



**INDUSTRIAL SEWING MACHINE
MODEL**

LS2-1780

<Classes>

**High-Speed Single-Needle Lockstitch
Automatic Undertrimmer**

INSTRUCTION MANUAL

Thank you for selecting the Mitsubishi Sewing Machine. We are sure you will enjoy its excellent functions. Please read this manual before attempting to operate the machine.

A180E588P01

PRECAUTIONS BEFORE STARTING OPERATION

(1) Safety Precautions

1. When turning the power on, keep your hands and fingers away from the area around/under the needle and the area around the pulley.
2. Power must be turned off when the machine is not in use, or when the operator leaves his/her seat.
3. Power must be turned off before tilting the machine head, installing or removing the "V" belt, adjusting the machine, or when replacing.
4. Avoid placing fingers, hairs, bars, etc., near the pulley, "V" belt, bobbin winder pulley, or motor when the machine is in operation. Injury could result.
5. Do not insert fingers into the thread take-up cover, under/around the needle, or pulley when the machine is in operation.
6. If a belt cover, finger guard, and/or eye guard are installed, do not operate the machine without these safety devices.

(2) Precautions before Starting Operation

1. If the machine's oil pan has an oil sump, never operate the machine before filling it.
2. If the machine is lubricated by a drop oiler, never operate the machine before lubricating.
3. When a new sewing machine is first turned on, verify the rotational direction of the pulley with the power on.
(The pulley should rotate counterclockwise when viewed from the pulley.)
4. Verify the voltage and (single or three) phase with those given on the machine nameplate.

(3) Precautions for Operating Conditions

1. Avoid using the machine at abnormally high temperature (35°C or higher) or low temperatures (5°C or lower). Otherwise, machine failure may result.
2. Avoid using the machine in dusty conditions.

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Preparation before operation

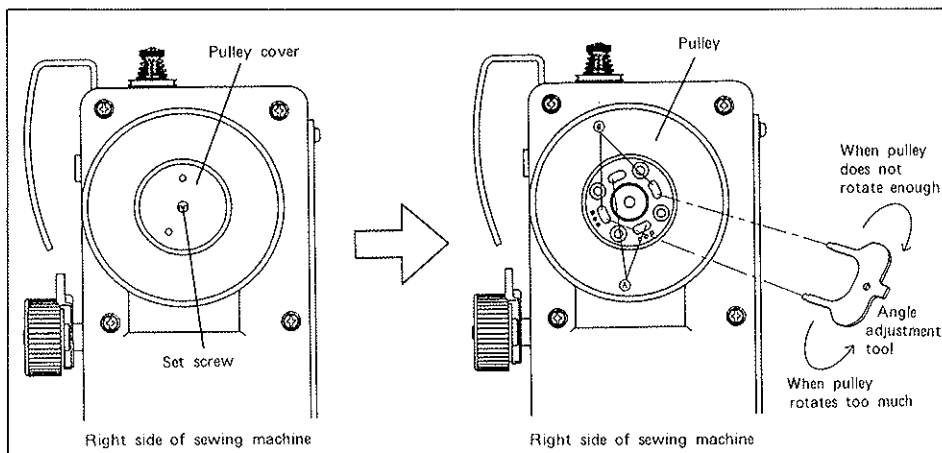
1 Adjusting the stop position

(1) Adjusting the UP position

- Run the sewing machine, and stop at the UP position.
- Remove the set screw from the pulley, and remove the pulley's cover.
- While supporting the pulley with the hand, set the angle adjustment tool in the two A holes (indicated with a white stamp), and turn the UP position reflection plate.
- After adjusting, run the sewing machine again, and stop at the UP position. Confirm the UP position with the needle stop position, etc.

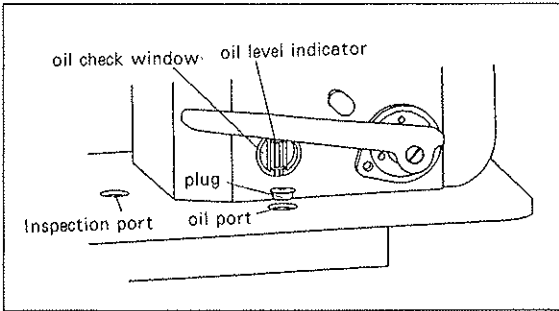
(2) Adjusting the DOWN position

- Run the sewing machine, and stop at the DOWN position.
- Remove the set screw from the pulley, and remove the pulley's cover.
- While supporting the pulley with the hand, set the angle adjustment tool in the two B holes (indicated with a black stamp), and turn the DOWN position reflection plate.
- After adjusting, run the sewing machine again, and stop at the DOWN position. Confirm the DOWN position with the needle stop position, etc.



Precautions for starting to operate

1 Lubrication

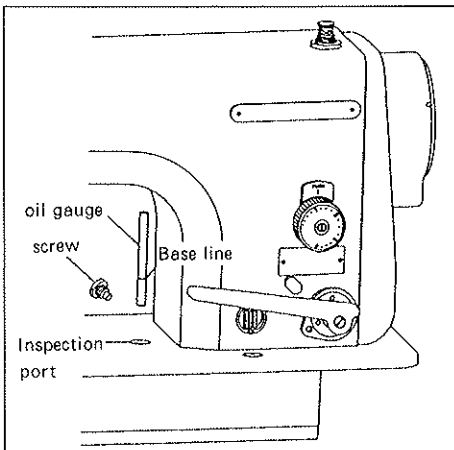


Before starting sewing machine operation, fill oil for hook lubrication into the oil tank.

