SINGER
457UX143

Service Manual

SINGER*
INDUSTRIAL PRODUCTS

457 UX143

CONTENTS

DESCRIPTION

The 457UX143 machine is a high speed, single needle, reverse feed, lockstitch, long arm, wide bight (max. 8mm), zigzag machine for stitching light and medium weight fabrics.

FEATURES

- Automatic lubrication system supplies oil by a screw type pump at low speeds as well as high speeds. A large capacity reservoir in the machine base cools the oil as it circulates.
- Oil flow can be checked through an oil flow window.
- Hook lubrication can be regulated.
- Machine head oil removing system by means of suction pump.
- Transverse, two to one, horizontal axis hook.
- Rotary take-up.
- Adjustable pre-tension.
- Rotary thread tension.
- Adjustable bight.
- Adjustable stitch length by two stitch length regulating screws for independently adjusting forward and reverse stitch lengths.
- Arm and bed shafts are mounted in ball bearings on their drive side.
- Removable arm and bed covers to allow access to all parts in the machine.
- The machine rests on a vibration absorbing gasket which is screwed onto the table and also serves to support the knee lifter and related parts.
- Pendant link mechanism with eccentric for adjusting feed dog to height and parallelism.
- Built-in bobbin winder.
- Stitch pattern can be reversed to left or right (mirror image) by means of bight control lever.
- Fine adjustment available for needle location.
- Stitch pattern can easily be changed by exchanging zigzag cam.

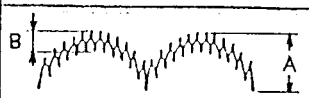
SPECIFICATION

Model	457UX143
Needle Bar Stroke	33.40mm (1.316")
Clearance Under Presser Foot	6.35mm (0.250")
Maximum Stitch Length	10 SPI (2.5mm)
Maximum Speed	4200 R.P.M.
Maximum Width of Bight	* 8.0mm (0.315")
Needle Bar Rise "0" Bight	2.54mm (0.100")
Length of Machine Bed	476.7mm (18-49/64")
Width of Machine Bed	177.8mm (7")
Space at Right of Needle	288.0mm (11-5/16")
Needle	Cat. 1906-01
Lubrication Oil	Type C
Machine Pulley (Safety Type No. 508820) for 9.5mm (3/8") V belt, Effective diameter 67.5mm (2.65")	
The arm is provided with a threaded hole for mounting Singer Light No. 623024-501	

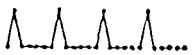
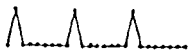
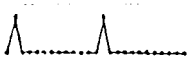
* Varies depending on position of eccentric for fine adjustment of needle.

REPLACEABLE CAMS

Standard cam fitted in machine

Part No.	Description	Stitch Pattern	Max. Pattern Width (mm) A	Max. Pattern Thickness (mm) B
411295	24-stitch scallop cam		8.0	2.6

Following cams are available at extra cost.

Part No.	Description	Stitch Pattern	Max. Pattern Width (mm) A	Max. Pattern Thickness (mm) B
411358	12-stitch open scallop cam		8.0	2.4
411360	24-stitch crescent scallop cam		8.0	3.6
411362	3 step zigzag cam		8.0	-
411364	Blind stitch cam (6 stitches)		5.0	-
411394	Plain zigzag cam		5.0	-
411396	Blind stitch cam (4 stitches)		5.0	-
411462	2 step zigzag cam		8.0	-
411464	24-stitch even scallop cam		8.0	3.4
411408	Blind stitch cam (8 stitches)		5.0	-
411482	Blind stitch cam (12 stitches)		5.0	-

INSTALLATION

Assemble oil reservoir fitted with knee lifter and gasket to the table, and place the machine on the gasket. When SINGER table is used, the machine should be placed so that the machine will rest on cushions provided at four corners of the table cut-out. In case the machine does not fit the table cut-out properly or when there is a play, it is recommended that adjustments be made by using shims or rework be done as required so that;

1. Machine will not rock.
2. Machine will be positioned in parallel with the table top.
3. Machine will not touch the table.
4. Machine bed will be just above the table top so as to allow the bed slide to be opened and the machine be supported only by the bed hinge connections when the machine is tilted back.

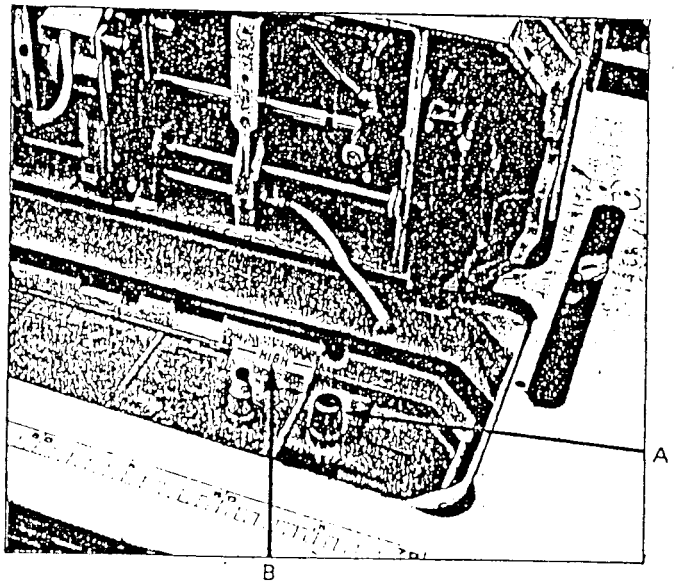


Fig. 1

When assembling the knee lifter, make sure that the plunger A, Fig. 1, is not missing.

The stroke of the knee lifting lever is determined by the adjustment of the knee lifting lever pin A, Fig. 2, relative to the stop screw B, Fig. 2. Adjust the stop screw B so that the presser bar lifting lever will drop down on its own weight when the knee lifting lever is raised to its highest point.

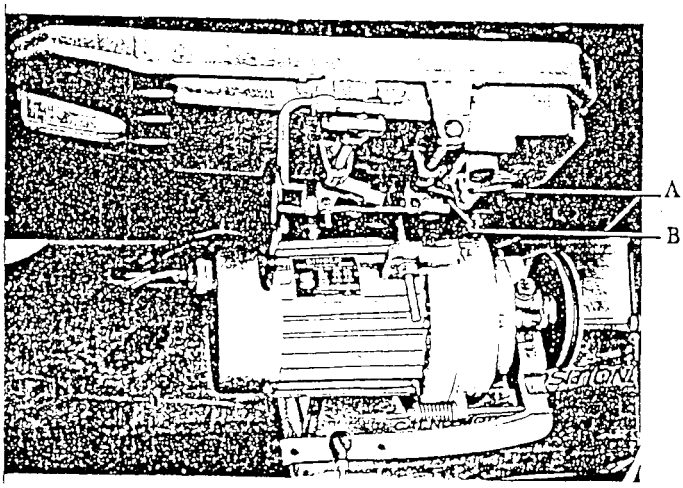


Fig. 2

The wire furnished with the machine is used for grounding. The machine must be grounded when an electric unit having a rated voltage of more than 42 volts and which is not grounded, is in direct contact with any metal portion of the machine.

Fasten one end of the ground wire to the bed top with screw C, Fig. 20 and the other end to the ground terminal on the motor.

LUBRICATION

Caution: Do not start the machine, not even to test the speed, until the machine has been sufficiently oiled as instructed below.

Use only SINGER oil, type C. Keep the oil level in the reservoir at the HIGH mark B, Fig. 3. It is recommended that the oil level be checked everyday. Refill the oil when the oil level is below the 'ADD OIL' mark. Keep the oil filter clean.

