

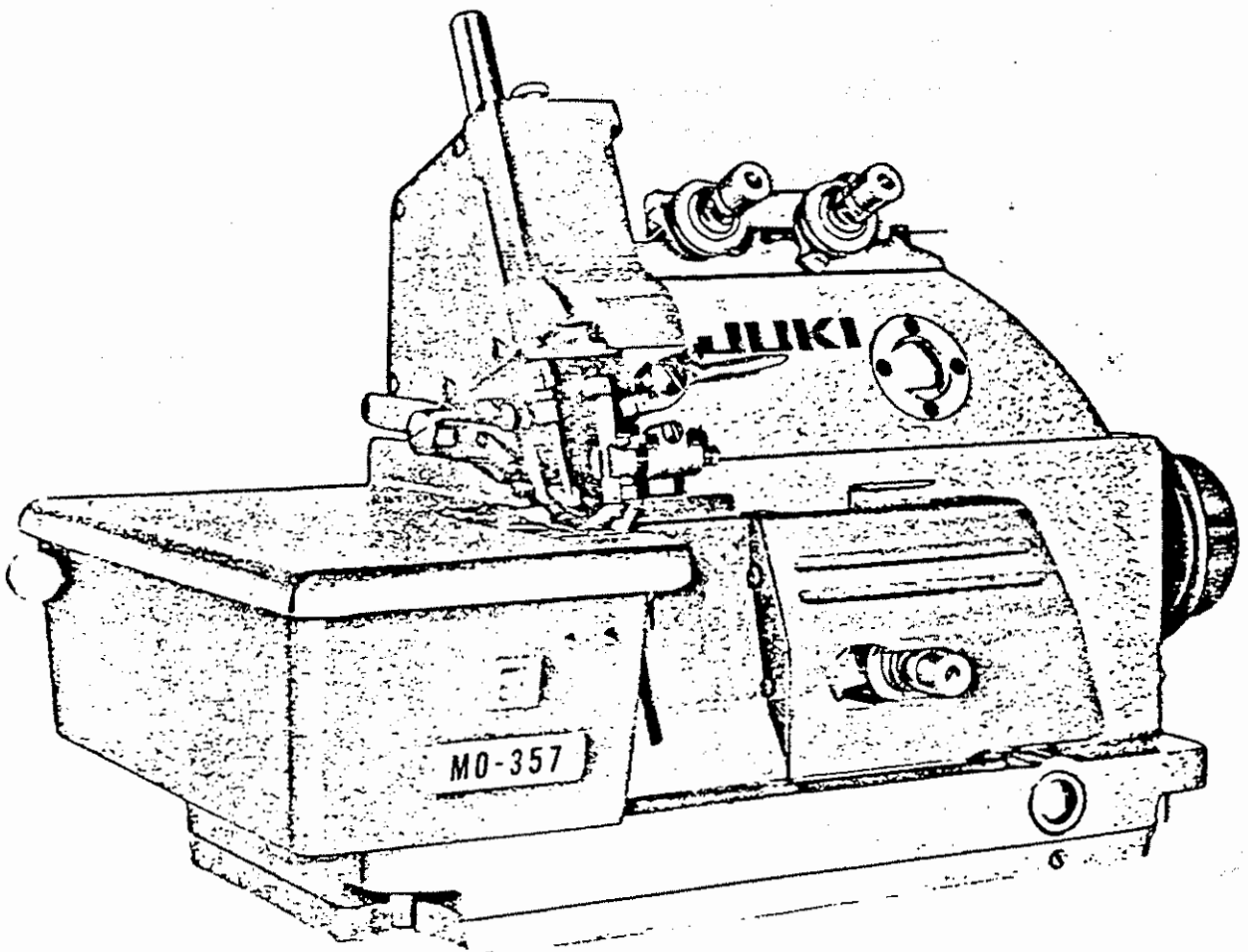
MODEL **MO-357-358**

HIGH SPEED STRAIGHT NEEDLE  
SAFETY STITCHING  
INDUSTRIAL SEWING MACHINE

---

---

# INSTRUCTION BOOK



**TOKYO JUKI INDUSTRIAL CO., LTD.**

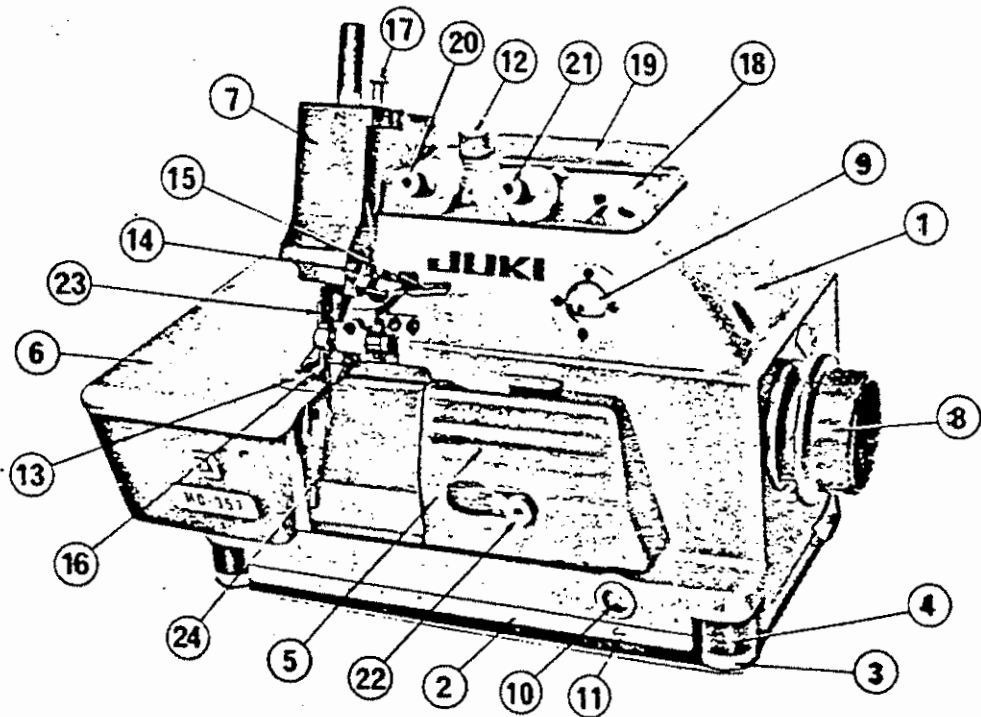
# CONTENTS

	Page
I. GENERAL DESCRIPTION OF THE MACHINES .....	1
1. Types of these models .....	2
2. Stitching Specifications .....	3
II. HOW TO OPERATE THE MACHINES .....	3
1. Cautions on the operation .....	3
2. Motor pulley and belt .....	3
3. How to install the machine .....	4
4. Lubrication and oil drain .....	5
5. Needle and its insertion .....	7
6. How to thread the machine .....	8
① To thread the overlock needle .....	8
② To thread the upper looper .....	8
③ To thread the lower looper .....	9
④ To thread the safety stitch needle .....	11
⑤ To thread the safety stitch looper .....	11
7. Thread tension .....	12
8. Presser foot and feed dog .....	13
9. Regulating the stitch length .....	14
10. Differential feed .....	15
11. Knife mechanism .....	17
12. Overlock stitch width .....	19
13. Regulating the needle guard .....	19
III. HOW TO ADJUST THE MACHINES .....	20
1. Adjusting the needle position .....	20
2. How to set the lower looper to the needle .....	21
3. How to set the upper looper to the needle .....	22
4. How to set the safety stitch needle to the safety stitch looper .....	23
5. Adjusting the lower thread cam .....	24
6. Adjusting the looper avoid motion of the safety stitch looper .....	25
IV. MAINTENANCE OF THE MACHINES .....	27
V. CAUSES OF MALFUNCTIONS AND REPAIRING .....	28

## CONVERSION TABLE

Milli Meter to Inch	Inch to Milli Meter
1 mm.....5/128"	1" ..... 25.4 mm
1.5mm.....1/16" less 1/256"	1/2"..... 12.7 mm
2 mm.....1/16" plus 1/64"	1/4"..... 6.35 mm
2.5mm.....3/32" plus 1/256"	3/4"..... 19.05 mm
3 mm.....1/8" less 1/128"	1/8"..... 3.175 mm
3.5mm.....1/8" plus 3/256"	3/8"..... 9.525 mm
4 mm.....5/32"	5/8"..... 15.875mm
4.5mm.....5/32" plus 5/256"	7/8"..... 22.225mm
5 mm.....3/16" plus 1/128"	1/16" ..... 1.5785mm
5.5mm.....7/32" less 1/256"	3/16" ..... 4.7625mm
6 mm.....1/4" less 1/64"	5/16" ..... 7.9375mm
6.5mm.....1/4" plus 1/256"	7/16" ..... 11.125mm
7 mm.....1/4" plus 3/128"	9/16" ..... 14.2875mm
7.5mm.....9/32" plus 3/256"	11/16"..... 17.4625mm
8 mm.....5/16"	13/16"..... 20.6375mm
8.5mm.....5/16" plus 5/256"	15/16"..... 23.8125mm
9 mm.....3/8" less 3/128"	1/32" ..... 0.79375mm
9.5mm.....3/8" less 1/256"	1/64"..... 0.396875mm
10 mm.....3/8" plus 1/64"	1/128"..... 0.19844mm
11 mm.....7/16" less 1/128"	
12 mm... 15/32" plus 1/256"	
13 mm... 33/64" less 1/256"	
14 mm... 35/64" plus 3/640"	
15 mm... 9/16" plus 3/128"	
16 mm... 5/8" plus 3/640"	
17 mm... 43/64" less 1/256"	
18 mm... 11/16" plus 1/64"	
19 mm... 3/4" plus 3/128"	
20 mm... 25/32"	

