

**MITSUBISHI
INDUSTRIAL
SEWING
MACHINE**

Model

LT2-230.-250

Class

**Double-Needle
Lockstitch, Automatic
Undertrimmer,
Variable Speed**

INSTRUCTION MANUAL

— CONTENTS —

PREPARATION FOR OPERATION

1	Power cable connection	1
2	Connection of control box	2
3	Adjustment of needle bar stop position	2

CAUTIONS ON USE

1	Oiling (1)	3
2	Oiling (2)	3
3	Oiling condition	4
4	Adjustment of oiling to rotating hook	4
5	Cautions on operation	4

OPERATION

1	Installation of needles	5
2	Winding of bobbin thread	5
3	Selection of thread	6
4	Threading of needle threads	6
5	Adjustment of stitch length and stitch reversing (touch-back).	7
6	Setting of bobbin	7
7	Threading of bobbin threads	8
8	Tension adjustment of bobbin threads	8
9	Balance of thread tension	8
10	Needle thread tension	8
11	Adjustment of presser foot pressure	8
12	Timing between rotating hook motion and needle motion	9,10
13	Adjustment of feed dog height	11
14	Relationship between rotating hook motion and take-up lever motion	12
15	Relationship between hook motion and opener motion	12
16	Relationship between needle motion and feed dog motion	13,14
17	Needle bar (left or right) stop operation (LT2-250)	15
18	Relationship between angle of corner stitching and stitch length	15
19	Installation of movable knife	16
20	Adjustment of thread trimmer cam	17
21	Adjustment of thread tension regulator	18
22	Adjustment of meshing pressure of movable knife and fixed knife	19
23	Sharpening of fixed knife	19
24	Adjustment for change of needle gage	20
25	Wiper adjustment	21

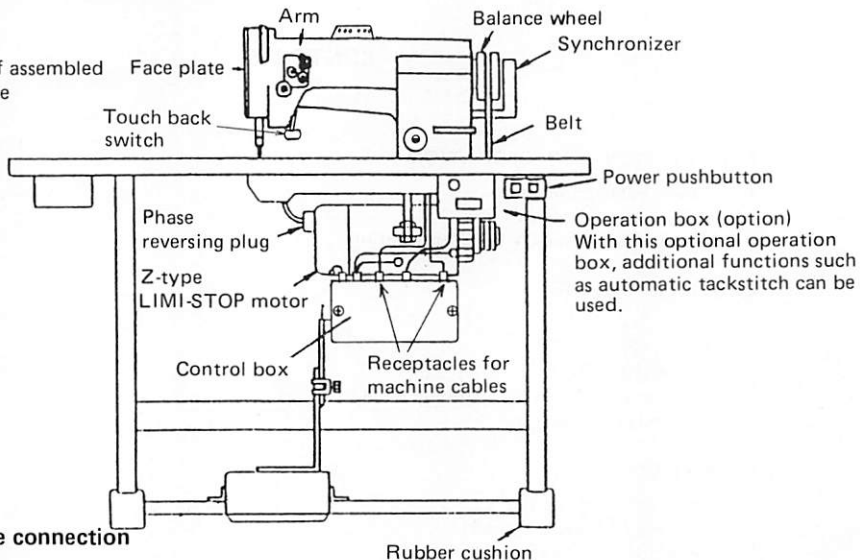
ADJUSTMENT AND OPERATION OF CONTROL UNIT

1	"1-2 POSITION" select switch operations	22
2	Pedal operation	22
3	Adjusting the pedaling forces	22
4	Adjusting the stitching speed	23
5	Optional functions	24, 25

CAUTION	26, 27
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PREPARATION FOR OPERATION

- Overall view of assembled sewing machine



1 Power cable connection

1. Connector

Each connector (plug) should be completely set to the corresponding receptacle after checking the mating direction.

2. Lamp leads

(1) For installation of a work lamp to the sewing machine, lamp leads are provided at the back of motor.

Remove the insulation tape and insulator from the lamp leads and connect them to the wires of lamp.

After the connection, be sure to protect the connected wires with insulation tape.

(2) For work lamp, use that of 6V 15 – 20W.

(3) When lamp is not used, properly insulate two lamp leads.

3. Power cable

(The power cable connection is same as stand-ard clutch motor cable connection.)

(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. The green lead should be grounded to the "GND" terminal without fail.

(2) The power fuse should be that having a rating of 10A for three-phase power source, and 20A for single-phase power source.

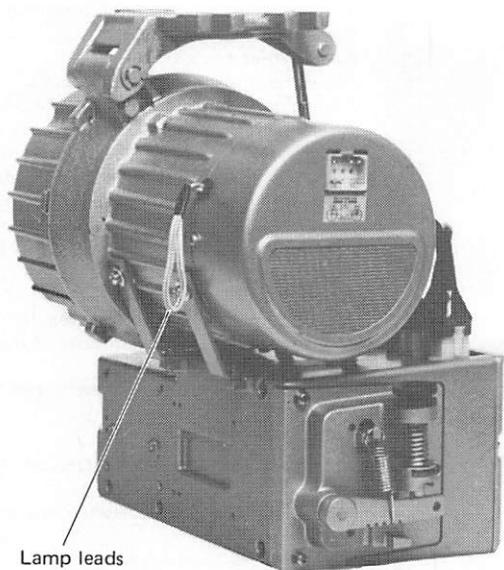
(3) The fuse used in the control box should be that having a rating of 8A.

4. Direction of rotation

Direction of rotation of the motor can be reversed by inverting the phase reversing plug in the motor end cover (remove the plug, turn it 180° and set to the plug socket again).

For single-phase motor, operate the switch after the motor has completely stopped (it will take about 2 min.).

Be sure to fully set the plug in the socket.

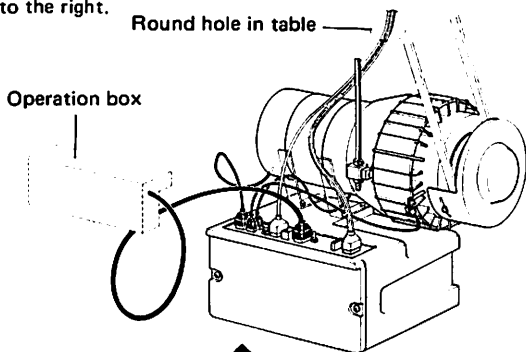


PREPARATION FOR OPERATION

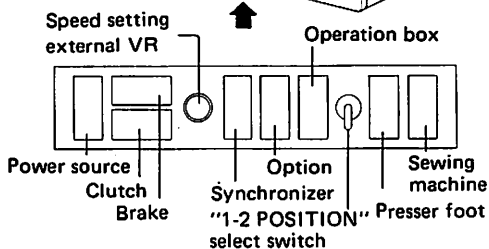
2 Connection of control box

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

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



Motor head model	Control box model
LT2-230-M1	LD-MD-137
LT2-230-B1	LD-MD-130
LT2-250-M1	
LT2-250-B1	



3 Adjustment of needle bar stop position

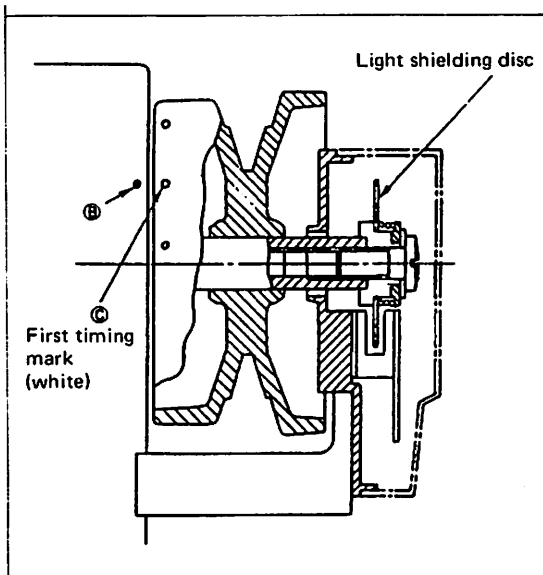
When the pedal is kicked down by heel, the machine stops with the timing mark (B) positioned in line with the first timing mark (C) on the balance wheel. All sewing machines have been factory-adjusted. However, if the timing marks deviate larger than 3mm, adjust light shielding disc position as follows:

(Preparation for adjustment)

1. Disconnect the plug (12 pins) of cable led from the machine head.
2. Remove the synchronizer cover.
3. Run the machine and stop with the needle at UP position. After the completion of the preparation, start the following adjustment:

(Adjustment)

1. While holding the light shielding disc by one hand turn the balance wheel to bring the timing mark (B) in line with timing mark (C).
2. Repeat pedaling operation (toe down and heel down) several times to make sure the needle can stop exactly at all times.
3. Then set the plug (12 pins) coming from the machine head into the receptacle.

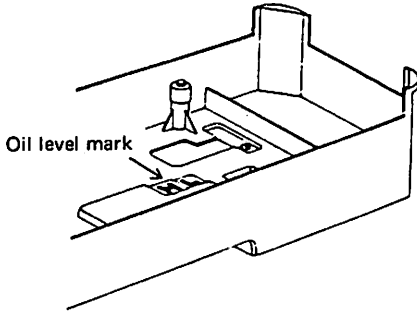


CAUTIONS ON USE

1 Oiling (1)

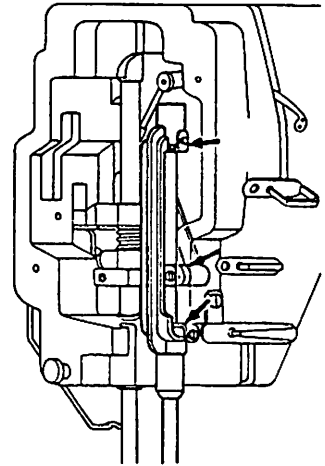
Fill the oil reservoir with oil up to "H" mark. Oil level should be periodically checked. If oil level is found below "L" level replenish oil to "H" level.