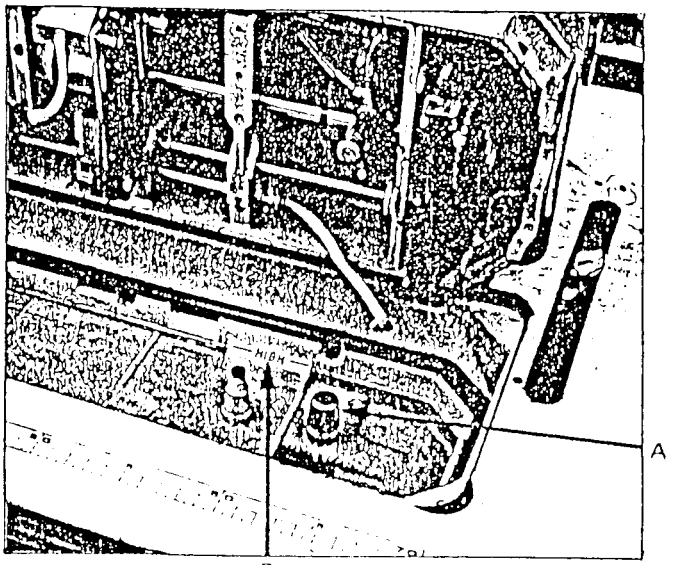


Fig. 3

LUBRICATION TO HOOK AREA

The amount of oil to be supplied to hook area is very important. To check the oil flow to the hook area, first remove the bobbin case from the machine. Then hold a piece of white paper under the hook by hand for approximately 15 seconds while running the machine at normal sewing speed. If the paper shows a slight trace of oil 0.8mm in width, the oil flow to the hook area is considered to be sufficient.

In case the paper does not show frace of oil or conversely, shows a trace of excessive amount of oil, it is suggested that the following stops be taken.

1. Tilt the machine back and loosen the locking nut.
2. Adjust the oil flow by turning the regulating screw A, Fig. 4.
   To increase the oil flow, turn the screw clockwise, and to decrease the oil flow, turn the screw counter-clockwise.
3. Tighten the locking nut after adjustment.

When the oil flow cannot be increased even after making the above adjustment, remove the hook and check whether the oil wick B in the oil filter screw at the front end of the hook shaft is clogged with lint or other foreign substance. Replace the oil wick when necessary.

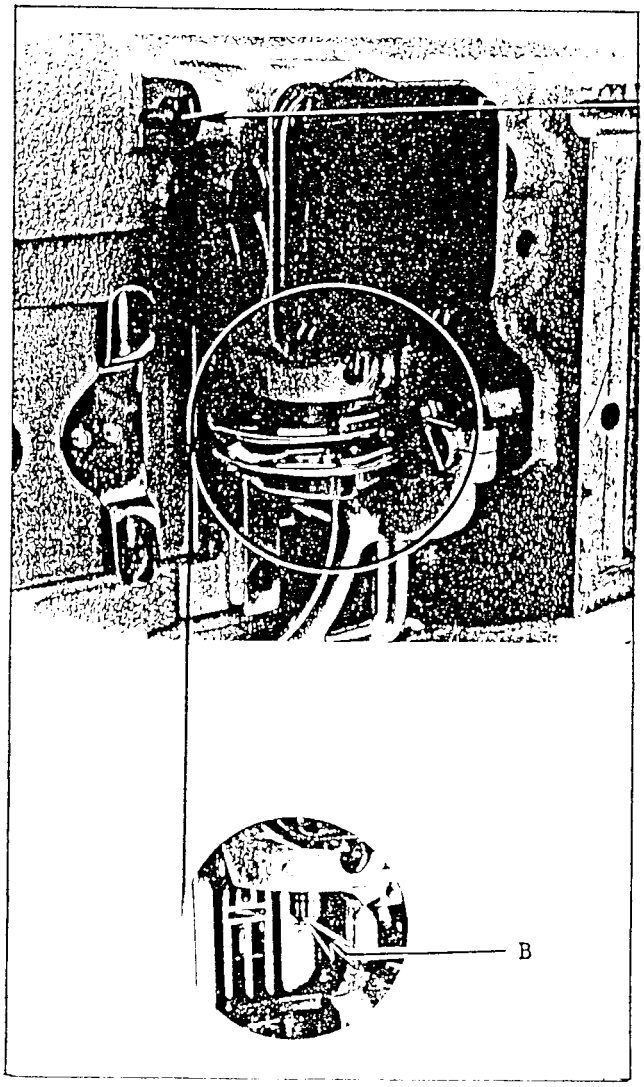


Fig. 4

MACHINE SPEED

The machine speed specified for the 457UX 143 machine is 4,200 R.P.M.

The maximum speed recommended for this machine depends on type of work performed, operator skill and type of material being sewn.

Run the machine at low speeds for several minutes until oil flow is visible in the oil flow window A, Fig. 5.

Caution: In new machines, or those that have been idle for several weeks or more, it may take a few moments for the automatic lubrication system to completely distribute oil to moving parts. Never attempt to run such machines at maximum speeds immediately before proper lubrication has been effected.

It is recommended that new machines be operated at a speed 500 R.P.M. less than the specified maximum speed for the first 150 hours.

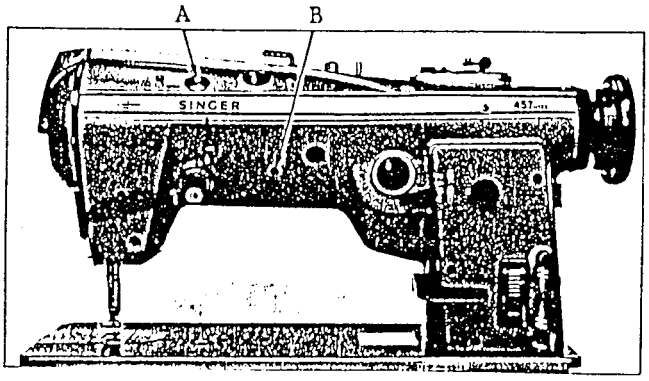


Fig. 5

NEEDLE

Genuine SINGER needle (chromium plated) listed below are recommended for use with this machine.

Cat. No. 1906-01 Set point
Cat. No. 1906-06 Ball point (light)
Cat. No. 1906-07 Ball point (medium)
Cat. No. 1906-08 Ball point (heavy)

The size of needle depends on type of thread used and material being sewn.

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

(Example) 100 - 1906-01 - 1
Quantity 100 pieces,
Cat. No. 1906-01, Size 14,
Chromium finish 1

THREAD

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

To determine the thread twist, hold the thread as shown in Fig. 6, turn the thread toward the operator between the thumb and forefinger of the right hand. If the thread is left twist, the strands will wind together; if right twist, the strands will unwind.

The accompanying chart lists cotton and silk thread sizes with the needle sizes normaly used with threads of the specified diameters.

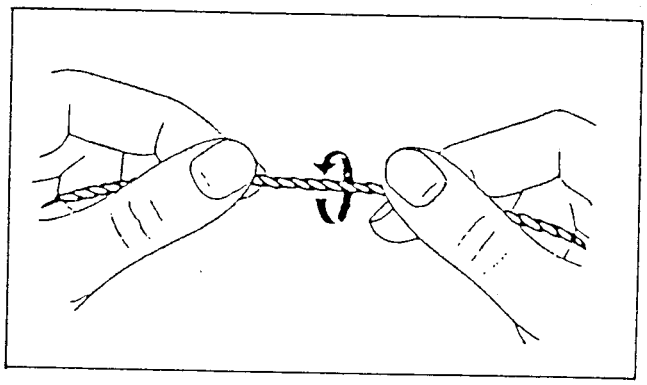


Fig. 6

Needle Size	Cotton	Silk
10	90 - 150	
12	70 - 90	
14	60 - 70	60 - 70
16	40 - 60	40 - 60
18	30 - 40	
20	24 - 30	

THREADING THE MACHINE

Threading The Machine

Place the bobbin onto the bobbin winder spindle. Pass the thread through the thread guide A, Fig. 7, between the pre-tension B, Fig. 7, and wind the thread clockwiseaaround the bobbin a few times. Push the trip lever C, Fig. 7 toward the bobbin as far as it will go and start the machine.

