Maintenance Manual for Embroidery Machine

HCR2 SERIES
Version 1.5

HappyJapan Inc.

For safe adjustment and repair

In order to conduct adjustment and repair safely and surely,

please be 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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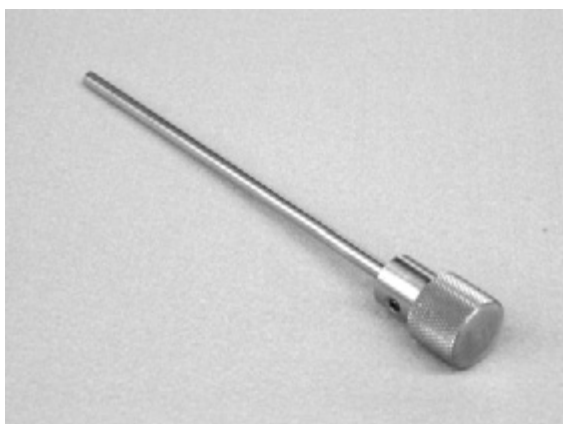
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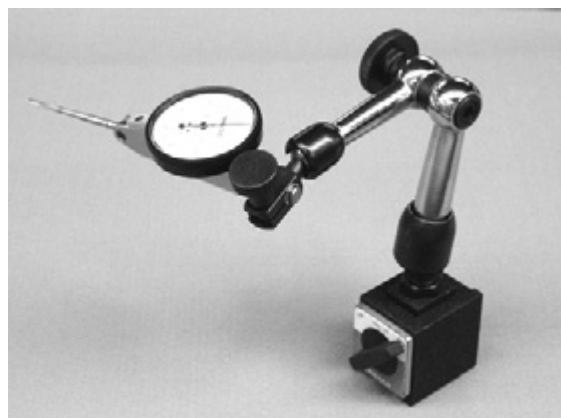
Special tool, Measuring equipment, Other

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M0404342

Needle height gauge　(Page 15, 51)

1   Placement of key mechanical parts

Control box

Thread guide pillar

Thread tension unit

Take-up lever

Needle bar change unit

Moving head

Thread guide A

Tread stand

Needle plate

Rotary hook   Rotary hook cover

Thread holder

1   Placement of key mechanical parts

Timing detecting unit

Y carriage

Upper shaft

X carriage

Thread cutting driver
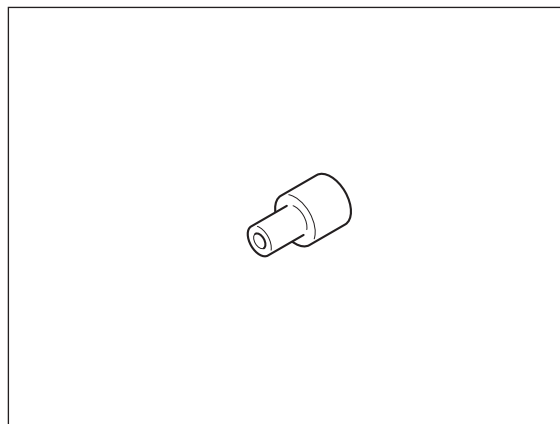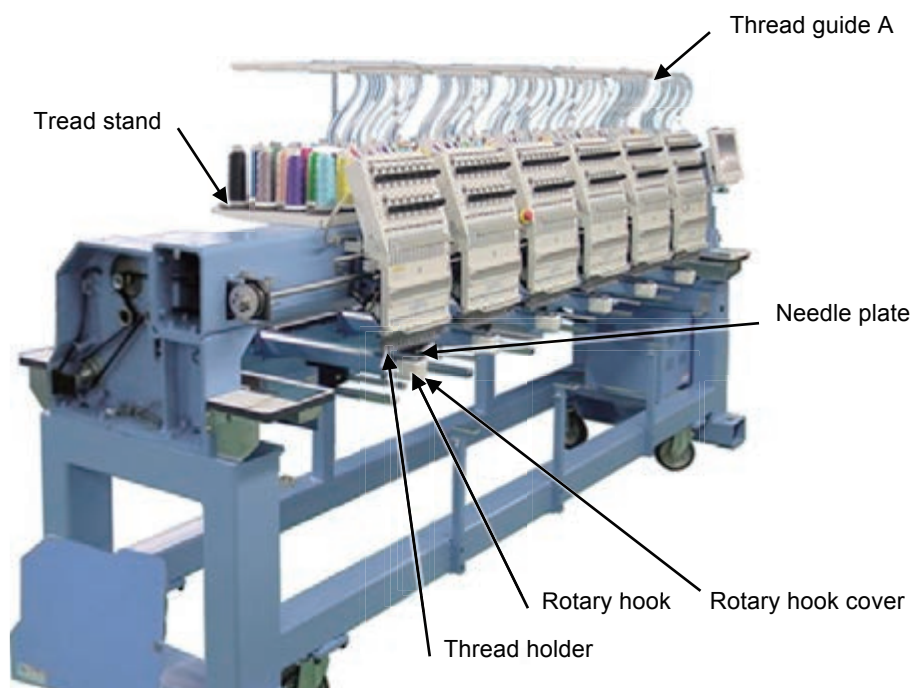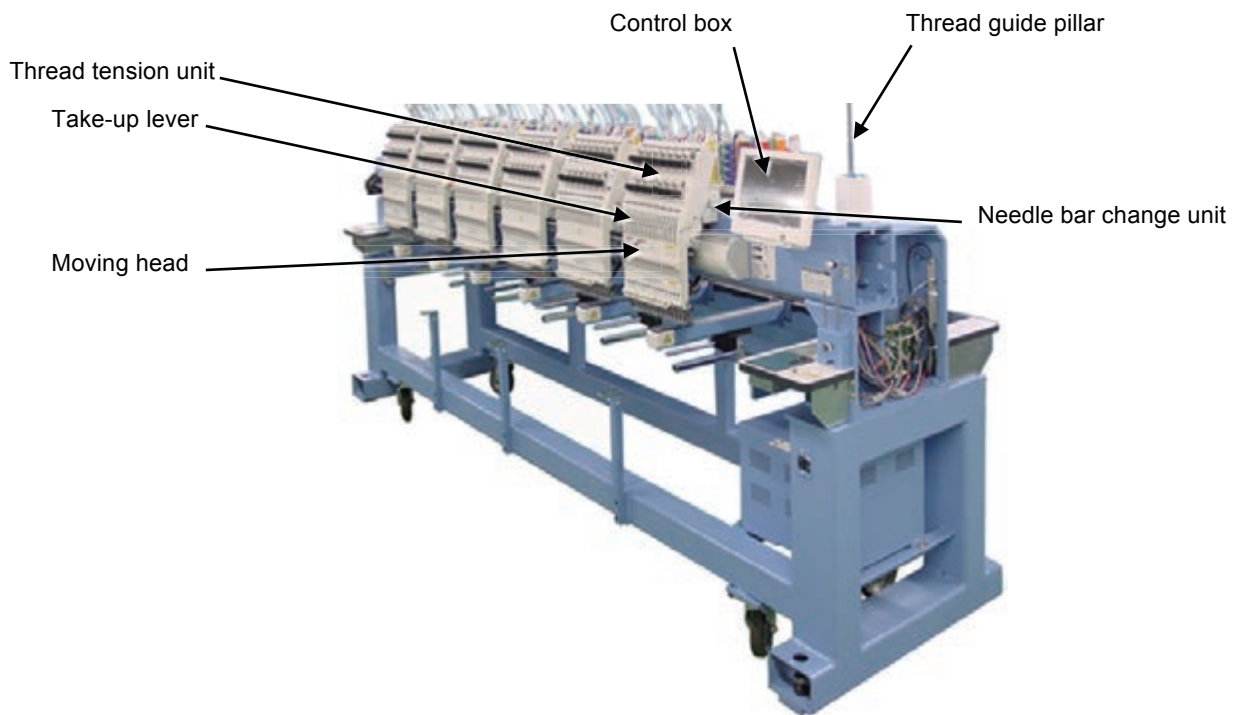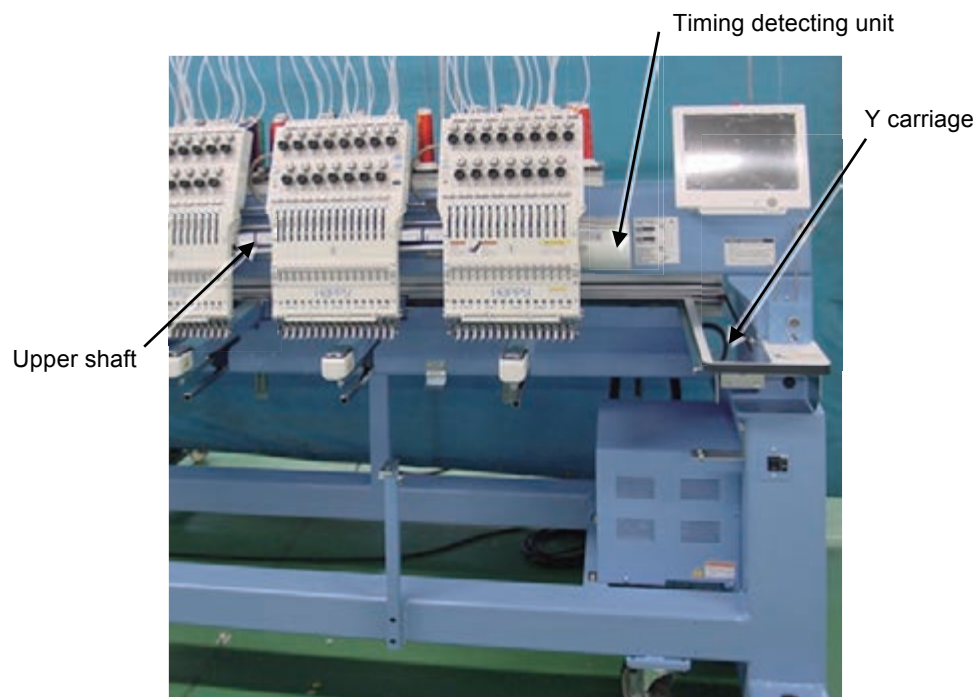
2-1, 2-2   Setting up the machine

2-1   Machine installation

Higher | Lower
Tighten
the lock nut
Water level
Head bed
Bolt
Lock nut
Block base
Rubber mount
Pipe cover
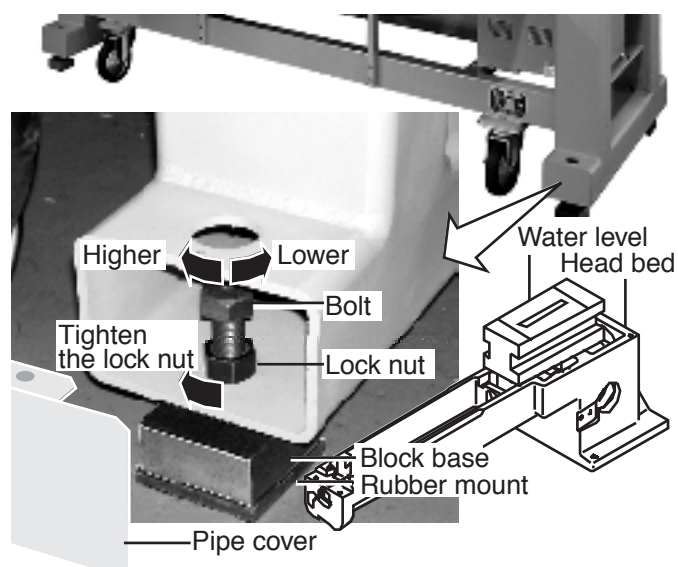
(1) place block base and rubber mount under bolts and adjust

bolts so that the machine becomes level.

Block bases and rubber mounts are included in

accessories.

At this moment, get caster slightly risen from the floor.

As shown in Fig., levelers should be placed on both sides

of head bed with upper cover removed.

(2) Fix the lock nut.

(3) Fix the pipe cover.

2-2   Assemble the thread guide

③ Thread guide A   Screws   ②

① Thread guide pillar
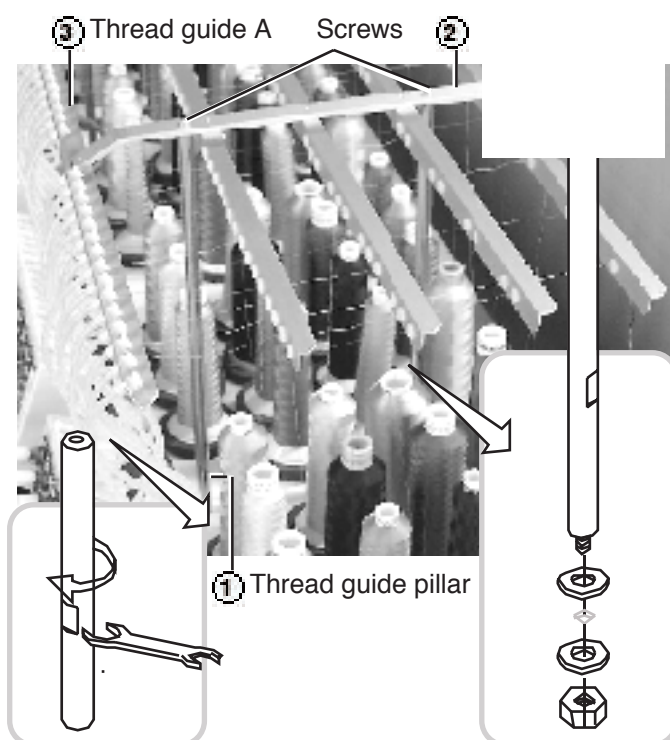
(1) Turn the thread guide pillar (front [long], rear [short])

clockwise with a spanner until tight.

Fix rear thread guide pillar with a washer and a nut (M8).

<Spanner> 10mm, 13mm

(2) Install the thread guide ass'y with supplied screws (M4x8).

(3) Fix thread guide A (with spiral tube) on thread guide ass'y

with screws (M3x8) from lower side.

2-3, 2-4　Setting up the machine

2-3　Removal of stopper

(1) Loosen the screw and remove the red shipping collars that

  are equipped on the both side of the guide bar.

(2) Remove head stopper.

  < Note > Number of head stopper is depending on model.

Head stopper
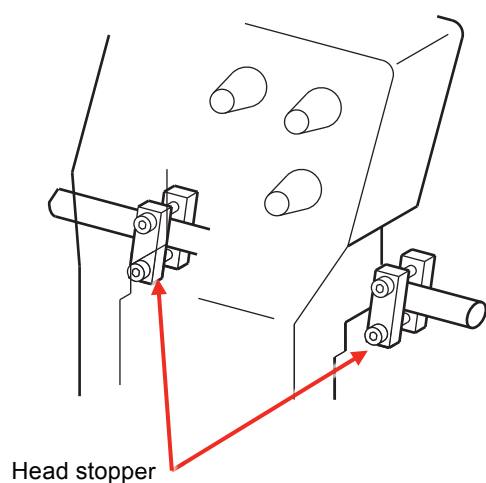
2-4　Check of needle position

 (1). Turn power switch ON, and enter user maintenance

  mode.

  Refer to [5　User maintenance mode]

(2) Remove bobbin case.

(3) With help of user maintenance mode, please move needle

  bar down and confirm needle position is center of needle

  hole on needle plate.

  < Note > Please move needle bar slowly

  < Note > Please check position of 8th needle, then check

  1st and 15th needle.

Needle　　　　　Needle hole of needle plate
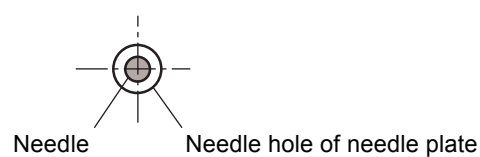
2-5　Setting up the machine

2-5　Check of needle height.

(1) Move moving head to the position which 8th needle is

active.

Remove bobbin case.

(2) Bring needle bar down.

Refer to [5　User maintenance mode]

(3) Turn upper shaft anti-clockwise and set dial disc to [L + 10

degrees].

Turn brake switch ON.

(4) Put needle height gauge in rotary hook.

(5) Check if the needle tip touches to the gauge slightly.
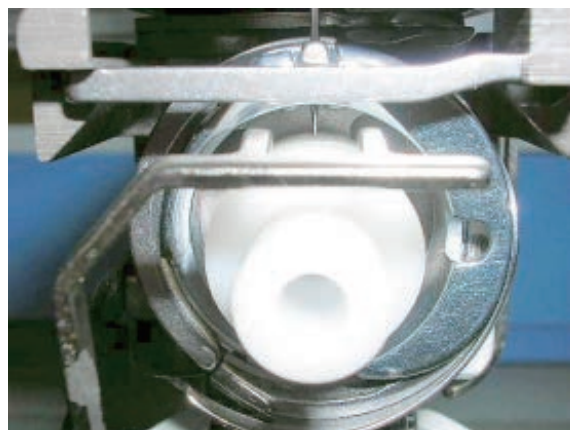
(6) Take "Needle height gauge" out from hook.

2-6, 2-7　Setting up the machine

2-6　Check of rotary hook timing

(1) Remove needle plate, Move moving head to the position

which 8th needle.

Turn upper shaft and set to lowest needle position [L]

Refer to [5　User maintenance mode]

(2) Turn upper shaft anti-clockwise and set dial disc to [25

degrees].

Turn brake switch ON.

(3) Check the position of needle and tip of hook as below.
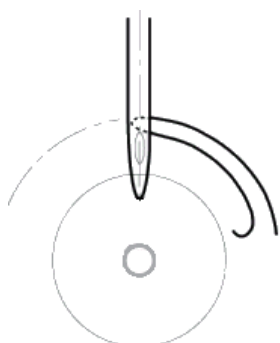
(4) Check the clearance between needle and rotary hook

should be [0.1 ~ 0.2mm].
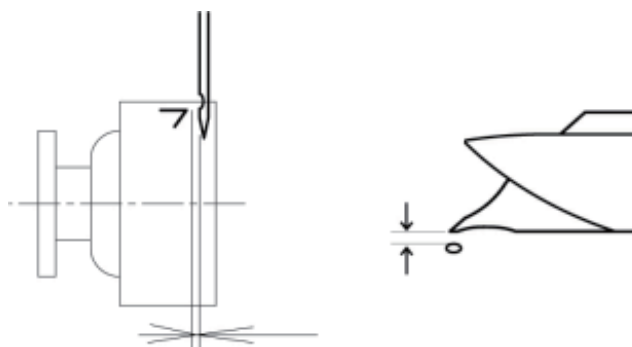
(5) Fix the needle plate.

2-7. Oiling

Lubricate the specified oil locations.

Oil : #10 Sewing machine oil
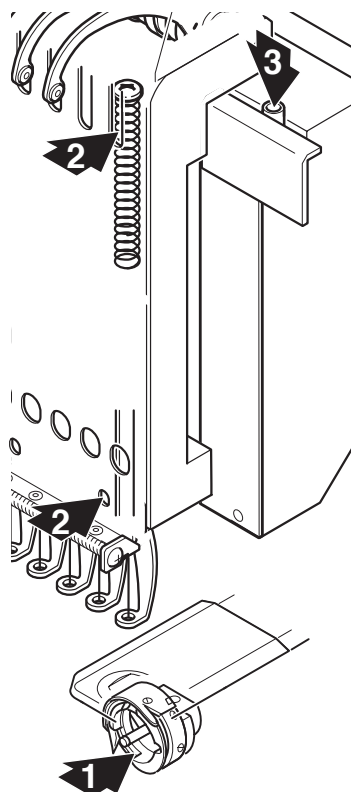
1) Rotary hook Between the outer and inner rotary hook

2) Needle bar

3) Head shaft

2-8   Setting up the machine

2-8   Check of thread path

   To keep stable and high quality stitches, please keep

   places where thread contacts in the best condition.

   <Note> Pleas confirm that there is no burr and crack at the

   position which thread is passing.

(1) Thread tension, Thread guide, Rectifier

      a) Revolution must be smooth

      b) No sticking of lint or dust

(2) Thread Adjusting Spring

      a) No burr and crack

      b) Spring move smoothly

(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

2-8　Setting up the machine

(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.
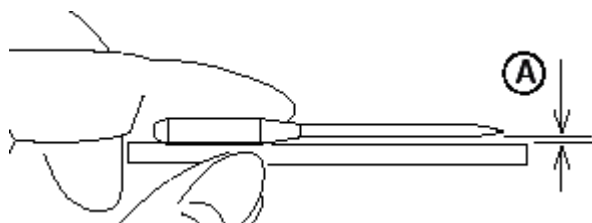
(6) Needle plate

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

Surface

Two setscrews

(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.
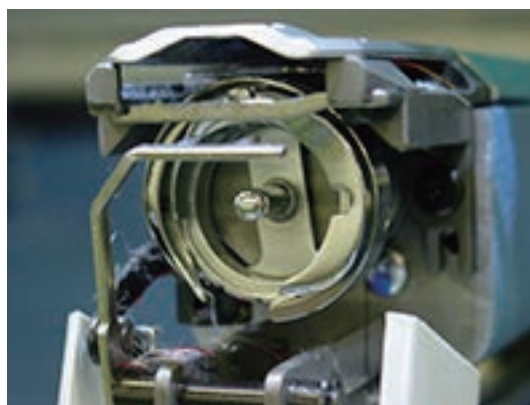
(9) Keeper

　a) No burr and crack in needle hole and around it.
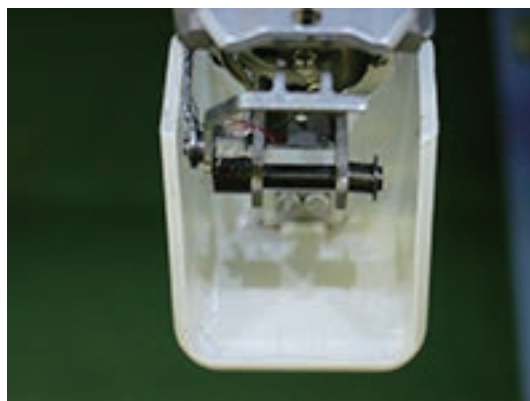
2-8   Setting up the machine

(10) Rotary hook retainer

   a) There is No burr and crack at the position which thread

 pass through.

Rotary hook retainer

20
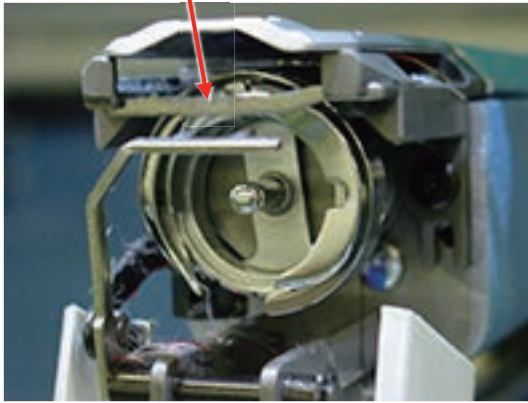
2-9   Setting up the machine

2-9   Threading

- Upper thread

Please adjust minor thread tension unit that detection rotary is not slipping and turn smoothly.

< Note > If tension of minor thread tension unit is too low, detecting rotary does not turn smoothly and thread slip on rotary.

Detecting rotary

Please check thread is not disturbed by spring.
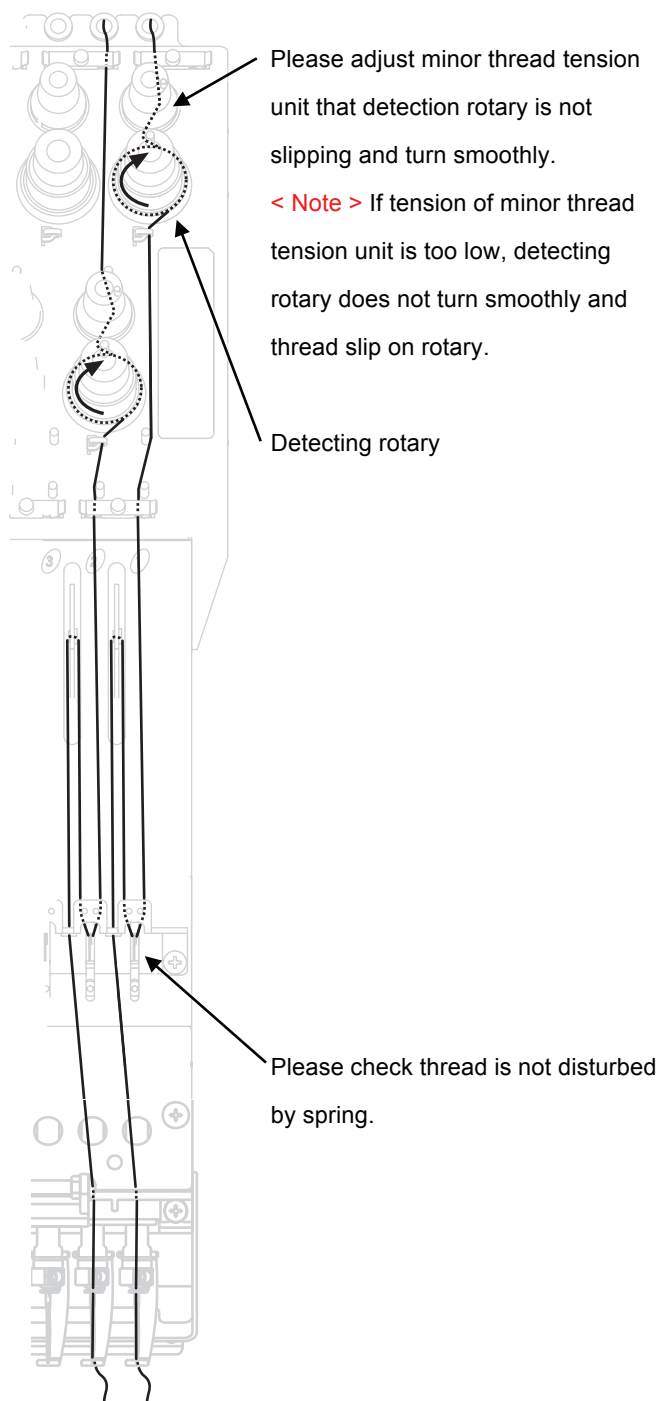
Upper thread tension should be adjusted depending on type of thread, needle and fabric etc.

< Standard >   100 ~ 150Cn (gf)
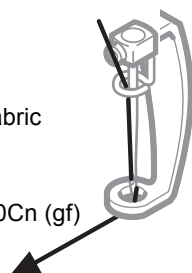
- Bobbin thread

Bobbin thread tension is depending on adjustment of upper thead.

Please note that bobbin will turn to arrow-marked direction when you pull bobbin thread.

<Standard>   25 ~ 35cN(gf)
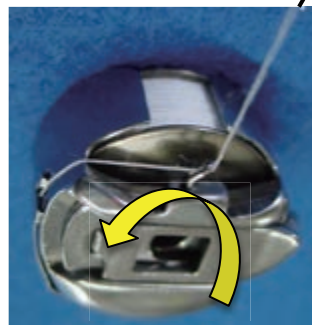
< Note > Please check thread is not disturbed by finger or latch.

Finger

Latch
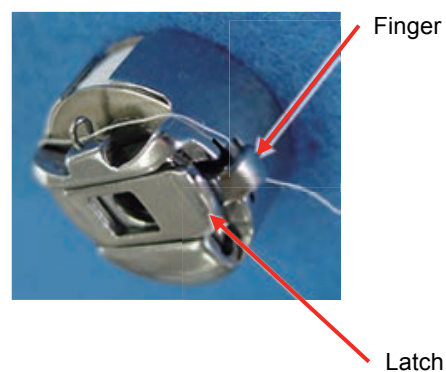
2   Setting up the machine

2-10   Trial sewing

(1) Turn thread break detecting switch ON.
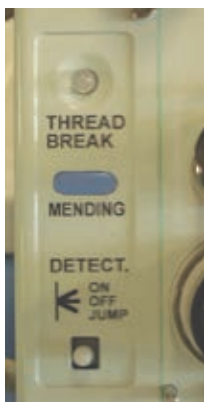
(2) Please confirm that thread trimming, thread catcher,

jumping is functioning.

< Important > For a month, please use machine with 70%

of maximum speed.

3-1   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.

Needle holder

Needle

Front
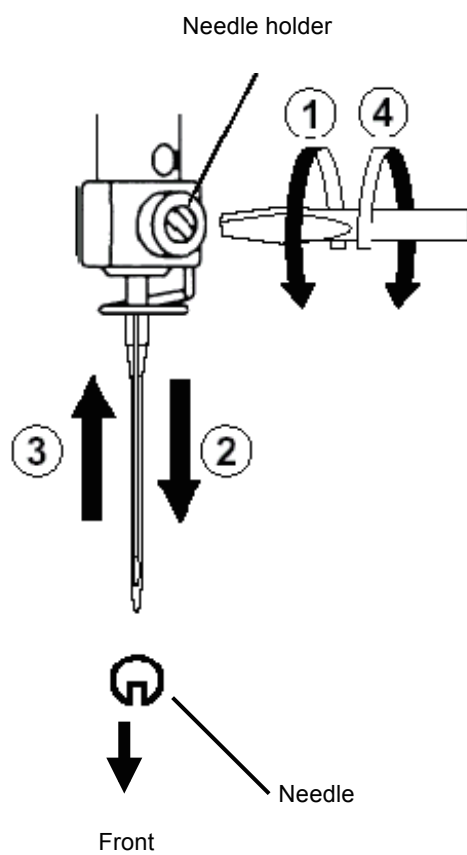
3-2   Selection of thread

1. Selection of upper thread.

<Description>

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

<Thickness>

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

<Twist>

Z twisted thread is to be used.

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

| Z-twisted | S-twisted |
| (Left - 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).

3-3   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 (rows German 65/70 through 85/90)

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

4-1-1   Exchange of needle bar driver

1. Remove moving head.

   Please refer to [4-2-1, 4-2-2   Assemble and remove

   moving head].

2. Remove needle bar driver.

2-1. Slide moving head to 8 th needle. And remove the Slide

   unit.   (Hexagon socket set screw : M4-10   2 pcs)
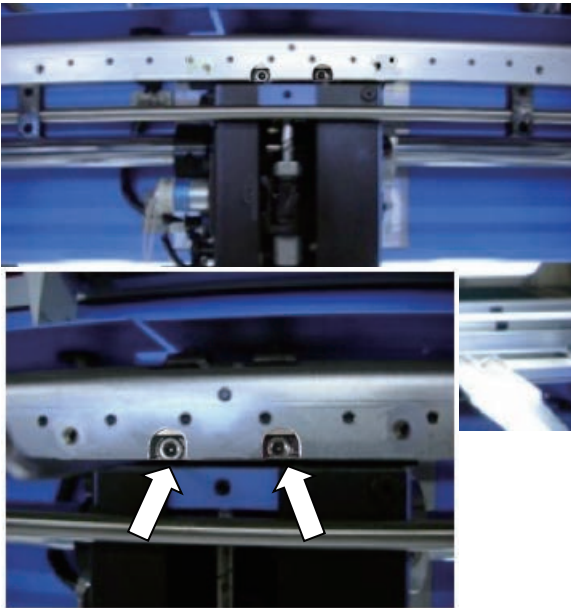
   2 screws are inside of the position with arrow mark on

above picture.
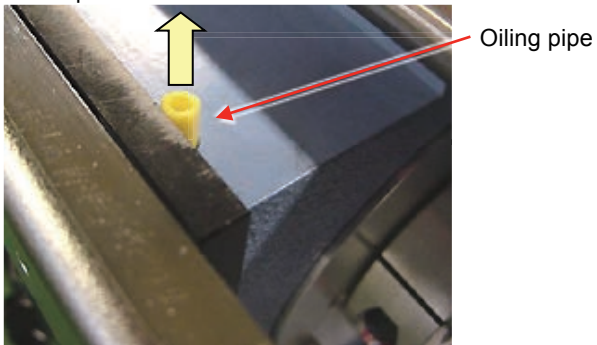
Oiling pipe

   Remove Oiling pipe

2-2. Loose screws for head shaft.

   (Hexagon socket set screw : M4-4   2 pcs)
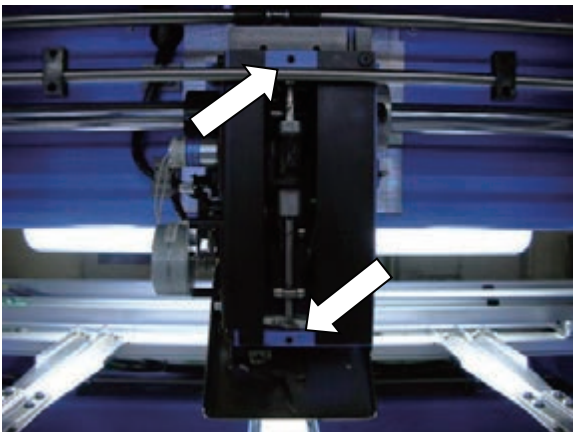
2-3. Slide up the Head shaft.
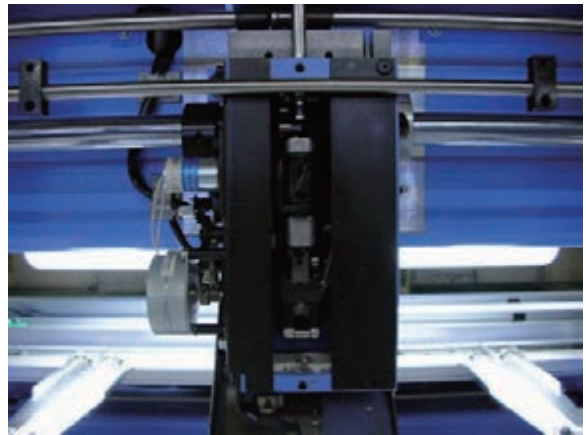
   Take off the broken needle driver.
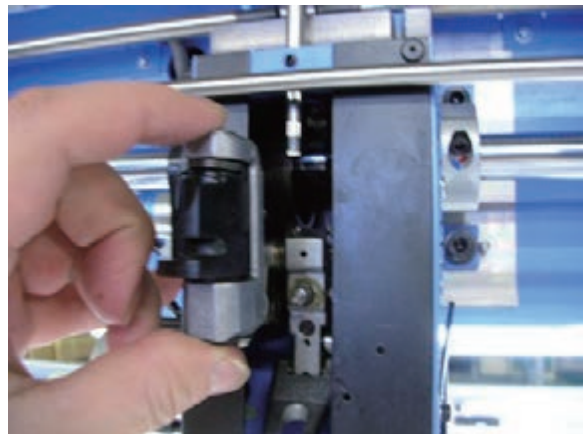
3. Set the new needle bar driver.

   Assemble reverse step with step no.2

3-1. Set needle bar driver to block pin.
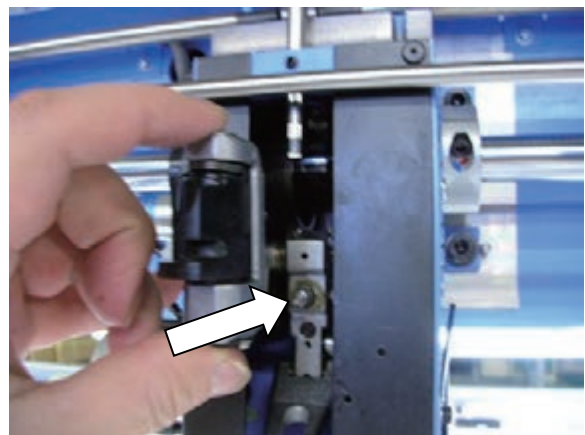
4-1-1　Exchange of needle bar driver

3-2. Set head shaft into the needle driver and tight screws.

(Hexagon socket set screw : M4-4　2 pcs)
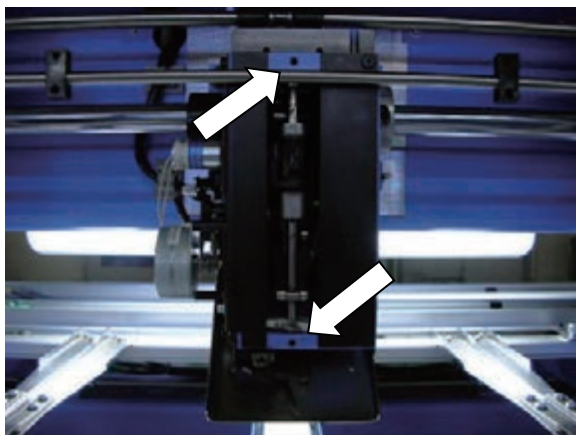
Set bottom head shaft face flat with head face.
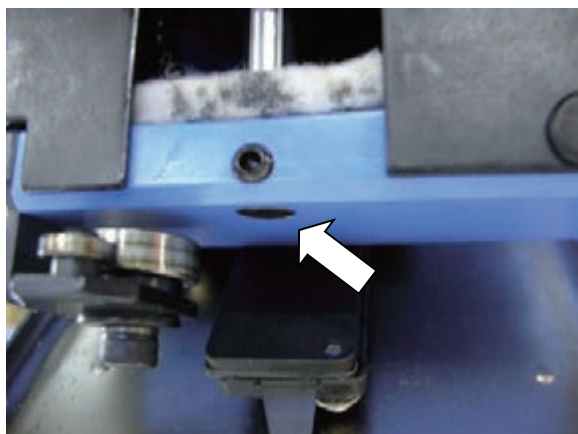
3-3. Set slide unit.

(Hexagon socket button head screw : M4-10)
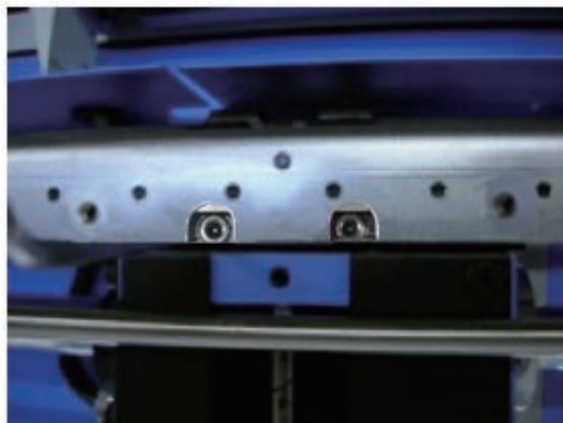
< Note > No clearance between head and slide unit.
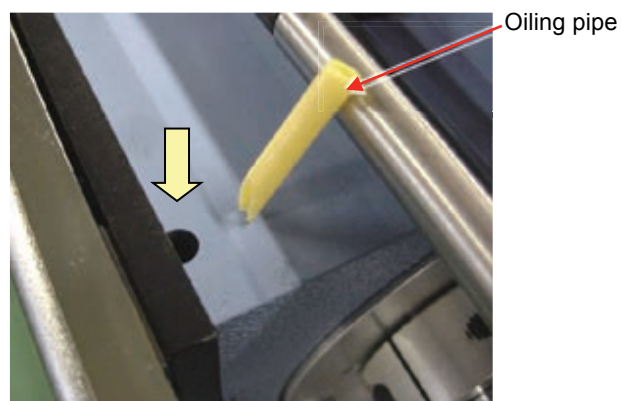
Oiling pipe

Keeping cut face front and insert oiling pipe into hole.

4. Install moving head.

Please refer to [4-2-1, 4-2-2　Assemble and remove moving head].

5. Check needle height.

Please refer to [2-5　Check of needle height].

4-1-2　Adjustment of take-up lever timing

1. Move moving-head to the position which 8st needle is

    active.

2. Remove the Upper shaft cover and Detecting cover.
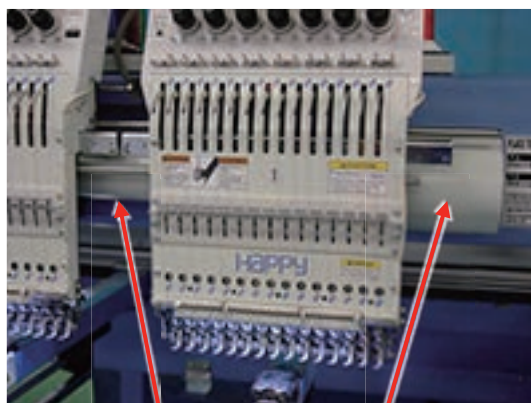
Upper shaft cover

Detecting cover

3. Move moving-head to the position which 1st needle is

    active.

    Remove the Face plate (right) and Head cover bracket.

Face plate (right)

4. Turn upper shaft and insert positioning pin into the hole of

    cam through the positioning hole on machine body.
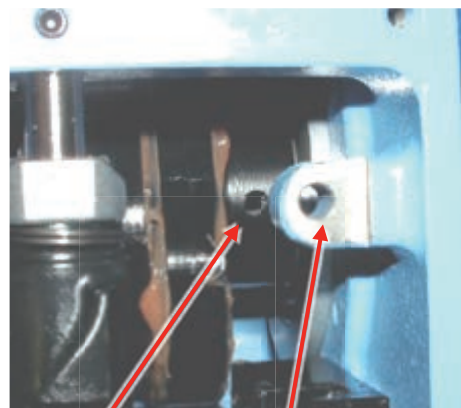
The hole of cam

The positioning hole on machine body

● Please note that moving head is removed on

the picture below just for taking photograph.

5. Loosen screw on take up lever cam.
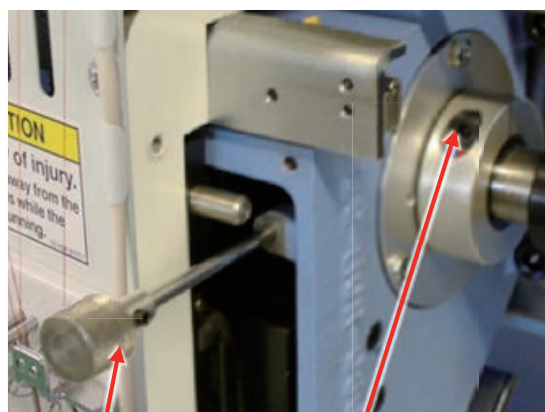
Screw on take up lever cam

The positioning pin

6. Turn upper shaft to the forward direction and set angle

[326 degrees].

Turn brake switch ON.

4-1-2   Adjustment of take-up lever timing

7. Fix screw.
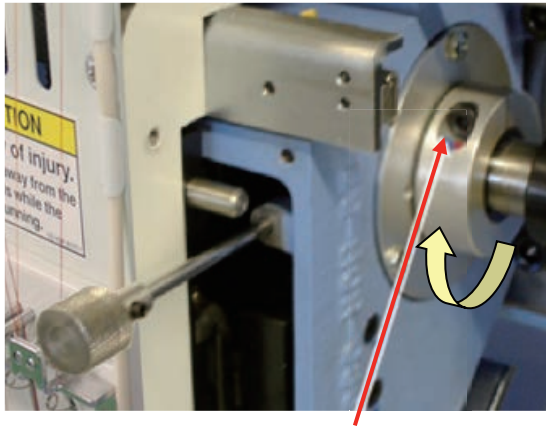
Screw on take up lever cam

8. Pull positioning pin out.

9. Turn brake switch OFF.

   Turn upper shaft and set angle at [270 degrees (C point)].

10. Set all covers.

4-1-3　Check of height of pressure foot

1. Bring needle bar down.

    Please refer to [5　User maintenance mode]

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

    Turn brake switch ON

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

    Please confirm that there is no gap between gauge and pressure foot and needle plate.

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

    Please refer to [4-1-4　Adjustment of height of pressure foot].

4-1-4   Adjustment of height of pressure foot

1. Bring needle bar down.

   Please refer to [5   User maintenance mode]

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

   Turn brake switch ON.

3. Loosen fixing screw of pressure foot (Fixing screw 1 pcs)

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

   1.2 mm is standard, But please adjust depends on thickness of material.

5. Tighten fixing screw for pressure foot.

                                    (Fixing screw 1 pcs)

   At this moment, no gap between gauge and pressure foot or needle plate.

4-1-5 Exchange of pressure foot

1. Loosen fixing screws of front panel (lower) and cord clip.

   (Fixing screw 2 pcs)

   Slide front panel (lower) to left or right direction up to the

   position of pressure foot to be replaced.

   In case you need to slide front panel (lower) further, please

   slide front panel (lower) on neighbor head

Cord clip
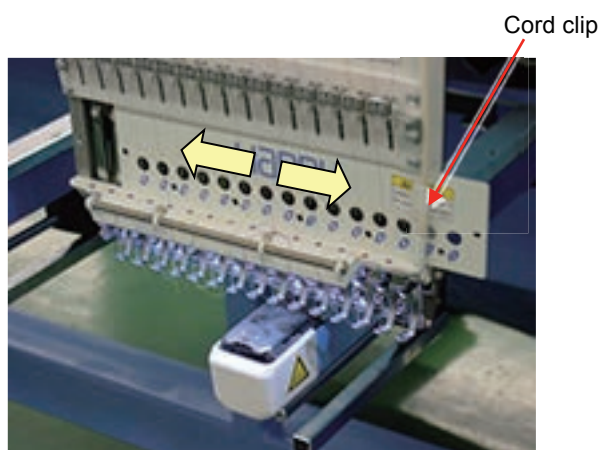
2. Remove needle, needle holder and cushion.

   < Note > When needle holder is removed, pressure foot

   move down quickly.

3. Remove pressure foot. (Fixing screw 1 pcs)
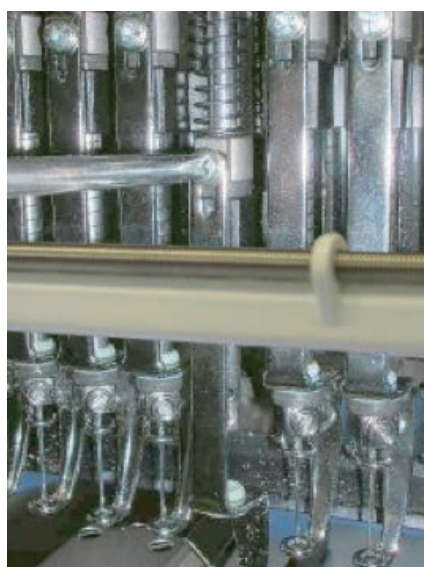
4. Install good parts.
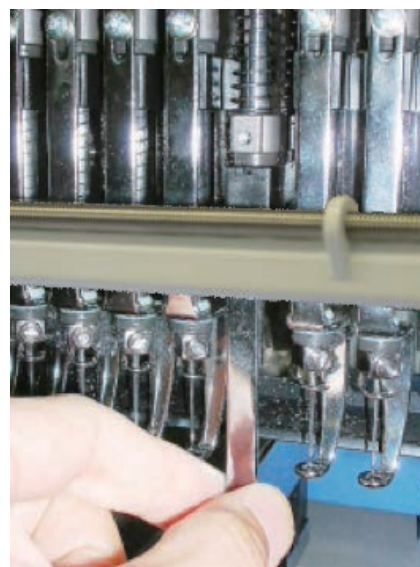
5. Please set needle and needle clamp.

   For set needle, please reference [3-1   Fixing of Needle].

6. Adjust needle height.

   Please refer to [4-2-6   Adjustment of needle height].

7. Bring needle bar down.

   Please refer to [5   User maintenance mode].

4-1-5   Exchange of pressure foot

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

   Turn brake switch ON.

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

   foot.

   Please confirm that there is no gap betwen gauge and

   pressure foot and needle plate.

10. Tighten fixing screw for pressure foot.

                                        (Fixing screw 1 pcs)

   At this moment, no gap between gauge and pressure foot

   or needle plate.
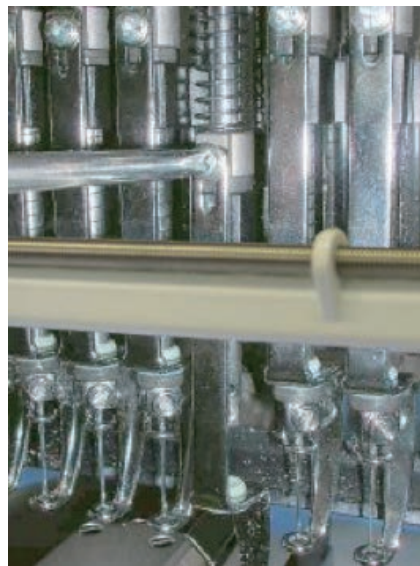
11. Return front panel (lower) and cord clip to previous

    places to finish.

4-1-6   Adjustment of thread catcher

1. Loosen screw of thread catcher, and push thread catcher

   to direction as below, and temporary fix screw.
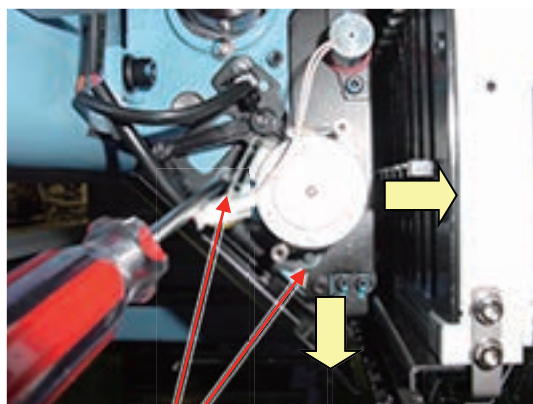
Screw

2. Check position of thread catcher

   Move hook in and out by hand and confirm that hook is

   moving smoothly.

   <Note> Please check at 1st needled and 15th needle

Space between hook and pressure foot

Space between back side of pressure foot and hook is 0.5

~ 1mm.
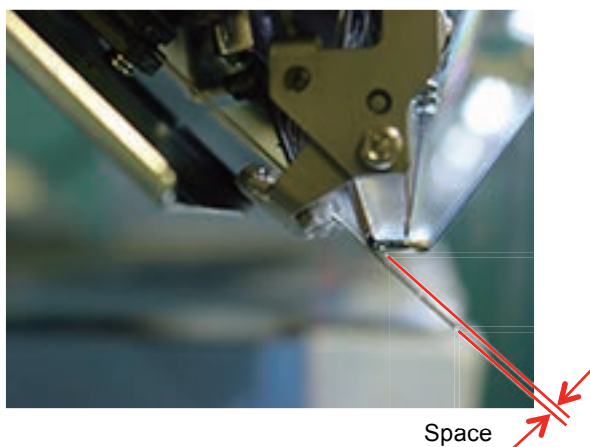
Space

If space is OK, fix thread catcher

3. In case space is not within allowance, re-adjust position of

   thread catcher

4. Turn thread break detecting switch ON

THREAD
BREAK

MENDING
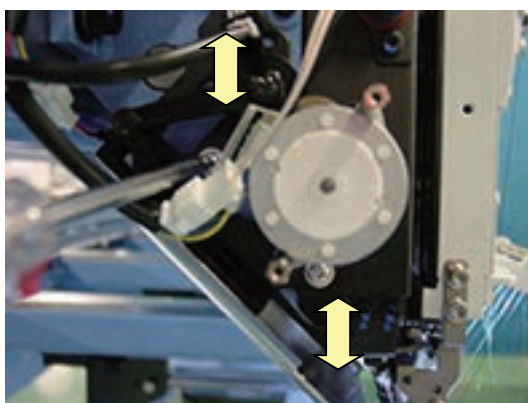
DETECT.
ON
OFF
JUMP
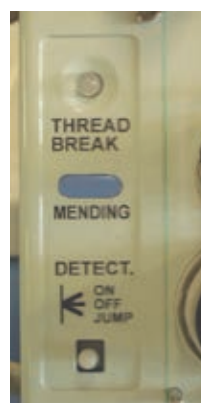
4-1-6 Adjustment of thread catcher

5. Pull hook completely and return to front for movement of 3
   pitches of gear.
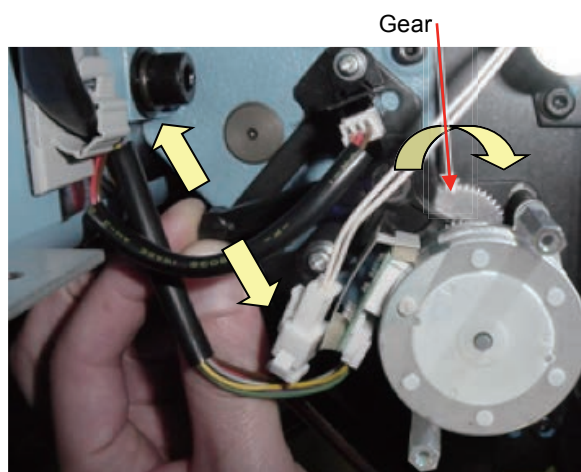
Gear

6. Loosen screw of photo sensor, and move photo sensor to
   the position that thread break lamp becomes RED and fix
   photo sensor.

Screw of photo sensor

THREAD
BREAK

MENDING

DETECT.
ON
OFF
JUMP
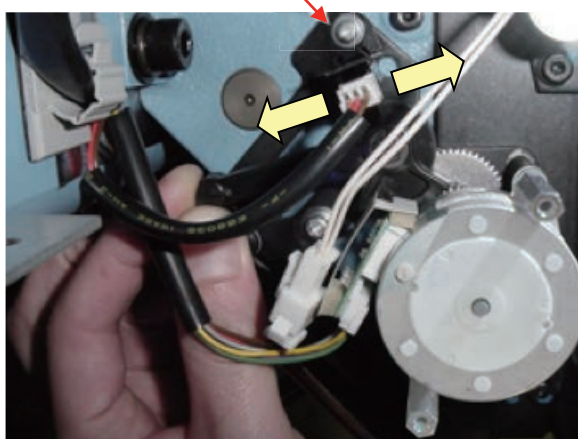
7. Pull hook completely and return to front for movement of 3
   pitches of gear, and confirm that thread break lamp
   becomes RED.

4-1-7　Exchange of thread catcher guide

1. Remove guard plate.

　　Use the #1 (+) Screw driver.

2. Exchange guide.

　　Fix the guide after moving it to the right.
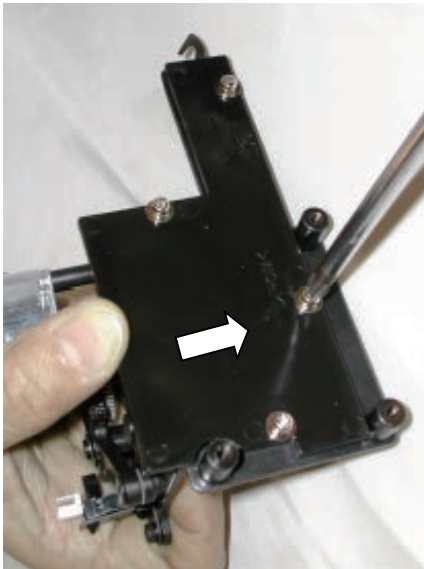
3. Install the guard plate.
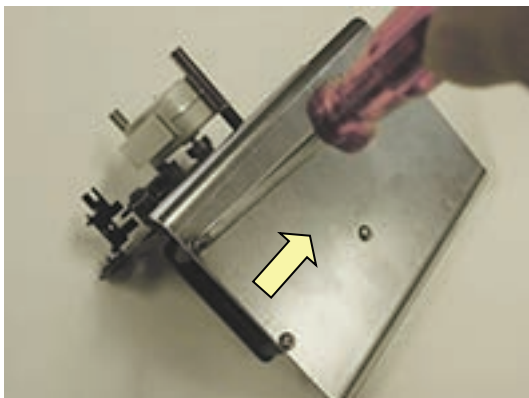
4. Please refer to [4-1-6　Fixing of thread catcher],

　　install thread catcher to finish.

4-1-8 Exchange of pressure foot cam

1. Please refer to [4-2-1, 4-2-2   Assemble and remove moving head], remove moving head and face plate (right).

Moving head

Face plate (right)

2. Remove pressure foot cam. (Fixing screw 3 pcs)

3. Put on grease to new presser foot cam.

Also, put on grease to fixing nuts, then insert nuts into hole of pressure foot cam to prevent drop of the nut.

<Grease>Shell alvania EP Grease

(Shell Gudas S2 V220 2)

4. Fix good part as temporally by fixing screw and nut.

Make sure to cover fixing hole with finger to prevent drop of the nut.

Please check bump 2mm between front of presser foot cam and front face of fixed head.

4-1-8 Exchange of pressure foot cam

5. Set dial disc to [L + 0 degrees].

In this time, please check distance between upper face of presser foot and bottom face of fixed head to [25.5+/-0.2mm].
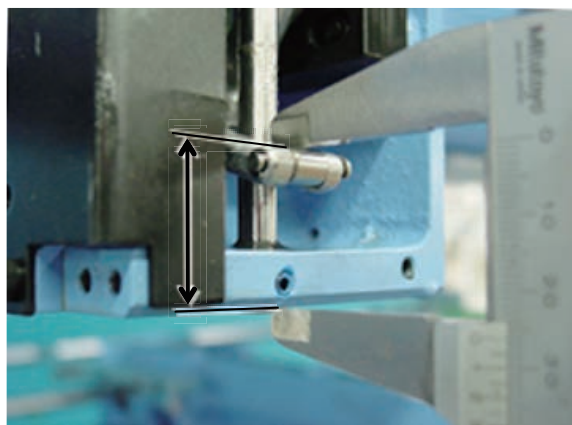
6. Set dial disc to [L + 60 degrees].

In this time, please check distance between upper face of presser foot and bottom face of fixed head to [26.1+/-0.2mm].

7. After check item 5 and 6 then tight screw completely for fix take-up lever cam.
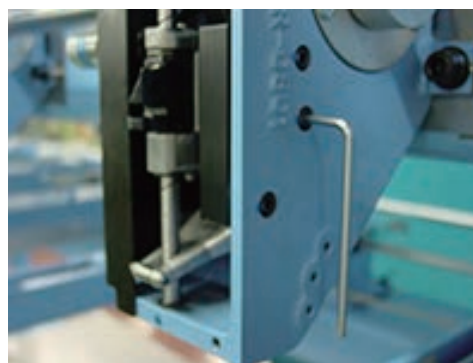
8. Put each unit back to where it was according to manual.

4-1-9　Adjustment of fixing of jump solenoid

1. Please refer to [4-2-1, 4-2-2　Assemble and remove
   moving head], remove moving head and face plate (right).
   Moving head

2. Remove jump solenoid ass'y. (Fixing screw 2 pcs)

3. Install good parts.

   Please check Jump solenoid position.
   Turn main shaft till touch plunger of jump solenoid
   and needle bar driver and check main shaft indicator.
   Should be between 83 to 87 degrees.

   Just touched to plunger
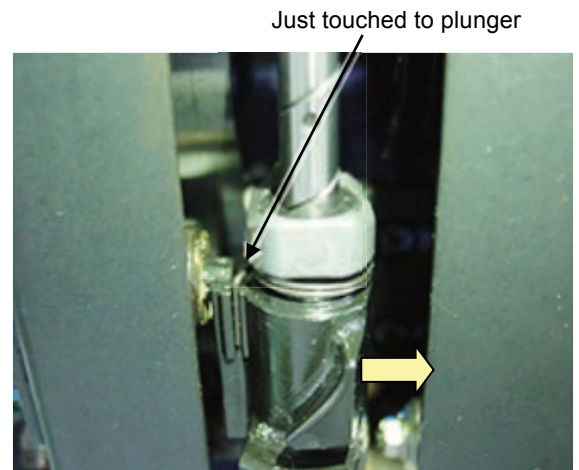
   <Dubble check> Please double check Jump solenoid
                  position by following test.
                  Continually fillip needle bar driver to arrow
                  direction while main shaft turning and
                  hearing plunger touch ing noise.
                  Should change noise between 83 to 87
                  degrees shaft position.

4. 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.

4-1-10   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.

Solenoid cable should come to the   back side.

Front face
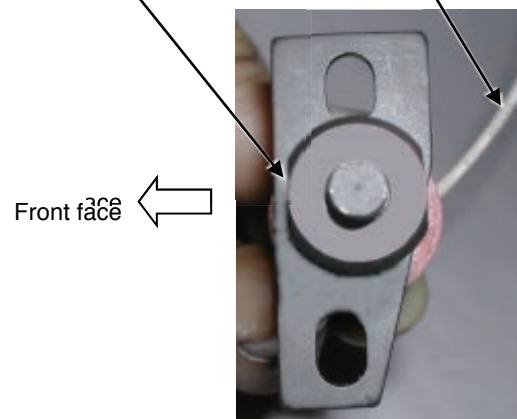
5.Confirm the movement of the plunger is smooth enough.
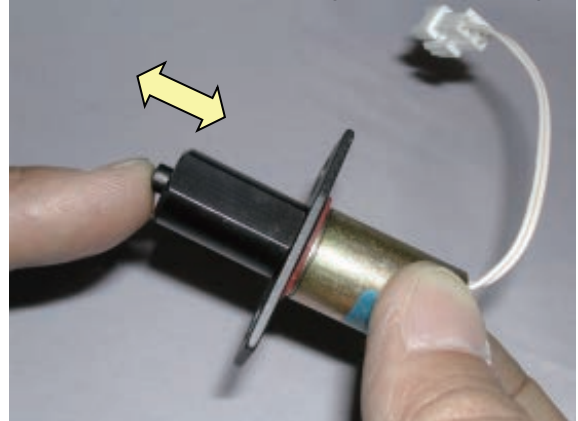
6.Procedure is done after assembling the Jump solenoid.

Referring to [4-1-9 Adjustment of fixing of jump solenoid].

4-2-1　Assemble and remove moving head (except for 1st head)

1. Remove moving head.

1-1. Set moving head at position that 15th needle is active.

　Remove the front panel (upper), cord clip and lighting
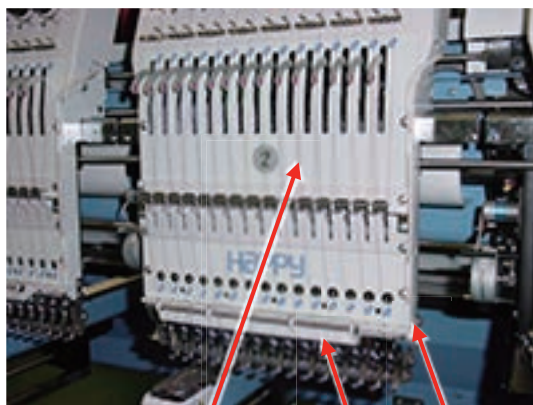
　bracket.

　(Truss head screw : M4-6　4 pcs)

Upper shaft cover　　　　　　　　Cord clip

Lighting bracket

1-2. Loosen screw on thread tension bracket

　(Pan head screw : M4-10　4 pcs)

1-3. Remove the thread tension bracket.

　(Pull thread tension bracket to front)

　Put thread tension bracket and lighting bracket on head

　upper cover.

1-4. Remove the set screw.

