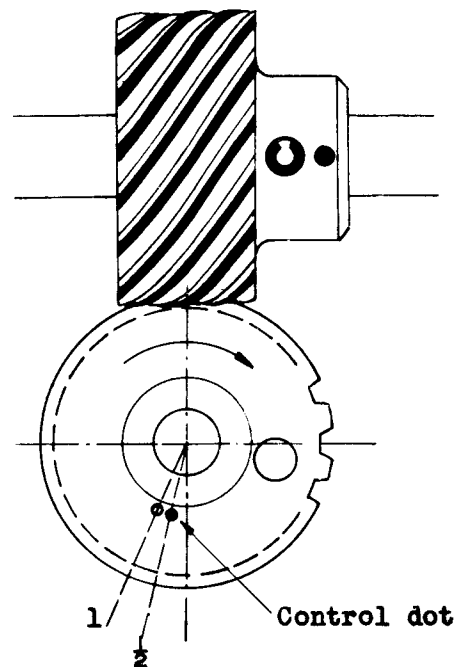
7



## FEED GEAR

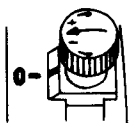
8

Needle bar at lower dead point



## FEED DOG

9

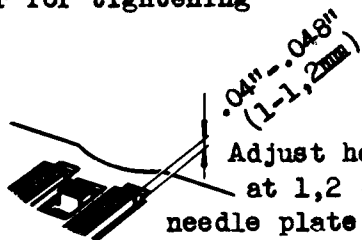


FEED DOG centering gauge  
11'005  
(70'226 N1)

Work cover  
11'014

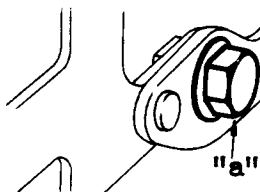
Fasten the  
two SCREWS  
after positioning

Support FEED DOG with  
screwdriver for tightening



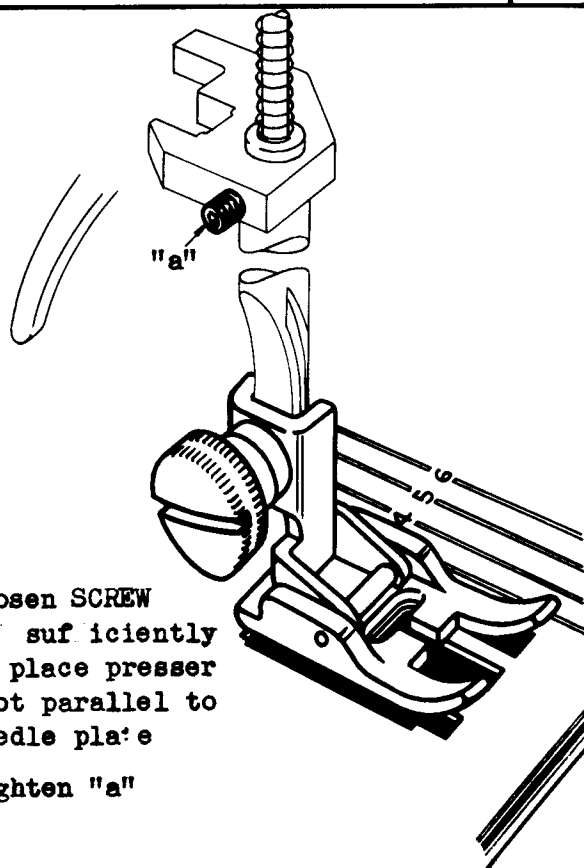
Adjust height  
at 1,2 (with  
needle plate, by  
turning "a" so  
that FEED DOG  
moves upwards

Feed dog must not  
touch needle  
plate at 4 FWD  
and 4 REV



## PRESSER BAR ORIENTATION

10

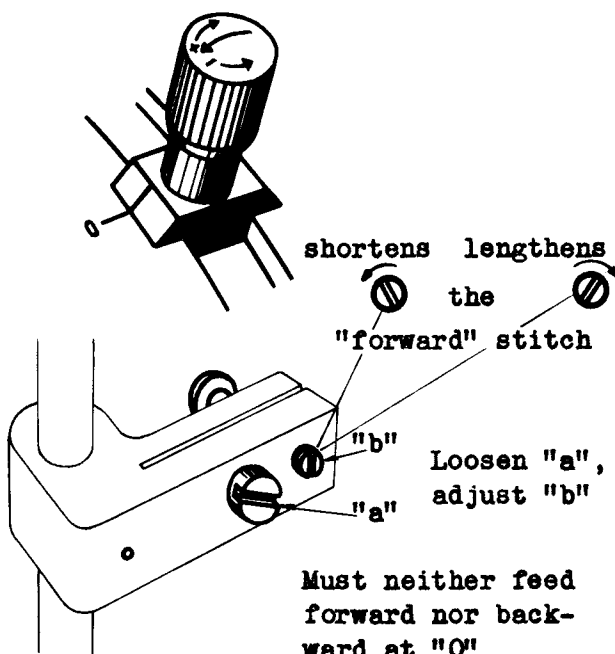


Loosen SCREW  
"a" sufficiently  
to place presser  
foot parallel to  
needle plate

Tighten "a"

## STITCH LENGTH

11



shortens lengthens  
the  
"forward" stitch

Loosen "a",  
adjust "b"

Must neither feed  
forward nor back-  
ward at "0"

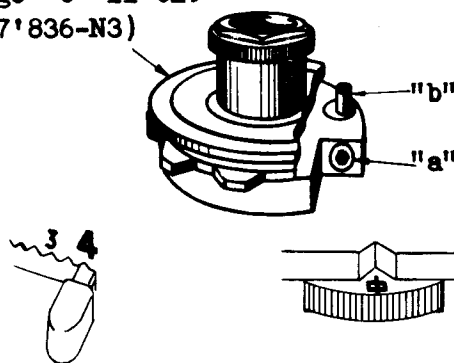
Tighten "a"

SEE TIB 18 § 107

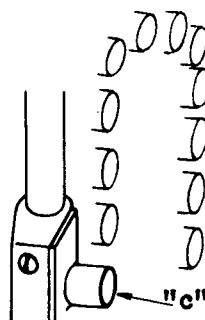
## ELNA-DISC DRIVE

12

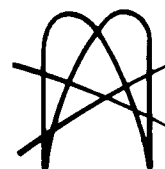
Gauge "0" 11'029  
(607'836-N3)



Run the machine at full speed, observe  
reflection of light on stud "c"



Loosen "a",  
adjust "b"  
Tighten "a"

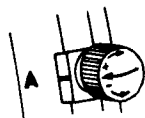
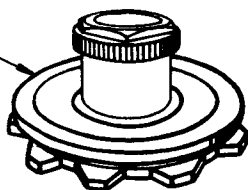


1052

# AUTOMATIC CLOTH FEED

13

Gauge "O"  
11'029  
(607'836-N3)



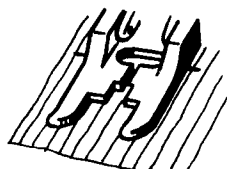
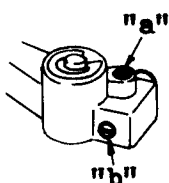
Loosen "a", adjust "b"  
to have neither forward  
nor backward  
feed at

