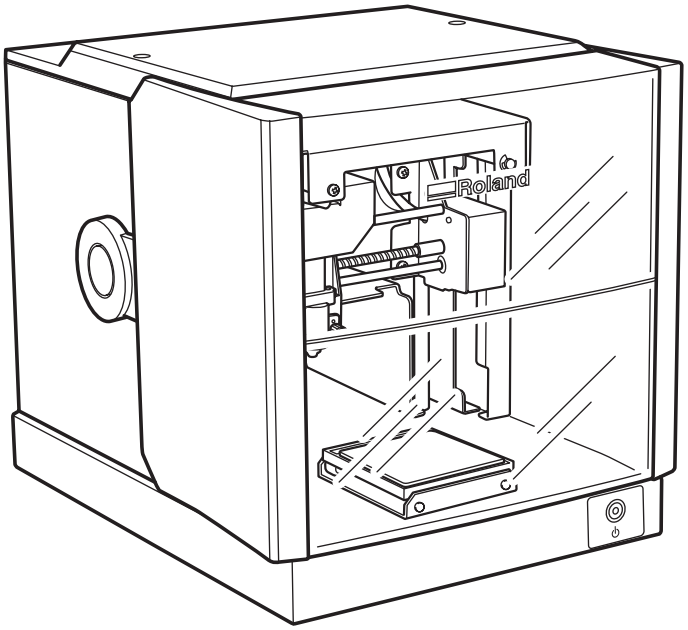
SERVICE NOTES

Roland

METAZA
MPX-90

Confidential



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Revision Record

Revision No.	Date	Description of changes	Approval	Issured
0	2010.04.02	First Edition	Kato	Kato
1	2010.06.09	1-2 PRINTING SYSTEM, 1-4 ACCESSORIES Parts have been revised.	Kato	Mabuchi
2	2010.10.29	1-2 PRINTING SYSTEM, 1-4 ACCESSORIES, 2-1 WIRING MAP Parts have been revised.	Hoshi	Misako
3	2013.6.27	1-4 ACCESSORIES Parts have been revised.	Onoda	Yamane
4	2015.5.15	1-2 PRINTING SYSTEM has been added.	Onoda	Ito

To Ensure Safe Work

About ⚠**WARNING** and ⚠**CAUTION** Notices.

⚠**WARNING**	Used for instructions intended to alert the operator to the risk of death or severe injury should the unit be used improperly.
⚠**CAUTION**	Used for instructions intended to alert the operator to the risk of injury or material damage should the unit be used improperly. * material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

About the Symbols

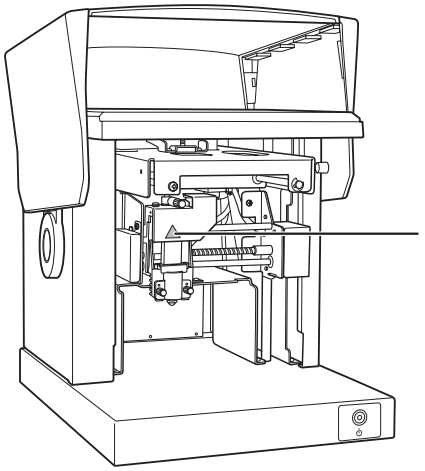
	The ⚠ symbol alerts the user to important instructions or warnings. The specific meaning of the symbol is determined by the design contained within the triangle. The symbol at left means “anger of electrocution”
	The symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. The symbol at left means not to touch.
	The symbol alerts the user to things that must be carried out. The specific thing that must be done is inadicated by the design contained within the circle. The symbol at left means the power-cord plug must be unplugged from the outlet.

In addition to the ⚠**WARNING** and ⚠**CAUTION** symbols, the symbol shown below is also used.

	Tips and advise before the adjustment.

About the Labels Affixed to the Unit

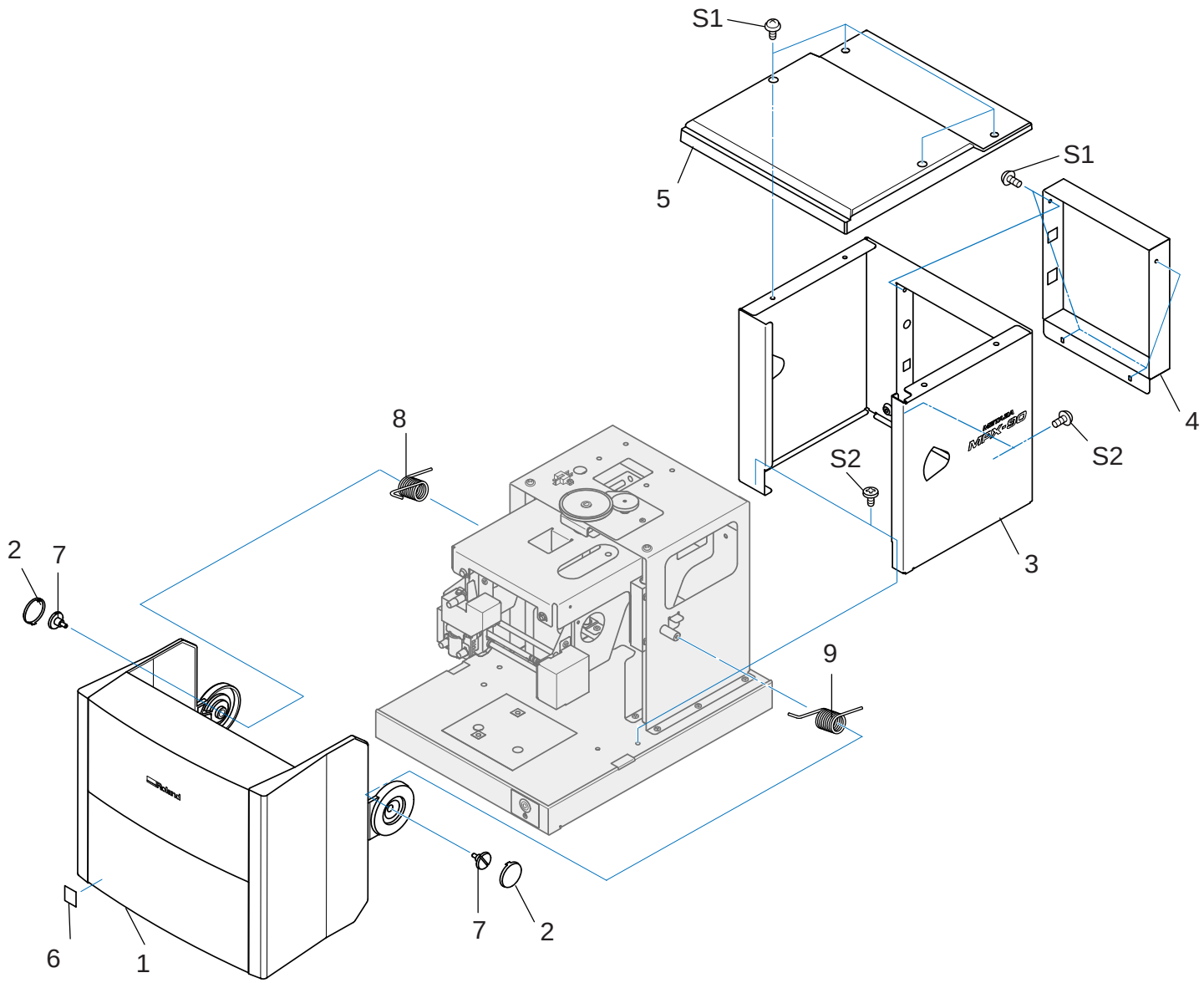
These labels are affixed to the body of this product. The following figure describes location



Caution: High Temperature
Never touch immediately after printing.

1 Structure & Spare Parts

1-1 COVER



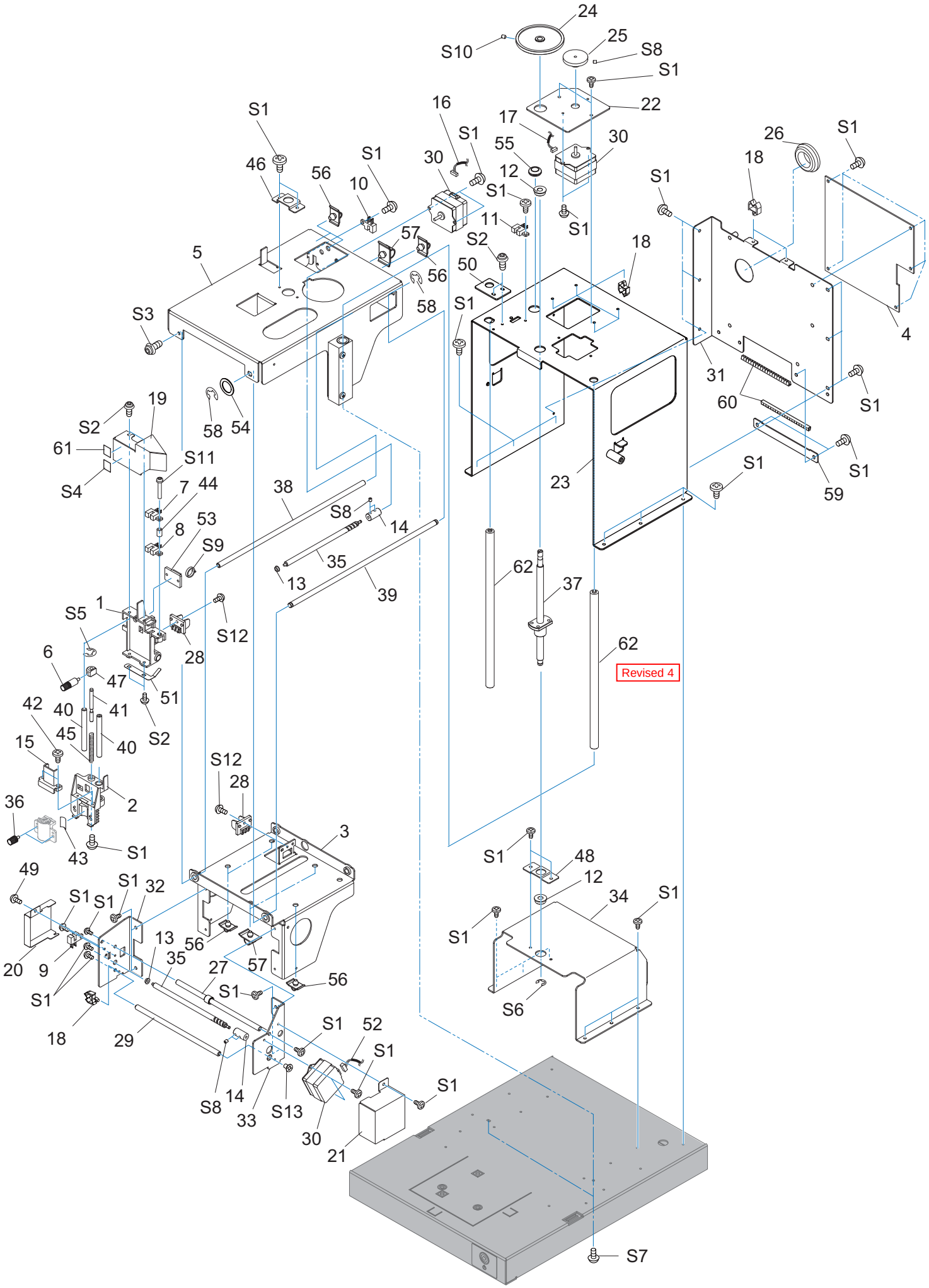
PARTS LIST -Main Parts-

	Parts No.	Parts Name	qt.
1	1000006644	COVER,FRONT MPX-90	1
2	1000006646	CAP,SCREW MPX-90	2
3	1000006637	COVER,BACK MPX-90	1
4	1000006640	COVER,CHASSIS MPX-90	1
5	1000006641	COVER,TOP MPX-90	1
6	1000003489	LABEL,MARK ECO#LA1014	1
7	1000006645	SCREW,COVER MPX-90	2
8	1000006643	SPRING,COVER L MPX-90	1
9	1000006642	SPRING,COVER R MPX-90	1

PARTS LIST -Supplemental Parts-

	Parts No.	Parts Name	qt.
S1	31289108AS	CUPSCREW SET, M3*8 NI 100 PCS.	8
S2	31019142AS	SCREW SET,BINDING M3*4 NI 100PCS.	4

1-2 PRINTING SYSTEM



1-2 PRINTING SYSTEM

PARTS LIST -Main Parts-

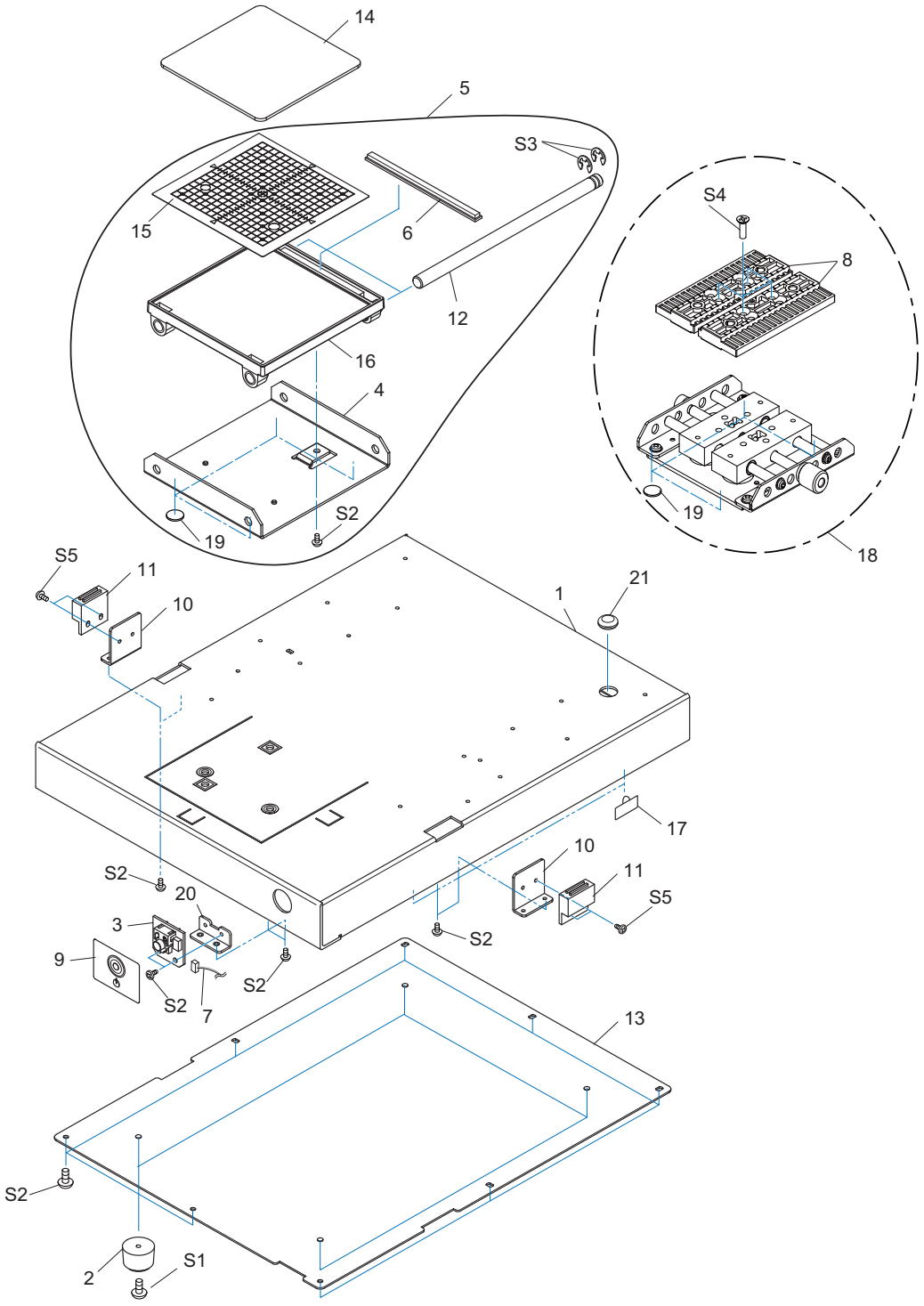
	Parts No.	Parts Name	qt.
1	1000006608	ASSY,CARRIAGE MPX-90	1
2	1000006612	ASSY,HOLDER CARRIAGE MPX-90	1
3	1000006596	ASSY,HOLDER CARRIAGE Y MPX-90	1
4	1000006654	ASSY,MAIN BOARD MPX-90	1
5	1000006595	ASSY,PLATE HOLDER Z MPX-90	1
6	1000000491	SCREW,HEAD MPX-70	1
7	1000007577	ASSY,SENSOR HEAD HEIGHT HIGH 2 MPX-90	1
8	1000007578	ASSY,SENSOR HEAD HEIGHT LOW 2 MPX-90 Revised 2	1
9	1000006607	ASSY,SENSOR X-AXIS MPX-90	1
10	1000006601	ASSY,SENSOR Y-AXIS MPX-90	1
11	1000006631	ASSY,SENSOR Z-AXIS MPX-90	1
12	1000006593	BEARING,SFL686ZZ MPX-90	2
13	1000000460	BEARING,F-630ZZ MPX-70	2
14	1000000462	BUSH,JOINT MPX-70	2
15	1000007506	CABLE-ASSY,HEAD 2 MPX-90 Revised 2	1
16	1000006599	CABLE-ASSY,Y MOTOR MPX-90	1
17	1000006628	CABLE-ASSY,Z MOTOR MPX-90	1
18	1000006647	CLAMP,UAMS-05-0 MPX-90	7
19	1000006622	COVER,HEAD SENSOR MPX-90	1
20	1000006621	COVER,X-AXIS SENSOR MPX-90	1
21	1000006620	COVER,X MOTOR MPX-90	1
22	1000006626	FLANGE,Z MOTOR MPX-90	1
23	1000006623	FRAME,SLIDE MPX-90	1
24	1000006630	GEAR,HEAD DRIVE MPX-90	1
25	1000006627	GEAR,Z MOTOR MPX-90	1
26	1000006633	GROMMET,HOLE CAPS CP-30-HC MPX-90	1
27	1000003719	GUIDE,CARRIAGE AXIS C MPX-80	1
28	1000006600	GUIDE,CARRIAGE MPX-90	2
29	1000006606	GUIDE,CARRIAGE X-AXIS MPX-90	1
30	22435200	MOTOR,14PM-M006-03ST MPX-60	3
31	1000006632	PLATE,BACK MPX-90	1
32	1000006604	PLATE,HEAD HOLDER L MPX-90	1
33	1000006605	PLATE,HEAD HOLDER R MPX-90	1
34	1000006591	PLATE,HOLDER Z SCREW MPX-90	1
35	1000003711	SCREW,4.8 MPX-80	2
36	1000006636	SCREW,PLAPOINT 3*6 BK MPX-90	2
37	1000006602	SCREW,Z AXIS MPX-90	1
38	1000006597	SHAFT,GUIDE Y L MPX-90	1
39	1000006598	SHAFT,GUIDE Y R MPX-90	1
40	1000006613	SHAFT,HEAD HOLDER MPX-90	2
41	1000006615	SHAFT,HEAD MPX-90	1
42	1000006669	SCREW,FLAT P-TIGHT 2*6 NI	2
43	1000006614	SHEET,RADIATION MPX-90	1
44	1000006611	SPACER,HEAD HEIGHT MPX-90	1
45	1000006617	SPRING,HEAD HOLDER MPX-90	1
46	1000006603	STOPPER,FLANGE MPX-90	1
47	1000006650	STOPPER,HEAD MPX-90 Revised 1	1
48	1000006592	SUPPORT,Z SCREW MPX-90	1
49	1000006927	SCREW,BINDING 3*3 SWCH10R	1
50	1000006915	PLATE,ADJUSTER MPX-90	1
51	1000006919	PLATE,CARRIAGE BASE MPX-90	1
52	1000006922	CABLE-ASSY,X MOTOR MPX-90	1
53	1000006925	CRADLE,TY3G1S	1
54	1000006916	WASHER,THRUST STW-FT100 0.5	1
55	1000006924	GROMET,RUBBER G-68	1
56	1000006920	CLAMP,CKS-05-L	6
57	1000006921	CLAMP,CKS-10-L	3
58	1000006928	RING,E ETW-8 CS	2
59	1000006929	PLATE,STOPPER MPX-90	1
60	1000006930	BUSH,GEE99F-A-C 80MM	2
61	1000006931	LABEL.HEAD SCREW MPX-90	1
62	1000006594	SHAFT,Z SLIDE MPX-90 Revised 4	2

Revised 2
P/No.15: Refer to the Service Information MPX90-004.
P/No.7,8: Refer to the Service Information MPX90-005.