1. Remove the rubber plug from the oil port, and fill the oil from the oil port.
2. Fill in oil until the tip of the oil level indicator matches the line in the oil check window.
3. Use the Mitsubishi-specified "MC70M" for the oil.
4. When done filling the oil, set the rubber plug into the oil port.
5. If the tip of the oil level indicator drops below the line in the oil check window during operation, replenish the oil.

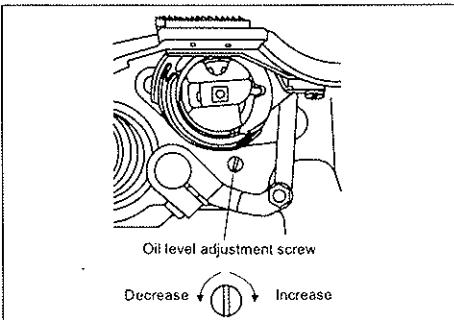
Note: The inside of the inspection port is lubricated before the sewing machine is shipped, so do not lubricate.

2 Checking the oil level and oil contamination



1. Remove the screw from the inspection port indicated with the arrow in the illustration.
2. Insert the enclosed oil gauge into the inspection port.
3. Remove the oil gauge, and confirm that the oil level and base line match. If the oil level is too high, remove some of the oil.

3 Adjustment of the amount of oil for hook

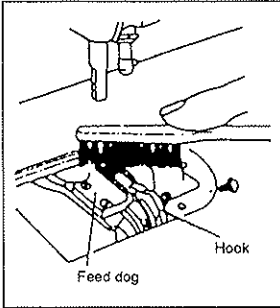


1. Turn the oil level adjustment screw, and adjust the amount of oil for hook.

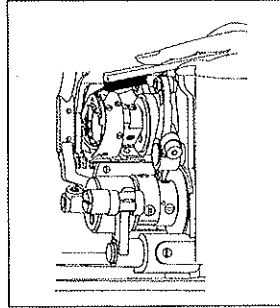
Precautions for starting to operate

4 Periodical cleaning

1. Machine



- 1) Remove the throat plate and clean the feed dog.
- 2) Assembling is to be made by screwing in the screw by 2 to 3 rotation by hand at first, then tightening them evenly by use of a long size screw driver.



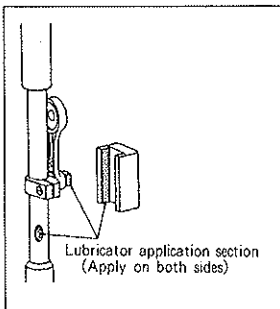
- 3) Lay down the machine head and clean the hook and inner bobbin case.

2. Control box Remove dust from connector (If the connector covered with dust, machine might misoperated.)

5 Precaution for position detector

1. A light type detection element is used in the detector. Thus, take care not to adhere or oil on the detector plate when the sewing machine pulley is removed for adjustments, etc. If dust or oil does adhere, wipe off with a soft cloth while taking care not to scratch the detector plate. Do not allow oil to seep into the clearances of the detector plate.
2. If the position detector connector has been disconnected, the belt has been removed, or the machine has locked completely, the motor is automatically switched off in a predetermined period of time to prevent the motor from burning. (The motor may not be switched off if incomplete lock-up or overload has occurred.) The operation is restored to normal by switching the power off, and then on after the fault has been repaired. The above also takes place when the detector has become faulty or any wire has been broken.

6 Applying Lubricator (When "M12" displays at the control box)



If "M12" appears on the control switch panel when the power switch is turned ON, it is time to apply Lubricator onto the needle bar.

Apply Lubricator with the following steps.

Step 1. Turn the power OFF and apply Lubricator to the shaded section shown in the drawing.

Step 2. Display the A mode "GCLR", and hold down the "D" key for approx. two seconds to cancel the error.

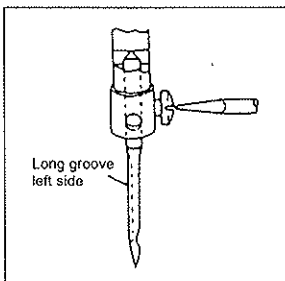
"Caution"

- "M12" will appear when the power switch is turned ON until the Lubricator is applied and "M12" is canceled. Note that "M12" can be canceled temporarily by pressing the "D" key.
- When "M12" appears and operation is continued for a set time without applying Lubricator (canceling M12), "E13" will appear, and the sewing machine operation will be disabled. Apply Lubricator and cancel the error in this case.

How to use the machine

1 How to attach needle

Note: Before making the following adjustment, be sure to switch off the power source.



1. Insert the needle up to the bottom of needle clamp and tighten the screw keeping the long groove side of needle forward the left.

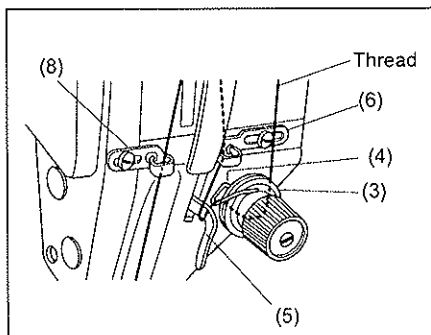
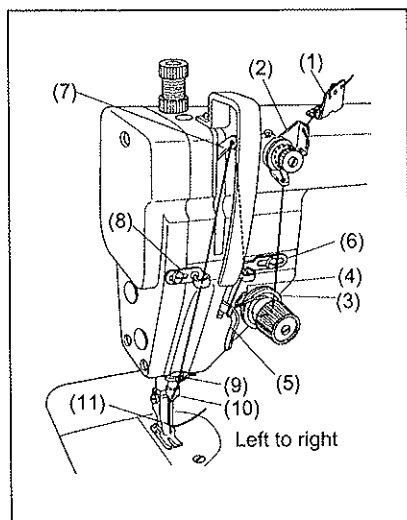
Note: If snapping of thread occurs during back sewing with polyester threads, it may be avoided by fitting the needle with the long groove shifted to the front side.

