

EXCELON

Service manual



Huvitz

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I. Troubleshooting Manual

1. Precautions for Safety

1. Before/During Maintenance.

- Maintenance should be done by the service persons who are accustomed to using the instrument, and have good technical knowledge.
- Be sure to turn the power off and remove the power cord from the electricity outlet during maintenance. If not, it may cause severe electric shock.
- Be sure to follow the maintenance procedure. If not, it may cause another malfunctions, and moreover fatal harm to the instrument.
- Do not drop parts or screws inside the instrument. It may cause fatal malfunctions.
- Use a proper tool during maintenance.
- When using grease be sure to refer to maintenance book to avoid misusing.

2. After Maintenance.

- Before turning on the power, be sure to check if the replaced parts are fixed securely to the right place.
- In case of strange odors or smoke being emitted from the machine, turn OFF the machine immediately and disconnect the power cord.

3. Cleaning.

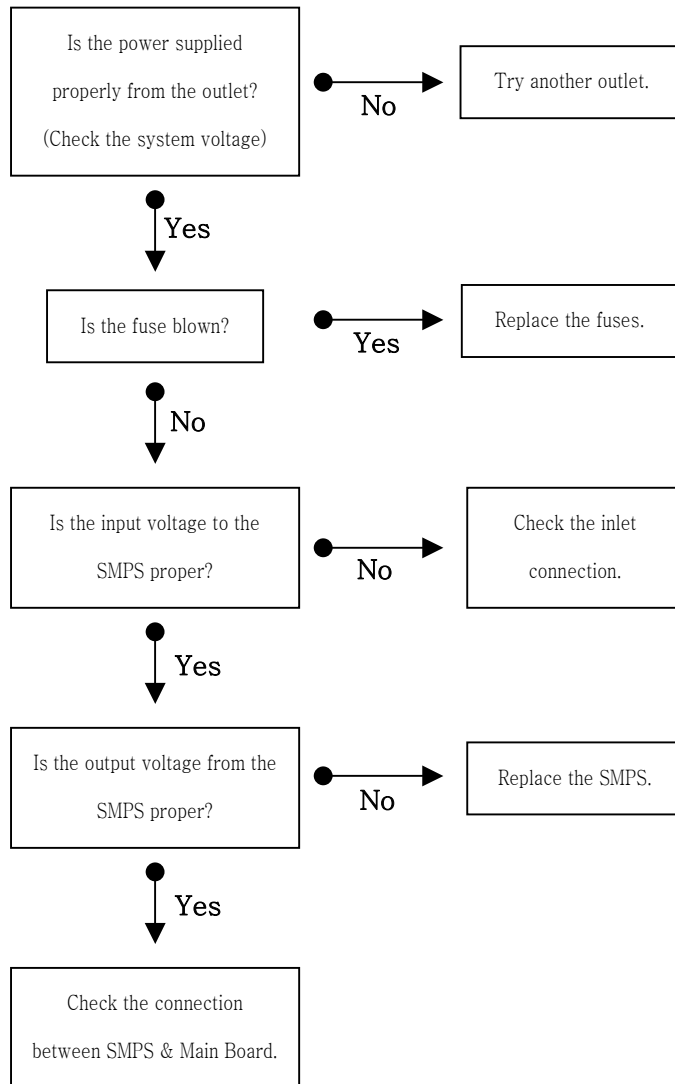
- Do not spray water inside the machine. Only inside the edging room is allowed.
- Be careful when using grease. Be sure to check where to paste or where not to.
- Do not wipe out any covers with chemical solvents.

2. Precautions for Installation

1. Be sure to check if the locking brackets are removed.
2. Be sure to check if the power output is suitable and stable.
3. Be sure to set the machine on a leveled place or table.
4. Never run the machine with the Main cover open.

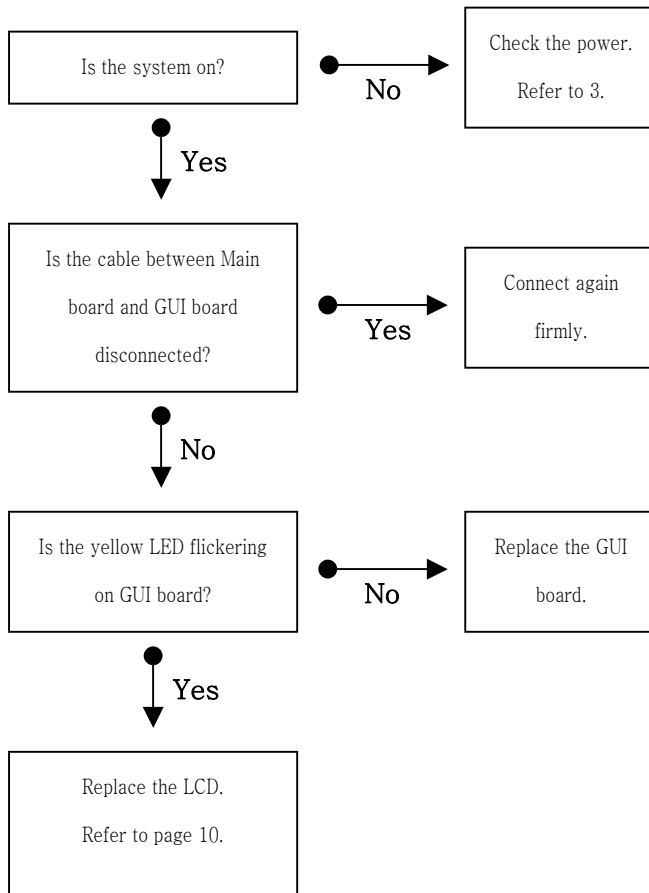
3. Malfunction during Power UP

3.1 System is not on.

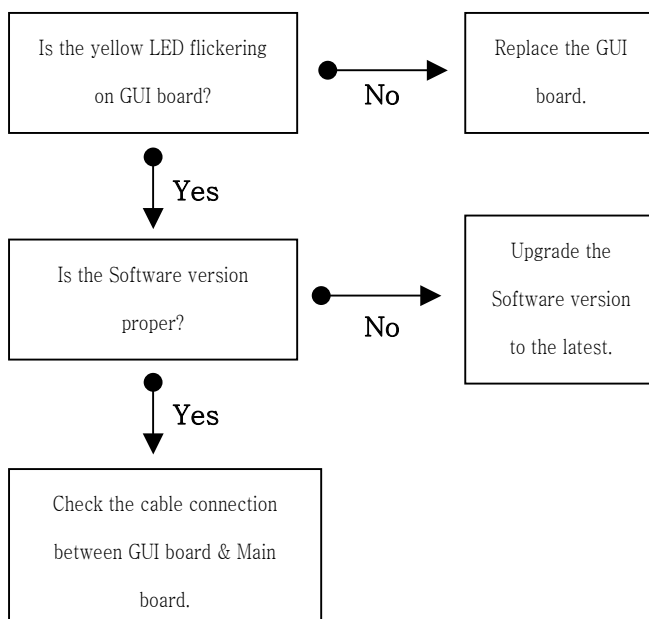


4. Malfunction at Display

4.1 LCD is not on.

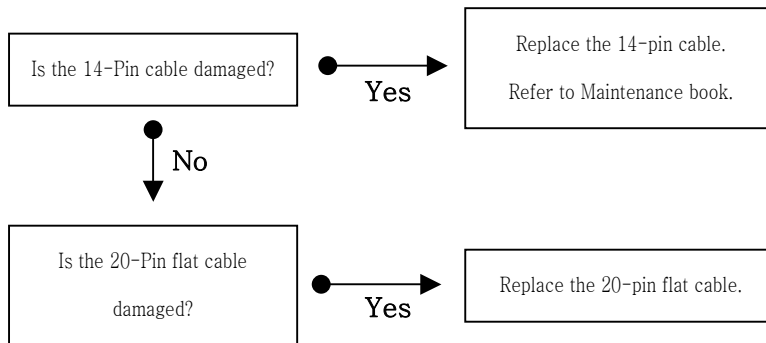


4.2 Screen freezes.



5. Malfunction at Frame Reader

5.1 Stylus goes up and is stuck. Sometimes repeats up-down and then, stops.



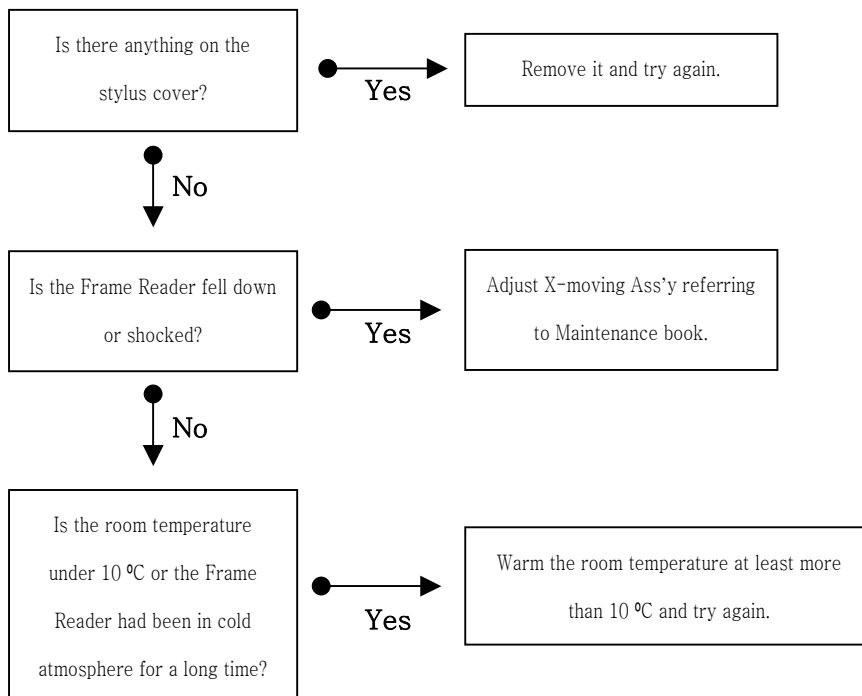
5.2 Frame shapes are significantly different or distorted.

5.2.1 Perform maintenance referring to 5.1

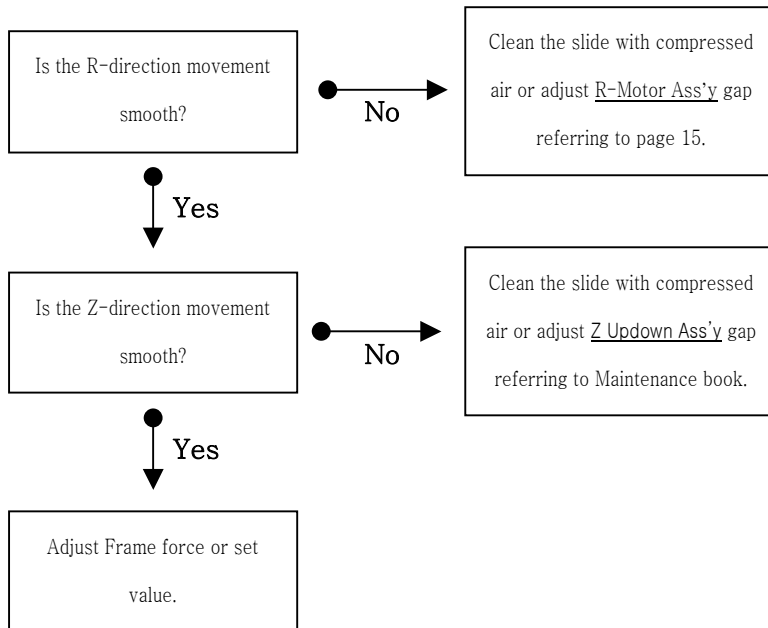
5.2.2 Perform Frame & Pattern Calibration.

5.3 Strange noise from the inside of the Frame Reader.

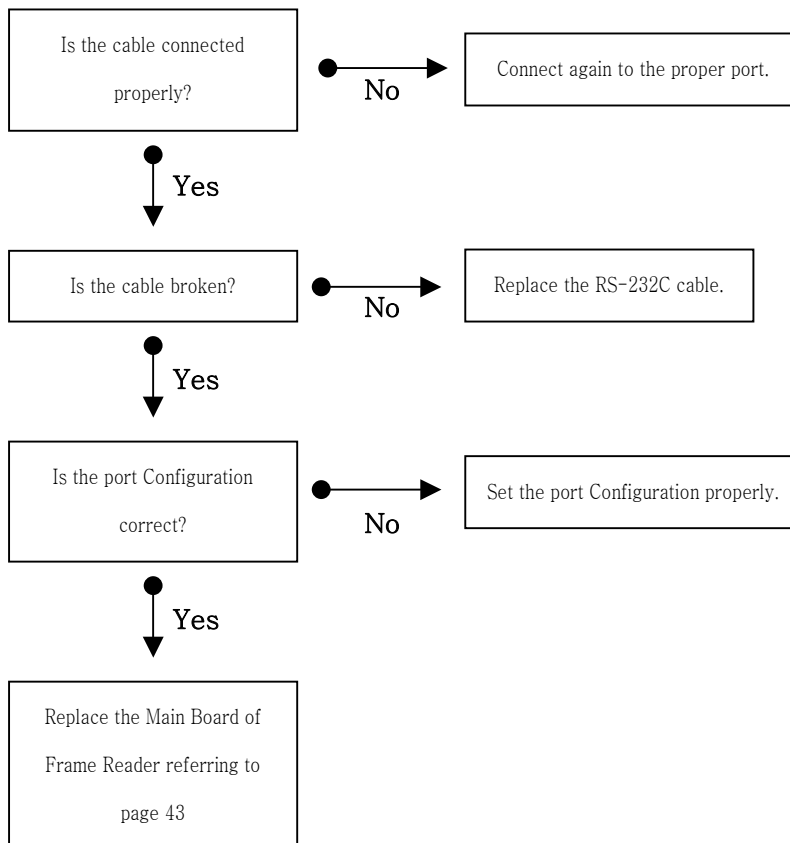
Stylus doesn't move to the left or right and starts reading at wrong position.



5.4 Stylus falls off a frame during reading.



5.5 After reading frame, “transmitting” message appears, but the data isn’t transmitted to the edging body.

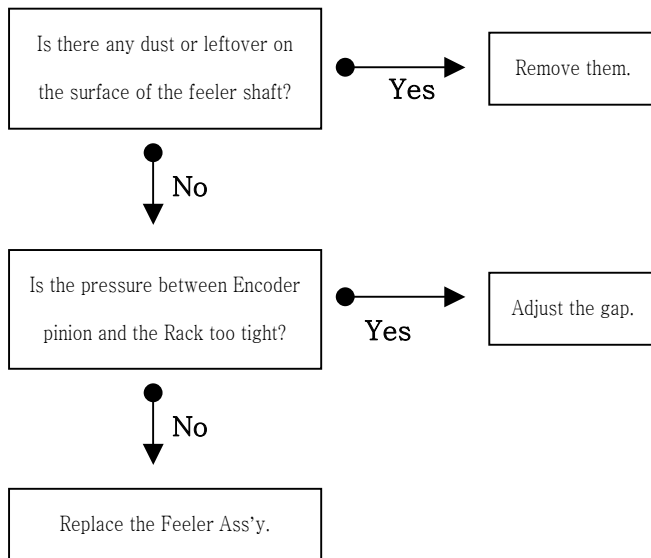


6. Malfunction during edging

6.1 Feeler doesn't move down.

Check the feeler PI position and adjust the backlash of between Rotate Worm and Worm wheel Ass'y.

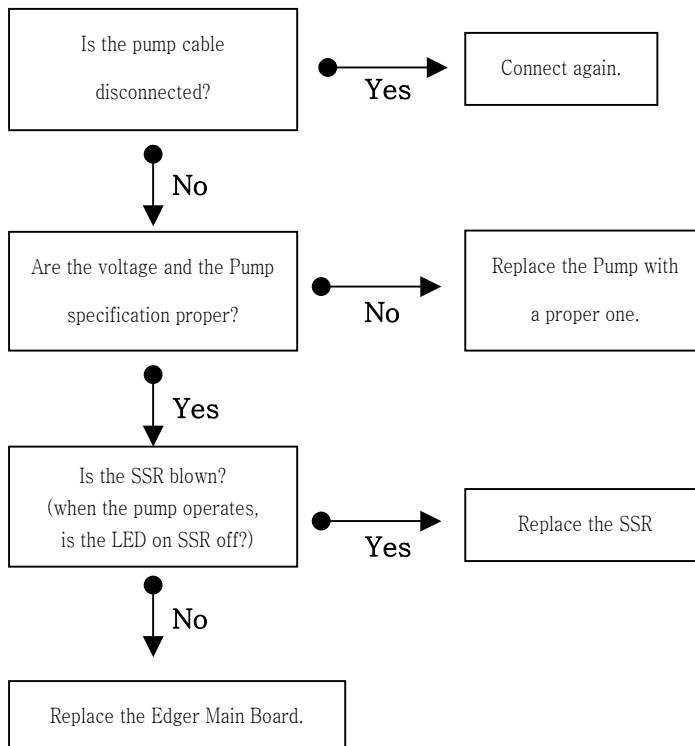
6.2 Feeler doesn't contact with lens.



6.3 Wheel doesn't rotate.

Check the Inverter cable.

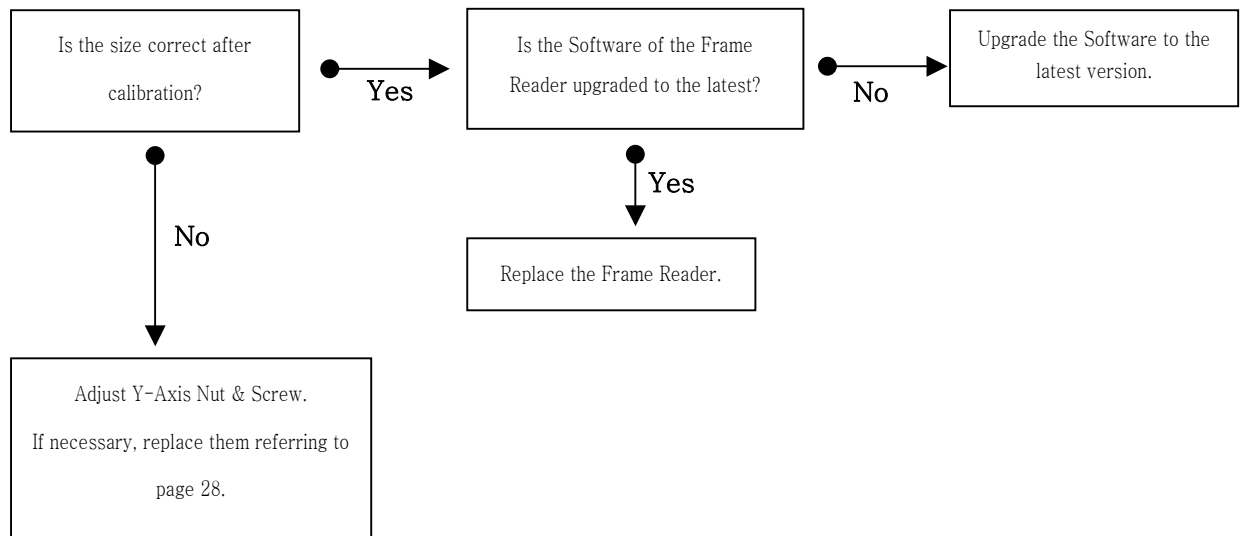
6.4 Water doesn't come out.



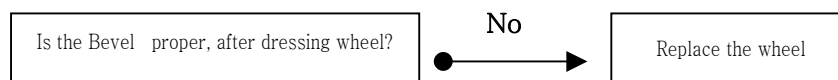
6.5 Bevel & Groove position varies oftenly.

Check the Feeler Ass'y referring to 6.2.

