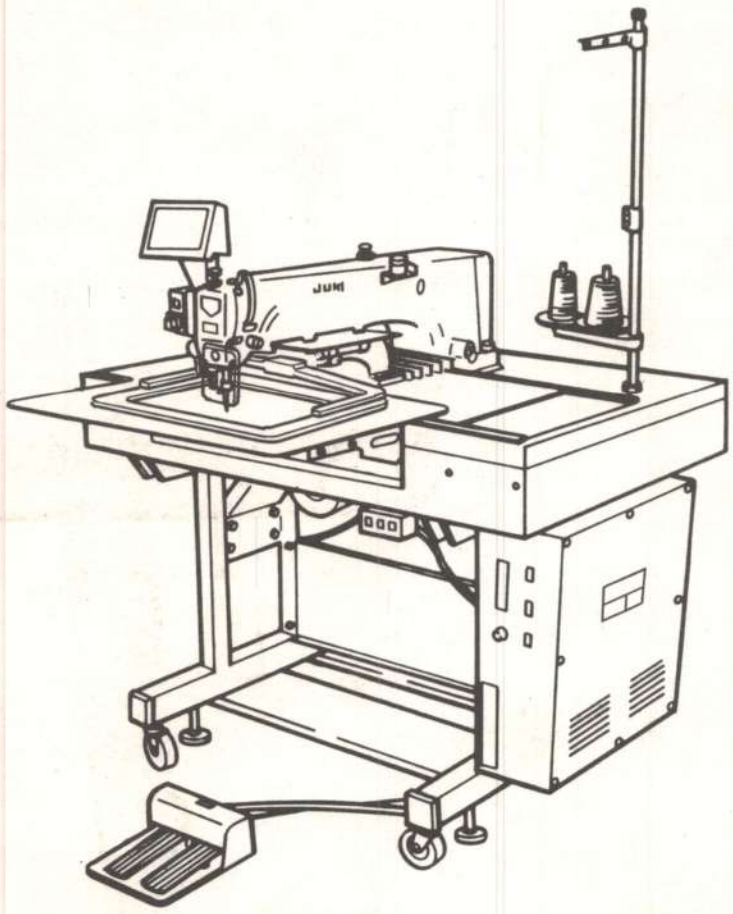
JUKI®

Large-sized, Computer-controlled
Cycle Machine

AMS-224C

INSTRUCTION MANUAL



NOTE : Read safety instructions carefully and understand them before using your AMS-224C.
Retain this Instruction Manual for future reference.

No.00
29194107

IMPORTANT SAFETY INSTRUCTIONS

Congratulations on your purchase of a JUKI machine.
To get the most out of the many functions of this machine and operate it in safety, it is necessary to use this machine correctly.
Please read this Instruction Manual carefully before use. We hope you will enjoy the use of your machine for a long time.Please remember to keep this manual in a safe place.

1. Observe the basic safety measures, including, but not limited to the following ones, whenever you use the machine.
2. Read all the instructions, including, but not limited to this Instruction Manual before you use the machine. In addition, keep this Instruction Manual so that you may read it at anytime when necessary.
3. Use the machine after it has been ascertained that it conforms with safety rules/standards valid in your country.
4. All safety devices must be in position when the machine is ready for work or in operation. The operation without the specified safety devices is not allowed.
5. This machine shall be operated by appropriately-trained operators.
6. For your personal protection, we recommend that you wear safety glasses.
7. For the following, turn off the power switch or disconnect the power plug of the machine from the receptacle.
   7-1 For threading needle(s), looper, spreader etc. and replacing bobbin.
   7-2 For replacing part(s) of needle, presser foot, throat plate, looper, spreader, feed dog, needle guard, folder, cloth guide etc.
   7-3 For repair work.
   7-4 When leaving the working place or when the working place is unattended.
   7-5 When using clutch motors without applying brake, it has to be waited until the motor stopped totally.
8. If you should allow oil, grease, etc. used with the machine and devices to come in contact with your eyes or skin or swallow any of such liquid by mistake, immediately wash the contacted areas and consult a medical doctor.

9. Tampering with the live parts and devices, regardless of whether the machine is powered, is prohibited.
10. Repair, remodeling and adjustment works must only be done by appropriately trained technicians or specially skilled personnel. Only spare parts designated by JUKI can be used for repairs.
11. General maintenance and inspection works have to be done by appropriately trained personnel.
12. Repair and maintenance works of electrical components shall be conducted by qualified electric technicians or under the audit and guidance of specially skilled personnel.
    Whenever you find a failure of any of electrical components, immediately stop the machine.
13. Before making repair and maintenance works on the machine equipped with pneumatic parts such as an air cylinder, the air compressor has to be detached from the machine and the compressed air supply has to be cut off. Existing residual air pressure after disconnecting the air compressor from the machine has to be expelled. Exceptions to this are only adjustments and performance checks done by appropriately trained technicians or specially skilled personnel.
14. Periodically clean the machine throughout the period of use.

15. Grounding the machine is always necessary for the normal operation of the machine. The machine has to be operated in an environment that is free from strong noise sources such as high-frequency welder.
16. An appropriate power plug has to be attached to the machine by electric technicians. Power plug has to be connected to a grounded receptacle.

17. The machine is only allowed to be used for the purpose intended. Other used are not allowed.
18. Remodel or modify the machine in accordance with the safety rules/standards while taking all the effective safety measures. JUKI assumes no responsibility for damage caused by remodeling or modification of the machine.

19. Warning hints are marked with the two shown symbols.

Danger of injury to operator or service staff

Items requiring special attention

FOR SAFE OPERATION

1. To avoid electrical shock hazards, neither open the cover of the electrical box for the motor nor touch the components mounted inside the electrical box.

1. So as to avoid personal injuries, do not put your fingers under the needle when turning ON the power switch or while the machine is in operation.
2. To prevent possible personal injury, never put your fingers inside the thread take-up cover while the machine is in operation.
3. Make sure to turn OFF the power switch so as to prevent possible accidents caused by abrupt start of the sewing machine when tilting the machine head or removing the V belt.
4. During operation, be careful not to allow your or any other person's head, hands or fingers to come close to the handwheel, V belt, bobbin winder and motor so as to avoid personal injuries that may occur when your hands/fingers are caught in the machine. Also, do not place anything close to them.
5. To avoid personal injuries, never operate the machine with the belt cover and the eye protection cover removed.
6. To avoid electrical shock hazards, nver operate the machine with the ground wire for the power supply removed.
7. The motor does not produce noise while the machine is at rest. Take care to remember to turn OFF the power to the machine so as to prevent possible accidents caused by abrupt start of the sewing machine.
8. If the machine is suddenly moved from a cold place to a warm place, dew condensation may be observed. In this case, turn ON the power to the machine after you have ascertained there is no danger of water drops in the machine.
9. In time of thunder and lightening, stop your work and disconnect the power plug from the receptacle so as to prevent accidents caused by damaged electrical components.
10. To avoid electrical shock hazards and accidents caused by damaged electrical components, be sure to turn OFF the power switch before inserting/detaching the power plug.
11. Dust accumulating in the control box could cause a malfunction or failure of the machine. Be sure to close the cover of the control box while the machine is in operation so as to prevent possible accidents because of damaged electrical components. In addition, periodically clean the filter of the fan. Remember to turn OFF the power to the machine before opening the cover of the control box.
12. Do not check inside the control circuits with a tester. Doing so applies a tester voltage to the semiconductor components, which could damage the electrical components.
13. So as to prevent possible accidents caused by abrupt start of the sewing machine during bobbin winding, depress the start switch after confirming that nothing is placed under the needle.
14. While the READY indicator lamp flashes on and off, the machine is performing a computation. After the completion of the computation, the feeding frame automatically comes down. Never place your fingers or any other thing under the feeding frame so as to prevent possible accidents caused by abrupt start of the sewing machine.
15. In the case of changing a sewing pattern to be used, turning "ON" the needle threading switch or turning "ON" the feeding frame switch, feeding frame automatically comes down. Never put your fingers under the feeding frame so as to prevent possible accidents caused by abrupt start of the sewing machine. In addition, never place your fingers near the feeding frame while the machine is in operation.
16. Never lift the machine head while the machine is in normal operation or during maintenance works.

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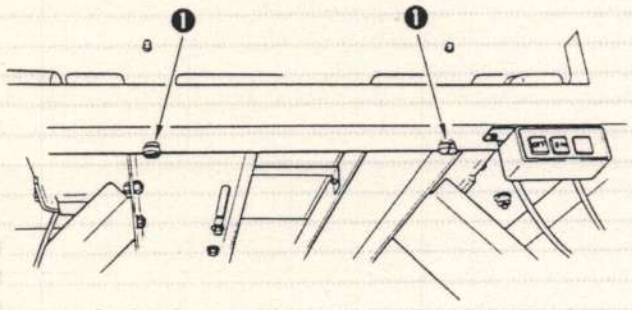
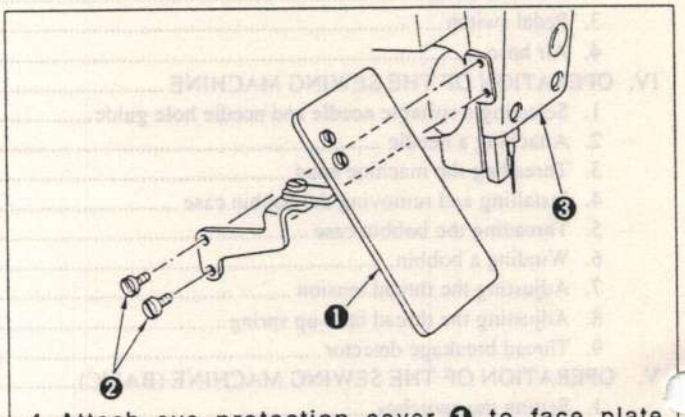
CAUTION BEFORE OPERATION

Following items have to be checked so as to prevent the machine from maloperating and being damaged.

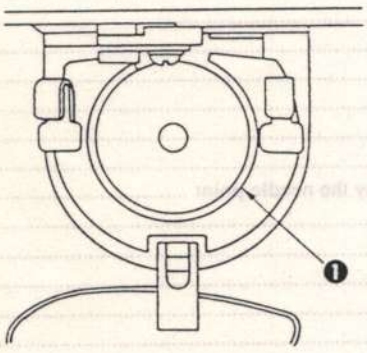
1. The sewing machine should travel counterclockwise, as observed from the pulley side. If the machine is allowed to run clockwise, the machine will automatically stop with error message [E] indicared on the panel.
2. Be sure to supply oil until the oil level reaches red marks on the oil gauge.



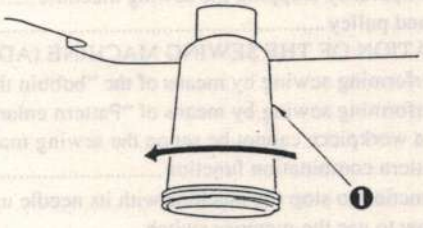
3. Remove bed fixing bolt ❶ before starting operation. When transporting your AMS-224C, install bed fixing bolt ❶ .



4. Attach eye protection cover ❶ to face plate cover ❸ using screws ❷ .

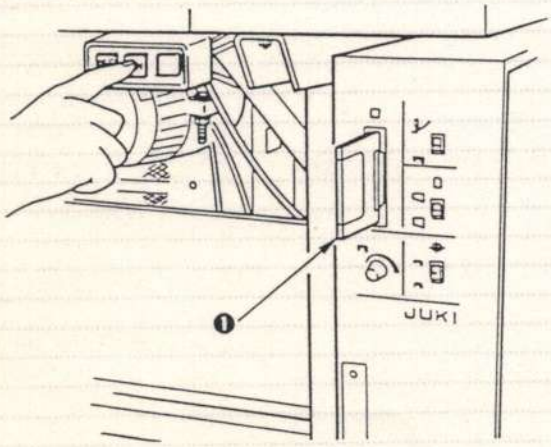


5. Apply one drop of the lubricating oil to the racing surface ❶ .

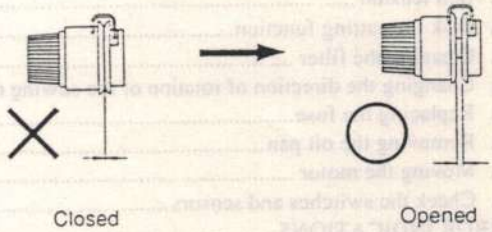


6. When polyethylene oiler ❶ becomes filed with oil, remove it and drain the oil.

CAUTIONS IN OPERATION

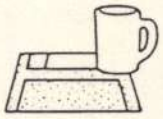


1. Be sure to turn ON/OFF the power to the machine with floppy disk ❶ removed. If the power switch should be turned ON or OFF with the floppy disk ❶ mounted, the data stored in the disk may be destroyed.

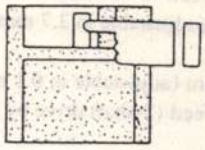


2. When the threader and sewing machine are switched ON, sew the desired sewing pattern with the thread tension disk closed. Once you have completed the thread trimming, the thread tension disk will open.

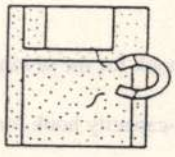
3. Precautions in handling floppy disks



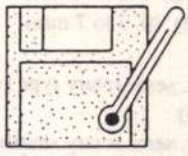
Do not place the floppy disk near an ashtray or food and drink.



Do not touch the exposed parts of the floppy disk.



Do not bring the floppy disk close to a magnetized material.



Do not place the floppy disk in a hot place (51°C or higher) or a place exposed to direct sunlight.

4. Before sewing a new pattern or a new feeding frame (small) be sure to check the contour of the pattern for the relation between the feeding frame and the pattern.

5. Be sure to check for a cause of trouble and take a proper corrective measure when the error indicator lamp lights up.

6. Do not draw, by hand, the material being sewn during sewing. Doing so will cause the needle shift from the correct position. If the needle moves from the correct position in terms of the X/Y direction, press the Set Ready switch twice. This will return the needle to the normal origin.

7. The AMS-223C is provided with the main unit input function as standard, however, a sewing pattern which extends beyond the sewing area (300 mm × 250 mm) cannot be sewn even if inputting it.
   When inputting data using the main unit input function, the travel limit of the sewing area cannot be detected with accuracy.
   So, sometimes pattern data which is larger than the sewing area specified may be created.

I. GENERAL

1. FEATURES

1. The AMS-224C is an electronic, 1-needle, cylinder-bed, lockstitch psttern sewing machine. It is an industrial automatic sewing machine designed mainly for sewing on various parts and for joining fabrics.
2. You can easily input patterns into the micro-floppy disk, using the JUKI compact programming device (PGM-5A), available optionally. Before you input new sewing pattern data into the micro-floppy disk, you can do trial sewing to check the result and make any necessary modifications. Furthermore, the sewing machine is provided with a data input function in its main unit (main unit input) as a standard feature. You may input data in accordance with the sewing product while moving the feed using the operation panel.

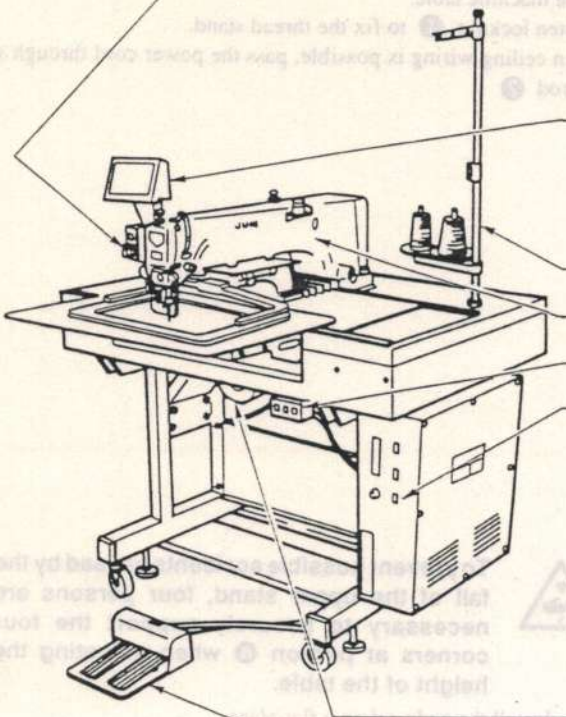
(Caution) The PGM-5 cannot be used with the AMS-224C model of sewing machine.

3. The work holder is driven by a stepping motor. You can change a stitching pattern simply by specifying the pattern No. affected.
4. The sewing machine is capable of inputting and modifying needle entry points in 0.1 mm steps.
5. The memory switch has been adopted. This means that the operator can add many different functions to the machine and can make a choice of a desired function by means of the operation panel.
6. The AMS-224C is designed to give error indication upon detection of troubles, enabling you to identify the problem at a glance. In addition, the machine incorporates a facility for testing the switches and other functions. This facility is useful for quick troubleshooting.
7. The second origin can be set as desired, so you do not have to care about the position of the needle point when setting a workpiece. The feeding frame can be manually lowered, thereby enabling the operator to position a workpiece with ease.
8. A compressor unit is optionally available. It can be attached to your AMS-224C with no additional machining.
9. The AMS-224C is capable of using sewing patterns that are used for all the AMS Series models of sewing machines. However, note that a sewing pattern that exceeds the sewing area of the AMS-224C cannot be used. The sewing patterns for the AMS-224C cannot be used for the other AMS Series models of sewing machine (of which minimum stitch length is not 0.1 mm). (Note: When using a sewing pattern used for the other AMS Series models, the AMS-224C will convert the conventional stitch length of 0.16 mm to 0.1 mm. This means that the stitch length and shape of the sewing pattern may change.)
10. So as to retain the sewing product to be sewn, the machine is provided as standard with the feeding frame arm.
11. The thread trimmer is capable of cutting thick needle thread and thick bobbin thread. (Thick thread equivalent to Spun #2, Ticket #6 or Tex #440 by English yarn count.) (For extra heavy-weight materials)

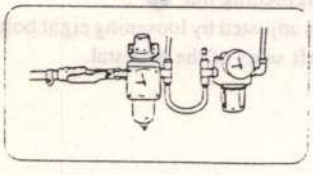
2. SPECIFICATIONS

1)	Sewing area :	X (lateral) direction 400 mm Y (longitudinal) direction 250 mm
2)	• Max. sewing speed :	2.000 s.p.m. (adjustable in 2.7 mm or less)
	• Jump speed :	250 mm/sec.
3)	Stitch length :	0.1 to 12.7 mm (adjustable in 0.1 mm steps)
4)	Feed motion of feeding frame :	Intermittent feed (2-shaft drive by stepping motor)
5)	Needle bar stroke :	41.2 mm
6)	Needle :	DP × 5, DP × 17
7)	Lift of feeding frame :	25 mm (standard) Max. 30 mm
8)	Intermediate presser stroke :	4 mm (standard) (0. 3 to 7 mm)
9)	Lift of intermediate presser :	20 mm
10)	Shuttle :	Large-capacity, semi-rotary type (self-lubricated) (Semi-rotary double-capacity hook for the sewing specification G)
11)	Bobbin case :	Large-capacity, semi-rotary shuttle type (Bobbin case for the semi-rotary double-capacity hook for the sewing specification G)
12)	Bobbin :	Large-capacity shuttle type (Bobbin for the double-capacity hook for the sewing specification G)
13)	Lubricating oil :	New Defrix Oil No. 2 (supplied by oiler)
14)	Thread trimmer :	Consists of moving knife and counter knife (actuated by grooved cam)
15)	Wiper :	Magnetically driven (with release switch)
16)	Intermediate presser lifter :	Vertical motion driven by an air cylinder (with release switch)
17)	Memory medium :	3.5 inch micro floppy disk (2DD)
	Memory pattern :	44 to 691 pattern/cassette
18)	Sewing operation :	Starts/ends at sewing start point or the 2nd origin
19)	Feeding frame :	Descends when the feeding frame switch is pressed. Another press on the switch causes the feeding frame to ascend.
20)	Start :	The machine is started by turning the start switch ON with the feeding frame down.
21)	Temporary stop facility :	Used to stop machine operation during a stitching cycle. After a temporary stop, the feeding frame can be moved along the stitching line by operating the "Backward" or "Forward" switch. The interrupted stitching cycle can be completed by pressing the start switch. Alternatively, the "Return to origin" switch may be pressed for quick move to the sewing start point or the 2nd origin after a temporary stop and the thread trimming.
22)	Enlarging/Reducing facility :	Allows a pattern to be enlarged or reduced on the X axis and Y axis, independently when sewing a pattern.
	Scale :	0.001 to 4 times (Either 0.01 steps or 0.001 steps can be selected.)
23)	Enlarging/Reducing method :	Pattern enlargement/reduction can be done by increasing/decreasing either stitch length or the number or stitches.
24)	Max. sewing speed limitation :	The maximum sewing speed can be set limited to any value within a range of 180 to 2.000 s.p.m., using the external control knob.
25)	Pattern selection :	1 to 999 patterns can be selected by specifying the desired pattern Nos.
26)	Pattern checking facility :	A pattern configuration can be checked by setting the "Sewing machine ON/OFF switch" to "OFF".
27)	Error indication :	17 types of error indication are given.
28)	Programming :	Involves point/linear/arc numeral data, temporary stop, thread trim, jump data, sewing speed, and stitch length.
29)	Bobbin thread counter :	Tells the time to replace the bobbin. If this facility is not used, it works as a 0 to 999 ring counter with resetting function.
30)	Memory backup :	In case of a power interruption, the pattern being used will automatically be stored in memory so that the interrupted sewing cycle may be resumed simply by pressing the Set Ready switch after the power is restored. No floppy disk is necessary. The memory is held for 100 hrs.
31)	2nd origin setting facility :	Using jog keys, a 2nd origin (needle position after a sewing cycle) can be set in the desired position within the sewing area. The set 2nd origin is also stored in memory.
32)	Needle-up stop facility :	When the needle does not stop in its upper position, the needle can be brought up to the upper position by turning the needle threading switch ON or OFF (provided the READY lamp is ON.)
33)	Sewing machine motor :	400W, 4P electronic-stop motor (550 W, 2P for the sewing specification G)
34)	Dimensions :	1,235 mm (W) × 1,190 mm (L) × 1,285 mm (H) (excluding thread stand)
35)	Gross weight :	319 kg
36)	Power consumption :	1 KVA
37)	Operating temperature range :	5° to 40°C
38)	Operating humidity range :	20 to 80% (no dew condensation)
39)	Line voltage :	Rated voltage ±10% 50/60 Hz
40)	Air pressure used :	0.5 to 0.55 MPa (5 to 5.5 kgf/cm^2) Note that the operating air pressure for driving the feeding frame is 0.5 MPa to 0.55 MPa (5 to 5.5 kgf/cm^2)
41)	Air consumption :	1.8 ℓ/min.