## NAMES OF HEAD PART MO-357



- |                           |  |
|---------------------------|--|
| ① Frame                   | ⑭ Needle bar                             |
| ② Base plate              | ⑮ Presser foot lifting lever             |
| ③ Frame guard             | ⑯ Presser foot                           |
| ④ Rubber cushion          | ⑰ Presser spring plunger adjusting screw |
| ⑤ Looper cover            | ⑱ Top cover                              |
| ⑥ Cloth plate             | ⑲ Thread eyelet                          |
| ⑦ Face plate cover        | ⑳ Overlock needle, thread tension nut    |
| ⑧ Hand wheel              | ㉑ Safety stitch, thread tension nut      |
| ⑨ Oil sight window        | ㉒ Upper looper, thread tension nut       |
| ⑩ Oil sight gauge         | ㉓ Upper knife                            |
| ⑪ Oil drain screw         | ㉔ Lower knife                            |
| ⑫ Oiling hole large screw |  |
| ⑬ Throat plate            |  |

It will simplify threading the machine to follow recommended sequence as designated by the numbers assigned to each thread, starting with thread No. 1. The various eyelets and guides on the machine for each thread have been color coded to further aid the threading process.

Thus sequence is:

thread No 1, lower looper thread, yellow color code;

thread No. 2, safety stitch looper thread, blue color code;

thread No. 3, upper looper thread, black color code;

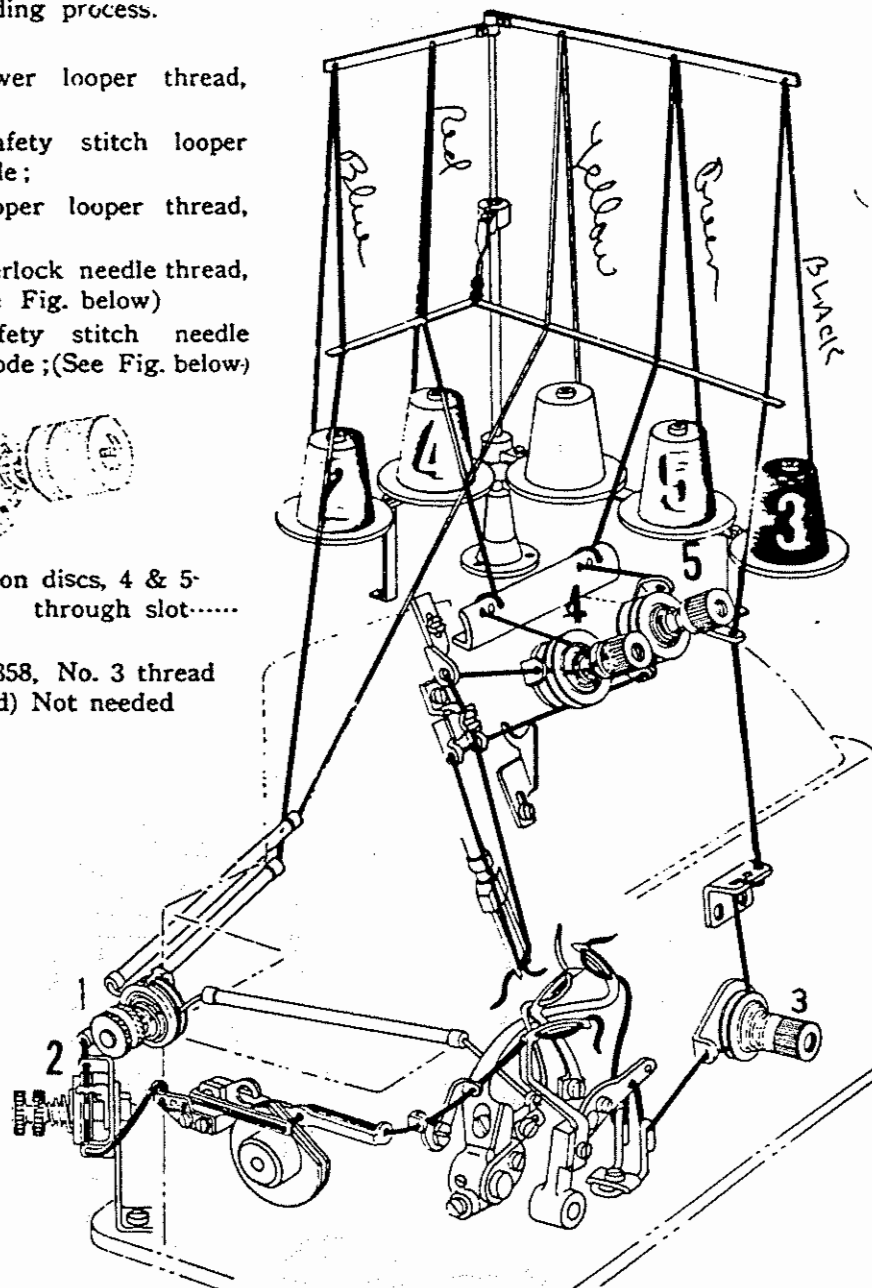
thread No. 4, overlock needle thread, red color code; (See Fig. below)

thread No. 5, safety stitch needle thread, green color code; (See Fig. below)



.....Between tension discs, 4 & 5-  
through slot.....

[Note] For MO-358, No. 3 thread  
(upper looper thread) Not needed



## I. GENERAL DESCRIPTION OF THE MACHINES

JUKI MODEL MO-357 is a 2-needle, 5-thread, and MO-358 is a 2-needle, 4-thread overlock type safety stitch machine. These machines can sew at a maximum speed of 5,000 s. p. m.

These machines can perform overlock stitching and safety stitching at the same time with either 4 threads or 5 threads and thus not only increases the efficiency of the sewing operation but also produces sturdy and accurate seams.

These machines are used extensively for overlocking, side joining, sleeve attaching etc. of light-weight and medium-weight materials.

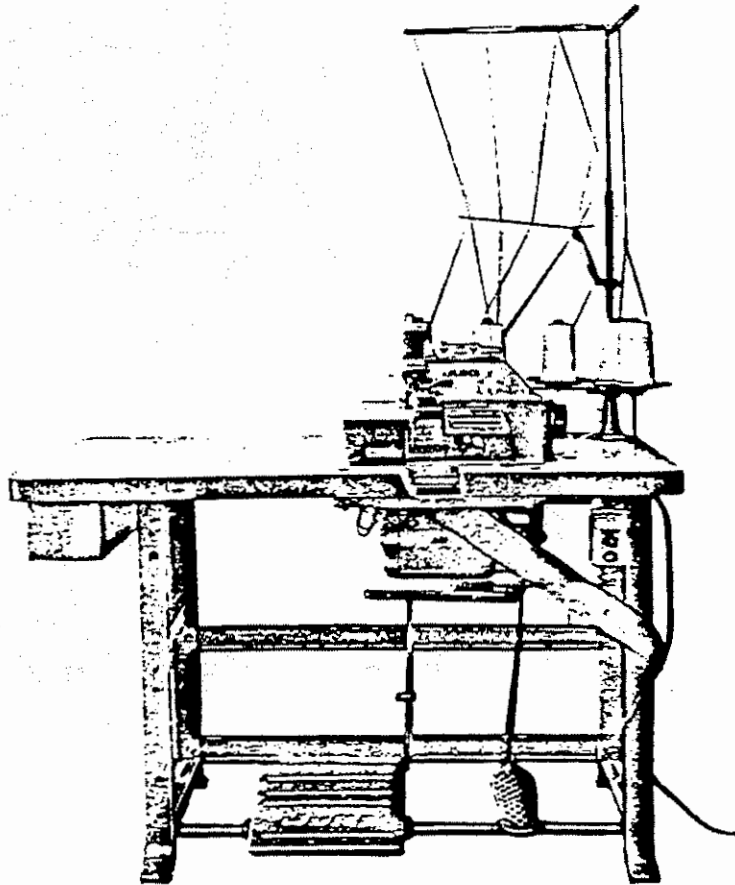


Fig. 1

Both of these machines are equipped with a differential feed mechanism.

Following are the outstanding features of these machines:

- ① A completely sealed automatic lubrication system, enabling this machine to endure high speed sewing.
- ② A straight needle is used, so that compared to machines using curved needles, there is hardly any needle breakage or skip sewing. The machine is best suited for light-weight or medium-heavy materials.
- ③ This machine can also be used as an overlock stitching or safety stitching machine separately as desired.
- ④ All essential parts of the machine are made of high quality materials, and the bearings and other frictional parts are specially constructed to lessen friction. Even at high speeds, the machine runs very smoothly and quietly.

Note: When stitching with 2 threads, be sure to order a spreader, separately.

