

# **OPERATION INSTRUCTION**

FOR

# 205RBATCL(E)



CONSOLIDATED SEWING MACHINE CORP.

Thank you very much for buying a sewing machine before using your new maching, please read the safety instructions below and the explanations given in the instruction manual.

With industrial sewing machinex, it is normal to carry out work while positioned directly in front of moving parts such as the needle and thread take—up lever, and comsequently there is always a danger of injury that can be caused by these parts. follow the instructions from training personnel and instructors regarding safe and correct operation before operating the machine so that you will know how to use it correctly.

#### SAFETY INSTRUCTIONS

#### 1 Safety indications and their meanings

This instruction manual and the indications and symbols that are used on the machineitself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people. The meanings of these indications and symbols are given below.

#### Indications



#### CAUTION

The instructions which follow this term indicate situations where failure to follow the instructions could cause injury when using the machine or physical damage to equipment and surroundings.

#### Symbols



This symbol ( $\triangle$ ) indicates something that you should be careful or. The picture inside the triangle indicates the nature of the caution tha muxt be taken.

(For example, the symbol at left means "bewatr of injury".)



........... This symbol ( $\bigcirc$ ) indicates something that you must not do.



This symbol ( ) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.

(For example, the symbol at left means "you must make the ground connection".)

#### 2 Notesonsafety



#### CAUTION

#### **Environmental requirements**



Use the sewing machie in an area which is free from sources of strong electrical noise such as high-frequency welders.

Sources of strong electrical noise may cause problems with correct operation.



Any fluctrations in the power supply voltage should be within 10% of the rated voltage for the machine.

Voltage fluctuations which are greater than this may cause problems with correct operation.



The power supply capacity should be greater than the requirements for the sewing machine's electrical consumption.

Insufficient power supply capacity may cause problems with correct operation.



The ambient temperature should be within the range of 5 C to 35 C during use.

Temperatures which are lower or tigher than this may cause problems with correct operation.



The relative humidity should be within the range of 45% to 85% during use, and no dew formation should occur in any devices.

Excessively dry or humid environments and dew formation may cause problems with correct operation.



Avoid exposure to direct sunlight during use. Ecposure to direct sunlight may cause problems with correct operation.



In the event of an electrical storm, turn off the power and disconnect the power cord from the wall outlet.

Lightning may cause problems with correct operation.



#### Installation



Machine installation should only be carried out by a qualified technician.



Contact your dealer or a qualified electrician for any electrical work that may need to be done.



The sewing machine weighs more than 35 kg. The instrallation should be carried out by two or more people.



Do not connect the power cord until installation is complete, otherwise the machine may operate if the treadle is pressed by mistake, which could resultin injury.



Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric shock, and problems with correct operation may also occur.



All cords should be secured at least 25 mm away from any moving parts. Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire or electric shocks could occur.



Install the belt covers to the machine head and motor.



If using a work table shich has casters, the casters should be secured in such a way so that they cannot move.



Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or noto your skin, otherwise inflammation can result.

Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhoea.

Keep the oil out of the reach of children.

#### Sewing



This sewing machine should only be used by operators who have received the necessary training in safe use beforehand.



The sewing machine should not be used for any applications other than sewing.



Be sure to wear protective goggles when using the machine.

If goggles are not worn, there is the danger that if a needle beaks, parts of the broken needle may enter your eyes and injury may result.



Turn off the power switch at the following times, otherwise the machine may operate if the treadle is pressed by mistake, which could result in in jury.

- When threading the needle
- When replacing the needle and bobbin
- When not using the machine and when leaving the macine unattended
- \* When using a clutch motor, the motor will keep turning even after the power is switched Iff as a result of the motor's inertis. Wait until the motor stops fully before starting work.



Attach all safety devices bdfore using the sewing machine. If the machine is used without these devices attached, injury may result.



If using a work table which has casters, the casters should bd secured in such a way so that they cannot move.



Do not touch any of the moving parts of press any objects against the machine shile sewing, as this may result in personal injury or damage to the machine.



If an error occurs in machine, or if abnormal noises or smells are noticed, immediately turn off the power switch. Then contact your nearest dealer or a qualified technician.



If the machine develops a problem, contact your nearest dealer of a qualified technician.

#### Cleaning



Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.

\* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's insreis. Wait until the motor stops fully before starting work.



Be sure to wear protective goggles and bloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.

Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhoea.

Keep the oil out of the reach of children.



### Maintenance and inspection



Maintenance and inspection of the sewing machine should only be carried out by a qualified



Ask your dealer or a qualified electrician to carry out any maintenance and inspection of the electrical system.



Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.

When carrying out inspection, adjustment and maintenance

When replacing consumable parts such as the rotary hook

When using a clutch motor, the motor will keep turning even after the power is switchen off as a result of the motor's inertia. Wait until the motor stops fully befor starting work.



If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.



Use only the proper replacement parts as speciried.



If any safety devices have been removed, be absolutely sure to re—install them to their original positions and check that they operate correctly before using the machine.



Any problems in machine operation shich result from unauthorized modifications to the machine will not be covered by the warranty.

#### 3 Warning labels

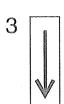
★ The following warning labels appear on the sewing machine.

Please follow the instructions on the labels at all gimes when using the machine. If the labels have been removed of are difficult to read, please contact your nearest dealer.





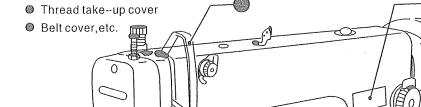
Be sure to connect the ground. If the ground connection is not secure, you run a high rick of receiving a serious electric shock, and problems with correct operation may also occur.

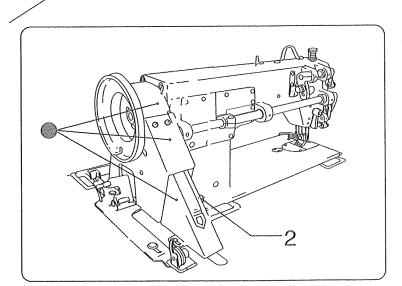


Direction of operation

#### Safety devices

Finger guard



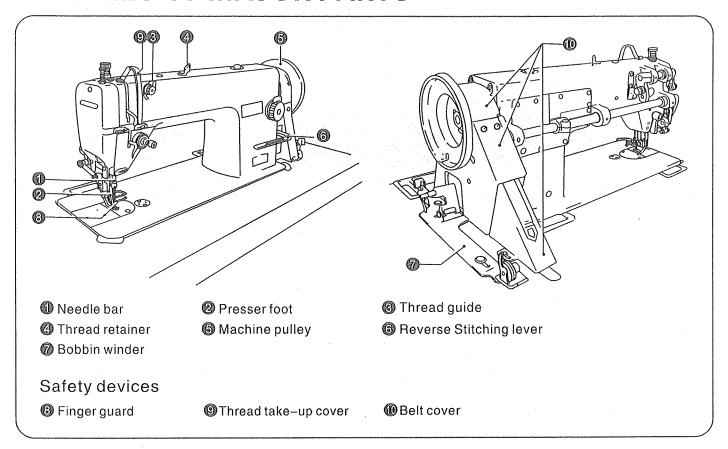


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# 1. NAMES OF MAJOR PARTS



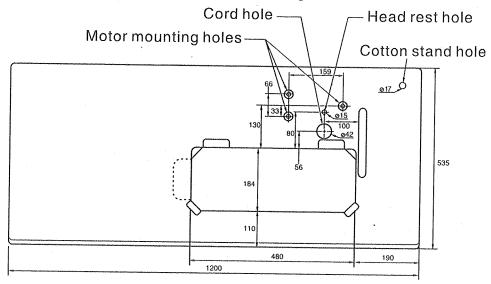
# 2.MACHINE SPECIFICATIONS

Use		For heavy-weight materials	
Sewing speed		2,000 rpm	
Maximum stitch length		8 mm	
Needle bar	stroke	37 mm	
Presser foot height	Presser bar lifter	8 mm	
	Knee lifter	16 mm	
Feed dog h	eight	1.2 mm	
Needle		DP X 17 #23	

# 3. WORK TABLE AND MOTOR

#### 3-1. Work Table

The top of the table should be 40 mm in thickness and should be strong enough to hold the weight and withstand the vibration of the sewing machine.