Tighten "a"

Must advance at

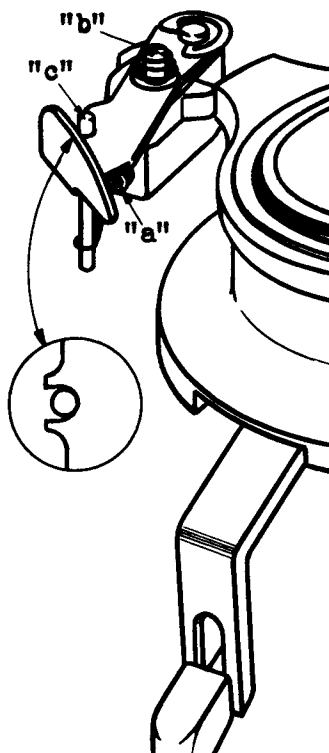
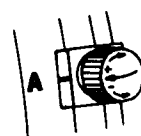
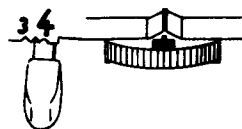
Must move back at

Advance and return  
practically equal



# BUTTONHOLE-DISC

14



Loosen "a",  
adjust "b"  
until key  
lever presses  
from the right  
on pin "c"

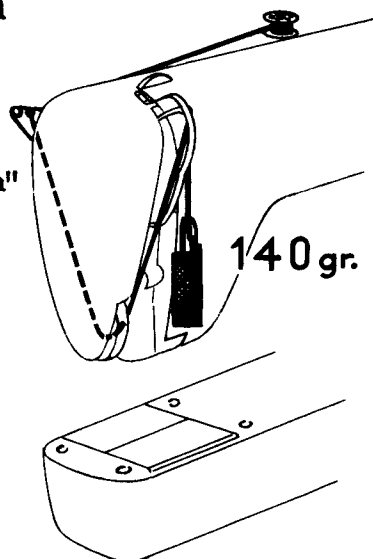
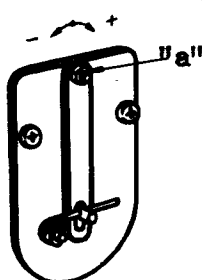
Tighten "a"

SEE TIB 33 § 1-2

# UPPER UNIVERSAL TENSION

15

Darning thread  
UFAG 70 (120)  
or equivalent



140 gr.

$4\frac{1}{4}$  : falls slowly

$4\frac{1}{2}$  : stops

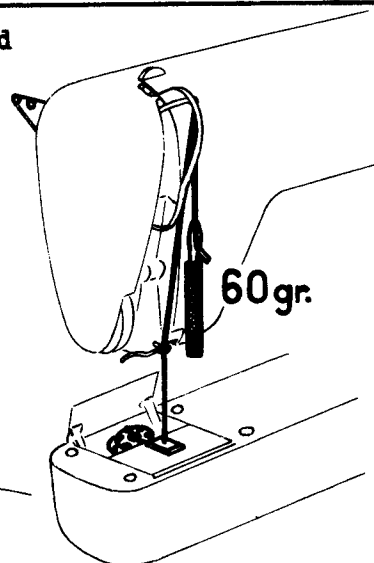
Turn nut "a" to adjust

SEE TIB § 610 C/3

# LOWER UNIVERSAL TENSION

16

Darning thread  
UFAG 70 (120)  
or equivalent



60 gr.

$\frac{3}{4}$  : falls slowly

1 : stops

Loosen guard ring beak to be able  
to turn lower tension axle "a"

After adjustment, tighten guard  
ring beak screws

SEE TIB § 610 C/3

SPECIAL EDITION

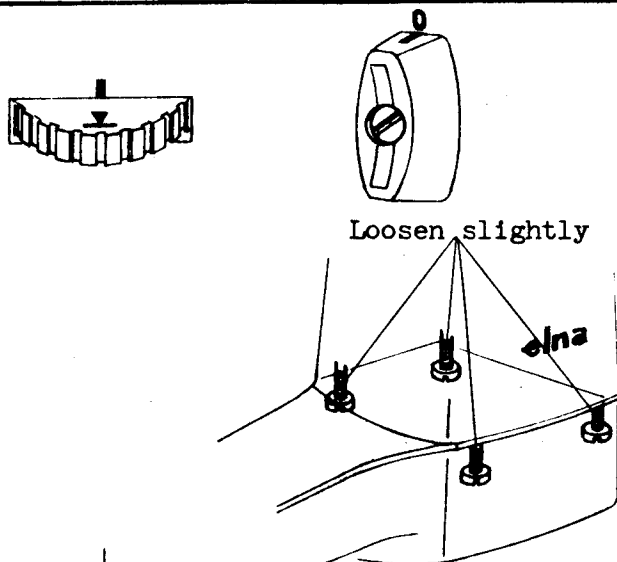


## MECHANICS' GUIDE

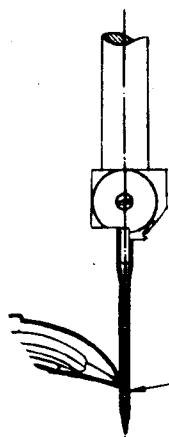
CLASS	11	ELNA-FREE ARM
"	13	ELNA-FLAT BED
"	21	ELNA ZIG ZAG-FREE ARM
"	23	ELNA ZIG ZAG-FLAT BED
"	41	ELNA AUTOMATIC-FREE ARM
"	43	ELNA AUTOMATIC-FLAT BED
"	62	ELNA SUPERMATIC-FREE ARM
"	64	ELNA SUPERMATIC-FLAT BED

# NEEDLE CLEARANCE - FREE ARM

1



Loosen slightly



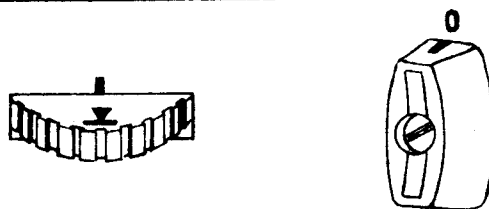
Adjust clearance by moving upper casing in relation to lower casing. Tighten the 4 screws.

Tolerance:  
Clearance or bending of needle: 0,05 mm (.002").

