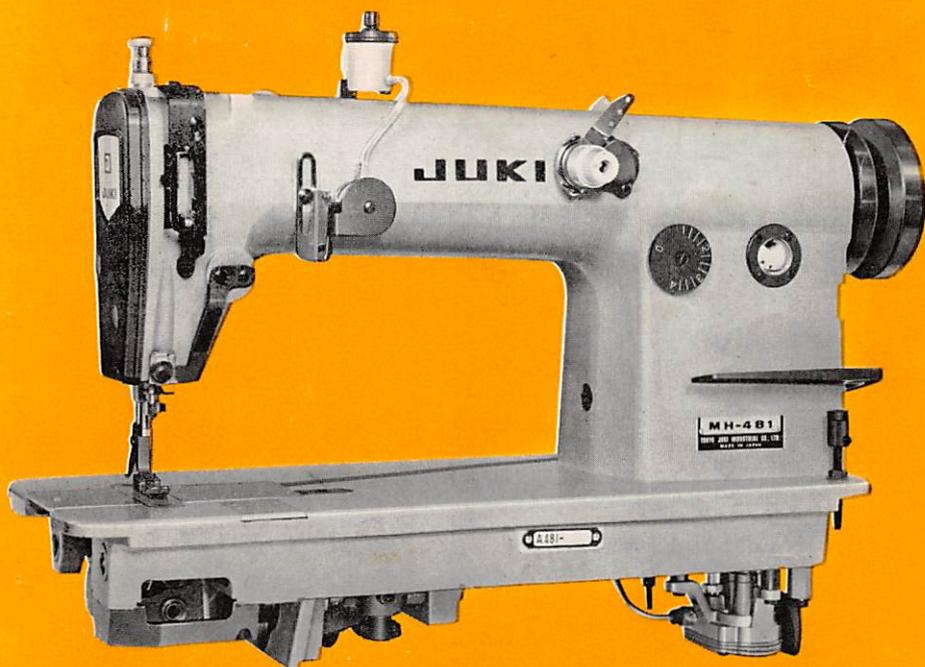




MODEL **MH-481**

HIGH SPEED, FLAT BED, SINGLE NEEDLE,
DOUBLE CHAINSTITCH
INDUSTRIAL SEWING MACHINE
WITH REVERSE FEED

INSTRUCTION BOOK



TOKYO JUKI INDUSTRIAL CO., LTD.

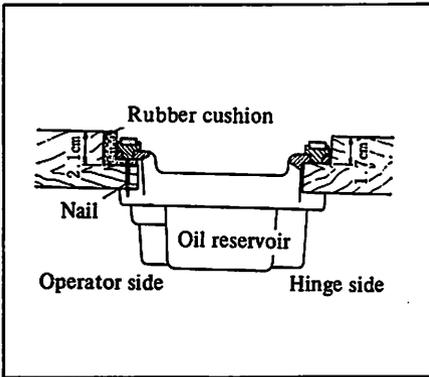
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1. HOW TO SET UP THE MACHINE

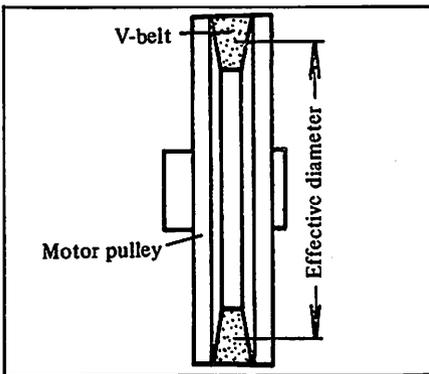
1) How to install the oil reservoir



As shown in the figure, support the oil reservoir by the 4 protruded parts of the groove of the table.

- ① Hammer-in the 2 front rubber washers which are supporting the head with nails into the protruded part of the table.
- ② Leave the 2 washers on the hinge side as they are and
- ③ Put the oil reservoir on top.
- ④ Insert the round felt on top of the rubber cushion.

2) Motor pulley and the belt



MH-481 can sew at a maximum speed of up to 5,500 s.p.m.

Accordingly, use a clutch motor of 3 phase AC 400W (1/2 HP). Use a V-belt of M type.

*The relation between the motor pulley and the number of rotation of the machine is shown by the following table. (The effective diameter of the motor pulley means the diameter as measured from the center of the V-belt when it is wound around the pulley)

The most appropriate length of the V-belt is 42 — 43 inches.

Frequency	Number of rotation of machine	Motor pulley No.	Effective diameter of motor pulley	Remarks
50 Hz	5,500 s.p.m.	MTKPO130000	130 φ	
	5,000 s.p.m.	MTKPO120000	120 φ	
	4,500 s.p.m.	MTKPO110000	110 φ	
60 Hz	5,500 s.p.m.	MTKPO110000	110 φ	
	5,000 s.p.m.	MTKPO100000	100 φ	
	4,500 s.p.m.	MTKPV090000	90 φ	

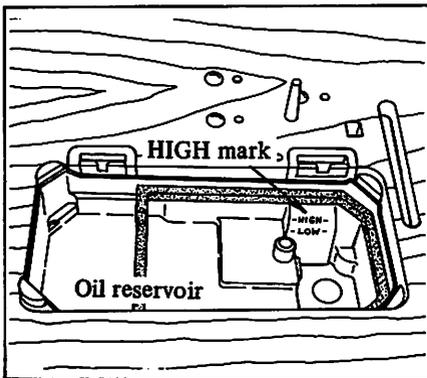
2. HOW TO OPERATE THE MACHINE

1) Cautions on operation

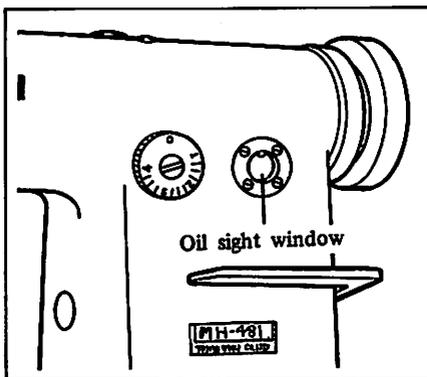
- ① Do not operate the machine without filling up the oil reservoir with sufficient oil.
- ② The direction of the rotation of the machine is toward the operator. Do not run the machine in the reverse direction.
- ③ The maximum rotational speed of the machine is up to 5,500 s.p.m. but for the first month drop this speed to about 4,500 s.p.m.

