

MITSUBISHI

INDUSTRIAL SEWING MACHINE

Model **LY2-3750** Classes

Single-Needle Upper-& Lower-Feed Lockstitch
Automatic Under trimmer
with Speed Controller

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

PRECAUTIONS BEFORE STARING OPERATION

1 Safety Precautions

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

2 Precautions before Starting Operation

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

3 Precautions for Operating Conditions

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

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SPECIFICATIONS

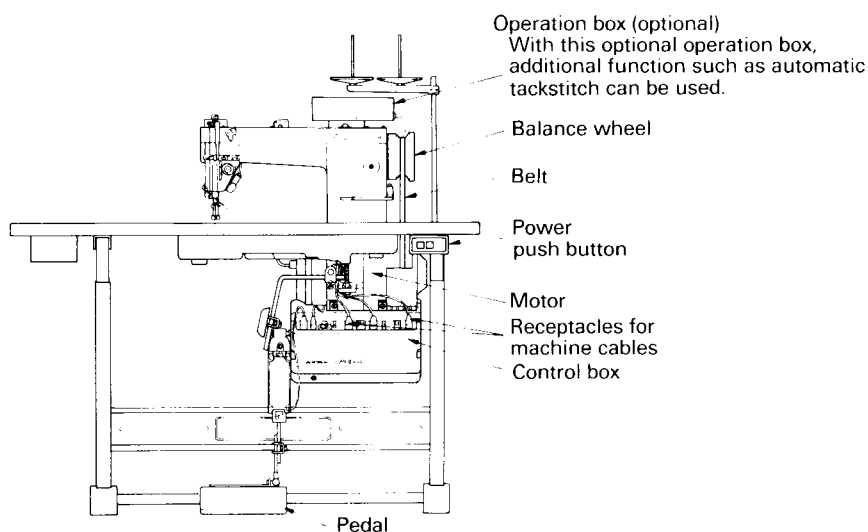
1 LY2-3750

Specifications	Model	LY2-3750-B1T
Material weight		Heavy
Max. Sewing speed	(spm)	2,000
Stitch length	(mm)	0 — 8.0
Needle bar stroke	(mm)	38.0
Thread take-up lever stroke	(mm)	73.0
Alternating movement	(mm)	2.0 — 5.0 (Walking foot)
Walking foot alternate operating system		Dial (One-touch)
Feed dog height	(mm)	1.0
Presser foot stroke (mm)	Hand lifter	6.0
	Knee lifter	16.0
Needle type		DP x 17 #22 (DB x 1 #22)
Hook		Fully rotating automatic lubrication (for thread trimmer), Large
Bobbin case		With idle running prevention spring
Bobbin		Made of steel for thread trimmer
Lubrication system		Automatic
Thread trimmer		Rotary scissoring by Left movable knife and right fixed blade
Touch back		○
Bed dimensions	(mm)	517 (W) x 178 (D) mm

CAUTION: Some materials and/or sewing conditions may require specifications other than those listed above.

PREPARATION BEFORE STARTING OPERATION

- **Assembled condition of machine, motor and operating box**



1 Power Cable Connection

1. Connection to power supply

Each connector (plug) should be completely set in the corresponding receptacle of the control box after checking the connector shape and mating direction.

- (1) When a three-phase motor is used, connect "U" phase to the red lead, "V" phase to the white lead, and "W" phase to the black lead. Motor rotation direction depends on the internal switch setting in the control box as described in Section 1-3.

The green wire must be connected to the ground terminal in order to properly ground the motor.

- (2) The appropriate power fuse capacity is as follows:

Three-phase power source: 200 to 240V : 10A

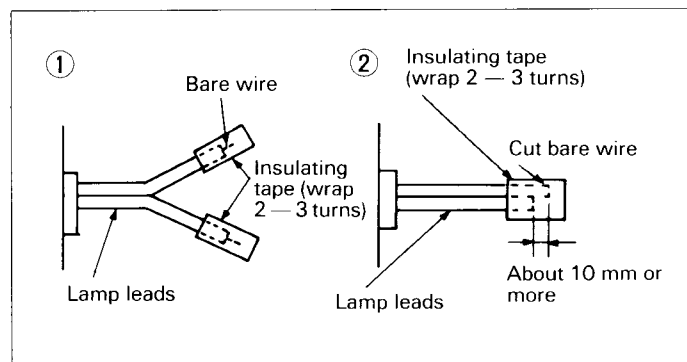
Single-phase power source: 100 to 120V : 15A

2. Lamp leads

- (1) When installing a work lamp (6V, 15 to 20W), remove the insulation from the leads at the back of the control box, strip the wire and connect them appropriately insulating the connections using insulating tape.

CAUTION The power switch must be turned off before connecting the lamp.

- (2) When a work lamp is not used, the lamp lead ends must be insulated as shown in Fig. ① or ② so that the two leads do not shortcircuit. If this is not done, the transformer in the control box will be burned.



CAUTION The work lamp must not be connected in parallel to any heater, such as a foot warmer. Otherwise, the load capacity will be exceeded and the transformer winding may be burned.

3. Direction of rotation

To change motor rotation direction, remove the rubber cap (see Fig. in section 2) at the bottom left of the motor front cover and push the internal direction selector switch.

The lamp built into the internal switch is off when the motor is rotating counterclockwise as viewed from the motor pulley. It is lit when the motor is rotating clockwise.

Rotation direction has been set to counterclockwise as seen from the motor pulley before shipment.

PREPARATION BEFORE STARTING OPERATION

2 Connection of Control Box

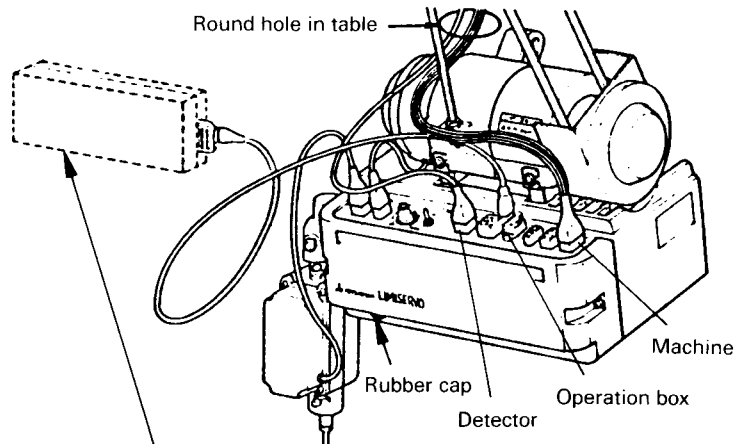
1. Connector

The control box should be connected as shown to the right.

Note:(1) Be sure to turn the power switch off before connecting or disconnecting the connectors.
 (2) The combination of the machine heads with the motor control panels are specified below. Use special care to ensure the correct combination when replacing the machine head or motor control panel.

Machine head model	Control box model
LY2-3750-B1T	XC-AM-A1020 XC-AM-B2020

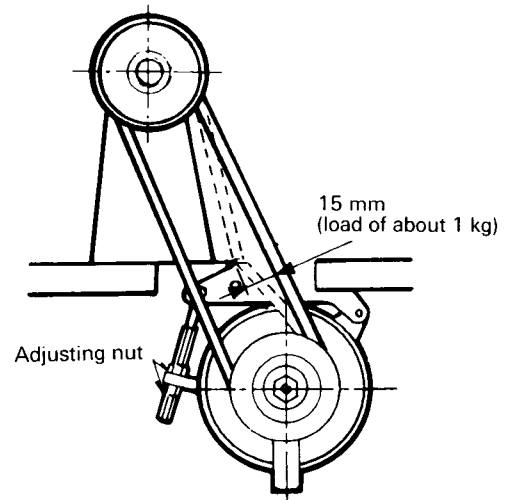
Routing the machining cords



Operation box (optional)
 Machine can be operated back tack sewing, pattern sewing, and automatic sewing with operation box (optional).
 (XC-C02, -C20, -C40, -C250)

3 Installing the Belt

1. Use a V-belt for sewing machine use, type M.
2. To adjust the belt tension, change the motor height by turning the tension adjust nuts so that the belt sinks about 15 mm when depressed by hand at the center of the belt span. (See Fig.)
 If the tension is too low, the speed may not be consistent in the low or medium range, or the needle may not stop in the proper position. If the tension is too high, the motor bearings will deteriorate more rapidly.



PREPARATION BEFORE STARTING OPERATION

4 Adjustment of Needle Bar Stop Position

1. Adjustment of "UP" position

When the pedal is kicked down by heel to cut the thread, the machine stops in the "UP" position. If the marks deviate more than 3 mm, adjust as follows:

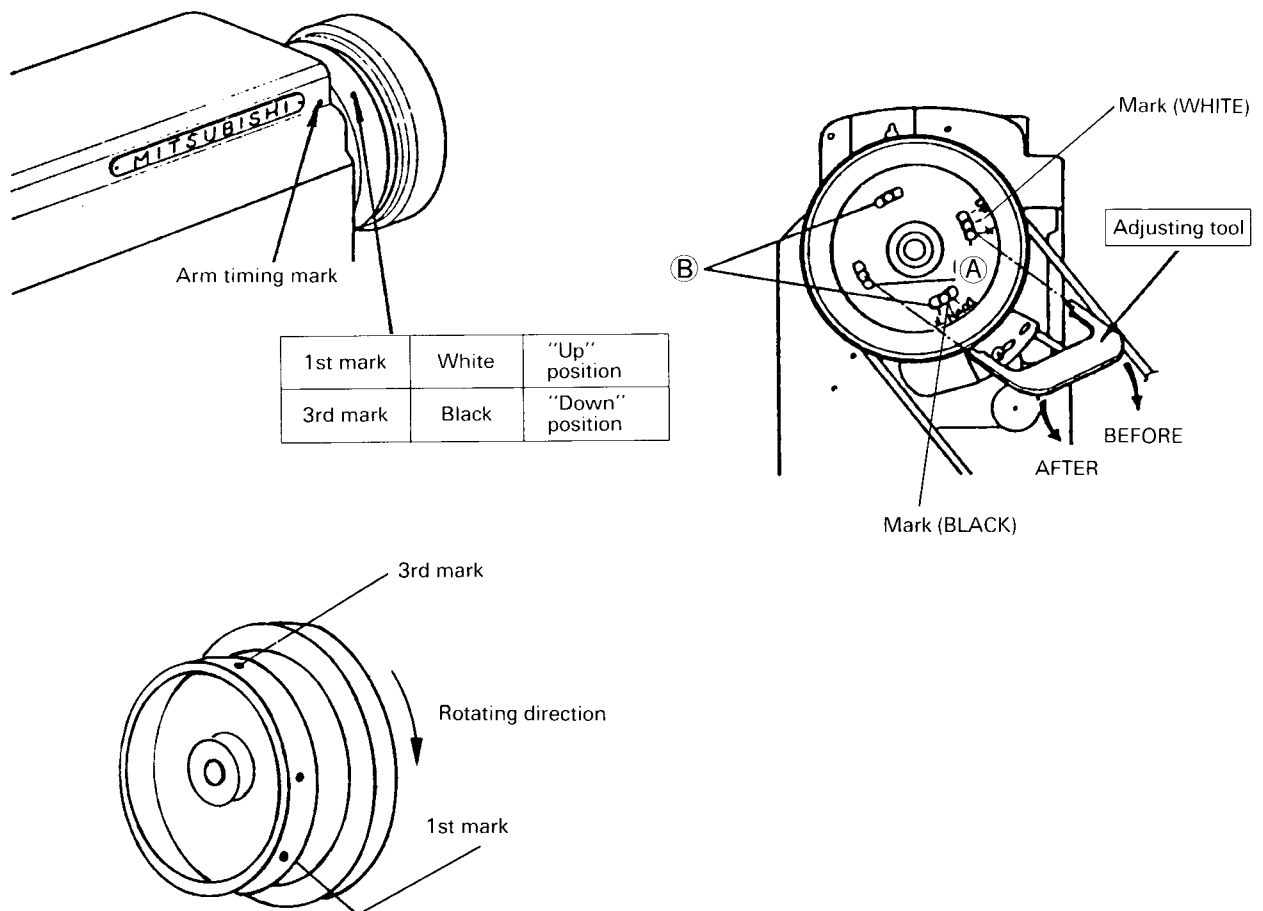
- (1) Disconnect the plug (12 pins) from the control panel.
- (2) Run the machine and stop in the "UP" position.
- (3) While holding the pulley, insert the "adjusting tool" in the two holes marked (A), then rotate the pulley.