II. NAMES OF SWITCHES



Air regulator



- Switches on the machine head

No.	Name	Page for reference
1	Temporary stop switch	P.13
2	Wiper switch	P.11

- Switches on the operation panel

No.	Name	Page for reference
1	Operation switch	P.11
2	Memory switch	P.19 ~

- Thread stand
- Machine head
- Power switch
- Switches (on the front face) of the control box

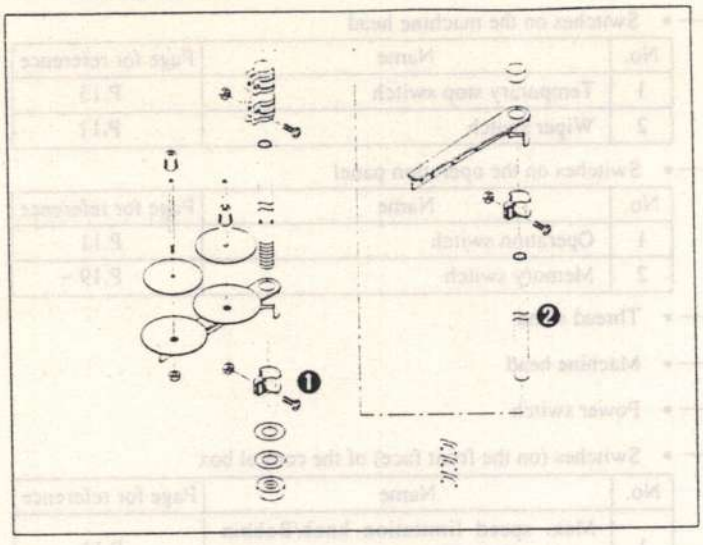
No.	Name	Page for reference
1	Max. speed limitation knob/Bobbin winder ON/OFF switch	P.11
2	Neeedle threading switch	P.8
3	Scale setting switch for INC/DEC of the stitch length & INC/DEC of the number of stitch	P.15
4	Sewing machine ON/OFF switch	P.12

- Sewing machine motor
- Pedal switch

No.	Name	Page for reference
1	Feeding frame switch	P.12
2	Start switch	P.12

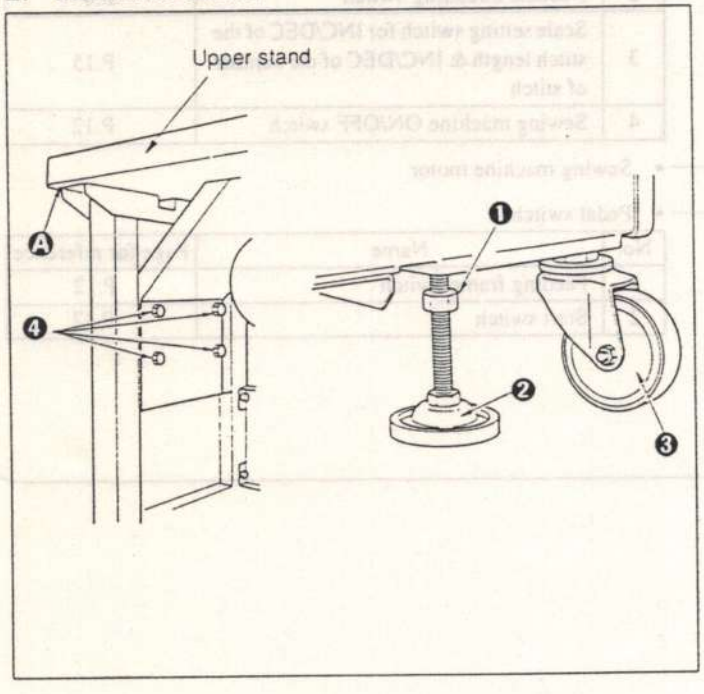
III. INSTALLATION

1. Thread stand



Assemble the thread stand, and put it in the hole in the top right corner of the machine table.
Tighten locknut ❶ to fix the thread stand.
When ceiling wiring is possible, pass the power cord through spool rest rod ❷ .

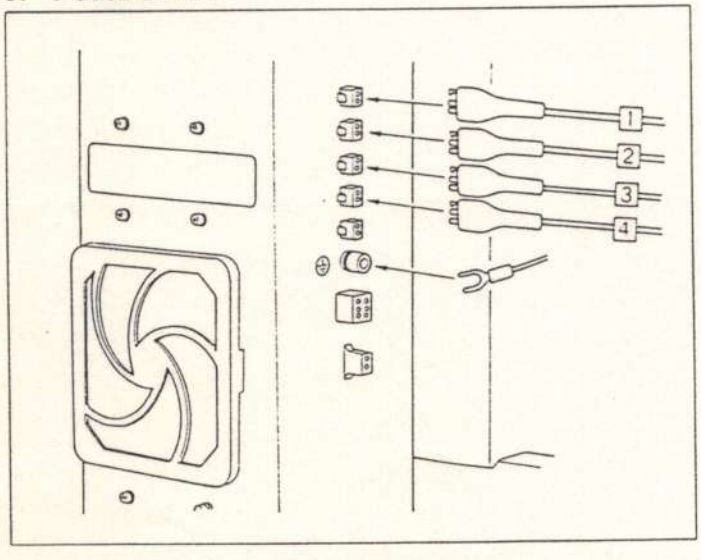
2. Machine stand



To prevent possible accidents caused by the fall of the upper stand, four persons are necessary to securely support the four corners at portion Ⓐ when adjusting the height of the table.

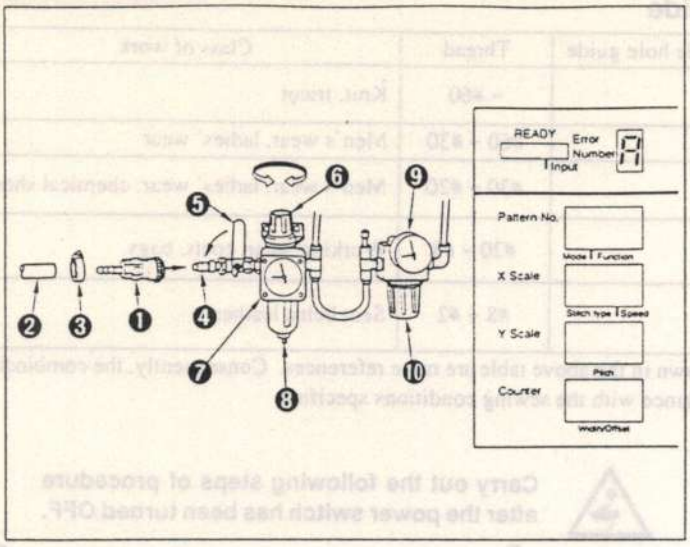
1) Install the pedestal on a flat place.
2) Loosen nut ❶ , and raise caster ❸ until it starts idling by turning level adjuster ❷ . After the installation, fix level adjuster ❷ by tightening nut ❶ .
3) The table height is adjusted by loosening eight bolts ❹ located at the right and left sides of the pedestal.

3. Pedal switch



1) Connect the connector of the pedal switch to the connector mounted on the rear portion of the control box following the order shown in the figure.
2) Connect the ground wire in position.

4. Air hose



1) Connect the air supply hose to quick-coupling joint (female) ❶ and fix it with cable clip ❸ .
2) Connect female side ❶ of the quick-coupling joint to male side ❹ of the joint.
3) Open air cock ❺ , pull it up and then adjust air adjusting knob ❻ by turning it so that the air pressure gauge ❼ indicates 0.5 MPa to 0.55 MPa (5 to 5.5 kgf/cm²). Then press the knob to maintain the pressure value.
4) Also adjust pressure gauge ❾ by turning air adjusting knob ❿ so that it indicates a pressure of 0.3 MPa to 0.35 MPa (3 to 3.5 kgf/cm²).
5) If the compressed air pressure is too low, the machine will stop running while indicating error [A] on the panel.

* The air pressure will be 0 kgf/cm² if you close air cock ❺ and push the button ❽ .

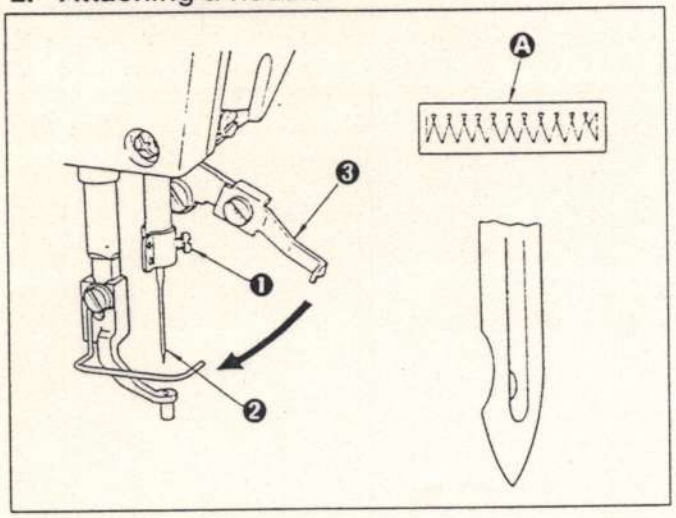
IV. OPERATION OF THE SEWING MACHINE

1. Selecting a suitable needle and needle hole guide

Material	Needle	Inside diameter of needle hole guide	Thread	Class of work
Extra light-weight	~ #11 DP × 5 (DP × 17)	φ1.6 for knit	~ #60	Knit, tricot
Synthetic	#11 ~ #14 DP × 5 (DP × 17)	φ1.6	#60 ~ #30	Men's wear, ladies' wear
Medium-weight	#14 ~ #18 (DP × 5) DP × 17	φ2, φ2.4	#30 ~ #20	Men's wear, ladies' wear, chemical shoes
Heavy-weight	#18 ~ #21 (DP × 5) DP × 17	φ2.4, φ3	#20 ~ #8	Working wear, coats, bags
Extra heavy-weight	#22 ~ #25 (DP × 5) DP × 17	φ3, φ3 with spot facing	#8 ~ #2	Seat belts, leather

* The combinations shown in the above table are mere references. Consequently, the combination may change in accordance with the sewing conditions specified.

2. Attaching a needle



Carry out the following steps of procedure after the power switch has been turned OFF.

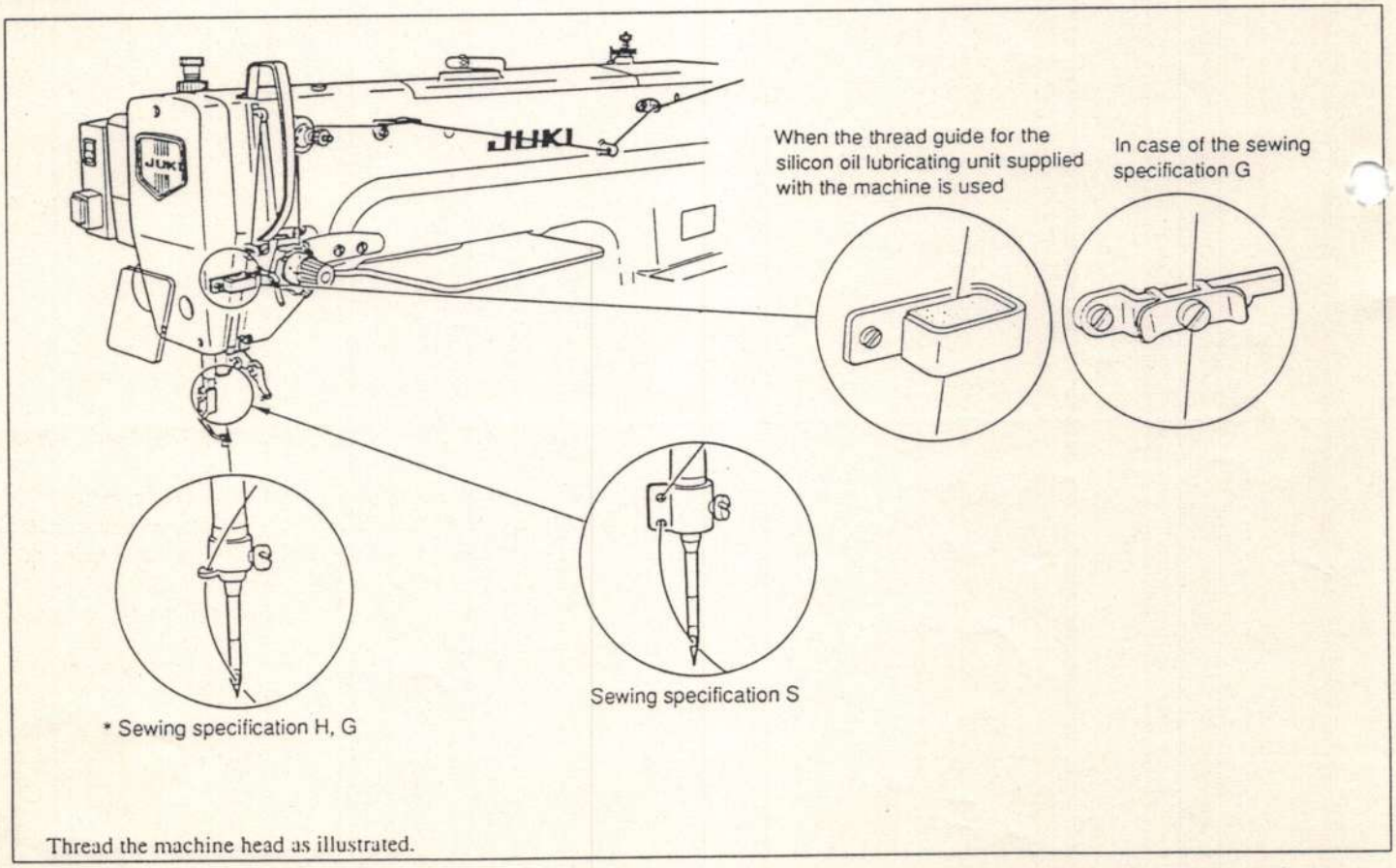
Move wiper ❸ in the direction of the arrow, and loosen setscrew ❶. Hold needle ❷ with the long groove facing toward you, and fully insert it into the hole in the needle bar. Tighten setscrew ❶.

(Caution)

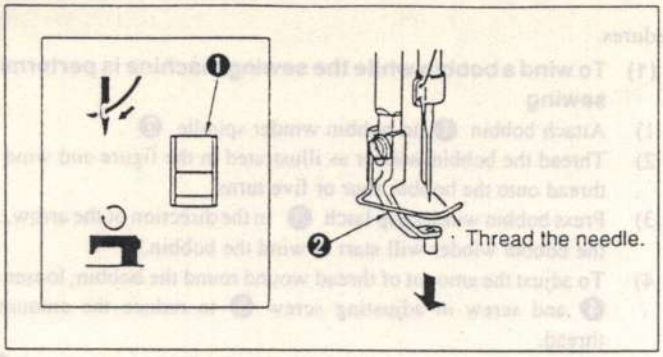
1. **If the needle thread stitches are finished as Ⓐ in the figure, install the needle orienting the groove on the needle slightly to the left.**
2. **If stitch skipping occurs during sewing, or t needle thread cannot be trimmed, install the needle orienting the groove on the needle slightly to the right.**
3. **When sewing heavy-weight materials with synthetic fiber thread, use a super needle for synthetic fiber.**
4. **Before attaching the needle, be sure to turn OFF the power to the machine.**

3. Threading the machine head

Set the Needle threading switch to the ⅓ side.



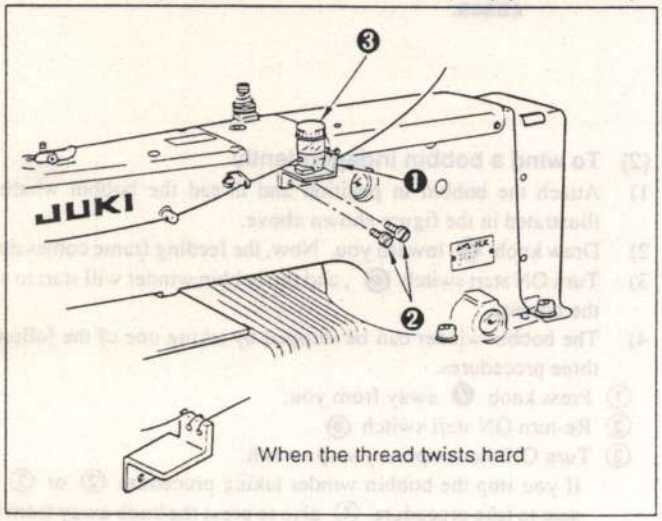
Thread the machine head as illustrated.



Set the needle threading switch ❶ to the ⅓ side, and intermediate presser ❷ will come down. Now, pass the needle thread through the needle eyelet.

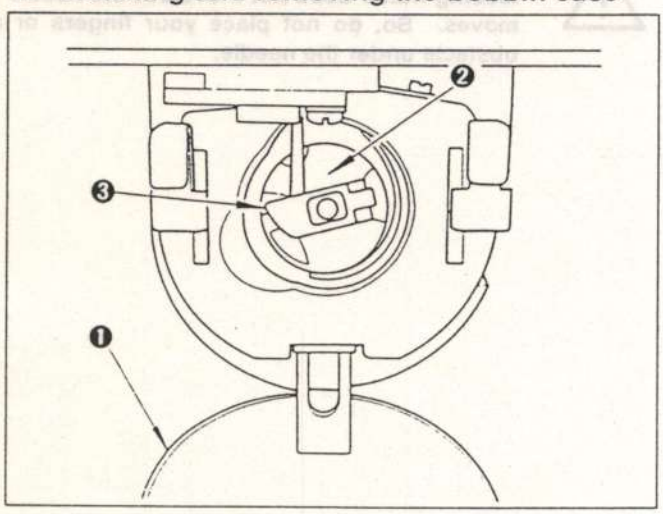
1. **When the intermediate presser comes down, the feeding frame will also come down. So, be careful.**
2. **If the needle threading switch is moved up and then down when the needle is not in its upper resting position (error message [3]), the sewing machine will automatically rotate and stop in the needle-up stop position. At this time, make sure that no obstacle is placed under the needle.**

When using the silicon oil tank (supplied only for the machine for extra heavy-weight materials)



1) Fix silicon oil tank base ❶ on the side face of the machine arm using screws ❷ mounted there. After the silicon oil tank base has been fixed, fix silicon oil tank ❸ on silicon oil tank base ❶ . Adjust the position of silicon oil tank ❸ in accordance with the threaded state of the sewing machine.
2) If the silicon oil tank is not used, remove silicon oil tank base ❶ from the machine arm.
(Silicon oil tank ❸ is secured with a magnet.)
3) If the thread twists hard on silicon oil tank base ❶ , reverse the direction of winding the thread.

4. Installing and removing the bobbin case

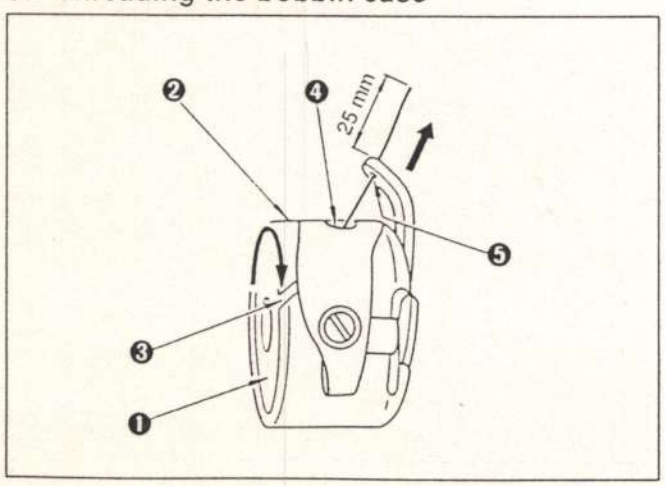


Carry out the following steps of procedure after the power switch has been turned OFF.

1) Open cylinder arm cap ❶ .
2) Raise and hold latch lever ❸ of bobbin case ❷ to take it out. The bobbin in the bobbin case does not come off as long as the latch lever is raised and held.
3) To load the bobbin case into the shuttle, fit it onto the shuttle shaft, and snap in the latch lever ❸ of the bobbin case.

If bobbin case ❷ is not secureiy loaded in the shuttle, bobbin case ❷ may slip off during sewing. So be careful.

5. Threading the bobbin case

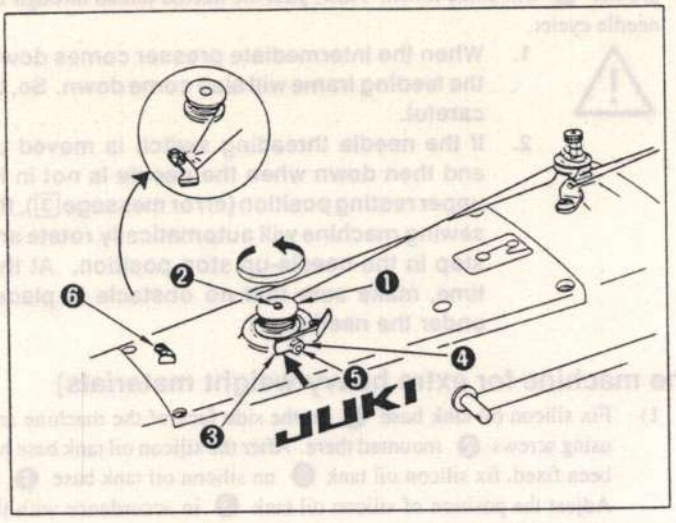


1) Hold bobbin ❶ in the hand so that it spins clockwise, and set it in bobbin case ❷ .
2) Pass the thread through slot ❸ in the bobbin case. Pull the thread to pass it under the tension spring out to thread exit ❹ . At this time, make sure that the bobbin turns in the direction of the arrow when the thread is pulled.
3) Pass the thread through hole ❺ . and pull the thread out about 25 mm from the hole.

(Caution) **If the bobbin is installed in the bobbin case orienting the reverse direction, the bobbin thread tension may be affected by the idling spring resulting in an inconsistent tension. So be careful.**

6. Winding a bobbin

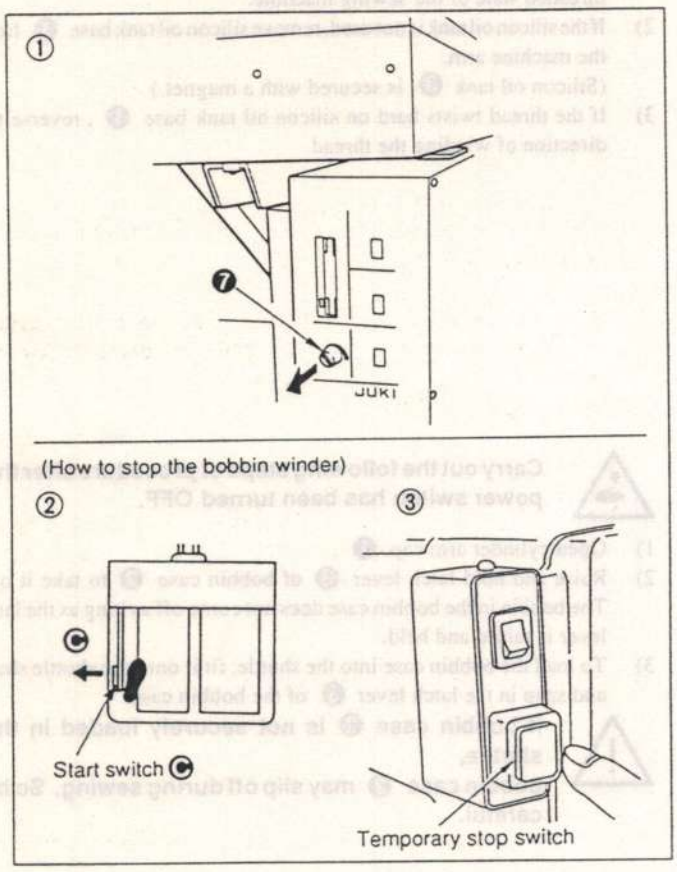
You can wind a bobbin taking one of the following two different procedures.



(1) To wind a bobbin while the sewing machine is performing sewing

1) Attach bobbin ❶ to bobbin winder spindle ❷ .
2) Thread the bobbin winder as illustrated in the figure and wind the thread onto the bobbin four or five turns.
3) Press bobbin winder trip latch ❸ in the direction of the arrow, and the bobbin winder will start to wind the bobbin.
4) To adjust the amount of thread wound round the bobbin, loosen nut ❹ and screw in adjusting screw ❺ to reduce the amount of thread.
5) You can cut the bobbin thread using bobbin thread presser ❻ . The end of thread trimmed is retained by bobbin thread presser ❻ .

(Caution) Be sure to use genuine JUKI bobbins and bobbin cases.



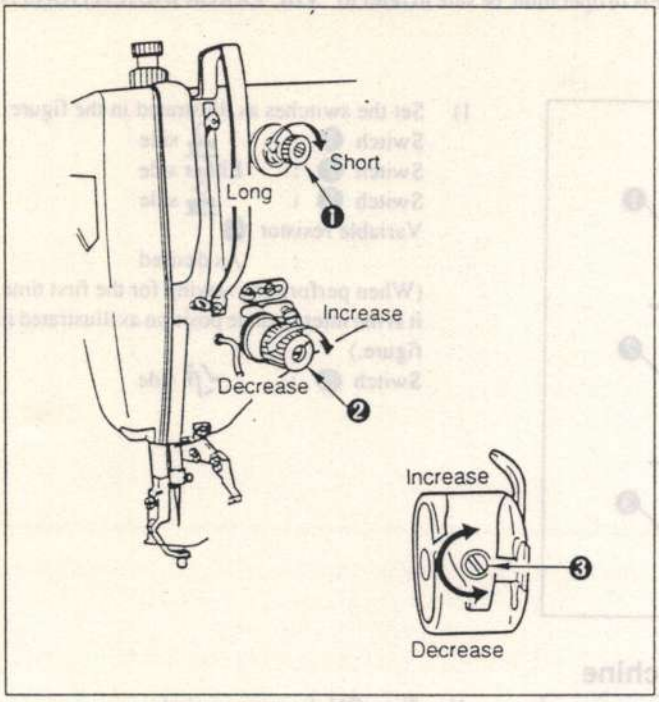
(2) To wind a bobbin independently

1) Attach the bobbin in position and thread the bobbin winder as illustrated in the figure shown above.
2) Draw knob ❼ toward you. Now, the feeding frame comes down.
3) Turn ON start switch ⓒ , and the bobbin winder will start to wind the bobbin.
4) The bobbin winder can be stopped by taking one of the following three procedures.
   ① Press knob ❼ away from you.
   ② Re-turn ON start switch ⓒ .
   ③ Turn ON the temporary stop switch.