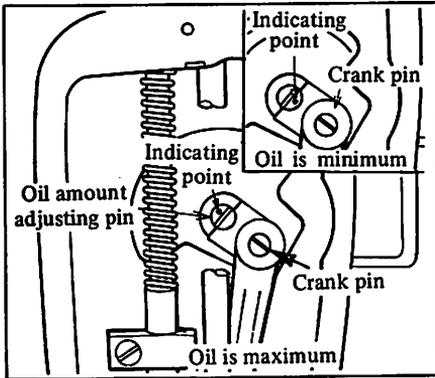
After that, run the machine with appropriate speed depending on the nature of work, kind of sewing material or sewing thread and capability of the operator.

2) Lubrication



- ① Before running the machine, fill up the oil reservoir with JUKI New Defrix Oil No. 1 up to the mark "HIGH".
- ② Watch and see that the oil level does not go under the "LOW" mark.
- ③ When the machine is run after filled up with oil, the oil can be seen splashing against the oil sight window when the oil circulation is normal.
- ④ When the oil gets dirty, replace it with fresh, clean oil. Pull out the oil plug screw in the oil reservoir and the oil can be drained.
- ⑤ When the machine is to be used for the first time or when it was idle for a long period of time, rotate the machine with a speed of 3,500 - 4,000 s.p.m. for about 10 minutes with the presser foot in raised up condition and allow the machine to get warmed up.





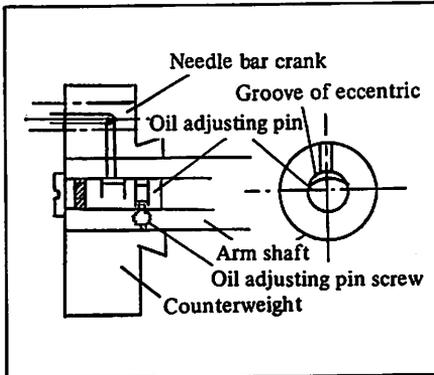
Adjusting the oil amount of the face part

When adjusting the oil amount to the needle bar crank parts, remove the face plate and adjust by rotating the oil amount adjusting pin at the end of the main shaft.

1. When the indicating point of the adjusting pin comes near the needle bar crank pin, the oil amount gets less and,
2. When the indicating point comes to the opposite point of the crank pin, the oil amount gets more.

CAUTION

The oil amount does not change immediately after adjustment, so have this in mind when adjusting the oil amount.



On oil amount adjusting pin

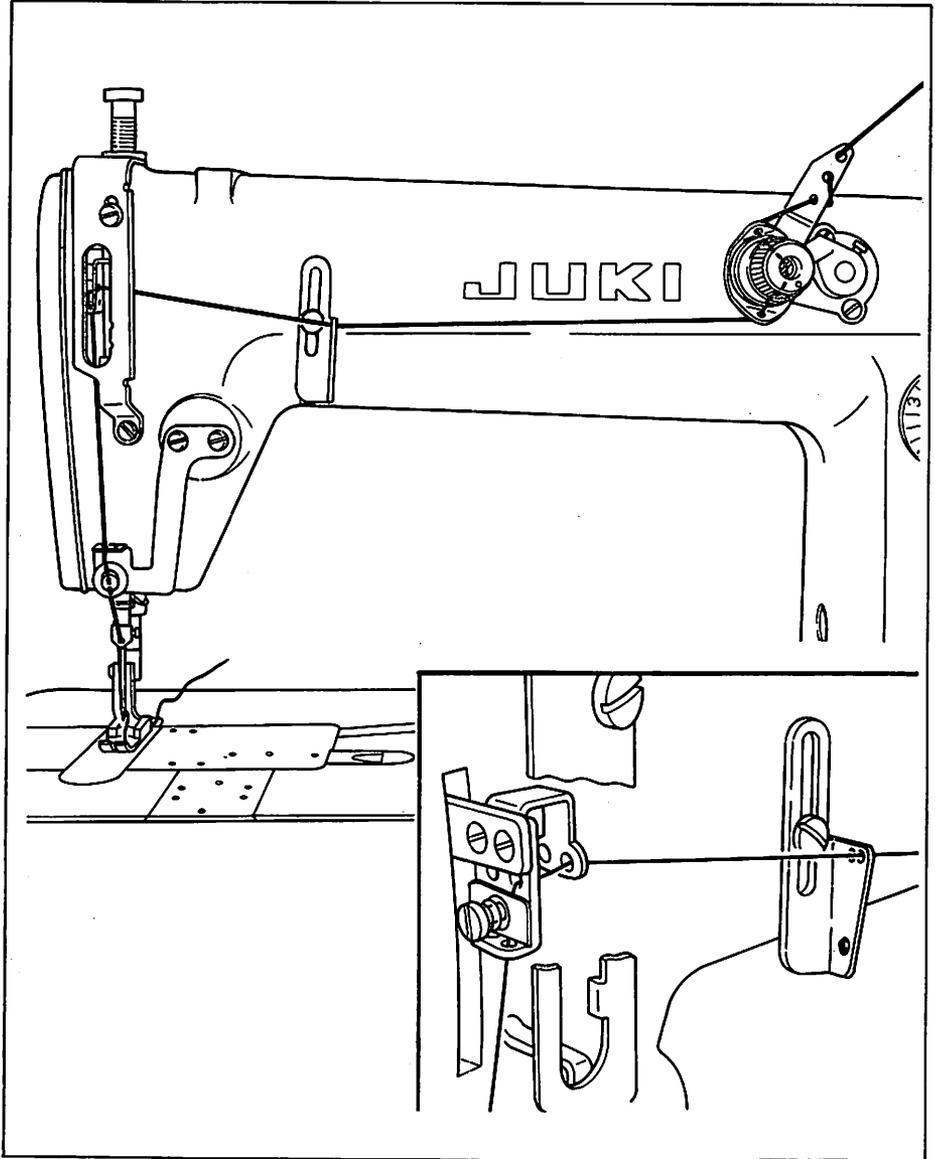
There is a carved groove on the oil adjusting pin as shown in the figure.