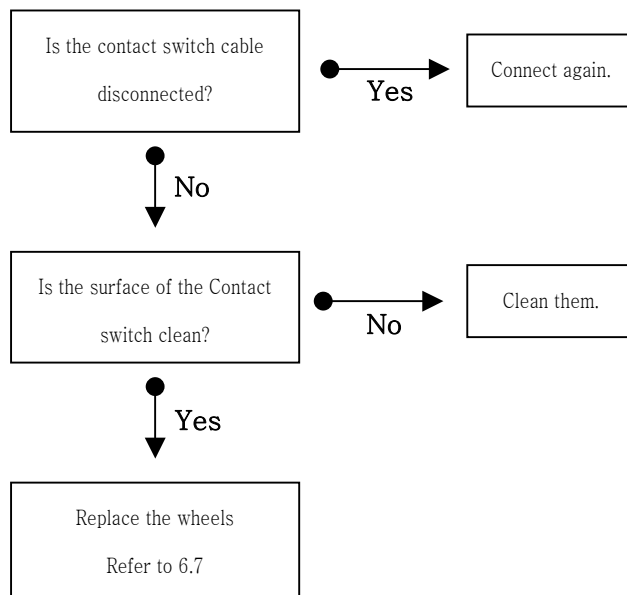
6.6 Sometimes lens size error between left and right occurs.



6.7 Bevel is rounded off.



6.8 Grinding takes too much time.



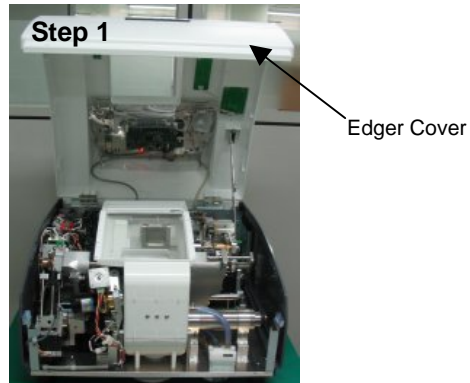
6.9 Lens axis shifted.

Use proper blocks, proper tapes and choose proper Edging Option.

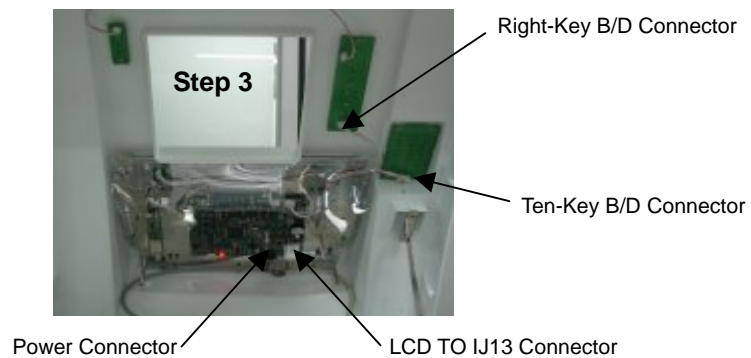
II. Edging Body Maintenance Manual

1. LCD Monitor Replacement

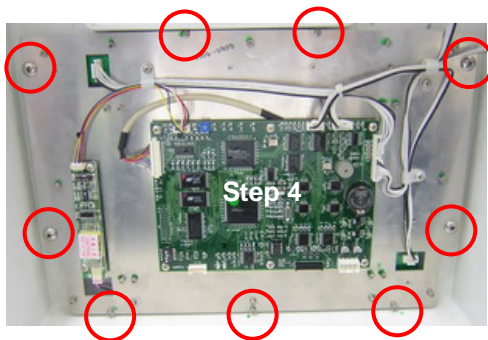
1. Open the Main Cover.



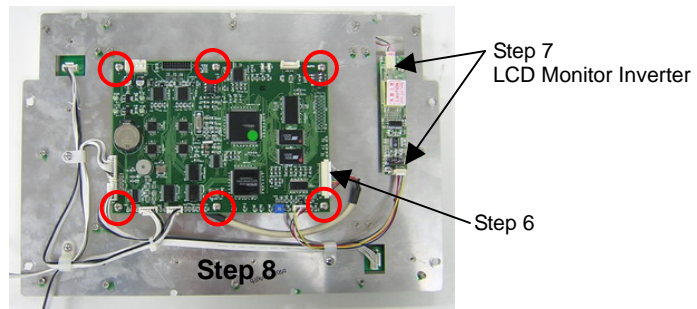
2. Remove the protection plastic cover of the LCD Ass'y.
3. Disconnect the four connectors linked to the GUI Board.



4. Remove all screws that are shown in below picture and Separate the LCD Ass'y.



5. Separate the LCD Window from the LCD Ass'y.
6. Disconnect all connectors.
7. Separate the GUI Board.



8. Replace LCD with a new one.
9. Assemble all removed parts in reverse order.

Caution

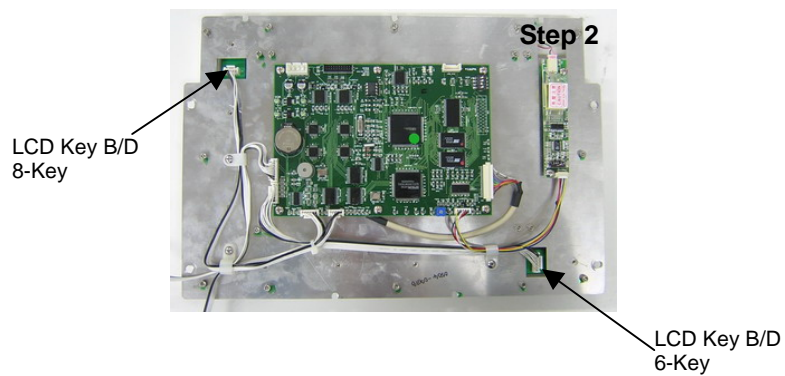
- Be careful with the surface of LCD.

Adjustment needed

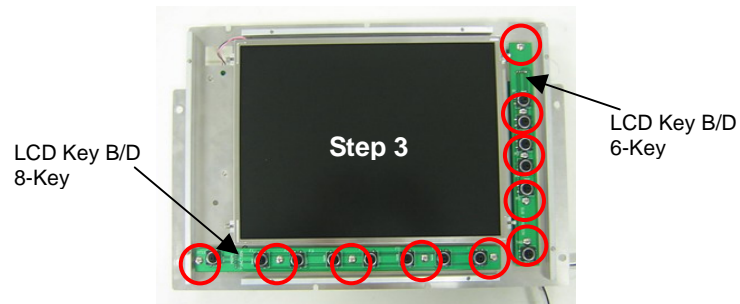
- None

2. LCD Key Board Replacement

1. Separate the LCD Ass'y from the Main Cover.



2. Remove the front acryl window and Separate wrong Key Board.



3. Replace it with a new one.
4. Assemble all parts in reverse order.

Caution

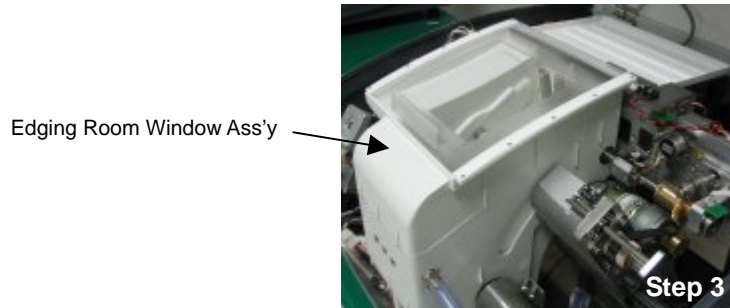
- Be sure to check whether every key function is right or not.

Adjustment needed

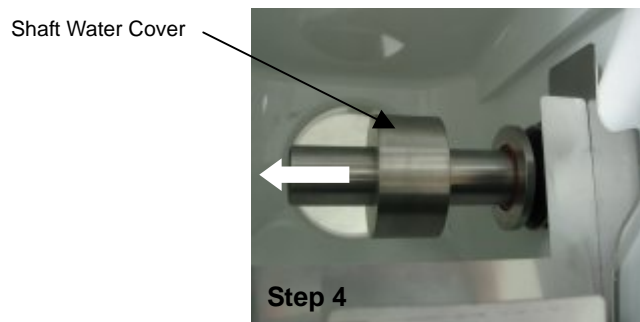
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3. Spindle Ass'y Bearing Replacement

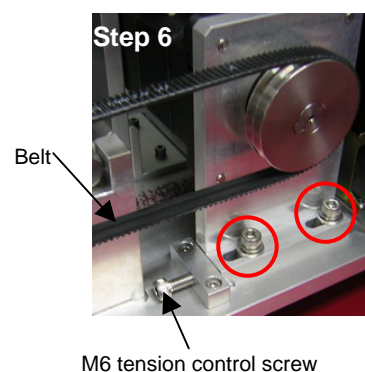
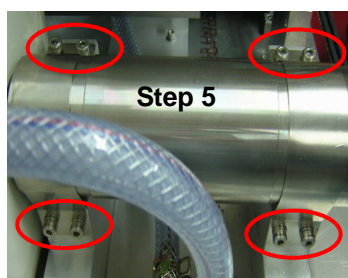
1. Open the Main Cover.
2. Remove the Edger right cover.
3. Remove the Edging room window Ass'y.



4. Remove the four Grinding Wheels and the Shaft Water Cover.
Refer to [12-1 Grinding Wheel Replacement] section.



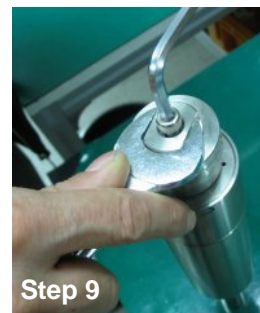
5. Remove the two Spindle holders.



6. Loosen the Tension control screw from Base Motor Pusher and loosen locking screws of the Motor Bracket.
7. Remove the Belt.
8. Separate the Spindle Ass'y from the Edging room.
9. Remove locking screw of the right side of the Spindle Ass'y with adequate tools.

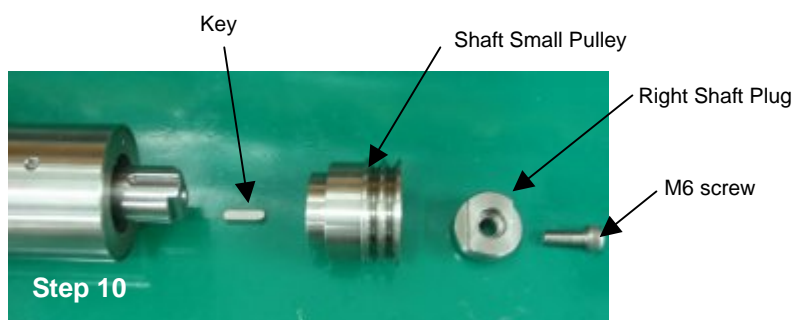


Spindle Ass'y



Step 9

10. Remove the Right Shaft Plug, Shaft Small Pulley and Key.

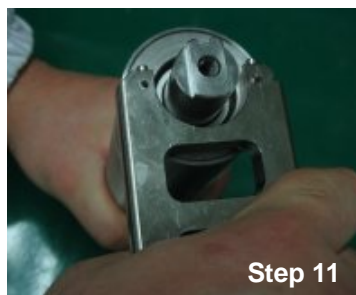


Step 10

11. Remove the Right Shaft Cover with adequate tool.



JIG



Step 11

12. Remove the O-ring and Shaft Water Cover Spacer.



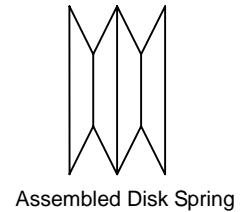
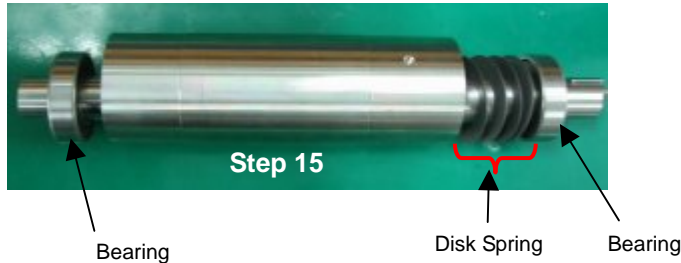
Step 12,13,14

13. Remove the two V-rings.

14. Remove the Left Shaft Cover with tool.

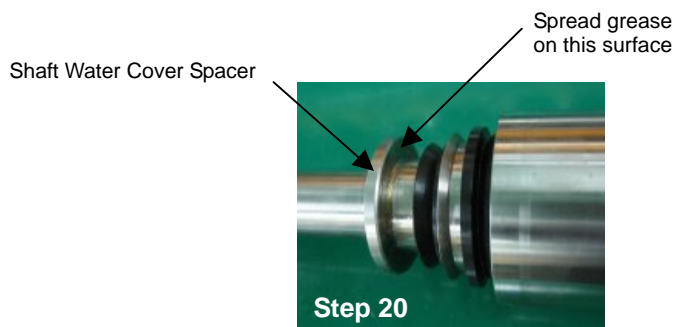
15. Separate ball bearings from both side of the Shaft Housing.

Be sure to remember the insertion direction of the Disk Springs when extracting the right side bearing.



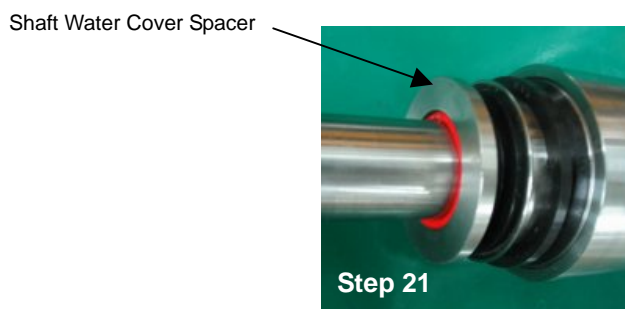
16. Replace them with new ones (6004ZZ).
 17. Assemble the Right Shaft cover.
 18. Assemble the Left Shaft cover.
 19. Insert V-rings. (If necessary, replace it with a new one)
 20. Insert the Shaft water cover spacer.

Be sure to spread mechanical grease between V-ring and Shaft water cover spacer.

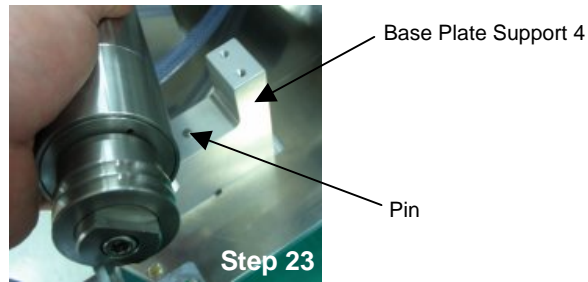


21. Insert O-ring into the Spindle Shaft Main.

The O-ring should be squeezed into the Shaft water cover spacer.

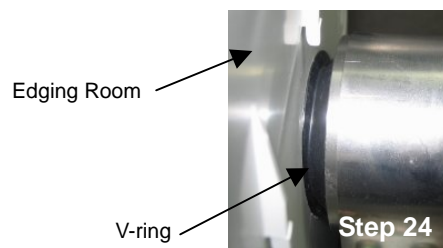


22. Assemble all parts in reverse order.
 23. Assemble Spindle Ass'y in reverse order. Be sure to fit the position with location pin.



24. Fit the Edging room and V-ring like below picture.

If necessary, spread some waterproof grease or something.



25. Assemble Spindle Ass'y holder in reverse order.

Be sure to check whether the Spindle Ass'y moves or not.

26. Assemble the Belt in reverse order and fit the belt tension between 90~100Hz or the deflection amount between 7 ~ 10mm when pressed in the middle of the belt.

27. Assemble wheels in reverse order.

Refer to [12-1 Grinding Wheel Replacement].

28. Assemble covers in reverse order.

Caution

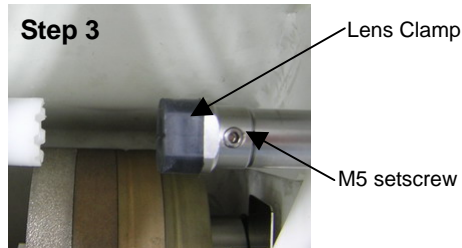
- Do not change the direction of the Disk Spring. (Step 15)
- There should be no water leakage.(Step 25)

Adjustment needed

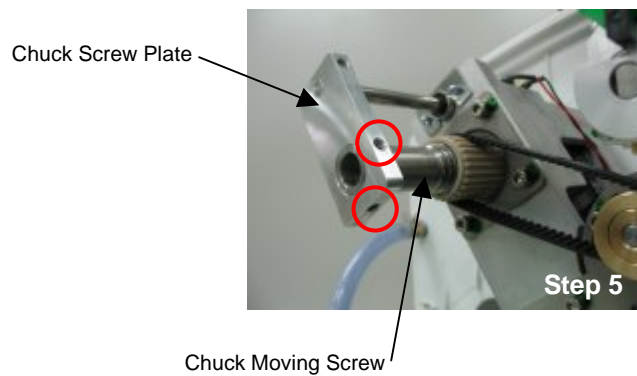
- Check whether the Wheel Ass'y works right in the Test Mode.
- After performing Size Calibration, check the Bevel Adjustment.
- If Bevel Adjustment value is changed, check the Size Adjustment.
- If there's large amount of vibration or noise, adjust belt tension or wheel balance again.

4. Clamp Screw & Nut Replacement

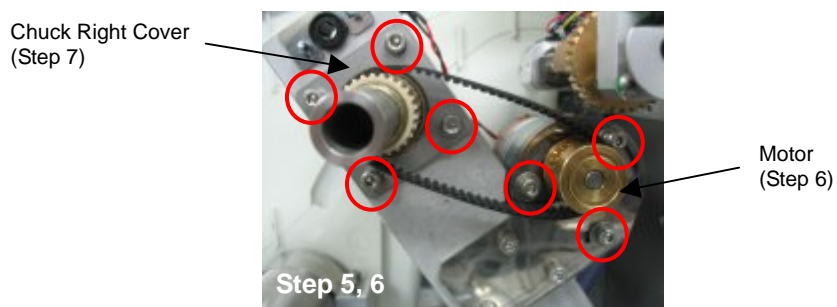
1. Open the Main Cover and right side cover.
2. Remove the Edging room window.
3. Remove the Lens Clamp.



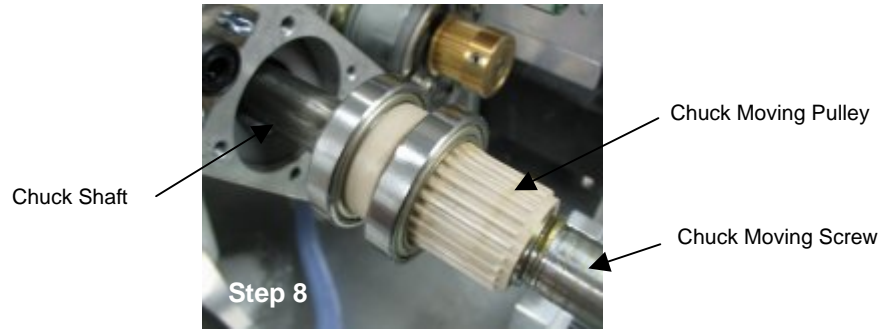
4. Loosen two setscrews from the Chuck Screw Plate and separate the Chuck Screw Plate from the Chuck Moving Screw.



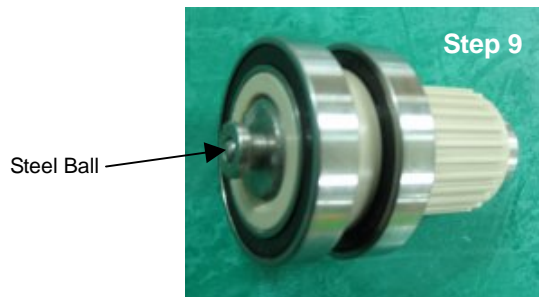
5. Loosen the three locking screws of the Motor bracket.
Remove the Belt.



