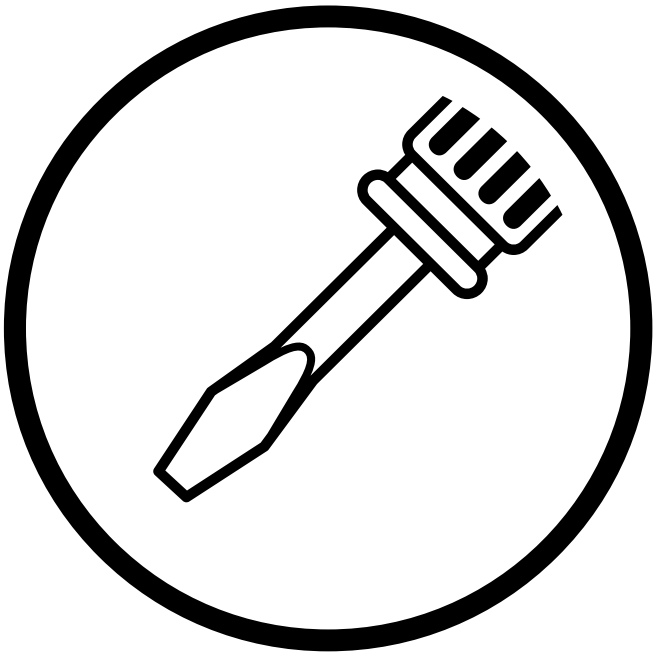
BAS-311E,311EL
BAS-326E,326EL

SERVICE MANUAL

Please read this manual before making any adjustments.

PROGRAMMABLE ELECTRONIC PATTERN SEWER
WITH CYLINDER BED



brother

This service manual is intended for BAS-311E, 311EL and 326E; be sure to read the BAS-311E, 311EL, and 326E, 326EL instruction manuals before this manual.
Carefully read the “SAFETY INSTRUCTIONS” below and the whole of this manual to understand this product before you start maintenance.
As a result of research and improvements regarding this product, some details of this manual may not be the same as those for the product you purchased.
If you have any questions regarding this product, please contact a Brother dealer.

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

⚠ DANGER	The instructions which follow this term indicate situations where failure to follow the instructions will almost certainly result in death or severe injury.
⚠ 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 (△) 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 "beware of injury".)

..... This symbol (⃠) 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 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 face plate of the control box.
Touching areas where high voltages are present can result in severe injury.

⚠ CAUTION

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 weights more than BAS-311E60kg,BAS-311EL·326E·326EL65kg. The installation 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 start switch is pressed by mistake, which could result in 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.

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, otherwise inflammation can result.
Furthermore, do not drink the oil or eat the grease under any circumstances, as they can cause vomiting and diarrhoea.
Keep the oil out of the reach of children.

Avoid setting up the sewing machine near sources of strong electrical noise such as high-frequency welding equipment.
If this precaution is not taken, incorrect machine operation may re

Have two people present to hold the machine head with both their hands when tilting it back or returning it to its original position.

Sewing

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

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

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 machine may operate if the start switch is pressed by mistake, which could result in injury.

- When not using the machine
- 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.

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

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

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

⚠ CAUTION

Cleaning

Turn off the power switch before starting any cleaning work, otherwise the machine may operate if the start switch is pressed by mistake, which could result in injury.

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 otherwise inflammation can result.
Furthermore, do not drink the oil or eat the grease under any circumstances, as they 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 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 from the wall outlet at the following times, otherwise the machine may operate if the start switch 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 and knife

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.

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

Use only the proper replacement parts as specified by Brother.

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.

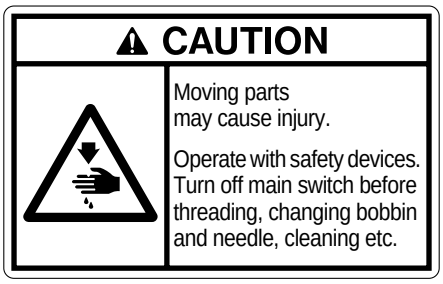
Any problems in machine operation which result from unauthorized modifications to the machine will not be covered by the warranty.

Have two people present to hold the machine head with both their hands when tilting it back or returning it to its original position.

3 Warning labels

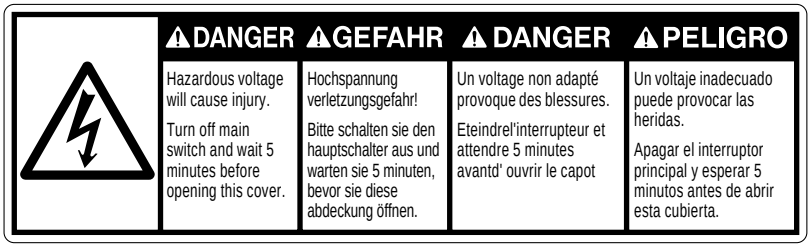
★The following warning labels appear on the sewing machine.
Please follow the instructions on the labels at all times when using the machine. If the labels have been removed or are difficult to read, please contact your nearest Brother dealer.

1

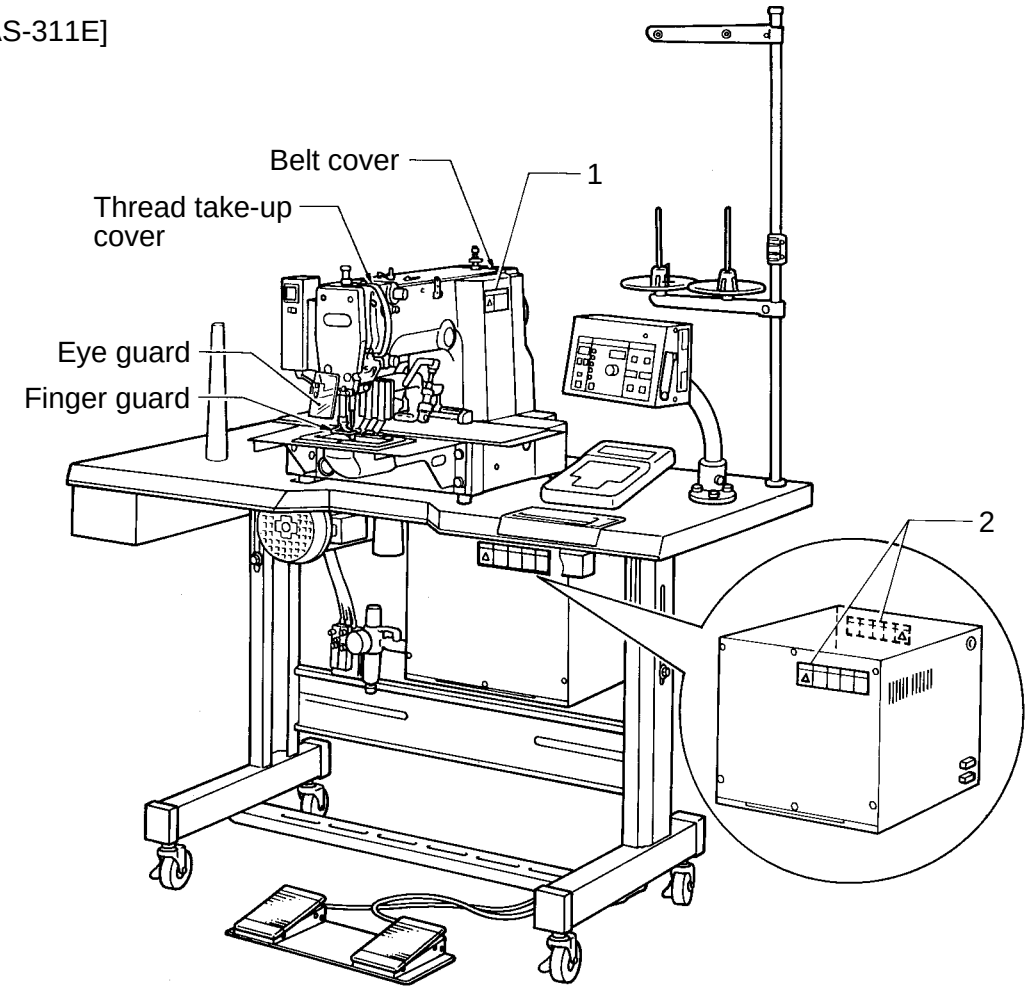


Safety devices: Thread take-up cover,
Eye guard, Belt cover,
Finger guard, etc.

2



[BAS-311E]



Explanation of models

This manual explains three models

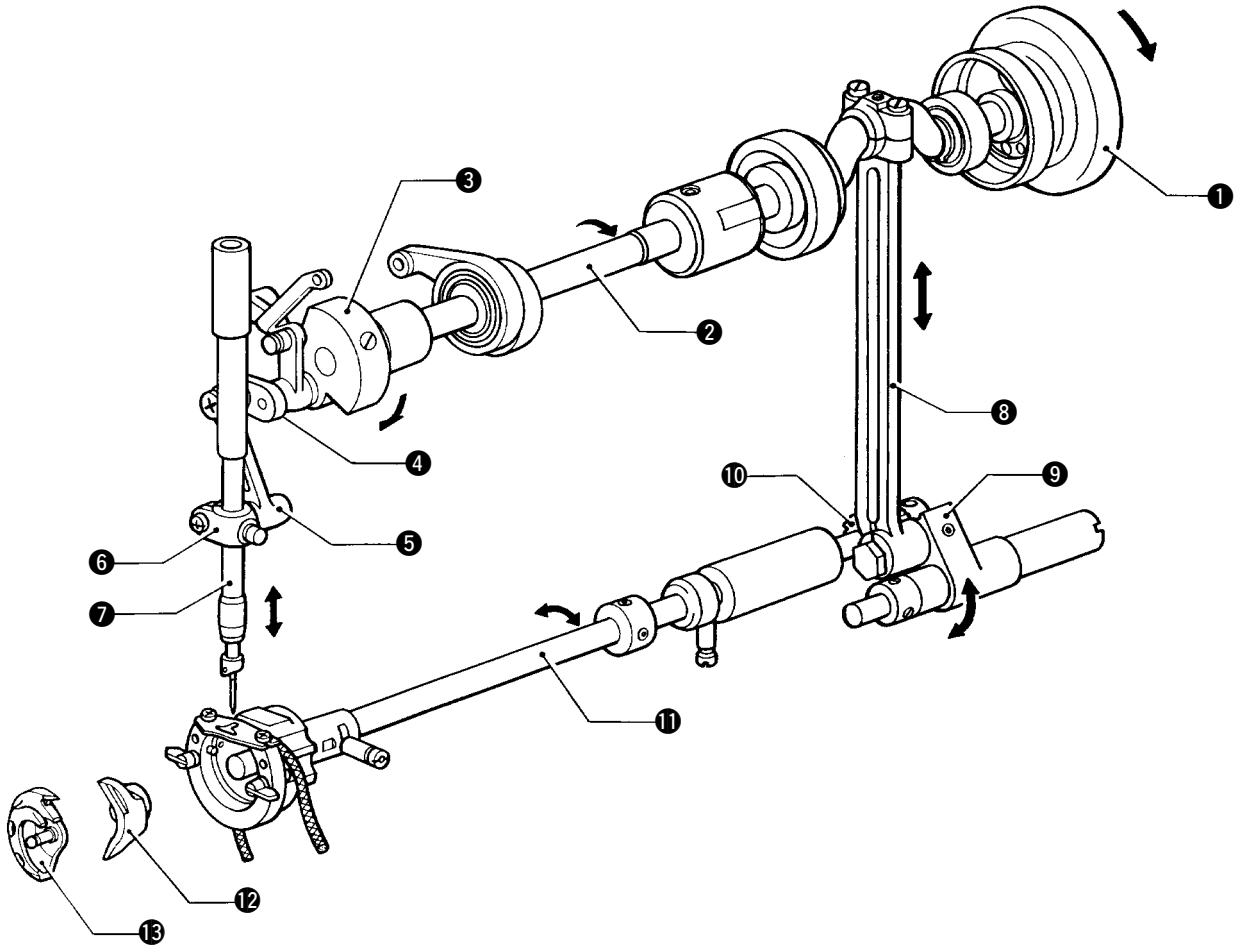
•BAS-311E (Solenoid type, Pnevmatic type), 311EL (Pnevmatic type), 326E, 326EL (Pnevmatic type)

Explanation for individual model is provided by identifying the model name. Check the model before useing the machine.

INDEX

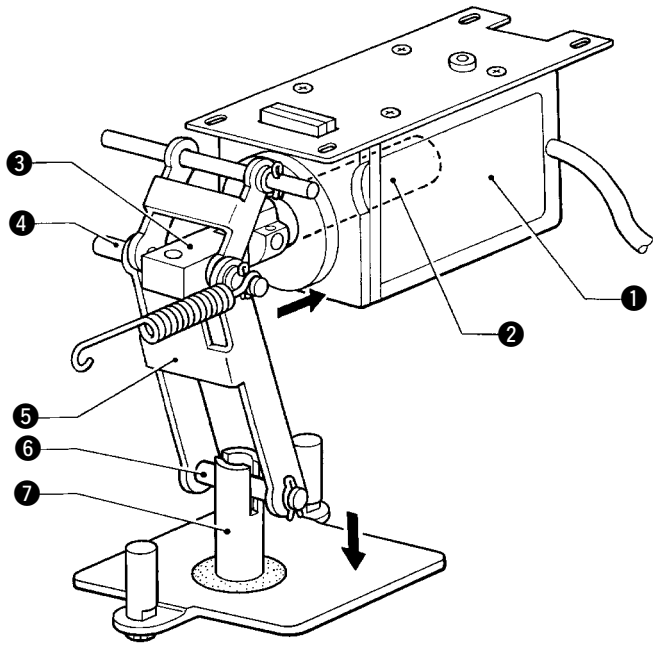
Chapter 1. Mechanical description

1. Needle bar, thread take-up, lower shaft and shuttle hook mechanism

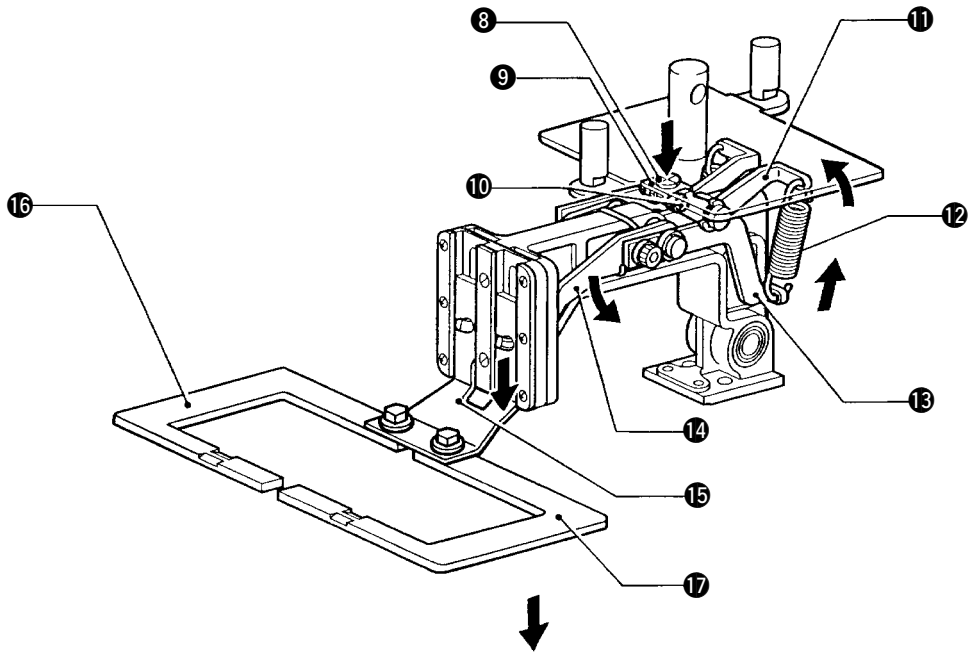


1. When the machine pulley ❶ rotates in the direction of the arrow, the upper shaft ❷ rotates, then it rotates the thread take-up crank ❸.
2. The needle bar crank ❹, attached to the thread take-up crank ❸, moves the thread take-up lever ❺.
3. The needle bar ❼ attached to the needle bar clamp ❻ is moved up and down.
4. When the machine pulley ❶ rotates in the direction of the arrow, the crank rod ❽ attached to the upper shaft ❷ moves up and down.
5. The crank rod ❽ oscillates the attached rock gear ❾.
6. The rock gear ❾ oscillates the lower shaft ⓫ through the lower shaft gear ❿. The lower shaft ⓫ oscillates the attached driver ⓬ and inner rotary hook ⓭ in the shuttle hook mechanism.

2. Work clamp lifting mechanism (1) (Solenoid type), 311E

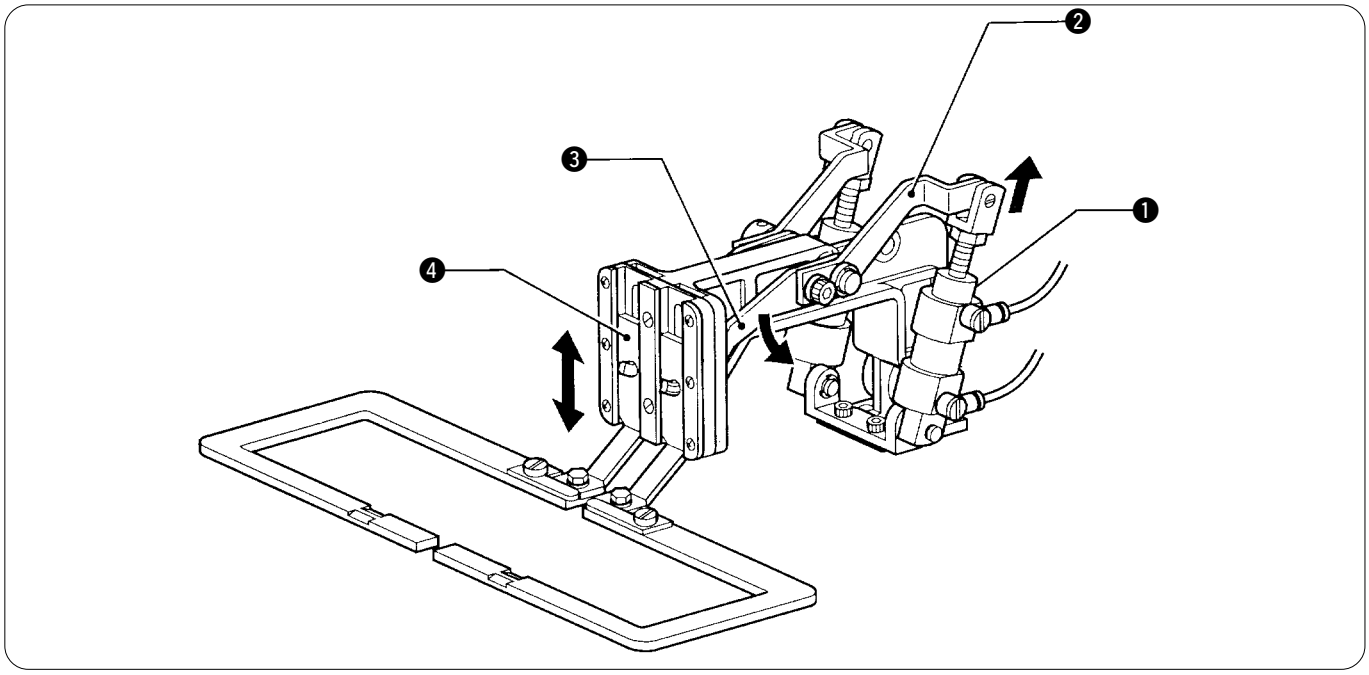


1. When the presser signal is on, the presser solenoid ❶ operates.
2. The plunger ❷ operates in the direction of the arrow and moves link (B) ❺ through link (C) ❸ and link shaft (A) ❹.
3. Link (B) ❺ presses down the presser plate ❼ through the link shaft (C) ❻.



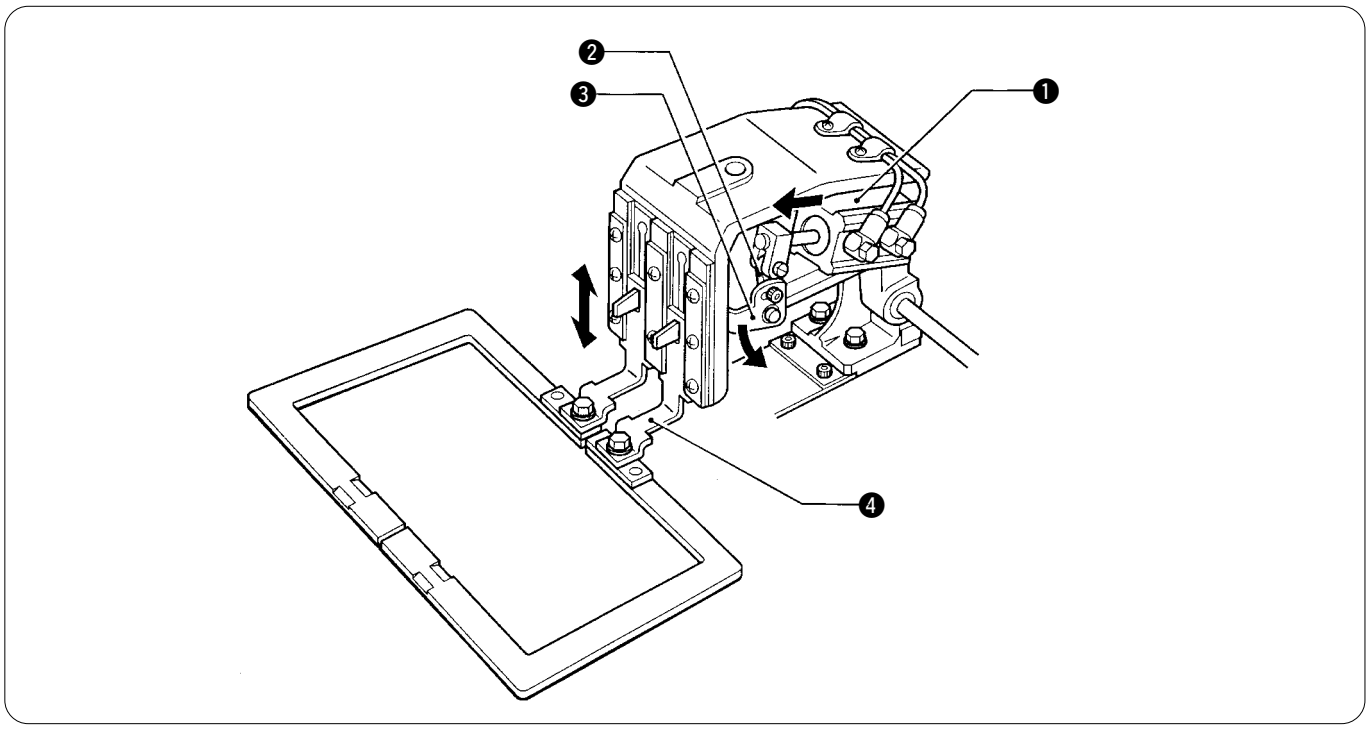
4. When the work clamp plate operates, the slider ❽ and the slider support ❾ are pressed down. When they are pressed, work clamp lifter lever R. ⓫ is raised through the slider support shaft ❿.
5. The spring ⓬, the work clamp arm lever (RR) ⓭ and (F) ⓮ which are linked to presser bar lifter lever (R) ⓫ operate in the direction of the arrow.
6. Work clamp (UN) ⓯ and presser foot (L) ⓰ ·(R) ⓱ are pressed down through work clamp lever (F) ⓮.

Work clamp lifting mechanism (2) 311E, 311EL (Pneumatictype)



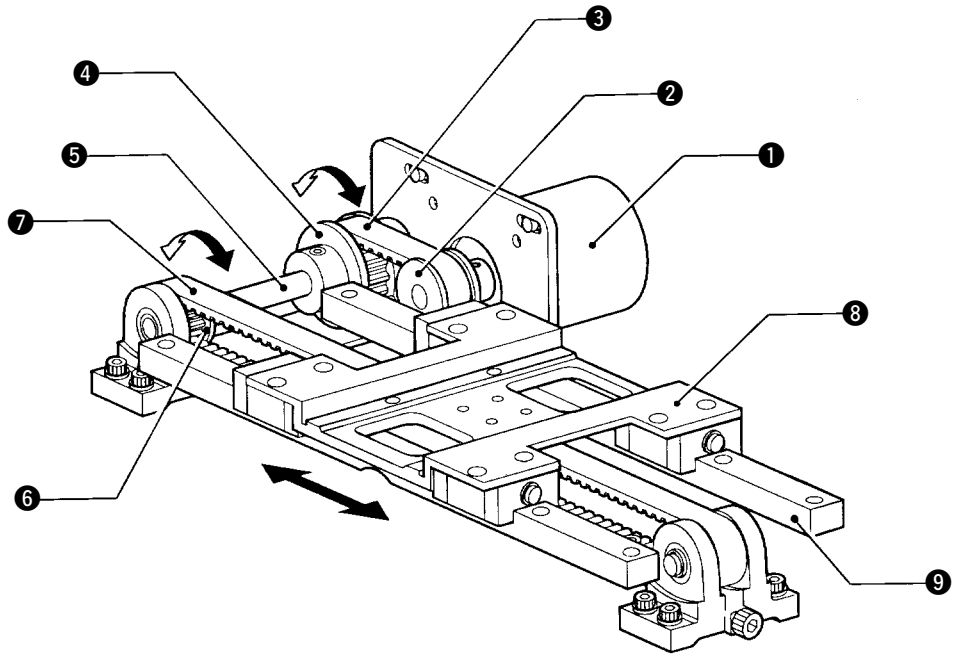
1. When the air cylinder ❶ operates in the direction of the arrow, work clamp arm levers R ❷ and F ❸ also operate in the direction of the arrow.
2. Work clamp SE ❹ is moved vertically via work clamp arm lever F ❸.

Work clamp lifting mechanism 326E



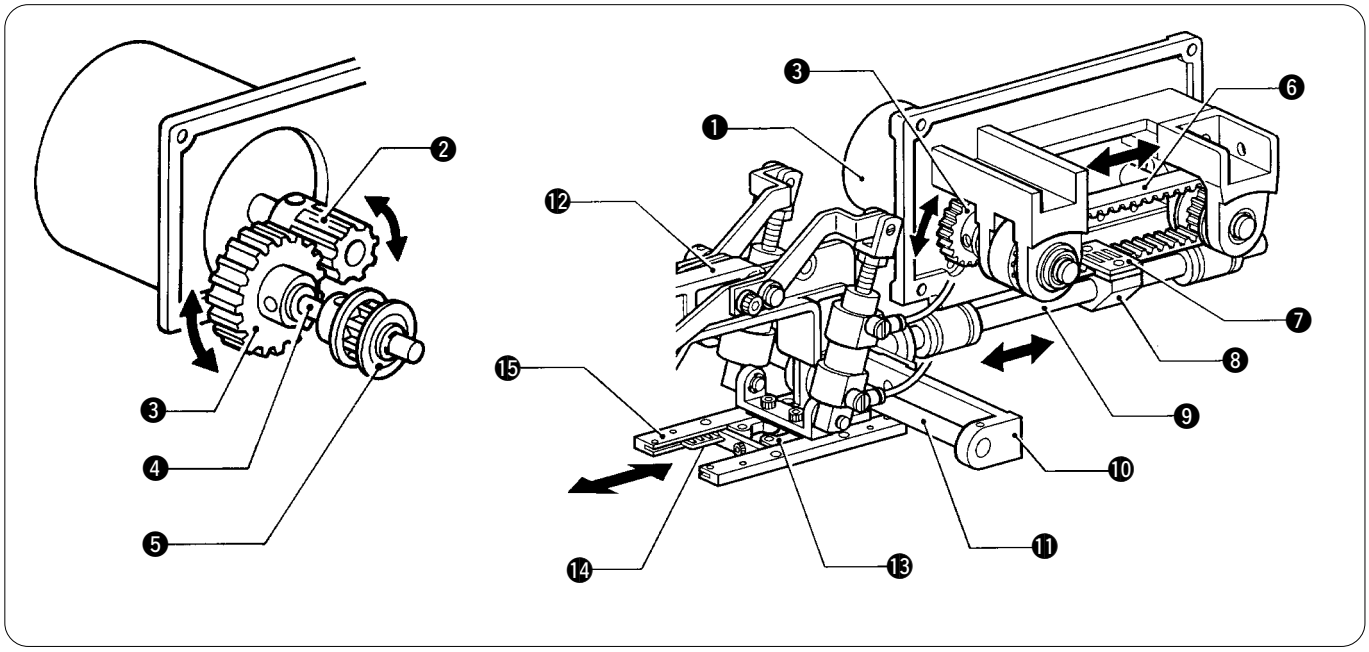
1. When the air cylinder ❶ operates in the direction of the arrow, work clamp lifter lever D ❷ and lever U ❸ also operate in the direction of the arrow.
2. Work clamp SE ❹ is moved vertically via knee lifter lifting lever U ❸.

3. Feed mechanism (X axis) 311E, 311EL, 326E, 326EL



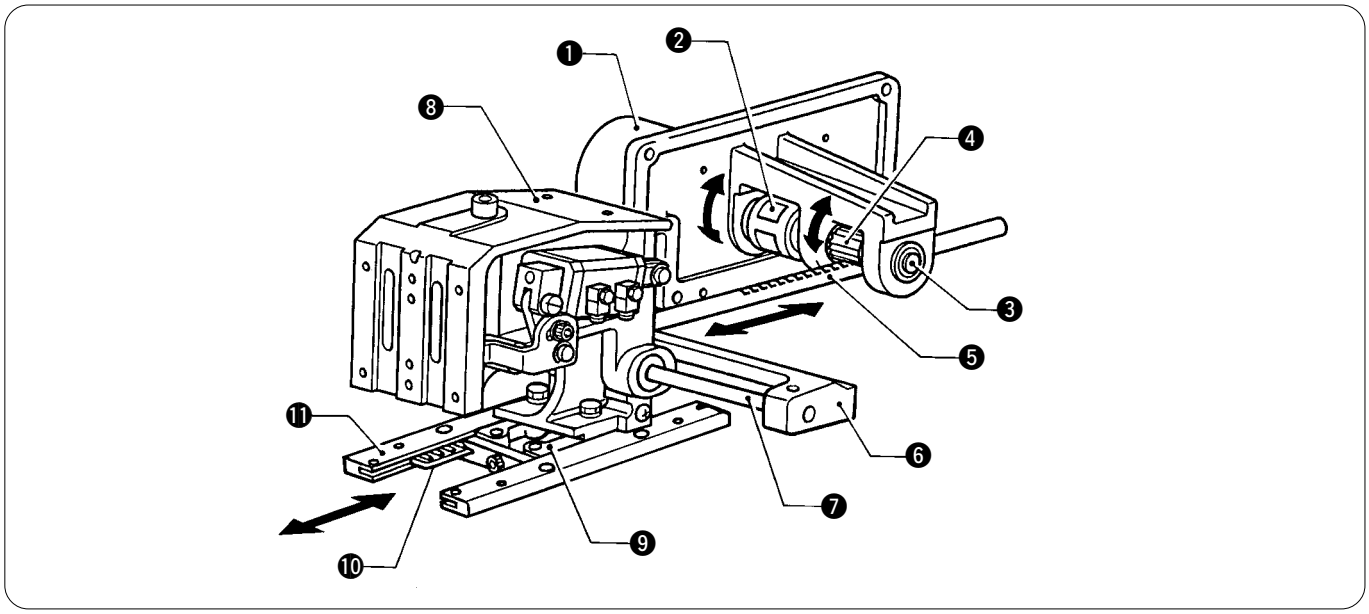
1. When X-timing pulley A326 ❷ attached to the X-pulse motor ❶ moves, its motion is transmitted to X-timing pulley B311 ❹ via X-timing belt A311 ❸.
2. When X-timing pulley B311 ❹ moves, timing pulley A ❻ linked to the X-timing pulley shaft ❺ moves X-timing belt B311 ❼ left and right.
3. Feed bracket X ❽ secured to X-timing belt B311 ❼ moves via linear guide 311 ❾ in the X direction (left and right).

Feed mechanism (Y axis) 311E and 311EL



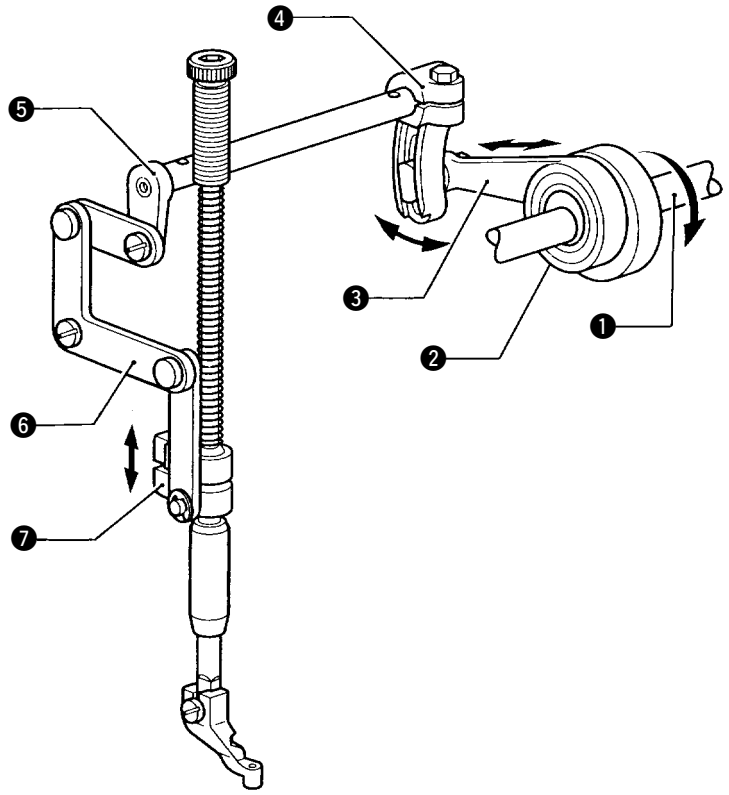
1. The driving gear ❷ attached to the Y-pulse motor ❶ oscillates the idle gear ❸.
2. When the idle gear ❸ oscillates, the Y-timing belt ❻ moves forward and backward through timing pulley (A)❺ attached to Y-pulley shaft (A)❹.
3. The belt holder ❼ and the Y-driving shaft holder ❽ which are fixed to the Y-timing belt ❻ operate the Y-driving shaft ❾.
4. The X-feed shaft support ❿ and the X-feed shaft ⓫ are attached to the Y-driving shaft ❾. The presser arm assembly ⓬ is attached to the Y-feed bracket ⓭.
5. The Y-feed bracket ⓭ operates in the Y-direction (moves longitudinally) via the Cross roller ⓮ and the Y-feed guide ⓯.

Feed mechanism (Y axis) 326E, 326EL



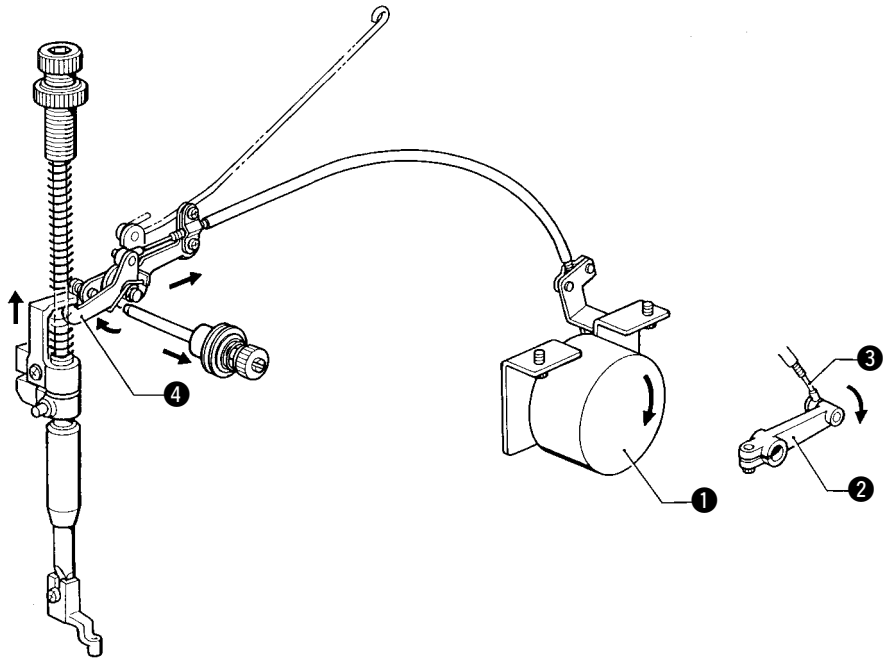
1. When the Y-pulse motor ❶ operates, its motion is transmitted to the driving gear ❹ attached to the Y-driving gear shaft ❸ via the coupling ❷.
2. The driving gear ❹ is engaged with the rack of the Y-driving shaft ❺, and the Y-driving shaft ❺ moves back and forth.
3. The work clamp arm assy ❽ is attached to the Y-feed bracket ❾ via X-feed shaft support 326 ❻ attached to the Y-driving shaft ❺ and the X-feed shaft ❼.
4. The Y-feed bracket ❾ operates in the Y-direction (back and forth) via cross roller 326 ❿ and Y-feed guide 326Y ⓫.

4. Presser foot mechanism (1)



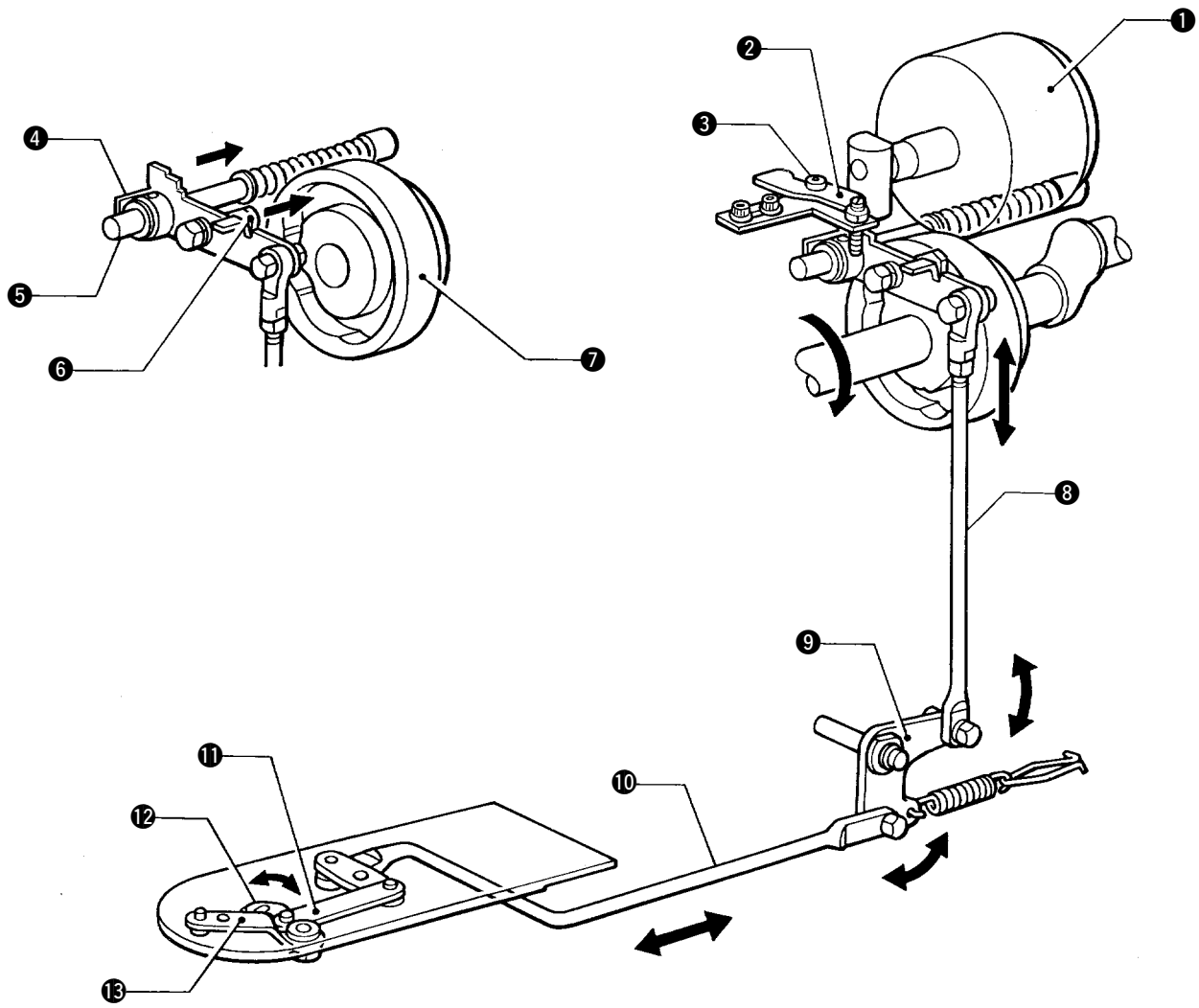
1. When the upper shaft ❶ rotates, the stepping work clamp cam ❷ moves eccentrically, and the stepping work clamp connecting rod ❸ oscillates stepping work clamp arm R ❹.
2. The oscillation of stepping work clamp arm R ❹ is transmitted to stepping work clamp arm F ❺, and the stepping link assy ❻ moves the presser bar lifter ❼ up and down.

Presser foot mechanism (2)



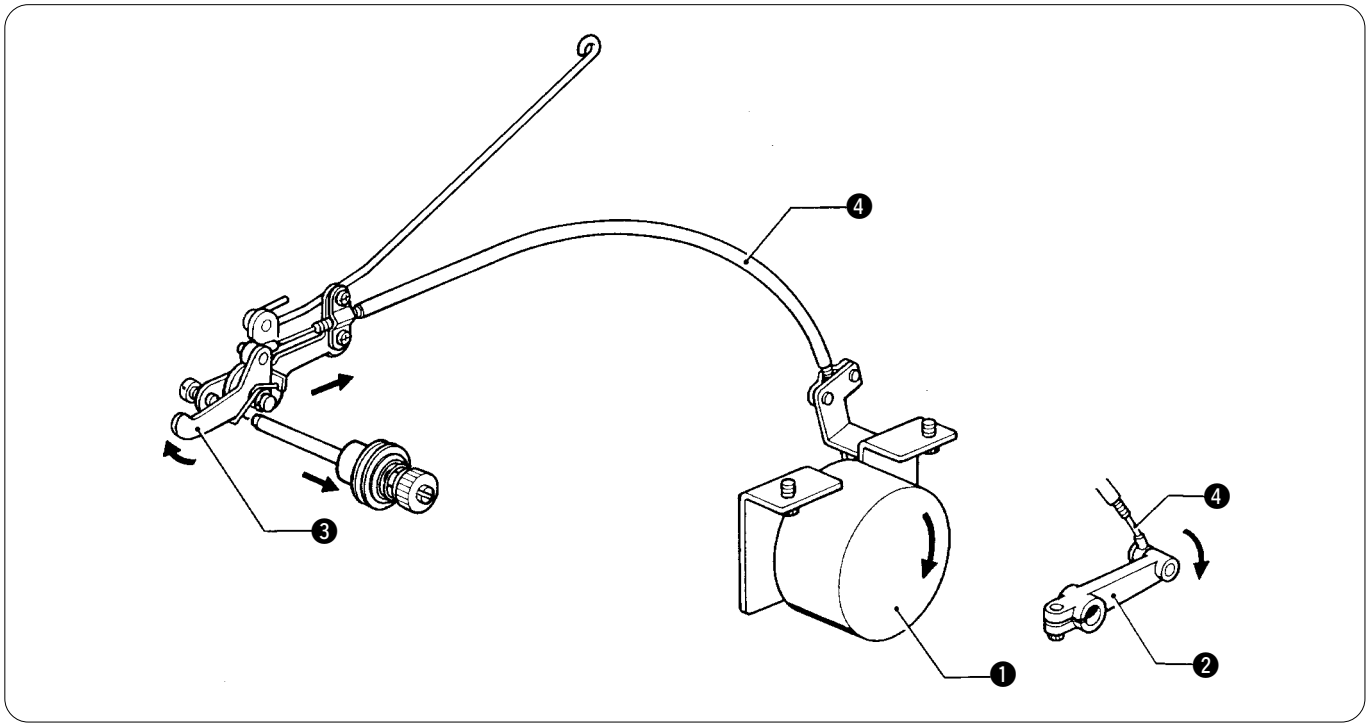
1. When the stepping work clamp signal is on, the stepping solenoid ❶ operates the lifter lever ❷.
2. The lifter lever ❷ operates the work clamp lifter lever assy ❹ via the work clamp lifter wire ❸.
   Note: When the machine stops, the stepping solenoid ❶ operates, and the presser foot rises as soon as the work clamp rises. At this time, tension releasing is performed.

5. Thread trimmer mechanism



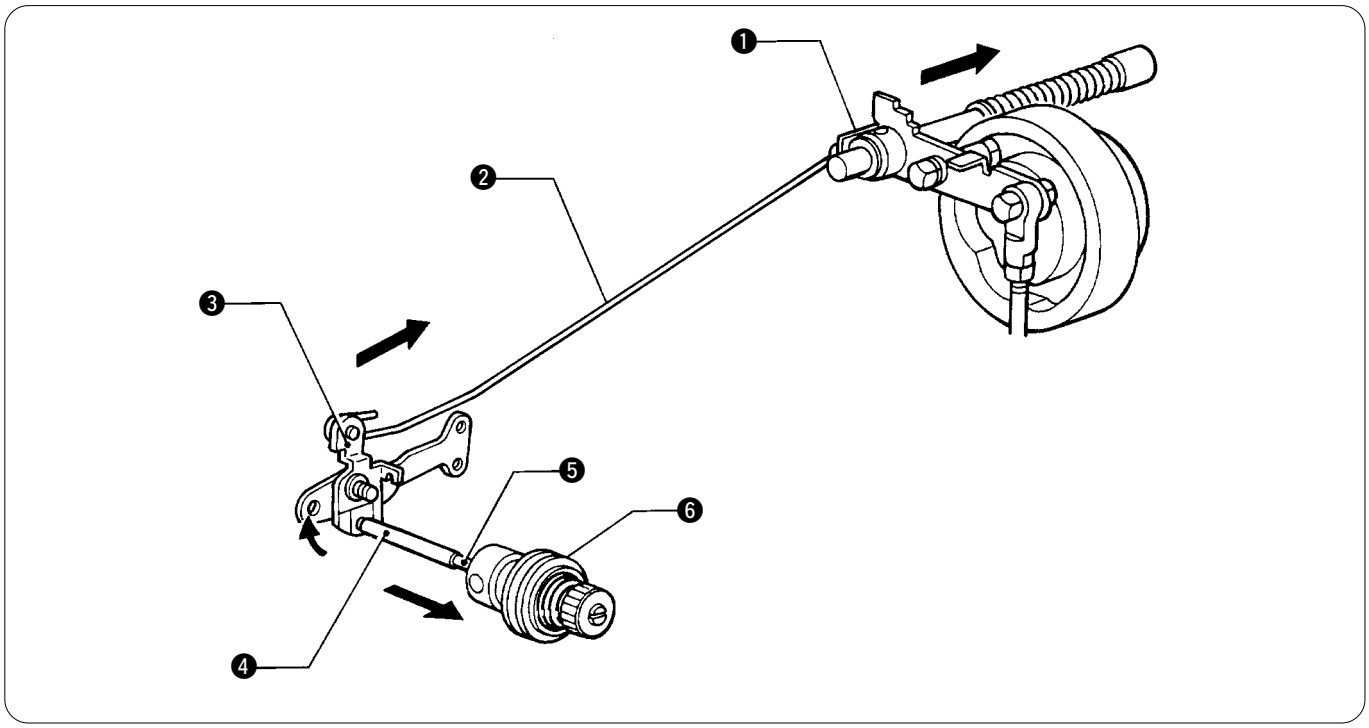
1. When the thread trimmer signal is on, the thread trimming solenoid ❶ pushes the pushing lever driving lever ❷.
2. The pushing lever driving lever ❷ pushes the thread trimmer driving lever ❹ in the direction of the arrow, pivoting on the shoulder screw ❸. The pushing lever driving lever ❷ slides along the driving lever shaft ❺.
3. The roller ❻ attached to the thread trimming driving lever ❹ fits into the groove of the thread trimmer cam ❼, and operates the thread trimmer rod ❽.
4. As the thread trimmer lever ❾ is linked to the thread trimmer rod ❽, the connecting rod lever ❿ operates.
5. When the thread trimmer connecting rod ⓫ linked to the connecting rod lever ❿ operates, the fixed knife ⓬ and the movable knife ⓭ fit into each other and perform thread trimming.

6. Thread nipper (1) when presser foot rises



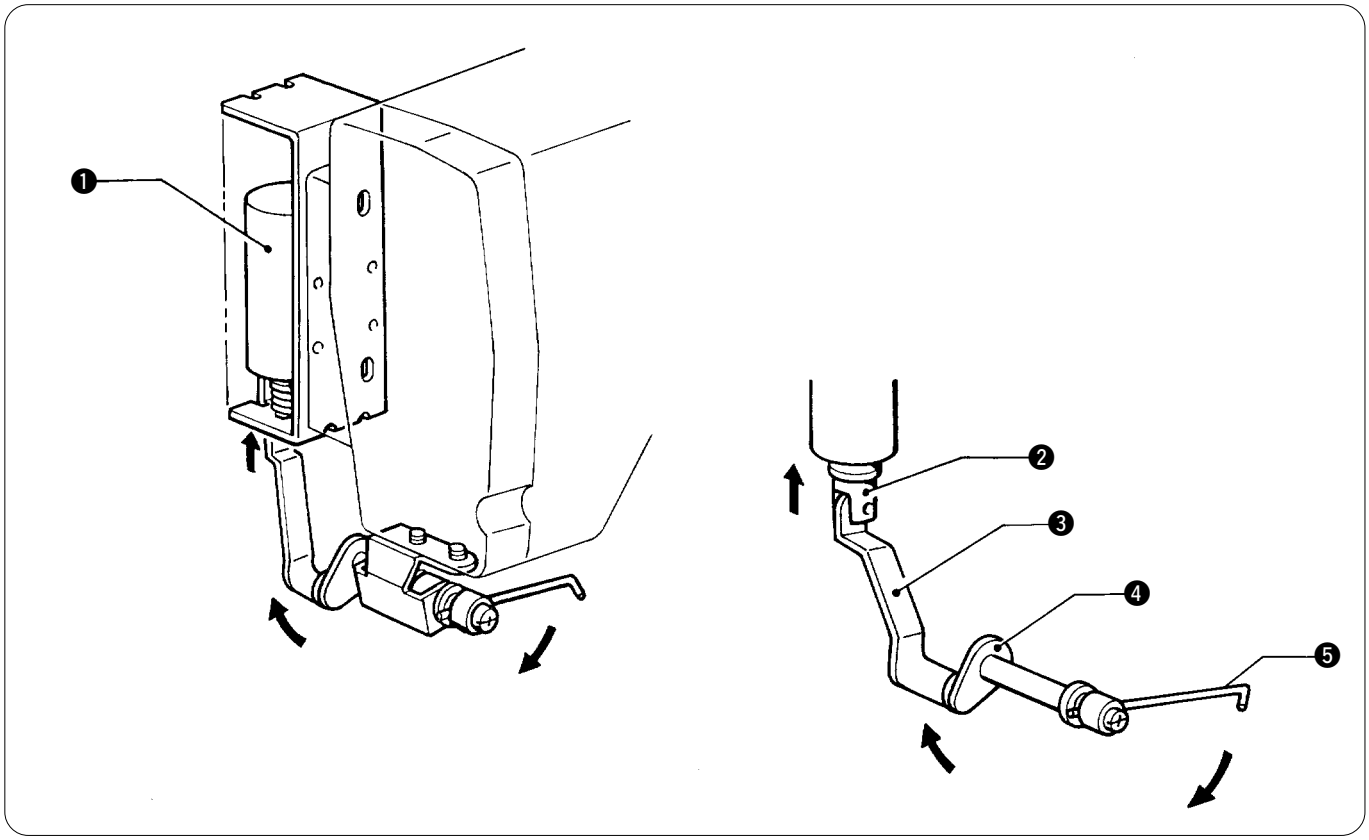
1. When the machine stops, the stepping solenoid ❶ operates, and the presser foot rises as soon as the work clamp rises.
2. The stepping solenoid ❶ operates the lifter lever ❷, and the work clamp lifter lever assy ❸ via the work clamp lifter wire ❹.

Thread nipper (2) during thread trimming



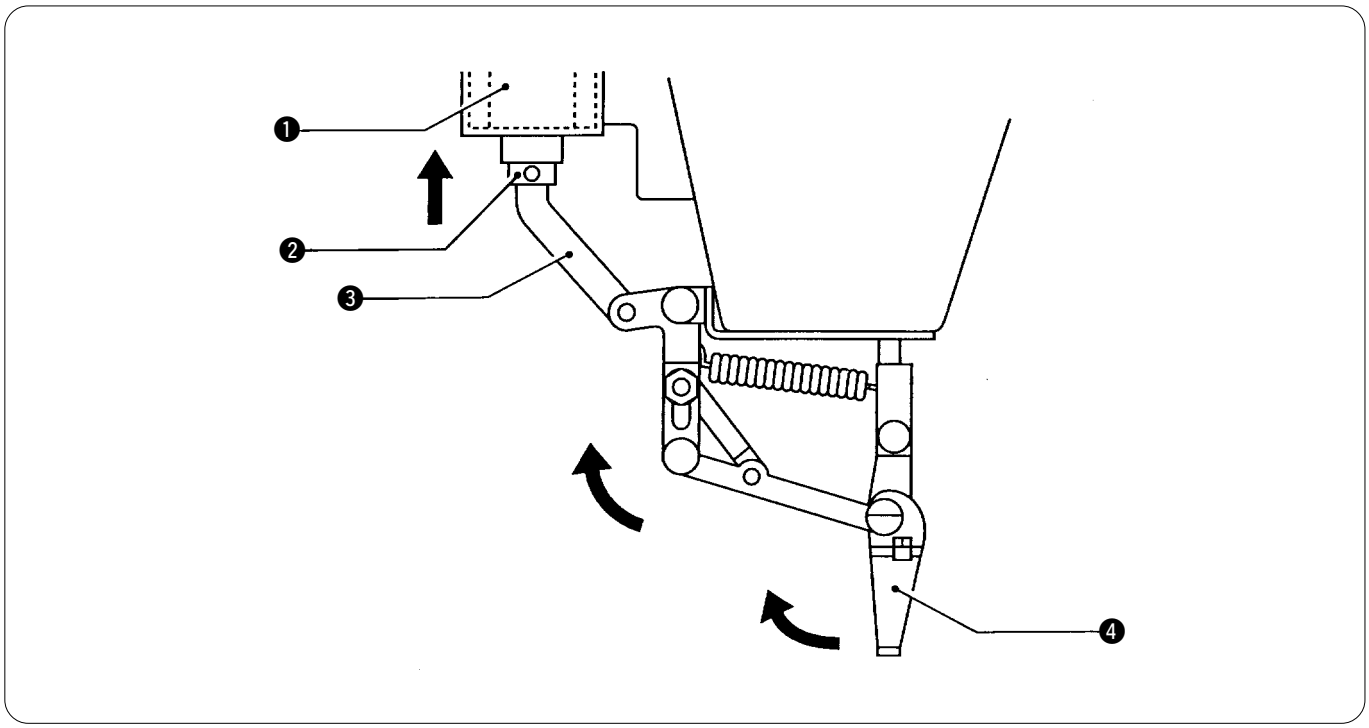
1. When the thread trimming signal is on and the thread trimming solenoid operates, the thread trimmer driving lever ❶ is pushed in the direction of the arrow.
2. The thread trimmer driving lever ❶ moves the tension release lever ❸ via the tension release rod ❷.
3. The tension release lever ❸ pushes the tension release bar ❹.
4. The end of the tension release bar ❹ pushes the pin ❺ and the tension disk opens ❻.

7. Thread wiper (1) (vertical wiper: standard)



1. After thread trimming, the thread wiper signal is on and the thread wiper solenoid ❶ operates.
2. When the plunger ❷ operates in the direction of the arrow, the thread wiper crank assembly ❹ attached to the end of the thread wiper connecting rod ❸ operates.
3. The wiper ❺ attached to the thread wiper crank assembly ❹ operates.

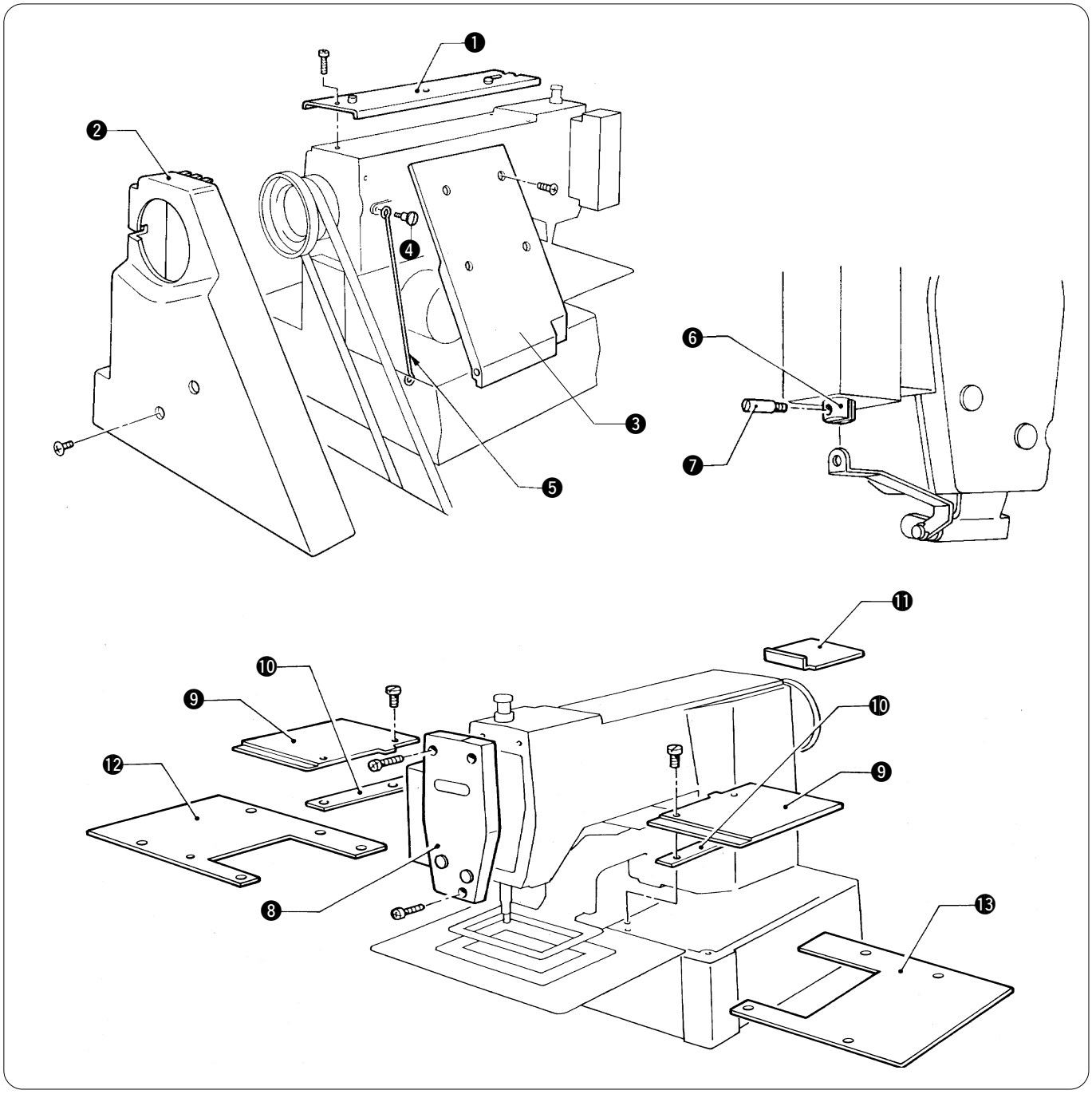
Thread wiper (2) (horizontal wiper: optional)



1. After thread trimming, the thread wiper signal is on and the thread wiper solenoid ❶ operates.
2. When the plunger ❷ operates in the direction of the arrow, T-wiper connecting rod assy S ❸ also operates.
3. Thread wiper A ❹ attached to T-wiper connecting rod assy ❸ operates.

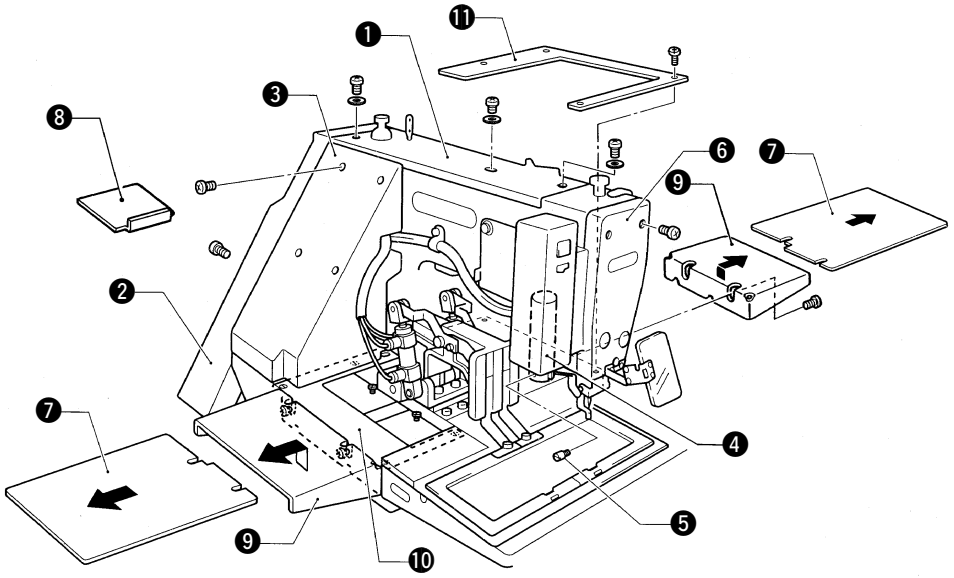
Chapter 2. Disassembly

1. Covers (1) 311E



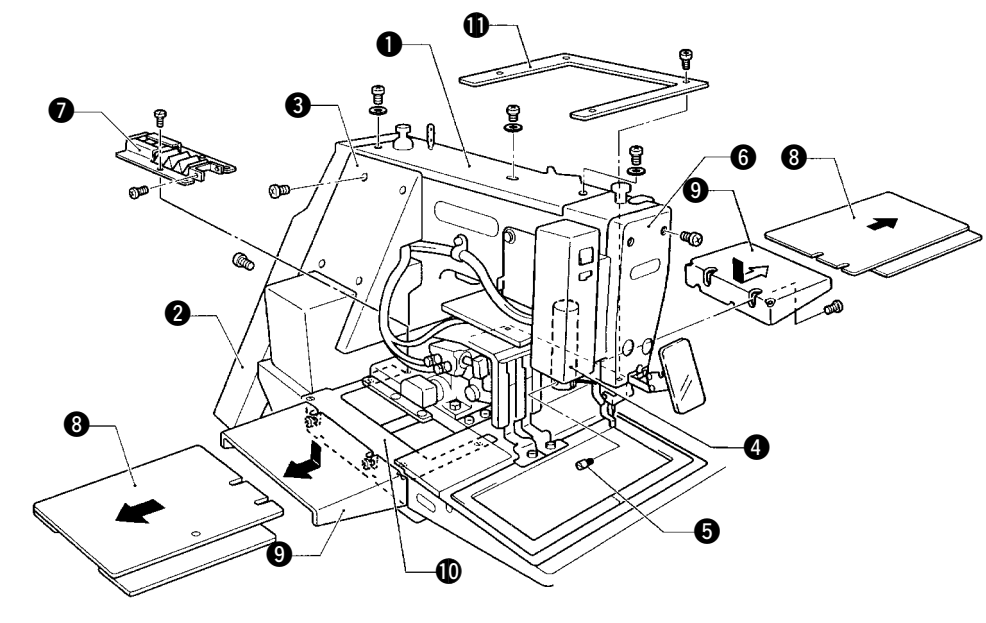
1. Remove the screw, the top cover ❶, the belt covers ❷ and the rear cover ❸.
2. Loosen shoulder screw ❹ and remove the work clamp lifter connect rod ❺.
3. Remove the plunger pin ❼ from the plunger ❻.
4. Remove the screw and the face plate ❽.
5. Remove the screw and the X-feed bracket covers ❾ on the right and left and cover spacer ❿ Y-feed bracket cover ⓫.
6. Remove the screw and XY-feed base covers (L) ⓬ and (R) ⓭.

Covers (2) 311EL



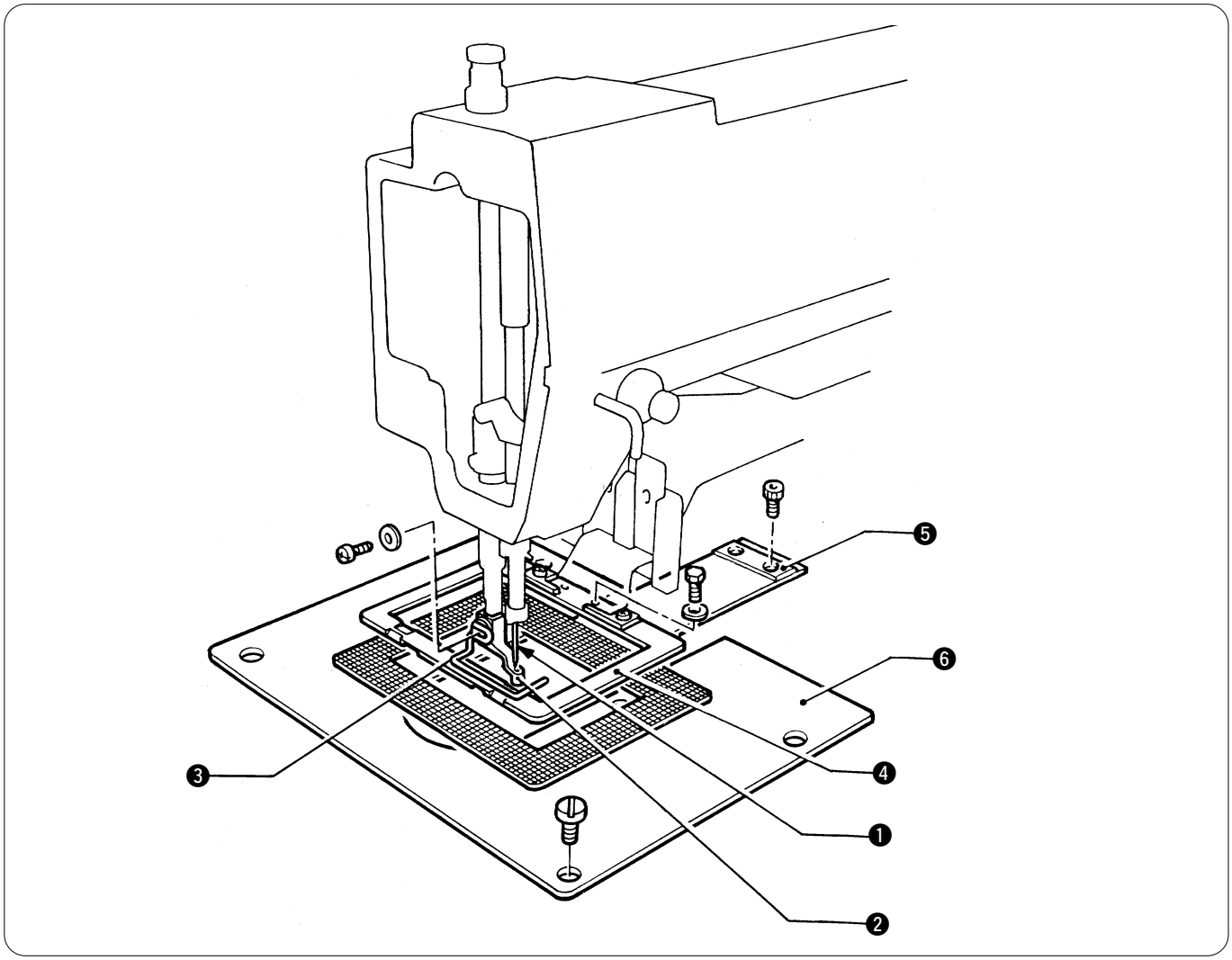
1. Remove the screws, the top cover ❶, the belt cover ❷, and the frame side cover ❸.
2. Remove the plunger pin ❺ from the plunger ❹.
3. Remove the screws, and the faceplate ❻.
4. Remove the screws, and X-axis feed bracket covers L and R ❼ and Y- feed bracket cover ❽.
5. Loosen the screws, and remove the left and right feed bracket cover supports ❾ in the direction of the arrow.
6. Remove the screws, and X-Y feed bracket covers L ❿ and R ⓫.

Covers (3) 326E, 326EL



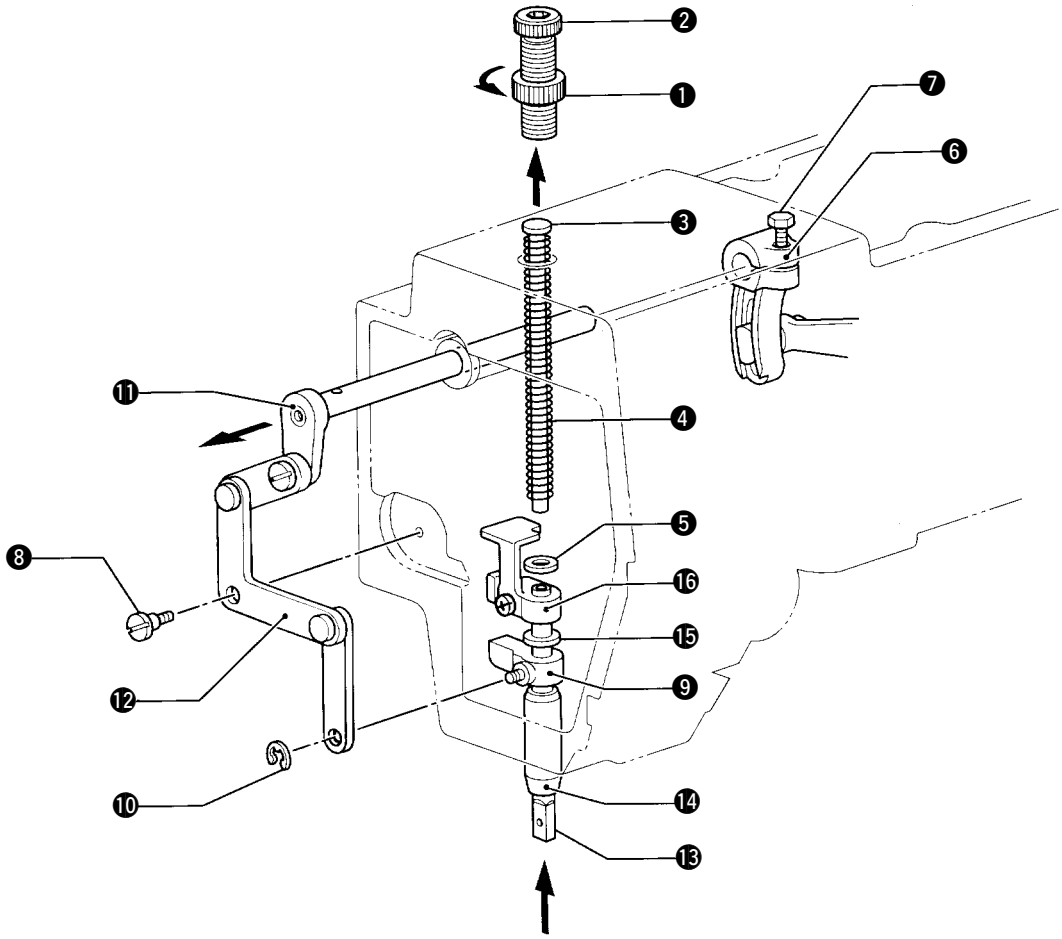
1. Remove the screws, the top cover ❶, the belt cover ❷, and the frame side cover ❸.
2. Remove the plunger pin ❺ from the plunger ❹.
3. Remove the screws, and the faceplate ❻.
4. Remove the screws, and the bellows assy ❼.
5. Remove the screws and X-axis feed bracket cover assemblies L and R ❽.
6. Loosen the screws, and remove the left and right feed bracket cover supports ❾ in the direction of the arrow.
7. Remove the screws, and X-Y feed bracket covers L ❿ and R ⓫.