Needle 16 or 100

# NEEDLE CLEARANCE - FLAT BED

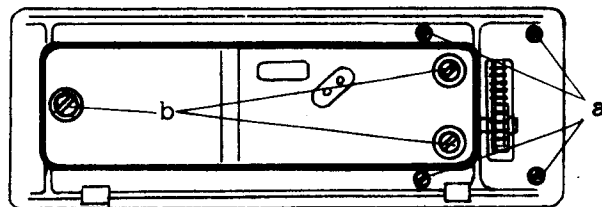
2



1. Slightly loosen the 4 assembly screws "a". Centre needle in needle plate hole. Tighten the 4 screws.

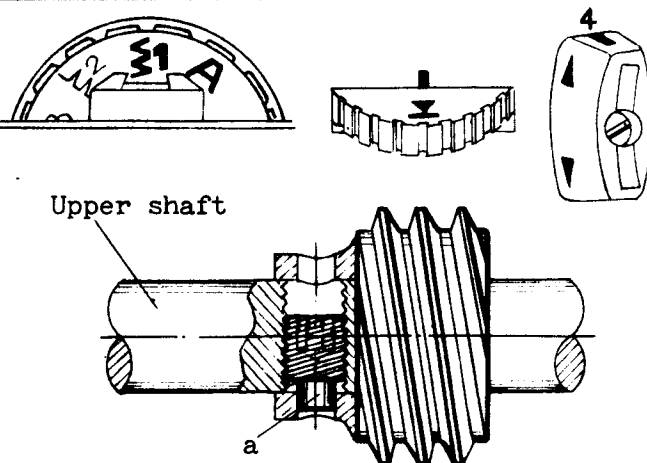
Needle 16 or 100

2. Slightly loosen the 3 screws "b". Adjust clearance as per ADJUSTMENT No. 1. Tighten the 3 screws.

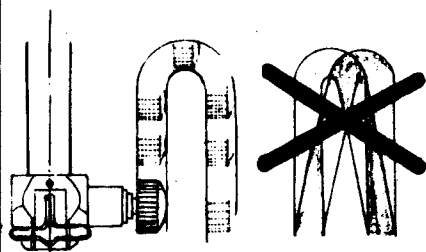


# ELNA-DISC DRIVE 21 23 41 43 62 64

3



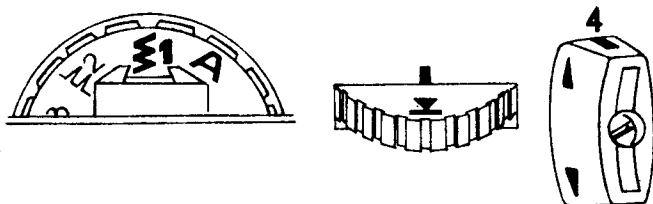
Upper shaft



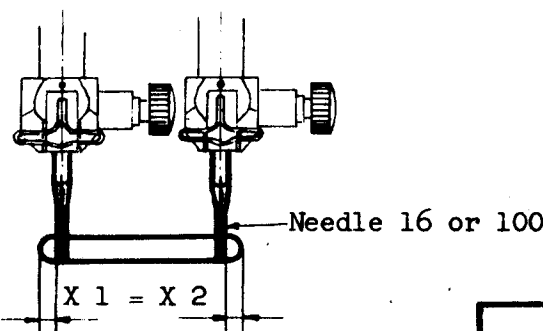
Run machine at full speed and observe needle clamping screw, which must describe an arc. In order to obtain a correct adjustment, free screw "a" and change the position of the worm (12 holes). Tighten "a".

# NEEDLE BAR SWING 21 23 41 43 62 64

4



Slightly loosen screw "a" and adjust "b" to obtain the swing:  $X 1 = X 2$ . Tighten "a".

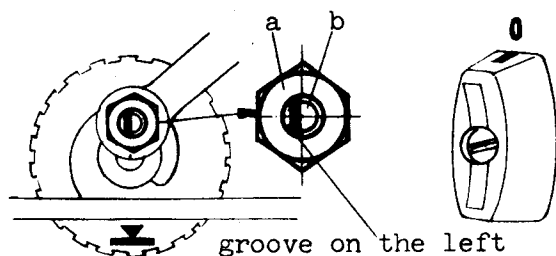


Needle 16 or 100

$X 1 = X 2$

CENTERING 21 23 41 43 62 64

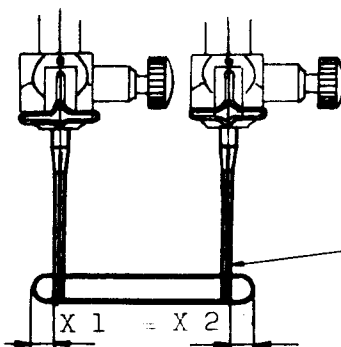
5



Slightly loosen nut "a" and adjust "b" to obtain the centering:  $X1 = X2$



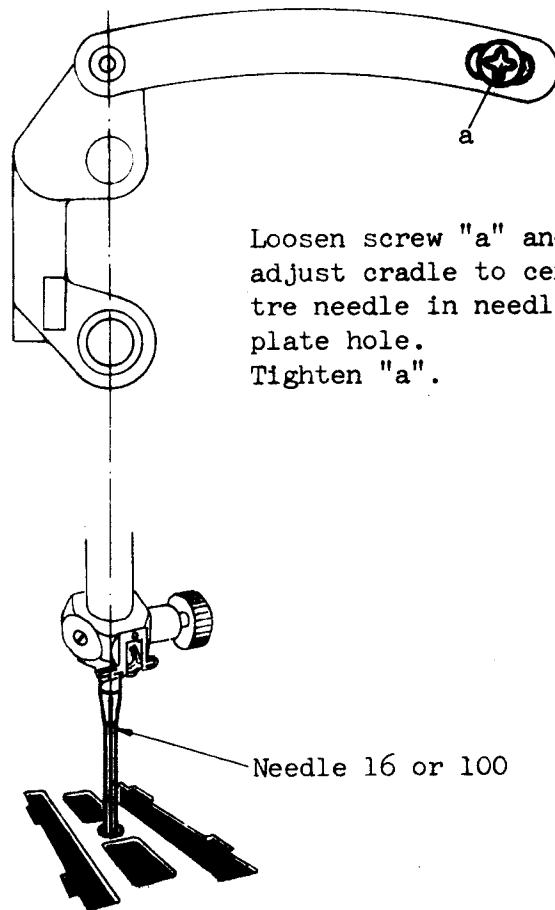
Tighten nut "a" whilst retaining eccentric "b".



Needle 16 or 100

CENTERING 11 13

6

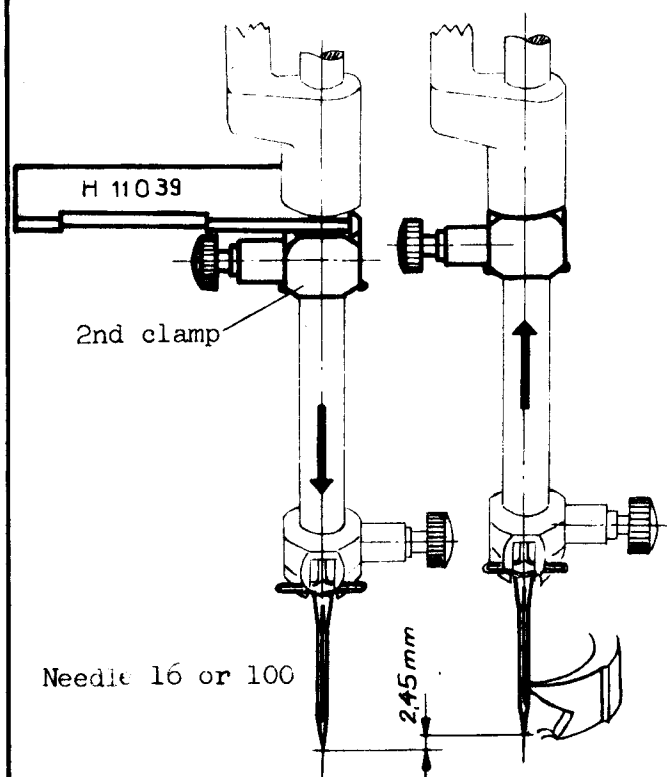


Loosen screw "a" and adjust cradle to centre needle in needle plate hole. Tighten "a".

