

NECCHI

SERVICE MANUAL

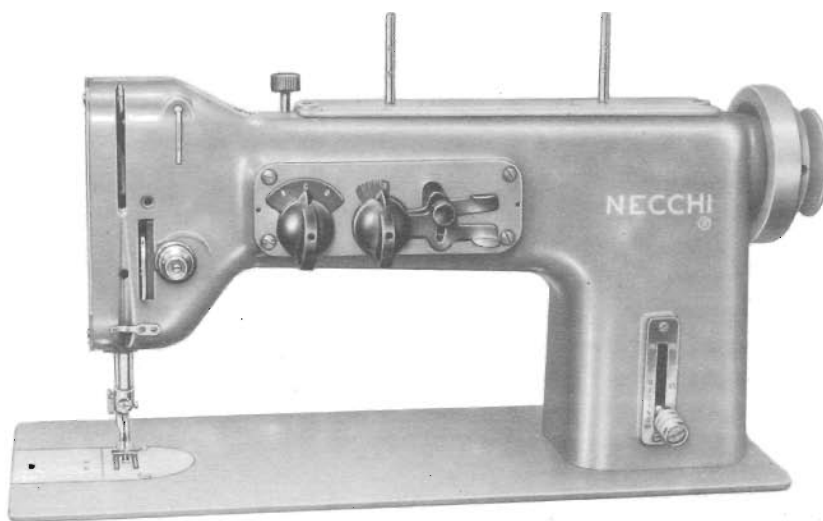
for the

R Z I

sewing machine

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FOREWORD

The following instructions, purposely written in a simple way, are intended for those mechanics who have to repair, check and service **NECCHI RZI** sewing machines.

All technical information and suggestions given in this manual should serve the mechanic as a guide, thus enabling him to solve any technical problem by following a common and established practise.

The mechanic should be able to state with certainty whether a sewing machine sews correctly or not, and consequently, whether repairs and timing operations are required. In fact, the customer quite often complains about the poor performance of his sewing machine, whilst the trouble in reality lies in the customer's own lack of experience in its use.

The mechanic should have the **SPARE PARTS CATALOGUE** as well as the **INSTRUCTION BOOK ON THE USE OF THE RZI SEWING MACHINE** always at hand.

Furthermore, every mechanic performing repairs or effecting deliveries should, in the first place, make sure that the customer, as well as the very sewing machine operator, know the following fundamental rules, which are clearly given in the instruction book:

- use of the correct needle,
- tension adjustment,
- thread control when beginning to sew,
- cleaning of the machine,
- lubrication of the machine.

The most important rules about these points are briefly given hereunder:

USING THE CORRECT NEEDLE

The needle must be selected in accordance with the type of material to be sewn, the kind of work to be performed and the thickness of the thread to be used (see **NEEDLE AND THREAD CHART** in the **RZI SEWING MACHINE INSTRUCTION BOOK**):

- correct insertion of the needle: the long groove of the needle must face the sewing machine operator,
- the upper end of the needle must touch the stopping pin in the needle bar,
- the needle must be securely held in the needle clamp by tightening the relevant fastening screw .

THREADING THE MACHINE CORRECTLY

(See the relevant illustrations in the **RZI SEWING MACHINE INSTRUCTION BOOK**).

ADJUSTING THE THREAD TENSIONS

The tensions of upper and lower thread are correctly balanced when both threads interlock in the center of the fabric.

Fig. 1 shows the three main cases which may occur «a-b-c» when altering the tension values, and precisely:

- a - lower tension too strong,
- b - upper tension too strong,
- c - tensions correctly balanced.

The tensions, of course, must be adjusted in such a way that the fabric does not present any gathering or curling.

It is also advisable to study the instructions on the tension adjustments contained in the **RZI SEWING MACHINE INSTRUCTION BOOK**.

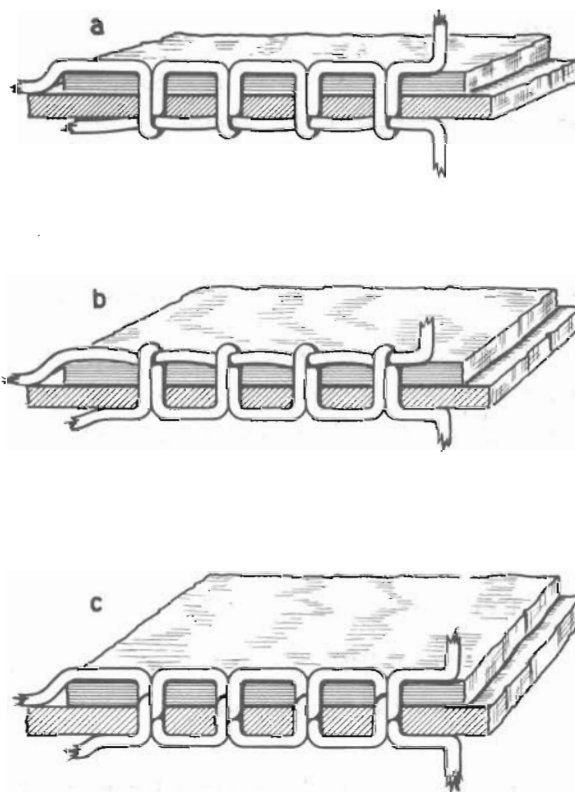


Fig. 1

CONTROLLING THE THREADS WHEN BEGINNING TO SEW

It would be advisable to insist that the customer becomes accustomed to holding the ends of the two threads with one hand when starting to sew, until at least four or five stitches have been made.

This simple rule, valid for all types of sewing machines, will prevent the end of the upper thread from entering into the hook race where it may cause the blocking of the sewing machine or interfere with the hook itself.

CLEANING THE MACHINE

It is of the utmost importance to clean the sewing machine frequently in order to keep it in good working conditions.

In order to do a good cleaning job, it is necessary to remove the needle and front plates, so that, by means of a small brush, all the lint and the small pieces of thread which may have accumulated inside can be taken out.

To complete the cleaning, use a light clean rag after the brushing.

LUBRICATING THE MACHINE

After the sewing machine has been wiped clean, apply a few drops of oil to all points marked on the relevant illustrations of the **RZI SEWING MACHINE INSTRUCTION BOOK**.

TOOLS

To service and repair any type of sewing machine efficiently, the mechanic should have available proper tools and several accessories, essential for a good maintenance job.

Furthermore, he must know how to operate the sewing machine and be familiar with the various mechanisms of the sewing machine and the manner in which they are timed.

Finally, he must be scrupulous about cleaning the sewing machine and oiling all points and parts which require lubrication.

In addition to those already contained in the **MECHANIC'S TOOL KIT**, the following tools and accessories should always be at the mechanic's disposal:

- emery cord,
- cleaning solution (a mixture of 90% Kerosene and 10% lubricating sewing machine oil),
- cup or tin pan to be filled with the cleaning solution and large enough to hold various small sewing machine parts,
- soft cleaning rags,
- scraps of various types of material, assortment of needles and threads.

TECHNICAL CHARACTERISTICS OF THE SEWING MACHINE

Main characteristics:

- industrial type high speed, zig-zag sewing machine with rotary hook,
- link thread take-up lever,
- invertible lockstitch, straight and zig-zag stitching,
- straight and zig-zag sewing in three positions (center, left and right),
- upper and lower shafts controlled by armored rubber belt drive,
- feed dog controlled directly by lower shaft,
- hook on horizontal axis and perpendicular to the longitudinal axis of the sewing machine,
- pendular movement of the needle bar support,
- lift spring on presser bar.