For oil, use white spindle oil specified by Mitsubishi.

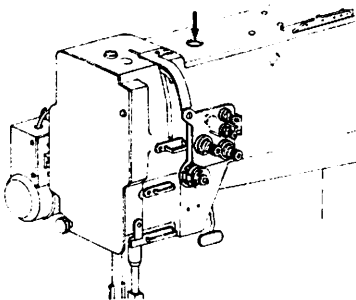


2 Oiling (2)

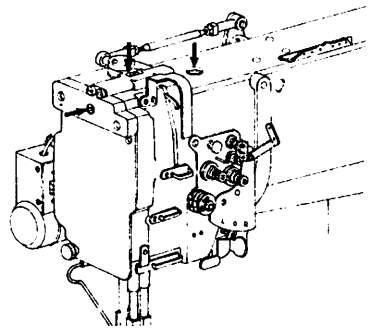
When a new sewing machine is used for the first time, or sewing machine left out of use for considerably long time is used again, replenish a suitable amount of oil to the portions indicated by arrow in the below figures.



Amount of oil ... \blacktriangleleft 5 ~ 6 drops



LT2-230

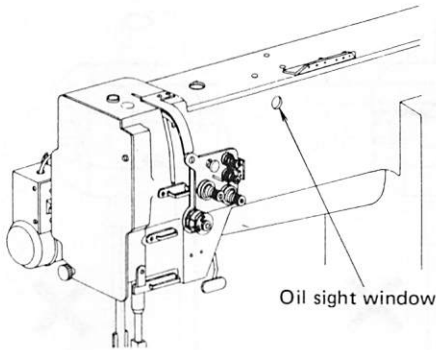


LT2-250

CAUTIONS ON USE

3 Oiling condition

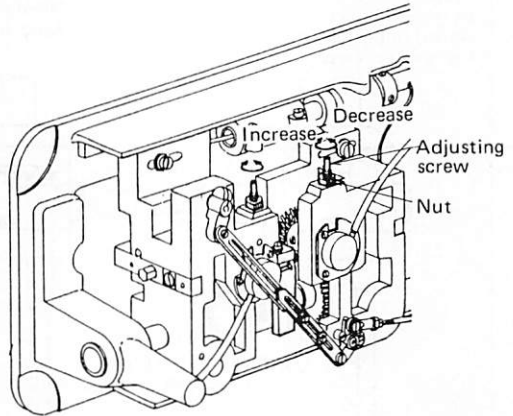
See dripping of oil during operation through the oil sight window to check oiling condition in the machine arm.



(Maintenance of motor)

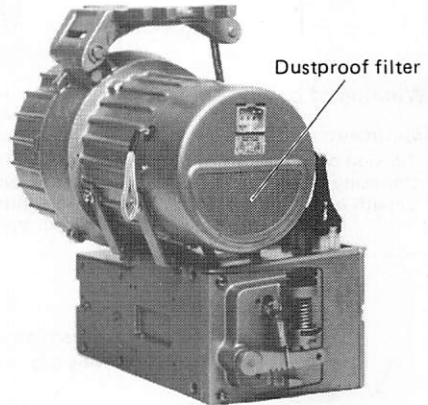
Remove dust from the motor filter every two or three months. (If operation is continued with the filter clogged with lint or dust, the motor might overheat.)

4 Adjustment on oiling to rotating hook



5 Cautions on operation

- (1) When the power is turned on or off, keep foot away from the pedal.
- (2) It should be noted that the brake may not work when the power is interrupted or power failure occurs during sewing machine operation.
- (3) Since dust in the control box might cause malfunction or control troubles, be sure to keep the control box cover close during operation.
- (4) Do not apply a multimeter to the control circuit for checking, otherwise voltage of multimeter might damage semiconductor components in the circuit.



OPERATION

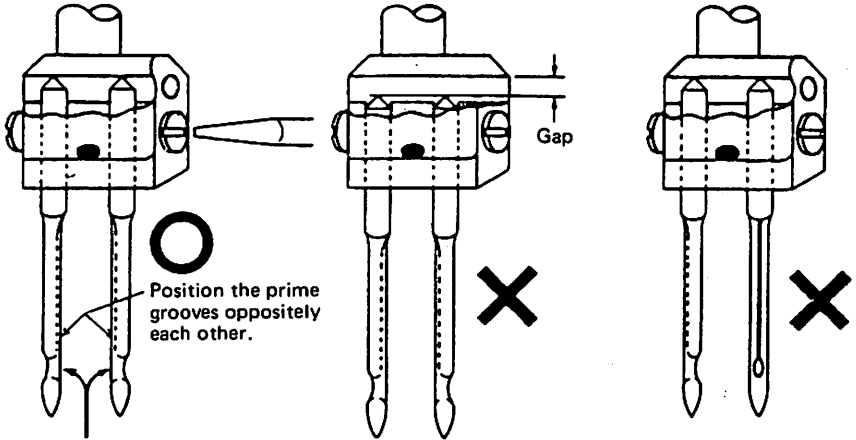
1 Installation of needles

Note: Before installing the needles, be sure to turn off the power.

Put each needle into needle socket until it is stopped at the bottom of needle socket and turn two needles so that their prime grooves are positioned oppositely each other. Then tighten set screws.

Needles are not fully inserted.

Needles are set in wrong direction.



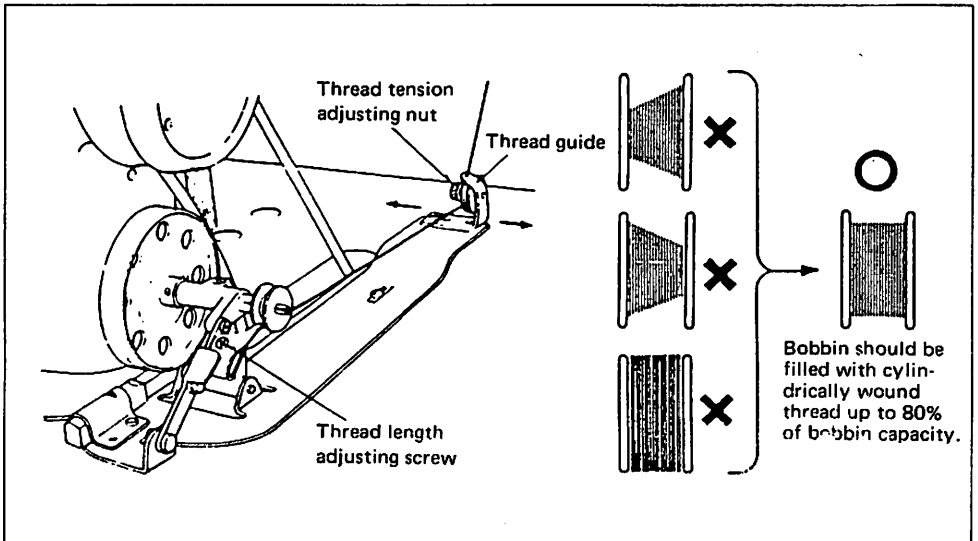
2 Winding of bobbin thread

Note: When bobbin thread is wound, keep the presser foot lifted.

Adjustment:

- Tension of wound thread
- Conically wound thread
- Length of wound thread

Slack winding is recommended for polyester thread and nylon thread. Move the thread guide toward smaller diameter of wound thread layer. Loosen the thread length adjusting screw to increase length of thread and tighten the screw to decrease length of thread.

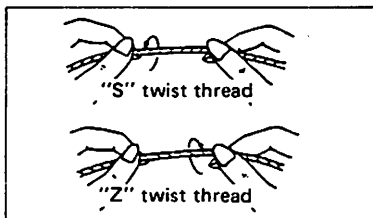


OPERATION

3 Selection of thread

It is recommended to use "S" twist thread in the left needle (viewed from front), and "Z" twist thread in the right needle.

When discriminate use of needle threads is impossible, use "Z" twist thread in both the needles. For bobbin thread, "S" twist thread as well as "Z" twist thread can be used.



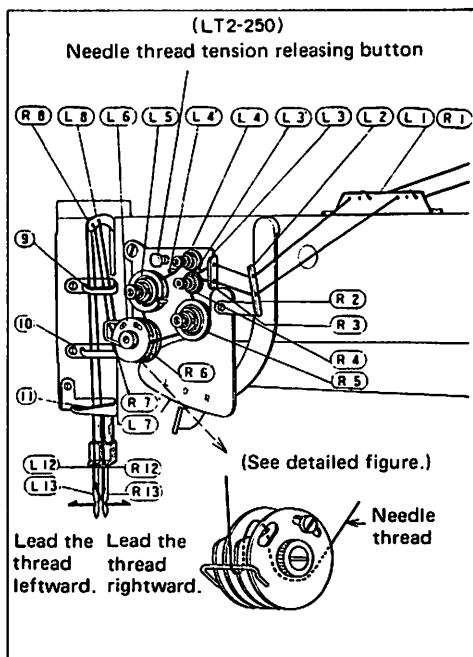
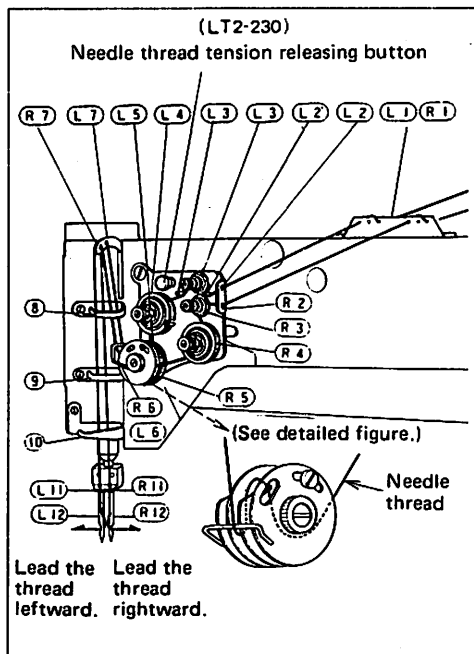
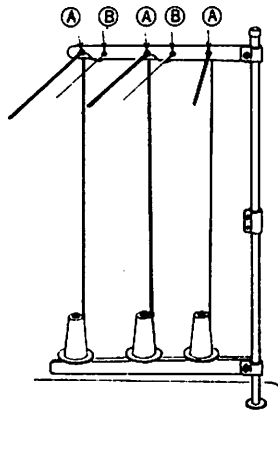
4 Threading of needle threads

(1) Pass each needle thread through thread guide (A).

