

# **MITSUBISHI INDUSTRIAL SEWING MACHINE**

**TECHNICAL INFORMATION**

**Model LU2-410. -430**

**Single, Double-Needle  
Lockstitch, Compound feed, Automatic  
Thread, Variable Speed**

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**ET-019A**  
 **MITSUBISHI  
ELECTRIC**

## CONTENTS

|  |        |
|--|--------|
| MACHINE HEAD CONSTRUCTION .....                                      | 1      |
| SPECIFICATIONS .....   | 2      |
| THREAD TRIMMER DIAGRAM .....   | 3      |
| PREPARATIONS FOR OPERATION .....                                     | 4 ~ 5  |
| 1. POWER CABLE WIRING .....  | 4      |
| 2. CONNECTION WITH CONTROL BOX .....                                 | 5      |
| 3. ADJUSTMENT OF NEEDLE BAR STOP POSITION .....                      | 5      |
| NOTE ON USE .....  | 6 ~ 7  |
| 1. OILING (1) .....  | 6      |
| 2. OILING (2) .....  | 6      |
| 3. LUBRICATION CONDITION .....                                       | 7      |
| 4. ADJUSTMENT OF LUBRICATION TO ROTATING HOOK .....                  | 7      |
| 5. HANDLING INSTRUCTIONS .....                                       | 7      |
| HOW TO USE THE SEWING MACHINE .....                                  | 8 ~ 17 |
| 1. INSTALLATION OF NEEDLES .....                                     | 8      |
| 2. WINDING OF BOBBIN THREAD .....                                    | 8      |
| 3. SELECTION OF THREAD .....   | 9      |
| 4. THREADING OF NEEDLE THREADS .....                                 | 9      |
| 5. ADJUSTMENT OF STITCH LENGTH AND REVERSE SEWING (TOUCH BACK) ..... | 10     |
| 6. SETTING OF BOBBIN .....   | 10     |
| 7. WINDING OF BOBBIN THREADS .....                                   | 11     |
| 8. TENSION ADJUSTMENT OF BOBBIN THREADS .....                        | 11     |
| 9. BALANCE OF THREAD TENSION .....                                   | 11     |
| 10. TENSION OF NEEDLE THREAD .....                                   | 11     |
| 11. ADJUSTMENT OF PRESSER FOOT PRESSURE .....                        | 11     |
| 12. TIMING ADJUSTMENT FOR ROTATING HOOK AND NEEDLE .....             | 12     |
| 13. ADJUSTMENT OF FEED DOG HEIGHT .....                              | 13     |
| 14. RELATION BETWEEN ROTATING HOOK AND TAKE-UP LEVER .....           | 14     |
| 15. RELATION BETWEEN ROTATING HOOK AND OPENER MOTIONS .....          | 14     |
| 16. RELATION BETWEEN NEEDLE AND FEED DOG MOTIONS .....               | 15     |
| 17. SAFETY CLUTCH (SAFETY DEVICE) .....                              | 16     |
| 18. ADJUSTMENT OF UPPER FEED (NEEDLE SIDE) STROKE .....              | 16     |
| 19. ADJUSTMENT OF OUTER AND INNER PRESSER FOOT .....                 | 17     |

**ADJUSTMENT OF THREAD TRIMMER..... 18 ~ 24**

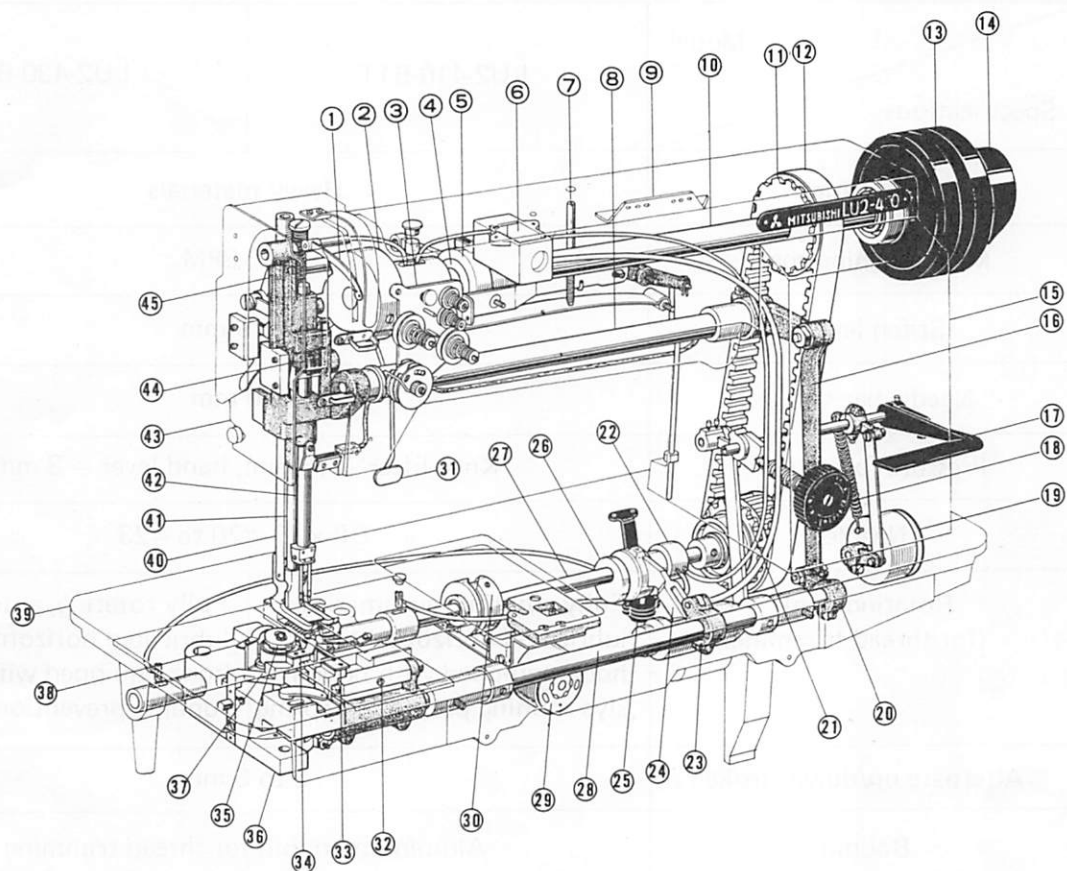
|   |    |
|---|----|
| 1. INSTALLATION OF MOVABLE KNIFE.....                                     | 18 |
| 2. POSITIONING OF THREAD TRIMMER CAM .....                                | 19 |
| 3. ADJUSTMENT OF THREAD TRIMMER CAM .....                                 | 19 |
| 4. ADJUSTMENT OF THREAD TRIMMER.....                                      | 20 |
| 5. ADJUSTMENT OF MOVABLE AND FIXED KNIFE MESHING PRESSURE .....           | 21 |
| 6. SHARPENING THE FIXED KNIFE.....  | 21 |
| 7. ADJUSTMENT OF NEEDLE GAUGE DISTANCE .....                              | 22 |
| 8. INSTALLATION OF SOLENOID CRANK.....                                    | 23 |
| 9. REMOVAL OF HOOK BRACKET.....   | 23 |
| 10. FEED DOG, THROAT PLATE, HOOK, BOBBIN CASE, BOBBIN, AND BED SLIDE..... | 23 |
| 11. ADJUSTMENT OF NEEDLE UP STOP POSITION .....                           | 24 |

**ADJUSTMENT AND APPLICATIONS FOR CONTROL SYSTEM ..... 25 ~ 27**

|   |         |
|---|---------|
| 1. SELECTION OF POSITIONS 1 AND 2 .....         | 25      |
| 2. PEDAL OPERATION.....                         | 25      |
| 3. ADJUSTMENT OF PEDAL OPERATION PRESSURE ..... | 25      |
| 4. ADJUSTMENT OF RUNNING SPEED.....             | 25      |
| 5. OPTIONAL FUNCTIONS.....                      | 26 ~ 27 |

**THREAD TRIMMER TROUBLESHOOTING LIST ..... 28 ~ 29**

## MACHINE HEAD CONSTRUCTION



### Major Components (LU2-430)

- |                                    |                                     |                                    |
|------------------------------------|-------------------------------------|------------------------------------|
| 1. Take-up lever                   | 16. Needle bar rock link            | 31. Touch-back switch (pushbutton) |
| 2. Crank                           | 17. Reverse-stitch lever            | 32. Feed bar                       |
| 3. Needle thread tension regulator | 18. Stitch length adjusting dial    | 33. Movable knife                  |
| 4. Eccentric ring                  | 19. Reverse-stitch solenoid         | 34. Fixed knife                    |
| 5. Crank rod                       | 20. Feed shaft crank (right)        | 35. Hook                           |
| 6. Oil tank                        | 21. Timing belt pulley (lower)      | 36. Hook bracket                   |
| 7. Pressure adjusting screw        | 22. Lubricator                      | 37. Fixed knife bracket            |
| 8. Needle bar rock shaft           | 23. Feed shaft crank (intermediate) | 38. Opener                         |
| 9. Thread retainer                 | 24. Feed lifting rod                | 39. Bed                            |
| 10. Arm shaft                      | 25. Filter                          | 40. Pressure bar                   |
| 11. Timing belt pulley (upper)     | 26. Feed rock cam                   | 41. Rock pressure bar              |
| 12. Timing belt                    | 27. Hook shaft                      | 42. Needle bar                     |
| 13. Balance wheel                  | 28. Feed rock shaft                 | 43. Face plate                     |
| 14. Synchronizer                   | 29. Thread timer solenoid           | 44. Needle bar clamp               |
| 15. Arm                            | 30. Thread trimmer cam              | 45. Needle bar support             |

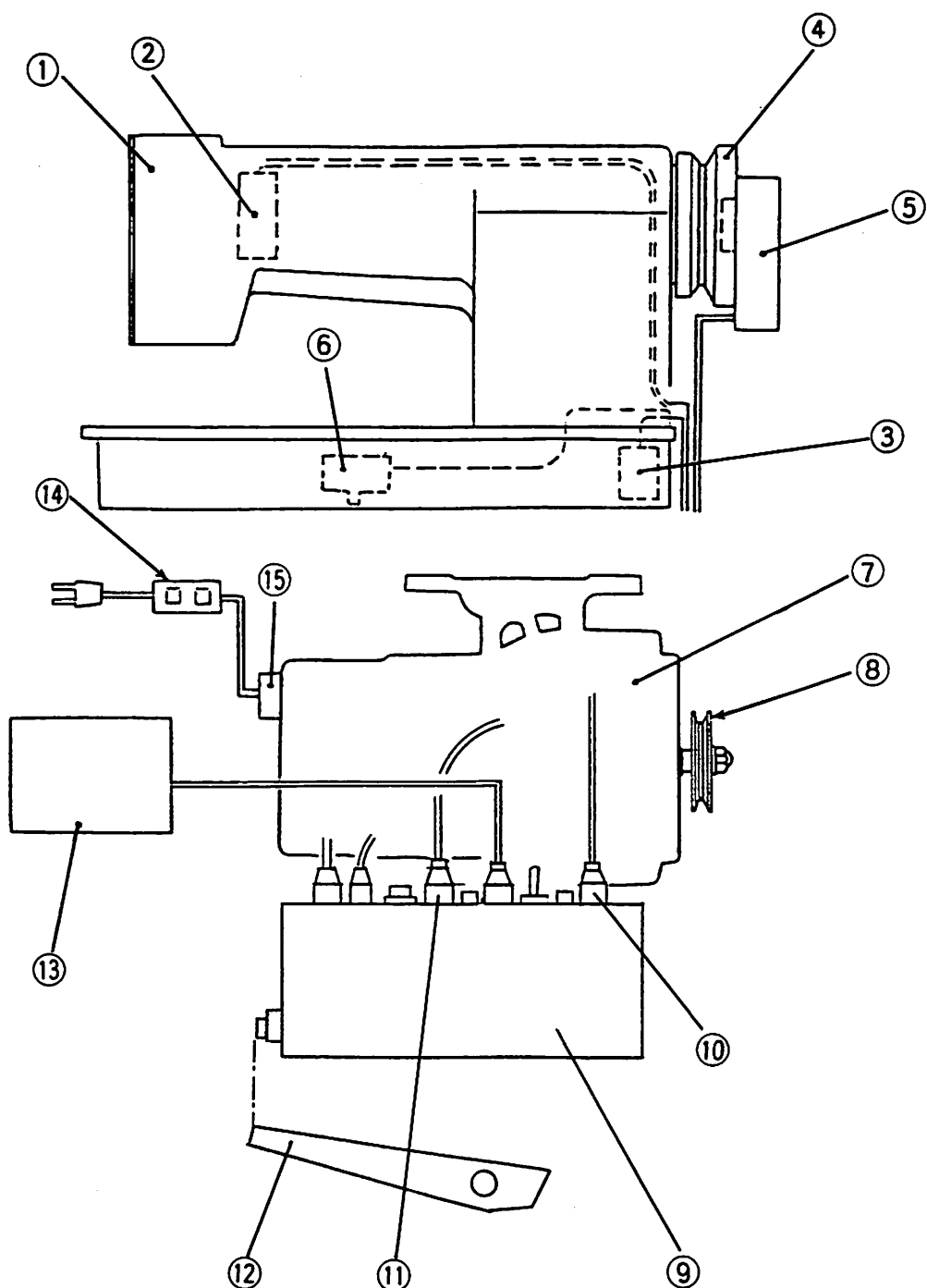
## SPECIFICATIONS

### Specifications of LU2-410-B1T and LU2-430-B1T

| Model<br>Specifications                | LU2-410-B1T   | LU2-430-B1T  |
|--|---|--|
| Application                            | Heavy materials   |  |
| Max. stitching speed                   | 2000 SPM  |  |
| Stitch length                          | 0 to 9 mm   |  |
| Needle bar stroke                      | 36.0 mm   |  |
| Pressure foot stroke                   | Knee lifter – 16 mm, hand lever – 8 mm  |  |
| Needle                                 | DP x 17 #20 to #23  |  |
| Rotating hook<br>(for thread trimming) | Fully rotating, automatically lubricated horizontal type hook equipped with bobbin slys running prevention spring | Fully rotating, automatically lubricated horizontal type hook equipped with idle running prevention spring |
| Alternate up/down stroke               | 2 to 6 mm   |  |
| Bobbin                                 | Aluminum bobbin for thread trimming   |  |
| Thread trimming method                 | Horizontal combination of fixed and movable knives  |  |
| Lubrication                            | Automatic Lubrication   |  |
| Automatic back-tack                    | Touch back leven system   |  |
| Bed size                               | 512 x 178 mm  |  |

Note: Use feed dog, throat plate, rotating hook, bobbin case, bobbin, and bed slide which are specifically utilized for thread trimming.  
Use high-quality bobbin which is not deformed.