#### 3-2. Motor

#### CAUTION



All cords which are connected to the motor should be secured at least 25mm away from any movoing parts.



Furthermore, do not excessively bend the cords or secure them too firmly with staples, otherwise there is the danger that fire of electric shocks could occur.



Install the correct belt cover which corresponds to the motor being used.

#### ⟨Motor⟩

Select the correct motor from those listed in the above table.

Refer to the instruction manual for the motor for details on installing and using the motor.

Power	Motor
Single-phase	2-pole,550 W motor
Three-phase	2-pole,550 W motor

#### (Motor pulley and V-belt)

Select the correct motor pulley and V-belt by referring to the table below to suit the power frequency of you area.

Sewing speed Frequency		Motor pulley	V-belt	
2,000rpm	50 Hz	Motor pulley Φ 110	1041 mm	
	60 Hz	Motor pulley Φ 110	104·1 mm	

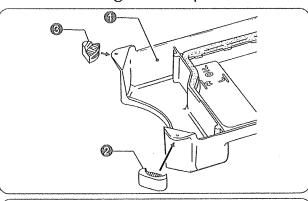
# 4.INSTALLATION

### CAUTION

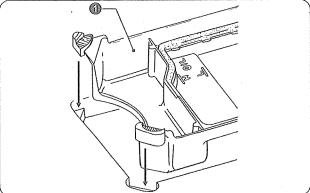
- The sewing machine should only be installed by a qualified technician.
- Do not connect the power cord until installation is complete, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.
- Ask your dealer or a qualified electrician for any electrical work that may need to be done.
- Be sure to connect the ground. If the ground connection is not secure, you run a high risk of receiving a serious electric Shock, and problems with correct operation may also occur.
- The sewing machine weights more than 35kg. The installation should be carried out by two or more people

Install the belt cover to the machine head.

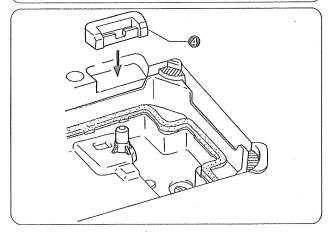
#### 4-1.Instaling the oil pan



- 1.Insert the two head cushions F ② into the front corners of the oil pan ④.
- 2.Insert the two head cushions B (a) into the back corners of the oil pan (a).

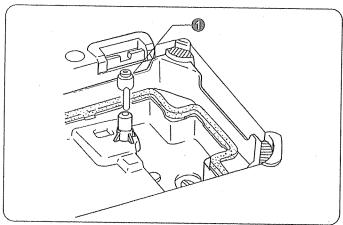


3. Place the oil pan ① into the groove in the work table so that corners are aligned.

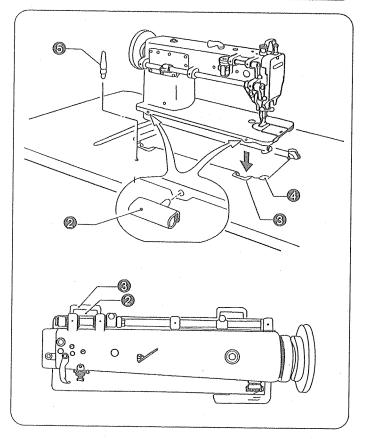


4.Insert the two rubber cushion @ into the notches in the work table.

# 4-2. Installing the machine head



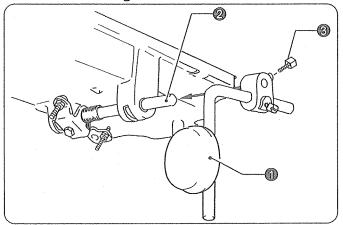
1.Insert the knee lifter complying bar ...



- 2.Insert the two hinges ② into the holes in the machine bed.
- 3.Clamp the hinges onto the rubber cushions in the work table, and then place the machine head onto the head cushions which are on top of the oil pan corners.
- 4. Tap the pillow into the table hole.
  NOTE: Tap the pillow securely into the table hole.

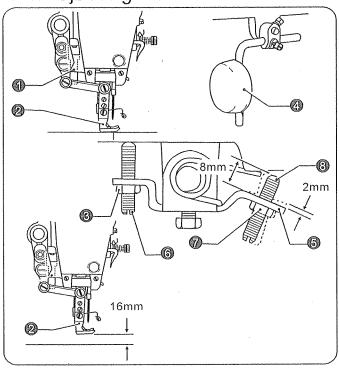
If the pillow is not pushed in as far as it will go, the machine head will not be sufficiently stable when it is tiltde back.

#### 4-3. Installing the knee lifter assembly



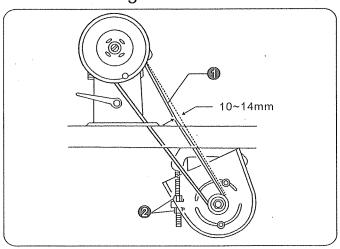
Place the knee lifter assembly ① onto the knee lifter bar ② on the oil pan, and the secure it by tightening the bolt .

#### 4-4. Adjusting the knee lifter



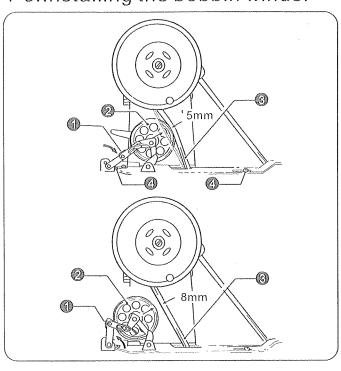
- 1.Lower the presser foot ② by using the presser bar lifter ①.
- 2.Loosen the nut @.
- 3. Turn the screw (a) to adjust so that the amount of play in the knee lifter (b) is approximately 2mm when the knee lifter plate (a) is gently pressde.
- 4. Securely tighten the nut 3.
- 5.Loosen the nut @.
- 6.Turn the screw (3) until the distance between the end of the screw (3) and the knee lifter is approximately 8 mm.
- 7. Turn the adjusting screw (3) to adjust so that the presser foot (2) is at the desired position within a distance of 16mm of the needle plate when the knee lifter plate (4) is fully pressed.
- 8. After adjustment is completed, securely tighten the nut .

### 4-5.Installing the belt



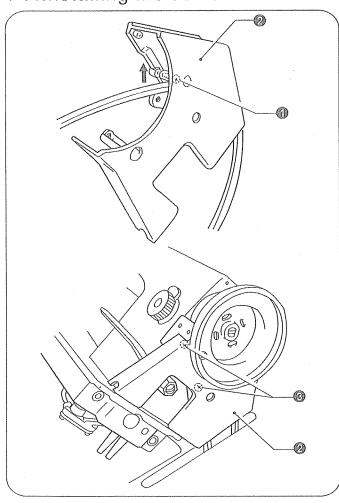
- 1. Tilt back the machine head, and then place the belt ① onto the motor pulley and the machine pulley.
- 2.Turn the two nuts ② to adjust so that there is 10 -14 mm of deflection in the V-belt ③ when it is pressed at the midwqy point with a force of 5 N.