When sufficient amount of thread has been wound on the bobbin, the bobbin winder will stop automatically. For more thread, loosen screws D and E and swing the trip lever C toward you and for less thread, swing the trip lever away from you. Then tighten the screws D and E.

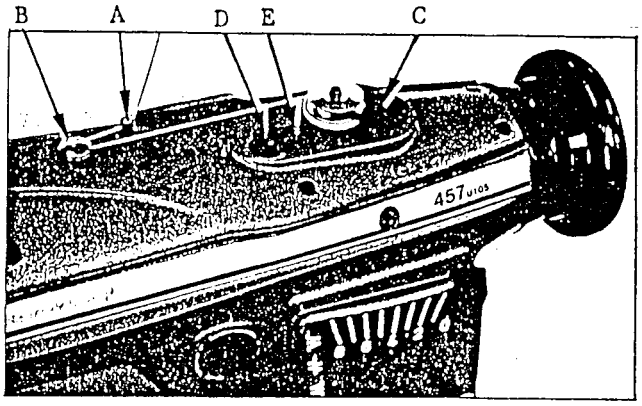


Fig. 7

When the bobbin is not wound evenly, loosen the set screw at the rear of the pre-tension B, adjust the height of the pre-tension B and then tighten the set screw.

Needle Thread

Turn the machine pulley toward the operator until the needle bar is at its highest point. Thread the machine as illustrated in Fig. 8.

1. From the spool holder, pass thread from right to left through the rear hole of the thread guide A and then from left to right through the front hole.
2. Draw thread from right to left through upper hole of the thread guide B on the pre-tension, and then from left to right through the lower hole.
3. Pass thread from right to left through the pre-tension C and wind the thread one turn around the rotary disc C, and lead it over the thread take-up spring E under the thread pull-off F.
4. Lead the thread through the thread guide hole in the long thread guide G and through the opening between the face plate H and the thread take-up guard.
5. Over the thread take-up lever J, down through the thread guard eye K, and through the needle bar thread guide L, and from front to rear through the eye of the needle.

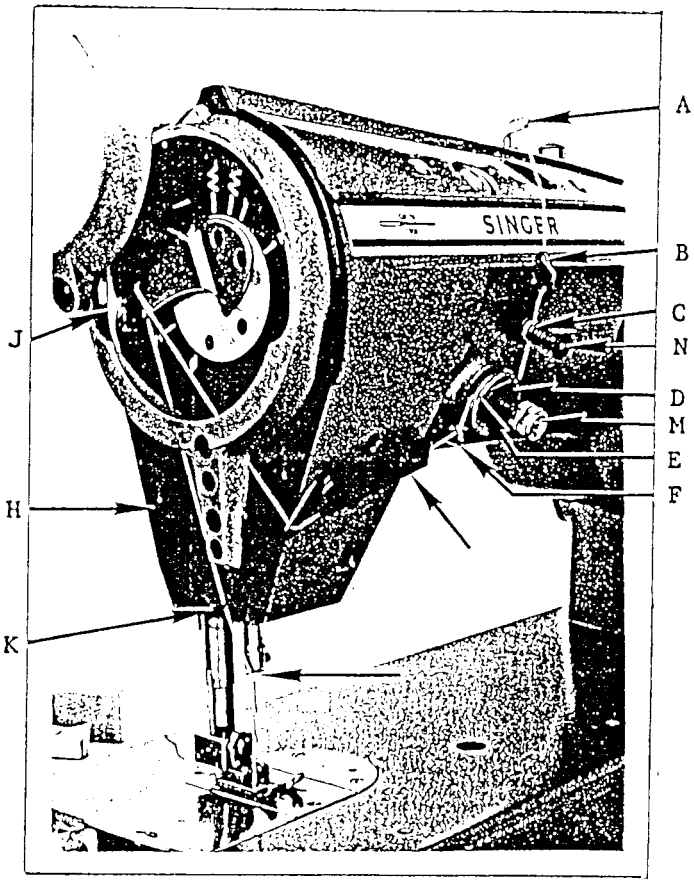


Fig. 8

Once the operator has become accustomed to threading the machine, threading the machine from the thread guide A to the eye of the needle can be accomplished in a single continuous motion.

Threading The Bobbin Case

To remove bobbin case; Turn machine pulley toward you until the needle bar is at its highest point. Open the bed slide and raise the bobbin case latch A, Fig. 9 and remove the bobbin case as is. The bobbin will be retained in the bobbin case as long as the latch is raised.

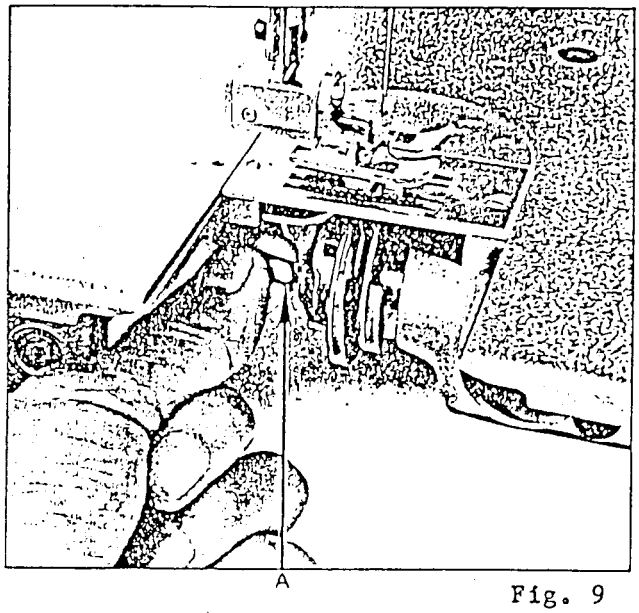


Fig. 9

To thread the bobbin case: Held the bobbin between thumb and forefinger of the right hand as shown in Fig. 10 so that the thread will unwind to the left. Hold the bobbin case with left hand with the bobbin thread tension regulating screw A facing upward and place the bobbin into the bobbin case.

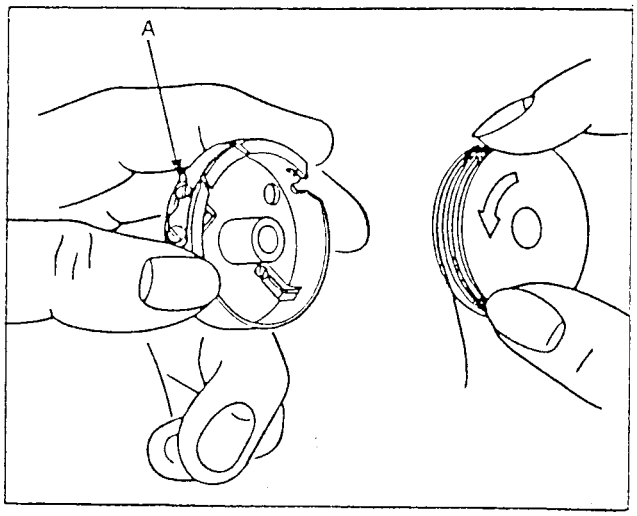


Fig. 10

Pull the thread into the slot A, under the spring B, through the next slot C, into the bobbin case and lead the thread out through the third slot D.

