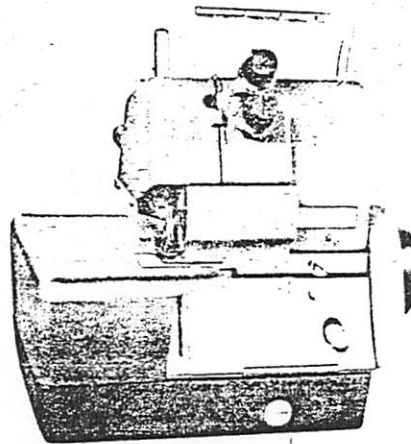


INSTRUCTION MANUAL
FOR
BROTHER EF4-B959



Twin Needle Overlock Sewing Machine

BROTHER INDUSTRIES, LTD.
NAGOYA JAPAN

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Brother Overlock Stitcher Model EF4-B959

The EF4-B959 is an automatically lubricated high-speed straight two needle overlock sewing machine of modern design. The new overlock stitcher boasts unsurpassed performance in providing perfect and beautiful overlock stitches for fabrics of all kinds and thicknesses, stockinet, suiting, broadcloth, jersey, etc. of cotton, wool, silk, rayon, nylon or other synthetic fibers. Not only is it dependable and versatile, the machine is guaranteed of complete parts interchangeability.

Features

1. Easy adjusting of looper timing assures even and uniform stitch-formation.
2. Feed pitch can be adjusted quickly and easily within a wide range of 1 mm to 6 mm by means of the graduated main and sub feed levers.
3. Differential feed can be adjusted to stretching or shirring as desired according to the kind of fabric.
4. Lubricating oil is supplied by a powerful pump to all major moving parts for smooth operation even at high speeds.
5. Mock safety stitch can easily be obtained by changing the cover looper.
6. Duralumin is used to lessen the load on the looper mechanism, so that the loopers always operate nice and smooth without accompanying undue temperature rise or noise even when the machine is running at high speeds.
7. The modern functional design helps brighten the workshop atmosphere and improve work efficiency.
8. Design registration and utility model applied for.

INSTALLING THE MACHINE

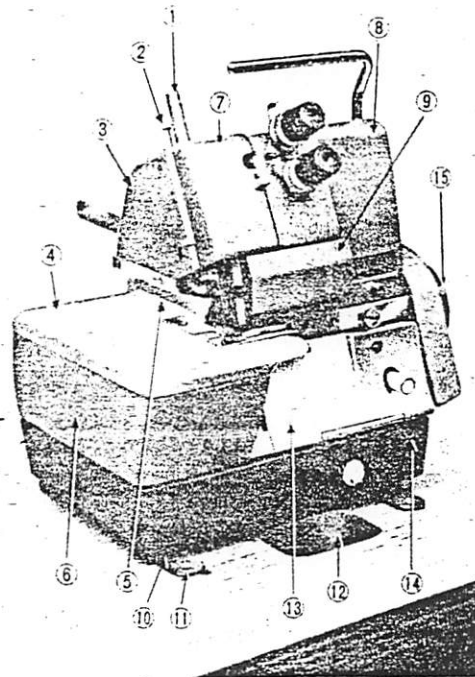


Fig. 1

1. Needle bar cap
2. Presser adjusting screw
3. Presser foot lifter lever cover
4. Cloth plate
5. Cloth guide
6. Cloth plate cover
7. Needle bar cover
8. Top cover
9. Upper knife cover
10. Cushion
11. Screw
12. Waste hole
13. Front cover
14. Oil pan
15. Arm pulley

Place the machine on the power table, making sure that it is properly positioned in relation to the belt and waste holes.

Fasten the machine feet to the table securely with screws at four places.

(Fig. 1)

See Fig. 2 for the arrangement of the machine, belt hole, waste hole, and presser lifter chain hole.



Fig. 2

Then fasten the pedal securely to the floor with screw; and connect the presser foot lifter lever to the pedal by means of the chain.

Adjust the chain to optimum length by hitching the small hook to an appropriate ring in the chain. (Figs 3 & 4)

Make sure that the chain is so adjusted that when the pedal is released the presser foot lifter lever is all the way up for the proper operation of the presser foot.

Belt tension can be adjusted by raising or lowering the motor. Press the belt with your thumb at mid point between the machine pulley and the motor pulley; and if it gives in 2~3mm. belt tension is right.

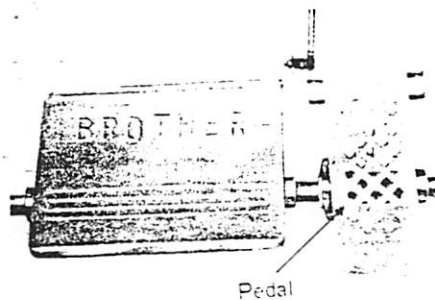


Fig. 3

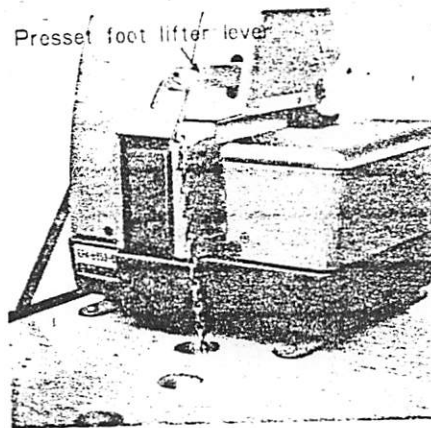


Fig. 4

PULLEY'S OPERATING DIRECTION

The normal operating direction of the pulley is clockwise as viewed from the pulley side.

BREAKING-IN

Although this machine operates at speeds up to 4,200 stitches per minute, a speed of about 3,800 stitches per minute is recommended for the first 200 hours (about one month). Bearings, cranks and sliding parts will have been well run in by this time. Then operate the machine at the normal sewing speed.

Following this practice will reduce troubles and extend machine life.

OILING

All oil is drained out before the machine is shipped out of the factory. Be sure to oil your machine before operating it for the first time.

Open the cloth plate; and pour oil into the oil cup until it reaches the reference line in the oil gauge on the front of the machine.

(Figs 5 & 6)

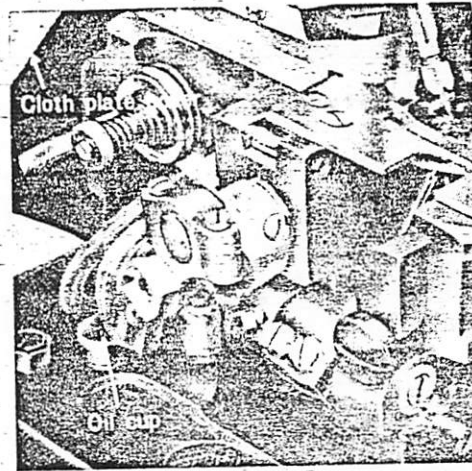


Fig. 5

Oil level must always be between the reference line and bottom of the oil gauge.

