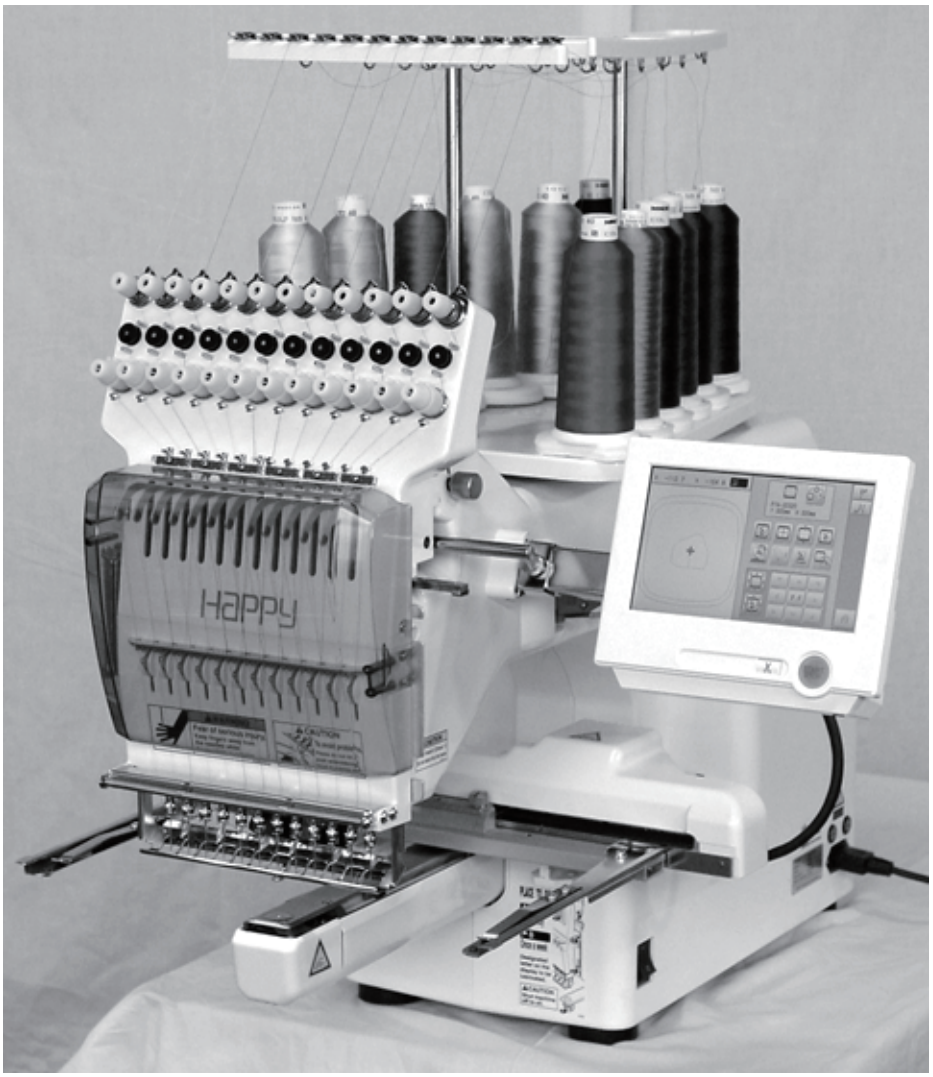
# Maintenance Manual for Embroidery Machine

# HCS2-1201-30

Version 2.0




HAPPY Industrial Corporation

# # For safe adjustment and repair #

In order to conduct adjustment and repair safely and surely,
please b42e sure to abide by what is mentioned in this manual to prevent trouble.

1. When you conduct adjustment and repair of this embroidery machine or handle electric related parts, you are required to take technical lesson in advance.

2. When you conduct adjustment and repair using this manual, please be sure to use together with instruction with it in hand.

# Please conduct in accordance with work process in this manual.
# In case there are no specific instructions or explanations in work process.
please be sure to unplug cord from receptacle.
# When you exchange parts, please be sure to use genuine parts designated by us.
# Please never remodel the embroidery machine.

When you handle circuit boards:
# In order to prevent troubles from static electricity, please remove earth from human body.
# Please don't touch metal part of circuit board with bare hand as it will short-circuit and threaten to break circuit boards.
# When you removed circuits boards from the machine or you store or transport them, please wrap them in static electricity preventive bag and avoid to give shock.

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# Special tool, Measuring equipment, Other

HSA90010

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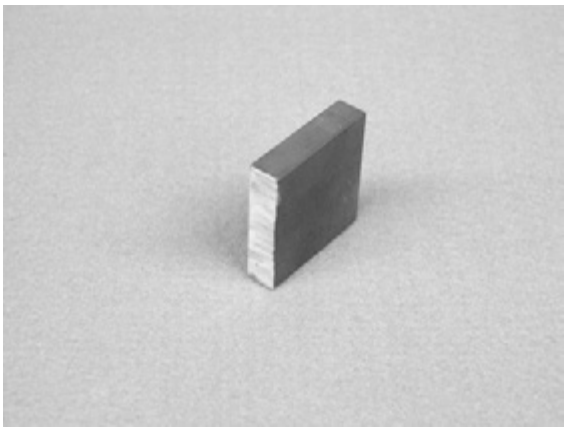
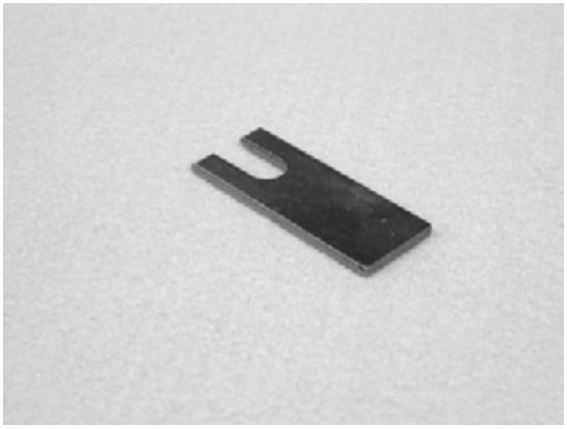


HSA90020

2.0mm thickness gauge (Page 102, 103)



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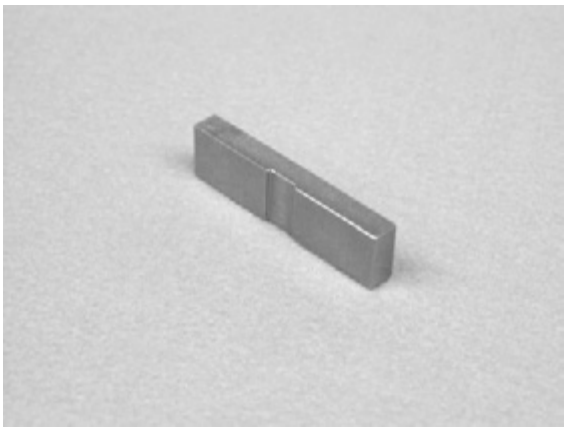
HSA90051

Bering positioning gauge [4.85mm] (Page 36)



HSA90061

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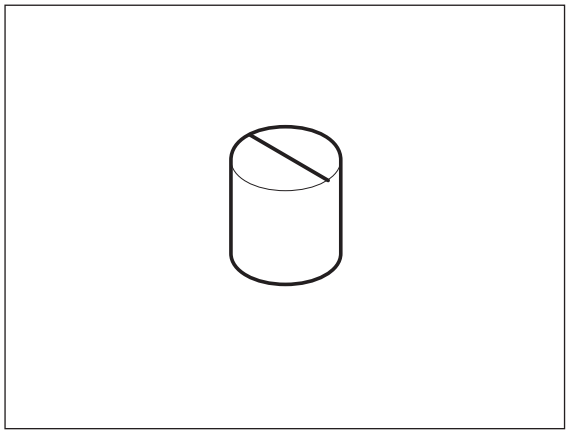
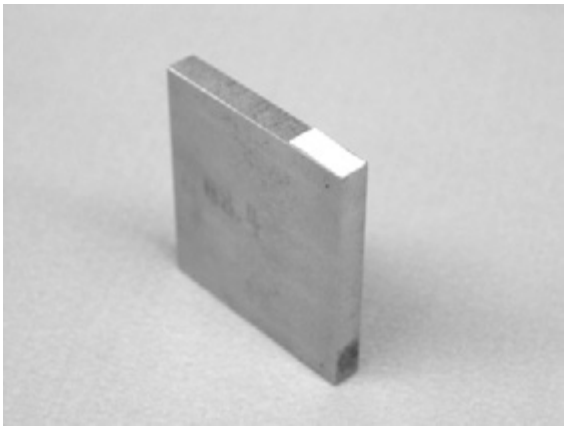


HSA90071

Thread holder positioning gauge [47.5mm] (Page 75)



HSA90080

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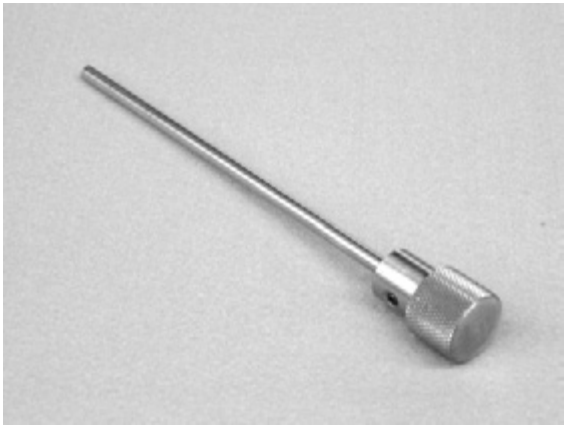

HSA90131

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HSA90200

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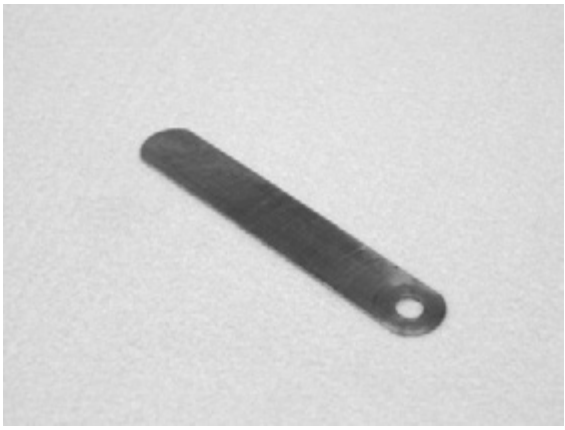
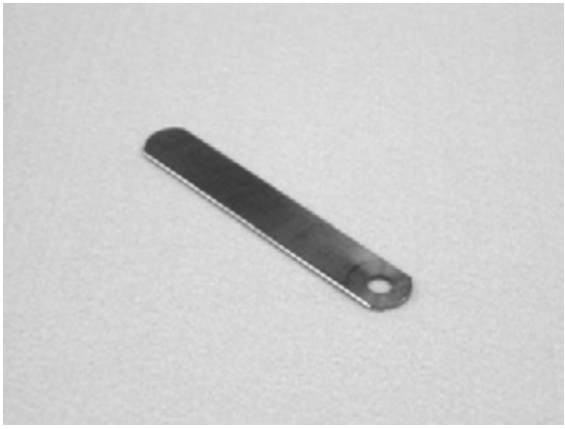


HSA90210

0.2mm thickness gauge  (Page 70, 91)



HSA90230

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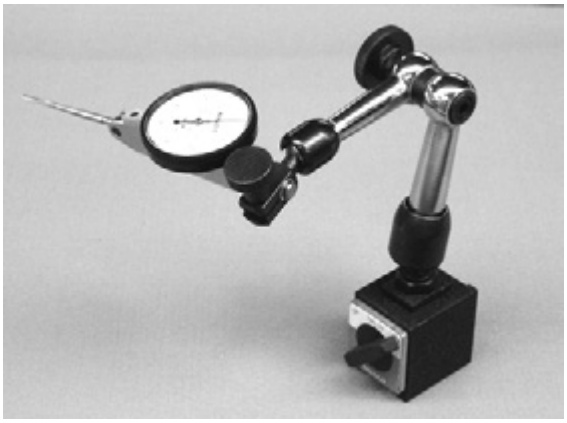
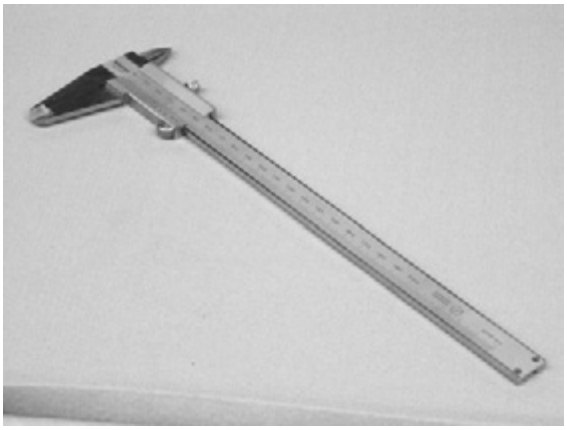


HSA90270

Vernier calliper gauge [200mm]



HSA90280

Tension gauge 1000cN (Page 105, 110, 118)

HSA90311

Shell alvania EP Grease 100g

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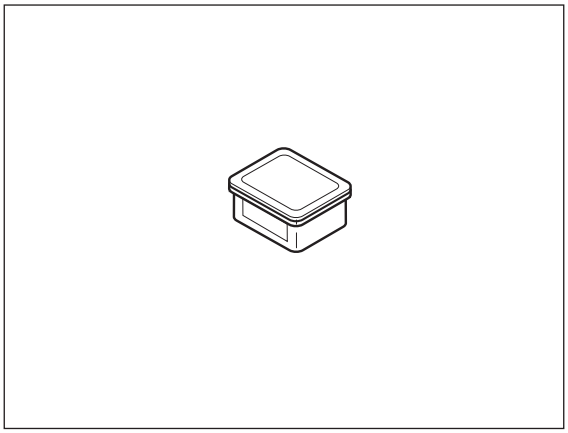

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Shell Grease7 MIL-G-23827B 50g

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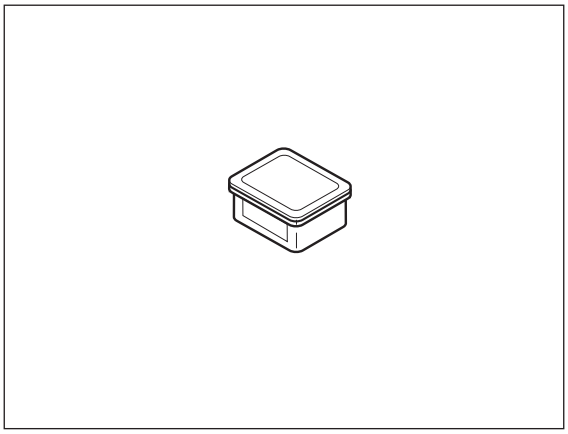

HSA90321

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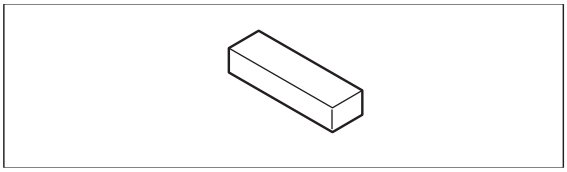
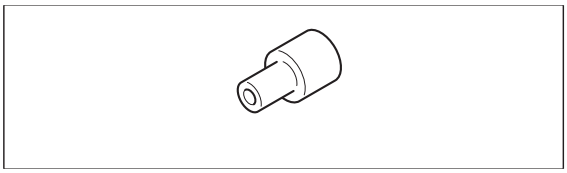
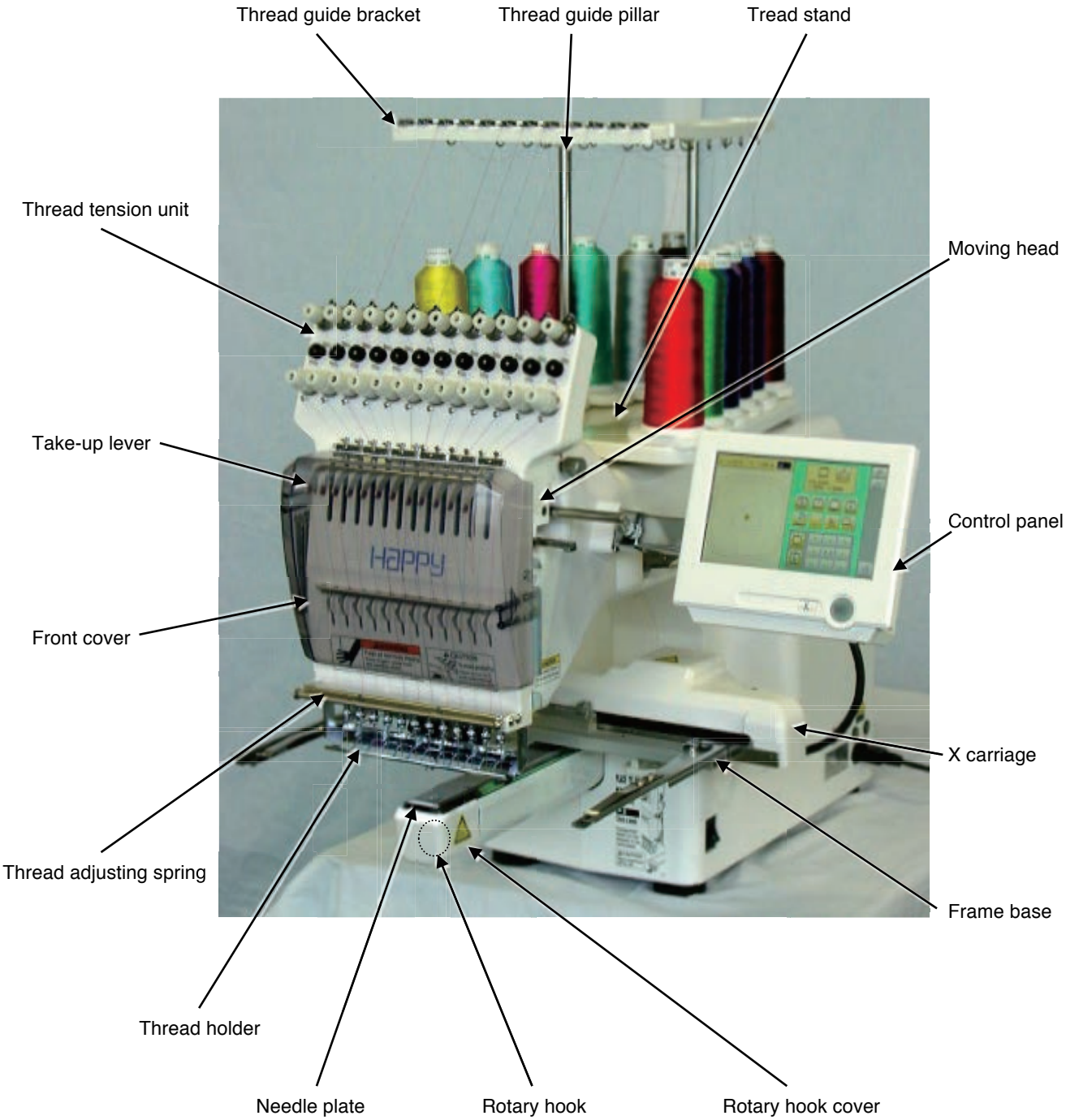


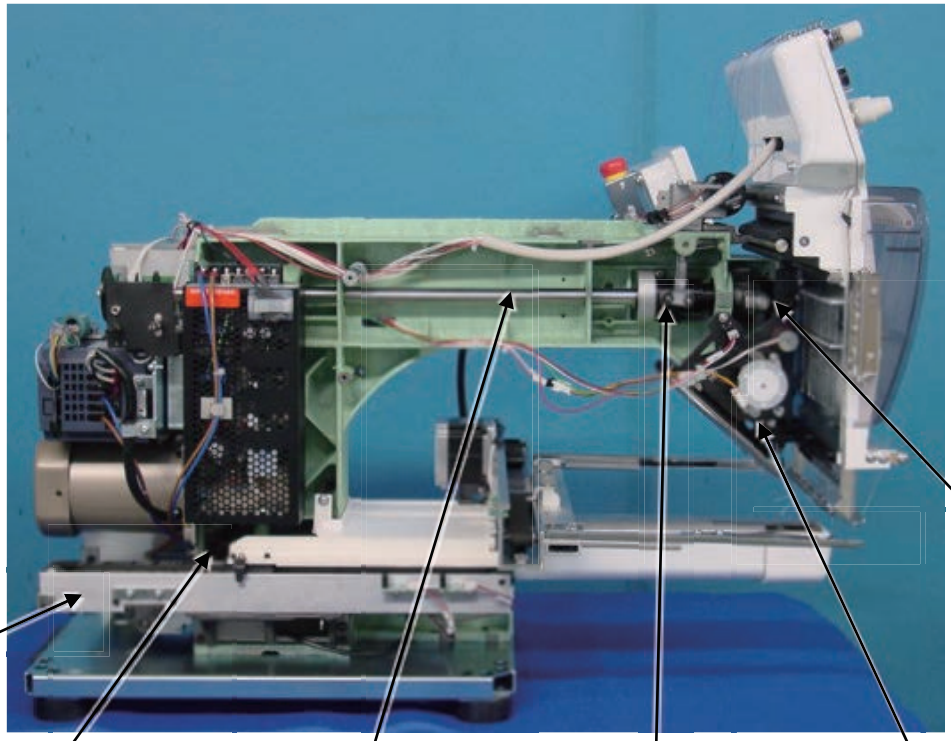
M0404342

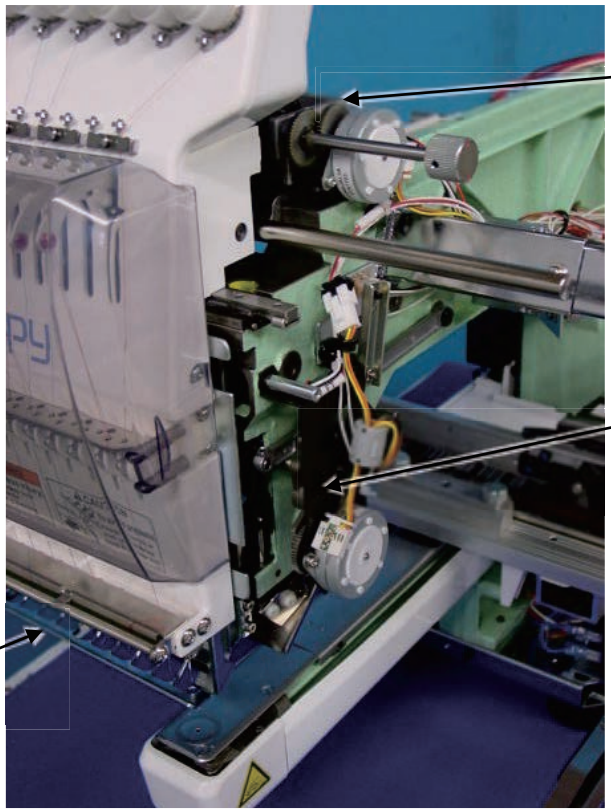
Needle height gauge (Page 65)



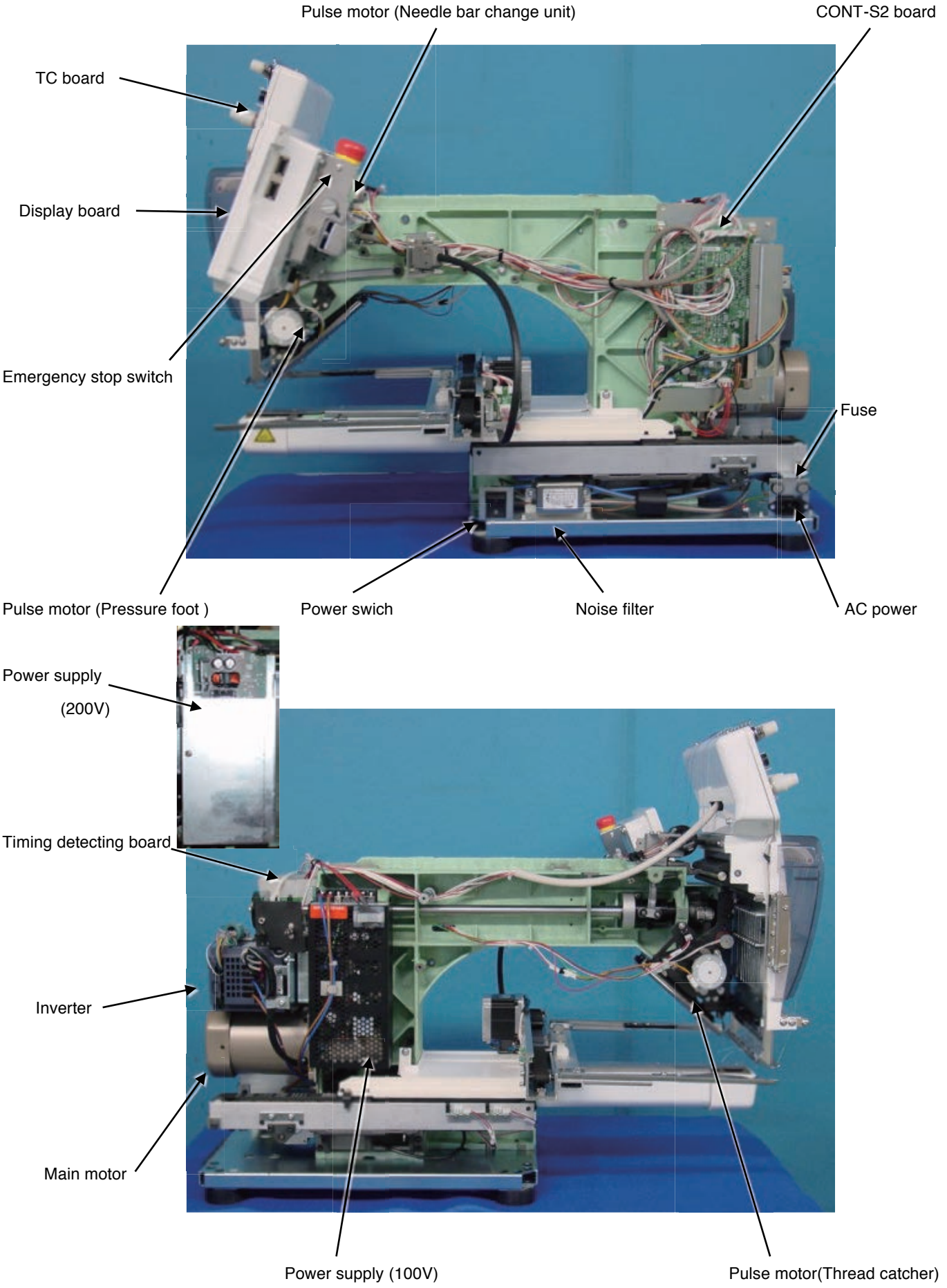
## 1-1 Placement of key mechanical parts




Needle bar
driver unit
Y carriage
Thread cutting driver
Upper shaft
Take-up lever cam
Thread cacher


Needle bar change unit
Pressure foot driver unit
Thread holder

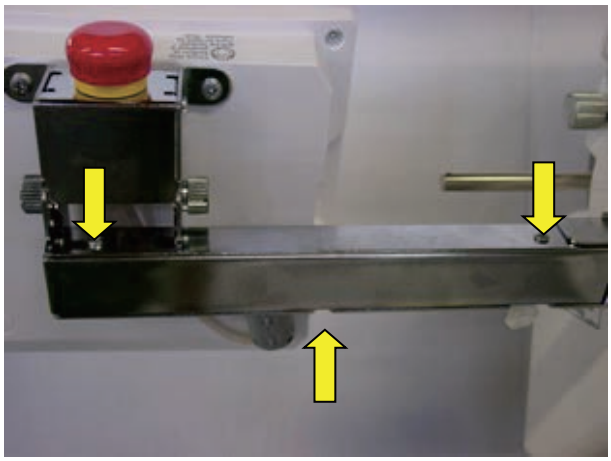
## 1-2 Placement of key electronic parts



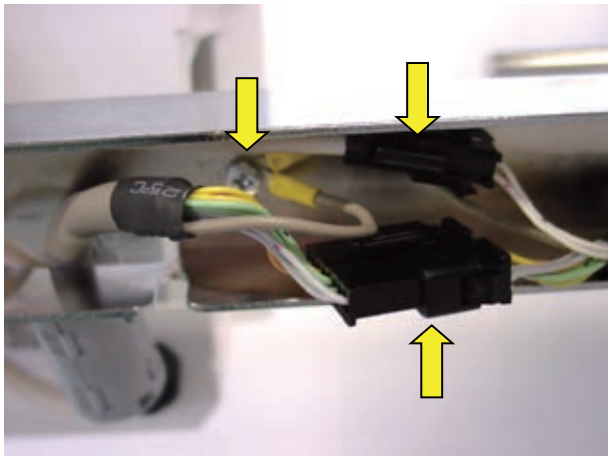
# 2-1 Removal of outer covers

<Check> Be sure to turn power switch OFF before work.

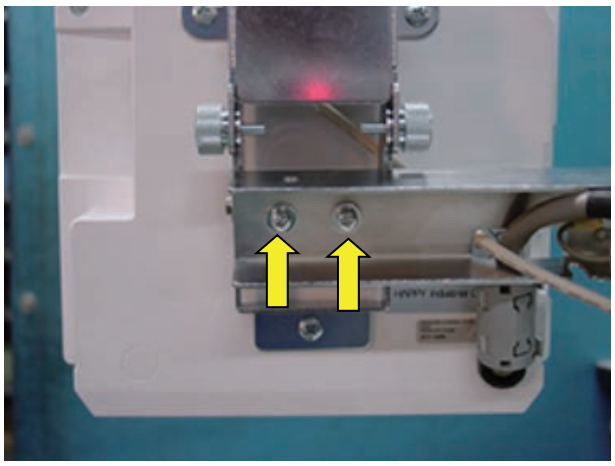
1. Remove three setscrews of arm E as shown in the figure below.



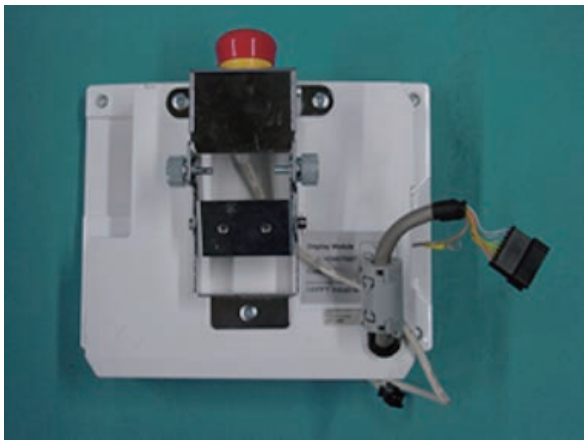
2. Disconnect the connectors indicated by the arrows in the figure below. Remove the screw that fixes cables.



3. Remove three setscrews on arm G as shown in the figure below.

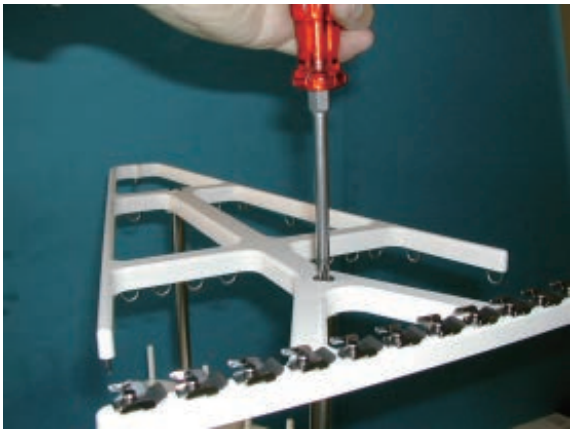


4. Remove control box.

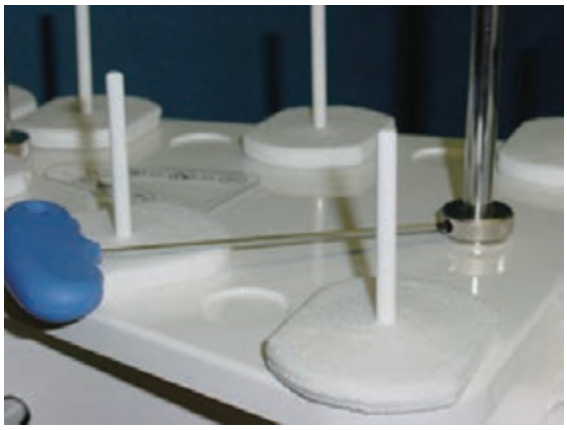


Please reverse procedure when installing control box.

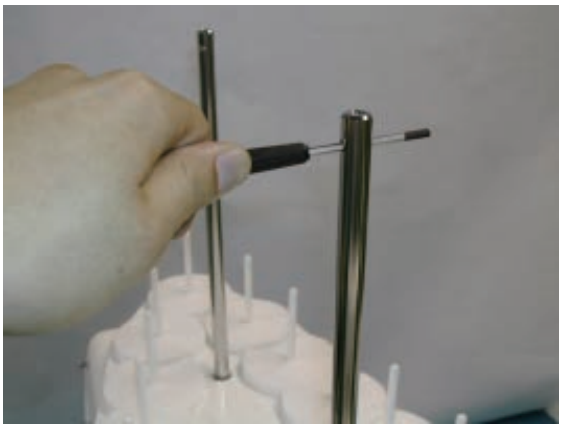
5. Remove thread guide bracket.



6. Loosen a screw of thread guide pillar

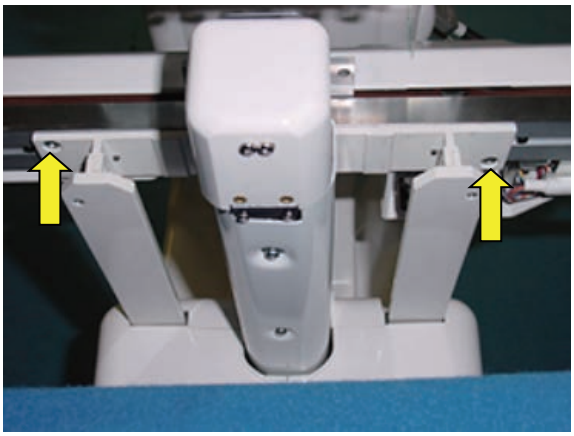


7. Remove thread guide pillar and thread stand.



8. Disconnect cable for X carriage.

9. Remove 2 screws, then take the X carriage off.

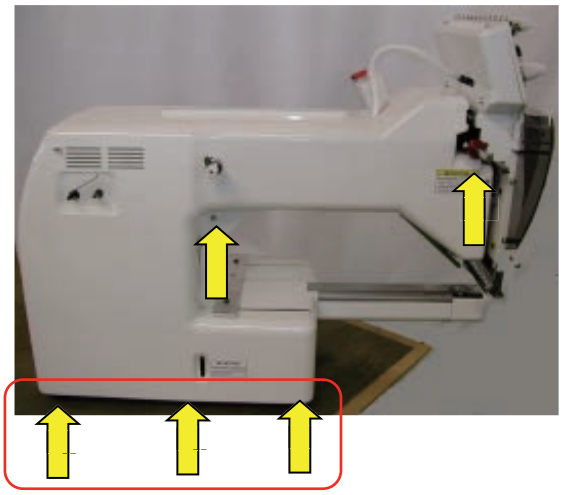


10. Remove the thread tension ass'y.

11. Remove the guide.

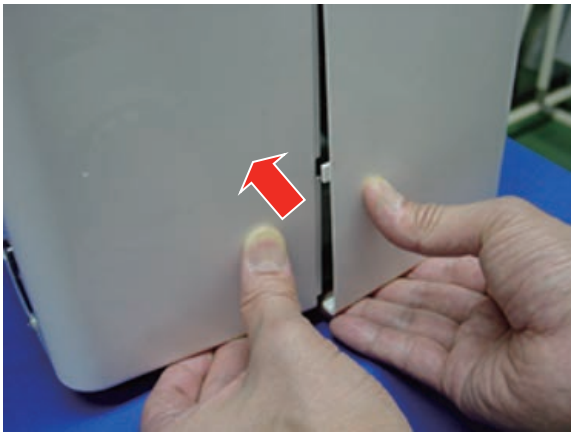
12. Take off rubber cap.

13. Remove cover (left). (Remove screw in arrow mark)



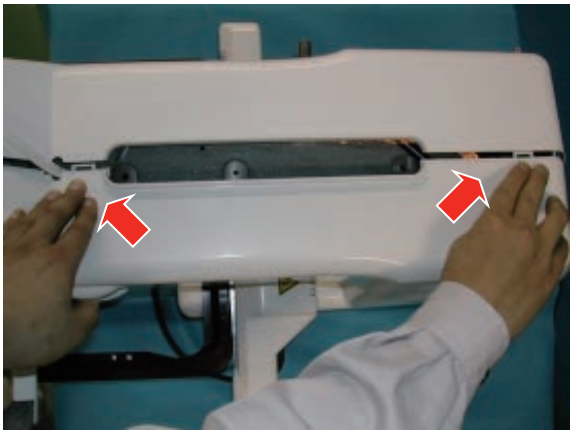
When the cover is fixed by 3 screws as above picture, please remove these screws.

14. Unlock nail of the cover (left) by pressing an arrow point of the cover (right).

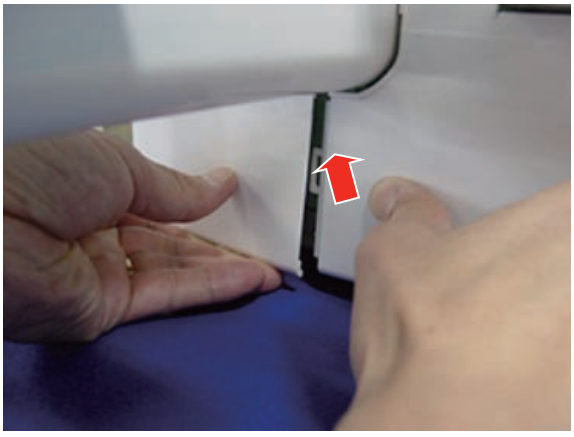


15. Remove the cover by pressing an arrow part of the picture.

(1) Upper part of the cover



(2) Front part of the cover



Nail shape

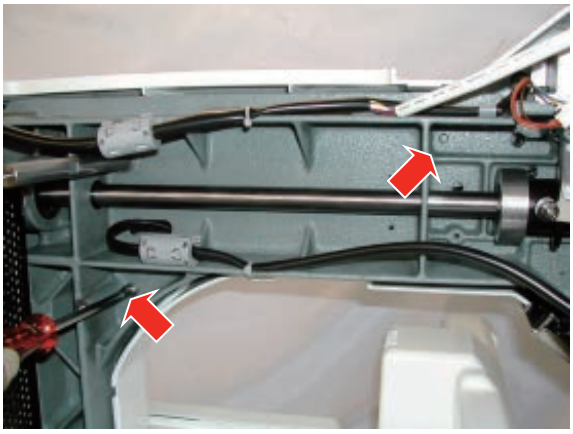
Male nail shape

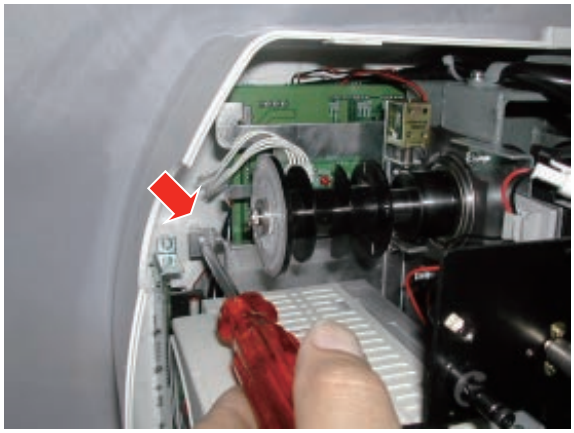
Female nail shape

When the cover is not fixed by screws, please tilt the machine slightly to access locking nail easily. Push down top of the cover and locking nail area as picture below, then the nail will be released from the machine base.

Nail shape

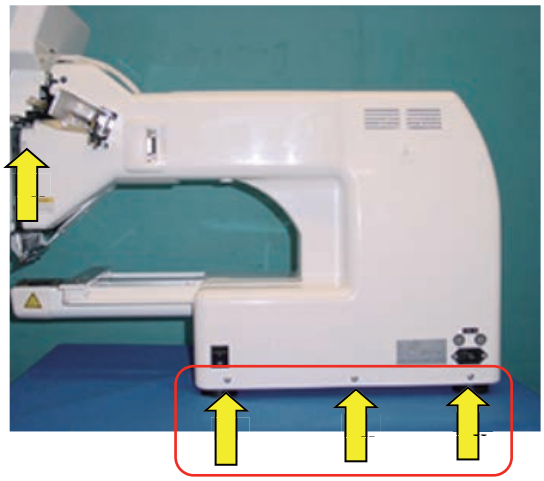
16. Remove the screw of an arrow part of the picture which fixes cover (right).





17. Remove an arrow marked screw which fixes hold arm D.

18. Remove cover (light). (Remove screw in arrow mark)



When the cover is fixed by 3 screws as above picture, please remove these screws.

19. Remove the cover (right).

20. By above process, removal of [cover] has finished.

If you need to operate the machine with control box, please re-assemble the arm and the control box.

# 3-1-1 Maintenance of thread path

In a bid to prevent poor sewing finish or thread break, please keep places where thread contacts in the best condition.

1. Thread tension, detecting roller

a) Revolution must be smooth

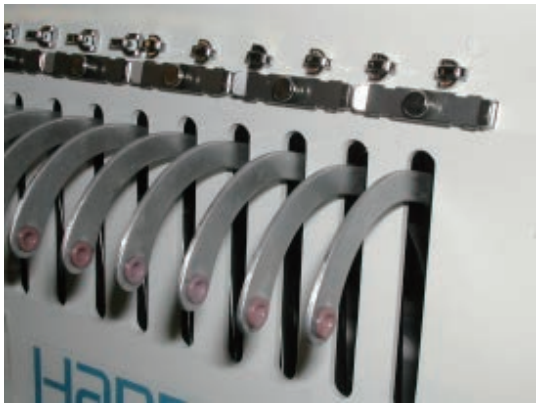
b) No sticking of lint or dust

2. Holes on thread guide plate

a) No burr and crack

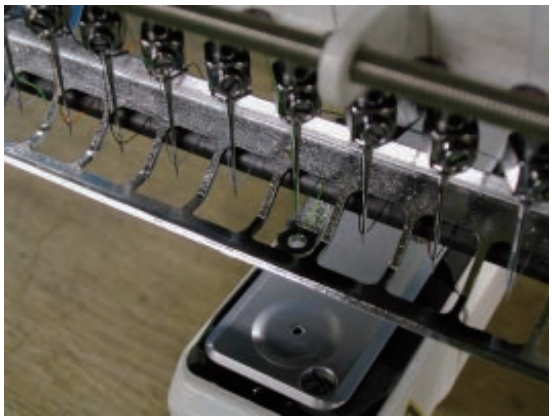
3. Ceramic and rim of take-up lever

a) No burr and crack



4. Thread path in lower side and needle holder.

a) No burr and crack



5. Needle

a) Needle tip shouldn't be warped or bent.

When you slide needle tip on surface of nail and

if the nail gets scratched.

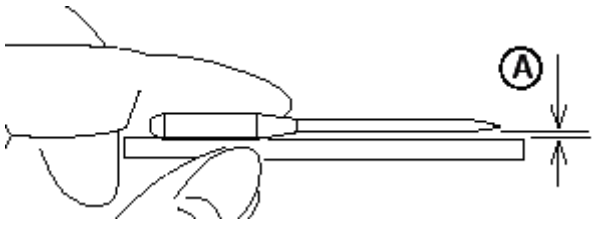
needle tip is warped. Please exchange it with new one.

Please place needle on flat surface and check

clearance (A) from side.

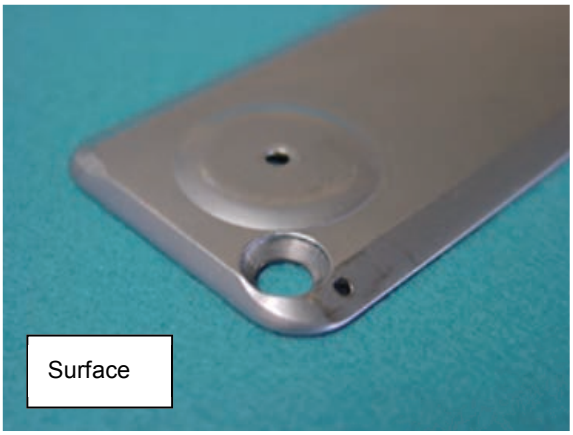
If clearance is not equal, needle is bent.

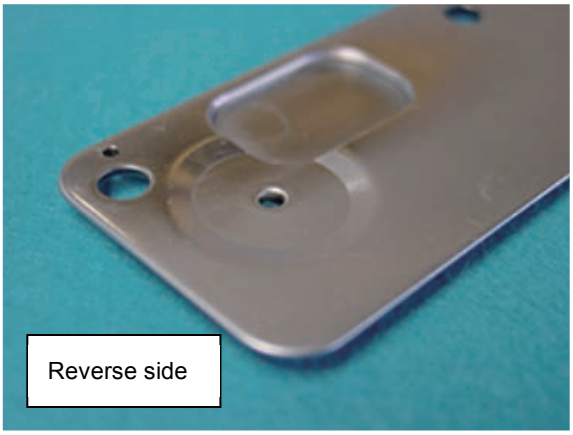
Please replace it with new one.



6. Needle plate

a) No burr and crack in needle hole and around it.

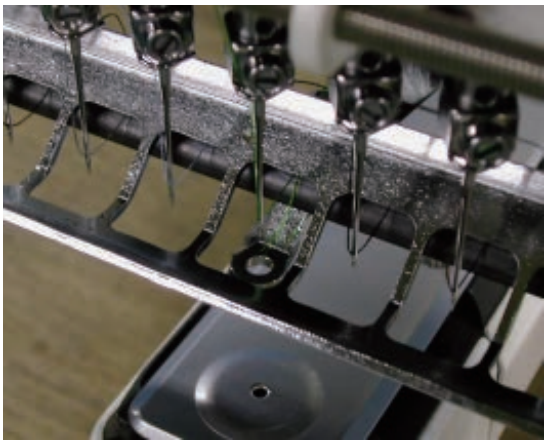



7. Pressure foot

a) No burr and crack inside hole

b) Not bent

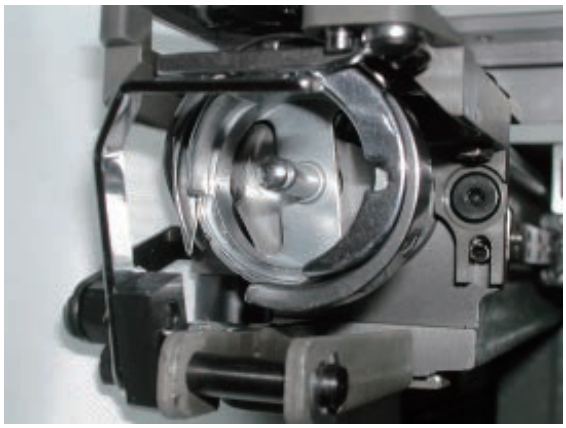


8. Rotary hook

a) No burr and crack.

b) Hook point not warped.

c) Backlash between bobbin case holder and outer hook should be less.



9. Keeper

a) No burr and crack on tip.

10. Thread adjusting spring

a) Should be robust.

# 3-1-2 Fixing of needle

1. In order of (1)-(4), please remove and fix needle.

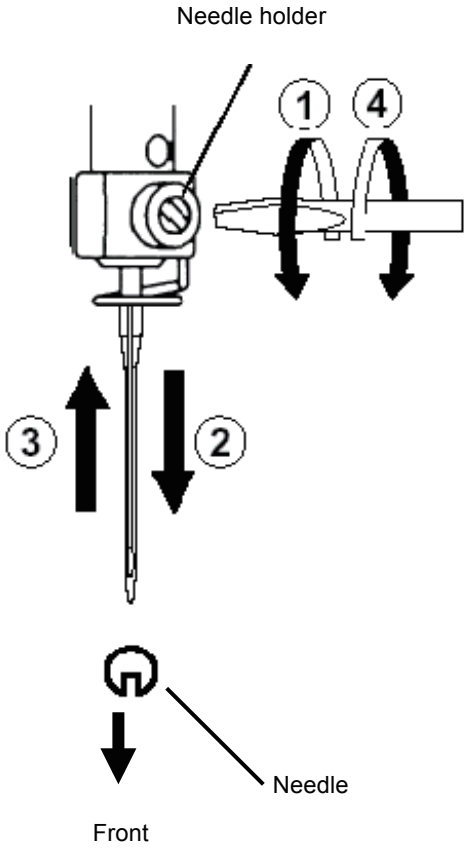
(1) Loosen screw holding needle.

(2) Remove needle.

(3) Insert needle till it goes to the end.

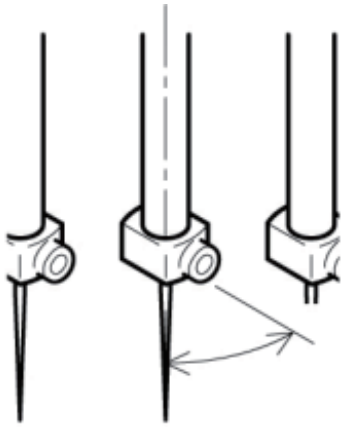
(4) Tighten screw holding needle.

Fix needle so that needle groove faces front.




* Set direction of needle holder as illustrated below.

Check needle holder dose not touch to Needle guard.



# 3-1-3 Selection of thread

1. Selection of upper thread.

<Description>

Please select considering cloth, design of pattern and flavour etc.

<Thickness>

Please refer to [Relation between needle and upper thread 3-1-4].

<Twist>

Z twisted thread is to be used.

(As rotary hook turns left- wise, Z twisted thread can prevent loosening of twist)

Z-twisted

(Left - twisted)

S-twisted

(Right - twisted)

2. Selection of lower thread.

Basically please use cotton thread (#80-120), #120 is recommendable.

Pay attention to the following in selection.

# Thickness should be equal.

# When it is lightly stretched. it doesn't break easily.

# In process of time, it doesn't get inferior.

Commercially available paper bobbin can be used, but please select thread with thickness corresponding to cotton thread (#80-120).

# 3-1-4 Relation between needle and upper thread

1. Description of needle

Basically please use [DB X K5] in standard accessory.

If description or thickness of cloth doesn't suit needle size, poor sewing finish / thread break / skipping will occur.

Therefore careful attention is required in selecting needle.

2. Relation between needle and upper thread will be found below. (Representative example is shown.)

Needle - Size is [German 75] in standard accessory.

If necessary, please select in accordance with description of thread and cloth.

Thread - In case needle size is [German 75], if thread is rayon,[#120] is recommendable.

Relation between needle and upper thread

| Needle Size | | Description of upper thread and thickness | | | |
|---|---|---|---|---|---|
| Organ | German | Cotton | Silk | Polyster | Rayon |
| 8 | 60 | 100-130 | 140-160 | 150-200 | 50-70 |
| 9 | 65 | 70-80 | 100-120 | 130-150 | 70-100 |
| 10 | 70 | | | | |
| 11 | 75 | 50-60 | 80-100 | 100-130 | 100-130 |
| 12 | 80 | | | | |
| 13 | 85 | 36-40 | 60-70 | 80-100 | 130-150 |
| 14 | 90 | | | | |
| 16 | 100 | 30-36 | 50-60 | 60-80 | 150-160 |
| 18 | 110 | 24-30 | 40-50 | 50-60 | 180-230 |

Scope to be used for general embroidery

Denier(d)

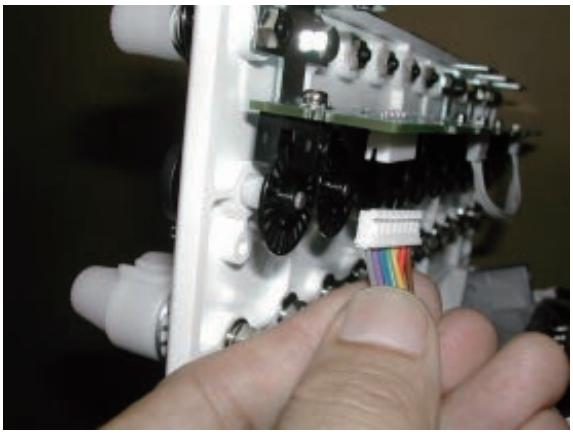
If needle size and thickness of thread don't match, following problem will be likely to occur.

- Thread break
- Skipping
- Poor sewing finish

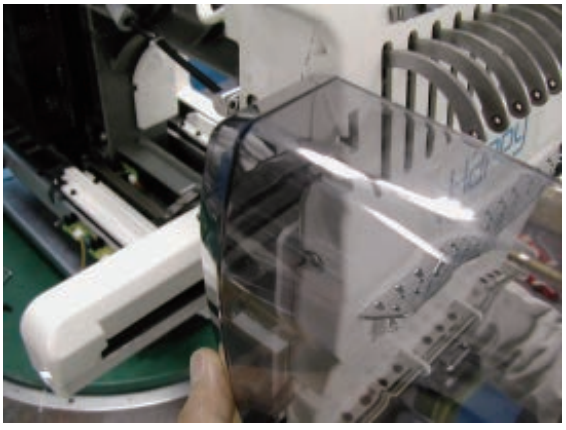
# 3-2-1Exchange of crank

1. Remove rear cover.

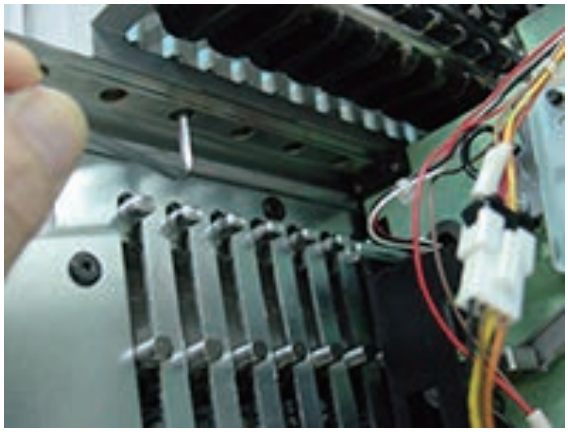
2. Disconnect TC cable and limit switch cable.

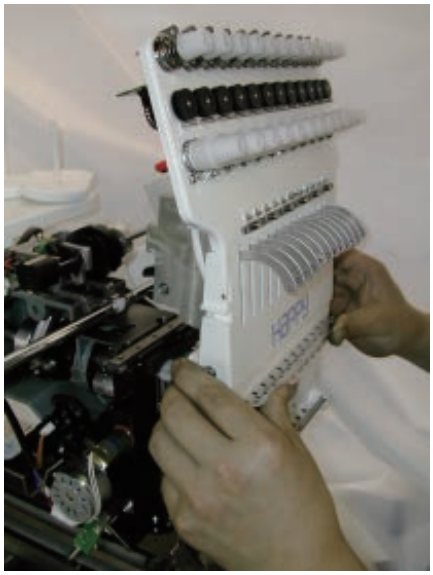


3. Remove front cover on front panel.



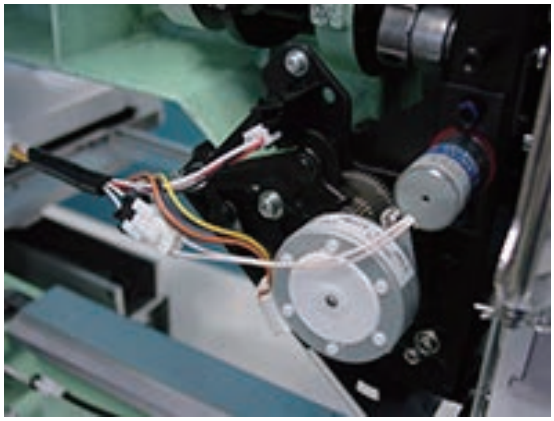
4. Referring to [3-3-3 Assemble the moving head], remove moving head.





<Caution> Do not lost simm material.

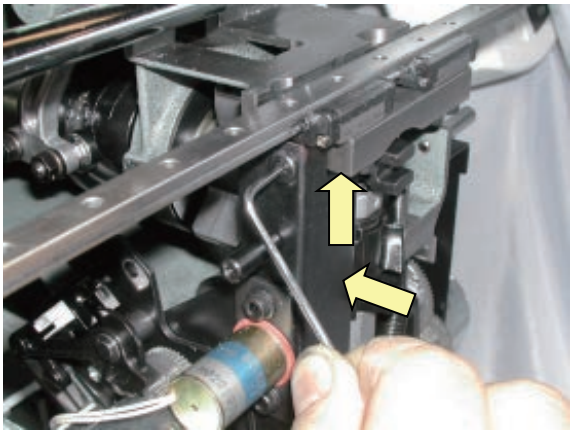
5. Disconnect cables around thread catcher.

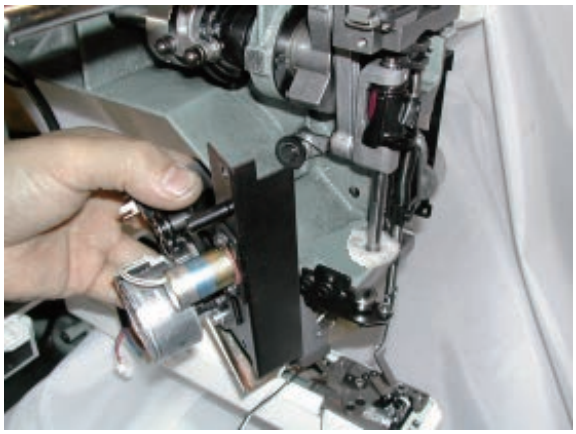


6. Remove face plate on the left.

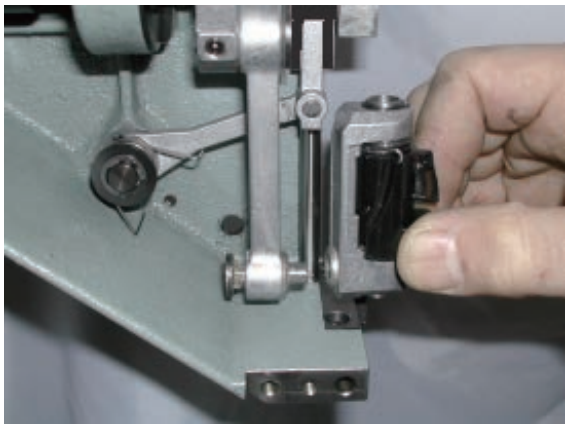
Installation position should be up and back side.

(As shown an arrow)

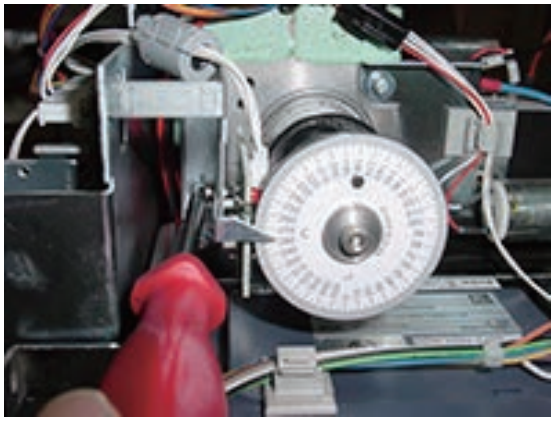




7. Referring to [3-2-4 Exchange of needle bar driver], remove needle bar driver ass'y.

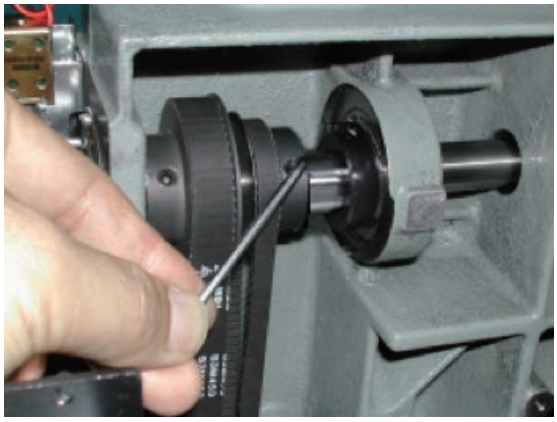


8.Remove circuit board assembly for timing detecting board.

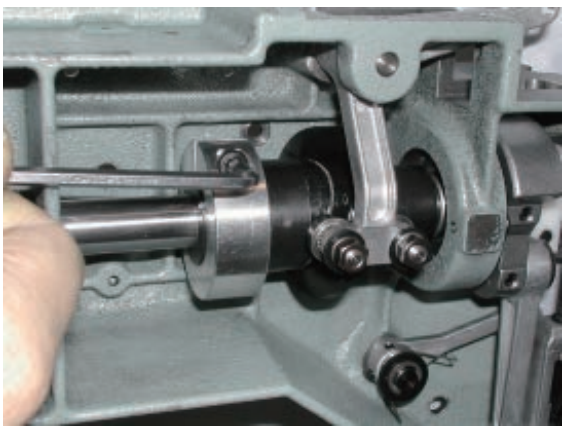


9. Remove bobbin winder and power supply.

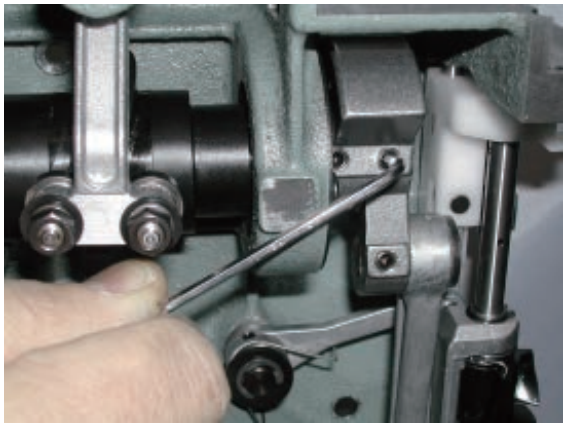
10. Loosen screw on upper shaft collar, upper pulley, drive pulley.



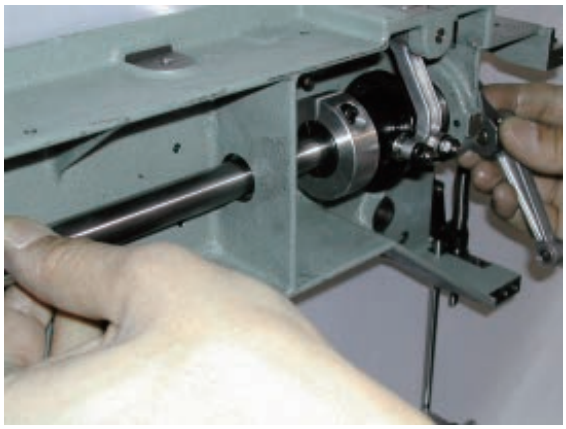
11. Loosen collar screw on take-up lever cam.



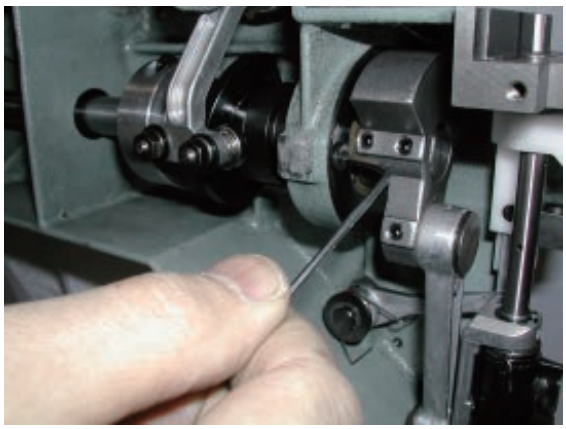
12. Loosen screw on crank.



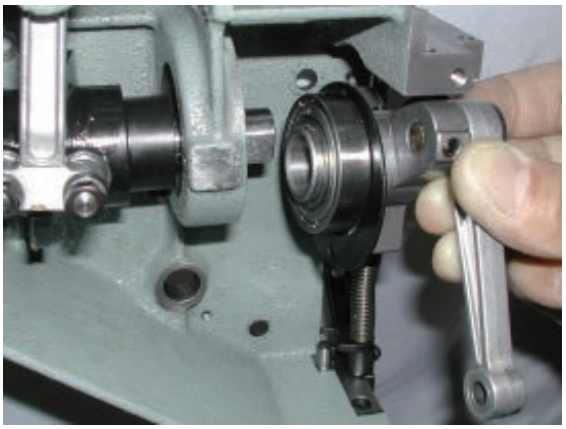
13. Pull out upper shaft. (To the extent that crank comes out)



14. Remove bearing retainer.



15. Remove crank ass'y.



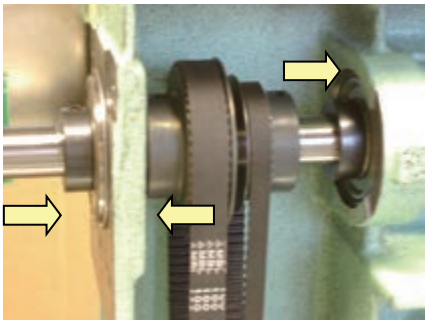
16. Put parts once removed back in reverse order

For adjusting fixing of each unit, please refer to process to adjust fixing of each unit.

<Important> Pay attention to following (1) - (4).

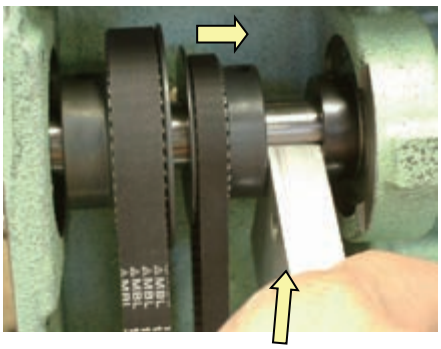
(1)Please fix upper shaft collar, upper pulley, drive pulley on flat surface of upper shaft with screw tightly.

(2)Make sure that pulleys and collars are attached without space from machine body except upper pulley.



(3)Position of upper pulley is [2mm] from upper shaft collar.

(3)Position of upper pulley is space from upper shaft collar.



Type of small collar

Thickness gauge [11.5mm]

(4)Confirm that belt is not interfere the pulley flange and not come out from pulley groove.

Adjustment will be done with following pulley.

Timing belt has to be adjusted with upper pulley position.

Motor belt has to be adjusted with motor pulley position.

