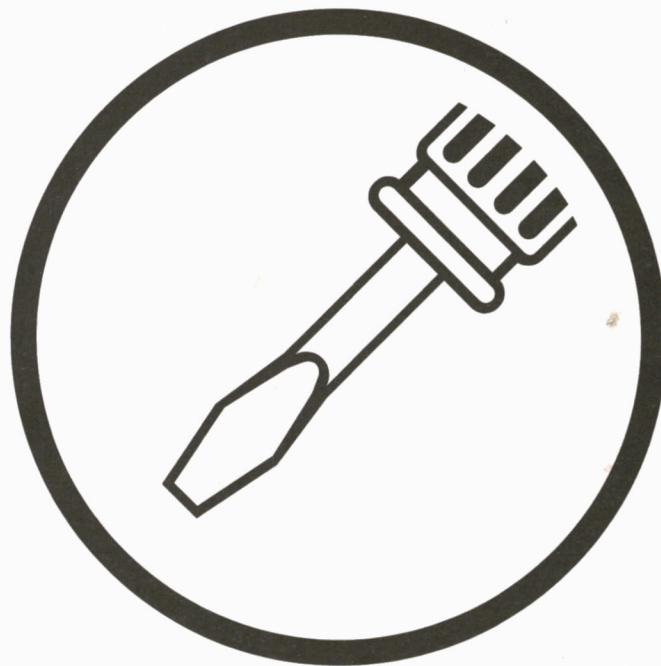


BAS-341A,342A

SERVICE MANUAL

Please read this manual before making any adjustments.

PROGRAMMABLE ELECTRONIC PATTERN SEWER WITH
CYLINDER BED



brother®

This service manual is for the BAS-341A and BAS-342A since they have the same mechanisms; the only difference is their sewing widths.

BAS-341A sewing area is 250 mm (W) × 150 mm (L).

BAS-342A sewing area is 300 mm (W) × 200 mm (L).

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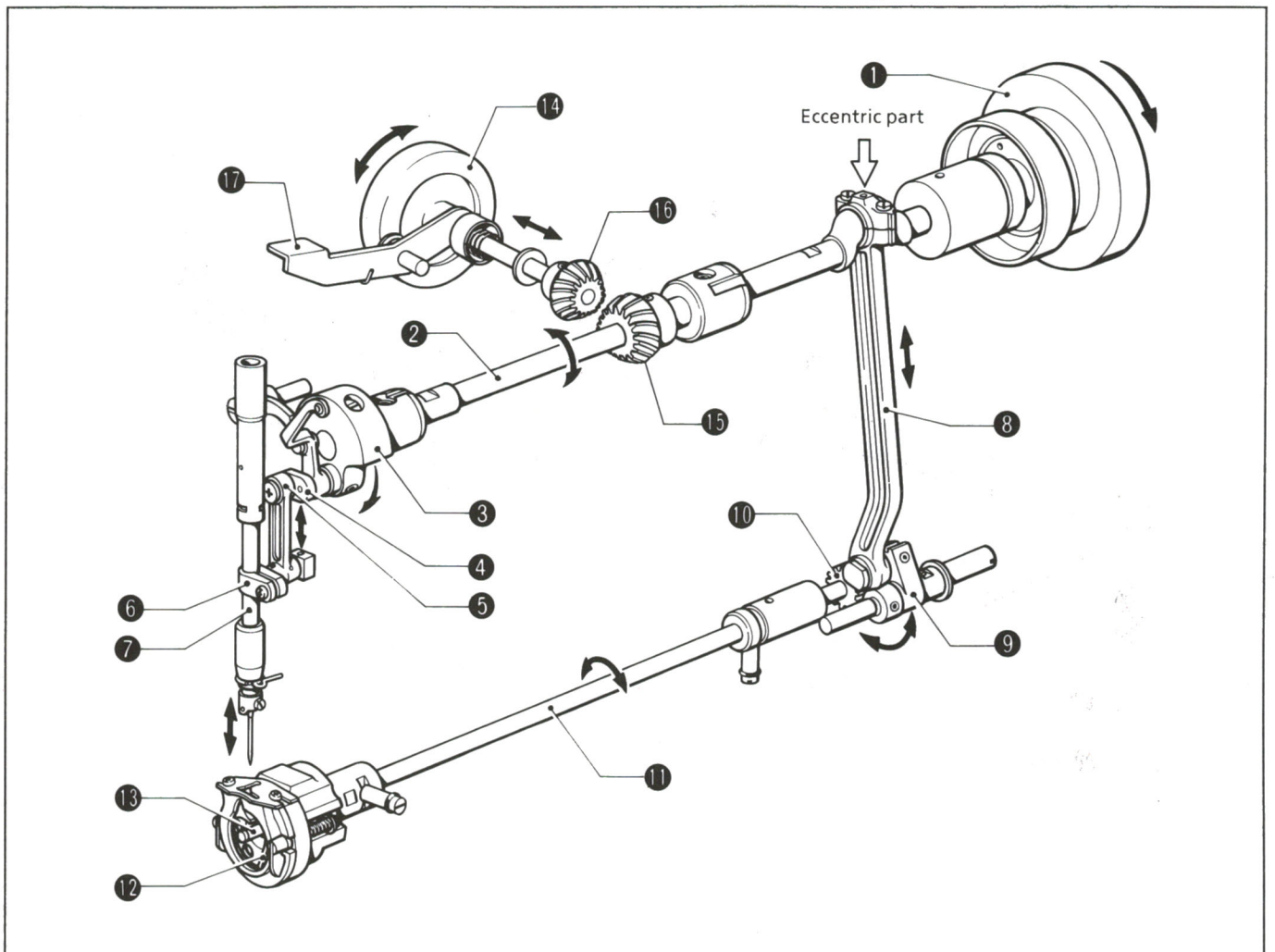
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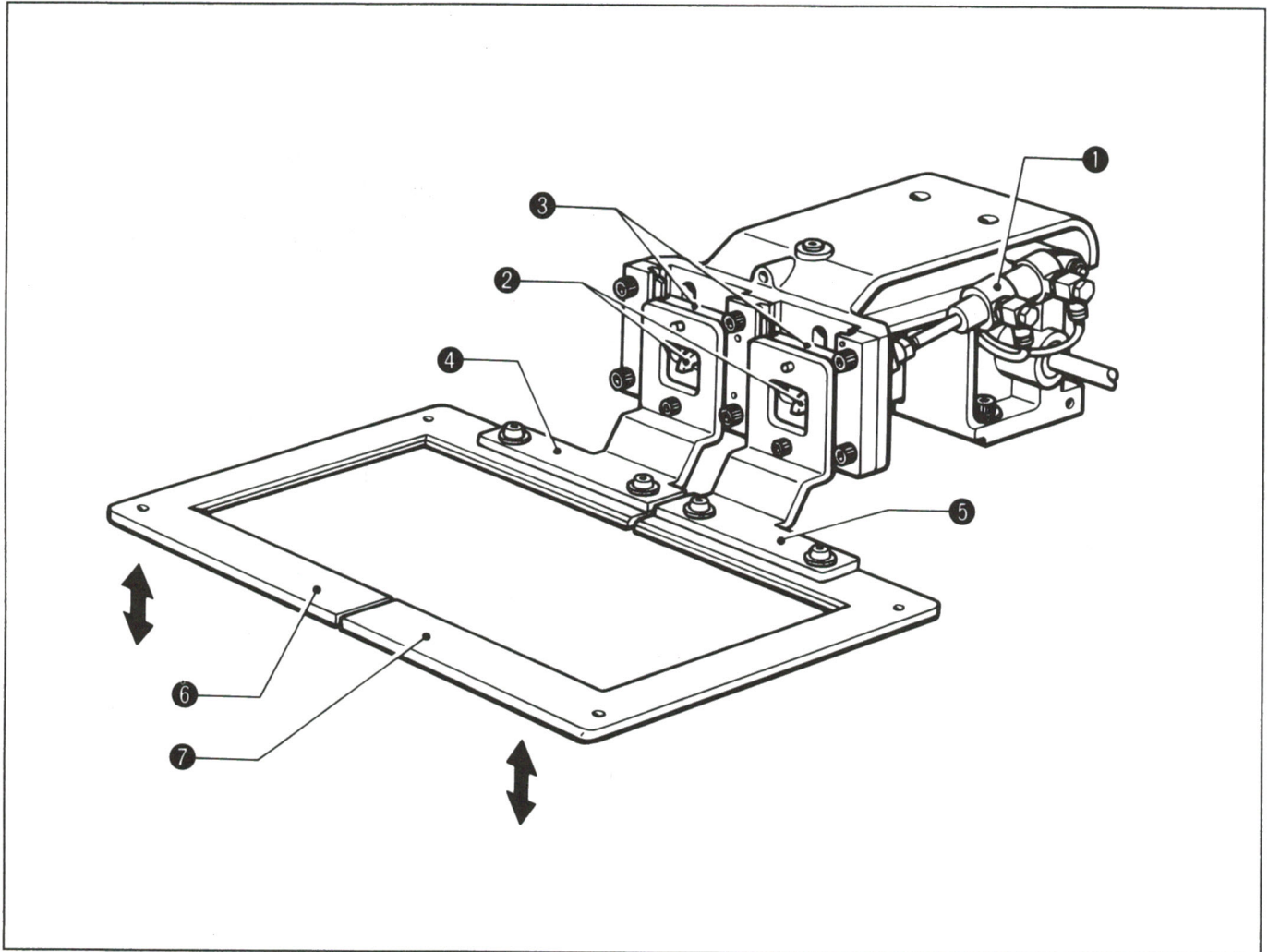
MECHANICAL DESCRIPTIONS

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



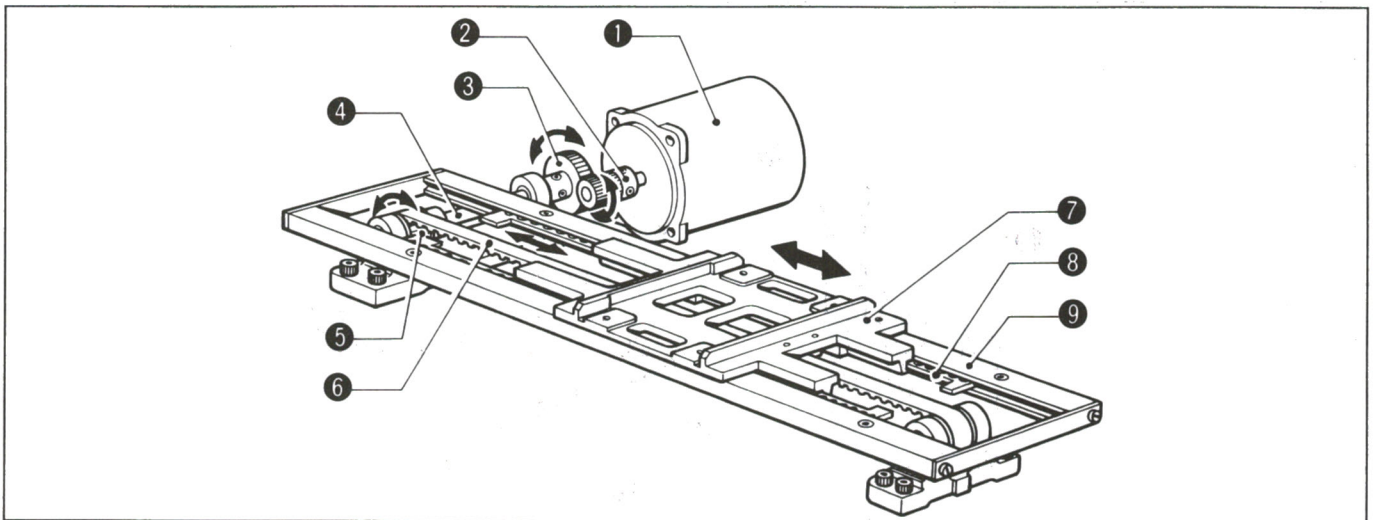
- 1) When the machine pulley ① rotates in the direction of the arrow, the motion is transmitted to the thread take-up crank ③ through the upper shaft ②.
- 2) The motion is then transmitted to the thread take-up lever ⑤ through the needle bar crank ④ attached to the thread take-up crank ③.
The needle bar ⑦ connected with the needle bar crank ⑥ makes vertical movement.
- 3) When the machine pulley ① rotates in the direction of the arrow, the motion is transmitted via the eccentric part of the upper shaft ②. Then, the crank rod ③ makes vertical movement.
- 4) The rock gear ⑨ attached to the crank rod ③ oscillates.
- 5) The oscillation of the gear ⑨ is transmitted to the lower shaft ⑪ through the lower shaft gear ⑩. Then the driver ⑫ and inner rotary hook (LB) ⑬ of the rotary hook mechanism also oscillate.
- 6) When the pulley ⑭ is pressed, the upper shaft bevel gear ⑮ fixed to the upper shaft ② engages with the vertical bevel gear U ⑯ and the stopper ⑰ functions to keep the engagement.
- 7) When the pulley ⑭ is turned in the direction of the arrow, the motion is transmitted to the upper shaft ②. The motion is then transmitted to the thread take-up lever ⑤ through the needle bar crank ④ attached to the thread take-up crank ③.
The needle bar ⑦ connected with the needle bar crank ⑥ makes vertical movement.

2 Work clamp lifter mechanism



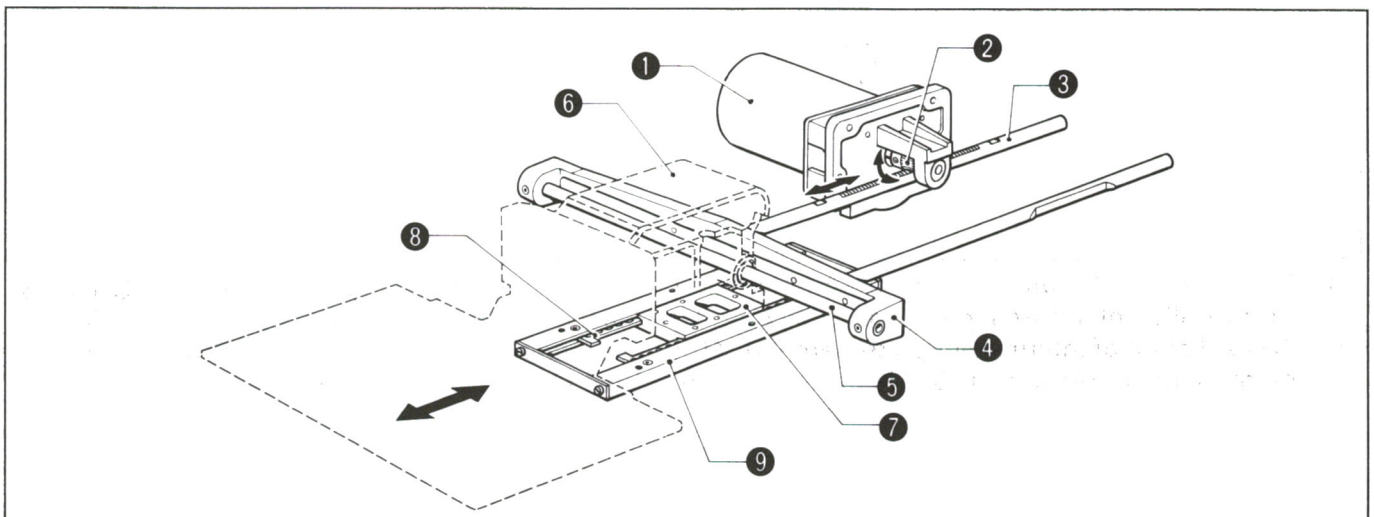
- 1) When the presser signal is on, the air cylinder operates.
- 2) The vertical movement is first transmitted from work clamp lifter lever U ② attached to the air cylinder ① to the presser feet SEL ④ and SER ⑤ attached to the presser foot ③, then to presser foot (L) ⑥ and presser foot (R) ⑦.

3 Feed mechanism (X axis)



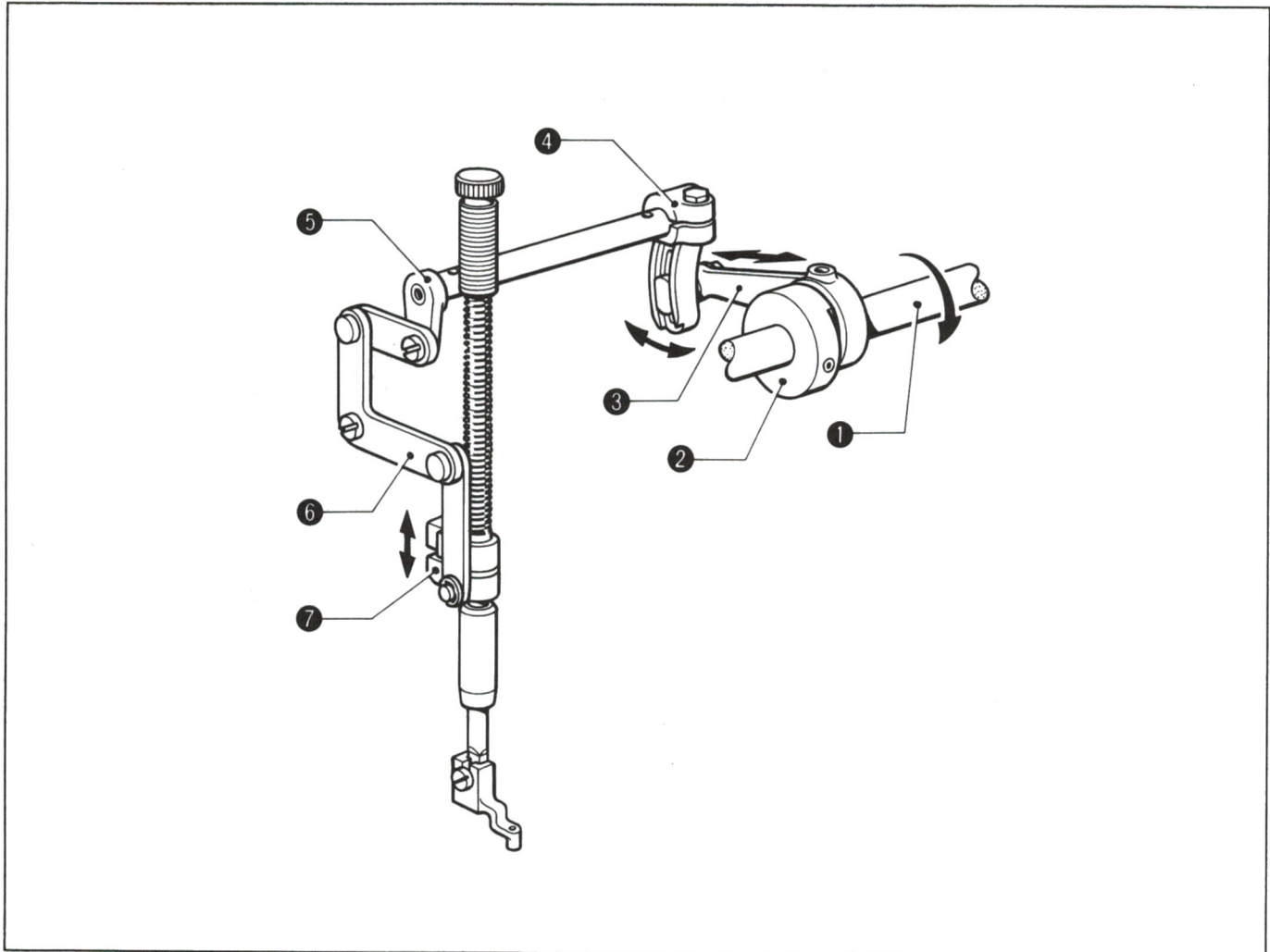
- 1) The oscillation of the actuating gear ② attached to pulse motor X ① is transmitted to the idle gear ③.
- 2) The oscillation of the idle gear ③ is transmitted to timing pulley A ⑤ attached to X-pulley shaft (L) ④ and the to the X-timing belt ⑥.
- 3) The X-feed bracket ⑦ fixed on the X timing belt ⑥ moves right and left (in the X direction) through the X-retainer ⑧ and X-feed guide (F) ⑨.

Feed mechanism (Y axis)



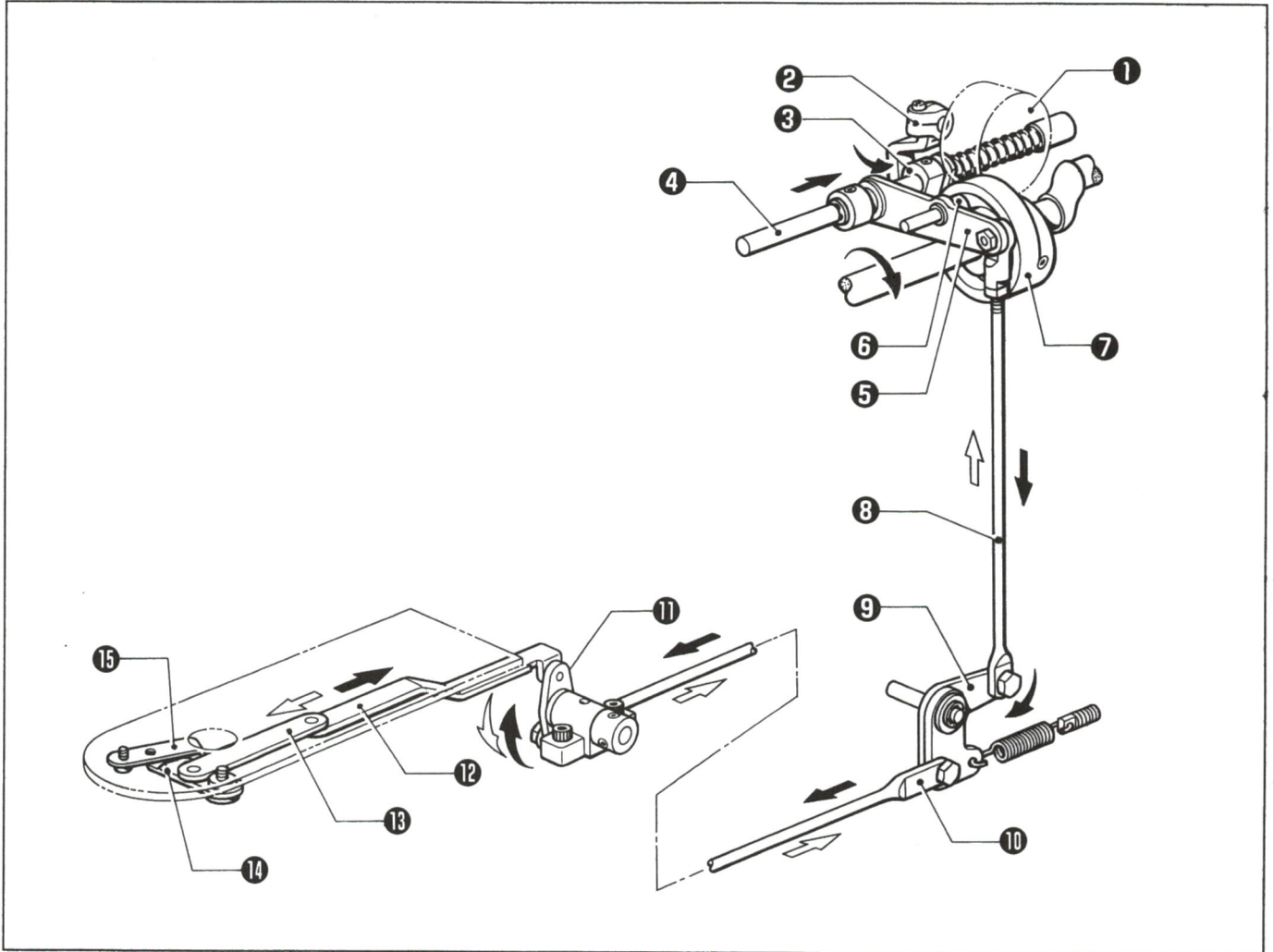
- 1) The oscillation of the actuating gear ② attached on pulse motor Y ① is transmitted to the Y-driving shaft ③.
- 2) The presser arm assembly ⑥ moves via the X-feed shaft support ④ and the X-feed shaft ⑤ which are attached to the Y-driving shaft ③. The presser arm assembly ⑥ is also attached to the Y-feed bracket ⑦.
- 3) The Y-feed bracket ⑦ oscillates in the Y direction (forward and backward) with the Y-retainer ⑧ and the Y-feed guide ⑨.

4 Intermittent presser mechanism



- 1) The upper shaft ① rotates. Then, the intermittent presser cam ② attached to the upper shaft ① moves eccentrically. Intermittent presser arm (R) ④ oscillates via the intermittent presser connecting rod ③.
- 2) The oscillation of intermittent presser arm (R) ④ is transmitted to the intermittent link assembly ⑤ via intermittent presser arm (F) ⑤. Then, the presser bar lifter ⑦ makes vertical movement.

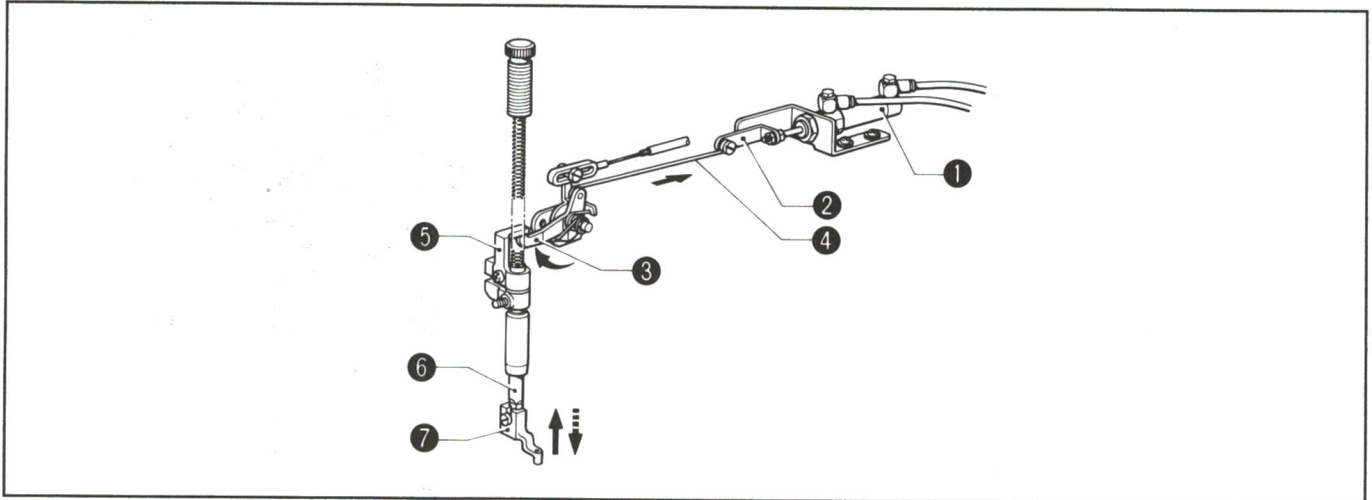
5 Thread trimmer mechanism



- 1) The thread trimming signal turns ON. The thread trimming solenoid ① operates the solenoid lever ②.
- 2) The driving lever collar ③ operates in the direction of the arrow via the solenoid lever ②. The motion is transmitted to the thread trimmer driving lever assembly ⑤ attached to the driving lever guide shaft ④.
- 3) The roller ⑥ attached to the thread trimmer driving lever ⑤ moves into the groove of the thread trimmer cam ⑦. Thread trimmer rod (S) ⑧ operates in the direction of the arrow.
- 4) Thread trimmer rod (L) ⑩ operates in the direction of the arrow via thread trimmer lever (D) ⑨. Thread trimmer connecting rod (L) ⑫ and the thread trimmer connecting rod ⑬ operate in the direction of the arrow via the connecting lever ⑪.
- 5) As thread trimmer connecting rod (L) ⑫ and the thread trimmer connecting rod ⑬ move in the direction of the arrow, the movable knife ⑭ and the fixed knife ⑮ operate to trim the thread.

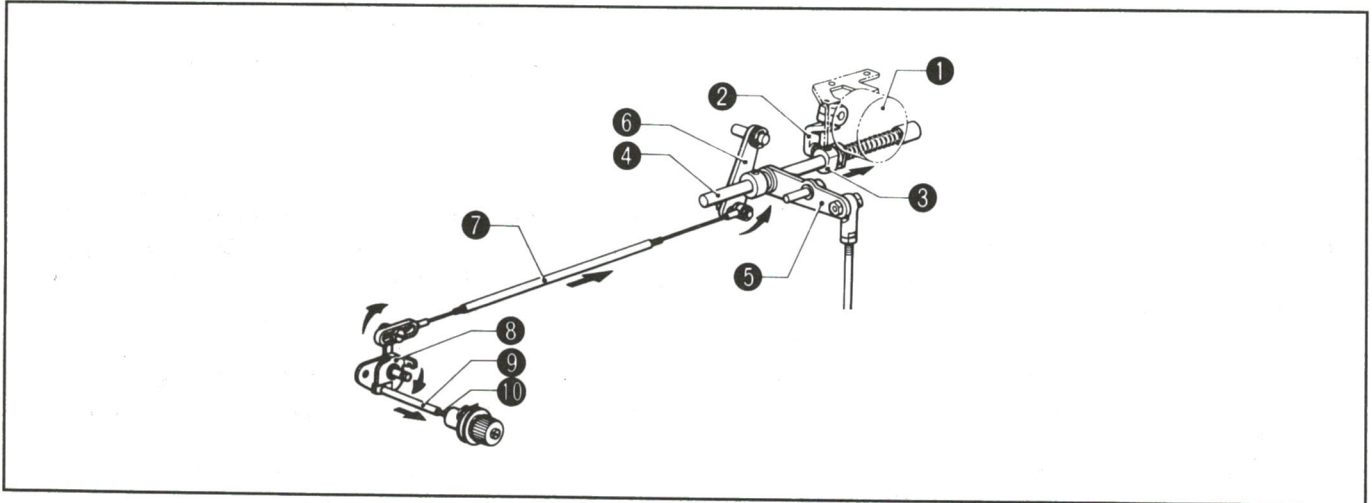
6 Tension release mechanism

<When the work clamp rises>



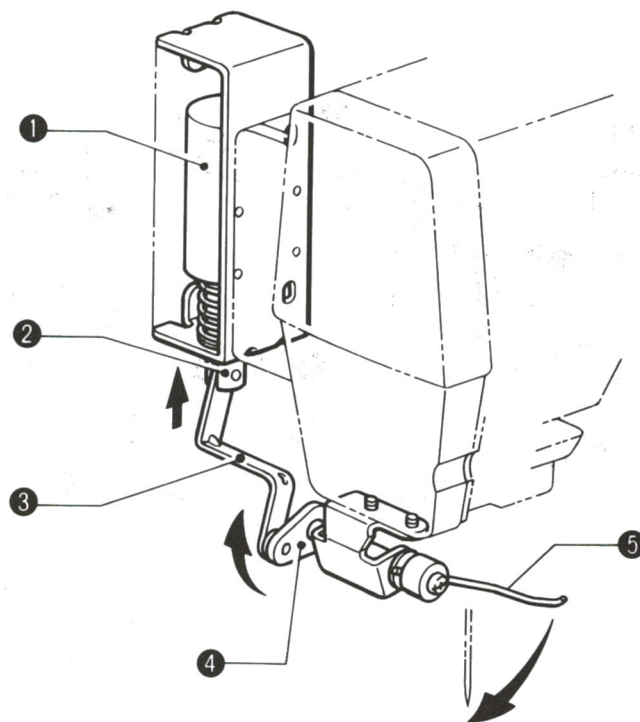
- 1) When the sewing machine is stopped, the air cylinder ① operates. Then, the presser and the work clamp rise simultaneously.
- 2) The air cylinder ① operates. Then, the work clamp lifter lever assembly ③ and the presser bar lifter rod ④ operate via the joint ②. The end of the work clamp lifter lever ③ pushes up the presser bar clamp ⑤. Then the presser bar ⑥ and the presser foot ⑦ make vertical movement.

<When the thread is trimmed>



- 1) The tension release signal turns ON. The thread trimming solenoid ① operates the solenoid lever ②.
- 2) The driving lever collar ③ operates in the direction of the arrow via the solenoid lever ② roller. The motion is transmitted to the thread trimmer driving lever ⑤ attached on the driving lever guide shaft ④.
- 3) The pin of the presser rod lever assembly ⑥ moves into the groove of the thread trimmer driving lever ⑤. Then the presser wire ⑦ and the tension release lever ⑧ operate in the direction of the arrow.
- 4) The side of the tension release lever ⑧ pushes the tension release shaft ⑨.
- 5) The end of the tension release shaft ⑨ pushes the tension release pin ⑩. Then, the tension disc is opened.

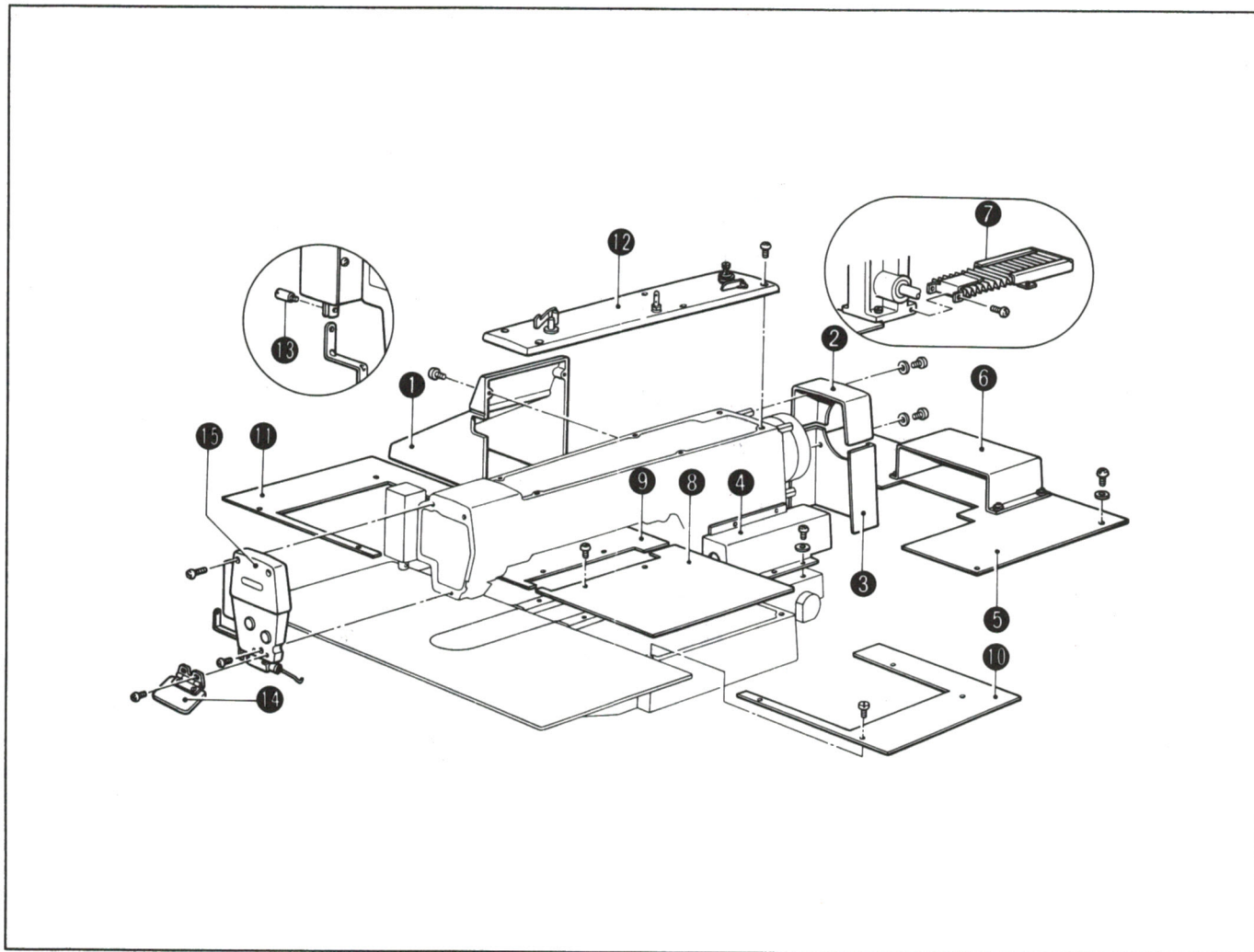
7 Thread wiper mechanism



- 1) After thread trimming, the thread wiper signal turns ON, then the thread wiper solenoid ① operates.
- 2) The plunger ② operates in the direction of the arrow. Then the thread wiper crank assembly ④ attached on the thread wiper connecting rod ③ operates in the direction of the arrow.
- 3) The wiper ⑤ attached on the thread wiper crank assembly ④ operates.

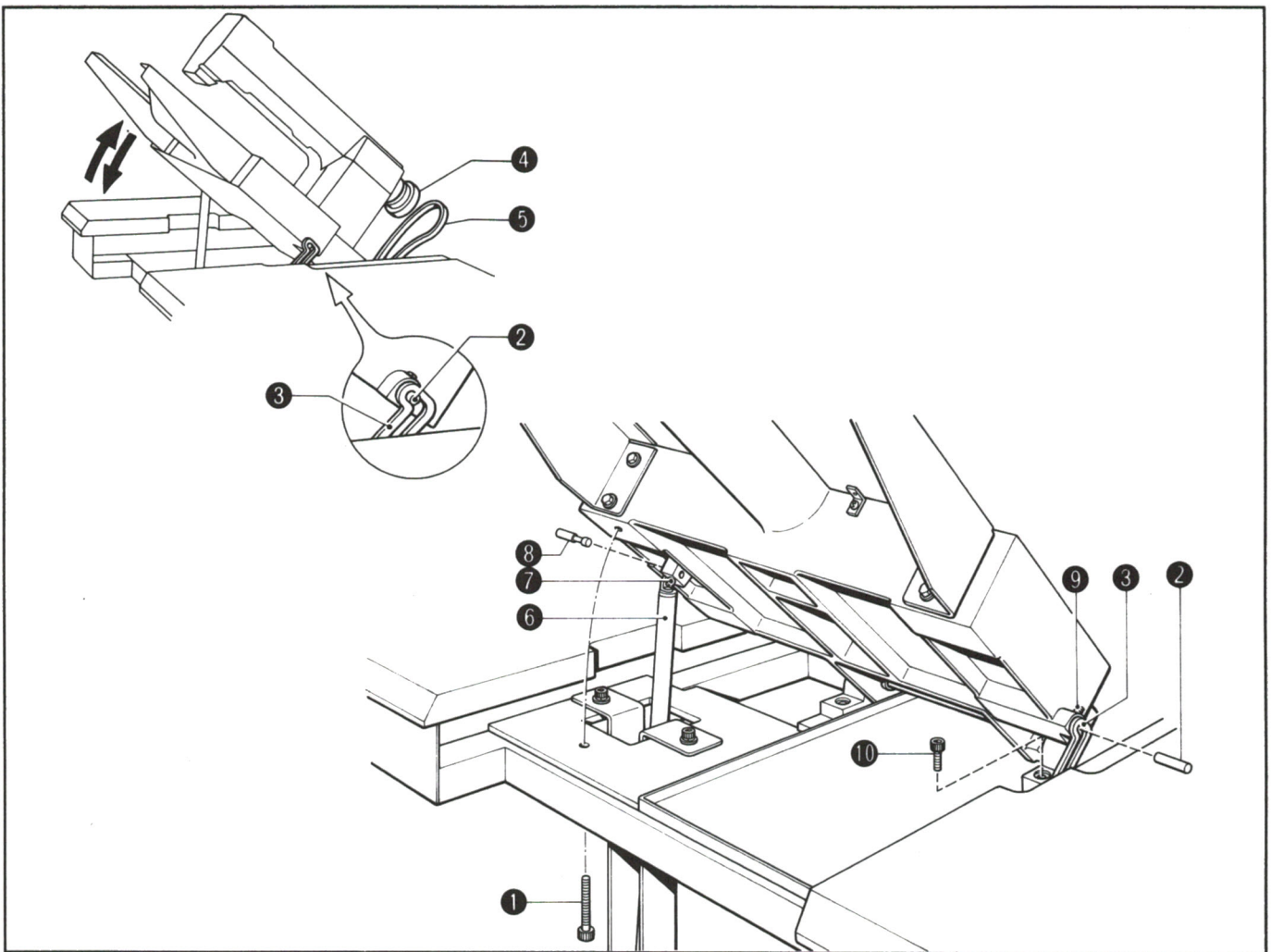
DISASSEMBLY

1 Machine covers



- 1) Remove the screws. Then remove the side cover ①, belt covers (U) ② and (D) ③, and the Y-feed guide shaft cover ④.
- 2) Remove the screw and the table rear cover ⑤ with guide shaft cover (R) ⑥.
- 3) Remove the screw and the bellow assembly ⑦.
- 4) Remove the screw and X-feed bracket covers (R) ⑧ and (L) ⑨.
- 5) Remove the screw and XY-feed base covers (R) ⑩ and (L) ⑪.
- 6) Remove the screw and the top cover ⑫.
- 7) Remove the plunger pin ⑬ of the thread wiper solenoid, the screw, the eye guard ⑭ and the face plate ⑮.

2 Machine head



1) Remove the bolt ❶ for fixing the machine head.

NOTE: The bolt for fixing the machine head is used only when shipping. Normally keep it in another place after removing it.

2) Tilt the machine. Be sure to lock the head support shaft ❷ in the head support lever ❸.

3) Remove the belt ❺ from the pulley ❹.

4) Loosen the set screw ❷ of the GS spring ❻ and remove GS spring shaft (U) ❸.

5) Loosen the set screw ❸ and remove the head support shaft ❷ from the head support lever ❸. Use caution!

6) Return the machine to its original position. Lower gently.

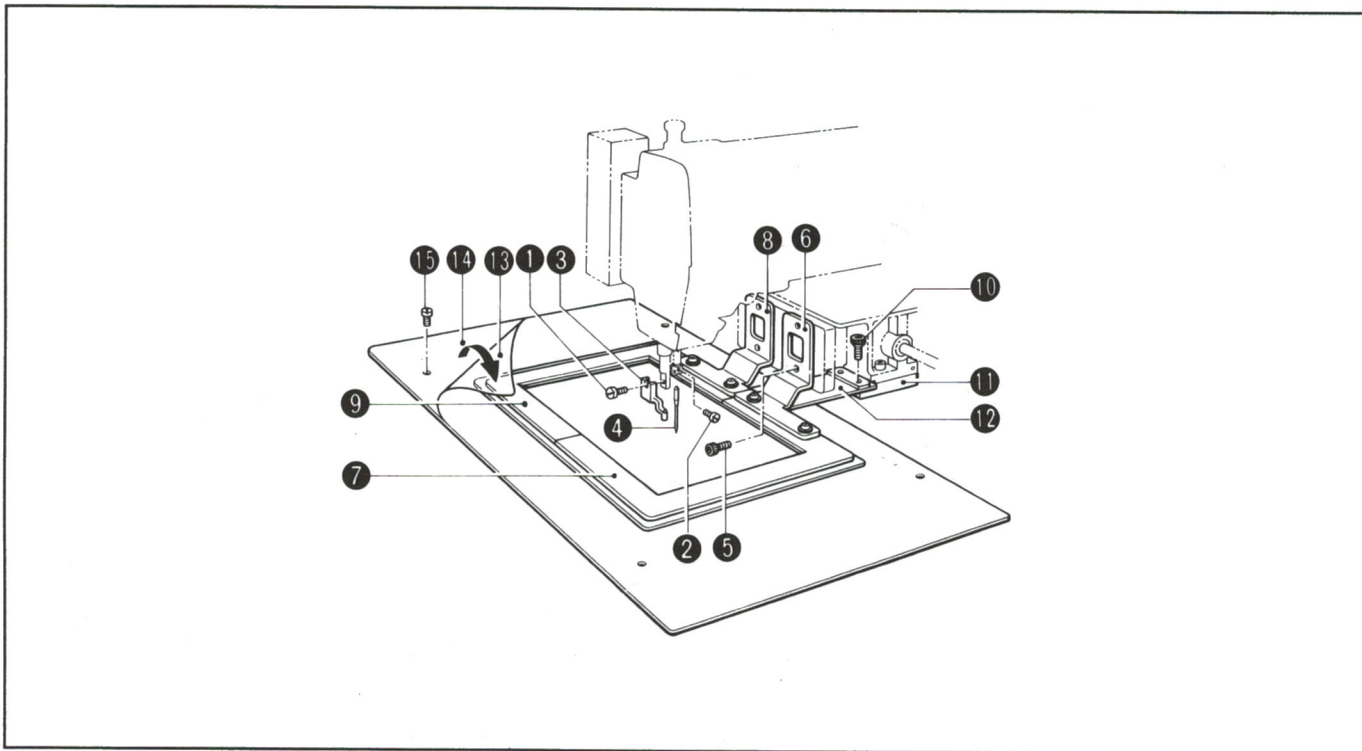
7) Remove the four bolts ❿ of the head hinge.

8) Remove the cords.

9) Shift the machine head from the power table to the working table.

