Bernina

REPAIR MANUAL

Class 530

I. FOREWORD

In the past years, sewing machines have undergone an extremely repid development, and the expert is therefore frequently called upon to decide questions of a technical nature which he cannot answer without instructions.

The sewing machine is one of the most important working machines in the world; and the BERNINA Record 530 requires more knowledge than the plain or zigzag stitch machines. We have therefore decided to provide all dealers, mechanics, and other persons engaged in the sale, repair, maintenance etc., with a manual, enabling them to acquaint themselves fully with the machine in all its details. The BERNINA Record 530 is both a fully equipped zigzag sewing machine with automatically guided needle, and ornamental stitch machine, which can easily be switched over to ornamental stitch gearing. It is therefore understandable, why we speak of two machines in one casing. The moments of both gear systems must be closely synchronized.

In the following explanatory notes we have endeavoured to explain everything in the simplest possible terms, and to supplement our explanations with suitable illustrations. Not only will this enable the future specialist to get to know this machine, but it will also be of a valuable assistance to the trained expert.

We hope that this manual will be of a real assistance to BERNINA specialists and that it will facilitate their work and maintain the lead of the BERNINA.

Bernina

REPAIR MANUAL

Class 530

I. FOREWORD

In the past years, sewing machines have undergone an extremely repid development, and the expert is therefore frequently called upon to decide questions of a technical nature which he cannot answer without instructions.

The sewing machine is one of the most important working machines in the world; and the BERNINA Record 530 requires more knowledge than the plain or zigzag stitch machines. We have therefore decided to provide all dealers, mechanics, and other persons engaged in the sale, repair, maintenance etc., with a manual, enabling them to acquaint themselves fully with the machine in all its details. The BERNINA Record 530 is both a fully equipped zigzag sewing machine with automatically guided needle, and ornamental stitch machine, which can easily be switched over to ornamental stitch gearing. It is therefore understandable, why we speak of two machines in one casing. The moments of both gear systems must be closely synchronized.

In the following explanatory notes we have endeavoured to explain everything in the simplest possible terms, and to supplement our explanations with suitable illustrations. Not only will this enable the future specialist to get to know this machine, but it will also be of a valuable assistance to the trained expert.

We hope that this manual will be of a real assistance to BERNINA specialists and that it will facilitate their work and maintain the lead of the BERNINA.

II. GENERAL

1. Description and important data.

The BERNINA Record is a zigzag and ornamental sewing machine with the following main characteristics:

Central bobbin case
Oscillating needle holder
Take-up lever
Ordinary zigzag gearing
Selector for 9 or 12 ornamental seams
Stitch width adjustment with stops
Left hand - center - right hand adjustment
Arrangement for lowering feed dog
Darning mechanism
Twin thread tension
Built-in sewing light
Foot attached without screws
Forward and backward sewing.

F i n i s h e s : The BERNINA Record can be supplied in two models:

(1) with knee control operation
(2) with foot control operation.

S i z e o f c a s e :

(1) Knee control operated model: 18.7/8" x 14.1/8" x 9 (480 x 360 x 230 mm)

(2) Foot control operated model: 21.5/8" x 14.1/8" x 9 (550 x 360 x 230 mm)

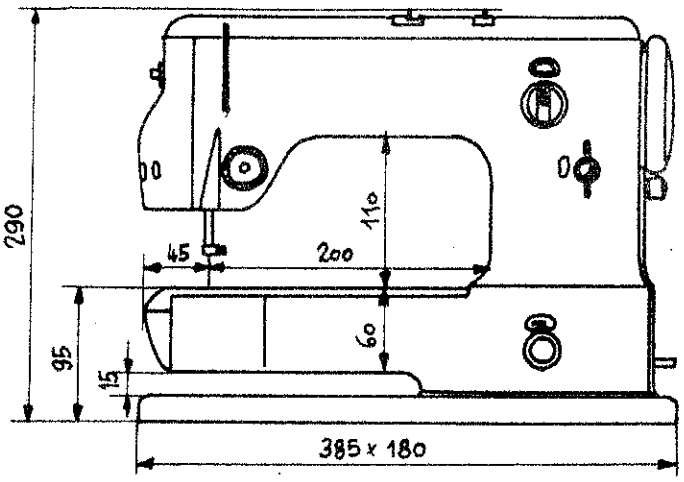


Fig.1

Circumference of free arm 230 mm(9") to embroidery hole plans

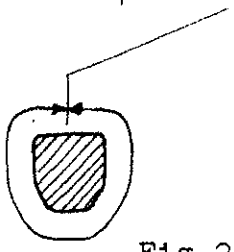


Fig.2

W'e i g h t :

Knee control operated model:		Foot control operated model:	
machine only with feed table	25.1/2 lbs. (11,5 kg.)		25.1/2 lbs. (11,5 kg.)
machine with accessories case and feed table	27.1/2 lbs. (12,5 kg.)	with foot control	321bs. (14,5 kg.)
machine with case	35 lbs. (16,0 kg.)		39.1/2 lbs. (18,0 kg.)
machine packed	42 lbs. (19,0 kg.)		48.1/2 lbs. (22,0 kg.)

2. Running speed.

The BERNINA Record is designed for a normal running speed of 1,150 stitches per minute. The actual number of stitches will very between a minimum of 1,000 and a maximum of 1,250 per minute and will depend on the output of the motor and the quality of the assembly (easy running).

In the majority of cases the speed will increase after delivery by the factory within the limits indicated above, as a result of the running in of the sliding surfaces.

3. Oiling and cleaning.

All moving parts of the machine must be oiled occasionally. This is done best before using the machine. One principle should be rigidly adhered to:

"A little oil in the right spot"

The importance of lubrication, as well as of the maintenance of the machine in general was already taken into consideration when the machine was designed. All oiling points are easily accessible by detaching the frame cover plate, opening the hinged head cover, unscrewing the belt cover plate, and unscrewing the casing of the motor.

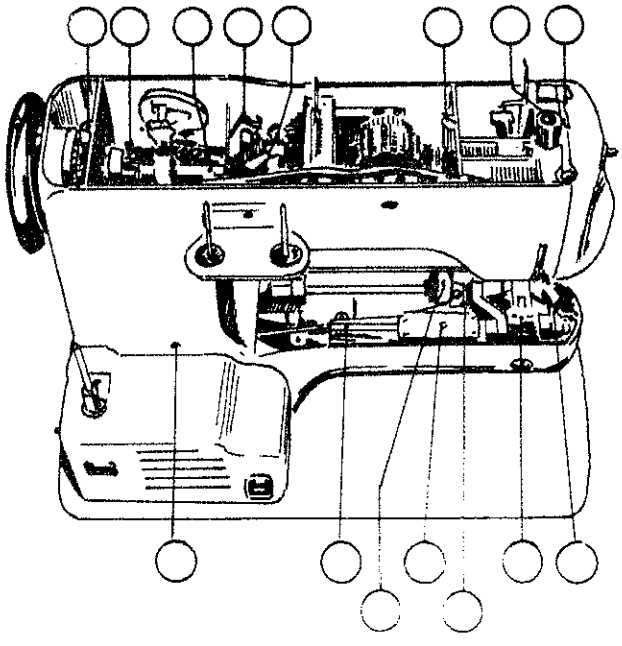


Fig.3

Bernina

REPAIR MANUAL

Class 530

I. FOREWORD

In the past years, sewing machines have undergone an extremely repid development, and the expert is therefore frequently called upon to decide questions of a technical nature which he cannot answer without instructions.