17. Please check and adjust timing mentioned below to finish.

[ 4-2-1 Upper shaft timing (L point, C point) ]

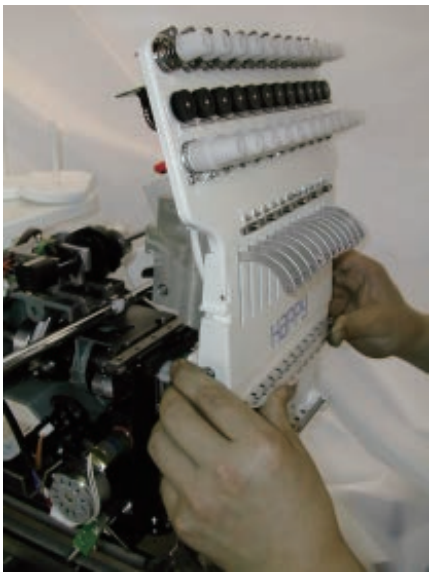
[ 3-2-8 Take-up lever timing ]

[ 3-5-1 Rotary hook timing ]

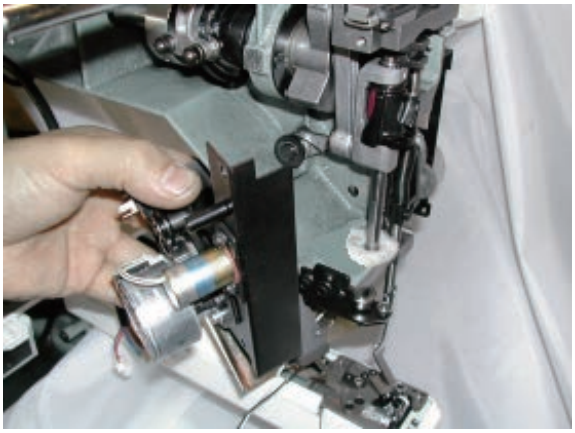
[ 3-6-5 Thread cut timing (except (for Rev.A) )

# 3-2-2 Exchange of rod

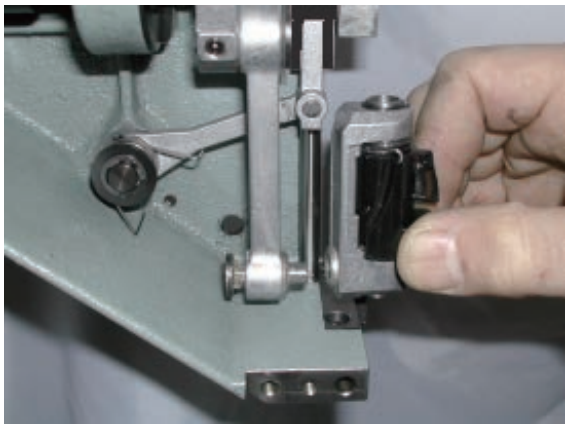
1. Referring to [3-2-1 Exchange of crank], moving head and face plate (left) ass'y.



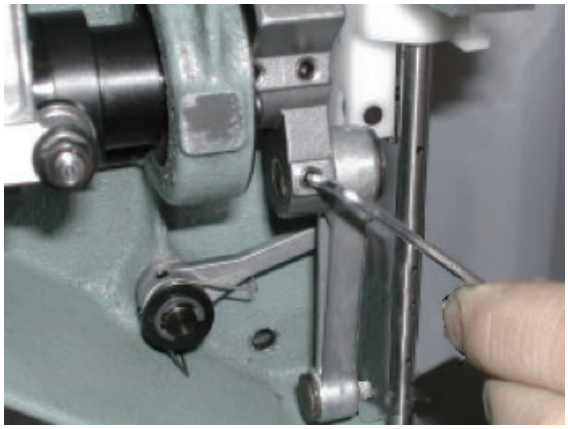
<Caution> Do not lost simm material.



2. Referring to [3-2-4 Exchange of needle bar driver], remove needle bar driver ass'y.

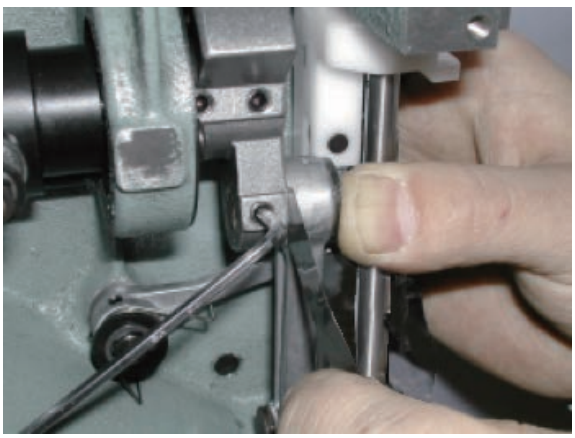


3. Loosen screw on rod pin to remove rod.



4. Install good parts.

<Important> Leave space of [0.03mm] between crank and rod.



5. Put each unit back to where it was according to manual.

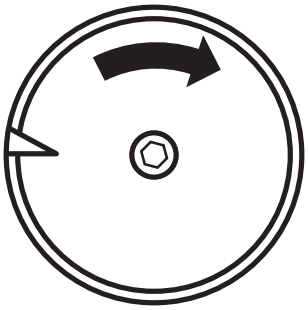
# 3-2-3 Adjustment of the lowest needle point

1. Loosen screw on detecting disk.

2. Turn upper shaft so that needle bar driver ass'y comes in the bottom.

In case there is moving head, bring needle bar down.

3. When dial disc reads [0 degree], fix detecting disk.



4. Work will finish by checking and adjusting timing mentioned below.

[ 4-2-1 Upper shaft timing (L point, C point) ]

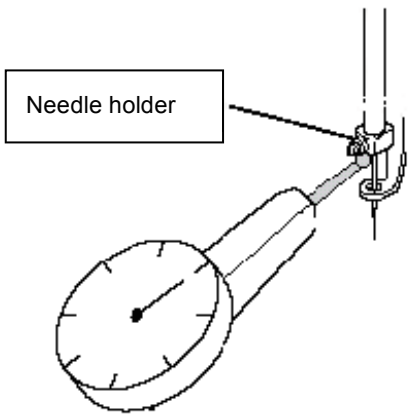
[ 3-2-8 Take-up lever timing ]

[ 3-5-1 Rotary hook timing ]

[ 3-6-5 Thread cut timing (except (for Rev.A) ))

Please use dial gauge for strict checking.

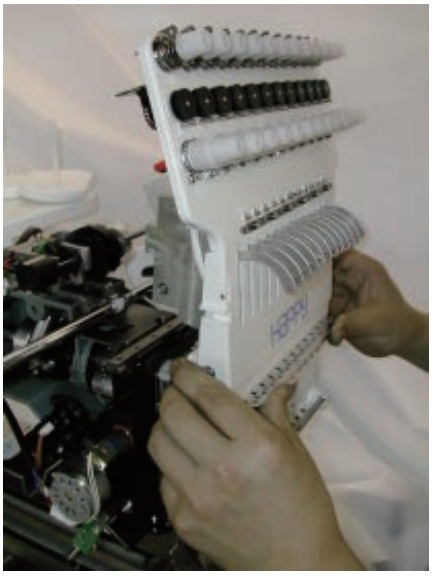
Please see that timing on dial disc comes to [0 degree] when dial swings in highest value.



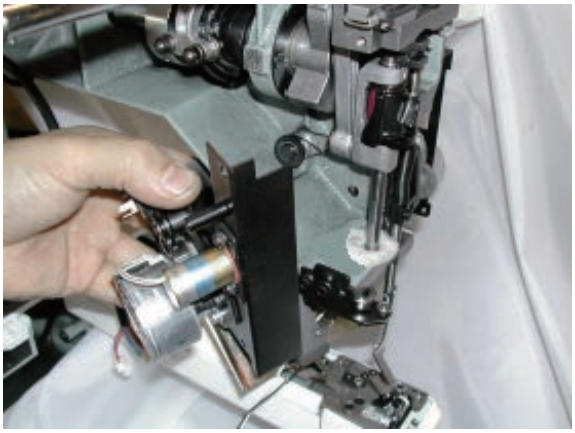

Dial-gauge

# 3-2-4 Exchange of needle bar driver

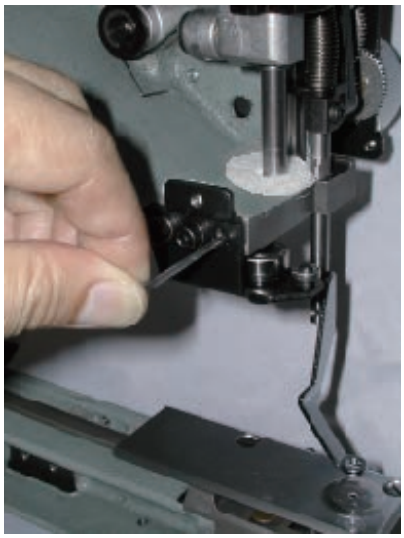
1. Refering to [3-2-1 Exchange of crank], moving head and face plate (left) ass'y.



<Caution> Do not lost simm material.



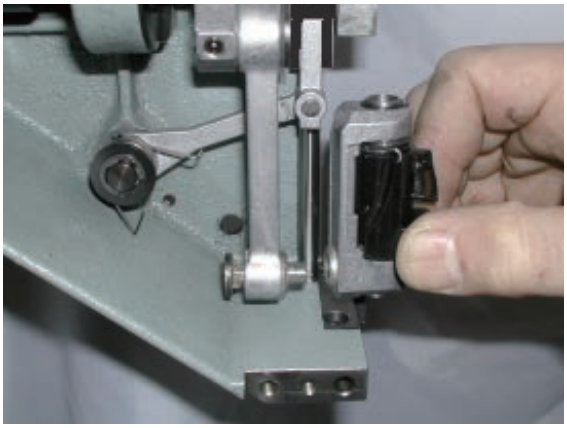
2. Loosen screw on main shaft in head.



3. Pull out main shaft in head.

4. Loosen screw on lower part of needle bar driver ass'y.

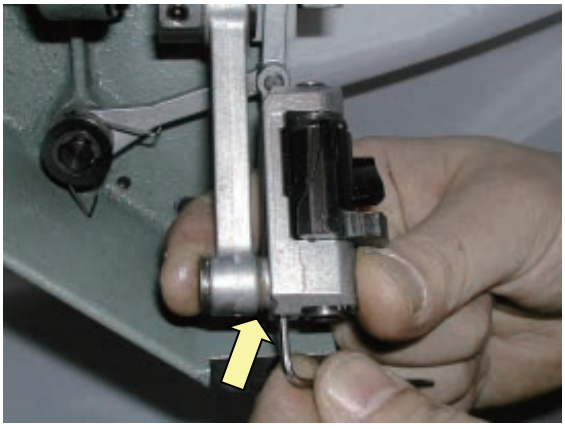
5. Remove needle bar driver ass'y.



6. Install good parts.

<Important>

Make sure that Needle bar driver ass'y rotate smoothly and no clearance between rod and arm.



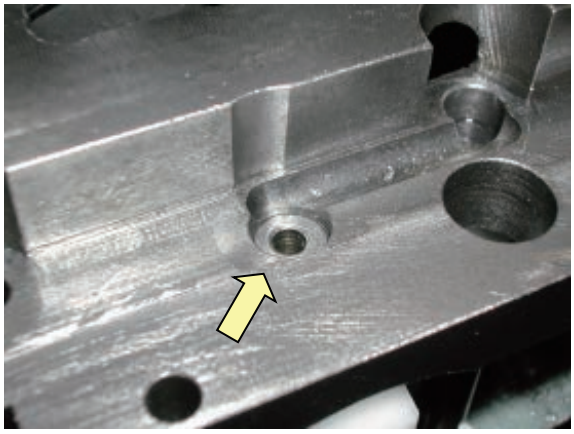
7. Put each unit back according to manual.

8. After exchange, please be sure to adjust needle height.

Please refer to [3-3-6 Adjustment of needle height].

<Attention>

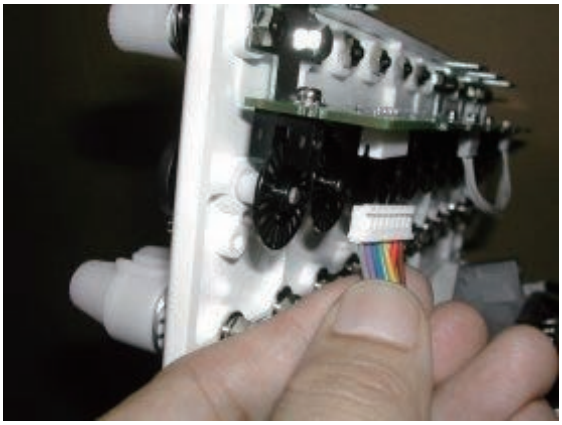
Head shaft should be positioned slightly lower than ditch for oil.



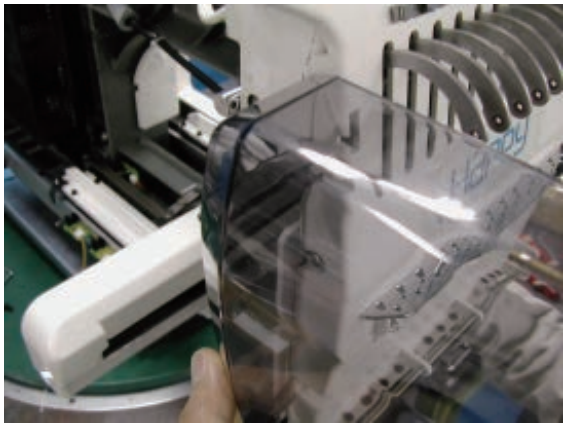
# 3-2-5 Adjustment of fixing of jump solenoid

1. Remove rear cover.

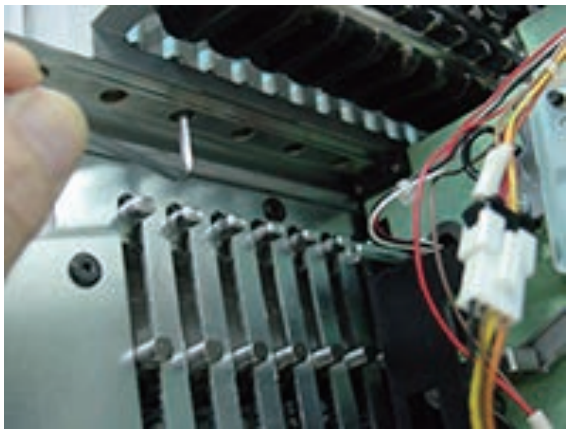
2. Disconnect TC cable and LED cable.

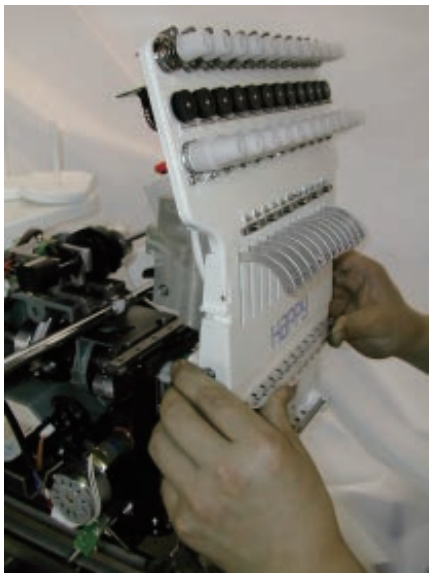


3. Remove front cover on front panel.



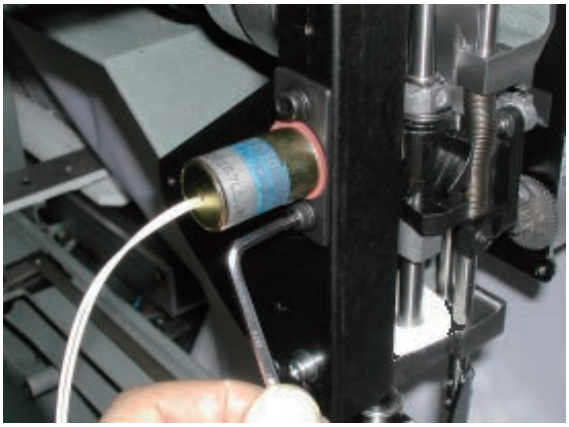
4. Remove moving head.





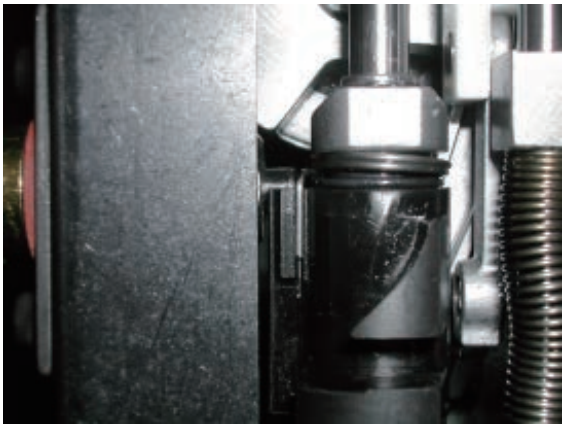
<Caution> Do not lost simm material.

5. Remove jump solenoid ass'y.



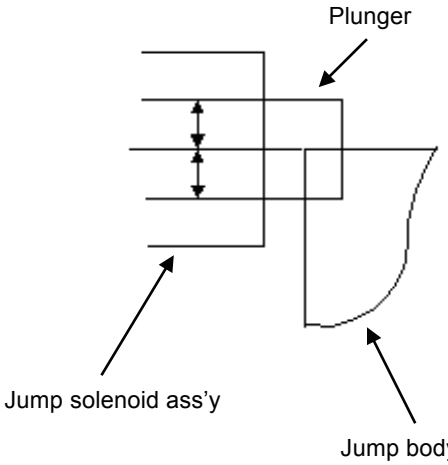
6. Install good parts.

Set upper shaft to [80 degrees] to adjust position of plunger of jump solenoid and jump body as illustrated below.



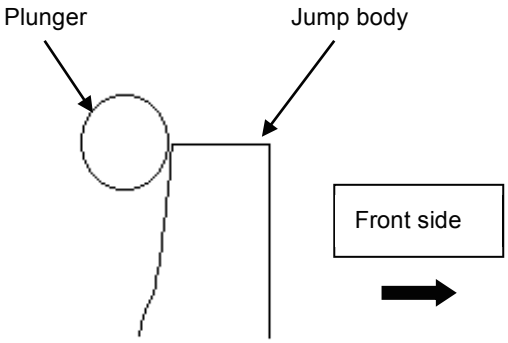
<Front view>

Viewing from front, jump body should come to center of Plunger.

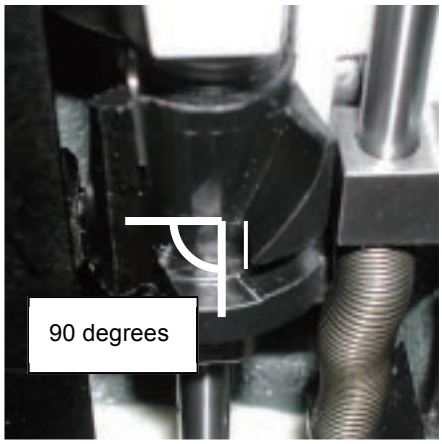



<View from left>

This shows a state that plunger and jump body contacts.




7. Adjust upper shaft to be [180 degrees] and tip of the body has to be same as the picture below.



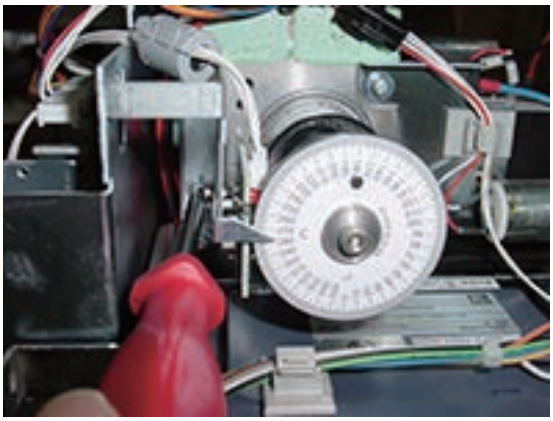

8. Please put parts back in reverse order to finish.

For adjustment of fixing of each unit, please refer to process to adjust fixing of each unit.

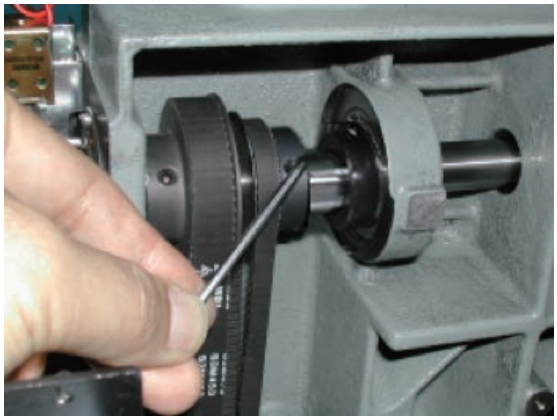
# 3-2-6 Exchange of take-up lever cam

1. Remove bobbin winder and power supply.

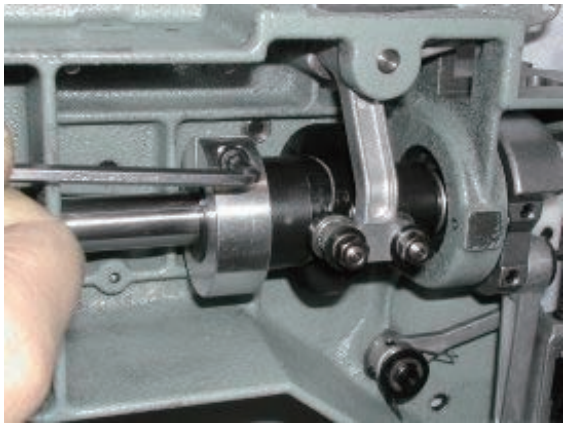
2. Remove timing detecting board ass'y.



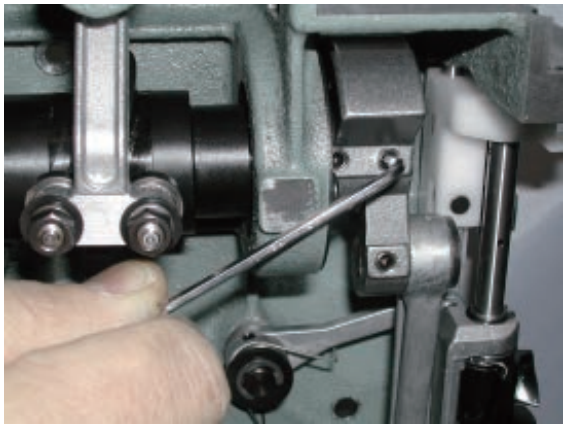
3. Loosen screws on upper shaft collar, upper pulley and drive pulley.



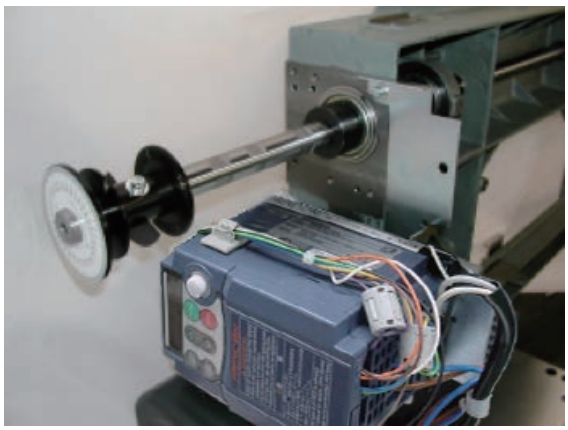
4. Loosen screw on fasten collar for take-up lever cam.



5. Loosen screw on crank.

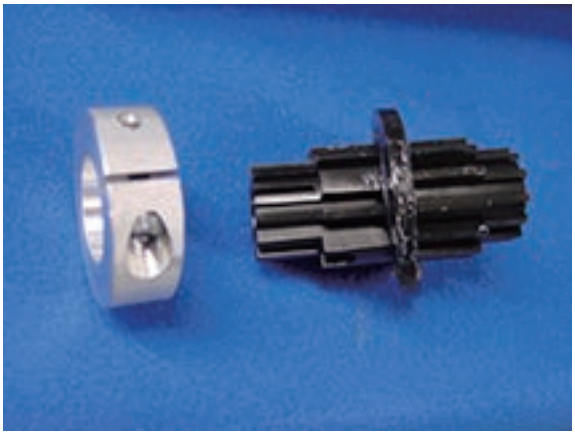


6. Pull out upper shaft (to the extent that shaft comes off from take-up lever cam).



7. Remove take up lever cam.

8. Remove fasten collar.



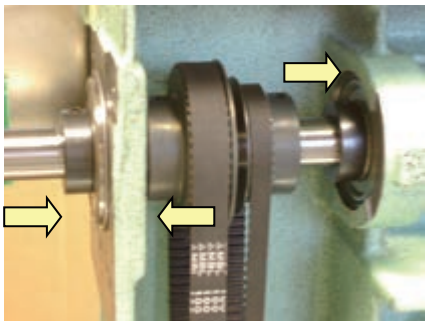
9. Put good parts back in reverse order.

For adjustment of fixing of each unit, please refer to process to adjust fixing of each unit.

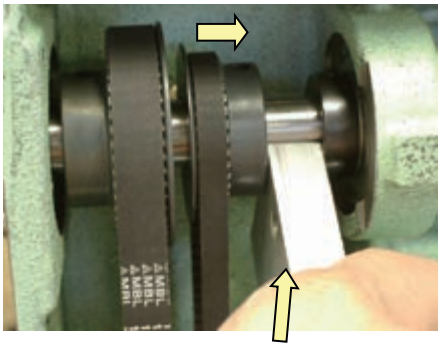
<Important> Pay attention to following (1) - (4)

(1)Install upper shaft collar, upper pulley, drive pulley and crank on flat surface of upper shaft with screw tightly.

(2)Make sure that pulleys and collars are attached without space from machine body except upper pulley.



(3)Position of upper pulley is space from upper shaft collar.



Type of small collar

Thickness gauge [11.5mm]

(4)Confirm that belt is not interfere the pulley flange and not come out from pulley groove.

Adjustment will be done with following pulley.

Timing belt has to be adjusted with upper pulley position.

Motor belt has to be adjusted with motor pulley position.

10. Please check and adjust the following timing to finish.

[ 4-2-1 Upper shaft timing (L point, C point) ]

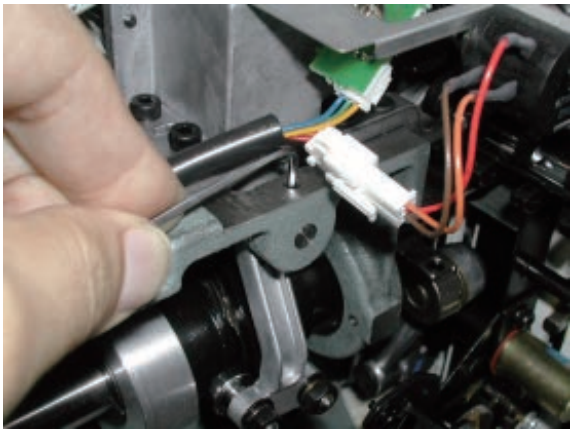
[ 3-2-8 Take-up lever timing ]

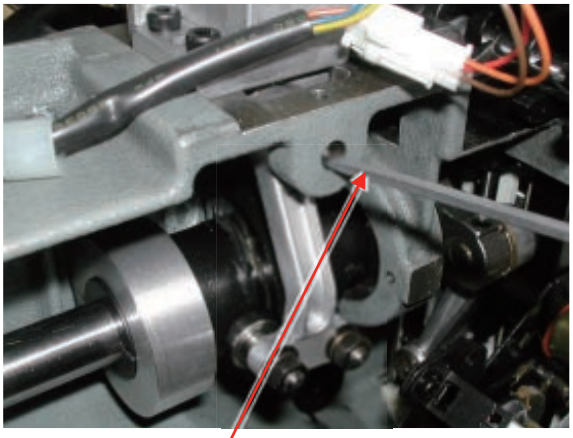
[ 3-5-1 Rotary hook timing ]

[ 3-6-5 Thread cut timing (except (for Rev.A) ))

# 3-2-7 Exchange of roller shaft ass'y

1. Remove take-up lever crank ass'y.





Push take-up lever drive shaft by slender shaft.

(Hexagon wrench etc.)

2.Exchange roller shaft ass'y.

<Spanner> 7mm, 8mm

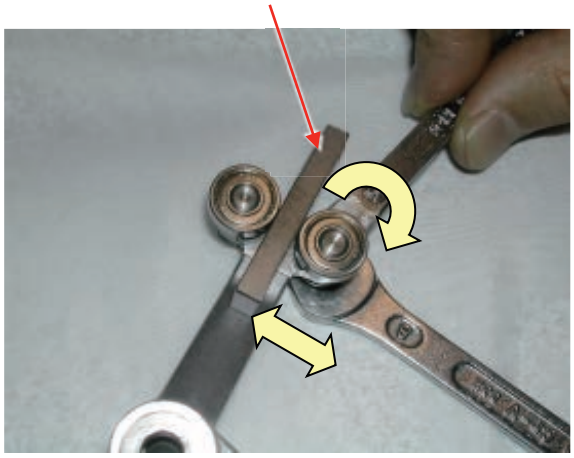
3. Insert bering positioning gauge [4.85mm] between bering and bering , and then tighten roller shaft ass'y.

Please adjust roller shaft for machine front side ways.

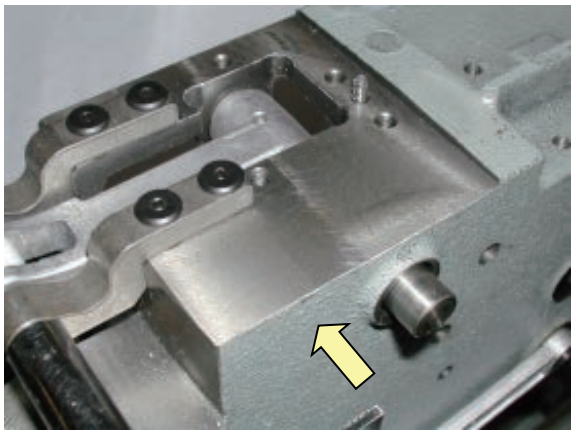
This roller shaft ass'y is eccentricity.

Turn lean screw and just touch roller to gauge.

Bering positioning gauge [4.85mm]



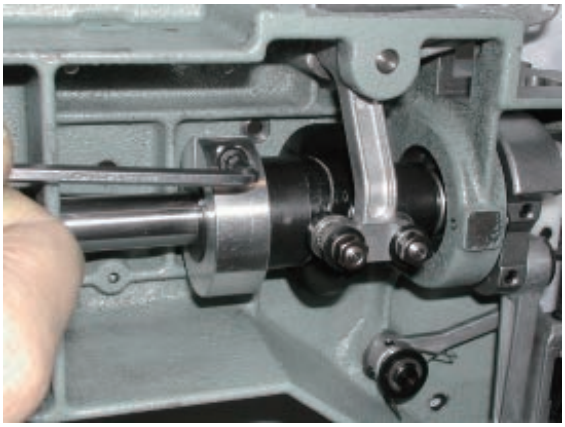
4. Return take-up lever crank ass'y to previous place to finish.



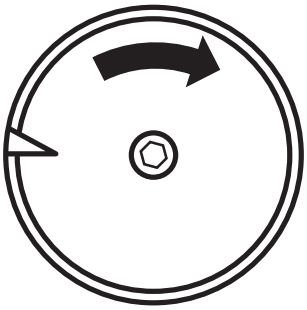
Please push to arrow ways until stop.

# 3-2-8 Adjustment of take-up lever timing

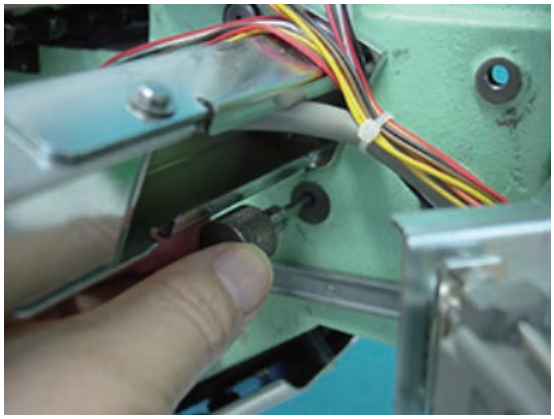
1. Loosen screw on fasten collar for take-up lever cam.



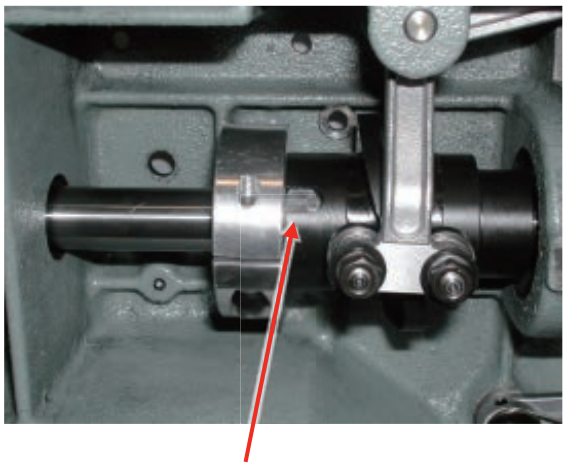
2. Set dial disc to [10 degrees].



3. Insert positioning pin from right side.



4. Turn take up lever cam slowly and insert positioning pin into pin groove.

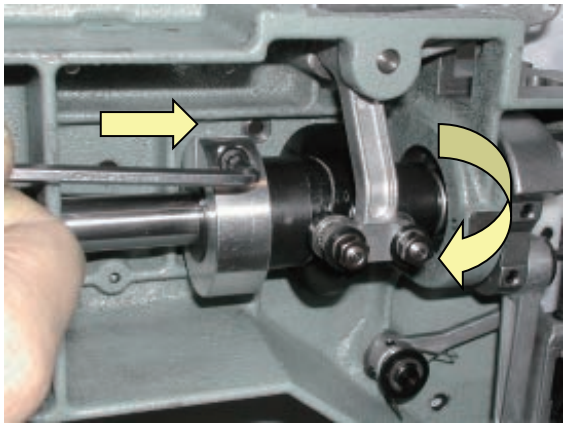


pin groove

5. Loosen screw.

<Important>

Rotate the Take up lever cam clockwise until pin ditch touches to positioning pin then tighten the screw. (No gap between take-up lever cam and crank)

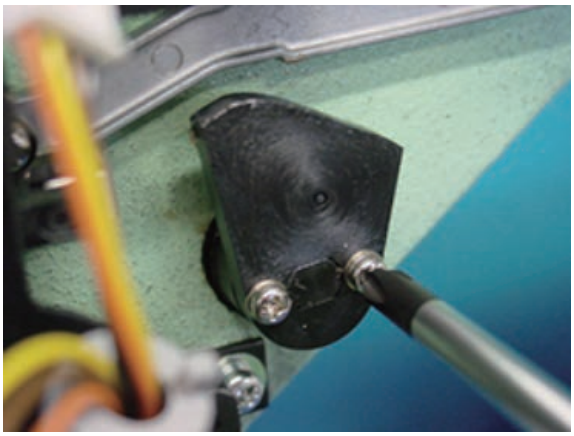


6. Pull out positioning pin.

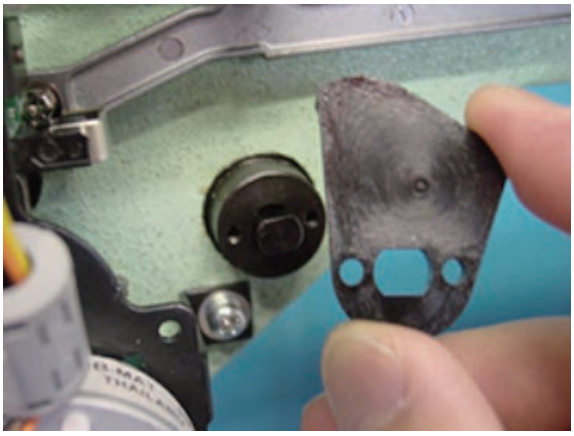
7. Turn upper shaft and set dial disc to [C] to finish.

# 3-2-9 Exchange of pressure foot cam

1. Remove screw on pressure foot cam.



2. Exchange pressure foot cam.

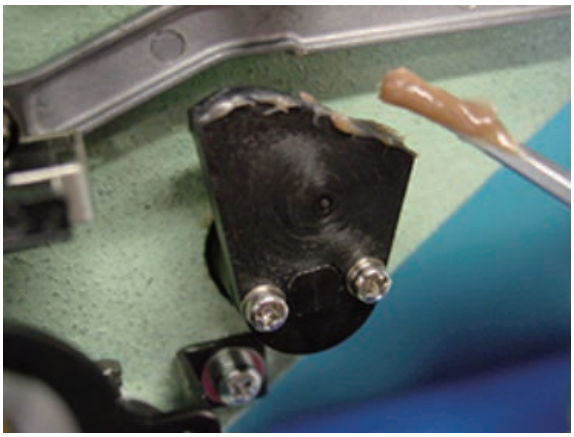


3. Put on grease to pressure foot cam.

<Grease>

Shell alvania EP Grease2

(Shell Gudas S2 V220 2)

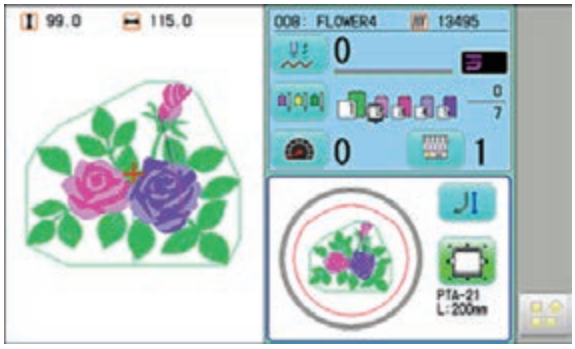


4. Exchange has finished.

# 3-2-10 Check of height of pressure foot

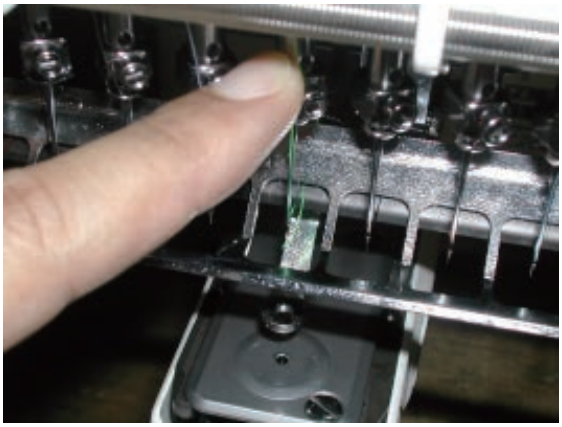
1. Bring pressure foot down. (Either way mentioned below)

(1)press  P_FOOT key on control box.

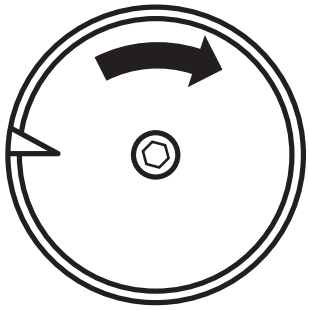



(2)Turn gear with finger.

2. Bring needle down.



3. Turn upper shaft and set dial disc to [0 degree].



4. Insert [Gauge I.2mm] between needle plate and pressure foot.

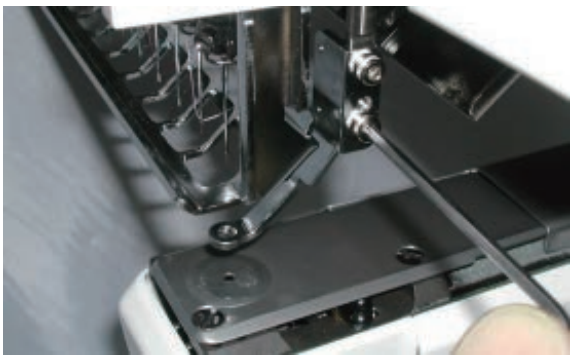
No gap between gauge and pressure foot or needle plate, will be OK.

5. If wrong space (not 1.2mm), please adjust height of pressure foot guide bar.

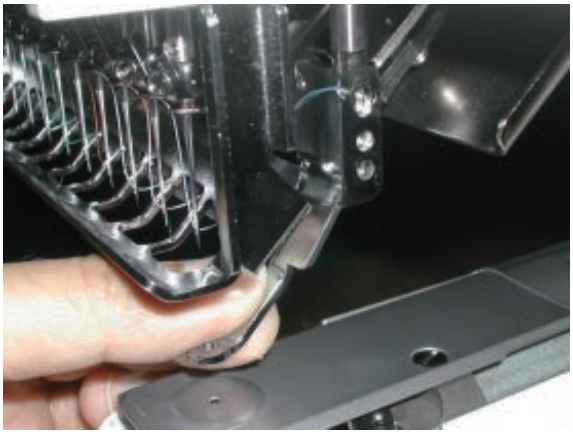
Please refer to [3-2-12 Adjustment of height of pressure foot guide bar ].

# 3-2-11 Exchange of pressure foot

1. Remove pressure foot.



2. Install good pressure foot.



3. Adjust height of pressure foot to finish.

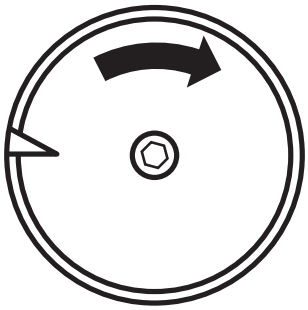
Please refer to [3-2-10 Check of height of pressure foot].

# 3-2-12 Adjustment of height of pressure foot guide bar

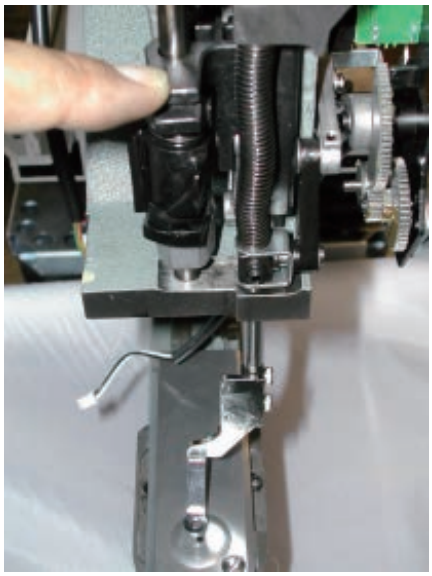
1. Tighten pressure foot of position for tublar, and then install needle plate for tublar frame.

2. Loosen the screw which fixes guide bar block.

3. Rotate the upper shaft to be lowest point [0 degrees].



4. Push down block ass'y.



5. Adjust the center between needle hole of needle plate and hole of pressure foot.

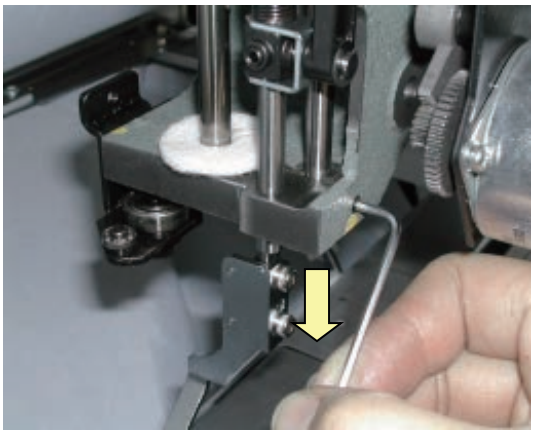
6. Insert thickness gauge [1.2mm] between needle plate and pressure foot then tighten the screw which fixes guide bar block.

7. Before terminates the adjustment, reconfirm procedure 5, Needle hole of needle plate and hole of pressure foot to be centered.

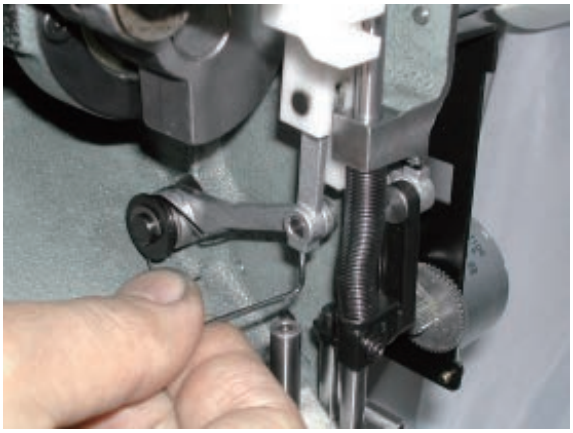
# 3-2-13 Exchange of pressure foot link and block

1. Move the head shaft lower.

2. Loosen the screw which fixes guide shaft
then move the guide shaft lower.

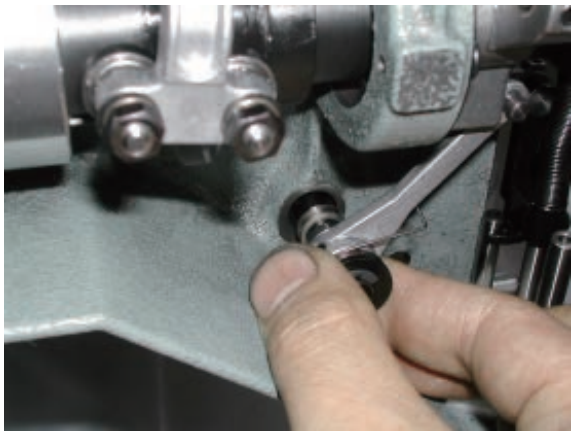


3. If you exchange block ass'y, loosen the screw which fixes pressure foot link A then remove block ass'y.

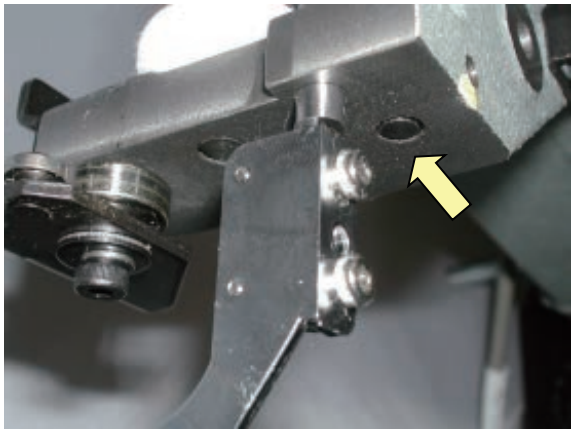


4. If you remove the pressure foot link B ass'y, first remove the pressure foot cam collar and pressure foot drive cam.

5. Remove pressure foot link B ass'y.

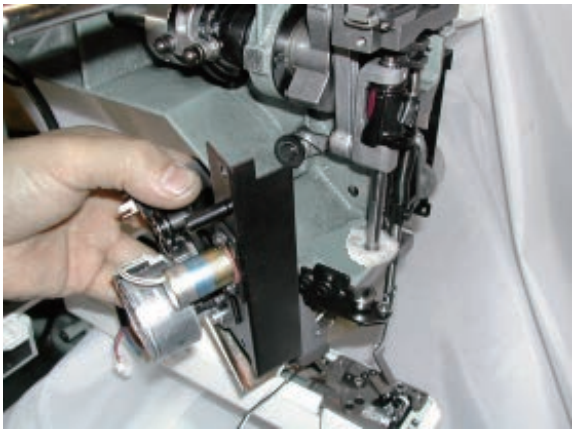


6. Assemble the parts by opposite procedure to terminate this exchange.
When assembling each unit, please refer to each procedure Instruction for assemble adjustment.
<Attention>
Position of guide shaft is attached to lowest and the side of Head.



# 3-2-14 Exchange of pressure foot drive lever

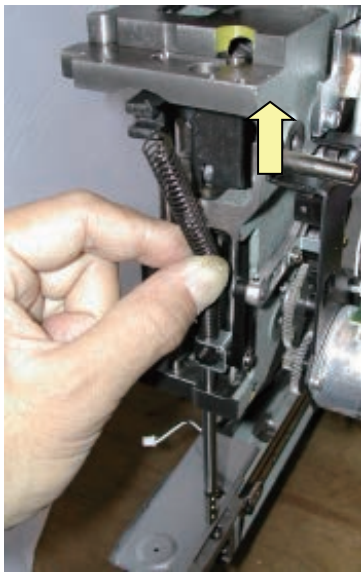
1. Remove face plate.



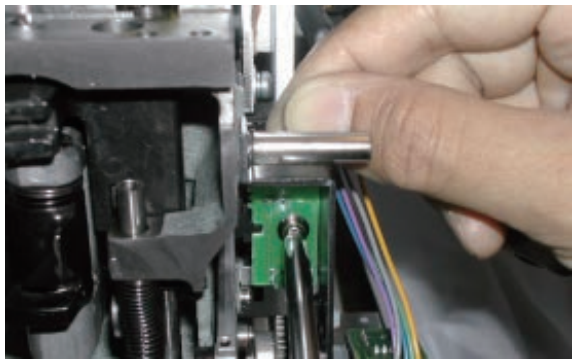
2.Remove upper rail.

3.Remove pressure foot and pressure foot guide bar.

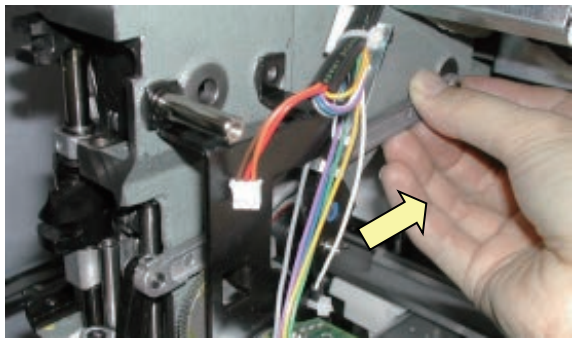
After remove pressure foot spring 2, remove pressure foot guide bar to up side.



4.Remove sensor board ass'y.



5.Exchange pressure foot drive lever ass'y.

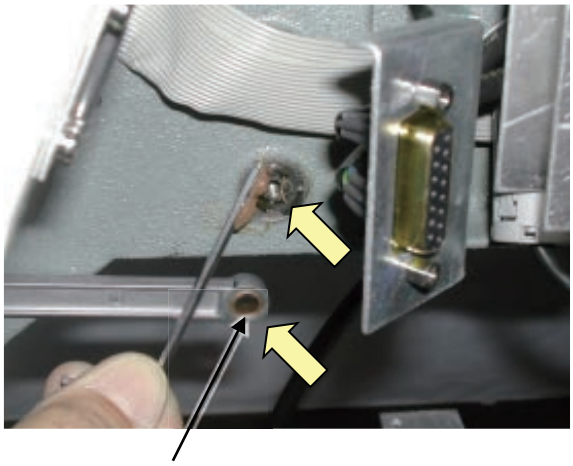


6. Put on grease to bady and oil bush of pressure foot lever ass'y.

<Grease>

Shell alvania EP Grease2

(Shell Gudas S2 V220 2)

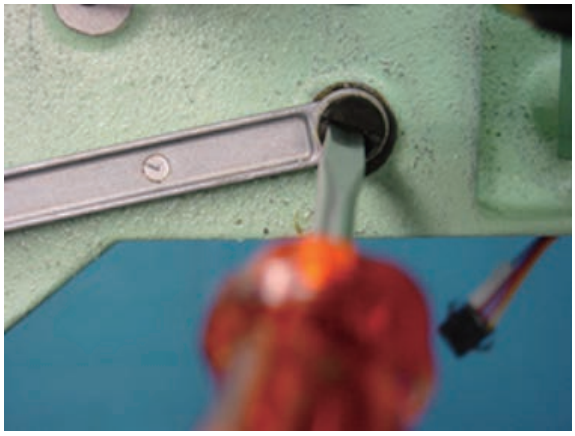


Oil insert bush

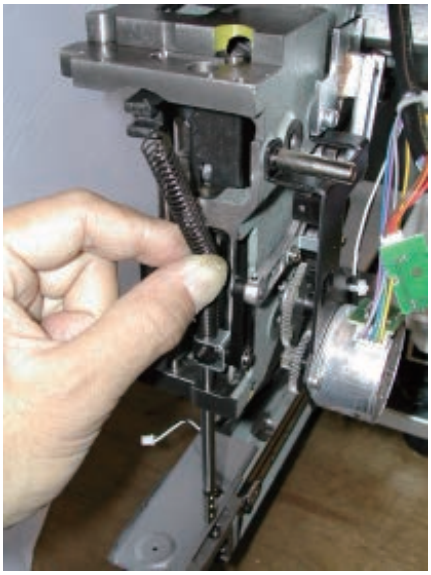
7. Put on grease to fulcrum shaft.

<Caution> Do not put on grease to a part of screw.

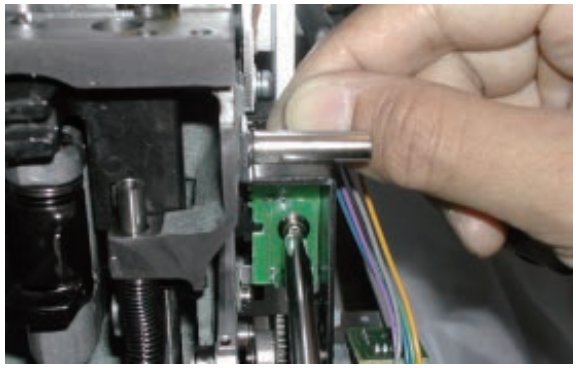
8. Assemble pressure foot drive lever ass'y.



9. Assemble pressure foot guide bar and pressure foot.



10. Assemble sensor board ass'y.

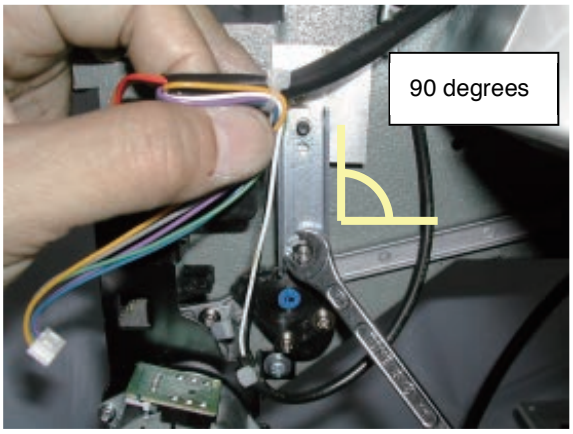


11. Adjust position of pressure foot guide plate A ass'y.

<Caution>

Make sure that pressure foot guide plate A ass'y is mount perpendicular and parallel to the body.

<Spanner> 7mm




12. Adjust the height of pressure foot guide bar.

Please refer to [3-2-12 Adjustment of height of pressure foot guide bar].

13. Assemble the upper rail of moving head.

Please refer to [3-3-1 Assemble the upper rail of moving head].

14. Assemble the face plate.

15. Install parts in reverse order to finish.

For adjustment of fixing of each unit, please refer to process to adjust fixing of each unit.

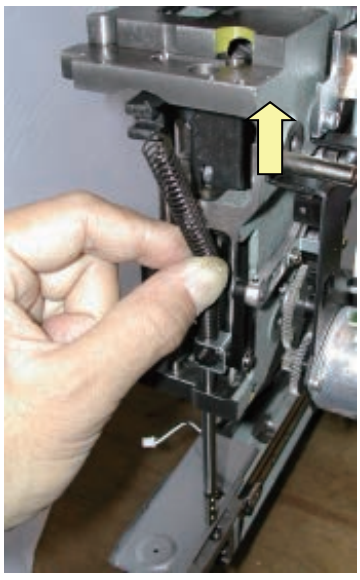
# 3-2-15 Exchange of pressure foot guide

1.Remove pressure foot.

2. Loosen the screw which fixes guide bar boss.

3. Remove pressure guide bar.

After remove pressure foot spring 2, remove pressure foot guide bar to up side.



4. Remove E-ring (E-4) which fixes guide bar boss.

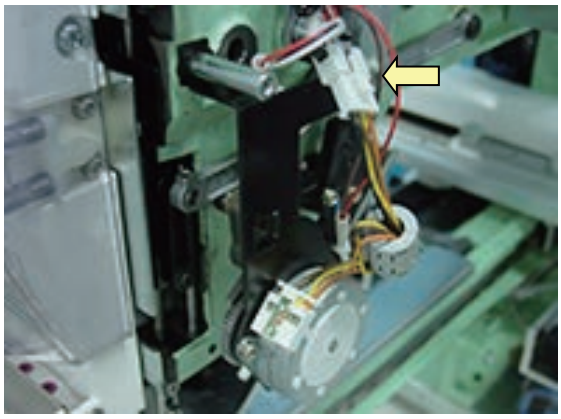
5.Exchange guide.

6.Assemble the pressure foot gude bar and pressure foot.

7. Adjust the height of pressure foot guide bar to finish.
   Please refer to [3-2-12 Adjustment of height of pressure foot guide bar.]

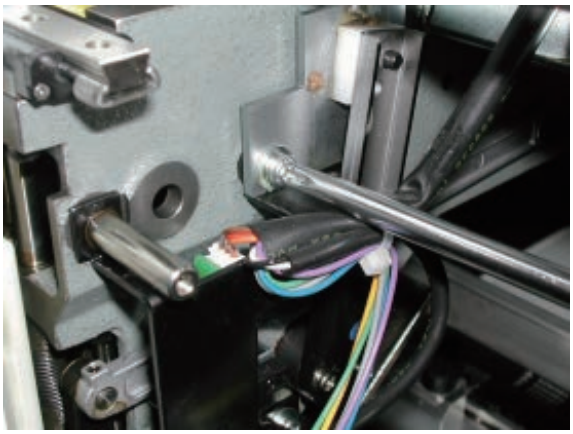
# 3-2-16 Exchange of pulse motor for pressure foot

1. Disconnect cable from Pulse motor and Sensor board ass'y.

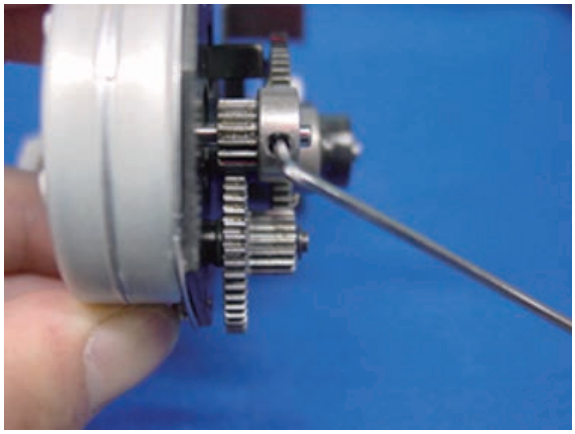


2. Down the Pressure foot.

3. Remove bracket ass'y.

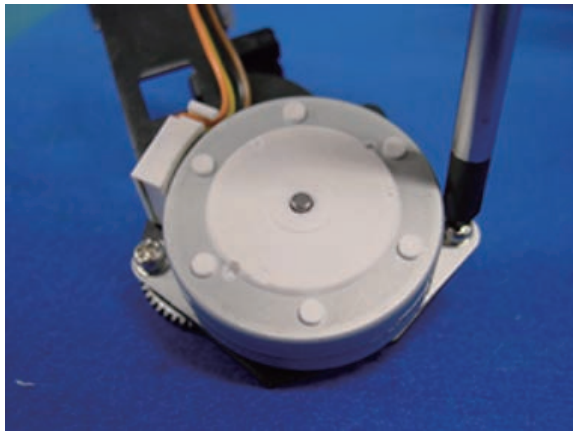


4. Remove drive gear A.



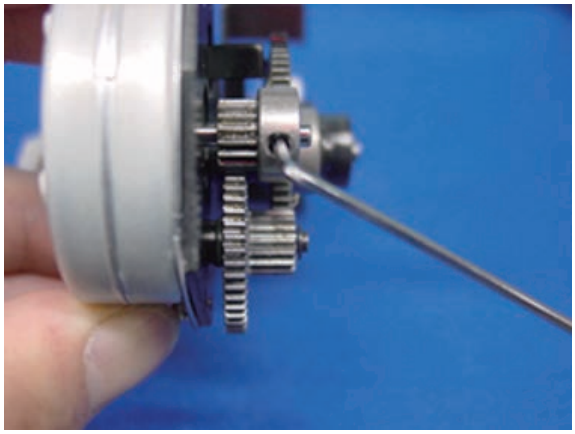
5. Exchange the pulse motor.

Fix it temporarily.



6. Assemble the drive gear A.

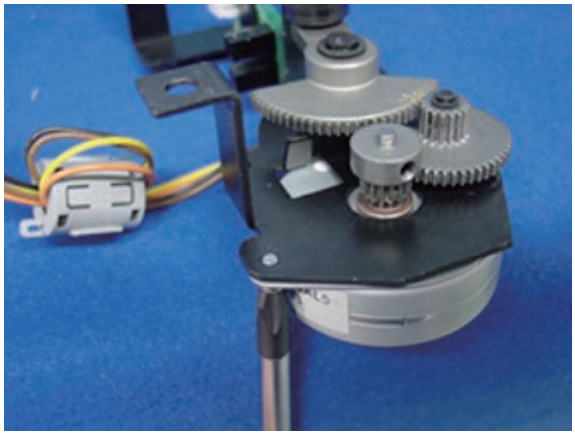
The position should come to the middle of the gear range.



7. Adjust position of pulse motor then fix it.

Keep slightly backlash between drive geer A and gear.

(Every point.)

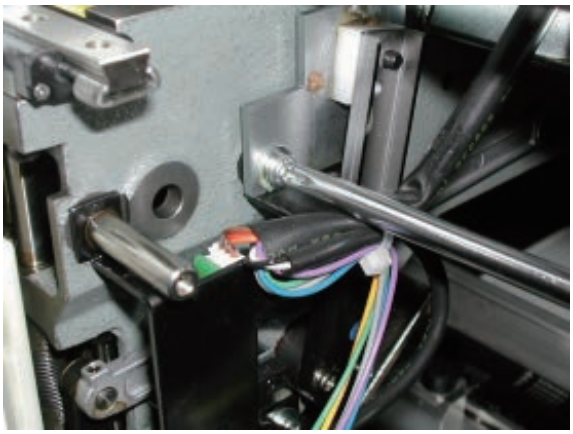


8. Continue to conduct [Adjust the pressure foot bracket ass'y].

Please refer to [3-2-17 Adjustment of pressure foot bracket ass'y].

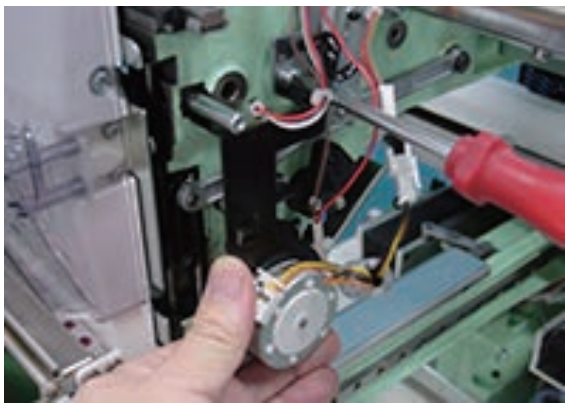
# 3-2-17 Adjustment of pressure foot bracket ass'y

1. Fix pressure foot bracket ass'y tentatively.



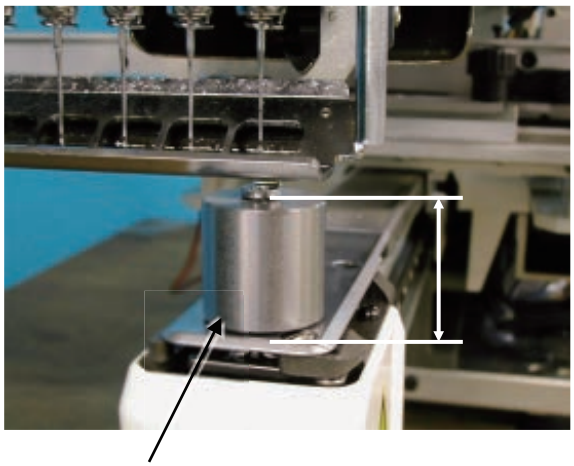
2. Lift up pressure foot.

3. Adjust the position of the pressure foot bracket ass'y.



<Important>

The space between needle plate and pressure foot should be [24.8 - 25.0mm].

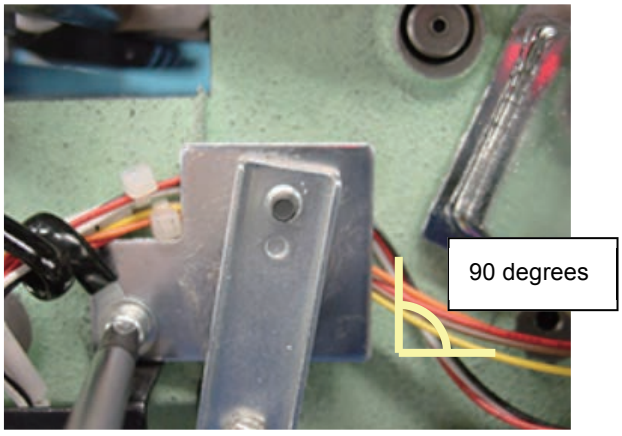


Gauge for adjustment of height of pressure foot bracket

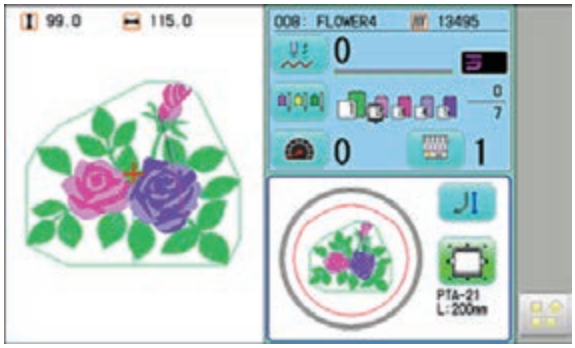
4. Adjust position of pressure foot guide plate B ass'y.

<Caution>

Make sure that pressure foot guide plate B ass'y is mount perpendicular and parallel to the body.