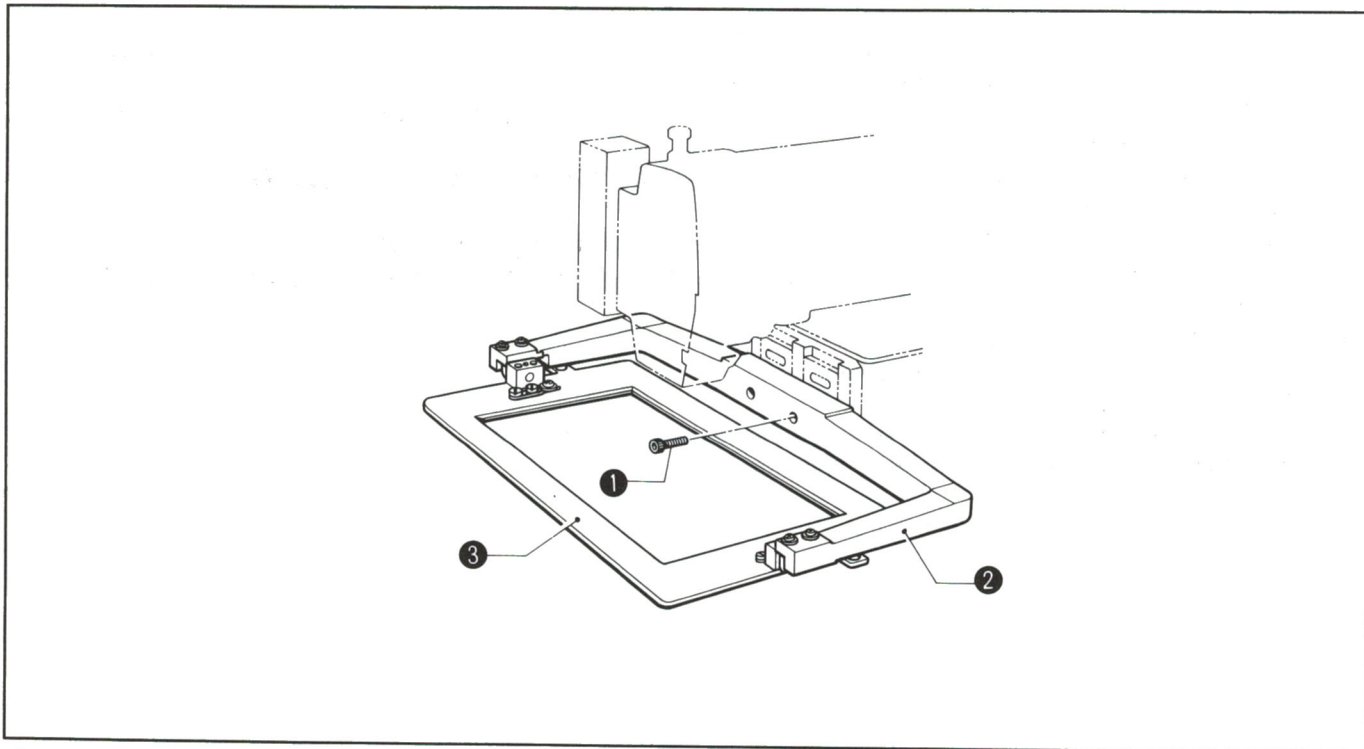
NOTE: The machine head weighs 70 kg to 80 kg.

3 Presser mechanism



[For air separation presser]

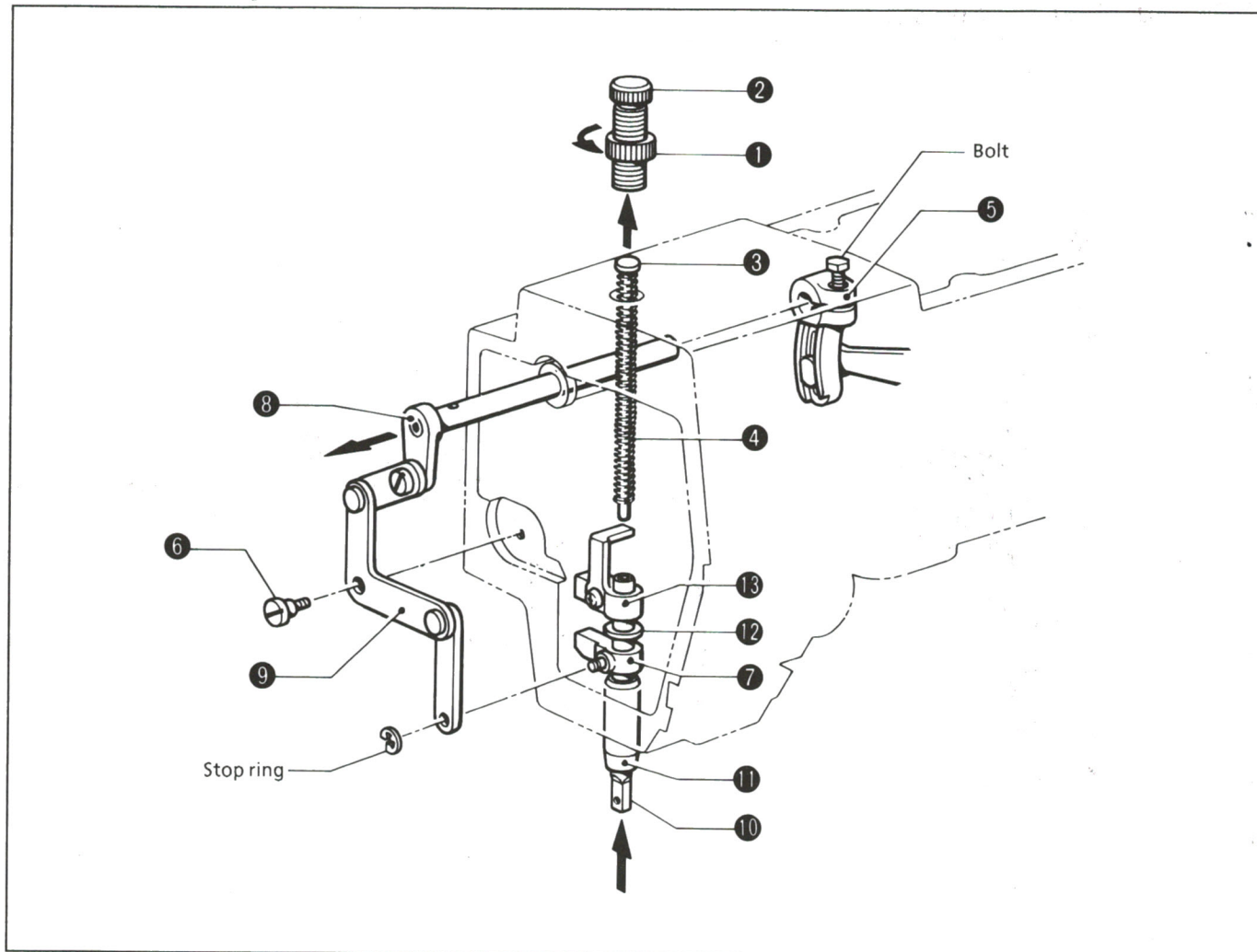
- 1) Remove the screws ① and ②, the presser foot ③ and the needle ④.
- 2) Remove the bolt ⑤, work clamp (SER) ⑥, presser plate (L) ⑦, work clamp (SEL) ⑧ and presser plate (R) ⑨.
- 3) Remove the screw ⑩, and the feed plate ⑫ from the Y-feed bracket ⑪.
- 4) Take the auxiliary plate sheet ⑬ off from the needle sub plate ⑭.
- 5) Remove the screw ⑮ and the needle sub plate ⑭.



[For air presser]

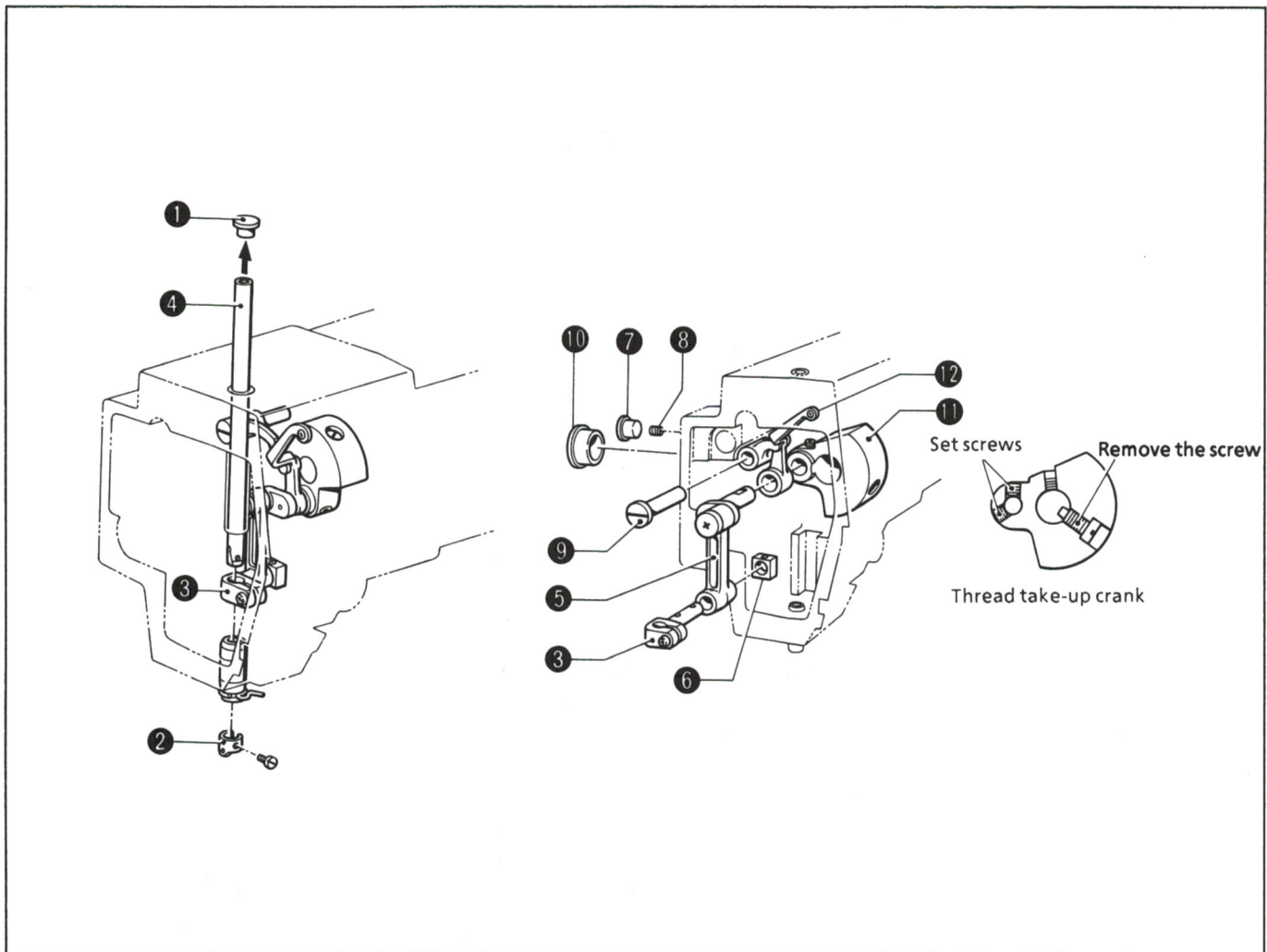
- 1) Remove the bolt ①, the work clamp (UNL) assembly ②, the presser plate (UNL) assembly ③.
- 2) Repeat steps 3 to 5 in the [For air separation presser] mentioned above.

4 Work clamp lifter mechanism



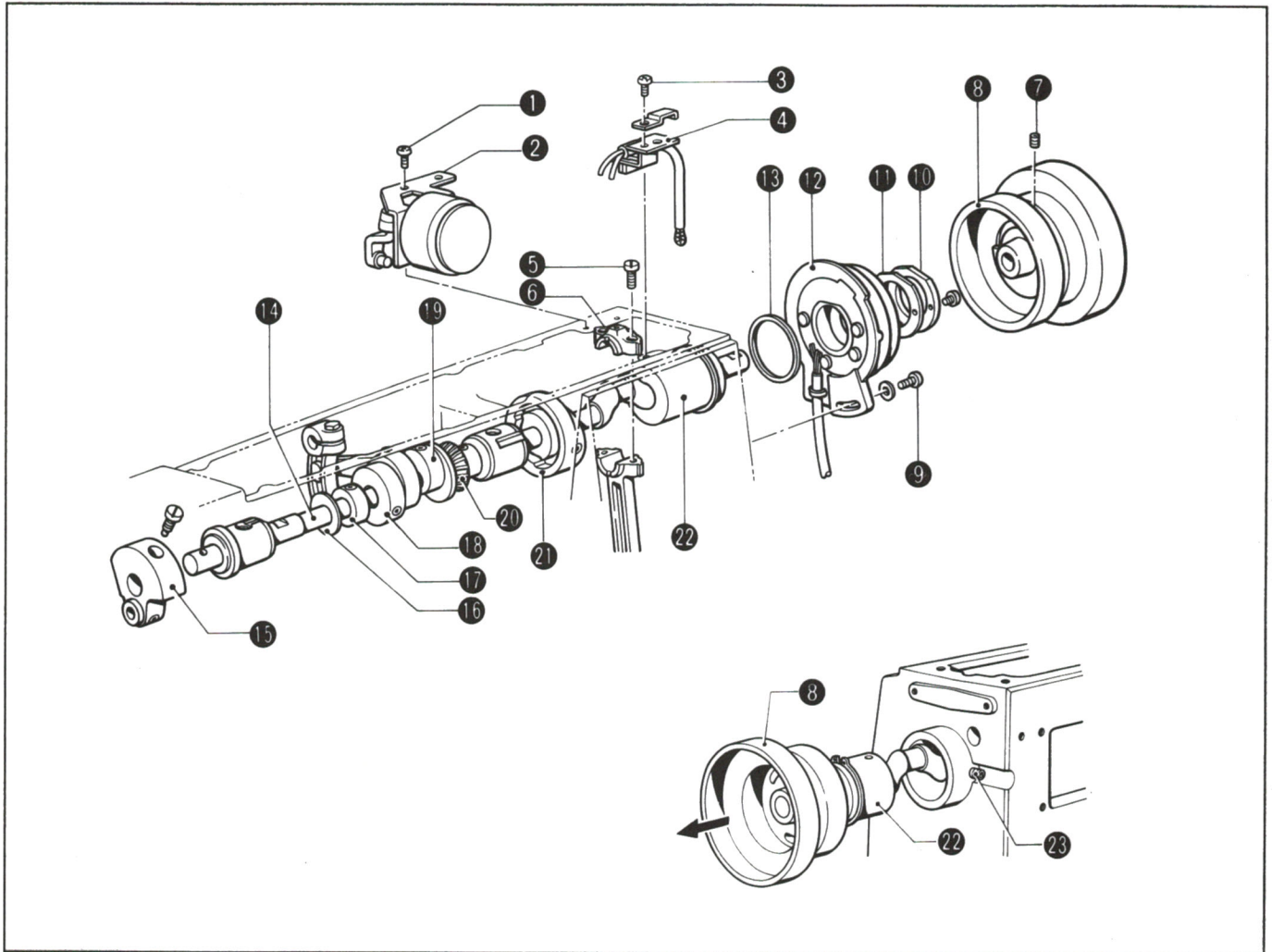
- 1) Loosen the nut ① and remove the adjust screw ②, the spring guide ③ and the spring ④ from the machine top.
- 2) Loosen the bolt of intermittent presser arm (R) ⑤ from the machine top and remove the stud screw ⑥ attached to the arm and the stop ring of the presser bar lifter ⑦ from the face plate side. Remove intermittent presser arm (F) ⑧ and the intermittent link assembly ⑨.
- 3) Push the presser bar ⑩ up from the portion of the body with needle mechanism, then remove it from the presser bar bush ⑪.
(The presser bar lifter ⑦, the cushion ⑫ and the presser bar clamp ⑬ will come off as a unit.)

5 Needle bar mechanism



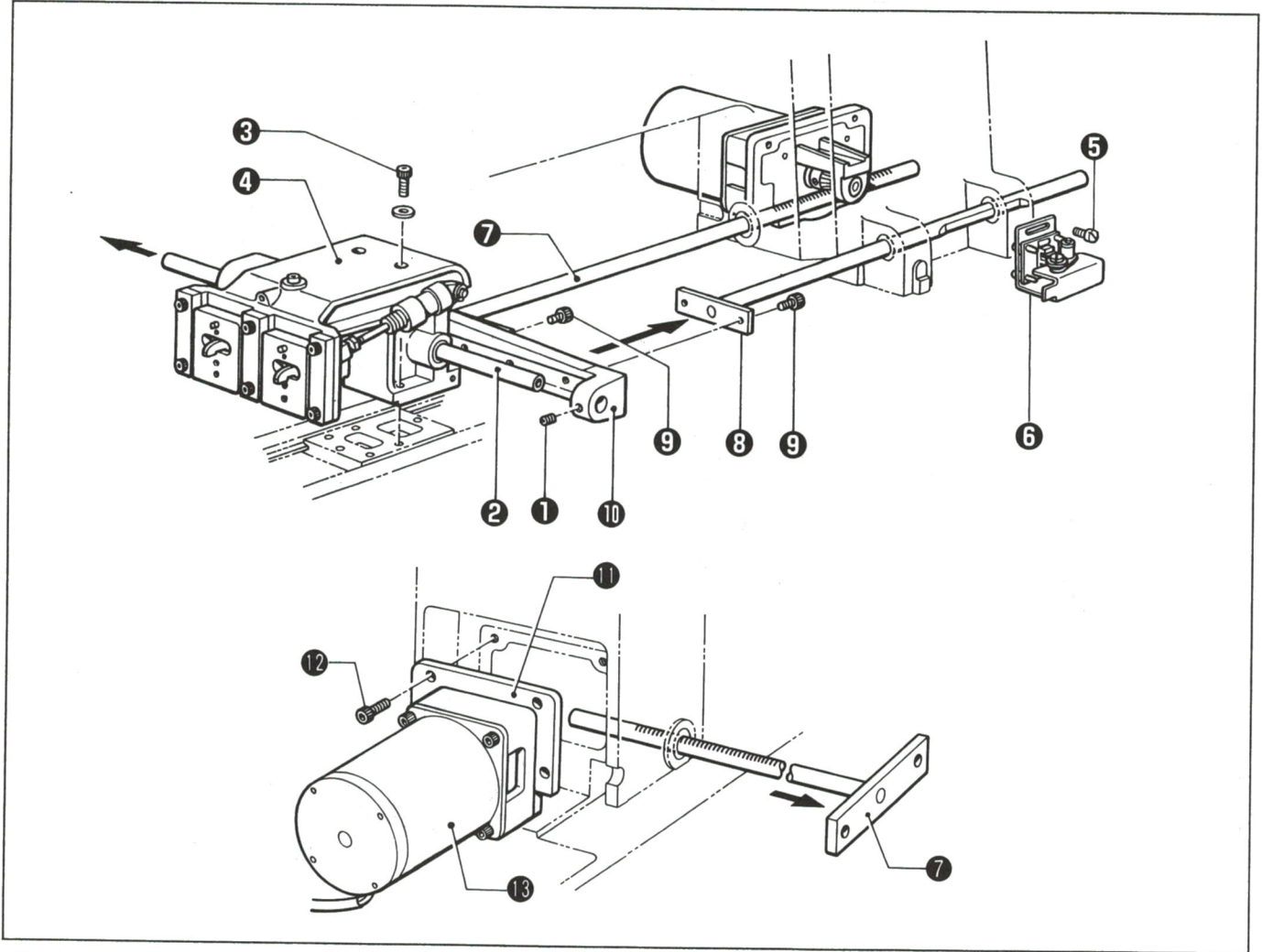
- 1) Remove the oil cap ① and needle bar thread guide (A) ②.
- 2) Loosen the screw of the needle bar clamp ③ and remove the needle bar ④ from the machine top.
- 3) Remove the needle bar clamp ③ from the thread take-up lever ⑤.
(At this time, the slide block ⑥ will come off.)
- 4) Remove the oil cap ⑦ and loosen the set screw ⑧. Then, remove the thread take-up support stud ⑨.
- 5) Remove the oil cap ⑩. Loosen the screw and set screw of the thread take-up crank ⑪ and remove the thread take-up lever ⑫.
(The thread take-up assembly will come off.)

6 Upper shaft mechanism



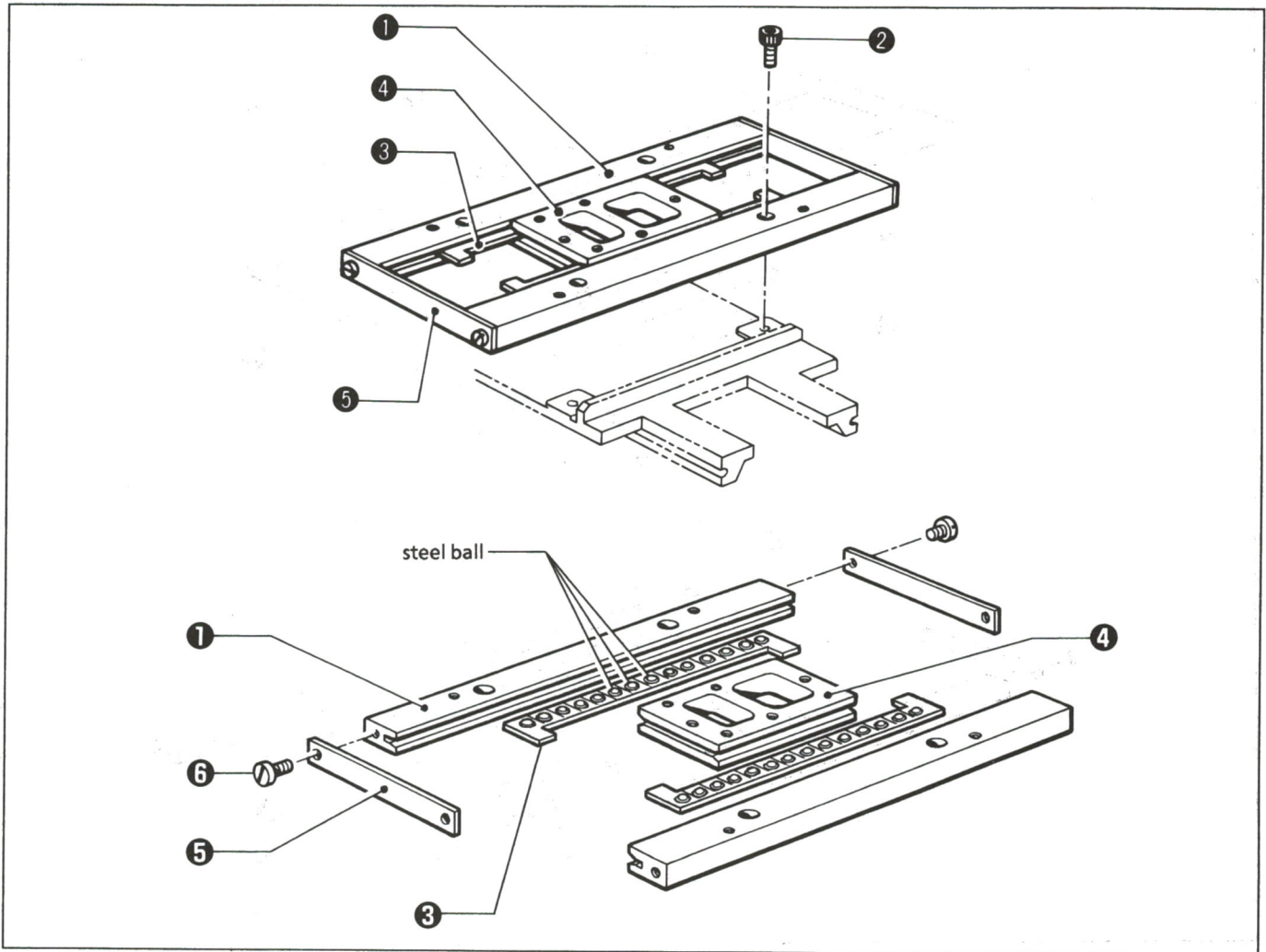
- 1) Remove the screw ① and the thread trimming solenoid ②.
- 2) Remove the screw ③ and the wick support ④.
- 3) Remove the screw ⑤ and the upper part of the crank rod assembly ⑥.
- 4) Loosen the set screw ⑦ and remove the pulley ③.
- 5) Remove the screw ⑨, the synchronizer support ⑩, the synchronizer support packing ⑪, the synchronizer ⑫ and the synchronizer packing ⑬.
- 6) Attach the pulley ③ to the upper shaft ⑭.
- 7) Loosen each screw or set screw of the thread take-up crank ⑮, the connecting rod partition plate ⑯, the set collar ⑰, the intermittent presser cam ⑱, the bobbin winder pulley ⑲, the upper shaft bevel gear ⑳ and the thread trimmer cam ㉑.
- 8) Loosen the set screw ㉓ of upper shaft bush (R) ㉒ and remove the upper shaft ⑭ with the pulley ③.
(The thread take-up crank ⑮, the connecting rod partition plate ⑯, the set collar ⑰, the intermittent presser cam ⑱, the bobbin winder pulley ⑲, the upper shaft bevel gear ⑳, the thread trimmer cam ㉑ and upper shaft bush (R) ㉒ will come off from the upper shaft respectively.)

7 Longitudinal feed mechanism (Y axis) (1)



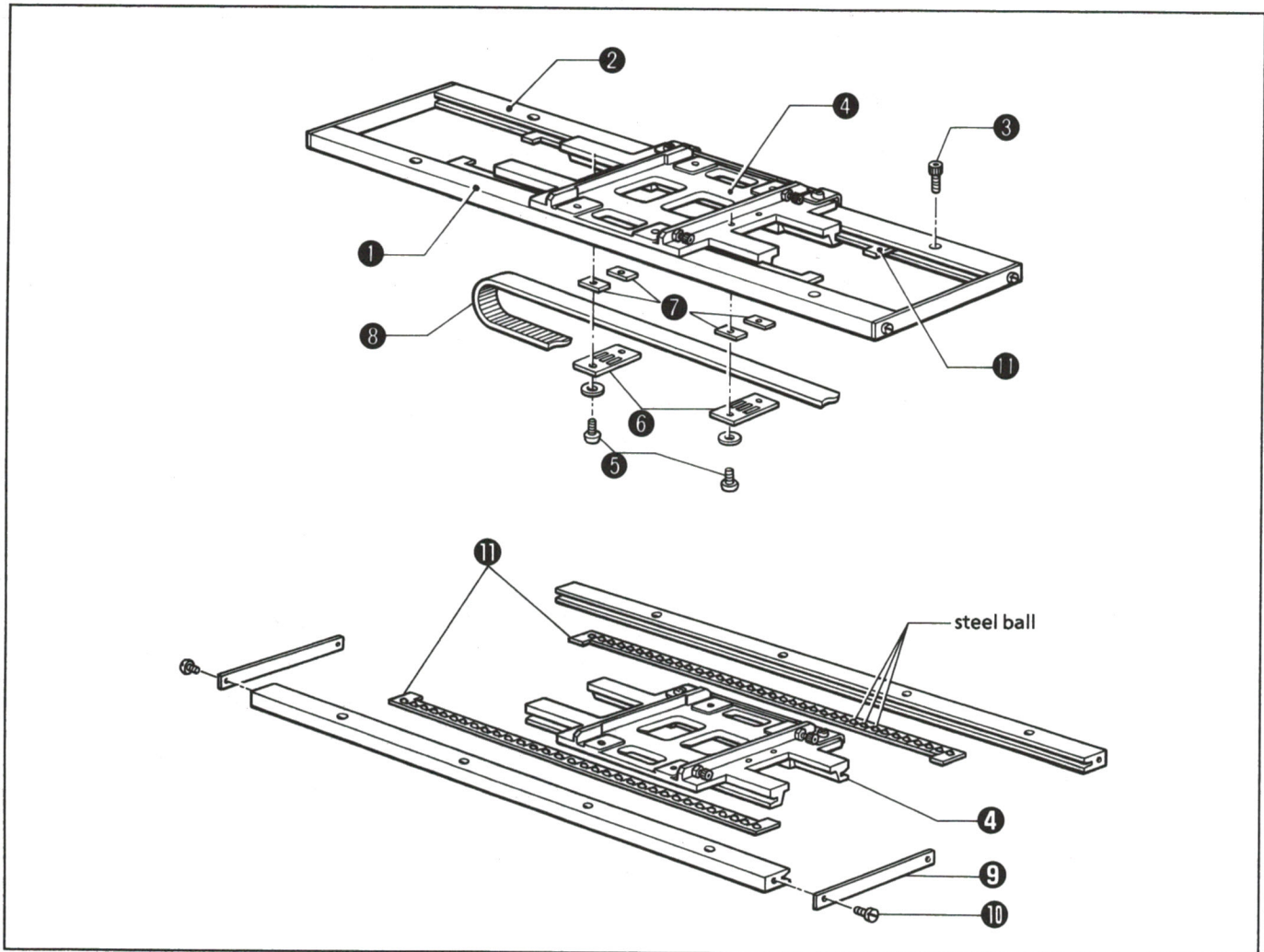
- 1) Loosen the set screw ① and remove the X-feed shaft ②.
- 2) Remove the bolt ③ and the presser arm assembly ④.
- 3) Remove the screw ⑤ and the Y-axis home position base ⑥.
- 4) Loosen the bolts ⑧ of the Y-driving shaft ⑦ and Y-driving guide shaft ③ respectively. Remove the Y-driving guide shaft ③ from the X-feed shaft support ⑩.
- 5) Remove the bolt ⑫, the Y-driving P motor bracket ⑪ with the pulse motor (Y) assembly ⑬, and the Y-driving shaft ⑦.

7 Longitudinal feed mechanism (Y axis) (2)



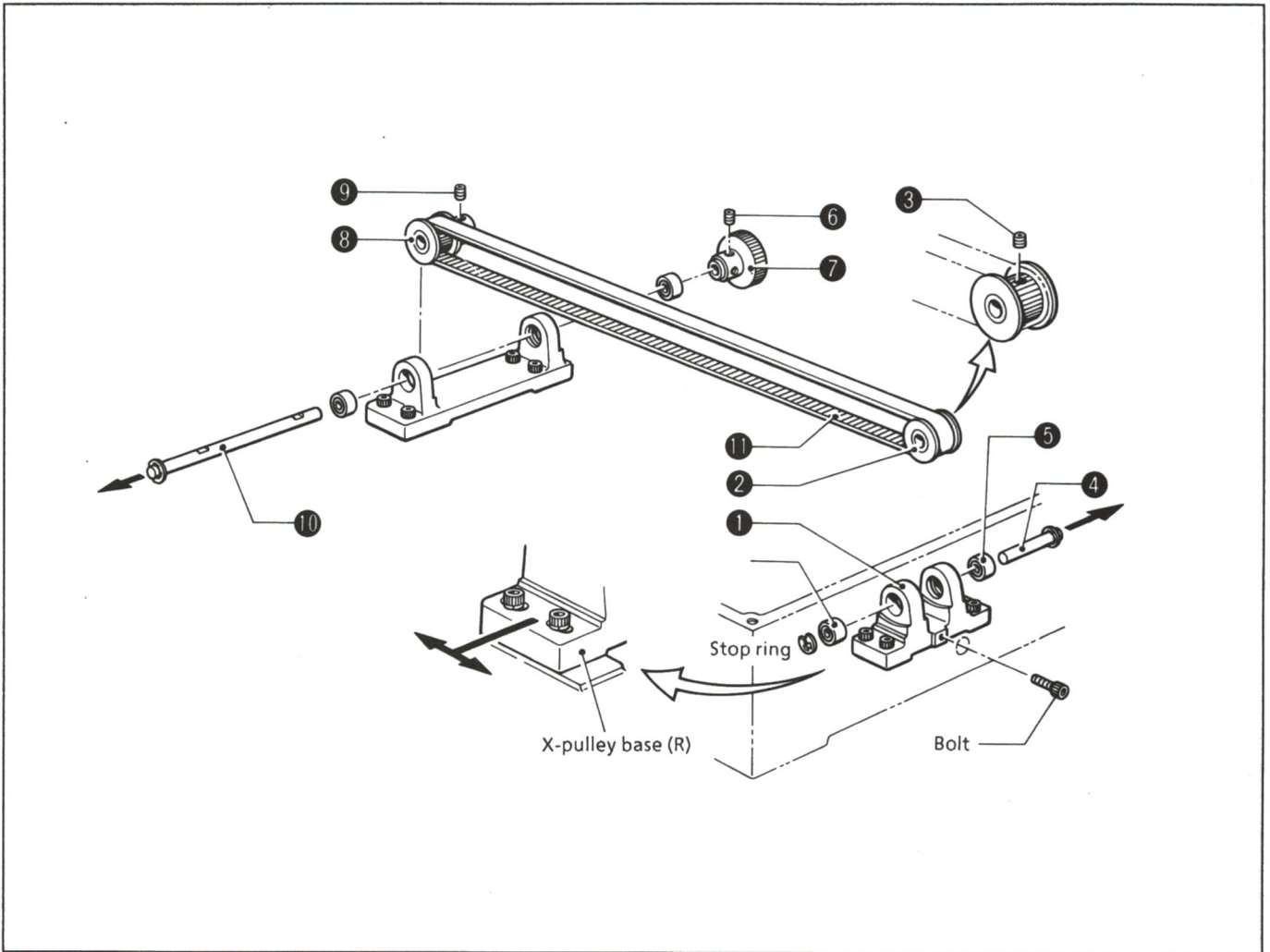
- 1) Remove the bolt ② of the Y-feed guide ①. Remove the Y-retainer ③ and the Y-feed bracket ④ as a unit.
- 2) Remove the screws ⑥ of the Y-stopper ⑤, then the Y-feed guide ①, Y-retainer ③, Y-feed bracket ④.

8 Traverse feed mechanism (X axis) (1)



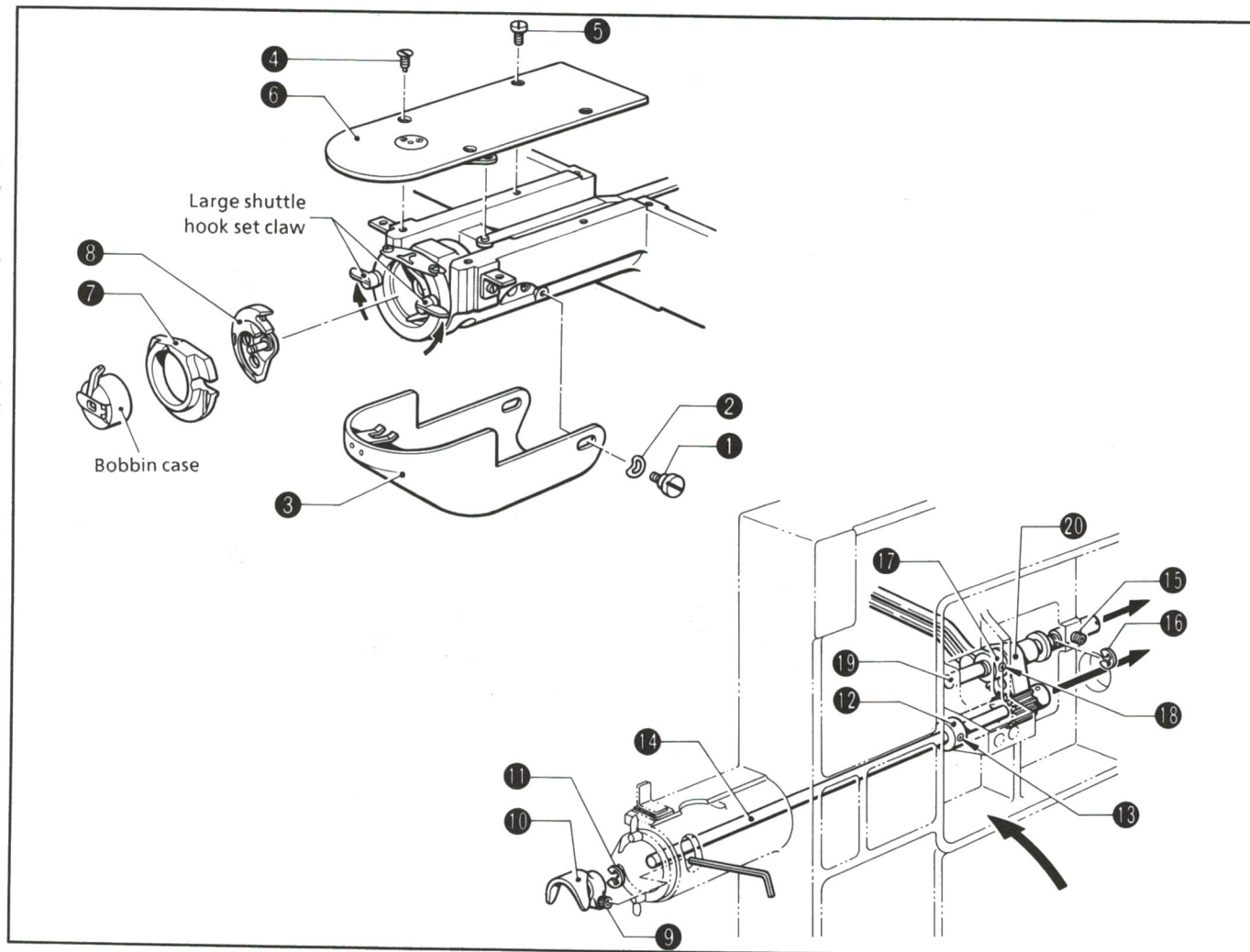
- 1) Remove the bolts ③ of X-feed guides (F) ① and (R) ②.
- 2) Remove the screw ⑤ of the X-feed bracket ④, the belt holder ⑥ and the timing belt spacer ⑦ from the X-timing belt ③. (The machine head should be standing.)
- 3) Remove the screws ⑩ of the X-stopper ⑨, then X-feed guides (F) ① and (R) ②, the X-retainer ⑪ and X-feed bracket ④.

8 Traverse feed mechanism (X axis) (2)



- 1) Remove the bolt. Loosen the bolts of X-pulley base (R) ❶ so that it moves right and left.
- 2) Loosen the set screw ❸ of timing pulley (B) ❷ and remove the stop ring. Remove X-pulley shaft (R) ❹ in the direction of the arrow. (Timing pulley (B) ❷, the two micro bearings ❺ will come off.)
- 3) Loosen the set screw ❹ and remove the idle gear ❽.
- 4) Loosen the set screw ❸ of timing pulley (A) ❸.
- 5) Remove X-pulley shaft (L) ❿ in the direction of the arrow, then X-timing belt ❶.

9 Lower shaft mechanism



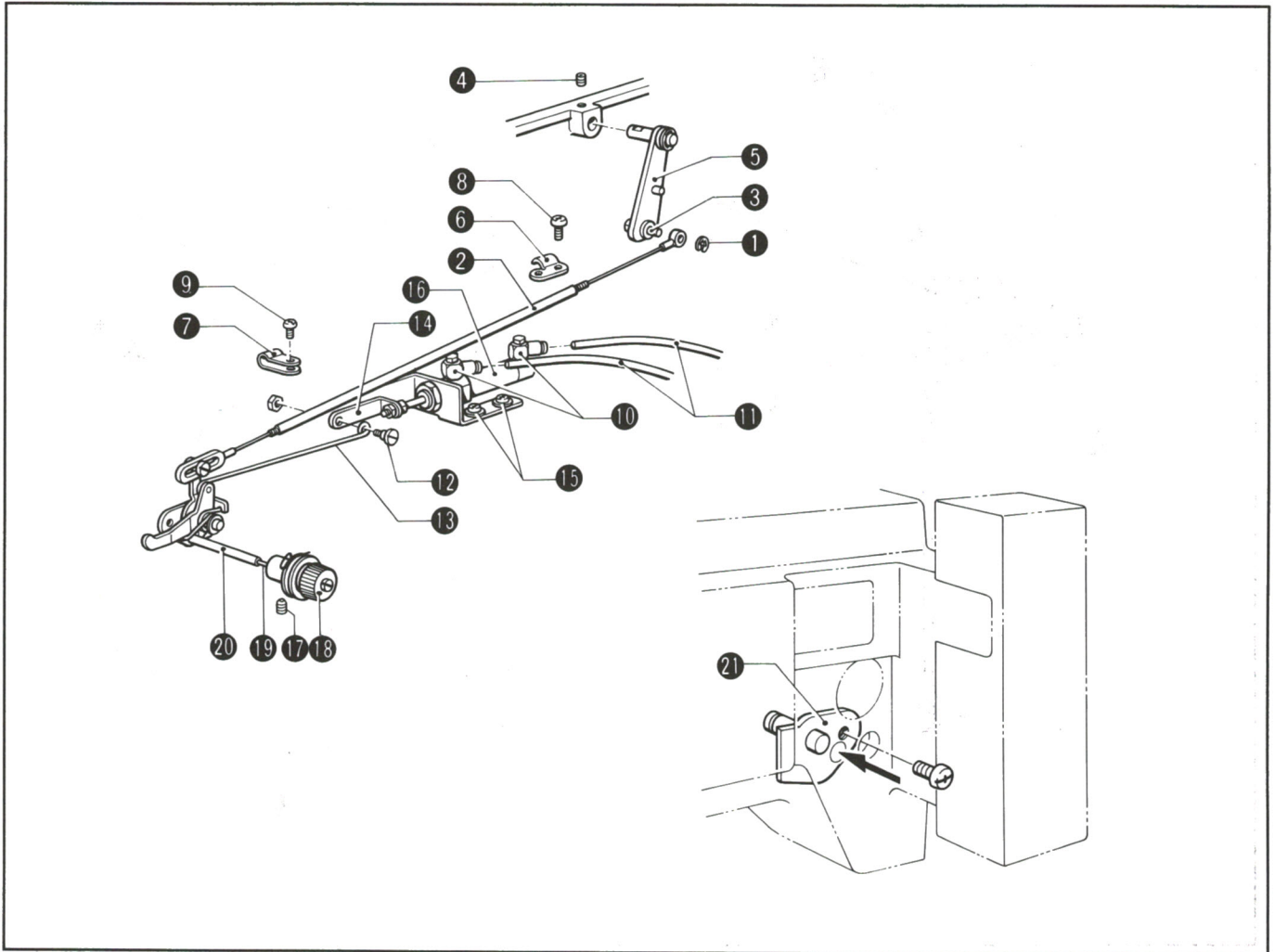
[Lower shaft]

- 1) Remove the stud screw ①, the spring washer ② and the large shuttle hook cover ③.
- 2) Remove the screws ④ and ⑤ and the needle plate ⑥.
- 3) Remove the bobbin case and lift the large shuttle hook set claw in the direction of the arrow. Then remove large shuttle hook ⑦ and inner rotary hook (LB) ⑧.
- 4) Tilt the machine in the direction of the arrow.
- 5) Loosen the bolt ⑨ and remove the driver ⑩ and the stop ring ⑪.
- 6) Loosen the set screw ⑬ of the set collar ⑫ and remove the lower shaft assembly ⑭ from the machine rear. (The set collar ⑫ will come off.)

[Rock gear shaft]

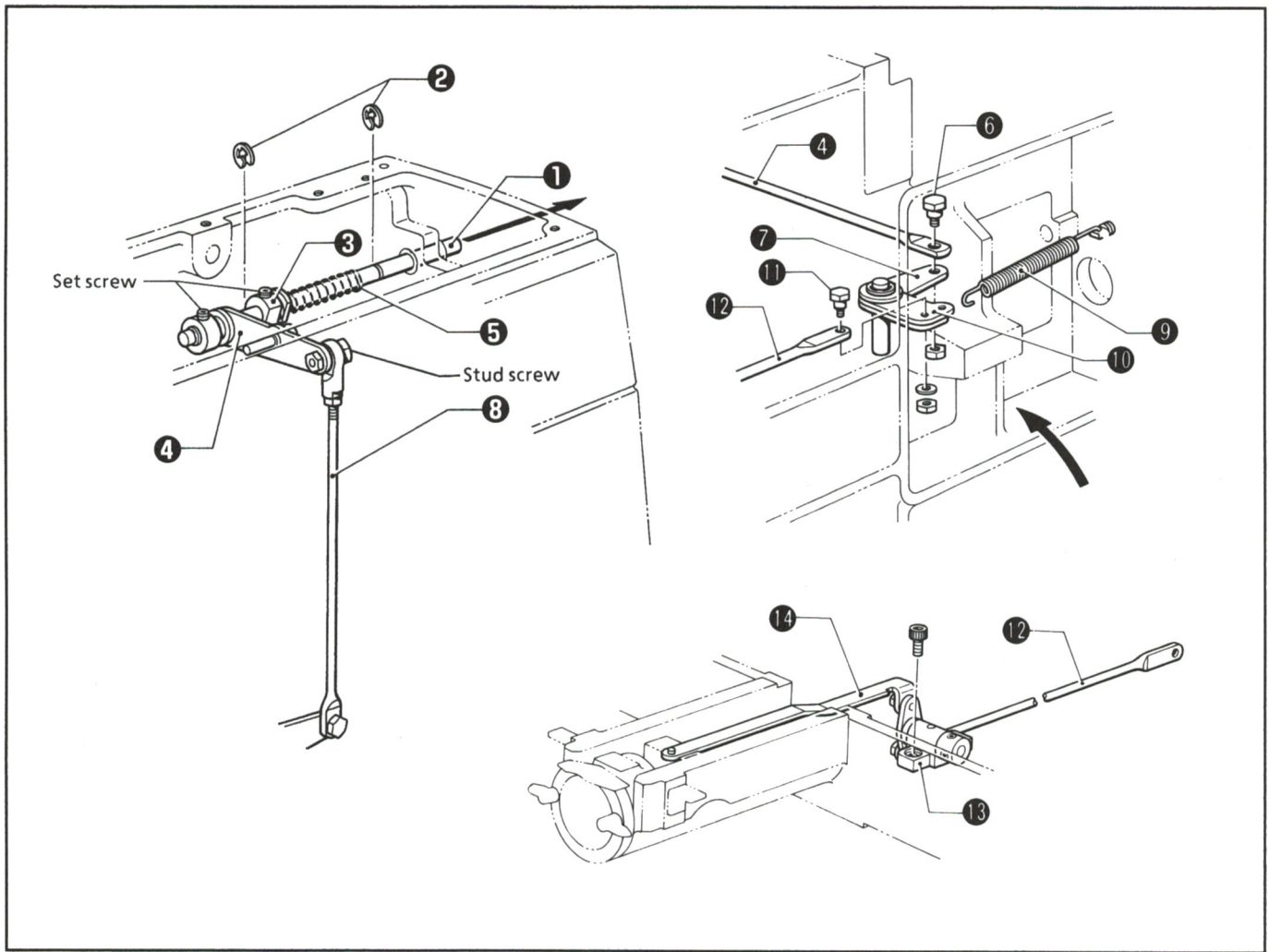
- 1) Loosen the set screw ⑮ and remove the stop ring ⑯.
- 2) Loosen the set screw ⑱ of the set collar ⑰ and remove the rock gear shaft ⑲ from the machine rear using a screwdriver. (The set collar ⑰ and the rock gear ⑳ will come off.)
- 3) Return the machine to its original position.