PARTS LIST -Supplemental Parts-

	Parts No.	Parts Name	qt.
S1	31019142AS	SCREW SET,BINDING M3*4 NI 100PCS.	50
S2	31289105AS	CUPSCREW SET, M3*6 3CBC 100 PCS	6
S3	31019159	SCREW SET,BINDING M4*6 NI 100 PCS.	1
S4	31279106	LABEL,CAUTION HOT SURF NO.778	1
S5	31149702AS	RING SET,E-RING ETW-3 100 PCS.	1
S6	31149708	RING SET,E-RING ETW-ES5 3C 100 PCS.	1
S7	-	CUPSCREW SET,M4*10 NI 100 PCS.	2
S8	31199701AS	SCREW SET,SET WP M3*3 NI 20 PCS	5
S9	31329601AS	CLAMP SET,INSULOK T-18S 100 PCS.	1
S10	32079101	SCREW SET,SET WP M4*8 NI 20 PCS.	1
S11	31019121	SCREW SET,BINDING M3*20 NI 100 PCS	1
S12	31289108AS	CUPSCREW SET, M3*8 NI 100 PCS.	2
S13	31169102AS	SCREW SET,FLAT M3*4 NI 100 PCS	1

1-3 TABLE



PARTS LIST -Main Parts-

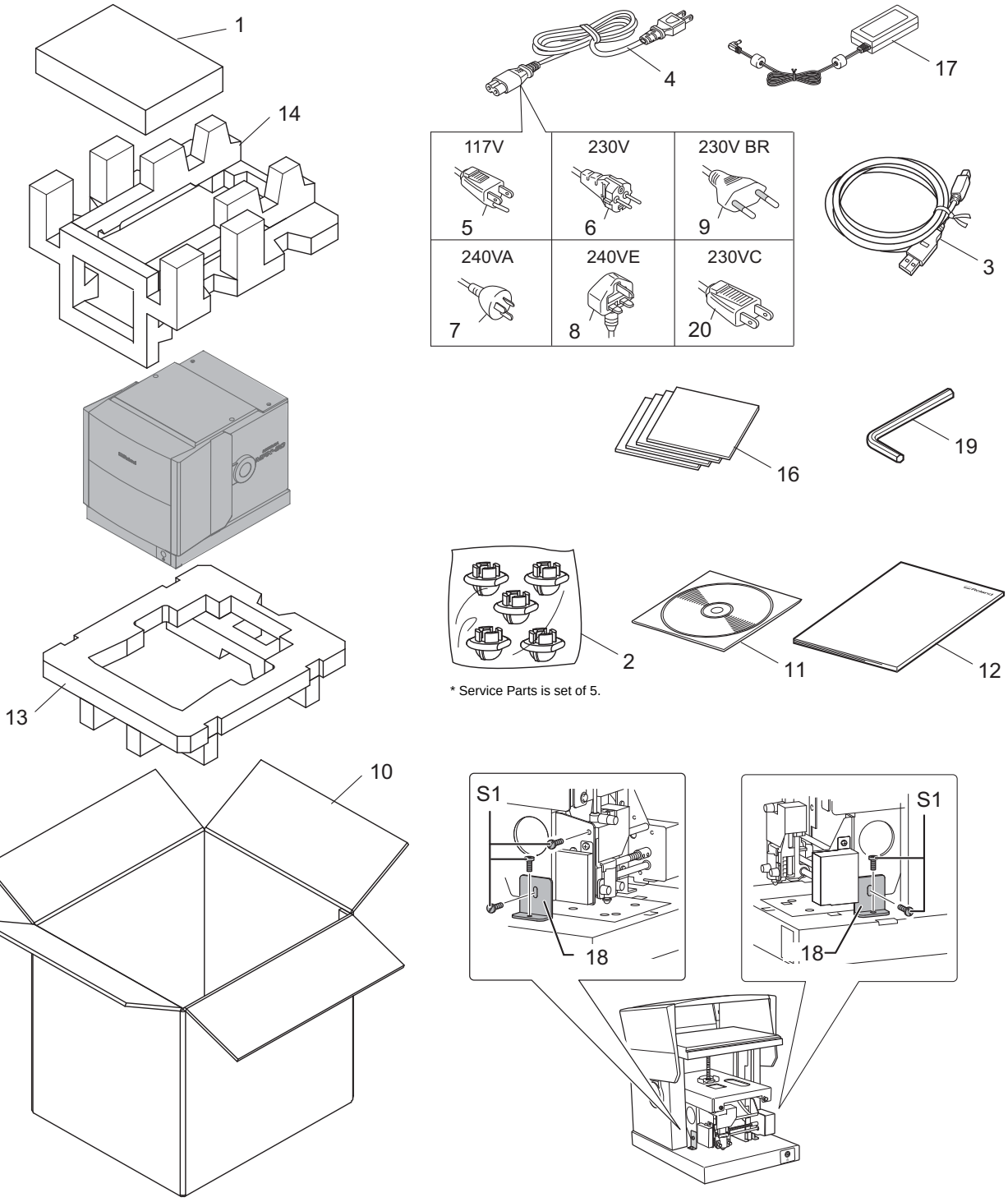
	Parts No.	Parts Name	qt.
1	1000006589	PLATE,BASE MPX-90	1
2	1000006639	ABSORBER,MPX-90	4
3	1000003759	ASSY,PANEL SWITCH BOARD MPX-80	1
4	1000006655	HOLDER,TABLE MPX-90	1
5	1000006656	ASSY,TABLE MPX-90	1
6	1000000455	BRUSH,CLEANER MPX-70	1
7	1000006590	CABLE-ASSY,PANEL SWITCH MPX-90	1
8	1000003749	CLAMP,PLATE MPX-80	2
9	1000006634	LABEL,SW MPX-90	1
10	1000006814	MAGNET,CATCH TL-105	2
11	1000006815	MAGNET,TL-105	2
12	1000006913	SHAFT,GUIDE TABLE MPX-90	2
13	1000006638	PLATE,BASE BOTTOM MPX-90	1
14	1000000470	SHEET,RUBBER MPX-70	1

	Parts No.	Parts Name	qt.
15	1000003710	SHEET,TABLE UNDER MPX-80	1
16	1000006817	TABLE,MPX-90	1
17	1000006838	STICKER,P-102G MPX-90	2
18	1000003779	ASSY,VISE MPX-80	1
19	1000006918	CUSHION,PORON H-48 0.8 MPX-90	8
20	1000006914	PLATE,PANEL SW MPX-90	1
21	1000006924	GROMET,RUBBER G-68	1

PARTS LIST -Supplemental Parts-

	Parts No.	Parts Name	qt.
S1	31289108AS	CUPSCREW SET, M3*8 NI 100 PCS.	4
S2	31019142AS	SCREW SET,BINDING M3*4 NI 100PCS.	17
S3	31149703AS	RING SET,E-RING ETW-4 100 PCS.	4
S4	31169113	SCREW SET,FLAT M4*12NI 50 PCS	4
S5	31089105AS	SCREW SET,PAN M3*5 C 100 PCS.	4

1-4 ACCESSORIES



* Service Parts is set of 5.

PARTS LIST -Main Parts-

	Parts No.	Parts Name	qt.
1	1000000510	A4 INNER BOX MPX-70	1
2	1000006679	ASSY,CAP HEAD MPX-90 5PCS	1
3	1000000089	CABLE,USB 2.0M BK TW	1
4	23495118	CABLE-AC,2P 100V 2.5M TW	1
5	23495119	CABLE-AC,2P 117V 2.5M TW	1
6	23495120	CABLE-AC,2P 230V 2.5M TW	1
7	23495123	CABLE-AC,2P 240VA 2.5M TW	1
8	23495122	CABLE-AC,2P 240VE 2.5M TW	1
9	1000006572	CABLE-AC,2P 117/230V BR 2.5M	1
10	1000006651	CARTON,BOX MPX-90	1
11	1000006536	DISK,CD RSP-070 SOFTPACKAGE	1
12	1000006548	MANUAL,USE EN MPX-90	1
	1000006547	MANUAL,USE JP MPX-90	1

	Parts No.	Parts Name	qt.
13	1000006653	PAD,BOTTOM MPX-90	1
14	1000006652	PAD,TOP MPX-90	1
16	22055423	PLATE,TEST 4PCS SET MPX-50	1
17	1000003501	POWER UNIT,AC-ADP.DCP-A01	1
	1000006895	POWER UNIT,AC-ADP.DCP-A01 LEVEL5 KC Revised 2	1
18	1000006616	RETAINER,CARRIAGE MPX-90 Revised 1	2
19	11939109	TOOL,HEXAGONAL WRENCH M2.5	1
20	1000010473	CABLE-AC,2P CHINA 10A/250V Revised 3	1

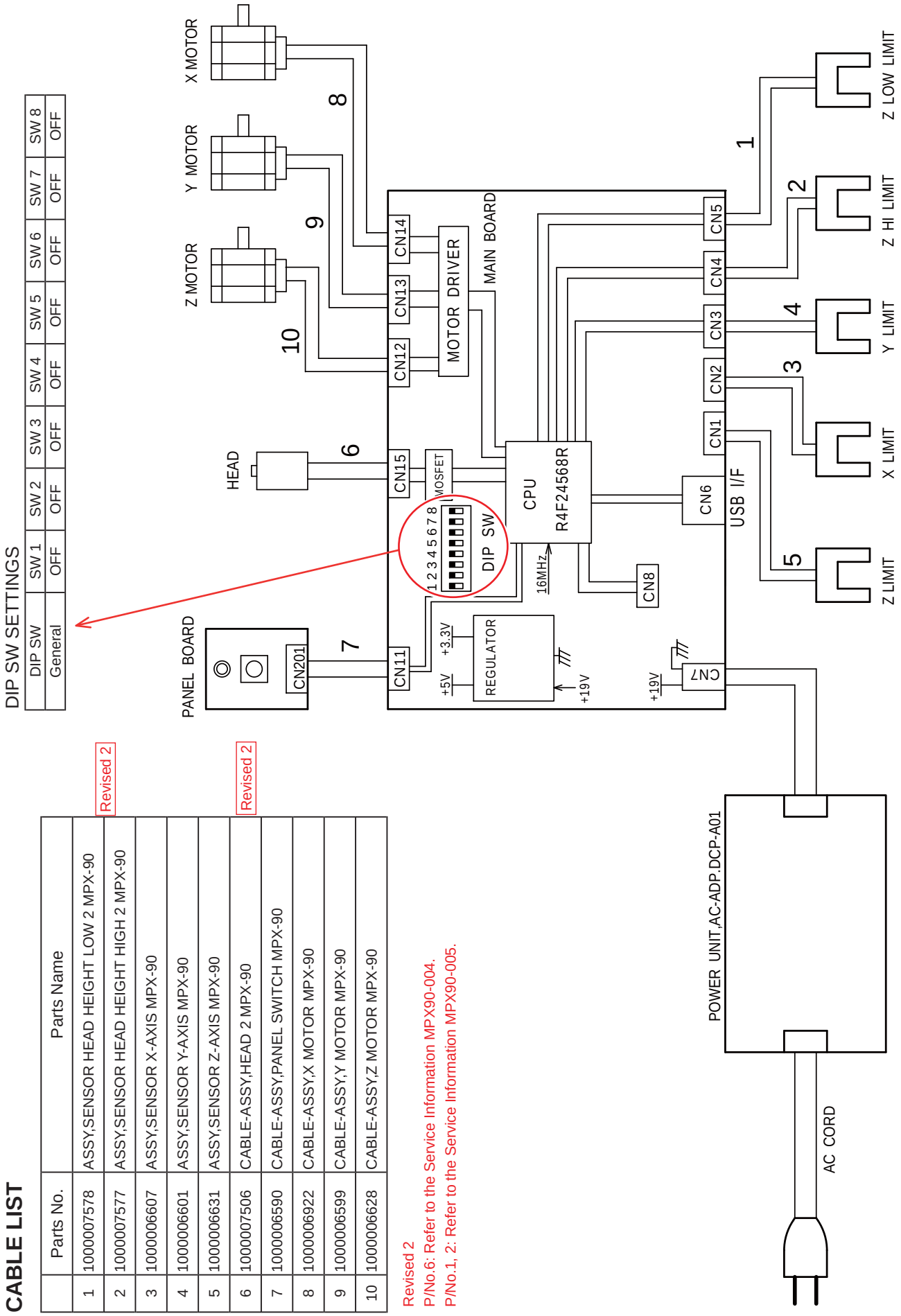
Revised 2: Refer to the Service Information MPX90-003.

PARTS LIST -Supplemental Parts-

	Parts No.	Parts Name	qt.
S1	31049105AS	SCREW SET,CAP M3*6 3CBC 20 PCS	5

2 Electrical Section

2-1 WIRING MAP



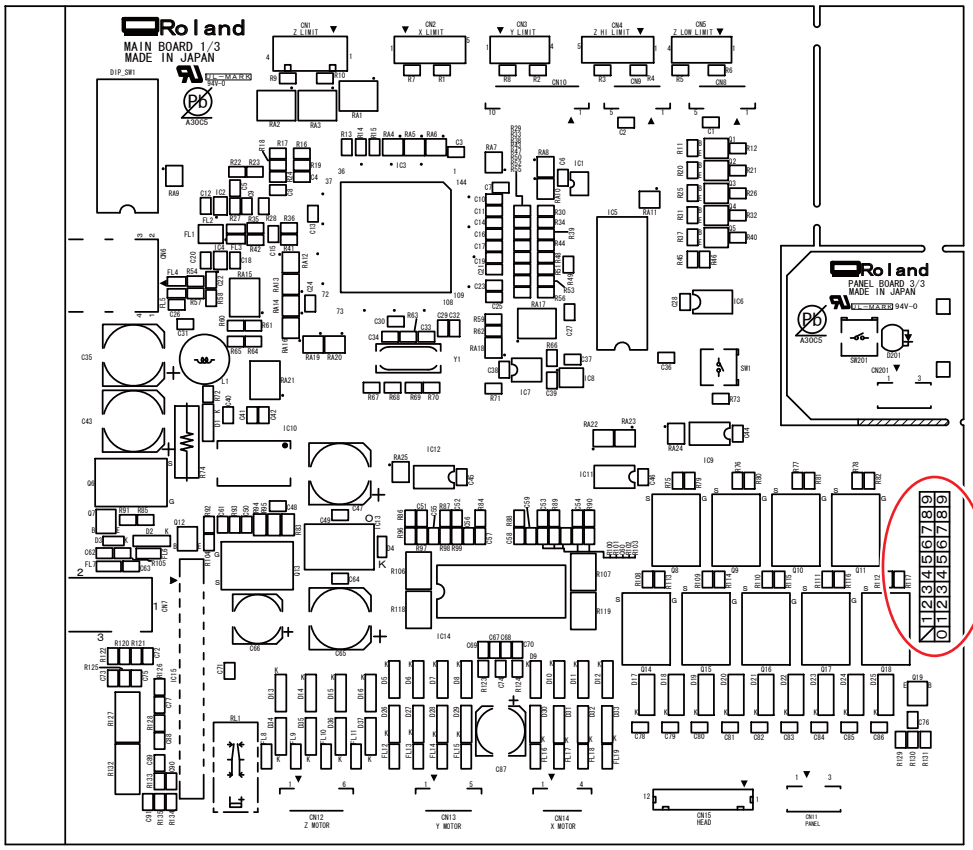
CABLE LIST

	Parts No.	Parts Name	
1	1000007578	ASSY,SENSOR HEAD HEIGHT LOW 2 MPX-90	Revised 2
2	1000007577	ASSY,SENSOR HEAD HEIGHT HIGH 2 MPX-90	
3	1000006607	ASSY,SENSOR X-AXIS MPX-90	
4	1000006601	ASSY,SENSOR Y-AXIS MPX-90	
5	1000006631	ASSY,SENSOR Z-AXIS MPX-90	
6	1000007506	CABLE-ASSY,HEAD 2 MPX-90	Revised 2
7	1000006590	CABLE-ASSY,PANEL SWITCH MPX-90	
8	1000006922	CABLE-ASSY,X MOTOR MPX-90	
9	1000006599	CABLE-ASSY,Y MOTOR MPX-90	
10	1000006628	CABLE-ASSY,Z MOTOR MPX-90	

Revised 2
P/No.6: Refer to the Service Information MPX90-004.
P/No.1, 2: Refer to the Service Information MPX90-005.

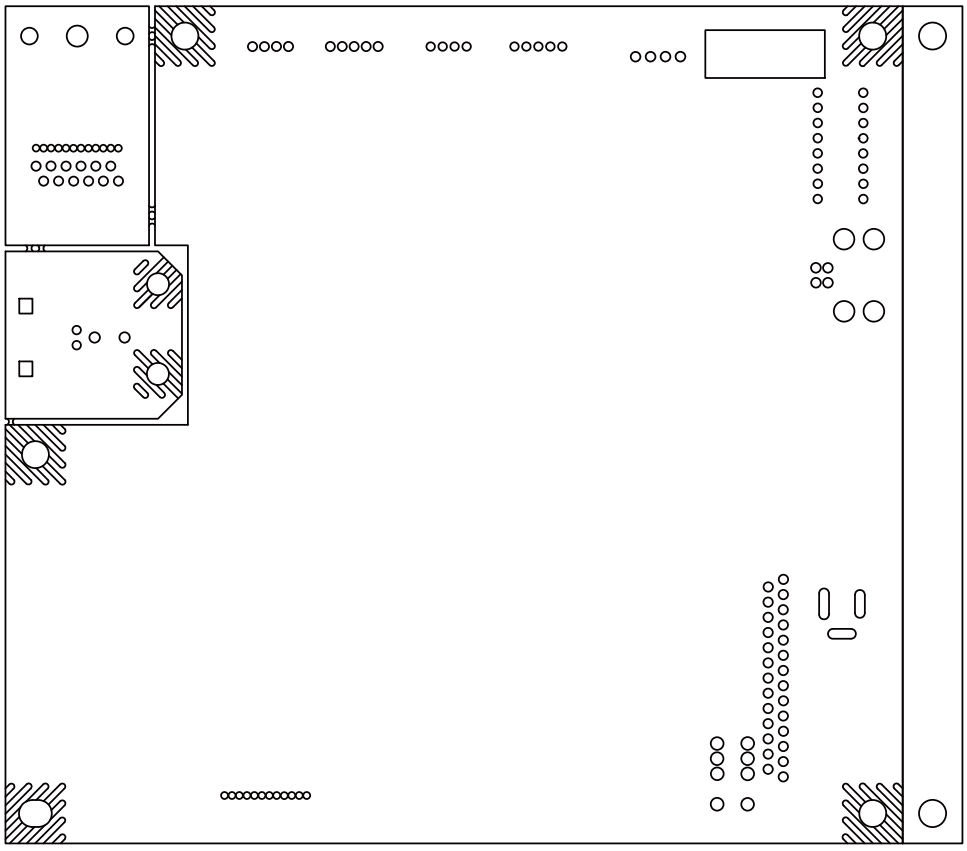
2-2 MAIN BOARD

MAIN BOARD Arrangement Diagram (Component Side)

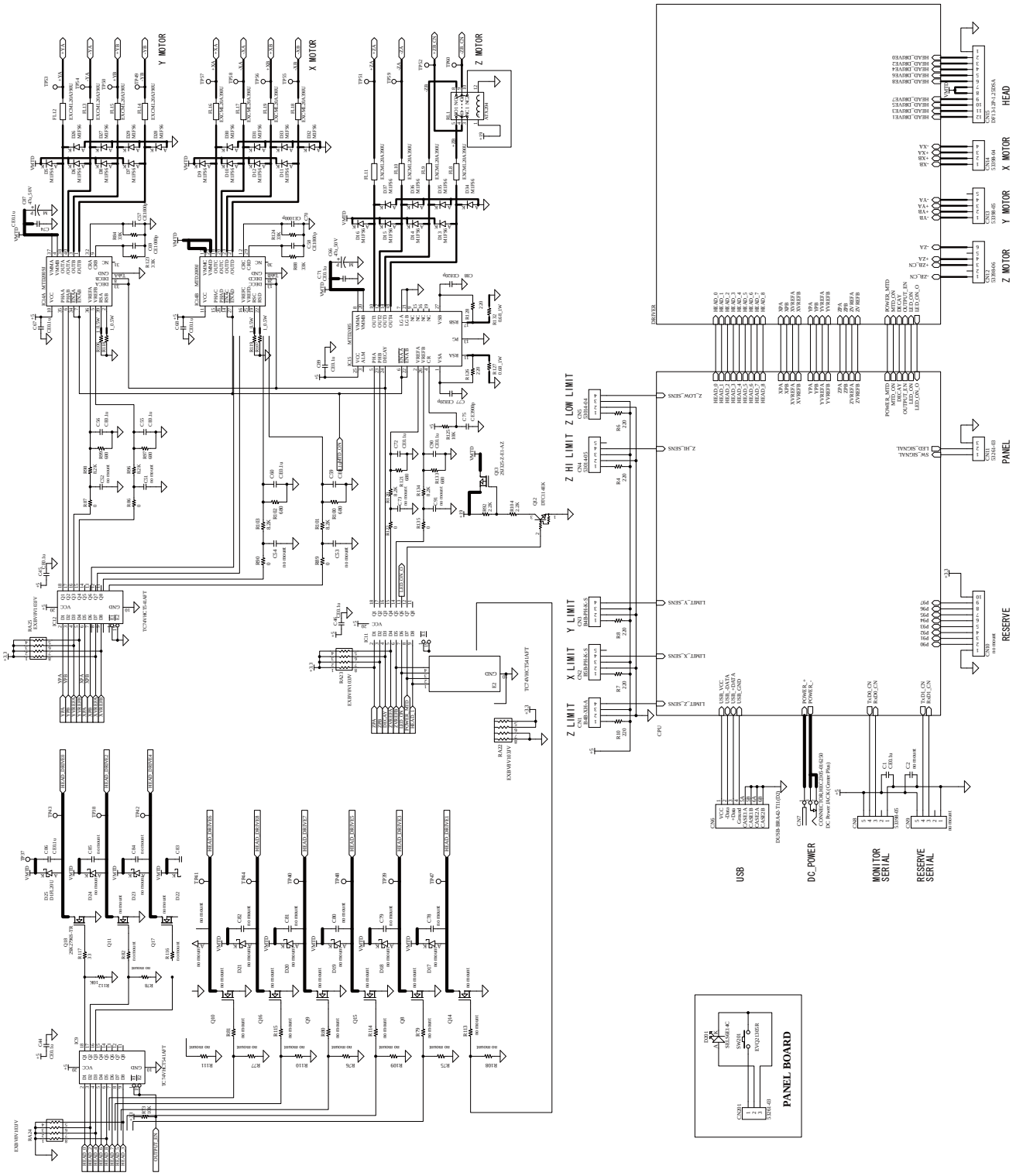


It Indicates the version of the Board.