Use DB × 1 or DA × 1 needle. According to fabric & thread, please choose the size of needle as follows.

Size of Needle	No. of Thread	Fabric
#9	#100 to #80	Extra thin fabric such as de Chin, Georgette, Organdy, etc.
#11	#80 to #60	Thin fabric such as Silk, Calico, Poplin, etc.
#14	#60 to #50	General fabrics such as Cotton, Wooden fabric, etc.
#16	#50 to #30	Thick Calico, Thick wooden fabric, Water proof cloth, thin leather, etc.
#18	#40 to #20	Thick fabric such as Suiting and Coat material, Thin Pouches, Denim, etc.
#21, #22	#20 to #10	General bags, denim, etc.
#23	#10 to #8	Tents, sheets, etc.

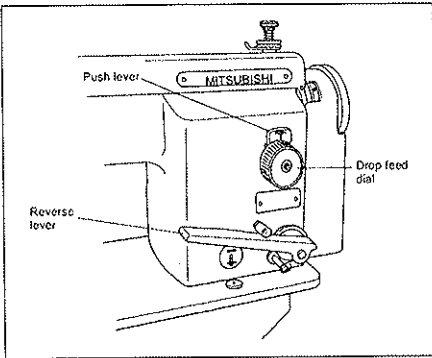
2 Threading

Raise the thread take-up lever to its highest position and thread the upper thread in the following order.

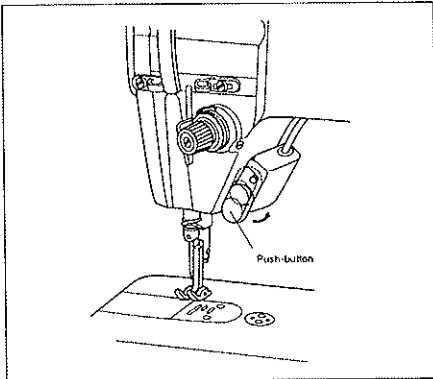


How to use the machine

3 Adjusting of stitch length & reverse lever






1. Rotate the drop feed dial while depressing the reverse lever and, then, pressing the push lever, when making the stitch length shorter.
2. If the reverse lever is depressed, reverse sewing (backward sewing) will take place.



3. <Touchback switch>
 - 1) With the push-button (touchback switch) pressed lightly during sewing, reverse sewing can be done.
 - (1) Reverse sewing will take place while the push-button is pressed.
 - (2) When the push-button is released, reverse sewing turns into forward sewing.
 - 2) When the push-button is turned 180 degrees in the direction of the arrow, the switch will be locked, and backward sewing will not take place even if the button is pressed.

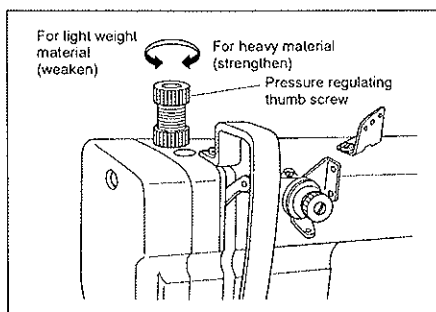
How to use the machine

4 Adjustment of the thread guide

	1	2	3
Thread guide position	Left 	Middle 	Right 
Materials	Heavy	Medium	Light
Thread (Ref.)	Polyester Cotton Vinylon #30 or more	Polyester #50 to 60 Cotton Vinylon #50 to 80	Polyester #50 to 60

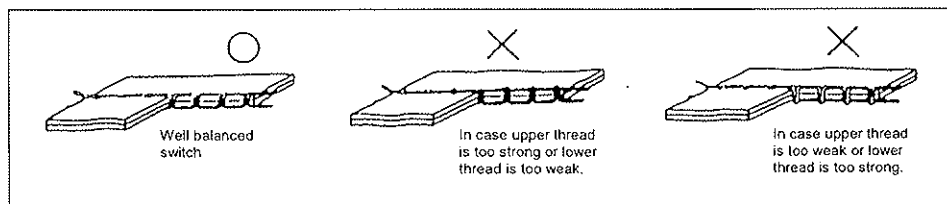
1. Refer to the table on the left, and adjust according to the stitching conditions, the material and thread.

5 Adjusting of pressure of presser foot



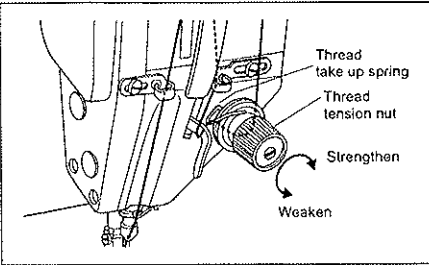
1. Pressure of the presser foot can be adjusted by turning the pressure regulating thumb screw.