Note: When thin slippery thread (polyester thread or filament thread, for example) is used, pass the thread through thread guide (B) as well.

(2) With the take-up lever located at the upper most position, pass each needle thread in the order shown in the following figure.

Note: Pressing the upper thread loosening button shown in the figure below opens the saucer of the upper thread tension adjuster, and the upper thread can easily pulled out.

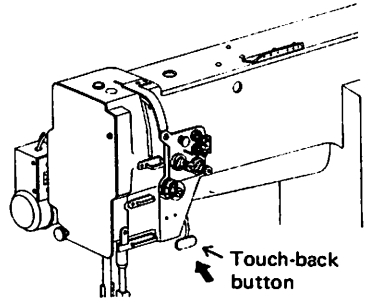
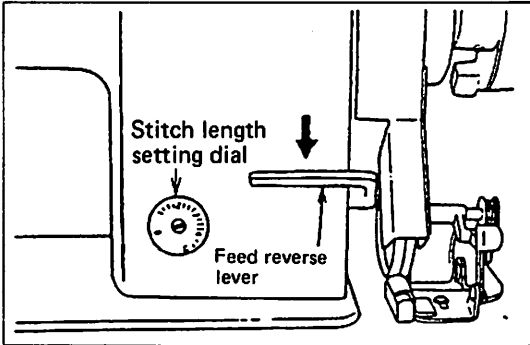


OPERATION

5 Adjustment of stitch length and stitch reversing (touch back)

Note: To make stitch length smaller, depress the feed reverse lever and set the stitch length setting dial to a desired position.

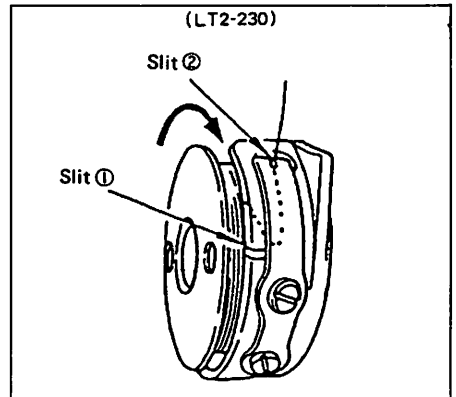
• Touch-back button . . . Direction of stitching can be reversed by depressing this button. Stitching goes on in reversed direction while the button is held down, and returns to forward direction when the button is released.



6 Setting of bobbin (LT2-230)

- (1) Hold the bobbin so that the bobbin thread is wound in right direction and put it into the bobbin case.
- (2) Pass the thread through the slit ① and pull it. The thread will be led out from the slit ②

*When the bobbin thread is pulled, the bobbin should rotate in the direction indicated by arrow in the figure.



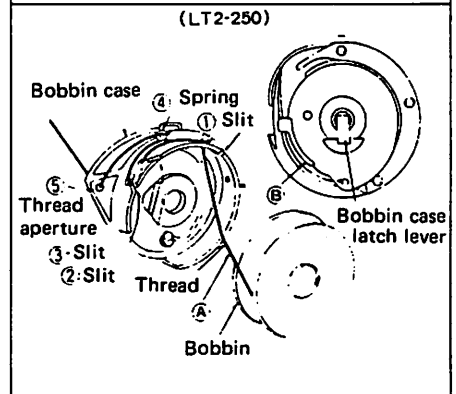
(LT2-250)

Threading in rotating hook (with tension spring) and installation of bobbin case

- (1) Pass the bobbin thread through slit (1) so that the thread can be unwound on the left side (A) of the bobbin.
- (2) Then pass the thread in the order from ① to ⑤ in the figure.
- (3) Match the protruded portion of rotating hook with the recessed portion (B) of bobbin case and install the hook and bobbin case to the rotating hook shaft.
- (4) Set the bobbin case latch lever.
- (5) Leave the thread end on the bed.

Note:

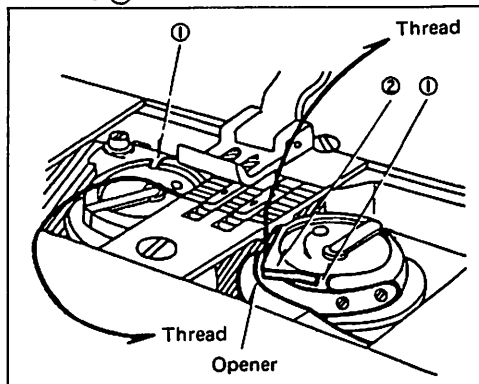
In LT2-250-BIT, the thread aperture (5) is not equipped with



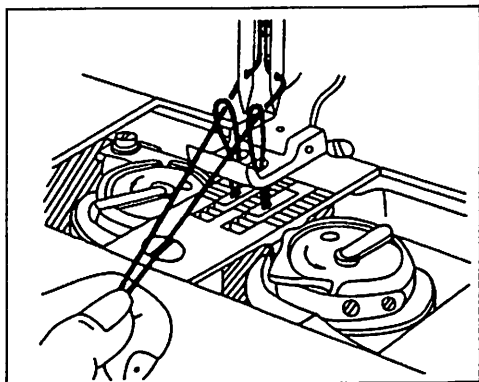
OPERATION

7 Threading of bobbin threads

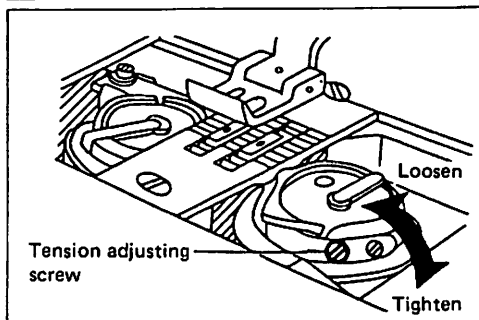
(1) Put bobbin thread into the slit ①, pass under the lug ② and extend it below the bed.



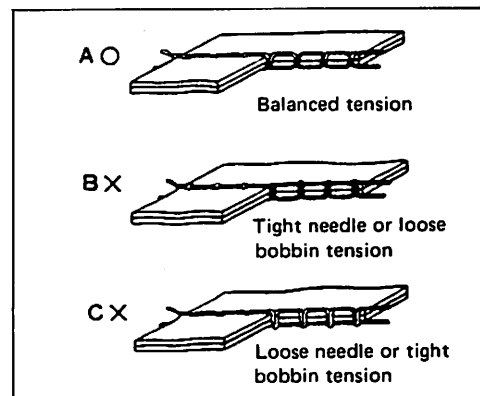
(2) While holding the two needle threads by left hand, rotate the handwheel one turn by right hand. By pulling up the needle threads, as shown in the figure, the bobbin threads will be lifted. Both of bobbin thread and needle thread should be aligned and led backward.



8 Tension adjustment of bobbin threads

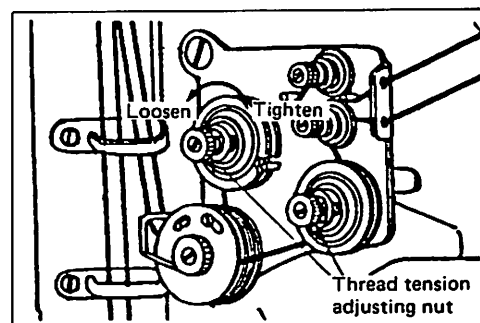


9 Balance of thread tension



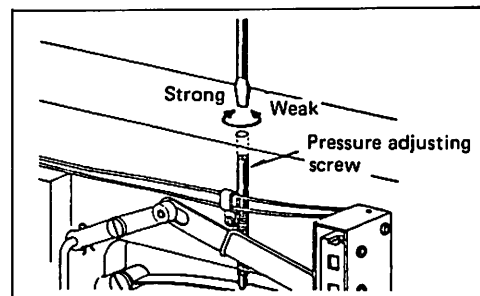
10 Needle thread tension

- Needle thread tension should be adjusted in reference to bobbin thread tension.
 - To adjust needle thread tension, turn each tension adjusting nut.
- Needle thread tension can be also adjusted for special fabric and thread by changing intensity and stroke of thread take up spring.



11 Adjustment of presser foot pressure

Pressure to fabric(s) can be adjusted by turning the pressure adjusting screw.



OPERATION

12 Timing between rotating hook motion and needle motion

(Among the following explanations, the size in upper line is for MITW and the size beneath it is for BIT.)

- (1) Set stitch length to "3.5" on the stitch length setting dial.
- (2) When needle is lifted 2.2 mm from the lowest position, as shown the following positional relationship should be maintained.

- The upper edge of needle eye should be 1.6 mm below the hook point.
- The hook point should be located at the center of needle axis.
- Gap between the hook point and the side face of needle should be 0.05mm.

- (3) Needle/rotating hook position can be adjusted as follows.
(For easy adjustment, it is recommended that the presser foot, throat plate and feed dog assemblies are removed.)

