# INSTRUCTION MANUAL

# 1510D serial

# IMPORTANT SAFETY INSTRUCTIONS

Putting sewing systems into operation is prohibited until it has been ascertained that the sewing systems in which these sewing machines will be built into, have conformed with the safety regulations in your country. Technical service for those sewing systems is also prohibited.

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

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

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

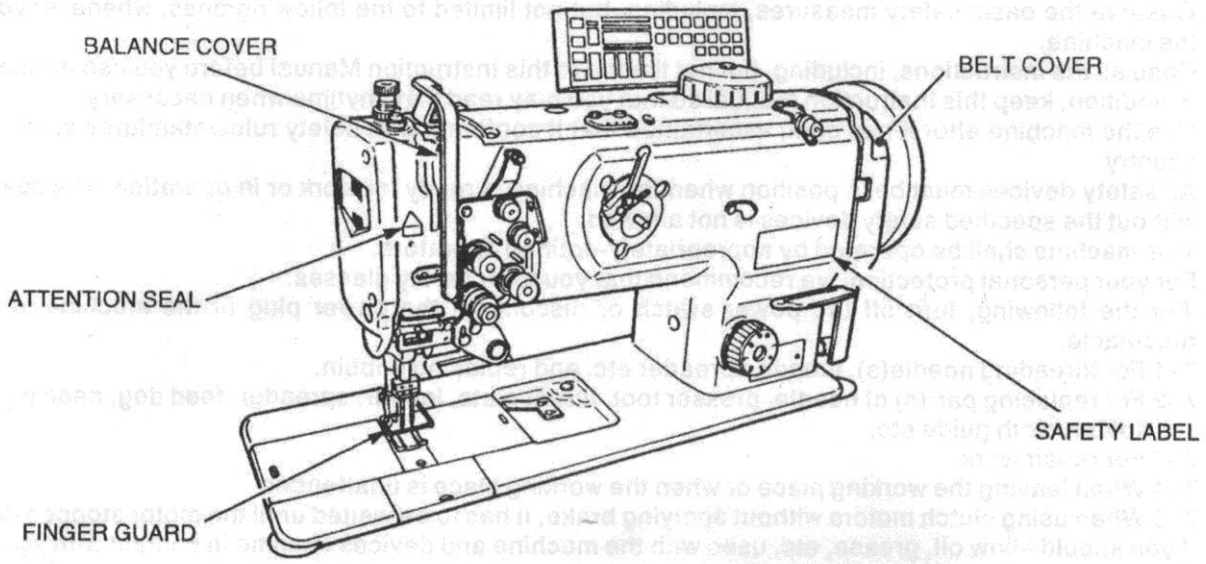
17. The machine is only allowed to be used for the purpose intended. Other used are not allowed.
18. Remodel or modify the machine in accordance with the safety rules/standards while taking all the effective safety measures. We assumes no responsibility for damage caused by remodeling or modification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

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


Danger of injury to operator or service staff


Items requiring special attention

## SAFETY DEVICE AND CAUTION




## FOR SAFE OPERATION

1. Keep your hands away from needle when you turn ON the power switch or while the machine is in operation.
2. Do not put your fingers into the thread take-up cover while the machine is operating.
3. Turn OFF the power switch when tilting the machine head, or removing the belt cover or the V belts.
4. During operation, be careful not to allow your or any other person's head, hands or clothes to come close to the handwheel, V belt and motor. Also, do not place anything close to them.
5. Do not operate your machine with the belt cover and finger guard removed.
6. When tilting the machine head, be sure to confirm that the head support bar is properly attached to your machine head, and be careful not to allow your fingers or the like to be pinched in the machine head. In addition, when the machine is used with the control panel, do not tilt or raise the machine head while holding the control panel.

1. To ensure safety, never operate the machine with the ground wire for the power supply removed.
2. When inserting/removing the power plug, the power switch has to be turned OFF in advance.
3. In time of thunder and lightening, stop your work and disconnect the power plug from the receptacle so as to ensure safety.
4. if the machine is suddenly moved from a cold place to a warm place, dew condensation may be observed. In this case, turn ON the power to the machine after you have confirmed that there is no danger of water drops in the machine.

CAUTION:
Note that safety devices such as "belt cover", "finger guard", etc. may be omitted from the illustrations in this Instruction Manual for easy explanation.
When operating the machine, be sure not to remove these safety devices.

CONTENTS

## BEFORE OPERATION

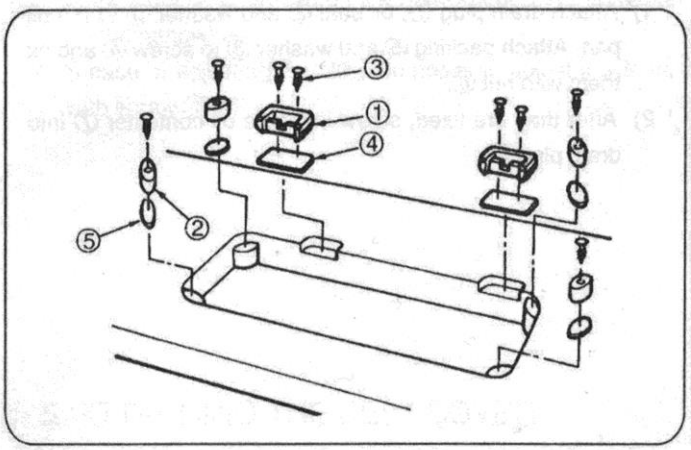
CAUTION:
Check the following so as to prevent maloperation of and damage to the machine.

- Before you put the machine into operation for the first time after the set-up, clean it thoroughly. Remove all dust gathering during transportation and oil it well.
- Confirm that voltage has been correctly set. Confirm that the power plug has been properly connected to the power supply.
- Never use the machine in the state where the voltage type is different from the designated one.
- The direction of normal rotation of the machine is counterclockwise as observed from the pulley side.
- Take care not to allow the machine to rotate in the reverse direction.
- When tilting the machine head, tilt it after removing knee lifter hook.
- Never operate the machine unless the machine head and the oil tank have been filled with oil.
- For a test run, remove the bobbin and the needle thread.
- For the first month, decrease the sewing speed and run the sewing machine at a speed of 2,000 rpm or less.
- Operate the handwheel after the machine has totally stopped.

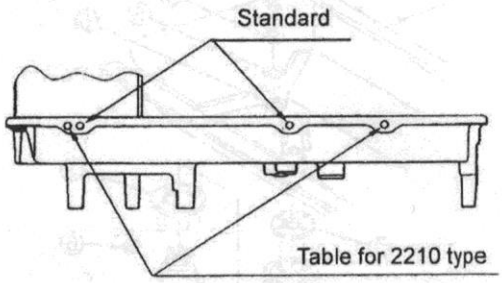
## SPECIFICATIONS

| | | |
|---|---|---|
| Model | 1560N (Standard gauge type)<br>1561N (2260 gauge type) | 1560N-7 (Standard gauge type)<br>1561N-7 (2260 gauge type) |
| Sewing speed | Max. 2,500 rpm<br>See "24.SEWING SPEED TABLE" on page 51. | |
| Stitch length(max.) | Normal feed: 9 mm Reverse feed: 9 mm | |
| Needle | SCHMETZ 135 x 17 (Nm 125 to Nm 180) (Standard: Nm 160) | |
| Thread | #30 to #5 (US:#46 to #138, Europe:20/3 to 60/3) | |
| Hook | Vertical-axis 2.0-fold capacity hook | |
| Lift of presser foot | Hand lifter lever: 9 mm | |
| | Knee lifter :16 mm | Auto-lifter: 16 mm |
| Lubricating oil | New Defrix Oil No.2 | |
| Noise | Workplace-related noise at sewing speed N=1,550 $min^{-1}$: $L_{PA} \leq 84$ dB(A) Noise measurement according to DIN 45635-48-A-1 | Workplace-related noise at sewing speed N=2,040 $min^{-1}$: $L_{PA} \leq 84$ dB(A) Noise measurement according to DIN 45635-48-A-1 |

# 1. INSTALLATION

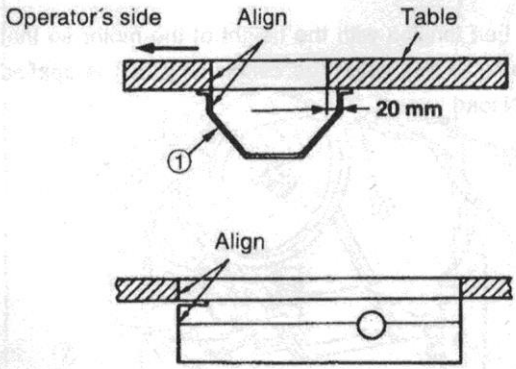



[Hinge attaching hole]

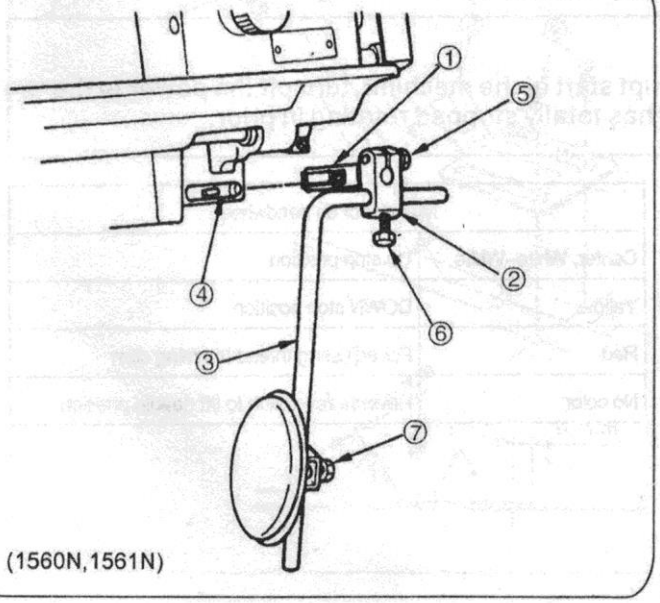



1) Attaching the hinge seats and the support rubbers of the machine head.
Fix the hinge seats ①and the support rubbers ② supplied with the machine on the table using pails ③.