2. Feed mechanism



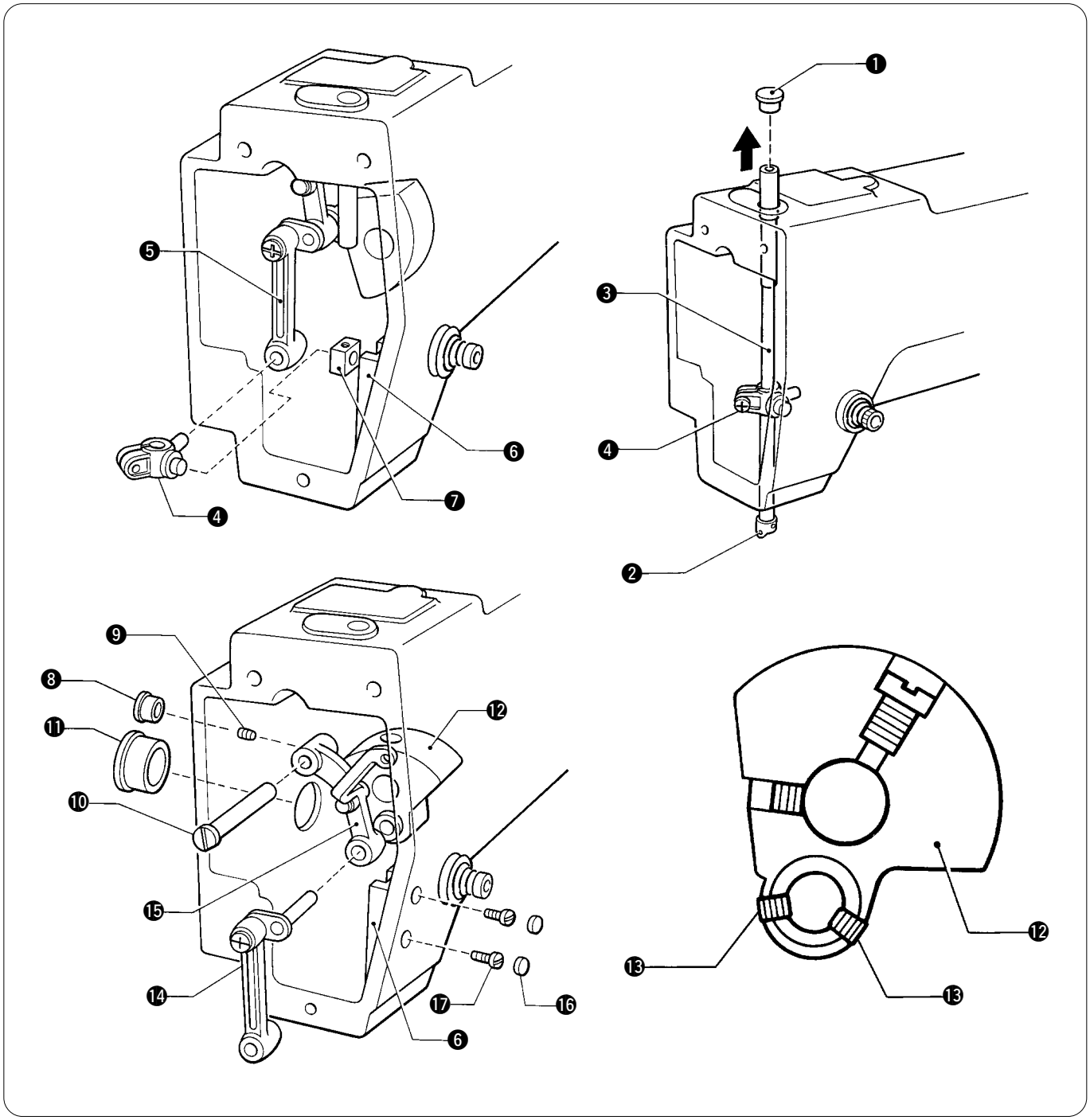
1. Remove the screw, the needle ❶ and the presser foot ❷ and finger guard ❸.
2. Remove the bolt and the work clamp ❹.
3. Remove the screw, the feed plate ❺ and the needle sub plate ❻.

3. Presser foot mechanism



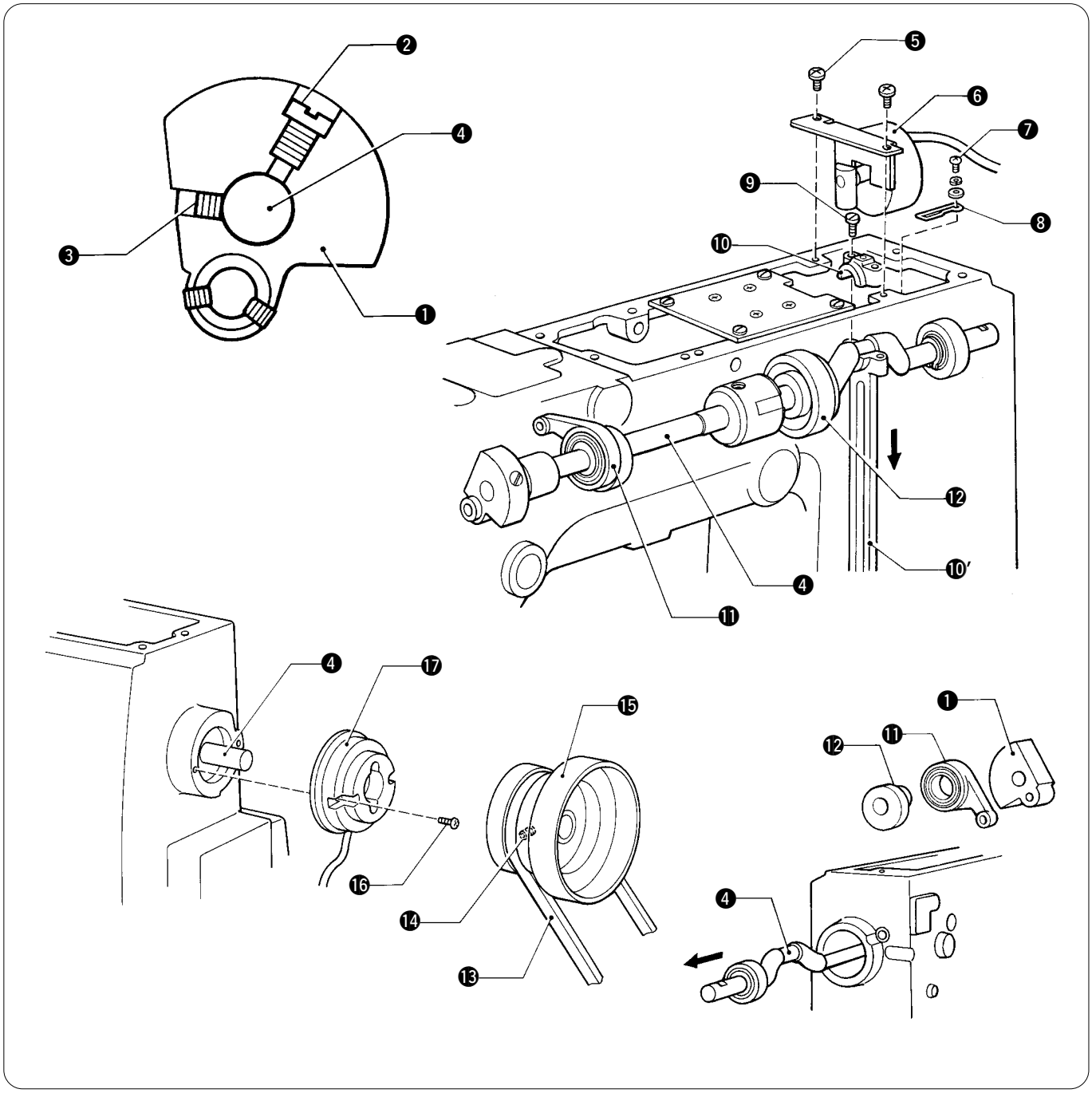
1. Loosen the nut ❶, remove the adjust screw ❷, the spring guide ❸, and the spring ❹ by lifting them from above of the machine, and remove the washer ❺.
2. Loosen the bolt ❼ of stepping work clamp arm R ❻, remove the shoulder screw ❽ and the retaining ring ❿ of the presser bar lifter ❾ from the faceplate, and then remove stepping work clamp arm F ⓫ and stepping link assy ⓬.
3. Push up the presser bar ⓭, and separate it from the presser bar bush ⓮.
   (The presser bar lifter ❾, the cushion ⓯, and the needle bar clamp ⓰ will come off as a set.)

4. Needle bar mechanism



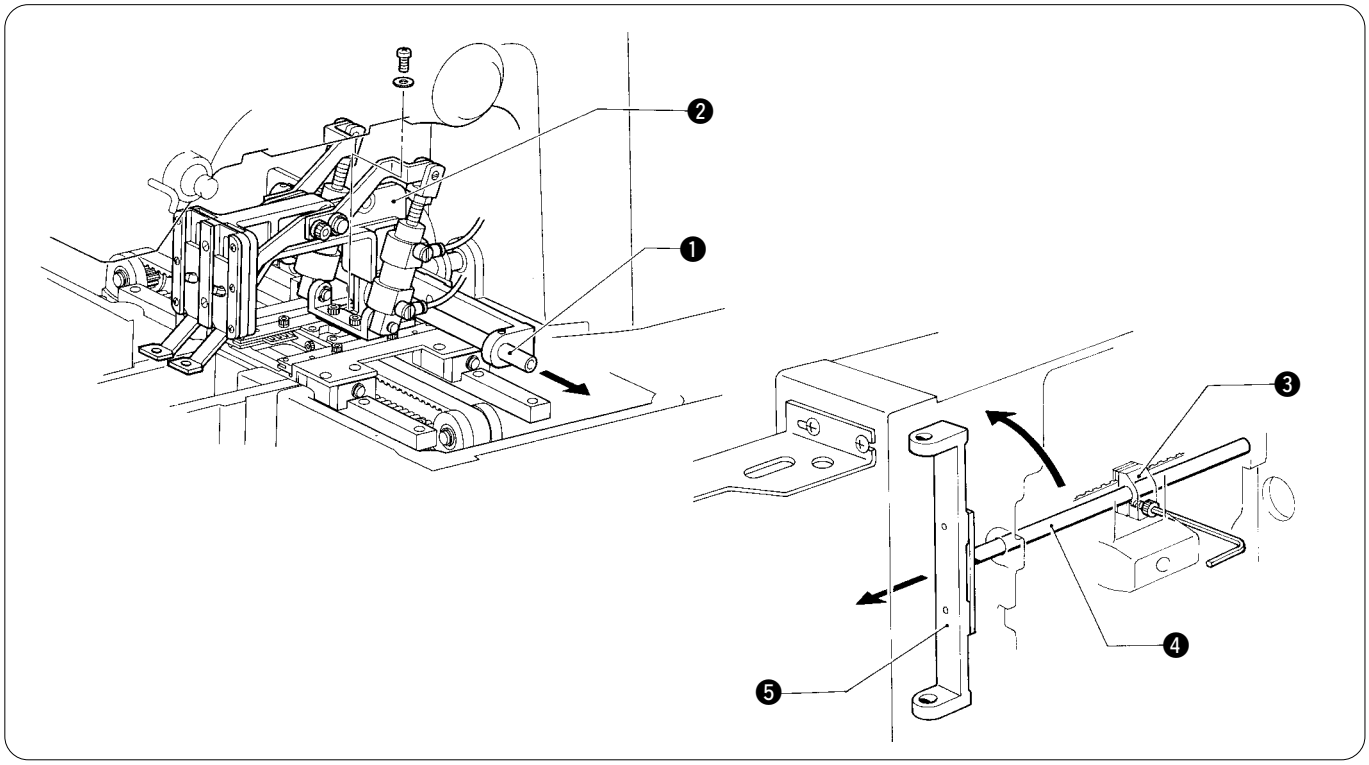
1. Remove the rubber cap ❶.
2. Remove the needle bar thread guide ❷ from the needle bar ❸.
3. Loosen the screw of the needle bar clamp ❹, and remove the needle bar ❸ through the machine top.
4. Remove the needle bar clamp ❹ from the thread take-up lever ❺.
   (Remove the needle bar guide slide block ❼ from the needle bar guide ❻.)
5. Remove the rubber cap ❽, loosen the set screw ❾, and remove the thread take-up support stud ❿.
6. Remove the oil cap ⓫, loosen the set screw ⓭ of the counter weight ⓬, and remove the thread take-up lever ⓮.
   (The thread take-up assembly ⓯ will come off.)
7. Remove the rubber cap ⓰, the screw ⓱, and the needle bar guide ❻.
   (Do not remove them if possible to prevent the machine from overheating due to needle bar rubbing.)

5. Upper shaft mechanism



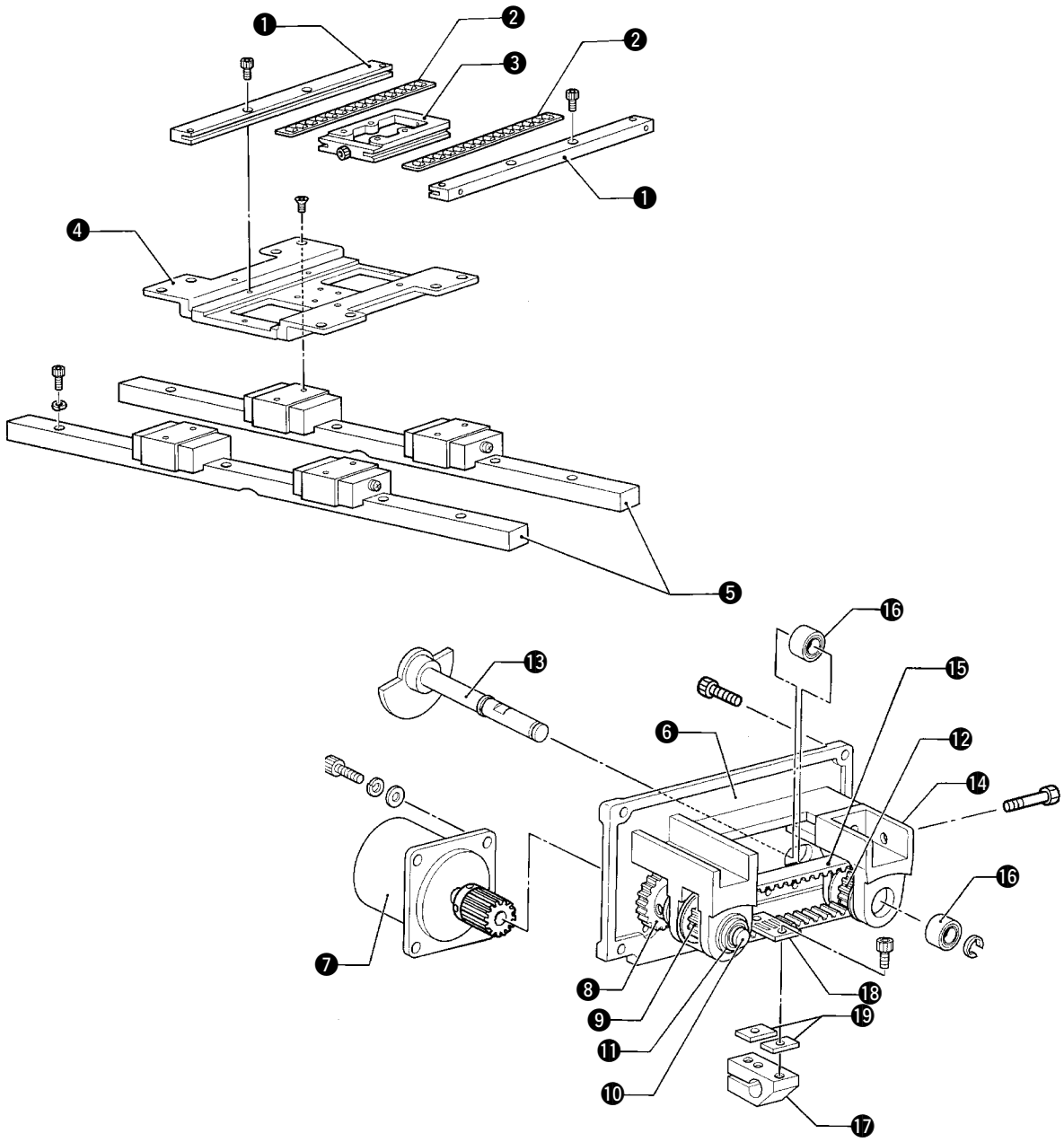
1. Loosen the screw ❷ and the set screw ❸ of thread take-up crank ❶.
   (The screw ❷ should be loosened until its end comes off the upper shaft ❹.)
2. Remove the screw ❺, and the thread trimming solenoid ❻.
3. Remove the screw ❼, and the wick support ❽.
4. Remove the screw ❾, and the crank rod ❿.
   (At this time, lower the crank rod ❿′ in the direction of the arrow.)
5. Loosen the set screws of the stepping work clamp cam ⓫ and the thread trimmer cam ⓬.
6. Remove the V belt ⓭, loosen the set screw ⓮, and remove the pulley ⓯.
7. Remove the screw ⓰ and the synchronizer ⓱.
8. Remove the upper shaft ❹ in the direction of the arrow.
   After that, remove the thread take-up crank ❶, the stepping work clamp cam ⓫, and the thread trimmer cam ⓬ from the upper shaft ❹, in this order.

6. Feed mechanism (Y axis) (1) 311E and 311EL



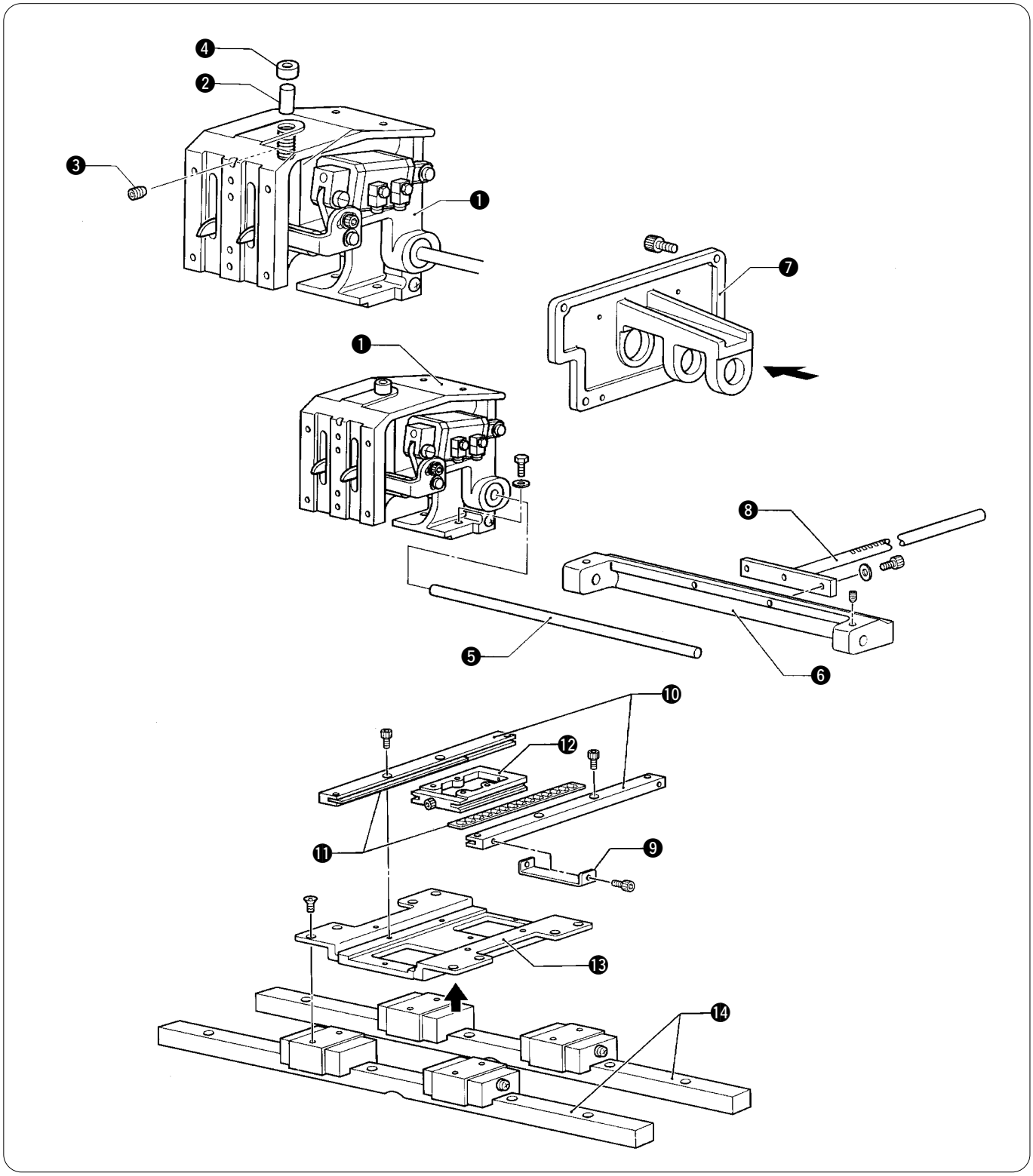
1. Loosen the set screw and remove the X-feed shaft ❶.
2. Remove the screws and the work clamp arm ❷.
3. Tilt the machine head until it stops.
4. Remove the bolt of the Y-driving shaft holder ❸, the Y-driving shaft ❹ and the X-feed shaft support ❺.
5. Raise the machine head.

Feed mechanism (Y axis) (2)



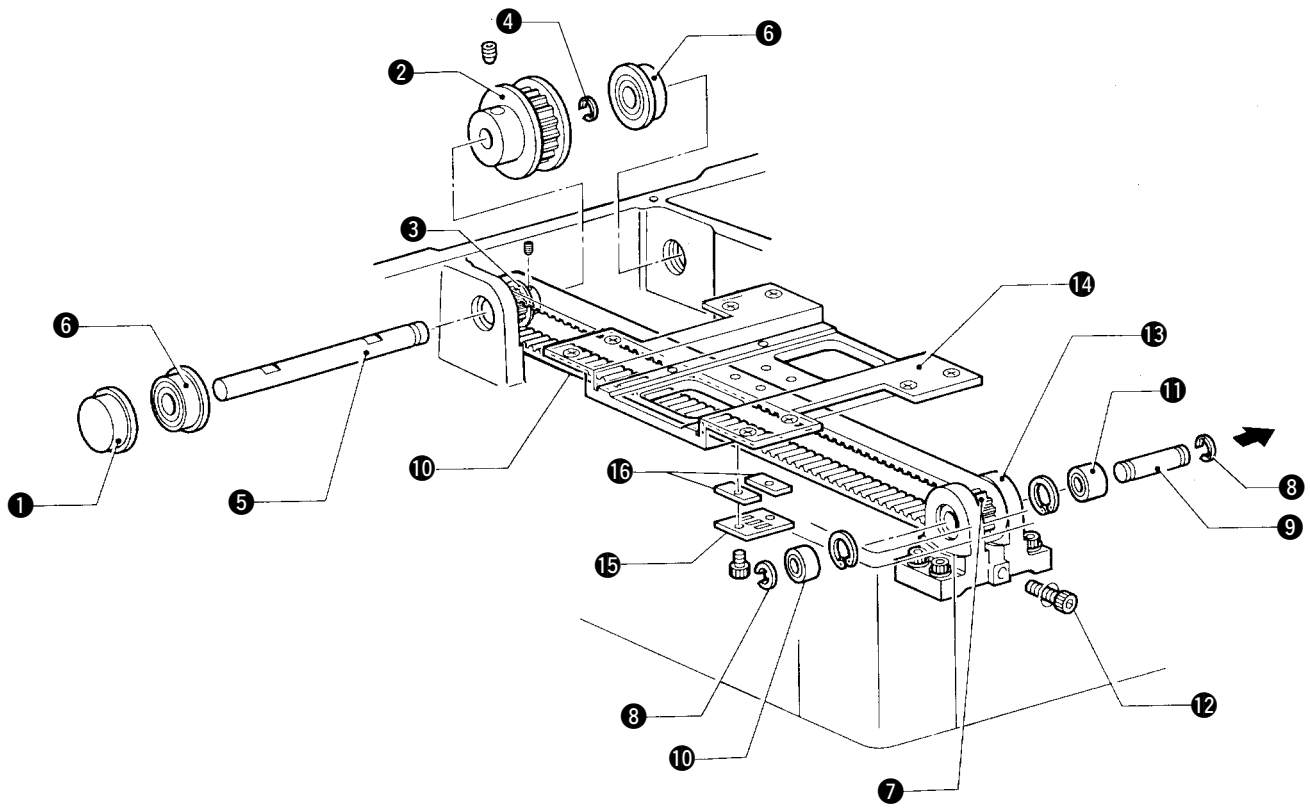
1. Remove the bolts, the Y-feed guide assembly ❶, the cross roller ❷, and the Y-feed bracket ❸.
2. Remove the screws, the X-feed bracket ❹, and the linear guide ❺.
3. Remove the bolts and the Y-driving pulse motor bracket ❻.
4. Remove the bolts and the Y-pulse motor ❼.
5. Loosen the set screws of the idle gear ❽ and timing pulley A ❾, and remove Y-pulley shaft A ❿ along with the retaining rings. (The idle gear ❽, timing pulley A ❾, and the ball bearing ⓫ will come off.)
6. Loosen the set screw of timing pulley A ⓬, and remove the two retaining rings and Y-pulley shaft B ⓭.
7. Remove the bolts, the Y-driving pulse motor bracket ⓮, timing pulley A ⓬, the Y-timing belt ⓯, and micro bearings ⓰.
   * To remove the Y-driving shaft holder ⓱, remove the bolt, the belt holder ⓲, the timing belt spacer, ⓳, and the Y-timing belt ⓯.

Feed mechanism (Y axis) (3) 326E, 326E



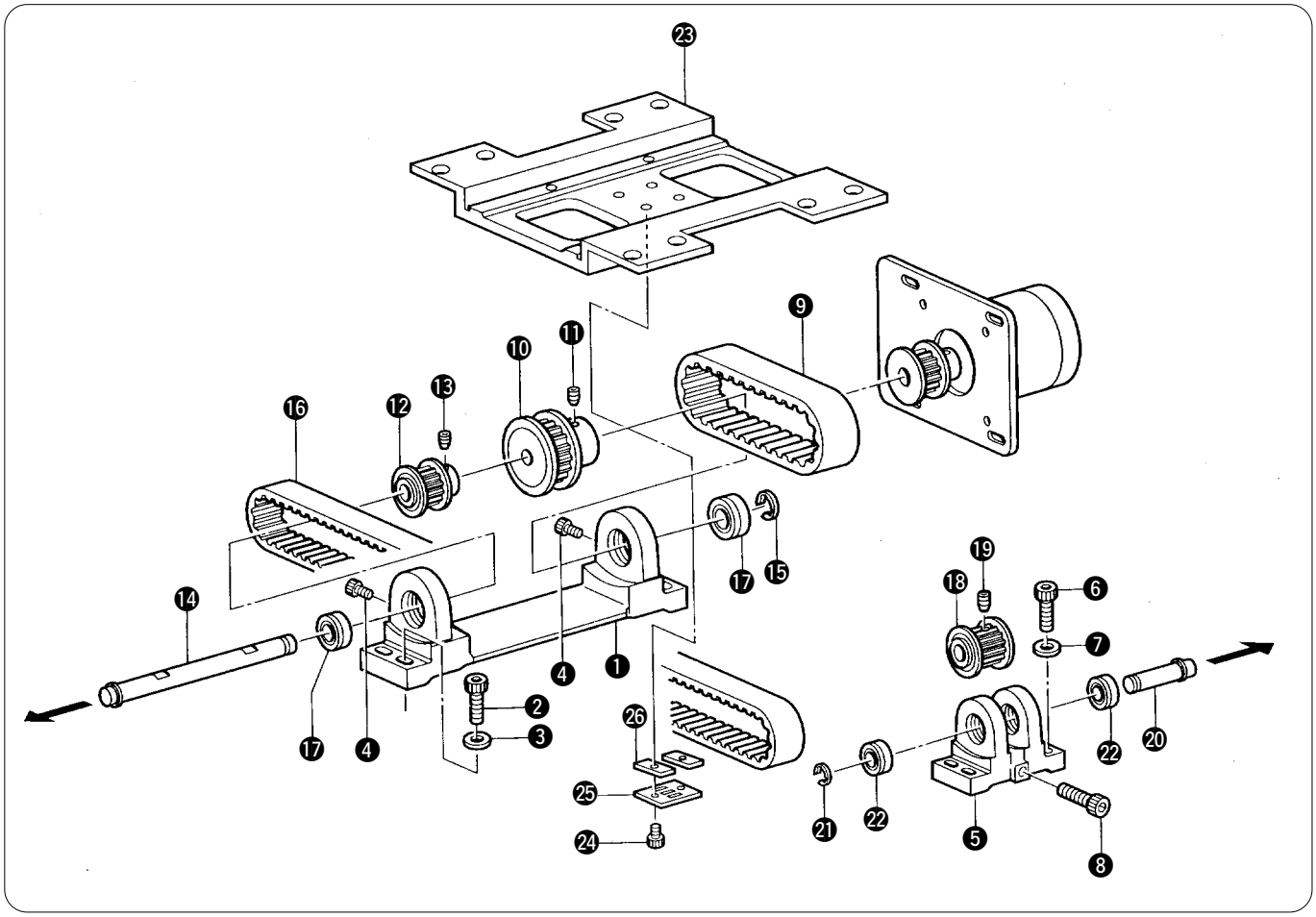
1. Secure the slider support shaft ❷ of the work clamp assy ❶ using the supplied set screw ❸.
   (To prevent the slider support shaft ❷ and the slider ❹ from suddenly protruding, be sure to do this job.)
2. Loosen the set screw, and remove the X-feed shaft ❺.
3. Remove the two bolts, and the work clamp assy ❶.
4. Remove the two bolts, and X-feed shaft support 326 ❻.
5. Remove the four bolts, the Y-feed pulse motor bracket ❼, and the Y-driving shaft ❽.
6. Remove the two bolts, and Y-feed bracket cover F ❾.
7. Remove the four bolts, Y-feed guide assy 326 ❿, cross roller 326 ⓫, and the Y-feed bracket ⓬.
8. Remove the eight set screws, the X-feed bracket ⓭, and the linear guide ⓮.

7. Feed mechanism (X axis) (1) 311E



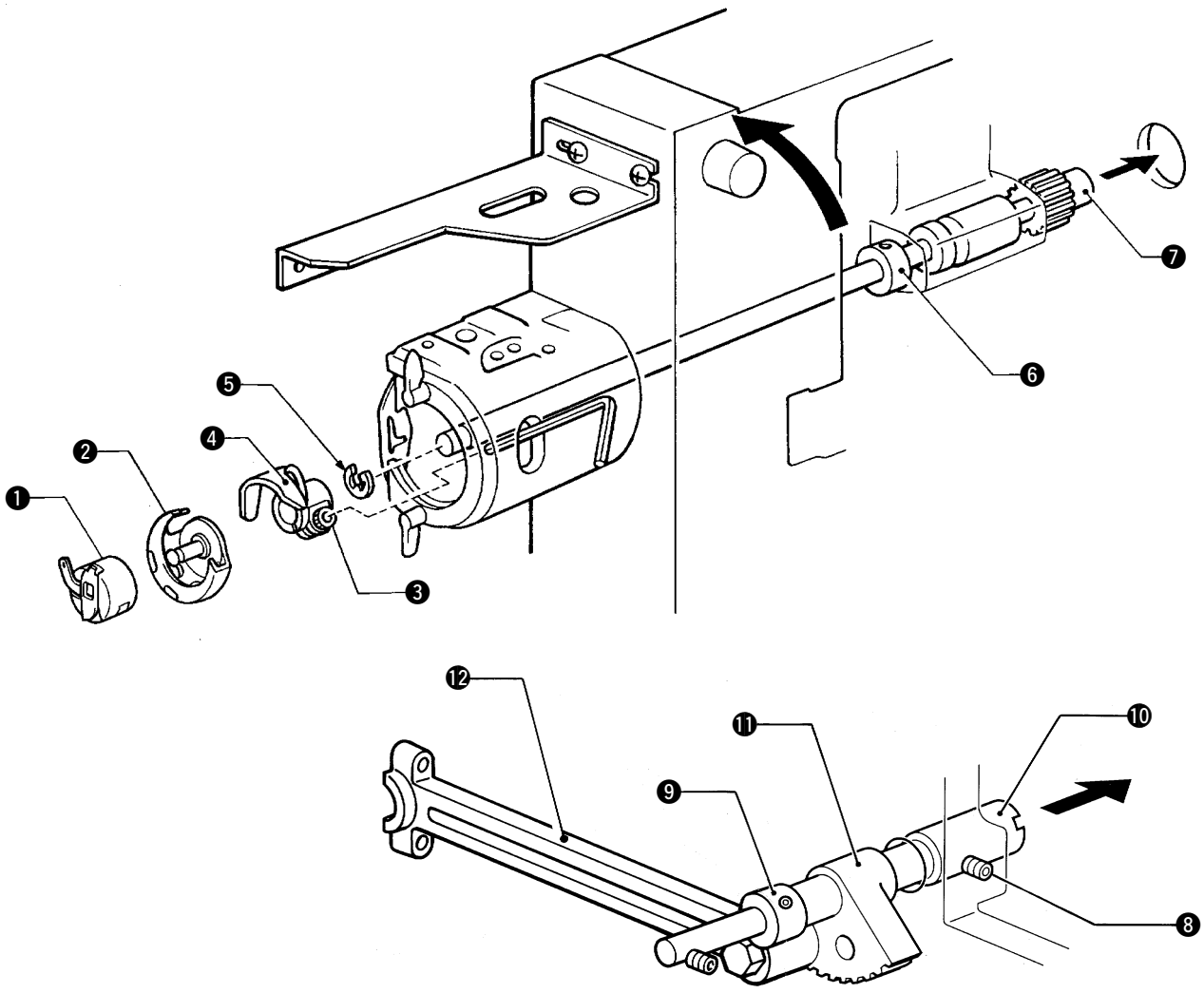
1. Remove the rubber cap ❶.
2. Loosen the set screws of X-timing pulley B311 ❷ and timing pulley A ❸, and remove the X-timing pulley shaft ❺ and retaining ring ❹. (X-timing pulley B311 ❷ and timing pulley A ❸, and the two ball bearings ❻ will come off.)
3. Loosen the set screw of timing pulley B ❼, and remove the retaining ring ❽ and X-pulley shaft B ❾. (Timing pulley B ❼, X-timing belt B311 ❿, and the two ball bearings ⓫ will come off.)
4. Remove the bolts ⓬ from adjustment holes, and separate X-pulley base B ⓭.
5. To remove the X-feed bracket ⓮, remove the eight set screws, the belt holder ⓯, the timing belt spacer ⓰, and X-timing belt B311 ❿.

Feed mechanism (X axis) (2) 311EL and 326E, 326EL



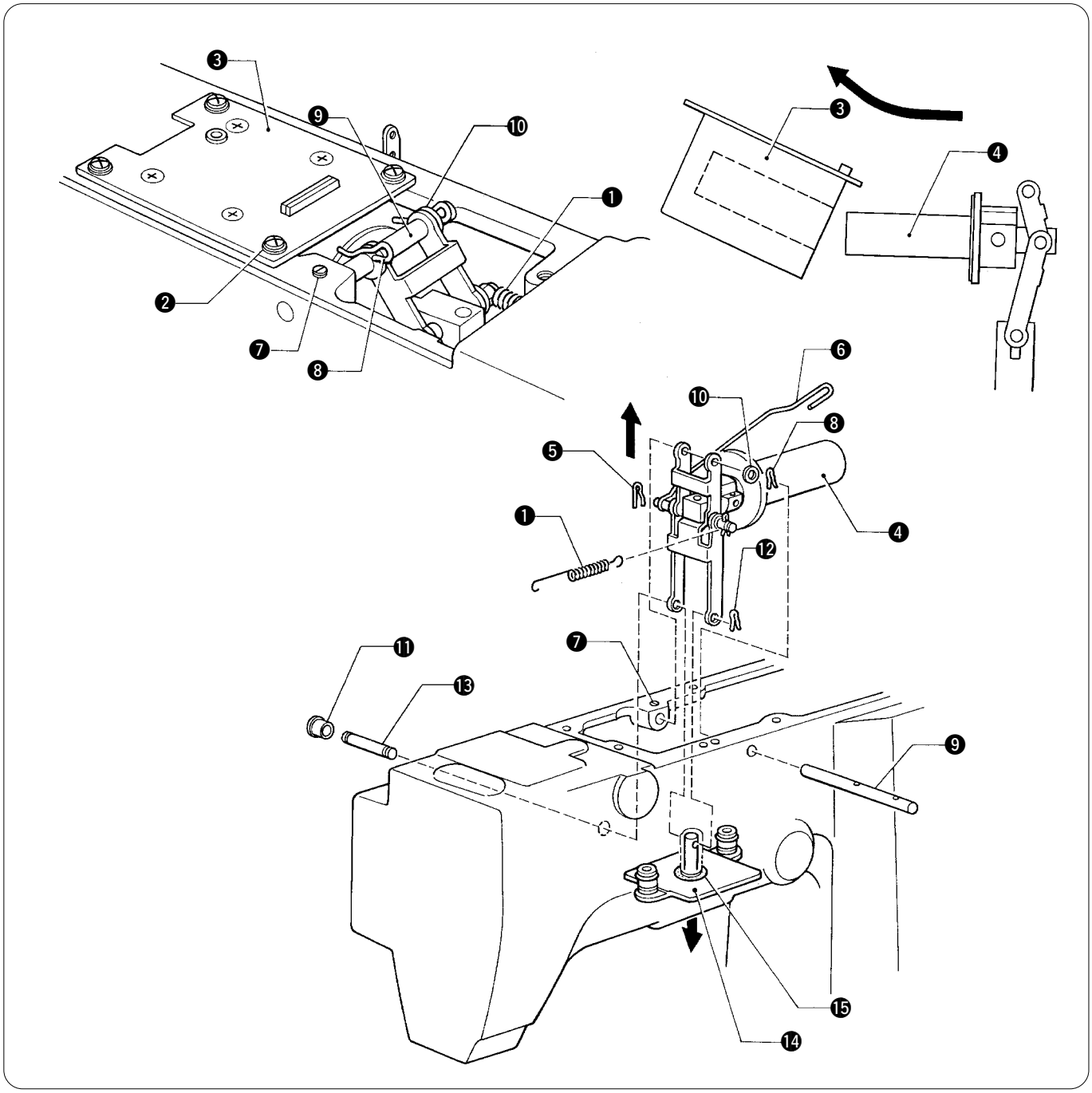
1. Remove the bolt ❷ and the washer ❸ of X-pulley bracket L ❶, and the adjust bolt ❹.
2. Remove the bolt ❻ and the washer ❼ of X-pulley bracket R ❺, and the adjust bolt ❽.
3. Remove X-timing belt A326 ❾.
4. Loosen the set screw ⓫ of X-timing pulley B326 ❿, and the set screw ⓭ of timing pulley A ⓬, and remove the back retaining ring ⓯ of the X-timing pulley shaft ⓮, and pull out the X-timing pulley shaft ⓮ in the direction of the arrow. (At this time, timing pulley ⓬, X-timing belt B326 ⓰, X-timing pulley B326 ❿, X-timing belt A326 ❾, and the two micro bearings ⓱ will come off.)
5. Loosen the set screw ⓳ of timing pulley B ⓲, remove the front retaining ring ㉑ of X-pulley shaft R ⓴, and pull out X-pulley shaft R ⓴ in the direction of the arrow.
   (At this time, X-timing belt B326 ⓰, timing pulley B ⓲, and the two micro bearings ㉒ will come off.)
6. Remove the bolt ㉔ on the back of the X-feed bracket ㉓, the belt holder ㉕, the timing belt spacer ㉖, and X-timing belt B326 ⓰.

8. Lower shaft mechanism



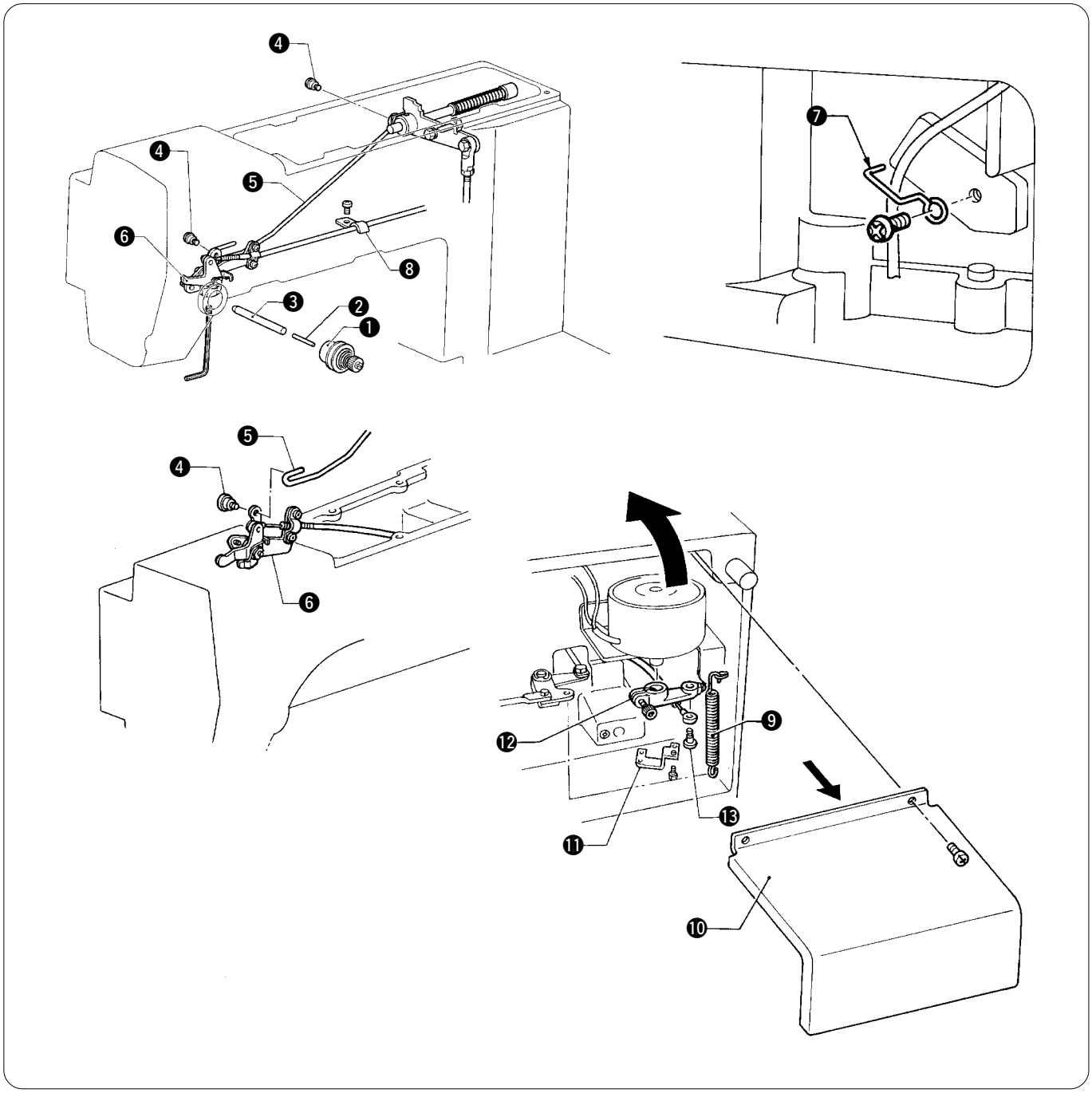
1. Tilt the machine head until it stops.
2. Remove the bobbin case ❶ and the shuttle hook ❷.
3. Loosen the bolt ❸, and remove the driver ❹ and the retaining ring ❺.
4. Loosen the set screw of the set screw collar ❻, and remove the lower shaft assembly ❼ from the rear of the machine.
5. Loosen the set screw ❽.
6. Loosen the set screw of the set screw collar ❾, and remove the rock gear shaft ❿ from the rear of the machine.
7. Remove the set screw collar ❾, the rock gear ⓫, and the crank rod ⓬.
8. Raise the machine head.

9. Work clamp lifter (Solenoid type)



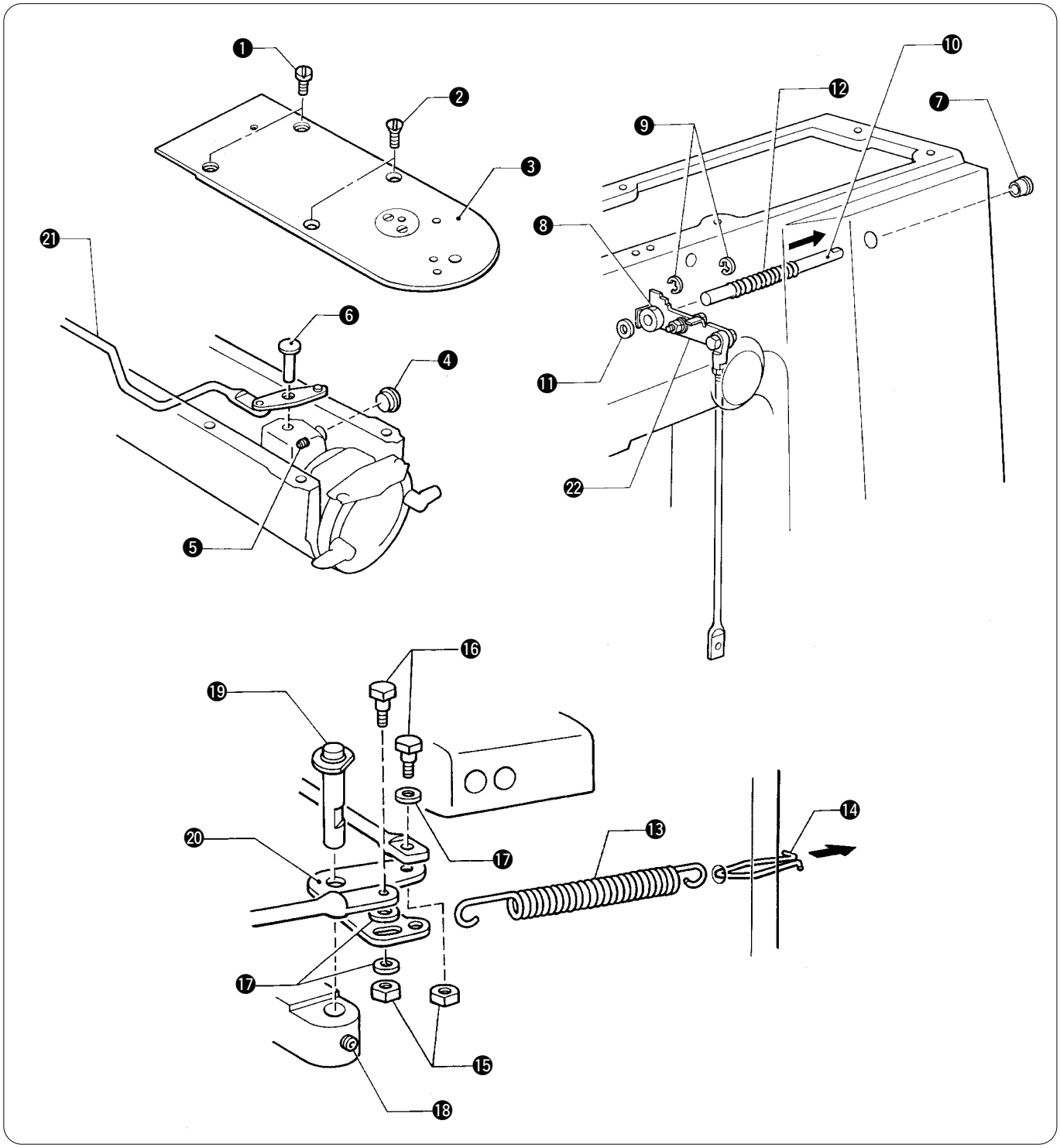
1. Remove the spring ❶.
2. Remove the screw ❷, and the presser solenoid ❸ from the plunger ❹ by lifting the latter from above.
   Be sure to hold the plunger ❹ securely so that it does not fall.
3. Remove the snap pin ❺ and the rod ❻.
4. Loosen the set screw ❼, and remove the snap pin ❽, link shaft A ❾, and the washer ❿.
5. Remove the rubber cap ⓫, the snap pin ⓬, and link shaft C ⓭.
   Be sure to hold the presser plate ⓮ and the presser bar lifter lever rubber ⓯ so that they do not fall.
6. Remove all parts connected to the plunger ❹ by lifting them upward.

10. Thread nipper mechanism



1. Remove the set screw, the thread tension ❶, the pin ❷, and the tension release bar ❸.
2. Remove the shoulder screw ❹ and the tension release rod ❺.
3. Remove the screw and the tension release assembly ❻.
4. Remove the screw, the cable support ❼, and the cord holder ❽.
5. Tilt the machine head until it stops.
6. Remove the extension spring ❾ and the SOL oil pan ❿.
7. Remove the screw and the wire support ⓫.
8. Loosen the bolt, and remove the work clamp lifter lever ⓬.
9. Loosen the set screw of the work clamp lifter lever ⓬, and remove the flanged shaft ⓭.
10. Return the machine head to its original position.

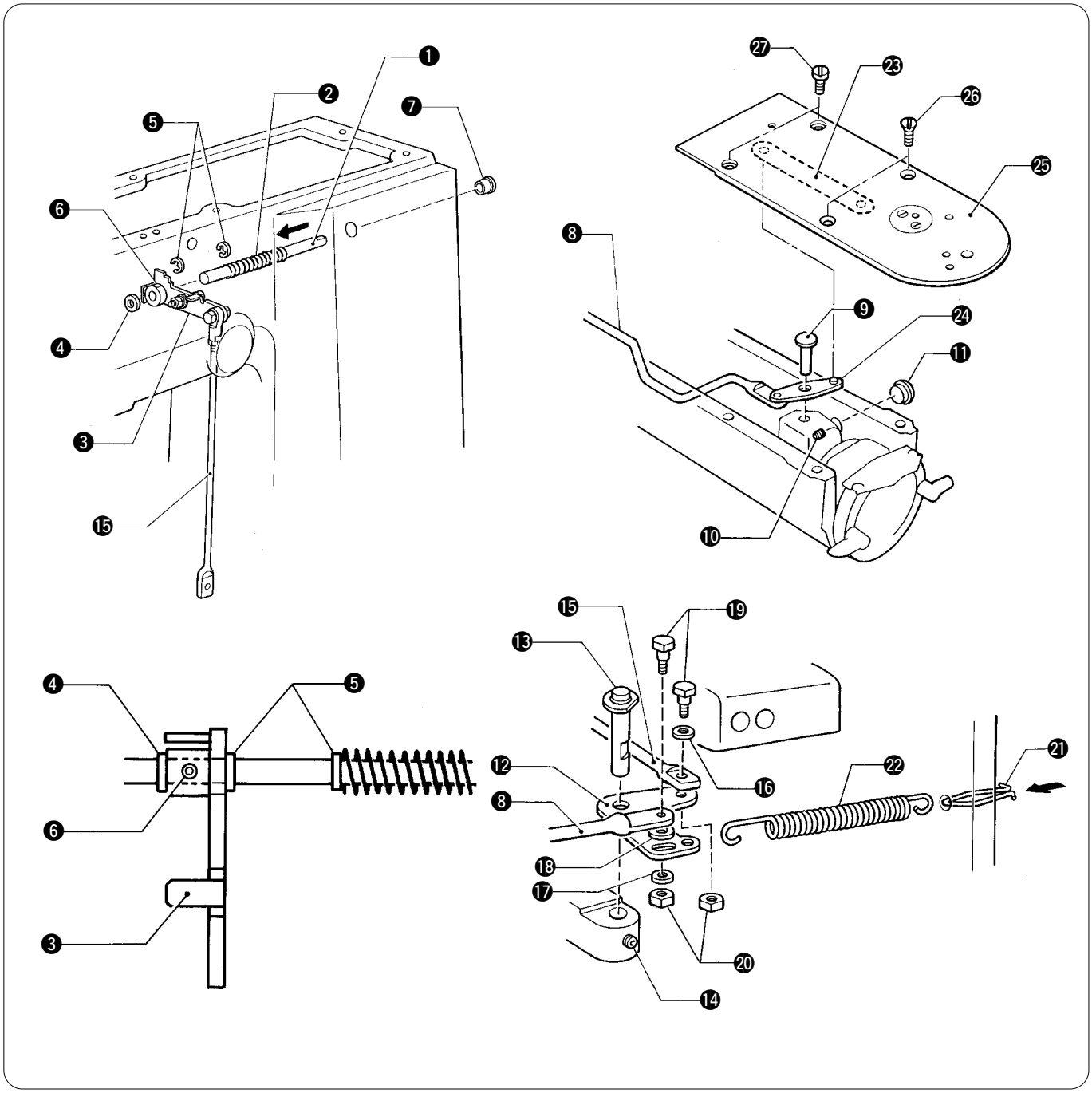
11. Thread trimmer mechanism



1. Remove the screws ❶, the flat screws ❷ and the needle plate ❸.
2. Remove the rubber cap ❹, loosen the set screw ❺, and remove the connecting rod lever shaft ❻.
3. Remove the oil cap ❼, loosen the set screw ❽, and remove the retaining ring ❾.
4. Remove the driving lever shaft ❿ by pulling it in the direction of the arrow. Then remove the cushion ⓫ and the spring ⓬ from the shaft.
5. Tilt the machine head until it stops.
6. Remove the thread trimmer return spring ⓭ and the spring hook ⓮.
7. Remove the nut ⓯, the shoulder screw ⓰, and the washer ⓱.
8. Loosen the set screw ⓲, and remove the lever shaft ⓳ and the thread trimmer lever ⓴.
9. Return the machine head to its original position, and remove the connecting rod lever ㉑ and the thread trimmer driving lever ㉒.

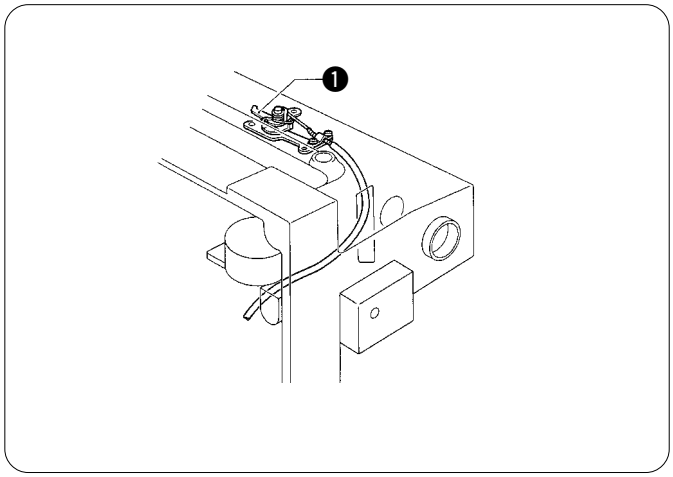
Chapter 3. Assembly

1. Thread trimmer mechanism (1)

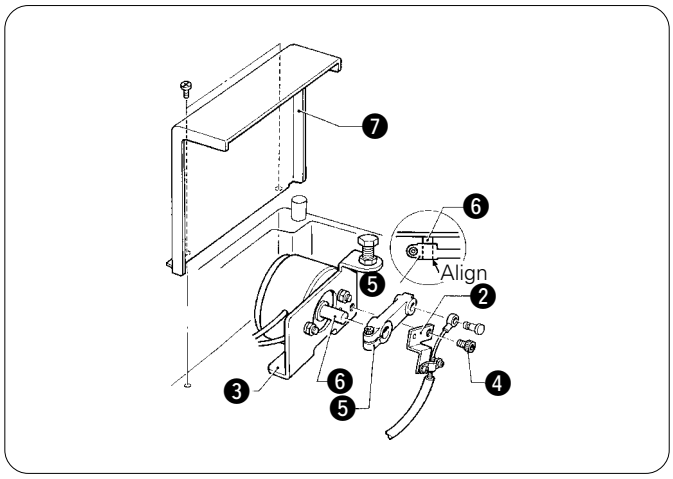


1. Insert the driving lever shaft ❶ into the machine. Place the spring ❷, the thread trimmer driving lever ❸, and the cushion ❹ on the shaft in this order.
2. Put the retaining rings ❺ on the shaft. Press the thread trimmer driving lever ❸ against the retaining rings ❺. Tighten the set screw ❻ on the screw flat.
3. Attach the oil cap ❼.
4. Insert the connecting rod lever ❽ into the machine, lightly press the connecting rod lever shaft ❾ against the former, then secure them using the set screw ❿.
5. Attach the rubber cap ⓫.
6. Tilt the machine head until it stops.
7. Pass the lever shaft ⓭ with the washer and the retaining ring, through the thread trimmer lever ⓬, and tighten the set screw ⓮ on the screw flat.
8. Attach the thread trimmer rod ⓯ and the connecting rod lever ❽ to the thread trimmer lever ⓬ using the washer ⓰, plain washer 4.37 (t=0.8) ⓱, washer 4.76 (t=0.5) ⓲, the stud screw ⓳, and the nut ⓴.
9. Attach the spring hook ㉑ to the inside of the machine, and connect the thread trimmer return spring ㉒ to it.
10. Return the machine head to its original position.
11. Fit the thread cutter connecting rod ㉓ on connecting lever pin ㉔ , and install needle plate ㉕ using the flat screws ㉖ and screws ㉗ (First tighten the flat screws ㉖ and screws ㉗).

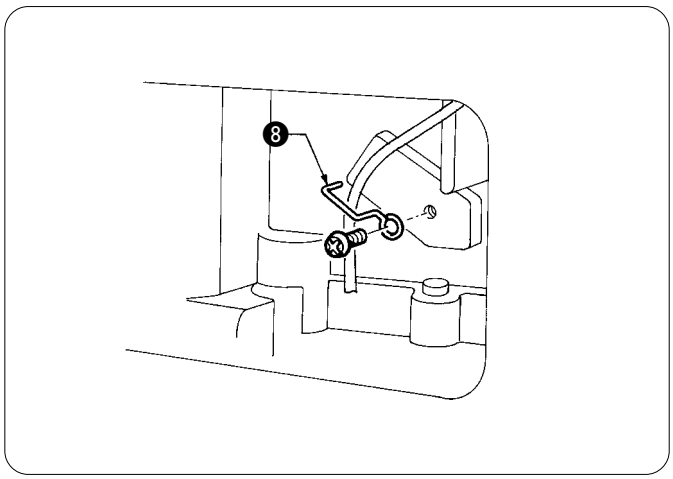
2. Thread nipper mechanism



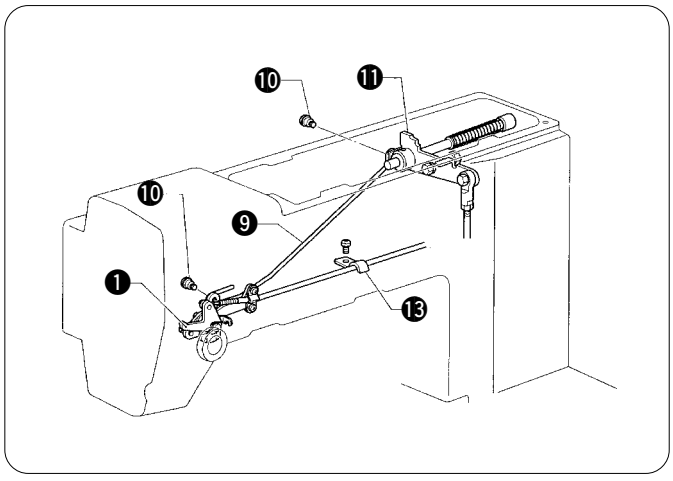
1. Pass the tension release assembly ❶ from the bottom of the machine to the top.



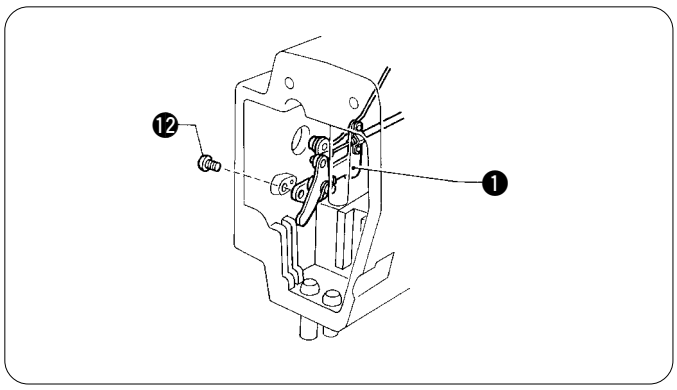
2. Attach the wire support ❷ to the solenoid set plate ❸ with the bolt ❹.
3. Temporarily attach the lifter lever ❺ to the shaft of the stepping solenoid ❻. At this time, align the end face of the lifter lever ❺ with the end face of the stepping solenoid ❻.
4. Attach the SOL oil pan ❼ using the screw.
5. Raise the machine head.



6. Attach the cable support ❽ to the machine body.

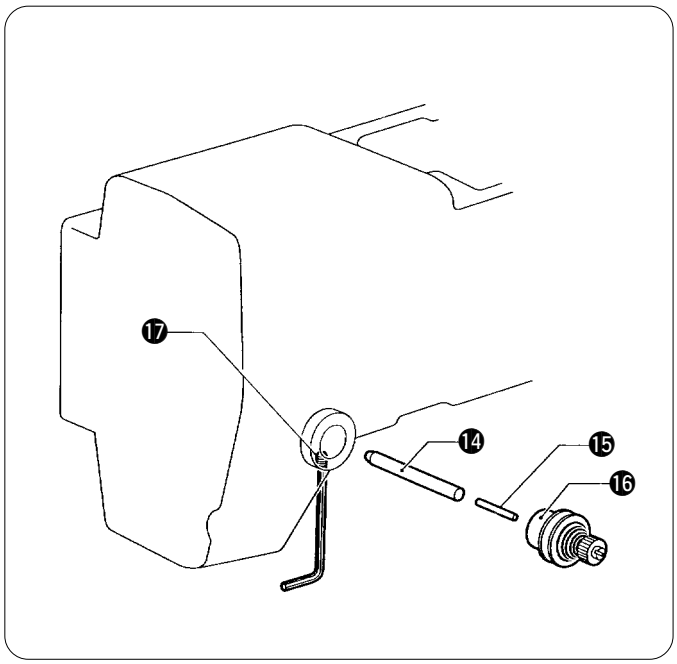


7. Attach the thread trimmer rod ❾ to the tension release assembly ❶ with the shoulder screw ❿.
8. Attach the other end of the tension release rod ❾ to the thread trimmer driving lever ⓫ using the shoulder screw ❿.

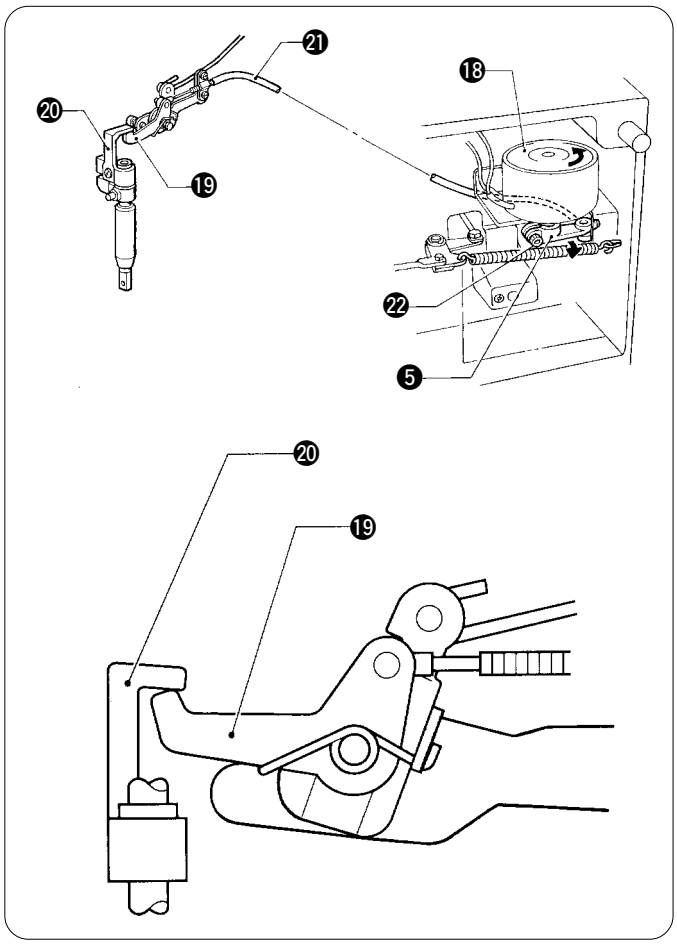


9. Attach the tension release assembly ❶ to the machine body with the screw ⓬.

10. Attach the cord holder ⓭ to the machine body.

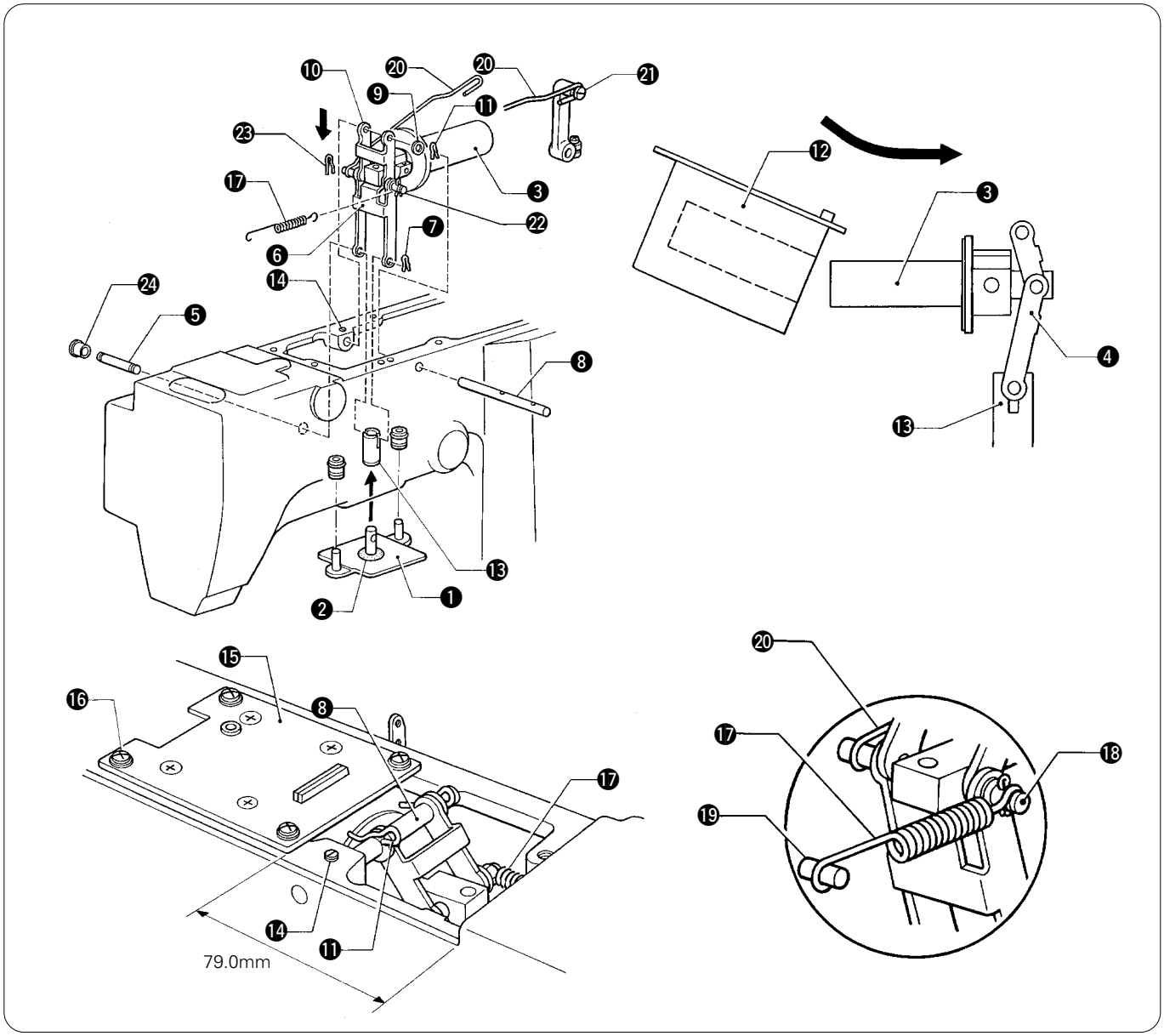


11. Attach the tension release bar ⓮, the pin ⓯ and the thread tension assembly ⓰ to the machine. Fit the set screw ⓱ in the groove of the thread tension assembly ⓰, then tighten it.



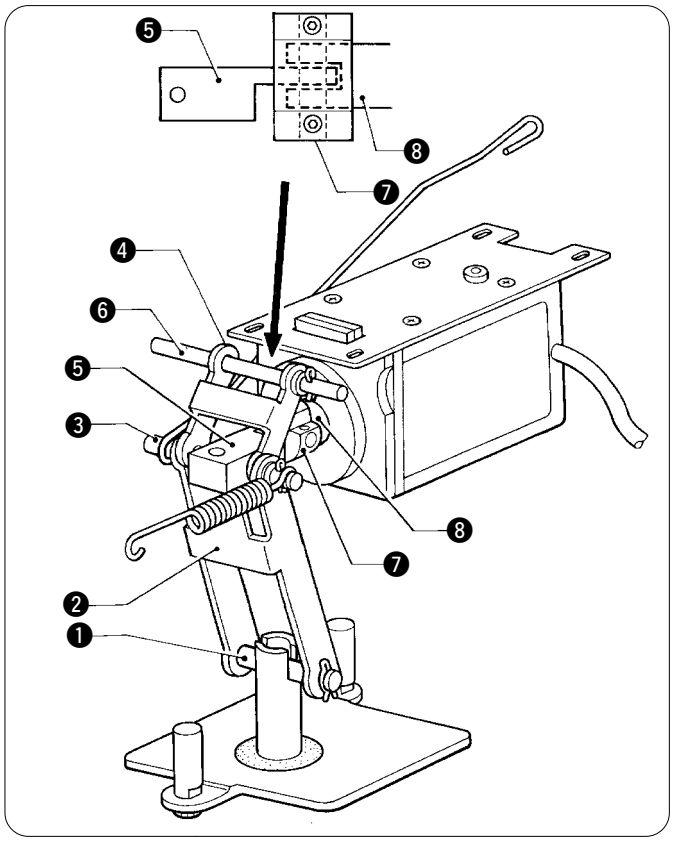
12. Turn the stepping solenoid ⓲ fully in the direction of the arrow. Move the lifter lever ❺ so that there is no clearance (0 mm) between work clamp lifter lever ⓳ and the presser bar clamp ⓴, remove the slack from the work clamp lifter wire ㉑, and tighten the bolt ㉒.

3. Work clamp lifter mechanism

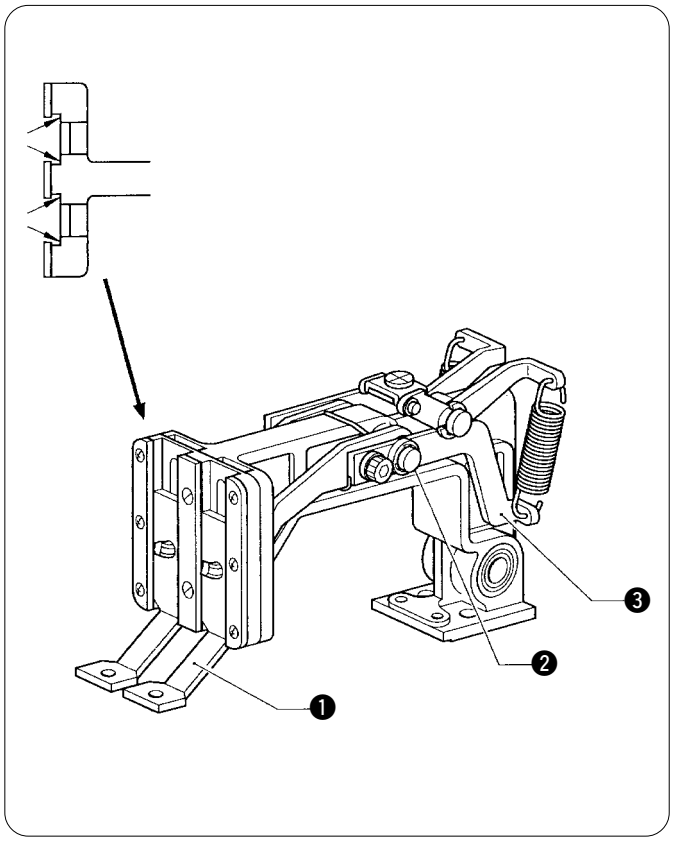


1. Attach the presser plate ❶ to the presser bar lifter lever rubber ❷, and insert them from the bottom of the arm. Insert the parts ❹ linked to the plunger ❸ from the top of the arm, and fit them on link shaft C ❺, link B ❻, and the presser plate ❶.
2. Fit the snap pins ❼ on both ends of link shaft C ❺.
3. Insert link shaft A ❽ into the machine, and pass it through the washer ❾ and link A ❿.
4. Fit the snap pins ⓫ on both sides of link shaft A ❽ and outside the washer ❾.
5. Attach the presser solenoid ⓬ to the top of the arm so as to cover the plunger ❸. Secure link shaft A ❽ using the set screw ⓮ so that link B ❻ is centered in the bush ⓭.
6. Slide the presser solenoid ⓯ until it has reached 19.0 mm from the end of the arm, where the plunger ❸ easily moves, and tighten the screw ⓰.
7. Attach the spring ⓱ to link shaft B ⓲ and the pin ⓳.
8. Hang the rod ⓴ on the shoulder screw ㉑, and insert the former into link shaft B ㉒, and secure it using the snap pins ㉓.
9. Attach the rubber cap ㉔.

Make sure that work clamp easily moves up and down, and apply grease to sliding portions to assemble parts.

