Please read this manual before using the machine.
Please keep this manual within easy reach for quick reference.

DIRECT DRIVE
PROGRAMMABLE ELECTRONIC PATTERN SEWER
<TREBLE HOOK>
Thank you very much for buying a BROTHER sewing machine. Before using your new machine, please read the safety instructions below and the explanations given in the instruction manual.

With industrial sewing machines, 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 consequently 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 machine itself 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

<table>
<thead>
<tr>
<th>Indication</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER</strong></td>
<td>The instructions which follow this term indicate situations where failure to follow the instructions will result in death or serious injury.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td>The instructions which follow this term indicate situations where failure to follow the instructions could result in death or serious injury.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>The instructions which follow this term indicate situations where failure to follow the instructions may result in minor or moderate injury.</td>
</tr>
</tbody>
</table>

Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>△</td>
<td>This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken. (For example, the symbol at left means &quot;beware of injury&quot;).</td>
</tr>
<tr>
<td>☠️</td>
<td>This symbol (✠) indicates something that you <strong>must not</strong> do.</td>
</tr>
<tr>
<td>✡️</td>
<td>This symbol (✡️) indicates something that you <strong>must</strong> do. The picture inside the circle indicates the nature of the thing that must be done. (For example, the symbol at left means &quot;you must make the ground connection&quot;).</td>
</tr>
</tbody>
</table>
[2] Notes on safety

**DANGER**

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the control box cover. Touching areas where high voltages are present can result in severe injury.

**WARNING**

Do not allow any liquids to get onto this sewing machine, otherwise fire, electric shocks or operating problems may occur.

If any liquid gets inside the sewing machine (machine head or control box), immediately turn off the power and disconnect the power plug from the electrical outlet, and then contact the place of purchase or a qualified technician.

**CAUTION**

**Environmental requirements**

- Use the sewing machine in an area which is free from sources of strong electrical noise such as electrical line noise or static electric noise. Sources of strong electrical noise may cause problems with correct operation.
- Any fluctuations 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 power consumption. Insufficient power supply capacity may cause problems with correct operation.
- Do not connect anything to the USB port other than the USB memory. If this is not observed, problems with operation may result.
- The pneumatic delivery capability should be greater than the requirements for the sewing machine's total air consumption. Insufficient pneumatic delivery capability 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 higher 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.
- 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 Brother dealer or a qualified electrician for any electrical work that may need to be done.
- The sewing machine weighs approximately 88 kg. The installation should be carried out by three or more people.
- Do not connect the power cord until installation is complete. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
- Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, do not apply excessive force when tilting back the machine head. The sewing machine may become unbalanced and fall down, and serious injury or damage to the sewing machine may result.
- 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 safety covers to the machine head and motor.
- If using a work table which 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 and grease, so that they do not get into your eyes or onto your skin. If the oil and grease get into your eyes or onto your skin, inflammation can result. Furthermore, do not drink or eat the lubricating oil or grease. They may cause diarrhea or vomiting. Keep the oil out of the reach of children.
CAUTION

Sewing

⚠️ To prevent problems, do not use objects with sharp points to operate the LCD panel.

⚠️ 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 breaks, parts of the broken needle may enter your eyes and injury may result.

⚠️ Turn off the power switch at the following times. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
   • When replacing the bobbin and needle
   • When not using the machine and when leaving the machine unattended

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

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

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

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

⚠️ If the machine develops a problem, contact your nearest Brother dealer or a qualified technician.

Cleaning

⚠️ Turn off the power switch before carrying out cleaning. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.

⚠️ Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin. If the oil and grease get into your eyes or onto your skin, inflammation can result. Furthermore, do not drink or eat the lubricating oil or grease. They may cause diarrhea or vomiting. 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 technician.

⚠️ Ask your Brother 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 before carrying out the following operations. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
   • Inspection, adjustment and maintenance
   • Replacing consumable parts such as the rotary hook

⚠️ Disconnect the air hoses from the air supply and wait for the needle on the pressure gauge to drop to “0” before carrying out inspection, adjustment and repair of any parts which use the pneumatic equipment.

⚠️ Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, do not apply excessive force when tilting back the machine head. The sewing machine may become unbalanced and fall down, and serious injury or damage to the sewing machine may result.

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

⚠️ When replacing parts and installing optional accessories, be sure to use only genuine Brother parts. Brother will not be held responsible for any accidents or problems resulting from the use of non-genuine parts.

⚠️ 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.

⚠️ To prevent accidents and problems, do not modify the machine yourself. Brother will not be held responsible for any accidents or problems resulting from modifications made to the machine.
The following warning labels appear on the sewing machine.
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

1. Be careful not to get your hand caught when tilting back the machine head and returning it to its original position.

2. 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.

3. Direction of operation

4. Be careful to avoid injury from moving parts.

5. Do not hold, otherwise problems with operation or injury may occur.
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1. NAMES OF MAJOR PARTS

(1) Power switch
(2) Control box
(3) LCD panel
(4) Work clamp switch
(5) Start switch
(6) STOP switch
(7) Pulley
(8) Cotton stand
(9) Solenoid valve

Safety devices:
(10) Finger guard
(11) Eye guard
(12) Thread take-up cover
(13) Rear cover
## 2. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Sewing machine</th>
<th>Lock stitch pattern tacking sewing machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stitch formation</td>
<td>Single needle lock stitch</td>
</tr>
<tr>
<td>Max. sewing speed</td>
<td>2,200 sti/min</td>
</tr>
<tr>
<td>Max. sewing area (XxY)</td>
<td>220 x 100 mm</td>
</tr>
<tr>
<td>Feed mechanism</td>
<td>Intermittent feed, pulse motor drive</td>
</tr>
<tr>
<td>Stitch length</td>
<td>0.05 – 12.7 mm</td>
</tr>
<tr>
<td>Maximum No. of stitches</td>
<td>20,000 stitches (per program)</td>
</tr>
<tr>
<td>No. of sewing data items that can be stored</td>
<td>999 (Internal memory, SD card, USB memory) (*)1</td>
</tr>
<tr>
<td>Work clamp lift method</td>
<td>Pneumatic cylinder method</td>
</tr>
<tr>
<td>Work clamp height</td>
<td>Max. 27.5 mm</td>
</tr>
<tr>
<td>Intermittent presser foot lift amount</td>
<td>19.5 mm (*)2</td>
</tr>
<tr>
<td>Intermittent presser foot stroke</td>
<td>2 – 4.5 mm, 4.5 – 10 mm or 0 (Default setting 3 mm) (*)2</td>
</tr>
<tr>
<td>Hook</td>
<td>Treble hook</td>
</tr>
<tr>
<td>Wiper device</td>
<td>Standard equipment</td>
</tr>
<tr>
<td>Thread trimmer</td>
<td>Standard equipment</td>
</tr>
<tr>
<td>Thread take-up device</td>
<td>Standard equipment</td>
</tr>
<tr>
<td>Cycle programs</td>
<td>30</td>
</tr>
<tr>
<td>Motor</td>
<td>550 W AC servo motor</td>
</tr>
<tr>
<td>Weights</td>
<td>Machine head Approx. 88 kg, LCD panel Approx. 0.8 kg</td>
</tr>
<tr>
<td></td>
<td>Control box 9 kg (Differs depending on destination)</td>
</tr>
<tr>
<td></td>
<td>(For single-phase 110 V and three-phase 380 V/400 V, the trans box is required.)</td>
</tr>
<tr>
<td>Air pressure</td>
<td>0.5 MPa 1.8 l/min.</td>
</tr>
</tbody>
</table>

(*)1 The number of data items and stitches that can be stored will vary depending on the number of stitches in each program. No guarantees of operation can be given for any media.

(*)2 Only applicable to -484 SF specifications.
3. INSTALLATION

**CAUTION**

- Machine installation should only be carried out by a qualified technician.
- Contact your Brother dealer or a qualified electrician for any electrical work that may need to be done.
- The sewing machine head weighs approximately 88kg. The installation should be carried out by three or more people.
- Do not connect the power cord until installation is complete.
- If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
- Hold the machine head with both hands when tilting it back or returning it to its original position. Furthermore, do not apply excessive force when tilting back the machine head. The sewing machine may become unbalanced and fall down, and serious injury or damage to the sewing machine may result.
- 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 staples, otherwise there is the danger that fire or electric shocks could occur.
- 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.
- Install the safety covers to the machine head and motor.

3-1. Table processing diagram

- The thickness of the table should be at least 40 mm, and it should be strong enough to bear the weight and vibration of the sewing machine.
- Check that the control box is at least 10 mm away from the leg. If the control box and the leg are too close together, it may result in incorrect sewing machine operation.

![Diagram of table processing](image-url)
3. INSTALLATION

3-2. Installing the control box

Remove the six screws (1), and then remove the control box cover (2).
(3) Control box  
(4) Bolts [4 pcs.] 
(5) Plain washers [4 pcs.] 
(6) Spring washers [4 pcs.] 
(7) Nuts [8 pcs.]

3-3. Installing the oil pan

(1) Oil pan  
(2) Nails [6 pcs.]  
(3) Waste oil tank
3. INSTALLATION

3-4. Installing the machine head

Place the machine head gently on top of the oil pan.