2. Adjustment of "DOWN" position

When the pedal is returned to the neutral position, the machine stops in the "DOWN" position. If the marks deviate more than 3 mm, adjust as follows:

- (1) Disconnect the plug (12 pins) from the control panel.
- (2) Run the machine and stop in the "DOWN" position.
- (3) While holding the pulley, insert the "angle adjusting tool" in the two holes marked (B), then rotate the pulley.

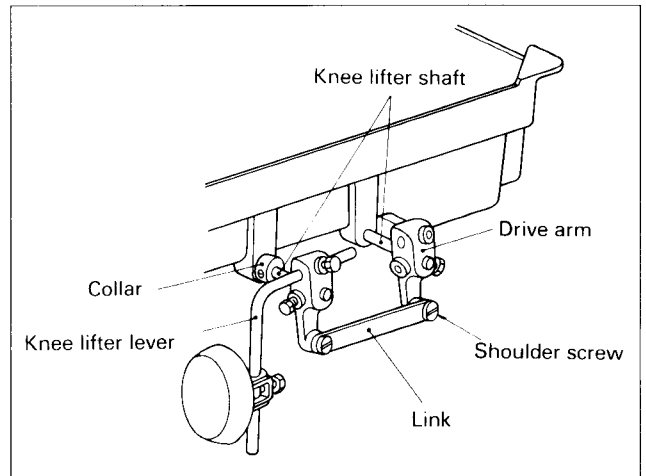
3. Confirm the stop operation then the plug (12 pins) coming from the machine head into the receptacle.



PREPARATION BEFORE STARTING OPERATION

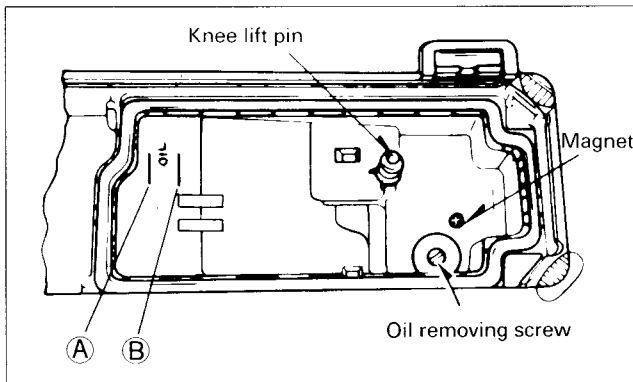
1 Installing the Knee Lifter

1. Pull out the knee lifter shafts (on the right and left) as far as possible, and properly set them.
2. Install the drive arm on each shaft.
3. Set a link between the right and left drive arms to connect them.
4. Install the knee lifter lever on the left drive arm.



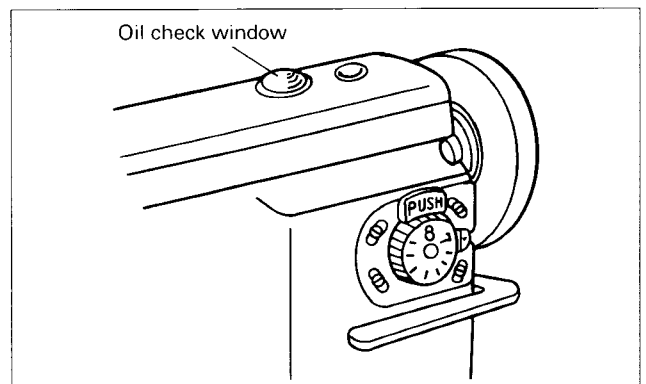
2 Lubrication

Pour oil up to position **A** of the oil tank. During operation, check the oil level periodically, and in cases where the oil level is below position **B**, replenish the oil supply up to position **A**. Use white spindle oil.



3 Condition of Oil Lubrication

While operating the machine, Check the condition of oil lubrication through the oil check window.

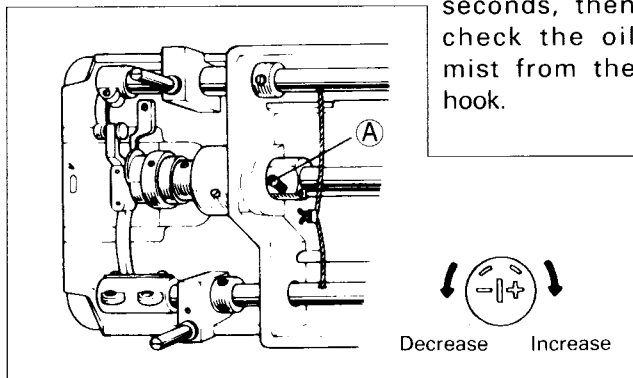


4 Adjustment of Hook Lubrication

Adjustment can be done by turning screw **A**.

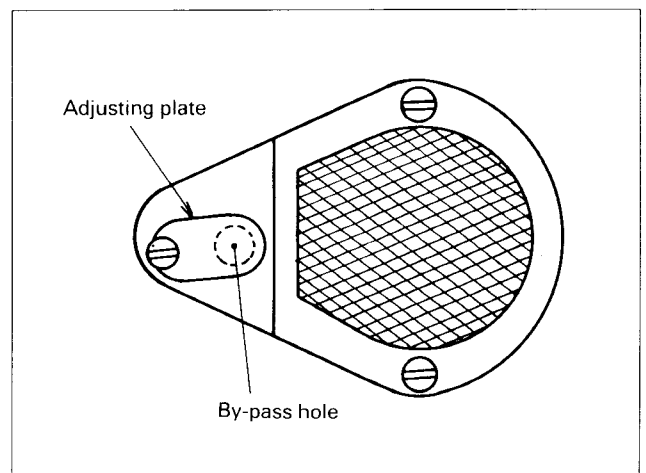
- When the screw has been fully tightened Maximum
- When the screw has been loosened by 5 revolutions Minimum

NOTE: After adjustment of this screw, the machine should be operated for at least 30 seconds, then check the oil mist from the hook.



5 Adjustment of Oil Pump

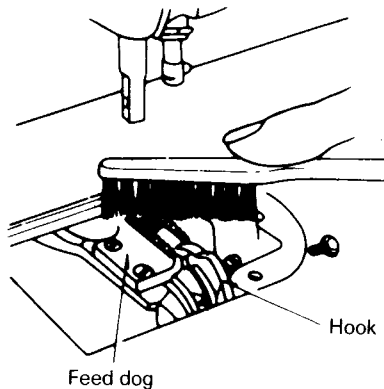
The standard adjustment is as follows: The adjusting plate keeps the bypass hole fully closed. To decrease splashing, open the bypass hole appropriately.



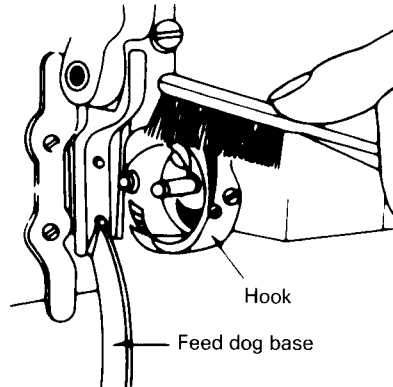
PREPARATION BEFORE STARTING OPERATION

6 Periodical Cleaning (Machine)

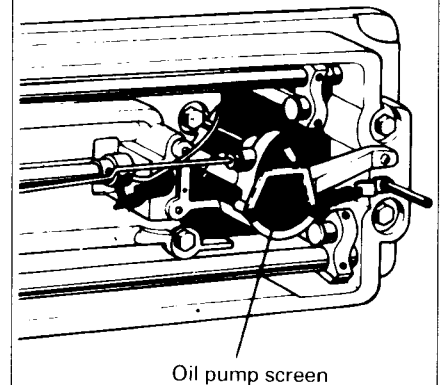
- Remove the thread plate and clean the lead dog. Reassembly should be done by screwing in the screw 2 — 3 rotations by hand at first, then tightening them evenly using a long-shafted screwdriver.



- Turn the machine head and clean the hook and remove any dust and/or lint inside the bobbin case.



- Lay down the machine head and remove any dust and/or lint on the oil pump screen.

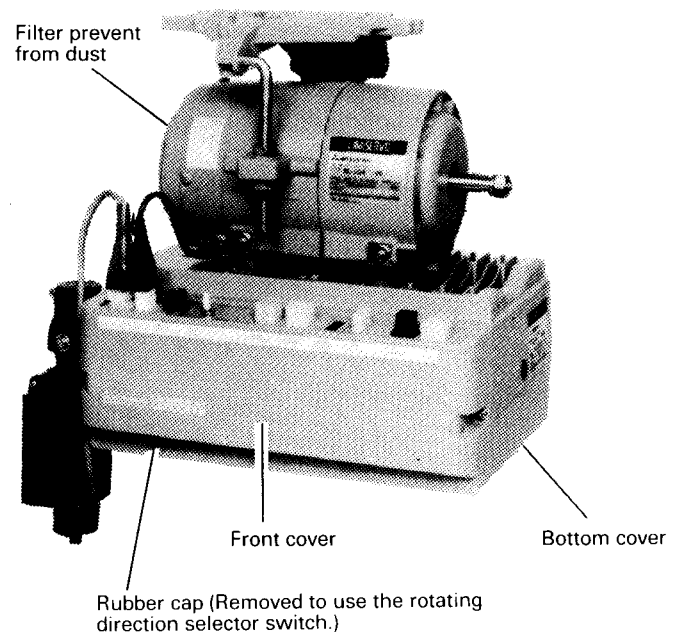


(Maintenance of Motor) Remove dust from the motor filter every one or two months. (Continued operation with the filter clogged with lint or dust may overheat the motor.)