About 400cc of oil fills the tank. Pure mineral oil with a Saybolt viscosity of 140 seconds (at 30° C) is recommended.

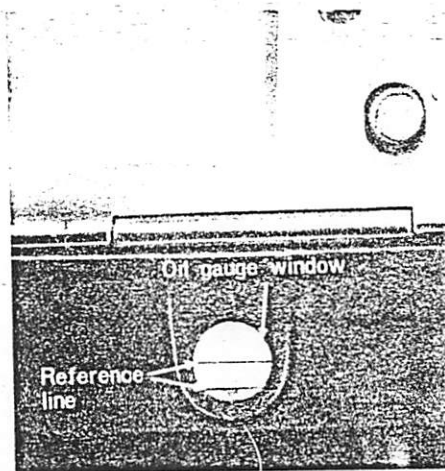


Fig. 6

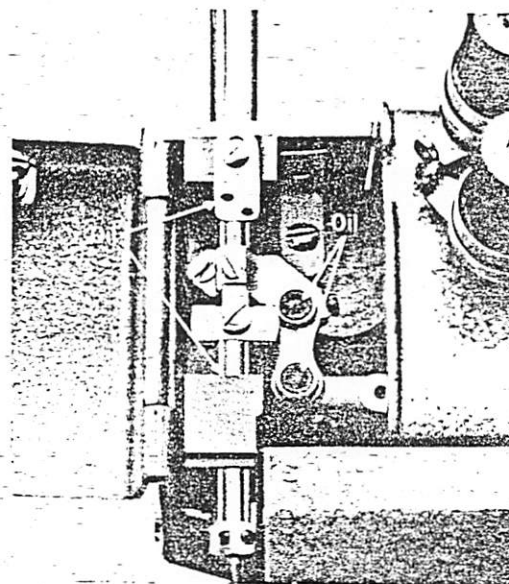


Fig. 7

In addition to filling the oil tank, supply oil to the needle bar, needle bar link and looper links.

(Figs 7 & 8)

At the end of the first 200 hours of operation, change old oil in the tank for fresh oil. Thereafter, change tank oil from time to time as required, depending on the degree of oil contamination.

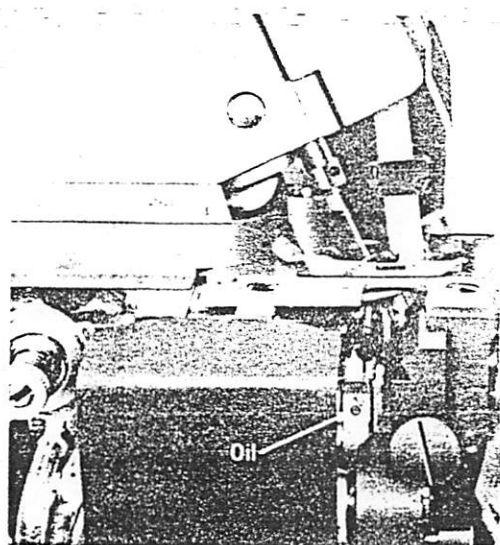


Fig. 8

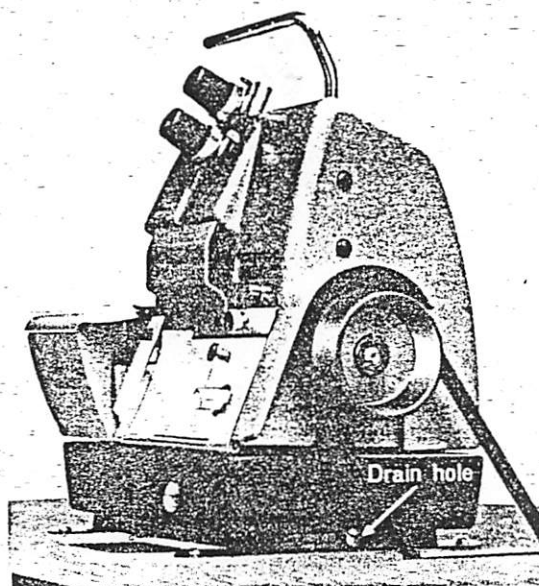


Fig. 9

To draw oil out of the tank, remove the screw in the drain hole under the pulley. (Fig. 9)

NEEDLES

Use DCxT needles for the EF4-B959. Available sizes are: #7, #8, #9, #11, #14, #16, #18, #19, and #21.

Choose the correct size needle for the thread being used. Thread must easily pass through the needle eye for good sewing performance.

REMOVING THE NEEDLE

Turn the pulley until the tip of the needle comes to the needle plate; loosen the needle clamp nut by turning it counterclockwise, using the accessory wrench. Turn the pulley again until the needle bar is up highest; and pull out the needle downward. (Fig. 10)

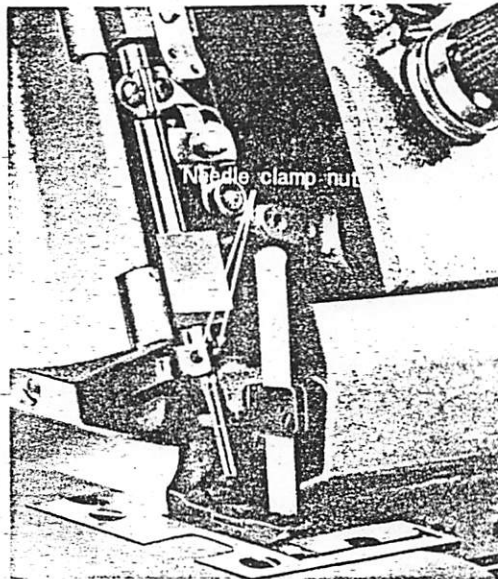


Fig. 10

INSTALLING THE NEEDLE

Turn the pulley until the needle bar is up highest. Hold the needle with its long groove facing yourself; and insert the needle into the needle bar all the way up. Turn the pulley until the tip of the needle comes down to the needle plate; and tighten the needle by turning the needle clamp nut clockwise with the accessory wrench. (Fig. 10)

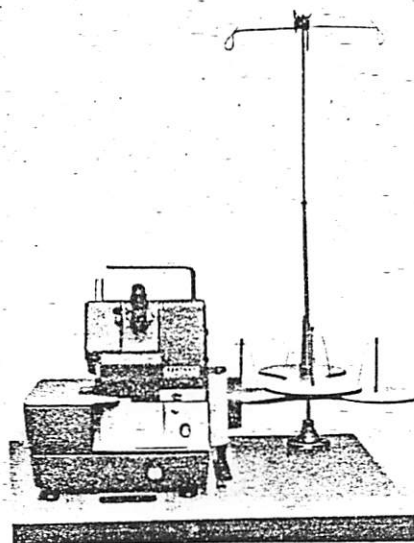


Fig. 11

SPOOL STAND

Use a three-spool stand. Fasten it securely to the proper position on the table with screws.