　A (Hexagon socket head cap screw : M4-20　6 pcs)

　B (Hexagon socket head cap screw : M4-6　2 pcs)

　C (Hexagon socket head cap screw : M4-18　4 pcs)
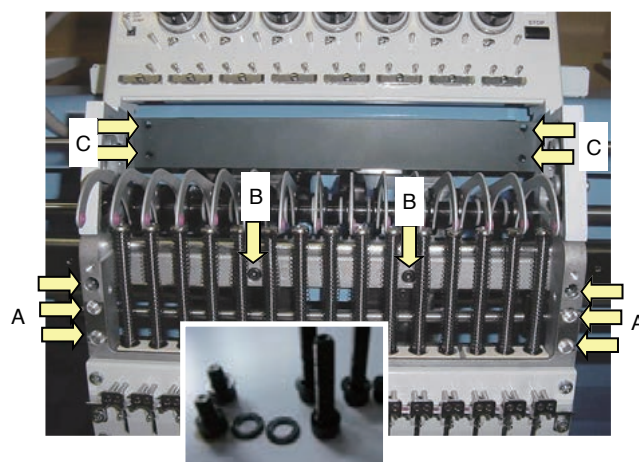
　Hexagon socket head cap screw is a set with plain washer.

　Please keep as a set.

4-2-1　Assemble and remove moving head (except for 1st head)

1-5. Slide moving head to right direction

After rail goes out from positioning roller, take moving head out.
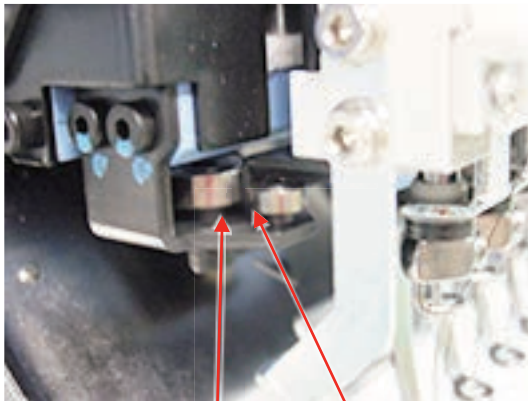
Positioning roller　　　　　Rail
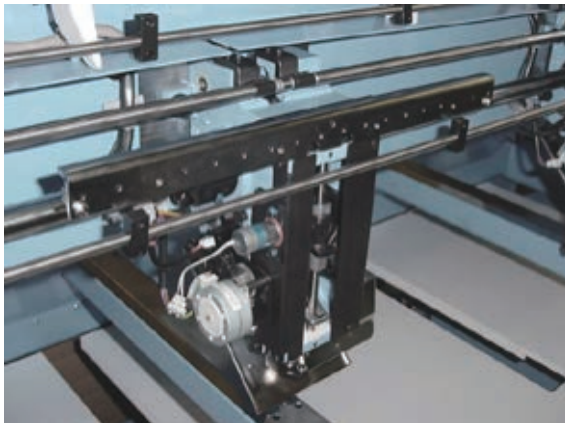
2. Install moving head.

2-1. Set moving head at position that 15th needle is active.

　Set all take-up lever to guide bar starting from 1st needle

Guide bar
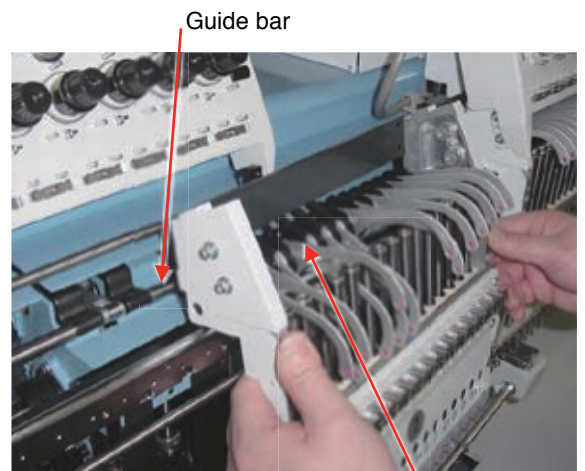
Take-up lever

Insert rail into positioning roller.
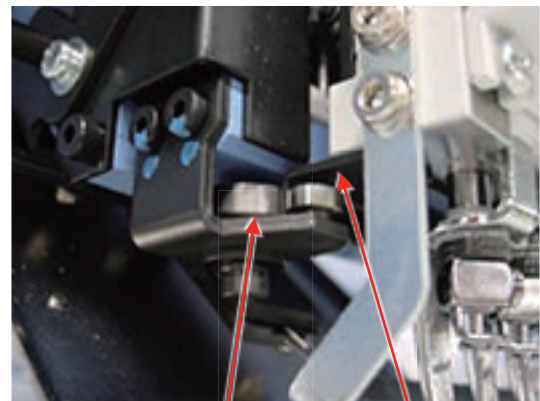
Positioning roller　　　　　Rail

2-2. Temporally tighten screws.

　A (Hexagon socket head cap screw : M4-20　6 pcs)

　B (Hexagon socket head cap screw : M4-6　2 pcs)

　C (Hexagon socket head cap screw : M4-18　4 pcs)
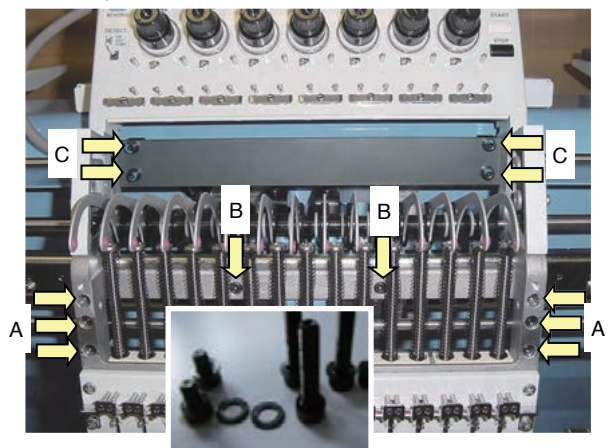
Please put plain washer with hexagon socket head cap screw.

4-2-1   Assemble and remove moving head (except for 1st head)

2-3. Move moving head to the position that 8th needle is

active.

Tighten 4 screws on moving head. (see photo below)

Moving head
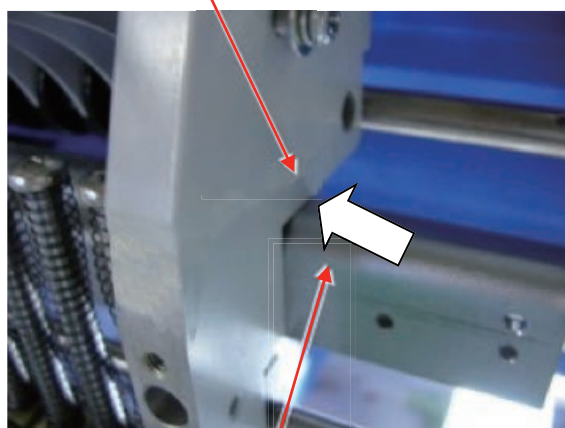
Rail support

Please confirm that there is no space at the arrow point on

above picture.

2-4. Set take-up lever to lever crank
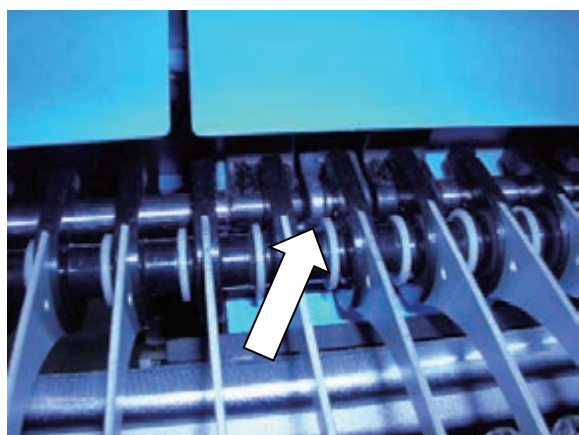
2-5. Please needle bar of 8th needle down until needle driver

catches needle bar boss. Then turn upper shaft to needle

down and check that needle is center of needle hole on

needle plate. If needle position is not center of needle hole,

please move moving head right or left to fit needle

position.

Please refer to [4-2-5   Adjustment of needle position (left

and right)].
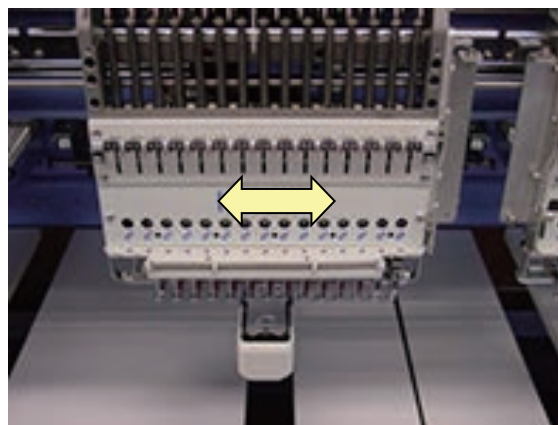
2-6. Tighten 8 screws on moving head. (See photo below)
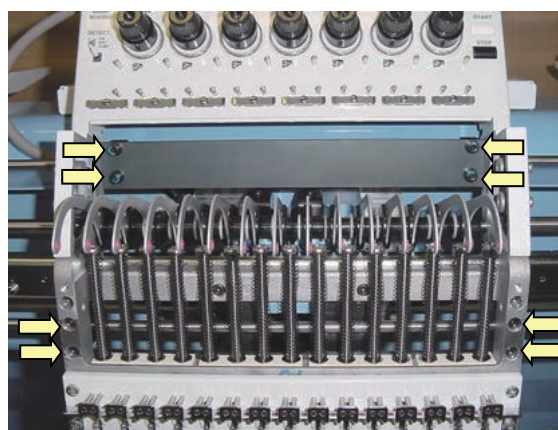
< Note > Gap between Moving head and Fasten Block

should be 2.5mm.
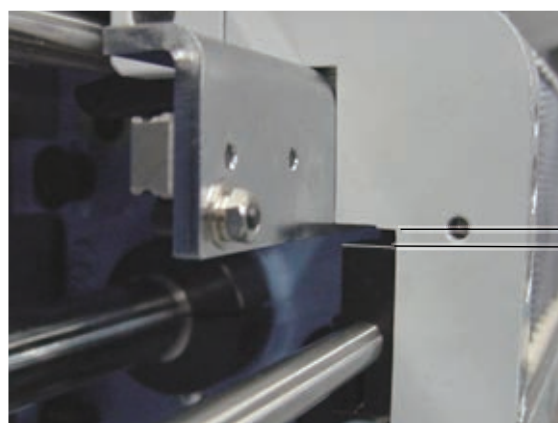
4-2-1　Assemble and remove moving head (except for 1st head)

2-7. Install Thread tension bracket.

   (Pan head screw : M4-10　4 pcs)

2-8. Set Front panel (Upper), cord clip and lighting bracket.

   (Truss head screw : M4-6　4 pcs)
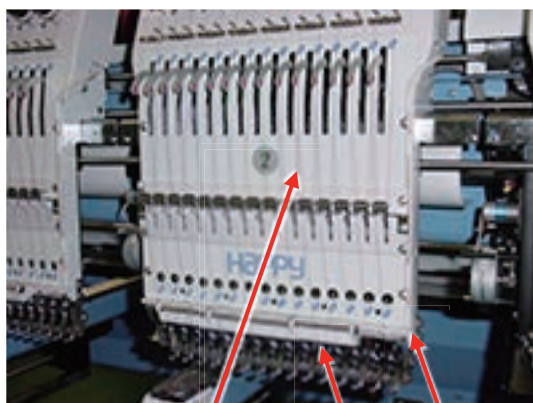
Upper shaft cover　　　　　　Cord clip

Lighting bracket

3. After installation of moving head, please check following points;

3-1. Check needle height, please check needle height at 1st , 8th and 15th needle.

   Please refer to [2-5　Check of needle height].

   In case needle height is not same for each needle, installation of moving head was wrong,

   Please check step 2-3 again.

3-2. Check of rotary hook timing, please check hook timing by 8th needle.

   Please refer to [2-6　Check of rotary hook timing]

   In case hook timing is not correct, installation of moving head was wrong,

   Please check step 2-5 again.

4-2-2　Assemble and remove moving head (1st Head)

< Note > When you need to take all moving head out, please take 1st head at last.

1. Remove moving head.

1-1. Remove the front panel (upper), cord clip and lighting bracket.

　(Truss head screw : M4-6　6 pcs)
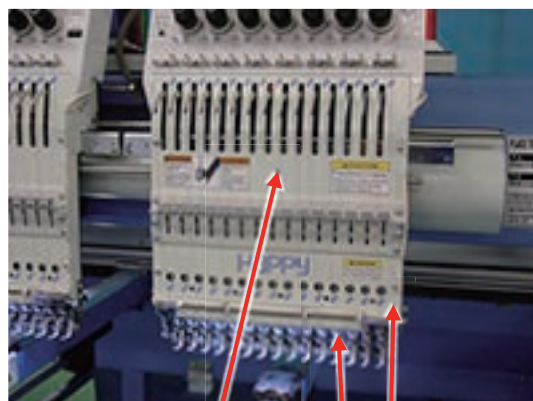
Upper shaft cover　　　　Cord clip

Lighting bracket

1-2. Loosen screw on Thread tension bracket

　(Pan head screw : M4-8　4 pcs)

1-3. Remove the thread tension bracket.

　(Pull thread tension bracket to front)

Put thread tension bracket and lighting bracket on head upper cover.
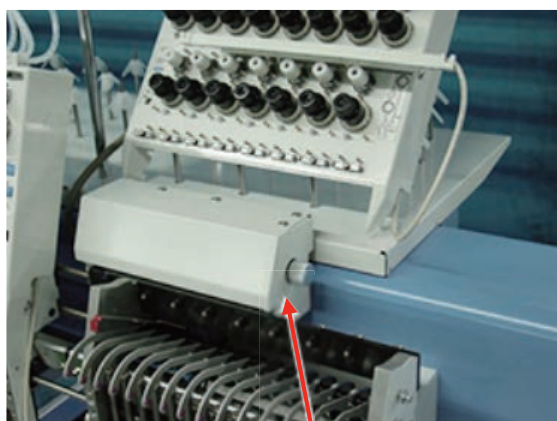
Needle bar change cover

1-4. Remove the Needle bar change cover and needle position plate.
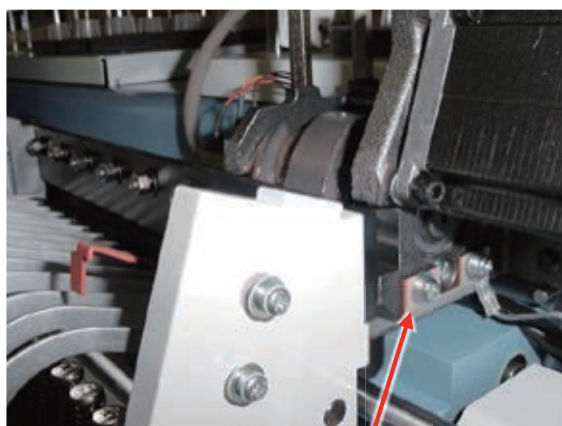
Needle position plate

4-2-2   Assemble and remove moving head (1st Head)

1-5. Move moving head to the position which 8th needle is

   active, by knob.

   Loosen screw on moving head support.

   (Hexagon socket head cap screw : M5-15 2pcs)
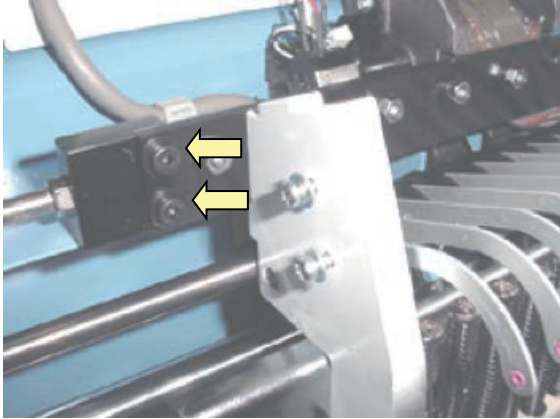
1-6.   Remove set screw.

   (Hexagon socket head cap screw : M4-20   6 pcs)

   (Hexagon socket head cap screw : M4-6   2 pcs)
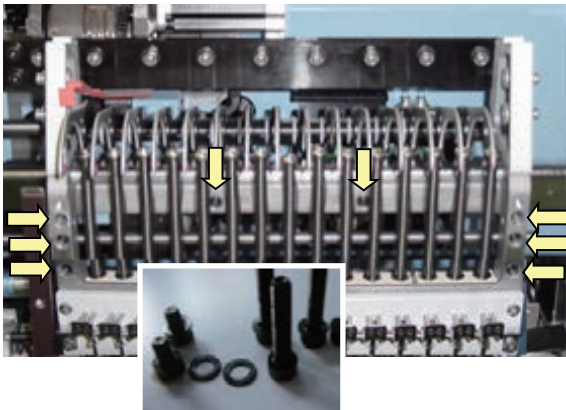
   Hexagon socket head cap screw is a set with plain washer.

   Please keep as a set.

1-7. Slide moving head to the right direction by knob, and

take moving head out after the rail going out from roller.
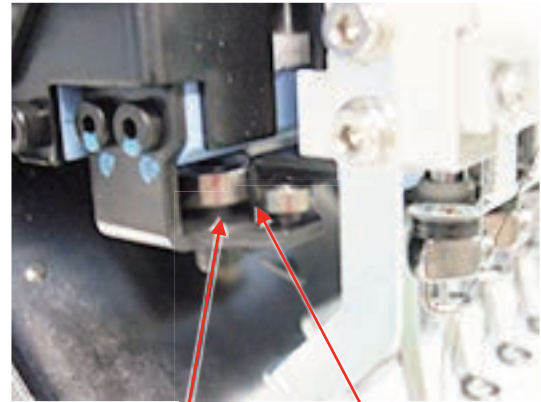
Positioning roller   Rail
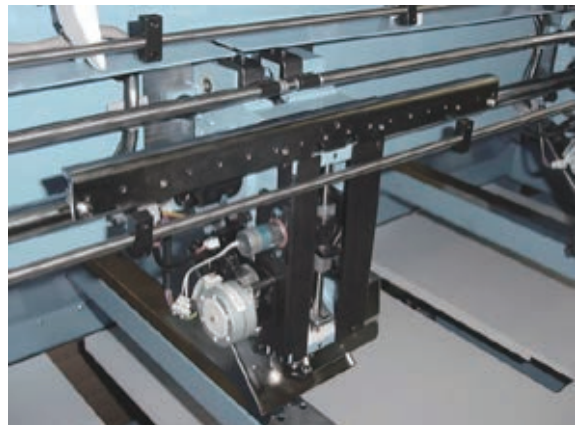
4-2-2　Assemble and remove moving head (1st Head)

2. Install moving head.

2-1. When you install moving head, please set the same position of Needle bar change unit as the position which you took Moving head out. (slightly moved to the right position then 15th needle)

< Note > In case you lost the position mentioned above: Please turn power on and move moving head to 14th needle by Needle change button, then move to 15th needle.

After setting to 15th needle, please move slightly to the right by knob of Needle bar change unit.

Guide bar

Cam follower
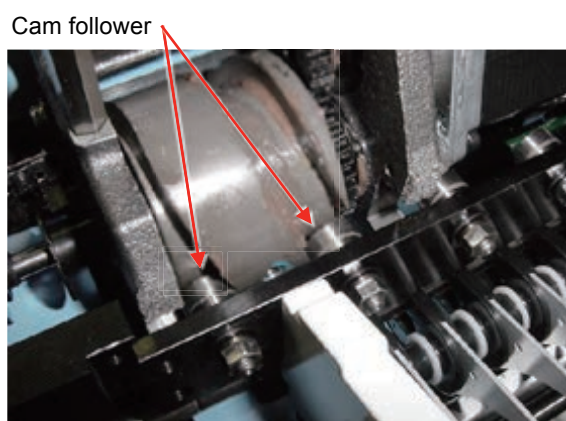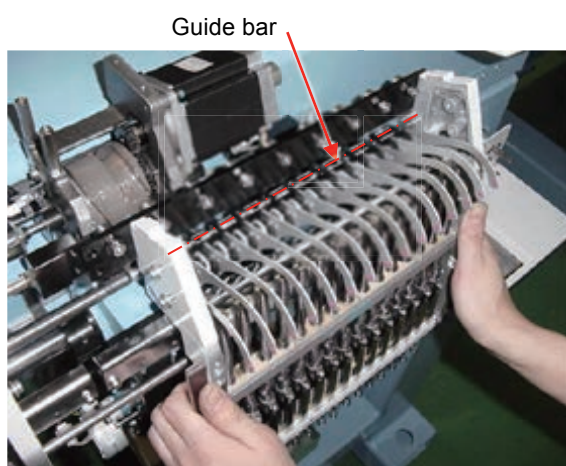
With turning knob, set the rail into Positioning Rollers.
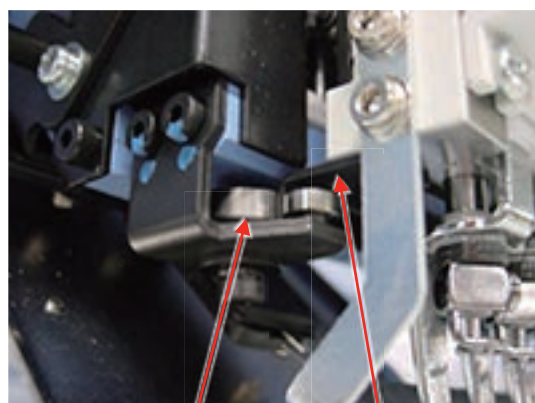
Positioning roller　　　　　　　Rail

2-2. Set moveing head to 15th needle position and temporally tighten screws.

（Hexagon socket head cap screw：M4-20　6 pcs）

（Hexagon socket head cap screw：M4-6　2 pcs）
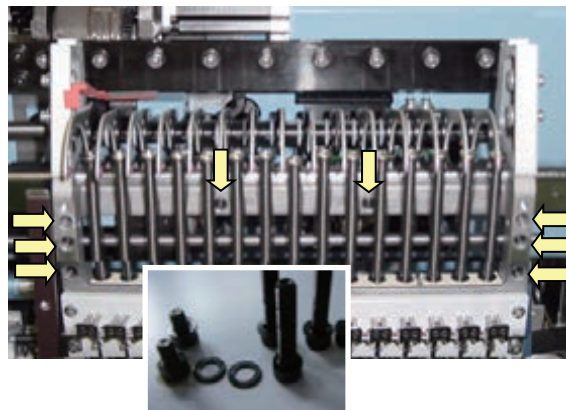
Please put plain washer with hexagon socket head cap screw.

2-3. Move moving head to the position that 8th needle is active.

Tighten 4 screws on moving head. (see photo below)
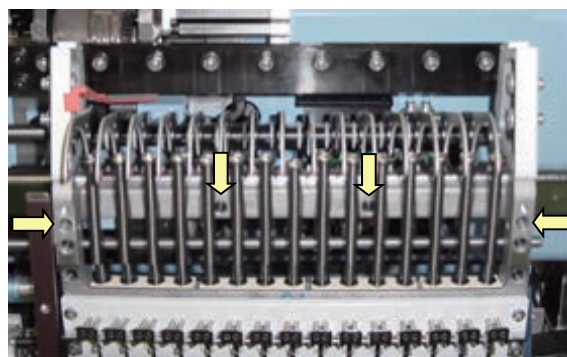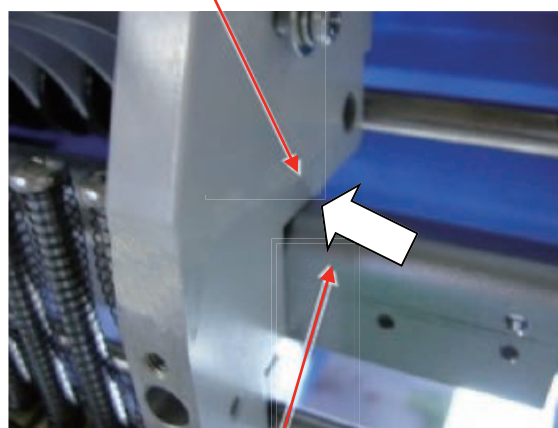
Moving head

Rail support

Please confirm that there is no space at the arrow point on above picture.

4-2-2　Assemble and remove moving head (1st Head)

2-4. Fix Moving head support to Slide Bar by screws.

(Hexagon socket head cap screw : M5-15　2 pcs)

Slide bar
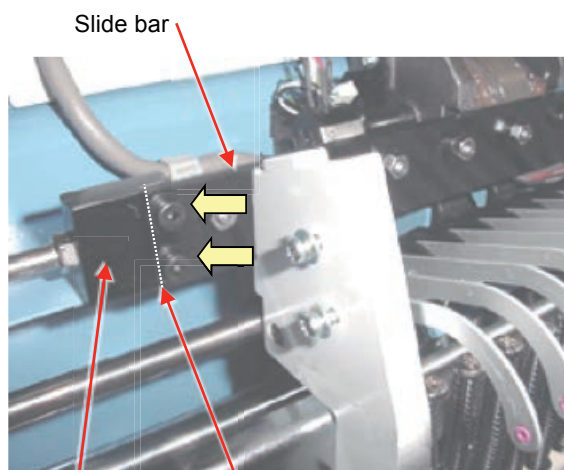
Moving head support　　Joint point

Please confirm that there is no space at joint point.

2-5. Tighten screw on moving shaft.
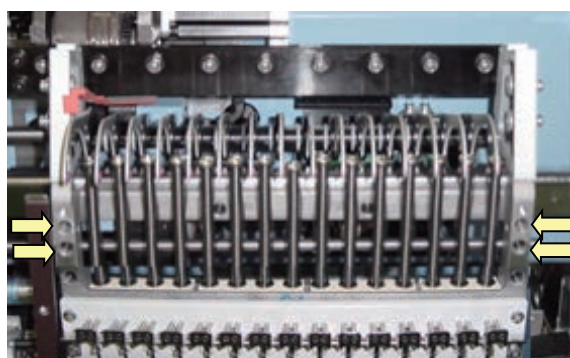
< Note > Please confirm "Fasten block" position to make clearance about [2.5mm] against "Moving head".
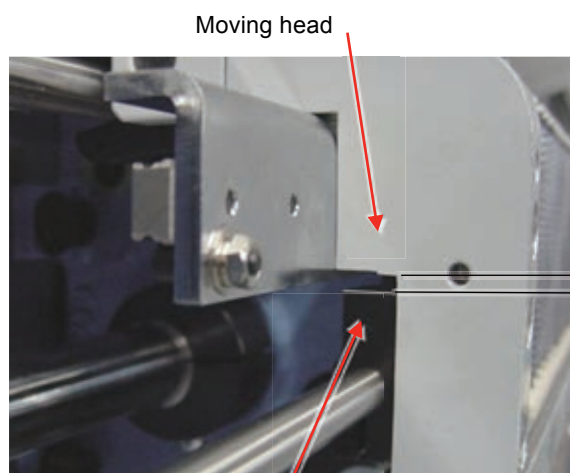
Moving head

Fasten block

2-6. Move moving head to the position that 1th needle is active.

Install the needle position plate.
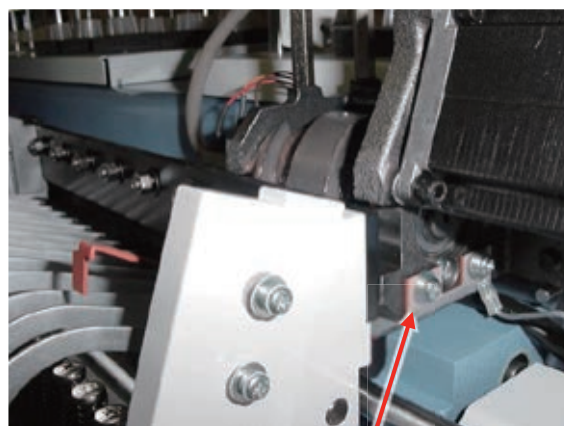
Needle position plate

2-7. Install Thread tension bracket.

(Pan head screw : M4-10　4pcs)
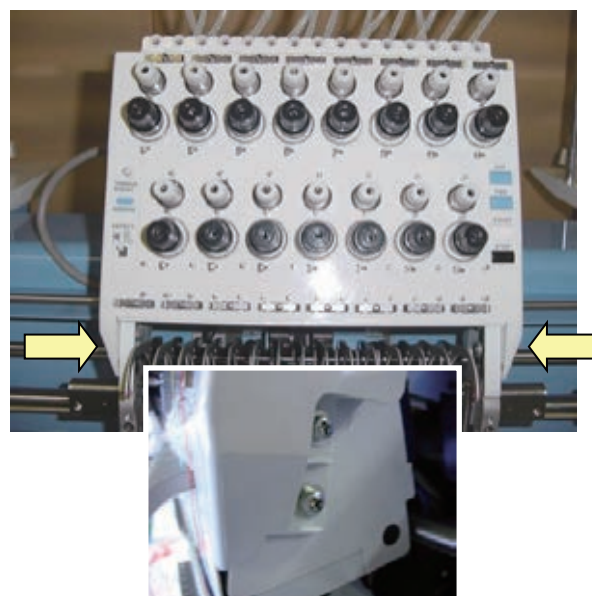
2-8. Set the front panel (upper), cord clip and lighting bracket.

(Truss head screw : M4-6　4 pcs)
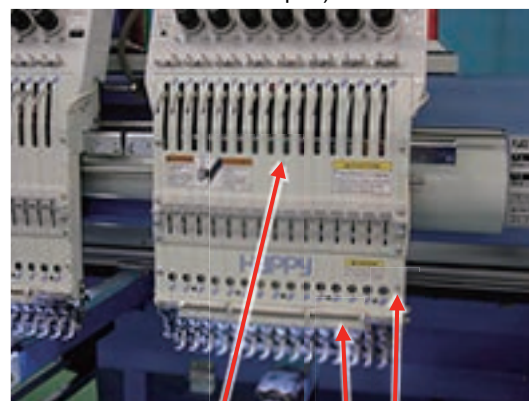
Upper shaft cover　　　Cord clip

Lighting bracket

4-2-2   Assemble and remove moving head (1st Head)

2-9. Please adjust Adjustment of needle position (left and

right) Adjust for 1st head].

Referring to [4-2-4   Adjustment of needle position (left

and right) Adjust for 1st head].

< Note > When you take 1st Moving Head out and

re-install, please check needle positon for all other head

too.

3. After installation of moving head, please check followindg

points;

3-1. Check needle height, please check needle hight at 1st,

8th and 15th needle.

Please refer to [2-5   Check of needle height].

In case needle height is not same for each needle,

installation of moving head was wrong,

Please check step 2-3 again.

3-2. Check of rotary hook timing, please check hook timing

by 8th needle.

Please refer to [2-6   Check of rotary hook timing]

4-2-3   Adjustment of needle position (back and front)

1. Please set Thread break detecting switch to ON for
   adjusting head. Other head, please set to JUMP.
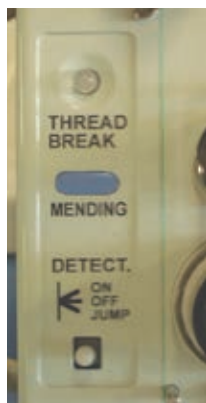
2. Push and pull the Moving head and check playing the
   moving head.

   In case of you find play the moving head

   Loose screw of positioning roller and re-tight the screw with
   jyointing the Rail.

Rail

Screw
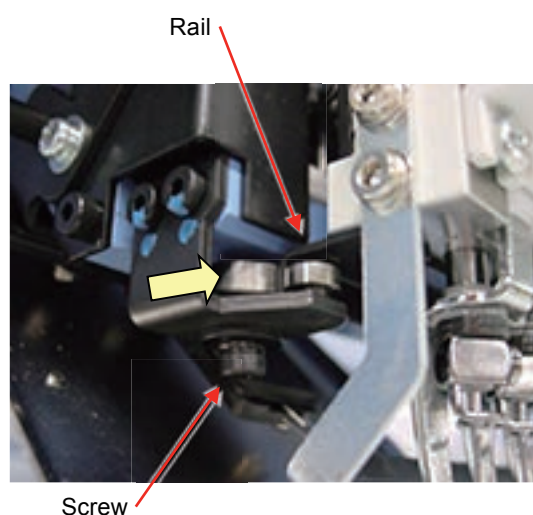
3. Move the Moving head to 8th needle, then down needle till
   needle point to face of needle plate.

   Please refer to [5   User maintenance mode].

4. Move the Positioning plate to front and back for adjust
   needle position against needle hole to center and tight the
   screw.

   < Note > Insert Lower rail to between the two bearing
   deeply.

Positioning plate
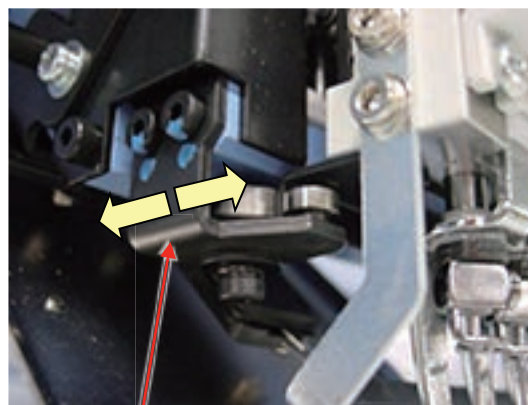
Needle   Needle hole of needle plate
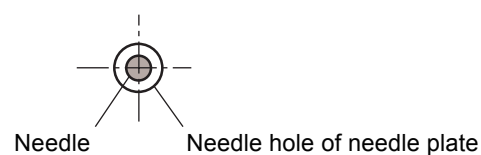
5. After adjustment, confirm the position by 1st and 15th
   needle also.

   If you have big different the needle position 8th and 1st and
   15th needle, please confirm again after you replate bland
   new needle.

6. After adjustment, please be sure to check and adjust
   clearance between needle and shuttle hook.

   Please refer to [4-4-1   Adjustment of rotary hook timing].

4-2-4 Adjustment of needle position (Left and Right)

Adjust for 1st head

If you change 1st head position, you need to confirm head position other all head.

1. Remove the cover of Needle bar change unit.

Cover

2. Push the Moving head right and left for confirm should not have a play the Cam. If you have a play the cam, please refare [4-3-1   Check / Adjustment of needle bar change unit].
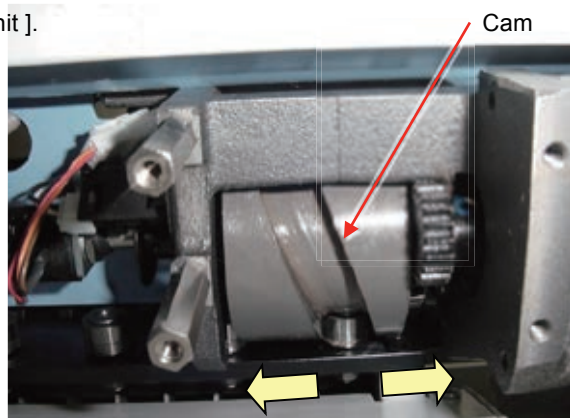
Cam

3. Move the head to 8th needle and remove Detecting Cover and Thread Detecting Board of 1st head and loose screw for needle bar change unit.

< Note > Please turn off machine power.
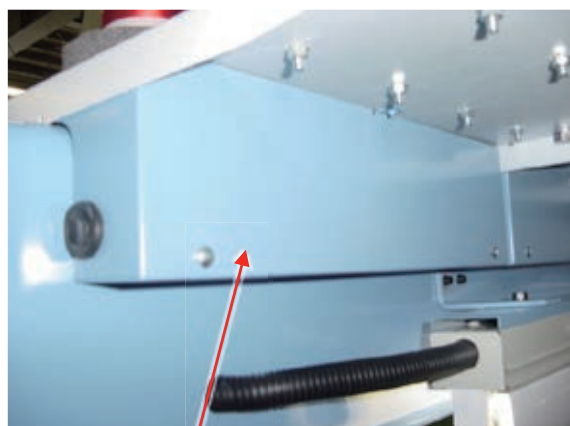
Detecting cover
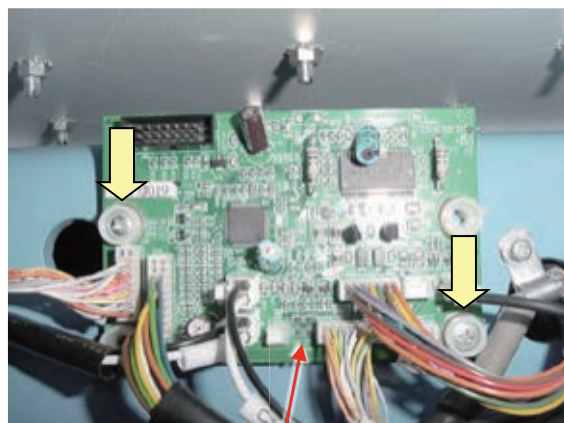
Thread detecting board

Screw for needle bar change unit inside the beem.

4. Turn the knob and stop at a needle stop position. Then down needle till needle point to needle plate face. You can move the Moving head with Needle bar change unit right and left for adjust needle position to cemter to needle plate hole.
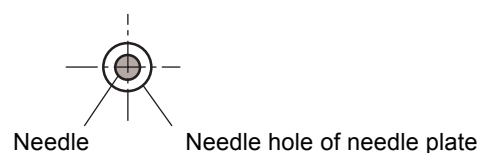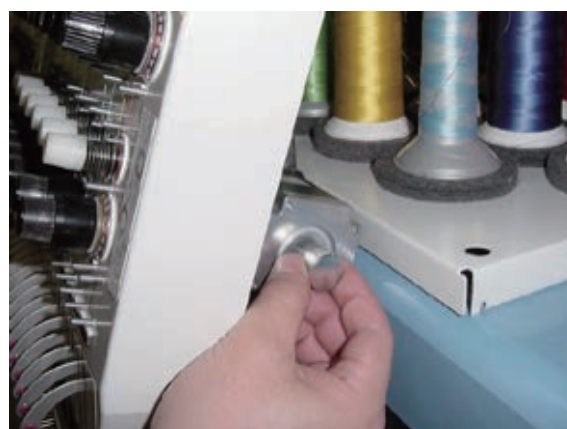
Needle   Needle hole of needle plate

4-2-4   Adjustment of needle position (left and right)

5. Please confirm needle position after tight the screw for
   needle bar change unit inside the beem.

6. Return Thread Detecting Board, detecting cover and
   needle bar change cover to previous places.

7. Turn on the machine and confirm the position at 8th needle
   position.
   If the needle position is not at center of needle hole, please
   refer to [4-3-1   Check / Adjustment of needle bar change
   unit].

8. Please confirm 1st and 15th needle also.

9. After adjustment the positon for 1st head, please adjust 2nd
   head to last head.
   Please refer to [4-2-5   Adjustment of needle position (left
   and right)   Adjust for 2nd to last each head   ].

4-2-5 Adjustment of needle position (left and right)

Adjust for 2nd to last each head

Please set Thread break detecting switch to ON for
adjusting head. Other head, please set to JUMP.

1. Move the Moving head to 8th needle and remove the Front
   panel (Upper) and cord clip.
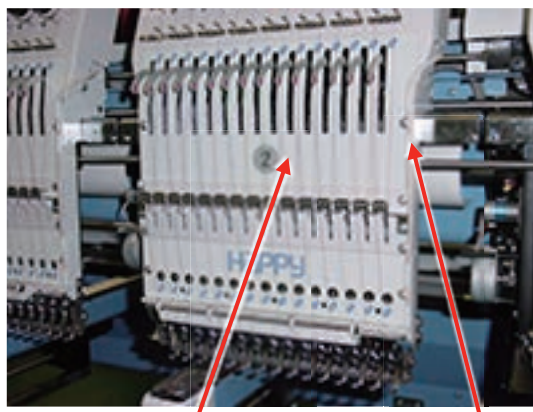
Upper shaft cover   Cord clip

2. Just loose 4 screws showing picture below.
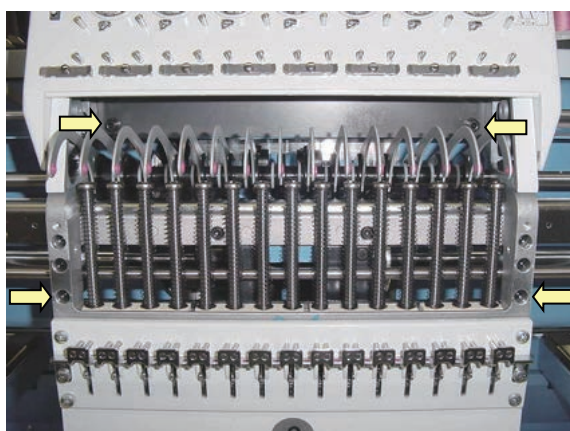
3. Down needle till point of neeld with face of the needle plate.
   Please refer to [5   User maintenance mode].

4. You can move Moving head right and left for position
   adjustment by hand. Then tight 4 screws.
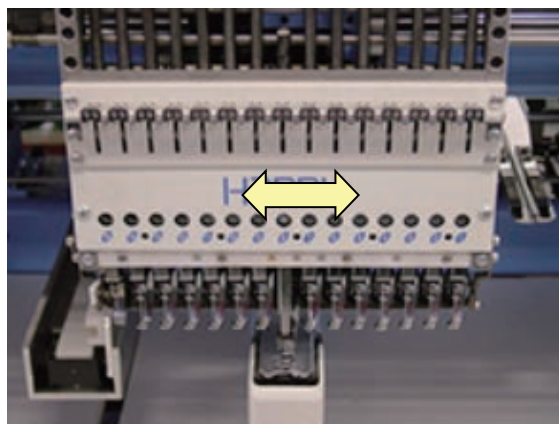
5. Please confirm 1st and 15th needle also after 8th needle.
   If the needle position is not at center of needle hole, please
   replace.

6. After adjustment,Please confirm needle height and rotary
   hook timing.
   Please refer to [4-2-6   Adjustment of needle height]
   [4-4-1   Adjustment of rotary hook timing].

7. Set the front panel (upper) and cord clip.

4-2-6　Adjustment of needle height

1. Remove the front panel (upper) and cord clip.

    Slide front panel (lower) to left or right direction up to the

    position that you can see needle bar to be adjusted.

    In case you need to slide front panel (lower) further, please

    slide front panel (lower) on neighbor head.
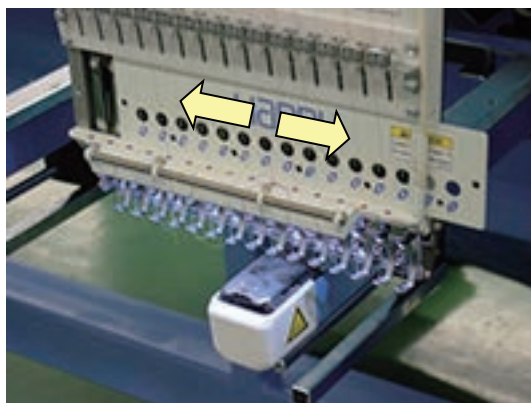
2. Remove bobbin case.
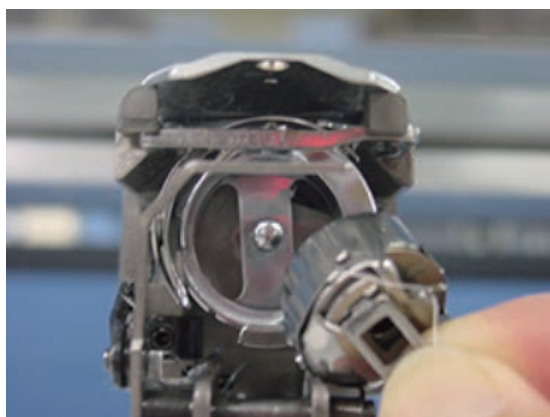
3. Bring needle bar down.

    Please refer to [5　User maintenance mode].

4. Turn upper shaft to set dial disc to [10 degrees].

5. Loosen screw on needle bar boss.
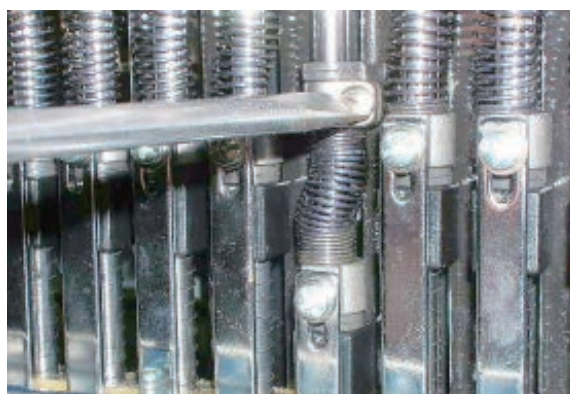
6. Put needle height gauge in rotary hook.

4-2-6   Adjustment of needle height

7. Adjust the needle bar height up and down till the needle tip

   touches to the gauge slightly.

8. Set direction of needle stop as illustrated below.
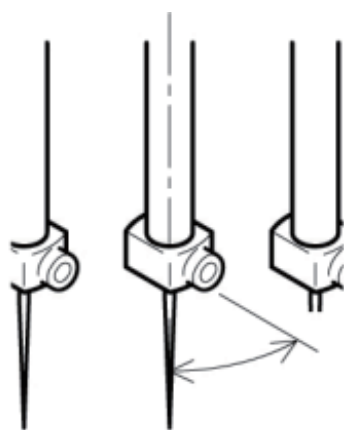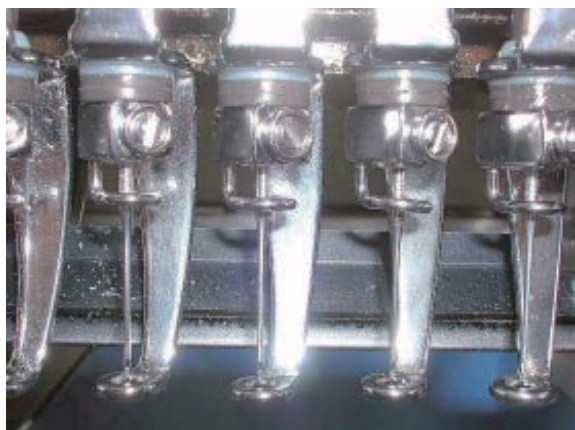
About 30 degrees

9. Tighten the screw of needle bar boss.
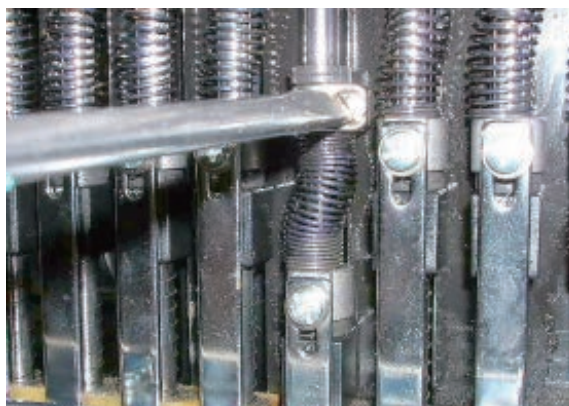
10. Take Needle height gauge out from Hook.

11. Back main shaft to [270 degrees (C point)] position.

12. Set "front panel (lower)" and cord clip, set "bobbin case"

    then end of process.

4-2-7　Adjustment of needle bar lowest point

1. Take Upper shaft cover.
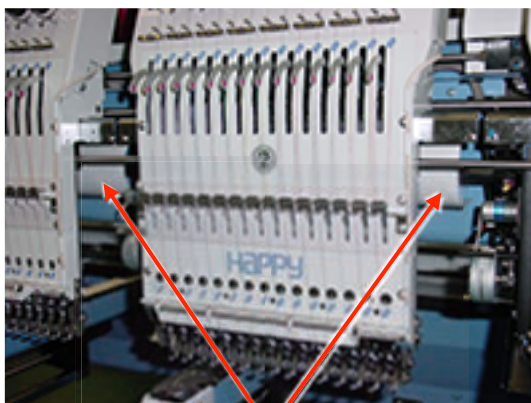
Upper shaft cover

2. Move moving head to the position that 14th needle is active.

   Take Thread catcher cover.

3. Turn off the brake switch.

   Turn upper shaft to set dial disc to [C point (270 degrees)].

4. Bring needle bar down.

5. Turn upper shaft to set dial disc to [0 degrees].

6. Turn on the brake switch.

7. Fix Dial-gauge set on left side of bed.

8. Set lever of the Dial-gauge at lower surface of needle holder then, adjust position of the Dial-gauge so as to move pointer of the Dial-gauge around 1mm.

4-2-7   Adjustment of needle bar lowest point

9. Loosen a fixing screw of fasten collar.
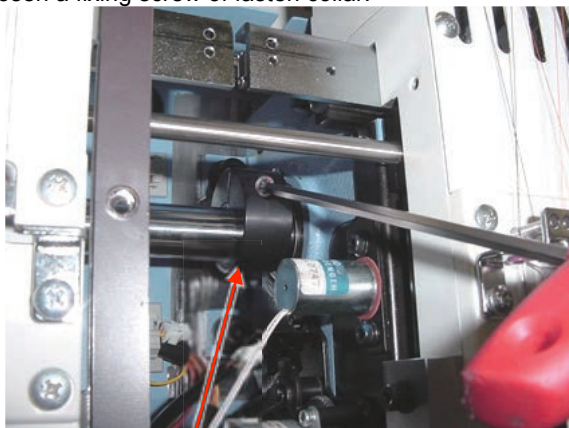
Fasten collar

10. Turn Fasten collar to the forward direction and move
   needle bar.

   < Note > Please do not turn the fasten collar so much,
   because the measuring range of the Dial-gauge is limited.

   In case needle bar can not be moved,
   Fixing screw for Fasten collar is loosen too much.
   Tight fixing screw for Fasten collar gradually up to the
   position that needle bar can be moved.
   < Note > If loosen too much, fasten collar will start slipping
   against needle bar cam.
   If tight too much, needle bar can not be moved again.
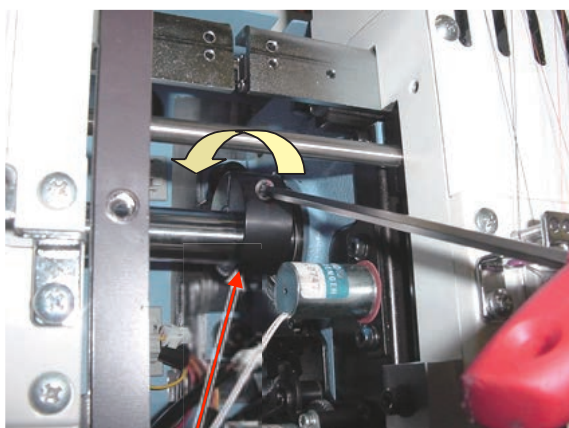
Fasten collar

11. Check movement of the Dial-gauge with turning fasten
   collar forward and back ward then, find needle bar lowest
   point that the movement of the dial-gauge stops.

12. Tighten fixing screw of fasten collar.
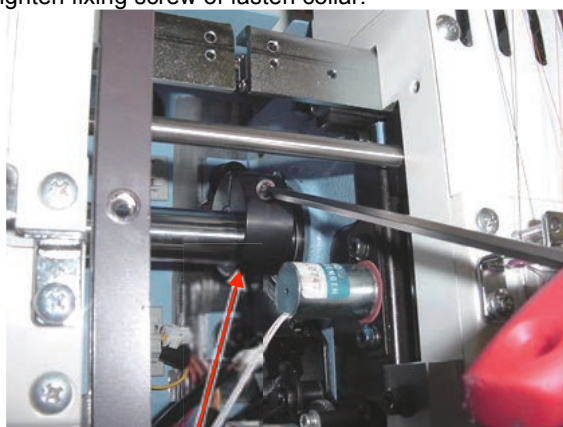
Fasten collar

13. Turn brake switch off.

14. Turn upper shaft to set dial disc to [0 degrees], Turn
   main shaft forward and back ward with checking the
   Dial-gauge movement then, stop the main shaft at needle
   bar lowest point.
   Confirm that the dial disk is located at [0 degrees].
   If the angle is not correct, repeat steps from 9 to 14.

15. Put removed all parts back to finish.

16. After adjustment, confirm the needle height and rotary
   hook timing also.
   Please refer to [4-2-6   Adjustment of needle height]
   [4-4-1   Adjustment of rotary hook timing].

4-2-8   Exchange of needle bar, needle bar spring, cushion and pressure foot block

1. Refering to [4-1-5 Exchange of pressure foot],

   remove pressure foot.

2. Loosen screw on needle bar boss.
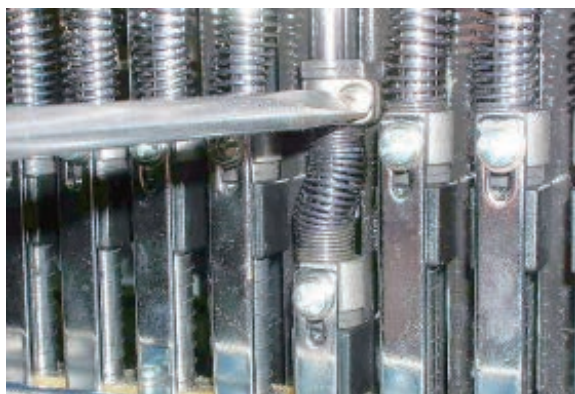
3. Take off "Needle bar boss".

   At this time, remove pressure foot spring (lower),

   pressure foot block, cushion, pressure foot boss and

   needle bar boss.

4. Set good parts to needle bar.

   At this time, if insert extra needle bar from under, you

   can work more easily.

   < Note > Care to insert direction for "Pressure foot" and

   "Pressure foot boss".

   Pressure foot block

   Check shape of direction.
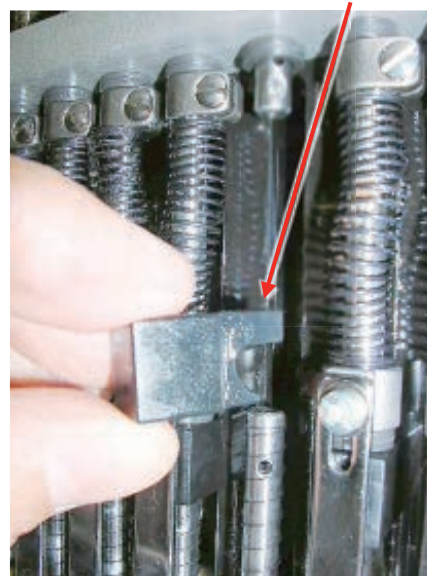
   Pressure foot boss

   Should hole to under side

4-2-8   Exchange of needle bar, needle bar spring, cushion and pressure foot block

5. Fix needle bar spring.

   Finally, push upper needle bar and string all parts then pull

   out lower extra needle bar.

   Slide needle bar to lower.

6. Fix pressure foot.
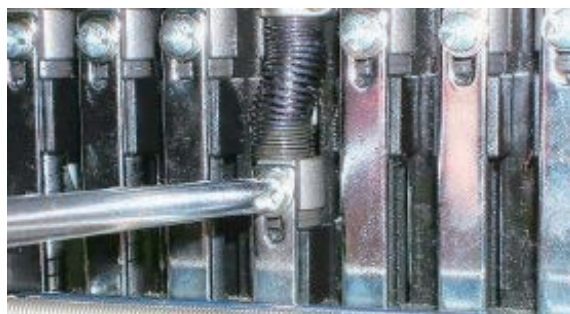
7. Fix needle, needle holder and cushion.
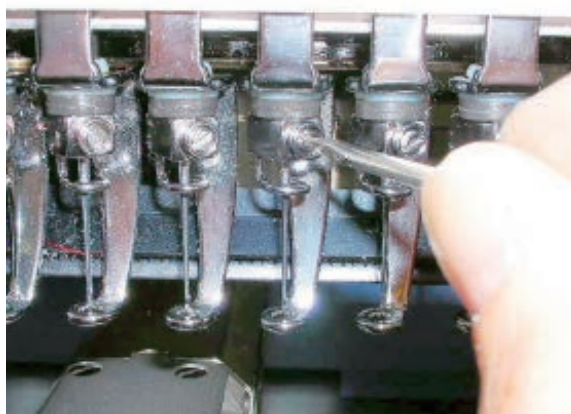
8. Adjust needle height.

   Please refer to [4-2-6 Adjustment of needle height].

9. Adjust pressure foot height.

   Please refer to [4-1-4   Adjustment of height of pressure

   foot].

10. Put removed parts back to finish.

4-2-9 Fixing of needle bar boss check plate

1. Remove moving head.

   Please refer to [4-2-1, 4-2-2   Assemble and remove
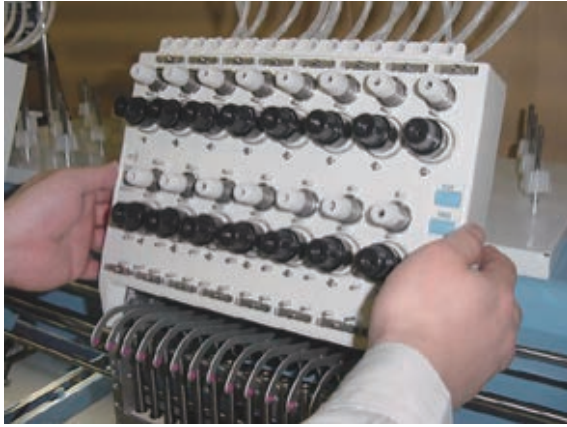
   moving head].

2. Exchange of needle bar boss check plate.

3. Temporarily, use the pan head screw to center the needle

   bar boss check plate then fix the screw

4. Fix positioning needle bar boss check plate.

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

4-2-10   Exchange of take-up lever

1. Remove moving head.

   Please refer to [4-2-1, 4-2-2 Assemble and remove moving

   Head].
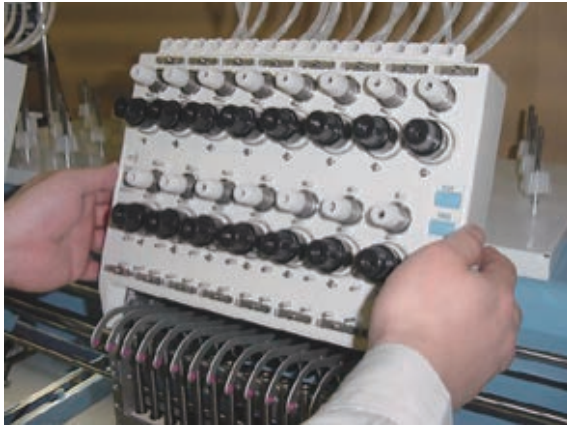
2. Loosen screw on take-up lever shaft. (Fixing screw 2 pcs)
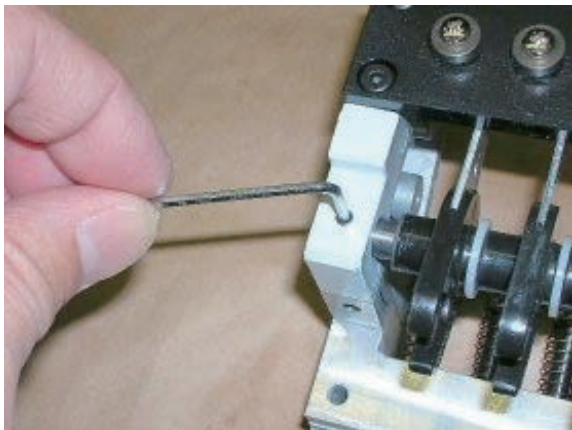
3. Remove the E-ring.
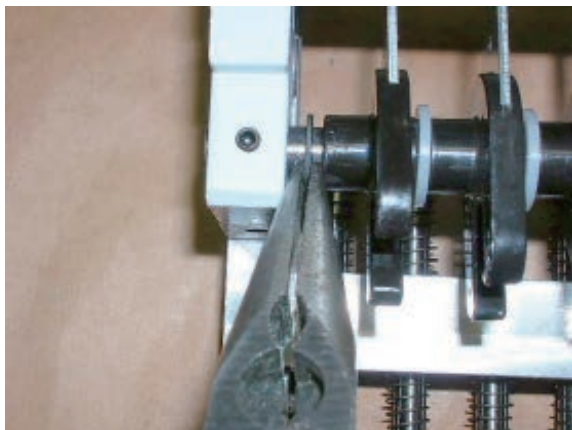
4. Please do not miss "Plastic thrust washer" between E-ring

   and Take up lever.

   Remove plastic thrust washer. (1 pcs)
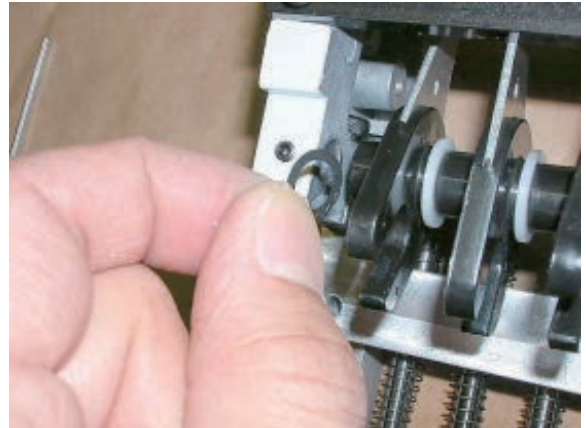
5. Remove the take up lever shaft first then remove the take-

   up lever.
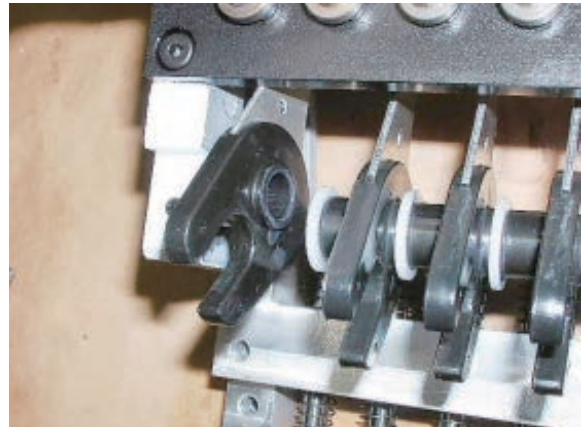
6. Remove plastic washer.
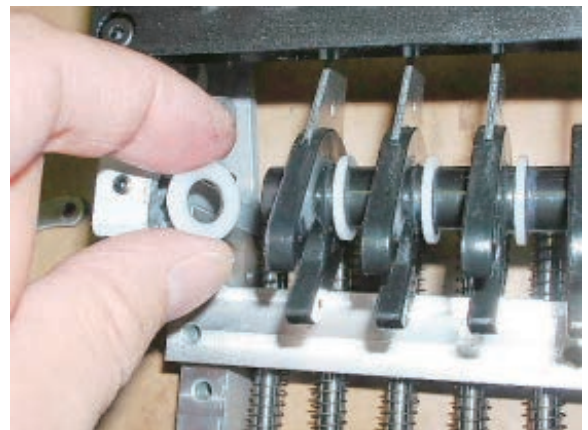
4-2-10　Exchange of take-up lever

7. Install good take-up lever assembly.
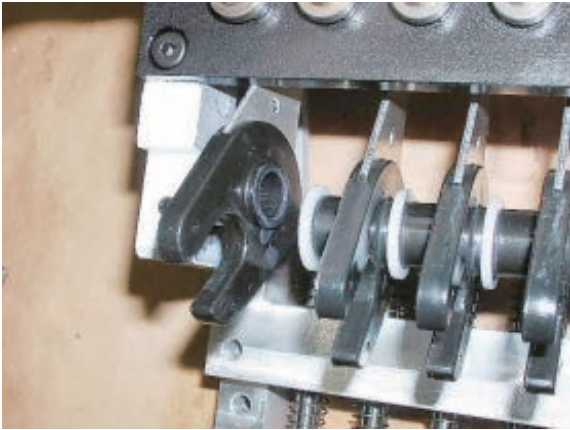
8. Leave space of [0.2mm] between take-up lever and
 moving head .
  Tight screw for "Take up lever shaft"

9. Put moving head in previous position to finish.

4-2-11   Adjustment of tension of thread adjusting spring

1. Remove thread adjusting unit ass'y. (Fixing screw 4 pcs)

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

   Put tip of spring in upper groove.