   If you stop the bobbin winder taking procedure ② or ③ , be sure to take procedure ① also to press the knob away from you.

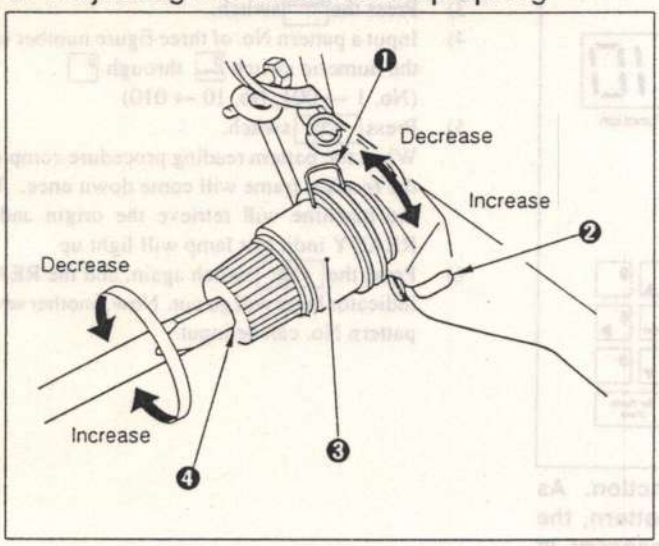
While the bobbin winder winds a bobbin, the feeding frame does not move but the needle bar moves. So, do not place your fingers or any obstacle under the needle.

7. Adjusting the thread tension



1) Adjusting the needle thread tension
Turn thread tension controller No. 2 ❷ clockwise to increase the bobbin thread tension, or counterclockwise to decrease it.
2) Adjusting the bobbin thread tension
Turn thread tension adjusting screw ❸ clockwise to increase the bobbin thread tension, or counterclockwise to decrease it.
3) Adjusting the length of thread remaining at the needle
Turn thread tension controller No. 1 ❶ clockwise to decrease the length of the thread which will remain on the needle after thread trimming, or counterclockwise to increase it. (Minimize the length of the thread which will remain on the needle as long as the thread does not slip off the needle.)

8. Adjusting the thread take-up spring



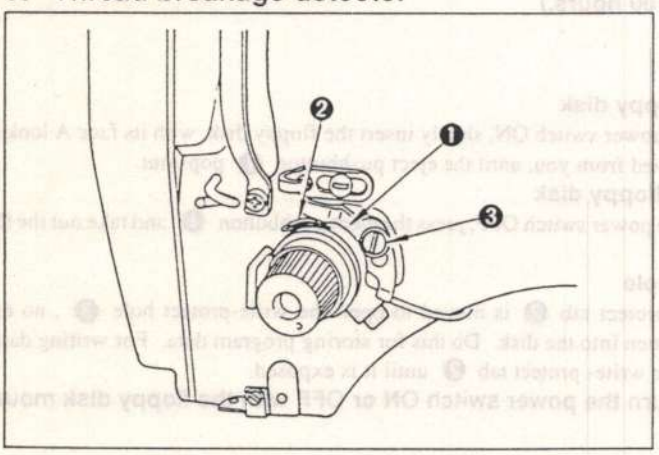
The normal stroke of thread take-up spring ❶ is 12 to 15 mm, and the tension at the starting point is 15 to 80 g.

(1) Adjusting the stroke
Loosen screw ❷ , and turn tension controller assembly ❸ clockwise to increase the stroke or counterclockwise to decrease it.

(2) Adjusting the tension
Insert the blade of a slotted screwdriver into the groove in the tension post ❹ , and turn it clockwise to increase the tension or counterclockwise to decrease it.

(Caution) Decrease the tension of the thread take-up spring for a synthetic fiber thread (approximately 15 g).

9. Thread breakage detector



Carry out the following steps of procedure after the power switch has been turned OFF.

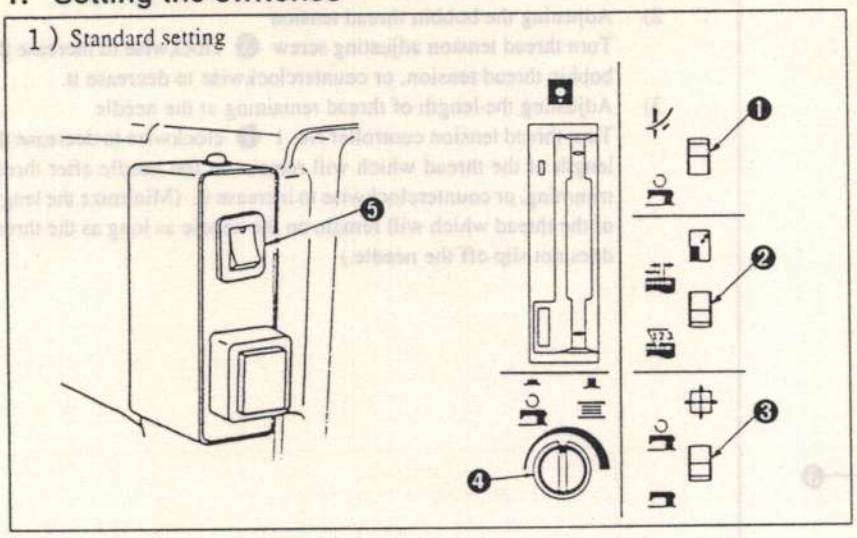
1) Adjust so that thread breakage detector disk ❶ is always in contact with thread take-up spring ❷ in the absence of the needle thread. (Slack: approx. 0.5 mm)
2) Whenever the stroke of thread take-up spring ❷ has been changed, be sure to readjust thread breakage detector disk ❶ . To make this adjustment, loosen screw ❸ .
3) Adjust so that thread breakage detector disk ❶ does not touch any adjacent metallic parts other than thread take-up spring ❷ .

Adjust so that thread breakage detector disk ❶ does not touch any adjacent metallic parts other than thread take-up spring ❷ .

V. OPERATION OF THE SEWING MACHINE (BASIC)

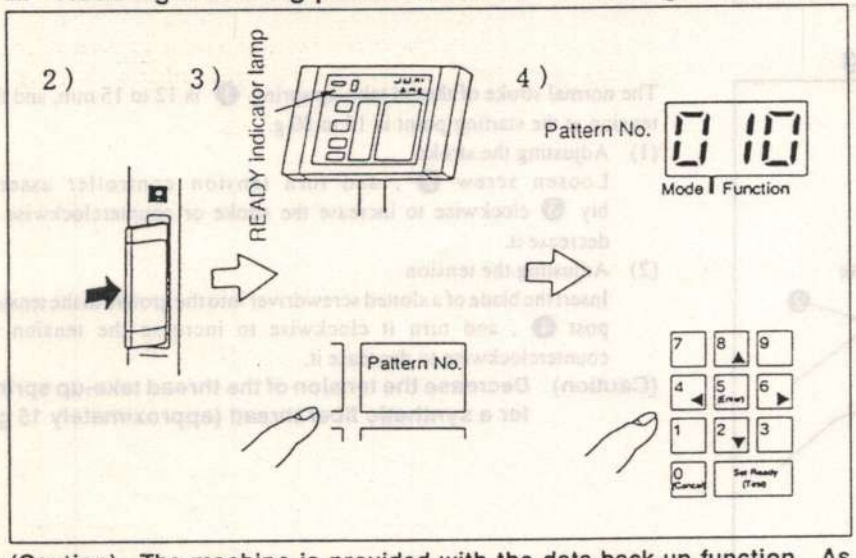
* If any error No. is shown on the operation panel while the sewing machine is in operation, be sure to refer to "VIII. ERROR INDICATIONS AND CORRECTIVE MEASURES"

1. Setting the switches



1) Set the switches as illustrated in the figure.
Switch ❶ : side
Switch ❷ : Either side
Switch ❸ : side
Variable resistor ❹
: As desired
(When performing sewing for the first time, set it at the intermediate position as illustrated in the figure.)
Switch ❺ : side

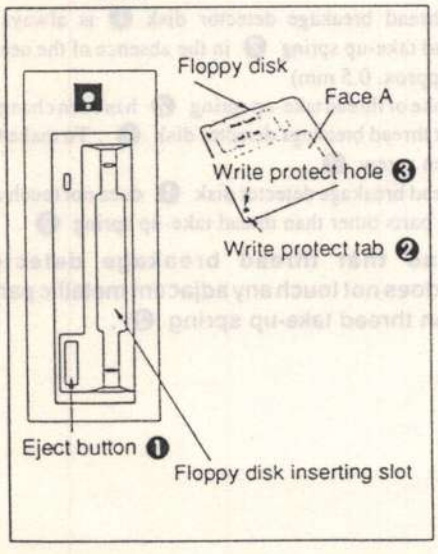
2. Reading a sewing pattern data in the sewing machine



1) Turn ON the power switch.
2) Insert a floppy disk.
3) Press the switch.
4) Input a pattern No. of three figure number using the numeric switch through .
(No. 1 → 001, No. 10 → 010)
5) Press switch.
When the pattern reading procedure completes, the feeding frame will come down once. Then the machine will retrieve the origin and the READY indicator lamp will light up.
6) Press the switch again, and the READY indicator lamp will go out. Now, another sewing pattern No. can be input.

(Caution) The machine is provided with the data back-up function. As long as you continuously use the same sewing pattern, the operation described in steps 2) through 4) are not necessary. In this case, there is no need for a floppy disk.
(Sewing data can be backed up for approximately 100 hours.)

3. Floppy disk driver



(1) Loading the floppy disk
After turning the power switch ON, slowly insert the floppy disk, with its face A looking to the right as observed from you, until the eject pushbutton ❶ pops out.

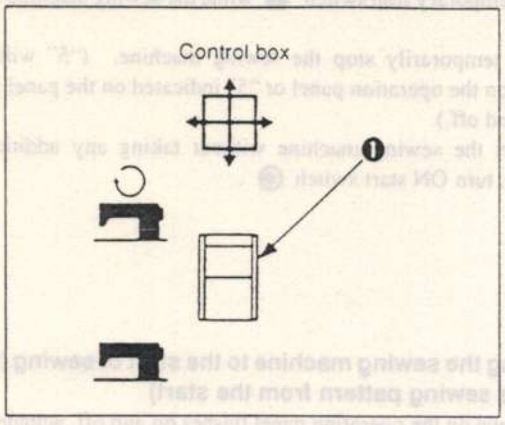
(2) Unloading the floppy disk
Before turning the power switch OFF, press the eject pushbutton ❶ and take out the floppy disk.

(3) Write-protect hole
When the write-protect tab ❷ is moved to open the write-protect hole ❸ , no data is allowed to be written into the disk. Do this for storing program data. For writing data into the disk, move the write- protect tab ❷ until it is exposed.

(Caution) Never turn the power switch ON or OFF with the floppy disk mounted.

4. Checking the contour of a sewing pattern

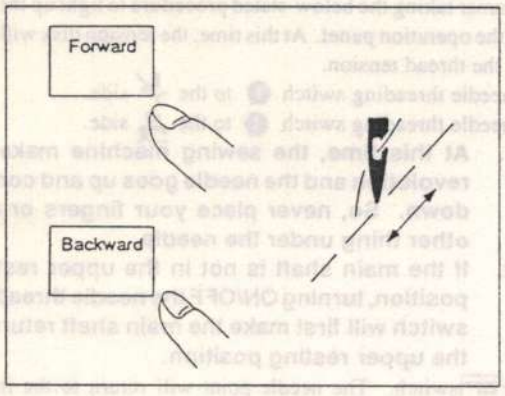
If you use an exclusive feeding frame, check the shape of a sewing pattern to be sewn for caution's sake. If the sewing pattern extends outside the feeding frame, the needle will interfere with the feeding frame during sewing, causing dangerous troubles including needle breakage.
You can check the contour of a sewing pattern taking one of the following two procedures.



(1) Confirmation on the control box

1) Set switch ❶ to the side as illustrated in the figure on the left.
2) Operate the sewing machine as described in "III. 5. Sewing." This will allow you to check the contour of a sewing pattern.
The sewing machine will not rotate but only the feed mechanism (feeding frame) will move.
3) After you have checked the contour of the sewing pattern, return switch ❶ to the side.

* To stop the sewing machine during the pattern shape checking procedure, refer to "III. 7. Temporarily stopping the sewing machine."

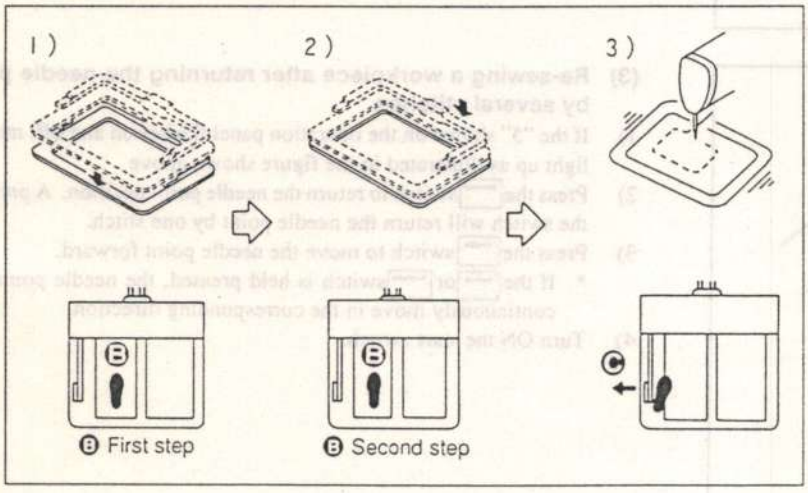


(2) Confirmation on the operation panel

1) Depress the pedal switch to lower the feeding frame.
2) Every press on the switch will move the needle point forward by one stitch. Keeping the switch held pressed, the needle will move forward continuously.
3) Every press on the switch will move the needle point backward by one stitch. Keeping the switch held pressed, the needle will move backward continuously.
4) After you have checked the contour of the sewing pattern, press the switch. This will return the needle point to the start position and the feeding frame will go up.

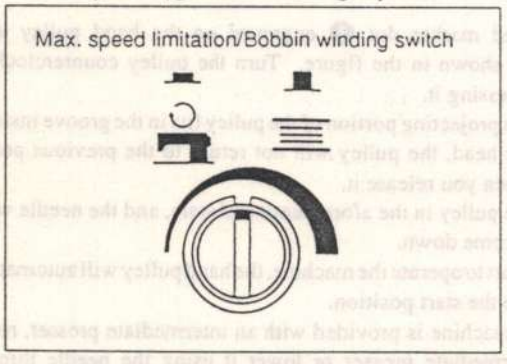
5. Sewing

After a sewing pattern has been read in the sewing machine (READY indicator lamp lights up), you can start sewing.



1) Place a workpiece under the feeding frame.
Slightly depress pedal Ⓑ of the pedal switch, and the feeding frame will stop in its intermediate stop position.
Release the pedal, and the feeding frame will rise back to the initial position.
2) Position the workpiece and further depress pedal Ⓑ. Then, the feeding frame will come down to the lowest position to clamp the workpiece.
Re-depress pedal Ⓑ until it will go no further, the feeding frame will return to the intermediate stop position.
3) Depress pedal Ⓒ when the feeding frame rests in the lowest position, the sewing machine will start sewing.
4) After the sewing machine completes sewing, the needle point will return to the home position and the feeding frame will go up.

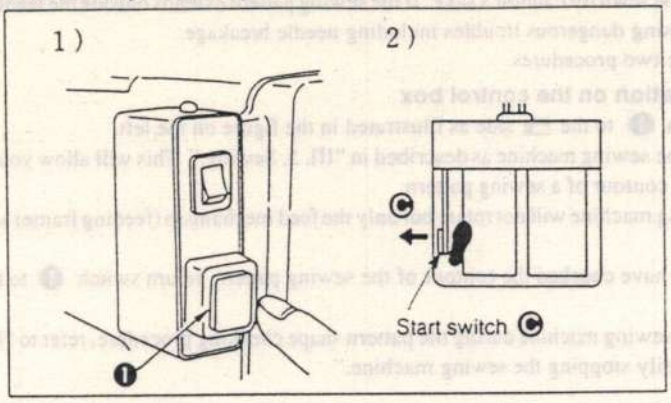
6. Adjusting the sewing speed



The sewing speed is automatically limited by the stitch length. To specify a sewing speed to a value lower than the aforementioned one, turn the knob counterclockwise.

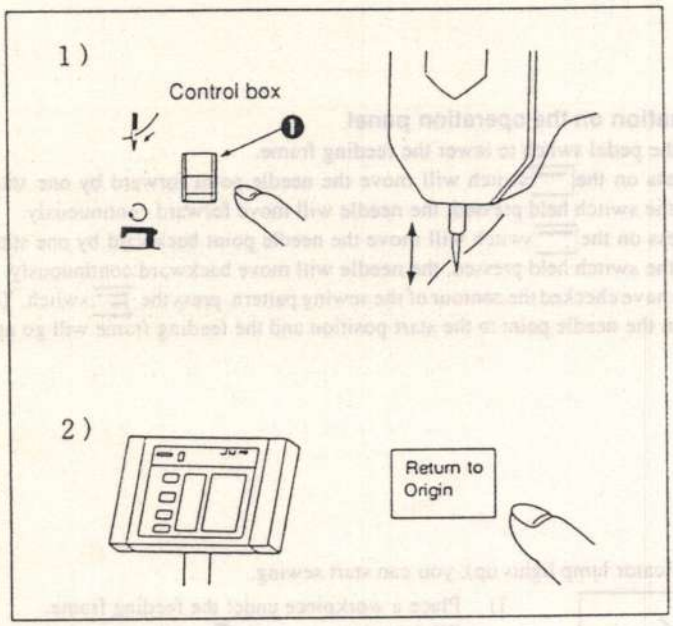
7. Temporarily stopping the sewing machine

You can temporarily stop the sewing machine during sewing or sewing pattern shape checking procedure.



(1) How to temporarily stop the sewing machine and re-start it

1) Press the temporary stop switch ❶ while the sewing machine is in operation.
This will temporarily stop the sewing machine. ("5" will be indicated on the operation panel or "5" indicated on the panel will flash on and off.)
2) To re-start the sewing machine without taking any additional procedure, turn ON start switch Ⓒ .

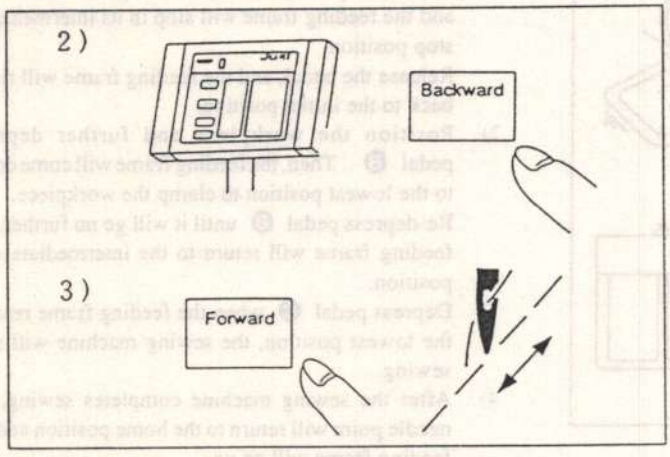


(2) Returning the sewing machine to the start of sewing (Re-sewing a sewing pattern from the start)

1) If "5" shown on the operation panel flashes on and off, actuate the thread trimmer taking the below-stated procedure to light up the "5" shown on the operation panel. At this time, the tension disk will rise to release the thread tension.
① Set needle threading switch ❶ to the side.
② Set needle threading switch ❶ to the side.

1. At this time, the sewing machine makes a revolution and the needle goes up and comes down. So, never place your fingers or any other thing under the needle.
2. If the main shaft is not in the upper resting position, turning ON/OFF the needle threading switch will first make the main shaft return to the upper resting position.

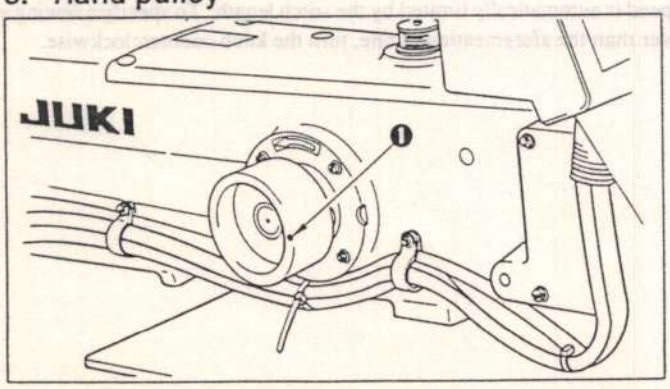
2) Press the switch. The needle point will return to the initial position and the feeding frame will go up.



(3) Re-sewing a workpiece after returning the needle point by several stitches

1) If the "5" shown on the operation panel flashes on and off, make it light up as illustrated in the figure shown above.
2) Press the switch to return the needle point position. A press on the switch will return the needle point by one stitch.
3) Press the switch to move the needle point forward.
* If the or switch is held pressed, the needle point will continuously move in the corresponding direction.
4) Turn ON the start switch.

8. Hand pulley



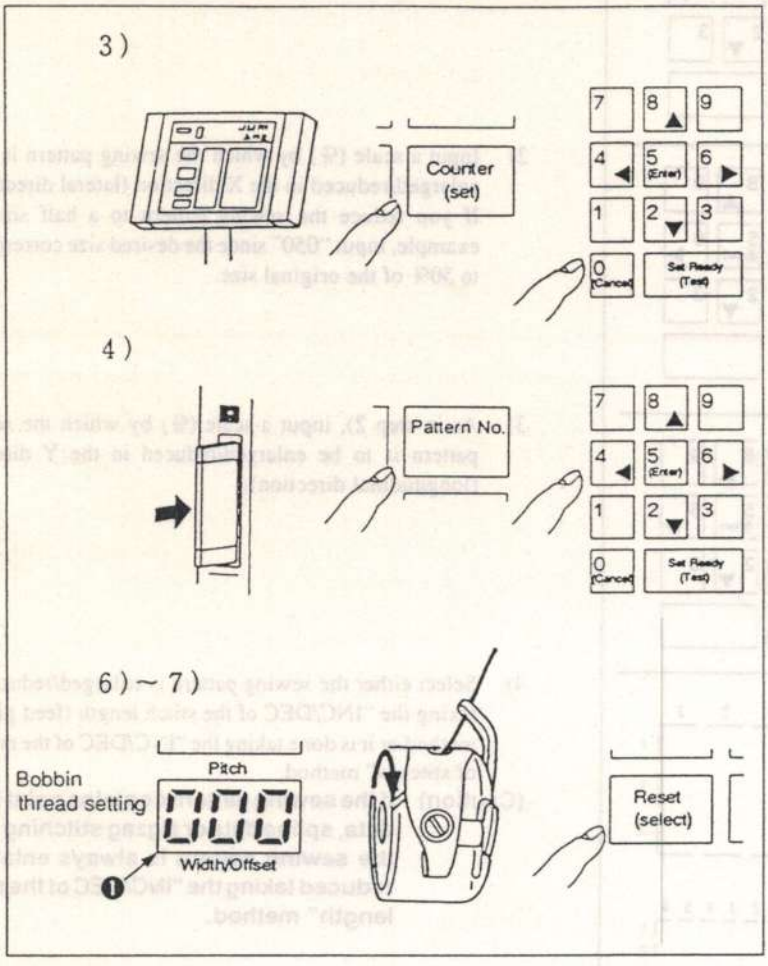
1) Bring red marker dot ❶ engraved on the hand pulley to the position shown in the figure. Turn the pulley counterclockwise while pressing it.
2) Once the projecting portion of the pulley fits in the groove inside the machine head, the pulley will not return to the previous position even when you release it.
3) Turn the pulley in the aforementioned state, and the needle will go up and come down.
4) If you start to operate the machine, the hand pulley will automatically return to the start position.