● Position adjustment of hook point

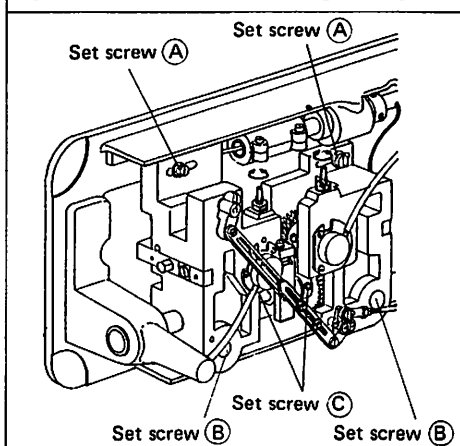
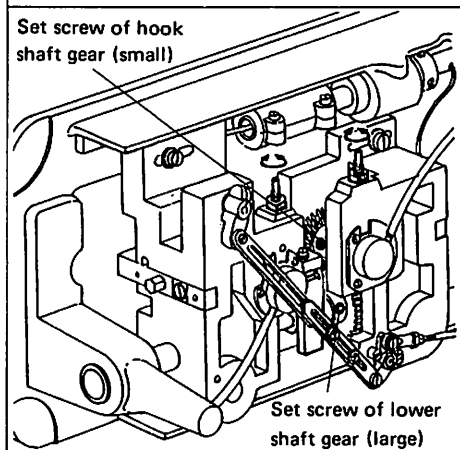
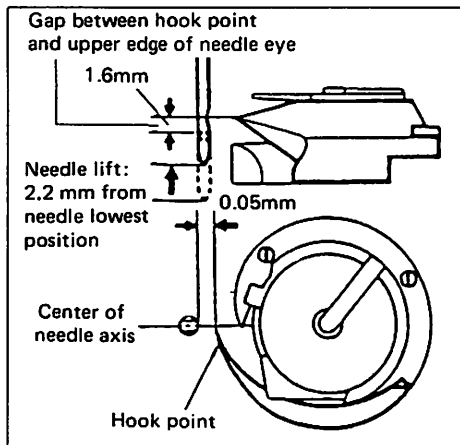
Adjust the hook point so that it comes to the center of needle axis.

- (1) Lean the machine head backward and loosen three set screws of hook shaft gear (small).
- (2) Turn the balance wheel and stop when the needle is lifted 2.2 mm from the lowest position.
- (3) Rotate the hook by hand to position the hook point to the center of needle axis.
- (4) Move the hook bracket leftward or rightward and position it so that gap between the hook point and side face of needle is 0.05 mm. For this adjustment, each screws A,B and two of C should be loosened.

Note: In the adjustment, do not excessively loosen set screws C and always maintain meshing of hook shaft gear and lower shaft gear.

- (5) Tighten the set screws in the following order:

- ① While pressing the lower shaft gear (large) against the side face of hook bracket, tighten the set screws C first.
- ② After checking gap between the needle and the hook, tighten the set screws A.
- ③ Then tighten the set screws B.

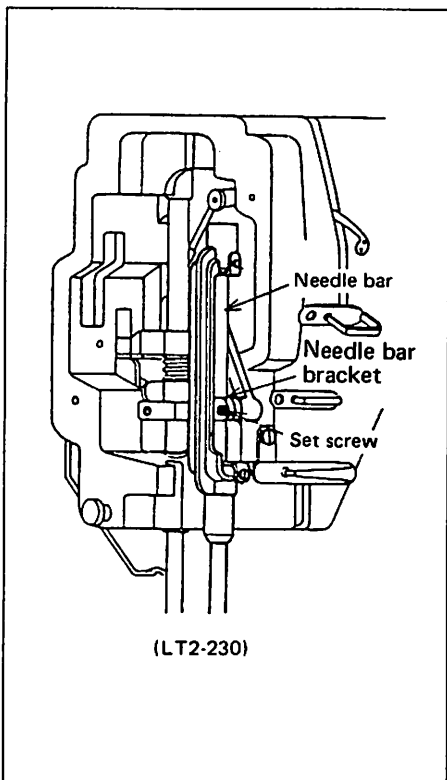


OPERATION

● Position adjustment of needle point

Adjust needle position so that gap between the upper edge of needle eye and the hook point is 1.6 mm when the needle is lifted by 2.2 mm from its lowest position.

- (1) Remove the face plate, loosen the set screw of needle bar bracket and vertically move the bar to adjust.
- (2) After the adjustment, tighten the set screw.



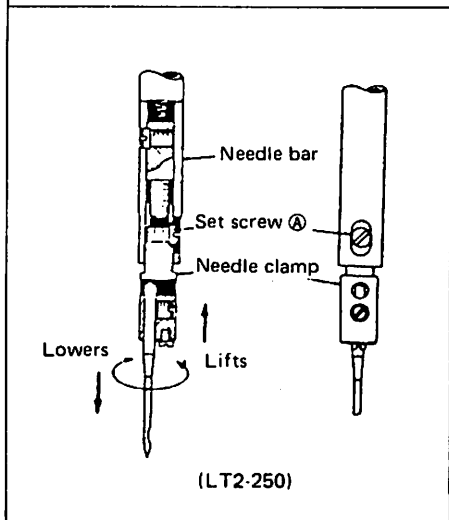
(LT2-230)

(LT2-250)

● Needle vertical position adjustment

Adjust vertical position of needle after one needle bar is located at its top position.

- (1) Remove the set screw (A).
- (2) Rotate one turn the needle clamp, thereby needle position can be changed by 0.6mm (equal to pitch of needle bar screw).
The needle lifts when the needle clamp is turned clockwise, and lowers when turned counterclockwise.
- (3) Return the needle clamp to the position before the adjustment and retighten the set screw (A).



(LT2-250)

OPERATION

13 Adjustment of feed dog height

Height of feed dog and pressure of presser foot should be adjusted for individual fabric(s) with the following cautions:

- ◆ Fabric will be damaged if the feed dog extends too high, or pressure of presser foot is too large.
- ◆ Even stitch length cannot be assured if the feed dog is too low or pressure of presser foot is too small.
- ◆ Feed dog height should be measured at the point where the needle is at the top position.

For light fabrics . . . Approx. 0.8mm from throat plate

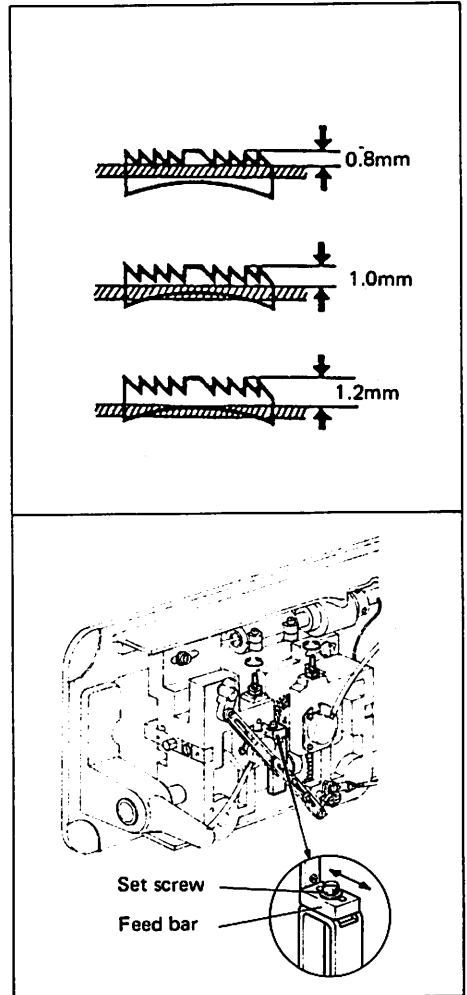
For usual fabrics . . . Approx. 1.0mm from throat plate

For heavy fabrics . . . Approx. 1.2mm from throat plate

Adjustment procedure

- (1) Lean the machine head backward.
- (2) Turn the handwheel by hand and stop when the feed dog rises to the maximum height.
- (3) Loosen the feed bar set screw.
- (4) Vertically move the feed bar (in the direction indicated by arrow in the figure) to adjust it to adequate height.
- (5) After the adjustment, tighten the feed bar set screw.

The feed dog height is factory-adjusted to 1 mm.

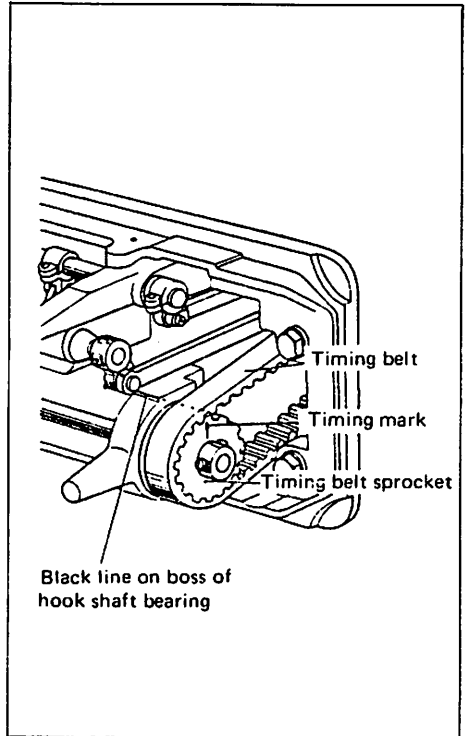


OPERATION

14 Relationship between rotating hook motion and take-up lever motion

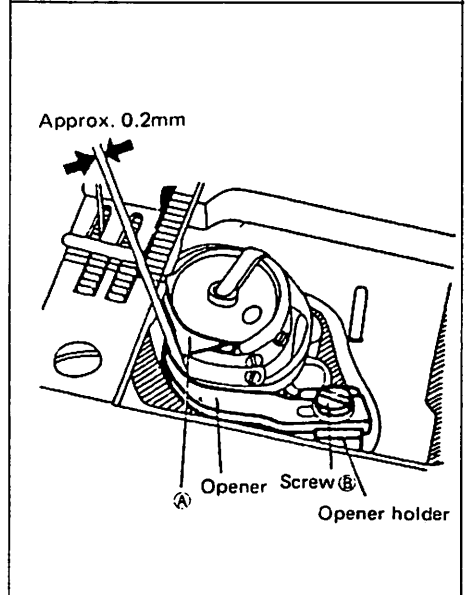
When the timing belt (cog belt) was removed for its replacement, for example, the relationship between rotating hook motion and take-up lever motion should be adjusted as follows:

- (1) Turn the balance wheel and stop when the take-up lever is lifted to its top position.
- (2) Lean the machine head backward and make sure the arrow (timing mark) put on the timing belt is in line with the black line on the boss of hook shaft bearing.
- (3) If the timing mark is not in line with the black line, remove the timing belt and install it again to adjust.