## THREAD TRIMMER DIAGRAM



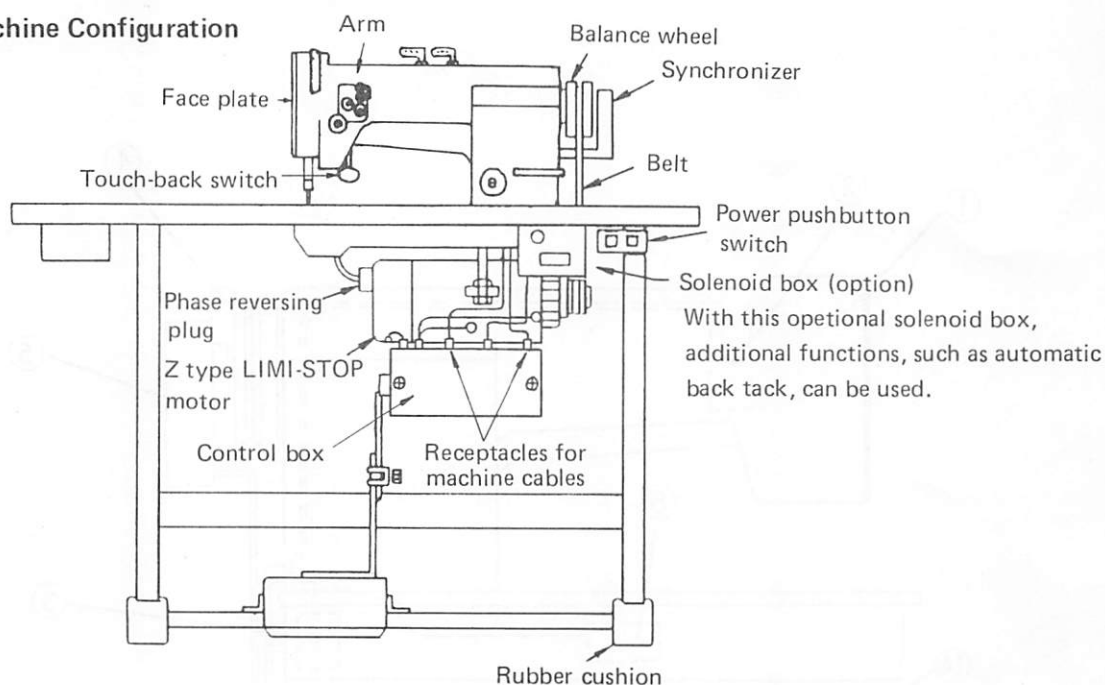
### Part Names

- |                                    |                               |                             |
|------------------------------------|-------------------------------|-----------------------------|
| 1. Machine head                    | 6. Thread trimmer solenoid    | 11. Synchronizer cord plug  |
| 2. Touch switch                    | 7. Motor                      | 12. Pedal                   |
| 3. Reverse-stitch control solenoid | 8. Drive pulley               | 13. Operation box           |
| 4. Balance wheel                   | 9. Control box                | 14. Power pushbutton switch |
| 5. Synchronizer                    | 10. Machine control cord plug | 15. Phase reversing plug    |



## PREPARATIONS FOR OPERATION

### Machine Configuration



## 1. POWER CABLE WIRING

### 1.1 Connectors

Before connecting connectors with the control box, be sure to check the shapes of matching connectors and their inserting directions.

### 1.2 Lamp Leads

- (1) Lamp leads are provided at the back of motor for fitting a work lamp to the machine. To fit the lamp, remove the insulation tape and insulator properly from the lamp leads. Then, connect them to lamp wires. After connection, be sure to protect connected wires with insulation tape.
- (2) Use 6 V, 15-20 W lamp.
- (3) When lamp is not used, properly insulate 2 lamp leads.

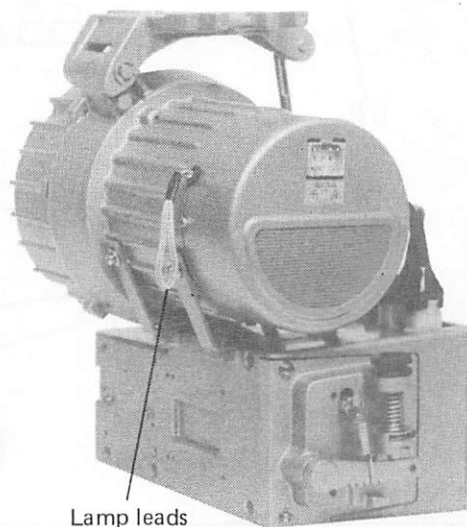
### 1.3 Power Cable Connection

Cable connection for power supply is the same as that for the standard clutch motor.

- (1) In the case of a 3-phase motor, connect U phase to red lead, V phase to white lead, and W phase to black lead. **Be sure to ground green lead by connecting it to the GND terminal.**
- (2) Power fuse capacity for 3-phase motor is 10 A; that for single-phase motor is 15 A.
- (3) Control box fuse capacity is 8 A.

### 1.4 Motor Rotating Direction

To reverse the direction of motor rotation, disconnect the phase reversing plug from the motor end cover, turn it 180°, and then plug it into the end cover. In the case of a single-phase motor, turn on the switch after the motor is brought to a complete stop (approximately 2 minutes). Also, be sure to fully insert the plug.

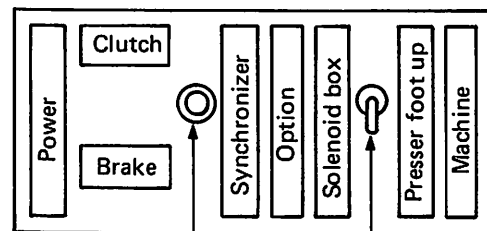
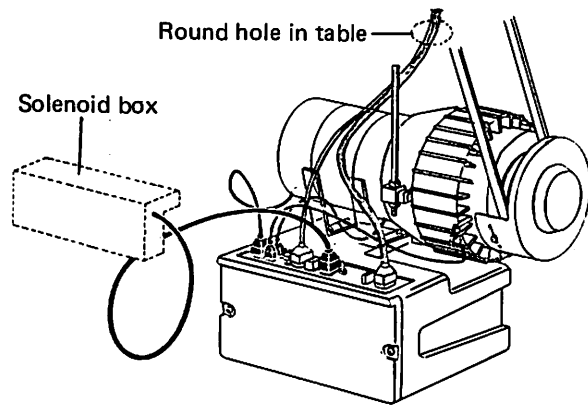


## 2. CONNECTION WITH CONTROL BOX

Wire the control box as shown at right.

Note: (1) For the sake of safety, before connecting or disconnecting connectors, be sure to turn off the power switch.  
(2) The combination of machine head and motor control box is as specified below. Keep in mind correct combination when replacing the machine head or control box.

| Machine head | Control box |
|--------------|-------------|
| LU2-410B1□□  | LE-MD-120   |
| LU2-430B1□□  | LE-MD-120   |



## 3. ADJUSTMENT OF NEEDLE BAR STOP POSITION

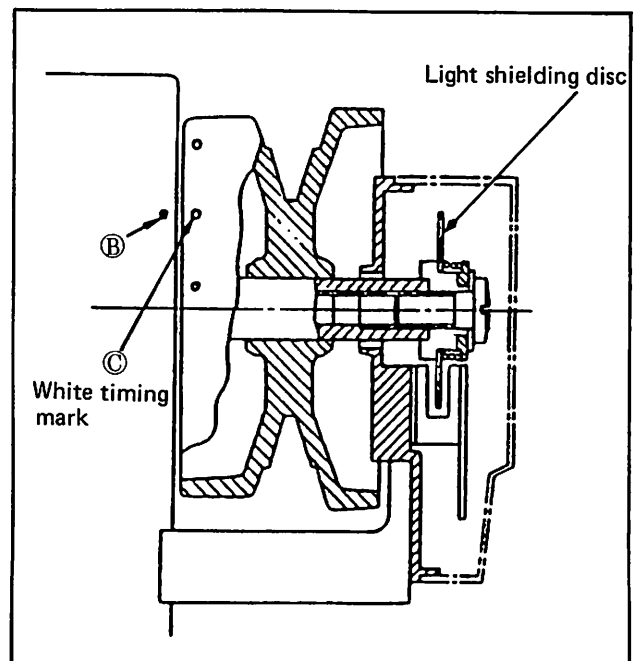
When the pedal is kicked down by heel and thread trimming is completed, the machine stops with the timing mark "B" matching with the white timing mark "C". The needle bar stop position of all sewing machines are factory-adjusted. However, if the timing marks are out of alignment more than 3 mm, adjust the setting position of light shielding disc in the following procedure:

### [Preparation]

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

### [Adjustment]

- 1) While holding the light shielding disc by hand, turn the balance wheel until the timing marks "B" and "C" are aligned.
- 2) Repeat pedal operation (toe down and heel down) several times to make sure the needle always stops exactly at the specified position.
- 3) Then, set the plug (12 pins), which comes from the machine head, into the receptacle.

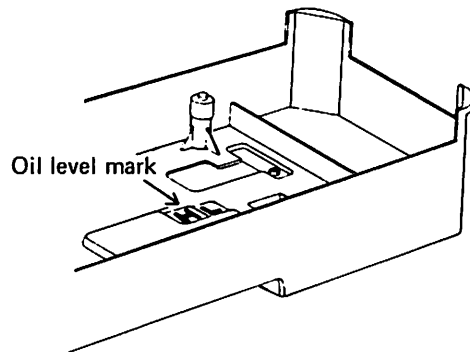




## NOTE ON USE

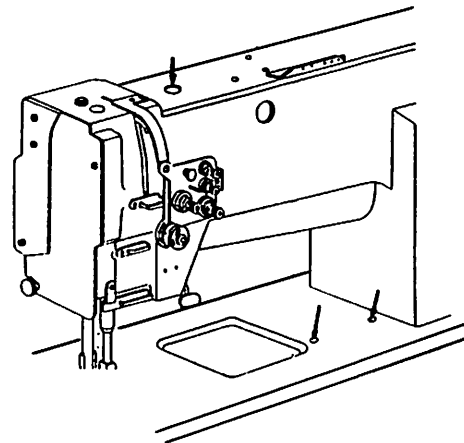
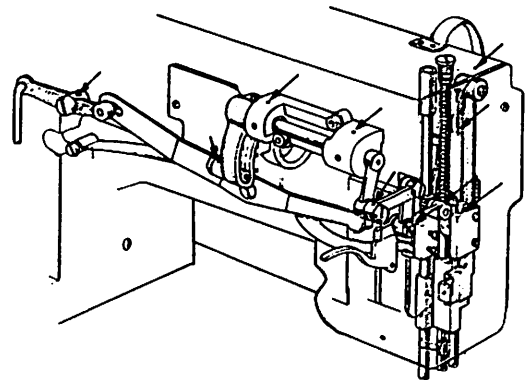
### 1. OILING (1)

Fill the oil reservoir with oil up to the "H" mark. Oil level should be periodically checked. When oil level is lower than the "L" level, replenish the reservoir with oil to the "H" level. Use white spindle oil specified by Mitsubishi.



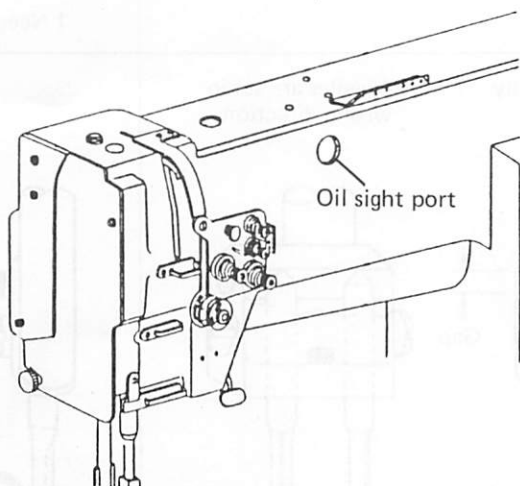
### 2. OILING (2)

When a new sewing machine is used for the first time or a sewing machine shelved for a long time is used again, apply required amount of oil to portions indicated by arrows in the figure below.