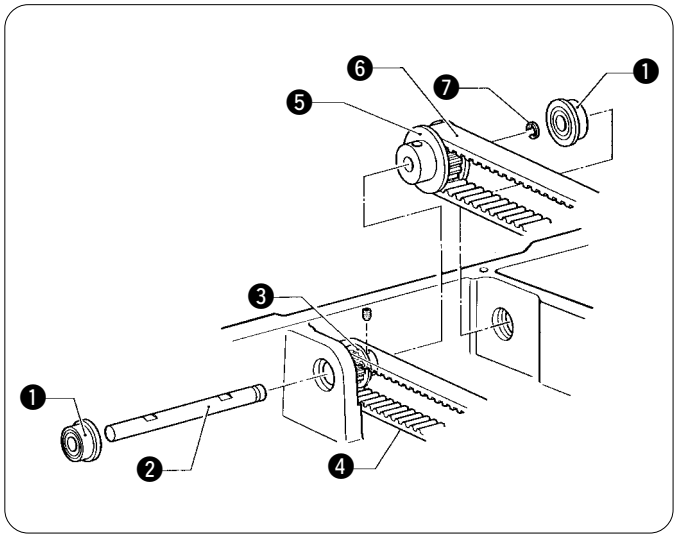


1. Sliding portions of link shaft C ❶ and link B ❷.
2. Sliding portions of link shaft B ❸, link B ❷, link A ❹, and link C ❺.
3. Sliding portions of link shaft A ❻ and link A ❹.
4. Sliding portions of link shaft D ❼, link C ❺, and plunger ❽.

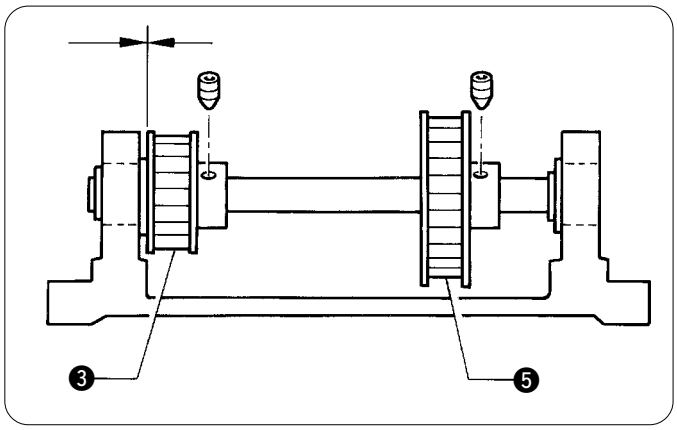


1. Sliding portion of the work clamp ❶ (Apply small amount of grease).
2. Sliding portions of the work clamp arm lever shaft ❷ and work clamp arm levers R and L ❸.

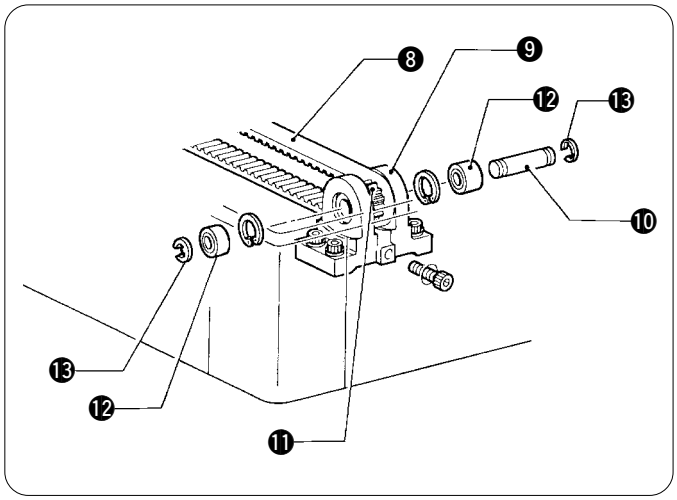
4. Feed mechanism (X axis) 311E



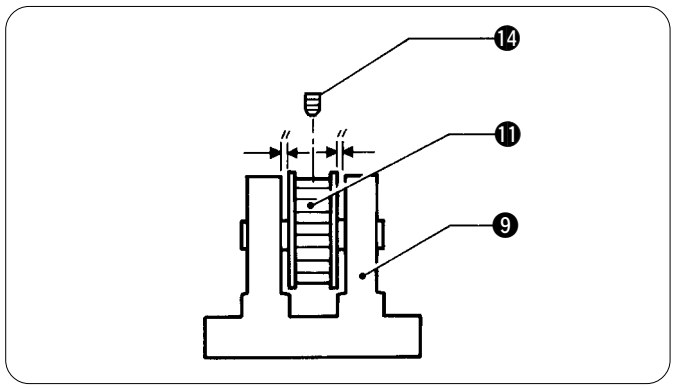
1. Fit the ball bearings ❶ on X-pulley bracket L, and pass the X-timing pulley shaft ❷ from the front of X-pulley bracket L through timing pulley A ❸, X-timing belt B311 ❹, X-timing pulley B326 ❺, and X-timing belt A326 ❻. Place the two retaining rings ❼ on both ends of the X-timing pulley shaft ❷ by pressing them against the ball bearings ❶, adjust timing pulley A ❸ so that there is no looseness in the X-timing pulley shaft ❷, and secure it using the set screws.



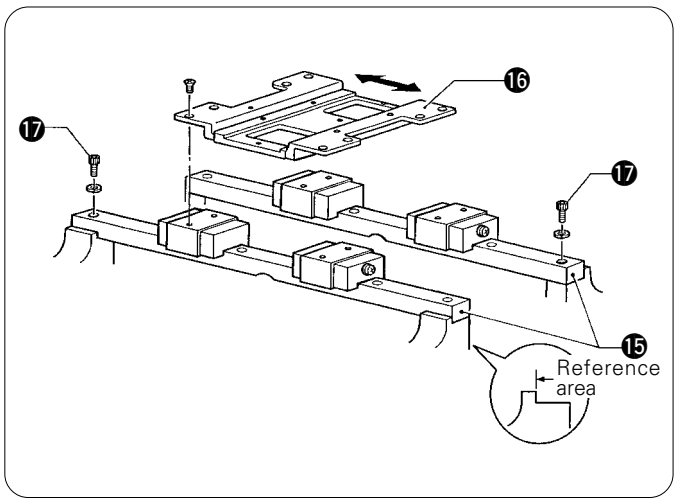
2. Secure X-timing pulley B326 ❺ on the screw flat using the set screw.



3. Loop the X-timing belt B ❽ around timing pulley (B) ⓫. Pass X-pulley shaft (B) ⓫ through timing pulley (B) ⓫, and the micro bearing ⓬. Secure them to the X-pulley base B ❾ using the retaining ring ⓭.



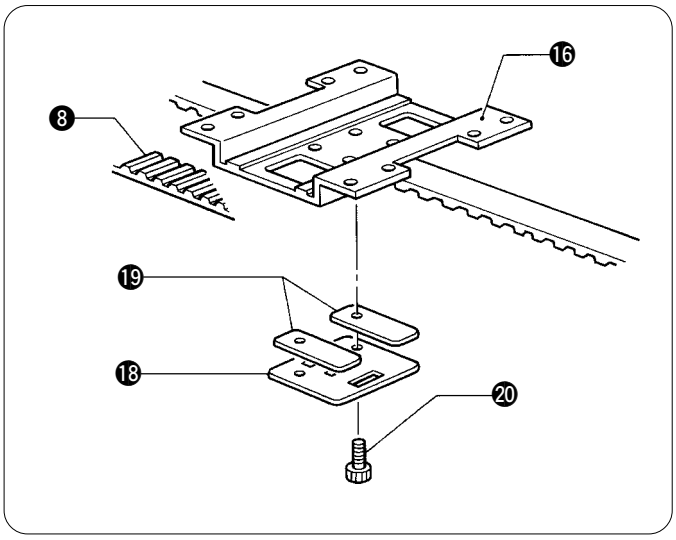
4. Place timing pulley (B) ⓫ at the middle of X-pulley base (B) ❾, then tighten the two set screws ⓮.



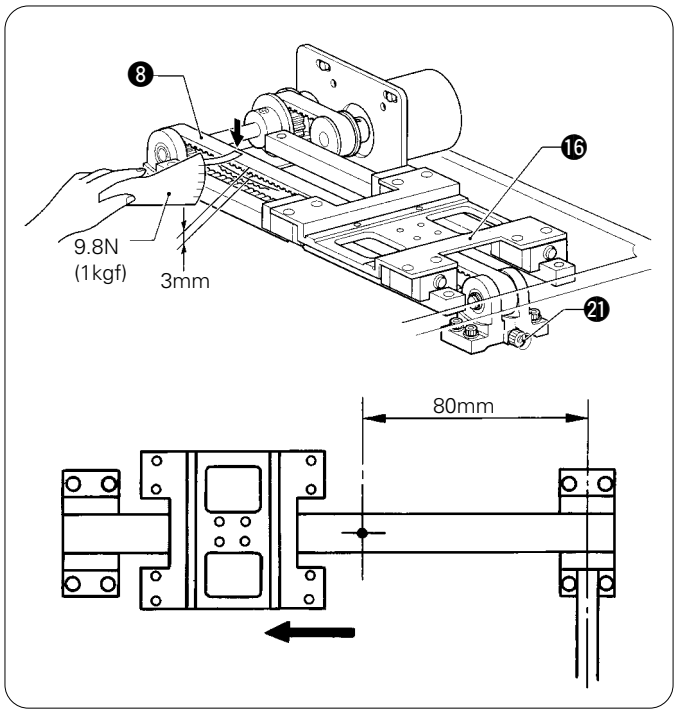
5. Attach the linear guide ⓯, the X-feed bracket ⓰, and the X-feed guide ⓱ to the bed using the three bolts ⓲.
   Note: Adjust the X-feed guide ⓱ so that the X-feed bracket ⓰ can easily move left or right.

Adjustment procedure

1. Position the front linear guide ⓳ in the reference area for installation on the front of the bed, and secure it using the six bolts ⓴ and six washers.
2. Attach the rear linear guide ㉑ to the rear of the bed using the five bolts ㉒ and five washers. Keep in mind that the linear guide can move easily.
3. Attach the X-feed bracket ⓰ to the linear guide ⓯ using the eight screws.
4. Adjust the rear linear guide ㉑ so that the X-feed bracket ⓰ can easily move left and right, and tighten the five bolts ㉒ on the rear linear guide.

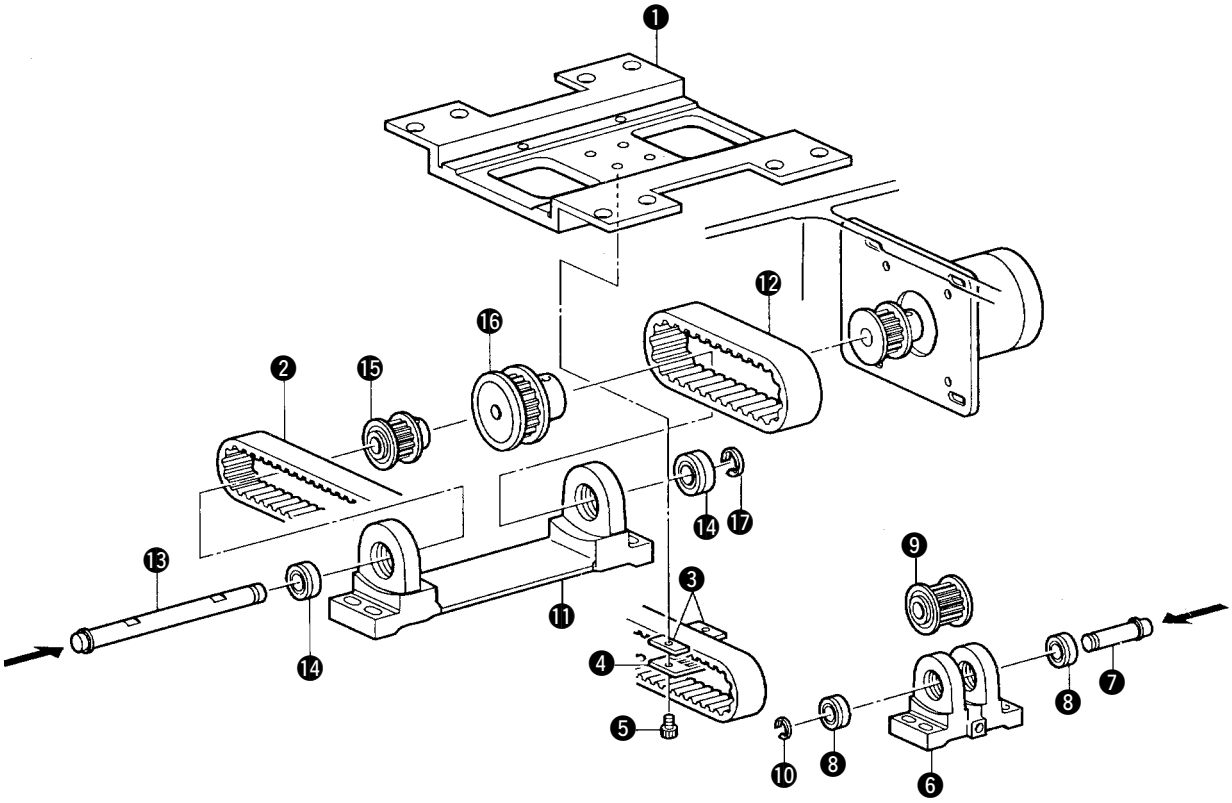


5. Place X-timing belt B ❽ between the two timing belt spacers ⓳ on the back of the X-feed bracket ⓰. Align a rectangular slot of the belt holder ⓲ with a tooth of X-timing belt B ❽. and secure them using the belt ⓴.



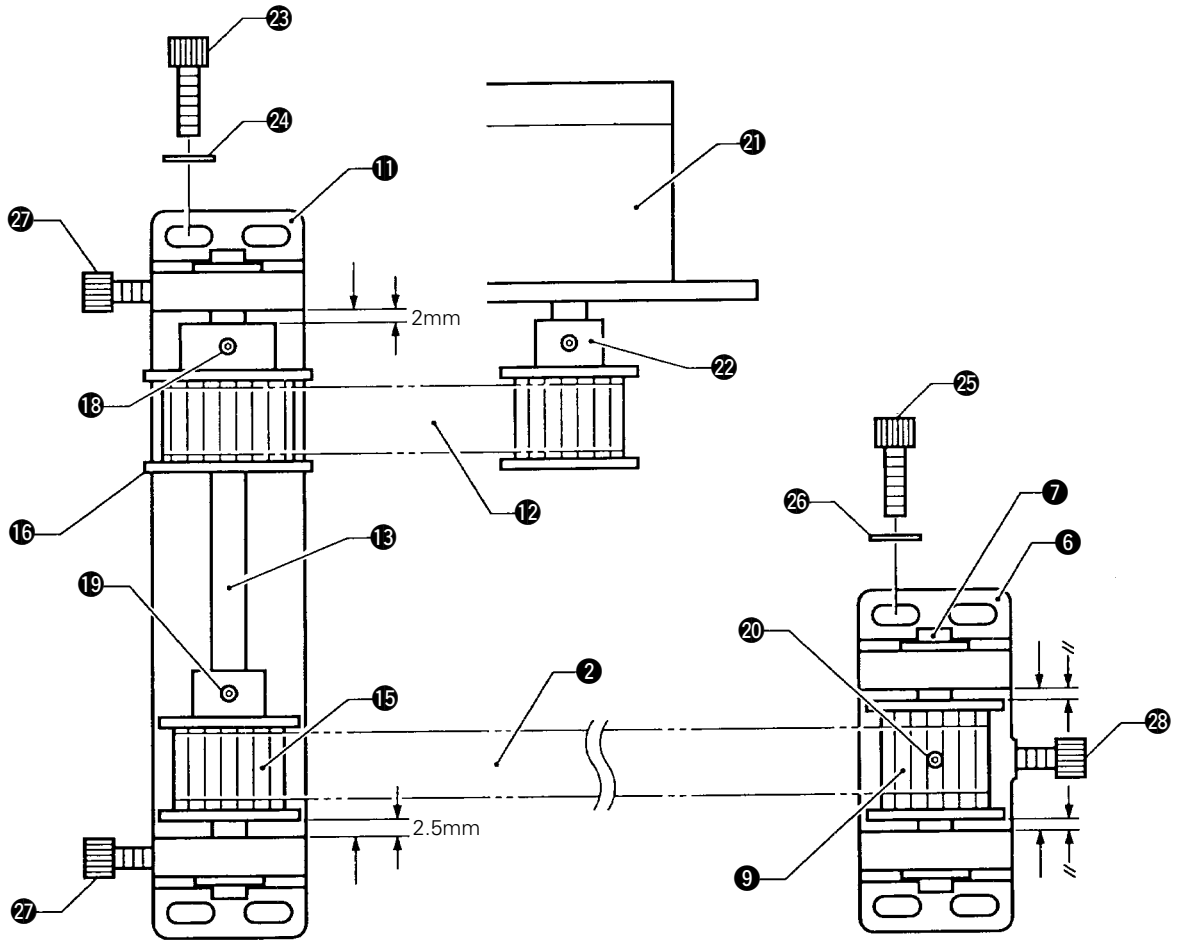
6. Move the X-feed bracket ⓰ to the left end and apply a load of 9.8N (1 kgf) to the center of the X-timing belt B ❽. Then adjust the X-timing belt B ❽ with the adjust screw ㉑ to produce a deflection of 3 mm.

Feed mechanism (X axis) 311EL, 326E



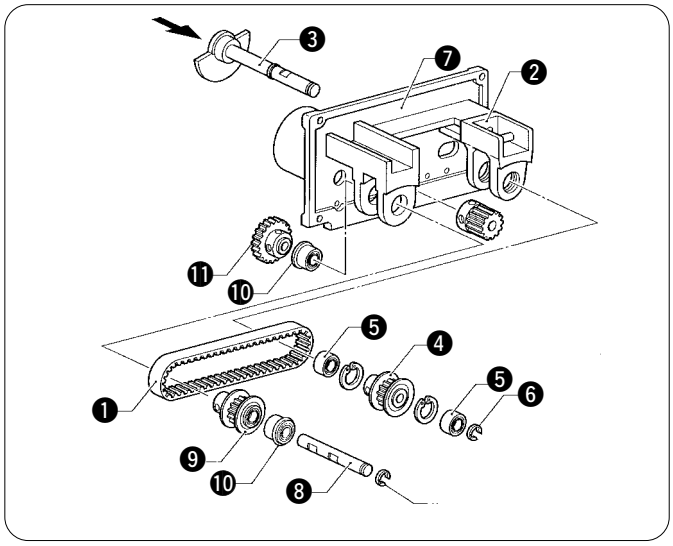
1. Place X-timing belt B326 ❷ between the two timing belt spacers ❸ on the back of the X-feed bracket ❶. Align a rectangular slot of the belt holder ❹ with a tooth of X-timing belt B326 ❷, and secure them using the bolt ❺.
2. Fit timing X-timing belt B326 ❷ in X-pulley bracket R ❻, pass X-pulley shaft R ❼ through the micro bearing ❽, timing pulley B ❾, and the micro bearing ❽, and attach the retaining ring ❿.
3. Place X-timing belt B326 ❷ and X-timing belt A326 ⓬ on X-pulley bracket L ⓫, pass the X-timing pulley shaft ⓭ through the micro bearing ⓮, timing pulley A ⓯, X-timing pulley B326 ⓰, and the micro bearing ⓮, and attach the retaining ring ⓱.

Feed mechanism (X axis) 311EL and 326E

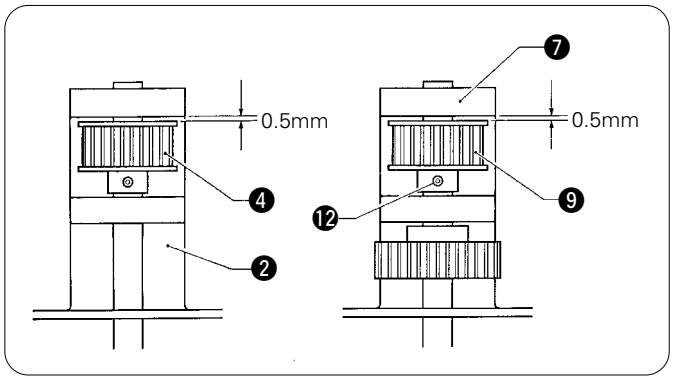


4. Position X-timing pulley B326 ⓰, which is attached to X-pulley bracket L ⓫ via the X-timing pulley shaft ⓭, so that there is a 2 mm clearance between the top of X-timing pulley B326 ⓰ and end A of X-pulley base L ⓫. Position timing pulley A ⓯ so that there is a 2.5 mm clearance between the bottom of timing pulley A ⓯ and end B of X-pulley base L ⓫. Then secure X-timing pulley B326 ⓰ and timing pulley A ⓯ to the X-timing pulley shaft ⓭ using the set screws ⓲ and ⓳.
5. Position timing pulley B ❾ attached to X-pulley bracket R ❻ so that clearances C and D are equal, then secure it to X-pulley shaft R ❼ using the set screw ⓴.
6. Loop X-timing belt A326 ⓬ around X-timing pulley A311 (A326) ㉒ of X-pulse motor ㉑ and X-timing pulley B326 ⓰. Temporarily attach X-pulley bracket L ⓫ to the bed using the bolt ㉓ and washer ㉔.
7. Loop X-timing belt B326 ❷ around timing pulley A ⓯ of X-pulley base L ⓫ and timing pulley B ❾ of X-pulley base R ❻. Temporarily attach X-pulley bracket R ❻ to the bed using the bolt ㉕ and washer ㉖.
8. Insert the bolt ㉗ that is used to adjust the tension of X-timing belt A326 ⓬ from the left side of the bed, into X-pulley bracket L ⓫.
9. Insert the bolt ㉘ that is used to adjust the tension of X-pulley belt B326 ❷ from the right side of the bed, into X-pulley bracket R ❻.

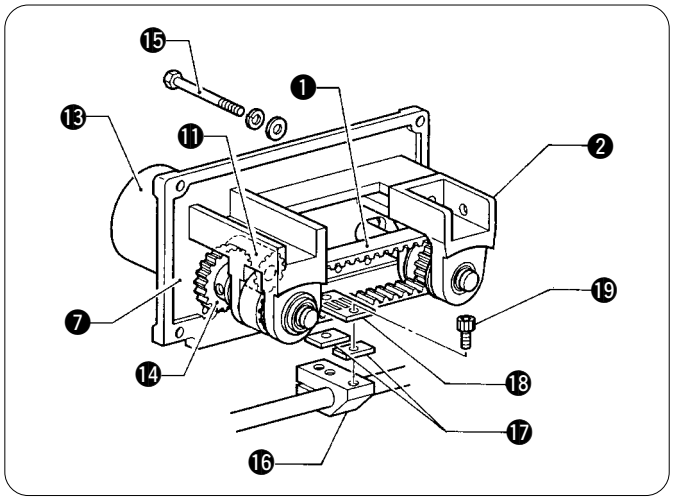
Feed mechanism (Y axis) 311E and 311EL



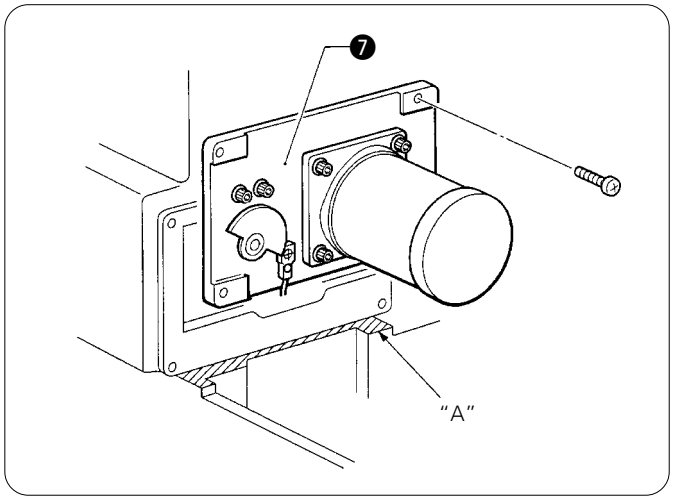
1. Loop the Y-timing belt ❶ around the Y-driving pulse motor bracket ❷, and pass Y-pulley shaft B ❸ through the Y-driving pulse motor bracket ❷, timing pulley A ❹, and the micro bearing ❺. Attach the retaining ring ❻ to hold them.
2. Insert Y-pulley shaft A ❽ into the Y-driving pulse motor base ❼, passing it through timing pulley A ❾, the ball bearing ❿, and the idle gear ⓫. Position the idle gear ⓫ so that there is no end play with it.



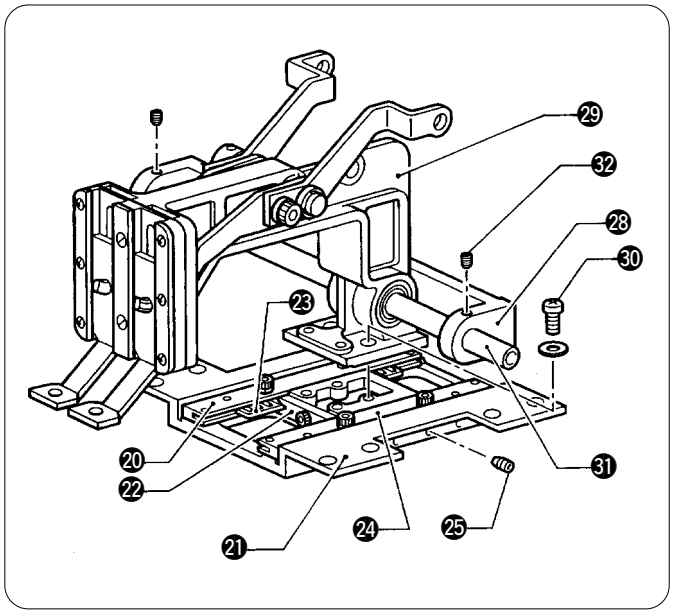
3. Secure timing pulley A ❹ with a clearance of 0.5 mm from the Y-driving pulse motor bracket ❷ left.
4. Secure timing pulley A ❾ with the set screw ⓬ to provide a 0.5 mm clearance with the Y-driving pulse motor base ❼.



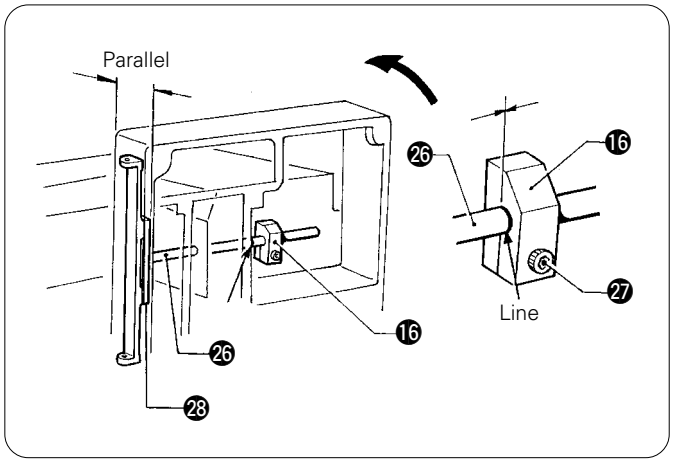
5. Lightly pressing the driving gear ⓮ of the Y-pulse motor ⓭ against the idle gear ⓫, attach the Y-pulse motor ⓭ to the Y-driving pulse motor base ❼.
   Note: Make sure that there is no backlash between the idle gear ⓫ and the driving gear ⓮.
6. Temporarily attach the Y-driving pulse motor bracket ❷ to the Y-driving pulse motor base ❼ using the bolts ⓯.
7. Sandwich the timing belt spacers ⓱ between the Y-timing belt ❶ and the Y-driving shaft holder ⓰, place the belt holder ⓲ on the Y-timing belt ❶, and secure the Y-timing belt ❶ to the Y-driving shaft holder ⓰.



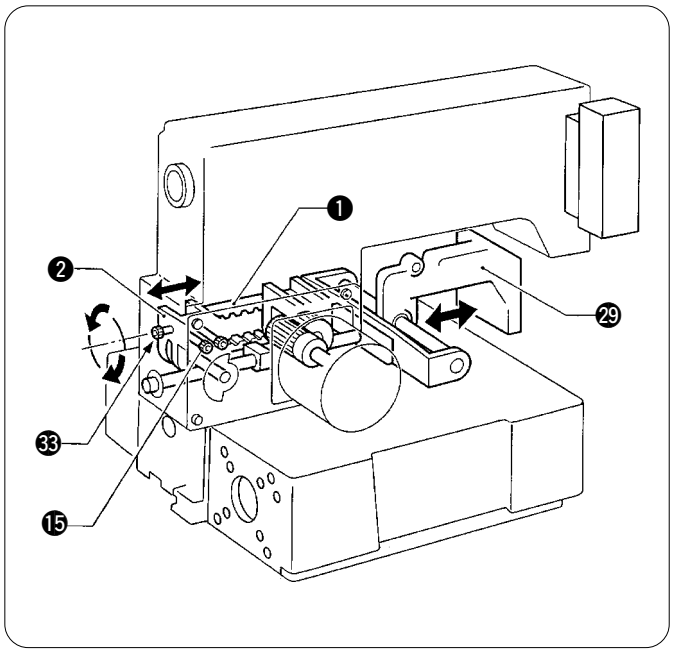
8. Lightly pressing the assembled Y-driving pulse motor base ❼ against end A of the machine, secure it with the screws.



9. Attach the Y-axis feed guide ⓴ to the left of the X-feed bracket ㉑, pressing the former against the latter.
10. Attach the Y-axis feed bracket ㉒, the cross roller ㉓, and the right of the Y-axis feed guide ㉔ right of the to the X-feed bracket ㉑.
    Note: When attaching the Y-axis feed guide ㉔ to the right of the X-feed bracket ㉑, lightly push it to the left so that there is no looseness in the Y-axis feed guide ㉒, and tighten the set screw ㉕.

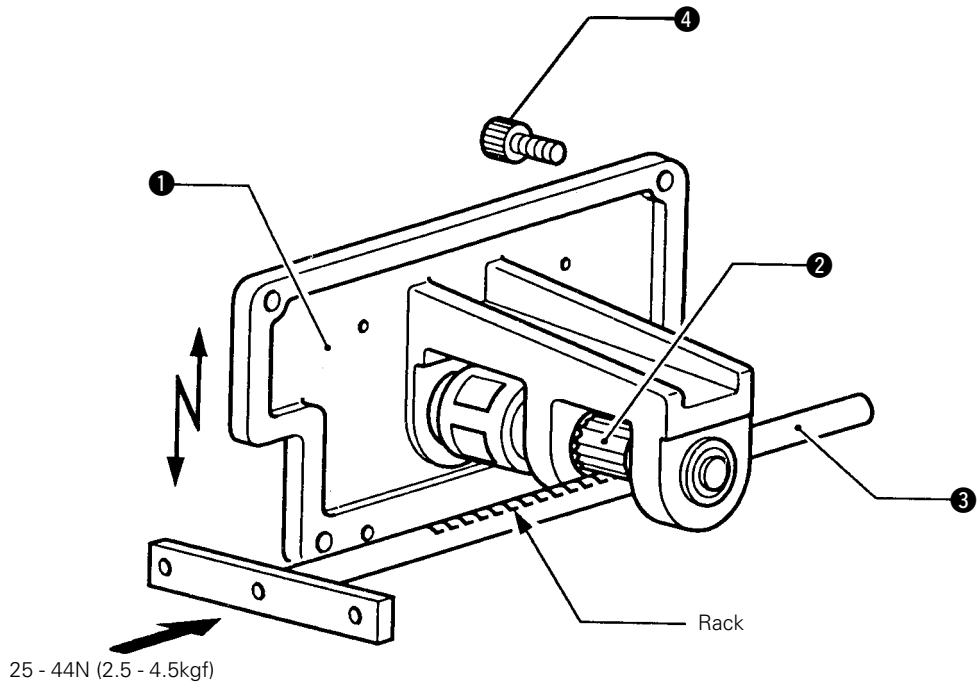


11. Tilt the machine head until it stops.
12. Pass the Y-driving shaft ㉖ through the Y-driving shaft holder ⑯.
    Align the reference line on the Y-driving shaft ㉖ with the end of the Y-driving shaft holder ⑯.
    Then, tighten the bolt ㉗.
    Note: Be sure to make the X-feed shaft support ㉘ parallel to the top of the bed to prevent timing belt (Y) ❶ from being damaged or cut.
13. Raise the machine head.

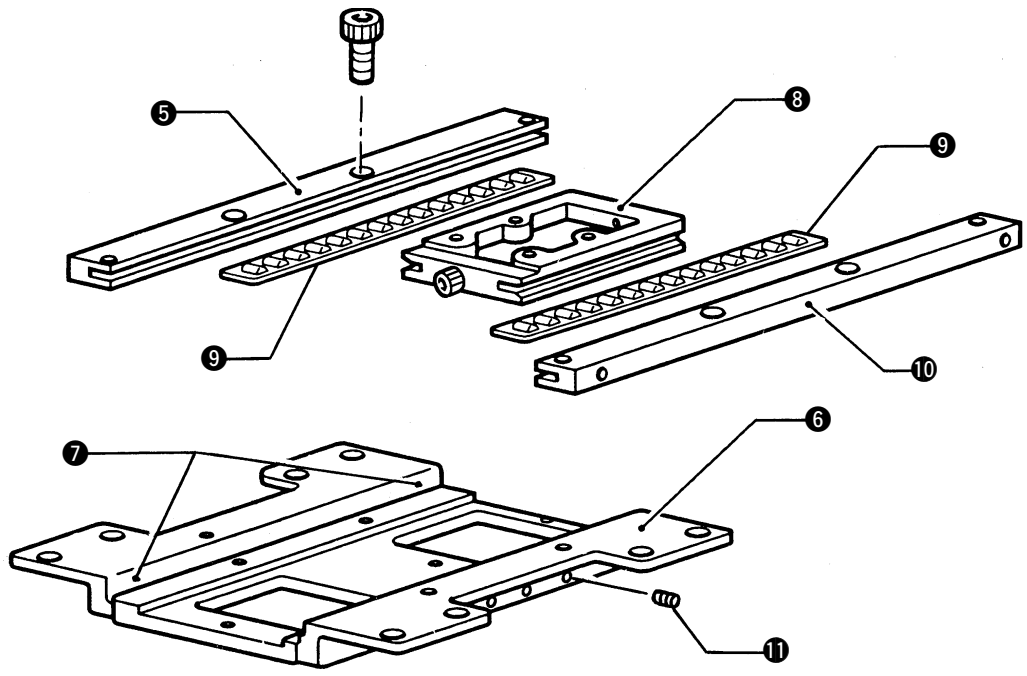


14. Temporarily attach the presser arm ㉙ to the Y-feed bracket ㉒ with the screw ㉚.
15. Pass the X-feed shaft ㉛ through the X-feed shaft support ㉘ and the presser arm ㉙, then secure it with the set screw ㉜.
16. Loosen the bolt ⑮ of the driving P motor bracket ❷. When the power is turned off, adjust the driving P motor bracket ❷ with the adjust bolt ⑮ so that timing belt (Y) ❶ is not slack and the presser arm ㉙ moves smoothly forwards and backwards. Then power on the machine and adjust the tension of timing belt (Y) ❶ with the adjust bolt ㉝ so that there is no looseness of the presser arm ㉙.
17. After adjustment, tighten the bolt ⑮ of the driving P motor bracket ❷.

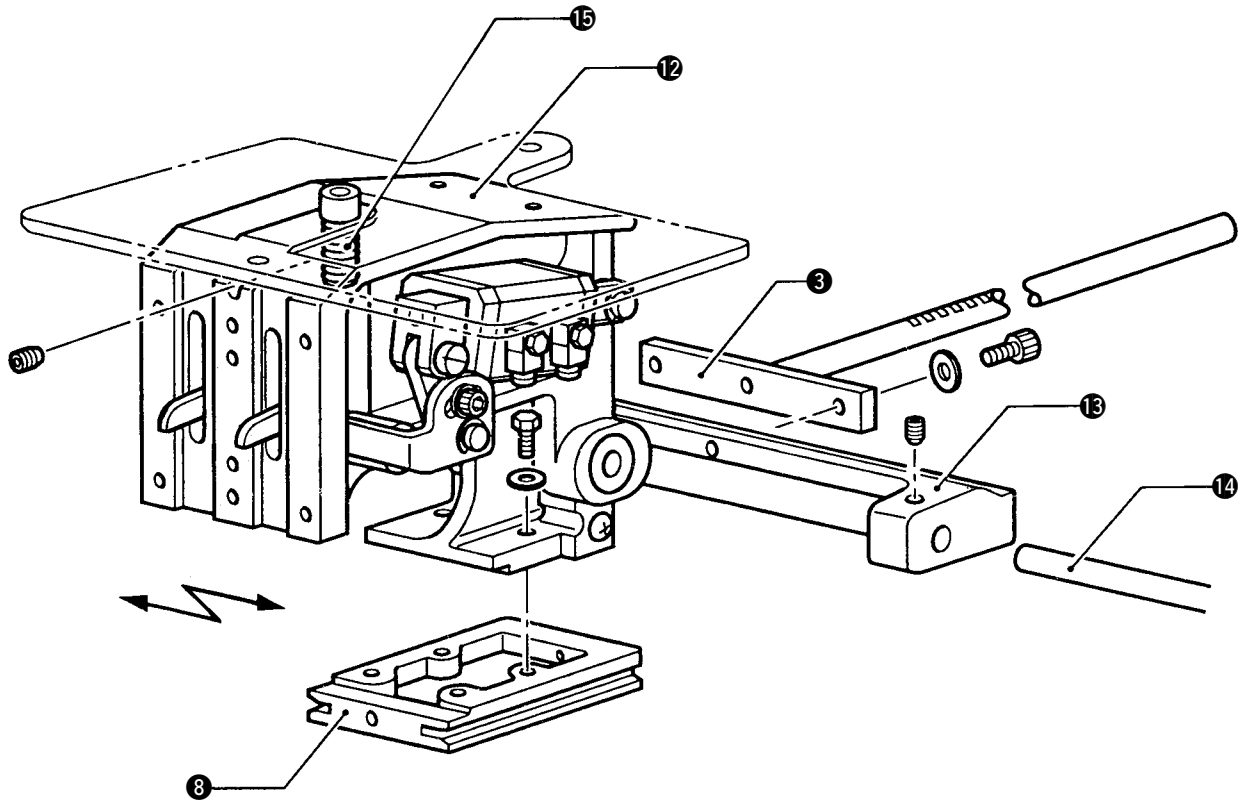
Feed mechanism (Y axis) 326E



1. Engage the driving gear ❷ embedded in the Y-feed pulse motor bracket ❶ with the rack of the Y-driving shaft ❸.
2. The engagement load between the driving gear ❷ embedded in the Y-feed pulse motor bracket ❶ with the rack of the Y-driving shaft ❸ should be 25 - 44 N (2.5 - 4.5 kgf) or less (so that the load will not fluctuate sharply). Move the Y-feed pulse motor bracket ❶ vertically to adjust the load, and secure it using the bolts ❹.

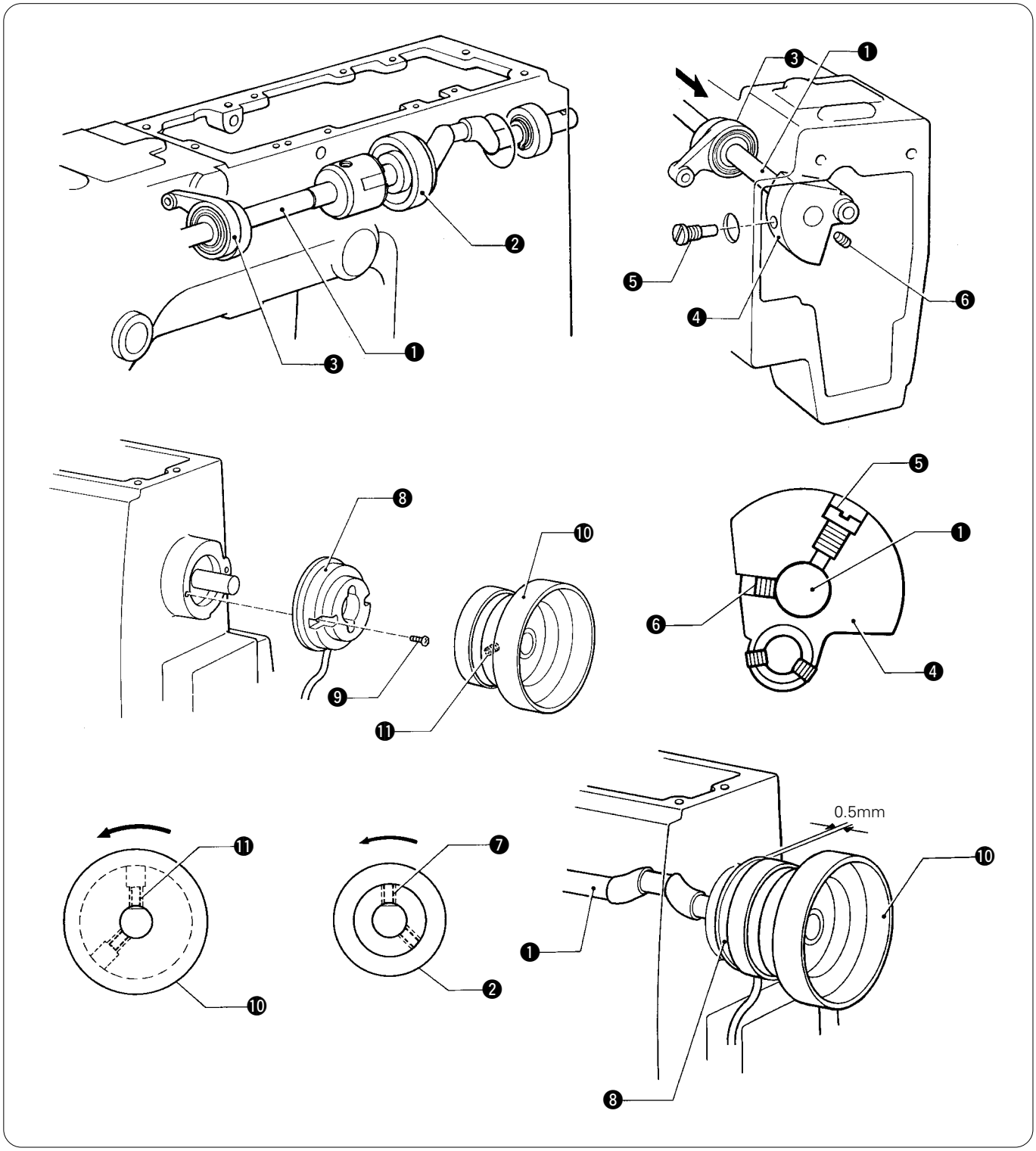


3. Attach the Y-axis feed guide ❺ to the left of the X-feed bracket ❻, pressing the former against ❼ the latter.
4. Attach the Y-feed bracket ❽, the cross roller ❾, and the right Y-feed guide ❿.
   When attaching the right Y-feed guide ❿ to the right of the X-feed bracket ❻, lightly pushing it to the left so that there is no looseness in the Y-feed bracket ❽, and tighten the bolt and set screw ⓫.



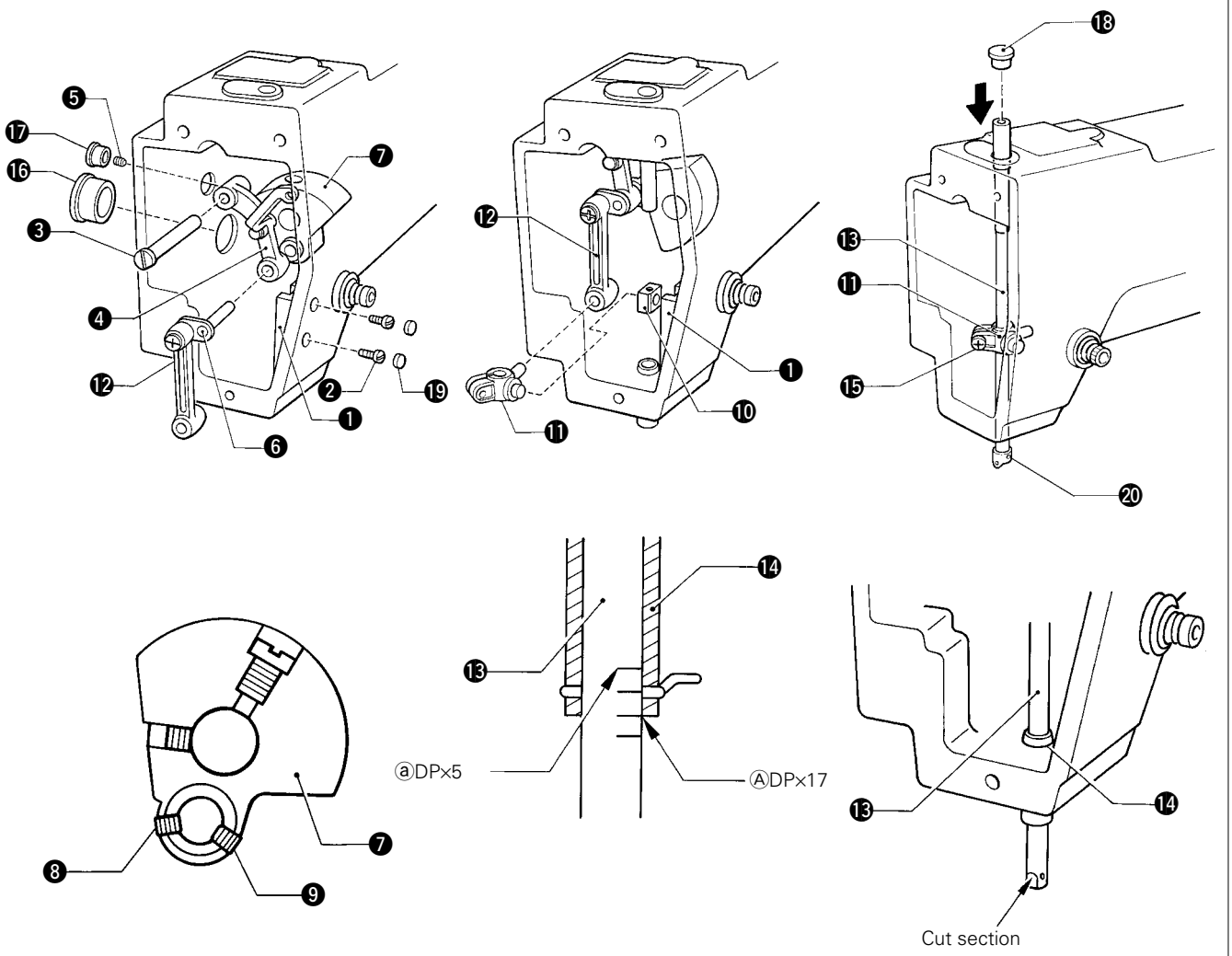
5. Temporarily attach the work clamp Arm ⓬ to the Y-feed bracket ❽ using the bolts and washers.
6. Temporarily attach the X-feed shaft support ⓭ to the Y-driving shaft ❸ using the bolts and washers.
7. Pass the X-feed shaft ⓮ through the X-feed shaft support ⓭ and the work clamp Arm ⓬, and secure the X-feed shaft support ⓭ and the X-feed shaft ⓮ using the set screws.
8. Move the work clamp Arm ⓬ left and right to make sure that there is no inclination in X-feed shaft ⓮. Then securely tighten the bolts of Y-driving shaft ❸ and the X-feed shaft support ⓭.
9. Remove the set screw of the slider support shaft ⓯ from the front of the work clamp Arm ⓬.

6. Upper shaft mechanism



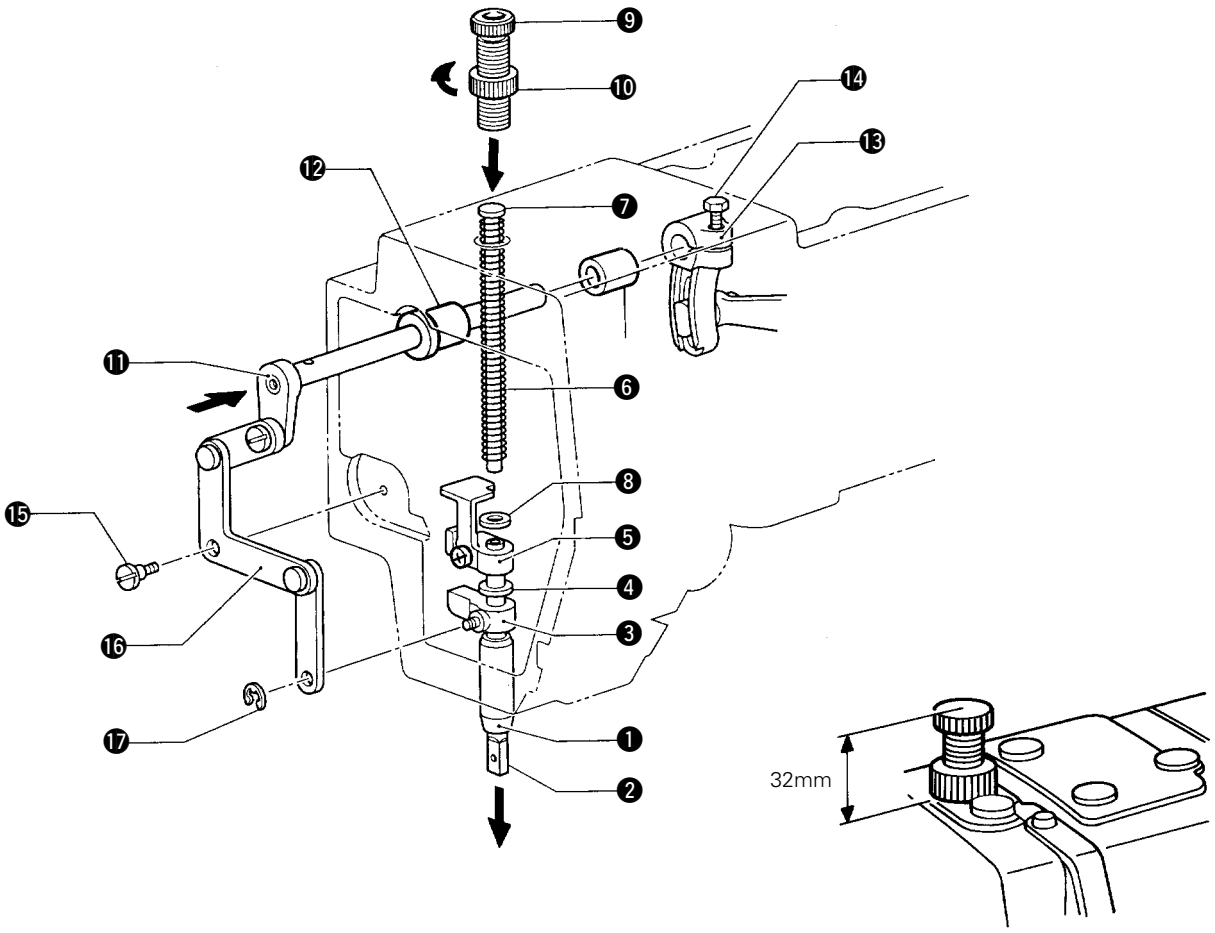
1. Insert the upper shaft ❶ from the rear of the machine, and place the thread trimmer cam ❷ and the stepping work clamp connecting rod ❸ on the shaft.
   * Apply adhesive (equivalent of Three Bond 1401) around the area which the bearing in the machine goes into. Also, apply grease to grooves on the thread trimmer cam ❷.
2. Pass the thread take-up crank ❹ from the face plate side over the upper shaft ❶, and tighten the screw ❺ and the set screw ❻.
3. Place the upper shaft bush between the thread take-up crank ❹ and the stepping work clamp connecting rod ❸, and secure the upper shaft ❶ so that there is no looseness. (At this time, do not securely tighten the set screw of the stepping work clamp conncting rod ❸.)
4. Press the thread trimmer conncting rod ❷ against the crank of the upper shaft ❶. Adjust the set screw ❼ that comes first when rotating to the screw flat, and tighten it.
5. Attach they synchronizer ❽ to the machine using the screw ❾.
6. Attach the pulley ❿ leaving a 0.5 mm clearance from the protrusion of the synchronizer ❽, tighten the set screw ⓫ that comes later when rotating to the screw flat.

7. Needle bar mechanism

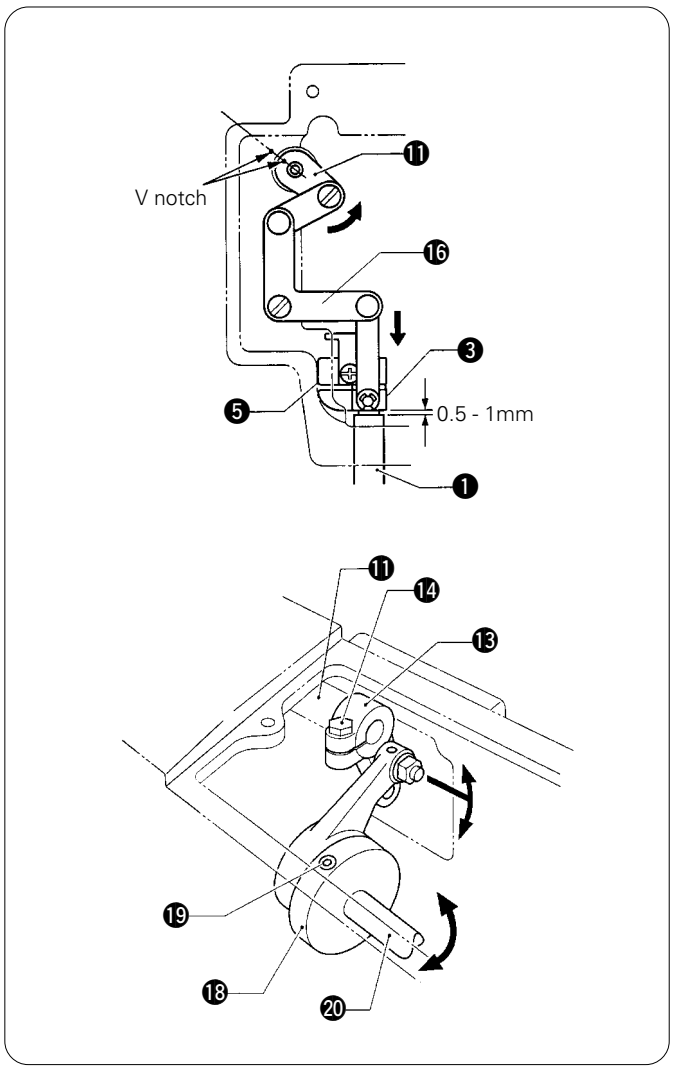


1. Temporarily tighten the screw ❷ of the needle bar guide ❶.
2. Pass the thread take-up support stud ❸ through the thread take-up assembly ❹, lightly press the former, and secure them using the set screw ❺.
3. Pass the needle bar crank ❻ through the thread take-up assembly ❹ and the counter crank ❼, adjust the set screw ❽ to the screw flat, and tighten the set screws ❽ and ❾.
4. Fit the chamfering side of the needle bar guide slide block ❿ into the groove on the needle bar guide ❶, and insert the shafts of the needle bar clamp ⓫ into the needle bar connecting rod ⓬ and the needle bar guide slide block ❿, as shown in the figure.
5. Insert the needle bar ⓭ from the top of the machine into the needle bar clamp ⓫.
6. Turn the pulley to set the needle bar ⓭ at its lowest position. Move the needle bar vertically so as to align the second lowest reference line Ⓐ (for using needle DP × 17) or the highest reference line ⓐ (for using needle DP × 5) on the needle bar ⓭ with the lower end of needle bar bush (D) ⓮. Tighten the screw ⓯ with the cut section of the needle bar facing the front.
7. Find the position of the needle bar guide ❶ so that the pulley rotates easily, and tighten the screw ❷.
8. Attach the oil cap ⓰ and the rubber caps ⓱, ⓲, and ⓳.
9. Fit the needle bar thread guide ⓴ on the needle bar ⓭.

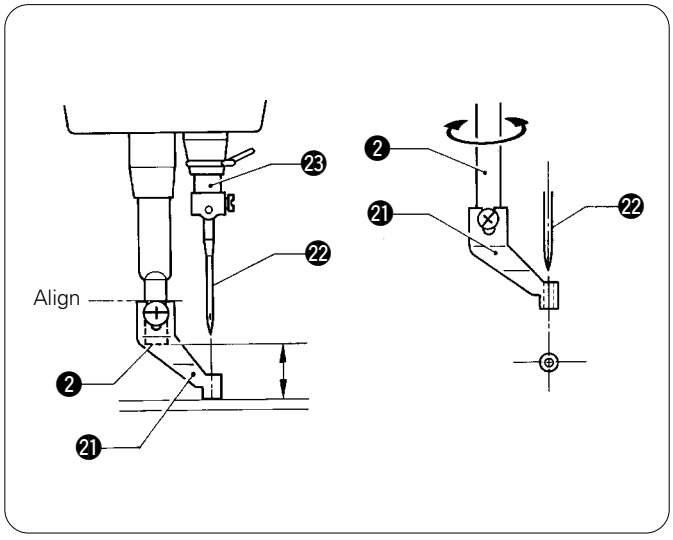
8. Presser foot mechanism



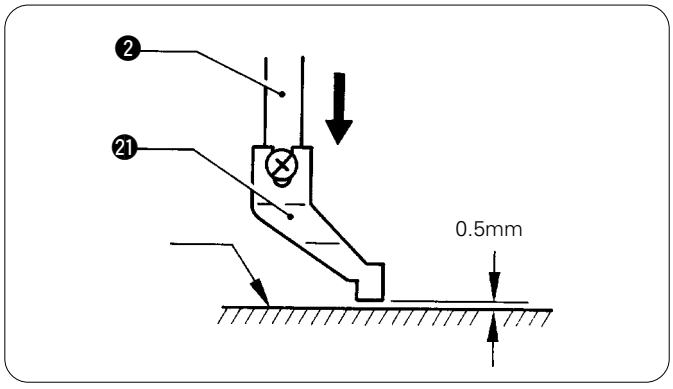
1. Insert the presser bar ❷ into the presser bar bush ❶. Pass the presser bar lifter ❸, the cushion ❹, and the needle bar clamp ❺ through the presser bar ❷ in that order.
2. Secure the needle bar clamp ❺ with the screw.
3. Insert the spring ❻ and the spring guide ❼ from the top of the arm, pass the spring guide ❼ through the washer ❽ and the presser bar ❷, and attach the presser adjusting screw ❾.
   Note: Position the presser adjusting screw ❾ using the presser adjusting nut ❿ so that there is approx. 32 mm from the top of the presser adjusting screw ❾ to the top of the machine.
4. Pass stepping work clamp arm F ⓫ through spreader shaft bushes (L) and (R) ⓬, then insert it into stepping work clamp arm R ⓭.
5. Attach the stepping link assy ⓰ to the arm using the shoulder screw ⓯, and to the presser bar lifter ❸ using the retaining ring ⓱.



6. Turn the pulley to align the needle bar with the shuttle hook. At this time, turn the stepping work clamp connecting rod ⓲ to turn stepping work clamp arm F ⓫ in the direction of the arrow and move the stepping link assy ⓰ in the direction of the arrow. When the presser foot is at the lowest position, secure the stepping work clamp connecting rod ⓲ to the upper shaft ⓴ using the set screw ⓳.
   Adjust the lift stroke of presser foot A to 3-5 mm, and 5-8 mm. When the clearance between the presser bar lifter ❸ and the presser bar bush ❶ is 0.5 - 1 mm, tighten the bolt ⓮ of stepping work clamp arm R ⓭. (At this time, the match mark of stepping work clamp arm F ⓫ will be almost aligned with that of arm.)
   Note: Make sure that stepping work clamp arm F ⓾ has no end play.

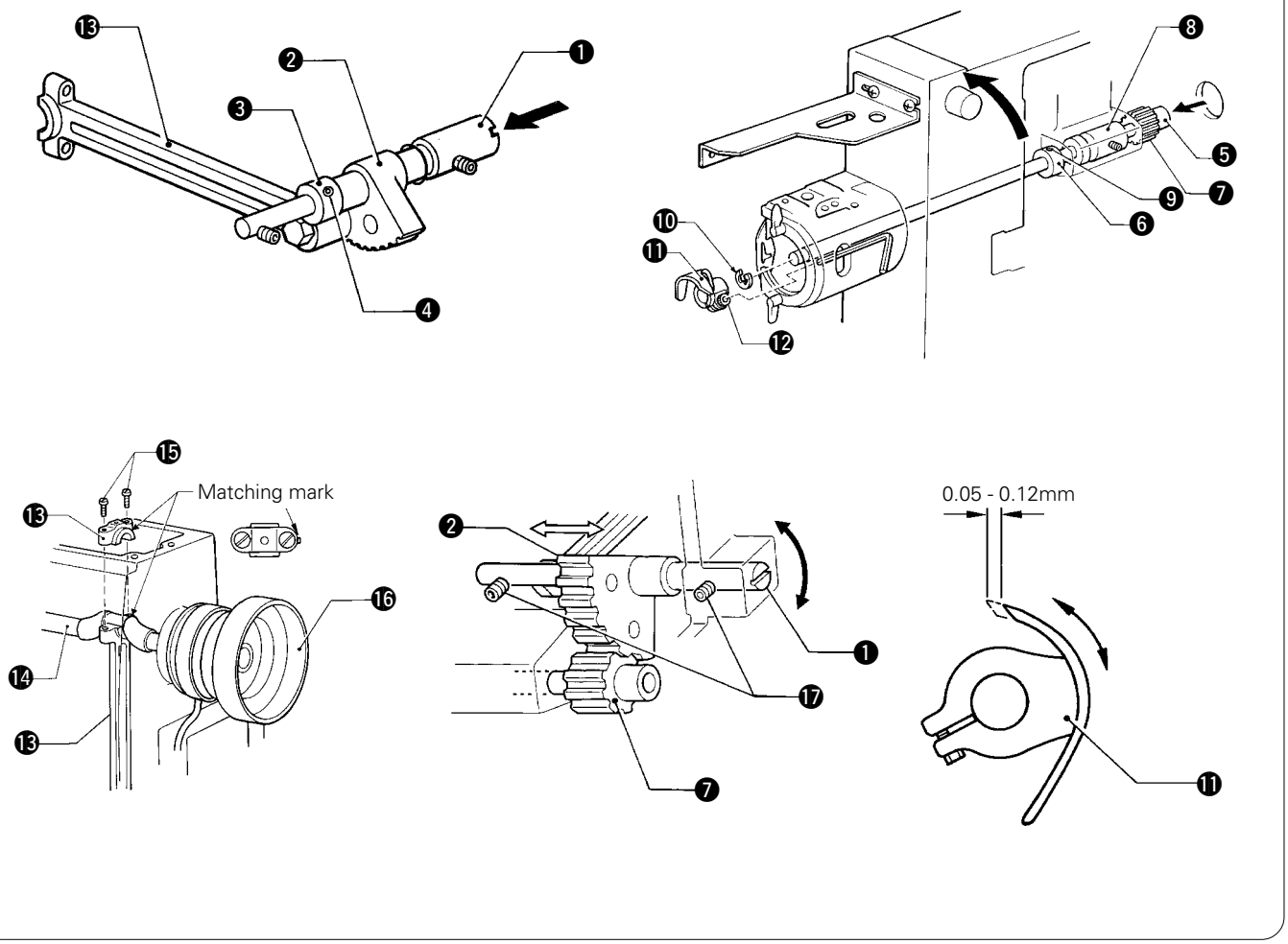


7. Secure the needle bar clamp ❺ using the screw so that when the presser bar ❷ is at the lowest position. The distance between the bottom of the presser bar ❷ and the top of the needle plate should be 23 mm. (22 mm for 311EL.)
   Attach the presser foot ㉑ to the presser bar ❷ so that the top of the presser foot ㉑ is aligned with the top of the screw that holds the presser foot ㉒.
8. Attach the needle ㉒ to the needle bar ㉓.
9. Turn the pulley to insert the needle ㉒ into the hole of the presser foot ㉑. Turn the presser bar ❷ so that the needle ㉒ is in the center of the hole of the presser foot ㉑, and tighten the screw of the needle bar clamp ❺.



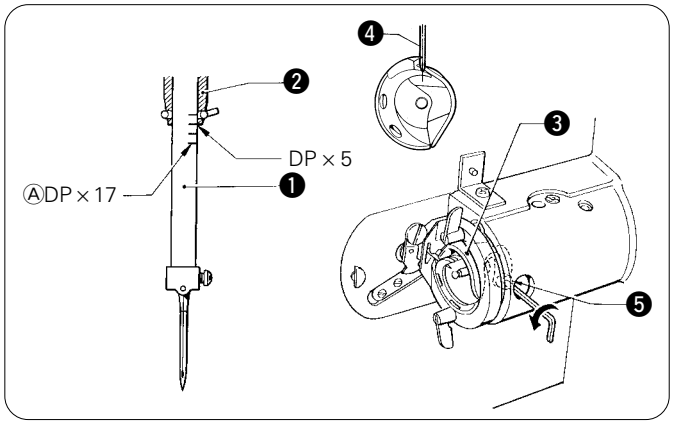
10. Turn the pulley to set the presser bar ❷ at its lowest position. Adjust the height of the presser foot ㉑ so that there is a 0.5 mm clearance from the top of the material to be sewn.

9. Lower shaft mechanism (1)

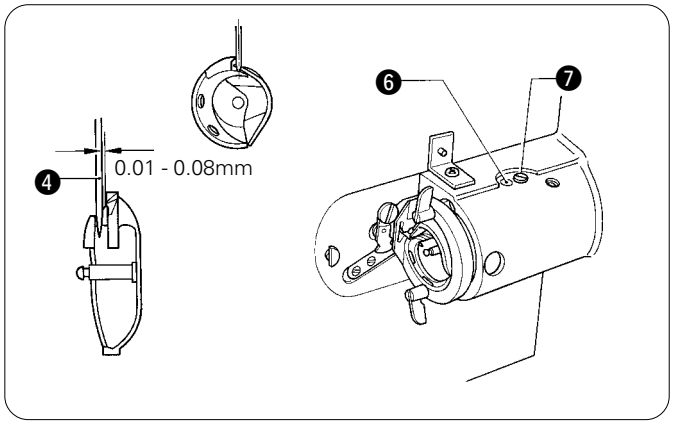


1. Tilt the machine head until it stops.
2. Insert the rock gear shaft ❶ from the rear of the machine, pass the rock gear ❷, the set screw collar ❸ over the shaft, bring them close together without any clearance, and tighten the set screw ❹.
3. Insert the lower shaft ❺ from the rear of the machine, pass the set screw collar ❻ over it, and engage the lower shaft gear ❼ with the rock gear ❷.
4. Sandwich the lower shaft bush ❽ between the lower shaft gear ❼ and the set screw collar ❻ without any clearance, and tighten the set screw ❾.
5. Fit the retaining ring ❿ on the lower shaft ❺, press the driver ⓫ against the retaining ring ❿, and tighten the bolt ⓬.
6. Return the machine head to its original position.
7. Fit the crank rod ⓭ over the crank of the upper shaft ⓮, align the matching mark of the crank rod ⓭ with that of the upper shaft ⓮, and tighten the screw ⓯.
8. Tilt the machine head until it stops.
9. Turn the pulley ⓰ to move the rock gear ❷ right and left until the pulley rotates easily. Turn the rock gear shaft ❶ to allow 0.05 - 0.12 mm play of the driver ⓫. Then tighten the set screw ⓱.
10. Return the machine head to its original position.

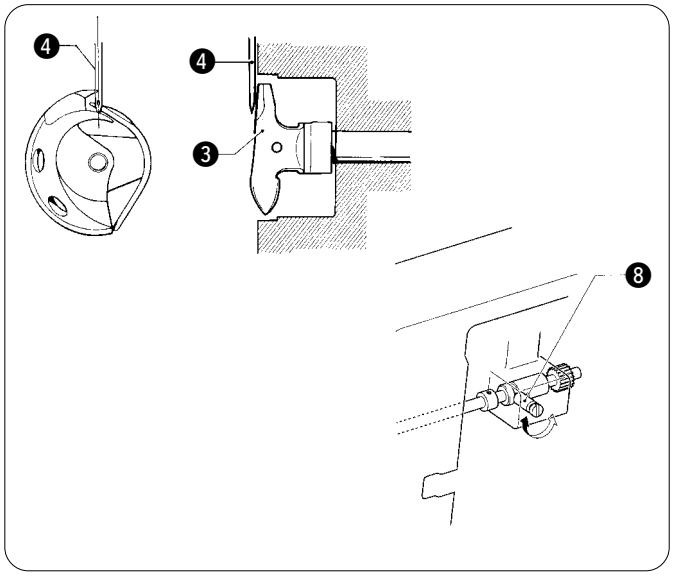
10. Lower shaft (Rotary hook) (2)



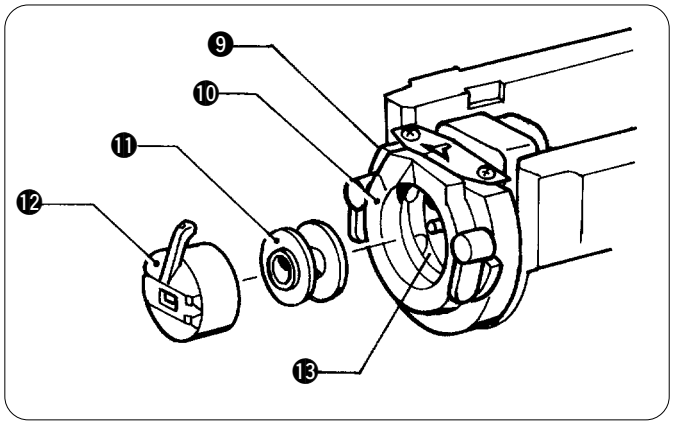
1. Fit the inner rotary hook in the large shuttle hook.
2. Turn the pulley to raise the needle bar from its lowest position until the second highest reference line on the needle bar ❶ aligns with the end of needle bar bush (D) ❷. Turn the shuttle driver ❸ so that the inner rotary hook point is aligned with the center of needle ❹, then tighten the bolt ❺.



3. Turn the pulley to align the inner rotary hook point with the center of the needle. Loosen the set screw ❻ so that the clearance between the needle ❹ and the inner rotary hook point is 0.01 - 0.08 mm, then rotate the shuttle hook adjust stud ❼ to adjust.

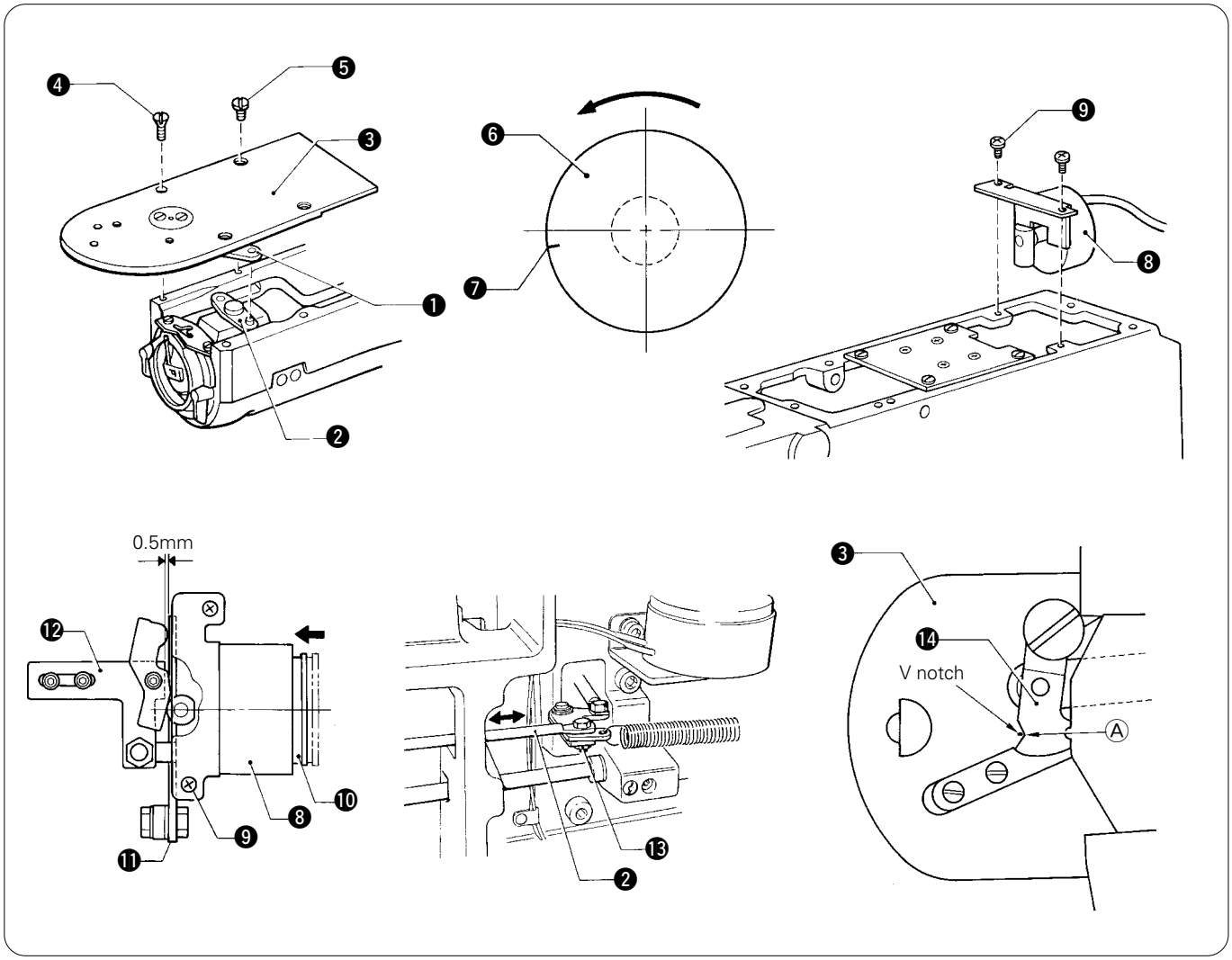


4. Turn the pulley to align the inner rotary hook point with the center of the needle ❹.
   Loosen the set screw and adjust the shuttle hook adjust stud ❽ so that the needle ❹ lightly contacts the needle receiver of the shuttle driver ❸.
5. Remove the needle ❹.