(Fig. 11)

THREADING

Use of the accessory pincette will make it easier for you to thread the thread guide and loopers.

THREADING THE OVERLOOPER

First, open the front cover. Lead the overlooper thread from the spool stand through the thread guide and the looper thread guide to the tension discs, pass the thread between the tension discs from right to left and into the hole of the overlooper thread guide.

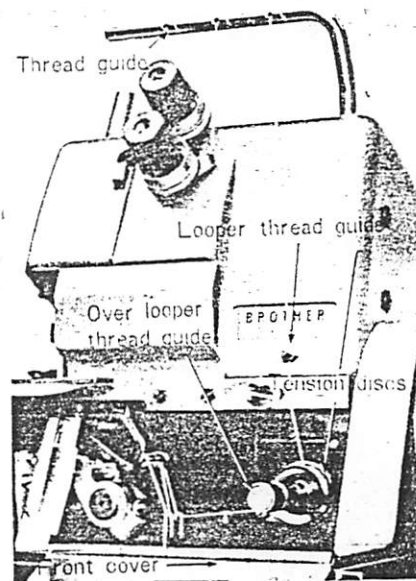


Fig. 12

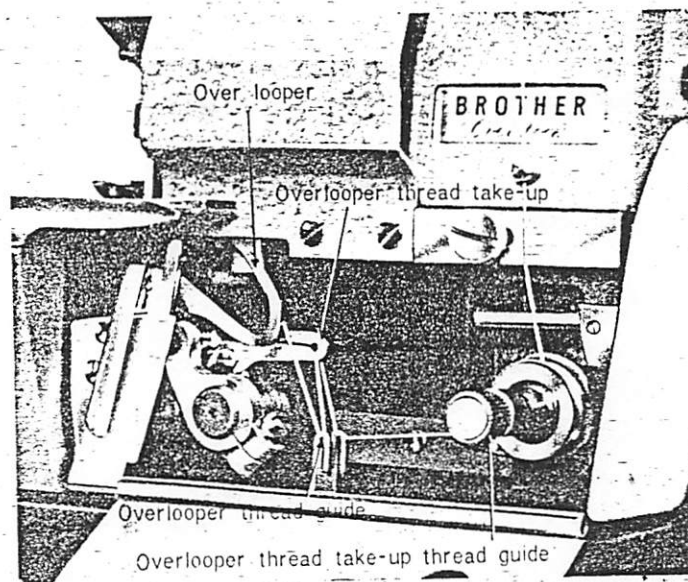
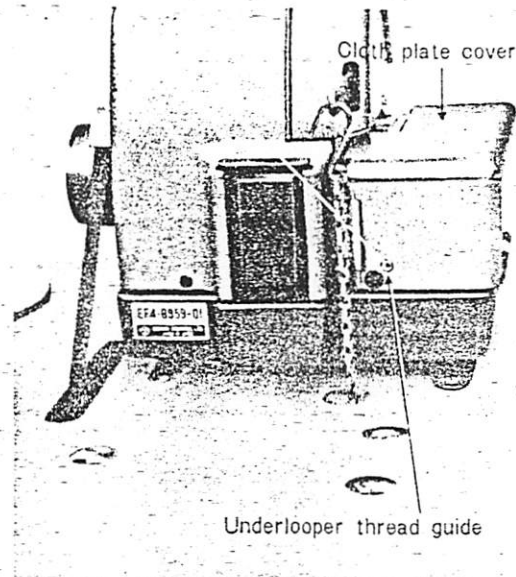


Fig. 13

Then turn the pulley until the overlooper is at its right extremity.
 Pass the thread through the overlooper thread guide, overlooper thread
 take-up and then the overlooper, making sure about 5cm of thread is out
 from the overlooper.

THREADING THE UNDERLOOPER



Guide the underlooper thread from the spool stand through the looper thread guide and the underlooper thread guide into the inside of the cloth plate cover.

(Fig. 14)

(For better thread tension, mount a U-hook on the table as a thread guide and pass the thread through it before leading the thread into the underlooper thread guide.)

Fig. 14

Open the cloth plate cover, pass the thread under the underlooper thread tension guide, then between the tension discs from above, and into the underlooper thread guide tube. (Fig. 15) Turn the pulley until the needle bar is up highest; and pass the thread through the underlooper thread take-up. (Fig. 15)

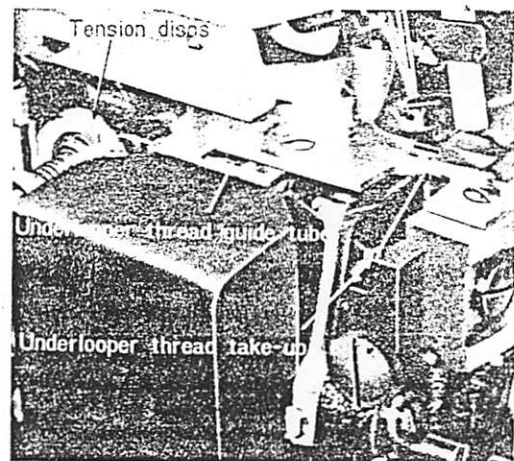


Fig. 15

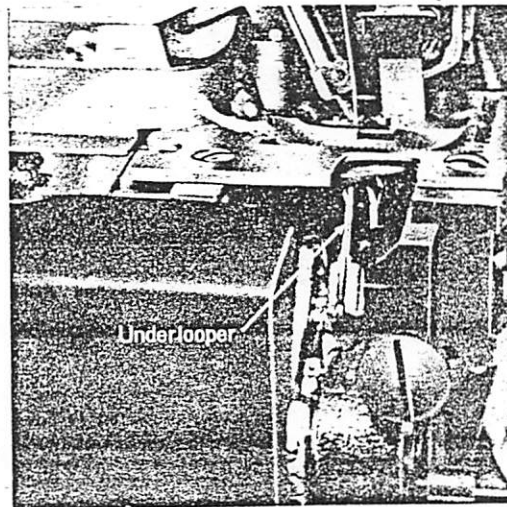


Fig. 16

Bring the underlooper to its left extremity (Fig. 16); and lead the thread into the hole in the underlooper. See that about 5cm of thread is out from the underlooper.