6. Remove the Chuck right cover.
7. Extract the Chuck Moving Pulley slowly.
The Chuck Moving Screw, the Chuck Moving Pulley and the Chuck Shaft are linked each other.



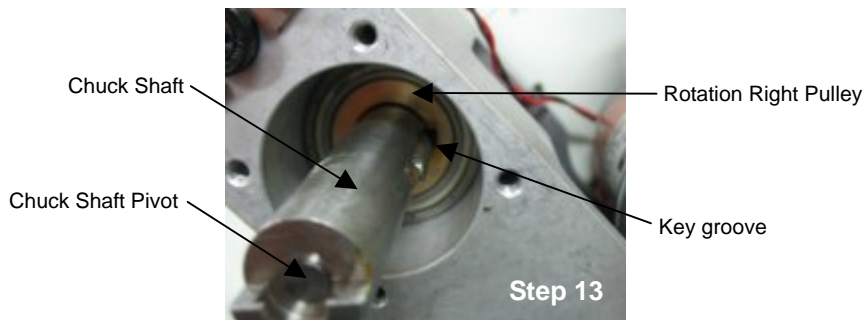
8. Separate the Chuck Moving Screw from the Chuck moving pulley.



9. Replace the new Chuck moving pulley ass'y.

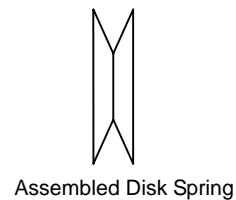
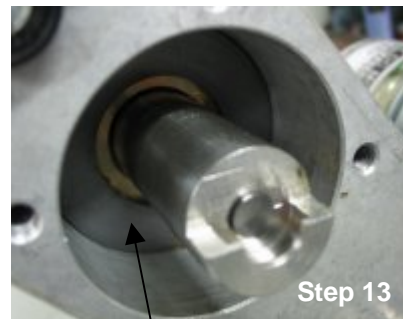
10. If necessary replace the steel ball with new one and spread mechanical grease enough.

11. If the Chuck Shaft Pivot is damaged, replace with new Chuck Shaft and new Chuck Shaft Pivot.

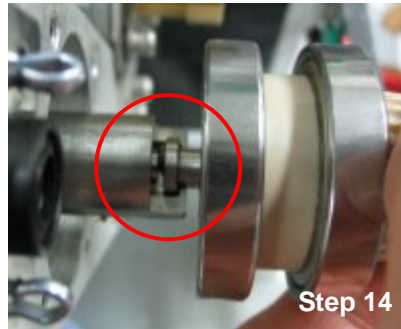


12. Spread the grease around the key of the Chuck Shaft.

13. Assemble the two Disk Springs like below picture.



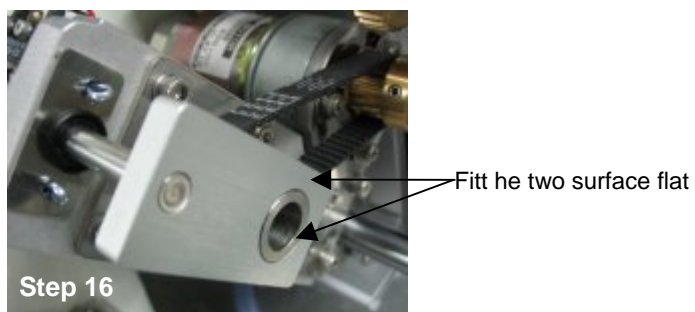
14. Assemble the Chuck moving pulley and Chuck shaft in reverse order. Be sure to hook Chuck Shaft Pivot with Chuck Moving Screw. Refer to below picture.



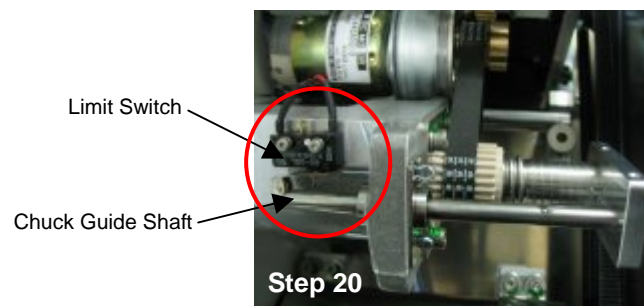
15. Assemble belt in reverse order. Belt deflection amount is about 3 ~ 5mm when the belt is pressed.

16. Assemble Chuck screw plate in reverse order.

Fit the Moving screw end and Plate surface to be aligned.



17. Be sure to check whether the Limit Switch functions rightly.



18. Assemble all parts in reverse order.

Caution

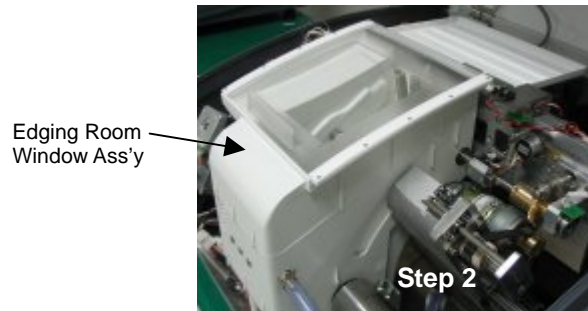
- Check whether Chuck Shaft moves smoothly.
- Be sure to put steel ball in right position. (Step 15)

Adjustment needed

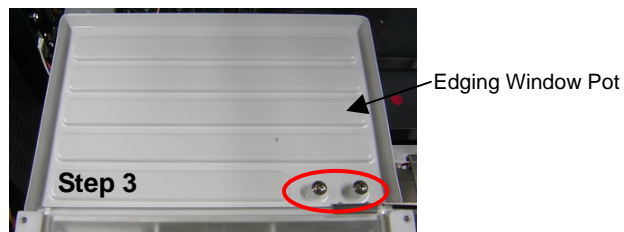
- Check whether Clamping process work rightly in the Test Mode.

5. Feeler Ass'y Replacement

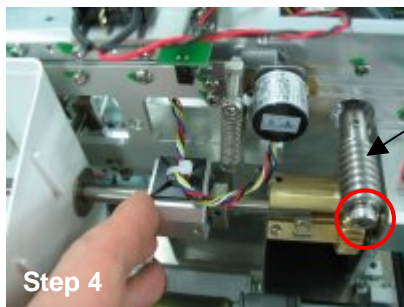
1. Open the Main Cover.
2. Remove the Edging Room Window Ass'y.



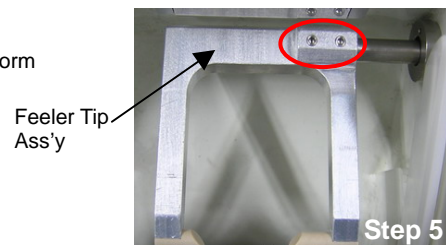
3. Remove the Edging Window Pot.



4. Rotate the Feeler Rotate Worm manually and let the Feeler Tip Ass'y go downward as below picture. Remove the Feeler Tip Ass'y.

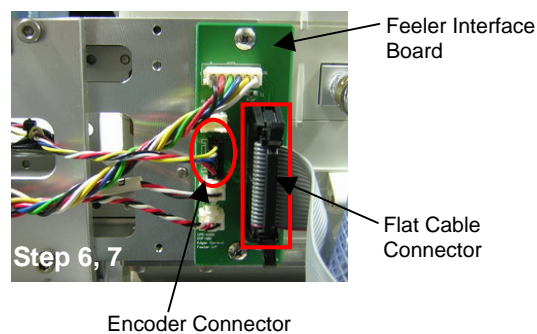


Feeler Rotate Worm



Feeler Tip Ass'y

5. Disconnect the Flat Cable linked between the Motor Control Board and the Feeler Interface Board.
6. Disconnect the Encoder Connector linked to the Feeler Interface Board.

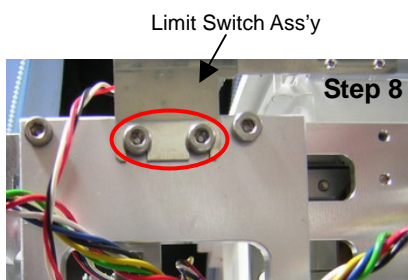


Feeler Interface Board

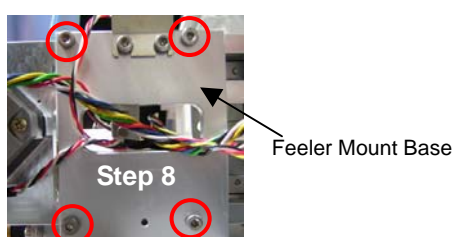
Flat Cable Connector

Encoder Connector

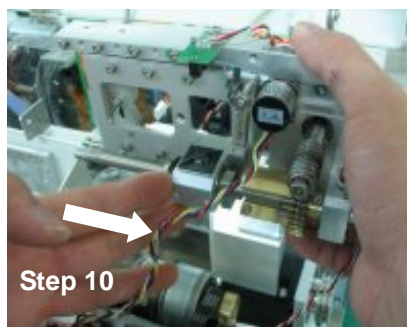
7. Remove the Window Cover Limit Switch Ass'y.



8. Remove four screws that are connecting Feeler Ass'y and Feeler Mount Base.
9. Remove screw connecting Edging Room and Feeler Ass'y.

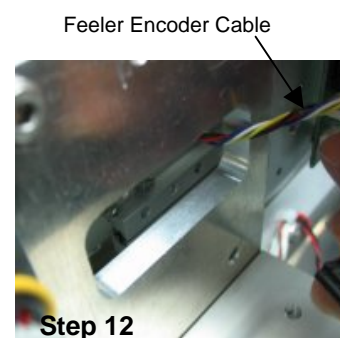
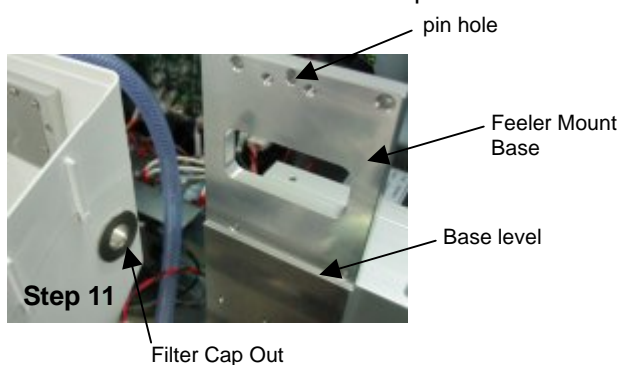


10. Separate the Feeler Ass'y to the right direction as below picture.



11. If there are a lot of dusts in Filter Cap, then remove them. If necessary, separate the Filter Cap.
12. Assemble the Feeler Ass'y in reverse order.

Be sure to let the Feeler Encoder Cable passes the rectangle slot of Feeler Mount Base.



13. After finishing assembling the Feeler Ass'y, check the smoothness of the Feeler Tip Ass'y.

14. Assemble all parts in reverse order.

Caution

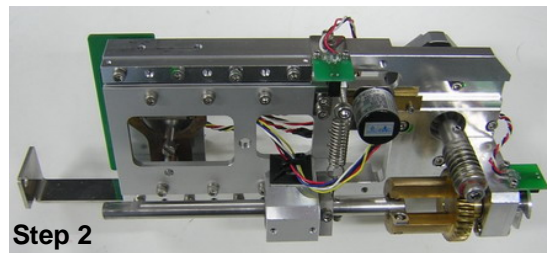
- Be sure to check smoothness of the Feeler.(Step 13)

Adjustment needed

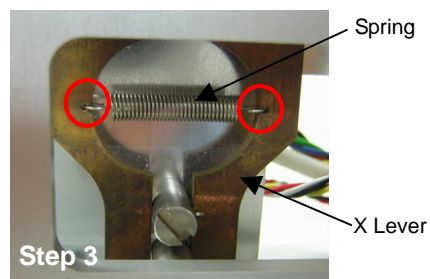
- Check whether the Feeler Ass'y functions are right in the Test Mode.
- After performing Feeler Calibration, check the Bevel Adjustment.
- If the Bevel Adjustment value is changed, check the Groove & SFB Adjustment.

6. Feeler Ass'y X Lever Spring Replacement

1. Refer to step 5 to separate the Feeler Ass'y.



2. Remove the spring linked between the two X Lever by the tweezers or adequate tool.



3. Replace it with a new one.
4. Assemble Feeler Ass'y referring to step5.

Caution

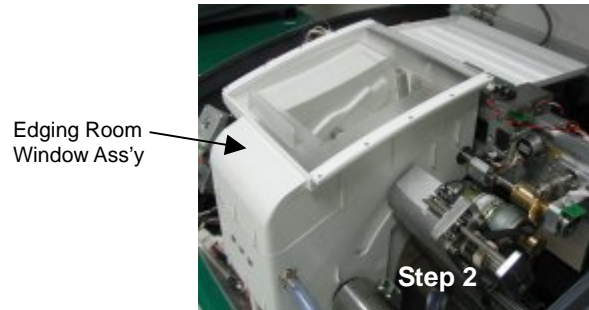
-

Adjustment needed

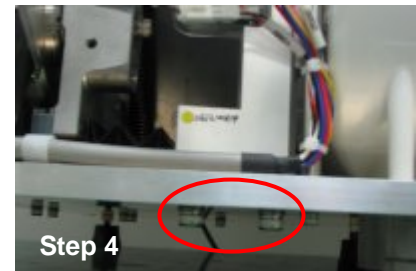
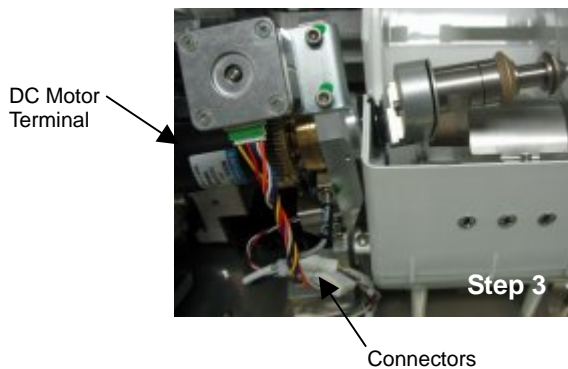
- Check whether the Feeler Ass'y functions are right in the Test Mode.
- After performing Feeler Calibration, check the Edging quality.
- If the Bevel Adjustment value is changed, check the Groove & SFB Adjustment.

7. SBG Ass'y Replacement

1. Open the Main Cover.
2. Remove the Edging Room Window Ass'y.



3. Disconnect all connectors.
4. Remove two locking screws from the bottom of the Edger.



5. Replace it with new one.
6. Assemble all removed parts in reverse order.

Caution

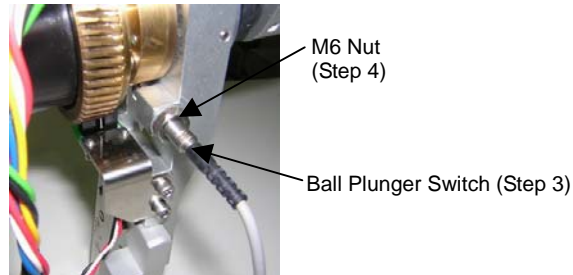
- Be sure to check if there is any water leakage while lens edging.

Adjustment needed

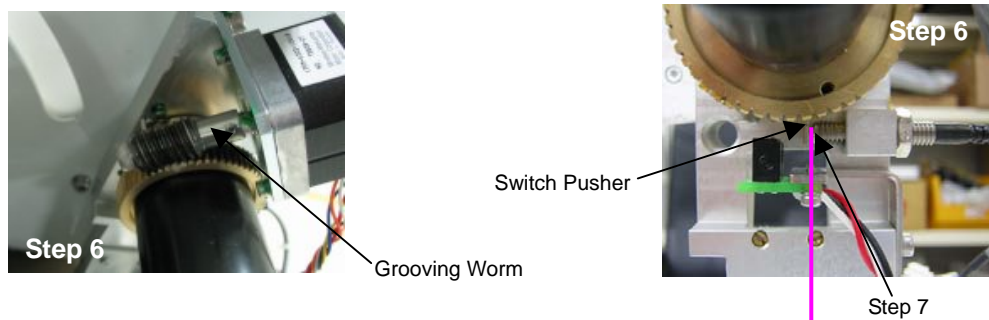
- Check whether the SBG Ass'y functions rightly in the Test Mode.
- Perform SBG Calibration and Groove & SFB Adjustment.

8. SBG Ass'y Ball Plunger Switch Replacement

1. Open the Main Cover.
2. Remove the Edger left cover.
3. Disconnect the Ball Plunger Switch Connector from the SBG Ass'y.



4. Take out the Plunger Switch.
5. Replace it with a new one and insert it a little bit temporarily.
6. Manually rotate grooving worm and set Switch Pusher to vertical position. (Wear gloves when rotating Grooving Worm)



7. Insert Plunger Switch until it touches the Switch Pusher completely.
8. Tighten the M6 Nut to fix the Ball Plunger Switch.
While fixing Plunger Switch, be sure to grab it tightly so that it doesn't move.
9. Connect the Ball Plunger Switch Connector.
10. Assemble all removed parts in reverse order.

Caution

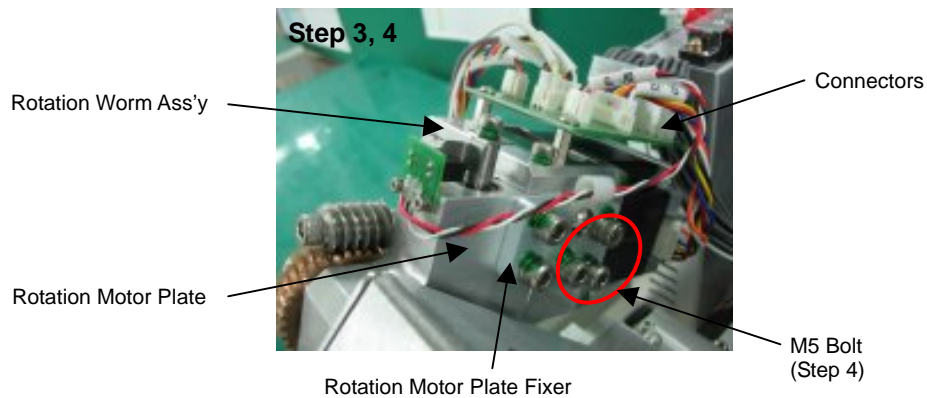
-

Adjustment needed

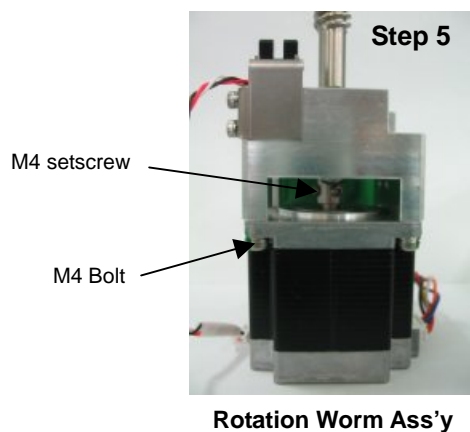
- Check whether the Ball Plunger Switch functions are right in the Test Mode.
- Perform SBG Calibration and Groove & SFB Adjustment.

9. Rotation Worm & Worm Wheel Replacement

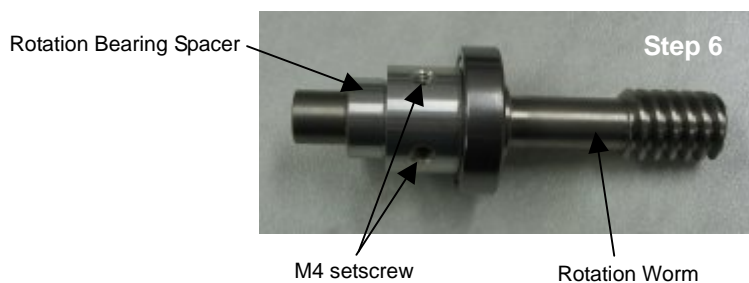
1. Open the Main Cover.
2. Remove the Edger left side cover
3. Disconnect all connectors.