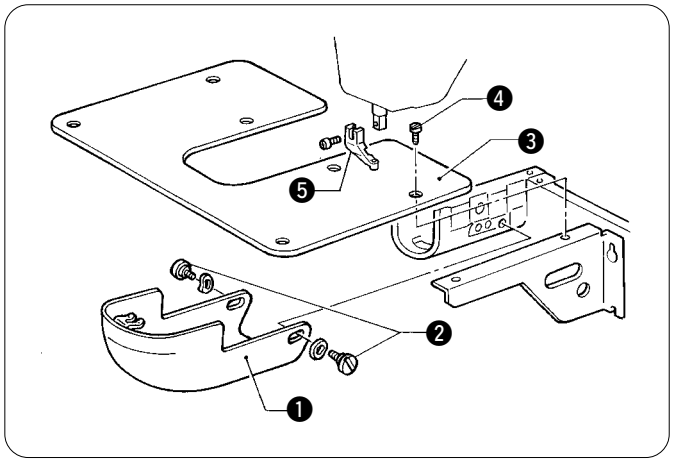
6. Attach the large shuttle hook ❾ to the large shuttle hook body ❿.
7. Insert the bobbin ⓫ into the bobbin case ⓬, then attach them to the inner rotary hook ⓭.

11. Thread trimmer mechanism

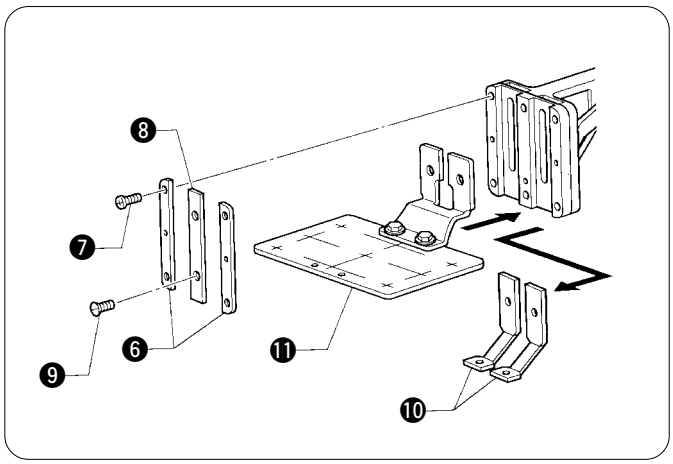


1. Fit the hole of the thread trimmer connecting rod ❶ over the pin of the connecting rod lever ❷. Secure the needle plate ❸ using the screws ❹ and ❺ so that the hole on the needle plate is centered at the needle position.
2. Turn the pulley ❻ until the mark ❼ has slightly passed over the horizontal line.
   (Adjust the position of the pulley to the position where the cam gooves on the thread trimmer cam do not fluctuate.)
3. Attach the thread trimming solenoid ❽ using the screw ❾. At this time, the plunger ❿ of the thread trimming solenoid ❽ must be fully pressed (the same status as when the thread trimming solenoid ❽ is turned on), and a 0.5 mm clearance must be provided between the thread trimmer driving lever ⓫ and the driving lever stopper ⓬.
4. Make sure that the thread trimmer driving lever ⓫ moves smoothly when the plunger ❿ is pressed and released.
5. Tilt the machine head until it stops.
6. Loosen the nut ⓭, move the connecting rod lever ❷ to the left and right to align the V notch Ⓐ of the movable knife ⓮ with the mark on the needle plate ❸, and tighten the nut ⓭.
7. Return the machine head to its original position.

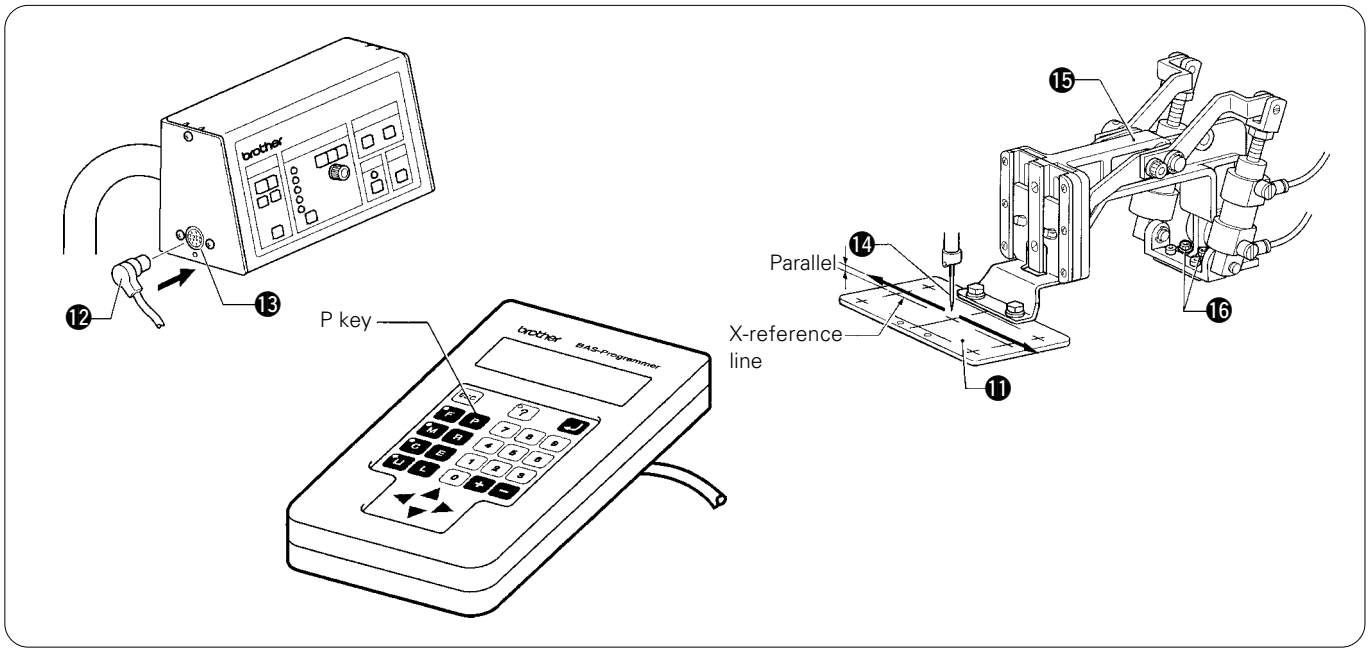
12. Feed guide mechanism (Home position adjustment: X) 311E, 311EL, and 326E



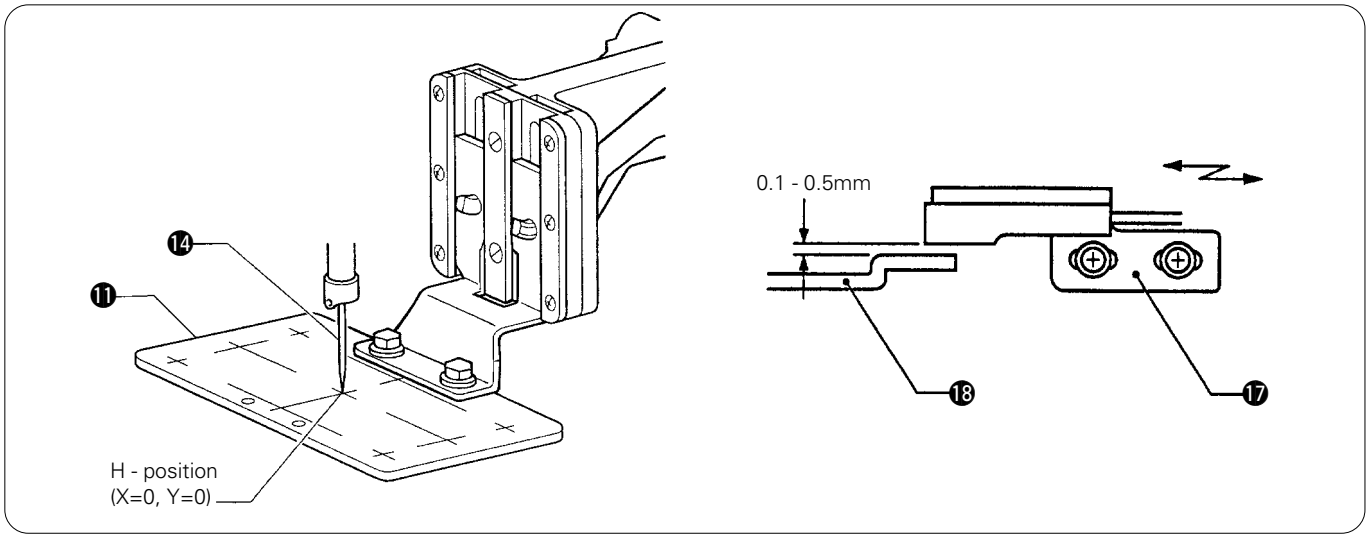
1. Secure the large shuttle hook cover ❶ with the two shoulder screws ❷.
2. Secure the needle sub plate ❸ with the screw ❹.
3. Remove the presser foot ❺.



4. Remove the screws ❼, tlat screws ❾ and the work clamp guide brackets A ❻, B ❽ and replace the work clamp ❿ with the H-position standard plate ⓫.
   Note: Securely attach the H-position standard plate ⓫ using the work clamp guide brackets A ❻, B ❽ and the flat screws ❾.



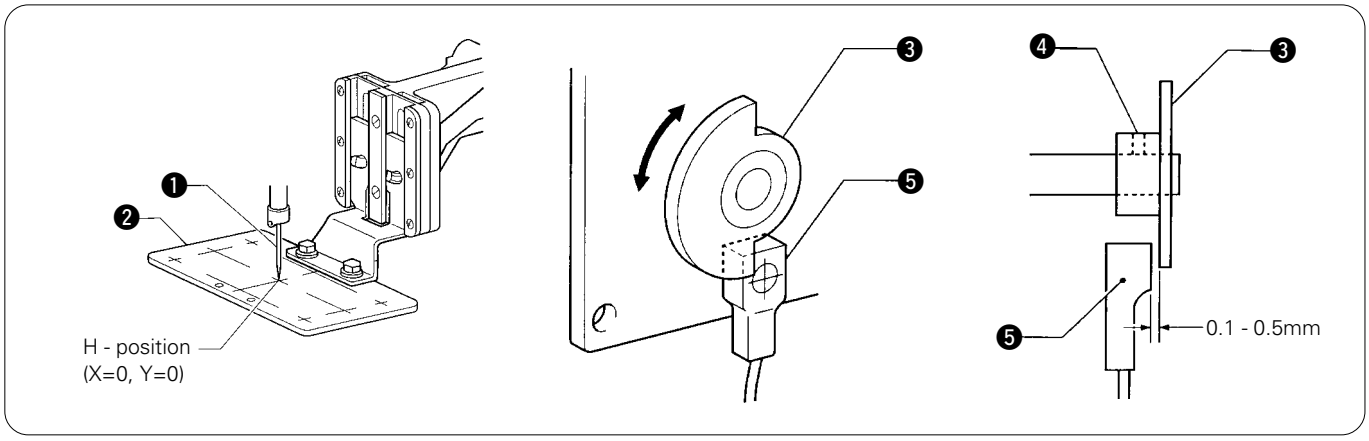
5. Connect the programmer ⓬ to the operation panel ⓭.
6. Plug the cord into the wall socket, and turn on the power of the machine.
7. Step on the foot switch to lower the H-position standard plate ⓫.
8. Press the P key on the programmer ⓬.
9. Attach the needle ⓮.
10. Turn the pulley to bring the needle ⓮ close to the H-position standard plate ⓫.
11. Press the jog key (◁ ▷) to adjust the work clamp arm ⓯ until its X-direction motion is parallel to the X-reference line of the H-position standard plate ⓫. Securely tighten the screws ⓰.



12. Press the P key and adjust the X-sensor setting plate ⓱ so that the needle ⓮ is aligned with the home position (X=0, Y=0) of the H-position standard plate ⓫.
13. Press the P key again to make sure that the needle ⓮ is aligned with the home position (X=0, Y=0) of the H-position standard plate ⓫.
14. Secure the X-sensor setting plate ⓱ using the screw.
15. Remove the needle ⓮.
16. Press the P key to be out of the program mode, and turn off the power.
17. Replace the H-position standard plate ⓫ with the work clamp.

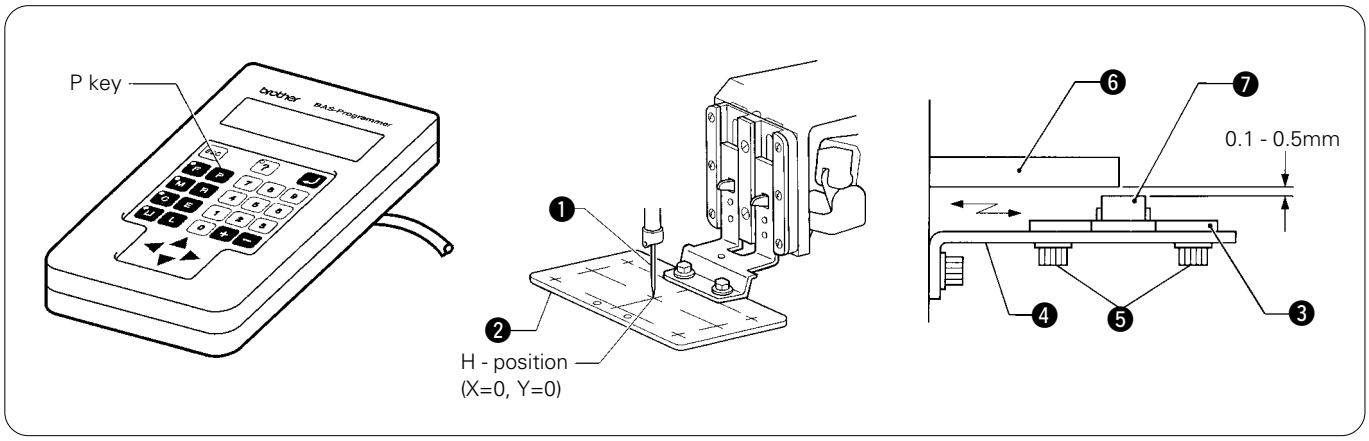
Note: When adjusting the X home position, be sure to set the clearance between the X-home position dog ⓲ and the surface where the sensor is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

Feed guide mechanism (Home position adjustment: Y) 311E and 311EL



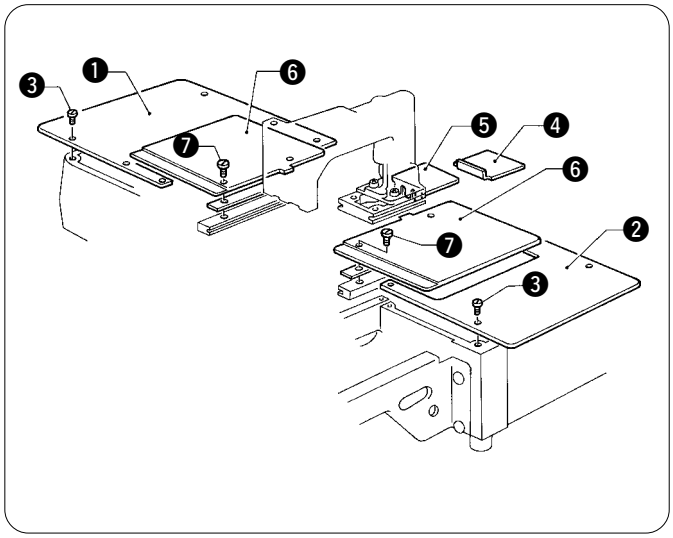
1. Press the P key on the programmer, and adjust the Y-home position dog ❸ so that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
2. Press the P key again to make sure that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
3. Secure the Y-home position dog ❸ using the set screw ❹.
4. Remove the needle ❶.
5. Press the P key to be out of the program mode, and turn off the power.
6. Replace the H-position standard plate ❷ with the work clamp.
   Note: When adjusting the Y home position, be sure to set the clearance between the Y-home position dog ❸ and the surface where the sensor ❺ is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

Feed guide mechanism (Home position adjustment: Y) 326E and 326EL

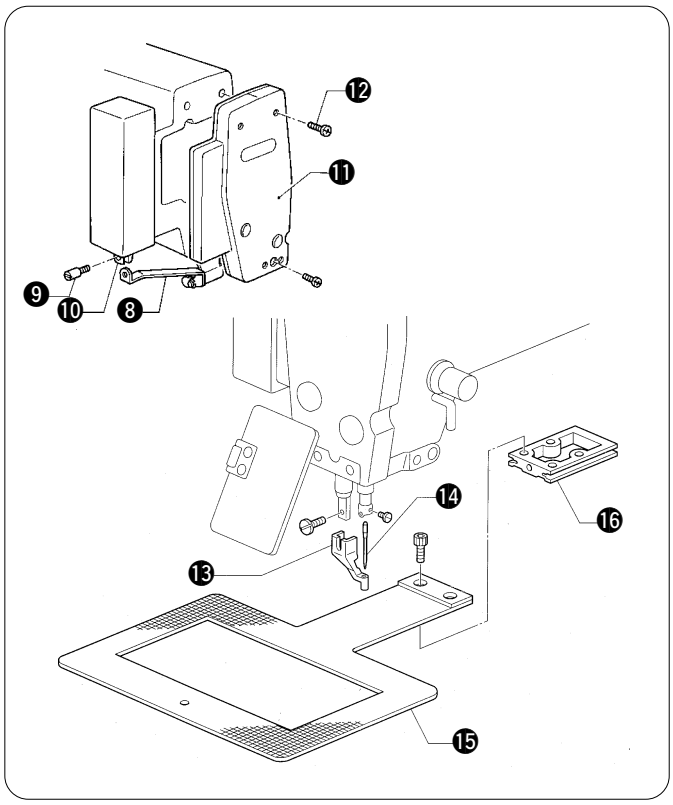


1. Press the P key on the programmer, and adjust the Y-sensor setting plate ❸ so that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
2. Press the P key again to make sure that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
3. Attach the Y-sensor setting plate ❸ to the Y-home position bracket ❹ using the bolt ❺.
4. Remove the needle ❶.
5. Press the P key to be out of the program mode, and turn off the power.
6. Replace the H-position standard plate ❷ with the work clamp.
   Note: When adjusting the Y home position, be sure to set the clearance between the Y-driving shaft ❻ and the surface where the sensor ❼ is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

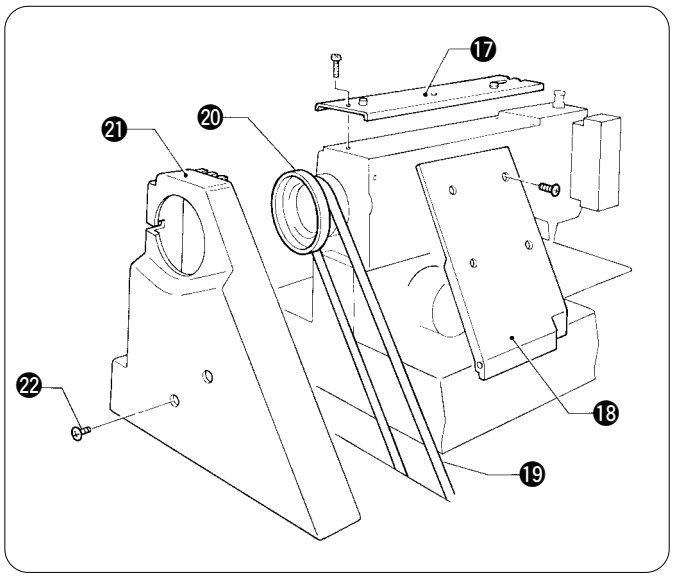
13. Covers 311E



1. Secure XY-feed base covers (L) ❶ and (R) ❷ with the screws ❸.
2. Attach Y-feed bracket cover (B) ❹ to Y-feed bracket cover (A) ❺.
   Secure the right and left X-feed bracket covers (L),(R) ❻ with the screws ❼.

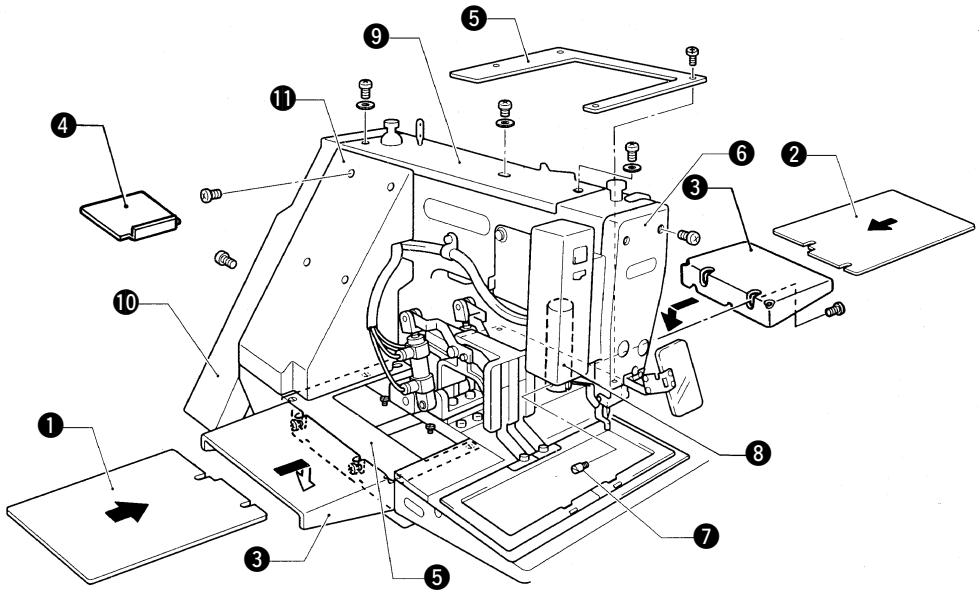


3. Attach the thread wiper connecting rod ❽ to the plunger ❿ with the plunger pin ❾, then secure the face plate ⓫ with the screw ⓬.
4. Attach the presser foot ⓭ and the needle ⓮ in place and attach the feed plate ⓯ to the feed bracket ⓰ with the screw.



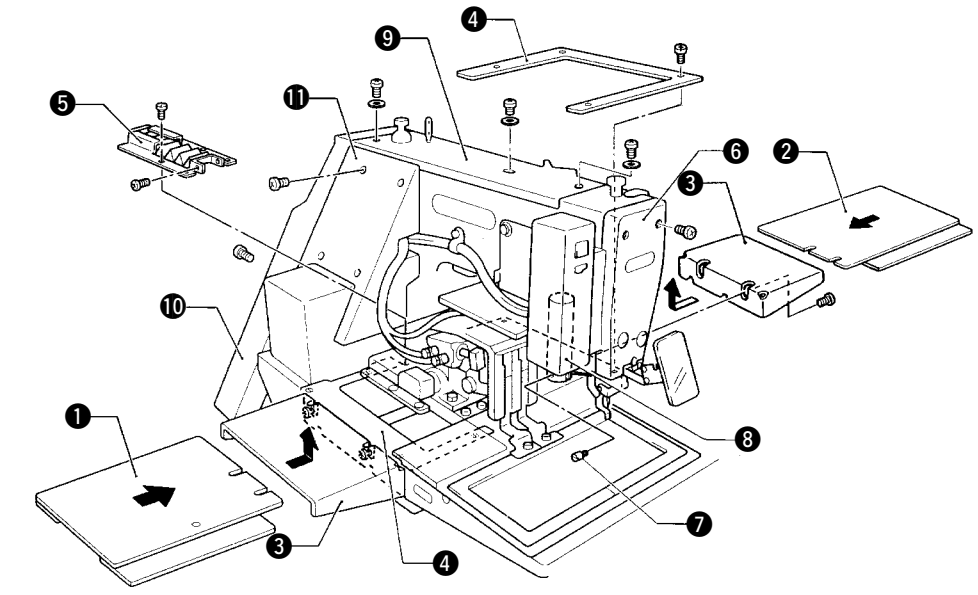
5. Attach the top cover ⓱, and the side cover ⓲ with the screws.
6. Set the V belt ⓳ over the pulley ⓴, then secure belt cover ㉑ with the screws ㉒.

311EL



1. Attach the XY-feed bracket covers L ❶ and R ❷ using the screws.
2. Insert the left and right feed bracket cover supports ❸ in the direction of the arrow, and tighten the screws.
3. Attach the X-axis feed bracket covers ❺ using the screws.
4. Attach the faceplate ❺ using the screws.
5. Attach the plunger pin ❻ to the plunger ❼.
6. Attach the top cover ❽, the belt cover ❾, and the frame side cover ❿ using the screw.

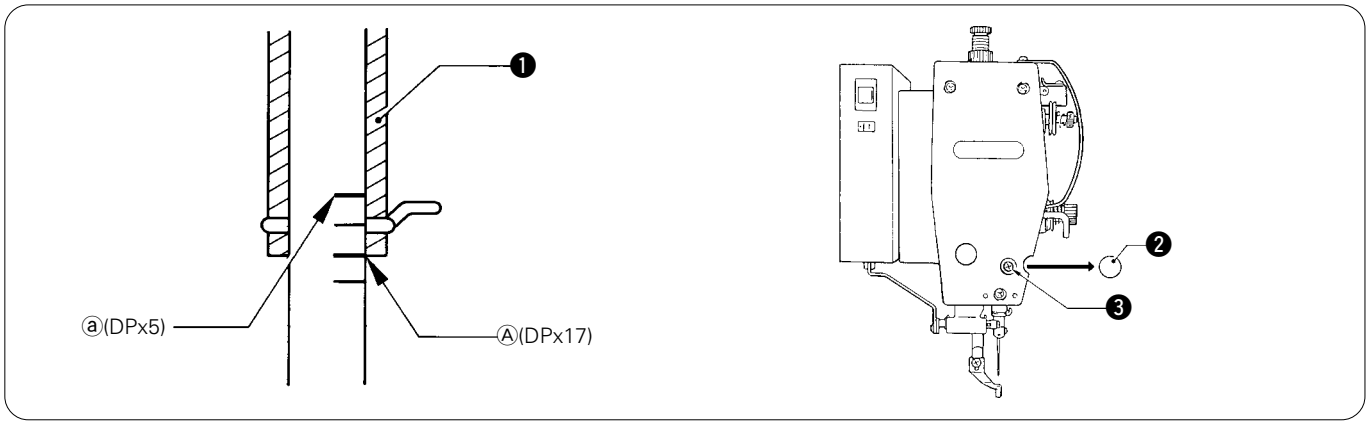
326E · 326EL



1. Attach the XY-feed bracket covers L ❶ and R ❷ using the screws.
2. Insert the left and right feed bracket cover supports ❸ in the direction of the arrow, and tighten the screws.
3. Attach the X-axis feed bracket covers ❹ using the screws. (Use the front screws.)
4. Attach the bellows assy ❺ to the work clamp arm and the X-axis feed bracket covers ❹ using the screws.
5. Attach the faceplate ❻ using the screws.
6. Attach the plunger pin ❼ to the plunger ❽.
7. Attach the top cover ❾, the belt cover ❿, and the frame side cover ⓫ using the screws.

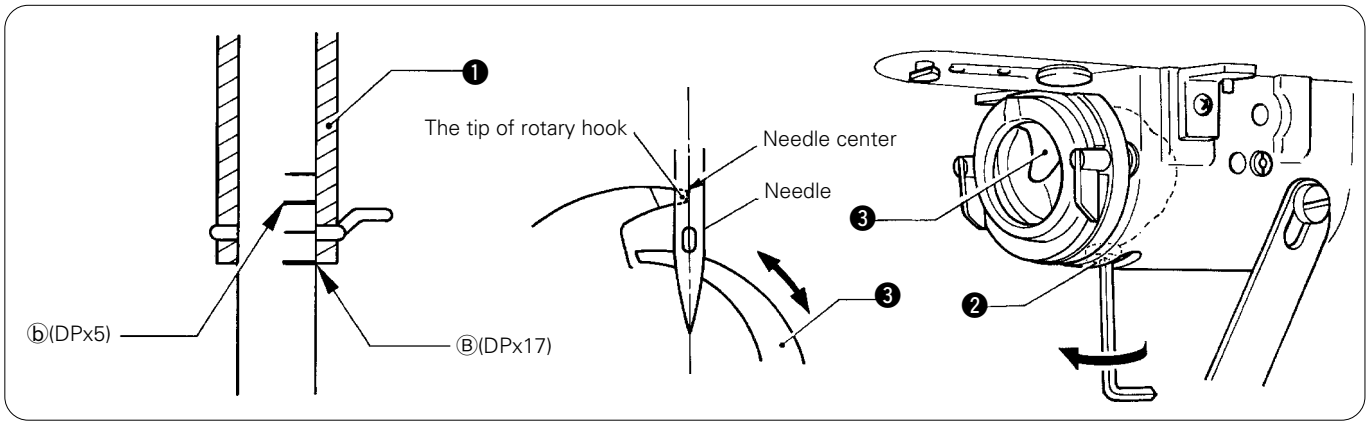
Chapter 4. Adjustments

1. Adjusting the needle bar height adjustment



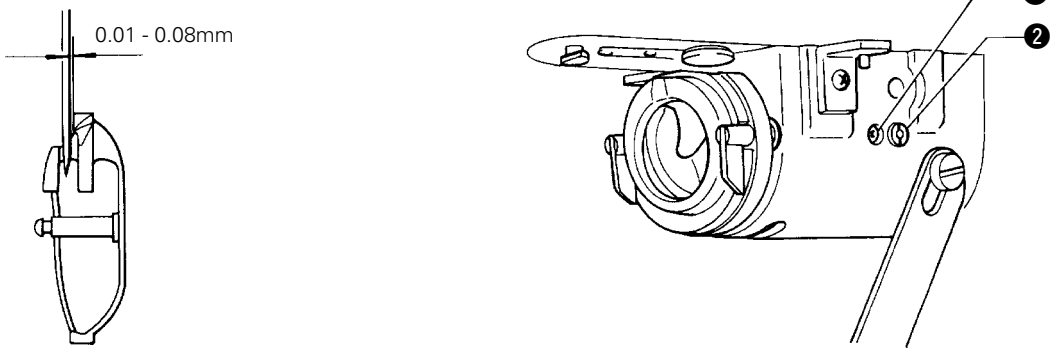
Turn the machine pulley to move the needle bar to the lowest position. Then remove the rubber cap ❷, loosen the screw ❸ and then move the needle bar up or down to adjust so that the second reference line from the bottom of the needle (reference line Ⓐ) is aligned with the lower edge of the needle bar bush ❶.
*If using a DP × 5 needle, use the highest reference line (reference line ⓐ).

2. Adjusting the needle bar lift amount



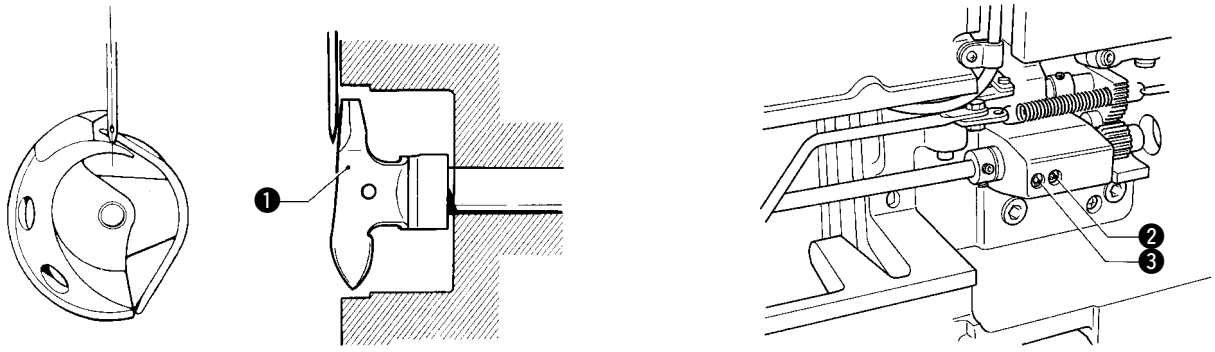
Turn the machine pulley to raise the needle bar from the lowest position until the lowest reference line on the needle (reference line Ⓑ) is aligned with the lower edge of the needle bar bush ❶. Then loosen the bolt ❷ and move the driver ❸ to adjust so that the tip of the rotary hook is aligned with the needle center line.
*If using a DP × 5 needle, use the second reference line from the top of the needle (reference line ⓑ).

3. Adjusting the needle clearance



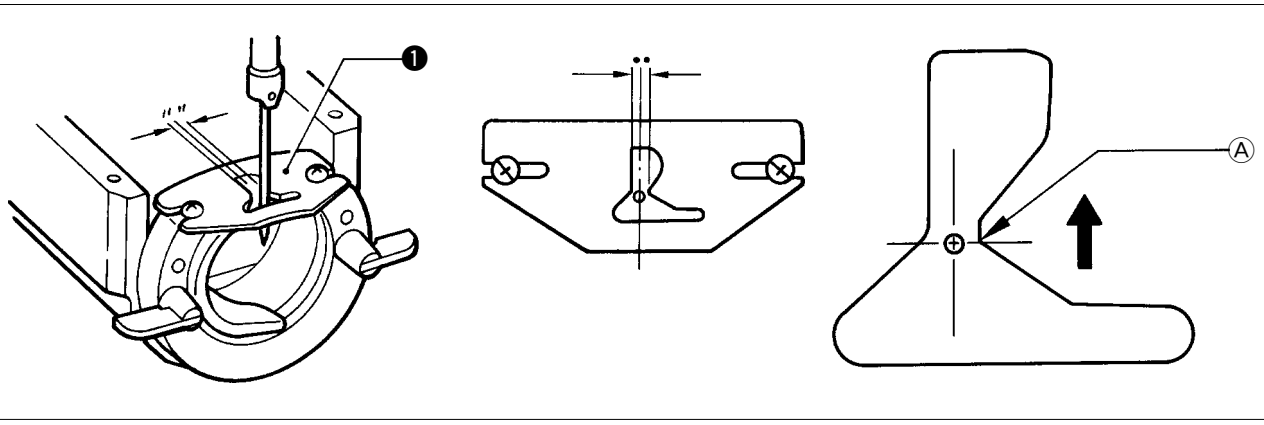
Turn the machine pulley to align the tip of the rotary hook with the needle center line. Then loosen the set screw ❶ and turn the eccentric shaft ❷ to adjust so that the clearance between the needle and the rotary hook is 0.01 - 0.08 mm.

4. Adjusting the driver needle guard



Turn the machine pulley to align the tip of the rotary hook with the needle center line. Then loosen the set screw ❷ and turn the eccentric shaft ❸ to adjust so that the driver needle guard ❶ contacts the needle. If the needle contact pressure is too great, skipped stitches may occur. On the other hand, if the driver needle guard ❶ is not touching the needle, the tip of the inner rotary hook will obstruct the needle, resulting in an excessively high amount of friction.

5. Adjusting the shuttle race thread guide



Install the shuttle race thread guide ❶ by pushing it in the direction of the arrow so that the needle groove is aligned with the center of the needle plate hole.

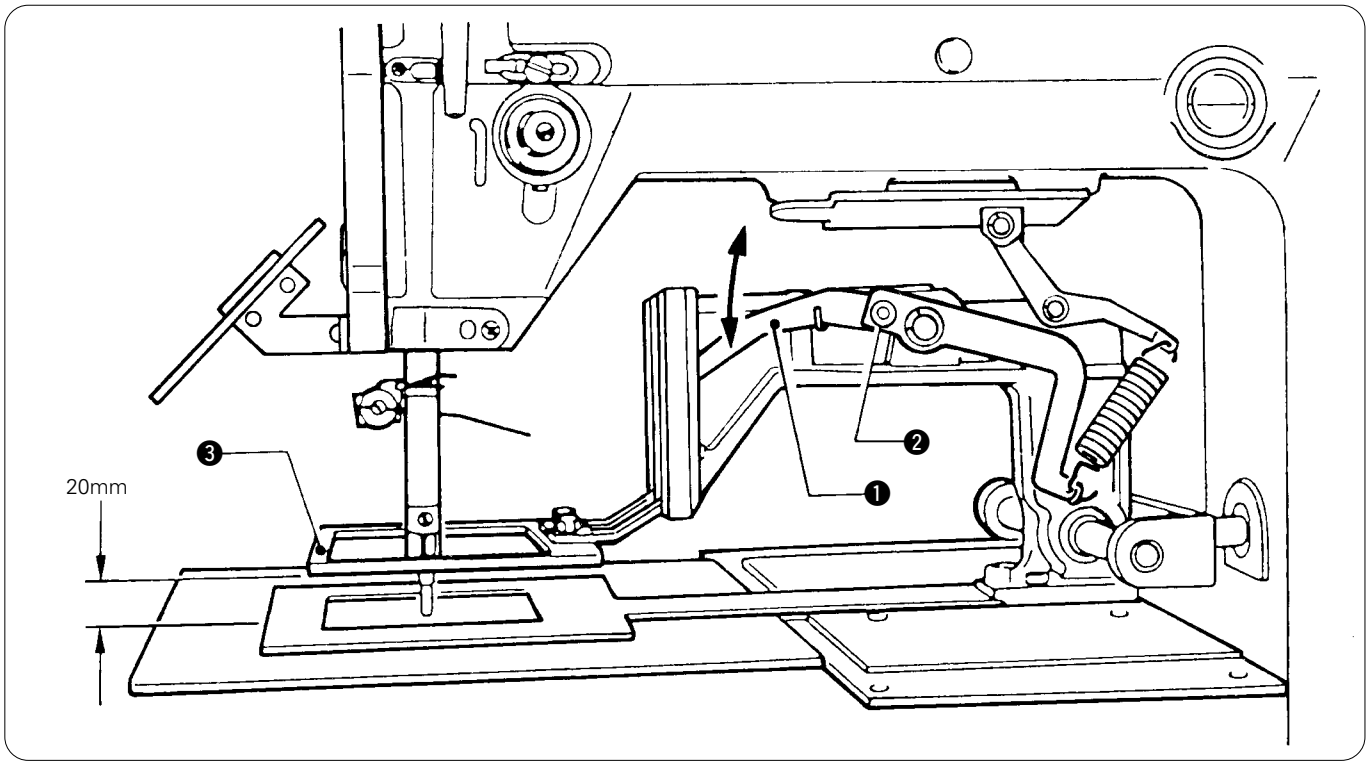
Note: If the shuttle race thread guide is in the wrong position, thread breakages, soiled thread or catching of the thread may occur.

6. Adjusting the two-step work clamp lift amount

- The maximum work clamp lift amount is 25 ± 1 mm (for solenoid type) or 30 ± 1 mm (for pneumatic type) from the top of the needle plate.
- The lift amount for each model is adjusted as shown in the table at the time of shipment.

type	Solenoid type	Pneumatic type
Lift amount	20mm	20mm

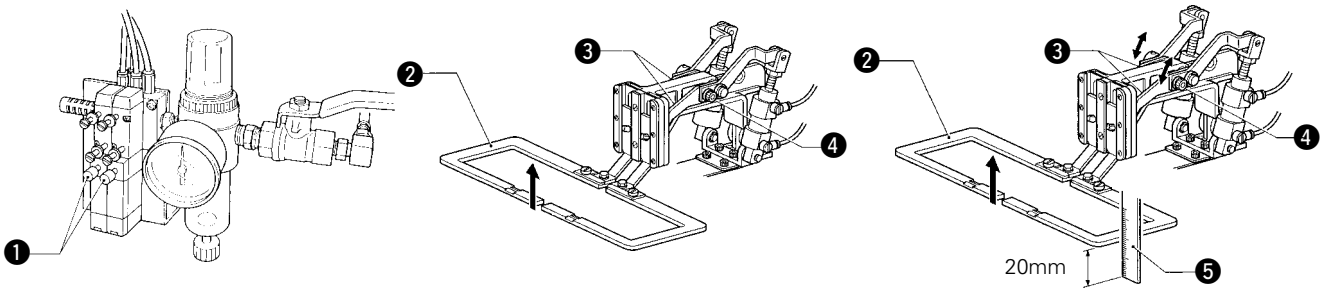
6-1. Solenoid type



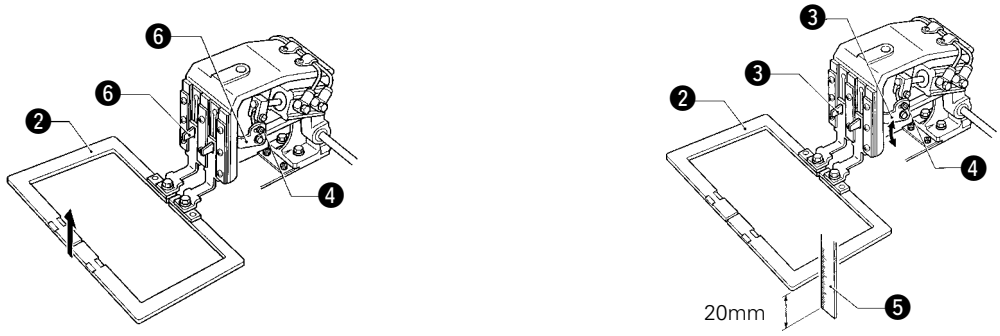
1. Turn the power switch OFF.
2. Loosen the bolts ❷ of work clamp arm lever F ❶.
3. Place a scale against the work clamp ❸, and then move work clamp arm lever F ❶ up or down to adjust so that the amount of lift above the top of the needle plate is 20 mm.
4. After adjusting the lift amount (20 mm), tighten the bolts ❷ of work clamp arm lever F ❶.

6-2. Pneumatic type

(BAS-311E · 311EL)

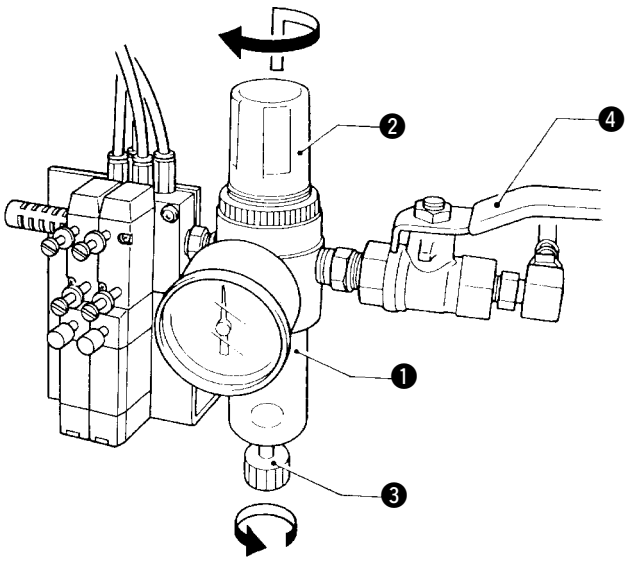


(BAS-326E · 326EL)



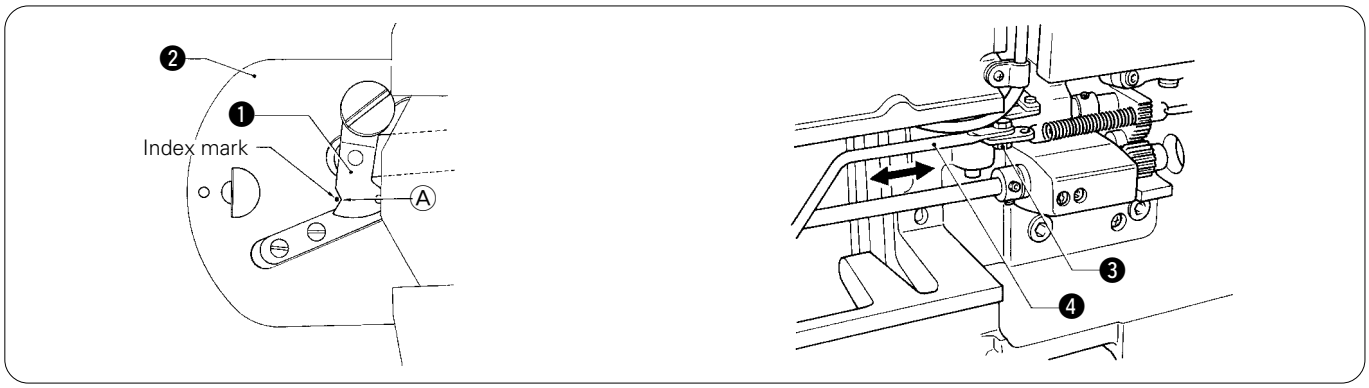
1. Turn on the air, and then press the work clamp lifter switch ❶ while turning it clockwise, to raise the work clamp ❷.
2. Loosen the bolts ❹ of work clamp arm lever F ❸ (BAS-326E, 326EL: work clamplifter lever ❻).
3. Place a ruler against the work clamp ❷, and then move work clamp arm lever F ❸ (BAS-326E, 326EL: work clamplifter lever ❻) vertically to find the position where the lift amount of the work clamp is 20 mm.
4. After adjusting the lift amount to 20 mm, tighten the bolts ❹ of work clamp arm lever F ❸(BAS-326E, 326EL: work clamplifter lever ❻).

6-3. Adjustment of air pressure (for Pneumatic type 311E, 311EL, 326E, 326EL)



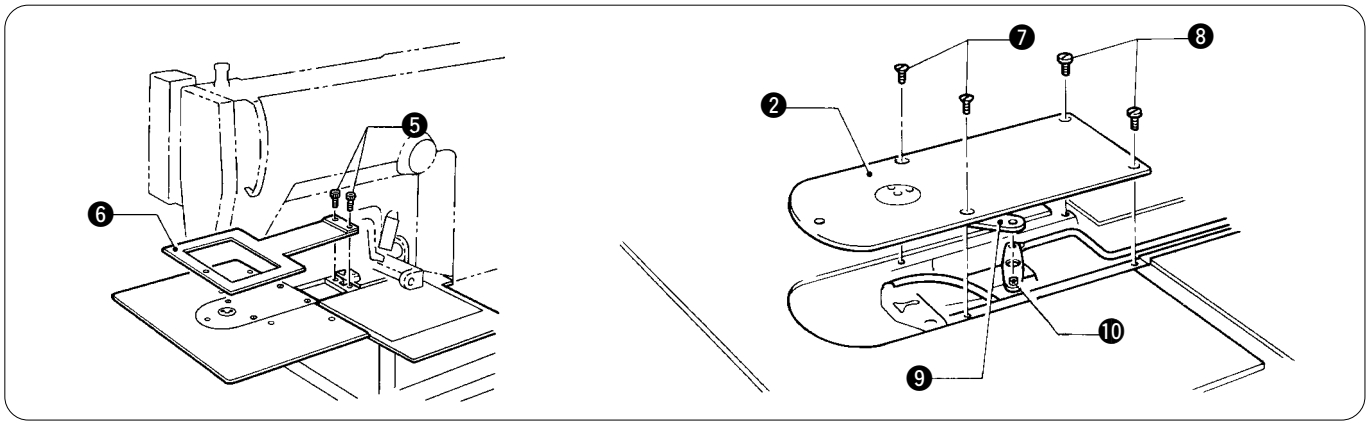
1. Air pressure should be 0.49 MPa [5 kgf /cm^2].
   The air pressure can be adjusted by pulling up and turning the control knob ❷ on the integrator ❶.
   After adjustment is complete, push the control knob ❷ downward to lock it.
2. If water stands in the bottle of the integrator ❶, turn the drain cock ❸ in the direction indicated by an arrow to drain the water.
   Note: Open the air cock ❹ slowly.

7. Adjusting the movable knife

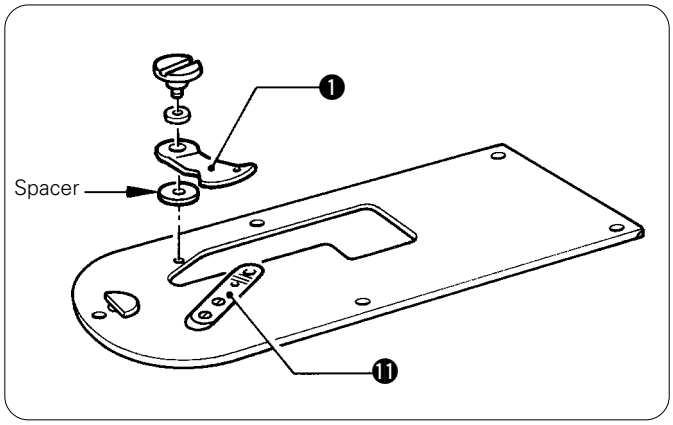


Loosen the nut ❸ and move connecting rod lever ❹ to the left or right to adjust so that the V section Ⓐ of the movable knife ❶ is aligned with the index mark Ⓑ on the needle plate ❷ when the machine is at the stop position.

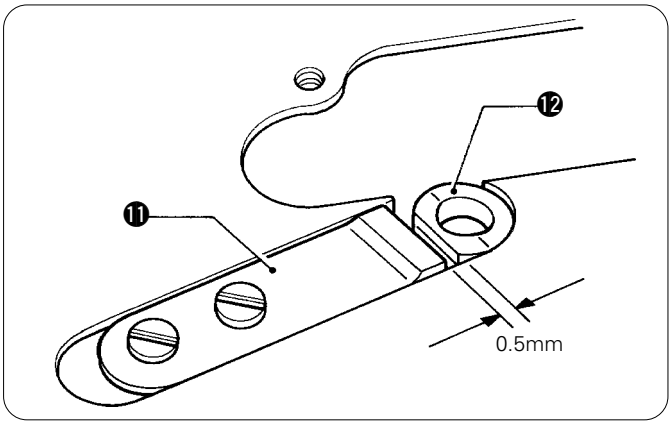
7-1. Replacing the movable and fixed knives



1. Remove the bolt ❺, and the feed plate ❻, the screws ❼ and ❽, and the needle plate ❷. Disconnect the thread cutter connecting rod ❾ from the connecting lever pin ❿.

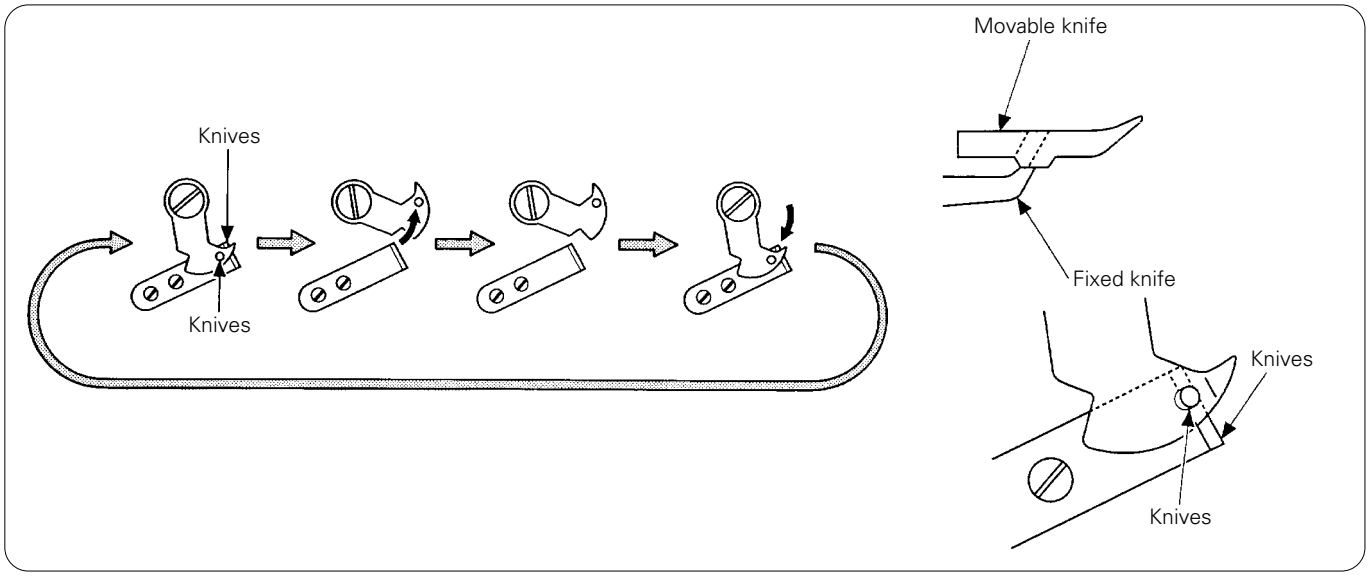


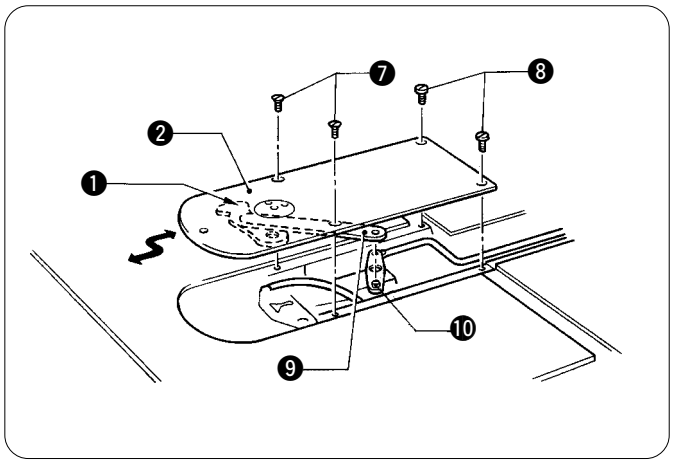
2. Remove the movable knife, and replace it with a new one. Check the cutting edge of the movable knife ❶ and the fixed knife ⓫. If necessary, use the provided movable knife spacer (t=0.4,t=0.5,t=0.6) to adjust the knives so that they cut properly.



3. Install the fixed knife ⓫ 0.5 mm away from the needle hole plate ⓬.

NOTE:
A. After the movable knife and fixed knife are properly engaged, tighten shoulder screw.
B. Turn the movable knife (in the direction of the arrow) while the shoulder screw is still tightened.
C. Loosen the shoulder screw.
D. Turn the movable knife (in the direction of the arrow) while the shoulder screw is still loosened.
Repeat above steps (A, B, C and D) four of five times to maintain the cutting performance of the knife.

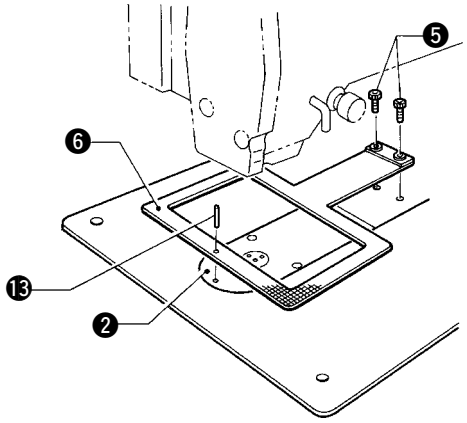




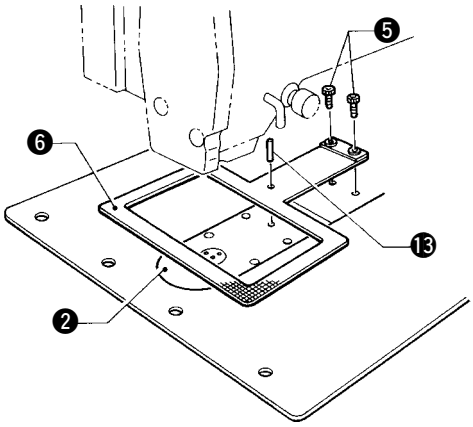
4. Fit the thread cutter connecting rod ❾ on connecting lever pin ❿, and install the needle plate ❷.

* When fitting the connecting rod ❾ on the connecting lever pin ❿ and before tightening the screws ❼ and ❽, move the needle plate ❷ back and forth slightly to confirm that the movable knife ❶ is pulled by the connecting rod ❾.

311E, 311EL

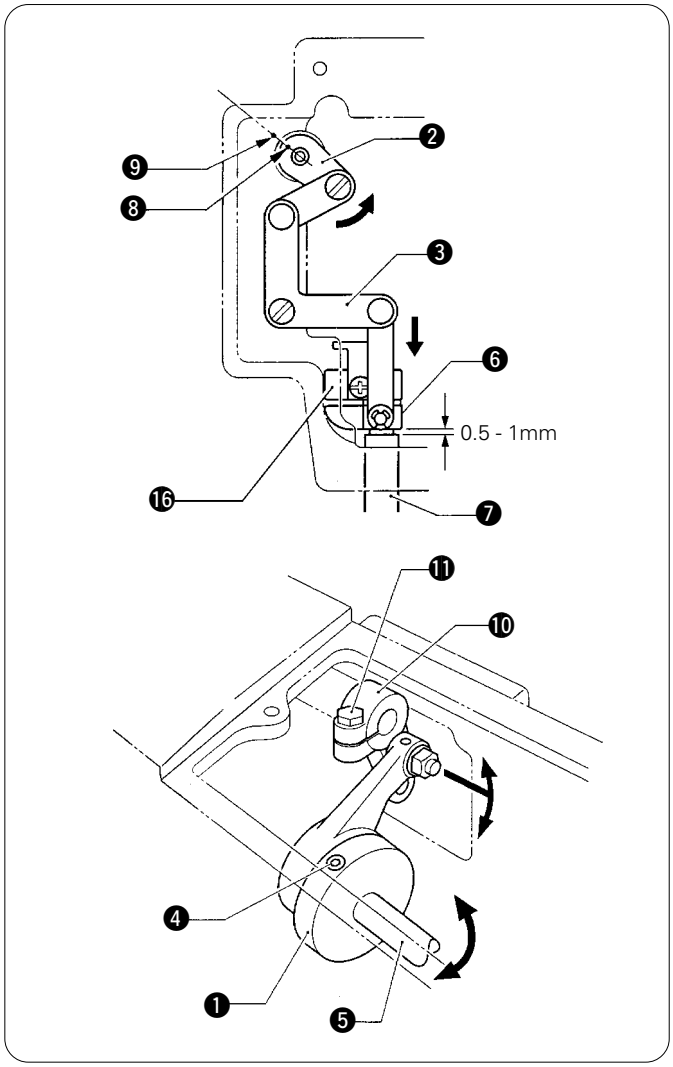


326E, 326EL

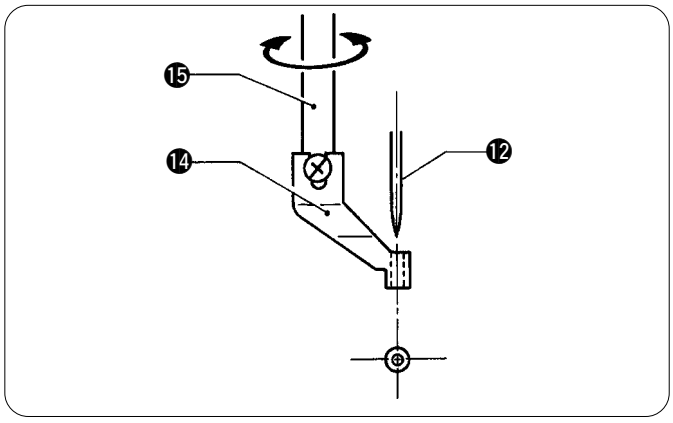


5. When installing the feed plate ❻, use a 2 mm- diameter pin ⓭ (such as a needle) to align the hole in the needle plate ❷ with the hole in the feed plate ❷ when the machine is at the home position, and then tighten the bolts ❺.
   * How to determine the mechanical home position
     a. Connect the programmer to the operation panel.
     b. Plug the cord into the wall socket, and turn on the power.
     c. Press the P key on the programmer to determine the mechanical home position.

8. Adjusting the lowest point of the presser foot

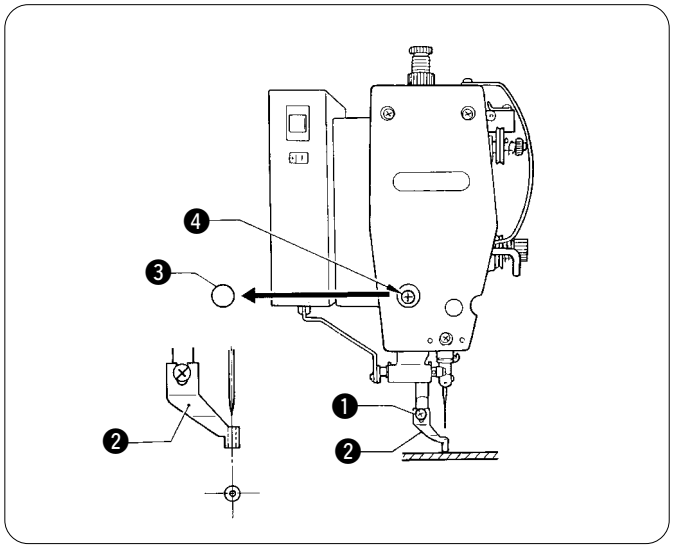


1. Turn the pulley to align the needle bar with the shuttle hook. At this time, turn the stepping work clamp connecting rod ❶ to turn stepping work clamp arm F ❷ in the direction of the arrow, and move the stepping link assy ❸ in the direction of the arrow. When the presser foot is at the lowest position, secure the stepping work clamp connecting rod ❶ to the upper shaft ❺ using the set screw ❹.
   Adjust the lift stroke of the presser foot to 3 - 5 mm, and 5 - 8 mm. When the clearance between the presser bar lifter ❻ and the presser bar bush ❼ is 0.5 - 1 mm, tighten the bolt of stepping work clamp arm F ❷. (At this time, the match mark ❽ of stepping work clamp arm F ❷ will be almost aligned with that of arm mark ❾.)
   Note: Make sure that stepping work clamp arm F ❷ has no end play.



2. Attach the needle to the needle bar.
3. Turn the pulley to insert the needle ⓬ into the hole of the presser foot ⓮. Turn the presser bar ⓯ so that the needle ⓬ is in the center of the hole of the presser foot ⓮, and tighten the screw of the needle bar clamp ⓰.

8-1. Presser foot adjustment

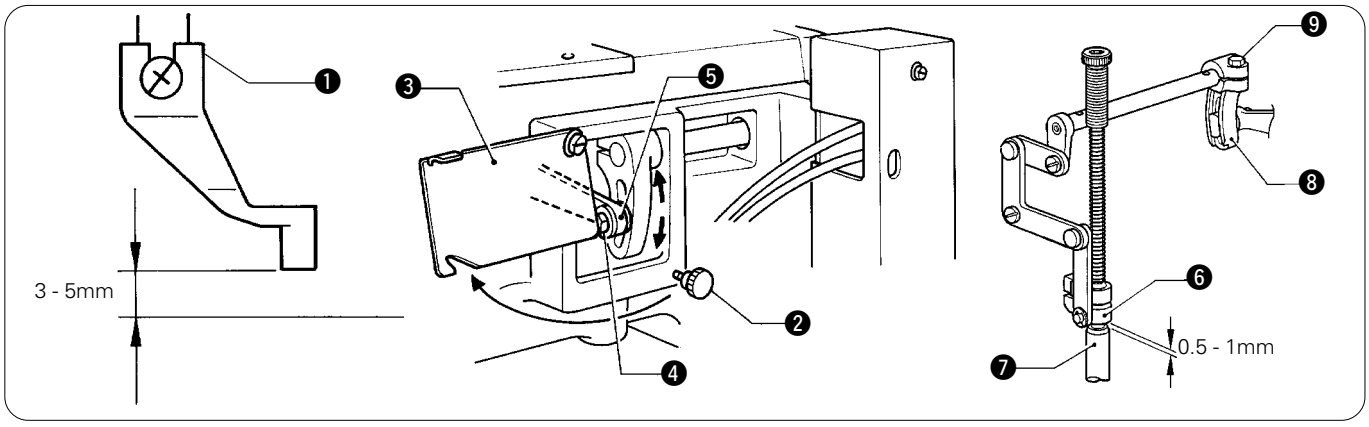


1. Loosen the screw ❶, lower the presser foot ❷ so that its bottom can lightly touch the workpiece, and tighten the screw ❶ again.
   Note: If the presser foot is lowered too far, the workpiece will shift when sewing. Also, if the presser foot is too high, skipped stitches may occur.
2. Turn the pulley manually to make sure that the needle enters the center of the needle hole in the presser foot ❷. If the needle is not aligned with the center of the needle hole, remove the cap ❸, loosen the screw ❹, and turn the presser foot (presser bar) for adjustment.

⚠ When the presser foot is in the high position and the needle point is projecting below the presser foot, it could cause injuries.

9. Changing the presser foot lift

Standard presser foot ❶ lift is 3 mm (max. 8 mm).

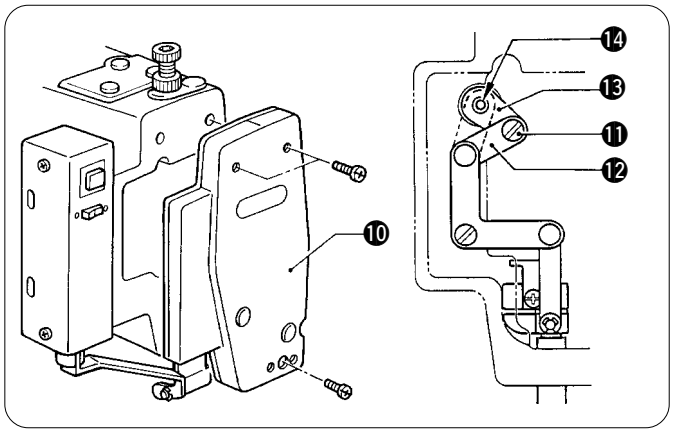


Adjusting presser foot lift to 3 - 5 mm

1. Loosen the shoulder screw ❷ and open the stepping cover ❸.
2. Loosen the nut ❹ and adjust the stepping work clamp con. rod ❺ pisition.
   (When the stepping work clamp con. rod ❺ is raised, the lift will amount increase. When lowered, the lift amount will decrease.)

Adjusting presser foot lift to 5 - 8 mm

1. Turn the upper shaft to set the presser foot to its lowest point. Loosen the bolt ❾ of stepping work clamp arm R ❽. Adjust the clearance between the presser lifter ❻ and the presser bar bush ❼ to 0.5 - 1 mm.
2. Loosen the nut ❹ and adjust the stepping work clamp con. rod ❺ position.
   (When the stepping work clamp con. rod ❺ is raised, the lift amount will increase. When lowered, the lift amount will decrease.

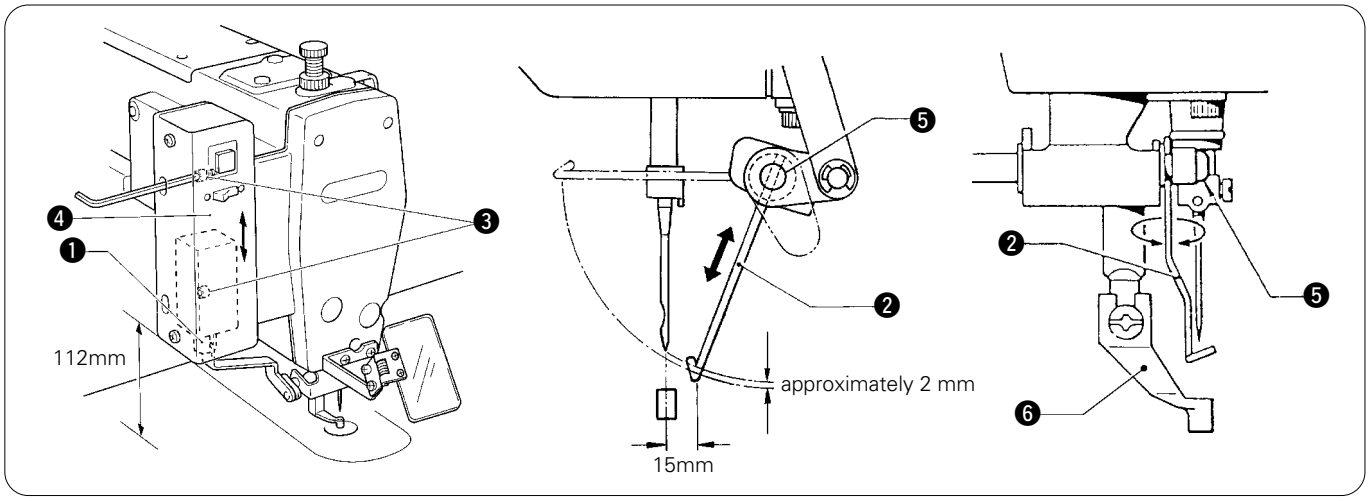


If vertical movement of the presser foot is not required

1. Remove the face plate ⓾.
2. Remove the shoulder screw ⓫ and re-attach the stepping link ⓬ to the upper screw hole ⓮ of stepping work clamp arm F ⓭.

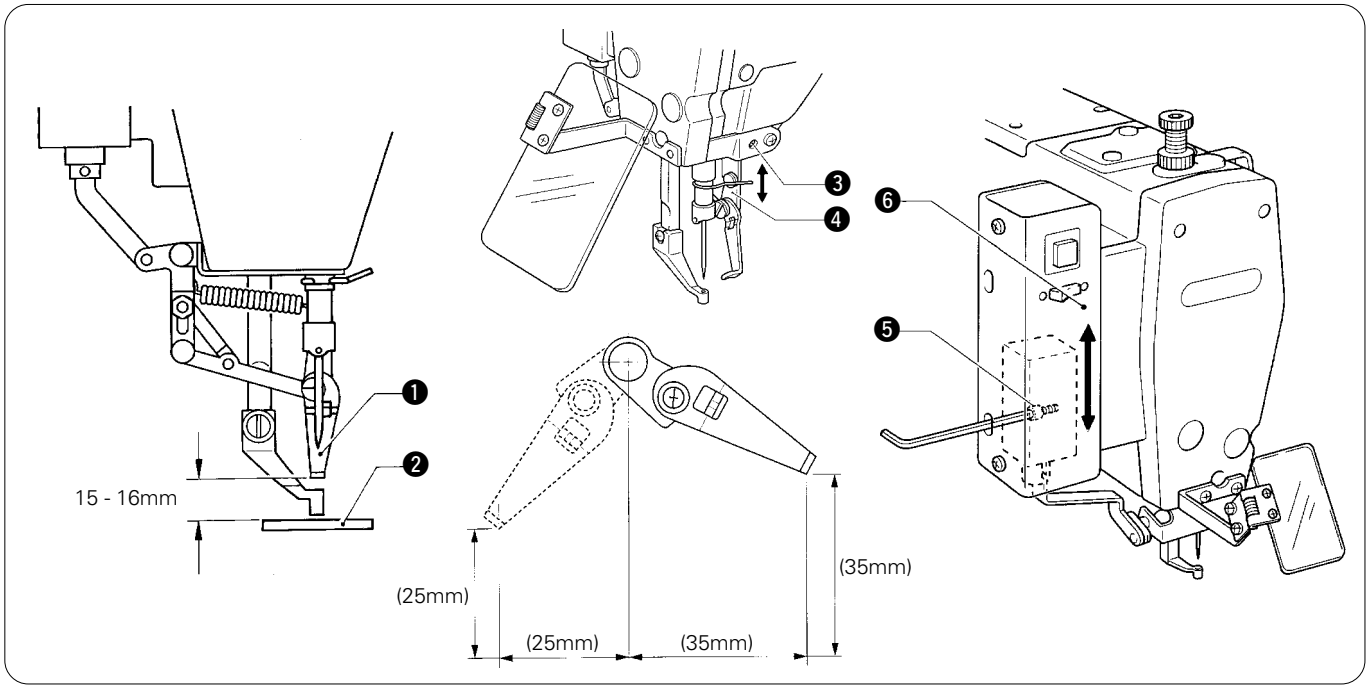
10. Wiper adjustment

■ For vertical wiper (standard)



1. When the thread wiper solenoid plunger ❶ is driven to the full stroke, the wiper ❷ should be 15 mm in front of the needle center. Loosen bolts ❸ and shift the entire solenoid bracket ❹ up or down to adjust.
   The standard height from the solenoid setting plate ❹ bottom to the needle plate top is approximately 112 mm.
2. When the wiper ❷ is operated and aligned with the center of the needle bar, the distance from the wiper ❷ to the point of the needle should be approximately 2 mm. Loose the screw ❺ and move the wiper ❷ in or out to adjust. As shown in Fig. A, make sure the wiper ❷ does not strike the presser foot ❻ or the needle.
   Note: Make that the wiper ❷ is not touching the finger guard.