The sewing machine is one of the most important working machines in the world; and the BERNINA Record 530 requires more knowledge than the plain or zigzag stitch machines. We have therefore decided to provide all dealers, mechanics, and other persons engaged in the sale, repair, maintenance etc., with a manual, enabling them to acquaint themselves fully with the machine in all its details. The BERNINA Record 530 is both a fully equipped zigzag sewing machine with automatically guided needle, and ornamental stitch machine, which can easily be switched over to ornamental stitch gearing. It is therefore understandable, why we speak of two machines in one casing. The moments of both gear systems must be closely synchronized.

In the following explanatory notes we have endeavoured to explain everything in the simplest possible terms, and to supplement our explanations with suitable illustrations. Not only will this enable the future specialist to get to know this machine, but it will also be of a valuable assistance to the trained expert.

We hope that this manual will be of a real assistance to BERNINA specialists and that it will facilitate their work and maintain the lead of the BERNINA.

II. GENERAL

1. Description and important data.

The BERNINA Record is a zigzag and ornamental sewing machine with the following main characteristics:

Central bobbin case
Oscillating needle holder
Take-up lever
Ordinary zigzag gearing
Selector for 9 or 12 ornamental seams
Stitch width adjustment with stops
Left hand - center - right hand adjustment
Arrangement for lowering feed dog
Darning mechanism
Twin thread tension
Built-in sewing light
Foot attached without screws
Forward and backward sewing.

F i n i s h e s : The BERNINA Record can be supplied in two models:

(1) with knee control operation
(2) with foot control operation.

S i z e o f c a s e :

(1) Knee control operated model: 18.7/8" x 14.1/8" x 9 (480 x 360 x 230 mm)

(2) Foot control operated model: 21.5/8" x 14.1/8" x 9 (550 x 360 x 230 mm)

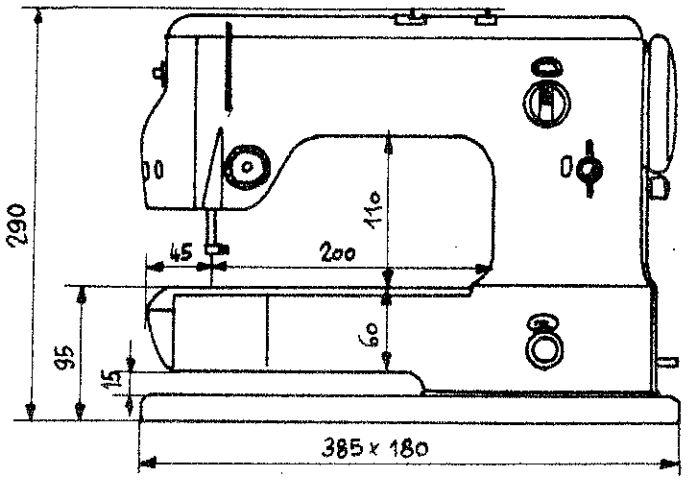


Fig.1

Circumference of free arm 230 mm(9") to embroidery hole plans

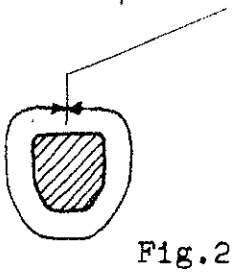


Fig.2

W'e i g h t :

Knee control operated model:		Foot control operated model:	
machine only with feed table	25.1/2 lbs. (11,5 kg.)		25.1/2 lbs. (11,5 kg.)
machine with accessories case and feed table	27.1/2 lbs. (12,5 kg.)	with foot control	32lbs. (14,5 kg.)
machine with case	35 lbs. (16,0 kg.)		39.1/2 lbs. (18,0 kg.)
machine packed	42 lbs. (19,0 kg.)		48.1/2 lbs. (22,0 kg.)

2. Running speed.

The BERNINA Record is designed for a normal running speed of 1,150 stitches per minute. The actual number of stitches will very between a minimum of 1,000 and a maximum of 1,250 per minute and will depend on the output of the motor and the quality of the assembly (easy running).

In the majority of cases the speed will increase after delivery by the factory within the limits indicated above, as a result of the running in of the sliding surfaces.

3. Oiling and cleaning.

All moving parts of the machine must be oiled occasionally. This is done best before using the machine. One principle should be rigidly adhered to:

"A little oil in the right spot"

The importance of lubrication, as well as of the maintenance of the machine in general was already taken into consideration when the machine was designed. All oiling points are easily accessible by detaching the frame cover plate, opening the hinged head cover, unscrewing the belt cover plate, and unscrewing the casing of the motor.

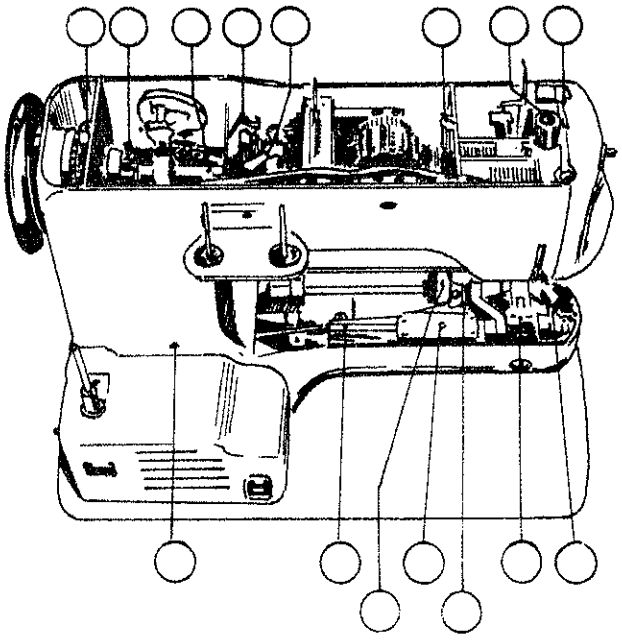


Fig.3

Most oiling places are marked in red; this, however, does not imply that only these places need to be lubricated. Use clean sewing machine oil, free from resins and acids. Inferior oil may cause the machine to jam, due to the oil drying.

By opening the hinged cover on the front of the free arm access is gained to the shuttle, the race of which should be oiled lightly but frequently where indicated by an arrow. Proper lubrication ensures the smooth running of the machine and lengthens its useful life.