### 1. Types of these models

Model	Needle width	Length of overlock stitching
MO-357-A	2 mm (1/16")	3-4.5 mm (1/8-5/32")
MO-357-B	3.2 mm (1/8")	3-4.5 mm (1/8-5/32")
MO-357-L	2 mm (1/16")	2-3.5 mm (1/16-1/8")
MO-357-8	3.2 mm (1/8")	6 mm (1/4") Fixed
MO-357-9	3.2 mm (1/8")	4.5-6 mm (5/32-1/4")
MO-357-10	3.2 mm (1/8")	3.5-6 mm (1/8-1/4")
MO-358-A	2 mm (1/16")	3-4.5 mm (1/8-5/32")
MO-358-B	3.2 mm (1/8")	3-4.5 mm (1/8-5/32")
MO-358 (H)	3.2 mm (1/8")	6 mm (1/4") Fixed

## 2. Stitching Specifications

Maximum sewing speed	.....	5,000 s. p. m.
Maximum stitch length	.....	3.2 mm (1/8") (Adjustable to 1.4-3.2 mm) (1/128~1/8")
Differential feed ratio	.....	Gather sewing 1:1.4 (Ratio of sub feed to main feed) Stretch sewing 1:0.7 (Ratio of sub feed to main feed)
Needles	.....	For overlock DC×27 (81×27) For chain DC×27 (81×27)
Needle bar stroke	.....	23.5 mm (29/32")

## II. HOW TO OPERATE THE MACHINE

### 1. Cautions on the operation

- ◎ Never, under any circumstances, run the machine without first oiling.
- ◎ The rotational direction of the machine, as viewed from the pulley side, is clock-wise. Never rotate the machine counter-clockwise. If you do, the oiling pump will not function and scorching of the essential parts will result.
- ◎ The maximum speed of this machine is 5,000 s.p.m. However, do not run the machine at a speed of more than 4,500 s.p.m. for the first month. After that, depending upon the nature of the work and the capability of the operator, run it at any appropriate speed.

### 2. Motor pulley and belt

When connected directly to the electric source, a 3-phase alternating current 1/2HP (400W) electric motor is used. Use a M type V-belt. The relation between the number of rotations of the machine and the dimension of the motor pulley is shown in the following table. (The



dimension of the motor pulley is measured from the center of the V belt to the center of V-belt of opposite side when it is on the pulley.)

Cycles	Rotation of Machine	Motor pulley No.	Motor pully dimension
50	5050	MTK-P01040-00	104 mm (3 <sup>7</sup> / <sub>8</sub> " )
	4610	MTK-P00950-00	95 mm (3 <sup>1</sup> / <sub>2</sub> " )
60	4940	MTK-P00850-00	85 mm (3 <sup>5</sup> / <sub>16</sub> " )
	4650	MTK-PV0200-00	80 mm (3 <sup>1</sup> / <sub>8</sub> " )

### 3. How to install the machine

The thread stand should be installed as shown in Fig. 2(a),(b).

First, insert rubber cushion ② under the thread spool stand ① and with 3 screws ③ firmly screw in to the table.

Then attach 3 thread winder bases ⑥ to the stand arms ④ and 2 winder bases to the thread ⑤ as shown in Fig. 2 (b). Attach these thread winder bases to the thread winder arm base ⑦ and ⑧ by means of a hexagonal bolt ⑩ aided by washer ⑨. Pass the thread stand rod ⑪ into the assembled thread spool arms base, plug the spool stand rod to the thread stand, and firmly fix in with a hexagonal bolt ⑫. Be sure that the stand arms ④ and ⑤ are at right angles to each other and then firmly fix them to the spool stand rod with hexagonal bolts ⑬ and ⑭.

Install the in-between thread guide ⑮ in an appropriate position to prevent the thread from getting entangled (Fig. 2 (a)).

The table is a semi-submerged type, but of course it is possible to install the machine on top of the table. First, with 4 set screws, fix the frame foundation Fig. 5 A securely on the table and by inserting the vibration-proof rubber in between, install the machine on the table. The pedal of the presser foot can be installed either on the right or left of the treadle, so install it any way most convenient for you. Fig. 3 shows how to install the left pedal and Fig. 4 shows how to install the right pedal. Install them according to the dimensional figures shown in Fig. 3 and 4.

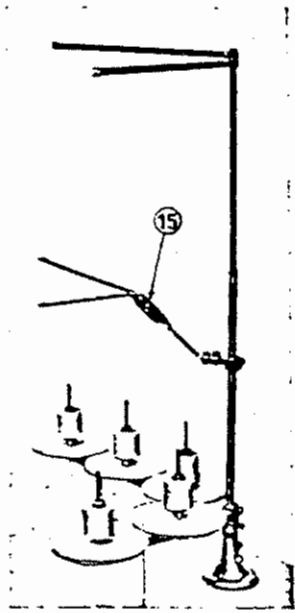


Fig 2 (a)

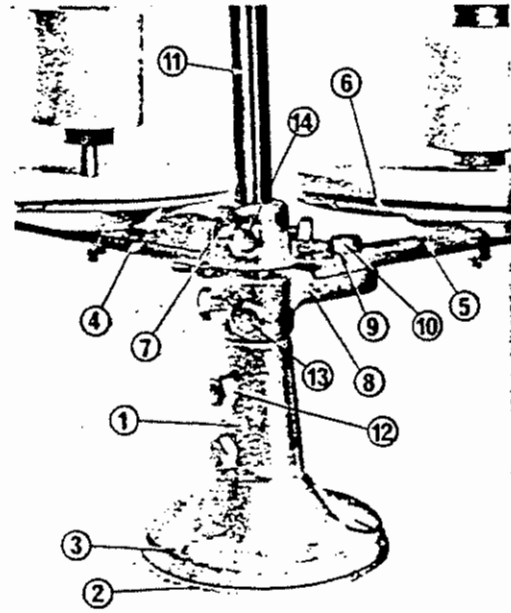


Fig 2 (b)

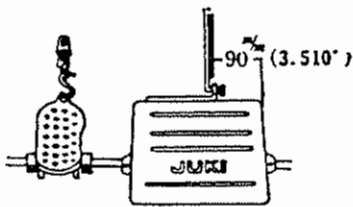
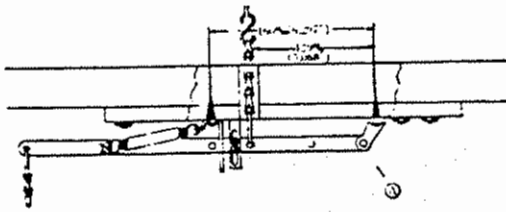


Fig 3

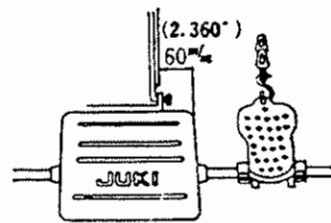


Fig 4

#### 41 Lubrication and oil drain (Fig. 5)

The lubrication of this machine is done by the gear pump, which is located under the frame, and all frictional parts are oiled by means of oil tubes and oil wicks. After lubricating, the oil returns to the oil reservoir under the frame and automatically repeats the oiling circulation.

Before running the machine, remove the large screw ① of the oiling

hole on the upper part of the machine and fill up to the red line of the oil sight gauge ② with new Defrix Oil No. 2. Be sure to screw in the removed screw tight after filling. When you start the machine, be sure to look into the oil sight window ③ to see that the oil pump is working smoothly. Before using the machine, check the oil sight gauge daily and should the oil level fall below the red line, fill it up to the red line again. When the machine is to be run for the first time, run it for about 2-3 weeks and then drain out the oil completely and replace it with fresh oil. After that, change the oil occasionally, whenever it is dirty.

To drain the oil, remove the oil drain screw ④ at the bottom part of the machine and draw out the spent oil. Be sure to replace this screw before refilling.

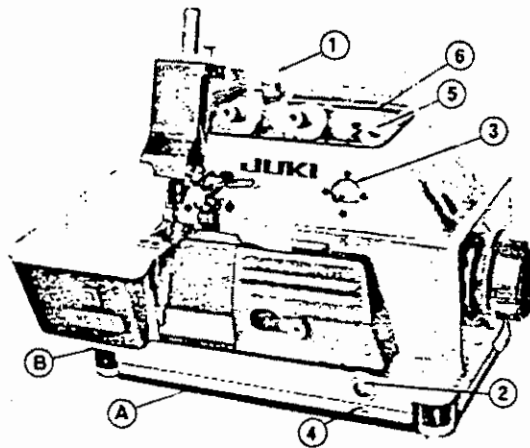


Fig 5

(Caution)

- ① If you use an undesignated oil, it might invite scorching of parts and oil leakage. So, be sure to use the designated Defrix Oil No. 2 only.
- ② There is an oil reservoir at the bottom of the frame which is covered by a filter screen ① Fig. 6. Occasionally some threads stick to this screen. Clean up this screen at least 2 or 3 times a year. To do so, first, remove the drain screw ② Fig. 6, then remove the bottom plate set screw ③ and remove the bottom plate ④. In doing so, be careful not to damage the gasket since this can lead to oil leakage.

Be sure to remove all oil and dirt from the surface of the gasket and then apply sufficient amount of JUKI seal, and replace this bottom plate.

- ③ As the lower knife adjuster ③ Fig. 21 makes a slight movement when the machine is running, apply a little quantity of oil to the upper part of the lower knife support bracket ④, Fig. 21.