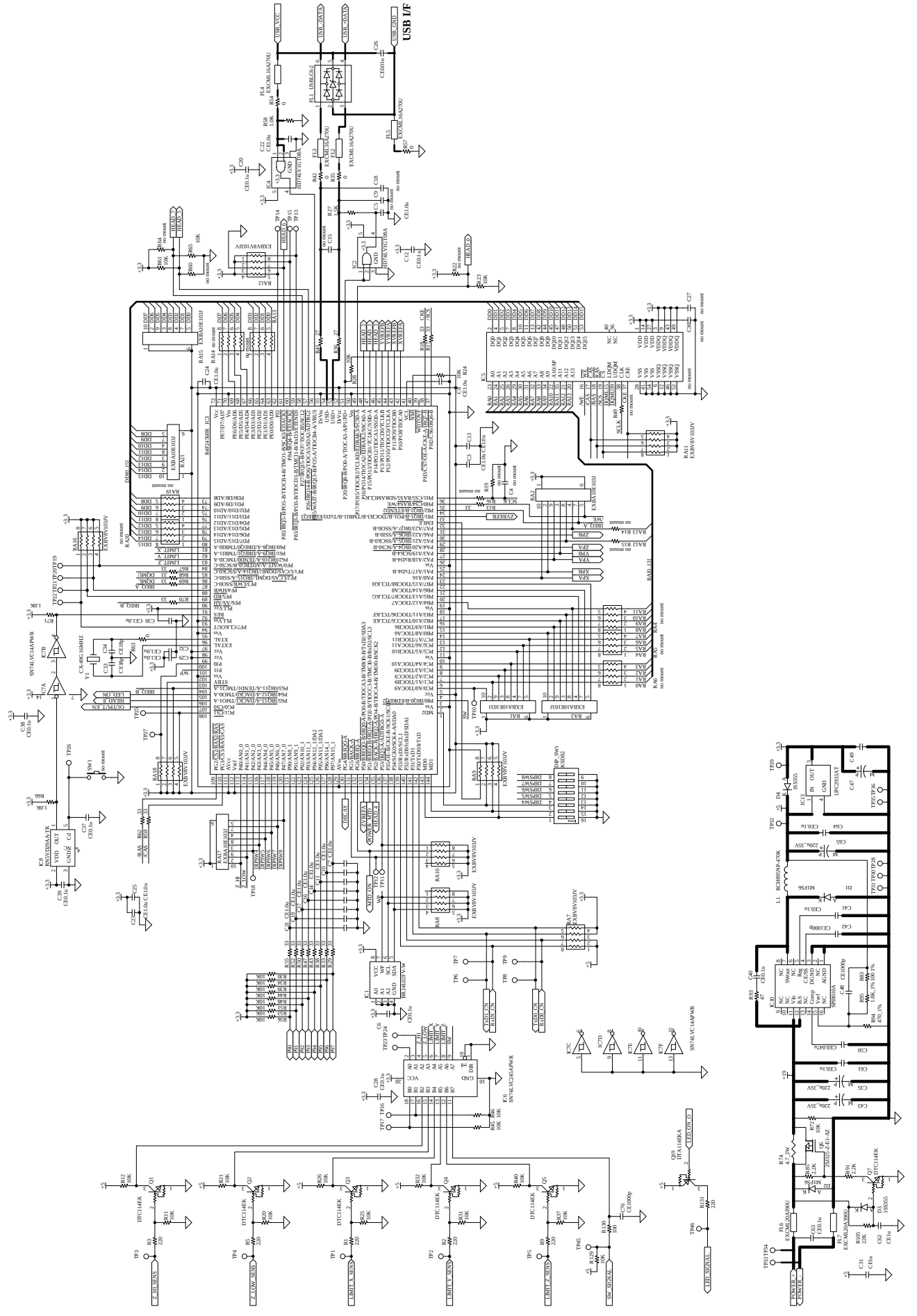
MAIN BOARD Arrangement Diagram (Soldering Side)



MAIN BOARD 1/2 Circuit Diagram



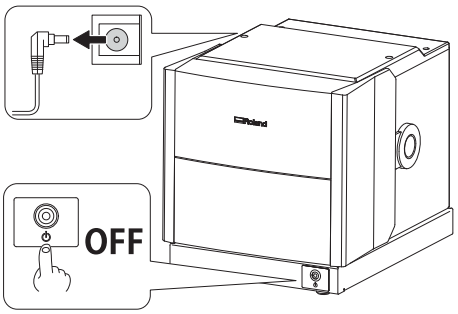
MAIN BOARD 2/2 Circuit Diagram



To Ensure Safe Work

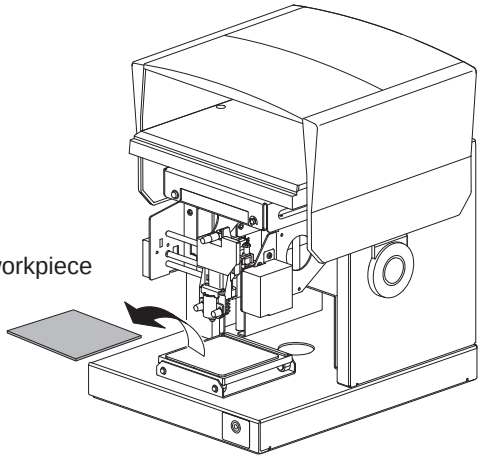
⚠WARNING

Turn off the power SW and unplug the AC adapter of the machine before performing the parts replacement.
Performing the parts replacement while the power is turned on may result in injury by unintended operation of the machine.



Turn off the power SW and unplug the machine

Remove a workpiece. Performing the parts replacement while setting the workpiece may result in damage to the workpiece.



Remove the workpiece

To prevent static damage, discharge static electricity from your body before you touch any of electronic devices. You can do so by touching an unpainted metal surface on the chassis.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

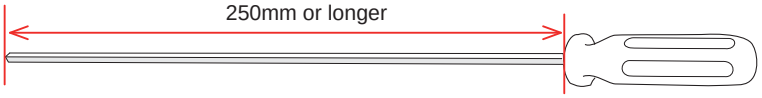
- When unpacking a static-sensitive device from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the device to the machine. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive devices, place it in an antistatic container or packaging first.
- Handle all sensitive devices in a static-safe area. If possible, use antistatic floor pads and workbench pads.

The necessary adjustments after the replacement of each part, and the referential time for each work are described as follows.

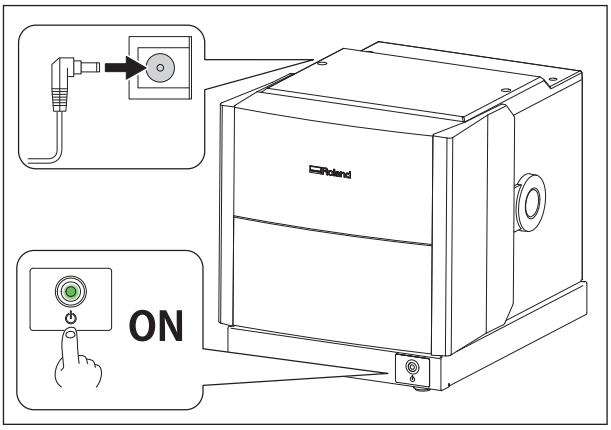
CONTENTS		TIME (min.)	TOTAL (min.)
X CARRIAGE GUIDE REPLACEMENT		10	10
Y CARRIAGE GUIDE REPLACEMENT		10	10
X MOTOR REPLACEMENT		15	20
ADJUSTMENT	LOAD CHECK	5	
Y MOTOR REPLACEMENT		15	20
ADJUSTMENT	LOAD CHECK	5	
Z MOTOR REPLACEMENT		15	20
ADJUSTMENT	LOAD CHECK	5	
MAIN BOARD REPLACEMENT (If the parameters cannot be transferred by MPX90Pit.)		10	37
ADJUSTMENT	FIRMWARE INSTALLATION	5	
ADJUSTMENT	ORIGIN CALIBRATION	10	
ADJUSTMENT	HITTING FORCE CALIBRATION	10	
ADJUSTMENT	SERIAL NUMBER SETTING	2	
MAIN BOARD REPLACEMENT (When the parameters can be transferred by MPX90Pit.)		10	17
ADJUSTMENT	FIRMWARE INSTALLATION	5	
ADJUSTMENT	PUT PARAMETER	2	
Z SCREW REPLACEMNT		15	20
ADJUSTMENT	LOAD CHECK	5	
X/Y/Z LIMIT SW REPLACEMENT		10 each	22 each
ADJUSTMENT	SENSOR CHECK	2 each	
ADJUSTMENT	ORIGIN CALIBRATION	10 each	

3-1 X CARRIAGE GUIDE REPLACEMENT

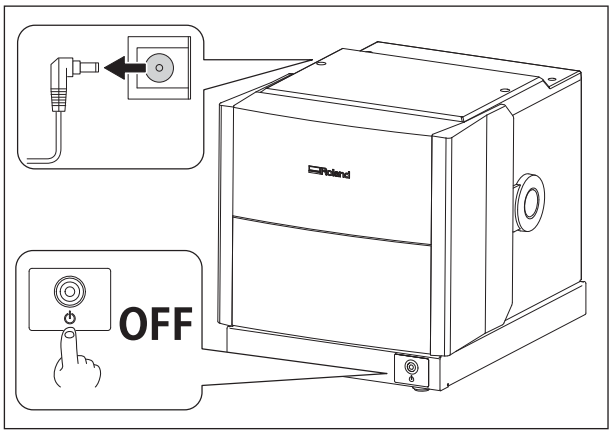
In addition to the ordinary tools, a Phillips screwdriver with a length of 250mm or longer is necessary.



1 Connect the AC adapter.
Turn on the main power SW. The head moves to the position of rear left.



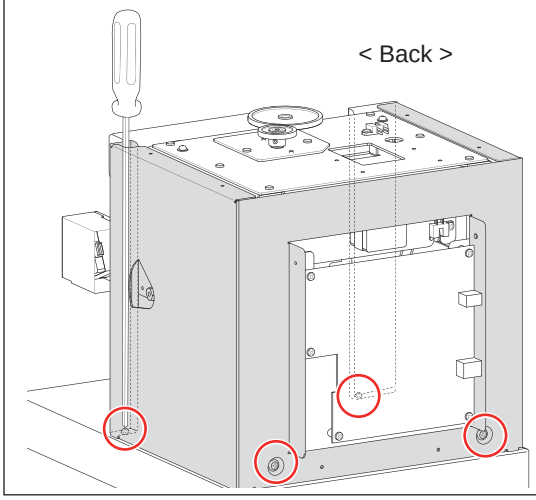
2 Turn off the main power SW, then pull out the AC adapter.

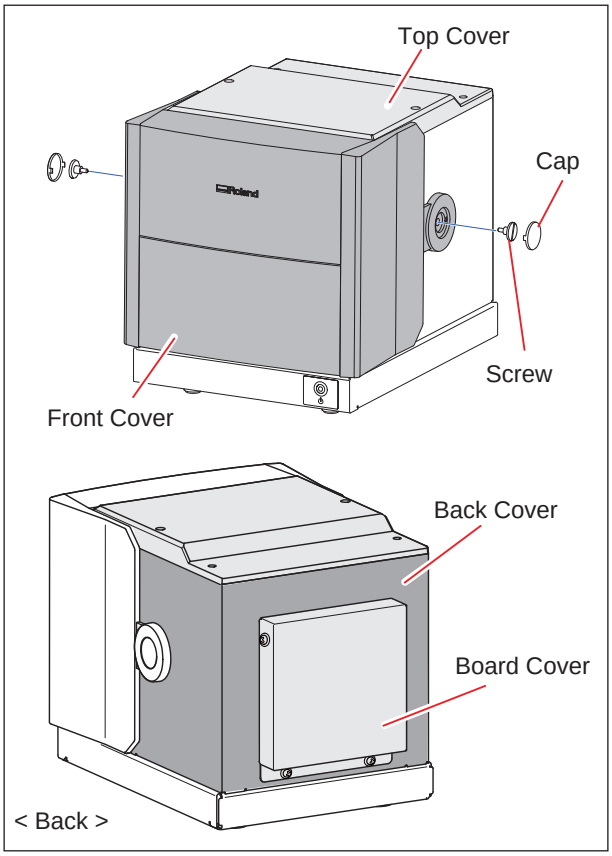


3 Remove the following parts.

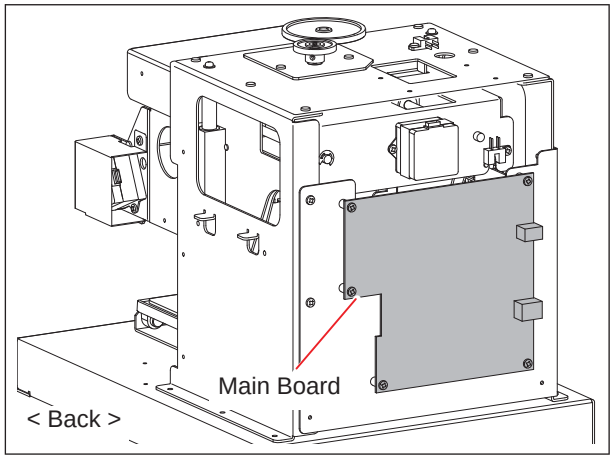
Cap
Screw
Front Cover
Top Cover
Board Cover
Back Cover

Screws of the Back Cover

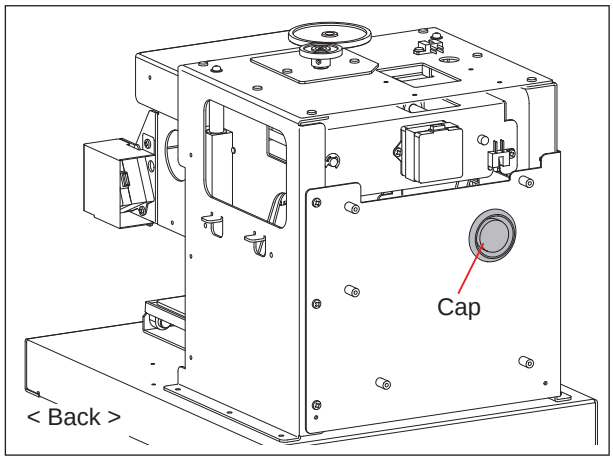




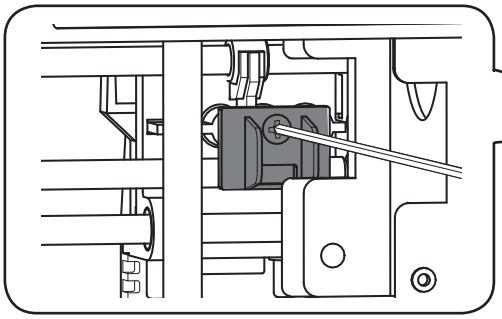
4 Disconnect all the connectors from the Main Board, and remove the Main Board.

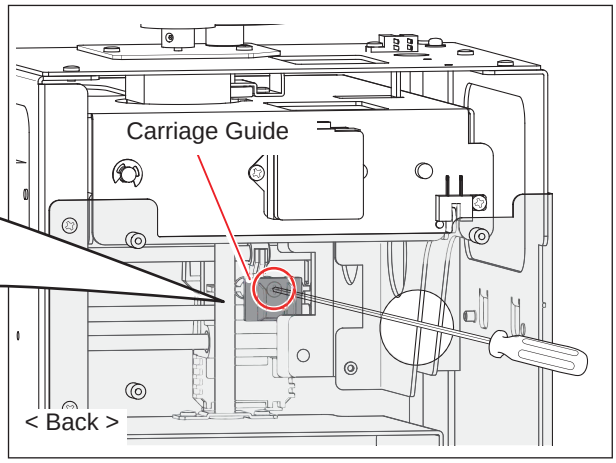


5 Remove the cap.

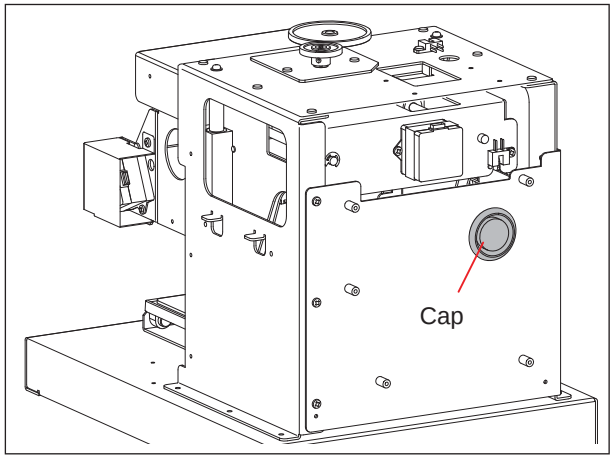


6 Remove the screw shown in the figure to remove the Carriage Guide. And replace it with the new one.
Check that the Head Carriage moves smoothly by hand without backlash.

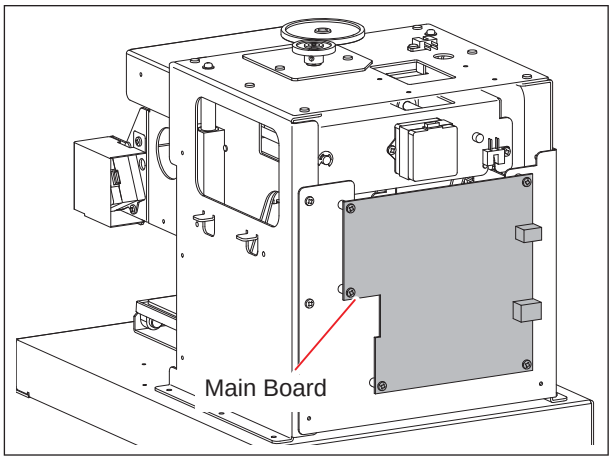




7 Fix the cap.



8 Fix the Main Board.
Connect all the connectors to the Main Board.

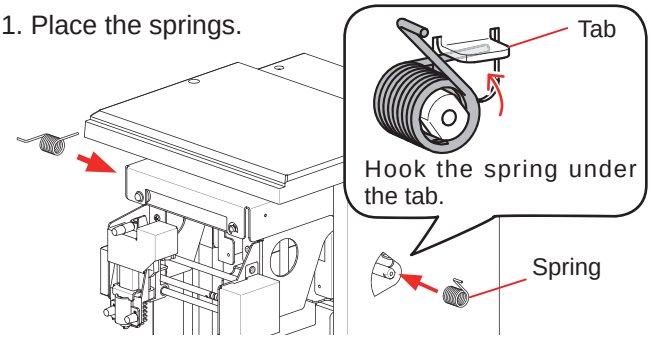


9 Fix the following parts.

Back Cover
Board Cover
Top Cover
Front Cover
Screw
Cap

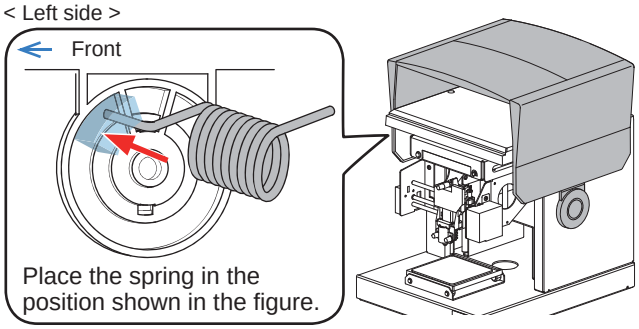
< To fix the Front Cover >

1. Place the springs.

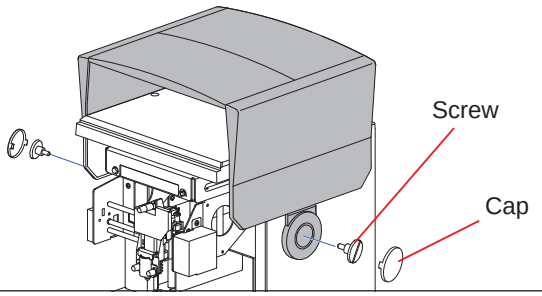


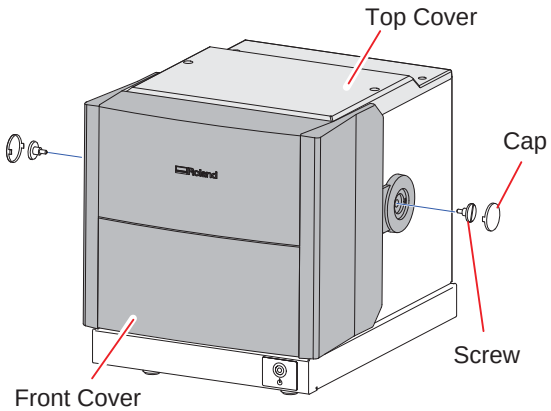
2. Place the Front Cover with the cover open.

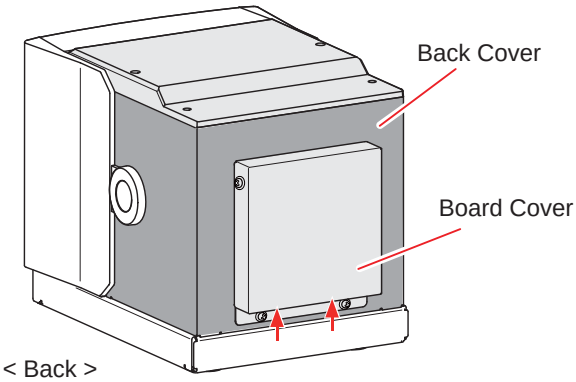
< Left side >



3. Fix the Front Cover with the screws and caps.



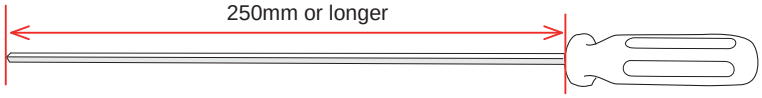




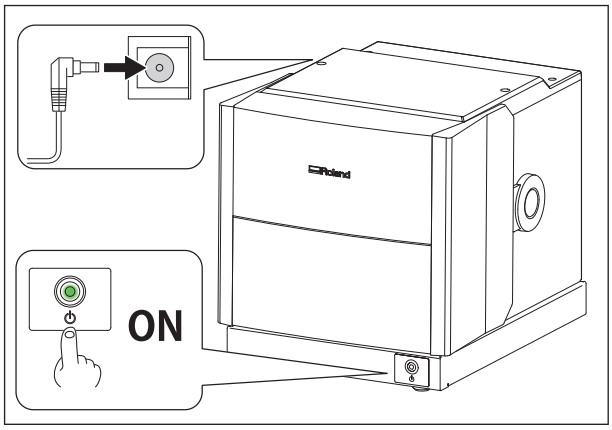
Fix the Board Cover while pushing it upward.