If a sewing machine has been kept in a cold room, it should be placed open in a warm room about one hour before it is taken in use; this will restore the viscosity of the oil in the bearings.

Important lubricating instructions for the motor.

(1) Excessive lubrication will cause failures.
(2) Falling off in the speed of the machine is almost invariably due to excessive lubrication of the motor.
(3) The motor of every new machines is lubricated at the factory, and need not to be lubricated during the first year of service.
(4) After the first year, the motor should be oiled once every six months if the machine is in daily use, by placing a maximum of 4-5 drops of oil into the two lubricating points marked in red. If the machine is used only once a week, one oiling per year will be sufficient also in the second and subsequent years.
(5) Insufficient lubrication of the motor will result in excessively noisy running.
(6) To lubricate the motor, remove the motor casing. This done by unscrewing the two small diagonally opposed nickel-plated screws below the bed plate, and adding 4 to 5 drops of clear and odourless sewing machine oil to the points marked in red on the two bearings.
(7) Great care must be taken to prevent oil from reaching other parts of the motor.
(8) These lubricating instructions apply only to the motor.

Cleaning the machine.

Proper cleaning after use is part of the efficient maintenance of the BERNINA Record. During the sewing thread ends are collecting, particularly around the shuttle. This waste may detrimentally affect the proper working of the machine and must, therefore, be removed at frequent intervals. From time to time detach the cover plate and remove the fluff accumulating under the needle plate. For this reason the cover plate is quickly detachable so that cleaning and lubricating can be effected easily.

To detach the cover plate, open the hinged latch 39 giving access to the shuttle, and press trip lever 40 with index of right hand (see Fig.5). It is not necessary to remove the presser foot, but the needle should be placed in the highest position. To insert the cover plate, slide it up to the side wall of the frame and insert the tongue of the cover plate into the guide provided in the frame. Then depress the front of the cover plate, and the trip will engage automatically (Fig.6).

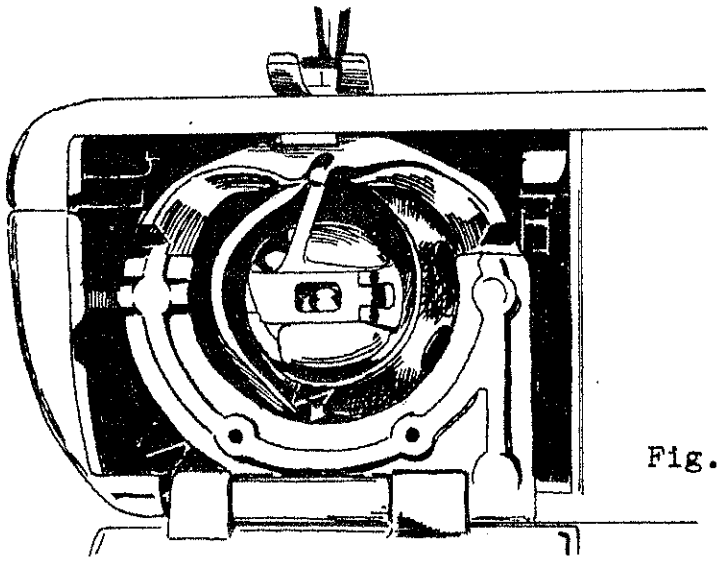


Fig.6

4. Needle and thread.

The needle is one of the most important components of the machine. Even the very best sewing machine will not work properly, if the quality of the needle is not up to the requirements of the work and the design and construction of the machine. The needle used should be of the flat shank type, and its gauge should correspond to the material and thread used.

The upper, thicker, part of the needle is called the shank. It is flattened (flat shank needle). Then follows a short conical part, forming the transition to the stem, the end of which is finished into the point, with the eye arranged slightly above. Two thread grooves are arranged on both sides of the needle stem, one of them being short and one long. The short groove is on the same side of the needle as the flattened part of the shank, with the long groove opposite. The thickness of the needle is measured on the stem and given in hundredths of millimeters (100/100 = 1 mm),e.g.,No.80 needle = 80/1000 mm = 0,8 mm (appr. 0,032").

For the BERNINA Record system 705 needles with groove should be used exclusively. In order to obtain satisfactory sewing results, use only best quality needles and highest grade thread. First select the thread suitable for the work, and then the suitable needle to accommodate the thread. The relation between needle and thread is correct if the thread, when placed in the long needle groove, fills

numbers usually used for sewing are Nos. 80, 90 and 100, those for crosswise darning Nos. 70 and 80.

Needle and thread table.

Needle system 705	Sewing thread		Darning thread
No.	6-ply unglazed	3-ply unglazed	2-ply
60	--	170-200	80-100
70	70-100	70-140	50-80
80	50-60	50-70	30-40
90	40-50	30-40	---
100	20-30	---	---

Suitable threads for sewing and darning.

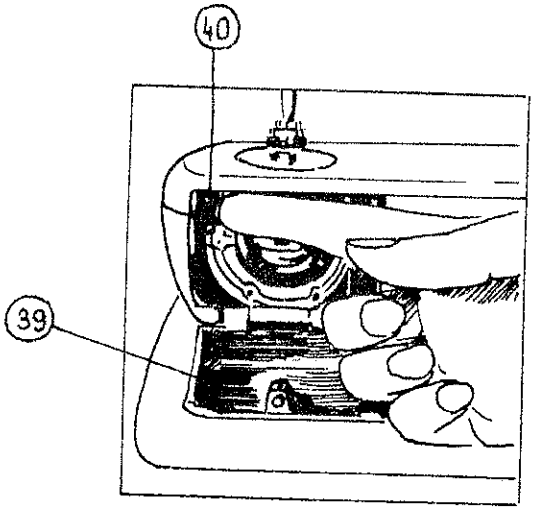
For plain sewing	Nos.60-90, 3-ply and 6-ply,unglazed
For darning	Nos.50-80, 2-ply
For zigzag sewing	Nos.60-90, 3-ply only
For ornamental stitches	Nos.30 and 40, 2-ply

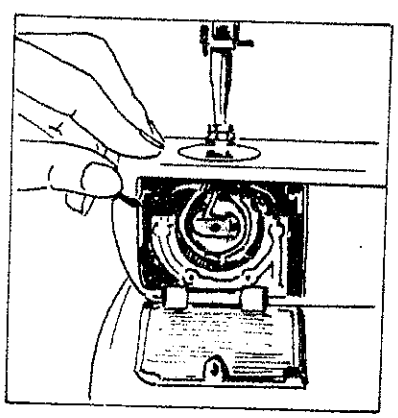
5. Preparing the machine for sewing.