10 Tension release



- 1) Remove the stop ring ① from the presser bar wire ② and the tension release wire shaft ③.
- 2) Loosen the set screw ④ and remove the presser rod lever assembly ⑤ from the arm.
- 3) Remove the screws ⑧ and ⑨ of the wire holder ⑥ and cord holder NK-3N ⑦. Then, remove the presser bar wire assembly ②.
- 4) Remove two urethan tubes (R) ⑪ from M5-05 elbows ⑩.
- 5) Remove the stud screw ⑫, then the presser bar lifter rod ⑬ from the joint ⑭.
- 6) Loosen two screws ⑮ and remove the air cylinder ⑯.
- 7) Remove the set screw ⑰, the thread tension assembly ⑱, the pin ⑲ and the tension release bar ⑳.
- 8) Remove the screw of the tension release bracket ㉑ from the outside of the arm, press the shaft part of the tension release bracket ㉑ and remove the tension release bracket ㉑ with the presser bar wire ②.

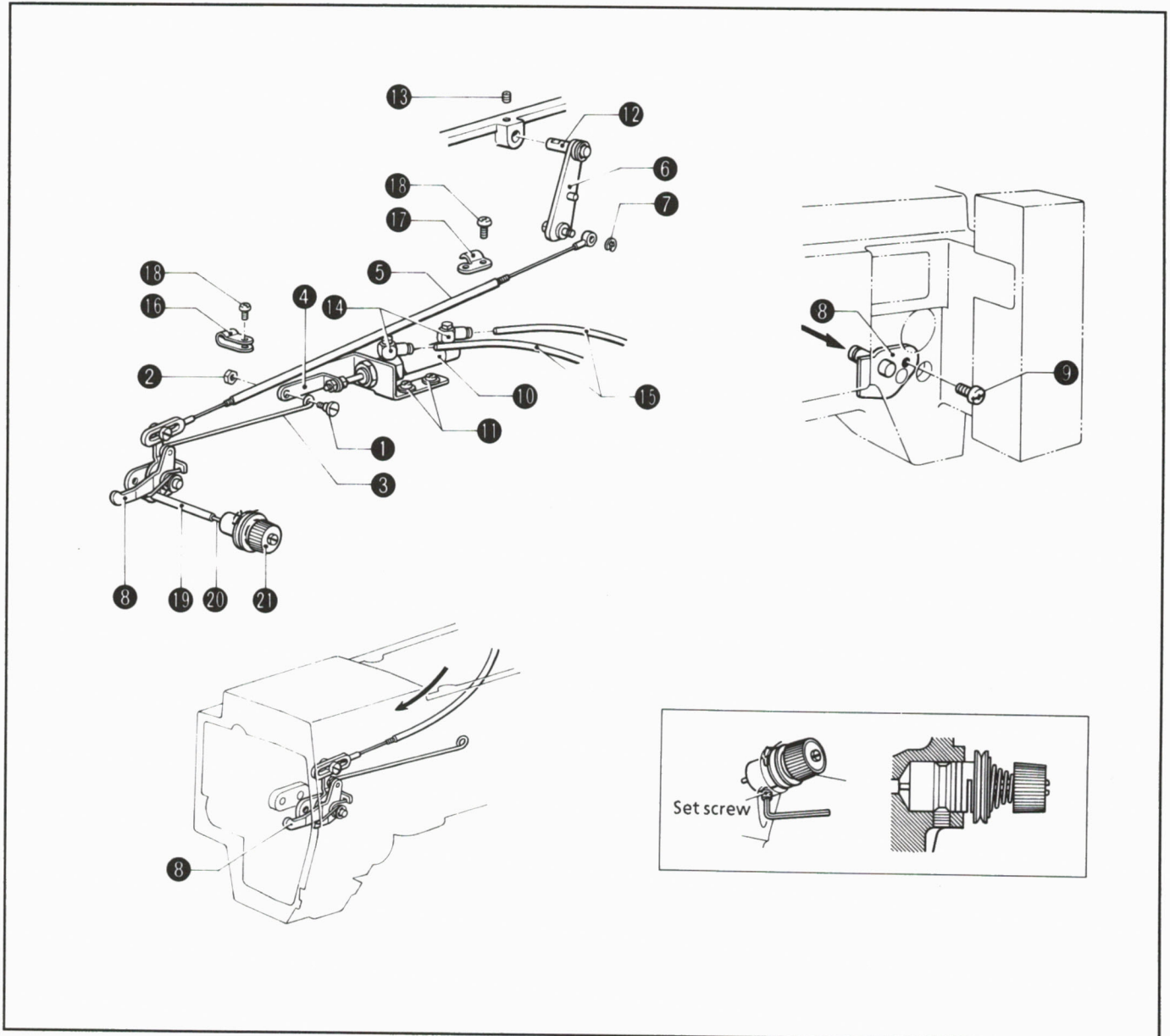
11 Thread trimmer



- 1) Remove the stop rings ② from the driving lever guide shaft ①.
- 2) Loosen the set screws of the driving lever collar ③ and the thread trimmer driving lever set ④. Remove the driving lever guide shaft ① from the machine rear.
(The thread trimmer driving lever set ④, the driving lever collar ③ and the spring ⑤ will come off.)
- 3) Tilt the machine in the direction of the arrow.
- 4) Remove the stud screw ⑥, then the thread trimmer rod (S) assembly ⑧ from thread trimmer lever (D) ⑦.
- 5) Remove the spring ⑤ from thread trimmer lever (U) ⑩.
- 6) Remove the stud screw ⑪, then thread trimmer rod (L) ⑫ from thread trimmer lever (U) ⑩.
- 7) Remove the bolt of the connecting lever support ⑬. Then remove the thread trimmer connecting rod (L) assembly ⑭ and thread trimmer rod (L) ⑫ as a unit.

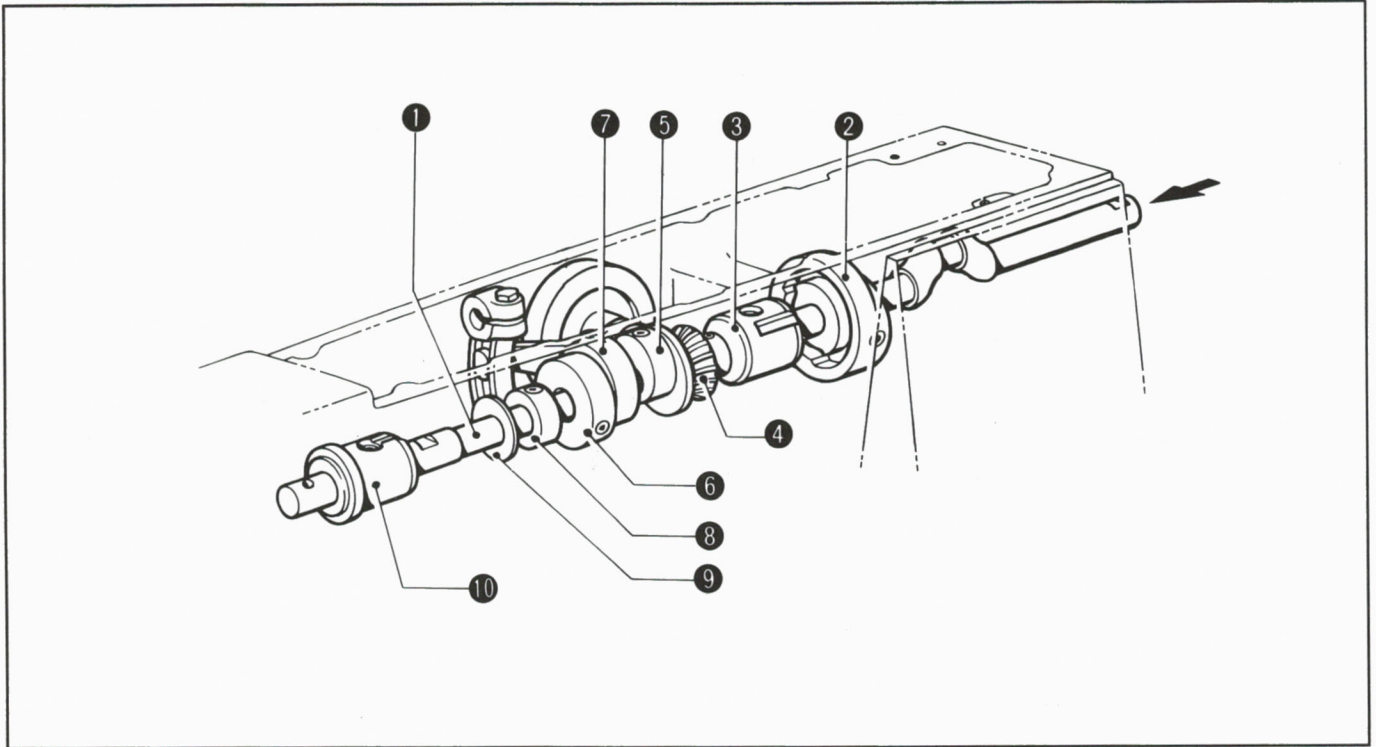
ASSEMBLY

1 Thread tension



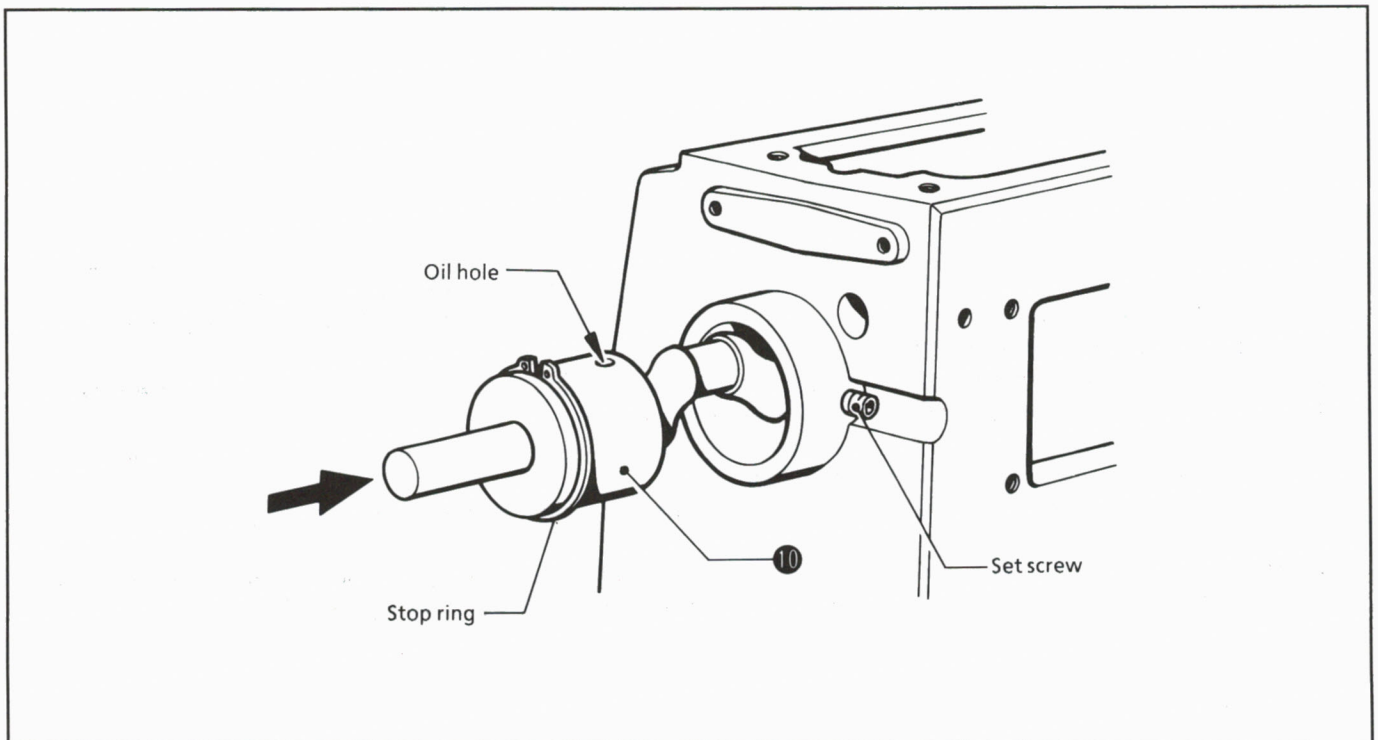
- 1) Attach the presser bar lifter rod ③ to the joint ④ with the stud screw ① and the nut ②.
Attach the presser bar wire assembly ⑤ to the presser rod lever assembly ⑥ with the stop ring ⑦. Then insert them from the top of the arm.
- 2) Insert the shaft part of the thread tension release assembly ③ into the arm, and tighten the screw ⑨.
- 3) Attach the air cylinder ⑩ to the arm with the two screws ⑪.
- 4) Insert the pin ⑫ of the presser rod lever assembly ⑥ into the arm hole, then tighten the set screw ⑬.
- 5) Attach two urethan tubes (R) ⑮ to M5-05 elbows ⑭.
- 6) Fit the presser bar wire assembly ⑤ in the cord holder NK-3N ⑯ and the wire holder ⑰. Then tighten the screws ⑱.
- 7) Attach the tension release bar ⑲, the pin ⑳ and the thread tension assembly ㉑ to the machine body, place the set screw in the groove of the thread tension assembly ㉑, then tighten it.

2 Upper shaft mechanism (1)



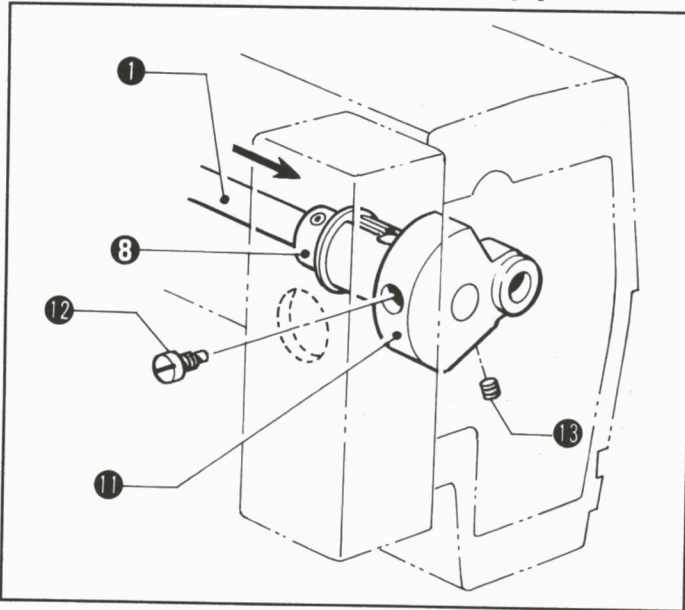
- 1) Insert the upper shaft ① into the arm through the rear. Insert the thread trimmer cam ② and attach it to upper shaft bush (M) ③. Pass the upper shaft bevel gear ④, the bobbin winder pulley ⑤, the intermittent presser cam ⑥, the intermittent presser connecting rod ⑦, the set collar ⑧ and the connecting rod partition plate ⑨ through upper shaft bush (F) ⑩ in that order.

NOTE: For assembly, apply grease to the thread trimmer cam ②, the intermittent presser cam ⑥ and the intermittent presser connecting rod ⑦.



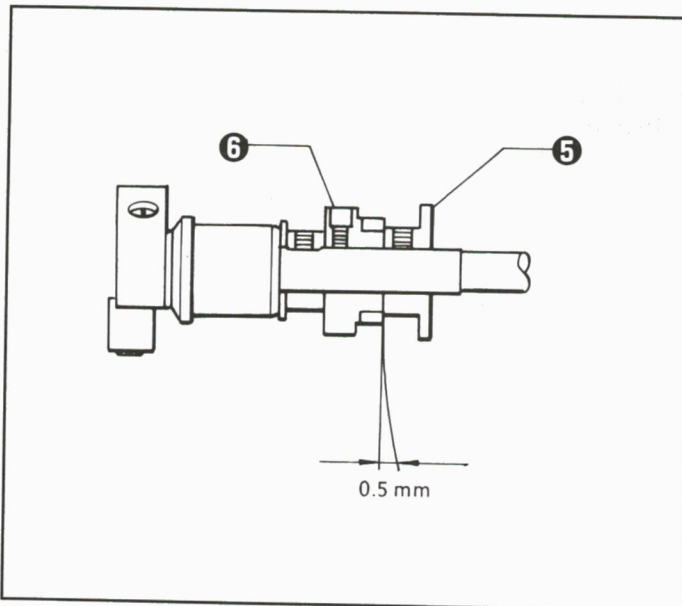
- 2) Set upper shaft bush (R) ⑩ with its oil hole facing up and insert it until the stop ring is in contact with the arm. Then secure upper shaft bush (R) ⑩ with the set screw.

2 Upper shaft mechanism (2)

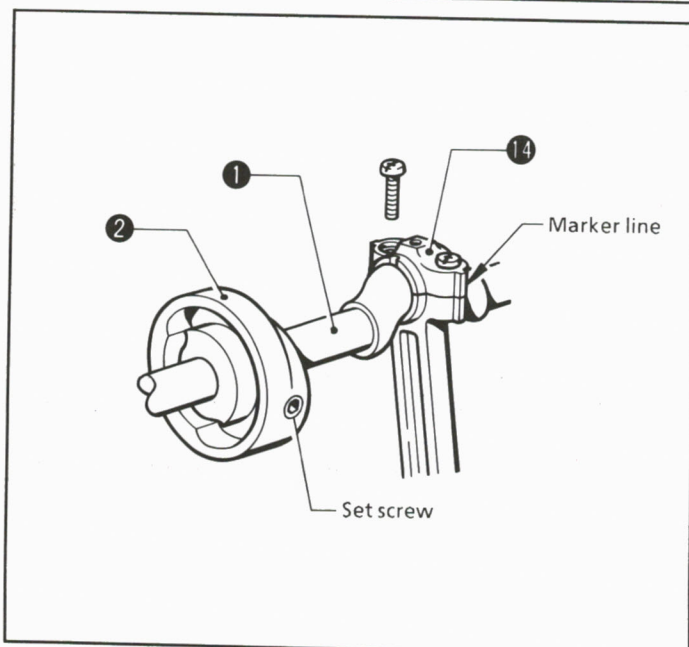


3) Align the thread take-up crank ⑪ with the tapered bore of the upper shaft ① and attach it with its screw ⑫ and set screw ⑬.

4) Adjust the upper shaft ① with the thread take-up crank ⑪ and the set collar ⑧ so that there is no end play and check that the upper shaft ① lightly rotates. Then check the screw flat and tighten the screw of the set collar ⑧.



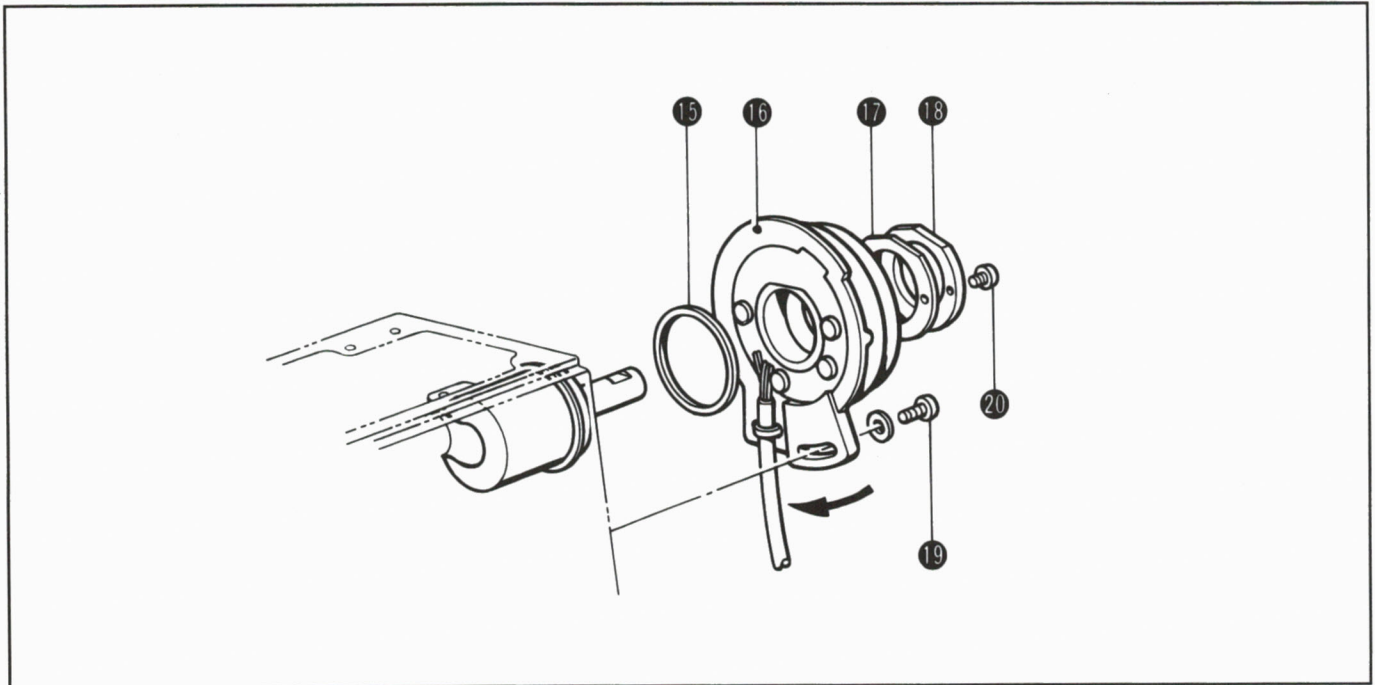
5) Adjust the intermittent presser cam ⑥ and bobbin winder pulley ⑤ so that there is 0.5 mm space between them, then tighten the set screw of the bobbin winder pulley ⑤.



6) Align the thread trimmer cam ② with the screw flat of the upper shaft ①, then tighten the set screw.

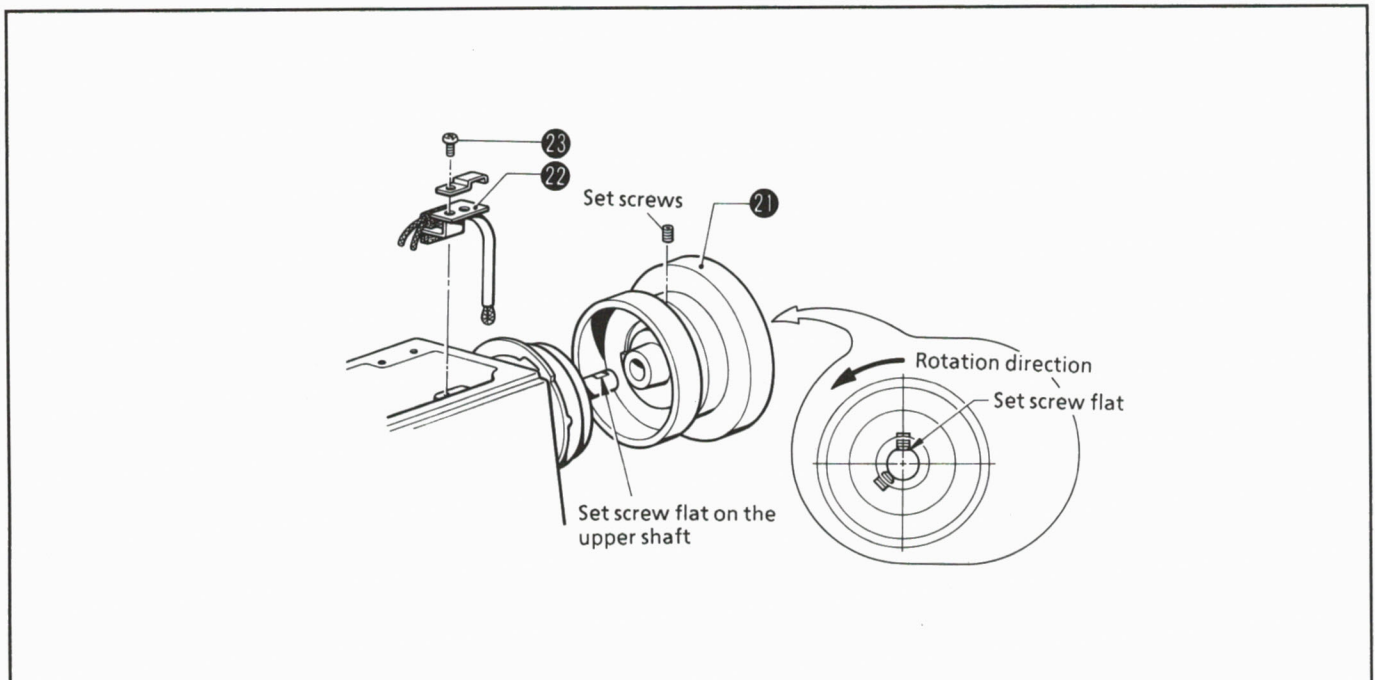
7) Align the crank rod assembly ⑭ on the marker line and attach the crank rod assembly ⑭ to the upper shaft ① with the screw.

2 Upper shaft mechanism (3)



8) Place the synchronizer packing 15, the synchronizer 16, the synchronizer support packing 17 and the synchronizer support 18 on the arm with the screws 19 and 20.

NOTE: The synchronizer 16 should be turned in the direction of the arrow.

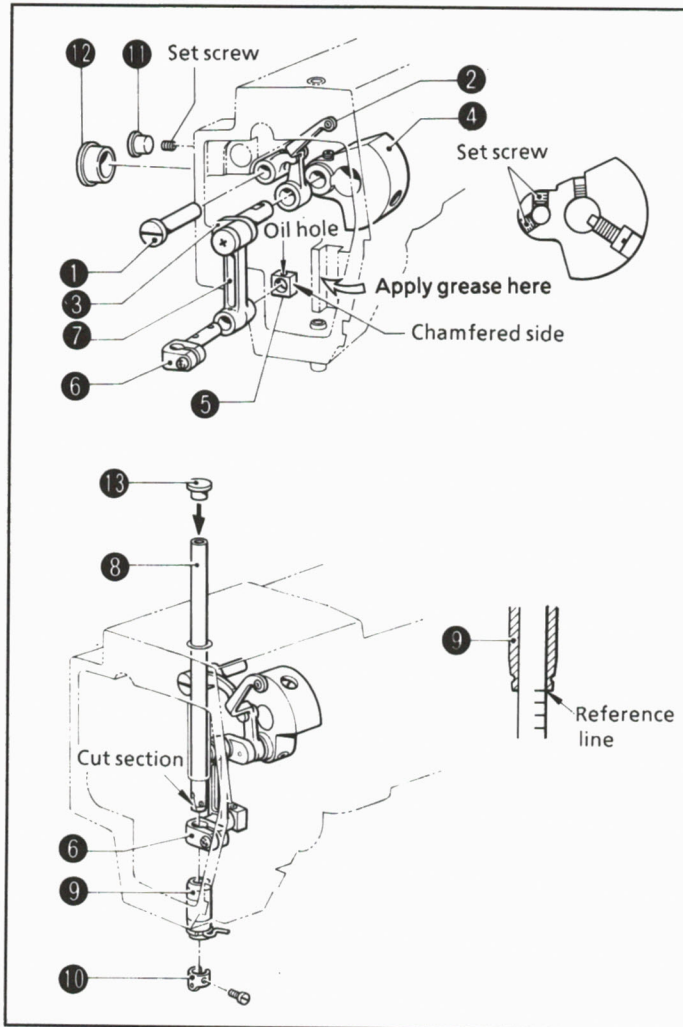


9) Attach the pulley 21 to the upper shaft 1 and check the screw flat, then tighten the set screw down squarely.

NOTE: The second screw hole of the pulley 21 in the rotation direction should be attached to the screw flat of the upper shaft.

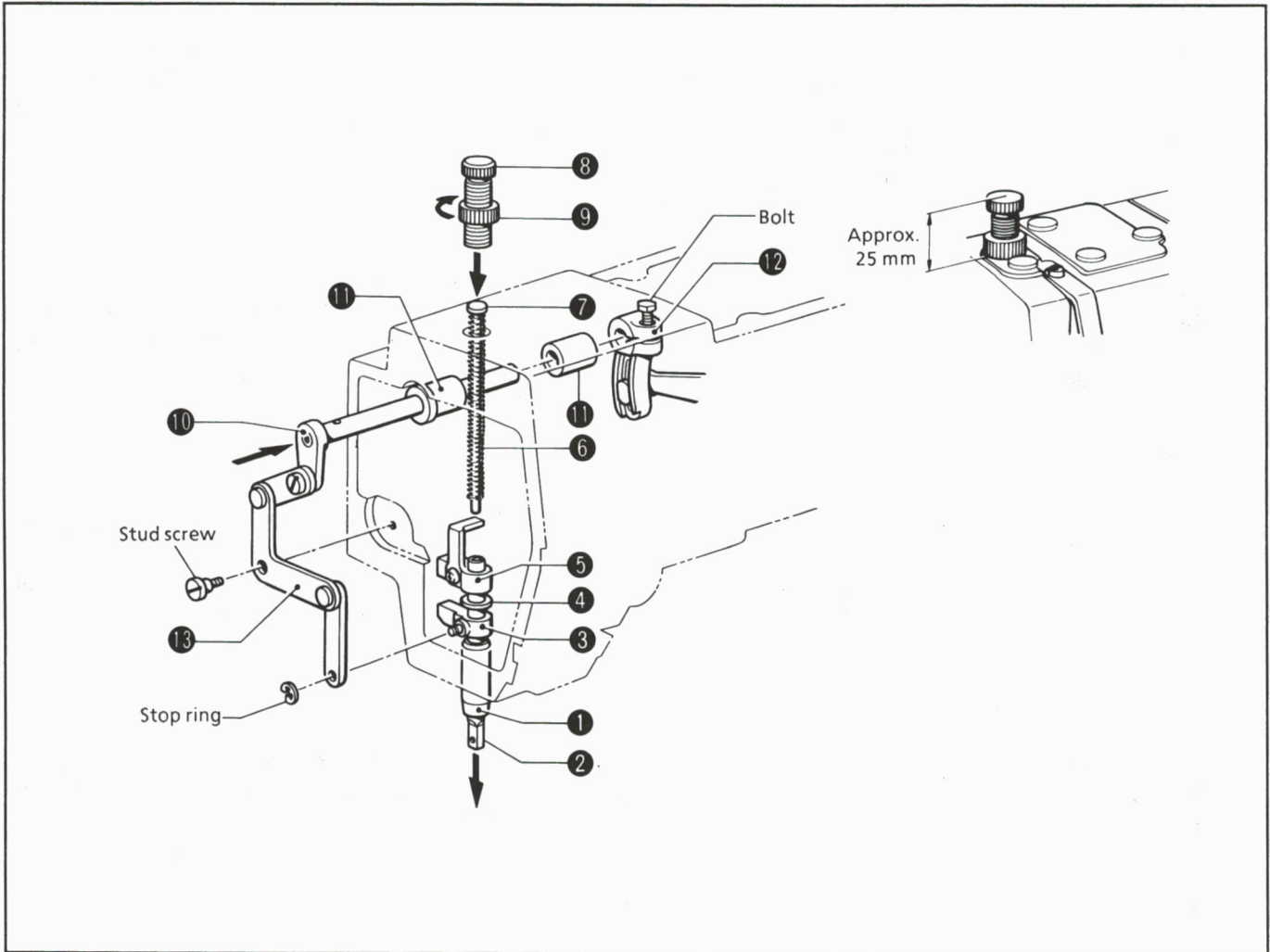
10) Attach the wick support 22 to the arm with the screw 23.

3 Needle bar mechanism



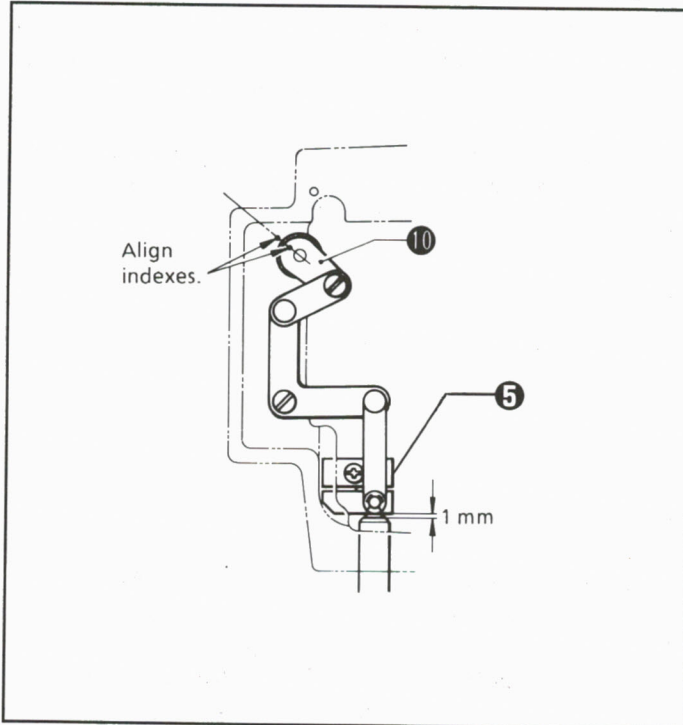
- 1) Insert the thread take-up support stud ① into the thread take-up assembly ②, check the screw flat and tighten the set screw so that there is no end play or no slack.
- 2) Insert the needle bar crank ③ into the thread take-up assembly ② and the thread take-up crank ④. Check the screw flat and adjust that there is no looseness between them, then tighten the set screws.
- 3) Apply grease to the groove of the arm to which the slide block ⑤ is attached. Set the slide block ⑤ with the chamfered side facing backwards and its oil hole up, into the groove of the arm.
- 4) Place the shaft part of the needle bar clamp ⑥ into the thread take-up lever ⑦ and the slide block ⑤.
- 5) Pass the needle bar ⑧ through the machine from its top and insert it into the needle bar clamp ⑥.
(At this time, put the oil cap on top of the needle bar ③.)
- 6) Turn the pulley to set the needle bar ③ at its lowest position. Align the second highest line of the needle bar ③ with the edge of needle bar bush (D) ⑨. Then with the cut section facing front, secure the needle bar ③ with the set screw.
- 7) Secure needle bar thread guide (A) ⑩ to the needle bar ③ with the set screw.
- 8) Put the oil caps ⑪ and ⑫ · ⑬ in the holes of the machine head.

4 Work clamp lifter mechanism (1)



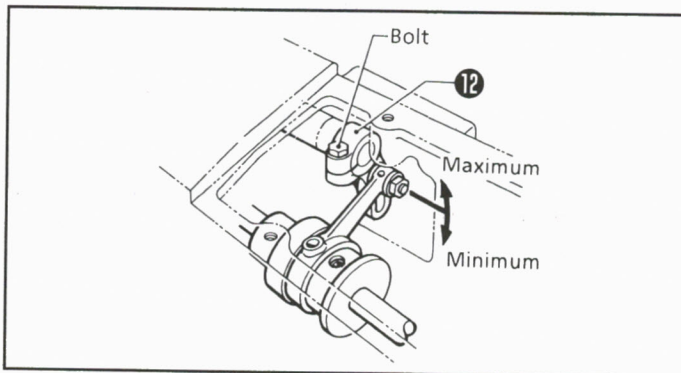
- 1) Insert the presser bar ② into the presser bar bush ①. Pass the presser bar lifter ③, the cushion ④ and the presser bar guide bracket ⑤ through the presser bar ② in that order.
 - 2) Secure the presser bar guide bracket ⑤ with the screw.
 - 3) Insert the spring ⑥ and the spring guide ⑦ into the arm from the top and attach the screw ⑧.
- NOTE: Adjust the nut ⑨ so that there is 25 mm distance between the adjust screw ③ top and the machine top, then secure it.
- 4) Pass intermittent presser arm (F) ⑩ through spreader shaft bushes (L) and (R) ⑪, then insert it into presser arm (R) ⑫.
 - 5) Attach the intermittent link assembly ⑬ to the arm with the stud screw, and to the presser bar lifter ③ with the stop ring.

4 Work clamp lifter mechanism (2)



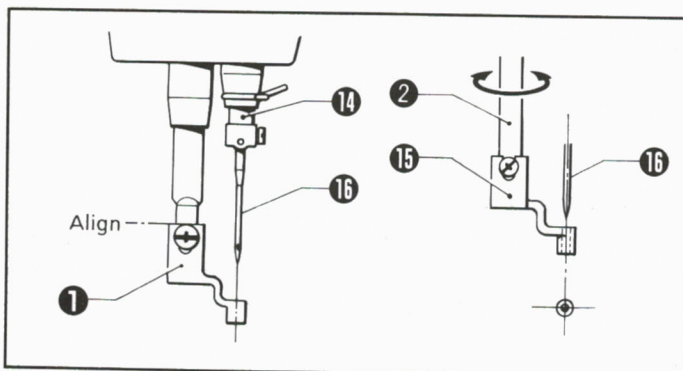
- 6) Turn the pulley to set the needle bar 14 at its lowest position.
Position intermittent presser arm (F) 10 and the arm so that their indexes are flush when intermittent rise is at its maximum. Then tighten the bolt of intermittent presser arm (R) 12.

NOTE: Check to be sure that intermittent presser arm (F) 10 has no end play.

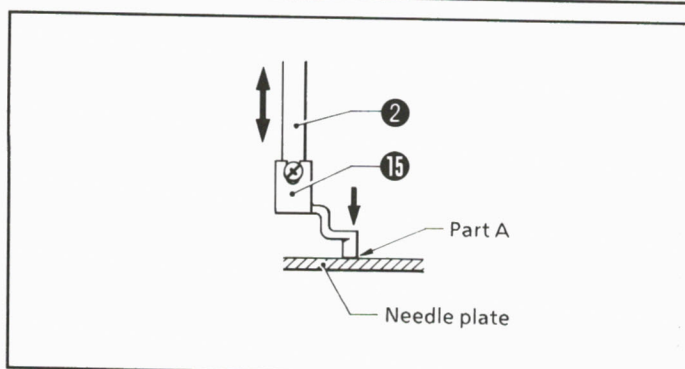


- 7) Attach the presser foot 15 to the presser bar 2 so that the top edge of the presser foot 15 aligns with the top end of the screw.

- 8) Attach the needle 16 to the needle bar 14.

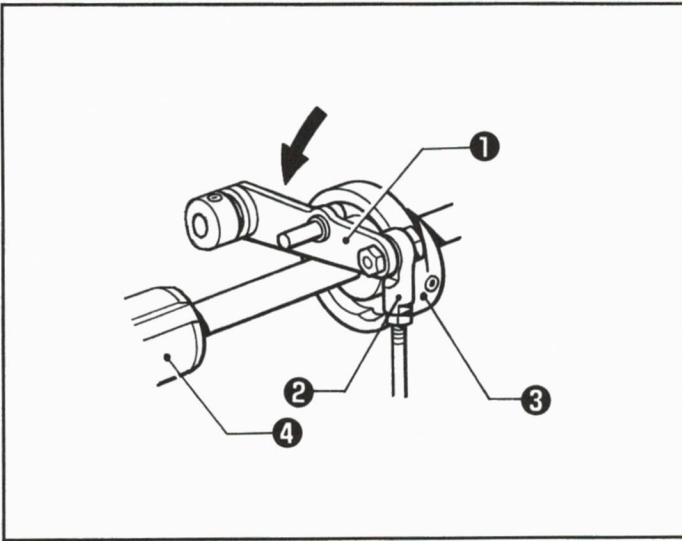


- 9) Turn the pulley to turn the presser bar 2 so that the needle 16 comes in the center of the presser foot 15 hole.

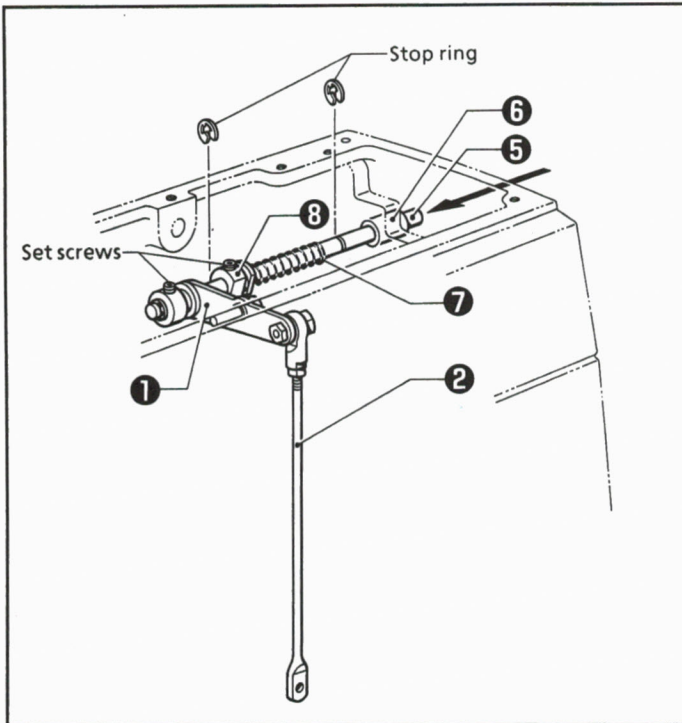


- 10) Turn the pulley to set the presser bar 2 at its lowest position. Vertically adjust the presser bar 2 so that part A of the presser foot 15 aligns with the needle plate top, then tighten the screw of the presser bar guide bracket 5.

5 Thread trimmer (1)

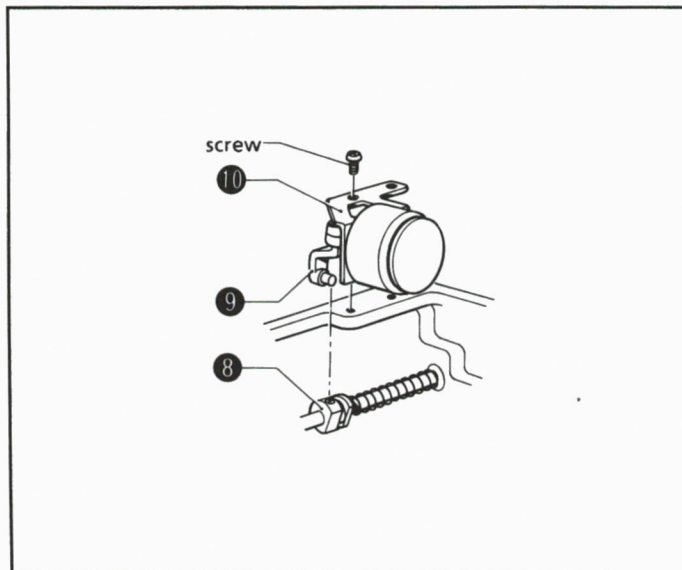


- 1) Attach the thread trimmer rod (5) assembly ② to the thread trimmer driving lever assembly ①. Secure them with the stud screw and the nut.
- 2) Put the thread trimmer driving lever assembly ① between the thread trimmer cam ③ and upper shaft bush (M) ④.



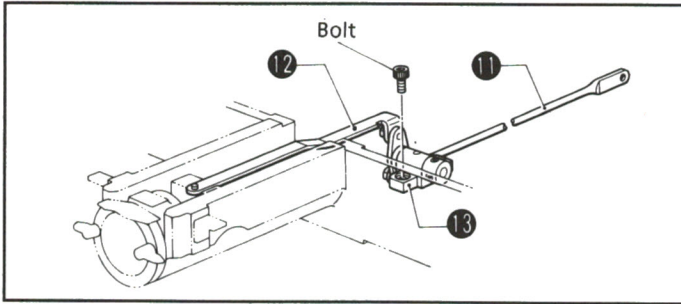
- 3) Pass the driving lever guide shaft ⑤ through the bush 8 x 15 ⑥, insert the driving lever guide shaft ⑤ into the arm from the outside and pass it through the spring ⑦, the driving lever collar ⑧ and the thread trimmer driving lever assembly ① in that order.
- 4) Attach the stop rings to the driving lever guide shaft ⑤ and contact the driving lever collar ⑧ and the stop ring, then tighten them.

Similarly, attach the thread trimmer driving lever assembly ① to the stop ring and secure it.

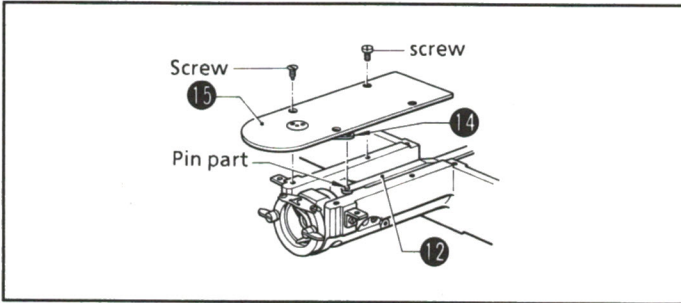


- 5) Put the pin part of the solenoid lever assembly ⑨ into the groove of the driving lever collar ⑧, then attach the thread trimming solenoid assembly ⑩ to the arm with the two screws.