6 Adjusting of thread tension



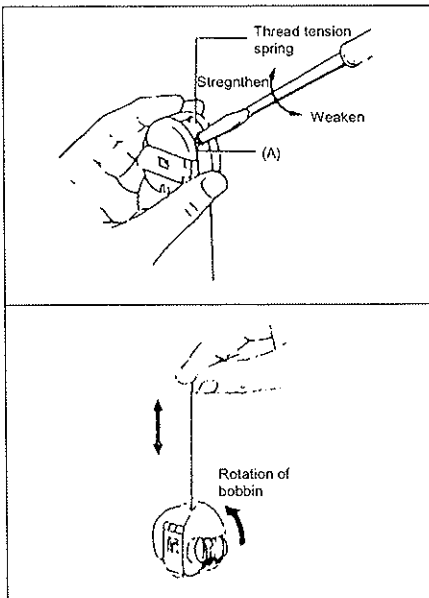
How to use the machine

7 Adjustment of upper thread tension



1. Upper thread tension can be adjusted by thread tension nut.
2. Upper thread is to be adjusted according to the lower thread tension.
3. For special fabric sewing with special thread, the desired tension can be obtained by adjusting the strength and operating range of thread take-up spring.

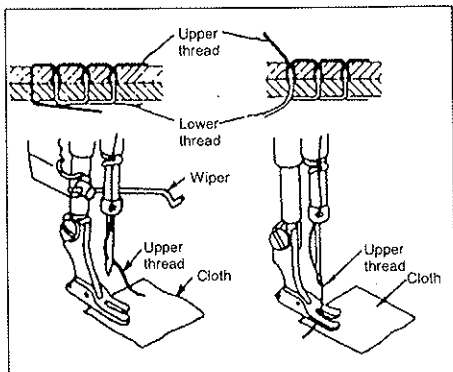
8 Adjustment of lower thread tension



1. Lower thread tension can be adjusted by screw (A).
2. In the case of cotton thread #60, the thread tension can be checked as the following. Hold the end of pulled out thread and if the bobbin case fall slowly, the tension is proper.

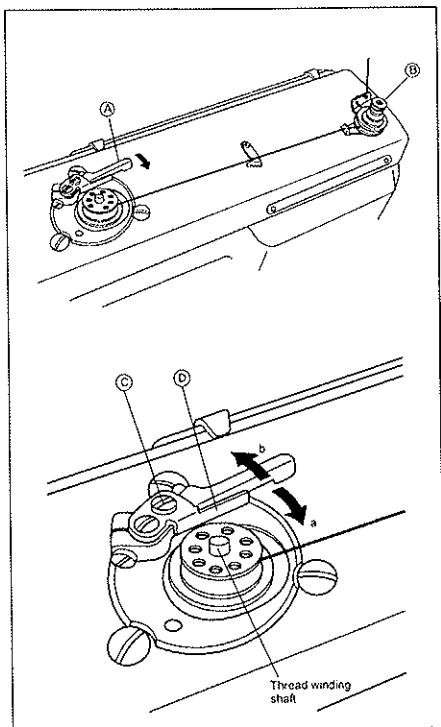
How to use the machine

9 Thread wiper (for machine equipped with thread wiper)



1. When the thread wiper is operated, in next sewing at starting point the end of upper thread does not remain on the surface of fabric.
2. Turn the switch OFF when not required.
The switch is located in the wiper solenoid cover behind the arm.

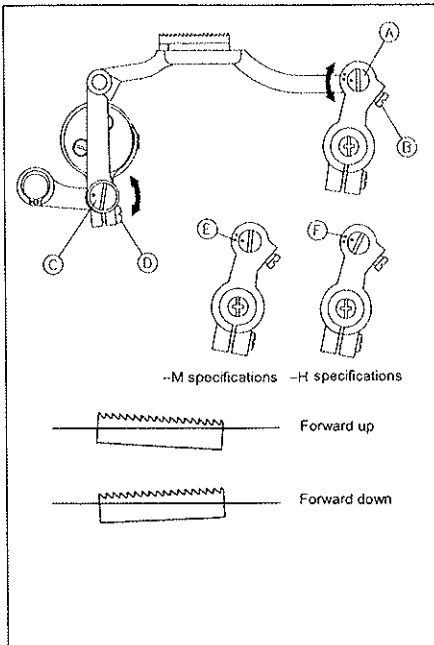
10 How to wind the lower thread on the bobbin



1. Press the bobbin onto the thread winding shaft.
2. Pass the thread for winding thread as shown in the figure, and wind the end of the thread clockwise around the bobbin several times, then wind the thread on the thread adjuster side counterclockwise several times.
3. Press lever (A) in the direction of the arrow, and start the sewing machine.
4. The operation will automatically stop when winding is completed.
5. Adjustment of thread winding strength
 - 1) Adjust with the thread adjuster nut (B).
6. Adjustment of thread winding amount
 - 1) Adjust by loosening screw (C) and moving the adjustment plate (D).
 - (1) The thread winding amount will decrease when moved in the direction of a.
 - (2) The thread winding amount will increase when moved in the direction of b.

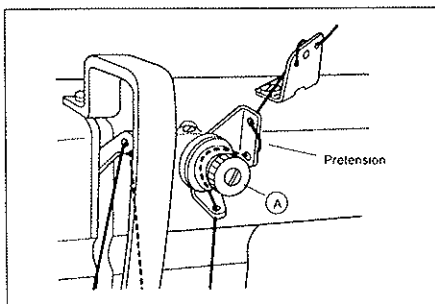
How to use the machine

11 Adjustment of feed dog height and inclination



1. To adjust the height and inclination of the feed dog, loosen screw **D** for the vertical guide arm, and turn the eccentric shaft **C**, or loosen screw **B** at the left of the horizontal feed arm, and turn the eccentric shaft **A**.
 - 1) When the eccentric shaft is set to "DOWN" position, puckering may be avoided and free loop is less like to occur.
 - 2) When the eccentric shaft is set to "UP" position, misalignment of fabrics is less likely to occur and yarn severance may be avoided.
2. The standard adjustments are as follow.
 - 1) As a standard, the mark for the eccentric shaft **A** at the left of the horizontal feed arm is installed so that:
For the -M Specifications ... Match the downward mark \ominus of horizontal feed arm.
For the -H Specifications ... Match the upward mark \oplus of horizontal feed arm.
 - 2) The feed dog height is adjusted with the eccentric shaft **C** for the vertical guide arm according to the sewing machine specifications.
 - 3) The standard feed dog height (at maximum) is as follows:
For -M Specifications ... 0.8
For -H Specifications ... 1.0