4. Remove three screws and separate Rotation Worm Ass'y.
5. Loosen setscrews shown in below picture.

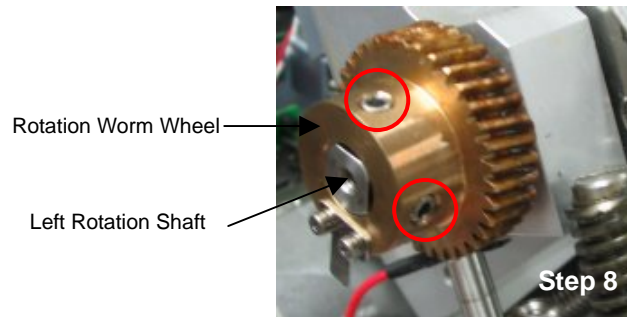


6. Remove Stepping Motor then separate Rotate Worm as below picture.



7. Replace it with a new one.

8. Loosen setscrews and separate Rotation Worm Wheel.



9. Replace it with a new one. Before tightening setscrews, be sure to press worm wheel until the surface and Left Rotation Shaft's end to be aligned.
10. Assemble all removed parts in reverse order.

Caution

- Be sure to make the backlash between Rotation Worm and Rotation Worm Wheel to be the least.

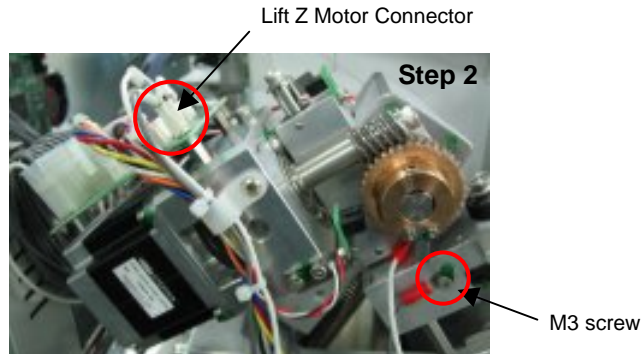
Adjustment needed

- Check whether rotation functions rightly in the Test Mode.
- After performing Size Calibration, check the Axis Adjustment.

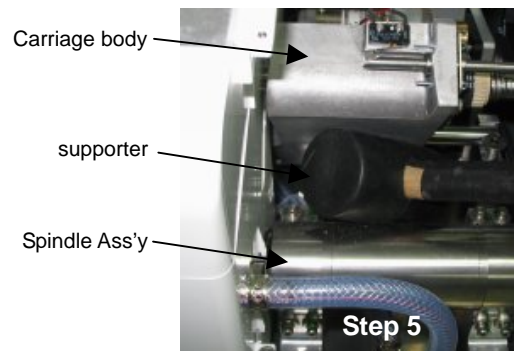
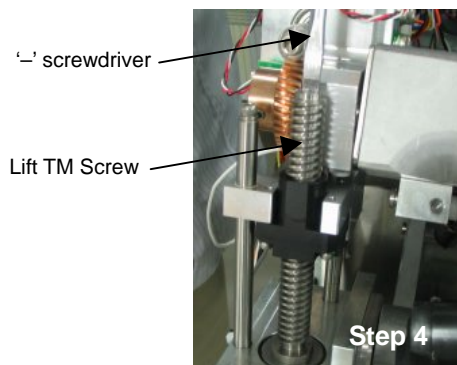
10. Y-axis Screw & Nut Replacement

1. Open the Main Cover and Edger Left Side Cover.
2. Disconnect the Lift Z Motor Connector.

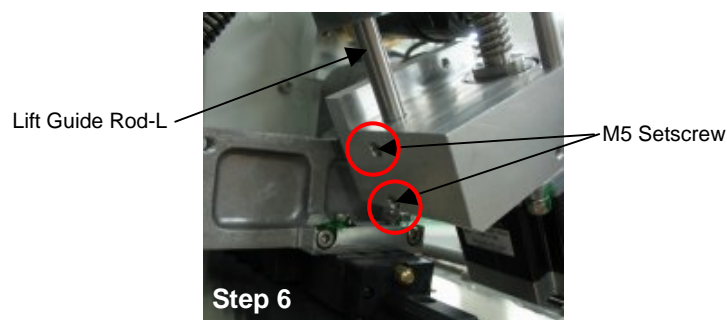
After loosening screw, separate the Contact Switch Terminal.



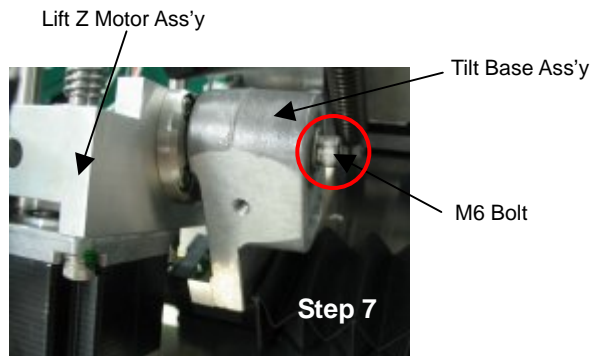
3. Remove Rotation Worm & Worm Wheel Ass'y referring to [Step9-Rotation Worm & Worm Wheel Replacement].
4. Rotate Lift TM Screw's '-' slot clockwise using a screwdriver. And let the Carriage Ass'y to be the lowest position.
5. Support the Carriage Body and Spindle Ass'y to avoid bumping with each other.



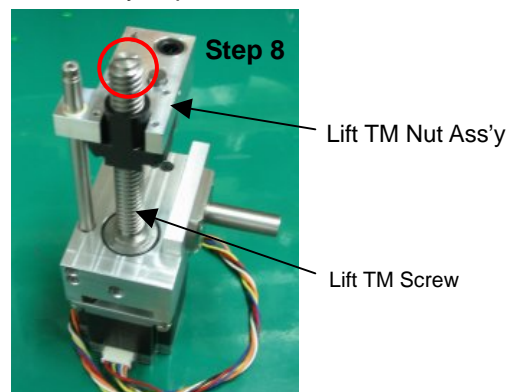
6. Loosen setscrews as shown in below picture and pull out Lift Guide Rod-L.



- Remove screw as shown in below picture and separate Lift Z Motor Ass'y from the Tilt Base Ass'y.

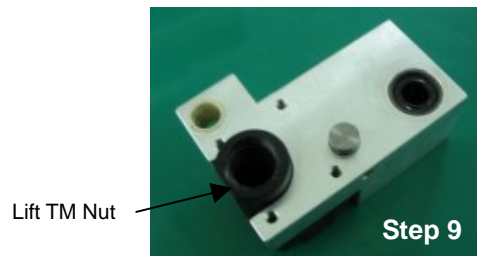


- Rotate the TM Screw until Lift TM Nut Ass'y separated.



Lift Z Motor Ass'y

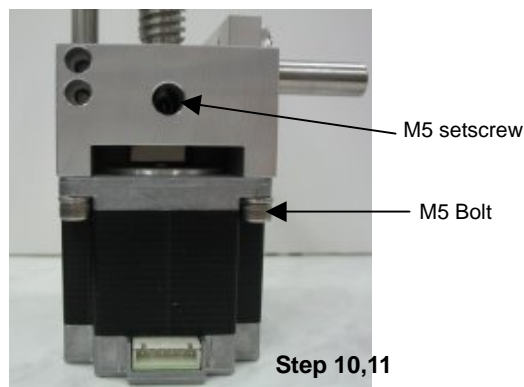
- Replace the TM Nut with a new one. Let the four screws to be loosened.



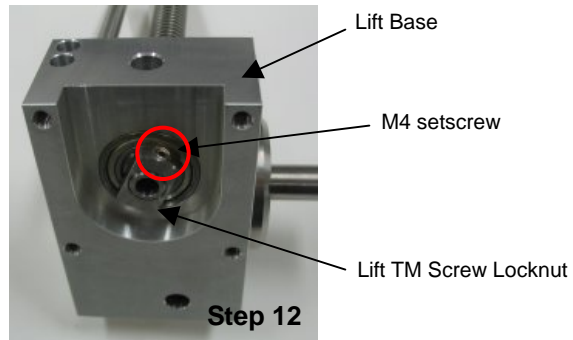
Lift TM Nut Ass'y

- Remove setscrews from the Lift Z Motor Ass'y as shown in below picture.

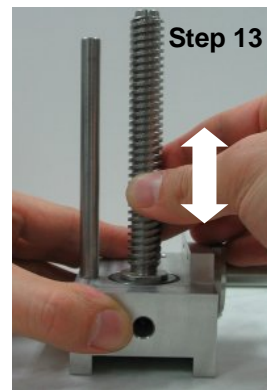
- Remove the Stepping Motor.



12. Loosen setscrew of the Lift TM Screw Locknut and separate the Locknut while rotating it.
Separate the TM Screw at the same time.

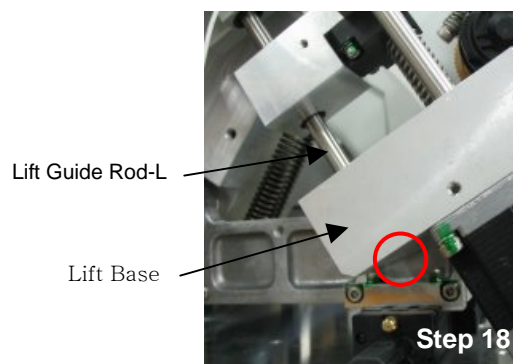


13. Replace the Lift TM Screw and if necessary, use new bearings.
Be careful with the direction of Thrust Bearing.

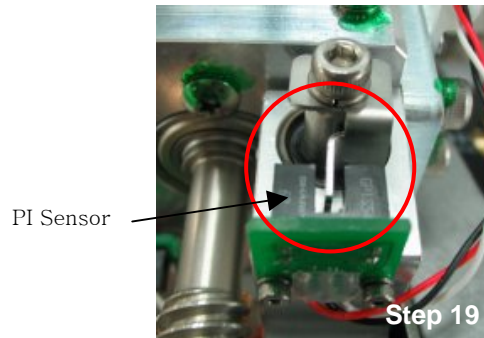


Lift TM Screw

14. Tighten the Locknut until it doesn't move up and down and tighten setscrew.
15. Assemble all removed parts in reverse order. Be careful when inserting Lift Guide Rod so that it doesn't damage ball bush.



16. Check the Pi Sensor's position when the Lift Guide Rod-L is assembled. Sensor dog should be in the middle of the PI slot.



17. Assemble all parts in reverse order.

Caution

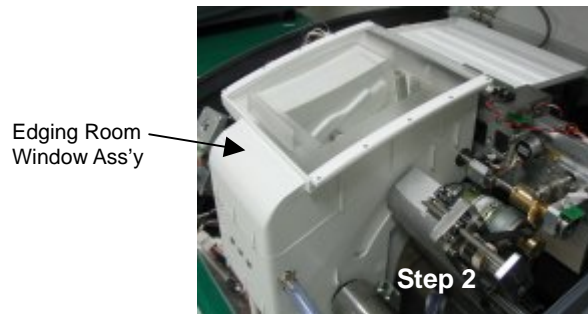
- Be sure to protect the Contact Switch surface. The surface should be clean both side.

Adjustment needed

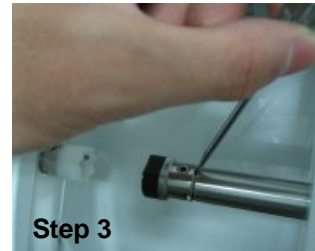
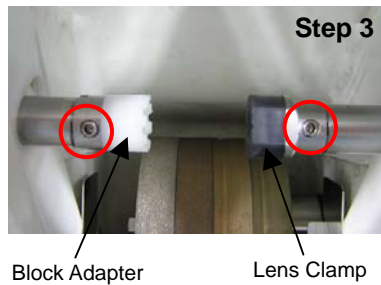
- Check whether the Z-movement functions rightly in the Test Mode.
- Perform Size calibration and all adjustment.

11. Edging Room Shaft Bush Replacement

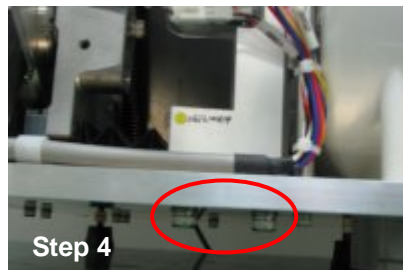
1. Open the Main Cover.
2. Remove the Edging Room Window Ass'y.



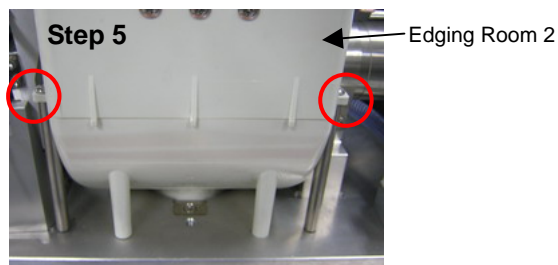
3. Remove the Block adapter and Lens clamp.



4. Loosen the SBG Ass'y slightly as below picture.



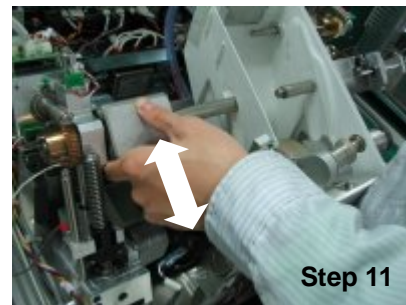
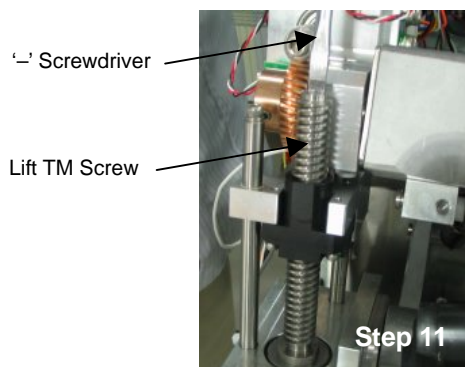
5. Loosen Edging Room2 slightly as below picture.



6. Lifting the Edging Room2 up a little bit, pull out both of the Edging Room Slider.
7. Pull out the both Edging Room Shaft Bush from the Shaft.



8. Replace them with new ones.
9. Assemble the Edging Room Slider in reverse order.
Be sure to confirm the Left and Right. They are symmetric distinctively.
10. Tighten Edging Room2 loosened in step5.
Rotate the Left TM Screw to make the Carriage Ass'y to be the lowest position.
Move the Carriage Ass'y up and down a few times to check whether it moves smoothly.



11. Assemble all parts in reverse order.

Caution

- Don't impact the Contact Switch by dropping Carriage. (Step 10)

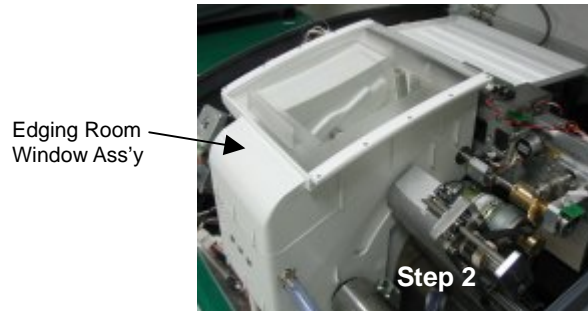
Adjustment needed

- Perform Y-Test and X-Test in the Test Mode.

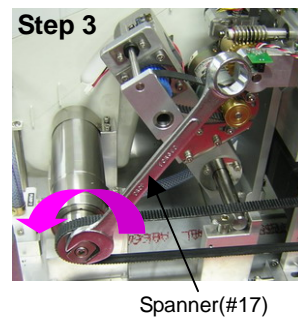
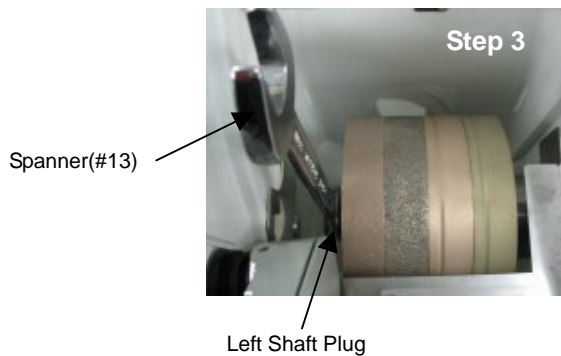
12. Replacement and maintenance of the consumable parts.

1. Grinding Wheel Replacement

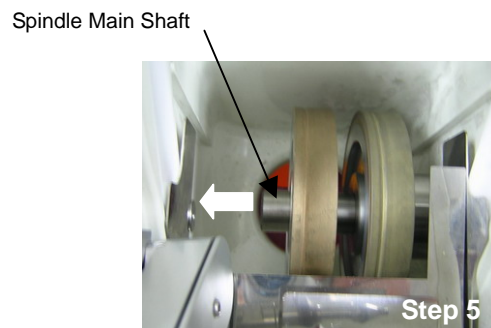
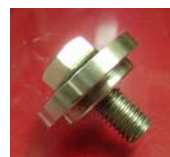
1. Open the Main Cover.
2. Remove the Edging Room Window Ass'y.



3. Grab the Left Shaft Plug with Spanner(#13) and the Right Shaft Plug with spanner(#17) of the Spindle Ass'y and then, unlock them to the direction as below picture.



4. Hold the Left Shaft Plug with fingers and rotate the Belt. Then remove the Left Shaft Plug from the shaft.
5. Remove the Grinding Wheels from the Spindle Main Shaft.



6. If necessary, clean the Main Shaft.
7. Spread a little of mechanical grease into the center hole of the new Wheels.
8. Replace the Wheels with new ones in reverse order. Be sure to check the wheel rotation direction.
7. Assemble all parts in reverse order.

Caution

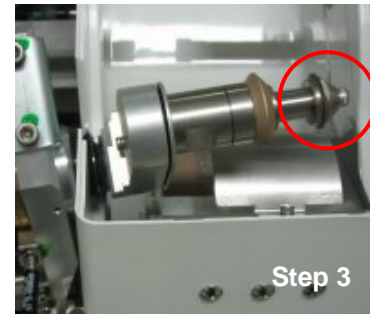
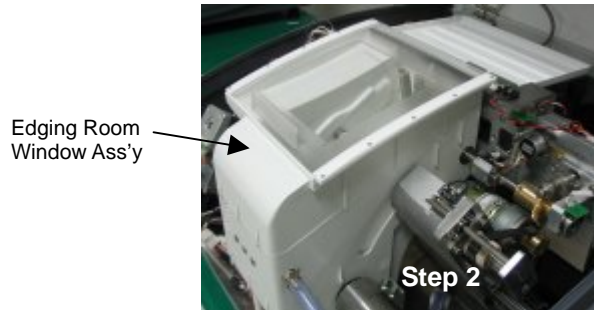
- Be careful of the insertion direction and order of the Grinding Wheels.

Adjustment needed

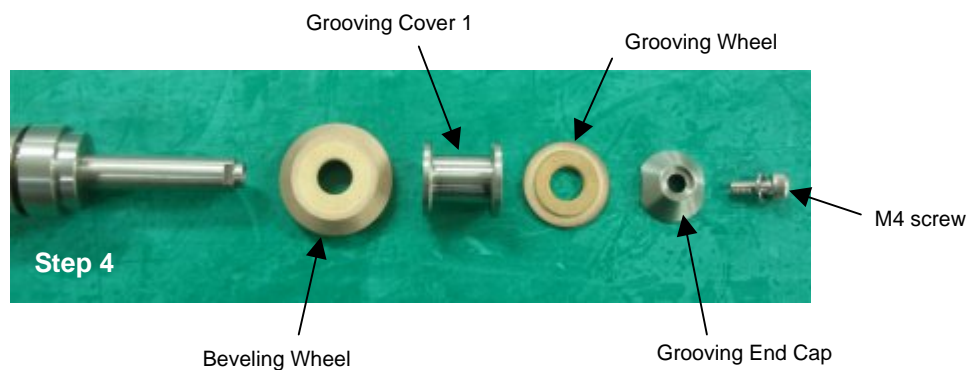
- Check whether the Wheel Ass'y functions are right in the Test Mode.
- Perform size calibration and all adjustments.