NUMERICAL DATA

- | | |
|--|---------------|
| - dimensions of bed plate | mm. 475 x 178 |
| - space under arm | mm. 275 x 130 |
| - needle bar race | mm. 34 |
| - maximum thickness of fabric to be sewn | mm. 7 |
| - maximum presser foot clearance | mm. 8 |
| - maximum stitch length | mm. 5 |
| - maximum zig-zag width | mm. 4.5 |

- maximum number of stitches per minute, according to the kind of work	2.500
- needle system	134
- required motor power:	
a) single phase	0.17 HP
b) three-phase	0.30 HP
- threads	16 ÷ 120

USE OF THE MACHINE

The RZ1 sewing machine is generally used for sewing light and medium weight fabrics.

It is particularly suitable for tailors and factories manufacturing clothings, overcoats; corsets, brassieres, sails, etc.

It can be furtherly used, with the aid of special attachments, for blindstitching, manufacturing tubular belts, cord assembling of shoe vamps, making key-hole buttonholes, etc. (See our «Special Attachments Catalogue»)

The RZ1 sewing machine can be operated either by treadle or by motor:

- by treadle: with large balance wheel and head bobbin winder,
- by motor: with small balance wheel with special groove for V belt, table bobbin winder and table spool holder, presser-bar knee-lifter.

NOTE: Every sewing machine head is identified by a serial number which can be found under the bed plate.

If replacement parts are needed from the factory, it is necessary to mention the serial number of the sewing machine head for which these parts are required.

HOW TO GET A NEW MACHINE READY FOR DELIVERY

Before delivering a new sewing machine to the customer, the mechanic should check that the sewing machine has not suffered any damage in transit.

For the said purpose, as soon as the sewing machine has been taken out from its crate, the mechanic will carry out a thorough cleaning of it, after having removed the sample work placed under the presser foot.

Then the following operations have to be performed:

- dismounting and cleaning of the bobbin case, race cover and hook,
- general lubrication (using special oil for sewing machines), avoiding the use of inappropriate oils, which would obviously jeopardise the regular performance of the sewing machine,
- checking and adjusting of the presser-bar,
- inserting the bobbin case in its housing,
- threading, sewing tests and tension regulation.

Moreover, before the delivery, it is necessary to find out for which specific work the sewing machine is required.

It would be advisable to secure, if possible, a sample of the fabric to be sewn and to execute some sewing tests on it, so as to ascertain whether the sewing machine is fit for that particular kind of work.

The above mentioned test, in the majority of cases, are also useful for the selection of the right threads and needles, to be suggested to the customer.

Upon delivery, the mechanic should also make it his duty to instruct the operator and to advise him about any particular detail of the sewing machine.

Delivery according to the above procedure will always be a guarantee of good performance and efficiency.

When the sewing machine is required for special work or has to be equipped with special attachments, it would always be advisable to request some samples and the necessary fabric for the special sewing tests to be effected on it at the factory.

TIMING THE MACHINE

The mechanic is usually called in when the customer notes that the performance of his sewing machine is no longer regular or when for some accidental reason or other, the sewing machine is damaged.

It is therefore necessary for the mechanic to be fully acquainted with the movements and the function of the various groups of parts in order to be able to work rapidly when timing and aligning them as they were originally.

Timing operations are intended to control and adjust the position of the various elements of the sewing machine, so that their exact reciprocal positions may reoccur periodically and at regular intervals, thus ensuring a regular and continuous performance of the sewing machine.

For each timing operation, when needed, reference will be made to particular gauges which should be included in every mechanic's tool kit.

Furthermore, whenever possible, a general rule for the timing procedure will be given when the corresponding timing gauge is not available to the mechanic.

Timing performed in accordance with the following rules is indispensable for:

- checking and replacing parts,
- after maintenance operations which require disassembling and reassembling of some mechanisms,
- timing of groups related to each other,
- it is necessary to eliminate some disturbances interfering with the proper functioning of the sewing machine.

In the following chapters we shall illustrate the most important timing operations of the various parts.

It should be noted, however, that whenever two parts are rigidly connected by a cutter, their reciprocal position is perfectly guaranteed as their coupling is carried out in the factory by means

of special gauges.

TIMING THE ZIG-ZAG MECHANISM

The timing operations of this particular group deal with:

- timing the eccentrics,
- alignment of the coupling axes and of the control knob kingpin on the axe itself,
- perpendicularity of the needle bar in its center position,
- coupling inclination, as to allow a complete run of the control knob without determining movements in the needle bar supporting frame.

TIMING THE ECCENTRICS

Move the needle displacement knob on its **C** (center) position and the zig-zag knob on **O** (zero); turning the balance wheel by hand, bring the needle bar to its highest position.

Once these preliminary operations have been performed, the timing of the eccentrics is executed as follows: (Fig.2)

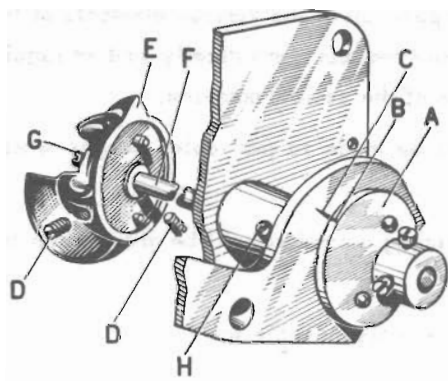


Fig. 2

the eccentric **A**, controlling the three positions, is properly adjusted if the line **B**, marked on the edge of the eccentric, and the line **C**, marked on the lever, coincide.

If such is not the case, loosen the two fastening set-screws **DD** which hold the knob **E** on the stem **F**; then, by inserting a small screw-driver into the slot **G** of the knob, rotate the eccentric **A** until the two above mentioned lines coincide.

Keep the knob always on its **C** position and tighten the fastening set-screws **DD**.

If the needle has moved from the center during the above mentioned timing operation, the following procedure has to be followed:

In order to control the timing of the eccentric commanding the zig-zag lever, use the timing gauge symbol **978407000**, (Fig.3).

Make certain that the needle bar is in its highest position. Insert the timing gauge in the fork **A** up to the point where the **V** of the gauge settles in the eccentric part **C** having the least eccentricity.

With the timing gauge thus placed, try to rotate the balance wheel. If the timing is correct, the balance wheel will not move and the needle bar will remain in its highest position. If the position

is not correct, loosen the fastening screws of the eccentric (not visible in Fig. 3), insert gauge No. **978407000** and rotate the balance wheel until the needle bar reaches its highest position.

Tighten the screws, checking that the eccentric touches the stem bushing in order to eliminate any possible axial play of the stem itself.

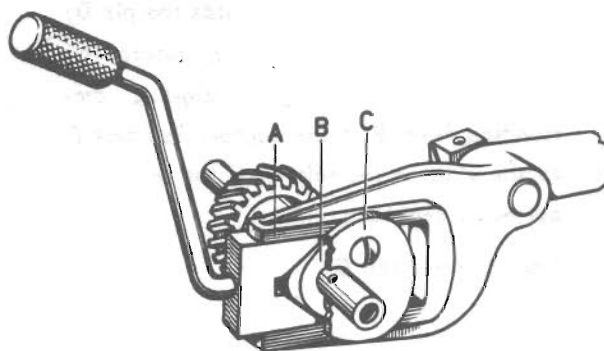


Fig. 3

ALIGNMENT OF THE COUPLING AXES

The alignment should be perfect if the above mentioned operations have been carried out correctly.