Needle 16 or 100

HOOK TIMING

7



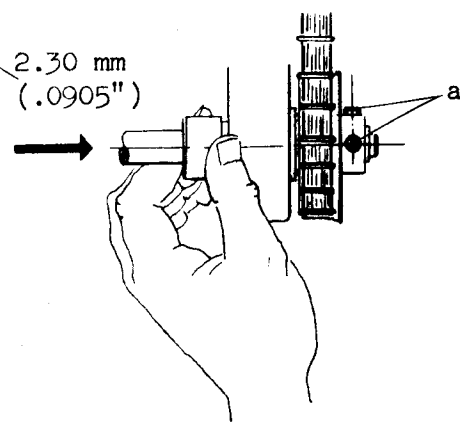
2nd clamp

Needle 16 or 100

2.45 mm

Tolerance:

2.60 mm (.1023")  
2.45 mm (.0964")  
2.30 mm (.0905")

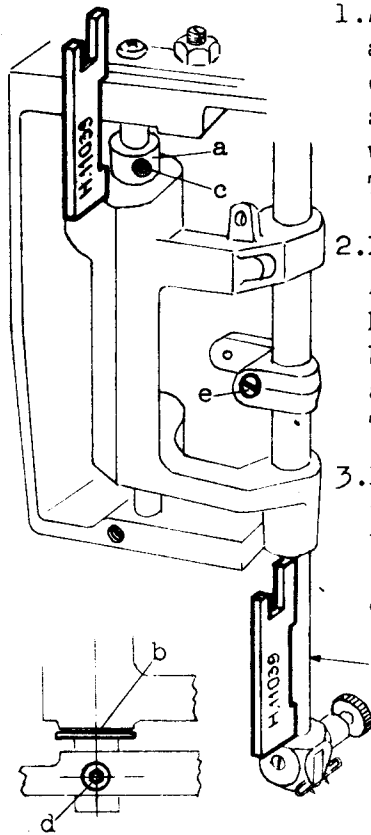


1. Slightly loosen the 2 screws "a". Place needle bar at its lowest position, insert gauge and press 2nd clamp against the latter; tighten needle clamping screw.
2. Remove gauge and turn flywheel towards you until 2nd clamp touches the cradle.
3. Place point of hook behind the centre of the needle by turning lower shaft in the working direction, whilst pressing in the direction of the arrow.
4. Eliminate axial play with driving pinion and tighten the 2 screws "a". Check for free running - without play nor hard points.

CHECK ADJUSTMENT NO. 11

## HEIGHT OF CRADLE AND NEEDLE BAR

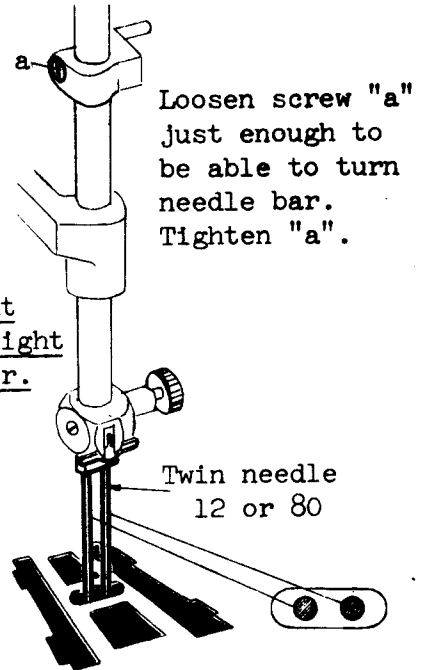
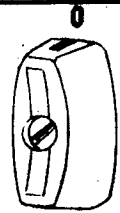
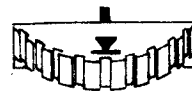
8



1. Adjust slight axial play of cradle between stop "a" and washer/clip "b". Tighten "c".
  2. Loosen screw "d". Adjust cradle height (26mm-1.03") by lifting cradle axle. Tighten "d".
  3. Loosen screw "e" to adjust needle bar height (45 mm - 1.77"). Tighten "e".
- lowest point

## ORIENTATION OF NEEDLE BAR

9



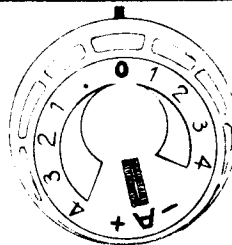
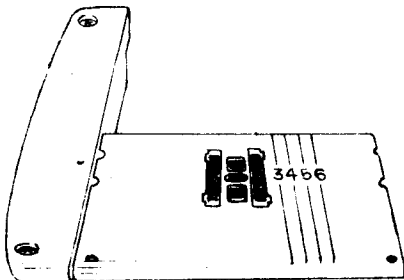
Take care that  
needle bar height  
does not alter.

Loosen screw "a"  
just enough to  
be able to turn  
needle bar.  
Tighten "a".

## FEED DOG

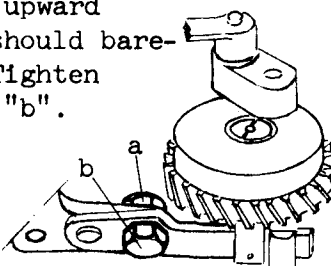
10

Position feed dog and fasten the 2 screws. Then tighten them by supporting feed dog with a screwdriver.



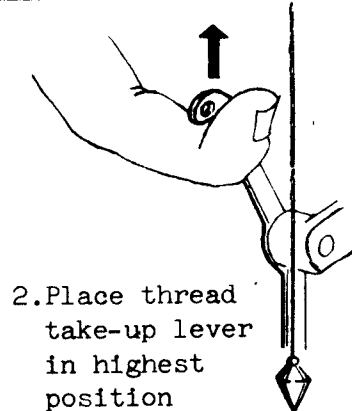
Loosen nut "a" and adjust feed dog height (1.15mm-.045") by turning screw "b" in upward direction. Feed dog should barely touch the gauge. Tighten "a" whilst retaining "b".

Feed dog must not touch needle plate on 4 FWD. and 4 REV.