**NOTE:**
- Be careful not to get the cords clamped between the machine head and the oil pan.
- When holding the machine head, do not hold it by the pulse motor. This may cause problems with operation of the pulse motor.

(1) Pins [2 pcs.]
(2) Set screws [2 pcs.]
(3) Hinge rubber assemblies [2 pcs.]
(4) Hinge holders [2 pcs.]
(5) Bolts [4 pcs.]
(6) Plain washers [4 pcs.]
(7) Nuts [4 pcs.]
(8) Head rest
(9) Bolts with washer [4 pcs.]
3. INSTALLATION

(10) Auxiliary plate
(11) Bolts with washer [8 pcs.]

Loosen the eight bolts with washer (11), and adjust so that the auxiliary plate (10) is 0 to 0.5 mm above the needle plate.

**NOTE:**
- Install the auxiliary plate (10) so that it is horizontal.
- If the auxiliary plate (10) is lower than the needle plate, the feed plate may get caught on the needle plate.

Move the work clamp arm all the way to the right when looking from the front of the sewing machine (the direction of the arrow in the illustration), and then gently tilt back the machine head.

**NOTE:**
- Three or more people should tilt back the machine head, and it should be tilted gently while being held with both hands.
- Be careful not to clamp any items such as screwdrivers under the cushion when tilting back the machine head.

(12) Bobbin winder tension assembly
(13) Set screw [1 pc.]
3. INSTALLATION

- Gas spring holders [2 pcs.]
- Spacer [2 pcs.]
- Bolt [2 pcs.]
- Nut [2 pcs.]
- Gas spring [2 pcs.]
- Shaft collars [2 pcs.]
- Gas spring shaft D [2 pcs.]
- Plain washers D [2 pcs.]
- Retaining rings E [2 pcs.]
- Bolts [2 pcs.]
- Gas spring shaft U [2 pcs.]
- Plain washers (medium) [2 pcs.]
- Plain washers (large) [2 pcs.]
- Spring washers [2 pcs.]
- Nuts [2 pcs.]
- Retaining rings E [2 pcs.]
- Plain washers (small) [2 pcs.]
- Absorber setting plate [2 pcs.]
- Bolts with washer [2 pcs.]
- Gas spring support cover [2 pcs.]
- Bolts with washer [6 pcs.]

Be sure to install so that the side with “UP” on it is facing upward.
3. INSTALLATION

1. Remove the two screws (35), and then temporarily remove the machine head switch assembly (36).
2. Use the two screws (35) which were removed to install the machine head switch assembly (36) in the position shown in the illustration.
3. Check that the machine head switch is turned on as shown in figure [A].

* If the machine head switch is not turned on, adjust the installation position while referring to “3-17. Checking the machine head switch”.

---

3-5. Installing the LCD panel

(1) Cradle
(2) Rubber cushion
(3) Wood screws [4 pcs.]
(4) Setting plate
(5) Flat screws [4 pcs.]
(6) LCD panel
(7) Staples [2 pcs.]

- Pass the cord of the LCD panel (8) through the table hole, and then insert it into the (PANEL) connector (9) on the side of the control box.
- Tighten the four wood screws (3) so that the thickness of the rubber cushion (2) is 5 mm.
3-6. Installing the two-pedal foot switch

(1) Two-pedal foot switch
(2) Conversion harness

Connect the connector for the two-pedal foot switch (1) to the conversion harness (2). Insert the conversion harness (2) into the P15 (PEDAL) connector on the main board. (Refer to “3-7. Connecting the cords”.)

* Be sure to make the ground connection. (Refer to “3-8. Connecting the ground wire”.)

<Two-pedal foot switch operating method>
When the work clamp switch (left) is depressed, both work clamps are lowered, and when the start switch (right) is depressed, the sewing machine starts sewing.

* The work clamp lowering method can be changed using memory switch No. 002. (Refer to “2-2. List of memory switch settings” in the “LCD Panel/Operation Panel” Instruction Manual.)

3-7. Connecting the cords

1. Gently tilt back the machine head.
2. Pass the cord bundle through the hole in the work table.
3. Loosen the two screws (1), and then open the cord presser plate (2) in the direction of the white arrow and pass the cord bundle through the opening.
4. Securely connect the connectors as indicated in the table below. (Refer to the next page.)

**NOTE:**
* Check that the connector is facing the correct way, and then insert it firmly until it locks into place.
* Secure the cables with cable ties and cord clamps, while being careful not to pull on the connector.
## 3. INSTALLATION

**NOTE:** Route the X, Y and intermittent presser foot pulse motor harnesses so that they do not touch the power supply board at the bottom of the control box.

*1: Only applicable to -484 SF specifications.

### Connectors

<table>
<thead>
<tr>
<th>Connectors</th>
<th>Connection location on main board</th>
<th>Cord clamps / cable ties</th>
</tr>
</thead>
<tbody>
<tr>
<td>X pulse motor encoder [5-pin] White</td>
<td>P17 (X-ENC)</td>
<td>(2)</td>
</tr>
<tr>
<td>Y pulse motor encoder [5-pin] Blue</td>
<td>P18 (Y-ENC)</td>
<td>(2)</td>
</tr>
<tr>
<td>Intermittent presser foot pulse motor encoder [5-pin] Black *1</td>
<td>P19 (P-ENC)</td>
<td>(2)</td>
</tr>
<tr>
<td>Machine head switch [3-pin]</td>
<td>P14 (HEAD-SW)</td>
<td>(2)</td>
</tr>
<tr>
<td>Conversion harness (two-pedal foot switch) [7-pin] White</td>
<td>P15 (PEDAL)</td>
<td>(2)</td>
</tr>
<tr>
<td>Machine head memory [6-pin]</td>
<td>P16 (HEAD-M)</td>
<td>(2)</td>
</tr>
<tr>
<td>Thread trimmer solenoid [6-pin]</td>
<td>P2 (SOL1)</td>
<td>(1)</td>
</tr>
<tr>
<td>Tension release solenoid [4-pin]</td>
<td>P3 (SOL2)</td>
<td>(1)</td>
</tr>
<tr>
<td>X pulse motor [4-pin] White</td>
<td>P21 (XPM)</td>
<td>(1)</td>
</tr>
<tr>
<td>Y pulse motor [4-pin] Blue</td>
<td>P22 (YPM)</td>
<td>(1)</td>
</tr>
<tr>
<td>Intermittent presser foot pulse motor [4-pin] Black *1</td>
<td>P23 (PPM)</td>
<td>(1)</td>
</tr>
<tr>
<td>Home position sensor [12-pin] White</td>
<td>P8 (SENSOR1)</td>
<td>(2) (3)</td>
</tr>
<tr>
<td>STOP switch [6-pin] White</td>
<td>P9 (HEAD)</td>
<td>(2) (3)</td>
</tr>
<tr>
<td>Valve harness [12-pin]</td>
<td>P35 (EX-OUT1)</td>
<td>(2) (3)</td>
</tr>
<tr>
<td>Upper thread breakage detector [2-pin] White</td>
<td>P36, 9 (HEAD)</td>
<td>(2) (3)</td>
</tr>
<tr>
<td>Thread trimming cylinder sensor harness [16-pin]</td>
<td>P10 (EX-IN1)</td>
<td>(2) (3)</td>
</tr>
</tbody>
</table>

**NOTE:** Lock the cord clamp securely.

---

**Removal:**

1. Press the tab.
2. Remove the connector.

---

**Securing:**

1. Insert the connector into the main board.
2. Press the tab securely.

---

3695B

---

BAS-326H-484, BAS-326H-484 SF
3. INSTALLATION

**< Motor board >**

<table>
<thead>
<tr>
<th>Connectors</th>
<th>Connection location on motor board</th>
<th>Cord clamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper shaft motor [4-pin]</td>
<td>(UVW)</td>
<td>(4)</td>
</tr>
<tr>
<td>Synchronizer [10-pin]</td>
<td>P11 (SYNC)</td>
<td>(2) (3)</td>
</tr>
</tbody>
</table>

5. Close the cord presser plate (6) in the direction of the white arrow, and secure it by tightening the two screws (5).

**NOTE:**
Close the cord presser plate (6) securely so that no foreign objects, insects or small animals can get inside the control box.

6. Check that the cords do not get pulled, and then gently return the machine head to its original position.
### 3. INSTALLATION

**BAS-326H-484, BAS-326H-484 SF**

**Connector D-sub connector**

<table>
<thead>
<tr>
<th>Connector</th>
<th>D-sub connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCD panel</td>
<td>(PANEL)</td>
</tr>
<tr>
<td>[9-pin]</td>
<td></td>
</tr>
</tbody>
</table>

(PANEL)
3-8. Connecting the ground wire

**CAUTION**

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.

- **(1)** Ground wire from the machine head
- **(2)** Ground wires from two-pedal foot switch harness (2 wires)

- Tighten the control box cover with the six screws. Check that the cords are not clamped by the cover at this time.

**NOTE:** Make sure that the ground connections are secure in order to ensure safety.
3-9. Connecting the power cord

**CAUTION**

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.