(Control Box) Remove dust from the connector. (If the connector is covered with dust, the machine might malfunction.)

7 Handling Instructions (Motor and Control Box)

1. Keep your feet away from the pedal when turning the power on or off.
2. As a safety precaution, always turn the power off when leaving your seat.
3. The brakes may fail if the power is switched off or power failure occurs during operation of the sewing machine.
4. The control box cover must be kept closed during machine operation to prevent malfunction caused by the entry of dirt.
5. The control circuitry must not be checked with a multimeter to protect the semiconductor parts from voltage.
6. The power switch must be turned off before tilting the machine head or touching the needle.
7. The three-phase motor must be grounded using the ground wire (GREEN). The single-phase motor must not be wired to a starburst connection.
8. When manipulating the switch in the control box, first turn off the power switch, then open the front cover (See Fig. to the right). If you have to open the bottom cover, wait for 10 minutes after the power switch has been turned off, since a high voltage is applied inside the box. (This is vital to discharge the built-in capacitors).



PREPARATION BEFORE STARTING OPERATION

9. Use the motor away from high noise sources such as high-frequency welders.
10. Securely insert the connectors after checking their shapes and directions.
11. A suitable capacity is 15A for a single-phase motor, and 10A for a three-phase motor respectively.
12. The detector uses an optical detecting element. Do not allow dirt, dust, oil, etc., to attach to the detecting plate when the machine pulley has been removed for adjustment, etc. If dirty, gently wipe it off while avoiding scratching the plate. Also, care should be taken to avoid oil soaking into the crevices in the plate.
13. If the position detector connector has been disconnected, the belt has been removed, or the machine has locked completely, the motor is automatically switched off after a predetermined period of time to prevent the motor from burning. (The motor, however, may not be switched off if it is incompletely locked up or overloaded.) Operation is restored to normal by switching the power off, then switching it on after the fault has been remedied. Note that the above situation also takes place when the detector has become faulty or any wire has been broken.

8 Installation of Belt Covers

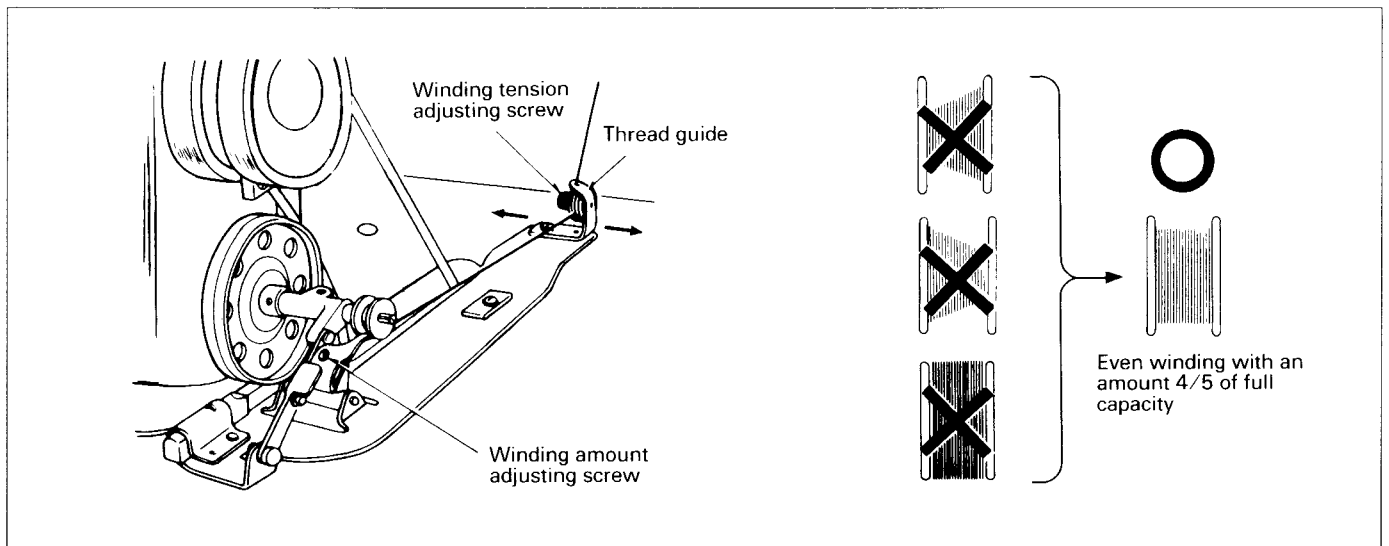
- (Machine) Be sure to install the belt cover for safety. Refer to the instruction manual provided in the accessory box.
(Motor) Be sure to install the belt cover for safety.

HOW TO ADJUST AND USE THE MACHINE

1 How to Wind the Lower Thread

CAUTION: Always keep the presser lifted before attempting a dry run.

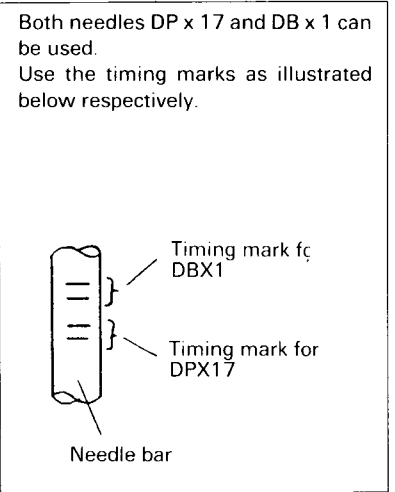
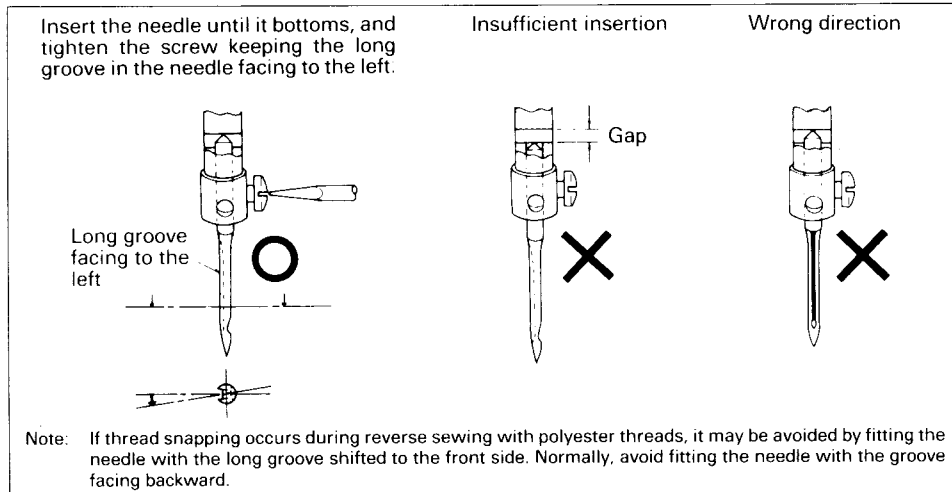
1. **Strength of winding:** Particularly in the case of nylon or polyester thread, wind the bobbin loosely.
2. **Uneven winding:** If the bobbin is wound unevenly, slide the thread guide toward the less wound portion of bobbin.
3. **Winding amount:** When the bobbin is wound excessively, loosen the adjusting screw. When the bobbin is wound insufficiently, tighten the adjusting screw.



HOW TO ADJUST AND USE THE MACHINE

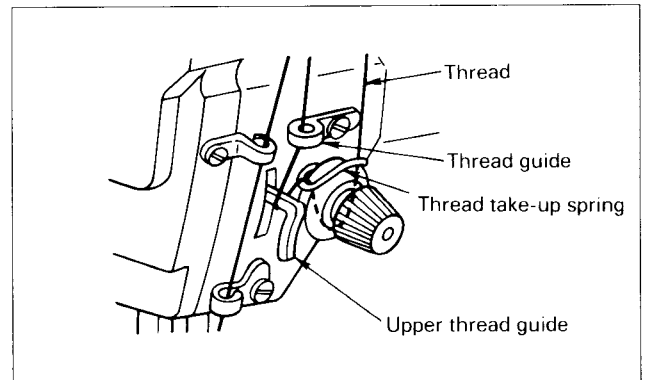
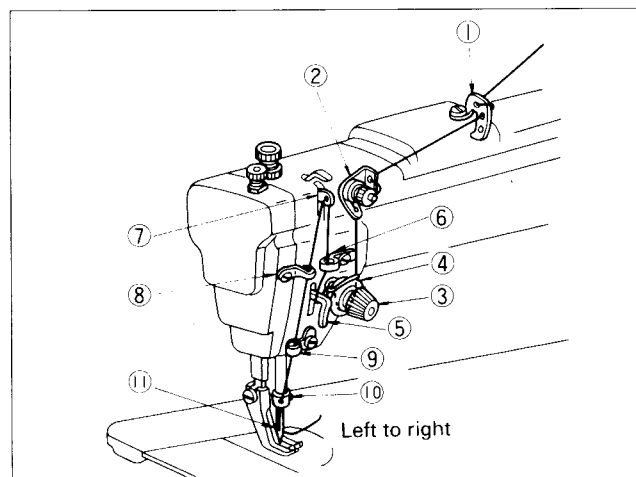
2 How to Attach a Needle

CAUTION: Before using the following procedures, be sure to turn the power switch off.



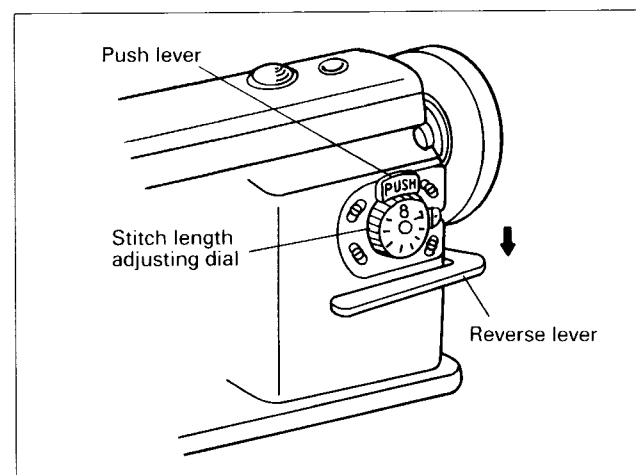
3 How to Route the Upper Thread

Raise the thread take-up lever to its highest possible position, and route the upper thread in the order illustrated below.