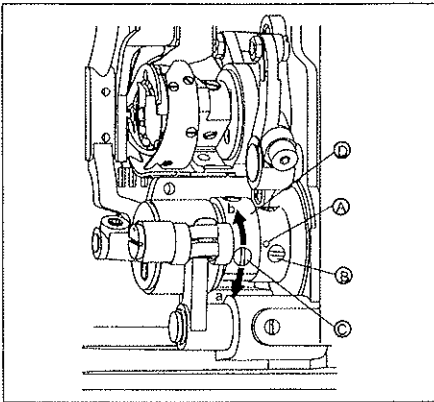
12 Adjustment of remaining needle thread length after thread trimming



1. Turn the pretension nut **A** and adjust.
2. When turned clockwise, the length of thread left in the needle will be short.
3. When turned counterclockwise, the length of the thread left in the needle will be long.

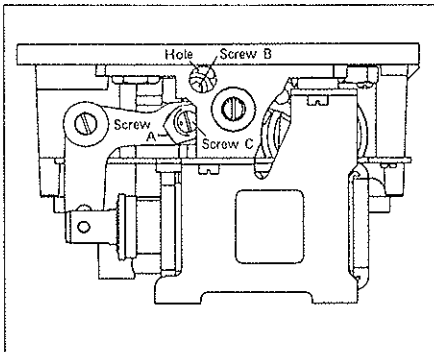
How to use the machine

13 Adjustment of feed timing



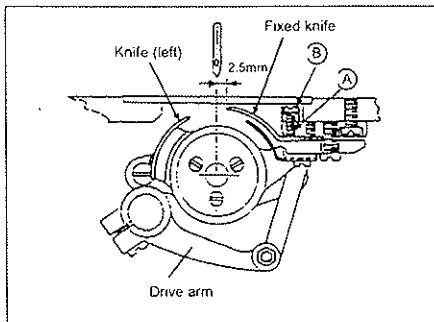
1. Feed timing in respect to needle
 - 1) When the needle is at the highest position, the matching mark (A) for the bearing bushing should face straight down as a standard.
 - 2) As a standard, the upper/lower feed eccentric ring (D) is installed so that screw (C) is linear with the bearing bushing's screw (B).
2. The vertical feed timing is adjusted by changing the installation position of the vertical feed eccentric ring.
 - 1) When the eccentric ring is moved in the direction of a, the vertical feed dog will rise earlier.
 - 2) When the eccentric ring is moved in the direction of b, the vertical feed dog will rise later.

14 Adjustment of forward/backward stitch length



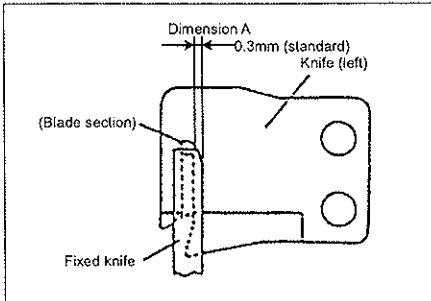
1. Loosen the screw A.
2. Align the screw B with the hole and loosen the screw B.
3. Turn the screw C and adjust.
4. The forward stitch length will increase and the backward length will decrease when the screw C is turned counterclockwise.
5. The forward stitch length will increase and the backward length will decrease when the screw C is turned clockwise.

15 Adjustment of knife engagement

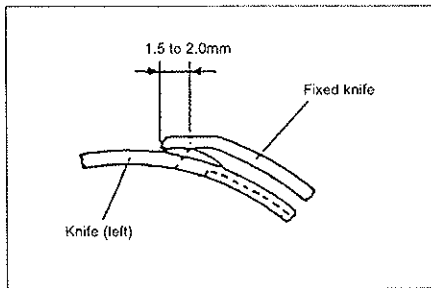


1. Position of fixed knife
 - 1) As a standard, the dimension between the fixed knife's end and the needle center is 2.5mm.

How to use the machine

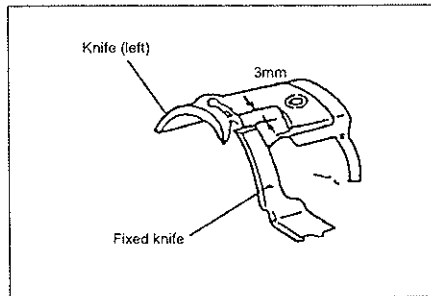


- 2) The standard relation of the knife (left) and fixed knife is shown in the figure. As a standard, Dimension A is 0.3mm.
- 3) When Dimension A is too large, the three piece of threads will be cut, and can cause the needle thread to come out from needle after trimming. If too small, the thread may not be trimmed correctly.
- 4) Adjust by adjusting the installation of the fixed knife.



2. Knife engagement amount

- 1) When the sewing machine is rotated while the solenoid is activated, the knife (left) will be rotated by the thread trimming cam. As a standard, the knife engagement amount should be 1.5 to 2.0mm when the knife (left) moves the most.
- 2) Adjust by adjusting the installation of the drive arm.