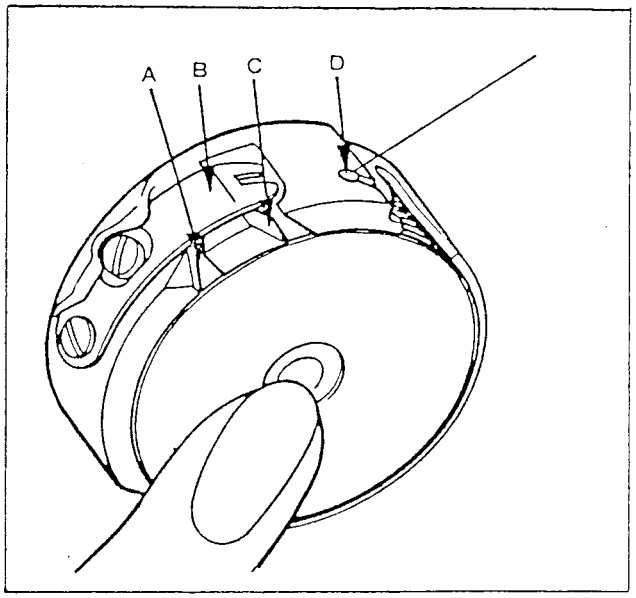


Fig. 11

To replace the bobbin case: Raise the bobbin case latch and fully insert the bobbin case into the stud of the bobbin case holder. When fully inserted, release the latch. Allow about 5cm of thread end to hang free and then close the bed slide.

INSERTING THE NEEDLE

1. Turn machine pulley toward the operator until needle bar reaches its highest point.
2. Loosen needle screw.
3. Insert needle into needle bar as far as it will go, with the long groove and eye of the needle facing the operator.
4. Tighten the needle screw.

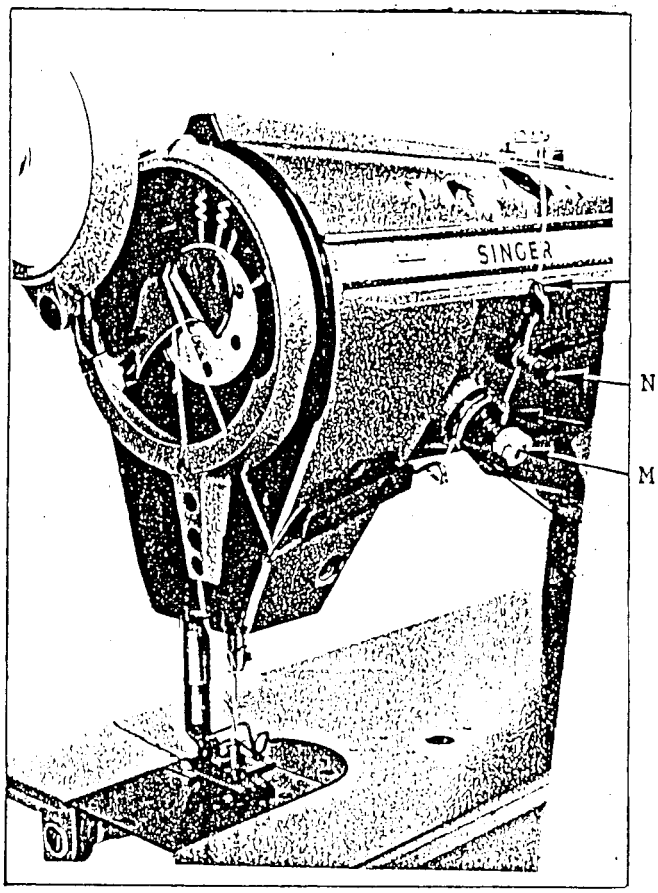


Fig. 12

REGULATING THREAD TENSION

Needle Thread Tension

Needle thread should be adjusted with presser foot DOWN. Adjustment is made by using the tension thumb nut M, Fig. 12 and pre-tension thumb nut N, Fig. 12.

The pre-tension must be adjusted so as to provide as light tension as possible permitting the rotary tension to rotate freely.

Bobbin Thread Tension

Adjust bobbin thread tension by means of the bobbin case tension spring regulating screw A, Fig. 13. To increase the tension, turn the screw clockwise and to decrease the tension, turn the screw counter-clockwise.

For normal sewing condition, th thread tension should be adjusted to such an extent that the bobbin case containing the bobbin will not drop down on its own weight when letting it hang free by holding the thread end drawn from the bobbin case.

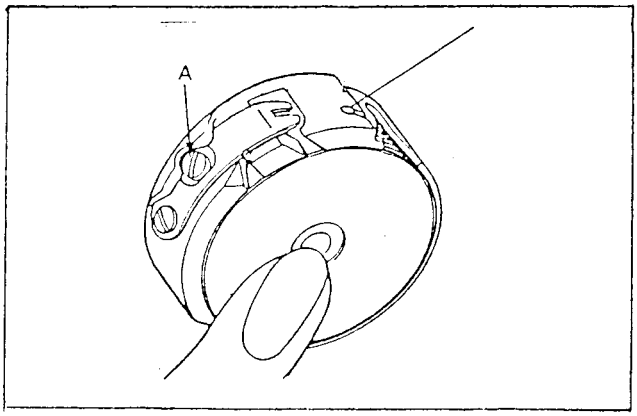
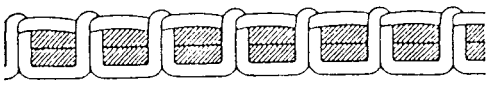


Fig. 13

Balancing The Needle and Bobbin Thread Tension

Perfect Stitch

Fig. 14



Too Tight Needle Thread Tension

Fig. 15

Too Loose Needle Thread Tension

Fig. 16

Tension Device

It is necessary to take up the slack of the needle thread before the needle enters the fabric.

To adjust the needle thread tension, first loosen the tension retaining screw A, Fig. 17. To increase the movement of the thread take-up spring, turn this screw clockwise and to decrease it, turn the screw counter-clockwise. Tighten the screw after adjustment.

To increase the tension of the thread take-up spring, turn the tension thumb nut D clockwise and to decrease it, turn the thumb nut counter-clockwise. After proper spring tension has been obtained, tighten the screw A.

The tension of the thread take-up spring must be high enough to operate reliably at high speeds and also allow the spring to move all the way down before the thread is drawn from the tension discs.

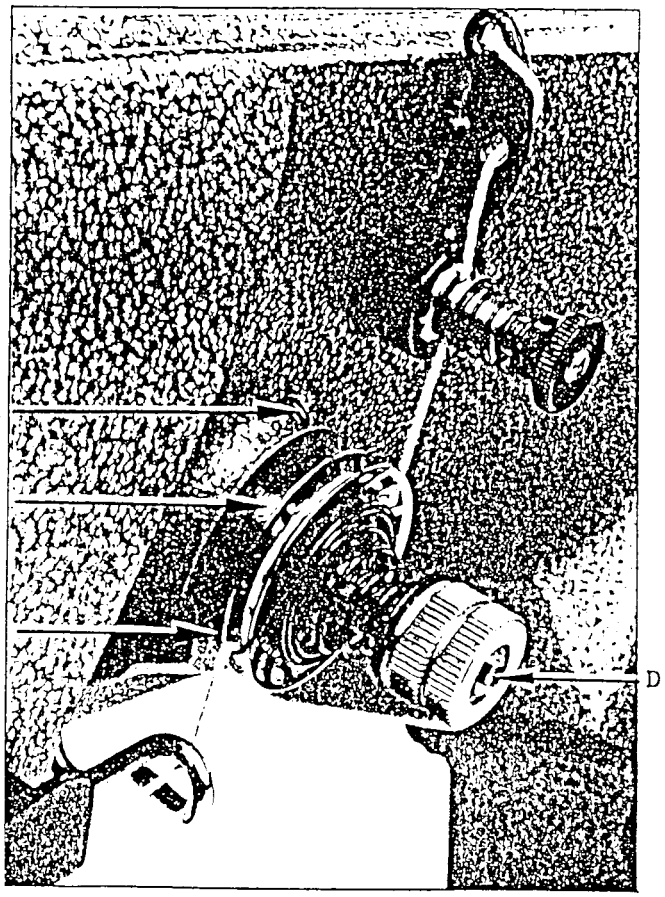


Fig. 17

Cleaning The Hook and Rotary Take-up

In order to assure a longer service life of the hook, it is necessary to clean the hook with a brush once or twice a day depending on the usage of the machine.