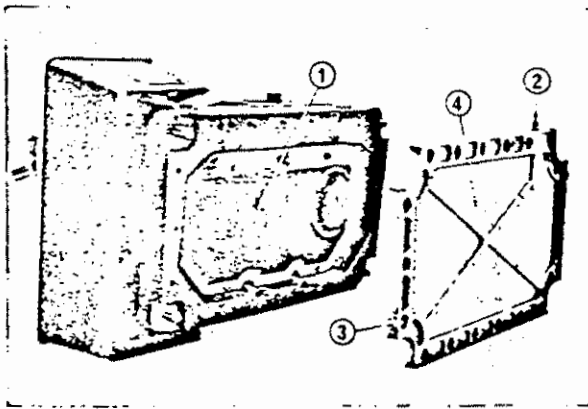


Fig 6

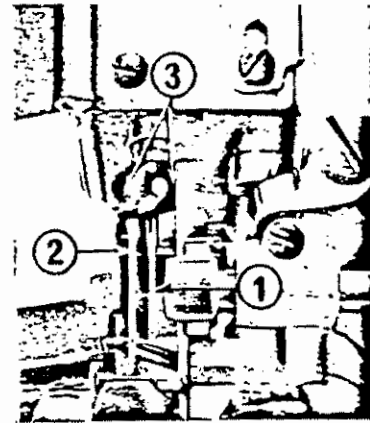


Fig 7

#### 5. The needle and its insertion (Fig. 7)

Use a needle size DC×27(81×27) for overlock stitching, ①, Fig. 7. (on the right side, facing the machine)

For safety stitching, use a needle DC×27, (81×27) ② Fig. 7. (on the left side)

To insert the needle, rotate the pulley, raise the needle bar to the highest point, loosen the needle set screw ③, insert the needle as far as it will go into the needle bar hole and then tighten the set screw. The direction of the inserting needle should be such that, as viewed from the front of the machine, the grooved part of the needle is facing the back part of the machine. As there are many different sizes of the needles, select the correct size according to the thickness of the thread and the type of material to be sewn.

6. How to thread the machine (Fig. 8)

Please refer to back of cover for color enlarged view of threading

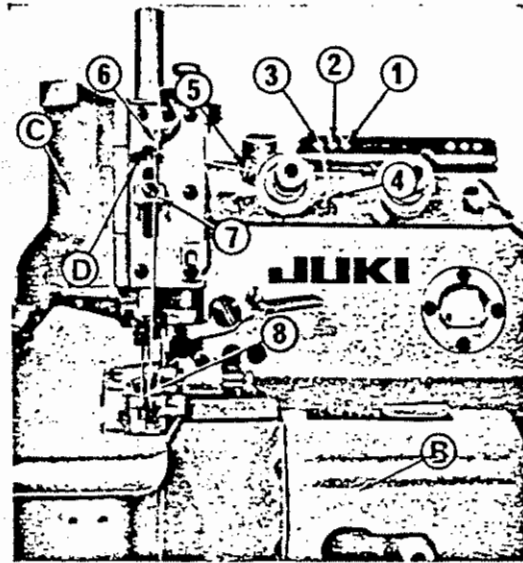


Fig. 8

- ① To thread the overlock needle  
(Please see Fig. 8)

Open the face plate cover ③ to your left, pass the thread from ①—④ in order, through the hole of the thread tension post and pass it in the order of ⑤—⑧.

- ② To thread the upper looper  
(Please see Fig. 9)

Slide the looper cover ⑥ slightly to your right and tilt it towards you, rotate the pulley to lower the needle bar, then thread the upper looper in the order of ①—⑩ as shown in Fig. 9.

When the threading is completed, close the looper cover ⑥ in its original position. Be sure the thread is not caught in the looper cover.

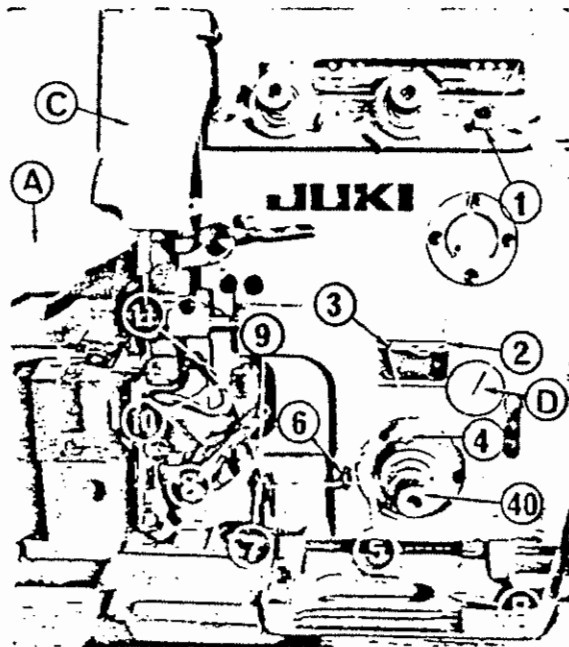


Fig. 9

- ③ To thread the lower looper  
(Please see Fig. 10 and Fig. 11)

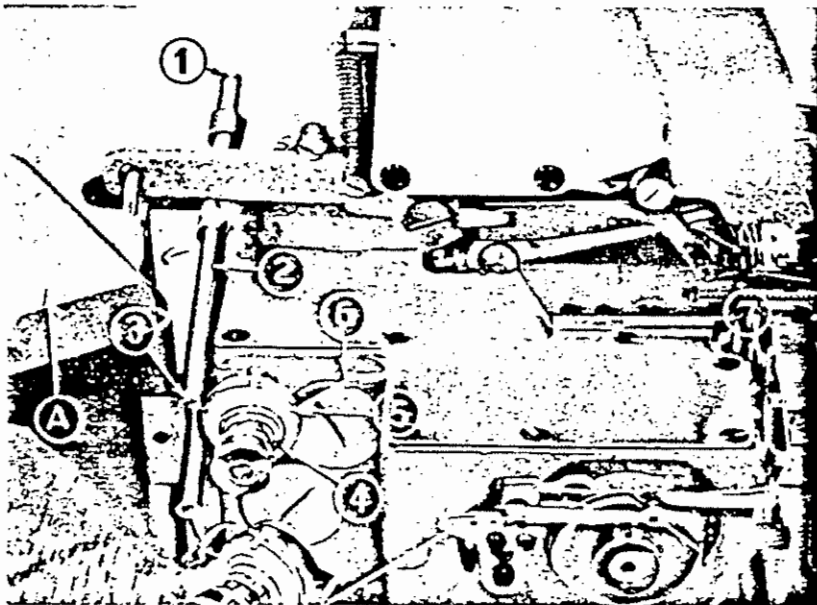


Fig. 10

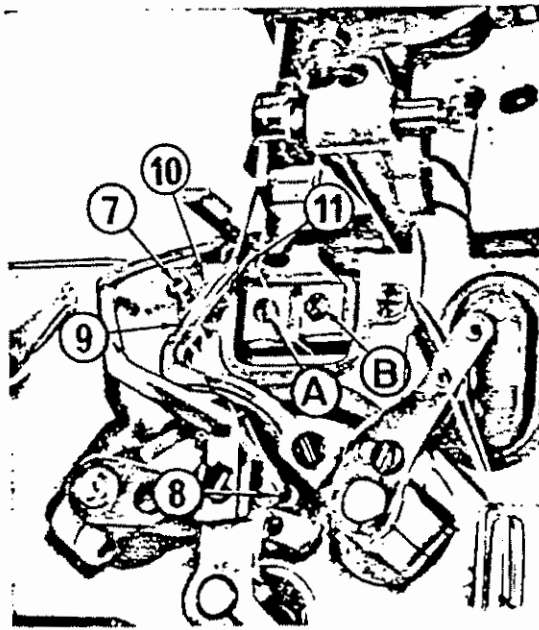


Fig. 11

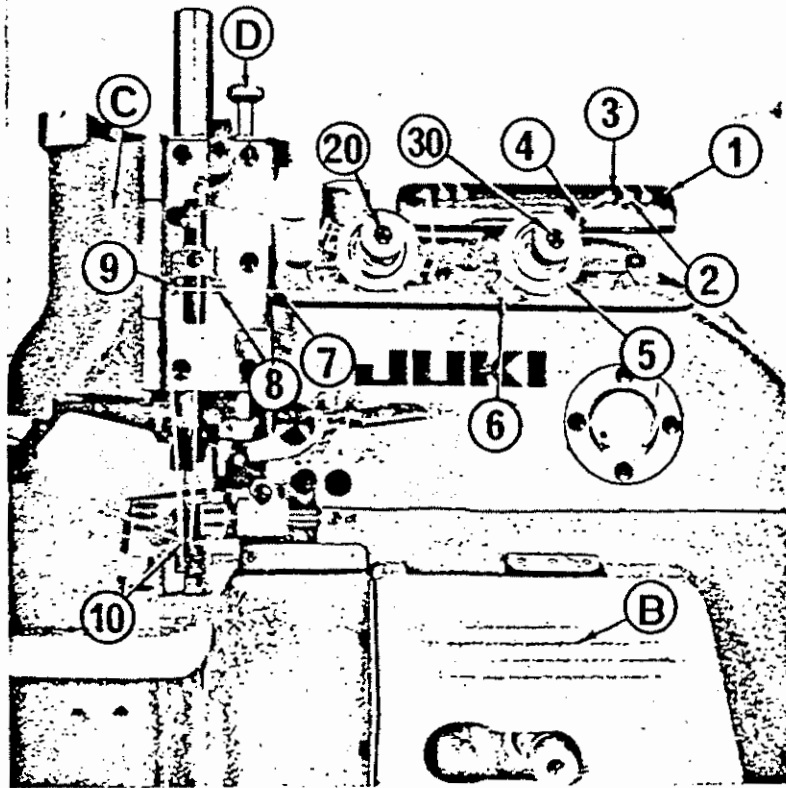


Fig. 12

Open the cloth plate cover ④, Fig. 10 to your left, lower the needle bar and thread the lower looper in the order of ①—⑪, as shown in Fig. 10 and Fig. 11.