   Strongest tension will be obtained in upper groove.
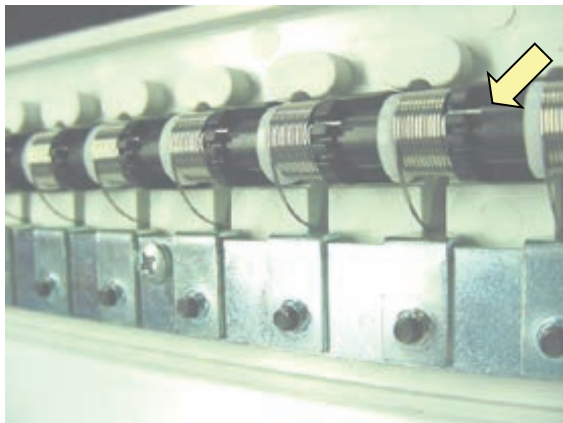
3. Fix thread adjusting unit ass'y to finish.

4-2-12   Adjustment of stroke of thread adjusting spring

1. Loosen screw on adjuster.
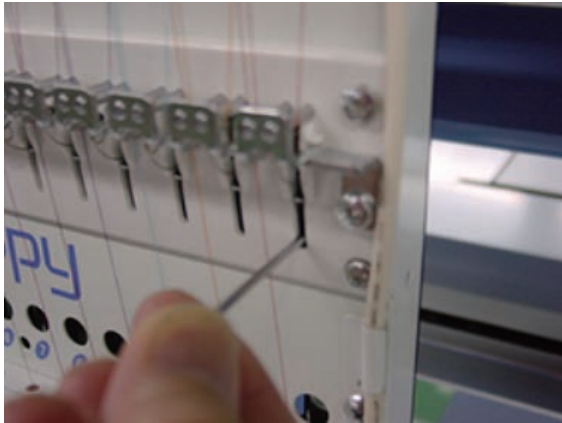
2. Move adjuster lower position with small flat-head driver.

   When you move adjuster upward, stroke will get small.

   When you move it down, stroke will get large.
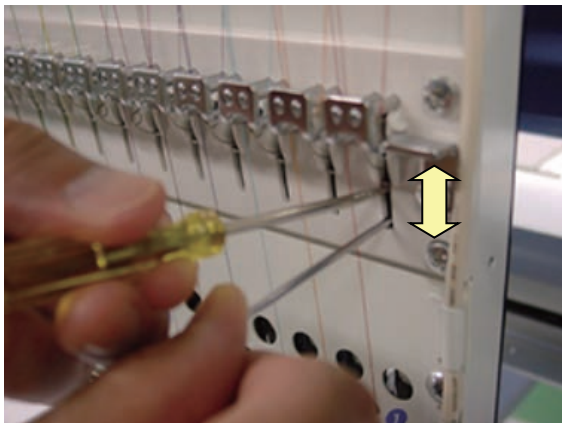
   * The lower position is default setting.

3. After adjustment, tighten screw to finish.

4-2-13 Adjustment of thread holder

1. Loosen screw to the extent that thread holder moves.
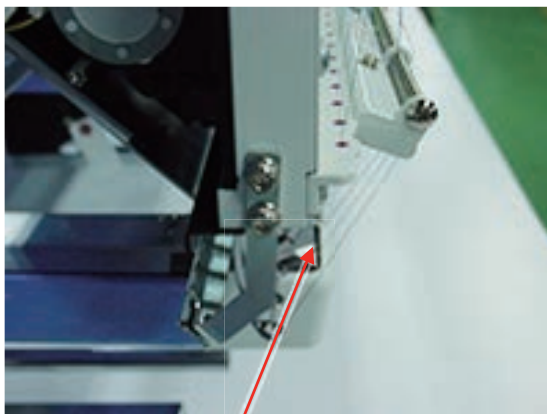
(Fixing screw 4 pcs)

Screw

2. Please putout and withdraw thread catcher by your finger and fix holder position at smoothly moving position.

<Note> Please check smoothly moving at 1st and 15th needle.

Positional relationship between pressure foot and holder (lower)

When downing the needle, should have gap more than 1 mm between holder and presser foot.

Gap
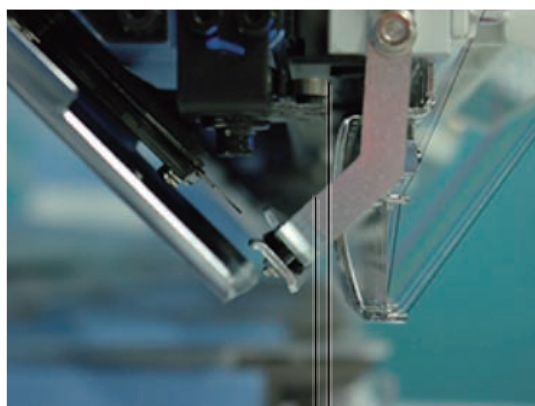
3. Thread catcher device should be adjusted if above clearance is not keepable.
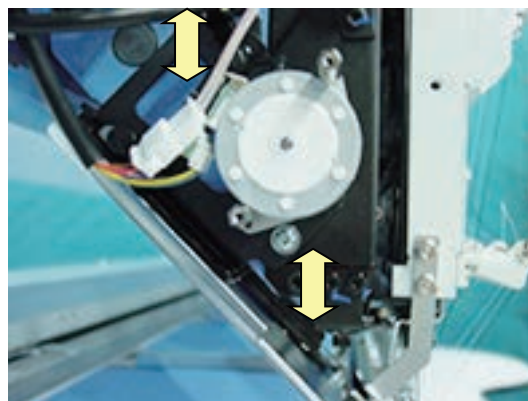
4. Press thread trim key and confirm whole thread trim revolution.

4-2-14　Adjustment of clip-type thread holder

1. Loosen screw to the extent that clip-type thread holder moves. (Fixing screw 4 pcs)
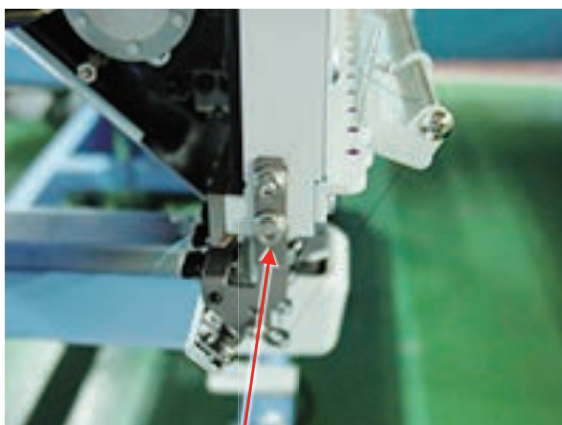
Screw

2. Please put out and withdraw thread catcher by your finger and fix holder position at smoothly moving position.
Hook has to touch surface of clip holder (lower).
< Note > Please check smooth moving at 1st and 15th needle.

Positional relationship between pressure foot and holder (lower)

When downing the needle, should have gap more than 1 mm between holder and presser foot.
When is hook pull out, space between hook and bottom of pressure foot should be more than 1mm.

Gap
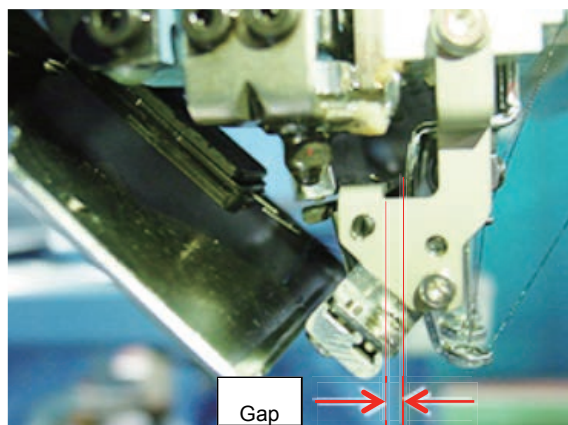
3. Thread catcher device should be adjusted if above clearance is not keepable.
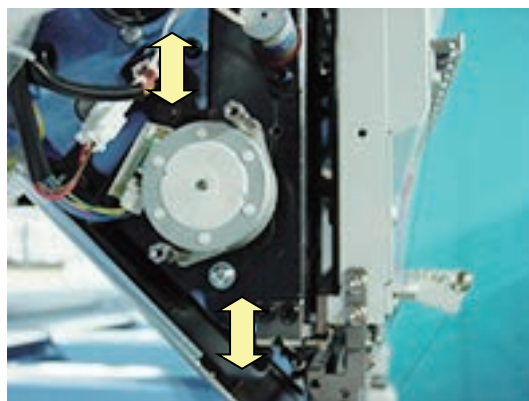
4. Space between Clip drive and clip should be 1-2mm.
< Note > Please check at 1st and 15th needle.
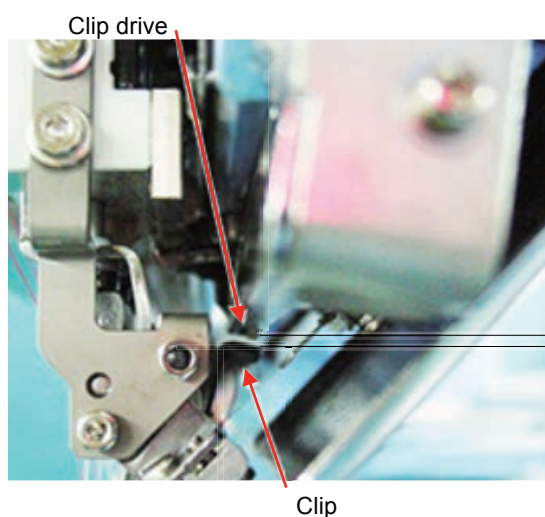
Clip drive

Clip

5. Press thread trim key and confirm whole thread trim revolution.

4-2-15　Adjustment of clip drive unit

1. Move moving head to the position that 1st needle is active.

2. Temporary fix Clip drive unit.

Screw
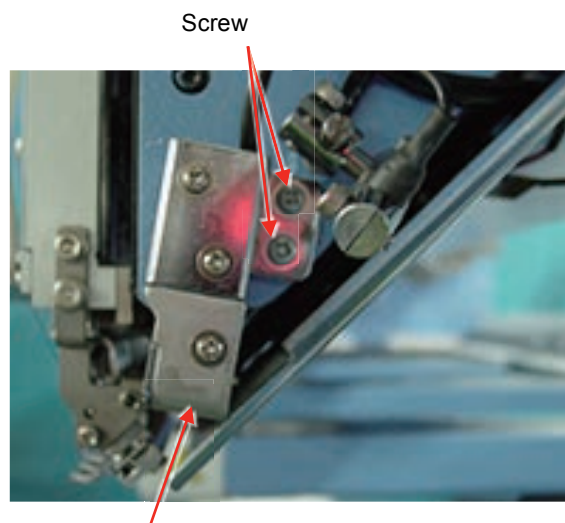
Clip drive unit

3. Connect cables and bundle by wiring clamp.

Cable
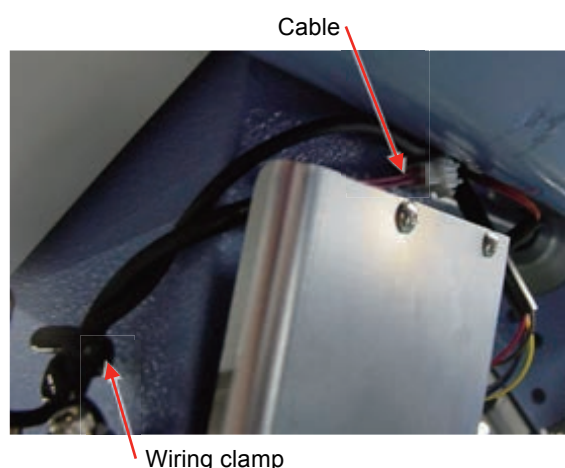
Wiring clamp

4. Space between Clip drive and Clip should be 1-2mm and push point of Clip Drive should be center of clip(right and left). Fix Clip drive unit at the position that unit is not touching to holder.
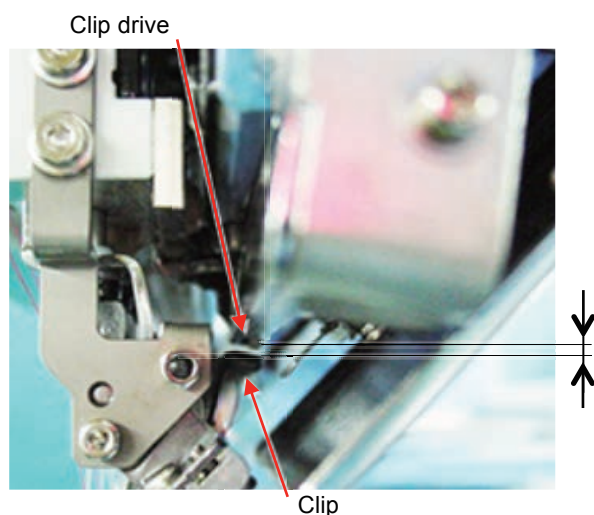
Clip drive

Clip

5. Turn power switch ON, and move moving head to 15th needle. Please confirm space between Clip drive and clip is same as space at 1st needle.

6. If case above space at 1st needle and at 15th needle is not same, position of clip holder may be incorrect.
Please check position of Clip holder and Clip drive unit.

7. Refer to [E5-1　How to enter maintenance mode] and enter maintenance mdoe.

8. Press Machine Test .
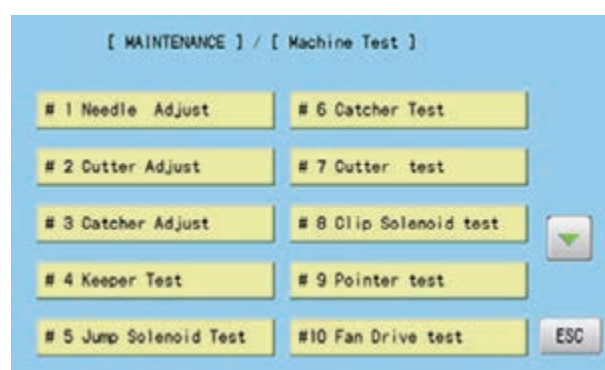
9. Press #8 Clip Solenoid Test .
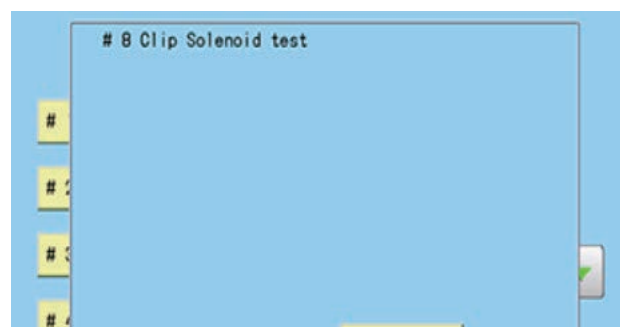
Please confirm that clip opens more than 2mm.

< Note > Please check at 1st and 15th needle

10. Press thread trim key and confirm whole thread trim revolution

4-3-1   Check / Adjustment of needle bar change unit

1. Remove cover for needle bar change unit.

Cover

2. Turn the knob to flat position of the cam and push moving head right and left side for confirm should not have a play the Cam.
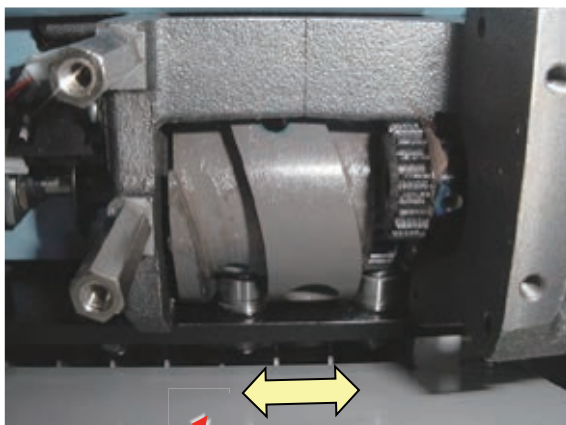
Moving head

2-1. If you had feel a play the cam, please loose the set screw on cam.
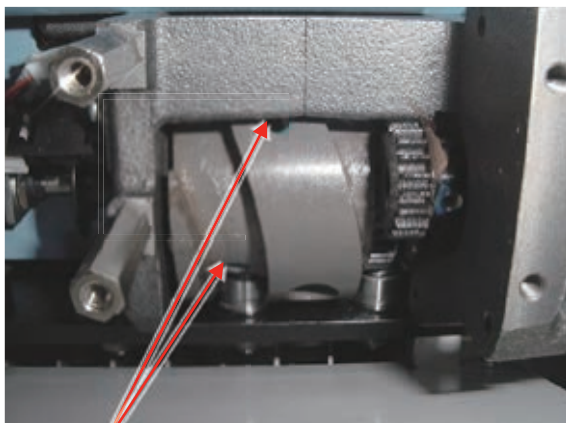
Set screw

Both hole has 2 pcs of set screw.

Inner set screw is "Cup Point" type and outer set screw is "Flat Point" type.

2-2. Push the Cam to right and push drive shaft to left side and tight Cam screws.
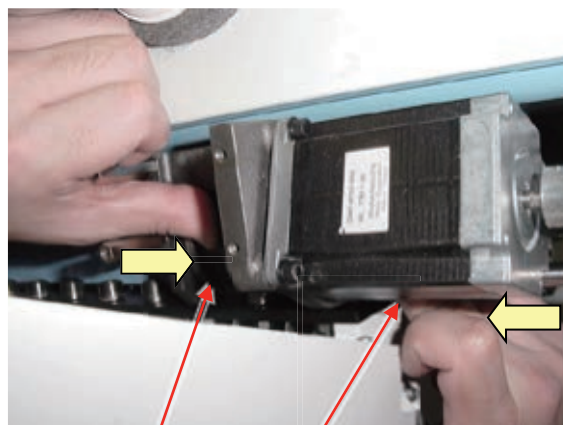
Cam   Drive shaft
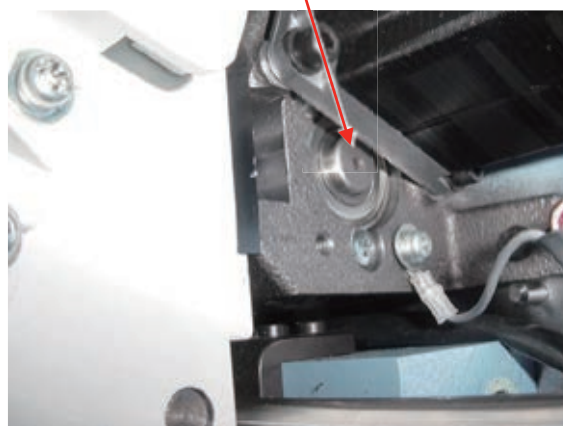
2-3. Check the cam should not have play.

After this adjustment, please check and adjust the needle position.

Please refer to [4-2-4   Adjustment of needle position (left and right)].

3. Turn the knob and stop at needle stopping point and confirm Senser and slit position reference following image.
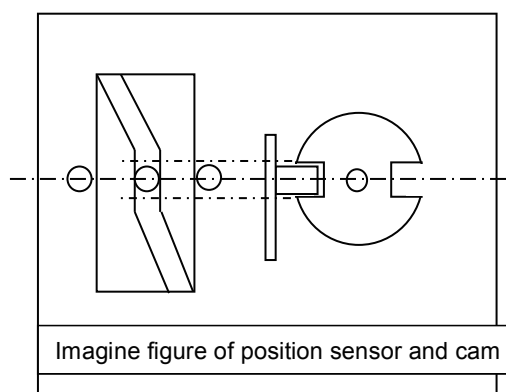
Imagine figure of position sensor and cam

4-3-1   Check / Adjustment of needle bar change unit

3-1. For adjustment the sensor and slit position, pleaseloose

a screw on the slit.

< Note > Please do NOT loose LEFT side screw.
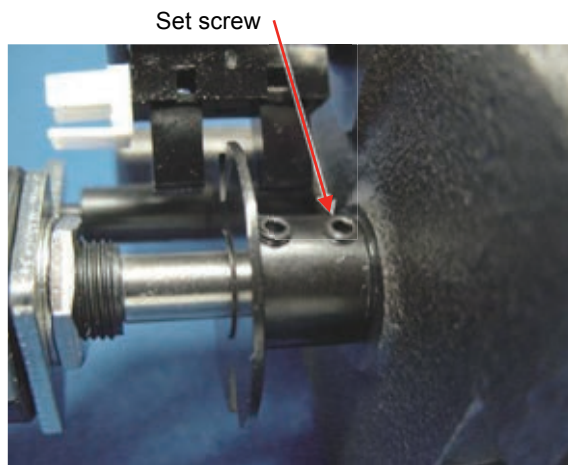
Set screw

3-2. Please adjust slit position to center of slit gap against

sensor when needle selection cam is middle position on

flat.Then tight screw of slit.
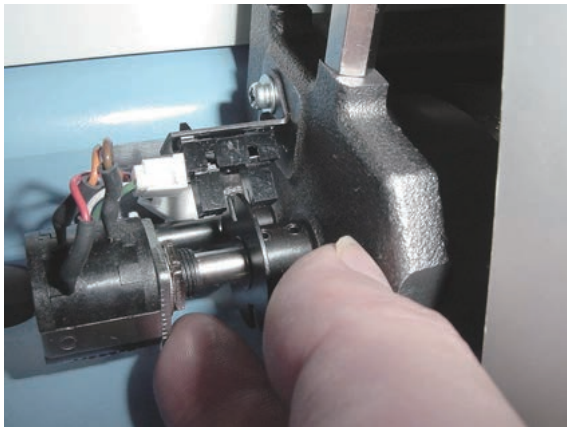
3-3. Turn the knob and confirm position of sensor and slit.

When needle selection cam is position on flat, angle of slit

against sensor should be even like below drawing.
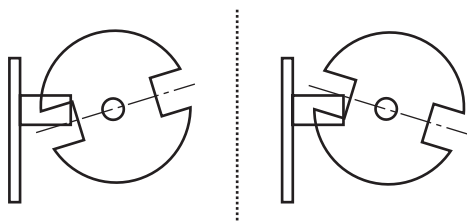
4. Turn the knob and move moving head to 15th needle.

5. Enter maintenance mode, referring to [E5-1 How to enter

maintenance mode]

6. Press � Machine Test ⎦.
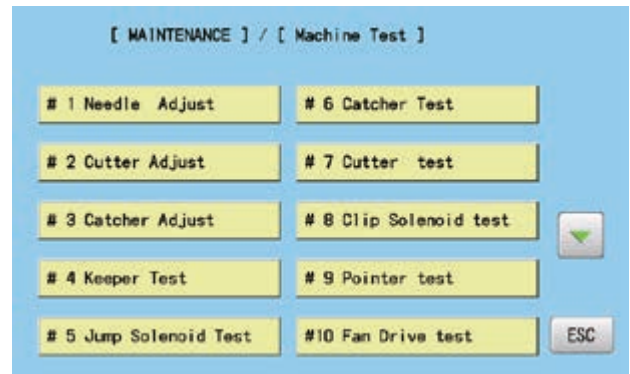
7. Press ⎣ #1 Needle Adjust ⎦ and press ⎣Position⎦.

Should showing [Needle Number   15*] and has beep

sound.

7-1. If your machine showing different (wrong needle number

or non * mark) message, potentiometer position is not

correct. Please loose left side screw of slit.

< Note > Please do NOT loose right side screw.
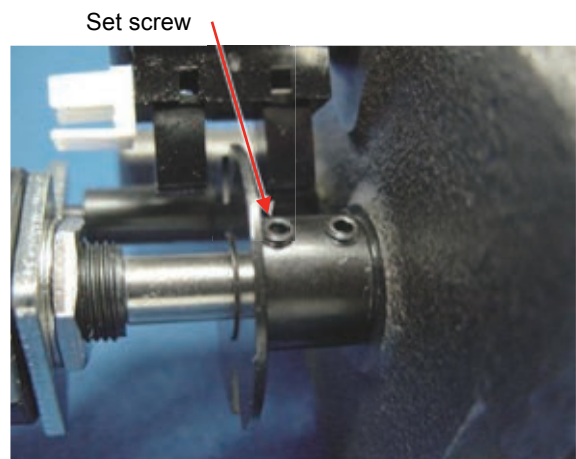
Set screw

4-3-1   Check / Adjustment of needle bar change unit

7-2. Turn shaft of Potentiometer and tight screw at middle

position on showing [*] mark.

7-3. Move Moving head to 1st head and press Position .

Confirm indication to [Needle Number   1*].

7-3. Move Moving head to 1st head and press Position .

7-4. Press BACK to complete settings.

8. Please check needle position to needle plate and back on

cover.

< Note > Piositioning image for needle selection Cam, Slit,

Sensor.

Center

Imagine figure of position sensor and cam
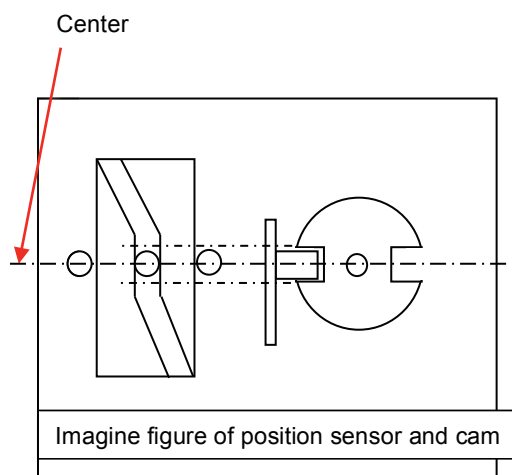
4-4-1 Adjustment of rotary hook timing

1. Move moving head to the position which 8th needle is

   active.

   Remove bobbin case and needle plate.

   (Fixing screw 2 pcs)

2. Loosen screw on rotary hook. (3 places)

   <Note> Please do not loose screws too much.
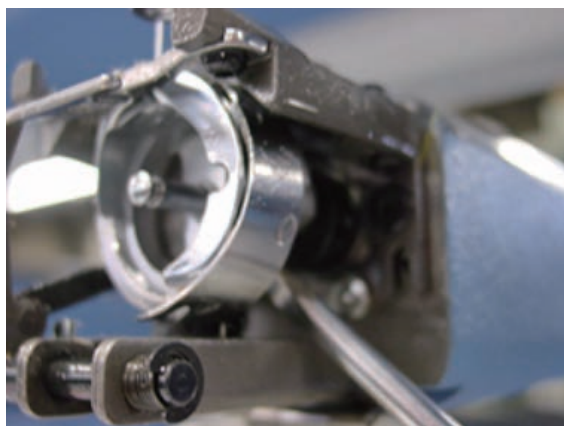
3. Bring needle down up to the needle lowest position.

   Refer to [5   User maintenance mode].

   <Note> Please do not loose screws too much.

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

   < Note > Turn upper shaft anti-clockwise

   Turn brake switch ON.

5. Set the position of needle and tip of hook as below.
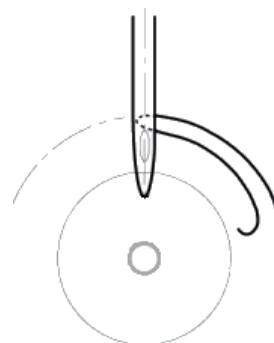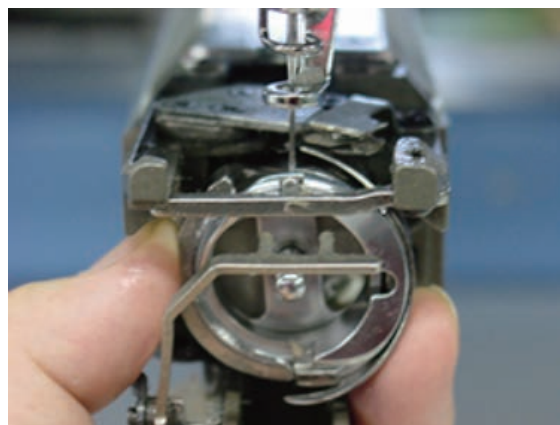
4-4-1　Adjustment of rotary hook timing

6. Clearance between needle and rotary hook should be [0.1 ~ 0.2mm]

Clearance
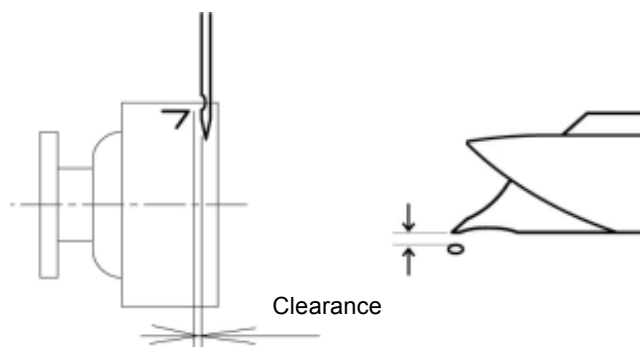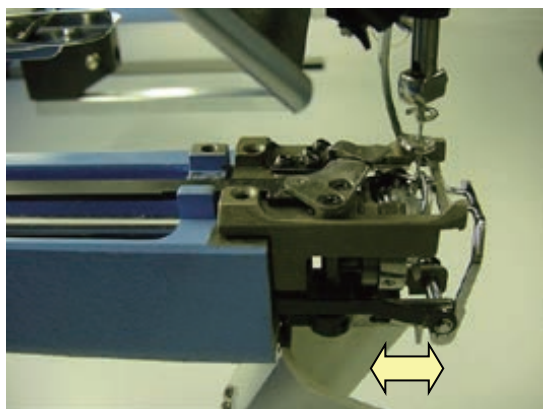
7. Check and adjust with 1st, 8th and 15th needle.

8. Tighten screws on rotary hook
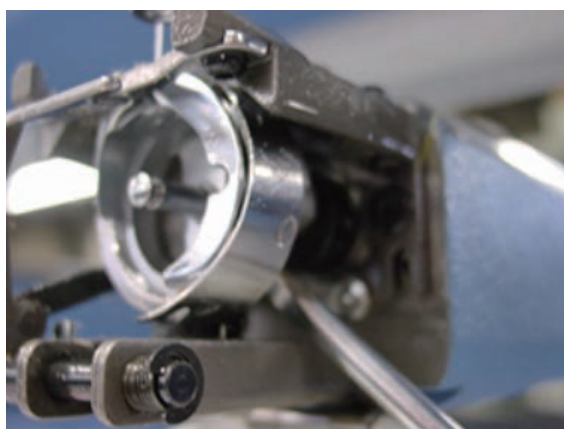
9. For making sure, check position of retainer on bobbin case holder.

Please refer to [4-4-2　Adjustment of retainer on rotary hook]

10. Set needle plate keeping needle position is center of needle hole on needle plate

Needle　　　　Needle hole of needle plate
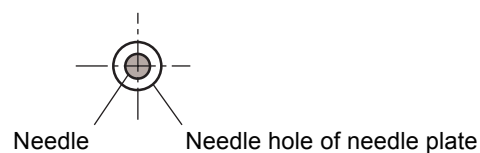
11. Adjustment has finished.

4-4-2　Adjustment of retainer on rotary hook

Loosen screw to the extent that retainer moves. (1 pcs)

0.8mm

Needle center position

4. Adjustment has finished.
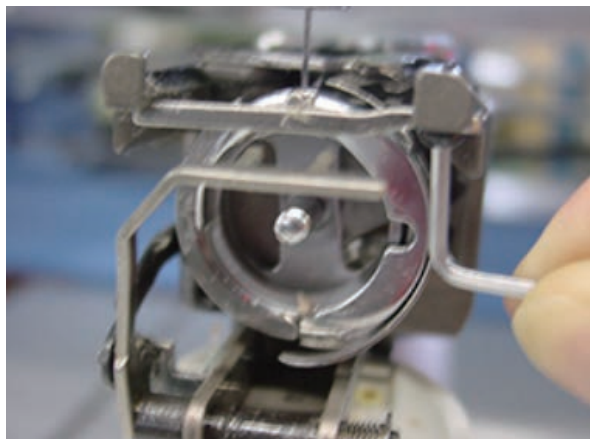
2. Adjust position back and forth, left and right.

Using adjustment gauge and adjust space to be [0.8mm]
for back and forth. (insert gauge between retainer and
inner hook)
The position for right and left is center of the needle.
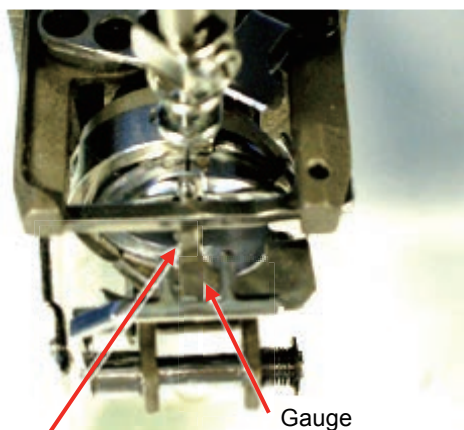
Gauge

Center of needle and center of retainer to be adjusted

Gauge

4-4-3 Exchange of rotary hook shaft

1. Take hook shaft out

1-1. Take hook retainer out.

   (Hexagon socket button head screw : M3-5)

   (Plain washer : M3)

1-2. Loosen screw and take hook out.
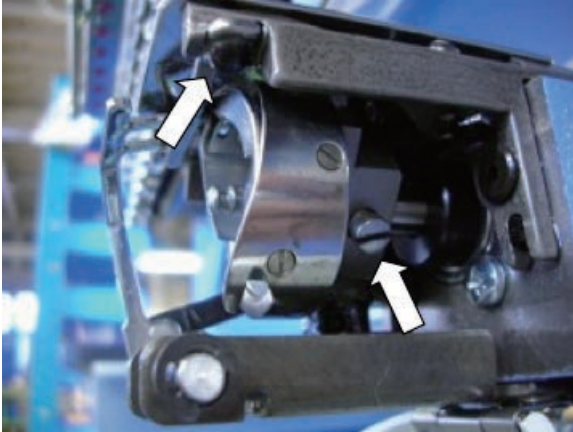
1-3. Loosen screw of collar.

   (Hexagon socket set screw : M4-4　2 pcs)

   Please loose screw enough, because shaft has flat face.

1-4. Take cover of bed.

(Screw for needle plate :　2 pcs)

1-5. Lossen screws (see below picture) total 4 pcs.

   (Hexagon socket set screw : M4-4　4 pcs)
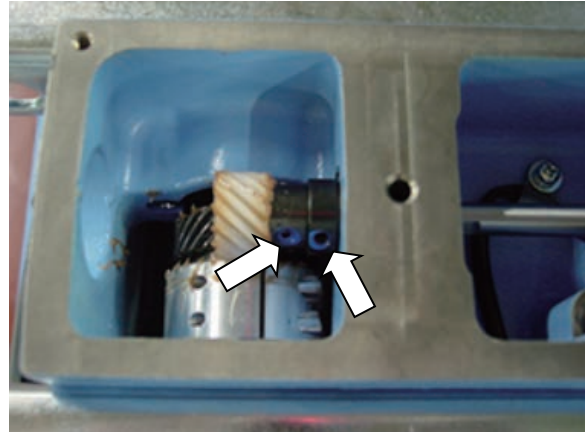
1-6. Take gear out.

1-7. Pull shaft out.

   Take hook shaft out has finished.

4-4-3　Exchange of rotary hook shaft

2. Install new shaft.

The parts which has one flat face is for hook side.

2-1. Insert shaft and adjust position of flat face and screw

position.

2-2. Shaft is 15mm out from collar.

Please fix screw

(Hexagon socket set screw : M4-4　2 pcs)

2-3. Put gear and fix.

Set screw position to flat face of shaft, and tighten screw.

(Hexagon socket set screw : M4-4　2 pcs)

Center of gear should be center of shaft.

(please adjust position of gear)

2-4. Please put grease on gear.

<Grease>Shell alvania EP Grease

< Note > Put grease equally.

3-5. Put cover of bed.

(Screw for needle plate :　2 pcs)

.

4-4-3 Exchange of rotary hook shaft

2-7. Put gear and fix.

Set screw position to flat face of shaft, and tighten screw.

(Hexagon socket set screw : M4-4   2 pcs)
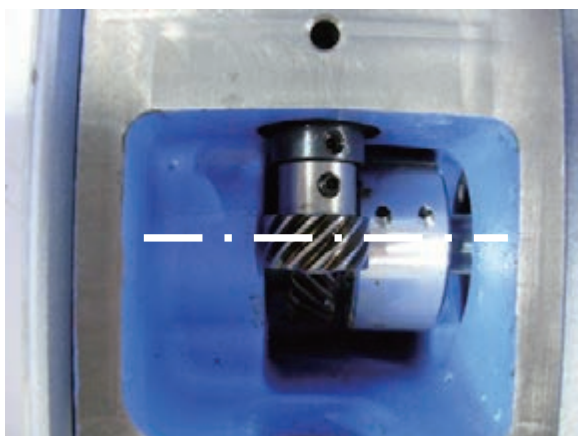
Center of gear should be center of shaft.

(please adjust position of gear)

2-8. Please put grease on gear.

<Grease>Shell alvania EP Grease

< Note > Put grease equally.

3-9. Put cover of bed.

(Screw for needle plate :   2 pcs)

3. Install hook

3-1. Temporary fix hook and hook retainer.

(Hexagon socket button head screw : M3-5)

(Plain washer : M3)
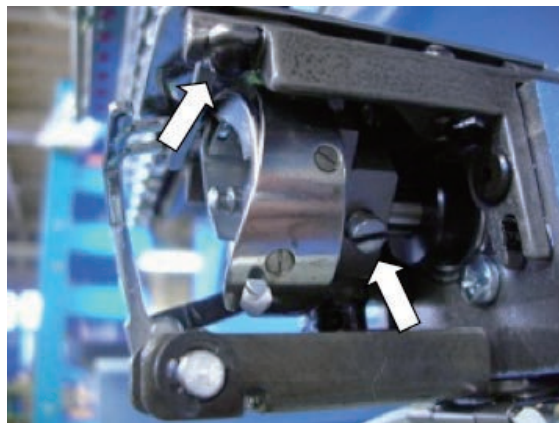
3-2. Adjust rotary hook timing.

Please refer to [4-4-1   Adjustment of rotary hook timing].

3-3. Adjust retainer on rotary hook.

Please refer to [4-4-2   Adjustment of retainer on rotary hook].

Exchange has finished.

4-5-1　Check of thread cutting driver

1. remove table support cover, cover for thread cutting driver.
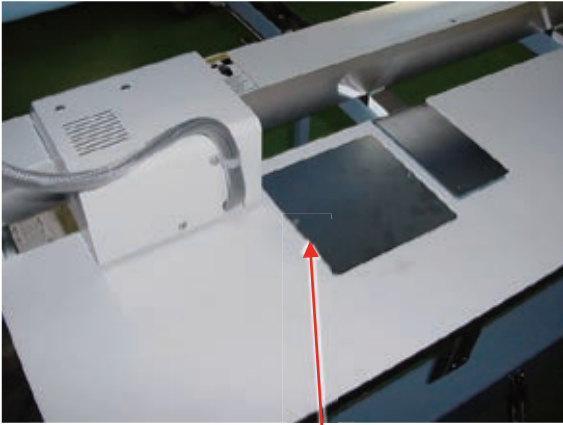
Cover for thread cutting driver
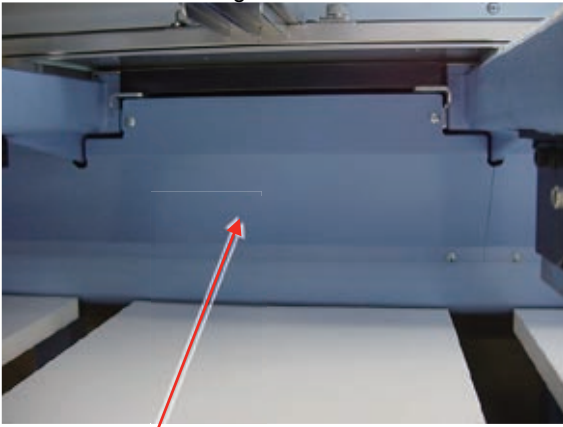
Table support cover

2. Keep Moving knife to closing.

Please refer to [5　User maintenance mode]
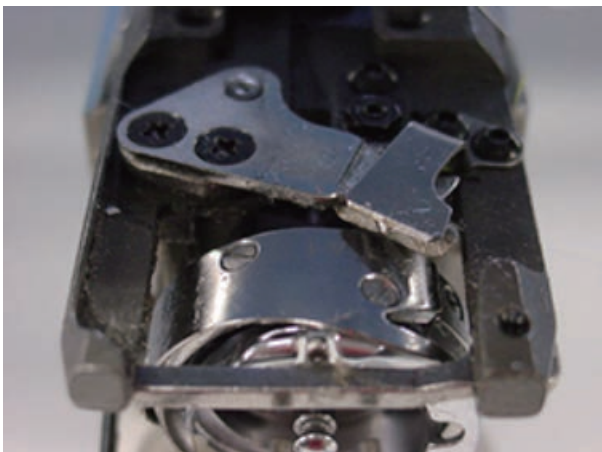
3. Check clearance between Driver base and Fasten block for guide [18 ~ 19mm].

Please confirm bulge right side point of "Slide shaft" position likefollowing picture.
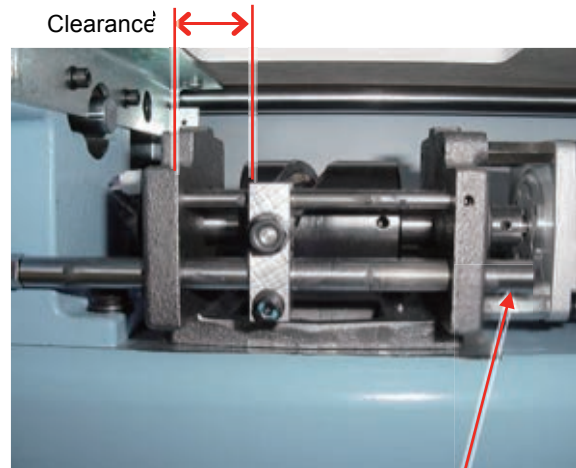
Clearance

Slide shaft

4. Turn the Cam till stop end. And confirm a ditch of Cam has allowance.
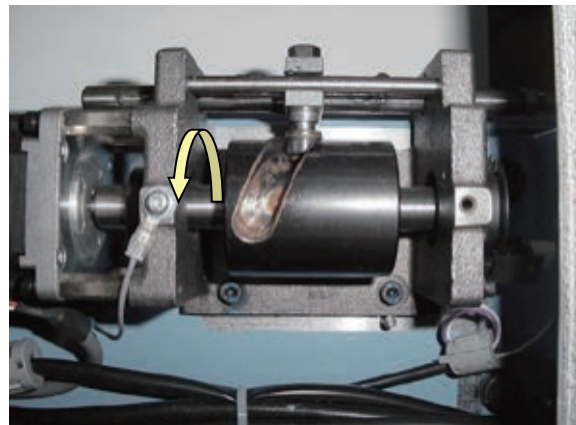
5. Keep Moving knife to opening.

Please refer to [5　User maintenance mode]

4-5-1   Check of thread cutting driver

6. Check clearance between "Driver base" and "Fasten block

   for guide" [40 ~ 41mm].

   Please confirm bulge left side point of "Slide shaft" position

   likefollowing picture.

Clearance

Slide shaft
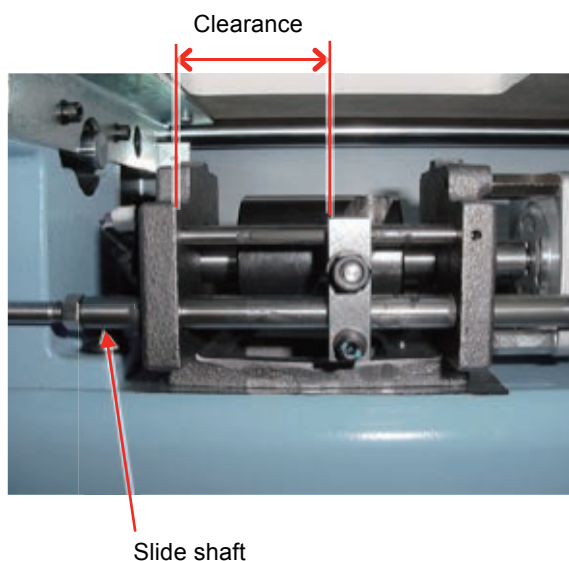
 - If you have some error in the step 3. ~ 6, please adjust

   [4-5-2   Adjustment of thread cutting driver].

7. Please keep Moving knife to closing.

   Please refer to [5   User maintenance mode].

   Return cover to previous places to finish.

4-5-2　Adjustment of thread cutting driver

1. Remove "Table support cover", and "Cover for thread cutting driver".
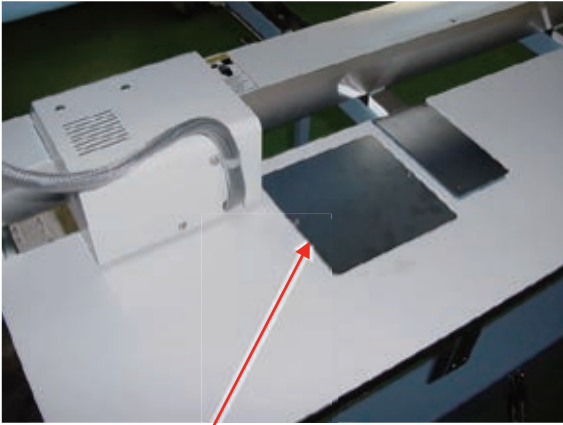
Cover for thread cutting driver
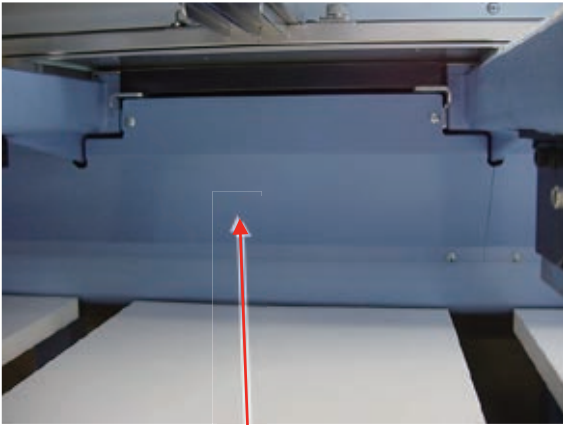
Table support cover

2. Turn the Thread cutting cam and move <u>Fasten block guide</u> to center area of the bracket.
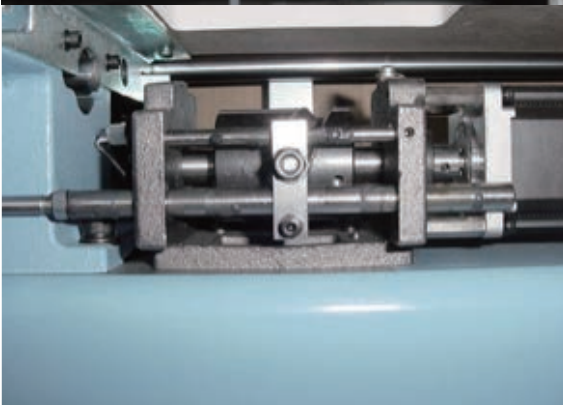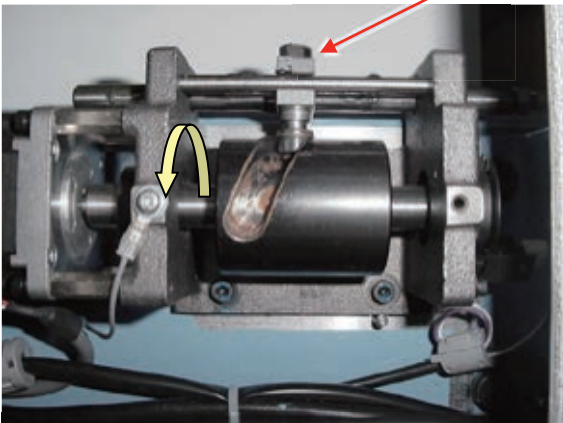
3. Loose Fasten screw and adjust slide shaft position to even protuberance against face of driver base and tight the screw.
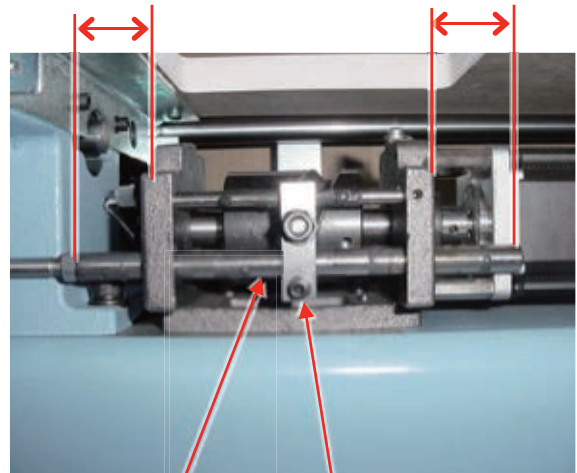
Slide shaft

Fasten screw

4. Turn the Thread cutting cam till end position. (Please see picture bellow)
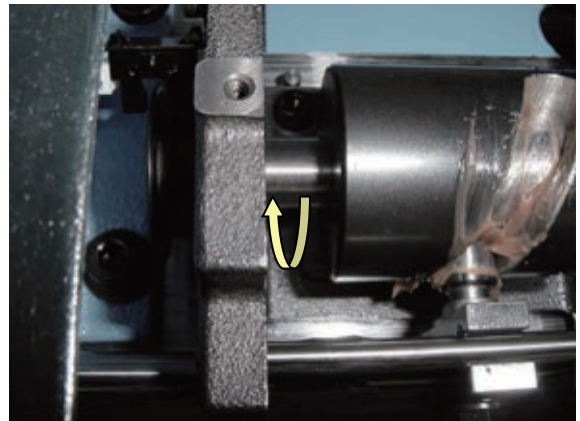
Please keep this position for next adjustment.

4-5-2 Adjustment of thread cutting driver

5. Adjust Slit right position against sensor.

   If you off the position, please adjust sensor position by

   screw on sensor bracket.

Sensor   Slit

6. After it, please adjust [4-5-5 Check / Adjustment of

   position of moving knife].

7. Confirm Moving knife position to CLOSE.

   Please refer to [5 User maintenance mode].

   Back on covers to previous position.

4-5-3　Exchange of moving knife

1. Remove needle plate. (Fixing screw 2 pcs)

2. Open moving knife.

    Please refer to [5　User maintenance mode].

3. Remove knife drive shaft retainer.

4. Pull out knife drive shaft ass'y.

5. Exchange moving knife.

6. Setting drive link hole to moving knife, insert knife drive

    shaft assembly.

7. 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.

8. Close moving knife.

    Please refer to [5　User maintenance mode].

9. Referring to [4-5-6 Adjustment of moving knife and

    fixed knife], check how well thread is cut and adjust, then

    finish this process.

4-5-4 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.
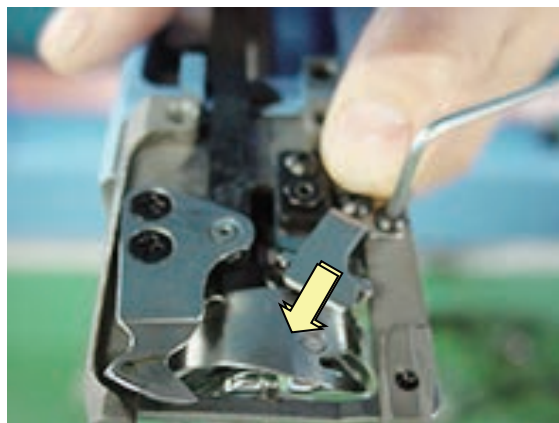
< Note > In case moving knife and the left side of fixed knife overlaps excessively when closing, adjust the position of fixed knife slightly to the right direction.

5. Referring to [4-5-6   Adjustment of moving knife and fixed knife], check how well thread is cut and adjust, then finish this process.

4-5-5　Check / Adjustment for position of moving knife

1. Remove the Needle plate

2. Please check knife closing position to following drawing.
   (Point of moving knife same face with fixed knife cutting line)
   Please refer to [5　User maintenance mode] for easy adjustment for this progress. You can open and close the knife manually.
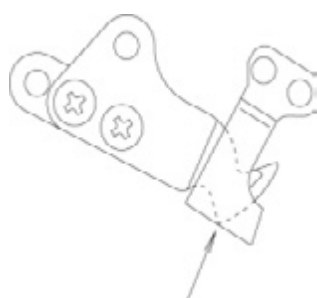
"Same face"

3. For this adjustment, remove Table support cover on front and go to next step.

4. Loosen screw on Thread cutting link and slide the link to right side for open the moving knife.
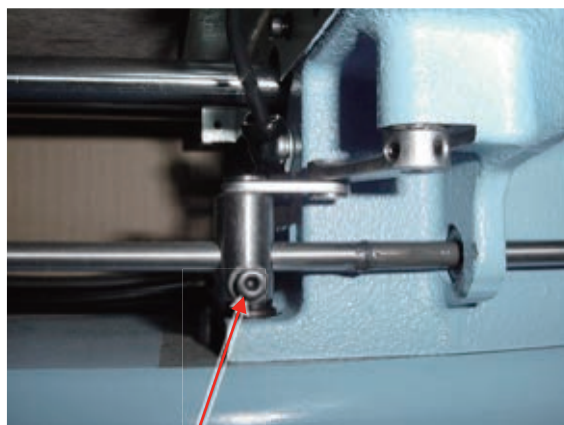
Screw

5. Slide the Thread cutting link to left side for close Moving knife and stop at right position of knife-closed point like bellow.
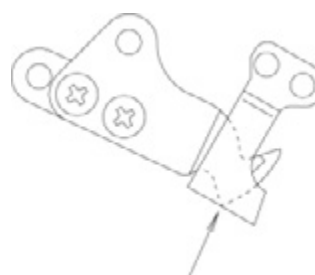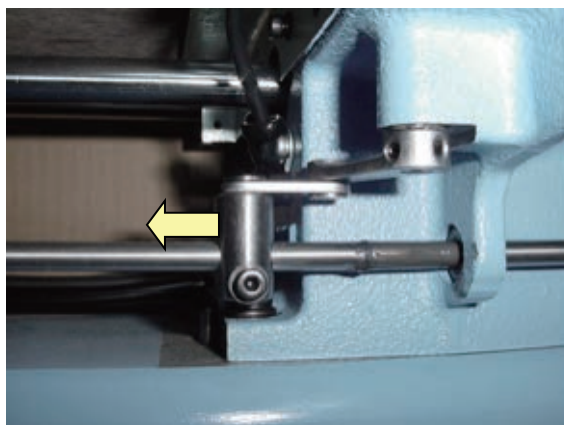
"Same face"

4-5-5   Check / Adjustment of position of moving knife

6. Keep the Thread cutting link position on "Step 5" and tight

   screw.

    Please confirm play the Link plate.

    If you have not playing the plate, possible

    moving knife not open correctly.
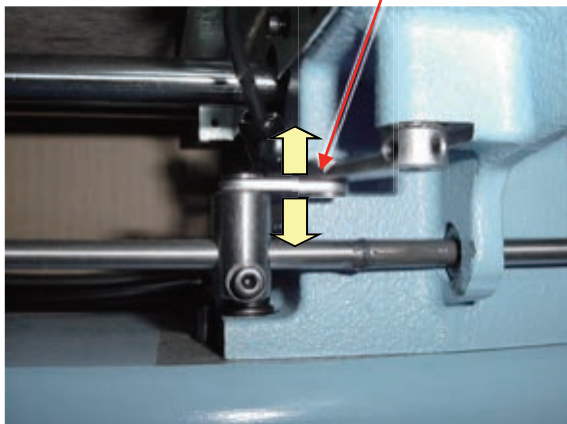
7. Check Moving knife closing point.

 - If the closing position is not right, please back Set 5. and 6.

  Please check opening point.

  Should open the "Moving knife" to left till "point of Moving

  knife" overfrom "Rotary hook retainer".
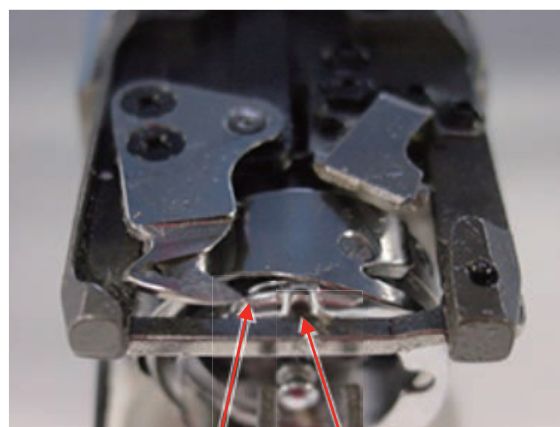
      Point of Moving knife

               Rotary hook retainer

 - If the position is not right, please check "Thread cutting

  driver".

  Referring to [4-5-1   Check of thread cutting driver].

8. After confirm, please back cover and needle plate.

4-5-6 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 [4-5-3 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.
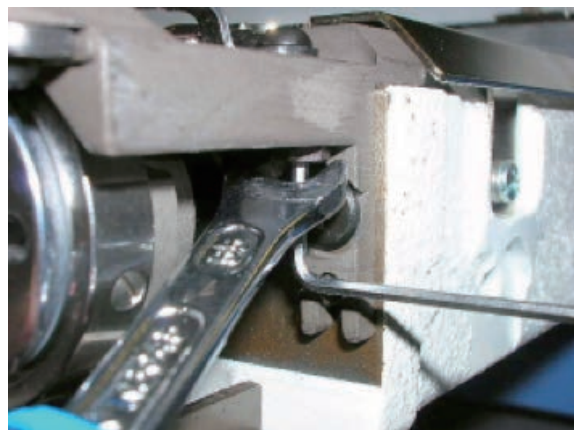
4. Cut thread and check how well it is cut.

   Use two polyester threads for checking.
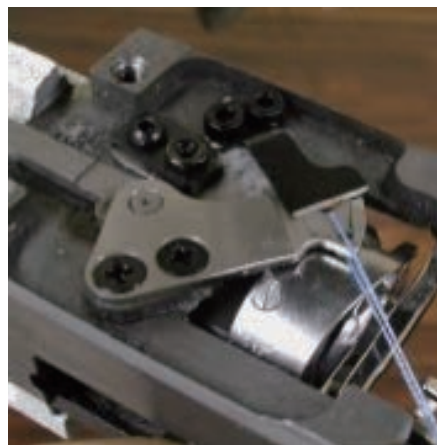
5. Check several times and if no mistakes are found, finish

   this process.

4-5-7　Adjustment of bobbin thread holder

1. Remove needle plate. (Fixing screw 2 pcs)

2. Close moving knife like putting bobbin thread between moving knife and bobbin thread holder.
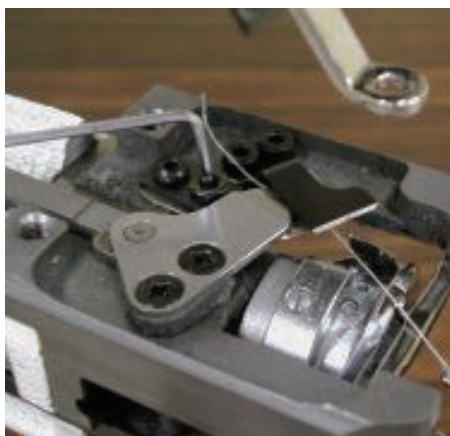
3. Adjust height of bobbin thread holder with adjusting screw.
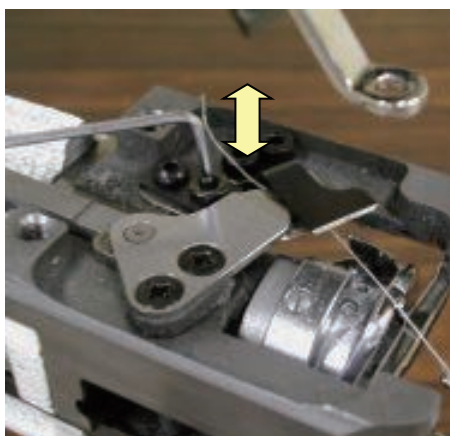
4. Pull bobbin thread toward arrow mark and see that bobbin thread comes off with tensile gauge [20 ~ 25g].
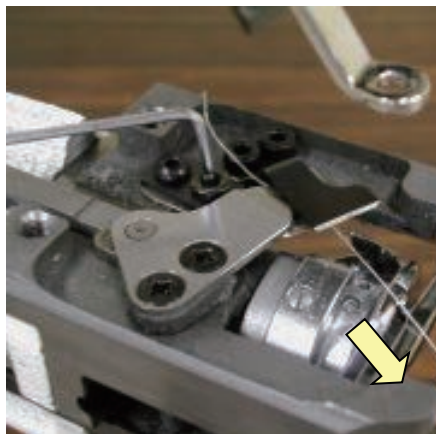
5. Tighten lock nut. (Don't move adjusting screw.)