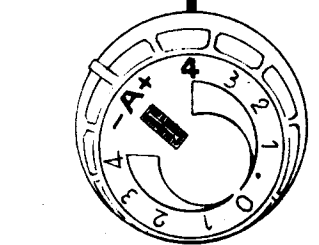


## FEED TIMING

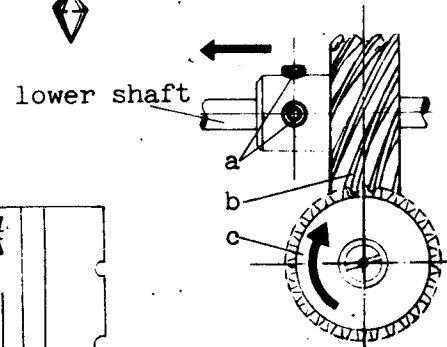
11



2. Place thread take-up lever in highest position



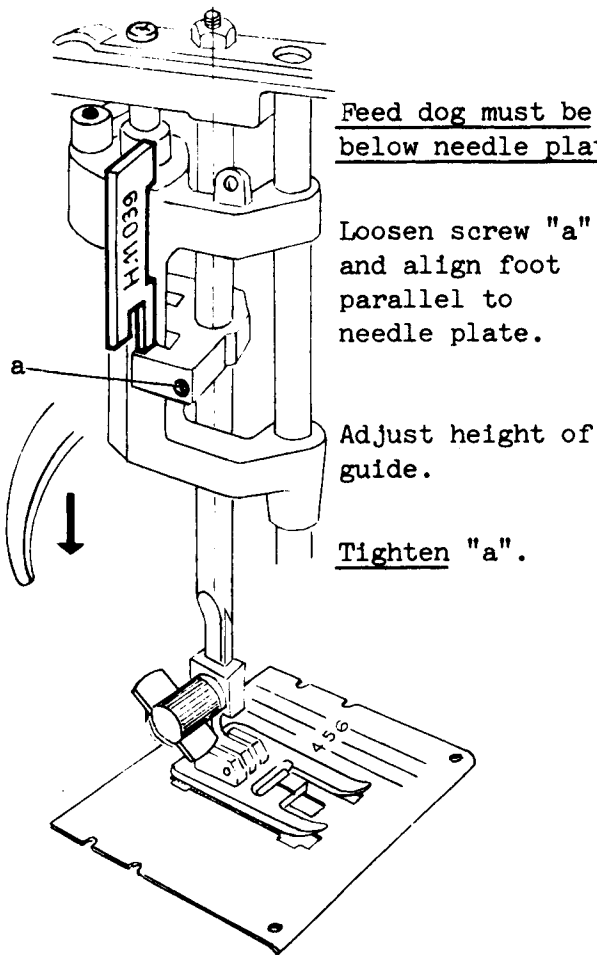
1. Free the 2 screws "a" and disengage pinion "b".



3. Place feed dog as indicated by turning feed gear "c" in direction of arrow. Engage pinion and align it to centre of feed gear. Tighten the 2 screws "a".  
Check: When thread take-up lever starts to descend, feed dog should continue to advance 1 mm (.04") further.

# PRESSER BAR

12



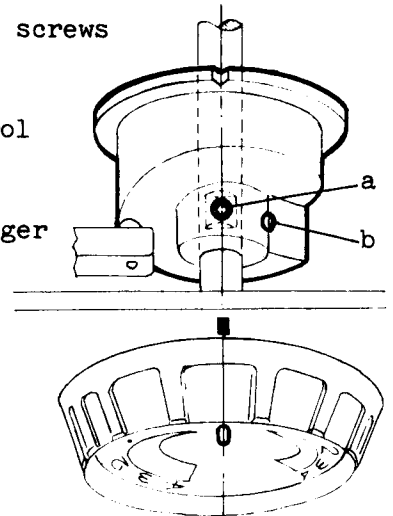
# STITCH LENGTH

13

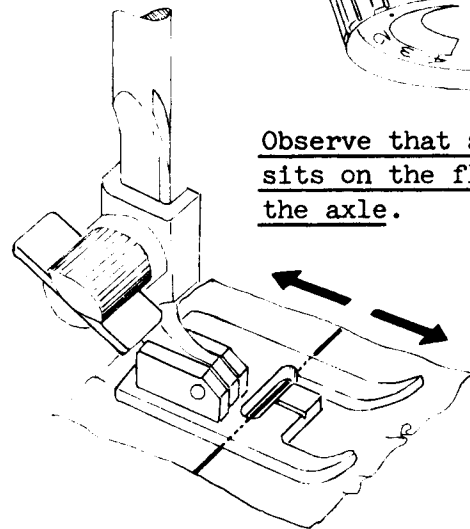
Slightly loosen screws "a" and "b".

Move feed control cam forward or backward until cloth is no longer fed at "0".

Tighten "a", then "b".



Observe that screw "a" sits on the flat of the axle.



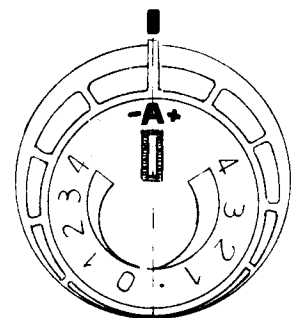
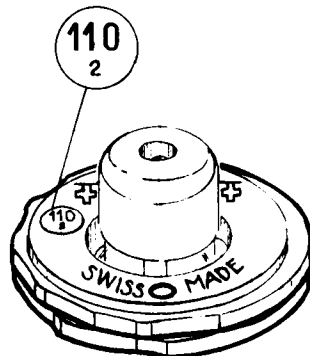
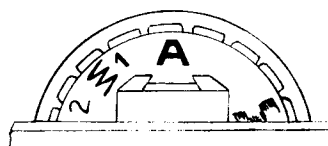
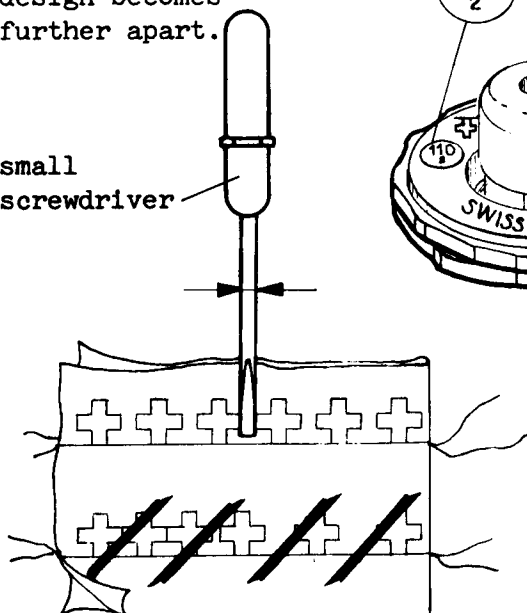
# AUTOMATIC FEED 62 64

14

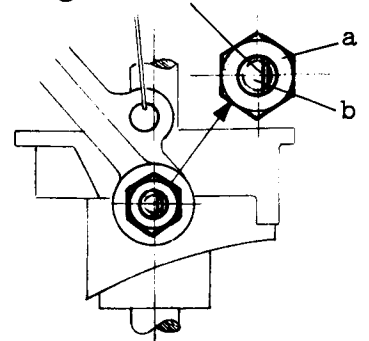
Loosen slightly nut "a".

By turning eccentric "b" clockwise, the design becomes further apart.

small screwdriver



groove on the right

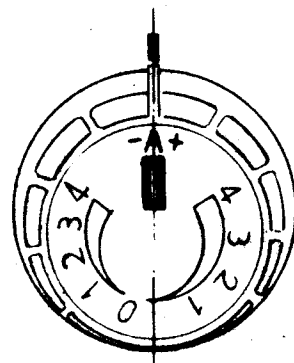
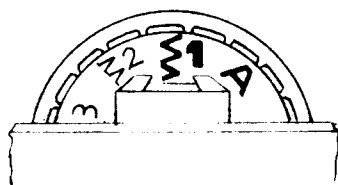


The distance between the crosses should be the width of the small screwdriver.