2. SBG Wheel Replacement

1. Open the Main Cover.
2. Remove the Edging Room Window Ass'y.



3. Remove locking screw with spanner(#15) and wrench.
4. Separate the Grooving End Cap, the Grooving Wheel, the Grooving Cover1 and the Beveling Wheel in orders.



5. Replace the Wheels with new ones in reverse order.
6. Assemble all removed parts in reverse order.
7. Be sure to check whether all parts attached tightly to prevent water leakage.
8. Assemble all parts in reverse order.

Caution

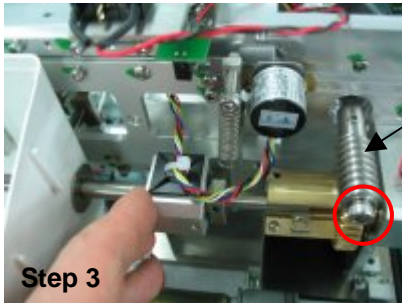
- Confirm that there is no sway between the Wheels and the other part. (Step 7)

Adjustment needed

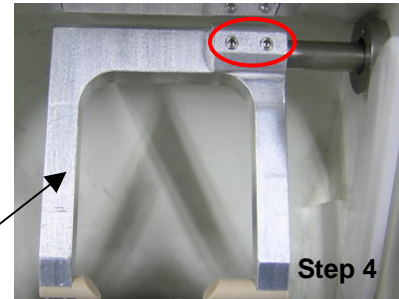
- Perform SBG calibration and Adjustment.

3. Feeler Tip Replacement

1. Open the Main Cover.
2. Remove the Edging Room Window.
3. Separate Feeler Tip Ass'y referring to STEP5.

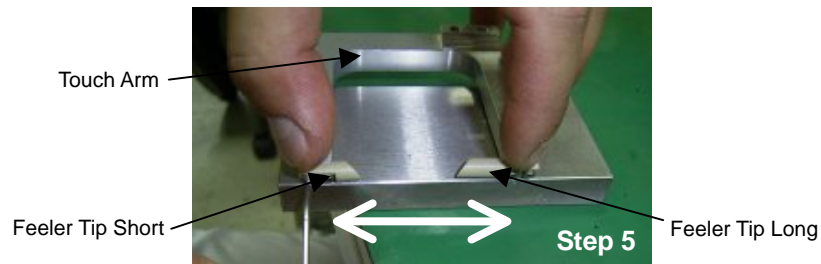


Feeler Rotate Worm



Feeler Tip Ass'y

4. Replace the Feeler tips with new ones. Fit the two tips to be parallel as possible.



5. Assemble in reverse order.

Caution

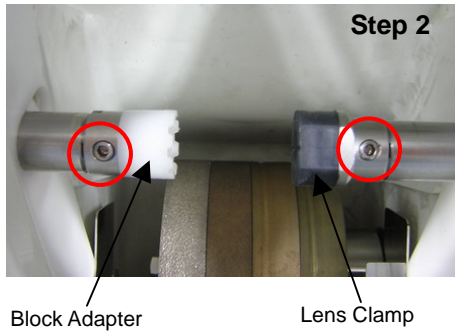
- Confirm the alignment of the two Feeler Tip.

Adjustment needed

- Perform Feeler Calibration.

4. Block Adapter and Lens Clamp Replacement

1. Open the Edging Room Window.
2. Loosen setscrew.



3. Replace them with new ones. When replacing Block adapter be sure to check whether there is any gap. If so loosen both setscrews a little bit and turn the power on and press CHUCK button. Make sure to insert both Block adapter and Lens clamp. Then tighten both setscrews.

Caution

- Do not close chuck without Block adapter and Lens clamp. If so the Chuck clamp will be stuck and will not move. In this case refer to step4 and pull out manually.

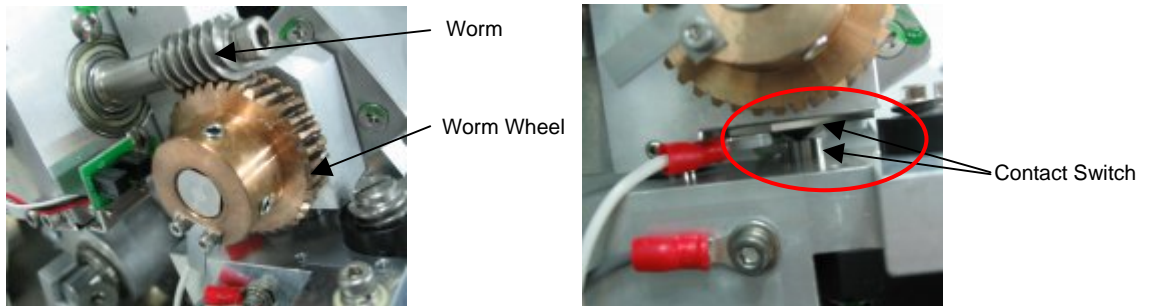
Adjustment needed

- Check the Bevel Adjustment.

5. Maintenance; Injection of the grease

1. Rotation Worm & Worm Wheel

- ① Wipe out dirty grease from the Rotation Worm & Worm Wheel surface.
- ② After spreading the grease on the Worm and the Worm Wheel, perform Rotation Test to spread grease evenly.

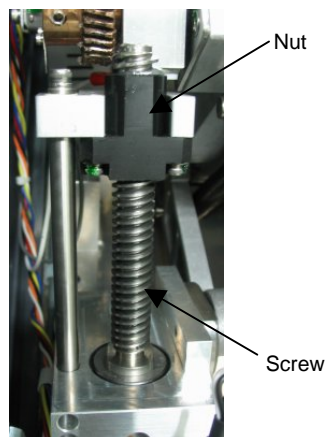


Caution

- Be sure to protect the Contact Switch surface from grease.
- Keep the hands off when it rotates. It can cause severe harm.

2. Y-axis Screw & Nut

- ① Wipe out dirty grease from the Screw & Nut surface.
- ② After spreading the grease on the Screw and Nut, perform Y-Test to spread grease evenly.

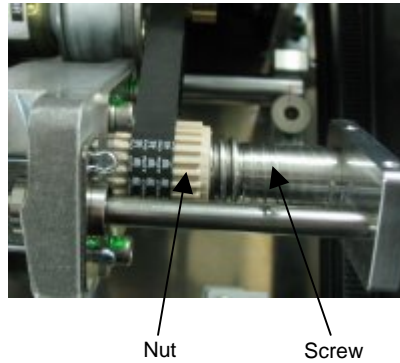


Caution

- Be sure to protect the Contact Switch surface from grease.
- Keep your hands off when it moves. It can cause severe harm.

3. Clamping Screw & Nut

- ① Wipe out dirty grease from the Screw & Nut surface.
- ② After spreading grease on the Screw and Nut, perform Clamp Test to spread grease evenly.

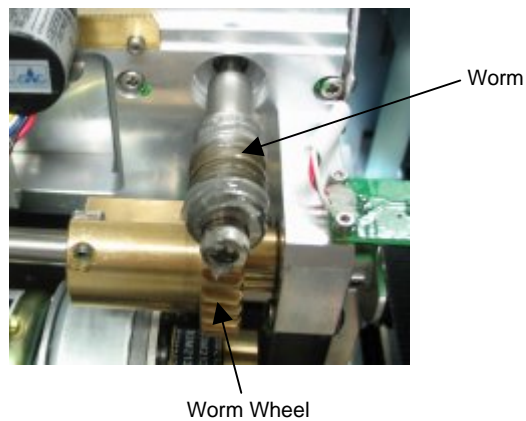


Caution

- Keep your hands off when it moves. It can cause severe harm.

4. Feeler Ass'y Rotation Worm & Worm Wheel

- ① Wipe out dirty grease from the Worm & Worm Wheel surface.
- ② After spreading grease on the Worm & the Worm Wheel, perform Feeler Test to spread grease evenly.

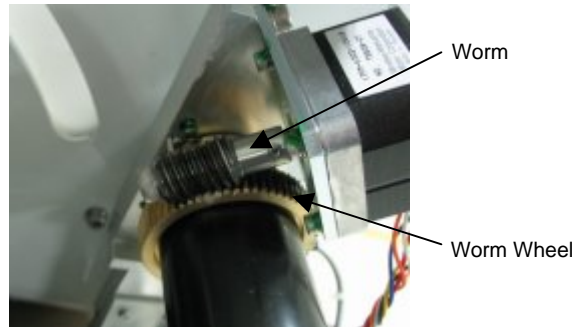


Caution

- Never spread grease on the Rack & Pinion of Encoder.
- Never spread grease on the Slider part for Feeler X-direction Motion.
- Keep your hands off when it moves. It can cause severe harm.

5. SBG Ass'y Rotation Worm & Worm Wheel

- ① Wipe out dirty grease from the Worm & Worm Wheel surface.
- ② After spreading grease on the Worm & Worm Wheel, perform Grooving Test to spread grease evenly.

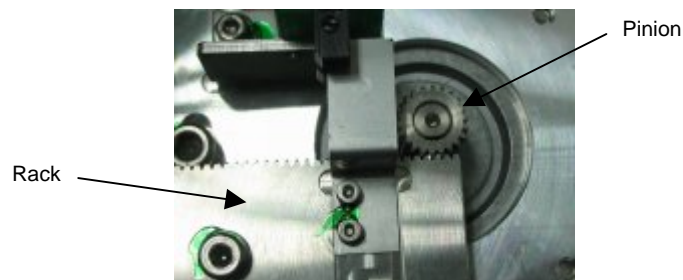


Caution

- Keep your hands off when it moves. It can cause severe harm.

6. X-axis Step Motor Rack & Pinion

- ① Wipe out dirty grease from the Rack & Pinion surface.
- ② After spreading grease on the Rack & Pinion, perform X-Test to spread grease evenly.



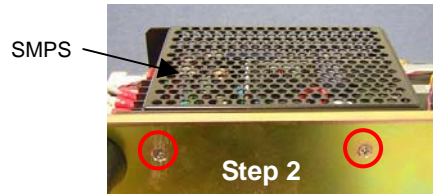
Caution

- Keep your hands off when it moves. It can cause severe harm.

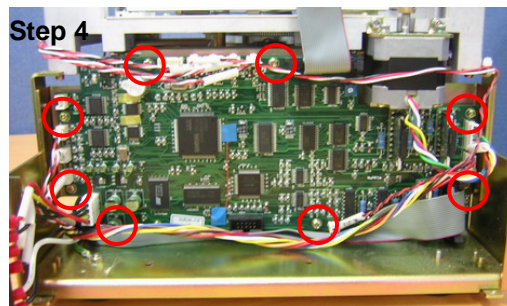
III. Frame Reader Maintenance Manual

1. Main Board Replacement

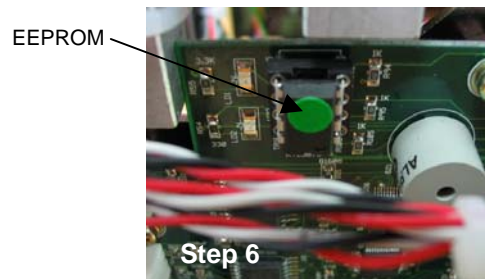
1. Remove the Top Cover.
2. Remove locking screws and remove the SMPS.



3. Disconnect all connectors from the Main Board.
4. Remove eight locking screws from the Main Board.
Then Remove the Main Board.



5. Replace it with a new Board and tighten eight locking screws.
6. Separate the EEPROM from the old Board and insert the EEPROM into the new Board.
Be sure to check the Pin Position of the EEPROM.



7. Connect all connectors in reverse order.
8. Assemble the SMPS in reverse order.
9. Assemble the Top Cover in reverse order.

Caution

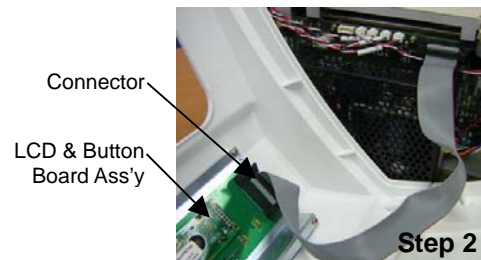
- Be sure to confirm whether all connectors are linked rightly.

Adjustment needed

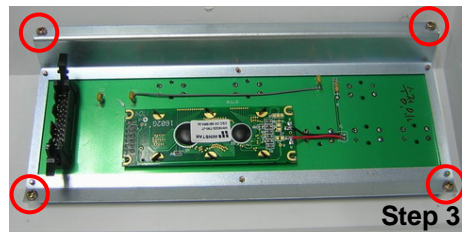
- If necessary, upgrade the software with the newest version.

2. LCD & Button Board Replacement

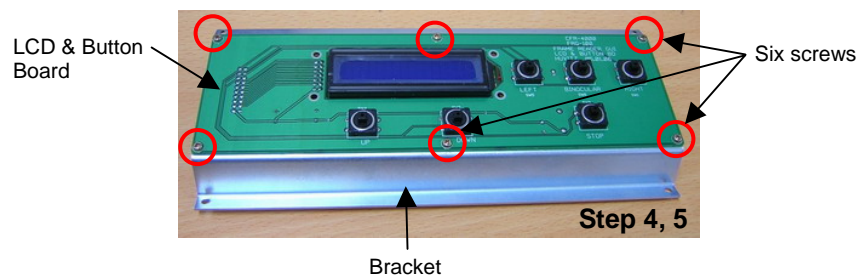
1. Remove the Top Cover.
2. Disconnect the 20pin connector linked to the LCD & Button Board Ass'y.



3. Remove four screws from the LCD & Button Board Ass'y.
Separate the LCD & Button Board Ass'y from the Top Cover.



4. Remove six locking screws from the LCD & Button Board.
And remove the LCD & Button Board from the bracket.



5. Replace it with a new LCD & Button Board and assemble in reverse order.
6. Assemble the Top Cover in reverse order.

Caution

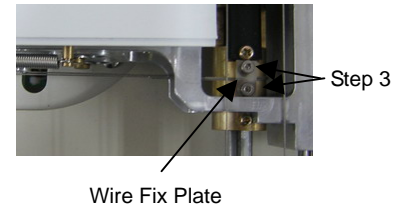
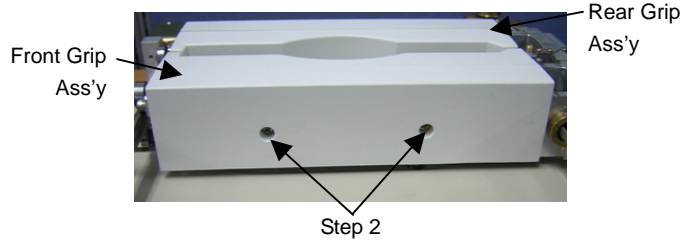
- Be sure to check whether all the buttons are pressed right.

Adjustment needed

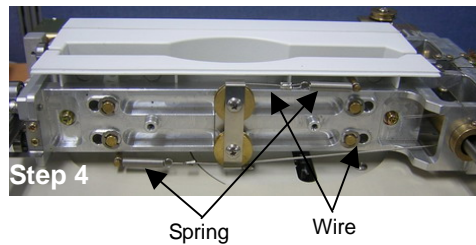
- None

3. Gripping Wire & Spring Replacement

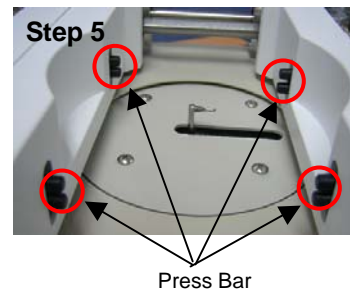
1. Remove the Top cover.
2. Remove the cover from the Front Grip Ass'y



3. Remove two locking screws from the Wire Fix Plate and remove the wire.
4. Replace them with new Wire and spring.



5. Tighten the Wire Fix Plate.
Check the gripping state while rotating the Grip Worm Gear manually.
4 Press Bars must move simultaneously. If not, do some adjustment.



6. Assemble the Front Grip Ass'y in reverse order.
7. Assemble the Top Cover in reverse order.

Caution

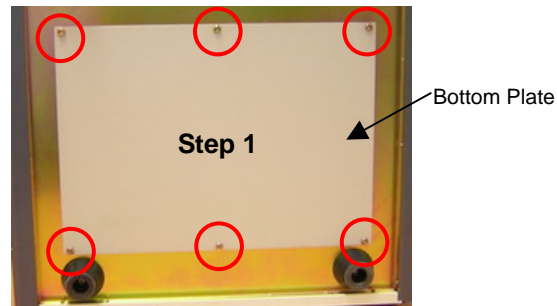
- If step 5 is not performed rightly there can be some trouble when reading Frames.

Adjustment needed

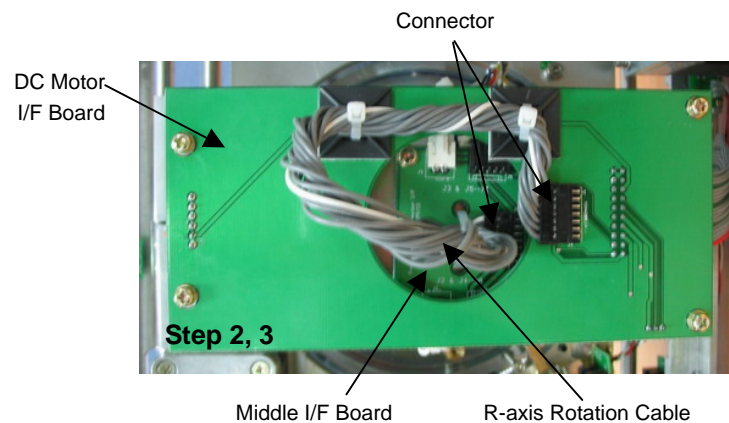
- Perform Frame Calibration.

4. R-axis Rotation Cable Replacement

1. Remove the Bottom Plate.



2. Disconnect the R-axis Rotation Cable connector linked between DC motor I/F Board and Middle I/F Board.
3. Remove the R-axis Rotation Cable.
Be sure to remember the tied shape of the R-axis Rotation Cable.



4. Replace it with a new one.
5. Tie the R-axis Rotation Cable with cable tie in the same way of the original shape. (Important)
6. Be sure to check whether the cable is free enough when it rotates fully and if there's any bump with other parts.
7. Assemble the bottom plate in reverse order.

Caution

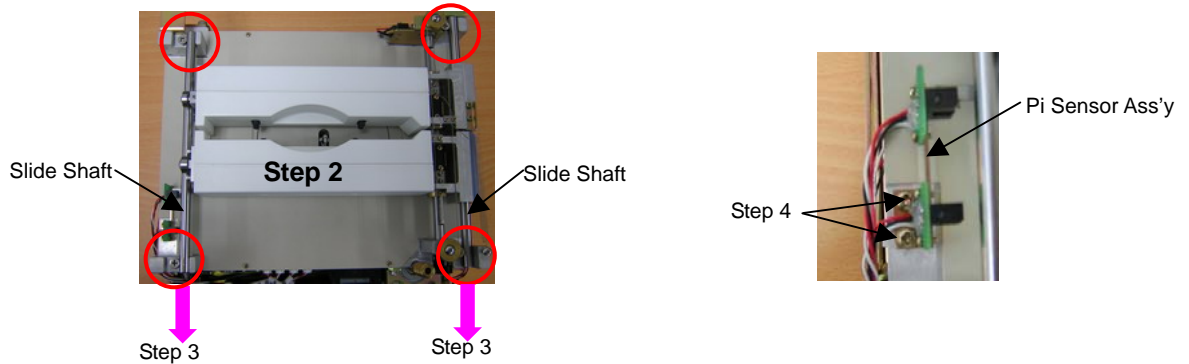
- Step 6 is extremely important for the cable lifetime.