Connect cords that match the voltage specifications.

**< EU specifications >**

(1) Filter box  
(2) Screws [4 pcs.]  
(3) Staples [6 pcs.]  
(4) Power cord

1. Attach an appropriate switch and cable to the power cord (4). (The green and yellow wire is the ground wire.)
2. Insert the power plug into a properly-grounded electrical outlet.

**NOTE:**

- Take care when tapping in the staples (3) to make sure that they do not pierce the cords.
- Do not use extension cords, otherwise machine operation problems may result.
3. INSTALLATION

<200 V system >
(1) Power switch
(2) Wood screws [2 pcs.]

1. Attach an appropriate plug to the power cord (4). (The green and yellow wire is the ground wire.)
2. Insert the power plug into a properly-grounded electrical outlet.

NOTE:
• Take care when tapping in the staples (5) to make sure that they do not pierce the cords.
• Do not use extension cords, otherwise machine operation problems may result.

3. Use the six screws to tighten the cover of the control box. Check that none of the cords are being clamped by the cover at this time.
3. INSTALLATION

<100 V / 400 V system >
(1) Power switch
(2) Wood screws [2 pcs.]

(3) Transformer box
(4) Transformer box plates [2 pcs.]
(5) Screws [with washer] [4 pcs.]
(6) 3-pin power supply connector
(7) Staples [6 pcs.]
(8) Cord clamps [2 pcs.]
(9) Power cord

1. Attach an appropriate plug to the power cord (9). (The green and yellow wire is the ground wire.)
2. Insert the power plug into a properly-grounded electrical outlet.

* The inside of the control box uses single-phase power.

NOTE:
- If the ground connection is not secure, electric shocks, operating errors or damage to electronic components such as PCBs may occur.
- Take care when tapping in the staples (7) to make sure that they do not pierce the cords.
- Do not use extension cords, otherwise machine operation problems may result.

3. Use the six screws to tighten the cover of the control box. Check that none of the cords are being clamped by the cover at this time.
3-10. Installing the cotton stand

NOTE:
Securely tighten the nut (3) so that the two washers (2) are securely clamped so that the cotton stand (1) does not move.
3. INSTALLATION

3-11. Installing the pneumatic unit

1. Install the pneumatic unit underneath the work table.
   (1) Solenoid valve assembly
   (2) Washers [2 pcs.]
   (3) Wood screws [2 pcs.]
   (4) Rubber hose

   NOTE:
   Make sure that the pneumatic unit does not touch the control box or the work table leg.

2. Connect each of the air tubes (5) to the valves so that all of the numbers match respectively.
   The air tubes (5) marked with an A connect to the front valve connections (A), and those marked with B connect to the rear connections (B).

3. Open the air cock (6).

After installing the pneumatic unit, adjust the air presser.
(Refer to "7-17. Adjusting the air pressure").
3-12. Adjusting the speed controller

<Adjusting the lifting and lowering speed for the work clamps>

You can adjust the lifting and lowering speed for the work clamps using the knobs (1) and (2) on valves 1 and 2. Valve 1 adjusts the right work clamp (3), and valve 2 adjusts the left work clamp (4). The knobs (1) and (2) should be adjusted so that the left and right work clamps operate at the same speed.

- When the upper knob (1) is tightened, the lifting speed becomes slower. When it is loosened, the lifting speed becomes faster.
- When the lower knob (2) is tightened, the lowering speed becomes slower. When it is loosened, the lowering speed becomes faster.

You can operate the work clamps when the power is turned off by pressing the manual buttons (5).

<Adjusting the thread wiper operating speed>

Valve 3 is used for adjusting the operating speed of the thread wiper (6). To use, fully tighten both the upper and lower knobs (7) and (8), and then loosen them both by 6 turns.

NOTE:
If the knobs (7) and (8) are tightened more than the settings mentioned above, upper thread wiping may not be carried out correctly.

<Adjusting the thread take-up lever operating speed>

Valve 4 is used for adjusting the operating speed of the thread take-up lever (9). To use, fully tighten both the upper and lower knobs (10) and (11), and then loosen them both by 6 turns.

NOTE:
If the knobs (10) and (11) are tightened more than the settings mentioned above, the upper thread trailing length may not be maintained correctly.
3-13. Installing the eye guard

**CAUTION**

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

(1) Bolt (loosen)
(2) Eye guard (tilt forward)
(3) Eye guard assembly
(4) Plain washers [2 pcs.]
(5) Bolts [2 pcs.]

After installing the eye guard assembly (3), return the eye guard (2) to its original angle, and then tighten the bolt (1) to secure it in place.

3-14. Installing the side cover and rear cover

(1) Side cover
(2) Screws [4 pcs.]
(3) Rear cover
(4) Screws [4 pcs.]

**NOTE:**

Be careful not to clamp the cords when installing the side cover and the rear cover.
3-15. Lubrication

**CAUTION**

Do not connect the power cord until lubrication is complete. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.

Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin. If the oil and grease get into your eyes or onto your skin, inflammation can result. Furthermore, do not drink or eat the lubricating oil or grease. They may cause diarrhea or vomiting.

Keep the oil out of the reach of children.

The sewing machine should always be lubricated and the oil supply replenished before it is used for the first time, and also after long periods of non-use.

Use only the lubricating oil <JX Nippon Oil & Energy Corporation Sewing Lube N10; VG10> specified by Brother.

* If this type of lubricating oil is difficult to obtain, the recommended oil to use is <Exxon Mobil Essotex SM10; VG10>.

1. Fill the arm-side oil tank with oil.
2. Fill the bed-side oil tank with oil.

**NOTE:**

Be sure to fill the machine with oil when the oil level is down to about one-third full in the oil sight glass. If the oil drops below the one-third level, there is the danger that the machine may seize during operation.

3. Remove the bobbin case and add 2-3 drops of oil to the sliding parts (1) of the outer rotary hook and inner hook.
4. If using the needle cooler (2), fill it with optional silicon oil (100 mm²/s). (Refer to "4-2. Threading the upper thread").
3. INSTALLATION

3-16. Installing the machine head fixing bolt
When transporting the sewing machine, secure the machine head to the table with the machine head fixing bolts.

(1) Plain washers [2 pcs.]
(2) Machine head fixing bolts [2 pcs.]

NOTE:
When operating the sewing machine, remove the machine head fixing bolts.

3-17. Checking the machine head switch

1. Turn on the power.
2. Check that no error numbers appear.

<If error [E050], [E051] or [E055] is displayed>
If the machine head switch (1) is not turned on, error [E050], [E051] or [E055] will occur.

Use the screw (2) to adjust the installation position of the machine head switch as shown in the illustration.
4. PREPARATION BEFORE SEWING

4-1. Installing the needle

⚠️ CAUTION

Turn off the power switch before installing the needle.
If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.

1. Loosen the set screw (1).
2. Insert the needle (2) in a straight line as far as it will go, making sure that the long groove on the needle is at the front, and then securely tighten the set screw (1).
4. PREPARATION BEFORE SEWING

4-2. Threading the upper thread

Thread the upper thread correctly as shown in the illustration below.

- When using threading mode for threading, the tension discs (1) will open so that the thread can be threaded more easily. Refer to <Threading mode> (P.25)

- Turn the machine pulley (2) and raise the thread take-up (3) to its highest position before threading the upper thread. (This will make threading easier and it will prevent the thread from coming out at the sewing start.)

- When threading the thread through the needle, allow a distance of approximately 45 mm between the needle hole and the end of the thread. If it is too long, the thread may become tangled, and if it is too short, the thread may pull out at the sewing start.

- If you would like to adjust the sensitivity of the thread breakage sensor, refer to "7-2. Adjusting the sensitivity of the thread breakage sensor".

[If using a needle cooler unit]
<Threading mode>
Threading mode is safe because the sewing machine will not start even when the start switch is depressed.

1. Turn on the power.

2. Touch the Thread key on the screen.
   - The work clamps (and the intermittent presser foot *1) will drop.
   - The tension discs (1) will open.

3. Threading the thread.

4. Ending threading mode
   The display will return to the previous screen.
   - The work clamps (and the intermittent presser foot *1) will return to where it was before threading mode was started.

*1: The intermittent presser foot is only applicable to -484 SF specifications.
4-3. Winding the lower thread

**CAUTION**

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

1. Place the bobbin onto the bobbin winder shaft (1).
2. Thread the thread as shown in the illustration, wind the thread around the bobbin several times, and then press the bobbin presser arm (2).
3. Turn on the power.
4. Lower the work clamps (and the intermittent presser foot) before depressing the start switch. Home position detection will be carried out.
5. Touch the Wind key (4) on the screen.
6. The display will switch to the thread winding mode screen.
7. Check that the needle does not touch the work clamps (and the intermittent presser foot), and then lower the work clamps (and the intermittent presser foot) before depressing the start switch.
8. Keep depressing the start switch until the lower thread stops being wound onto the bobbin.
9. Once winding of the set amount of lower thread (80 - 90% of the bobbin capacity) is completed, the bobbin presser arm (2) will return automatically.
10. Remove the bobbin, hook the thread onto the knife (3), and then pull the bobbin in the direction of the arrow to cut the thread.
11. Touch the OK key (5) to return to the previous screen.
4. PREPARATION BEFORE SEWING

Adjusting the bobbin winding amount
Loosen the screw (6) and move the bobbin presser (7).