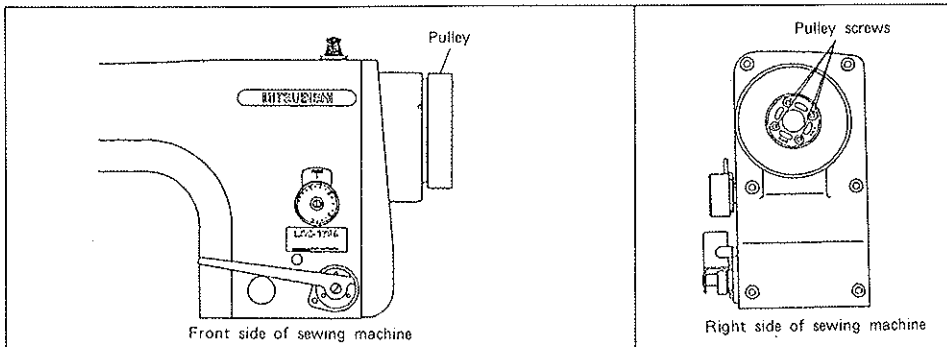
3. Adjustment of knife engagement pressure

- 1) As a standard, the knife (left) and fixed knife should start contacting at the position shown in the figure.
- 2) To adjust the engagement pressure, loosen the lock nut (B) and then adjust the adjustment screw (A).

How to use the machine

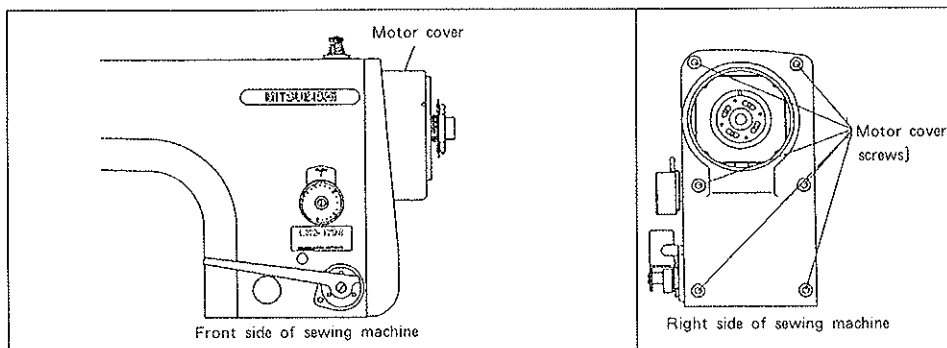
16 Removing the pulley

Loosen the pulley screws, and remove the pulley from the sewing machine.



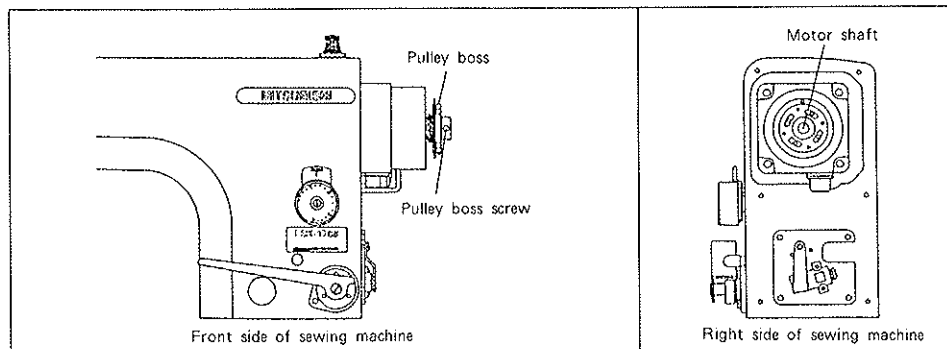
17 Removing the motor cover

Loosen the motor cover screws, and remove the motor cover from the sewing machine.



18 Removing the pulley boss

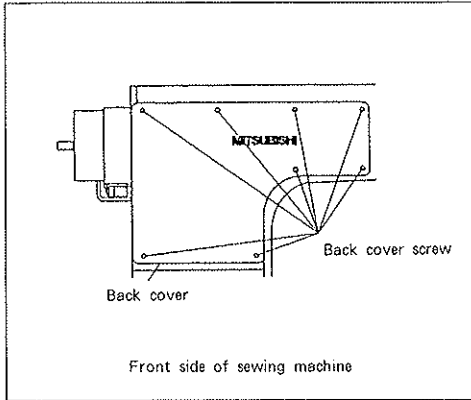
Loosen the pulley boss screws, and remove the pulley boss from the motor shaft.



How to use the machine

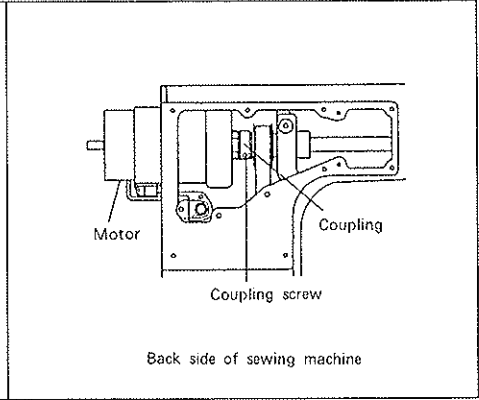
19 Removing the back cover

Loosen the back cover screw, and remove the back cover from the sewing machine.