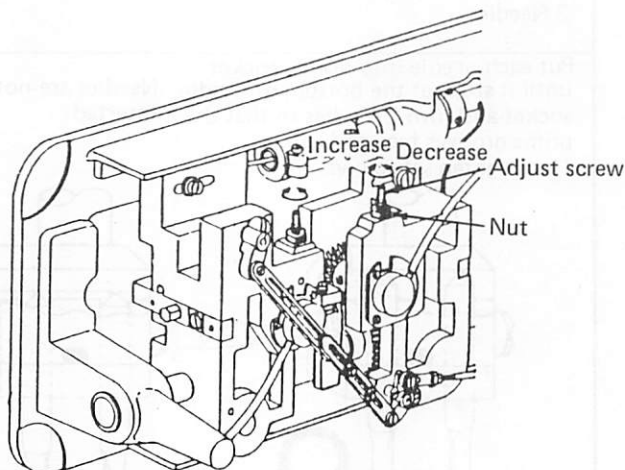


### 3. LUBRICATING CONDITION

Check lubricating condition during machine running by viewing oil drips through the oil sight port.

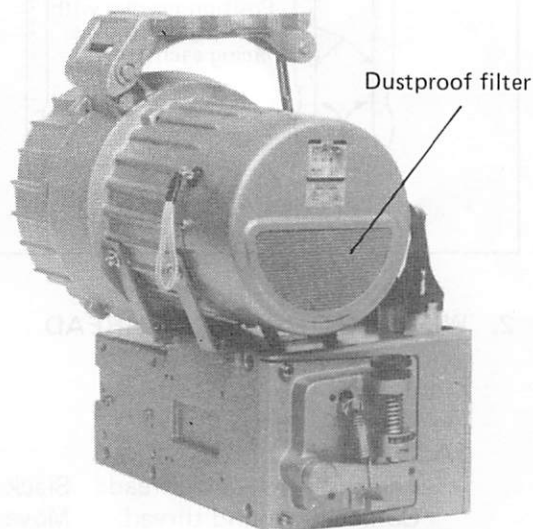


### 4. ADJUSTMENT OF LUBRICATION TO ROTATING HOOK



#### (Motor maintenance)

Remove dust from the motor filter every two or three months. (Continued operation with lint- or dust-clogged filter will cause the motor to overheat, thereby reducing motor service life.)



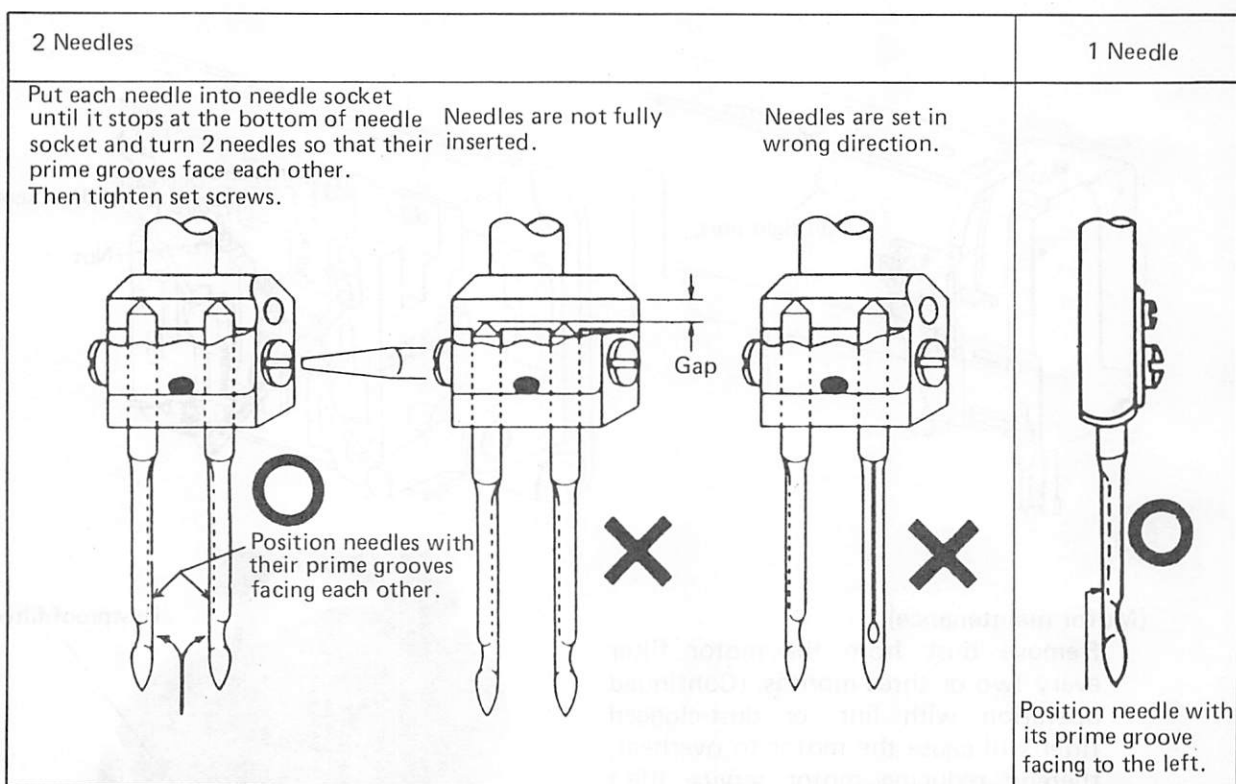
### 5. HANDLING INSTRUCTIONS

- (1) When the power is turned on or off, keep foot away from the pedal.
- (2) Note that the machine may not be braked when the power is turned off or when power failure occurs during operation.
- (3) Be sure to close the control box cover during sewing operation. Otherwise, dust will enter the control box, resulting in malfunction and trouble.
- (4) Do not apply a multimeter to the control circuits. Voltage from the multimeter may damage semiconductor parts.

## HOW TO USE THE SEWING MACHINE

### 1. INSTALLATION OF NEEDLES

Note: Install needles after turning off the power.

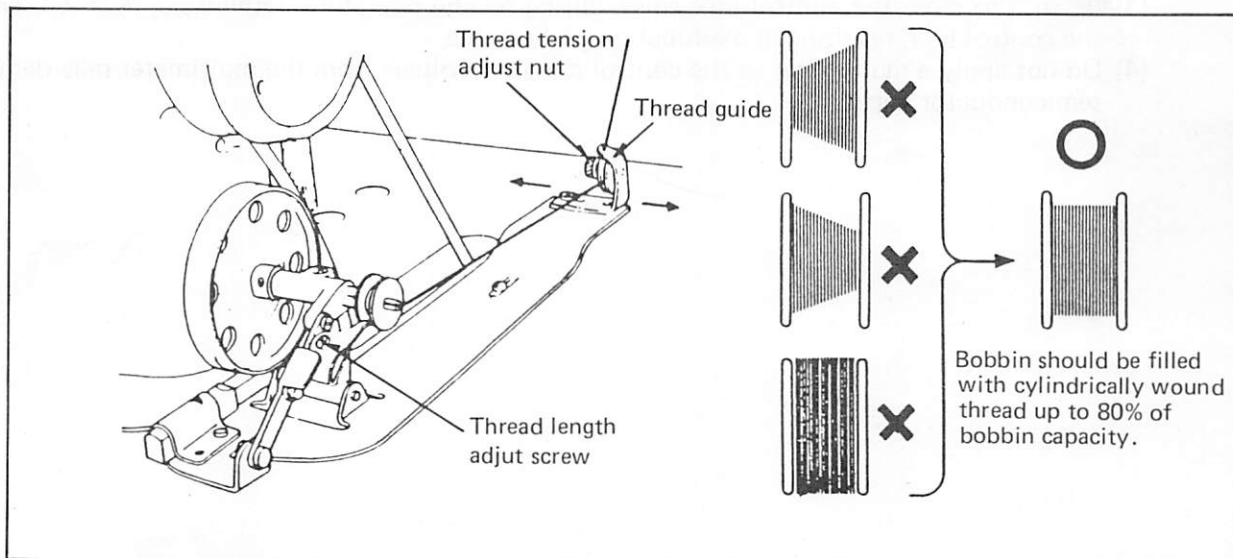


### 2. WINDING OF BOBBIN THREAD

Note: When operating under no load, keep the presser foot lifted.

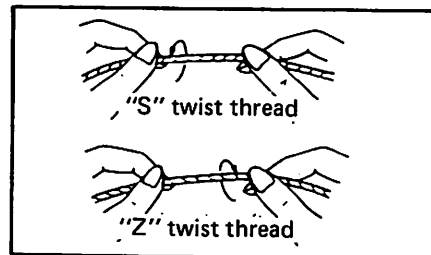
#### [Adjustment]

- Tension of wound thread: Slack winding is recommended for polyester and nylon threads.
- Conically wound thread: Move the thread guide toward smaller diameter of wound thread layer.
- Quantity of wound thread: Loosen the thread quantity adjusting screw to increase, and tighten to decrease, the quantity of wound thread.



### 3. SELECTION OF THREAD

It is recommended to use "S" twist thread for the left needle (viewed from front) and "Z" twist thread for the right needle. When it is difficult to use threads depending on needles, use "Z" twist thread for both needles. For bobbin thread, either thread will do.



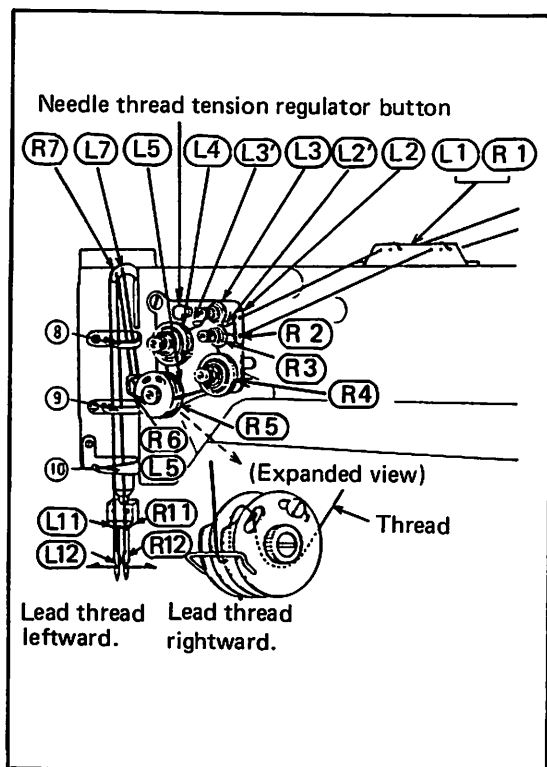
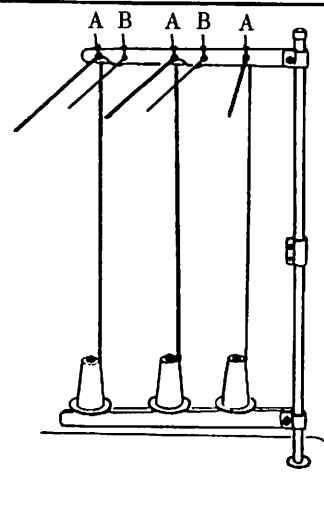
### 4. THREADING OF NEEDLE THREADS

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

Note: When thin slippery thread (such as polyester or filament thread) is used, pass the thread through thread guide "B" and then "A".

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

Note: Pressing the needle thread tension regulator button (shown in figure below) will open the tension disc, thereby allowing the needle thread to be picked up easily.

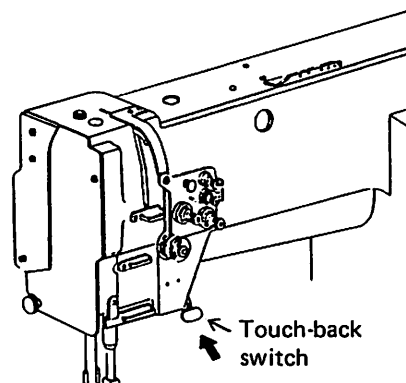
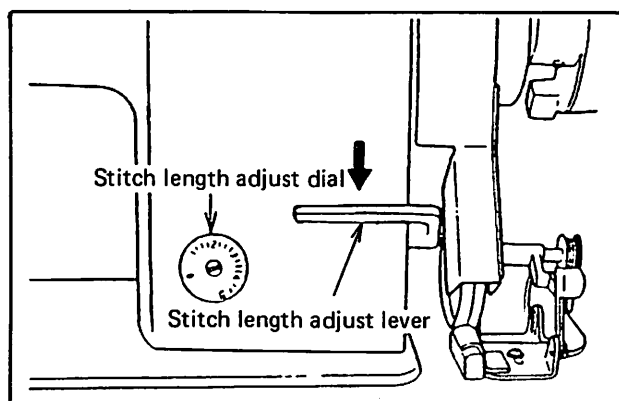


## 5. ADJUSTMENT OF STITCH LENGTH AND REVERSE SEWING (TOUCH BACK)

To make stitch length smaller, lower the stitch length adjust lever and turn the stitch length adjust dial.

