

SINGER
107G201,G203,G253

Service Manual for

107 G 201 / 107 G 203
107 G 253



*Sewing Equipment
For Industry*

USE **SINGER*** OILS and LUBRICANTS

They insure freedom from lubricating trouble and give longer life to sewing equipment

The following are the correct lubricants for this machine:

TYPE A - MANUFACTURING MACHINE OIL, LIGHT GRADE

When an oil is desired which will produce a minimum of stain on fabrics, even after a long period of storage, use:

TYPE C - MANUFACTURING MACHINE OIL, LIGHT GRADE

OTHER **SINGER*** LUBRICANTS

TYPE E - THREAD LUBRICANT

For lubricating the needle thread of sewing machines for stitching fabrics or leather where a thread lubricant is required.

TYPE F - MOTOR OIL

For oil-lubricated motors and plain bearings in power tables and transmitters.

NOTE: All the above oils are available in 1 quart and 1 gallon tins and 5 gallon drums.

GEAR LUBRICANT

This specially prepared grease is recommended for gear lubrication on manufacturing sewing machines.

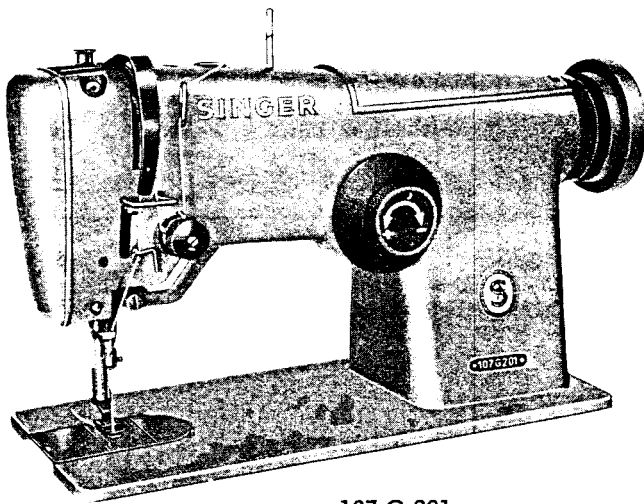
* A Trademark of THE SINGER COMPANY

SERVICE MANUAL

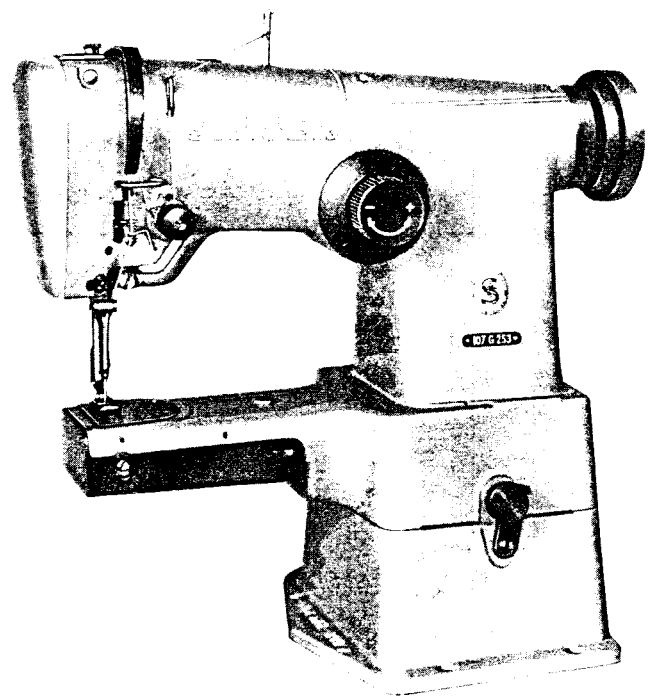
for

SINGER*

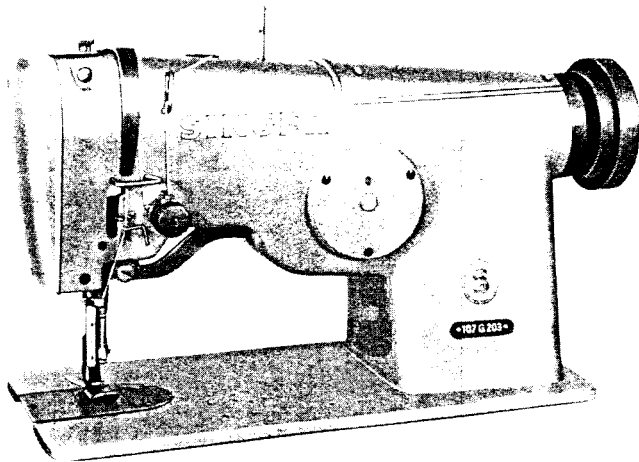
SEWING MACHINES



107 G 201



107 G 253



107 G 203

T H E S I N G E R C O M P A N Y

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DESCRIPTION

The 107 G 201 Machine is a single needle, drop feed, flat bed, lock stitch, zig-zag sewing machine for stitching light and medium weight fabrics.

Maximum bight is $\frac{7}{32}$ inch = 5.56 mm. The needle bar vibrates to both sides of the centerline.

Clearance under presser foot is $\frac{9}{32}$ inch = 7.14 mm.

Maximum stitch length = 7 stitches per inch = 3.62 mm per stitch.

The 107 G 203 Machine incorporates almost the same features as the 107 G 201 machine, however, its maximum bight is $\frac{5}{16}$ inch = 7.94 mm and the needle bar vibrates to the right of the normal (straight) line of stitching. The width of the bight can be set at the back of the machine.

Clearance under presser foot $\frac{1}{4}$ " = 6.35 mm.

Maximum stitch length = 6 stitches per inch = 4.23 mm per stitch.

The 107 G 253 Machine is a cylinder bed machine which otherwise incorporates the same features as the 107 G 201 machine. Contrary to the 107 G 201 the clearance under the presser foot is $\frac{3}{16}$ inch = 4.76 mm.

The following paragraphs concern the 107 G 201, 107 G 203 and 107 G 253 Machine unless otherwise stated.