* If the slide plate comes in contact with the table when opening it, place spacer rubbers ④ and ⑤ supplied with the machine under support rubbers ② and hinge seats ①.




2) Attaching the oil pan
Fix the oil pan ① supplied with the machine by tightening eight wood screws.

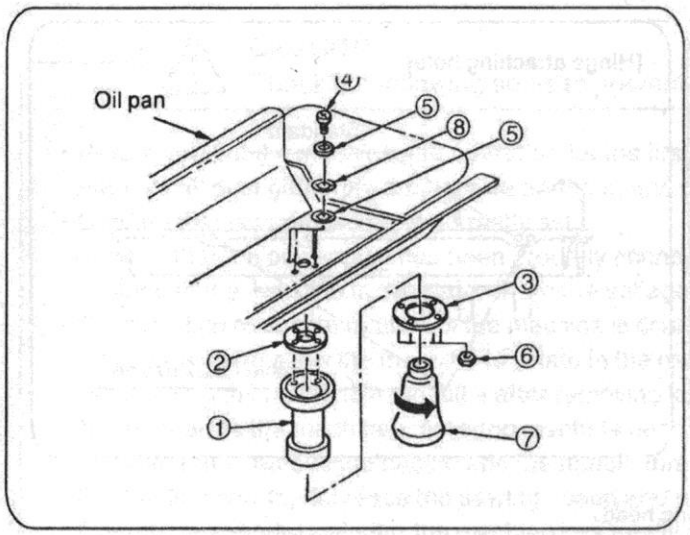



(1560N,1561N)

3) Adjust knee pad joint ①, knee lifter vertical shaft installing arm ② and knee pad lever ③ to the direction of knee lifter lever shaft ④ and assemble these components. (1560N, 1561N)

4) Adjust the direction of the pad with setscrews ⑤, ⑥ and ⑦. (1560N,1561N)

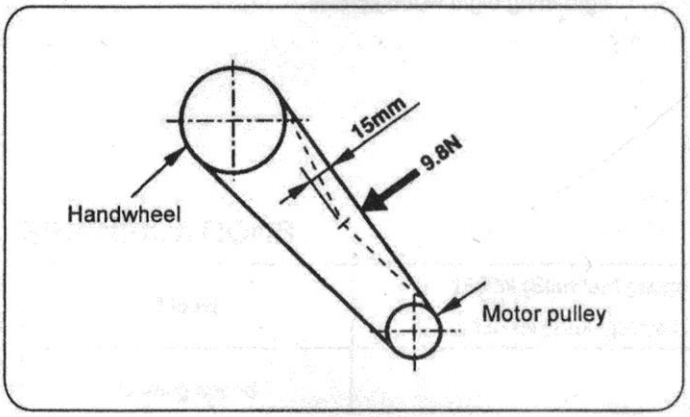
## 2. INSTALLING THE WASTE OIL CONTAINER




1) Attach drain plug ①, oil seal ② and washer ③ to the oil pan. Attach packing ⑤ and washer ⑧ to screw ④ and fix them with nut ⑥.
2) After they are fixed, screw in waste oil container ⑦ into drain plug ①.

## 3. ADJUSTING THE BELT TENSION

**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




Adjust the belt tension with the height of the motor so that the belt sags 15 mm when the center of V belt is applied with a 9.8 N load.

## 4. ADJUSTING THE STOP POSITION (1560N-7,1561N-7)

**WARNING:**
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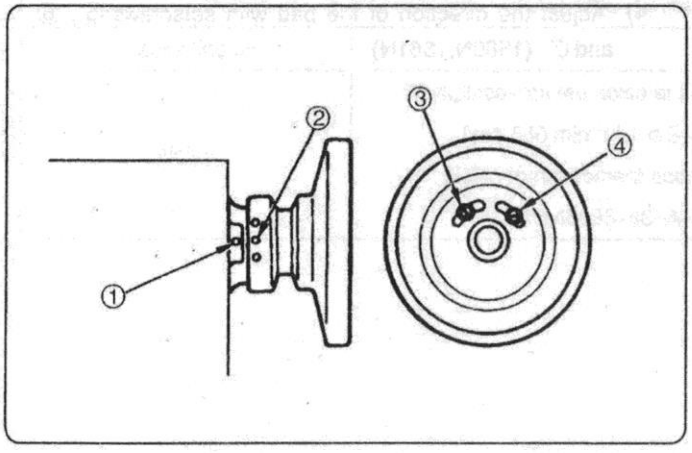


| Marker dot on handwheel | |
|---|---|
| Center, White-White | Up stop position |
| Yellow | DOWN stop position |
| Red | For adjusting thread trimming cam |
| No color | Reverse revolution to lift needle position |

1) The respective stop positions and adjusting positions are those when marker dot ① engraved on the machine arm aligns with marker dot ② engraved on the handwheel. For the marker dots engraved on the handwheel, refer to the table of marker dot on the handwheel.
2) In case of adjusting the UP stop position, adjust it with screw ③, and in case of adjusting the DOWN stop position, adjust it with screw ④.

## 5. ATTACHING THE BELT COVER

**WARNING:**
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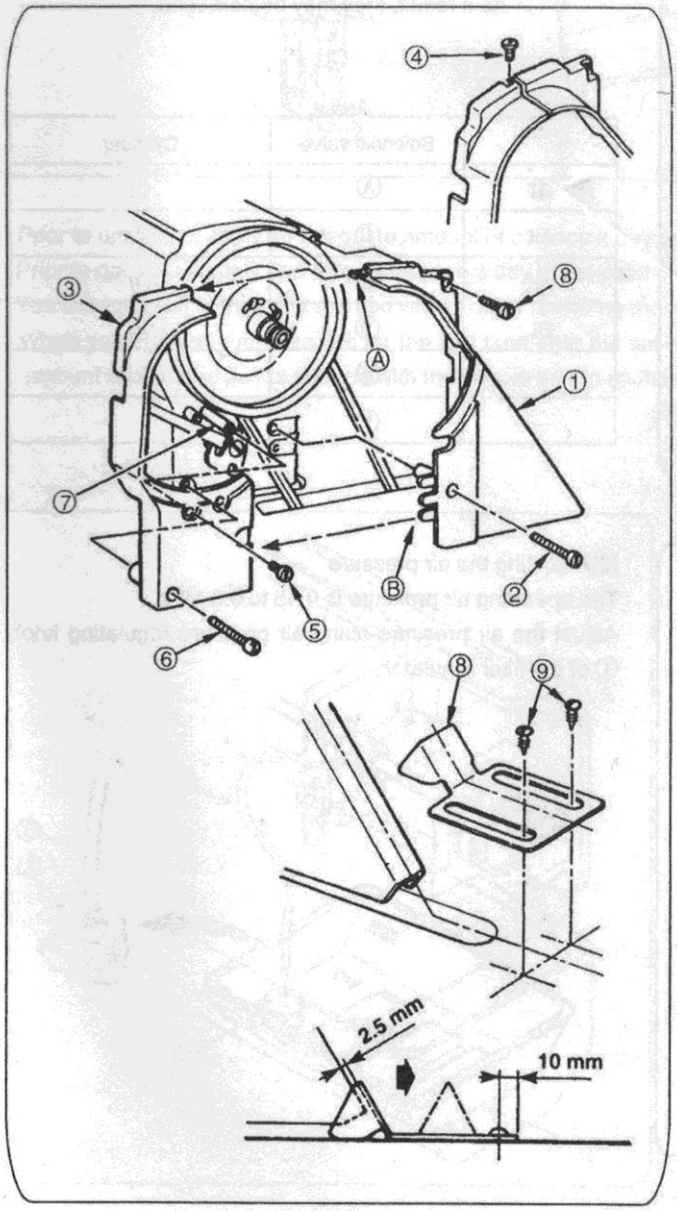
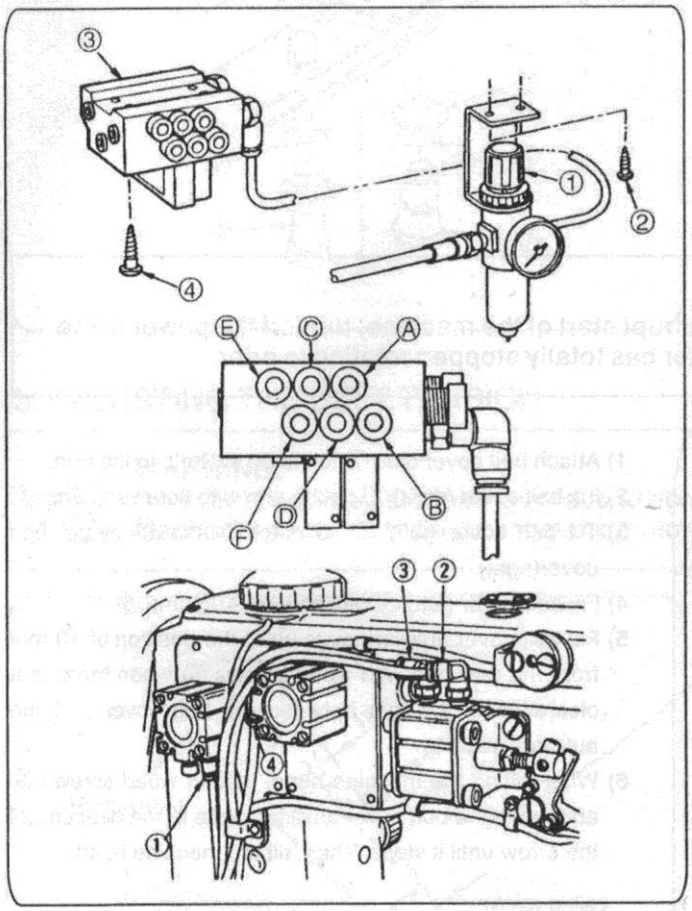



1) Attach belt cover stud ⑦ to the screw hole in the arm.
2) Fix belt cover (right) ① on the arm with screws ② and ⑧.
3) Fit belt cover (left) ③ to notch Ⓐ and Ⓑ of the belt cover(right).
4) Fix belt cover (left) ③ with screws ④,⑤ and ⑥.
5) Fix belt cover auxiliary plate ⑧ at the position of 10 mm from the rear end with wood screws ⑨ when there is a clearance of 2.5 mm between the belt cover and the auxiliary plate.
6) When tilting the machine head, loosen wood screws ⑨ and move the belt cover auxiliary plate in the direction of the arrow until it stops. Then, tilt the machine head.