Double check by moving stitch length dial several times from A to 4.



No double disc in machine

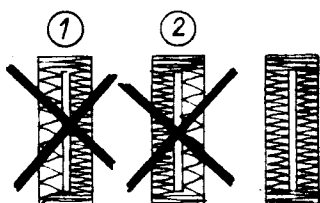
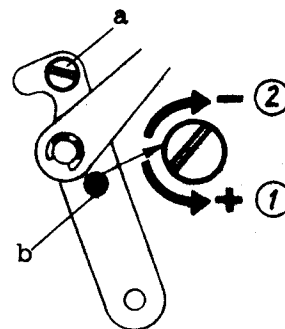


Preparation of machine:  
see instruction book

Sew an automatic buttonhole

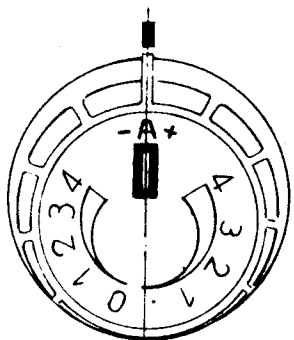
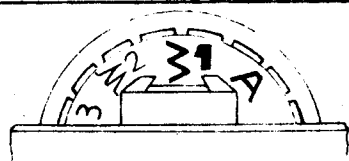
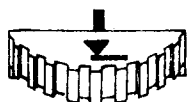
Slightly free screw "a"  
and adjust "b" to obtain  
the same density of  
stitches forward and  
reverse.

Tighten "a".

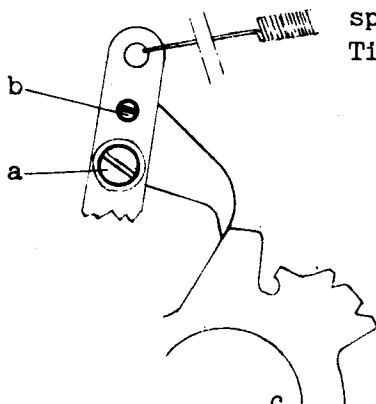


Always adjust on  
the first row.

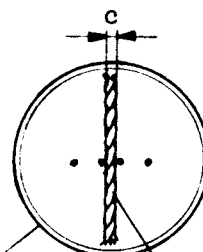
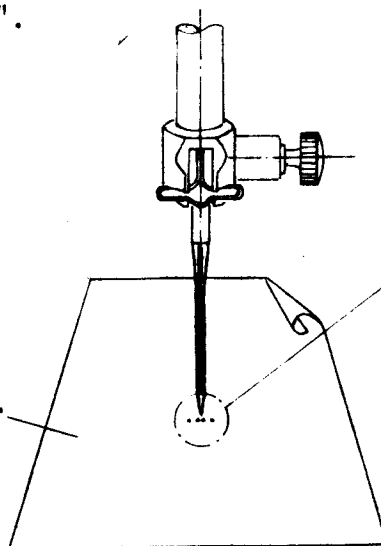
No double disc in machine



Slightly free screw "a"  
and adjust "b" to obtain  
spacing "c".  
Tighten "a".



Hold paper



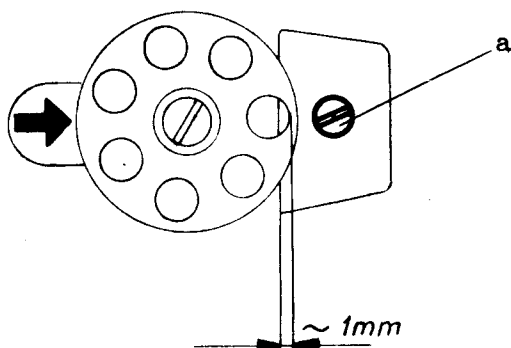
sewing thread

Check:  
Stitch width 2:  
make 2 slight pricks  
on the left.  
Stitch width 4 and  
back to 2:  
make 2 slight pricks  
on the right.

# BOBBIN WINDING

17

Loosen coupling knob half a turn

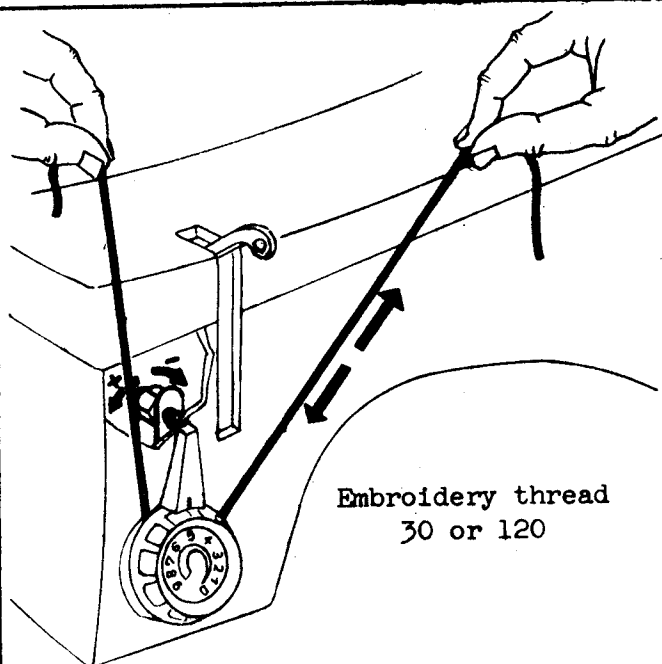


Loosen screw "a" to obtain an overleap of about 1 mm (.04").

Tighten "a".

# UPPER TENSION

18



At "0" there should be no tension.

At "1" there should be a little drag.

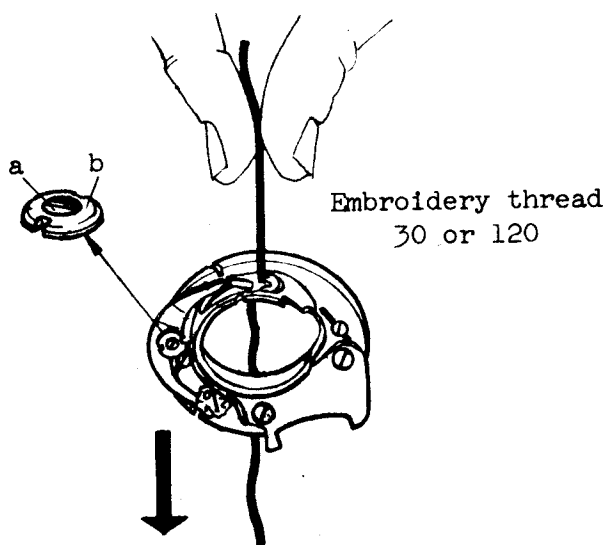
Turn nut:

to the left to increase

to the right to decrease

# LOWER TENSION

19



$\frac{1}{2}$ : should fall slowly  $\frac{3}{4}$ : should stop

Slightly loosen screw "a" and adjust "b".  
Tighten "a".