THREADING THE NEEDLE

First, open the needle bar cover. Turn the pulley until the needle is up highest. Guide the needle thread from the spool stand first to the thread guide; then into the upper hole of the needle thread guide; then between the ten-

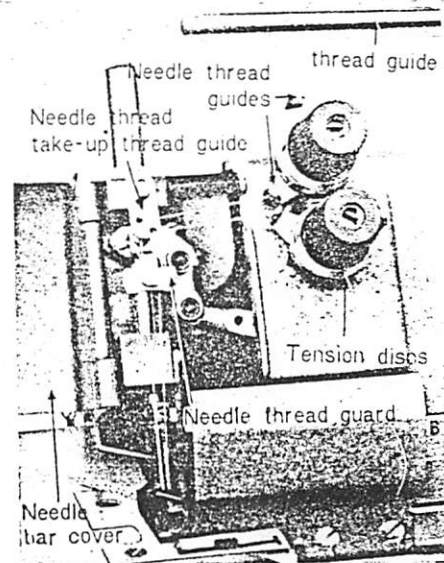


Fig. 17

sion discs from right to left; and into the left hole of the needle thread guide. Pass the thread through the hole in the needle thread take-up thread guide; then through the needle thread guard; and into the needle eye from your side toward the farther side of the table. See that about 5cm of thread is out from the needle eye. (Fig. 17)

TESTING WITHOUT FABRIC

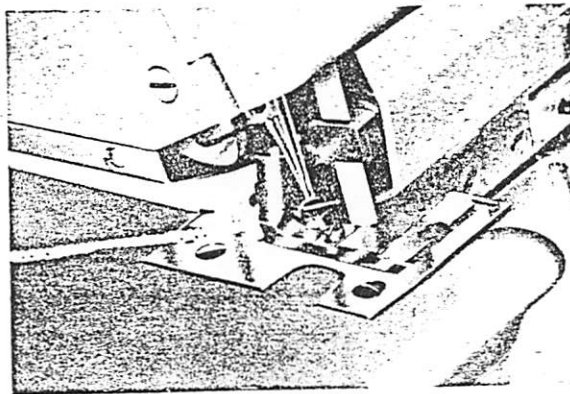


Fig. 18

After the threading, run the machine slowly by operating the treadle; and see that a chain of thread runs out toward the farther side of the table. (Fig. 18)

Note: If the tensions of the four threads are ill-balanced, the machine may not produce a good chain.

THREAD TENSIONS

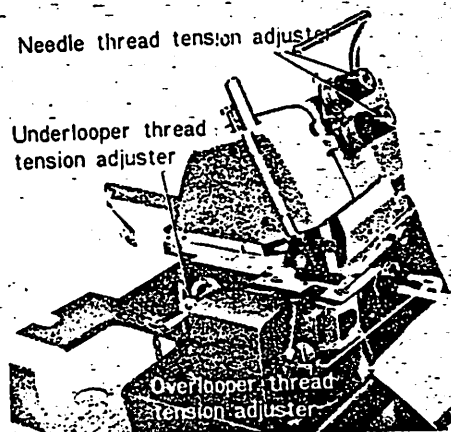


Fig. 19

The tensions of the needle and looper threads are adjusted by means of four tension adjusting thumb screws.

(Fig. -19)

The needle thread tension adjuster uses a strong-tension spring and the overlooper and underlooper tension adjusters a weak-tension spring.

Thread tension can be adjusted either to the 3-thread tight stitch (Fig. A), in which the needle thread has strong tension and the overlooper and underlooper threads are tied along the edge of a cloth, or to the 3-thread purl on the edge stitch (Fig. B), in which the needle thread has weak tension and extends to the edge of a cloth as it is tied with the overlooper and underlooper threads along the edge. These adjustments can easily be accomplished by means of the tension thumb screws.

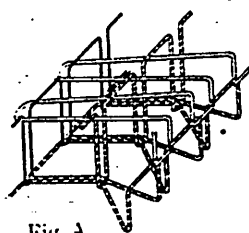


Fig. A

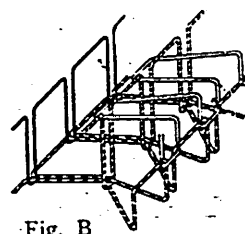
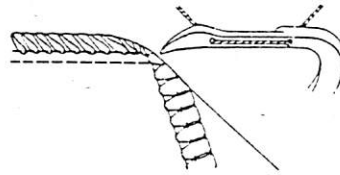
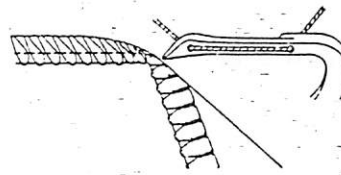


Fig. B

Mock safety stitch

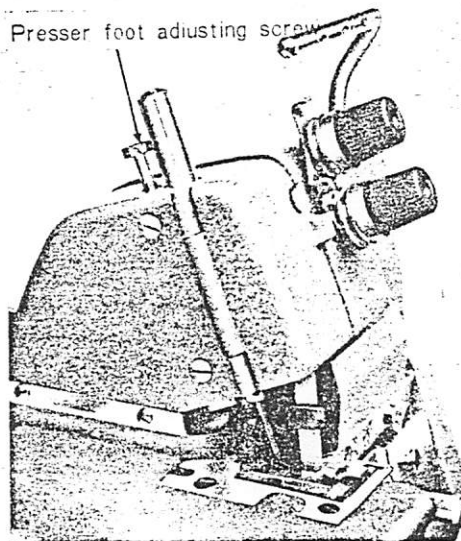


Twin needle overlock stitch



PRESSER FOOT PRESSURE

Presser foot adjusting screw



Presser foot pressure is adjusted by turning the presser foot adjusting screw.

(Fig. 20)

Although the presser foot must have enough pressure for proper feeding, it is advisable that the pressure be kept as small as permissible for high-speed operation.