3-2 Y CARRIAGE GUIDE REPLACEMENT

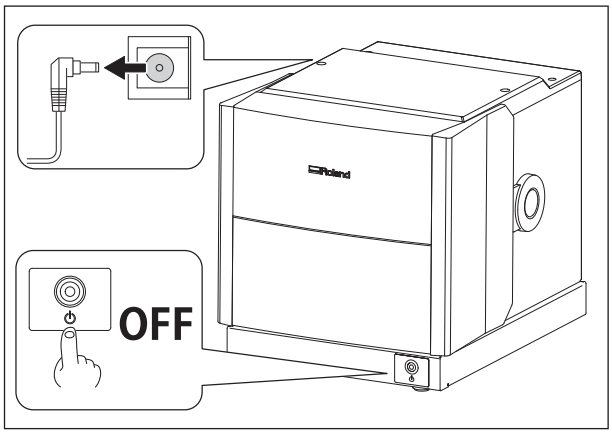
In addition to the ordinary tools, a Phillips screwdriver with a length of 250mm or longer is necessary.



1 Connect the AC adapter.
Turn on the main power SW. The head moves to the position of rear left.



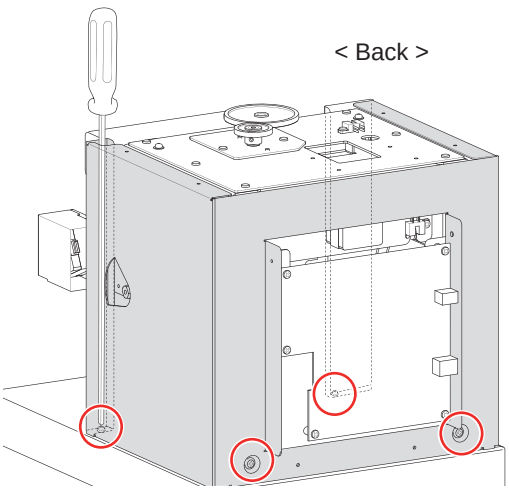
2 Turn off the main power SW, then pull out the AC adapter.

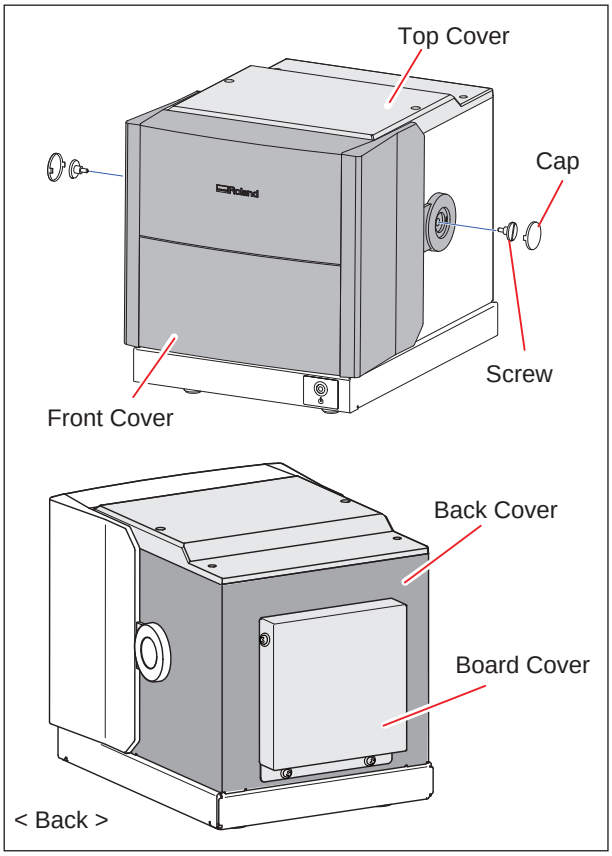


3 Remove the following parts.

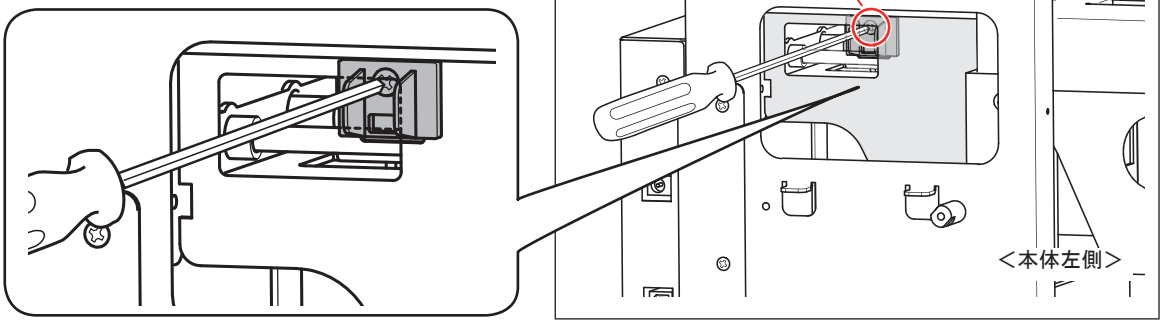
Cap
Screw
Front Cover
Top Cover
Board Cover
Back Cover

Screws of the Back Cover





4 Remove the screw shown in the figure to remove the Carriage Guide. And replace it with the new one.
Check that the Head Carriage moves smoothly by hand without backlash.

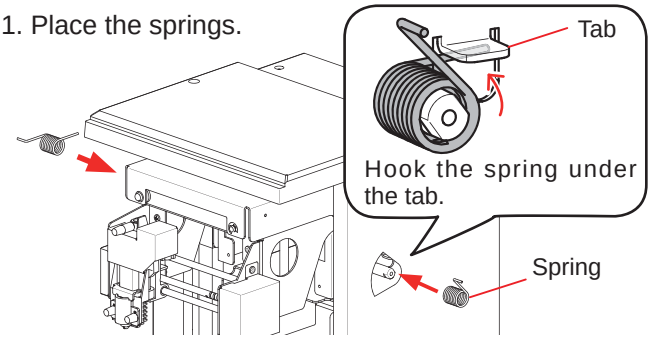


9 Fix the following parts.

Back Cover
Board Cover
Top Cover
Front Cover
Screw
Cap

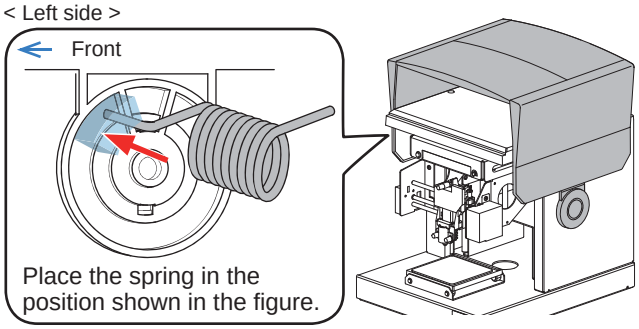
< To fix the Front Cover >

1. Place the springs.

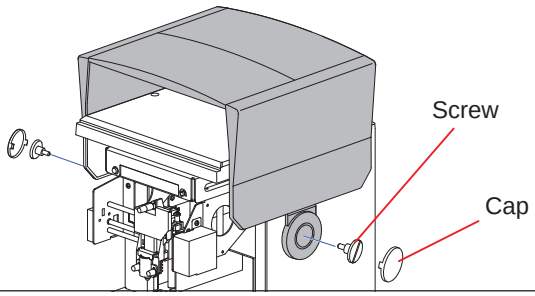


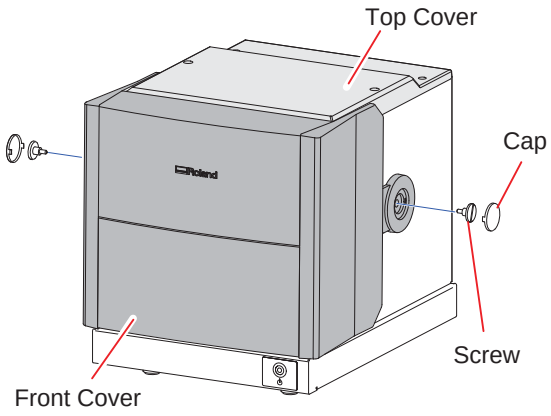
2. Place the Front Cover with the cover open.

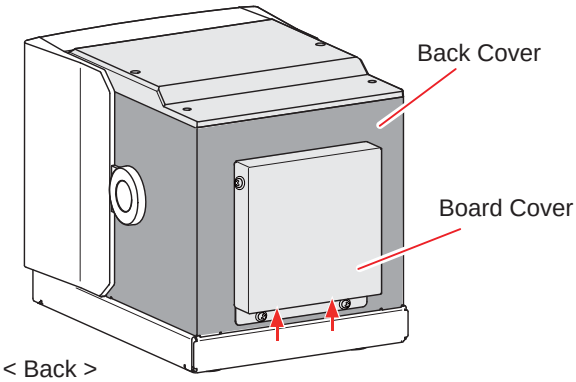
< Left side >



3. Fix the Front Cover with the screws and caps.



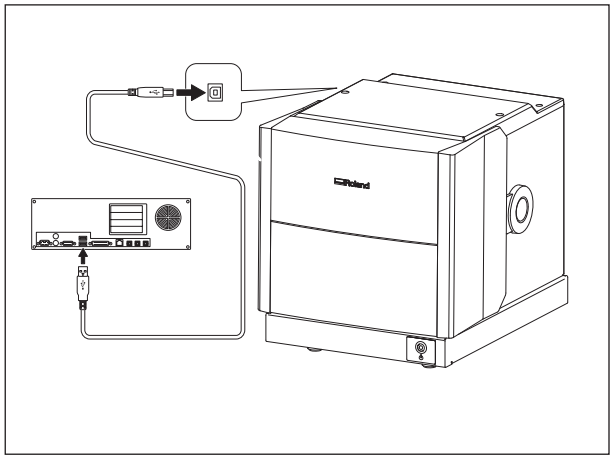




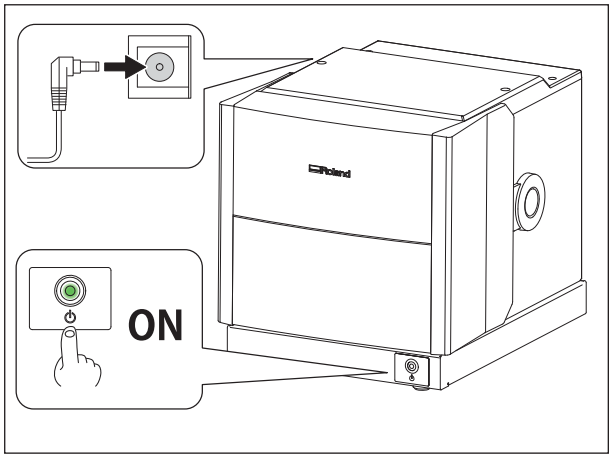
Fix the Board Cover while pushing it upward.

3-3 X MOTOR REPLACEMENT

1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when starting the MPX90Pit.
Connect the machine to your PC by a USB cable.

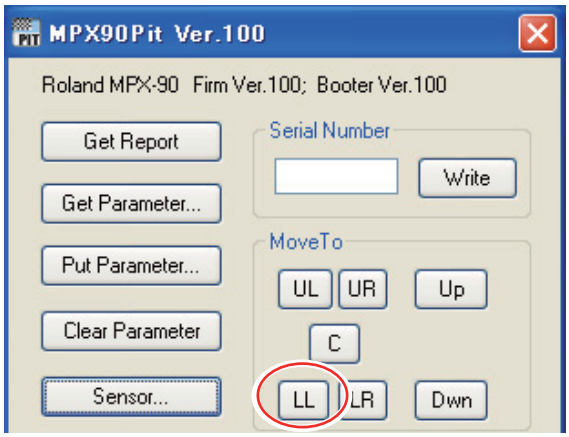


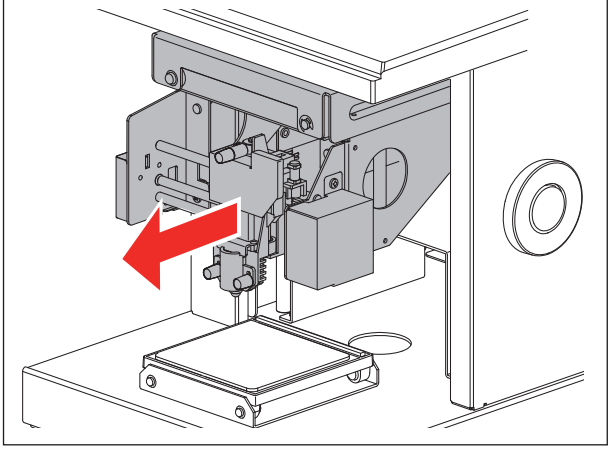
2 Connect the AC adapter.
Turn on the main power SW.



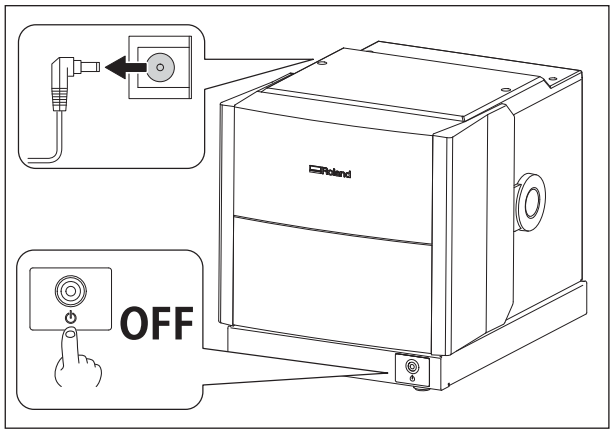
3 Start the MPX90Pit.
Click [LL] in [Move To] to move the Carriage to the position of front left.



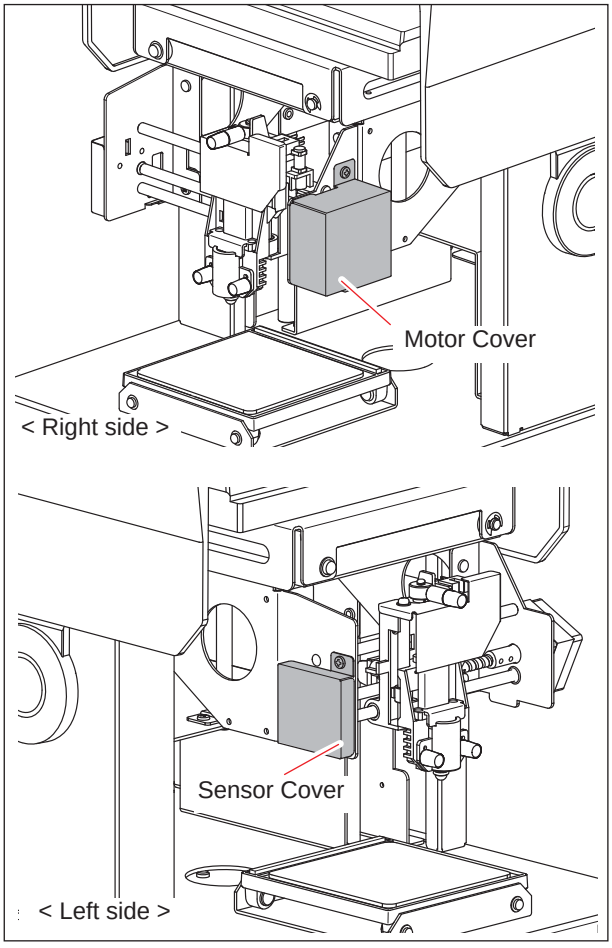




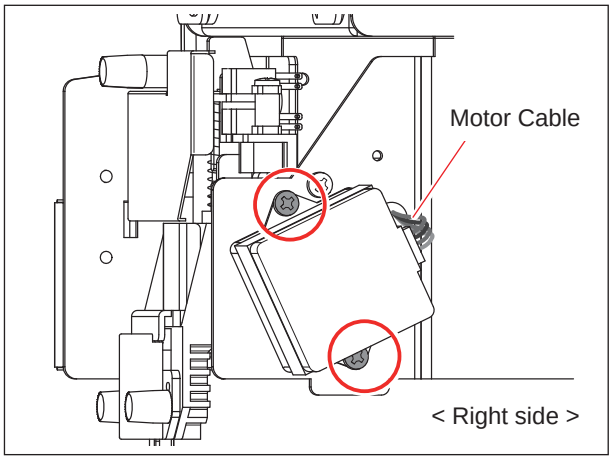
4 Turn off the main power SW, then pull out the AC adapter.



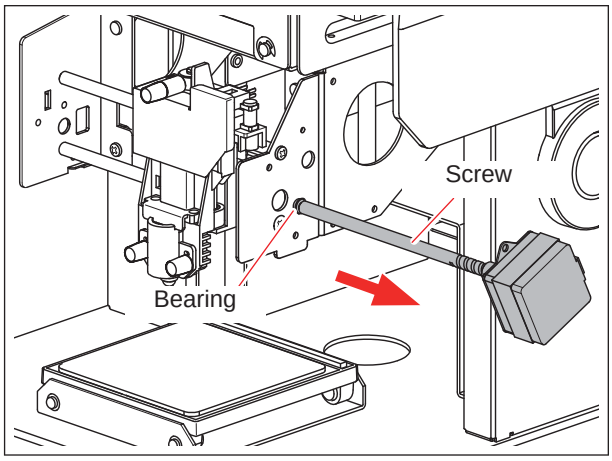
5 Open the Front Cover, and remove the Motor Cover and Sensor Cover.



6 Disconnect the motor cable and remove the 2 screws fixing the Motor.

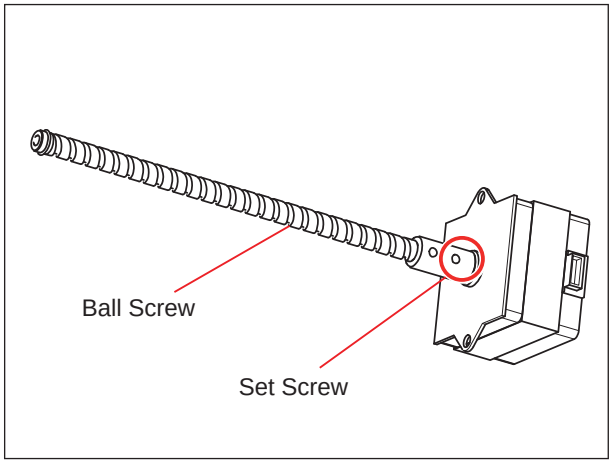


7 Remove the motor together with the Ball Screw.



At the end of the Ball Screw is the Screw Bearing.
Be sure not to lose the Bearing.

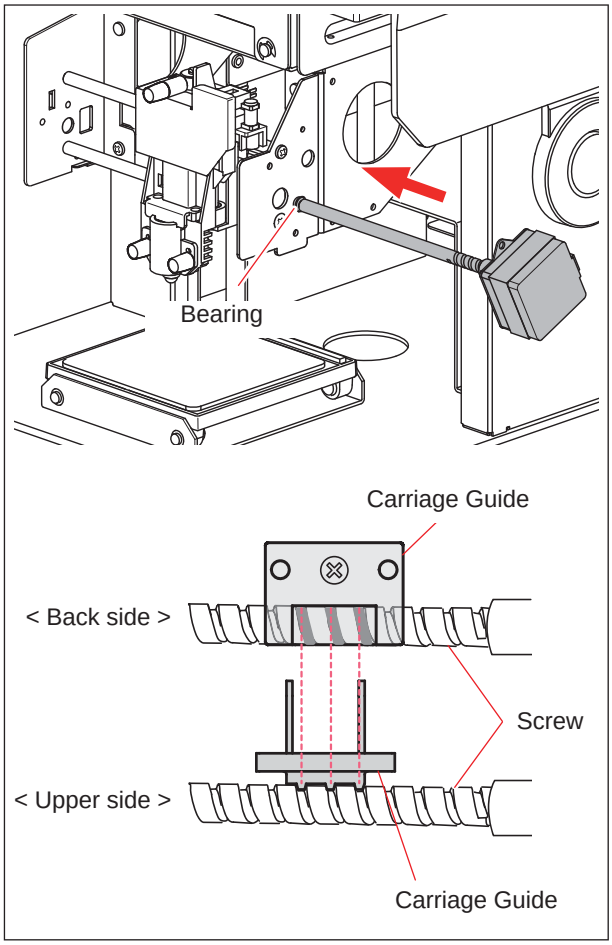
8 Loosen the set screw of the motor side to remove the Ball Screw from the motor.



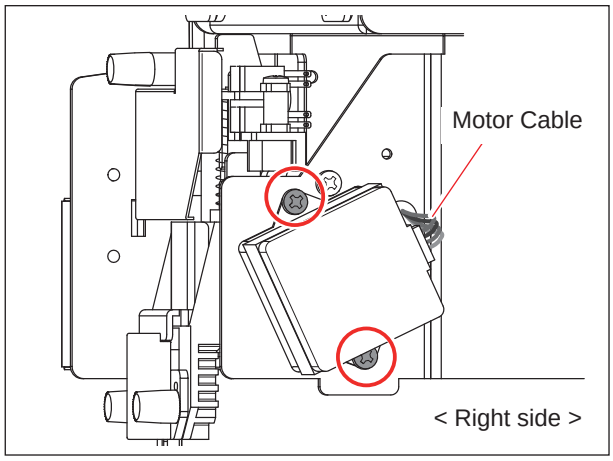
9 Fix the Ball Screw to the new motor temporarily and install it to the original place.
Check that the Carriage Guide meshes with the Ball Screw.

Put adequate quantity of grease (P/# 21675102 : GREASE,FLOIL G-902Y 10ML) to the Ball Screw.

Be sure not forget to fix the Bearing.

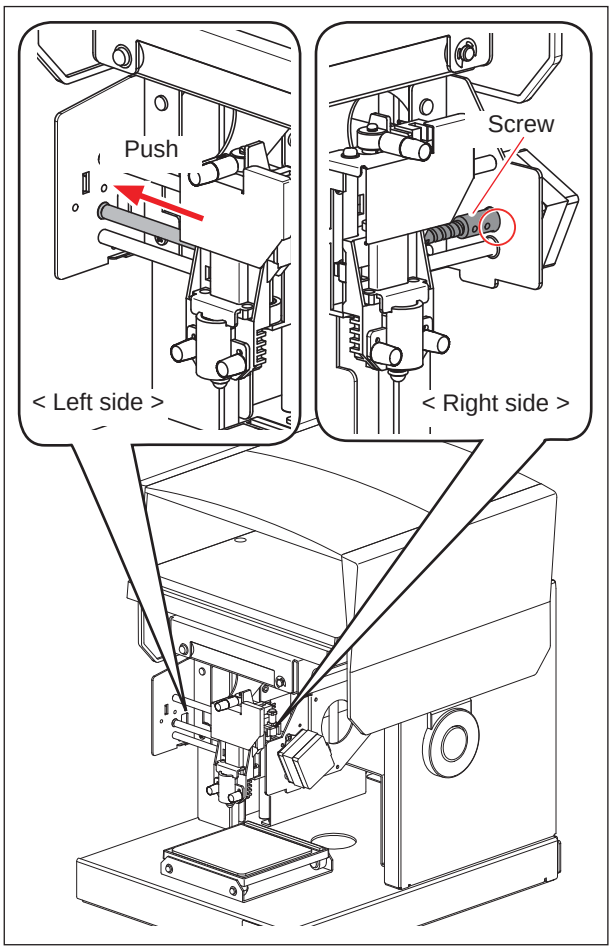


10 Fix the motor, and connect the motor cable.



Be sure that the cable side is facing right upward.