When the threading is completed, close the cloth plate cover ④ to its original position.

- ④ To thread the safety stitch needle (Please see Fig. 12)

Open the face plate cover ③ to your left, pass the thread in the order of ①—④, through the hole of thread tension post, and from ⑤—⑩ in order as shown in Fig. 12.

- ⑤ To thread the safety stitch looper  
(Please refer to Fig. 13, 14 and 15)

Open the cloth plate to your left, thread the looper in the order of ①—⑧; raise up the cam thread guide as shown in Fig. 14 and thread from ⑨ to ⑬ in order. Next, return the looper to its extreme left position and pass the thread to the looper in the order of ⑭—⑯

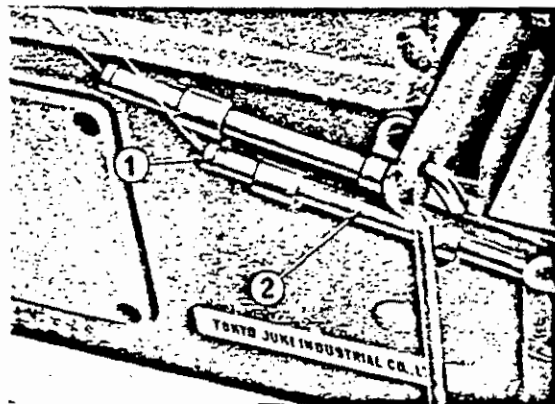


Fig. 13



Fig. 14

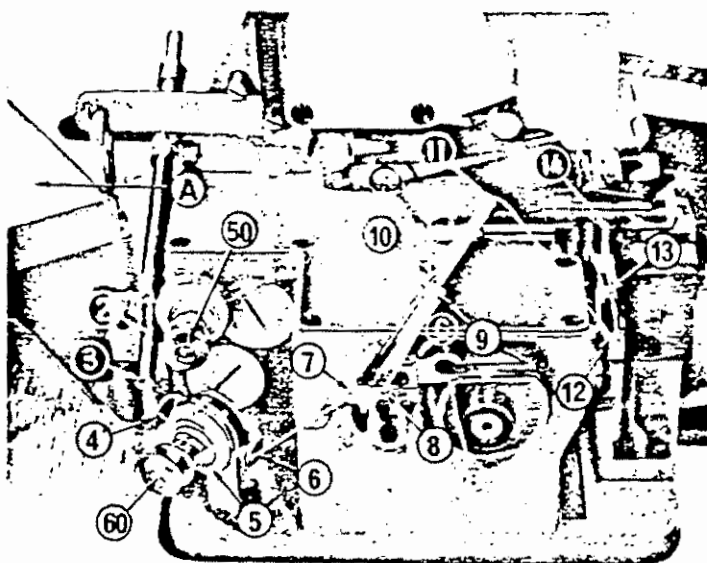
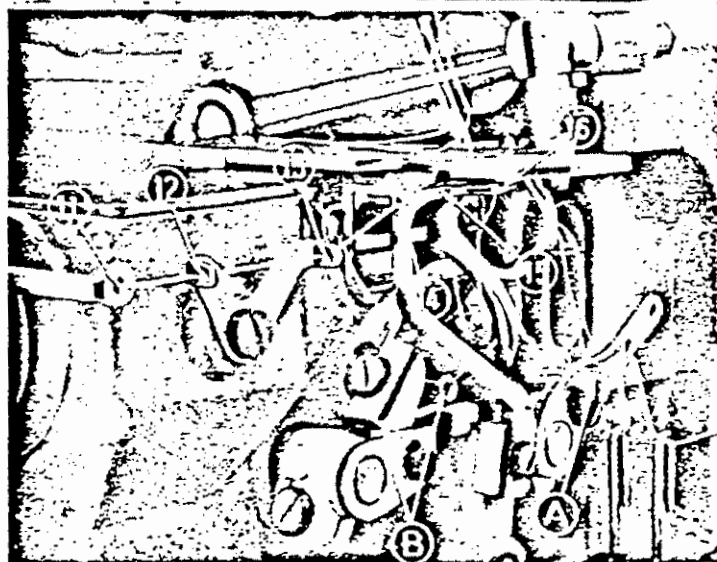


Fig. 15



## 7. Thread tension

The thread tension changes depending on the kind of sewing material, size and kind of thread, overlock width, length of stitches and other conditions. Therefore, conforming to the requirement of each case, the upper looper thread take-up A, Fig. 15 and the lower looper thread take-up B, Fig. 15 must be adjusted to the particular requirements of each case.

[1] Adjust the overlock stitching needle thread by 29 of Fig. 12.

- [2] Adjust the upper looper thread by ④ of Fig. 9.
- [3] Adjust the lower looper thread by ⑤ of Fig. 14.
- [4] Adjust the safety stitch needle thread by ③ of Fig. 12.
- [5] Adjust the safety stitch looper thread by ⑥ of Fig. 14.

Turn the thread tension nut to the right to tighten and to the left to loosen.

### 8. Presser foot and feed dog

The standard pressure of the presser foot at 5,000 s.p.m. is 6-7 kg. In sewing fine materials, if the foot pressure is too great or the feed dog is raised too high, the sewing cloth might be damaged. So, be very careful, please.

On the other hand, if the foot pressure is too weak, the presser will float up, resulting in shrinking of stitches. The maximum amount of protrusion of the feed dog from the throat plate surface is shown in the table below. When the height of the feed dog is less, even though the pressure is weak, the feeding power does not change appreciably.

Materials	Maximum protrusion of feed dog	Presser pressure
Extreme fine	0.5-0.6 mm ( $\frac{1}{50}$ - $\frac{1}{40}$ " )	Weaken
Fine (light weight)	0.6-0.8 mm ( $\frac{1}{40}$ - $\frac{1}{32}$ " )	Little stronger
Medium heavy	0.8-1 mm ( $\frac{1}{32}$ - $\frac{1}{25}$ " )	Stronger

The height of the feed dog can be adjusted by loosening the set screw of feed dog ① Fig. 11 and then after adjusting, tightening it again. When you do the adjusting, be sure that the height of the main feed dog and the differential feed are exactly same. Also, be sure that the feed dog does not touch the throat plate or the looper.

The presser foot is moved by the pedal. (For installing the pedal and its components, refer to Fig. 3 and Fig. 4). The adjustment of the

pressure of the presser foot can be done by turning the presser adjusting screw ④, Fig. 12.

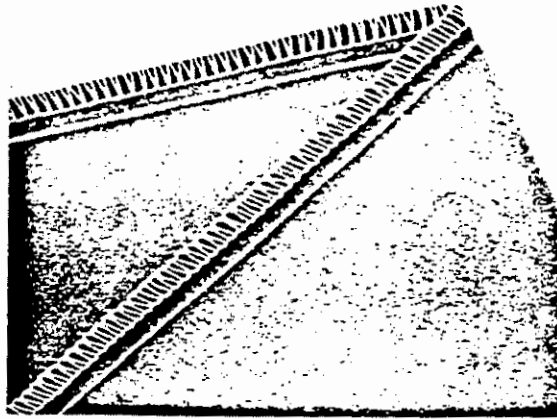


Fig. 16

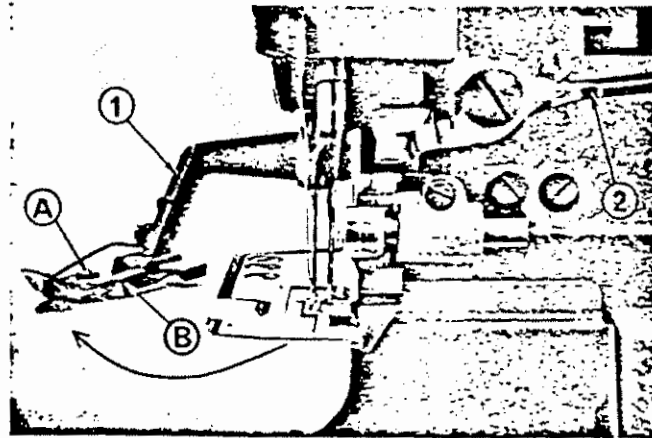


Fig. 17

If you want to release the presser arm ① Fig. 17 to your left, push down the presser foot lifting lever ② and swing the arm ① to your left. To return the arm to the original position, keep the lifting lever ② down and return the arm to the former position.

#### 9. Regulating the stitch length (See Fig. 18)

The length of stitch is adjusted by changing the eccentric amount

of the crankshaft cam. To do this, first move the looper cover to your right and tilt it towards you and release the feed adjusting hole set screw (D) Fig. 9.