Touch-back switch

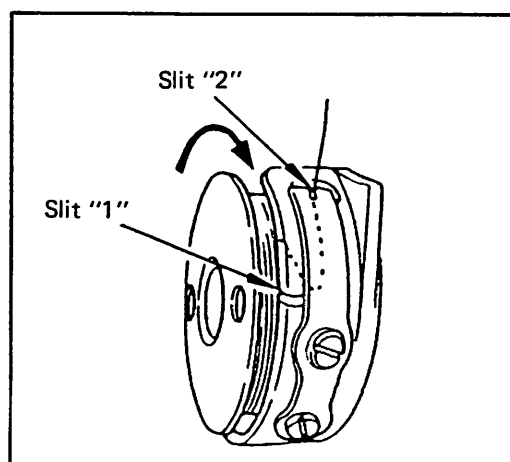
.... Direction of stitching can be reversed by pressing this switch. Stitching goes on in reverse direction while the button is pressed, and returns in forward direction when the button is released.



## 6. SETTING OF BOBBIN

- (1) Mount bobbin thread into bobbin case so that the thread is wound clockwise.
- (2) Then pass the thread through the slit "1" and pull. The thread passes under the tension spring and comes out of the slit "2".

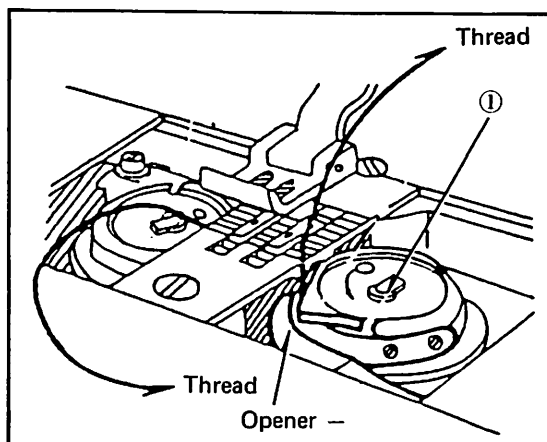
\* When the bobbin thread is pulled, the bobbin should rotate in the direction indicated by arrow in the figure.



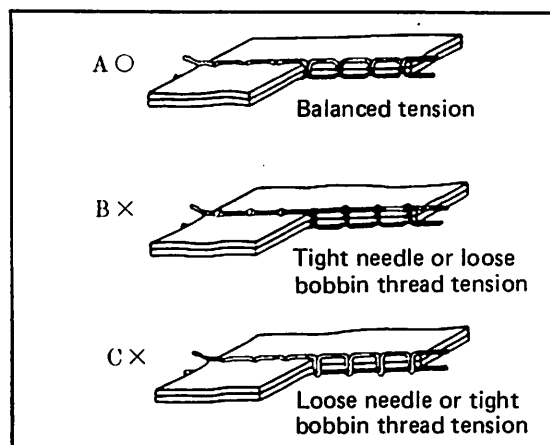


## 7. THREADING OF BOBBIN THREADS

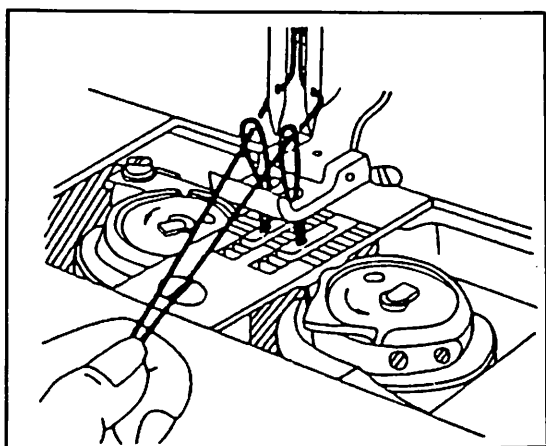
- (1) Mount the bobbin case in the hook and set the latch "1". Keep thread end over the bed.



## 9. BALANCE OF THREAD TENSION



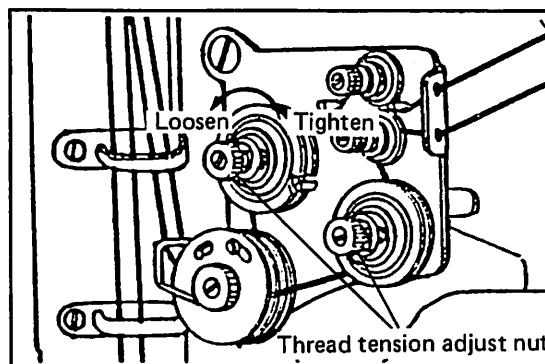
- (2) Pick up 2 needle threads by left hand and rotate the balance wheel 1 turn by right hand. By pulling up the needle threads as shown in the figure, the bobbin threads are lifted. Both bobbin and needle threads should be aligned and led backward.



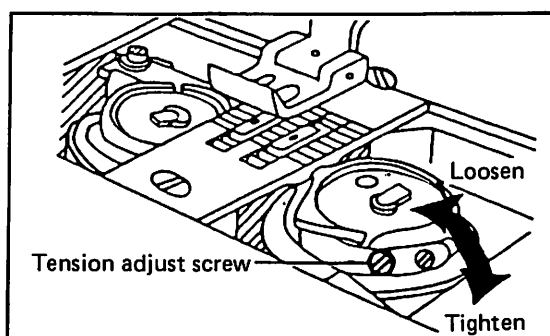
## 10. TENSION OF NEEDLE THREAD

Needle thread tension should be adjusted with respect to bobbin thread tension.

To adjust needle thread tension, turn each tension adjusting nut. Also adjust needle thread tension for special fabric and thread by changing force and stroke of slack thread take-up spring.

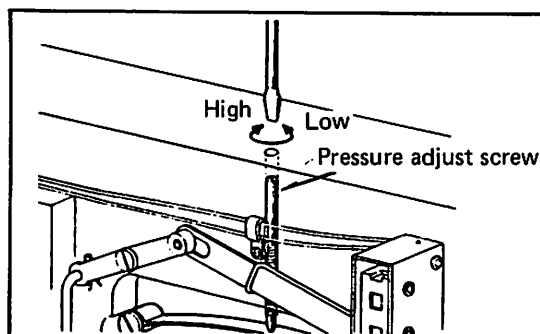


## 8. TENSION ADJUSTMENT OF BOBBIN THREADS



## 11. ADJUSTMENT OF PRESSER FOOT PRESSURE

Adjust pressure depending on fabrics by turning the pressure adjusting screw.





## 12. TIMING ADJUSTMENT FOR ROTATING HOOK AND NEEDLE

- (1) Set stitch length adjusting dial to "6".
- (2) When the needle is lifted 2.4 mm from its lowermost position, the rotating hook and the needle should be located at the following locations:

The upper edge of needle eye should be 2.3 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 0.05 mm.

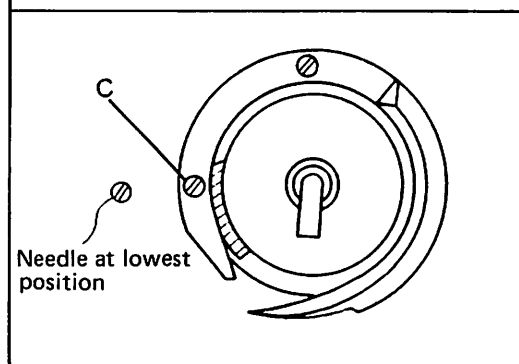
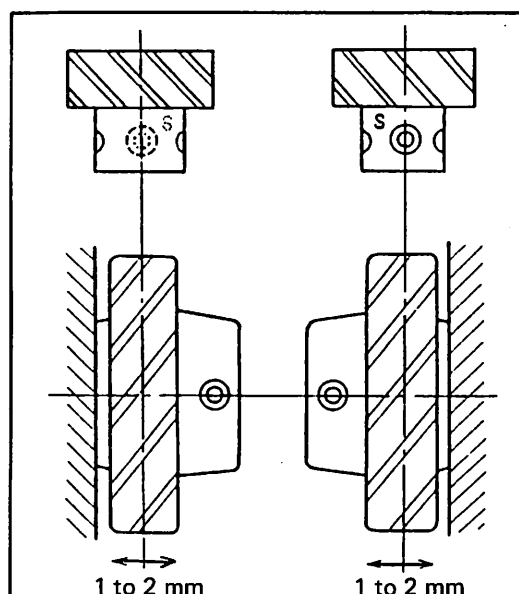
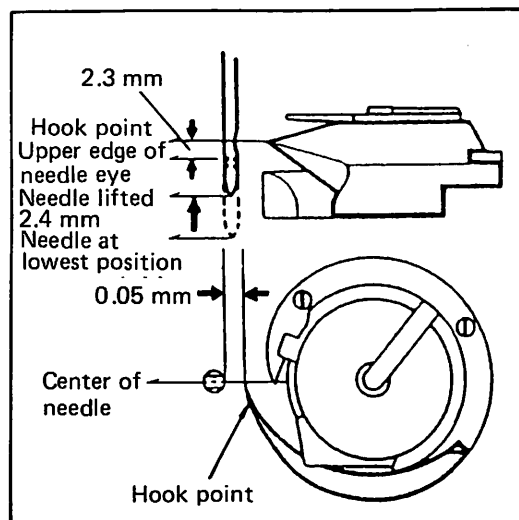
- (3) Needle and rotating hook positions can be adjusted in the following procedure:

- \* Easy adjustment can be made by removing the presser foot, throat plate, and feed dog before adjustment.

### Positioning the hook point

- (1) With the needle at lowermost position, mesh the right hand driving gear (small) with the large gear so that "S" screw is located at front, and mesh the left hand driving gear (small) so that "S" screw is located at rear.
- (2) Tighten "S" screws onto the set contact of hook shaft.
- (3) Guide of rotating hook position  
When the needle is at its lowermost position, the "C" screw in rotating hook is nearly in line with the needle.

- \* To make fine adjustment of hook and needle motions, loosen screw in driving gear (large) and move the driving gear (large) 1 to 2 mm in the axial direction.



### 13. ADJUSTMENT OF FEED DOG HEIGHT

The height of feed dog and the pressure of presser foot should be adjusted depending on fabrics.

Light fabric will be damaged if the feed dog position is too high or the presser foot pressure is too strong.

The stitch length of heavy fabric will not be uniform if the feed dog position is too low or the presser foot pressure is too weak.

Measure the height of feed dog by turning the balance wheel by hand and locating the feed dog at the highest position from the throat plate.

Light fabric . . . . .Approx. 0.8 mm above throat plate

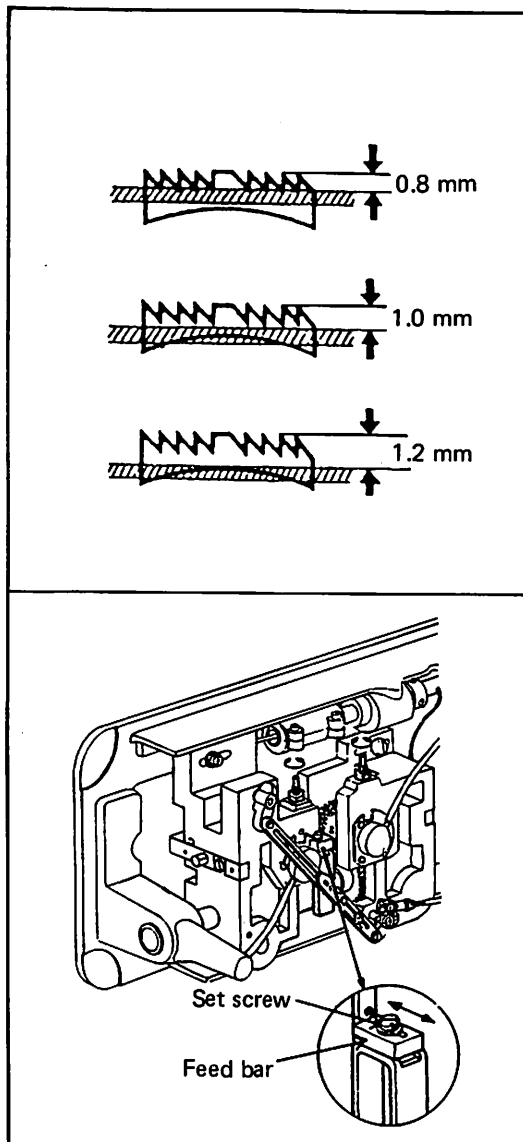
Normal fabric . . . . .Approx. 1.0 mm above throat plate

Heavy fabric . . . . .Approx. 1.2 mm above throat plate

#### Adjusting Procedure

- (1) Lean the machine head backward.
- (2) Turn the balance wheel by hand and stop it when the feed dog rises to the maximum height above the throat plate.
- (3) Loosen the feed bar set screw.
- (4) Vertically move the feed bar (in the direction indicated by arrow in the figure) to locate the feed dog at proper height.
- (5) After height adjustment, tighten the feed bar set screw.

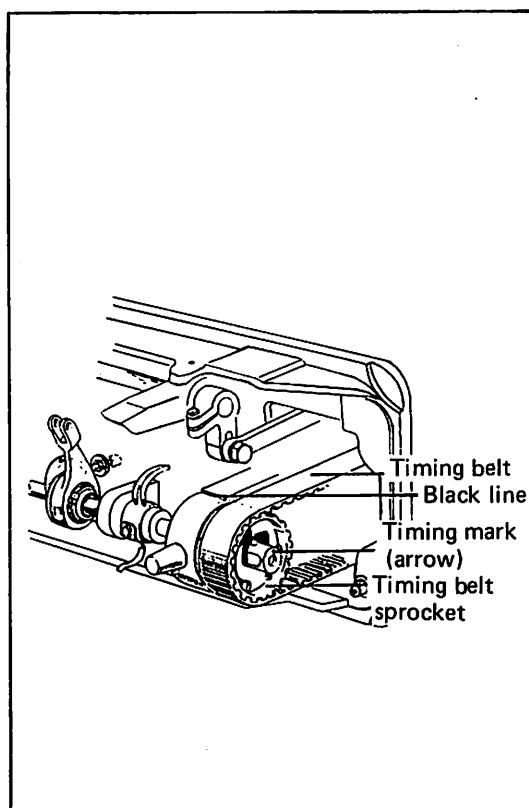
The feed dog height is factory-set at 1.2 mm.