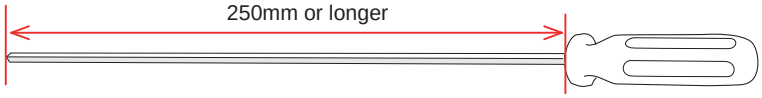
11 While pressing the Ball Screw toward the left, tighten the set screw of the motor side without backlash.



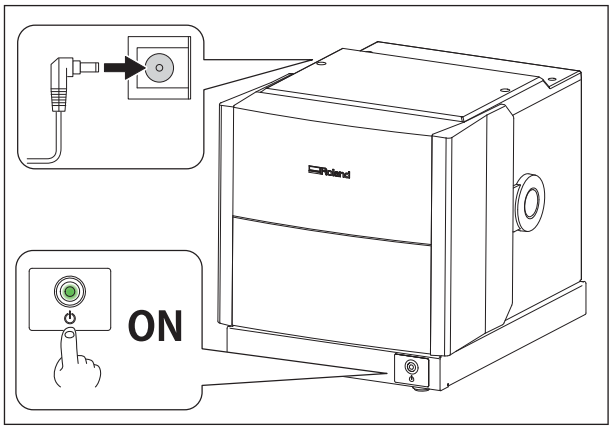
12 Perform the following procedure.
1. X Axis Load Check

3-4 Y MOTOR REPLACEMENT

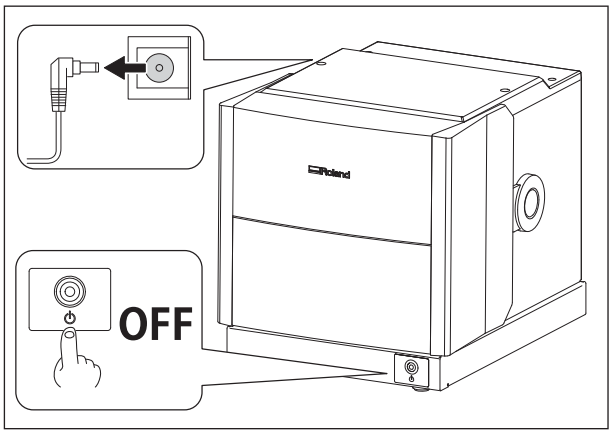
In addition to the ordinary tools, a Phillips screwdriver with a length of 250mm or longer is necessary.



1 Connect the AC adapter.
Turn on the main power SW. The head moves to the position of rear left.



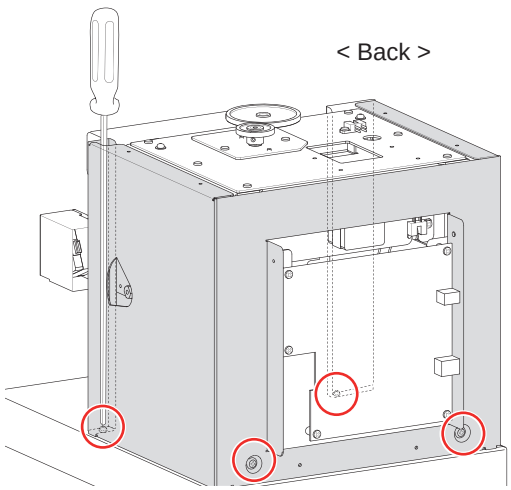
2 Turn off the main power SW, then pull out the AC adapter.

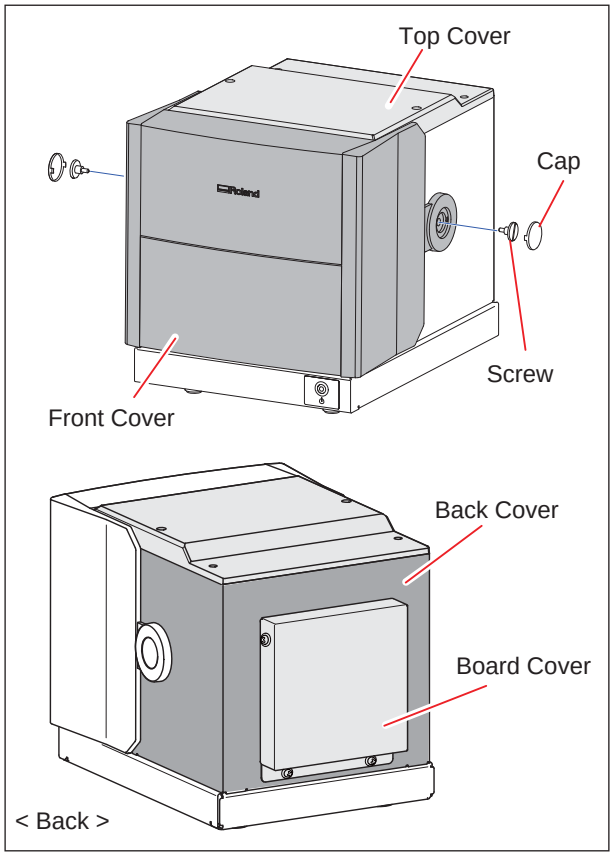


3 Remove the following parts.

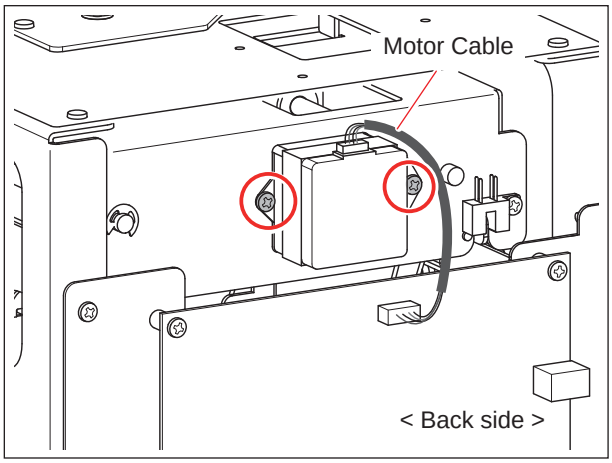
Cap
Screw
Front Cover
Top Cover
Board Cover
Back Cover

Screws of the Back Cover



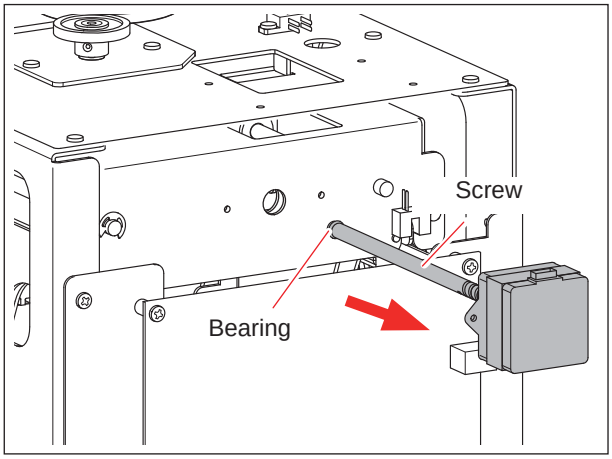


4 Disconnect the motor cable and remove the 2 screws fixing the Motor.

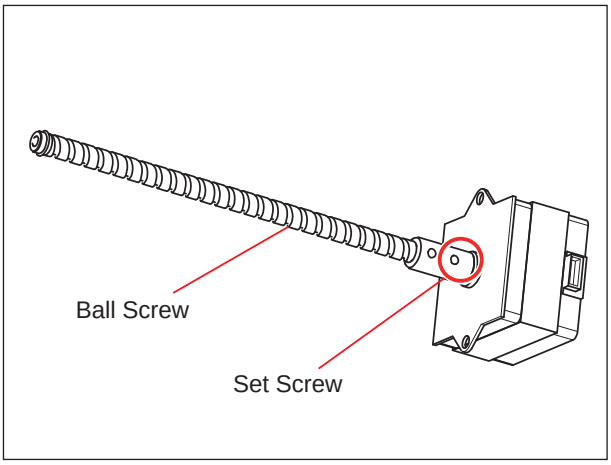


5 Remove the motor together with the Ball Screw.

At the end of the Ball Screw is the Screw Bearing.
Be sure not to lose the Bearing.



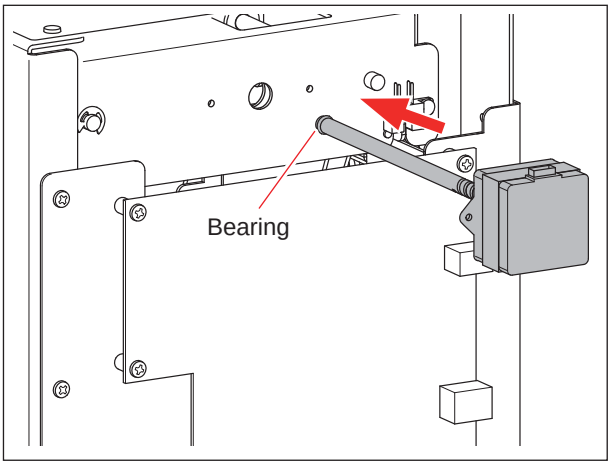
6 Loosen the set screw of the motor side to remove the Ball Screw from the motor.



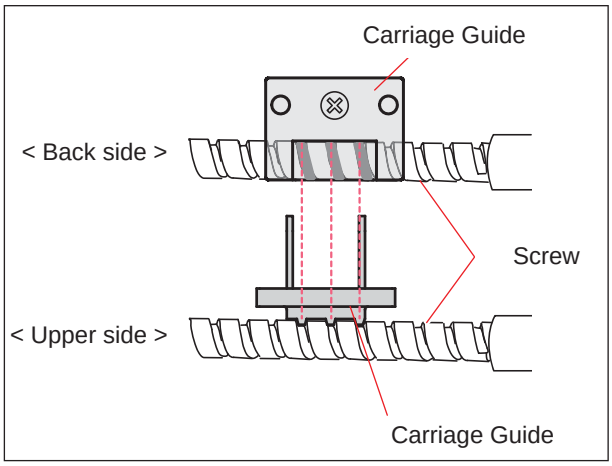
7 Fix the Ball Screw to the new motor temporarily and install it to the original place.
Check that the Carriage Guide meshes with the Ball Screw.

Put adequate quantity of grease (P/# 21675102 : GREASE,FLOIL G-902Y 10ML) to the Ball Screw.

Be sure not forget to fix the Bearing.

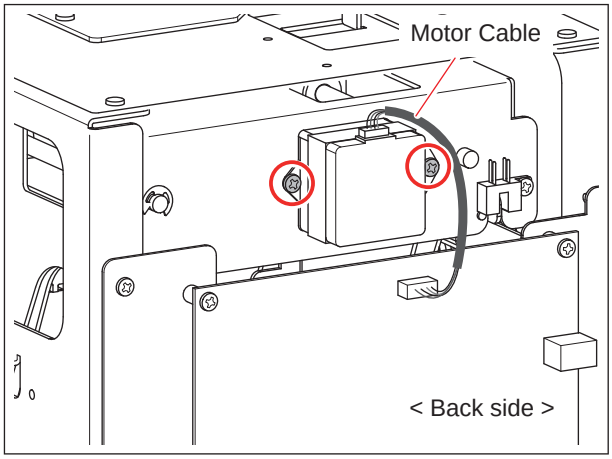


Check that the Carriage Guide meshes with the Ball Screw.

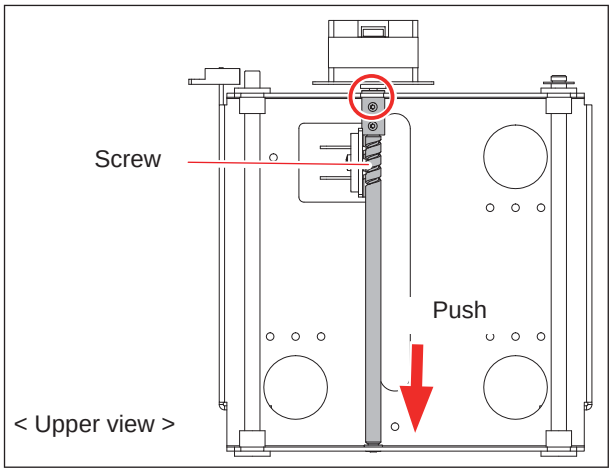


8 Fix the motor, and connect the motor cable.

Be sure that the motor cable side is facing upward.



9 While pressing the Ball Screw toward the front, tighten the set screw of the motor side without backlash.



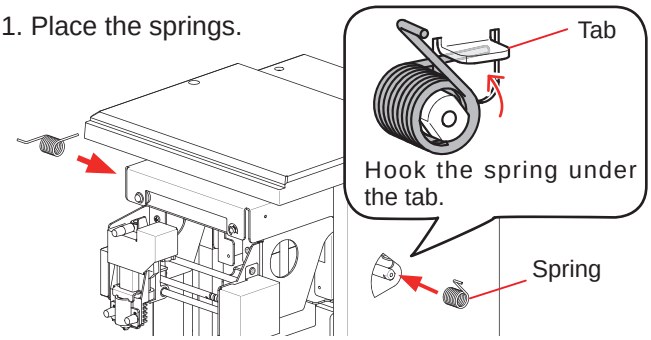
10 Perform the following procedure.
1. Y Axis Load Check

11 Fix the following parts.

Back Cover
Board Cover
Top Cover
Front Cover
Screw
Cap

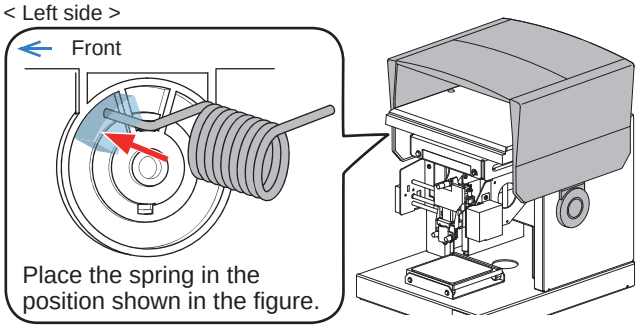
< To fix the Front Cover >

1. Place the springs.

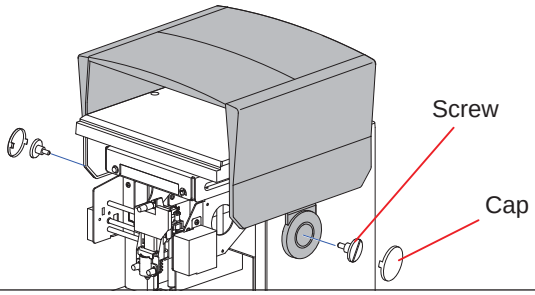


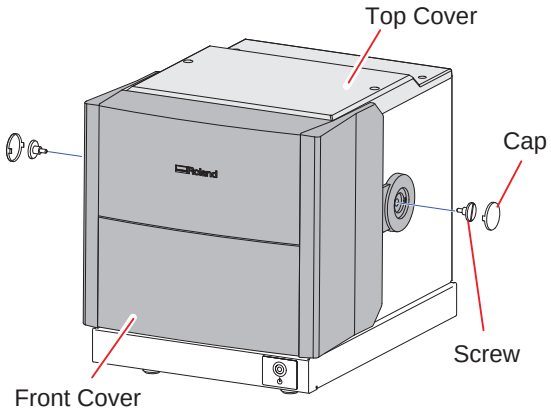
2. Place the Front Cover with the cover open.

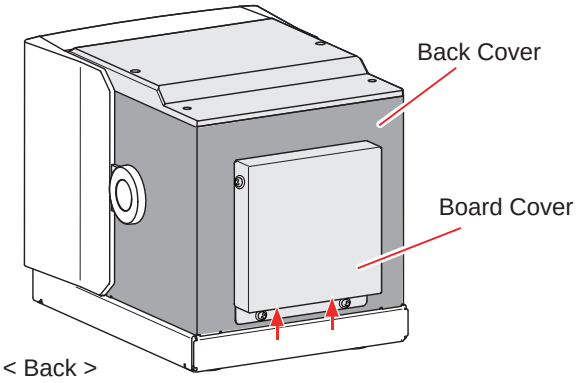
< Left side >



3. Fix the Front Cover with the screws and caps.



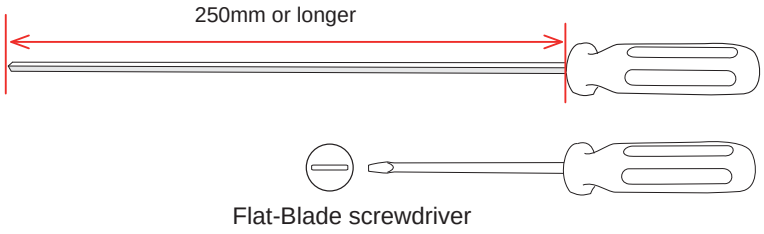




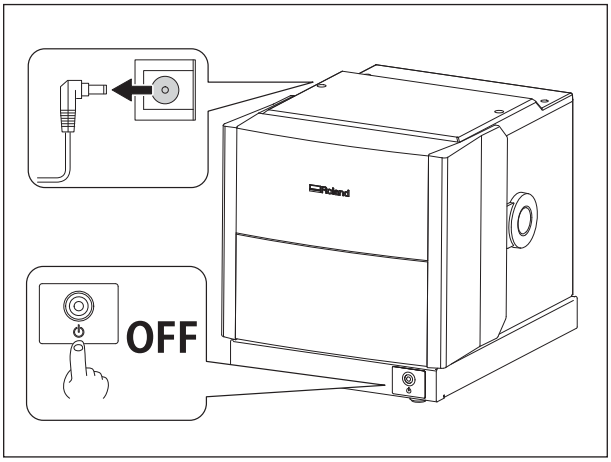
Fix the Board Cover while pushing it upward.

3-5 Z MOTOR REPLACEMENT

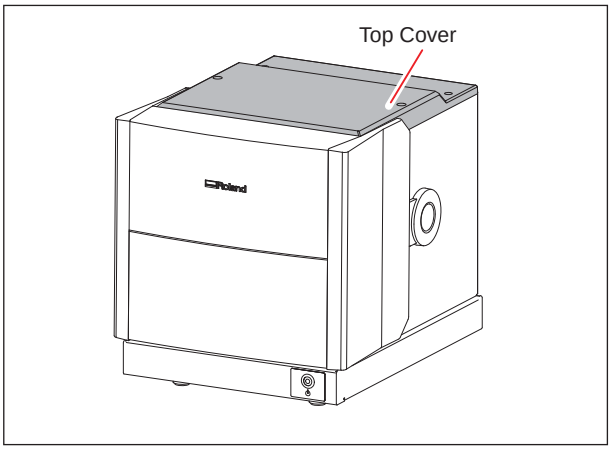
In addition to the ordinary tools, a Phillips screwdriver with a length of 250mm or longer and a flat-blade screwdriver are necessary.



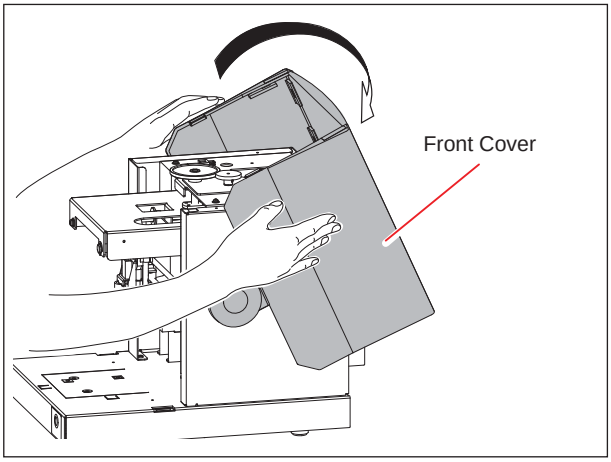
1 Turn off the main power SW, then pull out the AC adapter.



2 Remove the Top Cover.

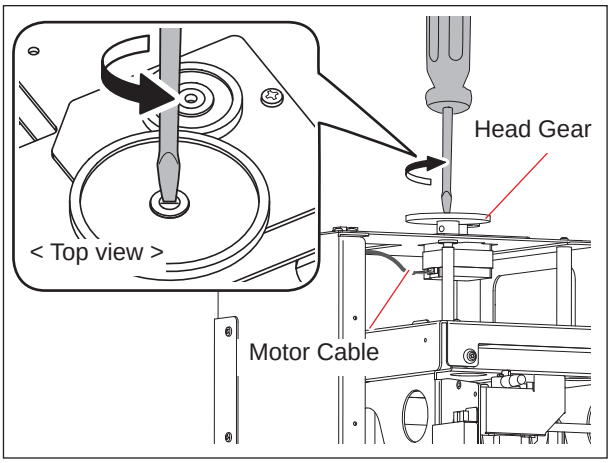


3 Open the Front Cover.

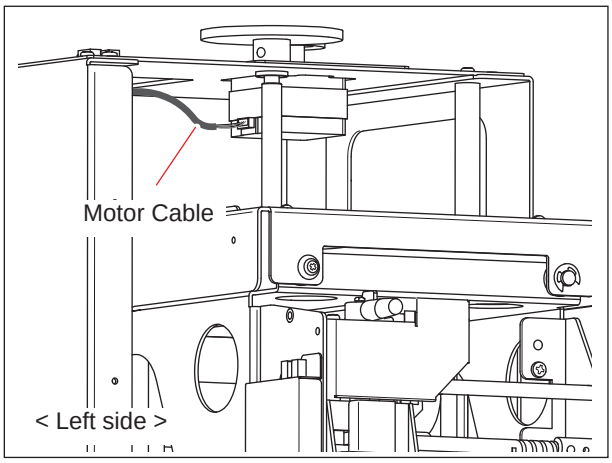


Hold the Front Cover by hand when opening it.