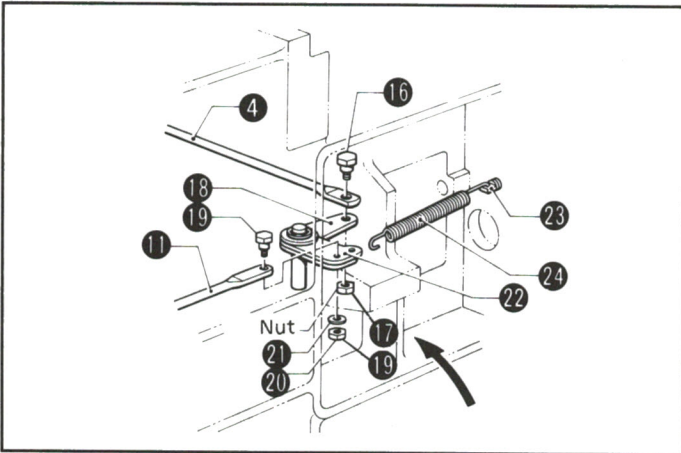
5 Thread trimmer (2)



- 6) Attach the connecting lever support (13) assembled thread trimmer rod (L) (11) and thread trimmer connecting rod (L) (12) to the arm with the bolt.

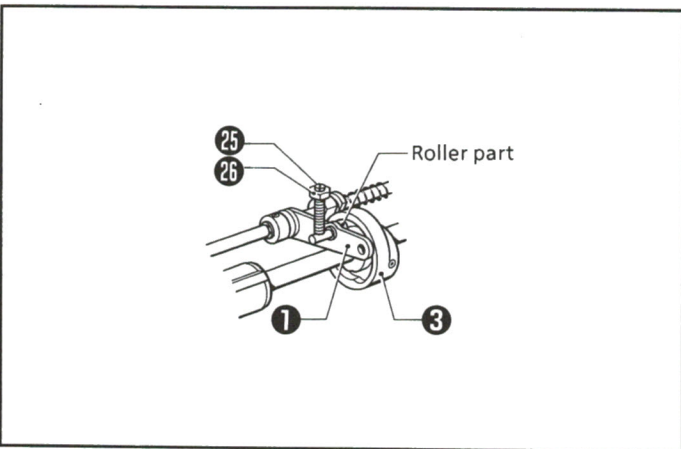


- 7) Attach the thread trimmer connecting rod (14) to the pin part of thread trimmer connecting rod (L) (12) and attach the needle plate assembly (15) to the arm with the screws.



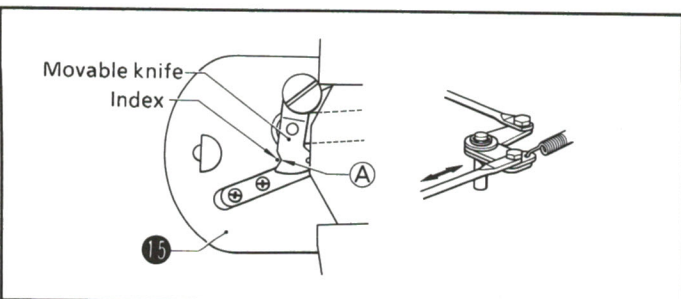
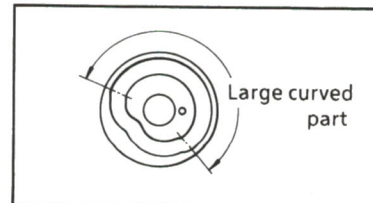
- 8) Attach the thread trimmer rod (S) assembly (4) to thread trimmer lever (D) (18) with the stud screw (16) and the nut (17). Attach thread trimmer rod (L) (11) to thread trimmer lever (U) (22) with the stud screw (19), the nut (20) and the washer (21).

- 9) Hook the spring (24) to spring hook (S) (23) and thread trimmer lever (U) (22).



- 10) Adjust the adjust screw (25) so that the roller of the thread trimmer driving lever assembly (1) smoothly goes in and out the groove of the thread trimmer cam (3). Then secure them with the nut (26).

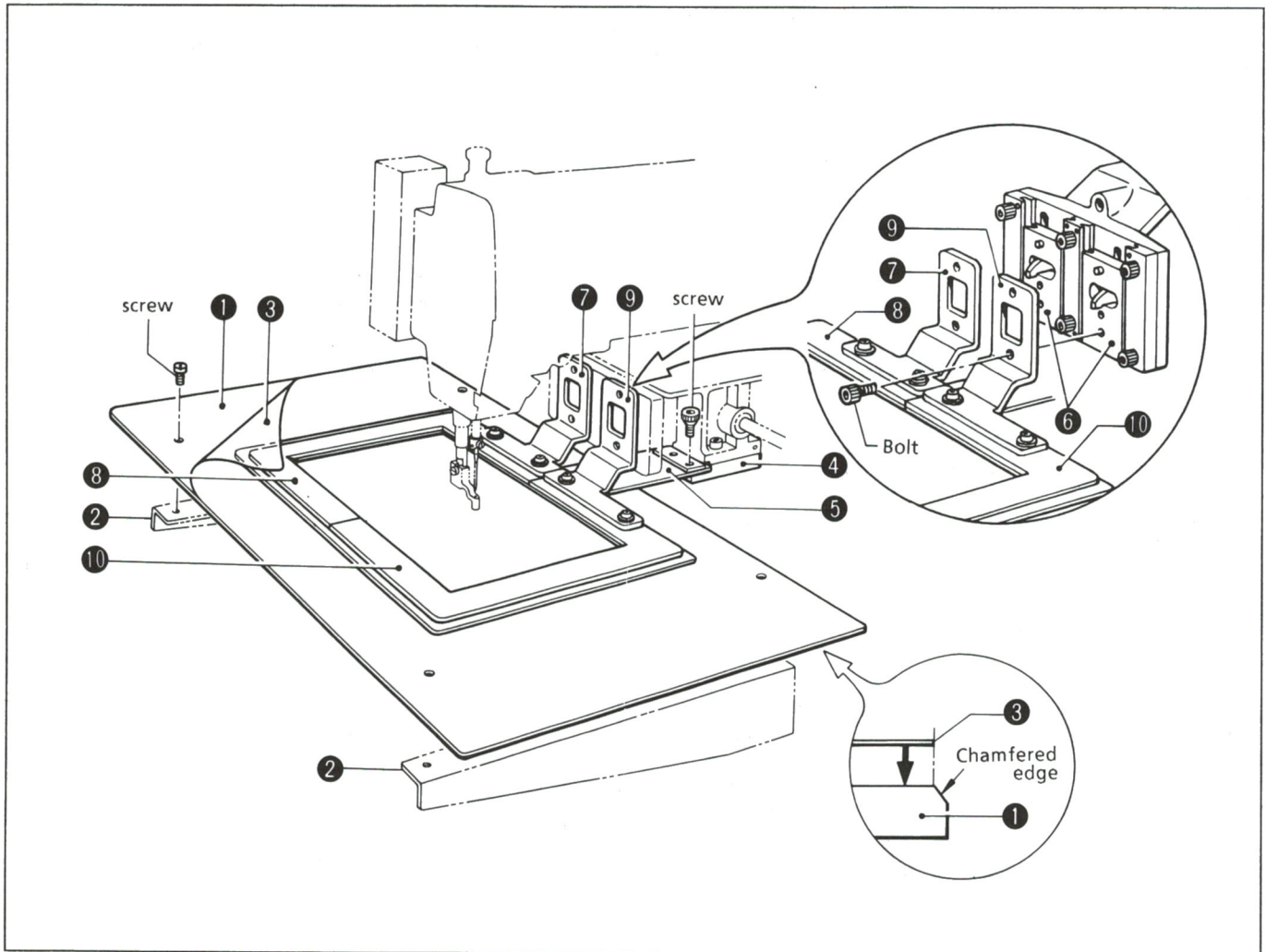
NOTE: This adjustment should be performed in the large curved part of the thread trimmer cam groove.



- 11) Vertically adjust thread trimmer levers (D) (18) and (U) (22) and align the V notch (A) of the movable knife with the index on the needle plate assembly (15), then secure thread trimmer lever (U) (22) with the nut (19).

6 Presser mechanism

[For air separate presser]

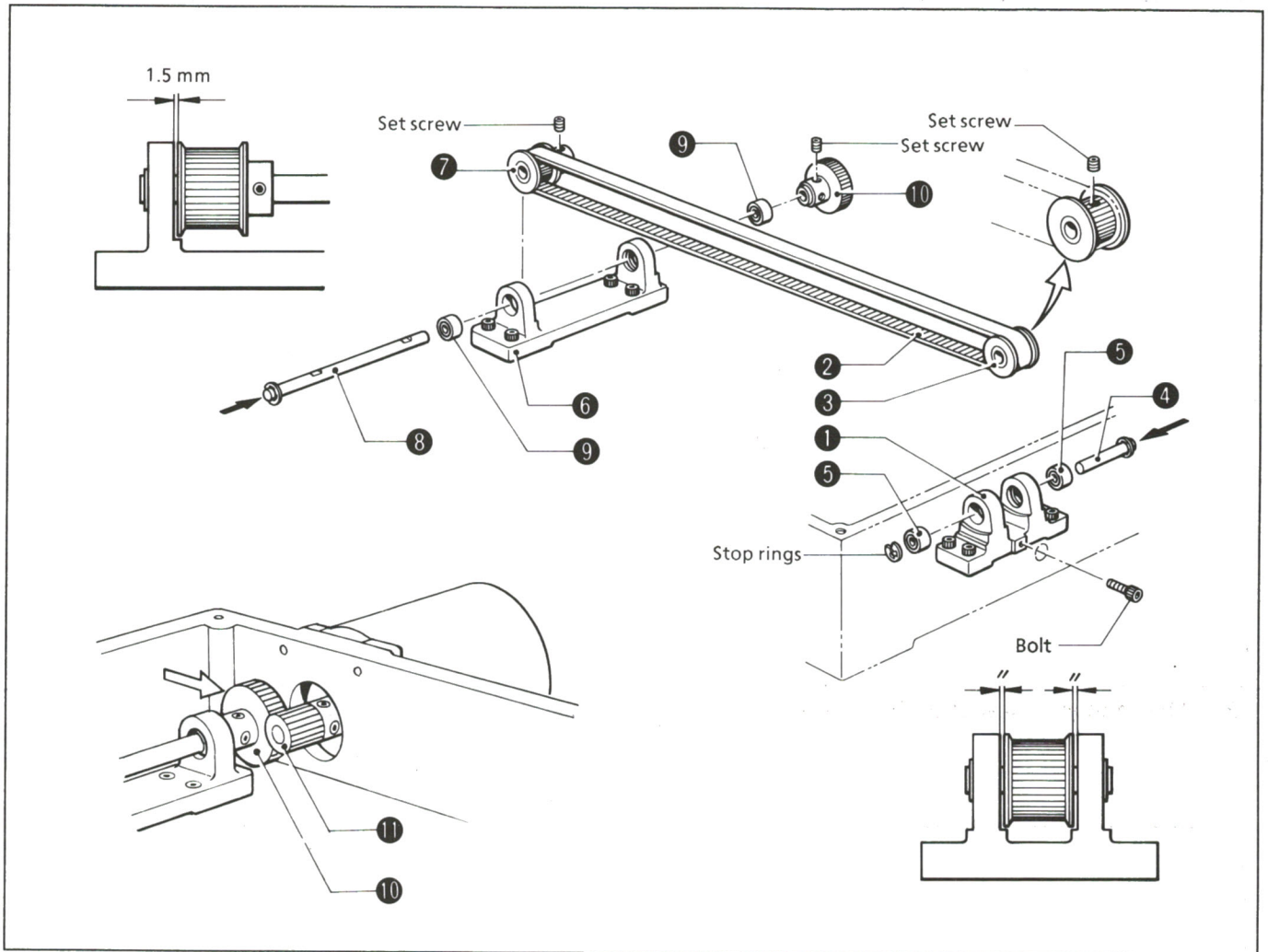


- 1) Attach the needle sub plate ① to the needle sub plate supports (L) and (R) ② with the screws.
- 2) Put the auxiliary sheet ③ on the needle sub plate ① top with aligning its rear end with the needle sub plate ①.

NOTE: The sheet should be replaced with a new one every month.

- 3) Attach the feed plate ⑤ to the Y-feed bracket ④ with the screws.
- 4) Attach work clamp (SER) ⑦, presser foot (L) ⑧, work clamp (SEL) ⑨, presser foot (R) ⑩ to the work clamp assembly ⑥ with the bolts.

7 Feed mechanism (X axis) (1)



- 1) Place the X-timing belt ② and timing pulley (B) ③ on X-pulley base (R) ①. To attach timing pulley (B) ③, pass X-pulley shaft (R) ④ through the micro bearing 8 ⑤, and attach the stop ring to the shaft. Check the screw flat on X-pulley shaft (R) ④ and secure timing pulley (B) ③ with the set screw.

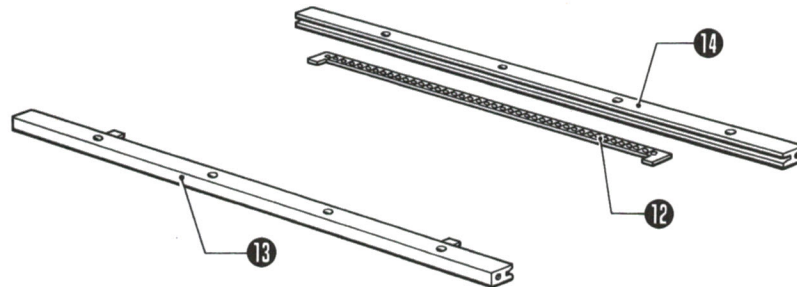
NOTE: Put timing pulley (B) ③ in the center of X-pulley base (R) ① and secure it with the two set screws.

- 2) Place the X-timing belt ② and timing pulley (A) ⑦ on X-pulley base (L) ⑥. Pass X-pulley shaft (L) ⑧ through the micro bearing 8 ⑤, and attach them to the idle gear ⑩ by pressing the driving gear ⑪ on the X-pulse motor.

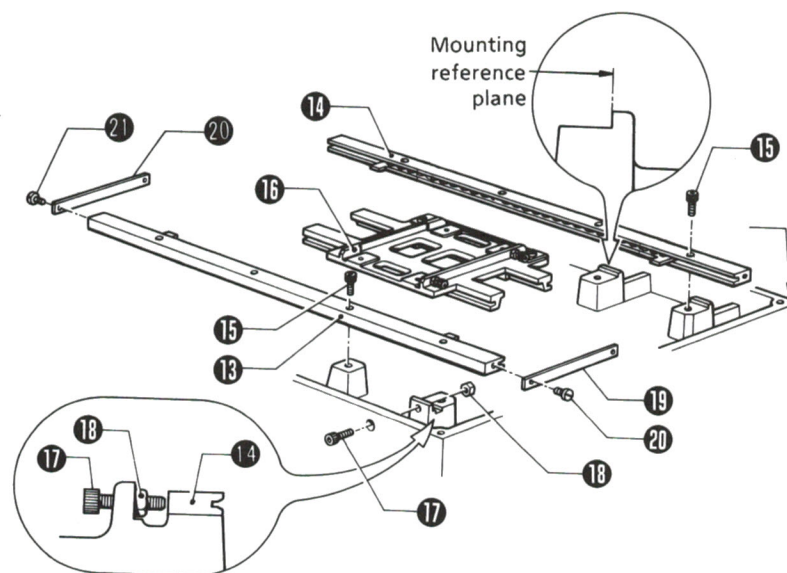
Check the screw flat on X-pulley shaft (L) ⑧ and adjust X-pulley shaft (L) ⑧ so that there is no end play in the shaft, then secure the idle gear ⑩ and timing pulley (A) ⑦ with the set screws.

- NOTE: Provide a 1.5 mm gap between timing pulley (A) ⑦ and X-pulley base (L) ⑥ and secure timing pulley (A) ⑦ with two set screws.

7 Feed mechanism (X axis) (2)

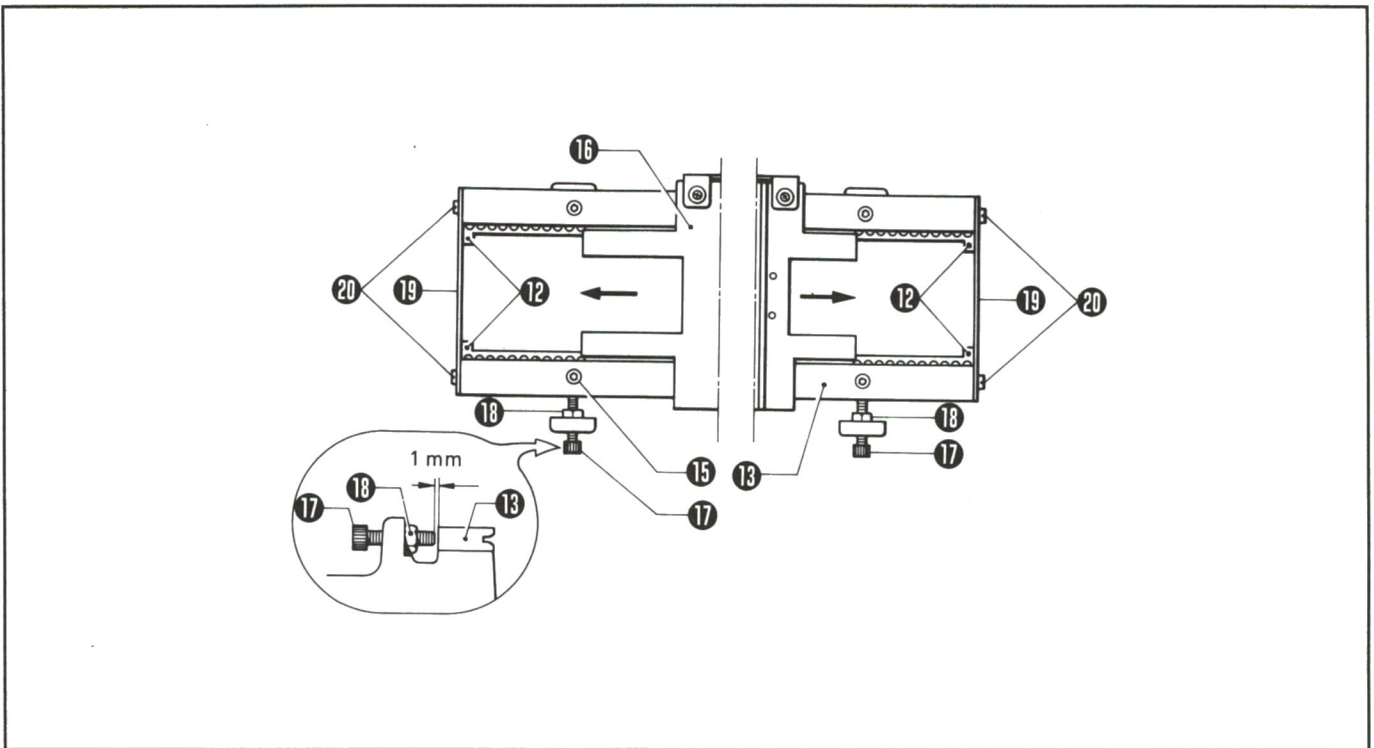


3) After applying grease to the X-retainers 12, assemble them to X-feed guides (F) 13 and (R) 14.

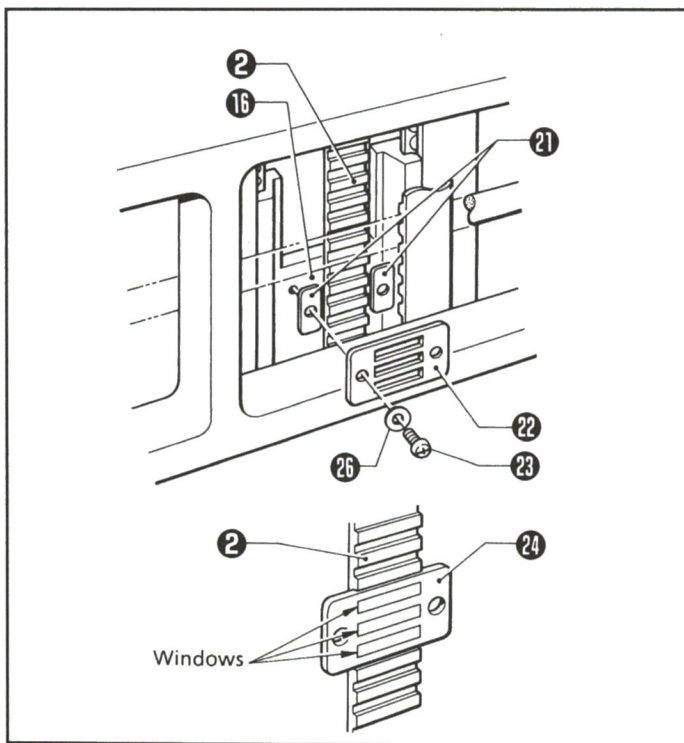


- 4) Place the back side of X-feed guide (R) 14 on the mounting reference planes in the bed and attach X-feed guide (R) 14 to the bed with the bolt 15.
 - 5) Put the X-feed bracket 16 between X-feed guides (F) 13 and (R) 14 and attach X-feed guide (F) 13 to the bed with the bolt 15.
 - 6) Attach the bolt 17 for adjustment and the nut 18 to the bed as in figure above.
 - 7) Attach the X-stoppers 19 to the ends of X-feed guides (F) 13 and (R) 14 with the screws 20.
- NOTE: At this time, the screws 20 should be temporarily tightened.

7 Feed mechanism (X axis) (3)

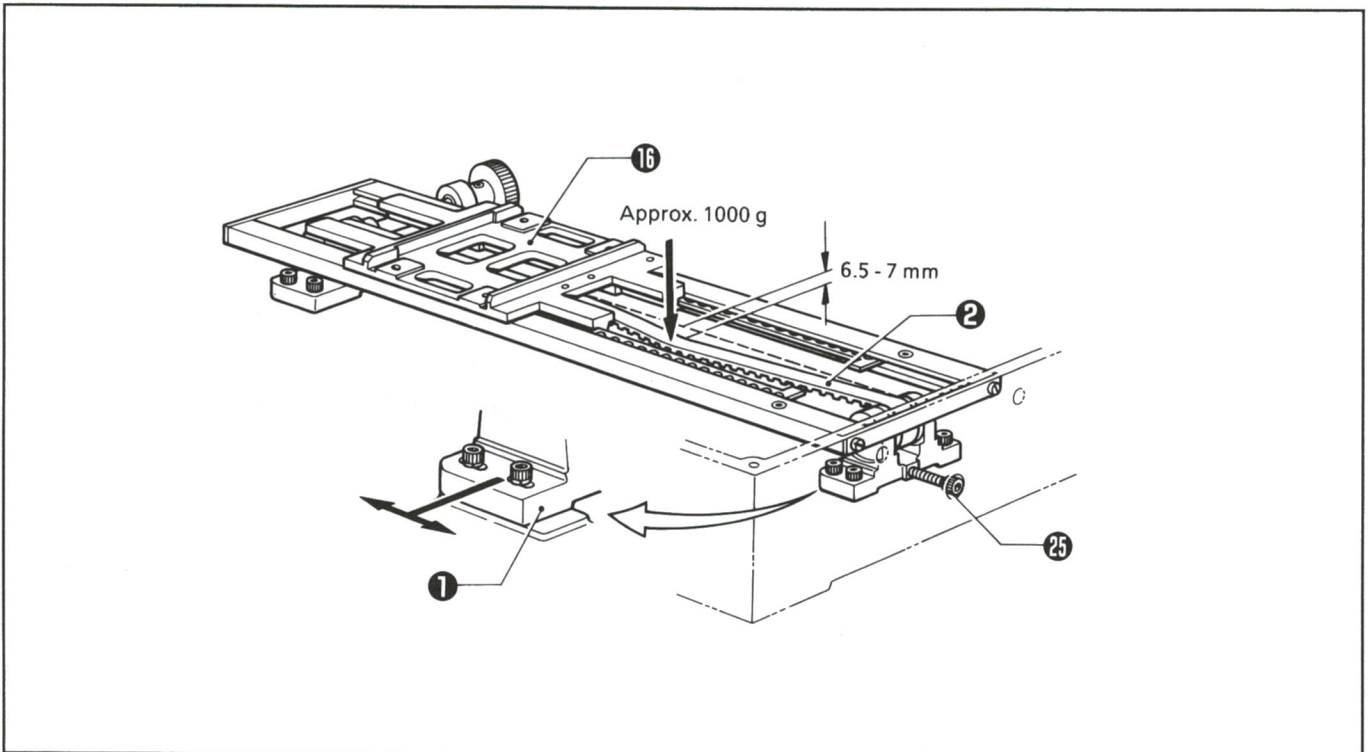


- 8) Make the X-retainer 12 touch the right and left X-stoppers 19.
Adjust X-feed guide (F) 13 by pressing the bolt 17 (within all the area) so that the X-feed bracket 16 has no slack and smoothly moves at 12 kg or less when it is pushed, and secure X-feed guide (F) 13 with the bolt 15.
After adjustment, tighten the nut 14 to provide a 1 mm gap between the end of bolt 17 and the rear of X-feed guide (F) 13.
- 9) After the above-mentioned adjustment, tighten the screws 20 of the right and left X-stoppers 19.



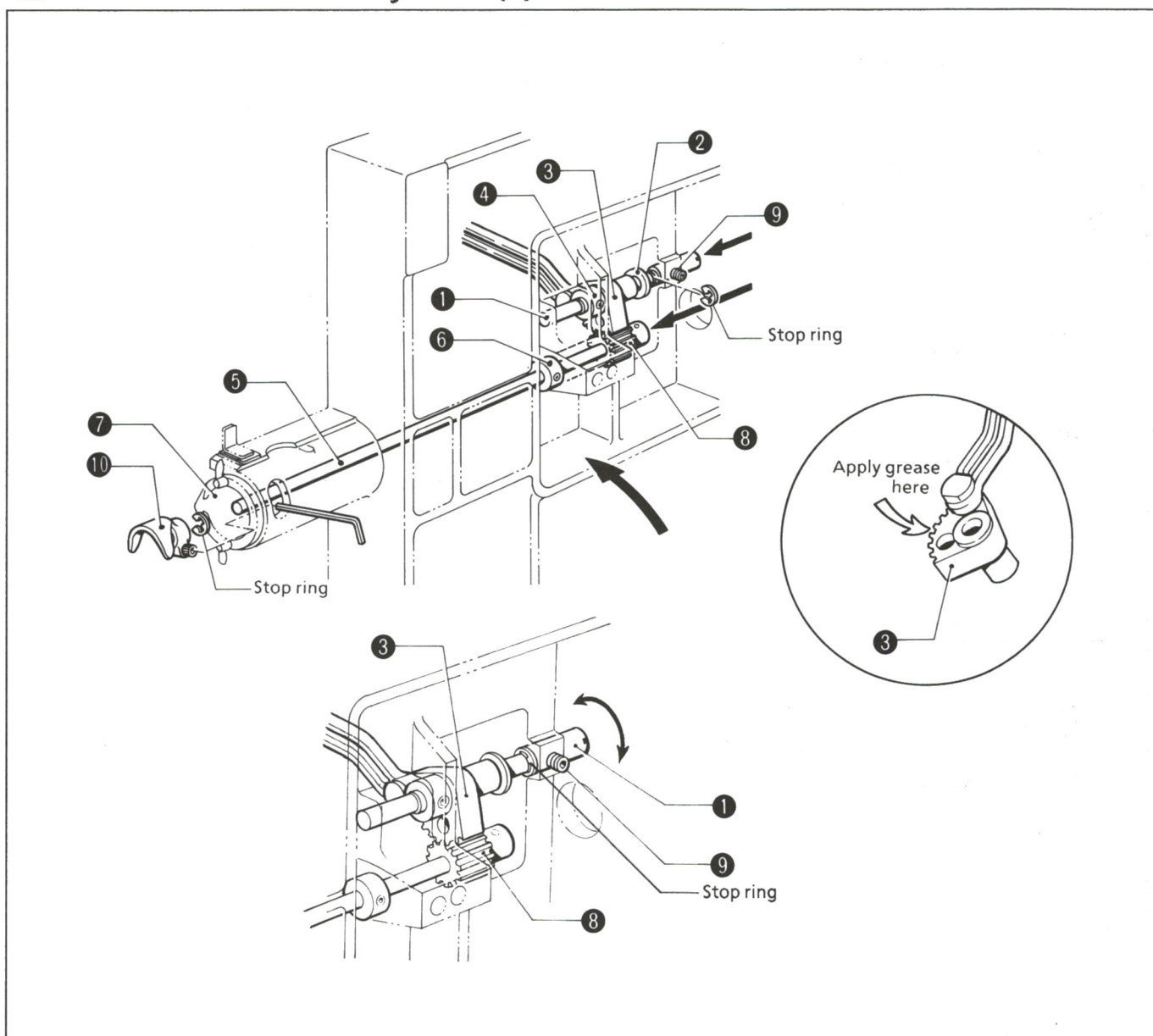
- 10) While putting the X-timing belt 2 between the timing belt spacers 21 at the bottom of the X-feed bracket 16 from the underside of the bed, fit the protrusions of the X-timing belt 2 in the windows of the belt holder 22.
Then, tighten the screws 23 and the plain washers 24.
(There are two belt holders on both sides.)

7 Feed mechanism (X axis) (4)



- 11) Move the X-feed bracket 16 to the center and apply a vertical load of 1000 g at the center of the X-timing belt 2 and adjust X-pulley base (R) 1 and bolt 25 so that the belt deflection is 6.5 mm to 7 mm (which is the same distance when pressing the X-timing belt until it slightly touches the lower shaft).

8 Lower shaft and rotary hook (1)

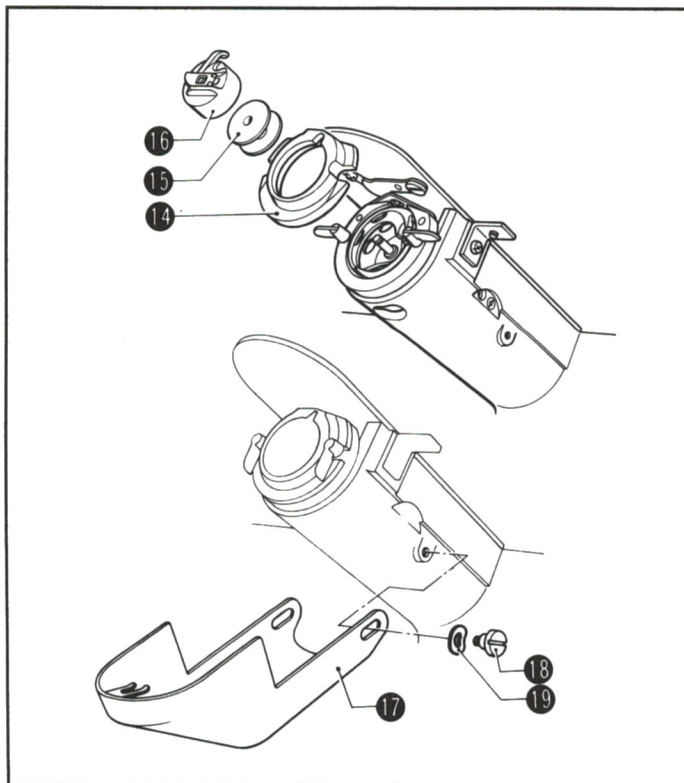
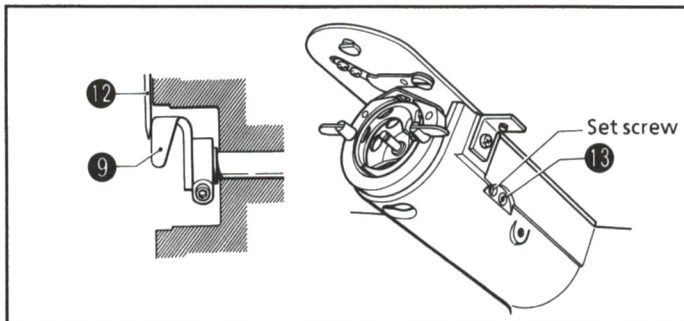
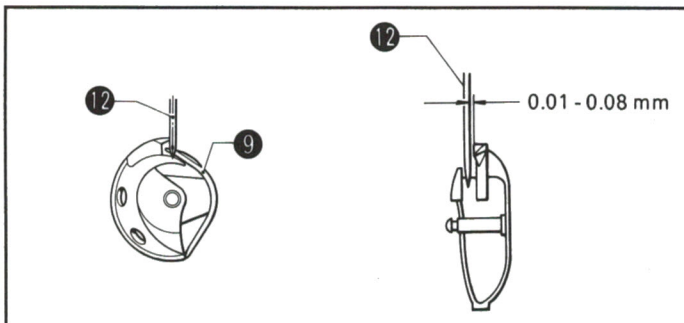
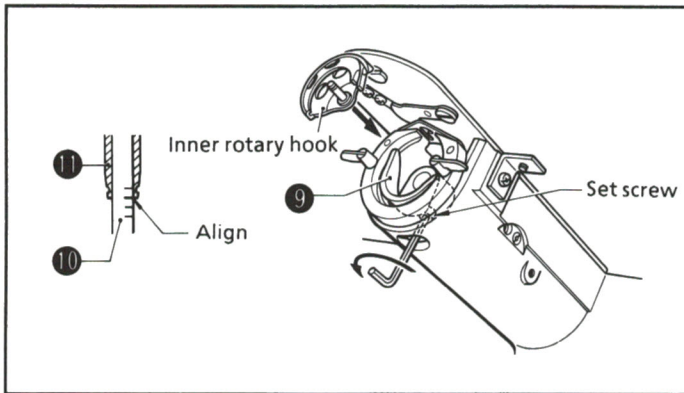


- 1) Tilt the machine.
- 2) Insert the rock gear shaft ① into the arm from the rear. Pass the washer ②, the rock gear ③ and the set collar ④ through the rock gear shaft ①, and attach the stop ring to the shaft ①.
- 3) Put the rock gear ③ between the set collar ④ and the stop ring and vertically adjust so that there is no end play between rock gear ③ and the shaft ①. Then tighten the set screw of the set collar ④.
- 4) Pass the lower shaft assembly ⑤ through the lower shaft bush from the rear of the arm and insert it into the set collar ⑥. Pass through the shuttle race base assembly ⑦ and place the stop ring on the lower shaft assembly ⑤.
- 5) Vertically adjust the lower shaft assembly ⑤ so that there is no end play. Tighten the set screw of the set collar ⑥.
- 6) Adjust the rock gear shaft ① so that there is no backlash between the lower shaft gear ③ and the rock gear ③. Then tighten the set screw.

NOTE: Apply grease to the rock gear ③.

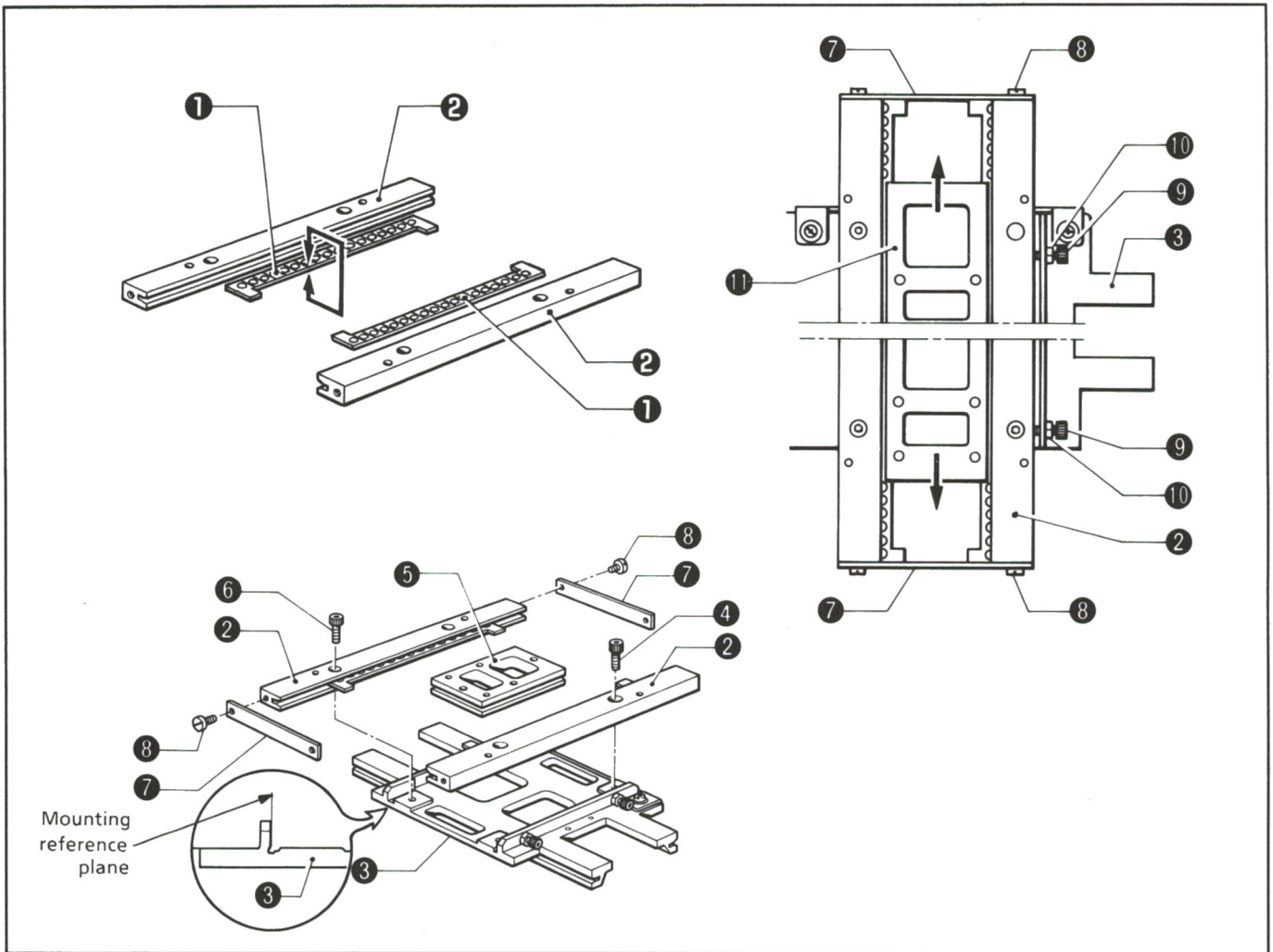
- 7) Place the driver ⑨ on the lower shaft assembly ⑤ and make it touch the stop ring, then temporarily secure it.
- 8) Return the machine to its original position.

8 Lower shaft and rotary hook (2)



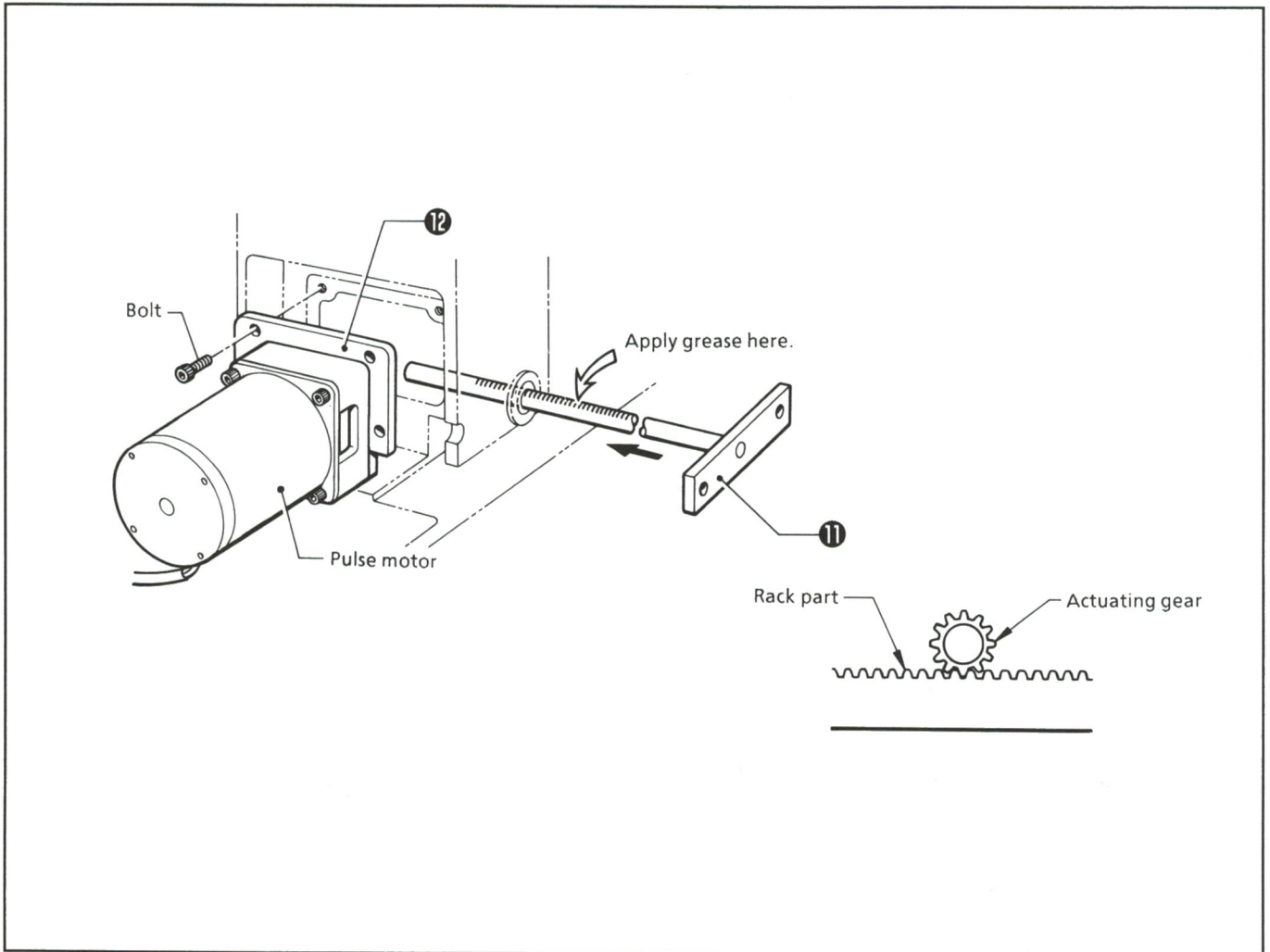
- 9) Fit the inner rotary hook in the large shuttle hook.
- 10) Turn the pulley to raise the needle bar ⑩ from its lowest position until the second highest reference line on the needle bar ⑩ aligns with the end of needle bar bush (D) ⑪. Adjust the driver ⑨ so that the inner rotary hook point is aligned with the center of needle ⑫, then tighten the bolt.
- 11) Turn the pulley to align the inner rotary hook point with the center of the needle ⑫. Loosen the set screw so that the clearance between the needle ⑫ and the inner rotary hook point is 0.01-0.08 mm, then rotate the shuttle hook adjust stud ⑬ to adjust.
- 12) Turn the pulley to align the inner rotary hook point with the center of the needle ⑫. Loosen the set screw and adjust the shuttle hook adjust stud ⑬ so that the needle ⑫ lightly contacts the needle receiver of the driver ⑨.
- 13) Remove the needle ⑫.
- 14) Attach the large shuttle hook ⑭ to the shuttle race base.
- 15) Insert the bobbin ⑮ into the bobbin case ⑯, then attach them to the inner rotary hook.
- 16) Attach the large shuttle hook cover ⑰ to the arm with the stud screw ⑱ and the spring washer ⑲.
- 17) Attach the needle ⑫.

9 Longitudinal feed (Y axis) (1)



- 1) Apply grease to the Y-retainer ① . Fit the Y-retainer ① into the Y-feed guide ② .
 - 2) Make the back of Y-feed guide ② touch mounting reference plane of the X-feed bracket ③ and secure them with the bolt ④ .
 - 3) Put the Y-feed bracket ⑤ between the Y-feed guide ② attached to the X-feed bracket ③ and another Y-feed guide ② . Then attach the Y-feed guide ② to the X-feed bracket ③ with the bolt ⑥ .
 - 4) Attach the Y-stoppers ⑦ to both ends of the Y-feed guide ② with the screws ⑧ .
- NOTE: At this time, the screw ⑧ of the Y-stoppers ⑦ should be temporarily tightened.
- 5) Attach the bolt ⑨ for adjustment and the nut ⑩ to the X-feed bracket ③ .
 - 6) Make the Y-retainer ① touch the Y-feed stoppers ⑦ . Adjust the Y-feed guide ② by pressing the bolt ⑨ attached to the X-feed bracket ③ so that the Y-feed bracket ⑤ has no slack and smoothly moves at 10 kg or less. Then, secure the Y-feed bracket ② with the bolt ⑥ .
After adjustment, secure the bolt ⑨ with the nut ⑩ when it slightly touches the back of the Y-feed bracket ② .
 - 7) After above adjustment is made, secure the Y-stoppers ⑦ attached to both ends of the Y-feed guide ② with the screws ⑧ .