#### 14. RELATION BETWEEN ROTATING HOOK AND TAKE-UP LEVER MOTIONS

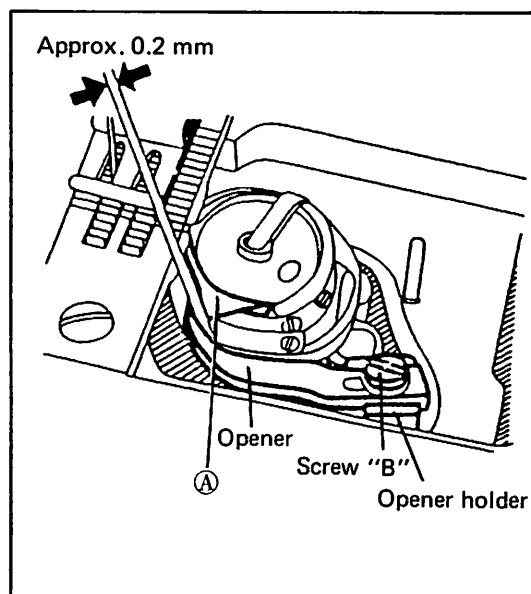
When the timing belt is removed for replacement, the relation between rotating hook and take-up lever motions should be as follows:

- (1) Turn the balance wheel and stop it when the take-up lever is lifted to its top position.
- (2) Lean the machine head backward and make sure the arrow (timing mark) on the timing belt sprocket matches the black line on the boss of hook shaft bearing.
- (3) If the timing mark is not aligned with the black line, remove and reinstall the timing belt to obtain proper alignment.



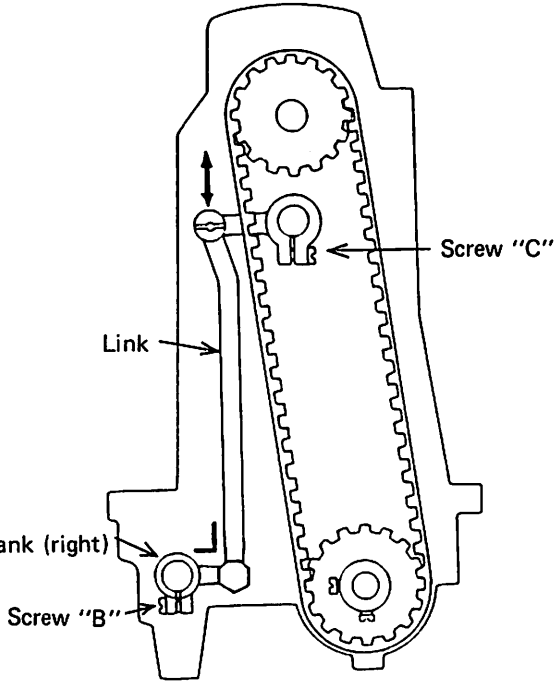
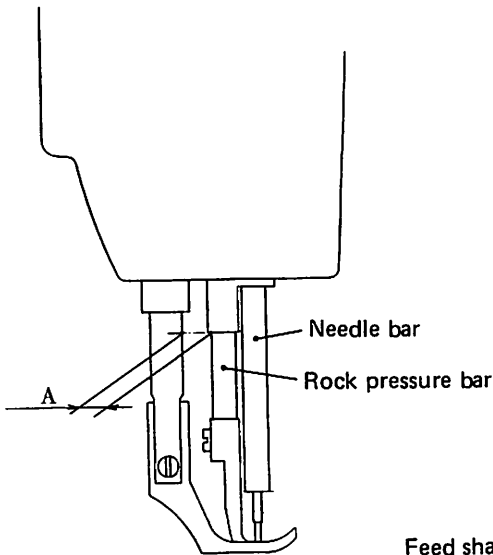
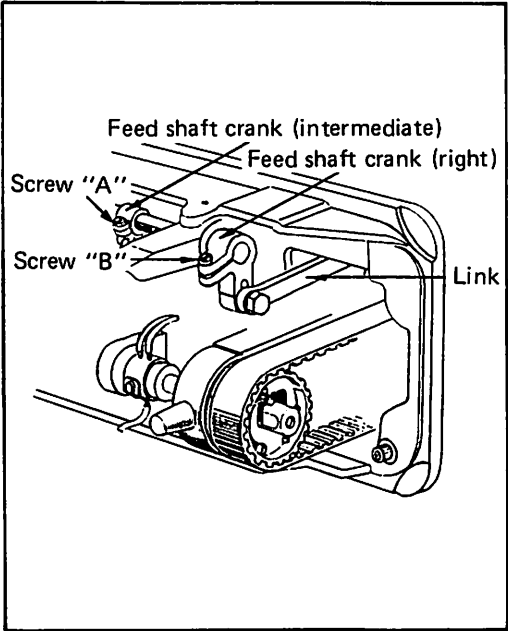
#### 15. RELATION BETWEEN ROTATING HOOK AND OPENER MOTIONS

- (1) Turn the balance wheel by hand and stop it when the opener holder is the longest distance away from the throat plate.
- (2) At this time, make sure that the gap between the bobbin case holder "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 the position of opener.



16. RELATION BETWEEN NEEDLE AND FEED DOG MOTIONS

- (1) Set the stitch length adjust dial to "0".
- (2) Lean the machine head backward.
- (3) Loosen the feed shaft crank set screws "A" and "B".
- (4) Lower the needle to its lowest position.
- (5) Allow 9-mm gap between the pressure bar and the rock pressure bar (10.1 mm for LU2-400 and 420). Then finger-tighten the feed shaft crank screws "A" and "B".
- (6) Check to see if the right feed shaft crank is connected with the link at right angles as shown in the figure.
- (7) If the connection is not at right angles, remove the back cover and loosen "C" screw to obtain the right angles.
- (8) After the completion of adjustment, fully tighten the screws "A", "B", and "C".



|                 | Dimension A |
|-----------------|-------------|
| LU2-410 and 430 | 9.0 mm      |
| LU2-400 and 420 | 10.1 mm     |

## 17. SAFETY CLUTCH (SAFETY DEVICE)

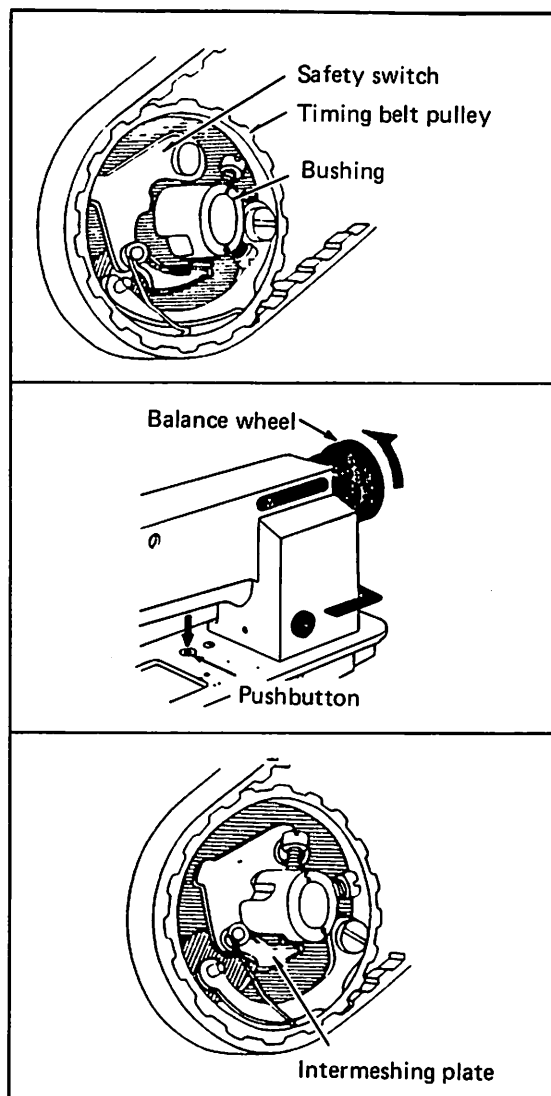
The safety clutch prevents hook and timing belt from being damaged when the machine runs under excessive load which is caused by the hook caught in threads.

### (1) Function

- 1) When the safety clutch is actuated, timing belt pulley races, causing the hook shaft to stop and only the arm shaft to keep turning. Therefore, immediately stop the machine.
- 2) Remove threads and other foreign matter from the hook.
- 3) Turn the timing belt pulley bushing by hand to check for smooth rotation of hook shaft. Then set the clutch mechanism back again.

### (2) Setting Procedure

- 1) While simultaneously pressing the pushbutton, which is located on the other side of bed, by left hand, slowly turn the balance wheel by right hand in the direction shown by arrow in the figure.
- 2) Now the balance wheel is stopped by the intermeshing plate provided in the clutch mechanism. Then turn the balance wheel again with further greater force.
- 3) Release the pushbutton which has been kept pressed.
- 4) The clutch mechanism is now set as shown in the figure.

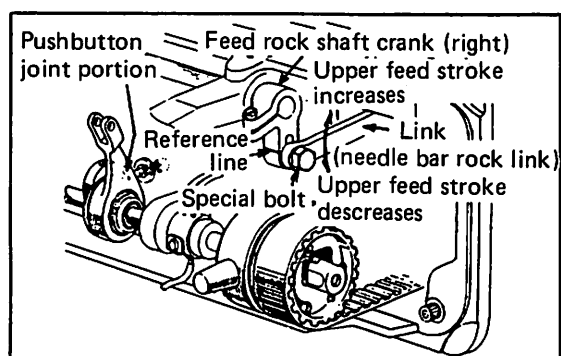


## 18. ADJUSTMENT OF UPPER FEED (NEEDLE SIDE) STROKE

When stitching is not made uniformly depending on fabrics, adjust the upper feed stroke by range of slot in feed rock shaft crank (right).

### [Adjusting Procedure]

- 1) Loosen the special bolt.
- 2) When this bolt is set at upper position, the upper feed stroke increases.
- 3) When this bolt is set at lower position, stroke decreases. (The upper and lower feeds are theoretically equivalent at the point where the reference line for feed rock shaft crank is aligned with the center of special bolt.)
- 4) After adjustment, tighten the special bolt.



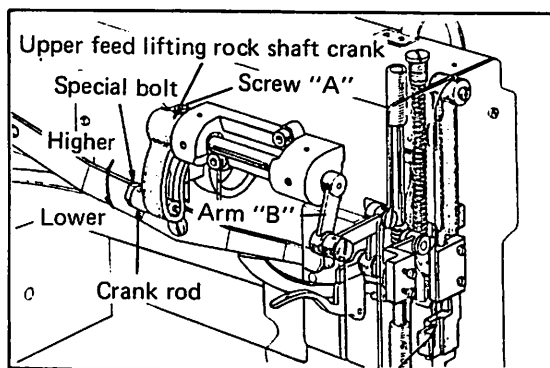
## 19. ADJUSTMENT OF OUTER AND INNER PRESSER FEET

### (1) Operating Height Adjustment

When springy material is sewn or when the thickness changes greatly, adjust the operating height of presser foot.

#### [Adjusting Procedure]

- 1) Loosen the special bolt.
- 2) Setting the crank rod special bolt at upper position increases the operating height of inner and outer presser feet.
- 3) Setting the bolt at lower position decreases the height.
- 4) After adjustment, tighten the special bolt.



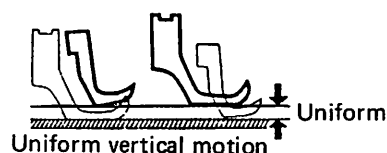
\* The height of presser feet is adjustable between 2 mm and 6 mm.

### (2) Alternate Up/Down Strokes

The best feed condition can be obtained by changing the alternate up/down strokes of outer and inner presser feet depending on fabrics.

#### Example:

When slippery fabric is sewn, reduce vertical stroke of outer presser foot and increase that of inner presser foot. This prevents slipping.

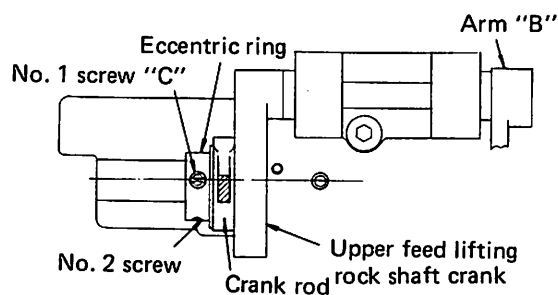


#### [Adjusting Procedure]

- 1) Turn the balance wheel and stop it when the take-up lever reaches its lowest position.
- 2) Lower the presser bar lifter.
- 3) Loosen the screw "A" in the upper feed lifting rock shaft crank.
- 4) Moving the crank "B" to the left increases the vertical stroke of inner presser foot and decreases that of outer presser foot.
- 5) Reversely, moving it to the right reduces the vertical motion of inner presser and increases that of outer presser.
- 6) After adjustment, securely tighten the screw "A". (Vertical stroke of inner presser foot is factory-set at 2 mm and that of outer at 3.2 mm.)