Fig. 20

STITCH AND DIFFERENTIAL FEED

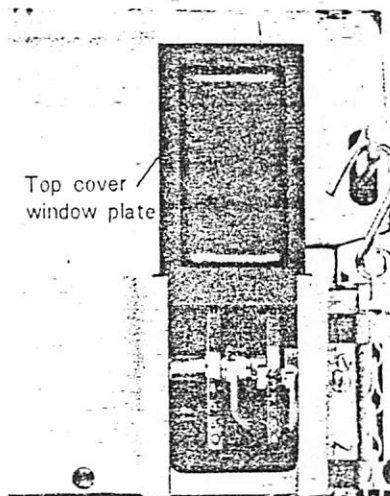


Fig. 21

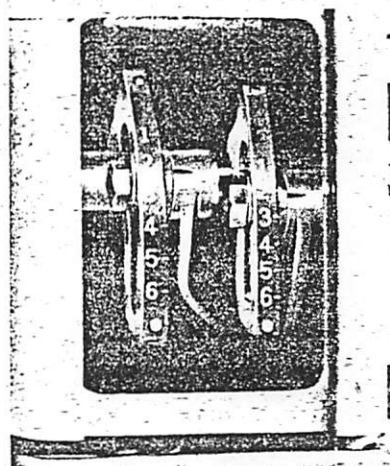


Fig. 22

When changing the stitch pitch or differential feed, first remove the top cover window plate by pulling it upward. (Fig. 21)

Of the two graduated and numbered levers inside the top cover window, the left one is the main feed lever, which controls the main feed dog, and the right one is sub feed lever, which controls the sub feed dog. (Fig. 22)

The numbers on these levers represent the extent of motion of the respective feed dogs. That is, they can be adjusted within a range of 1mm to 6mm.

To adjust the stitch pitch, first loosen the nuts on the side of the respective feed levers; move the levers until your desired numbers are in line with the red marks; and then re-tighten the nuts.

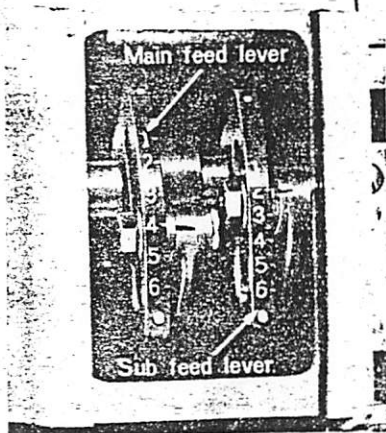


Fig. 23

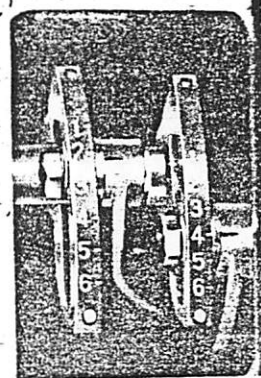


Fig. 24

STRETCHING

In this case, the sub feed lever's number must be smaller than the main feed lever's.

Cloth will be sewn stretched -- without gathering -- straight and beautiful. (Fig. 23)

SHIRRING

In this case, the sub feed lever's number must be larger than the main feed lever's.

Cloth will be sewn shirred -- without stretching -- straight and beautiful. (Fig. 24)

Set the levers to your desired differential feed according to the kind of fabrics.

STITCH WIDTH

Stitch width can be changed by adjusting the knives' cutting width and the stitch tongue of the presser foot. Standard stitch width is 5mm, and needle gauge is 2.2mm.

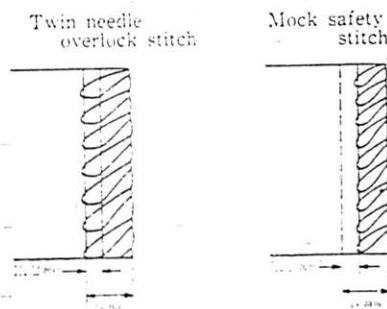


Fig. 25

To adjust the knives' cutting width, loosen the lower knife holder set screw and turn the lower knife holder adjusting screw as required.

Turning the adjusting screw clockwise (as viewed from the left side of the machine) increases the cutting width; and turning it counter-clockwise narrows it. (Fig. 25)

Cutting width (from the needle to the edge of cut cloth) can be adjusted within a range of 1.5mm to 5mm.



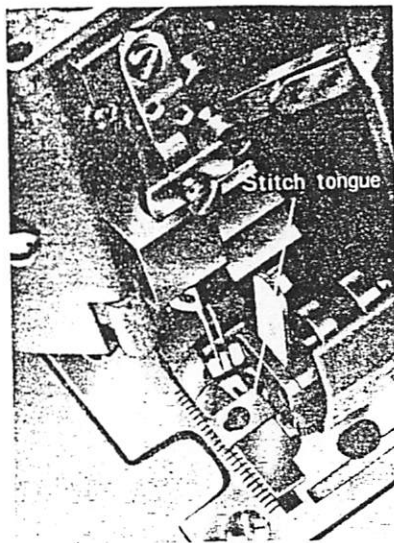


Fig. 26

To adjust the stitch width, first adjust the knives' cutting width and then mount the presser foot stitch tongue close to the upper knife. (Fig. 26)

Stitch width widens as the stitch tongue is moved rightward; and it narrows as the stitch tongue is moved leftward.

The correct stitch tongue position varies depending upon the knives' cutting width and the thickness and kind of fabric.

Actually sew the fabric to determine its correct position. The standard stitch tongue allows stitch width adjustment within a range of 3mm to 5mm.

Stitch tongue for 2.5mm stitch width is also available as an optional accessory.

ASSEMBLING AND ADJUSTING

To adjust or replace machine components, first open the cloth plate cover and the front cover; and then remove the upper knife cover; upper and lower knives; looper cover; presser foot; needle plate; cloth guide; overlooper crank cover; upper cover; needle bar cap; presser foot adjusting screw; and the assembly of presser lever cover and needle bar cover, in the order mentioned.

NEEDLE HEIGHT AND NEEDLE BAR STROKE

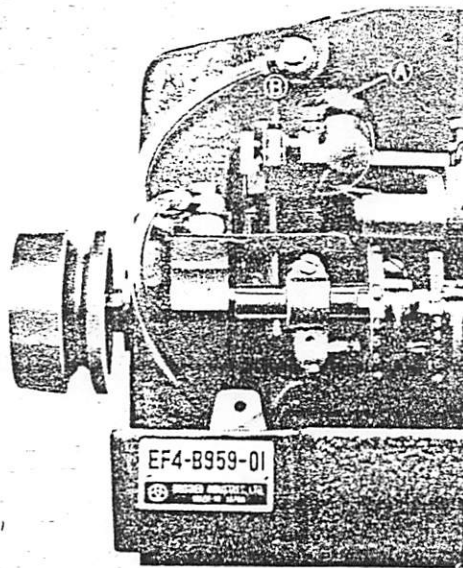


Fig. 27

Loosen the set screw (A) (Fig. 27) for the needle bar operating lever ball joint; and move the ball joint (B) (Fig. 27) in or out so that needle bar stroke is 25mm. Re-tighten the screw with wrench.