The following operations are necessary in order to prepare the machine for sewing:

Setting the needle
Correct selection of needle and thread
Threading the top thread
Winding of bobbin thread
Taking out bobbin case
Insertion of bobbin in case and threading the bobbin thread
Raplacing case with bobbin in shuttle
Bringing up the bobbin thread
Fitting the presser foot

These operations are described in detail in the operating instructions, and are here only repeated by means of the appropriate illustrations (Fig.7-10).





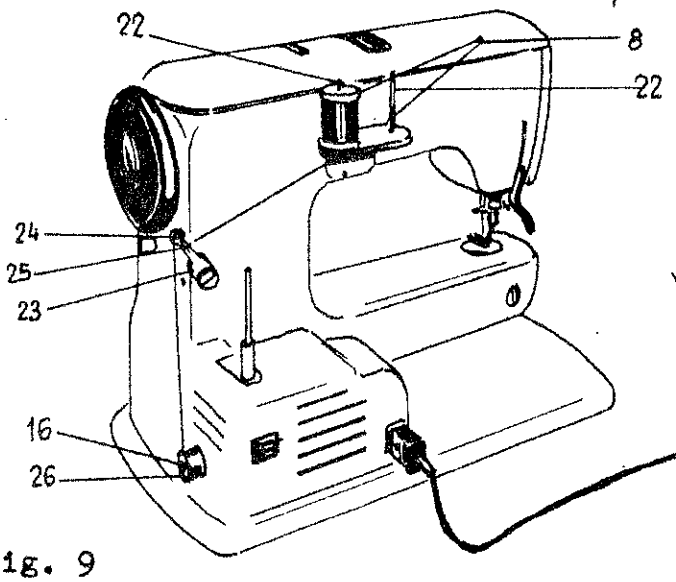


Fig. 9

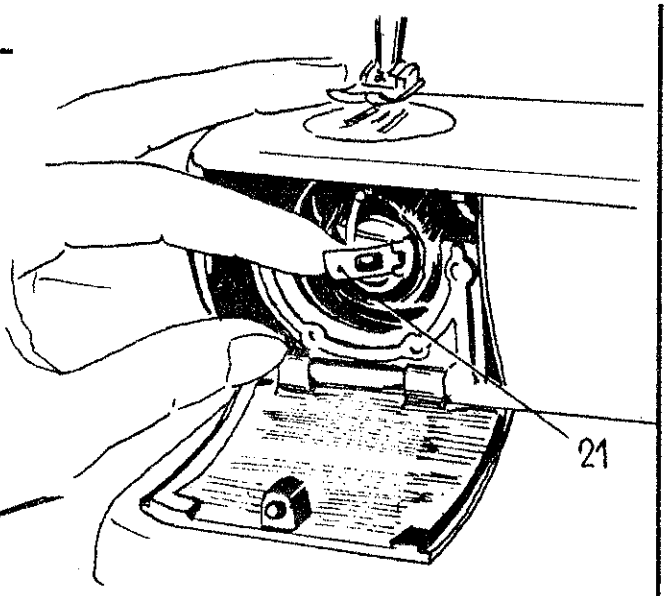


Fig. 10

6. Top thread tension and its adjustment; dismantling the tension box.

The setting of the thread tension is such that the same tension can be used for all ordinary sewing and darning work without additional adjustment.

An inspection hole is provided in the upper part of the thread tension box, both sides of which carry a setting mark 34. On the same level as this setting mark, and fitted to the adjusting nut beneath it, is a white ring 35, marking the standard adjustment of the thread tension.

For special work, such as ornamental stitches, embroidery, bead yarn work, etc., the tension may be altered by turning the adjusting nut 36. Clockwise rotation will push the white ring towards the back and thus increase the tension. Rotation in an anti-clockwise direction will ease the white ring forward, and reduce the tension. For normal work, the ring 35 and the white setting marks should be on the same level.

From time to time the thread tension box must be dismantled and the accumulated yarn fibres removed. The correct sequence for the reassembly is shown in the two accompanying illustrations.

Fig.11

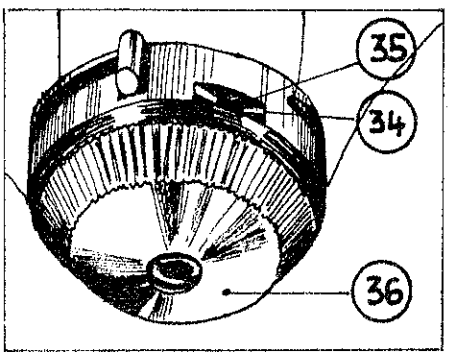
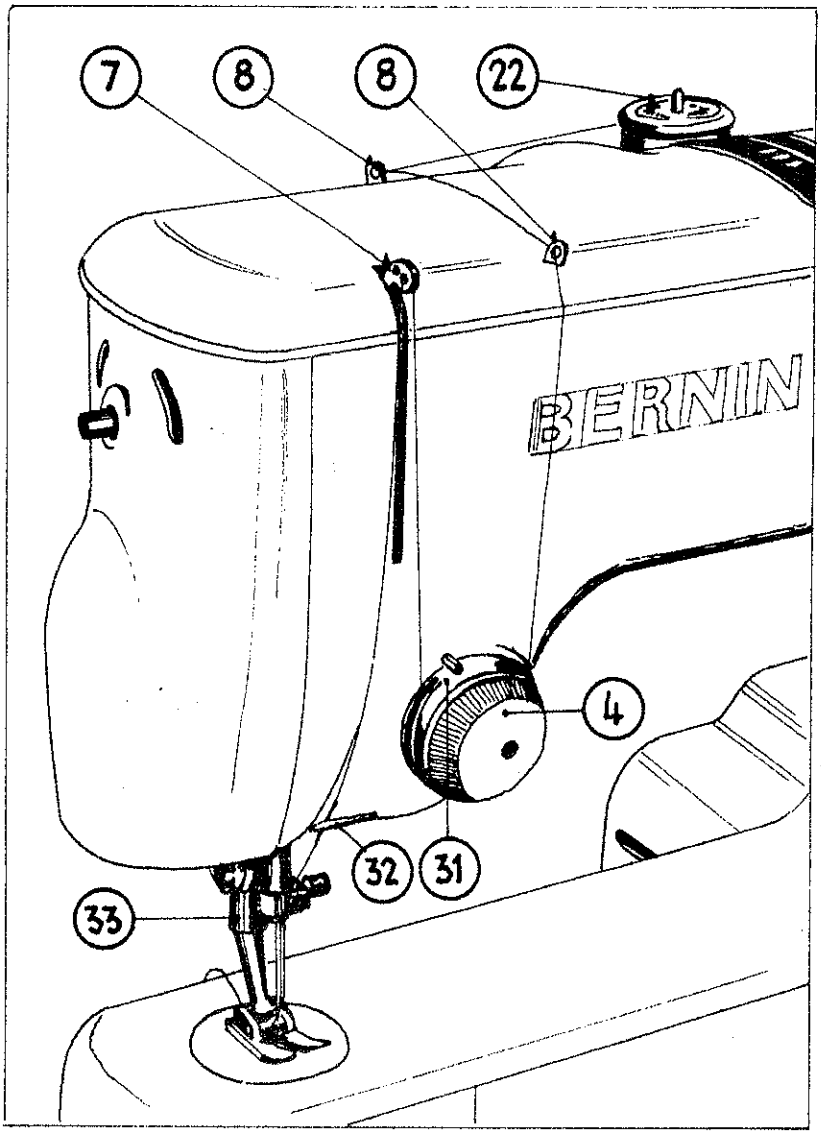
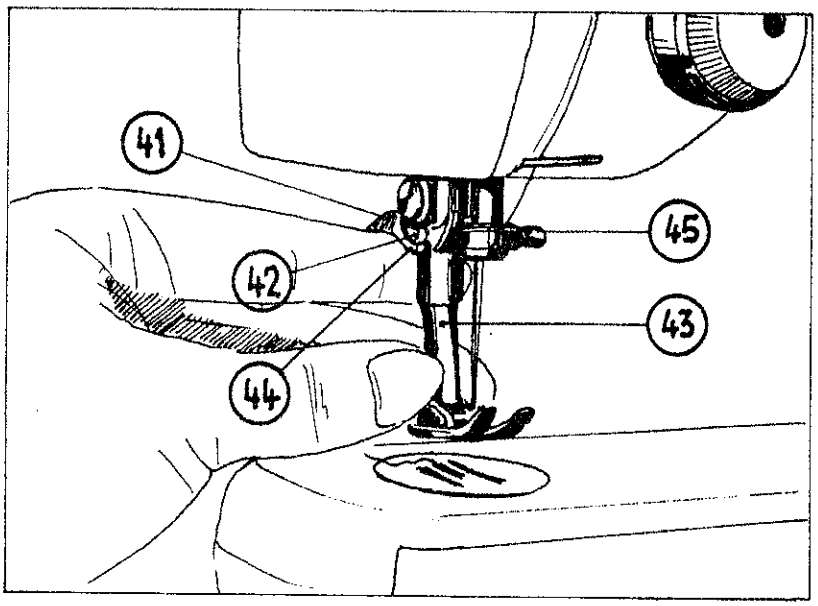