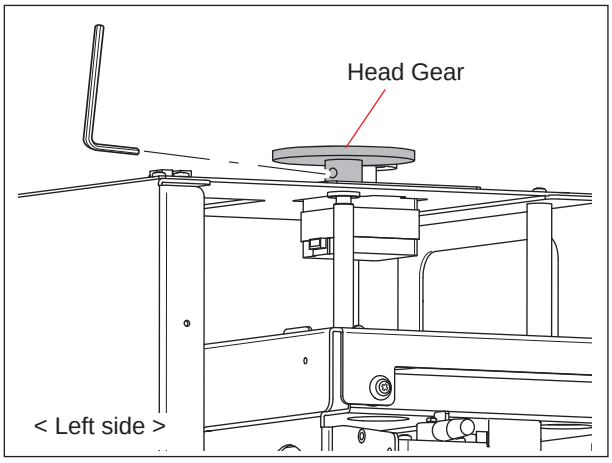
4 Turn the Head Gear to move down the Carriage to the accessible position to the connector of the motor using the flat-blade screwdriver.



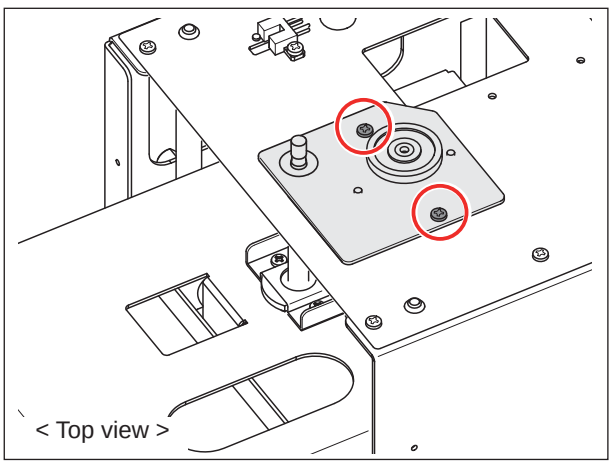
5 Disconnect the motor cable.



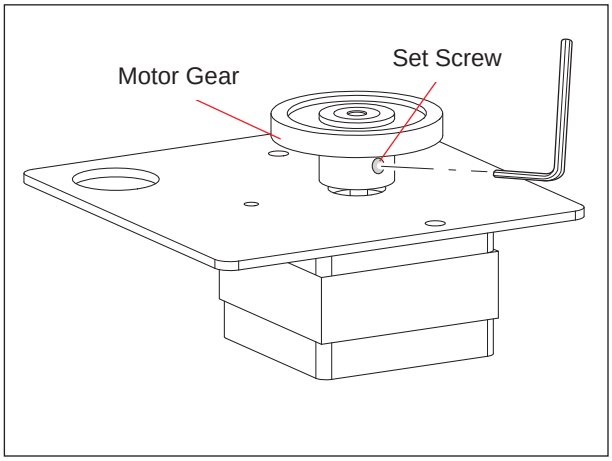
6 Remove the Head Gear.



7 Remove the 2 screws shown in the figure to remove the motor together with the plate.

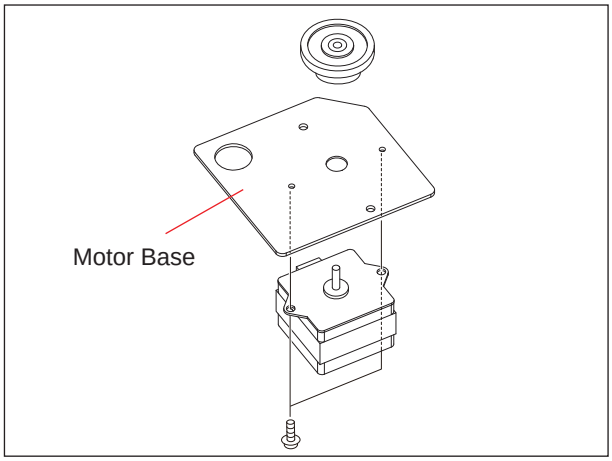


8 Loosen the set screw of the Motor Gear.

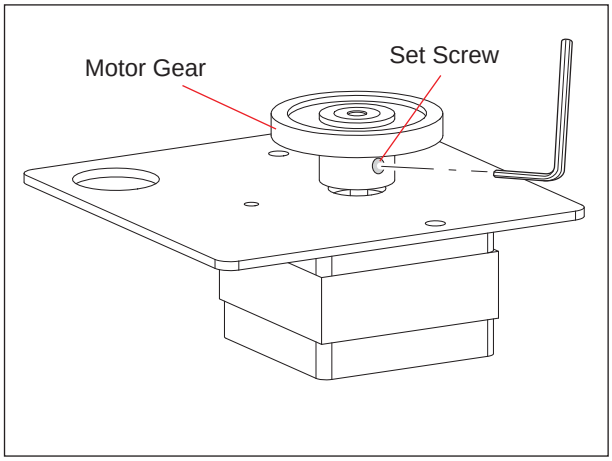


9 Remove the Motor Base from the Motor, and replace it with the new motor.

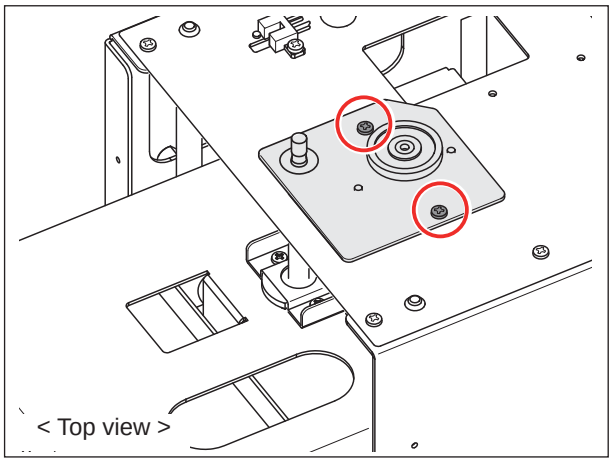
Be careful with the direction of the Motor Base.



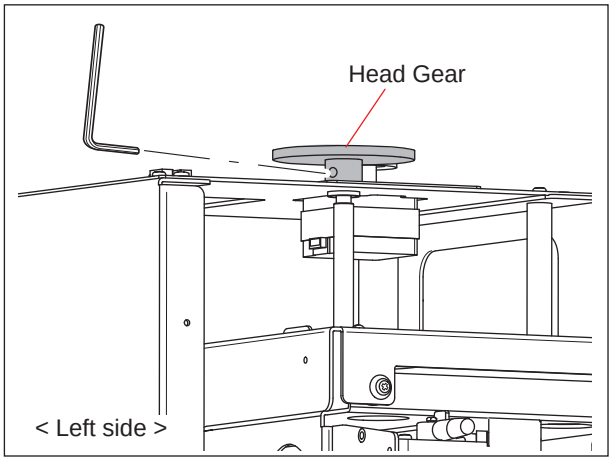
10 Fix the Motor Gear with the set screw temporarily.



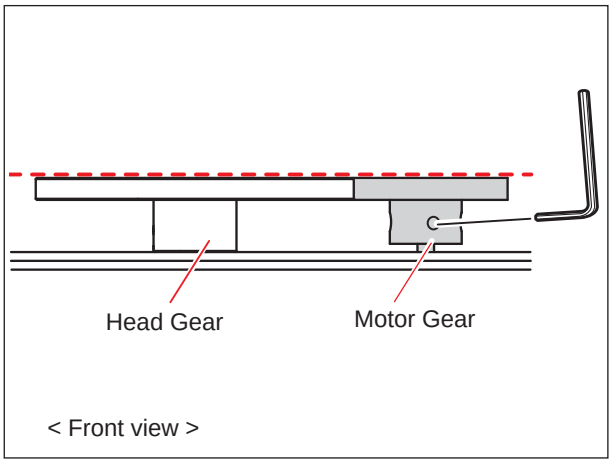
11 Fix the motor together with the plate.



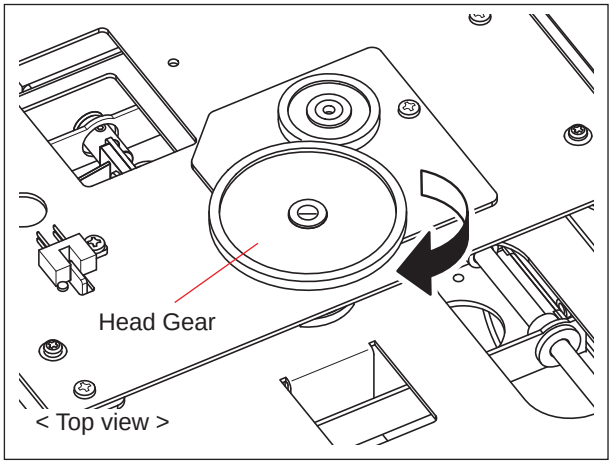
12 Fix the Head Gear.



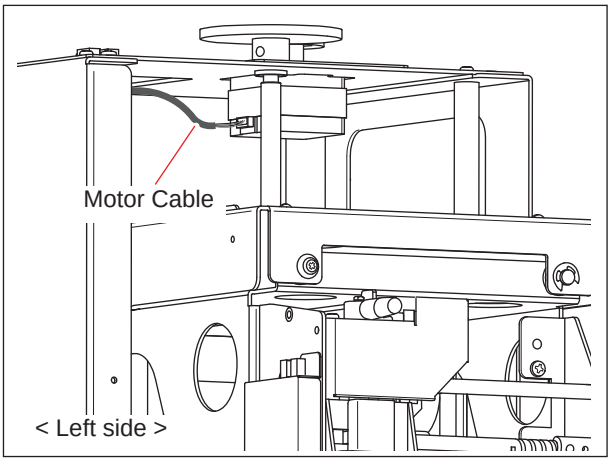
13 Tighten the so that the Motor Gear is on a level with the Head Gear.



14 Give one turn at least to the Head Gear to check that the gears mesh together.



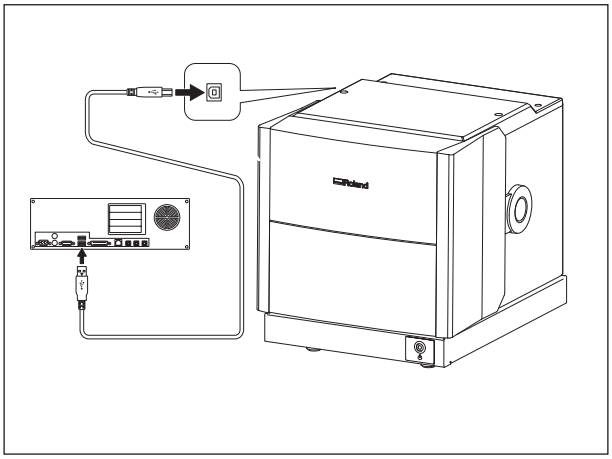
15 Connect the Motor Cable.



Perform the following procedure.
1. Z Axis Load Check

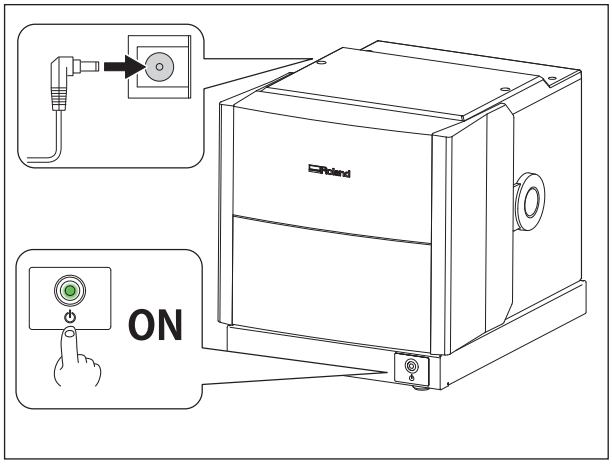
3-6 MAIN BOARD REPLACEMENT

1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when starting the MPX90Pit.
Connect the machine to your PC by a USB cable.

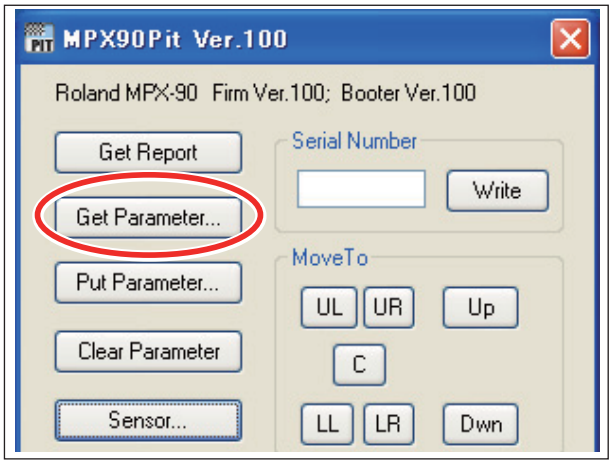


2 Connect the AC adapter.
Turn on the main power SW, and start the MPX90Pit.

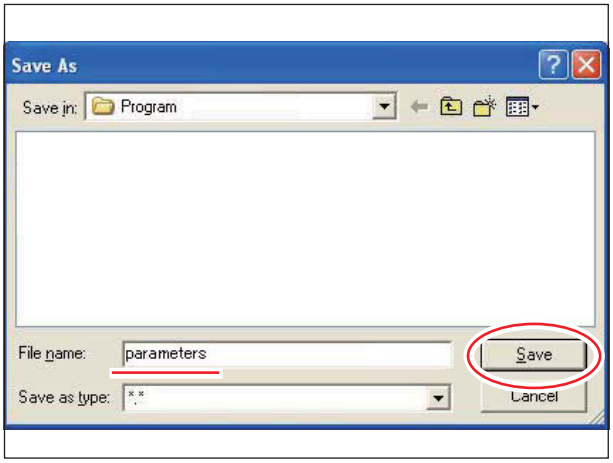




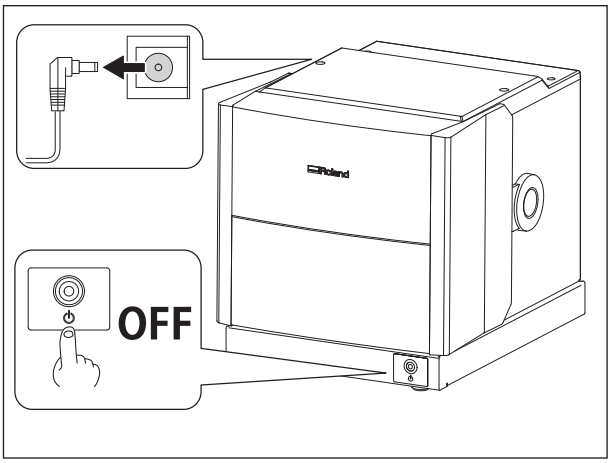
3 Click [Get Parameter].



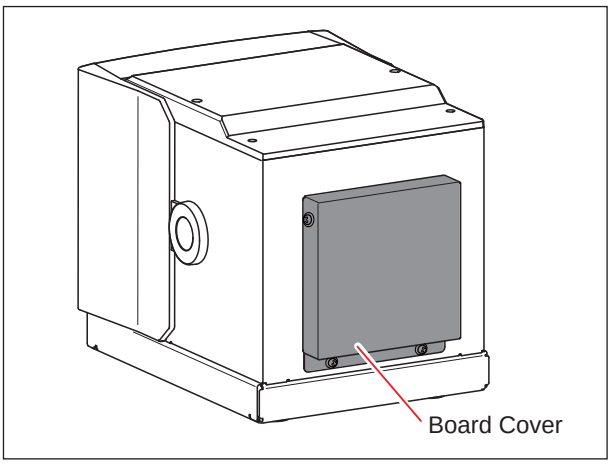
4 [Save As] screen is displayed.
Input a file name and save it.



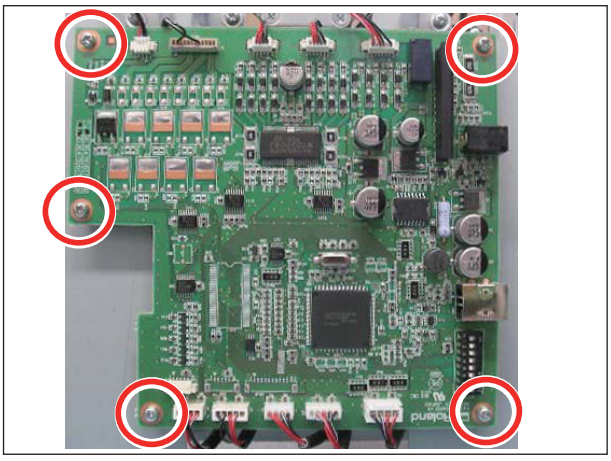
5 Turn off the main power SW, then pull out the AC adapter.



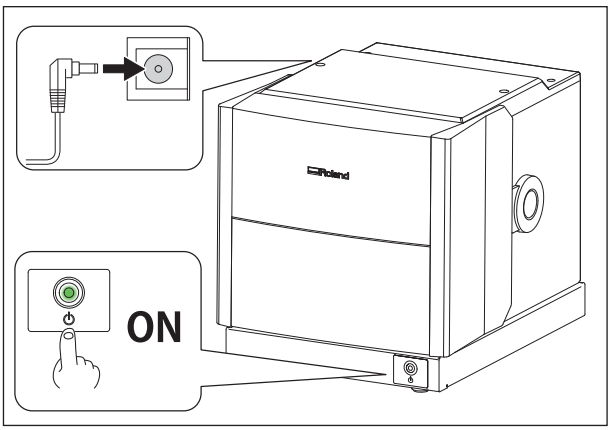
6 Remove the Board Cover.



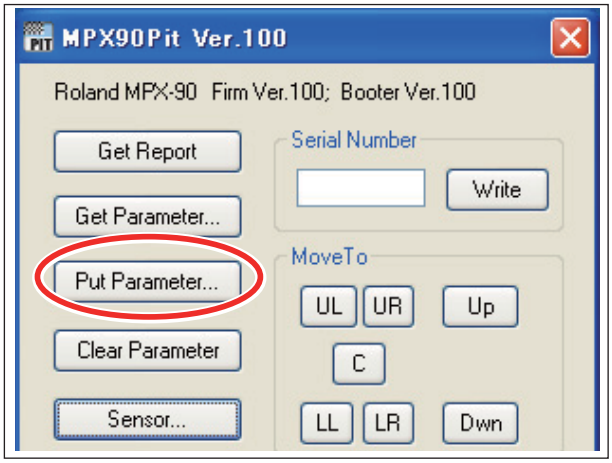
7 Disconnect all the connectors from the Main Board, and remove the Main Board.
Replace the Main Board with the new one, and re-connect all the connectors to the Main Board.



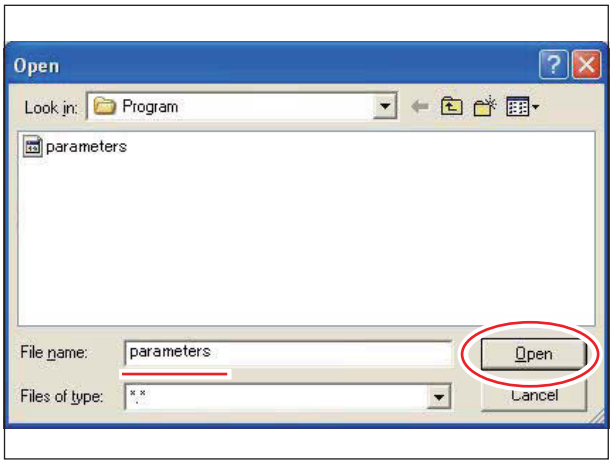
8 Connect the AC adapter and turn on the main power SW.



9 Click [Put Parameter].



10 [Open] screen is displayed. Select the parameter file that was saved, and click [Open] to write it to the new main board.



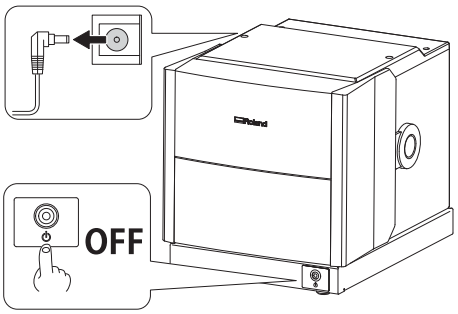
11 Perform the followings.
1. [4-3 FIRMWARE UPGRADE]
2. Put Parameter

Perform the followings if the parameters cannot be transferred to the new Main Board.
1. [4-3 FIRMWARE UPGRADE]
2. [4-4 ORIGIN CALIBRATION]
3. [4-5 HITTING FORCE CALIBRATION]
4. SERIAL NUMBER SETTING

To Ensure Safe Work

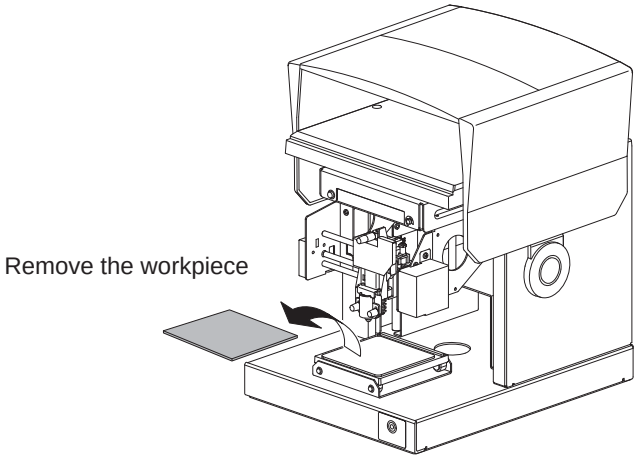
⚠WARNING

Turn off the power SW and unplug the AC adapter of the machine before performing the parts replacement.
Performing the parts replacement while the power is turned on may result in injury by unintended operation of the machine.



Turn off the power SW and unplug the machine

Remove a workpiece. Performing the parts replacement while setting the workpiece may result in damage to the workpiece.