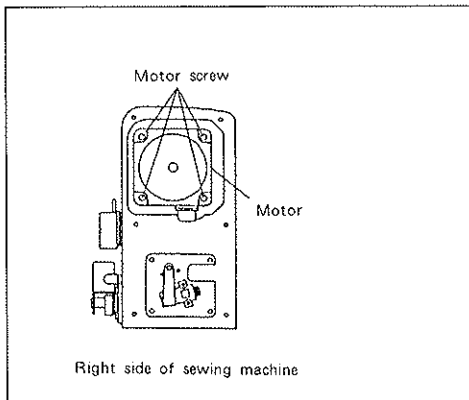
20 Removing the motor (1)

Loosen the coupling screw.



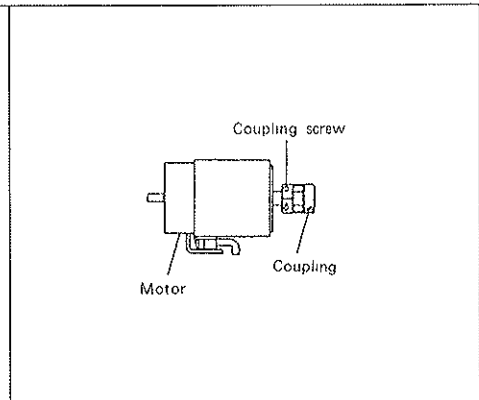
21 Removing the motor (2)

Loosen the motor screw, and remove the motor from the sewing machine.



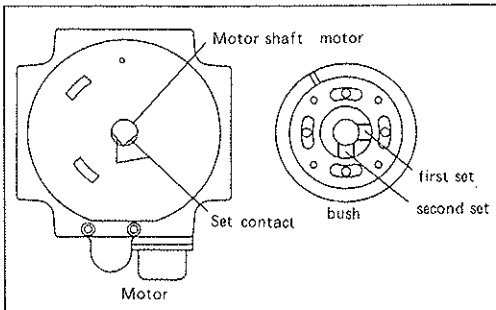
22 Removing the coupling

Loosen the coupling screw, and remove the coupling from the motor.



How to use the machine

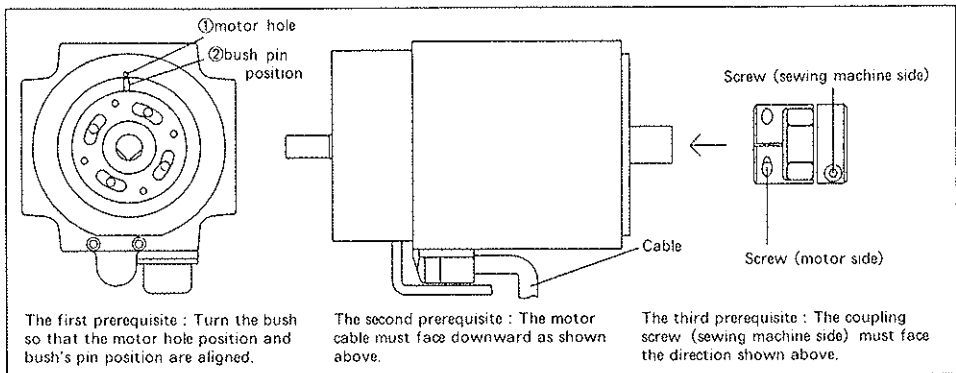
23 Installing the bush



1. Insert the bush into the motor shaft. Align the motor shaft's set contact with the bush's first set and second set, and tighten with the screw.

24 Installing the coupling

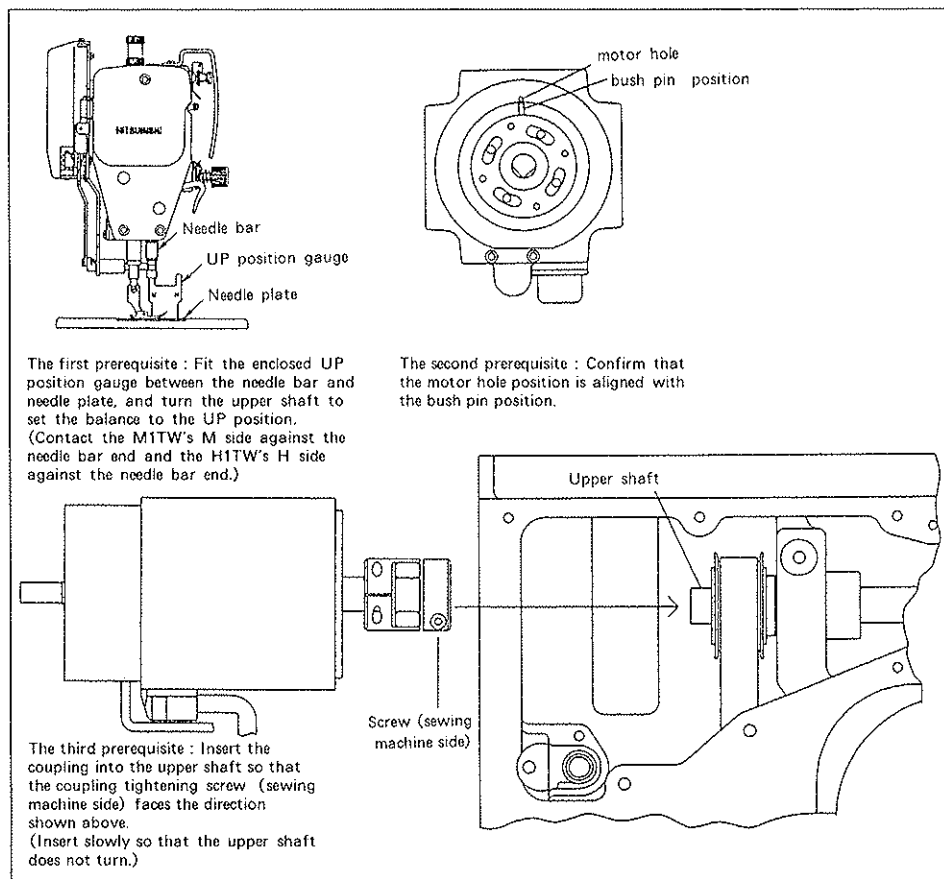
1. Insert the coupling into the motor shaft and tighten the screw (motor side) so that the following prerequisites are satisfied.