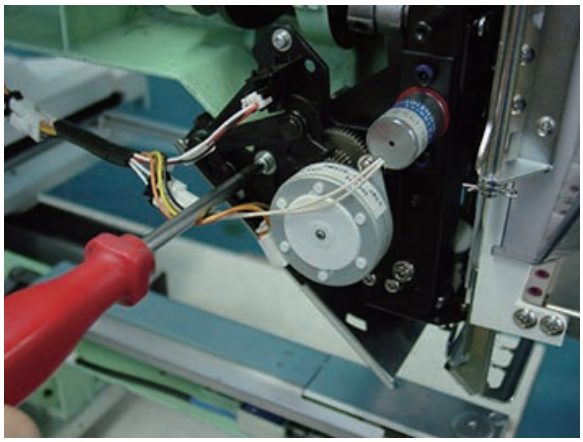



5. Procedure is done after confirming the pressure foot movement by pressing the  on control box.

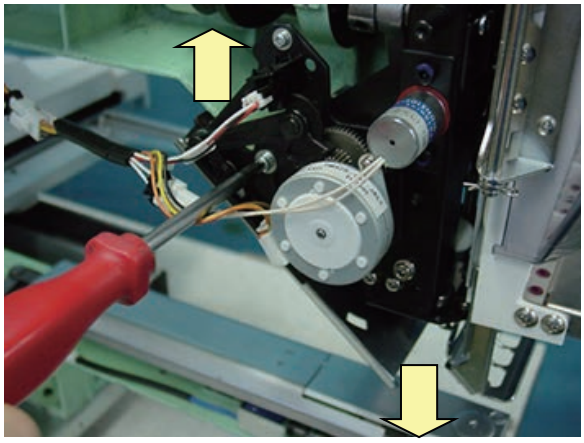


# 3-2-18 Exchange of thread catcher

1. Install thread catcher tentatively.



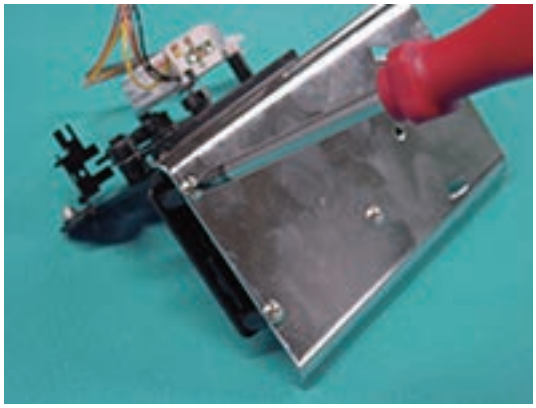
2. Tighten thread catcher pushing it upward and forward.
   (As shown an arrow.)



3. Continue to conduct [Adjustment of thread holder].
   When you adjustment of thread holder, in case of adjust again thread catcher.
   (Follow in [3-3-13 Adjustment of thread holder])

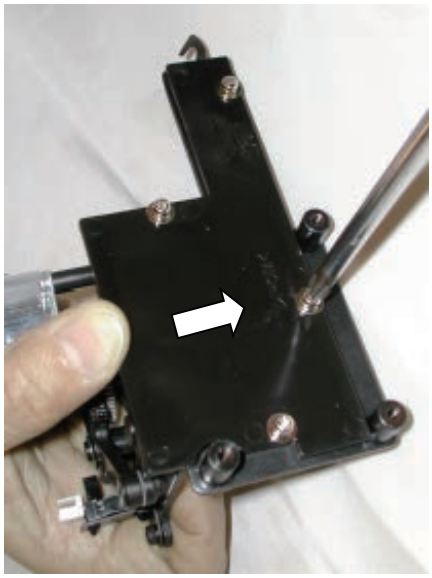
# 3-2-19 Exchange of thread catcher guide

1. Remove guard plate.

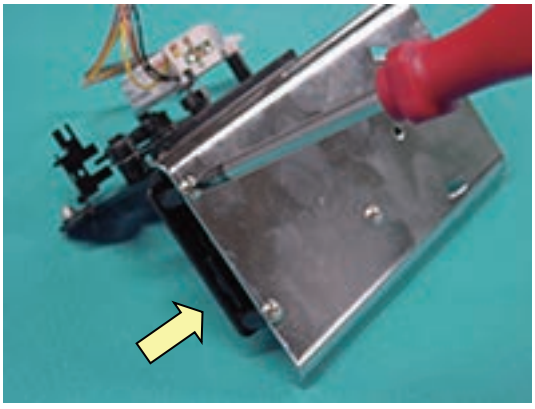


2. Exchange guide.

Fix the guide after moving it to the right.



3. Install the guard plate.



4. Please refer to [3-2-18 Exchange of thread catcher], install thread chatcer to finish.

# 3-2-20 Disassembling and Cleaning of jump solenoid

1. Disassemble the solenoid nut.

Use rubber sheet as safeguard.

2. Clean up the each part of the solenoid.

3. Put the designated grease on plunger part.

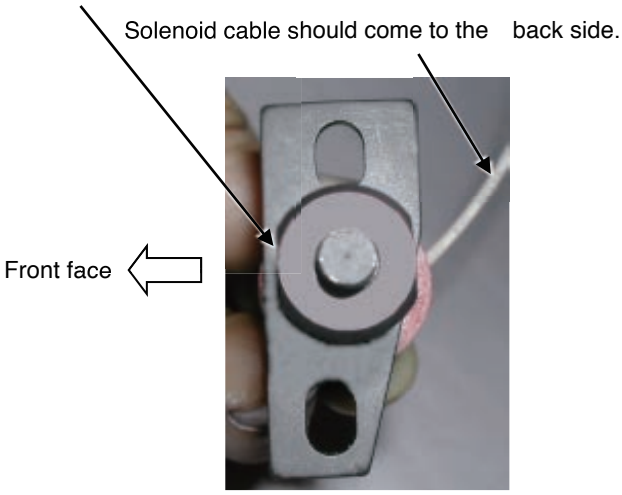
<Grease> Shell Grease7　MIL-G-23827B

Equivalent brand.

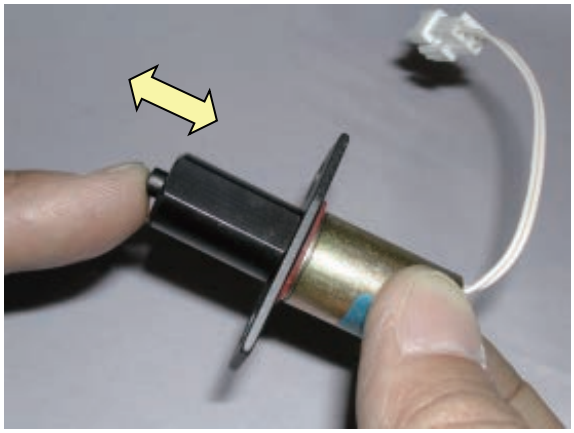
4. Assemble the solenoid to the original position.

The flat surface of the solenoid nut

should come to the front.




5. Confirm the movement of the plunger is smooth enough.



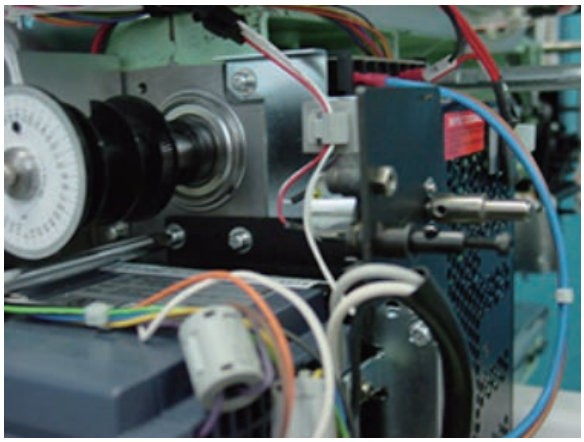
6. Procedure is done after assembling the Jump solenoid.

Referring to [3-2-5 Adjustment of fixing of jump solenoid].

# 3-2-21 Adjustment of bobbin winder

# Adjust if the thread is leans to one side.

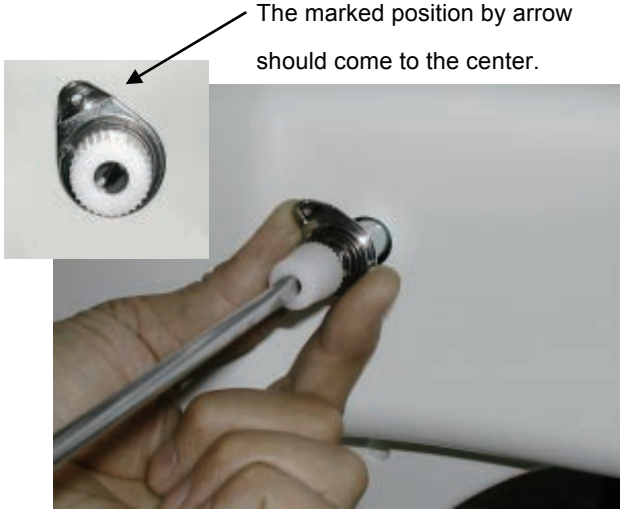
1. Assemble the winder bracket ass'y tentatively.



2. Assemble the left cover with keeping the space between shaft and the cover hole.

3. Assemble thread tension ass'y.

The marked position by arrow should come to the center.

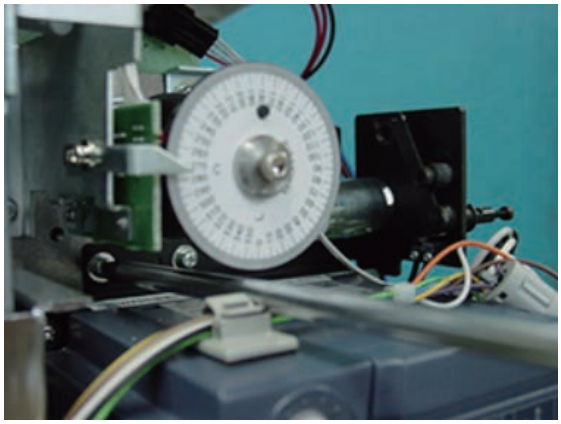


4. Assemble guide as tentatively.

5. Confirm that the shaft does not touch the cover by turning motor.

(Set the empty bobbin and down the Guide.)

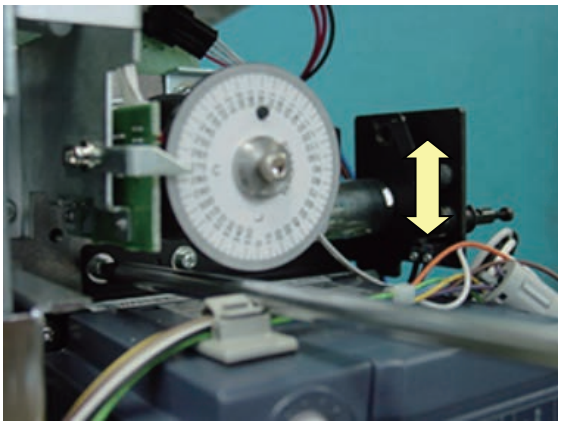
If the guide touches the bobbin adjust position of the winder bracket ass'y.



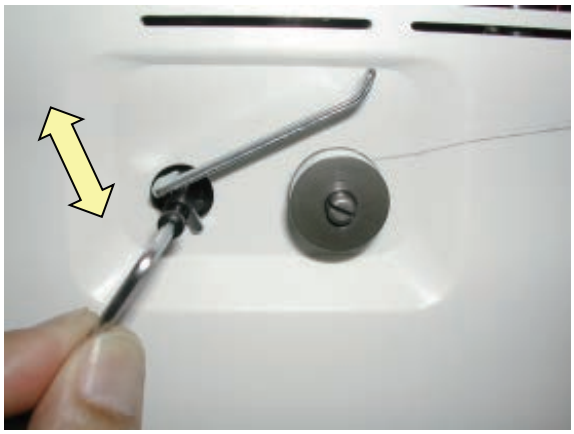
6. Adjust bobbin thread tension [30g] by tension gauge.

7. Rewind the bobbin thread.

8. Adjust the inclination of Winder bracket ass'y
in accordance with thread winding condition.



9.Adjust the height of Guide to adjust volume of thread
to be winded.

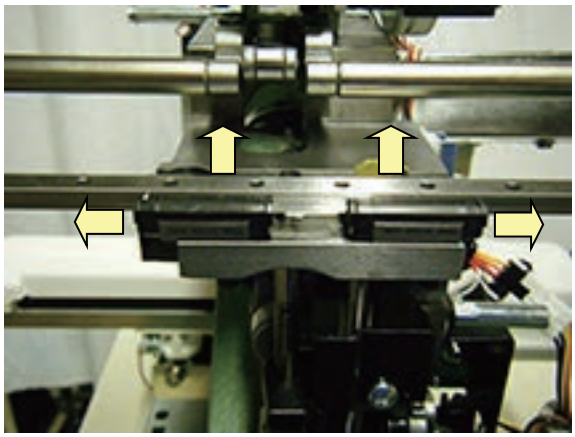


10. Reinstall the parts which has been removed.

# 3-3-1 Assemble the upper rail of moving head

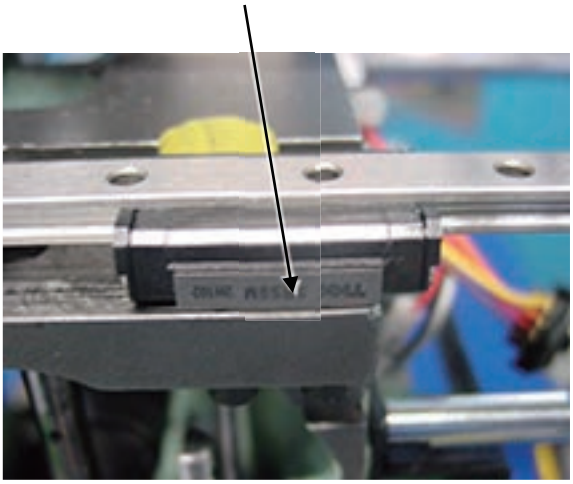
1. Tighten right and left LM guide base.

   Follow in picture, keep push to allow way each LM guide base.



<Notice>

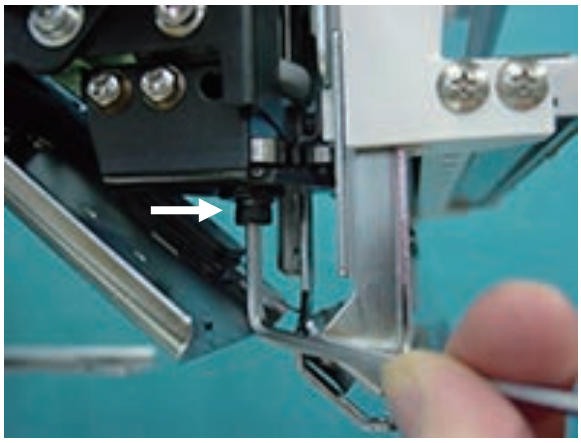
Should be front side which letter on side of LM guide base.



# 3-3-2 Adjustment of backlash (back and forth) of moving head

1. Adjust positioning roller shaft so as to put moving rail (lower) between bearings.

   Move moving head back and forth so as not to cause backlash.

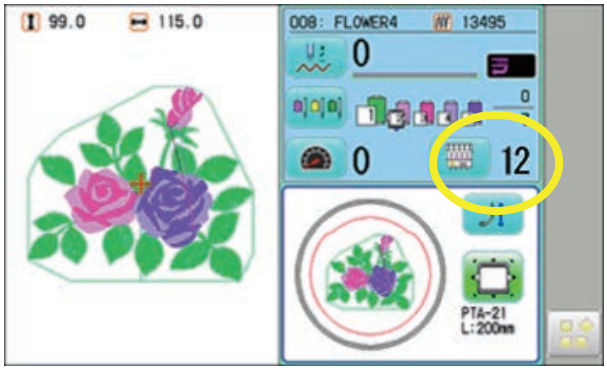


2. After adjustment, check and adjust needle drop to finish

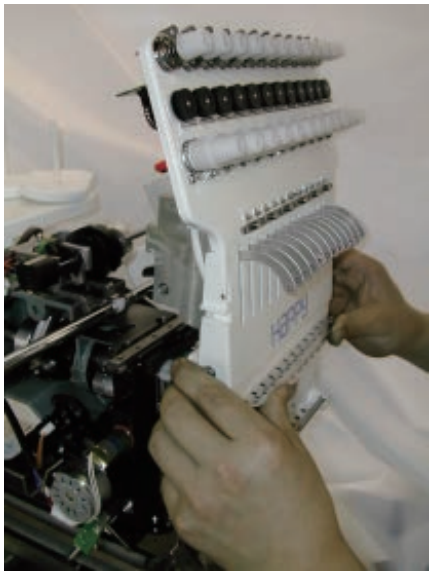
   Please refer to [3-3-4 Adjustment of needle position (back and forth) ].

# 3-3-3 Assemble the moving head

1. Please confirm that the position of needle bar change unit is set at 12th needle.

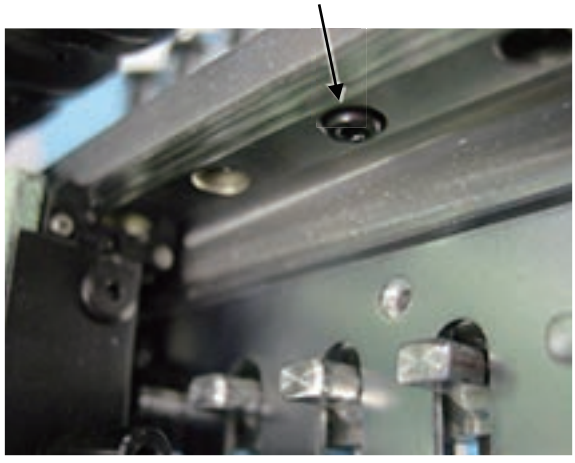



2. moving head を 12th needles の位置で、Install moving head tentatively.



<Caution>

Screw head not to come out from LM guide side.



3. Put in SIMM [0.05mm] between a moving head and LM guide.

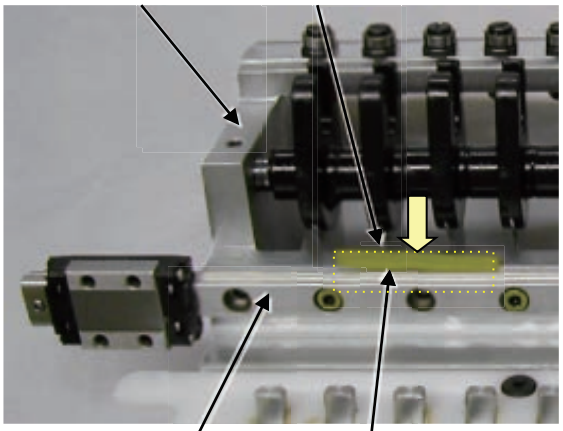
* Don't tighten a screw only by inserting SIMM here. Please give

<Caution> Do not lost simm material.

<View of behind>

Position which SIMM puts in screws

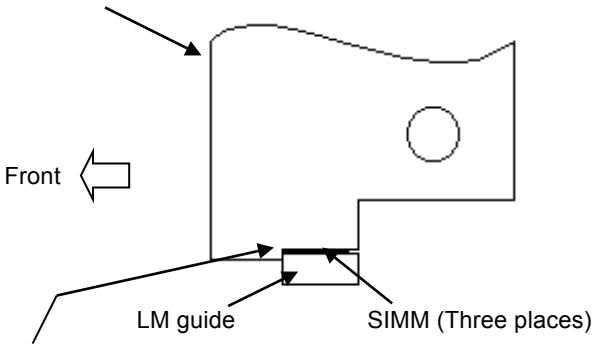
Moving head (central position between)



LM guide SIMM (Right)

<View of right side>

Moving head



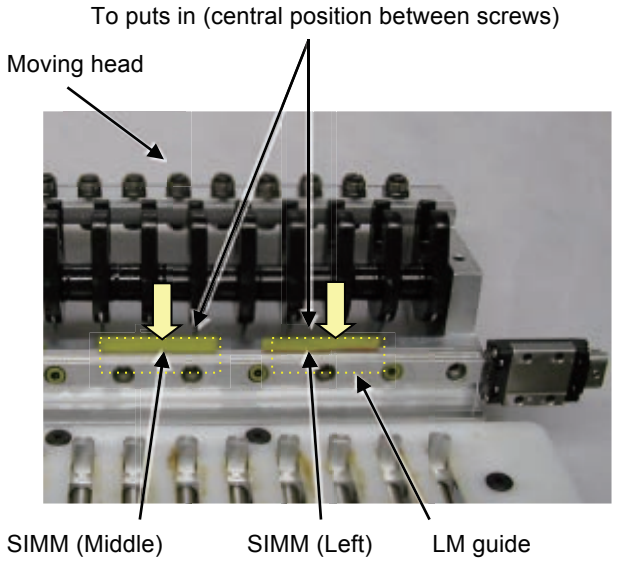

Position (it puts in to the back) which SIMM puts in

4. Turn the drive shaft B screw for manual operation,
and make it the 1st needle.

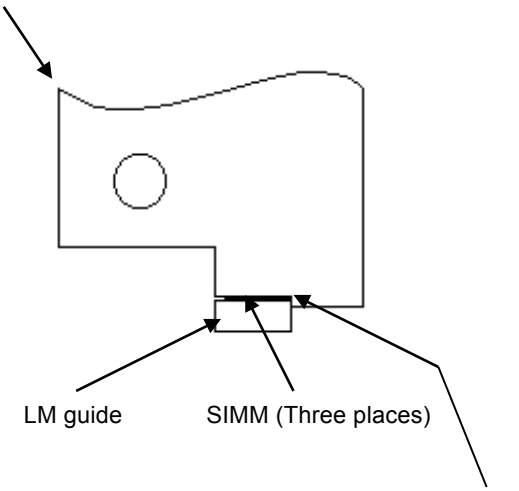
* When a moving head is caught on the way and does not carry out horizontal movement.
The screw tightened tentatively in "the work procedure 1" has come out from LM guide.
A screw from LM guide. Please fasten.

5. Put in SIMM [0.05mm] between a moving head and LM guide.

<View of behind>



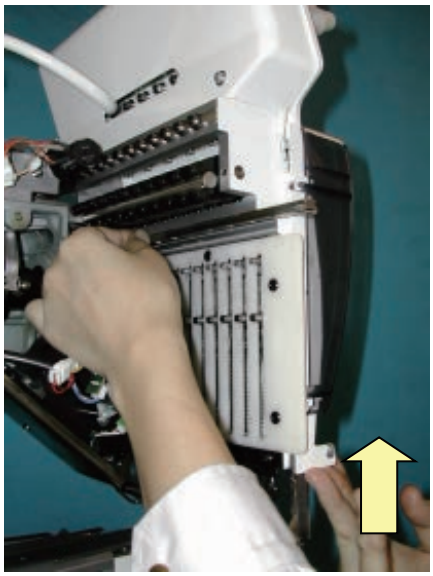

<Veiw of left side>




* Don't put in SIMM but push up a moving head lightly a case.

<important>

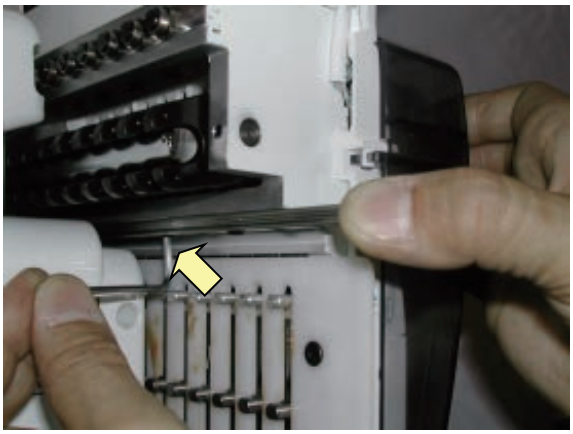
Please do not lower LM guide by any means.
There is a possibility that LM guide may bend.



6. Tighten an inside screw (arrow portion in a figure).

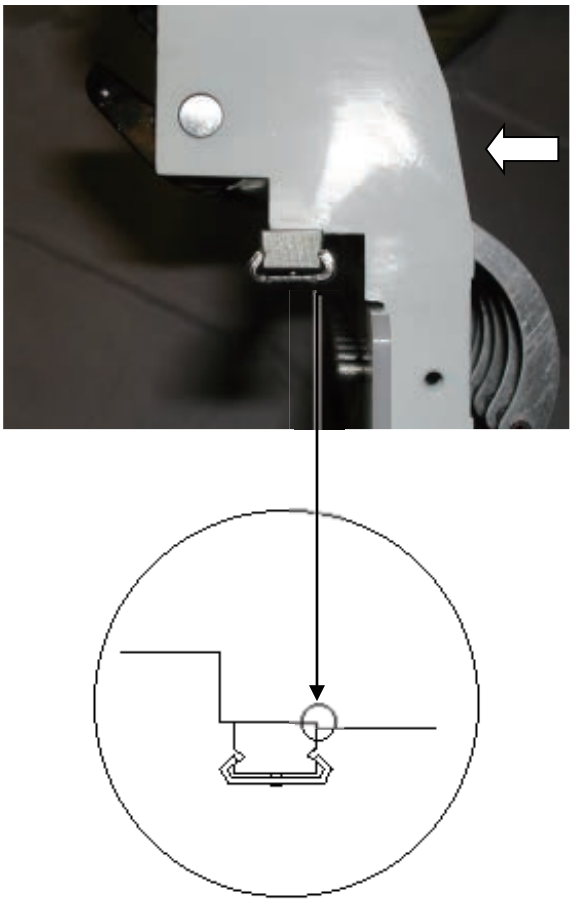
<important>

Please perform a screw bundle in order of "inside to outside."

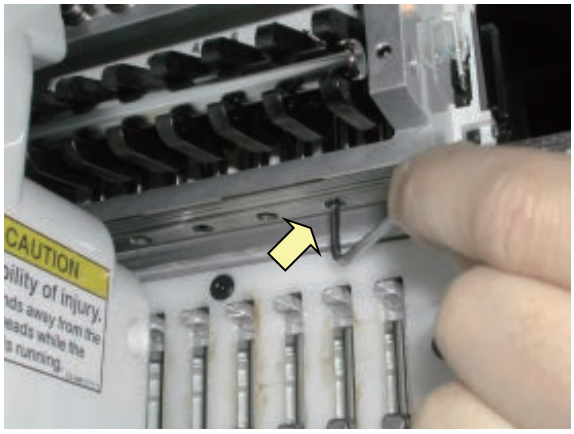


At this time, a moving head is pushed from the front and it is LM guide.

It is made for there to be no crevice.



7. An outside screw (arrow portion in a figure) is tightened.

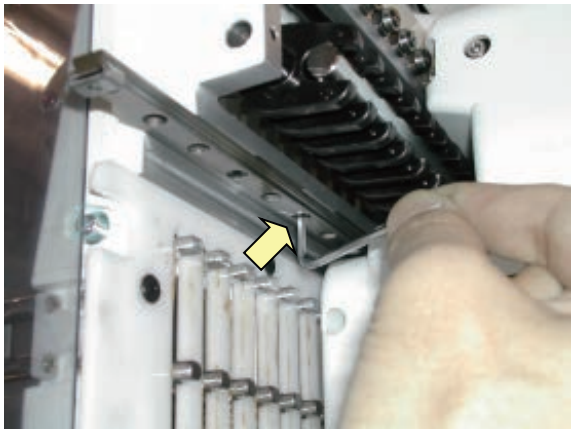



8. Turn the drive shaft B screw for manual operation, and make it the 12th needles.

9. Tighten an inside screw (arrow portion in a figure).

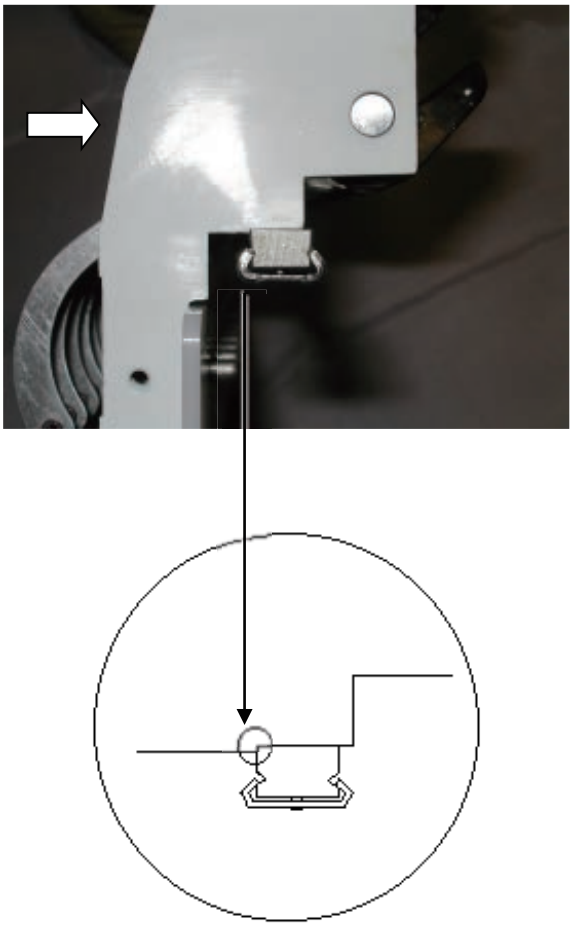
<important>

Please perform a screw bundle in order of "inside to outside."

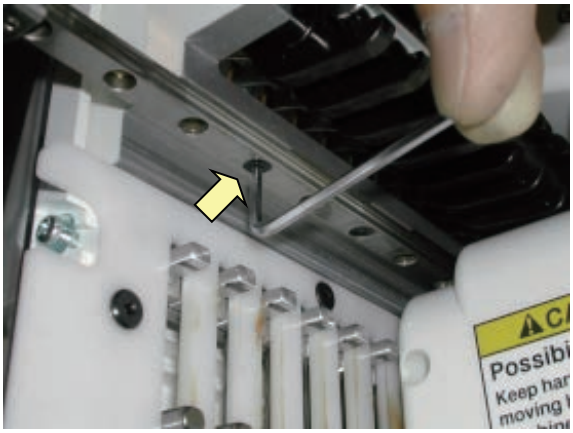


At this time, a moving head is pushed from the front and it is LM guide.

It is made for there to be no crevice.



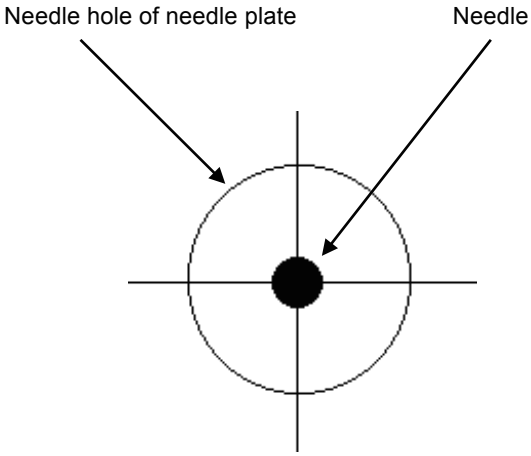
10. Tighten an outside screw (arrow portion in a figure).



11. Check center (right and left)(back and forth) of needle and needle hole of needle plate.(Needle No.1 ,6 and 12.)

<Caution>

Should be check needle No.1 ,6 and 12.




12. If not center (back and forth),please adjust needle position (back and forth).

Refer to [3-3-4 Adjustment of needle position (back and forth)].

13. If not center (right and left), please adjust again procedure 6-10.

14. If “OK”. Please check [needle position].

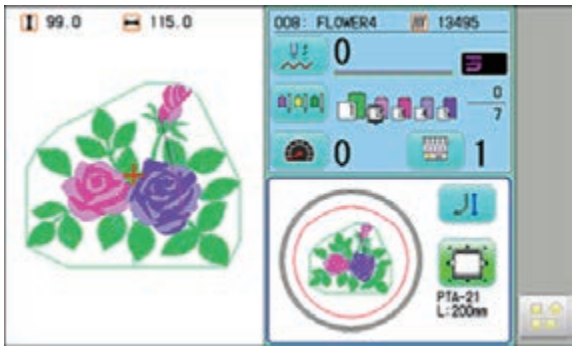
Refer to [3-3-5 Check of needle position].

If “NG” this process, adjust again procedure 12-13.

# 3-3-4 Adjustment of needle position (back and forth)

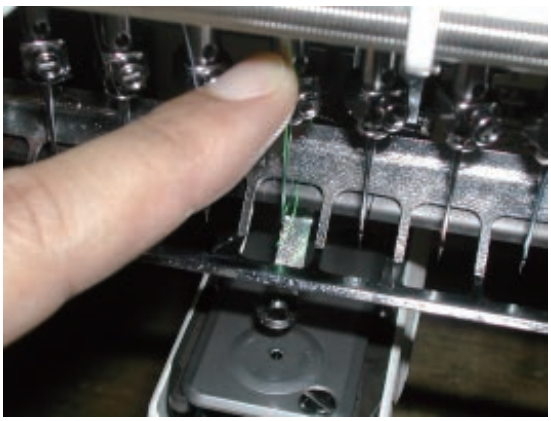
1. Bring pressure foot down. (Either way mentioned below)

(1)press  P_FOOT key on control box.

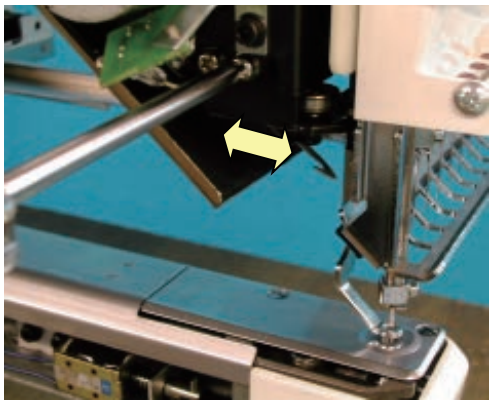



(2)Turn gear with finger.

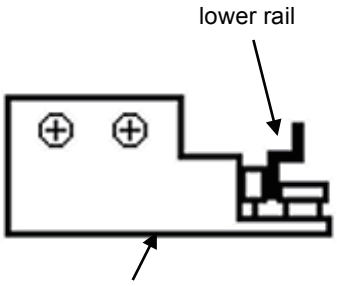
2. Bring needle down.



3. Turn upper shaft and set needle near to the lowest needle position [L] to adjust positioning plate ass'y.



* Insert Lower rail to between the two bearing deeply.
(This is for setting of Moving head completely.)




Viewing from side, set to center of needle hole.
#Check and adjust with 1st, 6th and 12th needle.

4. After adjustment, please be sure to check and adjust clearance between needle and shuttle hook.
Please refer to [3-5-1 Adjustment of rotary hook timing].

# 3-3-5 Check of needle position

1. A main switch is turned on.

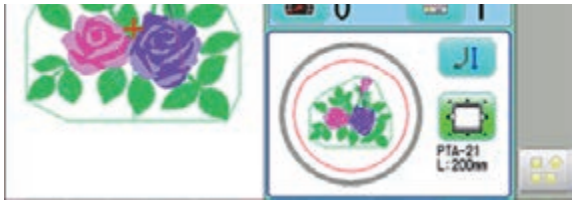
The Next is pressed and it changes into an operation state.

2. Press  and make it the 4th needles.

3. Stick a seal on needle hole of a needle plate.

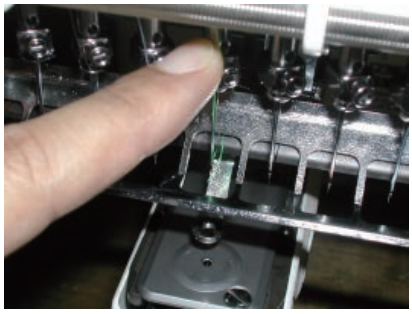
4. Bring pressure foot down. (Either way mentioned below)

(1)press  key on control box.




(2)Turn gear with finger.

5. Lower a needle bar with a finger.

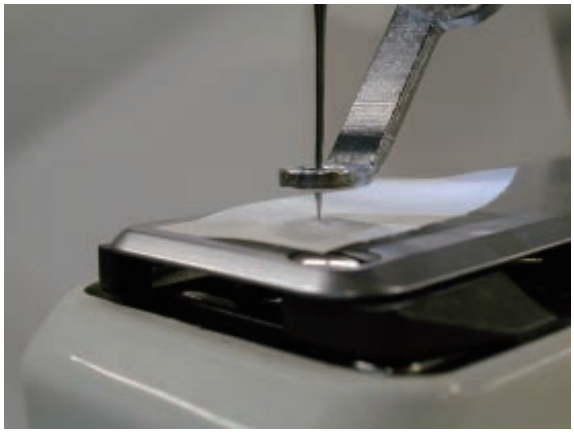


6. Turn an upper axis up to [302 degrees - 303 "], and it is the needle mark to a seal. A hole is made.

<Note>

Needle point will become large if the angle of a dial disc is made into 304 degrees or more.

An exact needle position check becomes impossible.



7. Reverse-rotate an upper axis, raise a needle bar, and unite with C [275 degrees].

(It returns to 303 degrees-> 220", and unites with 275 degrees after that.)

<Note>

If a top axis is right-rotated, a needle will enter deeply, and needle hole is greatly.

It becomes. Therefore, an exact needle position check becomes impossible.

8. 1st needle and the 12th needles are to 302 degrees - 303 degrees about an upper axis by the above-mentioned procedure. It turns, a needle is lowered and a needle position is checked.

It will be O.K. if the needle point goes into the seal hole made by the 6th needles at this time.

* If “NG”. Please adjust again, follow to [3-3-3 Asemble the moving head] of procedure 6-10.

The order which the screw which is fixing the move head fastens -- from an inner side. If it does not carry out correctly outside, a needle position will shift -- it is –

9. Un-stick a seal on needle plate to finish.

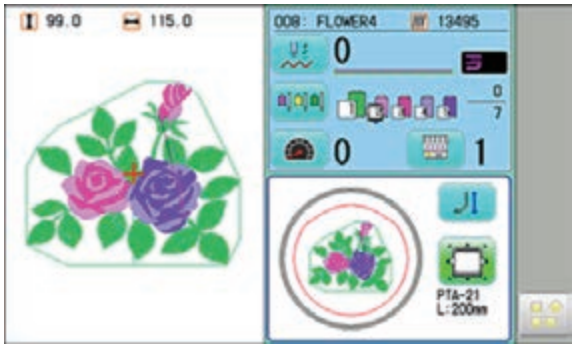
# 3-3-6 Adjustment of needle height

1. Remove lower front panel.

2. Remove bobbin case.

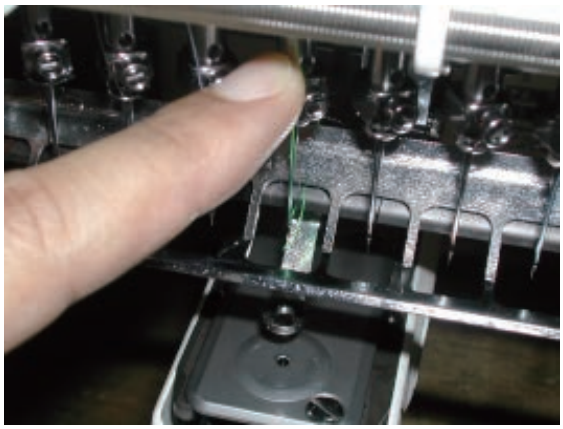
3. Bring pressure foot down. (Either way mentioned below)

(1)press  key on control box.

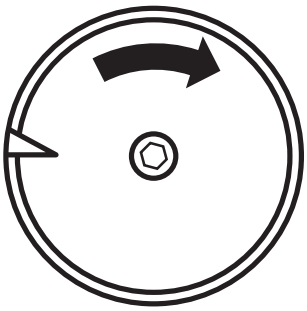



(2)Turn gear with finger.

4. Bring needle down.

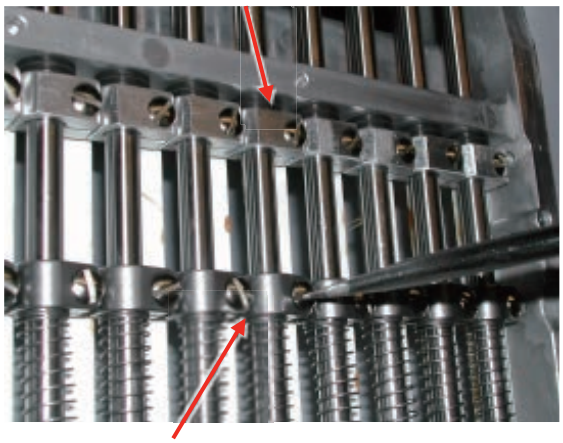


5. Turn upper shaft to set dial disc to [5 degrees].



6. Loosen needle bar boss and needle bar boss B.

Needle bar boss B

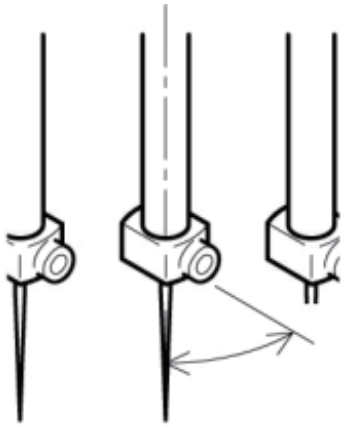


Needle bar boss

7. Put needle height gauge in rotary hook.

8. Adjust the needle bar height up and down till the needle tip touches to the gauge slightly.

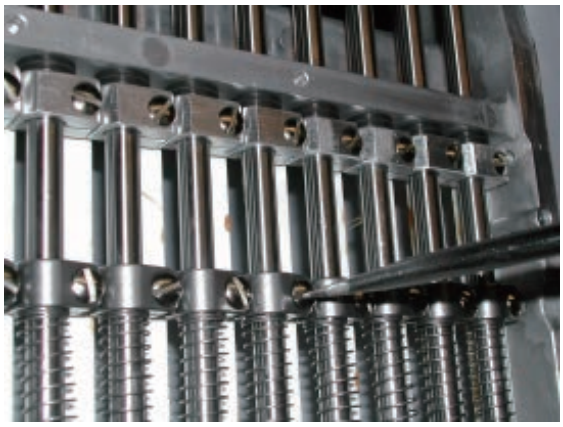
9. Set direction of needle holder as illustrated below.



About 30 degrees

* Check needle holder dose not touch to Needle guard.

10. Tighten the screw of needle bar boss.



11. Tighten the screw of needle bar boss B.

When tightening needle bar boss B, please insert gauge [25mm] in-between.

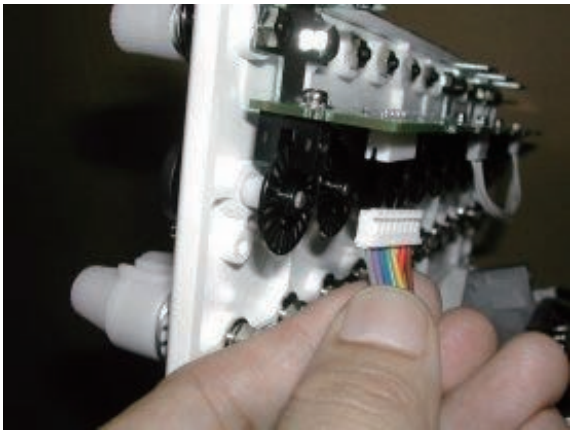
* Check the movement of needle bar goes smoothly.


12. Put things back in reverse order of 1-5 to finish.

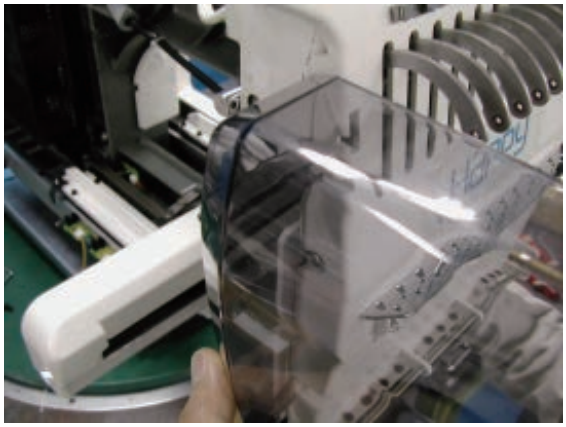
# 3-3-7 Exchange of needle bar, needle bar spring and cushion

1. Remove rear cover.

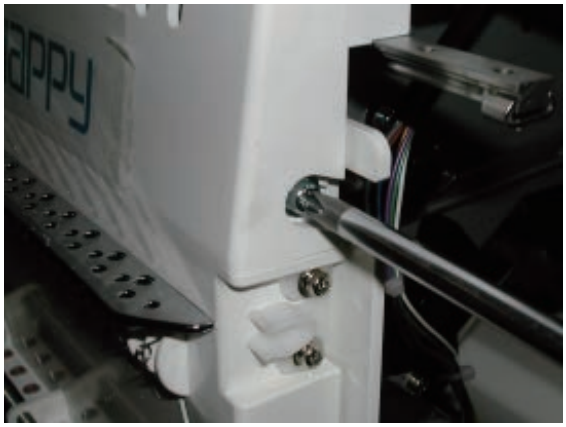
2. Disconnect TC cable and limit switch cable.



3. Remove front cover of front panel.

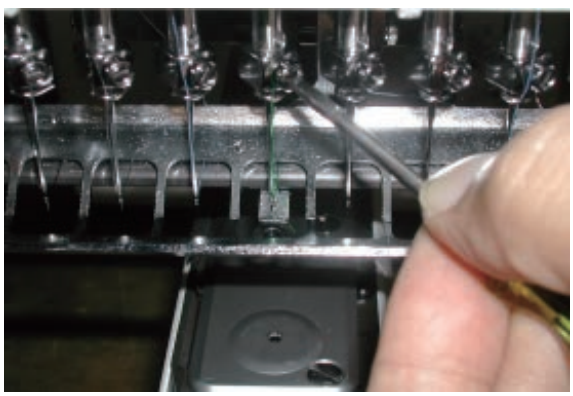


4. Remove thread tension bracket.



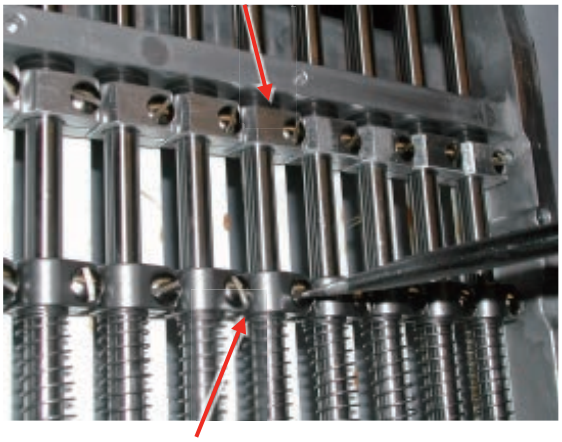
5. Remove lower front panel.

6. Remove needle and needle holder.



7. Loosen needle bar boss and needle bar boss B.

Needle bar boss B



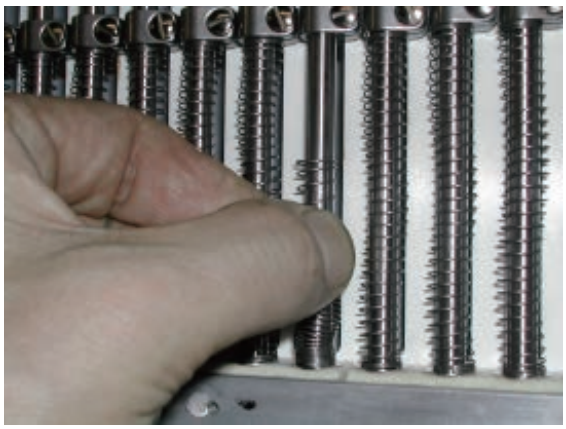
Needle bar boss

8. Pull out needle bar.

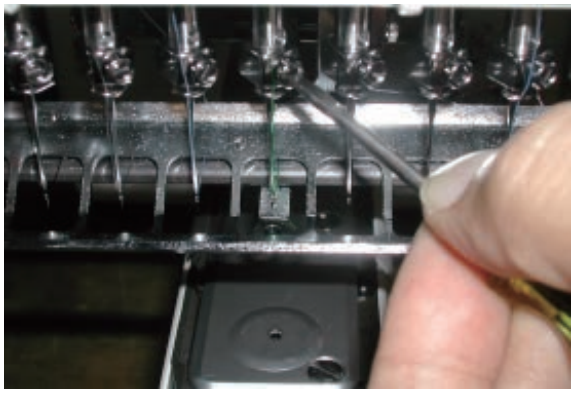
At this moment, remove needle bar boss,

needle bar bossB, needle bar spring and cushion.

9. While pressing needle bar spring, insert good needle bar.



10. Fix needle and needle holder.



11. Adjust needle height.

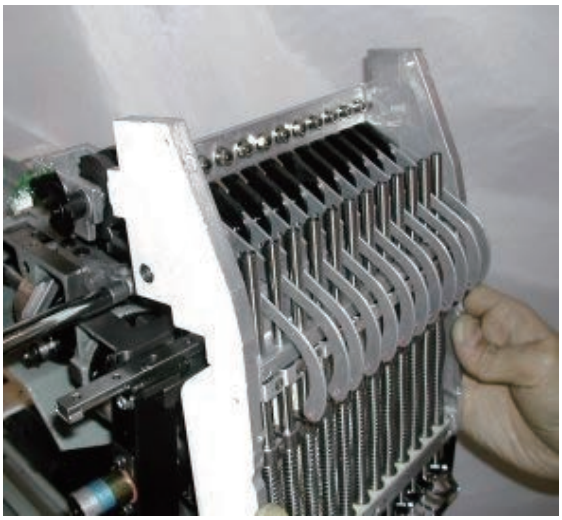
Please refer to [3-3-6 Adjustment of needle height].

12. Put removed parts back to finish.

# 3-3-8 Fixing of needle bar boss guide plate

1. Remove moving head.

   Please refer to [3-3-9 Exchange of take-up lever].



2. Exchange of needle bar boss guide plate.

   Temporarily, use the pan head screw to center the needle bar boss guide plate then fix the screw.

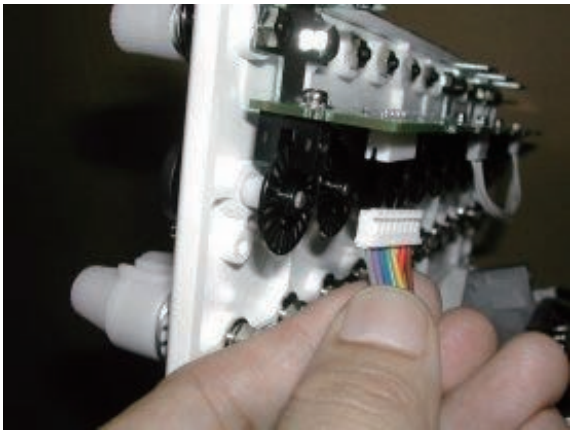
3. Fix positioning needle bar boss guide plate.

4. Put moving head and other removed parts back to finish.

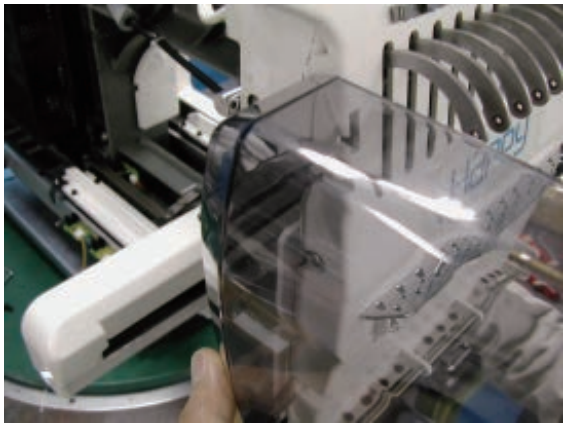
# 3-3-9 Exchange of take-up lever

1. Remove rear cover.

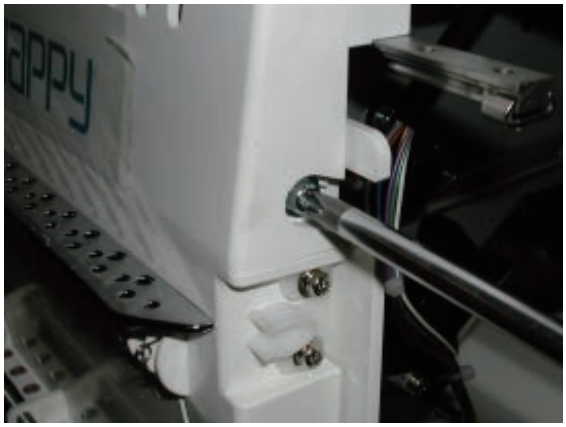
2. Disconnect TC cable and limit switch cable.



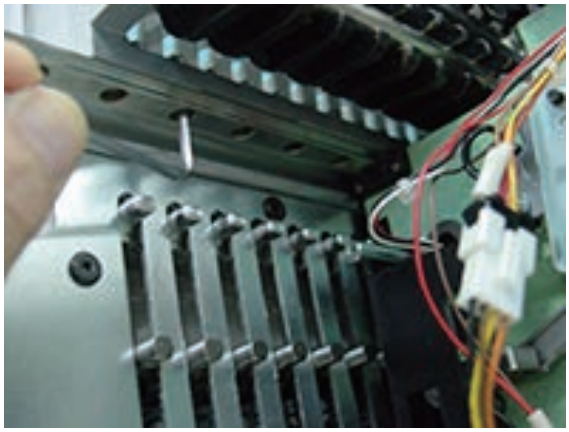
3. Remove front cover on front panel.

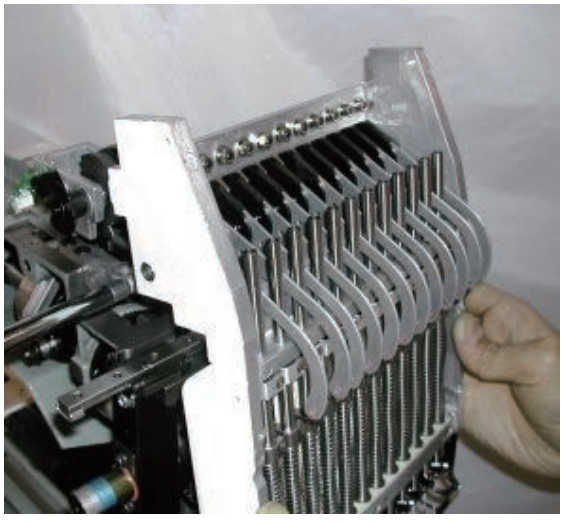


4. Remove thread tension bracket.

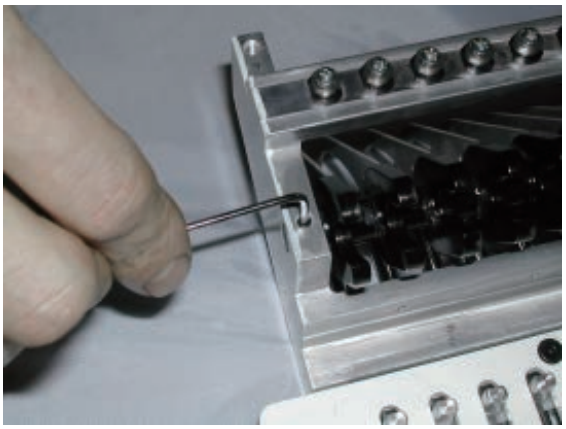


5. Remove moving head.

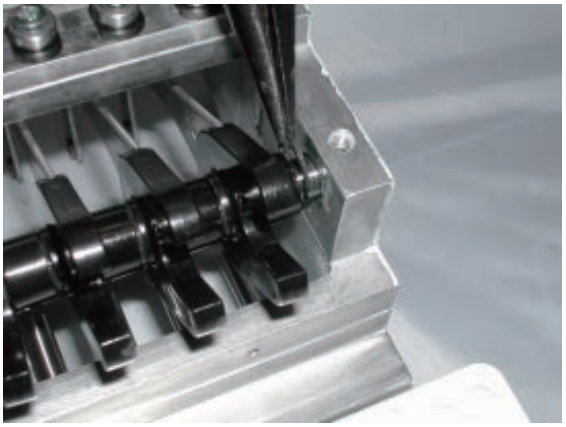




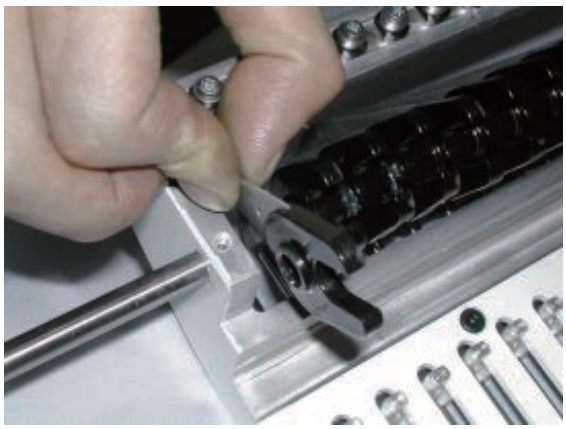
6. Loosen screw on take-up shaft.



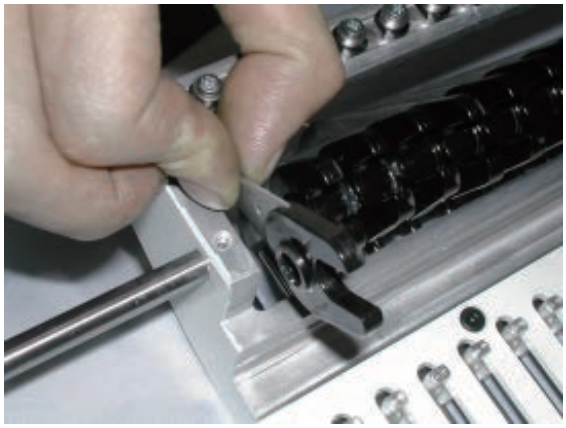
7. Remove the E-ring.



8. Remove the take up lever shaft first then remove the take-up lever.



9. Install good take-up lever assembly with plastic washer, E-ring.



10. Leave space of [0.2mm] between take-up lever and moving head .

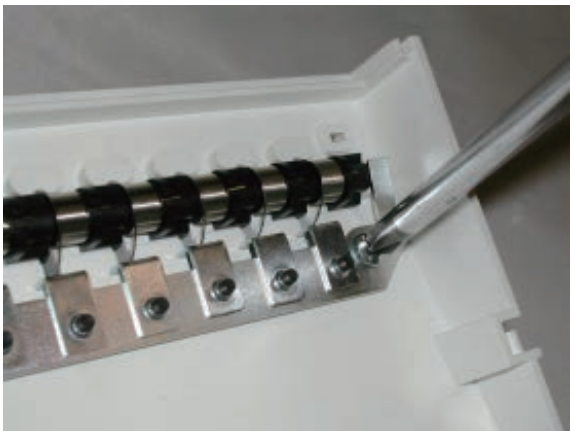
Tight screw for “Take up lever shaft”

11. Put moving head in previous position to finish.

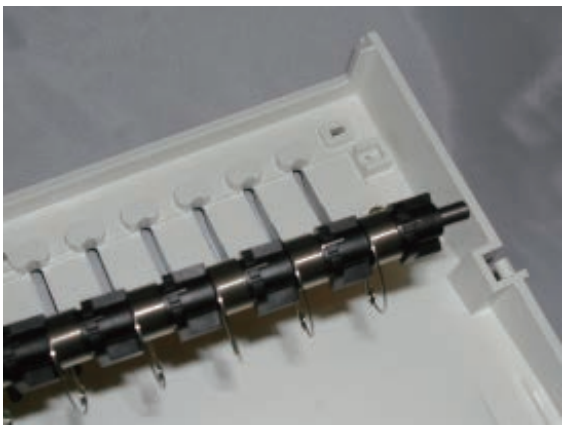
# 3-3-10 Exchange of thread adjusting spring

1. Remove lower front panel.

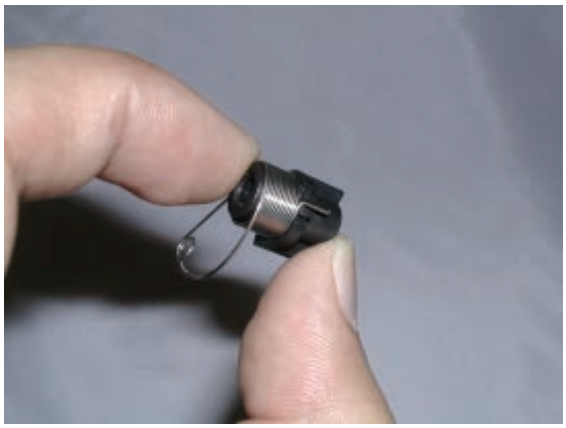
2. Remove adjuster base.



3. Remove thread adjusting spring ass'y.



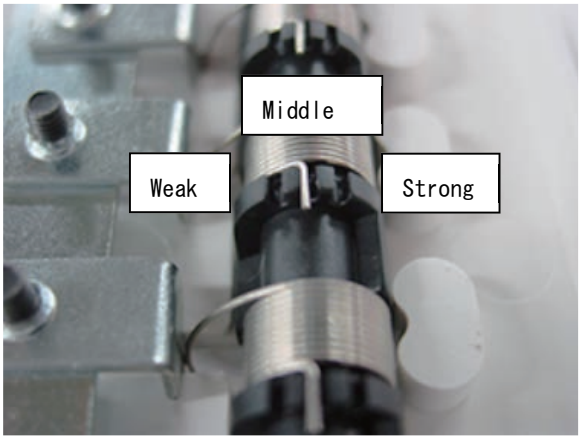
4. Remove thread adjusting spring and spring holder.

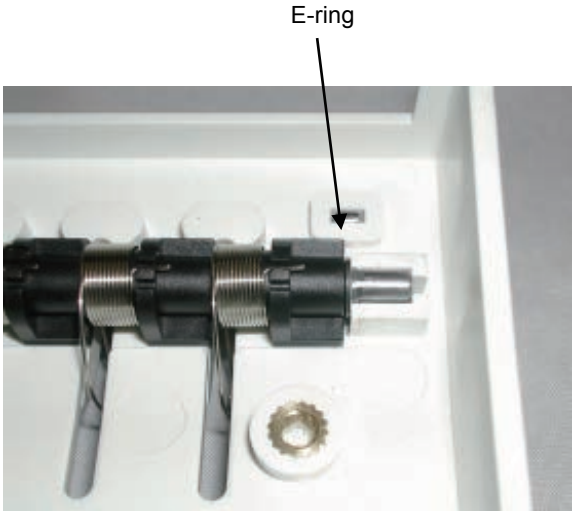


5. Exchange thread adjusting spring.

6. Assemble the thread adjusting spring into lower front panel.

Set the thread adjusting spring to [Middle] position as Picture below.





7. Put removed parts back in reverse order.

# 3-3-11 Adjustment of tension of thread adjusting spring

1. Remove lower front panel.

2. Block has spring groove to be able to adjust in three steps

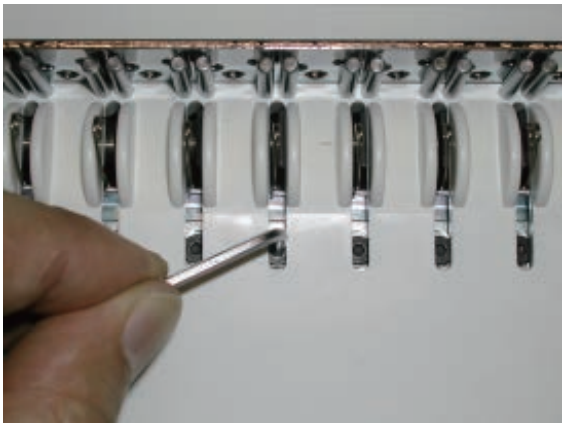
   Put tip of spring in desired position.

   Strongest tension will be obtained in upper groove.

3. Fix lower front panel to finish.

# 3-3-12 Adjustment of stroke of thread adjusting spring

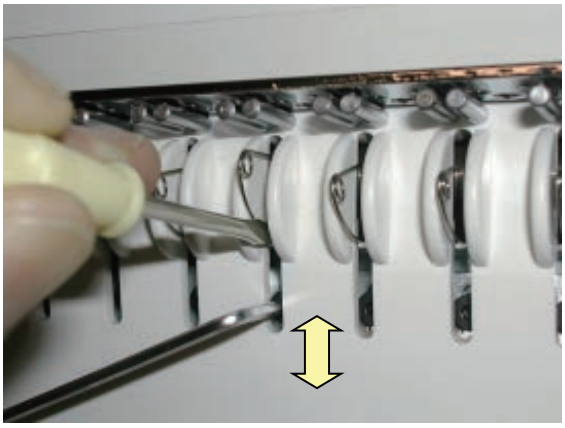
1. Loosen screw on adjuster.



2. Move adjuster position up and down with small frat-head driver to change stroke.

   When you move adjuster upward,stroke will get small.

   When you move it down, stroke will get large.



3. After adjustment, tighten screw to finish.

# 3-3-13 Adjustment of thread holder

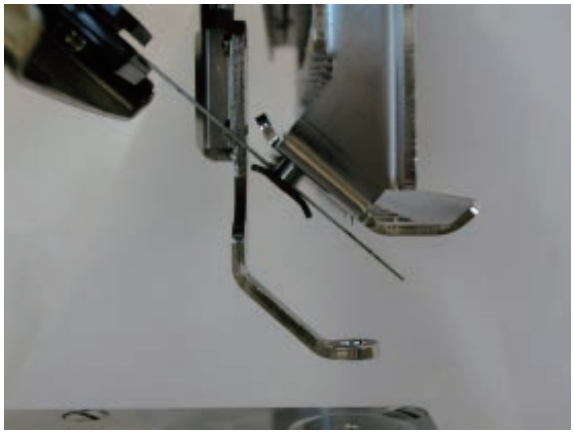
1. Remove the lower front panel.

2. Loosen screw to the extent that thread holder moves.

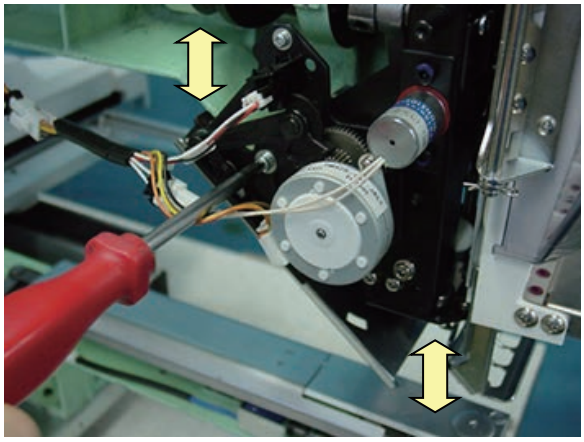
3. Insert positioning gauge [47.5±0.1mm] between lower part of moving head and holder (upper) and mount it vertical.

4. Hold down the pressurefoot and take the hook in and out by finger to check movement of hook goes smoothly. Check this at 1th , 6$^{th}$ , 12$^{th}$ needle.