The machine specifications are as follows:

1. Needle Bar Stroke $1\text{-}\frac{5}{16}$ inch = 33.40 mm
Presser Bar Lift $\frac{9}{32}$ inch = 7.15 mm
Maximum Throw of Needle Bar $\frac{7}{32}$ inch = 5.6 mm
(107 G 201 and 107 G 253 machine only)
Maximum Stitch Length 7 Stitches per inch = 3.63 mm per Stitch
(107 G 201 machine only)
Bed $15\text{-}\frac{3}{8}$ inches long, 7 inches wide = 390.53 mm long, 177.8 mm wide
(107 G 201 and 107 G 203 machine only)
Space at right of Needle 8 inches = 203.2 mm
Machine Pulley (Safety Type) for $\frac{3}{8}$ inch V-Belt = 9.50 mm
Outside diameter of belt groove 2.9 inches = 73.65 mm
Effective diameter for $\frac{5}{16}$ inch round leather belt (7.93 mm) $2\text{-}\frac{2}{3}$ inches = 60.30 mm
2. The bight up to $\frac{7}{32}$ inch = 5.6 mm is obtained by an eccentric and transmitted to the needle bar frame. The bight amplitude can be changed during sewing by turning the plastic regulating knob in directions "+" and "-" respectively.
3. The stitch length (forward feed only) is regulated by turning the adjusting knob at the machine pulley in directions "+" and "-" respectively, with the machine out of operation.
4. Transverse, horizontal axis hook, allows a lock stitch and zig-zag seam without half hitched stitches.
5. Sleeve take-up which controls the thread at all times to meet the exact requirements of the hook.
6. Two removable arm covers, at the top and in front of the arm provide accessibility to all parts in the arm.
7. The arm is provided with a tapped hole in the rear of the head end for mounting the Singer light.
8. Disc tension is used in connection with a concentric tension release device.

SPEED

The maximum speed recommended for the 107 G 201 and 107 G 253 machines is 2,500 R.P.M.

The maximum speed recommended for the 107 G 203 machine is 2,000 R.P.M.

The machines should be run slower than the maximum speed at the first until the parts which are in movable contact have become glazed by their action upon each other.

SETTING UP (Figure 1)

Before the machine is placed in the table top, the drip pan should be attached in the table top cutout by means of four nails in such manner, that a connection between the knee lifting lever lifting rod roller bracket and the knee rock lever is possible.

The knee lifter bracket is assembled as shown in Fig. 1.

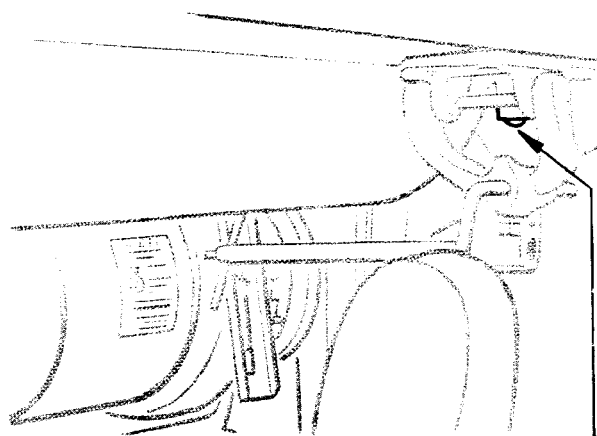


Figure 1

A

Fasten the knee lifter bracket in location shown in Fig. 1. Assemble it so that the lifter rod does not strike the drip pan. Slots in the bracket provide necessary adjustment.

Set the stop-stud "A", Fig. 1, in such a manner that the action of the knee lifter is stopped, as soon as the presser foot is raised high enough to trip the hand lever.

CAUTION: The machine should not be put in operation, even for a trial, unless all the instructions for the lubrication of the machine are observed.

LUBRICATION (Figures 2 — 7)

For the lubrication of the machines, only Singer Oil "Type B or D", supplied by The Singer Company, should be used.

In order to insure proper functioning of the machine and to prevent any excess wear of the moving parts and bearings it should be oiled regularly.

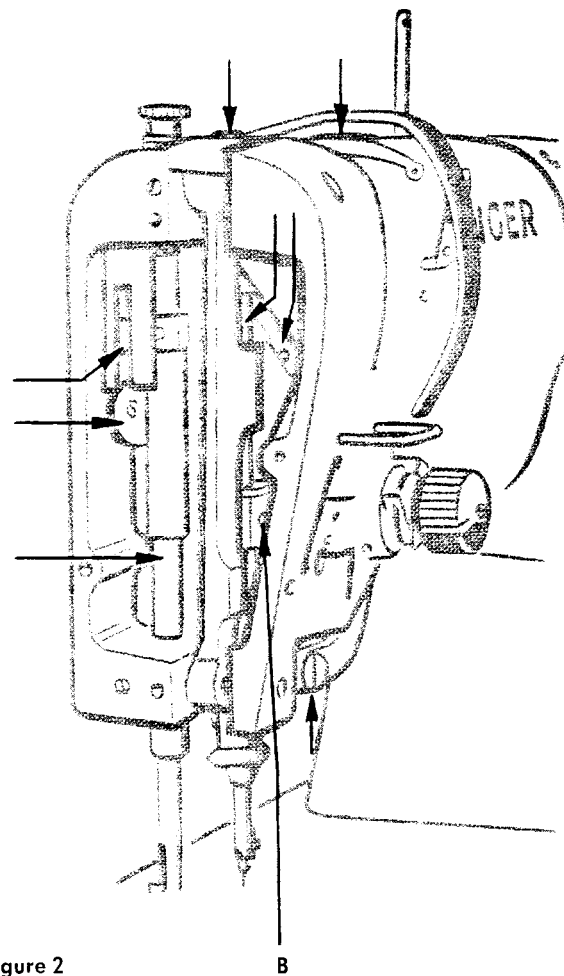


Figure 2

B

In case of continuous use, it should be oiled even more often, especially when it is used to produce long seams and run steadily. All points indicated by arrows in the figures 2 through 7 are lubrication points.

Remove the face plate as shown in Fig. 2, and oil all the bearings which are thus uncovered, then replace the face plate.

After its four fastening screws have been taken out, the arm cover (see Fig. 3) is removed, then all bearings and other oiling points thus uncovered are oiled. After this is done, replace the cover and tighten it down with the four screws.

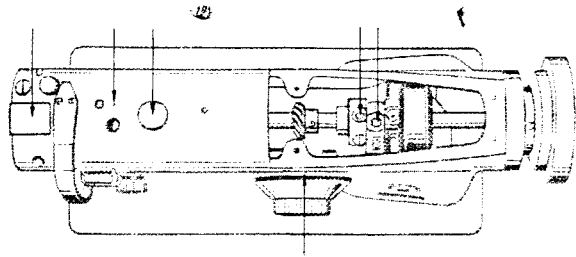


Figure 3

Fig. 4 shows the back of the machine with the various lubrication points (indicated by arrows).

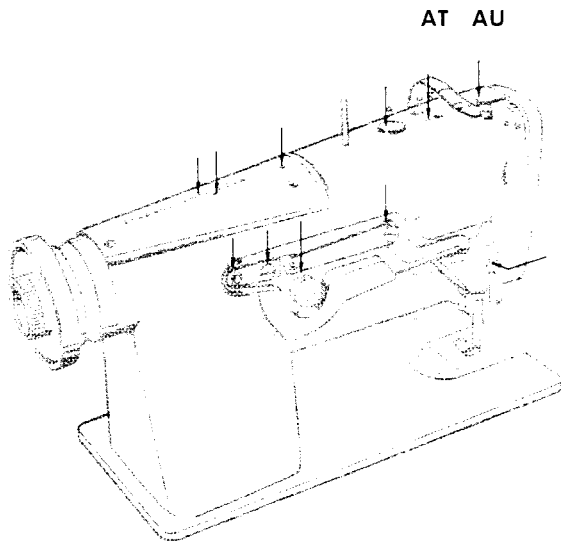


Figure 4

Prior to oiling the arm shaft bushing and the needle bar frame, remove the arm shaft bushing (front) oil packing plug "AT", Fig. 4 and the needle bar frame cap "AU", Fig. 4.