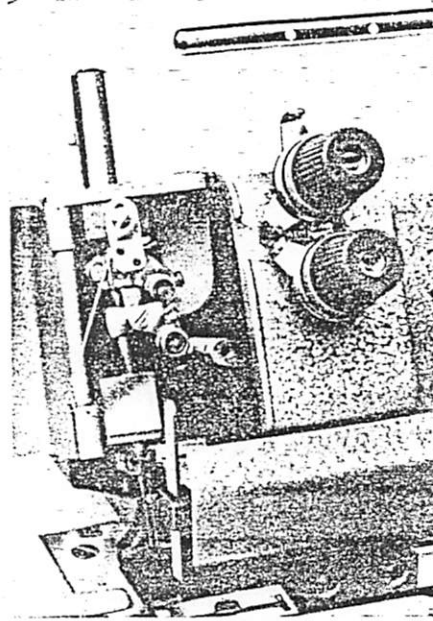


Fig. 28

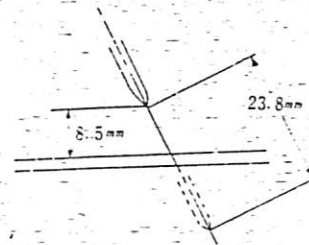


Fig. 29

Then mount the needle plate in place.

Turn the pulley until the needle bar is up highest. Loosen the needle bar clamp screw (A) (Fig. 28); and adjust the needle bar height so that it is 8.5mm from the top surface of the needle plate to the tip of the needle. (Fig. 29)

After the adjustment, re-tighten the needle bar clamp screw securely.

RELATIVE POSITIONS OF THE OVERLOOPER AND UNDER- LOOPER

Turn the pulley by hand in the normal operating direction, and see that when the overlooper crosses the underlooper the tip of the overlooper has just enough clearance to be free from contact with the swollen tip of underlooper. (Fig. 30)

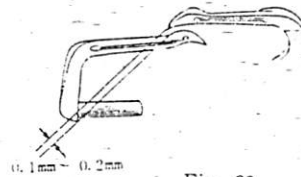


Fig. 30

The clearance can be adjusted by loosening the underlooper adjusting lever screw (B) (Fig. 31) and moving the under looper to the left or right. Be sure to re-tighten the underlooper adjusting lever screw (B) (Fig. 31) securely after making adjustments.

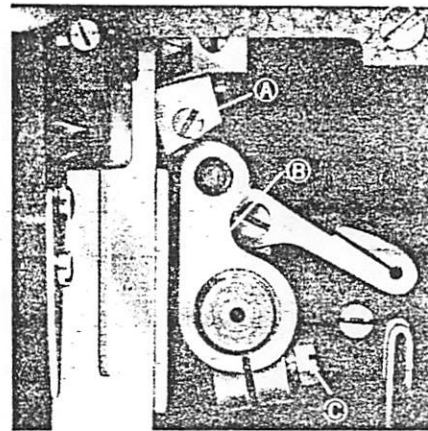


Fig. 31

THE OPERATING DISTANCES OF THE LOOPERS

Turn the pulley by hand and check the operating distances of the looper.

1. The distance from the center of the needle to the tip of the underlooper in its leftmost position should normally be 3.5mm. (Fig.32)

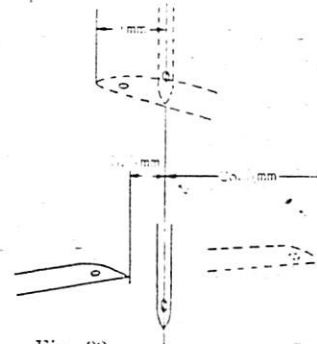


Fig. 32

2. The distance from the center of the needle to the tip of the overlooper in its leftmost position should normally be 9mm. (Fig. 32)

3. To adjust the operating distances of the looper, first loosen two set screws (A) (Fig. 33) for the overlooper lever and then set the underlooper to the standard distance given in paragraph 1.

4. Next, turn the pulley and check the overlooper if it has the correct clearance with the needle as mentioned in paragraph 2. If the clearance is smaller than 9mm loosen the overlooper crank ball joint set screw (B) (Fig. 33) and move the overlooper crank ball joint to the right. If the clearance is larger than 9mm, move the same ball joint to the left.

Then again make the adjustment mentioned in paragraph 3 and the inspection mentioned in paragraph 2.

If the above-mentioned adjustments have been made properly, the distance from the center of the needle to the tip of the underlooper in its rightmost position should be about 28.5mm.

Upon completion of the adjustments, be sure to re-tighten the overlooper crank ball joint set screw (B) (Fig. 33) and the overlooper lever set screw (A) (Fig. 33) securely.

- (a) Loosen screw (A) and adjust overlooper lever.
- (b) Loosen screw (B) and adjust ball joint.

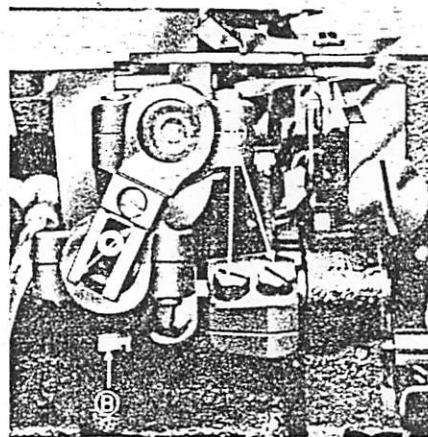


Fig. 33

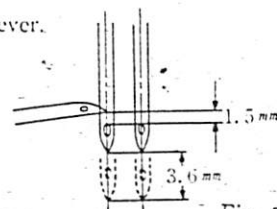


Fig. 34

RELATIVE POSITIONS OF THE NEEDLE AND LOOPER

Turn the pulley by hand in the normal operating direction.

When the underlooper is at its left extremity, the distance between the tip of the underlooper and the center of the left needle must be 3.5mm.

(Fig. 33)

When the needle is 3.6mm up from its lowest position, the tip of the underlooper must be in line with the axis of the needle at the center of the needle's depression. (Fig. 34)

In case of making adjustment, first loosen the overlooper crank screw (A) (Fig. 35), and then adjust the overlooper crank to the proper angle by means of two adjusting screws (B).