<Positional relationship between hook and holder (lower)>



5. Thread catcher device should be adjusted if above clearance is not keepable.

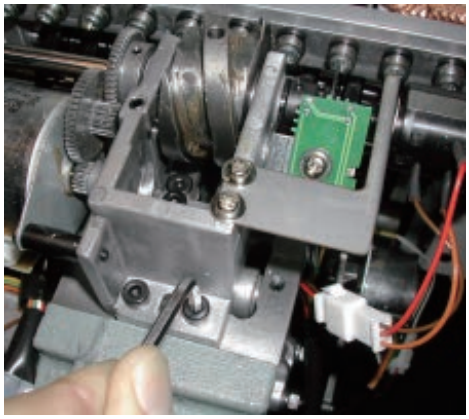


6. Check up with thread trimmer function.

7. Assemble lower front panel to terminate this procedure.

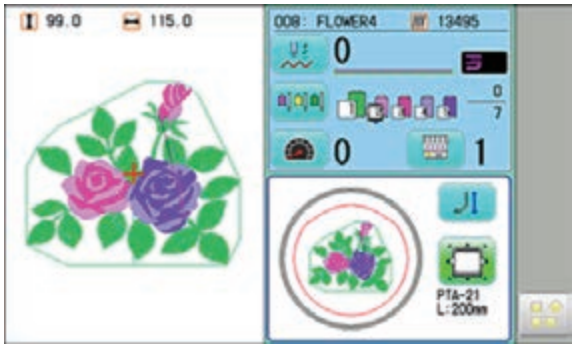
# 3-4-1 Fixing of needle bar change unit

1. Place needle bar change unit assembly.
   please set positioning hole on unit assembly to positioning pin.



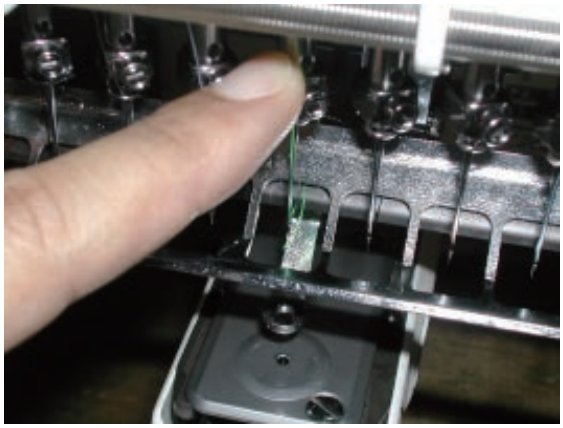
2. Bring pressure foot down. (Either way mentioned below)

(1)press  key on control box.

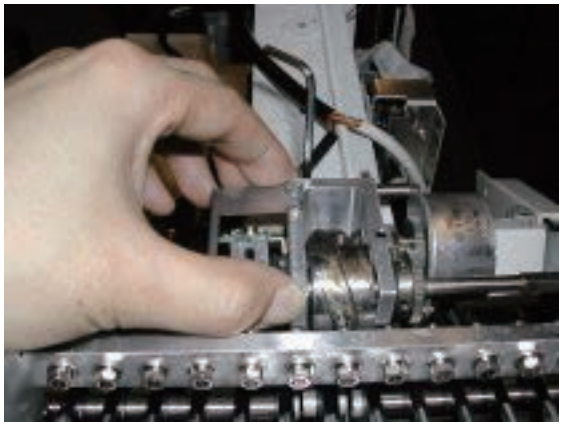



(2)Turn gear with finger.

3. Bring needle down, turn upper shaft to set near to [L point].



4. Adjust position of unit assembly so that needle comes to center against needle hole on needle plate.

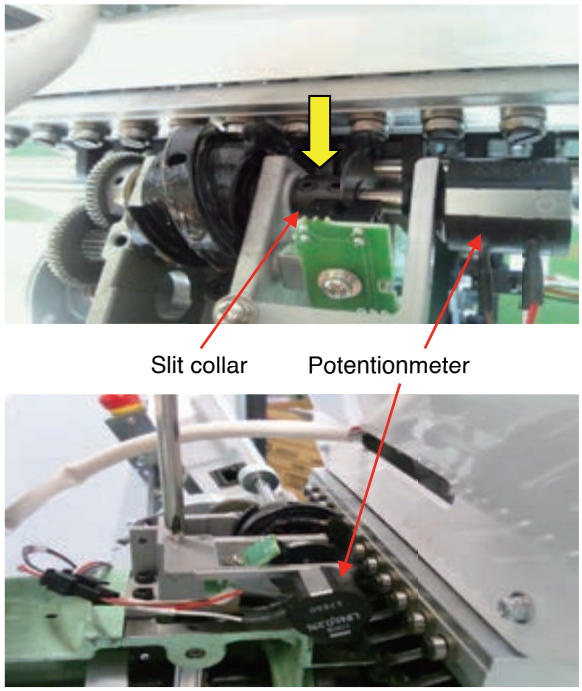


5. Install parts in reverse order to finish.
   For adjustment of fixing of each unit, please refer to process to adjust fixing of each unit.

# 3-4-2 Setting to detect needle position

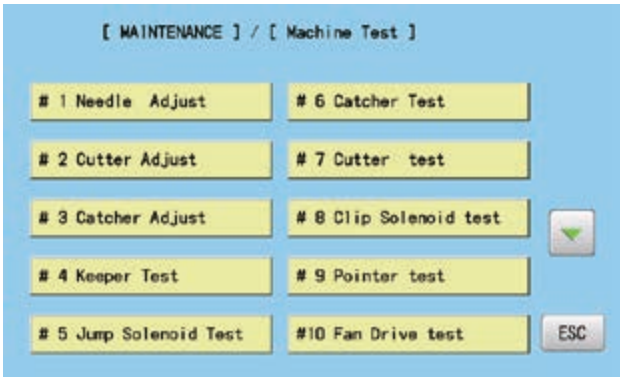
It is necessary to memorize the value of needle selection sensor along the needle positions.
Lateral motion of the machine may not be done normally without the settings.

1. Remove setscrew of slit collar and remove potentiometer.
   Do not remove the cable then.

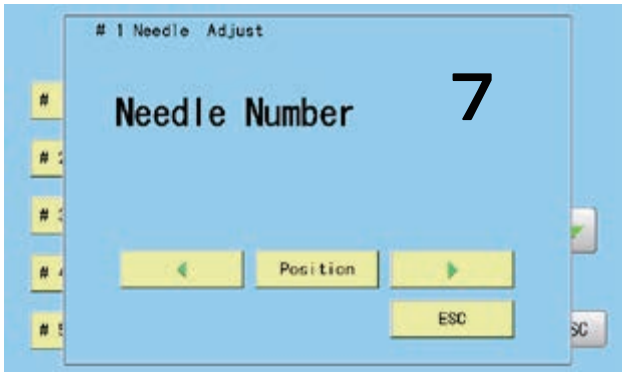



2. Refer to “4-5-1 How to enter maintenance mode” and enter maintenance mode.

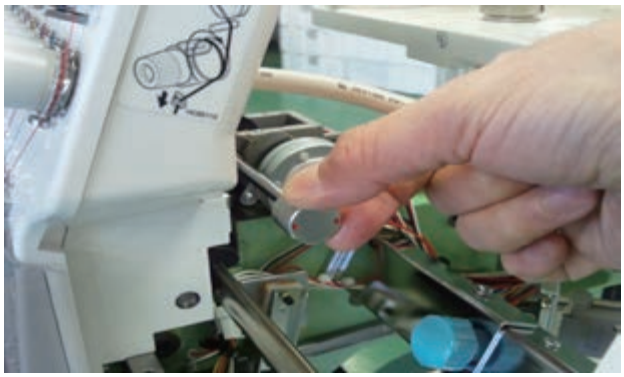
3. Press Machine Test .

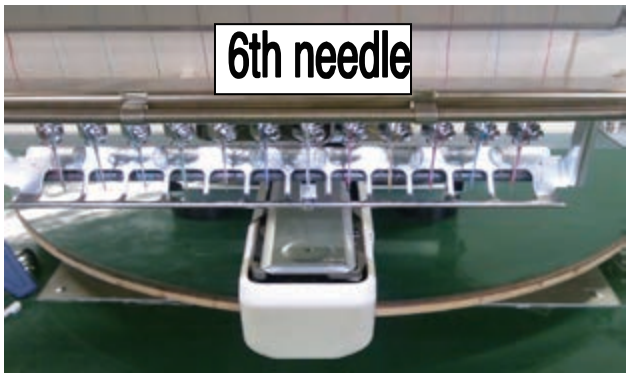



4. Press Needle Adjust
   Present needle position of potentiometer is indicated.
   The number of needle number on the screen is sometimes not the same as the number of actual needle position.




5. Turn knob so that the needle position can be the 6th needle.



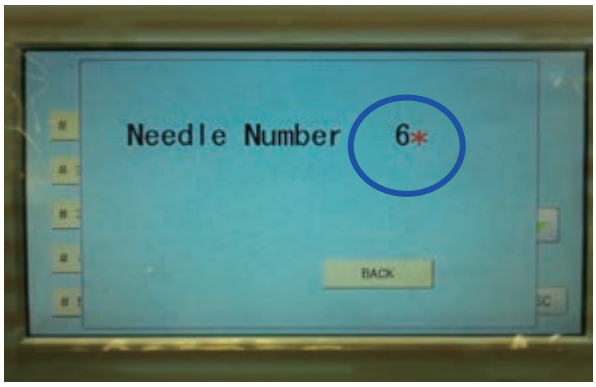


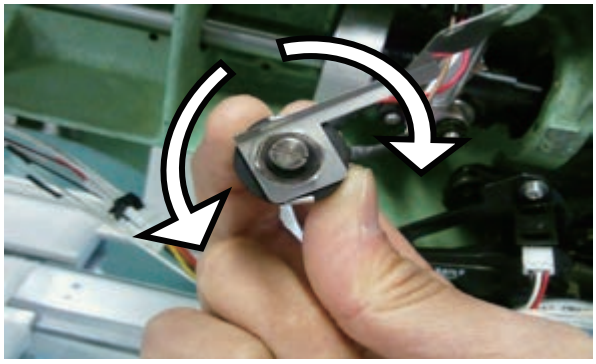

6. Press Position .

6. Turn the shaft of potentiometer to reach the 6th needle and continue to turn until *(asterisk) is indicated on the right of the needle number on the screen.

The machine make a beep once * indicates.

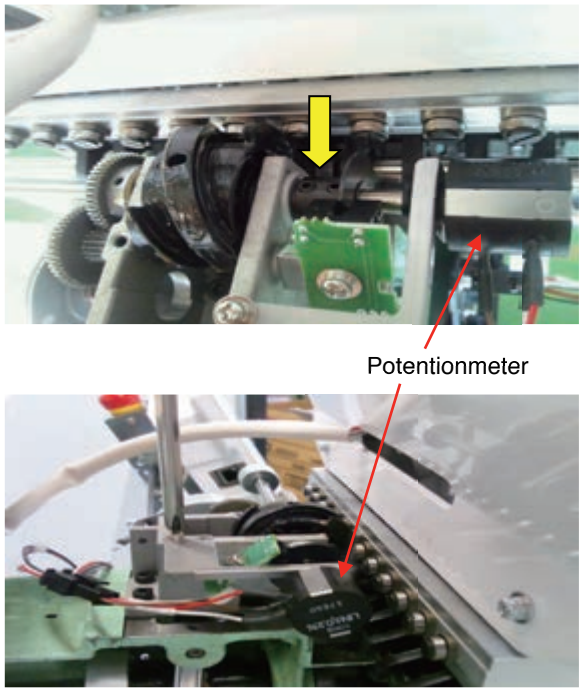
The machine dose not make a beep once * disappears.



Turning the shaft too much make * disappear, and turn the shaft back and forth, and adjust the position so that continuous beep is made.

7. Install potentiometer at the 6th position while beep is made and fix it with setscrew.



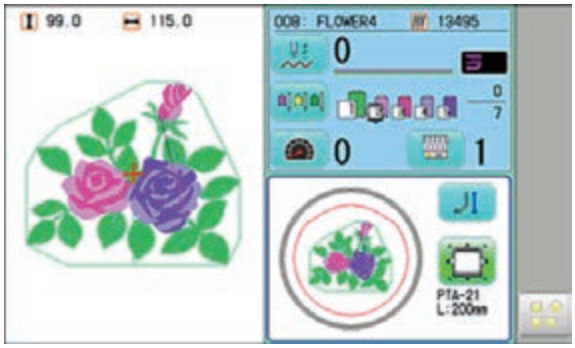

8. Press BACK to complete settings.

# 3-5-1 Adjustment of rotary hook timing

1. Remove needle plate.

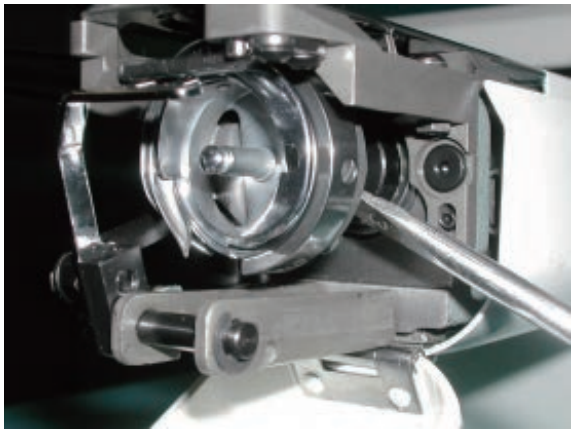
2. Bring pressure foot down. (Either way mentioned below)

(1) press  key on control box.

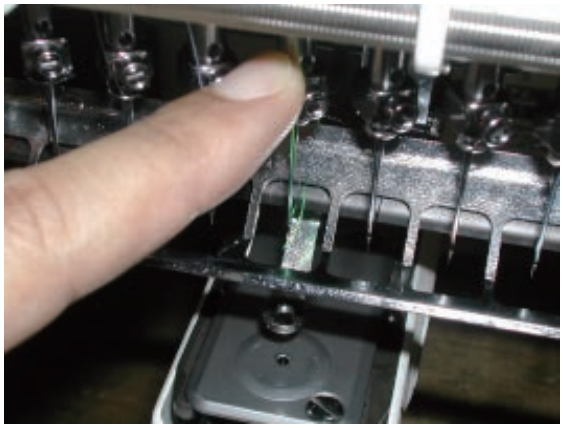



(2) Turn gear with finger.

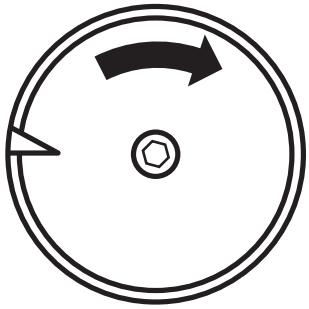
3. Tighten screw on rotary hook. (3 places)



4. Bring needle down.

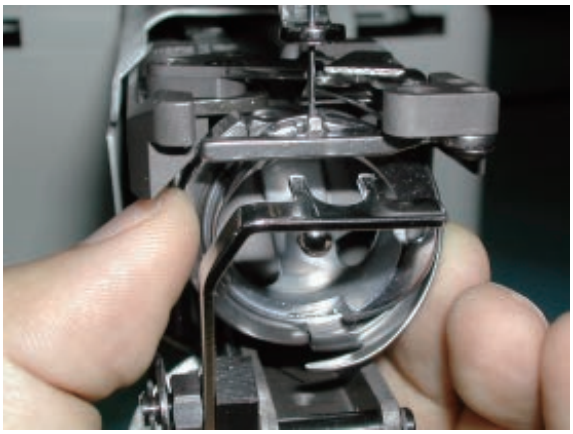


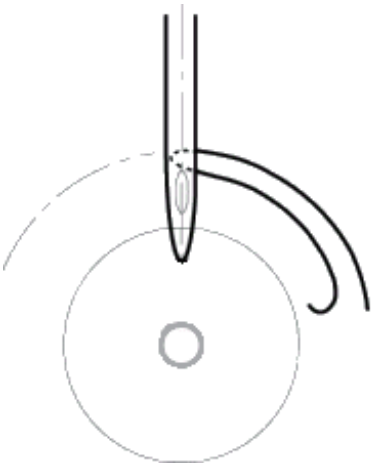
5. Turn upper shaft and set dial disc to [25 degrees].



6. Adjust rotary hook timing.

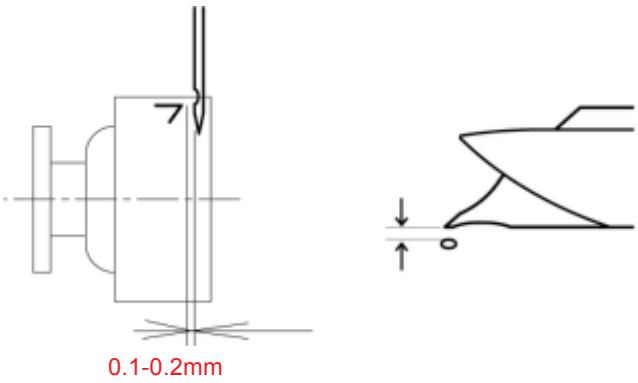
This procedure is preconditioned to use needle type [DB-K5] in which contains with our standard accessory.





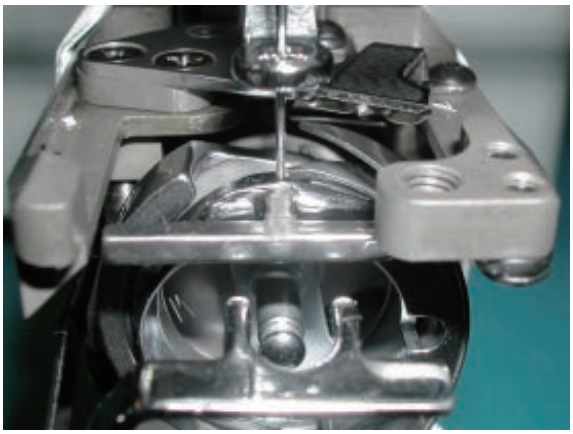
At this moment, clearance between needle and rotary hook should be [0.1-0.2mm].

Check and adjust with 1st, 6th and 12th needle.




7. For making sure, check position of retainer on bobbin case holder.

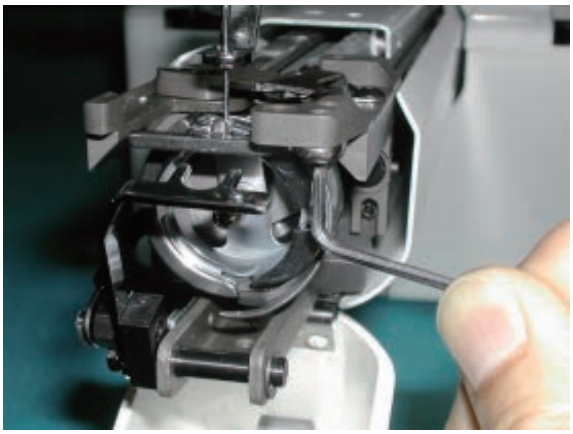
Please refer to [3-5-2 Adjustment of retainer on rotary hook] for adjusting value and follow it.



8. Adjustment has finished.

# 3-5-2 Adjustment of retainer on rotary hook

1. Loosen screw to the extent that retainer on bobbin case holder moves.

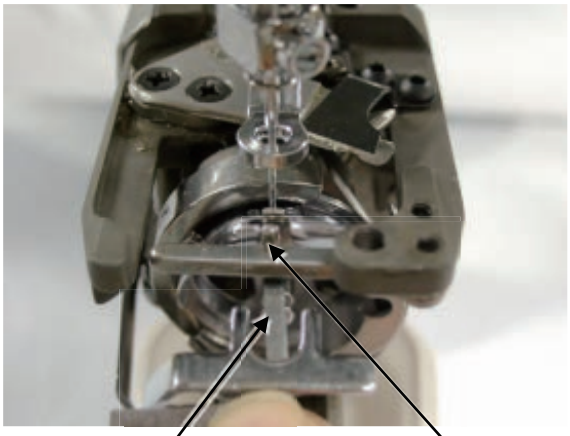


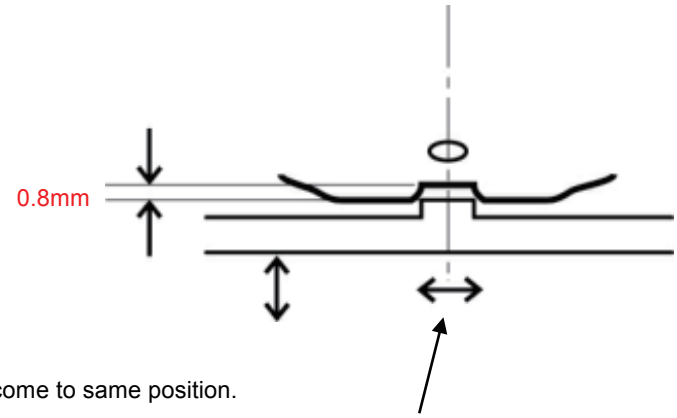
2. Install screw for Needle plate. (only front side)

(This avoid interfere of screw and Rotary hook retainer during installing Needle plate)

3. Adjust position back and forth, left and right.

Space has to be [0.8mm] and the position right and left is center of the needle.






Needle center and retainer center should come to same position.

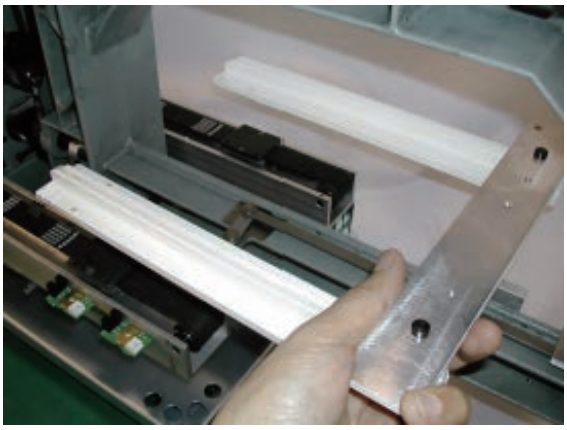
Retainer positioning gauge [0.8mm]

Needle center position

4. Adjustment has finished.

# 3-6-1 Assemble the arm ass'y

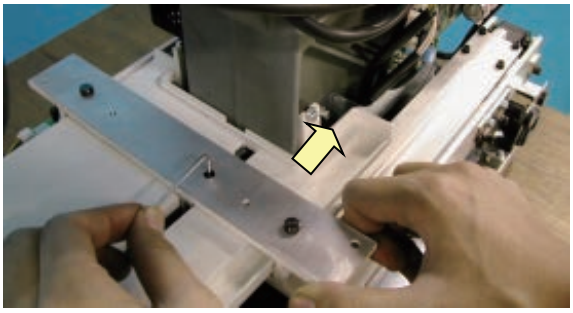
1. Assemble the arm ass'y tentatively.



2. Hold arm to backward and tighten only hithermost screw.

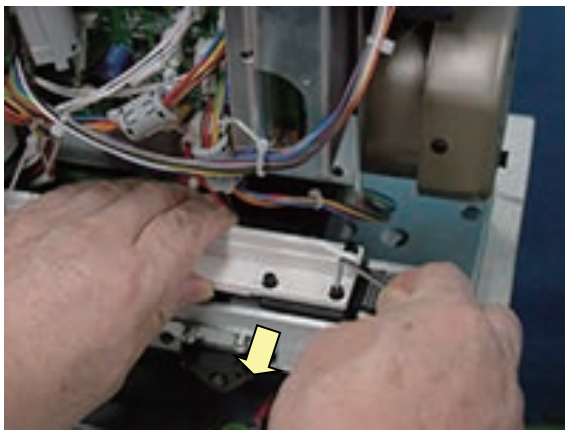
<Caution>

Make sure that there is clearance between arm and body.



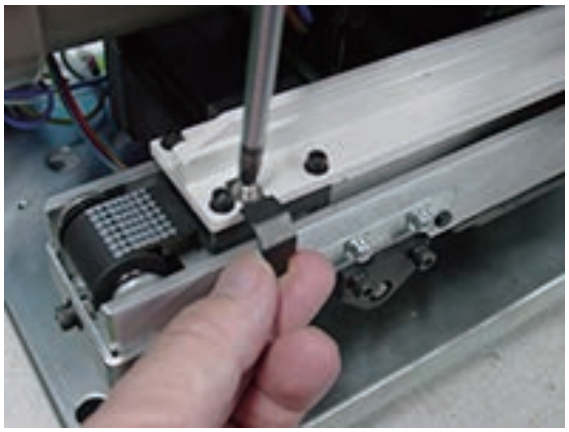
3. Hold the left side of arm to body and tighten screw.

4. Hold the right side of arm to arrow pointed direction at below picture and tighten screw.



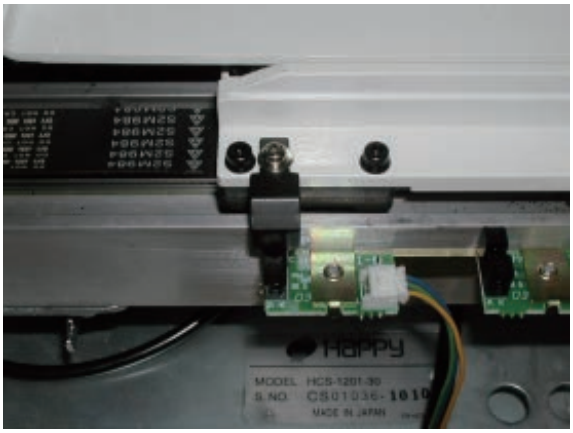
5. Assemble detecting plate.

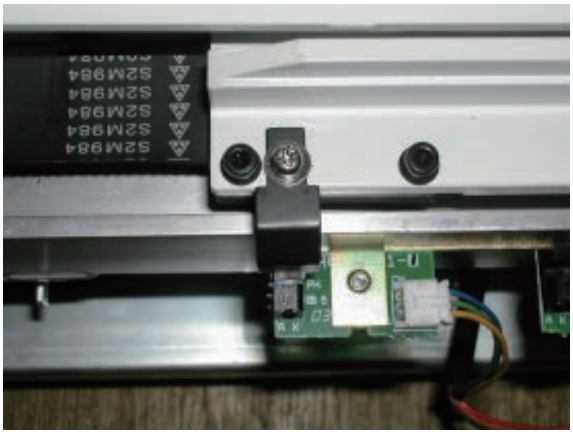
Make sure that detecting plate is mount perpendicular and parallel to the arm.

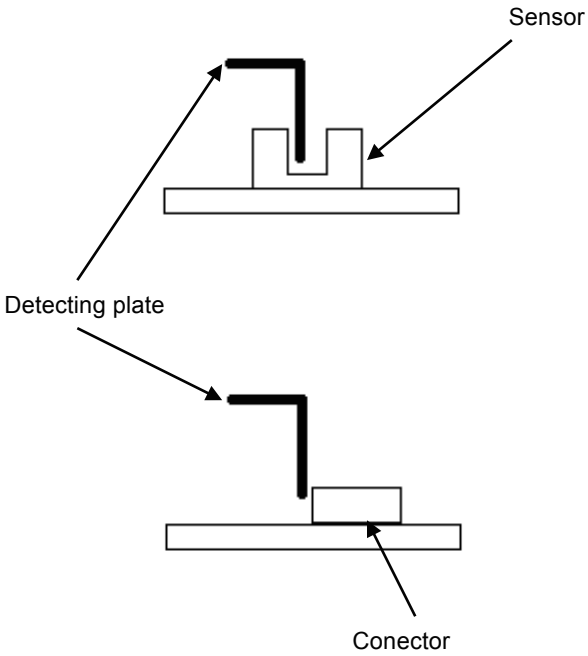


6. Check of interference between detecting plate and sensor or connector of sensor board.

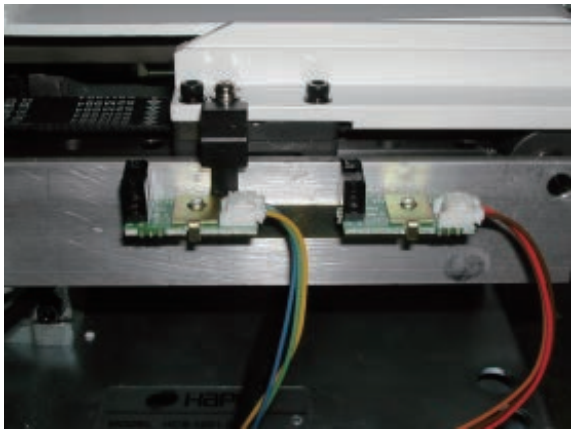
A part of sensor

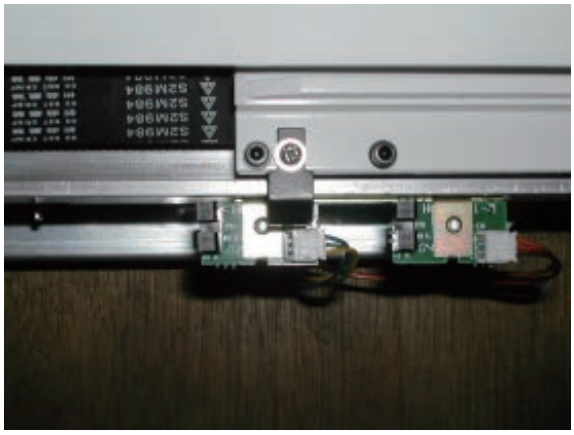







A part or conector





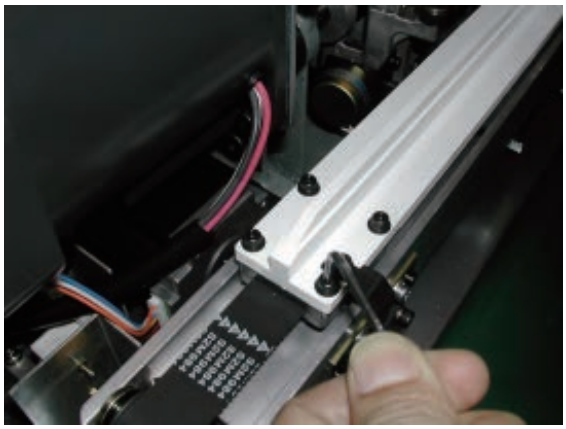
7. Adjust by bending detecting plate by hand if you find any interference with sensor or connector.

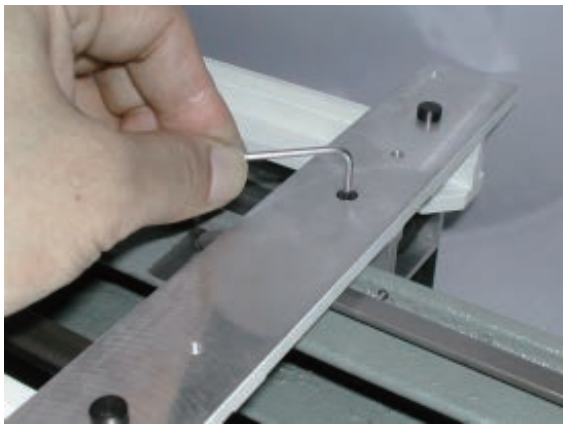
8. Finish this process.

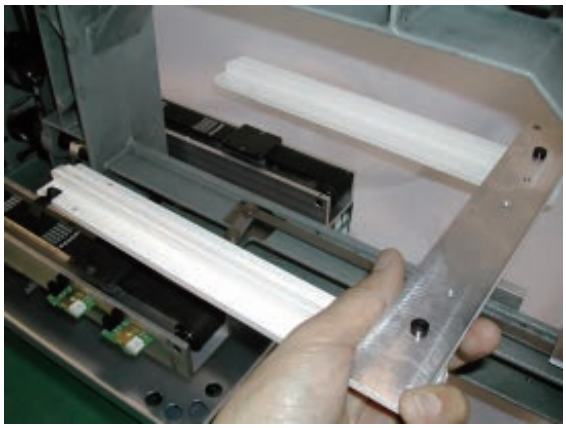
# 3-6-2 Exchange of thread cutting roller (except for Rev.A)

1. Remove bobbin winder and power supply.

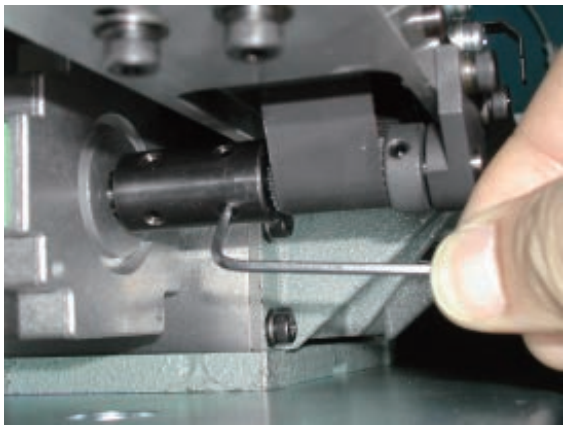
2. Remove arm.



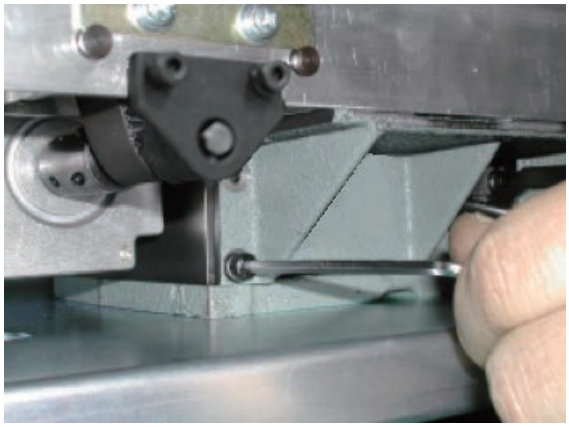




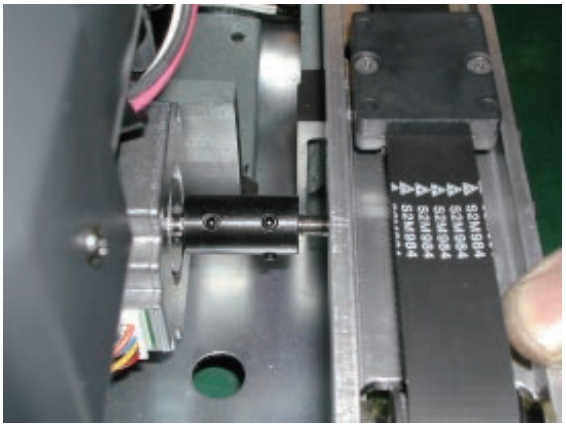
3. Loosen the screw for coupling of the Y carriage.



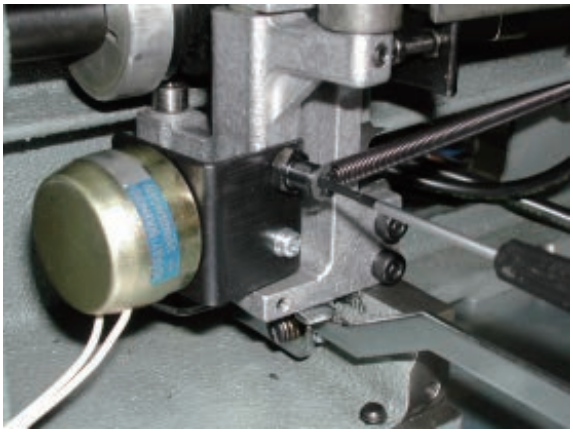
4. Remove the screw of Y carriage bracket (left).



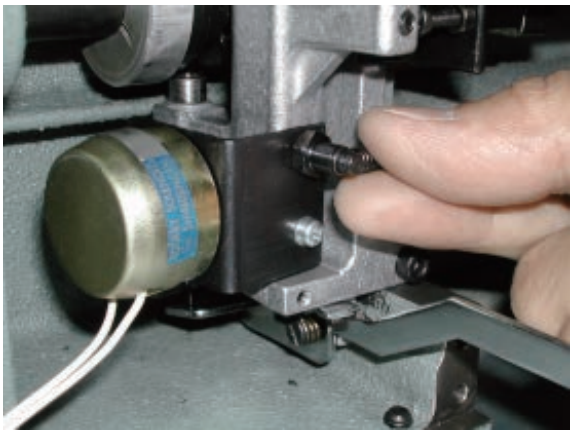
Remove the Y carriage.



5.Remove E-ring.

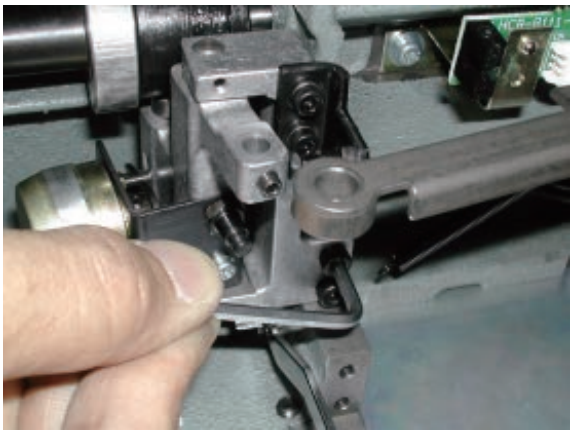


6.Remove spring.



7. Remove drive link ass'y from thread cutting driver ass'y .

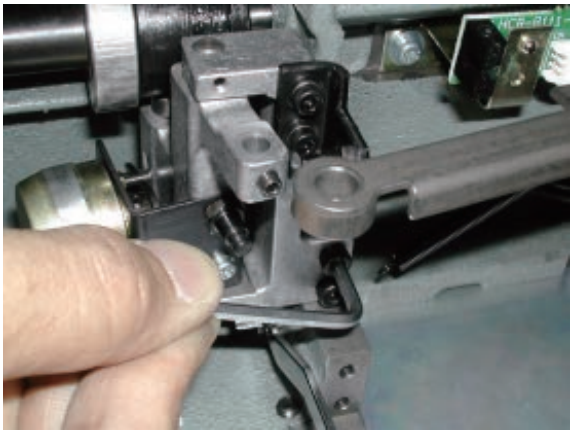
8. Remove thread cutting driver ass'y .



9. Remove thread cutting roller.

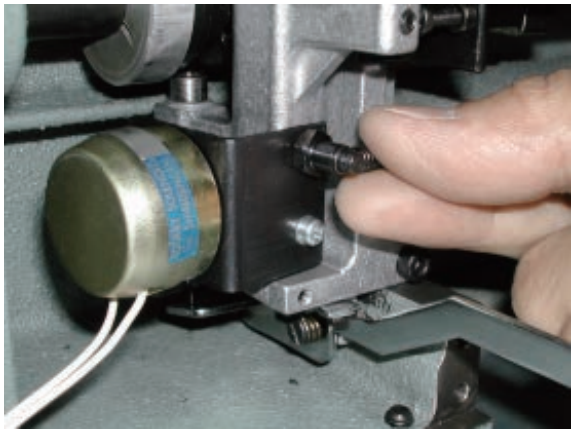
10. Fix good parts.

11. Fix thread cutting driver ass'y to the machine.



12. Fix drive link ass'y to thread cutting driver ass'y.

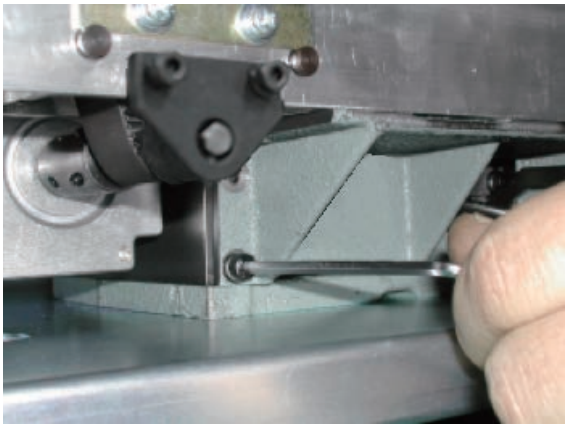
13.Fix spring and E-ring.



14. Fix Y carriage bracket (left) to the machine.

Fix the base with state of pushing it down.

Tighten drive shaft with screw.



15. Connect cable from sensor board.

Place parts back in accordance with manual.

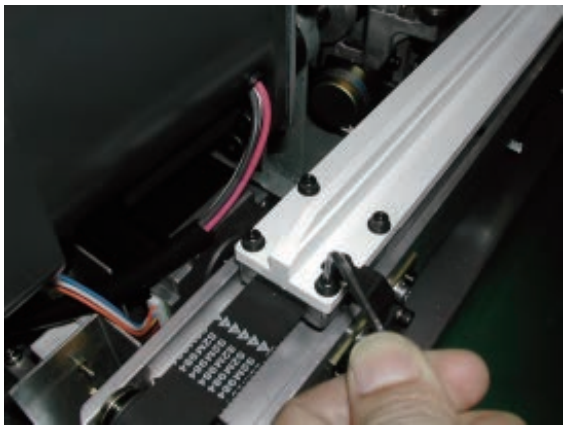
16. Check and adjust position of moving knife and thread cut timing to finish.

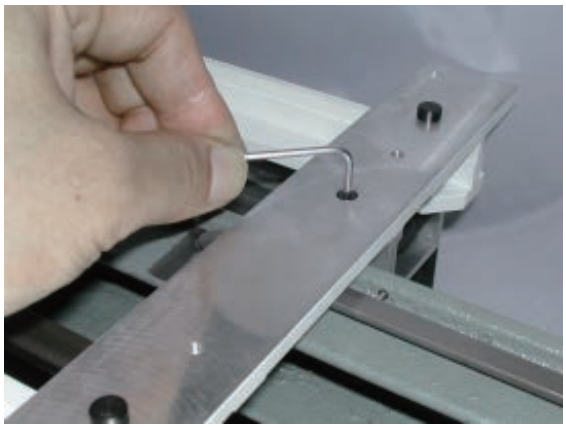
Please refer to respective adjustment.

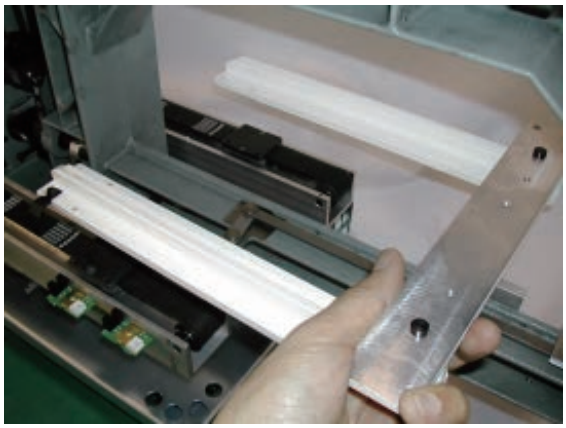
# 3-6-3 Exchange of thread cutting roller (for Rev.A)

1. Remove bobbin winder and power supply.

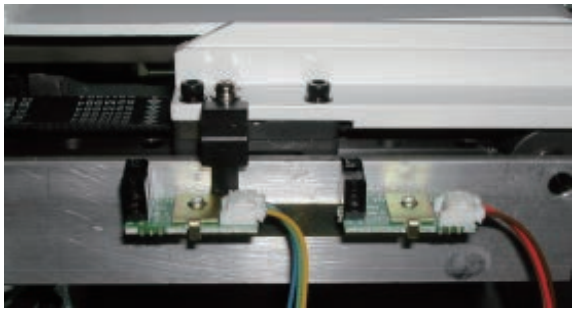
2. Remove arm.



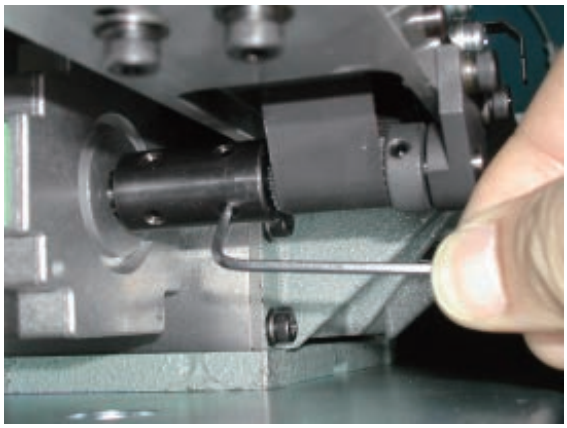




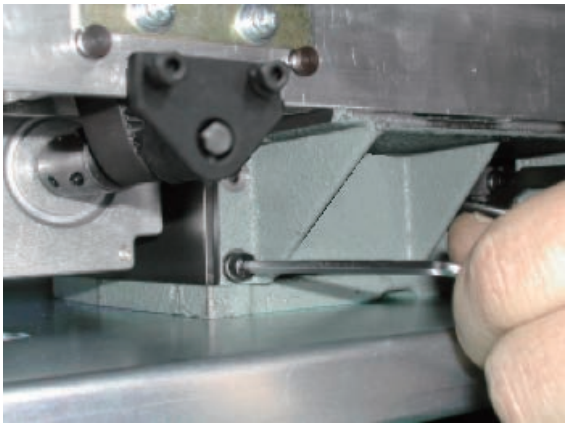
3. Disconnect cable from sensor board.



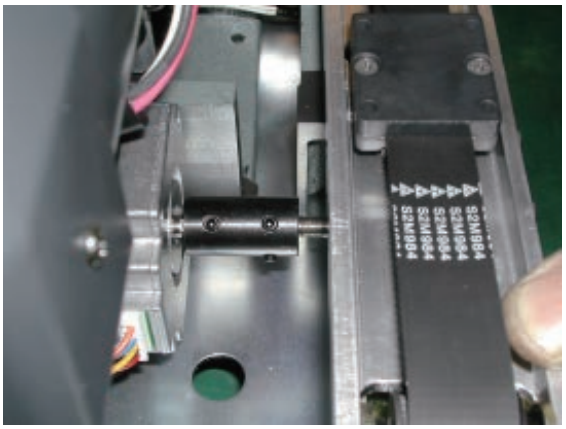
Loosen the screw for coupling of the Y carriage.



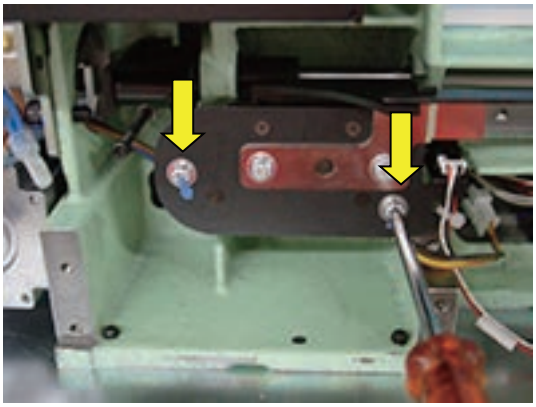
4. Remove the screw of Y carriage bracket (left).



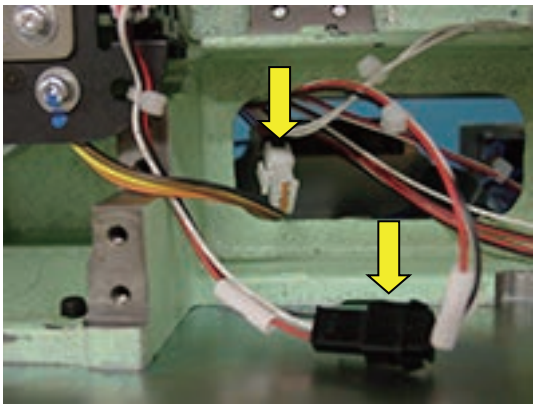
Remove the Y carriage.



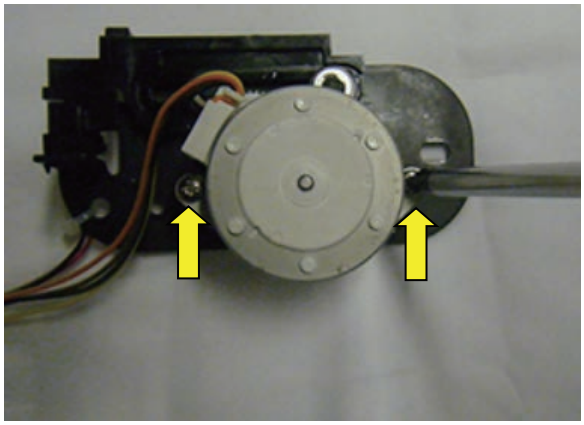
5. Remove thread cutting driver.



6. Disconnect cable.



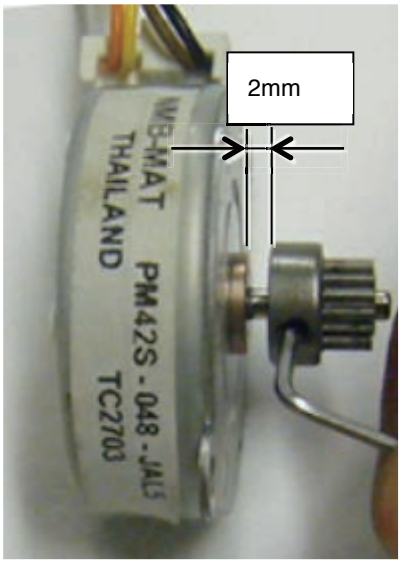
7. Remove Pulse motor.



8. Remove Drive gear.


9. Install Drive gear on good Pulse motor

Position of Drive gear is space from Pulse motor.



10. Place parts back in accordance with manual.

11. Check and adjust position of moving knife to finish.

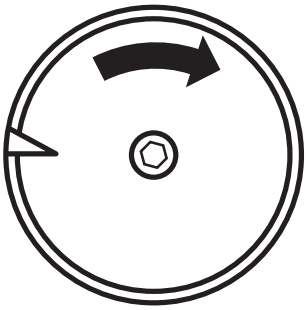
Please refer to respective adjustment.

# 3-6-4 Adjustment of thread cutting stopper (except for Rev.A)

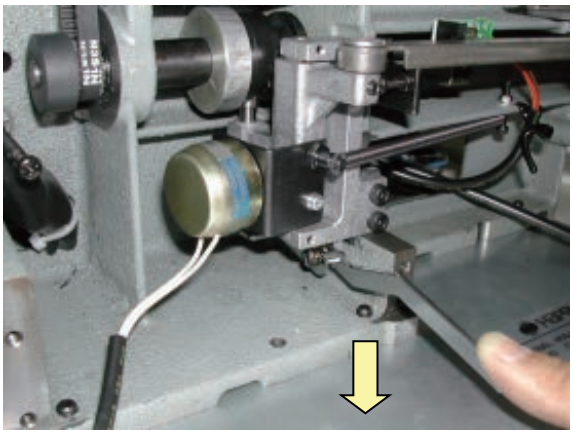
1. Adjust the thread cut timing.

   Please refer to [3-6-3 Adjustment of thread cut timing].

2.Turn upper shaft to set dial disk to [C (275 degrees)].

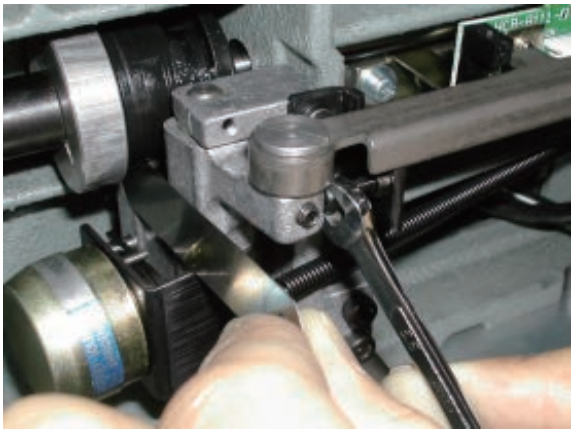


3. Keep the lever down.

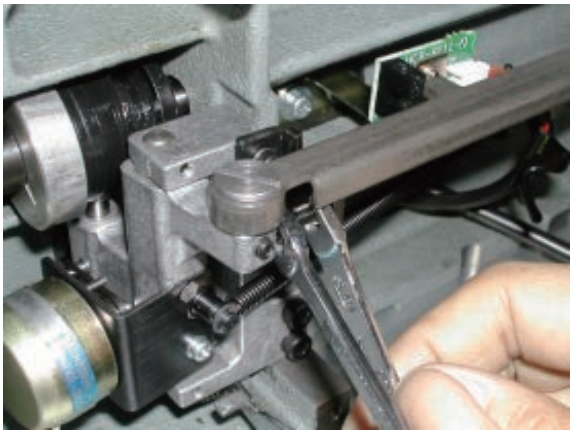


4. Insert 0.2mm thickness gauge between cam and roller and adjust the clearance [0.2mm] between cam and roller by adjusting screw.)

   (To be sure that cam and roller are contacted with thickness gauge and nogap.)



5. Tighten lock nut.



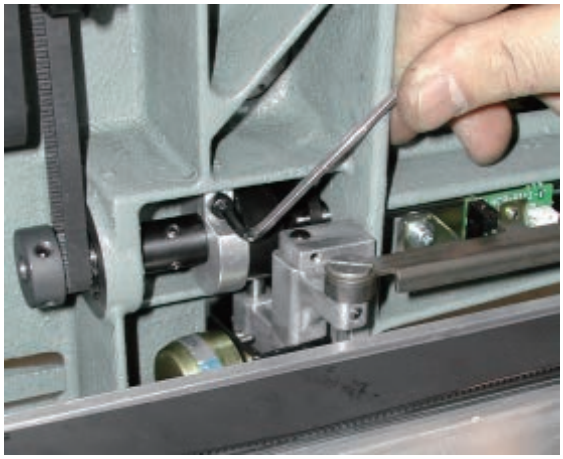
6. On checking the clearance [0.2mm] between cam and roller by using 0.2mm thikness gauge.

   If OK, all the procedure is done.

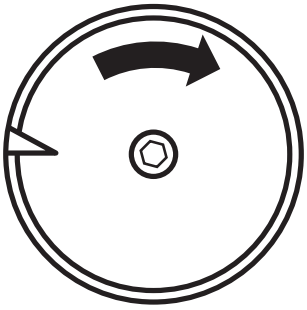
# 3-6-5 Adjustment of thread cut timing (except for Rev.A)

1. Remove bobbin winder and power supply.

2. Loosen screw on thread cut cam.

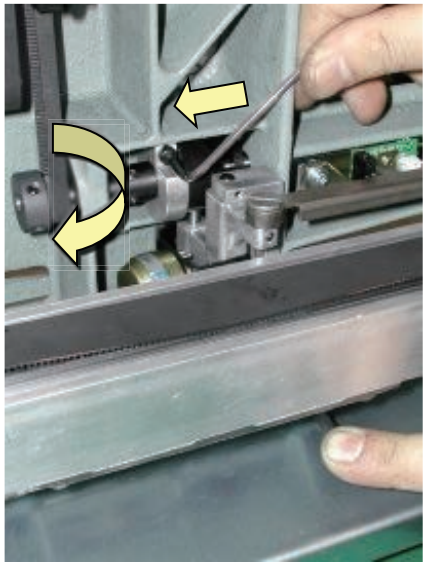


3. Set dial disc to [116 degrees].

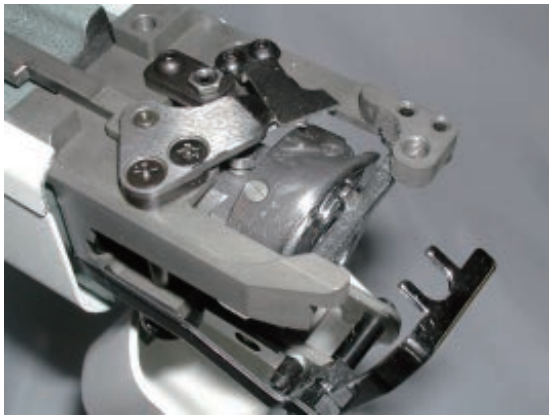


4. Turn thread cut cam clock-wise while pushing release lever down.

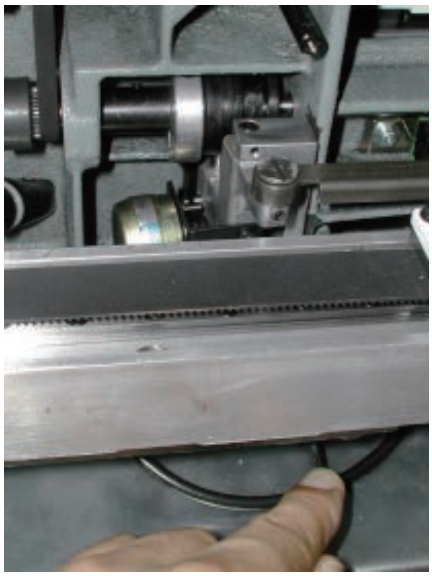
<Important> Push thread cut cam against rotary hook shaft collar A so as not to produce clearance between cam and collar.



5. Tighten screw on thread cut cam when moving knife began to open.



6. With release lever being pushed down, turn upper shaft to open and close moving knife repeatedly.



7. On Checking that the knife began to open, at [116 degrees (+0 / -2degrees)] work has finished.

# 3-6-6 Exchange of moving knife

1. Remove needle plate.

2. Remove knife drive shaft retainer.

3. Pull out knife drive shaft ass'y.

4. Exchange moving knife.

5. Setting drive link hole to moving knife, insert knife drive shaft assembly.

6. Pushing down moving knife and knife drive shaft retainer like putting them together, fix knife drive shaft retainer.
   # Fix so that there is no backlash in upward and downward direction and to to move lightly.

7. Referring to [3-6-8 Adjustment of moving knife and fixed knife],check how well thread is cut and adjust, then finish this process.

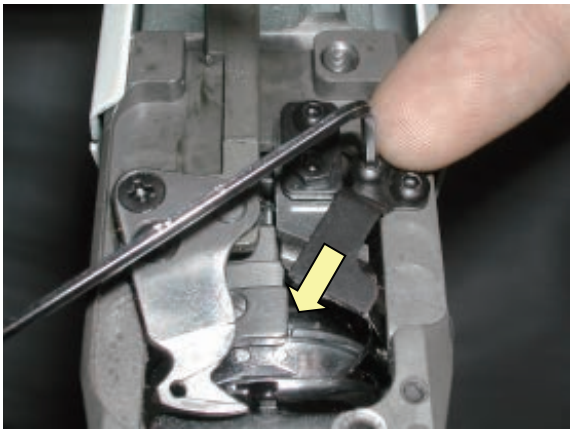
# 3-6-7 Exchange of fixed knife

1. Remove needle plate.

2. Remove fixed knife.

3. Exchange fixed knife.

4.Tighten fixed knife pushing to forward as full as possible.



<Notice>

In case moving knife and the left side of fixed knife overlaps excessively when closing, adjust the position of fixed knife slightly to the right direction.

5. Referring to [3-6-8 Adjustment of moving knife and fixed knife],check how well thread is cut and adjust, then finish this process.

# 3-6-8 Adjustment of moving knife and fixed knife

1. Remove needle plate.

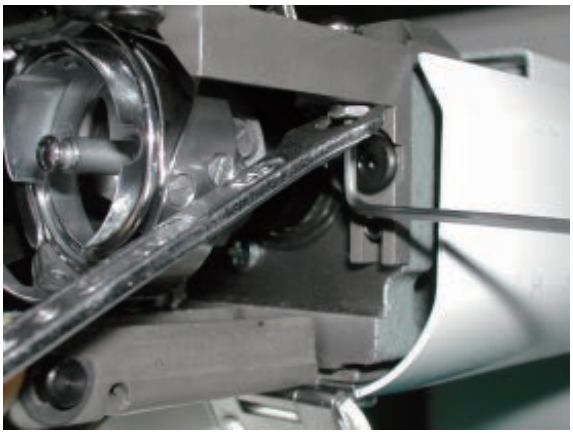
2. Check if knife drive shaft has no backlash in up and down direction.

If backlash is found, adjust it referring to [3-6-6 Exchange of moving knife].

3. Adjust slant of fixed knife with [upper adjustment screw] and [lower adjustment screw] that fix fixed knife.

<Note> Rub these screws together to the extent that you don't feel resistance.

<Spanner> 5.5mm



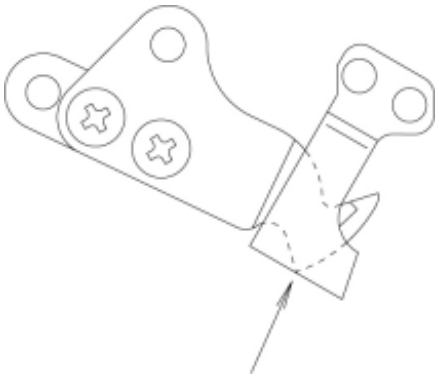
4. Cut thread and check how well it is cut.

Use two polyester threads for checking.

5. Check several times and if no mistakes are found, finish this process.

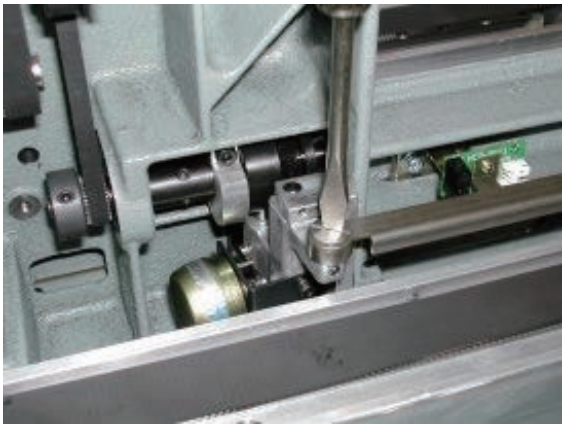
# 3-6-9 Adjustment of position of moving knife (except for Rev.A)

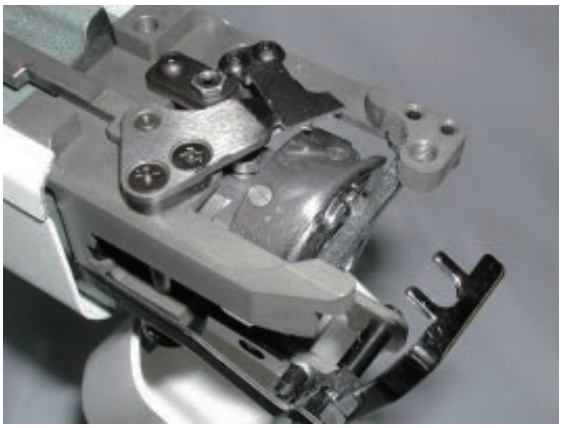
1. Loosen screw on link pin.



Adjustment of clearance between moving knife and fixed knife is where both tip of then are attached.

2. Turn link pin to adjust position of moving knife.

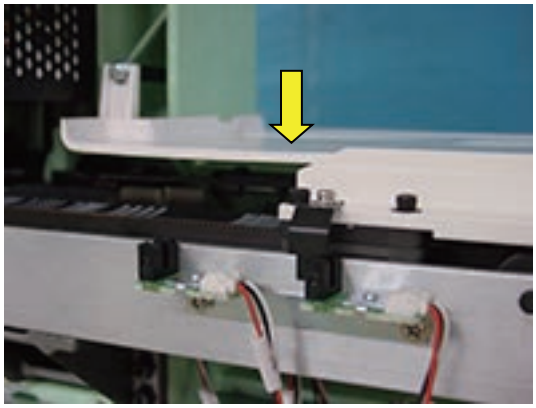




3. If necessary, please refer to [3-6-8 Adjustment of moving knife and fixed knife] and check how well thread is cut, then finish.

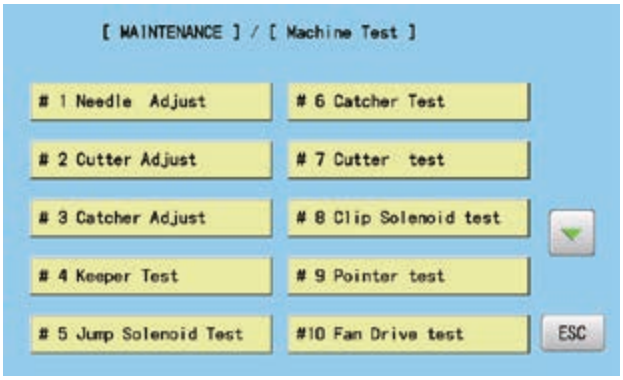
# 3-6-9b Adjustment of position of moving knife (for Rev.A)

1.Remove Needle plate and Cover (front).



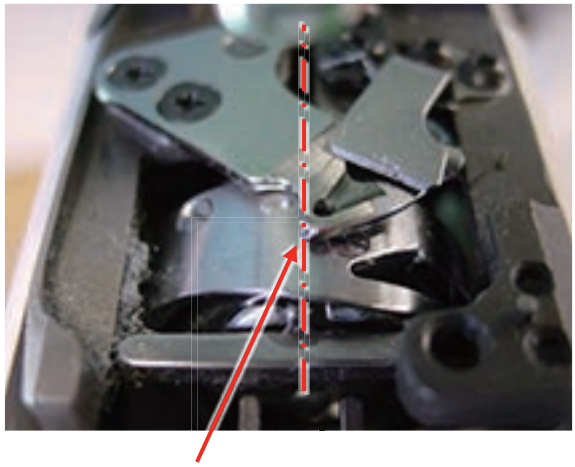
2. Enter maintenance mode in reference to [4-5-1 How to enter maintenance mode]

3. Press Machine Test .

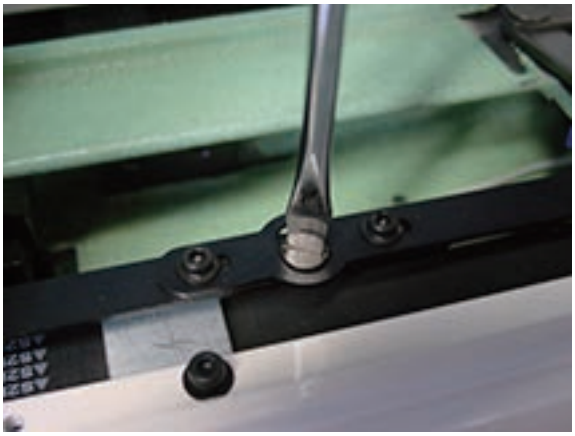



4. Press #2 Cutter Adjust,

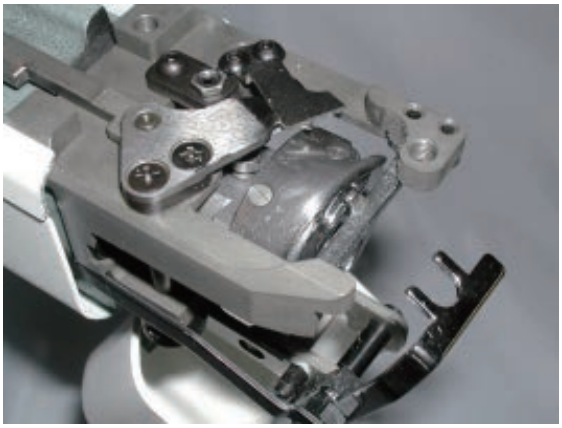

5. Press Separate, then the Moving knife will be opened.
Please confirm that the tip of Moving knife is located at center of Rotary hook retainer.