1. When this groove and the oiling hole of the main shaft are matched, the oiling amount becomes maximum.
2. When this groove comes to the opposite side of the oiling hole, the oiling amount becomes minimum.
3. The indicating point of the adjusting pin shows the side without the carved groove.

3) How to pass the needle thread

With the needle bar raised to its highest position, pass the thread in the order as shown in the figure.

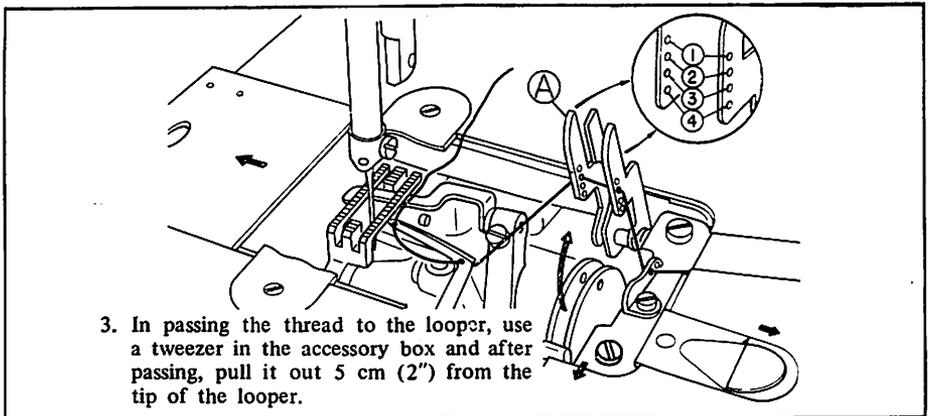
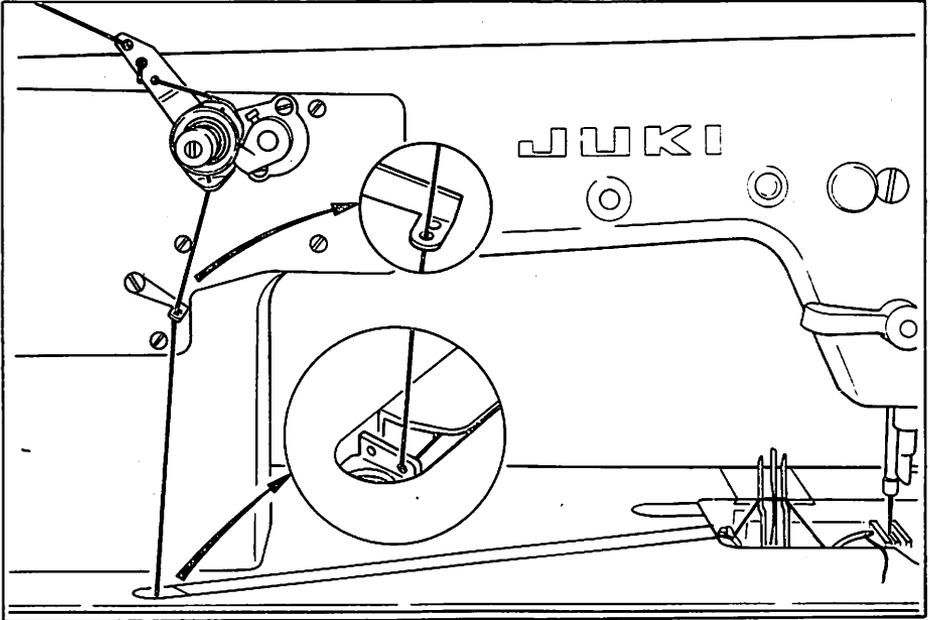
1. Pass the thread to the needle hole toward the opposite side of the operator from the operator side.
2. Pull out the thread which was passed through the needle about 10 cm (4").



4) How to pass the looper thread

Pass the looper thread as shown in the figure.

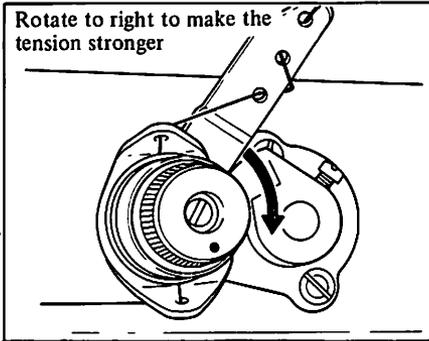
1. Pass the looper thread through the looper thread guide plate, as shown in the figure. When the thread is strongly twisted or when the stitch length is large, pass the looper thread as shown in the Fig. (A).
2. If the plate spring of the sketch is pulled toward front, A will rise. There are 4 thread holes of (A). These should be used separately according to the nature of the looper thread.
Holes ① ② are for threads with specially strong stretchy quality such as woolie nylon etc. or when the stitch length are over 3 mm (1/8").
Holes ③ ④ are for cotton thread or less stretchy quality.



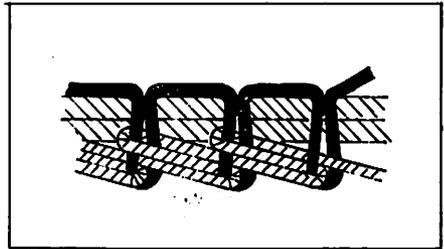
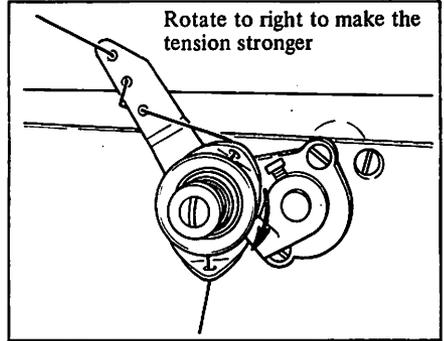
3. In passing the thread to the looper, use a tweezers in the accessory box and after passing, pull it out 5 cm (2") from the tip of the looper.