The practical test to see that the timing has been carried out satisfactorily is the following:

(Fig. 4)

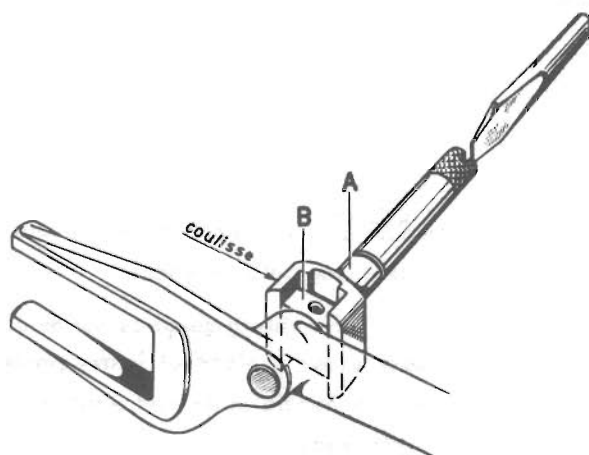


Fig. 4

- loosen the two set-screws of the zig-zag control knob on the coupling stem. Rotating the kingpin of the coupling by means of a screw-driver, the coupling should also rotate the square **B** on its axis without moving the needle.

Once this test has been performed and in order to replace the coupling in its exact position, see the following paragraph: **COUPLING INCLINATION.**

PERPENDICULARITY OF THE NEEDLE BAR IN ITS CENTRAL POSITION

In order to control this position, it is necessary to remove the presser foot, shift the needle displacement lever on **C** (center) and the zig-zag controlling knob on zero.

Rotate the balance wheel by hand until the needle bar reaches its highest position. Check that (Fig. 5) the needle **A** is perfectly centered in the needle plate hole **B**.

Before proceeding, make sure that the needle on the sewing machine is not bent.

In order to make the operation easier, you can use the needle plate with a small round hole which is a component part of the accessory kit.

If the needle appears to be out of line, the following steps must be taken:

- loosen the screw **C** which holds the pin **D**;
by means of a screw-driver, rotate the
eccentric pin **D** joining the zig-zag com-
manding lever **E** to the supporting frame **F**
to the right or the left, until the needle is
perfectly centered,
- tighten the screw **C**.

COUPLING INCLINATION

There should be sufficient inclination to allow complete freedom of movement of the zig-zag mechanism without causing any movement in the needle bar supporting frame.

In order to control the inclination of the axis **A** of the coupling **B** (Fig. 6), one must apply the special timing gauge **C** to the front plate of the sewing machine, so that the key **D** is close to the lower part of the needle bar supporting frame **E**.

The timing gauge must not register oscillations greater than 0.02 mm. for each complete revolution of the balance wheel.

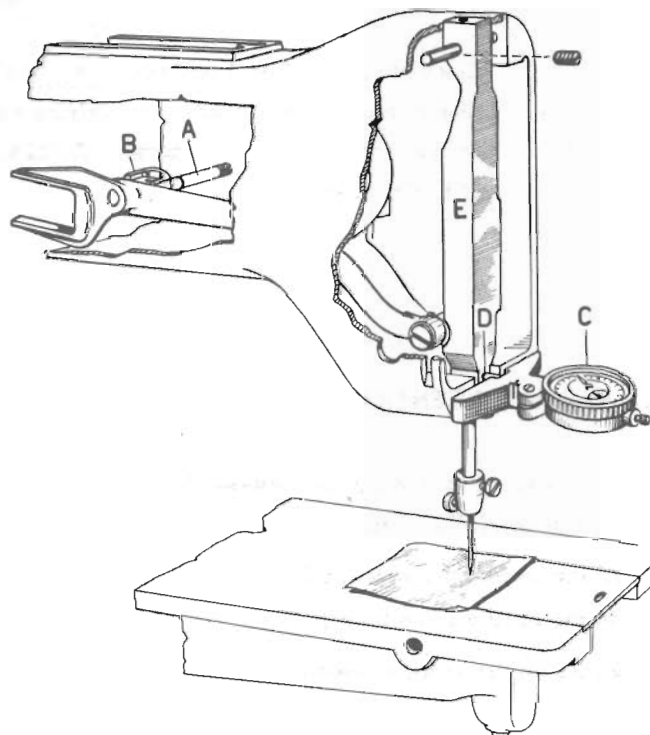


Fig. 6

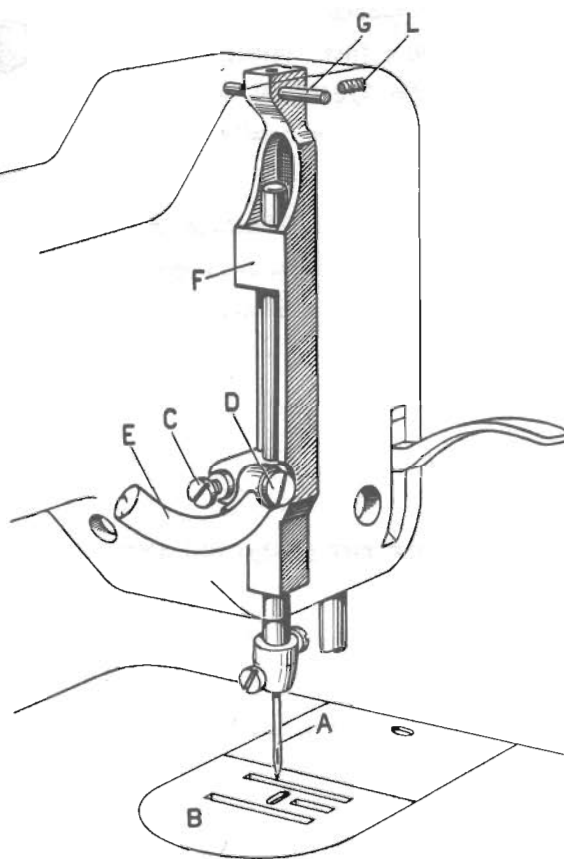


Fig. 5

If this timing gauge is not available, place a piece of heavy paper on the needle plate and hold it in place securely; rotate the balance wheel by hand and check that the needle point punctures the paper always in the same place.

In case the needle does not enter continuously in the same hole, loosen the two fastening set-screws of the zig-zag controlling knob, insert a screw-driver into the hole of the knob itself and rotate the pin of the coupling until the defect is eliminated.

The tighten the set-screws, making sure that the knob indicator is always set at zero.

VERIFYING THE TIMING OF THE ZIG-ZAG MECHANISM

To make sure that the timing of the zig-zag mechanism is correct, the following steps must be taken:

- set the stitch length controlling knob at **0** (zero), thus eliminating any feeding,
- set the zig-zag width controlling lever on its maximum position and the needle displacement lever on **C** (center),
- place a small piece of heavy paper under the presser foot and, with two turns of the balance wheel, have the needle puncture the paper first to the right and then to the left,
- shift the needle displacement lever to **D** (right), leaving the width of the zig-zag to the maximum,
- turn the balance wheel hand check whether the needle punctures the paper in the same points, both to the right and to the left, obtained with the needle displacement lever at **C**.

Repeat the operation shifting the needle displacement lever to its **S** position (left), and see whether the needle punctures the paper in the same points.

If the needle does not puncture the paper in the same point during the three operations, then the entire timing of the zig-zag mechanism must be rechecked since evidently some operations have not been carried out perfectly.