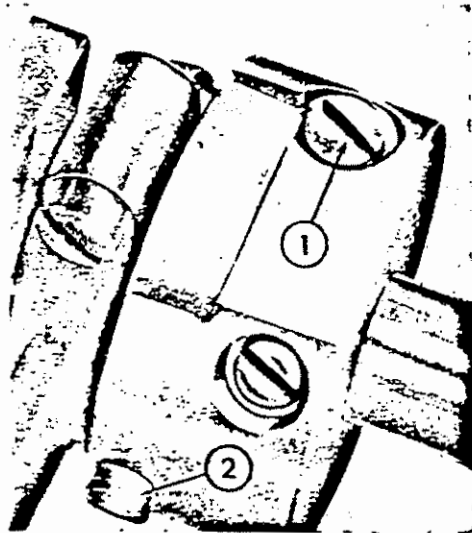


Fig. 18

Rotate the hand wheel and loosen the set screw ② Fig. 18. If the eccentric amount adjuster screw ① is turned to left, the stitches will be longer and if it's turned to right, the stitches will be shorter.

When the adjustment is completed, tighten the set screw ② and cover it up with the feed adjusting hole screw (D), Fig. 9. The feeding amount can be adjusted from 8 stitches (3.2 mm) (1/8") to 18 stitches (1.4 mm) (1/128") per inch (25.4 mm)

**(Caution)**

When all the adjustments are completed, be sure to securely tighten the set screw ②.

**10. Differential feed (Fig. 19, Fig. 20)**

This machine possesses two feeds, the main feed and the differential feed. The differential feeding can be regulated by the differential feed

adj  
ma  
  
sho  
difi  
gat  
stit  
is a  
it  
shc

ur  
w  
adjuster (Fig. 19) and consequently stretch or gather stitching can be made.

First, remove the hole seal large screw ①, Fig. 19 and loosen the shoulder screw ②, Fig. 20. The screw ② is so made to move the differential feed arm ③ groove up and down. If it's moved upwards, gather stitching will result, and if it's moved downwards, the stretch stitching will result. Also, the red line ④ in the middle of the groove is at the 0 position of the differential amount (feed ratio 1:1). When it is adjusted according to the requirement of the sewing, tighten the shoulder screw ② and the large plugging screw ①, Fig. 19.

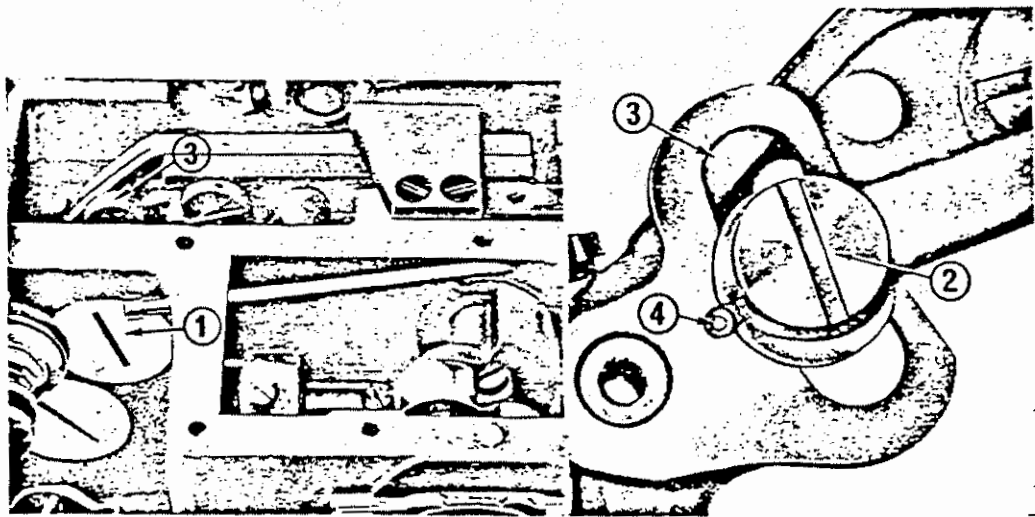


Fig. 19

Fig. 20

## 11. Knife mechanism (Fig. 21)

- To install the lower knife ①, do as follows: Loosen the lower knife clamp set screw ②, insert the lower knife into the groove of the lower knife holder ③, and having positioned the knife on a level with throat plate surface, tighten firmly with the lower knife clamp set screw ②.

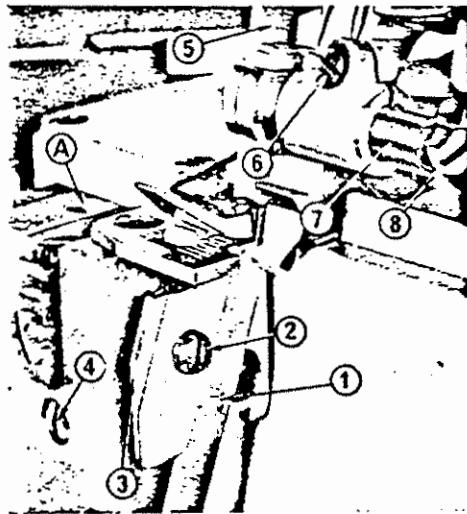


Fig. 21

- To adjust the width of knife, press down the lower knife holder to the left, tighten the stopper locking screw ④ and then determine the width (knife width) between the needle position and the upper knife ⑤.

The knife width will become wider if the upper knife holder stud clamp screw ⑥ is loosened and the upper knife holder stud ⑦ is moved to the right toward the pulley and if it's moved to the left towards the needle, it becomes narrower. The width can be adjusted from 2-5 mm ( $1/16 \sim 1/4$ " ) range. When the knife width is fixed, tighten the screw ⑥. When the upper knife is lowered to the lowest point, be sure that it sinks 0.5~1mm ( $5/256 \sim 5/128$ " ) below the level of lower knife (Fig. 22) by loosening the upper knife clamp screw (Fig. 21 ⑧), then tighten the screw ⑧.

When this adjustment is completed, be sure to loosen the stopper locking screw (Fig. 21 ④). Be doubly sure that the upper knife and the upper knife holder are not touching the throat plate, the looper cover or the feed base. If they are, the parts may be damaged.

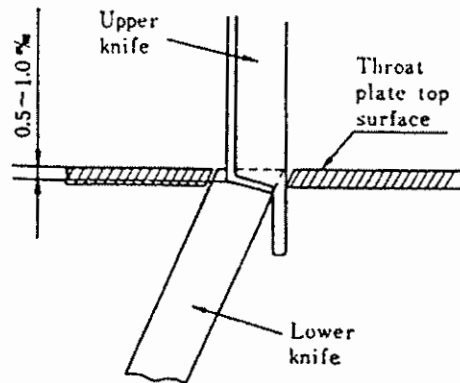


Fig. 22

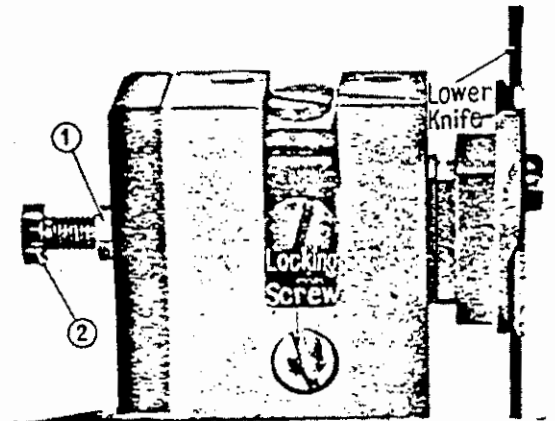


Fig. 23

- The normal pressure of the lower knife holder spring is 1.8-2.5 kg. Depending upon the kind of material to be sewn, make proper adjustments. To make this adjustment, loosen the lower knife adjusting nut ①, Fig. 23; if the lower knife adjusting screw ② is turned clockwise, the spring pressure gets stronger and if turned counter clockwise, it gets weaker.

When this adjustment has been made, retighten the lower knife adjusting nut ①. When the width of knife is changed greatly, the lower knife spring pressure will also be changed, so adjust it accordingly.

**(Caution)**

Adjust the knife width to match with the overlock width. (Refer Chapter II, Section 13)

## 12. Overlock stitch width

The knife width can be adjusted as explained before but the possibility of sewing overlock stitching with the same mechanical parts is very limited. So, if there is a big range of overlock width, different parts must be used.

The overlock width can be adjusted from 2-5 mm ( $1/16 \sim 3/16''$ ) by exchanging the parts, but the parts that come with this machine are all standard types of 3-4 mm ( $1/8 \sim 5/32''$ ) overlock width. To adjust this overlock width, loosen the stitch tongue set screw ①, Fig. 17. If the stitch tongue ② is moved to the right (pulley side) it will become wider and if moved to the left, it will become narrower. When the overlock width is changed, the thread tension, will change also, so remember to adjust the tension, as well.

## 13. Regulating the needle guard (Fig. 24)

The needle guard can be adjusted either forwards and backwards or up and down as viewed from the front of the machine.

If the screws ①, Fig. 24 are loosened, it can be adjusted either forwards or backwards and if the screw ②, Fig. 24 is loosened, it can be adjusted up and down. To make these adjustments, first, when the safety stitching needle ③ reaches its lowest point, see to it that the needle guard moves away from the needle thread to avoid touching it. If the guard touches the needle, either forwards or backwards, adjust it so that the needle will not be curved. Next, adjust the overlock stitching needle ④ by loosening the screws ⑤ and ⑥, Fig. 24.