If the thread winds onto the bobbin unevenly
Loosen the set screw (8) and move the bobbin winder tension assembly (9) up and down to adjust.
* For case A, move the bobbin winder tension assembly (9) down, and for case B, move it upward.

4-4. Installing the bobbin case

**CAUTION**

Turn off the power switch before installing the bobbin case.
If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.

1. Pull the hook cover (1) downward to open it.
2. While holding the bobbin so that the thread winds to the left, insert the bobbin into the bobbin case.
3. Pass the thread through the thread slot (2), pass it underneath the spring (3), and then pass it through the thread guide (4), leaving a trailing-out length of about 30 mm.
4. Hold the latch on the bobbin case and insert the bobbin case into the rotary hook.
4. PREPARATION BEFORE SEWING

4-5. Installing the anti-spin spring

If the following situations occur, operation can be improved by using an anti-spin spring.

- The lower thread becomes tangled inside the bobbin case
- Uneven thread tightening occurs at the sewing start

**Installation**

1. While inserting the projections on the anti-spin spring (1) into the grooves of the bobbin case, insert the anti-spin spring (1).

2. Push the anti-spin spring (1) to insert it securely so that it does not lift up above the inside edge (A) of the bobbin case.

**Removal**

Use the tip of a screwdriver or similar to remove as shown in the illustration.

4-6. Thread tension

[Thread tension reference]

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper thread</td>
<td>#4 or similar</td>
</tr>
<tr>
<td>Lower thread</td>
<td>#4 or similar</td>
</tr>
<tr>
<td>Upper thread tension (N)</td>
<td>2.5 – 3.0</td>
</tr>
<tr>
<td>Lower thread tension (N)</td>
<td>1.0 – 1.5</td>
</tr>
<tr>
<td>Pre-tension (N)</td>
<td>0.3 – 0.6</td>
</tr>
<tr>
<td>Needle</td>
<td>DP x 17 #25</td>
</tr>
<tr>
<td>Normal sewing speed</td>
<td>1,300 sti/min</td>
</tr>
</tbody>
</table>

4-6-1. Lower thread tension

Adjust the lower thread tension by turning the adjusting screw (1).
4-6-2. Upper thread tension

1. Turn the tension nut (1) (main tension) to adjust the tension as appropriate for the material being sewn.
2. Use the tension nut (2) (sub tension) to adjust so that the upper thread trailing length after thread trimming is about 45 mm.

4-7. Starting up

Before turning on the power, check that the needle bar is at the needle up stop position.

Turn the pulley (1) in the direction of the arrow until the ridge at the bottom of the thread take-up (2) is aligned with the index mark.

Turn on the power.
If a program has been registered, the program number and a preview of the sewing pattern will be displayed.
No programs are registered at the time of shipment from the factory, and so "---" is displayed as the program number (No.).

For details on the sewing data reading method, refer to "3. USING STORAGE MEDIA" in the "LCD Panel/Operation Panel" Instruction Manual.
5. SEWING

**WARNING**

Do not allow any liquids to get onto this sewing machine, otherwise fire, electric shocks or operating problems may occur.

If any liquid gets inside the sewing machine (machine head or control box), immediately turn off the power and disconnect the power plug from the electrical outlet, and then contact the place of purchase or a qualified technician.

**CAUTION**

Turn off the power switch at the following times.

If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.

- When replacing the bobbin and needle
- When not using the machine and when leaving the machine unattended

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

5-1. Sewing

1. Turn on the power.
2. Touch the △ or ▽ key to select the number for the program to be sewn.
   * For details on reading sewing data from SD cards and USB memory devices, refer to "3-4. Importing items of sewing data separately" in the LCD Panel/Operation Panel Instruction Manual.
3. Lower the work clamps (2) and depress the start switch (1).
   Home position detection will be carried out.
4. Place the materials under the work clamps (2).
5. Depress the work clamp switch (3).
   The work clamps (2) will be lowered.
6. Depress the start switch (1).
   The sewing machine will start sewing.
7. After sewing is completed, the thread trimmer will operate. And then the work clamps (2) will be raised.

Use work clamps which will hold the material securely so that it does not slip. If the material slips when using the standard work clamps and feed plate, process them so that the material does not slip.
5-2. Using the STOP switch
If you press the emergency stop switch (1) during actual sewing, an error dialog box will be displayed and the sewing machine will immediately stop.

**<Clearing>**
1. Touch the Reset key (2).
   - The thread will be trimmed, and then the error dialog box on the screen will disappear and the buzzer will stop.
2. A dialog box asking you to confirm if you want to continue sewing will be displayed.

**<Continuing sewing from a stopping point>**
If the thread breaks or the lower thread runs out during sewing, you can then continue sewing from the point where the thread broke or ran out.

1. Touch “Yes” (3) to switch to the resewing standby screen.
2. Touch the keys (5) and (6) on the screen to return to the position where sewing is to be resumed.
   - When you touch the key (5), the feed will move backward by 1 stitch, and when you touch the key (6), the feed will move forward by 1 stitch.
3. Depress the start switch.
   - The sewing machine will start operating and sewing will start.

**<Returning to the sewing start position without continuing sewing>**
If you do not wish to continue sewing, touch “No” (4).
- After home position detection is carried out, the mechanism will return to the sewing start position.
6. CLEANING

CAUTION

- Turn off the power switch before carrying out cleaning. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
- Be sure to wear protective goggles and gloves when handling the lubricating oil and grease, so that they do not get into your eyes or onto your skin. If the oil and grease get into your eyes or onto your skin, inflammation can result. Furthermore, do not drink or eat the lubricating oil or grease. They may cause diarrhea or vomiting.
- Keep the oil out of the reach of children.

6-1. Cleaning the rotary hook

Remove the bobbin case, and then remove the dust and lint from around the shuttle. Also wipe the bobbin to remove oil.

6-2. Cleaning the control box air inlet ports

Use a vacuum cleaner to clean the filters in the air inlet ports (2) of the control box (1) at least once a month.
6. CLEANING

6-3. Draining the oil

1. Remove and empty the waste oil tank (1) whenever it is full.
2. After emptying the waste oil tank (1), screw it back into its original position.

6-4. Checking the regulator

1. If water collects in the bottle of the regulator (1), close the air cock (2), and then turn the drain cock (3) in the direction of the arrow to drain the water.
2. After draining the water, tighten the drain cock (3).
3. Open the air cock (2).

6-5. Cleaning the eye guard

Wipe the eye guard clean with a soft cloth.

NOTE:
Do not use solvents such as kerosene or thinner to clean the eye guard.

6-6. Checking the needle

Always check that the tip of the needle is not broken and also that the needle is not bent before starting sewing.

6-7. Lubrication

Lubricate the sewing machine while referring to "3-15. Lubrication".
7. STANDARD ADJUSTMENTS

CAUTION

- Maintenance and inspection of the sewing machine should only be carried out by a qualified technician.
- Ask your Brother 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 before carrying out the following operations. If the foot switch is depressed by mistake, the sewing machine might start operating and injury could result.
  - Inspection, adjustment and maintenance
  - Replacing consumable parts such as the rotary hook
- Hold the machine head with both hands when tilting it back or returning it to its original position. In addition, do not apply excessive force when tilting back the machine head. The sewing machine may become unbalanced and fall down, and serious injury or damage to the sewing machine may result.
- If the power switch needs to be left on when carrying out some adjustment, be extremely careful to observe all safety precautions.
- 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.

7-1. Checking the machine head switch

Check that the machine head switch is turned on as shown in the illustration.

NOTE:
If the machine head switch is not turned on, errors "E050", "E051" and "E055" will be generated.
7-2. Adjusting the sensitivity of the thread breakage sensor

1. Open the cover (1) and remove the upper thread from the photo sensor (2).
2. Turn the control (3) to the right <a> until the LED (4) illuminates.
3. Turn the control (3) to the left <b> until the LED (4) switches off.
4. Place the upper thread into the photo sensor (2), and close the cover (1).

NOTE:
- Thread breakages may be difficult to detect depending on the thickness of the thread and the type of material being sewn. In such cases, turn the control (3) to adjust the sensitivity, or change the number of stitches for judgment of an upper thread breakage.
- Contact the place of purchase for information on changing the number of stitches for judgment of an upper thread breakage.
- If foreign objects get into the photo sensor (2), it will not be possible to detect thread breakages. Clean inside the photo sensor (2) to keep it free from dust and other foreign particles.
- If applying silicone to the thread, apply the silicone between the thread breakage detector and the thread take-up. If silicone is applied to the thread before it passes through the photo sensor (2), the sensor window inside the photo sensor (2) will become dirty, and detection errors or other problems with operation may occur.
7-3. Thread take-up spring

<table>
<thead>
<tr>
<th>Thread take-up spring height (mm)</th>
<th>2 – 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thread take-up spring tension (N)</td>
<td>1.0 – 1.4</td>
</tr>
</tbody>
</table>

**<Thread take-up spring height>**
Loosen the set screw (1) and turn the adjuster to adjust.

**<Thread take-up spring tension>**
Turn the tension stud (2) with a screwdriver to adjust the tension.

**NOTE:**
If the thread tension spring is not adjusted correctly, the upper thread trailing length will be uneven after thread trimming.