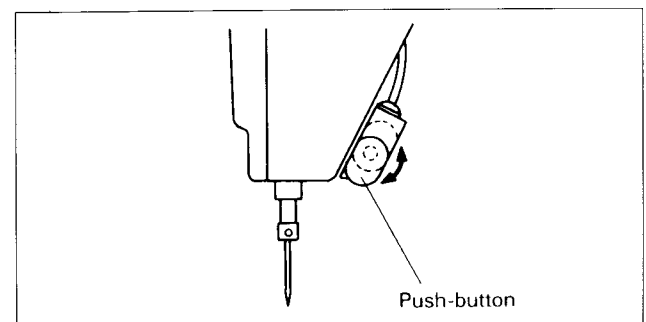


4 Adjustment of Stitch Length and Reverse Sewing

- To change the stitch length, rotate the stitch length adjusting dial while pressing the push lever.
- Pressing the stitch length adjusting lever allows for reverse stitching.

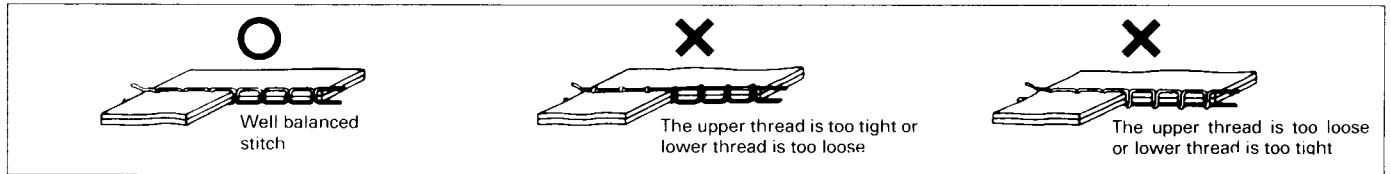


- The (touchback-type) pushbutton can be pressed to perform reverse stitching.
 - Normally, set the pushbutton as illustrated by the solid lines. To re sew the material, push the pushbutton.
 - Rotate the pushbutton as illustrated by the broken lines. In this case, the pushbutton will not move the material back. This function is useful when the material being sewn makes contact with the touch switch and you wish to avoid unexpected reverse sewing.



HOW TO ADJUST AND USE THE MACHINE

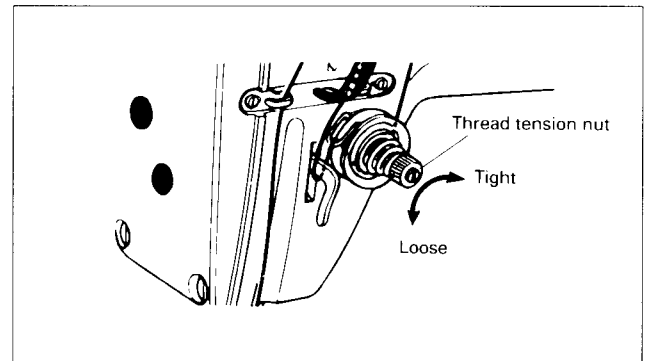
5 Adjusting the Thread Tension



6 Upper Thread Tension

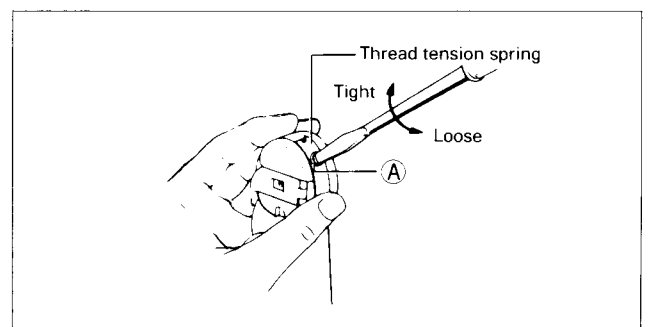
1. The upper thread can be adjusted based on the lower thread tension.
2. Adjustment can be done by rotating the thread tension nut.

For special fabric sewing with special thread, the desired tension can be obtained by adjusting the strength and operating range of thread take-up spring.



7 Lower Thread Tension

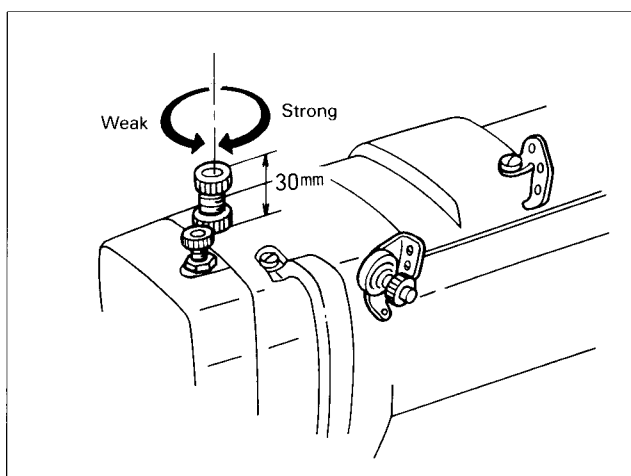
1. The lower thread tension can be adjusted by rotating screw (A).



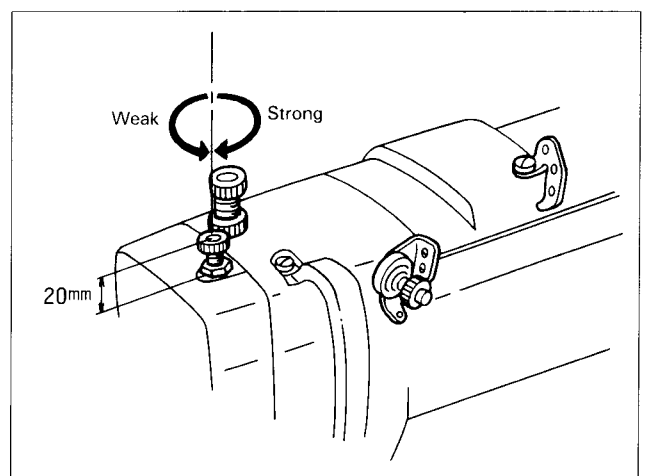
8 Adjustment of Presser Pressure

1. Pressure should be adjusted according to the material to be sewn.
2. Pressure on both the walking foot and the presser foot can be adjusted. (The adjusting screw has been set as illustrated before shipment.)
3. Sewing pressure should be adjusted to the minimum required strength.

<Presser foot pressure>



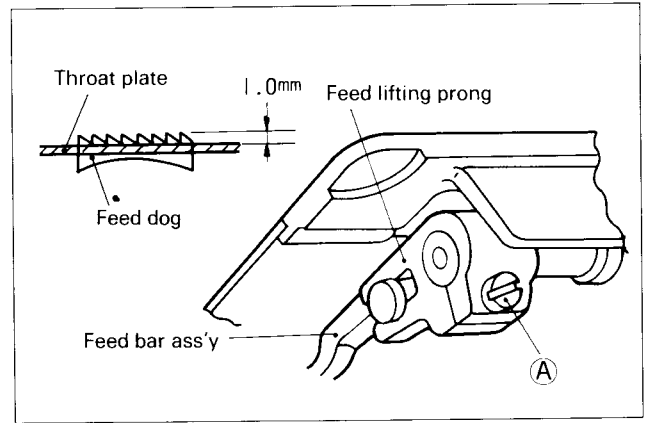
<Walking foot pressure>



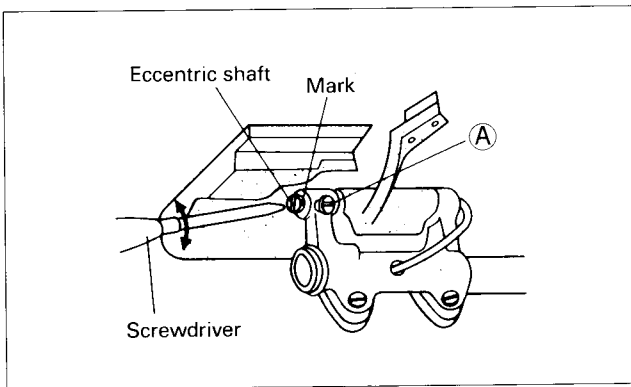
HOW TO ADJUST AND USE THE MACHINE

9 Feed Dot Height

- The feed dog should be 1.0 mm higher than the throat plate. This protrusion is standard.
- To adjust the dog height:
 - Loosen set screw (A), which is screwed in the feed lifting prong, and move the feed bar ass'y upward or downward.
 - When adjustment is completed, tighten set screw (A). Otherwise, the action of the feed bar ass'y will be sluggish.



10 Adjustment of Feed Dog Inclination



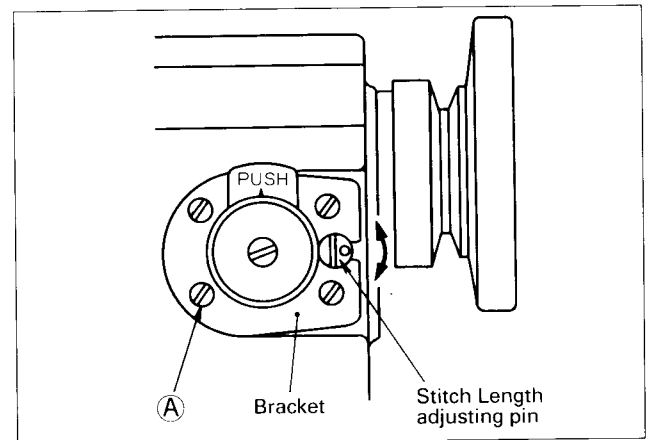
The feed dog has been set to standard (horizontally). If necessary, adjust the inclination according to the material to be sewn as follows:

- Slightly loosen screw (A) located in the feed rock shaft crank.
- Using a screwdriver
While pressing the groove located in the eccentric shaft by using a screw driver, rotate the eccentric shaft clockwise (to lift the front end) or counterclockwise (to lower the rear end).
- When adjustment is completed, tighten screw (A).

Position of mark on the eccentric shaft	Feed dog
Horizontal	Standard
Up	Front up (MAX.)
Down	Front down (MAX.)

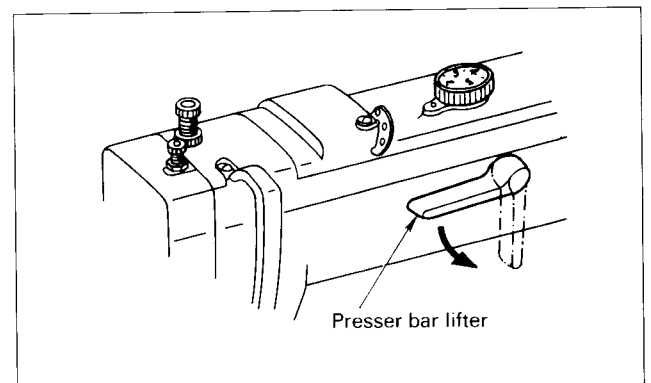
11 Adjustment of Stitch Length — Forward/Back Sewing

- Loosen the set screws (x 4) located in the bracket.
- Rotate the stitch length adjusting pin until the desired length is reached as follows:
 - Clockwise: Increases the stitch length in forward sewing, and decreases the stitch length in back sewing.
 - Counterclockwise: Decreases the stitch length in forward sewing, and increases the stitch length in back sewing.