(If your machine is provided with an intermediate presser, remove the intermediate presser or lower it using the needle threading switch. Then, operate the hand pulley.)

VI. OPERATION OF THE SEWING MACHINE (ADVANCED)

1. Performing sewing by means of the "bobbin thread counting function"

In case where a same pattern is sewn in repetition, the sewing machine will stop sewing when the number of workpieces (the specified number of workpieces) that can be sewn with a bobbin is reached. Check the (specified number of workpieces) before starting the sewing machine.
The bobbin thread counter counts the amount of bobbin thread in the two different method, i.e., one is (adding method) under which the bobbin thread counter indicates the finished the number of workpieces and the other is (subtracting method) under which the counter indicates the number of workpieces that can be sewn with the remaining amount of bobbin thread. You can make a choice of either counting method as desired.

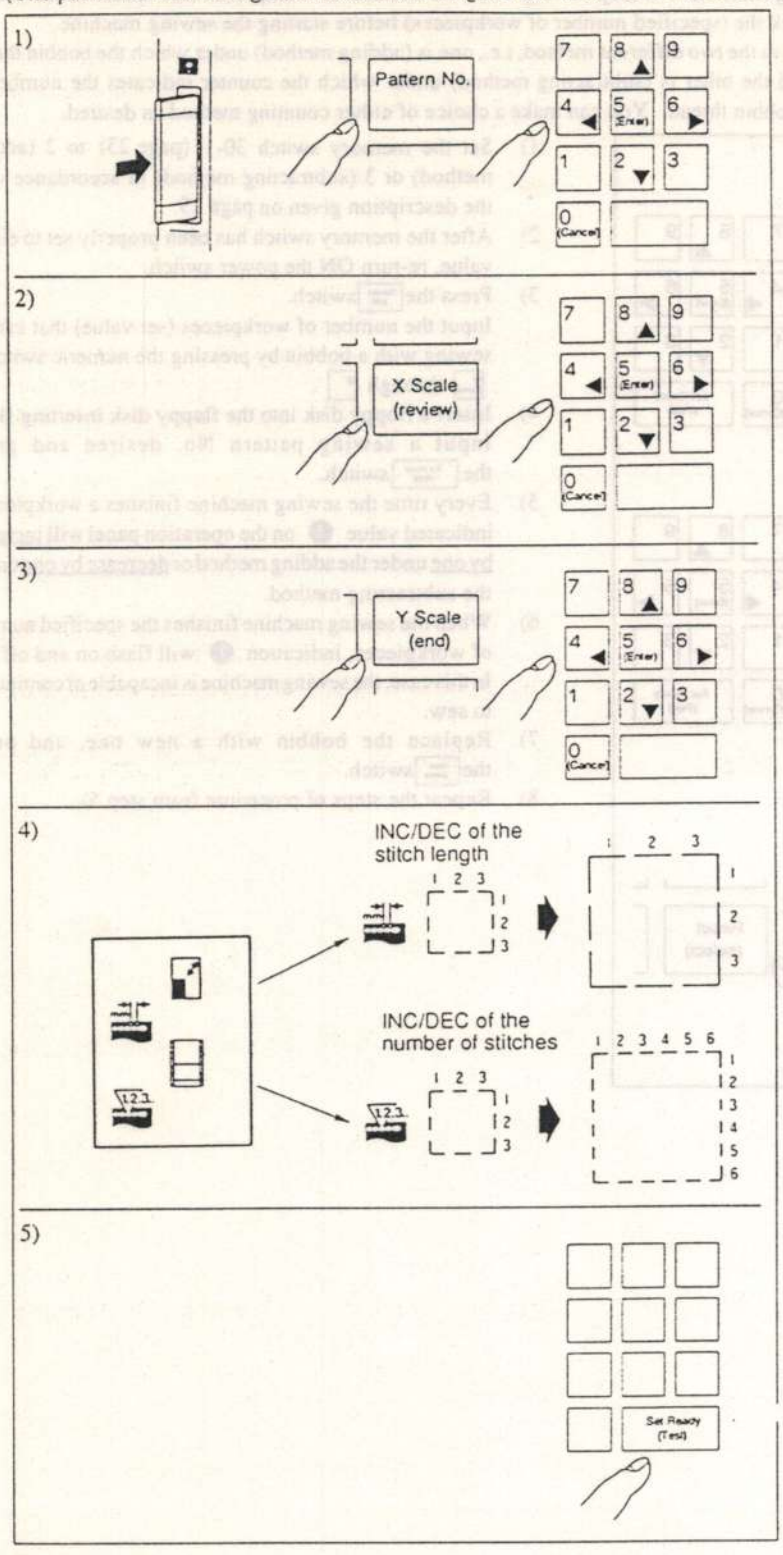


1) Set the memory switch 30-1 (page 23) to 2 (adding method) or 3 (subtracting method) in accordance with the description given on page 19.
2) After the memory switch has been properly set to either value, re-turn ON the power switch.
3) Press the [Counter (set)] switch.
   Input the number of workpieces (set value) that can be sewing with a bobbin by pressing the numeric switches [0] through [9].
4) Insert a floppy disk into the floppy disk inserting slot.
   Input a sewing pattern No. desired and press the [Set Ready (Test)] switch.
5) Every time the sewing machine finishes a workpiece, indicated value ❶ on the operation panel will increase by one under the adding method or decrease by one under the subtracting method.
6) When the sewing machine finishes the specified number of workpieces, indication ❶ will flash on and off.
   In this case, the sewing machine is incapable of continuing to sew.
7) Replace the bobbin with a new one, and press the [Reset (select)] switch.
8) Repeat the steps of procedure from step 5).

2. Performing sewing by means of "Pattern enlarging/reducing function"

The pattern can be enlarged/reduced in the range of 1% to 400% (1/100 to 4 times of the original size) while the size of pattern written in the floppy disk is taken as 100%.

(The pattern can be enlarged/reduced in the range of 0.1 % to 400 % in accordance with the setting of the Memory switch.)



1) Insert a floppy disk into the floppy disk inserting slot and input a sewing pattern No. desired.

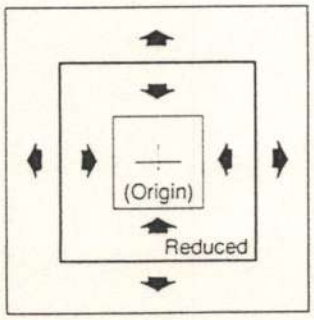
2) Input a scale (%) by which the sewing pattern is to be enlarged/reduced in the X direction (lateral direction). If you reduce the sewing pattern to a half size, for example, input "050" since the desired size corresponds to 50% of the original size.

3) As in step 2), input a scale (%) by which the sewing pattern is to be enlarged/reduced in the Y direction (longitudinal direction).

4) Select either the sewing pattern is enlarged/reduced taking the "INC/DEC of the stitch length (feed pitch)" method or it is done taking the "INC/DEC of the number of stitches" method.

(Caution) If the sewing pattern contains point input data, spline data or zigzag stitching data, the sewing pattern is always enlarged/reduced taking the "INC/DEC of the stitch length" method.

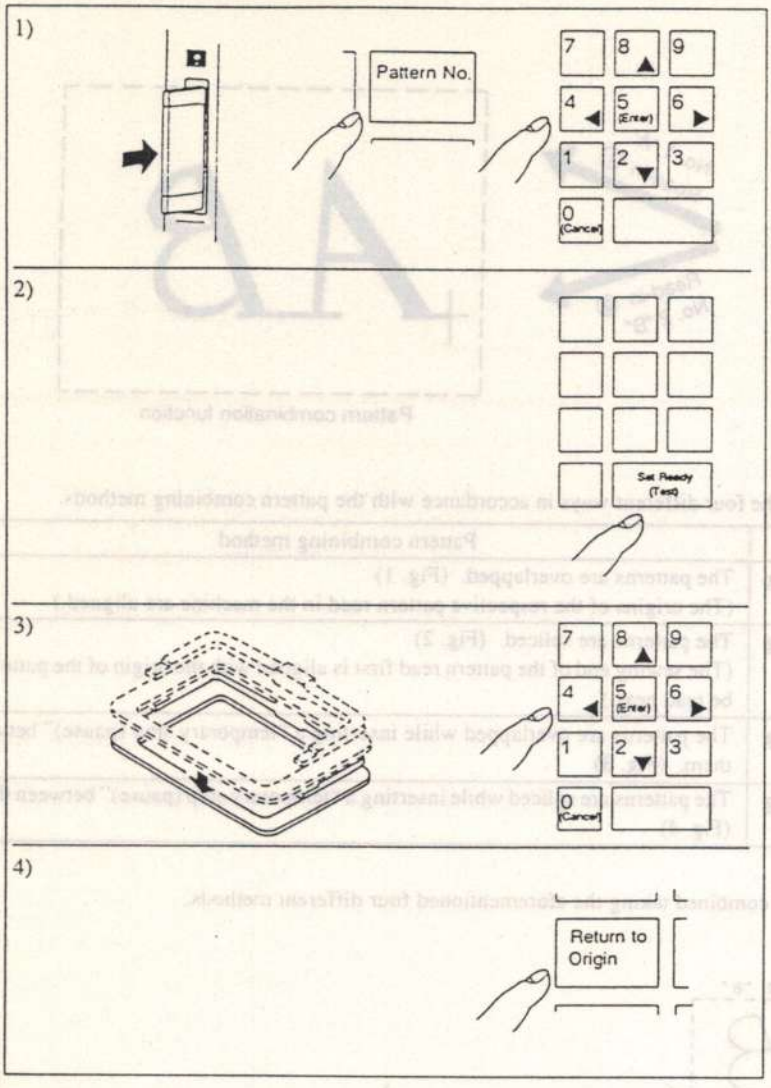
5) Press the [Set Ready (Test)] switch, and the sewing pattern data will be read in the sewing machine while being enlarged/reduced using the specified scale. Then, the machine will be ready for sewing.



(Note) Normally, a sewing pattern is enlarged/reduced using the (located at the center of the feeding frame) as the reference point. However, you can set another reference point for pattern enlargement/reduction. Refer to the Instruction Manual for Input Functions of the Main Unit for details.

3. If a workpiece cannot be set on the sewing machine because of the interruption by the needle point

Normally, the feeding frame rests at the sewing start position when you set a workpiece to be sewn on the sewing machine. If you cannot easily place the workpiece on the machine since the needle points interferes with you, you can specify the position of the feeding frame (turn-out point) as desired. (The sewing position will remain the same.)



1) Insert a floppy disk into the slot and input a sewing pattern No. desired.

2) Press the [Set Ready (Test)] switch, and the sewing machine will read the sewing pattern data from the floppy disk and the feeding frame will go up at the start position of sewing.

3) Depress the pedal switch to make the feeding frame come down. Then, press any of the switches [1], [2], [3], [4], [6], [7], [8] and [9] and the needle point will move in the direction of the arrow shown on the switch pressed.

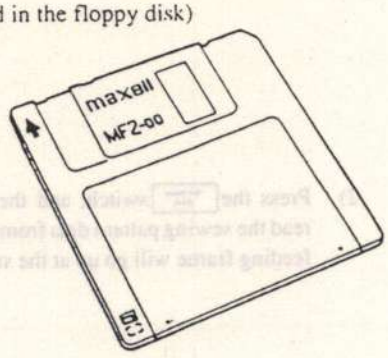
4) After you have moved the needle to a position at which the needle point does not interferes with you when setting the workpiece on the machine, press the [Return to Origin] switch or re-depress the pedal switch. This will make the feeding frame go up and the turn-out point will be entered.

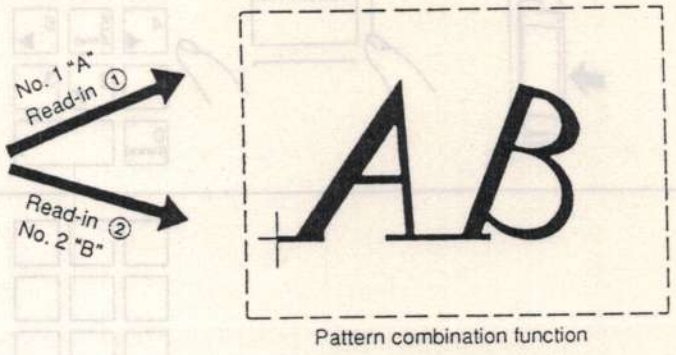
(Caution)
1. The turn-out point specified will be stored in memory at least for approximately 100 hours even if turning OFF the power to the machine.
2. If the [Set Ready (Test)] switch is pressed twice continuously, the turn-out point specified will be canceled.
3. If you specify a new turn-out point, the previously specified one will be canceled.

4. Pattern combination function

This function enables the machine to read only the desired parts of the patterns stored in the floppy disk to combine them for sewing.
The total number of stitches that can be combined is 16,000 stitches at the maximum. As long as the total number of stitches does not exceed 16,000. you need not care about the number of patterns.
If you have created embroidery patterns of all the alphabets respectively in the floppy patterns beforehand. you can combine some of these patterns to sew initials. This allows you to sew many different persons' names using a considerably small number of patterns (only 26 different patterns from A through Z).

(Patterns stored in the floppy disk)
No. 1 ← "A"
No. 2 ← "B"
No. 3 ← "C"
No. 4 ← "D"
⋮
No. 26 ← "Z"





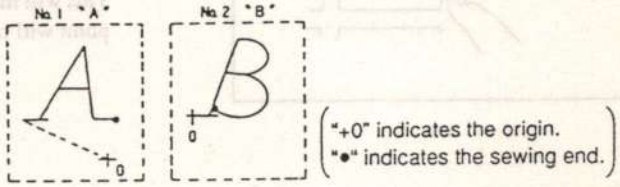
Pattern combination function

(1) Actuating the "pattern combination function"

The "pattern combination function" can be actuated in the four different ways in accordance with the pattern combining methods.

	Actuating method	Pattern combining method
1	Turn ON the power switch while pressing the 9 and 2 switches.	The patterns are overlapped. (Fig. 1) (The origins of the respective pattern read in the machine are aligned.)
2	Turn ON the power switch while pressing the 9 and 5 switches.	The patterns are spliced. (Fig. 2) (The sewing end of the pattern read first is aligned with the origin of the pattern to be read next.)
3	Turn ON the power switch while pressing the 9 and 3 switches.	The patterns are overlapped while inserting a "temporary stop (pause)" between them. (Fig. 3)
4	Turn ON the power switch while pressing the 9 and 6 switches.	The patterns are spliced while inserting a "temporary stop (pause)" between them. (Fig. 4)

– Example of a combination of sewing patterns –
Sewing pattern data "A" and "B" stored in a floppy disk are combined taking the aforementioned four different methods.



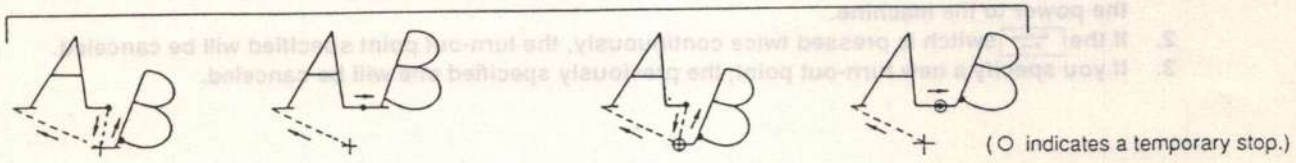
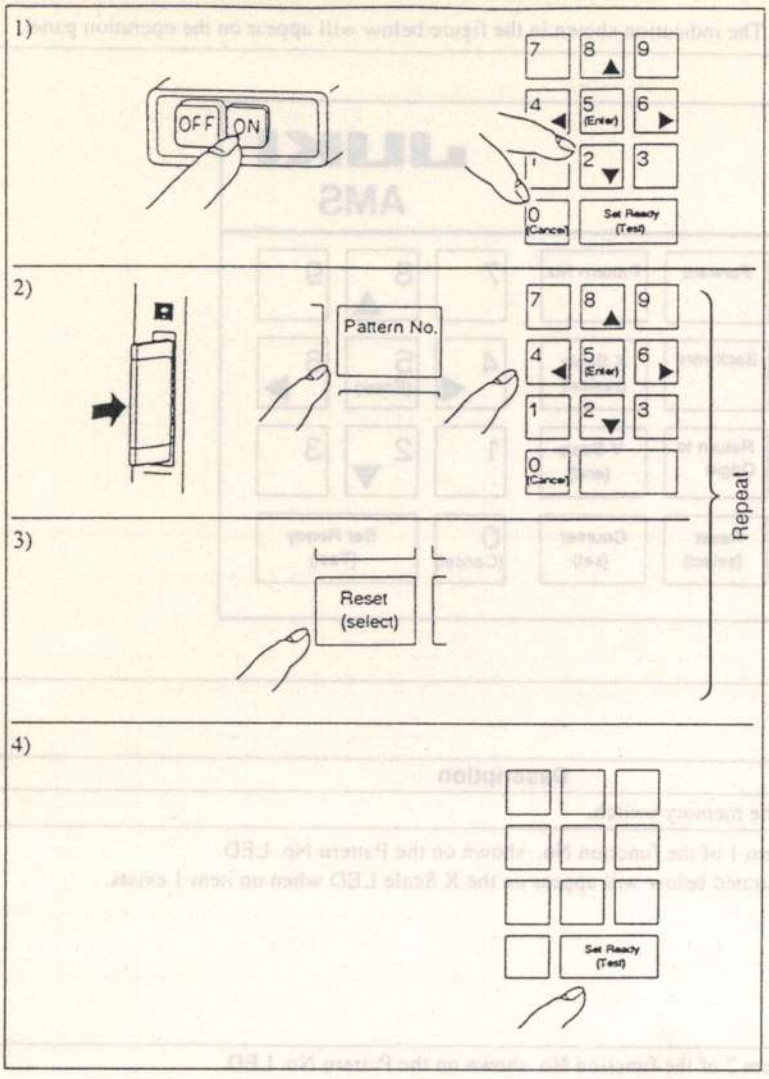


Fig. 1 Fig. 2 Fig. 3 Fig. 4

(2) Reading a sewing pattern data (In the case of (1)-1)



1) Actuate the sewing pattern combining function in the actuating method described in (1).

2) Insert a floppy disk into the floppy disk inserting slot and input a sewing pattern No. desired.
If you want to enlarge/reduce the sewing pattern input a scale now.

3) Press the [ ] switch, and the sewing pattern data will be read from the floppy disk.

(Caution) Sewing patterns can be combined as desired by repeating aforementioned steps 2) and 3).

4) After the desired sewing pattern data have been read out from the floppy disk, press the [ ] switch.
This will make the sewing machine retrieve the origin then ready for sewing.

(3) Erasing the pattern read in

If you have read in the pattern which is not necessary for your sewing by mistake and combine it with the other patterns, you cannot erase the wrong pattern.
So, if you have made a mistake in the pattern reading operation, it is necessary for you to re-actuate the function and carry out the pattern reading operation from the very start.
(This is also applied to the case where you wish to make a new combination of patterns after completing the previous sewing.)

(4) Storing the patterns combined in memory

It is impossible to write and store the combined pattern data on a floppy disk. Thanks to the data back-up function, however, the combined pattern data can be stored in memory of the main unit of sewing machine by turning OFF the power to the machine while the READY indicator lamp is on. To perform sewing, for the next time, using the combined pattern data, only press the [ ] switch.

5. Function to stop the machine with its needle up

If the needle is not in the highest position, the AMS gives Error [3] on the display. In this case, the machine will not operate since the foot switch and other switches are rendered ineffective. If the needle is not in the highest position when the machine is in the [sewing state], this "function to stop the machine with its needle up" allows you to raise the needle to the highest position of its stroke by operating the switch instead of turning the pulley by hand.

(Operating procedure)

When the needle does not rest in the highest position of its stroke under the [sewing state], confirm first that there is nothing under the needle and move up then down the [needle threading switch] that is mounted on the front face of control box.

① [Needle threading switch] UP : The feeding frame and intermediate presser come down.

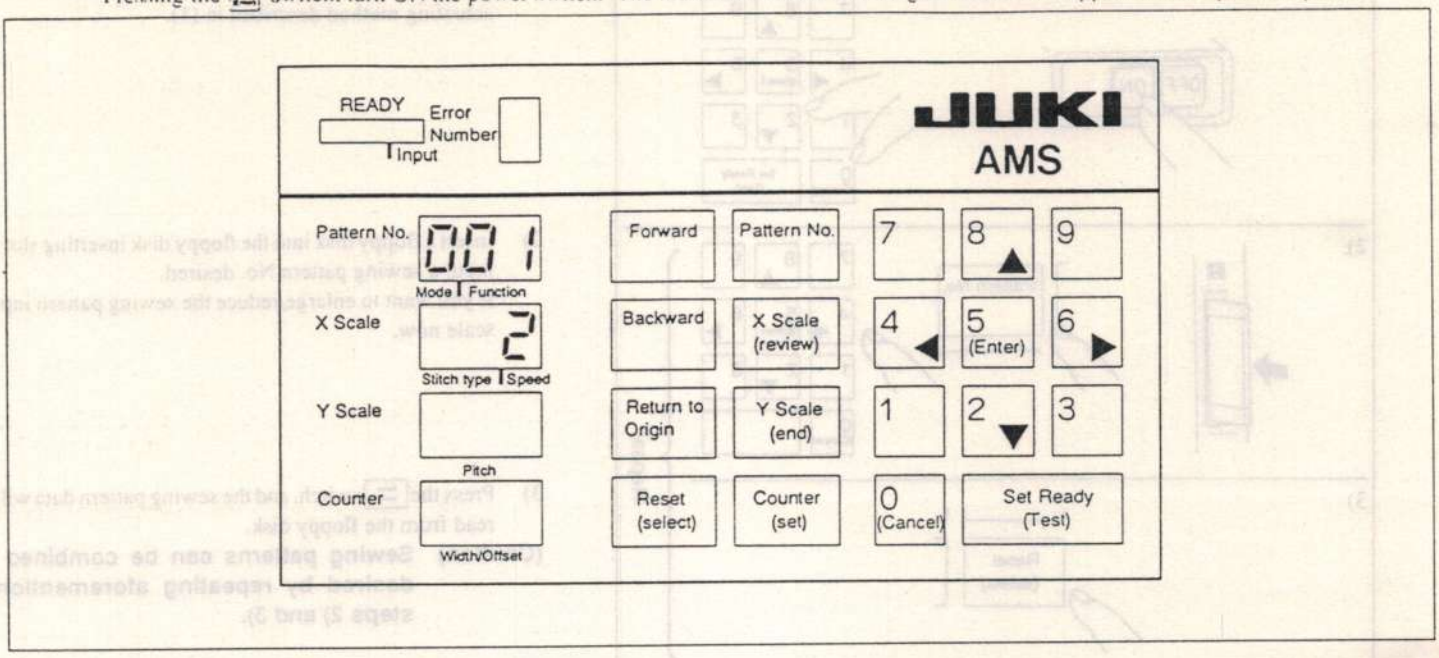
② [Needle threading switch] DOWN : The sewing machine turns by one revolution (needle goes up and comes down) and stops with its needle up.→The feeding frame and intermediate presser go up.

(Caution) During the aforementioned operation, the feeding frame, intermediate presser and needle move (go up and come down), it is very dangerous to operate the machine with your hands or any other part of your body placed under the feeding frame, intermediate presser and needle tip. So, carefully operate the machine with nothing placed under those parts of the machine.

6. How to use the memory switch

(1) Specifying the memory switch

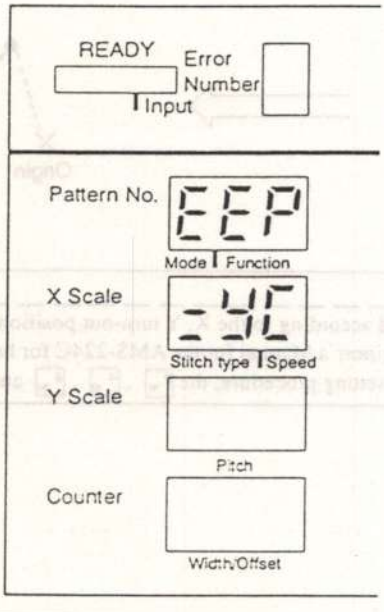
Pressing the [5] switch, turn ON the power switch. The indication shown in the figure below will appear on the operation panel.