5) The thread tension

Adjusting the needle thread tension

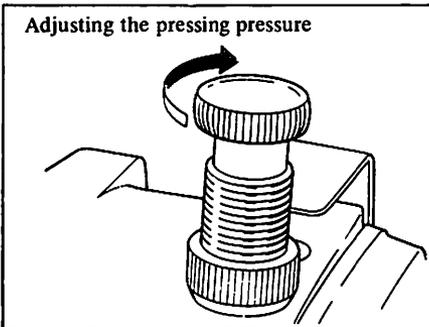


Adjusting the looper thread tension



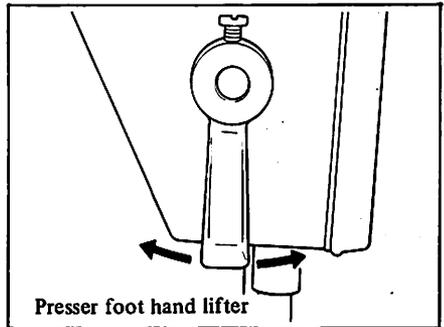
6) Presser foot and feed dog

Adjusting the pressing pressure



If the pressure adjusting screw is turned to right, the pressure becomes stronger and if it's turned to left, the pressure becomes weaker. The standard pressure is 5 kg.

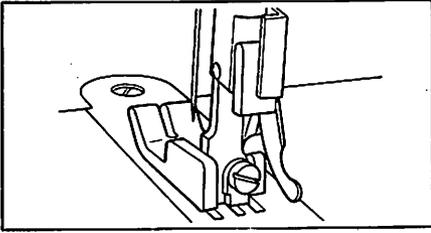
On presser foot hand lifter



To stop the presser foot at the lifted position, rotate the presser foot hand lifter either to right or left.

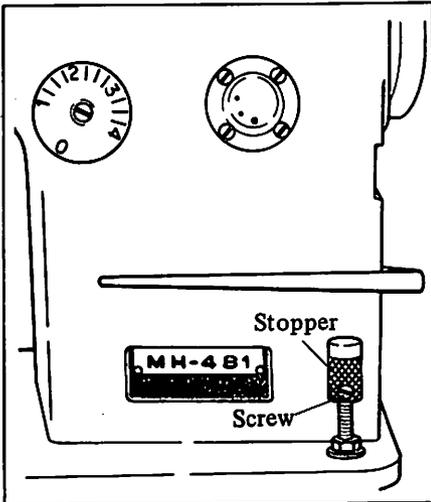
To lower the presser foot, manipulate the knee lifter once and the presser foot will return to its original position.

On chain-off thread presser



Irrespective of high speed or low speed sewing, a small chain-off thread presser is built-in in the MH-481 model so that the chain-off thread comes out easily. Conventional presser foot for general lock stitch can be used if no question is asked for chain-off thread.

7) On stitch length



Adjusting the stitch length

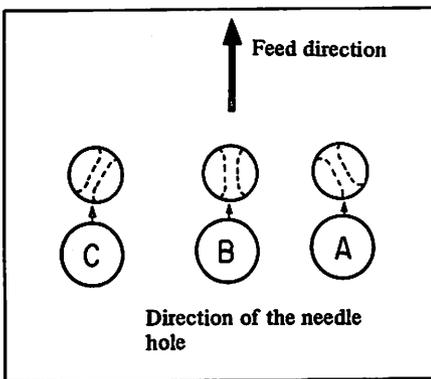
The stitch length of this model can be adjusted by rotating the feed adjusting dial on top of the feed lever.

The figures on the graduation scale is shown in millimeter (mm).

1. Rotate the feed adjusting dial either to right or left and
2. Match the wanted figure with the pin coming out from the frame.
* The maximum stitch length is 4 mm(5/32").
3. If the lever is pushed, it becomes reverse sewing with the standard pitch of 2mm (5/64").
4. If the position of the lever stopper is raised, the pitch of the reverse sewing becomes small.
5. If the position of the lever stopper is raised up further (loosen the nut and pull the stopper up) and the lever is pushed, it is possible to sew with normal sewing with small stitch length.

Take advantage of this feature for bartacking at the start of sewing or end of sewing.

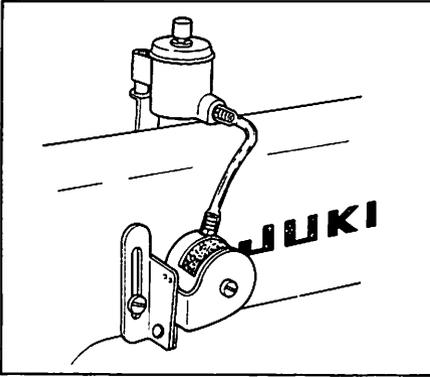
8) How to install the needle



The designated needle is TV x 7, #9~#21.

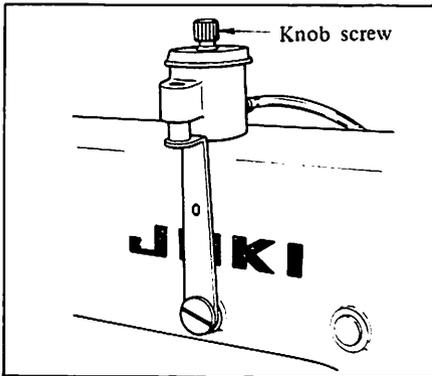
For stabilizing the reverse sewing, do not make the direction of the needle as shown in the figure C.

9) How to install the silicon oil lubricant unit



MODEL MH-481 is provided with SILICON OIL LUBRICATING UNIT for sewing with synthetic or mixed synthetic thread.