**(Caution)** After attaching the belt cover, confirm whether or not the respective cords do not come in contact with the belt and the handwheel. Disconnection of the cords will result when they come in contact

## 6. THE AIR DRIVE UNIT OF THE SEWING MACHINE EQUIPPED WITH AUTOMATIC DEVERSE FEED DEVICE AND AUTO-LIFTER(1560N-7,1561N-7)

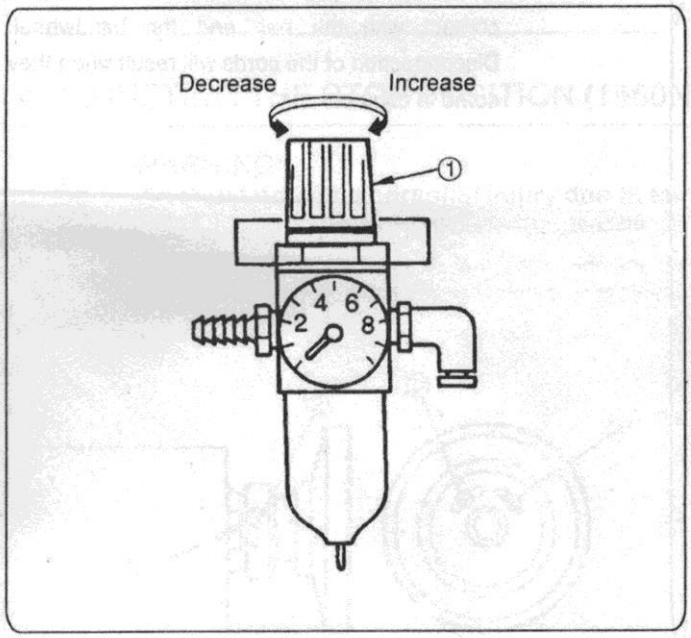
**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




1) Attach regulator (asm.) ① to the underside of the table with wood screws ② supplied with the regulator.
2) Attach air control unit (asm.) ③ to the four places on the underside of the table with wood screws ④ supplied with the unit.
3) Adjust the number of the air hose to the number of the air cylinder joint and insert the hose to the joint.

**(Caution)** Do not run the sewing machine while the presser foot is held raised with the auto-lifter. Needle bar comes in contact with presser foot.
As a result, they may be damaged.

| | Solenoid valve | Cylinder |
|---|---|---|
| BT | Ⓐ | ① |
| AK | Ⓒ | ② |
| AK | Ⓓ | ③ |
| DL | Ⓑ | ④ |
| — | Ⓔ | — |
| — | Ⓕ | — |




(2)Adjusting the air pressure
The operating air pressure is 0.45 to 0.5 MPa.
Adjust the air pressure using air pressure regulating knob ① of the filter regulator.

## 7. LUBRICATION

**WARNING:**
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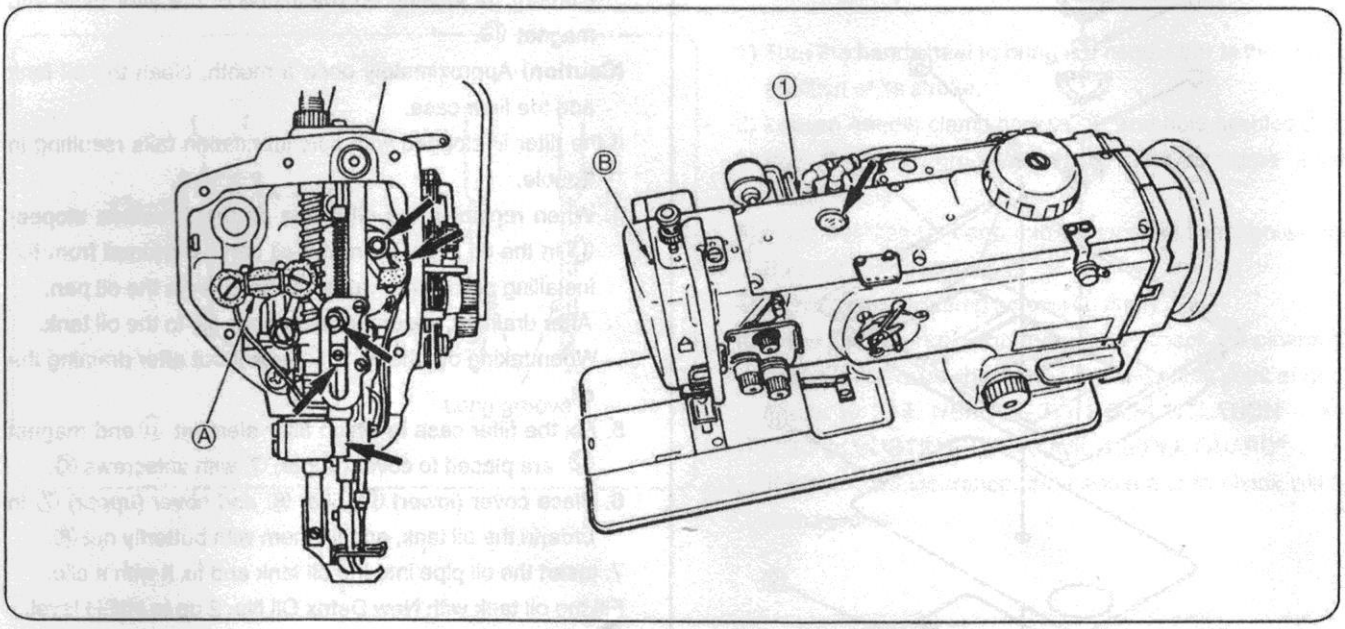
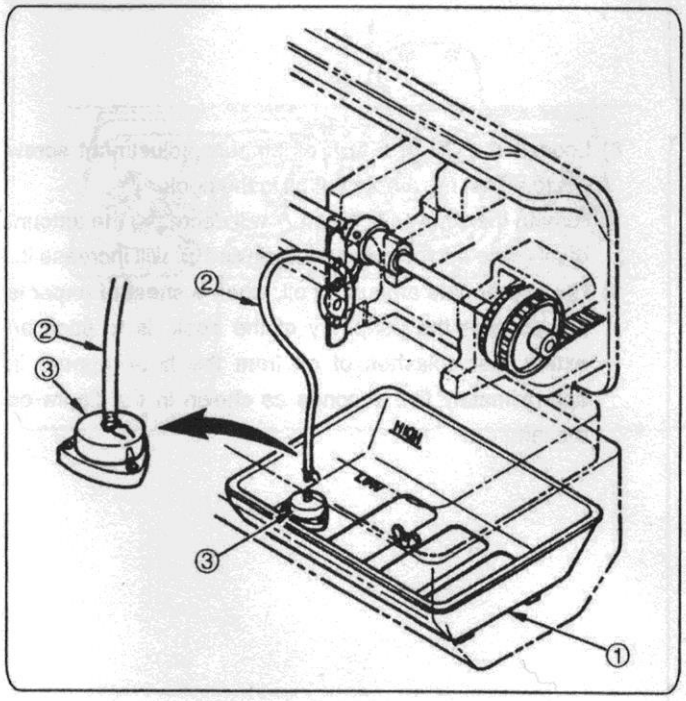
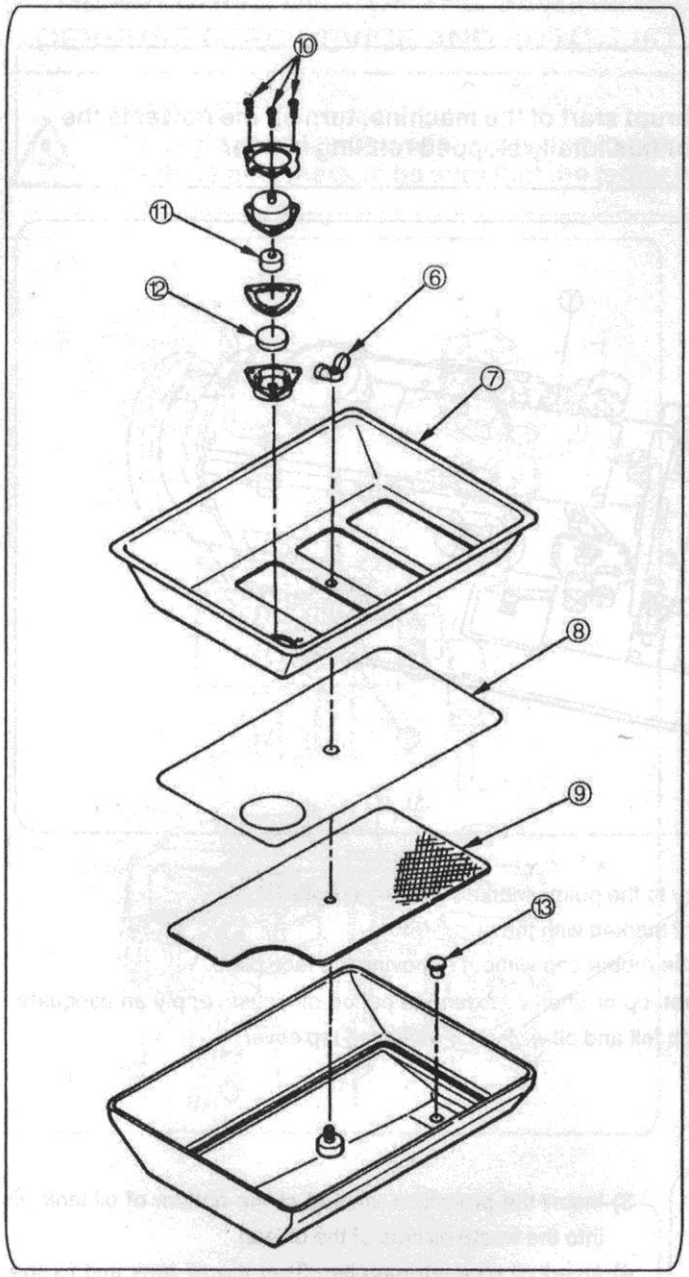



1) Prior to operation, apply an adequate amount of oil once a day to the points marked with the arrows Ⓐ.
   Prior to operation, apply one drop of oil once a day to the point marked with the arrow Ⓑ.
   * You can apply oil to the point marked with Ⓐ after removing the rubber cap without removing the face plate.
2) When you operate your machine for the first time after the set-up or after an extended period of disuse, apply an adequate amount of oil to the points marked with the arrows and to each felt and oil wick after removing top cover ①.