12 Manual Presser Bar Lifter

- Rotate the presser bar lifter in the direction of the arrow. This raises the presser foot.

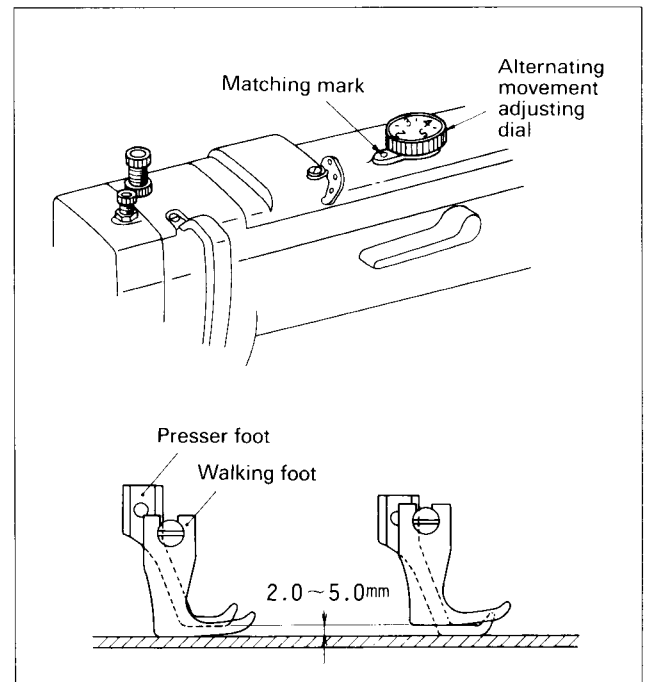


HOW TO ADJUST AND USE THE MACHINE

13 Adjustment of Walking Foot and Presser Foot

1. Adjustment of alternating movement

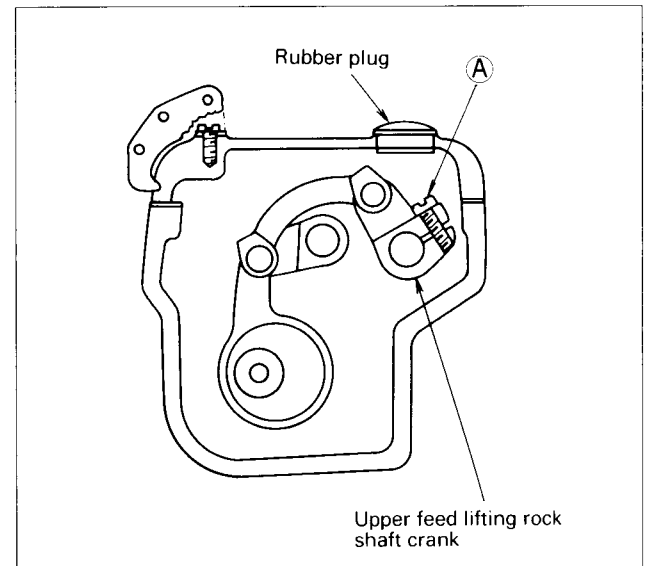
- (1) The alternating movement on the walking foot and presser foot can be adjusted by using the adjusting dial located on the top cover.
- (2) Face the desired number printed on the dial to the matching mark located on the top cover.
- (3) The number printed on the dial represents the possible protrusion of the walking foot and presser foot from the throat plate when the alternating movements on these are evenly set.
- (4) If the alternating movements are evenly set, they can be readjusted up to 2.0 — 5.0 mm.



2. To change the balance of the alternating movements between the walking foot and presser foot:

- (1) For example, to increase the rise of the walking foot, and decrease the rise of the presser foot:
 - ① Remove the rubber plug located on the top cover.
 - ② Rotate the pulley until the presser foot is slightly raised from the throat plate.
 - ③ Loosen set screw **A** (on the right side) located on the upper feed lifting rock shaft crank.
 - ④ The built-in spring pulls down the presser foot until it makes contact with the throat plate. Then, tighten set screw **A**.
 - ⑤ This completes the adjustment, i.e., the protrusion of the presser foot has been decreased by a set distance. And, the vertical motion of the walking foot has been increased by that same distance.
- (2) As a contrary case (1), to decrease the rise of the walking foot, and increase the rise of the presser foot:

First, rotate the pulley until the walking foot is slightly raised from the throat plate. Next, loosen screw **A**. Finally, tighten screw **A**. This decreases the rise of the walking foot.



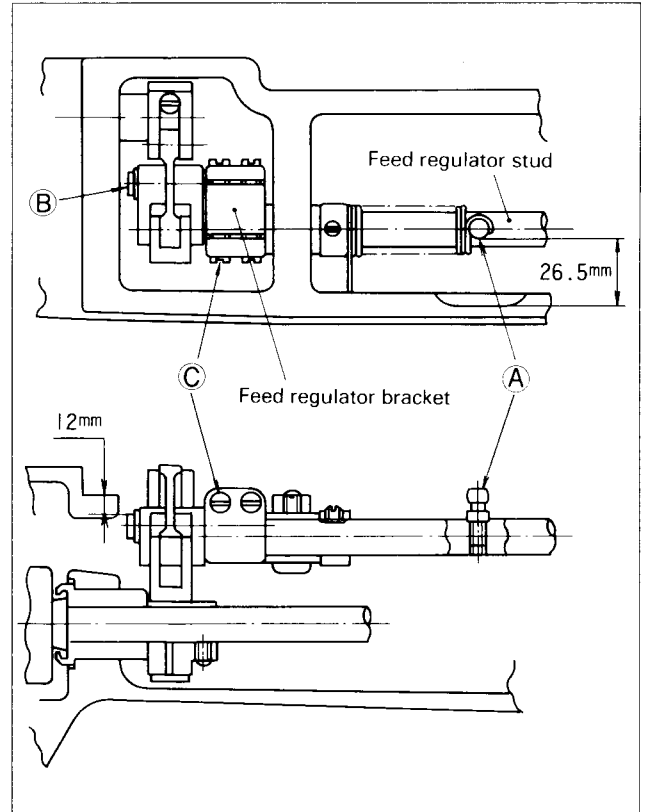
HOW TO ADJUST AND USE THE MACHINE

3. Installing the Feed Regulator Bracket

Should it be necessary to dismount and the feed regulator bracket and its related parts, use the procedure explained below.

CAUTION: If the feed regulator bracket is poorly positioned, the resultant alternating movements may be too short or long, causing defective machine operation.

- (1) Set the clearance between special screw **A** located on the regulator stud and the side wall of the machine arm to 26.5 mm as illustrated to the left. (Use a 26.5 mm spacer between these parts. This facilitates the operation.)
- (2) With the feed regulator stud held as explained in step (1) above, adjust the feed regulator bracket. This adjustment should insure a clearance of 12 mm between the periphery of pin **B** located on the feed regulator bracket and the top cover mounting face located on the arm. Tighten screws **C**.



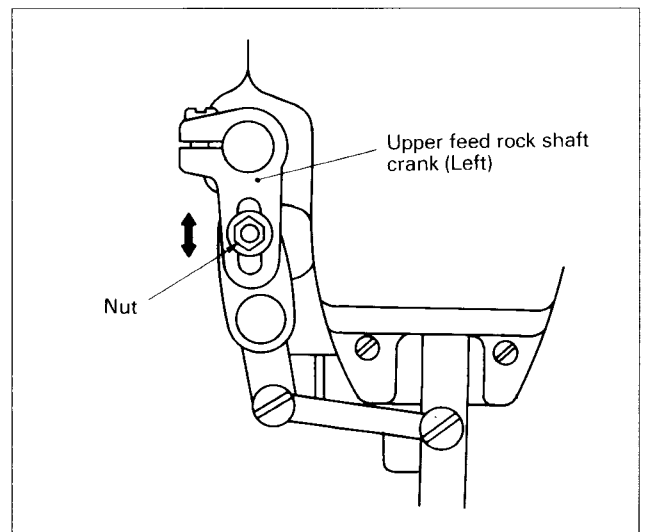
4. Feed Pitch Adjustment of Walking Foot

The ratio of the upper feed amount (of the walking foot) to the lower feed amount (of the feed dog) has been adjusted to 1 : 1. However, the walking foot feeding amount can be increased or decreased depending on the operating conditions.

- (1) Unscrew the nut located on the upper feed rock shaft crank (left), and shift to adjust the position of the pivot bracket upward or downward.