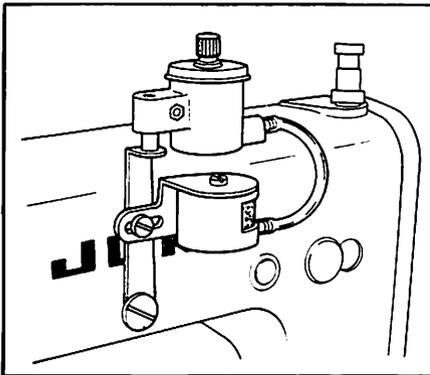
As shown in the figure, loosen and remove the set screw of the silicon oil lubricant unit installing stud and install the felt case as shown in the figure left.



Fill up the tank with silicon oil and if the knob screw is loosened, silicon oil will seep into the felt.

After that tighten the knob screw fully and when the punch mark of the knob screw has returned about half ~ one rotation, the oil amount is considered to be appropriate.

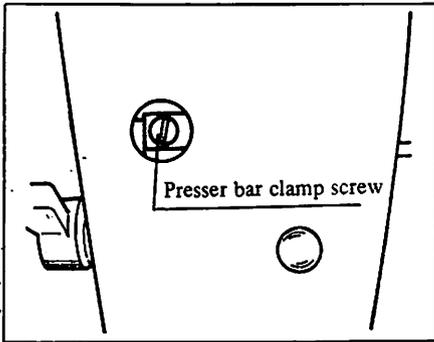
When the day's work is done or when the work is to be stopped for more than one hour, be sure to leave the knob screw firmly tightened and the silicon oil will not leak out and the next operation can be resumed smoothly.



When silicon oil lubricant unit is not in use, be sure to stop it as shown in the figure.

3. ADJUSTING THE MACHINE

1) Adjusting the presser foot and the feed dog

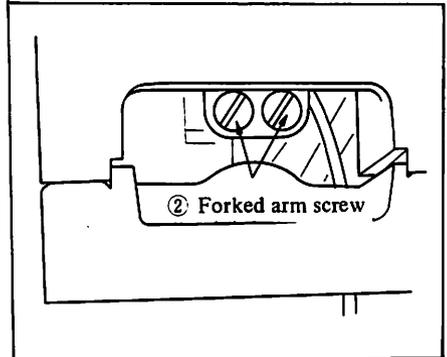
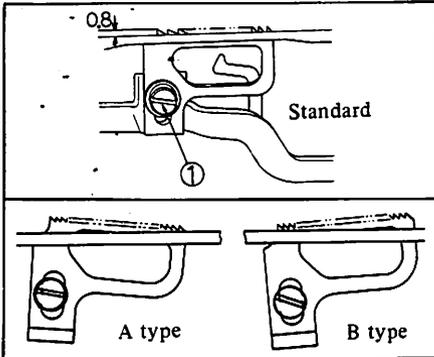


Adjusting the height of the presser bar

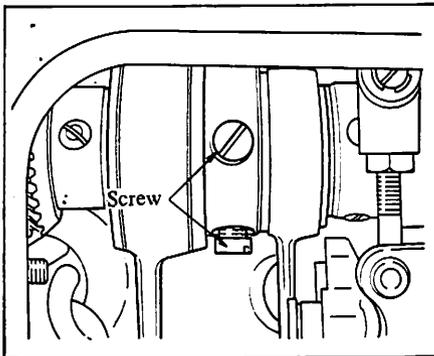
When the height or the direction of the presser bar is to be changed due to the exchange of presser foot:

1. Remove the rubber plug of the face plate.
2. From this hole, adjust by loosening the presser bar clamping screw.
3. After the adjustment, securely tighten the set screw.

How to install the feed dog

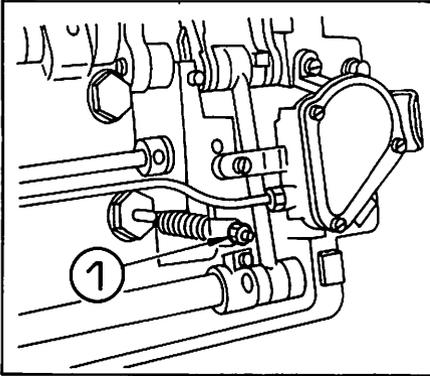


If the screw ② of figure is loosened, the slant of the feed dog can be adjusted either to A type or B type. The maximum protruding amount of the feed dog is 0.8 mm (1/32"). Adjust to this amount by screw ①.

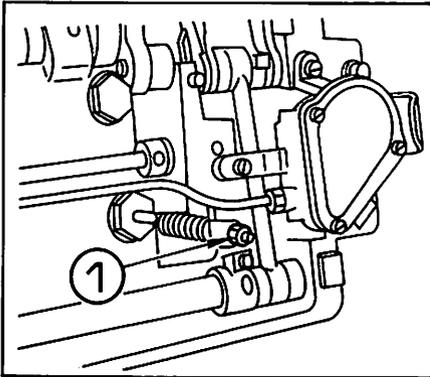


Matching the needle and the feed dog

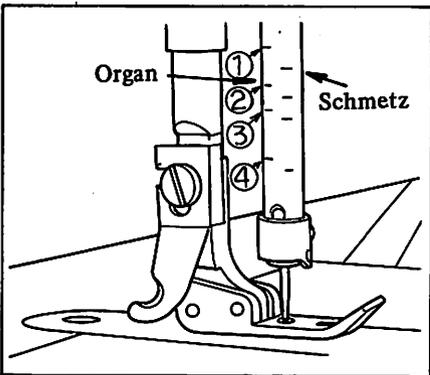
When the needle point has dropped to 3mm (1/8") bottom the surface of the throat plate, adjust the position of the feed dog by the screw of figure so that the feed dog sinks just below the lower surface of the throat plate.



2) On needle bar and needle



2) On needle bar and needle



Adjusting the pressing pressure of the feed lever

The reversing spring of the feed lever is strengthened somewhat so that at high speed sewing, no matter what kind of stitches are to be formed, the lever returns positively to the original position.