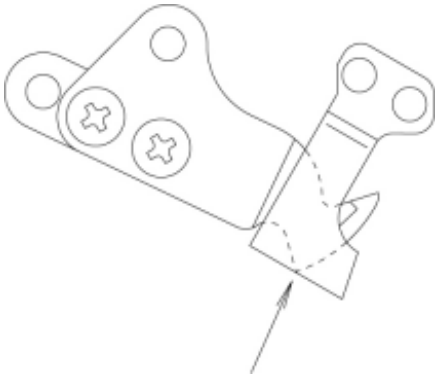



6. In case the tip of moving knife is not in the right position, loosen screw on Thread cutting rod, then adjust position of the Moving knife with turnning Eccentric pin.
Tighten screws.



7. Press Origin, then the Moving knife will be closed. Please confirm that the Moving knife is located as drawing below.





Adjustment of clearance between moving knife and fixed knife is where both tip of then are attached.

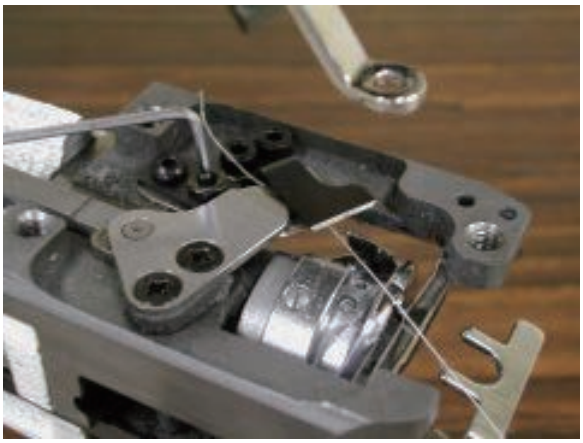
8. Press Separate and Origin by turns to confirm that t he Moving knife is closed in the right position.
Press ESC to finish「Maintenace mode」.

9. If necessary, please refer to [3-6-8 Adjustment of moving knife and fixed knife] and check how well thread is cut, then finish.

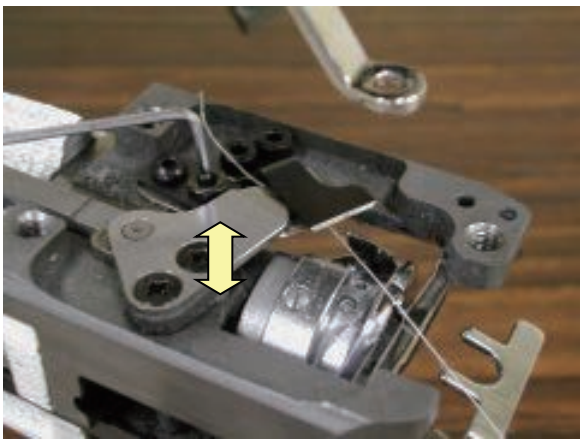
# 3-6-10 Adjustment of bobbin thread holder

1. Remove needle plate.

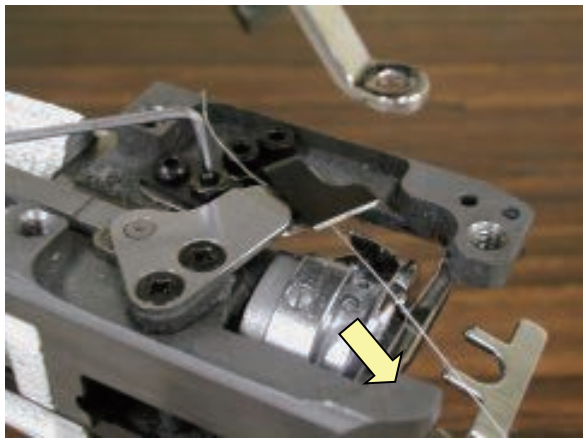
2. Close moving knife like putting bobbin thread between moving knife and bobbin thread holder.



3. Adjust height of bobbin thread holder with adjusting screw.



4. Pull bobbin thread toward arrow mark and see that bobbin thread comes off with tensile gauge [20-25g].

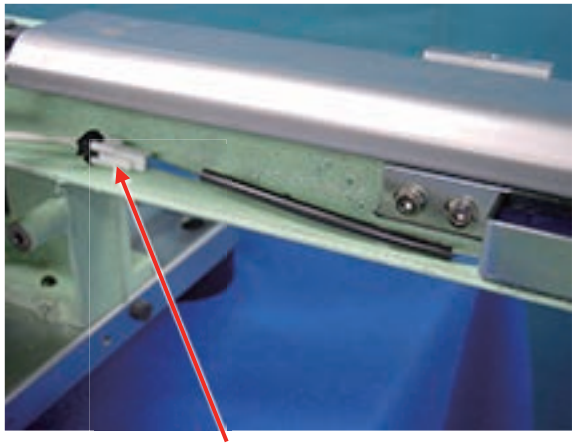


5.Tighten lock nut. (Don't move adjusting screw.)

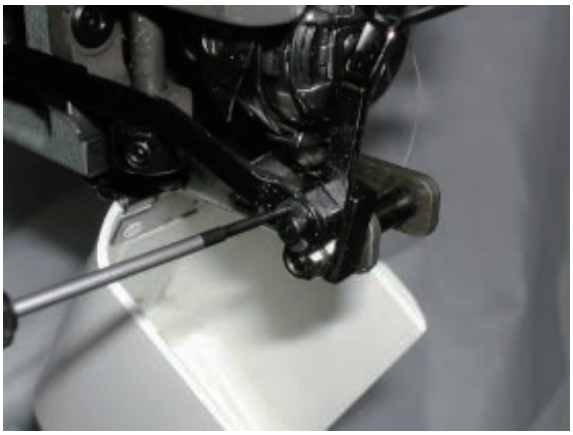
6. Check several times and if OK, finish this process.

# 3-6-11 Exchange of keeper solenoid

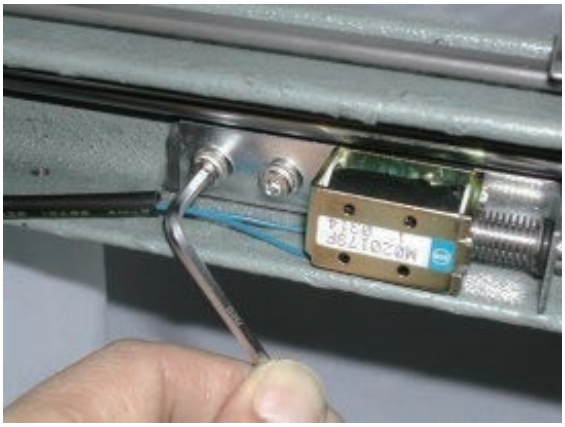
1. Remove Bed cover (lower) and take connector of Keeper solenoid out.



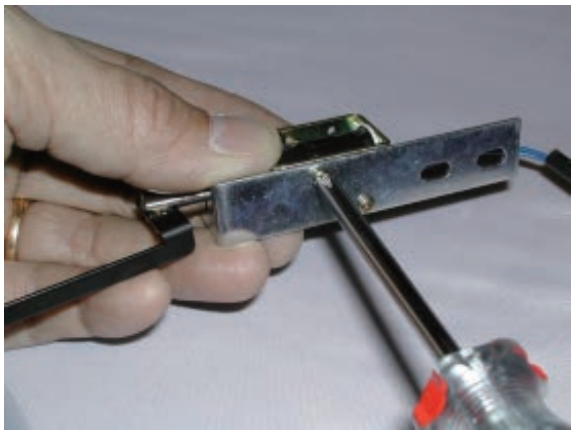

2. Remove E-ring on fulcrum pin.



3. Remove keeper solenoid ass'y.



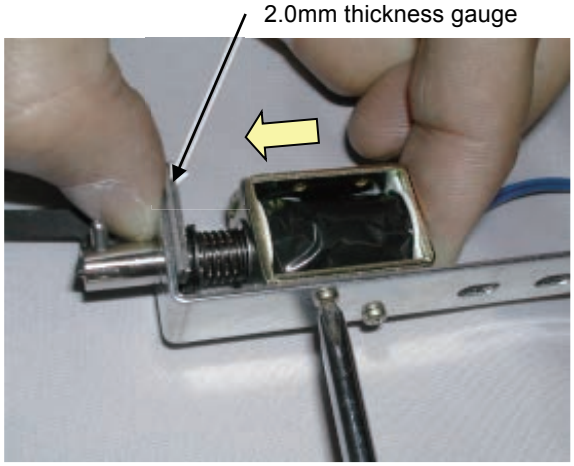
4. Exchange keeper solenoid.



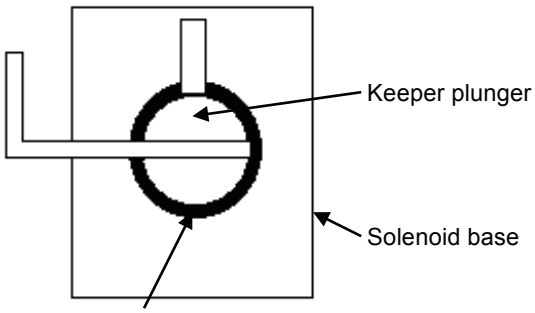
<Attention>

Pushing keeper solenoid to solenoid base.

Insert 2.0mm thickness gauge between solenoid base to polyslider.




<Front view>



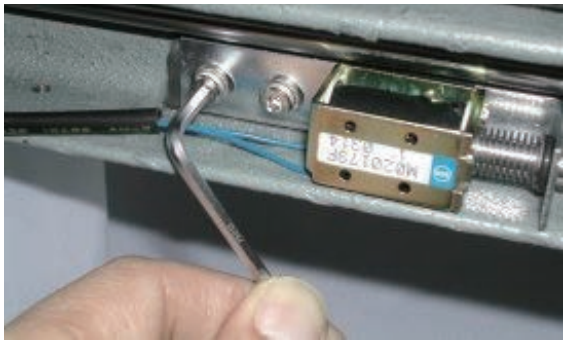

Clearance between keeper plunger and solenoid base should be kept as much as equally.

5.Put keeper solenoid ass'y in previous position then adjustment of position of keeper to finished.

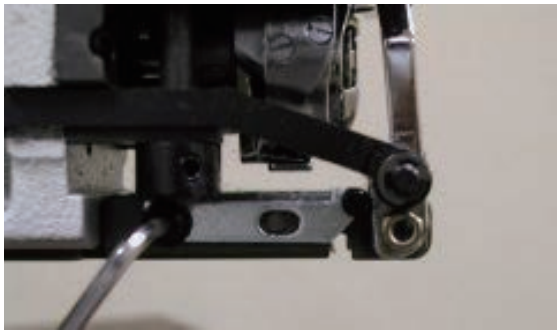
Refering to [3-6-12 Adjustment of position of keeper].

# 3-6-12 Adjustment of position of keeper

1. Loosen screw on solenoid base.

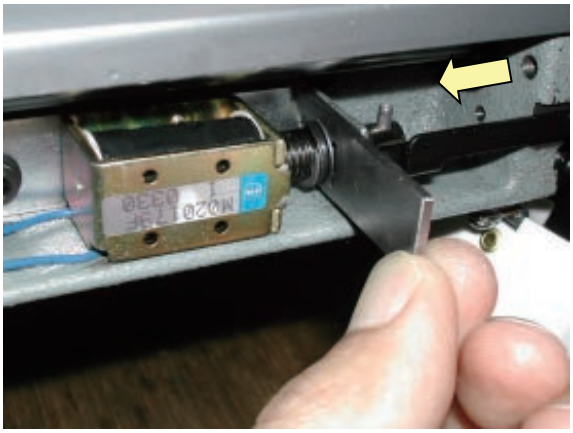


Loosen screw on stopper bracket.

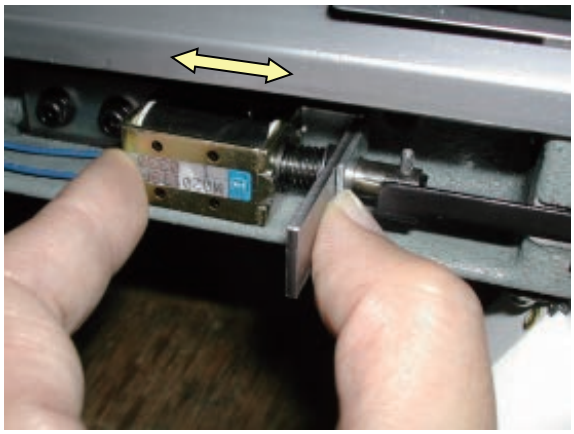


2. Insert keeper positioning gauge (Bobbin) into rotary hook.

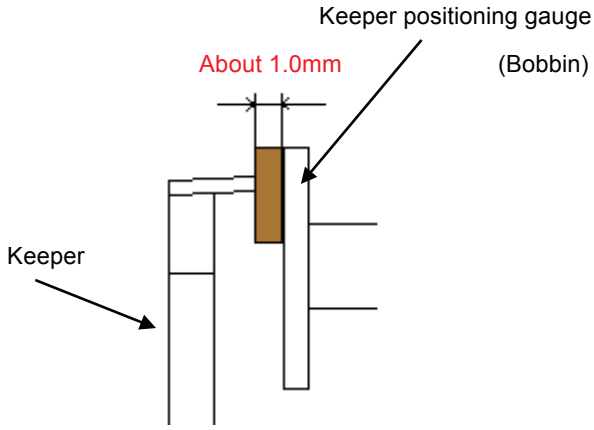
3. Insert [2.0mm] clearance gauge between solenoid base and slider then pull in keeper solenoid and keeper rod.



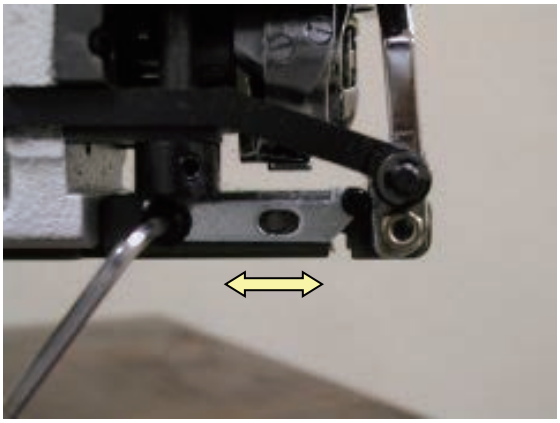
4. Adjust solenoid base where tip of keeper contacts slightly to the gauge then tighten bracket screw.
Clearance between bobbin and keepr is [about 1.0mm].



<View from right>



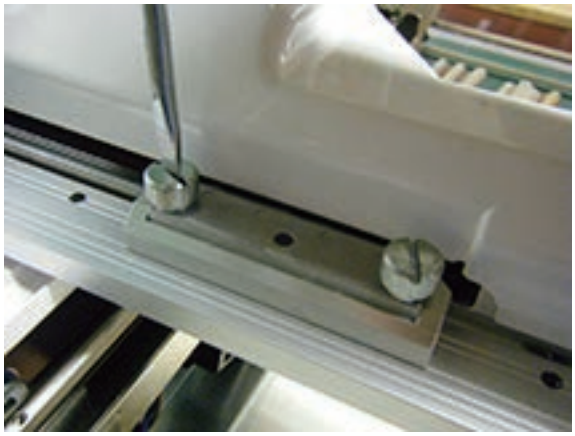

5. Adjust position of stopper bracket.
This is the position where tip of keeper contacts to gauge



6. Adjustment has finished.

# 3-7-1 Adjustment of X carriage belt tension

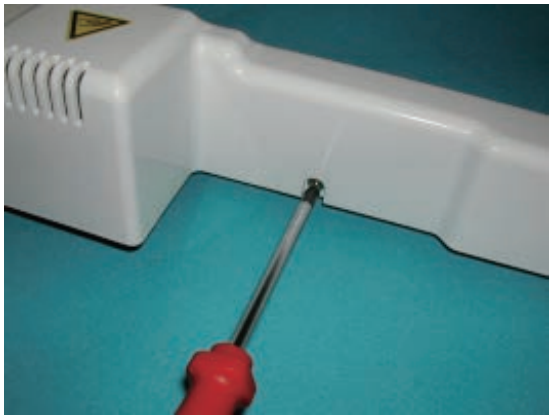
1. Remove frame base.



2. Disconnect X carriage cable.

3. Remove X carriage.

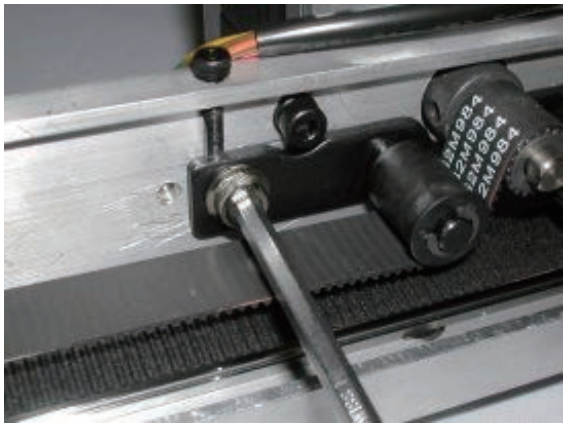
4. Remove X carriage cover.



5. Remove sensor bracket.

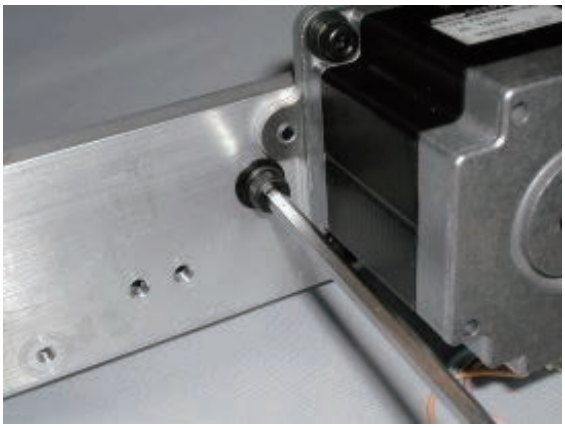
6. Loosen fixing screw for tension pulley bracket slightly.

(front side)



7. Loosen fixing screw for tension pulley bracket slightly.

(rear side)

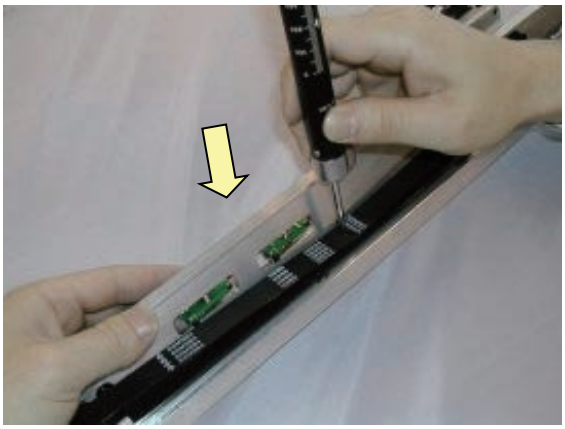


8. Adjust belt tension.

Use push and pull gauge.

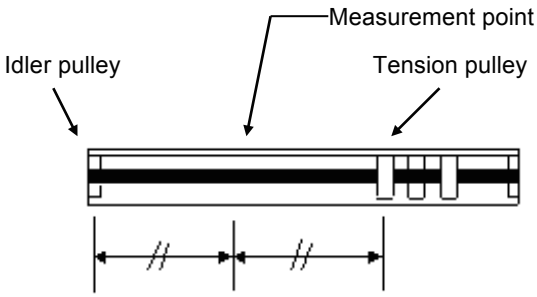
<Adjustment value>

[200g] at the status of which both belt is touch.

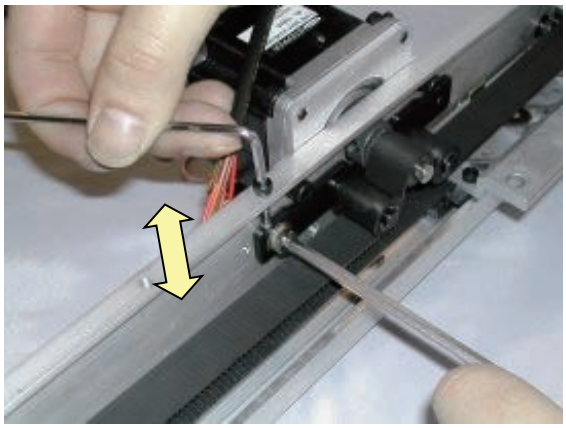


<Note> Slide connecting plate to right as full as possible.

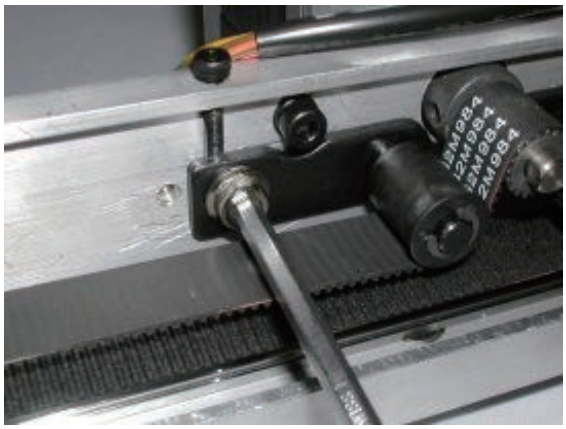
Gauge in the middle of idler pulley and tension pulley.



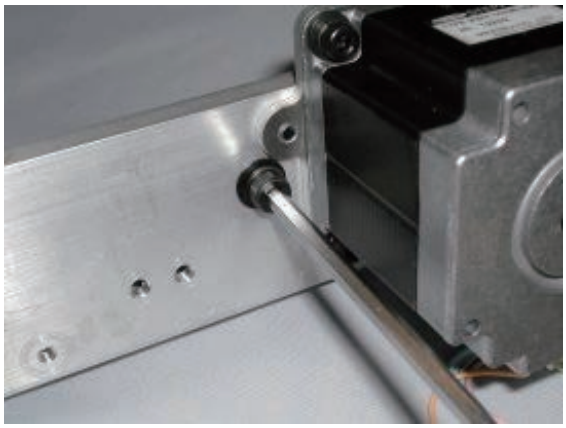

Adjustment, tighten fixing screw for tension pulley bracket.



9. Tighten fixing screw for tension pulley bracket. (front side)



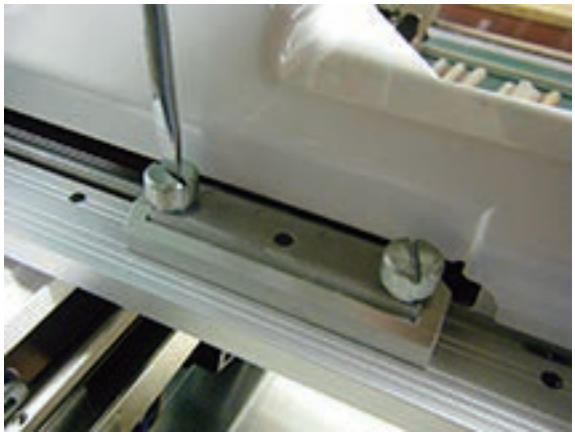
10. Tighten fixing screw for tension pulley bracket. (rear side)



11. Return things back to previous places in reverse order.

# 3-7-2 Exchange of X carriage belt

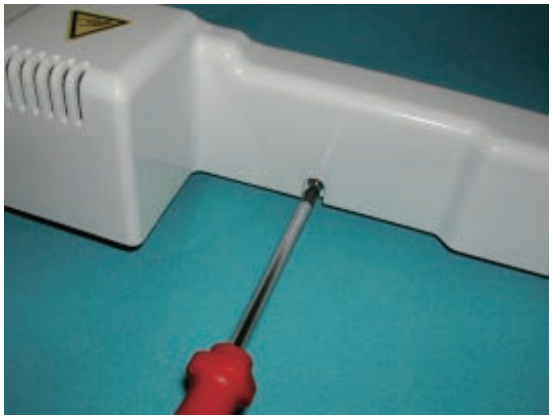
1. Remove frame base.



2. Disconnect X carriage cable.

3.Remove X carriage.

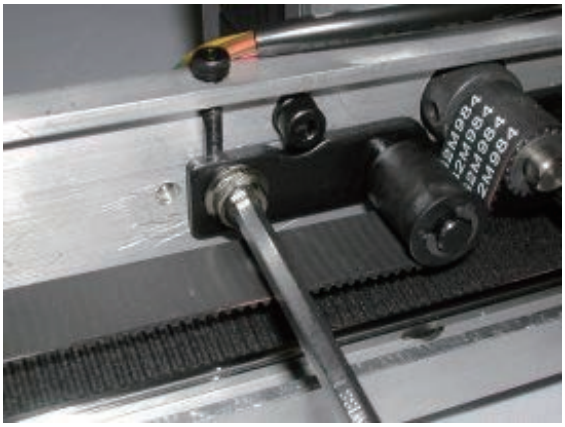
4. Remove X carriage cover.



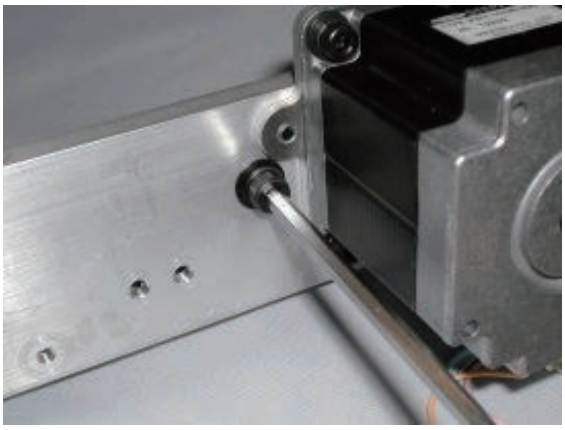
5. Remove sensor bracket.

6. Loosen screw for tension.

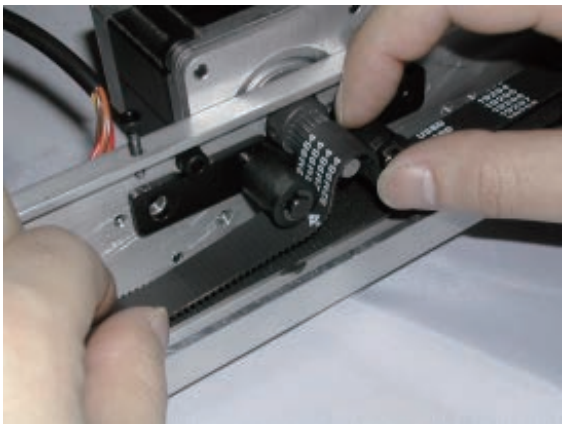
7. Remove the screw which fixes tension bracket.



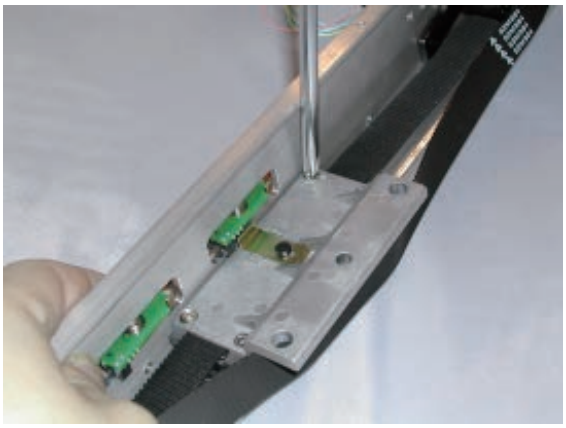
8. Loosen screw (rear) slightly to the extent that tension-bracket moves.

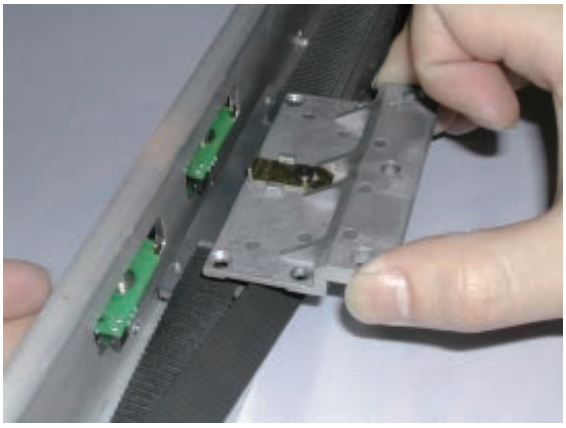


9. Remove belt from motor pulley.



10. Remove connecting plate.



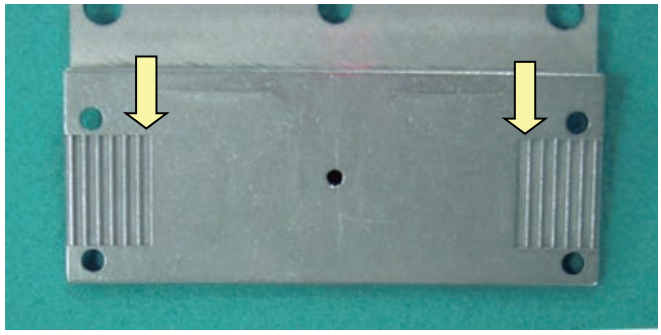


11. Exchange belt to good one.

<Important>

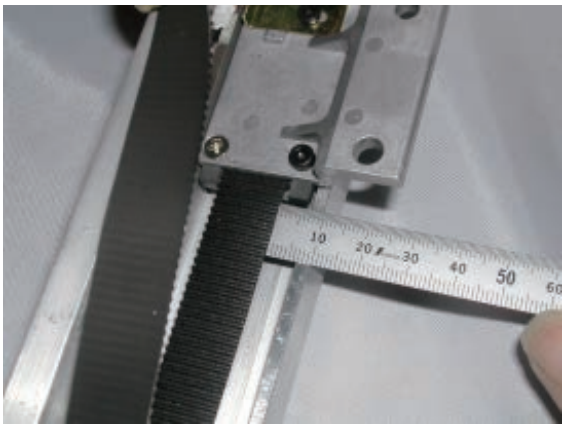
Exchange it so as not to break groove and belt tooth on belt of connecting plate.

Do not put belt tooth on the innermost groove of the connecting plate.



12. Adjust the position of belt.

Space between edge of X base and belt is [10mm].

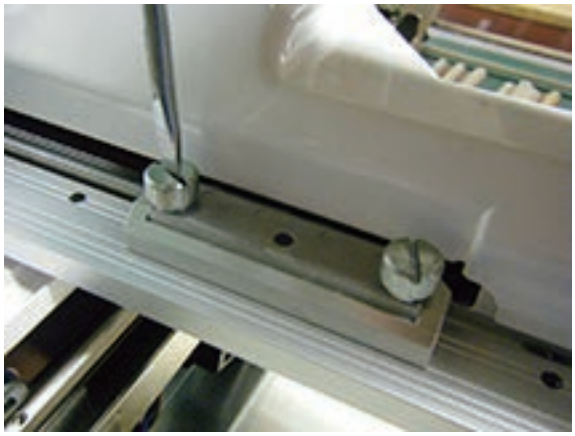



13. Referring to [3-7-1 Adjustment of X carriage belt tension], adjust tension of belt.

14. Return X carriage assembly and frame base to previous places to finish.

# 3-7-3 Adjustment of Y carriage belt tension

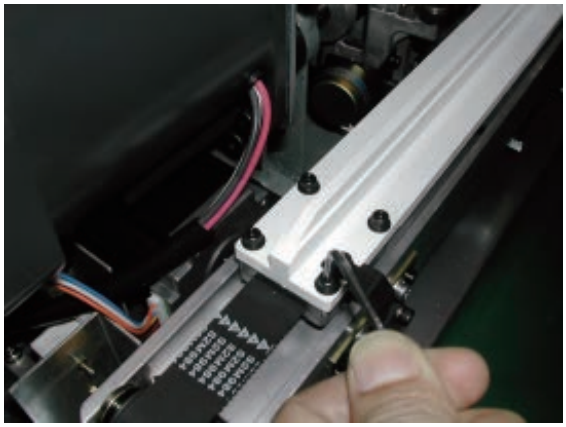
1. Remove frame base.

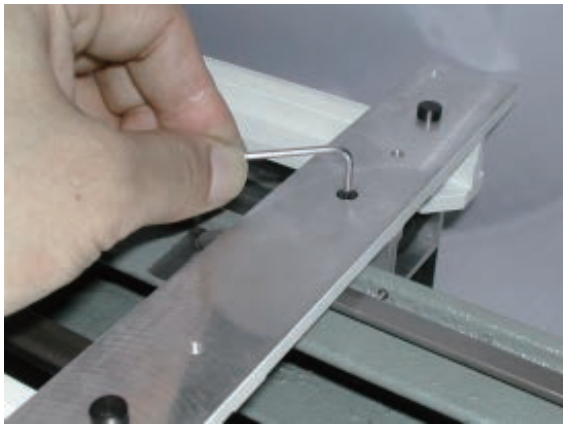


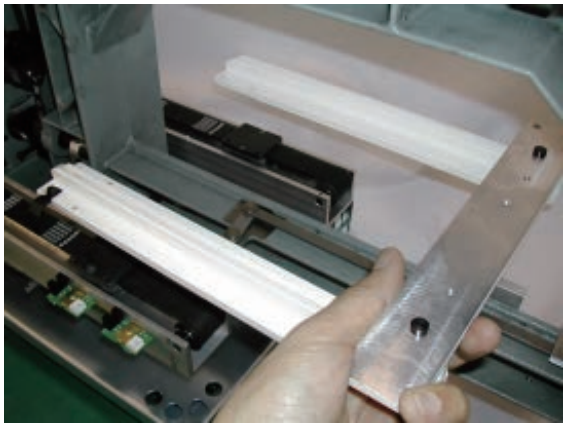
2. Disconnect X carriage cable.

3. Remove X carriage.

4. Remove arm.

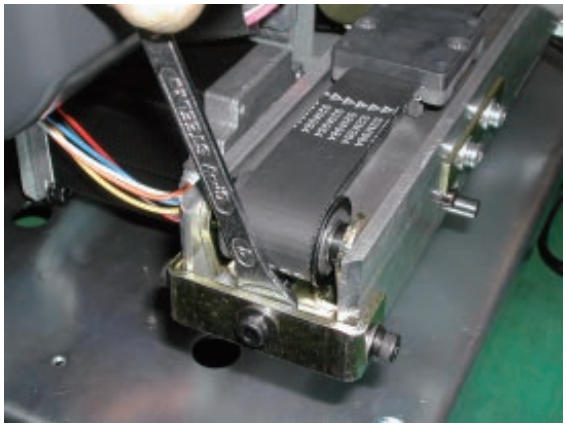




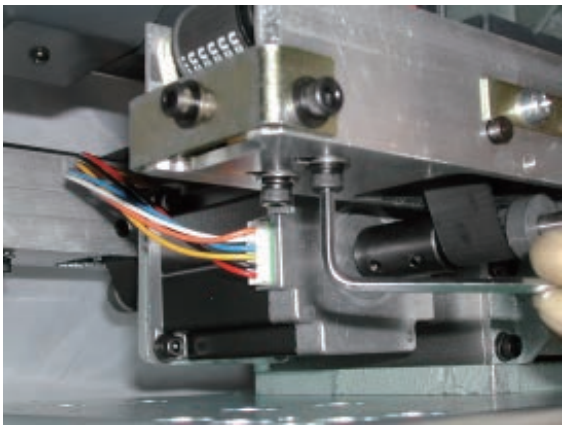


5. Loosen lock nut for tension adjustment screw.

<Spanner> 7mm



6. Loosen tension screw so as to move tension.

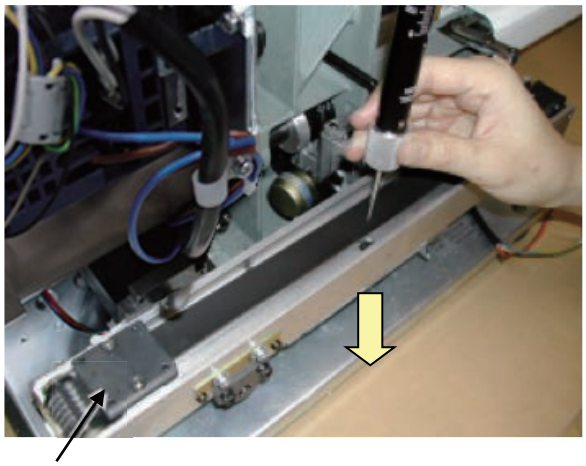


7. Adjust belt tension, to use belt tension gauge.

Use push and pull gauge.

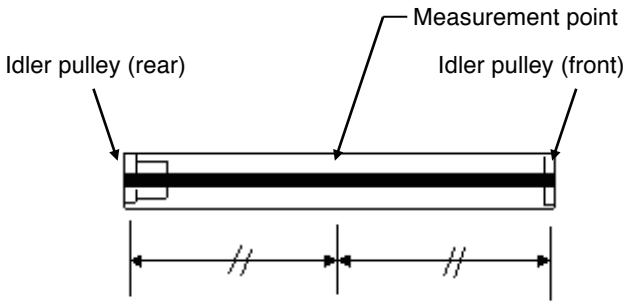
<Adjustment value>

Adjusted to be [200g] at state that Belt attaches to Rail.

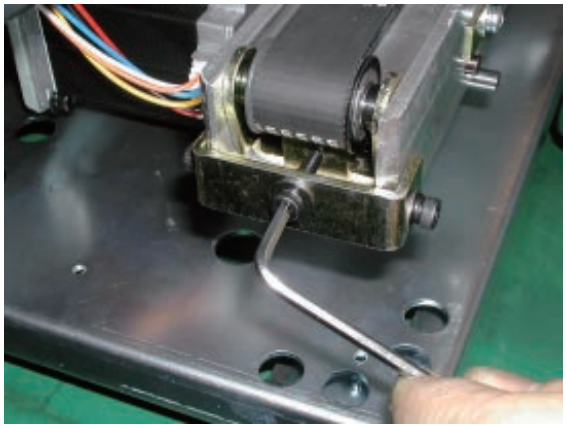


Push belt holding plate backward as full as possible.

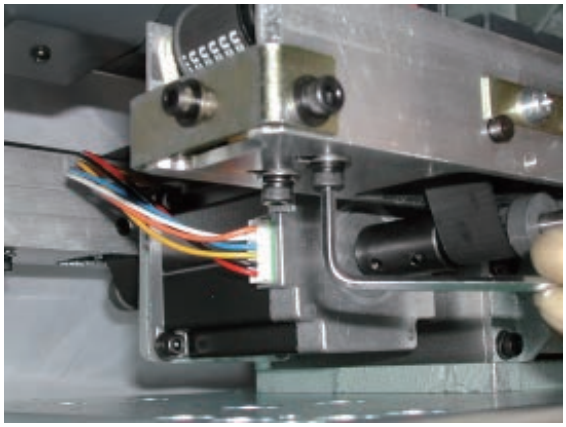
Gauge in the middle of idler pulley.



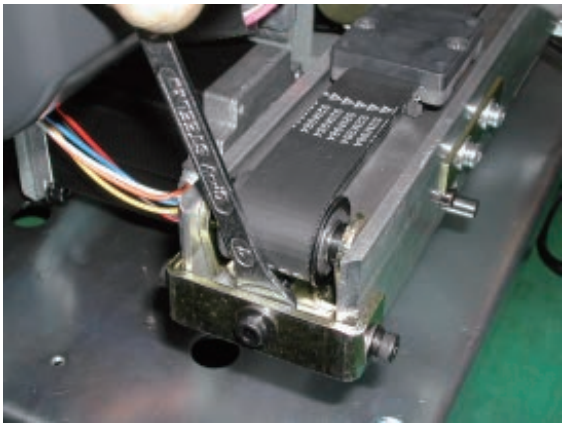

Adjust with screw.



8. Tighten screw on tension.



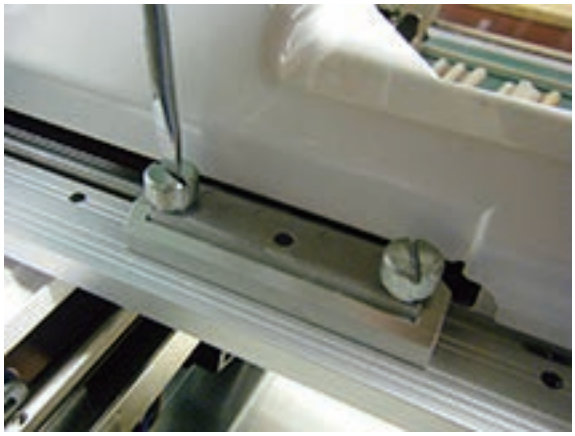
9. Tighten lock nut for tension adjustment screw.



10. Return arm, X carriage assembly and frame base to previous places to finish.

# 3-7-4 Exchange of Y carriage belt

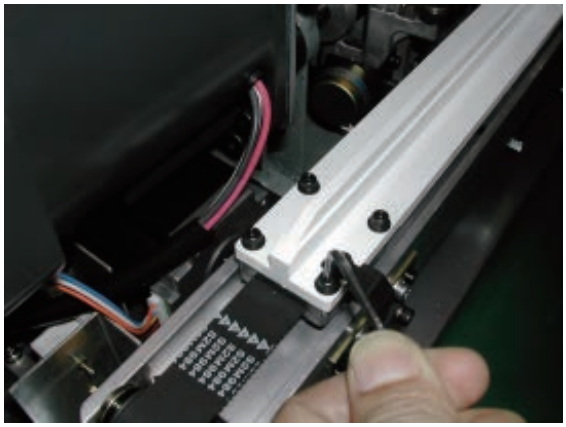
1. Remove frame base.

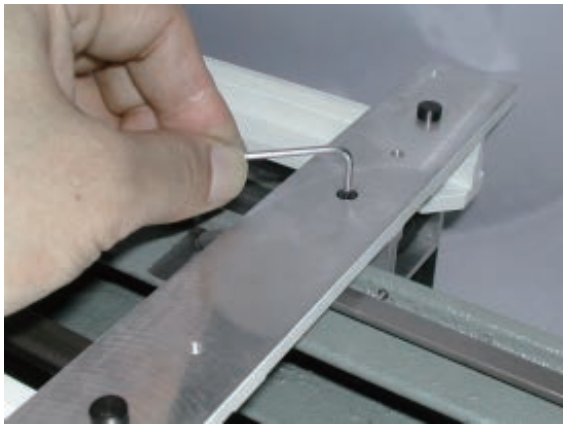


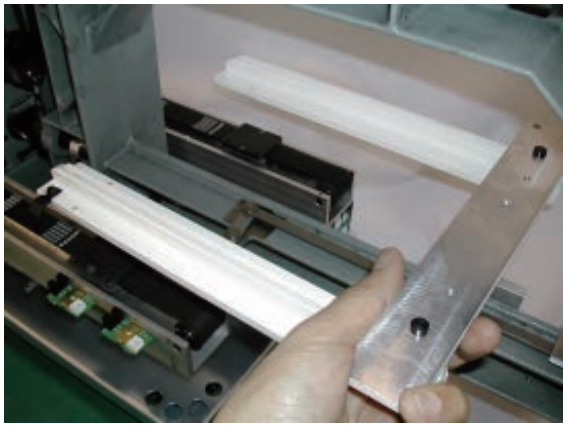
2. Disconnect X carriage cable.

3. Remove X carriage.

4. Remove arm.

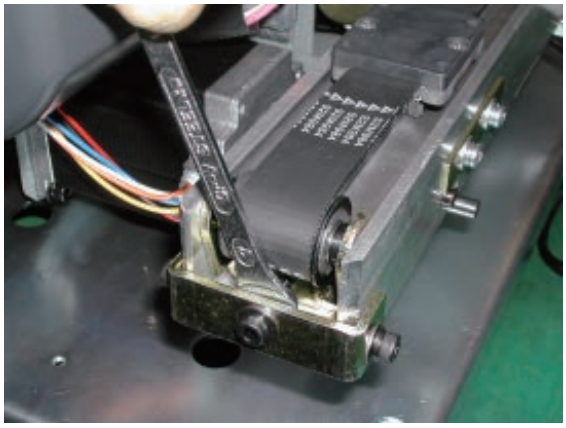




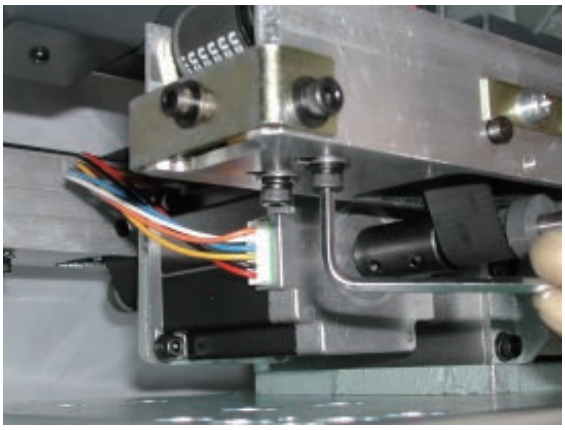


5. Loosen lock nut for tension adjustment screw.

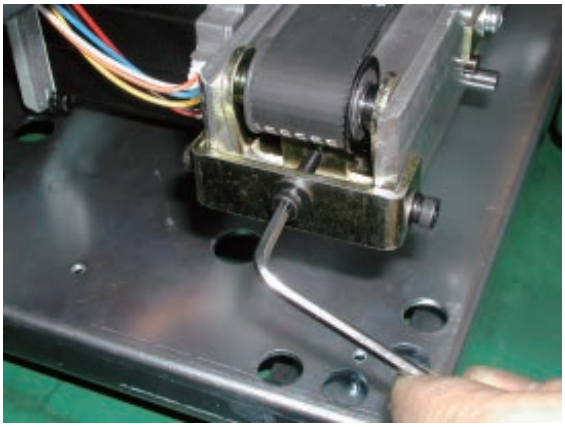
<Spanner> 7mm



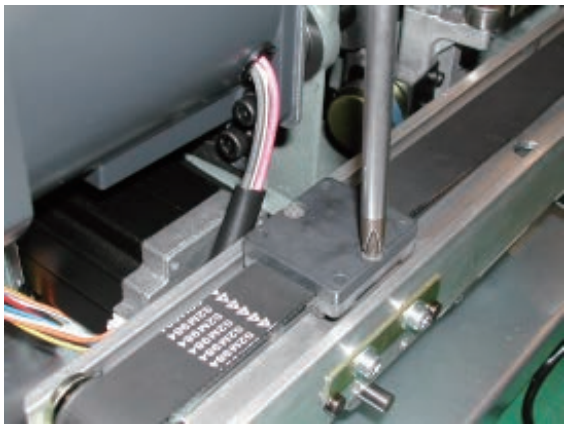
6. Loosen tension screw so as to move tension.



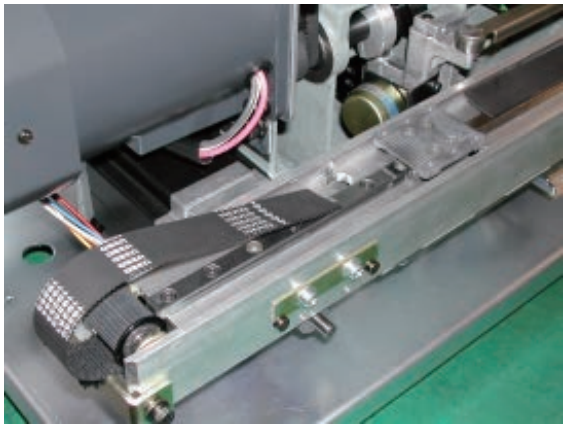
7. Loosen screw for tension.



8. Remove belt holding plate.



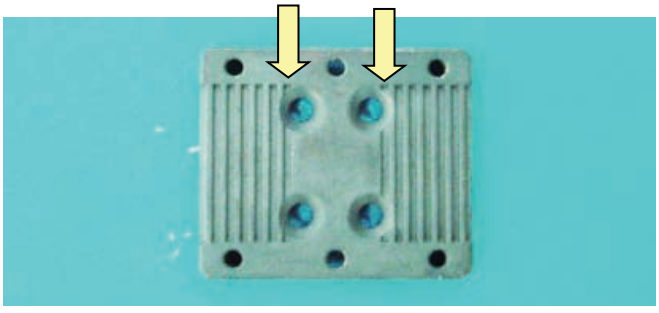
9. Exchange belt.



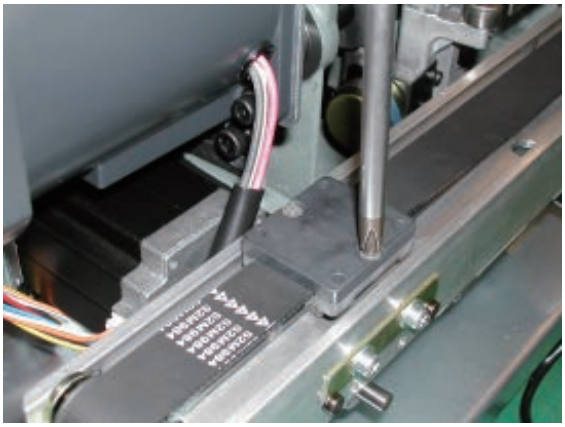
10. Set belt to belt groove of guide frame base.

<Important>Exchange it so as not to break belt tooth and convex on belt.

Do not put belt tooth on the innermost groove of the connecting plate.



11. Fix belt holding plate.



12. Referring to [3-7-3 Adjustment of Y carriage belt tension], adjust tension of Y belt.

13. Return arm, X carriage ass'y and frame base to previous places to finish.

# 3-8-1 Adjustme nt of timing belt tension

1. Remove bobbin winder and power supply.

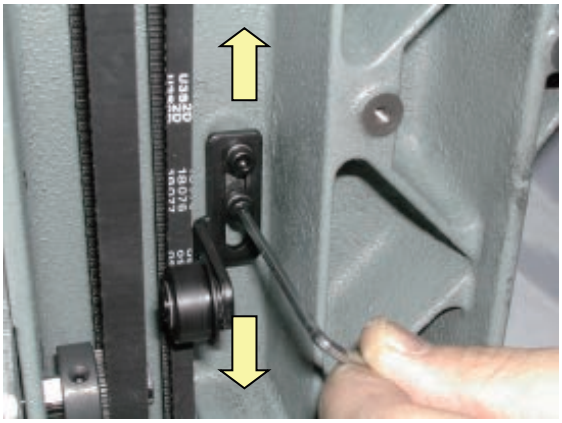
2. Adjust tension of timing belt.

<Important>

Tension shaft ass'y to be set at the center against screw hole of the body.

No need to adjust tension.

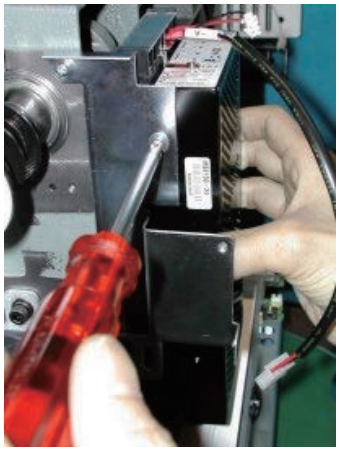
Please move tension shaft ass'y upward and downward to adjust.



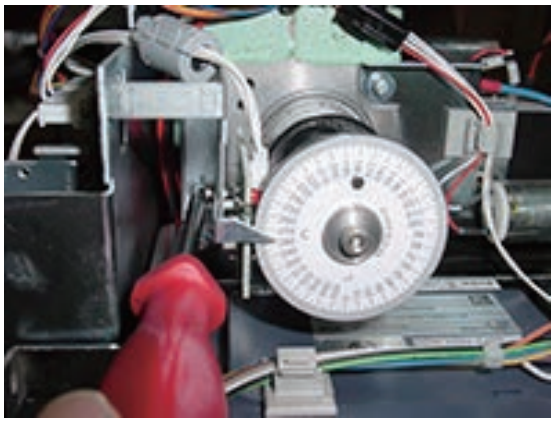
3. Please return power supply to previous places to finish.

# 3-8-2 Exchange of timing belt

1. Remove bobbin winder and power supply.



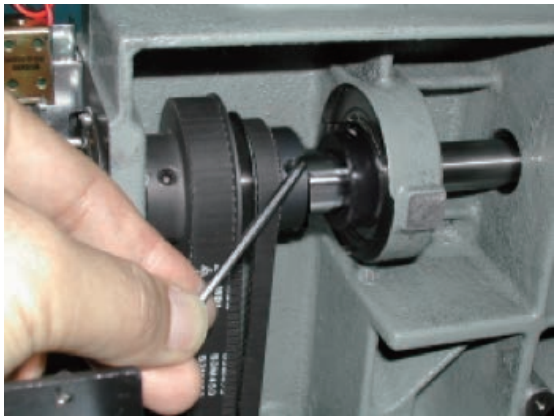
2. Remove timing detecting board ass'y.



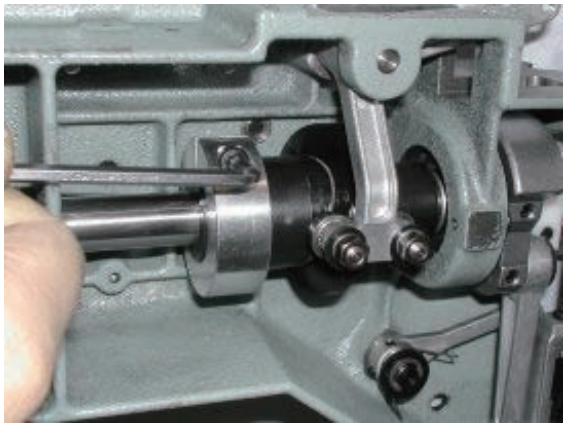
Remove support roller ass'y.

3. Loosen screws on upper shaft collar,

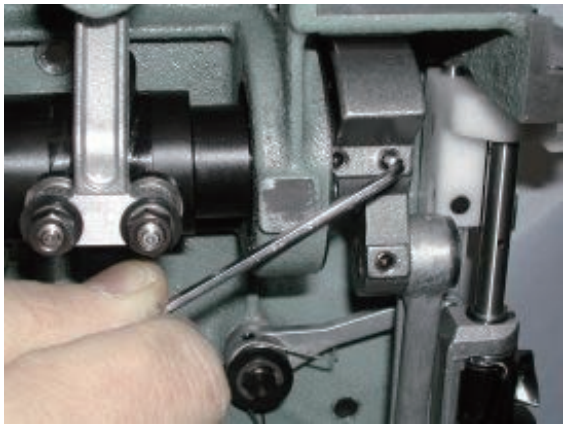
upper pulley and drive pulley.



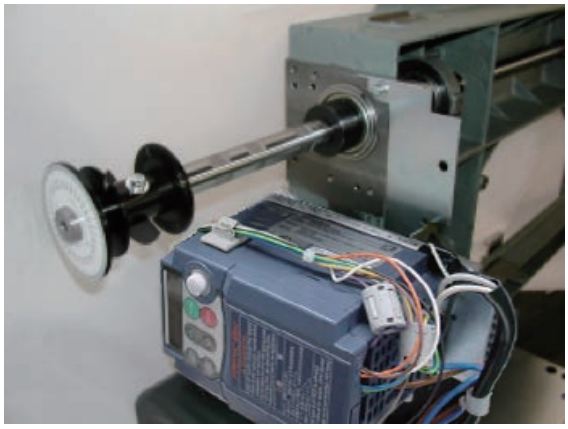
4. Loosen screw on fasten collar for take-up lever cam.



5. Loosen screw on crank.

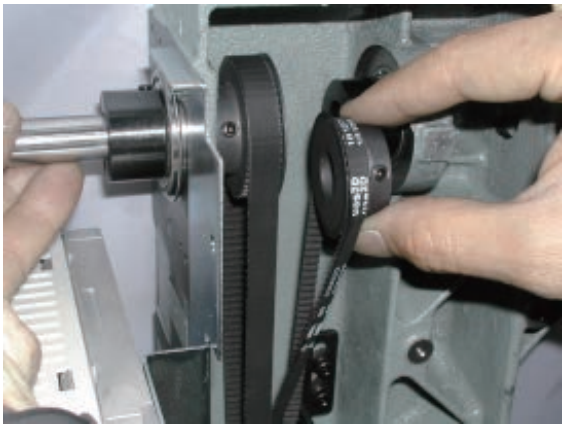


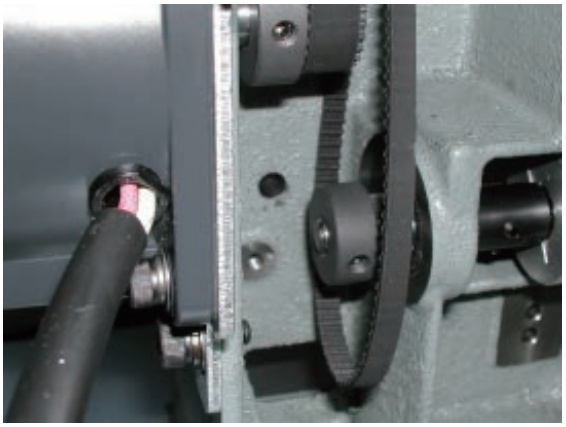
6. Pull out upper shaft.



7. Remove upper pulley and timing belt.

Install good timing belt.





8. Install parts in reverse order.

For installation and adjustment of each unit,

please refer to respective manuals.

Referring to [3-8-1 Adjustment of timing belt tension],

adjust tensile strength of timing belt.

<Important> Pay attention to following (1) - (4).

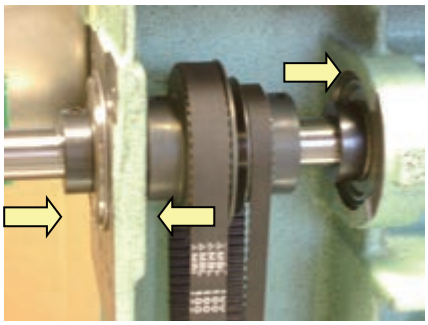
(1)When you install upper shaft collar, upper pulley,

drive pulley and crank, please fix them on flat surface

of upper shaft with screw.

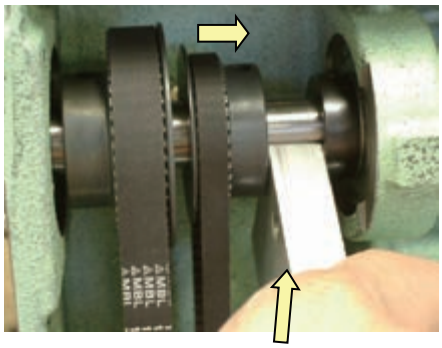
(2)Make sure that pulleys and collars are attached

without space from machine body except upper pulley.



(3)Position of upper pulley is space from upper

shaft collar.



Type of small collar

Thickness gauge [11.5mm]

(4)Confirm that belt is not interfere the pulley flange and

not come out from pulley groove.

Adjustment will be done with following pulley.

Timing belt has to be adjusted with [upper pulley position].

Motor belt has to be adjusted with [motor pulley position].

9. Check and adjust following timing to finish.

[ 4-2-1 Upper shaft timing (L point, C point) ]

[ 3-2-8 Take-up lever timing ]

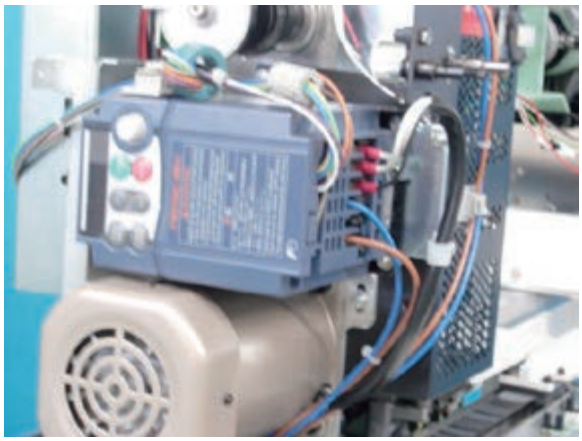
[ 3-5-1 Rotary hook timing ]

[ 3-6-5 Thread cut timing (except (for Rev.A) )

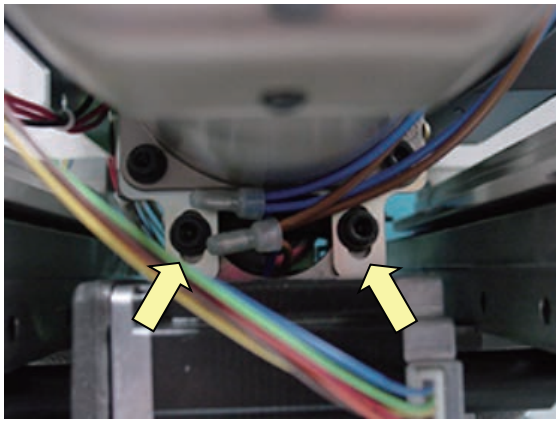
# 3-8-3 Adjustment of motor belt tension

1. Remove bobbin winder and power supply.

2. Remove inverter.



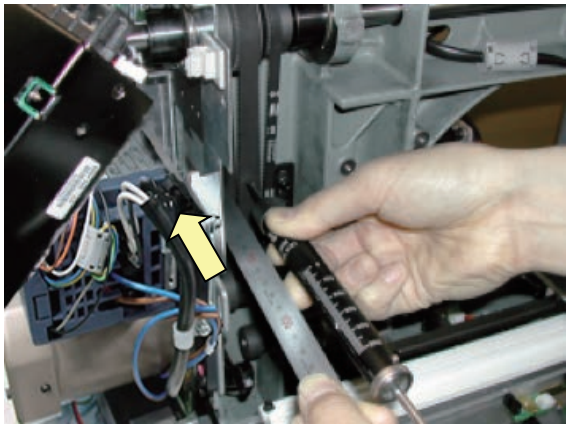
3. Loosen screw on motor bracket.



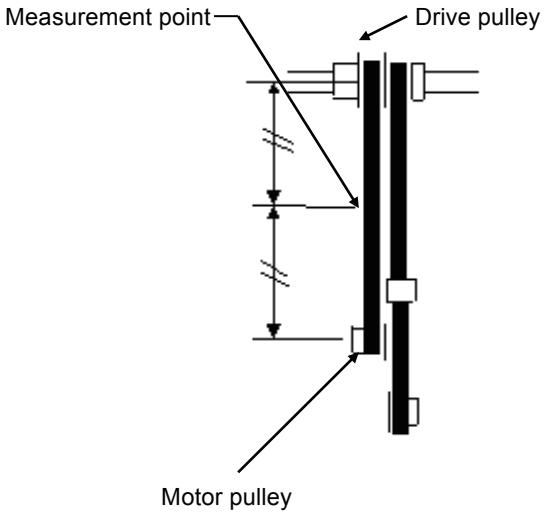
4. Adjust motor belt tension.

Use push and pull gauge.

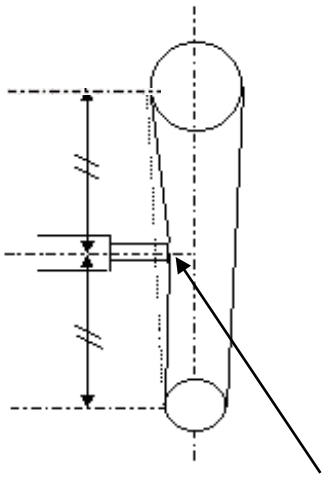
<Adjustment value> 320 - 330 g ／ 3㎜



Gauge in the near center between drive pulley and motor pulley.

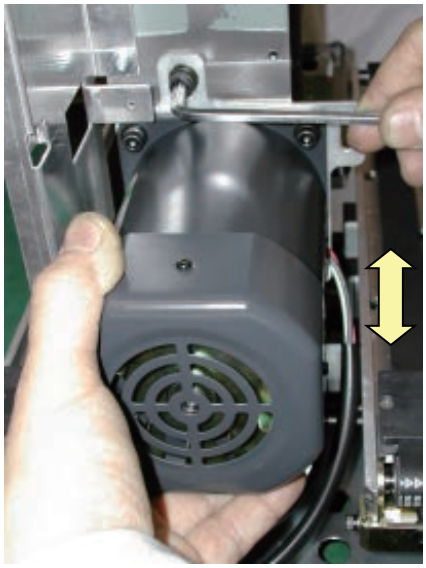


Adjust of tension should be 320 – 330g at belt is pressed 3mm.

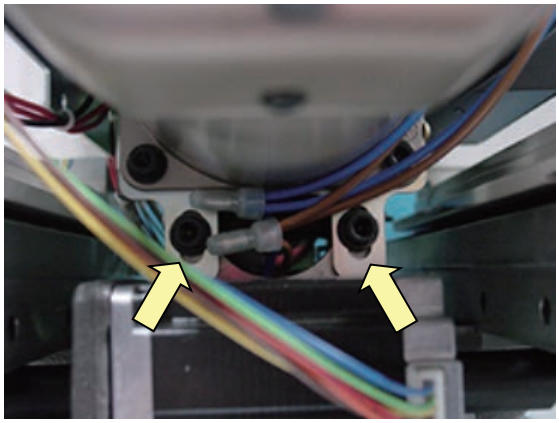


Belt is pressed 3mm

Move main motor upward and downward to adjust.



5. Tighten screw on motor bracket.

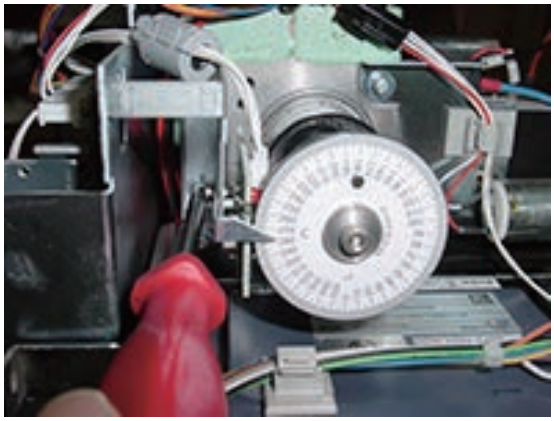


6. Return power supply bracket, power supply, bobbin winder and inverter to previous places to finish.

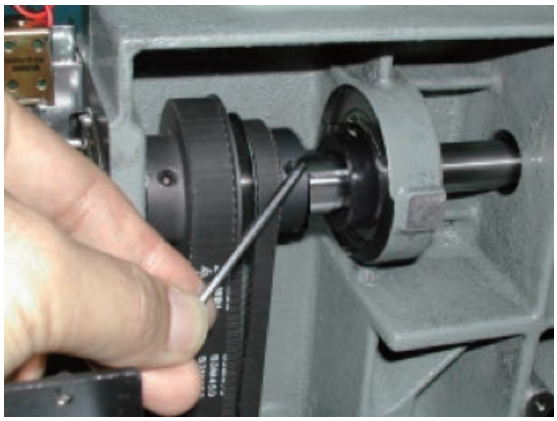
# 3-8-4 Exchange of motor belt

1. Remove bobbin winder and power supply.

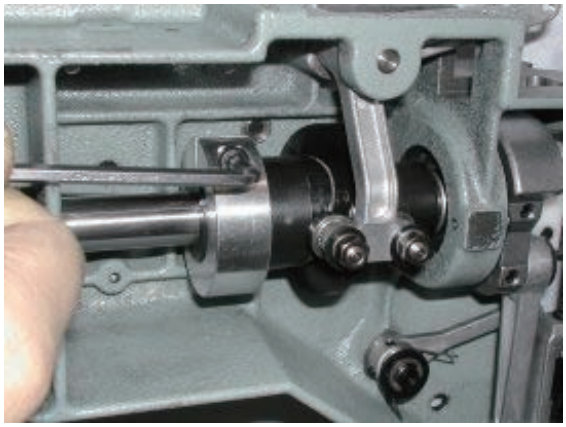
2. Remove timing detecting board ass'y.