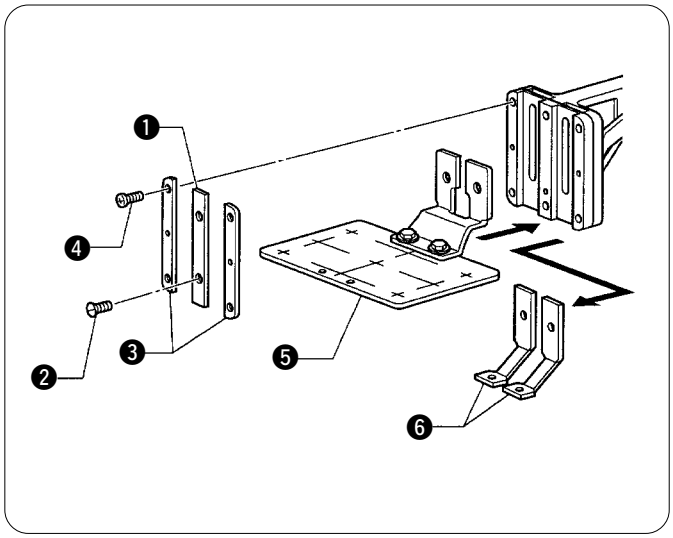
■ For horizontal wiper (optional)



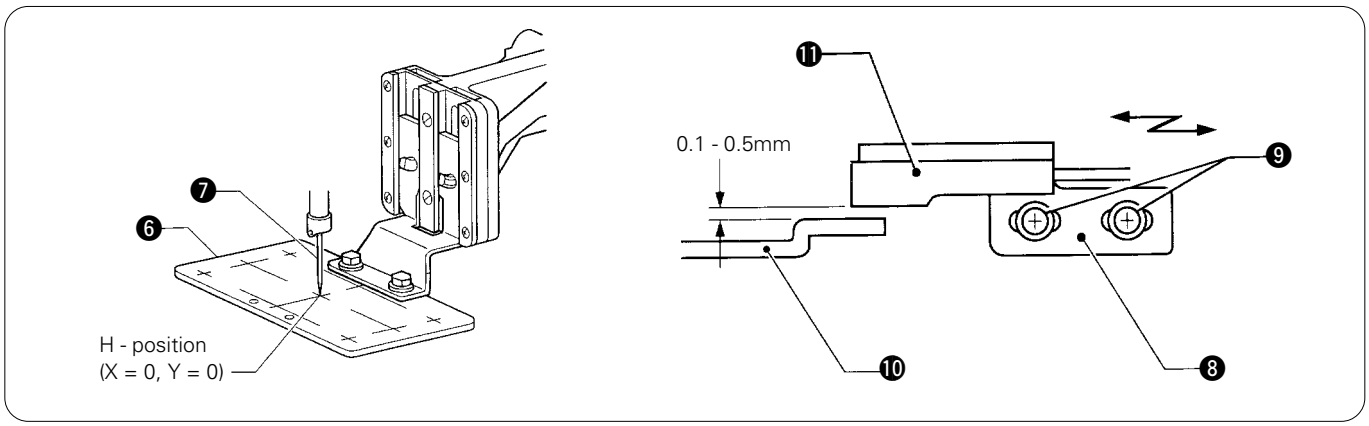
1. Loosen the set screw ❸ and move the wiper arm support ❹ up or down to adjust so that there is a clearance of 15 - 16 mm between the bottom of the thread wiper ❶ and the needle plate ❷ when the thread wiper ❶ is aligned with the center of the needle bar.
2. After the thread wiper has wiped the thread, loosen the bolt ❺ and move the solenoid setting plate ❻ up or down to adjust the distance to approximately 35 mm.

11. Adjusting the home position

■ (X axis)

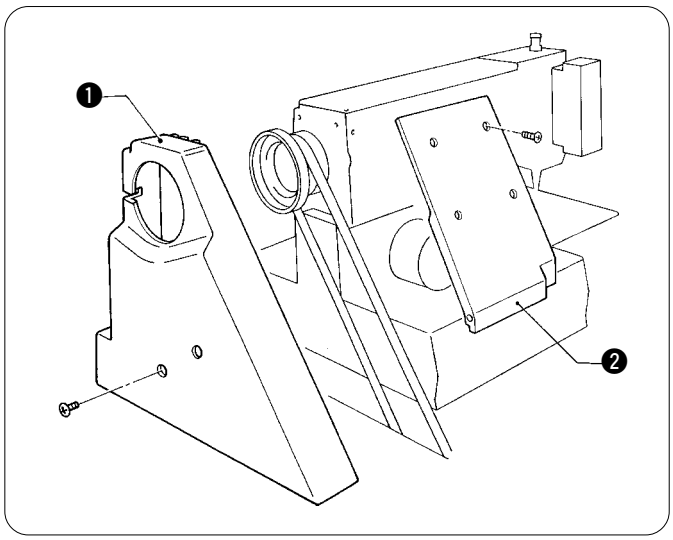


1. Remove the needle and presser foot.
2. Remove the flat screws ❷ and screws ❹ of the work clamp guide brackets A ❶, B ❸ and replace the work clamp ❻ with the H-position standard plate ❺.
   Note: Attach the H-position standard plate ❺ using the work clamp guide brackets A ❶, B ❸ and the flat screws ❷.

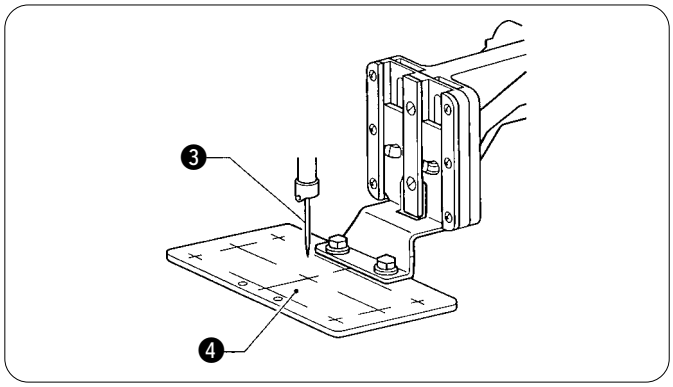


3. Press the P key and adjust the X-sensor setting plate ❽ so that the needle ❼ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❺.
4. Press the P key again to make sure that the needle ❼ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❺.
5. Secure the X-sensor setting plate ❽ using the screws ❾.
6. Remove the needle ❼.
7. Press the P key to be out of the program mode, and turn off the power.
8. Replace the H-position standard plate ❺ with the work clamp.
   Note: When adjusting the X home position, be sure to set the clearance between the X-home position dog ⓾ and the surface where the sensor ⓫ is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

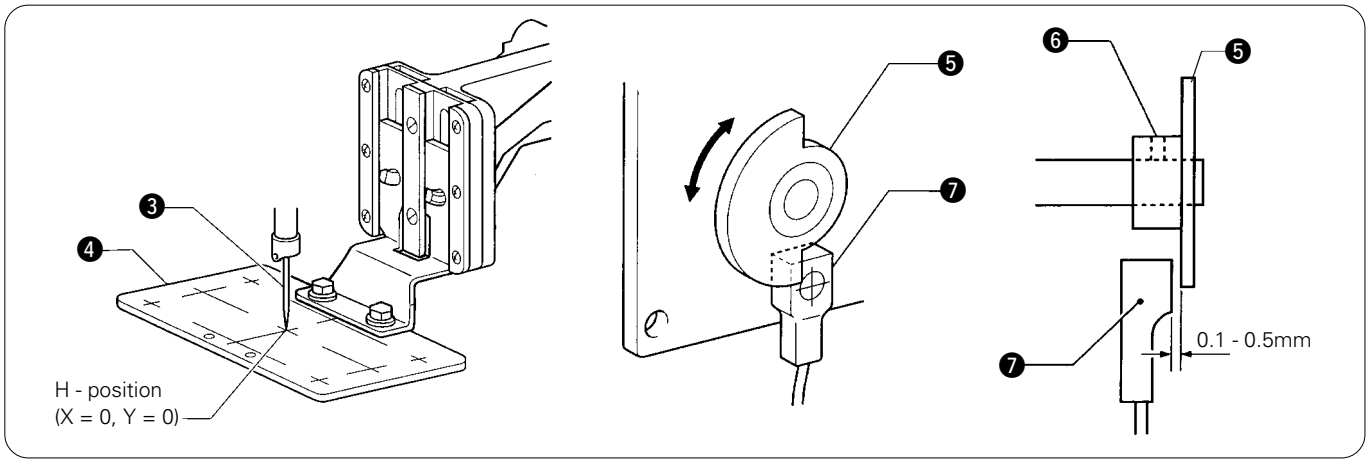
■ (Y axis) 311E and 311EL



1. Remove the belt cover ❶ and the frame side cover ❷.
2. Connect the programmer to the operation panel.
3. Turn on the power of the machine.
4. Press the P key on the programmer.



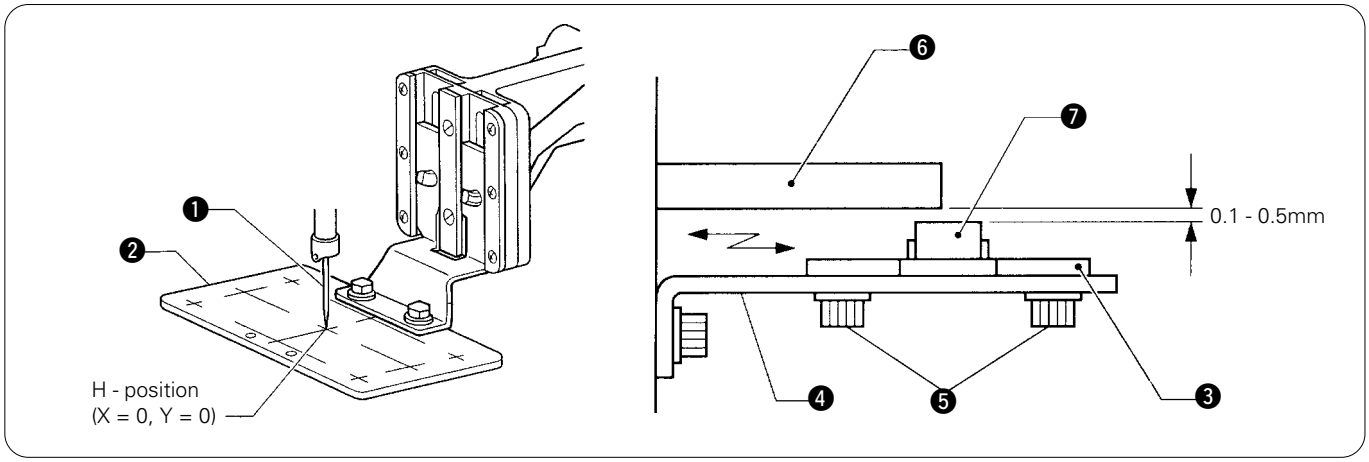
5. Attach the needle ❸.
6. Turn the pulley to approach the needle ❸ to the H-position standard plate ❹.



7. Press the P key and adjust the Y-home position dog ❺ so that the needle ❸ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❹.
8. Press the P key again to make sure that the needle ❸ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❹.
9. Secure the Y-home position dog ❺ using the set screw ❻.
10. Remove the needle ❸.
11. Press the P key to be out of the program mode, and turn off the power.
12. Replace the H-position standard plate ❹ with the work clamp.

Note: When adjusting the Y home position, be sure to set the clearance between the Y-home position dog ❺ and the surface where the sensor ❼ is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

■ (Y axis) 326E, 326EL

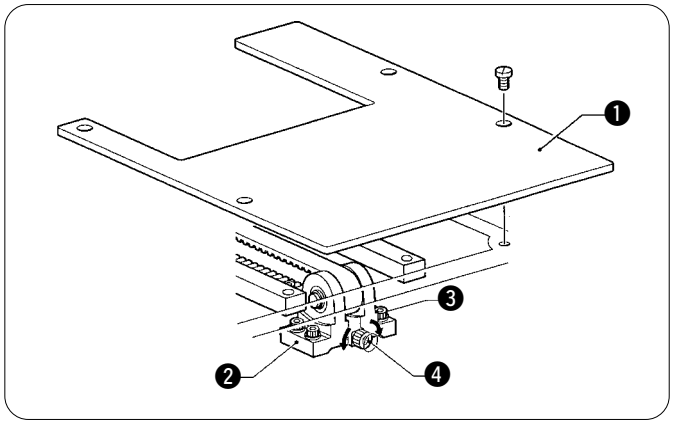


1. Press the P key and adjust the Y-sensor setting plate ❸ so that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
2. Press the P key again to make sure that the needle ❶ is aligned with the home position (X=0, Y=0) of the H-position standard plate ❷.
3. Attach the Y-sensor setting plate ❸ to the Y-home position bracket ❹ using the bolt ❺.
4. Remove the needle ❶.
5. Press the P key to be out of the program mode, and turn off the power.
6. Replace the H-position standard plate ❷ with the work clamp.

Note: When adjusting the Y home position, be sure to set the clearance between the Y-driving shaft ❻ and the surface where the sensor ❼ is activated to 0.1 - 0.5 mm. If the clearance is too great, an error in home position detection may occur because the temperature of the sewing machine rises during sewing operation.

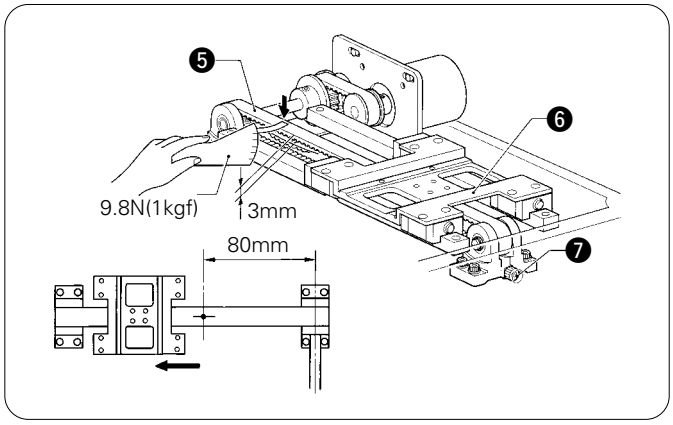
12. Adjusting the tension of the timing belt

Note: Be sure to check the home position after adjusting the tension of the timing belt.

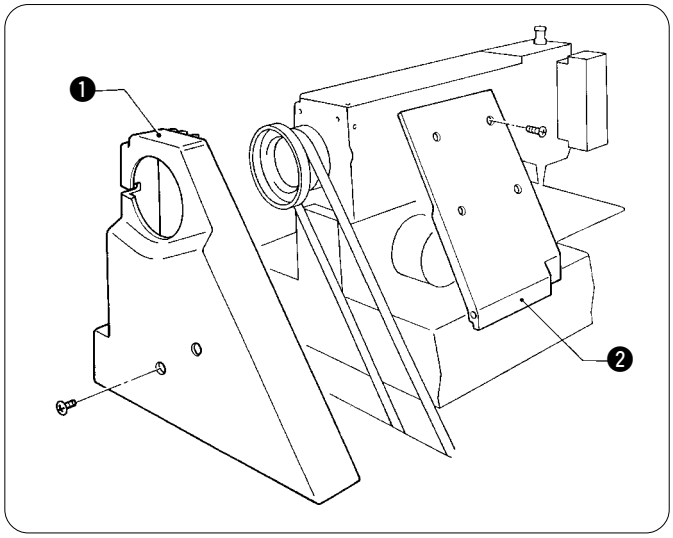


■ Adjusting the tension of X-timing belt 311E

1. Remove the X-feed bracket cover ❶.
2. Loosen the bolt ❸ of X-pulley base B ❷, then adjust the tension using the bolt ❹.

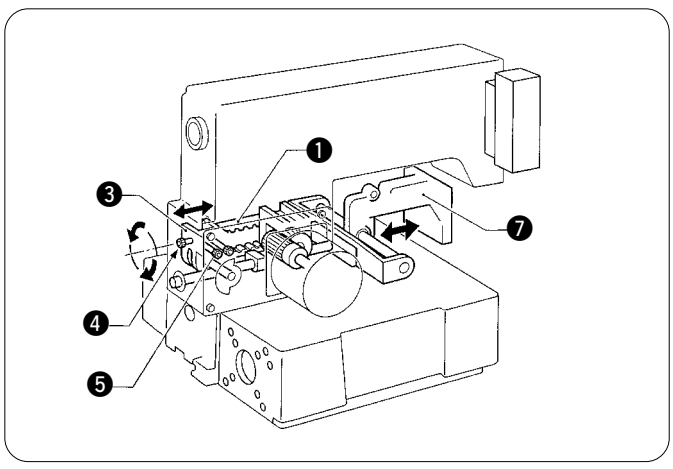


3. Move the X-feed bracket ❻ to the left end and apply a load of 9.8N (1 kgf) to the center of the X-timing belt B ❺. Then adjust the X-timing belt B ❺ with the adjust bolt ❼ to produce a deflection of 3 mm.



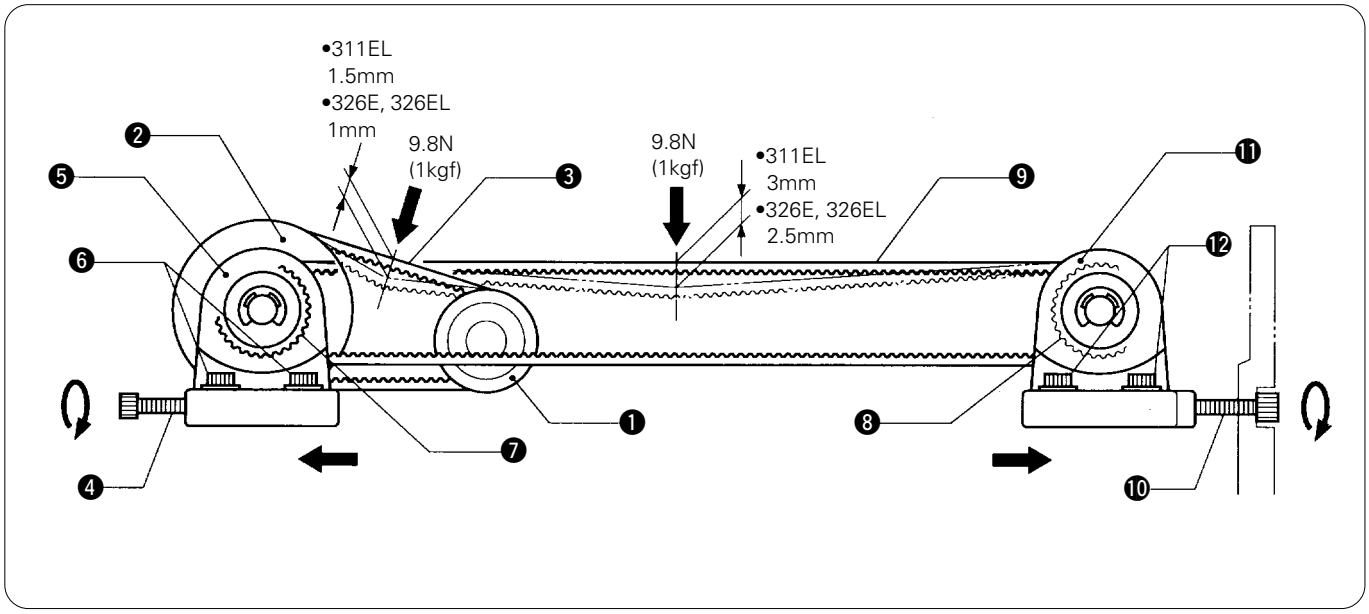
■ Adjusting the tension of Y-timing belt

1. Remove the belt cover ❶ and the frame side cover ❷.



2. Loosen the bolt ❹, and move the Y-feed pulse motor bracket ❸ to adjust the tension of the Y-timing belt.
3. When the power of the machine is turned off, there should be no slack in the Y-timing belt ❻ and the work clamp arm ❼ should move back and forth easily.
   Adjust the position of the Y-feed pulse motor bracket ❸ using the bolt ❺.
   When the power is turned on, move the work clamp arm ❼ back and forth, and adjust the tension of the Y-timing belt ❻ using the bolt ❺ so that there is no looseness in the work clamp arm ❼.

311EL and 326E, 326EL



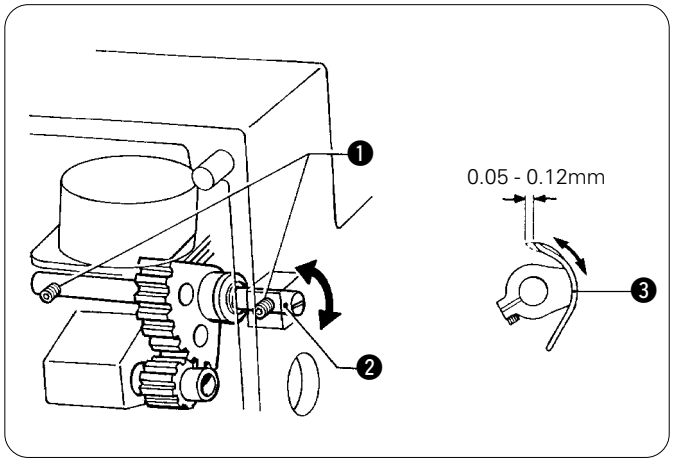
■ Adjusting the tension of X-timing belt A326

X-timing belt A326 ❸ is looped around X-timing pulley A311 (A326) ❶ and X-timing pulley B326 ❷.
The tension of X-timing belt A326 ❸ should have 1 mm deflection when it is pressed in the middle of X-timing pulley A311 (A326) ❶ and X-timing pulley B326 ❷ with a load of 4.9N (0.5 kgf) in the direction of the arrow.
Turn the bolts ❹ clockwise to move X-pulley bracket L ❺ until the appropriate tension is given, and secure X-pulley bracket L ❺ to the bed using the screws ❻.
Note: The bolts ❹ for adjusting the timing belt tension are in front of and behind X-pulley bracket L ❺. Adjust the bolts ❹ equally so that X-pulley bracket L ❺ does not lean to one side.

■ Adjusting the tension of X-timing belt B326

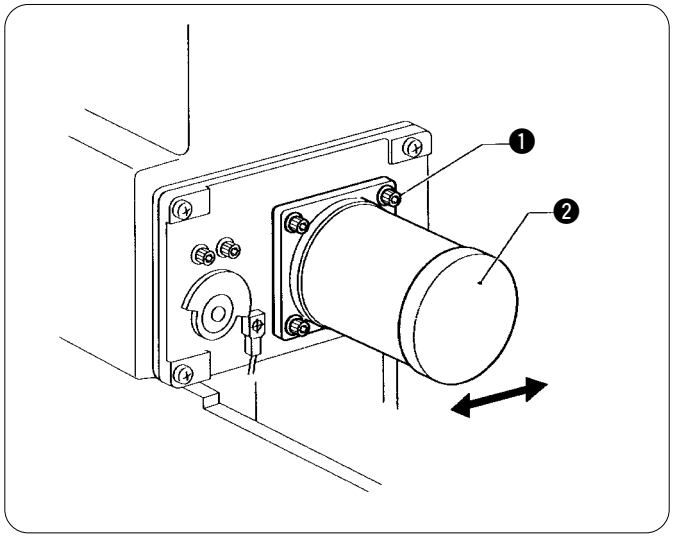
X-timing belt B326 ❾ is looped around timing pulley A ❼ and timing pulley B ❽.
The tension of X-timing belt B326 ❾ should have 3 mm deflection when it is pressed in the middle of timing pulley A ❼ and timing pulley B ❽ with a load of 9.8N (1 kgf) in the direction of the arrow. (326EL: 2.5 mm deflection with a load of 9.8N (1 kgf)
Turn the bolts ❿ clockwise to move X-pulley bracket R ⓫ until the appropriate tension is given, and secure X-pulley bracket R ⓫ to the bed using the bolts ⓬.

13. Adjusting backlashes



■ Lower shaft

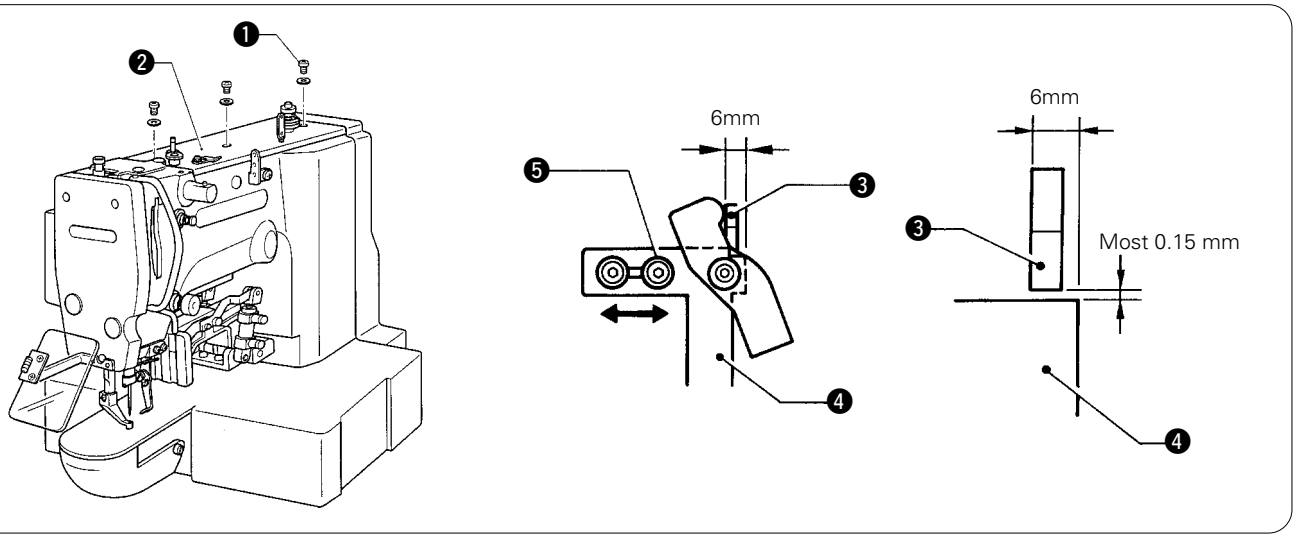
1. Tilt the machine head until it stops.
2. Loosen the set screw ❶, then turn the rock gear shaft ❷ to provide 0.05 - 0.12 mm looseness at the tip of the shuttle driver ❸.



■ Y-axis feed

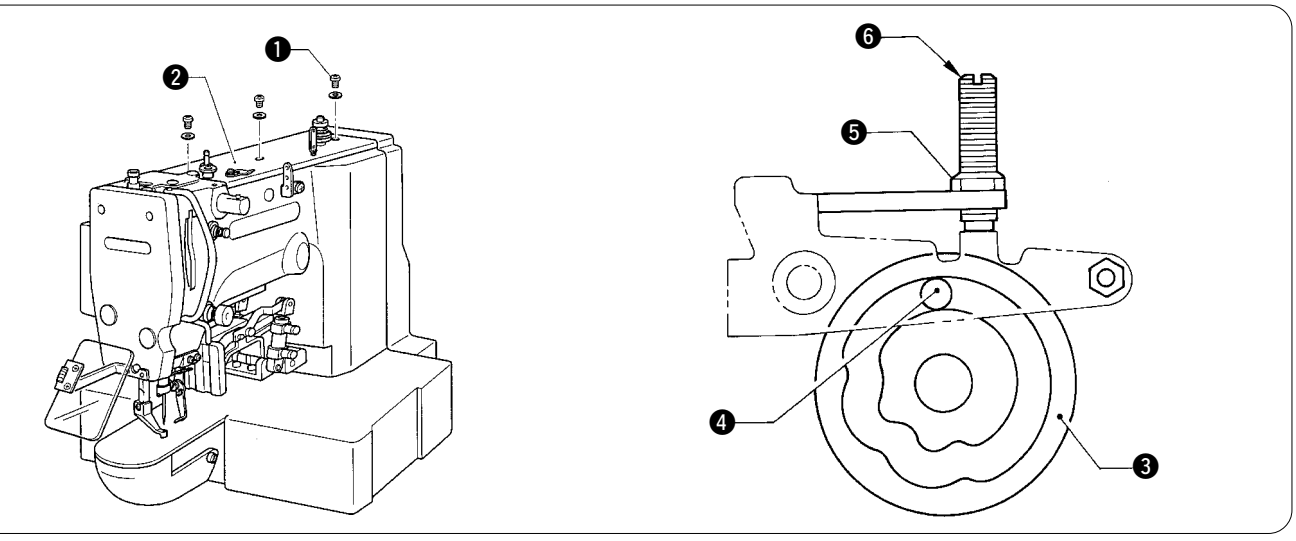
Loosen the four bolts ❶, then adjust the Y-pulse motor ❷ so that there is no backlash between the rock gear and the idle gear.

14. Adjusting the driving lever stopper position



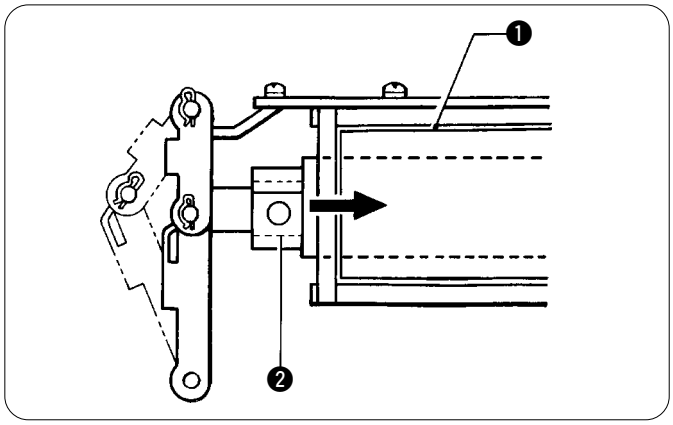
1. Remove the screws ❶ and the top cover ❷.
2. If thread trimming is not performed, loosen the bolts ❺ so that the difference between the thread trimmer driving lever ❸ and the driving lever stopper ❹ is 6 mm.
   * Make sure that the clearance between the thread trimmer driving lever ❸ and the driving lever stopper ❹ is at the most 0.15 mm.
   The driving lever stopper ❹ has an imprinted number mark: 2, 3, or 4. If the clearance is larger than 0.15 mm, replace the driving lever stopper 4 with that with a different number. For example, when the number 3 stopper is used, replace it with number 4 stopper. When the number 4 stopper is used, replace it with number 2 stopper.

15. Adjusting the thread trimmer driving lever position

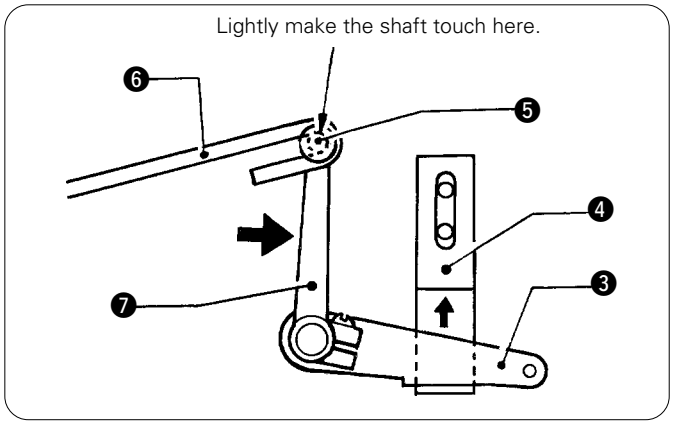


1. Remove the screws ❶ and the top cover ❷.
2. Turn the pulley to place the thread trimmer cam ❸ with its non-operating portion facing upward.
3. Loosen the nut ❺. Move the screw ❻ so that the roller ❹ of the thread trimmer driving lever will return smoothly when it is put into the groove of the thread trimmer cam ❸.

16. Work clamp lift components for manual operation (Solenoid type)

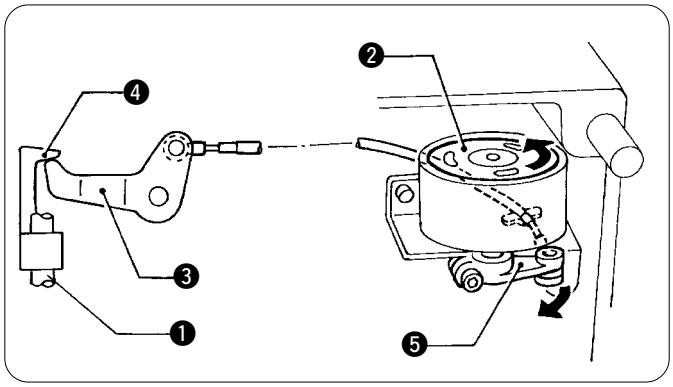


1. Fully press in the plunger ❷ of the work clamp solenoid ❶.

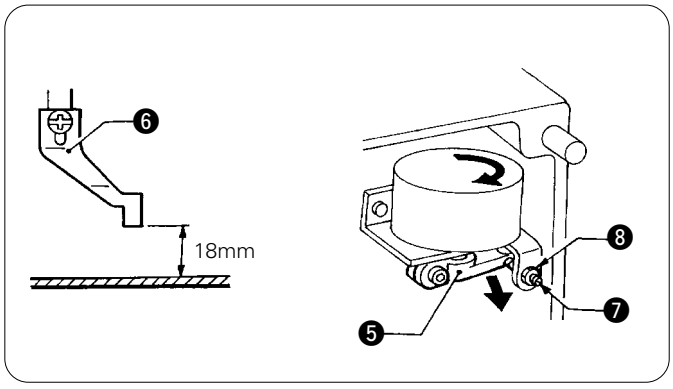


2. Adjust the presser bar lifter lever arm ❻ so that the shaft of the shoulder screw lightly touches the rod ❺ when the presser bar lifter lever ❸ is in contact with the stopper ❹.

17. Adjusting the presser foot height

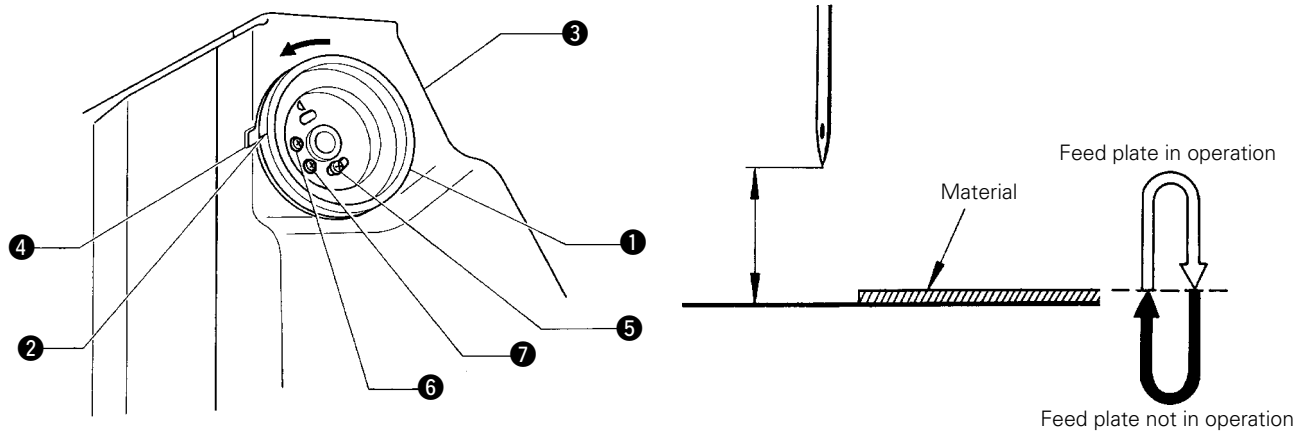


1. Turn the pulley to where the needle is at its lowest position. The lowest point of the presser bar ❶ is at the place where the needle is aligned with the shuttle hook.
2. Fully turn the plunger of the stepping solenoid ❷ in the direction of the arrow, then adjust the lifter lever ❺ so that the work clamp lifter lever ❸ is in contact with the clamp needle bar ❹.



3. Measure the dimension between the presser foot ❻ and the needle plate when the presser foot is at the lowest position.
   Turn the pulley to set the needle bar at its lowest position. When pulling the lifter lever ❺ toward you until it makes contact with the adjust screw ❼, the distance between the presser foot and the needle plate should be 18 mm. Loosen the nut ❽, and adjust the adjust screw ❼.

18. Adjusting the needle up stop position

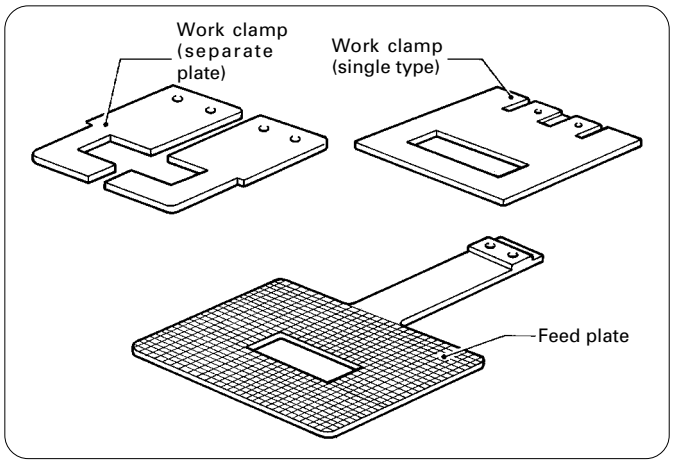


1. Loosen the screw ❺ (at the U side on the pulley ❶), and turn the pulley ❶ so that the mark ❷ on the pulley is inside the mark ❹ of the belt cover ❸ .
   The pulley ❶ stops later if it is turned clockwise; it stops earlier if it is turned counterclockwise.
   The standerd needle up stop position is 6 mm below the needle bar dead point.
2. Timing between the needle and the feed mechanism is adjusted so that the feed mechanism srarts operating after the needle comes out of the material sewn, and stops before the needle penetrates the material.
   The screw ❻ on the D side is tightened fully counterclockwise at the time of shipment.
3. The screw ❼ cannot be adjusted because it is used for detecting the needle stop position.

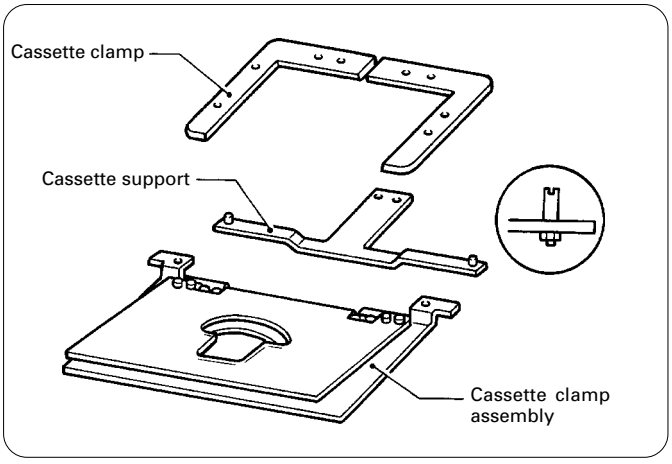
Chapter 5. How to make up the work clamp

- The work clamp is available in two types; clamping type and cassette type.
  The maximum sewing range is (W × L) BAS-311E (130mm × 60mm), 311EL (220mm × 60mm), 326E (200mm × 100mm), 326EL (220mm × 100mm).

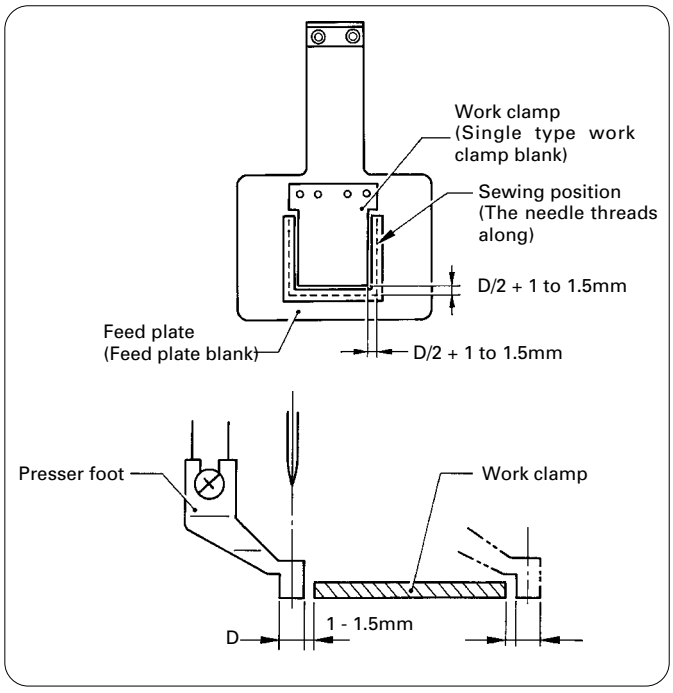
■ Clamping type



■ Cassette type



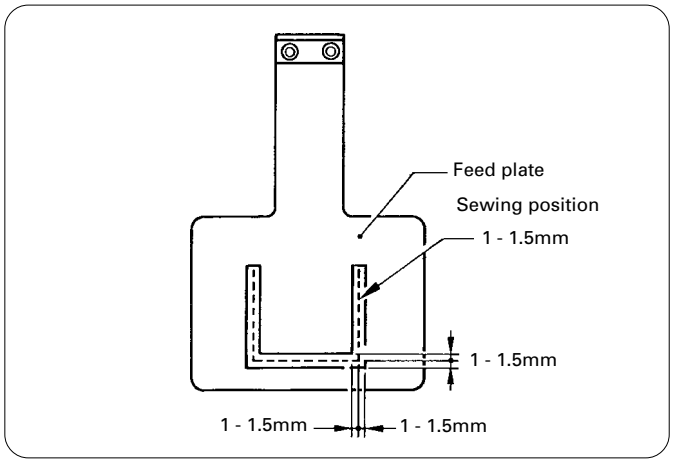
1. How to make up clamping type work clamp



■ How to make up the work clamp

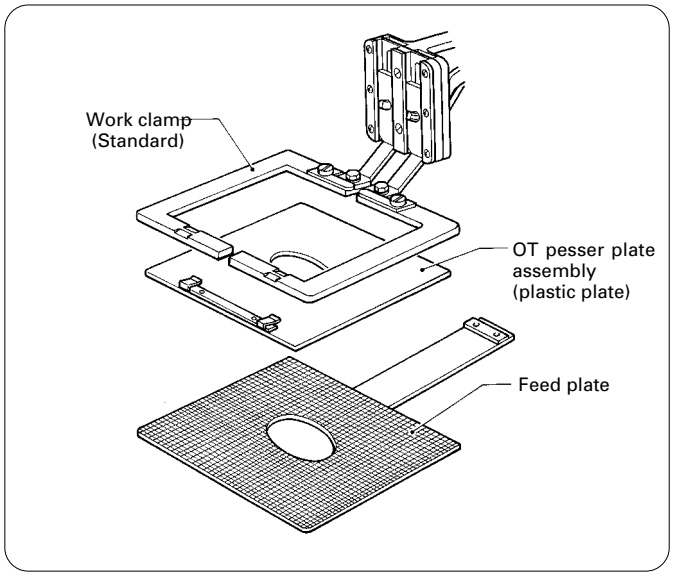
Cut out the work clamp blank so that the cutout size is wider than the sewing position by (half of the presser foot diameter + 1 to 1.5 mm).

D: diameter of the top end of the presser foot



■ How to make up the feed plate

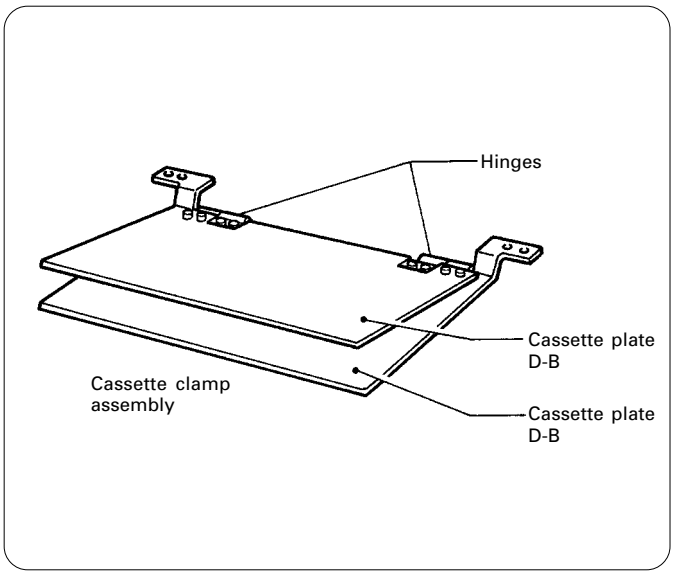
Cut out the feed plate blank 1 to 1.5 mm apart from the sewing position.
In the case of the left figure, 1 to 1.5 mm margin is required on both sides of the sewing position.



■ How to make up the plastic work clamp

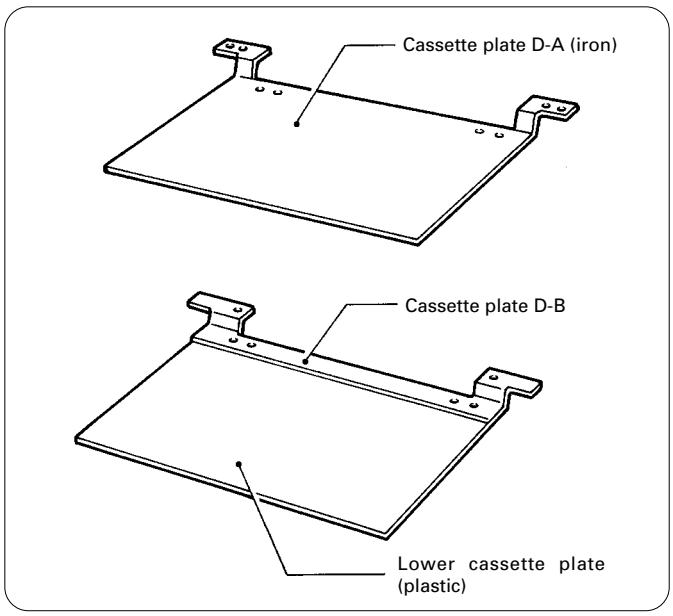
1. Cut out the plastic plate according to the counter of a material to be sewn.
2. Bond a paper cushion material or the like around the cut-out section to firmly press a material to be sewn.
3. Make up the feed plate by referring to item 2. "How to make up the feed plate".

2. How to make up cassette type work clamp



The cassette type work clamp is composed of cassette plate (U), cassette plate (D), and the hinges as illustrated in the left figure.

1. Cut out cassette plates (U) and (D). For cutting dimensions, refer to section "How to make up the clamping type work clamp".
   * Making up two cassettes to use them alternately will increase work efficiency.

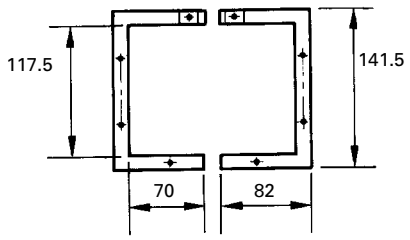


2. Bond a paper cushion material or the like around the cut-out section to firmly press a material to be sewn.

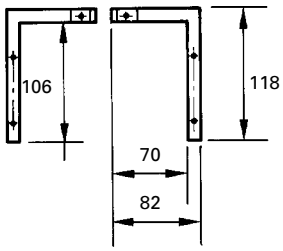
   Cassette plate (D) is available in two types; D-A and D-B.

   * Use cassette D-B with the same way as D-A, except that a plastic plate or the like must be bonded on the back of D-B. When mounting hinges on cassette plate D-B, insert a countersunk screw M3 into the 4.6 mm diameter countersunk hole prior to bonding the plastic plate.

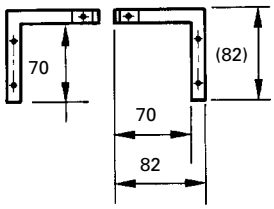
Cassette presser



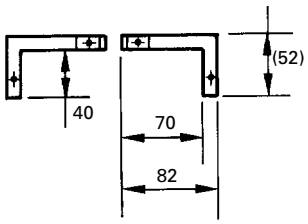
Cassette presser 1R	t=3.2	SO2845-001
Cassette presser 1L		SO2846-001



Cassette presser 2R	t=3.2	SO2847-001
Cassette presser 2L		SO2848-001

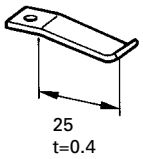


Cassette presser 3R	t=3.2	SO2849-001
Cassette presser 3L		SO2850-001

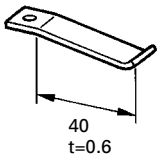


Cassette presser 4R	t=3.2	SO2851-001
Cassette presser 4L		SO2852-001

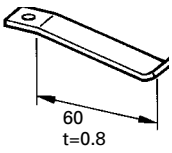
Clamp spring



Clamp spring 1	SO2853-001

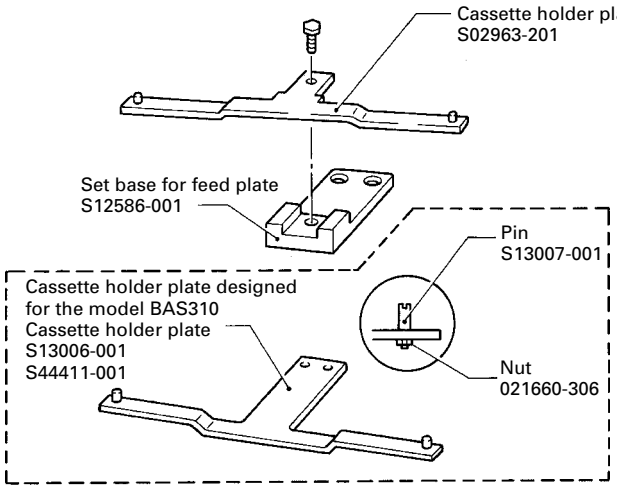


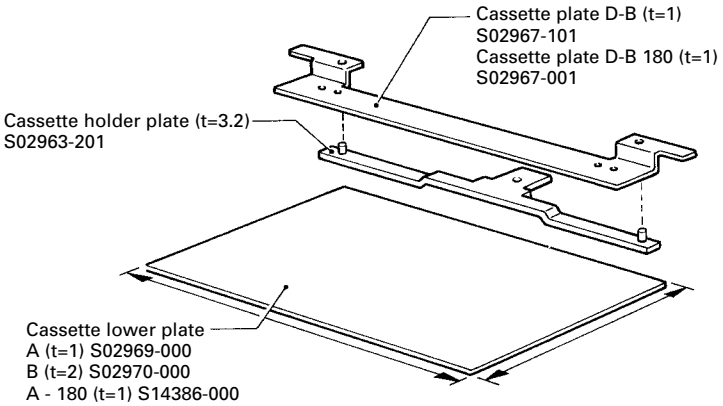
Clamp spring 2	SO2854-001

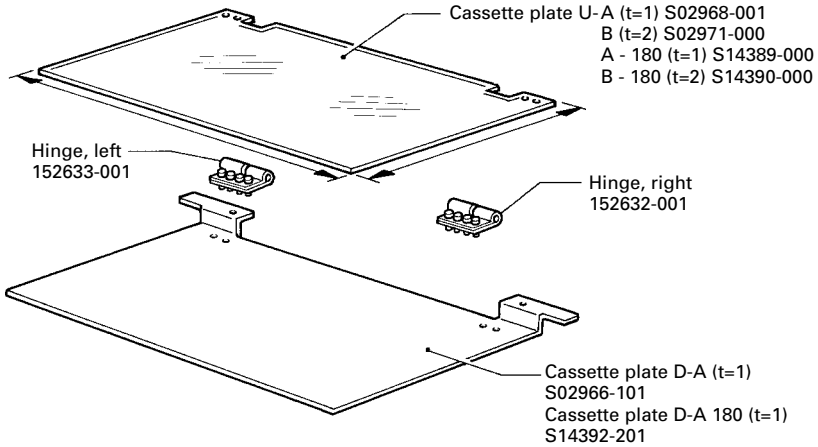


Clamp spring 3	SO2855-001

Note: To use the cassette support the set base for feed plate illustrated below should be attached.







Cassette presser (A) assembly	S02959-101
Cassette plate U-A	S02968-000
Hinge,left	152633-001
Hinge,right	152632-001
Cassette plate D-A	S02966-101

Cassette presser (B) assembly	S02960-101
Cassette plate U-A	S02971-000
Hinge,left	152633-001
Hinge,right	152632-001
Cassette plate D-A	S02966-101

Chapter 6 Power supply and electrical parts adjustment

1. Precautions at the time of adjustment

Pay attention to the following when opening the control box for maintenance.

■ Electric shock

Some large capacitors may have a high voltage remaining in them for up to 5 minutes after the power is turned off. To prevent electric shock, wait at least 5 minutes after the power is turned off before doing the following:

- Opening and closing the control box
- Replacing fuses
- Separating and joining connectors
- measuring resistance
- Doing anything with a possibility of touching something inside the control box

Some adjustments require measuring the voltage while the power is turned on with the control box kept open. In such a case, be careful not to touch any place other than that for the measurement. In addition, always keep in mind that a high voltage remains for 5 minutes after the power is turned off.

■ Injury

While the power is turned on, the cooling fan of the control box operates; be careful not to get caught in it.
When separating or rejoining connectors, and measuring something, be careful not to cut your fingers on metal parts such as heatsinks and covers.

2. Components inside the control box

The following are brief explanations of components inside the control box. See control circuit block diagram at the end of this manual for the details of the connections.

■ Main PCB

The main PCB is fixed to the rear panel of the control box. This PCB serves to control machine operation.

■ Power supply circuit board

The power supply circuit board is fixed at the bottom of the control box. Four fuses are mounted on this PCB.

■ Panel circuit board

The panel circuit board is fixed to the front panel of the control box. This PCB controls indications of the machine status and the input operation.

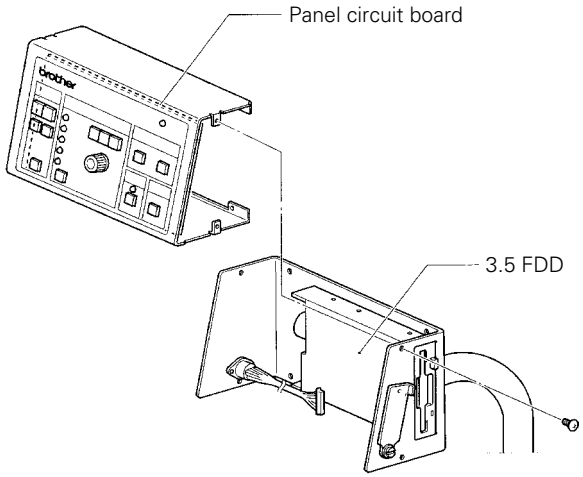
■ DC fan motor

The DC fan motor serves as a fan to cool the inside of the control box. Clean the inlet filter monthly.

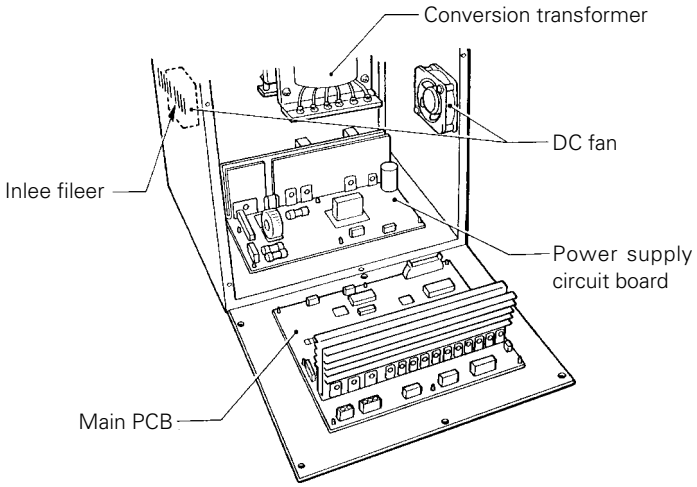
■ Conversion transformer (depending on power supply voltage specification)

The conversion transformer controls the power supply voltage to provide 220 V.

Operation panel



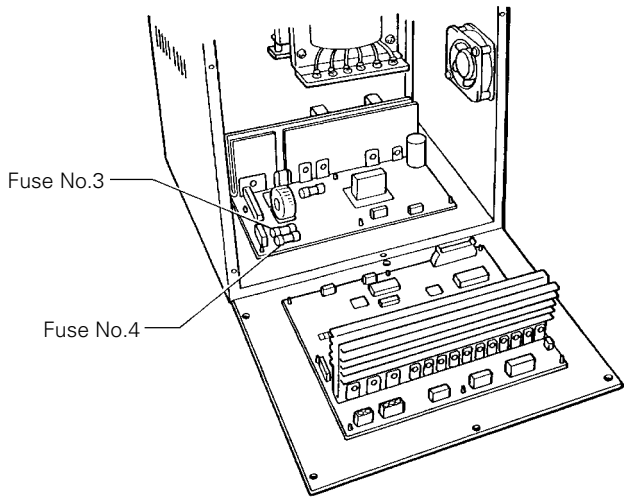
Control box

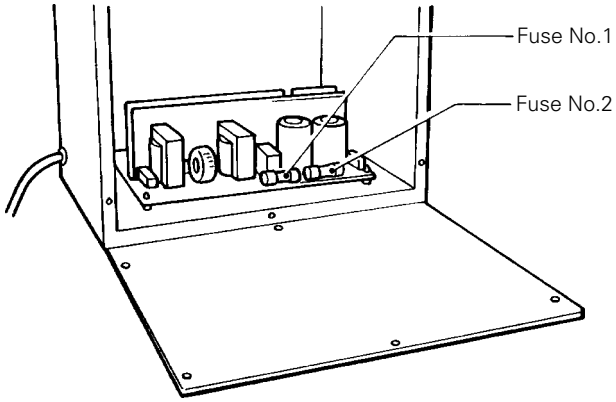


3. Fuse explanation

When replacing a fuse, follow the instructions indicated in "10-9. Troubleshooting flowchart."
If a component on a PCB is damaged, a fuse may blow again immediately even when it has been replaced.
When replacing a fuse, be sure to use the specified ones listed below.

No.	Part name	Part code	Manufacturer	When a fuse has blown
1	G fuse (5AFB) (quick melting type, 5A-250V)	S08030-000	Toyo Fuse Company TOYO5A	• The feed mechanism and work clamp do not operate. • Error [E-A1] appears.
2	G fuse (5AFB) (quick melting type, 5A-250V)	S08030-000	Toyo Fuse Company TOYO5A	• The machine motor does not turn. • Error [E-20] appears.
3	Fuse 6A (glass tube fuse, 6A-250V)	153242-000	Fuji Tanshi Company FGBO	The power lamp is not lit, and nothing operates.
4	Fuse 6A (glass tube fuse, 6A-250V)	153242-000	Fuji Tanshi Company FGBO	The power lamp is not lit, and nothing operates.



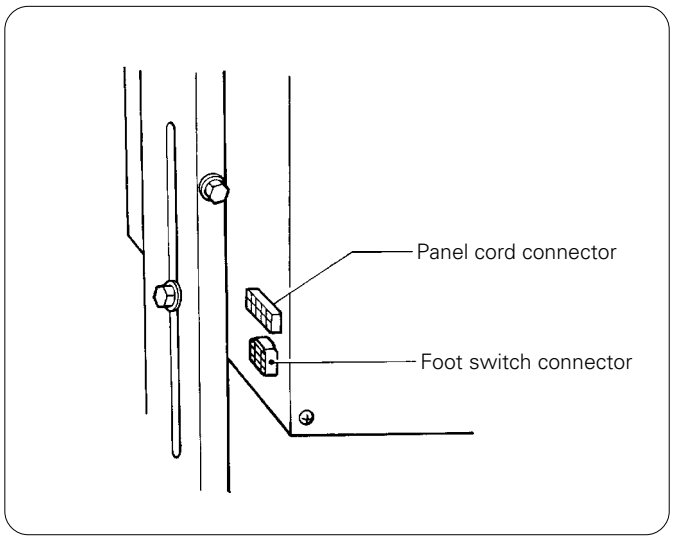


4. Connectors

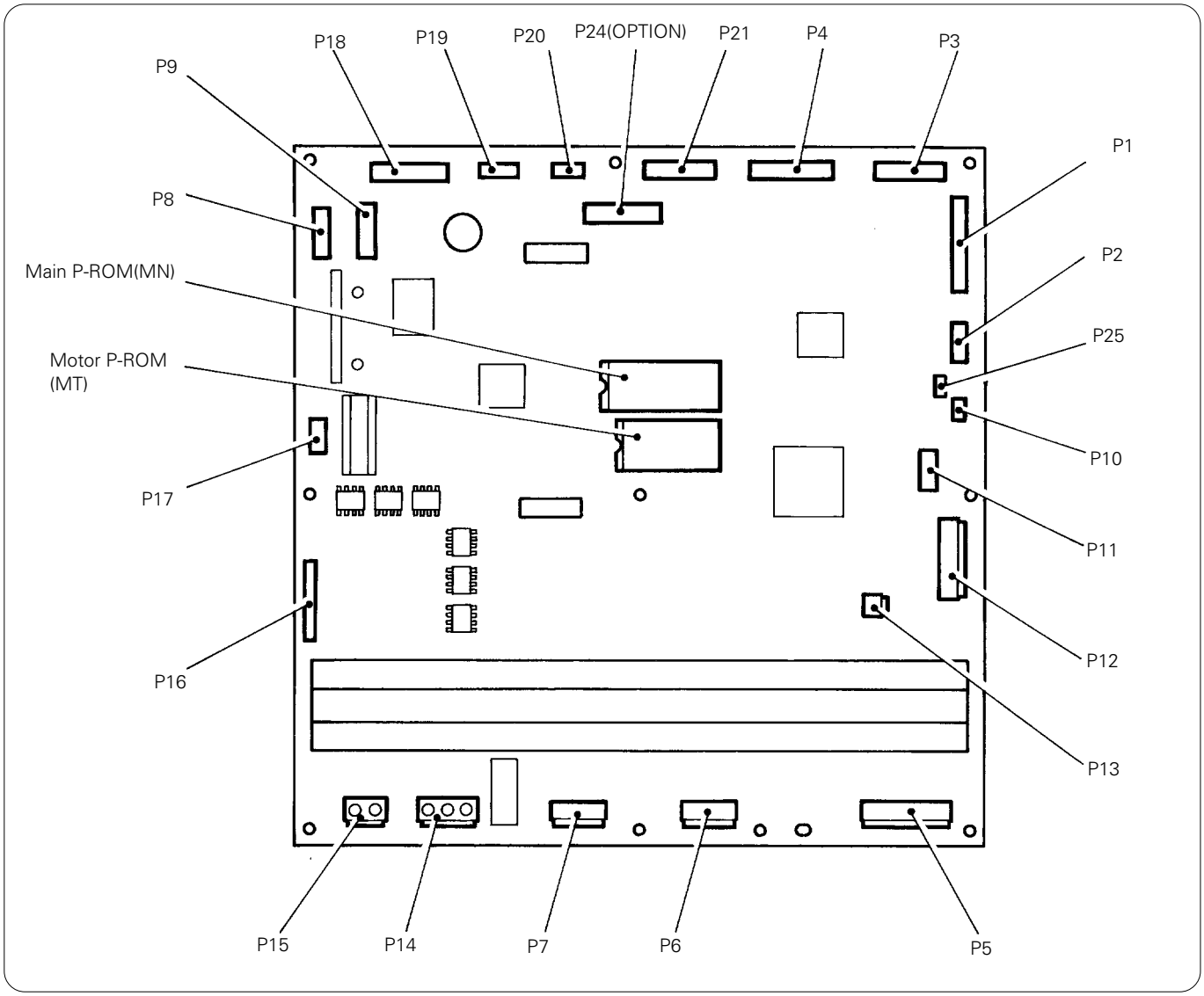
Most of the machine trouble is due to connector problems including improper connection or insufficient contact. Therefore, be sure to check if each connector is correctly inserted and that there is no contact failure between pins and wires before starting toubleshooting procedures.

■ Connector positions

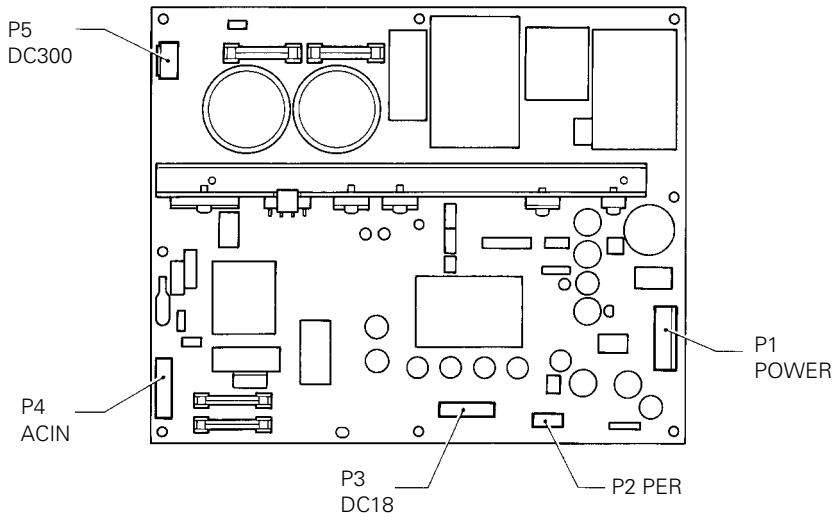
Outside of the control box



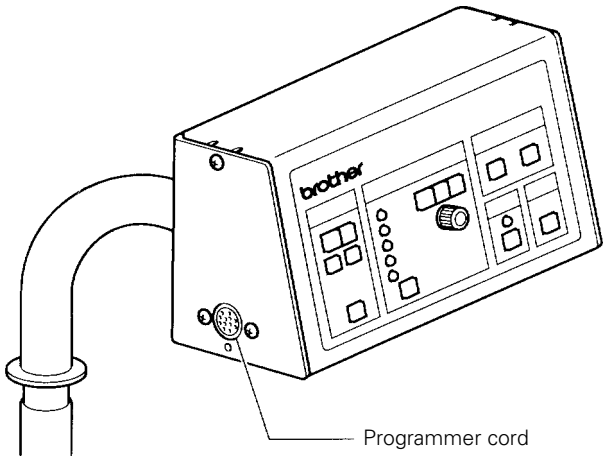
Main PCB



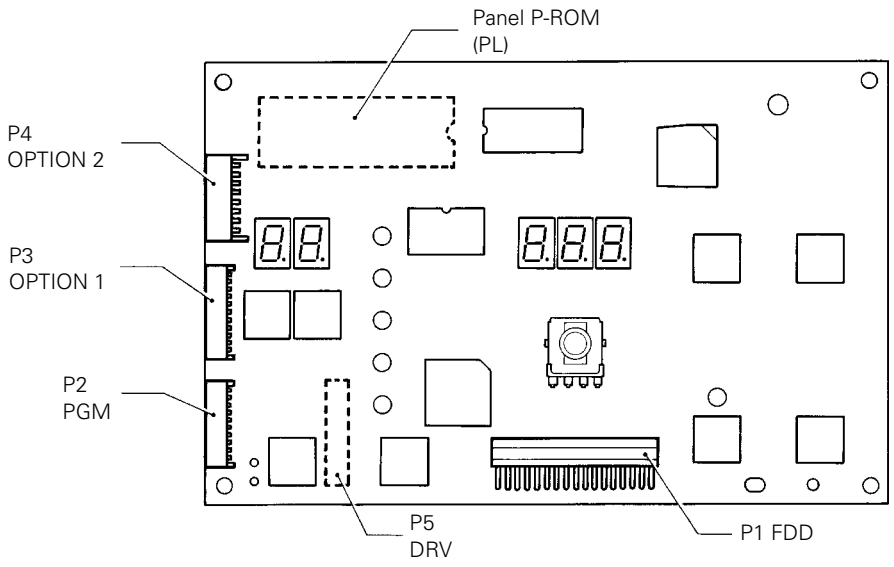
Power supply circuit board



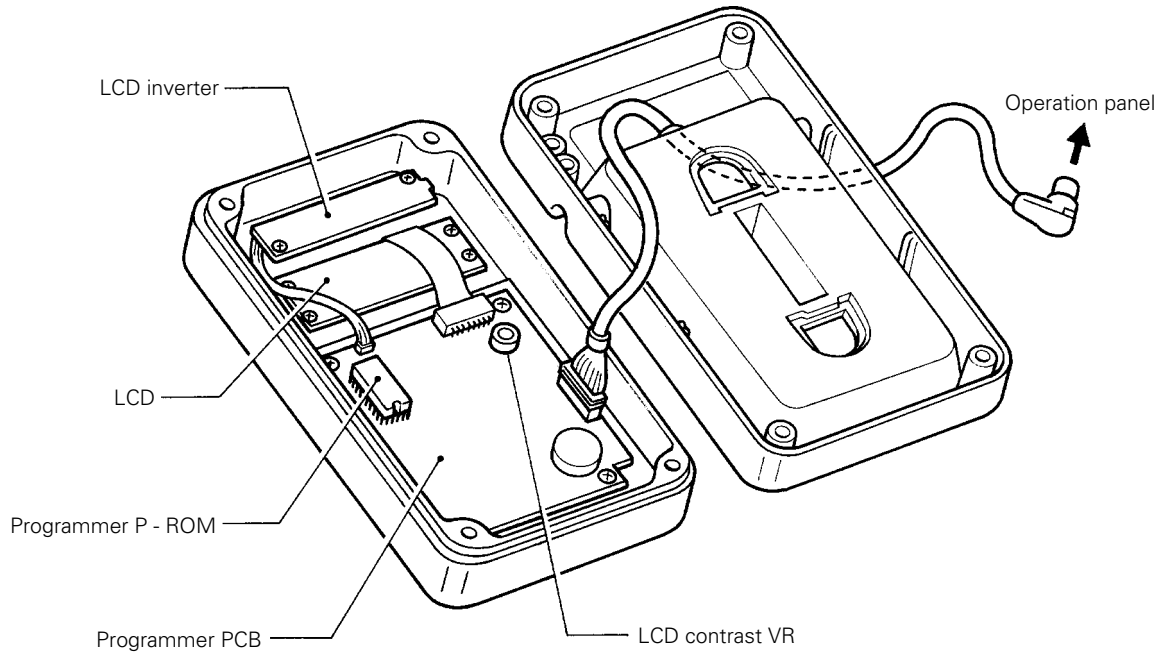
Outside of the panel



Panel circuit board



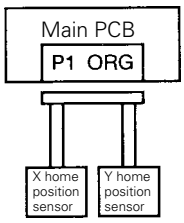
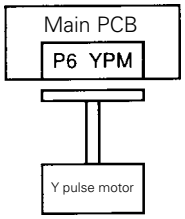
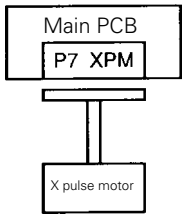
Programmer and programmer circuit board



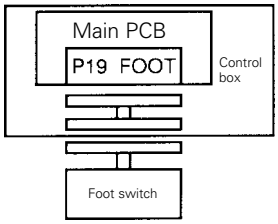
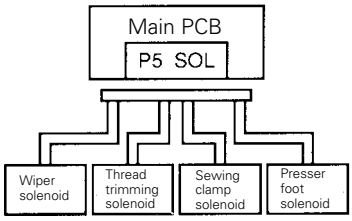
■ Contact failure

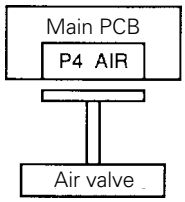
- The connectors functions are divided into four categories. Some connectors may belong to more than one group. Be sure to investigate another category if a problem is not found in one category.
- Ffor the details of connections, refer to the control circuit block diagram at the end of this manual.

1. Feed mechanism

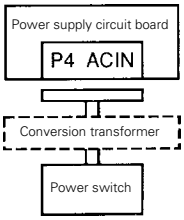
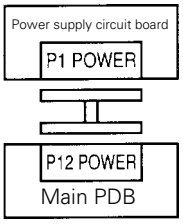
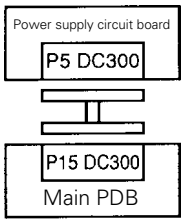
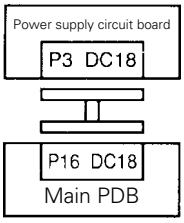
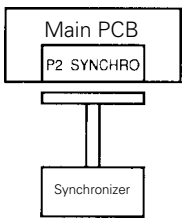
Problem	Connector No. and position
• Home position is not properly detected. • Error [E.A1] appears.	
• Forward feed does not operate correctly. • Error [E.A1] appears.	
• Sideways feed does not operate correctly. • Error [E.A1] appears.	

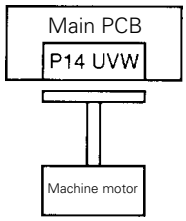
2. Work clamp lifter and thread trimmer mechanisms

• The work clamp does not operate. • The machine does not operate.	
• The work clamp does not operate. BAS-311E (Solenoid type) • Thread trimming is not performed. • Thread wiper does not operate. • The work clamp does not oeprate.	

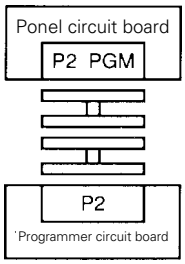
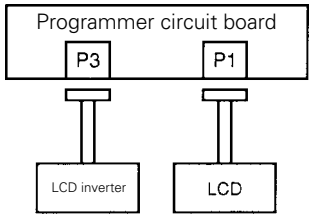
• The work clamp does not operate. • (For BAS-311E solenoid type, there is no need to carry out wiring to air valves.)	

3. Sewing operation

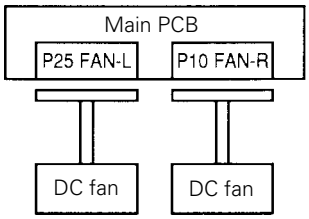
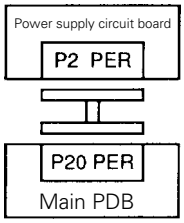
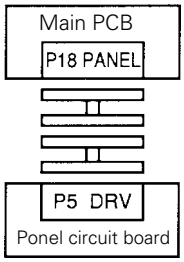
• The power lamp is not lit, and nothing operates. • Machine operation is unstable.	
• The power lamp is not lit, and nothing operates. • Machine operation is unstable. • The feed mechanism does not operate. • The work clamp and the presser foot do not operate. • Error [E.A1] appears.	
• The machine motor does not run. • Motor operation is unstable. • Needle up stop position is not correct. • Error [E.20] appears. • Error [E.22] appears.	
• The machine motor does not run. • Motor operation is unstable. • Needle up stop position is not correct. • Error [E.20] appears. • Error [E.22] appears.	
• The machine motor does not run. • Motor operation is unstable. • Needle up stop position is not correct. • Error [E.20] appears. • Error [E.22] appears.	