Two thread cutters are provided on the thread path in the rotary take-up in order to prevent the needle thread from being tangled around the rotary take-up. Whenever thread breakage occurs, make sure that no lint is accumulated around the rotary take-up. Remove lint before re-threading the machine each time.

ADJUSTMENT OF STITCH LENGTH

Stitch length in both forward and reverse feed can be adjusted by using the feed regulating screw E and F, Fig. 18 respectively. Stitch length indicator D, Fig. 18 is provided on the left side of the feed regulating screws to assist the operator in setting the length of stitch.

Stitch length can be varied by the operator by operating the feed regulating shaft lever C while running the machine within the range of the stitch length set by the stitch regulating screws E and F.

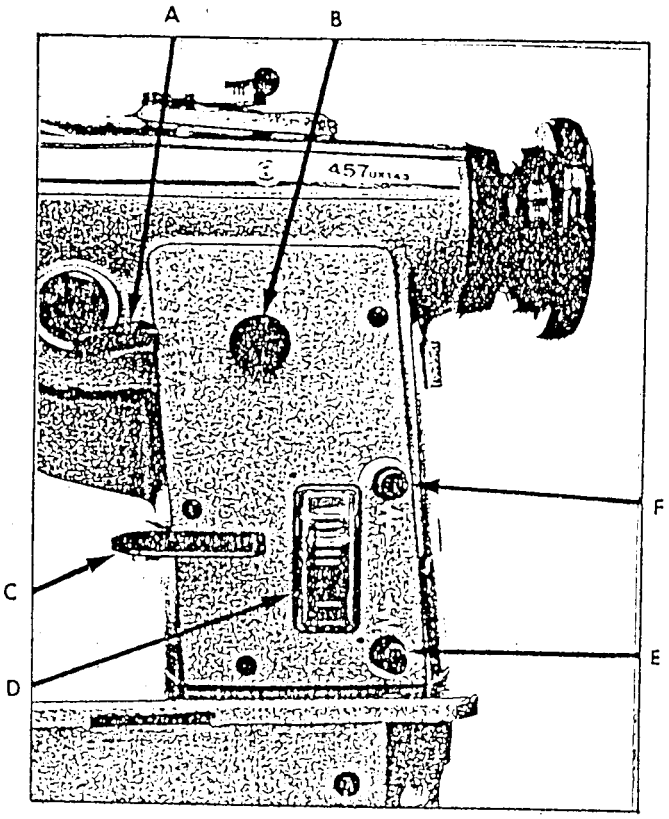


Fig. 18

REGULATING ZIGZAG STITCH WIDTH

Stitch pattern can be reversed (mirror imaged) either to left or right side by using the bight control lever A, Fig. 18.

Stitch pattern will be mirror imaged on right side when the bight control lever is set upward. Stitch pattern will be mirror imaged on left side when the bight control lever is set downward.

Patterns on both left and right sides can be adjusted up to the maximum stitch width of 8mm by means of the bight control lever A.

To change stitch width of the pattern, loosen the lock screw B, Fig. 18 and move the bight control lever A to the desired stitch width graduation shown on the front cover. Tighten the lock screw B after adjustment.

REGULATING PRESSER BAR PRESSURE

Presser bar pressure can be adjusted by using the presser bar pressure regulating screw B, Fig. 19. To increase the pressure, turn the screw clockwise and to decrease the pressure, turn the screw counter-clockwise.

Caution: The pressure exerted on the fabric must be as light as possible, yet sufficient to insure proper feeding of the fabric being sewn.

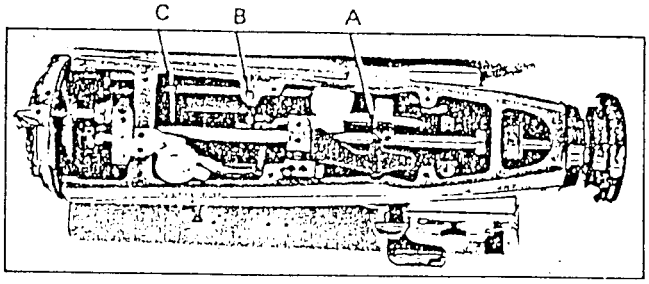


Fig. 19

ADJUSTMENT

Adjustment of Needle Bar Height

The correct distance between the throat plate seat and the needle screw with the needle bar at its highest point is 27.20 mm.

To adjust the needle bar height, loosen the throat plate screw B, Fig. 20 and slide open the throat plate. Then an auxiliary needle plug should be made by cutting the point section of a heavy needle. The length of this needle plug should equal the above specified distance minus the thickness of the throat plate.

Insert the auxiliary needle plug into the needle bar and secure it with needle screw. Slightly loosen the needle bar connecting stud screw with a screwdriver through the access hole A, Fig. 20, in the rotary take-up guard. Then make adjustment so that there is no clearance between the auxiliary needle plug and throat plate seat when the needle bar is at its lowest point. Tighten the needle bar connecting stud screw after adjustment. Close the throat plate.

Caution: Whenever needle bar height has been reset, check needle-to-hook timing.

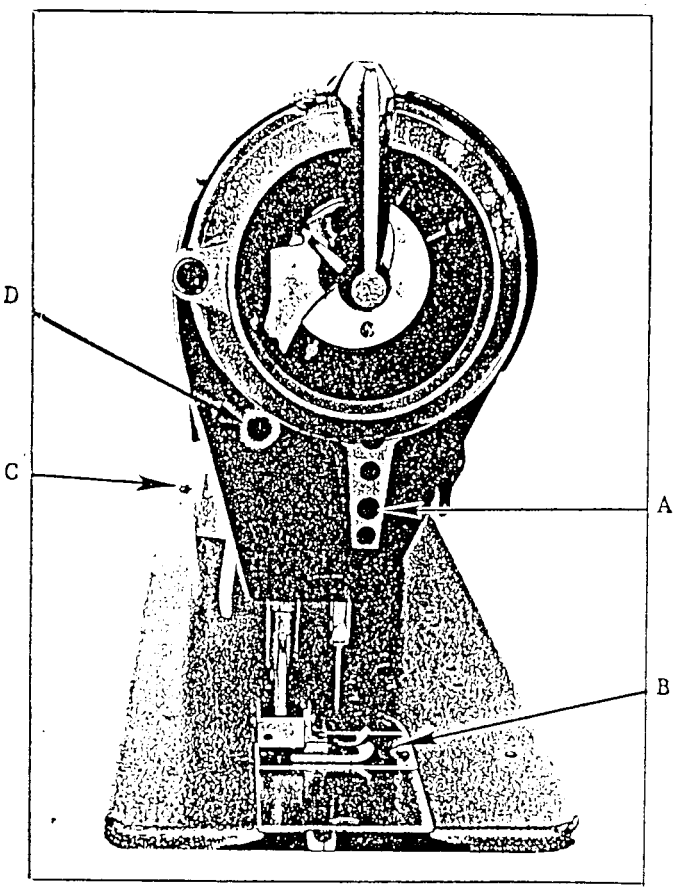


Fig. 20

Adjustment of Presser Bar

To align the presser foot with the needle, first lower the feed dog below the top surface of the throat plate. Lower the presser foot and loosen the presser bar position guide pinch screw D, Fig. 20 with a screwdriver through the opening in the face plate. Set the presser foot at correct position and tighten the pinch screw. The presser bar lifter must be adjusted so that a presser bar lift of 6.40mm (1/4 in.) will be obtained.