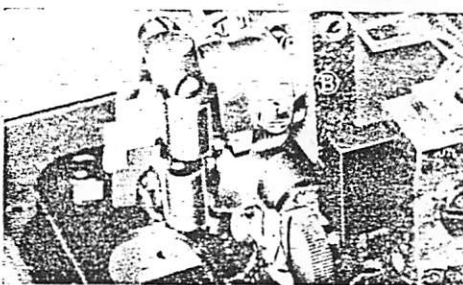


Fig. 35

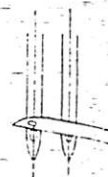
RELATIVE POSITIONS OF THE UNDERLOOPER AND NEEDLE

Turn the pulley by hand in the normal operating direction.

There must be a clearance of about 0.1mm between the tip of the underlooper and the needles when it passes their depression. At this instant, however, it is desirable that the clearance between the right needle and underlooper be slightly smaller, and the clearance between the left needle and underlooper be slightly larger, than the value mentioned above. These adjustments can be accomplished by loosening the needle bar connecting stud and turning the needle clamp as required. Turn the pulley further and see that the tip of the underlooper comes close enough to the needles' shank when it passes the needles on its return sewing from its right extremity. Clearance between the needles and underlooper can be adjusted by loosening the underlooper set screw (A) (Fig. 31) and tilting the underlooper forward or back as required.

RELATIVE POSITIONS OF THE OVERLOOPER AND NEEDLE

Fig. 36



Turn the pulley by hand in the normal operating direction.

When the overlooper's thread hole goes past the needle on its rightward travel, the overlooper maintains a clearance with the left needle, but touches the right needle and bends it slightly. If the overlooper does not operate this way, loosen two set screws (A) (Fig. 35) for the overlooper lever and move the lever forward or back as required. After the adjustment, tighten the two set screws securely. Also, see that when the hole in the tip of the overlooper is in line with the left needle, the needle holes are level with the lower edge of the overlooper.

(Fig. 36) Needle holes are level with overlooper's lower edge.

ADJUSTING THE HEIGHT AND ANGLE OF THE FEED DOGS

Adjust the feed dogs so that the tip of their teeth is 1mm above the top surface of the needle plate when they are up highest.

See that the tip of the main feed dog's teeth is level with that of the sub feed dog's.

Turn the pulley and make sure that when the feed dogs are on a level with the top surface of the needle plate they are parallel with that surface. The angle of the dog teeth can be adjusted by loosening the feed shaft set screw (A) (Fig. 37) and turning the feed shaft as required.

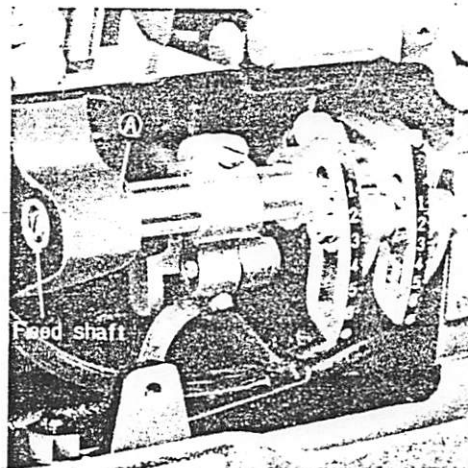


Fig. 37

ADJUSTING THE FEED DOGS IN CROSS DIRECTIONS

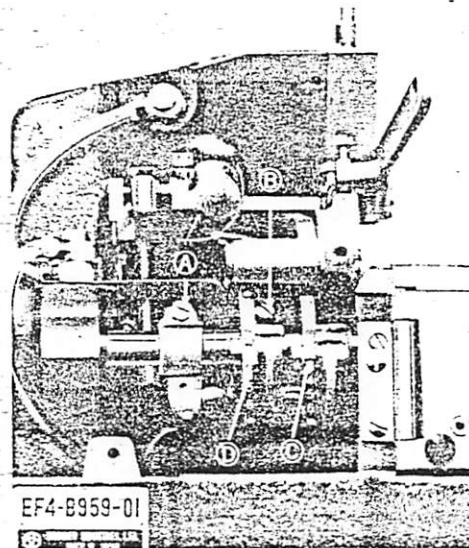


Fig. 38

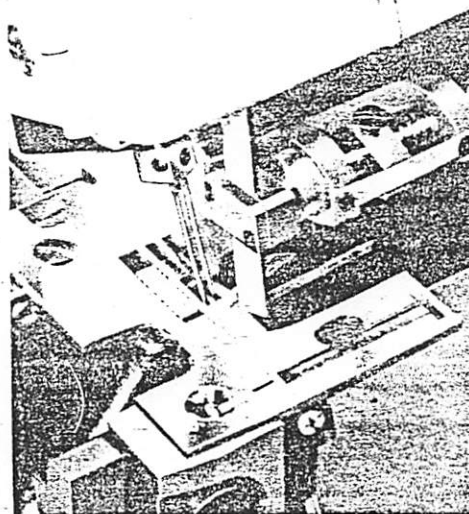


Fig. 39

First, loosen the feed lever set screw (A) (Fig. 38) and the main feed lever set screw (B) (Fig. 38); and increase the feed pitch to maximum.

Turn the pulley by hand in the normal operating direction until the feed dogs come closest to your side. With the feed dogs in that position, move the sub feed lever (C) (Fig. 38) forward or back so that there is a clearance of 0.5mm between the sub feed dog and the closer end of the needle plate's feed dog slot. (Fig. 39) Then, tighten the feed lever set screw (A) (Fig. 38) securely. Turn the pulley further in the normal operating direction until the feed dogs are farthest from your side. With the feed dogs in that position, move the main feed lever (D) (Fig. 38) forward or back so that there

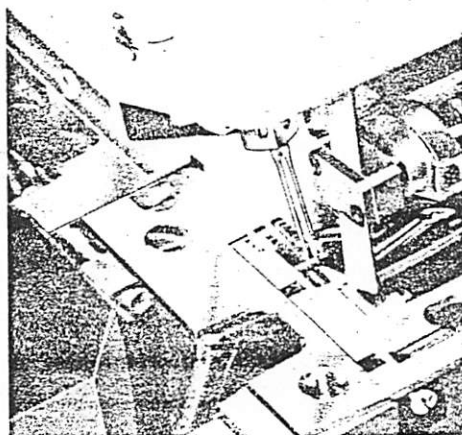


Fig. 40

is a clearance of 0.5mm between the main feed dog and the farther end of the needle plate's feed dog slot. (Fig. 40) Then, tighten the main feed lever set screw (B) (Fig. 38) securely.