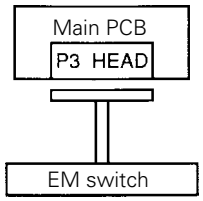
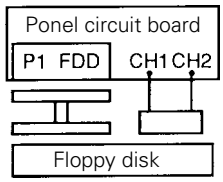
• The machine motor does not run. • Motor operation is unstable. • Needle up stop position is not correct. • Error [E.20] appears. • Error [E.22] appears.	

4. Programmer operation

• The programmer does not operate. • No switches on operation panel operate.	
• Keys on the programmer respond, but nothing appears on the display. (P1-LCD) • Display of the programmer is not lit. (Inverter for P3-LCD)	

5. Others

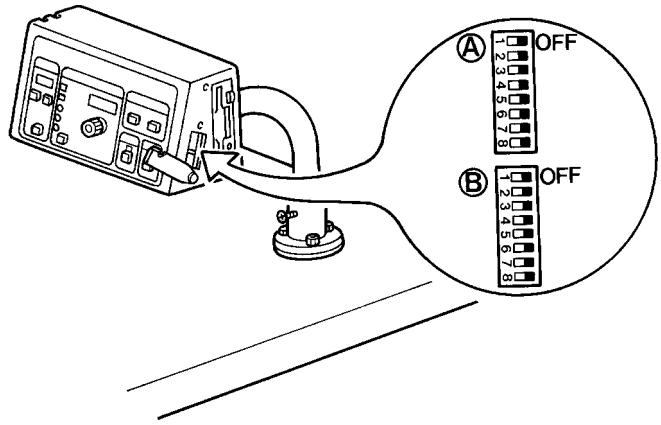
• The DC fan motor does not run. • Error [E.c5] appears. (P10 FAN-R) • Error [E.c1] appears. (P10 FAN-L)	
• Error [E.F1] appears.	
• Indication is strange. • Any switch does not have any effect. • The power lamp is not lit.	

• Error [E.12] appears. • Emergency stop switch is rejected.	
• Error [E.40] appears.	

5. DIP switches

Note: When changing DIP switch setting the power must be off.

Panel DIP switch functions



■ DIP switch Ⓐ

SW No.	When ON
Ⓐ - 1	After sewing is complete, the work clamp is raised by the operator and does not rise automatically.

- Various setting combinations for DIP switches No.2, No.3 and No.4 can be used to change the way the work clamp is raised and lowered.
- For pneumatic work clamps, the operation mode can be changed using the two-stage work clamp switch.

SW Ⓐ-2	SW Ⓐ-3	SW Ⓐ-4	Type	Function of work clamp pedal
—	—	—	Solenoid	Work clamp and presser foot rise and lower simultaneously.
ON	—	—	Solenoid	Only work clamp rises and lowers; presser foot lowers when starting switch is pressed.
—	ON	—	Pneumatic	For split-type work clamp the left/right order changes alternately.
ON	ON	—	Pneumatic	Pneumatic Only work clamp rises and lowers; presser foot lowers when starting switch is pressed.
—	—	ON	Pneumatic	ON Pneumatic Work clamp and presser foot rise and lower simultaneously.
ON	—	ON	Pneumatic	Right work clamp, left work clamp and presser foot lower in this order. They rise in the reverse order.
—	ON	ON	Pneumatic	Left work clamp, right work clamp and presser foot lower in this order. They rise in the reverse order.
ON	ON	ON	Pneumatic	Both left and right work clamps, and presser foot lower in this order. They rise in the reverse order.

SW No.	When ON
Ⓐ-5	After sewing is completed, work clamp does not automatically rise (only in split mode).
Ⓐ-6	Clamping force output is produced (Inner clamping device available as an option).
Ⓐ-7	Single-pedal operation using the starting switch; when the starting switch is pressed, the work clamp lowers, and when it is released, sewing starts.
Ⓐ-8	Thread breakage detector device is activated (available as an option).

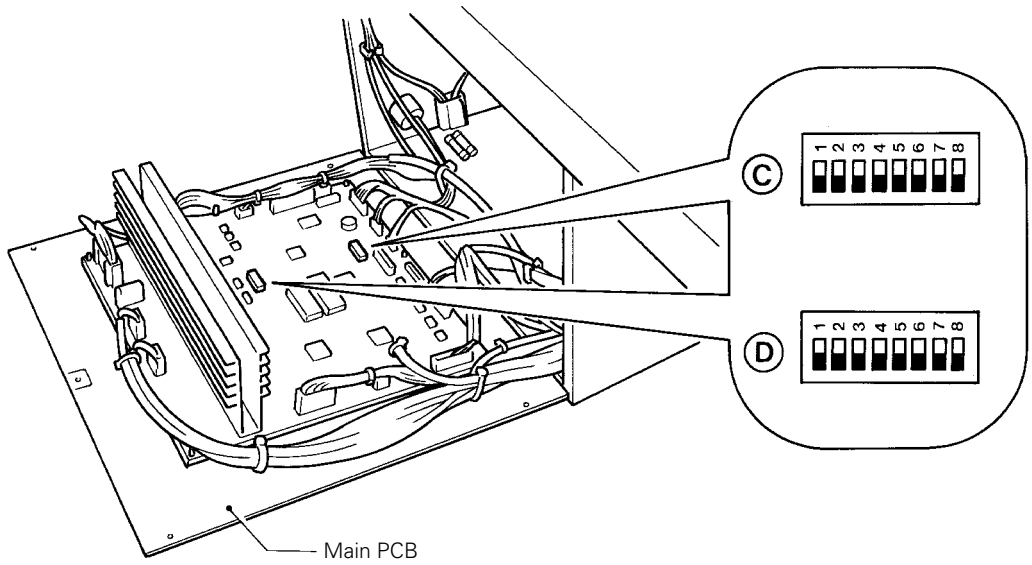
■ DIP switch Ⓑ

SW No.	When ON
Ⓑ-1	Single split mode activated
Ⓑ-2	————
Ⓑ-3	Thread is not trimmed after an emergency stop.
Ⓑ-4	Needle cooler output is produced. (available as an option).
Ⓑ-5	When a rotating-type thread breakage detector device is used, detection precision is changed from 8 to 14. When a fiber-type thread breakage detector device is used, detection precision is changed from 5 to 10.
Ⓑ-6	Fiber-type thread breakage detector device is ON, and DIP switch Ⓐ-8 is ON (available as an option)
Ⓑ-7	When using a 3-stage pedal
Ⓑ-8	Feeding speed is switched to high speed.

DIP switches inside the control box

⚠ DANGER

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



■ DIP switch Ⓒ

Ⓒ-1	Ⓒ-2	Ⓒ-3	Model	Area (X, Y)
—	—	—	—	—
ON	—	—	BAS311E	130×60
—	ON	—	BAS326EL	220×100
ON	ON	—	—	—
—	—	ON	—	—
ON	—	ON	—	—
—	ON	ON	—	—
ON	ON	ON	BAS311EL	220×60

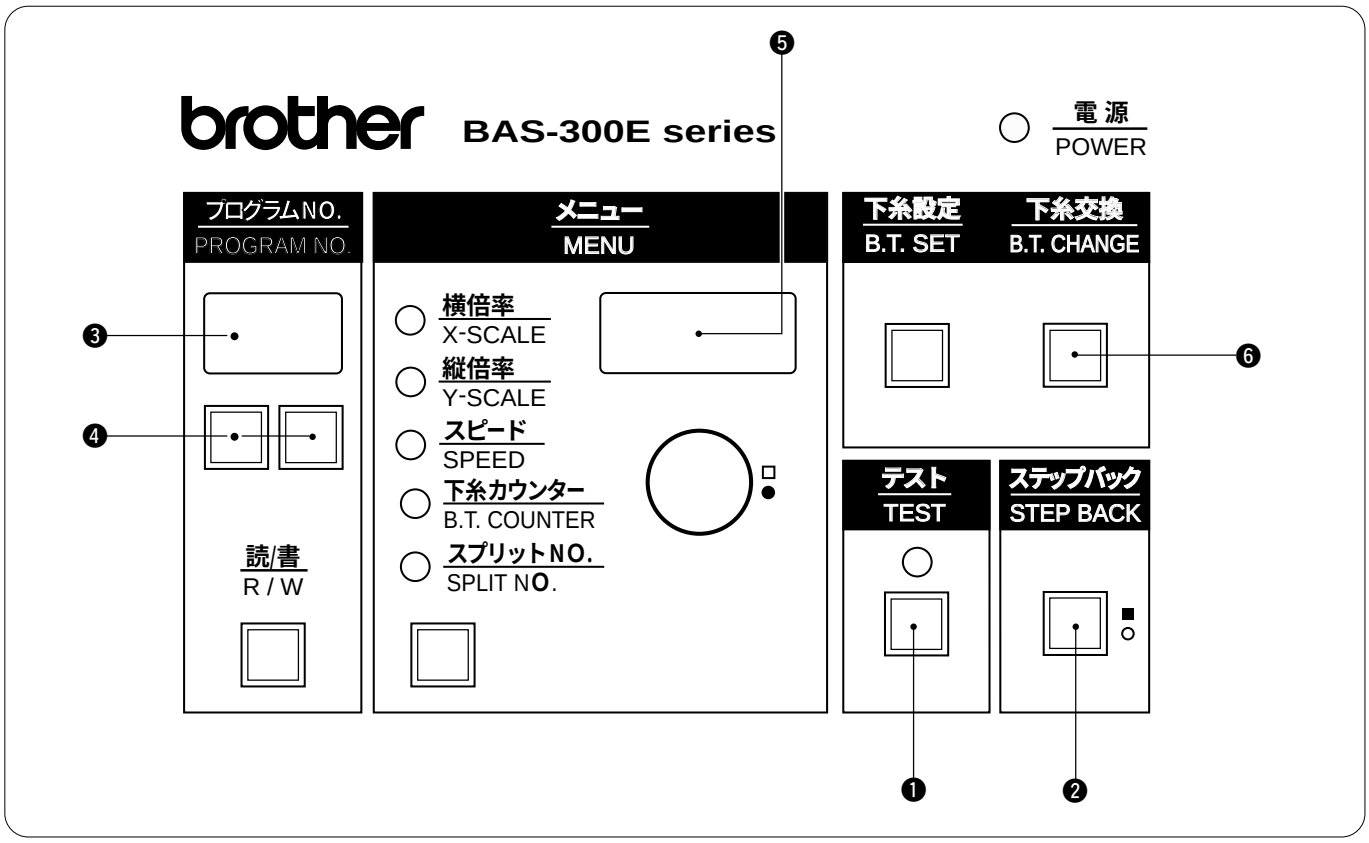
SW No.	When ON
Ⓒ-4	Controlled sewing area becomes 1200 mm × 400 mm
Ⓒ-5	5 For pneumatic type, set to ON when the connection has been changed so that the work clamp remains raised when the power is turned off.
Ⓒ-6	Stepping work clamp operated by air pressure is used (when solenoid type is standard).
Ⓒ-7	———
Ⓒ-8	———

■ DIP switch Ⓓ

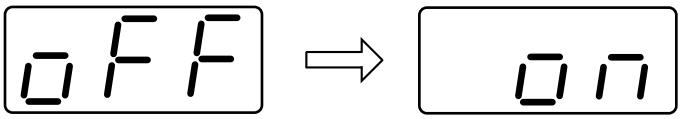
SW No.	When ON
Ⓓ-1	The first two stitches at the sewing start will be sewn at low speed (approx. 260 spm).
Ⓓ-2	The last two stitches at the sewing end will be sewn at low speed (approx. 260 spm).
Ⓓ-3	————
Ⓓ-4	The last two stitches at the sewing end will be sewn at low speed (approx. 700 spm).
Ⓓ-5	————
Ⓓ-6	Slow-speed sewing at the sewing start will be canceled.
Ⓓ-7	When the upper shaft is stopped, the motor will change direction and the needle bar will return to the vicinity of the needle up stop position.
Ⓓ-8	During an emergency stop, the thread is trimmed and the needle bar stops in the raised position.

6. Changing special functions using the memory switches

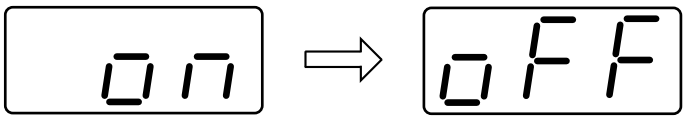
The functions of the switches on the operation panel can be changed to carry out special functions.
Note: The following are special uses. All the memory switches are set to OFF before shipment from the factory.



1. Turn on the power switch.
2. While pressing the TEST switch ❶, press the STEP BACK switch ❷ to switch to setting mode.
3. Press the program select switch ❹ so that the number displayed on the display screen ❸ matches the switch number (00 - 3F) for the function that you would like to select from the table.
4. Press the STEP BACK switch ❷ to switch the setting appearing in the display screen ❺ from OFF to ON.



If pressed once more:



■ If the B.T. CHANGE switch ❻ is pressed at this time, all memory switch settings will be changed to OFF.

5. Press the TEST switch ❶. The display will return to normal.

■ Memory Switches (00 – 0F)

SW No.	When ON
memo-00	When moving to the home position, the feed plate moves in the order X → Y and the start position moves in the order Y → X.
memo-01	When moving to the home position, the feed plate moves in the order Y → X and the start position moves in the order X → Y.
memo-02	The forward position becomes the home position, and movement is in the order Y → X and X → Y. Used for attaching buttons.
memo-03	Automatic ejector operates. (It is available by special order.) DIP switch Ⓐ-7 is set to ON. Cassette is held by automatic ejector and the sewing machine automatically starts.
memo-04	Needle stops in up position during emergency stop: (Needle normally stops in down position.)
memo-05	When sewing is finished, the feed plate moves via the machine home position to the start position.
memo-06	After the final stitch, the work clamp rises and then the feed plate returns to the start position.
memo-07	Intermittent work clamp is not used (does not rise).
memo-08	When using an alternating clamping presser (1/4 ON, 3/4 OFF), and when sewing overlapping rectangles.
memo-09	Wiper is changed to pneumatic wiper. (Pneumatic wiper is available as an option.)
memo-0A	Jog feeding becomes faster during programming.
memo-0b	ON when a two-stage tensioner is used. (Two-stage tensioner is available as an option.)
memo-0c	Single-pedal operation by means of two-stage work clamp switches. DIP switch Ⓐ-2 is ON
memo-0d	Clearing the emergency stop switch action is carried out using the STEP BACK switch.
memo-0E	Test feeding is carried out at the same speed as normal sewing. (For checking feed operation)
memo-0F	After sewing is finished, the work clamp automatically opens and closes once (practice operation)

■ Memory Switches (20 – 2F)

SW No.	When ON	
memo-20	During feed test operation, feeding 100 stitches at a time is possible using the STEP BACK switch.	C
memo-21	After the home position is detected and the machine moves to the sewing start position, the work clamp rises automatically.	C
memo-22	When extended option output No.1 is ON, the sewing machine starts automatically.	C
memo-23	Set to ON when the bobbin changer is being used. (This part is available by special order.)	C

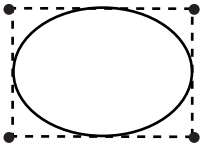
Note: C indicates that these functions are available for software versions MN-C or later.

■ Memory Switches (10 – 1F)

SW No.	When ON
memo-10	Milling device can be used (available as an option).
memo-11	Bobbin thread counter and production counter operate every time thread is trimmed.
memo-12	Work clamp is lowered by pressing work clamp first stage switch twice, without using work clamp second stage switch. When DIP switch Ⓐ-2 is set to ON, right work clamp and left one are lowered in this order; when OFF, left work clamp and right one are lowered in this order. They are raised simultaneously.
memo-13	When the work clamp is lowered, pressing the start switch causes locking; if the switch is released before locking, the work clamp is raised. When DIP switch Ⓐ-2 is set to ON, the right work clamp and the left one are lowered in this order; when OFF, the right work clamp and the left one are lowered in this order. They are raised in the reverse order.
memo-14	Needle up error is detected.
memo-15	ON when machine is equipped with signal tower indicator. (This indicator is available by special order.)
memo-16	ON when machine is equipped with thread nipper. (Thread nipper is available by special order.) After presser foot rises, thread nipper will operate.
memo-17	ON when machine is equipped with reset switch. (Reset switch is available by special order.)
memo-18	When the start switch is pressed, the right work clamp and the left one are lowered in this order, and sewing starts. When the work clamp first stage switch is pressed, the left work clamp and right one are lowered in this order (when DIP switch A-2 is set to ON). When DIP switch A-2 is set to OFF, the order is reversed.
memo-19	Produces three work clamp signal outputs (right and left work clamps, and presser foot) so that a two-position air valve can be used. (Two-position air valve is available by special order.)
memo-1A	When using a triple pedal (DIP switch Ⓑ-7 is also ON), the right is used exclusively to detect the home position. If DIP switch Ⓐ-7 is OFF, the left pedal causes left and right work clamps to be raised and lowered simultaneously. If ON, the left pedal causes the left work clamp to be raised and lowered, and the starting pedal causes the right work clamp to be lowered.
memo-1b	B430E single foot pedal can be used. DIP switch Ⓐ-7 should be ON.
memo-1c	Bobbin thread counter is decremented at the start of sewing.
memo-1d	An air pressure drop detection switch is used. (This detection switch is available by special order.)
memo-1E	Split number is changed automatically.
memo-1F	Program number is changed automatically.

■ Turn the dial while pressing the STEP BACK switch to change the values.

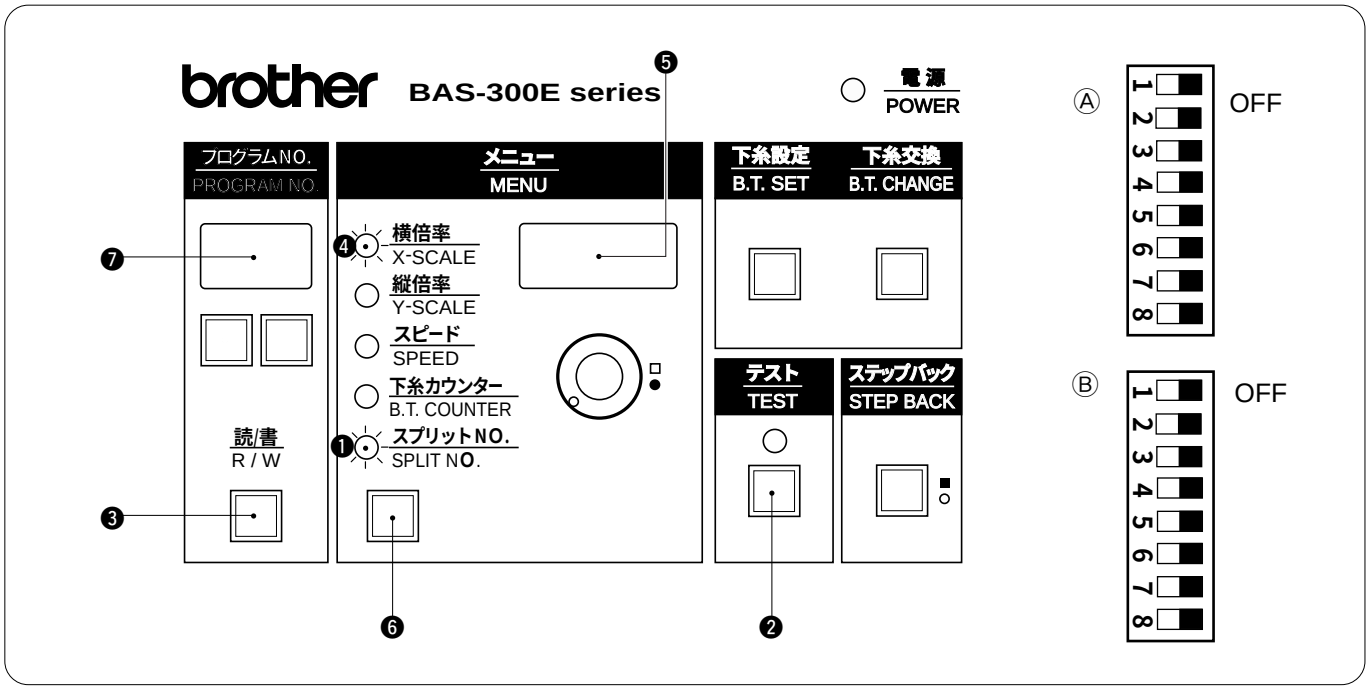
Turn the dial while pressing the STEP BACK switch to change the values.

SW No.	Possible setting range	Units	Initial value	Explanation
memo-30	1 - 999	x 10ms	10	Time until feed mechanism starts moving after work clamp has lifted.
memo-31	1 - 4	—	1	Changes the feed speed. 1 (Fast) ⟷ 4 (Slow)
memo-32	1 - 7	—	3	Changes the possible sewing speed for a given stitch length. 1 (Fast) ⟷ 7 (Slow) 1 (2,700/3 mm), 2 (2,600/3 mm), 3(2,500/3 mm), 4 (2,300/3 mm), 5 (2,000/3 mm), 6 (1,800/3 mm), 7 (1,200/3 mm) Settings 1 and 2 are outside the warranty specification at the time of shipment from the factory.)
memo-33	1 - 10	x 7.5°	5	Changes the feed timing 1 (Fast) ⟵ 5 (standard) ⟶ 10 (Slow)
memo-34	1 - 5	—	0	Number of stitches sewn at 400 spm (10W speed) at sewing start
memo-35	10 - 60	Xms	40	Solenoid ON time changes when work clamp is being lowered (solenoid specifications only) 10 ⟷ 60 (Quiet) (High work clamp capacity)
memo-36	1 - 3	—	1	Solenoid ON time to raise presser foot is changed. (Standard) 1 ⟷ 3 (Upper limit) 1 (10 ms) 2 (20 ms) 3 (30 ms) C
memo-37	0 - 3	—	3	Gear ratio is automatically corrected when 2DD data is read. 0: Follows the model specified in DIP switch C. 1: Reads 2DD data as 311A data. 2: Reads 2DD data as 326A data. 3: Reads 2DD data as 341A/342A data. [This function is available when panel PROM indication is PL-C or later.]
memo-38	1- 20	X0.1S	1	Delay time from the point when the cassette is clamped to the start of sewing when DIP switch A7 is ON during automatic sewing D
memo-39	0 - 11	—	0	[Set value] 0: Sensor home position, 1: Center of sewing area, 2: Upper left of sewing area, 3: Lower left of sewing area, 4: Upper right of sewing area, 5: Lower right of sewing area, 6: Sewing start point, 7: Sewing end point, 8: Upper left of mask, 9: Lower left of mask, 10: Upper right of mask, 11: Lower right of mask [Procedure] 1. Select memory switch 39. 2. Change X and Y scales. 3. Step on start switch to return to home position, and sewing data can be created with specified scales. [Mask] Upper left of mask  Lower left of mask ● Mask is a rectangular frame to cover the rounded edges of sewing data. ● In the left figure, an oval is sewing data, and the rectangle indicated with a broken line is the mask.

Note: C · D · F indicates that these functions are available for software versions MN-C · MND · MN-F or later.

SW No.	Possible setting range	Units	Initial value	Explanation
memo-3A	1-3	—	2	Change speed limit by stitch length. (Max. speed remains same) 1:Speed limit by stitch length is up,sewing speed increases. 2:Standard 3:Speed limit by stitch length is down, sewing speed decreases. * In case drifting problem occurs at a part of large stitch length, select 3. * If you select 1, Please be careful because drifting might occur depending on sewing condition. F
memo-3B - memo-3F	—	—	0	—

7. Checking the input sensor and DIP switch input



1. When the SPLIT NO. indicator ❶ is lit and the R/W switch ❸ is pressed while the TEST switch ❷ is being pressed, the X-SCALE indicator ❹ will be lit and the state of the X home position signal will appear on the display ❺.

   ■ When sensor is ON H

   ■ When sensor is OFF L

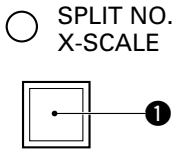
2. Each time the MENU switch ❻ is pressed, a different indicator will illuminate and the operating condition for the corresponding item will appear on the display.
   - When X-SCALE indicator is lit : X home position sensor
   - When Y-SCALE indicator is lit : Y home position sensor
   - When SPEED indicator is lit : Needle up signal (synchronizer)
   - When B.T. COUNTER indicator is lit : 24-split signal (synchronizer)
   - When SPLIT ON. indicator is lit : Needle down signal (synchronizer)

3. If the settings for DIP switch Ⓐ at the side of the operation panel are changed at this time, the changed switch number will appear in the left digit of the PROGRAM NO. display ❼.

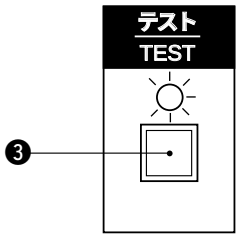
4. If the settings for DIP switch Ⓑ are changed at this time, the changed switch number will appear in the right digit of the PROGRAM NO. display ❼.

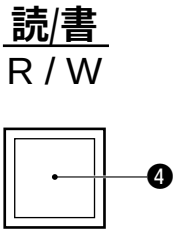
8. Checking the input voltage

1. Turn on the power switch.
2. Press the MENU switch❶ until the X-SCALE indicator ❷ is lit.



3. While pressing the TEST switch ❸, press the R/W switch ❹.





4. If the input voltage is normal, the input voltage conditions will be shown in the display as shown below.

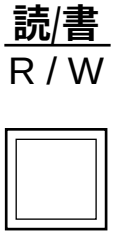
200-V specifications	090 - 110	"100" is displayed when the input voltage is 200 V.
220-V specifications	100 - 120	
230-V specifications	105 - 125	"110" is displayed when the input voltage is 100 V (for 100-V specs.), 380 V (for 380-V specs.) or 415 V (for 415-V specs.).
100-V , 380-V , 400-V and 415-V specifications	100 - 120	

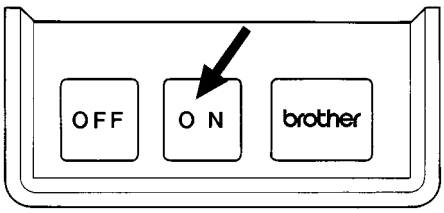
5. Press the TEST switch ❸ once more to return the display to the normal condition.

9. Clearing all memory settings

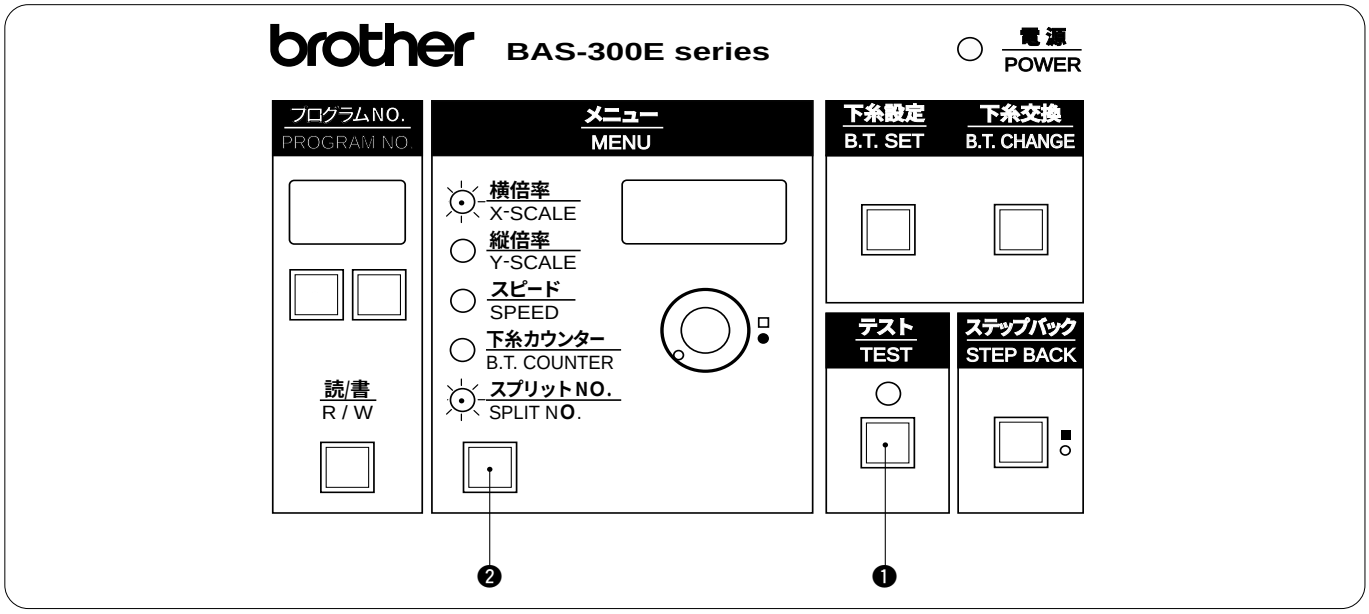
- If the sewing machine stops operating normally, the cause may be that an incorrect memory setting has been made by means of the memory switch, for instance. In this case, carry out the following procedure to clear the memory, and also check the DIP switch settings.

■While pressing the R/W switch, turn on the power. This will clear all of the memory settings.



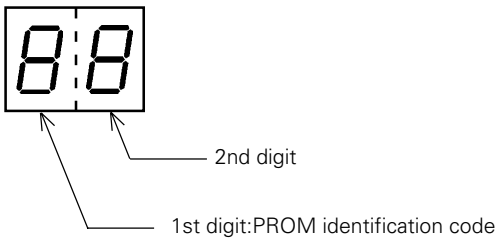


10. Confirming software version

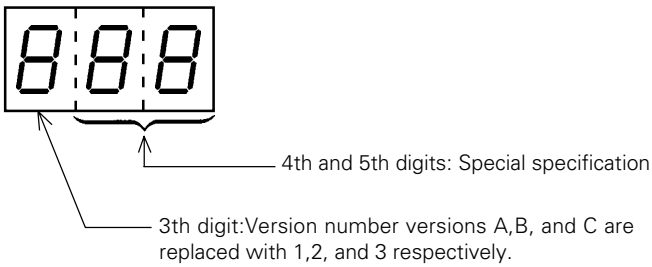


1. While pressing the TEST switch ❶, turn on the power to the machine. Version number of each PROM can be confirmed.

■Program NO display



■Menu display



2. Every time the MENU switch ❷ on the panel is pressed until the TEST switch ❶ is pressed again, the indication will change as follows:

Indication	LED of MENU switch	PROM
A (A)	X-SCALE	Main PROM (MN)
b (b)	Y-SCALE	Motor PROM (MT)
C (c)	SPEED	Programmer PROM (PG)
d (d)	B.T.COUNTER	Panel PROM (PL)

■Version number indication (example)

PROM label

BAS300E MN-C

Indication [A0] [300]

BAS300E PL-D03

Indication [d0] [403]

11. Error codes

NOTE ● If an operation problem occurs, a buzzer will sound and an error code will appear on the display screen; if a programmer is connected, an error message will appear on the screen.
● Wait 10 seconds or more after turning the power off before turning it back on again.

Code	Cause	Remedy
E.10	Emergency stop switch was pressed.	Press the emergency stop switch once more to cancel.
E.11	Emergency stop switch was pressed during sewing.	Press the emergency stop switch once more to cancel. The STEP BACK switch can then be used to resume sewing.
E.12	Emergency stop switch is being continually pressed, or emergency switch connection error.	Turn off the power and check.
E.20	Problem with machine motor stopping, or synchronizer connection error.	Turn off the power, and then turn the machine pulley to check if the machine has locked up. Check the synchronizer connection. Check if connectors P14, P15 or P16 are disconnected.
E.21	Machine motor operation error.	Turn off the power and check the ground wire connection.
E.22	Needle up stop position error.	Turn the pulley to align the index mark with the needle up stop position. Check the V-belt tension.
E.30	Data is outside possible sewing area due to enlargement or reduction ratio setting.	Check the enlargement or reduction ratio setting.
E.31	Data pitch exceeds 12.7 mm due to enlargement or reduction ratio setting.	Check the enlargement or reduction ratio setting.
E.32	No end code was input into sewing data.	Input an end code, or change the program number.
E.40	Floppy disk is not inserted, disconnected cord inside operation panel, or malfunction of drive.	Insert a floppy disk. If floppy disk is already inserted, turn off the power and check the connections of cords inside the operation panel.
E.41	Program number is invalid, no data, or floppy disk is not formatted.	Check the floppy disk.
E.43	Floppy disk changed from readable disk when setting the bobbin thread or when setting the memory switch.	Replace with readable floppy.
E.4F	Other error when reading floppy disk.	Replace the floppy disk and repeat the operation.
E.50	Floppy disk is write-protected.	Remove the write-protection.
E.51	Insufficient space on floppy disk.	Use a different floppy disk.
E.52	Floppy disk cannot be formatted.	Replace the floppy disk and repeat the operation.
E.5F	Floppy disk write error.	Repeat the operation.
E.60	Data backup is not possible (Panel PCB)	Turn off the power, wait a while and then turn it back on. If the error appears continually, contact a qualified service technician.
E.61	Data cannot be backed up. (Control PCB)	
E.70	Option output numbers are duplicated.	Change the option output number.
E.80	Thread breakage error detected by rotating-type thread breakage detector device.	Thread the upper thread. Sewing can then resume.
E.81	Upper thread breakage error detected by optical fiber-type sensor.	Thread the upper thread. Sewing can then resume.

■ Error codes [E.9 *] - [E.F *]

⚠ DANGER

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

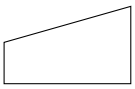
Code	Cause	Remedy
E.90	Abnormal drop in power supply voltage, or power was turned on again immediately after it was turned off.	Turn off the power and check the input voltage. After turning off the power, wait 3 seconds or more before turning it on again.
E.91	Abnormal rise in power supply voltage.	Turn off the power and check the input voltage.
E.A0	Starting switch was pressed without any valid sewing data loaded.	Re-read the sewing data.
E.A1	Home position point was not detected within a certain time during home position detection.	Turn off the power and check the X-Y feed and the home position sensor connection.
E.c0	Motor PROM is not correctly inserted.	Turn off the power and check.
E.c1	The box cooling fan (at the left when looking from the front) is not operating.	Turn off the power and check whether any thread scraps have built up.
E.c2	Heat shink of control circuit board is abnormally hot.	Turn off the power and clean the air intake port of the box.
E.c3	Abnormal current detected in X pulse motor.	Turn off the power and contact a qualified service technician.
E.c4	dAbnormal current detected in X pulse motor.	Turn off the power and contact a qualified service technician.
E.c5	The box cooling fan (at the right when looking from the front) is not operating.	Turn off the power and check whether any thread scraps have built up.
E.d0	Air pressure drop error.	Turn off the power and check.
E.E0	Main PROM is not correctly inserted.	Turn off the power and check.
E.E1	Communication error detected by control circuit board.	Turn off the power, wait a while and then turn it back on.
E.E2	Communication error detected by panel circuit board.	Turn off the power, wait a while and then turn it back on.
E.E3	Bad connection in cable between panel and box.	Turn off the power and check.
E.F0	Power relay is not operating (malfunction of power supply circuit board).	Turn off the power and contact a qualified service technician.
E.F1	Bad connection in cable between power supply circuit board and main circuit board.	Turn off the power and check.
E.F2	Abnormal current detected in power supply circuit board.	Turn off the power and contact a qualified service technician.

REFERENCE segment LED alphabet

8	Panel display	A	b	c	d	E	F	6	H	L	o
	Text display	A	b	c	d	E	F	6	H	L	O

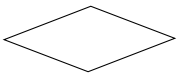
Chapter 7. Trouble shooting

■ Explanation of shapes

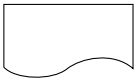


Indicates manual operation.

Indicates switch operation.



Selects the course of action to follow, using a yes-or-no decision-making process.



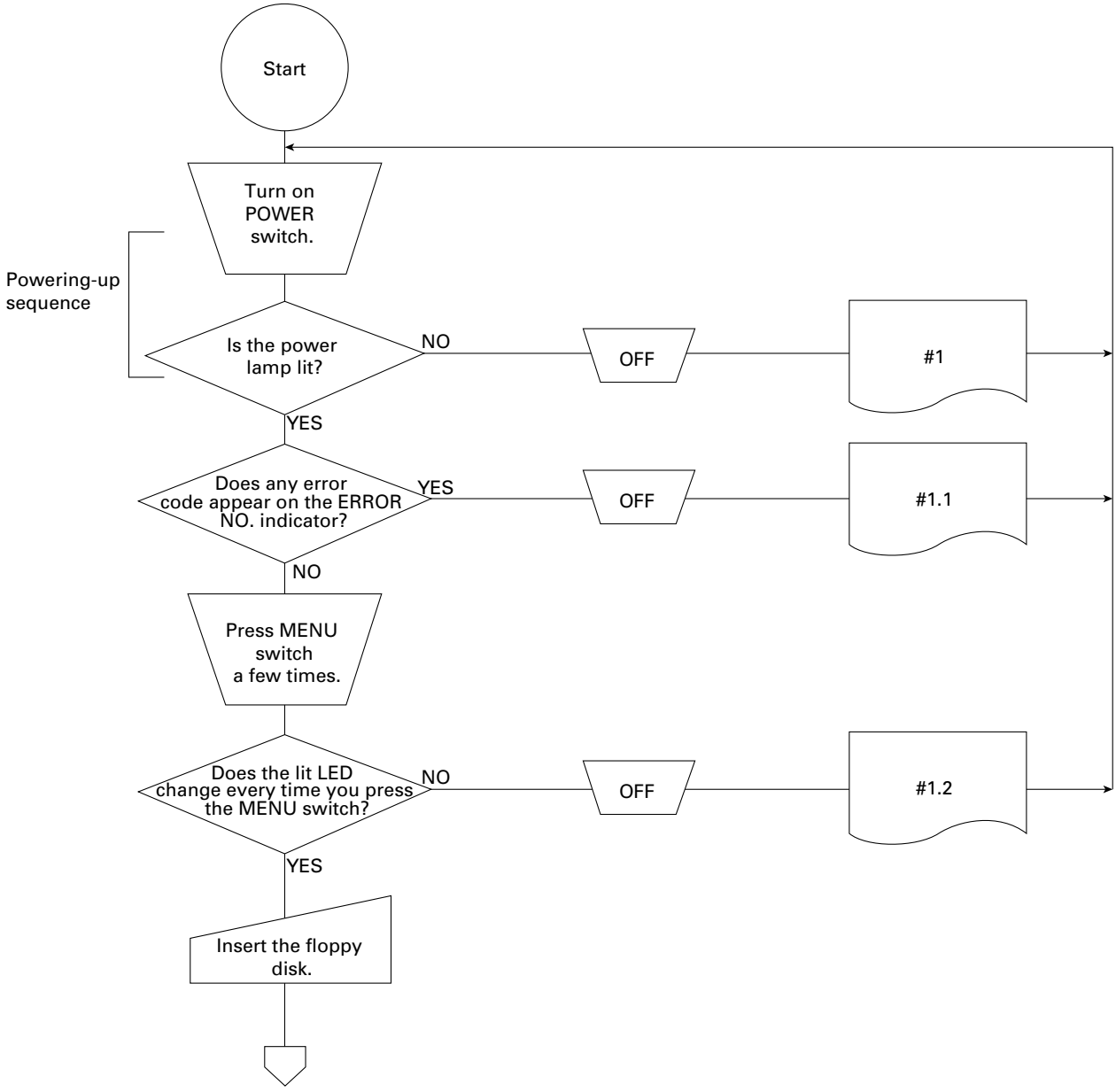
Indicates that the procedure to follow appears in the first column of "problem determination and solution table".

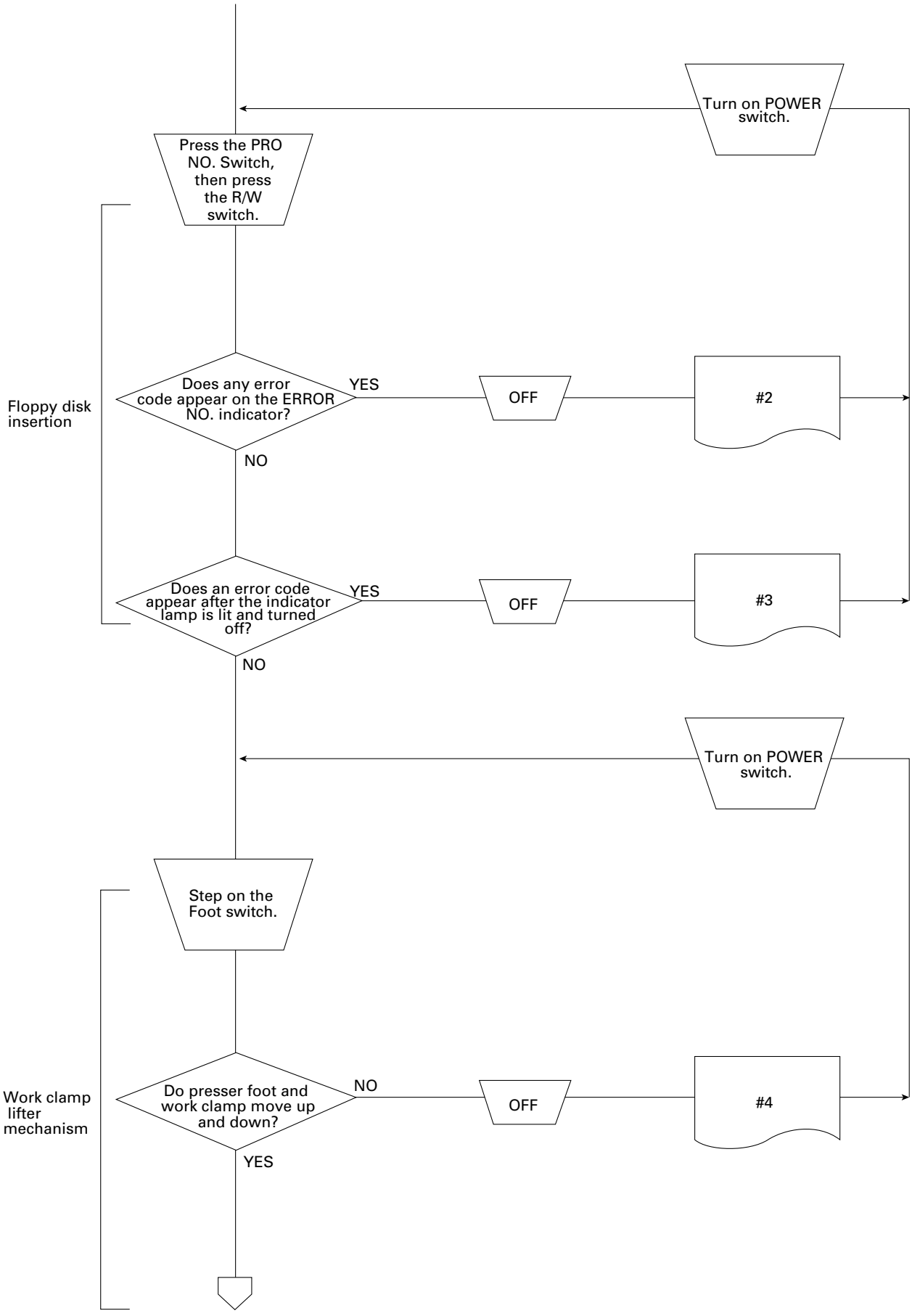
Indicates setting-up operation.

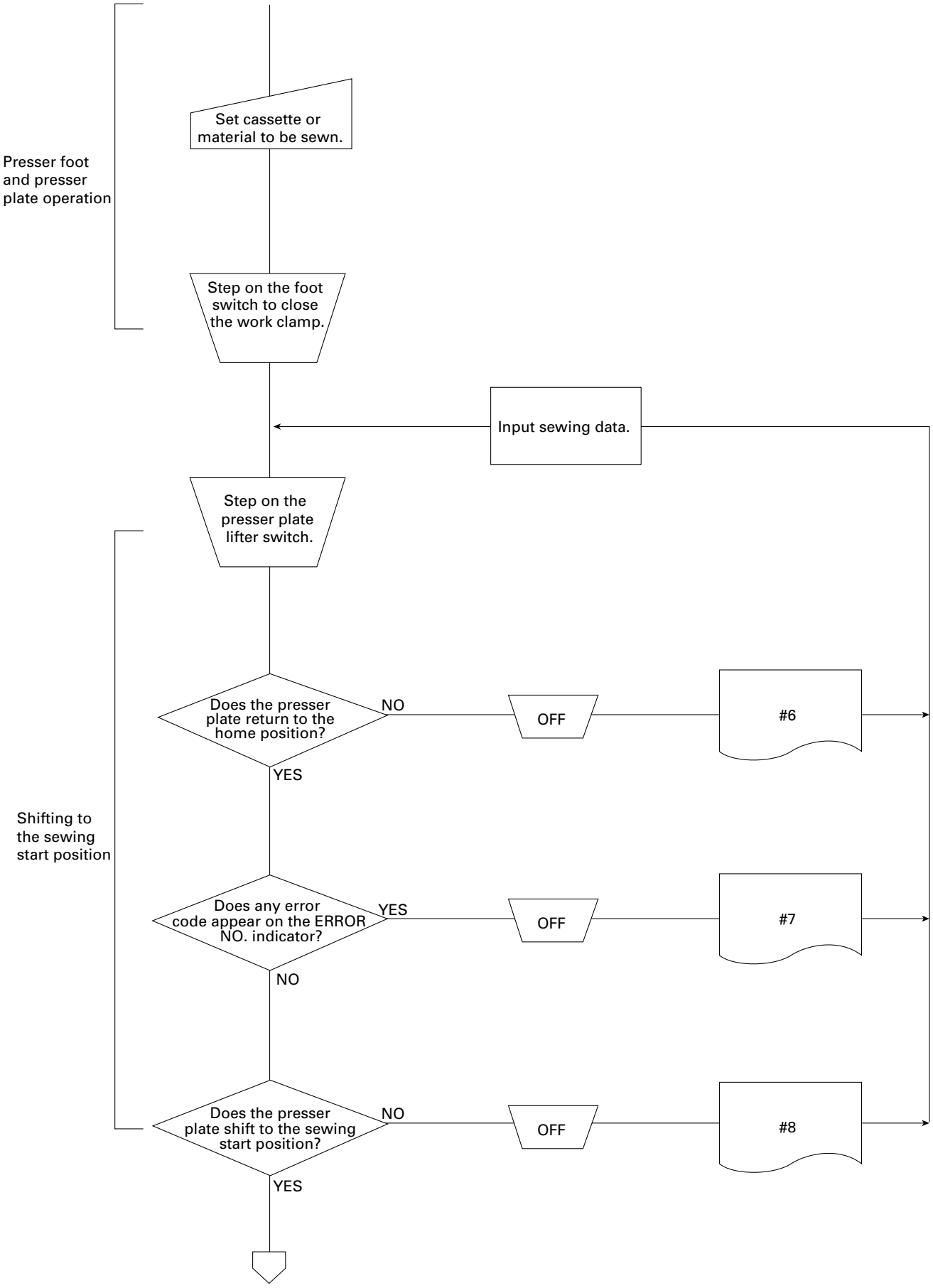
Indicates that the procedure to follow appears on the next page.

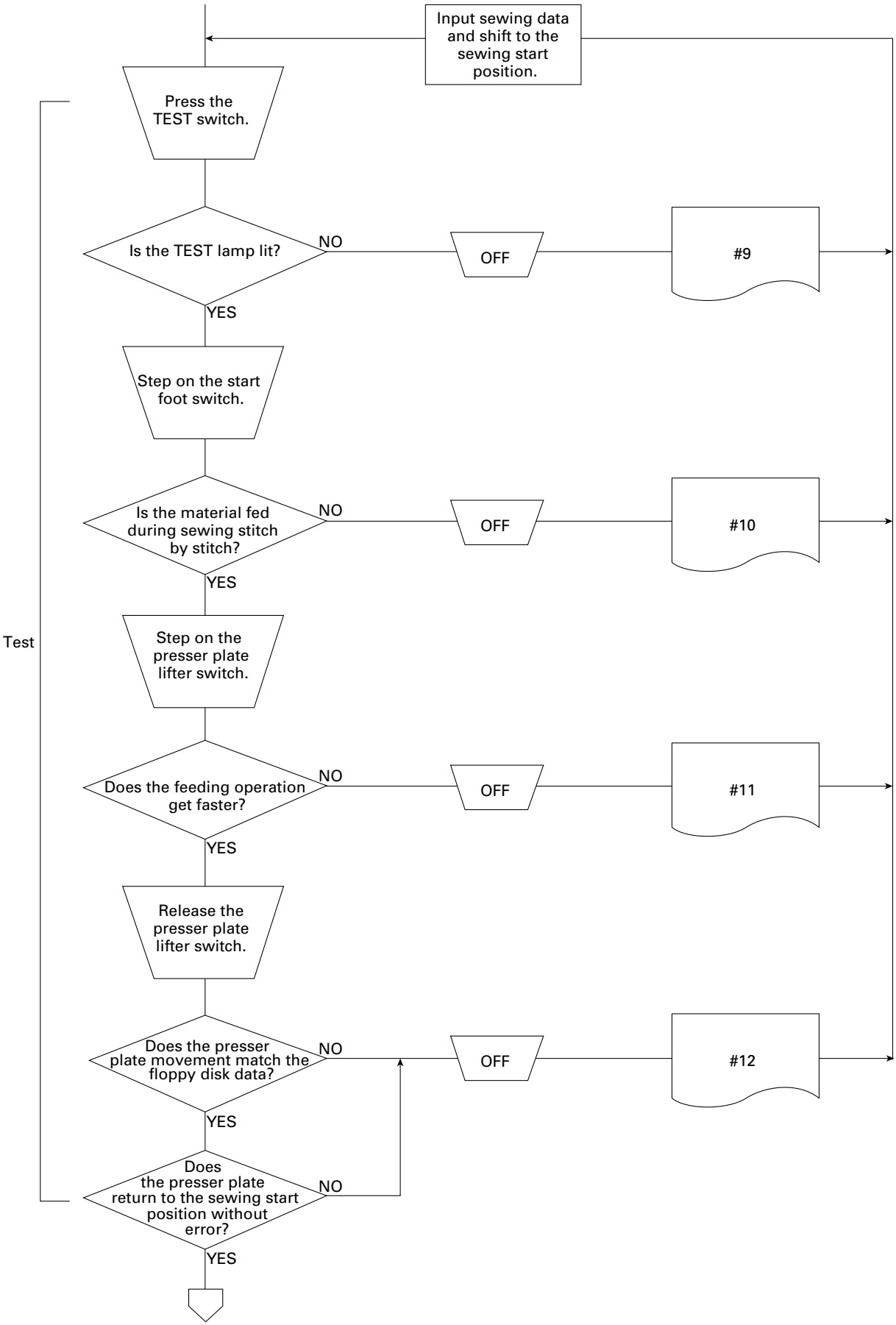
Indicates turning-off of the power switch.

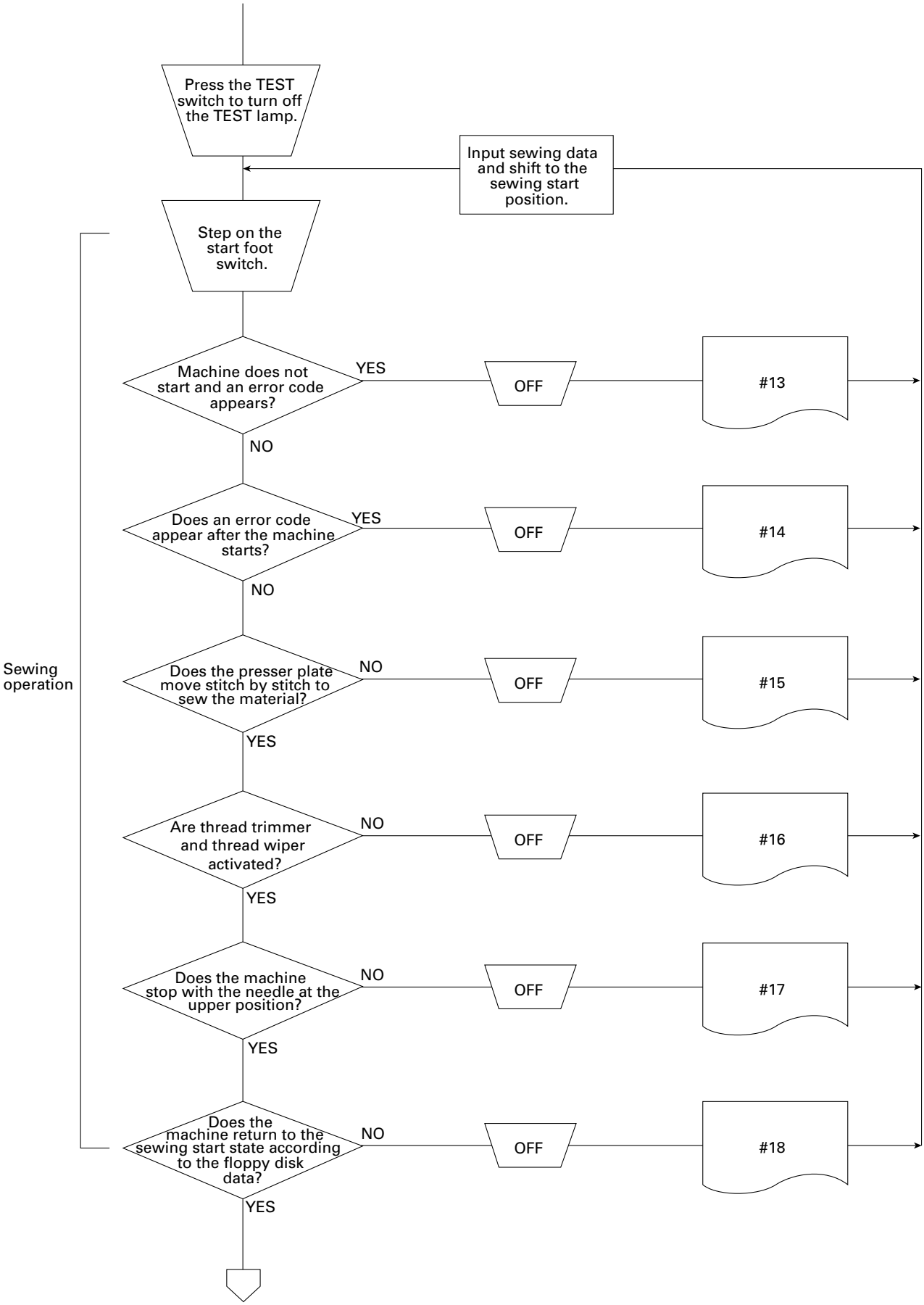
■ Flowchart

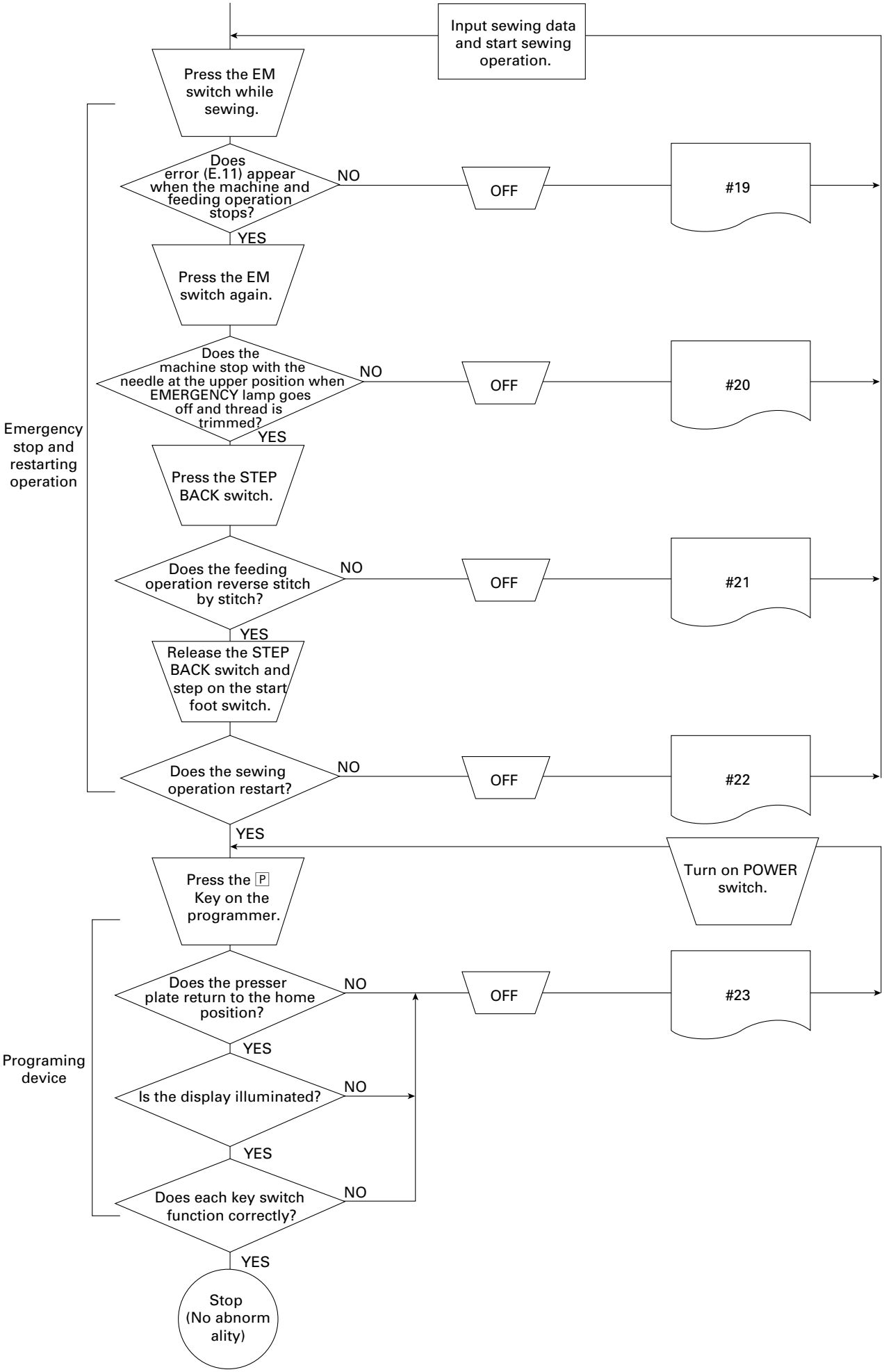



Turn on POWER switch.
Press the PRO NO. Switch, then press the R/W switch.
Floppy disk insertion
Does any error code appear on the ERROR NO. indicator?
YES
OFF
#2
NO
Does an error code appear after the indicator lamp is lit and turned off?
YES
OFF
#3
NO
Turn on POWER switch.
Step on the Foot switch.
Work clamp lifter mechanism
Do presser foot and work clamp move up and down?
NO
OFF
#4
YES


Presser foot and presser plate operation
Set cassette or material to be sewn.
Step on the foot switch to close the work clamp.
Input sewing data.
Step on the presser plate lifter switch.
Shifting to the sewing start position
Does the presser plate return to the home position?
NO
OFF
#6
YES
Does any error code appear on the ERROR NO. indicator?
YES
OFF
#7
NO
Does the presser plate shift to the sewing start position?
NO
OFF
#8
YES


Input sewing data and shift to the sewing start position.
Press the TEST switch.
Is the TEST lamp lit?
NO
OFF
#9
YES
Step on the start foot switch.
Is the material fed during sewing stitch by stitch?
NO
OFF
#10
YES
Step on the presser plate lifter switch.
Does the feeding operation get faster?
NO
OFF
#11
YES
Release the presser plate lifter switch.
Does the presser plate movement match the floppy disk data?
NO
OFF
#12
YES
Does the presser plate return to the sewing start position without error?
NO
YES
Test


Press the TEST switch to turn off the TEST lamp.
Input sewing data and shift to the sewing start position.
Step on the start foot switch.
Machine does not start and an error code appears?
YES
OFF
#13
NO
Does an error code appear after the machine starts?
YES
OFF
#14
NO
Does the presser plate move stitch by stitch to sew the material?
NO
OFF
#15
YES
Are thread trimmer and thread wiper activated?
NO
OFF
#16
YES
Does the machine stop with the needle at the upper position?
NO
OFF
#17
YES
Does the machine return to the sewing start state according to the floppy disk data?
NO
OFF
#18
YES
Sewing operation


Input sewing data and start sewing operation.
Press the EM switch while sewing.
Does error (E.11) appear when the machine and feeding operation stops?
NO
OFF
#19
YES
Press the EM switch again.
Does the machine stop with the needle at the upper position when EMERGENCY lamp goes off and thread is trimmed?
NO
OFF
#20
YES
Emergency stop and restarting operation
Press the STEP BACK switch.
Does the feeding operation reverse stitch by stitch?
NO
OFF
#21
YES
Release the STEP BACK switch and step on the start foot switch.
Does the sewing operation restart?
NO
OFF
#22
YES
Turn on POWER switch.
Press the P Key on the programmer.
Does the presser plate return to the home position?
NO
OFF
#23
YES
Programing device
Is the display illuminated?
NO
YES
Does each key switch function correctly?
NO
YES
Stop (No abnormality)

■ Problem solution and measures

Precautions

- Pay attention to the following when opening the control box for maintenance.

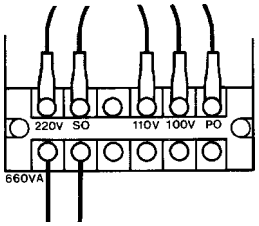
○ Electrical shock
Some large capacitors may have a high voltage remaining in them for up to 5 minutes after the power is turned off. To prevent electrical shock, wait at least 5 minutes after the power is turned off before doing the following:
* Opening and closing the control box
* Replacing fuses
* Separating and rejoining connectors
* Measuring resistance
* Doing anything with a possibility of touching something inside the control box
Some adjustments require measuring the voltage while the power is turned on with the control box kept open. In such a case, be careful not to touch any place other than that for the measurement. In addition, always keep in mind that a high voltage remains for 5 minutes after the power is turned off.

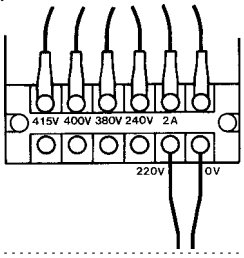
○ Injury
While the power is turned on, the cooling fan of the control box operates; be careful not to get caught in it.
When separating or rejoining connectors, and measuring something, be careful not to cut your fingers on metal parts such as the heatsinks and overs.

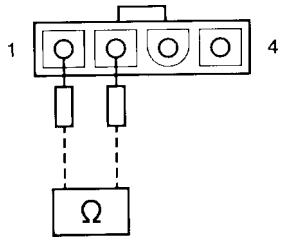
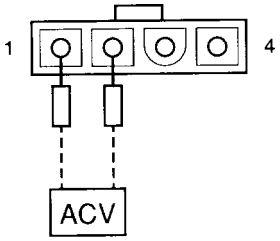
- When replacing a fuse, be sure to use a new one of the same quality and capacity as the old one.
- Refer to the circuit block diagram at the end of this manual regarding the connector numbers and their matches.

Before adjustment

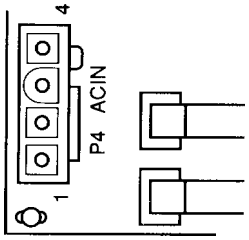
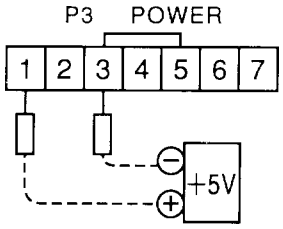
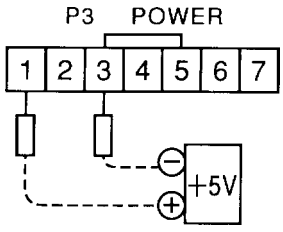
- While the power is turned off, check each connector is securely plugged in by referring to page 73 “List of connector numbers and matches.”
- Find the error status number in the troubleshooting flowchart.
- From the applicable part of the flowchart, take the reference number to find the correspondingly numbered details of the problem in the following table.

<table>
<tr><th>Error status</th><th>Probable causes</th><th>Check/repair/adjust</th><th>Parts to be replaced</th></tr>
<tr><td rowspan="3">#1 The power lamp does not light when the power is turned on.</td><td>1. Conversion transformer improperly wired (for 100 V, 110V specification)
To the power supply
To the power switch
 

(For 240 V, 380 V, 400 V, and 415 V specifications)
To the power supply circuit board
To the power switch
 

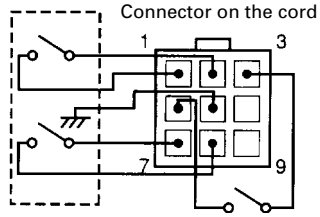
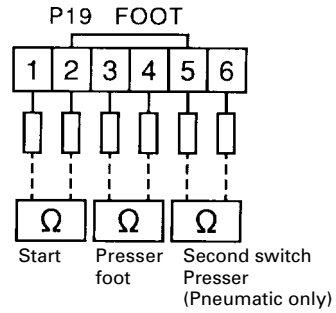
(For 200 V, 220 V, and 230 V specifications)
No conversion transformer is installed.</td><td>Note: Before adjustment, be sure to check that the power is turned off to prevent electric shock. If the power is turned on, turn off the power, and wait at least 5 minutes.
• Conversion in the control box
Check the transformer is correctly and securely wired to the terminals.
(For 200 V, 220 V, and 230 V specifications, this is not necessary.)</td><td></td></tr>
<tr><td>2. Conversion transformer defective
 
</td><td>Separate P4 (ACIN) connectors on the power supply circuit board, and check there is continuity between pins 1 and 2 in the connector on the cable.
If there is no continuity, replace the conversion transformer.
(For 200 V, 220 V, and 230 V specifications, this is not necessary.)</td><td>Conversion transformer</td></tr>
<tr><td>3. Power supply cable defective
 

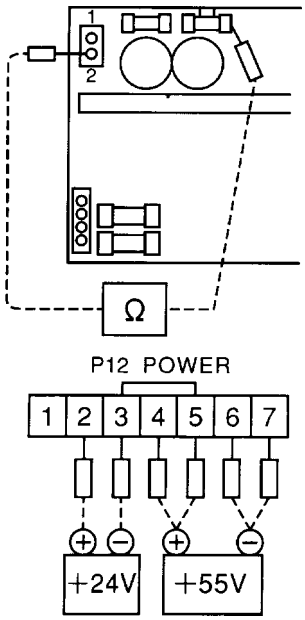
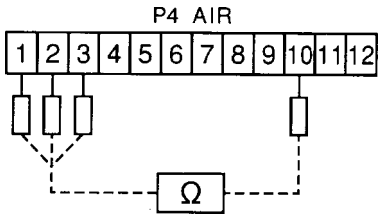
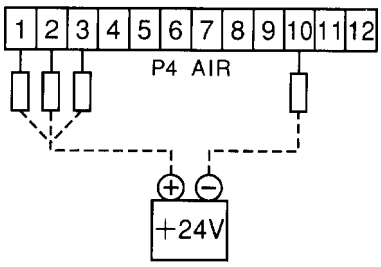
ACV</td><td>Separate P4 (ACIN) connectors on the power supply circuit board, turn on the power, and measure the voltage across pins 1 and 2 in the connector on the cable.
If the voltage is as shown in the table below, the power supply cable is not defective.
<table><tr><td>For 200 V, 220 V, and 230 V specifications</td><td>The same as the power supply voltage of wall socket</td></tr><tr><td>For 100 V, 110 V, 240 V, 380 V, 400 V, and 415 V specifications</td><td>About 220 V</td></tr></table>After checking, turn off the power, and rejoin P4 connectors.</td><td>Power supply cable</td></tr>
</table>

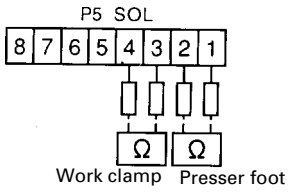
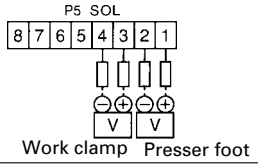
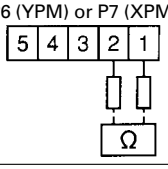
Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#1 continued	4. Fuse has blown	• Remove fuses No.3 and No.4, and check them for continuity. If there is no continuity, replace the fuses with new ones, and perform the check/repair/adjust items of #1-5.	Fuse 6A-250A
	5. Power supply circuit board defective  	• Separate P4 (ACIN) connectors on the power supply circuit board, and then measure the resistance between the followin oth cases, the power supply circuit board is not defective. • Measure the resistance between pins 1 and 2. If there is not short, the power supply circuit board is not defective. • rejoin P4 (ACIN) connectors on the power supply circuit board. Separate P3 (POWER) connectors on the main circuit board, turn on the power, and measure the voltage across pins 1 and 3 in the connector on the cable. If it is + 5V, the power circuit board is not defective. After measurement, turn off the power wait at least 5 minutes, and then rejoin P3 connectors.	Power supply circuit board
	6. Control circuit board defective 	• With P3 (POWER) connectors plugged in on the control circuit board, turn on the power, and measure the voltage across pins 1 and 3 in the connector on the cable. If it is + 5V, the power circuit board is not defective. After measurement, turn off the power.	Control circuit board
	7. Panel circuit board defective	• Check that P18 (PANEL) connectors of the main circuit board and P5 (DRV) connectors of the panel circuit board are plugged in.	Panel circuit board

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#1 The power lamp does not light when the power is turned on.	1. With error code [E.12], the emergency stop switch is activated, or it is defective.	• Check that connector P3 (HEAD) on the control circuit board is securely inserted and the emergency stop switch is correctly wired.	EM switch assembly
	2. With error code [E.21], the machine is malfunctioning.	• Check that grounding is securely made and there is no equipment that generates strong electrical noise nearby.	Control circuit board
	3. With error code [E.60], the panel circuit board is defective.	• Turn on the power again. If nothing changes, panel PCB is defective.	Panel circuit board
	4. With error code [E.61], the control circuit board is defective.	• Turn on the power again. If nothing changes, control PCB is defective.	Control circuit board
	5. With error code [E.90], the power supply voltage has sharply dropped.	• Check that the voltage of a socket is within ±10% of specified voltage. • Refer to #d1-1, -1, -3	
	6. With error code [E.91], the power supply voltage has sharply risen.	• Refer to #1.1-5	
	7. With error code [E.c0], the [MT] PROM on the control circuit board is defective.	• Refer to #1.1-13	PROM
	8. With error code [E.c1], the box cooling fan (at the left when viewed from the front) is defective.	• Check whether any thread scraps are not entangled in the cooling fan. • Check that connector P10 (FAN-R) on the control circuit board is securely inserted.	Fan motor assembly
	9. With error code [E.c2], the control box has overheated.	• Clean the air intake of the control box. • The temperature detector is screwed into the heatsink on the control circuit board. Turn on the power after the temperature of the heatsink falls. If the error still appears, the control circuit board is defective. • Note: If the machine is operating with the control box open, the heatsink will overheat, resultantly, error [E.c2] will occur.	Control circuit board
	10. With error code [E.c3], overcurrent has occurred in X-pulse motor.	• Check that connector P7 (XPM) on the control circuit board is securely inserted and the X-pulse motor is securely plugged in. • Refer to #1.1-2	X pulse motor control circuit board

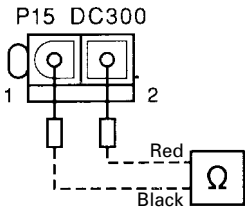
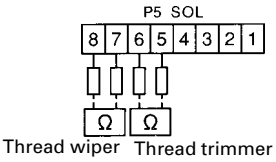
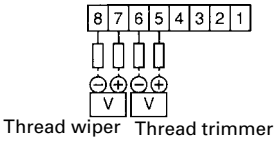
Error status	Probable cause	Check/repair/adjust	Parts to be replaced
#1 The power lamp does not light when the power is turned on.	11. With error code [E.c4], overcurrent has occurred in Y-pulse motor.	• Check that connector P6 (YPM) on the control circuit board is securely inserted and the Y-pulse motor is correctly wired. • Refer to #1.1-2	Y pulse motor control circuit board.
	12. With error code [E.c5], the box cooling fan (at the right when viewed from the front) is defective.	• Refer to #1.1-8 [E.CI] • Check that connector P25 (FAN-L) on the control circuit board is securely inserted.	Fan motor assembly
	13. With error code [E.E0], the [MN] PROM on the control circuit board is defective.	• Check that the PROM of the control circuit board is securely inserted and its leads are not bend. • Check that MN and MT of the PROM are matching those on the main PCB.	PRON
		• If the PROM has no problem, check the connection between pin 3 in connector P18 (PANEL) on the control circuit board and pin 5 in connector P5 (DRV) on the panel PCB.	Panel code
	14. With error code [E.F0], the relay on the power PCB is not working.	• Check that the PER code is securely inserted (refer to #1.1-15). If the error appears, replace the power PCB with a new one.	Power PCB
	15. With error code [E.F1], the cord is not securely inserted.	• Check that connector P2 (PER) of the power PCB and connector P20 (PER) on the main PCB are securely inserted. Check there is no damage in wiring.	PER code.
	16. With error code [E.F2], overcurrent has occurred in power PCB.	• Find a cause of noise. (Refer to #1.1-2.) • Replace the power PCB . (Refer to #1.1-14.)	Power PCB
#1.2 No switches on the panel are not activated.	1. Panel PCB is not correctly attached.	• Check whether the panel setting plate makes contact with a switch.	
	2. Panel PCB is defective.	• Refer to #1-7	Panel circuit board
	3. Programmer detective.	• Pull out the programmer. If a switch is activated, the programmer is defective.	Programmer
#2 If the R/W switch is pressed, the indicator lamp is not lit and an error code appears.	1. With error code [E.40], the cord or the floppy disk drive (FDD) is defective.	• Check the connections and pins between connector P1 on the panel PCB and the FDD, and between connectors CH1 and CH2 on the panel PCB and the FDD. • Replace the floppy disk drive.	FDD Harness Floppy disk drive

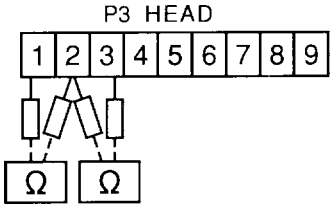
Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#3 After a few seconds after the R/W switch is pressed, an error code appears.	1. With error code [E.40], a floppy disk is not inserted.	• When a floppy disk is inserted into the FDD, check the sound of the motor.	Drive device
	2. With error code [E.41] or [E.4F], the floppy disk is defective.	• When error code [E.40], [E.41], or [E.4F] appears, insert other floppy disk into the FDD. If the FDD reads the floppy disk, the original disk is defective.	Floppy
	3. Panel circuit board defective		Panel circuit board
#4 The work clamp does not move up and down when the foot switch is stepped on.	1. Foot switch and code defective 1 - 2 Presser foot Connector on the cord  7 - 8 Start 3 - 4 Second switch Presser (Pneumatic only)	(Make sure that the power is turned off.) • Remove the connector for foot switch connected to the outside of the control box, and check the continuity between pins 1 and 2, and pins 7 and 8 in the connector on the cord. (For pneumatic specification, check the continuity between pins 3 and 4.) The continuity in each case should be normally ∞ Ω or 0 Ω when the switch is stepped on.	Foot switch
	2. Any cord in the control box is defective.  	• Insert the connector checked above, open the control box, and check the continuity between pins 1 and 2, pins 3 and 4, pins 5 and 6 in connector P19 (FOOT) on the PCB. (Without removing the connector, put a tester from the lead side.) The continuity in each case should be normally ∞ Ω or 0 Ω when the switch is stepped on.	Foot switch code assembly
	3. Fuse blown	• Remove fuse no.1 and check the continuity. (If there is no continuity, go to the next item.)	(Quick melting type 5A-250V

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#4 The work clamp does not move up and down when the foot switch is stepped on.	4. Power PCB defective. 	• Measure the resistance between a terminal in the center of the power PCB and pin 2 in connector P5 (DC300). The resistance should be ∞Ω. • Remove connector P12 (POWER) on the control circuit board, turn on the power, and measure the voltage across pins 4 and 6, pins 5 and 6, pins 5 and 7 on the cord. The voltage in each case should be +55V. Measure the voltage across pins 2 and 3. The voltage should be +20V to 24V. After measurement, turn off the power, wait at least 5 minutes, and insert P12.	Power PCB
	Work clamp for pneumatic specification (BAS-311E and 325E)		
	5. The air valve is defective. 	• Pull out connector P4 (AIR) on the control circuit board and measure the resistance between the following pins in the connector on the cord: Pins 1 and 10 (air valve for right work clamp) Pins 2 and 10 (air valve for left work clamp) Pins 3 and 10 (air valve for presser foot; only for optional specification) The resistance in each case should be 300 - 400 Ω.	Air valve Valve harness assy.
	6. The control circuit board (#3) is defective. 	• Pull out connector P4 (AIR) and measure the voltage across the following pins in the connector on the PCB: Pins 1 and 10 (air valve for right work clamp) Pins 2 and 10 (air valve for left work clamp) Pins 3 and 10 (air valve for presser foot; only for optional specification) The voltage in each case should be +20V to 24V. After measurement, turn off the power, wait at least 5 minutes, and insert P4.	Control circuit board.