Adjustment needed

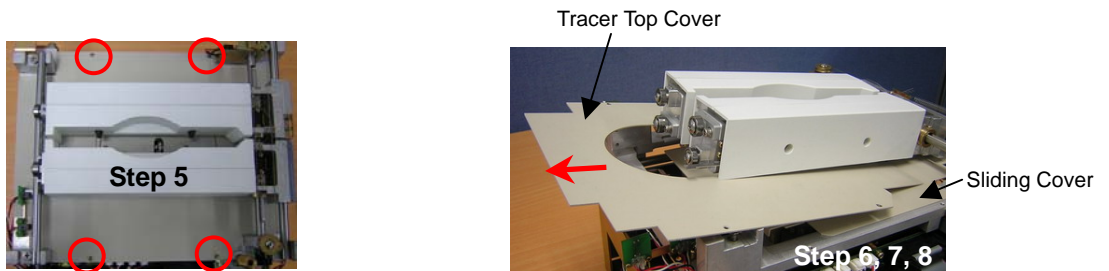
- None

5. Big Gear Idler & Step Motor Gear Replacement

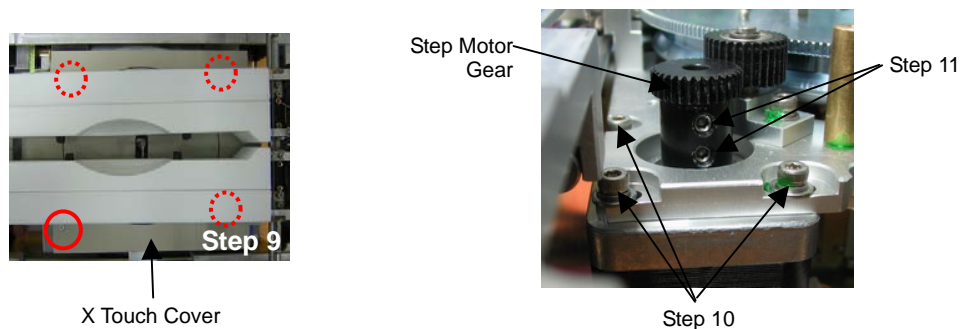
1. Remove the Top Cover and Side Cover.
2. Loosen four locking screws from the two Slide Shaft.



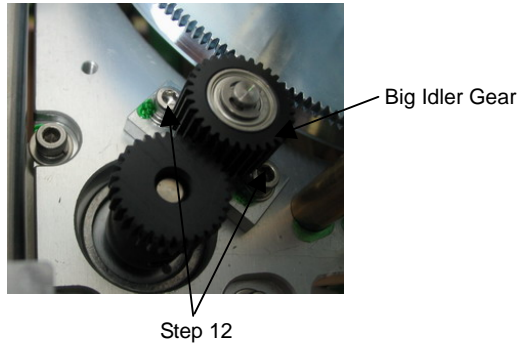
3. Take out the two Slide Shaft to the direction of above arrow mark.
4. Remove the PI Sensor Ass'y.
5. Remove the Top cover locking screws.
6. Lift left parts of the Front Grip Ass'y and Rear Grip Ass'y upward at the same time.
7. Remove the Tracer Top Cover to the direction of below arrow mark.



8. Remove the Sliding Cover in the same way of 6 to 7.
9. Remove the X touch Cover.
10. Loosen three locking screws of the Step Motor.



11. Loosen setscrews of the Step Motor Gear and remove the Step Motor Gear from the Step Motor axis.



12. Remove Big Gear Idler Ass'y.
13. Remove the E-ring from the Big Gear Idler Ass'y.
14. Separate the two Bearings and Big Gear Idler.
15. Replace the Big Gear Idler with a new one.
16. Assemble all parts in reverse order.
Be sure to make the backlash to be the least.
17. Assemble the Step Motor Ass'y in reverse order.
Be sure to make the backlash to be the least.
18. Assemble all parts in reverse order.

Caution

- Be careful when inserting the sliding shaft so that Ball Bush doesn't be damaged.

Adjustment needed

- Perform Frame Calibration.

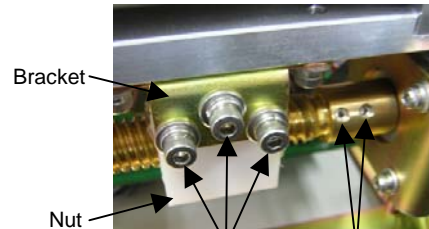
6. X-axis Screw & Nut Replacement

1. Remove the Top Cover, Side Cover and Rear Cover.
2. Remove the Inlet cover Ass'y.



Inlet Cover Ass'y

Step 2



Step 3

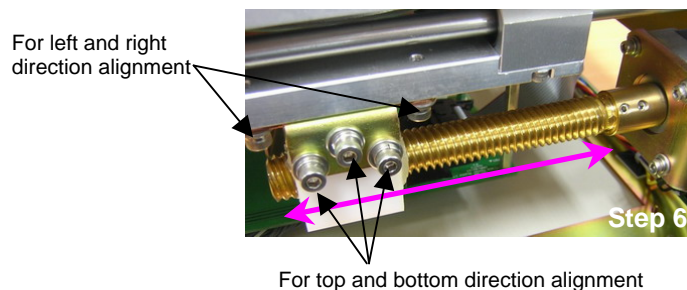
Step 4

3. Remove three screws from X-axis Nut.
4. Loosen setscrews from the X-axis Screw and separate the X-axis Screw and Nut from the Step Motor Axis.
5. Replace them in reverse order.
6. Align the X-axis Nut's position roughly and tighten three screws of step 3 and two screws for Nut Bracket slightly.

Rotate the X-axis screw to the full stroke of left and right manually.

When the alignment of the vertical direction is good, tighten the three screws.

When the alignment of the horizontal direction is good, tighten the two screws for Nut bracket.



For top and bottom direction alignment

7. When the replacement finished, be sure to check whether the movement is smooth or not.
If not, repeat step 6.
8. Assemble all parts in reverse order.

Caution

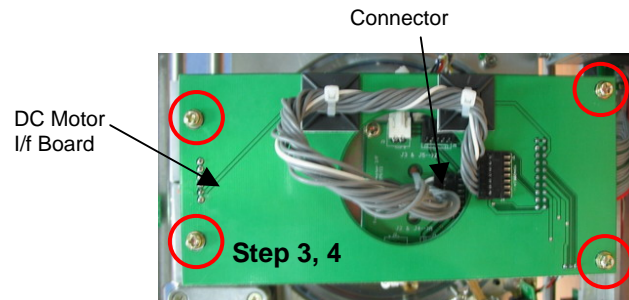
- Step 6 is important for the movement of left and right.

Adjustment needed

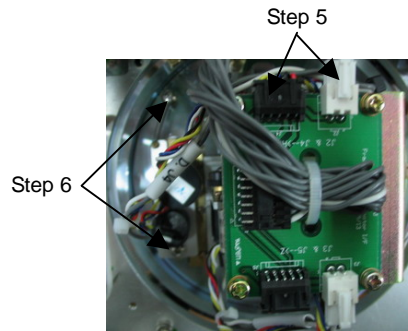
- Perform Frame Calibration.

7. R-axis Encoder & DC Motor Ass'y Replacement

1. Open the Top Cover and Side Cover.
2. Remove the Bottom Plate.
Refer to [4. R-axis Rotation Cable Replacement - Step '1'].
3. Disconnect the connector that is linked to the Middle I/F Board.
4. Remove locking screws from the DC Motor I/F Board and separate the DC Motor I/F Board.

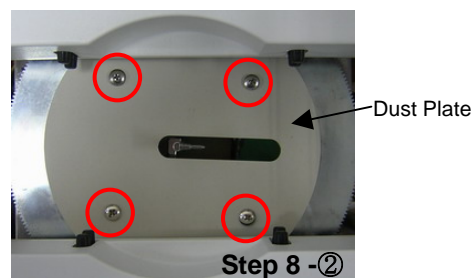


5. Disconnect the DC Motor Cable connector and Encoder Cable connector from the R-axis Encoder & DC Motor Ass'y.



6. Remove screw that is holding the R-axis Encoder & DC Motor Ass'y and screw for spring.
Take off the R-axis Encoder & DC Motor Ass'y.
7. Replace it with a new one in reverse order.
8. Check the backlash between Encoder Pinion and R-Encoder Rack according to below process.

- ① Remove the upper cover referring to [5. Big Idler Gear & Step Motor Gear Replacement- Step '2' to step '9'].
- ② Remove the Dust Plate.



- ③ Loosen locking screw of Gap-Controller-R.
- ④ While rotating Gap-controller-R align Encoder & DC Motor Ass'y and R-Encoder Rack so that backlash to be the least.



Step 8-③



Step 8-④

Gap-Controller-R

- ⑤ When alignment finished tighten the locking screw carefully to fix the Gap-Controller-R.
- ⑥ Assemble all removed parts in reverse order.

9. Connect the DC Motor cable connector and Encoder cable connector of R-axis Encoder & DC Motor Ass'y to the board.
10. Assemble I/F board in reverse order.
11. Assemble all removed parts in reverse order.

Caution

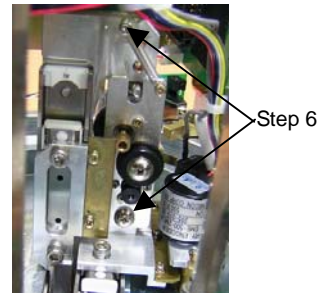
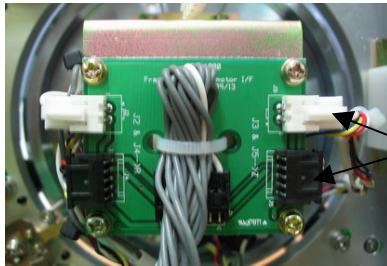
- Be sure to check R direction backlash.

Adjustment needed

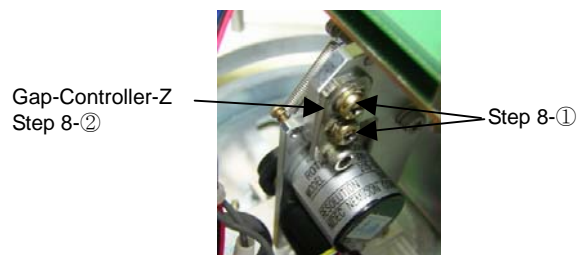
- Perform Full calibration.

8. Z-axis Encoder & DC Motor Ass'y Replacement

1. Remove the Top Cover and Side Cover.
2. Remove the Bottom Plate.
Refer to [4. R-axis Rotation Cable Replacement - Step '1'].
3. Disconnect the connector that is linked to the Middle I/F Board.
4. Remove DC Motor I/F Board and DC Motor I/F Board.
Refer to [7. R-axis Encoder & DC Motor Ass'y Replacement - Step '3', '4'].
5. Disconnect the DC Motor cable connector and Encoder cable connector of the Z-axis Encoder & DC Motor Ass'y.



6. Remove screw from the Z-axis Encoder & DC Motor Ass'y and for the spring also.
Take off the Z-axis Encoder & DC Motor Ass'y.
7. Replace them with new ones in reverse order.
8. Align Encoder Pinion and Z-Encoder Rack according to below process.
If the amount of backlash is good enough skip this step.
 - ① Loosen two locking screws of the Gap-Controller-Z.
 - ② Adjust backlash while moving the Gap-Controller-Z.
 - ③ When finished, tighten Gap-Controller-Z carefully.



9. Assemble all parts in reverse order.

Caution

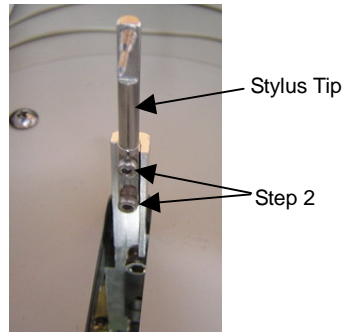
- Z-axis backlash is important.

Adjustment needed

- Perform Frame Calibration.

9. Stylus Tip Replacement

1. Lift the Stylus Tip up.
2. Remove two locking screws from the Stylus Tip.



3. Replace the Stylus Tip with a new one.
4. Assemble in reverse order.

Caution

- None

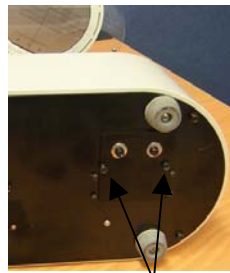
Adjustment needed

- Perform Pattern & Frame Calibration.

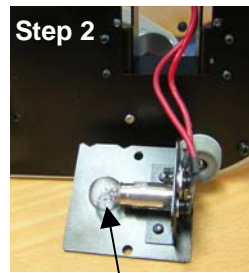
IV. Blocker Maintenance Manual

1. Lamp Replacement

1. Remove locking screws as shown in below picture.



Step 1



Lamp

2. Separate the Lamp Ass'y .
3. Remove the Lamp.
4. Replace old lamp with a new one.
5. Assemble in reverse order. Fit Lamp Ass'y 'V' slot to the two projected screws and tighten locking screws.



Attach 'v' slot to the two projected screw

Caution

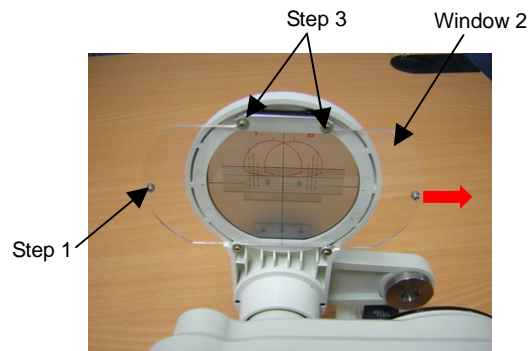
- Be careful when the lamp is on. It's extremely hot.

Adjustment needed

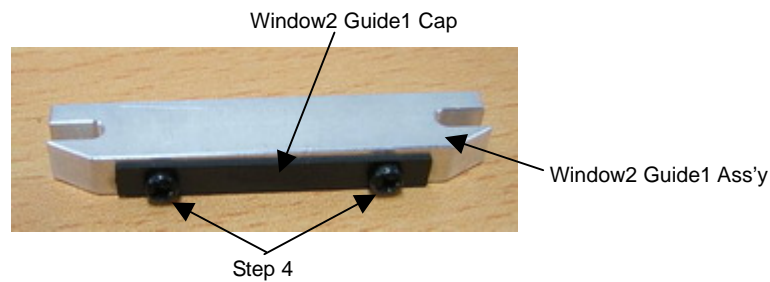
- None

2. Window2 Guide1 Ass'y Spring Replacement

1. Remove screws and nuts from the Window2 as shown in below picture.
2. Separate the Window2 from the Window Ass'y.



3. Remove two screws from Window2 Guide1 Ass'y and separate it.
4. Disassemble the Guide Ass'y and replace springs. Be careful of the small balls.



5. Assemble all parts in reverse order.

Caution

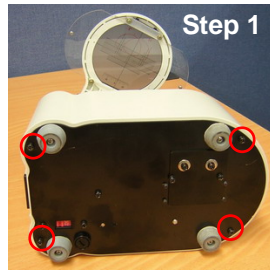
- None

Adjustment needed

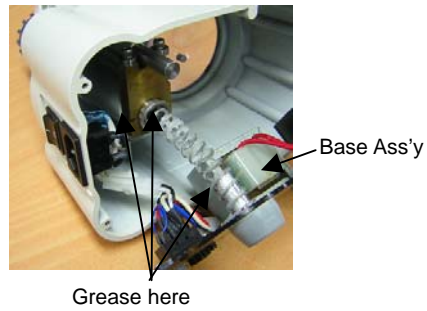
- None

3. Spreading grease on the Z-axis Shaft & Spring

1. Separate the Base plate.



2. Spread Grease as shown in below picture.



3. Spread Grease on the Block Main Axis also.
4. Assemble in reverse order.

Caution

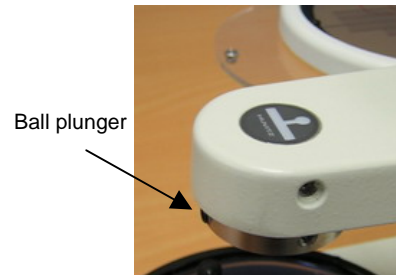
- None

Adjustment needed

- None

4. Block Holder adjustment

1. When the Lens Block is too tight or too loose adjust Ball Plunger as shown in below picture.
2. Rotate clockwise to tighten the Lens Block.
3. Rotate counter clockwise to loosen the Lens Block.