#### 4-6. Installing the bobbin winder

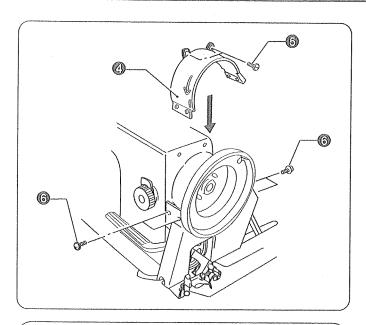


- 1. Push down the bobbin presser arm (1) as far as it will go.
- 2.Place the bobbin winder whell ② so that it pushes the belt ③ by approximately 5mm, and then place the bobbin winder so that it is parallel with the belt hole in the work table.
- 3.Install the bobbin winder to the work table with the two screws @.
- 4. Pull the bobbin presser arm back and check that there is approximately 8mm of clearance between the bobbin winder wheel and the belt .

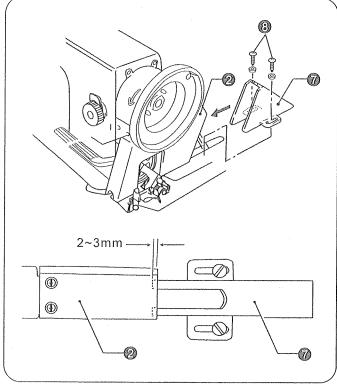
# 4-7.Installing the belt cover



- 1. Tilt back the machine head, and then loosen the screw ① of the belt cover ②.
- 2. Open the tip of the boss on the belt cover  $\ensuremath{\mathfrak{Q}}$  ,pass the V-belt through, and then tighten the screw  $\ensuremath{\mathfrak{Q}}$  .
- 3. Secure the belt cover by tightening the two screws .Pass the screwdriver through the hole in the machine pulley to tighten the screw at the left.

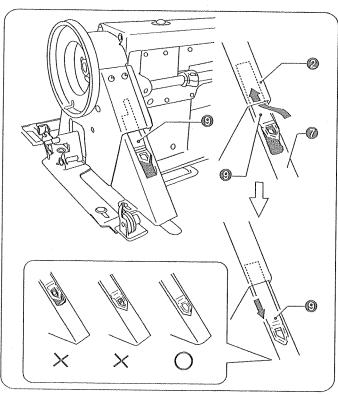


- 4. Return the machine head to the upright position, and the place belt cover U @ over the machine pulley.
- 5. Tighter the two screws (and the four screws (at to secure belt cover U (4)).

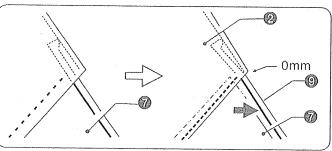


6. Place belt cover D @ so that it overlaps the belt cover @ by 2-3 mm, and then provisionally tighten the two screws @ .

#### 4.INSTALLATION



- 7.Insert the cover @ of belt cover D @ in between the belt cover @ and belt cover D @, and then place it into the groove of belt cover D @.
- 8.Slide the cover **(9)** down along the groove of belt cover D **(7)** as far as it will go.



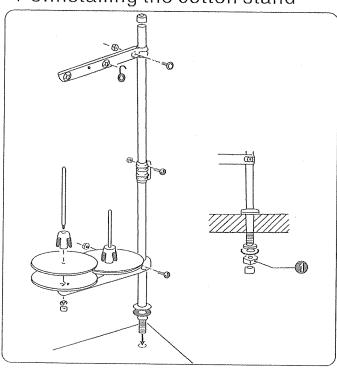
- 9.Pull belt cover D

  toward you until there is no c-learance between the belt cover 
  and the cover

  for an example of belt cover D

  toward you until there is no c-learance between the belt cover and the cover.
- 10. Dully tighten the two screws .(Refer to step 6.)

4-8. Installing the cotton stand



Assemble the cotton stand as shown in the illustration, and then install it to the work table.

★ Securely tighten the nut so that the cotton stand does not move.

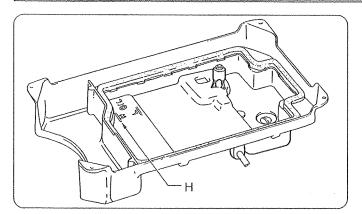
#### 4-9.Lubrication

#### CAUTION



Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result. Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarr hoea.

Keep the oil out of the reach of children.



- ★ Use only the lubricating oil specified.

  Tilt back the machine head and slowly pour in lubricating oil until the oil level reaches the H mark.
- \* If the oil level drops below the L mark, add more lubricating oil.

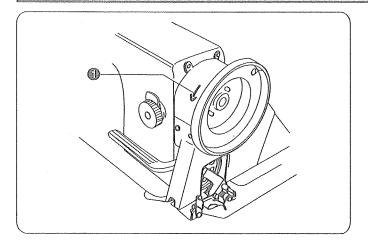
#### 4-10. Checking the machine pulley rotating direction



#### CAUTION

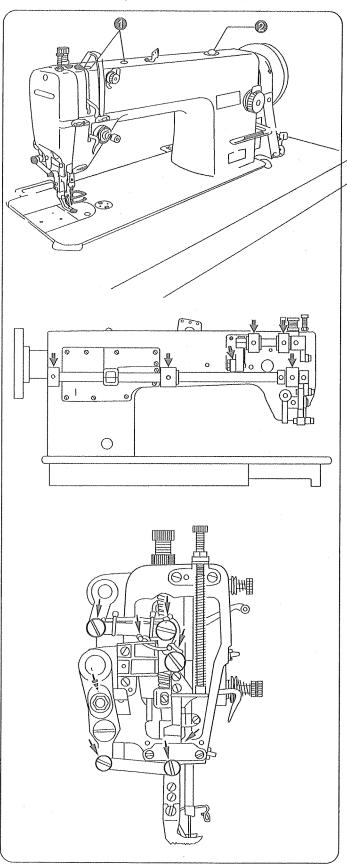


Do not touch any of the moving parts or place any objects against the machine while sewing, as this may result in personal ijjury or damage to the machine.



- 1.Insert the power cord plug into the wall outlet, and then turn on the jpower switch.
- 2. Depress the treadle slightly and check that the machine pulley starts to turn in the direction of the arrow .
- ★ If the direction of rotation is reversed, change the direction of rotation to the correct direction while refrring go the instruction manual for the motor.

### 4-11. Test operation



Carry out test operation when starting up a new sewing machine for the first time, or when restarting the sewing machine after a long period of non-use.

- 1.Remove the rubber caps ① on the top of the arm and the face plate, and apply an ample amount of specified oil to the arm and to the rear of the machine in the places indicated by the arrows.
- 2.Install the face plate.
- 3. Lift up the presser foot and presser bar lifter.
- 4.Run the sewing machine at normal sewing speed (2,000rpm), and look through the oil gauge window to check that the oil is being circulated.

# 5. PREPARATION BEFORE SEWING

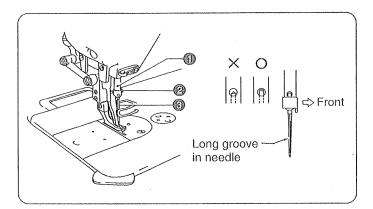
#### 5-1.Installing the needle

#### CAUTION



Turn off the power switch before installing the needle, otherwise the machine may operate if the treadle is pressed by mistake, which could result in innury.

\* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the notor's inertia. Wait until the motor stops fully before starting work.



- 1. Turn the machine pulley to move the needle bar 
  ① to its highest position.
- 2.Loosen the screw ②.
- 3.Insert the needle@in a straight line as far as it will go, making sure that the long groove on the needle is at the left, and then securely tighten the screw ②.