When the stitching pitch is small or when the machine is to be run by lowering the r.p.m., the pressing pressure of the feed lever can be lessened by loosening the adjusting nut ① of the accompanying figure.

Adjusting the pressing pressure of the feed lever

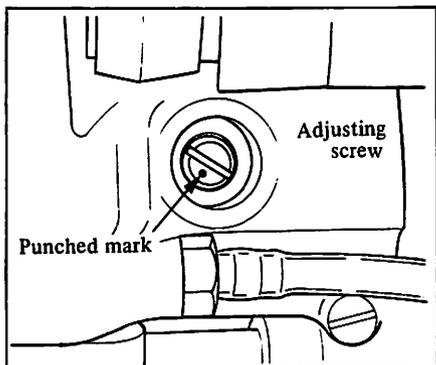
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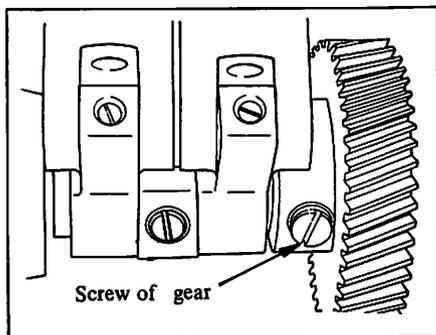
Adjusting the height of the needle bar

When an Organ needle (TV x 7) is used, set the height of the needle bar so that when the needle bar has reached to lower dead point, the left side carved line (No.1 mark) matches with the bottom surface of the needle bar lower bushing. (See figure)

Also, when the Schmetz needle (5463-35 etc.) is used, match it so that the right side carved line comes to the position as mentioned above. (At this condition, the distance between the needle point and upper surface of the throat plate becomes 10.0 mm(25/64").



- 1 Remove the rubber cap.
- 2 Rotate the hand wheel with the hand.
- 3 The heads of the plated adjusting screw ①, flat top screw, clamp screw will appear in that order, so at first, loosen the 2 screws, flat top and clamp screw.
- 4 If the punched mark of the adjusting screw ① is brought to right side, the dimension of B becomes bigger.
- 5 Adjustment is made depending on the size number of the needle but normally it is adjusted to #11 needle.
- 6 The adjustment should be made so that the looper goes as near the needle side as possible and returns. Then, after setting the position by tightening the flat top screw, securely tighten the clamp screw.

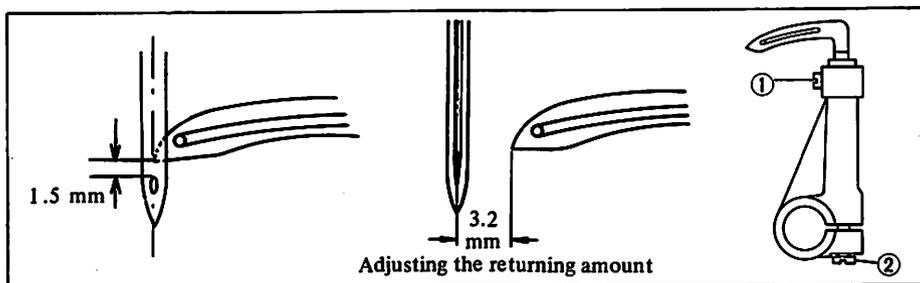


Matching the looper

When the needle is at the lowest point, the looper comes to extreme right position. This adjustment is made by loosening the screw of the gear.

Scooping amount of the looper

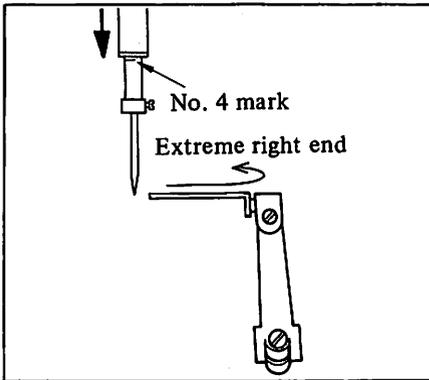
When the blade point of the looper has reached the center of the needle, the standard distance between the blade point and the upper end of the needle hole is 1.5mm(1/16"). When the No. 2 carved line of the needle bar is matched with the lower edge of the needle bar lower bushing, adjust so that the blade point of the looper comes to the center of the needle. The returning amount of the looper comes to approximately 3.2mm(1/8") and the relative relationship of the needle hole and the thread hole of the looper becomes as shown in the figure.



Clearance between the looper and the needle

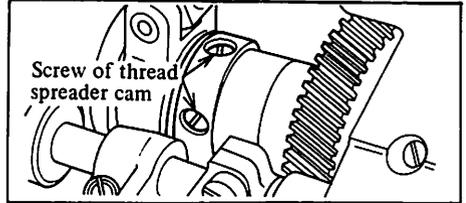
The clearance between the looper and the needle when the looper scoops up the thread should be as narrow as possible. After adjusting the needle guard, re-confirm this condition.

4) On thread spreader



Thread spreader is necessary in case of reverse sewing and at the same time it is very important to obtain stable stitches without skip-stitching in case of normal feed sewing. The timing of thread spreader against the needle

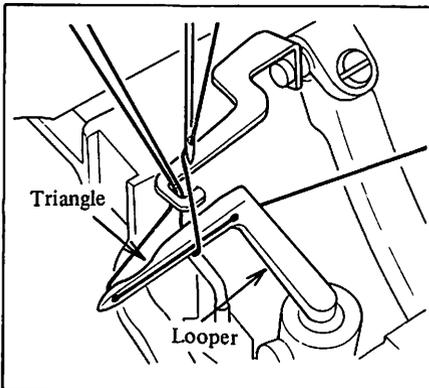
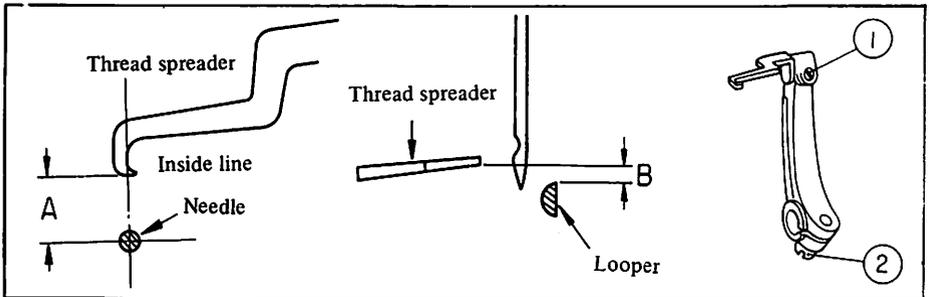
As shown in the figure, when the No. 4 mark of the needle bar appears from the bottom of the needle bar lower bushing, set the thread spreader with the thread spreader cam set screw, as shown in the figure, so that the thread spreader comes to extreme right end.