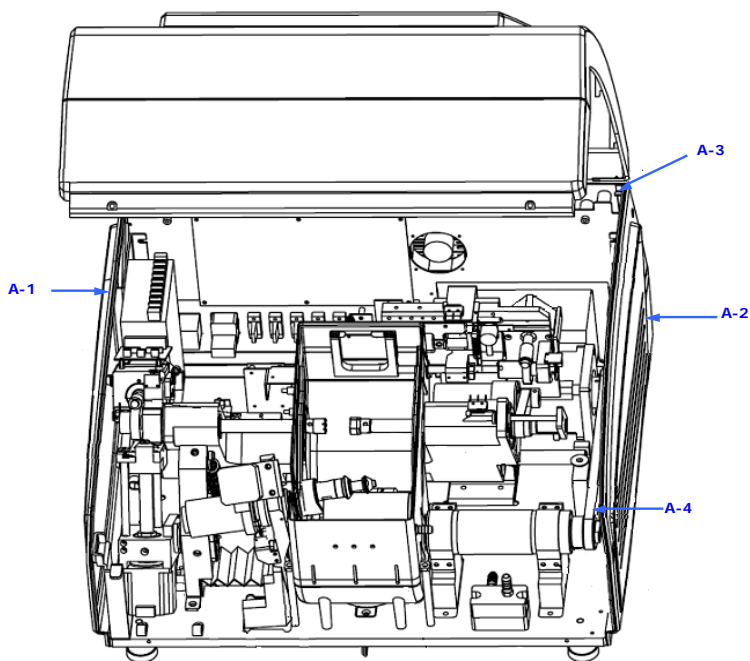
**Caution**

- None

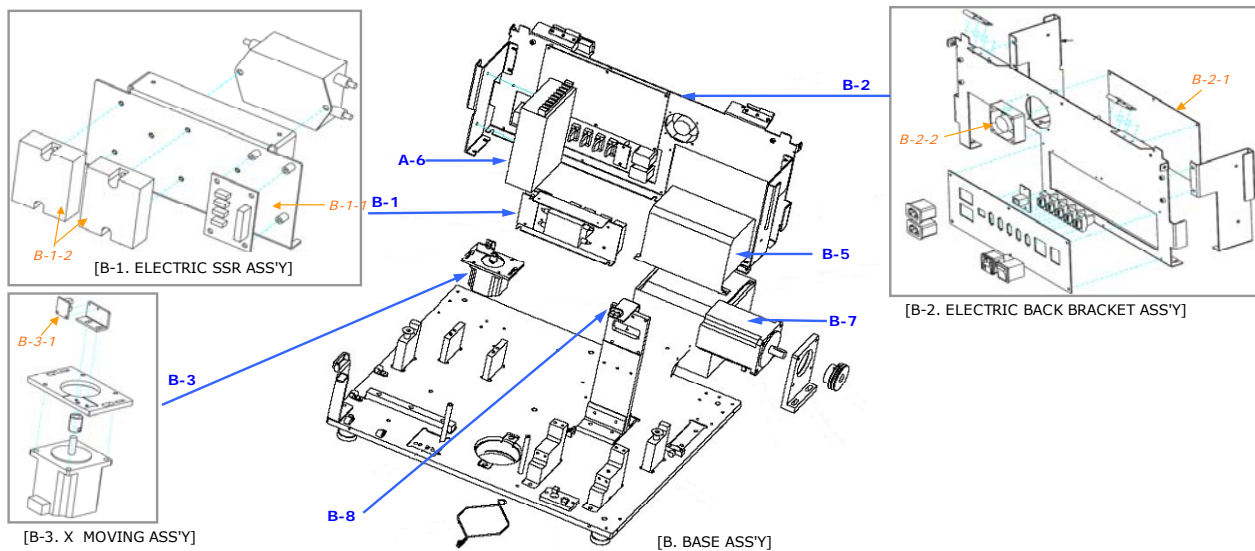
Adjustment needed

- None

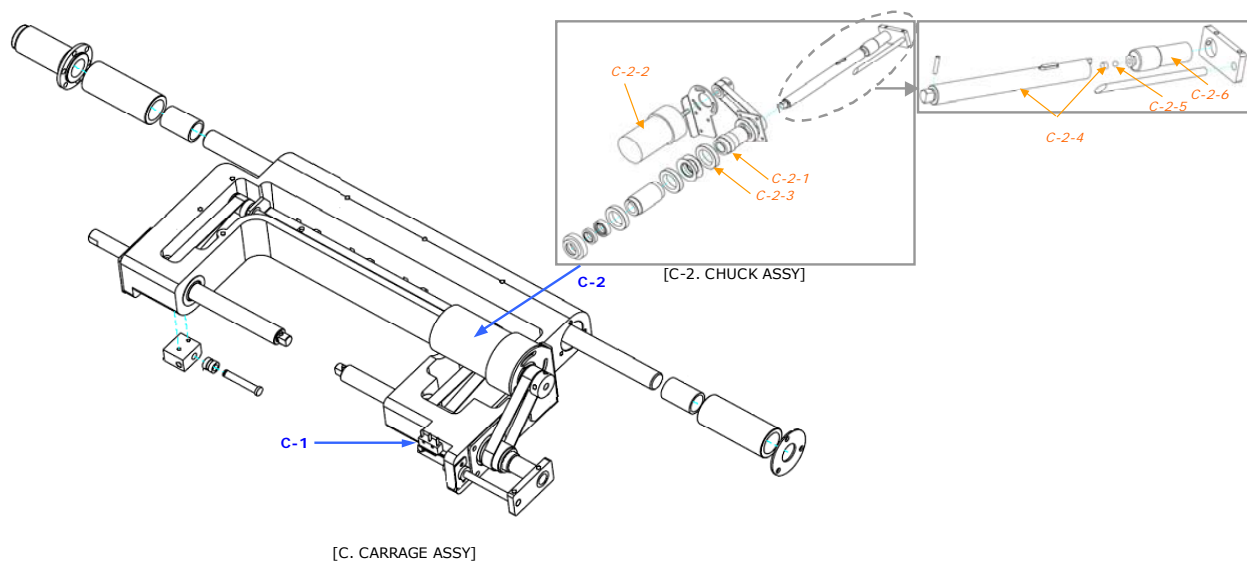
V. Repair Part Price List



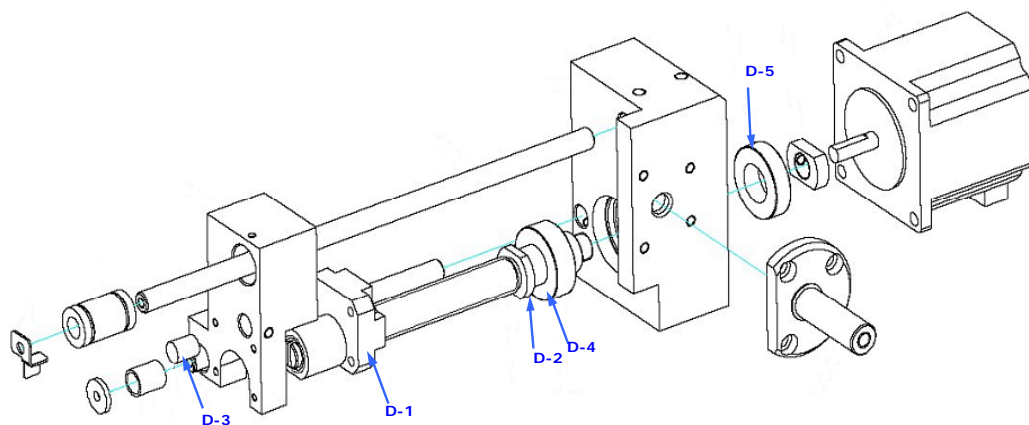
Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
A	MAIN			-
A - 1	COVER SIDE LEFT	2000MPOG001-A		20
A - 2	COVER SIDE RIGHT	2000MPOG002-A		20
A - 3	COVER BACK	2000A00G007-A		15
A - 4	BELT	3006A000004-A	POLYMAX 5M-615-2R	30



Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
B	BASE ASSY			
B - 1	ELECTRIC SSR ASS'Y			
B - 1 - 1	PCB ASSY (EGI-100)	GOEPCB2002-AA	GUI INTEFACE B/D EGI-100, 60X42	5
B - 1 - 2	SSR	7622S001215-A		25
B - 2	ELECTRIC BACK BRACKET ASS'Y			
B - 2 - 1	PCB ASSY (ECM-100)	GOEPCB7001-AS	MAIN CONTROL B/D, 230X155	115
B - 2 - 2	FAN	7620S002406-A		10
B - 3	X MOVING ASS'Y			
B - 3 - 1	X AXIS PI(M.J6)	GOEHAR3005-AS	W/ CABLE	5
B - 5	WHEEL INVERTER	6430TMT 2460-A		290
B - 6	SMPS	7560PG00220-A		145
B - 7	WHEEL MOTOR	6430TMT0004-A		250
B - 8	DOOR OPEN CHECK LIMIT SWITCH	GOEHAR4001-AS	W/ CABLE	5

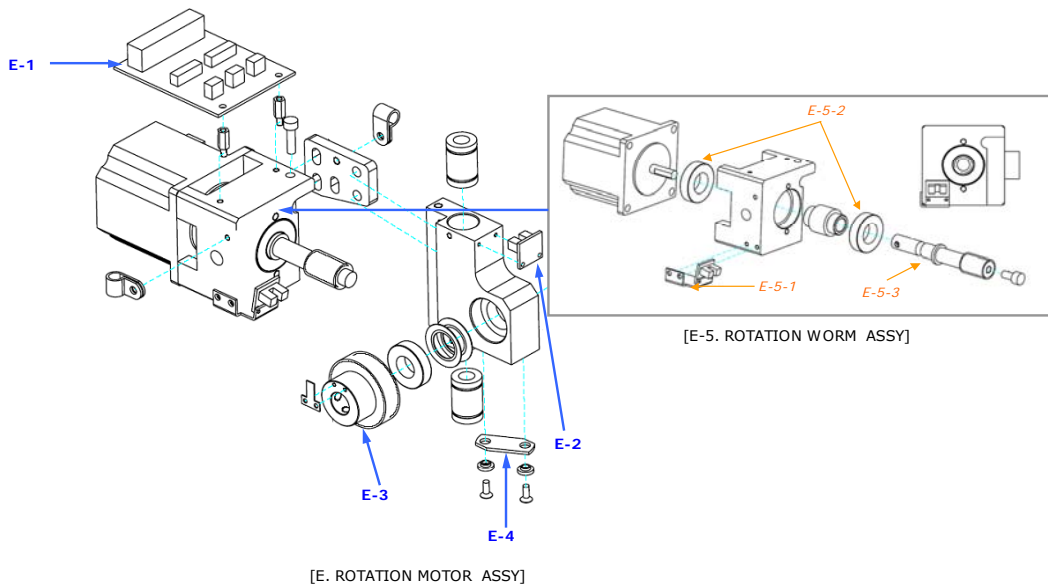


Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
C	CARRIAGE ASSY			
C - 1	CLAMP LIMIT SWITCH	G0EHAR4004-AS	W/ CABLE (M.J12)	5
C - 2	CHUCK ASSY			
C - 2 - 1	CHUCK MOVING PULLEY 3M 26	1230A00G002-B		50
C - 2 - 2	MOTOR(DC)	G0EHAR6008-AS	W/CABLE (G0EHAR6008-AA+ 6430TMT4450-A)	130
C - 2 - 3	BEARING	3002A000011-A		5
C - 2 - 4	CHUCK SHAFT	1210A00G007-A	W/ CHUCK SHAFT PIVOT(1240MP0G004-A)	40
C - 2 - 5	BEARING BALL	3002A00S002-A		0.5
C - 2 - 6	CHUCK MOVING SCREW	1210A00G008-A		20

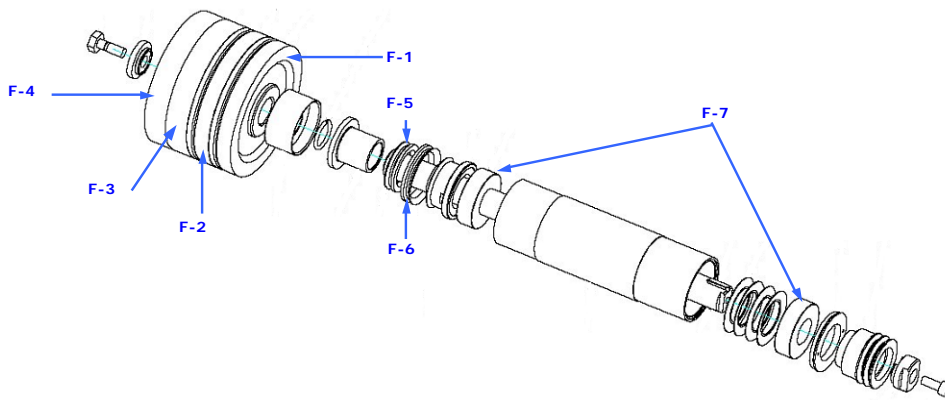


[D. LIFT Z MOTOR ASSY]

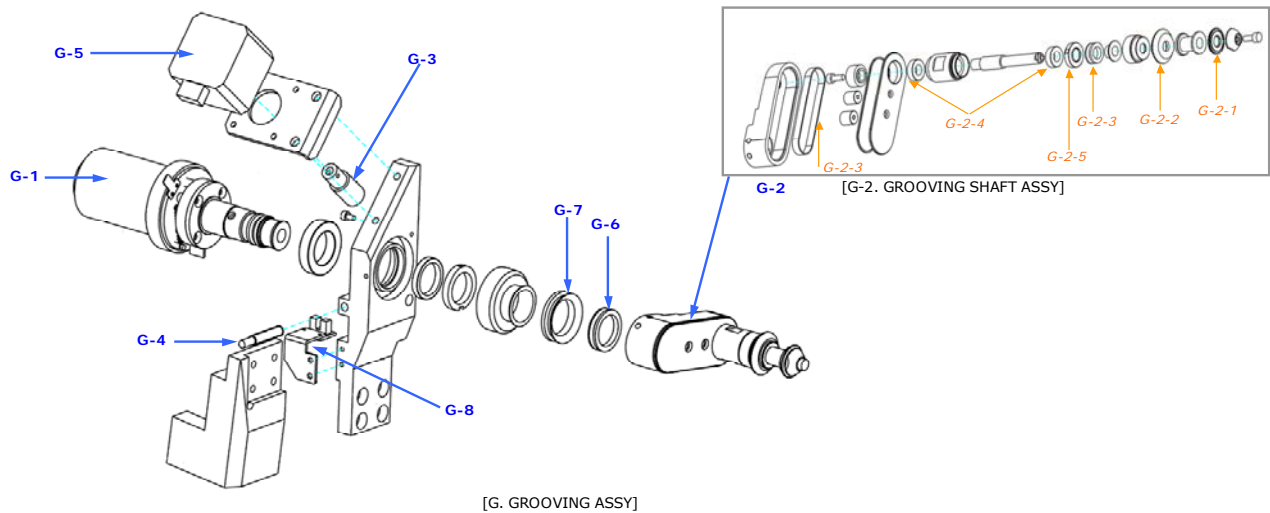
Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
D	LIFT Z MOTOR ASSY			
D - 1	LIFT TM NUT	1230A00G004-B		30
D - 2	LIFT TM SCREW	1210A00G016-A		30
D - 3	LIFT POINT OF CONTACT1	1210A00G019-A		20
D - 4	BEARING	3002A000014-A		3
D - 5	BEARING	3002A000013-A		4



Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
E	ROTATION MOTOR ASSY			
E - 1	PCB ASSY (ECG-101)	G0EPCB8002-AA	SBG INTERFACE B/D ECG-101, 70X55	5
E - 2	Y AXIS PI	G0EHAR3003-AS	W/ CABLE (G.J6)	5
E - 3	ROTATION WORM WHEEL	1220A00G005-A		30
E - 4	LIFT POINT FO CONTACT 2	1210A00G021-A		20
E - 5	ROTATION WORM ASSY			
E - 5 1	ROTATION PI E	G0EHAR3004-AS	W/ CABLE (G.J4))	5
E - 5 2	BEARING	3002A000013-A	6902ZZ	4
E - 5 3	ROTATION WORM	1210A00G022-A		20

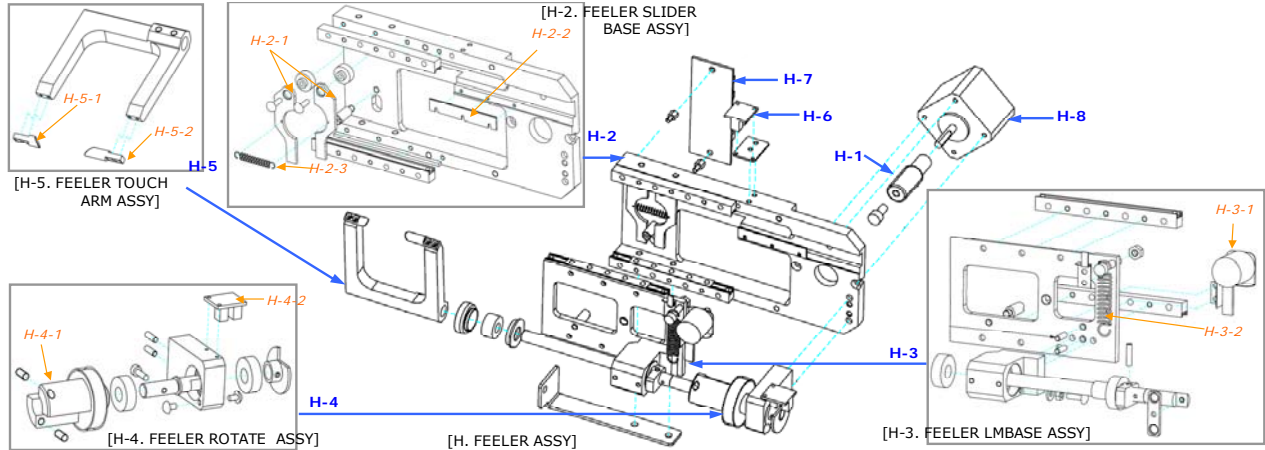


Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
F	WHEEL SHAFT ASSY			-
F - 1	WHEEL POLISHING	1250M20G001-A		600
F - 2	WHEEL FINISHING	1250M20G002-A		320
F - 3	WHEEL ROUGHING GLASS	1250M20G003-A		330
F - 4	WHEEL ROUGHING PLASTIC	1250M20G004-A		330
F - 5	V RING (28)	3004A000007-A		2
F - 6	V RING (35)	3004A000005-A		2
F - 7	BEARING	3002A000008-A	6004UU	4



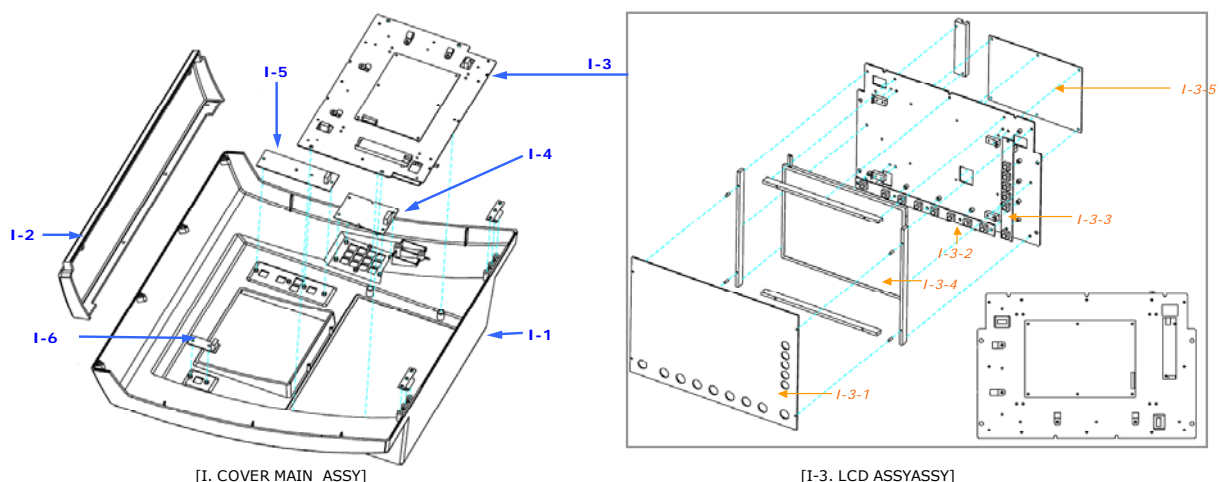
[G. GROOVING ASSY]

Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
G	GROOVING ASSY	GOMASSY500-AA		900
G-1	GROOVING MOTOR ASS'Y	GOMASSY510-AA		230
G-2	GROOVING SHAFT ASS'Y	GOMASSY520-AA		270
G-2-1	WHEEL GROOVING	1250MZ0G005-A		110
G-2-2	WHEEL BEVELING	1250MZ0G006-A		160
G-2-3	BELT	3006A000003-A		2
G-2-4	BEARING	3002A000018-A	688ZZ	4
G-2-5	V RING (10)	3004A000009-A	V-10A-NBR	2
G-3	GROOVING WORM	1210A00G042-A		15
G-4	HARNESS ASSY(CONTACT S/W)	GOEHAR4003-AS		2
G-5	MOTOR(STEP)	6430TMT1730-A		40
G-6	V RING (18)	3004A000008-A		2
G-7	V RING (22)	3004A000012-A		2
G-8	HARNESS ASSY(PI)	GOEHAR3007-AS		5



[H. FEELER ASSY]

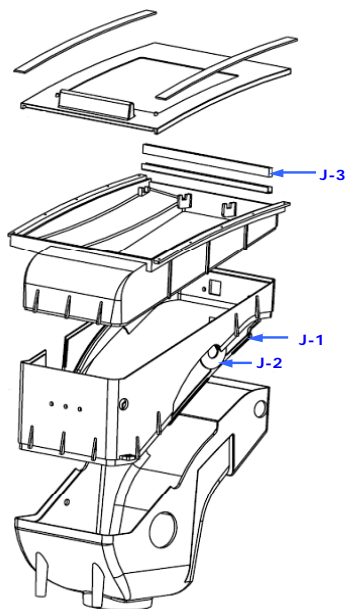
Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
H	FEELER ASSY	GOMASSY600-AA		570
H-1	FEELER ROTATE WORM	1210A00G043-A		15
H-2	FEELER SLIDER BASE ASS'Y	GOMASSY610-AA		125
H-2-1	X SPRING LEVER	1320A00G001-A		5
H-2-2	R NEC RACK	1320A00H001-A		40
H-2-3	SPRING	3008A000021-A		2
H-3	FEELER LMBASE ASS'Y	GOMASSY620-AA		150
H-3-1	ENCODER(ROTARY)	6440ERO5002-A		145
H-3-2	SPRING	3008A000022-A	AW 8-30	3
H-4	FEELER ROTATE ASS'Y	GOMASSY630-AA		35
H-4-1	FEELER WORM WHEEL	1220A00G014-A		30
H-4-2	ROTATION FEELER PI1	GOEHAR3001-AA	W/ CABLE(F.J4)	5
H-5	FEELER TOUCH ARM ASSY	GOMASSY640-AA		40
H-5-1	FEELER TIP SHORT	1230A00G008-A		10
H-5-2	FEELER TIP LONG	1230A00G009-A		10
H-6	SHIFT FEELER PI2	GOEHAR3002-AS	W/ CABLE(F.J3)	5
H-7	PCB ASSY (ECF-102)	GOEPCB8001-AA		5
H-8	MOTOR(STEP)	6430TMT1730-A		40