1) Explanation of the LED indications

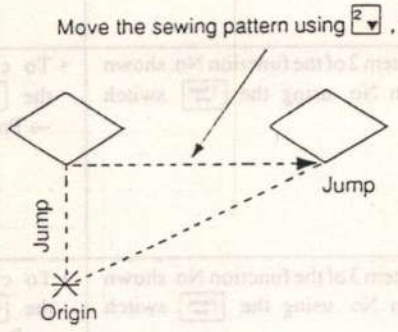
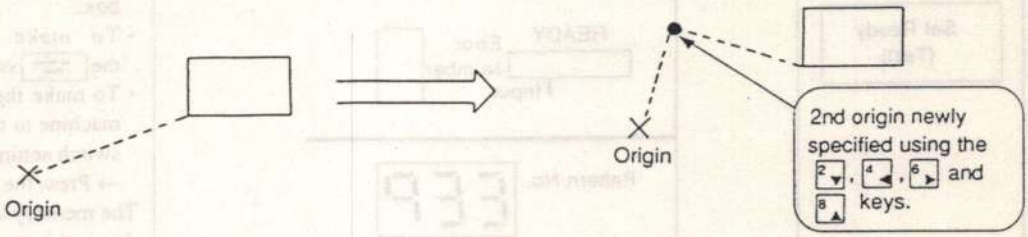
Name of LED indication	Description
Pattern No.	Indicates a function No. of the memory switch.
X Scale	Indicates the set value for item 1 of the function No. shown on the Pattern No. LED. Note that the indication illustrated below will appear on the X Scale LED when no item 1 exists. - - - Stitch type Speed
Y Scale	Indicates the set value for item 2 of the function No. shown on the Pattern No. LED. Note that the indication illustrated below will appear on the Y Scale LED when no item 2 exists. - - - Pitch
Counter	Indicates the set value for item 3 of the function No. shown on the Pattern No. LED. Note that the indication illustrated below will appear on the Counter LED when no item exists. - - - Width/Offset

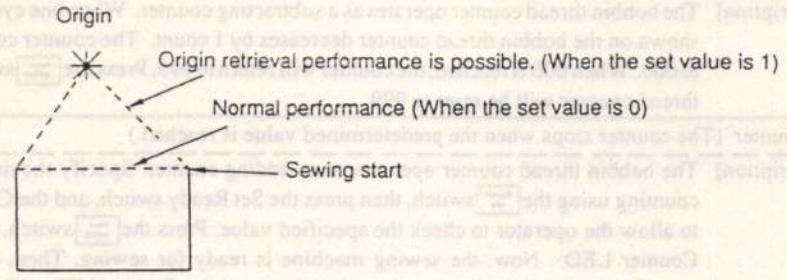
2) Function of the setting switches and how to operate them

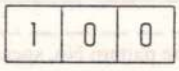
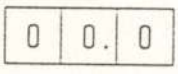
Name of switch	Function	Operation
Pattern No. Pattern No.	• Used to change the function No. of the memory switch shown on the Pattern No. LED. Select a function No. using the [Pattern No.] switch and [2▼] or [8▲] switch.	• To change the function No. from 41 to 46 Press the [Pattern No.] switch. → Press the [8▲] switch five times.
X Scale X Scale (review)	• Used to change the set value for item 1 of the function No. shown on the LED. Select a function No. using the [X Scale (review)] switch and [2▼] or [8▲] switch.	• To change the set value from 2 to 0 Press the [X Scale (review)] switch. → Press the [2▼] switch twice.
Y Scale Y Scale (end)	• Used to change the set value for item 2 of the function No. shown on the LED. Select a function No. using the [Y Scale (end)] switch and [2▼] or [8▲] switch.	• To change the set value from 3 to 1 Press the [Y Scale (end)] switch. → Press the [2▼] switch twice.
Counter Counter (set)	• Used to change the set value for item 3 of the function No. shown on the LED. Select a function No. using the [Counter (set)] switch and [2▼] or [8▲] switch.	• To change the set value from 2 to 6 Press the [Counter (set)] switch. → Press the [8▲] switch four times.
Set ready Set Ready (Test)	• Used to terminate the memory switch setting procedure. 	Press the [Set Ready (Test)] switch. Indication shown in the figure given on the left will appear on the operation box. • To make the set values effective Press the [Set Ready (Test)] switch. • To make the set values ineffective and return the machine to the state before starting up the memory switch setting mode Press the [0 Cancel] switch. → Press the [Set Ready (Test)] switch twice. The memory switch setting mode will terminate and the machine will return to the state where the machine enters immediately after the power to the machine has been normally turned ON.

Note : A number shown on the LED can be continuously increased/decreased by keeping the [2▼] or [8▲] switch held pressed.

(2) Table of functions of the memory switch

1) Operation setting		
Function No. 1		Function : Jog function
Item : 1 Jog mode		
Set value	0	Jog function is ineffective.
		[Description] The [2] , [4] , [6] and [8] keys (switches) are inoperative.
	1	Pattern travel
		[Description] A sewing pattern can be moved to a specified position by operating the [2] , [4] , [6] and [8] keys (switches). Pattern data read from a floppy disk is moved to a new location by adding a distance by which the pattern data is to be moved using the jog function. The second origin contained in the pattern data is rendered in effective. This setting can be reset by turning ON then OFF the [Test Pattern (Feed)] switch.
		[Example] 
	2	Turn-out position setting (Standard set value)
		[Description] The position specified using th [2] , [4] , [6] and [8] keys is set as the 2nd origin. A 2nd origin is specified for the convenience's sake during jump from the origin of the sewing pattern read from a floppy disk to the sewing start point without actually moving the sewing pattern. In this case, the 2nd origin contained in the pattern data will be ineffective. This setting can be reset by pressing the [Test Pattern (Feed)] switch twice.
		[Example] 
	3	Turn-out position setting
		[Description] A 2nd origin is specified according to the X, Y turn-out position contained in E²-PROM. (Note : Refer to the Engineer's Manual for the AMS-224C for how to specify the X, Y turn-out position.) In the turn-out position setting procedure, the [2] , [4] , [6] and [8] keys are ineffective.

1) Operation setting		
Function No. 6		
Item: 1 When the sewing machine completes sewing		
Set value	0	The machine does not retrieve the mechanical origin. (Standard set value)
		[Description] The mechanical origin retrieval performance is not carried out.
	1	The machine retrieves the mechanical origin.
		[Description] The machine retrieves the origin after the completion of sewing, then moves to the sewing start point. [Example] 
Item : 2 When a travel limit error occurs.		
Set value	0	The machine does not retrieve the mechanical origin.
		[Description] The mechanical origin retrieval performance is not carried out.
	1	The machine retrieves the mechanical origin. (Standard set value)
		[Description] When a travel limit error has occurred during sewing, the machine retrieves the origin, then moves to the sewing start point.

2) Processing function setting		
Function No. 13		Function : Enlargement/reduction
Item : 1 Pattern enlargement/reduction mode setting		
Set value	0	Pattern enlargement/reduction mode is prohibited.
		[Description] Pattern enlargement/reduction is prohibited. The machine is allowed only to sew a sewing pattern according to the original size of the pattern data stored on a floppy disk.
	1	Ascale can be set in 1% steps. (Standard setting)
		[Description] The XY scale can be set in 1% steps. Data setting range: 1 to 400% [Example of indication] 
	2	Ascale can be set in 0.1% steps.
		[Description] Set this item to 2 when you want to precisely specify a XY scale. Data setting range: 0 to 400.0% [Example of indication]  **Note : In this indication method, the hundreds digit is not shown on the Pattern No. LED. So, be careful.**

3) Command control		
Function No. 22		Function : Thread trimming command
Item : 1 Thread trimming command switch		
Set value	0	Thread trimming command is ineffective.
		[Description] A thread trimming command contained in sewing data is rendered ineffective. [Example] When a thick thread is used, an extra load is likely to be applied to the sewing machine mechanisms at the time of thread trimming causing the mechanism to be damaged. In this case, set item 1 to 0.
	1	Thread trimming command is effective. (Standard set value)
		[Description] The thread trimming command contained in sewing data is rendered effective.

4) Operation system control		
Function No.30		Function : Bobbin thread counter
Item : 1 Operation mode setting		
Set value	0	UP counter (loop) (Standard set value)
		[Description] The bobbin thread counter operates as an adding counter. When one cycle stitching completes, the value shown on the bobbin thread counter increases by 1 count. The counter counts the bobbin thread from 000 to 999. When 999 is reached, the counter will return to 000. Press the [=] switch, and the value on the bobbin thread counter will be reset to 000.
	1	DOWN counter (loop)
		[Description] The bobbin thread counter operates as a subtracting counter. When one cycle stitching completes, the value shown on the bobbin thread counter decreases by 1 count. The counter counts the bobbin thread from 999 to 000. When 000 is reached, the counter will return to 999. Press the [=] switch, and the value on the bobbin thread counter will be reset to 999.
	2	UP counter (The counter stops when the predetermined value is reached.)
		[Description] The bobbin thread counter operates as an adding counter. Specify the number of times of bobbin thread counting using the [=] switch, then press the Set Ready switch, and the Counter LED will flash on and off to allow the operator to check the specified value. Press the [=] switch, and "000" will be shown on the Counter LED. Now, the sewing machine is ready for sewing. Then, every time the sewing machine completes one cycle stitching, the value shown on the Counter LED will increase until the specified value is reached. When the specified value is reached, the value shown on the LED will flash on and off. Now, the sewing machine is incapable of continuing sewing any further.
	3	DOWN counter (The counter stops when 0 is reached.)
		[Description] The counter subtracts from the specified value until 000 is reached. When 000 is reached, the sewing machine stops. Specify the number of times of bobbin thread counting using the [=] switch, and the bobbin thread counter will subtract one from the specified value every time the sewing machine completes a cycle stitching. When "000" is reached, the Counter LED will flash on an off. Now, the sewing machine is incapable of continuing sewing any further. Press the [=] key, and the bobbin thread counter will be reset to enable the sewing machine to start sewing. Even when the bobbin thread counter indicates a value other than "000," you can reset the value to the specified one using the [=] key.

4) Operation system control		
Function No. 31		Function : Floppy disk data reading operation
Item : 2 Data reading mode setting		
Set value	0	Selective reading (standard value)
		[Description] Data stored on a floppy disk is not read unless setting data on pattern No., X/Y scale and the switch for INC/DEC of the number of stitches) have been changed.
	1	Constant data reading
		[Description] Pattern data is read from the floppy disk regardless of the pattern No. specified, XY scale specified and the setting of INC/DEC of the number of stitches setting switch.

4) Operation system control		
Function No. 36		Function : Selection of thread trimming after turning ON the temporary stop switch.
Item : 1 Thread trimming setting		
Set value	0	Thread trimmer automatically actuates.
		[Description] When the temporary stop switch is pressed, the sewing machine temporarily stops and the thread trimmer actuates.
	1	Thread trimmer is manually actuated. (Needle threading switch is used.) (Standard set value)
		[Description] When the temporary stop switch is pressed, the sewing machine stops and error No. "5" will flash on and off on the operation box. In this state, the thread trimmer is actuated by turning ON then OFF the needle threading switch.
	2	Thread trimmer is manually actuated. (Temporary stop switch is used.)
		[Description] If hen the temporary stop switch is pressed, the sewing machine stops and error No. "5" will flash on and off on the operation box. In this state, the thread trimmer is actuated by pressing the temporary stop switch again. The thread trimmer can also be actuated by operating the needle threading switch.

5) Mechanism control		
Function No. 40		Function : Selection of the sewing speed
Item : 1 Acceleration at the start of sewing		
Set value	0 ~ 4	Selection of the acceleration at the sewing start
		[Description] The start-up speed of the sewing speed is specified. It can be set to one of the six different stages. (Set value 1 is excluded.) Set value 0 : The standard start-up speed. (Standard set value) Set value 1 : Set value for embroidering (In this case, the start-up speed can be set to one of eight different stages.) Set value 2 : Set value 3 : Medium speed mode 1 Set value 4 : Medium speed mode 2
Item : 2 Sewing speed adapting to the material thickness		
Set value	0 ~ 3	Selection of the sewing speed adapting to the material thickness
		[Description] When sewing a heavy-weight material, the max. sewing speed can be limited to ensure a sufficient length of time to allow the material to be fed after the needle has come off the material. Set value 0 : 2,000 s.p.m. Light-weight material Set value 1 : 1,600 s.p.m. Set value 2 : 1,300 s.p.m. Set value 3 : 1,000 s.p.m. Extra heavy-weight material

5) Mechanism control		
Function No. 41		Function: Feed control
Item : 1 Selection of the feed timing		
Set value	0 ~ 9	Selection of the feed start timing
		[Description] The feed start timing can be advanced by 0 to 9 pulses so as to adapt to the material thickness. 9: Advances ⟵⟶ 0: Retards (Standard value: 0) **Note: When the max. sewing speed is set to 2,000 s.p.m., the feed start timing setting does not affect the max. sewing speed. So, when you operate your machine with the max. sewing speed set at 2,000 s.p.m., set the feed start timing at the standard set value.**

5) Mechanism control		
Function No. 42		Function: Thread trimmer prohibition
Item : 1 Designation of thread trimmer prohibition		
Set value	0	Thread trimmer is ineffective.
		[Description] Thread trimming is prohibited under any condition. [Example] When a thick thread is used. an extra load is likely to be applied to the sewing machine mechanisms at the time of thread trimming causing the mechanism to be damaged.
	1	Thread trimmer is effective.
		[Description] All the functions related to the thread trimmer are rendered effective. The thread trimmer operates under the operation mode in accordance with the set values of Function Nos. 22 and 36.

5) Mechanism control		
Function No. 43		Function : Feeding frame control
Item : 1 Operation sequence setting		
Set value	0 ~ 38	Selection of the feeding frame
		[Description] 0 : Monolithic feeding frame 1 : Monolithic feeding frame with stroke control facility (Standard Value) . 8 : Separately-driven feeding frame with stroke control facility Refer to the Engineer's Manual for the AMS-224C for the other settings. (Note that the work clamp foot and work clamp foot monut that are optionally available are required to use the function of the separately-driven feeding frame or double step stroke feeding frame)
Item : 2 Selection of the state of feeding frame at the sewing end		
Set value	0	The machine returns to the sewing start, then the feeding frame goes up. (Standard set value)
		[Description] After the completion of sewing, the sewing machine travels to the sewing start point, lifts the feeding frame and waits for the start of next sewing.
	1	The machine returns to the sewing start and stops with the feeding frame lowered.
		[Description] After the completion of sewing, the sewing machine travels to the sewing start point and waits for the start of next sewing with the feeding frame lowered. At this time, you can lift the feeding frame using the pedal switch.
	2	The feeding frame goes up to its intermediate stop position while the sewing machine returns to the sewing start.
		[Description] The feeding frame goes up to the first step of the double-stepped stroke during jump from the sewing end. Then the feeding frame is held raised until the machine reaches the sewing start.
	3	The feeding frame goes up to its intermediate stop position while the sewing machine returns to the sewing start.
		[Description] The feeding frame goes up to the second step of the double-stepped stroke during jump from the sewing end. Then the feeding frame is held raised until the machine reaches the sewing start.
Item : 3 Selection of the constant-lowering of the feeding frame		
Set value	0	Nomal control (Standard set value)
		[Description] The feeding frame up/down switch is used to lift/lower the feeding frame. The feeding frame operaters under the operation mode in accordance with the set values of items 1 and 2.
	1	Constant-lowering of the feeding frame during sewing
		[Description] As long as the READY indicator lamp is ON, the feeding frame is always held lowered. [Example] This operation mode is used when sewing a label or the like that is placed inside the feeding frame.

5) Mechanism control		
Function No. 44		Function : Intermediate presser control
Item : 1 Intermediate presser control		
Set value	0	Intermediate presser prohibition
		[Description] The intermediate presser is made inoperative. The intermediate presser is always fixed at the highest position of its stroke. [Example] Make the intermediate presser prohibition effective when sewing an inverting sewing pattern or the intermediate presser is not required for sewing in terms of the structure of the feeding frame used.
	1	Intermediate presser is operative. (Standard set value)
		[Description] The intermediate presser comes down at the start of sewing.
	2	Intermediate presser is operative.
		[Description] For the normal operation, the intermediate presser operates as in the case of set value (1). When the intermediate presser control is set to 2, the intermediate presser operates even when the sewing machine runs idle using the sewing machine ON/OFF switch.
Item : 2 Operation timing setting		
Set value	0	Intermediate presser comes down at the time of start-up (Standard set value)
		[Description] The intermediate presser is lowered immediately before the sewing machine starts to rotate after the start of sewing.
	1	Intermediate presser operates when the feeding frame comes down.
		[Description] The intermediate presser operates simultaneously with the lowering motion of the feeding frame. When the separately-driven feeding frame, which operates in several steps, is used, the intermediate presser is lowered simultaneously with the lowering motion of the feeding frame in the final step. (Note that the work clamp foot and work clamp foot mount that are optionally available are required to use the function of the separately-driven feeding frame.)

5) Mechanism control		
Function No. 45		Function : Wiper operation
Item : 1 Wiper operation mode setting		
Set value	0	Wiper prohibition
		[Description] The wiper is made inoperative. Under the state where the wiper is operative, the cycle time is slightly lengthened since the response time required to operate the wiper is taken into account. If you want to shorten the cycle time when the wiper is not required for the current operation, use this mode. **Note : The switch mounted on the machine head that is used to set the wiper operation is given priority.**
	1	Wiper is operative. (Standard set value)
		[Description] The magnet type wiper is made operative. A signal which matches the timing for actuating the magnetic type wiper is output. For the wiper operation timing, the wiper operates in accordance with the set value of item (2). **Note : The switch mounted on the machine head that is used to set the wiper operation is given priority.**
	2	Wiper is operative.
		[Description] The pneumatic type wiper is made operative. A signal which matches the timing for actuating the pneumatic type wiper is output. For the wiper operation timing, the wiper operates in accordance with the set value of item (2).
Item : 2 Wiper operation timing setting		
Set value	0	Wiper sweeps above the intermediate presser. (Standard set value)
		[Description] The wiper sweeps above the intermediate presser. Use this mode when sewing a light-weight material.
	1	Wiper sweeps below the intermediate presser.
		[Description] The wiper sweeps below the intermediate presser. Use this mode when sewing a heavy-weight material and the top end of the intermediate presser comes in contact with the material. Under this mode, the wiper sweeps below the intermediate presser after the intermediate presser has been raised.

5) Mechanism control		
Function No. 46		Function : Thread clamp operation
Item: 1 Thread clamp operation mode setting		
Set value	0	Thread clamp prohibition
		[Description] The thread clamp is made inoperative.
	1	Thread clamp is operative. (Standard set value)
		[Description] For the operating timing of the thread clamp, the thread clamp operates in accordance with the set value of item 2.
Item : 2 Thread clamp operation timing setting		
Set value	1 ~ 15	Thread clamp swings above the intermediate presser. (Standard set value)
		[Description] The number of stitches to be sewn, from the state where the thread clamp retains the needle thread to the point at which it releases the thread, is specified. The data setting range is 1 to 15 (stitches) as counted from the point at which the main shaft starts to rotate.

5) Mechanism control		
Function No. 47		Function : Selection of thread breakage detector
Item : 1 Operation mode setting		
Set value	0	Thread breakage detector prohibition
		[Description] The thread breakage detecting function is rendered ineffective. **Note: Use the thread breakage detector prohibiting function to make the thread breakage detection ineffective when the needle thread tension is decreased by a large margin or when the thread breakage detector fails to work with consistency.**
	1	Thread breakage detector is operative. (Standard setting)
		[Description] The thread breakage detector is rendered effective. It works to stops the sewing machine, in case of thread breakage, in accordance with the number of stitches specified for item 2.

5) Mechanism control		
Function No. 48		Function : Selection of air pressure drop detecting function
Item : 1 Operation mode setting		
Set value	0	Air pressure drop detector prohibition
		[Description] The air pressure drop detecting function is rendered ineffective.
	1	Air pressure drop detector is effective. (Standard set value)
		[Description] The air pressure drop detector is rendered effective. When the detector detects a drop of air pressure and error indication "A" will appear on the operation box.

5) Mechanism control		
Function No. 49		Function : Selection of upper detecting function
Item : 1 Operation mode setting		
Set value	0	Upper detecting function prohibition
		[Description] The upper detecting function is rendered ineffective regardless of the state of the sewing machine, i.e., preparation state or sewing state. It is possible to move the feed with the needle point placed near the feeding frame (workpiece) when programming data using the input functions of the main unit or checking the shape of a sewing pattern. Note that the upper detector works when starting up the sewing machine (when the main shaft rotates). In this case, an error will result if the needle is not in the highest position of its stroke. Also note that the needle can be returned to the highest position of its stroke by operating the needle threading switch.
	1	Upper detecting function is effective. (Standard set value)
		[Description] The upper detector is always rendered effective. If the needle is not in the highest position of its stroke when the feed operates and the main shaft rotates, error "3" will appear on the operation box.

5) Mechanism control		
Function No. 56		Function : Selection of floppy disk data reading sequence
Item : 1 Operation mode setting		
Set value	0 ~ 4	Set value 0 (AMS-224C (0.1 mm type) priority mode)
		[Description] A long time is required to read data from a floppy disk because of difference and interchangeability of the floppy disks applicable to the AMS Series. Use this function to minimize the length of time required to read data stored on a floppy disk. [Data reading sequence] [1] : Floppy disk for the AMS-224C [2] : Floppy disk for the AMS-B type [3] : Floppy disk for the AMS-A type [4] : } Normally disused. [5] : }

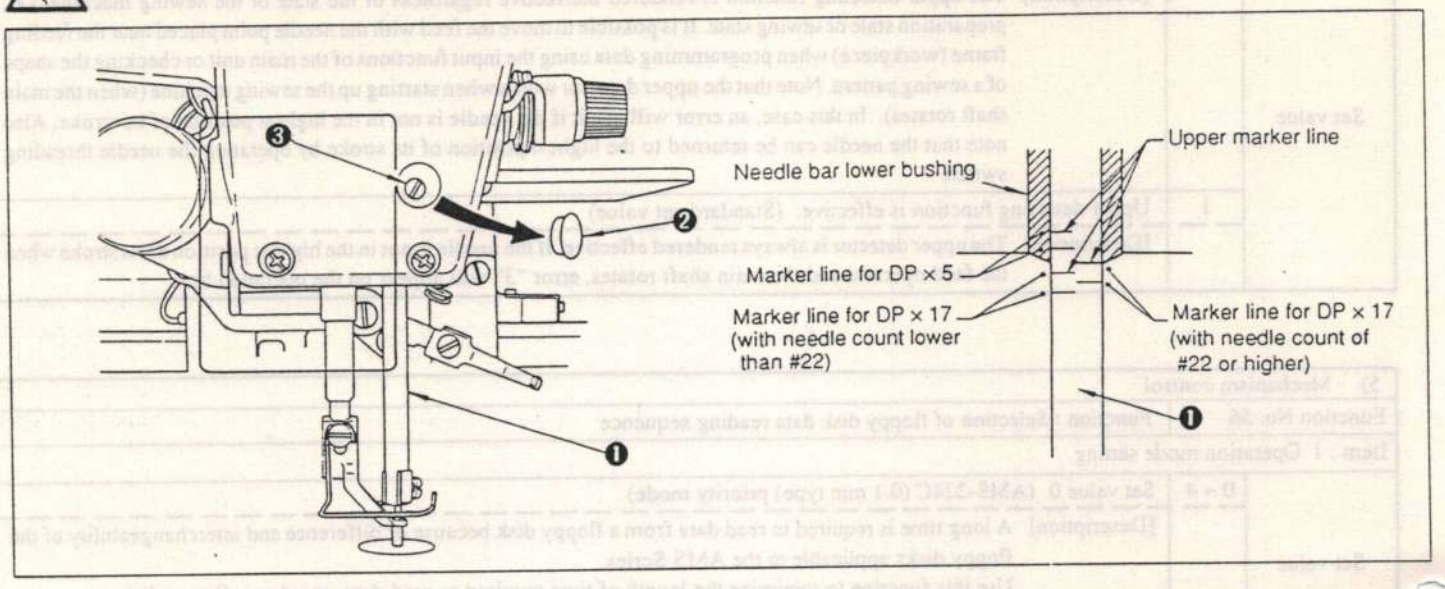
Set value	Data reading sequence		
	1	2	3
0	[1]	[2]	[3]
1	[2]	[1]	[3]
2	[3]	[1]	[2]
3	–	–	–
4	–	–	–

Note : Do not read data from the floppy disk for the AMS-224C, AMS-A or -B type model of sewing machine with the function set at 3 or 4.