3) Insert the projection located at the bottom of oil tank ① into the waste oil hole of the oil pan.
4) Insert oil pipe ② into filter ③ of the oil tank and fix the pipe with a clip.
5) Pour the New Defrix Oil No. 2 into the oil tank until HIGH level is reached.
6) Add the same lubricating oil up to HIGH level as soon as the oil level has come down to LOW level.
7) After the lubrication, you can see from oil sight window ⑤ that the oil rises up when the operation is normal.
   (However, the machine should run at 1,500 rpm or more.)




■ Cleaning the oil tank

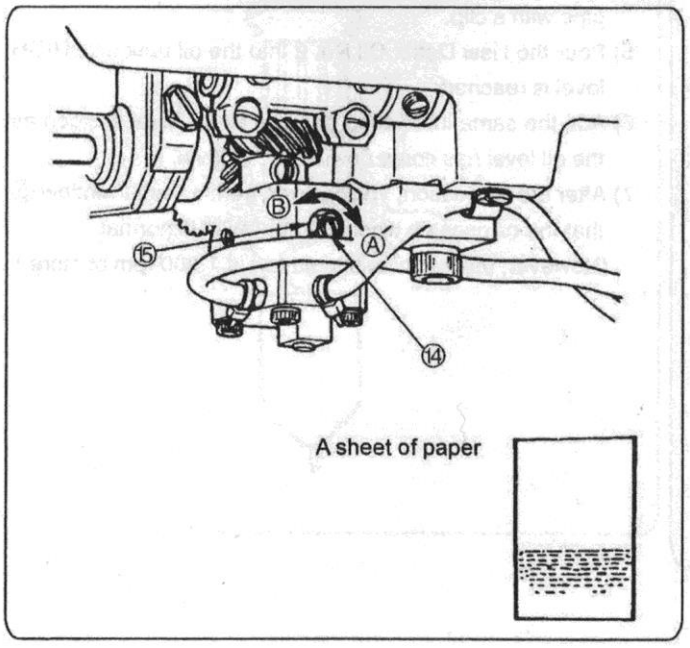
1. Remove the oil pipe from oil tank ①.
2. Remove butterfly nut ⑥ and take out cover(upper) ⑦, filter ⑧ and cover(lower) ⑨ to clean the oil tank.
3. Remove filter case setscrews ⑩, and clean filter element ⑪ located on the inside of the filter case and magnet ⑫.

**(Caution)** Approximately once a month, clean the oil tank and the filter case.

If the filter is clogged with soil, lubrication fails resulting in trouble.

4. When replacing the oil in the oil tank, remove stopper ⑬ in the oil tank. Then, the oil can be drained from the installing port of the waste oil container in the oil pan.
   After draining, securely set stopper ⑬ to the oil tank.
   When taking out the oil tank, take it out after draining the oil.
5. Fix the filter case in which filter element ⑪ and magnet ⑫ are placed to cover (upper) ⑦ with setscrews ⑩.
6. Place cover (lower) ⑨, filter ⑧ and cover (upper) ⑦ in orderin the oil tank, and fix them with butterfly nut ⑥.
7. Insert the oil pipe into the oil tank and fix it with a clip.

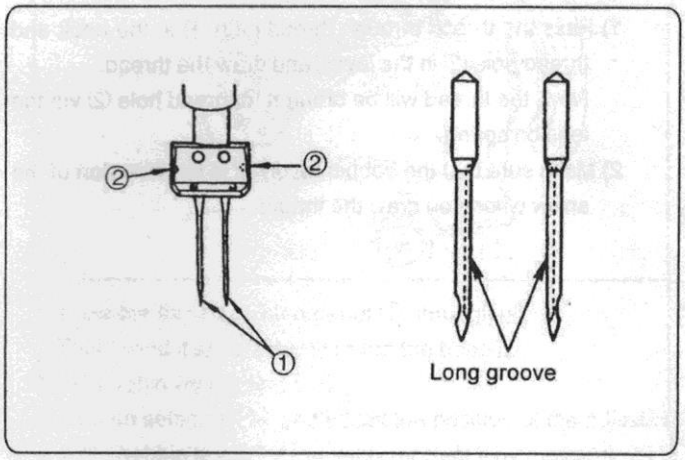
Fill the oil tank with New Defrix Oil No. 2 up to HIGH level.




8) Loosen nut ⑮ and turn oil amount adjustment screw ⑭ to adjust the amount of oil in the hook.
   Turning the screw clockwise Ⓐ will decrease the amount of oil in the hook or counterclockwise Ⓑ will increase it.
9) The appropriate amount of oil, when a sheet of paper is placed near the periphery of the hook, is to such an extent that splashes of oil from the hook appear in approximately five seconds as shown in the figure on the left.

## 8. ATTACHING THE NEEDLE

WARNING:
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.

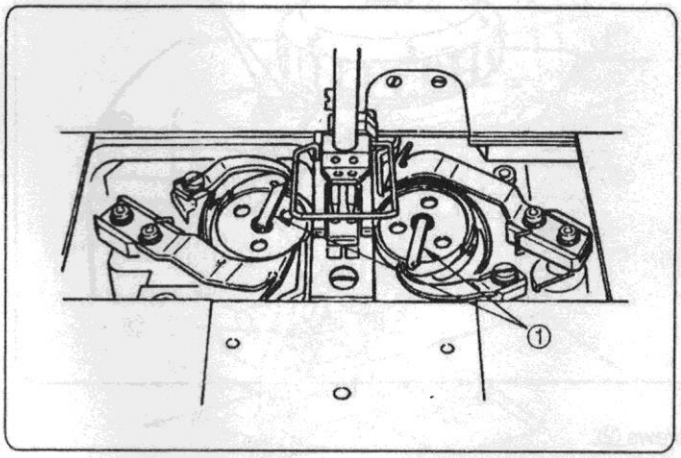



1) Turn the handwheel to bring the needle bar to the highest position of its stroke.
2) Loosen needle clamp screws ②, and hold needles ① so that the long grooves in the needles come inside respectively.
3) Push needles ① deep into the needle clamp holes until they will go no further.
4) Tighten needle clamp screws ② firmly.

**(Caution)** When replacing the needle, check the clearance provided between the needle and the blade point of hook. (Refer to "19. NEEDLE-TO-HOOK RELATION" and "20. ADJUSTING THE HOOK NEEDLE GUARD".)
If there is no clearance, the needle and the hook will be damaged.

## 9. ATTACHING AND REMOVING THE BOBBIN

WARNING:
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




1) Lift latch ① of hook, and take out the bobbin.
2) Put the bobbin into the shaft in the hook correctly and release the latch.

**(Caution)** 1.Do not make the machine run idle with the bobbin (bobbin thread). The bobbin thread is caught in the hook. As a result, the hook may be damaged.
2.Be careful so as not to get hurt with the top end of the counter knife.

## 10. THREADING THE HOOK

WARNING:
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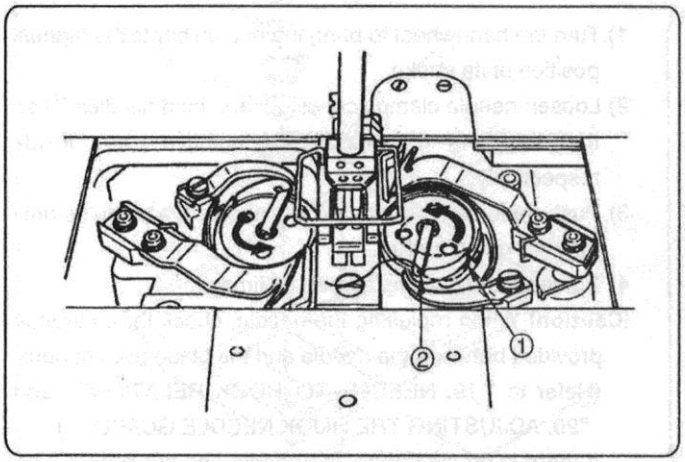
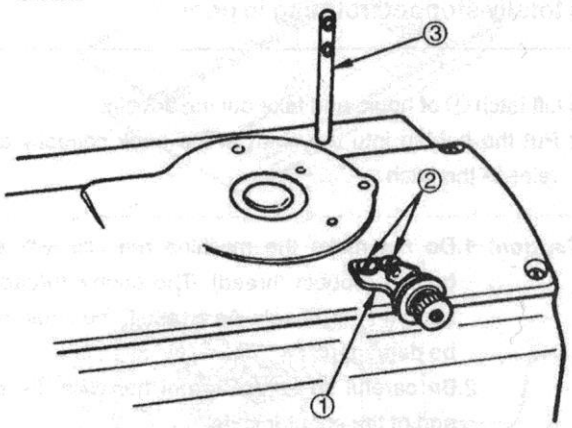


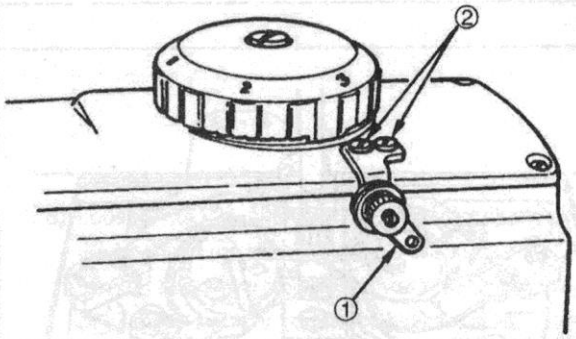

1) Pass the thread through thread path ① in the hook and thread hole ② in the lever, and draw the thread.
   Now, the thread will be brought to thread hole ② via the tension spring.
2) Make sure that the bobbin revolves in the direction of the arrow when you draw the thread.