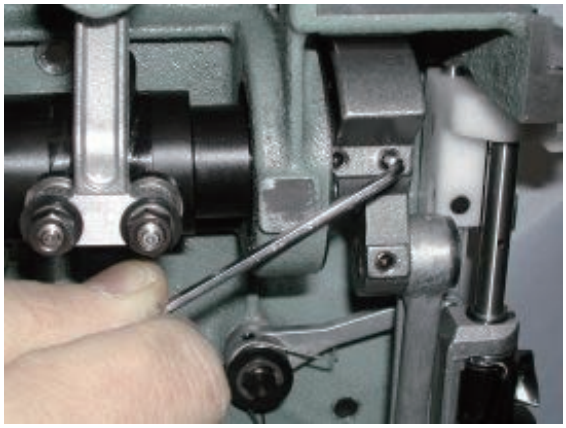
3. Loosen screws on upper shaft collar,
upper pulley and drive pulley.



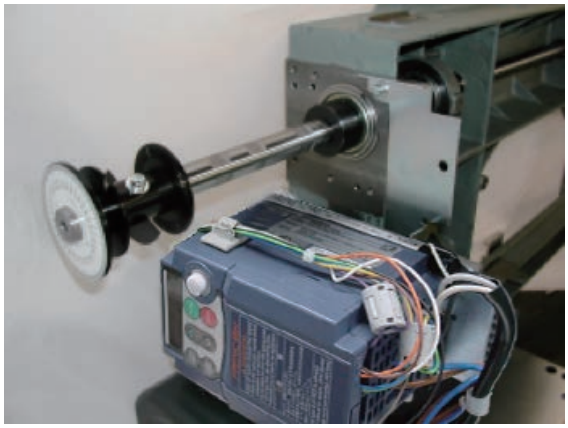
4. Loosen screw on fasten collar for take-up lever cam.



5. Loosen screw on crank.

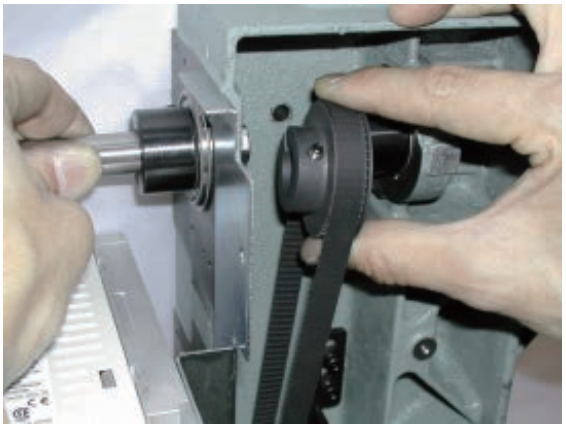


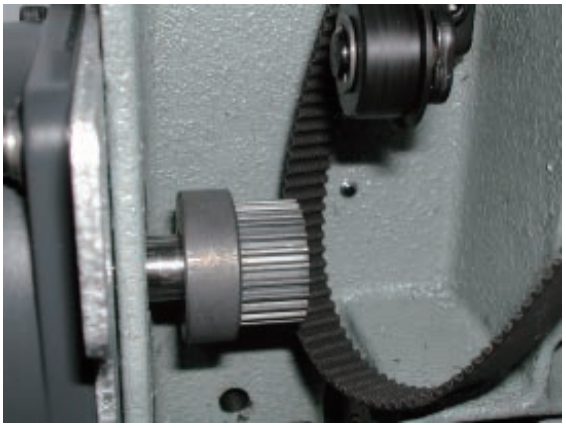
6. Pull out upper shaft.



7. Remove drive pulley and motor belt.

Install good motor belt.





8. Install each parts in reverse order.

For installation and adjustment of each part,

please refer to respective manuals.

Referring to [3-8-3 Adjustment of motor belt tension],

adjust tensile strength of motor belt.

<Important> Pay attention to following (1) - (4).

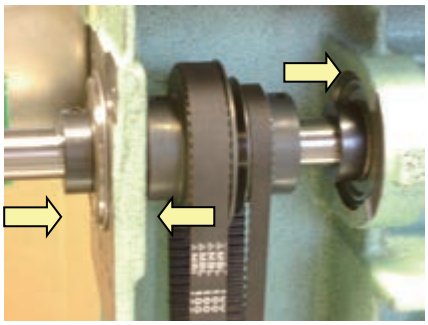
(1)When you install upper shaft collar, upper pulley,

drive pulley and crank, please fix them on flat surface

of upper shaft with screw.

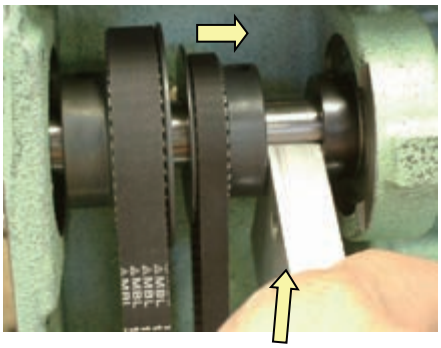
(2)Make sure that pulleys and collars are attached

without space from machine body except upper pulley.



(3)Position of upper pulley is space from upper

shaft collar.



Type of small collar

Thickness gauge [11.5mm]

(4)Confirm that belt is not interfere the pulley flange and

not come out from pulley groove.

Adjustment will be done with following pulley.

Timing belt has to be adjusted with [upper pulley position].

Motor belt has to be adjusted with [motor pulley position].

9. Check and adjust following timing to finish.

[ 4-2-1 Upper shaft timing (L point, C point) ]

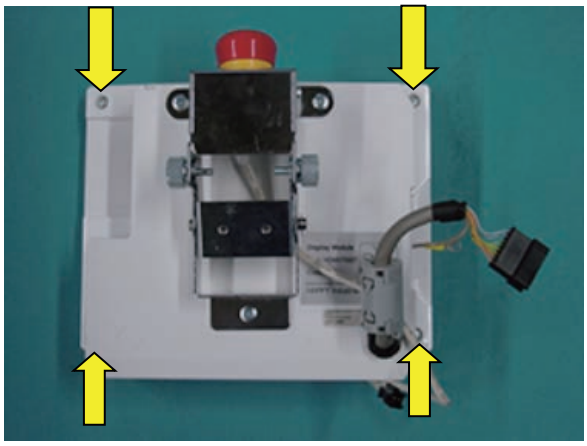
[ 3-2-8 Take-up lever timing ]

[ 3-5-1 Rotary hook timing ]

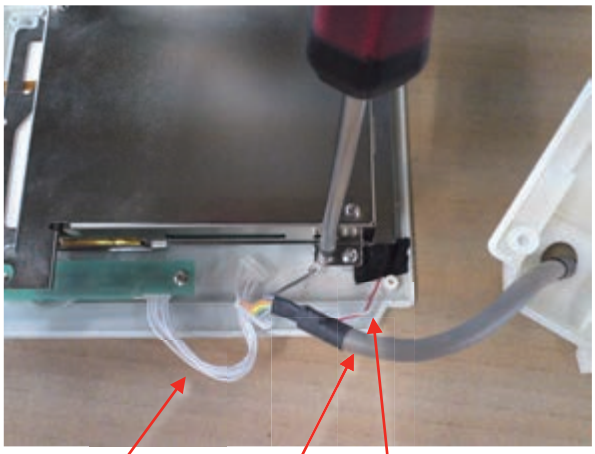
[ 3-6-5 Thread cut timing (except (for Rev.A) )

## 4-1-1 Remove LCD and LCD-CE board

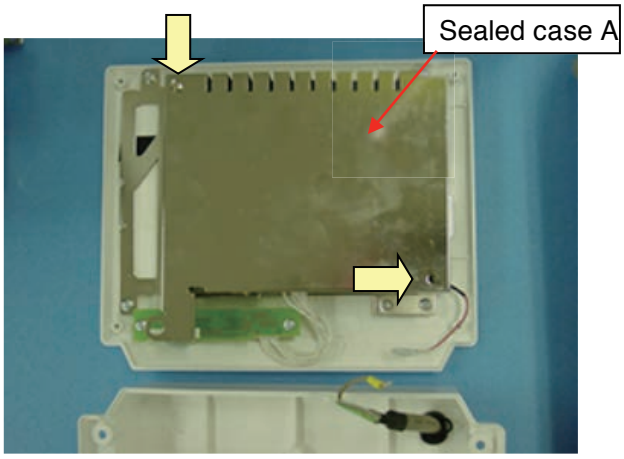
1. Remove four setscrews as shown in the figure below and remove rear cover.



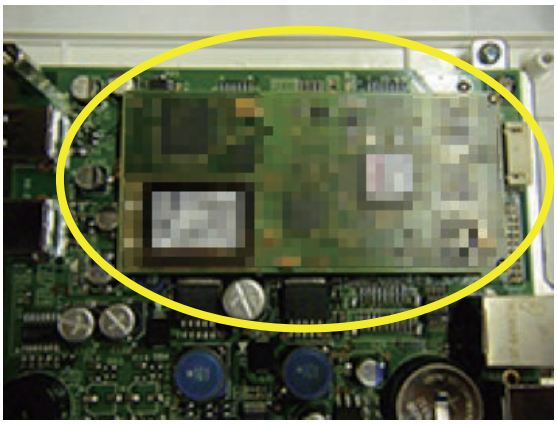
2. Remove connectors for SW cable, Box cable, cable for LCD inverter (red/white).



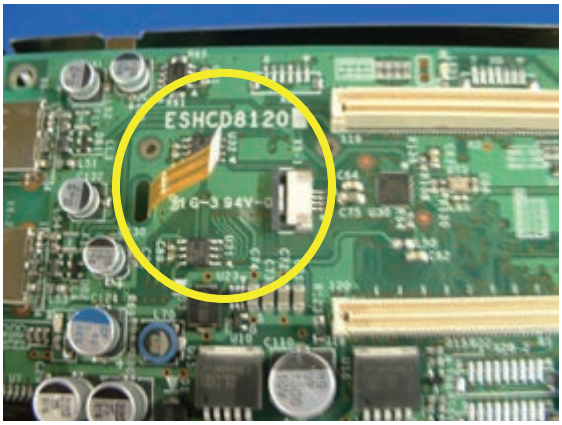

3. Remove set screw and sealed case A.



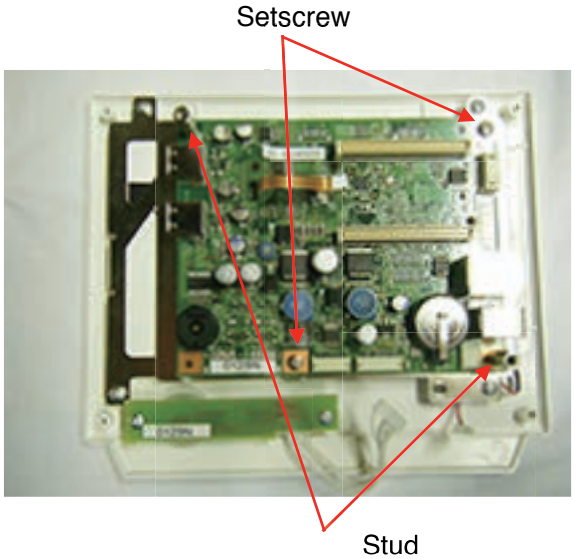

4. Remove core module.



5. Remove narrow flat cable for LCD unit.

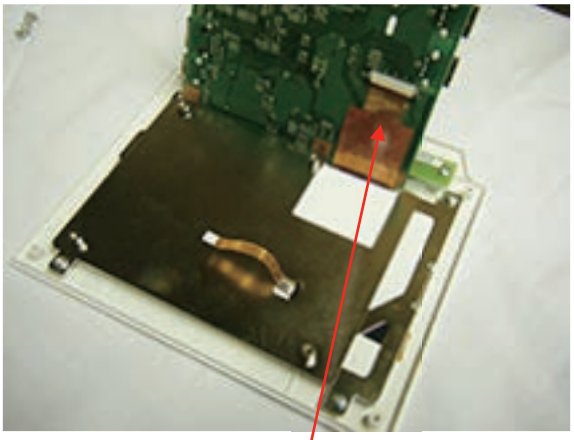



6. Remove two sets screws and two studs.



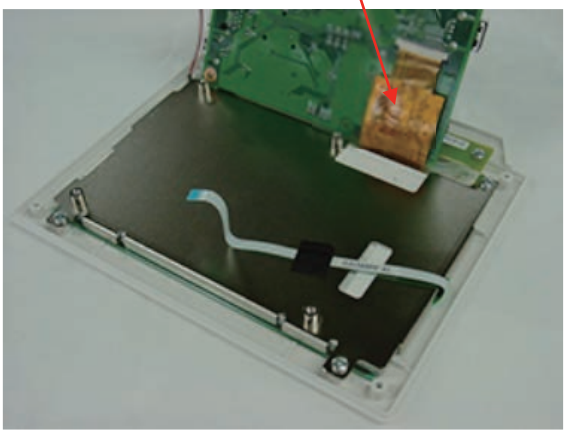
7. Lift LCD-CE board as shown in the figure below.
Remove wide flat cable for LCD unit.

Ser.No. **~1027033**



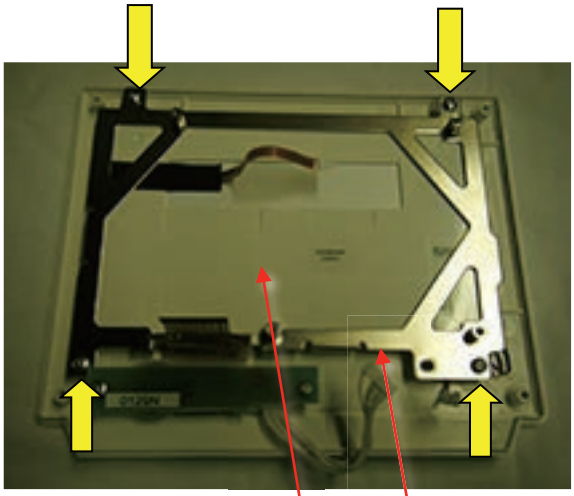
Wide flat cable

Ser.No. **1028001A~**



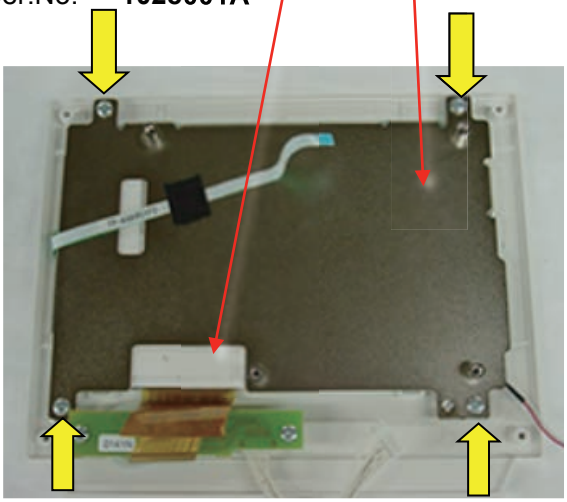
8. Remove four setscrews and LCD unit.

Ser.No. **~1027033**



LCD unit Display

Ser.No. **1028001A~**

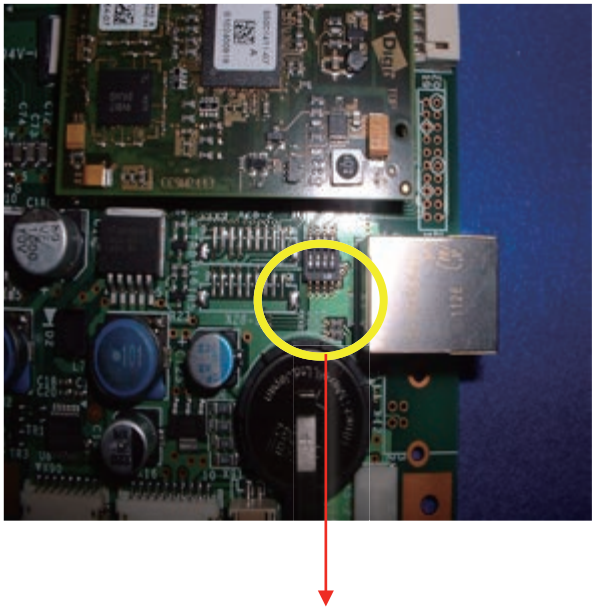


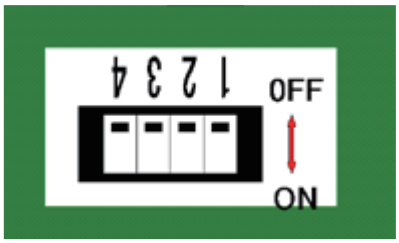
Please reverse procedure when installing LCD-CE board.

# 4-1-2 Setting for LCD-CE board

2**DIP switch (LCD-CE-U)**

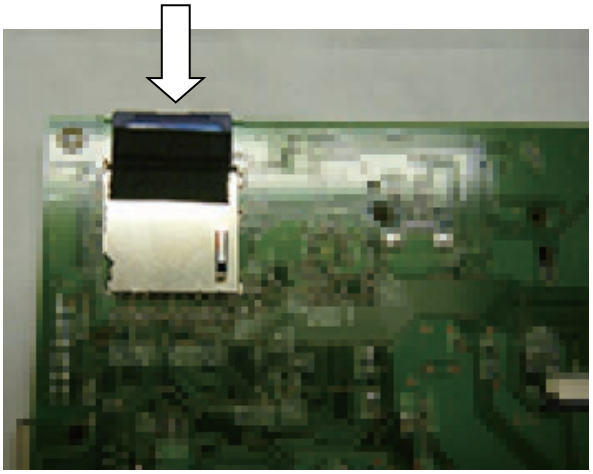
Switch to OFF on all the settings for DIP switch.





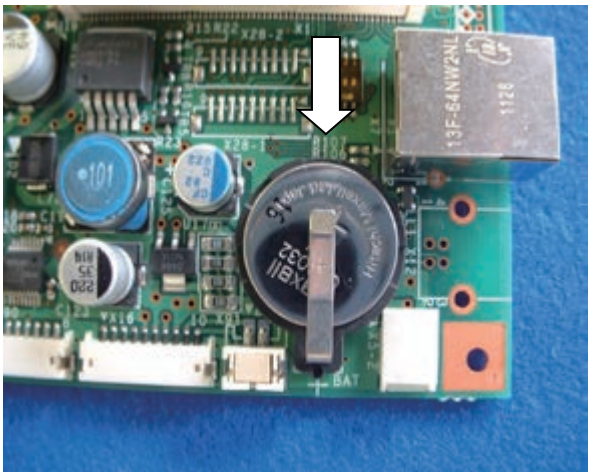

**Memory card**

Insert our official memory card (EPZ01220).
Refer to the latest parts list for the parts number.
This memory card contains programs and data for an embroidery machine.
You cannot use any memory cards on the market.

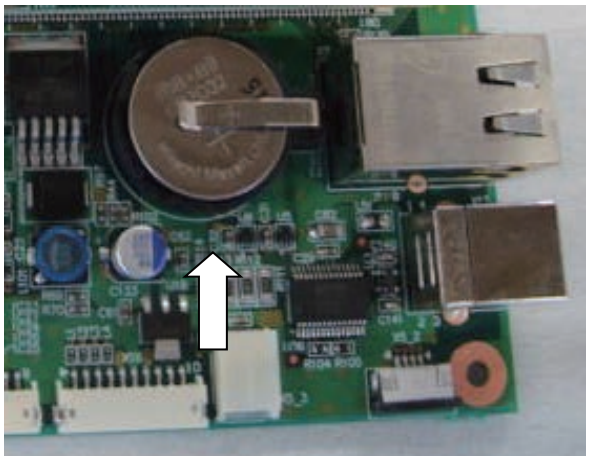


**Coin battery**

Insert our official coin battery (EPZ01190).
Refer to the latest parts list for the parts number.
The battery is used for back-up power source of real-time
clock on an embroidery machine.
Replace new battery if clock dose not indicate the correct
time after setting a clock and turning power switch OFF.



LCD-CE-U



LCD-CE-MX

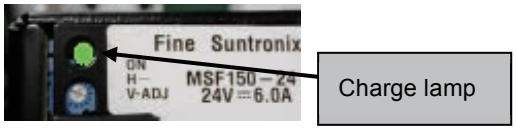
**Disposal of coin battery of LCD-CE board**

Dispose of a coin battery by following the method
specified by each country or each region.

# 4-1-3 Power supply settings

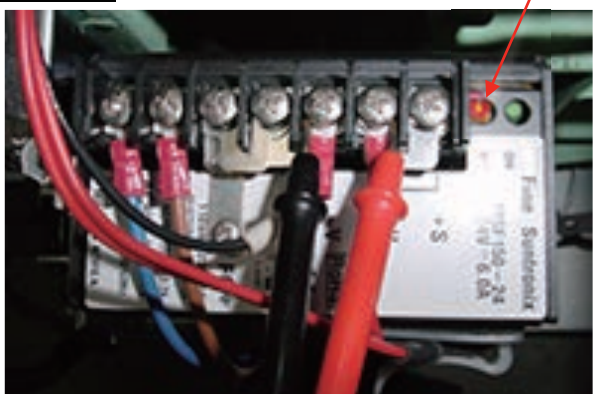
(Please use digital output tester)

Check : Make sure charge lamp is off on the power supply for 100V before you start to work.

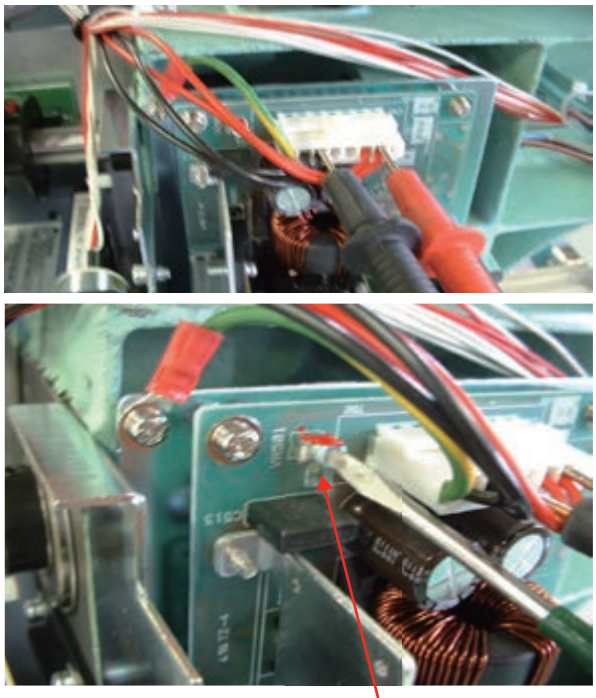



1. Turn the machine on and put tester against terminal plate or connector, then turn V-ADJ to adjust to [24.6V±0.1V].

for 100V




For 200V

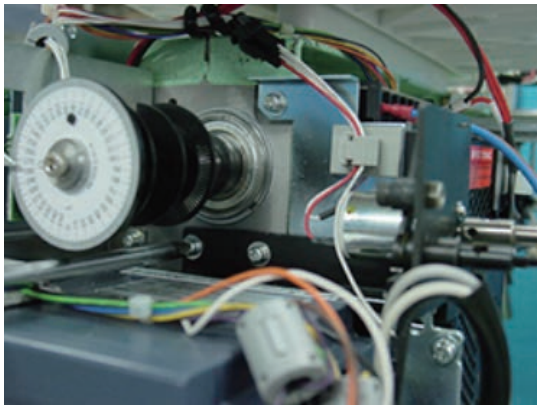



Notice 1 : Be sure to put cover on power supply terminal plate on the power supply for 100V.

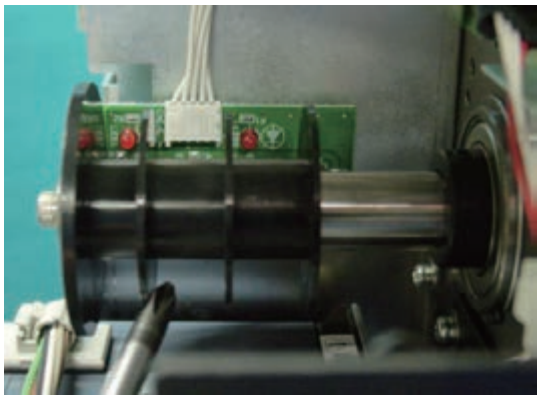
Notice2 : Make sure the voltage specifications of the machine and power supply before turn on power.

# 4-2-1 Adjustment of upper shaft timing (C point / L point)

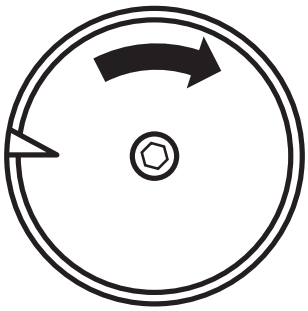
1. Remove bobbin thread winding motor ass'y.



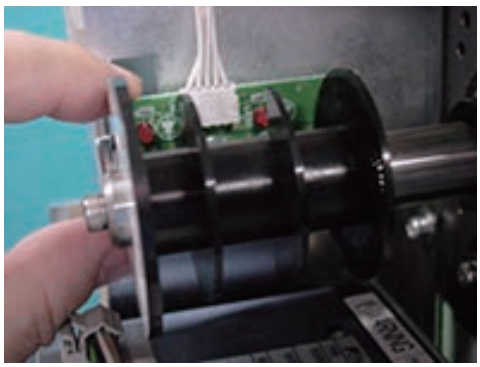
2. Fix 2 screws tentatively timing detecting board.



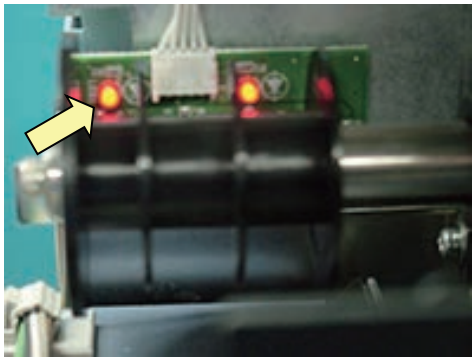
3. Set upper shaft to [0 degree].



4. Move circuit board up and down and set to position where LED 2 disappears at [0 degree], then fix with screw.



5. With this state, turn to C point and check if LED1 lights between [265 and 282 degrees].

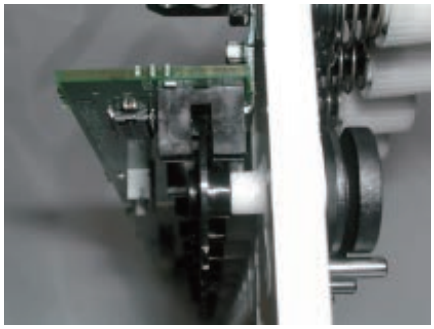


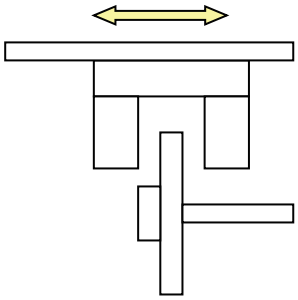
* Check dose not scratch plastic slit to Timing sensor.

6. Put bobbin thread winding motor ass'y back to where it was.

## 4-2-2 Adjustment of TC board

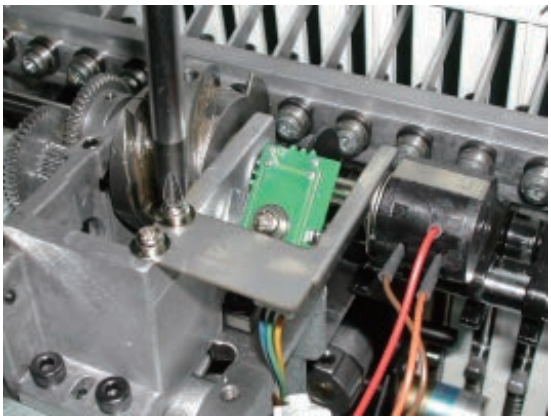
Viewing from side of circuit board, set slit so that it comes to center of sensor, fix it.

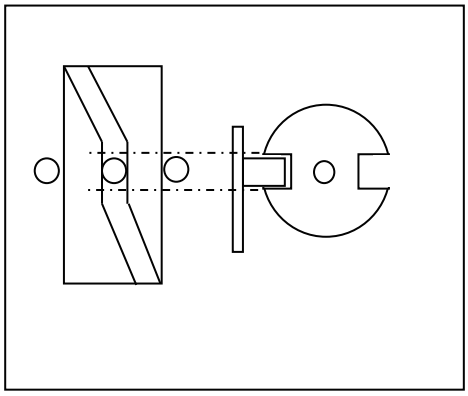




## 4-2-3 Adjustment of stop position of needle bar change unit

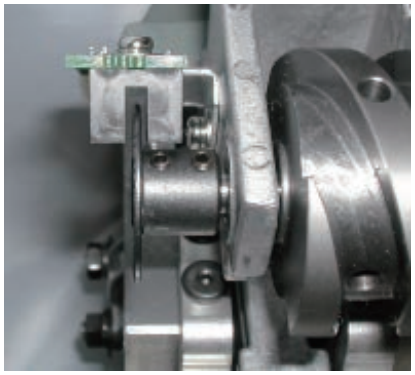
1. Remove potentiometer ass'y.

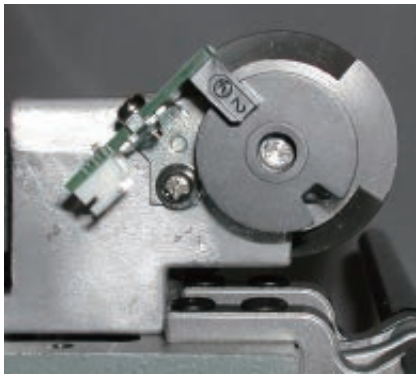




Imagine figure of position sensor and cam

2. Set position where sensor on sensor board and slit don't cross to area where moving head doesn't move when turning groove cam.





3. After installation, please fix potentiometer referring to [3-4-2 Setting to detect needle position].

# 4-3-1 Remove of Inverter

<Notice>

Please disconnect machine inlet from the wall.

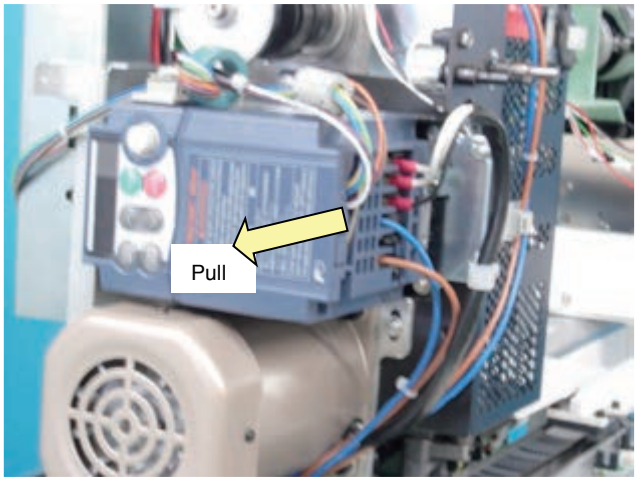
<Check>

Before you start to work, make sure the display of inverter is off.

1. Remove outer cover. Refer to [2-2 How to remove outer cover].

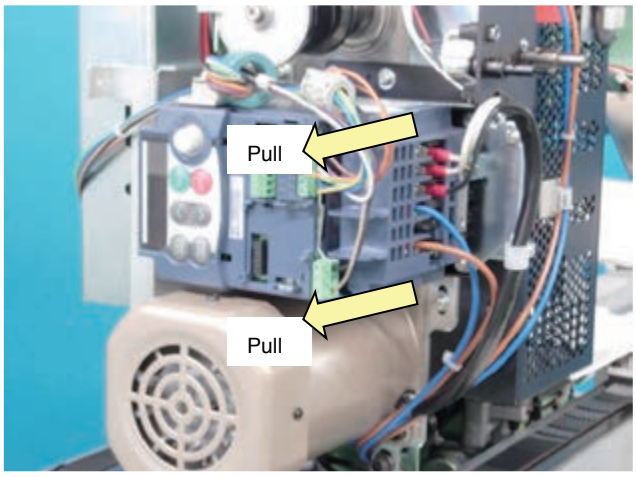
2. Remove control terminal cover.

Insert fingers in a gap (under the “PULL” indication) on the underside of control terminal cover, and pull the cover toward yourself and remove it.

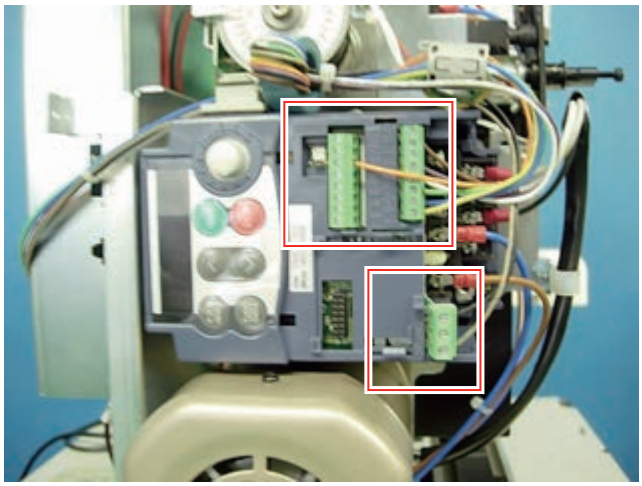



3. Remove main terminal cover

Hold both left and right ends of main terminal cover with fingers and slide the cover toward yourself and remove it.

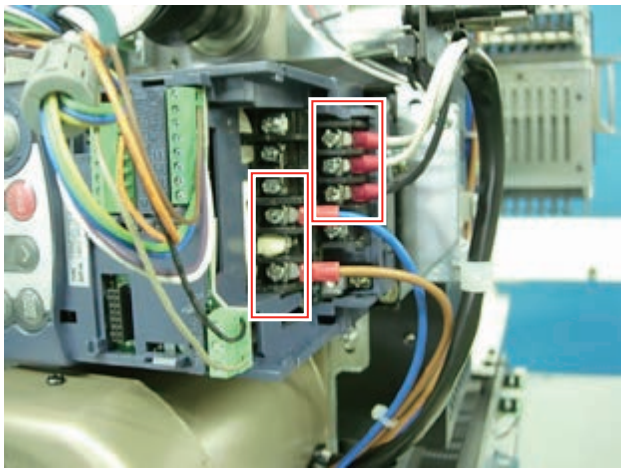



4. Loosen screw with Phillips screwdriver for precision instrument and remove 9 cables. (Cable color: ORANGE, BROWN, PURPLE, WHITE, GREEN, BLUE, YELLOW, BLACK, and GLAY)

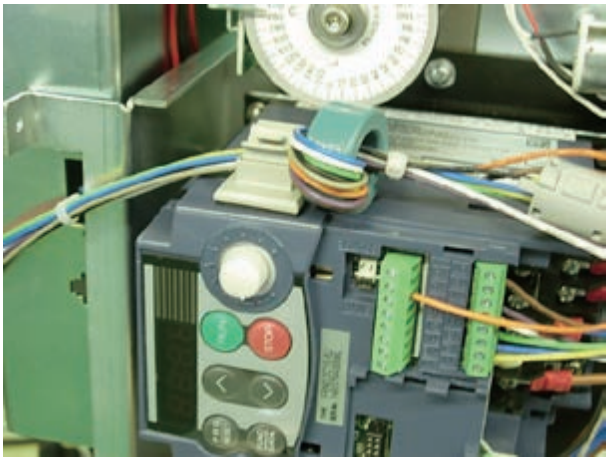


5. Remove screws with Phillips screwdriver and remove power cable and motor cable.

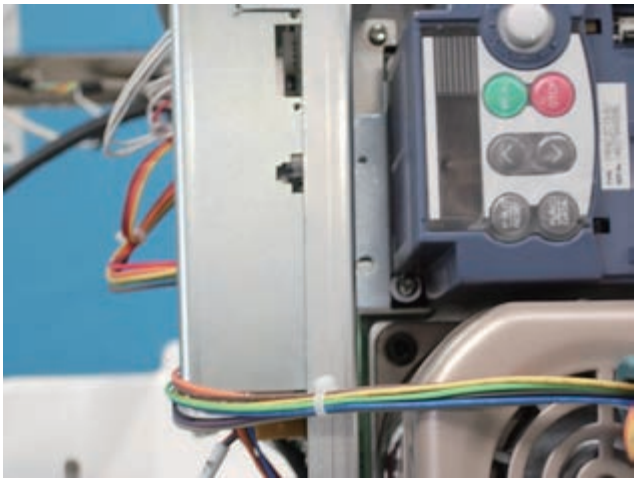
(Cable color: GLAY, WHITE BLACK, BLUE, and BROWN)

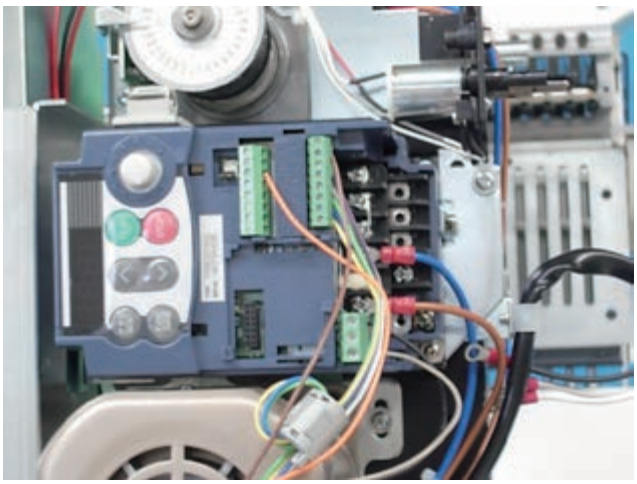


6. Remove cable from clamp.

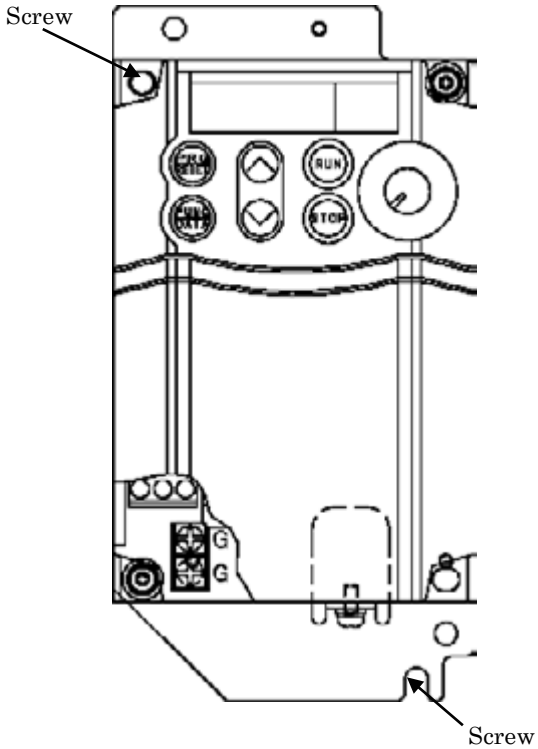


7. Remove two screws shown in the following figure and inverter.

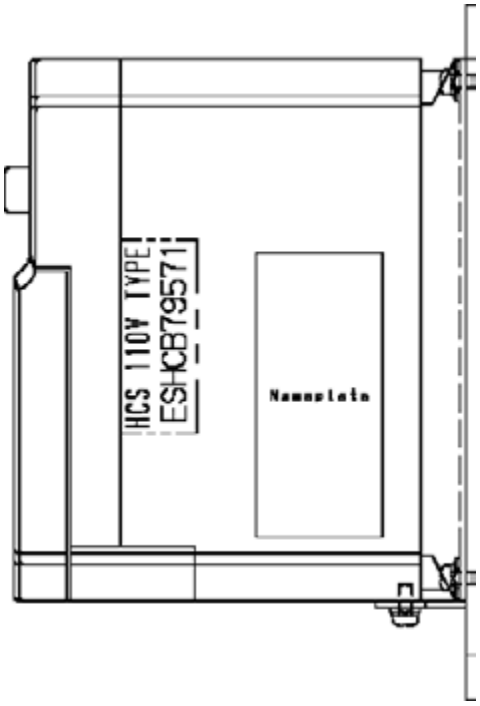




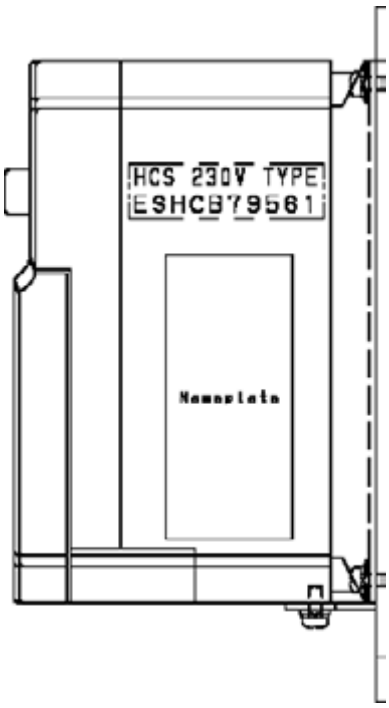
End of process.




Inverter for 110 - 120V




Inverter for 200 - 230V



# 4-3-2 Inverter Installation

<Note>

Please check your replacement inverter type and machine Voltage specification before replace inverter.

Sticker on inverter

For 110 - 120V

| HCS 110V TYPE<br>ESHCB79571 |
|---|

For 200 - 230V

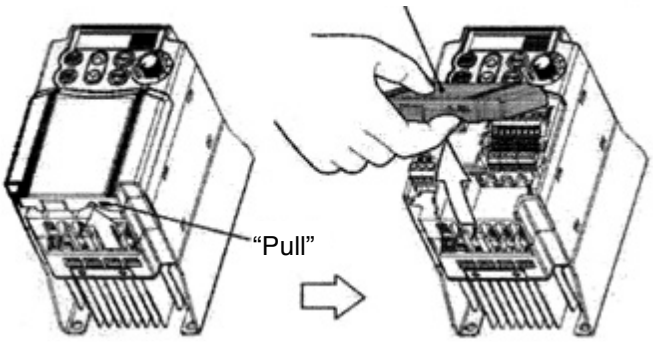
| HCS 230V TYPE<br>ESHCB79561 |
|---|

Refer to specification sticker for voltage specifications of the machine.

1. Remove control terminal cover.

Insert a finger in a gap (under the “PULL” indication) on the underside of control terminal cover, and pull the cover toward yourself and remove it.

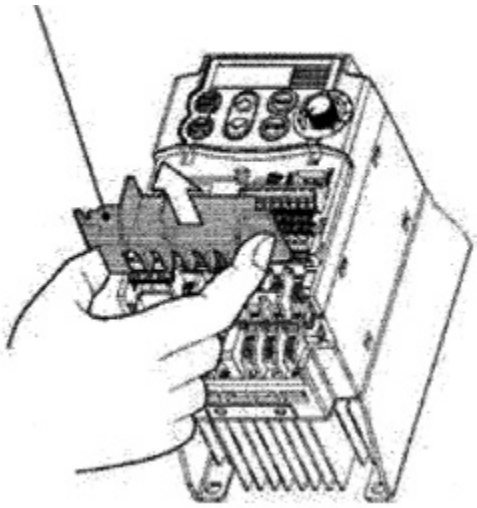
Control terminal cover



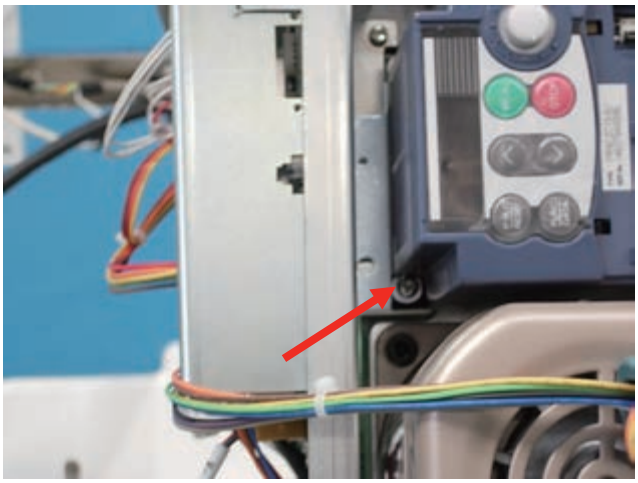

2. Remove main terminal cover

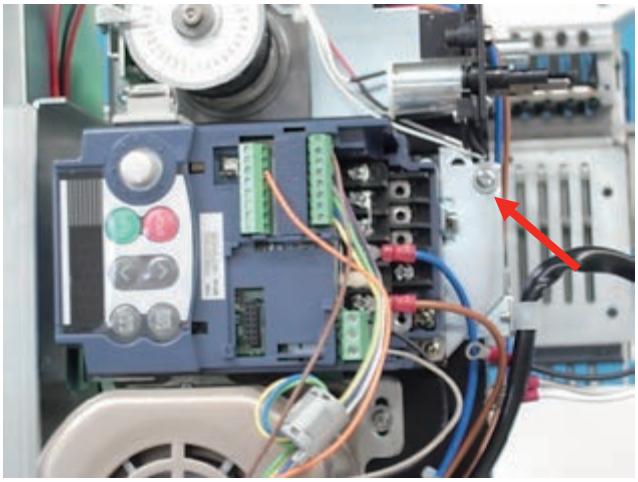
Hold both left and right ends of main terminal cover with fingers and slide the cover toward yourself and remove it.

Main terminal cover

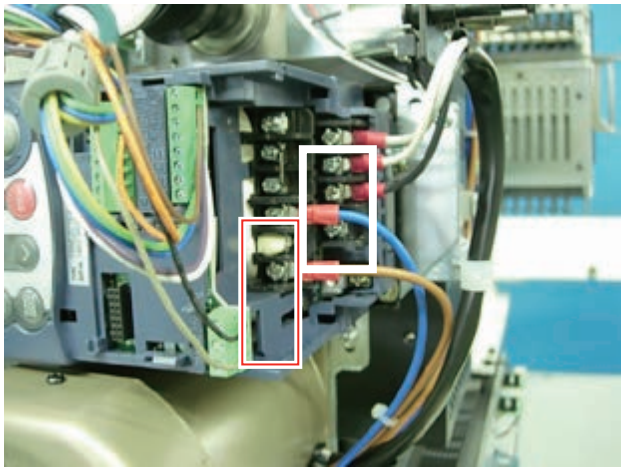


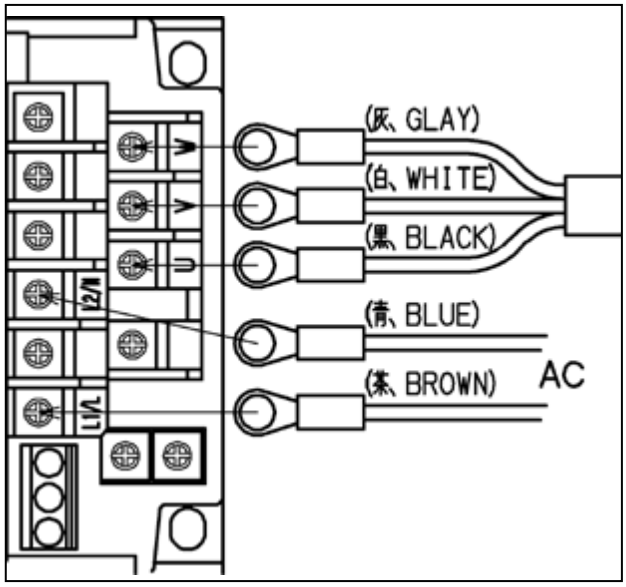
3. Install inverter in the machine with two screws tightened.



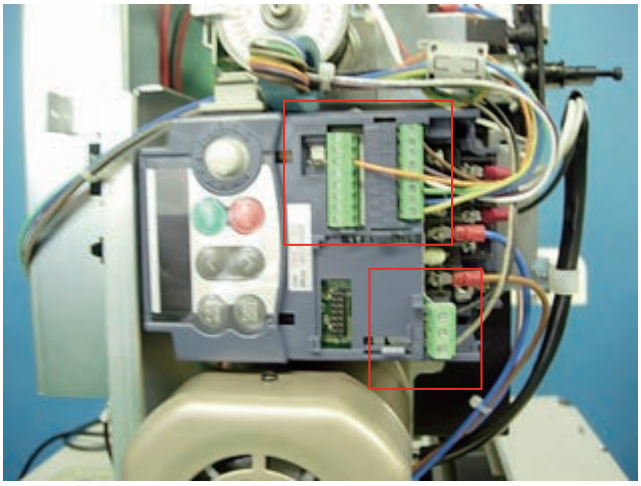


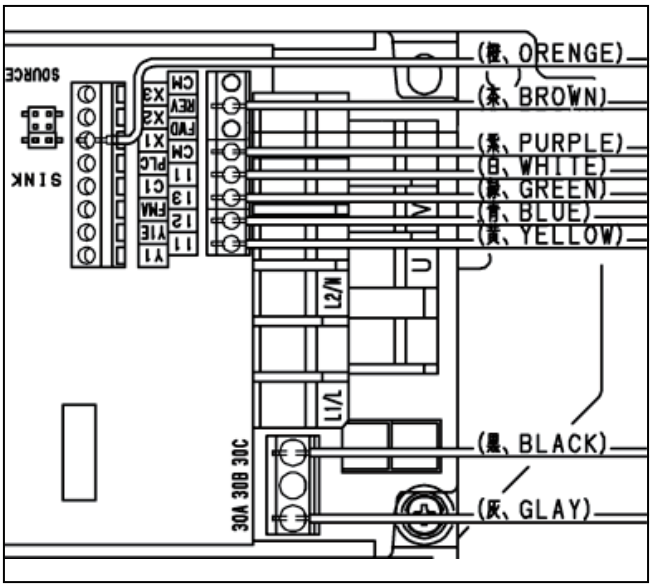
4. Tighten screws with screwdriver to install power cable and motor cable per the following connection diagram.
(Cable color: GLAY, WHITE, BLACK, BLUE, BROWN)



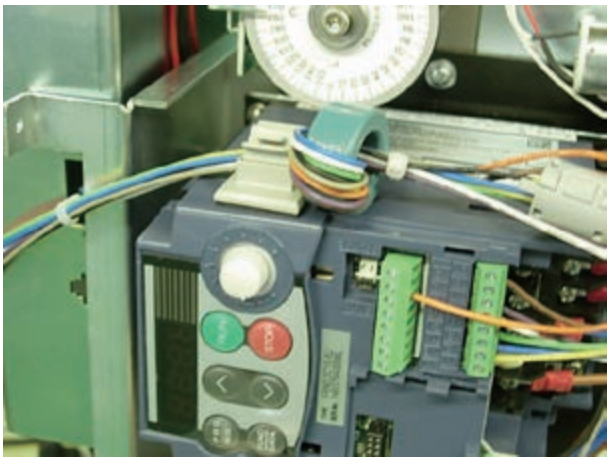



5. Tighten screw and connect 9 cables the following connection diagram. (Cable color: ORANGE, BROWN, PURPLE, WHITE, GREEN, BLUE, YELLOW, BLACK, and GLAY)






6. Fix cable to the clamp.



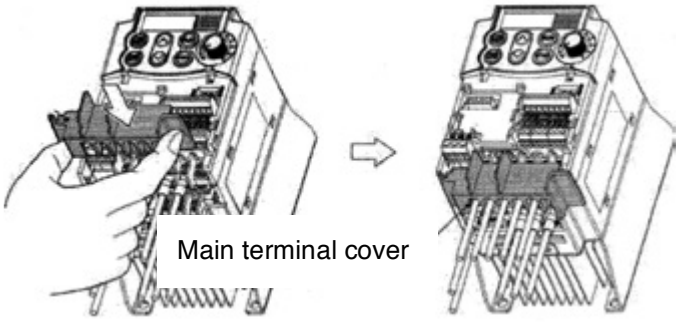
7. Set main terminal cover

Install main terminal cover

Hold both left and right ends of main terminal cover with fingers and install the cover in the inverter

<Note>

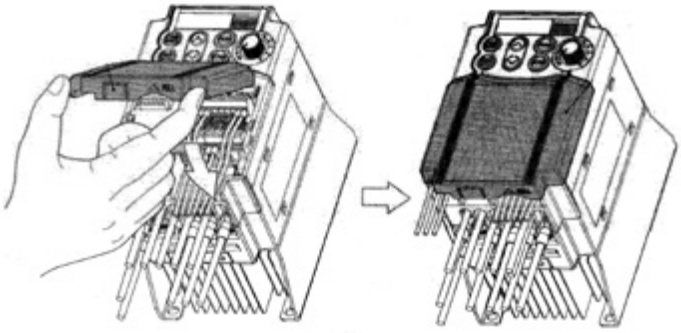
Install main terminal cover not to apply stress to the cable. If stress is applied to the cable, load is applied to the screws for the main terminal and the screws might be loosened.




8. Install control terminal cover

Install the cover by inserting the nail on top of the cover to the ditch of the inverter.

Do not pinch any cables with the cover.



9. Referring to [4-4-5 Setting of revolution], Perform [Initializing of machine speed].

Inverter Installation is done.

<Note>

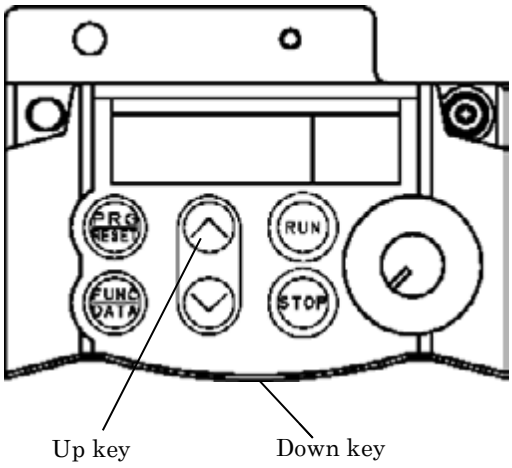
Check if voltage specifications of the machine and inverter are matched before installation.

# 4-3-3 How to set inverter

In case of spare parts supply, parameter is preset. Please contact HAPPY, when you need to change it.
Parameter cannot be set while machine is running .
Pay attention to electric wires as setting is done with power is on.

How to release the setting change prohibition

Release the prohibition by following the procedures below since parameter is set as setting change prohibition.




1. Press PRG/RESET.

   [ I.F _ _ ] is displayed.

2. Press FUNC/DATA.

   [ F 0 0 ] is displayed.

3. Press FUNC/DATA again.

   [ 1 ] is blinking.

   (This means setting change is prohibited.)

4. Press Up key or Down key while pressing STOP.

   [ 0 ] is blinking.

   (This means you can change settings.)

5. Press FUNC/DATA.

   After [SAVE] is indicated,

   [ F 0 1 ] is displayed.

   By above process, you will be able to set parameters.

Next, change each setting.

6. Press Up key and function code is displayed. Select the function code whose parameter you would like to change. (Press Up key and the function code returns to the previous code.)

The following table shows function codes, setting details, and factory default setting. Functions other than described below are initial setting of inverter.

Refer to the next clause for the method of initial setting.

| Code | Function | → | Setting | |
|---|---|---|---|---|
| F00 | Prohibition of change | → | 1 | 〈 Protect 〉 |
| F01 | Frequency set mode | → | 1 | |
| F02 | Drive / Operation | → | 1 | |
| F03 | Maxmum frequency | → | 85.0 | |
| F05 | Base frequency volteage | → | 200 | |
| F07 | Acceleration time 1 | → | 2.0 | |
| F08 | Deceleration time1 | → | 0.5 | |
| F11 | Motor thermal protection | → | 0.63 | |
| F15 | Upper limit freq. limter | → | 85.0 | |
| F20 | DC brake. starting freq. | → | 1.0 | |
| F21 | DC braking current | → | 30 | |
| F22 | DC braking time | → | 0.5 | |
| F23 | Start frequency | → | 0.5 | |
| F26 | Carrier frequency | → | 6 | |
| F27 | Tone | → | 2 | |
| F37 | Load selection | → | 2 | |
| C05 | Multi stage frequency 1 | → | 2.3 | |
| C33 | Analog input filter | → | 0.05 | |
| C34 | Analog input adjustment | → | 50.0 | |
| C50 | Bias frequency | → | 0.0 | |
| P02 | Motor capacity | → | 0.09 | |
| P03 | Motor rated current | → | 0.63 | |

7. Select the code you would like to change and press FUNK/DATA.

   Parameter of the function is displayed.

8. Change parameter by pressing Up or Down key.

9. Press FUNK/DATA.

After [SAVE] is displayed, the next function code is displayed.

This means change of the function code is made.

How to set the prohibition setting

10. After each setting is done, select [ F 0 0 ] by pressing Up or Down key to return to setting change prohibition.

11. Press FUNC/DATA.

[ 0 ] is blinking.

12. Press Up key while pressing STOP.

[ 1 ] is blinking.

13. Press FUNC/DATA.

After [ S A V E ] is displayed,

[ F 0 1 ] is displayed.

14. Press PRG/RESET.

[ I.F _ _ ] is displayed.

15. PRG/RESET again.

Return to normal mode.

# 4-3-4 Initialization of parameter

Please note that you are unable to make this setting while the machine is running.

When setting is mistakenly made in mid way, the setting will return to parameter in normal standard in one action.

Thereafter please change to parameter you want to set.

1. Enable parameter to be changed by referring 1. to 5. in [How to set inverter].

2. Press PRG/RESET.
   [ I.F _ _ ] is displayed.

3. Select [ I.H _ _ ] by pressing Down key 3 times.

4. Press FUNC/DATA.
   [ H 0 3 ] is displayed.

5. Press FUNC/DATA again.
   [ 0 ] is displayed.

6 Press Up key while pressing STOP.
   [ 1 ] is displayed.

7. Press FUNC/DATA.
   After [ S A V E ] is displayed,
   [ 0. 06 ] - [ 0. 07 ] is displayed.

8. Press FUNC/DATA.
   [ I.F _ _ ] is displayed.

The settings of inverter become initial settings.

Then, change parameter and return to prohibition setting by referring to the previous clause.

# 4-4-1 Program update procedure

* The sequence of procedures of program update is described below..
If you need more details, please refer to each manual.

1. Insert the updated program downloaded USB memory to the USB port of the machine with its power turned “OFF”.
Press NEXT while pressing START/STOP button of the control box at tne screen after the machine is booted.

2. Enter maintenance mode and update machine program and main program from the menu.

→ 4-4-3 Machine program update
→ 4-4-4 Main program update

3. Press [MENU] button and select [System] in menu of [OTHER] for initialization of system.
4. Press [MENU] button and select [Speed] in menu of [OTHER] for automatic speed setting.

→ 4-4-5 Setting of revolution
→ 4-4-5 Initializing of machine speed

5. [Replacement of LCD-CE board]
Calender setting

6. end of process

## 4-4-2 Preparation for program update

* Download updated program file and decompress the file.

Program
for HCD2, HCS2, HCH, HCR2 " "MainProgramA**** "

*Copy the decompressed file(s) or the folder that contains decompressed file to USB memory.
File names on your PC are shown below:

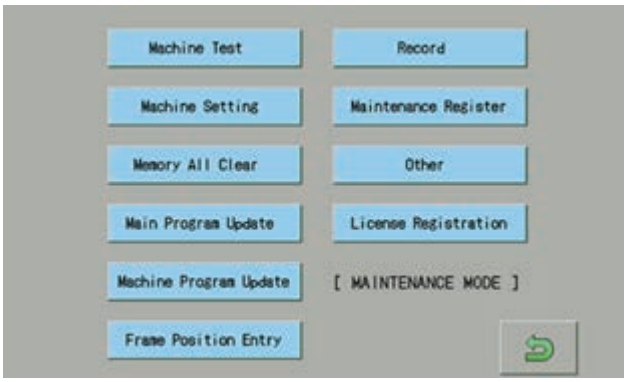
Program for HCD2, HCS2, HCH, HCR2 " UpDateFile"

<NOTE 1>
・Copy the program to the root folder of USB memory.

# 4-4-3 Machine program update (Main program ～Ver.*1.21)

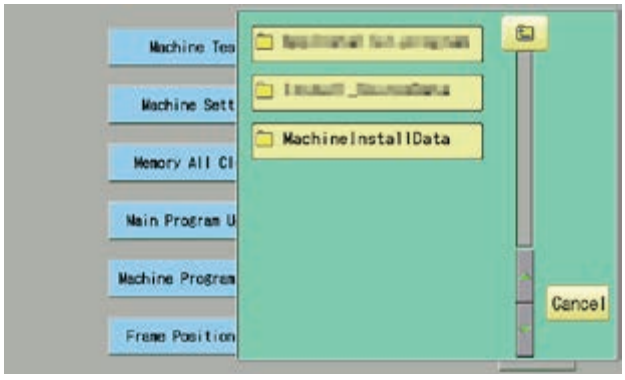
1. Insert USB memory that contains data for version up into insertion slot on the control box.

2. Refer to [ 4-5-1 How to enter maintenance mode] and enter maintenance mode.
   The screen shows below:

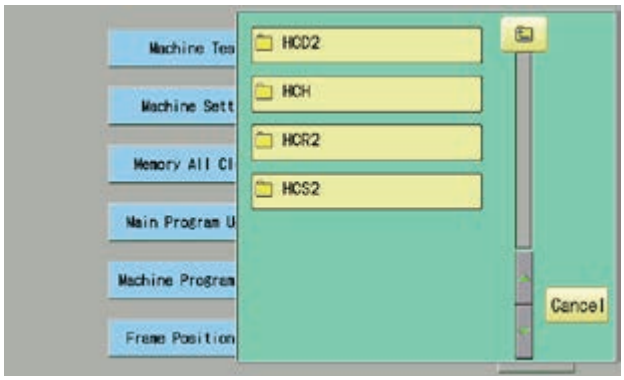



3. Press Machine Program Update.
   The screen shows contents of the USB memory.


4. Select [UpdateFile].




5. Select [MachineInstallData].



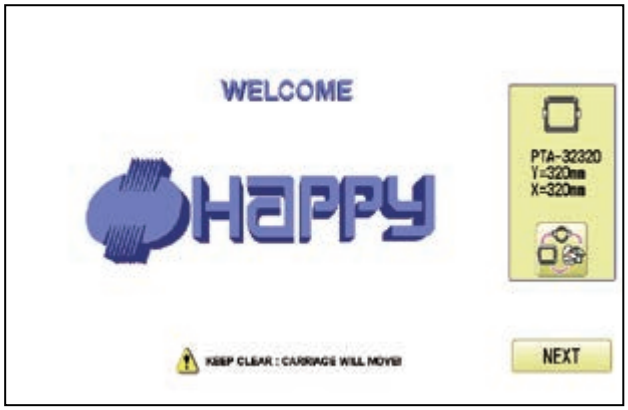

6. Select the machine model.


7. Select the file.
   Installation of program begins.
   After successful installation, the display will return to step no.2.

<NOTE>

* Please do not take out USB memory during installation.
* Please do not turn off the power during installation (it will take for a while for completion of installation).

8. Turn OFF the power and then turn ON the power.



9. Press NEXT.

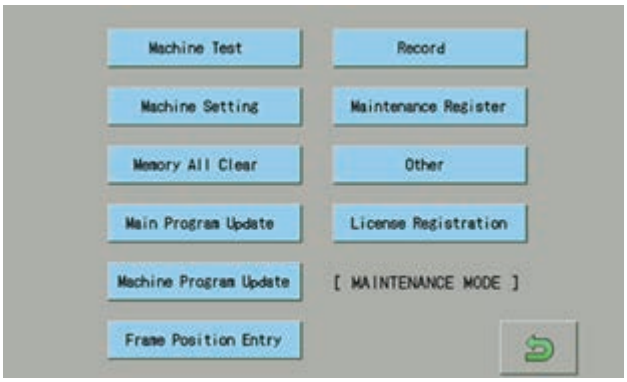
10. Referring to [4-4-5　Setting of revolution],
Perform [Re-Initialization of machine system]
And [Initializing of machine speed].

・* End of process.

# 4-4-4 Main program update (Main program ～Ver.*1.21)

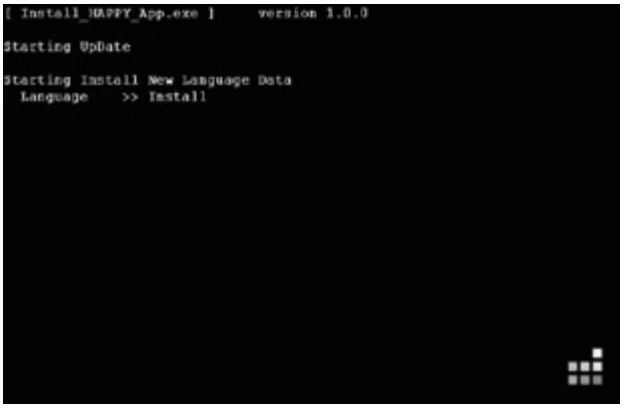
1. Insert USB memory that contains data for version up into insertion slot on the control box.