[I. COVER MAIN ASSY]

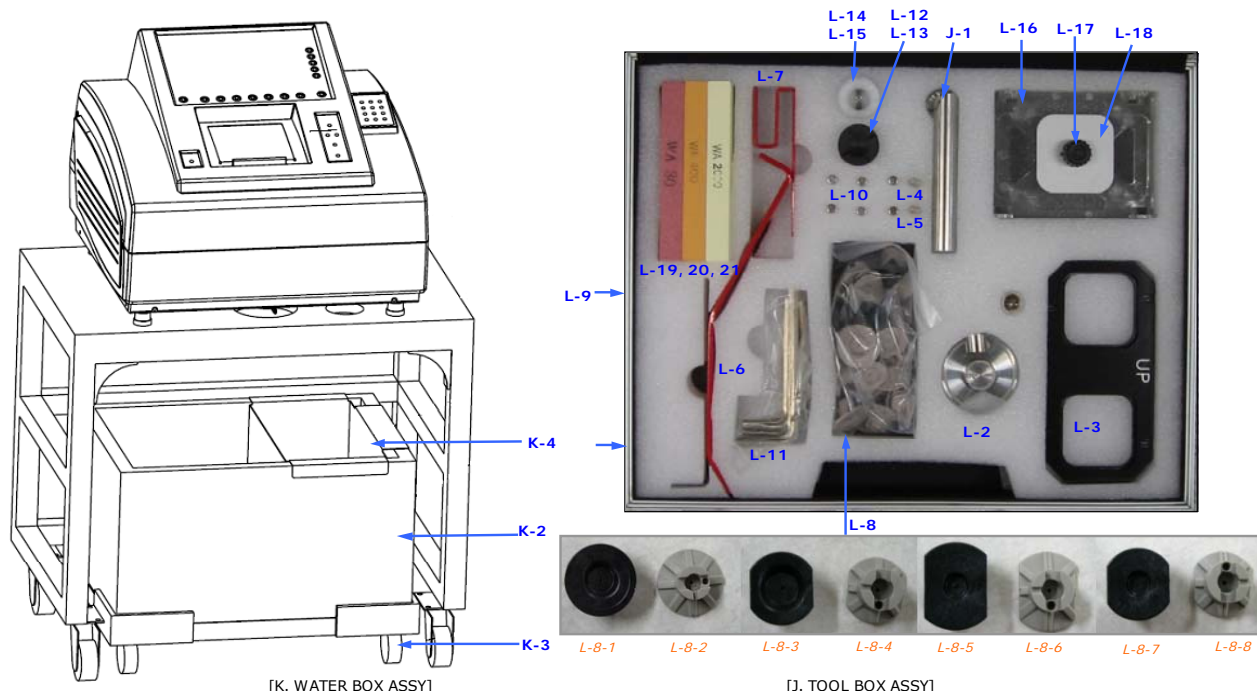
[I-3. LCD ASSYASSY]

Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
I	COVER MAIN ASSY			
I- 1	COVER MAIN	2000A00G005-A		35
I- 2	COVER FRONT	2000A00G006-A		10
I- 3	LCD ASSY	G0MASS711-AA		680
I- 3-1	LCD WINDOW	1230A00G010-A		10
I- 3-2	PCB ASSY (KEY-100)	G0EPCB4001-AS		1
I- 3-3	PCB ASSY (KEY-100)	G0EPCB4002-AS		1
I- 3-4	LCD MONITOR	7202LGRLP10-A	W/ INVETER	380
I- 3-5	PCB ASSY (EGM-100)	G0EPCB1001-AS	GUI CONTROL B/D EGM-100, 170X140	160
I- 4	PCB ASSY (KEY-100)	G0EPCB4003-AA	KEY INPUT B/D EGN-100, 90X60 12KEY	2
I- 5	PCB ASSY (KEY-100)	G0EPCB4004-AA	KEY INPUT B/D EGS-100, 130X40 5KEY	2
I- 6	PCB ASSY (KEY-100)	G0EPCB4005-AA	KEY INPUT B/D EGC-100, 20X50 1KEY	2



[J. EDGING ROOM ASSY]

Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
J	EDGING ROOM ASSY			
J- 1	EDGING ROOM SLIDER	2020A00G001-A		2
J- 2	EDGING ROOM SHAFT BRUSH	1230A00G006-A		1
J- 3	SPONGE	3016A000002-A		1



[K. WATER BOX ASSY]

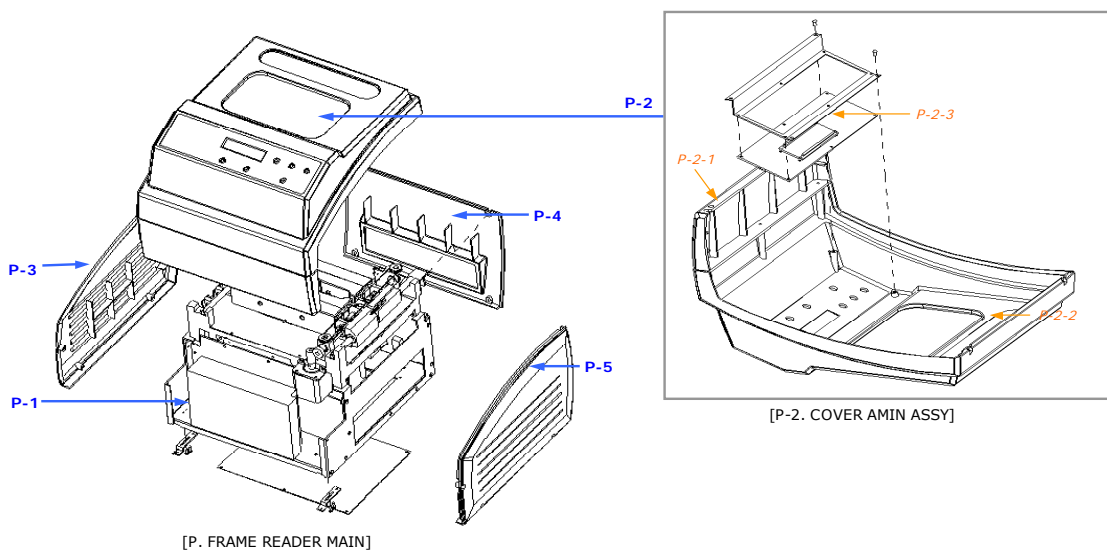
[J. TOOL BOX ASSY]

Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
K	WATER BOX ASSY			360
K - 1	WATER PUMP	G0EHAR6011		100
K - 2	WATER TANK	3018A000013		15
K - 3	WATER TANK CARRIER	3018A000014		70
K - 4	WATER STRAINER	1310A00G031		175

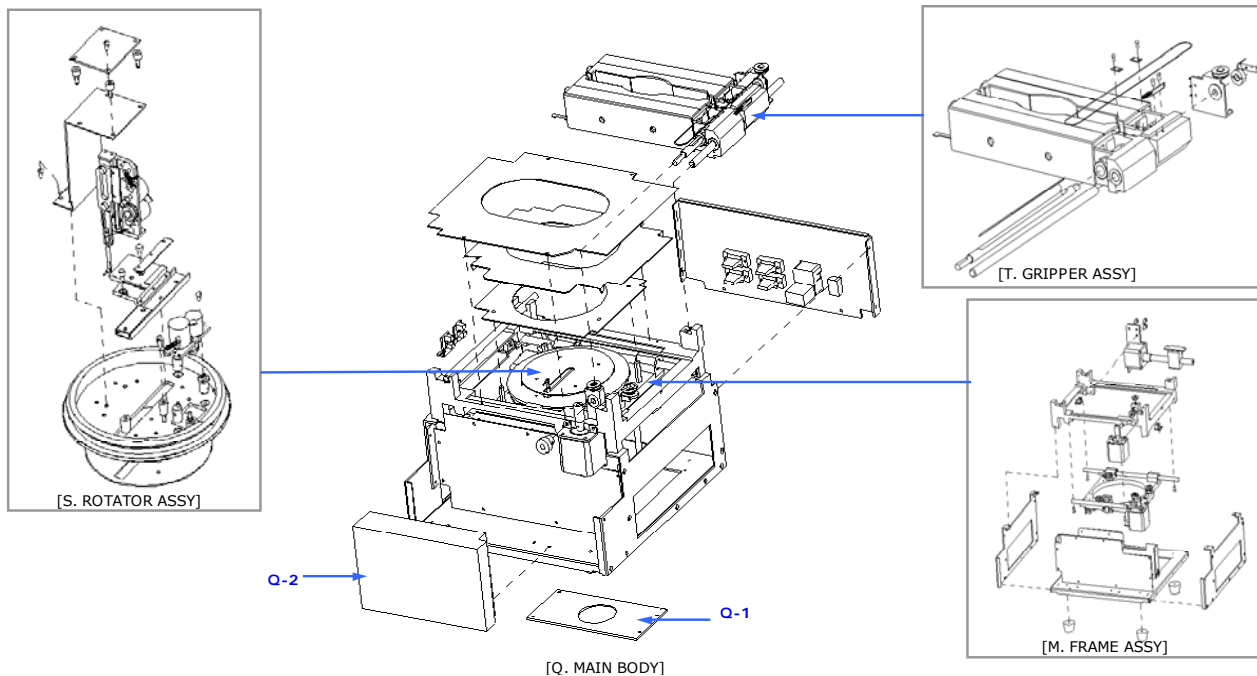
Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
L	TOOL BOX ASSY	G0MASSY800-AA		225
L - 1	BLOCK REMOVER	1210A00G057-A		5
L - 2	MAIN CALIBRATION JIG	1210A00G061-A		40
L - 3	FRAME CALIBRATION JIG	1200MP0H011-A		30
L - 4	FEELER TIP SHORT	1230A00G008-A		10
L - 5	FEELER TIP LONG	1230A00G009-A		10
L - 6	MOVING FIXER 1	1330MS0G002-B		10
L - 7	MOVING FIXER 2	1330MS0G003-B		5
L - 8 - 1	LEAP BLOCK(BLACK)	2010A00G005-B	High curve	1
L - 8 - 2	LEAP BLOCK(GREY)	2010A00G002-C	High curve	1
L - 8 - 3	SMALL LEAP BLOCK(BLACK)	2010A00G004-B	Low curve	1
L - 8 - 4	SMALL LEAP BLOCK(GREY)	2010A00G003-C	Low curve	1
L - 8 - 5	LEAP BLOCK(BLACK)	2010A00G009-A	High curve	1
L - 8 - 6	LEAP BLOCK(GREY)	2010A00G008-A	High curve	1
L - 8 - 7	SMALL LEAP BLOCK(BLACK)	2010A00G007-B	Low curve	1
L - 8 - 8	SMALL LEAP BLOCK(GREY)	2010A00G006-B	Low curve	1
L - 9	TOOL BOX	3022A000005-A		40
L - 10	FUSE	7610S003127-A	10A,250V	0.5
L - 11	L LENCH SET	9340A00LW15-AS	1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0M/M	2
L - 12	LENS CLAMP ASS'Y	G0MASSY811-AA		15
L - 13	SMALL LENS CLAMP ASS'Y	G0MASSY812-AA		15
L - 14	BLOCK ADAPTER ASS'Y	G0MASSY814-AB		10
L - 15	SMALL BLOCK ADAPTER ASS'Y	G0MASSY815-AC		10
L - 16	PATTERN HOLDER	2010A00H001-A	PLASTIC	10
L - 17	PATTERN FIX BOLT	3000A000003-A		0.5
L - 18	PATTERN	1200MP0H010-A		10
L - 19	DRESSING STICK	3022A00G001-A	WA80	3
L - 20	DRESSING STICK	3022A00G002-A	WA400	5
L - 21	DRESSING STICK	3022A00G003-A	WA2000	10
M	FINISH BLOCKING PADS		3M LeapIII Tape 1696M (1000Pads)	70



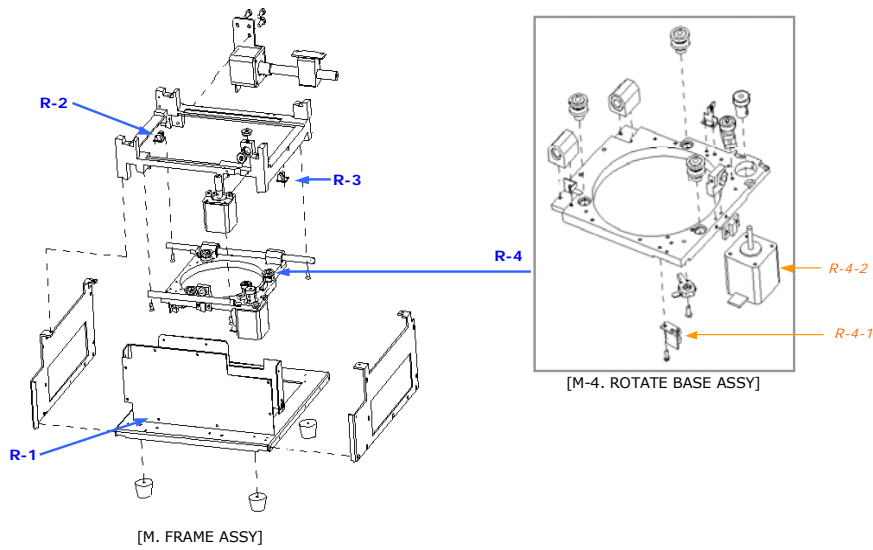
[M. FINISH BLOCKING PADS]



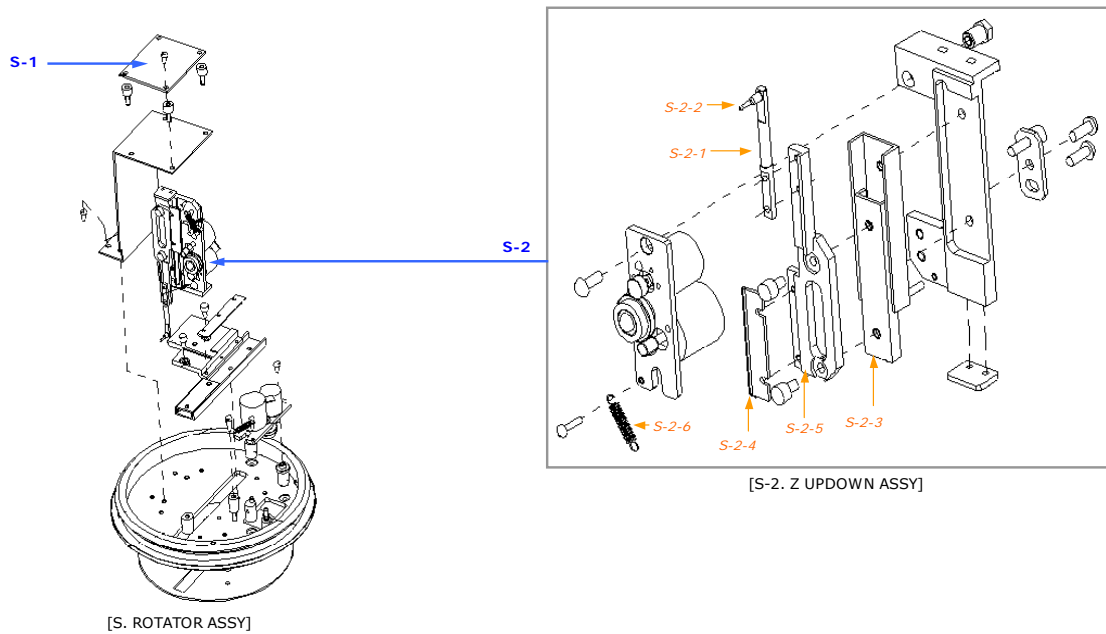
Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
P	FRAME READER MAIN			-
P - 1	BOTTOM COVER	1330MS0H001-A		10
P - 2	COVER MAIN ASS'Y			45
P - 2 - 1	FRONT COVER	2000A00H001-A		5
P - 2 - 2	UPPER COVER	2000A00H008-A		10
P - 2 - 3	PCB ASSY (FRG-100)	HOEPCB1001-AA	GUI CONROL W/ LCD	30
P - 3	LEFT SIDE COVER	2000MP0H001-A		5
P - 4	REAR COVER	2000A00H005-A		5
P - 5	RIGHT SIDE COVER	2000MP0H002-A		5



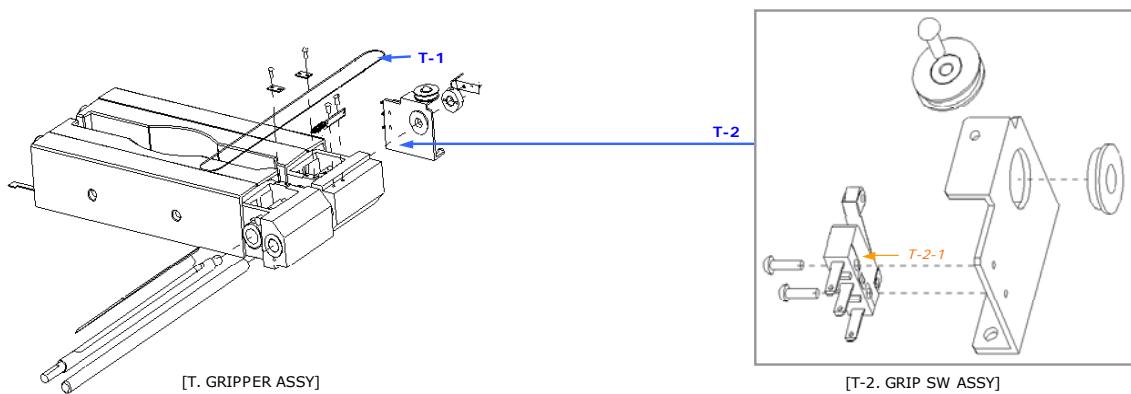
Ref No.	Name of Part	Code of Part	Description	Unit Price(U\$)
Q	MAIN BODY			-
Q - 1	ROTATE PCB2	61800H00001-A	INTERFACE B/C FRI-100 150X70	10
Q - 2	SMPS	7560PH00220-A		80



Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
R	FRAME ASSY	H0MASSY003-AA		-
R - 1	TRACER PCB	61700H00001-A	MAIN CONTROL B/D FRM102, 255X130	30
R - 2	LEFT PI SENSOR	H0EHAR3004-AS		5
R - 3	RIGHT PI SENSOR	H0EHAR3005-AS		5
R - 4	ROTATE BASE ASSY	H0MASSY014-AA		240
R - 4 - 1	R PI SENSOR	H0EHAR6003-AS	W/D CABLE	5
R - 4 - 2	ROTATION STEP MOTOR	H0EHAR3003-AS	W/D CABLE	40



Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
S	ROTATOR ASSY	H0MASSY021-AA		
S - 1	ROTATE PCB1	61600H00001-A	MOTOR CONTROL B/D FRD-100,50X54	5
S - 2	Z UPDOWN ASSY			
S - 2 - 1	STYLUS SHAFT	1210A00H006-A		10
S - 2 - 2	STYLUS TIP	1240MP0H002-A		10
S - 2 - 3	PRECISION SLIDE	3012A000002-A		105
S - 2 - 4	Z ENC RACK	1320A00H002-A		30
S - 2 - 5	Z SHAFT PLATE	1200MP0H008-A		30
S - 2 - 6	TENSION SPRING	3008A000004-A		2



Ref No.	Name of Part	Code of Part	Description	Unit Price(US\$)
T	GRIPPER ASSY			-
T - 1	GRIP WIRE	3008A000005-A		3
T - 2	GRIP SW ASSY	H0MASS012-AA		20
T - 2 - 1	LIMIT SWITCH	H0EHAR4001-AS		5