increase



decrease

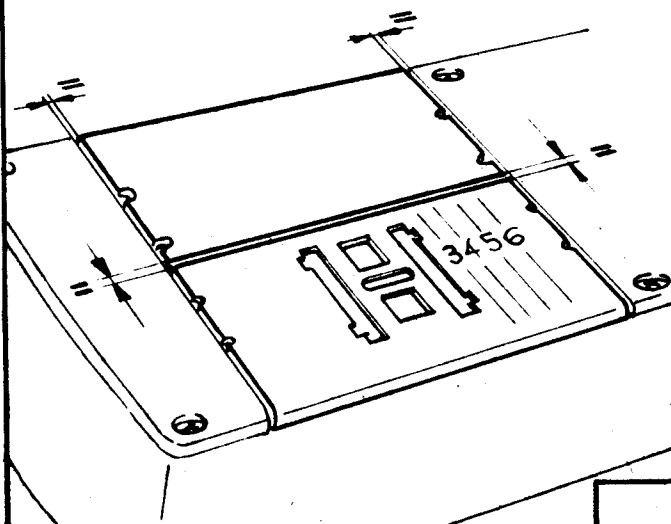
Important:

Move tension dial several times from "0" to "2" and double check the above adjustment.

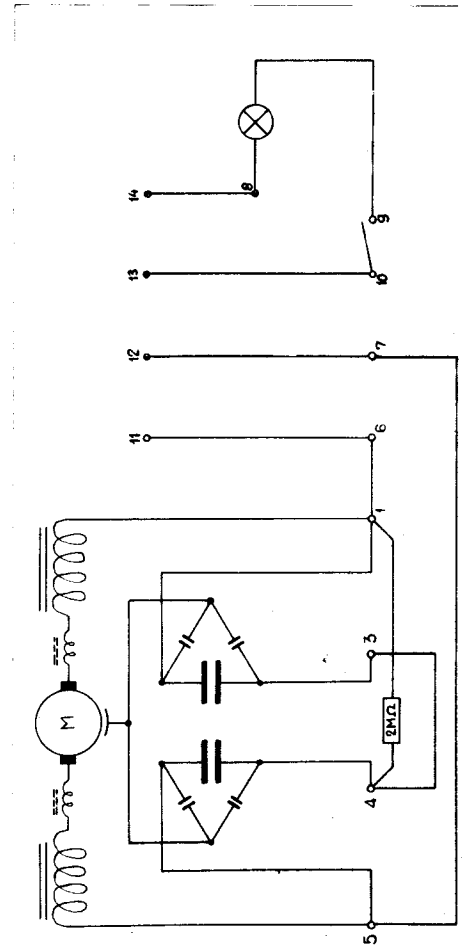
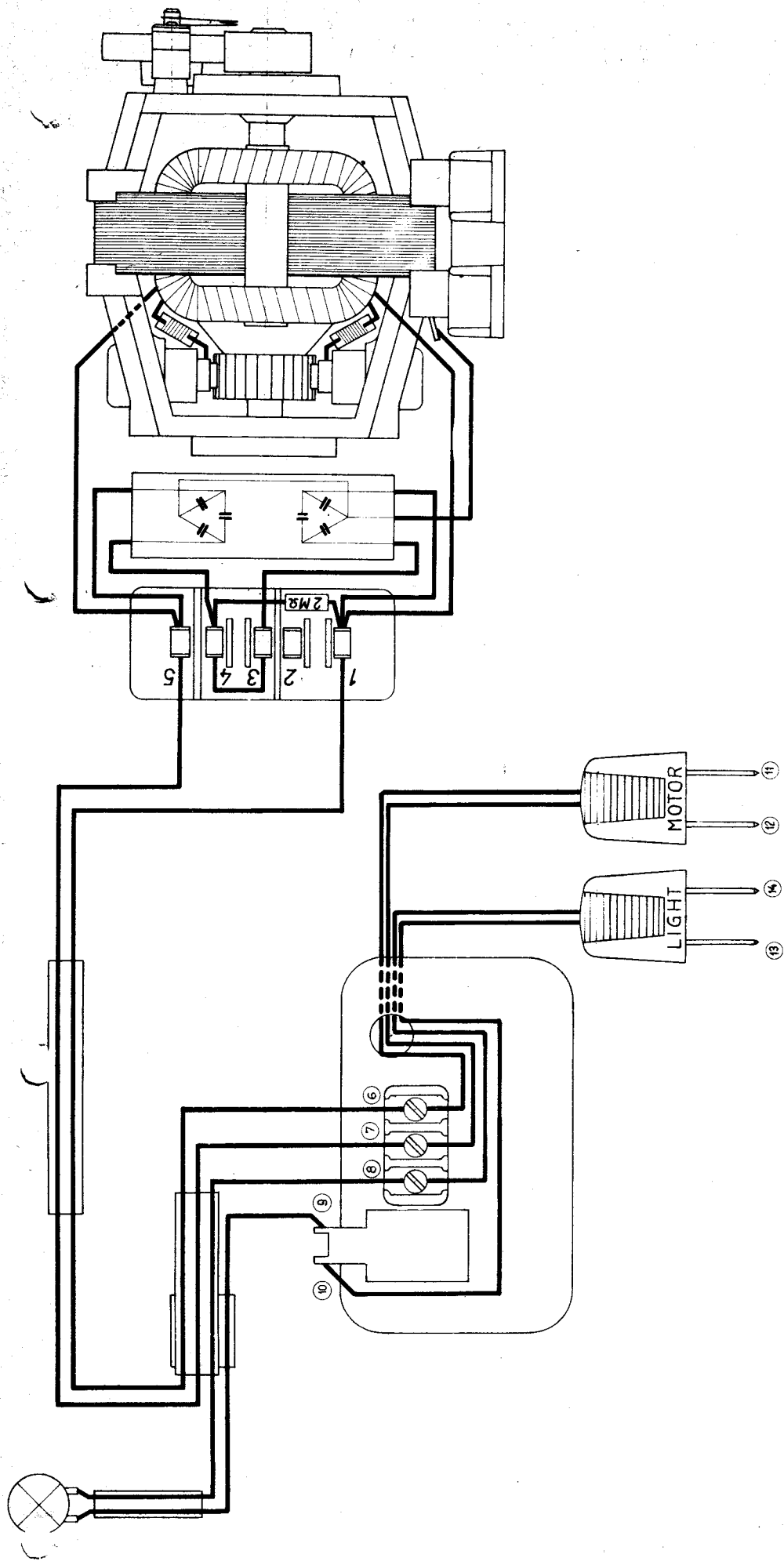
# CENTERING OF SEPARATING PLATE