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

4-5-8 Adjustment of position of keeper

1. Remove needle plate and bed cover.
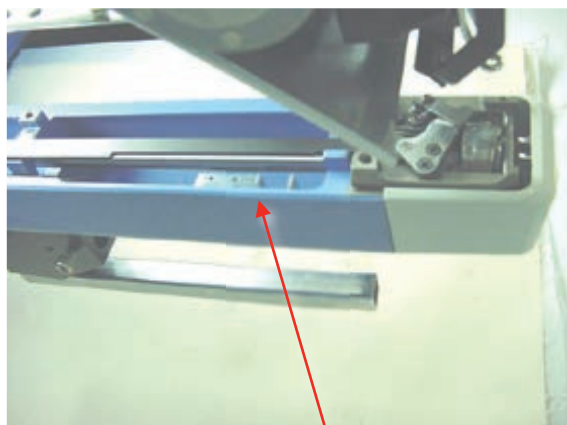
Solenoid base

2. Loosen screw on solenoid base. (Fixing screw 2 pcs)
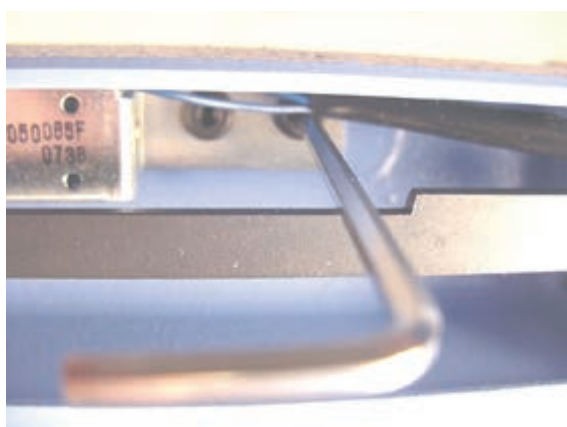
3. Loosen screw for stopper. (1 pcs)
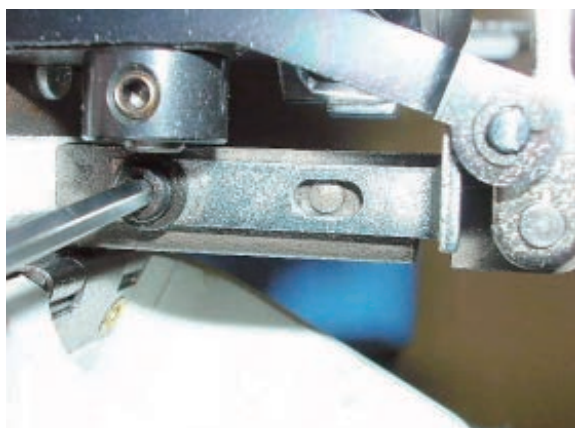
4. Insert keeper positioning gauge (Bobbin) into rotary hook.

5. Refer to [E5-1   How to enter maintenance mode] and

   enter maintenance mode.

6. Press Machine Test .

[MAINTENANCE] / [Machine Test]

1 Needle Adjust   # 6 Catcher Test

2 Cutter Adjust   # 7 Cutter test

3 Catcher Adjust   # 8 Clip Solenoid test

4 Keeper Test   # 9 Pointer test

5 Jump Solenoid Test   #10 Fan Drive test   ESC
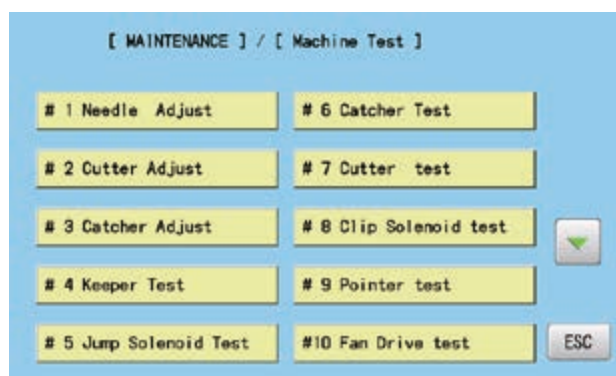
4-5-8   Adjustment of position of keeper

7. Press [#4 Keeper Test].
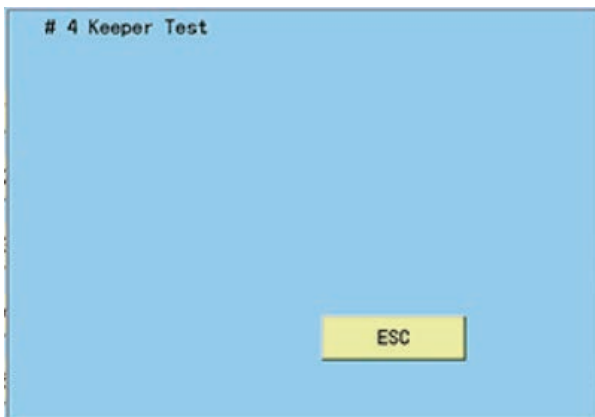
Adjust solenoid base where tip of keeper contacts slightly

to the gauge then tighten bracket screw.

Clearance between bobbin and keepr is [about 1.0mm].

< View from right>

Keeper positioning gauge

About 1.0mm   (Bobbin)
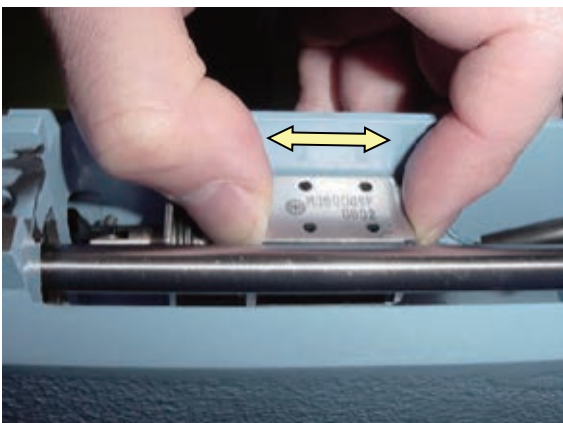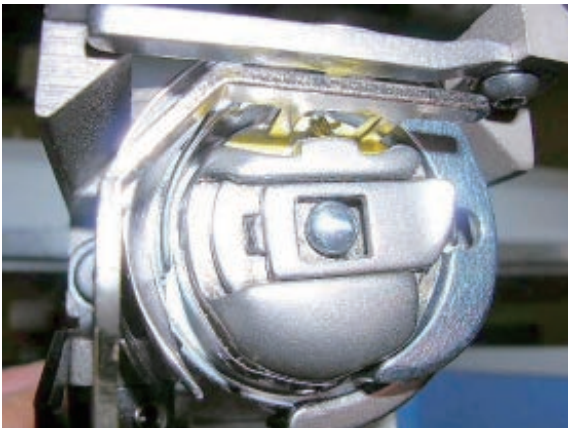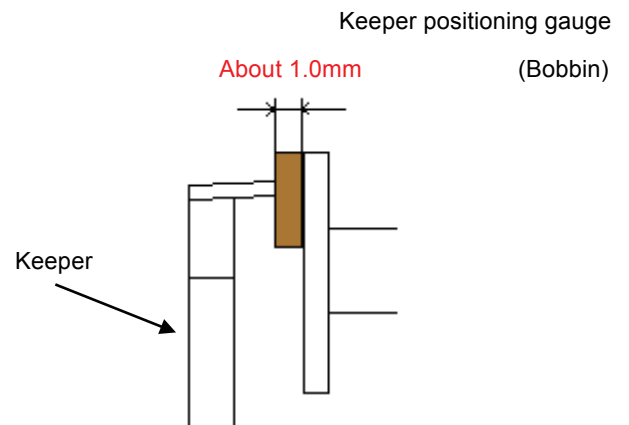
Keeper

8. Adjust position of stopper.

   This is the position where tip of keeper contacts to gauge.
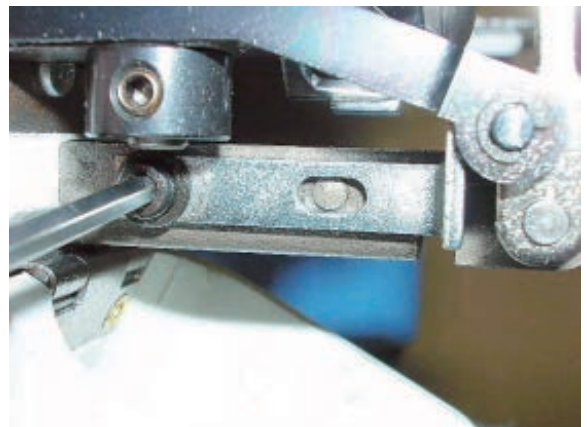
9. Adjustment has finished.

4-6-1　Adjustment of X carriage drive belt tension

1. Remove base cover and drive unit cover.
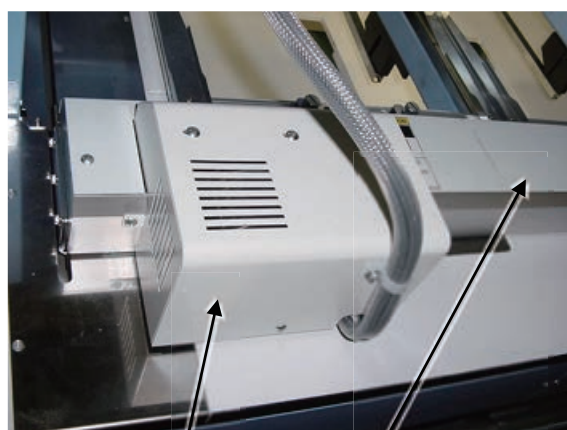
Drive unit cover　　Base cover

2. Loosen the adjusting lock nut.

　<Spanner> 7mm
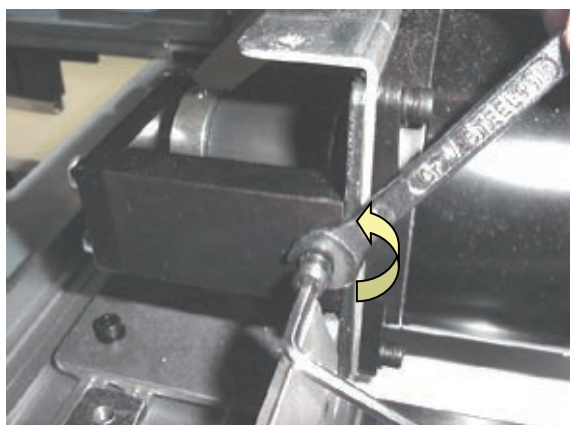
3. Loosen screw of Pulse motor bracket half turn

　　　　　　　　　　　　(3 pcs)
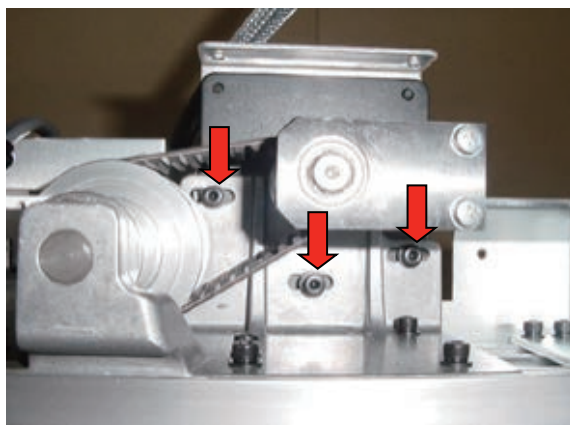
4. Set tension adjustment screw position 10mm from face of bracket of shaft support.

　Tighten screw by 1/4 turn.
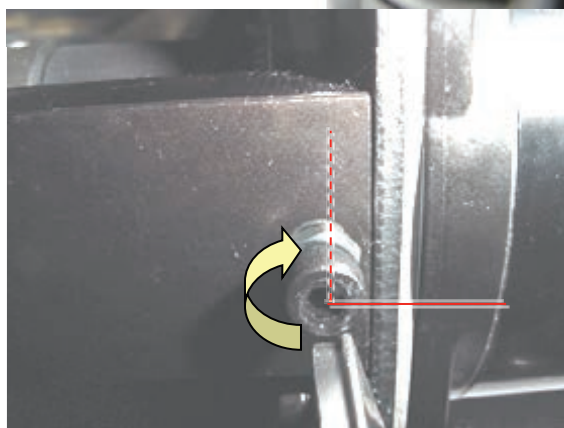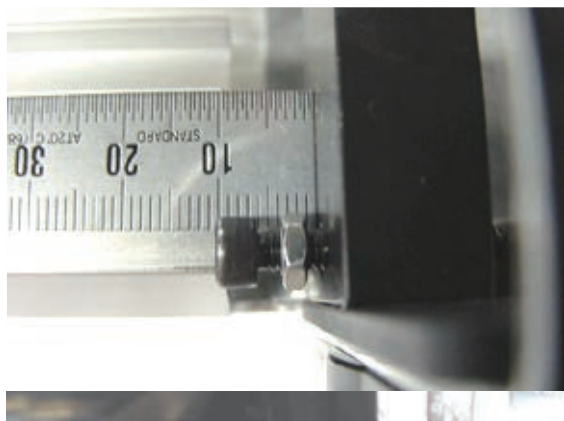
5. Tighten screw for the pulse motor bracket.

6. Tighten the adjusting lock nut.
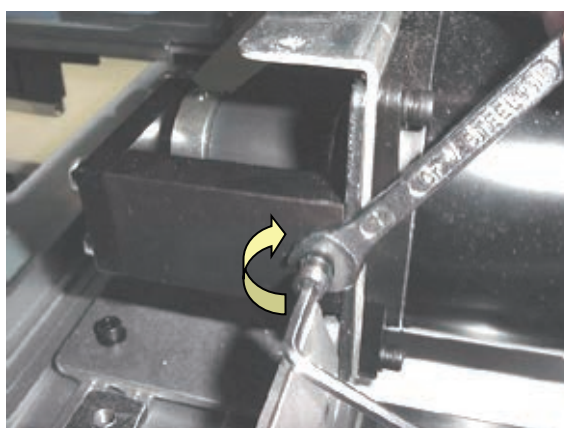
4-6-1　Adjustment of X carriage drive belt tension

7. Return base cover and drive unit cover to previous places.

8. Please refer to [E5-6　Position- Registration of coordinates for positioning sensor], register embroidery area and finish this adjustment.

4-6-2　Adjustment of X carriage timing belt tension

1. Take drive unit cover and X carriage base cover out.
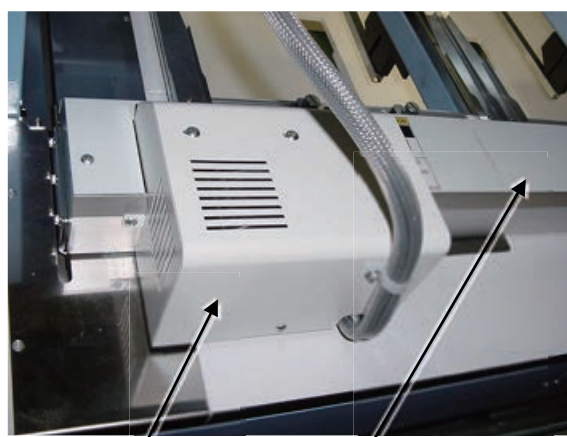
Drive unit cover　　　X carriage base cover

2. Loosen lock nut for tension adjusting nut.

　　<Spanner> 7mm
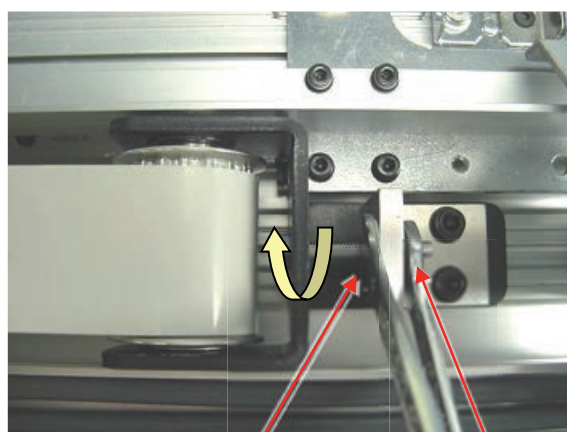
Lock nut　　　　　　　　Adjusting nut

3. Loosen screws of tension plate half turn.

　(2 screws)
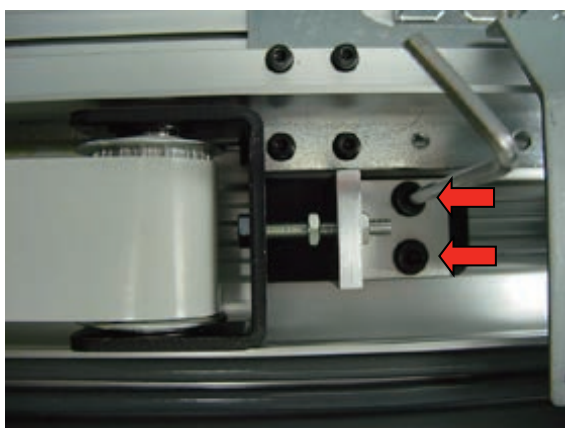
4. Push belt at center of belt by push gauge with 500gf.

　　Please adjust tension of belt by adjusting nut that belt

　　moves 5-6mm.

5~6mm
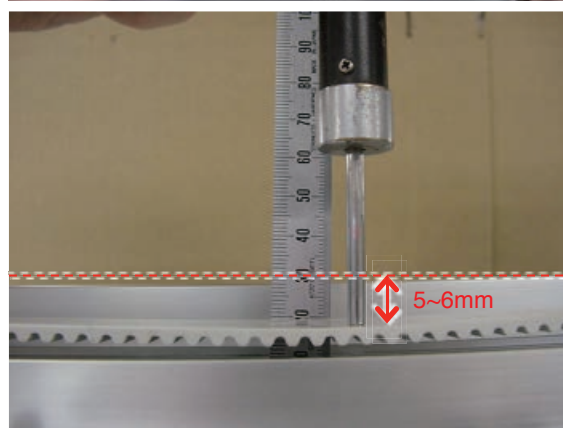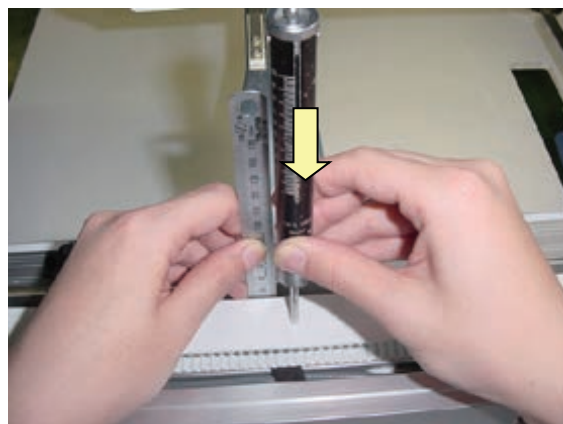
5. Tighten the screws of tension plate.

6. Tighten the lock nut for tension adjusting nut.
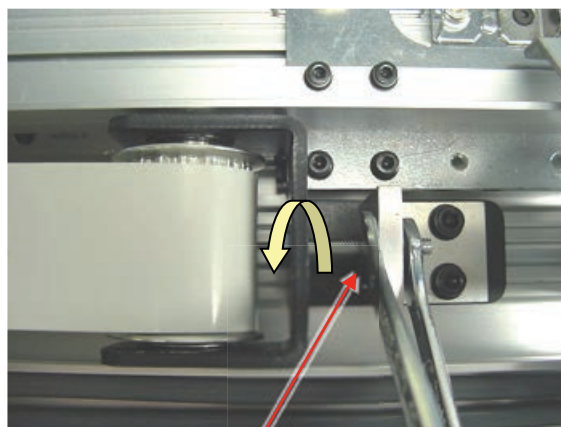
Lock Nut

4-6-2   Adjustment of X carriage timing belt tension

7. Return base cover and drive unit cover to previous places.

8. Please refer to [E5-6 Position- Registration of coordinates
   for positioning sensor], register embroidery area and finish
   this adjustment.

4-6-3   Adjustment of Y carriage drive belt tension

1. Take middle cover and rear cover out.
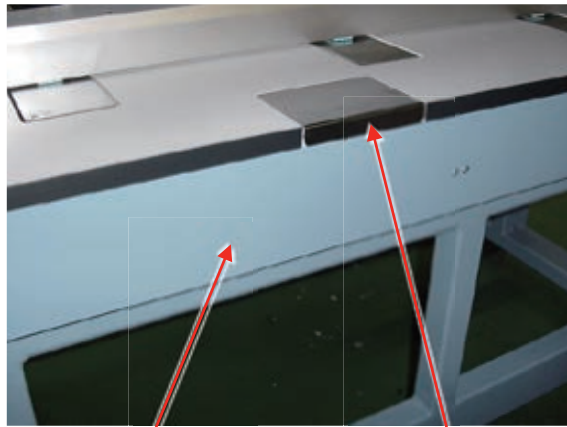
Rear cover   Middle cover

2. Take out table support cover located front of middle cover.
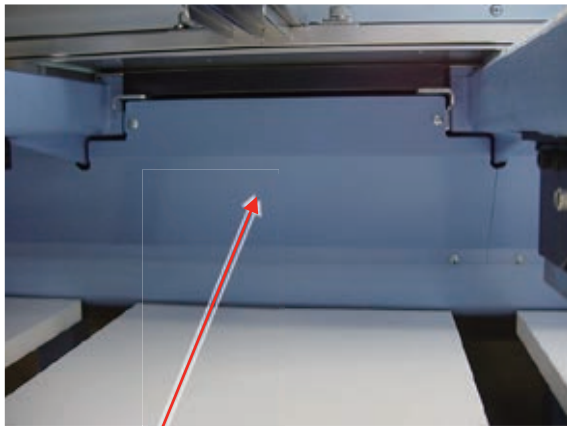
Table support cover

3. Loosen lock nut of tension adjusting screw.

   (you can find this screw under table)

    <Spanner> 7mm
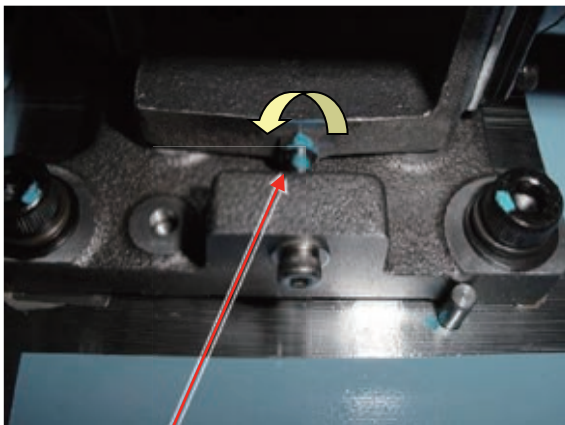
Lock nut

4. Loosen screws of Y motor base by half turn.
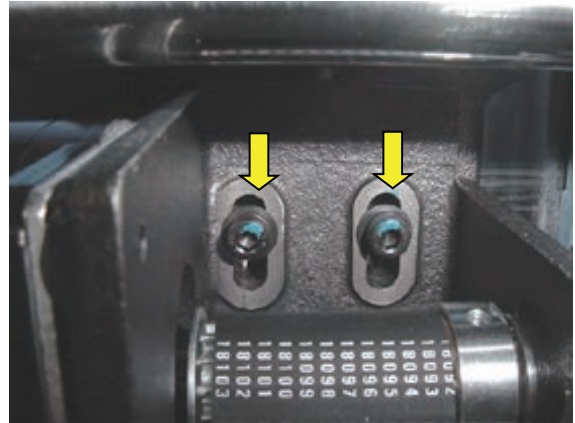
5. Push belt by push gauge with 500gf.

   Belt should hide half of hole for motor fixing screw.

   Please adjust tension by tension adjusting screw

    < Note > Push gauge should touch belt with 90 degrees

    and be close to table edge.

Hole for motor fixing screw
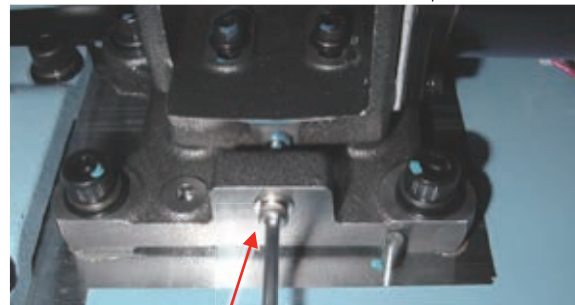
Tension adjusting screw

4-6-3　Adjustment of Y carriage drive belt tension

6. Tighten screws of Y motor base
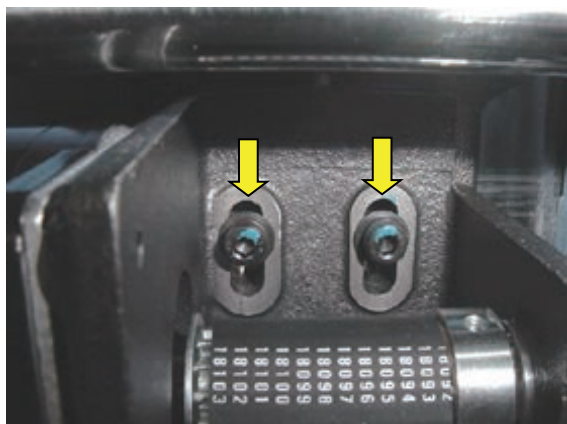
7. Tighten lock nut of tension adjusting screw
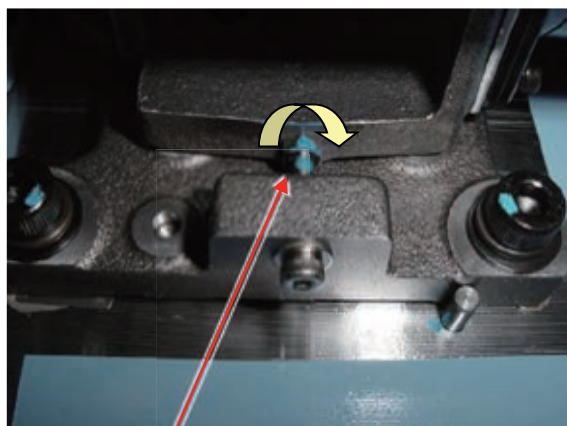
Lock nut

8. Set table support cover

9. Set rear cover and middle cover

10. Please register frame position

Please refer to [E5-6　Position- Registration of

coordinates for positioning sensor].

4-6-4　Adjustment of Y drive timing belt tension

The way of adjustment of Y drive timing belt is same right side

and left side.

Below explantion is for right side.

1. Take Y cover bracket and Y cover out.
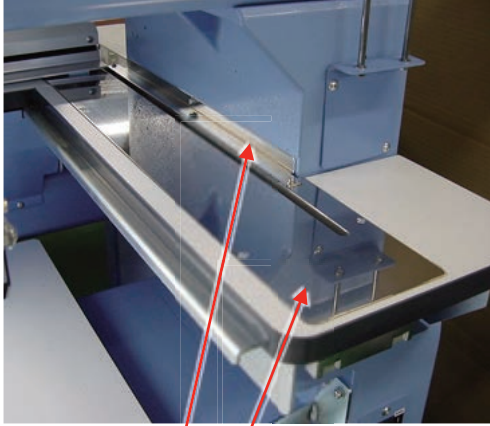
Y cover bracket

Y cover

2. Move X carriage 150mm from center of idler pulley, and put

a mark at 75mm.

150mm
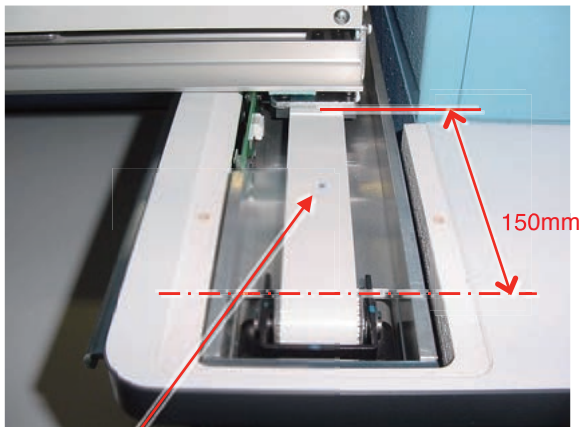
A mark

3. Loosen lock nut for tension adjusting screw.

<Spanner> 7mm
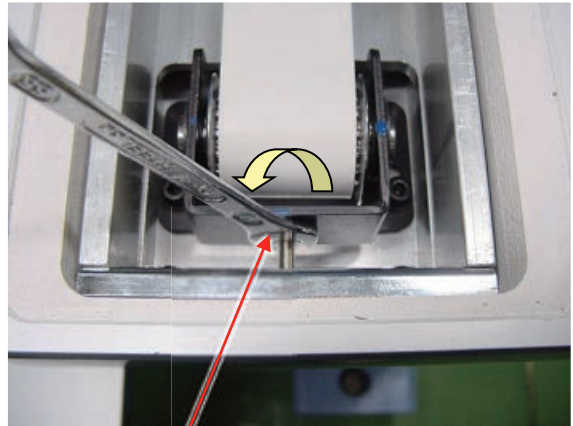
Lock nut

4. Loosen screw for idlerpulley bracketby half turn.
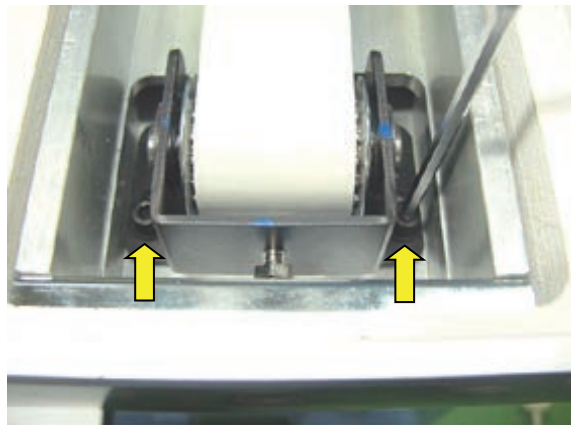
4-6-4   Adjustment of Y drive timing belt tension

5. Push belt by push gauge at a mark position.

Belt should move 2.5 ~ 3.0mm by 1kgf of push gauge.

Please adjust tension by tension adjusting screw
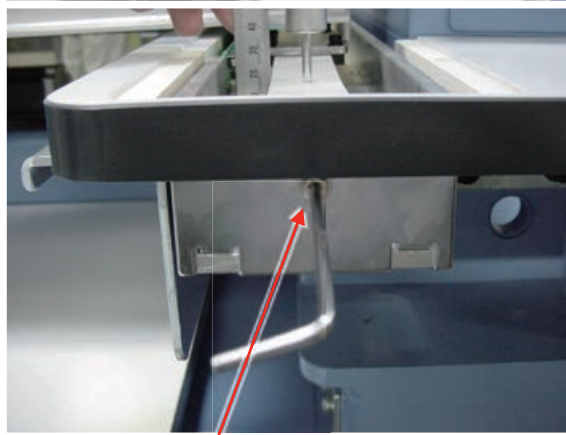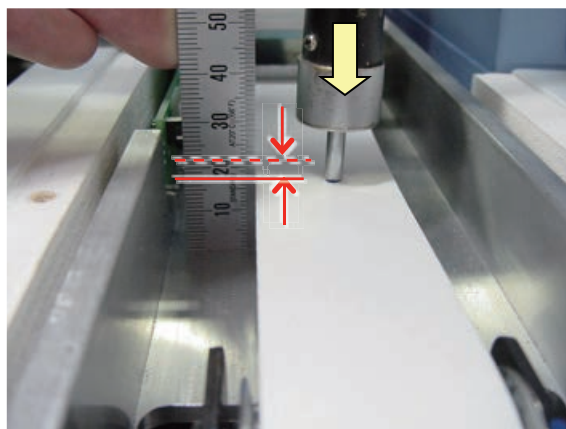
Tension adjusting screw

6. Tighten screws of idler pulley bracket
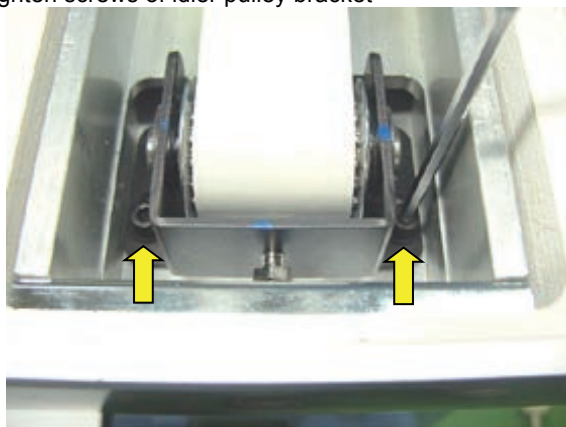
7. Tighten lock nut of tension adjusting screw
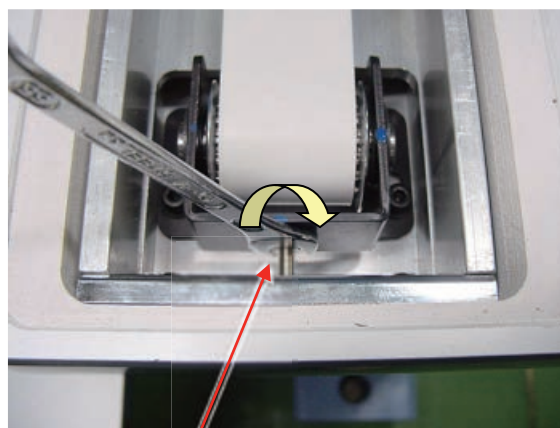
Lock nut

8. Set Y cover and Y cover bracket

9. Please register frame position.

Please refer to [E5-6 Position- Registration of coordinates

for positioning sensor].

4-6-5 Adjustment of center carriage timing belt tension

1. Take middle cover and rear cover out.
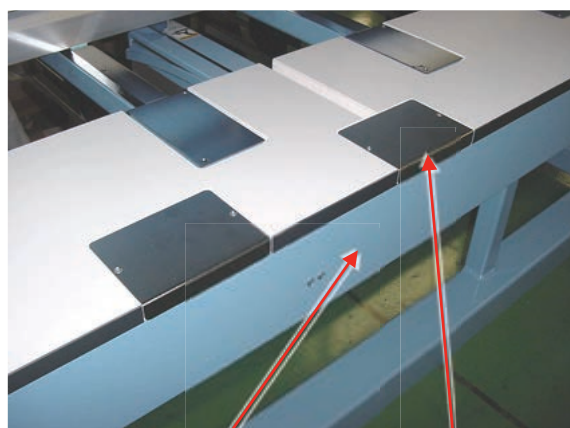
Rear cover   middle cover

2. Loosen lock nut for tension adjusting screw.

   <Spanner> 7mm
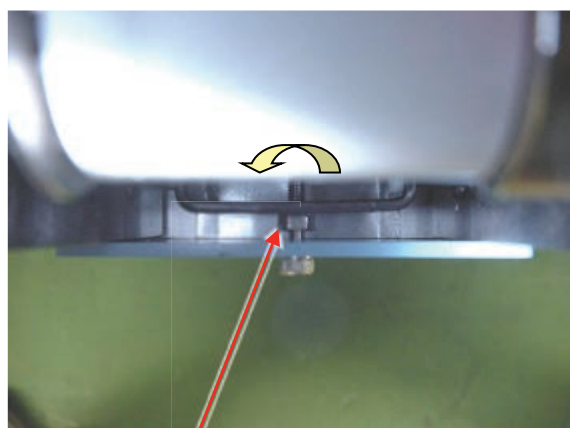
Lock nut

3. Loosen screws for idler bracket by half turn.

 (2 pcs)
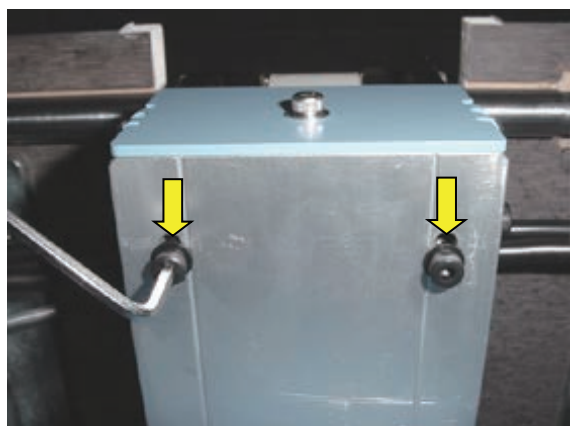
5. Adjust space between tension plate and idler pulley bracket

   5mm by tension adjusting screw.

Idler pulley bracket
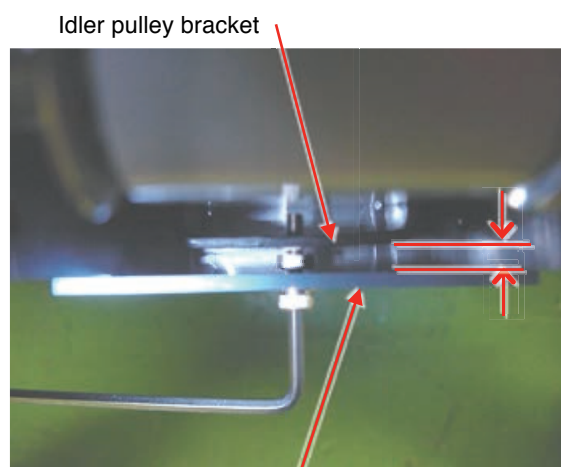
Tension plate

6. Tighten lock nut for tension adjusting screw.
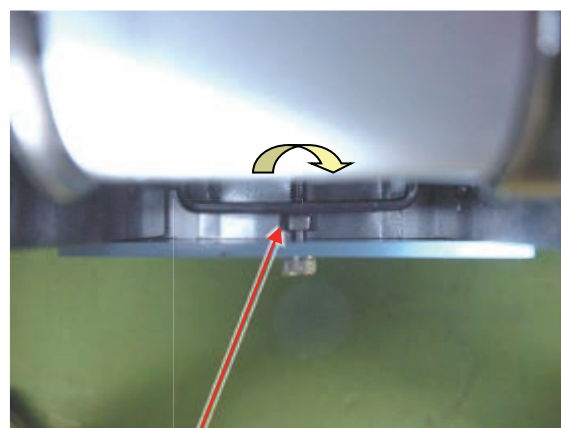
Lock nut

7. Set middle cover and rear cover.

8. Please register frame position.

   Please refer to [E5-6 Position- Registration of coordinates

   for positioning sensor].

4-7-1　Adjustment of upper shaft timimg belt tension

1. Take mission cover (left) out

Mission cover(left)

2. Loosen lock nut of tension adjusting screw

<Spanner> 7mm

3. Loosen screws for tension plate by half turn

< Note > Please do not turn main shaft, when screws for

tension plate is loosen. Timing may be changed
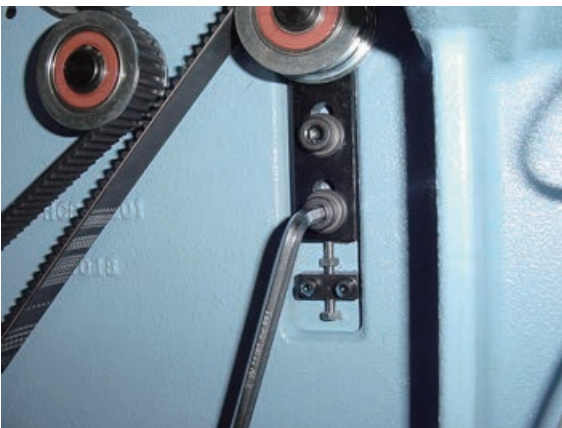
4. Adjust space between tension plate and tension plate

(lower) 12.5 ~ 13mm by tension adjustingscrew

< Note > Please Keep tension plate straight.
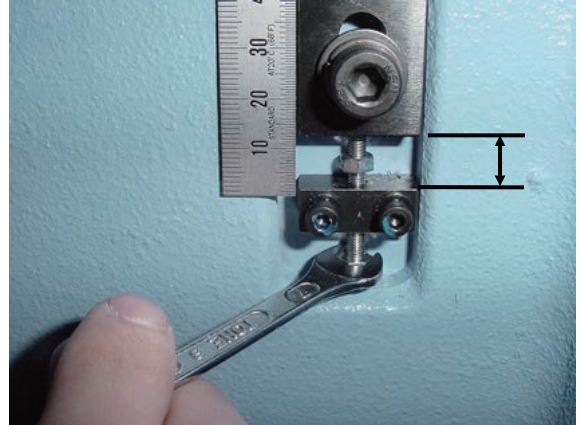
5. Tighten screws for tension plate.
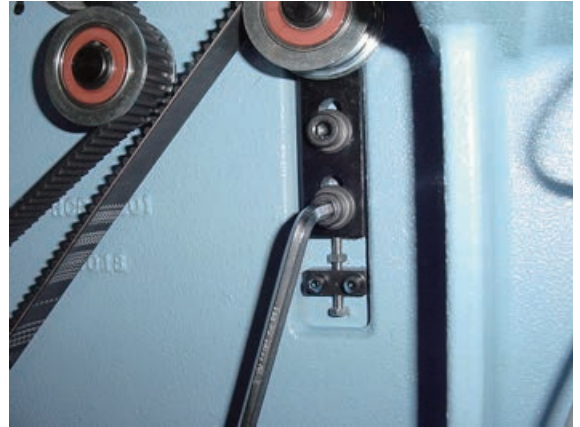
6. Tighten lock nut of tension adjusting screw.
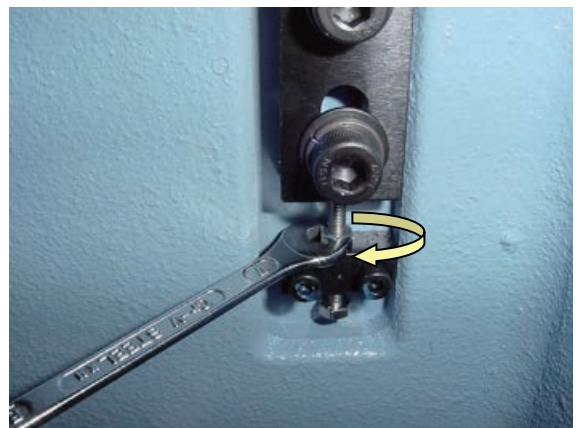
7. Set mission cover (left).

4-7-2　Adjustment of timing detecting unit

1. Remove the Head cover and Detecting cover.

Detecting cover

2. Loosen screws on coupling (2pcs).

(Coupling can be turned by hand.)
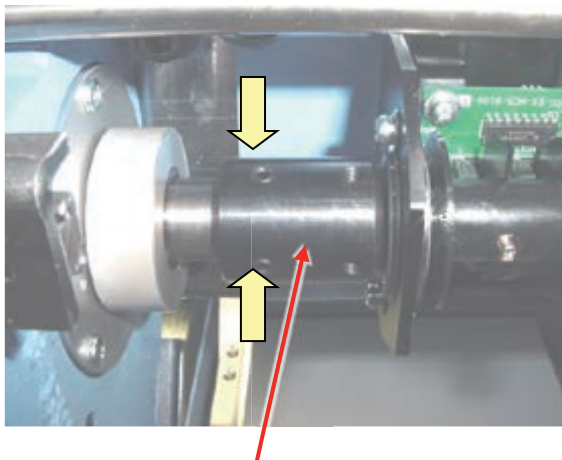
Coupling

3. Set upper shaft to [0 degree] .

Turn brake switch ON.

4. Turn coupling anti-clockwise to the position which LED4

light goes out, then tighten screws on coupling.
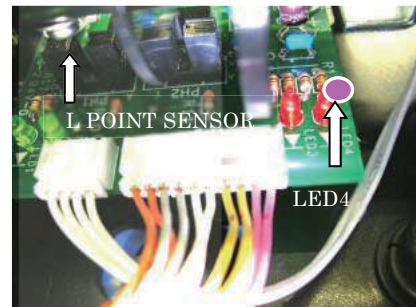
5. After tightening screw, turn brake switch OFF.

Please confirm that LED4 light goes out when angle of

upper shaft is "0 degree", and LED3 turnes on when angle

of upper shaft is "270 ~ 284degrees (C point)".
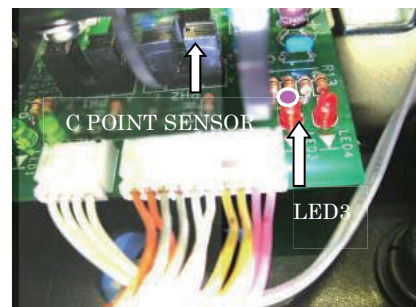
6. Please confirm that should not touch "Slit" and "Sensor".
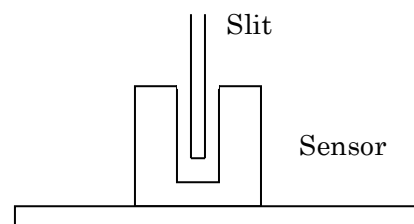
4-7-2   Adjustment of timing detecting unit

7. Loosen the screw for fixing timing slit showed as below so

   that timing slit can turn itself.
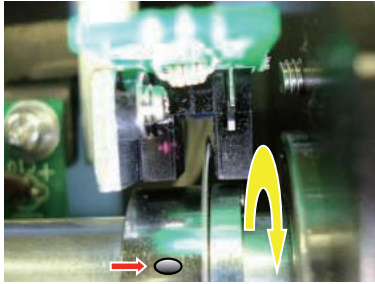
8. Adjust the distance between timing slit and timing board.

   As showed below, adjust the distance between timing slit

   and timing board to [0.7 + / - 0.2mm] and tighten the

   screw.

Space
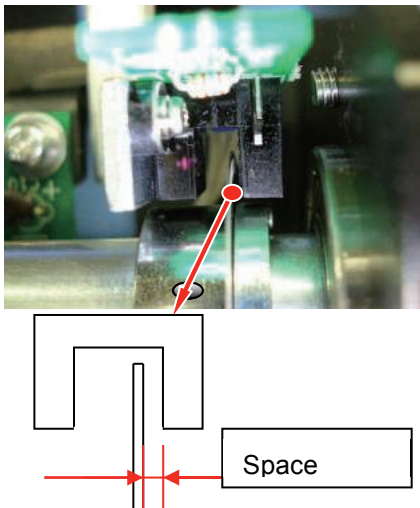
< Note > Be careful not to bend timing slit, because it is very

   thin.

9. Put cover back, finish of procedures.

5 User maintenance mode

User maintenance mode has the items as below.

Change jump————Change the needle bar's movement.

"JUMP" : Needle Jump, "DRIVE" : Needle Drive

Upper shaft turns—Upper shaft turns clockwise and counterclockwise.

When release button, upper shaft stops.

Needle change——Move the sewing head to the adjustment needle in the direction of the arrows.

[Cut] Cutter Open/Close————Open and close knife of thread trimming

[Catch] Cathcer Open/Close———Open and close thread catcher

[Clip] Clip-type thread holder (option)   ————Open and close clip-type thread holder

[Keeper] Keeper Open/Close——Open and close keeperr

[Origin] Standby position————In case, each equipment position without standby position, as example "Upper shaft is not at C point, Thread cut blade is not at stop position, Thread Catcher is open position", this key work for back to standby position automatically.

Indicates point which sensors are active.

L point sensor————————The point that indicator becomes RED is L-point, when main shaft is turned.

C point sensor————————The point that indicator becomes RED is C-point, when main shaft is turned.

Needle sensor————————The point that indicator becomes RED is needle position, when moving head is moved

Origin point of cutter————The point that indicator becomes RED is origin point of cutter

Origin point of thread catcher ——The point that indicator becomes RED is origin point of thread cacther

Angle ————————————Indicate angle of main shaft.

Please use "Dial" on upper shaft, when you need to know precise angle.

5-1 How to enter "User Maintenance Mode"

1. When the machine is stopped, press [icon] and

3. Press "Maintenance".

The display shows as below.

2. Press "OTHER".

Calendar	Version
Network	Maintenance
System	Language
Speed	Calibrate

Cancel

Condition	
☐ L Point Sensor	
■ C Point Sensor	
■ Needle Center	
■ Cutter Origin	
■ Catcher Origin	

Angle
2TH

⚠ CAUTION! < Move Machine >

Main Shaft Turns

Cut | Catch
Clip | Keeper
Origin

END
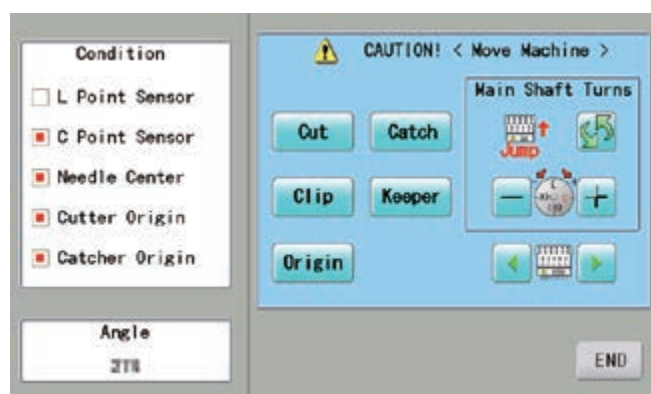
4. Please follow instruction of "5-2　Machine Movement".

5. In case you press ⬚END at above display, return to Menu

    display.

    If you press 🏠 button once more, return to drive

    mode.

5-2　Machine Movement

1. Refer to [5-1　How to enter "User Maintenance Mode"]

    and enter to User Maintenance Mode.
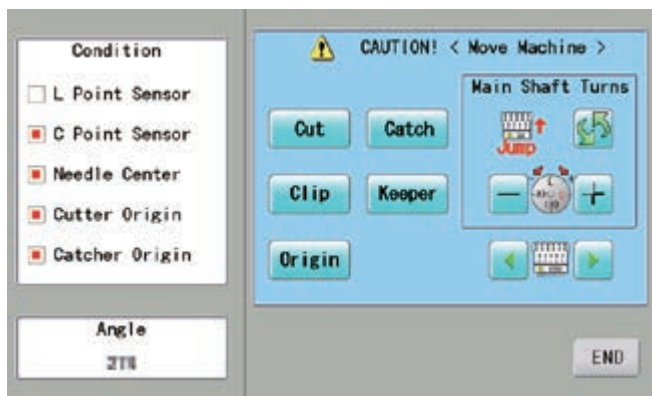
2. Press oen of button on control panel and check machine

    movement.

    < Note > The machine moves quickly.

    please be carefull that all head move at once.

    machine show following message when you press key.

    C point　　　　　 : Upper shaft is not at C point.

    Cut blade　　　　 : Thread cut blade is not at standby

    　　　　　　　　　　position.

    Thread Catcher　 : Thread Catcher is open position.

    Please press ⬚Origin for back to standby potion and

    repeat step 2 again.

3. When you press ⬚END, close user maintenance mode

    and return to Menu mode.

E1 Placement of key electronic parts

Seiral Port

CONT-R2 board

Control Box

Timing Circuit Board

Bobbin Thread Winder

Main Switch

Jump Unit

Main Motor

Brake

Thread Catcher

Brake Release Switch

Head SW Circuit Board
TC7-8 Circuit Board
Jump SW Circuit Board
Core module
LCD-CE-U board
LCD unit
Laser Position Marker
Upper Thread Holder
Keeper Unit
Power Supply Box

Needle Bar Changing Unit
Detection Circuit Board
Keeper Relay Circuit Board
X Motor
Y Motor
Sensor Relay Circuit Board

Before Rev. A
Rev. A
PM Driver
Power Relay Circuit Board
Inverter Unit
Transformer
Fan
DC Power Supply

E2 Exchange and Setting of electric related component

<note> Please take electric plug, when you exchange electric component.

E2-1 Exchange of CONT-R2 board

1. Take mission cover out.
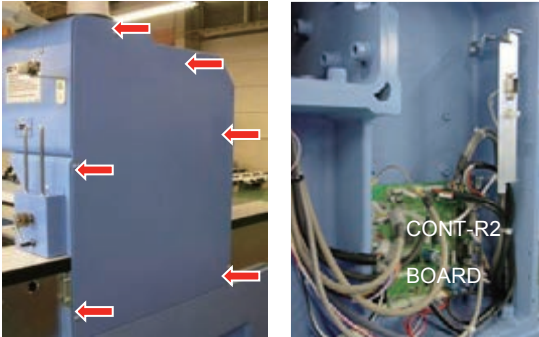
2. Take all connector out and exchange CONT-R2 board.
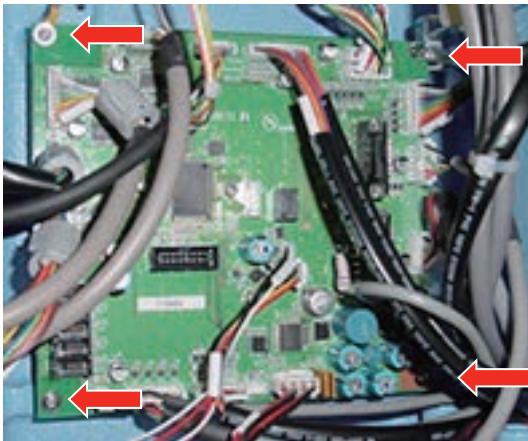
3. Fix screws and connect all cable which are taken.

4. Make adjustment from step 1 to 5 as below, or follow the instruction [E5-8 Machine Setting Navigation after exchanging CONT board (Main program Ver.*1.34~)], then the procedure of Exchange of CONT-R2 board is complete.

    （1）E5-5　Machine setting
    （2）E4-2　Machine program update
    （3）E4-3，E4-3a　Main program update
    （4）E5-6　Frame Position Entry—Registration of
         coordinates for positioning sensor
    （5）E4-4　Initializing of machine speed

E2-& Exchange Timing Circuit Board

1.Timing Circuit Board consist with two part(A and B).
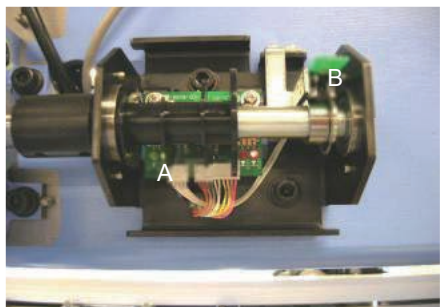
2.Take A part out

Unscrew 2 screws, then take C cable and D harness out
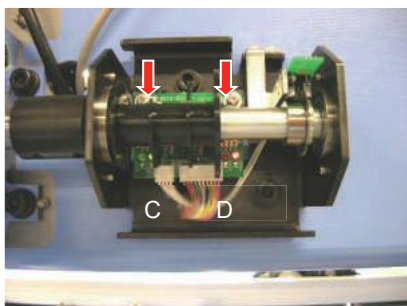
3.Take B part out

Unscrew 2 screws
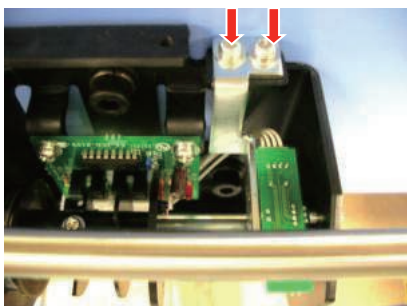
4.Replace A part

Fix by screws, and set cable and haeness

<note> Slit should be set between sensor
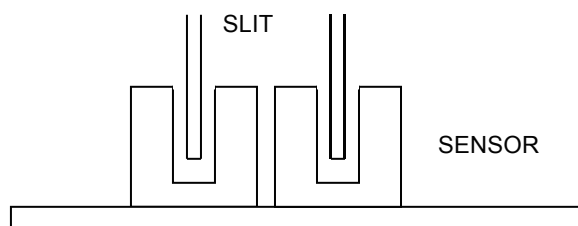
5.Replace B part

Fix by screws

<note> Slit should be between sensor. Be careful for handling of slit, because slit is thin and soft.
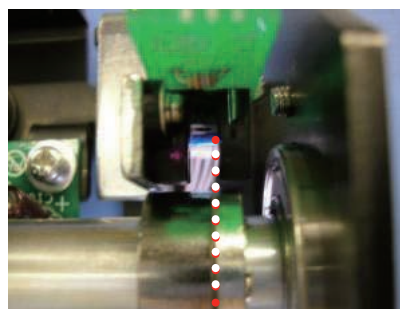
6.Loosen screw for Slit and make it free from shaft
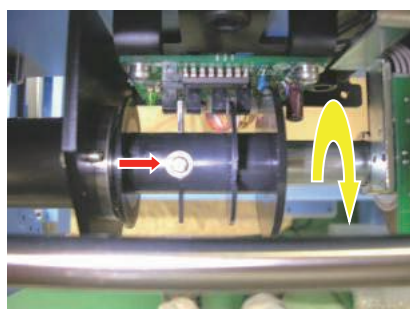
7.Turn main shaft and set [0 degree(L point)]
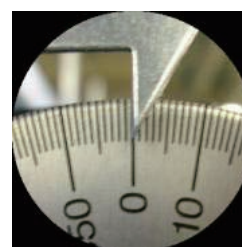
8.Turn Slit clock-wise(see from scale side) and fix by screw at the point which LED 4 is turned off.

L POINT SENSOR
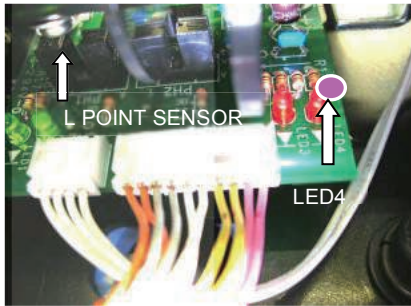
LED4

9.After fixing Timing Circuit Board, Turn Main shaft and check if LED 4 is turned off at 0 dgree of main shaft

10.Turn main shaft counterclockclock wise(see from scale side), and confirm LED 3 is turned on at the C Point(270-284 degree)

C POINT SENSOR

LED3
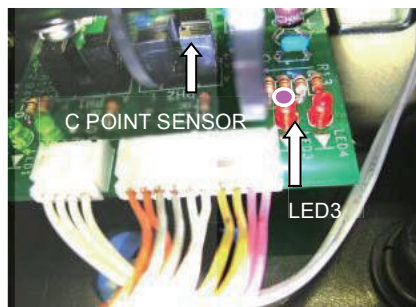
11.Control that slit does not touch sensor
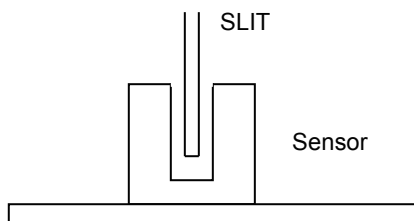
SLIT

Sensor

12.Loosen screw and make Timing Slit free to turn
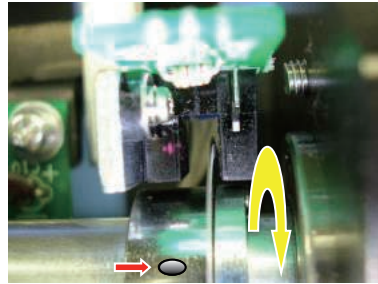
13.Keep space 0.7+ -0.2mm between Timing Slit and Sensor, and fix

0.7(+ -0.2)mm
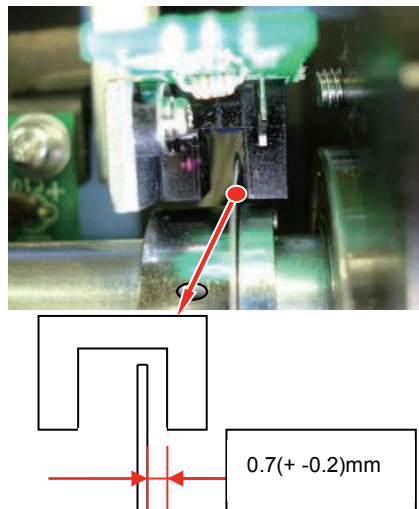
<note> Be careful for handling of slit, because slit is thin and soft.

E2-3 Connection of Detection Circuit Board

CN6 on Detection Circuit Board has different way of

connection for each head.

Please attention to following information.
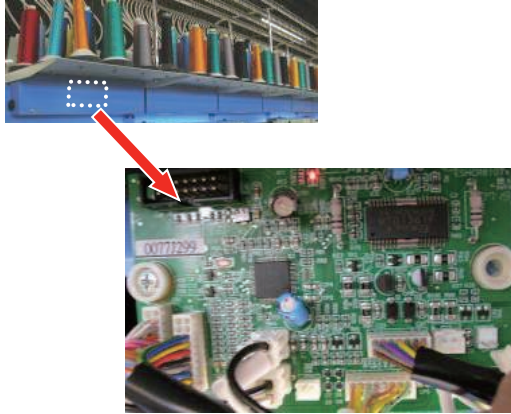
1.For Head with emergency stop SW->TC-EMG harness
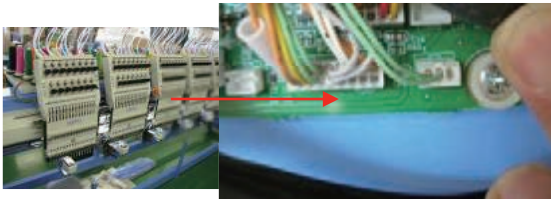
2.For Head without emergency SW->white loop harness
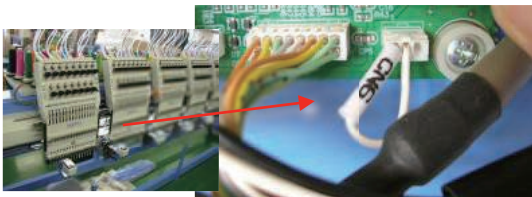
3.For last Head->Red loop harness
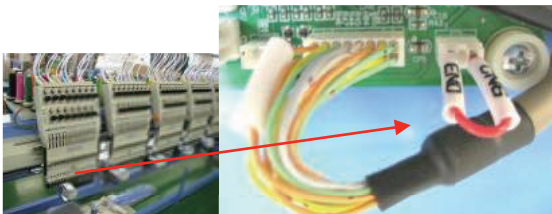
After connect all, please check if emergency SW works

correctly.

E2-(Exchange TC7-8 Circuit Board

1. Remove the thread tension bracket.

   Please refer to [4-2-1, 4-2-2　Assemble and remove

   moving head].

2. Take cover out from moving head by unscrew 7 screws.
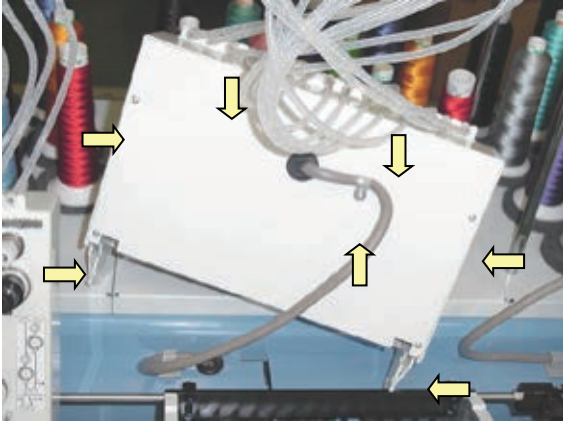
3. Take harness and screws out.
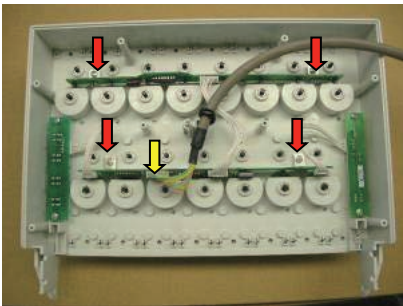
4.Slide board and take out.
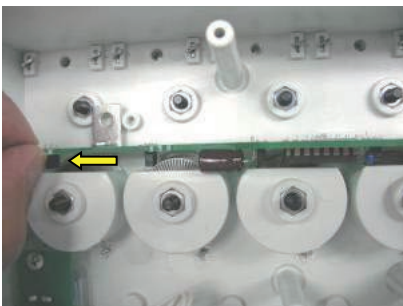
   <note> Do not pull without sliding, Sensor may be broken.