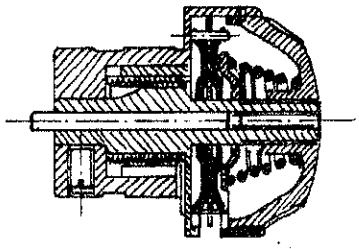
Fig.12

1 thread tension box
2 washer on inside thread tension box pin
3 thread tension spring
4 pressure disc
5 thread tension disc (equal to 7)
6 intermediate thread tension disc
7 thread tension disc
8 thread tension bolt
9 thread control spring
10 regulating ring
with slot for thread control spring
11 thread tension bushing
12 stop belt
riveted into thread tension bushing
13 set screw to held thread tension bolt in the bushings, after the


7
8
8
22
BERNINA
4
32
31
33


41
45
42
43
44

The adjusting ring mounted in the thread tension box is under quite considerable tension; to extract it, a pair of pliers should be used which are equipped with two pins engaging in the two slots of the ring. This will enable the ring to be easily dismantled.



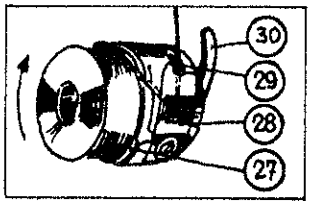
7. The bobbin thread tension and its adjustment.

For certain types of work, e.g., embroidery, raised buttonholes, etc., it may also be desirable to adjust the tension of the bobbin thread. The tension is mounted on the bobbin case in the shape of a flat spring, and is adjustable by means of a screw mounted in its centre. For normal sewing no adjustment is required. The thread tension pre-set in the factory takes 44 grams of No.60 yarn, whilst the same tension will take 19,5 grams of No.120 DMC darning yarn.

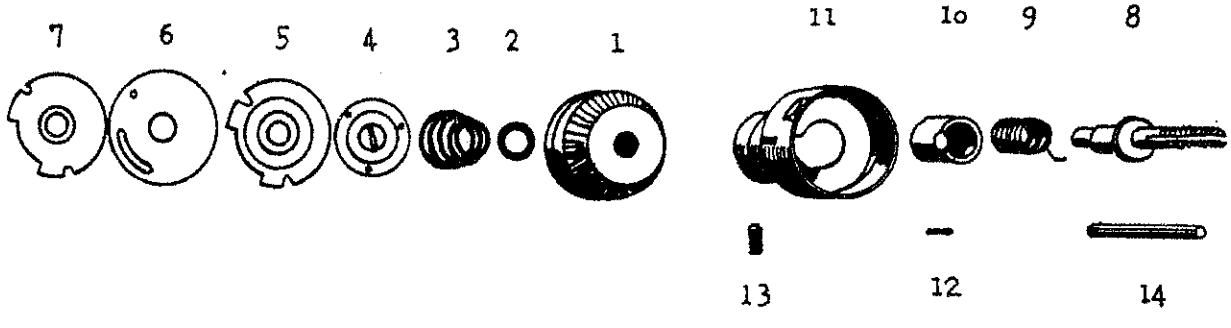
This makes it possible to carry out all ordinary sewing work as well as darning or cross-weaving without altering the tension. The thread tension is tested by means of tension weights, which can be inserted into the bobbin case in the same manner as the shuttle. The free thread and is held tight and the case and weight are allowed to unwind slowly and evenly.

It must be noted that the spring presses against the thread discharge with its entire width, and that the thread is pulled out evenly in every position. The method of extracting the bobbin case is shown in Fig.13.

8. Adjusting the foot pressure.



The success of a good seam depends on the pressure of the foot on the layer of fabric to be sewn. For normal work this pressure should amount to approx.1,200 grams,(42 1/2 oz), whilst it is somewhat less for light, and somewhat higher for heavier materials. It is adjusted by means of a screw at the top of the cloth presser bar. Turning this screw by means of a screw driver in a clockwise direction increases the pressure, whilst turning in the opposite direction will decrease the same.