When the needle guard is raised too high, the loop will be crushed, resulting in skipped stitches.

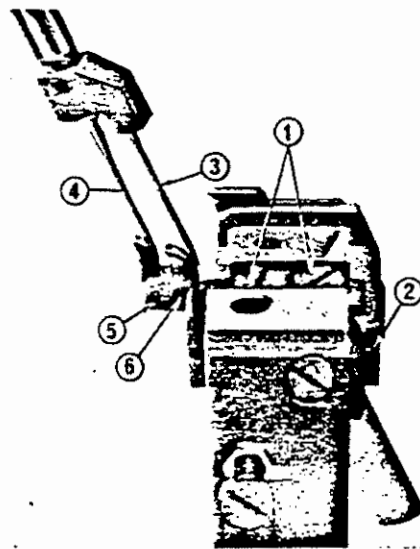


Fig. 24



### III. HOW TO ADJUST THE MACHINE

#### 2. Adjusting the needle position (Fig. 25)

The height of the needle bar should be adjusted by loosening the needle bar clamp screw  $\text{\textcircled{D}}$ , Fig. 8 so that when the needle bar has reached the upper point, the overlock stitching needle  $\text{\textcircled{1}}$  will come to

9 mm-9.5 mm (about  $\frac{3}{8}$ " ) vertical distance above the throat plate  $\text{\textcircled{3}}$ , and the chain stitching needle  $\text{\textcircled{2}}$  will be 7.9-8.4 mm (about  $\frac{5}{16}$ " ). When this adjustment has been made, be sure to check that the needle is not touching the throat plate and then go ahead with the sewing.

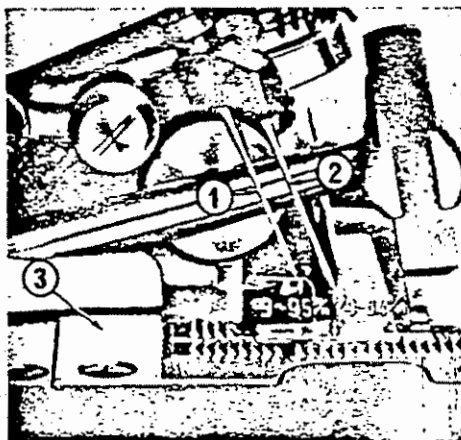


Fig. 25

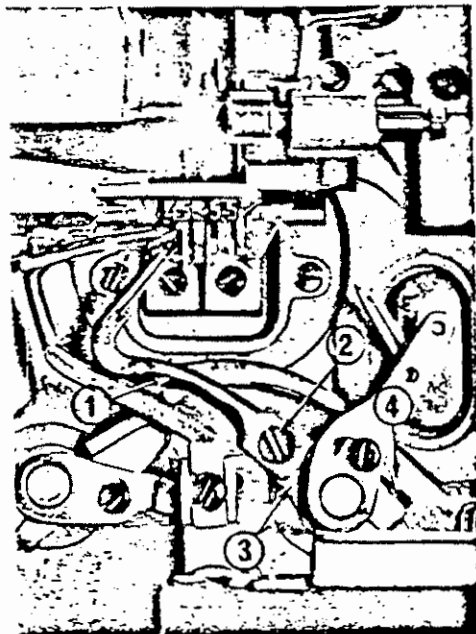


Fig. 26

## 2. How to set the lower looper to the needle (Fig. 26)

First, drop the needle to its lowest position. Loosen the set screw ② of the lower looper ①, set the standard radius (distance from center of shaft to the looper knife tip) of the lower looper knife tip at  $56\text{ mm}$  ( $2\frac{3}{16}''$ ) and by adjusting the long hole of the lower looper, fix it to the lower looper holder ③ by the set screw ②.

Next, lightly tighten the lower looper holder set screw ④, rotate the pulley and return the looper to its most extreme left position. At this point, adjust so that the clearance between the needle center and the knife tip becomes  $4.5\text{ mm} \sim 5.5\text{ mm}$  ( $\frac{5}{32} \sim \frac{7}{32}''$ ), then tighten the set screw ④ firmly. The optimal clearance between the needle and the looper (front and rear) is approximately,  $0.05\text{ mm}$  ( $\frac{1}{512}''$ ). When the above adjustments are made, the relation between the needle and the upper looper will be such that when the looper knife tip is at the center of the needle, the clearance between the knife tip and upper tip of the needle hole will become  $1.8 \sim 2.3\text{ mm}$  ( $\frac{1}{16} \sim \frac{3}{32}''$ ).

w  
r  
n  
e  
  
e  
is  
e  
v  
r  
e  
r  
e  
e

### 3. How to set the upper looper to the needle (Fig. 27)

Loosen the set screw ① of the upper looper ③ and adjust the standard radius of the upper looper to 67.7 m/m (2 1/4") and tighten the screw ① of the upper looper ③ to the upper looper support ②. Next, lightly tighten the upper looper holder set screw ④, rotate the pulley and raise the upper looper point tip to its extreme left position.

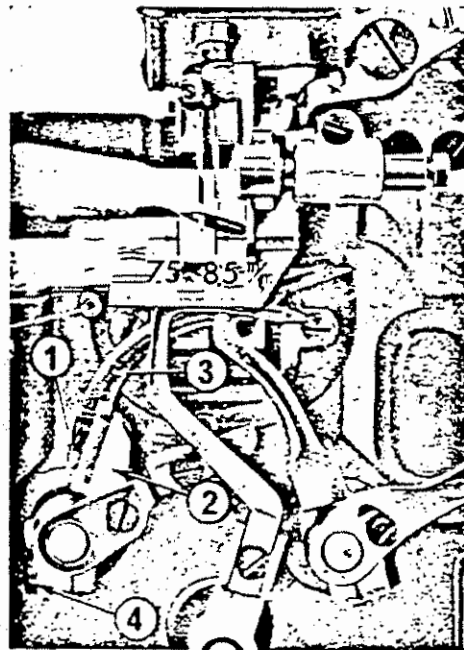


Fig 27

At this point, match the knife tip and the center of the needle so that the clearance between them is 7.5 mm ~ 8.5 mm (9/32 ~ 5/16").

Also, the front and rear relation between the needle and the upper looper should be such that even if the upper looper's side should touch the

needle, there is a clearance of  $0.05\sim 0.1\text{ mm}$  ( $1/512\sim 1/256''$ ) to prevent the needle from curving. And again, when the upper looper scrapes the grooved part of the lower looper, adjust the upper looper by either advancing it to the front or returning it within the range of  $7.5\sim 8.5\text{ mm}$  ( $9/32\sim 5/16''$ ) so that its back will have a clearance of  $0.3\sim 0.7\text{ mm}$  ( $1/80\sim 1/40''$ ) or over.

When the above adjustment is made, tighten the upper looper holder set screw ④.

#### 4. How to set the safety stitch needle to the safety stitch looper (Fig. 28, a, b, c, d, e)

The standard radius of the blade point of the chain looper is  $67.6\text{ mm}$  ( $2\frac{1}{4}''$ ) but as long as it does not hit the feed dog, try to set it a little above the standard radius.

The standard radius can be adjusted by loosening the set screw ②.

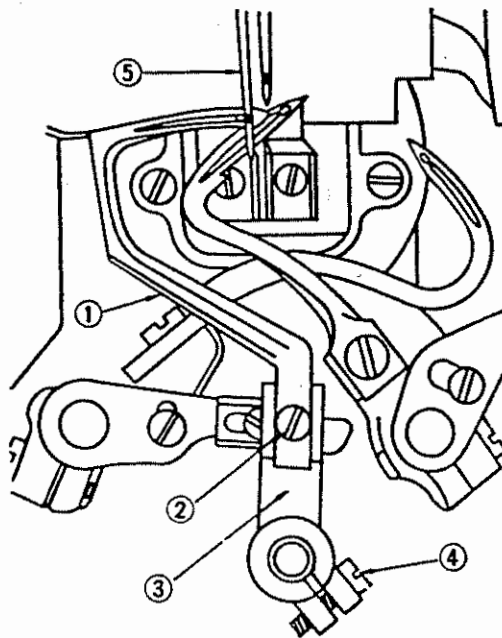


Fig. 28

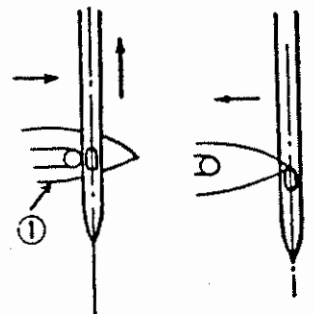


Fig. 28 a      Fig. 28 b

Next, as shown in Fig. 28 a, determine the position of the looper so that when the safety stitch looper ① advances, the thread hole of the

looper will line up on the left side of the needle eye at same height. Then, tighten the set screw ④ (Fig. 28) firmly.

When the safety stitch looper retreats, the blade point of the looper comes between the center of the needle eye and the upper part of the needle eye as shown in Fig. 28 b.

At the final retreated position of the chain looper, the space between the looper blade point and the center of the needle eye should be  $2.7\sim 3.4$  mm ( $1/9\sim 1/8''$ ). (Fig. 28c)

When the blade point of the looper has advanced to the center of the needle eye, the distance to the upper part of the needle eye should be approximately  $2$  mm ( $1/16''$ ) (Fig. 28d)

If, after having been set as shown in Fig. 30a, it still does not conform to Fig. 28c, it will be necessary to change the timing. To do so, remove the frame top cover ⑥ (Fig. 5), and adjust by loosening the eccentric cam set screw ①, (Fig. 28 e).