5. Insert Board into guide and slide and adjust sensor position

   to be center of slit.
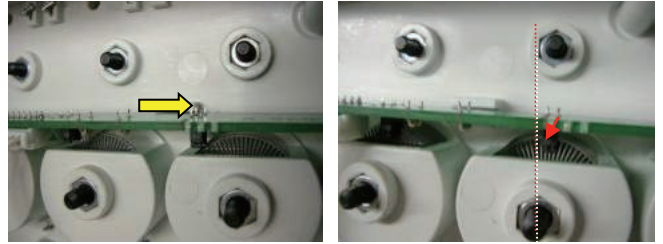
6. Check that sensor is not touching to slit.

   Fix by screw and connect harness.
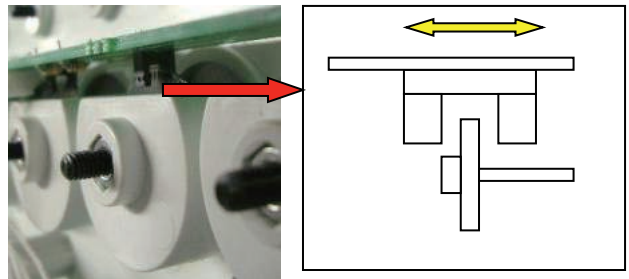
   <note> The Front led cord and cable for emergency sw has

   　　　to pass as below photo.
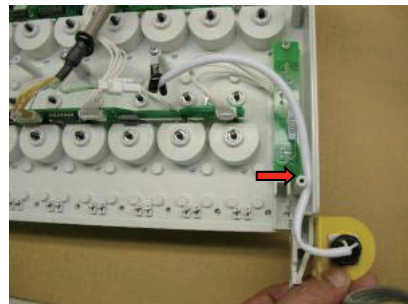
7. Set cover and Install Thread tension bracket.

E2-)   Exchange needle stop sensor and potentiometer

1. Move head position to needle no.15 by head moving knob

2.Unscrew and take cover out
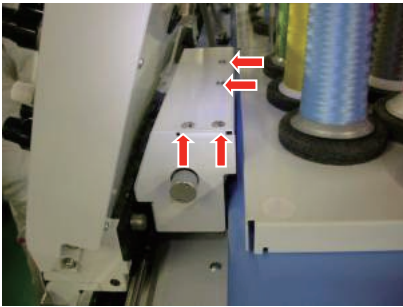
3. Take 2 connectors out
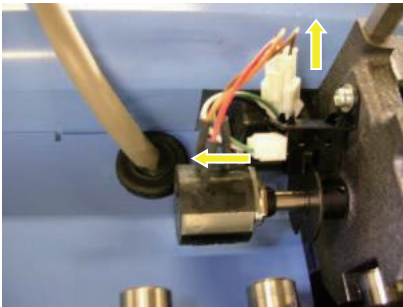
4. Unscrew and take Sensor

   Set new sensor and fix by screw and connector
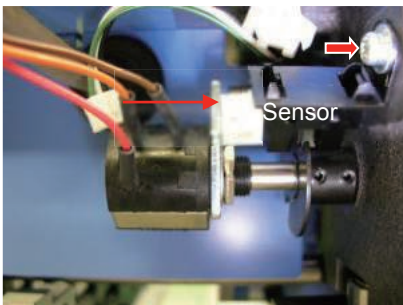
5.Loosen screw and pull potentiometer out
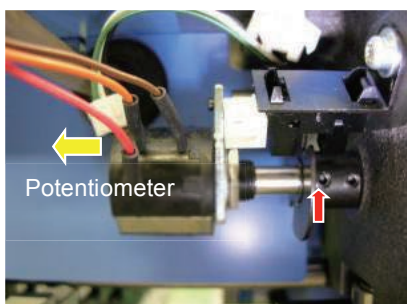
6.Loosen slit collar fixing screw and make slit collar free to turn
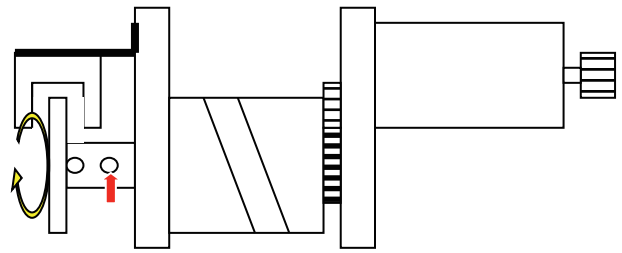
7.Adjust notch position of slit collar to be sensor, and cam position where moving head does not move
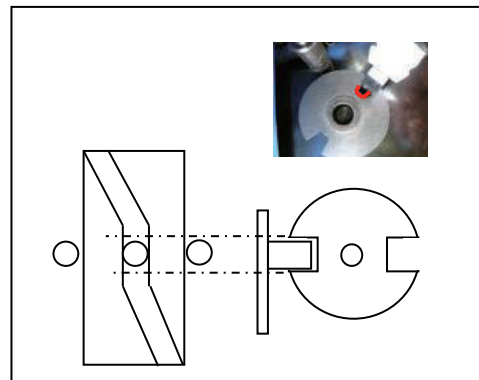
8.Connect harness of potentiometer
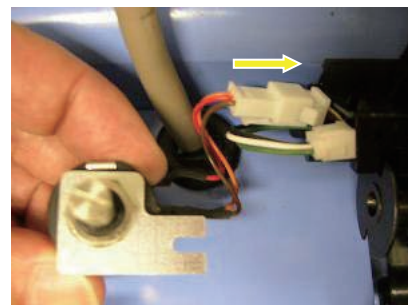
9. Enter maintenance mode, referring to [E5-1 How to enter maintenance mode]

10. Press Machine Test .
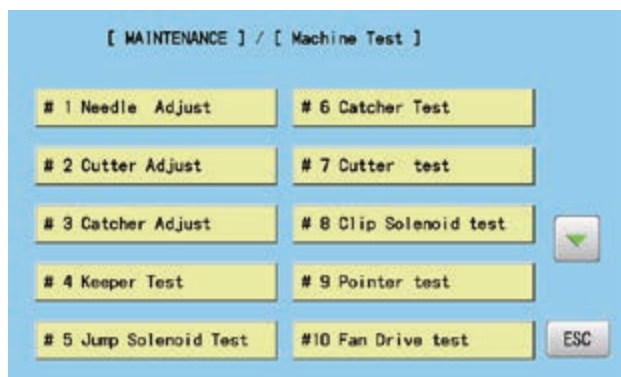
11. 7. Press #1 Needle Adjust   and press Position .
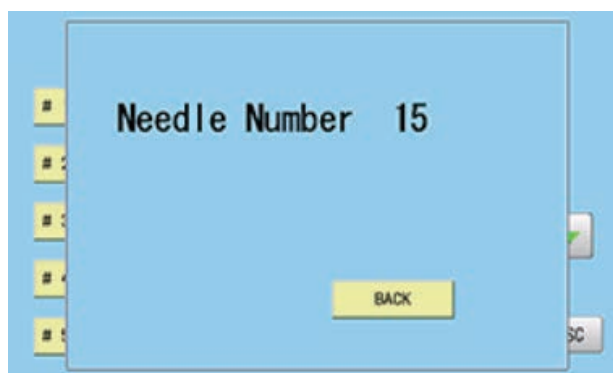
12. Turn shaft of potentiometer
    and set position where * mark
    and needle number (15)
    appear on screeen with
    sound.
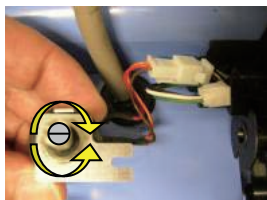
13. Set potentiometer and fix
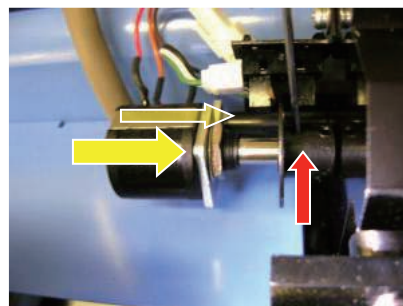
Sensor is located at notch center of slit collar and * mark
is shown on creen

The position of sensor is not lacated at notch of slit collar,
re-adjust again
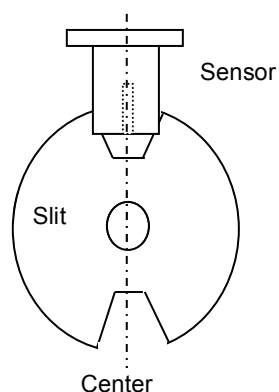
14. Turn knob and move head to 1st needle position

* mark appears, when notch center of slit collar comes
sensor position. If position is not matching, please re-adjust
again

E2-6 Exchange Thread trimming sensor

1.Take table cover out

2.Exchange sensor and connect haeness
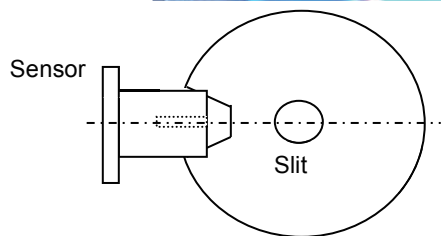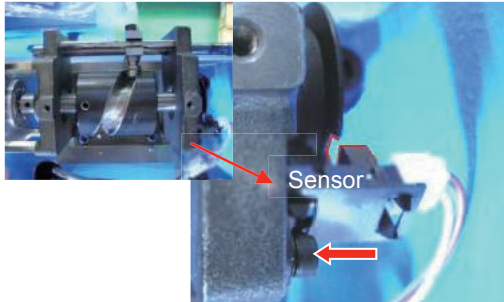
<note> Sensor should place at center of slit

3.Loosen Cap screw (1pc)

4.Turn CAM and confirm that shaft is not moving
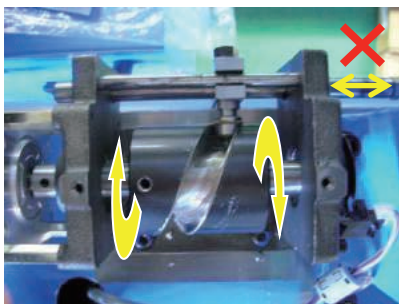
5.Turn CAM and set sensor position is out from slit. Power on and press NEXT on control box
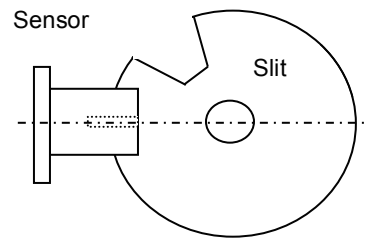
6.CAM turns and stops at stopping position automatically. Check postion of moving knife

Position of Moving knife and fixed knife

Relation of CAM and Knife   ● stopping position

CAM   SENSOR&SLIT   KNIFE ASS'Y
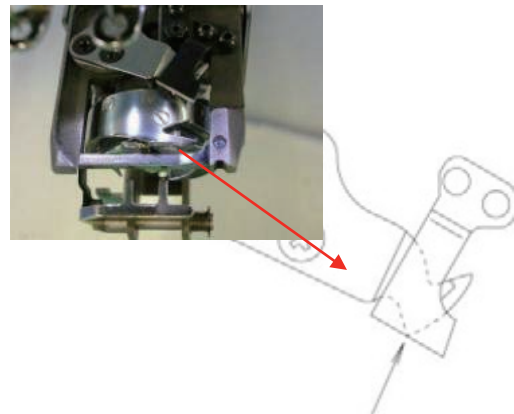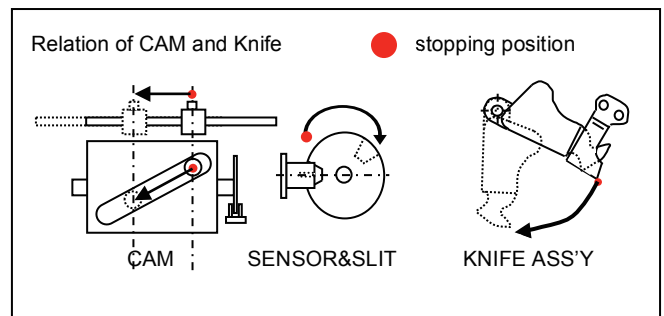
7. Fix Cap screw

Set cover

E2-+ Exchange X-Y Position Sensor

1.Unscrew and take cover out
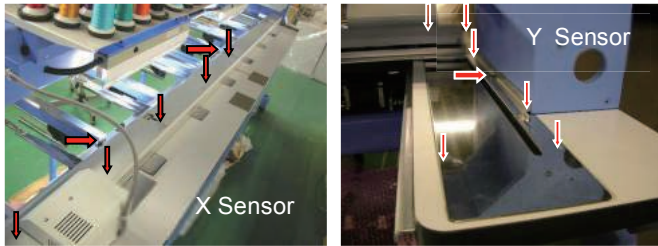
2.Unscrew and take Position Sensor Circuit Board. Then take
  harness out
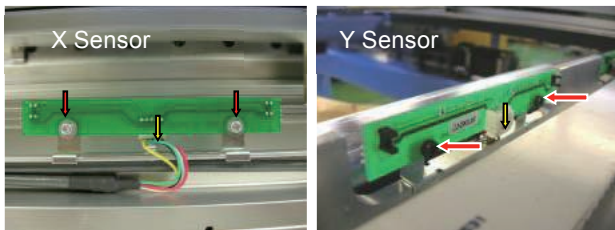
3.Replace Board and set harness, and fix by screw

<note> Adjust postion of detecting plate to be center of
      sensor
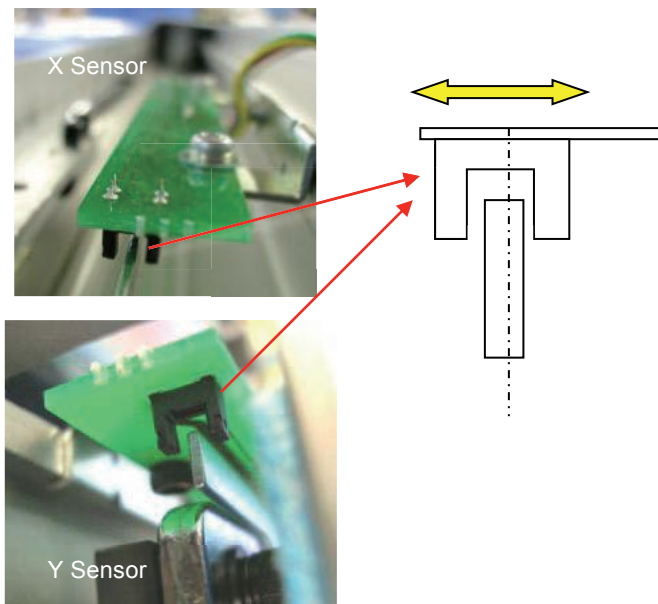
4.Set cover

5.Set coordintes

  Refer [E5-6 Position- Registration of coordinates for
  positioning sensor]

E2-, Exchange Brake Unit

1. Take reft rear table.

   Take mission cover (left side)

   out.

2. Take connector out

   Unscrew and take brake solenoid
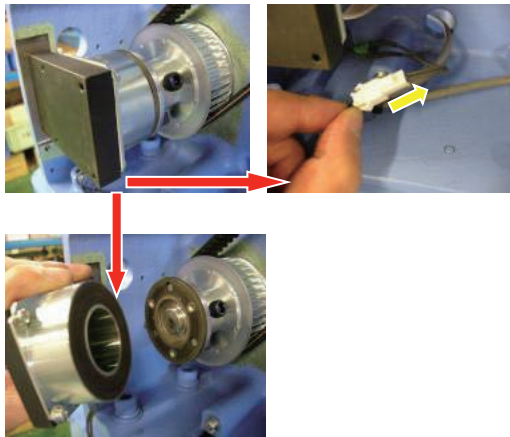
3. Put 0.1-0.15mm paper between brake solenoid and brake disk, and fix brake solenoid by screw

4. Take paper out and set cover, set reft rear table.

E2-9 Exchange Pulse Motor Driver (Before Rev. A)

<note>

Before starting the following work, please take electric power cable out

1.Take box cover out

X-AXIS

Y-AXIS
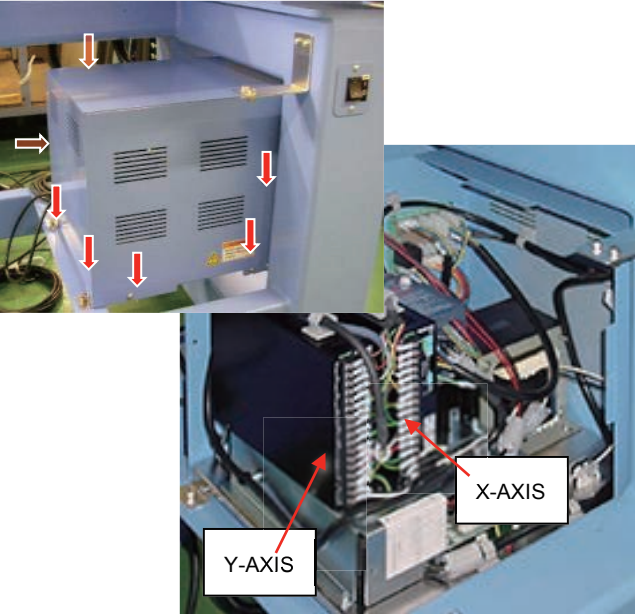
2.Take harnesses out from driver
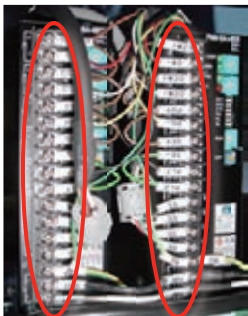
3. Take AC100V connector out.

    Unscrew 4 screws on base plate.
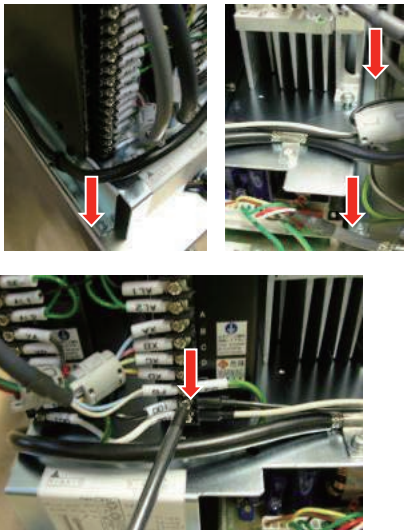
4. Unscrew from reverse side of base plate
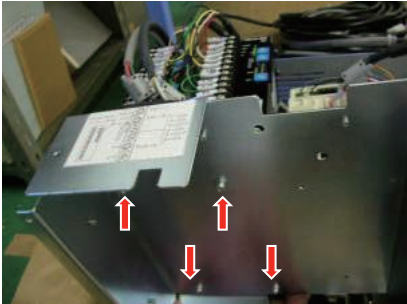
5. Check setting of new driver(same setting for X and Y)

<note> Driver is same as one for HCR, but setting is different

SWH	1
SWL	E
EX1	ON
EX2	ON
F/R	OFF
PD	ON
PL	OFF
SL	ON
RUN	0

6. Fix driver by screws and connect harnesses, and put cover. Detail information about harnesses conenction is mentioned in [E7-1 Pulse motor driver (PMD) wiring]

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E2-10 Exchange Pulse Motor Driver (Rev. A)

<note>

Before starting the following work, please take electric power

cable out

1. Take box cover out

X-AXIS

Y-AXIS
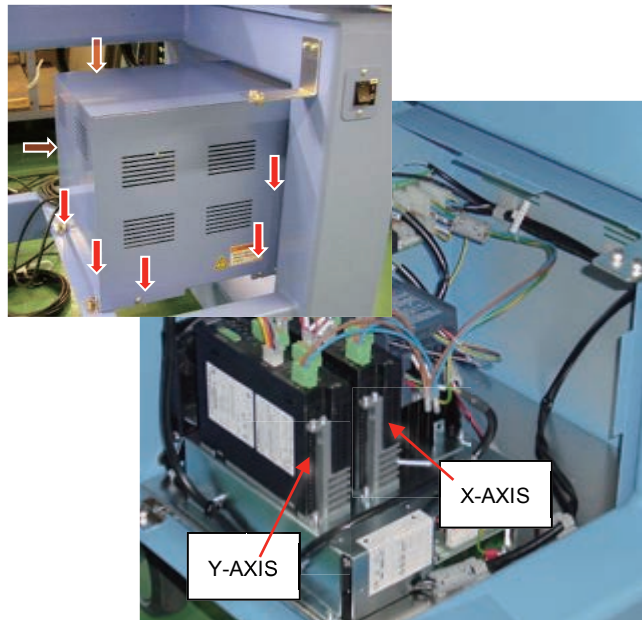
2. Take harnesses out from driver.
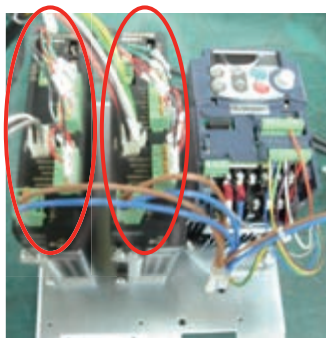
3. Unscrew 4 screws on base plate

4. Check setting of new driver. (same setting for X and Y)

4	OFF
3	OFF
2	ON
1	ON

RUN	A
STOP	2
STEP	5
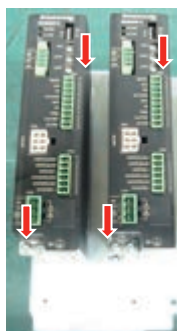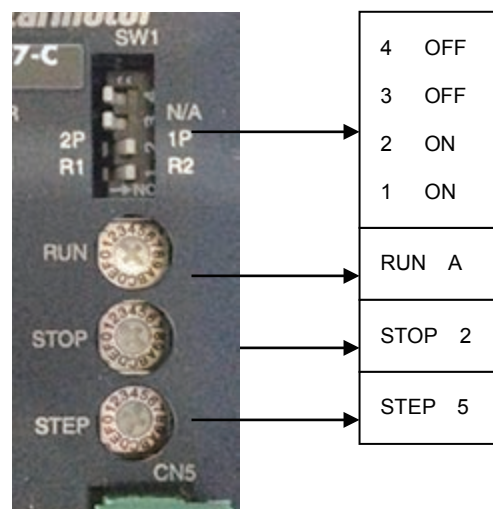
5. Fix driver by screws and connect harnesses, and put

   cover.

   Detail information about harnesses conenction is

   mentioned in [E7-1 Pulse motor driver (PMD) wiring]

E2-11 Exchange Switching Power Supply

<note>

Before starting the following work, please take electric power cable out

1. Take box cover out
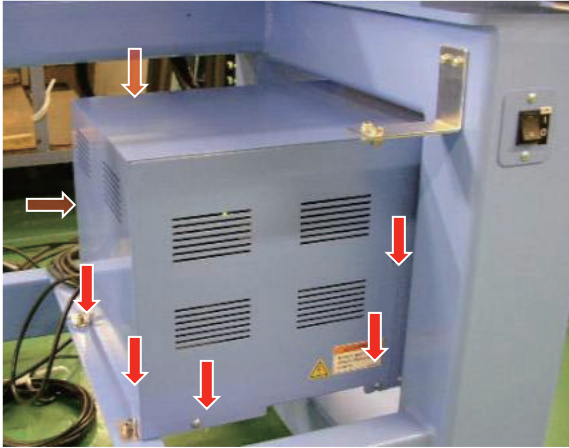
2. Take AC100V connector out. (Before Rev. A)

Unscrew 4 screws on base plate.
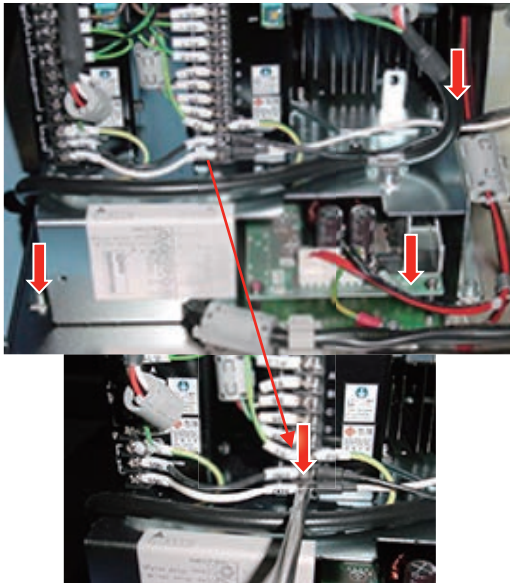
3. Switching Power Supply locates under base plate

Unscrew and teke connector out

4. Replace Swicthing Power Supply and fix screw and connector

<note> Harness should not get caught
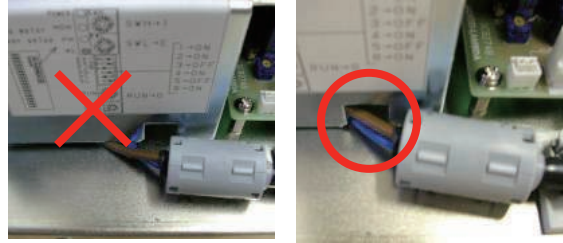
5. Refer [E2-12 Adjustment of Voltage for Switching Power Supply] and adjust voltage setting

E2-12 Adjustment of Voltage for Switching Power Supply

1. Take box cover out.
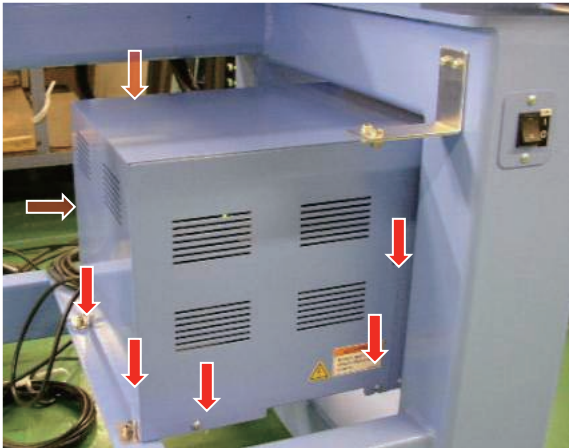
2. Take mission cover(right side) out.
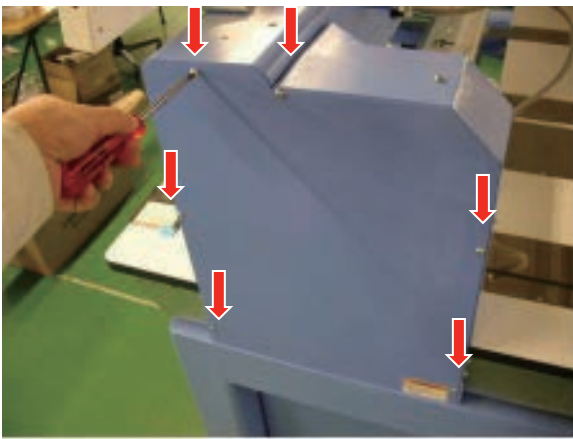
3.Set [DC] of degital tester.
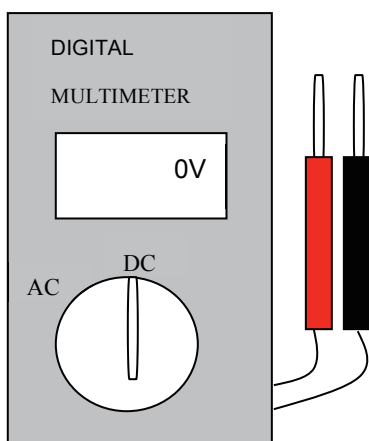
4. Put tester into CN28 of Drive B board.

<note>
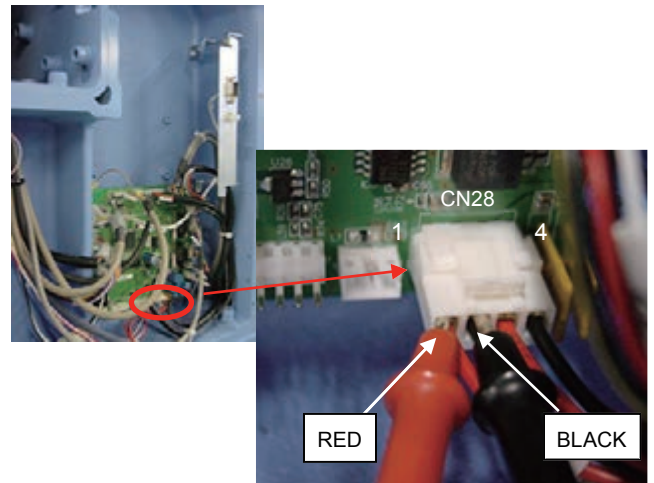
   *Tester(red) to be put into no.1 of CN28

   *Tester(black) to be put into no.2 of CN28

5. Power main switch on, and turn VR(volume) on Switching
Power Supply and set [24.0V+-0.1V] .
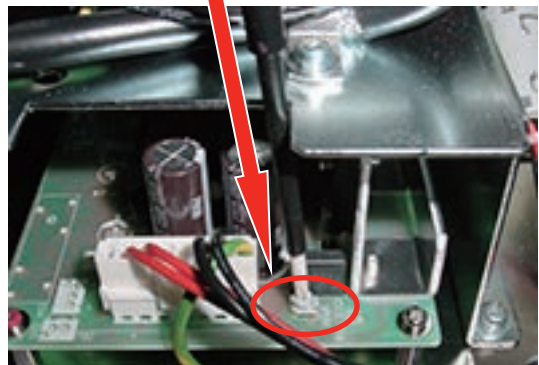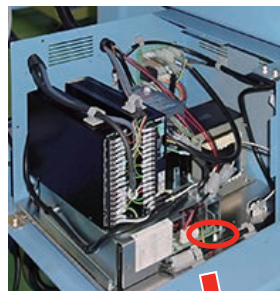
Set cover

E2-14 Exchange Cooling Fan

<note> Before starting the following work, please take electric power cable out

1. Take box cover out
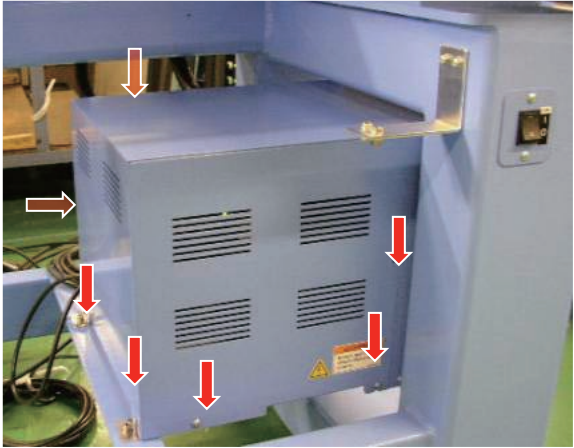
2. Take filter out
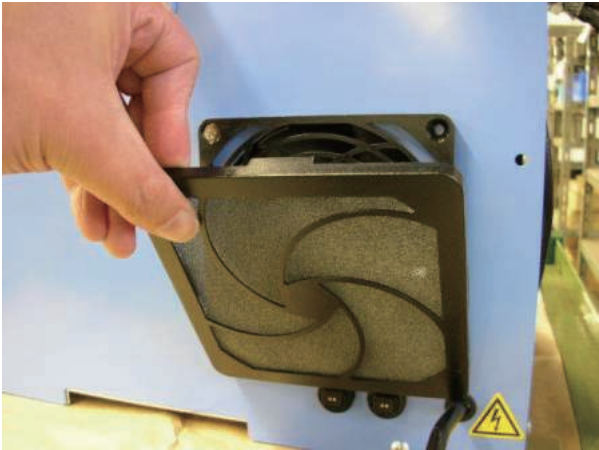
3. Unscrew fan cover (note: nut is on reverse side)
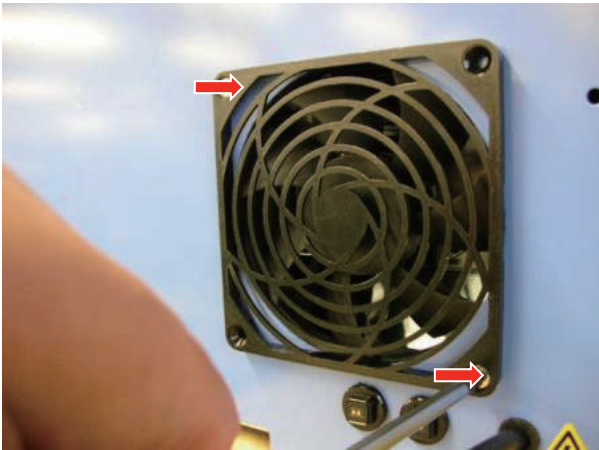
4. Take connector out, then take fan out from box
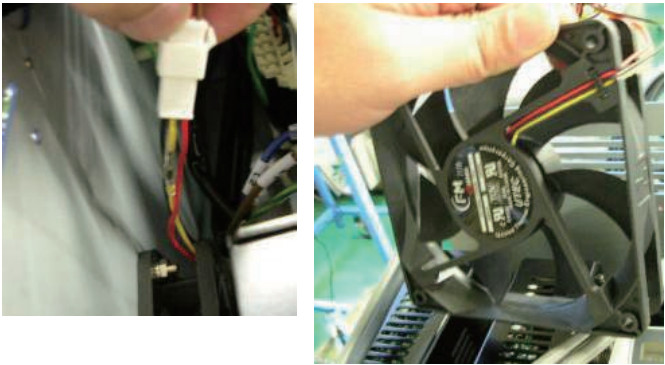
5. Replcae fan and connect all connector and fix

<note1> Direcetion of fan: Label side is front

<note2> Check that fan is not touching to any other part

<note1>   <note2>

BACK

FRONT

AIR
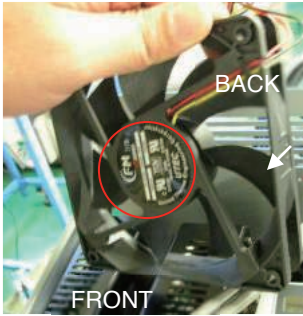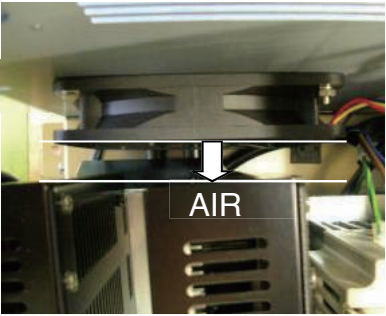
6 .Put cover

E2-15 Exchange Inverter

<note> Before starting the following work, please take electric power cable out

1. Take box cover out
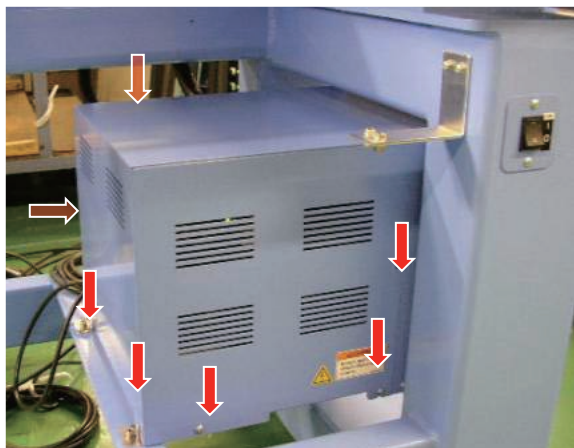
<check>Display is off

2. Take all harnes out, take inverter out.
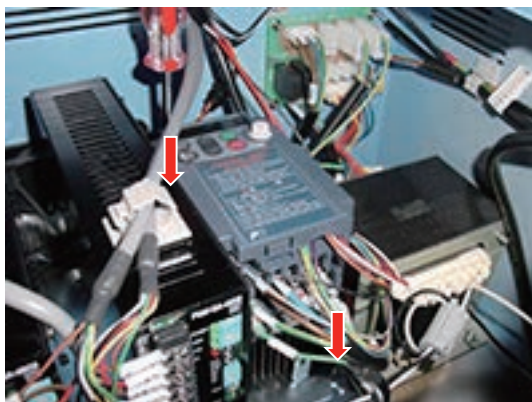
3. Remove control terminal cover.

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.

Control terminal cover
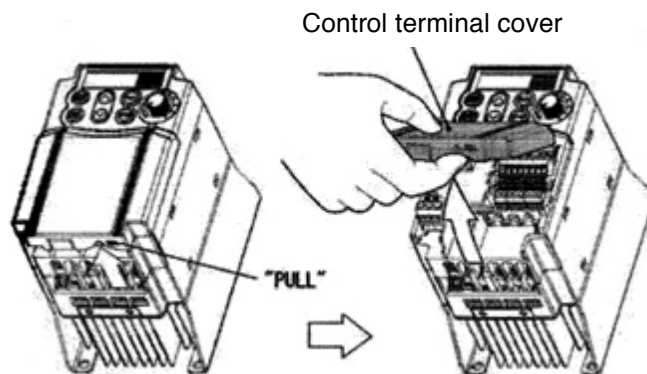
4. Remove main terminal cover

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

Main terminal cover

5. Set new inverter and connect harness, and fix

Pefer [E7-2 Inverter wiring] for detail information of harness connection

6. Put cover

7. Referring to [E4-4 Setting of revolution],

Perform [Initializing of machine speed].

E2-16　Setting 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.

E2-16-1　Parameters release the keep off setting and Parameters setting

How to release the setting change prohibition

Release the prohibition by following the procedures below

since parameter is set as setting change prohibition.

Up key　　　　Down key
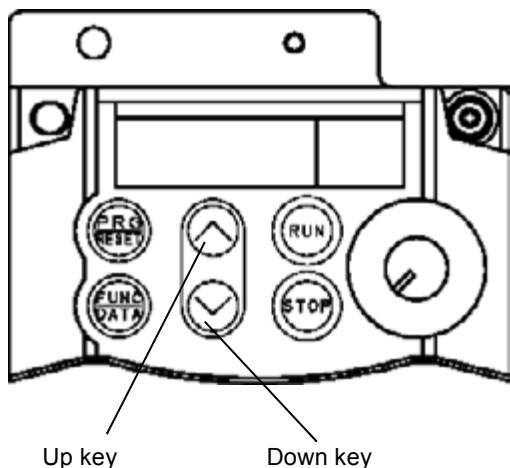
1. Press PRG/RESET.

  [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 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 Down 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	→	100.0
F05	Base frequency voltage	→	200
F07	Acceletion time 1	→	1.2
F08	Deceletration time 1	→	0.7
F09	Torque booost	→	11.0
F11	Motor thermal protection	→	2.30
F15	Upper limit freq. limter	→	100.0
F20	DC brake. Starting freq.	→	1.5
F21	DC braking current	→	20
F22	DC braking time	→	1.0
F23	Start frequency	→	0.5
F26	Carrier frequency	→	6
F27	Tone	→	1
F37	Load selection	→	1
C05	Multi stage frequency 1	→	2.6
C33	Analog input filter	→	0.05
C34	Analog input adjustment	→	50.0
C50	Bias frequency	→	3.0
P02	Motot capacity	→	0.40
P03	Motor rated current	→	2.30

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.

E2-16-2 Initialize parameters

P lease 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 in [E2-16-1
   Parameters release the keep off setting and Parameters
   settin].

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. 00] is displayed.

The settings of inverter become initial settings.

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

E3 Open and remove control box
E3-1 Remove control box

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

1. Take mission cover out.
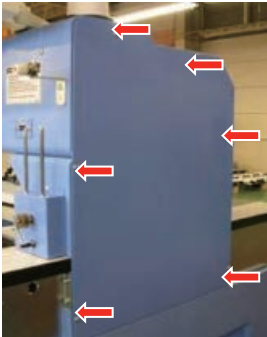
2. Disconnect the connectors indicated by the arrows in the figure below. Remove the screw that fixes cables.
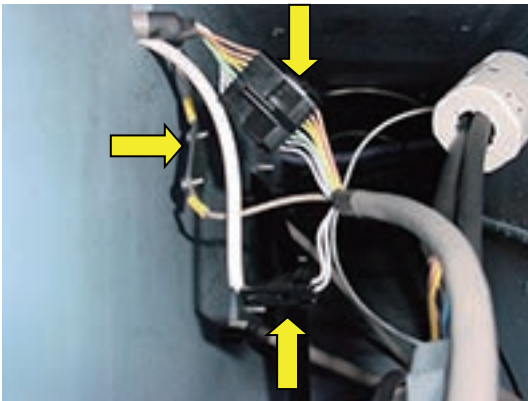
3. Remove Clamp filter.

Remove three setscrews on bracket A as shown in the figure below.
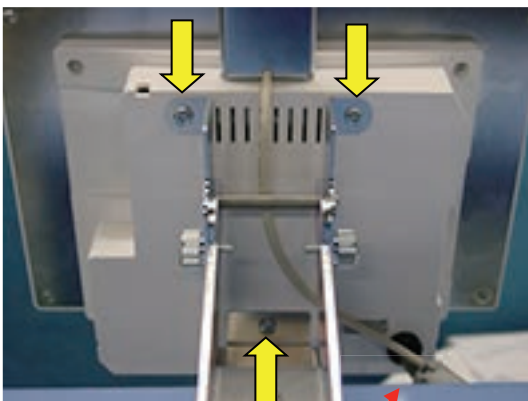
Clamp filter

4. Remove control box.

Standard

10.4"
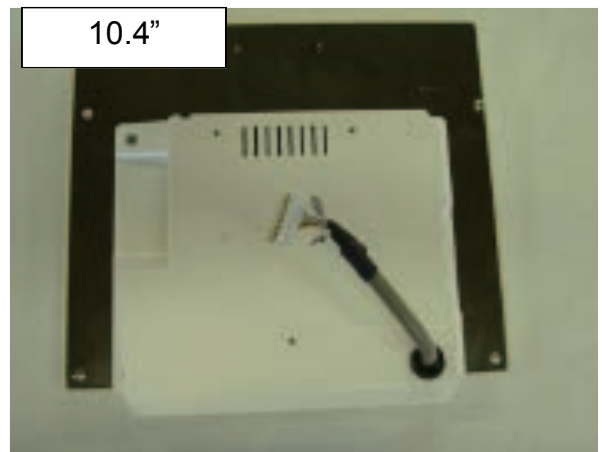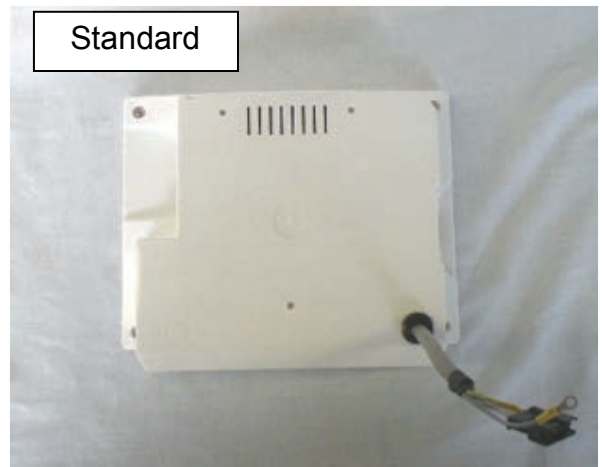
Please reverse procedure when installing control box.

E3-2 Remove 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
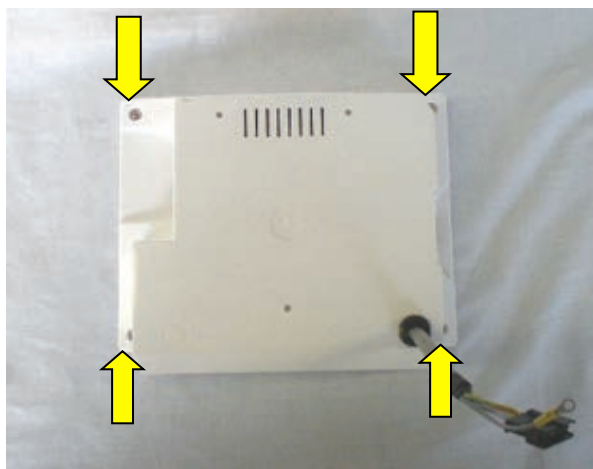
 LCD inverter (red/white).

SW cable   Box cable

            Cable for LCD inverter (red/white)
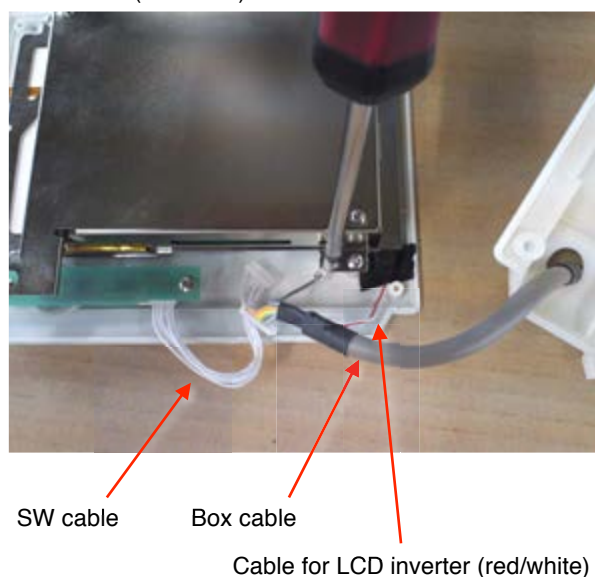
3. Remove set screw and sealed case A.

Sealed case A
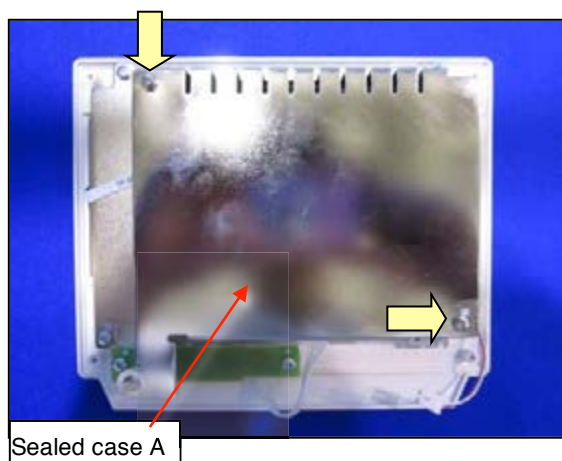
4. Remove core module.
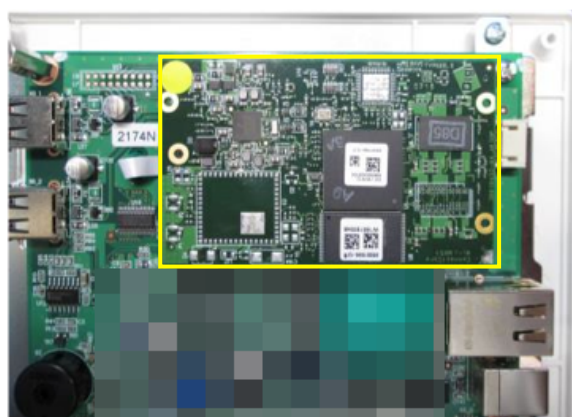
5. Remove narrow flat cable for LCD unit.
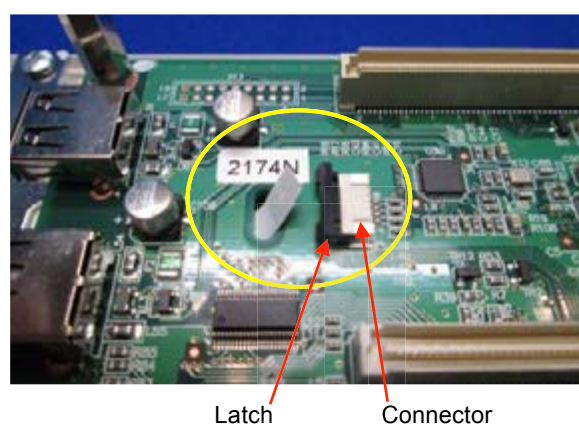
        Latch   Connector

When you pull the latch to cord side, the cord release.

When you push the latch to connector side, the cord

fixed.

Release		Fix	
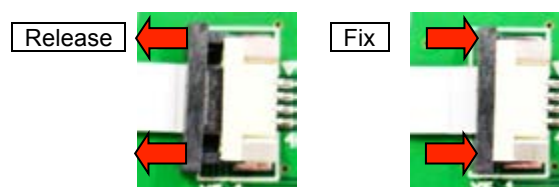
6. Remove two sets screws and two studs.

            Setscrew

            Stud
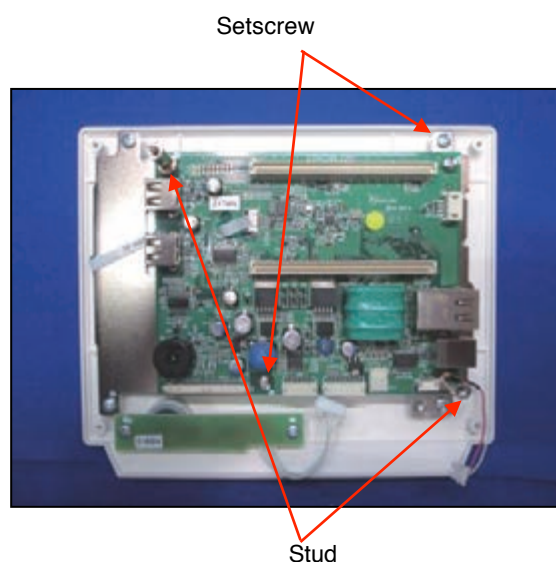
7. Lift LCD-CE board as shown in the figure below.

Remove wide flat cable for LCD unit.

Mac. No. ~1011003A
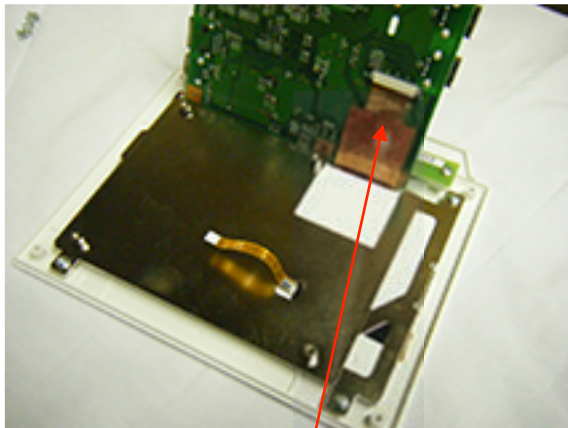
Wide flat cable

Mac. No. 1011007A ~

（When the tape for fixing is stuck on connector, please

peel off.）

Connector
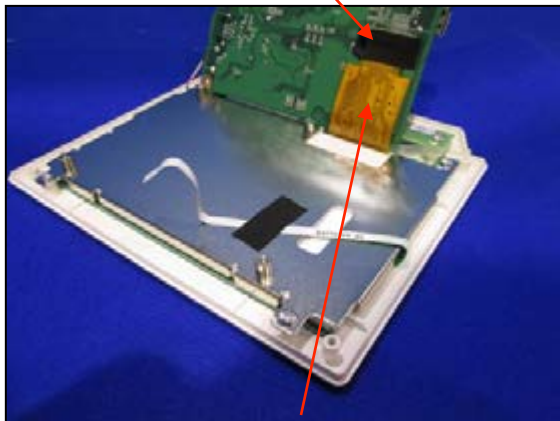
Wide flat cable

When you pull the latch to cord side, the cord release.

When you push the latch to connector side, the cord

fixed.

Release

Latch
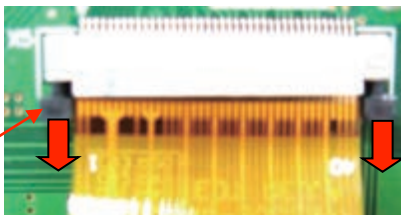
Fix
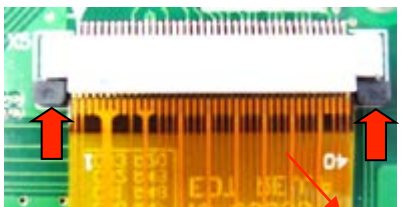
8. Remove four setscrews and LCD unit.

Mac. No. ~1011003A
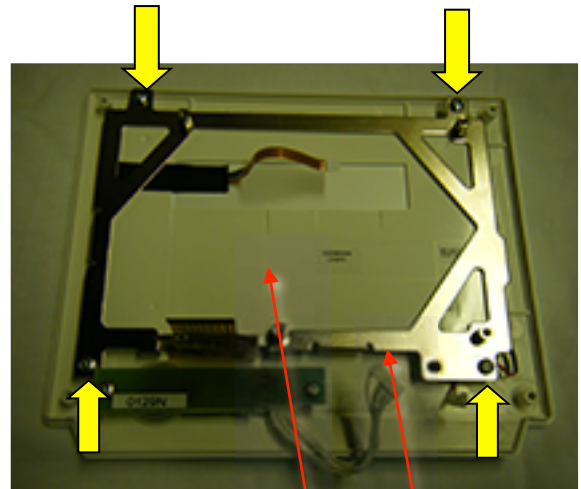
LCD unit   Display bracket

Mac. No. 1011007A ~
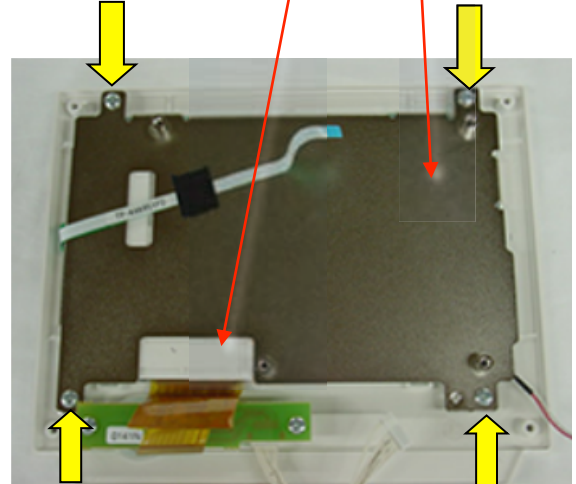
Remove touch panel.

Touch panel

Please reverse procedure when installing LCD-CE board.

E3-2a 10.4" Remove LCD-CE board

1. Remove emergency stop blacket.

   Remove four setscrews as shown in the figure below

   and remove rear cover.
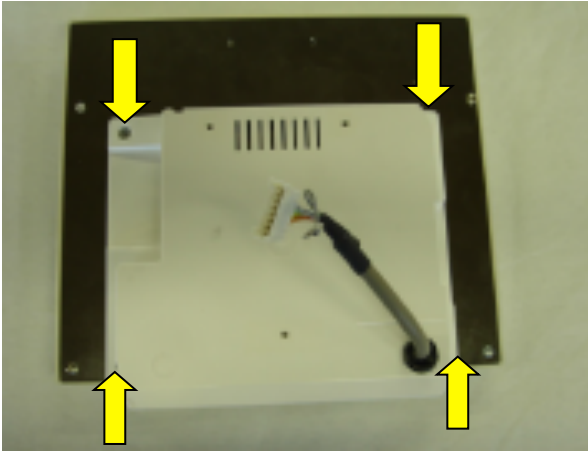
2. Remove connectors for SW cable, Box cable.
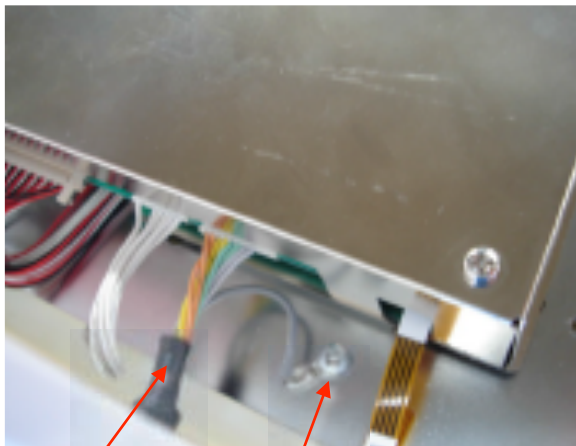
Box cable

Screw for ground

3. Remove set screw and sealed case A.
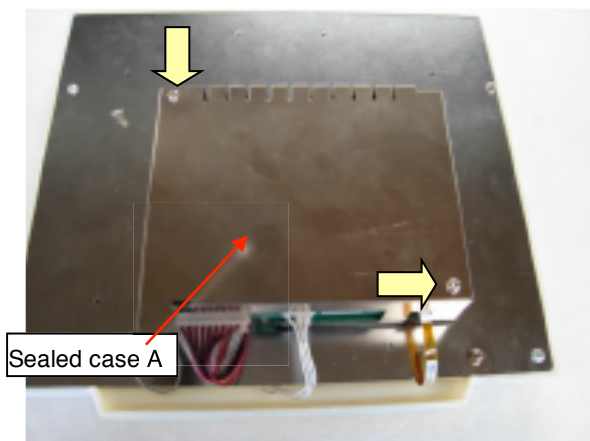
Sealed case A

4. Remove connectors.

LVDS cable

SW cable   Narrow flat cable for LCD unit

5. Remove two sets screws and two studs.
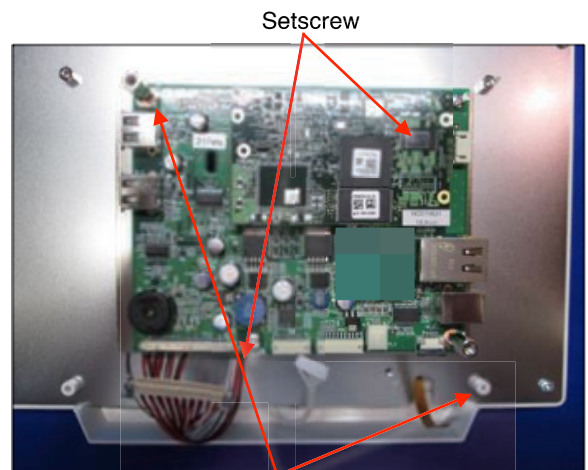
Setscrew

Stud

6. Remove sealed case B.

Sealed case B
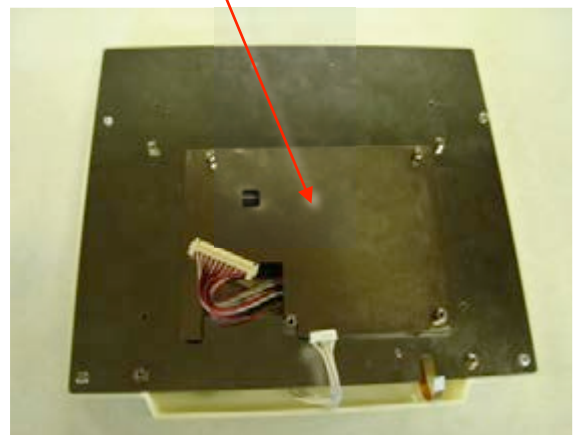
7. Remove set screw and rear cover.
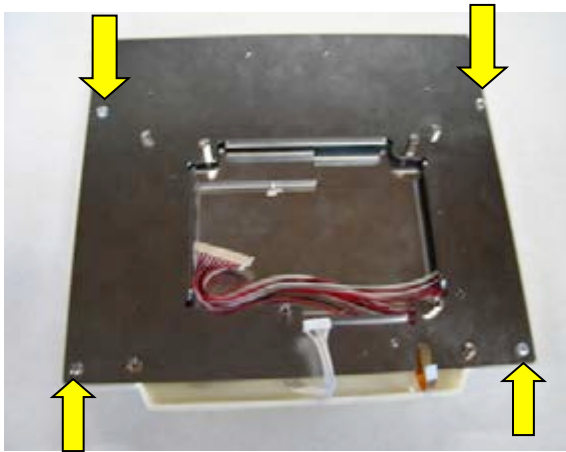
8. Remove set screw and LCD unit.

LCD unit
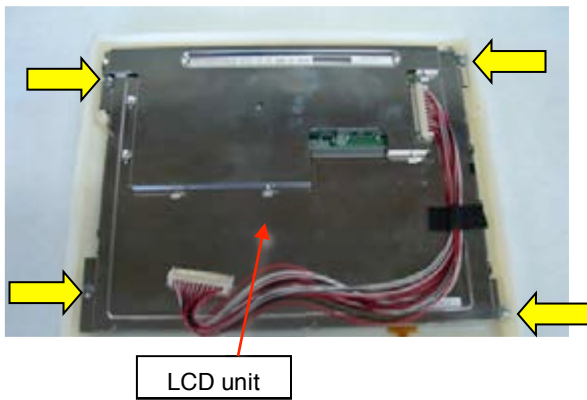
Please reverse procedure when installing LCD-CE board.

E3-3 Setting for LCD-CE board

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

Switch to OFF on all the settings for DIP switch.
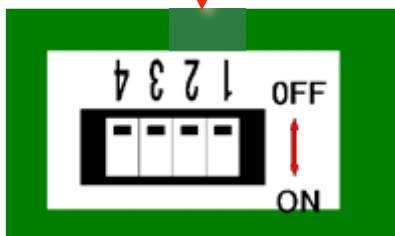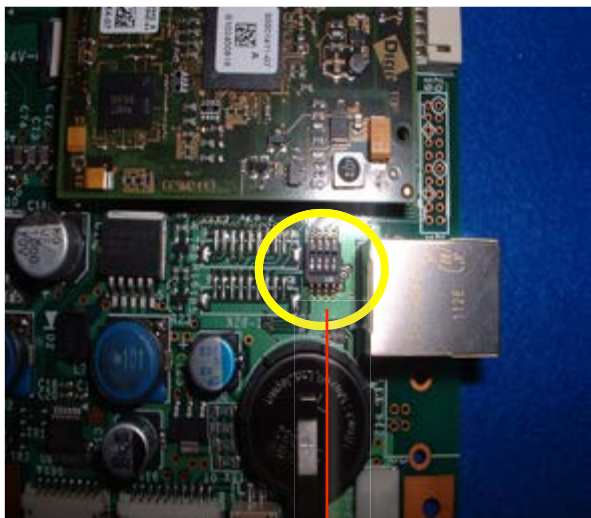
Memory card

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.

<Notice> Please contact us if you need to use third party's memory card from local market.