How to use the machine

25 Installing the motor (1)

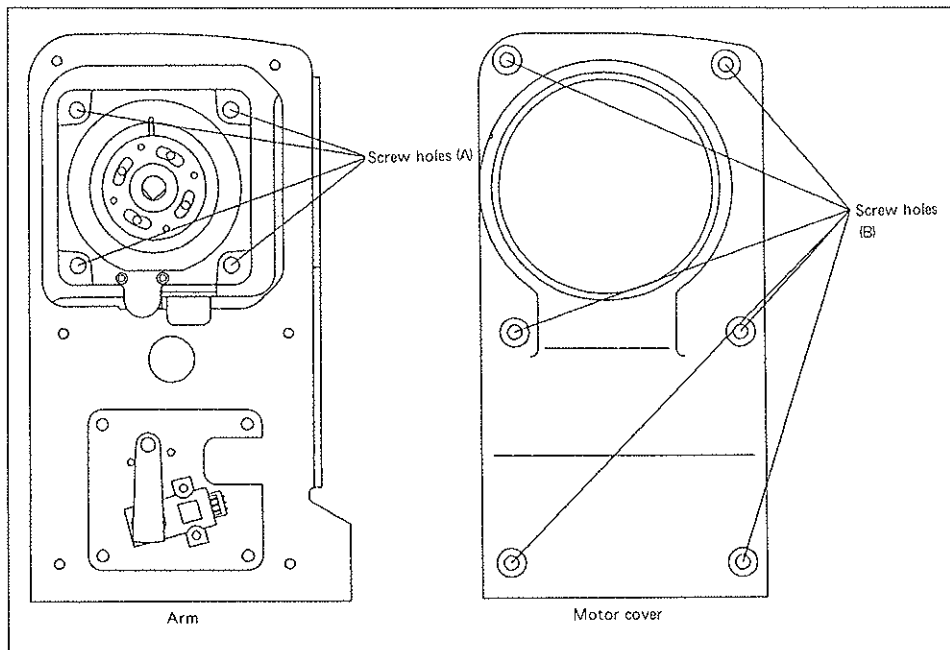
1. Insert the coupling into the upper shaft and tighten the screw (sewing machine side) so that the following prerequisites are satisfied.



How to use the machine

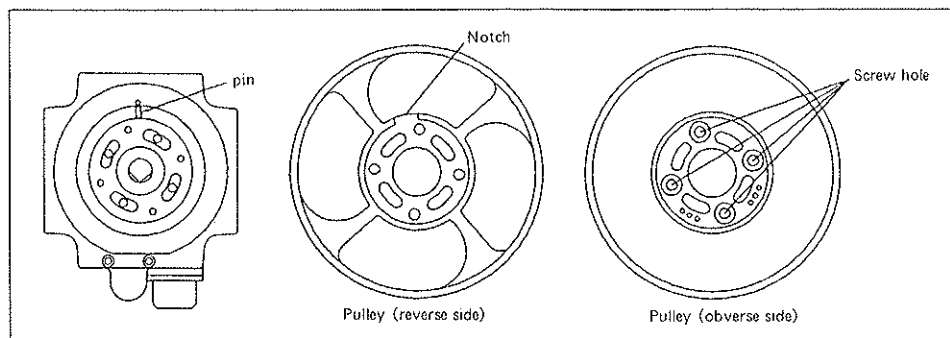
26 Installing the motor (2)

1. Mount the motor onto the arm by tightening the four screws into screw holes (A).
2. Mount the motor cover onto the arm by tightening the six screws into screw holes (B).



27 Installing the pulley

1. Align the bush pin with the notch on the pulley, and fit the pulley onto the bush.
2. Align the bush screw holes with the pulley screw holes and tighten with screws.



Specifications

1 LS2-1780 specifications

		LS2-1780M1TW	LS2-1780H1TW
Material weight		Thin to medium-thick material	Heavy material
Max. speed		5,000rpm	3,500rpm
Stitch length		0 to 4 mm	0 to 7 mm※
Needle bar stroke		31.8mm	34.9mm
Presser foot clearance	Hand lifter	6 mm	
	Auto lifter	9 mm	
	Knee lifter	13mm	
Needle type		DB×1 #14	DB×1 #22
Hook (for thread trimming)		Full rotation automatic lubrication (standard)	Full rotation automatic lubrication (heavy)
Bobbin case		With spring for dry run prevention	
Bobbin		Steel for thread trimmer	
Thread trimming method		Left knife rotating, right knife fixed engagement type	
Oil lubrication method		Automatic lubrication (slightly lubricate to hook and needle bar.)	
Touch back unit		○	
Thread wiper		○	○
Bed dimensions		517×178mm	

※When sewing at stitch length of 6mm or longer, set the sewing speed to 3,000rpm or less.

- (Note)
- Always use a hook and bobbin case dedicated for the thread trimmer.
 - Use a high quality bobbin that will not deform.

After-sales service

If any trouble or faults occur, contact the place of purchase or your dealer's sewing machine department.

 **mitsubishi electric corporation**

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