After oiling, the two plugs mentioned above, must be replaced again.

Fig. 5 shows the underside of the 107 G 201 machine with the various lubrication points.

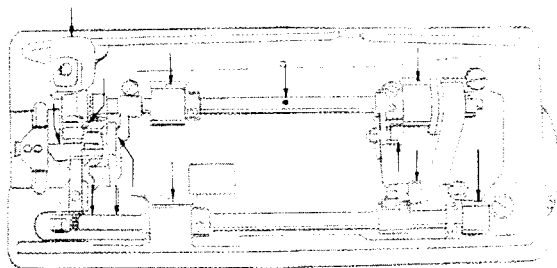


Figure 5

Remove the belt and tilt the machine back on its hinges and apply oil at the places where there are parts in movable contact, then tilt the machine forward into place.

Occasionally oil the bobbin case bearing in the bobbin case race.

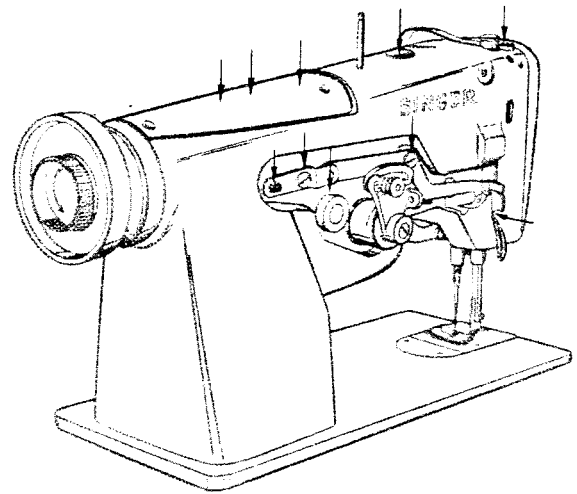


Figure 6

Fig. 6 shows the back of the 107 G 203 machine with the various lubrication points.

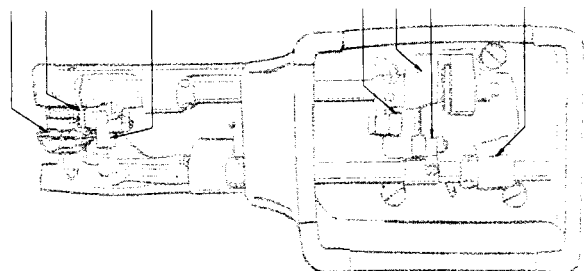


Figure 7

Fig. 7 shows the underside of the 107 G 253 machine with the various lubrication points.

NEEDLES

The needles recommended for these machines are SINGER* NEEDLES, Catalog 1901, chromium finish.

The size of the needle to be used should be determined by the size of the thread which must pass freely through the eye of the needle. Rough or uneven thread or thread which passes with difficulty through the eye of the needle will interfere with the successful operation of the machine.

Orders for needles must specify the quantity required, the catalog number, the size number and the finish.

Example: 100 - 1901 - 12 - 1
 100 Needles
 1901 Cat. No.
 12 Size
 1 Chromium Finish

Singer Needles and packets are stamped with the trademark "SINGER".

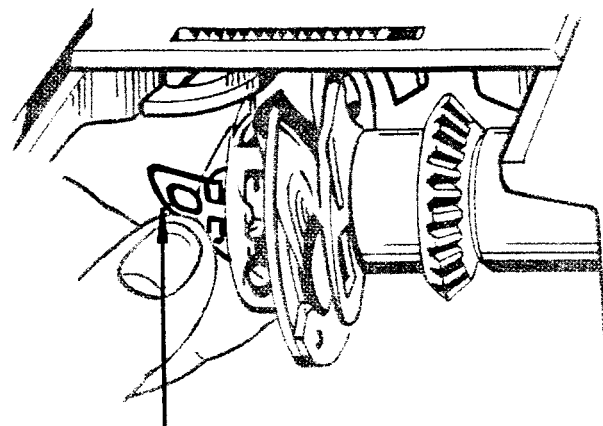


Figure 9 H

After the bed slide has been opened reach under the table, open the bobbin case latch "H", Fig. 9, and remove the bobbin case cap from the hook by means of this latch. While the latch remains open, the bobbin will be retained in the bobbin case cap.

Release the latch and the bobbin will drop out.

THREAD (Figure 8)

Left twist thread should be used in the needle. Either right or left twist can be used in the bobbin.

To determine the thread twist, hold the thread as shown in Fig. 8. Turn the thread toward the operator between the thumb and forefinger of the right hand. If left twist, the strands will wind together; if right twist, the strands will unwind.

Based on past experience the sizes of the needles and threads recommended are as follows:

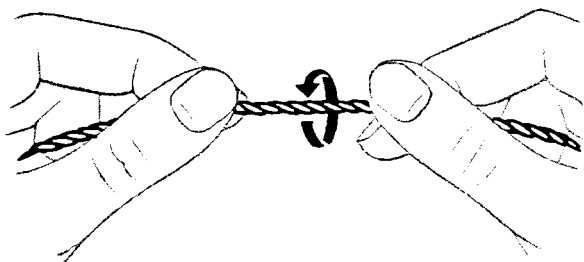


Figure 8

Needle Size	Cotton	Silk
10	90 - 150	000 - 00
12	70 - 90	00 - 0
14	60 - 70	0 - A
16	40 - 60	A - B
18	30 - 40	B - C
20	24 - 30	C - E

TO REMOVE THE BOBBIN CASE CAP (Figure 9)

First, turn the machine pulley toward the operator until the needle is at its highest point.

TO WIND THE BOBBIN (Figure 10)

Fasten the bobbin winder to the table with its driving pulley in front of the machine belt so that the pulley will be released when sufficient thread has been wound upon the bobbin.

Place the bobbin on the bobbin winder spindle and push it on as far as it will go.