The necessary information will be provided.
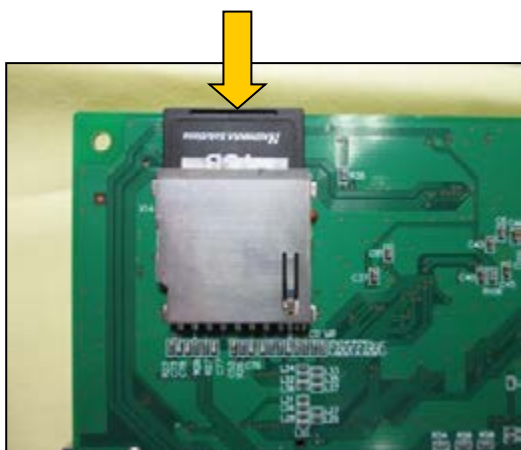
Coin battery

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
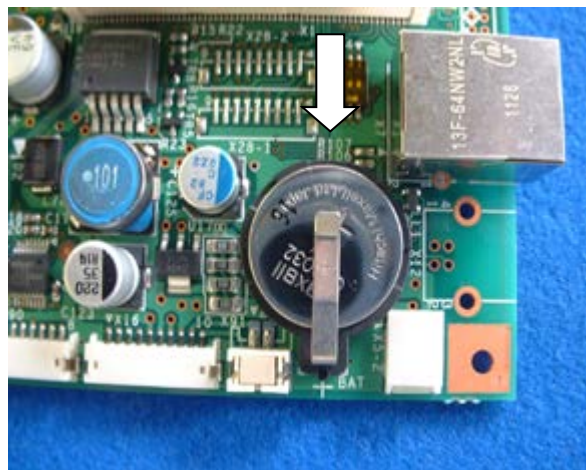
LCD-CE-MX   (Mac. No.   ～1036002A)
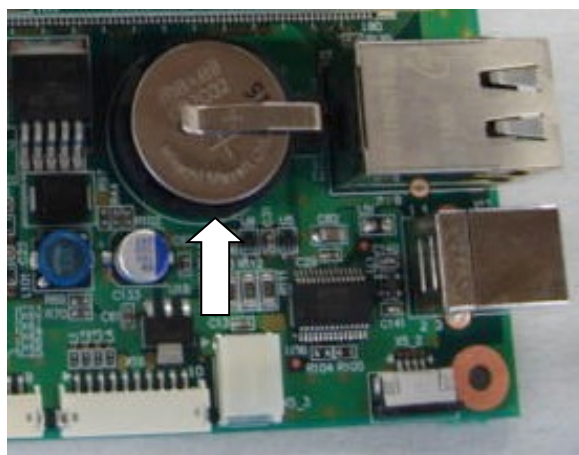
Disposal of coin battery of LCD-CE board

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

E4 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 the screen after
   the machine is booted.

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

E4-2 Machine program update
E4-3 Main program update

3. [Replacement of CONT-S2 board]
   Register frame position in Maintenance Mode.

E5-6 Position—Registration
   of coordinates for
   positioning sensor

4. Press [MENU] button and select [System] in menu of [OTHER] for initialization of system.

5. Press [MENU] button and select [Speed] in menu of [OTHER] for automatic speed setting.

E4-4 Setting of revolution

   Initializing of machine
   speed

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

7. end of process

E4-1 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.

E4-2 Machine program update

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

2. Refer to [E5-1 How to enter maintenance mode] and enter maintenance mode. The screen shows below:
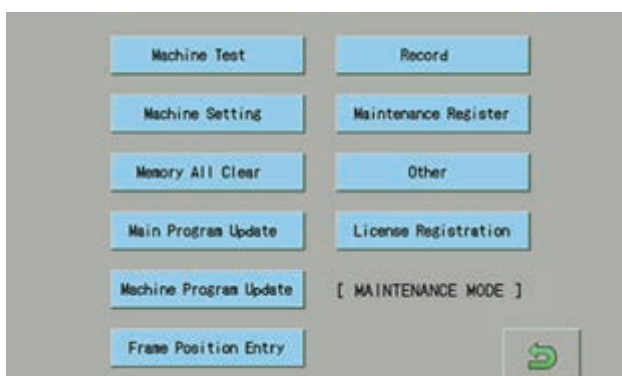
3. Press Machine Program Update.
   The screen shows contents of the USB memory.
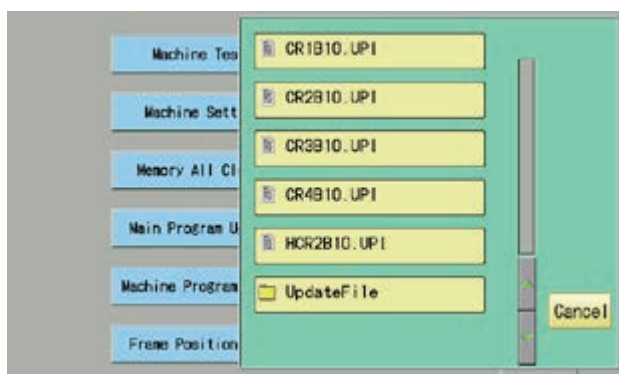
4. Select [UpdateFile].
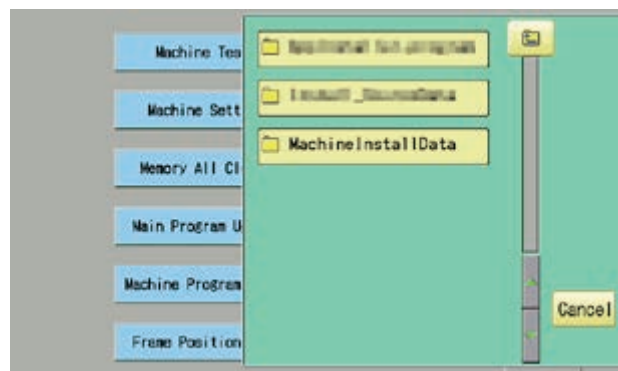
5. Select [MachineInstallData].

6. Select the machine model.
   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).

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

8. Press NEXT.

9. Referring to [E4-4   Setting of revolution],

   Perform [Re-Initialization of machine system]

   And [Initializing of machine speed].

 ・* End of process.

E4-3 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 [E5-1 How to enter maintenance mode] and enter maintenance mode. Display comes as below.
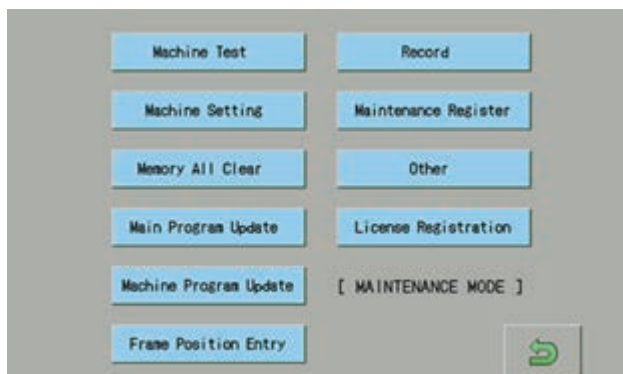
3. Press Main Program Update.
   Select 3 items such as Language, Letter and and make the screen show "Update" on each item.

4. Press ENTER.
   Installation of program begins.
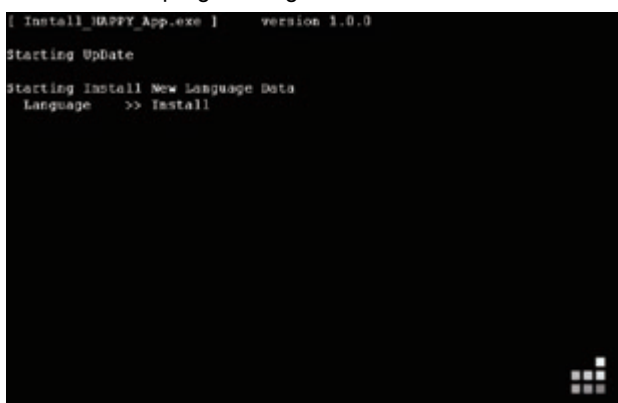
<NOTE>

* 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 [E4-4 Setting of revolution], Perform [Re-Initialization of machine system] And [Initializing of machine speed].

* End of process.

E4-3 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).

Calendar	Version
Network	Maintenance
System	Language
Speed	Calibrate
Cancel	

3. Press Version .

— Main Program (Control Box) —
Version A1.21

— Machine Program (Machine Board) —
1.Machine Control : HC52 B1.4
2.Frame Drive Data : C51/B 1.D
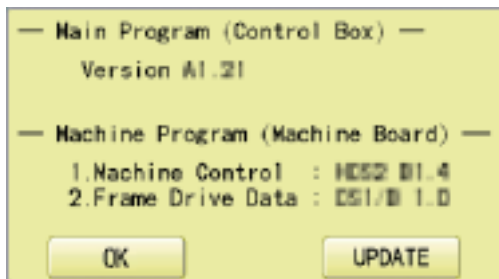
OK   UPDATE

4. Press UPDATE .

Installation of program begins.
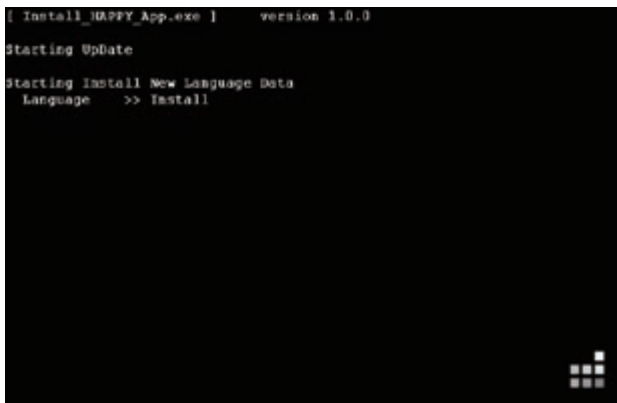
[Install_HAPPY_App.exe]   version 1.0.0

Starting UpDate

Starting Install New Language Data
 Language   >> Install

<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.

WELCOME
HAPPY
PTA-32320
Y=320mm
X=320mm
KEEP CLEAR : CARRIAGE WILL MOVE!
NEXT

* Press NEXT button.

10. Referring to [E4-4 Setting of revolution],
   Perform [Re-Initialization of machine system]
   And [Initializing of machine speed].

* End of process.

E4-4 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 .


```
System initialize OK?

      Cancel      OK
```
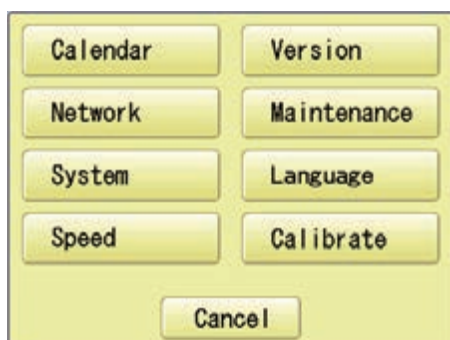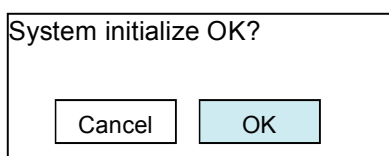
3. Press OK .

   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 .

```
Speed setting OK?
CAUTION! <Main shaft turns>

      Cancel      OK
```
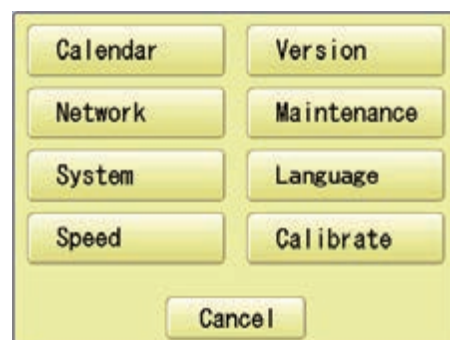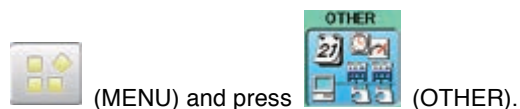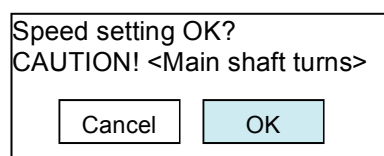
3. Press OK .

   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.

E5 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

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.)

License Registration————Limited usable period

Replaced CONT Board————Machine Setting Navigation after exchanging CONT board (Main program Ver.*1.34~)

E5-1 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.
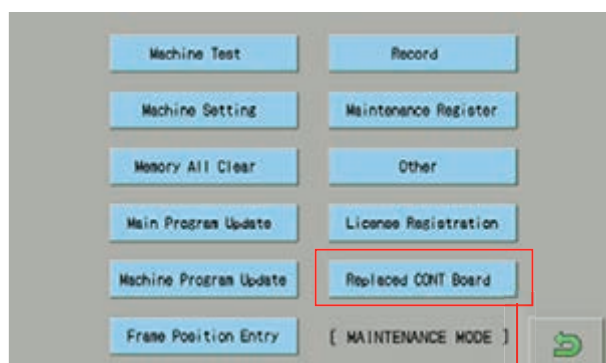
Main program Ver.*1.34~

3. Press [icon].

You can enter maintenance mode again by long key press

of [icon] (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.

E5-2 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 Needle Adjust : Input of Needle bar detect Potentiometer
At section of [Setting to detect needle position], this function can be used to set position of Potentiometer.

#2 Cutter Adjust : Action test of moving knife Open-Close
Use this function to adjust stop position of Moving knife.

#3 Catcher Adjust : Action test of Thread catch hook
This test is used to adjust stop position of Thread catch hook.

#4 Keeper Test : Action test of Keeper solenoid ON-OFF
This test is used to check action of Keeper.

#5 Jump Solenoid Test : Movement test of jump device ON-OFF.
This test is used to check movement of Jump device.

#6 Catcher Test : Movement test of thread catch hook IN-OUT
Use this test to check movement of Thread catch hook.

#7 Cutter Test : Action test of moving knife Open-Close
Use this function to check opening-closing action of Moving knife.

#8 Clip Solenoid : Action test of clip type thread holder (Option)
This test is used to check movement of clip type thread holder.

#9 Pointer Test : Action test of laser pointer (Option)
This test is used to check action of Laser pointer.

#10 Fan Drive Test : Action test of cooling fan ON-OFF
Use this function to check movement of cooling fan.

#11 Encoder Check : Input test of L point / C point timing
With turning main shaft, you can use this function to check if L point signal, C point signal, and timing signal are correct or not.

#12 Position Data Entry : Position Data Entry Confirm frame moving sensor
This test is used to check action of Frame moving sensor.
From Main program Ver.*1.34~, the Pulse motor will be un-locked when you activate the test, then you can move the embroidery frame to your desire position.

#13 Position Data Entry : Confirm registration of frame position data
You can use this function to check if Frame position data are entered correctly.

#14 Shaft Drive Test : Main shaft control test
You can turn main shaft with pushing "Start" or "Jump" key of Needle bar section.
This function can be used for test run after maintenance work.

#15 Sequin test (Option)
This test is used to check or adjust of Sequin device.

#16 Rotary Hook Adjust
This function can be used for [Adjustment of needle height] or [Adjustment of rotary hook timing].
You can also use the function through operation panel as well.

40, 220 degrees

160, 340 degrees   100, 280 degrees
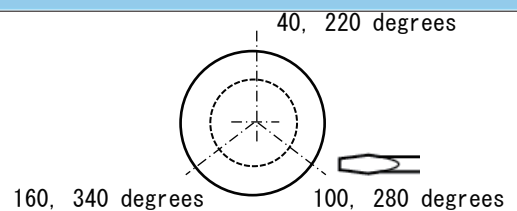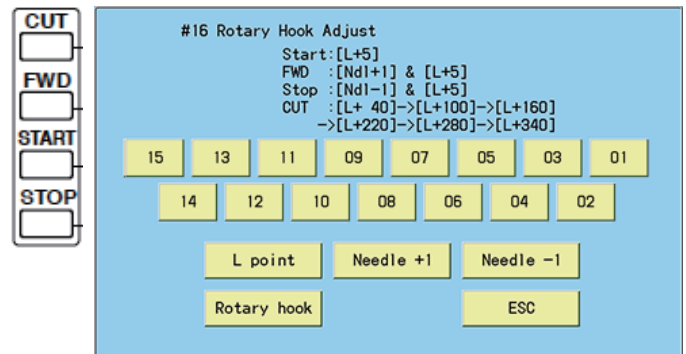
[01]-[15]: Needle change   (Main program Ver.*1.37~)
[START]or[L point]: Main shaft will turn and set Needle bar position for [Adjustment of needle height] (L+10 degree).
[CUT]or[Rotary hook]: Rotary hook will turn and stop every 120 degrees to access 3 fixing screws easier.
[FWD]or[Ndl +1],
[STOP]or[Ndl -1]: Needle bar moves to the left or right, then sets Needle bar position for [Adjustment of needle height] (L+10 degree).

#17 Needle Posi. Adjust   (for factory production)

1. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode].

2. Press Machine Test .

```
[ MAINTENANCE ] / [ Machine Test ]

# 1 Needle  Adjust        # 6 Catcher Test

# 2 Cutter Adjust         # 7 Cutter  test

# 3 Catcher Adjust        # 8 Clip Solenoid test    ▼

# 4 Keeper Test           # 9 Pointer test

# 5 Jump Solenoid Test    #10 Fan Drive test        ESC
```

3. Select desired number to be confirmed.

   Page is switched by pressing ▼ ▲ .

   Selected item will be executed.

```
# * ***************




                                    ESC
```
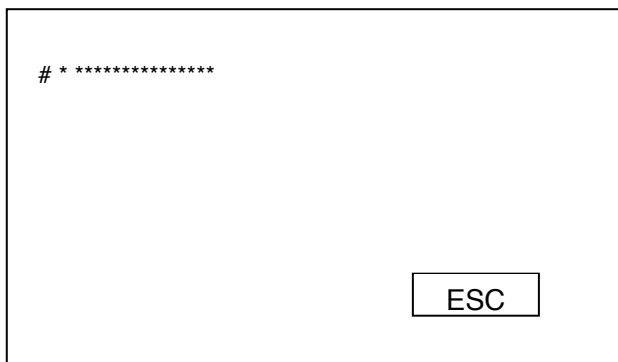
4. The screen returns to the [MACHINE TEST] screen by

   pressing ESC .

   (Unnecessary to press ESC if the item completes

   automatically.)

```
[ MAINTENANCE ] / [ Machine Test ]

# 1 Needle  Adjust        # 6 Catcher Test

# 2 Cutter Adjust         # 7 Cutter  test

# 3 Catcher Adjust        # 8 Clip Solenoid test    ▼

# 4 Keeper Test           # 9 Pointer test

# 5 Jump Solenoid Test    #10 Fan Drive test        ESC
```
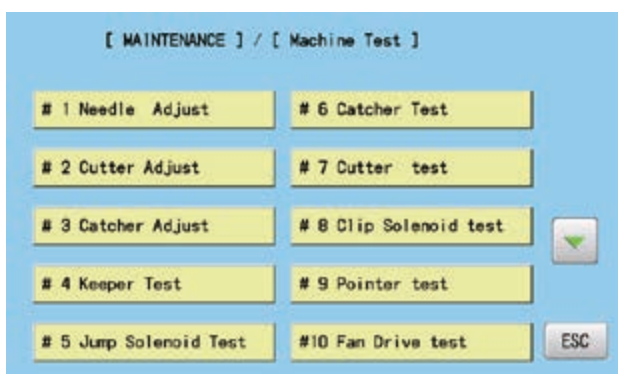
5. Return to drive mode by pressing ESC and   .

E5-3 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 Core module) 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 [E5-1 How to

   enter maintenance mode]

2. Press Memory All Clear .
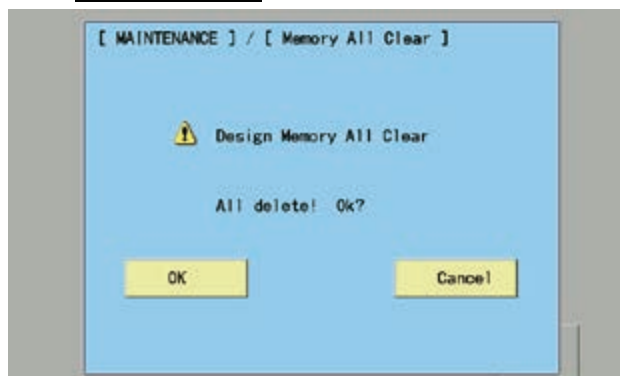
3. Confirmation of free area and all delete will be started after

   pressing OK .
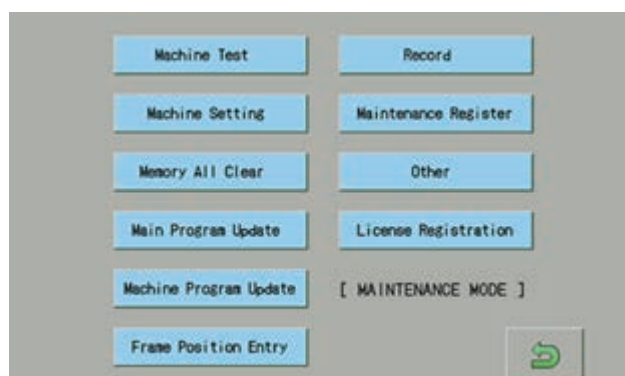
4. Return to drive mode by pressing ESC and .

E5-4 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

Occurrence record by error type   : Accumulated number of each error occurrence

Thread break history   : The number of thread break by needle bar

E5-4-1 Total number of stitch

1. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode]

2. Press Record.

[MAINTENANCE] / [Record]

THREAD   ERROR   STITCH

ESC
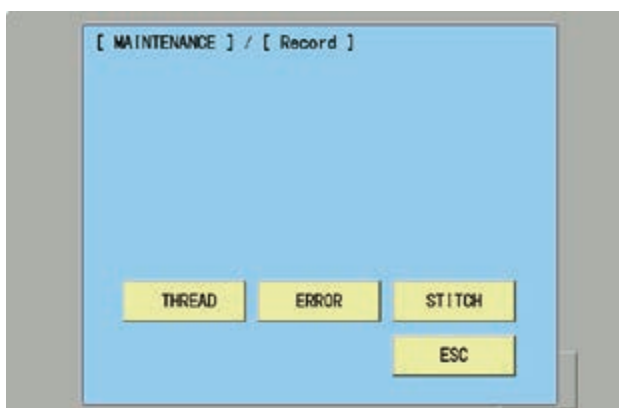
3. Press STITCH.

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

[Stitch Record]

Total Stitch : 0

CLEAR   ESC

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

Clear Total Stitch ?
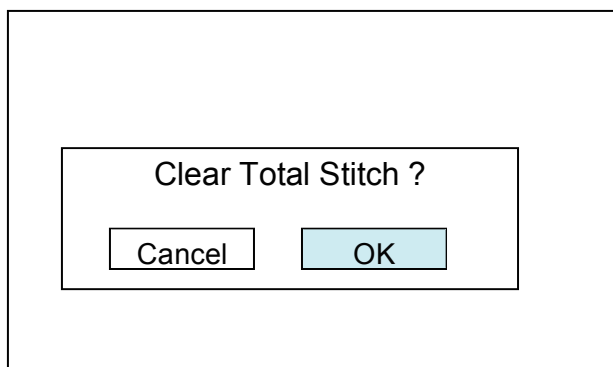
Cancel   OK

* 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 .

E5-4-2 Record of Error occurrence

1. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode]

2. Press Record .
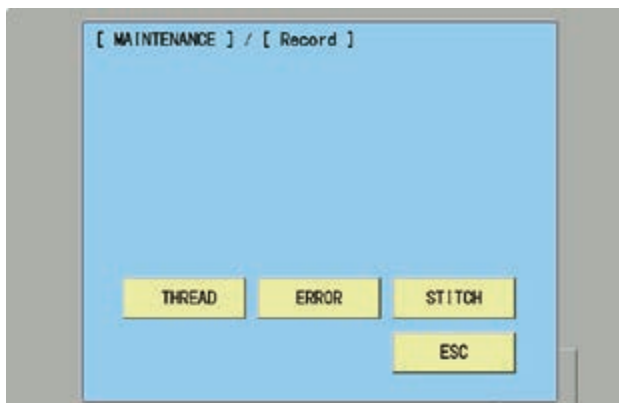
3. Press ERROR.

Enable to confirm Record of error occurrence

* Enable to confirm Occurrence date and error number

with button.

Selection menu of Clear Error Record will be opened when pressing CLEAR.
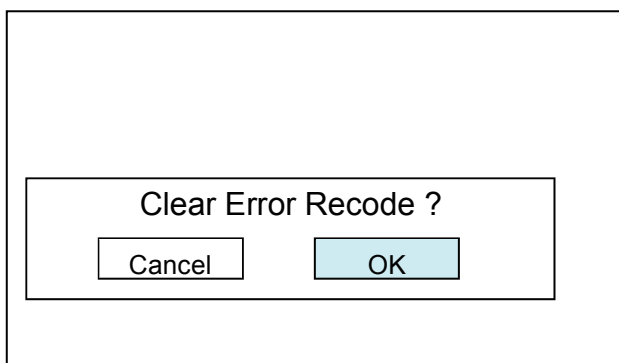
* Error record is cleared by pressing OK and the screen of the procedure 3 is displayed.

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

E5-4-3 Number of occurrence in each error display

1. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode]

2. Press Record .

[MAINTENANCE] / [Record]

THREAD   ERROR   STITCH

ESC
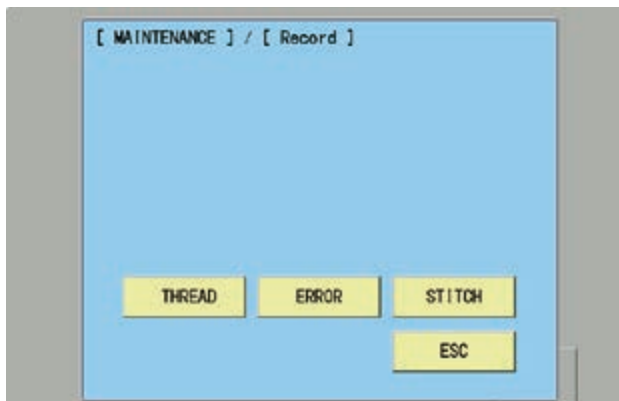
3. Press ERROR.

You can confirm record of error occurrence.

[Error Record]
Err-code   Date
1:
2:
3:
4:
5:
6:
7:
8:
9:
10:

COUNT   ▲

CLEAR   ▼   BACK

4. Press COUNT .

You can confirm total number of occurrence in each error.

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

[Error Record] / [Error Count]
Err-code Date   Err-code Date
E-000 :   0   E-010 :   0
E-001 :   0   E-011 :   0
E-002 :   0   E-012 :   0
E-003 :   0   E-013 :   0
E-004 :   0   E-014 :   0
E-005 :   0   E-015 :   0
E-006 :   0   E-016 :   0
E-007 :   0   E-017 :   0
E-008 :   0   E-018 :   0
E-009 :   0   E-019 :   0

▲

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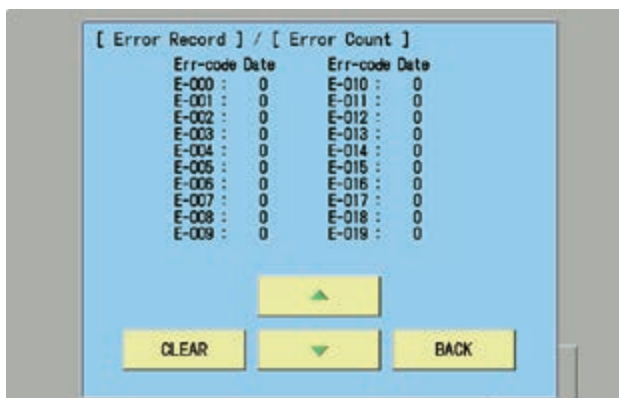
* You can confirm accumulated number for E-000 to E-255

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.

Clear Error Total Count ?
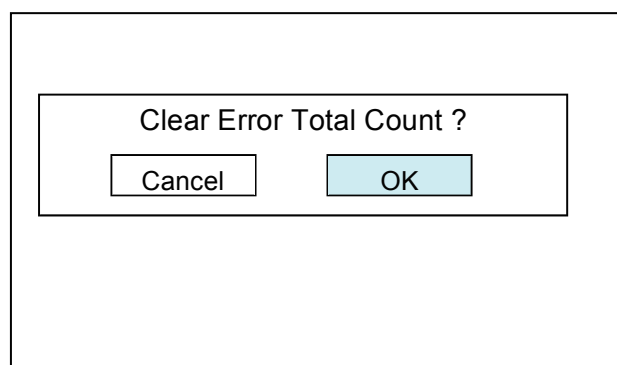
Cancel   OK

* 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.

E5-4-4 Thread break history

1. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode]

2. Press Record .

```
[ MAINTENANCE ] / [ Record ]




            THREAD      ERROR      STITCH

                                    ESC
```
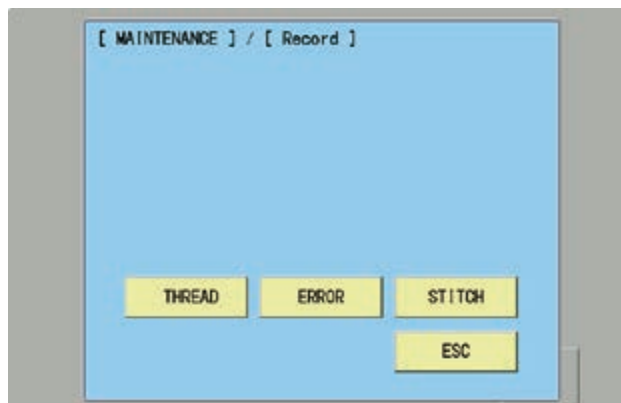
3. Press THREAD.

You can confirm thread break history by needle bar.

```
[ Record ] / [ THREAD ]
        Head: I    Total:      2
       Needle:Count         Needle:Count
          1:    1             9:    0
          2:    0            10:    0
          3:    0            11:    0
          4:    0            12:    0
          5:    0            13:    0
          6:    0            14:    0
          7:    0            15:    0
          8:    1

                    ▲         CLEAR

                    ▼         BACK
```

· *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.

```
            Clear Thread Break Count ?
            Cancel              OK
```
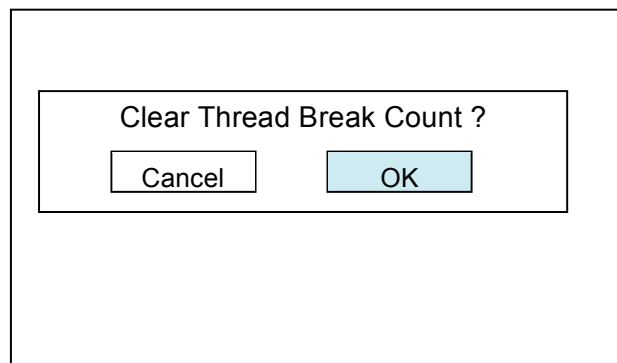
* Thread break history is cleared by pressing OK and the screen of the procedure 3 is displayed.
* If you do not prefer to clear it, press Cancel and the screen of the procedure 3 is displayed.

6. Head is switched by pressing ▲ ▼ .
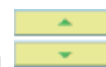
E5-5 Setup—Machine setting

<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	: HCR2		
*2	Max Needle Number	: 15	(1-15)	: Number of Needle
$ 3	Max Head Number	: □	(1-30)	: Number of Head
$ 4	Machine Max Speed	: □□□	(500-2000)	: Maximum rotation
$ 5	Machine Max Area X	: □□□	(0-15000)	: Maximum embroidery area at X axis
*6	Machine Max Area Y	: 4500	(0-15000)	: Maximum embroidery area at Y axis
$ 7	X Position Sensor	: □	(0-12)	: Number of position sensor at X axis
* 8	Y Position Sensor	: 6	(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 (To be determined)
#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		: Thread cutting unit type
*15	X Start Base Angle	: 60	(20-90)	: Starting angle of frame movement on X axis
*16	Y Start Base Angle	: 60	(20-90)	: Starting angle of frame movement on Y axis
*17	X Start Angle(CAP)	: 40	(20-90)	Starting angle of frame movement on X axis for cap frame
*18	Y Start Angle(CAP)	: 40	(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	: 250 (0-1000)		Close timing of Clip when Thread trim (ms) Set to 250 when the Clip holder device is Yes.
*22	Border Overlap	: 8	(0-8)	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 [E5-1 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.

E5-6 Position- Registration of coordinates for positioning sensor

This procedure is to memorize embroidery area into the machine.

*This procedure has to be done after exchange of CONT-R2 board position sensor board.

(Machine will display error [E-67 Position data] without the registration of coordinates of position sensor.

<note> Registeraion should be done with cover installed. Correct position may not be registered, if the registration is done with cover off.

As frame moves at maximum embroidery area, be surenot to have anything around the machine.

1.Refer to [E5-5 Setup- Machine setting] and confirm the following setting

5   Machine Eria X

    HCR2-1502:   5000

    HCR2-1504:   3600

    HCR2-X1504:   5000

    HCR2-1506:   3600

    HCR2-X1506:   5000

    HCR2-1508:   3600

6   Machine Eria Y

    HCR2-1502:   4500

    HCR2-1504:   4500

    HCR2-X1504:   4500

    HCR2-1506:   4500

    HCR2-X1506:   4500

    HCR2-1508:   4500

7   X Position Sensor

    HCR2-1502:   6

    HCR2-1504:   4

    HCR2-X1504:   6

    HCR2-1506:   4

    HCR2-X1506:   6

    HCR2-1508:   4

7   Y Position Sensor

    HCR2-1502:   6

    HCR2-1504:   6

    HCR2-X1504:   6

    HCR2-1506:   6

    HCR2-X1506:   6

    HCR2-1508:   6

2.Press ESC button.
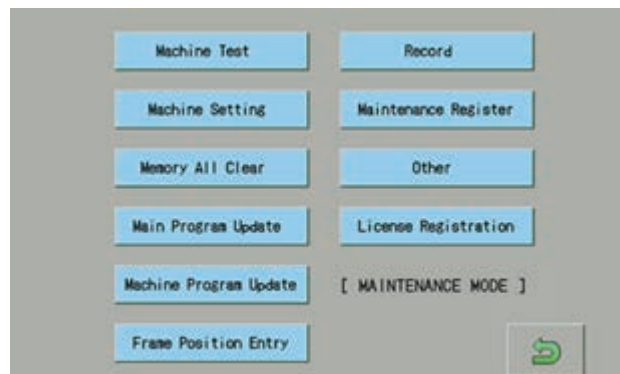
3. Press Frame Position Entry .

Operate according to displayed below message.

(1). Fix carriage cover

(2). Remove cap frame

(3). Move carriage to center mark position by

. (Refer to below display)

(4). Press START button

(Press ESC button in case of cancellation)

Center mark position of X axis   Center mark position of Y axis
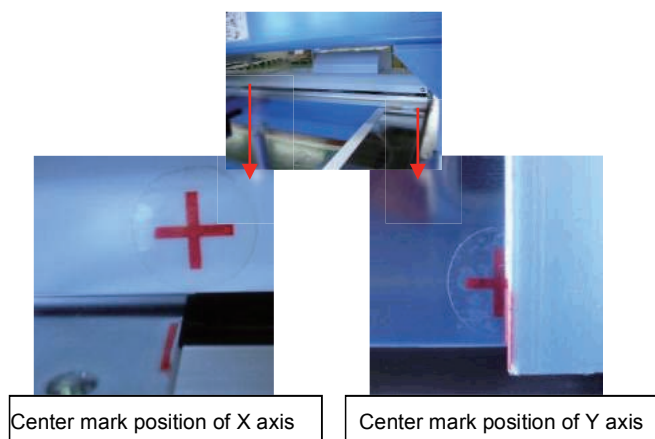
4. When you press START button, registration of X axis direction will start. Frame moves as below.
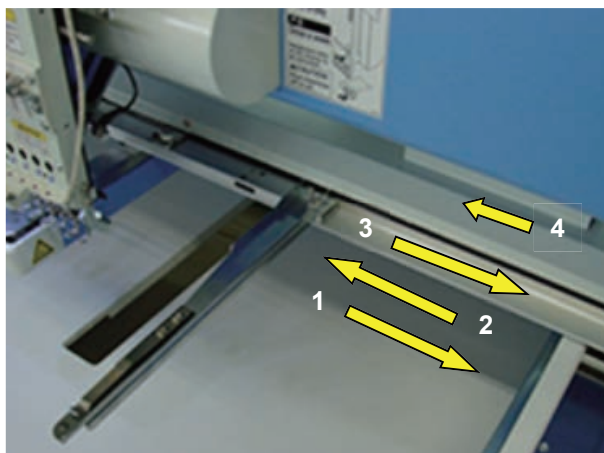
5. Then registration of Y axis direction will start. Frame moves as below.
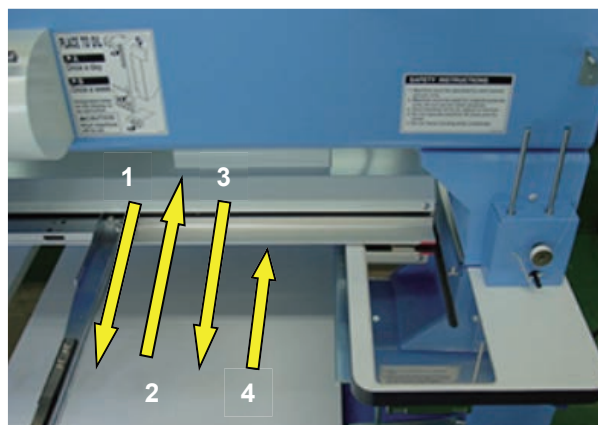
6. Bellow message will be displayed with successful completion.

- - - - Complete - - - -
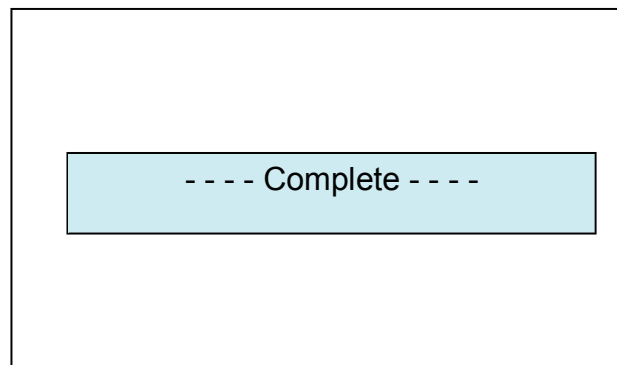
Retry from step 3, if [Error] occurs

Frame position registration is finished.

7. Return to drive mode by pressing ESC and .

E5-7　Maintenance Register—Registration of machine maintenance date

Registration of machine maintenance date

When last maintenance date is registered, next regular

maintenance date will be set automatically.

1. Enter maintenance mode in reference to [E5-1 How to

　 enter maintenance mode].

2. Press Maintenance Register.

3. Press Register.

　 The current date will be registered as last maintenance

　 date.

> When the machine runs more than 2000 hours (default
>
> setting) or 365 days are passed after last maintenance,
>
> the machine will display the message to have regular
>
> maintenance.
>
>
>
> This machine must take maintenance!
> Please contact your dealer.
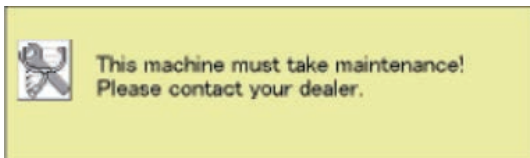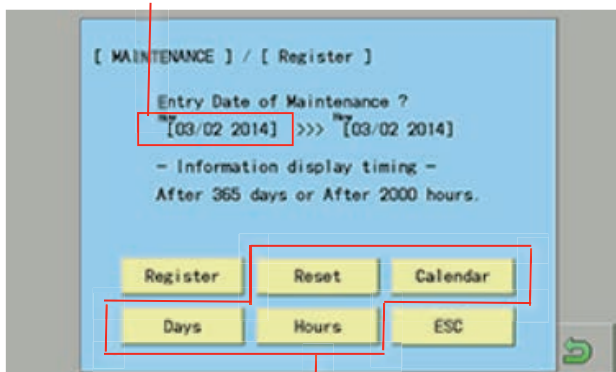
Registered date

Main program Ver.*1.34~

・ Pressing the RESET button delete the registered date.

・ When the Calender button is pressed, you can set

　 calendar of the machine.

・ By pressing Days button, you can change the number of

　 days for regular maintenance. (1 ~ 3,650 dsys)

・ By pressing Hours button, you can change the number of

　 running time for regular maintenance. (1 ~ 50,000 hours)

4. Press ESC.

　 Return to maintenance mode.
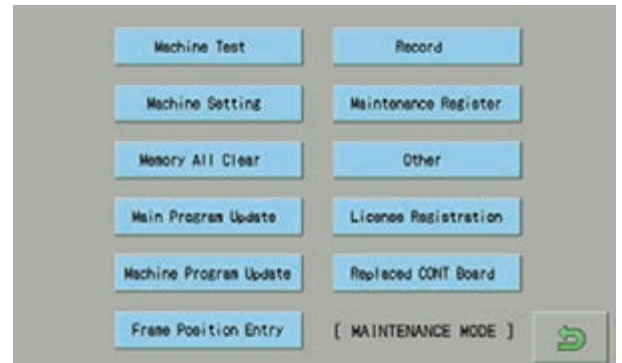
・ End of process.

E5-8   Machine Setting Navigation after exchanging CONT board (Main program Ver.*1.34~)

After exchange CONT board, please activate [Machine Setting Navigation after exchanging CONT board] function. Then you can set necessary machine setting with one process.

E5-5 Setup   Machine setting

E4-2   Machine program update

E4-3a   Main program update

E5-6   Position Registration of coordinates for positioning sensor

E4-4   Initializing of machine speed

・Refer to [E4-1   Preparation for program update] and prepare latest update programs.

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

2. Refer to [E5-1   How to enter Maintenance mode] and enter maintenance mode.   The screen shows below:

3. Press Replaced CONT Board.

Start Setup-Navigation?

Cancel   OK
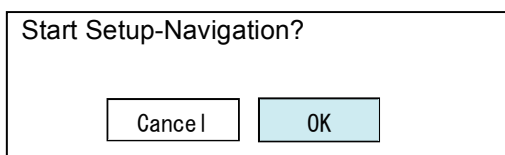
4. Press OK.

5. Select model name of your embroidery machine.

1st Step: Option Selection

OK
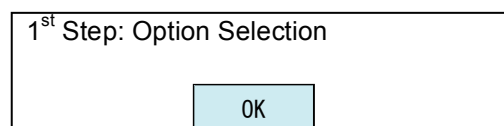
6. Press OK.

Machine setting menu will be opened and all items which are required to set will be highlighted.
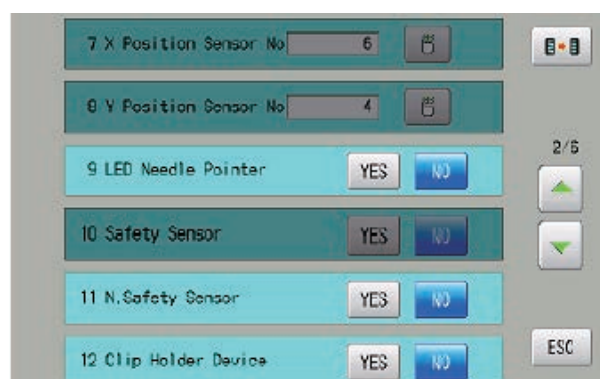
7. Press ESC after setting of necessary items.

2nd Step: Program Update

OK
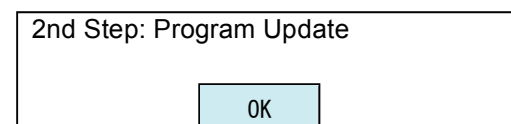
8. Press OK.

Save the latest program to USB memory
And set USB to USB slot on panel.

OK
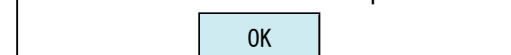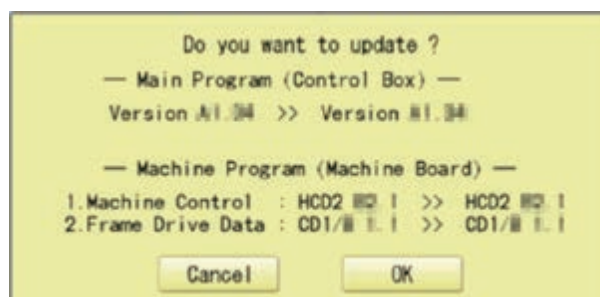
9. Press OK.

10. When the current machine program is older than latest

   version, press OK .

   The installation will be started.


```
[ Install_HAPPY_App.exe ]      version 1.0.0

Starting UpDate

Starting Install New Language Data
   Language    >> Install
```
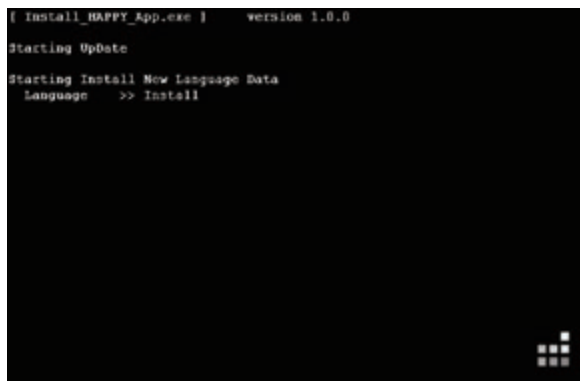
   If the current machine program is same or newer version,

   press Cancel .

   | 3rd Step: Select machine serial No. |
   | (for auto-machine setting) |
   | OK |

11. Press OK .


```
10[    ]  -  10[    ]

10[    ]   -
```
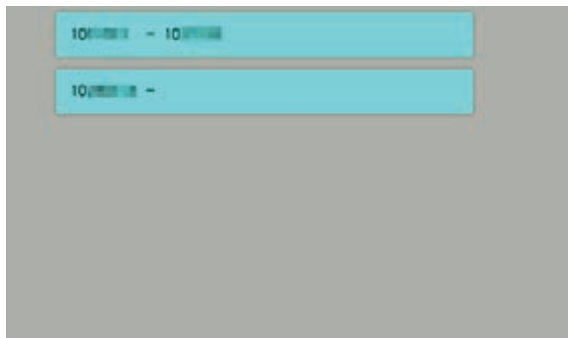
12. Enter the corresponding machine number.


```
4th Step: Frame Position Entry

            OK
```

13. Press OK .


```
[ MAINTENANCE ] / [ Entry Frame Position ]

   1. Set Carriage Cover
   2. Take Cap Drive Frame out
   3. Move frame to Center Mark
   4. Press START key

   ⚠ Warning move frame!

      START            ↖ ↑ ↗
                       ← F.F →
      ESC              ↙ ↓ ↘
```

14. Press START .

   [Position Registration of coordinates for positioning

    sensor] begins.

   Refer to [E5-6   Position Registration of coordinates

   for positioning sensor] for more details.

15. Press ESC.

   | Final Step: Speed setting |
   | OK |

16. Press OK .


```
        Speed setting OK?
CAUTION! <Main shaft turns>

            🔘

   Cancel          OK
```

17. Press OK .

   [Initializing of machine speed] will be started.

   Refer to [Initializing of machine speed] of [E4-4 Setting

   of revolution] for more details.

   | Setup is completed. |
   | OK |

18. Press OK .

   The screen returns to the maintenance mode。


```
   Machine Test          Record

   Machine Setting       Maintenance Register

   Memory All Clear      Other

   Main Program Update    License Registration

   Machine Program Update  Replaced CONT Board

   Frame Position Entry   [ MAINTENANCE MODE ]   ↩
```
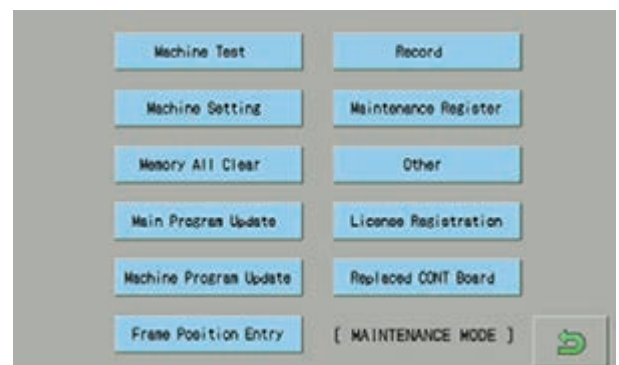
・End of process.

E6-2 Installation of laser position marker

<note> laser position marker is factory option and installed at factory. In case you need to install later at your side, trained engineer has to install

ESHCRU28010 Laser position marker set
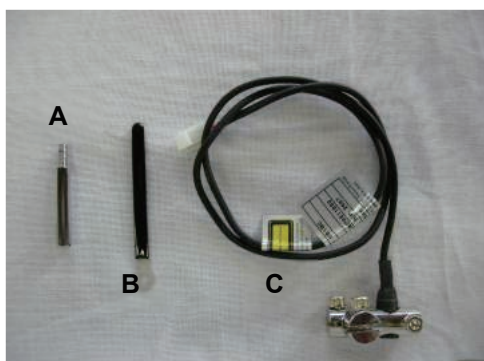
1.Set bandage(B) with stud(A) on right side of moving head
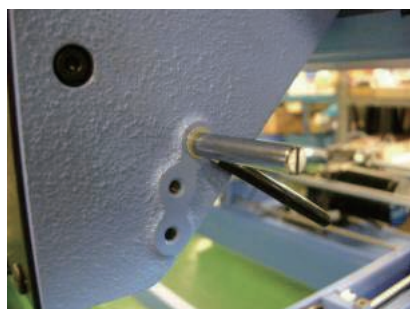
2.Bind harness of pointer unit (C) with bandage(B)

3.Set pointer unit (C) on stud (A)

4.Pass harness through hole at left side of moving head
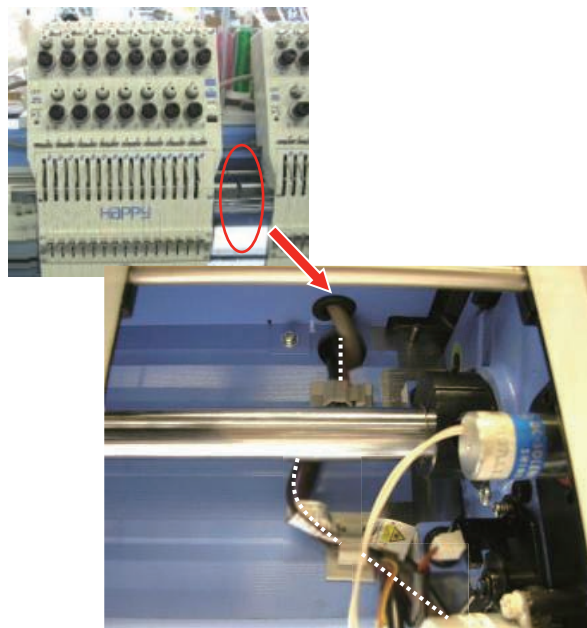
5.Put harness to CN11 on detection circuit board
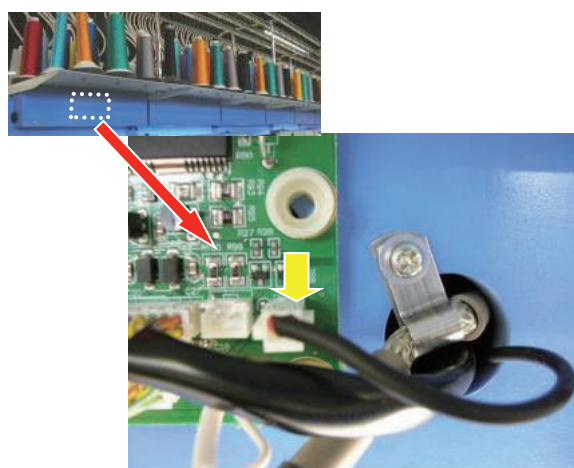
6. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode].

7. Press Machine Setting.

8. Change [9   LED Needle Pointer   No] to

   [9   LED Needle Pointer   Yes].

9. Prss ESC button.
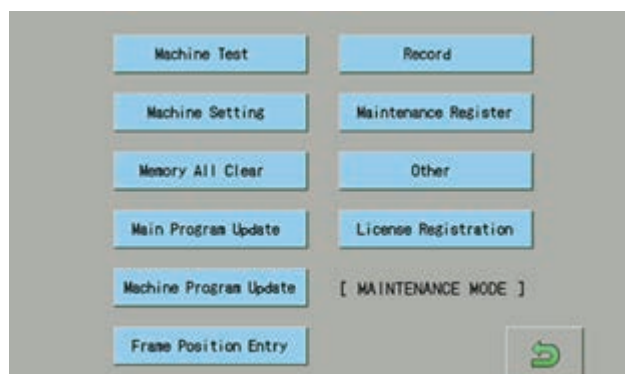
10. Press , return to running menu.

11.   Press and .

12.Adjust angle of pointer unit to point needle position
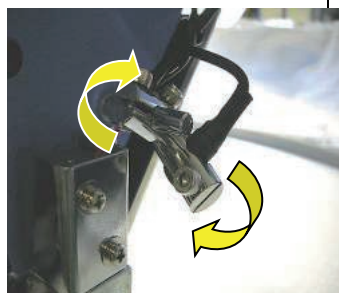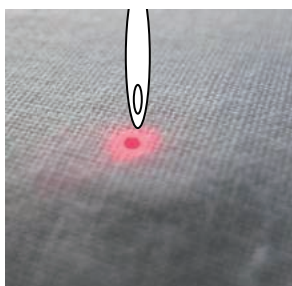
<note> Position may be changed depend on thickness of

    fabric

E6-3 Installation of Safety sensor (front)

<note>Safety sensor (front) is factory option but sensor is not set on machine. Please install sensor according to this instruction.

HCR2-FS2-4   Safety sensor (front)(for 2 and 4 haeds)

HCR2-FSX4-6   Safety sensor (front)(for X4 and 6 haeds)

HCR2-FSX6-8   Safety sensor (front)(for X6 and 8 haeds)

HCRU28C1x   Safety sensor (front) (without Harness A)
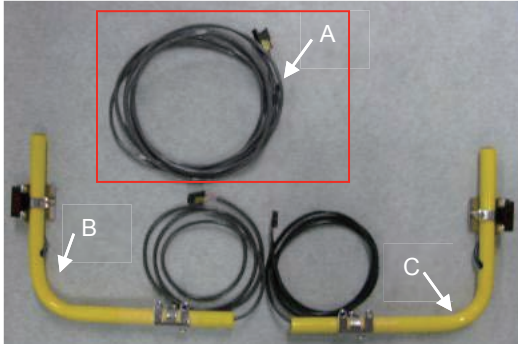
<note> Harness A is installed on machine, if sensor is ordered with machine

<Check>If you would like to order safety sensor separately, please check the machine if harness A is already installed or not. For some high-demand countries, harness A is installed beforehand at factory. In this case, you need to order only Safety sensor (front) (without Harness A).

B=Sensor(emission part)

C=Sencer(receiving part)

1.Take cover out at behind of machine
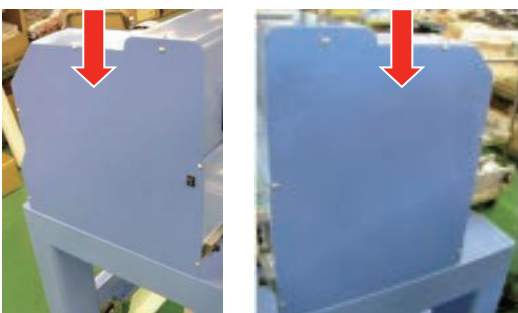
2.Take mission covers (right and left) out

3.Connect harness

<note> Harness A is installed on machine, if sensor is ordered with machine or If harness A is already installed on the machine, you can skip this step.

Connect harness A into CN15 on CONT-R2 board in mission (right)
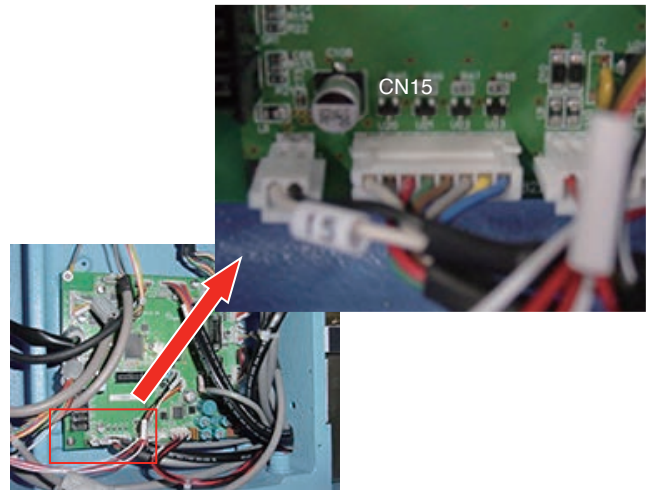
Extend harness to mission (left)
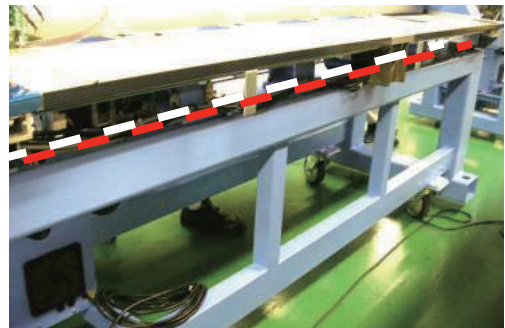
<note> harness should not touch to rotation parts and belts

4.Install sensor(C) at right side

5. Cut center part of grommet and pass harness through grommet as photo below.
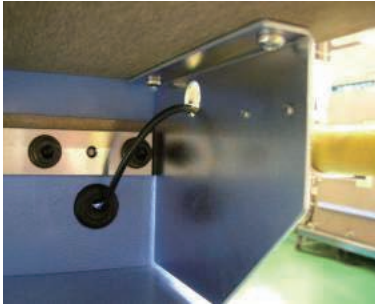
6. Connect harnessinto CN13 on Drive circuit board

CN13
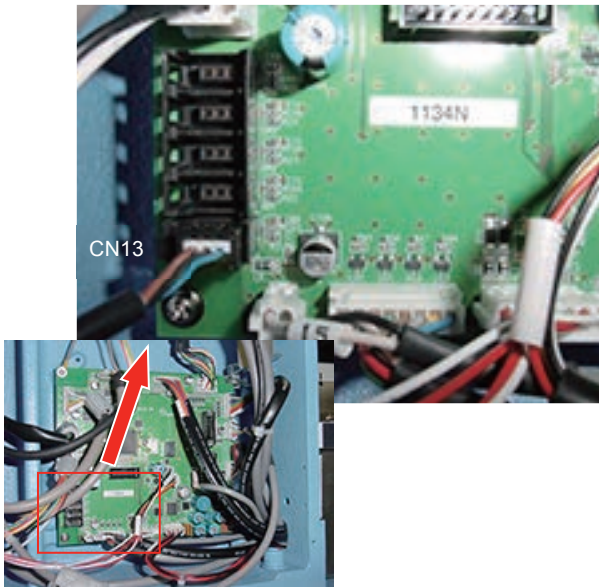
7. Install sensor(B) at left side
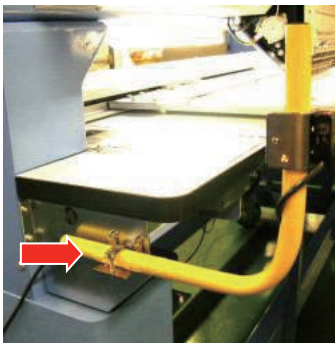
8. Cut center part of grommet and pass harness through grommet as photo below.

9. Pass harness through missin (left) and bring to front

   <note> harness should not touch to belt
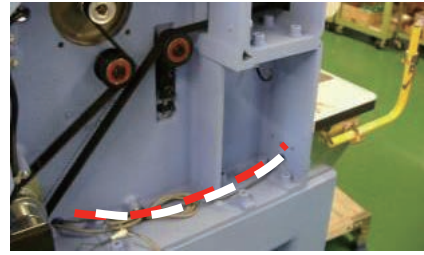
10. Connect harness to extension harness(LS5) at lower part of Y carriage

   <note> put cable in order for avoiding to touch to shaft

11. Set cover

   <note> harness should not get caught in the cover

12. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode].

13. Press Machine Setting.

14. Change [11   N.Safety Sensor   <u>No</u>] to

  [11   N.Safety Sensor   Yes].

15. Prss $\boxed{\text{ESC}}$ button.
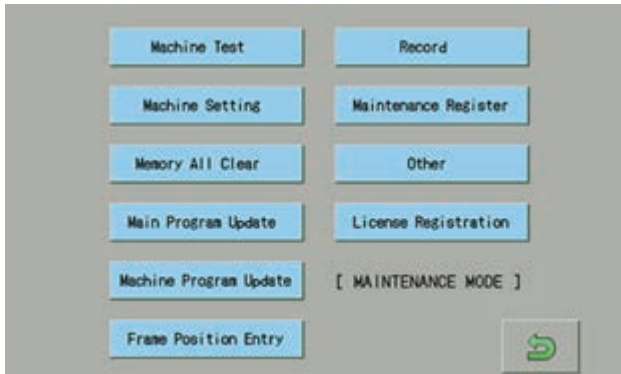
16. Press , return to running menu.

  After these setting, Sencor becomes effective

17. Adjust position of sensors. Confirm both LED (green and Orange) is lighting
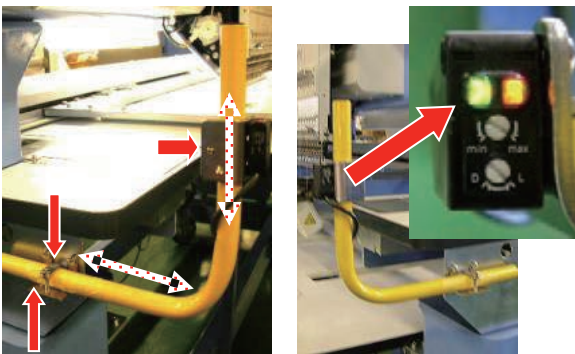
<note> Sencor should be finxed vertical

E6-4 Installation of Safety sensor (rear)

<note> Safety sensor (rear) is factory option but sensor is not set on machine. Please install sensor according to this instruction

HCR2-RS2-4   Safety sensor (rear)(for 2 and 4 haeds)

HCR2-RSX4-6   Safety sensor (rear)(for X4 and 6 haeds)

HCR2-RSX6-8   Safety sensor (rear)(for X6 and 8 haeds)

HCRU28D10   Safety sensor (rear)(without Harness A)
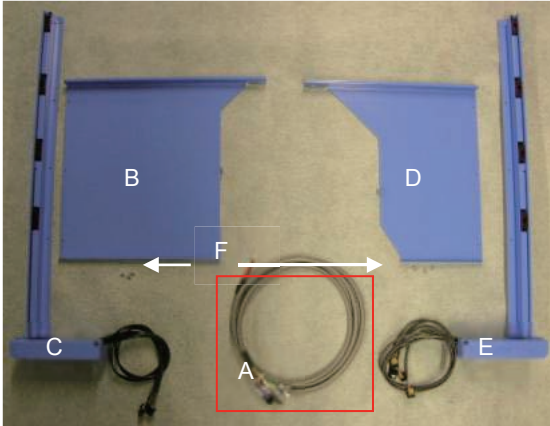
<note> Harness A is installed on machine, if sensor is ordered with machine

<Check>If you would like to order safety sensor separately, please check the machine if harness A is already installed or not. For some high-demand countries, harness A is installed beforehand at factory. In this case, you need to order only Safety sensor (rear) (without Harness A).