Hook Timing

Adjustment of hook timing should be made after final adjustment of the needle bar height. A new needle should be used for adjustment of hook timing.

Set the bight at "0". When the timing mark A, Fig. 21, provided on the face plate is aligned with the timing mark B provided on the rotary take-up, the hook point shown in Fig. 22 must be in alignment with the center line of the needle.

To adjust hook timing, remove the presser foot, throat plate, feed dog and bobbin case. Make certain that the needle bar height is correctly set. Insert a new needle into the needle bar, loosen two set screws in the hub of the hook and while holding the machine pulley (with the timing mark aligned with each other), rotate the hook until the hook point is at the center line of the needle. Tighten the hook set screws after adjustment. Check the clearance between the hook point and needle at the maximum stitch width.

Caution: Hook point should be as close to the needle as possible without rubbing the needle.

The function of the needle guard is to prevent the hook point from being damaged when the needle is deflected into the path of the hook point. Whenever the hook has been replaced, check the needle guard for proper adjustment. If any adjustment is required, this can be made by bending the guard as required with a screwdriver without upsetting the location of the hook.

The needle should be set so as to lightly rub the needle guard B, Fig. 22 without deflection.

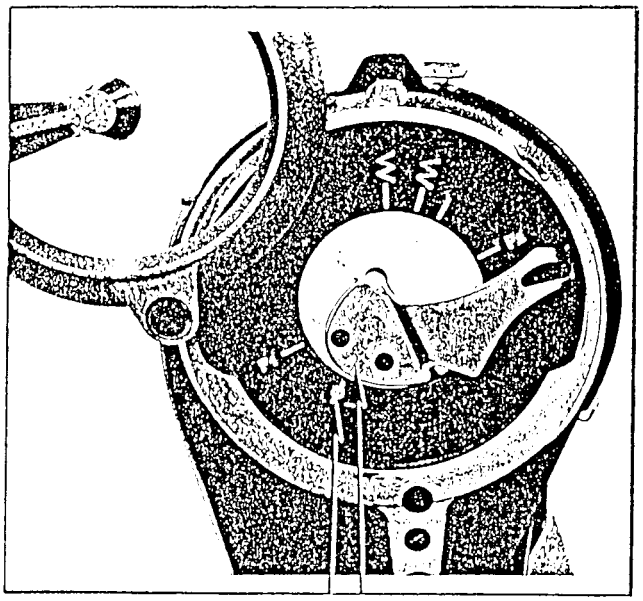


Fig. 21

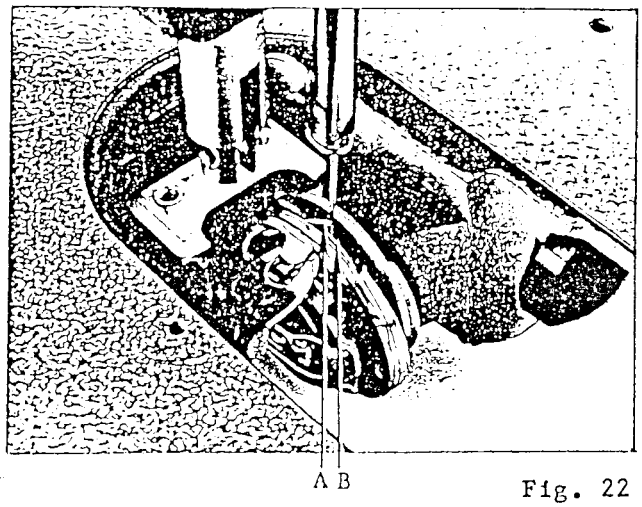


Fig. 22

Adjustment of Feed Mechanism

1. Adjustment of feed dog position (front to back, left and right direction)

   When the feed dog is not centered in the throat plate slot, loosen the feed driving rock shaft crank pinch screw D, Fig. 23 and set the feed dog at the enter of the throat plate slot. Tighten the pinch screw D after the feed dog has been centralized in the throat plate slot.

2. Adjustment of feed dog height

   To adjust the height of the feed dog, loosen the feed bar pinch screw A, Fig. 23 and turn the feed bar lifting hinge pin B, Fig. 23 clockwise or counter-clockwise until the feed dog is positioned 1.0 - 1.1mm above the top surface of the throat plate.

   To allow elliptical motion of the feed dog, the indicator line provided at the head of the hinge pin B must be facing the throat plate.

3. Adjustment of parallelism of the feed dog

   To adjust the parallelism of the feed dog in relation with the top surface of the throat plate, loosen two hinge pin screws C, Fig. 23 and turn the hinge pin E clockwise or counter-clockwise as required. Tighten the hinge pin screws C after adjustment.

   For normal sewing condition, the feed dog should be set so that all the teeth of the feed dog will rise to an equal height above the throat plate when the feed dog is at its highest position and parallel to the top surface of the throat plate.

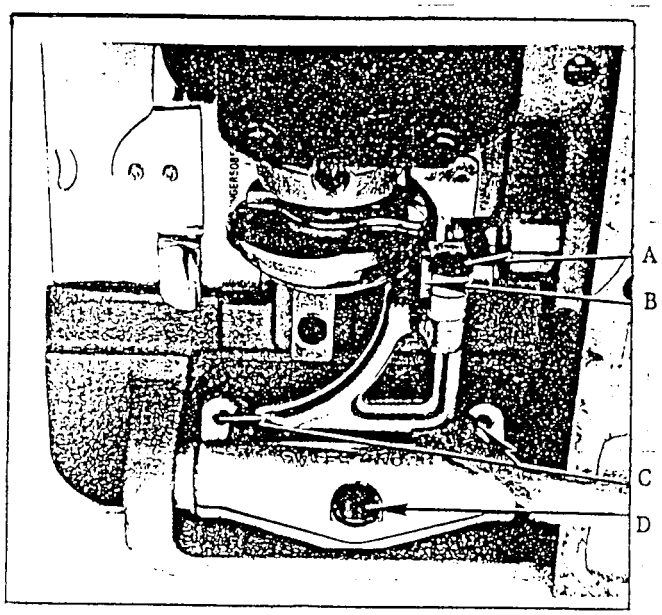


Fig. 23

4. Adjustment of feed timing

When the timing mark B, Fig. 24 on the rotary take-up is aligned with the timing mark C, Fig. 24 on the face plate, the timing mark A, Fig. 25 on the feed cam must be aligned with the timing mark B, Fig. 25 on the feed connection link. When these timing marks are out of alignment, loosen the bed shaft connection belt pulley set screw and align the timing mark with each other. Then tighten the set screw.

5. Adjustment of zero feed position

There should be no feeding in both forward and reverse when the machine is set for zero feed.

To adjust the zero feed position, turn the feed regulating screw E and F, Fig. 18 until the stitch length pointer is aligned with the graduation at the mid-point of stitch length indicator D, Fig. 18. Loosen the feed regulating connection shaft crank screw C, Fig. 25 and move the feed carrier E, Fig. 25 until zero feed is obtained. Tighten the screw C after adjustment.