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#4 The work clamp does not move up and down when the foot switch is stepped on.	Work clamp and presser foot for solenoid specification (BAS-311E)		
	7. Solenoid is defective. 	• Remove connector P5 (SOL) on the control circuit board, and measure the resistance between the following pins in the connector on the cord: Pins 1 and 2 (presser foot): approx. 5-6 Ω. Pins 3 and 4 (work clamp): approx. 5-6 Ω. Pins 5 and 6 (thread trimmer): approx. 7-8 Ω. Pins 7 and 8 (thread wiper): approx. 6-7 Ω.	Solenoid Solenoid code
	8. Control circuit board is defective. 	• Remove connector P5 (SOL) on the control circuit board, turn on the power, and measure the voltage across the following pins in the connector on the control circuit board: Pins 1 and 2 (presser foot): 0 or +55V Pins 3 and 4 (work clamp): 0 or +55V	Control circuit board.
#6 When the start switch is stepped on, the work clamp does not return to its home position.	1. Foot switch and cord are defective.	• Refer to #4-1	Foot switch
	2. Any cord in the control box is defective.	• Refer to #4-2	Foot switch code assembly
#7 When the start switch is stepped on, an error code appears.	1. When the feed mechanism does not move and error code [E.A1] appears, fuse has blown.	• Refer to #4-3	(Quick melting type 5A-250V)
	2. When the feed mechanism does not move and error code [E.A1] appears, the power PCB is defective.	• Refer to #4-4.	Power PCB
	3. When the feed mechanism moves in the unusual direction and error code [E.A1] appears, the home position sensor is defective.	• Turn power off and then on again. Move the feed mechanism manually around the home position to check whether the LED of the home position sensor is lit. (The feed mechanism can be moved manually before the home position is detected.) • Set the input sensor check mode to check the sensor input. (Refer to page 90, "7. Checking the input sensor and DIP switch input".) If the above step (a) is approved, and the sensor input can not be changed, the cord or the control circuit board is defective.	Home position sensor Control circuit board
	4. When the feed mechanism operation is unusual, the pulse motor is defective. 	• Remove connectors P6 (YPM) and P7 (XPM) on the control circuit board, and measure the resistance between the following pins in the connector on the cord:Pins 1 and 2, pins 2 and 3, pins 3 and 4, pins 4 and 5, and pins 5 and 1. The resistance in each case should be approx. 2.0 - 2.5 W. After measurement, return connectors P6 and P7 to their original positions.	Pulse motor Pulse motor harness

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#8 The work clamp does not move to the sewing start position.	1. Pulse motor has been out of control because of insufficient torque. (The feed mechanism does not move as programmed.)	• If the work clamp or material to be sewn is sluggish, set DIP switch B-8 to off and set the feed speed to low.	
	2. Mechanical adjustment is not sufficient.	• Turn the power off and then on again. Move the feed mechanism manually to check that it can easily move around the sewing area.	
	3. Pulse motor defective.	• Refer to #7-4	Pulse motor
	4. The control circuit board is defective.		Control circuit board.
#9 The TEST lamp is not lit when the TEST switch is pressed.	1. Panel circuit board is defective.	• Refer to #1 and #2 (panel switch).	Panel circuit board
#10 No feeding operation occurs during the test.		• Refer to #6, #7, and #8	
#11 Rapid feed can not be performed during the test.	1. Foot switch and cord defective	• Refer to #4-1	
#12 The machine does not operate as programmed during the test.		• Refer to #8	
#13 The machine does not operate for sewing and error [E.20] appears.	1. Cord is defective.	• Check that connector P3 (DC18) on the power PCB and connector P16 (DC18) on the control circuit board are securely inserted. • Check that connector P5 (DC300) on the power PCB and connector P15 (DC300) on the control circuit bard are securely inserted. • Check that connector P14 (UVW) on the control circuit board is securely inserted and there is no looseness of the machine motor.	Power supply harness H-P Motor power cord.

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#13 The machine does not operate for sewing and error [E.20] appears.	2. The control circuit board is defective. 	• Remove connector P15 (DC300) on the control circuit board, and measure the resistance between pins 1 and 2 in the connector on the control circuit board. (A digital meter can not be used.) Using X1K Ω range, the needle should indicate 10K Ω -30K Ω. After measurement, return P15 to its original position. (If this measurement is not approved, check control circuit board fuses nos. 2, 3, and 4. They may be blown.)	Control circuit board.
#14 After the machine operates, an error code appears.	1. When error code [E.20] appears after the machine operates, the synchronizer is defective.	• Check that connector P2 (SYNCHRO) on the control circuit board is securely inserted and there is no damage in the synchronizer cable.	Synchronizer assembly
	2. When error code [E.20] appears after the machine operates, the machine has been locked due to insufficient adjustment.	• Turn the pulley manually to check it can easily rotate.	
	3. When error code [E.90] appears after the machine operates, the power supply voltage has sharply dropped.	• Refer to #1.1-5 If the power supply capacity per machine is 600VA or more, the voltage sharply drops as soon as the machine starts, resulting this error to appear.	
#15 The machine cannot sew patterns as pro-grammed.	1. The synchronizer is defective.	• Refer to #14-1. Even if the synchronizer is defective, the test feeding will be performed correctly.	Synchronizer assembly
	2. The feed mechanism does not move as programmed.	• Refer to #8-1, 2, 3, 4.	
#16 Thread trimmer and thread wiper do not operate.	1. Mechanical adjustment is insufficient.	• Remove the covers. If the solenoids for thread trimmer and thread wiper do not operate, check the following items.	
	2. The solenoid is defective. 	• Refer to #4-7. (When measuring for thread wiper, turn on the thread wiper switch.)	Solenoid Solenoid harness
	3. The control circuit board is defective. 	• Remove connector P5 (SOL) on the control circuit board, turn on the power, start sewing, and measure the voltage across the following pins in the connector on the control circuit board: Pins 5 and 6 (thread trimming) Pins 7 and 8 (thread wiper) The voltage in each case should be output for an instance at the end of sewing.	

Error status	Probable causes	Check/repair/adjust	Parts to be replaced
#17 The machine does not stop with the needle at the upper position.	1. The synchronizer is not properly adjusted.	• If the needle stop position varies at random every time the machine operation is complete, adjust the needle stop position to the upper position.	
	2. Control circuit board defective		Control circuit board.
#18 The machine can not sew patterns as pro-grammed.		• Refer to #8-1, 2, 3, 4.	
#19 The operation will not stop if the emergency stop switch is pressed.	1. EM switch defective. 	• Remove connector P3 (HEAD) on the control circuit board, and check the continuity on the cord. Between pins 1 and 2: 0 Ω normally or ∞ Ω when the emergency stop switch is pressed. Between pins 2 and 3: ∞ Ωnormally or 0 Ω when the emergency stop switch is pressed.	EM switch assembly.
#20 The thread trimmer does not operate after the emergency stop switch is canceled.		• Refer to #16, #17	
#21 The STEP BACK switch is inoperative.	1. Panel circuit board defective	• Refer to #1 and #2 (panel switch).	Panel circuit board
#22 Sewing is not resumed.		• Refer to #8-1, 2, 3, 4 and #13, #14.	
#23 Programming can not be made.	1. The programmer connector and its cable are defective.	• Remove connector P2 (PGM) on the panel PCB and connector P2 on the programmer PCB, and then return them to their positions.	
	2. The programmer is defective.	• Replace the programmer with a new one.	Programmer
	3. Panel circuit, board defective	• Replace the panel circuit board with a new one.	Panel circuit board

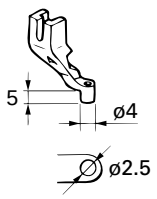
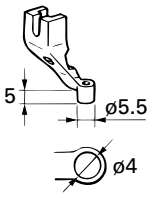
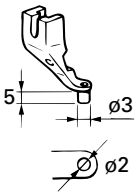
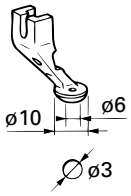
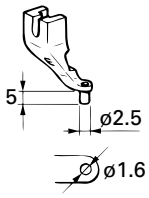
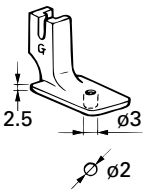
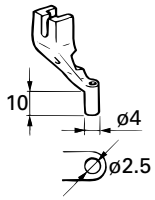
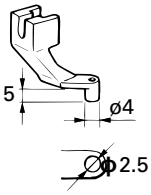
Chapter 8. 1. Gauge parts list according to subclasses

The following parts are available for the BAS-311E, 311EL, 326E, 326EL for adding further flexibility to the range of applications.

Model	BAS-311E				BAS-311EL	BAS-326E • (326EL)	
Subclass	-11	-21	-22	-23	-1	-1	-2
Use / Par name	Heavy-weight materials (Solenoid type)	Heavy-weight materials(Pneumatic type)	Medium weight materials(Pneumatic type)	Extraheavy-weight materials(Pneumatic type)	Thick (Air type)	Thick (Air type)	Medium thick materials (Air type)
Needle hole plate 	Needle hole plate E (ø2.6) S10212-101	Needle hole plate E (ø 2.6) S10212-101	Needle hole plate F (ø2.2) S10213-001	Needle hole plate M (ø4.0) S34348-001	Needle hole plate E (ø 2.6) S10212-101	Needle hole plate E (ø2.6) S10212-101	Needle hole plate F (ø2.2) S10213-001
Inner rotary hook assembly 	Inner rotary hook LB assembly S15663-991	Inner rotary hook LB assembly S15663-991	Inner rotary hook LA assembly S1566-992	Inner rotary hook LB assembly S15663-991	Inner rotary hook LB assembly S15663-991	Inner rotary hook LB assembly S15663-991	Inner rotary hook LA assembly S1566-992
Large shuttle hook 	Large shuttle hook B 152686-101	Large shuttle hook B 152686-101	Large shuttle hook A 152682-101	Large shuttle hook B 152686-101	Large shuttle hook B 152686-101	Large shuttle hook B 152686-101	Large shuttle hook A 152682-101
Tension spring 	Tension spring B 144588-001	Tension spring B 144588-001	Tension spring 145519-001	Tension spring B 144588-001	Tension spring B 144588-001	Tension spring B 144588-001	Tension spring 145519-001
Bobbin case assembly 	Bobbin case assembly LA Sd15902-401	Bobbin case assembly LA S15902-401	Bobbin case assembly LA S15902-401	Bobbin case assembly LB S15903-401	Bobbin case assembly LA S15902-401	Bobbin case assembly LA S15902-401	Bobbin case assembly LA S15902-401
Needle bar thread guide 	Needle bar thread guide A S02438-001	Needle bar thread guide A S02438-001	Needle bar thread guide A S02438-001	Needle bar thread guide B S02439-001	Needle bar thread guide A S02438-001	Needle bar thread guide A S02438-001	Needle bar thread guide A S02438-001
Needle	DP × 17 #21 145646-021	DP × 17 #21 145646-021	DP × 5 #16 107415-016	DP × 17 #25 145646-025	DP × 17 #19 145646-019	DP × 17 #21 145646-021	DP × 5 #16 107415-016
Feed plate 	Feed plate 311B S42797-001	Feed plate 311B S42797-001	Feed plate 311A S42777-001	Feed plate 311B S42797-001	Feed plate 326B S44389-001	Feed plate 326B S44389-001 (Feed plate 326LB S51038-001)	Feed plate 326A S44388-001 (Feed Plate 326LA S51037-001)
Work clamp 	Work clamp A S42843-001	Work clamp A S42843-001	Work clamp A S42843-001	Work clamp B S42844-001	Work clamp A S42843-001	Work clamp A S42843-001	Work clamp A S42843-001
Spring 	Spring 107606-001	Spring 107606-001	Spring 104525-001	Spring 107606-001	Spring 107606-001	Spring 107606-001	Spring 104525-001

Chapter 9. Gauge parts list

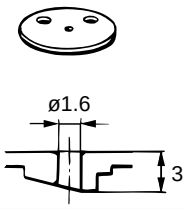
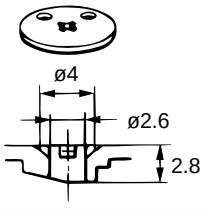
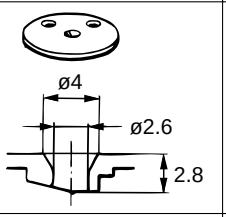
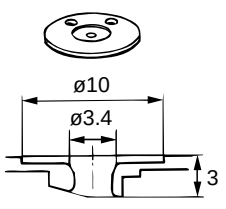
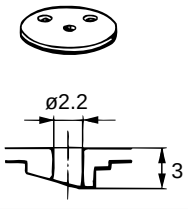
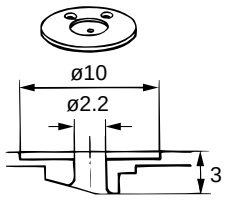
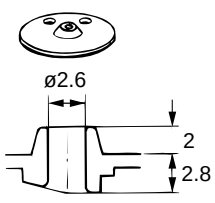
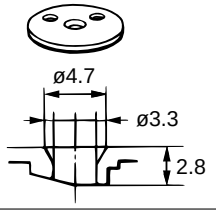
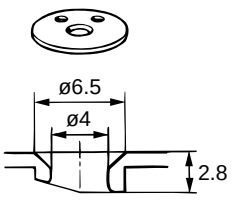
■ Presser foot

Ref.No.A *	Ref.No.B	Ref.No.C	Ref.No.D
			
Ref.No.E	**Ref.No.F**	**Ref.No.G**	**Ref.No.J**
			
Ref.No.XY			
			

REF.NO.	CODE	QTY	NAME OF FPARTS	REF.NO.	CODE	QTY	NAME OF FPARTS
A	S42843001	1	PRESSER FOOT, A	E	S42847001	1	PRESSER FOOT, E
				F	157237001	1	PRESSER FOOT, F
			"OPTION PARTS"	G	158592001	1	PRESSER FOOT, G
B	S42844001	1	PRESSER FOOT, B	J	S42848001	1	PRESSER FOOT, J
C	S42845001	1	PRESSER FOOT, C				<For Horizontal wiper>
D	S42846001	1	PRESSER FOOT, D	XY	S42849001	1	PRESSER FOOT, XY

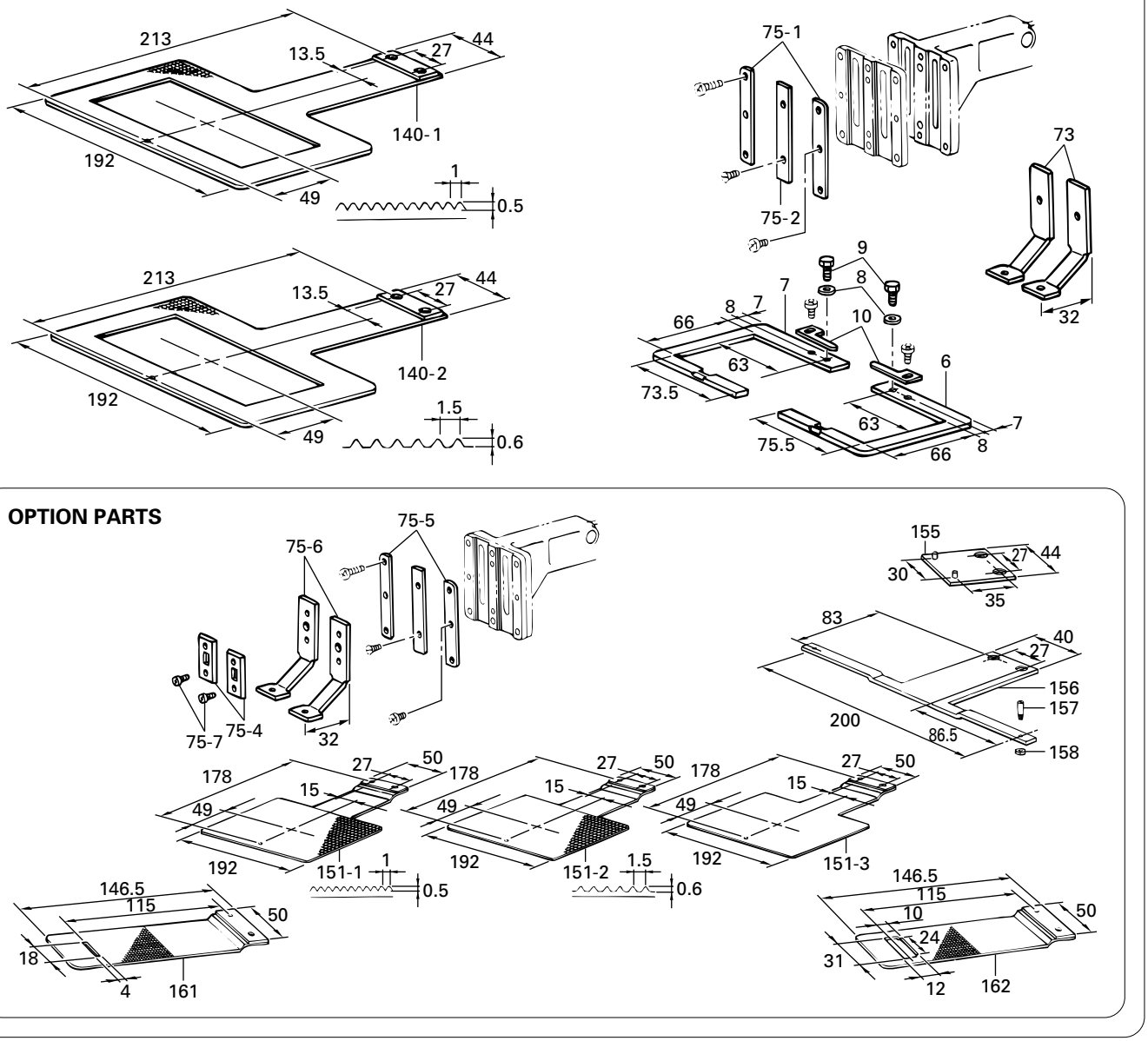
The * symbol is for standard parts.

■ Needle hole plate

Ref.No.A	Ref.No.D	Ref.No.E *	Ref.No.ED	Ref.No.F *
				
Ref.No.FD	**Ref.No.H**	**Ref.No.L**	**Ref.No.M ***	
				

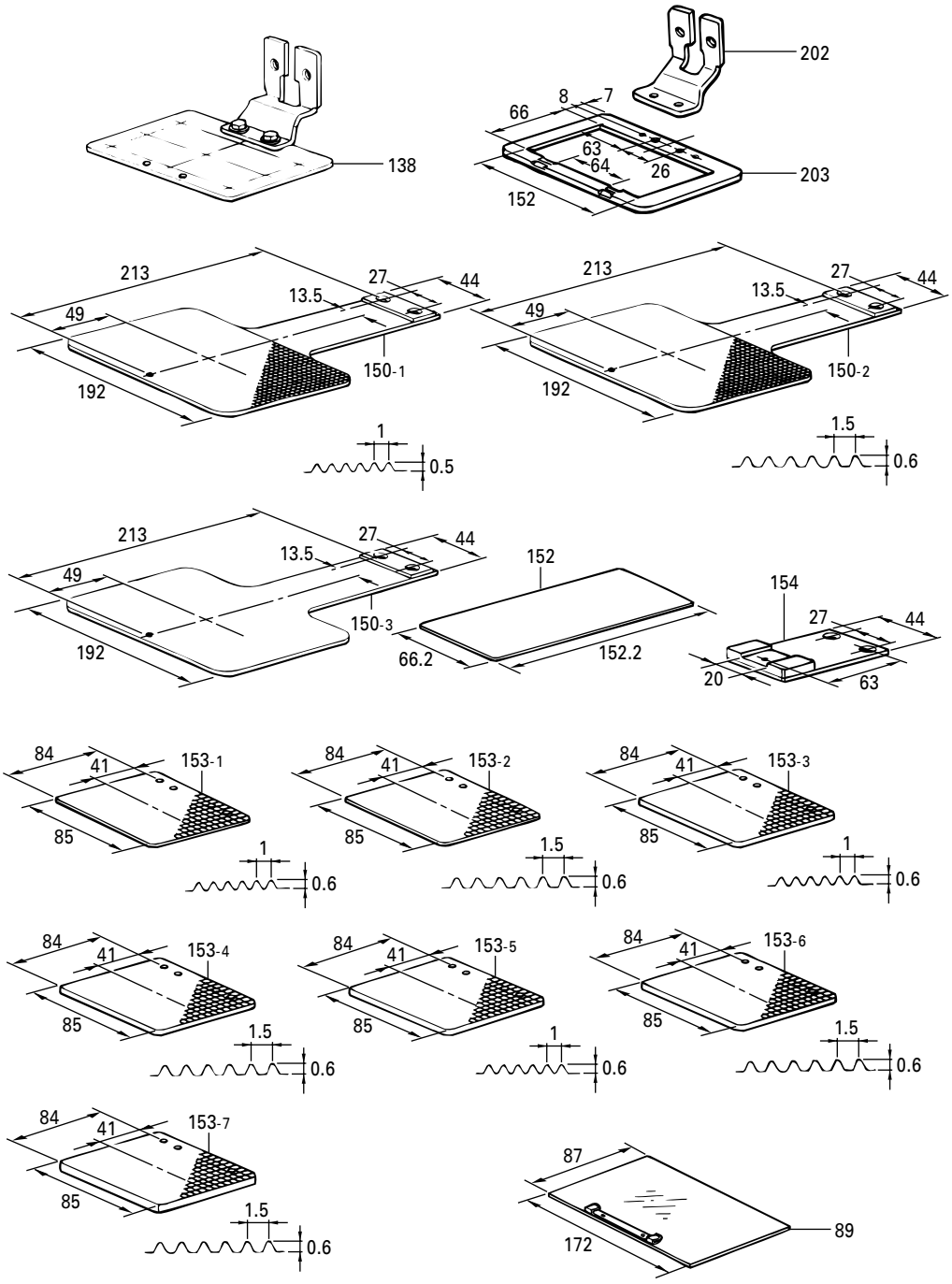
REF.NO.	CODE	QTY	NAME OF FPARTS	REF.NO.	CODE	QTY	NAME OF FPARTS
			<For 311E & 311EL, 326EL "heavy materials">				"OPTION PARTS"
E	S10212101	1	NEEDLE HOLE PLATE, E ø2.6	A	S10211001	1	NEEDLE HOLE PLATE, A
			<For 311E, 326EL "medium materials">	D	S29997001	1	NEEDLE HOLE PLATE, D
F	S10213001	1	NEEDLE HOLE PLATE, F ø2.2	ED	S30925001	1	NEEDLE HOLE PLATE, ED
			<For 311E "extra heavy materials">	FD	S30926001	1	NEEDLE HOLE PLATE, FD
M	S34348001	1	NEEDLE HOLE PLATE, M ø4.0	H	S30450001	1	NEEDLE HOLE PLATE, H
				L	S25127001	1	NEEDLE HOLE PLATE, L

■ Work clamp, Feed plate (BAS-311E)



REF.NO.	CODE	QTY	NAME OF PARTS
6	S42772001	1	WORK CLAMP, R311
7	S42773001	1	WORK CLAMP, L311
8	025680232	2	WASHER, PLAIN M4.37
9	153403002	2	BOLT, SM4.37X7
10	S10065001	2	POSITIONING PLATE
73	S42801001	2	WORK CLAMP, SE
75-1	S42787001	2	WORK CLAMP GUIDE BRACKET, A
75-2	S42884001	1	WORK CLAMP GUIDE BRACKET, B
			<For medium materials>
140-1	S42777001	1	FEED PLATE, 311A t=1.2
			<For heavy & extra heavy materials>
140-2	S42797001	1	FEED PLATE, 311B t=1.2
			"OPTION PARTS"
75-3	S42798001	1	WORK CLAMP GUIDE BRACKET
75-4	S42799001	2	WORK CLAMP AJUSTING PLATE
75-5	S42800001	2	ADJUSTING PLATE
75-6	S42802001	2	WORK CLAMP, SE-OP
75-7	062670512	4	SCREW, PAN SM3.57-40X5
			<For One-touch work clamp>
155	S14841001	1	OT FEED PLATE BRACKET ASSY
156	S13006001	1	CASSETTE HOLDER PLATE
157	S13007001	2	PIN
158	021660306	2	NUT, 3 SM3.18-40
			<OT-Feed Plate blank>
151-1	S43700001	1	OT-FEED PLATE BLANK, A t=1.2
151-2	S43821001	1	OT-FEED PLATE BLANK, B t=1.2
151-3	S43822001	1	OT-FEED PLATE BLANK, C t=1.2
			<For Denim>
161	S14253001	1	OT FEED PLATE BLANK, DE t=1.2
			<For general>
			OT FEED PLATE t=1.2
162	S14252001	1	

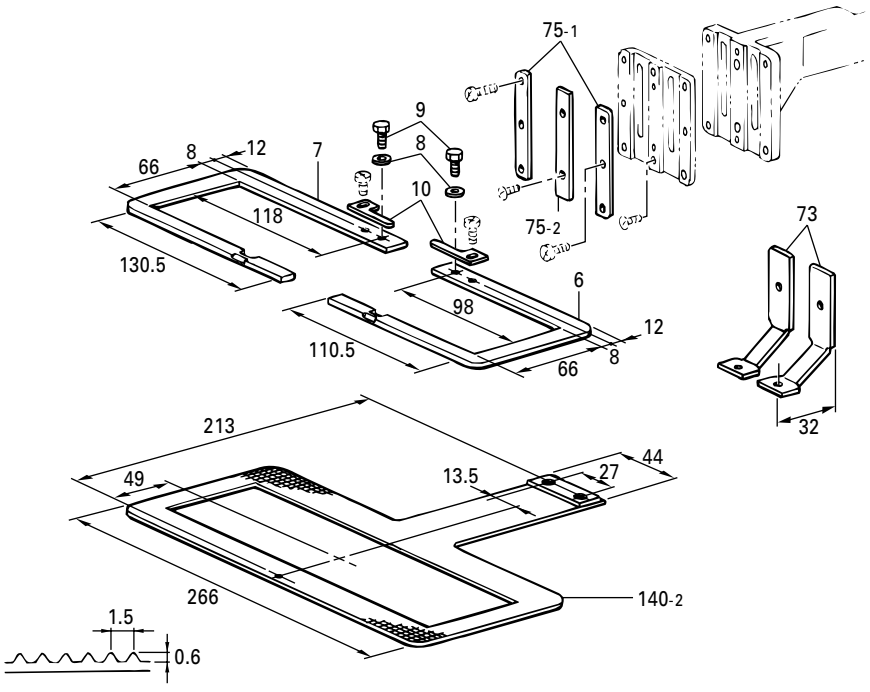
■ Feed plate blank and Work clamp blank (BAS-311E)



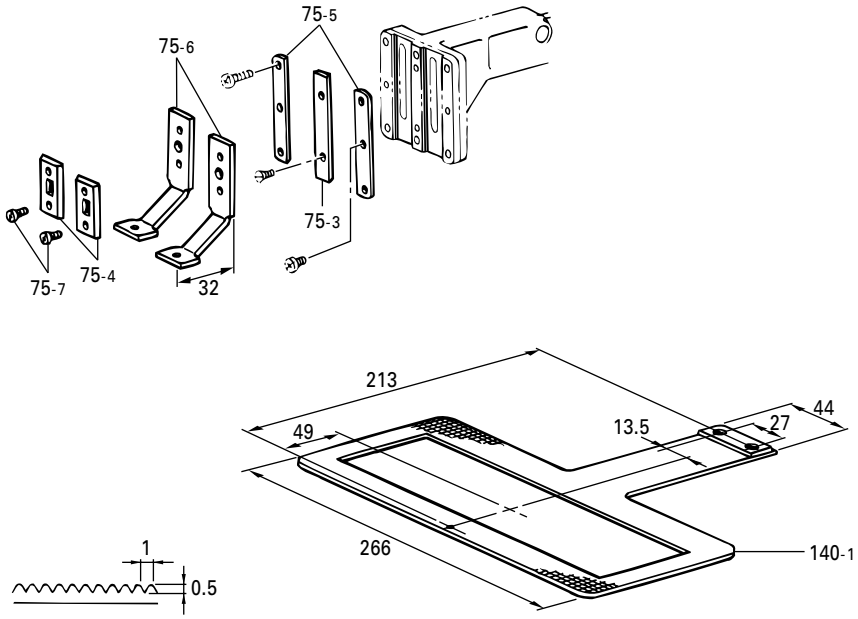
REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			<For gauge parts>	153-3	S43826001	1	WORK CLAMP BLANK, A-4.0 t=4.0
138	S42888001	1	H-POSITION STANDARD PLATE ASSY*	153-4	S43827001	1	WORK CLAMP BLANK, B-4.0 t=4.0
				153-5	S43828001	1	WORK CLAMP BLANK, A-5.0 t=5.0
			<For feed plate attachment>	153-6	S43829001	1	WORK CLAMP BLANK, B-5.0 t=5.0
150-1	S43697001	1	FEED PLATE BLANK, A311 t=1.2	153-7	S43830001	1	WORK CLAMP BLANK, 6.0 t=6.0
150-2	S43698001	1	FEED PLATE BLANK, B311 t=1.2				
150-3	S43699001	1	FEED PLATE BLANK, C311 t=1.2				<One-touch work clamp plate assy>
152	S43823001	1	FEED PLATE INNER PLATE	89	S43691001	1	WORK CLAMP PLATE ASSY, OT311
154	S12586001	1	FEED PLATE SETTING BRACKET	89	S43691002	1	WORK CLAMP PLATE ASSY, OT311
				89	S43691003	1	WORK CLAMP PLATE ASSY, OT311
			<The blank for work clamp>				
153-1	S43824001	1	WORK CLAMP BLANK, A-3.2 t=3.2	202	S43986001	1	WORK CLAMP, UN
153-2	S43825001	1	WORK CLAMP BLANK, B-3.2 t=3.2	203	S43987001	1	WORK CLAMP, 311 UN

☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

■ Work clamp and Feed plate (BAS-311EL)

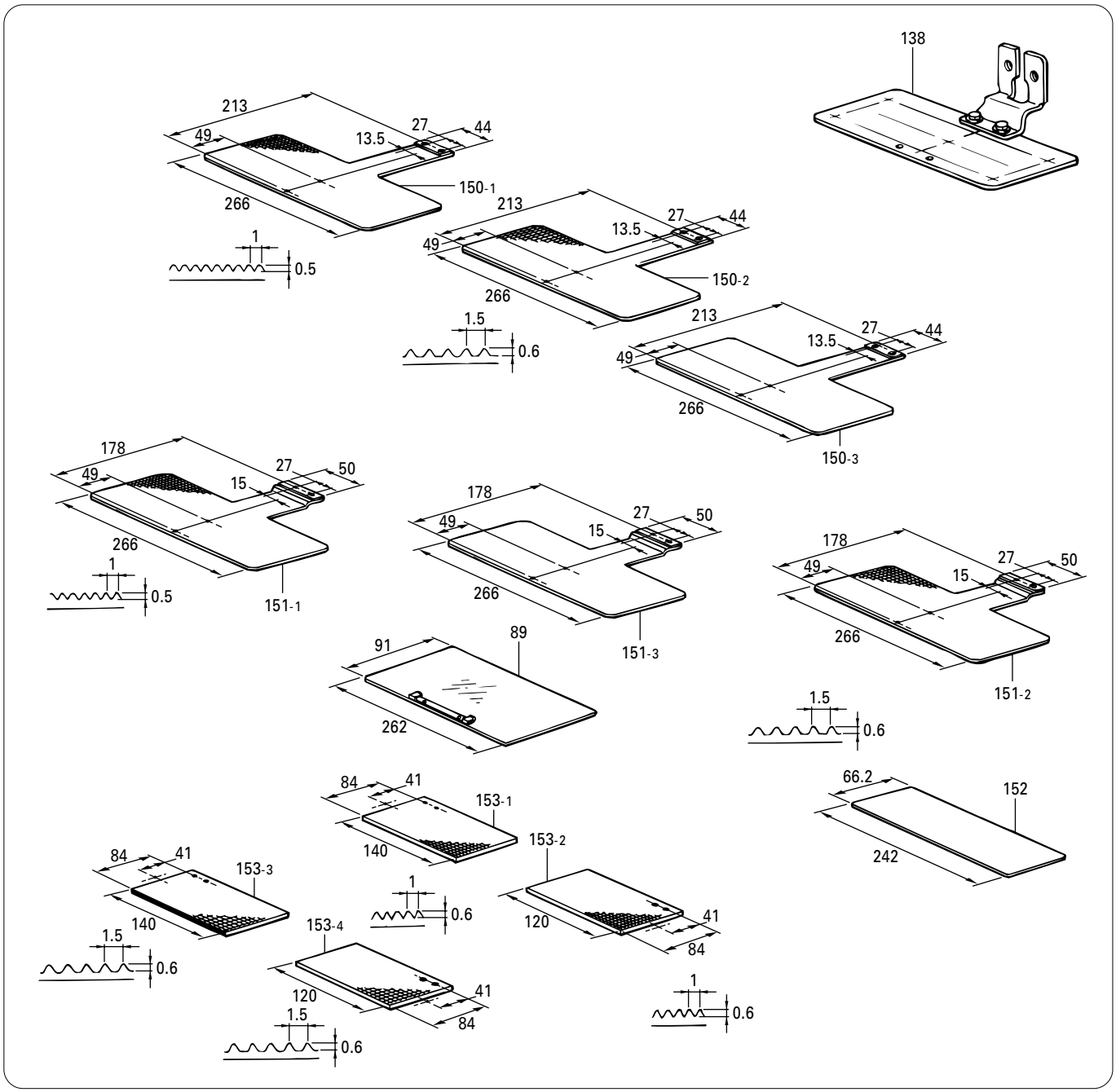


OPTION PARTS



REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
6	S44614001	1	WORK CLAMP, R311L				"OPTION PARTS"
7	S44613001	1	WORK CLAMP, L311L	75-3	S42798001	1	WORK CLAMP GUIDE BRACKET
8	025680232	2	WASHER, PLAIN M 4.37	75-4	S42799001	2	WORK CLAMP AJUSTING PLATE
9	153403002	2	BOLT, SM4.37X7	75-5	S42800001	2	ADJUSTING PLATE
10	S10065001	2	POSITIONING PLATE	75-6	S42802001	2	WORK CLAMP, SE-OP
73	S42801001	2	WORK CLAMP, SE	75-7	062670512	4	SCREW, PAN SM3.57-40X5
75-1	S42787001	2	WORK CLAMP GUIDE BRACKET, A				<For medium materials>
75-2	S42884001	1	WORK CLAMP GUIDE BRACKET, B <For heavy materials>	140-1	S44621001	1	FEED PLATE, A 311L t=1.2
140-2	S44622001	1	FEED PLATE, B 311L t=1.2				

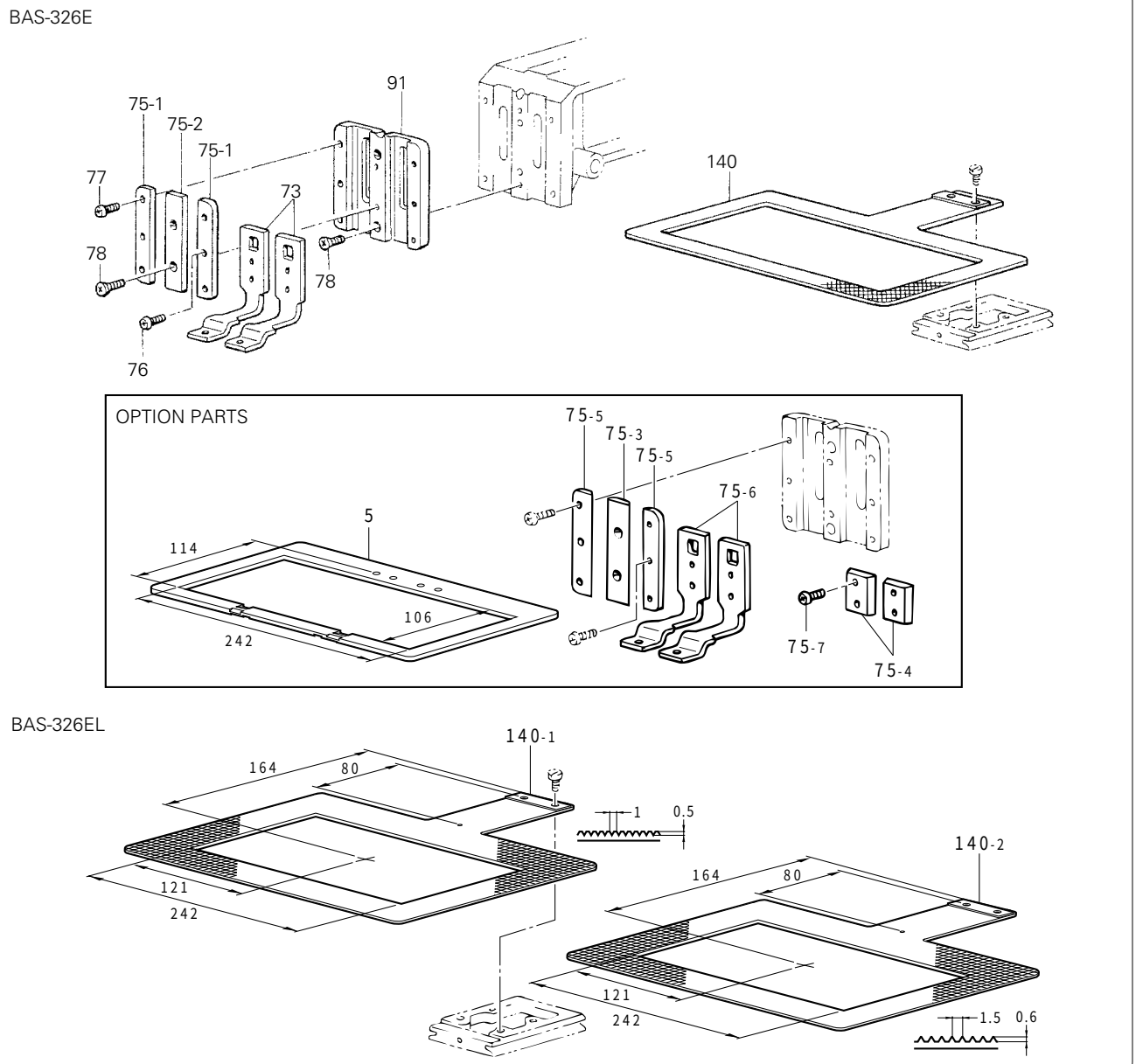
■ Feed plate blank and Work clamp blank (BAS-311EL)



REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			"OPTION PARTS"				<The blank for work clamp>
			<One-touch work clamp plate assy>				<Thick = 3.2mm>
89	S45591001	1	WORK CLAMP PLATE ASSY, OT311L t-0.5	153-1	S45604001	1	WORK CLAMP BLANK, A-3.2L311L
89	S45593001	1	WORK CLAMP PLATE ASSY, OT311L t=1.0	153-2	S45605001	1	WORK CLAMP BLANK, A-3.2R311L
89	S45595001	1	WORK CLAMP PLATE ASSY, OT311L t=2.0	153-3	S45606001	1	WORK CLAMP BLANK, B-3.2L311L
				153-4	S45607001	1	WORK CLAMP BLANK, B-3.2R311L
			<For gauge parts>				<Thick = 4.0mm
138	S44608001	1	H-POSITION STANDARD PLATE ASSY*	153-1	S45608001	1	WORK CLAMP BLANK, A-4.0L311L
				153-2	S45609001	1	WORK CLAMP BLANK, A-4.0R311L
			<For feed plate attachment>	153-3	S45610001	1	WORK CLAMP BLANK, B-4.0L311L
150-1	S45597001	1	FEED PLATE BLANK, A311L t=1.2	153-4	S45611001	1	WORK CLAMP BLANK, B-4.0R311L
150-2	S45598001	1	FEED PLATE BLANK, B311L t=1.2				<Thick = 5.0mm>
150-3	S45599001	1	FEED PLATE BLANK, C311L t=1.2	153-1	S45612001	1	WORK CLAMP BLANK, A-5.0L311L
152	S45603001	1	FEED PLATE INNER PLATE	153-2	S45613001	1	WORK CLAMP BLANK, A-5.0R311L
				153-3	S45614001	1	WORK CLAMP BLANK, B-5.0L311L
			<For one-touch work clamp>	153-4	S45615001	1	WORK CLAMP BLANK, B-5.0R311L
151-1	S45600001	1	OT-FEED PLATE BLANK, A311L t=1.2				<Thick = 6.0mm>
151-2	S45601001	1	OT-FEED PLATE BLANK, B311L t=1.2	153-3	S45616001	1	WORK CLAMP BLANK, 6.0L311L
151-3	S45602001	1	OT-FEED PLATE BLANK, C311L t=1.2	153-4	S45617001	1	WORK CLAMP BLANK, 6.0R311L

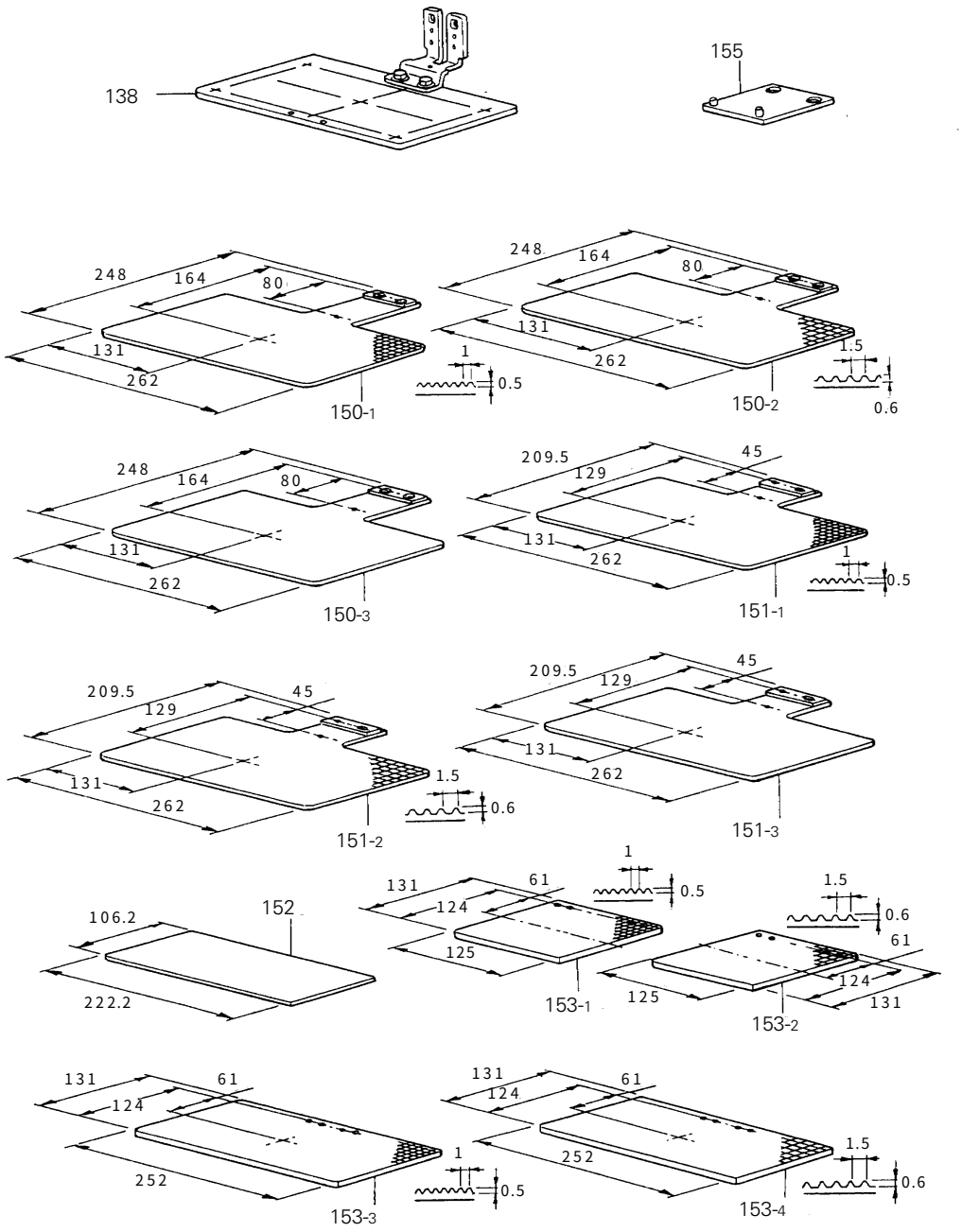
☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

■ Feed mechanism (BAS-326E)



REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
73	S44447001	2	WORK CLAMP, SE				<For Thick materials>
75-1	S42787001	2	WORK CLAMP GUIDE BRACKET, A	140	S44389001	1	FEED PLATE, B326 t=1.2
75-2	S42884001	1	WORK CLAMP GUIDE BRACKET, B	140-2	S51038001		FEED PLATE, B326L t=1.2
76	062670712	2	SCREW, PAN SM3.57-40X7				
77	062671212	4	SCREW, PAN SM3.57-40X12				"OPTION PARTS"
78	107038003	4	SCREW, FLAT SM3.57	5	S44448001	1	WORK CLAMP, UN326
91	S44455001	1	WORK CLAMP GUIDE PLATE	5	S51042001	1	WORK CLAMP, UN326L
				75-3	S42798001	1	WORK CLAMP GUIDE BRACKET
			<For Medium-thick materials>	75-4	S44451001	2	PRESSER ADJUSTING PLATE
140	S44388001	1	FEED PLATE, A326 t=1.2	75-5	S42800001	2	ADJUSTING PLATE
140-1	S51037001		FEED PLATE, A326L t=1.2	75-6	S44453001	2	PRESSER FOOT, SE-OP

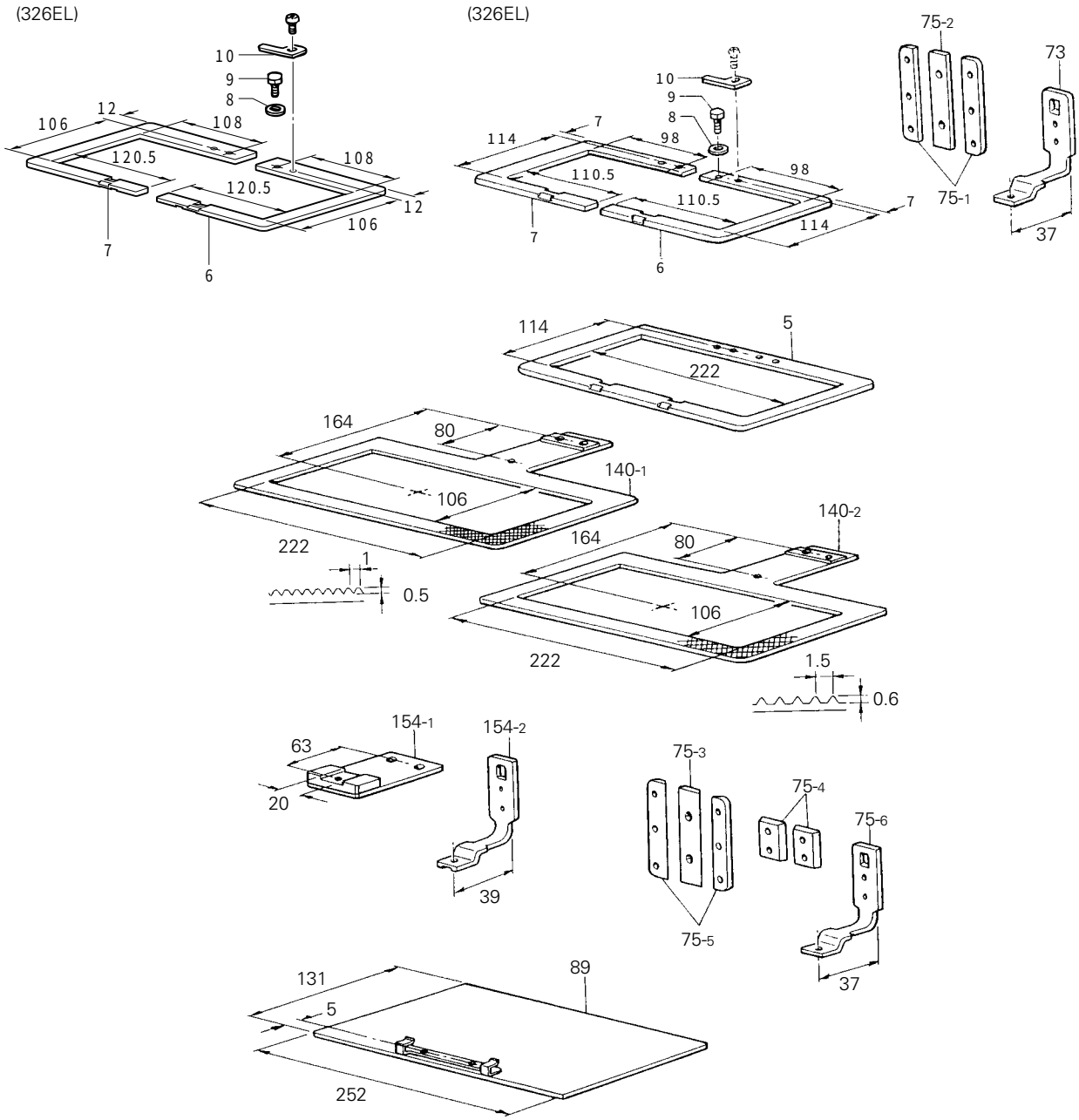
■ Feed mechanism (Option parts) BAS-326E



REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			<FOR GAUGE PARTS>				<The blank for work clamp>
138	S44366001	1	H/POSITION STANDARD PLATE ASSY*	153-1	S44391001	1	WORK CLAMP BLANK, SE A-3.2 t=3.2
				153-1	S44393001	1	WORK CLAMP BLANK, SE A-4.0 t=4.0
			<Attachment for one-touch feed plate>	153-1	S44395001	1	WORK CLAMP BLANK, SE A-5.0 t=5.0
155	S14841001	1	OT FEED PLATE BRACKET ASSY	153-2	S44392001	1	WORK CLAMP BLANK, SE B-3.2 t=3.2
				153-2	S44394001	1	WORK CLAMP BLANK, SE B-4.0 t=4.0
			<Attachment for feed plate>	153-2	S44396001	1	WORK CLAMP BLANK, SE B-5.0 t=5.0
150-1	S44405001	1	FEED PLATE BLANK, 326A t=1.2	153-2	S44397001	1	WORK CLAMP BLANK, SE B-6.0 t=6.0
150-2	S44406001	1	FEED PLATE BLANK, 326B t=1.2	153-3	S44398001	1	WORK CLAMP BLANK, UN A-3.2 t=3.2
150-3	S44407001	1	FEED PLATE BLANK, 326C t=1.2	153-3	S44400001	1	WORK CLAMP BLANK, UN A-4.0 t=4.0
152	S44390000	1	FEED PLATE INNER PLATE	153-3	S44402001	1	WORK CLAMP BLANK, UN A-5.0 t=5.0
				153-4	S44399001	1	WORK CLAMP BLANK, UN B-3.2 t=3.2
			<The blank for one-touch feed plate>	153-4	S44401001	1	WORK CLAMP BLANK, UN B-4.0 t=4.0
151-1	S44408001	1	OT FEED PLATE BLANK, A t=1.2	153-4	S44403001	1	WORK CLAMP BLANK, UN B-5.0 t=5.0
151-2	S44409001	1	OT FEED PLATE BLANK, B t=1.2	153-4	S44404001	1	WORK CLAMP BLANK, UN B-6.0 t=6.0
151-3	S44410001	1	OT FEED PLATE BLANK, C t=1.2				

☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

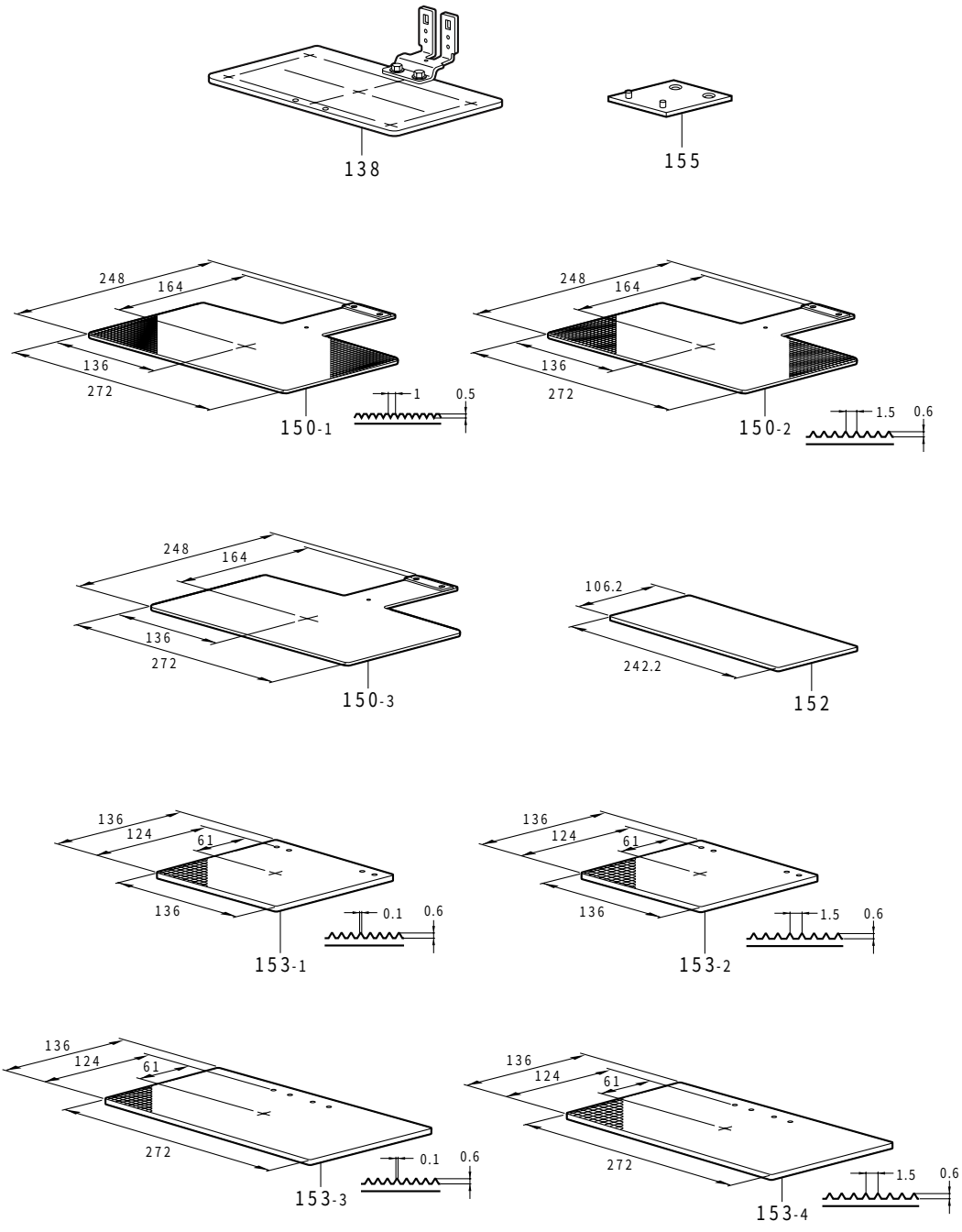
■ Feed mechanism (BAS-326E, 326EL)



REF.NO.	CODE	QTY	NAME OF PARTS
6	S44431001	1	WORK CLAMP, R326
6	S51030001	1	WORK CLAMP, R326EL
7	S44432001	1	WORK CLAMP, L326
7	S51031001	1	WORK CLAMP, L326L
8	025680232	2	WASHER, PLAIN M4.37
9	153403002	2	BOLT, SM4.37X7
10	S10065001	2	POSITIONING PLATE
73	S44447001	2	WORK CLAMP,SE
75-1	S42787001	2	WORK CLAMP GUIDE BRACKET, A
75-2	S42884001	1	WORK CLAMP GUIDE BRACKET, B
			<For medium-thick materials>
140-1	S44388001	1	FEED PLATE, A326 t=1.2
			<For thick materials>
140-2	S44389001	1	FEED PLATE, B326 t=1.2

REF.NO.	CODE	QTY	NAME OF PARTS
			"OPTION PARTS"
5	S44448001	1	WORK CLAMP, UN326
75-3	S42798001	1	WORK CLAMP GUIDE BRACKET
75-4	S44451001	2	PRESSER ADJUSTING PLATE
75-5	S42800001	2	ADJUSTING PLATE
75-6	S44453001	2	PRESSER FOOT, SE-OP
			"For BAS-326A & BAS-326LA"
			<Attachment for work clamp & feed plate>
154-1	S12586001	1	FEED PLATE SETTING BRACKET
154-2	S44413001	2	WORK CLAMP, SE
			<For one-touch work clamp plate assy>
89	S44374001	1	WORK CLAMP PLATE ASSY, 326-OT t=0.5
89	S44376001	1	WORK CLAMP PLATE ASSY, 326-OT t=1.0
89	S44378001	1	WORK CLAMP PLATE ASSY, 326-OT t=2.0

■ Feed mechanism (Option parts)



REF.NO.	CODE	Q'TY	NAME OF PARTS
			<Gauge parts>
138	S51043001	1	H-POSITION STANDARD PLATE ASSY
			<Attachment for feed plate>
150-1	S51045001	1	FEED PLATE BLANK, A 326L t=1.2
150-2	S51046001	1	FEED PLATE BLANK, B 326L t=1.2
150-3	S51047001	1	FEED PLATE BLANK, C 326L t=1.2
152	S48555000	1	INNER PLATE, FED PLATE
			<For work clamp blank>
153-1	S51051001	1	WORK CLAMP BLANK, SE A-3.2-L t=3.2
153-1	S51053001	1	WORK CLAMP BLANK, SE A-4.0-L t=4.0
153-1	S51055001	1	WORK CLAMP BLANK, SE A-5.0-L t=5.0
153-1	S51057001	1	WORK CLAMP BLANK, SE A-6.0-L t=6.0
153-2	S51052001	1	WORK CLAMP BLANK, SE B-3.2-L t=3.2
153-2	S51054001	1	WORK CLAMP BLANK, SE B-4.0-L t=4.0
153-2	S51056001	1	WORK CLAMP BLANK, SE B-5.0-L t=5.0
153-2	S51058001	1	WORK CLAMP BLANK, SE B-6.0-L t=6.0
153-3	S51059001	1	WORK CLAMP BLANK, A-3.2 UN-L t=3.2
153-3	S51061001	1	WORK CLAMP BLANK, A-4.0 UN-L t=4.0
153-3	S51063001	1	WORK CLAMP BLANK, A-5.0 UN-L t=5.0
153-3	S51065001	1	WORK CLAMP BLANK, A-6.0 UN-L t=6.0
153-4	S51060001	1	WORK CLAMP BLANK, B-3.2 UN-L t=3.2
153-4	S51062001	1	WORK CLAMP BLANK, B-4.0 UN-L t=4.0
153-4	S51064001	1	WORK CLAMP BLANK, B-5.0 UN-L t=5.0
153-4	S51066001	1	WORK CLAMP BLANK, B-6.0 UN-L t=6.0
			<Attachment for one-touch feed plate>
155	S14841001	1	OT-FEED PLATE BRACKET ASSY

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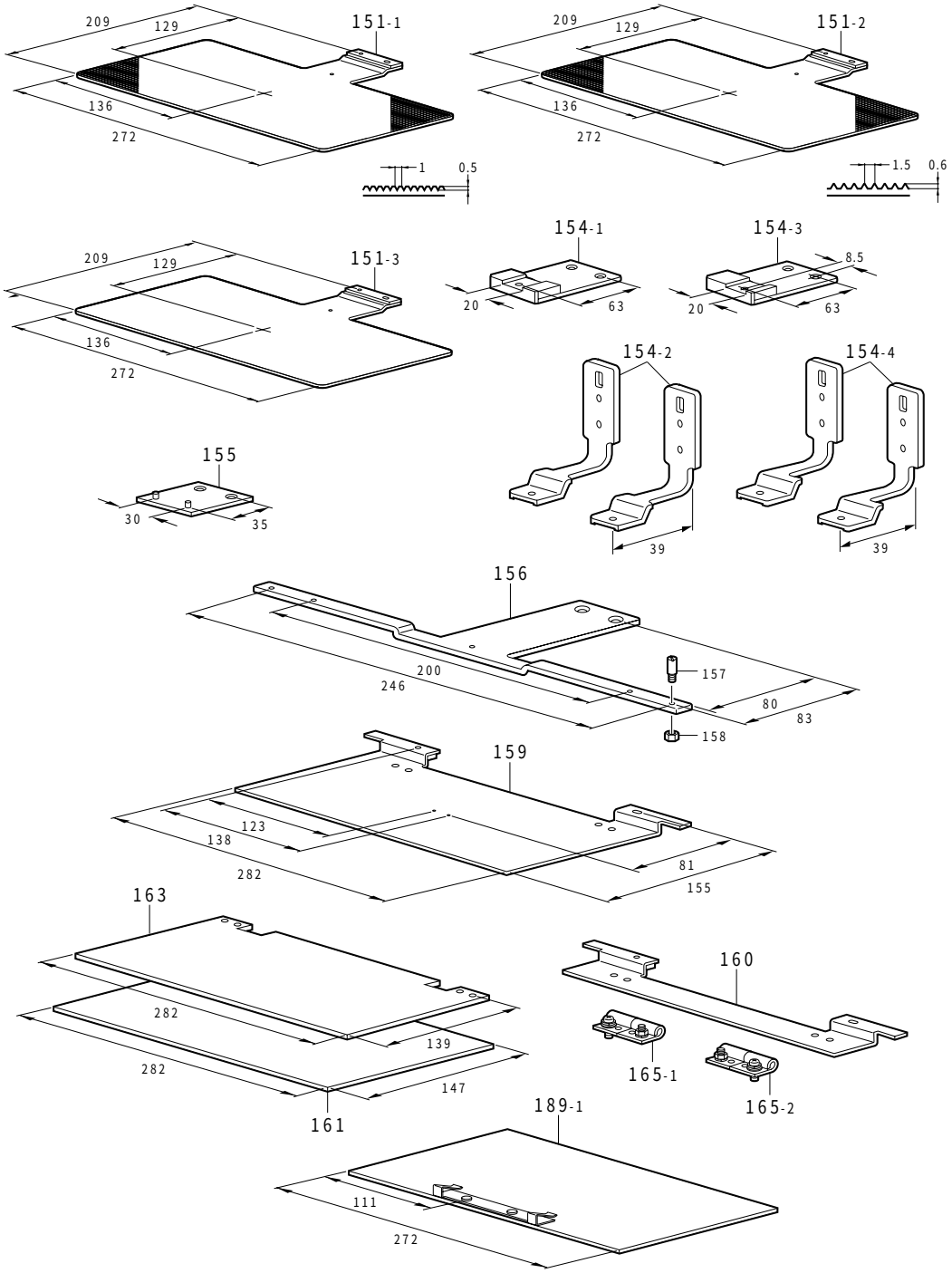
■ Feed mechanism (Option parts) BAS-326E,326EL



REF.NO.	CODE	QTY	NAME OF PARTS
			<The blank for one-touch feed plate>
151-1	S51048001	1	OT-FEED PLATE BLANK, A 326L t=1.2
151-2	S51049001	1	OT-FEED PLATE BLANK, B 326L t=1.2
151-3	S51050001	1	OT-FEED PLATE BLANK, C 326L t=1.2
			<Attachment for one-touch feed plate>
155	S14841001	1	OT-FEED PLATE BRACKET ASSY
			"For BAS-326A & BAS-326LA"
			<Attachment for work clamp & feed plate>
154-1	S12586001	1	FEED PLATE SETTING BRACKET
154-2	S44413001	2	WORK CLAMP, SE-226
154-3	S44463001	1	FEED PLATE SETTING BRACKET, SP
154-4	S44464001	2	WORK CLAMP, SE-226SP
		1	<For cassette clamp assy>

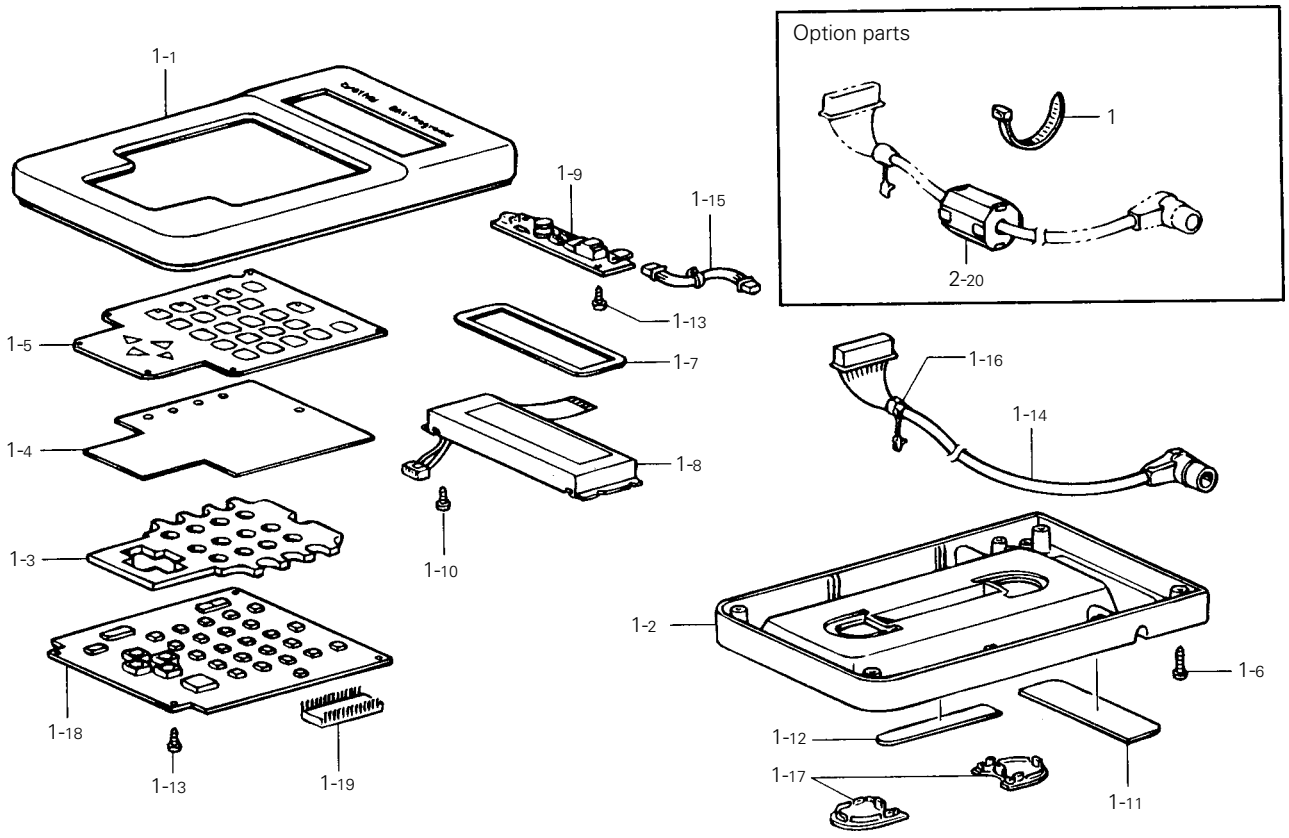
REF.NO.	CODE	QTY	NAME OF PARTS
189-1	S51067001	1	OT-WORK CLAMP PLATE ASSY, 326L t=0.5
189-1	S51069001	1	OT-WORK CLAMP PLATE ASSY, 326L t=1.0
189-1	S51071001		OT-WORK CLAMP PLATE ASSY, 326L t=2.0
		1	<Attachment for cassette clamp>
156	S44411001	2	CASSETTE HOLDER PLATE
157	S13007001	2	PIN, CASSETTE HOLDER
158	021660306	1	NUT, 3 SM3.18-40
159	S14392201	1	CASSETTE PLATE, D-A180
160	S14388101	1	CASSETTE PLATE, D-B180
161	S14386000	1	CASSETTE LOWER PLATE, A-180 t=1
161	S14387000	1	CASSETTE LOWER PLATE, B-180 t=2
163	S14389000	1	CASSETTE PLATE, U-A180 t=1
163	S14390000	1	CASSETTE PLATE, U-B180 t=2
165-1	152632001	1	HINGE ASSY, R
165-2	152633001	1	HINGE ASSY, L

Chapter 10. Option parts

■ **Programmer assy**	Used to create sewing patterns for the BAS-300E series. It can also be used to display error messages.
■ **Inner clamp device**	Used for efficient sewing around labels, emblems and tape; operates by air together with the outer presser, so material slippages wil not occur.
■ **One-touch clamping device**	Allows the clamp to be replaced quickly and easily, without the need for extra tools. The positioning adjustment that has been previously required for other clamps is no longer necessary.
■ **Milling device**	This device can be used to cut a variety of objects such as grooves, holes, and outline shapes in plastic or aluminum sheets.
■ **WP stitch device**	Increases the stitch creation range for perfect stitches.
■ **Auto bobbin changer**	When the amount of bobbin thread remaining becomes low, this device automatically replaces the bobbin. This reduces the need for tasks such as checking the amount of bobbin thread remaining and replacing bobbins, so that productivity can be increased.
■ **Snap fastener and hook attachment device**	This attachment is for holding snap fasteners and hooks.
■ **Needle thread presser device**	This allows the upper thread to be securely placed under the material for the first stitch at the sewing start.
■ **Thread breakage detector device**	Available as rotary type or fiber type, stops sewing when a thread breakage is detected and warms the operator.
■ **Needle coder device**	This is a pneumatic-type needle cooler which prevents the thread breaking due to heat. It is particularly useful when sewing thicker materials at high sewing speeds.
■ **OT Presser**	Use according to particular sewing needs in order to provide an even clamping force.
■ **Soft presser**	At the first stage, the work clamp applies only a spring force so that the material can be positioned. Then at the second stage, air pressure provides a full clamping force.
■ **Cassette presser**	This allows the operator to hold two clamps so that the preparation for the next operation can be carried out while sewing is in progress. Overlapping operations are thus possible, which can greatly boost productivity.
■ **Play prevention work clamp**	This work clamp prevents any play from occurring in the clamp.
■ **Thread wiper the side**	Wipes the upper thread away to the side when an inner clamping device is being used.
■ **Air wiper device**	The thread wiper is driven by a pneumatic cylinder.
■ **2-step thread tension device**	Allows the upper thread tension to be switched between two settings at any position desired by using the programmer.