    B=Safety Guard (right)
    C=Sensor (receiving part)
    D=Safety Guard (left)
    E=Sencer (emission part)
    F=M3X6 screws (6 pcs)

1. Take cover out at behind of machine
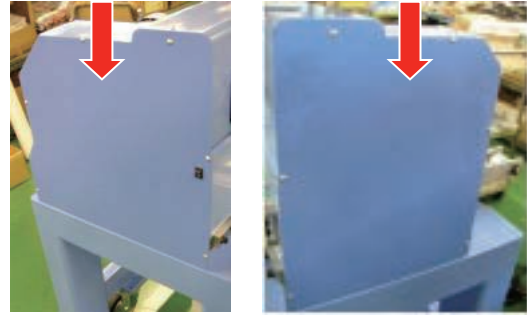
2. Take mission covers (right and left) out

3.Connect harness

<note> Harness A is installed on machine, if sensor is ordered with machine or If harness A is already installed on the machine, you can skip this step.

Connect harness A into CN12 on CONT-R2 board in mission(right)
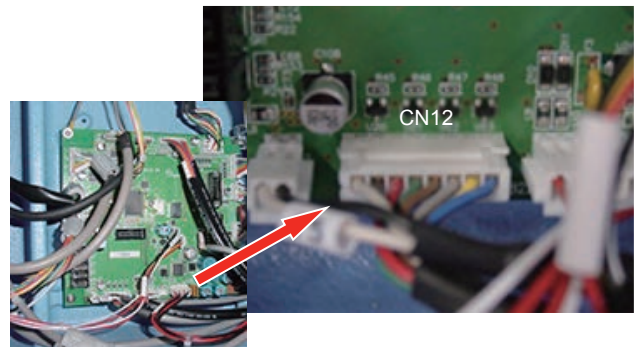
Extend harness to mission (left)
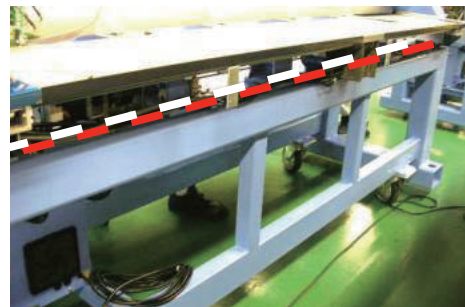
<note> harness should not touch to rotation parts and belts

4. Remove screw of rmission (right), Install Safety Guard on missin (right)
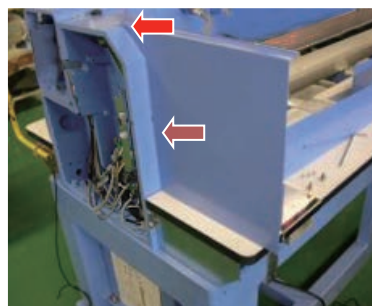
5. Remove screw of body, Fix Sencor (C) on body and fix to Sefety Guard(B) by screws(F)
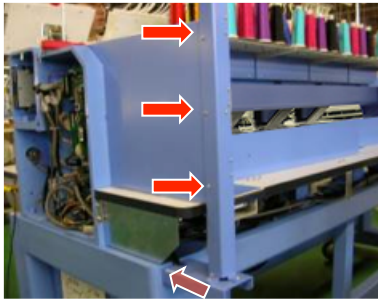
6.Pass harness into mission box
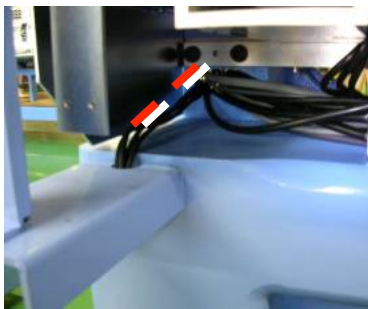
7. Connect harnessinto CN14 on Drive circuit board

RS4   ->   CN14-RS4

RS3   ->   CN14-RS3

RS2   ->   CN14-RS2

RS1   ->   CN14-RS1
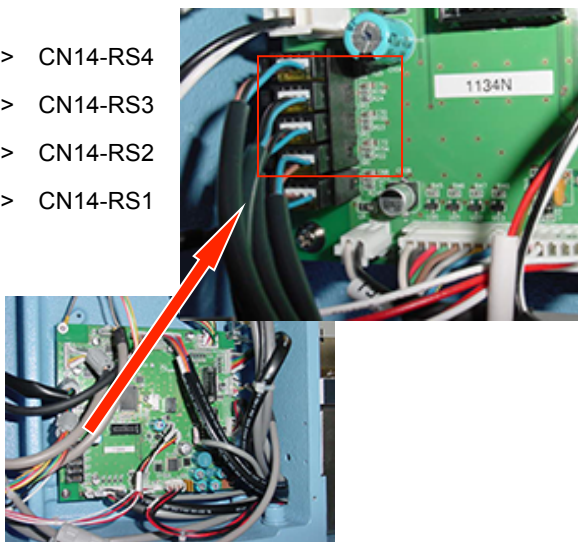
8. Remove screw of rmission (left), Set Safety Guard (D) on mission (left)
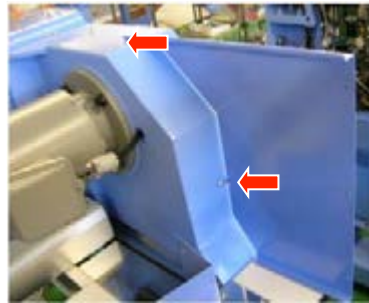
9. Remove screw of body, Fix Sencor (E) on body and fix to Sefety Guard(D) by screws(F)
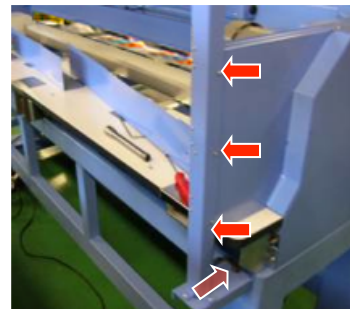
10. Connect harness to extension harness(LS*) at   side of Y carriage

<note> put cable in order for avoiding to touch to shaft

LS1   <-   LS1

LS2   <-   LS2

LS3   <-   LS3

LS4   <-   LS4
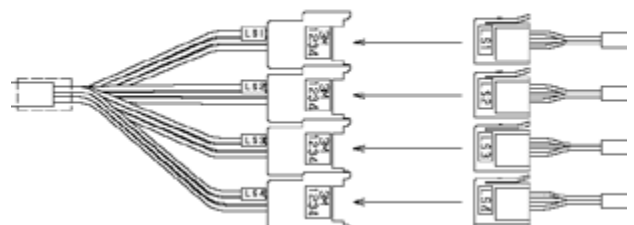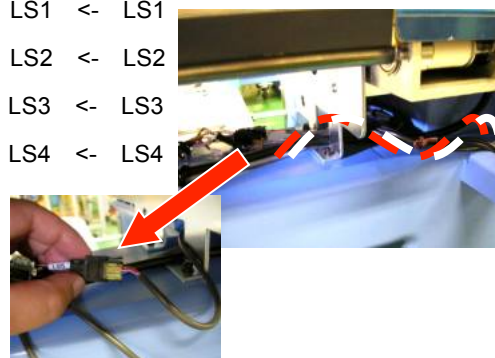
11.Set cover

<note> harness should not get caught in the cover

12. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode].

<note> This setting is done already, if sensor is ordered with machine. You can skip this step

13. Press Machine Setting .

1 Machine Type	M50	< >	0·0
2 Max Needle Number	15	5	
3 Max Head Number	1	5	1/5
4 Machine Max Speed	1300	5	▲
5 Machine Eria X	500	5	▼
6 Machine Eria Y	400	5	ESC

14. Change [10   Safety Sensor   No] to

[10   Safety Sensor   Yes].

15. Prss ESC button.

Machine Test	Record
Machine Setting	Maintenance Register
Memory All Clear	Other
Main Program Update	License Registration
Machine Program Update	[MAINTENANCE MODE]
Frame Position Entry	⤴

16. Press ⤴ , return to running menu.

After these setting, Sencor becomes effective

17.In case error occurs during operation:

Please adjust position of sensor where both LED (green and Orange) light stable by screws below.

BACK
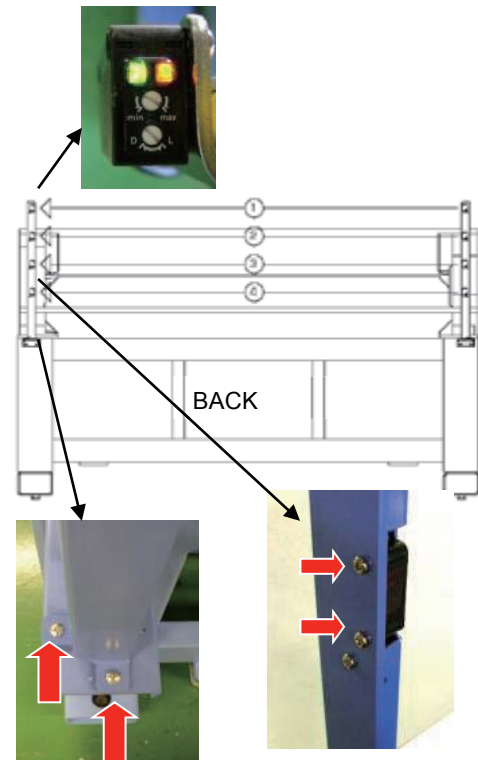
<note> Please do not press sensor, when you need to move machine. The position of sensor may be changed.

E6-5 Installation of bobbin thread winder

<note> Bobbin thread winder is factory option and installed at factory. In case you need to install later at your side, trained engineer has to install

ESHCRU36010 Bobbin thread winder set.
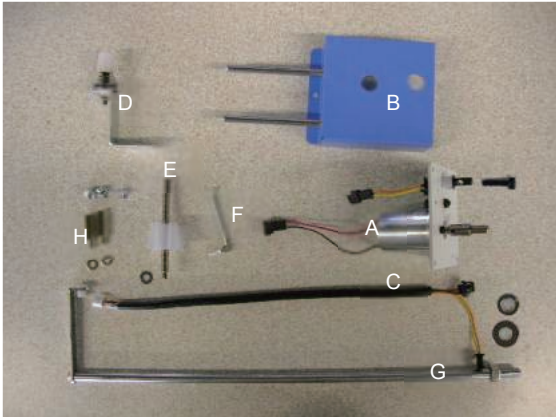
1.Take mission cover (right) out.
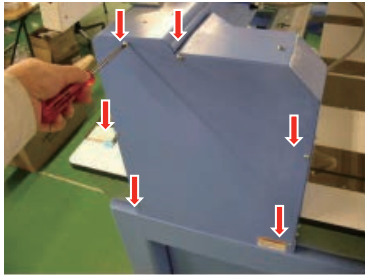
2.Set stud (H) with M4 washer.

  <Spanner> 7mm

3.Connect harness (C) to harness of motor (A) with limit

  switch, and put harness into mission.
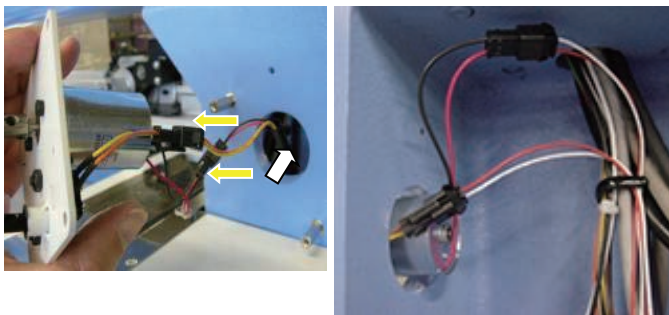
4.Fix winder(A). (Screw M4x8)
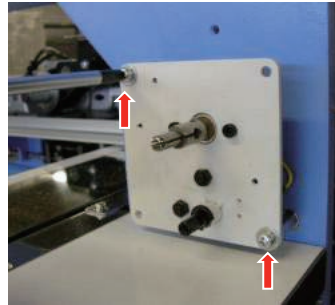
5.Connect harness (C) into CN24 on CONT-R2 board.

6.Set Thread tension device (D) on Body. (Screw M4x8)

7.Set thread stand (E) with M4 washer.
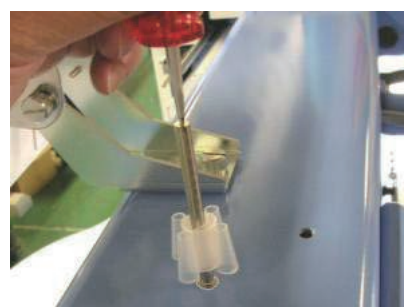
8. Set thread guide (G) with M8 washer and spring washer.

  Adjust a position of eyelet on bobbin thread guide to

  a position above of thread standpin (E), and fix nut.

Eyelet

Thread stand pin (E)
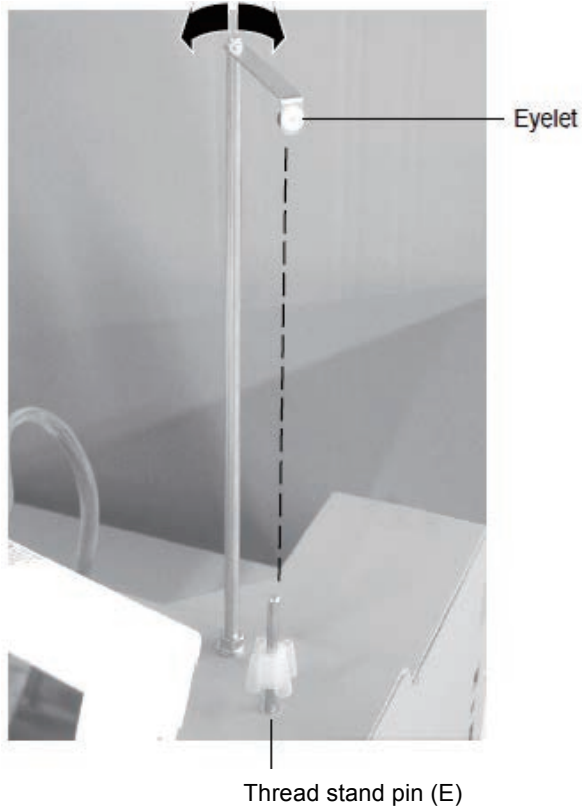
9.Set stop switch (F).

10.Set cover and power on.

11. Put thread and start to wind bobbin thread.

  Adjust position bobbin stand and thread tension (E) for

  winding thread equally.

OK   NG

Increase   Decrease

Thread tension (E)
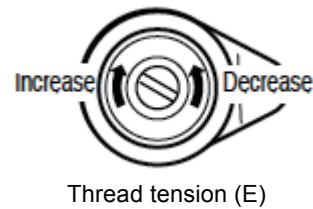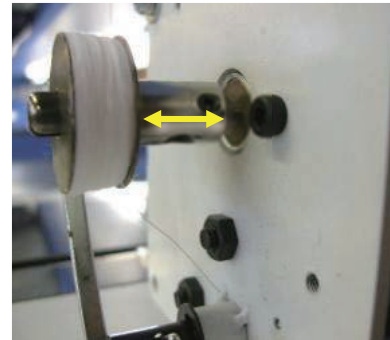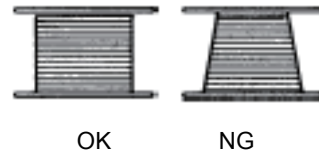
12. Take stop switch (F) out and put cover (B).

13. Set stop switch (F) and adjust position where stop switch

  (F) will open , when bobbin wilnd thread full.
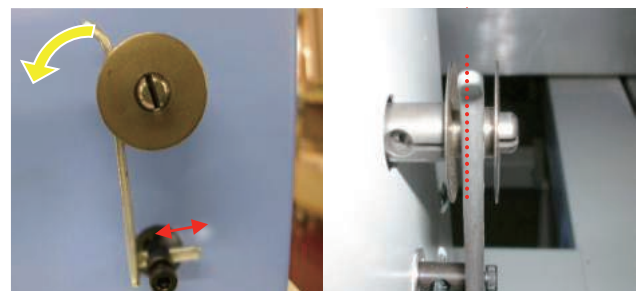
E6-6 Installation of Upper Thread Holder

<note> Upper Thread Holder is factory option and installed at factory. In case you need to install later at your side, trained engineer has to install

ESHCRU15010 Upper Thread Holder set
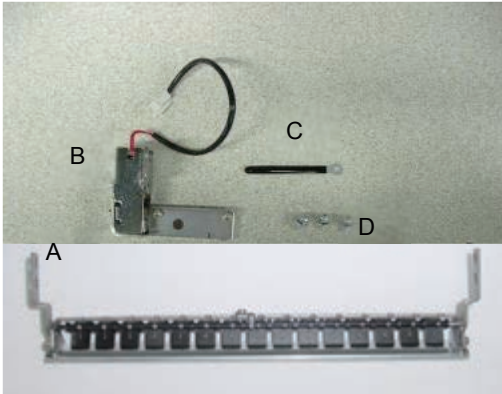
1.Set thread holder(A) under moving head
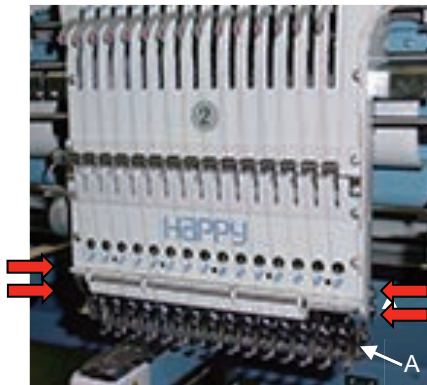
2.Check smooth movement of thread catcher at 1st and 15th needle

3.Set Clip drive unit (B) with bandage (C) by screw (D) at right side of moving head.
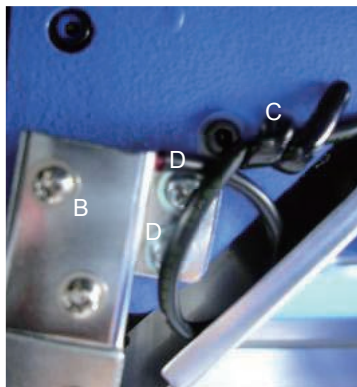
(bandage is common used for laser pointer and thread holder)

4.Connect harness to connector (2P) at left side of moving head, and bind cable with bandage.

<note> Cable should not touch to any moving part
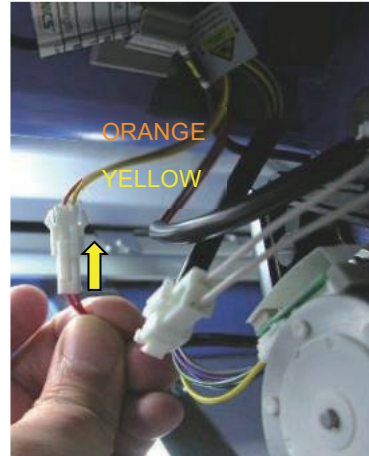
5.Adjust space around 1~2mm between clip dirve unit (B) and thread holder
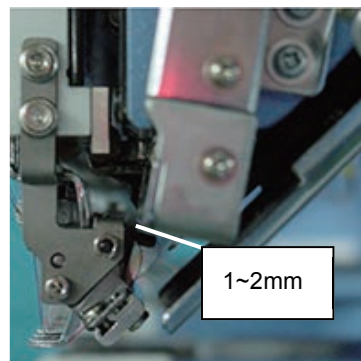
6. Enter maintenance mode in reference to [E5-1 How to enter maintenance mode].

<note> This setting is done already, if Upper Thread Holder is ordered with machine. You can skip this step

7. Press Machine Setting.

8. Change [12   Clip Holder Device   No] to

   [12   Clip Holder Device   Yes].

9. Prss ESC button.
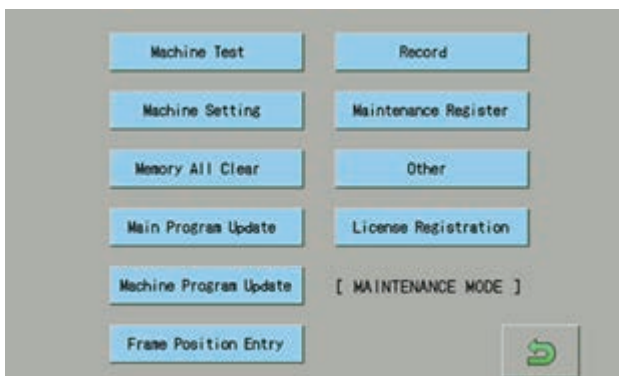
10. Press , return to running menu.

   After these setting, Upper Thread Holder becomes

    effective.

E6-7 Installation of Fulcrum shaft for Cap drive frame

Needle plate   Rotary cylinder   Rail bracket   Head number sticker

Fulcrum shaft   Guide shaft   Set screw for base   Cap drive frame ass'y

Needle plate

Fig. 1

Rotary cylinder   Needle plate

Rotary cylinder   Fixing screw   Fulcrum shaft

Gap 0.5~1.0mm

Needle plate

Fig. 2
Fig. 3

Fulcrum shaft   Guide shaft   Set screw for guide shaft
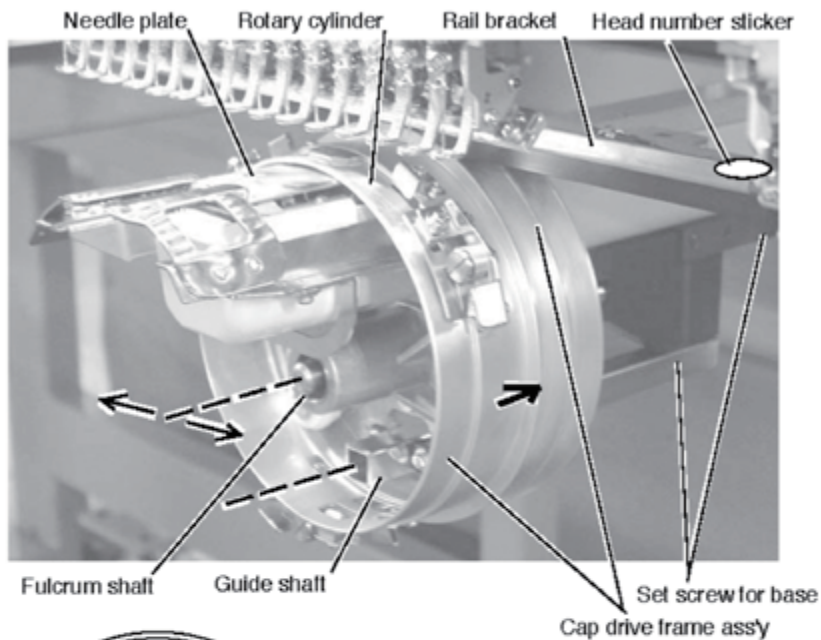
Fulcrum shaft is adjusted together with cap drive frame as a set when the machine leaves the factory.

✳ When you hold cap drive frame assembly, be sure to hold part of rotary cylinder. If you hold rail bracket, fingers will be pout between rail bracket and notary cylinder or rail bracket will get out of place.
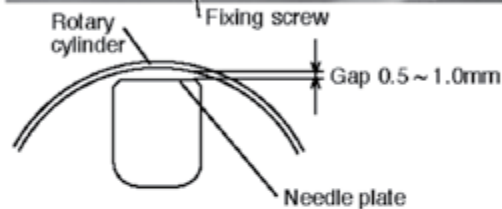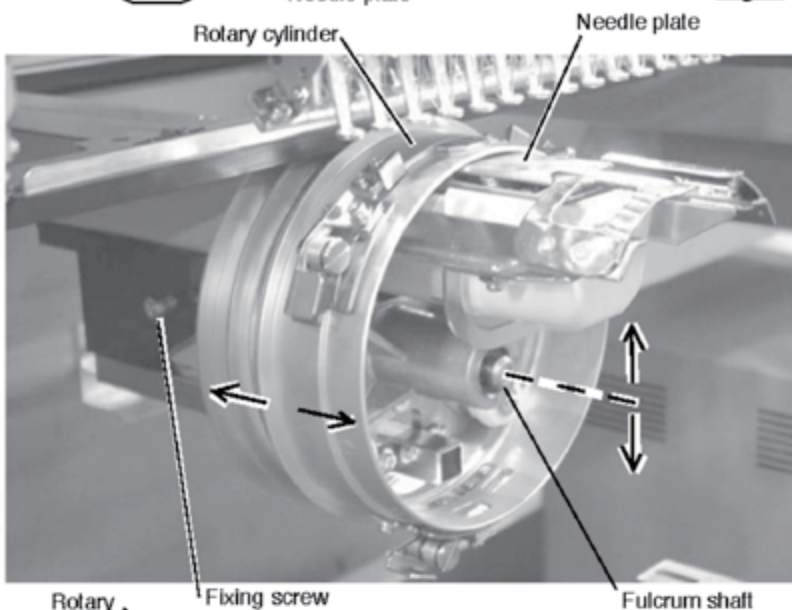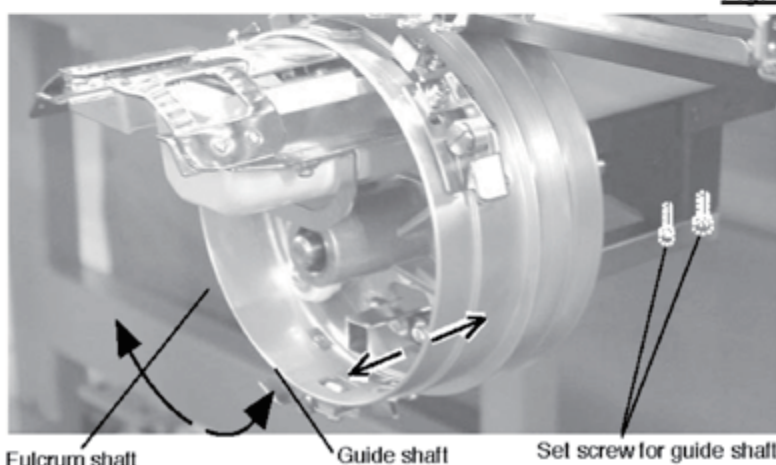
1. As shown in Fig. 1, insert cap drive frame assembly with head number sticker labeled for respective head in fulcrum shaft and guile shaft.
2. As shown in Fig. 1, place cap drive frame assembly with set screw for base so that upper inside of rotary cylinder hits needle plate without producing gap.
3. As shown in Fig. 2, move fulcrum shaft up and down with hand and adjust so that gap between upper inside of rotary cylinder and needle plate comes to gap shown in Fig. and fix with fixing screw.
✳ Move rotary cylinder back and forth to confirm that gap in front and back of needle plate is same.

4. As shown in Fig. 3, move rotary cylinder back and forth with hand within limit of length of fulcrum shaft to confirm smooth movement. If it doesn't have smooth move, loosen set screw for guide shaft on guide shaft slightly to adjust, then fix after adjustment.

E7 Electric system diagram

E7-1 Pulse motor driver (PMD) wiring   (Before Rev. A)
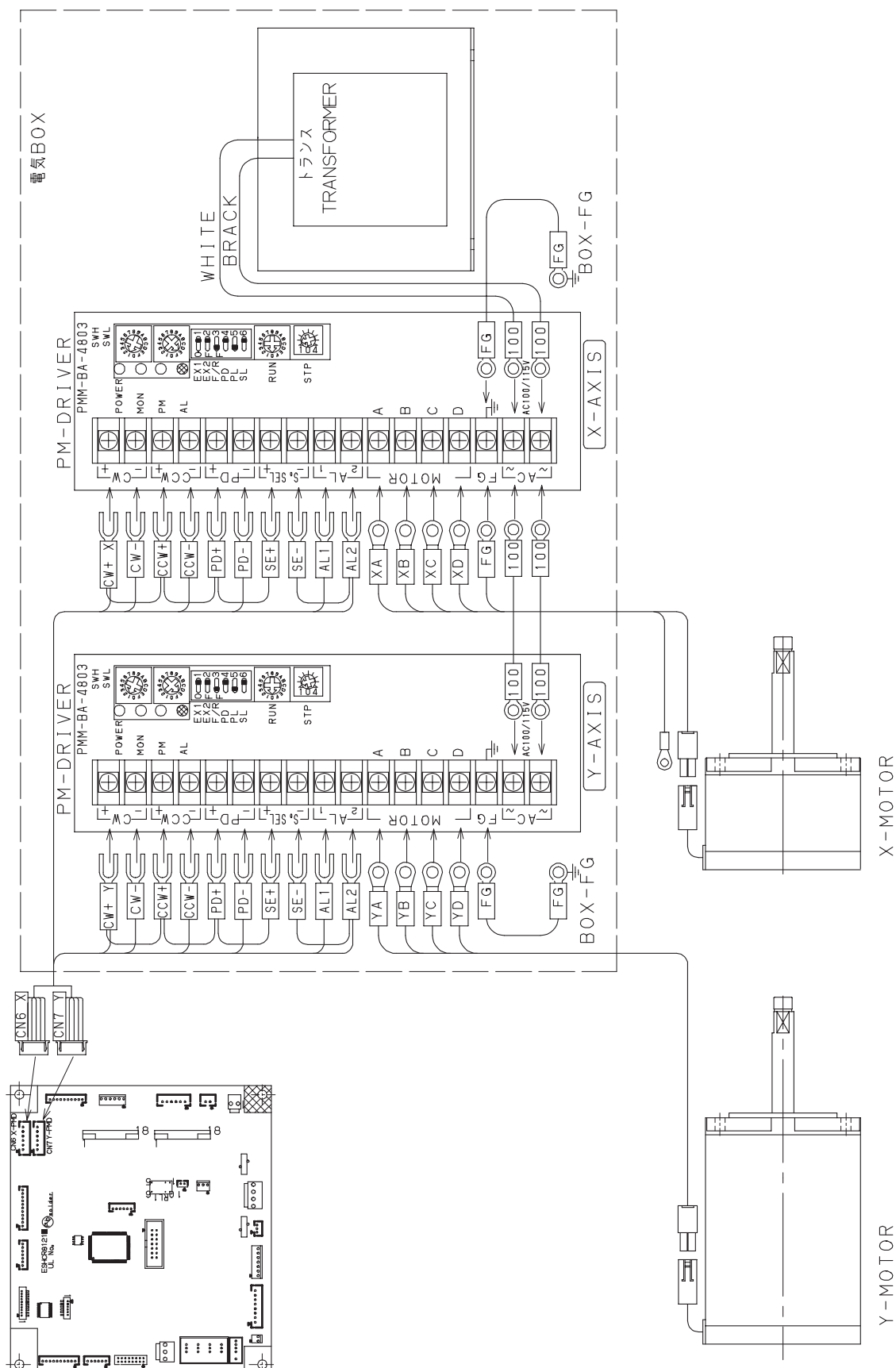
E7-1 Pulse motor driver (PMD) wiring   (Rev. A)
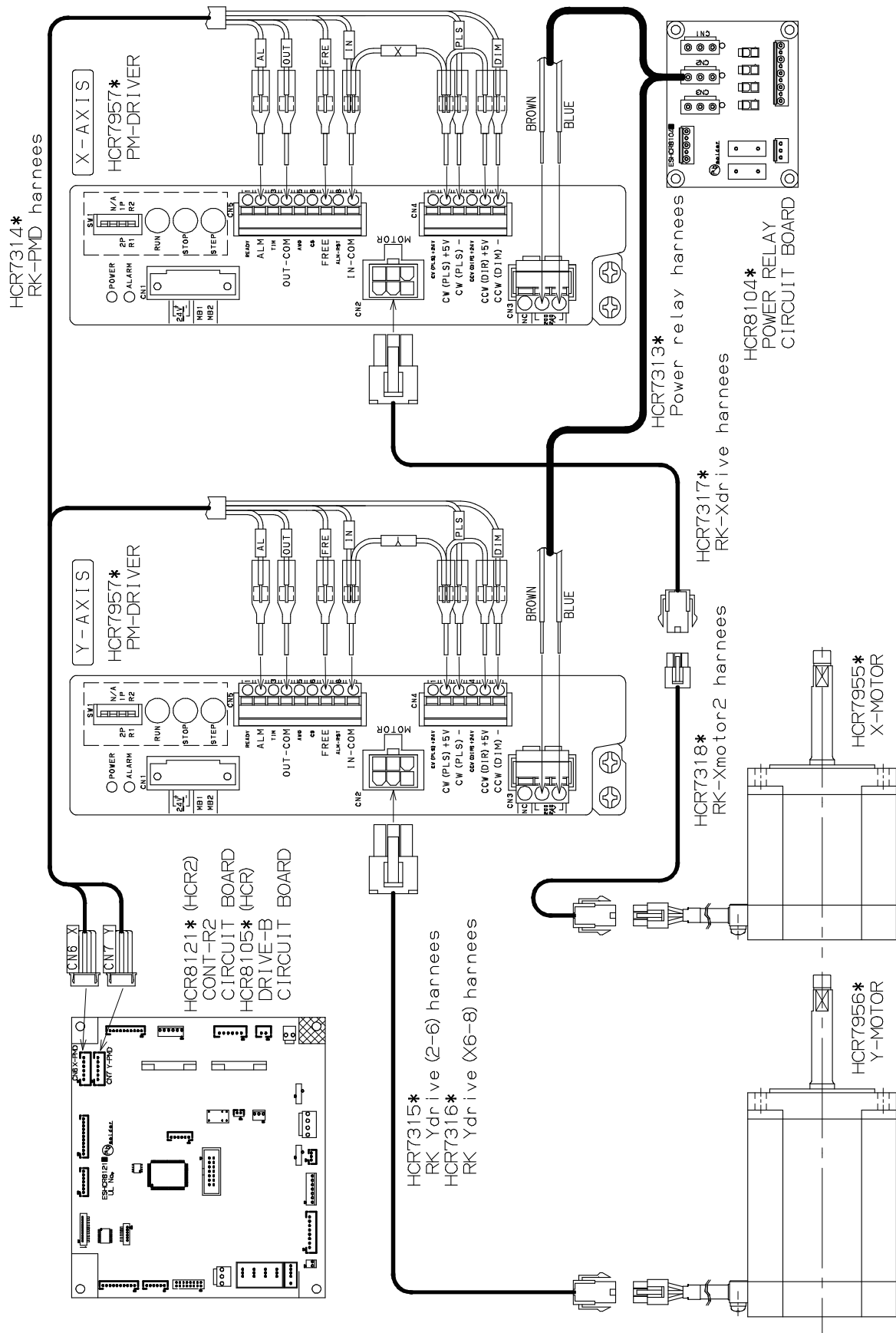
E7-1 Pulse motor driver (PMD) setup   (Rev. A)

ORK－ステッピングモータードライバー設定値
RK-stepping motor driver setup

・機能設定スイッチ
Function setup switch
No.4→Left side
No.3→Left side
No.2→Right side 1P (1Pulse-Input)
No.1→Right side R2 (Step select R2)

・運転電流設定スイッチ
Driving current setup switch
RUN→A (100%)

・停止電流設定スイッチ
Stop current setup switch
STOP→2 (20%)

・ステップ角設定スイッチ
Step angle setup switch
STEP→5 (0.225°)

SW1

4	3	2	1	NO
	N/A	1P	R2
2P	R1		

RUN

STOP

STEP

HCR7957*
HCR-RK-PMD

POWER
ALARM

24V
MB1
MB2
CN1

SW1
N/A
1P
R2
2P
R1

RUN
STOP
STEP

CN5
READY
ALM
TIM
OUT-COM
C6
FREE
ALM-RST
IN-COM

CN2
MOTOR

CN4
CW (PLS) +5V
CW (PLS) −
CCW (DIR) +5V
CCW (DIR) −

CN3
NC

電気BOX
Electric BOX

X-AXIS
Y-AXIS

E7-2 Inverter wiring

E7-4 Electrical connection diagram (Before Rev. A)

7inch Controll box
(HDM-07000 type)

B01 LCD+TP Unit

CORE module

B03 Memory

A01-1

X5-1

X5

B04 Emergency sw set

LCD-CE circuit board

A02

Battery

B02 X5-2

X90 X16

C16

A03 CN1

TP-SW circuit board

C17

LCD (1)

7inch Controll box
(HDM-07000W type)

B01 LCD+TP Unit

CORE module

B03 Memory

A01-2

X5-1

X5

B04 Emergency sw set

LCD-CE circuit board

A02

Battery

B02 X5-2

X90 X16

C16

B42 Antenna

B41

SMB cable

A03 CN1

TP-SW circuit board

C17

LCD (1)

10.4inch Controll box
(HDM-10400 type)

B61 LCD+TP Unit

CORE module MX

B03 Memory

A21-1

ESHCD8122 UL.No.

B62 10.4 Emergency sw set

A22

LCD-CE-MX circuit board

B02 Battery

X5-4

X90 X16 X5-2

10.4 inch

C16

A03 CN1

TP-SW circuit board

C17

LCD (1)

10.4inch Controll box
(HDM-10400W type)

B61 LCD+TP Unit

CORE module MX
WLAN

B03 Memory

A21-2

ESHCD8122 UL.No.

B62 10.4 Emergency sw set

A22

LCD-CE-MX circuit board

B02 Battery

X5-4

X90 X16 X5-2

10.4 inch

B42 Antenna

B41

SMB cable

C16

A03 CN1

TP-SW circuit board

C17

LCD (1)

X CARRIAGE

CN1
A08
C36

X-axis motor
B11

Thread
cut
stop sensor
B05

CN1
A08
C51

CN1
A08
C37

CN10
CN1
***
CN11
***
A07
CN12
***
C38

CN1
CN10
68
C52
CN11
48
A07
CN12
28
C53

CN1
A08

A08

Position senser
circuit board

Senser relay
circuit board

Senser relay
circuit board

Position senser
circuit board

XM (5)

LCD (1)
C18

C19

C14

C26   C47

C12   SP (5)

Timing circuit
board
C28
C27
A06
CN1 CN2 CN3

CONT-R2 circuit
Board
A05

C13   IS (5)

Needle stop
sensor
B05
C29

C30
B07

Potentiometer
B06

Color change motor

DT (3)

C31
B08

DTP (3)
RS4 (4)
RS3 (4)
RS2 (4)
RS1 (4)
RS5 (4)

Thread cut motor

C34   KEP (4)

Under thread
stop switch
B43

LS5 (4)
LS (3)

C09   OFF (5)

Under
thread motor
B44

C48

C10

PS (5)

MISSION BOX

B26

LAN Cross Cable

B25

USB Cable

(HAED)

通常頭又はスタート/ストップがある頭
Usually head or start/stop sw haed

非常停止がある頭
Head with emegency stop sw

最終頭
Final head

TC7-8
CN2   circuit board
C45   A09

TC7-8
CN2   circuit board
C45   A09

TC7-8
CN2   circuit board
C45   A09

A10
CN4 CN1   CN3 CN5

Head SW
circuit board
A11

A10
CN4 CN1   CN3 CN5

A10
CN4 CN1   CN3 CN5

CN1
C44

CN1
C44

CN1
C44

CN1

Jump sw
circuit board

Emergency stop sw
2HEAD TYPE→1HEAD
X4, 4HEAD TYPE→3HEAD
6HEAD TYPE→4HEAD
X6HEAD TYPE→3, 5HEAD
8HEAD TYPE→3, 6HEAD

Jump sw
circuit board

Jump sw
circuit board

Start/Stop SW
2HEAD TYPE→2HEAD
X4, 4HEAD TYPE→2, 4HEAD
6HEAD TYPE→2, 5HEAD
X6HEAD TYPE→2, 4, 6HEAD
8HEAD TYPE→2, 5, 8HEAD

C20
A13 Front Lighting
Board

C20
A13 Front Lighting
Board

B10

C20
A13 Front Lighting
Board

C21

C22

C21

C49

C49

DT (1)
C32
DTP (1)
C33
+24V

C41
C40
+24V

C41
C40
+24V

C41
C40

CN8 CN10 CN11
CN9   CN6
CN1
CN2   CN7
CN3

CN8 CN10 CN11
CN9   CN6
CN1
CN2   CN7
CN3

CN8 CN10 CN11
CN9   CN6
CN1
CN2   CN7
CN3
CN4

A12
Detection
circuit board
C25
C23

A12
Detection
circuit board
C25

A12
Detection
circuit board
C25
C24

Thread
catch motor
B09

Jump
B24 solenoid

Thread
catch motor
B09

Jump
B24 solenoid

Thread
catch motor
B09

Jump
B24 solenoid

Thread
catch sensor
B05

Clip
B50 solenoid

Thread
catch sensor
B05

Clip
B50 solenoid

Thread
catch sensor
B05

Clip
B50 solenoid

pointer
B51

pointer
B51

pointer
B51

機種の頭数により異なる。
It differs depending on the model and the head

(BED)

It differs depending on the model and the head

CONTROL BOX side

MAIN motor side

(AC LINE)

POWER SUPPLY BOX

E7-5 List of electrical connection diagrams (Before Rev. A)

Parts Names	Parts No.	Remark
A01-1 Core module	EPZ0118*	
A02 LCD-CE-U circuit board	HCD8121*	
A03 TP-SW circuit board	HCD8116*	
A05 CONT-R2 circuit board	HCR8121*	
A06 Timing circuit board	HCD8109*	
A07 Senser Relay circuit board	HCD8111*	
A08 Position sensor circuit board	HCD8110*	
A09 TC7-8 circuit board	HCR8115*	
A10 Jump sw circuit board	HCR8108*	
A11 Head SW circuit board	HCR8109*	
A12 Detection circuit board	HCR8107*	
A13 Front lighting circuit board	HCB8116*	
A14 Keeper relay circuit board	HCR8112*	
A15 Power relay circuit board	HCR8104*	

Parts Names	Parts No.	Remark
B01 LCD+TP unit	HCD7954*	
B02 Battery CR2032	EPZ0119*	
B03 Memory card	EPZ0122*	
B04 Emergency stop sw (DISP)	HCD7945*	
B05 Photo sensor	EPP0052*	
B06 Potentiometer	HCB7960*	
B07 Color change motor	HCB7921*	
B08 Thread cut motor	HCD7913*	
B09 Thread catch motor	EPM0059*	
B10 Emergency stop sw (HEAD)	HCR7953*	
B11 X-axis motor	HCR7911*	2、4、X4、6H type machine
X-axis motor	HCR7912*	X6、8H type machine
B12 Y-axis motor	HCR7913*	
B13 Keep solenoid	HCD7905*	
B14 DC fan unit	HCR7951*	
B15 Power switch whis remotoOff	EPS0089*	
B16 Noise filter	EPK0118*	
B17 Circuit Protector	EPF0030*	
B18 Transformer	HCR7921*	
B19 Terminal block	EPF0049*	

Parts Names	Parts No.	Remark
B20 PM Driver	HCR7910*	
B21 DC24V power supply	EPK0112*	
B22 Inverter unit	HCR7918*	
B23 Main motor	EPM0062*	
B24 Jump solenoid	HCB7901*	
B25 USB cable	EPZ0075*	
B26 LAN cross cable	EPZ0126*	

* :改訂番号 Mark is a revision number

Parts Names	Parts No.	Remark
C01 HCR POWER CORD	HCR7001*	
C02 C. protector harnees	HCR7005*	
C03 Surge absorber harnees	HCR7003*	
C04 Power switch harnees	HCR7006*	
C05 Inverter power harnees	HCR7009*	
C06 Power supply harnees	HCR7007*	
C07 Transformer tap harnees	HCR7004*	
C08 PMD Power harnees	HCR7010*	
C09 PD-FAN harnees2	HCR7212*	
C10 DC power harnees2	HCR7215*	
C11 Main motor (2-4) harness	HCR7090*	2、4H type machine
Main motor (X4-6) harness	HCR7091*	X4、6H type machine
Main motor (X6-8) harness	HCR7092*	X6、8H type machine
C12 PMS harnees	HCR7020*	
C13 Inverter harnees2	HCR7222*	
C14 OP-DC harnees	HCR7114*	
C15 Motor (2-6TYPE) harnees	HCR7081*	2、4、X4、6H type machine
Motor (X6-8TYPE) harnees	HCR7082*	X6、8H type machine
C16 SW cable2	HCD7252*	

Parts Names	Parts No.	Remark
C17 BOX cable2	HCD7273*	
C18 CONT cable2	HCD7272*	
C19 RS232C cable2	HCD7271*	
C20 Front led cable2	HCD7225*	
C21 TC-S harnees2	HCR7311*	
C22 TC-E harnees2	HCR7312*	
C23 EMG short harnees	HCR7227*	
C24 EMG end harnees2	HCR7228*	
C25 Jump & Thread catch harnees	HCR7029*	
C26 X motor harnees2	HCR7230*	
C27 Encoder harnees2	HCR7239*	
C28 Timing harnees2	HCR7240*	
C29 Potentiometer relay harnees2	HCR7241*	
C30 Color change motor harnees2	HCR7242*	
C31 Thread cut motor harnees2	HCR7243*	
C32 Detection SG harnees2	HCR7307*	
C33 Detection P relay harnees2	HCR7306*	
C34 Keep relay harnees2	HCR7248*	
C36 Limit relay (1000) harnees2	HCR7254*	2、4H type machine
Limit relay (1200) harnees2	HCR7255*	6、X4、X6、8H type machine

Parts Names	Parts No.	Remark
C37 Limit relay (1200) harnees2	HCR7255*	2、4H type machine
Limit relay (1400) harnees2	HCR7256*	6、X4、X6、8H type machine
C38 Limit relay (1400) harnees2	HCR7256*	2H type machine
Limit relay (1600) harnees2	HCR7257*	X4、X6H type machine
C39 Keep (360type) harness2	HCR7265*	4、6、8H type machine
Keep (500type) harness2	HCR7266*	2、X4、X6H type machine
C40 DetecP (360 type) harnees	HCR7071*	4、6、8H type machine
DetecP (500 type) harnees	HCR7072*	2、X4、X6H type machine
C41 Detec SG (360) harnees2	HCR7309*	
Detec SG (500) harnees2	HCR7310*	
C42 Keep 55 harnees2	HCR7277*	
C43 Keep 90 harnees2	HCR7278*	4、6、8H type machine
Keep 105 harnees2	HCR7279*	2、X4、X6H type machine
C44 TC switch harnees	HCR7023*	
C45 TC connecting harnees	HCB7215*	
C46 X Drive harnees2	HCR7232*	
C47 L Senser harnees2	HCR7233*	
C48 UDC motor harnees2	HCD7269*	
C49 LED relay harnees2	HCR7308*	

* :改訂番号 Mark is a revision number

Parts Names	Parts No.	Remark
C51 Limit relay (680) harnees2	HCD7243*	
C52 Limit relay (480) harnees2	HCD7242*	
C53 Limit relay (280) harnees2	HCD7241*	
C54 Ground harnees	HCR7211*	

(OPTION)		
A01-2 Core module WLAN	EPZ0117*	
B41 SMA cable	EPZ0121*	
B42 Antenna	EPZ0120*	
A21-1 Core module MX	EPZ0139*	
A21-2 Core module MX WLAN	EPZ0140*	
A22 LCD-CE-MX circuit board	HCD8121*	
B61 10.4LCD+TP unit	EPZ0141*	
B62 10.4Emergency stop sw (DISP)	HCD7955*	

	Parts No.	Remark
B43 Under thread stop switch	HCD7922*	
B44 Under Thread DC-motor unit	HCD7921*	
B45 HCR2 Back sefty S1 senser	HCR7945*	
B46 HCR2 Back sefty S2 senser	HCR7946*	
B47 HCR2 Back sefty S3 senser	HCR7947*	
B48 HCR2 Back sefty S4 senser	HCR7948*	
B49 HCR2 Needle sefty S5 senser	HCR7949*	
B50 Clip solenoid	HCR7903*	
B51 pointer	HCR7941*	
C71 Senser relay (2-4) harnees	HCR7295*	2、4H type machine
Senser relay (X4-6) harnees	HCR7296*	X4、6H type machine
Senser relay (X6-8) harnees	HCR7297*	X6、8H type machine
C72 Needle relay (2-4) harnees2	HCR7301*	2、4H type machine
Needle relay (X4-6) harnees2	HCR7302*	X4、6H type machine
Needle relay (X6-8) harnees2	HCR7303*	X6、8H type machine

* :改訂番号 Mark is a revision number

E7-6 Electrical connection diagram (Rev. A)

Controll box
(HDM-07000
   Code:**B type)

CORE module MX
A21-1
ESHCD8122 UL No.
B03 Memory
B01 LCD+TP Unit
X5-1
B04 Emergency sw set
X5
A22 LCD-CE-MX circuit board
B02 Battery
X5-4 X90 X16 X5-2
C16
A03 CN1
TP-SW circuit board
C17
LCD (4)

Controll box
(HDM-07000W
   Code:**B type)

CORE module MX
A21-1
ESHCD8122 UL No.
B03 Memory
B01 LCD+TP Unit
X5-1
B04 Emergency sw set
X5
A22 LCD-CE-MX circuit board
B02 Battery
X5-4 X90 X16 X5
C16
A03 CN1
TP-SW circuit board
C17
LCD (4)
B42 Antenna
B41
SMB cable

10.4inch Controll box
(HDM-10400 type)

CORE module MX
B03 Memory
B61 LCD+TP Unit
A21-1
ESHCD8122 UL No.
B62 10.4 Emergency sw set
A22 LCD-CE-MX circuit board
B02 Battery
X5-4 X90 X16 X5-
10.4 inch
C16
A03 CN1
TP-SW circuit board
C17
LCD (4)

10.4inch Controll box
(HDM-10400W type)

CORE module MX
WLAN
B03 Memory
B61 LCD+TP Unit
A21-2
ESHCD8122 UL No.
B62 10.4 Emergency sw set
A22 LCD-CE-MX circuit board
B02 Battery
X5-4 X90 X16 X5-2
10.4 inch
C16
A03 CN1
TP-SW circuit board
C17
LCD (4)
B42 Antenna
B41
SMB cable

X CARRIAGE

CN1
A08
C36
X-axis motor
B29

CN1
A08
C37
*** CN10 CN1
*** CN11
A07

CN1
A08
C38
*** CN12
Senser relay circuit board

Position senser circuit board

XM (7)

Thread cut stop sensor
B05
C51
CN1
A08

CN1 CN10 68 C52 CN1
A07 CN11 48 A08
CN1 CN12 28 C53 CN1
A08

Senser relay circuit board

Position senser circuit board

LCD (1) (2) (3) C18

C19
C14

C57 C47

C28
Timing circuit board
C27
A06 CN1 CN2 CN3

C29
Needle stop sensor B05
Potentiometer B06

DT (5)
DTP (5)
RS4 (6)
RS3 (6)
RS2 (6)
RS1 (6)
RS5 (6)

Under thread stop switch B43
Under thread motor B44

LS5 (6)
LS (6)
C48

CONT-R2 circuit Board
A05

C55 SP (7)
C13 IS (7)
C30 B07 Color change motor
C31 B08 Thread cut motor
C34 KEP (6)
C09 OFF (7)
C10
PS (7)

MISSION BOX

B26
LAN Cross Cable

B25
USB Cable

通信頭又はスタート/ストップがある頭
Usually head or start/stop sw haed

TC7-8 circuit board
CN2
C45 A09

A10
CN4 CN1 CN3 CN5

CN1
Jump sw circuit board
C44

Head SW circuit board
A11
C44 CN1

Start/Stop SW
2HEAD TYPE→2HEAD
X4、4HEAD TYPE→2、4HEAD
6HEAD TYPE→2、5HEAD
X6HEAD TYPE→2、4、6HEAD
8HEAD TYPE→2、5、8HEAD

A13 Front Lighting Board
C20
C21
C49

DT (4) C32 +24V
DTP (4) C33

CN8 CN10 CN11
CN4 CN9 CN6
CN1 CN2 CN3 CN7
C25 C23

A12 Detection circuit board

Thread catch motor B09
Thread catch sensor B05
Jump solenoid B24
Clip solenoid B50
pointer B51

非常停止がある頭
Head with emegency stop sw

TC7-8 circuit board
CN2
C45 A09

A10
CN4 CN1 CN3 CN5

CN1
Jump sw circuit board
C44

Emergency stop sw
2HEAD TYPE→1HEAD
X4、4HEAD TYPE→3HEAD
6HEAD TYPE→4HEAD
X6HEAD TYPE→3、5HEAD
8HEAD TYPE→3、6HEAD

A13 Front Lighting Board
C20 B10
C22
C49

C41
C40 +24V

CN8 CN10 CN11
CN4 CN9 CN6
CN1 CN2 CN3 CN7
C25

A12 Detection circuit board

Thread catch motor B09
Thread catch sensor B05
Jump solenoid B24
Clip solenoid B50
pointer B51

最終頭
Final head

TC7-8 circuit board
CN2
C45 A09

A10
CN4 CN1 CN3 CN5

CN1
Jump sw circuit board
C44

A13 Front Lighting Board
C20
C21

C41
C40

CN8 CN10 CN11
CN4 CN9 CN6
CN1 CN2 CN3 CN7
C25 C24

A12 Detection circuit board

Thread catch motor B09
Thread catch sensor B05
Jump solenoid B24
Clip solenoid B50
pointer B51

機種の頭数により異なる。
It differs depending on the model and the head

1H 2H 3H 4H 5H 6H

Keep solenoid (B13) C42
Keep solenoid (B13) C43
Keep solenoid (B13) C42
Keep solenoid (B13) C43
Keep solenoid (B13) C42
Keep solenoid (B13) C43

(A14) CN3 CN1 / CN4 CN2 Keeper relay circuit board
(A14) CN3 CN1 / CN4 CN2 Keeper relay circuit board
(A14) CN3 CN1 / CN4 CN2 Keeper relay circuit board

KEP (4)

C39 C39

機種の頭数により異なる。
It differs depending on the model and the head

CONTROL BOX side   MAIN motor side

RS1 (B45) Back sefty S1 senser LS1
RS2 (B46) Back sefty S2 senser LS2
RS3 (B47) Back sefty S3 senser LS3
RS4 (B48) Back sefty S4 senser LS4

RS1 (4)
RS2 (4)
RS3 (4)
RS4 (4)

LS (4)   C71

RS5 (B49) Needle sefty S5 senser LS5

RS5 (4)
LS5 (4)   C72

Table cover
C54
FG

Power switch whih remoto OFF 250V 10A
(B15)
2 1 BROWN
4 3 BLUE
C04

OFF (4)

Inverter signal
IS (4)

POWER SUPPLY BOX

NOISE FILTER 250V 10A
(B16)
BLUE
BROWN

(B14) DC-FAN

(B22) INVERTER UNIT AC200~240V 750W
OT/L3
OS/L2
OR/L1
BLUE
BROWN
YELLOW/GREEN
W/T3
V/T2
U/T1
YELLOW/GREEN
BLACK
WHITE
RED

MAIN MOTOR Ø3 400W
YELLOW/GREEN PE
BLACK W
WHITE V
RED U
(B23)
C11

(B21) DC POWER SUPPLY IN AC200~240V OUT DC24V-240W
CN2
+24V +5V   PS (4)
CN3

YELLOW/GREEN
FG
BLUE
BROWN
(B17)
NF2
NF1
C01
C02
AC200 (1Ø)
AC220 (1Ø)
AC230 (1Ø)
AC240 (1Ø)
CIRCUIT PROTECTOR 250V 8A

CN10
3 FG
2 N
1 L
SURGE ABSORBER

CN1
3 FG
2 N
1 L

CN2
3 PE YELLOW/GREEN
2 N BLUE
1 L BROWN

CN4
5 PE YELLOW/GREEN
3 N BLUE
1 L BROWN

C59 C06

PM-DRIVER
(B27)
Y-AXIS
BROWN
BLUE

PMD signal
SP (4)
C56 (B28) Y-axis motor

(A15) POWER RELAY CIRCUIT BOARD

CN3
3 PE
2 N
1 L
Reserve

CN6
1 AC240V
3 AC230V
5 AC220V
9 AC200V
C07

PM-DRIVER
(B27)
X-AXIS
BROWN
BLUE

X-Motor
XM (4)
C58

E7-7 List of electrical connection diagrams (Rev. A)

Parts Names	Parts No.	Remark		Parts Names	Parts No.			Parts Names	Parts No.		
(A01-1) Core module	EPZ0118*		(B01)	LCD+TP unit	HCD7954*		(B21)	DC24V power supply	EPK0112*		
(A02) LCD-CE-U circuit board	HCD8121*		(B02)	Battery CR2032	EPZ0119*		(B22)	Inverter unit	HCR7918*		
(A03) TP-SW circuit board	HCD8116*		(B03)	Memory card	EPZ0122*		(B23)	Main motor	EPM0062*		
			(B04)	Emergency stop sw (DISP)	HCD7945*		(B24)	Jump solenoid	HCB7901*		
(A05) CONT-R2 circuit board	HCR8121*		(B05)	Photo sensor	EPP0052*						
(A06) Timing circuit board	HCD8109*		(B06)	Potentiometer	HCB7960*		(B25)	USB cable	EPZ0075*		
(A07) Senser Relay circuit board	HCD8111*		(B07)	Color change motor	HCB7921*		(B26)	LAN cross cable	EPZ0126*		
(A08) Position sensor circuit board	HCD8110*		(B08)	Thread cut motor	HCD7913*						
(A09) TC7-8 circuit board	HCR8115*		(B09)	Thread catch motor	EPM0059*		(B27)	PM Driver	HCR7957*		
(A10) Jump sw circuit board	HCR8108*		(B10)	Emergency stop sw (HEAD)	HCR7953*		(B28)	Y-axis motor	HCR7956*		
(A11) Head SW circuit board	HCR8109*						(B29)	X-axis motor	HCR7955*		
(A12) Detection circuit board	HCR8107*										
(A13) Front lighting circuit board	HCB8116*		(B13)	Keep solenoid	HCD7905*						
(A14) Keeper relay circuit board	HCR8112*		(B14)	DC fan unit	HCR7951*						
(A15) Power relay circuit board	HCR8104*		(B15)	Power switch whis remotoOff	EPS0089*						
			(B16)	Noise filter	EPK0118*						
			(B17)	Circuit Protector	EPF0030*						

* :改訂番号 Mark is a revision number

Parts Names	Parts No.	Remark		Parts Names	Parts No.			Parts Names	Parts No.	
			C17	BOX cable2	HCD7273*		C37	Limit relay (1200) harnees2	HCR7255*	2、4H type machine
C01 HCR POWER CORD	HCR7001*		C18	CONT cable2	HCD7272*			Limit relay (1400) harnees2	HCR7256*	6、X4、X6、8H type machine
C02 C. protector harnees	HCR7005*		C19	RS232C cable2	HCD7271*		C38	Limit relay (1400) harnees2	HCR7256*	2H type machine
C03 Surge absorber harnees	HCR7003*		C20	Front led cable2	HCD7225*			Limit relay (1600) harnees2	HCR7257*	X4、X6H type machine
C04 Power switch harnees	HCR7006*		C21	TC-S harnees2	HCR7311*		C39	Keep (360type) harness2	HCR7265*	4、6、8H type machine
C05 Inverter power harnees	HCR7009*		C22	TC-E harnees2	HCR7312*			Keep (500type) harness2	HCR7266*	2、X4、X6H type machine
C06 Power supply harnees	HCR7007*		C23	EMG short harnees	HCR7227*		C40	DetecP (360 type) harness	HCR7071*	4、6、8H type machine
C07 Transformer tap harnees	HCR7004*		C24	EMG end harnees2	HCR7228*			DetecP (500 type) harness	HCR7072*	2、X4、X6H type machine
C08 PMD Power harnees	HCR7010*		C25	Jump & Thread catch harnees	HCR7029*		C41	Detec SG (360) harness2	HCR7309*	
C09 PD-FAN harnees2	HCR7212*							Detec SG (500) harness2	HCR7310*	
C10 DC power harnees2	HCR7215*		C27	Encoder harnees2	HCR7239*		C42	Keep 55 harnees2	HCR7277*	
C11 Main motor (2-4) harness	HCR7090*	2、4H type machine	C28	Timing harnees2	HCR7240*		C43	Keep 90 harnees2	HCR7278*	4、6、8H type machine
	Main motor (X4-6) harness	HCR7091*	X4、6H type machine	C29	Potentiometer relay harnees2	HCR7241*			Keep 105 harnees2	HCR7279*	2、X4、X6H type machine
	Main motor (X6-8) harness	HCR7092*	X6、8H type machine	C30	Color change motor harnees2	HCR7242*		C44	TC switch harnees	HCR7023*	
			C31	Thread cut motor harnees2	HCR7243*		C45	TC connecting harnees	HCB7215*	
C13 Inverter harnees2	HCR7222*		C32	Detection SG relay harnees2	HCR7307*					
C14 OP-DC harnees	HCR7114*		C33	Detection P relay harnees2	HCR7306*		C47	L Senser harnees2	HCR7233*	
			C34	Keep relay harnees2	HCR7248*		C48	UDC motor harnees2	HCD7269*	
			C36	Limit relay (1000) harnees2	HCR7254*	2、4H type machine	C49	LED relay harnees2	HCR7308*	
C16 SW cable2	HCD7252*			Limit relay (1200) harnees2	HCR7255*	6、X4、X6、8H type machine				