9) Longitudinal feed (Y axis) (2)



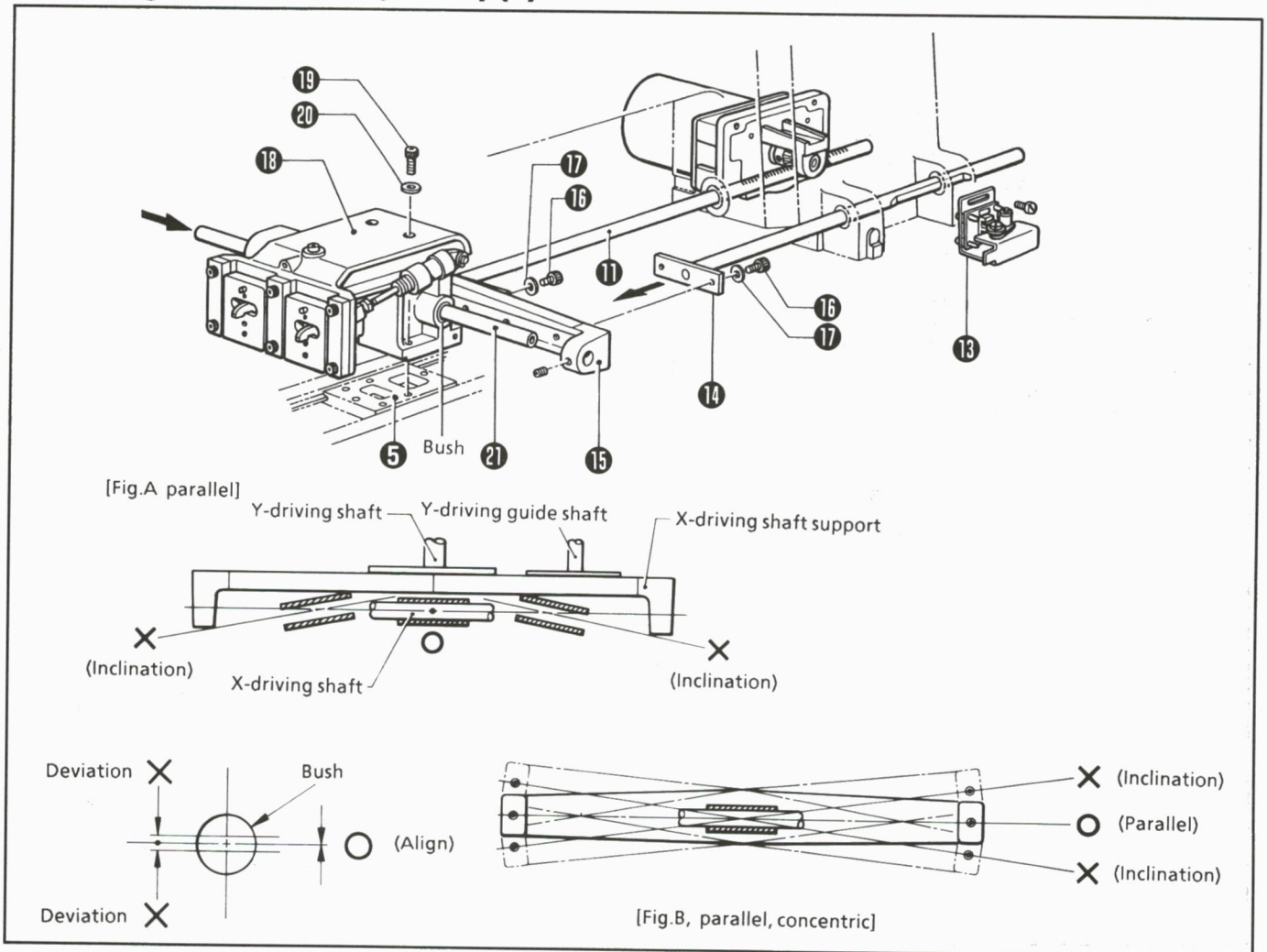
8) Pass the Y-driving shaft ⑪ through Y-driving shaft bushes (F) and (R).

NOTE: Apply grease to the rack part of the Y-driving shaft ⑪.

9) Apply non-sag type liquid gasket (Three Bond 1212) to the mounting plane of the Y-driving P motor bracket ⑫. Then secure the Y-driving P motor bracket ⑫ with the bolt.

NOTE: Before tightening the bolt, adjust the backlash between the rack part on the Y-driving shaft ⑪ and the actuating gear.

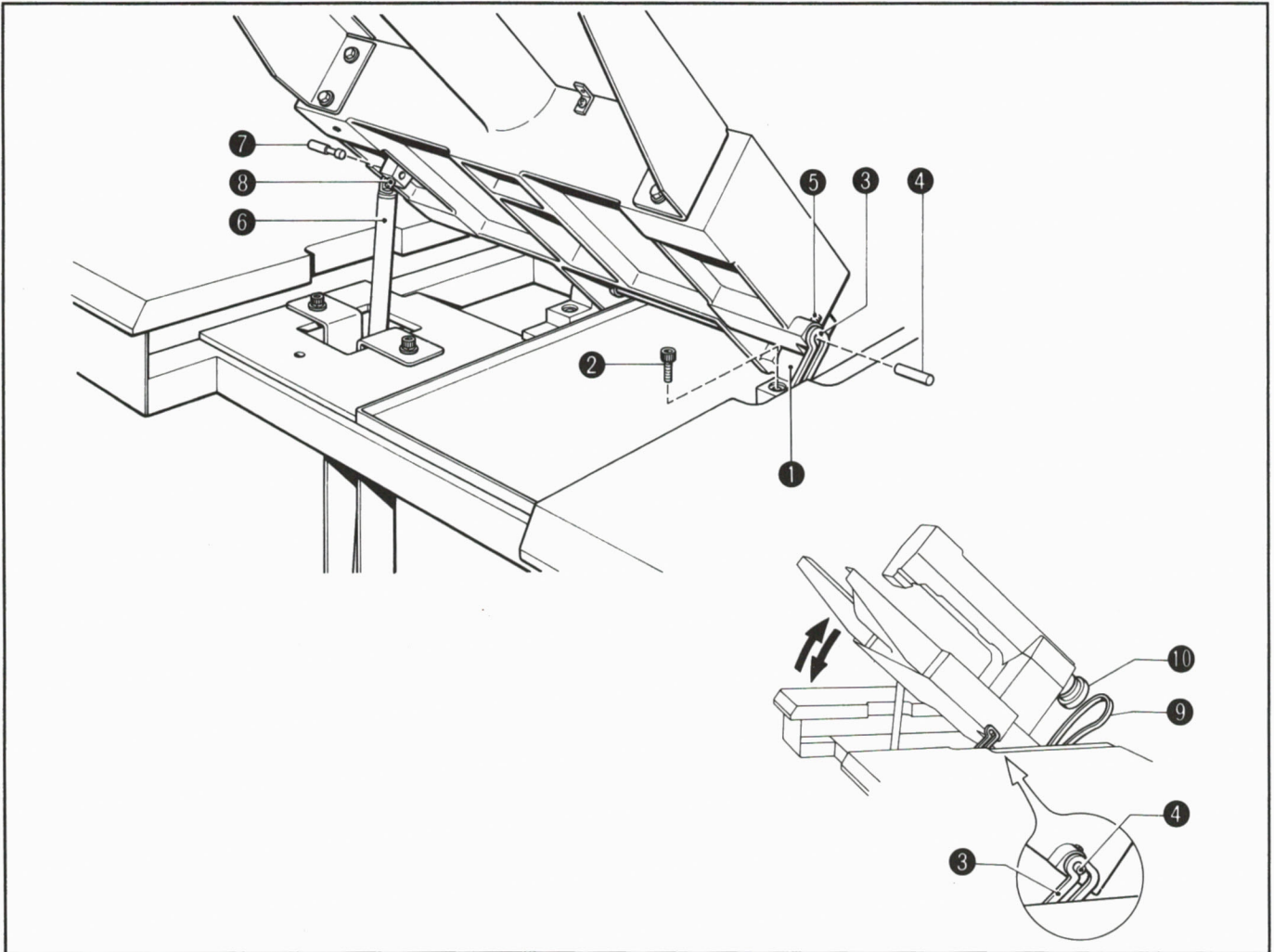
9 Longitudinal feed (Y axis) (3)



- 10) Secure the Y-home position dog assembly 13 with the screw. Inject grease into the inside of the linear bush and pass the Y-driving guide shaft 14 through the linear bush.
- 11) Temporarily attach the X-feed shaft support 15 to the Y-driving shaft 11 and Y-driving guide shaft 14 with the bolt 16 and the plain washer 17.
- 12) Temporarily attach the presser arm assembly 18 to the Y-feed bracket 5 with the bolt 19 and the plain washer 20. Temporarily secure the X-feed shaft 21 to the X-feed shaft support 15 with the set screw. Make the X-feed shaft 21 parallel to the inner linear bush hole of the presser arm assembly 18 (Refer to figure A). Then, secure the presser arm assembly 18 and the Y-feed bracket 5 with the bolt 19 and the plain washer 20.
- 13) Adjust the X-feed shaft support 15 inclination so that the inner linear bush hole of the presser arm assembly 18 and the X-feed shaft 21 are flush or concentric at any point of the sewing area. (Refer to figure B.)
Attach the Y-driving shaft 11 and the Y-driving feed shaft 14 to the X-feed support 15 with the bolt 16 and the plain washer 17.

NOTE: Check that the X-feed shaft 21 easily passes through the linear bush hole of the presser arm assembly 18 and the X-feed shaft support 15 hole.

10 Machine head



1) Place the machine head on the power table, then secure the head hinge ① with the four bolts ②.

NOTE: Do not damage electrical cords.

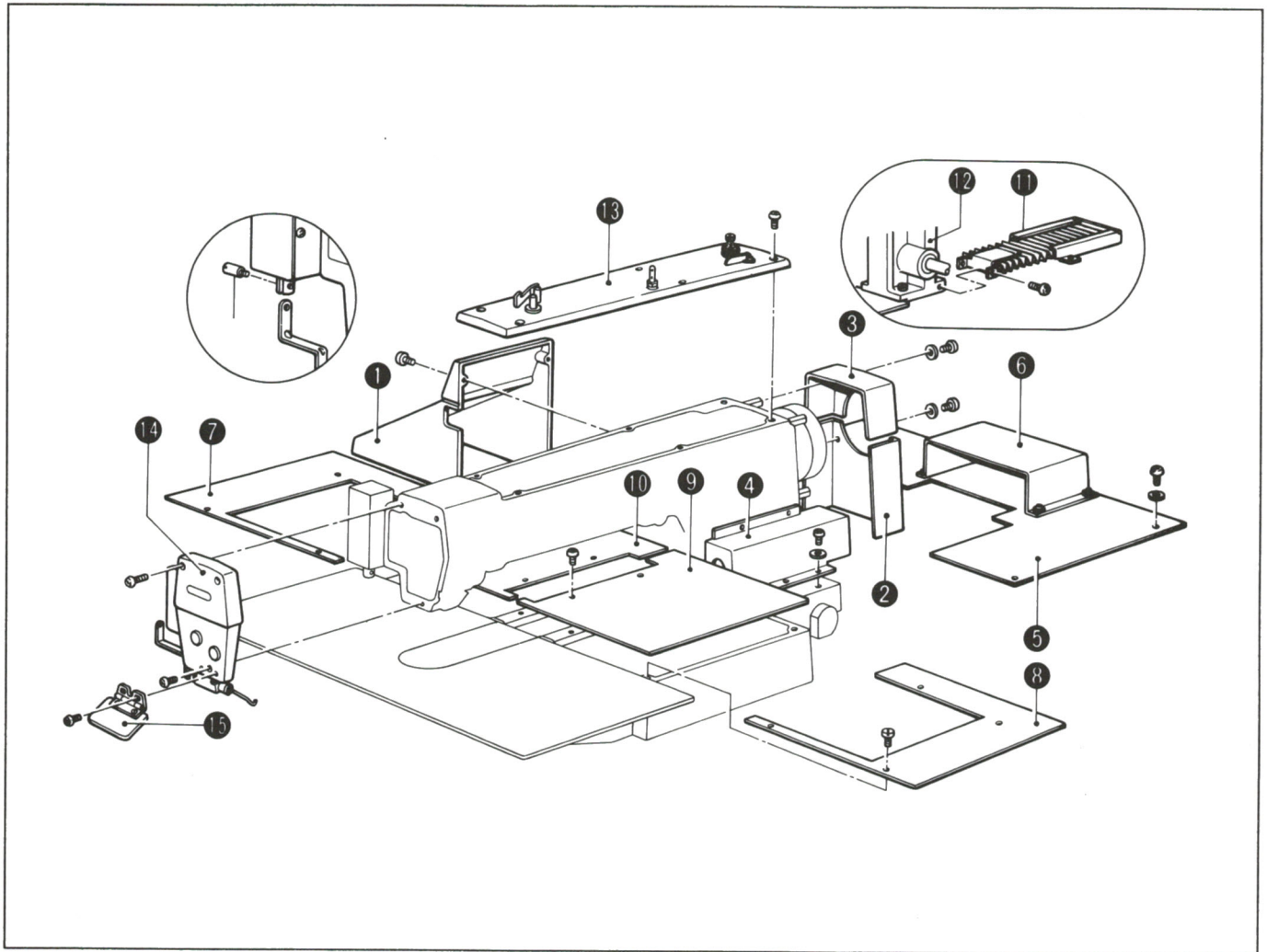
2) Tilt the machine. Raise the head support lever ③ and pass the head support shaft ④ through the arm, then tighten the set screw ⑤.

3) Set the GS spring ⑥ into the machine head and insert GS spring shaft (U) ⑦ into the hole, then tighten the set screw.

4) Attach the belt ⑨ to the pulley ⑩.

5) Return the machine head to its original position. Unlock the head support lever ③. Connect each connector to its proper position.

11 Machine covers



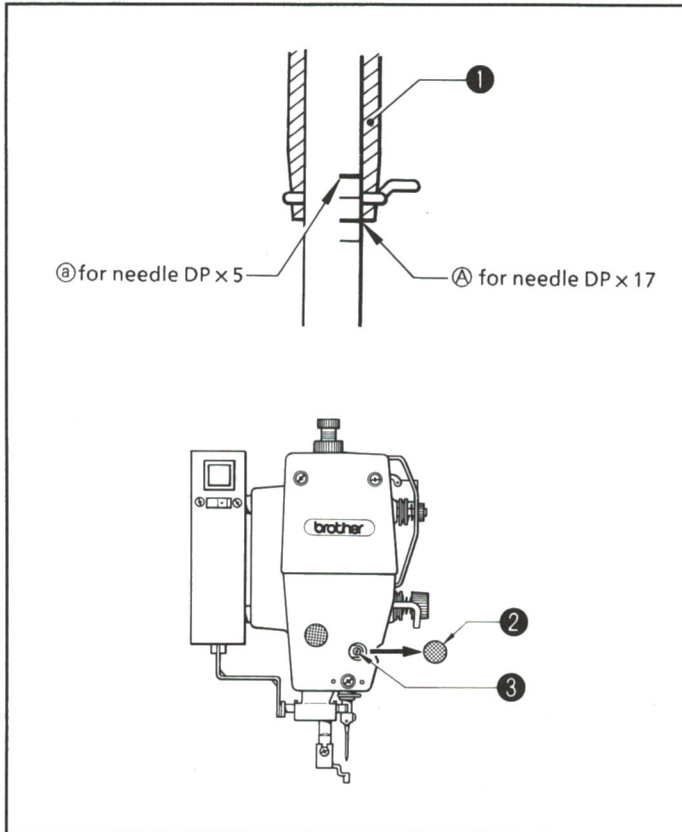
- 1) Attach the side cover ❶, belt covers (D) ❷ and (U) ❸ with the screw.
 - 2) Attach the Y-feed guide shaft cover ❹ with the screw.
 - 3) Secure the table rear cover ❺ with guide shaft cover (R) ❻ with the screw.
 - 4) Attach XY-feed base covers (L) ❽ and (R) ❾ with the screws.
 - 5) Attach X-feed bracket covers (R) ❿ and (L) ⓫ with the screws.
- NOTE: The back screws on the X-feed bracket covers (R) ❿ and (L) ⓫ should not be attached.
- 6) Secure the bellow assembly ⓬, the presser arm assembly ⓭ and the X-feed bracket covers (R) ❿ and (L) ⓫ with the screws.
 - 7) Attach the top cover ⓮ and the face plate ⓯ with their screws respectively.
 - 8) Attach the eye guard ⓰ to the face plate ⓯ with screws.

STANDARD ADJUSTMENTS

When making adjustments, gently press the pulley on the machine head to engage the stopper and turn the pulley by hand.

After adjustment, be sure to release the stopper and return the pulley to the normal operating position.

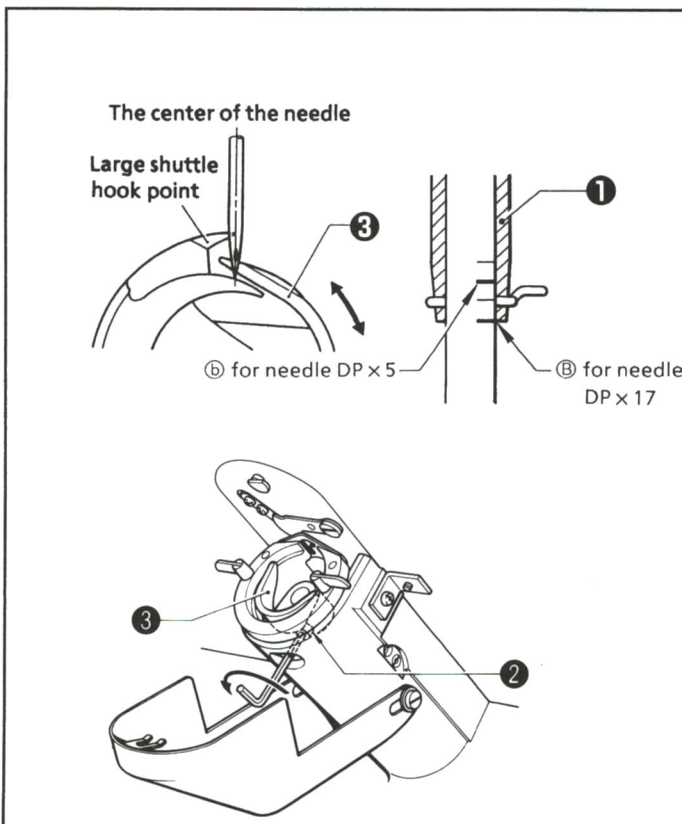
1 Needle bar height



Turn the pulley to set the needle bar to its lowest position. Remove the cap ② and loosen the screw ③. Vertically adjust the needle bar so that the second lowest reference line ① on the needle bar aligns with the bottom end of the needle bush ①.

NOTE: When using needle DP x 5, align the highest reference line ① with the bottom end of the needle bar bush ①.

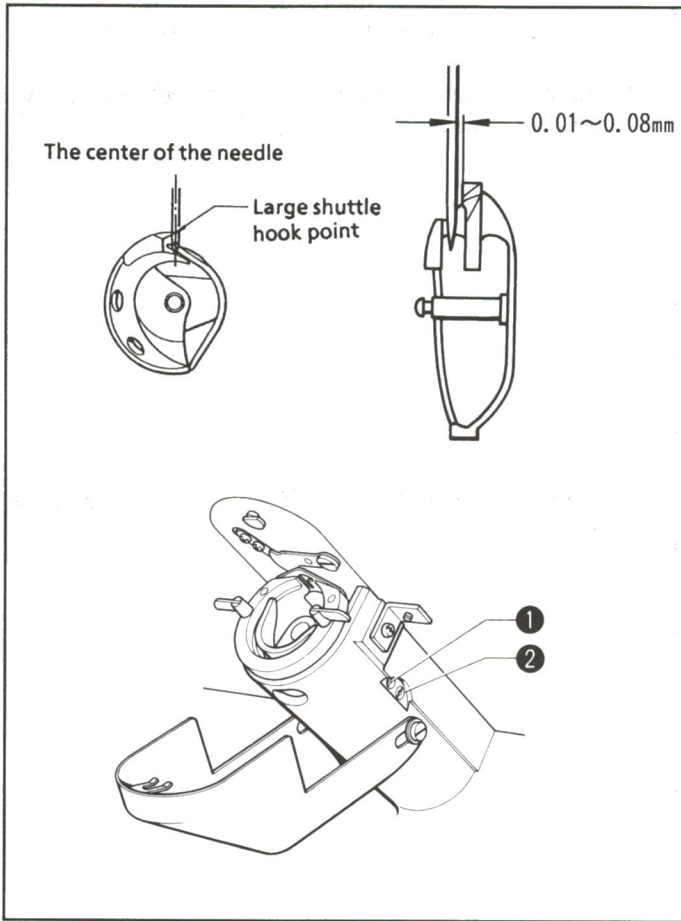
2 Needle bar lift stroke



Turn the pulley to raise the needle bar from its lowest position. Loosen the bolt ② and adjust the driver ③ so that the rotary hook point aligns with needle center when the lowest reference line ① on the needle bar aligns with the bottom end of the needle bar bush ①.

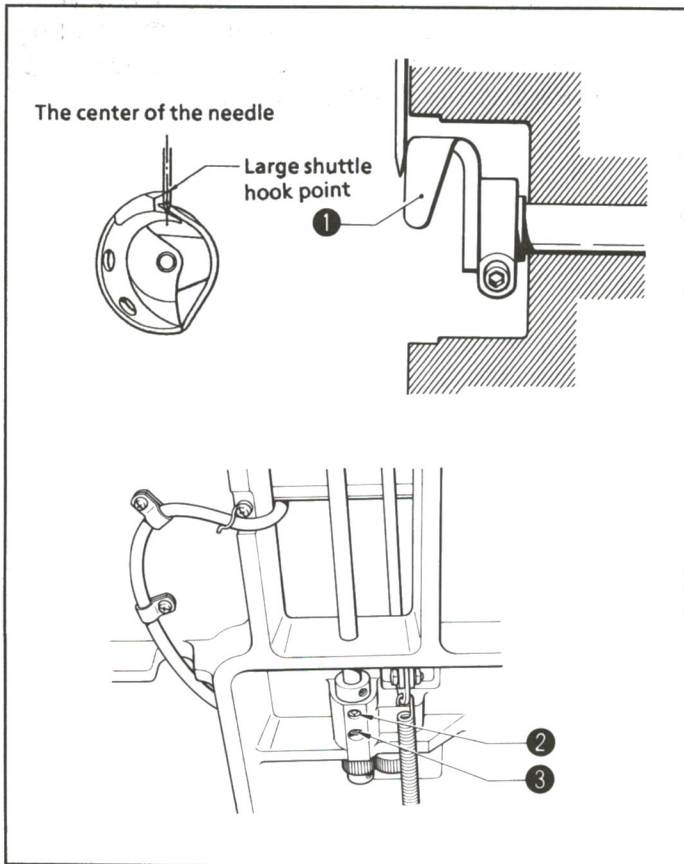
NOTE: When using needle bar DP x 5, it is when the second highest reference line ① on the needle bar aligns with the bottom end of the needle bar bush ①.

3 Gap between needle and shuttle hook point



Turn the pulley to align the shuttle hook point with the needle center. Loosen the set screw ① and turn the shuttle hook adjust stud ② to provide 0.01 mm -0.08 mm clearance between the needle and the shuttle hook point.

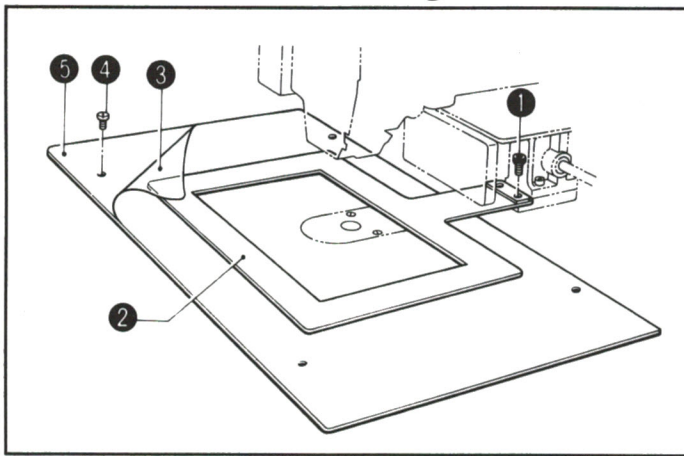
4 Needle receiver



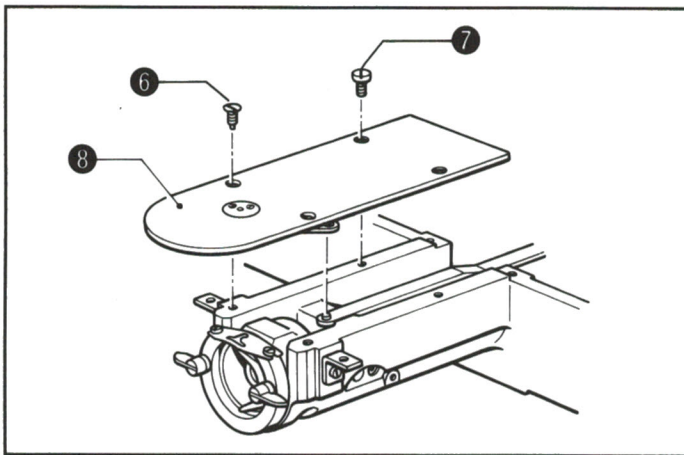
Turn the pulley to align the shuttle hook point with the needle center. Loosen the set screw ② and adjust the shuttle hook adjust stud ③ so that the driver ① is contact with the needle.

NOTE: Excessive needle-to-driver contact will result in skipped stitches. Insufficient contact may cause the shuttle hook tip to interrupt with the needle, resulting abnormal wear.

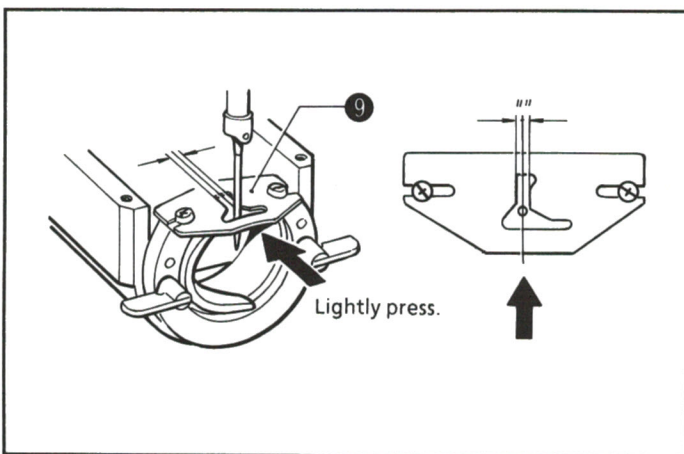
5 Shuttle race thread guide



- 1) Remove the screw ① and the feed plate ②.
- 2) Remove the auxiliary plate sheet ③, the screw ④ and the needle sub plate ⑤.

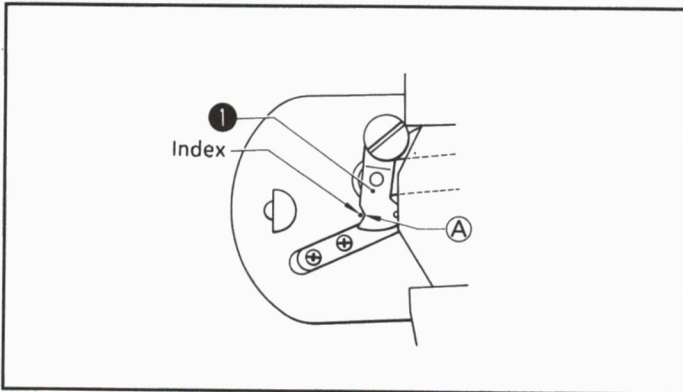


- 3) Remove the screws ⑥, ⑦ and the needle plate ⑧.

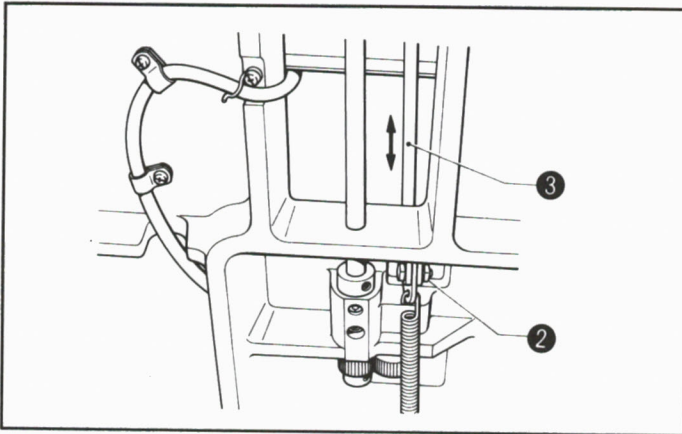


- 4) Adjust the shuttle race thread guide ⑨ so that the needle is centered in the needle groove of the shuttle race thread guide ⑨. Lightly pressing the shuttle race thread guide ⑨ inward, secure it with the screw.

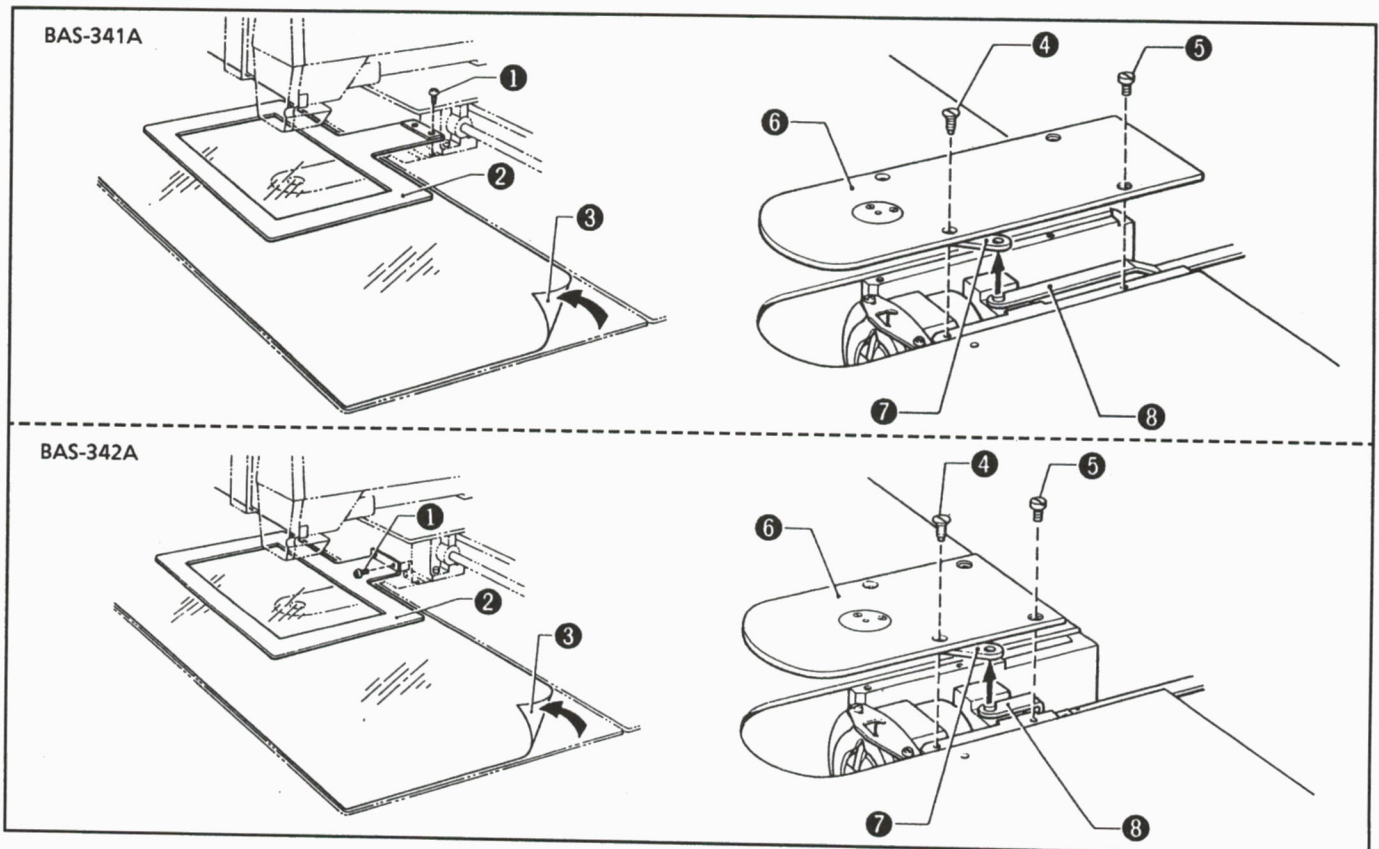
6 Movable knife



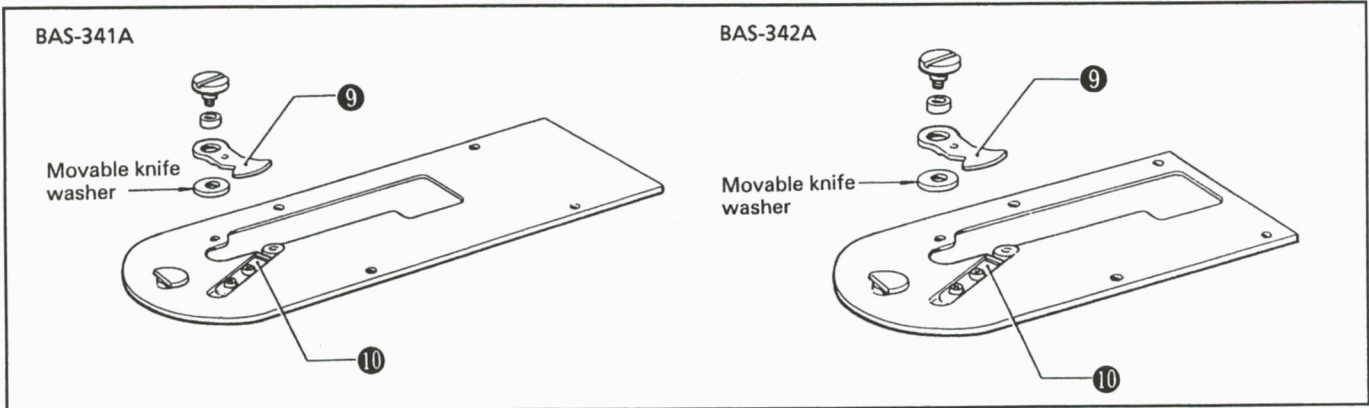
Loosen the nut ②. Vertically adjust thread trimmer rod (L) ③ so that V notch ④ of the movable knife ① aligns with the index on the needle plate when the machine is stopped.



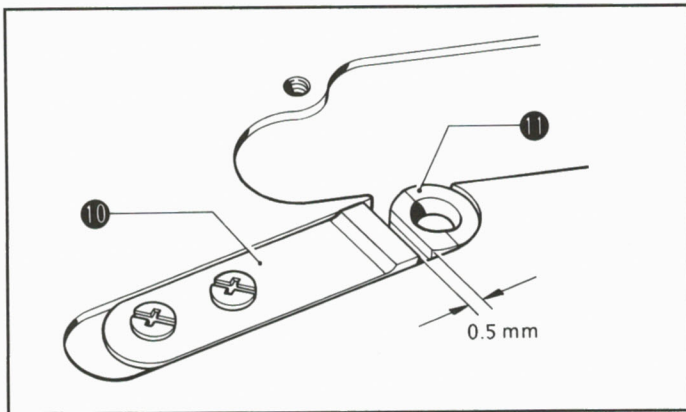
[Replacing the movable and fixed knives]



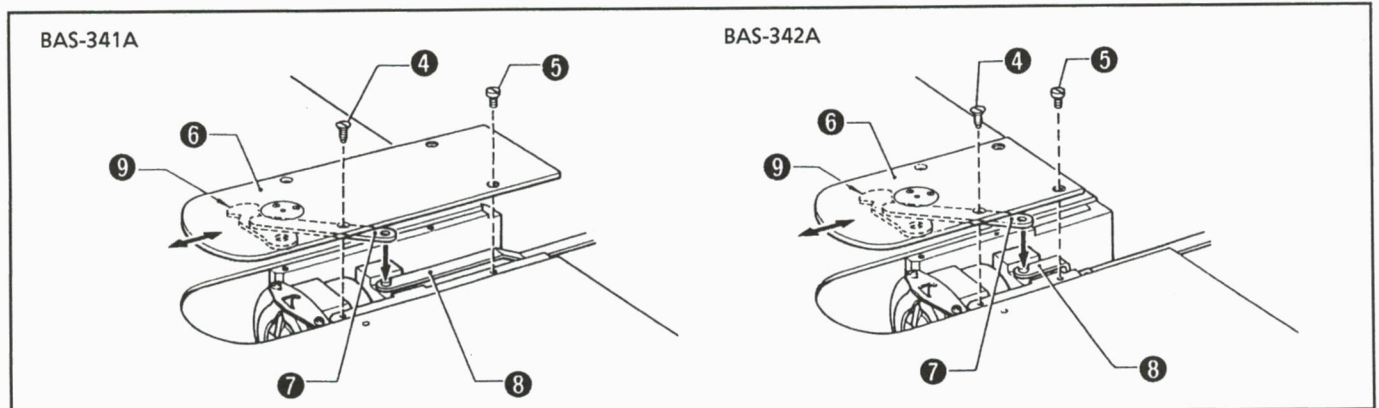
- 1) Remove the screws ① and the feed plate ②. Then tear off the auxiliary plate sheet ③. Remove screws ④ and ⑤, and needle plate ⑥. Now disconnect the thread cutter connecting rod ⑦ from thread trimmer connecting rod (L) ⑧.



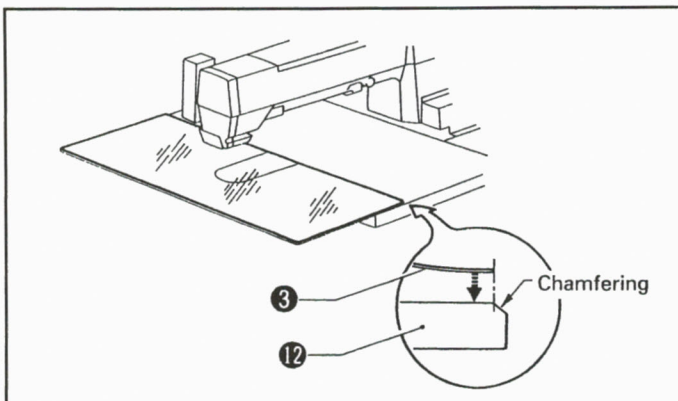
- 2) Remove the movable knife, and replace it with a new movable knife. Now check the cutting edge of the movable knife 9 and the fixed knife 10. If necessary, use the provided movable knife washer (T = 0.4, T = 0.5, T = 0.6) to adjust the knives so that they cut properly.



- 3) Attach the fixed knife 10 0.5 mm away from the needle hole plate 11.



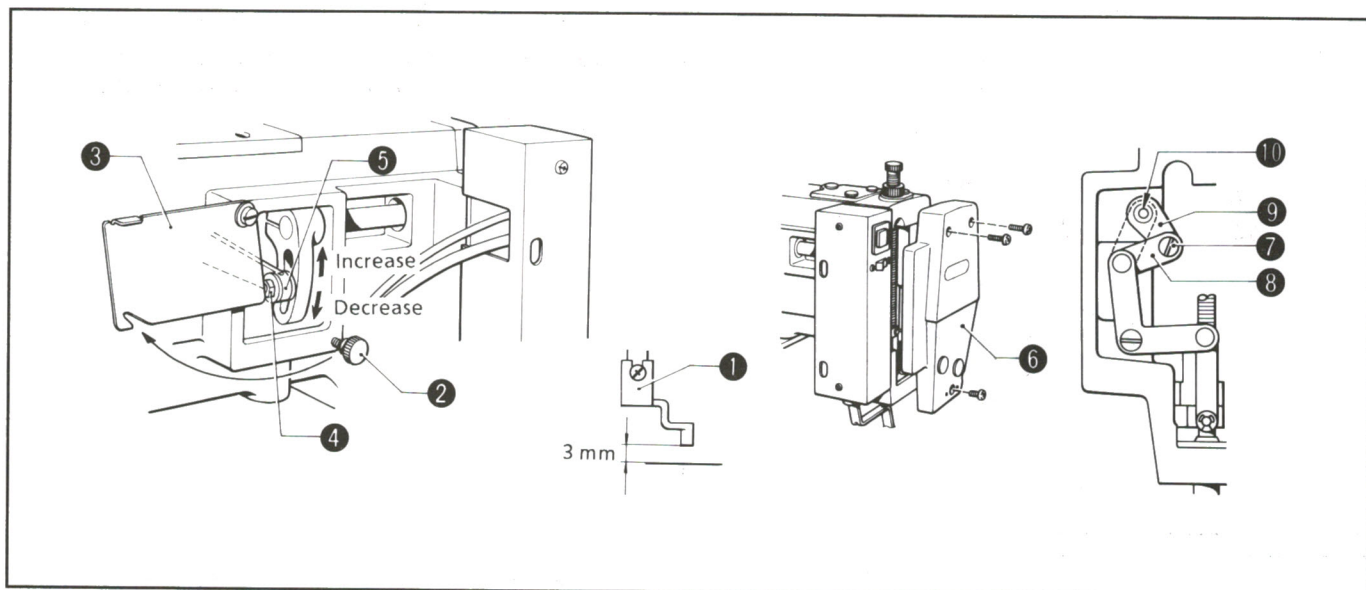
- 4) Fit the thread cutter connecting rod 7 on connecting lever pin 8, and install needle plate 6.
 ※ When fitting the connecting rod 7 on the connecting lever pin 8 and before tightening screws 4 and 5, move the needle plate back and forth a little bit to confirm that the movable knife 9 is pulled by the connecting rod 7.



- 5) Stick the auxiliary plate sheet 3.
 When sticking, adjust the edge of auxiliary plate sheet to the ridgeline in the rear chamfering of needle sub plate 12.
 ※ One month is a standard to replace the sheet.

7 Presser foot stroke

The standard lift stroke of the presser foot ① is 3 mm. (max. 8 mm)



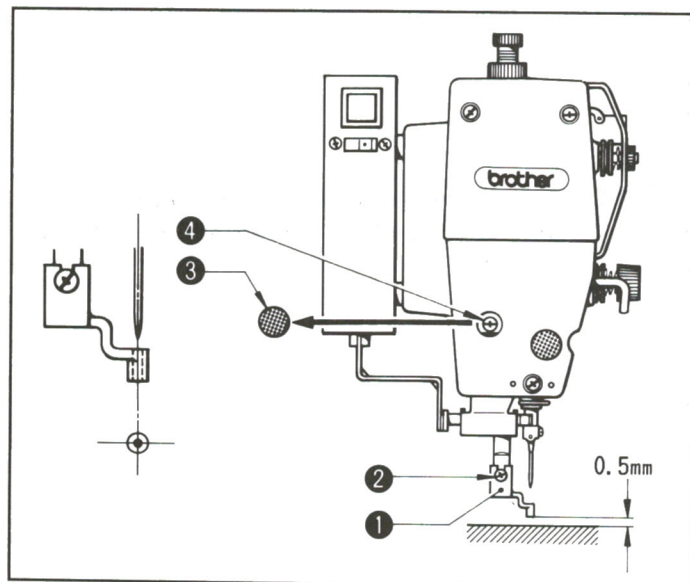
<How to adjust work clamp stroke>

- 1) Loosen the stud screw ② and open the intermittent cover ③.
- 2) Loosen the nut ④ and adjust the position of the intermittent presser connecting rod ⑤.
(When the intermittent presser connecting rod is at the upper position, the lift stroke will increase. When at the lower position, it will decrease.)

<If no vertical movement of the work clamp is required>

- 1) Remove the face plate ⑥.
- 2) Remove the stud screw ⑦ and re-attach the intermittent connecting rod ③ to the screw hole ⑩ at the end of intermittent presser arm (R) ⑧.

8 Presser foot

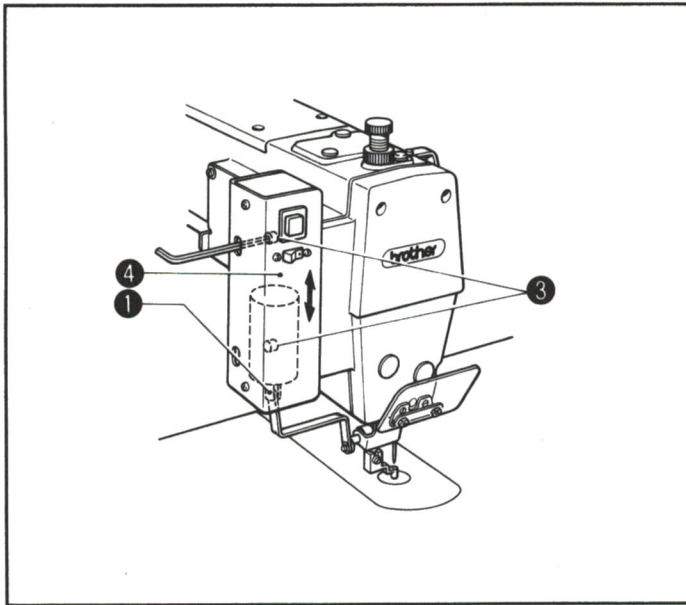


- 1) Loosen the screw ②. Adjust the space between the bottom surface of the presser foot ① and the material so that it is approx. 0.5 mm when the pulley is turned until the needle bar is at its lowest position.