## 11. INSTALLING THE BOBBIN WINDER THREAD GUIDE

1560N
1561N



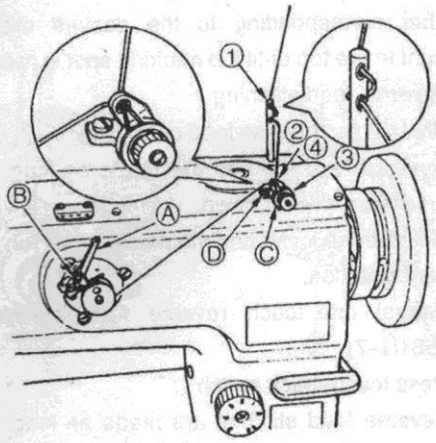

1560N-7
1561N-7



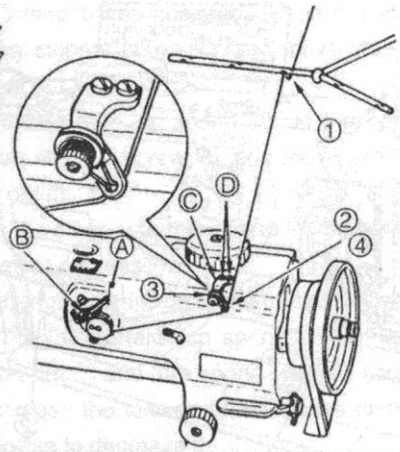

1) Attach bobbin winder thread guide ① to the top cover using screws ②.
   For the 1560N and 1561N attach the thread guide so that it is facing to the upper left, and for the 1560N-7 and 1561N-7 it is facing to the lower right.
2) Adjust the position of the thread guide referring to "12.WINDING A BOBBIN".
3) For the 1560N and 1561N strike bobbin thread guide rod ③ into the machine arm.

## 12. WINDING A BOBBIN

1560N
1561N




1560N-7
1561N-7




1) Pass the thread in the order of ①, through ④.
   Then, wind it several turns round the bobbin.
2) Tilt bobbin winder lever Ⓐ.
3) Loosen setscrew Ⓑ and adjust the position of the adjusting plate to wind a bobbin about 80% of its capacity.
4) If the bobbin is wound unevenly, correct it by moving bobbin winder thread guide Ⓒ back or forth.
   Then, tighten setscrews Ⓓ.
5) When the bobbin is filled up, the bobbin winder lever automatically releases the bobbin and the bobbin winder stops running.

## 13. THREADING THE MACHINE HEAD

**WARNING:**
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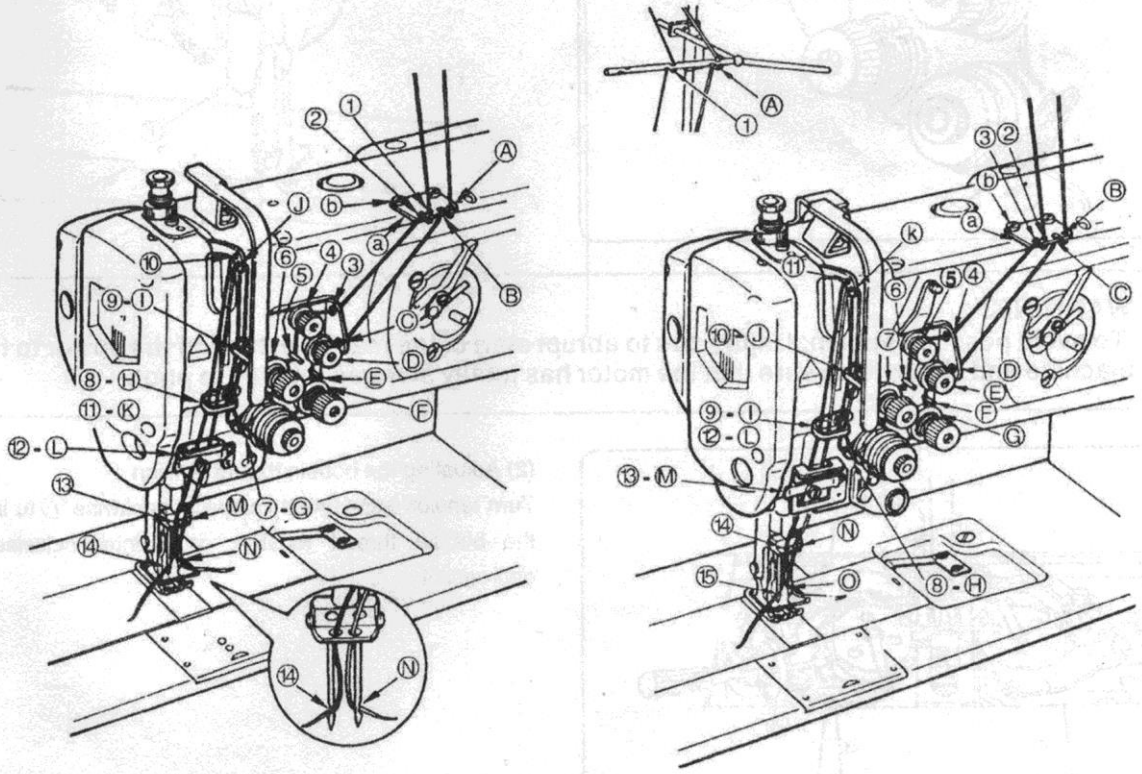
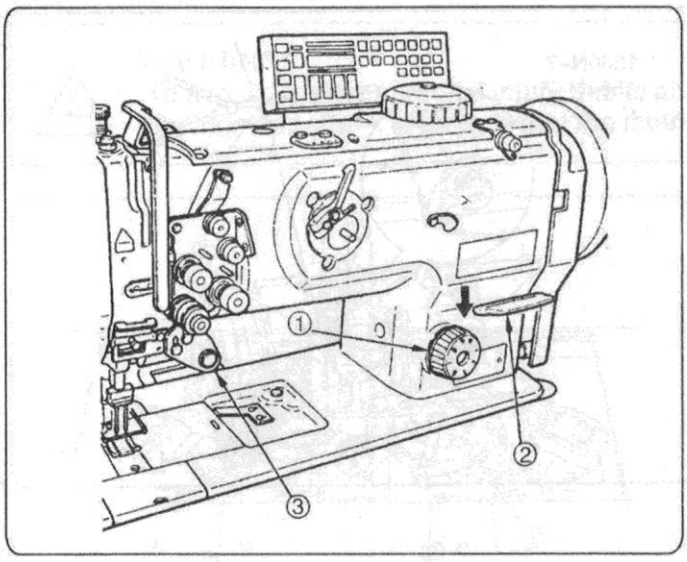



1. Attach arm thread guide ⓐ to the top cover with setscrew ⓑ.
2. Pass the left-hand needle thread in the order of ① to ⑭(⑮).
   Pass the right-hand needle thread in the order of Ⓐ to Ⓝ (Ⓞ) as illustrated in the figure.

## 14. ADJUSTING THE STITCH LENGTH




Turn stitch dial ① counterclockwise (clockwise) so that the number corresponding to the desired stitch length is brought to the top until the marking spot is reached.

(1) Reverse feed stitching

1) Press down reverse feed control lever ②.

2)Reverse feed stitches are made as long as you keep pressing the lever down.

3) Release the lever, and the machine will run in the normal feed direction.

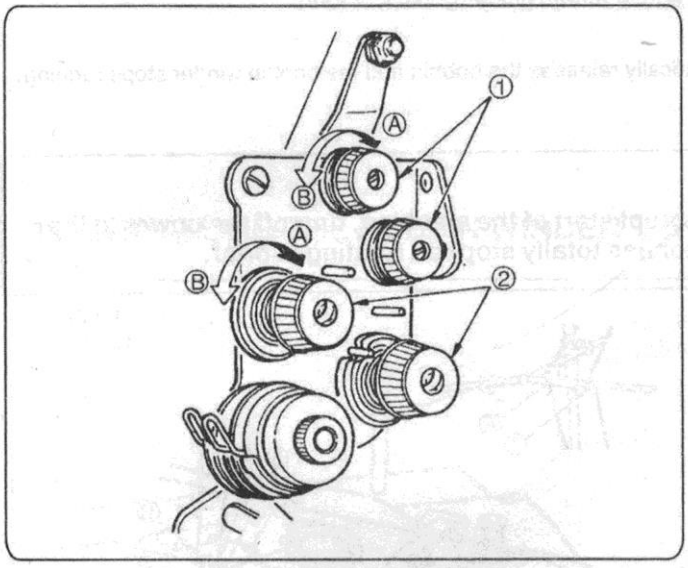
(2)Manual one-touch reverse feed stitching(1560N-7, 1561N-7)

1) Press touch-back switch ③.

2) Reverse feed stitches are made as long as you keep pressing the lever down.

3) Release the switch, and the machine will run in the normal feed direction.

## 15. THREAD TENSION

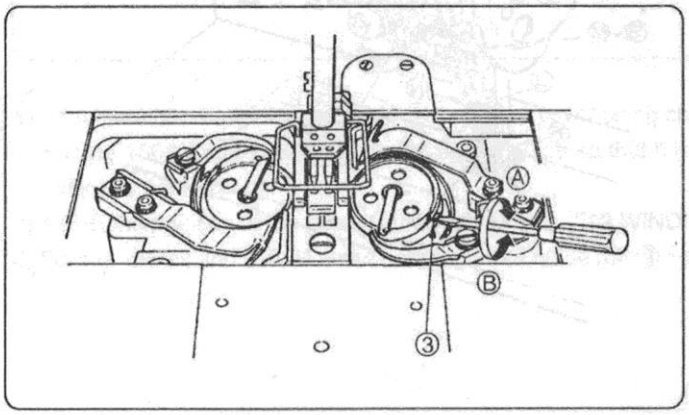



(1) Adjusting the needle thread tension

1) Turn thread tension nut No.1 ① clockwise Ⓐ to shorten the length of thread remaining on the top of needle after thread trimming. Turn the nut counterclockwise Ⓑ to lengthen it.