TIMING THE FEED DOG

In order to check the timing of the feed dog, the following steps must be taken:

- bring the needle bar to its lowest position; in this case the correct position is obtained when the needle bar connecting link is perfectly vertical,
- check that the lines **AA** (Fig.7) marked in red on the eccentrics **B** and their strips **C** coincide both in the eccentric controlling group of the feeding **1** and in the lifting mechanism **2** (located under the base of the sewing machine). Should one or both eccentrics be incorrectly timed, proceed as follows:

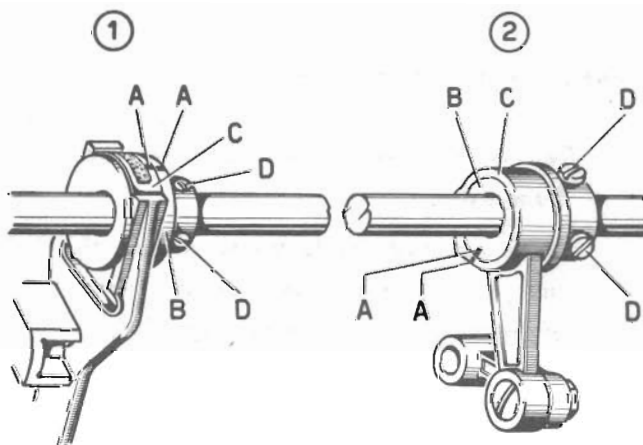


Fig. 7

- without moving the sewing machine and with the needle bar in its lowest position, loosen the fastening set-screws and screws **DD** of the eccentrics that are not properly adjusted (Fig.7). Rotate the eccentric on the shaft until the two control lines **AA** coincide. Finally, tighten the set-screws firmly, making sure that the needle bar is always in its lowest position.

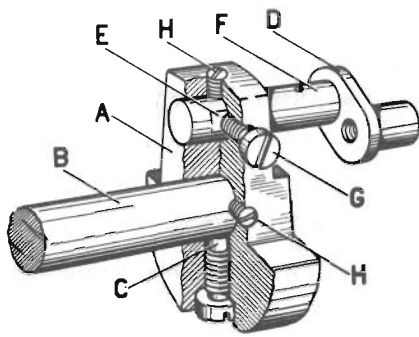


Fig. 8

TIMING THE COUNTERWEIGHT - LINK THREAD TAKE-UP LEVER

The timing of this group is quite simple.

For a correct timing operation, the following steps should be taken:

- the counterweight **A** (Fig.8) must be fixed on the shaft **B** by means of a conical screw **C** which must enter into the housing cut out for it in the upper shaft,
- the longer shaft **F** of the driving crank **D** must be fitted into the counterweight with its flat side **E** set in such a way that the screw **G** corresponds to it and holds the crank in place.

The set-screws **HH** serve as an auxiliary support for the two joints.

TIMING THE NEEDLE BAR - ROTARY HOOK

The timing of these two groups is obtained by using the gauges symbol nos. **10.5.1/1** and **10.5.1/2** (Fig.9).

The following is a description of the operations to be carried out and of the best method to use the gauges.

PRELIMINARY OPERATIONS

- Remove the presser foot, the needle and front plates,
- make sure that the fastening screws of the gear controlling the hook and those of the two pulleys are firmly tightened,

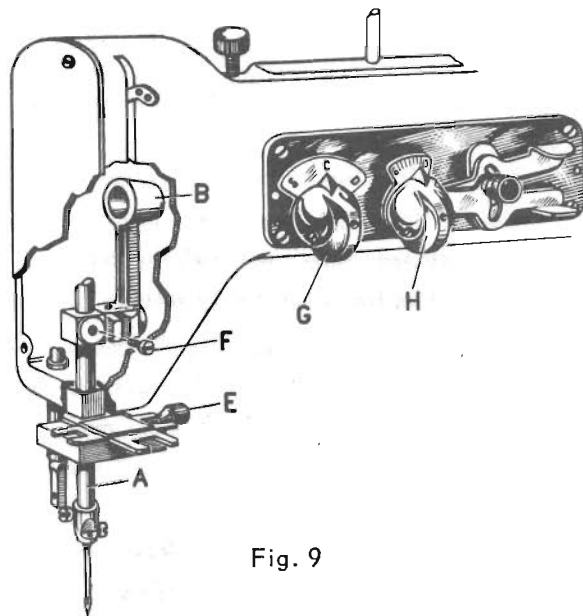


Fig. 9

PLACING THE TIMING GAUGE

- Turn the balance wheel by hand and bring the needle to its lowest position. In order to check that the needle is in its lowest possible position, make sure that the needle bar controlling link **B** is vertical,

- shift the indicator of the needle displacement lever **G** on its **C** (center) position and that of the zig-zag width controlling lever **H** to **O** (zero),
 - place the cross gauge **10.5.1/1** at the bottom of the needle bar support with its fork of 2 mm. and round the needle bar, making sure that the gauge is set against the lower end of the arm. Place the clamp **10.5.1/2** below the other gauge and pushing it against the former gauge.
- When sure that the clamp, timing gauge and arm are close to one another, tighten button **E** of the clamp,
- remove the timing gauge **10.5.1/1**, making first sure that it moves easily between the clamp and the lower end of the arm, but without allowing any play.

VERIFYING THE TIMING

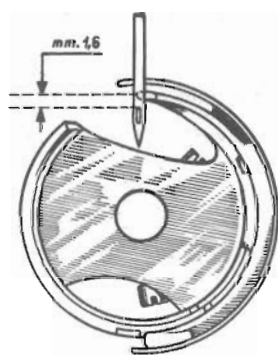


Fig. 10

Turn the balance wheel slowly until the clamp, which has been left on the needle bar, sets against the lower end of the arm.

In this position the rotating point of the hook should be 0.1 mm. from the needle (Fig.11) and right on its cross section line (Fig.10).

If the positions of the needle and of the hook point are not as described, proceed as follows:

HOOK POINT NOT IN LINE WITH THE NEEDLE

- Loosen the three screws **A-A-A** fastening the hook on the shaft (Fig.12),
- rotate the hook until the point is on the cross section line of the needle (Fig.10),
- make sure that the timing is reached and tighten the three screws **A-A-A**.

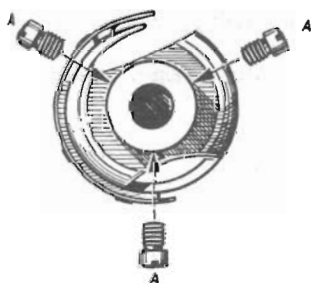


Fig. 12



Fig. 11

POSITIONING THE HEIGHT OF THE NEEDLE

The procedure is the following:

- shift the indicator of the needle displacement lever **G** on its **C** (center) position and the zig-zag width controlling lever **H** on **O** (zero) (Fig.9),
- rotate the balance wheel by hand until the hook point is on the cross section line of the needle and check that the clearance between the hook point and the upper part of the needle

- hole is approximately 1.6 mm. (Fig.10),
- if the distance is not correct, bring the needle bar to its lowest position and loosen screw **F** (Fig.9) on the needle bar connecting sleeve by inserting a screw-driver in the cut out provided in the face plate of the sewing machine,
- when the needle is set on the desired position, tighten screw **F**,

NEEDLE DISTANCE FROM HOOK POINT

When the point of the hook is not 0.1 mm. from the needle, the following operations will be necessary:

- loosen the three screws **A-A-A** which hold the hook on the shaft (Fig.12),
- shift the hook axially, until the required position is obtained. Tighten the three screws.