Remove the workpiece

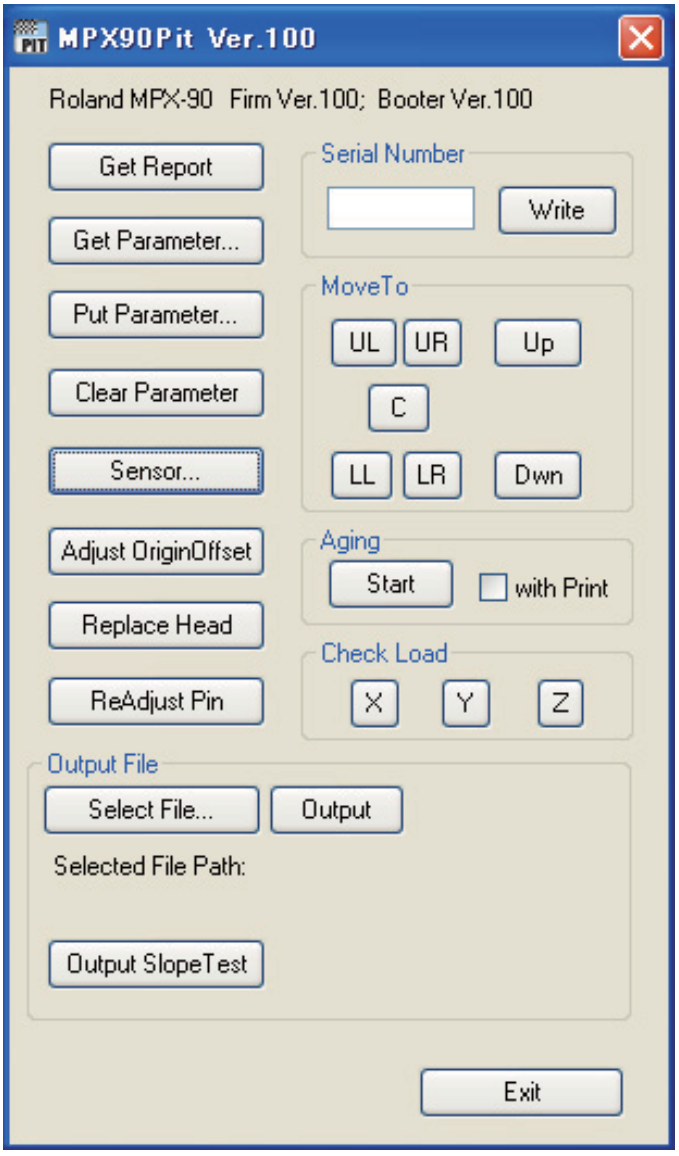
To prevent static damage, discharge static electricity from your body before you touch any of electronic devices. You can do so by touching an unpainted metal surface on the chassis.

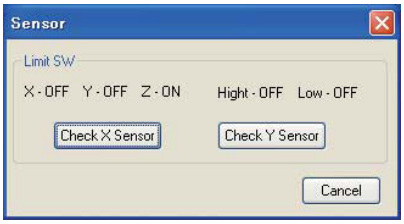
You can also take the following steps to prevent damage from electrostatic discharge (ESD):

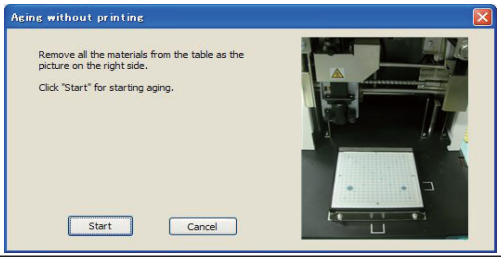
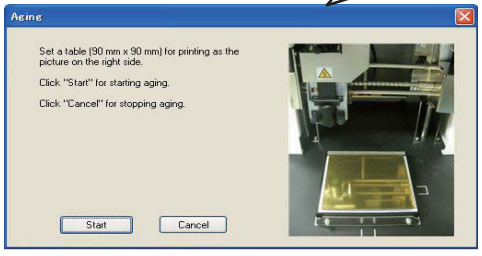
- When unpacking a static-sensitive device from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the device to the machine. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive devices, place it in an antistatic container or packaging first.
- Handle all sensitive devices in a static-safe area. If possible, use antistatic floor pads and workbench pads.

4-1 ADJUSTMENT SOFTWARE "MPX90Pit"

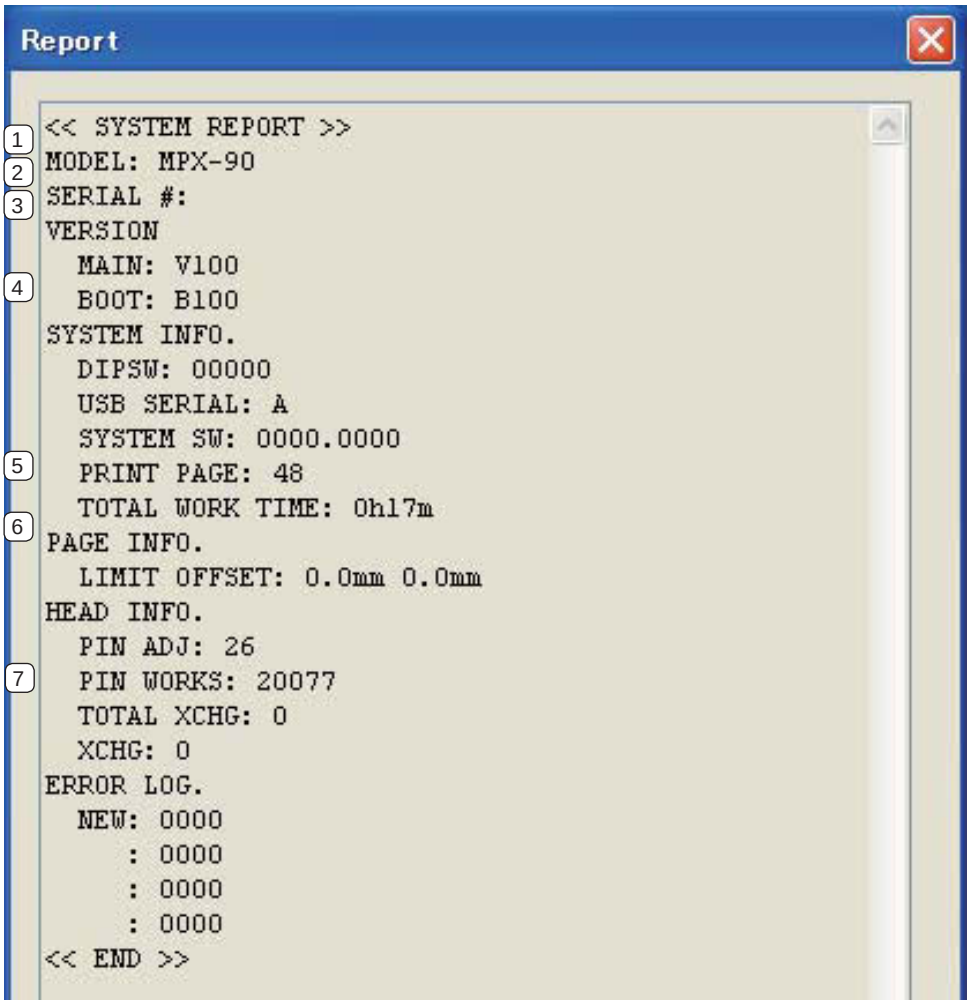
To communicate with the MPX-90 using the MPX90Pit, it is necessary to have the MPX-90 driver installed in your PC.



Function	Contents
Get Report	Get a system report of the machine and save as a text file.
Get Parameter...	Get the parameters of the Main board and save as a binary file.
Put Parameter...	Write the parameters to the Main Board.(Parameters will be activated when you restart the machine.)
Clear Parameter	Initialize the parameters.
Sensor...	Check all the sensors on the machine. Click [Check X Sensor] or [Check Y Sensor] to check the X and Y Limit Sensors. 
Adjust OriginOffset	Origin offset adjustment wizard is displayed. The wizard navigates you to print the adjustment pattern and set the origin calibration.
Replace Head	Head replacement wizard is displayed. The wizard navigates you to replace the head and adjust the hitting of pins.
ReAdjust Pin	Pin adjustment wizard is displayed. The wizard navigates you to print the adjustment pattern and adjust the hitting of pins.
Serial Number	Write Write the serial number of the machine to the Main Board.

MoveTo	Move the head to the UL left back, UR right back, LL left front, LR right front, C center. And move the head Up up, Dwn down.
Aging	Start Aging wizard is displayed. Start in the wizard screen.Perform aging. (Move all axes in full stroke.) Check [with Print], perform aging while printing. * The size of the pattern is about 80mm x 80mm.  
CheckLoad	Check the load of each axis.
Output File	Select File... Specify the file to print. Output Print the specified file. Output SlopeTest Print the slope calibration pattern.
Exit	Close the MPX90pit.

4-2 SYSTEM REPORT

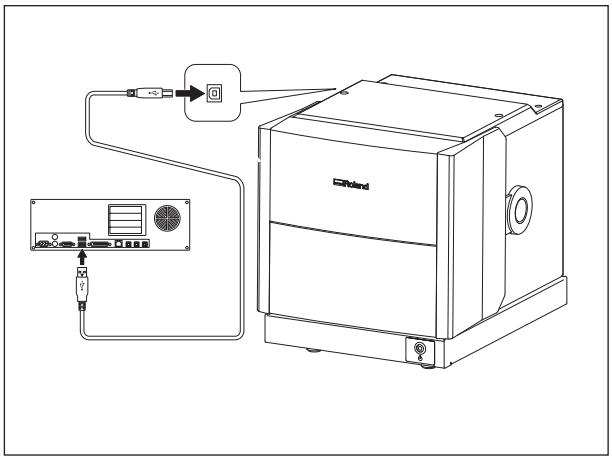


	Display	Contents		Remarks	User Initialize
1	MODEL	Model name			
2	SERIAL NO.	Serial number			
3	VERSION	The version of firmware		Main / Boot	
4	SYSTEM INFO.	DIPSW	: DIPswitch		
		USB SERIAL	: USB identifier		* 1
		SYSTEM SW	: System switch		
		PRINT PAGE	: Number of times printing has been performed	Unit : page	
		TOTAL WORK TIME	: Total printing time	Unit : hour/min	
5	PAGE INFO.	LIMIT OFFSET	: Correction parameter of the limit switch position	In order of X/Y	
6	HEAD INFO.	PIN ADJ	: Pin force calibration of each pin		
		PIN WORKS	: Number of times hitting has been performed	Unit : number of times	
		TOTAL XCHG	: Number of times the head has been replaced	Unit : number of times	
		XCHG	: Number of times the head has been replaced (same as [TOTAL XCHG])	Unit : number of times	
7	ERROR LOG.		:Error history	In order of the latest * Refer to Section 6 for more information.	

* 1 The application for changing USB serial is required.

4-3 FIRMWARE UPGRADING (Referential Time : 5min.)

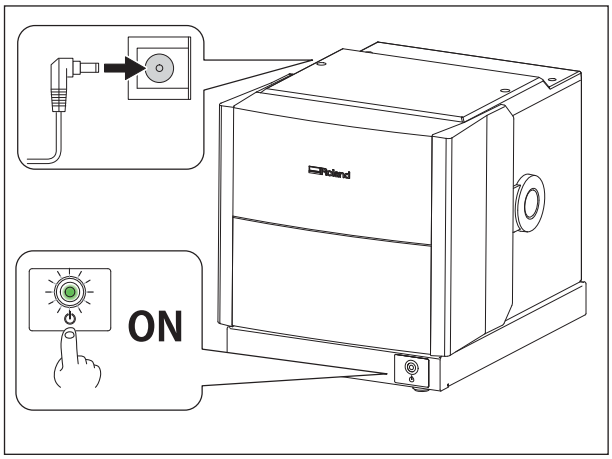
1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when upgrading.
Connect the machine to your PC by using a USB cable.



2 Connect the AC adapter while pressing the power button.
Wait for blinking the Standby LED, and release pressing. The machine starts in the firmware upgrade mode.



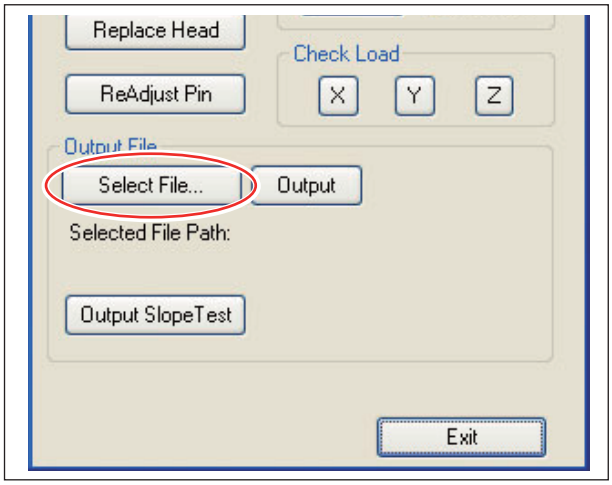
When starting with the upgrade mode, [Found New Hardware Wizard] may appear even if the driver has already been installed. If the wizard appears, insert the installation CD (Roland Software Package) and install the driver while the LED is blinking. Continue the upgrade procedure after the driver installation is completed.



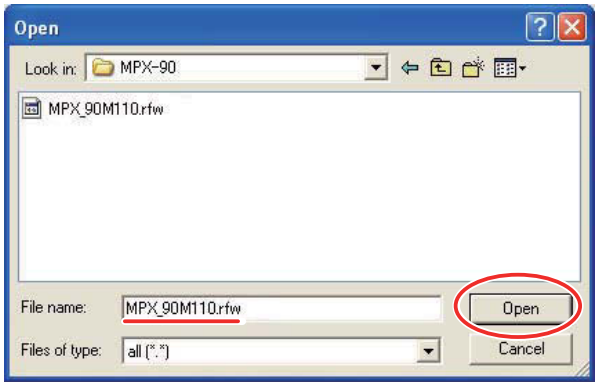
3 Start the MPX90Pit.



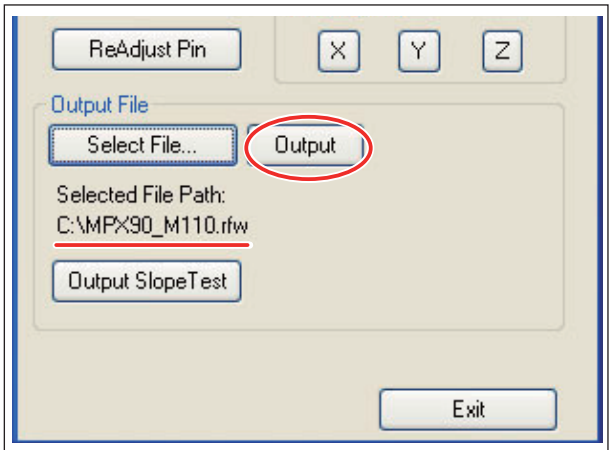
4 Click [Select File...] in the [Output File].



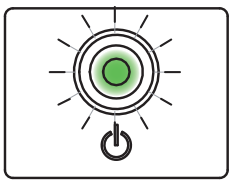
5 [Open] screen is displayed.
Select the firmware file for sending the firmware and click [Open].



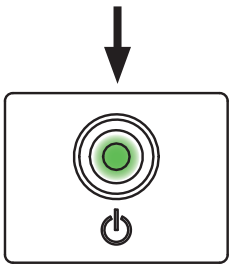
6 Selected file is displayed.
Click [Output]. The machine starts to send the firmware.



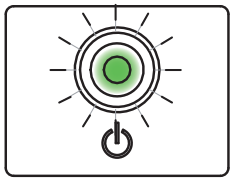
LED blinks faster while receiving the firmware.



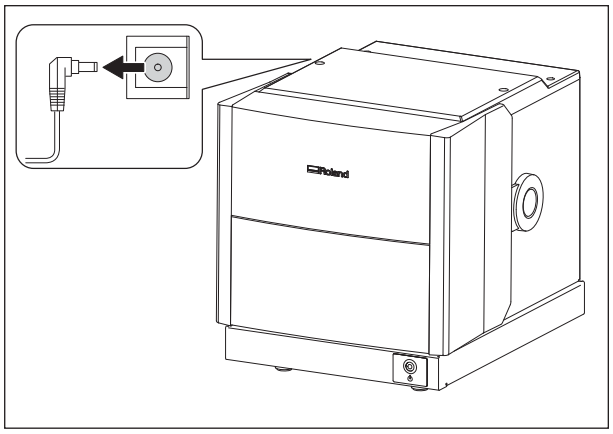
LED is turned on when upgrading is completed.



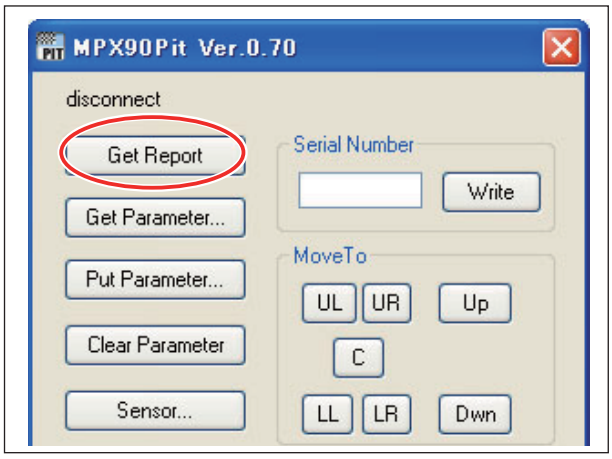
LED blinks rapidly when the machine has failed to receive the firmware.
Turn off the main power SW and check if the firmware file is wrong/broken, or the Main board is broken.
Then enter the firmware upgrade mode and send the firmware again.



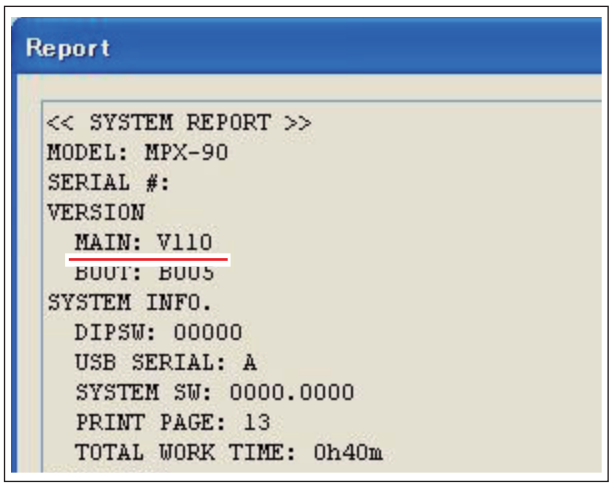
7 Disconnect the AC adapter to turn off the power.



8 Turn on the main power SW and click [Get Report] to display the system report.



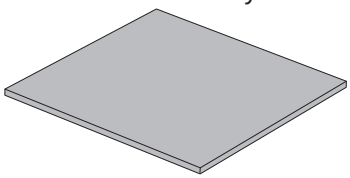
9 Check that the firmware is upgraded correctly.



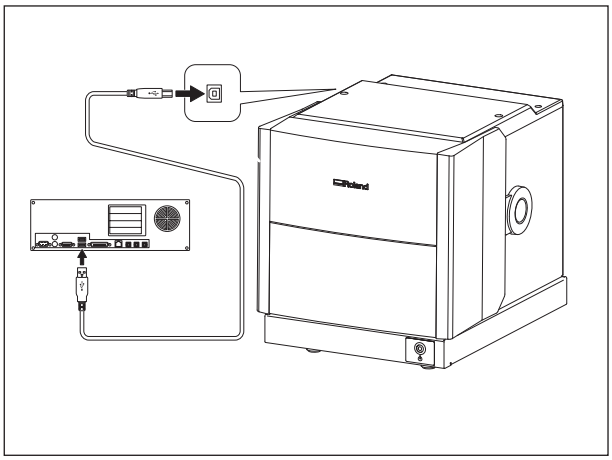
4-4 ORIGIN CALIBRATION (Referential Time : 15min.)

This is to adjust the origin position of the machine. It is necessary when the parameters cannot be transferred to the new Main Board when replacing the Main Board.
When changing the Marking Pin using the MPX-90 Head Manager, quit MPX90Pit. The value of the parameters go wrong when the MPX-90 Head Manager and MPX90Pit are used simultaneously.

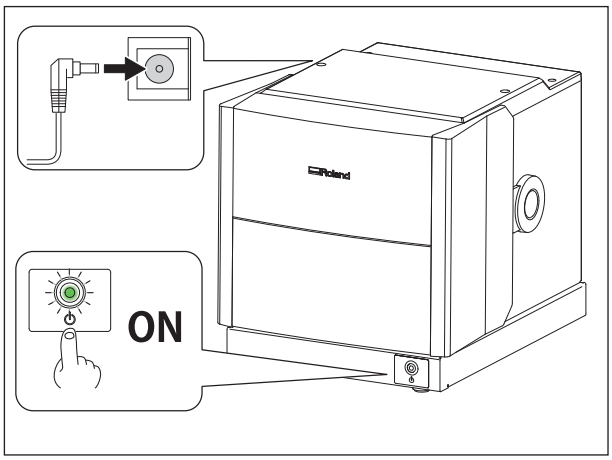
Necessary material : Test plate
22055423 : PLATE,TEST 4PCS SET MPX-50
or a brass plate larger than 30 x 60mm.)



1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when performing the origin calibration.
Connect the machine to your PC by using a USB cable.