2) Turn thread tension nut No.2 ② clockwise Ⓐ to increase the needle thread tension, or counterclockwise Ⓑ to decrease it.

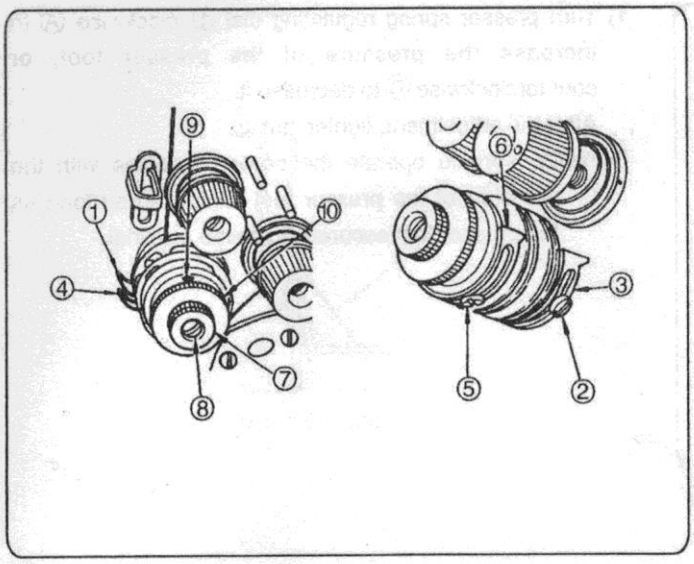
**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




(2) Adjusting the bobbin thread tension

Turn tension adjustment screw ③ clockwise Ⓐ to increase the bobbin thread tension, or counterclockwise Ⓑ to decrease it.

## 16. THREAD TAKE-UP SPRING



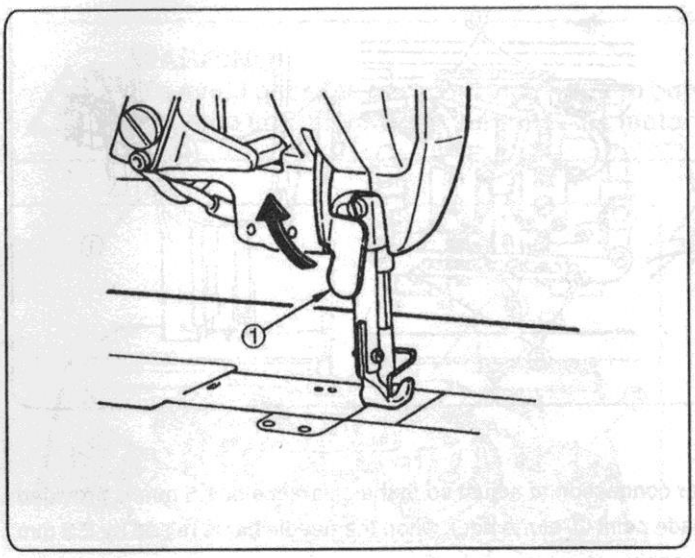

(1) To change the stroke of the thread take-up spring

1) For thread take-up spring ① on the left-hand side, loosen stopper screw ② and move stopper ③ to the right or left.
2) For thread take-up spring ④ on the right-hand side, loosen stopper screw ⑤ and move stopper ⑥ to the right or left.
3) Move the stopper to the right to increase the stroke or to the left to decrease it.

(2) To change the tension of the thread take-up spring

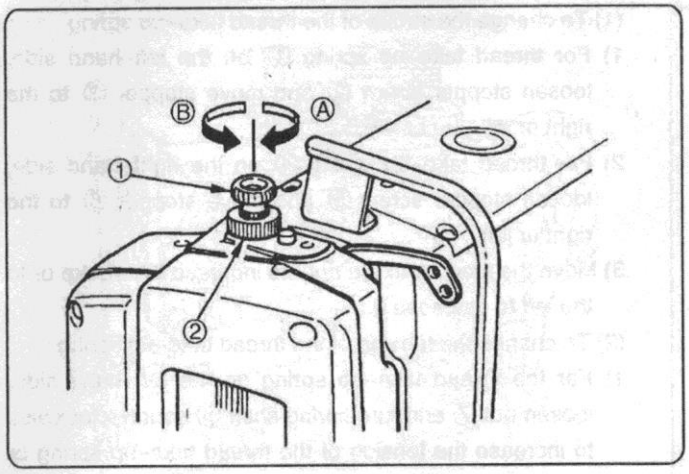
1) For the thread take-up spring on the left-hand side, loosen nut ⑦ and turn spring shaft ⑧ counterclockwise to increase the tension of the thread take-up spring or clockwise to decrease it.
2) For the thread take-up spring on the right-hand side, loosen screw ⑨ and turn thread take-up spring peg ⑩ counterclockwise to increase the tension of the thread take-up spring or clockwise to decrease it.

## 17. HAND LIFTER




1) When you want to keep the presser foot in the lifted position, lift hand lifter ① in the direction of the arrow. This makes the presser foot rise 9 mm and stay at that position.
2) To make the presser foot come down to its home position, lower the hand lifter.

## 18. ADJUSTING THE PRESSURE OF THE PRESSER FOOT

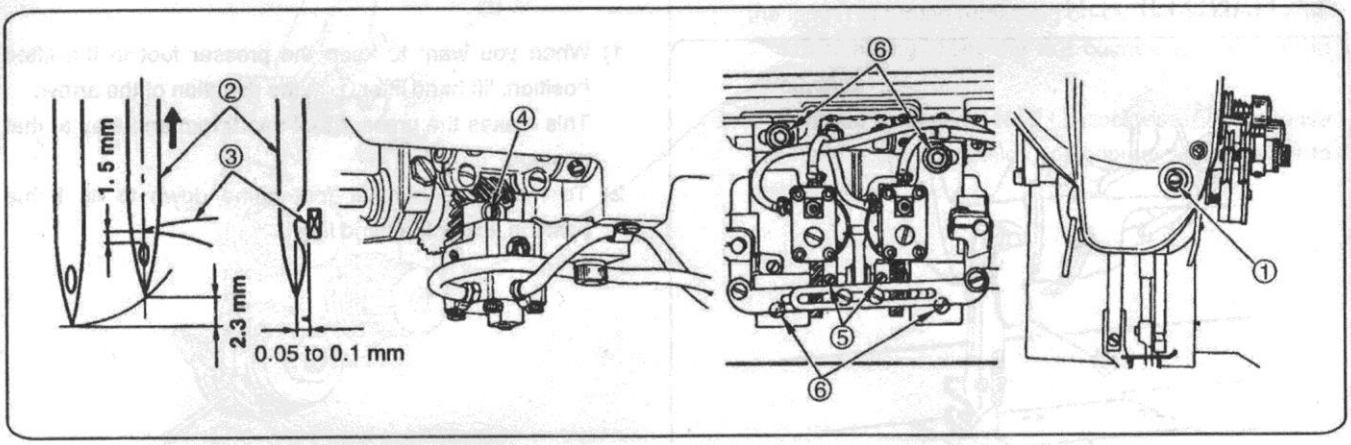



1) Turn presser spring regulating dial ① clockwise Ⓐ to increase the pressure of the presser foot, or counterclockwise Ⓑ to decrease it.
   After the adjustment, tighten nut ②.

**(Note)** Be sure to operate the sewing machine with the pressure of the presser foot minimized as long as the presser foot securely holds the material,

## 19. NEEDLE-TO-HOOK RELATION

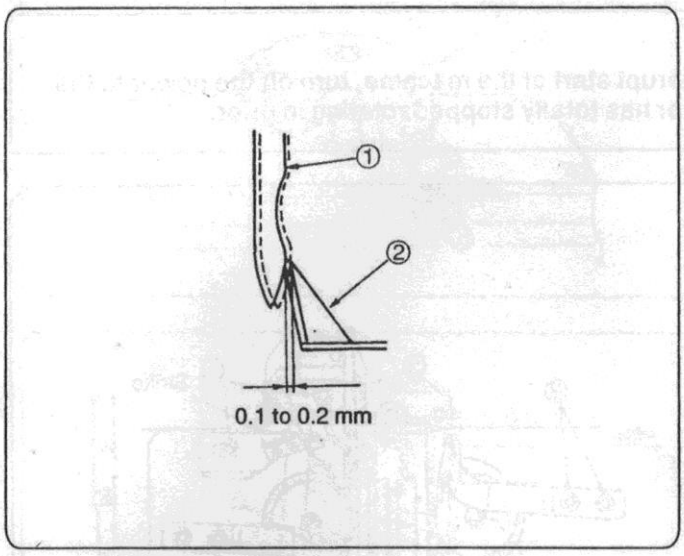
**WARNING:**
**To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.**




1) Set the stitch dial to 0 [zero].
2) Turn the handwheel and loosen setscrew ① in the needle bar connection to adjust so that a clearance of 1.5 mm is provided between the top end of the needle eyelet of needle ② and blade point ③ of the hook when the needle bar is raised by 2.3 mm from the lowest position of its stroke. Then, tighten the screw again.
3) Loosen four setscrews ⑤ in the screw gear (large) and turn the handwheel to make the needle bar ascend by 2.3 mm from the lowest position of its stroke.
4) Loosen setscrews ⑥ in the hook driving shaft saddle and move the hook driving shaft saddle to the right or left until a clearance of 0.05 to 0.1 mm is provided between the blade point of the hook and the needle at the position where blade point ③ of the hook is almost aligned with the center of needle ②.
   After the adjustment, tighten setscrews ⑥.
5) Move the screw gear (large) to the right or left until blade point ③ of the hook is aligned with the center of needle ② and tighten four setscrews ⑤. However, fit the setscrew No.1 of setscrews ⑤ to the flat section of the hook driving shaft and tighten it.