After this operation, it is advisable to check once again the timing of the hook and needle with the relevant gauge and, should this be incorrect, to proceed according to the rules set down in the chapter **TIMING THE NEEDLE BAR - ROTARY HOOK.**

FEED DOG

The purpose of this part is to feed the fabric regularly for a certain distance at every stitch so that the space between one perforation of the fabric by the needle and the next one equals the desired length of stitch.

A perfect feeding operation is of great importance for the final result of sewing.

An incorrectly operating feed dog will cause irregular feeding of the fabric, unequal lengths of the stitches, and a seam which is not straight.

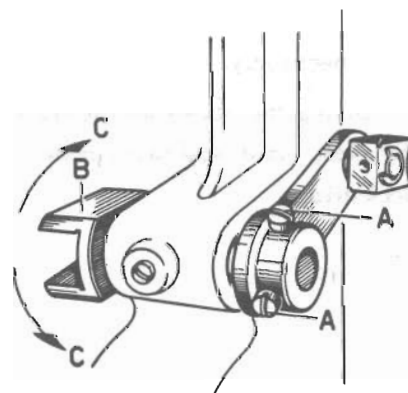
There are many circumstances which may cause the above mentioned defects.

Before further investigating the causes of incorrect feeding, it is necessary to make certain that the various parts of the feeding mechanism are properly assembled, adjusted and timed, which can be checked by following the instructions contained in the chapter **TIMING THE FEED DOG.**

FORWARD AND REVERSE RUN

- Place the stitch length regulating lever on its maximum forward position, that is completely down (AV),

- place a small piece of heavy paper under the presser foot and, by turning the balance wheel by hand, execute 11 needle perforations (10 spaces),
- shift the stitch length regulating lever to its maximum reverse position, that is completely up (IN),
- shift the piece of heavy paper and execute another series of 11 perforations,
- check by means of a Mauser gauge or with a ruler that the two external perforations of each series be at a 50 ± 3 mm. distance,
- should not the distances be equal, loosen the screws A-A (Fig. 13) and angularly move the coupling B controlling the feed dog in one of the two directions (arrows C-C) until the desired position is reached.



POSITIONING THE FEED DOG

Remove (Fig. 14) the needle plate; loosen the two screws A-A which hold the feed dog to its support B; move the feed dog C until it is properly center-

Fig. 13

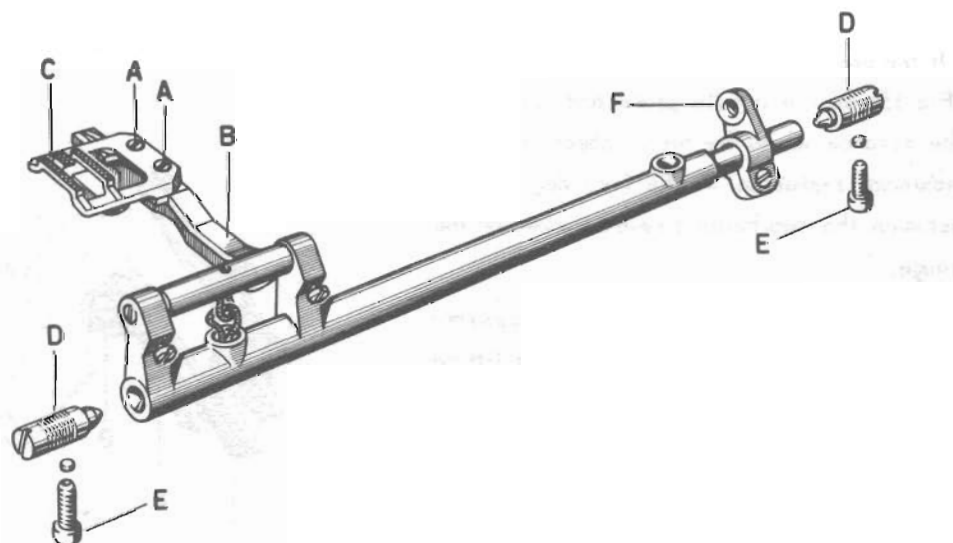


Fig. 14

ed in the needle plate; tighten the screws.

Whenever it is not possible to center the feed dog by the simple operation of moving it on its support, it will be necessary to adjust the position of the feed dog support by acting on the conical pins D of the feeding shaft.

The position of the shaft can be adjusted by loosening the two screws E and moving then the two conical pins D in the direction desired. Before tightening the two screws E, make sure that there is no axial play in the shaft.

While turning the balance wheel by hand towards you, check whether the movement of the feed dog in the direction of sewing is correctly centered in relation to the slots of the needle plate:

namely, whether the feed dog, in its extreme positions, is equally distanced from the adjacent ends of the feed dog slots in the needle plate.

Check also whether the feed dog is correctly centered in the direction perpendicular to the top surface of the needle plate: namely whether the tips of the feed dog teeth are alternately at equal distances above and below the top surfaces of the needle plate during the sewing.

In case the feed dog is not properly centered, loosen the screw on the joint **F** and turn the feeding shaft until the required alignment is obtained. Firmly tighten the screw and again check whether the feed dog is now correctly centered in the direction of sewing.

If necessary, repeat the aforementioned procedure until the feed dog is centered correctly.

During the above mentioned operations, be careful not to shift the joint or crank axially along the shaft, as it may cause other inconveniences due to the improper alignment of the crank with the eccentric.

MAXIMUM PROTUSION OF THE FEED DOG TEETH

The checking should be performed according to the following procedure:

- lift the presser foot, place the gauge No.10.1 (Fig.15) on the needle plate and, by turning the balance wheel by hand, check that the maximum protusion of the feed dog results between the two heights «a-a» marked on the gauge.

If such is not the case, it will be necessary to adjust the connecting link **A** of the lifting shaft in the following manner:

- loosen the pressure screw **B** of the connecting joint,
- raise or lower the support **C** of the feed dog until the latter is in its correct position, which can be checked with the above mentioned gauge and rotating the balance wheel by hand,
- tighten the pressure screw **B**,

Be sure to tighten all screws after the adjustments have been completed.

Make some sewing samples and if other inconveniences should occur you may consider some of the following points:

- defective regulation of the pressure of the presser foot,

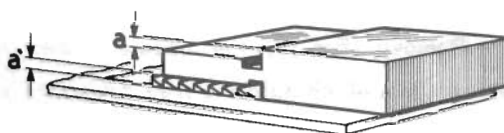


Fig. 15

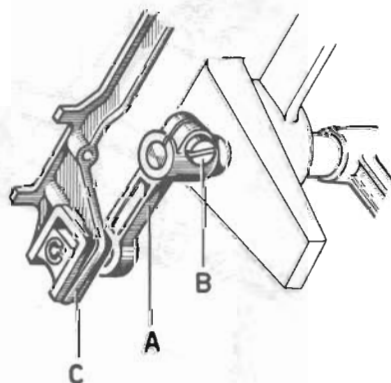


Fig. 16

- presser foot resting irregularly on the feed dog teeth,
- worn teeth.

DEFECTIVE PRESSURE OF THE PRESSER FOOT

It should be quite evident that the defective or incorrect pressure of the presser foot is bound to influence the results of the sewing as well as the adjustments of the feed dog, due to the reciprocal action between these two parts.

For a proper adjustment of the presser foot pressure, the following general rules should be kept in mind:

- the greater the thickness of the fabric, the greater is the pressure required and which has to be supplied by the presser foot,
- for same thicknesses a rigid fabric requires less pressure than a soft one.