2. Refer to [ 4-5-1 How to enter maintenance mode ] and enter
maintenance mode. Display comes as below.




2. Press Main Program Update.
Select 3 items such as Language, Letter and make the screen show “Update” on each item.

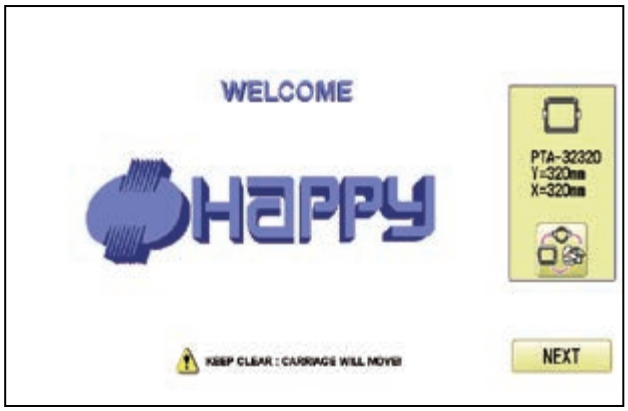

4. Press ENTER.
Installation of program begins.




<NOTE>
* Please do not take out USB memory during installation.
* Please do not turn off the power during installation (it will take for a while for completion of installation).

Retry updating when the screen shows “Error” due to writing error.

Once update id complete, the machine will be rebooted automatically.




5 Press NEXT button.

6. Referring to [4-4-5 Setting of revolution], Perform [Re-Initialization of machine system] And [Initializing of machine speed].

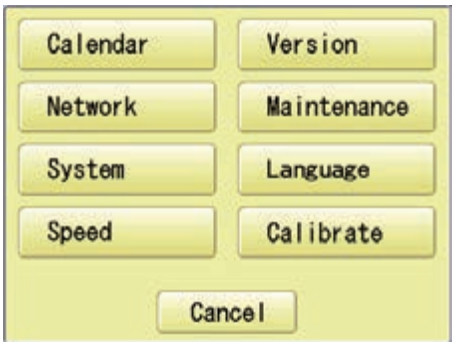
* End of process.

# 4-4-4a　Machine program and Main program update (Main program Ver.*1.22～)

1.Insert USB memory that contains data for version up into insertion slot on the control box.

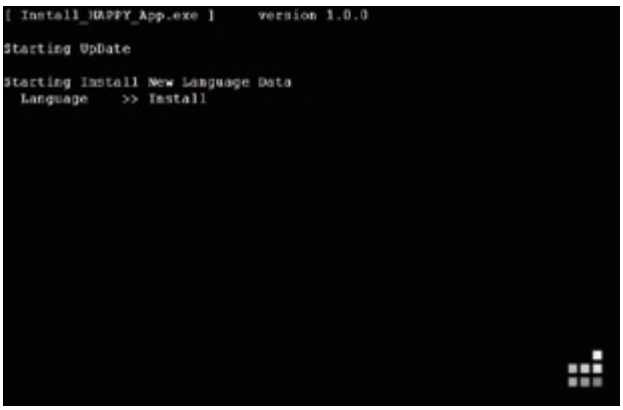
2. Press  (MENU) and press 

(OTHER).




3. Press Version.


4. Press UPDATE.
Installation of program begins.

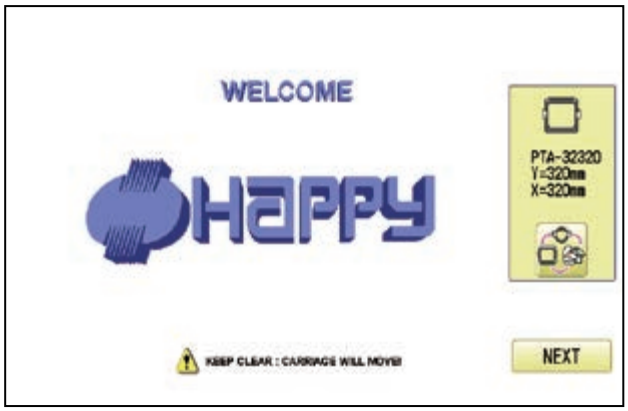



<NOTE>

* Please do not take out USB memory during installation.
* Please do not turn off the power during installation (it will take for a while for completion of installation).

Retry updating when the screen shows “Error” due to writing error.

Once update id complete, the machine will be rebooted automatically.




5. Press NEXT button.

6. Referring to [4-4-5　Setting of revolution], Perform [Re-Initialization of machine system] And [Initializing of machine speed].

* End of process.

# 4-4-5 Setting of revolution

**Re-Initialization of machine system**

Perform this function only to fix problems with the machine.

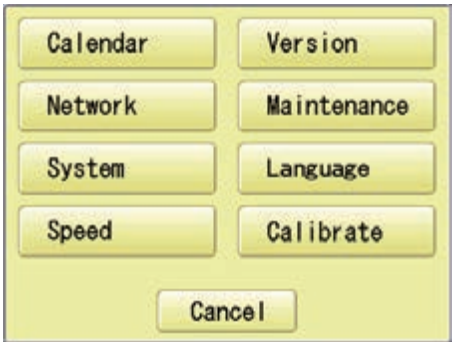
When performed, all settings in the “OPTION” menu are lost.

Be sure to reset the “OPTION” menu after performing this function.

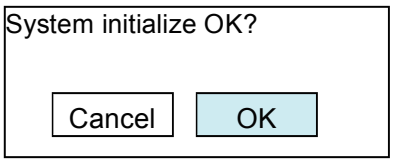
1. Turn on the power. After the program start up, press

 (MENU) and press  (OTHER).






2. Press System.




3. Press OK.

Formatting of the machines systems are carried out.

Indicate HAPPY logo in screen.

End of process.

**Initializing of machine speed**

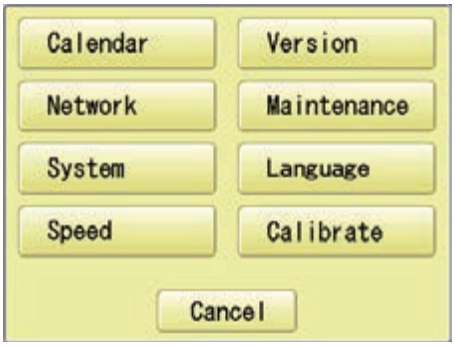
Setting of revolution of main shaft, which is suitable to the machine is required.

If setting is not done, the revolution may not speed up.

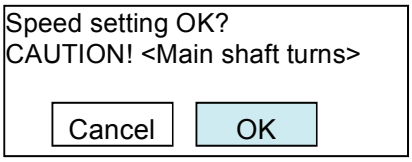
1. Turn on the power. After the program start up, press

 (MENU) and press  (OTHER).






2. Press Speed.




3. Press OK.

Main shaft adjusts its revolution speed automatically.

Message complete will be displayed when setting is

finished and it goes back to drive mode.

End of process.

# 4-5 Maintenance mode

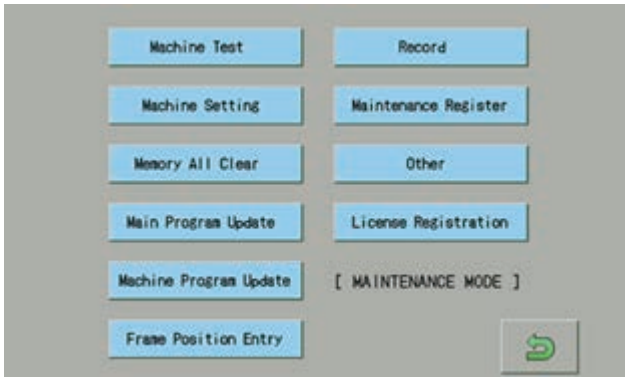
Maintenance mode consists of items as shown below.

Machine Test————Movement test, maintenance, and adjustment
Machine Setting————Machine control setting
Memory All Clear————Initialization of design memory.
Main Program Update—Update of operation program and language data
Machine Program Update————Update of control program and frame move data
Frame Position Entry—Registration of coordinates for positioning sensor (Not used in HCS2)
Record————Total number of stitches, Error occurrence record, Occurrence record by error type.
Maintenance Register—Registration of machine maintenance date(Normally not used at maintenance)
Other————Other (This item is neither configured nor used.)

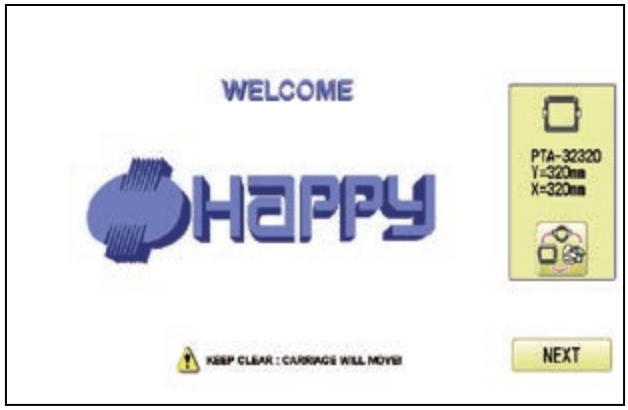
# 4-5-1 How to enter maintenance mode

1. Turn on machine.


2. Press NEXT while pressing START/STOP button at the screen of the control box after booting the machine.




3. Change to booting screen when you press  .




You can enter maintenance mode again by long key press

of  (Menu) at the Drive screen after maintenance mode is finished.

However, you cannot use the reentry method above once

the machine is turned off and rebooted.

# 4-5-2 Machine Test—Machine movement

Below operation will be moved solely. In some operations, actuator of motor will be moved, Keep hands and face away during
movement for your own safety.

#1 Input of Needle bar detect Potentiometer
(For adjustment)

#2 Action test of moving knife Open-Close
(For Rev.A)

#3 Adjusting sensor of Thread catch hook
(Not used in HCS2)

#4 Action test of Keeper solenoid ON-OFF

#5 Movement test of jump solenoid ON-OFF

#6 Movement test of thread catch hook
IN-OUT

#7 Action test of moving knife (for Cam type)
Action test of moving knife Open-Close
(For Rev.A)

#8 Action test of clip type thread holder
(Not used in HCS2)

#9 Action test of laser pointer (Option)

#10 Action test of cooling fan ON-OFF
(Not used in HCS2)

#11 Encoder Check

#12 Confirm frame moving sensor
(Not used in HCS2)

#13 Confirm registration of frame position data
(Not used in HCS2)

#14 Main shaft control test

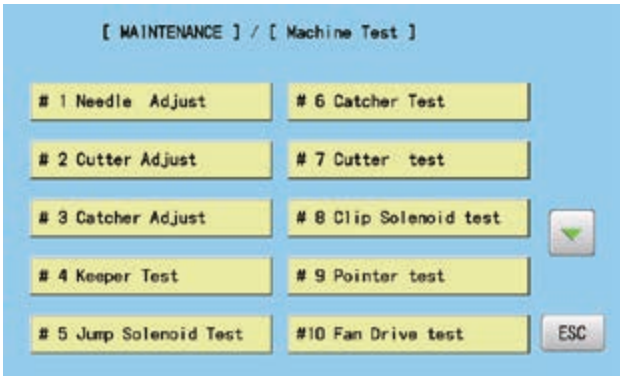
#15 Sequin test
(Not used in HCS2)

#16 Rotary Hook adjust
(Not used in HCS2)

#17 Needle Posi.
(Not used in HCS2)

1. Enter maintenance mode in reference to [4-5-1 How to enter maintenance mode]

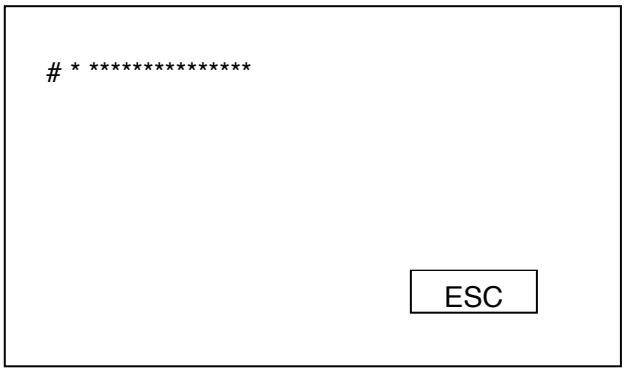
2. Press Machine Test .



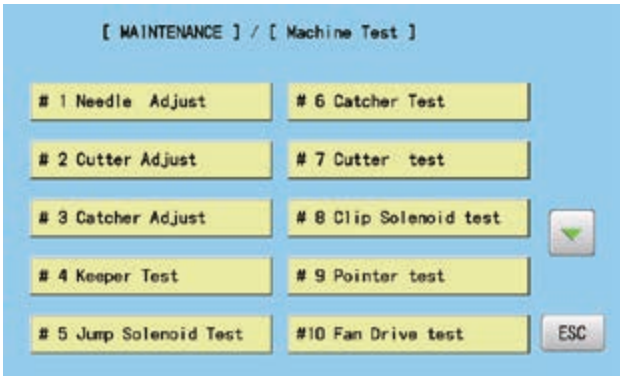

3. Select desired number to be confirmed.

Page is switched by pressing  .

Selected item will be executed.




4. The screen returns to the [MACHINE TEST] screen by pressing ESC .
(Unnecessary to press ESC if the item completes automatically.)




5. Return to drive mode by pressing ESC and  .

# 4-5-3 Memory All Clear—Initialization of design memory

Delete all the design memory.

Execute this function when occurring design breakage or impossibility of design input.

If abnormality is found after deleting all the data, replace LCD-CE board (or Memory card) since the board might be broken.

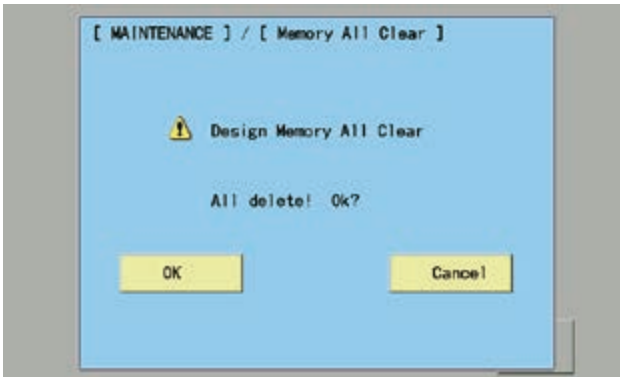
<NOTE>

All the internal design memory will be deleted by initialization of design memory.

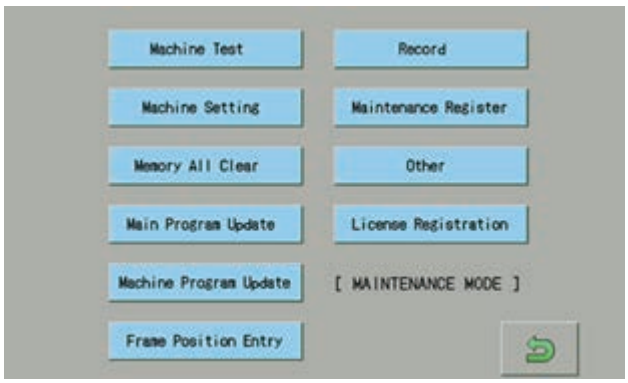
You have to be careful when initializing design memory.

1. Enter maintenance mode in reference to [4-5-1 How to enter maintenance mode ]

2. Press Memory All Clear .




3. Confirmation of free area and all delete will be started after pressing OK .




4. Return to drive mode by pressing ESC and  .

# 4-5-4 Record—Operation data display

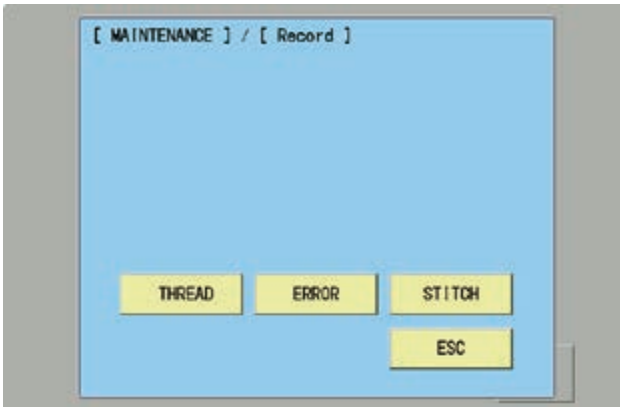
You can confirm history of operation.

Total number of stitch : Total number of stitch used for embroidery so far
Error occurrence record : Type of errors and its occurrence date for the last 32 errors
Occurrence record by error type : Accumulated number of each error occurrence
Thread break history : The number of thread break by needle bar

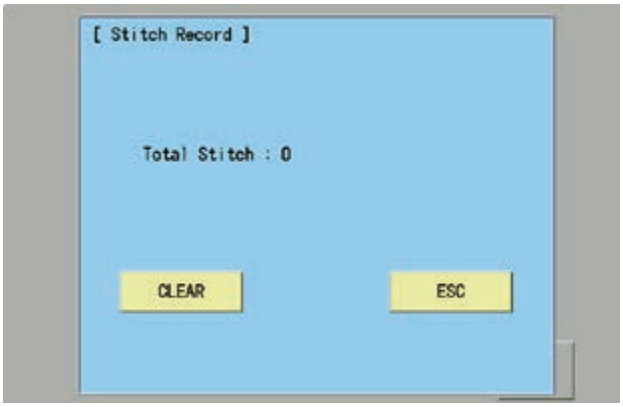
## 4-5-4-1 Total number of stitch

1. Enter maintenance mode in reference to [ 4-5-1 How to enter maintenance mode ]

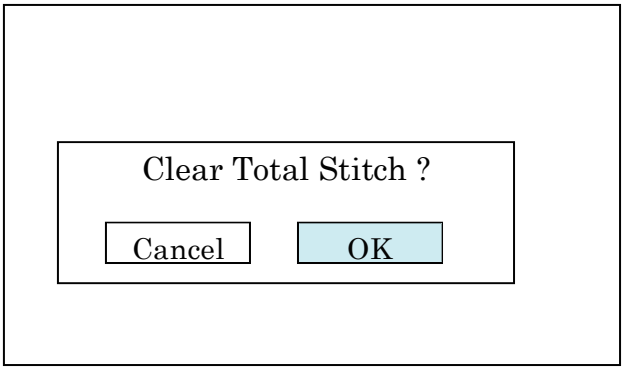
2. Press Record.




3. Press STITCH.
The screen shows total number stitches used for embroidery so far.




4. Selection menu of Clear Total Stitch will be opened when
pressing CLEAR at Procedure 3.




* Total number of stitch is cleared after pressing OK and
the screen shows one in the procedure 3. Total number of stitch is 0.

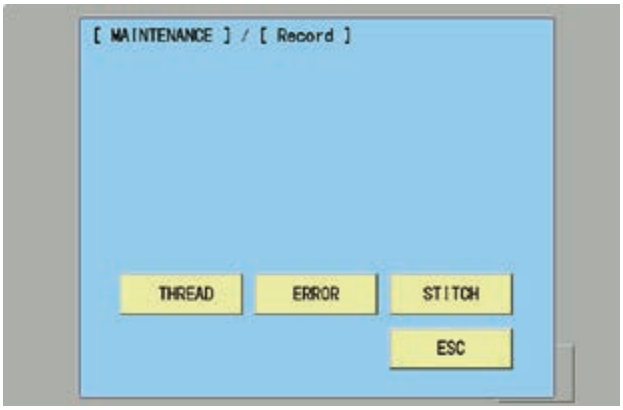
* If you do not prefer to clear it, press Cancel and
the screen shows of the procedure 3 is shown

5. Return to drive mode by pressing ESC and  .

# 4-5-4-2 Record of Error occurrence

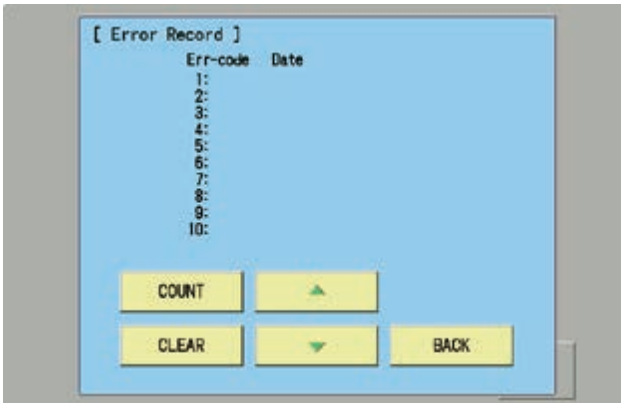
1. Enter maintenance mode in reference to [ 4-5-1 How to enter maintenance mode ]

2. Press Record .

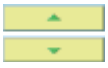



3. Press ERROR.

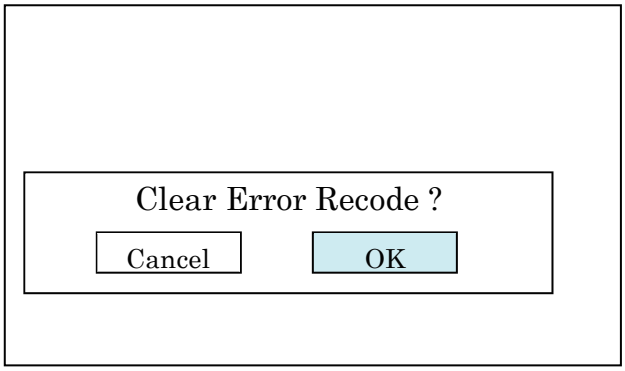
Enable to confirm Record of error occurrence




* Enable to confirm Occurrence date and error number of last

32 cases with  button.

Selection menu of Clear Error Record will be opened when pressing CLEAR.




* Error record is cleared by pressing OK and the screen of

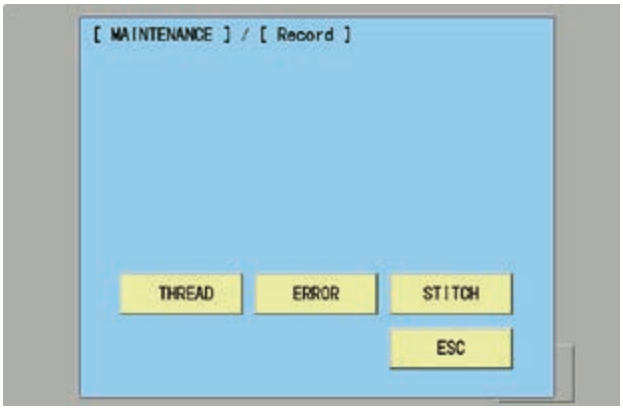
the procedure 3 is displayed.

* If you do not prefer to clear it, press Cancel and the screen of the procedure 3 is displayed..

# 4-5-4-3 Number of occurrence in each error display

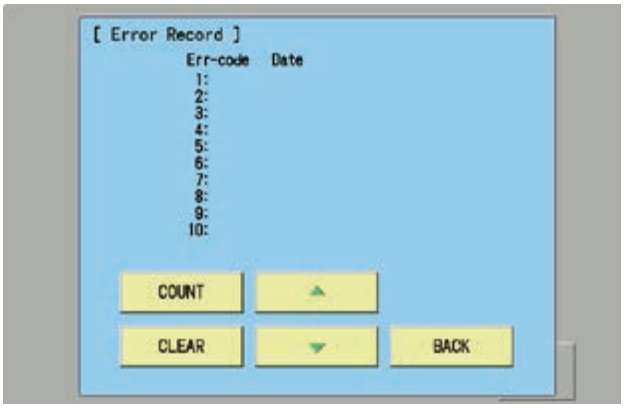
1. Enter maintenance mode in reference to [ 4-5-1 How to enter maintenance mode ]

2. Press Record .




3. Press ERROR.

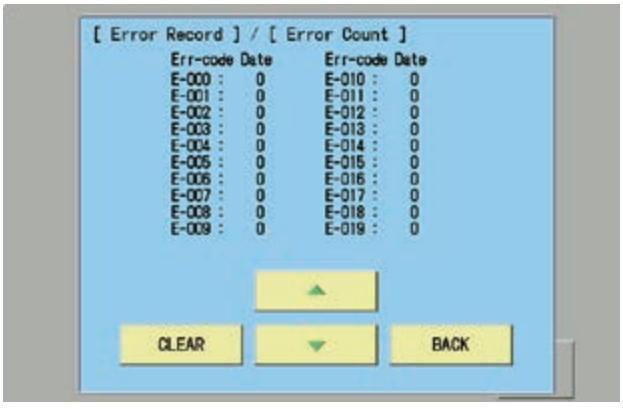
You can confirm record of error occurrence.




4. Press COUNT .

You can confirm total number of occurrence in each error.

(E-000 to E-255 will be displayed )




* You can confirm accumulated number for E-000 to E-255

with .

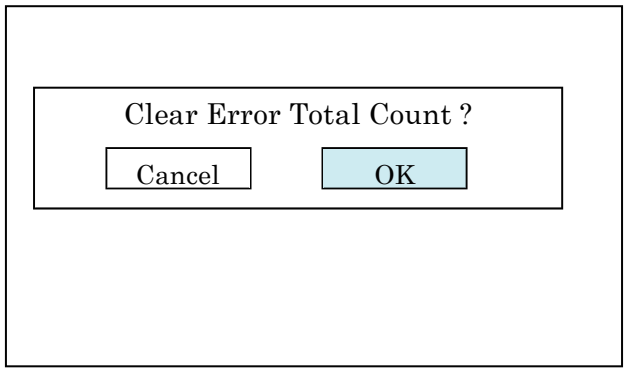
* The screen returns to the previous screen by pressing

BACK.

5. Selection menu of Clear Error Total Count will be opened

when pressing CLEAR and the screen of procedure 4

is displayed.




* Error record is cleared by pressing OK and the screen of

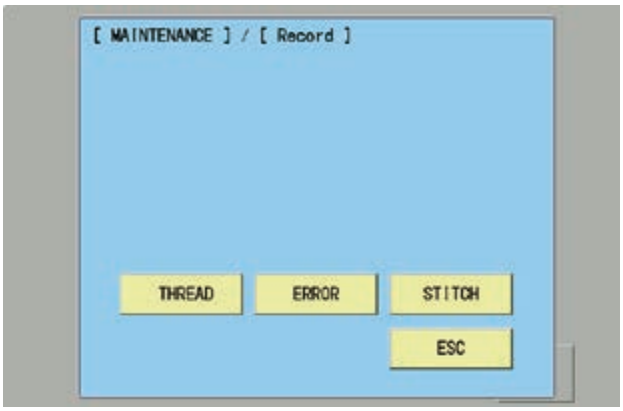
the procedure 4 is displayed.

* If you do not prefer to clear it, press Cancel and the screen of the procedure 4 is displayed.

## 4-5-4-4 Thread break history

1. Enter maintenance mode in reference to [ 4-5-1 How to enter maintenance mode ]

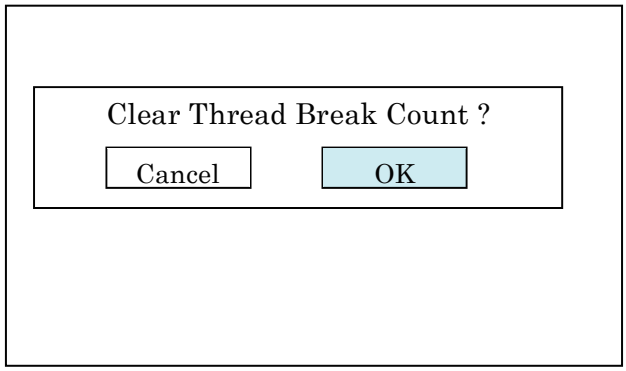
2. Press Record .




3. Press THREAD.
You can confirm thread break history by needle bar.


- *The screen returns to the previous screen by pressing BACK.

5. Selection menu of Clear Thread Break Count will be opened when pressing CLEAR at the screen of procedure 3.




* Thread break history is cleared by pressing OK and the screen of the procedure 3 is displayed.

* If you do not prefer to clear it, press Cancel and the screen of the procedure 3 is displayed.

# 4-5-4-5 Setup—Machine setting

<NOTE> ( *: Setting is for each indivisual machine, so prohibit to change setting. When you need to chage it, please contact us in advance)

( $ : Setting is different for each model type. Please check before changing data)

( # : Setting is depending on options installed. Please check before changing data)

Contents

| | | | | |
|---|---|---|---|---|
| * 1 | Machine Type | : HCS2 | | |
| * 2 | Max Needle Number | : 12 | (1-15) | : Number of Needle |
| * 3 | Max Head Number | : 1 | (1-30) | : Number of Head |
| * 4 | Machine Max Speed | : 1000 | (500-2000) | : Maximum rotation |
| * 5 | Machine Max Area X | : 290 | (1-1000) | : Maximum embroidery area at X axis |
| * 6 | Machine Max Area Y | : 290 | (1-1000.) | : Maximum embroidery area at Y axis |
| * 7 | X Position Sensor | : 0 | (0-12) | : Number of position sensor at X axis |
| * 8 | Y Position Sensor | : 0 | (0-12) | : Number of position sensor at Y axis |
| # 9 | LED Needle Pointer | : No | | : Use of LED Pointer Yes or No |
| * 10 | Safety Sensor | : No. | | : Use of safety sensor ( rear )Yes or No |
| * 11 | N.Safety Sensor | : No. | | : Use of safety sensor (front) Yes or No |
| * 12 | Clip Holder Device | : No | | : Use of Clip holder device YES or NO |
| * 13 | Borer Device | : No. | | : Use of Borer device Yes or No |
| $14 | Cutter Unit Type | : ***** | (PulseMtr, Solenoid) | : Thread cutting unit type |
| 15 | X Start Base Angle | : 50 | (20-90) | : Starting angle of frame movement on X axis |
| 16 | Y Start Base Angle | : 50 | (20-90) | : Starting angle of frame movement on Y axis |
| 17 | X Start Angle(CAP) | : 50 | (20-90) | Starting angle of frame movement on X axis for cap frame |
| 18 | Y Start Angle(CAP) | : 50 | (20-90) | Starting angle of frame movement on Y axis for cap frame |
| * 19 | Color Change Speed | : Slow1 | (Normal / Slow1 ~ Slow4) | Speed of needle bar change |
| * 20 | Brush Data [*0.1mm] | : 200 | (0-250) | Distance of thread brush (mm) after thread cut (1:0.1mm , 200:20.0mm ⋯ 250:25.0mm) |
| * 21 | Clip Close Timing | : 0 (0-1000) | | Close timing of Clip when Thread trim (ms) Set to 200 when the Clip holder device is Yes. |
| * 22 | Border Overlap | : 0 | (0-10) | Overlap of between heads for border frame |
| * 23 | Trace Needle No. | : 1 | (1-15) | Needle Number for Trace |
| * 24 | Device Com. Speed | : 19200bps | (2400-115200) | Communication speed for Sequin device and Cording device |
| * 25 | Sequin Dev. Left | : No | | Use of left side Sequin device Yes or No |
| * 26 | Sequin Dev. Right | : No | | Use of right side Sequin device Yes or No |
| * 27 | Sequin Dev. Type | : Other | (Happy) | Type of Sequin device |
| * 28 | Number of 3-Needle | : 0 | (0-15) | Needle number of 3-Needle device |

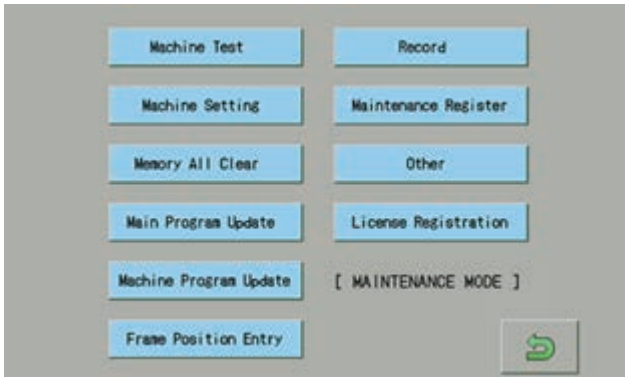
1. Enter maintenance mode in reference to [ 4-5-1 How to enter maintenance mode ].

2. Press Machine Setting.


3. Select desired number and modify setting.

- Setting values become default by pressing  .
- Page is switched by pressing  .

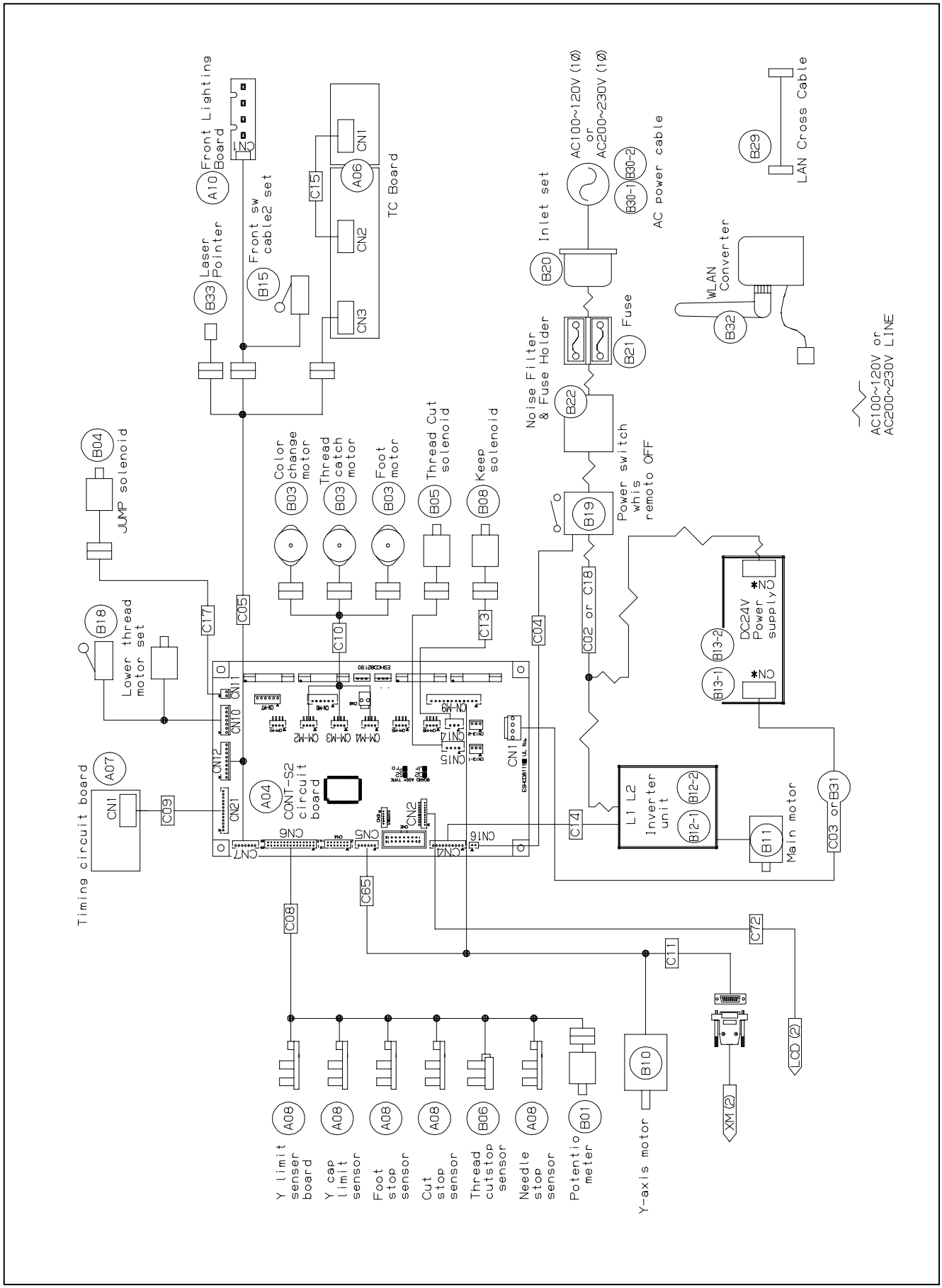
4. Press ESC button after modifying of setting number.



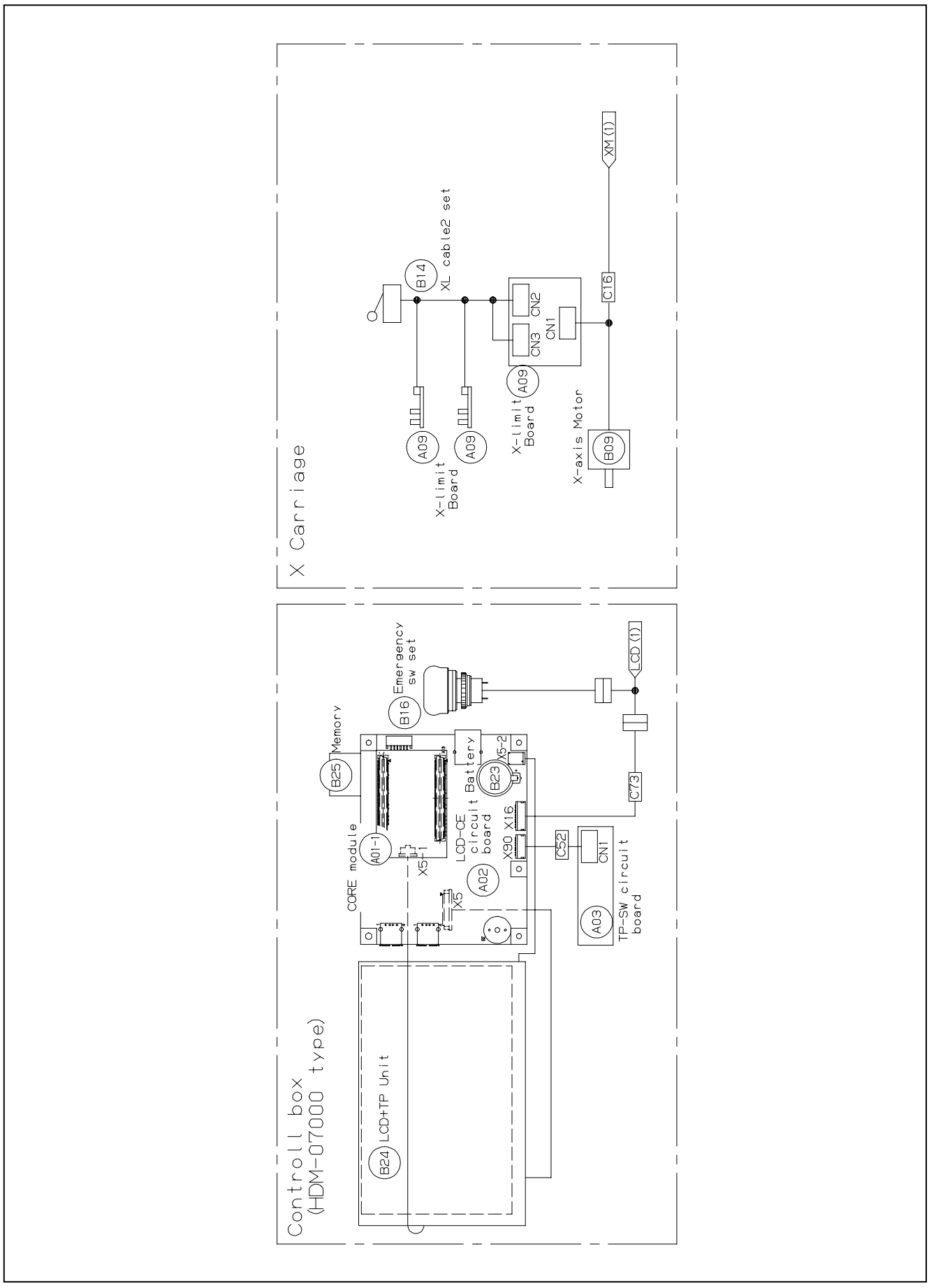

5. The screen returns to drive mode by pressing  .

6. Turn off power and on again before use a machine.

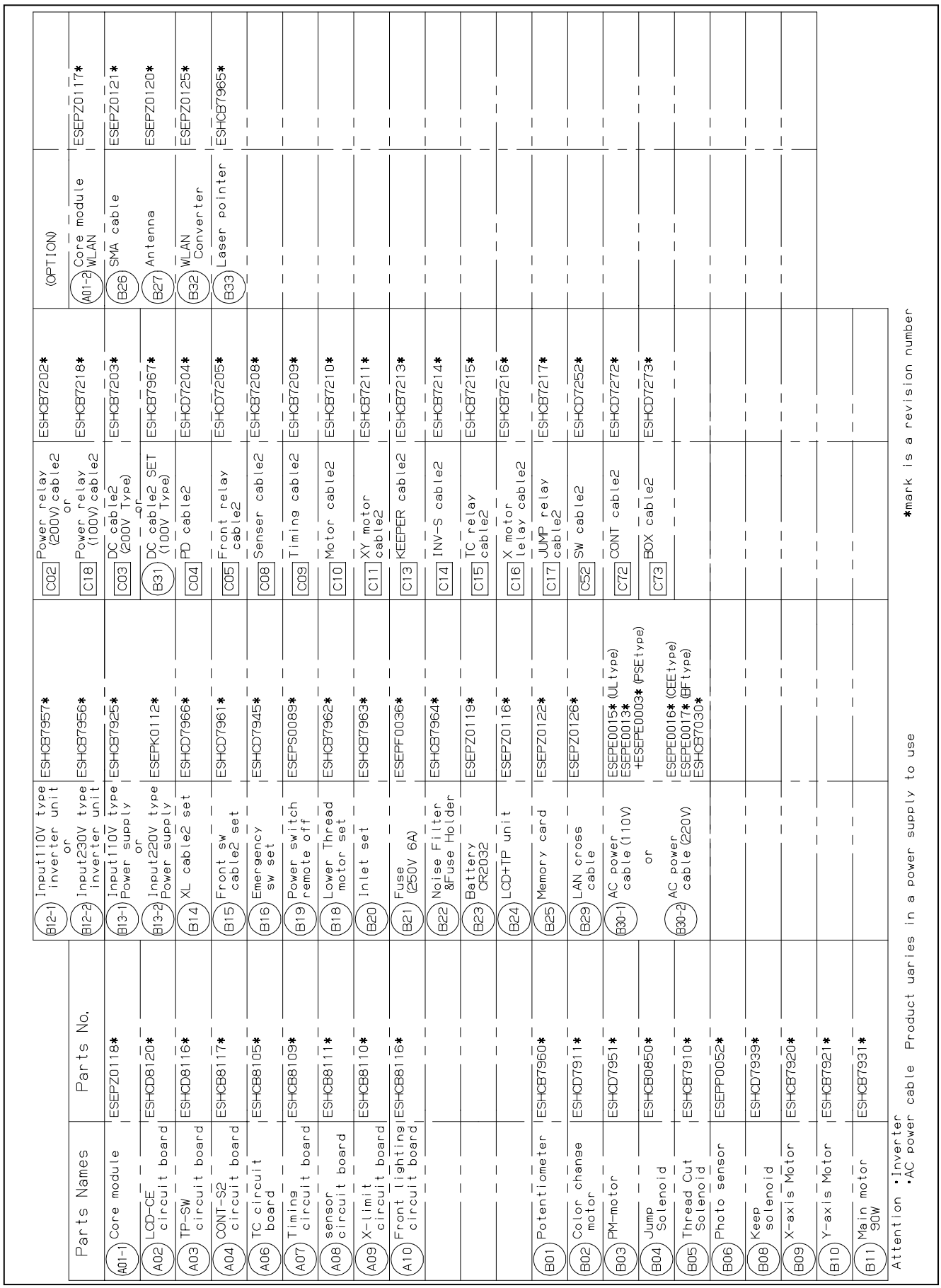
# 5-1-1 Electrical connection diagram (except for Rev.A)



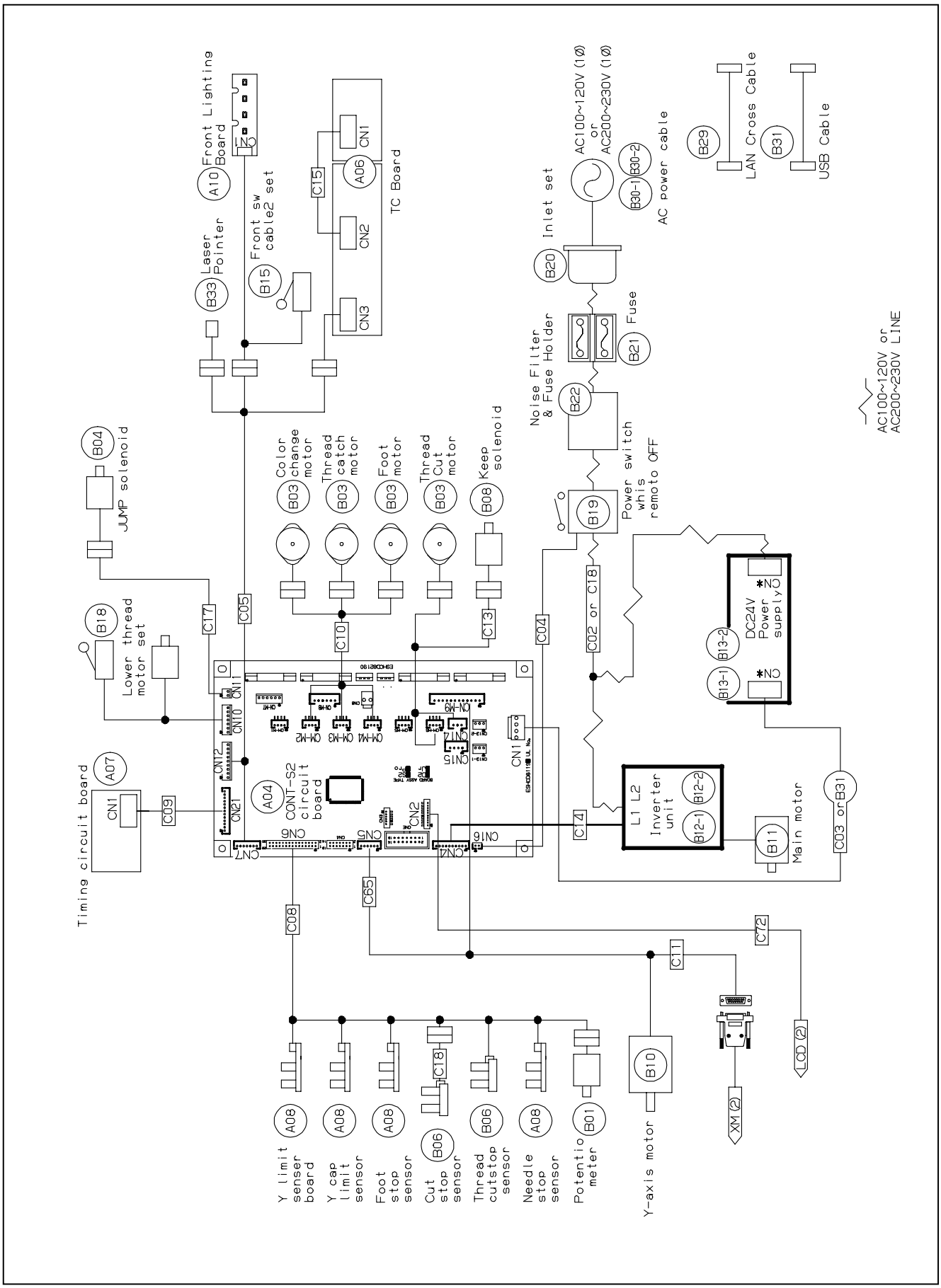
# 5-1-1 Electrical connection diagram (except for Rev.A)



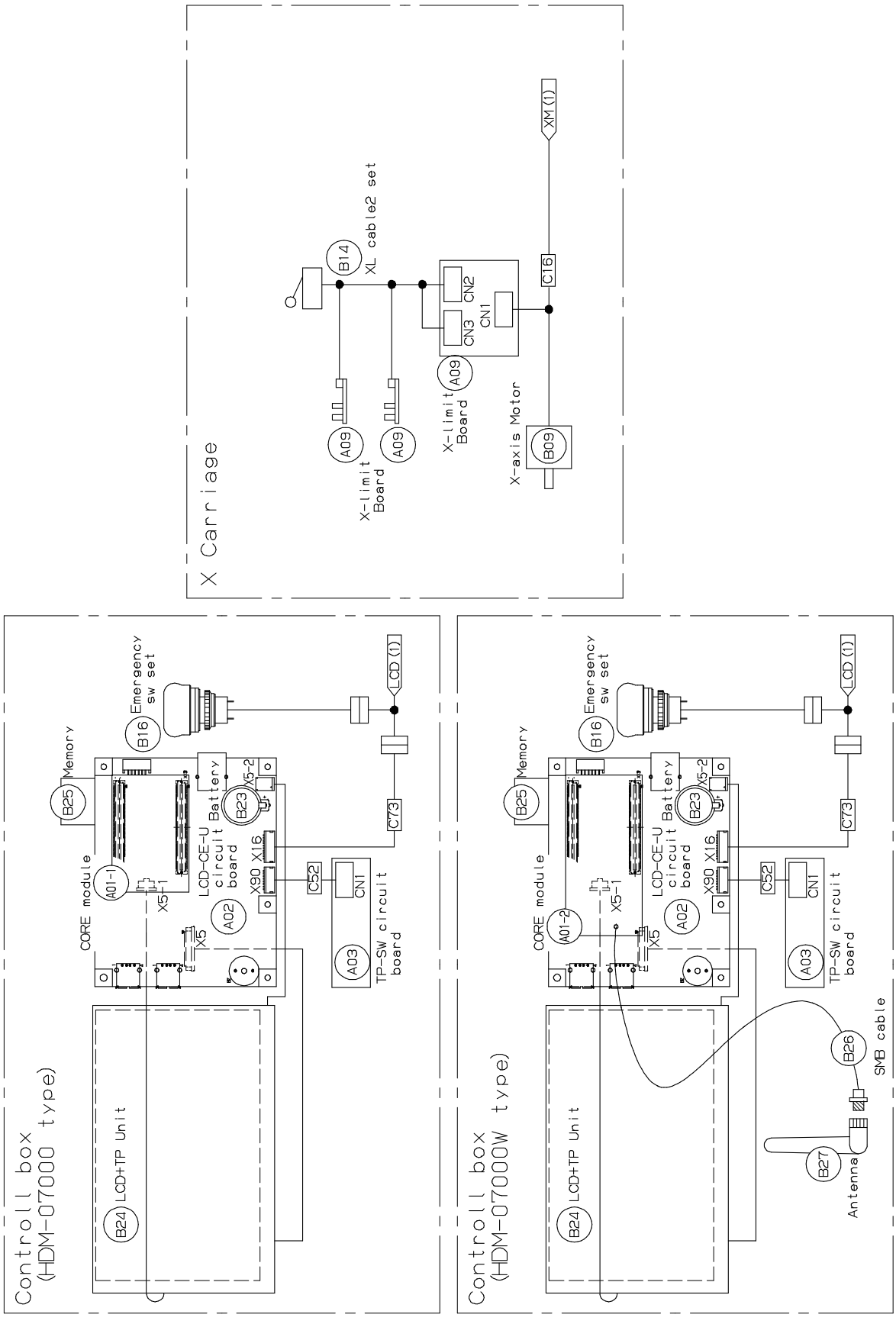
# 5-1-2 List of electrical connection diagrams (except for Rev.A)



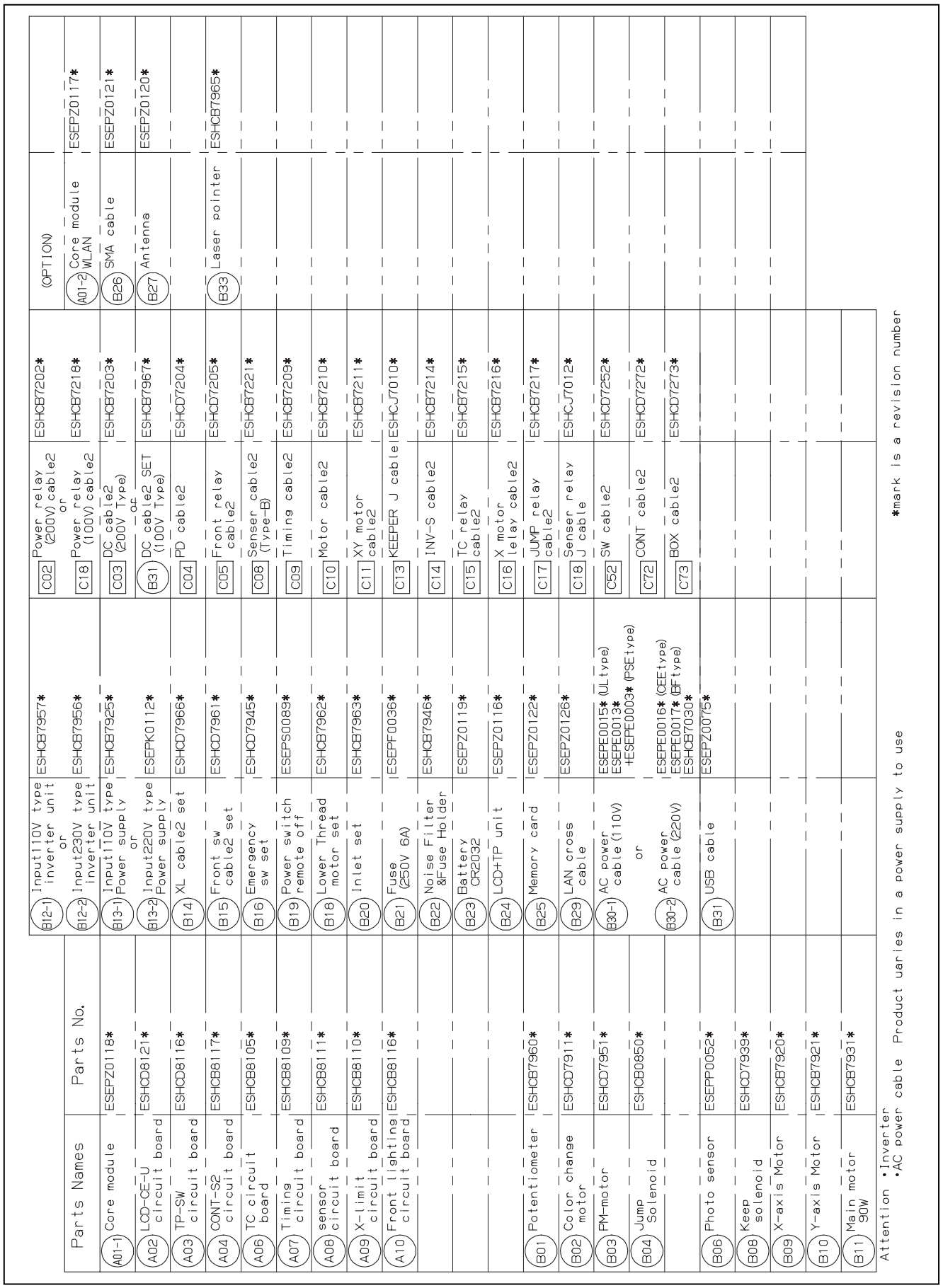
# 5-1-3 Electrical connection diagram (for Rev. A)



# 5-1-3 Electrical connection diagram (for Rev. A)



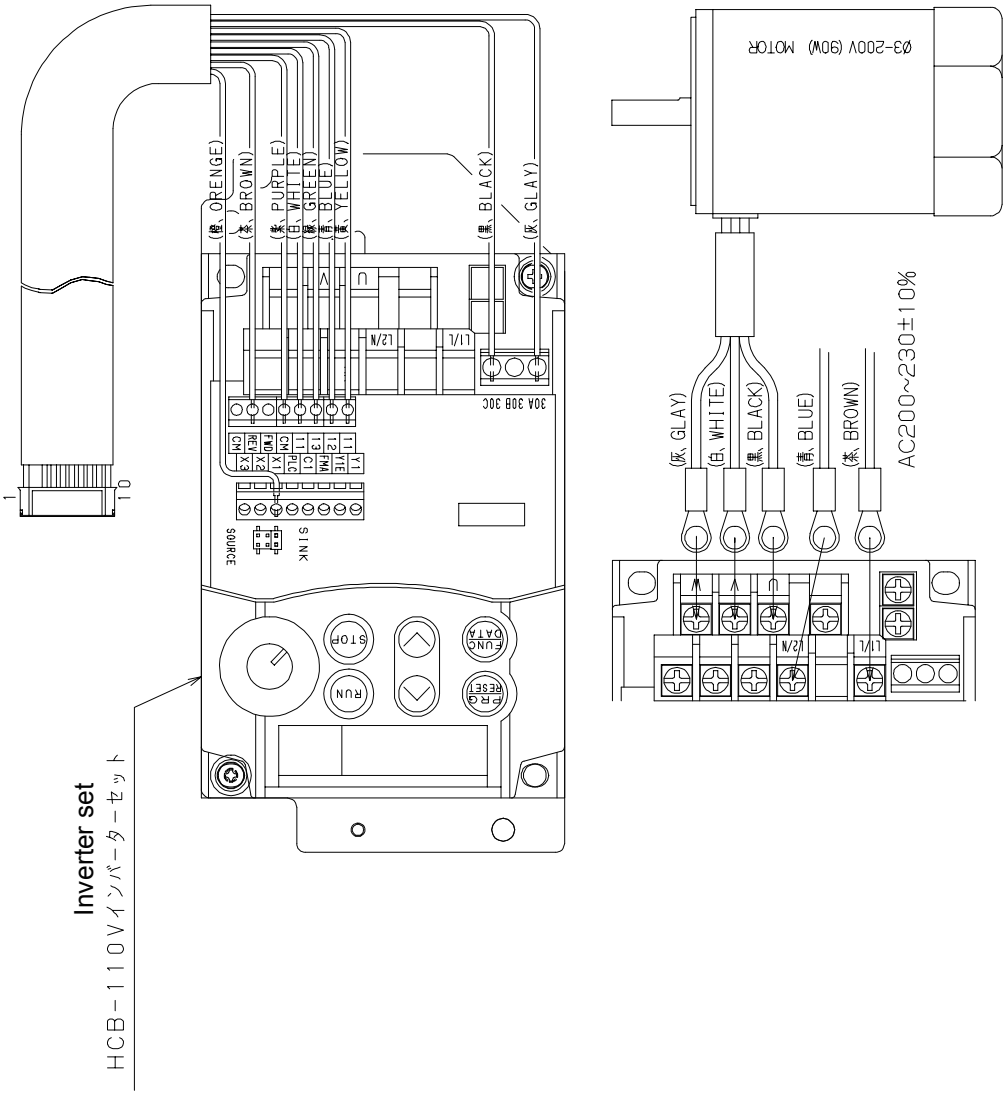
# 5-1-4 List of electrical connection diagrams (for Rev. A)



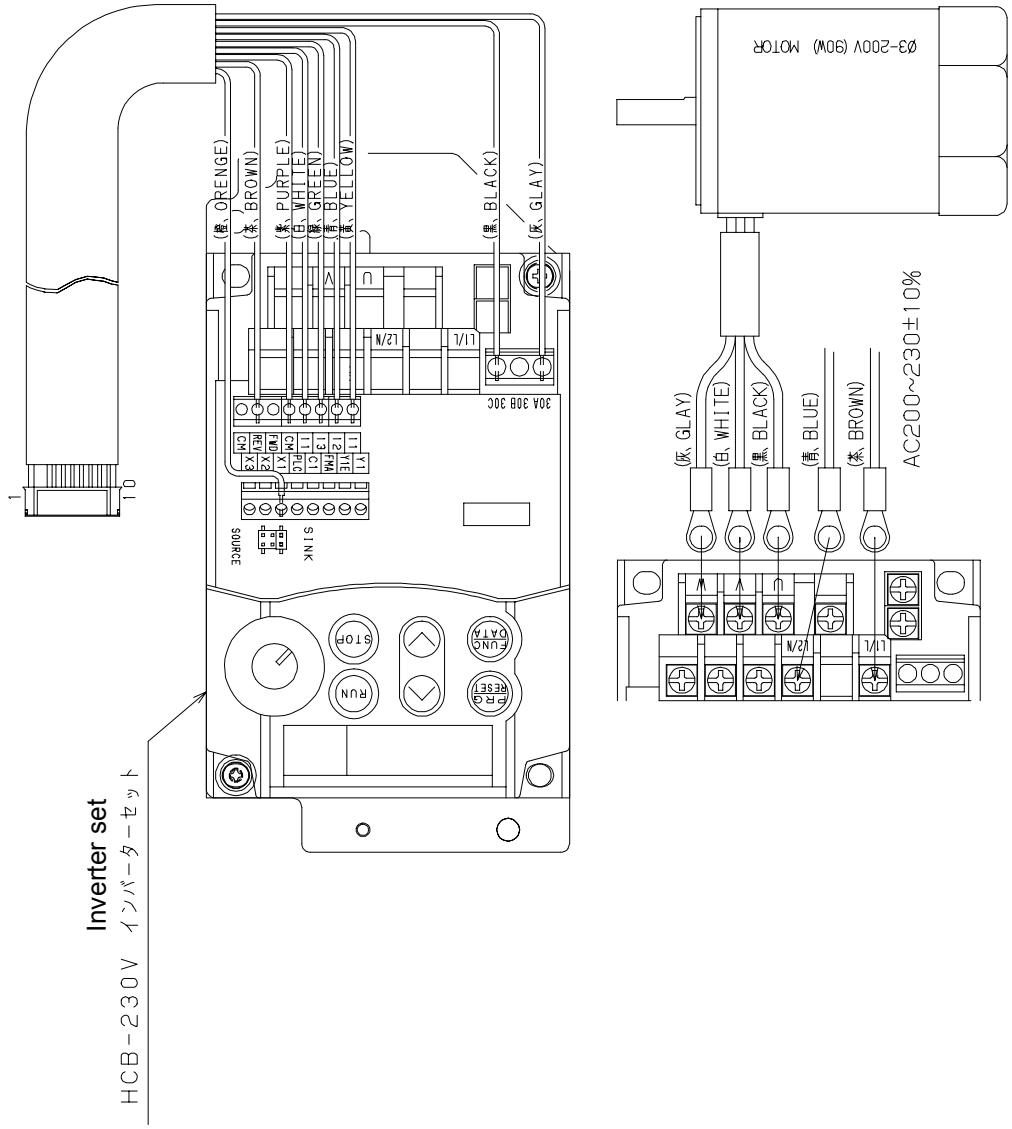
| Parts Names | Parts No. | B12-1 Input110V type inverter unit | ESHCB7957* | C02 Power relay (200V) cable2 or C18 Power relay (100V) cable2 | ESHCB7202* ESHCB7218* | (OPTION) A01-2 Core module WLAN | ESEPZ0117* |
|---|---|---|---|---|---|---|---|
| A01-1 Core module | ESEPZ0118* | B12-2 Input230V type inverter unit | ESHCB7956* | | | | |
| A02 LCD-CE-U circuit board | ESHCD8121* | B13-1 Input110V type Power supply or B13-2 Input220V type Power supply | ESHCB7925* ESEPK0112* | C03 DC cable2 (200V Type) or B31 DC cable2 SET (100V Type) | ESHCB7203* ESHCB7967* | B26 SMA cable | ESEPZ0121* |
| A03 TP-SW circuit board | ESHCD8116* | B14 XL cable2 set | ESHCD7966* | C04 PD cable2 | ESHCD7204* | B27 Antenna | ESEPZ0120* |
| A04 CONT-S2 circuit board | ESHCB8117* | B15 Front sw cable2 set | ESHCD7961* | C05 Front relay cable2 | ESHCD7205* | B33 Laser pointer | ESHCB7965* |
| A06 TC circuit board | ESHCB8105* | B16 Emergency sw set | ESHCD7945* | C08 Senser cable2 (Type-B) | ESHCB7221* | | |
| A07 Timing circuit board | ESHCB8109* | B19 Power switch remote off | ESEPS0089* | C09 Timing cable2 | ESHCB7209* | | |
| A08 sensor circuit board | ESHCB8111* | B18 Lower Thread motor set | ESHCB7962* | C10 Motor cable2 | ESHCB7210* | | |
| A09 X-limit circuit board | ESHCB8110* | B20 Inlet set | ESHCB7963* | C11 XY motor cable2 | ESHCB7211* | | |
| A10 Front lighting circuit board | ESHCB8116* | B21 Fuse (250V 6A) | ESEPF0036* | C13 KEEPER J cable | ESHCJ7010* | | |
| | | B22 Noise Filter &Fuse Holder | ESHCB7946* | C14 INV-S cable2 | ESHCB7214* | | |
| | | B23 Battery CR2032 | ESEPZ0119* | C15 TC relay cable2 | ESHCB7215* | | |
| | | B24 LCD+TP unit | ESEPZ0116* | C16 X motor relay cable2 | ESHCB7216* | | |
| B01 Potentiometer | ESHCB7960* | B25 Memory card | ESEPZ0122* | C17 JUMP relay cable2 | ESHCB7217* | | |
| B02 Color change motor | ESHCD7911* | B29 LAN cross cable | ESEPZ0126* | C18 Senser relay J cable | ESHCJ7012* | | |
| B03 PM-motor | ESHCD7951* | B30-1 AC power cable (110V) or B30-2 AC power cable (220V) | ESEPE0015* (ULtype) ESEPE0013* +ESEPE0003* (PSEtype) ESEPE0016* (CEEtype) ESEPE0017* (BFtype) ESHCB7030* | C52 SW cable2 | ESHCD7252* | | |
| B04 Jump Solenoid | ESHCB0850* | | | C72 CONT cable2 | ESHCD7272* | | |
| | | | | C73 BOX cable2 | ESHCD7273* | | |
| B06 Photo sensor | ESEPP0052* | B31 USB cable | ESEPZ0075* | | | | |
| B08 Keep solenoid | ESHCD7939* | | | | | | |
| B09 X-axis Motor | ESHCB7920* | | | | | | |
| B10 Y-axis Motor | ESHCB7921* | | | | | | |
| B11 Main motor 90W | ESHCB7931* | | | | | | |

Attention •Inverter *mark is a revision number
•AC power cable Product varies in a power supply to use