7-4. Arm thread guide R

The standard position of arm thread guide R (1) is when the screw (2) is installed to the screw hole (3) on the left side and the arm thread guide R (1) is pushed to the right side as far as it will go.

To adjust the position, loosen the screw (2) and then move arm thread guide R (1).

* If upper thread breakages or poor thread tightening occur when sewing heavy-weight materials, move arm thread guide R (1) to the left. (The thread take-up amount will become greater.)
* If upper thread breakages or poor thread tightening occur when sewing light-weight materials, install the screw (2) to the screw hole (4) on the right side, and then move arm thread guide R (1) to the left or right to adjust its position. (The thread take-up amount will become smaller.)
7-5. Adjusting the needle and rotary hook timing

Turn the pulley (1) by hand in the direction of the arrow to raise the needle bar from the lowest position until the lowest reference line on the needle bar (reference line B) is aligned with the lower edge of the needle bar bush (2), and then loosen the two set screws (4) and move the rotary hook to adjust so that the rotary hook tip (3) is aligned with the center of the needle.

7-6. Adjusting the needle clearance

Turn the pulley (1) in the direction of the arrow to align the rotary hook tip (2) with the center of the needle, and then loosen the two set screws (3) and move the rotary hook forward or back to adjust so that the clearance between the needle and the rotary hook tip (2) is 0.01 to 0.08 mm.
7-7. Adjusting the thread take-up amount

At the time of shipment from the factory, the thread take-up amount (stroke) of the thread take-up lever (1) is adjusted to the standard amount of 5 mm. Adjust this amount according to the sewing conditions to prevent the thread from pulling out at the sewing start.

Adjustment method
Loosen the pre-tension nut (2), and then turn the stopper (socket bolt) (3) to adjust the extension position of the thread take-up cylinder (4).

* If you would like to reduce the upper thread trailing amount, tighten the stopper (3).
* If you would like to increase the upper thread trailing amount, loosen the stopper (3).

NOTE:
If you make the stroke of the thread take-up lever (1) to be shorter than necessary, it will cause the upper thread trailing length to become too short and the thread will pull out. In addition, if the stroke is made to be longer than necessary, it will cause the upper thread trailing length to become too long, and the thread will become tangled on the underside of the material being sewn, creating an untidy finish.

7-8. Adjusting the clearance between the inner hook and the hook stopper

Loosen the two screws (3) and move the hook stopper setting base (4) to adjust so that the tip of the hook stopper (1) is approximately 0.8 mm away from the needle drop surface of the inner hook (2).
7. STANDARD ADJUSTMENTS

7-9. Replacing the movable and fixed knives

1. Loosen the two bolts (1) and then remove the feed plate (2).
2. Open the hook cover, remove the two screws (3) and the four flat screws (4), and then remove the needle plate (5).

3. Remove the movable knife (6) and the fixed knife (7).
4. Install the new movable knife (6) and fixed knife (7) while referring “7-11. Adjusting the engagement of the movable knife and fixed knife”.
   * Apply grease to the outside of the movable knife collar (8) at this time.
   * Install the fixed knife (7) 0.5 mm away from the needle hole plate (9).
5. Check that the movable knife (6) and fixed knife (7) cut the thread cleanly. Replace the movable knife spacer with accessory spacers (10) (t=0.4, 0.5, 0.6, 0.7) so that the knives trim the thread accurately.
   * If the knife pressure is too weak and the thread is not completely cut, use a thinner movable knife spacer (10).
   * If the knife pressure is too strong and the movable knife turns stiffly, use a thicker movable knife spacer (10).

6. Apply grease to the pin (11), place it into the movable knife connecting plate (12), and install it to the needle plate (5).
7. Check that the needle is aligned with the center of the needle hole.
7-10. Adjusting the position of the movable knife

1. Open the top cover and tilt back the machine head.
2. Turn the pulley (1) by hand to move the needle bar to its lowest position.
3. Loosen the nut (2), tighten the set screw (5) until the collar (3) touches the inside of the groove in the thread trimmer cam (4), and then loosen the set screw (5) by approximately 1/4 of a turn.
4. Tighten the nut (2), and then check that the collar (3) is not touching the inside of the groove in the thread trimmer cam (4).
   In addition, push the driving lever (6) by hand toward the thread trimmer cam (4) until the collar (3) touches the groove of the thread trimmer cam (4), and then check that the driving lever (6) returns smoothly to its original position when it is released.
5. Turn the pulley (1) by hand in the direction of the arrow to move the needle bar to its lowest position, and push the thread trimming solenoid (7) as far as it will go.
6. With the collar (3) inserted into the groove of the thread trimmer cam (4), turn the pulley (1) by hand to set the driving lever (6) to the reverse position and so that the driving lever (6) is at its lowest point (when the thread take-up (8) is close to its lowest position).
7. Loosen the two screws (9), and then remove the cover (10).
8. Loosen the bolt (11).
9. Push the movable knife (12) in the direction of the arrow to take up the play, and then move the movable knife connecting plate (13) forward or back to adjust so that the V section (A) is aligned with the index mark (B) on the needle plate.
10. After tightening the bolt (11), check the above position once more.
11. Replace the cover (10).

7-11. Adjusting the engagement of the movable knife and fixed knife

A. Once the movable knife (1) and fixed knife (2) are overlapping as shown in Fig. <1>, tighten the shoulder screw (3).
B. Turn the movable knife (1) while the shoulder screw (3) is still tightened. (Move in the direction of the arrow)
C. Loosen the shoulder screw (3).
D. Turn the movable knife (1) while the shoulder screw (3) is still loosened. (Move in the direction of the arrow)

Repeat above steps A → B → C → D → A four or five times to maintain the cutting performance of the knife.
7. STANDARD ADJUSTMENTS

7-12. Installing the feed plate

1. Touch the Settings key.

2. Select "Sewing Machine Adjustment".

3. Select "Feed plate installation".
Depress the work clamp switch (1) to lower the work clamps, and then depress the start switch (2).  
・After the home position is detected and the work clamps drop, the feed mechanism will move to the feed plate installation position and then the work clamps will rise.

Use a 2 mm diameter pin to align the holes in the X feed bracket (3) and the needle plate (4) with the two holes in the feed plate (5), and then tighten the two bolts (6).  
**NOTE:** Install the feed plate so that the surface with the index mark is facing upward.
7. STANDARD ADJUSTMENTS

7-13. Adjusting the thread wiper

1. Close the air cock (1).
2. Loosen the two screws (4) and shift the entire solenoid setting plate (5) up or down to adjust so that the thread wiper (3) is 15 mm in front of the needle center when the thread wiper cylinder (2) is pushed up to its full stroke.
3. Loosen the screw (6) and adjust the position of the thread wiper (3) so that the distance from the thread wiper to the tip of the needle is approximately 2 mm and the tip of the thread wiper (3) is approximately 3 mm from the center of the needle when the thread wiper (3) passes below the needle during operation.
   **NOTE:** Check that the thread wiper (3) does not touch the finger guard.
4. Open the air cock (1).

7-14. Intermittent presser foot installation position
(-484 SF specifications only)

Install the intermittent presser foot (1) with the screw (2) so that the distance from the bottom of the intermittent presser foot to the top of the needle plate is 19.5 mm when the sewing machine is stopped and the intermittent presser foot (1) is raised.
7-15. Adjusting the intermittent presser foot (-484 SF specifications only)

The intermittent presser foot stroke can be adjusted to within 2 – 10 mm by adjusting the position of the stepping clamp connecting rod and changing the installation position of stepping clamp link.

<Changing the installation position of stepping clamp link>

1. Remove the face plate.
2. Remove the two screws (1) and the two shoulder screws (2), and then remove stepping clamp link (3).
3. Change the installation position for stepping clamp link (3) to either A, B or C above.

If the position of the stepping clamp connecting rod is adjusted as described in the following at any one of the installation positions, the adjustment range for the intermittent presser foot stroke will as given in the following table.

<table>
<thead>
<tr>
<th>Installation position</th>
<th>Intermittent presser foot stroke range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 – 4.5mm</td>
</tr>
<tr>
<td>B</td>
<td>4.5 – 10mm</td>
</tr>
<tr>
<td>C</td>
<td>0 mm (Intermittent presser foot does not move up and down)</td>
</tr>
</tbody>
</table>
7. STANDARD ADJUSTMENTS

<Stepping clamp connecting rod position adjustment>

1. Loosen the screw (1), and then open the cover (2).
2. Loosen the nut (3), and then adjust the position of the stepping clamp connecting rod (4).
   - When the stepping clamp connecting rod (4) is raised, the intermittent presser foot stroke will increase.
   - When the stepping clamp connecting rod (4) is lowered, the intermittent presser foot stroke will decrease.