PRESSER FOOT RESTING IRREGULARLY ON THE FEED DOG TEETH

The two surfaces - the under surface of the presser foot and the top level of the feed dog - must be parallel.

To check that the two above mentioned surfaces are parallel a very simple test can be carried out by using a thin sheet of paper (0.05 mm. thick).

- Raise the feed dog to its highest position,
- lower the presser foot,
- raising and lowering the presser foot lever, subsequently insert the sheet of paper under one corner of the presser foot and then repeat the operation under each of the three remaining corners.

The paper should be held equally by each of the four corners.

If this is not the case, it is obvious that the under surface of the presser foot or the top level of the feed dog or both are incorrectly positioned.

Let us consider the case of an incorrect positioning of the presser foot.

It is easy to check in the following manner:

- make the same test with a piece of paper as described above, but with the feed dog lowered. In this way the presser foot comes into direct contact with the needle plate,
- repeat the test in the four corners of the presser foot instead of the four corners of the feed dog,

- if the test proves that the presser foot rests evenly on the needle plate, then it is evident that the resting surface of the feed dog is not even.

One of the ways to obviate this inconvenience is to adjust the positioning of both the feed dog and the presser foot.

Should it be a question of defective parts, it will be necessary to substitute them with new ones.

WORN TEETH

When it is evident that the teeth of the feed dog have been consumed and are worn (easily noted by the eye or by passing a finger over them), then it is advisable to substitute the feed dog, bearing in mind the adjustments and the timings described above.

NOTE : *When sewing light weight fabrics (silks for example) it is advisable to lower the level of the maximum protusion of the feed dog teeth, while the pressure of the presser bar should be maintained at a minimum.*

Moreover, remember to always consult our SPECIAL ATTACHMENTS CATALOGUE, in which you may find the necessary feed dog and presser feet to be used when executing special works.

NEEDLE

The needle too is a very important part of a sewing machine. The mechanic should be capable of indicating the proper needle to be used according to the type of sewing to be done.

The needle system 134 which is used on the RZI sewing machines offers a large variety of needle points; thus a wide range of choice is offered to the consumer. Often the use of one type rather than another may make all the difference between perfect and imperfect sewing.

The needle must have a sharp point to prevent tearing of the fabric during sewing; it must be straight and its eye must not be sharp.

Of course, it is always extremely important to check that the needle has been properly inserted into the needle bar.

PRESSER BAR

The presser bar, as it allows the regulation of the presser foot pressure on the fabric, must always be considered in relation to the feed dog.

The following paragraphs, therefore, have to be integrated with the information given in the chapter regarding the **FEED DOG**.

The main operations to be effected on the presser bar are the following: (Fig.17)

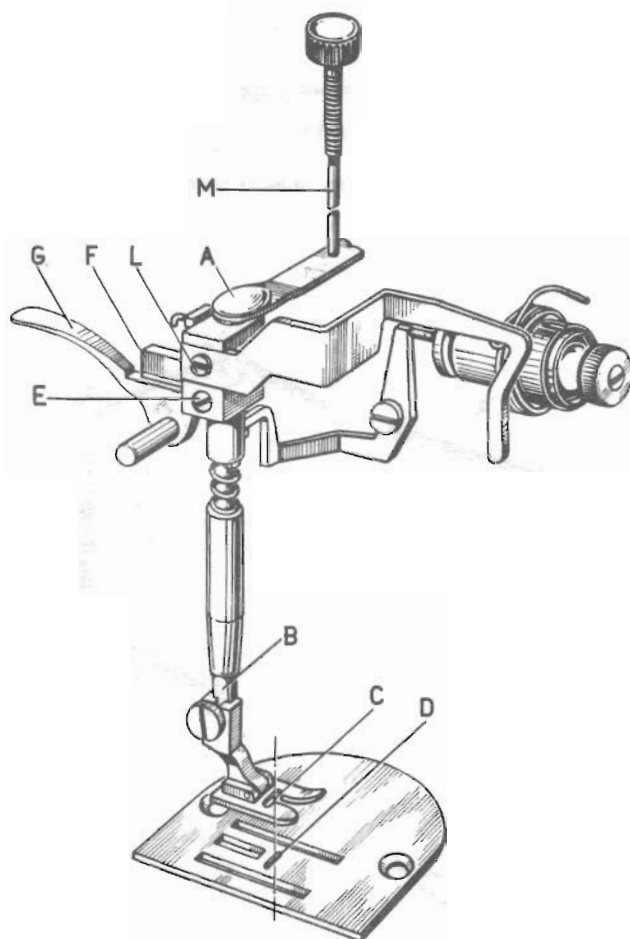


Fig. 17

CHECKING THE PRESSURE

It can be stated that, even though approximate, there is an interdependence between the pressures exerted by the spring A of the presser bar B, the tension of the upper thread and that of the lower thread. More precisely, while maintaining constant the type of fabric in use and the tension of the lower thread, with each added layer of fabric placed under the presser foot, there must be a corresponding increase in the tension of the upper thread and in the pressure exerted by the presser bar.

ALIGNMENT OF PRESSER BAR AND PRESSER FOOT

The hole C of the presser foot must be aligned with the center of the hole D in the needle plate.

In order to correct any possible displacement, it is necessary to loosen the screw E of the presser bar guide and adjust precisely the position of the presser foot, making sure, however, that no movement of the presser bar on its axis takes place, for such a movement will cause a change in pressure.

Once centered, the screw E must be firmly tightened. Sometimes the fact that the hole of the presser foot and the hole of the needle plate are not centered may depend from some clearance of the presser bar guide F or from possible plays in the presser foot. In these cases, it is advisable to substitute the defective parts.

PRESSER FOOT LIFTING

When the presser foot is raised, there should be a space of 8 mm. between the base of the presser foot and the needle plate (Fig.17).

OPENING OF THE UPPER TENSION DISCS

The opening of the upper tension discs is controlled by the disc disengagement lever which is, in turn, controlled by the presser bar lever or by the presser-bar knee-lifter.

It is advisable to check that the discs open when the presser foot is almost totally raised.

PRESSER-BAR KNEE-LIFTER (Fig.18)

Sometimes the pressure of the presser foot may be hampered by an incorrect adjustment of the controlling chain A. When the presser foot B is lowered, the chain should not be too tight. If it is necessary to adjust the chain tension, act on the sleeve C joining the lower end of the chain D to the rod E which enters into the controlling block F. The nut G must be loosened before the adjustment.

When the chain has been adjusted, tighten the nut, otherwise the sleeve C will move during operation altering the length of the chain.

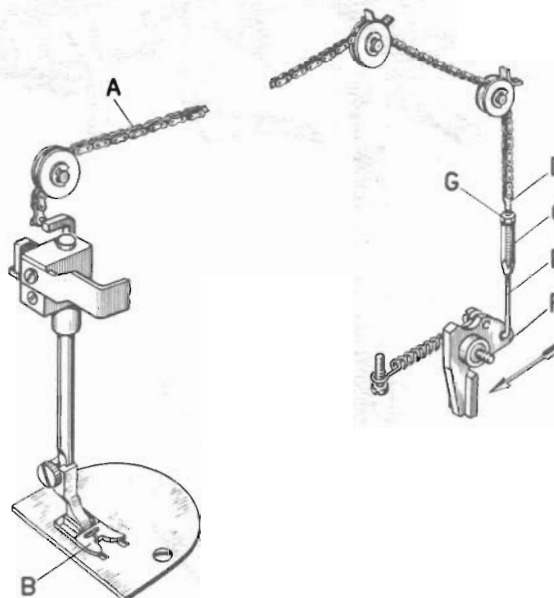


Fig. 18

ZIG-ZAG GROUP

The dismantling and reassembling of the zig-zag group should take place only when it is necessary to substitute some component parts of the group itself.