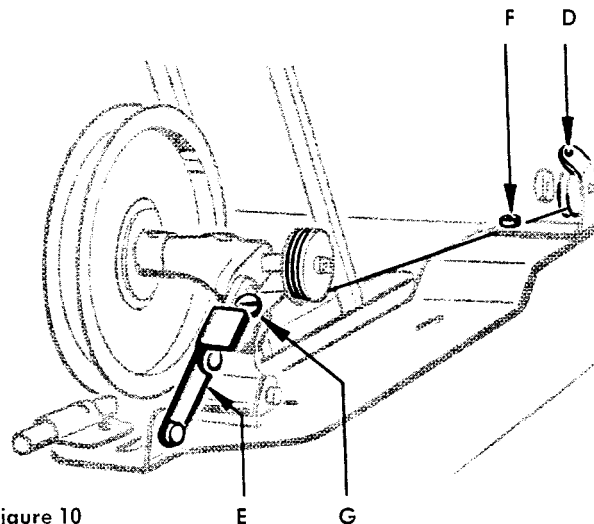


Figure 10 E G

Next pass the thread through the thread guide in the tension bracket "D", Fig. 10, and around the tension discs to the bobbin. Then wind the end of the thread around the bobbin a few times. Press down lever "E",

Fig. 10, to push the bobbin winder pulley against the machine belt and start the machine. When sufficient thread has been wound upon the bobbin, the bobbin winder will stop automatically. If the thread does not wind evenly on the bobbin, loosen the screw "F", Fig. 10, at the tension bracket and move same to the right or left as required. Then retighten the screw "F", Fig. 10.

The amount of thread wound on the bobbin is regulated by the screw "G", Fig. 10. To wind more thread on the bobbin, turn the screw to the right; for less thread turn the screw to the left.

Bobbins can be wound while the machine is in operation.

CAUTION: Synthetic threads should be wound with the smallest tension possible.

TO THREAD THE BOBBIN CASE

(Figures 11, 12 and 13)

Hold the bobbin between the thumb and forefinger of the right hand, the thread drawing on top from the right towards the left.

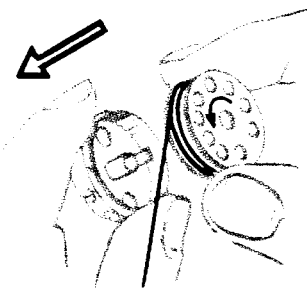


Figure 11

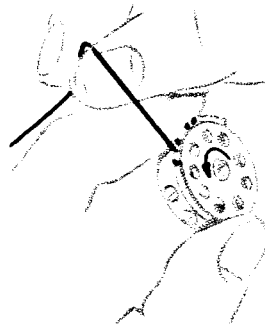


Figure 12

With the left hand hold the bobbin case open side up, the tension spring being at the front (see Fig. 11), and place the bobbin into it.

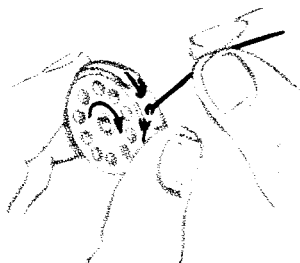


Figure 13

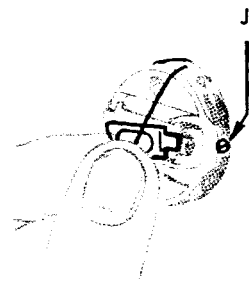


Figure 14

Then pull the thread towards the left into the slot in the edge of the bobbin case (see Fig. 12), draw the thread under the tension spring and into the second slot in the edge of the bobbin case; then pull the

thread between the bobbin and bobbin case and into the third slot, in the edge of the bobbin case, then into the delivery eye, as shown in Fig. 13.

TO REPLACE THE BOBBIN CASE

(Figure 14)

After threading take the bobbin case by the latch and place it on the center stud of the bobbin case base holder. Release the latch, press the bobbin case until the latch engages in the groove near the end of the stud. Allow about 2 inches = 50.8 mm of thread to hang free and close the bed slide.

Fig. 14 shows how to hold the bobbin case cap after threading it, before it is placed into the hook.

TO SET THE NEEDLE

Turn the machine pulley toward the operator until the needle bar reaches its highest point. Loosen the needle set screw at the lower end of the needle bar and push the needle into the bar up to the needle stop with the long groove and the eye facing the operator. Then securely tighten the needle set screw.

UPPER THREADING

(Figures 15, 16 and 17)

Turn the machine pulley over toward you until the needle bar is at its highest position.

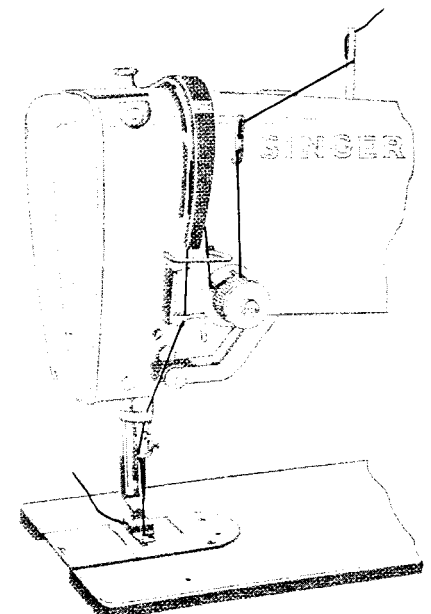


Figure 15

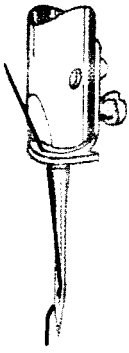


Figure 16

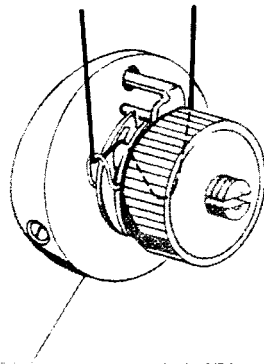


Figure 17

Lead the thread from the spool through the various guides, the tension take-up lever and down through the eye of the needle straight from you toward the presser bar.

As the thread is passed around between the tension discs draw it up and to the right until it passes into the fork above the thread controller.

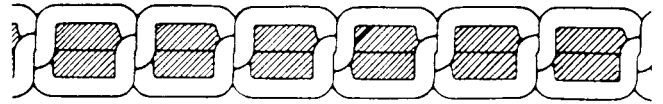


Figure 18

If the tension on the needle thread is too tight, or if that on the bobbin thread is too loose, the needle thread will lie straight along the upper surface of the material, Fig. 19.

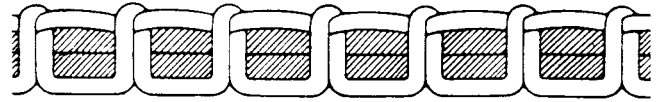


Figure 19

If the tension on the bobbin thread is too tight, or if that on the needle thread is too loose, the bobbin thread will lie straight along the underside of the material, Fig. 20.

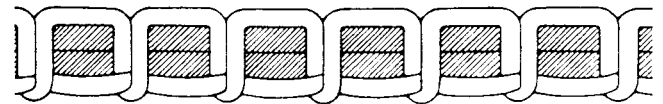


Figure 20

TO PREPARE FOR SEWING

With the left hand hold the slack end of the thread loosely and turn the machine pulley toward the operator until the needle moves down and up again to its highest point thus catching the bobbin thread. Then draw up the needle thread and the bobbin thread will come with it. Lay both threads back under the presser foot.