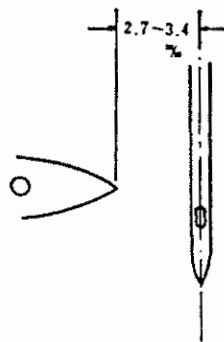


Fig. 28 c

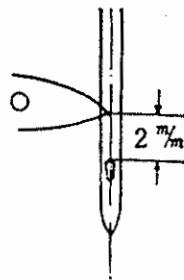


Fig. 28 d

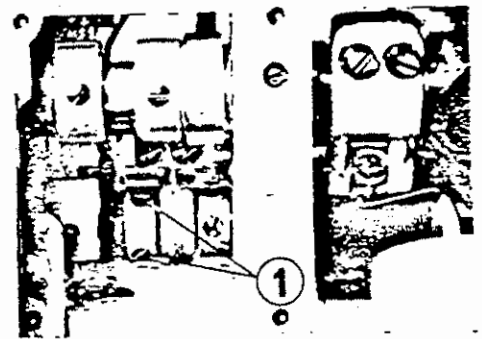


Fig. 28 e

##### 5. Adjusting the lower looper thread cam (Fig. 29)

Install the lower looper thread cam ① so that when the needle bar is at the upper point, loosen the cam set screw ② to set the flat part of the cam horizontal. After it's installed, be sure to tighten it. The function of this lower looper thread cam is to remove the sagging of the

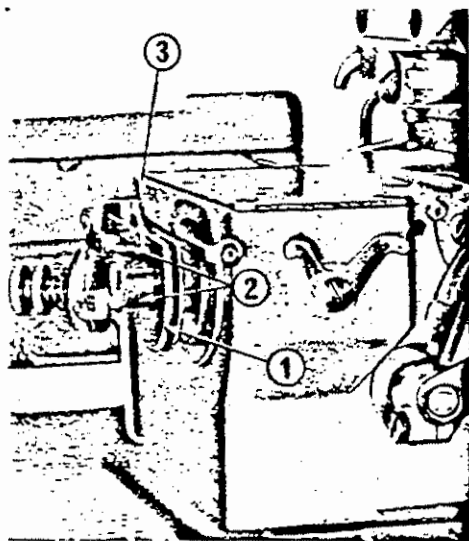


Fig. 29

lower looper thread when the looper returns and the needle enters the triangle created by the upper looper thread and the lower looper thread. Another function is to loosen the lower looper thread sufficiently when the upper looper thread tightens. The lower looper thread cam guide ③ adjusts the over-sagging of the lower looper thread by loosening the set screw ④ and changing its direction when the looper has moved to the extreme back position.

#### 6. Adjusting the looper avoid motion of the safety stitch looper (Fig. 30)

When a thick needle is used, it will hit the looper and sometimes the needle may break. In such an instance, adjust the looper avoiding range of the safety stitch looper as follows:

First, open the back cover of the machine. Next, rotate the pulley with your hand and set the safety stitch looper in the position as shown by Fig. 30. Loosen the set screws ① and ②. Rotate the looper avoiding link pin ③. As this looper avoiding link pin is an eccentric type pin, the clearance of the center of the pin ④ either stretches or shrinks. Also, when the looper avoiding link pin is rotated, the small edge part ⑤ of the looper avoiding connecting rod goes up and down.

A) When the looper avoiding range must be increased, rotate the looper avoiding link pin ③ to lower the small edge part ⑤.

B) When the looper avoiding range must be decreased, rotate the looper avoiding link pin to raise the small edge part ⑤.

Next, adjust so that the forward and backward direction clearance between the needle and the blade point of the safety stitch looper comes to approximately  $0.05\sim 0.1\text{ mm}$  ( $1/500\sim 1/250''$ ), then tighten the set screw ②.

By adjusting this eccentric pin, it is possible to adjust the forward and backward motion range of the looper to anywhere between approximately  $3.0\sim 3.4\text{ mm}$  (about  $1/8''$  or so).

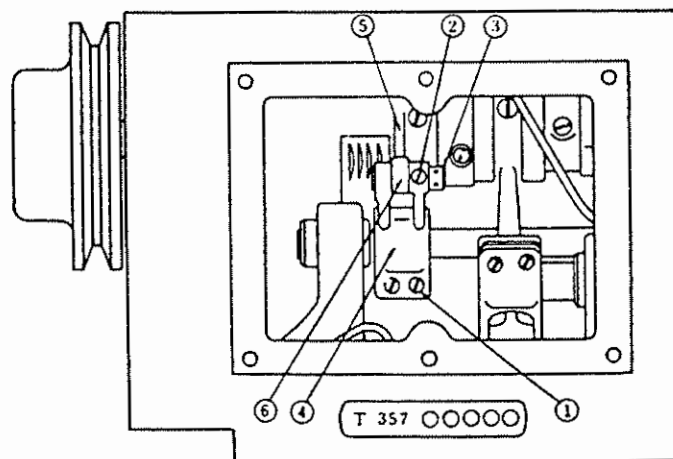


Fig. 30

## IV. MAINTENANCE OF THE MACHINE

1. As this machine trims the edge of the cloth, plenty of waste cloth, dust etc. will accumulate, so clean the machine constantly. Dust will accumulate especially between the throat plate and the feed dog, so remove the throat plate at least once a week and clean it well.

2. To keep the knives sharp, it is desirable to hone the knives constantly, so at least once in every 3-4 days, hone them thoroughly.

As shown in Fig. 31, hone the upper knife to  $25^\circ$  and the lower knife to  $10^\circ$ .

3. For optimal performance, the machine must be maintained at all times; in addition, give the machine an overall inspection at least once a year.

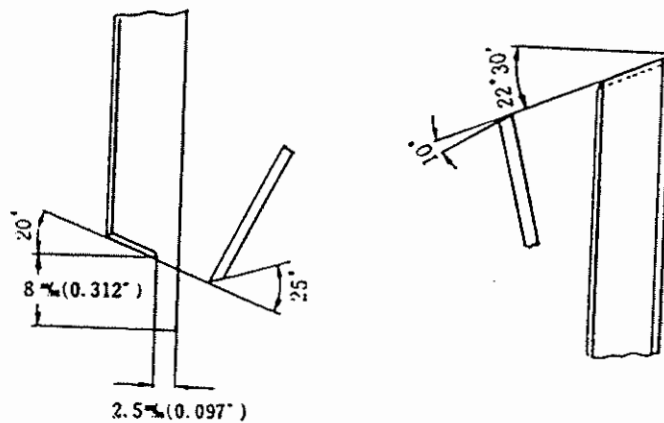


Fig. 31



## V. CAUSES OF MALFUNCTIONS AND REPAIRING

No.	Malfunctions	Reasons	Repairing
1.	Needle breakage	① Wrong needle used ② Needle size wrong ③ Needle inserted wrong ④ Relation with needle guard is wrong ⑤ Relation between needle and looper is wrong ⑥ Needle is curved	Use DC×1 (81×1), DM×13 (82×13) Use correct size needle for cloth See needle insertion chapter II-5 See needle guard adjusting chapter II-13 See chapter on needle and looper matching Change to new needle
2.	Knife cutting not sharp enough	① Knife worn out ② Installing angle of upper knife to lower knife is wrong ③ Upper and lower knives installed wrong ④ Lower knife spring pressure too weak	Re-sharpen every 3-4 days Refer to Chapter II-11 Refer to Fig. 22 Increase spring pressure to 1.8-2.5kg see Chapt. II-11
3.	Stitches skip	① Needle position wrong ② Timing of needle and looper wrong ③ Looper tip dull ④ Right twist thread used for upper looper ⑤ Thread tension defective	Correct needle position See Chapt. III-2 Refer to Chapt. III-3, 4 Hone it with whetstone or replace with new looper Change to left twist Refer Chapt. II-7
4.	Thread breakage	① Inferior thread ② Thread too thick compared to needle ③ Needle groove and needle eye not made right ④ Needle not inserted right ⑤ Thread tension disc pressure too big	Change to better quality thread Change to correct size needle or thread Change to better needle Refer to Chapt. II-5 Adjust thread tension pressure

No.	Malfunctions	Reasons	Repairing
5.	Wrinkles appear in stitches	⑥ Thread paths of needle, looper or throat plate bruised ⑦ Needle and looper not timed right ① Needle too large ② Thread tension too strong ③ Foot pressure too great ④ Feed dog too high ⑤ Throat plate not suitable	Repair with whetstone or buff Refer to Chapt. III-3, 4 Select needle appropriate for kind of thread and cloth Adjust by turning thread tension nut Release pressure by turning adjusting screw to left Lower the feed dog and match the height of main feed with differential feed Change it with a new throat plate which will produce correct overlock width
6.	Uneven stitches	⑥ Knife does not cut well ⑦ Differential feed not matched correctly ① Flaw in thread tension ② Thread tightening inadequate ③ Needle point is blunted ④ Presser foot pressure inadequate ⑤ Height of feed dog inadequate	Re-sharpen knife See Chapter II-10 Use uniform size thread Use mechanical thread winder Clean thread paths Make thread tension stronger Change with a new sharp pointed needle Strengthen for heavy materials Raise it up for heavy materials