15 Relationship between hook motion and opener motion

- (1) Turn the balance wheel by hand and stop when the opener holder is located most remotely from the throat plate.
- (2) Make sure gap between the bobbin case (A) and the opener is approximately 0.2 mm.
- (3) If the gap is too large or small, loosen the opener set screw (B) and adjust position of the opener.

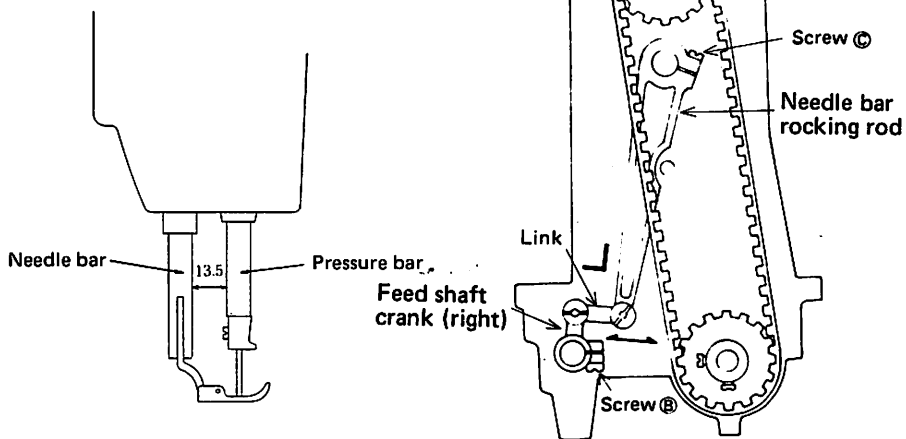
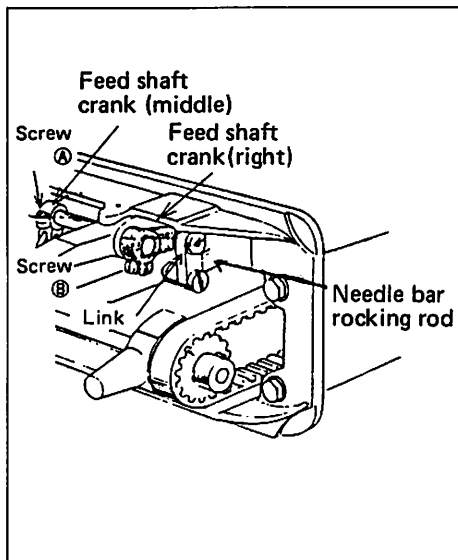


OPERATION

16 Relationship between needle motion and feed dog motion (LT2-230)

○ The feed dog should be adjusted so that the needle can plunge into the feed dog needle hole at the center of the hole.

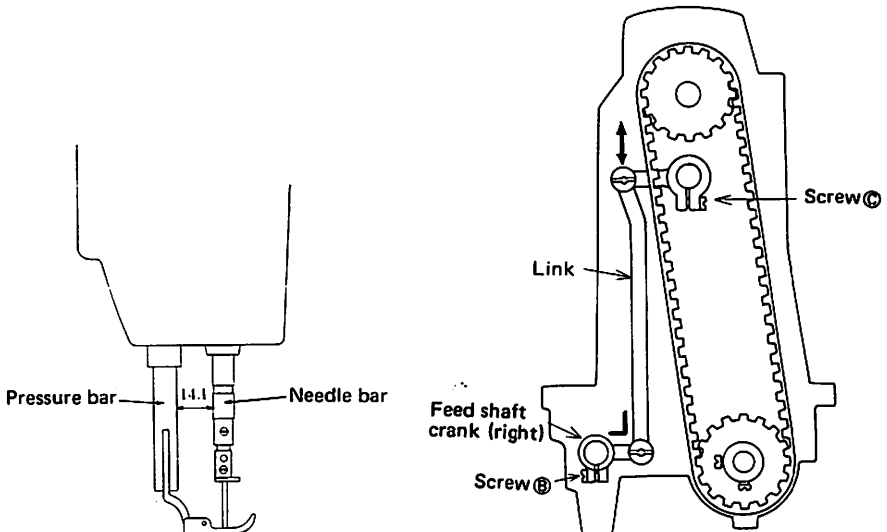
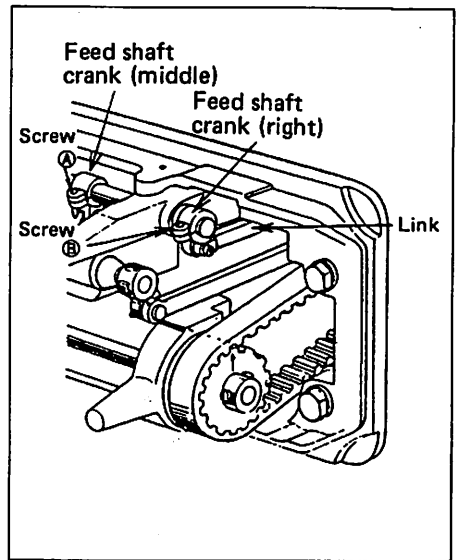
- (1) Set stitch length to "0" on the stitch length setting dial.
- (2) Lean the machine head backward.
- (3) Loosen the feed shaft crank set screw (A) and (B).
- (4) Lower the needle to the lowest position.
- (5) Adjust the distance between the pressure bar and the needle bar to be 13.5, and tentatively tighten the screws (A) and (B) of the feed shaft crank.
- (6) Check that the right feed shaft crank is connected with the link at right angle, as shown in Figure.
- (7) If the connection is not at right angle, remove the back cover, loosen the screw (C) and move the needle bar rocking rod in the arrow direction to adjust.
- (8) After the completion of adjustment, fully tighten the screws (A), (B) and (C).



OPERATION

Relationship between needle motion and feed dog motion (LT2-250)

- The feed dog should be adjusted so that the needle can plunge into the feed dog needle hole at the center of the hole.
- (1) Set stitch length to "0" on the stitch length setting dial.
 - (2) Lean the machine head backward.
 - (3) Loosen the feed shaft crank set screw (A) and (B).
 - (4) Lower the needle to the lowest position.
 - (5) Adjust the distance between the pressure bar and the needle bar to be 14.1, and tentatively tighten the screws (A) and (B) of the feed shaft crank.
 - (6) Check that the right feed shaft crank is connected with the link at right angle, as shown in Figure.
 - (7) If the connection is not at right angle, remove the back cover, loosen the screw (C) and move the Link in the arrow direction of the figure to adjust.
 - (8) After the completion of adjustment, fully tighten the screws (A), (B) and (C).



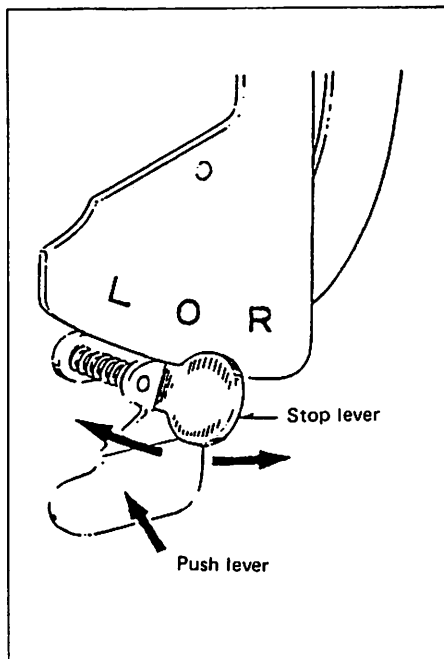
OPERATION

17 Needle bar (left or right) stop operation (LT2-250)

- The stop lever should be set to "L" or "R" position.

Note: Although the stop lever can be operated during sewing operation, it is recommended for safe operation that the sewing machine is stopped with the take-up lever at nearly its top position and the lever is set.

- (1) Left needle bar stop operation
Move the stop lever to "L" position to stop the left needle bar.
- (2) Right needle bar stop operation
Move the stop lever to "R" position to stop the right needle bar.
- (3) Two needle bar operation
To change single-needle (left or right) operation to double-needle operation, depress the push lever backward. The stop lever will automatically return to "0" position and double-needle operation becomes possible.

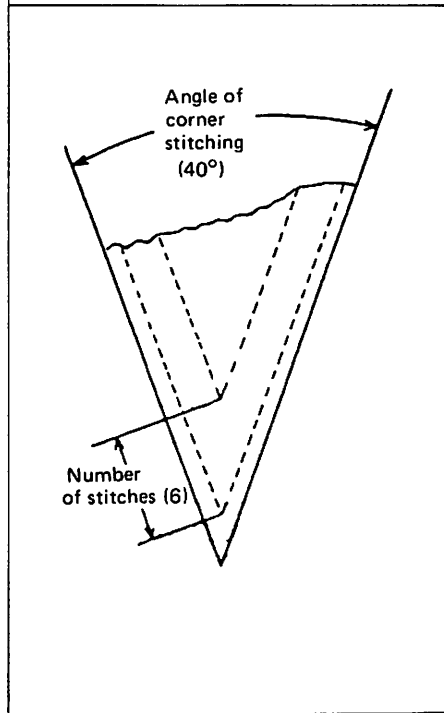


18 Relationship between angle of corner stitching and stitch length

- (1) In order to assure neat corner stitching, stitch length should be determined in reference to angle of corner stitching from the following table (applicable only to 1/4 needle width).
- (2) By determining stitch length of inside stitching for a given angle of corner stitching, the number of outside corner stitches can be identified from the table.
- (3) Ex.: When stitch length of 40° corner stitching is determined to 2.9mm, the number of stitches is "6".