#### 5-2. Removing the bobbin case

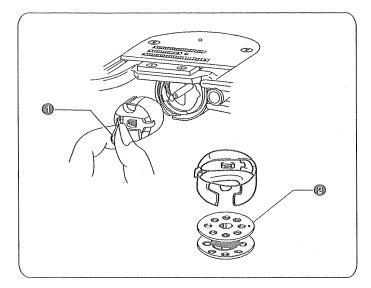


#### CAUTION



Turn off the power switch before removing the bobbin case, otherwise the machine may operste if the treadle is pressed by mistake, which could result in injury.

\* When using a clutch motor, the motor will keep turning even after the jpower is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.



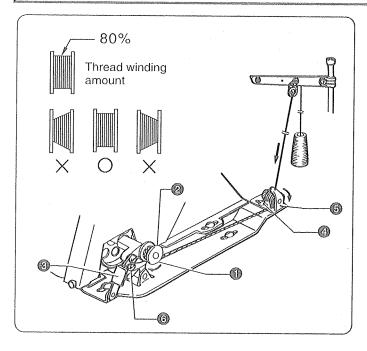
- 1. Turn the machine pulley to raise the needle until it is above the needle plate.
- 2.Pull the latch (1) of the bobbin case upward and then remove the bobbin case.
- 3. The bobbin @ will come out when the latch @ is released.

#### 5-3. Winding the lower thread

#### CAUTION



Do not touch any of the moving parts or place any objects against the machine while winding the lower thread, as this may result in personal injury or damage to the machine.



- 1. Turn on the power switch.
- 2. Place the bobbin onto the bobbin winder shaft 2.
- 3. Wind the thread several times around the bobbin in the direction in dicated by the arrow.
- 4. Push down the bobbin presser arm 3.
- 5. Raise the presser foot with the presser foot lifer.
- 6.Depress the treadle. Lower thread winding will then start.
- 7. Once winding of the lower thread is completed, the bobbin presser arm will return automatically. If the thread cannot be wound on evenly, loosen the screw and move the bobbin winder guide to the side where there is less thread.

Turn the adjustment screw to adjust the bobbin winding amount.

To increase the winding amount: Tighten the screw. To decrease the winding amount: Loosen the screw.

#### Note:

The amount of thread wound onto the bobbin should be a maximun of 80% of the bobbin capacity.

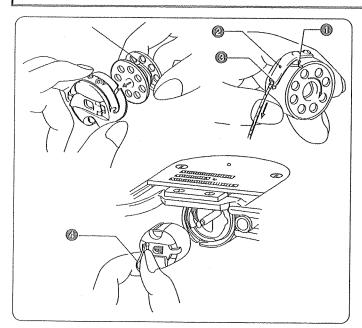
### 5-4. Threading the lower thread



#### CAUTION



Turn off the power switch before installing the bobbin case, otherwise the machine mqy operate if the treadle is pressed by mistake, which could result in injury.



- 1. Turn the machine pulley to raise the needle to its highest position.
- 2. While holding the bobbin so that the thread winds to the right, in sert the bobbin int the bobbin case.
- 3. Pass the thread through the slot ① and underthe tension spring ②, and then pull it out from the theread guide ③.
- 4. Check that the bobbin turns clockwise when the thread is pulled.
- 5. Hold the latch on the bobbin case and insert the bobbin case into the rotary hook.

#### 5-5. Threading the upper thread

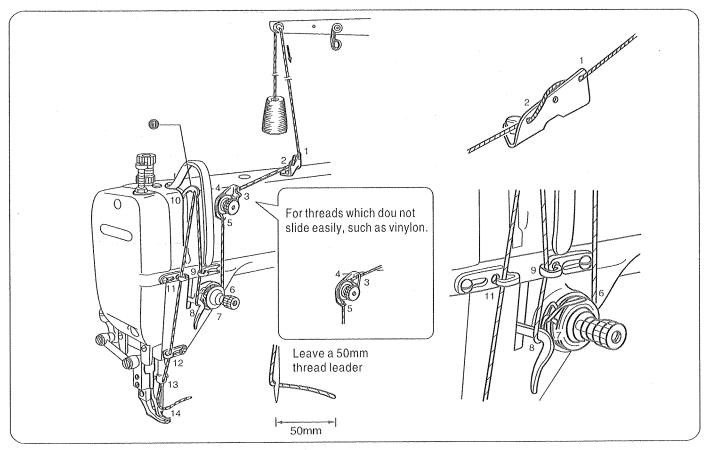
#### CAUTION



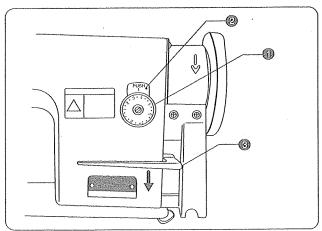
Turn off the power switch before threading the upper thread. Otherwise the machine mqy operate if the treadle is pressed by mistake, which could result in injury.

\* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Raise the thread take-up lever before threading the upper thread. This will make threading easier and it will prevent the thread from coming out at the sewing start.



#### 5-6. Adjusting the stitch length



While pressing the stopper ②, turn the stitch length dial ③ to the left and right to align the stitch length number with the reference line on the stopper ②.

The larger the number, the longer the stitch length will be.

When turning the stitch length dial from a larger setting to a smaller setting, it will be easier to turn the dial if the reverse stitching lever sis pushed to the halfwqy-down jposition.

# 6.SEWING

# A CAUTION



Attach all safety devices before using the sewing machine. If the machine is used without these devices attached, injury may result.



Turn off the power switch at the following times ,otherwise the macine may operate if the treadle is pressed by mistake, which could result in injury.

- · When threading the needle
- · When replacing the needle and bobbin
- · When not using the machine and when leaving the machine unattended
- When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's in ertia. Wait until the motor stops fully before starting work.

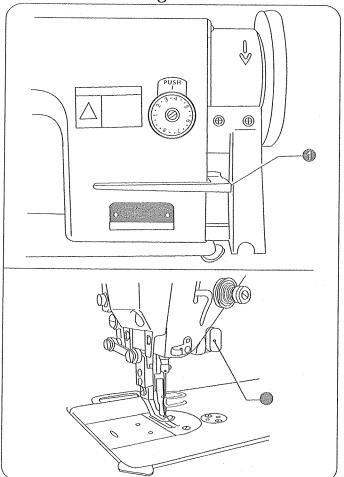


Do not touch any of the moving parts of place any objects against the machine while sewing ,as this may result in personal injury or damage to the machine.

#### 6-1. Sewing

- 1. Turn on the power switch.
- 2. Depress the treadle to start sewing.

6-2.Backtacking



When the reverse lever or the actuator is pressed during sewing, the feed direction will be reversed. When it is released, the feed direction will return to normal.

# 7. THREAD TENSION

### 7-1.. Adjusting the thread tension

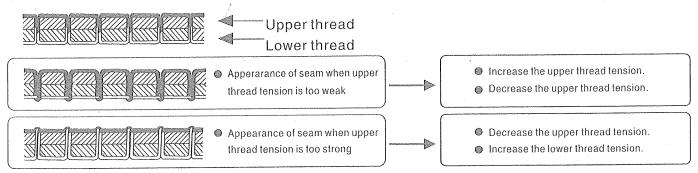
#### CAUTION

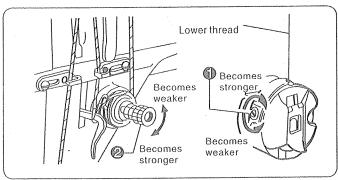


Turn off the power switch before removing of inserting the bobbin case, otherwise the machine may operate if the treadle is pressed is pressed by mistake, which could result in injury.

\* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully bdforestarting work.

#### Correct seam





<Lower thread tension>

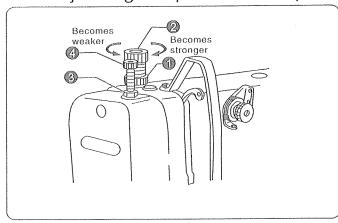
Adjust by turning the adjustment screw (1) until the bobbin case drops gently by its own weight while the thread end coming out of the bobbin case is held.

<Upper thread tension>

After the lower thread tension has been adjusted, adjust the upper thread tension so that a good, even stitch is obtained.

- 1.lower the presser foot.
- 2. Adjust by turning the thread tension nut ②.

#### 7-2. Adjusting the presser foot pressure



<Adjusting the presser foot pressure>

1.Loosen the adjustment nut ...

2. Turn the adjustment screw ② to adjust the presser foot pressure.

The presser foot pressure should be as week as Possible, but strong enough so that the material does not slip.

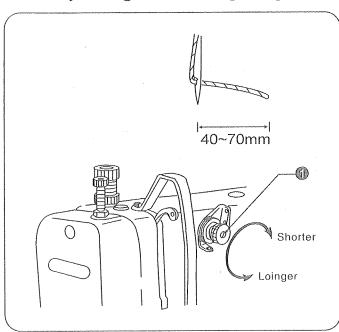
- 3. Tighten the adjustment nut (1).
- <Adjusting the walking foot pressure>
- 4.Loosen the adjustment nut 3.
- 5. Turn the adjustment screw to adjust the walking foot pressure.

The walking foot pressure can be increased by turning the adjustment screw (a) to the right, and can be decreased by turning it go the left.

6. Tighten the adjustment nut 3.

For easily damaged material, the walking foot pressure and holding pressure should be decreased.

# 7-3. Adjusting the trailing length after thread trimming



Adjust by turning the thread guide.

At the time of thread trimming, the thread tension is loosened and tension is applied by the thread guide only.

The standard trailing length for the upper thread is  $40\sim70$ mm.

If the tension of the thread guide (1) is increased, the lengths of the threads trailing from the needle tips will be reduced; if the tension is reduced, the lengths will be increased.

## 8.CLEANING

The following cleaning operations should be carride out each day in order to maintain the performance of this machine and to ensure along service life.

#### CAUTION



Turn off the power switch before carrying out cleaning, otherwise the machine may operate if the treadle is pressed by mistake, which could result in injury.

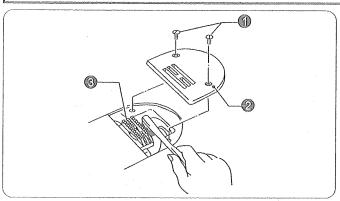
\* When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.



Be sure to wear protective goggles and gloves when handling the lubricating oil, so that no oil gets into your eyes or onto your skin, otherwise inflammation can result.

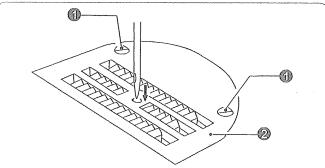
Furthermore, do not drink the oil under any circumstances, as it can cause vomiting and diarrhoea.

Keep the oil out of the reach of children.



- 1. Raise the presser foot.
- 2. Remove the two screws (1), and then remove the needle plate (2).
- 3.Use a soft wire brush to clean any dust from the feed dog 

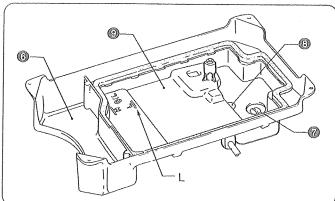
  .
- 4.Install the needle plate @ with the two screws .



Continues of the second of the

- 5. Turn the machine pulley slowly and check that the neede is lowered through the center of the hole in the needle plate ②.
  - \*If the needle does not go through the center:
  - · Check that the needle is not bent.
  - Loosen the two screws (1) and then re-seat the needle plate (2).
- 6. Turn the machine pulley to rais the needle adove the needle plate ② , and then check that the tip of the needle is not blunt.
- 7. Tilt back the machine head.
- 8. Remove the bobbin case (a).
- 9. Wipe off any dust from the rotary hook with a soft cloth, and check that there is no damage to the rotary hook .
- 10.Remove the bobbin from the bobbin case @ and clean the bobbin case @ with a cloth.
- 11.Insert the bobbin into the bobbin case ② ,and then place the bobbin case ③ back into the machine.

#### 8.CLEANING



10 4 3 3 5 5 5 5 5 6 6 6 8 7

- 12. Clean the oil sump 6 with a cloth.
- 13.If the oil level drops below the L mark, add more lubricating oil.
  - ★ Use only the lubricating oil specified.
  - ★ If the lubricating oil is contaminated, remove the oil cap screw and drain the oil.
     Clean off and dirt on the ollection magnet
     ②and in the oil pan ②.
- 14. Return the machine head to its ofiginal position.
- 15. When carrying out a test sewing, apply 2-3 drops specified oil to the lubrication points.
- 16. Check that the upper thread is threaded correctly.

17. Carry out a test sewing.

# 9.STANDARD ADJUSTMENTS

# A CAUTION

Maintenance and inspection of the sewing machine should only be carride out by qualified personnel.



Ask your dealer of a qualified electrician to carry out any maintenance and inspection of the electrical system.



If any safely devices have been removed, be absolutely sure to re-install them to their original positions and check that they operate correctly before using the machine.



Turn off the power switch and disconnect the power cord from the wall outlet at the following times, otherwise the machine may operate if the treadle is depressed by mistake, which could result in injury.

When carrying out in spection, adjustment and maintenance

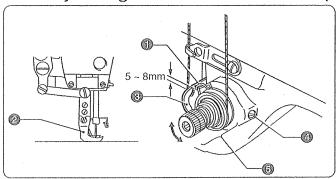
When replacing consumable parts such as the rotary hook

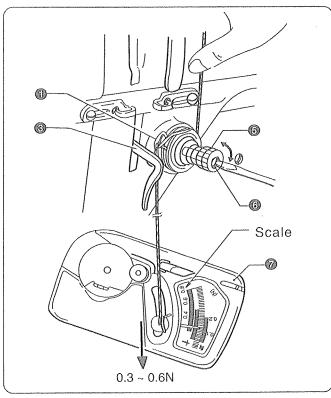
When using a clutch motor, the motor will keep turning even after the power is switched off as a resuit of the motor's inertia. Wait until the motor stops fully before starting work.



If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.

#### 9-1. Adjusting the thread tension spring

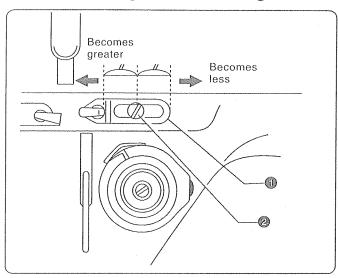




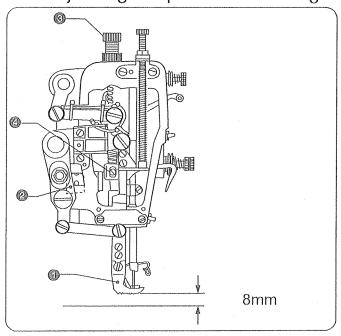
- ★ The standard position of the therad tension sjpri-Ng (1) is 5-8mm above the surface of the thread guide (3) when the presser foot (2) is lowered.
- 1.lower the presser foot ②.
- 2.Loosen the set screw (4).
- 3. Turn the thread tension bracket (5) to adjust the spring position.
- 4. Securely tighten the set screw 2.
- 1. Push the needle thread with your finger until it is slightly higher than the thread tension bracket 6 and so that the upper thread is not pulled out.
- 2.Pull the upper thread down until the thread ten sion spring (1) is at the same height as the base of the thread guide (3), and then measure the tension of the thread tension spring (1).
- 3.Insert a screwdriver into the slot of the thread tension stud (a), and turn the screwdriver to adjust the tension of the thread tension spring (a).