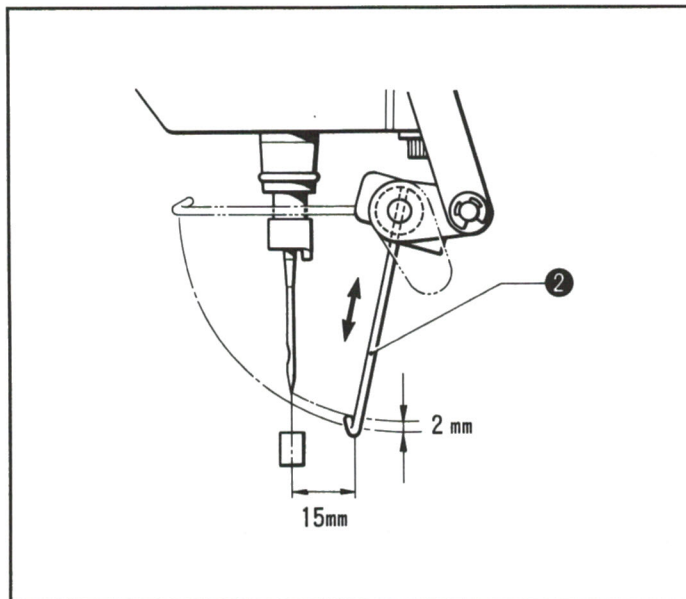
NOTE: When the work clamp is too low, the material will slip during sewing. When too high, skipped stitches will occur.

- 2) Turn the pulley by hand. Check if the needle enters into the needle hole center of the presser foot ①. If the needle does not enter into the needle hole center, remove the oil cap ③, loosen the screw ④ and adjust the presser foot (or presser bar).

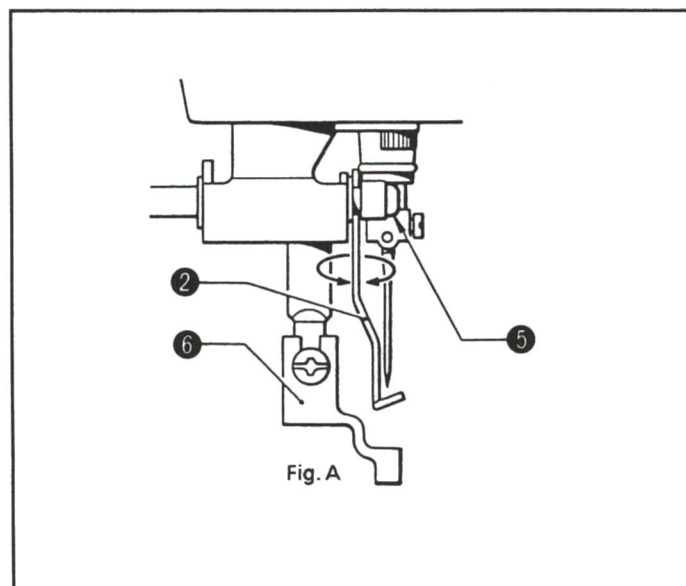
9 Thread wiper



- 1) When the plunger ① of the thread wiper solenoid is fully retracted, loosen the screw ③ and shift the entire solenoid setting plate ④ vertically so that the thread wiper ② is 15 mm away from the needle center towards the front of the machine.

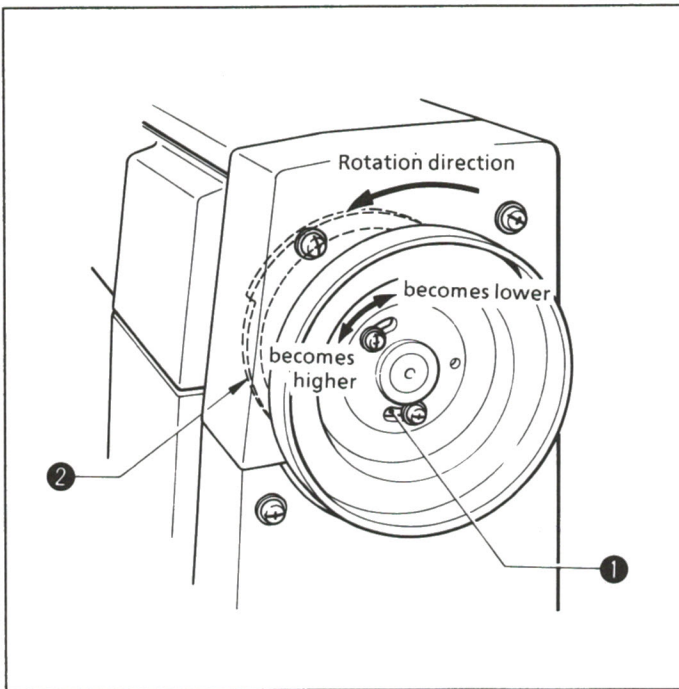


- 2) Operate the thread wiper ② so that it aligns with the needle bar center. Loosen the screw ⑤ and move the thread wiper ② to provide approximately 2 mm clearance with the needle tip.



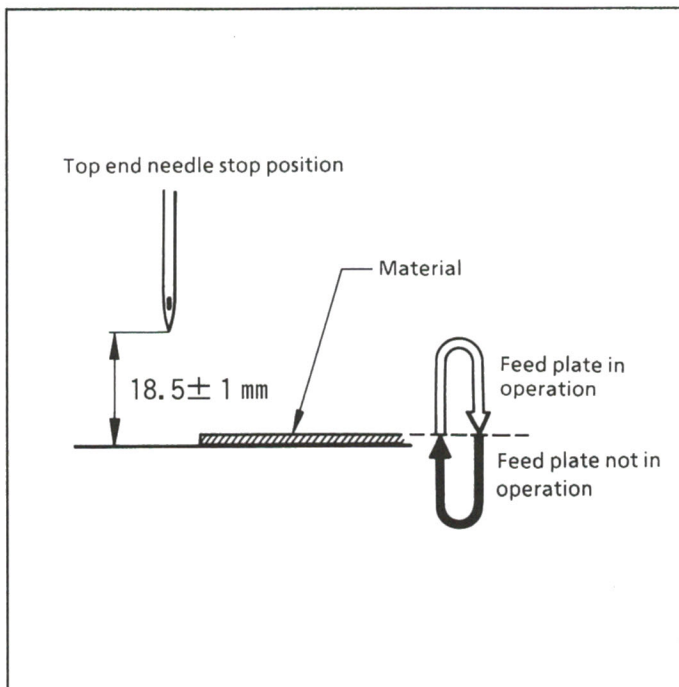
- 3) Check that the thread wiper ② does not strike the presser foot ⑥ or the needle as illustrated in figure A.

10 Needle stop position and work feeding timing



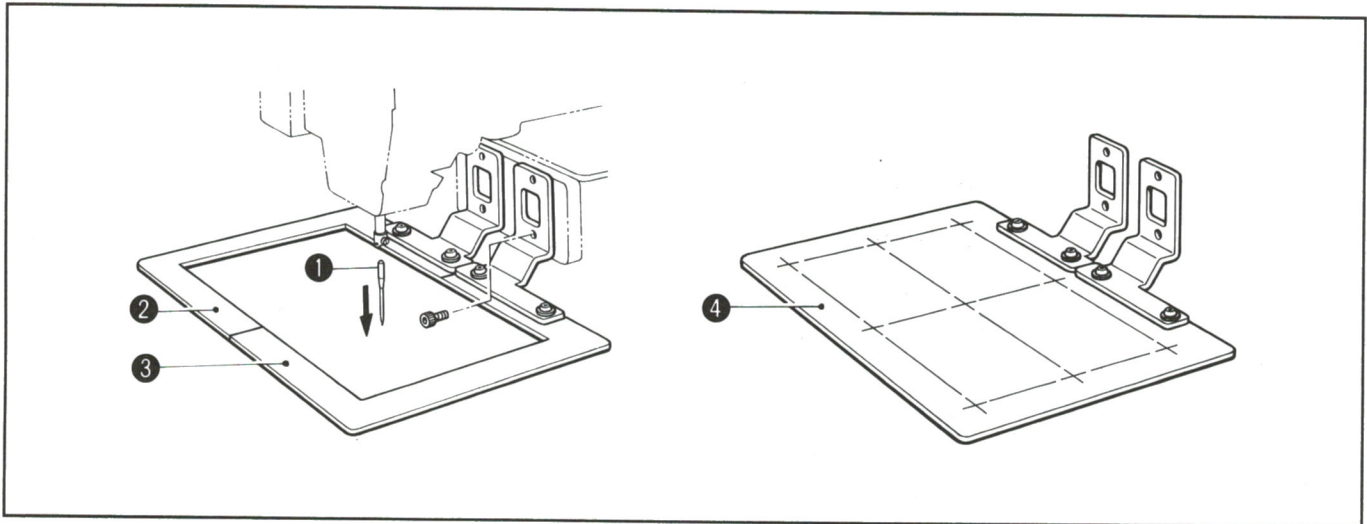
Adjust the needle upper plate ❶ so that the needle tip comes to a stop 19 mm away from the needle plate top.

NOTE: The timing between the needle and the feed mechanism is adjusted with the synchronizer ❷ so that the feeding operation starts after the needle has come out of the material and stops before the needle enters the material.



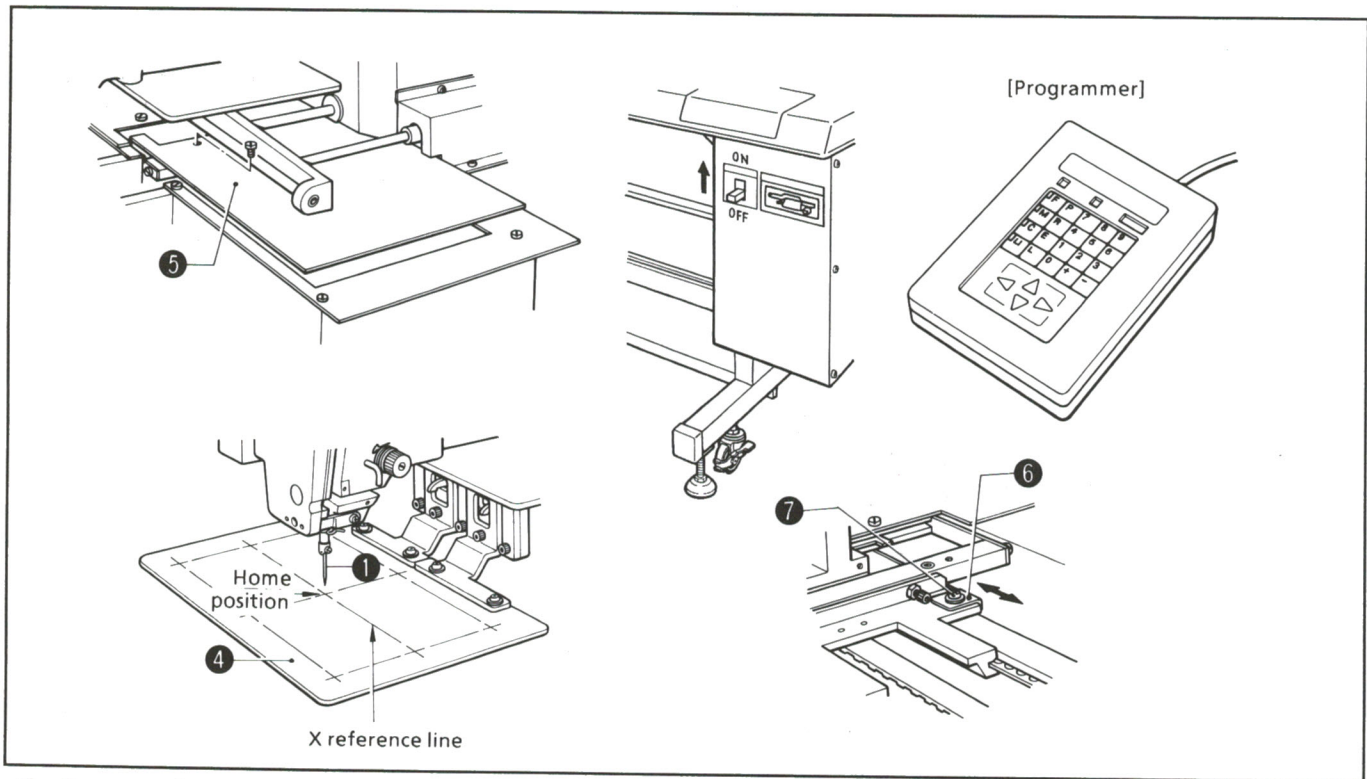
Turning the needle upper plate ❶ clockwise will lower the stop position; turning it counterclockwise will raise it.

11 Home position (1)



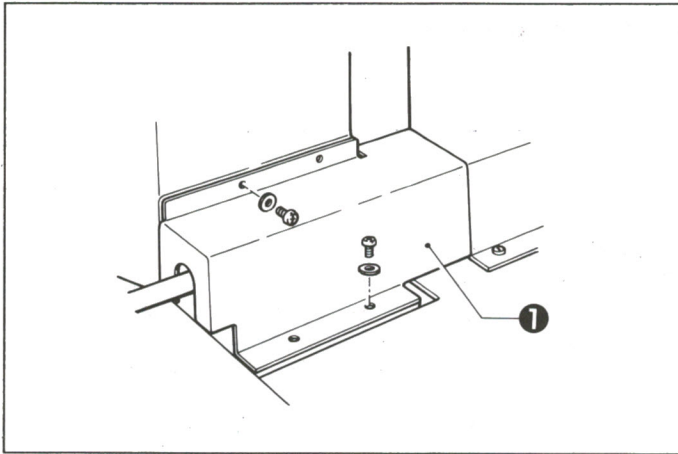
- 1) Remove the needle ①, work clamps (SEL) ② and (SER) ③.
- 2) Attach the home position standard plate ④ with the bolts.

[Adjustment of X axis]



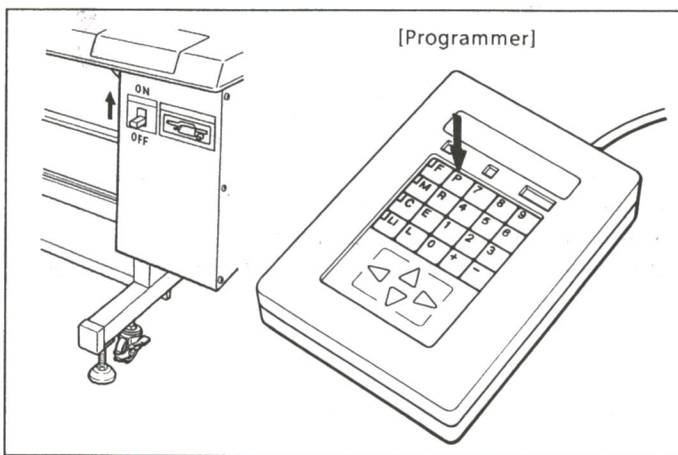
- 1) Remove the screw and X-feed bracket cover (R) ⑤.
- 2) Turn on the power switch.
- 3) Press the P key on the programmer device.
- 4) Attach the needle ①.
- 5) Turn the pulley to approach the needle ① to the home position standard plate ④.
- 6) Loosen the screw ⑦ of the X-home position dog ⑥ and horizontally adjust the X-home position dog ⑥ so that the needle ① tip aligns with the home position on the home position standard plate ④.

11 Home position (2)

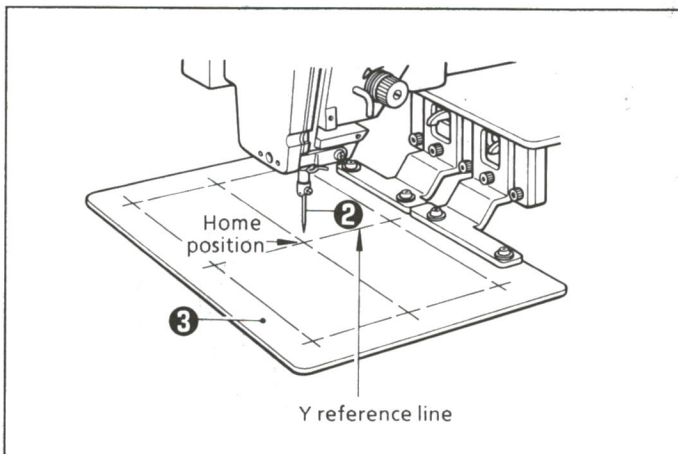


[Adjustment of Y axis]

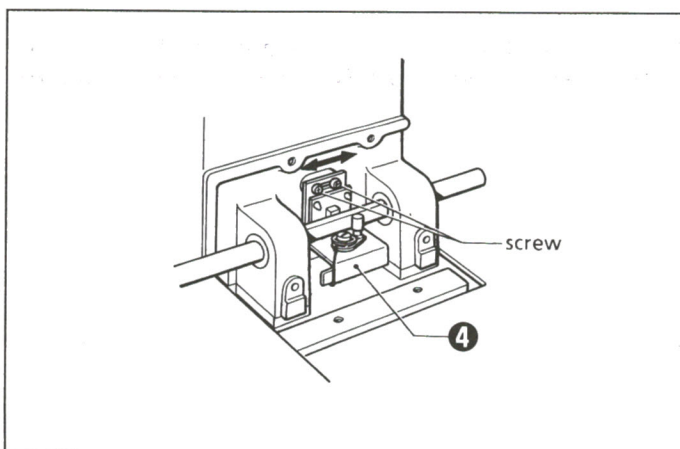
- 1) Remove the Y-feed guide shaft cover ①.



- 2) Turn on the power switch.
- 3) Press the **P** key on the programmer device.



- 4) Attach the needle ②.
- 5) Turn the pulley to approach the needle ② to the home position standard plate ③.

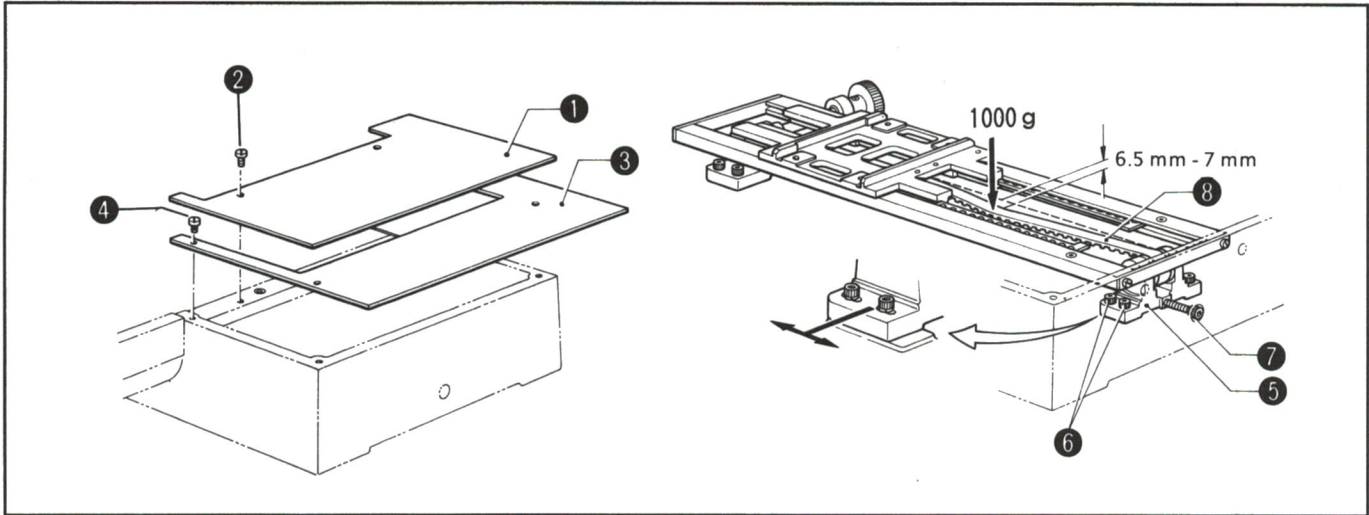


- 6) Horizontally adjust the Y-home position dog ④ so that the needle ② tip aligns with the home position on the home position standard plate ③.

12 Tension of timing belt

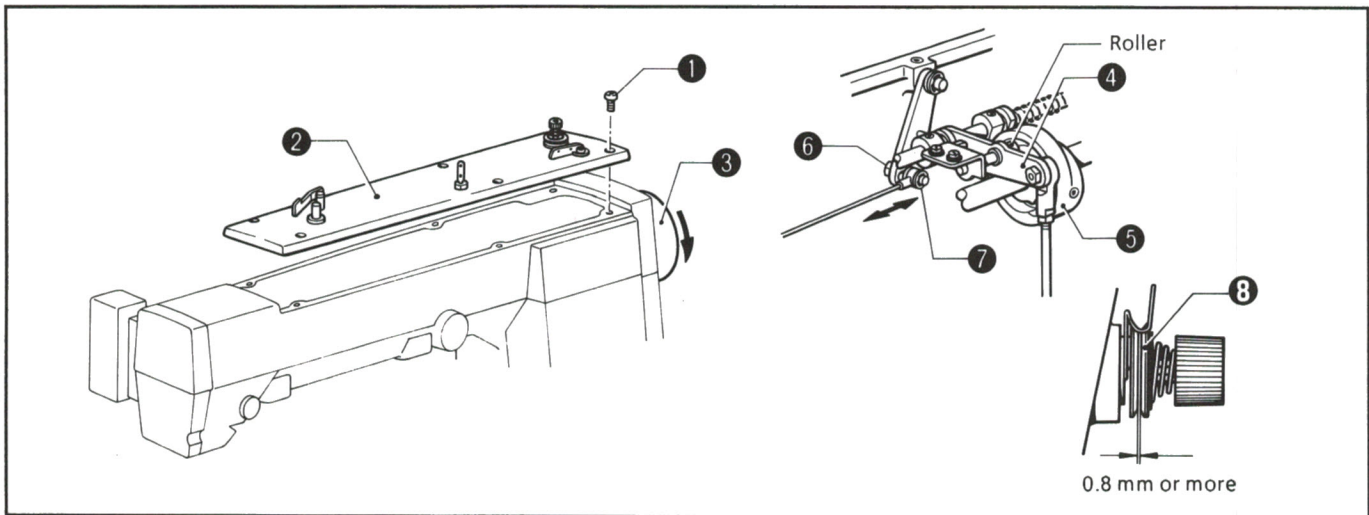
NOTE: After adjusting the tension of timing belt, check the home position.

[Adjustment of X-timing belt]



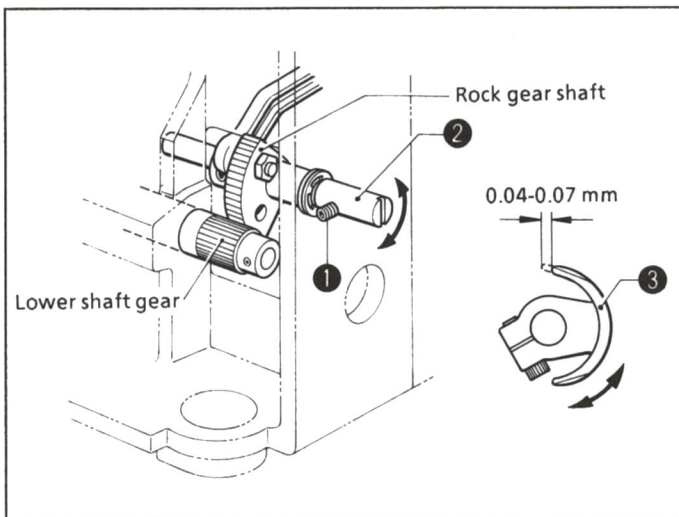
- 1) Remove the screws ② · ④, X-feed bracket cover (R) ① and XY-feed base cover (R) ③.
- 2) Loosen the bolt ⑥ on X-pulley base (R) ⑤, then adjust X-pulley base (R) ⑤ with the bolt ⑦.
- 3) Apply a vertical load of approximately 1000 g at the center of the X-timing belt ⑧ so that the belt deflection is approximately 6.5 mm to 7 mm.

13 Tension release



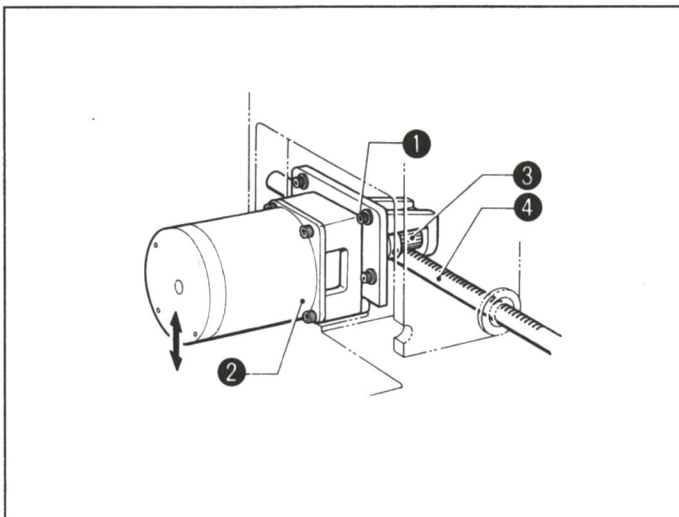
- 1) Remove the screw ① and the top cover ②.
- 2) Turn the pulley ③ to set the roller of the thread trimmer driving lever ④ into the groove of the thread trimmer cam ⑤. Loosen the nut ⑥ and move the tension release wire shaft ⑦ backwards and forwards to provide 0.8 mm or more clearance of the tension disc ⑧.

14 Backlash



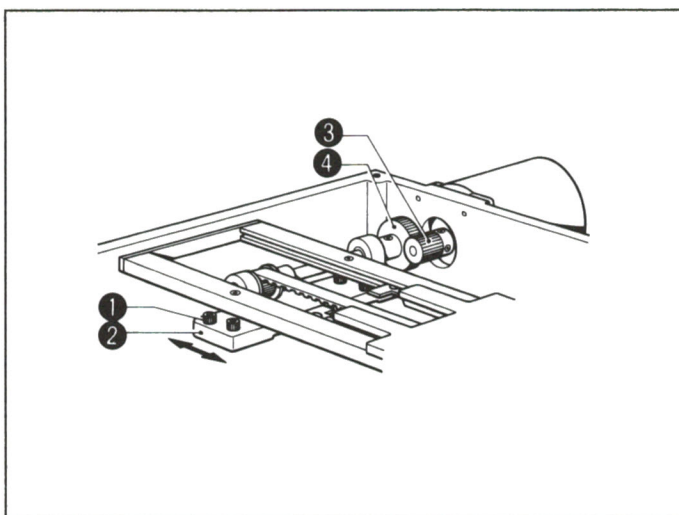
<Lower shaft>

- 1) Tilt the machine.
- 2) Loosen the set screw ①, then turn the rock gear shaft ② to provide 0.04 mm to 0.07 mm slack at the tip of the driver ③.



<Y-axis feed>

Loosen the four bolts ① and vertically adjust pulse motor (Y) ② so that there is no backlash between the rock gear shaft ③ and Y-driving shaft ④.

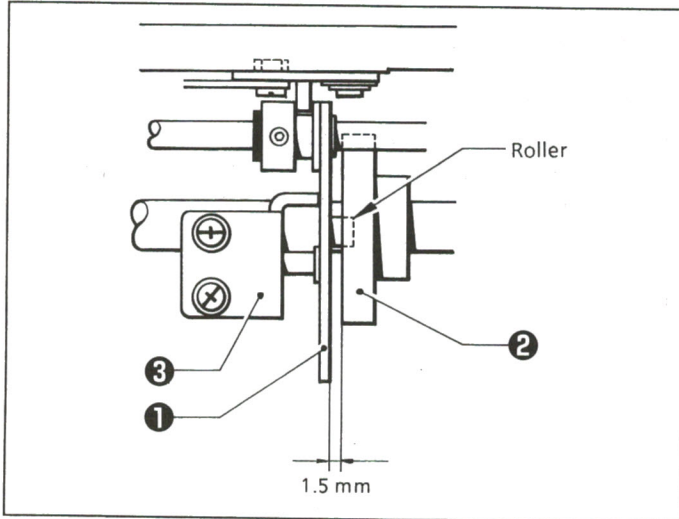


<X-axis feed>

Loosen the four bolts ① and horizontally adjust X-pulley base (L) ② so that there is no backlash between the driving gear ③ and the idle gear ④.

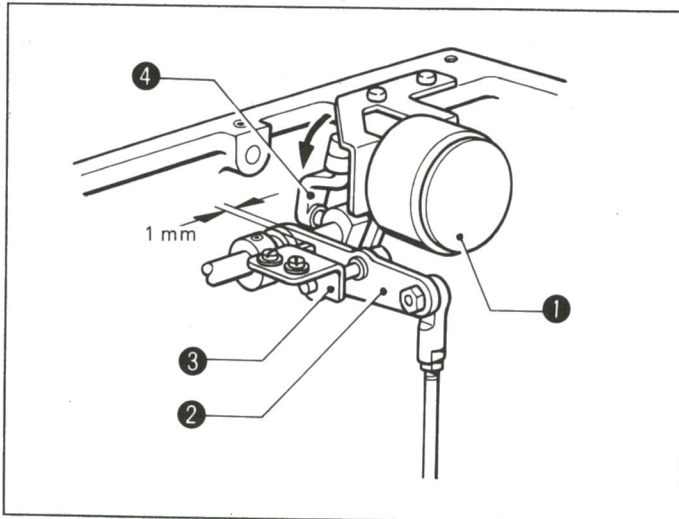
NOTE: When this adjustment is completed, be sure to check and adjust the tension of the X-timing belt.

15 Thread trimmer cam position



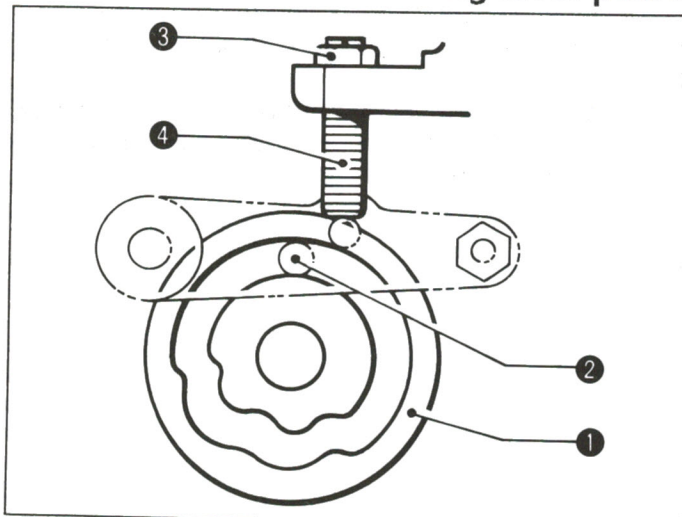
- 1) Fit the roller of the thread trimmer driving lever ① into the groove of the thread trimmer cam ②, then turn the pulley.
- 2) Vertically adjust the thread trimmer cam ② to provide 1.5 mm clearance with the thread trimmer driving lever ① when the thread trimmer driving lever ① returns to its original position to touch the driving lever stopper ③.

16 Solenoid lever position



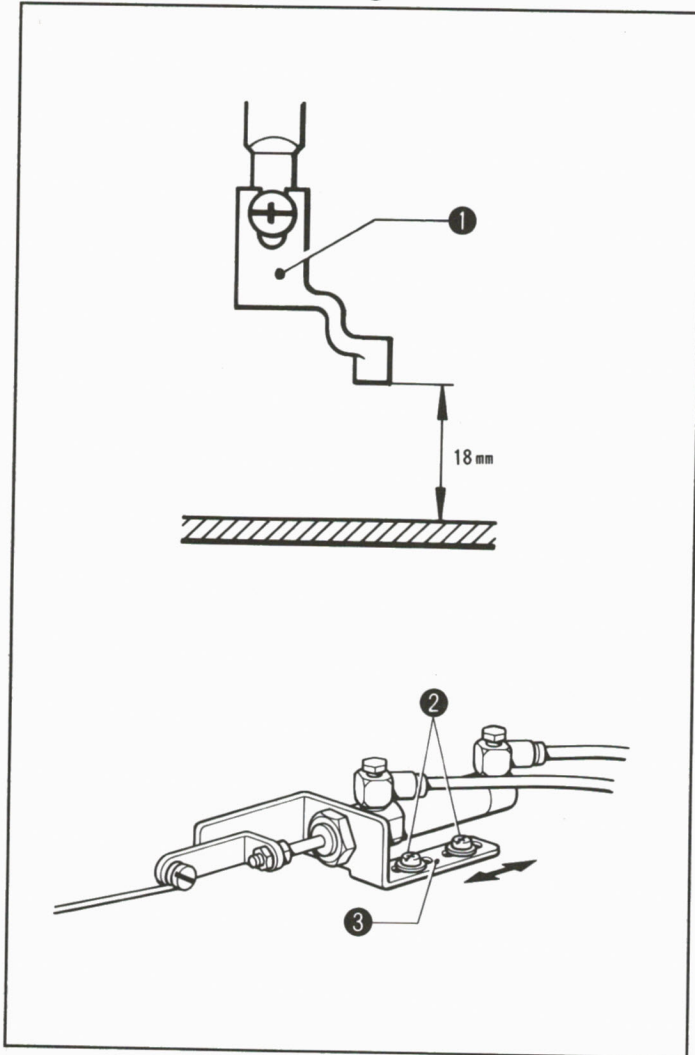
Fully turn the plunger of the thread trimming solenoid ① in the direction of the arrow, then adjust the solenoid lever ④ so that there is a 1 mm clearance between the thread trimming driving lever ② and driving lever stopper ③.

17 Thread trimmer driving lever position



- 1) Turn the pulley to place the thread trimmer cam ① with its large curved groove up.
- 2) Set the roller ② of the thread trimmer driving lever into the groove of the thread trimmer cam ①, loosen the nut ③ and adjust the adjust screw ④ so that the roller of the thread trimmer driving lever smoothly returns to its original position.

18 Presser foot height



- 1) Turn the pulley to set the needle at its lowest position.
- 2) Loosen the screw ② and adjust the cylinder bracket ③ backwards and forwards so that the presser foot ① is raised 18 mm above the needle plate.

NOTE: At this time, set the intermittent stroke to its minimum (3 mm).

ELECTRICAL CHECK AND DIP SWITCH

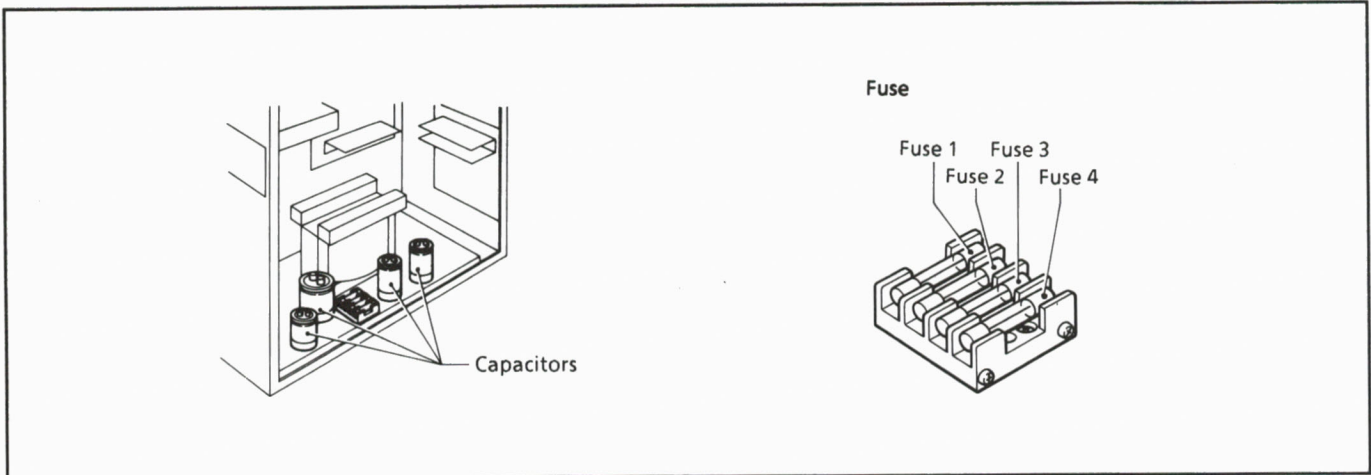
Warning

NEVER touch four large-sized capacitors inside the control box (see the illustration below). The high-voltage residual charges stay for a minimum of 1 - 2 minutes after the power is turned off.

Cautions

- * During checking or repair work when the power is applied, take care not to short -circuit terminals.
- * Check if the cooling fan in the control box works correctly. If it stops, electronic parts and devices may be damaged due to high temperature inside the control box. To prevent the air vents from being choked with dust, clean them at regular intervals.

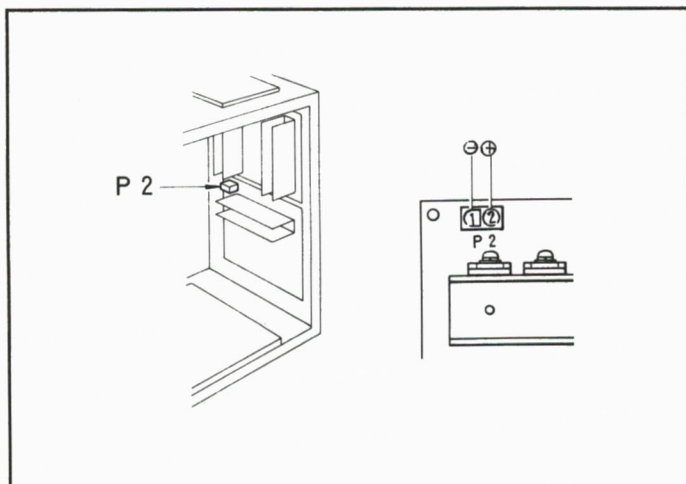
1 Fuses



NOTE: When replacing the fuses, be sure to use the specified ones listed below.

No.	Part name	Part code	Manufacturer	Problem
1 (see NOTE)	G fuse 5AFB (Quick melting type, 5A-250V)	S08030-000	Toyo Fuse Company TOYO 5A	The machine motor does not turn.
2	Fuse 15A (Glass tube fuse, 15A-125V)	S02887-000	Fuji Tansi Company FUJI 15A	The feed plate and work clamp do not operate.
3	Fuse 5A (Glass tube fuse, 5A-125V)	152565-000	Fuji Tansi Company FUJI 5A	The power lamp does not come on and no operation occurs.
4	Fuse 2A (Glass tube fuse, 2A-125V)	152566-000	Fuji Tansi Company FUJI 2A	The work clamp does not operate.

NOTE: Prior to replacing fuse 1, be sure to check the pulse motor drive (PMD) PCB.



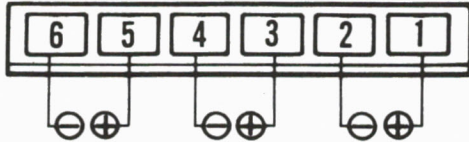
Measure the resistance between the ⊕ and ⊖ terminals.

- If $10\text{K}\Omega$ - $30\text{K}\Omega$: it is normal. (by $1\text{K}\Omega$ range)
- If 0Ω or ∞ : Replace the pulse motor drive (PMD) PCB, instead of replacing fuse 1.

2 Voltage measurement

1. Checking the control voltage

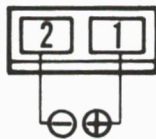
Turn on power while connecting the connector P1 to the control PCB, then measure the voltages between pins 1 and 2, 3 and 4, and between 5 and 6 of connector P1.



Check points of P1 on the control PCB	Acceptable value
Between pins 1 and 2	Approx. 65 Vdc Approx. 8.5Vdc Approx. 0.25 Vdc
Between pins 3 and 4	
Between pins 5 and 6	

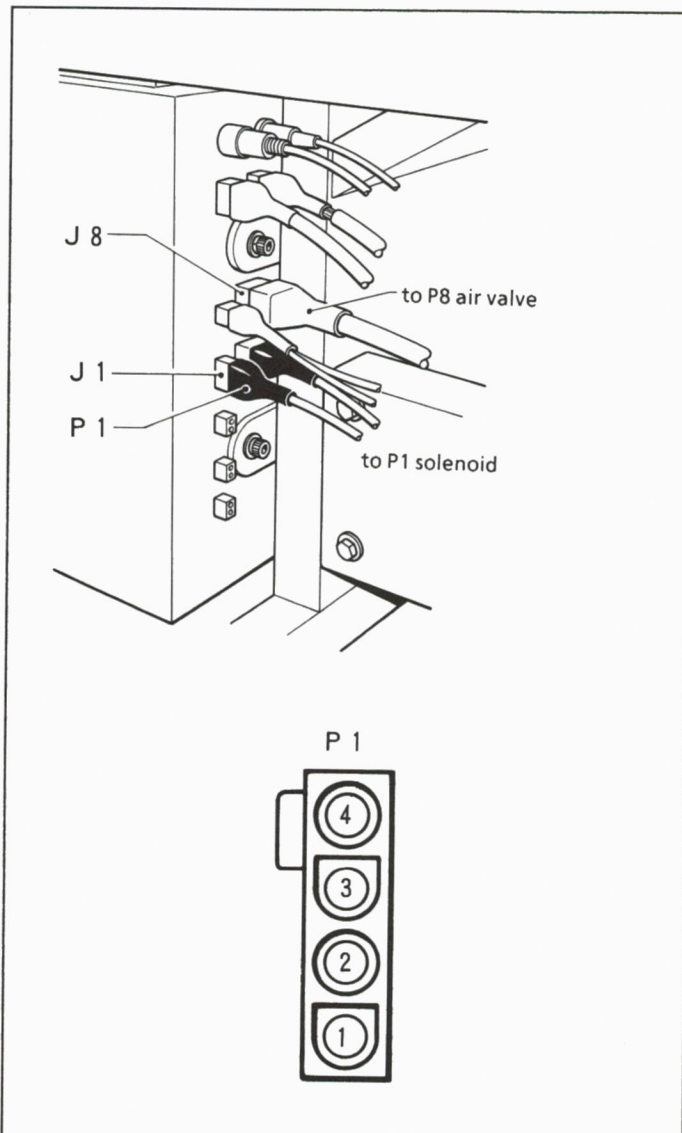
2. Checking the +5V source

Turn on power while connecting the connector P12 to the control PCB, then measure the voltage between pins 1 and 2 of connector P12.



Check points of P12 on the control PCB	Acceptable value
Between pins 1 and 2	5 ± 0.25 Vdc

3. Checking solenoids' voltages



- 1) Turn the power switch OFF. Disconnect connector P1 from J1, then measure each solenoid resistance.

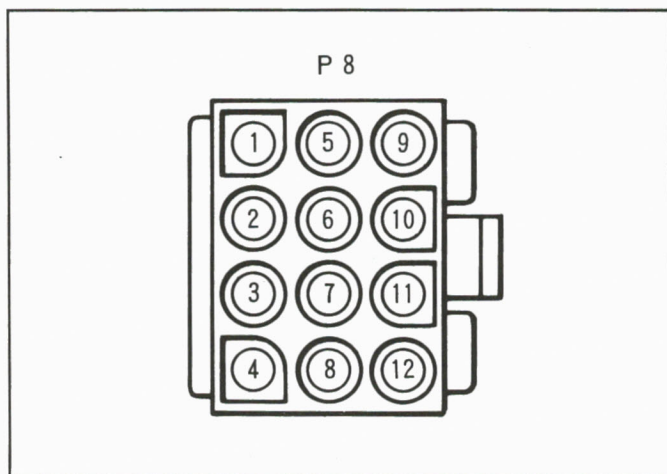
Check points	Solenoid	Acceptable value
Between pins 1 and 2	Thread trimming solenoid	Approx. 10Ω
Between pins 3 and 4	Thread wiper solenoid	Approx. 6Ω

- 2) Insert P1 into J1, then turn the power switch ON. Insert the test probe from the lead wire side and measure the voltage.

Check points	Solenoid	Acceptable value
Between pins 1(+) and 2(-)	Thread trimming solenoid	60V
Between pins 3(+) and 4(-)	Thread wiper solenoid	60V

The indicator should oscillate instantly after sewing.

4. Checking air valve's voltage



- ① Presser plate (R) valve
- ② Presser plate (L) valve
- ③ Work clamp valve
- ④ Inner clamp valve
- ⑤ Optional valve 1
- ⑥ Optional valve 2
- ⑦ Optional valve 3
- ⑧ Needle cooler valve

⑩ + 24V

⑪ + 24V

NOTE: ④ to ⑧ are optionals.

- 1) Turn the power switch OFF . Disconnect connector P8 from J8, then measure the resistance of each valve.
Resistance of each valve (from ① · ② · ③ to ⑩) should be approx. 300Ω.
- 2) Connect connector P8 to J8, then turn the power switch ON.
Insert the test probes into connector P8 from the lead wire side, then measure the voltages.

Check points	Acceptable value
Between pins 1(-) and 10(+)	0.1V - 24V
Between pins 2(-) and 10(+)	0.1V - 24V
Between pins 3(-) and 10(+)	0.1V - 24V

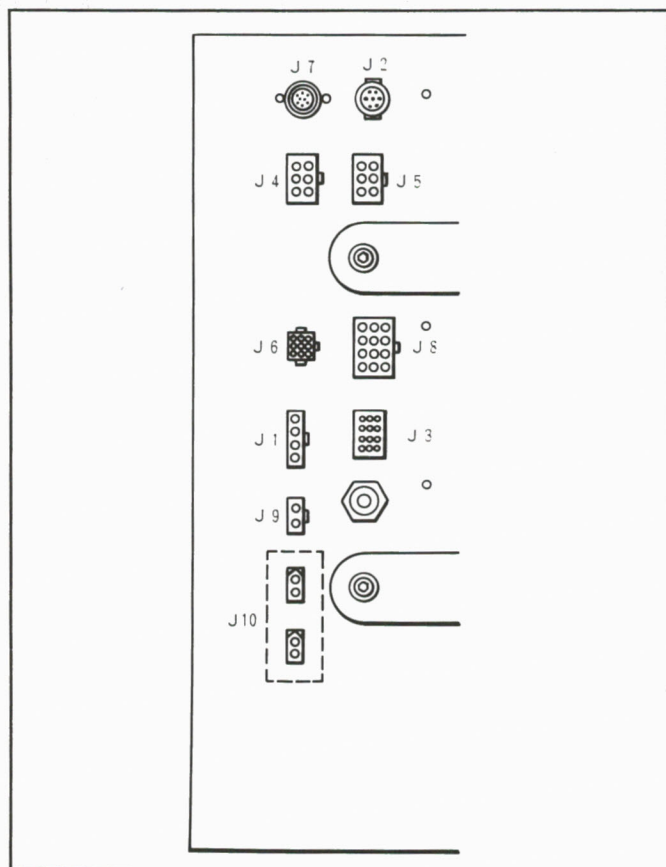
When the work clamp pedal is treadled, each reading should be max. 24V / min. 0.1V.