TO REGULATE THE TENSIONS

(Figures 14, 18, 19, 20 and 26)

The regulation of the needle and bobbin thread tensions is dependent on the material to be used.

The tension on the needle thread should be regulated only when the presser foot is down and the thread tension not released. The tension is regulated by means of the tension thumb nut "AB", Fig. 26.

The tension on the bobbin thread is regulated by means of the small regulating screw "J", Fig. 14, in the bobbin case cap tension spring. To increase the tension, turn the screw to the right. To decrease the tension, turn the screw to the left. At the standard setting (= for normal sewing) the bobbin thread should just carry the weight of the bobbin case cap with the inserted bobbin.

The needle and bobbin threads should be locked in the center of the thickness of the material, Fig. 18, when the tensions are correctly regulated.

TO SET THE WIDTH OF THE BIGHT

(Applies to 107 G 201 and 107 G 253 machines only) (Figure 21)

The width of the zig-zag stitch can be set while the machine is in operation.

The bight, up to $\frac{7}{32}$ inch (5.6 mm), is obtained by an eccentric and transmitted to the needle bar frame.

The width of the bight can be changed by turning the plastic regulating knob "L", Fig. 21, in directions "+" and "-" respectively.

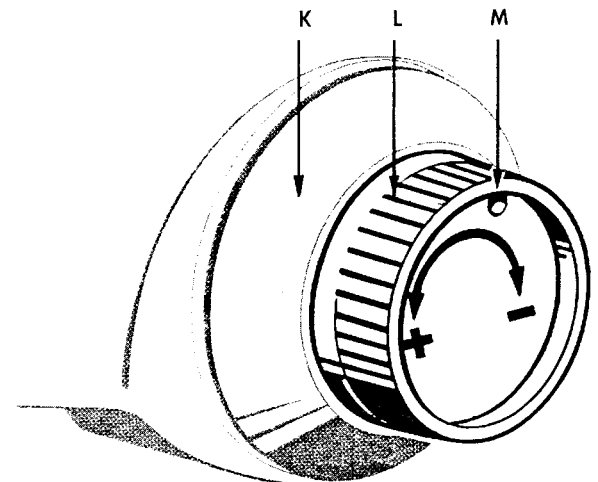


Figure 21

Maximum bight $\frac{7}{32}$ inch (5.6 mm) is obtained when the regulating knob is turned counter-clockwise up to the stop.

TO SET THE WIDTH OF THE BIGHT

(Applies to 107 G 203 machine only)
(Figure 22)

After loosening of the thumb nut "O", Fig. 22, the width of the bight can be regulated by shifting of the needle vibrating lever "N", Fig. 22, within the range of the graduated scale from 0-10. Each graduation of the scale represents a change of $\frac{1}{32}$ inch = 0.79 mm of the bight.

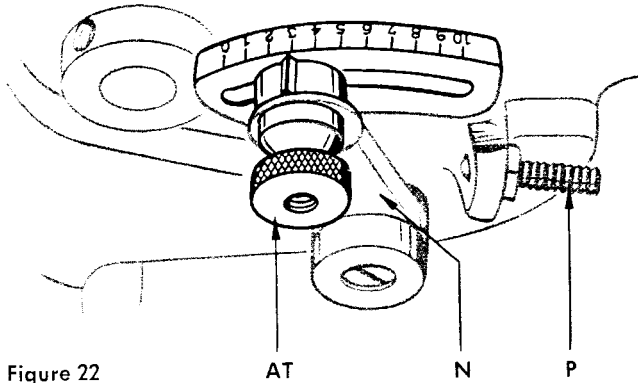


Figure 22

For straight-away stitching the needle vibrating lever "N", Fig. 22, must be set on "0" on the graduated scale.

The number 10 of the graduated scale represents the maximum width of bight which is $\frac{5}{16}$ inch = 7.94 mm.

After the needle vibrating lever has been set to the desired position the thumb nut "O", Fig. 22, must be retightened.

If it is desired to have the range of adjustments smaller than 0-10, this can be achieved by means of the adjustable stop-screw "P", Fig. 22.

TO SET THE NEEDLE VIBRATING ECCENTRIC

(Applies to 107 G 201 and
107 G 253 machines only) (Figure 23)

By this adjustment the bight is limited to a desired width.

First the regulating knob "S", Fig. 23, is turned into "+" direction up to the stop (maximum bight setting).

After the set screw "R", Fig. 23, has been loosened and removed, the plunger "Q", Fig. 23, is turned clockwise until the desired maximum width of the bight is obtained.

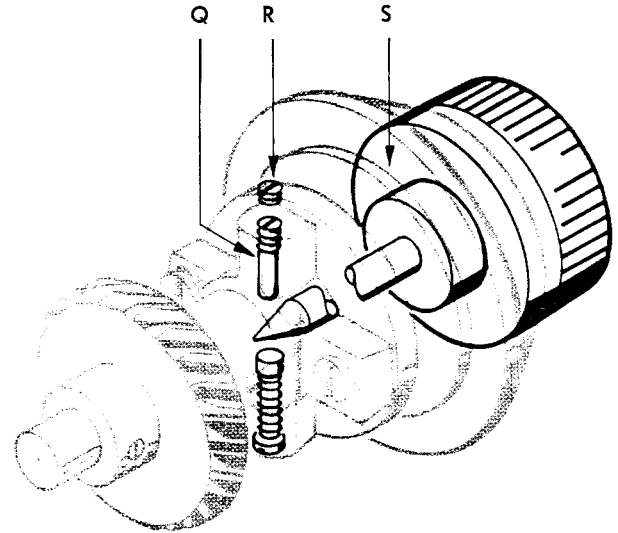


Figure 23

The width of the bight can be regulated by turning the regulating knob "S", Abb. 23, in "+" or "-" direction respectively, however, only within the limited range that has been achieved by the above adjustment.

TO SET THE STITCH LENGTH (Figure 23)

With the machine out of operation, the stitch length (forward feed only) can be regulated by turning the adjusting knob "T", Fig. 23, at the machine pulley in directions "+" and "-" respectively.

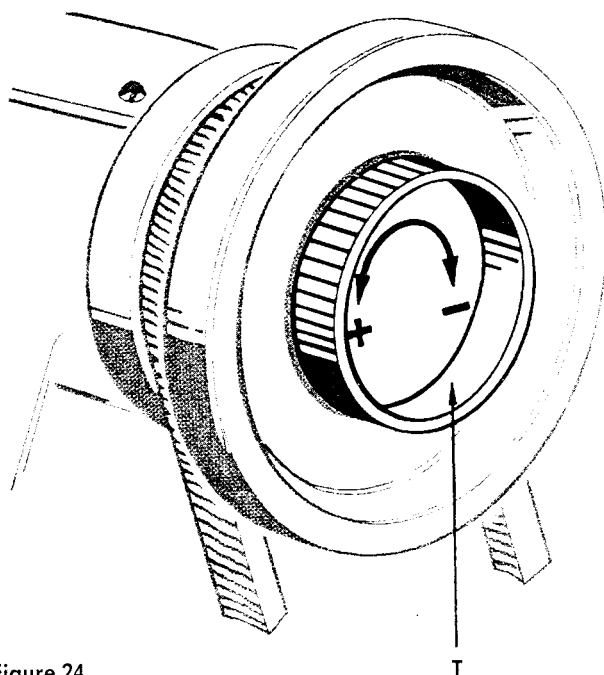


Figure 24

Maximum stitch length is obtained by turning the regulating knob "T", Fig. 24, in "-" direction (counter-clockwise) up to the stop.