Next, adjust the needle bar and intermittent presser foot timing.
3. Turn the pulley in the direction of the arrow to raise the needle bar from the lowest position until the lowest reference line on the needle bar (reference line B) is aligned with the lower edge of the needle bar bush (5).
   (If using a DP x 5 needle, align with the second reference line from the top (reference line b).)
4. Open the top cover and loosen the two set screws (6).
5. Align the index marks of the stepping clamp cam (7) and the stepping clamp connecting rod (4), and then tighten the two set screws (6).

Check the following after changing the intermittent presser foot stroke.

1. With the intermittent presser foot (1) lowered, turn the pulley in the direction of the arrow to move the intermittent presser foot (1) to its lowest position.
2. Check that the presser foot (1) does not touch the needle plate and that the presser bar clamp (2) does not touch the presser bar bush (3).

<If they are touching>
Remove the motor cover (4).
Loosen the nut (5), and turn the bolt (6) until it is pressing against the intermittent drive lever (7), and then adjust until the two points mentioned above are not touching.
7-16. Adjusting the work clamp lift amount

The maximum lift amount for the work clamp is 27.5 mm above the surface of the needle plate.

1. Turn on the air, and then depress the work clamp switch (1) to raise the work clamps (2).
2. Loosen the two bolts (4) of the work clamp arm lever (3), and move the work clamp arm lever (3) up or down to adjust.

7-17. Adjusting the air pressure

Lift up the handle (2) of the regulator (1) and then turn it to adjust the air pressure to 0.5 MPa. After adjustment is complete, push the handle (2) downward to lock it.

If water has collected in the bottle of the regulator (1), turn the drain cock (3) in the direction indicated by an arrow to drain the water.

**NOTE:**
Open the air cock (4) slowly.
7-18. If processing the work clamps and the feed plate to a shape that matches the sewing pattern

Process the work clamps and feed plate which match the sewing pattern, while referring to the processing diagram below.

* Values in parentheses are the recommended sizes when sewing using the maximum area (220x100 mm).
8. LIST OF ERROR CODES

**DANGER**

Wait at least 5 minutes after turning off the power switch and disconnecting the power cord from the wall outlet before opening the control box cover. Touching areas where high voltages are present can result in severe injury.

If a malfunction occurs with the sewing machine, a buzzer will sound and an error code will appear on the screen. Follow the remedy procedure to eliminate the cause of the problem.

### Switch-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
</table>
| E010 | The STOP switch was pressed.  
Press the RESET key to clear the error. |
| E011 | The STOP switch was pressed.  
Press the RESET key to clear the error.  
You can press the keys on the LCD panel to move the feed in order to continue sewing. |
| E012 | The STOP switch was pressed.  
Press the RESET key to clear the error, and then depress the start switch to move the feed mechanism to the home position. |
| E015 | The STOP switch was still being pressed when the power was turned on, or there is a problem with the STOP switch connection.  
Turn off the power, and then check that connector P9 on the main board is properly inserted. |
| E016 | Problem with the STOP switch connection.  
Turn off the power, and then check that connector P9 on the main board is properly inserted. |
| E020 | The start switch was pressed without the work clamp being lowered.  
First lower the work clamp. |
| E025 | The start switch was pressed when the power was turned on.  
Release foot from the start switch. |
| E035 | Work clamp switch was being depressed when power was turned on.  
Release foot from the switch. |
| E050 | Machine head tilting was detected after the power was turned on.  
Turn off the power, and then return the machine head to its original position.  
Check that the connector P14 on the main board is properly inserted. |
| E051 | Machine head tilting was detected while the sewing machine was operating.  
Turn off the power, and then check that the connector P14 on the main board is properly inserted. |
| E055 | Machine head tilting was detected when the power was turned on.  
Turn off the power, and then return the machine head to its original position.  
Check that the connector P14 on the main board is properly inserted. |
| E064 | Touch panel was being touched when power was turned on.  
Turn off the power and then turn it back on again without touching panel. |
| E065 | A key on the LCD panel was still being pressed when the power was turned on, or key is faulty.  
Turn off the power and then turn it back on again without touching panel. |
## 8. LIST OF ERROR CODES

### Motor-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E110</td>
<td>The needle bar is not stopped in the needle up stop position. Turn the pulley until the point where the error display disappears.</td>
</tr>
<tr>
<td>E111</td>
<td>Upper shaft did not stop at the needle up stop position when the sewing machine stopped. Turn off the power, and then check that connectors P11 and P1 on the motor board and the connector P6 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E121</td>
<td>Thread trimming was not completed. Turn off the power, and then check if the cutting edges of the fixed knife and movable knife are damaged or worn.</td>
</tr>
<tr>
<td>E130</td>
<td>Main motor stopped due to a problem, or resolver is faulty. Turn off the power, and then turn the pulley and check if the sewing machine has locked up. Check connectors P11 and P1 on the motor board, P6 on the main board and P4 of the main motor are properly inserted.</td>
</tr>
<tr>
<td>E131</td>
<td>Resolver is not connected correctly. Turn off the power, and then check that the connector P11 on the motor board is properly inserted.</td>
</tr>
<tr>
<td>E132</td>
<td>Problem detected with main motor operation. Turn off the power, and then check that connectors P11 and P1 on the motor board, the connector P6 on the main board and the connector P4 of main motor are properly inserted.</td>
</tr>
<tr>
<td>E133</td>
<td>Main motor stopping position is incorrect. Turn off the power, and then check P11 and P1 on the motor board, P6 on the main board and P4 of main motor are properly inserted. Main motor is overheating, or temperature sensor is faulty. Turn off the power, and then check the main motor.</td>
</tr>
<tr>
<td>E150</td>
<td>Main motor is overheating, or temperature sensor is faulty. Turn off the power, and then check the main motor. (When sewing data with a small number of stitches (15 stitches or less) is sewn repeatedly, the main motor may overheat and this error code may be generated.)</td>
</tr>
</tbody>
</table>
## Feed mechanism-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E200</td>
<td>X-feed motor home position cannot be detected. Problem with X-feed motor or poor X home position sensor connection. Turn off the power, and then check that connectors P17, P21 and P8 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E201</td>
<td>X-feed motor stopped due to a problem. Turn off the power, and then check if there are any problems in the X-feed direction. Turn off the power, and then check that connectors P17 and P21 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E204</td>
<td>X-feed motor stopped due to a problem during sewing. Turn off the power, and then check if there are any problems in the X-feed direction. Turn off the power, and then check that connectors P17 and P21 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E205</td>
<td>X-feed motor stopped due to a problem while moving to the sewing start position. Turn off the power, and then check if there are any problems in the X-feed direction. Turn off the power, and then check that connectors P17 and P21 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E206</td>
<td>X-feed motor stopped due to a problem during test feeding. Turn off the power, and then check if there are any problems in the X-feed direction. Turn off the power, and then check that connectors P17 and P21 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E210</td>
<td>Y-feed motor home position cannot be detected. Problem with Y-feed motor or poor Y home position sensor connection. Turn off the power, and then check that connectors P18, P22 and P8 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E211</td>
<td>Y-feed motor stopped due to a problem. Turn off the power, and then check if there are any problems in the Y-feed direction. Turn off the power, and then check that connectors P18 and P22 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E214</td>
<td>Y-feed motor stopped due to a problem during sewing. Turn off the power, and then check if there are any problems in the Y-feed direction. Turn off the power, and then check that connectors P18 and P22 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E215</td>
<td>Y-feed motor stopped due to a problem while moving to the sewing start position. Turn off the power, and then check that connectors P18 and P22 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E216</td>
<td>Y-feed motor stopped due to a problem during test feeding. Turn off the power, and then check if there are any problems in the Y-feed direction. Turn off the power, and then check that connectors P18 and P22 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E230</td>
<td>Feed motor stopped due to a problem. Reduce the sewing speed or change the operation settings to the settings for heavy-weight materials. Ask the place of purchase for details on the setting method.</td>
</tr>
</tbody>
</table>