VII. MAINTENANCE

1. Height of the needle bar (Changing the length of the needle)

Carry out the following steps of procedure after the power switch has been turned OFF.

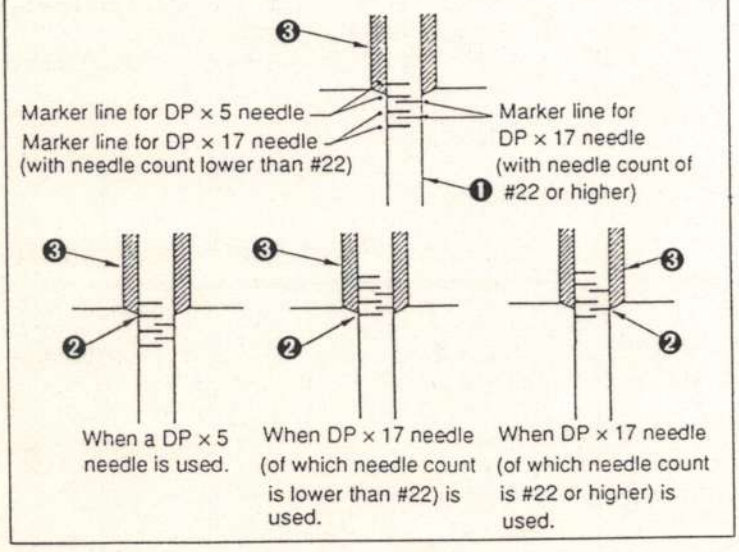


1) Bring needle bar ❶ down to the lowest position of its stroke. Loosen needle bar connection screw ❸ and adjust so that the upper marker li
engraved on the needle bar aligns with the bottom end of the needle bar lower bushing.
Needle bar ❶ has three types of marker lines (three pairs of marker lines) according to the needle size.
The needle bar height has been factory-adjusted at the time of delivery as described below in accordance with sewing specifications.
*1 Sewing specification S : Marker line of DP × 5 needle
Sewing specification H : Marker line of DP × 17 needle (with needle count lower than #22)
Sewing specification G : Marker line of DP × 17 needle (with needle count of #22 or higher) (The needle bar of the sewing machine of which sewing specification is S or H does not have this pair of marker lines.)

**(Caution) The lower one of a pair of marker lines are used for "adjusting the needle and hook."
After the adjustment, turn the pulley to check for an extra load.
Refer to *1, *2 "XII. Numbering system".**

2. Needle and shuttle

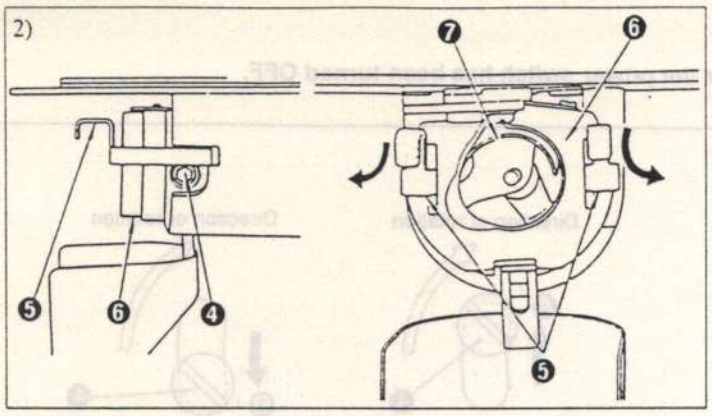
1) (Relation between the needle and the marker lines on the needle bar)



**Carry out the following steps of procedure after t
power switch has been turned OFF.**

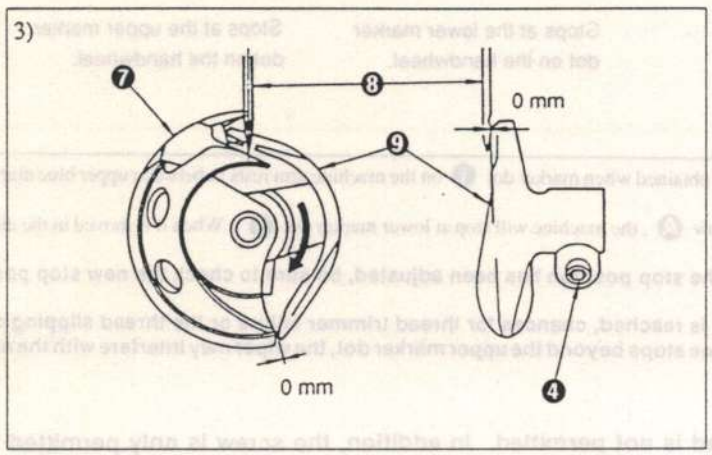
1) Turn the pulley by hand in the normal direction of rotation to raise needle bar ❶ and align lower mark line ❷ engraved on the needle with the bottom end of needle bar lower bushing ❸ .
The needle-to-hook relation has been factory-adjusted at the time of delivery as described below in accordance with sewing specifications.
Sewing specification S : Marker line of DP × 5 needle
Sewing specification H : Marker line of DP × 17 needle (with needle count lower than #22)
Sewing specification G : Marker line of DP × 17 needle (with needle count of #22 or higher)

(Caution) The needle bar has three pairs of marker lines in accordance with the needle sizes. The lower one of a pair of marker lines is called the "lower marker line."

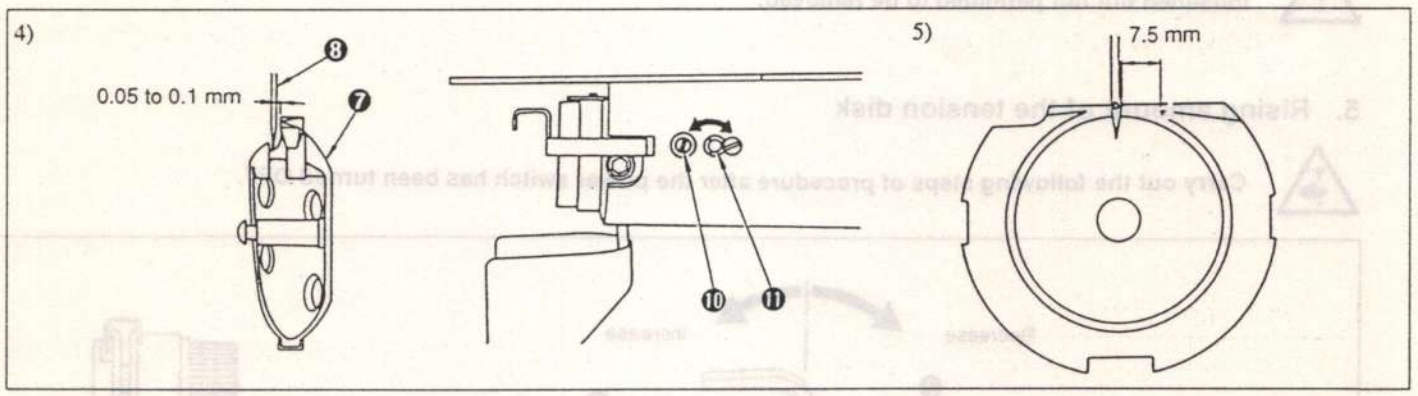


2) Loosen screw (hexagon socket head screw) ❹ in the driver. Drawing bobbin case opening lever hook ❺ toward you, open it to the right and left until bobbin case opening lever ❻ comes off.

(Caution) **At this time, be careful not to let shuttle ❼ come off and fall.**



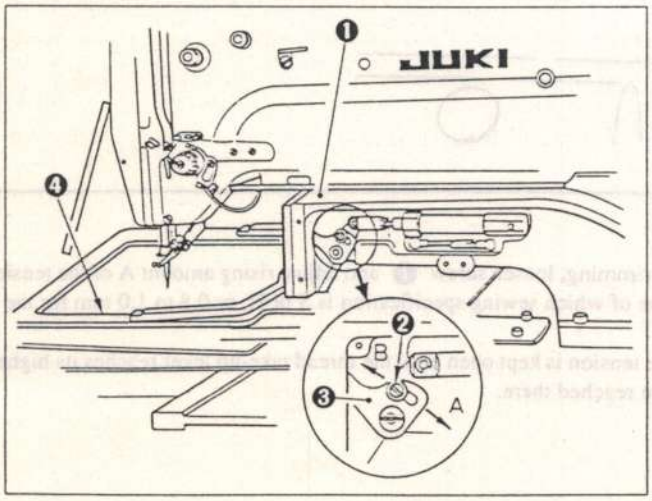
3) Adjust so that the blade point of shuttle ❼ meets the center of needle ❽ . At the same time, adjust so that a clearance of 0 mm is provided between the front end face and the needle since diver ❾ receives the needle on its front end face so as to prevent the needle from bending. After the adjustment, tighten screw ❹ in the driver.



4) Loosen shuttle race setscrew ❿ , and adjust the longitudinal position of the shuttle race. To do this adjustment, turn shuttle race adjusting shaft ⓫ clockwise or counterclockwise to provide a 0.05 to 0.1 mm clearance between needle ❽ and the point of shuttle ❼ .

5) After adjusting the longitudinal position of shuttle race, further adjust to provide a 7.5 mm clearance between the needle and the shuttle race. Tighten setscrew ❿ .

3. Height of the feeding frame



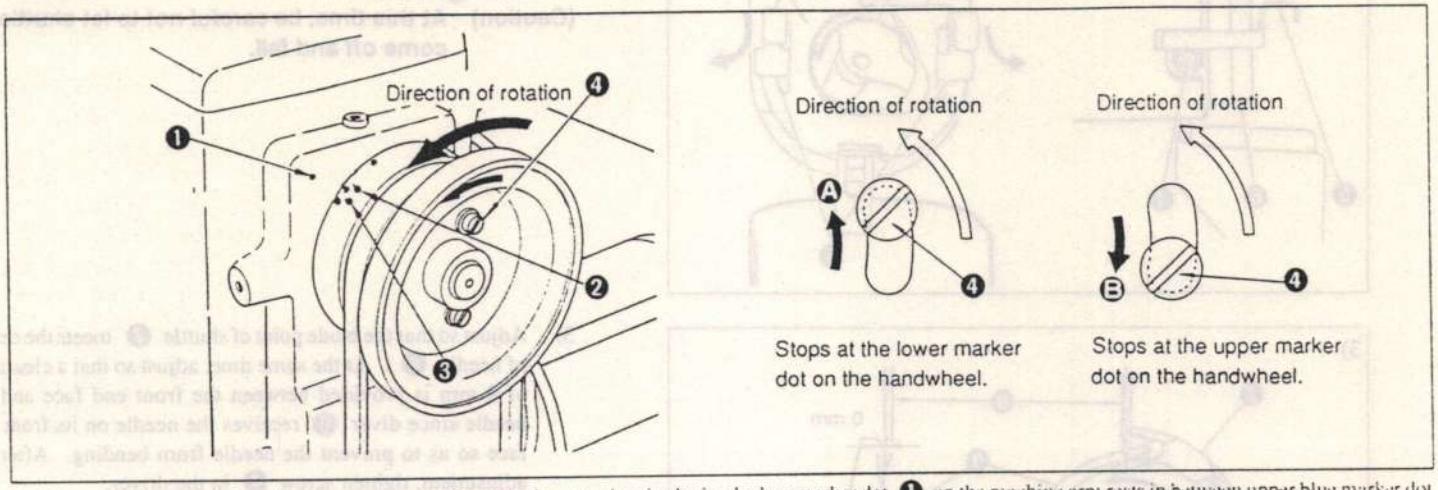
Carry out the following steps of procedure after the power switch has been turned OFF.

1) Loosen screws ❷ which is located in the right-hand side of feed bracket ❶ . Shifting lever ❸ in the direction arrow A will increase the height of feeding frame ❹ or in the direction arrow B will decrease the height of the feeding frame.

2) After the adjustment of the height of the feeding frame, securely tighten screws ❷ .

4. Needle-up position

Carry out the following steps of procedure after the power switch has been turned OFF.



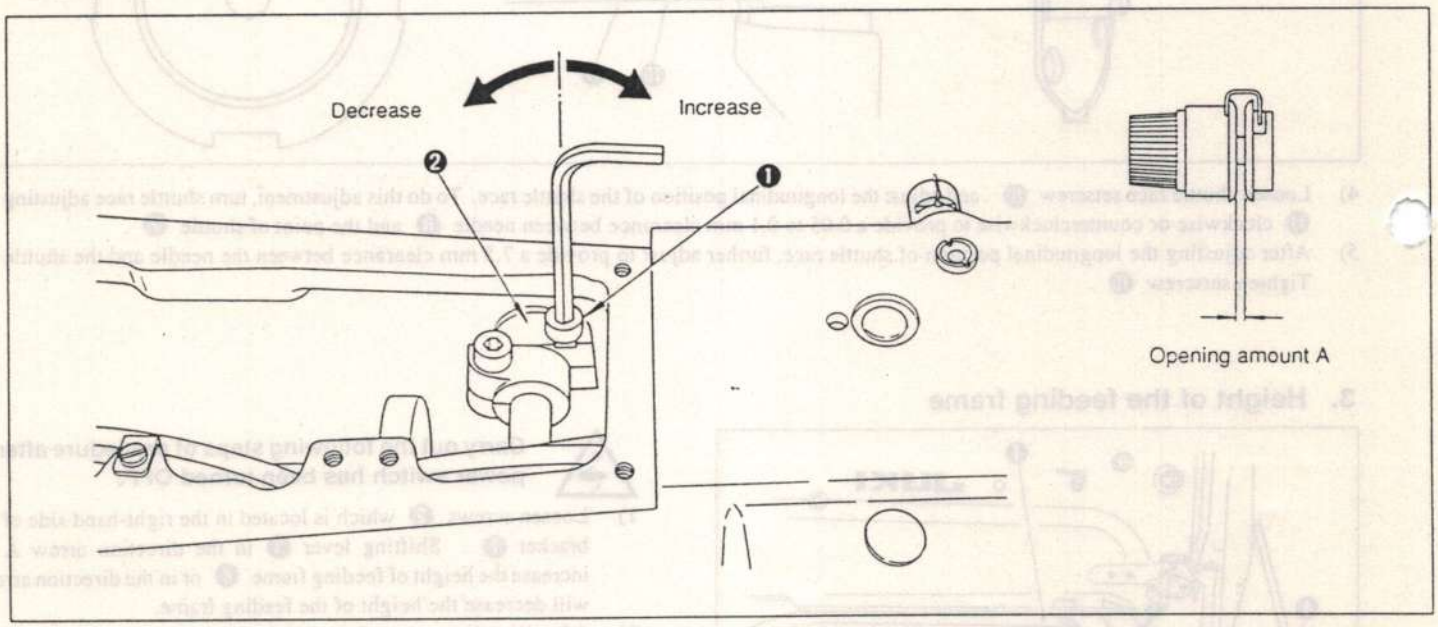
1) The normal stop position when the sewing machine completes sewing, is obtained when marker dot ❶ on the machine arm rests in between upper blue marker dot ❷ and lower blue marker dot ❸ engraved on the handwheel.
2) When adjusting screw ❹ is loosened and moved in the direction of arrow Ⓐ, the machine will stop at lower marker dot ❸. When it is moved in the direction of arrow Ⓑ, the machine will stop at upper marker dot ❷.

(Caution) 1. **Usually, no adjustment is required. However, if the stop position has been adjusted, be sure to check the new stop position, setting a workpiece.**
2. **If the machine stops before the lower marker dot is reached, chances for thread trimmer failure or the thread slipping off needle may increase. On the contrary, if the machine stops beyond the upper marker dot, the wiper may interfere with the needle. Properly adjust the stop position.**

Operating the machine with screw ❹ loosened is not permitted. In addition, the screw is only permitted to be loosened but not permitted to be removed.

5. Rising amount of the tension disk

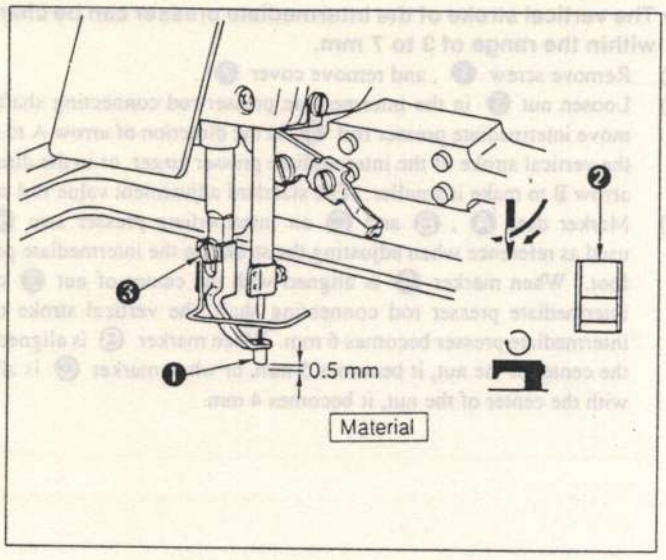
Carry out the following steps of procedure after the power switch has been turned OFF.



1) Remove the arm top cover.
2) To adjust the rising amount of the tension disk at the time of thread trimming, loosen screw ❶ and adjust rising amount A of the tension disk, by moving tension arm ❷ to 0.6 to 0.8 mm for the sewing machine of which sewing specification is S or H, or 0.8 to 1.0 mm for the sewing machine of which sewing specification is G.
3) After the adjustment, turn the handwheel by hand to confirm that the tension is kept open until the thread take-up lever reaches its highest dead point and it is securely closed after the thread take-up lever has once reached there.

6. Height of the intermediate presser

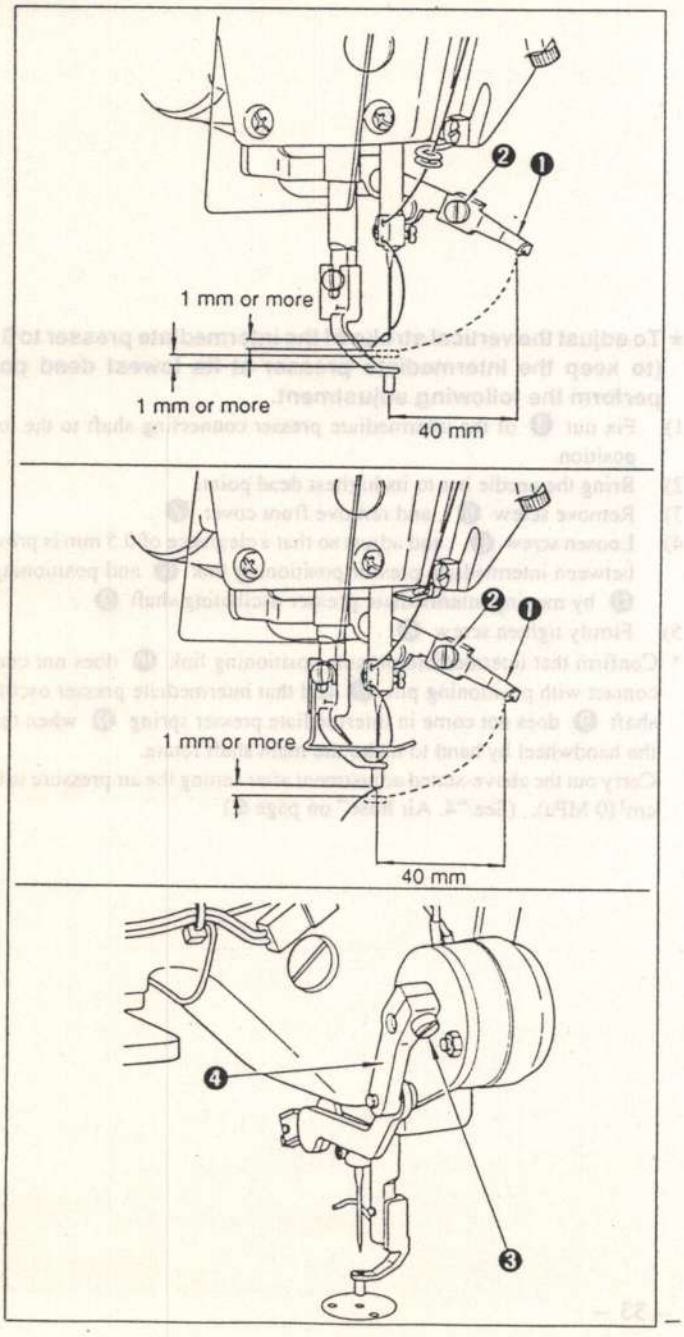
Set the Needle threading switch to the ⅄ side.



1) Confirm that the needle enters just the center of intermediate presser ❶.
2) When Needle threading switch ❷ on the control box is set to the ⅄ position while the READY indicator lamp lights up, the feeding frame and the intermediate presser will come down. Loosen screw ❸, and adjust so that a clearance of 0.5 mm (thickness of the needle thread used) is provided between the material and the bottom end of the intermediate presser when the needle is brought to the lowest point of its stroke by turning the pulley. If using a floppy material, adjust the clearance as small as the extent where the intermediate presser comes in contact with the material (a 0 mm clearance).
3) After the adjustment, set Needle threading switch ❷ to the position. Then the machine rotates until it stops with its needle up.
(The intermediate presser can be used with the material of which thickness is 5 mm or less.)

7. Wiper

Set the Needle threading switch to the ⅄ side.



(1) For the wiper which sweeps above the intermediate presser (standard adjustment for the sewing specification S or H)

When the READY indicator lamp is ON, move the needle up to its highest position, and set the Needle threading switch to the ⅄ position. Adjust so that, when wiper ❶ passes under the needle point, the clearance between the wiper and the needle point becomes 1 mm or more and the clearance between the wiper and the intermediate presser becomes also 1 mm or more.
Loosen screw ❷, and perform the aforementioned adjustment.

(2) For the wiper which sweeps under the intermediate presser (standard adjustment for the sewing specification G)

Stop the needle in the highest position of its stroke. Adjust so that a clearance of 1 mm or more is provided between the needle and the wiper and between the intermediate presser and the wiper when wiper ❶ passes under the intermediate presser.
Loosen screw ❷ and perform the aforementioned adjustment.

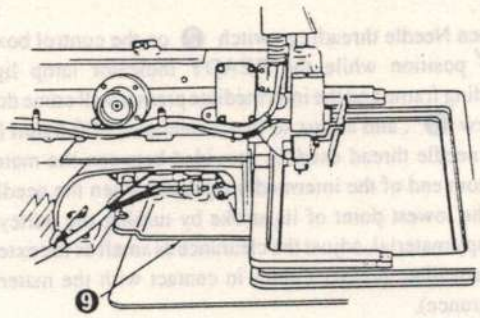
When wiper ❶ returns to its home position, the end face of wiper ❶ should be spaced 40 mm from the center of the needle.
To adjust, loosen clamping screw ❸ in the wiper arm and change the installing angle of wiper arm ❹.

* The position at which the wiper sweeps (above or under the intermediate presser) can be changed over by operating the memory switch.
When sewing a material of which thickness is 3 mm or less, make the wiper sweep above the intermediate presser. When sewing a material of which thickness exceeds 3 mm, make the wiper sweep under it.