Position of the thread spreader latch

When the No. 3 carved line of the needle bar is matched to the bottom of the needle bar lower bushing, adjust the thread spreader as shown in the figure.

- ① The right and left direction should be such that the inside surface of the thread spreader should match with the center of the needle.
- ② Adjust so that the front and back dimension A should be 2 mm (5/64") with the screw ①.
- ③ The height should be adjusted so that the clearance between the bottom surface of the thread spreader and the upper surface of the looper to be 0.2 mm (1/100") with the screw ②.



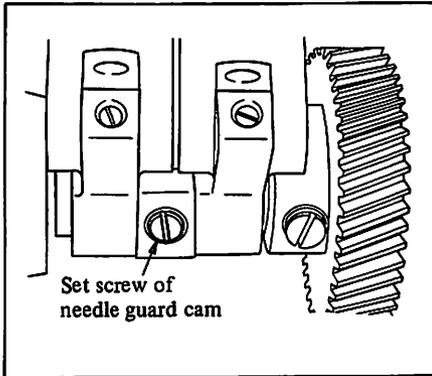
Method of thread spreader

① When the thread spreader latch returns, the tip of the thread spreader latch is positively grasping the looper thread and one side of the needle thread loop until the needle point enters the triangle of the thread.

③ After the needle point has entered the triangle, the looper should release the thread.

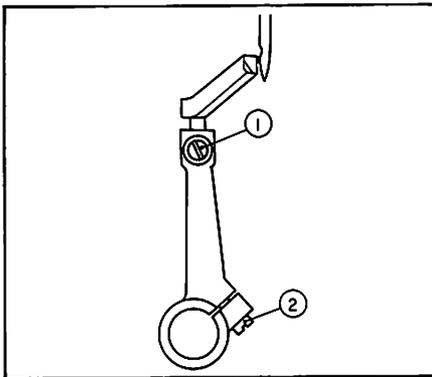
Above are the thread spreader adjustments for both normal and reverse stitches to form correct stitches.

5) Needle guard and loop guide



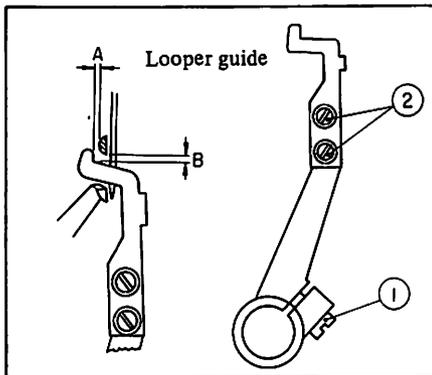
The timing of the needle guard

The timing of the needle guard is determined by matching the first screw of the figure with the flat part of the shaft.



Position of the needle guard

When the looper scoops up the needle thread, adjust so that the needle point lightly touches the needle guard. Set the height as high as possible to about cover the needle thread loop. Loosen set screws ① and ② for this adjustment.

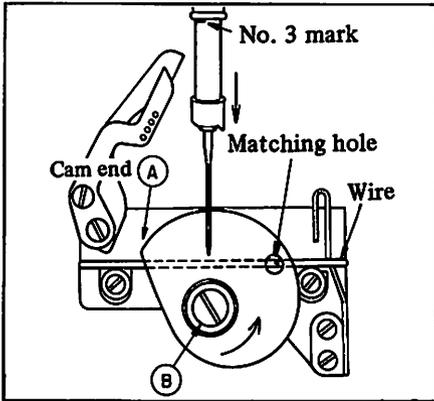


Position of the looper guide

The looper guide should be installed as near the looper as possible so that it will not touch the looper. Adjust it so that the dimension of A will be about 0.2 — 0.5 mm (1/100" — 1/64"), and of B to be about 0.5 — 1.0 mm (1/64" — 3/64").

Dimension of A should be adjusted by loosening screw ① and of B loosen screw ②.

6) On looper thread cam

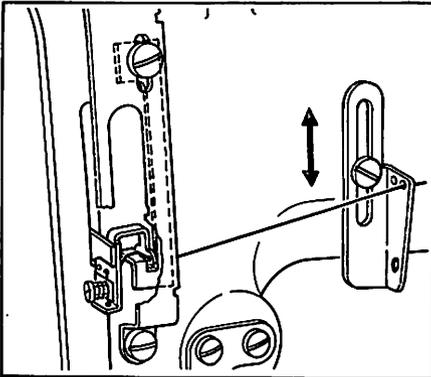


As shown in the figure, when the No. 3 carved line of the needle bar comes to the bottom surface of the needle bar lower bushing, make it so that the wire can be seen through the hole of the matching hole of the cam. The timing of the looper thread cam can be adjusted by loosening the screw B and after the position is determined tighten the screw securely.

After all adjustments are completed, verify the following:

1. Verify that when the looper thread came off from the protruded end (A) of the looper thread cam, the needle point has completely entered the triangle of the looper thread.