Note:If using a tension gauge (a) (sold separately) to measure the tension, take the reading from the scale on the side of the red line.

### 9-2. Adjusting arm thread guide R



### 9-3. Adjusting the presser foot height



The standard position of arm thread guide R is the position where the screw is in the center of the adjustable range for arm thread guide R i.

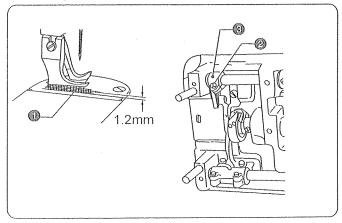
To adjust the position, loosen the screw ② and theen move arm thread guide R ④.

- When sewing thick material, move arm thread guide R to the left. (the thread take-up amount willbecome greater.)
- When sewing thin material, move arm thread guide R ⊕ to the right. (The thread take-up amount will become less.)

The standard height of the presser foot ② is 8mm when the presser foot is raised with the presser bar lifter Lever ①.

- 1. The height of the presser foot ② can be adjusted dy turning the pressure regulating thumb screw ③ and raising the presser bar lifter lever ④ without applying pressure.
- 2.Rem ove the oil cap and loosen the screw (3); ad just the presser foot height by raising of lowering the presser bar (5).

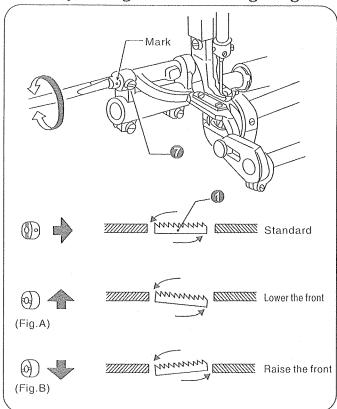
### 9-4. Adjusting the feed dog height



#### Adjusting the feed dog height

- 1. When the feed dog is at its highest position above the needle plate, the standard height is 1.2mm.
- 2.To adjust the height of the feed dog , move it to the highest position above the needle plate, loosen the set screw , and raise or lower the feed lifting arm .

### 9-5. Adjusting the feed dog angle

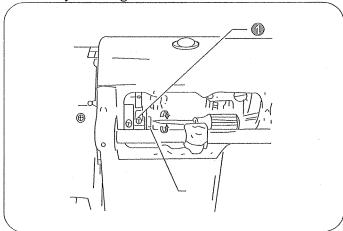


Adjusting the feed dog angle

The standard angle of the feed dog when it is at I-ts highest position above the needle plate is obtained when the embossed mark on the feed bracket shaft is horizontal.

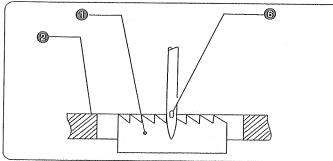
- 1. Turn the machine pulley to move the feed dogto its highest position above the nddble plate.
- 2.Loosen the set screw ?.
- 3. Turn the feed bracket shaft **(3)** in the direction of the arrow within a range of 90 with respect to the standard position.
  - \* Inorder to prevent puckering, lower the front of the feed dog (Figure A).
  - \* In order to prevent the material from slipping, raise the front of the feed dog (Figure B).
- 4. Securely tighten the set screw 7.
  - \* The height of the feed dog will change after the angle has been adjusted, so it will be necessary to re-adjust the height of the feed dog

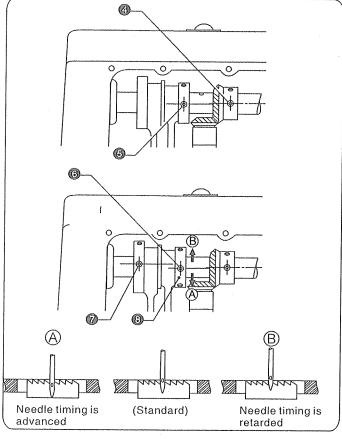
#### 9-6. Adjussting the difference between the forward and backtack stitch lengths



- 1. Reove the rear cover.
- 2.Loosen the screw 1 and turn the connecting stud 2 .
  - \* If the connecting stud ② is turned clockwise, the forward stitch length will in crease, and the backtack stitch length will decrease.
  - \* If the connecting stud ② is turned counterclockwise, the forward stitch length will decrease, and the backtack stitch length will increase.
- 3. Securely tighten the screw  $\textcircled{\scriptsize 10}$  .

# 9-7. Adjusting the needle and feed mechanism timing





The standard timing is obtained when the feed dog is lowered from its highest position until it is flush with the top of the needle plate and the needle eye is also aligned horizontally with these flush surfaces. Adjust by changing the phases of eccentric wheel UD and the level feed eccentric wheel.

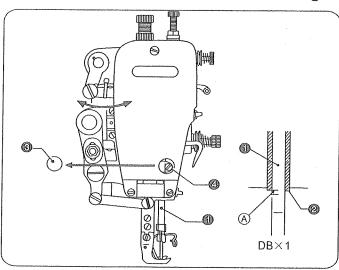
- 1. Remove the side plate.
- 2. Remove the oil cover.
- 3. Position the third set screw ③ on eccentric wheel Udso that its center is slightly lower than the secretary-ond set screw ④ on the upper shaft bevel gear.
- 4. Position the third set screw **10** on the level feed eccentric wheel so that its center is slightly higher than the second set screw **10** on eccentric wheel UD.
- 5. If adjustment to a position that differ from the standard position is required, loosen the three set screws on eccentric wheel UD (3), and then ture eccentric wheel UD (3) in direction (A) or direction (B) to adjust.

To increase the tightness of the thread, turn eccentric wheel UD® in direction (A). (The needlt timing will be advanced.)

To avoid bending of the needle, turn eccentric wheel UD (3) in direction (B). (The needle timing will be retarded.)

6. After adjusting, securely tighten all of the set screws.

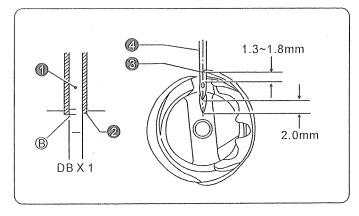
# 9-8. Adjusting the needle bar height and rotary hook timing

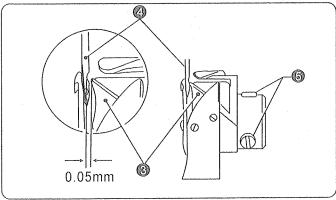


Reference line. Which is the top line on the needle Bar , should be aligned with the lower edge of needle bar bushing(D) as shown in the illustration when the needle bar is at its lowest position.

- 1. Turn the machine pulley to set the needle bar ① to its lowest position.
- 2. Remove the rubber cap 🔞 .
- 3.Loosen screw and then move the needle bar up or down to adjust it s position.
- 4. Securely tighten the screw 🚳 .
- 5. Replace the rubber car 🚳 .

#### 9.STANDARD ADJUSTMENTS

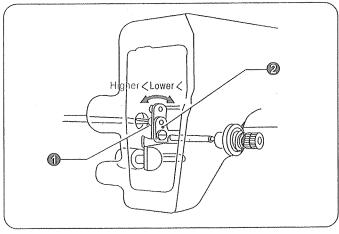




The tip of the rotary hook should be aligned with the center of the neeble when the needle bar moves up from its lowest position to the position where reference line, which is the bottom line on the needlt bar , is aligned with the lower edge of the needle bar bushing (D) as shown in the illustration.