Relationship between stitch length and number of stitches (applicable only to 1/4 needle width)

Number of stitches \ Angle of corner stitching	2	3	4	5	6	7	8
30°				4.8	4	3.7	3.0
40°			4.4	3.5	2.9	2.5	2.2
50°		4.6	3.4	2.7	2.3	2.0	1.7
60°	5.5	3.7	2.8	2.2	1.9	1.6	
70°	4.6	3.0	2.3	1.8	1.5		
80°	3.8	2.5	1.9	1.5	1.3		
90°	3.2	2.1	1.6	1.3			
100°	2.7	1.8	1.3				
110°	2.2	1.5					
120°	1.8	1.2					
130°	1.5						
140°	1.1						

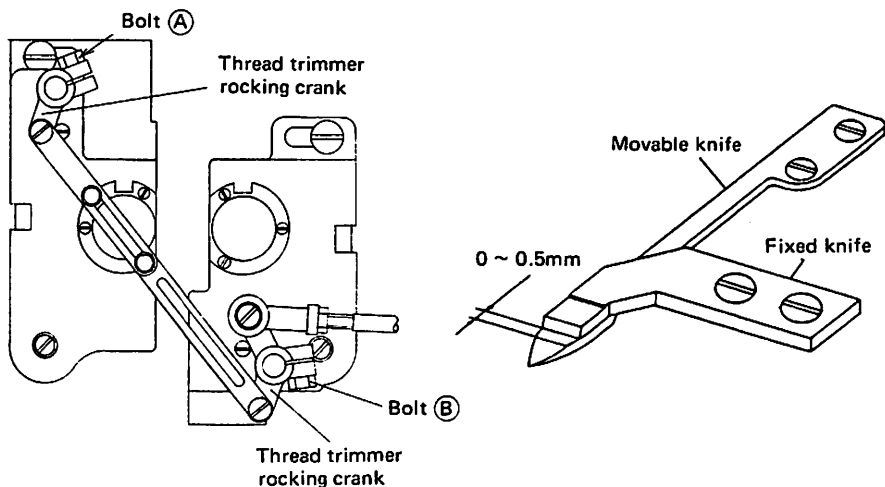


OPERATION

19 Installation of movable knife

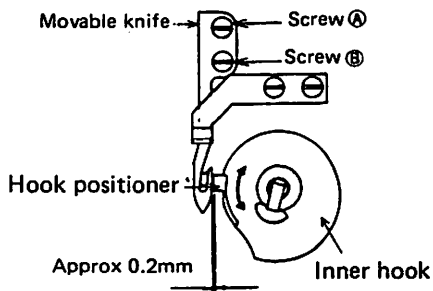
1. Initial position of movable knife

- (1) Turn the balance wheel and lower the needle bar to the lowest position.
- (2) Push the cam follower crank so that the cam roller enters into the thread trimmer cam groove.
- (3) Turn the balance wheel until the black mark point on the arm meets the white mark point on the balance wheel.
Set the cam follower crank at this position with a screwdriver temporarily preventing the cam roller coming out from the cam groove.
- (4) Loosen the thread trimmer rocking crank clamp bolts (A) and (B).
- (5) Adjust the movable knife so that the movable knife end slant portion protrudes 0 – 0.5 mm from the fixed knife, as shown in Figure and tighten the bolts (A) and (B) .



2. Gap between movable knife and bobbin case holder stopper

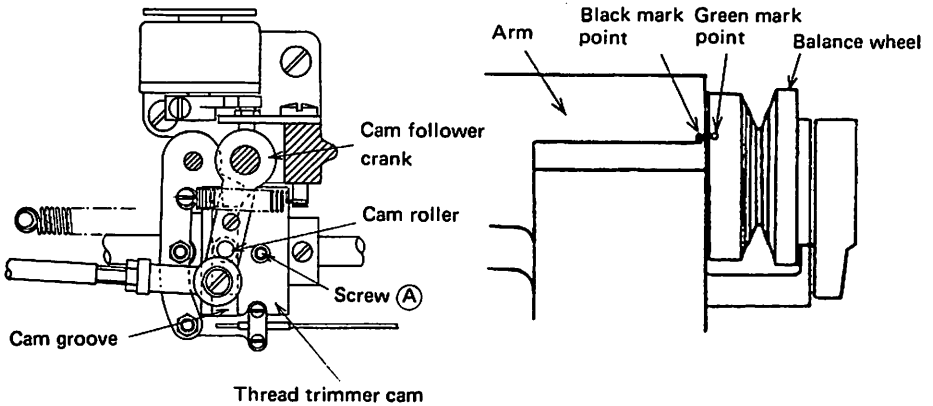
- (1) Turn the balance wheel by hand until needle reaches the lowest position.
- (2) With the needle at the lowest position, depress cam follower crank, turn the balance wheel until the movable knife reaches the extremity of its stroke.
- (3) Manually rotate the inner hook in the direction indicated by arrow in Figure and adjust gap between the movable knife and the inner hook stopper to about 0.2 mm (the screws (A) and (B) should be loosened for this adjustment).



OPERATION

20 Adjustment of thread trimmer cam

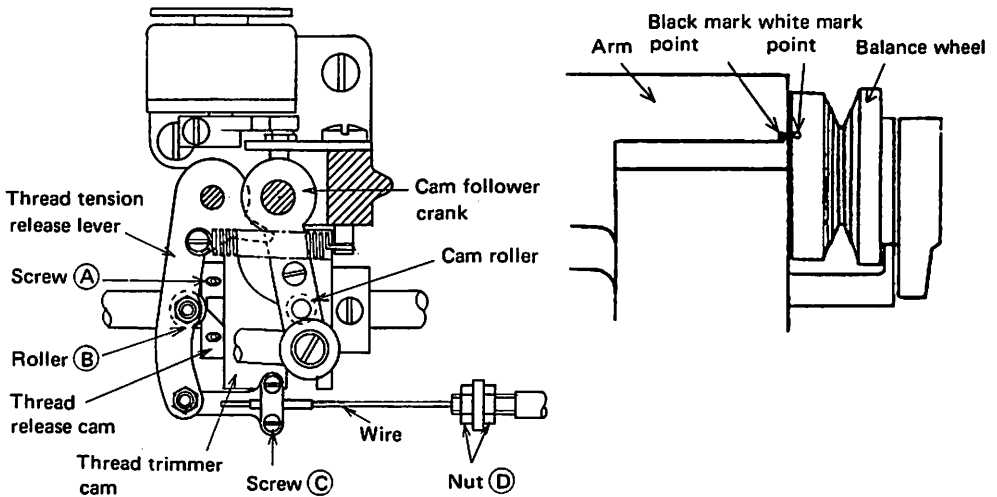
- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread trimmer cam so that the movable knife starts moving when the green mark point on the balance wheel comes in line with the black mark point on the arm.
To adjust, loosen two thread trimmer cam clamp screws (A).



OPERATION

21 Adjustment of thread tension regulator

- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) Maintaining the needle position, depress the cam follower crank and put the cam roller into the groove of thread trimmer cam.
- (3) Turning the balance wheel by hand, adjust the thread tension release cam so that the tension disc close when the white mark point on the balance wheel comes in line with the black mark point on the arm.
To adjust, loosen two tension release cam clamp screws (A).
- (4) Opening degree of tension disc should be adjusted with the tension release roller (B) mounted on the convexed portion of thread release cam, as shown in Fig.
To adjust, loosen the screws (C) and draw the wire.
- (5) Make fine adjustment by loosening the nut (D).



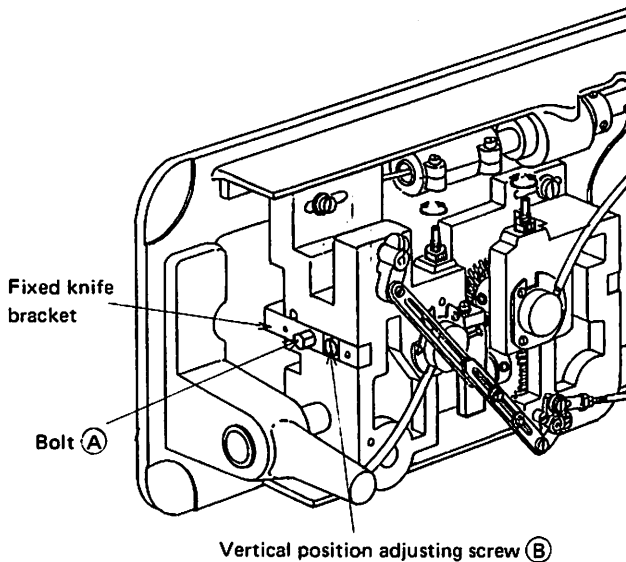
OPERATION

22 Adjustment of meshing pressure of movable knife and fixed knife

- (1) Loosen the fixed knife bracket clamp bolt (A).
- (2) Turn the vertical position adjusting screw (B) to adjust meshing pressure and then tighten the bolt (A).

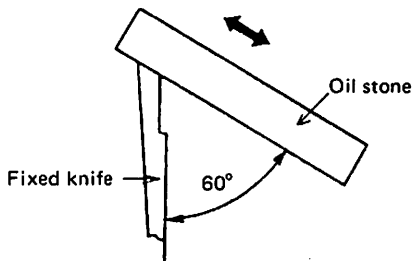
Note: Since excess pressure causes large torque to the thread trimming mechanism and trimming failure, adjust it so that thread can be trimmed with minimum pressure.

- (3) Move the movable knife and check that the thread can be sharply trimmed.