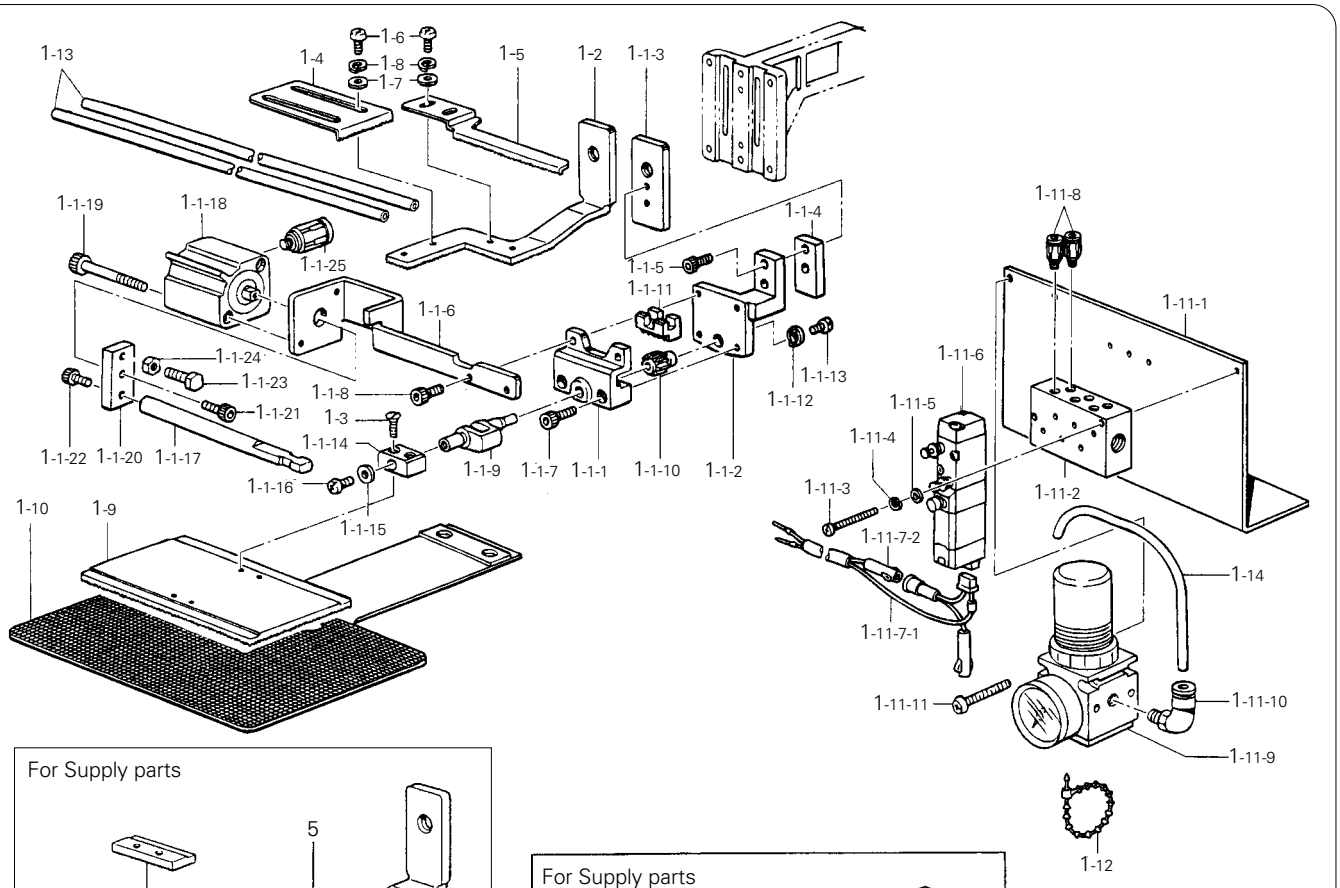
* Refer to the separate Parts Book for details.

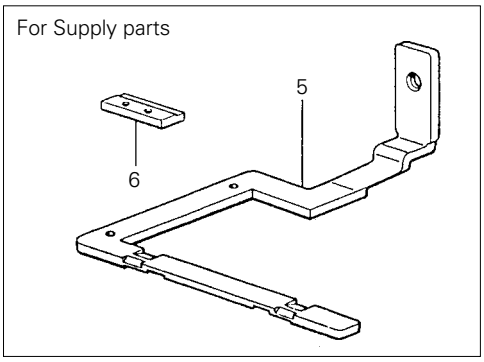
■ Programmer

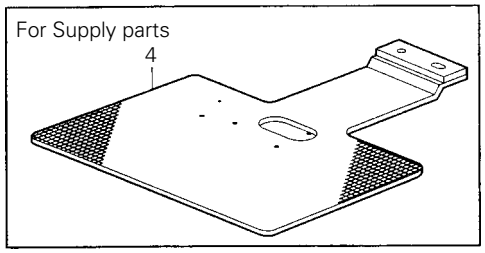


REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
1	S43249001	1	PROGRAMMER ASSY	1-12	S43272000	1	MAGNET,B
1-1	S43250000	1	TOP COVER,PROGRAMMER	1-13	037300615	6	TAPPING SCREW,PAN V M3X6
1-2	S43251000	1	LOWER COVER,PROGRAMMER	1-14	S43267000	1	PROGRAMMER HARNESS
1-3	S43252000	1	SPACER,KEYBOARD	1-15	S43268000	1	INVERTER HARNESS
1-4	S43253000	1	RUBBER SHEET,KEYBOARD	1-16	S43270000	1	CORD BUSH,KR51
1-5	S43254000	1	KEYBOARD SHEET	1-17	S43981000	2	LOWER COVER,PROGRAMMER
1-6	037301015	4	TAPPING SCREW,PAN V M3X10	1-18	S43259001	1	PROGRAMMER PCB ASSY
1-7	S43255000	1	LCD COVER	1-19	S43269000	1	PROM PROGRAMMER ASSY
1-8	S43256000	1	LCD				
1-9	S43257000	1	INVERTER,LCD				"OPTION PARTS"
1-10	037200615	4	TAPPING SCREW,PAN V M2X6	1-20	S40621000	1	EMI CORE,ESD-SR-15
1-11	S43271000	1	MAGNET,A	1-21	149809000	1	BEAD BAND,L

■ Inner clamping device (Option device)

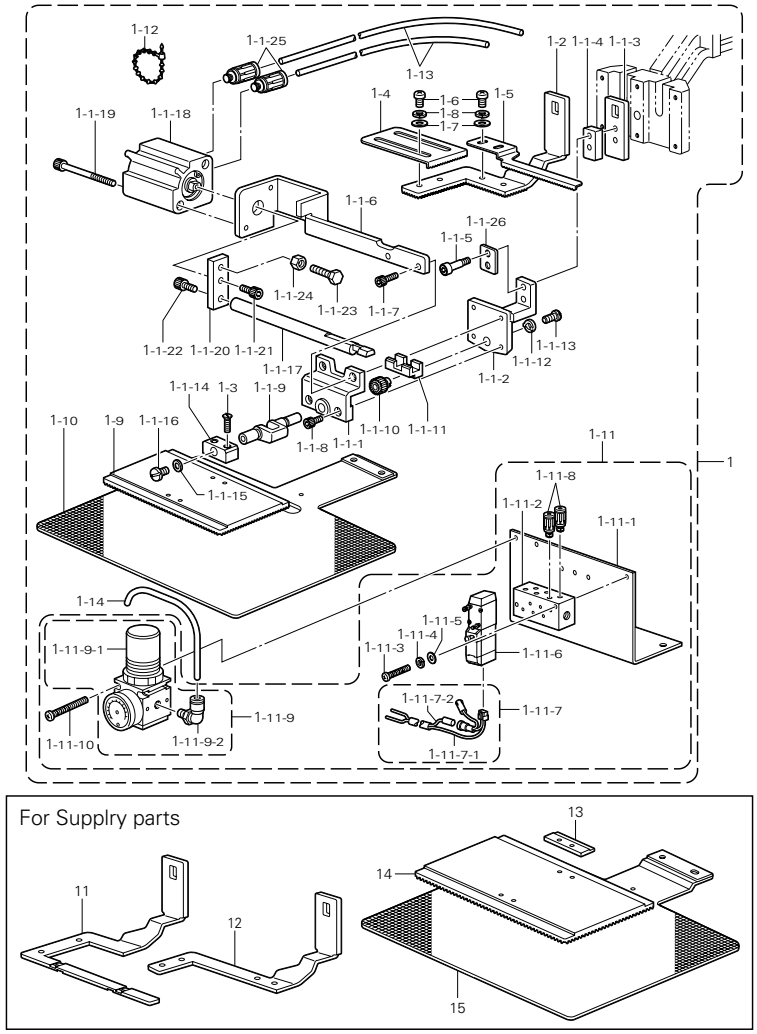






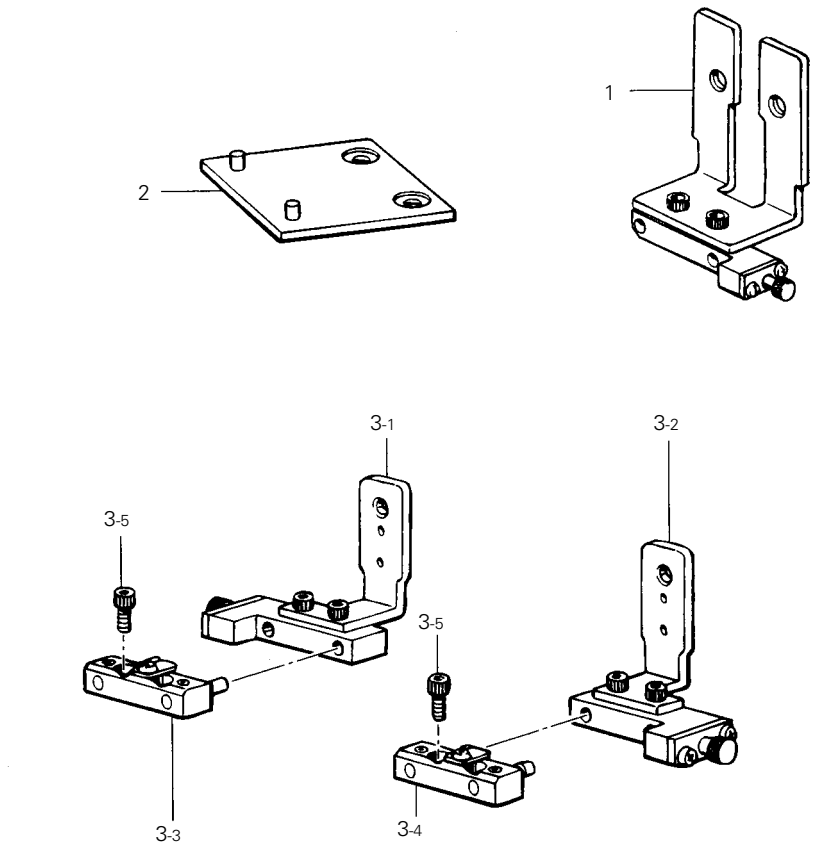
REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
1	S44793009	1	INNER CLAMPING DEVICE SET	1-3	117291002	2	SCREW,FLAT SM3.18
1-1	S12633209	1	WORK CLAMP CRANK ASSY,LA	1-4	154252001	1	POSITIONING PLATE,L
1-1-1	S12634009	1	WORK CLAMP CRANK HOLDER,A	1-5	154253001	1	POSITIONING PLATE,R
1-1-2	S12635009	1	WORK CLAMP CRANK HOLDER,B	1-6	062670512	4	SCREW,PAN SM3.57-40X5
1-1-3	S12636001	1	WORK CLAMP CRANK HOLDER,C	1-7	025350332	4	WASHER,PLAIN L3.5
1-1-4	S12641009	1	WASHER	1-8	028350242	4	WASHER,SPRING 2-3.5
1-1-5	018681232	2	BOLT,SOCKET SM4.37-40X12	1-9	154256101	1	WORK CLAMP BLANK,A
1-1-6	S12638009	1	REVERSE CYLINDER BRACKET	1-10	S12645001	1	FEED PLATE BLANK,312-1
1-1-7	018301236	2	BOLT,SOCKET M3X12	1-11	S44745009	1	INNER CLAMP VALVE ASSY,3
1-1-8	018301036	2	BOLT,SOCKET M3X10	1-11-1	S31570209	1	VALVE SETTING PLATE,4-HH
1-1-9	S05665001	1	WORK CLAMP CRANK,LA	1-11-2	S44748001	1	AIR MANIFOLD,3
1-1-10	154235001	1	REVERSE GEAR	1-11-3	062302505	2	SCREW,PAN M3X25
1-1-11	154236001	1	REVERSE RACK	1-11-4	028030242	2	WASHER,SPRING 2-3
1-1-12	145087001	1	WASHER	1-11-5	025030232	2	WASHER,PLAIN M3
1-1-13	149831101	1	SET SCREW,SM3.18	1-11-6	S43683001	1	SOLENOID VALVE
1-1-14	154237001	1	WORK CLAMP PLATE HOLDER,L	1-11-7	S43696000	1	VALVE HARNESS,X1
1-1-15	025350132	1	WASHER,PLAIN S3.5	1-11-7-1	S44746000	1	VALVE HARNESS
1-1-16	100242003	1	SCREW,SM3.57	1-11-7-2	S44750000	1	VALVE HARNESS,24V
1-1-17	S12637009	1	REVERSE ROD	1-11-8	S18415101	2	HALF UNION,Q4M5
1-1-18	S12639001	1	REVERSE CYLINDER	1-11-9	S12647001	1	AIR REGULATOR
1-1-19	S12642009	2	BOLT,SOCKET M3X35	1-11-10	S29704000	2	ELBOW,4-1/8
1-1-20	S12640009	1	JOINT	1-11-11	062404005	2	SCREW,PAN M4X40
1-1-21	018300836	1	BOLT,SOCKET M3X8	1-12	340400001	2	BEAD BAND
1-1-22	018300836	1	BOLT,SOCKET M3X8	1-13	S03803000	2	AIR TUBE
1-1-23	017501216	1	BOLT,M5X12	1-14	S28741000	1	AIR TUBE,L=300
1-1-24	021500216	1	NUT,2 M5	4	S14598001	1	OT FEED PLATE BLANK, 312
1-1-25	S18415101	2	HALF UNION,Q4M5	5	S12644001	1	EXTERNAL WORK CLAMP FOOT 312-2
1-2	S12643001	1	OUTER WORK CLAMP,312-1	6	S10542001	1	INNER CLAMP (LL)

■Inner clamping device (Option device) BAS-326EL



REF.NO.	CODE	Q'TY	NAME OF PARTS	REF.NO.	CODE	Q'TY	NAME OF PARTS
1	S51073009	1	INNER CLAMPING DEVICE SET, 326E	1-5	154253001	1	POSITIONING PLATE, R
1-1	S44420009	1	WORK CLAMP CRANK ASSY, LA	1-6	062670512	4	SCREW, PAN SM3.57-40X5
1-1-1	012634009	1	WORK CLAMP CRANK HOLDER, A	1-7	025350332	4	WASHER, PLAIN L3.5
1-1-2	S12635009	1	WORK CLAMP CRANK HOLDER, B	1-8	028350242	4	WASHER, SPRING 2-3.5
1-1-3	S44421001	1	WORK CLAMP CRANK HOLDER, C	1-9	154256101	1	WORK CLAMP PLATE BLANK, A
1-1-4	S44422001	1	SPACER, CRANK HOLDER	1-10	S51075001	1	FEED PLATE BLANK, H 326L t=1.2
1-1-5	150382001	2	BOLT, SOCKET SM4.37X18	1-11	S44745009	1	INNER CLAMP VALVE ASSY, 3
1-1-6	S12638009	1	REVERSE CYLINDER BRACKET	1-11-1	S31570209	1	VALVE SETTING PLATE, 4-5H
1-1-7	018301236	2	BOLT, SOCKET M3X12	1-11-2	S44748001	1	AIR MANIFOLD, 3
1-1-8	018301036	2	BOLT, SOCKET M3X10	1-11-3	062302506	2	SCREW, PAN M3X25
1-1-9	S05665001	1	WORK CLAMP CRANK, LA	1-11-4	028030242	2	WASHER, SPRING 2-3
1-1-10	154235001	1	REVERSE GEAR	1-11-5	025030232	2	WASHER, PLAIN M3
1-1-11	154236001	1	REVERSE RACK	1-11-6	S43683001	1	SOLENOID VALVE
1-1-12	145087001	1	WASHER	1-11-7	S43696000	1	VALVE HARNESS, X1
1-1-13	149831101	1	SET SCREW, SM3.18	1-11-7-1	S44746000	1	VALVE HARNESS
1-1-14	154237001	1	WORK CLAMP PLATE HOLDER, L	1-11-7-2	S44750000	1	VALVE HARNESS, 24V
1-1-15	025350132	1	WASHER, PLAIN S3.5	1-11-8	S18415101	2	HALF UNION, Q4M5
1-1-16	100242003	1	SCREW, SM3.57	1-11-9	S45252000	1	REGULATOR ASSY
1-1-17	S12637009	1	REVERSE ROD	1-11-9-1	S45253000	1	REGULATOR
1-1-18	S12639001	1	REVERSE CYLINDER	1-11-9-2	A45254000	2	JOINT, 3109-4-10
1-1-19	S12642009	2	BOLT, SOCKET M3X35	1-11-10	062404005	2	SCREW, PAN M4X40
1-1-20	S12640009	1	JOINT	1-12	340400001	2	BEAD BAND
1-1-21	018300836	1	BOLT, SOCKET M3X8	1-13	S03803000	2	AIR TUBE, 4L=1300
1-1-22	018300836	1	BOLT, SOCKET M3X8	1-14	S28741000	1	AIR TUBE, 4L=300
1-1-23	017501216	1	BOLT, M5X12				
1-1-24	021500216	1	NUT, 2 M5				"For Supply parts"
1-1-25	S18415101	2	HALF UNION, Q4M5	11	S44426001	1	OUTER WORK CLAMP, 326E-2
1-1-26	S44424001	1	SPACER, CRANK HOLDER	12	S51076001	1	OUTER WORK CLAMP, 326L-3
1-2	S44425001	1	OUTER WORK CLAMP, 326E-1	13	S10542001	1	INNER CLAMP, LL
1-3	117291002	2	SCREW, FLAT SM3.18	14	S51077001	1	WORK CLAMP BLANK, A 326L
1-4	154252001	1	POSITIONING PLATE, L	15	S51078001	1	OT-FEED PLATE BLANK, H 326L t=1.2

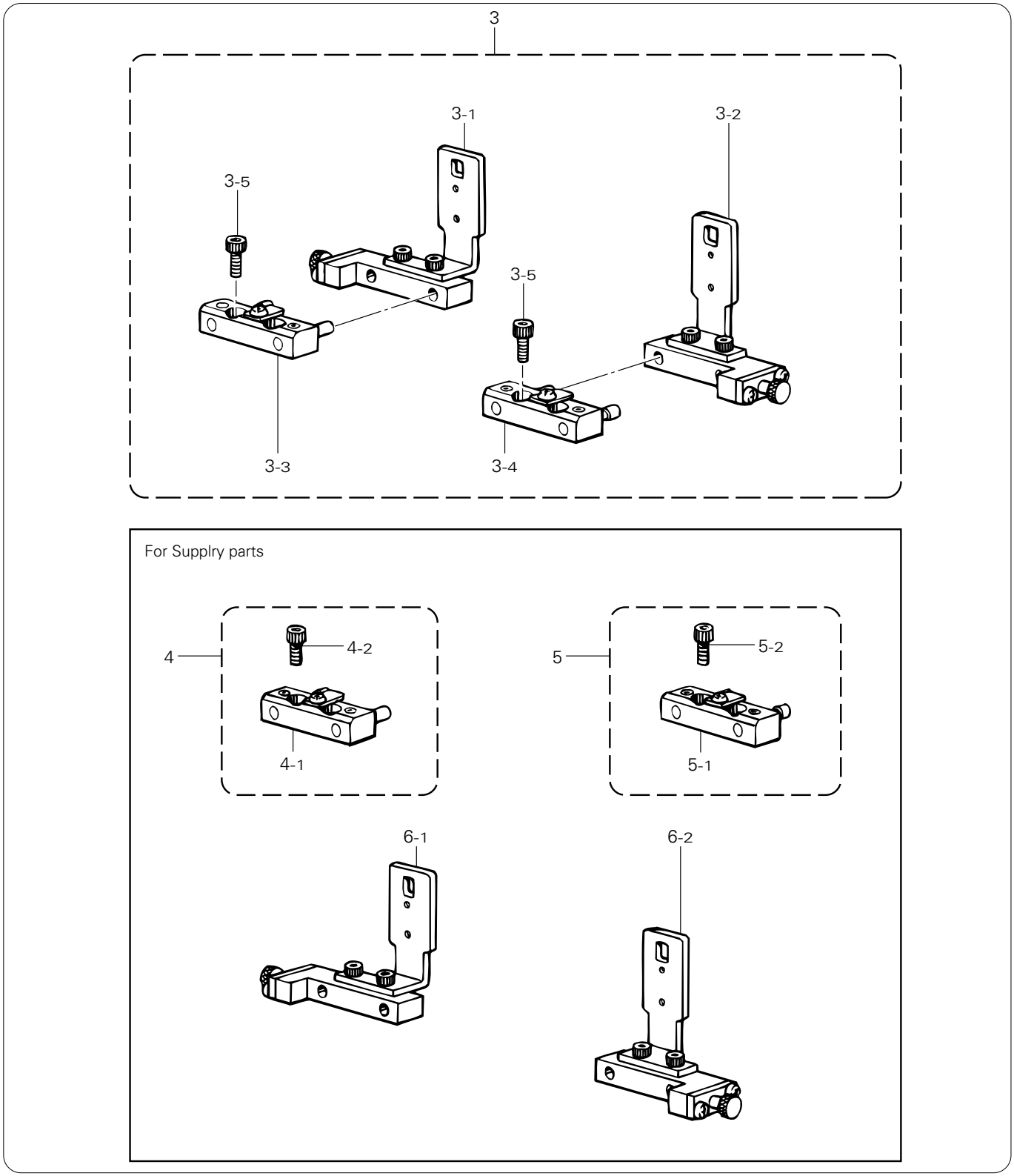
■ One-touch work clamp



REF.NO.	CODE	QTY	NAME OF PARTS
1	S24612001	1	<For attaching the snap & hook> ONE-TOUCH HOLDER ASSY,UN
2	S14841001	1	<For change the feed plate setting position> OT FEED PLATE BRACKET ASSY
3	S44794001	1	<For One-touch work clamp set> ONE-TOUCH WORK CLAMP SET
3-1	S20280101	1	ONE-TOUCH HOLDER ASSY,L
3-2	S20286101	1	ONE-TOUCH HOLDER ASSY,R
3-3	S20289101	2	WORK CLAMP HOLDER ASSY,L
3-4	S20293101	2	WORK CLAMP HOLDER ASSY,R
3-5	018680822	8	BOLT,SOCKET SM4.37X8
			<For supply parts"
4	S20822101	1	WORK CLAMP HOLDER SET,L
4-1	S20289101	1	WORK CLAMP HOLDER ASSY,L
4-2	018680822	2	BOLT,SOCKET SM4.37X8
5	S20823101	1	WORK CLAMP HOLDER SET,R
5-1	S20293101	1	WORK CLAMP HOLDER ASSY,R
5-2	018680822	2	BOLT,SOCKET SM4.37X8
3-1	S20280101	1	ONE-TOUCH HOLDER ASSY,L
3-2	S20286101	1	ONE-TOUCH HOLDER ASSY,R

☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

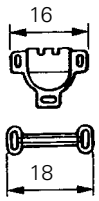
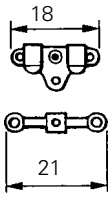
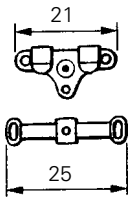
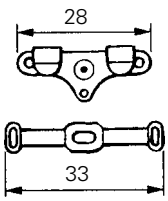
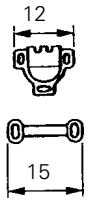
■ One-touch work clamp (Option parts) BAS-326EL

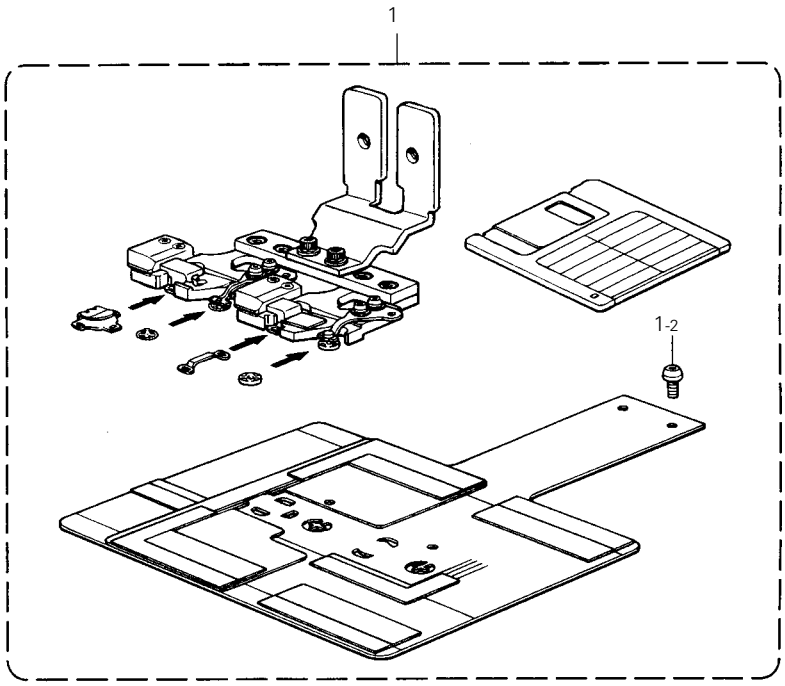


REF.NO.	CODE	Q'TY	NAME OF PART	REF.NO.	CODE	Q'TY	NAME OF PART
			<One-touch work clamp set>	4	S20822101	1	WORK CLAMP HOLDER SET, L
3	S44414001	1	ONE-TOUCH WORK CLAMP SET	4-1	S20289101	1	WORK CLAMP HOLDER ASSY, L *
3-1	S44415001	1	ONE-TOUCH HOLDER ASSY, L *	4-2	018680822	2	BOLT, SOCKET SM4.37X6
3-2	S44417001	1	ONE-TOUCH HOLDER ASSY, R *	5	S20823101	1	WORK CLAMP HOLDER SET, R
3-3	S20289101	2	WORK CLAMP HOLDER ASSY, L *	5-1	S20293101	1	WORK CLAMP HOLDER ASSY, R *
3-4	S20293101	2	WORK CLAMP HOLDER ASSY, R *	5-2	018680822	2	BOLT, SOCKET SM4.37X6
3-5	018680822	8	BOLT, SOCKET SM4.37X6	6-1	S44415001	1	ONE-TOUCH HOLDER ASSY, L *
				6-2	S44417001	1	ONE-TOUCH HOLDER ASSY, R *
			"FOR SUPPLY PARTS"				

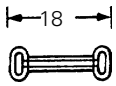
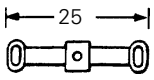
☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

■ Snap fastener and hook attachment device

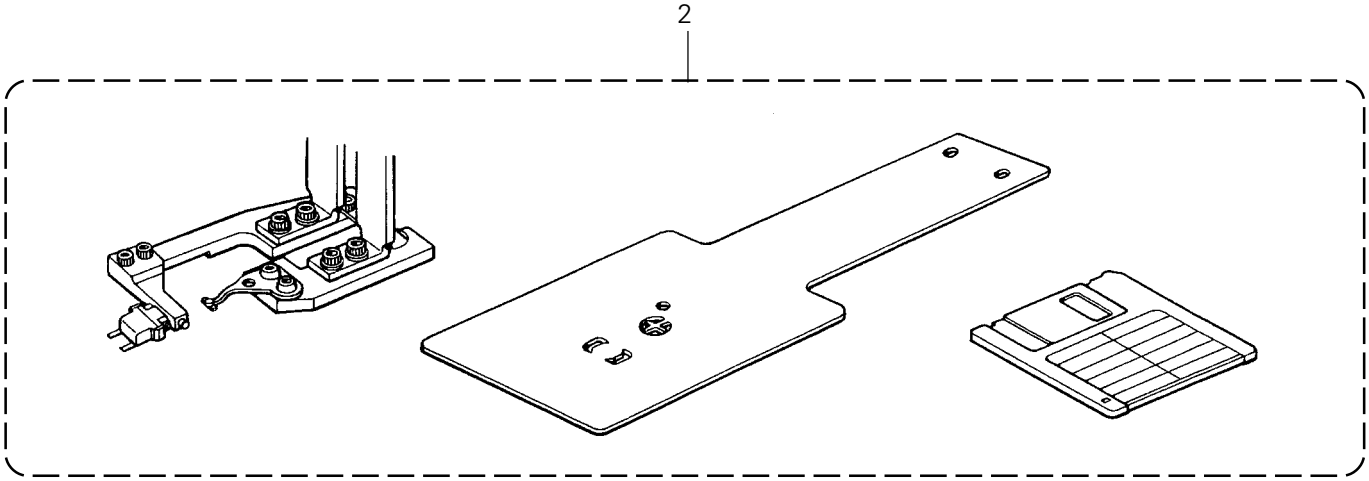
M-508K	M-520K
	
M-525K	**M-533K**
	
M-528K	**OM ø7.6,ø8.6**
	

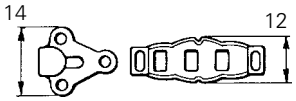
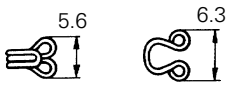
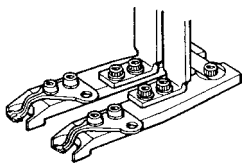
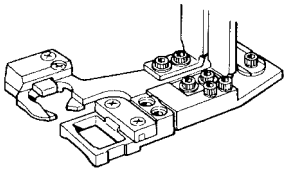
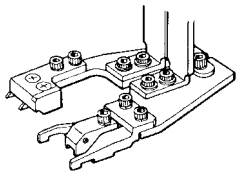
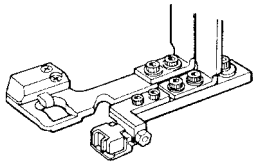
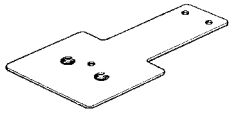
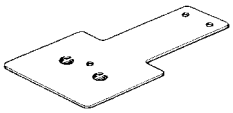
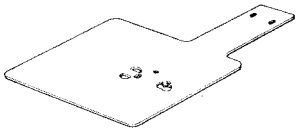
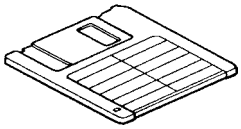
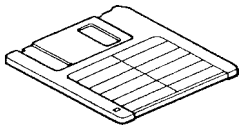
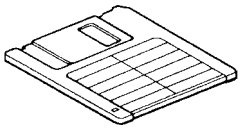


REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			<FOR M-508K>				<FOR M-525K>
1	S42804001	1	WORK CLAMP SET,S.H	1	S42811001	1	WORK CLAMP SET,S.H
			<FOR M-528k>				<FOR M-533K>
1	S42807001	1	WORK CLAMP SET,S.H	1	S42813001	1	WORK CLAMP SET,S.H
			<FOR M-520K>				
1	S42809001	1	WORK CLAMP SET,S.H	1-2	153057002	2	SCREW,BUTTON HEAD SM4.37

M-508	M-525
	

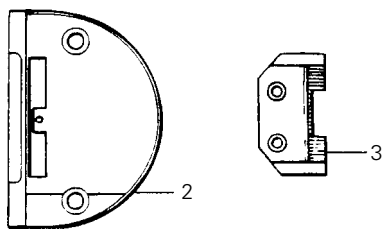
REF.NO.	CODE	QTY	NAME OF PARTS
			<FOR M-508>
2	S18614001	1	WORK CLAMP SET,AS
			<FOR M-525>
2	S18621001	1	WORK CLAMP SET,AS



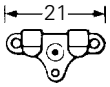
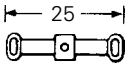
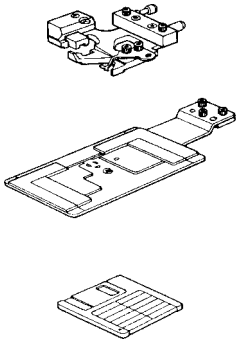
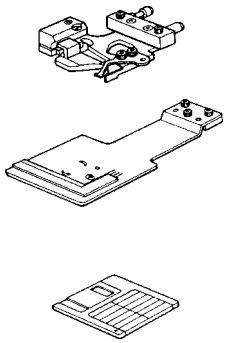
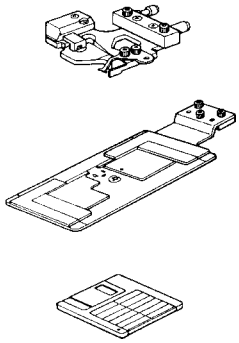
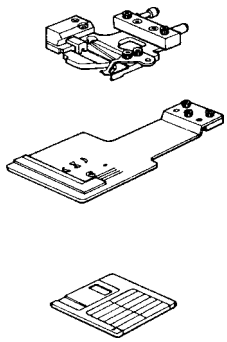
310-SW DEVICE UNIT	310-HE DEVICE UNIT		
	<FORM -510>	<FORM-10>	<FORM-521>
S21553-001*	S21559-001*	S21565-001*	S21591-001*
—			
OM ϕ7.6, ϕ8.6 	—	—	—
			
			
			

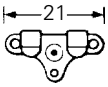
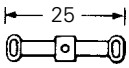
☆Parts which have an asterisk (*) parts which have been assembled and adjusted to high precisions. These parts should never be disassembled.

■ For sewing the belt with hook

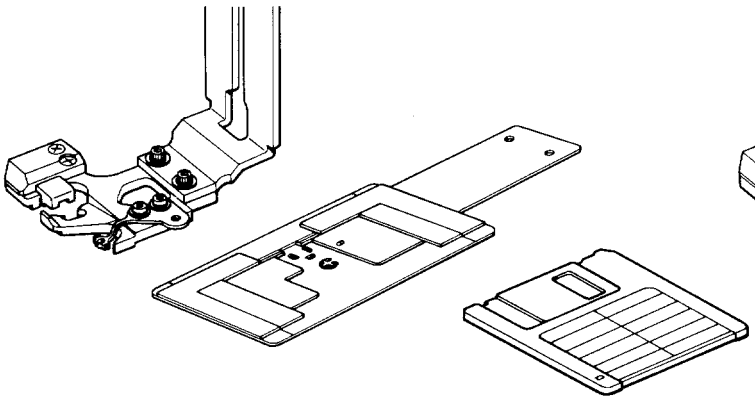


REF.NO.	CODE	QTY	NAME OF PARTS
			<For Sewing the belt with hook>
2	S13099001	1	NEEDLE PLATE,H
3	S13100001	1	FEED DOG,H

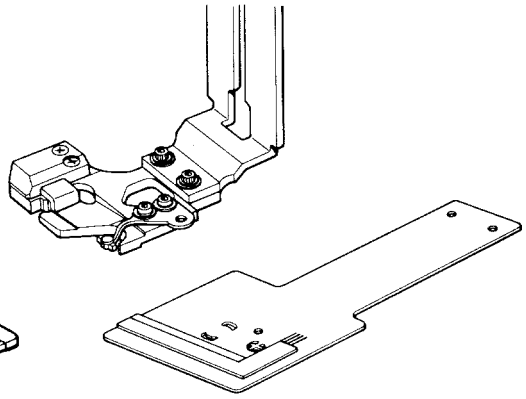
NAME OF PARTS	310-HSQ DEVICE UNIT			
	M-508 MALE	M-508 FEMALE	M-525 MALE	M-525 FEMALE
PARTS CORD	S24605-101	S24614-101	S24621-101	S24628-101
HOOK SIZE (mm)				
SNAP SIZE (mm)	OM Ø7.6,Ø8.6			
				
SHAPE				

NAME OF PARTS	310-HS DEVICE UNIT			
	M-508 MALE	M-508 FEMALE	M-525 MALE	M-525 FEMALE
PARTS CORD	S18581-001	S18590-001	S18598-001	S18606-001
HOOK SIZE (mm)				
SNAP SIZE (mm)	OM Ø7.6,Ø8.6			
				

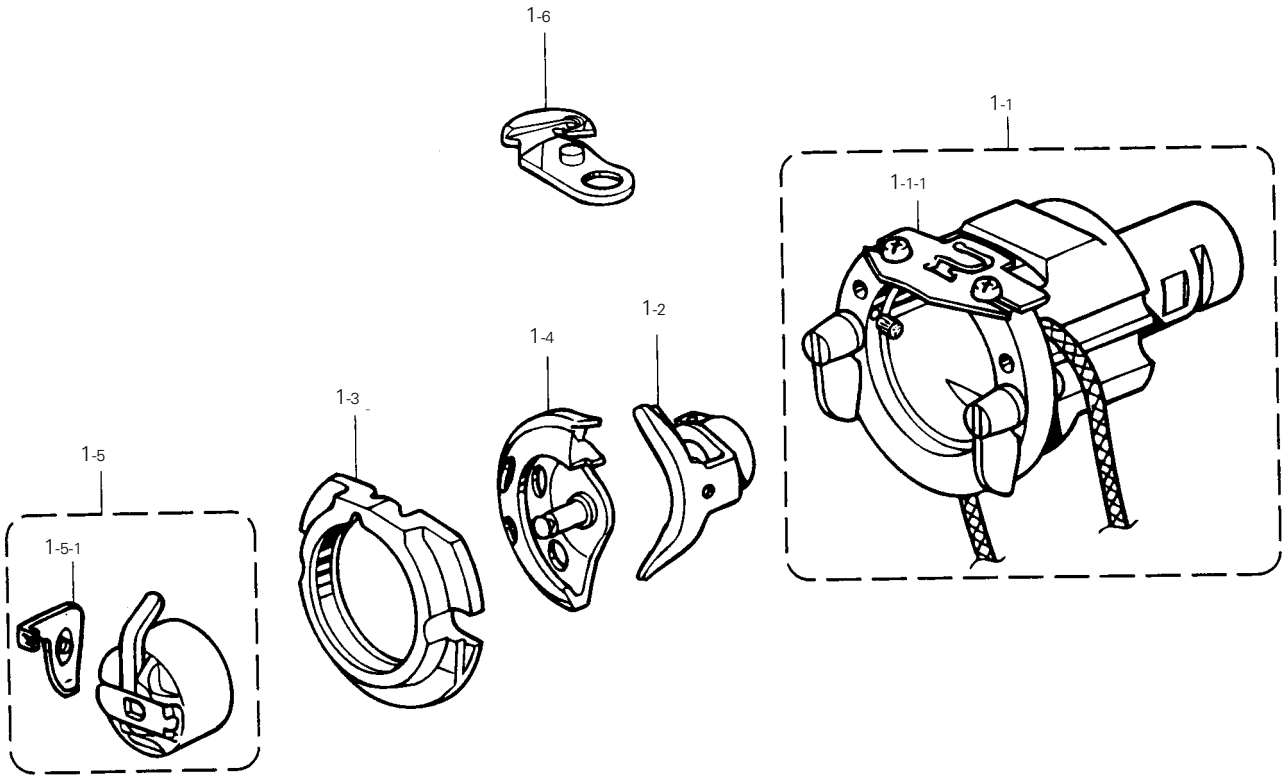
MALE



FEMALE

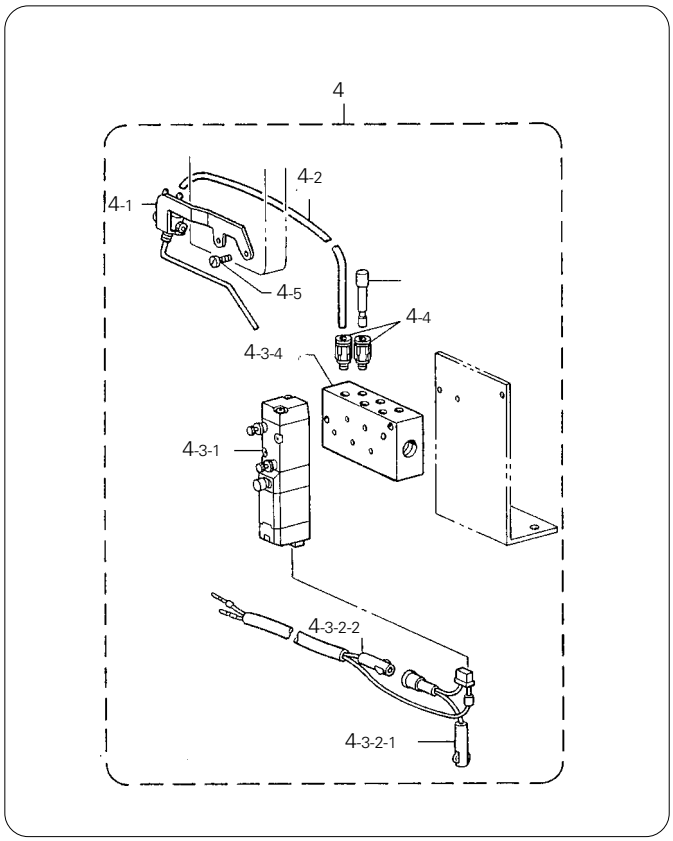


■ Wide perfect device



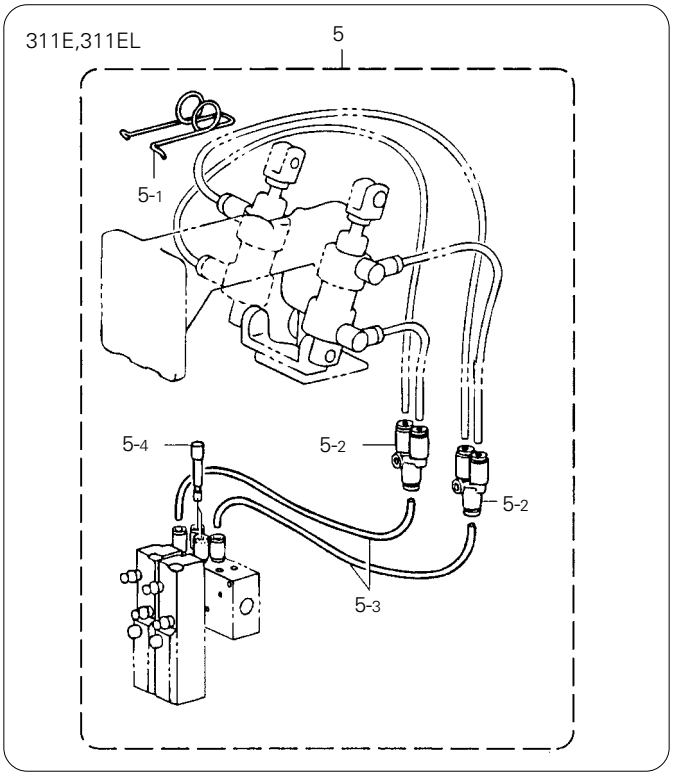
REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
1	S44795001	1	WIDE PERFECT STITCH SET	1-4-1	S40842991	1	SHUTTLE HOOK BOX ASSY,WP
1-1-1	S40837001	1	SHUTTLE RACE BASE ASSY,WP	1-4-1-1	S40842001	1	SHUTTLE HOOK,WP
1-2	S40840001	1	DRIVER,WP	1-5-1	S40843001	1	BOBBIN CASE ASSY,WP
1-3	S40841101	1	SHUTTLE RACE BODY,WP	1-6-1	S40846001	1	MOVABLE KNIFE ASSY,WP

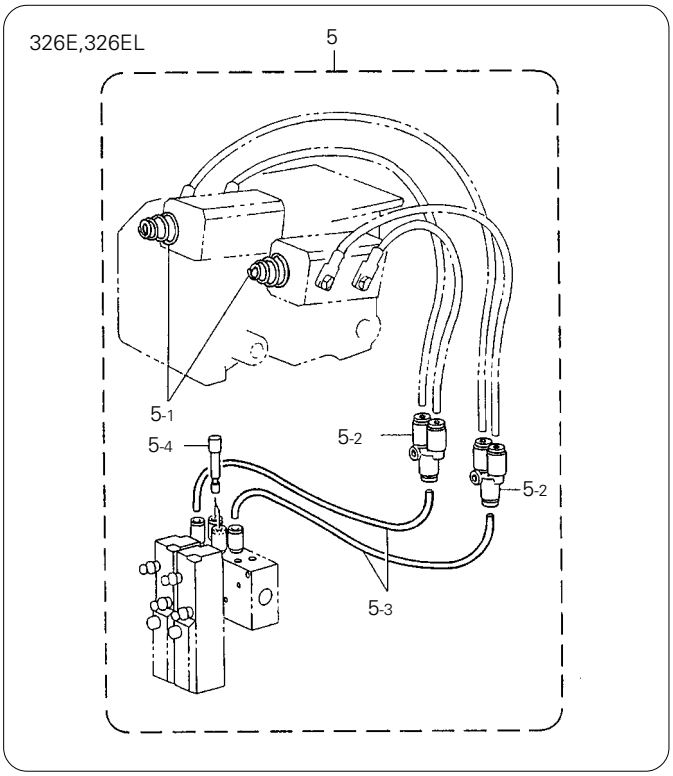
■ Needle cooler set



REF.NO.	CODE	QTY	NAME OF PARTS
			<Needle cooler set>
4	S43846009	1	NEEDLE COOLER SET
4-1	S18027101	1	NEEDLE BLOWER
4-2	S15031008	1	AIR TUBE,4L=1900
4-3	S43839008	1	SOLENOID VALVE ASSY,OP3
4-3-1	S43683001	1	SOLENOID VALVE
4-3-2	S43696000	1	VALVE HARNESS,X1
4-3-2-1	S44746000	1	VALVE HARNESS
4-3-2-2	S44750000	1	VALVE HARNESS,24V
4-3-3	S44748001	1	AIR MANIFOLD,3
4-3-4	S18415101	2	HALF UNION,Q4M5
4-4	S04897000	1	PLUG,4
4-5	062670812	2	SCREW,PAN SM3.57-40X8

■ Soft work clamp set

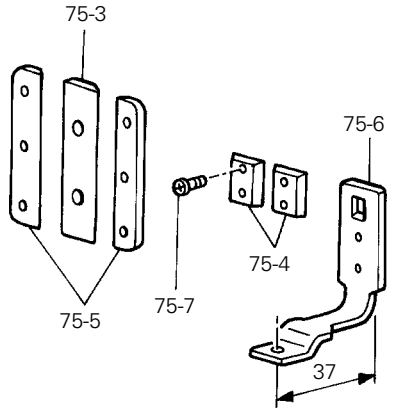




REF.NO.	CODE	QTY	NAME OF PARTS
			<Soft work clamp set>
5	S43979001	1	SOFT WORK CLAMP SET
5-1	S43980001	1	SPRING
5-2	S12104000	2	UNION,Y4
5-3	S08140000	2	AIR TUBE,4L=200
5-4	S04897000	2	PLUG,4

REF.NO.	CODE	QTY	NAME OF PARTS
			<Soft work clamp set>
5	S43979001	1	SOFT WORK CLAMP SET
5-1	S43980001	1	SPRING
5-2	S12104000	2	UNION,Y4
5-3	S08140000	2	AIR TUBE,4L=200
5-4	S04897000	2	PLUG,4

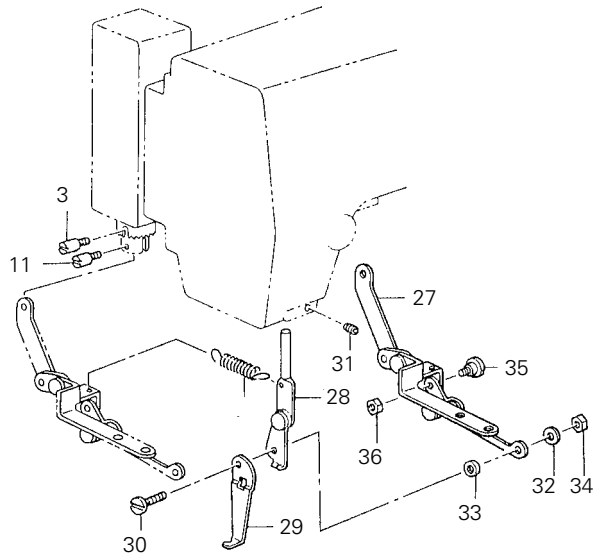
■ Play prevention work clamp



REF.NO.	CODE	QTY	NAME OF PARTS
			"OPTION PARTS"
75-3	S42798001	1	WORK CLAMP GUIDE BRACKET
75-4	S42799001	2	WORK CLAMP AJUSTING PLATE
75-5	S42800001	2	ADJUSTING PLATE
75-6	S42802001	2	WORK CLAMP,SE-OP
75-7	062670512	4	SCREW,PAN SM3.57-40XS

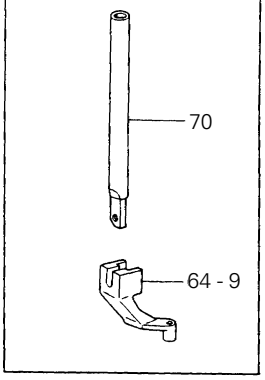
■ For Horizontal Wiper

For Horizontal wiper



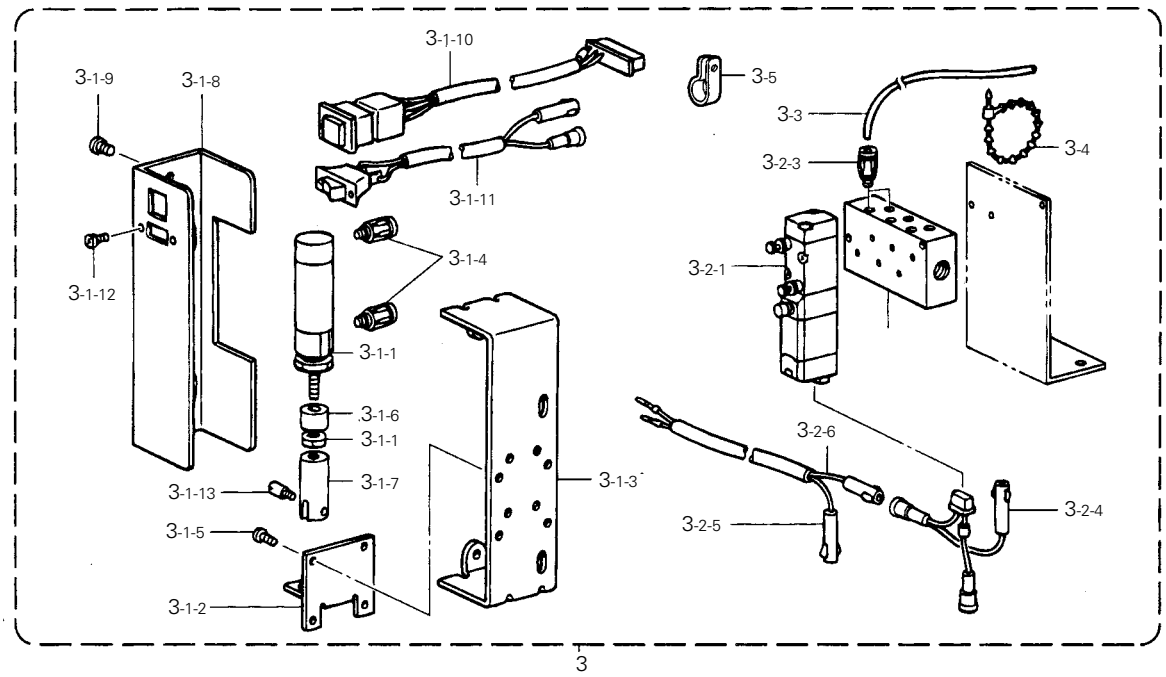
REF.NO.	CODE	QTY	NAME OF PARTS
			<For Horizontal wiper>
27	S42859001	1	THREAR WIPER ASSY, SIDE
28	S42864001	1	WIPER ARM ASSY
29	156206001	1	THREAD WIPER,A
30	S13385001	1	SCREW,SM3.57X10
31	014710522	1	SET SCREW,SOCKET (CP)SM4.76
32	S21875001	1	WASHER
33	S12668001	1	COLLAR
34	021670202	1	NUT,2 SM3.57
35	100659001	1	SHOULDER SCREW,SM3.18
36	021660102	1	NUT,15M3.18
37	159111001	1	SPRING

For Horizontal wiper



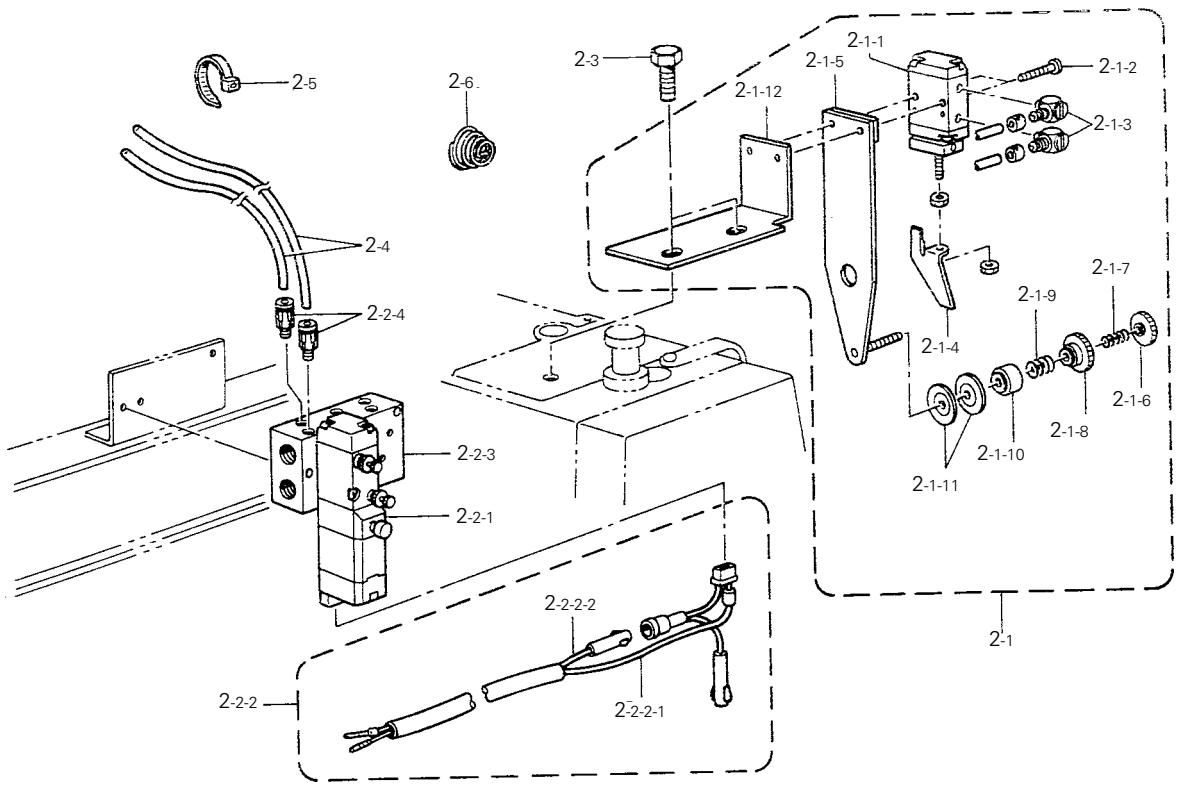
REF.NO.	CODE	QTY	NAME OF PARTS
			<For Horizontal wiper>
64-9	S42849001	1	PRESSER FOOT, XY
70	S42880051	1	PRESSER BAR, SIDE

■ Thread wiper set: Pneumatic type



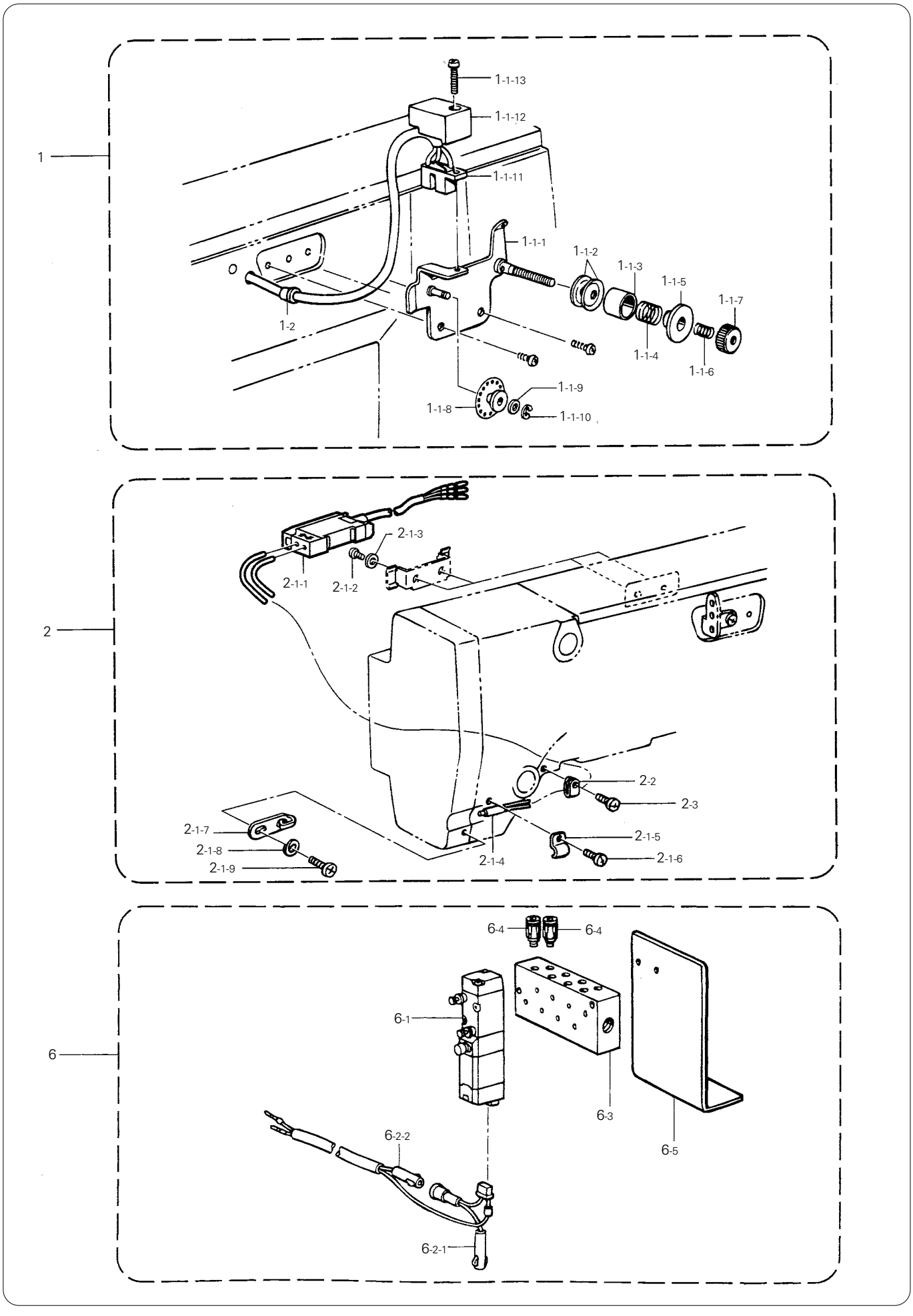
REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			<Thread wiper set: Pneumatic type>	3-1-11-1	S43843009	1	THREAD WIPER SWITCH ASSY
3	S43841009	1	TR.WIPER SET,PNEUMATIC TYPE	3-1-12	062300612	2	SCREW,PAN M3X6
3-1	S43842009	1	TR.WIPER ASSY,PNEUMATIC TYPE	3-2-1	S43844001	1	AW-SOLENOID VALVE ASSY,3
3-1-1	S17942000	1	AIR CYLINDER	3-2-1-1	S43683001	1	SOLENOID VALVE
3-1-2	S31777001	1	CYLINDER SUPPORT PLATE	3-2-1-2	S44748001	1	AIR MANIFOLD,3
3-1-3	S10214009	1	SETTING PLATE,SOLENOIDHALF	3-2-1-3	S18415101	2	HALF UNION,Q4M5
3-1-4	S18415101	2	UNION, Q4M5	3-2-1-4	S44759000	1	AW-VALVE HARNESS,A
3-1-5	062670612	4	SCREW,PAN SM3.57-40X6	3-2-1-5	S44760000	1	AW-VALVE HARNESS,B
3-1-6	S31778000	1	STOPPER,CYLINDER	3-2-1-6	S44750000	1	VALVE HARNESS,24V
3-1-7	S31779001	1	JOINT,CYLINDER	3-3	S15031008	2	AIR TUBE,4L=1900
3-1-8	S31776009	1	CYLINDER COVER	3-4	340400001	7	BEAD BAND
3-1-9	062680512	2	SCREW,PAN SM4.37-40X5	3-5	149287000	4	CORD HOLDER,7N
3-1-10	S43203000	1	EM-SWITCH ASSY	3-1-13	S02680001	1	PLUNGER PIN

■ 2-step tension device



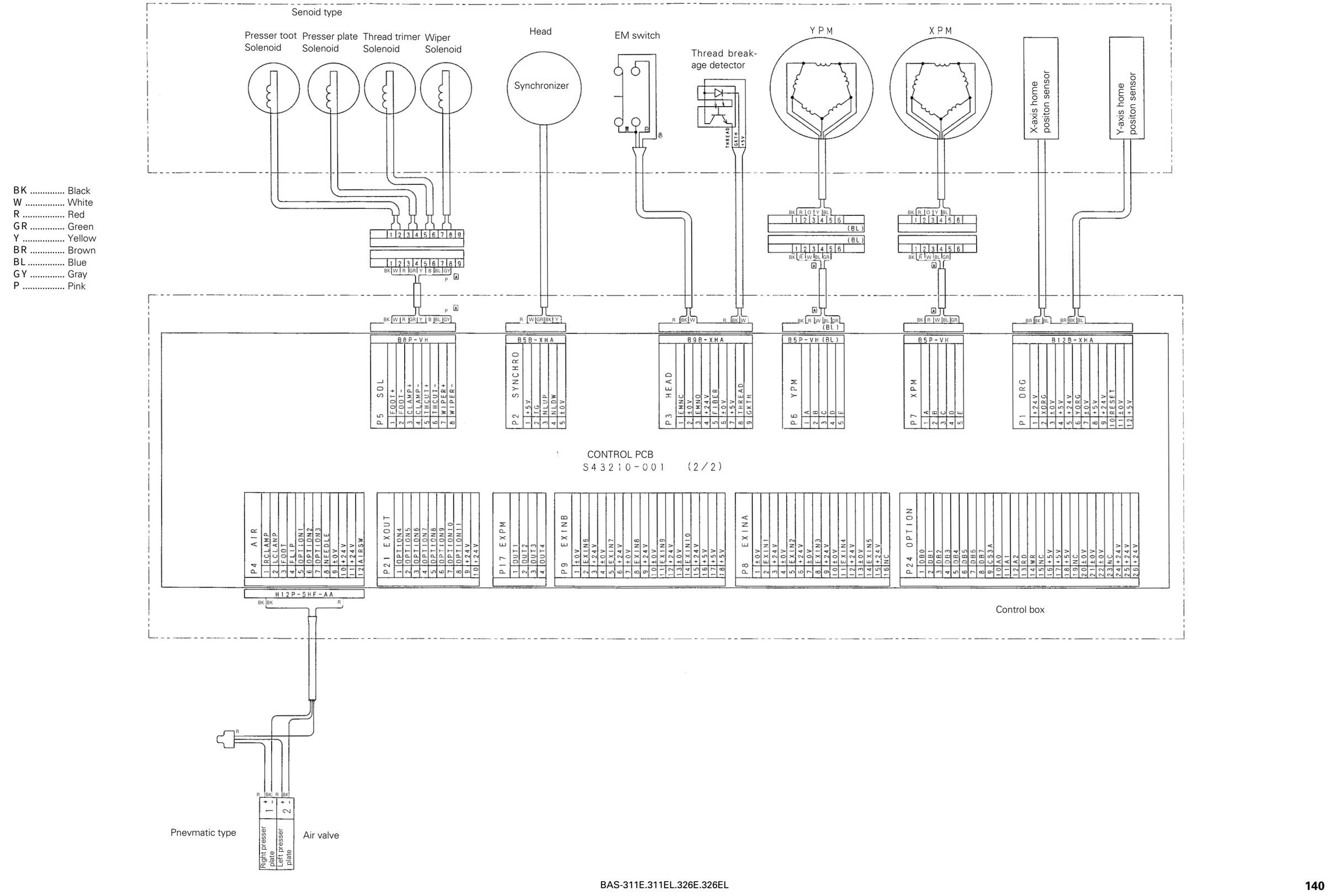
REF.NO.	CODE	QTY	NAME OF PARTS	REF.NO.	CODE	QTY	NAME OF PARTS
			<2-step tension device>	2-1-1-12	S34536001	1	CYLINDER SETTING BRACKET
2	S43837001	1	2-STEP THREAD TENSION DEVICE SET,1	2-2-1	S43839005	1	SOLENOID VALVE ASSY,OP3
2-1-1	S43838001	1	2-STEP THREAD TENSION ASSY	2-2-1-1	S43683001	1	SOLENOID VALVE
2-1-1-1	S34706000	1	AIR CYLINDER,10X10	2-2-1-2	S43696000	1	VALVE HARNESS,X1
2-1-1-2	018302032	2	BOLT,SOCKET M3X20	2-2-1-2-1	S44746000	1	VALVE HARNESS
2-1-1-3	S12150000	2	TUBE ELBOW,M-5HL-4	2-2-1-2-2	S44750000	1	VALVE HARNESS,24V
2-1-1-4	S34533001	1	COUNTERSINK CLAW	2-2-1-3	S44748001	1	AIR MANIFOLD,3
2-1-1-5	S34534001	1	SUB TENSION BRACKET ASSY	2-2-1-4	S18415001	2	HALF UNION,Q4M5
2-1-1-6	155510001	1	TENSION NUT	2-3	017821813	2	BOLT,SM7.94X18
2-1-1-7	146060000	1	SPRING	2-4	S15031008	2	AIR TUBE,L=1900
2-1-1-8	146059001	1	PRE-TENSION NUT	2-5	340400001	5	BEAD BAND
2-1-1-9	146058001	1	PRE-TENSION SPRING	2-6	104525001	1	TENSION SPRING
2-1-1-10	146206009	1	THREAD GUIDE DISC PRESSER	2-7	149287000	3	CORD HOLDER,7N
2-1-1-11	144504001	2	THREAD GUIDE DISC				

■ Auxiliary device

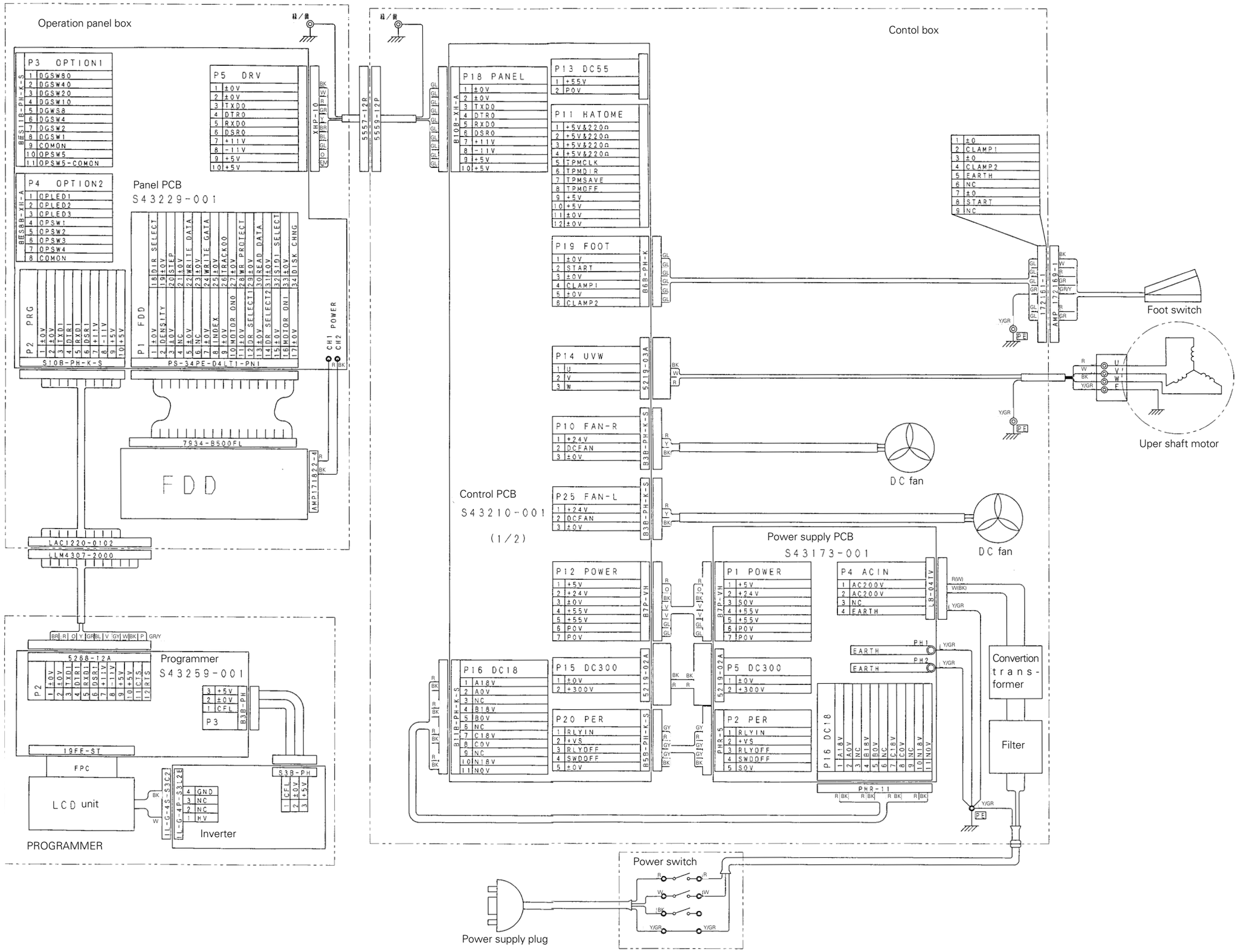


REF.NO.	CODE	QTY	NAME OF PARTS
			"Thread breakage detector"
			<Rotary-type>
1	S43833009	1	TR BREAKAGE DETECTOR SET,R
1-1	S43834009	1	TR BREAKAGE DETECTOR ASSY,R
1-1-1	S18032001	1	DETECTOR BRACKET ASSY
1-1-2	144504001	2	THREAD GUIDE DISC
1-1-3	146206009	1	THREAD GUIDE DISC PRESSER
1-1-4	146058001	1	PRE-TENSION SPRING
1-1-5	146059001	1	PRE-TENSION NUT
1-1-6	146060000	1	SPRING
1-1-7	155510001	1	TENSION NUT
1-1-8	157255100	1	PULLEY,A
1-1-9	025030135	1	WASHER,PLAIN S3
1-1-10	048020342	1	RETAINING RING,E2
1-1-11	S43835000	1	SENSOR ASSY
1-1-12	S18037009	1	SENSOR COVER
1-1-13	062301616	1	SCREW,PAN M3X16
1-2	146080000	1	CORD BUSH
			<Beam-type>
2	S43836001	1	TR BREAKAGE DETECTOR SET,F
2-1	S43977001	1	TR BREAKAGE DETECTOR ASSY,F
2-1-1	S43279000	1	AMP UNIT
2-1-2	062300612	2	SCREW,PAN M3X6
2-1-3	025030232	2	WASHER,PLAIN M3
2-1-4	S29468100	1	FIBER UNIT,N
2-1-5	S11884001	1	SENSOR SETTING PLATE
2-1-6	062300612	1	SCREW,PAN M3X6
2-1-7	S02617001	1	FACE PLATE THREAD GUIDE
2-1-8	028350242	1	WASHER,SPRING 2-3-5
2-1-9	060670612	1	SCREW,BIND SM3.57-40X6
2-2	S11816000	1	CLAMP,NK-2N
2-3	060670612	1	SCREW,BIND SM3.57-40X6
			<Addition valve set>
6	S43847001	1	SOLENOID VALVE ASSY,OP4
6-1	S43683001	1	SOLENOID VALVE
6-2	S43696000	1	VALVE HARNESS,X1
6-2-1	S44746000	1	VALVE HARNESS
6-2-2	S44750000	1	VALVE HARNESS,24V
6-3	S44749001	1	AIR MANIFOLD,4
6-4	S18415101	2	HALF UNION,Q4M5
6-5	S31554009	1	VALVE SETTING PLATE,4-5

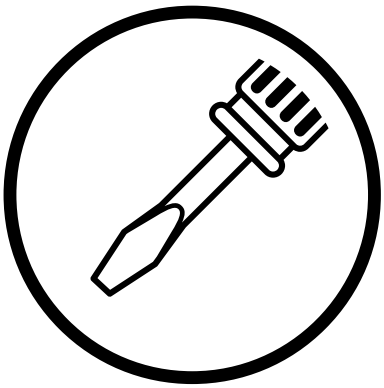
Control Block Diagram



V ..... Violet
O ..... Orange



brother



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