- 1. Turn the machine pulley to raise the needle bar from its lowest position until reference line (B) is aligned with the lower edge of the needle bar bush (D) as shown in the illustration.
  - \* When the needle bar moves up 2mm, the distance from the needle thread hole to the tip of the rotary hook should bd1.3–1.8mm
- 2.Loosen the set screws (3), and then align the tip of the rotary hook (3) with the center of the needle (4).
  - \* The distance betwiin the tip of the rotary hook and the needle should be apprisimately 0.05mm.
- 3. Securely tighten the set screws 6.

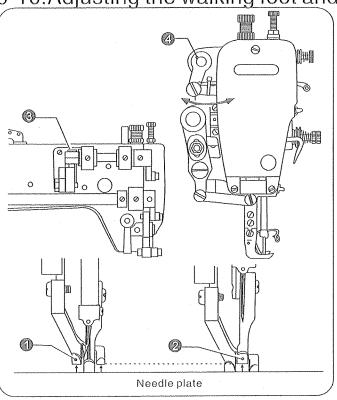
# 9-9. Adjusting the tension release timing



The opening time for the thread tension discs can be adjusted by adjusting the position of the presser foot strlke.

- \*Loosen the screw.
  - Move the guide@to the right to loosen the thread tension when presser foot is lowered.
  - Move the guide ② to the left to loosen the thread tension when the presser foot is raised.

9-10. Adjusting the walking foot and presser foot

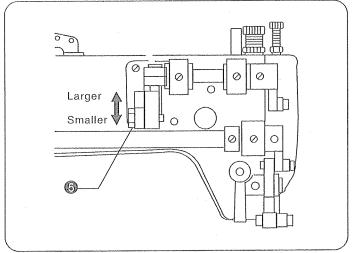


- 1. Vertical movement of walking foot and presser foot.
- ★ The walking foot ② and presser foot ② move vertically one after another.
- ★ Adjust the height of walking foot and presser foot so that they are equal of the presser foot
   is a little lower, when walking foot and presser foot are each in the up position.

Place the thread take—up lever at the lowest position, and lower the presser bar lifter.

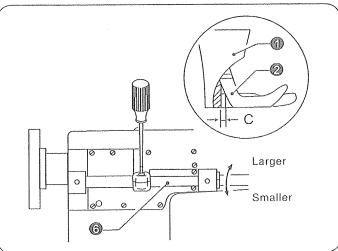
Adjust the left side of the upper feed lifting arm by moving it clockwise or counterclockwise by loosening screw .

Move counterclockwise····Both feet will rise equally. Move clockwise······The presser foot will rise less.

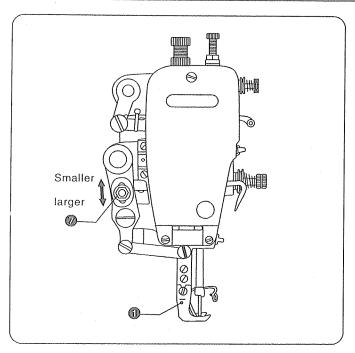


- 2. Heights of walking foot and presser foot
- ★ Adjust the height of the walking foot and presser foot to match the material being sewn.

Loosen the shoulder screw (and move the walking foot and presser foot up and down to adjust.



- 3. Adjusting the forward/back clearance of the walking foot and presser foot
- ★ Maintain a constant clearance (approximately3mm) so that the front of the groove in the walking foot@ does not strike the rear of the presser foot ②. Loosen the screw of feed arm R, and then turn the feed rock shaft to ⑥ adjust.



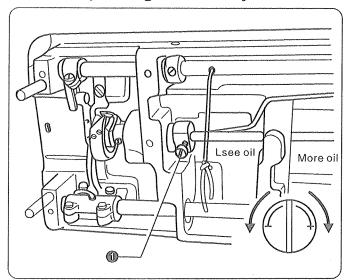
#### 4. Walking foot feed amount

The standard ratio between the feed amount for the feed dog and the feed amount for the walking foot (1) is 1:1.

The feed amount for the walking foot can be changed to suit the material being sewn.

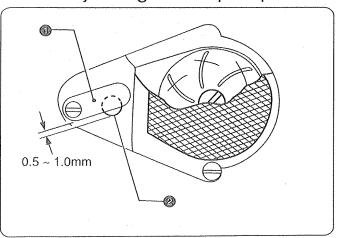
Loosen the nut and move the roller shaft up or down to adjust.

# 9-11. Adjusting the rotary hook lubrication amount



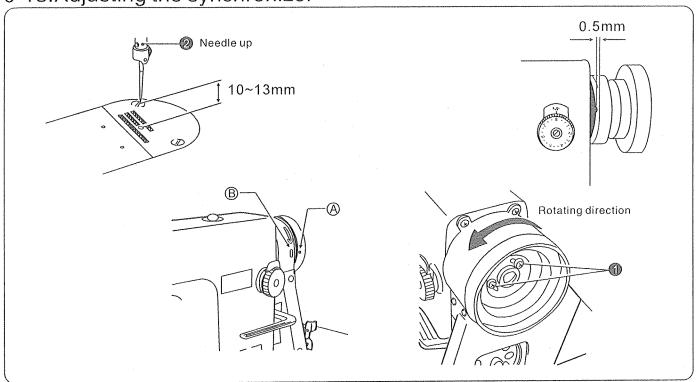
Tilt back the machine head, and then turn the oil adjusting screw (1) to adjust the lubricating amount.

#### 9-12. Adjusting the oil pump



If you cannot see the oil being circulated by looking through the oil gauge window when the sewing machine is runnibng at low speed, turn the oil adjusting plate so that the oil hole is covered.

### 9-13. Adjusting the synchronizer



- The synchronizer consists of two elements which are used to detect the needle position. Ome of these elements is used to control the needle down signal and the thread trimmer signal.
- When the power is turned on and the sewing machine is stopped in the needle up position, pulley mark (A) should be aligned with belt cover reference line (B) and tjere sjpi; d be a 10 to 13mm gap between the needle plate top and needle tip.

If adjustment is necessary , refer to the procedure below.

- Needle up stop plsition adjustment
- 1. Turn off the power switch.
- 2.Loosen the two set screws 🕡 .
- 3. Move the set screws ② in the direction of normal pulley rotation to raise the needle bar ②. Move the Screws ③ in the opposite direction to lower the needle bar ②.
- 4. Tighten the set screws 🕥 .
- Needle down and thread trimmer signals

Do not adjust the needle down stop position.

Note: The synchronizer is preadjusted at the factory. Do not remove the synchronizer after removing the pulley. When mounting the pulley be sure to leave a 0.5mm gap bet ween the pulley edge and synchronizer.

Furthermore, tighten the two machine pulley set screws so that the rear set screw is at the screw stop on the upper shaft when seen from the machine pulley turning direction.

# 10.REPLACING THE FIXED KNIFE AND MOVABLE KNIFE

# A CAUTION

 $\bigcirc$ 

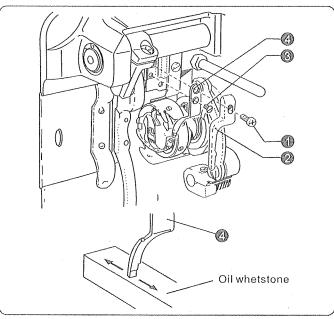
Replacement of parts should only be carried out by a rualified technician.