## Work clamp-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E300</td>
<td>Work clamp home position cannot be detected. Problem with work clamp motor or poor work clamp home position sensor connection. Turn off the power, and then check that connectors P19, P23 and P8 on the main board are properly inserted.</td>
</tr>
<tr>
<td>E301</td>
<td>Work clamp raised or lowered position cannot be detected. Turn off the power, and then check if there are any problems in the work clamp vertical direction. Turn off the power, and then check that connectors P19 and P23 on the main board are properly inserted.</td>
</tr>
</tbody>
</table>
## Communication and memory-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E401</td>
<td>Communication error was detected between the main board and the motor board when the power was turned on. Turn off the power, and then check that connector P5 on the main board and the connector P2 on the motor board are properly inserted.</td>
</tr>
<tr>
<td>E410</td>
<td>Communication error was detected between the main and the panel. Turn off the power, and then check that the connector P10 on the programmer main board inside the LCD panel, the connector on the right side of the control box, connectors P5 and P32 on the main board and the connector P2 on the motor board are properly inserted.</td>
</tr>
<tr>
<td>E411</td>
<td>Communication error was detected between the main and the motor board. Turn off the power, and then check that the connector P5 on the main board and the connector P2 on the motor board are properly inserted.</td>
</tr>
<tr>
<td>E420</td>
<td>No storage media is inserted. Press the RESET key to clear the error. Insert the storage media and then try again.</td>
</tr>
<tr>
<td>E421</td>
<td>The program number is invalid or it has no corresponding data. Press the RESET key to clear the error. Check that data for this program number is present.</td>
</tr>
<tr>
<td>E422</td>
<td>Error occurred while reading. Press the RESET key to clear the error. Check the data.</td>
</tr>
<tr>
<td>E425</td>
<td>Error occurred while writing to storage media. Check the storage media. It may be write-protected. There is a possibility of a failure of the storage media or free space shortage of storage media. Press the RESET key to clear the error. Use the specified storage media.</td>
</tr>
<tr>
<td>E427</td>
<td>The program containing the specified program has been cleared. Press the RESET key to clear the error.</td>
</tr>
<tr>
<td>E430</td>
<td>Cannot be accessed to the main board (flash memory). Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E435</td>
<td>Cannot be accessed to the programmer main board (flash memory). Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E440</td>
<td>Cannot be accessed to the main board (EEPROM). Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E445</td>
<td>Cannot be accessed to the programmer main board (EEPROM). Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E450</td>
<td>Model selection cannot be read from the machine head detector. Turn off the power, and then check that the connector P16 on the main board is properly inserted.</td>
</tr>
<tr>
<td>E452</td>
<td>Machine head detector is not connected. Turn off the power, and then check that the connector P16 on the main board is properly inserted. If you press the RESET key to clear the error, you can restart the machine using the backup data in the machine head detector.</td>
</tr>
<tr>
<td>E453</td>
<td>Problem with data in machine head detector. Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E454</td>
<td>Problem with data in machine head detector. Press the RESET key to clear the error and then data is recovered.</td>
</tr>
<tr>
<td>E471</td>
<td>The program number is invalid or it has no corresponding data. Press the RESET key to clear the error. Check that data for this program number is present in the internal memory.</td>
</tr>
<tr>
<td>E474</td>
<td>Internal memory is full and copying is not possible. Press the RESET key to clear the error. Delete the sewing data.</td>
</tr>
</tbody>
</table>
### Data editing-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E500</td>
<td>The enlargement ratio setting caused the sewing data to extend outside the sewing area. Set the enlargement ratio again. Press the RESET key to clear the error.</td>
</tr>
<tr>
<td>E502</td>
<td>The enlargement ratio caused the stitch length to exceed the maximum length of 12.7 mm. Press the RESET key to clear the error. Set the enlargement ratio again.</td>
</tr>
<tr>
<td>E510</td>
<td>Error in data. Press the RESET key to clear the error. Please try again. If an error occurs while reading the data, revise the data.</td>
</tr>
<tr>
<td>E511</td>
<td>No end code has been input into pattern data. Press the RESET key to clear the error.</td>
</tr>
<tr>
<td>E512</td>
<td>Number of stitches exceeds allowed maximum. Press the RESET key to clear the error.</td>
</tr>
<tr>
<td>E520</td>
<td>Extended option output number already exists. Press the RESET key to clear the error. Change the extended option output number. If not using the extended option output, initialize the data to clear the extended option program.</td>
</tr>
<tr>
<td>E582</td>
<td>Memory switch version does not match. Press the RESET key to clear the error. Read data for the same version.</td>
</tr>
<tr>
<td>E583</td>
<td>User parameter version does not match. Press the RESET key to clear the error. Read data for the same version.</td>
</tr>
</tbody>
</table>

### Device-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E600</td>
<td>Upper thread breakage occurred. Thread the upper thread. Press the RESET key to clear the error. Re-sewing is possible.</td>
</tr>
<tr>
<td>E670</td>
<td>Problem with the lower thread detector. Turn off the power, and then check the lower thread detector.</td>
</tr>
</tbody>
</table>
### 8. LIST OF ERROR CODES

#### Board-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E700</td>
<td>Abnormal rise in power supply voltage. Turn off the power, and then check the input voltage.</td>
</tr>
<tr>
<td>E701</td>
<td>Abnormal rise in main motor drive voltage. Turn off the power, and then check the voltage.</td>
</tr>
<tr>
<td>E705</td>
<td>Abnormal drop in power supply voltage. Turn off the power, and then check the input voltage.</td>
</tr>
<tr>
<td>E710</td>
<td>Abnormal current was detected in main motor. Turn off the power, and then check if there are any problems with the sewing machine. Turn off the power, and then check that connectors P11 and P1 on the motor board, P6 on the main board and P4 of the main motor are properly inserted.</td>
</tr>
<tr>
<td>E711</td>
<td>Abnormal current was detected in pulse motor. Turn off the power, and then check if there are any problems with the work clamp operation.</td>
</tr>
<tr>
<td>E730</td>
<td>External error input (AIRSW) was detected. Turn off the power, and then check the air pressure.</td>
</tr>
</tbody>
</table>

#### Version updating-related errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E860</td>
<td>No main software is present. Install the main control software.</td>
</tr>
<tr>
<td>E865</td>
<td>No motor software is present. Install the motor control software.</td>
</tr>
<tr>
<td>E880</td>
<td>Software update request is not accepted. Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E881</td>
<td>Software updating did not complete normally. Turn off the power, and then repeat the software update procedure.</td>
</tr>
<tr>
<td>E883</td>
<td>No software data is present in the storage media. Check that the software data has been saved into the correct folder.</td>
</tr>
<tr>
<td>E884</td>
<td>There is a problem with the software data. Write the correct data into the storage media.</td>
</tr>
<tr>
<td>E887</td>
<td>Software updating could not be carried out. Turn off the power, and then turn it back on again.</td>
</tr>
<tr>
<td>E888</td>
<td>It failed to send and receive software update file. Please try again.</td>
</tr>
<tr>
<td>E889</td>
<td>Written data to flash memory is incorrect. Please try again.</td>
</tr>
<tr>
<td>E890</td>
<td>Software updating could not be carried out. Please try again.</td>
</tr>
</tbody>
</table>

#### Other errors

<table>
<thead>
<tr>
<th>Code</th>
<th>Cause of error and remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>E920</td>
<td>Failed to read bar-code. Press the RESET key to clear the error.</td>
</tr>
</tbody>
</table>

If an error code that is not listed above appears or if carrying out the specified remedy does not solve the problem, contact the place of purchase.
9. TROUBLESHOOTING

- Please check the following points before calling for repairs or service.
- If the following remedies do not fix the problem, turn off the power and consult a qualified technician or the place of purchase.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing machine does not start when the power is turned on and the start switch is depressed.</td>
<td>Machine head switch does not work.</td>
<td>Check if the machine head switch cord is disconnected.</td>
<td>P. 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust the position of the machine head switch.</td>
<td>P. 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If the machine head switch is malfunctioning, replace it with a new one.</td>
<td>P. 34</td>
</tr>
<tr>
<td>The following parts do not work.</td>
<td>Air cock is closed.</td>
<td>Open the air cock.</td>
<td>P. 18</td>
</tr>
<tr>
<td>- Work clamp</td>
<td>Air pressure is too weak.</td>
<td>Adjust the regulator so that the air pressure is about 0.5 MPa.</td>
<td>P. 47</td>
</tr>
<tr>
<td>- Thread wiper</td>
<td>Speed controller has been tightened too far. (applicable to thread trimmer cylinder and thread take-up lever)</td>
<td>Work clamp: Adjust the speed controller by loosening it 4 turns from the fully-tightened position.</td>
<td>P. 19</td>
</tr>
<tr>
<td>- Thread trimmer cylinder</td>
<td></td>
<td>Adjust the speed controller by loosening it 6 turns from the fully-tightened position.</td>
<td>P. 19</td>
</tr>
<tr>
<td>- Thread take-up lever</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work clamp does not rise to the maximum height.</td>
<td>Work clamp arm lever position is incorrect.</td>
<td>Adjust the position of the work clamp arm lever.</td>
<td>P. 47</td>
</tr>
<tr>
<td>Work clamp pressure is too weak.</td>
<td>Air pressure is too weak.</td>
<td>Adjust the regulator so that the air pressure is about 0.5 MPa.</td>
<td>P. 47</td>
</tr>
<tr>
<td>Work clamp pressure is not uniform at front and back of work clamp.</td>
<td>Work clamp is tilted.</td>
<td>Adjust the tilt of the work clamp.</td>
<td>*</td>
</tr>
<tr>
<td>Thread wiper does not operate correctly.</td>
<td>The thread wiper is obstructing the needle.</td>
<td>Adjust the height of the thread wiper.</td>
<td>P. 44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust the operating stroke of the thread wiper.</td>
<td>P. 44</td>
</tr>
<tr>
<td></td>
<td>Thread wiper position is incorrect.</td>
<td>Adjust the operating stroke of the thread wiper.</td>
<td>P. 44</td>
</tr>
</tbody>
</table>

(Continued on next page)