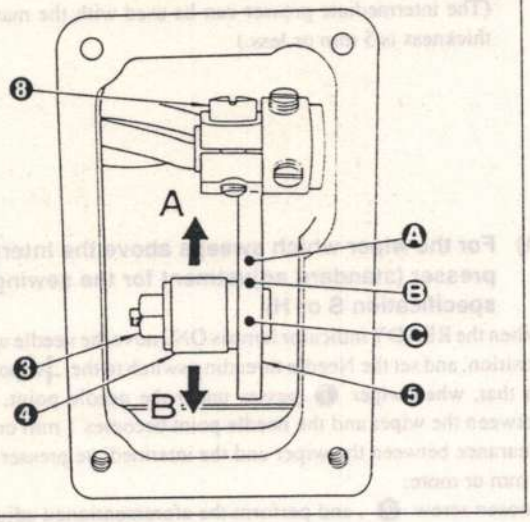
8. Vertical stroke of the intermediate presser

Carry out the following steps of procedure after the power switch has been turned OFF.

1)



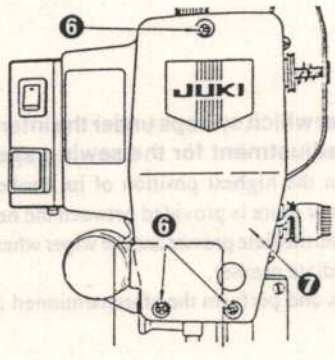
2) 3)



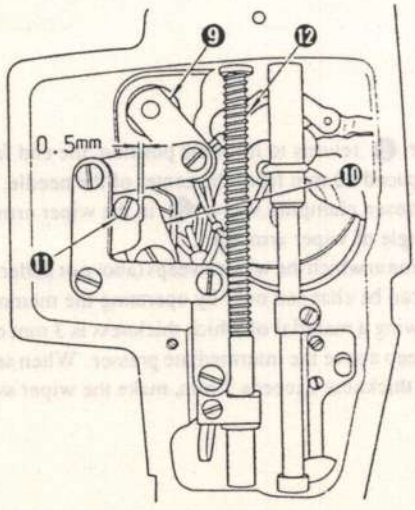
★ The vertical stroke of the intermediate presser can be changed within the range of 3 to 7 mm.

1) Remove screw ❶ , and remove cover ❷ .
2) Loosen nut ❸ in the intermediate presser rod connecting shaft. and move intermediate presser rod ❹ in the direction of arrow A to make the vertical stroke of the intermediate presser larger, or in the direction arrow B to make it smaller. The standard adjustment value is 4 mm.
3) Marker dots Ⓐ , Ⓑ and Ⓒ on intermediate presser arm ❺ are used as reference when adjusting the stroke on the intermediate presser foot. When marker Ⓐ is aligned with the center of nut ❸ of the intermediate presser rod connecting shaft, the vertical stroke of the intermediate presser becomes 6 mm. When marker Ⓑ is aligned with the center of the nut, it becomes 5 mm, or when marker Ⓒ is aligned with the center of the nut, it becomes 4 mm.

3)



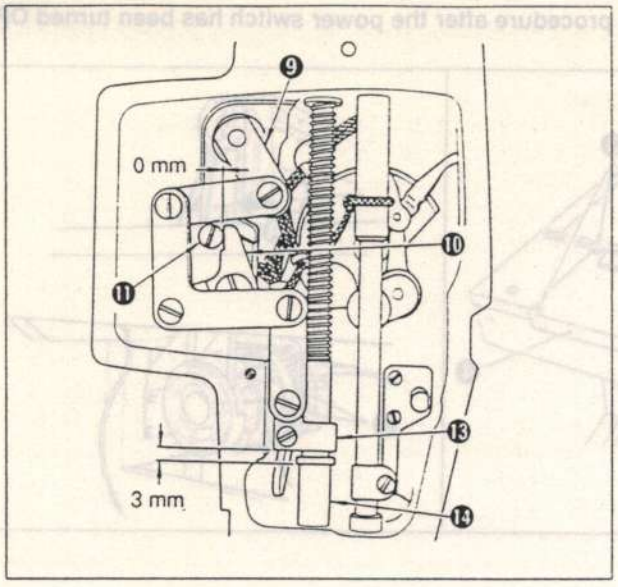
4) 5)



★ To adjust the vertical stroke of the intermediate presser to 0 mm (to keep the intermediate presser at its lowest dead point), perform the following adjustment.

1) Fix nut ❸ of the intermediate presser connecting shaft to the lowest position.
2) Bring the needle bar to its highest dead point.
3) Remove screw ❻ , and remove front cover ❼ .
4) Loosen screw ❽ , and adjust so that a clearance of 0.5 mm is provided between intermediate presser positioning link ❿ and positioning pin ⓫ by moving intermediate presser oscillating shaft ❾ .
5) Firmly tighten screw ❽ .

* Confirm that intermediate presser positioning link ❿ does not come in contact with positioning pin ⓫ and that intermediate presser oscillating shaft ❾ does not come in intermediate presser spring ⓬ when turning the handwheel by hand to make the main shaft rotate.
Carry out the above-stated adjustment after setting the air pressure to 0 kgf/cm² (0 MPa). (See "4. Air hose" on page 6.)

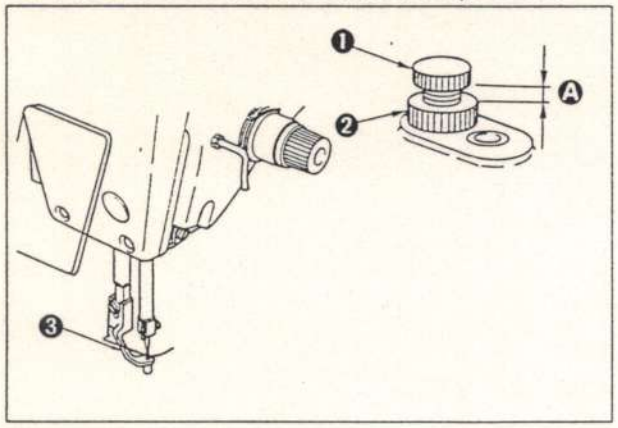


★ To return the vertical stroke of the intermediate presser foot from 0 mm to 3 to 7 mm, perform the following adjustment.

1) Bring the needle bar to its lowest dead point.
2) Loosen screw ❽ , and move intermediate presser oscillating shaft ❾ to make intermediate presser positioning link ❿ come in close contact with position pin ⓫ . Then adjust the clearancebetween intermediate presser connecting stud ⓭ and intermediate presser bar bushing ⓮ to 3 mm.
3) Firmly tighten screw ❽ (See page 33.).

* Turn the handwheel by hand to rotate the main shaft. Then make sure that intermediate presser positioning link ❿ closely adheres to positioning pin ⓫ . Be sure to make the above adjustments after having decreased the air pressure to 0 kgf/cm² (0 MPa). (See "4. Air hose" on page 6.)

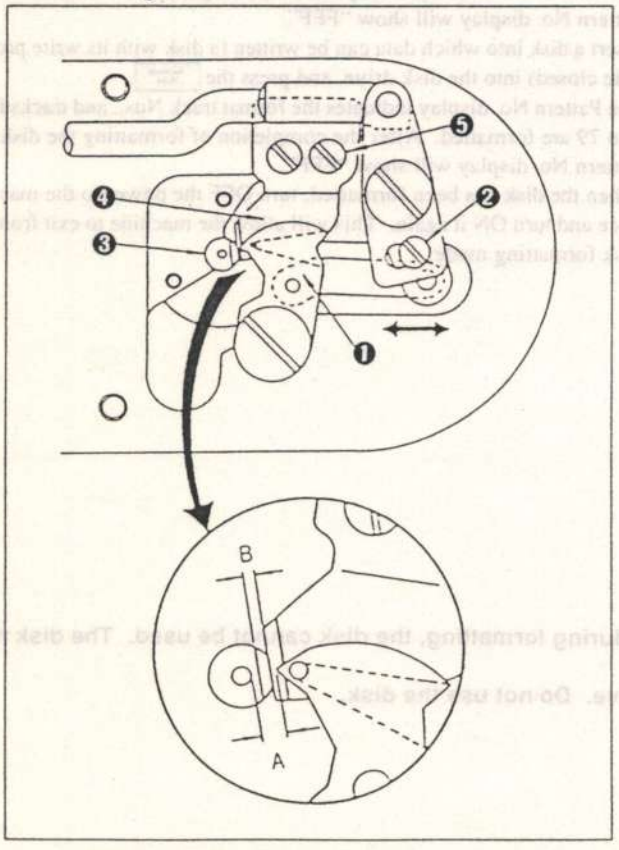
9. Pressure of the intermediate presser



Carry out the following steps of procedure after the power switch has been turned OFF.

1) Loosen nut ❷ of the intermediate presser adjusting screw.
2) Tighten intermediate presser ❸ adjusting screw ❶ to increase the pressure applied to the workpiece when the presser clamps it.
3) Adjustable range Ⓐ of the intermediate presser adjusting screw is 0 to 29 mm.

10. Moving knife and counter knife



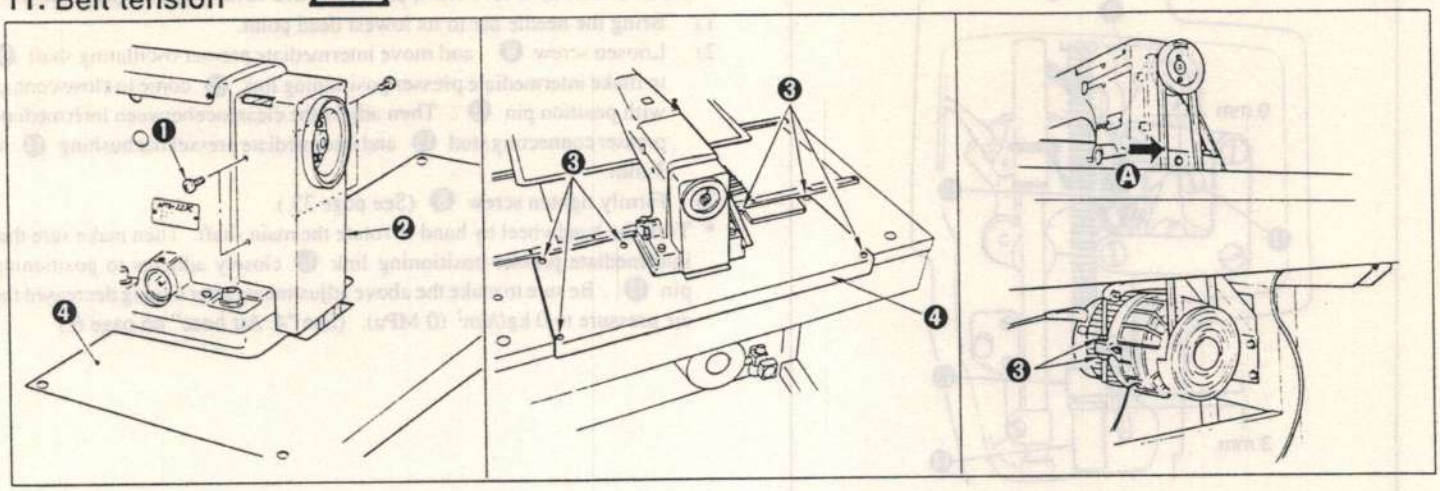
Carry out the following steps of procedure after the power switch has been turned OFF.

1) When the sewing machine stops in the upper stop position. loosen adjusting screw ❷ and adjust clearance A provided between the thread handling section of moving knife ❶ and the edge of needle eyelet.
2) After the adjustment, manually actuate the thread trimmer to check for proper positioning.
3) Loosen screw ❺ , and adjust clearance B provided between the needle hole guide ❸ and the counter knife ❹ .

Section to be adjusted / Sewing specification	A	B
S • H	4.5 mm	0.8 mm
G	6 mm	1.5 mm

Carry out the following steps of procedure after the power switch has been turned OFF.

11. Belt tension

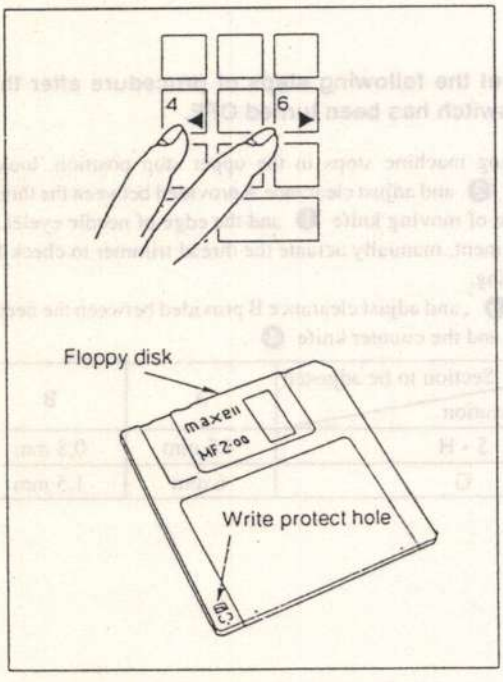


1) Remove screws ❶ and remove belt cover ❷ .
2) Remove screws ❸ and remove table rear cover ❹ .
3) Adjust the belt tension using adjusting nut ❸ so that the belt slackens by 10 mm when an approximately 1 kg load is applied to section Ⓐ of the belt.

1. **Replace or install/attach the belt with the presser foot removed.**
2. **If the belt is insufficiently tensed, the belt may vibrate during sewing or the machine may fail to stop at the predetermined position.**
3. **If the belt is excessively tensed, the motor bearing will be deteriorated in a shorter time of period.**

12. Disk formatting function

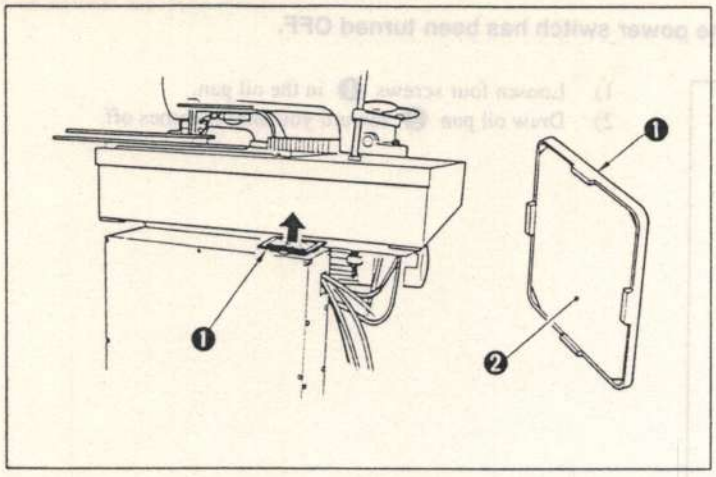
Any new disk must be formatted (on the *MS-DOS) before used.
All patterns stored in a disk can also be erased by formatting.
* MS-DOS is registered trademark of Microsoft Inc., in the U.S.A.



1) Turn ON the [power switch] while pressing switches [4] and [6] . This makes the machine ready for formatting a disk. At this time the Pattern No. display will show "FFF".
2) Insert a disk into which data can be written (a disk with its write protect hole closed) into the disk drive, and press the [ ].
3) The Pattern No. display indicates the format track Nos., and tracks from 0 to 79 are formatted. After the completion of formatting the disk, the Pattern No. display will show "FFF".
4) When the disk has been formatted, turn OFF the power to the machine once and turn ON it again. This will allow the machine to exit from disk formatting mode.

(Caution) **If you should take the disk out or turn the power OFF during formatting, the disk cannot be used. The disk must be formatted again.**
If an error "0" is displayed, it means the disk is defective. Do not use the disk.

13. Cleaning the filter

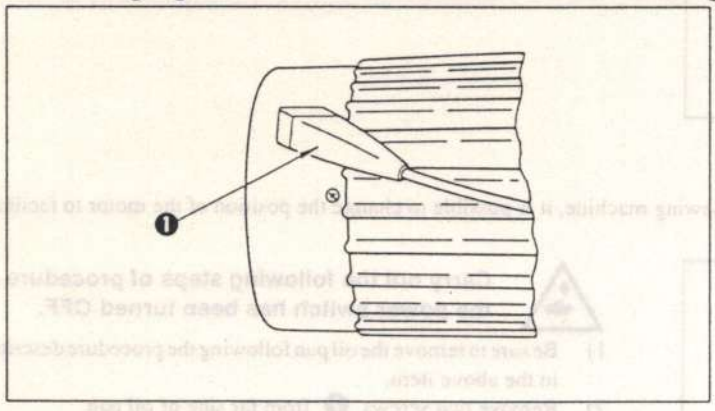


Carry out the following steps of procedure after the power switch has been turned OFF.

Clean the filter ❷ of the control box fan once every week.

1) Pull the screen kit ❶ in the direction of the arrow to remove it.
2) Wash the filter ❷ under running water.
3) Reinstall the filter ❷ and the screen kit ❶ .

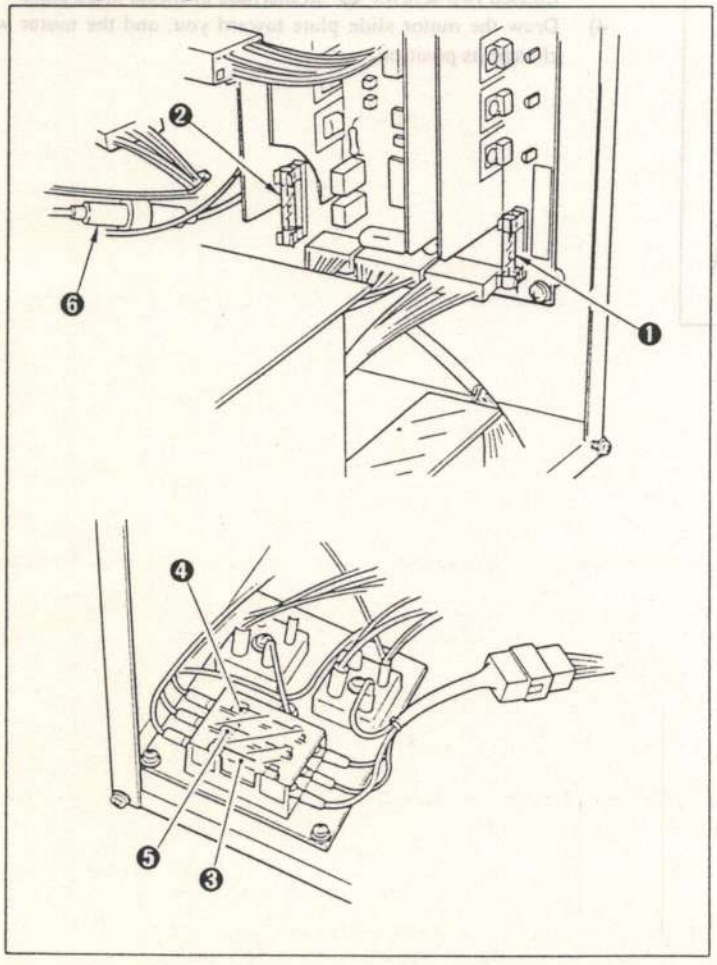
14. Changing the direction of rotation of the sewing machine



Carry out the following steps of procedure after the power switch has been turned OFF.

1) Remove connector ❶ from the rear of the motor (on the opposite side from the handwheel).
2) Change the direction of connector by 180°, and reconnect it securely until it will go no further.

15. Replacing the fuse



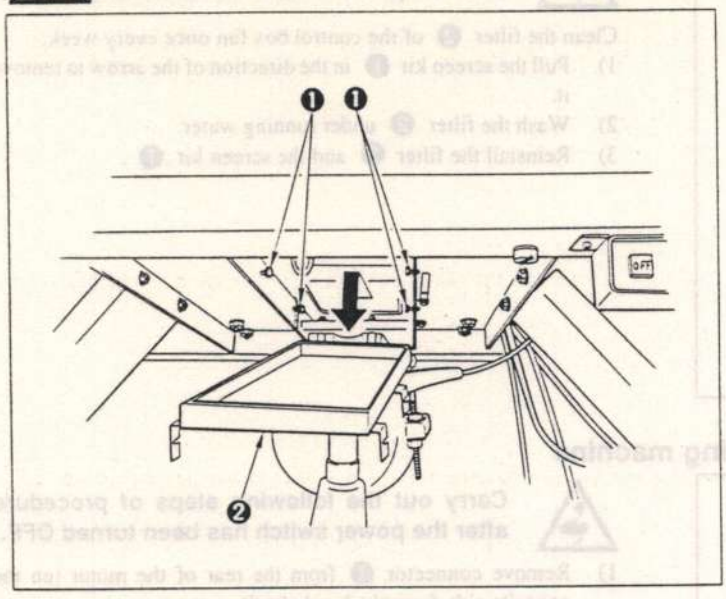
To replace a blown fuse, turn the power switch OFF, open the control box cover, and replace it with a new fuse with the specified capacity.

The machine uses the following six fuses:

❶ 7A standard melting fuse for stepping motor (X) protection
❷ 7A standard melting fuse for stepping motor (Y) protection
❸ 10A standard melting fuse for stepping motor power supply protection
❹ 7AT time-lag fuse for solenoid power supply protection
❺ 1A standard melting fuse for 100VAC power supply protection
❻ 2A standard melting fuse for marking light power supply protection

16. Removing the oil pan

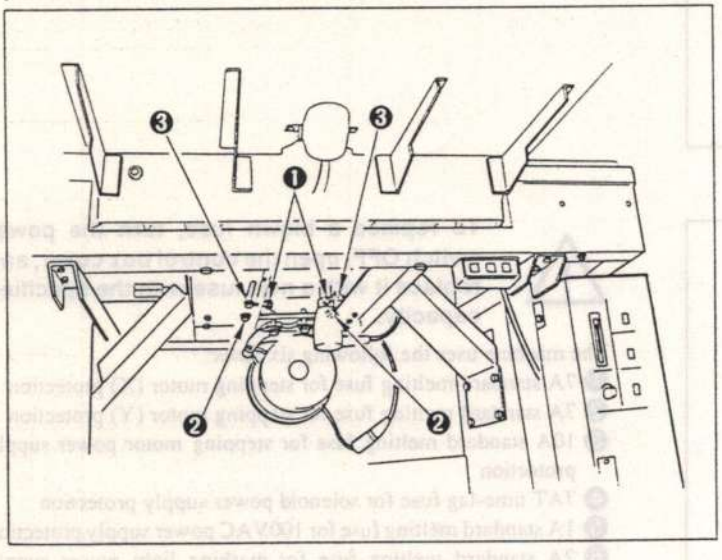
Carry out the following steps of procedure after the power switch has been turned OFF.



1) Loosen four screws ❶ in the oil pan.
2) Draw oil pan ❷ toward you until it comes off.

17. Moving the motor

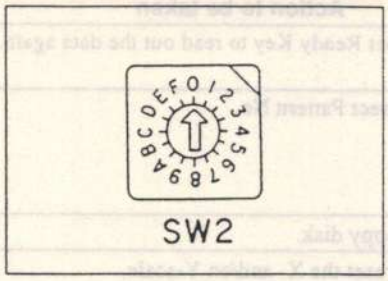
At the time of maintenance and inspection of the lower section of the sewing machine, it is possible to change the position of the motor to facilita... your work.



Carry out the following steps of procedure after the power switch has been turned OFF.

1) Be sure to remove the oil pan following the procedure described in the above item.
2) Remove two screws ❶ from far side of oil pan.
3) Remove two screws ❷ from far side of motor slide plate. Loosen two screws ❸ in this side of motor slide plate.
4) Draw the motor slide plate toward you. and the motor will change its position.

18. Check the switches and sensors



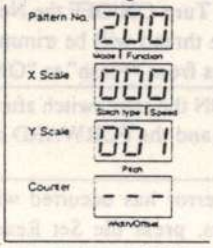
1) If any trouble has occurred, you can check the switches and sensors for normal performance.
2) Open the cover of the control box. Set DIP switch SW2 mounted on the I/F (interface) circuit board at "2" using a small screwdriver.

Operating procedure

① Set the SW2 at "2" and turn ON the power switch.
All the displays on the operation box (panel) indicate "888."

② Depress the start switch or the feeding frame switch to make display A (Fig. 3) indicate the step (Fig. 2) to be checked.
Every time you depress the switch, indication given on display A will change successively.

③ Turn ON/OFF the switch or sensor to be check, and the corresponding display (B through I) will change over between "0" and "1." (Fig. 1)



(Fig. 2)

Example of operation

(To check whether the Reset switch on the operation box (panel) works normally)

Set the SW2 at "2" and turn ON the power switch.

↓

(All the displays indicate "888.")

↓

Depress the feeding frame switch three times to set the step to "2." (Fig. 1)

Press the Reset switch. (Turn it ON/OFF.)