TO SET THE ECCENTRIC WHICH GOVERNS THE STITCH LENGTH (Figure 25)

By this adjustment the stitch length (stitches per inch) is limited to a certain number of stitches.

First the regulating knob "W", Fig. 25, is turned into the "-" direction up to the stop (maximum stitch length setting).

After the set screw "U", Fig. 25, has been loosened and removed, the plunger "V", Fig. 25, is turned clockwise until the desired maximum stitch length (stitches per inch) is obtained.

The stitch length (stitches per inch) can be regulated by turning the regulating knob "W", Fig. 25, in "+" or

"-" direction respectively, however, only within the limited range that has been achieved by the above adjustment.

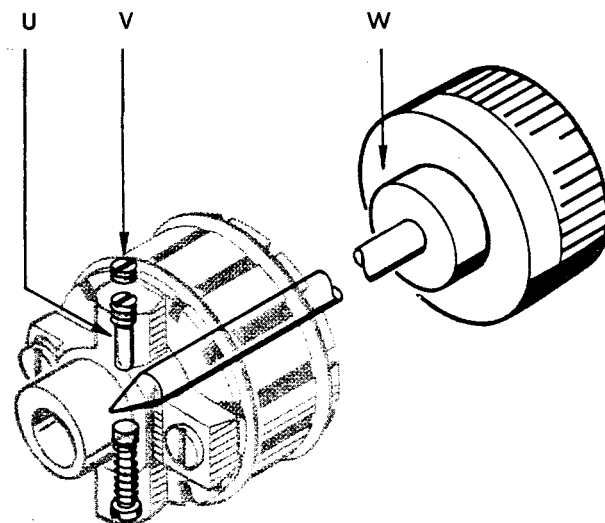


Figure 25

TO CLEAN THE HOOK

In order to preserve the life of the hook it is necessary to clean the hook by means of a brush once or twice daily depending on the materials used.

TO SET THE THREAD TAKE-UP SPRING (Figure 26)

The thread take-up spring "X", Fig. 26, set at the factory for normal sewing conditions, must have sufficient free movement to complete its action and should be at rest against the lower end of the thread take-up spring regulator "Y", Fig. 26, when the point of the needle in its downward stroke penetrates the material. The action of the spring should be sufficient to assure a light tension on the thread when same passes around the bottom of the bobbin case and casts off the hook point.

By loosening the tension retaining screw "AA", Fig. 26, the tension complete can be rotated until the spring regulator is in the desired position.

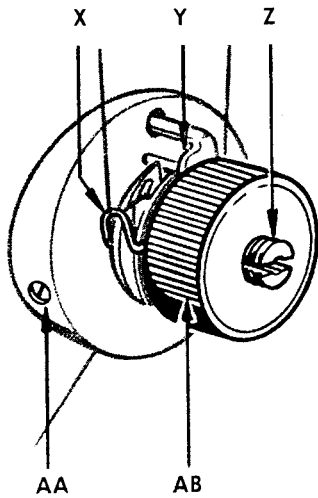


Figure 26

The tension of the thread take-up spring is set by turning the tension stud "Z", Fig. 26, either toward the right to increase it or toward the left to decrease it, with the screw "AA", Fig. 26, securely tightened.

The tension on the thread take-up spring should be sufficient to insure its action at top speed; however, it should be light enough so that the spring will move all the way up before the thread is pulled through the tension discs. The tension on the thread take-up spring requires different settings depending upon the size of the thread and other particular sewing conditions.

TO SET THE PRESSER BAR (Figure 27)

In order to align the presser foot with the needle, lower the presser foot onto the throat plate and loosen the presser bar position guide screw "AD", Fig. 27, through the opening in the arm. Then move the presser foot into the desired position and securely tighten the presser bar position guide screw "AD", Fig. 27.

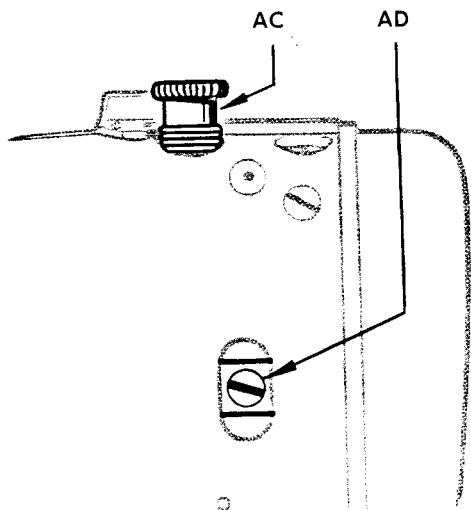


Figure 27

The presser bar lifter must be set so that a presser bar lift of $\frac{9}{32}$ inch = 7.15 mm is obtained.

TO REGULATE THE PRESSURE OF THE PRESSER BAR ON THE MATERIAL (Figure 27)

The pressure of the presser bar on the material is regulated by the presser bar thumb screw "AC", Fig. 27.

To increase the pressure turn the thumb screw clockwise (in), to decrease the pressure turn the thumb screw counter-clockwise (out).

CAUTION: The pressure on the material should be as light as possible while still sufficient to insure proper feeding.

TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT AND TO ADJUST THE NEEDLE BAR FRAME (Applies to 107 G 201 and 107 G 253 machines only) (Figures 2, 28 and 29)

Time adjustments can be tested or made only when the needle bar frame is held stationary for straight-away stitching.

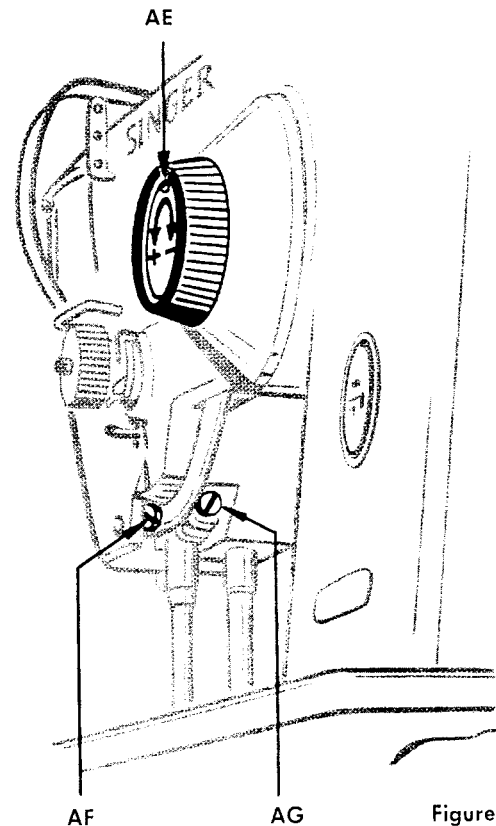


Figure 28

The needle should be inserted into the needle bar as far as it will go and should not be bend.