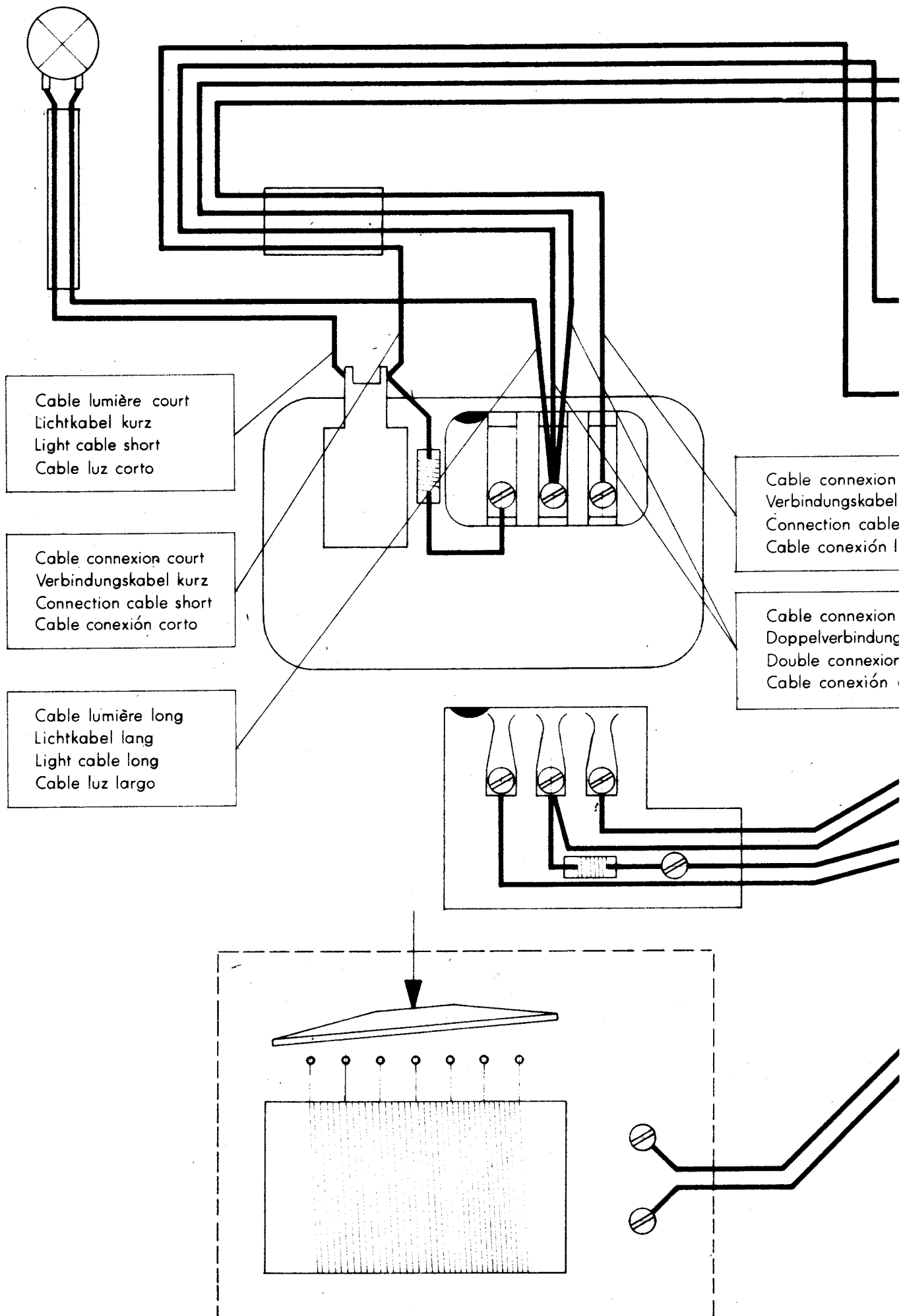
20

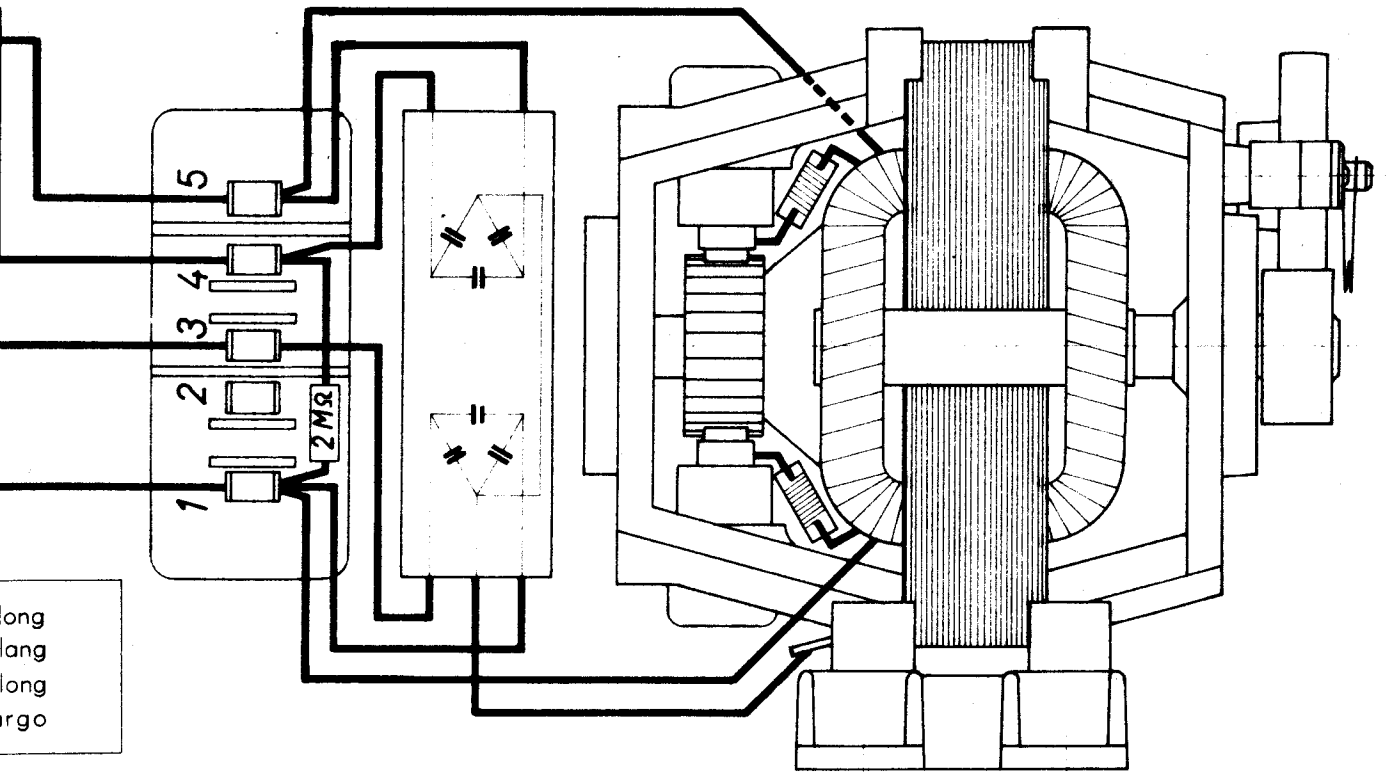
1. Place separating plate and tighten screws slightly.
2. Align separating plate with the needle plate and make sure that it is parallel.
3. Tighten screws.



Plana UJA  
Plana Canada







long  
lang  
long  
argo

double  
skabel  
cable  
oble