- 3) When the optional valve is used:

Measure the resistance between each valve and ⑩. (Refer to step 1.)

Measure the resistance between each valve (-) and ⑩ (+) when each valve operates. (Refer to step 2.)

3 Control box

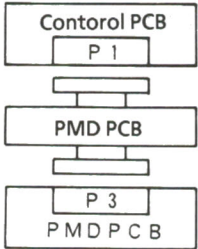
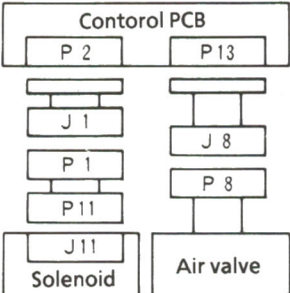
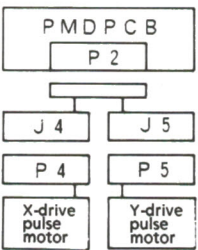
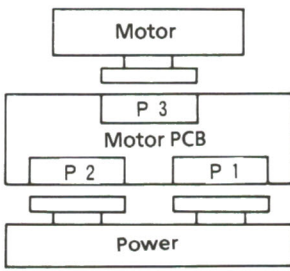
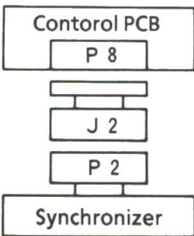


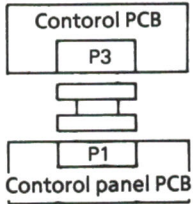
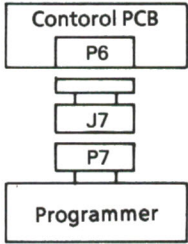
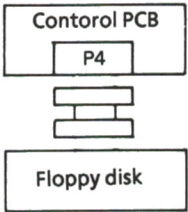
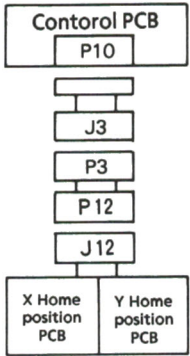
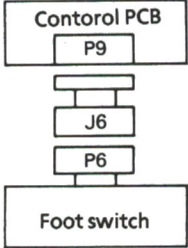
- J1 : Solenoid connector
- J2 : Synchronizer connector
- J3 : Connector for emergency stop, zero-point signal and thread breakage detection
- J4 : X-drive pulse motor connector
- J5 : Y-drive pulse motor connector
- J6 : Foot switch connector
- J7 : Programming device connector
- J8 : Air valve connector
- J9 : Machine light connector (6V AC, 2A)
- J10 : Marker light connector (5V AC, 3A)

4 Explanation of connectors

If the machine has been disassembled or adjusted during repair work, most of the machine troubles are due to connector problems including improper connection or weak contact. It is, therefore, necessary to check each connector number and pin contact for correct connection prior to proceeding to the troubleshooting procedures.

The table below lists the connector numbers and symptoms resulting from wrong connections. For detailed connector and harness arrangement, refer to page 93, "CONTROL CIRCUIT BLOCK DIAGRAM".

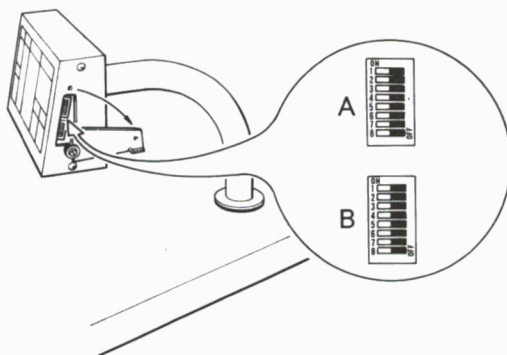
Connector No. and location	Drive signals and source	Symptoms resulting from wrong connection
	Control power source	<ul style="list-style-type: none"> Abnormal motion No motion
	Solenoid drive power source Air valve drive power source	<ul style="list-style-type: none"> Faulty operation of the work clamp, presser foot, thread wiper components, thread trimming components
	Pulse motor drive power source	<ul style="list-style-type: none"> Step out in X and Y axes Unusual noises of X-drive and Y-drive pulse motors
	Start/stop control currents for the machine	<ul style="list-style-type: none"> Abnormal rotation of the machine Stop operation failure
	+ 5V Needle stop position control, synchronization control, and rotation control signals	<ul style="list-style-type: none"> The machine rotates at abnormally high speed, then stops. (Error No. 2) The needle does not stop at the correct top-end position. The machine rotates, but the feed mechanism does not work.

Connector No. and location	Drive signals and source	Symptoms resulting from wrong connection
	+ 5V Speed control signal	<ul style="list-style-type: none"> • The POWER lamp does not come on. • Although the speed control dial is turned, the machine does not change the rotation speed and keeps it at 2000 rpm.
	Key and switch signals Indicator control signals	<ul style="list-style-type: none"> • Malfunction of programming device
	Read and write signals from/to floppy disks	<ul style="list-style-type: none"> • The floppy disk data cannot be read.
	X and Y home position signals EMERGENCY stop switch signal LED signal	<ul style="list-style-type: none"> • The machine cannot detect home position. • The emergency stop function cannot be activated. • The EMERGENCY stop lamp lights and its function cannot be cancelled.
	Drive signal Work clamp lifting signal	<ul style="list-style-type: none"> • The machine neither starts operation nor lifts the work clamp if the corresponding foot switch is depressed.

5 DIP switch

1. DIP switch function summary

Be sure to turn off the power switch before changing ON/OFF of the DIP switch.



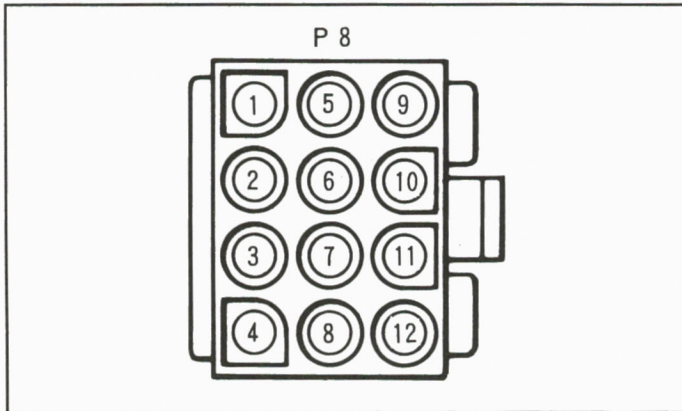
Ⓐ

Selector No.	When set to ON
1	The machine does not raise the work clamp after sewing is complete.
2	Lowers the left work clamp first, and the right one second in the air cylinder drive mode.
3	Lowers the right work clamp first, and the left one second in the air cylinder drive mode.
4	When 2, 3 and 4 are on, the presser foot descends by treading the start pedal.
5	The work clamp does not rise when splitting.
6	Activates the inner clamping function.
7	Activates single-pedaling function with the start foot switch.
8	Activates thread breakage detector.

Ⓑ

Selector No.	When set to ON
1	Single split mode possible
2	8,000 - stitch sewing possible
3	The machine does not trim the thread after emergency stop.
4	Needle cooler signal is outputted. (Needle cooler is an optional.)
5	Thread breakage detection sensitivity changes from 8 stitches to 14 stitches.
6	OFF
7	OFF
8	OFF

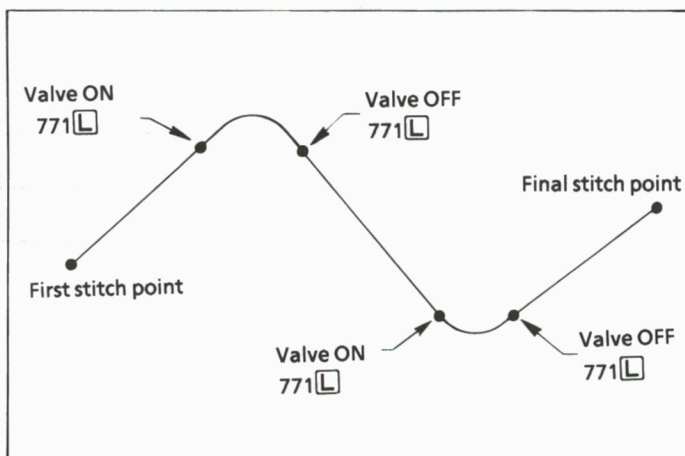
6 Optional output



- ① Presser plate (R) valve
- ② Presser plate (L) valve
- ③ Work clamp valve
- ④ Inner clamp valve
- ⑤ Optional valve 1
- ⑥ Optional valve 2
- ⑦ Optional valve 3
- ⑧ Needle cooler valve

- ⑩ + 24V
- ⑪ + 24V

NOTE: ④ to ⑧ are optionals.



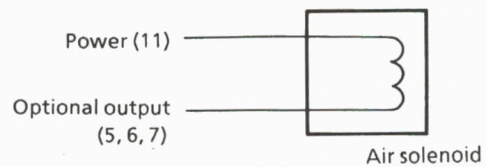
※ The valve will always be off at the first stitch point.

[How to connect]

- 1) Disconnect connector P8 from pin 12 attached on the control box for valve output.
- 2) Referring to below, connect the air solenoid valves correctly to the pins for optional output and for the power supply.

Optional output 1: Corresponds to pin 5
 (Optional output 2: Corresponds to pin 6)
 (Optional output 3: Corresponds to pin 7)
 Power supply (+ 24V): Connect to pin 10 or 11

- 3) Connect the connector to the original location.



NOTE 1: Pin 11 for power supply can be used commonly for three outputs.

NOTE 2: Use MOLEX 1381 ATL (143548-000) as the connecting pin.

[Programming stitch data]

- 1) Press the [P] key to select the program mode. If you want to edit stitch data which you have stored on a floppy disk, load the data from the floppy disk.
- 2) Using the + and - keys, move the needle to the position where you wish to set the optional output to ON or OFF.
- 3) Press the [7] key twice, followed by the [1], [2], or [3], then the [L] key to set the desired optional output at the position you have selected.
- 4) Repeat steps 2 and 3 above until you reach the final stitch point.

TROUBLESHOOTING

1 Mechanism

Error indication on operation panel

Error code	Cause
1	The EMERGENCY stop button is pressed.
2	Motor or synchronizer defective.
3	Program area overloaded.
4	No floppy disk is inserted or the cable connections are wrong.
5	The floppy disk is write-protected.
6	No program.
7	Floppy disk drive defective.
8	Thread breakage is detected.
9	Protective circuit activated because of abnormal voltage.
A	No effective sewing pattern data is stored.

Problem	Cause	Check	Solution	Page
Malfunction of thread wiper	Thread wiper interfering with needle	Clearance between thread wiper and needle tip	Adjust thread wiper height.	48
		Needle stop position	Adjust needle stop position (needle and needle plate top).	49
	Improper location of thread wiper	Thread wiper position	Adjust wiper movement.	48
Improper bobbin thread volume wound	Improper location of bobbin presser	Bobbin thread volume	Adjust bobbin presser position.	

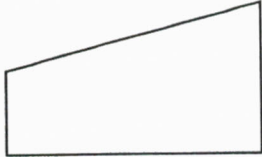
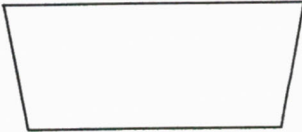
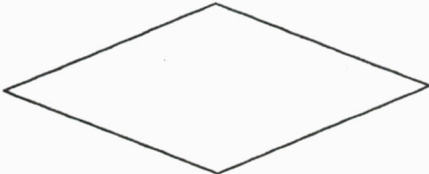




Problem	Cause	Check	Solution	Page
Thread escape	Improper length and hardness of thread take-up spring	Length and hardness of thread take-up spring	Adjust thread take-up spring.	
	Needle thread length	Tension at thread breakage detection	Adjust pre-tension.	
		Sub tension	Adjust sub tension.	
	Improper clearance of tension disk	Tension disk clearance	Adjust clearance.	
	Improper needle location	Needle location, presser foot and material	Re-program needle location.	
Needle thread break	Excess needle thread tension	Needle thread tension	Adjust needle thread tension.	
	Needle improperly installed	Needle orientation	Install needle with longitudinal groove facing operator.	
	Thread too thick for needle	Thread and needle	Replace thread with those matching needle.	
	Flaws and burrs on needle, needle hole plate and shuttle hook	Needle, needle hole plate and shuttle hook	Polish or replace faulty parts.	
	Heat in thread path	Thread end state	Use liquid (silicon) cooling device.	
	Bobbin thread break	Excess bobbin thread tension	Bobbin thread tension	Adjust bobbin thread tension.
Flaws or scratches on edge of needle hole plate or bobbin case		Edge of needle hole plate and bobbin case	Polish or replace faulty parts.	

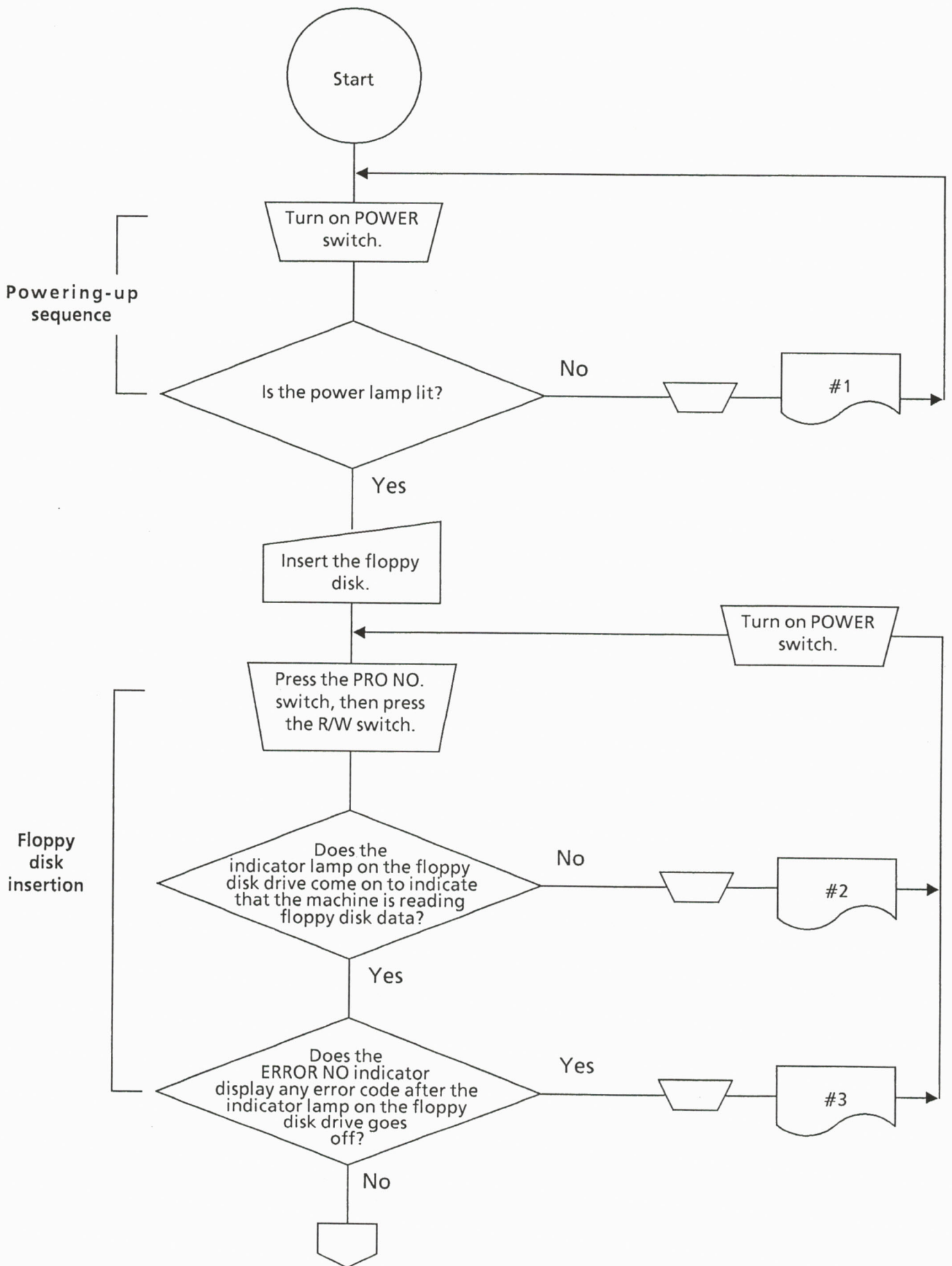
Problem	Cause	Check	Solution	Page	
Needle break	Needle interfering with shuttle hook	Clearance between needle and shuttle hook tip	Adjust clearance between needle and shuttle hook.	43	
		Needle bar height	Adjust needle bar height.	42	
	Needle bent	Needle	Replace needle.		
	Sidewise needle movement	Timing between needle and feeding operations	Adjust synchronizer.	49	
	Needle interfering with movable knife	Movable knife location	Adjust movable knife position.	45	
	Improper needle location to presser foot	Needle location and presser foot	Adjust presser foot height.		
			Re-program the needle location.		
	Stitch skipping	Excess clearance between needle and shuttle hook tip	Clearance between needle and shuttle hook tip	Adjust clearance between needle and shuttle hook tip.	43
			Needle bar height	Adjust needle bar height.	42
		Improper contact of needle with shuttle hook	Contact of needle and shuttle hook tip	Adjust driver position.	42
Driver overloaded by needle			Clearance between needle and driver	Adjust needle receiver of driver.	43
Needle bent		Needle	Replace needle.		
Needle improperly installed		Needle orientation	Install needle with longitudinal groove facing operator.		
Work clamp (intermittent) not in effect		Work clamp height	Adjust work clamp height.		

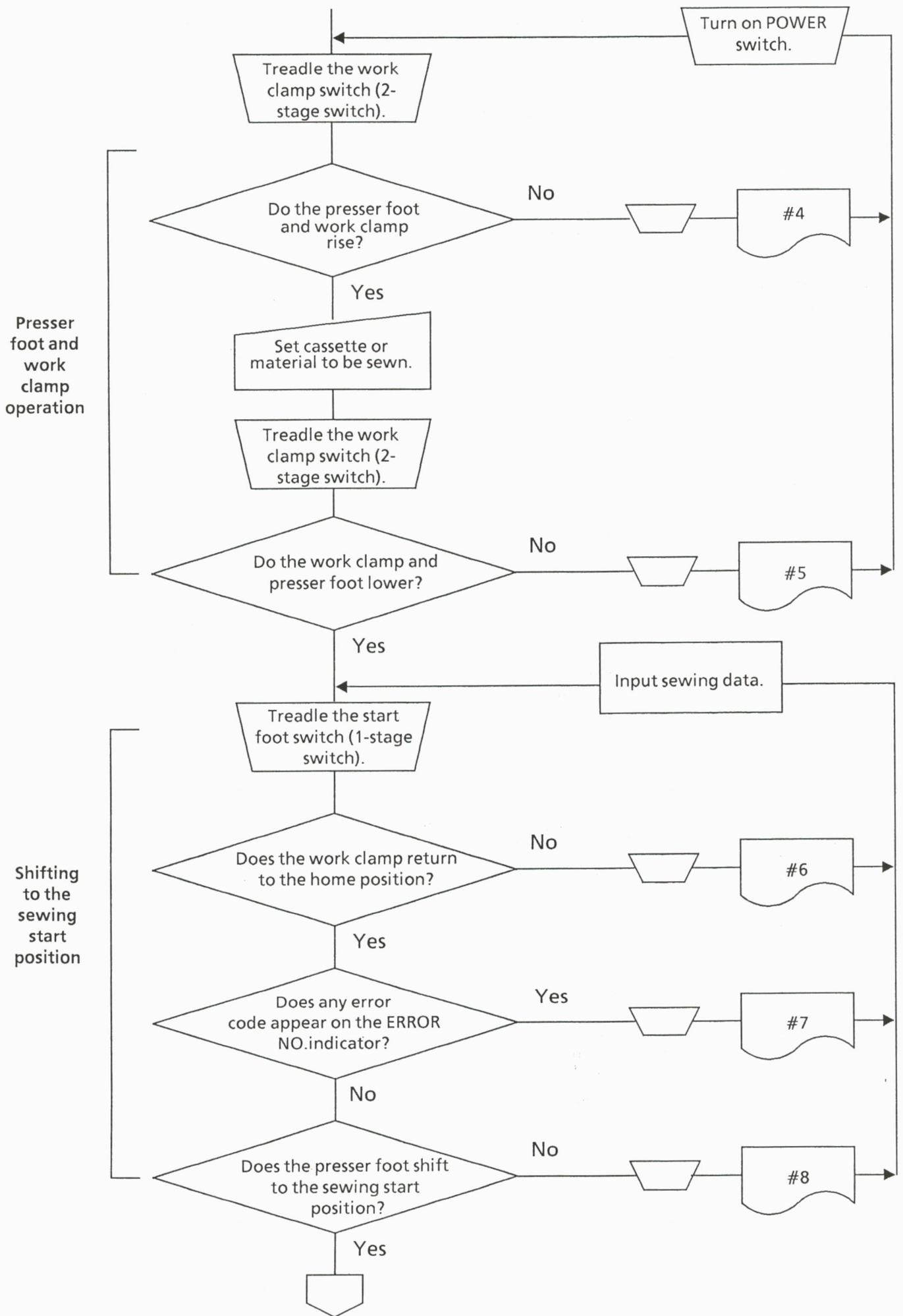
Problem	Cause	Check	Solution	Page
Needle thread cannot be cut.	Dull fixed knife	Fixed knife edge	Sharpen or replace fixed knife.	/
	Movable knife cannot catch needle thread.	Location of shuttle race thread guide	Adjust shuttle race thread guide.	44
		Final stitch direction	Complete stitching in forward stitch direction	/
	Movable knife cannot catch needle thread due to final stitch skipped.	Final stitch	See "Stitch skipping" in problem item.	65
	Improper location of movable knife	Movable knife location	Adjust movable knife.	45
	Wrong engagement pressure of movable knife and fixed knife	Engagement of the movable knife and fixed knife	Replace movable knife's washer.	46
Poorly tightened thread	Needle thread tension too weak	Needle thread tension	Adjust needle thread tension.	/
	Bobbin thread tension too weak	Bobbin thread tension	Adjust bobbin thread tension.	/
	Improper length and hardness of thread take-up spring	Length and hardness of thread take-up spring	Adjust thread take-up spring.	/
Bobbin thread cut	Flaws or burrs on movable knife	Movable knife	Polish or replace faulty parts.	44
	Excess bobbin thread tension	Bobbin thread tension	Adjust bobbin thread tension	/
	Improper bottom end position of fixed knife	Clearance between fixed knife and needle plate	Adjust fixed knife to provide 0.5 mm clearance between its tip and needle plate hole.	45

Problem	Cause	Check	Solution	Page
Thread breakage detector functions when thread is not broken.	Tensions of pretensions and thread take-up spring is unbalanced.	Thread breakage detector pretension Machine head pretension Thread take-up spring	Set total tension of both pretensions to lower than that of thread take-up spring.	
	Thread breakage detector is too sensitive.	Thread breakage detection stitch margin setting	Change stitch margin to 14 stitches by switching DIP switch ⑤-5.	
	Thread breakage detector pulley does not rotate.	Pretension thread tension and threading of machine head pulley	Adjust tension. Pass thread through pulley.	
Thread breakage detector does not function even if thread is broken.	Thread breakage detector switch is set to OFF.	DIP switch setting in operation panel	Set DIP switch to ON.	
	Sensor is dirty.	Thread breakage detector pulley and sensor	Remove dust or oil from pulley or sensor.	
Presser foot hits Presser plate	Air presser drop	Check valve of air presser	Turn knob of integrator to adjust air presser to 0.49 Mpa (5.0 kgf/cm ²).	

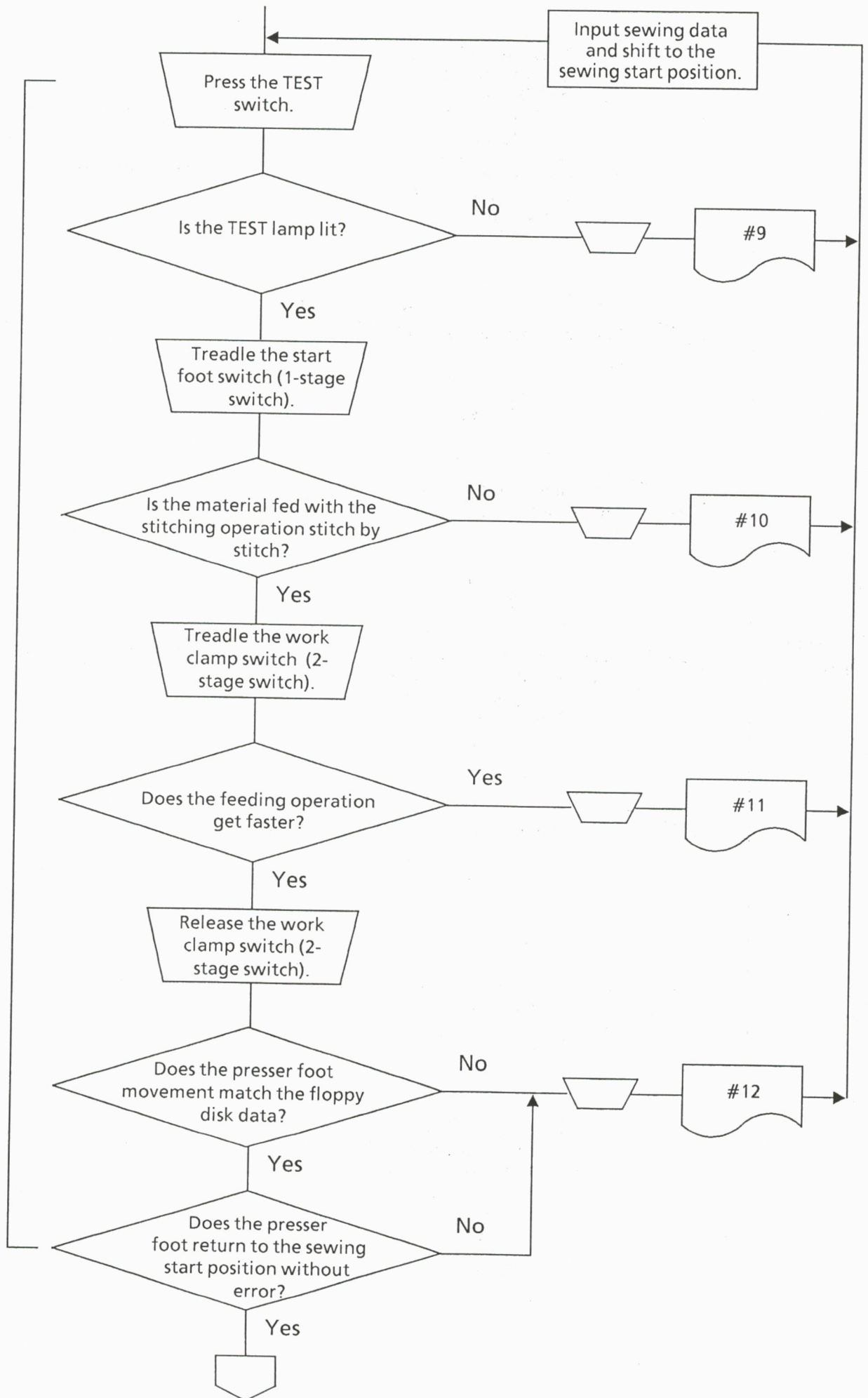
2 Electric / Electronics

- 1  Indicates manual operation.
- 2  Indicates switch operation.
- 3  Selects the course of action to follow, using a yes-or-no decision-making process.
- 4  Indicates that the procedure to follow appears in the first column of "problem determination and solution table".
- 5  Indicates setting-up operation.
- 6  Indicates that the procedure to follow appears on the next page.
- 7  Indicates turning-off of the power switch.

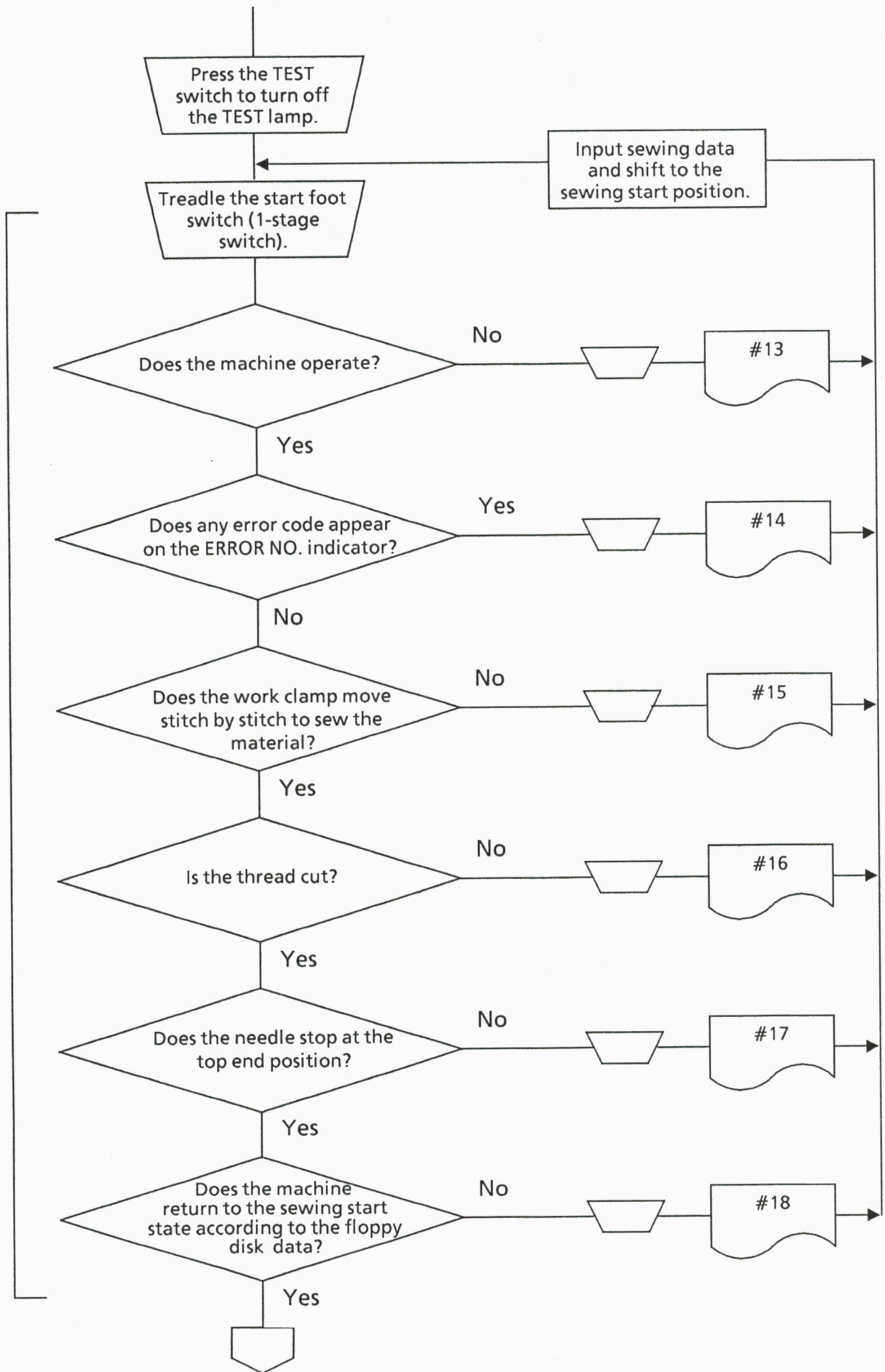




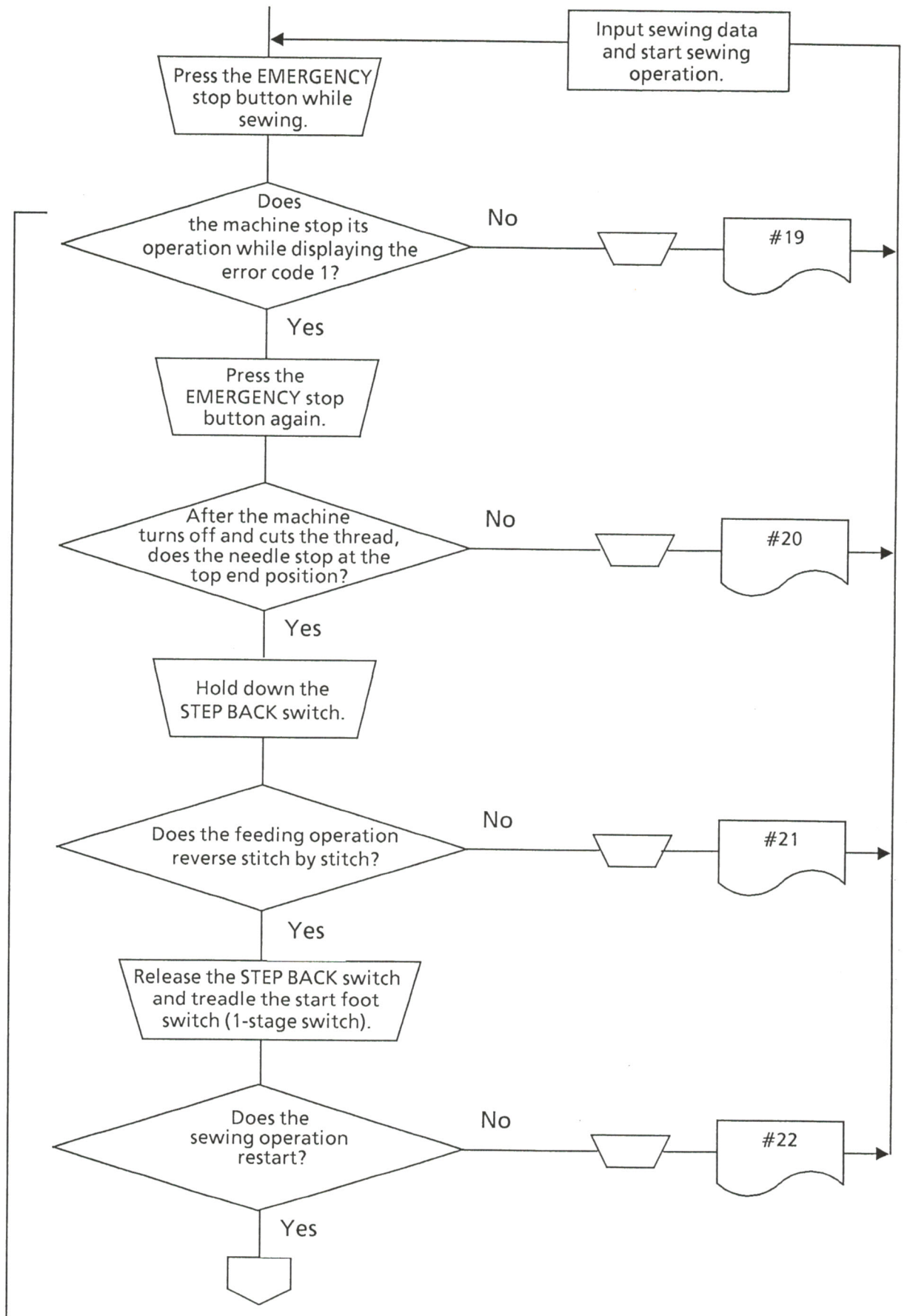
Test

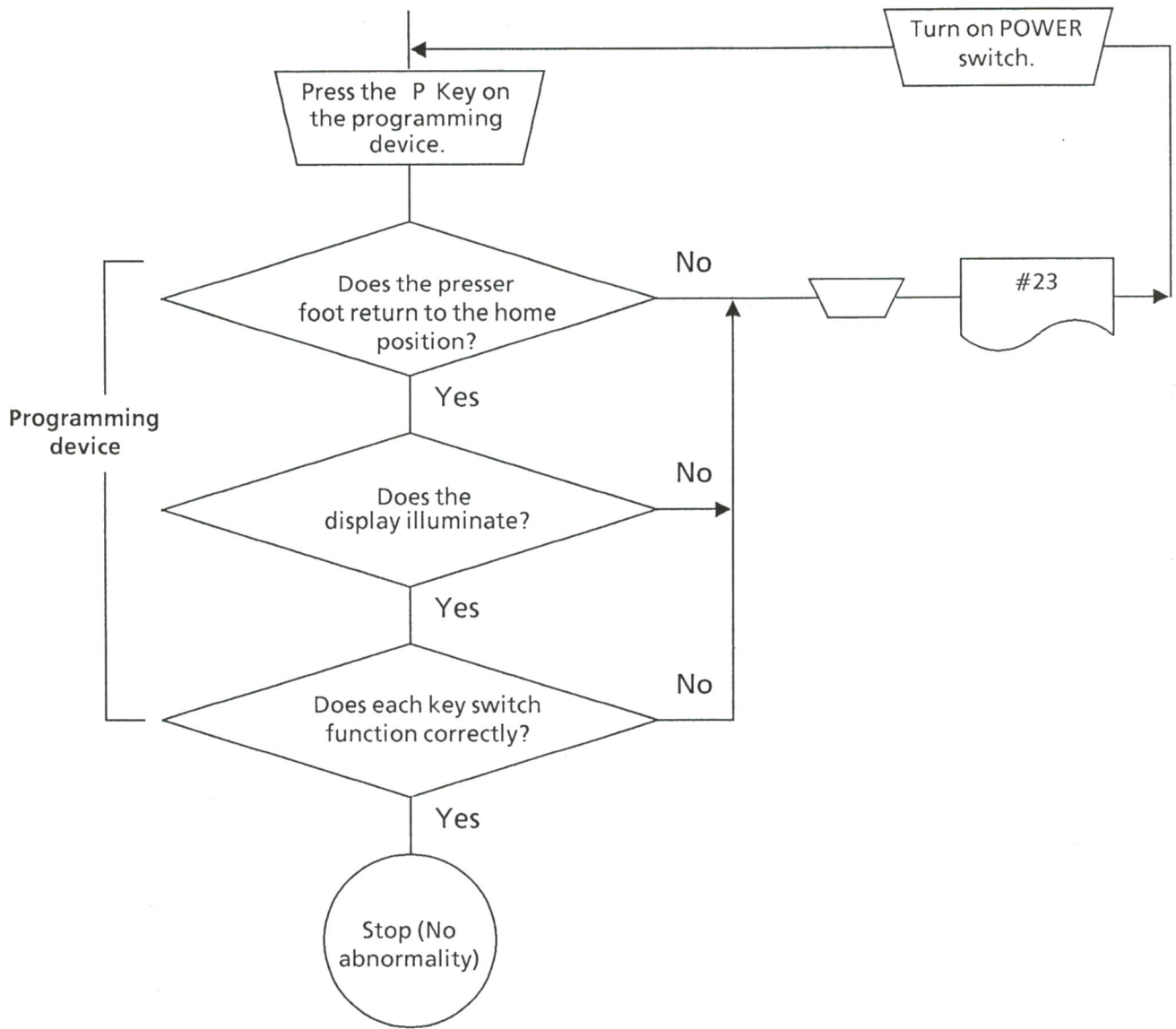


Sewing operation



Emergency stop and restarting operation






PROBLEM DETERMINATION AND SOLUTION

Precautions

1. Be sure to turn the power switch OFF before opening the control box cover or plugging / unplugging the power cord.
2. When replacing a fuse, be sure to use a new one having the same quality and capacity as the old one.

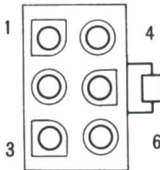
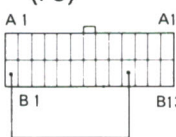
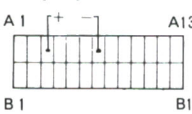
Problem determination and solution table

- Prior to proceeding to the following table, check that
 - no fuse is blown
 - each plug is correctly inserted.
- Letters marked with an asterisk (e.g. (a)*) in the CHECK / ADJUSTMENT / REPAIR column indicate that those items should be checked while the power is applied.

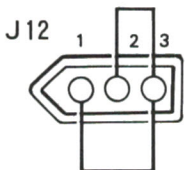
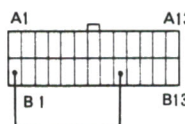
NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#1 The POWER lamp does not light when the POWER switch is turned ON.	1. Power cord defective 	(a)*Unplug power connector P13 connected to the breaker of the control box, turn the power ON, then measure the voltage on P13. If it is not approx. 200 V AC (100, 110, 200, 220, 240, 380, 415 V AC, according to each specification), the power cord is defective.	Power cord	90
	2. Blown fuse	(a) Remove fuse No.3 and check it for continuity. If there is no continuity, replace the fuse.	Fuse No. 3 (Glass tube fuse 5A)	56
	3. Power supply unit defective	(a)*Unplug connector P1 of the control PCB, turn the power ON, then measure the voltage between pins 3 and 4. If it is not approx.10V DC, the control box is defective. NOTE: Insert a tester probe into the connector from the lead wire side.	Control box	57
	4. Control PCB defective	(a)*Unplug connector P12 of the control PCB, turn the power ON, then measure the voltage on the PCB. If it is not +5V, the control PCB is defective.	Control PCB	57
	5. Operation panel PCB defective	Check the connection between the operation panel PCB and connector P3 of the control PCB.	Operation panel PCB	90
#2 When the R/W switch is pressed, the indicator lamp on the floppy disk drive (FDD) does not light and the FDD does not read the floppy disk data.	1. Connector contact defective	(a) Check the connections, harnesses, and pin contacts between connector P3 of the control PCB and the operation panel PCB and between connectors P4 or P12 of the control PCB and the FDD.		90
	2. Control PCB defective	(a) Turn the power ON and press the EMERGENCY stop button to check if the buzzer sounds intermittently. Then press the button again to check if the buzzer stops. If the buzzer does not operate in such manner, the control PCB is defective. (b) Treadle the work clamp switch. If the work clamp does not work normally, the control PCB is defective.	Control PCB	

NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
<p>#2 If the R/W switch is pressed, the indicator lamp on the floppy disk drive (FDD) does not light and the FDD does not read the floppy disk data.</p>	3. Work clamp switch (2-stage switch) defective	(a) If the work clamp automatically operates just by turning the power on without any other operator action, the work clamp switch is defective. (b) Unplug connector P6 of the control box and press the R/W switch. If the machine operates normally, the work clamp switch is defective.	Work clamp switch (2-stage switch)	90
	4. Floppy disk drive (FDD) defective	(a) Replace the FDD.	FDD	
<p>#3 After a few seconds the R/W switch is pressed, an error code appears on the ERROR display.</p>	1. Floppy disk defective	Check if the error code No.4 appears on the ERROR indicator. If yes, insert other floppy disk. If the newly inserted floppy disk is normally read, the old floppy disk is defective.	Floppy disk	
	2. Floppy disk drive (FDD) defective	Check if the error code No.7 appears on the ERROR indicator. If yes, replace the FDD.	FDD	
	3. Control PCB defective	Replace the control PCB .	Control PCB	57
<p>#4 The work clamp will not rise when the work clamp switch (2-stage switch) is treadled.</p>	1. Blown fuse	(a) Remove fuse No.2 and check it for continuity. If there is no continuity, replace the fuse.	Fuse No.2 (15A)	56
	2. Power supply defective	(a)*Turn the power ON while connector P1 of the control PCB is plugged, then measure the voltage between pins 5 and 6. If it is not approx.25 V DC, the power supply is defective.	Control box	57
	3. Work clamp switch (2-stage switch) and its cable defective	(a) Unplug connector P6 of the control box, then check it for continuity, respectively. If the measured value is not the following specified value, the work clamp switch or its cable is defective: 0Ω or ∞Ω when the work clamp switch is trod or released, respectively.	Work clamp switch (2-stage switch) or its cable	58
	4. Control PCB defective	(a) Refer to #2, 2(a). (b) Treadle the start foot switch while holding down STEP BACK switch. If an error code does not appear on the ERROR indicator, the control PCB is defective. (c)* Referring to 2-4 "checking air valve's voltage" (p 58), measure each valve's voltage. If it is not approx. 24 V DC, it is defective.	Control PCB	57 58

NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#4 The work clamp will not rise when the work clamp switch (2-stage switch) is treadled.	5. Air valve	(a) Referring to 2-4 "Checking air valve's voltage" (p 58), measure the voltage. If it is not approx.300Ω, the air valve is defective.	Air valve	57 58
#5 The work clamp will not lower when the work clamp switch (2-stage switch) is treadled.	1. Work clamp switch (2-stage switch) defective	If the work clamp automatically lowers or rises when the power is turned OFF or ON, respectively, without any other operator action to the machine, the work clamp switch is defective. If the work clamp once lowered by treadling the work clamp switch rises by releasing it, the work clamp switch is defective.	Work clamp switch (2-stage switch)	
#6 The presser foot will not return to the home position when the start foot switch (1-stage switch) is treadled.	1. Start foot switch (1-stage switch) and its cable defective	(a) If the presser foot does not shift at all, reinsert connector P9 of the control PCB and connectors J6 and P6 of the control box. (b) Unplug connector P6 of the control box, then check it for continuity. If the measured value is not the following specified value, the start foot switch or its cable is defective: ∞Ω or 0Ω when the start foot switch is off or on, respectively.	Start foot switch (1-stage switch)	90
	2. Home position signal error	(a) If the work clamp moves in the reverse direction and rasps, the home position signal is in error. (b) Reinsert connector P10 of the control PCB, connectors J3 and P3 of the control box, and connectors J12 and P12 of the machine head. (c) Press the emergency switch twice, then operate the feeding mechanism by hand. If the LED on the home position PCB does not flicker when the presser foot approaches the home position, the home position signal is in error. (d) Check if the sensor (particularly, Y-home position sensor) on the home position PCB is subject to any light. If yes, protect the sensor from the light. (e) Remove dust on the X home position reflection plate.	Home position PCB	
	3. Blown fuse	(a)*If fuse No.2 blows repeatedly, PMD.circuit board or solenoid is defective. (b) Remove fuse No.2, then check it for continuity. If there is no continuity, replace the fuse.	PMD circuit board Control circuit board Solenoid Fuse No.2 (15A)	56







NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#6 The presser foot will not return to the home position when the start foot switch is treadled.	4. Power supply unit defective	(a)*Turn the power on while connector P1 still inserted into the circuit board. Then, measure the voltage between pins 1 and 2. If it is not approx. 65V DC, the power supply unit is defective.	Control box	57
	5. Pulse motor or its cable defective 	(a) Unplug connector P4 and P5 from J4 and J5 of the control box, then measure the resistance. If it is not approx. 0.5Ω between pins 1 and 2, between pins 1 and 3, between pins 4 and 5, and between pins 4 and 6, the pulse motor or its cable is defective.	Pulse motor assembly	
#7 When the presser foot shifts to the home position, an error code appears on the ERROR indicator.	1. If error No.3 is displayed, floppy disk is defective.	If error code No.3 appears, the floppy disk area is overloaded with sewing program.		
	2. If error No.9 is displayed, the voltage is abnormal.	Referring to #1-1, check the power supply voltage when the machine is stopped and when sewing is being performed. Voltage may be lowered because of the short-circuited solenoid.		
#8 The presser foot will not shift to the sewing start position.	1. Floppy disk defective	Insert other floppy disk. If the machine functions normally with the newly inserted floppy disk, the old floppy disk is defective.	Floppy disk	
	2. Control PCB defective	Replace the control PCB.	Control PCB	57
#9 The TEST lamp will not light when the TEST switch is pressed.	1. TEST switch or its cord defective (P3) 	(a) Unplug connector P3 of the control PCB, then check the operation panel harness connector for continuity. If the measured value is not the following specified value, the operation panel PCB is defective; Between pins B1 and B10: ∞Ω or 0Ω when the TEST switch is off or on, respectively.	Panel PCB	90
	2. Test lamp and its cord defective (P3) 	(a) Unplug connector P3 of the control PCB, then check continuity between pins A7(+) and A3(-) of the operation panel harness connector. If the tester pointer does not read some value with the maximum magnified ohm range, the operation panel PCB is defective.	Operation panel PCB	90
	3. Control PCB defective	Replace the control PCB.	Control PCB	57
#10 No feeding operation occurs during the test.		Refer to #6 - 1, 3 to 6.		

NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#11 Rapid feed can not be used during the test.	1. Work clamp switch (2-stage switch) defective	Refer to #4, 3.		
#12 The machine does not operate as programmed during the test.	1. Feeding mechanism not adjusted.	Adjust the feeding mechanism to move smoothly by hand.		
	2.	Refer to #6, 1, 3 to 6.		
#13 The machine does not operate for sewing.	1. Cable defective	Check continuity between connector P11 of the control PCB and P4 of the motor PCB. Check the terminals between connector P3 of the motor PCB and the motor, for looseness.		
	2. Control PCB defective	If the error code No.2 does not appear on the ERROR indicator, check voltages on the control PCB.	Control PCB	57
	3. Power module short- circuited	If the error code No.2 appears on the ERROR indicator and the fuse No.1 is blown, the power module is short-circuited.	Motor PCB Fuse No.1 (5A, FB)	56
#14 The machine operates at high speed and then stops suddenly while displaying an error code.	1. Synchronizer or its cord defective	(a) Check if connector P8 of the control PCB and connectors J2 and P2 of the control box are correctly connected. If not, correct the connections. (b) Replace the synchronizer.	Synchronizer assembly	
	2. Abnormal voltage (Error No. 9)	Refer to #7-2.		
#15 The machine operates but the work clamp does not.	1. Synchronizer or its cord defective	Refer to #14. NOTE: If the machine is placed in this error status, the test operation will be normally performed.		
#16 The thread cannot be cut.	1. Synchronizer or its cord defective	Refer to #15.		
	2. Control PCB defective	(a)*Referring to 2-3 (p 57), measure each solenoid's voltage. If the indicator does not oscillate, the control PCB is defective.	Control PCB	57

NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	PROBABLE CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#16 The thread cannot be cut.	3. Thread trimming solenoid or its cable defective	(a) Referring to 2-3 "Checking solenoid's voltages" (P 57), measure the resistance. If it is not approx. 10Ω, the thread trimming solenoid is defective.	Thread trimming solenoid assembly	57
#17 The needle does not stop at the top end position after the thread is cut.	1. Synchronizer not adjusted properly	If the needle stop position varies at random each the machine operation is complete, adjust the needle stop signal issuing timing.		
	2. Control PCB defective	Replace the control PCB.	Control PCB	57
#18 The machine cannot sew patterns as programmed.		Refer to #12. (p 78)		
#19 The operation will not stop if the EMERGENCY stop button is pressed.	1. EMERGENCY stop button or its cable 	(a) Unplug connector P12 from J12 of the machine bed, then check it for continuity. If the resistance is not the following specified value, the emergency stop button assembly is defective; Between pins 1 and 3: 0Ω or ∞Ω when the EMERGENCY stop button is OFF or ON, respectively. Between pins 2 and 3: ∞Ω or 0Ω when the EMERGENCY stop button is OFF or ON, respectively.	EMERGENCY stop button assembly	
#20 The thread cannot be cut after the emergency stop state is cancelled.		Refer to #16 and #17.		
#21 The STEP BACK switch is inoperative.	1. STEP BACK switch or its cable defective 	(a) Unplug connector P3 of the control PCB, then check the operation panel harness connector for continuity. If the measured value is not the following specified resistance, the operation panel PCB is defective. Between pins B1 and B9; normally ∞Ω When the STEP BACK switch is ON, it should be 0Ω.		90
#22 The machine stops sewing operation in midstream.		Refer to #12 and #13.		78

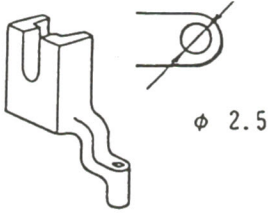
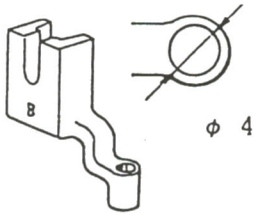
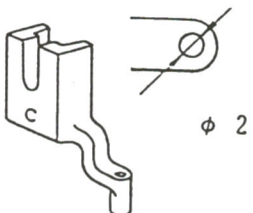
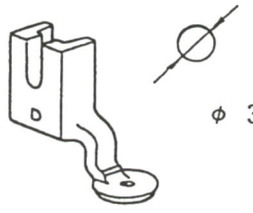
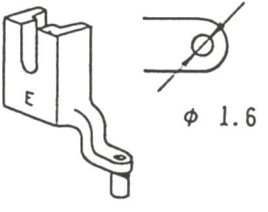

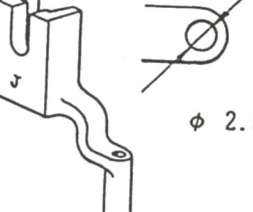
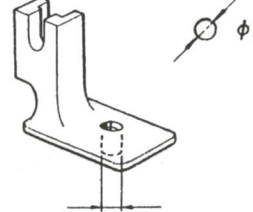
NO. IN CHAPTER 8 FLOWCHART AND ERROR STATUS	P R O B A B L E CAUSES	CHECK / ADJUSTMENT / REPAIR	REPLACEMENT PARTS	REF. PAGE
#23 Programming cannot be made.	1. Programming device connector or its cable defective	Reinsert connectors P7-J7 and connector P6 of the control PCB.		90
	2. Programming device defective	Replace the programming device.	Programming device	
	3. Control PCB	Replace the control PCB.	Control PCB	57

SPARE PARTS AND DEVICE

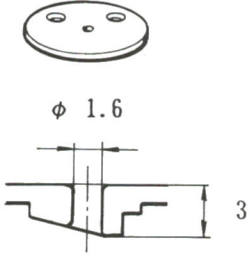
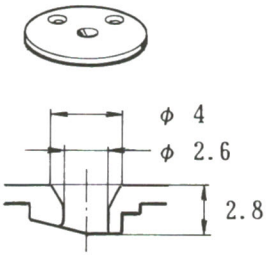
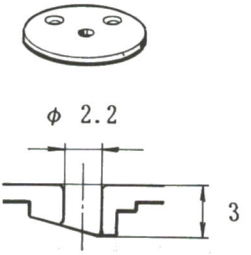
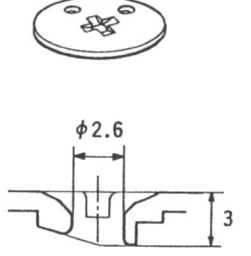
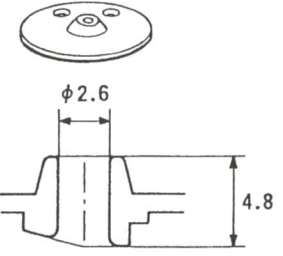
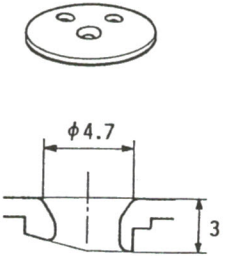
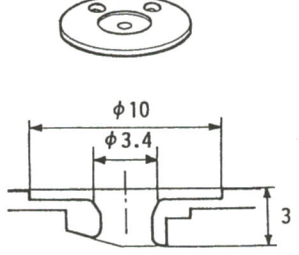
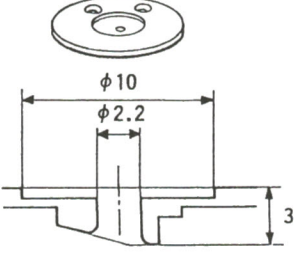
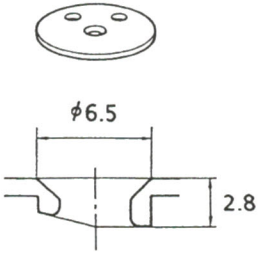
Parts	Thin and medium material		Thicker material	
Needle 	Needle DP x 5 #9	107415-009	Needle DP x 17 #14	145646-014
	Needle DP x 5 #11	107415-011	Needle DP x 17 #16	145646-016
	Needle DP x 5 #14	107415-014	Needle DP x 17 #18	145646-018
	Needle DP x 5 #16	107415-016	Needle DP x 17 #19	145646-019
	Needle DP x 5 #18	107415-018	Needle DP x 17 #21	145646-021
	Needle DP x 5 #19	107415-019	Needle DP x 17 #24	145646-024
	Needle DP x 5 #21	107415-021	Needle DP x 17 #25	145646-025
Needle hole plate 	Needle hole plate A	S10211-001	Needle hole plate E	S10212-001
	Needle hole plate F	S10213-001		
Inner rotary hook 	Inner rotary hook (A)	152685-001	Inner rotary hook (B)	152687-001
	Inner rotary hook (LA)	S15662-001	Inner rotary hook (LB)	S15663-001
Large shuttle hook 	Large shuttle hook (A)	152682-001	Large shuttle hook (B)	152686-001
Thread take-up spring 	Thread take-up spring	145519-001	Thread take-up spring B	144588-001
Tension spring 	Thread tension spring	104525-001	Thread tension spring	107606-001

Caution: Needle and needle-hole plate must be properly selected to the thread and material to be sewn.

1 Presser foot

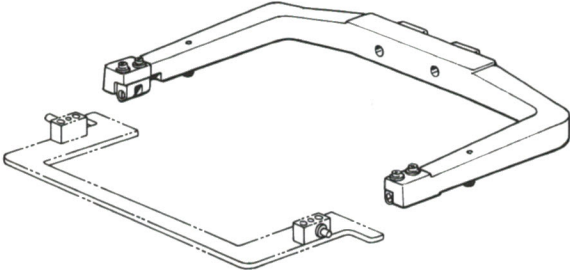
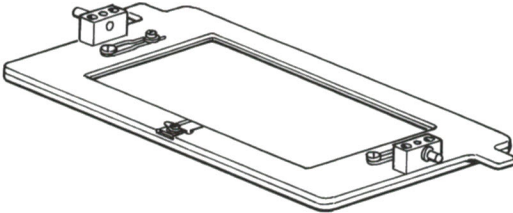
A	152283-101	B	152636-001	C	152637-001	D	154069-001
							
E	154089-001	F	157237-001	J	S13815-001	G	158592-001
							

2 Needle hole plate

A	S10211-001	E	S10212-101	F	S10213-001
					
D	S29997-001	H	S30450-001	L	S25127-001
					
ED	S30925-001	FD	S30926-001	M	S34348-001
					

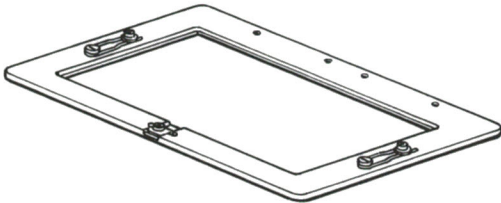
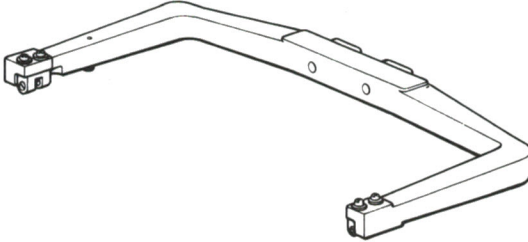
3 Work clamp (UNS) assembly

Presser plate (UNS) assembly

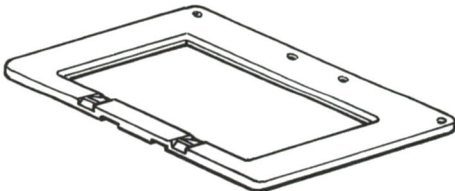
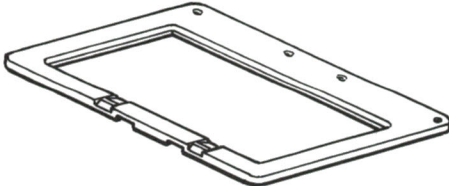
S19620-009 (180 × 100)	S19611-001 (180 × 100)
 <p>• Can be also used with a cassette presser for BAS326 model.</p>	

4 Presser plate (SEU) assembly

Work clamp (UNL) assembly

S19635-001 (250 × 150)	S19609-009 (250 × 150)
	

5 Presser plate (SEU)

S19637-001 (180 × 100)	S19638-001 (150 × 100)
	

6 Presser blank

E1	S17979-001	E4	S17981-001
L	S19599-001	R	S19600-001

UN/Presser Blank UN

1	S21723-001	2	S21724-001

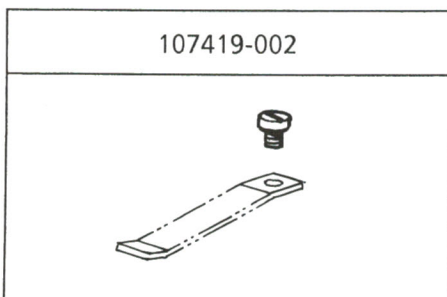
7 OT presser plate

2	S19594-001 (T = 2, 250 × 150)	S2	S19618-001 (T = 2, 180 × 100)
3	S19592-001 (T = 3, 250 × 150)	S3	S19616-001 (T = 3, 180 × 100)
4	S17982-001 (T = 4, 250 × 150)	S4	S19614-001 (T = 4, 180 × 100)
A-150	S09378-001 (T = 0.5)	A-180	S13695-001 (T = 0.5)
B-150	S09379-001 (T = 1)	B-180	S13697-001 (T = 1)
C-150	S09380-001 (T = 2)	C-180	S13968-001 (T = 2)

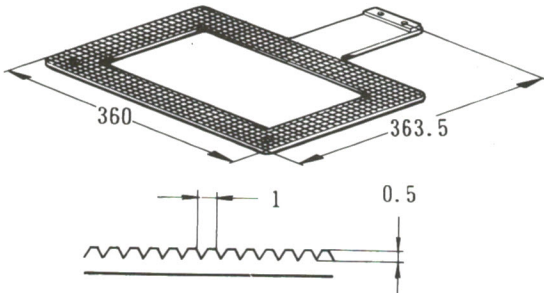
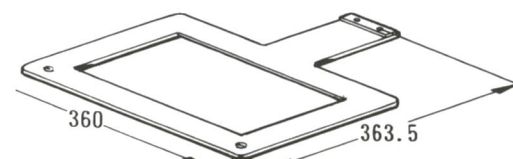
8 Spring plate

1	S02853-001	2	S02854-001	3	S02855-001
<p>t = 0.4</p>		<p>t = 0.6</p>		<p>t = 0.8</p>	

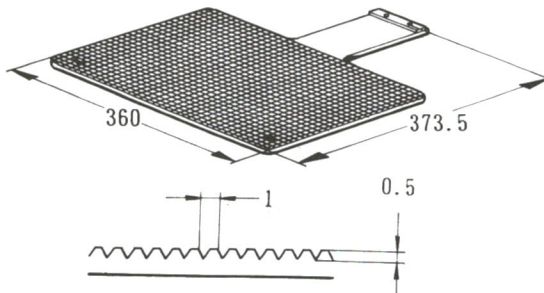

Screw 4.37



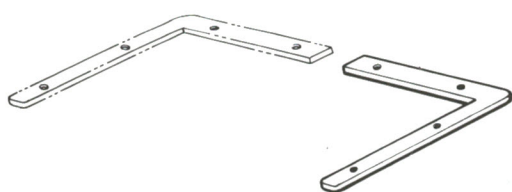
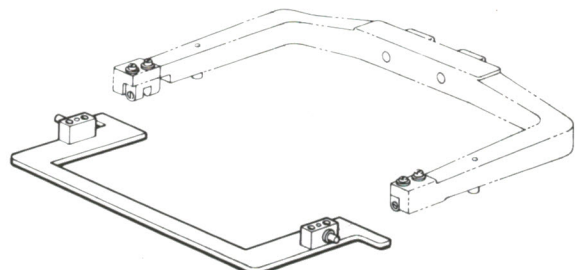
9 Feed plate

A	S24665-001	C	S24666-001
			

10 Feed plate blank

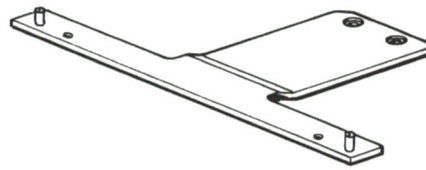
A	S24667-001	C	S24668-001
			

11 Presser plate (assembly)

C-1	S19634-001	C-2	S19914-001
 <p data-bbox="151 2049 774 2083">● Can be also used with a cassette presser for BAS326 model.</p>			

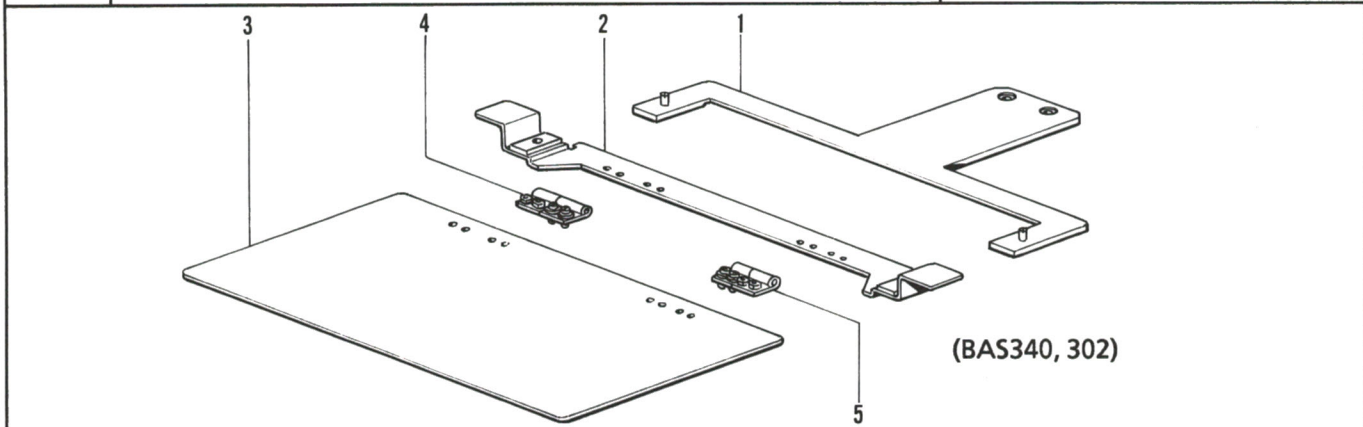
12 Cassette holder plate 326 assembly

S24671-001



(BAS326, 326L)

①	Cassette holder plate assembly	S24669-001
②	Cassette plate	S19630-001
③	Cassette lower plate	S19631-001
④	Hinge assembly (R)	152632-001
⑤	Hinge assembly (L)	152633-001

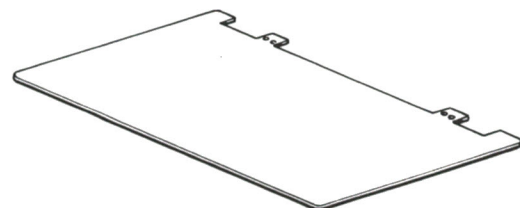
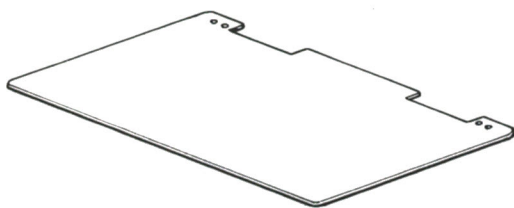


(BAS340, 302)

13 Cassette inside plate

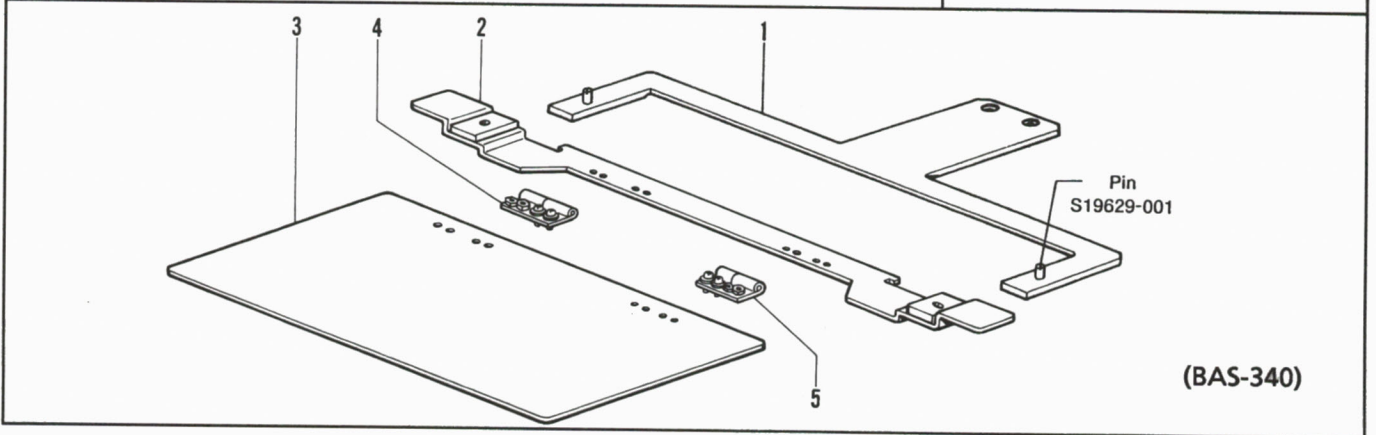
14 Cassette upper plate

1	S19643-000 (T = 1.0)	1	S19644-000 (T = 1.0)
2	S19632-000 (T = 2.0)	2	S19633-000 (T = 2.0)

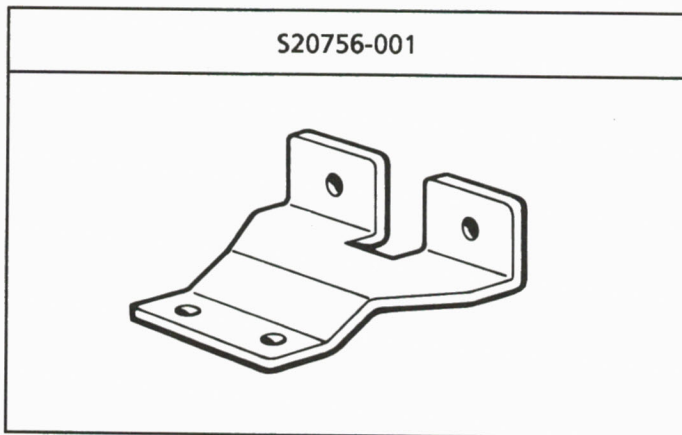


15 Cassette holder plate assembly 341L

①	Cassette holder plate assembly 341L	S24673-001
②	Cassette plate 341L	S20755-001
③	Cassette lower plate	S19631-001
④	Hinge assembly (R)	152632-001
⑤	Hinge assembly (L)	152633-001

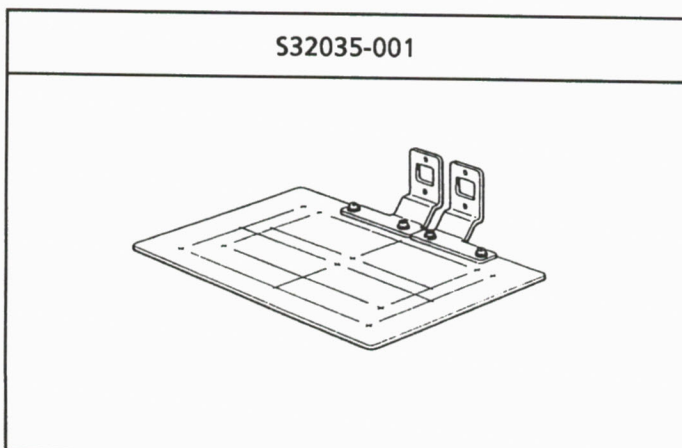


16 Work clamp (SEU)

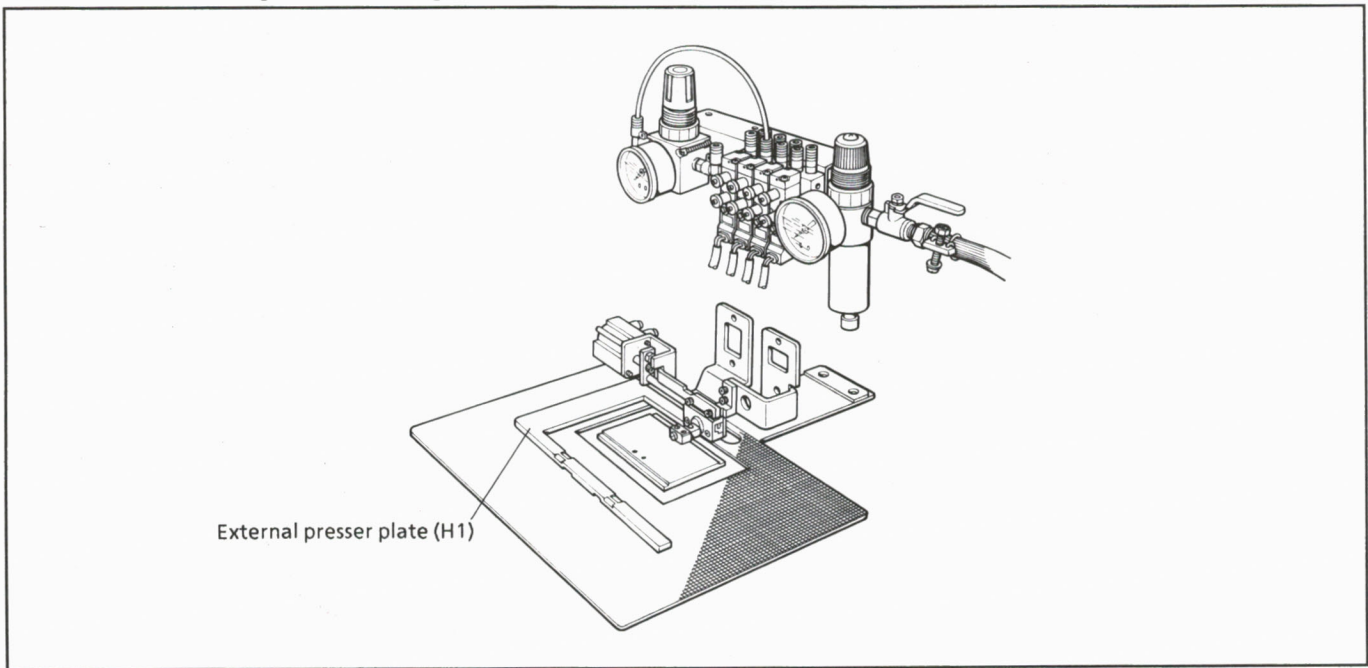


- Can be also used with a presser for the BAS 326 model.

Zero Point Standard Plate Assy



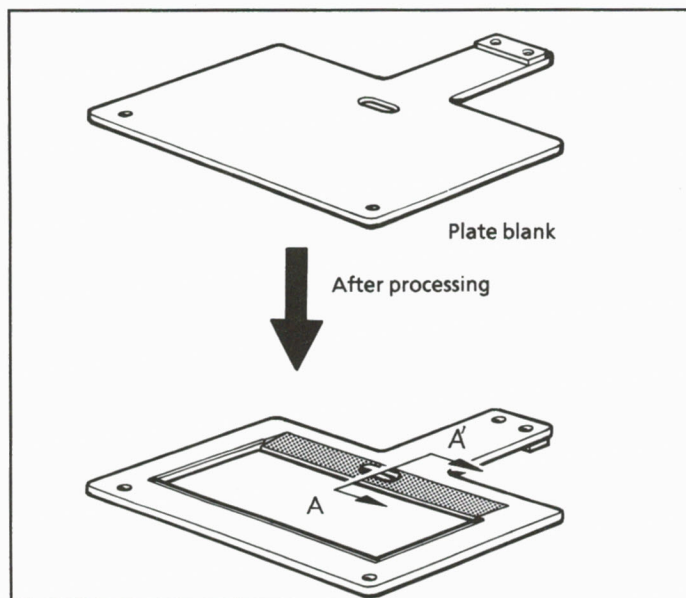
17 Inner clamp assembly



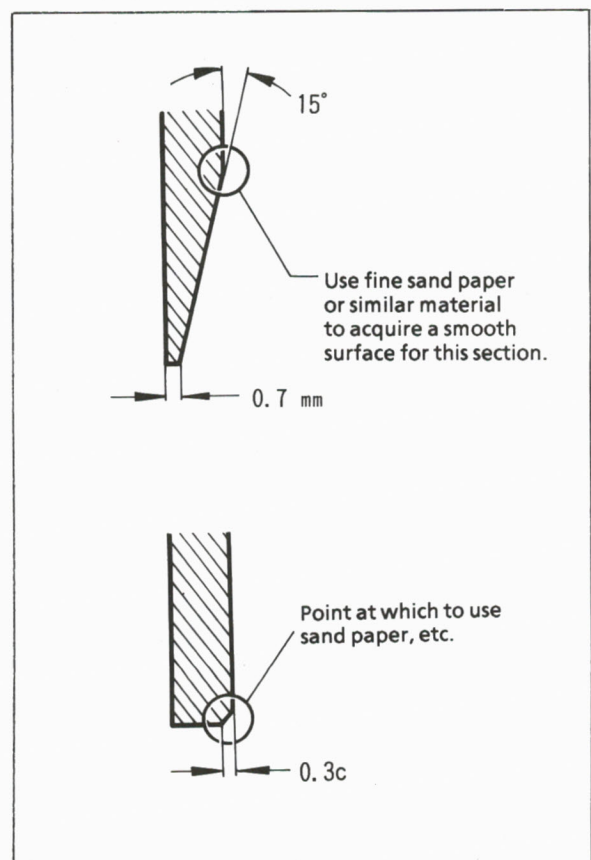
- When the inner clamping device is used with the OT presser plate, attach the OT presser to external presser plate (H1). Setting the labels and other materials to be sewn will be easier.

Caution for working upon feed plate blank

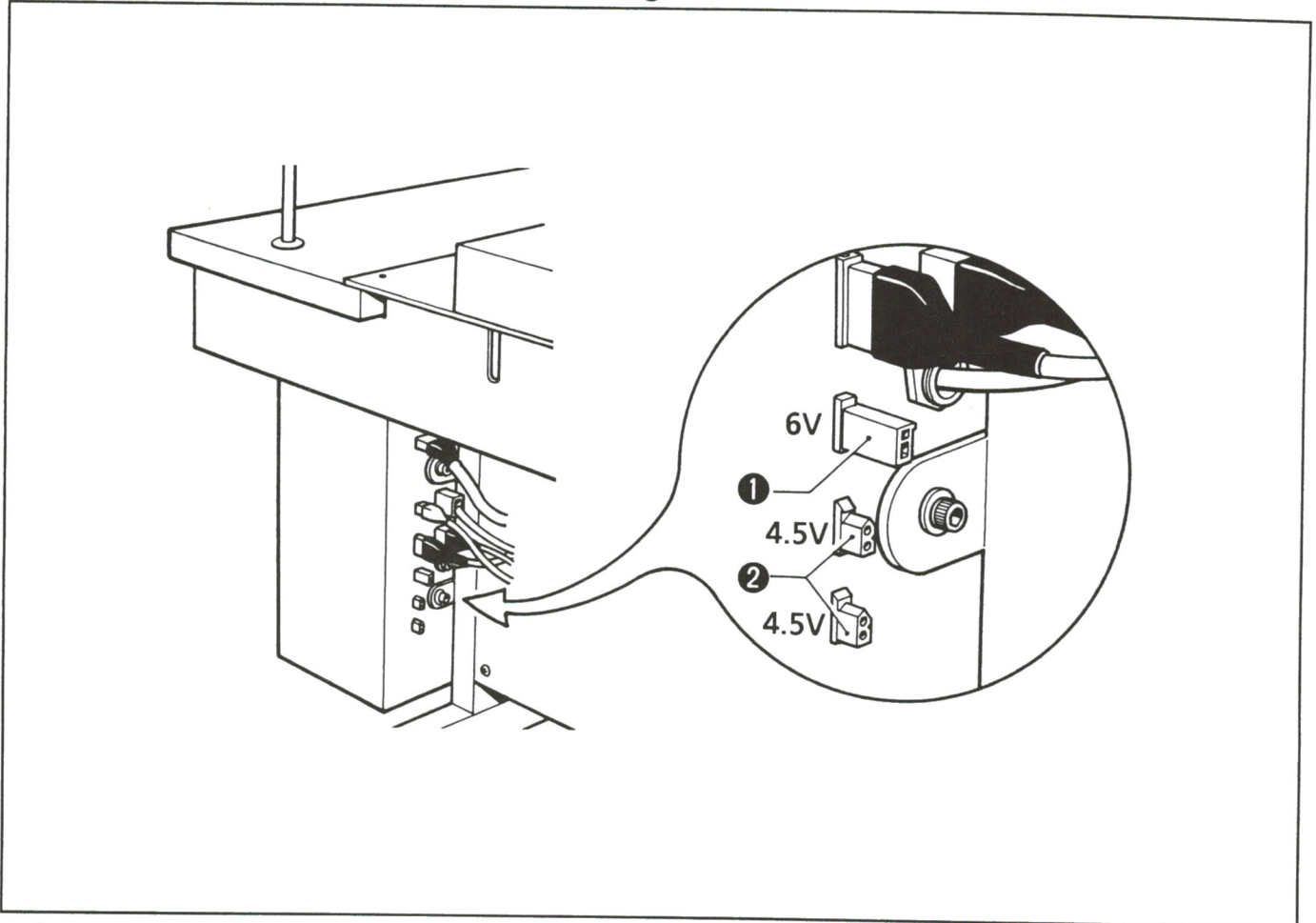
When you use the feed plate blank and add to work upon it, chamfer the back side of it as shown in the figure below.



NOTE: For other back-side corners, chamfer at 0.3 C or more and polish them with the fine sand paper.



Using terminals of lamp and marker light



When using the lamp, use the connector ① (AC6V). When using the marker light, use the connector ② (AC4.5V).

Lamp

- The lamp below is an optional.
(S-15404-001 ML651-01 lamp P assembly)
- The lamp must be AC 6V and have a wattage of 10 W or less.
- When attaching a lamp, use the following parts (optional) by replacing the corresponding parts associated with the lamp if necessary:

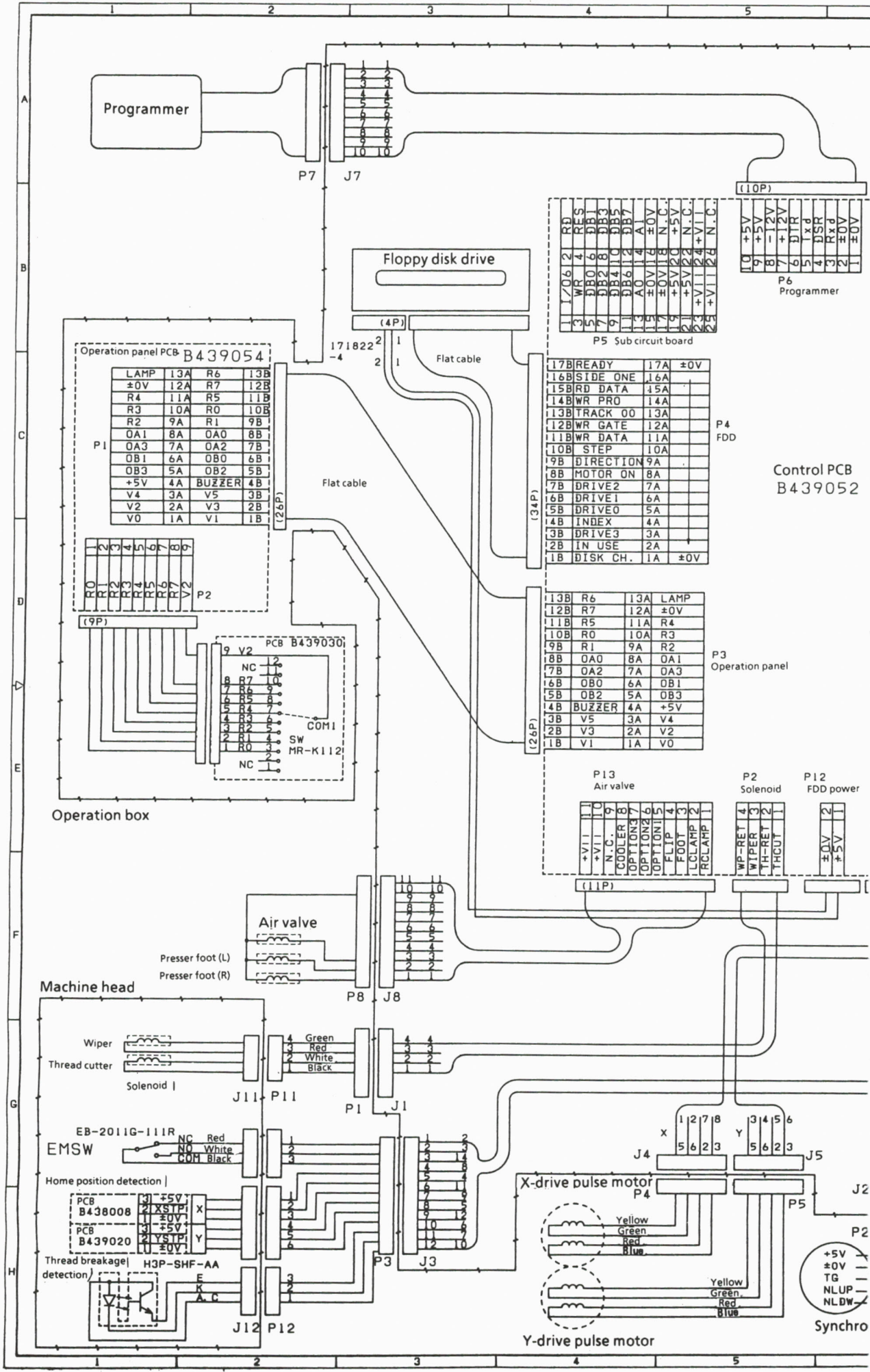
Part name	Part code	No. of pcs.
Connector 3191-02R1	S18466-000	1
Terminal pin (female)	143548-000	2
Connector 1545P	S05008-000	1
Terminal pin (male)	143549-000	2

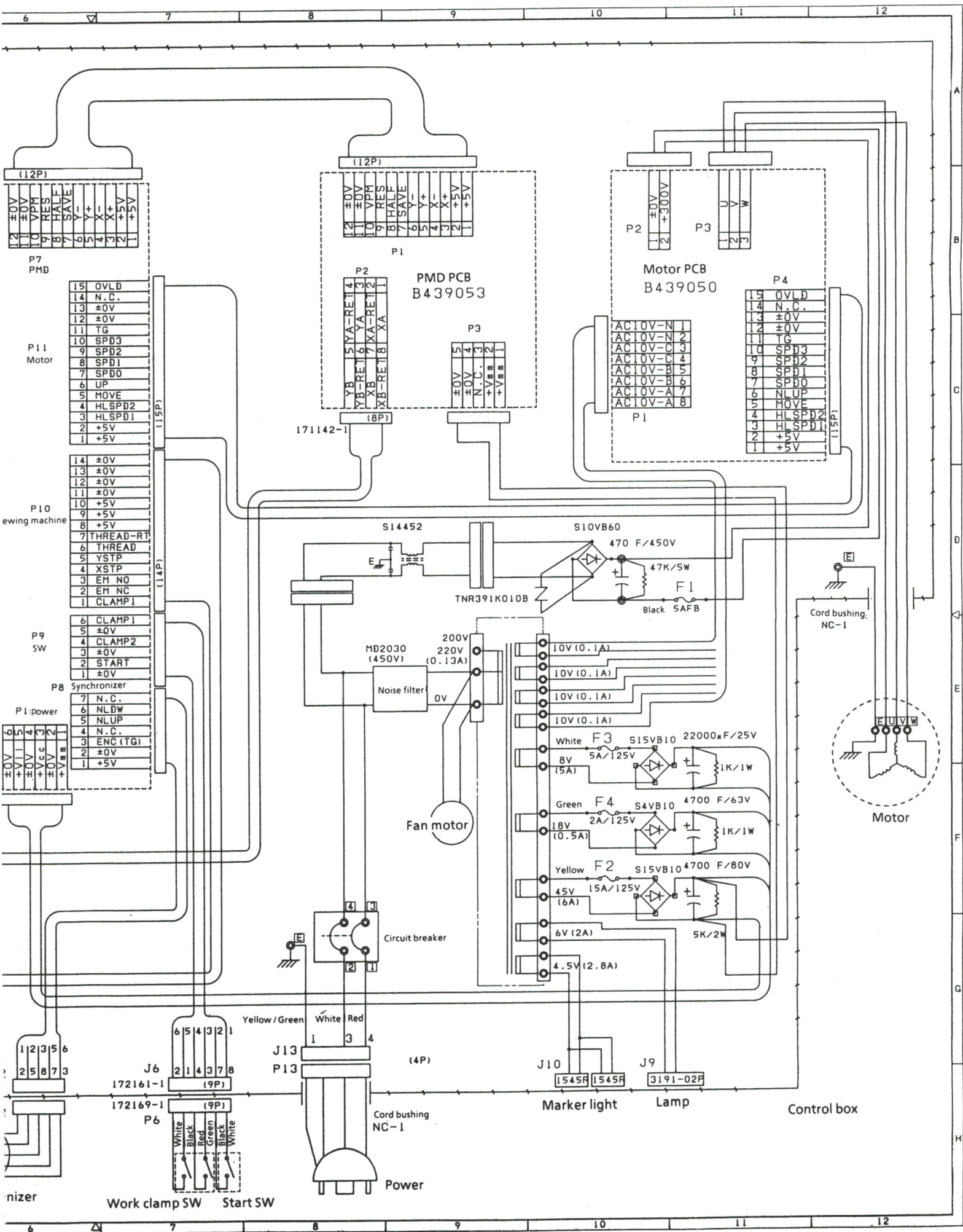
Marker light

- The marker light must have a voltage of AC 5V and a wattage of 10 W or less.
- When attaching a marker light, use the following parts (optional) by replacing the corresponding parts associated with the marker light if necessary:

Part name	Part code	No. of pcs.
Connector 3191-02R1	S18466-000	1
Terminal pin (female)	143548-000	2
Connector 1545P	S05008-000	1
Terminal pin (male)	143549-000	2

CONTROL CIRCUIT BLOCK DIAGRAM





brother[®]



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