23 Sharpening of fixed knife

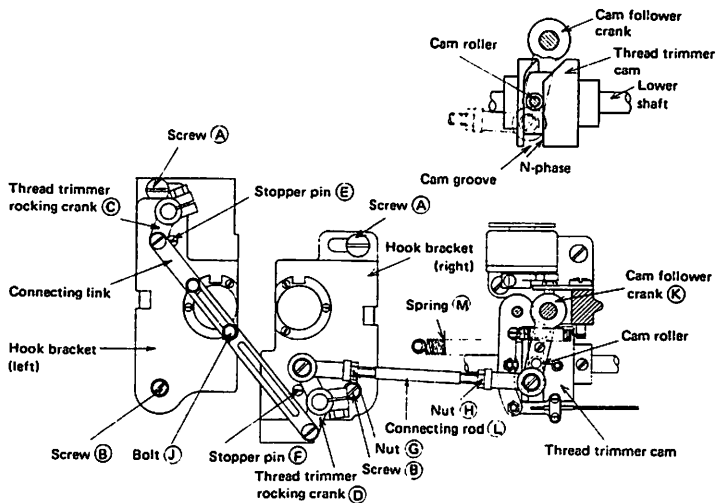
When the knives dull, the fixed knife should be sharpened as illustrated in Fig. Since it is very difficult to sharpen the movable knife, replace it with a new one when it dulls.



OPERATION

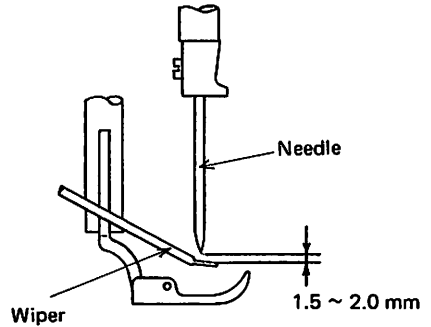
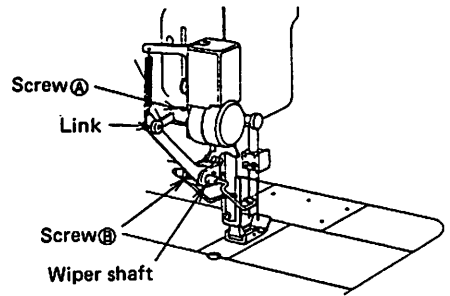
24 Adjustment for change of needle gage

- (1) Replace the throat plate, feed dog and needle clamp.
(Since the throat plate and feed dog are special parts designed for thread trimming machine, be sure to use those specified by us.)
- (2) Lean the machine head backward.
- (3) Loosen two connecting link clamp bolts (J).
- (4) Remove the spring (M).
- (5) Loosen the hook bracket clamp screws (A) and (B) and adjust gap between each needle and hook.
- (6) When the needles and hooks have been adjusted, install the spring (M).
- (7) Contact the rocking cranks (C) and (D) to the stopper pins (E) and (F) and tighten the connect link clamp bolt (J).
- (8) Turn the balance wheel by hand until the needles reach the lowest position.
- (9) Loosen the nuts (G) and (H).
- (10) Depress the cam follower crank (K) and adjust the connecting rod (L) so that the cam roller can smoothly enter the groove of thread trimmer cam. Then tighten the nuts (G) and (H).
- (11) Adjustment of the cam groove and the cam roller
 - (a) Push the cam follower crank so that the cam roller enters into the cam groove.
 - (b) Turn the connecting rod (L) and adjust the clearance between the cam roller and the cam groove surface (N) as small as possible, and tighten the nuts (G) and (H).
 - (c) Push the cam follower crank again and check that the cam roller enters into the thread trimmer cam groove smoothly.

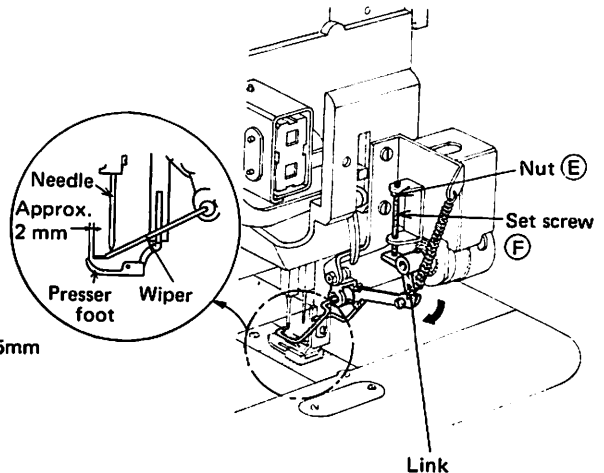
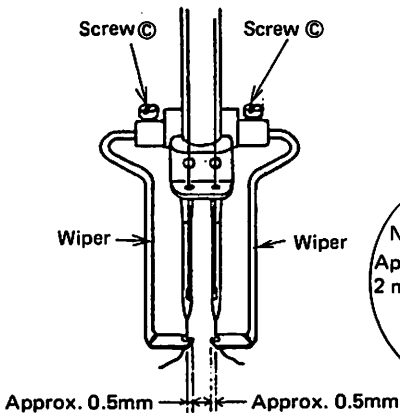


25 Wiper adjustment

- (1) Set stitch length dial to "5" and stop the sewing machine with the needle at UP position.
- (2) Loosen the screw (A) and adjust the link to be parallel with the bed surface, as shown in Fig.
- (3) Loosen the screw (B) and turn the wiper shaft to adjust so that gap between the tip of wire and needle point is within a range from 1.5mm to 2mm.
- (4) Loosen the nut (E) and turn the screw (F) to adjust the clearance between the wiper point and the presser foot becomes about 2 mm when the link is pushed by finger as shown
- (5) Pass each needle thread through needle eye.
- (6) Loosen the screw (C) and move the wiper 0.5 mm leftward or rightward to adjust so that thread can be securely hooked by the wiper.



Caution: For a gauge size over 5/8" (16 mm), replace with the separate wiper shaft.



ADJUSTMENT AND OPERATION OF CONTROL UNIT

1 "1-2 POSITION" select switch

Needle stop position can be selected between "1-POSITION" and "2-POSITION".

● ————— mark "2-POSITION"

● ————— mark "1-POSITION"

When the switch set at "1 POSITION", thread is trimmed in one turn of the sewing machine when the pedal is kicked back by heel.

2 Pedal operation

The pedal operation and resultant motion (stitching, thread trimming and needle motion) are as follows;

Pedal operation "1-2 POSITION" switch setting	Toe down ↓ Neutral	Neutral ↓ Light heeling	Neutral ↓ Full heeling
1 POSITION	Stop with needle at "UP" position	Presser foot goes up	Presser foot goes UP after one turn and thread trimming
2 POSITION	Stop with needle at "DOWN" position	Presser foot goes up	Presser foot goes UP after half (needle DOWN to UP) and thread trimming
Pedal operation			

- Notes:
1. Stitching speed can be changed by changing degree of pressing down of the pedal.
 2. For automatic presser foot lift, use optional unit, LE-FM-1 or LE-FM-2, or solenoid valve (DC 24V).
 3. For tackstitching, use optional control bracket, LD-C2, C4 or C6.

3 Adjusting the pedaling forces

1. Adjusting the pedal toe down force

The pedal toe down force can be adjusted by changing hooking position of the coil spring to the lever.

It should be noted that the lever may not be stopped at position if the force is adjusted too small.

2. Adjusting the pedal heeling force

To adjust, loosen nut "A" and turn bolt "B".

After the adjustment, tighten nut "A" (see Fig. 6).

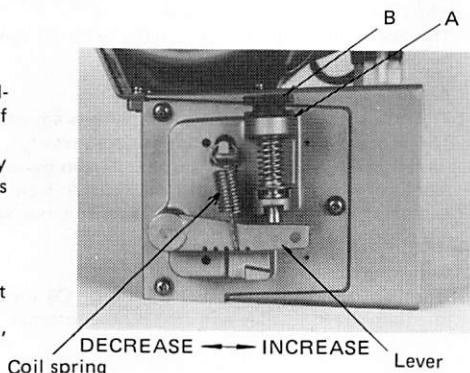


Fig. 6 Adjusting the pedal pressing down force

ADJUSTMENT AND OPERATION OF CONTROL UNIT

4 Adjusting the stitching speed

1. Adjusting the maximum stitching speed

- (1) Adjusting the maximum speed (Maximum speed is the speed achieved when the pedal is fully pressed down)

Two variable resistors are available for adjustment of the maximum speed: one is located in the control box and the other is on the control box front panel.

The variable resistor on the control box front (external VR) permits adjustment of speed within the range from the low (minimum) speed to the maximum speed set by the internal variable resistor "H".

The internal variable resistor "H" is set by us when the motor is shipped as follows:

Pole	Internal variable resistor "H" setting	External variable resistor adjustable range
2 pole	3700 rpm (LT2-230 MITW) 3000 rpm (LT2-250, LT2-230 BIT)	Maximum speed ~ 250 rpm

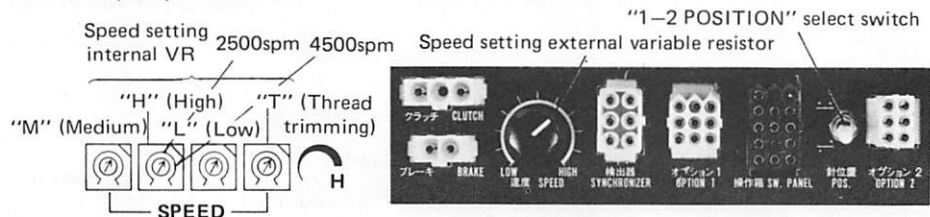
For speed setting out of the adjustable range of the external variable resistor, the setting of internal variable resistor "H" must be changed.

Marks are put on the internal variable resistor "H" at two points (2,500 rpm and 4,500 rpm), as shown in Fig. 7, for reference.

For fine speed adjustment, use a speed meter

CAUTION

- (1) Speed faster than that set on the two variable resistors cannot be achieved by increasing motor pulley diameter over a certain diameter.