Upper position → Feed pitch → Small

Lower position → Feed pitch → Large

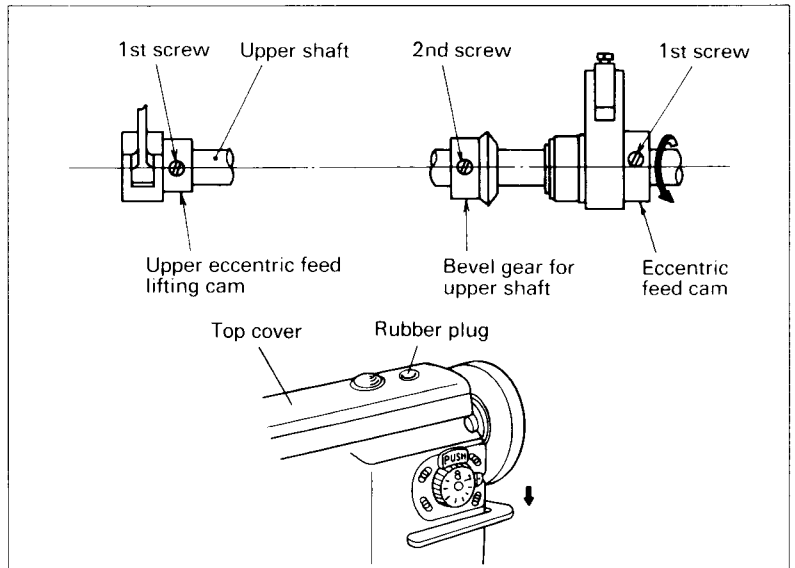


HOW TO ADJUST AND USE THE MACHINE

14 Adjustment of Feed Timing

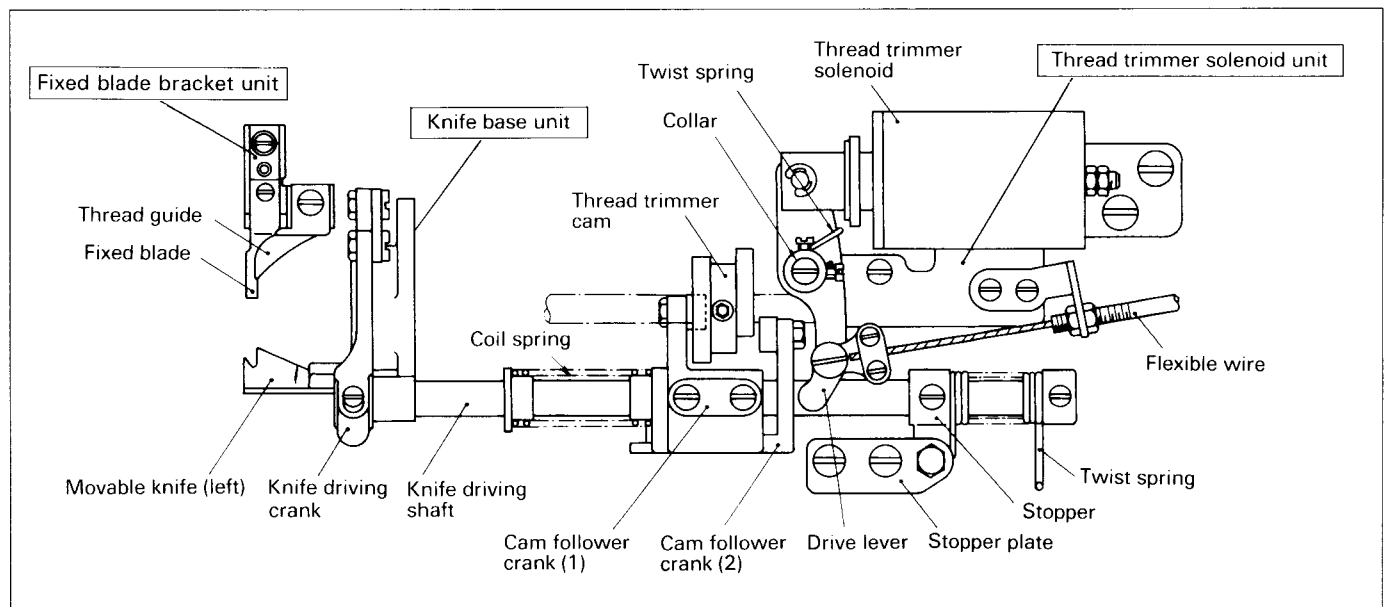
1. The standard position of the eccentric feed cam and eccentric feed lifting cam are illustrated to the right.
2. To adjust the position, first open the top cover. Properly slide the eccentric ring.
3. The eccentric feed cam can also be adjusted by removing the rubber plug located on the top cover.

In the latter case, however, the built-in bevel gear is concealed; care should be taken when adjusting.



15 Adjustment of Thread Trimmer Mechanism

1. Configuration of Thread Trimmer Mechanism



2. Precautions for Adjustment

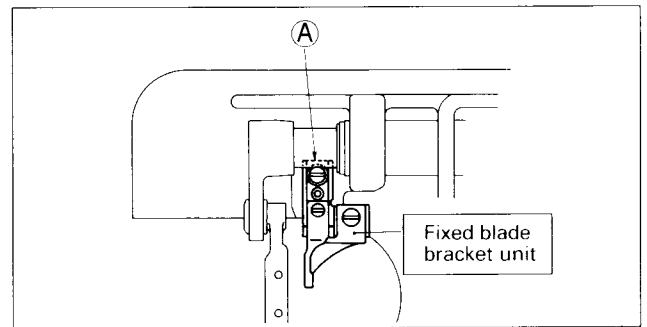
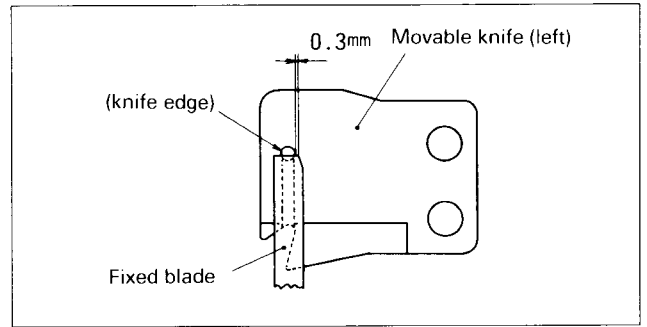
The LY2-3750 uses a thread trimmer drive system with a lower shaft cam. So, if you rotate the machine by one revolution with the thread trimmer solenoid activated (i.e., with the roller located on the cam follower arm kept engaged with the thread trimmer cam), the movable knife (left) will make contact with the needle, breaking the contacting parts.

Activate the built-in solenoid only when the normal thread trimming cycle is active (lower position → upper position).

HOW TO ADJUST AND USE THE MACHINE

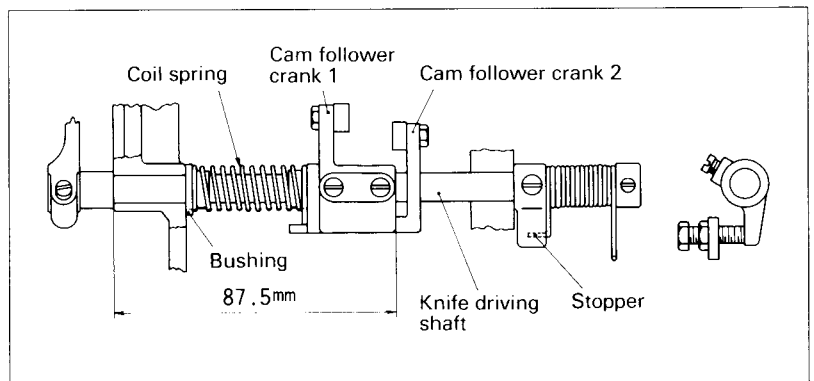
3. Relation between the Fixed Blade and Movable Knife (Left) Edge

- (1) The standard position is illustrated to the right.
- (2) If the distance (0.3 mm) is too wide, such a situation may allow for "triple" thread breakage to occur, resulting in detached needle thread after threads are cut. Also, if it is too narrow, such a situation may lead to unexpectedly uncut threads. Please keep this in mind.
- (3) The adjustment necessary in step (2) can be done by correctly installing the fixed blade bracket unit or correctly mounting the fixed blade.
- (4) The fixed blade bracket unit has been installed using screw (A) with the bobbin case holder position bracket removed (See Fig. to the right).



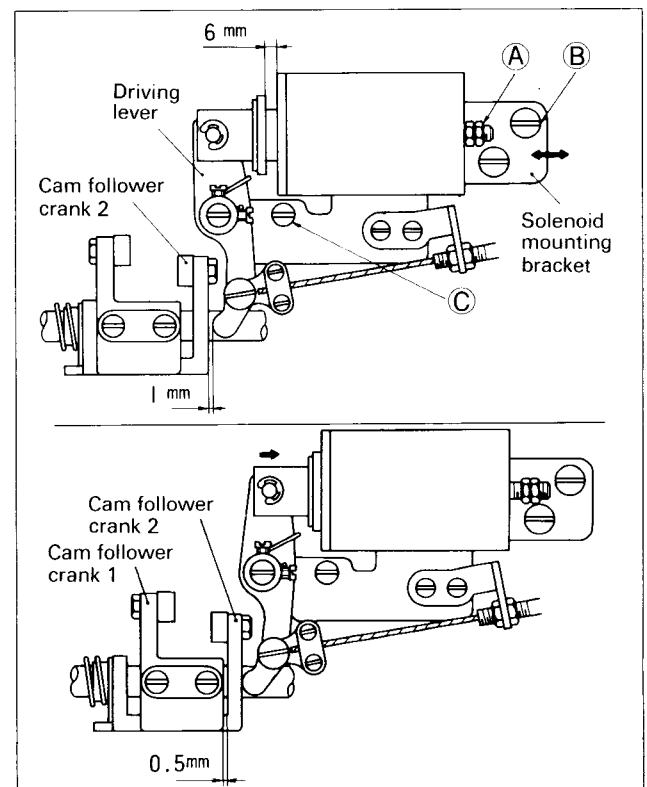
4. Knife Driving Shaft

- (1) The standard position is illustrated to the right.
- (2) When assembling, the knife driving shaft must first be put through the drive arm.
- (3) Cam follower crank 1 must be positioned as illustrated to the right, and secured on the recess located on the knife driving shaft.
- (4) The stopper must be secured on the recess in such a way that the knife driving shaft is snug and smoothly rotates in the shaft direction.



5. Installing the Thread Trimmer Solenoid Unit

- (1) Operation stroke of the thread trimmer solenoid
 - ① Standard operation stroke is 6.0 mm.
 - ② This stroke can be adjusted by using nut (A).
- (2) Installing the unit
 - ① The unit can be mounted by using screws (B) and (C).
 - ② Clearance of 1 mm must be insured between the driving lever and cam follower crank 2 with stopper nut (A) made contact with the solenoid.
- 3 In such a situation, activating the solenoid should create a clearance of 0.5 mm between cam follower crank 1 and 2. This situation is standard. To meet this standard, slide the solenoid mounting bracket in the direction of the arrow as illustrated, if adjustment is needed.