* :改訂番号 Mark is a revision number

Parts Names	Parts No.	Remark	(OPTION)				Parts Names	Parts No.	Remark
C51 Limit relay (680) harnees2	HCD7243*		A01-2 Core module WLAN	EPZ0117*			B43 Under thread stop switch	HCD7922*	
C52 Limit relay (480) harnees2	HCD7242*		B41 SMA cable	EPZ0121*			B44 Under Thread DC-motor unit	HCD7921*	
C53 Limit relay (280) harnees2	HCD7241*		B42 Antenna	EPZ0120*			B45 HCR2 Back sefty S1 senser	HCR7945*	
C54 Ground harnees	HCR7211*						B46 HCR2 Back sefty S2 senser	HCR7946*	
			A21-1 Core module MX	EPZ0139*			B47 HCR2 Back sefty S3 senser	HCR7947*	
C55 PMS harnees	HCR7314*		A21-2 Core module MX WLAN	EPZ0140*			B48 HCR2 Back sefty S4 senser	HCR7948*	
C56 Motor (2-6TYPE) harnees	HCR7315*	2、4、X4、6H type machine	A22 LCD-CE-MX circuit board	HCD8121*			B49 HCR2 Needle sefty S5 senser	HCR7949*	
Motor (X6-8TYPE) harnees	HCR7316*	X6、8H type machine	B61 10.4LCD+TP unit	EPZ0141*			B50 Clip solenoid	HCR7903*	
C57 RK-Xmotor2 harnees	HCR7318*		B62 10.4Emergency stop sw (DISP)	HCD7955*			B51 pointer	HCR7941*	
C58 RK-X Drive2 harnees	HCR7317*								
C59 Power supply harnees	HCR7313*						C71 Senser relay (2-4) harnees	HCR7295*	2、4H type machine
							Senser relay (X4-6) harnees	HCR7296*	X4、6H type machine
							Senser relay (X6-8) harnees	HCR7297*	X6、8H type machine
							C72 Needle relay (2-4) harnees2	HCR7301*	2、4H type machine
							Needle relay (X4-6) harnees2	HCR7302*	X4、6H type machine
							Needle relay (X6-8) harnees2	HCR7303*	X6、8H type machine

∗ :改訂番号 Mark is a revision number

E7-8 Explanation of function of circuit board

HCD8121*

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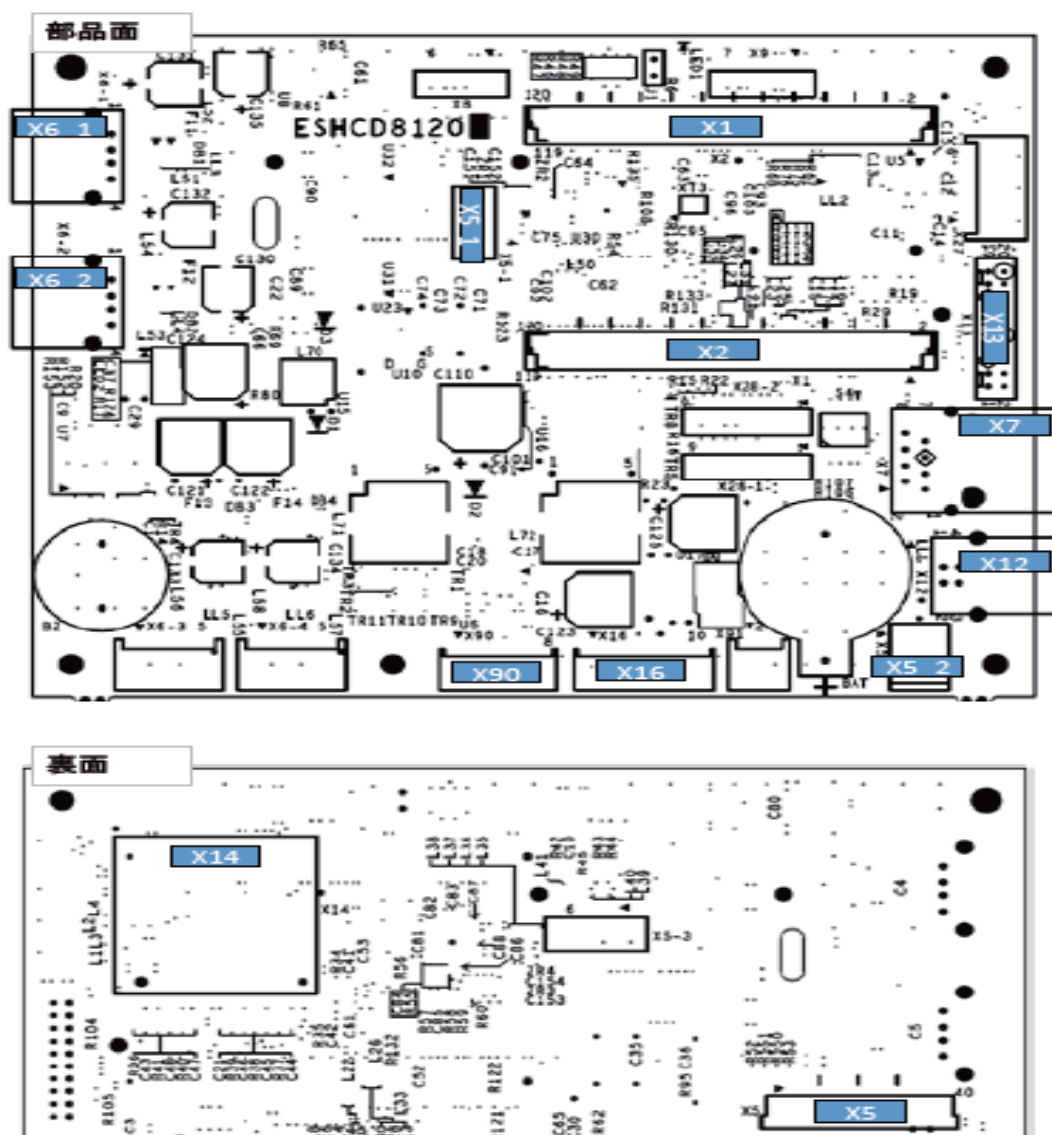
CN No.	Function
X1	Core module I/F
X2	Core module I/F
X5	7in LCD I/F
X5_1	7in touch panel input
X5_2	7in LCD backlight output
X6_1	USB-A connector 1
X6_2	USB-A connector 2
X7	LAN
X12	USB-B connector
X13	AUX
X14	SD card
X16	TP-SW board I/F
X90	CONT-** board I/F
Other CN	Reserved

HCD8122*

LCD-CE-MX Circuit 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	10.4in touch panel input
X5_3	7in LCD backlight output
X5_4	10.4in LCD I/F
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
OOtherther Other CN	Reserved

HCD81222
LCD-CE-MX Circuit board Ass'y
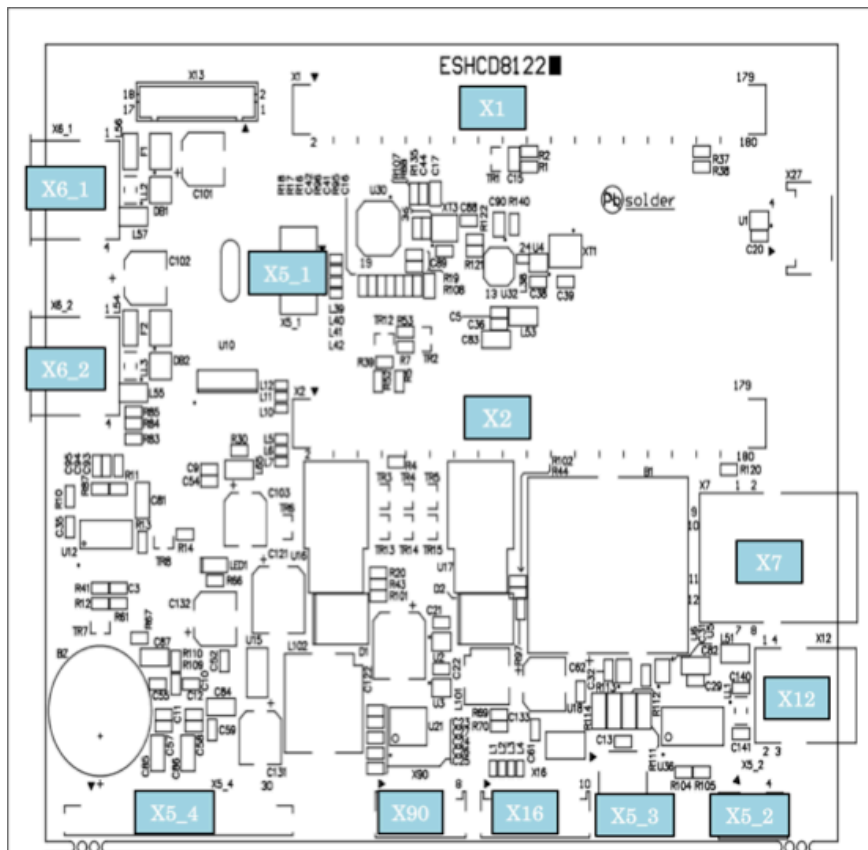
CN No.	Function
X1	Core module I/F
X2	Core module I/F
X 5	7in LCD I/F
X 5_1	7in touch panel input
X5_2	10.4in touch panel input
X5_3	7in LCD backlight output
X5_4	10.4in LCD I/F
X 6_1	USB-A connector 1
X 6_2	USB-A connector 2
X 7	LAN
X 12	USB-B connector
X 14	SD card
X16	TP-SW　board I/F
X90	CONT-** board I/F
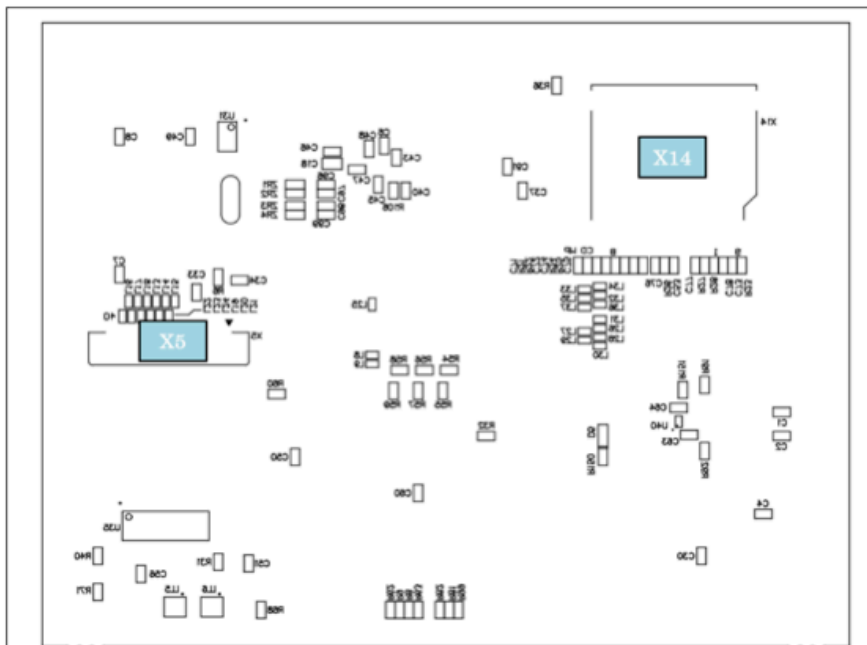
HCR8116*
TP–SW Circuit Board Ass'y
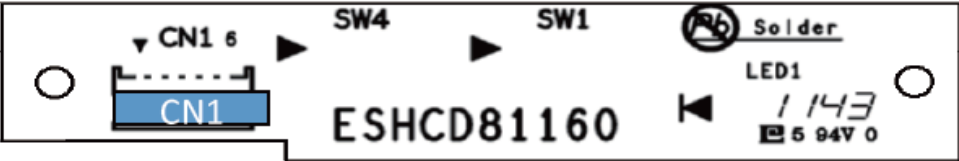
CN No.	Function
CN1	Switch output, LED input

HCR8121*

CONT-R2 Circuit Board Ass'y
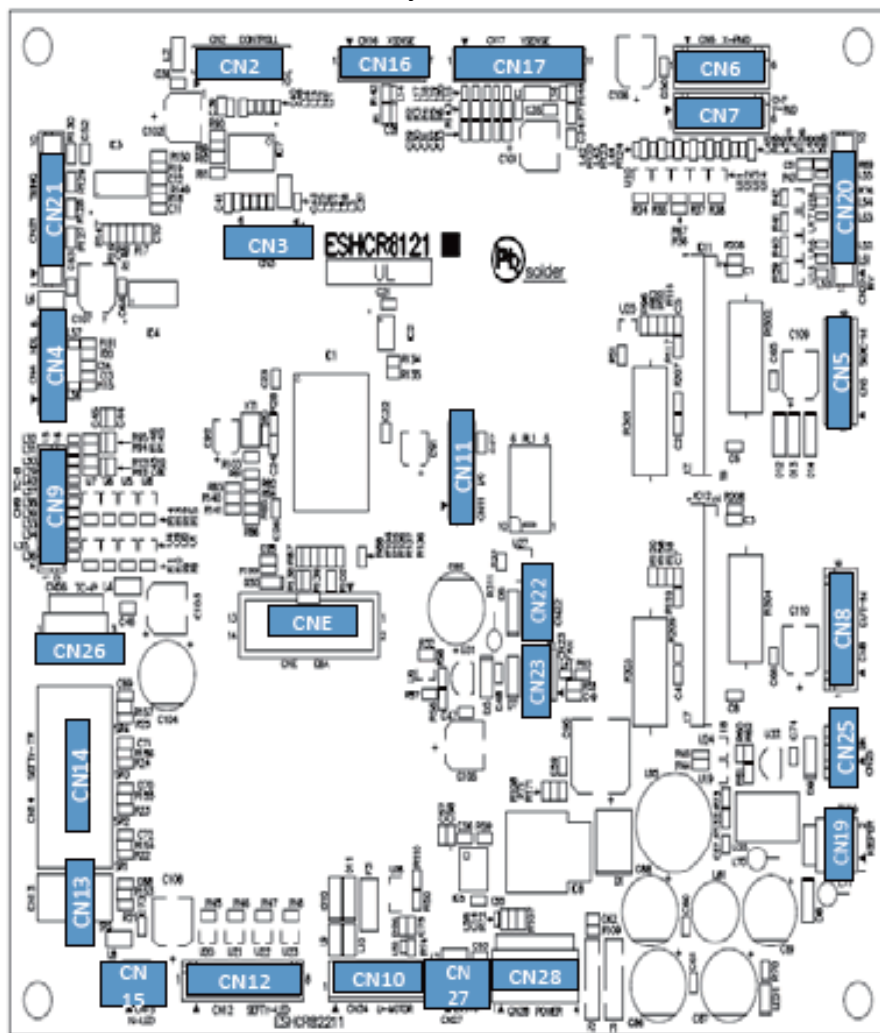
CN No.	Function
CN2	Control box I/F
CN3	Option I/F
CN4	Needle bar change potensionmeter, Needle bar change orig point sensor input
CN5	Needle bar change motor output
CN6	X motor I/F
CN7	Y motor I/F
CN8	Thread cutting motor output
CN9	Thread detecting board output Front LED I/F
CN10	Bobbin winder motor output
CN11	AUX I/F
CN12	Back sefty sensor LCD output
CN13	Needle sefty sensor input
CN14	Back sefty sensor input
CN15	Needle sefty sensor LCD output

CN No.	Function
CN16	X position sensor I/F
CN17	Y position sensor I/F, Thread cutting orig sensor input
CN19	Keeper solenoid output
CN20	Inverter I/F
CN21	Timing detecting I/F
CN22	Main switch remote output
CN23	Main box fan output
CN25	Main shaft brake I/F
CN26	24V power source for Thread detecting board
CN27	AUX
CN28	Input of 24V power source
CNE	Reserved

HCD8109*
TIMING Circuit Board Ass'y
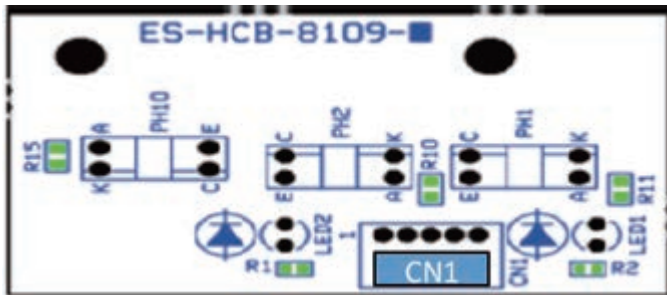
CN No.	Function
CN1	Out put of L point, C point,　angle sensor

HCD8110*
POSITION SENSER Circuit Board Ass'y

CN No.	Function
CN1	Sensor out put

HCR8115*
TC7-8 Circuit Board Ass'y
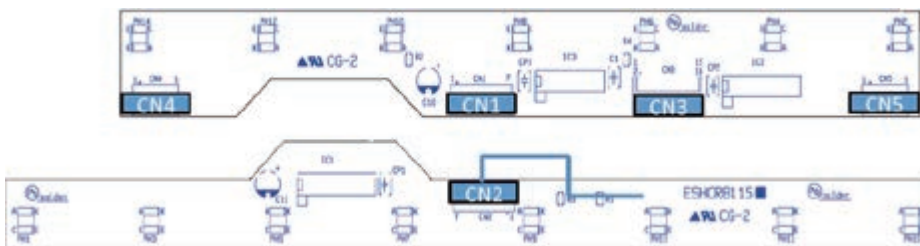
CN No.	Function
CN1	Out put to even number sensor
CN2	Input of even number sensor
CN3	Detecting board ass'y I/F
CN4	Jump SW board I/F
CN5	Start/Stop board I/F

HCR8108*
JUMP SW Circuit Board Ass'y

CN No.	Function
CN1	TC7–8 board I/F
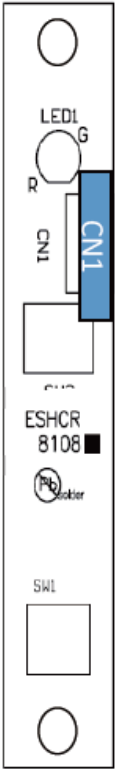
HCR8109*
START/STOP Circuit Board Ass'y

CN No.	Function
CN1	TC7–8 board I/F
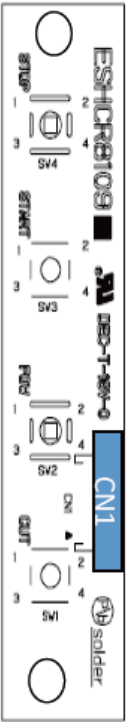
HCR8107*
DETEC Circuit Board Ass'y
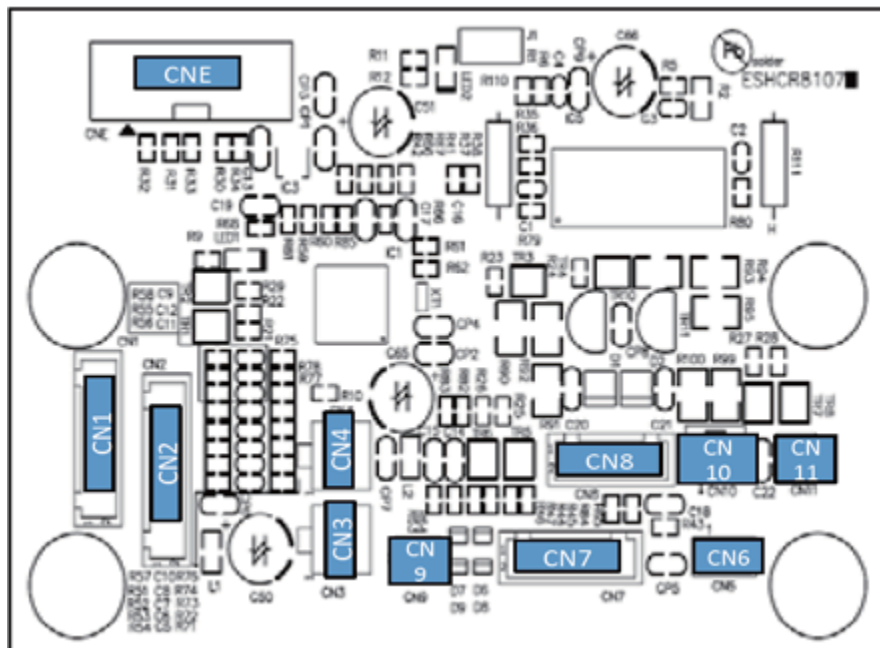
CN No.	Function
CN1	Input of relay control signal (to CONT−R2 board)
CN2	Output of relay control signal (to next detecting board)
CN3	24V power source for Thread detecting board
CN4	24V power source for Thread detecting board
CN6	Emergency stop I/F (Connect relay cable when the emergency button is not fixed with head)
CN7	TC7−8 board I/F
CN8	Output of Thread catch motor, Jump solenoid, Clip solenoid
CN9	Option I/F
CN10	Unused
CN11	Laser pointer output
CNE	Reserved for factory

HCB8116*
FRONT LED Circuit Board Ass'y
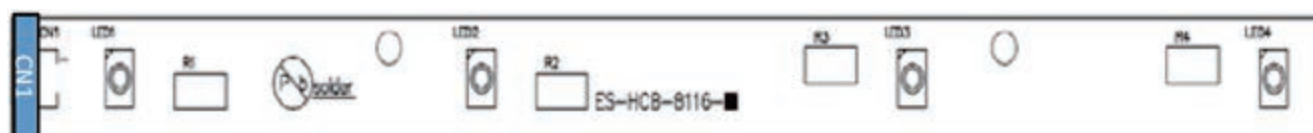
CN No.	Function
CN1	24V power source input

HCR8112*
KEEPER RELAY Circuit Board Ass'y
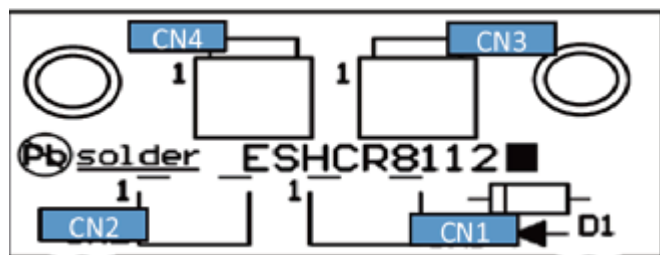
CN No.	Function
CN1	Keeper 1
CN2	Keeper 2 (next head)
CN3	Input of keeper relay
CN4	Output of keeper relay

HCR8104*
POWER RELAY Circuit Board Ass'y
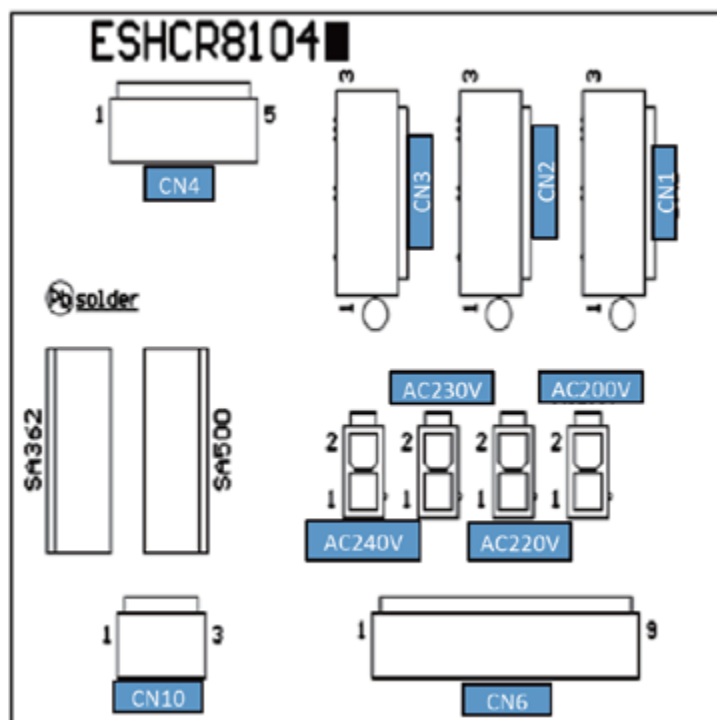
CN No.	Function
CN1	AC power source input
CN2	AC power source relay (Inverter) (Rev. A XY-PM driver)
CN3	AC power source relay (for Optionr)
CN4	AC power source relay (Switching power supply)
CN6	Transformer input (Rev. A : Unconnected)
AC200V	
AC220V	Changing of tap for transformer
AC230V	
AC240V	

E8　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.

Receive contact from customer

↓

Ask machine type and serial number

↓

Ask contents of question

*Circumstance of machine (Windy, Dusty, Floor condition and etc)

*Embroidery condition (Frame, Fabric, Thread, Pattern)

*Machine creations. (Create menu)

*Version of machine program.

*Version of Happylinf software.

*About connecting PC.

 *etc.

↓

You may prepare instruction book and parts book by customer.

↓

Respond for customer's question

*Advice by Instruction book and Parts book.

*Advice referencing maintenance manual.

*If you can not immediate, contact again after more detail check.

↓

Ask customer's contact number

*Phone, Fax and E-mail

↓

OK

*If you find case of respond, contact customer kindly.

NG ⟶ Visit your technician

*Ask schedule for visit

E9   Trouble shooting

E9-1   Electricity doesn't turn on

Trouble	Factor	Cause of trouble and measure	Page
Electricity doesn't turn on	Mechanical	1. Did fuse blow? 　　1-1 If it did, replace it.	
		2. Check of defect on board. 　　2-1 Replace of LCD-CE board. 　　2-2 Replace of LCD unit. 　　2-3 Replace of CONT-R2 board	 E3-2 E3-2 E2-1
		3. No problem in power supply? 　　3-1 Check and adjust the correct voltage. 　　3-2 Try to replace power supply.	 E2-12 E2-11
		4. Check of Cable catching causes short-circuit. 　　4-1 Please insulate the cable after removing outer cover. 　　4-2 Replace of cable.	 E2-5
		5. Confirm not getting power supply from same outlet with other embroidery machine or other machines which contains motor. 　　5-1 Preferably only 1 embroidery machine should be connected with 1 outlet. 　　　　(Maximum 2-3machines)	
	Operator	1. Didn't press emergency switch? 　　1-1 Release lock.	
	Environment	1. Is electricity in receptacle? 　　1-1 Supply power.	

(　　　) ----- Reference instruction book

E9-2 Thread break

Trouble	Factor	Cause of trouble and measure	Page

Thread break	Mechanical	1. Is needle drop unstable by vibration?
		
		    1-1 Reconsider where to install the machine.
		
		    1-2 Move the machine to floor fully reinforced.
			2-1

		2. No burr or scratch in thread guide hole?
		
		    2-1 Remove burr and scratch.
		
		    2-2 Replace of thread guide.
			2-8

		3. No problem in thread adjusting spring?
		
		    3-1 Replace spring if it doesn't spring.
		
		    3-2 If weak or broken, replace it.
			2-8

		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.
		
		    4-3 Correct so as for cable not to touch slit disc.
		
		    4-4 Check cable of TC 12 Board is unconnected
			E2-4

		5. No problem in thread guide unit and thread tension ass'y?
		
		    5-1 Remove burr and scratch if appeared.
		
		    5-2 Remove lints and clean.
			2-8

		6. Does disc on thread tension ass'y. turn smoothly?
		
		    6-1 Remove lints and clean.
		
		    6-2 Replace
			2-8

		7. Is backlash between take-up lever and take-up crank roller not bigger? 7-1 Replace of take-up lever.	4-2-10

		8. No problem in needle holder?
		
		    8-1 Remove burr and scratch.
		
		    8-2 Make proper fixing. (direction)
		
		    8-3 Replace if thread guide is bent.
			3-1
			2-8

		9. No burr and scratch on needle plate?
		
		    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.
			2-8

		10. No problem in pressure foot?
		
		    10-1 Remove burr and scratch.
		
		    10-2 Correct bent.
		
		    10-3 Adjust height.
		
		    10-4 Replace of pressure foot.
		
		    10-5 Replace of pressure foot drive cam.
			2-8
			2-8
			4-1-4
			4-1-5

(   ) ----- Reference instruction book

Trouble	Factor	Cause of trouble and measure	Page
Thread break	Mechanical	11. No problem in rotary hook?	2-8
		11-1 Clean it to remove lints.	(23-2)
		11-2 Furbish scratch.	
		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.	4-4-2
		13. No problem in needle?	
		13-1 Fix it properly .	3-1
		13-2 Select proper size of needle to match thread thickness.	3-3
		13-3 If tip of needle is warped or bent, replace.	2-8
		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.	4-2-8
		17. Does needle bar make smooth movement?	
		17-1 If bent, replace it.	4-2-8
		18. Needle doesn't drop in the center of needle hole.	
		18-1 Adjust positioning plate and adjust needle drop back and forth.	4-2-3
		18-2 Adjust position of needle selection unit, then adjust needle drop right and left.	4-2-4, -5
		19. Is the lowest needle position proper?	
		19-1 Adjust mechanical lowest needle position.	
		19-2 Adjust electric lowest needle position.	E2-2
		20. Is needle height proper?	
		20-1 Adjust as specified.	4-2-6
		21. Is rotary hook timing proper?	
		21-1 Adjust as specified.	4-4-1
		22. Is clearance between needle and rotary hook proper?	
		22-1 Adjust as specified.	4-4-1

(   ) ----- Reference instruction book

Trouble	Factor	Cause of trouble and measure	Page
Thread break	Mechanical	23. Check tip of keeper hit the bobbin case.	
		23-1 Adjust it regularly.	4-5-8
		24. Is take-up lever timing proper ?	
		24-1 Adjust as specified.	4-1-2
		25. No problem in timing belt?	
		25-1 Adjust tension.	4-7-1
		25-2 If scratched or damaged, replace it.	
		26. Is revolution setting proper?	
		26-1 Make automatic speed setting.	E4-4
		27. Is inverter setting proper ?	
		27-1 Make setting.	E2-16
	Operator	1. Operation is wrong (no proper [Machine settings] 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.	2-9
		3-2 <Bobbin thread> Considering upper thread tension, set tension.	2-9
		4. Is bobbin winding proper?	
		4-1 Adjusting bobbin winding tension, wind with proper strength.	E6-5
		5. Is bobbin put in bobbin case properly?	
		5-1 Viewing from front of bobbin case, set so that bobbin turns left-wise.	2-9
		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?	(4-6, 4-7)
		7-1 Pass thread properly.	2-9
		8. Is cloth properly stretched?	(6-2, 7-6)
		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

Trouble	Factor	Cause of trouble and measure	Page
Thread break	Operator	10. Is frame used to suit pattern size?	(2-10)
		10-1 Use frame to suit pattern size.	
		11. When you dispose of thread (thread remains around rotary hook),	
		didn't you damage rotary hook, needle plate with scissors?	
		11-1 Tell to dispose of thread carefully.	
		11-2 Open needle plate to dispose of thread.	(23-2)
		12. Didn't you neglect cleaning and oiling?	
		12-1 Tell to always clean and use cleanly.	(23-2)
		12-2 Tell to oil regularly.	(23-1b)2-7
	Thread & cloth	1. Is thread used to suit needle size?	
		1-1 Use thread to suit needle size.	3-3
		2. Is thread used to suit embroidery? (thread twist, tender thread).	3-2
		2-1 Don't use too strongly twisted thread.	
		2-2 Twist of thread is to be left-wise.	
		2-3 Use tender thread.	
		2-4 Don't use thread with knot or uneven size.	
		3. Is thread properly wound aginst cone?	
		3-1 Use thread to be wound smoothly.	
		4. Isn't tip of cone warped or isn't thread caught in scratch?	
		4-1 Remove warp and scratch.	
		5. Don't use thread left for a long period? (inferior thread).	
		5-1 Don't buy thread more than you use.	
		5-2 Tell not to store thread for a long period.	
		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?	2-1
		1-1 Reconsider place to install the machine.	
		1-2 Move the machine to place where floor is strong enough.	
		2 Are room temperature and humidity proper against thread?	(23-1)
		2-1 It is desirable to install air conditioner to keep temperature and humidity	
		in a certain level.	
		3. Doesn't embroidery machine receive direct sunlight? (cause of inferior thread)	
		3-1 See not to expose to sunlight (spread curtain)	

(   ) ----- Reference instruction book

Trouble	Factor	Cause of trouble and measure	Page
Thread break	Environment	4. Is there something that produce steam, wasted cotton, dust around. the embroidery machine? 4-1 Keep the embroidery machine off those things.	

		5. Does thread go out of control by taking wind from outside or heater etc.?
		
		    5-1 Keep the embroidery machine off such wind.
		
		    5-2 Move the embroidery machine to proper place.	

	Pattern	1. Does thread break occur repeatedly at same place in design? 1-1 Check pattern to modify punching.	

		2. Is it too narrow between stitches?
		
		    2-1 Check pattern to modify punching.
		
		    2-2 Setting of [Reading] menu. (Stitch sweeper)
			(14-4)

		3. Too many empty stitches? 3-1 Make [Reading] setting. (Skip null stitches)	(14-4)

	Others	1. Using spray paste (adhesive material)
		
		    1-1 Clean around rotary hook.
		
		    1-2 Replace or clean needle.
		
		    1-3 Use this paste at a given place and never use in front or back of
		
		      the embroidery machine.
			(23-2)
			
			3-1

(   ) ----- Reference instruction book

E9-3   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.	4-5-2
		2. Isn't rubbing of fixed knife and moving knife weak?	
		2-1 Adjust to be able to rub properly.	4-5-6
		3. Does moving knife make smooth move?	
		3-1 Check if rubbing of moving knife and fixed knife is not too strong.	4-5-6
		3-2 Check no loosening of screw on moving knife.	4-5-3
		3-3 Check no damage or scratch on face of moving knife.	
		4. Check Displace of moving knife.	
		4-1 Adjust of moving knife position.	4-5-5
		5. Check defacement of moving knife or fixed knife.	
		5-1 If possible, furnish with file.	4-5-6
		5-2 Replace	4-5-3
		6. No backlash in up and down direction of knife drive shaft?	4-5-3
		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?	4-5-6
		7-1 Check no loosening of screw on fixed knife.	
		8. Does thread cut pulse motor work properly?	
		8-1 Check cable.	
		8-2 If trouble found in LCD-CE board or CONT-R2 board, replace.	E3-2, E2-1
		8-3 If trouble found in thread cut pulse motor, replace.	
		8-4 Adjust of thread cut sensor position.	E2-6
		9. Is number of revolution proper at time of thread cut?	
		9-1 Make automatic speed setting.	E4-4
		9-2 If trouble in LCD-CE board or CONT-R2 board, replace.	E3-2, E2-1
		10. Is there no skipped stitch?	
		10-1 Adjust needle depth.	4-2-6
		10-2 Adjust clearance between needle and rotary hook.	4-4-1
		10-3 Is height of pressure foot proper?	4-1-4
		10-4 Is rotary hook timing proper?	4-4-1
		10-5 Is relation between needle and thread proper?	3-3

(　　　) ----- Reference instruction book

Trouble	Factor	Cause of trouble and measure	Page
Erroneous thread cut (E-190) (E-193)	Mechanical	11. Check the needle bar moves up and down during thread cut.	
		11-1 Replace needle bar cushion.	4-2-8
		11-2 Replace needle bar driver.	4-1-1
		12. Is position of keeper proper?	
		12-1 Adjust the fixed position regularly.	4-5-8
		13. Check the movement of keeper goes smoothly.	
		13-1 Readjust if it is not smooth.	4-5-8
	Operator	1. No negligence in cleaning thread cut device?	(23-2)
		1-1 Tell to clean regularly.	
		# It's desirable to prepare brush with soft hair and air gun.	
		2. Is timing of thread tension proper?	2-9
		2-1 <Upper thread> Considering sewing finish, set tension.	*
		2-2 <Bobbin thread> Considering upper thread tension, set tension.	*
	Environment	1. Are power and voltage rated and stable?	
		1-1 Supply rated voltage.	(23-1)
	Thread & cloth	1. Is twist of thread too strong?	
		1-1 Use thread with proper twist.	3-2
		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

E9-4　Off-registration of pattern

Trouble	Factor	Cause of trouble and measure	Page
Off-registration of pattern	Mechanical	1. Does frame move smoothly? 　1-1 Avoid curling of thread and cloth. 　1-2 Reinstall of outer cover in case of touch with outer cover.	
		2. Is carriage belt tension proper? 　2-1 Adjust all belts as specified.	4-6-1 4-6-3
		3. No loosening of screws on carriage drive? 　3-1 Check screw. If loosened, tighten firmly.	
		4. No lints or dust around idler pulley on carriage? 　4-1 Clean	
		5. No damage in carriage belt? 　5-1 If damaged, replace.	
		6. No backlash of back and forth in moving head? 　6-1 Adjust positioning roller shaft to remove backlash back and forth.	 4-2-3
		7. Is height of pressure foot proper? 　7-1 Adjust as specified.	 4-1-4
		8. No problem in motion of pulse motor? 　8-1 Check wiring. If screw got loosened, tighten more. 　8-2 After 9-1, still problem, then replace.	
		9. No problem in motion of PMD ? 　9-1 Check wiring. If screw got loosened, tighten more. 　9-2 After 10-1, still problem, then replace.	 E2-8, 10
		10. Does't other frame than Happy's genuine one used? 　10-1 If frame is too heavy, don't use it. 　10-2 If setting is not proper, set it so as not to move.	
		11. No problem in LCD-CE board or CONT-R2 boaer ? 　11-1 Try to initialize. 　11-2 Replace of CPU board.	 E4-4 E3-2, E2-1
		12. Is number of revolution proper? 　12-1 Make automatic speed setting.	E4-4
		13. Not affected by noise? 　13-1 Don't use the machine near where noise is generated.	

(　　　) ----- Reference instruction book

E9-4 Off-registration of pattern

Trouble	Factor	Cause of trouble and measure	Page

Off-registration of pattern	Mechanical	14. No problem in timing sensor unit?
		
		  14-1 Test the Machine-Test Machine movement #11 (Test of timing sensor
		    unit) of Maintenance mode, Check timing sensor unit.
		    If trouble found, error number and messages will be displayed.
		    If measure doesn't solve the trouble, replace of timing circuit board
		    or cable.
			E5-2

		E-18 Problem in detecting angle of main shaft.
		    Check timing slit.
		    Adjust timing slit.
		    Turn main shaft once by hand.
		    If LED4 (L point) lights two times or more, Adjust detecting slit.
			4-7-2

		E-51 L point sensor doesn't detect.
		E-52 C point sensor doesn't detect.
		    Clean dust attached to sensor.
		    Check detecting slit.
		    If trouble found, Adjust detecting slit.
			4-7-2

	Operator	1. Is setting of frame correct?
		  1-1 Frame should be put in positioning hole on tubular frame.
		  1-2 Set so as for screw not to loosen.
			(6-3, 7-6)

(   ) ----- Reference instruction book

Trouble	Factor	Cause of trouble and measure	Page
Off-registration of pattern	Operator	2. Is cloth properly stretched. 2-1 Stretch properly.	(6-3, 7-6)
		3. Is thread tension proper? 3-1 Observing sewing rhythm, set thread tension properly.	2-9
		4. Was the machine left for a long time in middle of sewing? 4-1 Try to finish sewing as soon as possible.	

	Environment	1. Is strength of table and floor enough?
		
		  1-1 Check where to place the machine again.
		
		  1-2 Move to where floor is strong enough.
			2-1

		2. No problem in pulse motor driver by low power and voltage (variation)?
		
		  2-1 Supply rated voltage.
		
		  2-2 Use transformer.
		
		  2-3 Use stabilizer.
			(23-1)

		3. Is there no place where noise is generated near the machine? 3-1 Don't use the machine near where noise is generated.	
		4. Doesn't drive frame hit obstacle? 4-1 Remove obstacle.	
	Thread & cloth	1. Not using shrinkable cloth? 1-1 Use backing paper (consider number of sheets to use).	(4-3)
		2. Isn't breakable cloth is used by thread tightening? 2-1 Use backing paper (consider number of sheets to use).	(4-3)
		3. Is proper backing paper used? 3-1 Use backing paper to match cloth.	(4-3)
		4. Isn't cloth (embroidery) too heavy? 4-1 Don't use extremely heavy cloth.	

	Pattern	1. Pattern data may be destroyed.
		
		  1-1 Read again.
		
		  1-2 Let new pattern read.
			(5-5, 5-6)

		2. Memory pattern was destroyed. 2-1 Let new pattern read.	(5-5, 5-6)

		3. No problem in memory media ?
		
		  3-1 Initialize and read again.
		
		  3-2 Prepare new memory media.
			(5-5)

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E9-5 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 LCD-CE board is in trouble, replace.
		
		    1-4 In case CONT-R2 board is in trouble, replace.
			
			E3-2
			
			E2-1

		2. Is keeper put in right place?
		
		    2-1 Put it as specified.
		
		    2-2 Modify bent of keeper.
		
		    2-3 Adjust it again if movement is not smooth.
			
			4-5-8
			
			4-5-8

		3. When thread trim action, please check upper thread wind keeper or not. 3-1 If dose not wind, please adjust keeper position again.	
		4. Is magic-tape on thread catch holder not worn? 4-1 Replace magic-tape.	

		5. Does bobbin thread holder hold bobbin thread?
		
		    5-1 Adjust pressure when contacting moving knife.
		
		    5-2 In case bobbin thread holder is in trouble, replace.
		
		    5-3 Clean bobbin thread holder.
			
			4-5-7

		6. No error in thread cut (2 threads cut)?
		
		    6-1 Check and adjust thread cut timing.
		
		    6-2 Position moving knife as specified.
		
		    6-3 Check and polish burr or scratch on moving knife.
		
		    6-4 In case moving knife is in trouble, replace.
			
			4-5-2
			
			4-5-5
			
			4-5-3

		7. Are clearance between needle and rotary point and needle height are proper?
		
		    7-1 Adjust clearance between needle and rotary hook as specified.
		
		    7-2 Adjust needle depth.
			
			4-4-1
			
			4-2-6

		8. Doesn't thread catch hook cut upper thread?
		
		    8-1 Polish burr on hook.
		
		    8-2 In case hook is in trouble, replace.	

		9. Does thread catch hook hold upper thread?
		
		    9-1 Check if cable was cut or there is something unusual.
		
		    9-2 In case pulse motor is in trouble, replace.
		
		    9-3 Adjust fixing position.
		
		    9-4 If hook is bent, modify.
		
		    9-5 In case hook is in trouble, replace.
		
		    9-6 In case LCD-CE board is in trouble, replace.
		
		    9-7 In case CONT-R2 board is in trouble, replace.
			
			4-1-6
			
			E3-2
			
			E2-1

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Trouble	Factor	Cause of trouble and measure	Page
Upper thread comes off from needle hole	Mechanical	10.Check the needle bar moves when start sewing.	
		12-1 Adjust position to fix jump solenoid.	
		12-2 Replace needle bar driver.	4-1-1
		11. Is number of revolution proper when sewing started?	
		13-1 Make automatic speed setting.	E4-4
		12.Is height of pressure foot proper?	
		14-1 Adjust as specified.	4-1-4
	Operator	1. Isn't thread tension too strong?	
		1-1 Weaken tension not to cause trouble in sewing rhythm.	2-9
		2. Keen in cleaning thread cut device?	
		2-1 Clean bobbin thread holder regularly.	(23-2)
		3. Is setting of bobbin thread proper?	*
		3-1 Pass thread on bobbin thread guide surely.	2-9
		4. Is bobbin thread properly wound?	*
		4-1 Adjust tensile strength of bobbin winder and check holding plate.	(4-4)
		4-2 Pull out bobbin thread to check if it comes out smoothly.	2-9
		5. Is upper thread properly passed?	(4-6, 4-7)
		5-1 Pass properly again.	2-9
		6. Does thread cone stand properly?	(4-6)
		6-1 Keep thread from hitting felt.	
		6-2 Stand vertically.	
		7. Is [Machine settings] properly set?	(5-1)
		7-1 Select setting of length of TRD. Cut [Long].	
		7-2 Select setting of Quick start mode [No].	
		7-3 Select setting of STR. Lock stitch [Yes].	
	Thread & Cloth	1. Is thread used to suit embroidery? (thread twist, tender thread).	3-3
		1-1 Don't use too strongly twisted thread.	
		1-2 Twist of thread is to be left-wise.	
		1-3 Use tender thread.	
		1-4 Don't use thread with knot or uneven size.	
	Environment	1. Does wind let thread go beyond control? (outside wind, heater, and fan etc.)	
		1-1 Keep the embroidery machine off from wind.	
	Pattern	1. Is there stop sewing stitch for start sewing?	
		1-1 Modify pattern.	

(   ) ----- Reference instruction book

E9-6　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.).
		
		    1-1 Modify bent or warp.
		
		    1-2 Replace keeper.	

		2. Keeper doesn't return properly at time of thread cut.
		
		    2-1 Modify bent of keeper.
		
		    2-2 Adjust position to fix.
		
		    2-3 Adjust it again if movement is not smooth.
			4-5-8

		3. Upper thread does not come off from magic tape of thread holder.
		
		    3-1 Insert something(Thickness 0.1-0.2mm) into holder then move it right and
		      left to put magic tape in order.
		
		    3-2 Replacement of magic tape.	

		4. Doesn't thread catch hook cut upper thread?
		
		    4-1 Polish burr on hook.
		
		    4-2 In case hook is in trouble, replace.	

	Operator	1. Setting of thread tension is weak. 1-1 Strengthen so as not to cause trouble in sewing rhythm.	2-9
		2. Is [Machine settings] properly set? 2-1 Select setting of length of TRD. cut [Normal].	(5-1)
	Thread & cloth	1. Using hard cloth make thread difficult to go through. 1-1 Select needle and thread.	3-3
		2. Using thick cloth make thread difficult to go through. 2-1 Select needle and thread.	3-3

		3. Is thread used to suit embroidery? (thread twist, tender thread).
		
		    3-1 Don't use too strongly twisted thread.
		
		    3-2 Twist of thread is to be left-wise.
		
		    3-3 Use tender thread.
		
		    3-4 Don't use thread with knot or uneven size.
			3-2

(   ) ----- Reference instruction book

E9-7   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.
		
		    1-1 Clean roller shaft holder.
		
		    1-2 Check if slit disc doesn't contacts sensor.
		
		    1-3 Clean sensor if dust gets stuck.
		
		    1-4 Check if cord doesn't contacts slit disc.
		
		    1-5 Check Disconnection of cable.
		
		    1-6 Check clog of thread detection roller. Roller shaft should haveclearance.
			E2-4

		2. Check circuit board.
		
		    2-1 Replace of LCD-CE board.
		    2-2 Replace of TC 12 board.
		    2-3 Replace of Detection board
		    2-4 Replace of CONT-R2 board
			E3-2
			E2-4
			E2-3
			E2-1

		3. Sometimes needle bar doesn't work when start sewing. 3-1 Replace of needle bar driver.	4-1-1
	Operator	1. No thread is passed through detecting roller. 1-1 Pass thread properly.	2-9
		2. Is thread tension proper? 2-1 Observing sewing rhythm, adjust thread tension properly.	2-9

		3. Is proper detection sensitivity of thread cut selected?
		
		    3-1 Select detection sensitivity according to sewing condition of thread and cloth etc.
		
		    3-2 Please check [TRD. break detect] in setting menu to except [Off].
			(5-1)

		4. Is thread tension proper?
		
		    4-1 Observing sewing rhythm, adjust to proper thread tension.
		
		      (Adjust it little bits stronger.)
			2-9

	Environment	1. Is there any device to yield lints etc. around the embroidery.
		
		    1-1 Keep it off the embroidery machine.
		
		    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)
		
		    2-1 Keep thread off wind.
		
		    2-2 Move the embroidery machine to other place.	

	Thread & Cloth	1. Isn't silicone agent used on thread?
		
		    (Thread slips at detecting roller part due to adhere of silicone.)
		
		    1-1 Clean silicone agent attached to detecting roller groove.	

(   ) ----- Reference instruction book

E9-8   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. 　　1-1 Get rid of it.	(23-2)
		2. Check return of keeper goes smooth. (when start sewing, thread cutting. 　　2-1Adjust it regularly.	4-5-8
		3. Check upper thread is sticking at thread guide part of bobbin case. 　　3-1 Get rid of it. 　　3-2 Do not use of bobbin case in which thread guide is coiled type. 　　　(use standard type)	(23-2)
		4. Effect by breakage of parts. 　　4-1 Repair broken place.	
		5. No damage in electric parts ? 　　5-1 Replace of LCD-CE board. 　　5-2 Replace of Timing Board. 　　5-3 Replace of inverter. 　　5-4 Replace of CONT-R2 board.	E3-2 E2-2 E2-15 E2-1
		6. Trouble of software in LCD-CE circuit board. 　　6-1 Initialize, then make automatic speed setting.	E4-3 E4-4
		7. Trouble in control of number of revolution. 　　7-1 Make automatic speed setting.	E4-4
	Operator	1. Isn't foreign stuff such as thread or cloth caught in where revolution is driven. 　　1-1 Get rid of foreign stuff. 　　1-2 Stretch properly.	(6-3, 7-6)
		2. Isn't thread tension too strong (stop at time of action of thread cut)? 　　2-1 Weaken tension so as not to cause trouble in sewing rhythm.	2-9
		3. Check condition of lubrication. 　　3-1 Lubricate (refer to message)	2-7 (23-1b)
	Environment	1. Check adequate level of voltage (refer to trip of inverter). 　　1-1 Supply rated voltage. 　　　200V:220V:230V:240V (It varies in the specifications.)	(23-1)

(   ) ----- Reference instruction book

E9-9　Malfunction of needle bar change

Trouble	Factor	Cause of trouble and measure	Page
Head does not move (E-021) (E-022)	Mechanical	1. Check lint or cloth is seized between Lower Moving rail and Bearing. 　1-1 Remove seized lint or cloth.	
		2. Check lint or waste is seized in gap of Moving Cam. 　2-1 Remove seized lint or waste.	
		3. Effect by breakage of parts. 　3-1 Repair broken place.	
		4. No problem in CONT-R2 board. 　4-1 Replace of CONT-R2 board.	E2-1
	Operator	1. Check Stopper of Moving Head is removed. 　1-1 Remove Stopper.	2-3
Uncontrollable Move (E-024) (E-025)	Mechanical	1. No problem in sensor circuit board ? 　1-1 Clean dust attached to sensor. 　1-2 Replace sensor circuit board.	E2-5
		2. Trouble in potentiometer. 　2-1 Replace	E2-5
		3. Needle number is not exactly recognized. 　3-1 Recognize needle number with maintenance mode.	E2-5
		4. Breakage of Pulse Motor. 　4-1 Replace Pulse Motor.	

(　　　) ----- Reference instruction book

E9-10　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.	
		1-1 Adjust position of Thread catcher	4-1-6
		1-2 Adjust position of Thread holder.	4-2-13, -14
		2. Excessive distance between Hook and tip of Needle.	
		2-1 Adjust position of Thread catcher.	4-1-6
		2-2 Adjust position of Thread holder.	4-2-13, -14
Hook of Thread catcher does not extend	Mechanical	1. Check Hook of Thread catcher bent or not.	
		1-1 Repair bent Hook.	
		1-2 Replace Hook.	
		2. Check position of Thread catcher is proper.	
		2-1 Adjust	4-1-6
		3. Check position of Thread holder is proper.	
		3-1 Adjust	4-2-13, -14
		4. Check Thread catcher.	
		4-1 Check cable is securely connected.	
		4-2 Replace Pulse Motor with trouble.	
		5. No damage in electric parts?	
		5-1 Replace LCD-CE Board.	E3-2
		5-2 Replace of CONT-R2 board.	E2-1
		5-3 Replace of Detection board	E2-3
Hook hits or catches Needle (E-193)	Mechanical	1. Check Hook is bent or not.	
		1-1 Repair bent Hook.	
		1-2 Replace Hook.	
		2. Check position of Thread catcher is proper.	
		2-1 Adjust	4-1-6
		3. Check position of Thread holder is proper.	
		3-1 Adjust	4-2-13, -14
	Operator	1. Check if Needle is securely set.	
		1-1 Set Needle properly.	3-1
Constant display of E-193	Mechanical	1. Trouble of Photo sensor.	
		1-1 Replace Photo sensor.	4-1-6

(　　　) ----- Reference instruction book

E9-11   Others / Mechanical

Trouble	Factor	Cause of trouble and measure	Page
Needle Breakage	Mechanical	1. Check Needle is not bent.	2-8
		1-1 Replace bent Needle.	3-1
		2. Check Moving Head set securely.	
		2-1 Adjust Positioning Roller Shaft.	4-2-3
		3. Secure adequate distance between Needle and Rotary Hook.	
		3-1 Adjust distance properly.	4-4-1
	Operator	1. Is thread method in proper way?	
		1-1 Threading again in a proper way.	2-9
		2. Check upper thread comes in a smooth way.	
		(Thread stand, Thread tension point, double back etc)	
		2-1 Adjust place be caught in.	(4-7)
		3. Check whether fabric is fixed firmly or not.	
		3-1 Hooping fabric firmly again.	(6-3, 7-6)
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.	4-2-13, -14
		1-2 In case pressure foot is fixed at an angle, fix it vertically again.	4-1-4
Abnormal noise	Mechanical	1. By defect of cover installation. (Pressure foot drive, Carriage etc)	
		1-1 Take care of insert condition, clearance etc and fix again.	
		2. By lack of oil inside rotary hook.	
		2-1 Refuel	2-7,(23-1)
		2-2 Replace of rotary hook	4-4-1
Big noise	Mechanical	1. Bearing gap of take up crank ass'y.	
		1-1 Adjust roller shaft ass'y.	
		1-2 Replace of roller shaft ass'y.	
		2. Gap between take up lever ass'y and take up clank ass'y.	
		2-1 Replace of take up lever ass'y.	
		2-2 Replace of take up lever crank ass'y	
		3. Needle bar driver gap of needle bar driver ass'y.	
		3-1 Replace of needle bar driver ass'y.	4-1-1
		4. Big gap pressure foot cam	
		4-1 Replace of take-up lever cam.	4-1-8

(   ) ----- Reference instruction book

E9-12   Others / Electric

Trouble	Factor	Cause of trouble and measure	Page
Frame overrun	Mechanical	1. Interference between censor circuit board and douser.	E2-7
		1-1 Position adjustment of douser.	
		1-2 Replace of censor circuit board.	
		2. Check whether cable has problem or not.	E2-7
		2-1 Replace in case damage exists.	
		2-2 Insert connector again.	
		3. No damage in electric parts?	
		3-1 Replace LCD-CE Board.	E3-2
		3-2 Replace of CONT-R2 board.	E2-1
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.	
		1-1 Bundle cable again	
Defect of LCD	Mechanical	1. Check LCD .	
		1-1 Replace of LCD	E3-2
		2. Inadequate condition of cable insertion	
		2-1 Insert to the back firmly	
		3. Check whether LCD-CE board is out of order or not.	
		3-1 Replace of LCD-CE board	E3-2
Defect of data communication (E-90) (E-91)	Mechanical	1. Check whether PC has problem or not.	
		1-1 Affirm whether there is problem or not.	
		2. Check LCD-CE board is out of order or not.	
		2-1 Replace of LCD-CE board.	E3-2
	Operator	1. Baud rate does not fit between machine side and PC side.	
		1-1 Make setting of baud rate	(5-1)
Watch doesn't indicate time	Mechanical	1. Trouble in back-up battery	
		1-1 Replace board.	E3-3
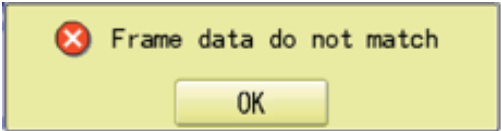
(   ) ----- Reference instruction book

P**-P** --- Refer to Happy Link instruction book

E10-1 Startup error and measure (Main program Ver.*1.37~)

Error message will be displayed if error occurs during machine startup.

After confirming contents, press button [OK] on control box to release error, then restore in accordance with measure in this list.

Message	Error	Measure
❌ Error The information of the EMB machine does not match the Control Box's. OK	Exchanged control box or CONT board does not match for the installed data of [Machine setting].	When only control box has been exchanged, open the menu of [E5-5 Setup — Machine setting] and just close without any amendment. When CONT board has been exchanged, follow the procedure of [E5-8 Machine Setting Navigation after exchanging CONT board].
❌ Frame data do not match OK	Installed frame drive data in the machine does not match.	Check setting contents of [Machine setting] by referring [E5-5 Setup—Machine setting], then follow the procedure [E4-2 Machine program update].

E10-2 Error and measure

When trouble occurred while the machine is running, error number and error item will be displayed. After confirming contents,

press button [OK] on control box to 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. (2)If recurred, replace LCD-CE board.	E3-2
002	Power source	Power failure or abnormal voltage		
004	System memory	Trouble in system memory.	Replace LCD-CE board.	E3-2
014	Fan Alarm	Cooling fan fault	(1)Clean dust attached to fan. (2)Replace fan.	E2-14
015	Inverter trip	Trouble in drive unit on main shaft. Overload on main shaft motor, 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. (2)If trouble found, repair where damaged. (3)If inverter in trouble, replace. (4)Check if voltage high or not. If high,check origin of power source of factory. Or use stabilizer, transformer to set to rated voltage.	E2-15
016	Alarm X unit	X-motor-related trouble, i.e. x-motor overload, short circuit, problem with motor drive unit, voltage drop (momentary)	(1)Power off machine, test pantograph movement manually. Check for any abnormality throughout full range of motion. If none found, power on again.	
017	Alarm X unit	Y-motor-related trouble, i.e. y-motor overload, short circuit, problem with motor drive unit, voltage drop (momentary)	(2)Check related harnes. (3)Replace of PMD.	E2-9, 10
018	Main shaft	Suspension of main shaft in mid way.	(1)Check if trouble found between main shaft and drive. If trouble found, restore. (2)If recurred, find cause and fix. (3)Make automatic speed setting again. (4)If inverter in trouble, replace.	E4-4 E2-15
020	Needle detect	Needle position not detected. Trouble in stop position of needle selection unit.	(1)Turn needle selection cam by hand to set to regular position. (2)Fix needle selection related mechanical trouble. (3) Replace sensor circuit board or potentiometer.	E2-5
021 022	Needle move	Suspension of needle selection motor in mid way. Trouble in take-up lever hinders. Trouble in position detecting circuit board.	(1)Turn needle selection cam by hand to set to regular position. (2)Fix needle selection related and take up lever related troubles. (3)Replace sensor circuit board or potentiometer.	E2-5

(   ) ----- Reference instruction book

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. (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 (poten-tiometer) and needle number of moving head.	E2-5
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. (2)Let the machine recognize needle number.	E2-5
030	Slow mismatch	Inadequate adjustment of number of low speed revolution. Low speed revolution doesn't come below 100rpm.	(1)Make automatic speed setting. (2)If not solved even after speed adjustment, replace LCD-CE board.	E4-4 E3-2
050	C point	Main shaft stops off its position.	(1)Turn main shaft to plus direction to set to C point.	(24-5)
051	L sensor	Poor lowest needle position sensor on timing detecting circuit board. Damage in timing detecting circuit board, stained photo sensor, poor adjustment of slit disc.	(1)If photo sensor is stained, clean. (2)Adjust timing. (3)Replace main shaft timing circuit board.	E2-2
052	C sensor	Damage in color change point sensor on timing circuit board. Damage in timing detecting circuit board, stained photo sensor, poor adjustment of slit disc.		
060	X limit	Drive frame went beyond limits in X direction.	(1) Move drive frame back to limits with move key.	
061	Y limit	Drive frame went beyond limits in Y direction.	(2) Correct pattern size and setting contents.	
063	Drive Setup	During embroidery, preparation for frame movement did not complete within predetermined time.	(1) Malfunction of "Lowest needle position" sensor on detection circuit board, Improper adjustment. (2)Make automatic speed setting.	E2-2 E4-4
064	X Center sens.	Trouble in embroidery frame sensor	(1) Check if position sensor is dirty. Turn off power source, then turn on again.	E2-7
065	Y Center sens.		(2) Setup mistake of the machine parameter (3) Replace position sensor circuit board.	E5-5,-6 E2-7
066	Frame drive	Frame movement did not complete during origin point movement.	(1) Dirt L point sensor [PH1] or wrong position of slit. (2) Dirt timing slit, position adjustment (3) Replace timing circuit board.	E2-2 E2-2 E2-2
067	L sensor	Consumption of embroidery frame coordinate data.	Adjust position sensor position on carriage. Then register frame position again.	E2-7

(   ) ----- Reference instruction book

No.	message	Error	measure	page
068	Position set	Failure to read embroidery frame sensor signal. (Return)	(1) Check if position sensor is dirty. Turn off power source, then turn on again.	E2-7
069	Position Entry	Failure to read embroidery frame sensor signal. (Entry)	(2) Setup mistake of the machine parameter (3) Replace position sensor circuit board.	E5-5,-6 E2-7
070	Safety sensor	Safety sensor has been tripped.	(1)Clear area around safety sensor. (2)Check material dose not shut out safety sensor beam. (3) Adjust safety sensor position.	E6-3, E6-4
090	Miss reception	Error has occurred during data transfer (via cable) between machine and PC.	(1)Let the machine read pattern data from first. (2)Set transmitting speed of the machine and personal computer.	(5-5) (5-1)
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. (2)By setting reading of pattern data,	(14-5) (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. (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. (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. (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. (2)Re-initialize machine system.	E4-4
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).	

(   ) ----- Reference instruction book

No.	message	Error	measure	page
120	Memory error	It became impossible to retain contents of memory.	(1) Turn power off once and turn on again. (2) If problem recurs frequently, replace LCD-CE board.	E3-2
130	Disk error	Unable to communicate continuously with memory media.	(1)Turn off power source once and turn it on again. (2)Memory media reading processor may defective. Replace the LCD-CE board.	E3-2
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.
			(2)Memory media might be defective.
			   Prepare another memory card or data
			   disk which is not defective.
			(3)Initialize 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. 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. (2) Check dirt of trim sensor or position of slit. (3)Modify the adjustment if the problem repeats. (4) Adjust sensor position.	(24-6)

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.
			(2)Adjust and correct trouble that hinders
			   motion of thread catch hook.
				(24-8)

(   ) ----- Reference instruction book

No.	message	Error	measure	page
203	Install data	Error has occurred during update of program.	Check an update program.	E4-1
215	Frm. drive err	Frame movement did not complete. during normal movement. (Time over)	(1) Check timing sensor unit and slit. (2) Install updated program.	E2-2 E4-3
217	Frm.drive data	Frm.drive data	Install updated program.	E4-3
255	Default Error	During embroidery, frame movement did not complete until main shaft reach "Lowest needle position".	Re-initialize machine speed setting. Check adjustment of upper shaft timing. (C point / L point)	E4-4

(   ) ----- Reference instruction book

E11 Tables for timing / adjustment value

		Tables for Timing/Adjustment value		
Machine No.		− 1008009	1008010 − 1017013A (2014.1)	1018001A〜 (2014.11)
Take-up lever timing		326°	←	←
Rotary hook timing		23°	←	25°
Needle height		5°	←	10°
Needle bar lowest point		0°	355°	0°
Main shaft timing	L	LED4 light out at 0 degrees (Clockwise)	←	←
	C	LED3 light on at 270-284 degrees (Clockwise)	←	←
Jump solenoid		85°	←	←