III. ADJUSTMENT OF THE MACHINE.

1. Seams, sewing components and their functions.

The BERNINA Record enables three different kinds of stitches to be made:

11. The straight seam (Fig.14)
12. The zigzag seam (Fig.15)
13. The various ornamental seams (Fig.16)

For the purpose of producing the seam, the sewing machine is equipped with certain components, whose individual functions must be precisela synchronized. These parts are the following:

1. The needle
2. The needle plate
3. The shuttle
4. The thread feed
5. The feed dog
6. The cloth presser foot
7. The thread tension and the thread tension adjustment

Fig.14

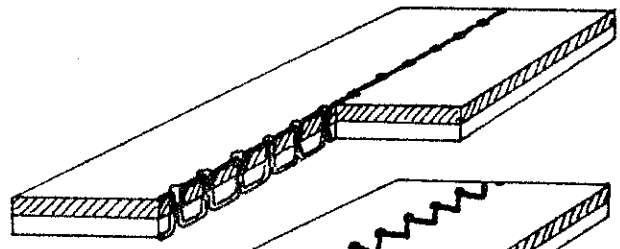


Fig.15

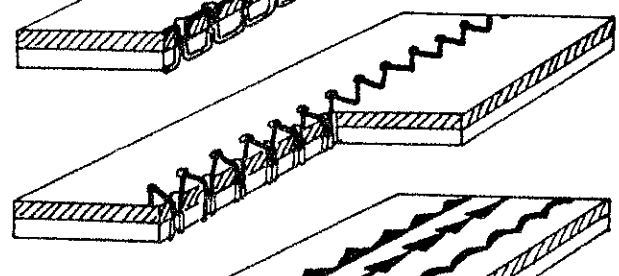
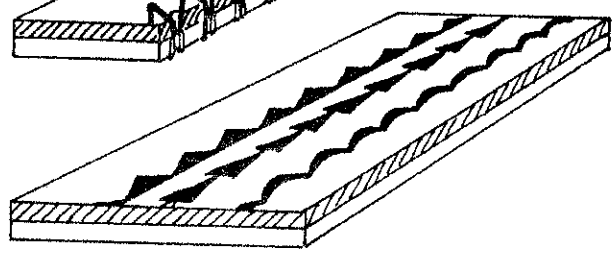


Fig.16



11. The needle.

The needle has the task of piercing the fabric, and to bring the top thread which is to be knotted with the bottom thread down to the shuttle and thus to form the loop which is necessary for the action of the shuttle.

This loop is formed after the needle has pierced the fabric and reached its lowest position. The thread is taut and positioned in the long groove on the front part. On the rear side it lies in the short groove, and further up between the needle stem and the pierced fabric. If the needle now lifts by a small amount, the so-called loop lift, the braking effect of the friction between fabric and needle then results in a loop being forward near the eye on the side of the needle carrying the short groove, into which the tip of the shuttle engages.

21. The needle plate.

polished so that top and bottom threads can pass without friction. In addition, it possesses a cut-out in the shape of the feed dog, which automatically advances the fabric.

31. The shuttle.

The shuttle of the BERNINA Record cl.530 is an oscillating shuttle (with reciprocating movement). Amongst its essential parts are the shuttle point, the guide, and a pin for the bobbin case which, in turn, holds the bobbin. The bobbin case is locked on the shuttle pin and is provided on the outside with a bobbin thread tensioner. The shuttle is positioned centrally on the shuttle guide, and is termed a central bobbin shuttle.

Its task is to take the top thread from the needle, to widen the loop and to guide it around the shuttle. All surfaces touching the thread are highly polished.

41. The thread feed (takup).

The thread feed (takup) of the BERNINA Record cl.530 is an articulated thread lever, whose individual parts are capable of performing movements which are adjusted to the thread requirements. During the downward travel of the needle it supplies as much thread as the needle needs, the so-called needle thread. After the formation of the loop it supplies the loop thread, i.e., a sufficient amount of thread for the extension of the loop and for its travel round the shuttle. Finally it takes up the excess amount of thread and tightens the stitch, thus forming a firm knot inside the material.

51. The feed dog.

The feed dog is a serrated, hardened piece of steel, which engages into the slots of the needle plate. Its task is to advance the fabric after every stitch. In order to achieve this, it performs a rectangular movement. It advances the fabric (towards the rear), descends below the needle plate, and returns to the initial position. During its return, the needle perforates the fabric for a new stitch. When the needle has left the fabric, it emerges from the slots and advances the material, thus completing the cycle.

61. The presser foot.

Its task is to press the layers of fabric on to the needle plate and to ensure that the fabric is held firmly while the stitch is being formed. The pressure applied can be adjusted, and is synchronized with the movement of the feed dog. The base is smoothly polished so that the advance takes place without jamming.

71. Thread tension and thread adjustment.

The thread tension arrangement has the purpose of restricting the amount of thread used in the formation of the stitch, and to take as much thread off the spool as is required for the next stitch.

It consists of three thread tensioning plates, which are held under pressure by means of an adjusting nut and spring, and is encased in a bell-shaped cover. On the cover is a setting mark, shilst the nut carries a ring indicating the amount of tension required. Inside the cover is a thread feed spring which during the sewing Operation withdraws the loose thread, when the needle pierces the material.

The thread tensioning device is rendered inoperative by lifting the

2. Setting the machine.

Care must be taken to rotate the machine only in the direction of running, i.e., towards the front. Before beginning with the setting make sure that the machine has been assembled correctly. No component must be allowed to cause harsh running. All parts must be tight, and there must be no play; this applies in particular to the needle guide support, as otherwise no perfectly straight stitch is possible.

To ensure greatest sewing safety, the BERNINA Record 530 must be particularly carefully adjusted. In addition to straight sewing adjustments, there are also the zigzag stitch setting and the setting of the ornamental stitching arrangement.

The machine should be first adjusted as zigzag machine, and then as ornamental stitching machine. The movements must be fully identical in the sequence of both adjustments. For the setting a perfectly straight No.705 needle with size 80 groove should be used.

The cranked transmission for the needle bar cannot be adjusted and supplies a needle stroke of 33,65 mm (, 1,325").

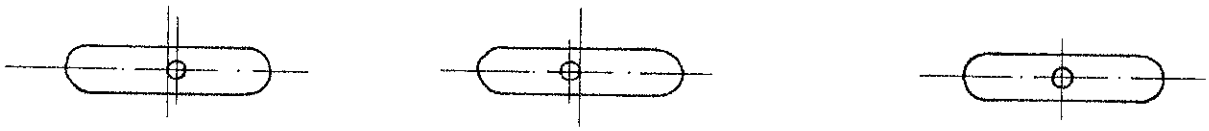
The same applies to the articulated thread lever (takup). Also in this case no adjustment is provided. The eye of the thread lever has a travel (measured between the top and bottom position) of 60,5 mm (= 2,382").

21. The needle bar.

First remove the frame cover, the base cover plate and head cover, and move the lever for the ornamental stitch gear towards the front. Then proceed with the provisional adjustment of the

1. needle bar.

The needle bar, without needle, is positioned so that the upper edge of the needle stop is in line with the lower edge of the needle reverser support.



a) wrong b) wrong c) correct

Fig.17

The adjustment is carried out by loosening the set screw of the needle bar carrier, shifting the needle bar in a vertical direction, and tightening the set screw. Care must be taken to maintain the needle stop parallel to the needle hole.

2. Next fit the adjusting needle No.80, set the zigzag to zero, i.e., to straight sewing, attach the base cover with the needle plate and check the movement of the needle in the needle hole.