**(Note)** When replacing the hook, tighten four setscrews ④ in the screw gear (small) first. However, fit the setscrew No.1 which is "V" shaped at the top end of setscrews ④ to the "V" groove in the hook shaft and tighten it.

## 20. ADJUSTING THE HOOK NEEDLE GUARD




When a hook has been replaced, be sure to check the position of the hook needle guard.

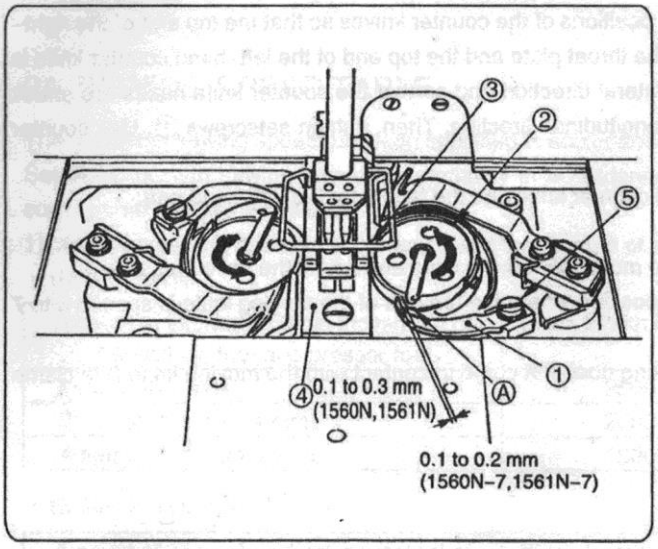
As the standard position of the hook needle guard, hook needle guard ② must push the side face of needle ① to lean the needle by 0.1 to 0.2 mm away from its straight position.

If not, adjust the hook needle guard by bending it.

1) To bend the hook needle guard inward, apply a screwdriver to the outside of the hook needle guard.
2) To bend the hook needle guard outward, apply a screwdriver to the inside of the hook needle guard.

## 21. ADJUSTING THE BOBBIN CASE OPENING LEVER

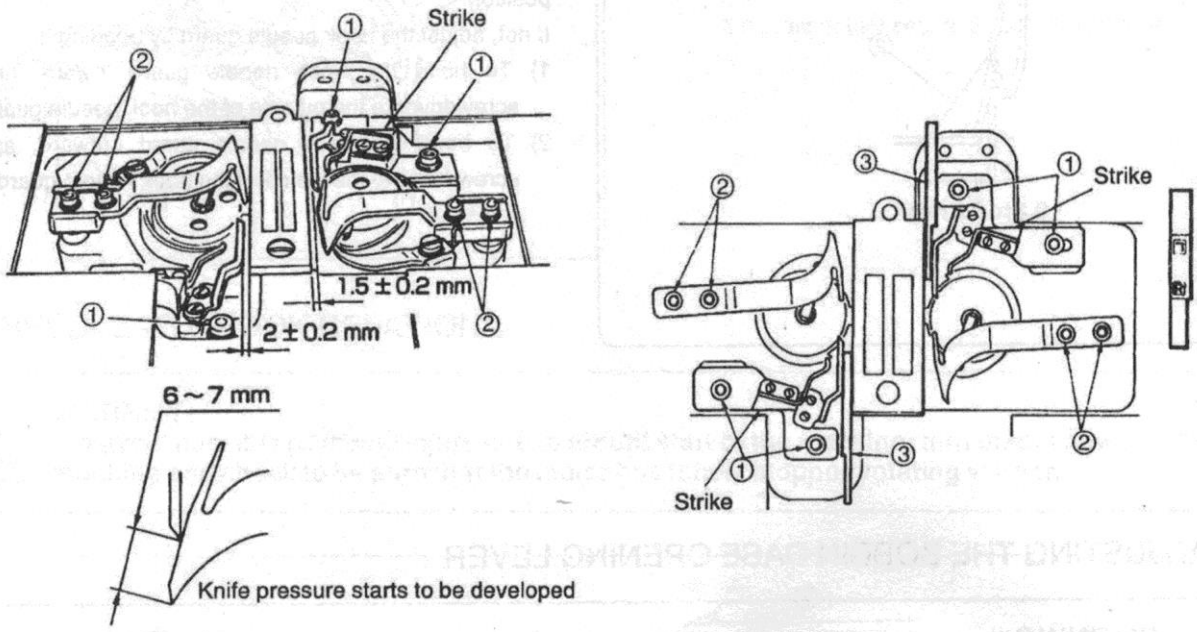
**WARNING:**
**To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.**




1) Turn the handwheel in its normal rotational direction to bring bobbin case opening lever ① to its back end position.
2) Turn bobbin case ② in the direction of the arrow until bobbin case stopper ③ rests in the groove in throat plate ④.
3) Loosen screw ⑤ in the bobbin case opening lever and adjust so that a clearance of 0.1 to 0.2 mm (1560N-7, 1561N-7), 0.1 to 0.3mm (1560N, 1561N) is provided between the bobbin case opening lever and protruding section Ⓐ of the bobbin case.

## 22. POSITION OF THE COUNTER KNIFE AND ADJUSTMENT OF THE KNIFE PRESSURE(1560N-7,1561N-7)

**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




1) Move the moving knife by hand to its forward travel end.

· Adjusting the counter knife

2) Loosen setscrews ① in the counter knife bases, and adjust the positions of the counter knives so that the top end of the right-hand counter knife is 1.5 ± 0.2 mm away from the end face of the throat plate and the top end of the left-hand counter knife is 2 ± 0.2 mm away from the end face of the throat plate in the lateral direction and so that the counter knife bases are struck against the difference in step of the hook shaft bases in the longitudinal direction. Then, tighten setscrews ①. Use counter knife gauge ③ supplied with the machine as standard.
Use the face R of the counter knife ③ gauge for the right-hand counter knife and the face L for the left-hand one.

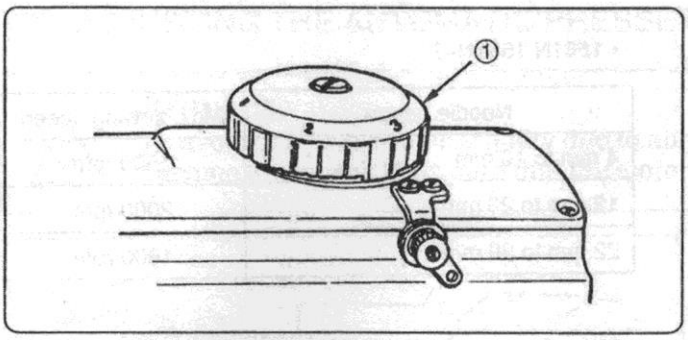
· Adjusting the knife pressure

3) Loosen setscrews ② in the moving knife. Turn the handwheel to move the moving knife and adjust the knife pressure.
In the standard state, the knife pressure is developed from the position where the top end of the moving knife is spaced 6 to 7 mm from the top end of the counter knife.

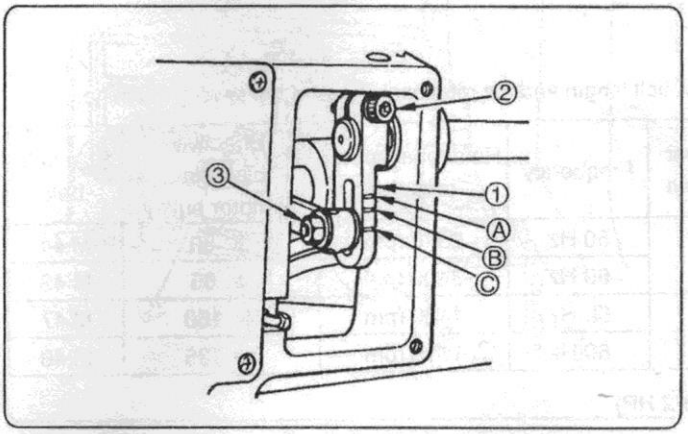
**(Caution)** Adjust the knife pressure in the state that the clamp spring does not come in contact with the moving knife (the clamp pressure is not developed).

## 23. ADJUSTING THE LIFTING AMOUNT OF THE PRESSER FOOT AND THE WALKING FOOT

**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




The lifting amount of the presser foot and the walking foot is adjusted using dial ① . Turn the dial clockwise to increase the lifting amount or counterclockwise to decrease it.




The amount of alternate vertical movement of the presser foot and the walking foot is normally equal. To increase the amount of alternate vertical movement, move upper feed arm ① upward in the range of the slot.
To decrease it, move the upper feed arm downward. Then, tighten the nut ③
To change the lifting amount of the presser foot and that of the walking foot, loosen screw ② in the upper feed arm, turn the handwheel to this side and tighten screw ② when the bottom faces of the presser foot and the walking foot are flush at the top surface of the throat plate.
Then, the lifting amount of the presser foot becomes more than that of the walking foot. Or, turn the handwheel in the reverse direction to increase the lifting amount of the walking foot more than that of the presser foot.

| Standard of the amount of alternate virtical movement | |
|---|---|
| Engraved marker line Ⓐ | Approx. 5 mm |
| Engraved marker line Ⓑ | Approx. 4 mm |
| Engraved marker line Ⓒ | Approx. 3 mm |

## 24. SEWING SPEED TABLE

The maximum sewing speed has been specified in accordance with sewing conditions as shown in the table below.
Set the maximum sewing speed appropriately in accordance with the sewing conditions given taking care not to exceed the corresponding specified value.

1) Maximum sewing speed in accordance with the amount of alternate vertical movement of the walking foot and presser foot.