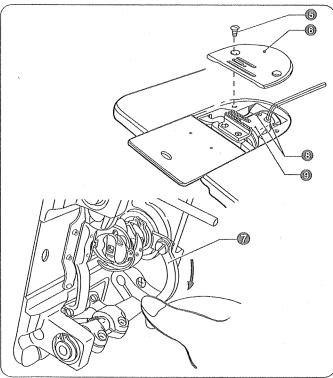


Thrn off the power switch and disconnect the power cord from the wall outlet before replacing any parts, otherwise the machine may operate is the treadle is pressde by mistake, which could result in injury.



Use only the proper replacement parts as secified.





#### Replacing the fixed knife

- 1. Tilt back the machine head.
- 2.Remove the screw (1), and then remove the B-case holder position bracket (2).
- 3. Remove the screw (a), and the remove the fixed knife(a).
- \* Carry out the above steps in reverse to install the fixed knife **(a)**.

Sharpening the fixed knife
If the knives become blunt, sharpen the fixed knives as shown.

#### Replacing the movable knife

- 1. Remove the needle.
- 2. Lift up the presser foot using the presser bar lifter.
- 3. Remove the two screws (3), and then remove the needle plate (6).
- 4. Turn the machine pulley to raise the needle bar to its highest position.
- 5. Tilt back the machine hesd.
- 6. Push the thread trimmer connecting rod in the direction of the arrow until the two screws can be seen.
- 7.Remove the two screews (3), and then rmove the movable knife (9).
- \* Carry out the above procedure in reverse to install the movable knife.

# 11.TROUBLESHOOTING

- Plaese check the following points before calling for repairs of service.
- If the following suggestion's do not solve the priblem, turn off the machine power supply and comtact you nearest service center.

#### CAUTION



Turn off the power switch and disconnect the power cord before carrying out troubleshooting, otherwise the machine will operate if the treadle is pressed by mistake, which could result in injury.

When using a clutch motor, the motor will keep turning even after the power is switched off as a result of the motor's inertia. Wait until the motor stops fully before starting work.

Problem	Possible cause	Page
1.Upper thread is not tight.	ls the upper thread tension too wesk,or is the lower thread tension	
	too serong? Adjust the upper thread tension or lower thread tenion.	15
	Is the needle and feed mechanism timing correct?	, ,
<u> </u>	Advance the needle timing.	22
2.Lower thread is not tight.	Is the lower thread tension tooweak, or is the upper thread tension too strong? Adjust the lower thread tension or upper thread tension.	15
73/87773/87773/87773/87773/877		
3. Skipped stitches occur while		
sewing	If the needle tip is bent or broken, replace the neeele.	****
		,
	Ifit is incorrect, in stall the needle correctly.	11
	Is the machine properly threaded? If it is incorrect, thread the thread correctly.	12 · 3
	Is the presser foot pressure too weak?	12.3
	Adjust the presser foot pressure.	15
	Is the needle too thin?	, ,
	Replace the needle with a needle that is on rank thicker.	
	ls the presser foot to high?	
	Adjust the height of the presser foot.	20
	Is the needle and rotary hook timing incorrect?	
	Adjust the height of the needle bar.	22
	Adjust the needle and rotary hook timing.	23
	Adjust the tension of the thread tension spring.	19
	Adjust the tension of the throad tension spring.	10

Problem	Possible cause	Page
4.Skipped stitches at sewing start	<ul> <li>Is the thread tension spring too strong?</li> <li>Reduce the tension of the thread tension springs.</li> <li>Is the thread tension spring operation range too large?</li> </ul>	19
	Lower the position of the thread tension spring.  Is the needle too wide?	19
	Try using a needle with a count that is one lower than the current needle.	13
Thread unravelling at sewing start	Is the trailing length of the upper thread too short after thread trimming?	
	Adjust the thread guide.  Are the threads not being trimmde cleanly?  Sharpen the fixed knives,or replace the fixed and movable knives if	16
Upper thread	necessary.  Is the length of thread trailing out from the bobbin case afeter thread trimming too short?	27
	If the bobbin is spinning loosely, replace the bobbin tension spring in the bobbin case.  Is the needle up stop position too higt?	11
	Adjust the synchronizer.	26
5.Uneven seam	<ul><li>Is the presser foot pressure too weak?</li><li>Adjust the presser foot pressure.</li></ul>	15
	<ul><li>Is the feed dog goo low?</li><li>Adjust the feed dog height.</li><li>Is the bobbin scratch ed?</li></ul>	20
	If the bobbin is damaged,smmooth it with an oiled grindstone of re– place it.	
6.Material slippage	Is the presser foot pressure too strong?	
	Adjust the presser foot pressure.  Is the angle of the feed dog incorrect?  Tilt the front of the feed dog up slightly.	15 21
	<ul> <li>Is the needle and feed mechanism timing correct?</li> <li>Retard the needle timing.</li> </ul>	22
	·	

# 11.TROUBLESHOOTING

Problem	Possible cause	Page
7.Lower thread is tangled at the sewing start.	Is the bobbin spinning direction correct when the lower thread is being pulled? Set the bobbin so that it turns in the opposite direction to the rotary	
	hook.  Is there too much thread wound onto the bobbin?	12
-thread	The bobbin winding amount should not be more than 80%.  Is the bobbin tension spring attached?  Attach the bobbin tension spring.	12
	Is the bobbin turning smoothly? If the bobbin is not turning smoothly, replace the bobbin.	
Spinning of bobbin during thread trimming	Is a bobbin other than the light–alloy bobbins specified. Being used? Use only bobbins which are specified.	_
80%		
8.Upper and lower threads are breaking.	Is the needle bent or is the needle tip broken? Replace the needle if it is bent or broken.	_
<u></u>	Is the needle properly installed? If it is incorrect, install the needle correctly.	11
,	<ul> <li>Is the needle properly threaded?</li> <li>If it is incorrect, thread the needle correctly.</li> <li>Is the upper of lower thread tension too weak or too strong?</li> </ul>	12 · 13
	Adjust the upper thread or lower thread tension.  Is the upper thread may be loose because the thread tension spring operation range is too small?	15
	Ajjust the position of the thread tension spring.  Is the rotary hook, feed dog or other part damaged?	19
	If they are damaged, amooth them with an oiled grindstone or re– place the damaged parts.	
9.Incorrect thread trimming (upper and lower threads are both not being trimmed.)	Is the fixed knife or movable knife damaged or worn? Replace the fixed knife or the movable knife.	27
		- N
10.Incorrect thread trimming (upper thread or lower	Is the needle properly installed? If it is incorrect, install the needle correctly.	. 11
thread is not being trimmed).	It it is incorrect, install the fleedle correctly.  Is the fixed knife of movable knife blunt?  Replace the fixed knife or the movable knife.	27
A		

# 11.TROUBLESHOOTING

Problem	Possible cause		
1.Broken needles	Is the material being pushed or pulled with excessive force during sewing?	-	
	Is the needle properly installed? If it is incorrect, install the needle correctly.	11	
	Is the needle bent, is the needle tip broken, or is the needle hole blocked?		
	Replace the needle.  Is the needle and rotary hook timing incorrect?	_	
	Adjust the height of the needle bar.	22	
_ W	Adjust the needle and rotary hook timing.	23	
	<ul> <li>Is the needle timing advanced to rar with respect to the feed dog?</li> <li>Retard the needle timing.</li> </ul>	22	
	Caution—		
	<ul> <li>It is extremely dangerous to leave any pieces of broken needle sticking in the material. If the needle breaks, search for all pieces until the whole of the needle is found again.</li> <li>Furthermore, we recommend that through steps be taken to account for such needles to comply with produst liability regulations.</li> </ul>		

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