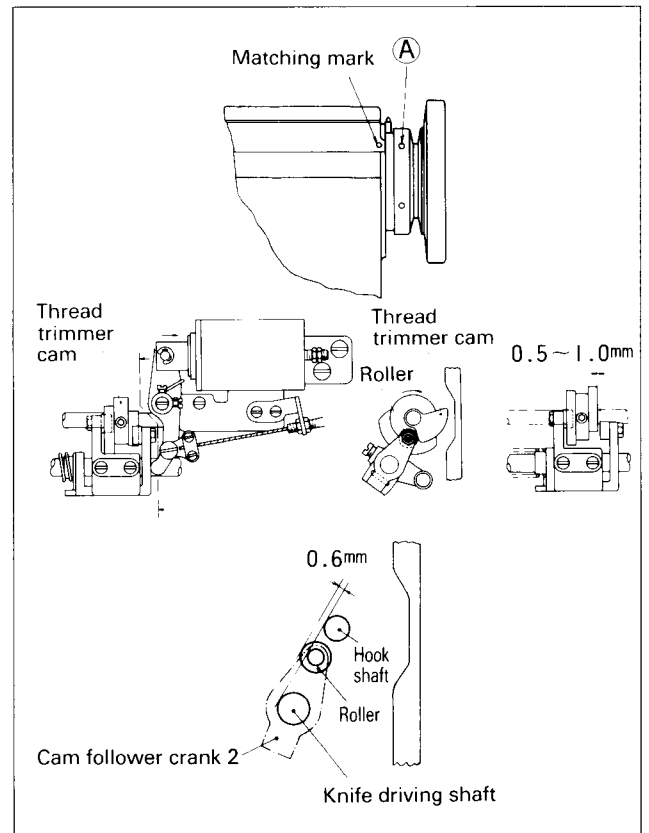


HOW TO ADJUST AND USE THE MACHINE

6. Installing the Thread Trimming Cam

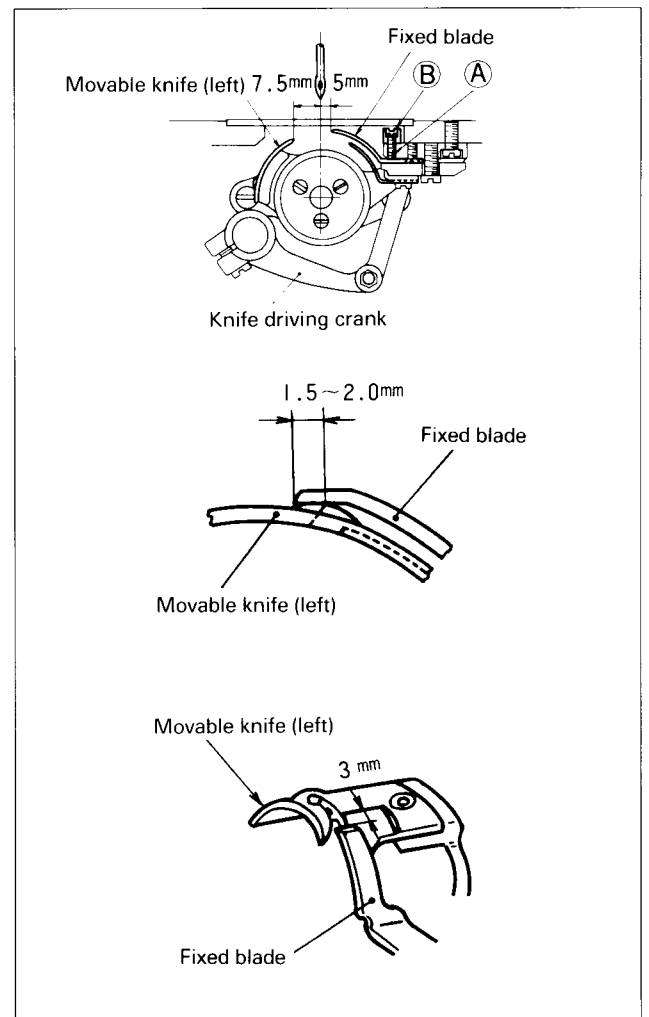
- (1) Face the 2nd timing mark **(A)** (GREEN) located on the pulley to the matching mark on the arm.
- (2) With the thread trimmer solenoid activated, rotate the thread trimmer cam forward until the cam makes contact with the roller. Then, secure the cam.
- (3) With the thread trimmer solenoid deactivated, allow the cam follower crank 2 to return to its original position. This should create a clearance of 0.5 — 1.0 mm between the cam and roller end. This distance is standard.

CAUTION The standard position of cam follower crank 2 before activation is illustrated to the right. If this position has been changed due to, say, removal of stopper plate, etc., first perform the specified adjustment by using the adjusting bolt located on the stopper plate before following steps (1) to (3).



7. Adjustment of Knife Engagement

- (1) Position of movable knife (left) and fixed blade
 - ① See the illustration. The standard distances from the needle center are 7.5 mm and 5 mm from the movable knife (left) and fixed blade respectively.
- (2) Adjustment of knife engagement
 - ① With the solenoid activated, turn on the machine. This rotates the thread trimming cam which rotates the movable knife (left).
When the movable knife (left) has moved to its farthest distance, the standard engagement of the blade is 1.5 — 2.0 mm.
 - ② The engagement can be adjusted by properly mounting the drive arm.
- (3) Adjustment of knife engaging pressure
 - ① See the illustration. In such a situation, the blade (left) and the fixed blade should first make contact with each other. This situation is standard.
 - ② If a thread is poorly cut, particularly when it is thick, slightly increase the engaging pressure. This should solve the problem.
 - ③ The engaging pressure can be adjusted in this way: Loosen lock nut **(B)** (See Fig.), and adjust it by using adjusting screw **(A)**.

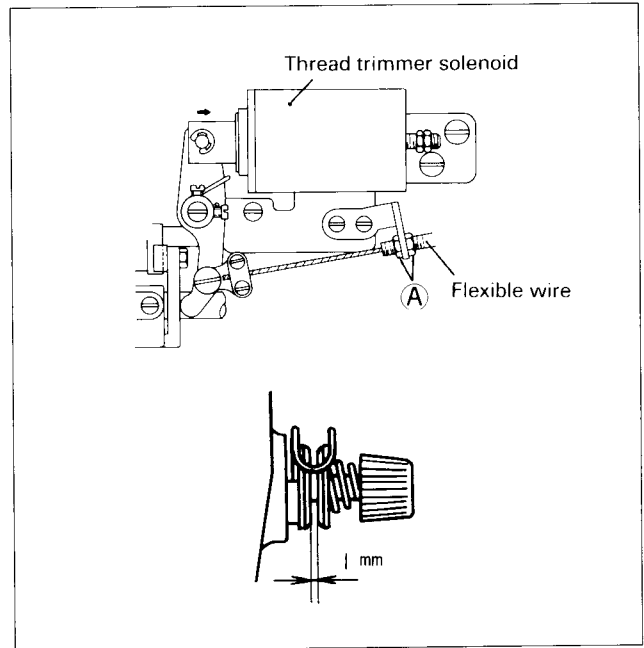


HOW TO ADJUST AND USE THE MACHINE

8. Adjustment of Needle Thread Tension Release

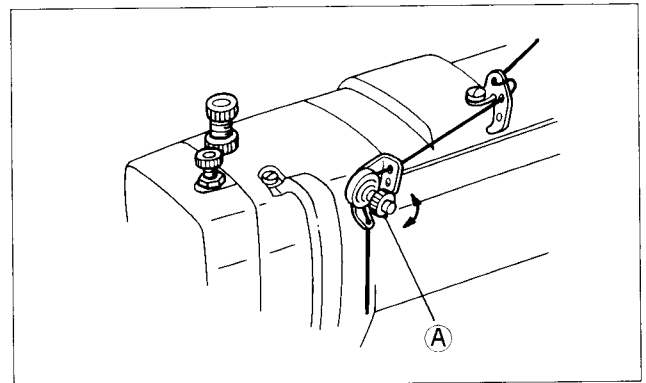
- (1) With the thread trimmer solenoid activated, adjustment should be such that the tension discs located on the upper thread tension regulator are separated from each other by about one (1) mm.
- (2) Adjustment can be done in this way: Loosen nut (A) and properly shift the flexible wire.

CAUTION If the tension discs are too narrowly, the upper thread may be liable to be broken, resulting in detached needle thread. Also, if the space between the discs is too wide, the excessive blank space between the discs may result in loose stitches.



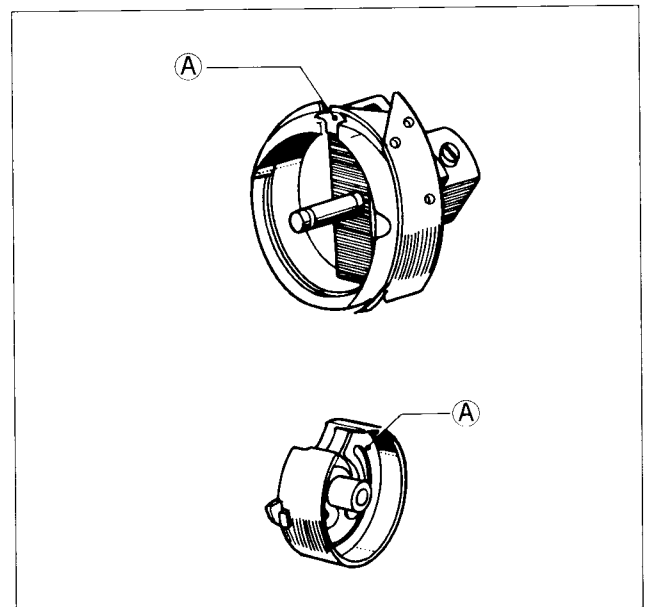
9. Adjustment of Needle Thread Remaining Length

- (1) The length of remaining thread can be adjusted by rotating tension regulating nut (A) as follows:
 Clockwise Short in length
 Counterclockwise Long in length



16 Hook and Bobbin Case

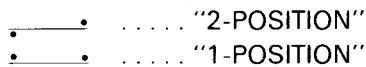
1. Use a special bobbin for machines with thread trimmers whose rotating hook has bobbin thread guide slit (A).
2. Also, use a bobbin case whose bottom has spring A capable of preventing racing.
3. The bobbins provided in the package can be used.



HOW TO USE AND ADJUST THE CONTROL BOX

1 "1-2 POSITION" Select Switch Operations

The needle stop position can be switched between "1-POSITION" and "2-POSITION" by operating the select switch on the control box panel.



When the pedal is kicked back by heel with the "1-2 POSITION" select switch set at "1-POSITION", the thread is trimmed with one turn of the balance wheel.

2 Pedal Operation

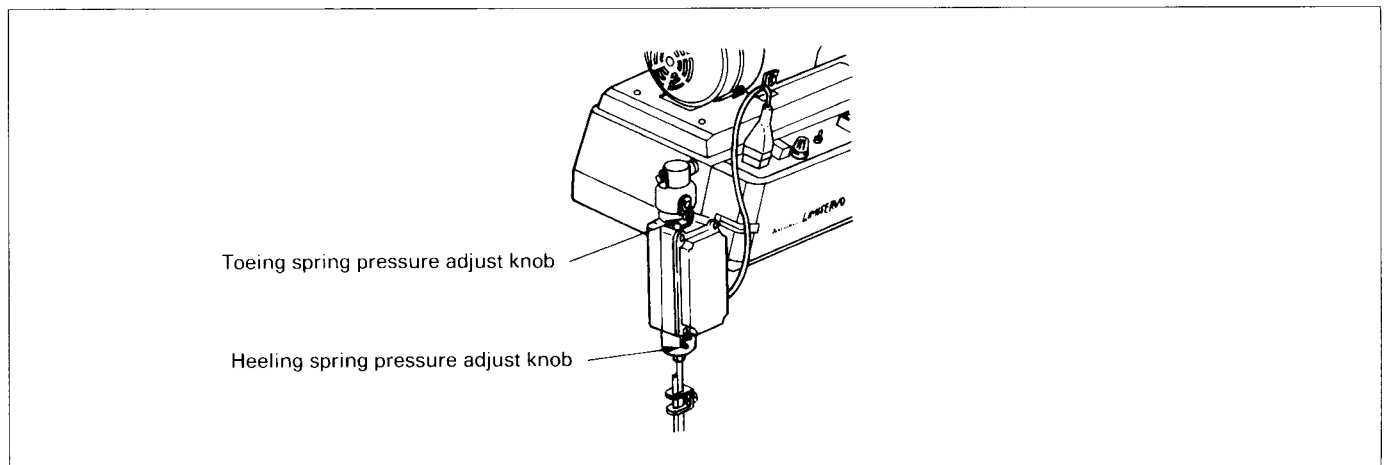
The two-stage "kick-back" mechanism connected to the pedal allows the machine to run, trim, and lift the presser automatically as follows:

1-2 POSITION setting \ Pedaling	Toe down → Neutral	Neutral → Light heeling	Neutral → Full heeling
1-POSITION	Stop at needle "UP" position	Presser foot goes up.	Sewing machine rotates one turn and trims thread.
2-POSITION	Stop at needle "DOWN" position	Presser foot goes up.	Sewing machine rotate half turn from Down to Up position and trims thread, the presser foot goes up.
Pedal operation			

- NOTES: 1. The stitching speed can be changed by changing the pedal pressing-down depth.
2. Use optional automatic presser foot lifter, LE-FA.