By turning the regulating knob "AE", Fig. 28, in "-" direction (clockwise) the machine is set for straight-away stitching.

It must be observed that the needle enters the throat plate hole exactly in center position.

Should this not be the case, loosen the set screw "AG", Fig. 28, and by turning of the eccentric stud "AF", Fig. 28, bring the needle bar into the desired position.

After this adjustment, the set screw "AG", Fig. 28, is retightened again and thus a substantial adjustment has been accomplished.

The needle bar has two marks, which are approximately $\frac{3}{32}$ inch = 2.38 mm apart.

When the needle bar is down in the lowest position the upper mark should just be visible at the lower end of the needle bar frame.

Should this not be the case, loosen the set screw "B", Fig. 2, of the needle bar connecting stud and bring the needle bar into the desired position.

After this adjustment has been accomplished, retighten the set screw "B", Fig. 2.

This set screw is accessible through a hole in front of the machine arm near the head end.

In order to check proper timing of the needle bar frame, turn the regulating knob "AE", Fig. 28, in "-" direction (counter-clockwise) up to the stop (maximum bight setting).

While the machine pulley is then turned towards the operator and as the needle starts to move up from its lowest position, the needle bar frame should start with its lateral movement.

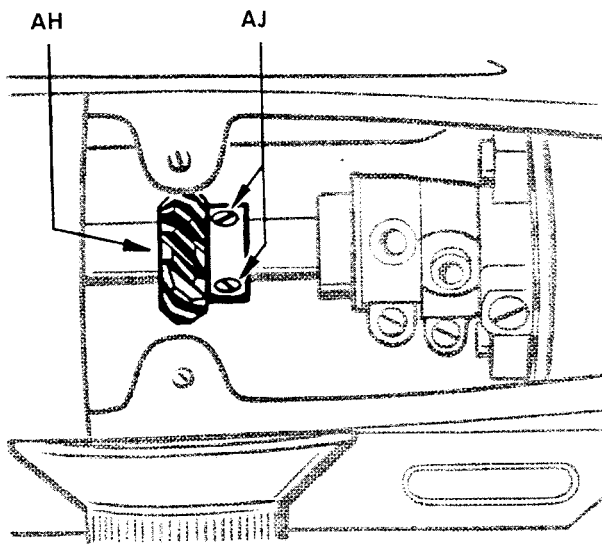


Figure 29

Should this not be the case, the timing of the needle bar frame can be adjusted by shifting the needle vibrating pinion "AH", Fig. 29, after the set screws "AJ", Fig. 29, have been loosened.

After this adjustment has been accomplished the set screws "AJ", Fig. 29, must be retightened.

CAUTION: If the needle bar does not have any marks, the proper timing is achieved when the needle has moved up $\frac{3}{32}$ inch = 2.38 mm from its lowest position and when the hook point then is directed towards the needle center $\frac{1}{16}$ inch = 1.57 mm above the needle eye.

TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT AND TO ADJUST THE NEEDLE BAR FRAME (Applies to 107 G 203 machine only) (Figures 2, 22, 28 and 29)

Time adjustments can be tested only when the needle bar frame is held stationary for straight-away stitching.

The needle should be inserted into the needle bar as far it will go and should not be bend.

After loosening of the thumb nut "O", Fig. 22, the needle vibrating lever "N", Fig. 22, can be shifted to "AT" on the graduated scale.

The machine is now set for straight-away stitching and the needle should enter the throat slot on the far left as it would be the case when it were round instead of slotted.

When the needle does not enter the throat plate slot on the far left loosen the set screw "AG", Fig. 28, and by turning of the eccentric stud "AF", Fig. 28, bring the needle bar into the desired position.

After this adjustment the set screw "AG", Fig. 28, is retightened and thus a substantial adjustment has been accomplished.

The needle bar has two marks, which are approximately $\frac{3}{32}$ inch = 2.38 mm apart.

When the needle bar is down in the lowest position the upper mark should just be visible at the lower end of the needle bar frame.

Should this not be the case, loosen the set screw "B", Fig. 2, of the needle bar connecting stud and bring the needle bar into the desired position.

After this adjustment has been accomplished, retighten the set screw "B", Fig. 2.

This set screw is accessible through a hole in front of the machine arm near the head end.

In order to check the proper timing of the needle bar frame, the needle vibrating lever "N", Fig. 22, is shifted to "10" on the graduated scale (maximum bight setting) after the thumb nut "O", Fig. 22, has been loosened.

While the machine pulley is then turned towards the operator and as the needle starts to move up from its lowest position, the needle bar frame should start with its lateral movement.

Should this not be the case, the timing of the needle bar frame can be adjusted by shifting the needle vibrating pinion "AH", Fig. 29, after the set screws "AJ", Fig. 29, have been loosened.

After this adjustment has been accomplished, the set screws "AJ", Fig. 29, must be retighten.

CAUTION: If the needle bar does not have any marks, the proper timing is achieved when the needle has moved up $\frac{3}{32}$ inch = 2.38 mm from its lowest position and when the hook point then is directed towards the needle center $\frac{1}{16}$ inch = 1.57 mm above the needle eye.

TO TIME THE HOOK

(Figures 30, 31 and 32)

Loosen the hook driving bevel pinion shaft belt pulley set screws "AR", Fig. 32, and turn the machine pulley toward you until the needle bar goes to its

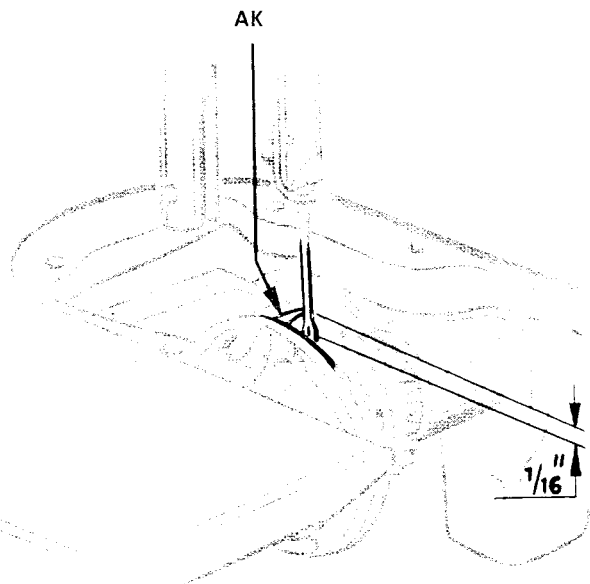


Figure 30

lowest position and upward until the lower mark across the needle bar is just visible at the end of the needle bar frame, then stop turning and hold the machine pulley firmly.