It is extremely important that, when dismantling the zig-zag group, the two plates A-B (Fig.19), which are mounted under the control knobs, be not touched.

These small plates are mounted on the control board in the factory with the help of special gauges which are not distributed to our concessionaires, inasmuch as the mechanic should never have occasion to remove these discs.

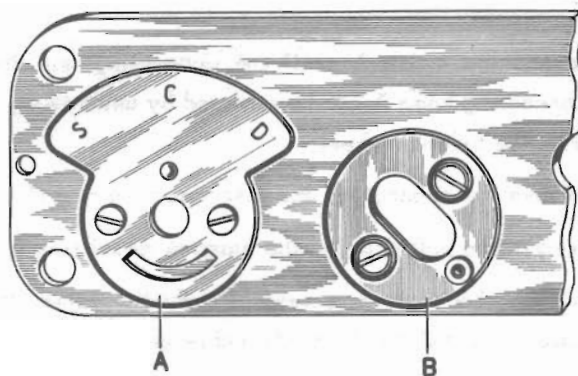


Fig. 19

to be followed is:

- dismantle the zig-zag plate as described above,
- dismantle the thread hook (Fig. 17) by removing the fastening screw L,
- dismantle the eccentric pin D (Fig.5) joining the zig-zag lever - needle bar supporting frame, after having removed the screw C which holds the pin itself,
- dismantle the needle bar supporting frame F (Fig.5).

In order to remove the supporting frame, it is necessary to loosen the set-screw L, holding the pin G and remove the pin by means of a thin rod. Once these have been removed, the supporting frame can be easily dismantled together with the needle bar and its joint.

If possible, it is advisable not to further dismantle this group.

- Remove, unscrewing it, the knob M (Fig.17) and take off the presser spring A,
- remove the presser foot,
- loosen the set-screw E and remove the presser bar B,
- take off the zig-zag lever from the lower end.

To reassemble, follow the same instructions in the reverse order, following all the timing and adjusting rules.

BALANCE WHEEL GROUP

Should it be necessary to dismantle the balance wheel, proceed according to the following instructions.

The complete plate A (Fig.20) besides the controls of the zig-zag mechanism, has also another organs and it can be easily removed by loosening the four fastening screws B.

The two pins C serve as a reference point when reassembling the plate.

When dismantling the knobs and the relevant pins, please then refer to the paragraph **ZIG-ZAG GROUP** for their reassembling.

When it is necessary to dismantle the zig-zag commanding lever E (Fig.5), the procedure

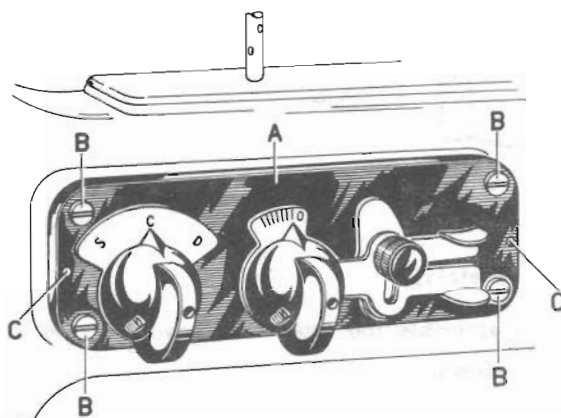


Fig. 20

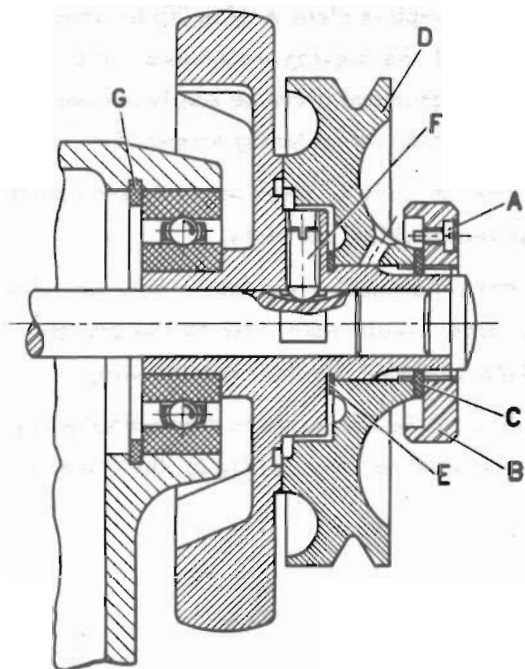


Fig. 21

For treadle driven sewing machines (Fig.21):

- loosen the screw A until the connecting and disconnecting knob B can be removed by unscrewing it from the balance wheel,
- remove the connecting and disconnecting ring C,
- remove the pulley D and the balance wheel ring E,
- loosen the two set-screws F which secure the balance wheel to the shaft and remove the balance wheel.

To reassemble the group correctly, proceed according to the following rules:

- insert the balance wheel on the shaft taking care to set the external ring of the ball-bearing slightly against the ring G,
- make the pointed set-screw coincide with the V groove of the upper shaft and then tighten it completely,

pletely,

- assemble the other components of the group in the opposite order of the procedure described above.

For motor driven sewing machines (Fig.22):

- loosen the two set-screws F which secure the balance wheel to the shaft and remove the balance wheel.

When reassembling, take care to set the external ring of the ball-bearing slightly against the ring G.

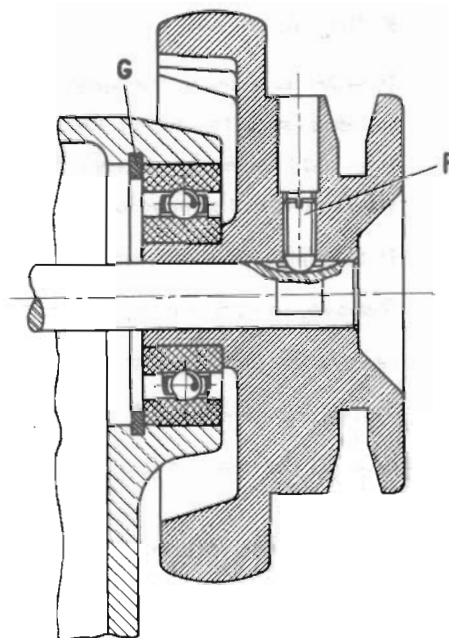


Fig. 22

UPPER SHAFT GROUP

Besides the balance wheel, described above, also other mechanism such as the zig-zag group, hook, link thread take-up lever and needle bar controls are connected with the upper shaft.

Only in exceptional cases it will be necessary to replace the upper shaft, a description of which is given hereafter:

- balance wheel: for instructions on the assembling and dismantling of the balance wheel, see

- the preceding paragraph,
- zig-zag controlling board-plate and needle bar supporting frame: see paragraph **ZIG-ZAG GROUP**,
- connecting rod pin (Fig.23); it is sufficient to loosen the set-screw **A** which secures the pin **B** and to remove it by means of a small rod.