3 Adjustment of Pedal Toeing and Heeling Pressures

The lever unit spring pressure is adjustable in three steps by changing the position of the corresponding spring pressure adjust knob.



4 Adjustment of Stitching Speed

1 Adjusting the maximum stitching speed (pedal fully pressed down by toe)

- (1) The maximum stitching speed can be adjusted by the internal VR "H" inside the control box, and the external VR on the panel of control box.
- (2) The external VR permits speed setting within a range of the maximum speed set by the internal VR "H" to the low (minimum) speed.
- (3) The internal VR "H" has been set before shipment.

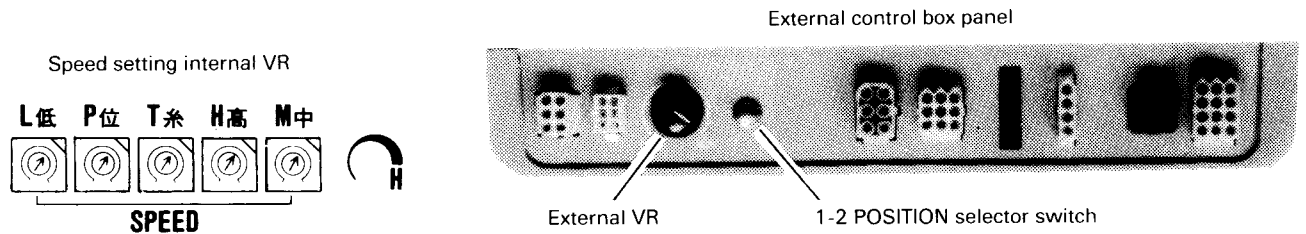
Internal VR "H"	Adjustable range of external VR
200 spm	Max. — Low

To set the stitching speed other than those listed above, the internal VR "H" must be re-adjusted.

HOW TO ADJUST AND USE THE CONTROL BOX

CAUTION:

Stitching speeds should not be set faster than those set by the internal VR "H" and external VR even if a motor pulley having a larger diameter is used.



2 Adjusting the low speed (stitching speed when the pedal is pressed down lightly)

- (1) Low stitching speed can be adjusted by the internal VR "L".
- (2) Rotate the VR clockwise. This increases the speed. Rotate the VR counterclockwise. This decreases the speed.
- (3) The low speed is adjustable within a range of 160 to 320 spm (It has been set to 250 spm before shipment).

3 Adjusting the positioning speed

- (1) The positioning speed can be adjusted by the internal VR "P".
- (2) Rotate the VR clockwise. This increases the speed. Rotate the VR counterclockwise. This decreases the speed.
- (3) The positioning speed is adjustable within a range of 160 to 320 spm (It has been set to 250 spm, before shipment).

4 Adjusting the thread trimming speed

- (1) The thread trimming speed can be adjusted by the internal VR "T".
- (2) Rotate the VR clockwise. This increases the speed. Rotate the VR counterclockwise. This decreases the speed. (It has been set to 200 spm before shipment).
- (3) For change of the thread trimming speed adjustment, refer to the sewing machine setting up procedure or consult with our service agency.

5 Adjusting the tackstitching speed

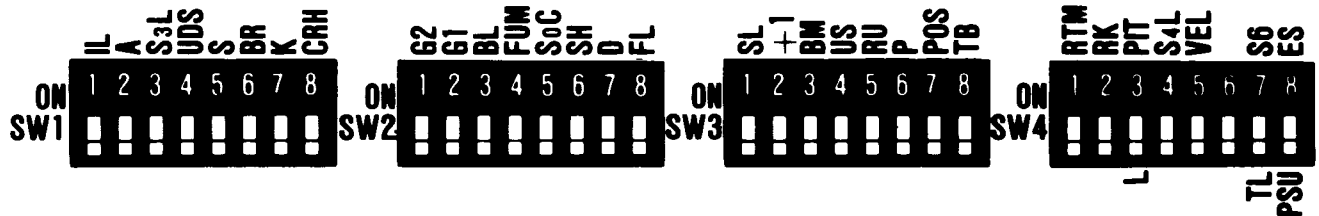
When an optional operation box is used for tackstitching control, the tackstitching speed (medium speed) can be set by the internal VR "M". (It has been set to 700 spm before shipment).

HOW TO ADJUST AND USE THE CONTROL BOX

5 Optional Functions

By connecting the external (optional) connectors to the option connector, and setting the corresponding internal DIP switches, various optional functions can be used. For details, consult with our service agency.

1. Internal DIP Switch



- IL : Thread trimmer interlock canceling switch
Used to cancel the operation restart disable command at the time of thread trimming. Set to ON to allow the machine to restart operation after an interlock time has passed.
- A : Standing -work sewing machine high-speed switch
(Unnecessary when the external VR is used).
- S3L : Presser foot lifting cancel switch by light heeling
- UDS : Needle UP/Down control by back tack switch
Allows a half stitch to be sewn by turning the back tack switch S7 on when the sewing machine has stopped.
- K : Chain stitch sewing machine thread trimmer switch
- CRH : High-speed correction stitching switch
- G1, G2 : Gain switches
Set as follows in accordance with the sewing machine used.

G1	G2	Sewing machine used
OFF	OFF	Light material, high-speed
ON	OFF	Heavy material, high-speed
ON	ON	Heavy material, low-speed
OFF	ON	Light material, high-speed *

*The flickering of a fluorescent light can be minimized by the above setting, but the motor power is reduced.

- BL : Soft brake switch
Set to ON to apply brakes when stopping the sewing machine.
- SoC : One-stitch switch
The optional connector ① — ⑥ signal (low speed So) allows a single stitch to be sewn.
- SH : One-shot function switch
- D : Start backtacking speed varying switch
Allows start backtacking speed to be changed (between low and backtacking speeds) in accordance with the pedal toeing degree.

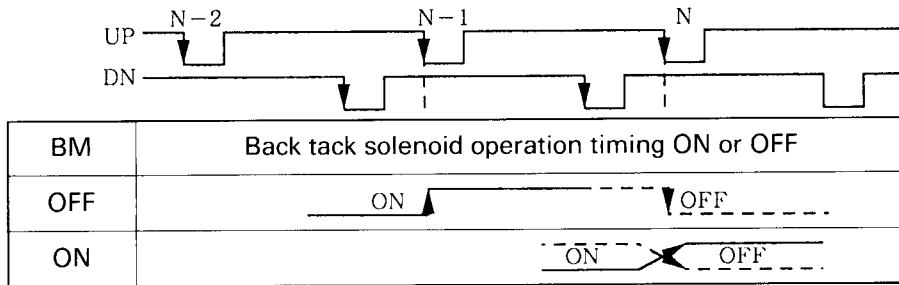
HOW TO ADJUST AND USE THE CONTROL BOX

SL, +1 : Slow start switch

	0	1 stitch	2 stitches
SL	OFF	ON	ON
+1	OFF	OFF	ON

BM : Backtacking stitch change switch

Used to set the back tack solenoid operation timing to match the length of the backtacking stitch.



US : Needle UP control by back tack switch

RU : Reverse needle lifting switch

Used to stop the sewing machine near the needle bar top dead center by reversing the motor after thread trimming.

PSU/ES : UP position priority stop/emergency stop selector switch

Used to switch the option connector ① — ② signal between the UP position priority stop (thread trimming UP position priority stop for the XC-AM and XC-AMF) PSU and emergency stop ES functions.

POS : 1-2 POSITION switch

TB : Back tack solenoid at thread trimming

RTM : Up-to-TM signal reverse switch

Reverse the motor after thread trimming up to the position of the TM signal of the 3-position type detector (XC-K-22).

RK : DOWN-to-UP position reverse switch

Fully heeling pedal or switching on the thread trimmer signal S2 reverses the motor from the DOWN to the UP position without thread trimming.

PIT/L : Use at the L side position

S4L : High-speed operation signal (S4) disable switch

VEL : Speed adjusting mord switch

Used to switch the adjusting speed setting of the internal VR.

Set this switch to the "OFF" position before starting sewing.

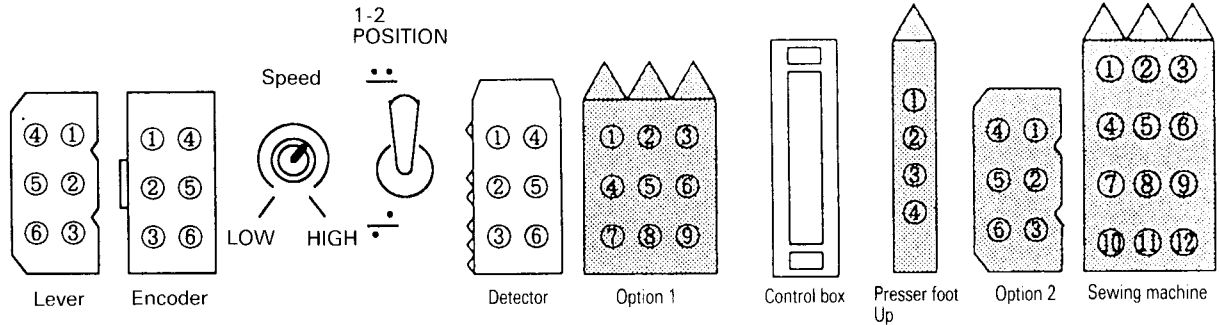
S6/TL : Thread trimming safety/thread trimming cancel selector switch

Used to switch the sewing machine connector ⑤ — ⑥ signal between the thread trimming safety S6 and thread trimming cancel TL functions.

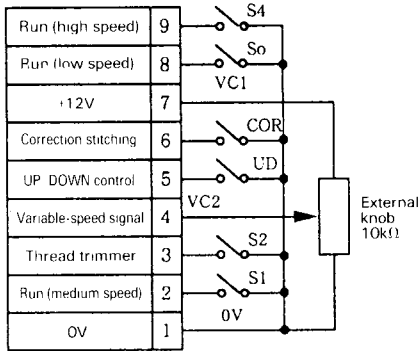
HOW TO ADJUST AND USE THE CONTROL BOX

2. Optional Connectors

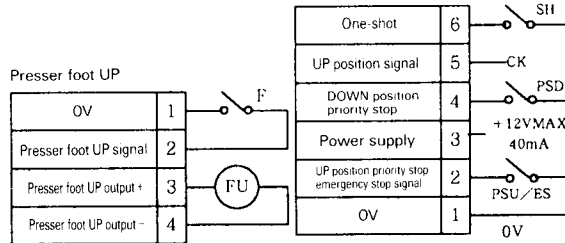
Various external controls can be used by connecting external signals to the optional connector. Use only reliable contacts when contacts are necessary for input signals.



Option 1



Option 2



Sewing machine