· 1560N,1561N

| Amount of alternate virtical movement of the walking foot and presser foot | Stitch length:6 mm or less | Stitch length: More than 6 mm and 9 mm or less |
|---|---|---|
| Less than 3 mm | 2500 rpm | 2000 rpm |
| 3 mm to less than 4 mm | 2000 rpm | 2000 rpm |
| 4 mm to less than 6.5 mm | 1600 rpm | 1600 rpm |

· 1560N–7, 1561N–7

| Amount of alternate virtical movement of the walking foot and presser foot | Stitch length:6 mm or less | Stitch length: More than 6 mm and 9 mm or less |
|---|---|---|
| Less than 2.5 mm | 2500 rpm | 1800 rpm |
| 2.5 mm to less than 4 mm | 2200 rpm | 1800 rpm |
| 3 mm to less than 4 mm | 1800 rpm | 1800 rpm |
| 4 mm to less than 6.5 mm | 1600 rpm | 1600 rpm |

2) Maximum sewing speed in accordance with the needle gauge

· 1560N,1560N-7

| Needle gauge | Max. sewing speed |
|---|---|
| 3.2 mm (1/8) to 9.5 mm (3/8) | 2500 rpm |
| 12.7 mm (1/2) to 19.1 mm (3/4) | 2000 rpm |
| 22.2 mm (7/8) to 31.8 mm(1-1/4) | 1600 rpm |

· 1561N,1561N-7

| Needle gauge | Max. sewing speed |
|---|---|
| 4 mm to 10 mm | 2500 rpm |
| 12 mm to 20 mm | 2000 rpm |
| 22 mm to 30 mm | 1600 rpm |

## 25. MOTOR PULLEY AND V BELT

Use an M type V belt.

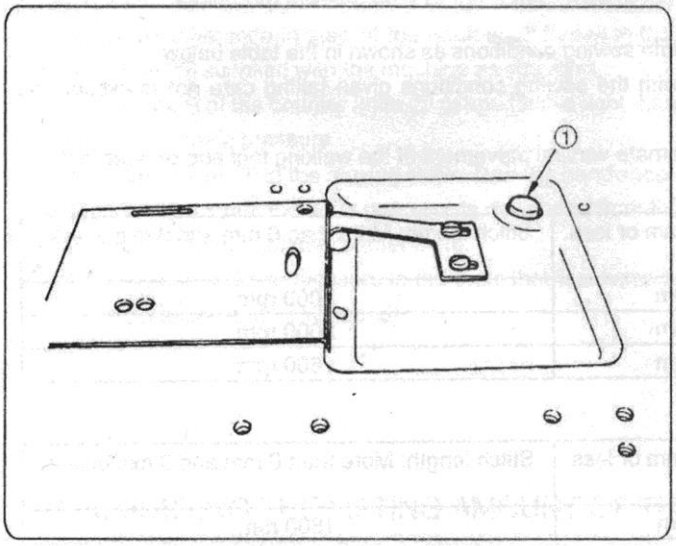
The following table shows the relationship among the motor pulley, belt length and the rotational speed of the sewing machine.

| Model | Rotational speed of sewing machine | Effective diameter of handwheel | Number of poles | Frequency | Rotational speed of motor | Effective diameter of motor pulley | Size of V belt |
|---|---|---|---|---|---|---|---|
| 1560N 1561N | 2500 rpm | ϕ 93.3mm | 2 | 50 Hz | 2840 rpm | ϕ 80 | M 44 |
| | | | | 60 Hz | 3400 rpm | ϕ 65 | M 43 |
| | | | 4 | 50 Hz | 1430 rpm | ϕ 160 | M 47 |
| | | | | 60 Hz | 1715 rpm | ϕ 135 | M 46 |

For the motor, use a 2P or 4P clutch motor of 3-phase 400W (1/2 HP)

## 26. RESETTING THE SAFETY CLUTCH

WARNING:
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.



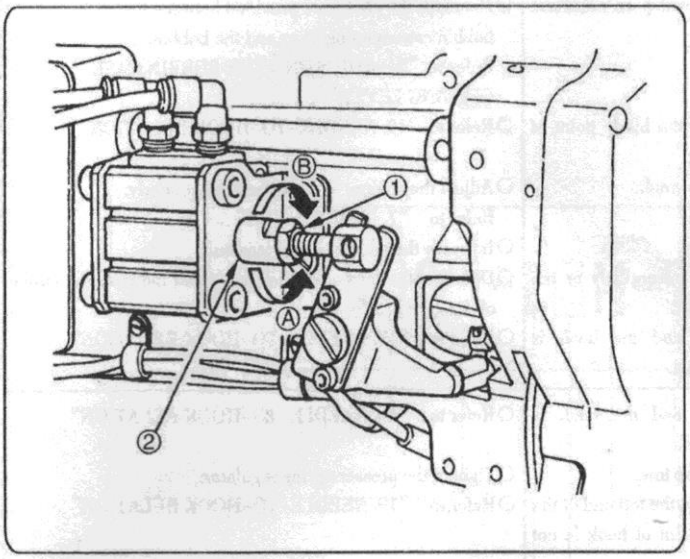

The safety clutch functions when an excessive load is applied to the hook or the other components during sewing. At this time, the hook will never rotate even if turning the handwheel.

When the safety clutch has functioned, remove the cause and reset the safety clutch as given in the following procedure.

1) Pressing push button ① located on the top surface of the machine bed, strongly turn the handwheel in the reverse direction of rotation.
2) The resetting procedure completes when the handwheel clicks.

## 27. ADJUSTING THE AUTOMATIC PRESSER FOOT LIFTER

**WARNING:**
To avoid possible personal injury due to abrupt start of the machine, turn off the power to the machine and check to be sure that the motor has totally stopped rotating in prior.




1) Loosen adjustment nut ①, turn cylinder rod ② and adjust so that the lifting amount of the presser foot is 16 mm when the cylinder is fully compressed.
   Turn the rod in the direction of Ⓐ to decrease the lifting amount, or turn it in the direction of Ⓑ to increase the lifting amount.
2) After the adjustment, tighten adjustment nut ①.

## 28. TROUBLES IN SEWING AND CORRECTIVE MEASURES

| Troubles | Causes | Corrective measures |
|---|---|---|
| 1. Thread breakage<br>( Thread frays or is worn out. ) | ①Thread path, needle point, hook blade point or bobbin case resting groove on the throat plate has sharp edges or burrs. | ○Remove the sharp edges or burrs on the blade point of hook using a fine emery paper. Buff up the bobbin case resting groove on the throat plate. |
| | ②Needle thread tension is too high. | ○Decrease the needle thread tension. |
| | ③Bobbin case opening lever provides an excessive clearance at the bobbin case. | ○Decrease the clearance provided between the bobbin case opening lever and the bobbin. Refer to "21. ADJUSTING THE BOBBIN CASE OPENING LEVER" . |
| (Needle thread trails 2 to 3 cm from the wrong side of the fabric) | ④Needle comes in contact with the blade point of hook. | ○Refer to "19. NEEDLE-TO-HOOK RELATION" |
| | ⑤Amount of oil in the hook is too small. | ○Adjust the amount of oil in the hook properly. Refer to "7. LUBRICATION" . |
| | ⑥Needle thread tension is too low. | ○Increase the needle thread tension. |
| | ⑦Thread take-up spring works excessively or the stroke of the spring is too small. | ○Decrease the tension of the spring and increase the stroke of the spring. |
| | ⑧Timing between the needle and the hook is excessively advanced or retarded. | ○Refer to "19. NEEDLE-TO-HOOK RELATION" . |
| 2. Stitch skipping | ①Timing between the needle and the hook is excessively advanced or retarded. | ○Refer to "19. NEEDLE-TO-HOOK RELATION" |
| | ②Pressure of the presser foot is too low. | ○Tighten the presser spring regulator. |
| | ③The clearance provided between the top end of the needle eyelet and the blade point of hook is not correct. | ○Refer to "19. NEEDLE-TO-HOOK RELATION" |
| | ④Hook needle guard is not functional. | ○Refer to "20. ADJUSTING THE HOOK NEEDLE GUARD" . |
| | ⑤Improper type of needle is used. | ○Replace the needle with one which is thicker than the current needle, by one count. |
| 3. Loose stitches | ①Bobbin thread does not pass through the tension spring of the inner hook. | ○Thread the bobbin thread correctly. |
| | ②Thread path has been poorly finished. | ○Remove rough parts with a fine emery paper or buff it up. |
| | ③Bobbin fails to move smoothly. | ○Replace the bobbin or hook with a new one. |
| | ④Bobbin case opening lever provides too much clearance at the bobbin. | ○Refer to "21. ADJUSTING THE BOBBIN CASE OPENING LEVER" . |
| | ⑤Bobbin thread tension is too low. | ○Increase the bobbin thread tension. |
| | ⑥Bobbin has been wound too tightly. | ○Decrease the tension applied to the bobbin winder. |
| 4. Thread slips off the needle eyelet simultaneously with thread trimming. | ①Thread tension given by the tension controller No.1 is too high. | ○Decrease the thread tension given by the tension controller No. 1. |
| 5. Thread slips off the needle eyelet at the start of sewing. | ①Thread tension given by the tension controller No.1 is too high. | ○Decrease the thread tension given by the tension controller No. 1. |
| | ②Clamp spring has improper shape. | ○Replace the clamp spring with a new one or correct the current one. |
| | ③Bobbin thread tension is too low. | ○Increase the bobbin thread tension. |
| 6. Thread is not cut sharply. | ①The blades of moving knife and counter knife have been improperly adjusted. | ○Refer to "22. POSITION OF THE COUNTER KNIFE AND ADJUSTMENT OF THE KNIFE PRESSURE" . |
| | ②The knives have blunt blades. | ○Replace the moving knife and counter knife with new ones, or correct the current ones. |
| | ③Bobbin thread tension is too low. | ○Increase the bobbin thread tension. |
| 7. Thread remains uncut after thread trimming.<br>(Bobbin thread trimming failure when stitch length is comparatively short.) | ①Initial position of the moving knife has been improperly adjusted. | ○Refer to the Engineer's Manual. |
| | ②Bobbin thread tension is too low. | ○Increase the bobbin thread tension. |
| 8. Thread breaks at the start of sewing after thread trimming. | ①The needle thread is caught in the hook. | ○Shorten the length of thread remaining on the needle after thread trimming. Refer to "15. THREAD TENSION" . |