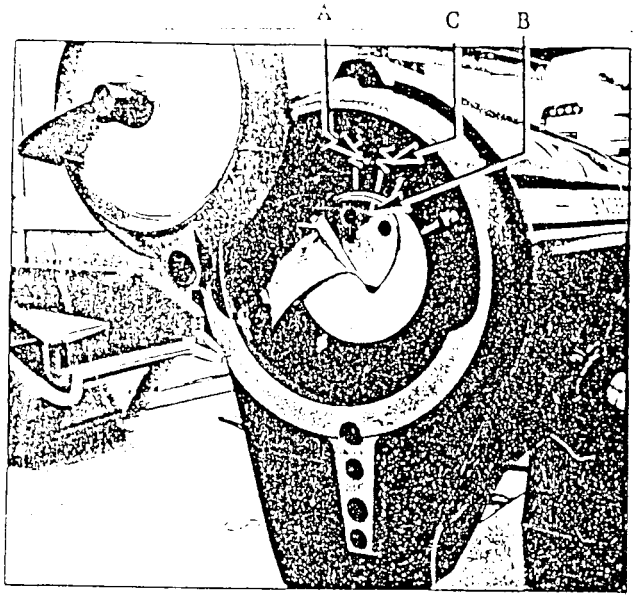


Fig. 24

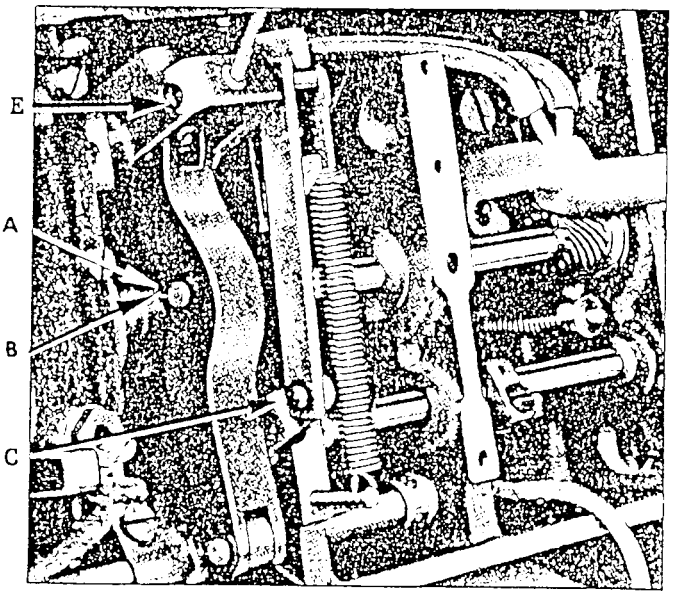


Fig. 25

Adjustment of Needle Bar Vibrating Mechanism

Remove arm cover (front), arm cover (back) and arm cover (top).

1. Removal and replacement of zigzag cam

   First align the timing mark D, Fig. 27 with the direction of the screw B and remove or replace zigzag cam. After exchanging the cam, make certain that there is no noticeable clearance between the roller and the cam by rotating the cam by hand.

   When there is an excessive clearance, adjust the position of the roller in relation to the cam by loosening the nut C and turning the screw B clockwise. Tighten the nut C after djustment.

2. Adjustment of needle bar timing

   The machine must be adjusted so as to minimize the sidewise movement of the needle while it is in the fabric when the machine pulley is turned with the machine set for maximum stitch width. Also, the sidewise movement of the needle when it is about to enter the fabric, must be held down to a minimum.

   When there is an excessive sidewise movement of the needle, loosen the set screw for the zigzag cam A, Fig. 27 and turn the zigzag cam until the excessive sidewise movement is eliminated. Then tighten the set screw.

3. Adjustment of bight

   The machine must be capable of producing the specified maximum stitch width of 8mm when the machine pulley is turned with the machine set for maximum stitch width. When the stitch width of 8mm cannot be achieved, make adjustment by means of the stop screw C, Fig. 26 (the one shown on left side).

Note: For blind stitch, the stitch width becomes 5mm when set for the maximum bight.

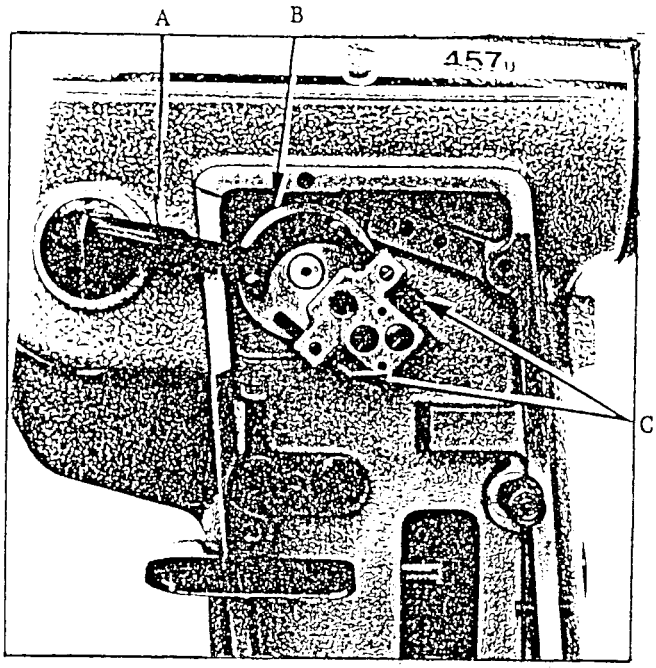


Fig. 26

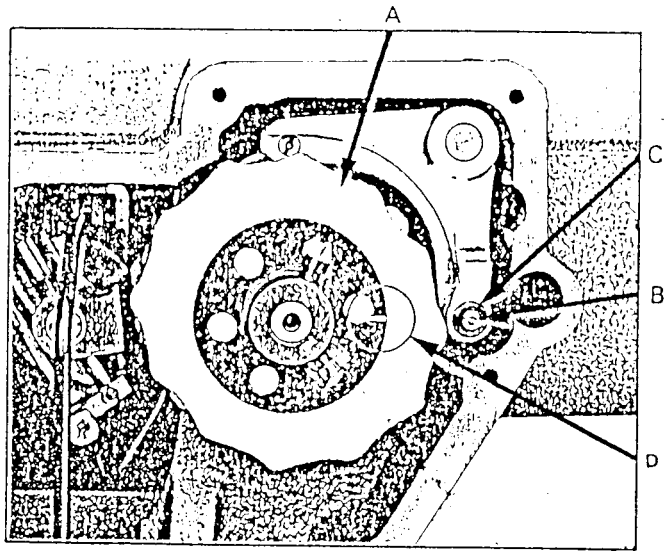


Fig. 27

4. Adjustment of needle position

When the machine pulley is turned with the machine set for the maximum bight of 8mm, the needle lacation should be centralized in the throat plate slot. If the needle location is out of center, loosen the screw for the needle bar yoke connecting link driving lever A, Fig. 28 and move the lever A upward when the needle location is off center as illustrated in the sketch (1) below, and move the lever downward when the needle location is off center as illustrated in the sketch (2) below.

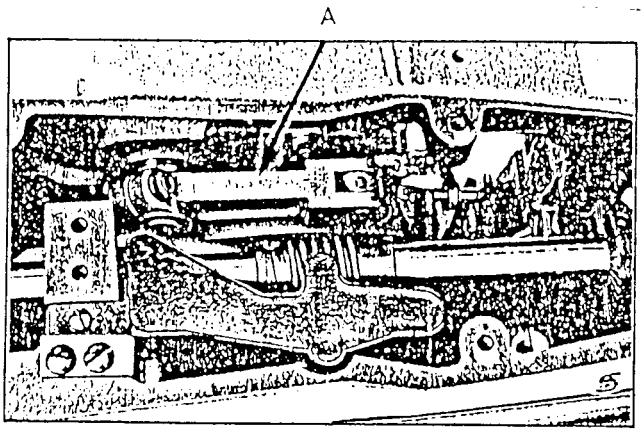


Fig. 28

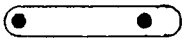
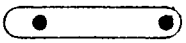
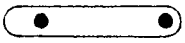
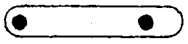
	(1)	(2)
Right Needle Position		
Left Needle Position		

Fig. 29

Adjustment of Needle Bar Yoke Connection Link

Adjustment of needle location

When the machine pulley is turned with the machine set for maximum bight, there should be a clearance of more than 0.5mm between the needle and the edge of the throat plate slot in the direction of the needle movement.

When the clearance is less than the above, loosen the screw for the needle bar yoke connecting link hinge bearing A, Fig. 30 and move the needle bar frame to left or right as required. When the specified clearance has been obtained, tighten the screw.