# 5-2-1 Connection of inverter 100V



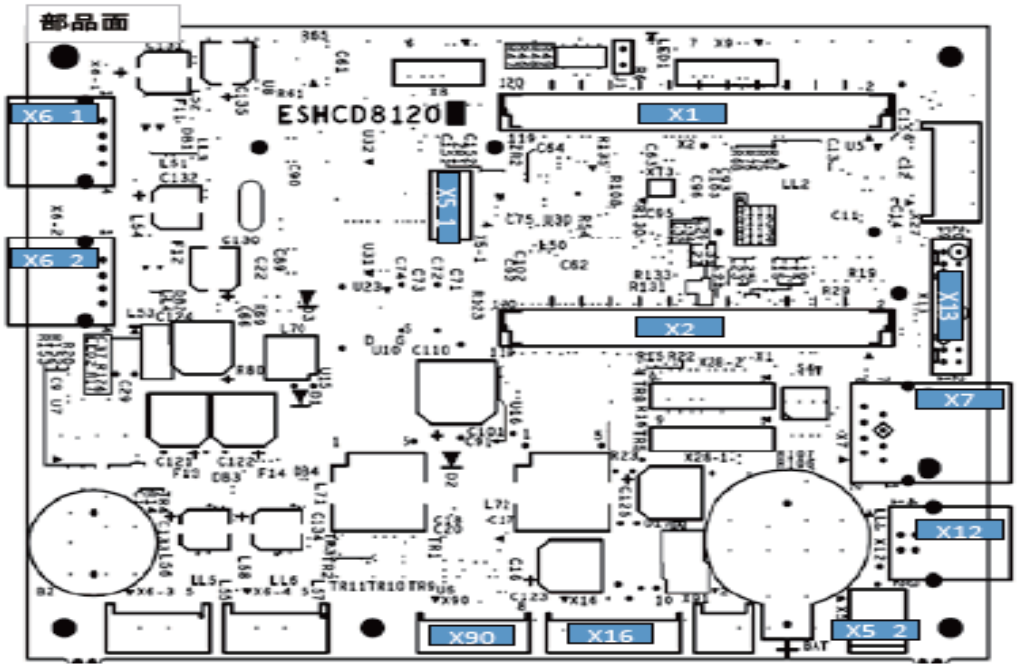
# 5-2-2 Connection of inverter 200V



# 5-3 Explanation of function of circuit board

HCD8121*

LCD-CE-U board Ass'y

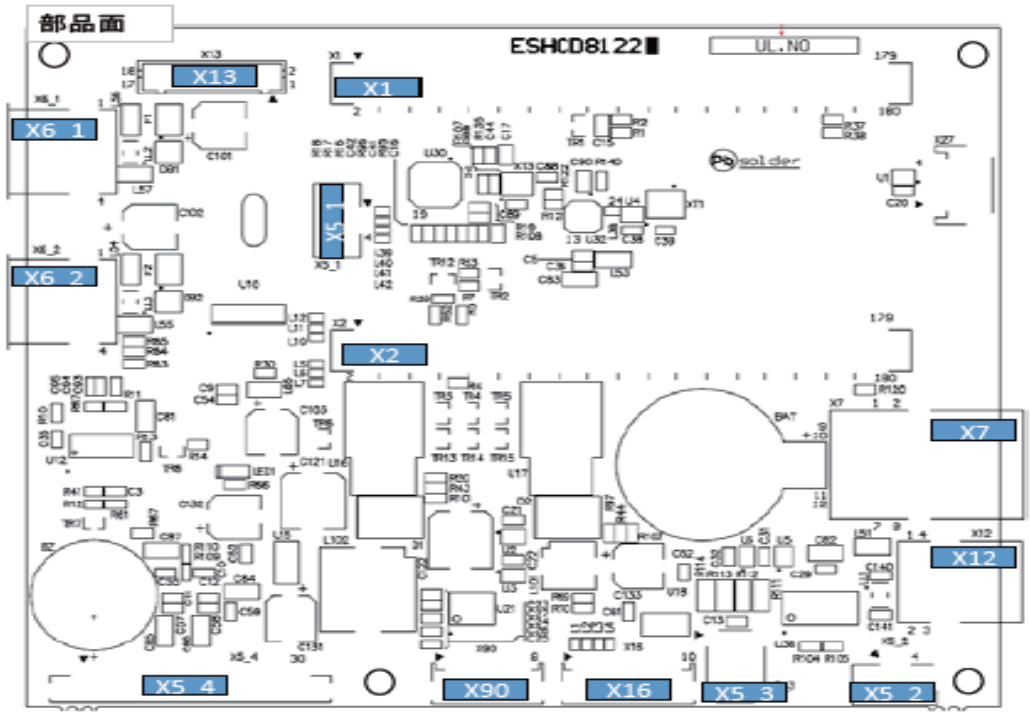


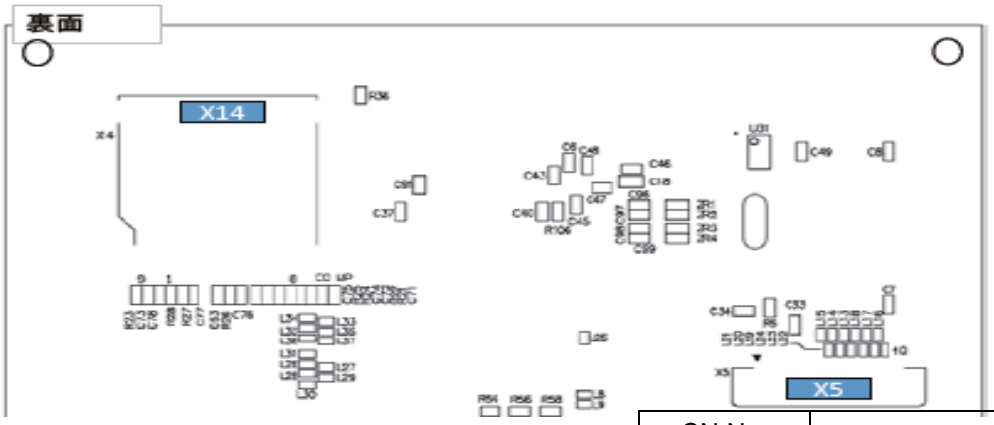


| CN No. | Function |
|---|---|
| X1 | Core module I/F |
| X2 | Core module I/F |
| X5 | 7in LCD I/F |
| X5_1 | 7in touch panel input |
| X5_2 | 7in LCD backlight output |
| X6_1 | USB-A connector 1 |
| X6_2 | USB-A connector 2 |
| X7 | LAN |
| X12 | USB-B connector |
| X13 | AUX |
| X14 | SD card |
| X16 | TP-SW　board I/F |
| X90 | CONT-** board I/F |
| Other CN | Reserved |

HCD8122*

LCD-CE-MX board Ass'y

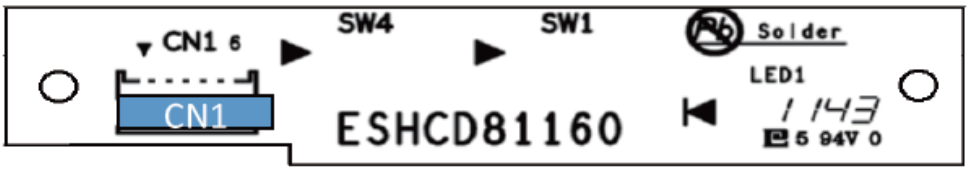



| CN No. | Function |
|---|---|
| X1 | Core module I/F |
| X2 | Core module I/F |
| X 5 | 7in LCD I/F |
| X 5_1 | 7in touch panel input |
| X5_2 | 10.4in touch panel input |
| X5_3 | 7in LCD backlight output |
| X5_4 | 10.4in LCD I/F |
| X 6_1 | USB-A connector 1 |
| X 6_2 | USB-A connector 2 |
| X 7 | LAN |
| X 12 | USB-B connector |
| X 13 | AUX |
| X 14 | SD card |
| X16 | TP-SW　board I/F |
| X90 | CONT-** board I/F |
| OOtherther Other CN | Reserved |

HCD8116*

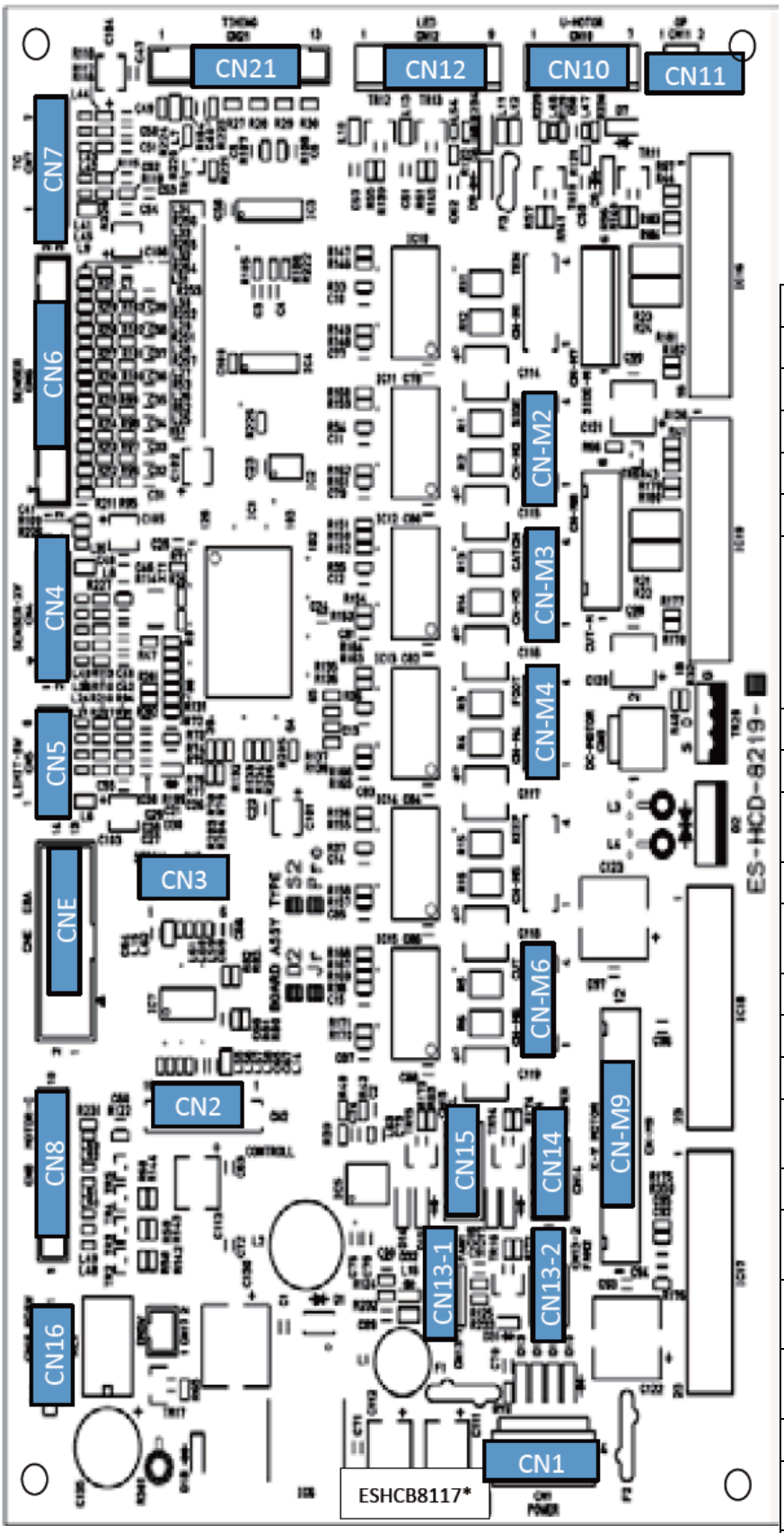
TP-switch board ass'y




| CN No. | Function |
|---|---|
| CN1 | Switch output, LED input |
| | |

HCB8117*

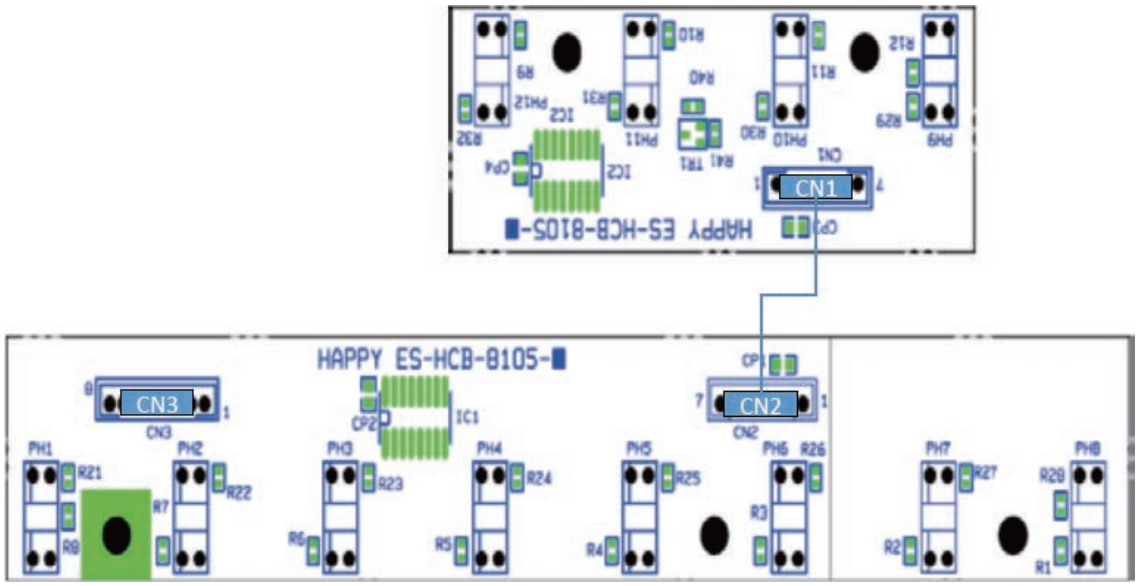
CONT-S2 board Ass'y




| CN No. | Function |
|---|---|
| CN1 | Input of 24V power source |
| CN2 | Control box I/F |
| CN3 | Option I/F |
| CN4 | X-Y position sensor I/F |
| CN5 | Unused |
| CN6 | Input of Thread catcher,Needle bar change, Thread cutting orig sensor Needle bar change potensionmeter |
| CN7 | T/C sensor I/F |
| CN8 | Inverter I/F |
| CN10 | Bobbin winder motor output |
| CN11 | Clip solenoid output |
| CN12 | Laser pointer output, Front LED output |
| CN13-1 | Fan 1 I/F |
| CN13-2 | Fan 2 I/F |
| CN14 | Keeper solenoid output |
| CN15 | Thread cutting solenoid output |
| CN16 | Main switch remote output |
| CN21 | Input of C poiny, L point, Main shaft　angle |
| CN-M2 | Needle bar change motor output |
| CN-M3 | Output of Thread catch motor |
| CN-M4 | Pressure foot motor output |
| CN-M6 | Thread cutting motor output |
| CN-M9 | X-Y motor output |
| CNE | AUX |
| | |

HCB8105*

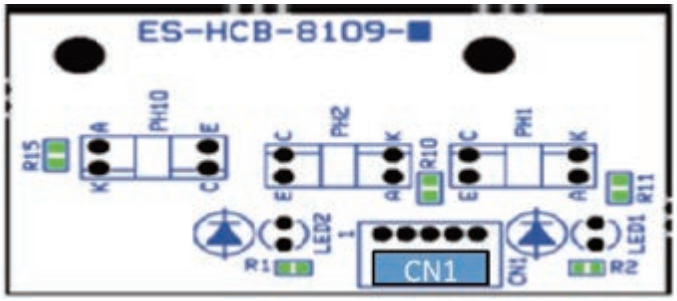
TC12 board ass'y




| CN No. | Function |
|---|---|
| CN1 | Sensor output (9-12 needle) |
| CN2 | Sensor input (9-12 needle) |
| CN3 | CONT-S2 board I/F |
| | |

HCD8109*

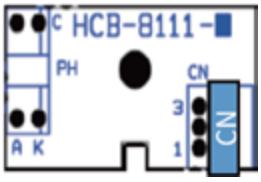
Timing detecting board ass'y




| CN No. | Function |
|---|---|
| CN1 | Out put of L point, C point, angle sensor |
| | |
| | |

## HCB8111*

SENS0R Circuit Board Ass'y




| CN No. | Function |
|---|---|
| CN | Sensor output |
| | |

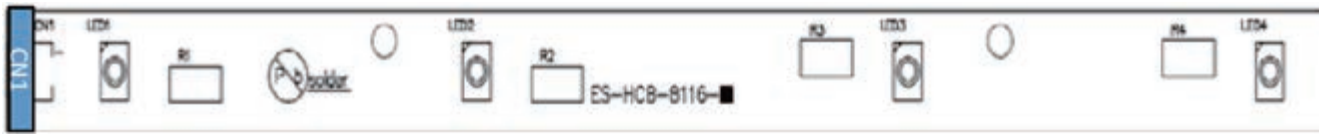
## HCD8110*

POSITION SENSOR Circuit Board Ass'y


| CN No. | Function |
|---|---|
| CN1 | Sensor out put |
| | |

## HCB8116*

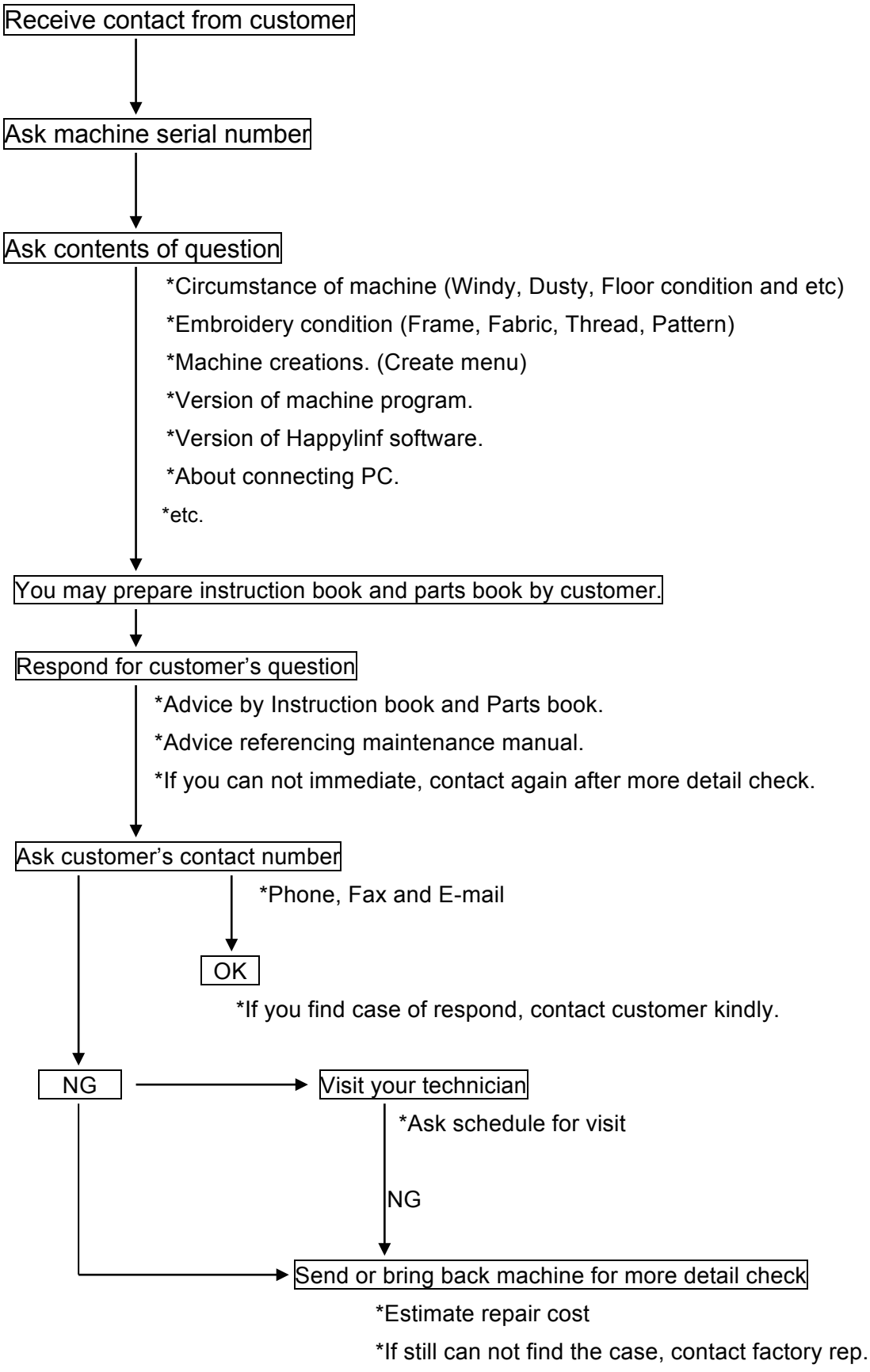
FRONT LED Circuit Board Ass'y




| CN No. | Function |
|---|---|
| CN1 | 24V power source input |
| | |

# 6-1 How to respond for some question (As example step)

*When you receive some question from customer, please use this step for sold problem as sample.



# 6-2-1 Trouble shooting (Electricity doesn’t turn on)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Electricity doesn't turn on | Mechanical | 1. Did fuse blow?<br>1-1 If it did, replace it. | |
| | | 2. Check of defect on board.<br>2-1 Replace of CONT board.<br>2-2 Replace of LCD-CE board. | |
| | | 3. No problem in power supply?<br>3-1 Check and adjust the correct voltage.<br>3-2 Try to replace power supply. | 4-1-3 |
| | | 4. Check of Cable catching causes short-circuit.<br>4-1 Please insulate the cable after removing outer cover.<br>4-2 Replace of cable. | |
| | | 5. Confirm not getting power supply from same outlet with other embroidery machine or other machines which contains motor.<br>5-1 Preferably only 1 embroidery machine should be connected with 1 outlet.<br>(Maximum 2-3machines) | |
| | Operator | 1. Didn't press emergency switch?<br>1-1 Release lock. | (3-8) |
| | Environment | 1. Is electricity in receptacle?<br>1-1 Supply power. | |

(  ) ---Reference instruction book

# 6-2-2 Trouble shooting (Thread break)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Thread break | Mechanical | 1. Is needle drop unstable by vibration? | (2-4) |
| | | 1-1 Reconsider where to install the machine. | |
| | | 1-2 Move the machine to floor fully reinforced. | |
| | | 1-3 Use strong table to be able to endure vibration. | |
| | | 2. No burr or scratch in thread guide hole? | 3-1-1 |
| | | 2-1 Remove burr and scratch. | |
| | | 2-2 Replace of thread guide. | |
| | | 3. No problem in thread adjusting spring? | 3-1-1 |
| | | 3-1 Replace spring if it doesn't spring. | |
| | | 3-2 If weak or broken, replace it. | |
| | | 4. Does detecting roller make smooth turn? | |
| | | 4-1 Clean inside hole of bearing. | |
| | | 4-2 Correct so as for slit disc not to touch sensor. | 4-2-2 |
| | | 4-3 Correct so as for cable not to touch slit disc. | |
| | | 4-4 Check cable of TC 12 Board is unconnected | |
| | | 5. No problem in thread guide unit and thread tension ass'y? | 3-1-1 |
| | | 5-1 Remove burr and scratch if appeared. | |
| | | 5-2 Remove lints and clean. | |
| | | 6. Does disc on thread tension ass'y. turn smoothly? | 3-1-1 |
| | | 6-1 Remove lints and clean. | |
| | | 6-2 Replace | |
| | | 7. Is backlash between take-up lever and take-up crank roller not bigger? | |
| | | 7-1 Replace of take-up lever. | 3-3-9 |
| | | 8. No problem in needle holder? | |
| | | 8-1 Remove burr and scratch. | |
| | | 8-2 Make proper fixing. (direction) | 3-1-2 |
| | | 8-3 Replace if thread guide is bent. | 3-1-1 |
| | | 9. No burr and scratch on needle plate? | 3-1-1 |
| | | 9-1 Remove burr and scratch in needle hole. | |
| | | 9-2 Remove burr and scratch around needle hole on back of needle plate. | |
| | | 9-3 Replace it if not furbished. | |
| | | 9-4 If furbishing made needle hole wider, replace it. | |
| | | 10. No problem in pressure foot? | |
| | | 10-1 Remove burr and scratch. | 3-1-1 |
| | | 10-2 Correct bent. | 3-1-1 |
| | | 10-3 Adjust height. | 3-2-12 |
| | | 10-4 Replace of pressure foot. | 3-2-11 |
| | | 10-5 Replace of pressure foot drive cam. | 3-2-9 |

# 6-2-2 Trouble shooting (Thread break)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Thread break | Mechanical | 11. No problem in rotary hook? | 3-1-1 |
| | | 11-1 Clean it to remove lints. | (23-2) |
| | | 11-2 Furbish scratch. (23-2) | |
| | | 11-3 If backlash of bobbin case holder and outer hook grows bigger, replace them. | |
| | | 11-4 Replace. | |
| | | 12. No problem in rotary hook retainer? | |
| | | 12-1 Remove burr and scratch. | |
| | | 12-2 Adjust position. | 3-5-2 |
| | | 13. No problem in needle? | |
| | | 13-1 Fix it properly . | 3-1-2 |
| | | 13-2 Select proper size of needle to match thread thickness. | 3-1-4 |
| | | 13-3 If tip of needle is warped or bent, replace. | 3-1-1 |
| | | 13-4 Replace. | |
| | | 14. No problem in bobbin case? | |
| | | 14-1 Remove rust and scratch. | |
| | | 14-2 If thread guide spring is off, replace it. | |
| | | 15. No problem in bobbin? | |
| | | 15-1 Remove scratch (iron bobbin). | |
| | | 15-2 If distorted. replace it. | |
| | | 16. Is needle bar spring not broken? | |
| | | 16-1 Replace it. | 3-3-7 |
| | | 17. Does needle bar make smooth movement? | |
| | | 17-1 If bent, replace it. | 3-3-7 |
| | | 18. No backlash in moving head? | |
| | | 18-1 Adjust positioning roller shaft. | 3-3-2 |
| | | 19. Needle doesn't drop in the center of needle hole. | |
| | | 19-1 Adjust positioning plate and adjust needle drop back and forth. | 3-3-4 |
| | | 19-2 Adjust position of needle selection unit, then adjust needle drop right and left. | 3-4-1 |
| | | 20. Is the lowest needle position proper? | |
| | | 20-1 Adjust mechanical lowest needle position. | 3-2-3 |
| | | 20-2 Adjust electric lowest needle position. | 4-2-1 |
| | | 21. Is needle height proper? | |
| | | 21-1 Adjust as specified. | 3-3-6 |
| | | 22. Is rotary hook timing proper? | |
| | | 22-1 Adjust as specified. | 3-5-1 |
| | | 23. Is clearance between needle and rotary hook proper? | |
| | | 23-1 Adjust as specified. | 3-5-1 |

( ) ---Reference instruction book

# 6-2-2 Trouble shooting (Thread break)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Thread break | Mechanical | 24. Check tip of keeper hit the bobbin case. | |
| | | 24-1 Adjust it regularly. | 3-6-12 |
| | | 25. Is take-up lever timing proper ? | |
| | | 25-1 Adjust as specified. | 3-2-8 |
| | | 26. No problem in timing belt ? | |
| | | 26-1 Adjust tension. | 3-8-1 |
| | | 26-2 If scratched or damaged, replace it. | 3-8-2 |
| | | 27. No problem in motor belt ? | |
| | | 27-1 Adjust tension. | 3-8-3 |
| | | 27-2 If scratched or damaged, replace it. | 3-8-4 |
| | | 28. Is revolution setting proper ? | |
| | | 28-1 Make automatic speed setting. | 4-4-5 |
| | | 29. Is inverter setting proper ? | |
| | | 29-1 Make setting. | 4-3-3 |
| | Operator | 1. Operation is wrong (no proper [OPTION] setting for sewing ?) | |
| | | 1-1 Tell how to operate. | (5-1) |
| | | 2.Is pattern dwindled too much by pattern adjustment ? | |
| | | 2-1 Adjust size so as to produce less thread break. | |
| | | 2-2 Use pattern edited again (density_ change). | |
| | | 3. Is thread tension properly set ? | |
| | | 3-1 <Upper thread> Considering sewing finish, set tension. | (8-1) |
| | | 3-2 <Bobbin thread> Considering upper thread tension, set tension. | (4-5) |
| | | 4. Is bobbin winding proper ? | |
| | | 4-1 Adjusting bobbin winding tension, wind with proper strength. | (4-4) |
| | | 5. Is bobbin put in bobbin case properly ? | |
| | | 5-1 Viewing from front of bobbin case, set so that bobbin turns left-wise. | (4-5) |
| | | 6. Does thread cone stand properly ? | (4-6) |
| | | 6-1 Keep thread from hitting felt. | |
| | | 6-2 Stand vertically. | |
| | | 7. Is passing of thread proper ? | |
| | | 7-1 Pass thread properly. | (4-7) |
| | | 8. Is cloth properly stretched ? | (6-2) (7-5) |
| | | 8-1 No loosening and no too much tightening. Even tension in depth and width. | |
| | | 8-2 Texture should be even in direction of X and Y. | |
| | | 9. Is frame properly set? | (6-3) (7-6) |
| | | 9-1 Frame should be put in positioning hole on tubular-frame. | |
| | | 9-2 No loosening of screw. | |

( ) ---Reference instruction book

# 6-2-2 Trouble shooting (Thread break)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Thread break | Operator | 10. Is frame used to suit pattern size?<br>10-1 Use frame to suit pattern size. | |
| | | 11. When you dispose of thread (thread remains around rotary hook),<br>didn't you damage rotary hook, needle plate with scissors?<br>11-1 Tell to dispose of thread carefully.<br>11-2 Open needle plate to dispose of thread. | |
| | | 12. Didn't you neglect cleaning and oiling?<br>12-1 Tell to always clean and use cleanly.<br>12-2 Tell to oil regularly. | (23-2) |
| | Thread &<br>cloth | 1. Is thread used to suit needle size?<br>1-1 Use thread to suit needle size. | 3-1-4 |
| | | 2. Is thread used to suit embroidery? (thread twist, tender thread).<br>2-1 Don't use too strongly twisted thread.<br>2-2 Twist of thread is to be left-wise.<br>2-3 Use tender thread.<br>2-4 Don't use thread with knot or uneven size. | 3-1-3 |
| | | 3. Is thread properly wound aginst cone?<br>3-1 Use thread to be wound smoothly. | |
| | | 4. Isn't tip of cone warped or isn't thread caught in scratch?<br>4-1 Remove warp and scratch. | |
| | | 5. Don't use thread left for a long period? (inferior thread).<br>5-1 Don't buy thread more than you use.<br>5-2 Tell not to store thread for a long period.<br>5-3 Tell how to store. (direct sunshine. humidity dust etc.) | |
| | | 6. Isn't poor unwoven cloth used? Is number of sheets used proper? | |
| | Environment | 1. Is strength of table and floor enough?<br>1-1 Reconsider place to install the machine.<br>1-2 Move the machine to place where floor is strong enough.<br>1-3 Use table with strength endurable against vibration. | (2-4) |
| | | 2 Are room temperature and humidity proper against thread?<br>2-1 It is desirable to install air conditioner to keep temperature and humidity<br>in a certain level. | |
| | | 3. Doesn't embroidery machine receive direct sunlight? (cause of inferior thread)<br>3-1 See not to expose to sunlight (spread curtain) | (2-5) |

( ) ---Reference instruction book

# 6-2-2 Trouble shooting (Thread break)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Thread break | Environment | 4. Is there something that produce steam, wasted cotton, dust around.<br>the embroidery machine?<br>5-1 Keep the embroidery machine off those things. | (2-5) |
| | | 5. Does thread go out of control by taking wind from outside or heater etc.?<br>6-1 Keep the embroidery machine off such wind.<br>6-2 Move the embroidery machine to proper place. | (2-5) |
| | Pattern | 1. Does thread break occur repeatedly at same place in design?<br>1-1 Check pattern to modify punching. | |
| | | 2. Is it too narrow between stitches?<br>2-1 Check pattern to modify punching.<br>2-2 Setting of [OPTION] menu. (Stitch sweep) | (14-4) |
| | | 3. Too many empty stitches?<br>3-1 Make [OPTION] setting. (this setting doesn't read empty stitches) | (14-4) |
| | Others | 1. Using spray paste (adhesive material)<br>1-1 Clean around rotary hook.<br>1-2 Replace or clean needle.<br>1-3 Use this paste at a given place and never use in front or back of the embroidery machine. | (23-2)<br>3-1-2 |

( ) ---Reference instruction book

# 6-2-3 Trouble shooting (Erroneous thread cut)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Erroneous thread cut (E-190) (E-193) | Mechanical | 1. Is thread cut timing proper? | |
| | | 1-1 Set timing to specified value. | 3-6-3 |
| | | 1-2 Check no loosening of screw on thread cut cam. | |
| | | 2. Isn't rubbing of fixed knife and moving knife weak? | |
| | | 2-1 Adjust to be able to rub properly. | 3-6-6 |
| | | 3. Does moving knife make smooth move? | |
| | | 3-1 Check if rubbing of moving knife and fixed knife is not too strong. | 3-6-8 |
| | | 4. Check Displace of moving knife. | |
| | | 4-1 Adjust of moving knife position. | 3-6-9 |
| | | 5. Check defacement of moving knife or fixed knife. | |
| | | 5-1 If possible, furnish with file. | |
| | | 5-2 Replace | 3-6-6 and 3-6-7 |
| | | 6. No backlash in up and down direction of knife drive shaft? | 3-6-8 |
| | | 6-1 Check no loosening of screw on moving knife. | |
| | | 6-2 Check no loosening of screw on knife drive shaft. | |
| | | 7. No backlash in fixed knife? | 3-6-8 |
| | | 7-1 Check no loosening of screw on fixed knife. | |
| | | 8. Does thread cut solenoid work properly? | |
| | | 8-1 Check cable. | |
| | | 8-2 If trouble found in CONT board, replace. | |
| | | 8-3 If trouble found in thread cut solenoid (or motor), replace. | |
| | | 9. No trouble in thread cut drive? | |
| | | 9-1 If thread cut roller broken, replace. | 3-6-2 |
| | | 9-2 If roller screw gets loosened, tighten firmly. | |
| | | 10. Is number of revolution proper at time of thread cut? | |
| | | 10-1 Make automatic speed setting. | 4-4-5 |
| | | 10-2 If trouble in CONT board, replace. | |
| | | 11. Is there no skipped stitch? | |
| | | 11-1 Adjust needle depth. | 3-3-6 |
| | | 11-2 Adjust clearance between needle and rotary hook. | 3-5-1 |
| | | 11-3 Is height of pressure foot proper? | 3-2-10 |
| | | 11-4 Is rotary hook timing proper? | 3-5-1 |
| | | 11-5 Is relation between needle and thread proper? | |

( ) ---Reference instruction book

# 6-2-3 Trouble shooting(Erroneous thread cut)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Erroneous thread cut (E-190) (E-193) | Mechanical | 12. Check the needle bar moves up and down during thread cut. | |
| | | 12-1 Adjust position of jump solenoid. | 3-2-5 |
| | | 12-2 Replace needle bar cushion. | 3-3-7 |
| | | 12-3 Replace needle bar driver. | 3-2-4 |
| | | 13. Is position of keeper proper? | |
| | | 13-1 Adjust the fixed position regularly. | 3-6-12 |
| | | 14. Check the movement of keeper goes smoothly. | |
| | | 14-1 Readjust if it is not smooth. | 3-6-12 |
| | Operator | 1. No negligence in cleaning thread cut device? | |
| | | 1-1 Tell to clean regularly. | (23-2) |
| | | # It's desirable to prepare brush with soft hair and air gun. | |
| | | 2. Is drive greased? | |
| | | 2-1 Apply grease to thread cut cam. | |
| | | 3. Is timing of thread tension proper? | |
| | | 3-1 <Upper thread> Considering sewing finish, set tension. | (8-1) |
| | | 3-2 <Bobbin thread> Considering upper thread tension, set tension. | (4-5) |
| | Environment | 1. Are power and voltage rated and stable? | |
| | | 1-1 Supply rated voltage. | |
| | Thread & cloth | 1. Is twist of thread too strong? | |
| | | 1-1 Use thread with proper twist. | |
| | | 2. No skipping by use of lots of paste? | |
| | | 2-1 Use small amount of paste. | |
| | | 2-2 Remove paste stuck to needle. | |

( ) ---Reference instruction book

# 6-2-4 Trouble shooting (Off-registration of pattern)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Off-registration of pattern | Mechanical | 1. Does frame move smoothly?<br>1-1 Avoid curling of thread and cloth.<br>1-2 Reinstall of outer cover in case of touch with outer cover.<br>1-3 Adjust with no clearance between Arm and Connecting plate B. | 2-1 |
| | | 2. Is bound of frame base too big?<br>2-1 Fix frame base between bearing and base without gap. | (6-1) |
| | | 3. Is carriage belt tension proper?<br>3-1 Adjust all belts as specified. | 3-7-1<br>3-7-3 |
| | | 4. No loosening of screws on carriage drive?<br>4-1 Check screw. If loosened, tighten firmly. | |
| | | 5. No lints or dust around idler pulley on carriage?<br>5-1 Clean | |
| | | 6. No damage in carriage belt?<br>6-1 If damaged, replace. | 3-7-2<br>3-7-4 |
| | | 7. No backlash of back and forth in moving head?<br>7-1 Adjust positioning roller shaft to remove backlash back and forth. | 3-3-2 |
| | | 8. Is height of pressure foot proper?<br>8-1 Adjust as specified. | 3-2-12 |
| | | 9. No problem in motion of pulse motor?<br>9-1 Check wiring. If screw got loosened, tighten more.<br>9-2 After 9-1, still problem, then replace. | |
| | | 10. No problem in motion of CONT board?<br>10-1 Check wiring. If screw got loosened, tighten more.<br>10-2 After 10-1, still problem, then replace. | |
| | | 11. Does't other frame than Happy's genuine one used?<br>11-1 If frame is too heavy, don't use it.<br>11-2 If setting is not proper, set it so as not to move. | |
| | | 12. No problem in LCD-CE board?<br>12-1 Try to initialize.<br>12-2 Replace of LCD-CE board. | 4-4 |
| | | 13. Is number of revolution proper?<br>13-1 Make automatic speed setting. | 4-4-5 |
| | | 14. Not affected by noise?<br>14-1 Don't use the machine near where noise is generated. | |
| | Operator | 1. Is setting of frame correct?<br>1-1 Frame should be put in positioning hole on tubular frame.<br>1-2 Set so as for screw not to loosen. | (6-3) (7-6) |

(  ) ---Reference instruction book

# 6-2-4 Trouble shooting(Off-registration of pattern)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Off-registration of pattern | Operator | 2. Is cloth properly stretched.<br>2-1 Stretch properly. | (6-2) (7-5) |
| | | 3. Is thread tension proper?<br>3-1 Observing sewing rhythm, set thread tension properly. | (4-5) (8-1) |
| | | 4. Was the machine left for a long time in middle of sewing?<br>4-1 Try to finish sewing as soon as possible. | |
| | Environment | 1. Is strength of table and floor enough?<br>1-1 Check where to place the machine again.<br>1-2 Move to where floor is strong enough.<br>1-3 Use strong table to be able to endure vibration. | (2-4) |
| | | 2. No problem in pulse motor driver by low power and voltage (variation)?<br>2-1 Supply rated voltage.<br>2-2 Use transformer.<br>2-3 Use stabilizer. | |
| | | 3. Is there no place where noise is generated near the machine?<br>3-1 Don't use the machine near where noise is generated. | |
| | | 4. Doesn't drive frame hit obstacle?<br>4-1 Remove obstacle.<br>4-2 When useing cap frame, see not to hit table. | (2-4)<br><br>(2-5) |
| | Thread & cloth | 1. Not using shrinkable cloth?<br>1-1 Use backing paper (consider number of sheets to use). | (4-3) |
| | | 2. Isn't breakable cloth is used by thread tightening?<br>2-1 Use backing paper (consider number of sheets to use). | (4-3) |
| | | 3. Is proper backing paper used?<br>3-1 Use backing paper to match cloth. | (4-3) |
| | | 4. Isn't cloth (embroidery) too heavy?<br>4-1 Don't use extremely heavy cloth. | |
| | Pattern | 1. Pattern data may be destroyed.<br>1-1 Read again.<br>1-2 Let new pattern read. | (5-6) |
| | | 2. Memory pattern was destroyed.<br>2-1 Let new pattern read. | (5-6) |
| | | 3. No problem in USB memory ?<br>3-1 Initialize and read again.<br>3-2 Prepare new USB memory. | |

( ) ---Reference instruction book

# 6-2-5 Trouble shooting(Upper thread comes off from needle hole)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Upper thread comes off from needle hole | Mechanical | 1. Is keeper in motion? | |
| | | 1-1 Check if cable was cut or there is something unusual. | |
| | | 1-2 In case solenoid is in trouble, replace. | |
| | | 1-3 In case CONT board is in trouble, replace. | |
| | | 2. Is keeper put in right place? | |
| | | 2-1 Put it as specified. | 3-6-9 |
| | | 2-2 Modify bent of keeper. | |
| | | 2-3 Adjust it again if movement is not smooth. | |
| | | 3. Is magic-tape on thread catch holder not worn? | |
| | | 3-1 Replace magic-tape. | |
| | | 4. Does bobbin thread holder hold bobbin thread? | |
| | | 4-1 Adjust pressure when contacting moving knife. | 3-6-8 |
| | | 4-2 In case bobbin thread holder is in trouble, replace. | |
| | | 4-3 Clean bobbin thread holder. | |
| | | 5. No error in thread cut (2 threads cut)? | |
| | | 5-1 Check and adjust thread cut timing. | 3-6-5 |
| | | 5-2 Position moving knife as specified. | 3-6-9 |
| | | 5-3 Check and polish burr or scratch on moving knife. | |
| | | 5-4 In case moving knife is in trouble, replace. | 3-6-6 |
| | | 6. Are clearance between needle and rotary point and needle height are proper? | |
| | | 6-1 Adjust clearance between needle and rotary hook as specified. | 3-5-1 |
| | | 6-2 Adjust needle depth. | 3-3-6 |
| | | 7. Doesn't thread catch hook cut upper thread? | |
| | | 7-1 Polish burr on hook. | |
| | | 7-2 In case hook is in trouble, replace. | |
| | | 8. Does thread catch hook hold upper thread? | |
| | | 8-1 Check if cable was cut or there is something unusual. | |
| | | 8-2 In case pulse motor is in trouble, replace. | |
| | | 8-3 Adjust fixing position. | 3-2-18 |
| | | 8-4 If hook is bent, modify. | |
| | | 8-5 In case hook is in trouble, replace. | |
| | | 8-6 In case CONT board is in trouble, replace. | |
| | | 9. Check tension of thread adjusting spring is too weak. | |
| | | 9-1 Adjust of tension. | 3-3-11 |
| | | 10. Check Stroke of thread adjusting spring is too big. | |
| | | 10-1 Adjust of stroke. | 3-3-12 |

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# 6-2-5 Trouble shooting(Upper thread comes off from needle hole)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Upper thread comes off from needle hole | Mechanical | 11.Check the needle bar moves when start sewing.<br>11-1 Adjust position to fix jump solenoid.<br>11-2 Replace needle bar driver. | <br>3-2-5<br>3-2-4 |
| | | 12. Is number of revolution proper when sewing started?<br>12-1 Make automatic speed setting. | <br>4-4-5 |
| | | 13.Is height of pressure foot proper?<br>13-1 Adjust as specified. | <br>3-2-12 |
| | Operator | 1. Isn't thread tension too strong?<br>1-1 Weaken tension not to cause trouble in sewing rhythm. | (4-5) (8-1) |
| | | 2. Keen in cleaning thread cut device?<br>2-1 Clean bobbin thread holder regularly. | <br>(23-2) |
| | | 3. Is setting of bobbin thread proper?<br>3-1 Pass thread on bobbin thread guide surely. | (4-5) |
| | | 4. Is bobbin thread properly wound?<br>4-1 Adjust tensile strength of bobbin winder and check holding plate.<br>4-2 Pull out bobbin thread to check if it comes out smoothly. | (4-4) (4-5) |
| | | 5. Is upper thread properly passed?<br>5-1 Pass properly again. | (4-6) (4-7) |
| | | 6. Does thread cone stand properly?<br>6-1 Keep thread from hitting felt.<br>6-2 Stand vertically. | (4-6) |
| | | 7. Is [OPTION] properly set?<br>7-1 Select longer setting of upper thread length. | (5-1) |
| | Thread & Cloth | 1. Is thread used to suit embroidery? (thread twist, tender thread).<br>1-1 Don't use too strongly twisted thread.<br>1-2 Twist of thread is to be left-wise.<br>1-3 Use tender thread.<br>1-4 Don't use thread with knot or uneven size. | 3-1-3 |
| | Environment | 1. Does wind let thread go beyond control? (outside wind, heater, and fan etc.)<br>1-1 Keep the embroidery machine off from wind. | (2-5) |
| | | 2. Is voltage of power as rated and stable?<br>2-1 Supply rated voltage. | |
| | Pattern | 1. Is there stop sewing stitch for start sewing?<br>1-1 Modify pattern. | |

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# 6-2-6 Trouble shooting(Upper thread remains)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Upper thread remains | Mechanical | 1. Upper thread is difficult to come out of keeper at time of thread cut (bent or warp etc.).<br>1-1 Modify bent or warp.<br>1-2 Replace keeper. | |
| | | 2. Keeper doesn't return properly at time of thread cut.<br>2-1 Modify bent of keeper.<br>2-2 Adjust position to fix.<br>2-3 Adjust it again if movement is not smooth. | 3-6-12 |
| | | 3. Upper thread does not come off from magic tape of thread holder.<br>3-1 Insert something(Thickness 0.1-0.2mm) into holder then move it right and left to put magic tape in order.<br>3-2 Replacement of Guard holder (upper) ass'y. | 3-3-14 |
| | | 4. Doesn't thread catch hook cut upper thread?<br>4-1 Polish burr on hook.<br>4-2 In case hook is in trouble, replace. | |
| | Operator | 1. Setting of thread tension is weak.<br>1-1 Strengthen so as not to cause trouble in sewing rhythm. | (4-5) (8-1) |
| | | 2. Is [OPTION] properly set?<br>2-1 Select length of upper thread [standard]. | (5-1) |
| | Thread & cloth | 1. Using hard cloth make thread difficult to go through.<br>1-1 Select needle and thread. | 3-1-4 |
| | | 2. Using thick cloth make thread difficult to go through.<br>2-1 Select needle and thread. | 3-1-4 |
| | | 3. Is thread used to suit embroidery? (thread twist, tender thread).<br>3-1 Don't use too strongly twisted thread.<br>3-2 Twist of thread is to be left-wise.<br>3-3 Use tender thread.<br>3-4 Don't use thread with knot or uneven size. | 3-1-3 |

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# 6-2-7 Trouble shooting (Malfunction of thread break detection)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Malfunction of thread break detection (empty detection) | Mechanical | 1. Trouble in turning detection roller.<br>1-1 Clean roller shaft holder.<br>1-2 Check if slit disc doesn't contacts sensor.<br>1-3 Clean sensor if dust gets stuck.<br>1-4 Check if cord doesn't contacts slit disc.<br>1-5 Check Disconnection of cable. | 4-2-2 |
| | | 2. Check circuit board.<br>2-1 Replace of CONT board.<br>2-2 Replace of TC 12 board. | |
| | | 3. Sometimes needle bar doesn’t work when start sewing.<br>3-1 Replace if cushion has been decrepit.<br>3-2 Replace of needle bar driver.<br>3-3 Adjust of jump solenoid position.<br>3-4 Clean and overhaul of Jump solenoid.<br>3-5 Replace of Jump solenoid. | 3-2-4<br>3-2-5<br>3-2-20 |
| | Operator | 1. No thread is passed through detecting roller.<br>1-1 Pass thread properly. | (4-6) (4-7) |
| | | 2. Is thread tension proper?<br>2-1 Observing sewing rhythm, adjust thread tension properly. | (4-5) (8-1) |
| | | 3. Is proper detection sensitivity of thread cut selected?<br>3-1 Select detection sensitivity according to sewing condition of thread and cloth etc. | (5-1) |
| | Environment | 1. Is there any device to yield lints etc. around the embroidery.<br>1-1 Keep it off the embroidery machine.<br>1-2 Move the embroidery machine to other place. | |
| | | 2. Doesn't thread go beyond control by wind? (thread comes off from needle hole by loosing)<br>2-1 Keep thread off wind.<br>2-2 Move the embroidery machine to other place. | (2-5) |
| | Thread & Cloth | 1. Isn't silicone agent used on thread?<br>(Thread slips at detecting roller part due to adhere of silicone.)<br>1-1 Clean silicone agent attached to detecting roller groove. | |

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# 6-2-7 Trouble shooting (Malfunction of thread break detection)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Malfunction of thread break detection (not detected) (slow detected) | Mechanical | 1. Check circuit board.<br>1-1 Replace of CONT board.<br>1-2 Replace of TC 12 board. | |
| | Operator | 1. Is thread tension proper?<br>1-1 Observing sewing rhythm, adjust to proper thread tension.<br>(Adjust it little bits stronger.) | (4-5) (8-1) |
| | | 2. Is proper detecting sensitivity of thread cut selected?<br>2-1 In case of being not detected, make [thread cut detection] setting to [yes].<br>2-2 Select detection sensitivity of thread cut according to sewing condition of thread and cloth etc. | (5-1) |

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# 6-2-8 Trouble shooting (Suspension of upper shaft)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Suspension of main shaft (E-18) (E-51) (E-52) | Mechanical | 1. Upper thread twine round rotary hook or rotary hook retainer.<br>1-1 Get rid of it. | |
| | | 2. Check return of keeper goes smooth. (when start sewing.)<br>2-1Adjust it regularly. | 3-6-12 |
| | | 3. Check upper thread is sticking at thread guide part of bobbin case.<br>3-1 Get rid of it.<br>3-2 Do not use of bobbin case in which thread guide is coiled type. (use standard type) | |
| | | 4. Out of Needle bar block B from pressure foot block.<br>4-1 Insert needle bar block B into pressure foot block by doing needle bar change manually.<br>4-2 Clean and overhaul of Jump solenoid. | 3-2-20 |
| | | 5. Defect on drive part of pressure foot.<br>5-1 Modify Pin B and hit part of link A and B by sand paper.<br>5-2 Replace of pressure foot block ass'y and link ass'y. | 3-2-13 |
| | | 6. Effect by breakage of parts.<br>6-1 Repair broken place. | |
| | | 7. No damage in electric parts?<br>7-1 Replace of CONT board.<br>7-2 Replace of Timing Board.<br>7-3 Replace of inverter. | |
| | | 8. Trouble of software in LCD-CE circuit board.<br>8-1 Initialize, then make automatic speed setting. | 4-4-5 |
| | | 9. Trouble in control of number of revolution.<br>9-1 Make automatic speed setting. | 4-4-5 |
| | Operator | 1. Isn't foreign stuff such as thread or cloth caught in where revolution is driven.<br>1-1 Get rid of foreign stuff.<br>1-2 Stretch properly. | (6-2) (7-5) |
| | | 2. Isn't thread tension too strong (stop at time of action of thread cut)?<br>2-1 Weaken tension so as not to cause trouble in sewing rhythm.<br>3. Check condition of lubrication.<br>3-1 Lubricate (refer to message) | (4-5) (8-1) |
| | Environment | 1. Check adequate level of voltage (refer to trip of inverter).<br>1-1 Supply rated voltage.<br>100V – 115V -10V / +15V<br>200V – 230V -10V / +10V | |

( ) ---Reference instruction book s ---Standard c ---Color monitor

# 6-2-9 Trouble shooting (Malfunction of needle bar change)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Head does not move<br>(E-021)<br>(E-022) | Mechanical | 1. Check lint or cloth is seized between Lower Moving rail and Bearing.<br>1-1 Remove seized lint or cloth. | |
| | | 2. Check lint or waste is seized in gap of Moving Cam.<br>2-1 Remove seized lint or waste. | |
| | | 3. Effect by breakage of parts.<br>3-1 Repair broken place. | |
| | Operator | 1. Check Stopper of Moving Head is removed.<br>1-1 Remove Stopper. | |
| Uncontrollable Move<br>(E-024)<br>(E-025) | Mechanical | 1. No problem in sensor circuit board ?<br>1-1 Clean dust attached to sensor.<br>1-2 Replace sensor circuit board. | 4-2-3 |
| | | 2. Trouble in potentiometer.<br>2-1 Replace | 4-2-4 |
| | | 3. Needle number is not exactly recognized.<br>3-1 Recognize needle number with maintenance mode. | 3-4-2 |
| | | 4. Breakage of Pulse Motor .<br>4-1 Replace Pulse Motor. | |

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# 6-2-10 Trouble shooting (Defect on Thread catcher)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| does not catch thread | Mechanical | 1. Thead catcher does not extend hook sufficiently.<br>1-1 Adjust position of Thread catcher .<br>1-2 Adjust position of Thread holder. | <br>3-2-18<br>3-3-13 |
| | | 2. Excessive distance between Hook and tip of Needle.<br>2-1 Adjust position of Thread catcher.<br>2-2 Adjust position of Thread holder. | <br>3-2-18<br>3-3-13 |
| Hook of Thread catcher does not extend | Mechanical | 1. Check Hook of Thread catcher bent or not.<br>1-1 Repair bent Hook.<br>1-2 Replace Hook. | |
| | | 2. Check position of Thread catcher is proper.<br>2-1 Adjust | <br>3-2-18 |
| | | 3. Check position of Thread holder is proper.<br>3-1 Adjust | <br>3-3-13 |
| | | 4. Check Thread catcher.<br>4-1 Check cable is securely connected.<br>4-2 Replace Pulse Motor with trouble. | |
| | | 5. Check CPU Board.<br>5-1 Replace CONT Board. | |
| Hook hits or catches Needle (E-193) | Mechanical | 1. Check Hook is bent or not.<br>1-1 Repair bent Hook.<br>1-2 Replace Hook. | |
| | | 2. Check position of Thread catcher is proper.<br>2-1 Adjust | <br>3-2-18 |
| | | 3. Check position of Thread holder is proper.<br>3-1 Adjust | <br>3-3-13 |
| | Operator | 1. Check if Needle is securely set.<br>1-1 Set Needle properly. | <br>3-1-2 |
| Constant display of E-193 | Mechanical | 1. Trouble of Photo sensor.<br>1-1 Replace Photo sensor. | |

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# 6-2-11 Trouble shooting (Others / Mechanical)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Needle Breakage | Mechanical | 1. Check Needle is not bent. | |
| | | 1-1 Replace bent Needle. | 3-1-2 |
| | | 2. Check Moving Head set securely. | |
| | | 2-1 Adjust Positioning Roller Shaft. | 3-3-2 |
| | | 3. Secure adequate distance between Needle and Rotary Hook. | |
| | | 3-1 Adjust distance properly. | 3-5-1 |
| | Operator | 1. Is thread method in proper way? | |
| | | 1-1 Threading again in a proper way. | (4-7) |
| | | 2. Check upper thread comes in a smooth way. (Thread stand, Thread tension point, double back etc) | |
| | | 2-1 Adjust place be caught in. | |
| | | 3. Check whether fabric is fixed firmly or not. | |
| | | 3-1 Hooping fabric firmly again. | (6-2) (7-5) |
| Defect of pressure foot movement | Mechanical | 1. Check whether pressure foot and thread catcher holder touch each other or not. | |
| | | 1-1 Adjust installment position of thread catch holder. | 3-3-13 |
| | | 1-2 In case pressure foot is fixed at an angle, fix it vertically again. | |
| | | 2. Defect of censor circuit board. | |
| | | 2-1 Replace of censor circuit board. | |
| Abnormal noise | Mechanical | 1. Check whether needle clamp touch needle guard or not. | |
| | | 1-1 Adjust direction of needle clamp. | 3-3-6 |
| | | 1-2 Adjust of backward and forward position of thread catch holder. | 3-3-13 |
| | | 1-3 In case it has bend of right or left direction, adjust it's fix. | |
| | | 2. By defect of cover installation. (Pressure foot drive, Carriage etc) | |
| | | 2-1 Take care of insert condition, clearance etc and fix again. | |
| | | 3. By lack of oil inside rotary hook. | |
| | | 3-1 Refuel | (23-1) |
| | | 3-2 Replace of rotary hook | 3-5-1 |
| | | 4. Touching of cap switch bracket on X carriage to cover. | |
| | | 4-1 Adjust bend of bracket. | |
| Big noise | Mechanical | 1. Gap between pressure foot block and needle bar boss B. | |
| | | 1-1 Replace of pressure foot block. | 3-2-13 |
| | | 2. Bearing gap of take up crank ass'y. | |
| | | 2-1 Adjust bearing. | |
| | | 2-2 Replace of bearing. | |
| | | 3. Gap between take up lever ass'y and take up clank ass'y. | |
| | | 3-1 Replace of take up lever ass'y. | 3-3-9 |
| | | 3-2 Replace of take up lever crank ass'y | |

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# 6-2-12 Trouble shooting (Others / Electric)

| Trouble | Factor | Cause of trouble and measure | Page |
|---|---|---|---|
| Frame overrun | Mechanical | 1. Interference between censor circuit board and douser.<br>1-1 Position adjustment of douser.<br>1-2 Replace of censor circuit board. | |
| | | 2. Check whether cable has problem or not.<br>2-1 Replace in case damage exists.<br>2-2 Insert connector again. | |
| | | 3. Check CONT board.<br>3-1 Replace of CPU circuit board. | |
| Key on control box can not be pressed down and returned | Mechanical | 1. When removing panel in replacing circuit board , due to poor cable bundling, circuit board being pushed from inside.<br>1-1 Bundle cable again | |
| Defect of LCD | Mechanical | 1. Check LCD .<br>1-1 Replace of LCD | |
| | | 2. Inadequate condition of cable insertion<br>2-1 Insert to the back firmly | |
| | | 3. Check whether LCD-CE board is out of order or not.<br>3-1 Replace of LCD-CE board | |
| Defect of data communication (E-90) (E-91) | Mechanical | 1. Check whether cable is insert firmly.<br>1-1 Insert again | |
| | | 2. Check whether PC has problem or not.<br>2-1 Affirm whether there is problem or not. | |
| | | 3. Check whether LCD-CE circuit board is out of order or not.<br>3-1 Replace of CD-CE board. | |
| Pattern disappears / Watch doesn't indicate time | Mechanical | 1. Trouble in back-up battery<br>1-1 Replace battery on CONT board. | 4-1-2 |
| | | 2. No trouble in memory card on LCD-CE board?<br>2-1 Conduct [memory all clear] in maintenance mode.<br>2-2 If above measure doesn't solve the trouble, replace LCD-CE circuit board. | 4-5-3 |

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# 6-3-1 Error and measure

When trouble occurred while the machine is running, error number and error item will be displayed. After confirming contents, press key [OK] o release error, then restore in accordance with measure in this list.

| No. | Message | Error | Measure | Page |
|---|---|---|---|---|
| 001 | Circuit board | Trouble detected in control circuit board. | (1)Turn power off once and turn on again.<br>(2)If recurred, replace LCD-CE board. | 4-1-1 |
| 002 | Power source | Power failure or abnormal voltage | | |
| 004 | System memory | Trouble in system memory. | Replace LCD-CE board. | 4-1-1 |
| 015 | Inverter trip | Trouble in drive unit on main shaft.<br>Overload on main shaft motor,<br>damage in drive unit on main shaft. | (1)Turn power off, turn main shaft by hand and if no trouble found, turn power on again.<br>(2)If trouble found, repair where damaged.<br>(3)If inverter in trouble, replace.<br>(4)Check if voltage high or not. If high,check origin of power source of factory.<br>Or use stabilizer, transformer to set to rated voltage. | 4-3 |
| 018 | Main shaft | Suspension of main shaft in mid way. | (1)Check if trouble found between main shaft and drive. If trouble found, restore.<br>(2)If recurred, find cause and fix.<br>(3)Make automatic speed setting again.<br>(4)If inverter in trouble, replace. | 4-4-5<br>4-3 |
| 020 | Needle detect | Needle position not detected.<br>Trouble in stop position of needle selection unit. | (1)Turn needle selection cam by hand to set to regular position.<br>(2)Fix needle selection related mechanical trouble.<br>(3) Replace sensor circuit board or potentiometer. | 4-2-4 |
| 021<br>022 | Needle move | Suspension of needle selection motor in mid way.<br>Trouble in take-up lever hinders.<br>Trouble in position detecting circuit board. | (1)Turn needle selection cam by hand to set to regular position.<br>(2)Fix needle selection related and take up lever related troubles.<br>(3)Replace sensor circuit board or potentiometer. | 4-2-4 |

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| No. | message | Error | measure | page |
|---|---|---|---|---|
| 024 | Needle center | Stop position of needle bar is off center | (1)Turn needle selection cam by hand to set to regular position.<br>(2)If trouble occurs repeatedly, fix mechanical trouble in needle selection & its vicinity. | |
| 025 | Needle over | Specified needle number went beyond needle number of the machine. | Adjust position of needle selection cam (potentiometer) and needle number of moving head. | 3-4-2 |
| 026 | Needle differ | As needle number differed from memory when power turned on, it was renewed. | (1)Turn power off once and turn on again.<br>(2)Let the machine recognize needle number. | 3-4-2 |
| 030 | Slow mismatch | Inadequate adjustment of number of low speed revolution.<br>Low speed revolution doesn't come below 100rpm. | (1)Make automatic speed setting.<br>(2)If not solved even after speed adjustment, replace LCD-CE board. | 4-4-5<br>4-1-1 |
| 050 | C point | Main shaft stops off its position. | (1)Turn main shaft to plus direction to set to C point. | ( 24-4 ) |
| 051 | L sensor | Poor lowest needle position sensor on timing detecting circuit board.<br>Damage in timing detecting circuit board, stained photo sensor, poor adjustment of slit disc. | (1)If photo sensor is stained, clean.<br>(2)Adjust timing.<br>(3)Replace main shaft timing circuit board. | 4-2-1 |
| 052 | C sensor | Damage in color change point sensor on timing circuit board.<br>Damage in timing detecting circuit board, stained photo sensor, poor adjustment of slit disc. | | |
| 055 | Take-up cover | Take-up cover is open.<br>Limit switch of take-up cover is defective. | (1)Please close take-up cover.<br>(2)Replace the limit switch if defective. | |
| 060 | X limit | Drive frame went beyond limits in X direction. | (1) Move drive frame back to limits with move key.<br>(2) Correct pattern size and setting contents. | |
| 061 | Y limit | Drive frame went beyond limits in Y direction. | | |

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| No. | message | Error | measure | page |
|---|---|---|---|---|
| 090 | Miss reception | Error has occurred during data transfer | Let the machine read pattern data from first. | ( 5-5 ) |
| 091 | No send | Data is not put in for over 10 seconds. | Let the machine read data from first. | ( 5-5 ) |
| 103 | Data format | Machine unable to determine format of pattern data. | (1)Check format of pattern data.<br>(2)By setting reading of pattern data, | ( 14-4 )<br>( 14-4 ) |
| 104 | Miss function | Timing to read pattern data doesn't conform. | Read pattern data again from the first. | ( 5-5 ) |
| 105 | Dual function | One stitch data has more than 2 functions. | (1)Read pattern data again from the first.<br>(2)Check and modify the design data if there is wrong. | ( 5-5 ) |
| 106 | No function | Interval between start read time and time of reception of actual pattern data | Read pattern data again from the first | ( 5-5 ) |
| 108 | Improper read | While reading pattern data, there accrued error in internal processing. | Read pattern data again from the first. | ( 5-5 ) |
| 110 | Memory full | While reading pattern data, memory exceeded its capacity. | (1)Delete unnecessary patterns and read from the outset. | ( 5-B ) |
| 111 | Change over | While reading pattern data, the frequency of color change (color No.) exceeded 250 times. | (1)Modify pattern data and reduce frequency of color change of one pattern to less than 250 times.<br>(2)Divide pattern data and reduce frequency of color change of one pattern to less than 250 times. | |
| 112 | Data error | Pattern data of pattern to be embroidered is damaged. | (1)Read pattern data again from the first.<br>(2)Read pattern data again if you have a backup data. | ( 5-B ) |
| 114 | Id over | The number of pattern in memory has reached maximum of 250. | Delete unnecessary patterns and read. | ( 5-B ) |
| 116 | Not found Id | Specified pattern does not exist. | (1)Check setting.<br>(2)Re-initialize machine system. | 4-4 |
| 118 | Trace data over | The stitch number counts over 1024 stitches during preparing Trace data. | Set Embroidery area of pattern data within 2m(X) x 2m(Y). | |
| 120 | Memory error | It became impossible to retain contents of memory. | (1) Turn power off once and turn on again.<br>(2) If problem recurs frequently, replace LCD-CE board. | 4-1-1 |

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| No. | message | Error | measure | page |
|---|---|---|---|---|
| 130 | Disk error | Unable to communicate continuously with memory media. | (1)Turn off power source once and turn it on again.<br>(2)Memory media reading processor may defective.<br>Replace the LCD-CE board. | 4-1-1 |
| 131 | Device no ready | Memory media is not set. | Check if memory media is properly set. | ( 5-5 ) |
| 133 | Bad disk | Improper or faulty memory media. | (1)Memory media might be not eadable with the machine. Prepare readable memory media for the machine.<br>(2)Memory media might be defective. Prepare another memory media which is not defective.<br>(3)Initialize (FAT 32) the memory media if it is not initialized. | ( 5-5) |
| 141 | Not found name | Designated pattern is not found. | Memory media might be not readable with the machine.<br>Prepare readable memory media for the machine. | ( 5-5 ) |
| 142 | Disk full | Memory media is full to capacity. | Clear unnecessary patterns or use a different memory media. | |
| 143 | Multi name | Another pattern with same name has been detected while attempting to write to memory media. | Change name, use a different memory media, or overwrite existing pattern. | |
| 190 | Cut blade | Thread cut knife is not at stop position. | (1)Restore the moving knife to stop position.<br>(2) Check dirt of trim sensor or position of slit.<br>(3)Modify the adjustment if the problem repeats.<br>(4) Adjust sensor position. | ( 24-5 ) |
| 191 | Cut Sensor | Thread cutting device did not move correctly. | (1) Press the [CUT] button 2~3 times.<br>(2) Check if thread is twined around the moving knife.<br>(3) If photo sensor is stained, clean.<br>(4) Replace the photo sensor board. | |
| 193 | Catcher | Thread catch hook is not in its stop position. | (1)Check if mistake is found in thread cut. If found, cut thread and move thread catch hook to proper position.<br>(2)Adjust and correct trouble that hinders motion of thread catch hook. | ( 24-6 ) |
| 215 | Frm. drive err | Frame movement did not complete. during normal movement. (Time over) | (1) Check timing sensor unit and slit.<br>(2) Update program | 4-4-3, 4-4-4a |
| 255 | Default Error | During embroidery, frame movement did not complete until main shaft reach “Lowest needle position". | Re-initialize machine speed setting.<br>Check adjustment of upper shaft timing.<br>(C point / L point) | 4-4-5 |

( ) ----- Reference instruction book

# 6-4-1 Tables for timing / adjustment value

| | | Tables for Timing/Adjustment value |
|---|---|---|
| Take-up lever timing | | 10 degrees |
| Rotary hook timing | | 25 degrees |
| Needle height | | 5 degrees |
| Thread cut timing (except for Rev.A) | | 116 degrees (+0 / -2degrees) |
| Main shaft timing | L | LED2 light out at 0 degrees |
| | C | LED1 light on at 265-282 degrees |
| Carriage | X | 200g |
| | Y | 200g |
| Timing belt | | - |
| Motor belt | | 320 – 330 g |

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