With the left hand turn the hook until the hook point "AK", Fig. 30, is at the center of the needle ($\frac{1}{16}$ inch above its eye). See that the end play to the shaft is nearly eliminated, then retighten the pulley set screws "AR", Fig. 32.

To set the hook to or from the needle: loosen the screws "AL" and "AN", Fig. 31, and move the hook to the desired position and retighten the screws "AL" and "AN", Fig. 31.

CAUTION: The hook point should pass the needle as closely as possible without, however, touching it.

TO REMOVE THE HOOK (Figure 31)

After loosening the bobbin case stop set screw "AO", Fig. 31, switch the bobbin case stop "AP", Fig. 31, to the position shown on Fig. 31; then remove the hook position screw "AM", Fig. 31, and remove the hook.

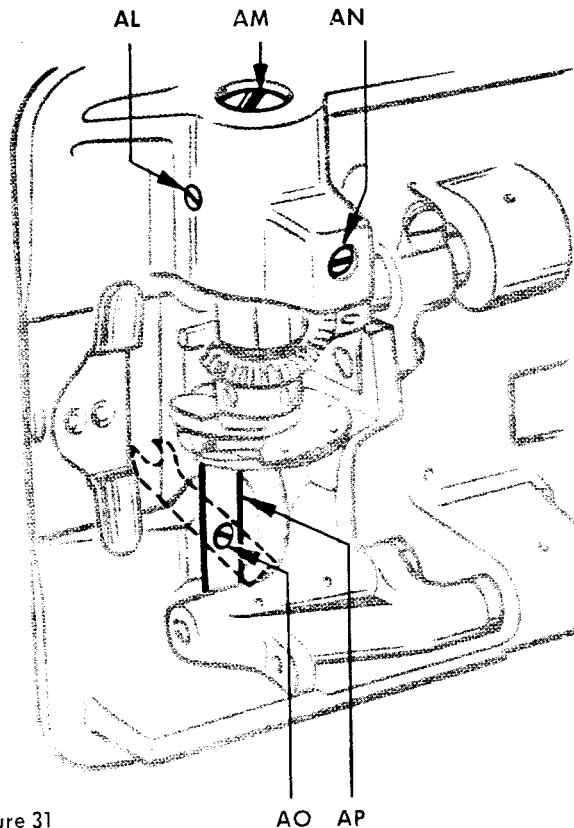


Figure 31

TO ADJUST THE FEED DRIVING MECHANISM (Figure 32)

To take up lost motion of the feed driving and lifting connections, adjust their hinge and pinch screws.

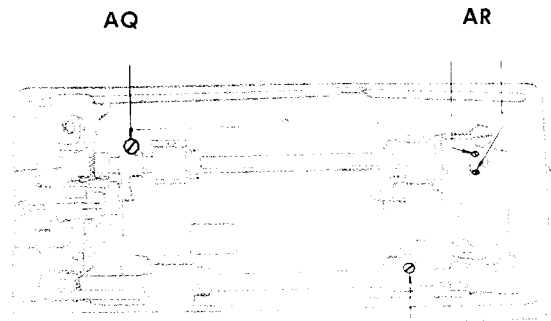


Figure 32

AS

To prevent the feed dog from striking at either end of the slots in the throat plate: loosen screw "AS", Fig. 32, and move the feed dog forward or backward until the longest stitch can be taken without the feed dog striking the throat plate and retighten the screw "AS", Fig. 32.

TO RAISE OR LOWER THE FEED DOG (Figure 32)

Usually, when at its highest position, the feed dog should show a full tooth above the throat plate.

Remove the throat plate: clean the lint and dirt from between the feed points and replace the throat plate. Tilt the machine back and turn the machine pulley toward you until the feed dog is at its highest position: loosen screw "AQ", Fig. 32, and raise or lower the feed dog as desired and retighten the screw "AQ", Fig. 32.

When raising or lowering the feed dog be careful that its underside does not drop low enough to strike the hook.

TO REMOVE THE NEEDLE VIBRATOR GEAR SHAFT (Figure 21)

The cover and the plastic turning knob "K" and "L", Fig. 21, can be removed together after loosening the three set screws, which are accessible through the opening "M", Fig. 21, in the plastic turning knob.

Then, after removing the three set screws in the flange of the needle vibrator eccentric bracket, on the front of the arm, it can be removed.

Now loosen all set and pinch screws of such parts, which are located on the needle vibrator arm shaft (needle vibrator arm shaft collar etc.).

The shaft can now be pulled out.

When replacing these parts be careful that the large washer is in place between the gear and arm, that the position screws are set firmly against the flat spots on the shaft and that the set screws are at the right of the position screws when the shaft has been returned to its place.

TO REPLACE THE ARM SHAFT CONNECTION BELT

Remove the needle to avoid damage to the hook. Slide belt off the lower pulley, loosen the two screws

in the machine pulley and remove the machine pulley with the ball bearing from the arm shaft. Lift the belt up and draw it around the arm shaft through the space normally occupied by the ball bearing.

The new belt is inserted through the ball bearing hole. After placing belt over upper pulley, replace machine pulley. To remove all end play from the shaft, lightly tighten set screws in machine pulley and tap the machine pulley into position with the palm of the hand. Tighten the machine pulley set screws firmly.

In replacing the belt see that the hook (sewing) and needle are in correct time before running the belt on the lower pulley and verify the correctness of the timing before commencing to sew.

For proper adjustments see "TO TIME THE HOOK", Page 13.

TO REMOVE THE ARM SHAFT (Figure 24)

First turn out the plastic feed regulating knob "T", Fig. 24, at the machine pulley, then remove all pinch and set screws of the needle vibrator mechanism (compression screw etc.); loosen the position screw and the set screw in the belt pulley, also loosen and remove the position screw from the feed lifting eccentric and from the needle bar crank; loosen the set screws in the needle bar frame driving gear pinion (on the arm shaft) and draw the shaft out from the machine pulley end of the machine.

TO REMOVE THE ARM SHAFT BUSHING (FRONT)

After removing the needle bar crank, remove the bushing position screw from the back of the arm, insert a brass rod through the arm cap hole and drive the bushing out.

TO REPLACE THE ARM SHAFT AND CONNECTIONS

Return the shaft to its place through the belt pulley, the feed lifting eccentric, the shaft gear, friction washer and needle bar crank; return the position screws to the belt pulley, feed lifting eccentric and needle bar crank, and into their position holes in the shaft; tighten the set screw of each and replace the machine pulley, leaving the least possible end play to the shaft.