The needle must be exactly in the middle of the needle hole, both longitudinally and across.

22. Centring of needle movement.

If a longitudinal correction must be made (in direction of the fabric advance), as shown in Fig.17, a and b, unscrew the bakelite handwheel and the drive pulley

press frame into correct position. Retighten all screws.

If a lateral correction must be made (i.e., at a right angle to the direction of the fabric advance), unscrew the connecting bar set screw in the guide fork, i.e. in the part connecting the zigzag of the stitch width, set the needle centrally in the needle hole, and tighten the set screw.

23. The needle reversing support.

Next the needle reversing support must be adjusted in such a way, that it is perfectly firm. The zigzag remains set at zero. Unscrew the screw with the conical locknut in the guide fork by means of a special spanner (screw driver for the slotted nuts), and adjust the stud up and down, until the reversing support, and with it also the needle, remain perfectly still when the machine is rotated. Retighten the locknut.

24. Distribution of stitches for zigzag operation, LH - C - RH stop.

Next the stitch distribution in the needle plate is adjusted by setting the zigzag to 4 and checking whether, with the machine turning, the left hand and right hand stitches are equidistant from the centre stitch.

In the instances "b" and "c" the adjustment described under 21, §2, was not made correctly.

To adjust, loosen the set screw on the reversing lever supporting the zigzag crank, and set needle as indicated in Fig.18a. Retighten screw

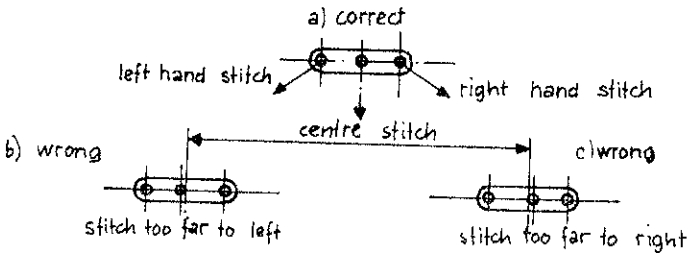


Fig.18

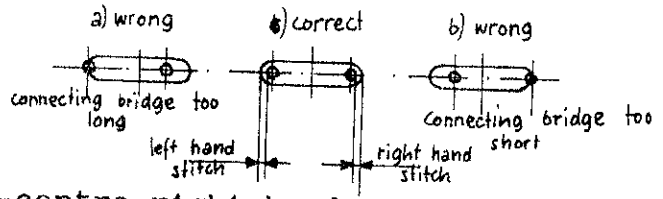


Fig.19

To adjust left hand-centre-right hand setting, the graduated bridge pieces between the zigzag crank and the stop lever, fitted to the inner end of the zigzag adjusting button at zero.

If the graduated bridge is too long, the stitches will shift towards the left hand side (Fig.19a), if it is too short, towards the right hand side (Fig.19b).

The needle is equidistand from the needle hole edge both on the left hand and on the right hand side.

To adjust, set the stitch position button to the left, loosen bolt with hexagonal head and hexagonal nut (8mm spanner for bolt, 6 mm for nut) and shift needle into correct position as shown in Fig.19a. Retighten bolt.

25. Lateral movement of the needle.

The lateral and the vertical movement of the needle must be exactly synchronized. It must not start before the needle has left the fabric, and must have ceased when the needle begins to pierce it. It is derived from the zigzag excentric running at half speed (1:2). Adjustment is made by means of a worm wheel fitted to the frame shaft, which reacts upon an adjusting ring. Loosen both screws of the worm wheel, keep the same in position pressed to the adjusting ring by means of a screw driver, and turn the handwheel in a clockwise direction. If the handwheel is turned forward, the lateral movement of the needle will shift according to Fig.18c, in the opposite case according to Fig.18b.

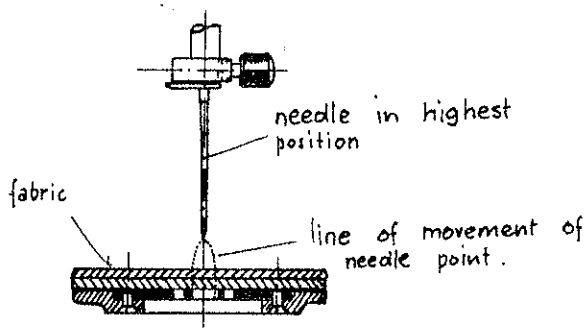


Fig.20

The needle starts its lateral movement after having left the sew material and ends it before stitching into the material again. It is preferable for this lateral movement to begin somewhat earlier, rather than to finish too late. The following illustrations clarify the adjustment.

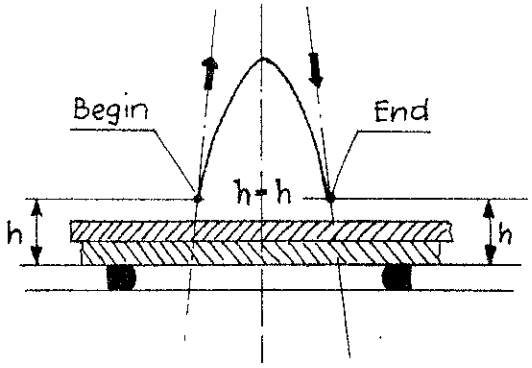


Fig.21 correct

The needle begins its lateral movement after leaving the fabric and finishes it before penetrating it

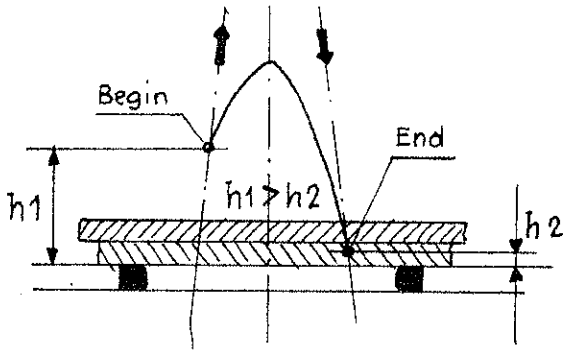
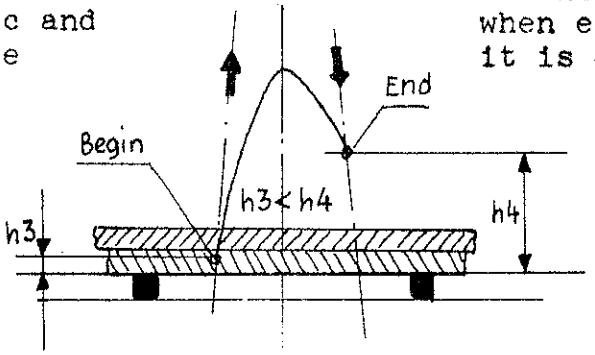


Fig.22 faulty

The laterla movement of the needle begins too late; when entering the fabric, it is deflected.