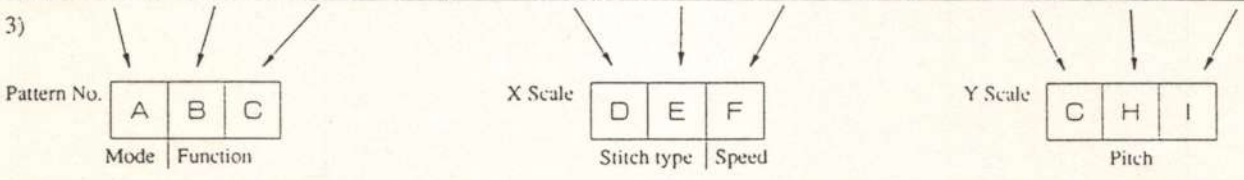
The Reset switch works normally as long as the indication shown on display B changes over between "0" and "1."

If the indication shown on display B does not change at all, suspect that the switch or related components are defective.

* The blank columns are used for special-purpose maintenance.

Step (Display A) \ Display	B	C	D	E	F	G	H	I
0 (Operation box switch)	0	1	2	3	4	5	6	7
1 (Operation box switch)	8	9	Pattern No.	X Scale	Y Scale	Counter	Forward	Backward
2 (Operation box, maintenance)	Reset	Return to Origin	Set Ready					
3 (Sensor, maintenance)			Air pressure sensor (Note 2)	Needle threading switch				
4 (Switch)				Temporary stop switch	Bobbin winder ON/ OFF switch	Sewing machine ON/ OFF switch	Scale setting switch (INC/DEC of the stitch length & INC/DEC of the number of stitches)	PGM-5A (Check for connection.)
5 to 7 (Maintenance)								
8 (Detector, error)			Thread breakage detector (error 9)	Lower detection	Upper detection (error 3)			
9 (Sensor, caution 4)	X origin sensor	Y origin sensor	X travel sensor		+Y travel limit sensor (front)	−Y travel limit sensor (rear)		
A (Option)								

(Fig. 3)



(Caution)
1. For some switches and sensors, the indication on display A will change from "0" to "1." For the other switches and sensors, it will change from "1" to "0."
2. Check the air pressure sensor by "reducing the air pressure" and "increasing the air pressure (0.5 MPa (5 kgf/cm²) or higher)" referring to "air hose" on page 6.
3. For start switch and feeding frame switches 1 and 2, the step (on display A) changes when depressing the switch. This means that the switches cannot be checked by observing a change of the indication on the display (0 ↔ 1). However, the switch can be checked by depressing the switch. The step corresponding to the switch depressed changes as long as the switch works normally.
4. To check the X and Y sensors, remove the connector of the stepping motor junction cable beforehand when the power to the machine is OFF. Then, set the step (shown on display A) to "9" and check the sensors by moving the feed (feeding frame) by hand to the back and forth and to the right and left.

VIII. ERROR INDICATIONS

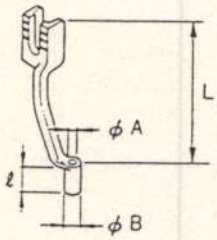
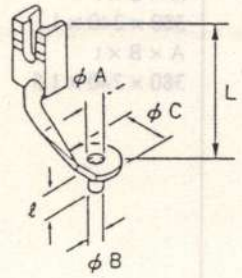
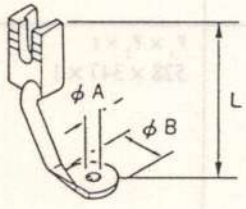
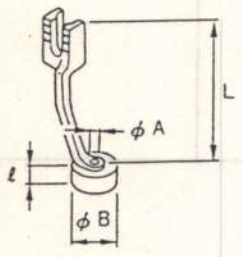
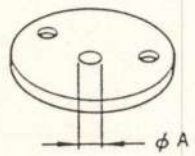
Error No.	Indicator lamp	Error description	Action to be taken
1	ON	Comes on if a malfunction has resulted in a data read-out error.	Press the Set Ready Key to read out the data again.
	ON The pattern No. indicator lamp flashes on and off	Starts when there is no data for the relevant number.	Set the correct Pattern No.
	Flash	A floppy disk is no inserted.	Insert a floppy disk.
2	ON	Comes on if the stitch length exceeds 12.7 mm over the computable range in an attempt to enlarge a pattern based on the number of stitches.	Correctly reset the X- and/on Y-scale.
3	ON	Comes on if the needle is not in its highest position.	Turn the handwheel until error No. "3" disappears. Or turn ON/OFF the Needle Threading switch to raise the needle to its highest position.
4	ON	Comes on if the maximum sewing area (400mm × 250 mm) is exceeded.	During a sewing cycle : Press the Return to Origin key. While setting the 2nd origin : Press the Jog key.
5	Flash	Starts when the temporary stop switch is turned ON.	Press the start switch to actuate the sewing machine again. Turn ON/OFF the Needle Threading switch, and the thread will be trimmed. (The lamp display changes from "Flash" to "ON".)
	ON	Comes on when only the feeding frame is moving. Comes on when the temporary stop switch is turned ON.	Turn ON the start switch after pressing the Return to Origin and the FORWARD or BACKWARD key.
6	ON	When large pattern data have been read or a complicated processing has been carried out resulting in shortage of memory.	If the error has occurred when combining sewing patterns, press the Set Ready key (switch) or re-specify a scale.
7	ON	Comes on if a malfunction has caused the machine to lock, or if there has been a failure in the needle position detector.	Turn OFF the power switch. Replace the defective parts or eliminate the cause of the machine locking. Then turn ON the power switch.
8	ON	Comes on if a poor connection of a solenoid connector is detected.	Turn OFF the power switch, and check for the loose solenoid connection.
9	ON	Comes on if the needle thread is broken.	Re-thread the machine head, press the Return to Origin key and the FORWARD or BACKWARD keys to move the feeding frame backward. Then press the start switch.
0	Flash	Starts when trying to format a floppy disk with the write-protect tab in the open position (the disk cannot be formatted).	Move the write-protect tab so that it is in its closed position.
	ON	Comes on when trying to format a defective floppy disk.	Replace the floppy disk.
A	ON (Flash)	Air pressure is low. Air is not supplied to the sewing machine. Connector of the junction cable for the air valve disconnects. (Air pressure has dropped during sewing.)	Turn OFF the power switch. Set the air pressure on the high pressure side to 5 to 5.5 kgf/cm² (0.5 to 0.5 MPa). Connect the connector. (Adjust the air pressure to the specified value and re-start the sewing machine.)
E	ON	Comes on when the sewing machine rotates in the reverse direction.	Turn OFF the power switch. Change the rotation direction of the motor.

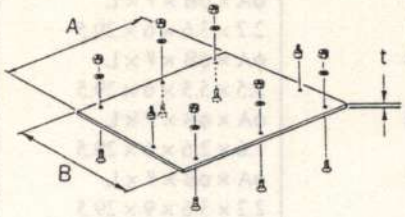
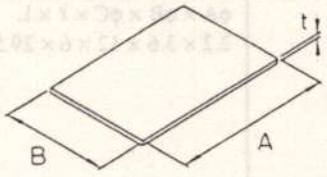
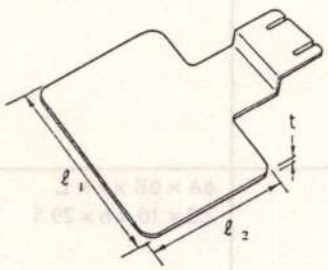
IX. TROUBLES AND CORRECTIVE MEASURES

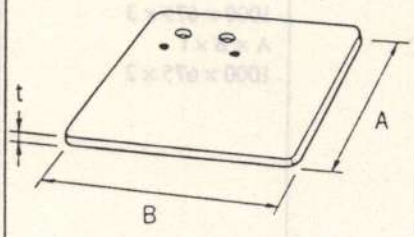
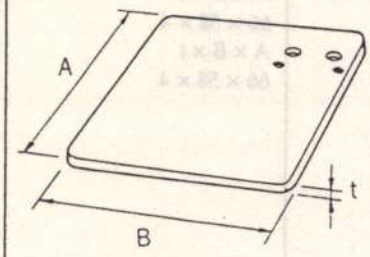
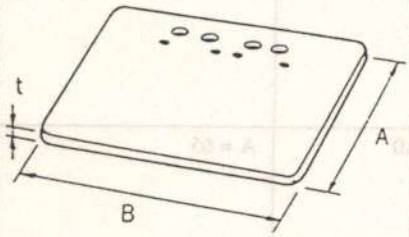
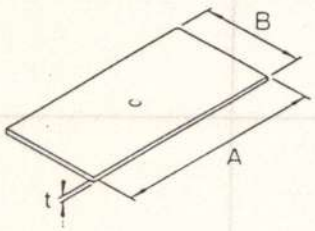
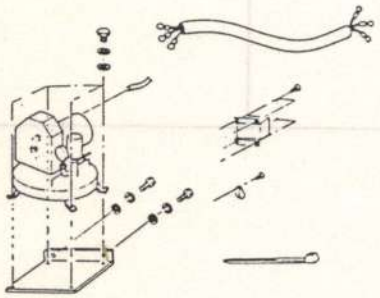
Trouble	Cause	Corrective measures	Page
1. Thread slips off the needle at sewing start	1 Stitches are skipped at sewing start.	○ Adjust the clearance between the needle and the shuttle to 0.05 to 0.1 mm.	30
	2 The thread remaining on the needle after thread trimming is too short.	○ Decrease the tension given by thread tension controller No. 1.	10
		○ Increase the tension of the thread take-up spring.	10
		○ Use the standard type of needle bar thread guide.	
		○ Decrease the stitch length at the start of sewing.	
	3 The bobbin thread is too short.	○ Decrease the bobbin thread tension.	10
		○ Increase the clearance between the needle hole guide and the counter knife.	34
	4 The feed timing is bad.	○ Properly adjust the feed timing.	25
2. Thread often breaks or synthetic thread splits finely.	1 The shuttle or the shuttle driver has scratches.	○ Remove the shuttle or the shuttle driver, and remove the scratches, using a whetstone or buff.	7
	2 The needle has a defective eye.	○ Replace the needle.	
	3 The needle hole guide has scratches.	○ Buff or replace the needle hole guide.	
	4 The intermediate presser hole is scratched.	○ Buff or replace the intermediate presser.	
	5 The needle hits the intermediate presser.	○ Adjust the position of the intermediate presser.	
	6 Fibrous wastes are in the groove of the shuttle race.	○ Remove the shuttle, and remove the fibrous wastes.	30
	7 The needle thread tension is too high.	○ Decrease the needle thread tension.	10
	8 The thread take-up spring tension is too high.	○ Decrease the thread take-up spring tension.	10
	9 The synthetic thread melts due to frictional heat.	○ Use silicone oil.	7,8
		○ Use a needle with lower count.	7
		○ Decrease the sewing speed.	12
3. Needle often breaks.	1 The needle is bent.	○ Replace the needle.	7
	2 The needle hits the intermediate presser.	○ Adjust the position of the intermediate presser properly.	
	3 The feed timing is bad.	○ Adjust the timing to feed the material properly.	25
	4 The needle is too thin for the material.	○ Change the needle with one of which count is suited to the material.	7
	5 The needle bends in contact with the shuttle driver.	○ Correct the needle-to-shuttle relationship in position.	30
4. Thread trimmer fails to trim thread.	1 The counter knife if dull.	○ Replace the counter knife.	34
	2 The clearance between the needle hole guide and the counter knife is too small.	○ Correct the clearance.	
	3 The moving knife has been improperly positioned.	○ Correct the position of the moving knife.	34
	4 The last stitch has been skipped.	○ Correct the timing between the needle and the shuttle.	30
	5 The bobbin thread cannot be trimmed.	○ Change the pattern so that thread trimming is performed in the direction of the perfect stitching.	
		○ Lengthen the stitch length just before thread trimming.	

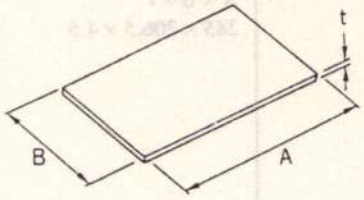
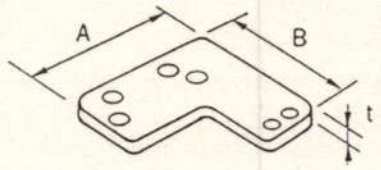
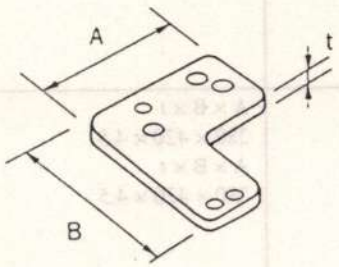
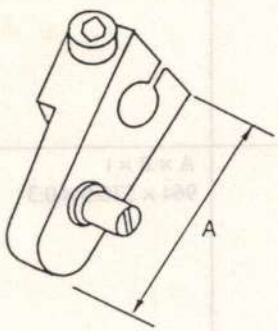
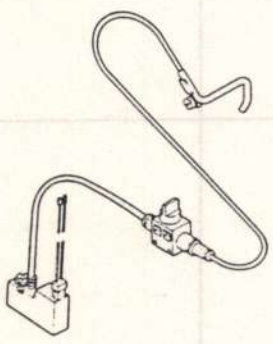
Trouble	Cause	Corrective measures	Page
5. Stitches are frequently skipped.	1 The timing between the needle and the shuttle is bad.	○ Correctly position the shuttle with respect to the needle.	30
	2 The clearance between the needle and the shuttle is too large.	○ Correctly position the shuttle with respect to the needle.	30
	3 The needle is bent.	○ Replace the needle.	7
	4 The feed timing is not correct.	○ Correct the feed timing.	25
	5 The needle bends in contact with the shuttle driver.	○ Correct the position of the shuttle driver.	30
	6 The height of the intermediate presser is incorrect..	○ Correct the height of the intermediate presser.	34
	7 The needle is not attached correctly.	○ Attach the needle so that the long groove of the needle faces slightly to the right.	7
6. Improperly tensed stitches are made.	1 Needle thread tension is insufficient.	○ Increase the needle thread tension.	10
	2 Tension disc No. 2 floats from its predetermined position.	○ Adjust installation of tension disc No. 2.	10
	3 Feed timing is not proper.	○ Adjust the material feed timing.	25
	4 Height of intermediate presser is improper. the material due to untwisted needle thread.	○ Adjust the height of the intermediate presser.	34
	5 Isolated idling loops are formed on the wrong side of the material due to untwisted needle thread.	○ Increase the needle thread tension. ○ Apply silicon oil	10 7,8
7. Thread breaks at the time of thread trimming.	1 The moving knife has been improperly positioned.	○ Correct the position of the moving knife.	34
8. The sewing product slips out of the predetermined position on the machine during sewing.	1 The sewing product is not securely clamped.	○ Attach a non-slip material such as a piece of emery paper on the reverse side of the feeding frame. ○ Machine an exclusive feeding frame made of metal.	
9. The needle thread loosens.	1 The needle thread is insufficient.	○ Increase the needle thread tension.	10
	2 Single yarn of the needle thread loosens due to untwisted needle thread.	○ Increase the needle thread tension. ○ Replace the needle with a thicker needle. ○ Apply silicon oil.	10 7 7,8

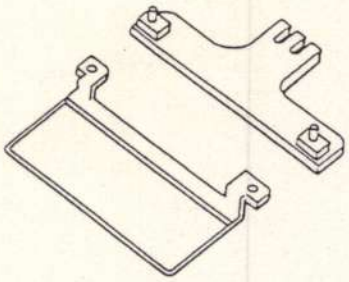
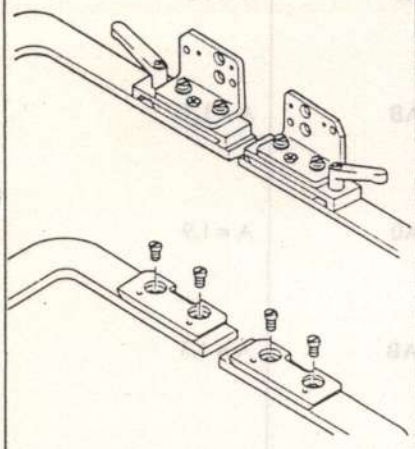
X. OPTIONS

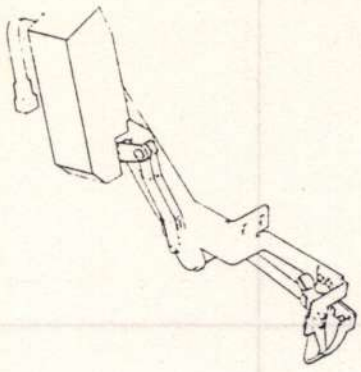
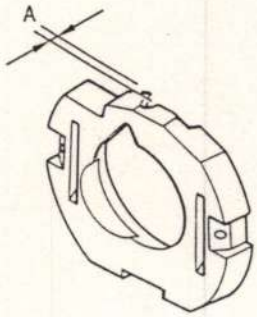
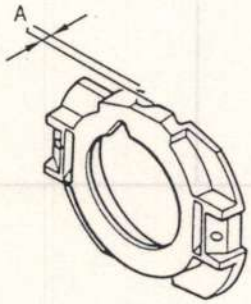
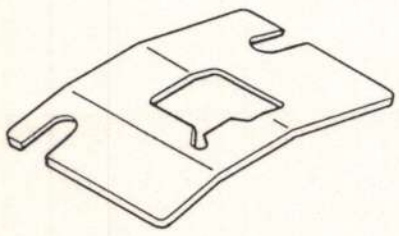
Name of part	Type	Part No.	Size (mm)
1. Intermediate presser foot 	Intermediate presser foot (A)	B1601 220 000	φA × φB × ℓ × L 2.2 × 3.6 × 6 × 29.5
	Intermediate presser foot (B)	B1601 220 00B	φA × φB × ℓ × L 3.5 × 5.5 × 6 × 29.5
	Intermediate presser foot (E)	B1601 220 00E	φA × φB × ℓ × L 1.6 × 2.6 × 6 × 29.5
	Intermediate presser foot (F)	B1601 220 00F	φA × φB × ℓ × L 2.2 × 3.6 × 9 × 29.5
	Intermediate presser foot (G)	B1601 220 00G	φA × φB × ℓ × L 2.7 × 4.1 × 5 × 29.5
	Intermediate presser foot (C)	B1601 220 00C	φA × φB × φC × ℓ × L 2.2 × 3.6 × 12 × 6 × 29.5
	Intermediate presser foot (D)	B1601 220 00D	φA × φB × L 2.2 × 12 × 34.5
	Intermediate presser foot asm. with ring	B1601 220 0A0	φA × φB × ℓ × L 2.2 × 10 × 6 × 29.5
2. Needle hole guide 	Needle hole guide (A) for light-weight materials	B2426 210 00A	φA = 1.6
	Needle hole guide (B) for medium-weight materials	B2426 210 00B	φA = 2.0
	Needle hole guide (C) for knits	B2426 210 00C	φA = 1.6
	Needle hole guide (D) for heavy-weight materials	B2426 210 00D	φA = 2.4
	Needle hole guide (F) for heavy-weight materials	B2426 210 00F	φA = 3.0
	Needle hole guide (G) for heavy-weight materials	B2426 210 00G	φA = 3.0 (with a counterbore)
	Needle hole guide (H) for heavy-weight materials	B2426 210 00H	φA = 3.0 (eccentric hole)

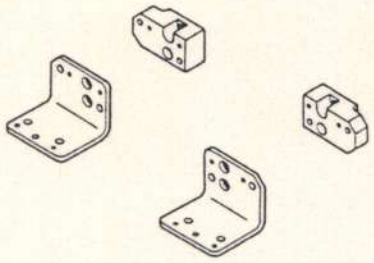
Name of part	Type	Part No.	Size (mm)
	Feeding frame blank (Common to left and right) Screw Screw Washer Nut	B2618 224 C00 SS7090410SP SS2111010TP WP0450000SD B1626 850 000	A × B × t 510 × 326 × 3
4. Sponge sheet 	Rubber sheet Sponge sheet Sheet (A) Sheet (B)	B2591 220 000 B2564 223 C00 B2587 220 000 B2588 220 000	A × B × t 250 × 200 × 1.5 A × B × t 450 × 300 × 1.5 A × B × t 380 × 240 × 1 A × B × t 380 × 240 × 1.5
5. Feed plate blank 	Feed plate blank	B2556 224 C0A	ℓ_1 × ℓ_2 × t 528 × 347 × 1

Name of part	Type	Part No.	Size (mm)
6. Machinable plastic blank 	Feeding frame blank, right with knurl	B2622 223 C00	A × B × t 285 × 206.5 × 4.5
	Double-stepped feeding flame blank without knurl (left & right)	B2626 223 C00	A × B × t 285 × 206.5 × 4.5
	Feeding frame, left with knurl	B2623 223 C00	A × B × t 285 × 206.5 × 4.5
	Separate type feeding frame blank with knurl	B2620 223 C00	A × B × t 280 × 420 × 4.5
	Separate type feeding frame blank without knurl	B2621 223 C00	A × B × t 280 × 420 × 4.5
7. Cover 	Cover for throat plate	B1170 224 C00	A × B × t 964 × 576.5 × 0.3
8. Compressor unit 	CU03		

Name of part	Type	Part No.	Size (mm)
9. Blank sheet for feed plate 	Sheet A for work clamp (velpolen) Sheet B for work clamp (velpolen) Sheet C for work clamp (velpolen)	B2595 220 00A B2595 220 00B B2595 220 00C	A × B × t 1000 × 675 × 1 A × B × t 1000 × 675 × 3 A × B × t 1000 × 675 × 2
10. Presser joining metal fitting  	Special-purpose feeding frame, left asm. Special-purpose feeding frame, right asm. (A joining metal fitting used for attaching the feeding frame of the AMS-206. -210 or -212.)	B2630 215 0A0 B2630 215 AA0	A × B × t 66 × 58 × 4 A × B × t 66 × 58 × 4
11. Tension releaser 	Tension releasing arm interlocked with the intermediate presser • Releases the needle thread tension in synchronization with the ascending motion of the intermediate presser. (Applicable models : AMS-215C, -220C, -222B, -224B. -229B, -223C and -224C)	B2316 215 0A0	A = 65
12. Needle cooler 	Needle cooler asm.	B4720 215 0B0	

Name of part	Type	Part No.	Size (mm)
13. Cassette holder 	Cassette holder fixing plate asm. Cassette holder asm.	B2581 224 CA0 B2582 224 CA0	
14. One-touch clamp 	One-touch clamp foot asm. Setscrew Slider asm.	B2640 215 0B0 SS615 061 0SP B2641 215 0A0	

Name of part	Type	Part No.	Size (mm)
15. Needle thread clamp 	Needle thread clamp asm.	B2120 215 0A0	
16. Shuttle race ring  	Shuttle race ring. coupling (For shuttle race. height of needle guard 1.3 mm) H type shuttle race ring coupling (For shuttle race. height of needle guard 1.7 mm) Shuttle race ring coupling (For double-capacity shuttle. height of needle guard 1.9 mm) Shuttle race ring B coupling (For double-capacity shuttle. height of needle guard 1.3 mm) Shuttle race ring C coupling (For double-capacity shuttle. height of needle guard 0.8 mm)	B1817 205 0A0 B1817 205 0AB B1817 210 0A0 B1817 210 0AB B1817 210 0AC	A = 1.3 A = 1.7 A = 1.9 A = 1.3 A = 0.8
17. Shuttle race cap 	Auxiliary shuttle race cap (To be placed over the standard shuttle race cap so as to prevent stitch skipping)	B1815 210 A00	

Name of part	Type	Part No.	Qty
18.Double-stepped feeding frame 	• Receiver plate, right ASM.	B2604 223 CA0	1
	• Receiver plate, left ASM.	B2605 223 CA0	1
	• Presser foot mount, right ASM.	B2602 223 CA0	1
	• Presser foot mount, left ASM.	B2603 223 CA0	1
	• Screw	SS9151120CP	4
	• Washer	WP0621026SP	4
	• Screw	SS7151210SP	4
	• Washer	WP0621026SP	4
	• Screw	SS7150910SP	4
	• Washer	WP0651056SD	4
	• Nut	NS6150330SD	2
	• Screw	SS8150822TP	2