ADJUSTING THE HEIGHT OF THE PRESSER FOOT

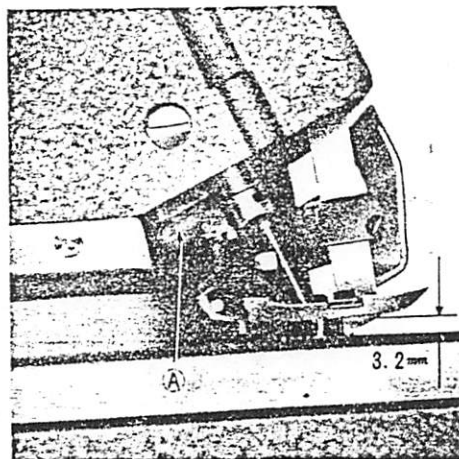


Fig. 41

Turn the pulley until the upper knife holder is up highest; and install the presser foot in place.

When the presser foot lifter lever (A) (Fig. 41) is pulled down, the presser foot must stop at a level 3.2mm above the top surface of the needle plate. This adjustment can be made by loosening the nut (C) (Fig. 42) of the stopper (B) (Fig. 42) in the front

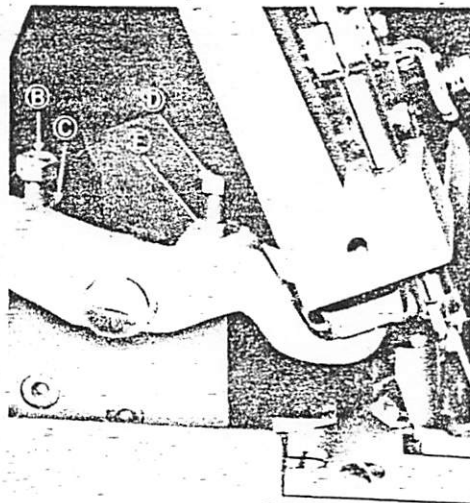


Fig. 42

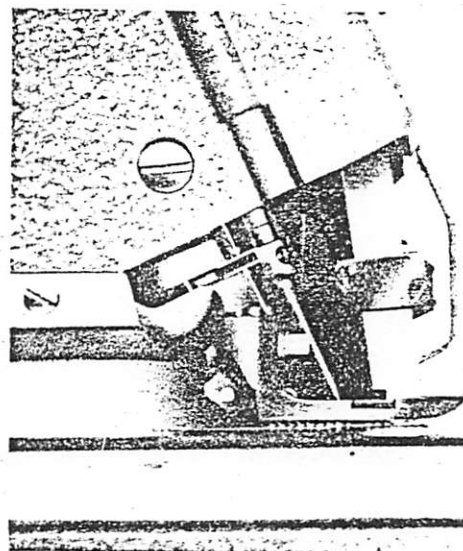


Fig. 43

part of the lifter lever. Be sure to re-tighten the nut securely when the necessary adjustment has been made.

Next, release the presser foot lifter lever; and see that there is a clearance of 1mm between the tip of the presser foot lifter lever and the presser arm when the presser foot rests on the needle plate. (Fig. 43) Adjustment of this clearance can be made by loosening the nut (E) (Fig. 42) of the front stopper (D) (Fig. 42) for the presser foot lifter lever.

Be sure to re-tighten the nut securely after the adjustment.

When these adjustments are over, put the assembly of the upper cover, pulley cover and thread guide back in place.

Then, put the overlooper crank cover, looper cover, foot lifter cover, needle bar cover, cloth guide, presser foot lifter cover, needle bar cover, cloth

INSTALLING AND REMOVING THE LOWER KNIFE

To remove the upper knife, loosen the upper knife set screw (A); and pull out the upper knife (B) upward.

To put the upper knife back in place, hold it with its cutting edge directed leftward; keep the upper knife holder (I) pressed rightward; insert the upper knife downward into the slot of the upper knife holder between the upper knife holder block (C) and the upper knife clamp (D). Adjust the upper knife

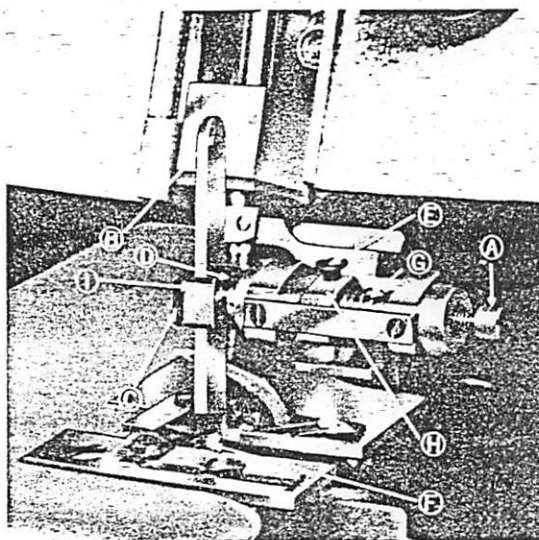


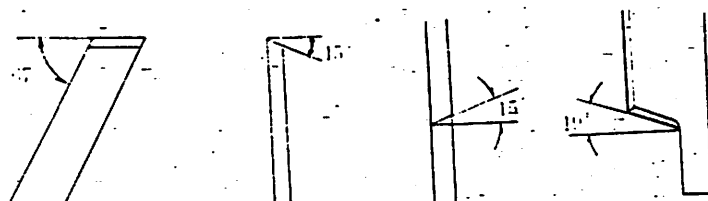
Fig. 45

so that when it is down lowest in its travel the tip of the upper knife covers the tip of the lower knife as much as 0.5mm. Then tighten the upper knife set screw (A).

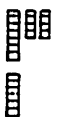
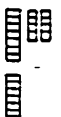
To adjust the upper knife in cross directions, loosen the upper knife holder guide set screw (E); and bring the upper knife to properly fit into the needle plate's slot (F).

The upper knife with the upper knife presser spring (G) must keep the lower knife pressed. Press the upper knife presser spring (G) to a length of about 13mm by means of the upper knife holder guide (H).

When the upper knife is properly in place, put the upper knife cover on in such a way that it lightly touches the side of the upper knife. (Fig. 45)



SPECIFICATIONS

	EF4-B959-01	EF4-B959-21
Type of stitch	Twin needle overlock	Mock safety
Max. sewing speed	4200 rpm	4200 rpm
Stitch length	1mm ~ 6mm	1mm ~ 6mm
Differential feed	adjustable to stretching or shirring	adjustable to stretching or shirring
Presser foot height	3.2mm	3.2mm
Standard stitch width	3mm ~ 5mm	3mm ~ 5mm
Shape of feed dog		
Needle gauge	2mm	2mm
Cutting width	adjustable	adjustable
Needle	DC×1	DC×1
Weight of head	18.1kg	18.1kg