### (3) Mounting the Eccentric Ring

- 1) Turn the balance wheel by hand to bring the needle bar at the highest position.
- 2) In this state, locate No. 1 screw "C" in eccentric ring as shown in the figure and tighten it.



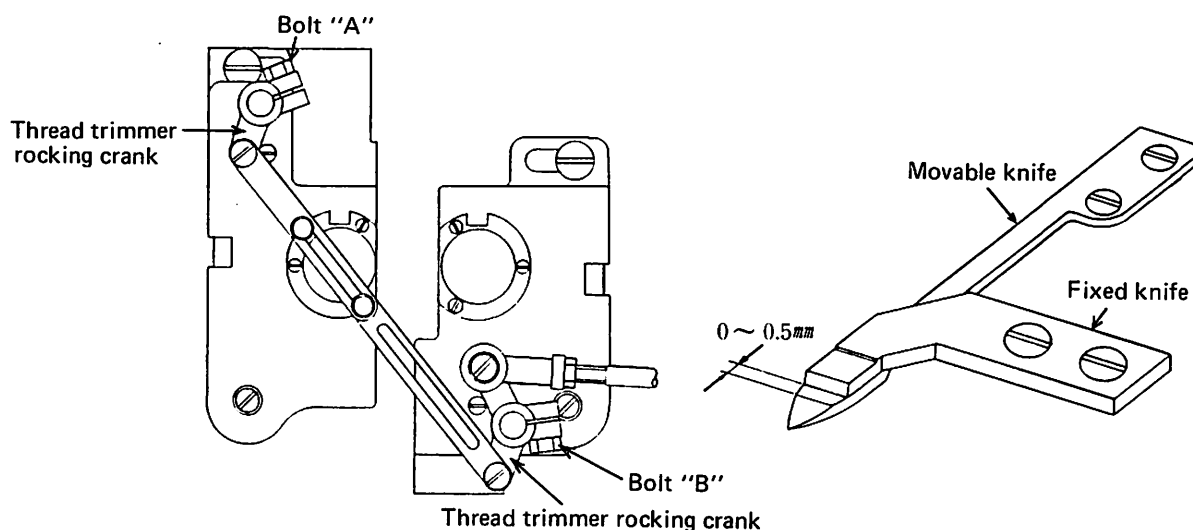


## ADJUSTMENT OF THREAD TRIMMER

### 1. INSTALLATION OF MOVABLE KNIFE

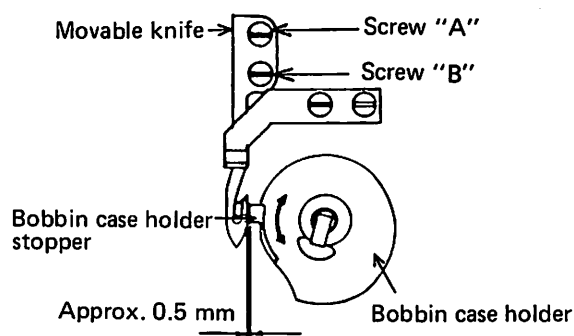
#### 1.1 Initial Position of Movable Knife

- (1) Turn the balance wheel by hand until the needles reach their lowest position.
- (2) With the needles at this position, push the cam follower crank to locate the cam roller onto the thread trimmer cam groove.
- (3) In this state, turn the balance wheel and stop it at the point where the black point on the arm is aligned with the white point on the balance wheel. At this time, make necessary work on the cam follower crank using screw and screwdriver to prevent the roller from slipping out of the cam groove.
- (4) Loosen the bolts "A" and "B" on the thread trimmer rocking crank.
- (5) Adjust the movable knife so that its slant portion protrudes 0 to 0.5 mm from the fixed knife blade as illustrated in the figure. Then tighten the bolts "A" and "B".



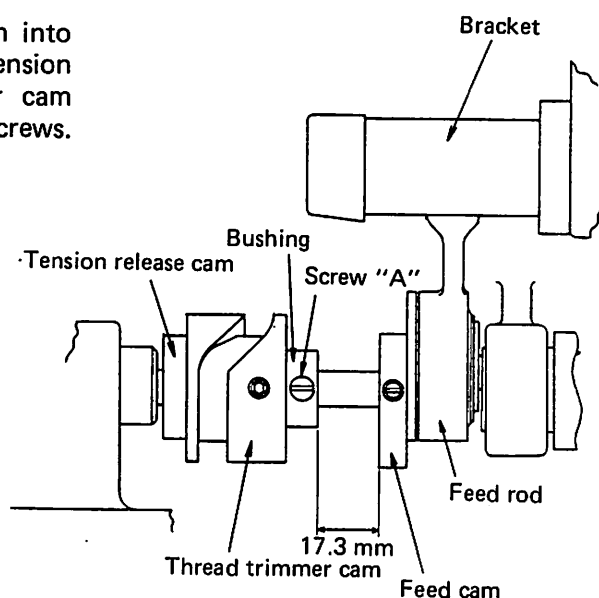
#### 1.2 GAP BETWEEN MOVABLE KNIFE AND BOBBIN CASE HOLDER STOPPER

- (1) Turn the balance wheel by hand until the needles reach their lowest position.
- (2) With the needles at this position, push the cam follower crank. Then turn the balance wheel by hand until the movable knife reaches the end of its stroke.
- (3) Turn the bobbin case holder by hand in the direction indicated by the arrow in the figure. Then adjust the gap between the movable knife and the bobbin case holder stopper to approximately 0.5 mm by loosening the screws "A" and "B".



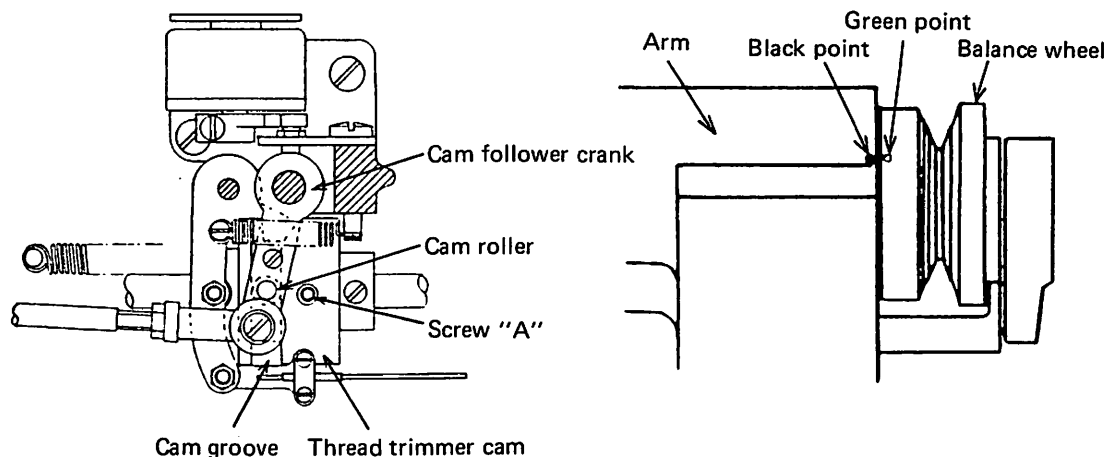
## 2. POSITIONING OF THREAD TRIMMER CAM

- (1) Adjust the gap between the feed cam and the bushing to 17.3 mm and tighten the hook shaft set screw "A".
- (2) After bringing the thread trimmer cam into contact with the bushing, and the tension release cam with the thread trimmer cam (i.e. after eliminating gap), tighten set screws.



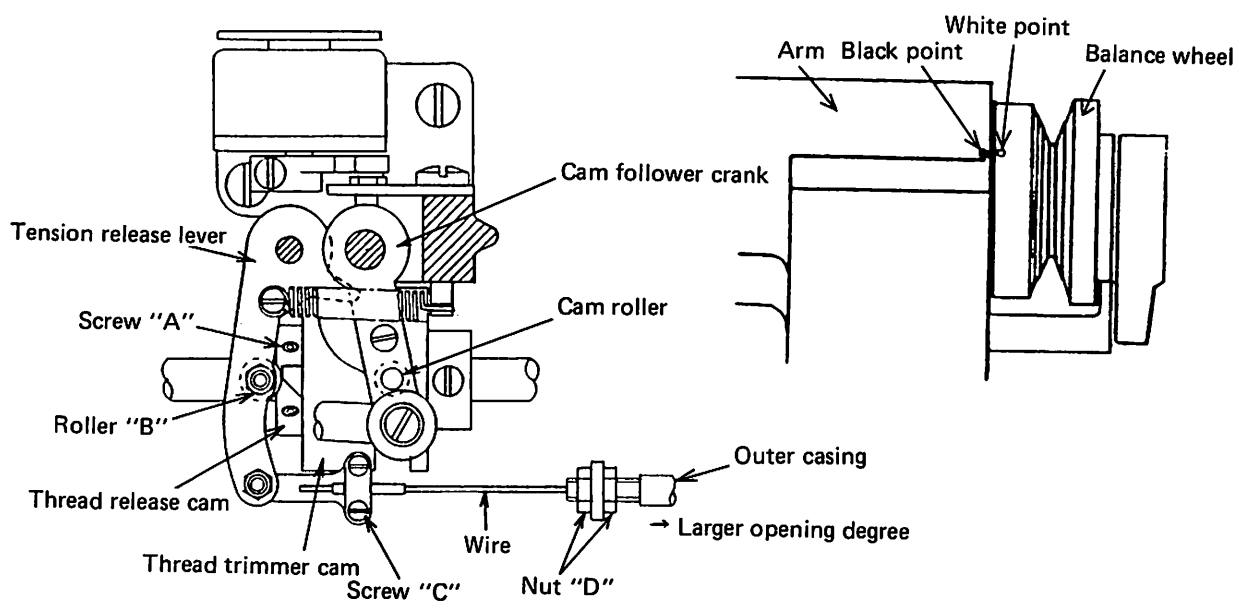
## 3. ADJUSTMENT OF THREAD TRIMMER CAM

- (1) Turn the balance wheel by hand until the needles reach their lowest position.
- (2) With the needles at this position, push the cam follower crank to locate the cam roller onto the groove of thread trimmer cam.
- (3) By turning the balance wheel by hand, adjust the thread trimmer cam so that the movable knife starts moving when the green point on the balance wheel is aligned with the black point on the arm. To make this adjustment, loosen 2 thread trimmer cam clamp screws "A".



#### 4. ADJUSTMENT OF THREAD RELEASER

- (1) Turn the balance wheel by hand until the needles reach the lowest position.
- (2) With the needles at this position, push the cam follower crank to locate the cam roller onto the groove of thread trimmer cam.
- (3) By turning the balance wheel by hand, adjust the thread tension release cam so that the tension disc closes when the white point on the balance wheel is aligned with the black point on the arm. For this adjustment, loosen 2 tension release cam clamp screws "A".
- (4) Adjust the opening degree of tension disc with the tension release lever roller "B" which is mounted on the convexed portion of thread release cam as shown in the figure. For this adjustment, loosen the nut "C" and draw the wire.
- (5) For fine adjustment, loosen the nuts "D" (0.5 to 0.7 mm).
- (6) When the nuts "D" are loosened and the outer casing is shifted rightward, the opening degree increases.

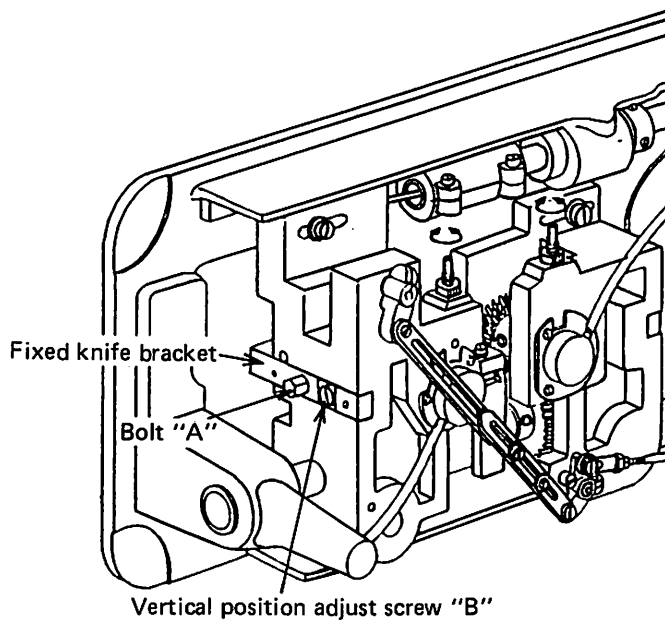


## 5. ADJUSTMENT OF MOVABLE AND FIXED KNIFE MESHING PRESSURE

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

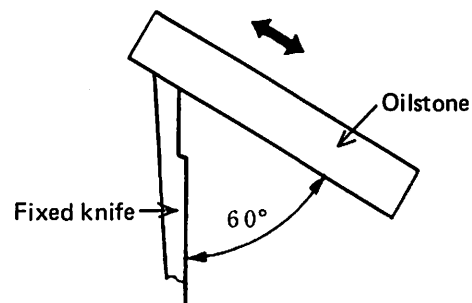
Note: Since excess scissoring pressure causes large torque to the thread trimming mechanism and results in trimming failure, adjust it so that the thread can be trimmed with minimum pressure.