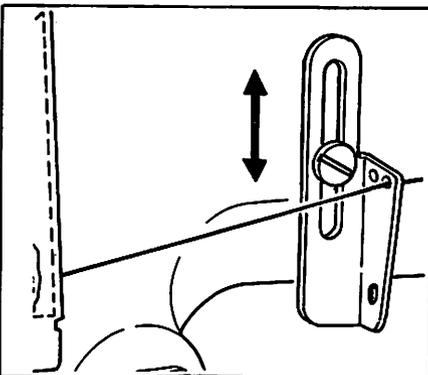
7) On the position of the take-up thread tension lever



When the needle bar is at the lowest point, if the needle thread is pulled in by hauling motion by the take-up thread tension lever, the needle thread loop becomes big at the scooping time of the needle thread.

In case of normal fine thread, lower the needle to the lowest dead point.

8) On the frame thread eyelet



The thread tightening changes according to the positions of the frame thread eyelet. When the frame thread eyelet is lowered, the tightening of the looper thread becomes weaker and if it's raised up, the tightening becomes stronger.

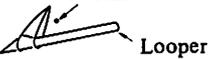
4. MAINTENANCE OF THE MACHINE

To maintain the machine in constant smooth running condition, be sure to do as follows:

- 1) Give the machine an overall inspection daily and verify its running condition.
 - * Verify if the oil is circulating smoothly by watching through the oil sight window.
 - * If a different operator is running the machine daily,, be sure to have him contact an expert maintenance crew for guidance.
- 2) Inspect the following parts at least once a week:
 - * Throat plate, sliding plate and remove the cam cover and by using a brush dust off the dirt from the groove of the feed dog.
 - * Tilt the machine toward the opposite side and,
 - (1) Remove the thread hards stuck to the oil pump netting and remove the rubbish inside the oil reservoir.
 - (2) When the oil becomes dirty and blackish, pull out the oil plug and exchange the dirty oil with new, fresh JUKI Defrix Oil No. 1.
 - (3) Verify that the oil level is always above the "LOW" mark.
 - (4) Wipe away the black steel powder sticking to the magnet at the bottom of the oil reservoir.

5. MALFUNCTIONS & CORRECTIVE MEASURES

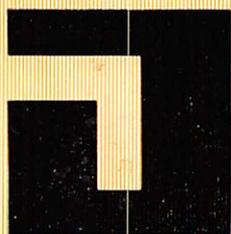
No.	Malfunctions	Causes	Corrective Measures	Ref. Page
1	Thread breakage	1. Quality of thread is bad.	① Use a better quality thread	7
		2. Thread is thick compared to needle.	② Change the needle or thread to proper size.	
		3. Thread breakage due to heat of needle.	③ This occurs on synthetic thread. Use silicon oil lubricant. Lower the r.p.m.	8
		4. Thread tension is too strong.	④ Weaken the thread tension.	6
		5. The thread path of needle, looper, throat plate, needle guard, looper guide and all other thread paths are bruised.	⑤ Sharpen with oil whetstone or by buffing.	
		6. Due to twice passing of thread.	⑥ Activate the thread take-up tension lever.	14
2	Skip-stitch	1. Skip-stitching of needle thread.	① Verify the scooping amount of looper.	11
		 <p>2 stitches collapse *(This occurs when looper does not scoop needle thread)</p>	② Verify the clearance between the looper and needle.	11
			③ Verify the timing of the looper & needle.	11
			④ Depending on the thread, activate the thread take-up tension lever.	14

No.	Malfunctions	Causes	Corrective Measures	Ref. Page
2	Skip-stitch		⑤ Verify the correct installation of the needle ⑥ Verify the timing of the needle guard. ⑦ Refer to the passing of the thread.	7 13 4, 5
		2. Loper thread skip-stitches.  * One stitch collapses  Needle Loper * (This occurs when the needle drops into the triangle of thread.)	① Verify above ① & ③. ② Verify the timing of the looper thread cam. ③ Adjust the position of the thread spreader hook ④ Make the tension of the looper thread stronger. ⑤ Refer to passing of the thread.	14 12 6 4,5
		3.  * Inadequate linking of loop. (This occurs when the needle thread is too much on left side.)  Needle Loper Besides above (In case of synthetic thread.) (In case of mixed synthetic thread.)	① Refer to 1. 3. of skipping of needle thread. ② Verify the timing of the thread spreader and position of hook of the looper ① Drop the sewing speed ② Use silicon oil lubricant. ③ Use needle for synthetic thread. ① Make the scooping amount of looper greater ② Drop the sewing speed ③ Use silicon oil lubricant	12 1 8 11 1 8
3	Inadequate tightening of thread	1. When the needle thread tension is weak. 2. When the bobbin thread tension is strong. 3. Insufficient palling out of looper thread cam. 4. The thread is too thick against the needle. 5. Depending on the position of intermediate thread guide.	① Tighten the needle thread tension nut. ② Loosen the looper thread tension nut. ③ Change the thread passing to looper thread cam. ④ Change the needle. ⑤ Lower the position of the frame thread eyelet.	6 6 14 7 14

No.	Malfunctions	Causes	Corrective Measures	Ref. Page
		6. Position of the thread take-up thread tension lever. 7. The throat plate	⑥ Raise up the position of the lever. ⑦ Use large needle hole throat plate	14
4	Needle breakage	1. Needle may be curved. 2. Inspect the timing of the feed dog with the needle. 3. Inspect the installation of presser foot. 4. Needle guard 5. When the tension of the needle thread is too strong. 6. Thickness of needle.	① Change the needle. ② Is the timing correct ? ③ See if the hole of presser foot, hole of throat plate and loop guide plate are placed in the center of needle. ④ Verify the timing and position of needle guard. ⑤ Make the tension of the needle thread weaker. ⑥ Select the correct size needle to conform to the nature of the sewing cloth and its thickness.	7 10, 11 13 6 7
5	Puckering	1. Tension of thread is too strong. 2. Timing of the looper cam. 3. Processed condition of thread path. 4. When pressing pressure of presser foot is too strong.	① Sew with weaker tension. (Especially, lower the tension of looper thread) ② Verify if the timing is correct. ③ Polish the thread path with lapping agent on thick thread #8 ④ Loosen the adjusting screw	6 14 6

(Please note)

* Due to improvements on the mechanism of the machine, the method of operation and some part of the specification may have to be changed without previous notice.



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