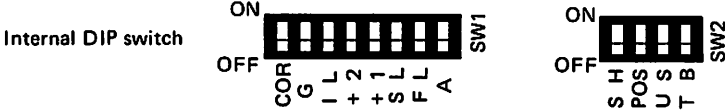
- (2) Adjusting the low speed (Positioning speed is the speed when the pedal is pressed down slightly)
The positioning speed (low speed) can be adjusted by the internal variable resistor "L". Speed increases when the internal variable resistor "L" is turned clockwise, and decreases when turned counter-clockwise.
The positioning speed is adjustable within a range from 160 rpm to 320 rpm (set to 250 rpm by us).
- (3) Adjusting the thread trimming speed
The internal variable resistor "T" permits adjustment of thread trimming speed.
The speed increases when the variable resistor "T" is turned clockwise, and decreases when turned counter-clockwise. (set to 200 rpm by us).
Since thread trimming speed may differ from machine to machine, refer to the instruction manual of the sewing machine or consult our service agency for readjustment of thread trimming speed.
- (4) Adjusting the bartacking speed
When an operation box, LD-C2, C4 or C6 (option) is used for bartacking, bartacking speed (medium speed) can be adjusted by the internal variable resistor "M".

ADJUSTMENT AND OPERATION OF CONTROL UNIT

5 Optional functions

By connecting external (optional) control signal to the option connector, and setting the correspond internal DIP switch, various optional functions can be used.

For details, consult with our service agency.



(1) Internal DIP switch

- COR** : Correction stitching (high-speed stitching switch)
- G** : Gain switch (to be set at "ON")
- A** : High-speed stitching switch for stand working type sewing machine (not necessary when external variable resistor is available)
- SH** : One-shot function switch
- IL** : Thread trimmer interlock release switch
- POS** : "1-2 POSITION" (thread trimming)
- US** : Needle "UP" position stop by touch-back switch
- TB** : Back solenoid operation at thread trimming
- FL** : Automatic presser foot lift (by S₂)

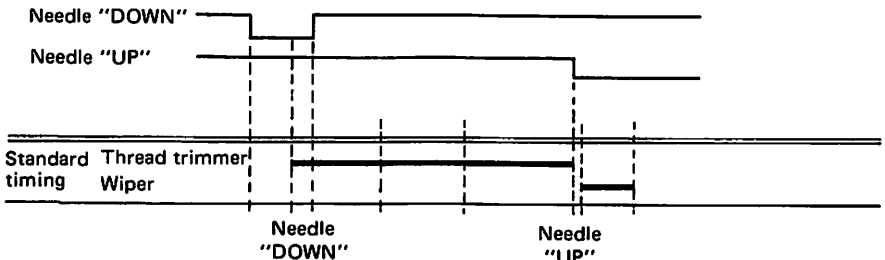
+ 2 }
+ 1 } Slow start control switch
S L }

	0	1 stitch	2 stitches	3 stitches	4 stitches
S L	OFF	ON	ON	ON	ON
+ 1	OFF	OFF	ON	OFF	ON
+ 2	OFF	OFF	OFF	ON	ON

(2) Automatic thread trimming timing chart

The timing of automatic thread trimmer operation should be adjusted in accordance with the instruction written in the sewing machine setting up procedure.

The timing chart is as follows:

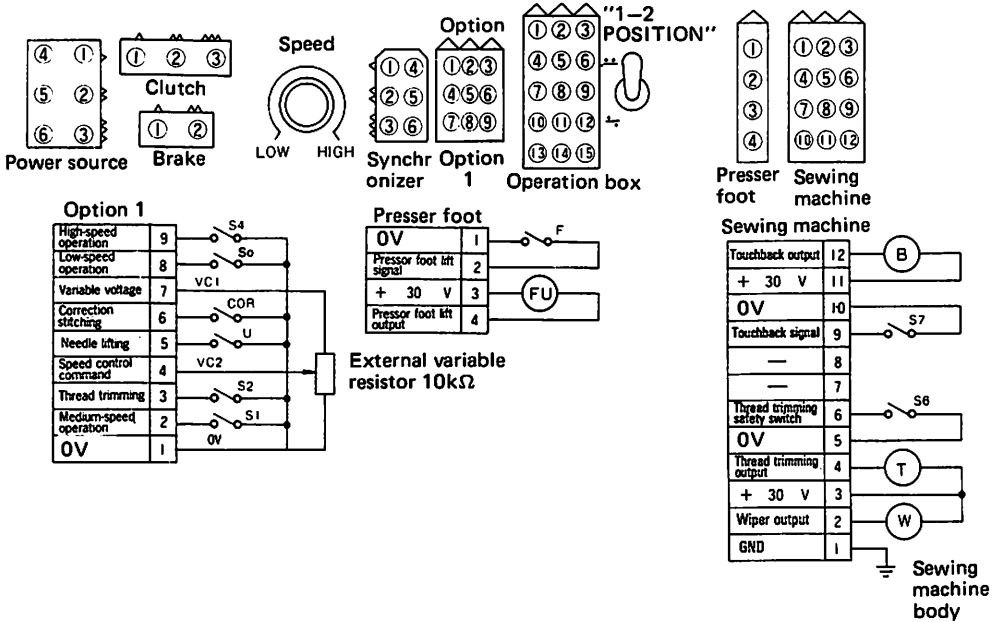


ADJUSTMENT AND OPERATION OF CONTROL UNIT

(3) Option connector

Various external controls can be used by connecting external signal to the option connector.

For contacts necessary for input signal, use reliable one.

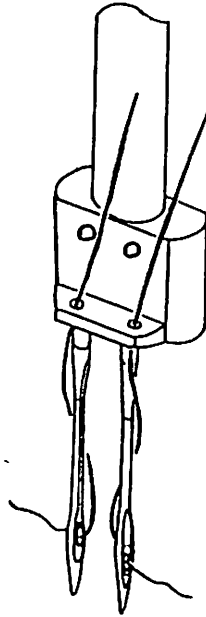


(4) Reverse stitching by touchback switch

Touchback switch (S₇) is operative only while the sewing machine is in operation.

CAUTION: Threading for light fabric stitching

When a needle of small gauge (below #11) is used, each needle thread should be wound about 3/4 turn around needle and then passed through needle eye, as shown below, to assure neat stitches. It is recommended to use stepped needle.



(Caution)

Adjustment of Needle Stop Position (LT2-230-B1T, LT2-250-B1T)

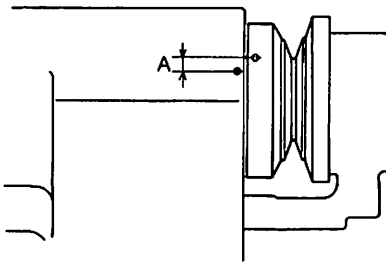
The machines, LT2-230-B1T and LT2-250-B1T, are shipped out after completion of the sewing and thread trimming tests with the thread of vinylon No.8 for both the needle and bobbin on three-folded denim (0.8mm in thickness).

It is necessary to adjust the needle stop position after the thread is trimmed according to the thickness and material of the used sewing thread, and the thickness and material of the fabric to be sewn. Follow the adjusting procedure mentioned below.

Adjustment

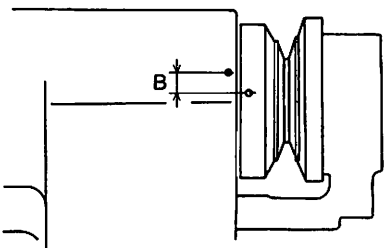
Check the distance between the white mark on the balance wheel and the black mark on the arm when the needle stops at UP position after the fabric is sewn and the thread is trimmed.

1. When the needle stop early;



If the distance A shown left is 2 mm or more, the malfunction of the knives occur, and the needle threads and the bobbin threads (at the left and right sides) are not trimmed properly.

2. When the needle stop late;



If the distance B shown left is 5 mm or more, the clearance between the needle and the throat plate becomes narrow.

3. Adjusting Method

If the needle stop position is deviated as shown above, adjust the setting location of the synchronizer detector disc so that the distance A may be within 2 mm and the distance B within 5 mm according to the adjusting procedure mentioned in the section [3], Adjustment of Needle Bar Stop Position, on the page 2 of the Instruction Manual. In adjusting, make sure of the stop position after the sewing and the thread trimming is actually completed.

SPECIFICATIONS

Specifications of LT2-230 and LT2-250

Model	LT2-230-M1TW				LT2-250-M1TW				LT2-230-B1T		LT2-250-B1T		LT2-250-A1T	
Spec.	Medium-heavy fabric								Medium-heavy fabric					
Stitching speed (Max.)	4000 spm	3500 spm	3500 spm	3000 spm	3000 spm	2500 spm	3000 spm	2500 spm	3000 spm	2500 spm	3000 spm			
Stitch length	0~4 mm	5 mm	0~4 mm	5 mm	0~6 mm	7 mm	0~6 mm	7 mm	0~6 mm	7 mm	5 mm			
Needle bar stroke	33.4 mm		32.0 mm		35.0 mm			32.0 mm						
Presser foot stroke	Knee lifter: 9 mm Hand lever: 7 mm				Knee lifter: 13 mm hand lever: 7 mm									
Needle	DP x 5 #14 (#11~#18)								DP x 5 #18 (#14~#21)					
Rotating hook (for thread trimmer use)	Full-rotation, automatic lubrication, horizontal type hook, equipped with raching prevention spring				full-rotation, automatic lubrication, horizontal type hook, equipped with raching prevention spring									
Bobbin case			Equipped with spring				Equipped with spring							
Bobbin	Aluminum bobbin for thread trimmer use				Aluminum bobbin for thread trimmer use									
Thread trimming method	Combination of fixed knife and movable knife													
Lubrication	Automatic lubrication													
Automatic back	Touch-back													
Bed size	517 x 178 mm													

- Notes:
- Feed dog, throat plate, rotating hook, bobbin case and bobbin should be those designed for thread trimmer.
 - Bobbin should be of high quality free from deformation.