- (3) Move the movable knife to check if the thread is sharply trimmed.

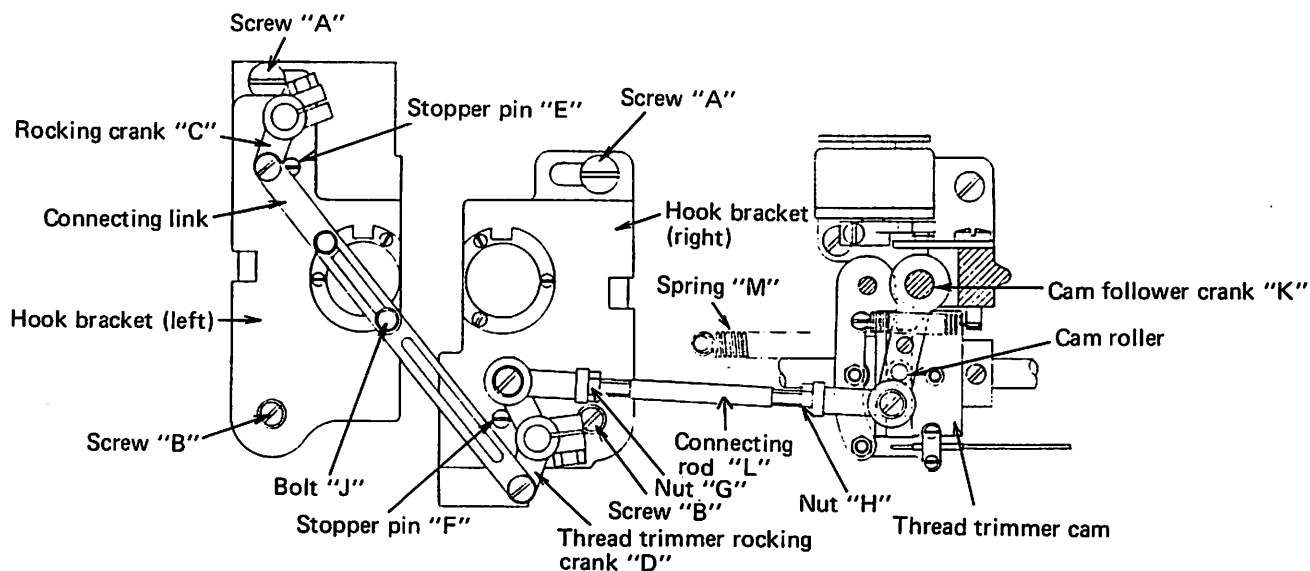


## 6. SHARPENING THE FIXED KNIFE

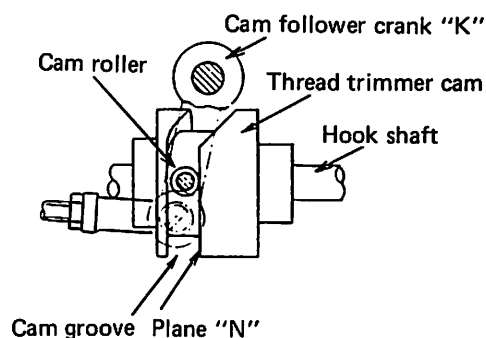
When the cutting edge of knife is dull, sharpen the fixed knife as shown in the figure. Since the movable knife is difficult to sharpen, replace it with a new one.



## 7. ADJUSTMENT OF NEEDLE GAUGE DISTANCE



- (1) Lean the machine head backward.
- (2) Loosen 2 connecting link clamp bolts "J".
- (3) Replace the throat plate, feed dog, and needle clamp.
- (4) Remove the spring "M".
- (5) Loosen the hook bracket clamp screws "A" and "B" to adjust the gaps between needles and hooks.
- (6) When the needles and hooks have been adjusted, install the spring "M".
- (7) Make the rocking cranks "C" and "D" contact with the stopper pins "E" and "F", and tighten the connecting 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) Push the cam follower crank "K" and adjust the connecting rod "L" so that the cam roller is smoothly placed onto the groove of thread trimmer cam.
- (11) Adjustment of cam groove and cam roller
  - a) Push the cam follower crank to place the cam roller onto the cam groove.
  - b) By turning the connecting rod "L", minimize the gap between the cam roller and the plane "N" as shown in the figure (within 0.2 mm). Then tighten the nuts "G" and "H".
  - c) Push the cam follower crank again to check if the cam roller is smoothly placed onto the thread trimmer cam groove.

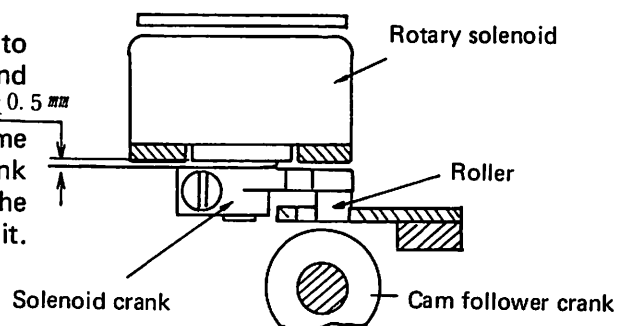


**Note:** When needle width exceeds 3/4", change the connecting rod "L".

## 8. INSTALLATION OF SOLENOID CRANK

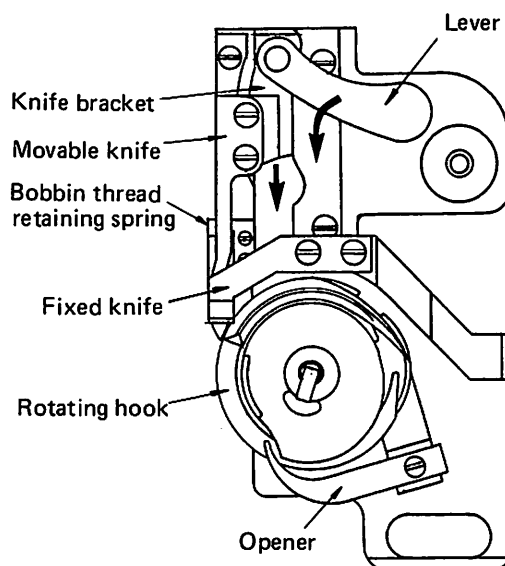
- (1) Install the solenoid crank, providing a 0— to 0.5—mm gap between the rotary solenoid and the solenoid crank.

\* Larger gap will cause the roller to come into contact with the cam follower crank during solenoid rotation, resulting in the malfunction of thread trimmer unit.



## 9. REMOVAL OF HOOK BRACKET

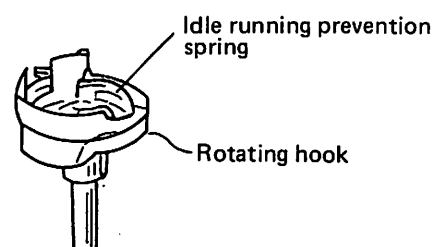
- (1) Removal of hook bracket (left) (LU2-430)  
The hook bracket (left) can be removed without disassembling the thread trimmer unit.
- (2) Remove the hook bracket (right) in the following procedure:
  - 1) Remove the opener.
  - 2) Remove the fixed knife.
  - 3) Remove the hook.
  - 4) Remove the movable knife.
  - 5) With the lever raised, remove the knife bracket by shifting it in the direction indicated by arrow in the figure.
  - 6) Remove the bobbin thread retaining spring.
  - 7) Shift the lever in the arrow direction to remove the hook bracket (right).



\* Reassemble the hook bracket in reverse procedure.

## 10. FEED DOG, THROAT PLATE, HOOK, BOBBIN CASE, BOBBIN, AND BED SLIDE

- (1) Since the feed dog, throat plate, hook, bobbin case, bobbin, and bed slide are specifically used for thread trimming, be sure to use ones specified by Mitsubishi.
- (2) Slip running prevention spring  
A conical spring is loaded in the rotating hook to prevent the bobbin from slip running during thread trimming.
- (3) Bobbin  
Use the bobbin which is attached to the machine. Since the bobbin is made of aluminum, it easily deforms. To prevent this, wind the thread as lightly as possible.





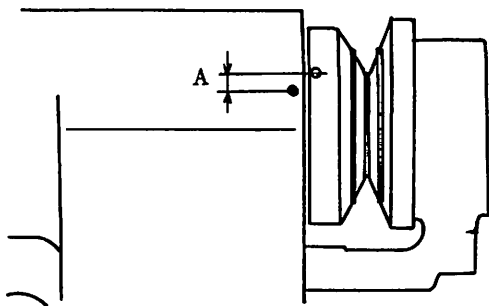
## 11. ADJUSTMENT OF NEEDLE UP STOP POSITION (LU2-410-B1T, LU2-430-B1T)

The needle UP stop position, after thread trimming, should be adjusted depending on the thicknesses and materials of threads and fabrics. For adjustment, proceed as follows:

### [Adjusting Procedure]

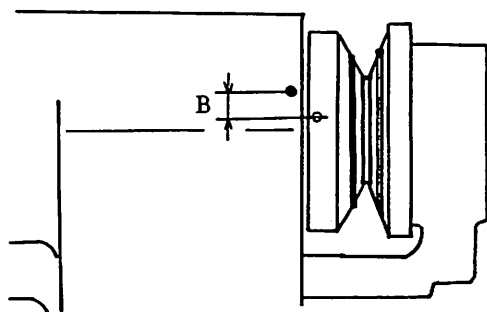
Perform stitching and thread trimming on a sample and check deviation between the white point on the balance wheel and the black point on the arm when needle UP motion stops.

#### 1) Advanced needle UP stop timing



When deviation "A" is more than 2 mm, thread trimming knife fails to operate, resulting in trimming failure of both needle and bobbin threads at left and right.

#### 2) Delayed needle UP stop timing



When deviation "B" is more than 5 mm, clearance between needle edge and throat plate reduces.


#### 3) Adjustment

If deviations are present as shown above, adjust the light shielding disc portion of synchronizer until the specified dimensions "A" and "B" are obtained. For adjusting procedure, see Section 3 "ADJUSTMENT OF NEEDLE BAR STOP POSITION" in page 5 of the Instruction Manual. When making the adjustment, check the stop position through actual stitching and thread trimming.

## ADJUSTMENT AND USE OF CONTROL SYSTEM

### 1. SELECTION OF POSITIONS 1 AND 2

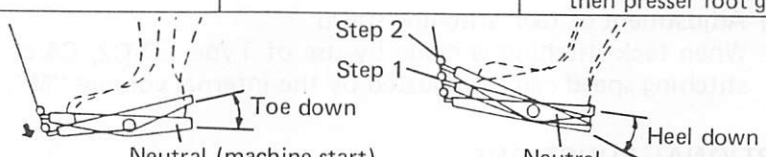
Select the machine stop position by use of the select switch on the panel.


 : Position 2  
 : Position 1

When position 1 is selected, the thread is trimmed following a turn by a heel-down operation on the pedal.

### 2. PEDAL OPERATION

The 2-step pedal operation feature allows the operation of run, thread trimming, and automatic rise of presser foot.

| Pedal Operation<br>Position Setting | TOE DOWN to<br>NEUTRAL  | NEUTRAL TO SLIGHT<br>HEEL DOWN | NEUTRAL TO<br>HEEL DOWN   |
|-------------------------------------|---|--------------------------------|---|
| Position 1                          | Needle stops at UP position.  | Pressure foot goes up.         | One turn and thread trimming, then presser foot goes up.                          |
| Position 2                          | Needle stops at DOWN position.  | Pressure foot goes up.         | Needle from UP to DOWN, half turn and thread trimming, then presser foot goes up. |
| Pedal Operation                     |  |                                |   |

Note 1: Variable speed run from low to high speeds is available depending on pedaling strokes.

Note 2: Since presser foot rise is output to the presser foot up connector, use solenoid valve (DC 24 V).

Note 3: Use optionally available Type LD-C2, C4, or C6 solenoid box for tack-stitching.

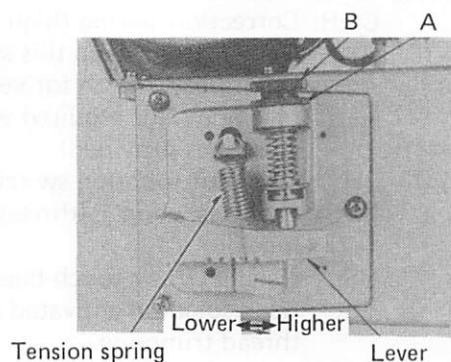
### 3. ADJUSTMENT OF PEDAL OPERATION PRESSURE

#### 3.1 Adjustment of Pedal Tow-down Force

Pedal tow-down pressure can be adjusted by changing the hooking position of the tension spring on the lever. Note that too weak pressure may cause malfunction due to unstable lever stop position.

#### 3.2 Adjustment of Pedal Heel-down Force

After loosening the nut "A", turn the bolt "B" to adjust spring pressure. After adjustment, tighten and secure the nut "A".