26. Driver, thread passage, lateral adjustment of shuttle and shuttle guide.

Prior to commencing with the adjustment of the above mentioned parts, make certain that the rack, and the shuttle driver with its pinion are faultlessly assembled. No play must be discernible in either of them.

If the drive jams, the rack must be raised, and if the play in the teeth is excessive, it must be lowered. This is done by loosening the clamp screw with inside hexagon. The bearing pin of the rack is accessible from the bottom of the base, after detaching the base plate.By moving the bearing pin on one direction or the other, the desired effect can be obtained. Do not forget to retighten screw.

Now place the rack in front dead centre, with the needle in the lowest position. The adjustment is carried out on the crank plate fitted to the vertical spindle (also called the lift plate, since the lift excentric is attached to it). Loosen both fixing screws and move rack into front dead centre by turning the crank plate on the vertical spindle. Tighten both screws.

When adjusting the shuttle driver, 2 cases must be taken into account:

(1) Adjustment with new rack pinion
(2) Adjustment of shuttle driver where shuttle driver and pinion are machined untrue (as supplied by the factory).

If (1). The rack pinion is loose on the shuttle driver spindle.Turn shuttle driver by means of flat pliers until the shuttle point is 1,6 m from the needle, when the left hand stitch is effected (Fig.25). Take out shuttle driver, redrill, reset, and refit.

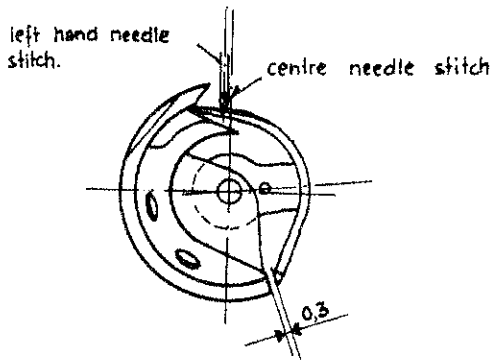
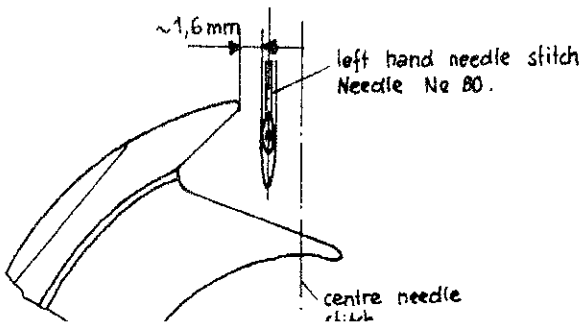


Fig.24

Next the size of the thread passage is tested, i.e.,the play between shuttle and shuttle driver. It should be 0,3 mm (0.0119"),and should be checked with a feeler gauge (Fig.26). If it is too large or too small, adjust the lower driver leg by means of an adjusting tool (Fig.27) inward or outward, until the gauge shows the correct play between driver and shuttle.



If (2) in the case of machines with untrue pinions and drivers, the dimensions indicated under (1) will be obtained automatically when the shuttle driver and the pinion are engaging in the proper position i.e., when the correct tooth of the pinion engages into the correct slot of the rack. If necessary, several positions should be tried.

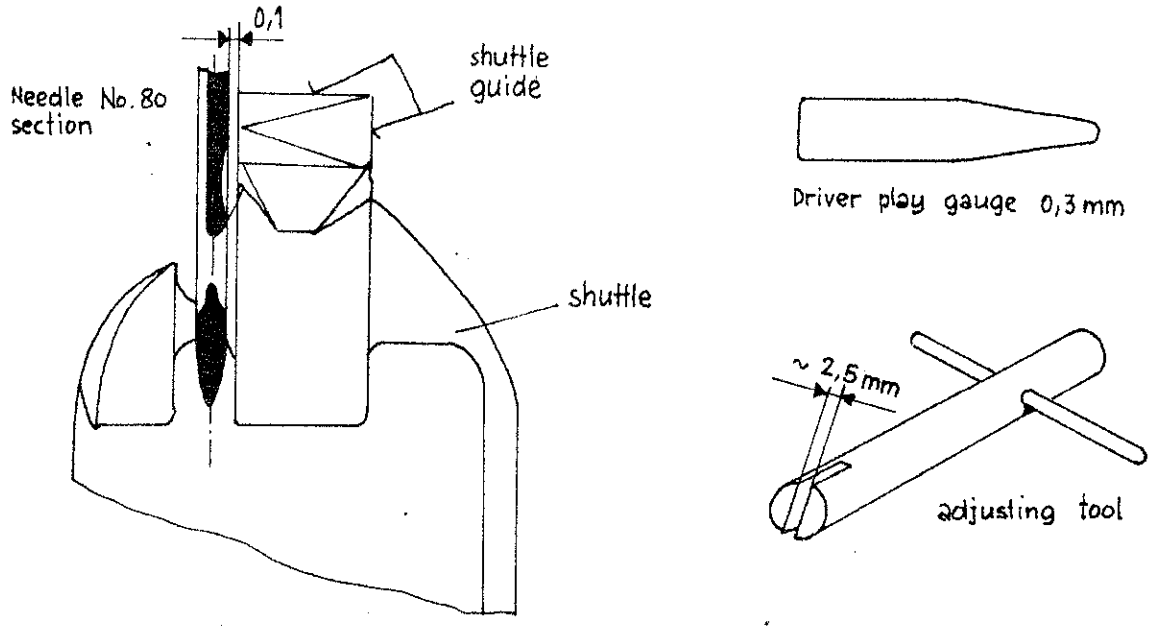


Fig. 28

Next check the lateral adjustment of the needle in relation to the shuttle. The distance should be 0,1 mm (= 0,004") (Fig.28). The lateral adjustment is carried out by shifting the shuttle guide.

Unscrew the screw fitted to the rear base wall (accessible from the top left hand side), and move the whole shuttle guide forward or back according to shether the needle distance is too large or too small. After adjustment retighten screws.

27. Loop lift 1,8 mm (0,071").

Loop lift is the amount by which the needle lifts from its lowest position. After the termination of this stroke, the point of the shuttle must be behind the needle in order to catch the loop. The point should be on the same level as the front edge of the needle. The relative position of point and eye, i.e. the final vertical position of the needle, is adjusted after the adjustment of the loop lift.

The loop lift is adjusted in the

left hand stitch position

using the so-called loop lift gauge (Fig.30).

Set left hand stitch, adjust needle to the lowest position, fit the clamp (Fig.31) to the needle bar, place the 1,8 gauge to the lower edge of the reversing support and hold in position with the clamp (Fig.29). Next extract the gauge and raise needle bar until the clamp touches.

Now the shuttle is set by turning the crank plate fitted to the vertical spindle until the shuttle point is on the same level as the front edge of the needle. Retighten the screws of the crank plate.