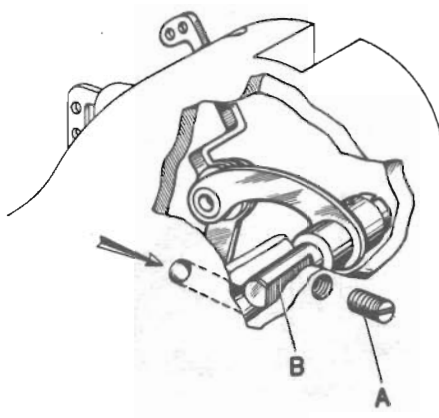


Fig. 23

Other operations to be performed are:

- loosen and remove the two screws **A** (Fig.24) and take off plate **B** which serves as a guide to the knee-link. Pay attention to keep the spacing washers separate, which are found between the plate and the arm.
- loosen (Fig.25) the set-screws **A-A** fastening the zig-zag controlling gear **G** and the screws **A'-A'** of the supporting ring **B** on the upper shaft,
- remove the belt **D** (Fig.25) connecting the lower and upper shafts, and loosen the two fastening screws **F** of the upper pulley **E**,
- remove the upper shaft from the left part of the sewing machine. It is advisable to remove the upper shaft without removing the link thread take-up lever, connecting rod, knee and counter-weight.

When reassembling the upper arm and the parts which are directly connected with it, all the above described operations must be carried out in the opposite order.

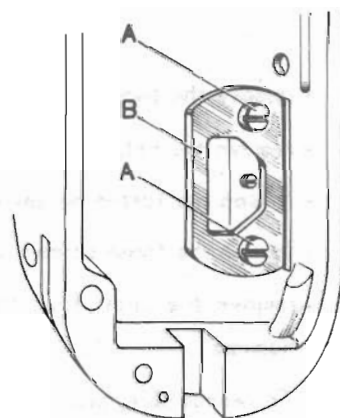


Fig. 24

HOW TO REMOVE AND REPLACE THE BELT

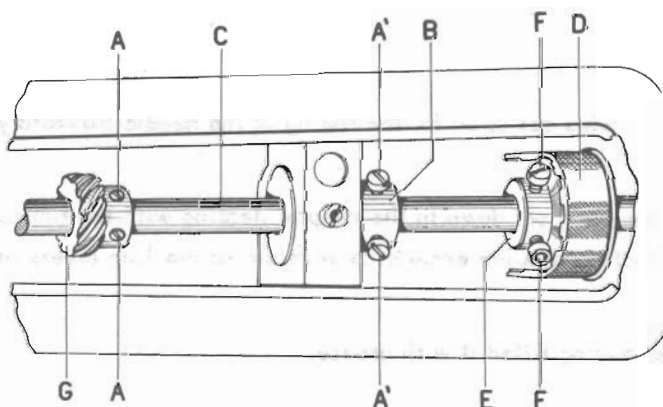


Fig. 25

To remove the belt, dismantle the group of the balance wheel, pull the belt out from the lower pulley and remove it from the housing of the balance wheel ball-bearing.

To replace it, proceed as follows:

- rotate the upper shaft until the needle bar reaches its highest position,
- rotate the lower shaft until the alignment marks on the eccentrics and their strips coincide,

- place the belt on the spoke-pulleys (upper and lower) and turn the balance wheel by hand until the belt is properly in place.

LOWER SHAFT GROUP

To dismantle the lower shaft (Fig.26) proceed as follows:

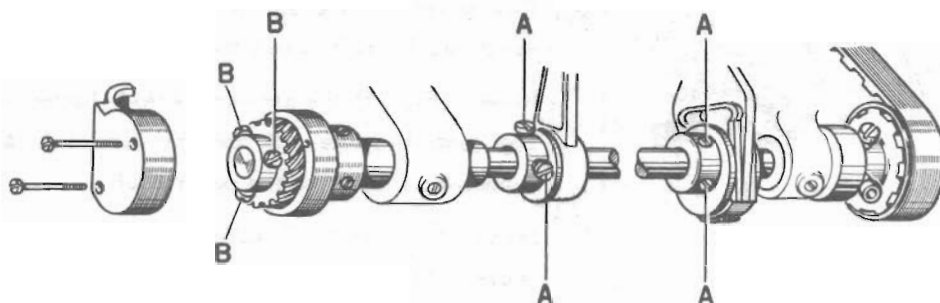


Fig. 26

- remove the two fastening screws and the cover of the gear carter,
- remove the belt from the lower pulley,
- loosen the fastening set-screws **A** of the eccentrics,
- loosen the three screws **B** and remove the gear,
- remove the shaft from the right side of the machine, hitting it on the left end with a plastic hammer.

To reassemble, proceed as follows:

- insert the shaft, mounting the two eccentrics already in their housings (the forks of the two rods commanding the feed dog),
- insert the ball-bearing until it rests in its housing. Do not move the ball-bearing axially along the lower shaft in this operation,
- place the belt on its pulley,
- secure the controlling gear following the rules set down for the timing of the needle bar-rotary hook,
- secure the two eccentrics following the rules set down in the chapter dealing with the timing of the feed dog and making sure to perfectly align the eccentrics with the controlling levers of the feed dog,
- apply the cover to the gear carter, after having filled it with grease.

CONTROLLING GROUP OF THE ROTARY HOOK

To dismantle and reassemble this group proceed as follows (Fig.27):

- remove screw **A** and the hook retainer **B**,
- bring the feed dog to its highest position by turning the balance wheel by hand,
- remove the three screws **C-C-C** and the rotary hook,
- remove the cover of the carter,
- loosen the three screws **D** and remove the gear **E**,
- loosen the set-screw **F** and remove the group: bushing, pin, gear from the rear part of the sewing machine.

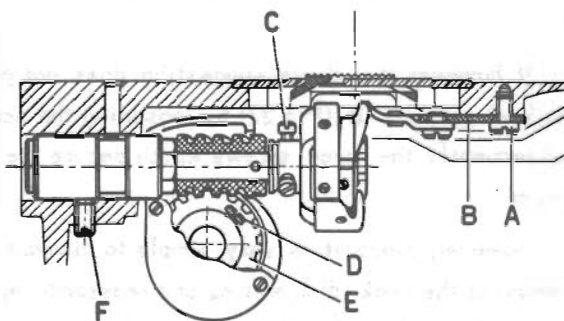


Fig. 27

To assemble, follow the above instructions in the opposite order.

Once the hook-carrier is set in place, it is necessary to time the group according to the instructions contained in the chapter **TIMING OF NEEDLE - ROTARY HOOK**.

Make sure that there is sufficient space between the hook carrier and the hook for the discharge of the thread.

REGULATING THE GEAR PLAY

It is possible to regulate the gear play in the RZI sewing machines by means of a rotation of an eccentric bushing through which the pin commanding the hook goes through.

To perform this adjustment, proceed as follows:

- loosen the set-screw **F**,
- remove the gear carter,
- using a 14 mm. wrench, rotate the bushing which is placed on the rear part of the gear where the hook is mounted,

CLOGGING AND JAMMING OF THE HOOK

The clogging or jamming of the hook is generally caused by some pieces of thread which have become caught in the hook race,

In this case, do not try to force the sewing machine, since you could seriously damage it or

maladjust its timing.

If an end of the piece of thread is still hanging out from the hook, take it between the fingers and, while turning the balance wheel backwards and forwards slowly, gently but firmly try to remove it.

If however the above suggestion does not give any result, it will be then necessary to remove the hook retainer B (Fig.27) by loosening the screw which holds it to the sewing machine base and subsequently the three screws which secure the ring. Then remove the hook carrier and the piece of thread.

However, since it is very simple to dismantle the hook, it is advisable to clean it in this way. Removing the hook (dismantling and reassembling it) it calls for the subsequent timing of the group as already explained in the relevant chapter.