### 4. ADJUSTMENT OF RUNNING SPEED

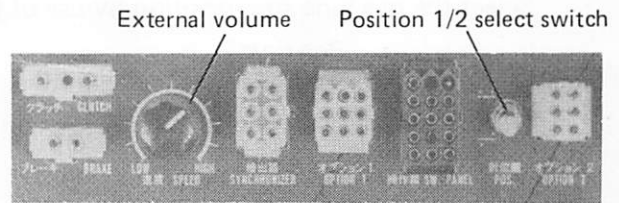
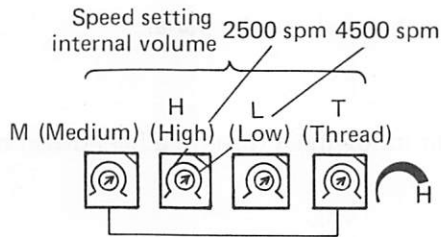
#### (1) Adjustment of maximum speed (speed obtained when pedal is fully stamped)

Two volumes for changing maximum speed are provided inside the control box and on the exterior panel of control box. The external volume allows adjustment in the range of maximum to low speeds which have been set by the internal volume "H". The internal volume "H" is factory-set at the following speeds.

| No. of Poles | Internal Volume "H" Setting | Adjustable Range by External Volume |
|--------------|-----------------------------|-------------------------------------|
| 2 poles      | 2000 spm                    | Max. speed to 200 spm               |

To select speeds which are outside the aforementioned range, adjust the internal volume "H". Since the internal volume "H" is marked at 2 locations (with 2500 spm and 4500 spm) as shown in the following page, use these marks as guides. For finer speed setting, use a tachometer, etc.

Note: Even if the motor pulley diameter is made larger, speed higher than the settings of internal volume "H" and external volume cannot be obtained.



- (2) Adjustment of positioning speed (speed obtained when pedal is slightly stamped)  
The positioning (low) speed can be adjusted by the internal volume "L". Turning it clockwise increases speed and counterclockwise decreases. Adjustable range is 160 to 320 spm. (This volume is factory-set at 200 spm.)
- (3) Adjustment of thread trimming speed  
The thread trimming speed can be adjusted by the internal volume "T". Clockwise turn increases speed and counterclockwise decreases. This volume is factory-set at 175 spm. For the adjustment of trimming speed, consult the Adjustment Instruction Manual or your dealer.
- (4) Adjustment of tack-stitching speed  
When tack-stitching is made by use of Type LD-C2, C4 or C6 solenoid box (option), tack-stitching speed can be adjusted by the internal volume "M".

## 5. OPTIONAL FUNCTIONS

By the connections of internal switch and external optional connector, this sewing machine can be applied to a vertical work sewing machine and various types of automatic machines. For details, consult your dealer.

### (1) Internal switch

COR: Correction sewing (high speed)  
G: Gain switch (Keep this switch on.)  
A: High-speed switch for vertical sewing machine (Not required when external volume is provided)  
SH: One-shot function switch  
POS: Positions 1 and 2 (thread trimming motion)  
US: Needle UP by touch-back switch  
TB: Back solenoid activated at time of thread trimming

IL: Thread trimming interlock reset switch  
+2 } Slow  
+1 } Start  
SL } Switch

|    | 0   | 1<br>needle | 2<br>needles | 3<br>needles | 4<br>needles |
|----|-----|-------------|--------------|--------------|--------------|
| SL | OFF | ON          | ON           | ON           | ON           |
| +1 | OFF | OFF         | ON           | OFF          | ON           |
| +2 | OFF | OFF         | OFF          | ON           | ON           |

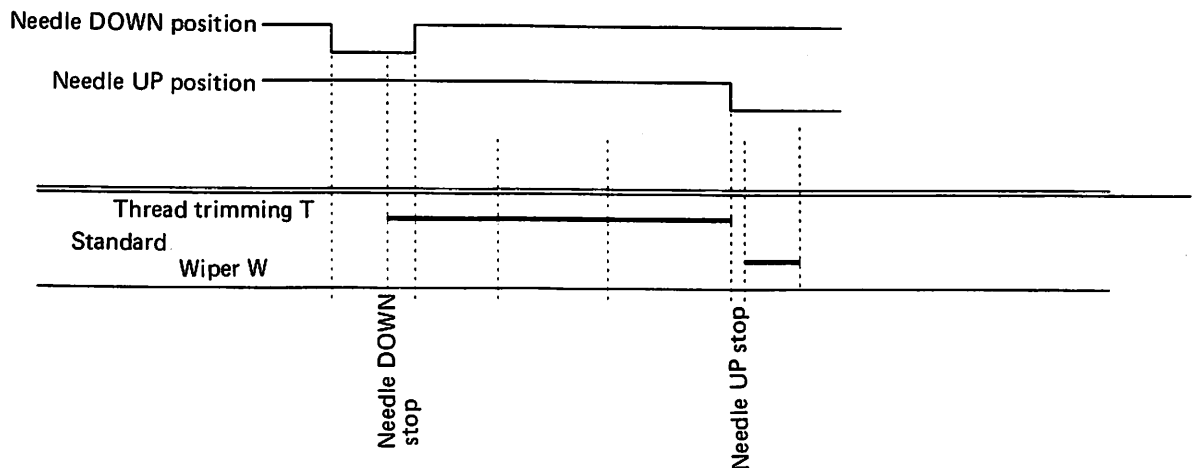
FL: Automatic presser foot rise reset by S<sub>2</sub>





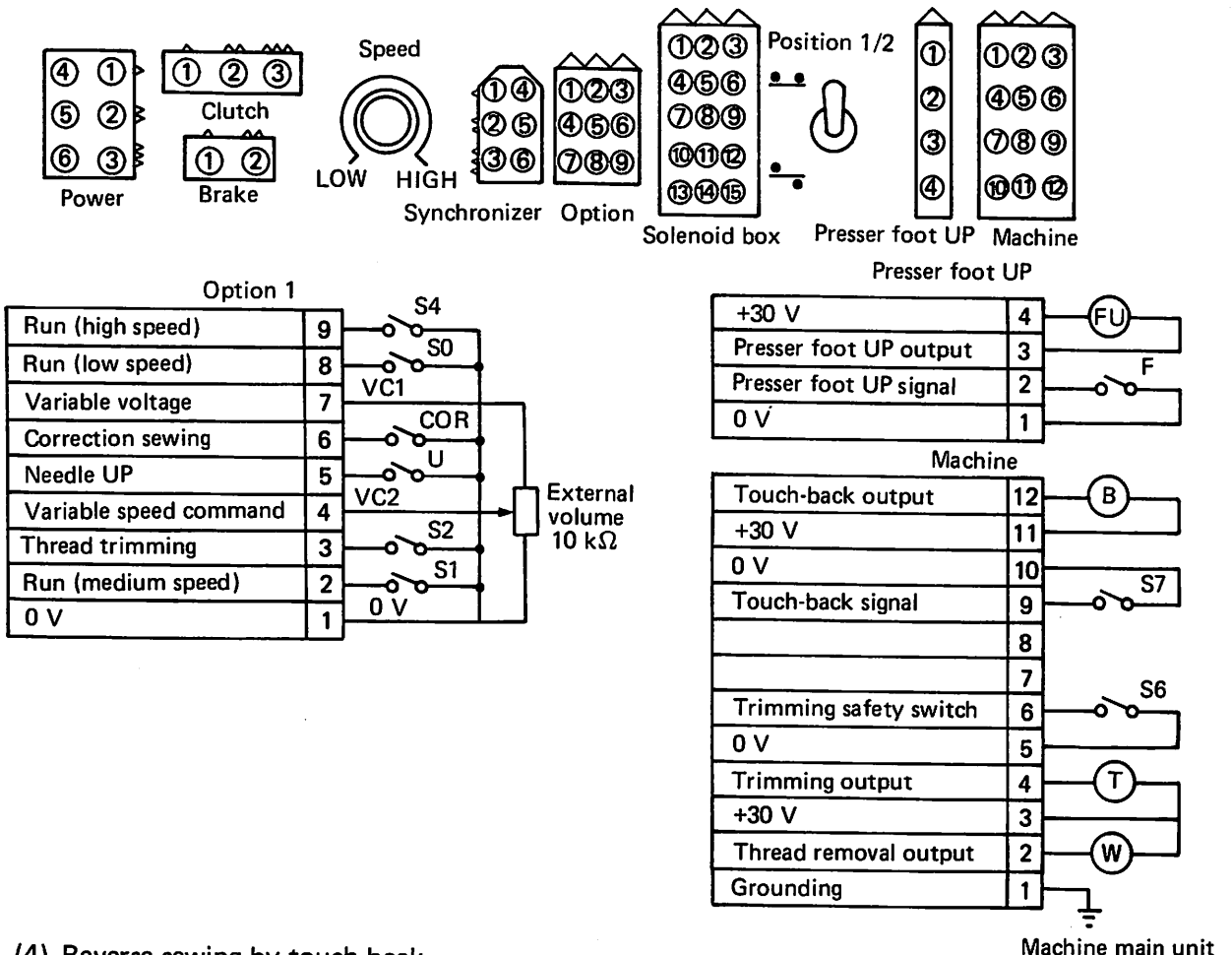
## (2) Automatic thread trimming

Set and adjust thread trimming timing with P5 and P24.



## (3) Optional connectors

Various operations are possible by applying signals from exterior to optional connectors. For input signals, use contacts which are highly reliable in contacting performance.



## (4) Reverse sewing by touch-back

The operation by use of touch-back switch (S<sub>7</sub>) is actuated only during machine operation.

## THREAD TRIMMER TROUBLESHOOTING LIST

| Trouble   | Cause  | Corrective Action  | Reference   |
|---|--|--|---|
| Thread is not trimmed.                                    | <ol style="list-style-type: none"> <li>1. Roller does not rest onto cam groove when needle is at the lowest position.</li> <li>2. Fixed knife is not in positive engagement with movable knife.</li> <li>3. Movable knife is improperly located.</li> <li>4. Machine stop position timing is too advanced.</li> <li>5. Thread trimmer cam is improperly adjusted.</li> <li>6. Needle thread tension release timing is too advanced.</li> </ol> | <p>Adjust cam follower crank position.</p> <p>Check setting of solenoid crank.</p> <p>Adjust intermeshing pressure between movable and fixed knives.</p> <p>Check setting of movable knife.</p> <p>Adjust synchronizer.</p> <p>Adjust thread trimmer cam.</p> <p>Adjust needle thread tension regulator.</p> | <p>Sec. 7 (10) in P. 22</p> <p>Sec. 8 in P. 23</p> <p>Sec. 5 in P. 21</p> <p>Sec. 1 in P. 18</p> <p>P24</p> <p>Sec. 3 in P. 19</p> <p>Sec. 4 in P. 20</p> |
| After thread trimming, needle thread slips out of needle. | <ol style="list-style-type: none"> <li>1. Needle thread tension disc fails to open.</li> <li>2. Thread catches in thread retainer.</li> <li>3. Thread is not smoothly passed through thread handling parts.</li> <li>4. Needle thread tension releasing timing is too delayed.</li> </ol>  | <p>Adjust needle thread tension regulator.</p> <p>Check threading of needle thread.</p> <p>Polish thread handling parts such as thread retainer, needle thread tension regulator, and needle clamp.</p> <p>Adjust needle thread tension regulator.</p>   | <p>Sec. 4 in P. 20</p> <p>Sec. 4 in P. 9</p> <p>Sec. 4 in P. 20</p>   |
| After trimming, needle thread is too long.                | <ol style="list-style-type: none"> <li>1. Bobbin thread retaining spring pressure is too high.</li> <li>2. Pretension is insufficient.</li> <li>3. Needle thread tension releasing timing is too advanced.</li> </ol>  | <p>Reduce spring pressure.</p> <p>Increase spring pressure.</p> <p>Adjust needle thread tension regulator.</p>   | <p>Sec. 4 in P. 20</p>  |

| Trouble   | Cause   | Corrective Action  | Reference   |
|---|---|--|---|
| After trimming, needle thread is too short.                     | <ol style="list-style-type: none"> <li>Working stroke of slack thread take-up spring is too large.</li> <li>Thread is not smoothly passed through thread handling parts.</li> <li>Opening degree of needle thread tension disc is insufficient.</li> <li>Thread is caught in thread retainer.</li> <li>Pretension is too high.</li> <li>Thread is broken by movable knife and bobbin thread retaining spring.</li> <li>Needle thread tension releasing timing is improper.</li> </ol> | <p>Reduce working stroke to the degree that sewing performance is not adversely affected.</p> <p>Polish thread handling parts such as thread retainer, needle thread tension regulator, and needle clamp.</p> <p>Adjust needle thread tension regulator.</p> <p>Check threading of needle thread.</p> <p>Decrease pretension.</p> <p>Buff end of bobbin thread retaining spring.</p> <p>Adjust cam of needle thread tension regulator cam.</p> | <p>Sec. 4 in P. 20</p> <p>Sec. 4 in P. 9</p> <p>Sec. 4 in P. 20</p> |
| Stitches skip at start of sewing.                               | <ol style="list-style-type: none"> <li>Bobbin thread is out of bobbin thread retaining spring.</li> <li>After thread trimming, needle thread is too short.</li> <li>Bobbin thread tension is too high.</li> <li>Slow start switch is turned on.</li> <li>Thread is wound 1 turn around needle.</li> </ol>   | <ol style="list-style-type: none"> <li>Correct spring pressure and also movable knife contact surface.</li> </ol>  |   |
| 5 to 6 stitches after start of sewing, bobbin thread is broken. | <ol style="list-style-type: none"> <li>Bobbin thread tension is too high.</li> <li>Bobbin thread is entangled due to idle running of bobbin.</li> <li>Thread is not smoothly passed through feed needle eye and throat plate, or is damaged.</li> </ol>   | <p>Check if idle running prevention spring is inside rotating hook.</p> <p>Polish needle eye and throat plate.</p>   | P. 23   |





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