(*) Refer to the “LCD Panel/Operation Panel” Instruction Manual.
### 9. TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower thread winds to one side.</td>
<td>Height of bobbin winder tension assembly is incorrect.</td>
<td>Adjust the height of the bobbin winder tension assembly.</td>
<td>P. 27</td>
</tr>
<tr>
<td>Lower thread winding amount is incorrect.</td>
<td>Bobbin presser position is incorrect.</td>
<td>Adjust the position of the bobbin presser.</td>
<td>P. 27</td>
</tr>
<tr>
<td>Thread unraveling at sewing start.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needle is too thick.</td>
<td>Select a needle that is suitable for the sewing conditions.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Upper thread trailing length is too short.</td>
<td>When threading the thread through the needle, allow a distance of approximately 45 mm between the needle hole and the end of the thread.</td>
<td>P. 24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust the sub-tension so that the upper thread trailing length after thread trimming is approximately 45 mm.</td>
<td>P. 29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the stroke of the thread take-up lever.</td>
<td>P. 38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Adjusting the stroke of the thread take-up lever should be carried out also if adjusting the sub-tension fails to prevent the thread from pulling out.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amount of lower thread being fed out from bobbin is too small.</td>
<td>Set the feeding amount to approximately 30 mm.</td>
<td>P. 27</td>
</tr>
<tr>
<td></td>
<td>Sewing start speed is too fast.</td>
<td>Adjust the sewing start speed.</td>
<td>(*1)</td>
</tr>
<tr>
<td>Skipped stitches occur.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rotary hook tip is missing.</td>
<td>Replace the part.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needle is too thin.</td>
<td>Select a needle that is suitable for the sewing conditions.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Needle is too thick.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needle is bent.</td>
<td>Replace the needle.</td>
<td>P. 23</td>
</tr>
<tr>
<td></td>
<td>Needle is not installed correctly.</td>
<td>Install the needle so that it faces correctly.</td>
<td>P. 23</td>
</tr>
<tr>
<td></td>
<td>Clearance between needle and rotary hook tip is too large.</td>
<td>Adjust the needle clearance.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Needle and rotary hook timing is incorrect.</td>
<td>Adjust the timing.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Material is flapping.</td>
<td>Replace the needle hole plate with one with a smaller needle diameter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use a thinner feed plate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>* Recommended thickness: 1.5 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Process the work clamps and the feed plate into shapes that can hold the material near the seam.</td>
<td>P. 48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adjust the intermittent height of the intermittent presser foot.</td>
<td>(*1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-484 SF specifications only)</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper thread is breaking.</strong></td>
<td>Thread is too thick for the needle.</td>
<td>Select a thread which is suitable for the needle.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Needle is not installed correctly.</td>
<td>Install the needle so that it faces correctly.</td>
<td>P. 23</td>
</tr>
<tr>
<td></td>
<td>Thread is not threaded correctly.</td>
<td>Thread the thread correctly.</td>
<td>P. 24</td>
</tr>
<tr>
<td></td>
<td>Damage or burring in parts such as the rotary hook, hook stopper, needle hole plate, needle or thread path.</td>
<td>Repair the respective part by buffing it. Alternatively, replace the part.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Needle and rotary hook timing is incorrect.</td>
<td>Adjust the timing.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Upper thread tension is too strong.</td>
<td>Reduce the upper thread tension.</td>
<td>P. 29</td>
</tr>
<tr>
<td></td>
<td>Thread take-up spring tension is too strong.</td>
<td>Reduce the tension of the thread take-up spring.</td>
<td>P. 36</td>
</tr>
<tr>
<td></td>
<td>Thread breaks due to heat.</td>
<td>Use a needle cooler unit.</td>
<td>P. 21, 24 (1)</td>
</tr>
<tr>
<td><strong>Lower thread is breaking.</strong></td>
<td>Damage to the needle hole plate or bobbin case.</td>
<td>Repair the respective part by buffing it. Alternatively, replace the part.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Lower thread tension is too strong.</td>
<td>Reduce the lower thread tension.</td>
<td>P. 28</td>
</tr>
<tr>
<td><strong>Needle breaks.</strong></td>
<td>Needle is bent.</td>
<td>Replace the needle.</td>
<td>P. 23</td>
</tr>
<tr>
<td></td>
<td>Needle is too thin.</td>
<td>Select a needle that is suitable for the sewing conditions.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Needle and rotary hook tip are touching.</td>
<td>Adjust the needle clearance.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Needle and rotary hook timing is incorrect.</td>
<td>Adjust the timing.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Feed timing is too slow.</td>
<td>Advance the feed timing.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Upper thread is not cut.</strong></td>
<td>Movable knife is blunt.</td>
<td>Replace the movable knife with a new one.</td>
<td>P. 39</td>
</tr>
<tr>
<td></td>
<td>Fixed knife is blunt.</td>
<td>Sharpen the fixed knife or replace it with a new one.</td>
<td>P. 39</td>
</tr>
<tr>
<td></td>
<td>Movable knife is not picking up the upper thread.</td>
<td>Adjust the timing.</td>
<td>P. 37</td>
</tr>
<tr>
<td></td>
<td>Movable knife is not picking up the needle thread because the last stitch is being skipped.</td>
<td>Refer to &quot;Skipped stitches occur&quot;.</td>
<td>P. 56</td>
</tr>
<tr>
<td><strong>Lower thread is not cut.</strong></td>
<td>Lower thread tension is too weak.</td>
<td>Increase the lower thread tension.</td>
<td>P. 28</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper thread is not tight.</strong></td>
<td>Needle is too thin.</td>
<td>Select a needle that is suitable for the sewing conditions.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Hole diameter in needle hole plate is too small.</td>
<td>Replace the needle hole plate with one with a larger hole diameter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Feed plate is too thin.</td>
<td>Use a thicker feed plate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hole diameter of intermittent presser foot is too small. (-484 SF specifications only)</td>
<td>Replace the intermittent presser foot with one with a larger hole diameter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sliding parts of outer rotary hook and inner hook have little or no sewing machine oil.</td>
<td>Lubricate the felts for the sliding parts of the outer rotary hook and inner hook.</td>
<td>P. 21</td>
</tr>
<tr>
<td></td>
<td>Damage or burring in parts such as the rotary hook, hook stopper, needle hole plate, needle or thread path.</td>
<td>Repair the respective part by buffing it. Alternatively, replace the part.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Lower thread tension is too strong.</td>
<td>Reduce the lower thread tension.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Upper thread tension is too weak.</td>
<td>Increase the upper thread tension.</td>
<td>P. 29</td>
</tr>
<tr>
<td></td>
<td>Thread take-up spring tension is too weak.</td>
<td>Increase the tension of the thread take-up spring.</td>
<td>P. 36</td>
</tr>
<tr>
<td></td>
<td>Upper thread does not release correctly from hook stopper.</td>
<td>Adjust the forward-back clearance between the tip of the hook stopper and the surface of the inner hook needle drop section to approximately 0.8 mm.</td>
<td>P. 38</td>
</tr>
<tr>
<td></td>
<td>Feed timing is too fast.</td>
<td>Retard the feed timing.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Intermittent height of intermittent presser foot is too low. (-484 SF specifications only)</td>
<td>Adjust the intermittent height of the intermittent presser foot.</td>
<td>(*1)</td>
</tr>
<tr>
<td><strong>Lower thread is not tight.</strong></td>
<td>Lower thread tension is too weak.</td>
<td>Increase the lower thread tension.</td>
<td>P. 28</td>
</tr>
<tr>
<td></td>
<td>Upper thread tension is too strong.</td>
<td>Reduce the upper thread tension.</td>
<td>P. 29</td>
</tr>
<tr>
<td><strong>Uneven thread tightening at the sewing start.</strong></td>
<td>Bobbin spinning.</td>
<td>Use an anti-spin spring.</td>
<td>P. 28</td>
</tr>
<tr>
<td><strong>Poor seam finish on underside of material at the sewing start.</strong></td>
<td>Upper thread trailing length is too long.</td>
<td>Adjust the sub-tension so that the upper thread trailing length after thread trimming is approximately 45 mm.</td>
<td>P. 29</td>
</tr>
<tr>
<td></td>
<td>Thread take-up spring tension is too weak.</td>
<td>Reduce the stroke of the thread take-up lever.</td>
<td>P. 38</td>
</tr>
<tr>
<td></td>
<td>*Adjusting the stroke of the thread take-up lever should be carried out also if adjusting the sub-tension fails to improve the seam finish.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upper thread trailing length is irregular.</strong></td>
<td>Movable knife is blunt.</td>
<td>Replace the movable knife with a new one.</td>
<td>P. 39</td>
</tr>
<tr>
<td></td>
<td>Fixed knife is blunt.</td>
<td>Sharpen the fixed knife or replace it with a new one.</td>
<td>P. 39</td>
</tr>
<tr>
<td></td>
<td>Sub-tension is too weak.</td>
<td>Adjust the sub-tension.</td>
<td>P. 29</td>
</tr>
<tr>
<td></td>
<td>Thread take-up spring tension is too weak.</td>
<td>Increase the tension of the thread take-up spring.</td>
<td>P. 36</td>
</tr>
</tbody>
</table>
INSTRUCTION MANUAL

* Please note that the contents of this manual may differ slightly from the actual product purchased as a result of product improvements.

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