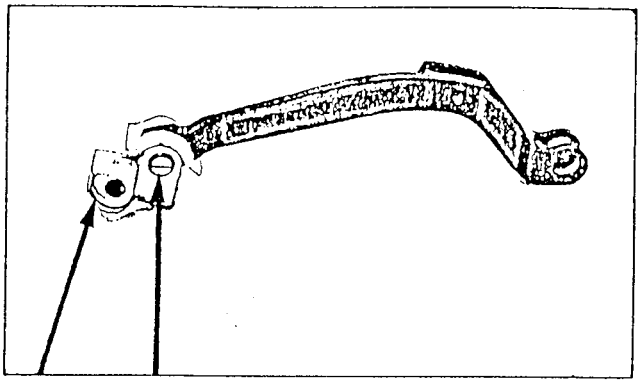


Fig. 30

Fine adjustment of needle location

Fine adjustment of needle location is available when so desired. This can be done by turning the needle bar yoke connecting link hinge bearing stud (eccentric) B, Fig. 30 as required with a screwdriver through the access hole B, Fig. 31.

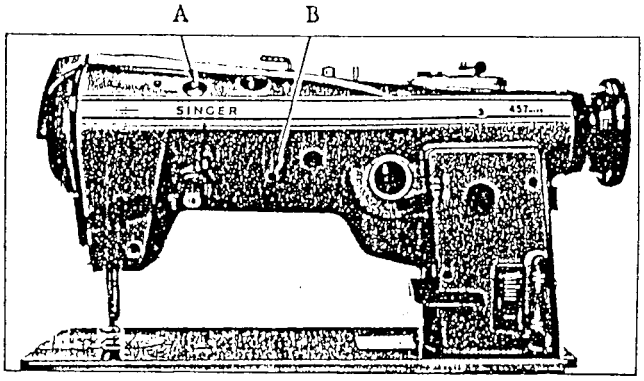


Fig. 31

Replacint The Timing Belt

Remove the needle to avoid damage to the hook prior to exchanging belt. Tilt the machine back and slide belt off the lower pulley. Loosen two screws in the machine pulley and remove the machine pulley together with ball bearing from the arm shaft. Lift the belt up and draw it around the arm shaft through the space for ball bearing.

Insert a new belt through the space for ball bearing. After placing the belt over the upper pulley, replace the machine pulley together with ball bearing. Pinch tighten the set screws in the machine pulley, and top the machine pulley into position with the palm of hand to eliminate end play. Secure the machine pulley by tightening the set screws firmly.

Place the other end of the belt over the lower pulley after aligning the timing mark B, Fig. 24 on the rotary take-up with the timing mark C, Fig. 24 on the face plate, and also aligning the timing mark A, Fig. 25 on the feed cam with the timing mark B, Fig. 25 on the feed connection link.

Adjustment of Tension Releaser

Tension on the thread (pressure applied by tension discs) is automatically released when the presser foot is raised by operating the presser bar lifter.

It is possible to advance or retard the activation of the tension releaser by adjusting the regulating screw C, Fig. 32.

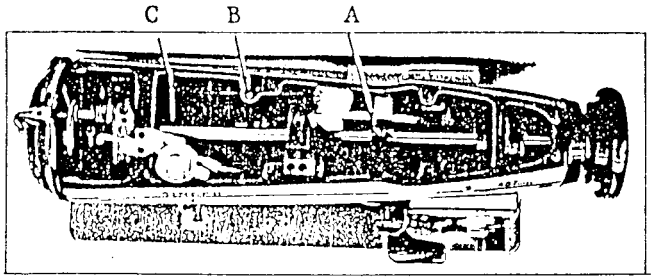


Fig. 32

Adjustment of Needle Bar Yoke

The front to back movement of the needle bar yoke can be adjusted by means of the needle bar guide studs C and D, Fig. 33 which are positioned near the needle bar bushing (lower) and held in place with locking screws. The needle bar yoke can be adjusted with the guide studs so as to operate freely in line with the needle bar connecting stud and link.

The needle bar guide stud (rear) D, Fig. 33, needle bar connecting stud guide block A, Fig. 33 and needle bar connecting link guide block B, Fig. 33 are factory setting and therefore, no change should be made to these settings

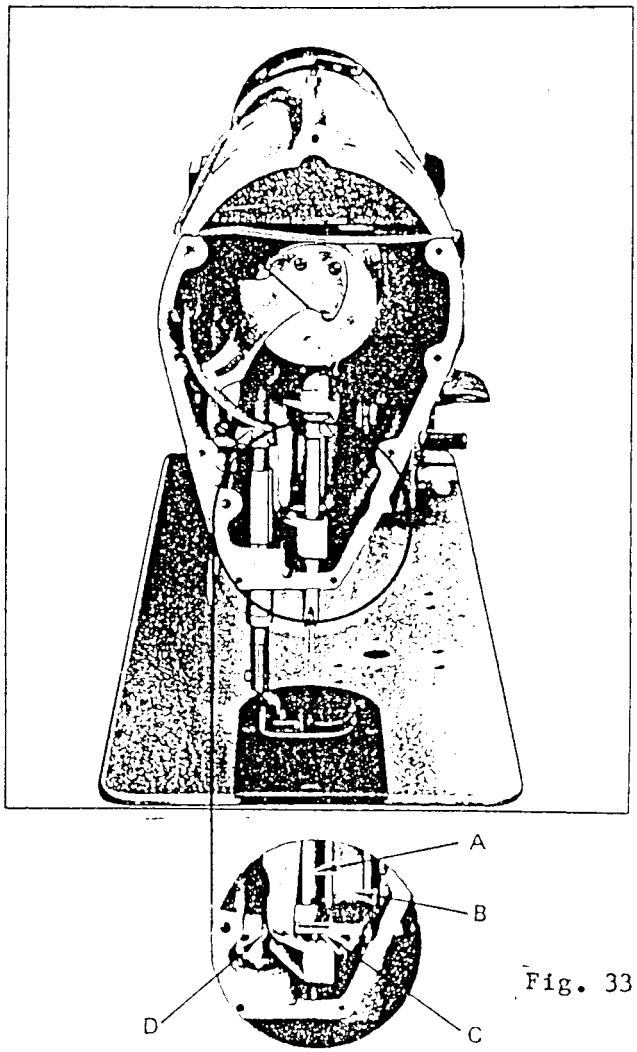


Fig. 33

TROUBLE SHOOTING GUIDE

Listed below are common sewing difficulties and possible causes thereof. These problems can be overcome by following the instructions contained in this manual.

A. Needle thread breaks.

1. Thread take-up lever unthreaded.
2. Thread wound on rotary take-up only once.
3. Pre-tension unthreaded.
4. Thread take-up lever tangled with lint.
5. Needle point damaged or needle is bent or set incorrectly.
6. Check spring not properly adjusted.
7. Thread is wrong size for needle. Thread is old or too weak.
8. Insufficient lubrication to hook.
9. Nicks or burrs in surfaces over which thread passes (hook, throat plate, etc)
10. Hook not properly adjusted.

B. Uneven seams

1. Needle thread and bobbin thread tension not properly balanced.
2. Bobbin thread tension not uniform due to bobbin, bobbin case or bobbin case holder being deformed or dirty.
3. Check spring not correctly adjusted.
4. Needle point is blunt or damaged.

C. Poor feeding of material

1. Presser foot pressure insufficient.
2. Teeth of feed dog dirty or set too low.

D. Skipping stitches

1. Needle is bent.
2. Needle improperly set into needle bar.
3. Wrong needle is used.
4. Needle is too small for thread being used.
5. Wrong thread size.
6. Machine threaded incorrectly.
7. Hook damaged or out of timing.
8. Needle deflects rubbing needle guard.
9. Check spring not properly adjusted.