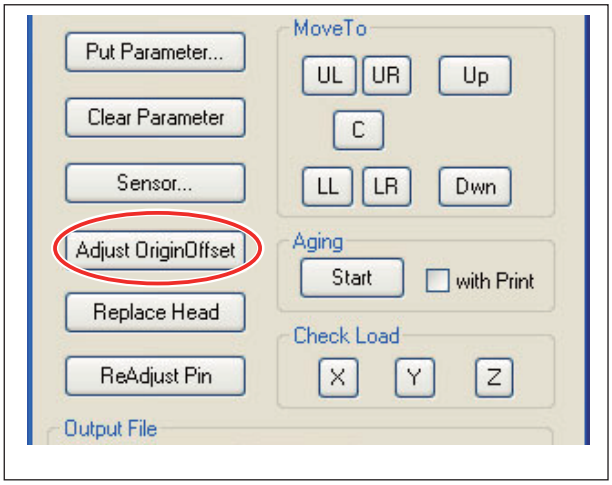


2 Connect the AC adapter.
Turn on the main power SW.

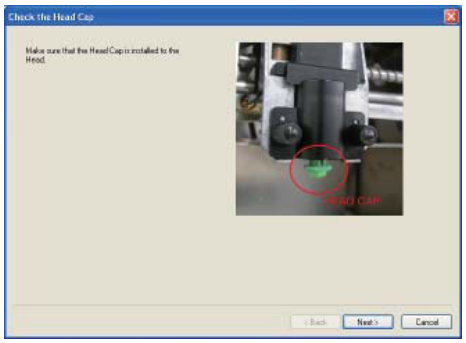


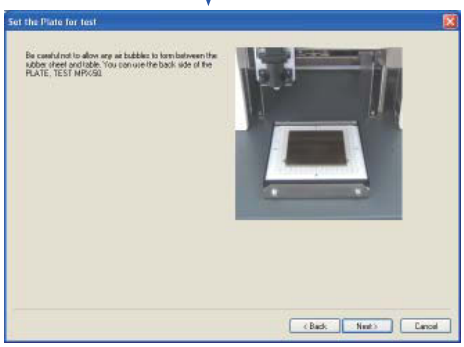
3 Start the MPX90Pit.
Click [Adjust OriginOffset].

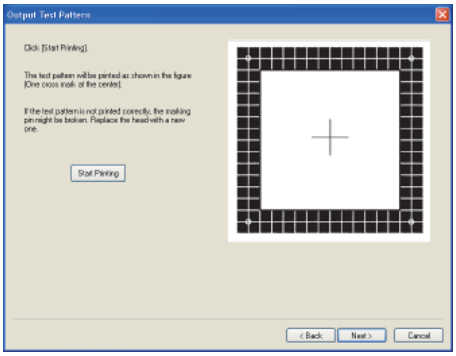


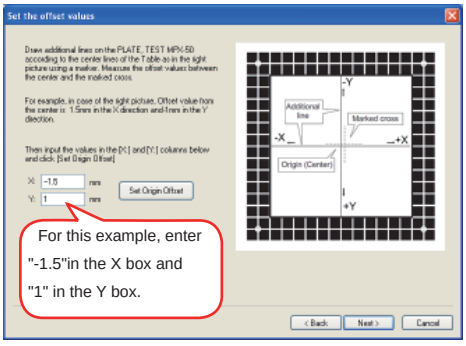


4 Origin Calibration wizard starts.
Perform the origin calibration according to the wizard.





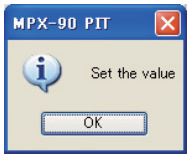


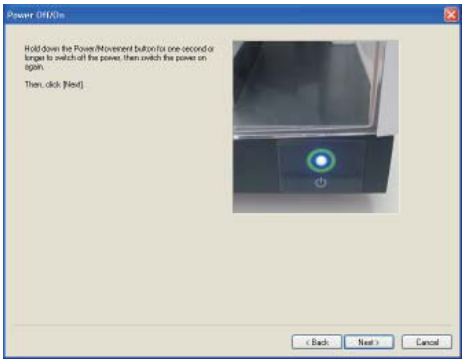


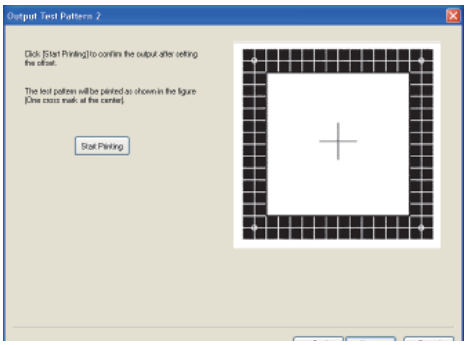
For this example, enter "-1.5"in the X box and "1" in the Y box.

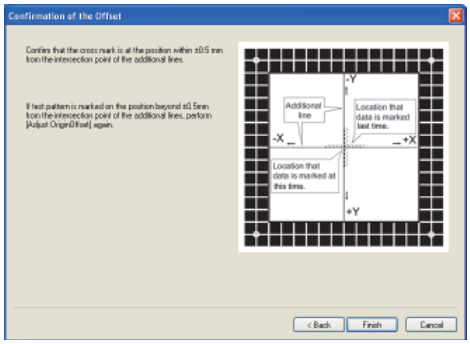
In Y Axis, the upper side from the center is the negative coordinate, and the lower side from the center is the positive coordinate.
When performing the Origin calibration using the Windows driver, in Y Axis, the upper side from the centre is the positive coordinate, and the lower side from the centre is the negative coordinate.

Click [Set Origin Offset]. The right screen is displayed. Click [OK].





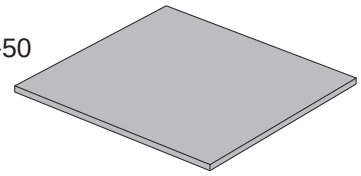




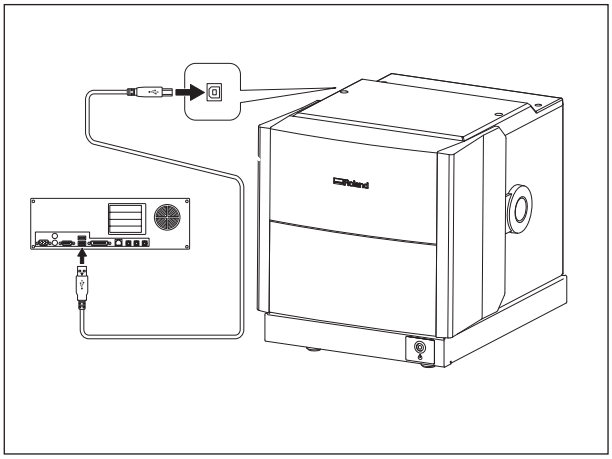
4-5 HITTING FORCE CALIBRATION (Referential Time : 15min.)

This is to adjust the hitting force of the pin. It is recommended to use the test plate bundled with MPX-90. When using the MPX-90 Head Manager, quit MPX90Pit. The value of the parameters go wrong when the MPX-90 Head Manager and MPX90Pit are used simultaneously.

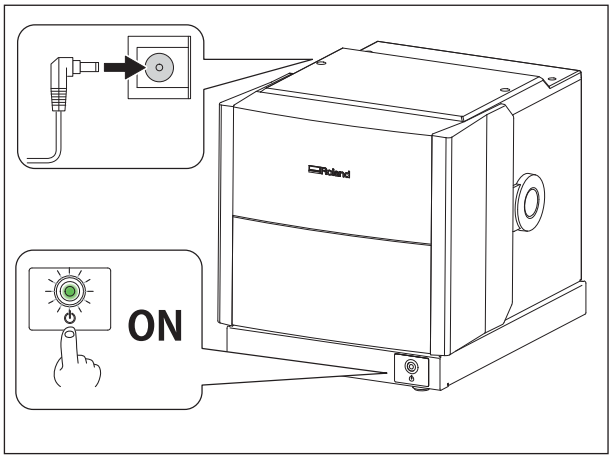
Necessary material : Test plate
22055423 : PLATE,TEST 4PCS SET MPX-50
or a brass plate larger than 30 x 60mm.)



1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when performing the Hitting Force Calibration.
Connect the machine to your PC by using a USB cable.

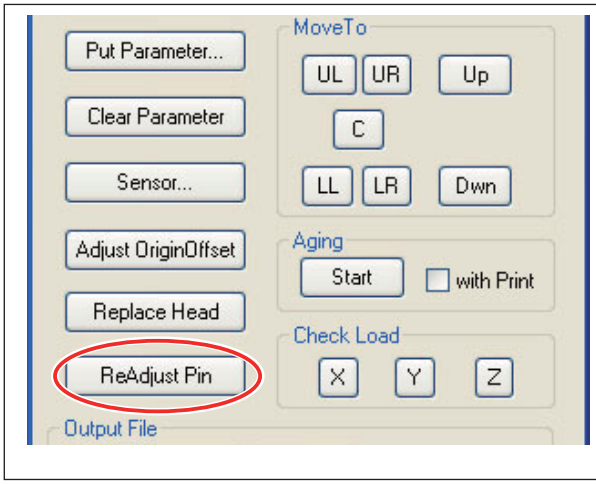


2 Connect the AC adapter.
Turn on the main power SW.

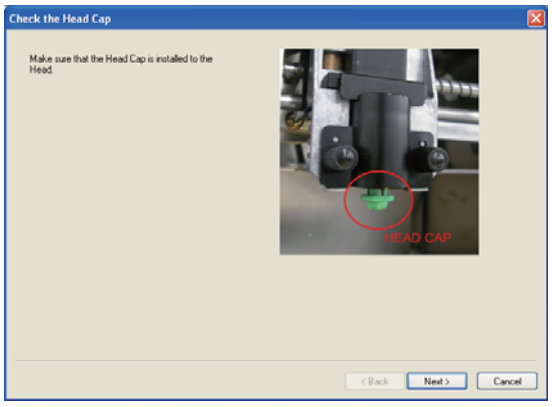


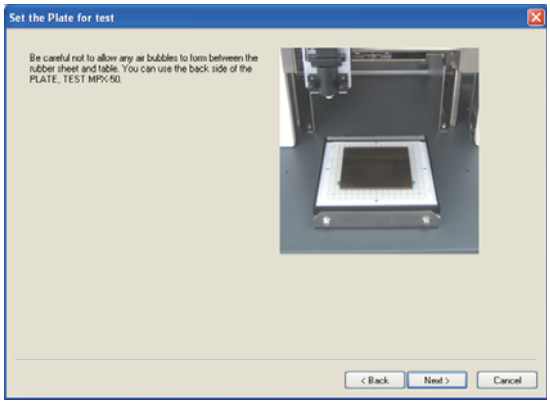
3 Start the MPX90Pit.
Click [ReAdjust Pin].

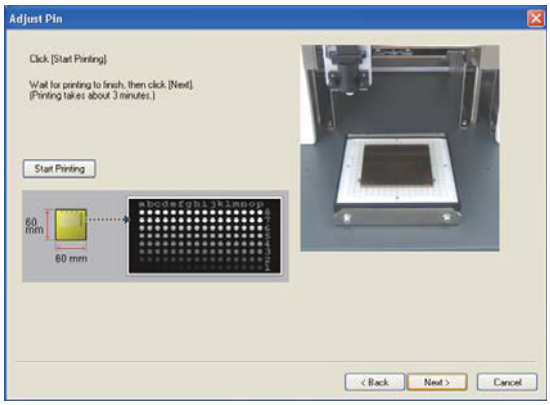


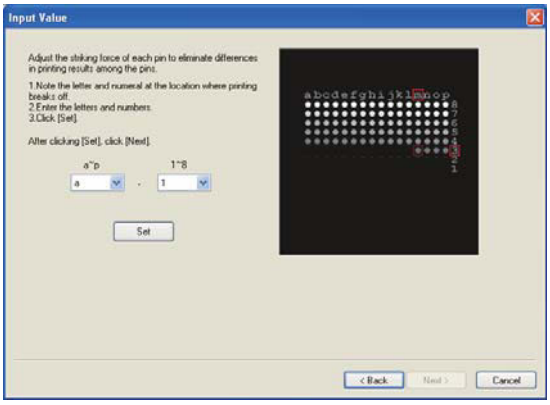


4 Hitting Force Calibration wizard starts.
Perform the Hitting Force calibration according to the wizard.

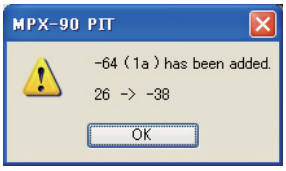




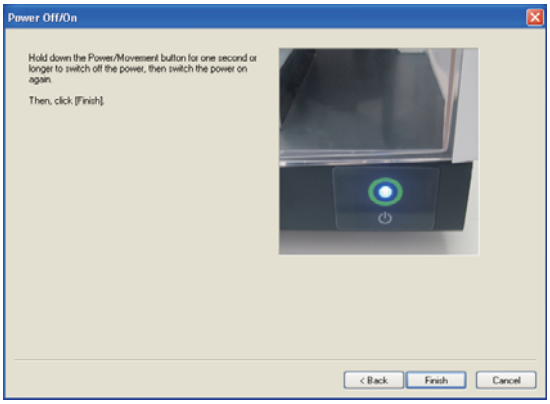




Click Set . The screen below is displayed.
Click [OK].



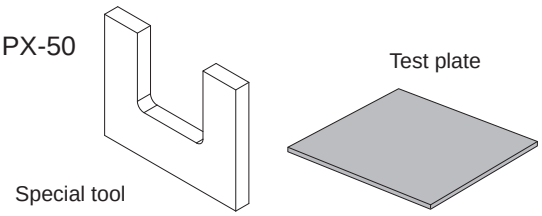
The correction value is computed automatically from the measured value.



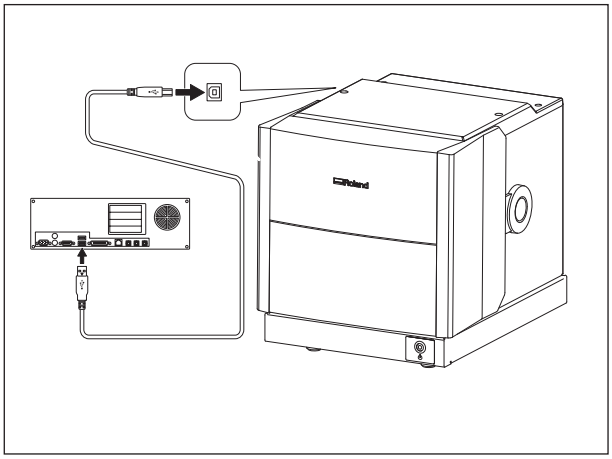
4-6 SLOPE CALIBRATION (Referential Time : 25min.)

This is to maintain the parallel level of the Printing System by using a block after reassembling the Printing System. It is required to perform [4-4 ORIGIN CALIBRATION] before this adjustment.

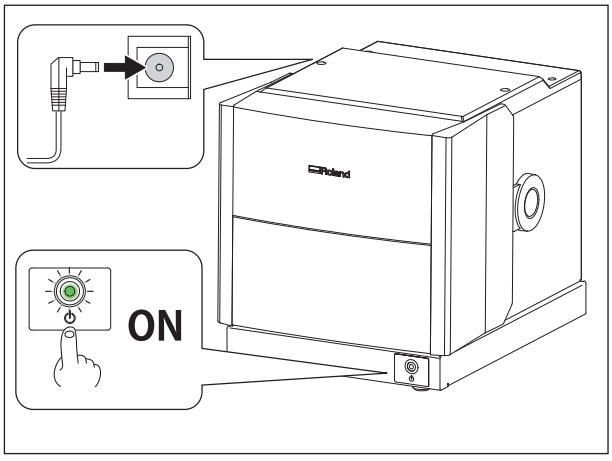
Necessary special tool : 1000006820 TOOL,BLOCK MPX-90 ST-117
Necessary material : Test plate
22055423 : PLATE,TEST 4PCS SET MPX-50
or a brass plate larger than 30 x 60mm



1 It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when performing the Slope Calibration.
Connect the machine to your PC by using a USB cable.

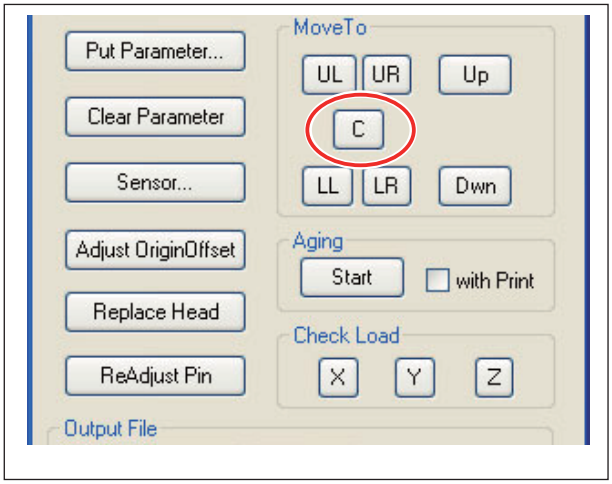


2 Connect the AC adapter.
Turn on the main power SW.



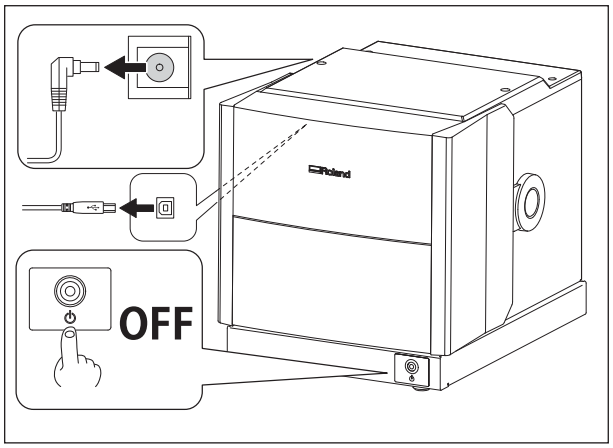
3 Start the MPX90Pit.
Click [C] in [Move To] to move the Carriage to the center position.



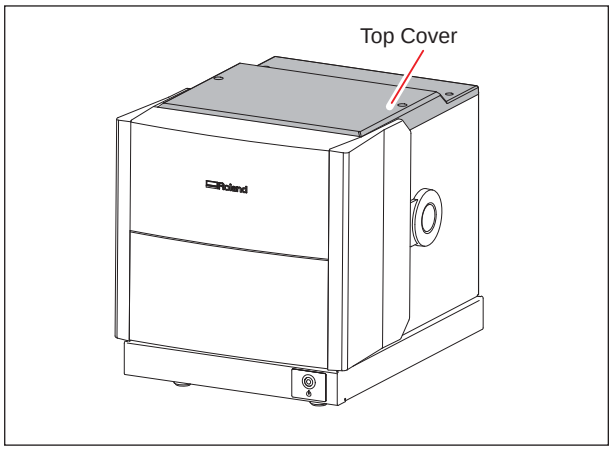


4 Turn off the main power SW, then pull out the AC adapter.

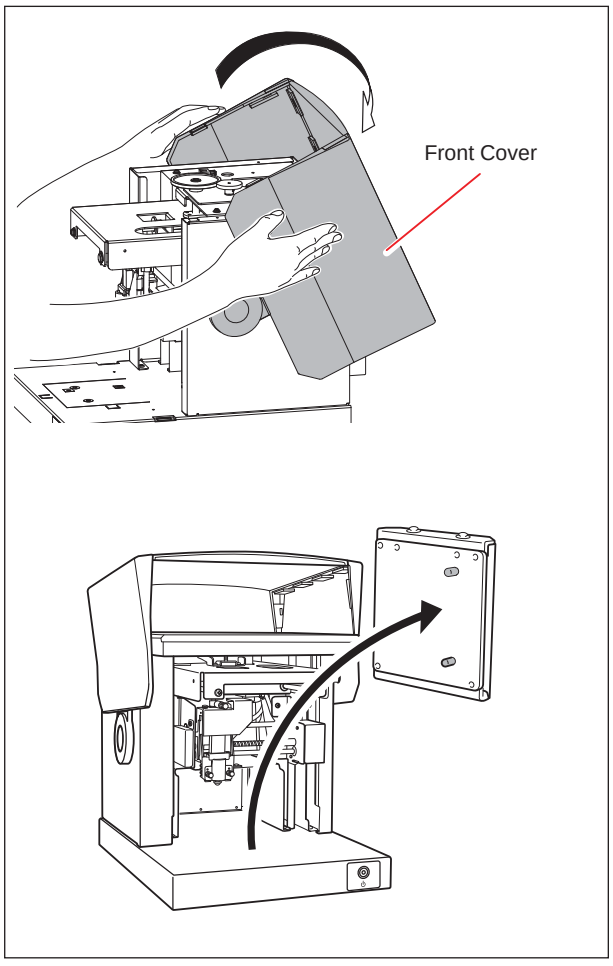
Disconnect the USB cable.



5 Remove the Top Cover.



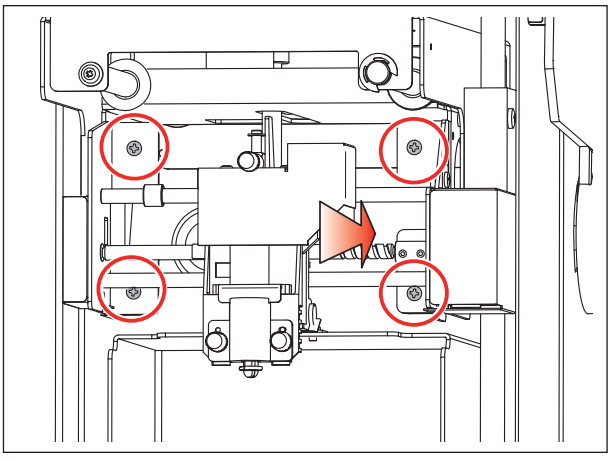
6 Open the Front Cover.



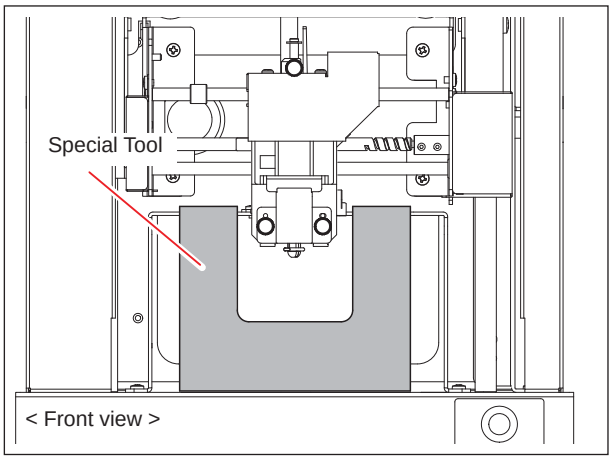
Hold the Front Cover by hand when opening it.

Detach the table or center vise if they are set.

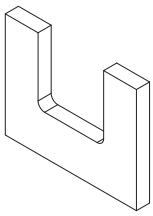
7 Move the Printing System to the back side by hands. Loosen the 4 screws shown in the figure.



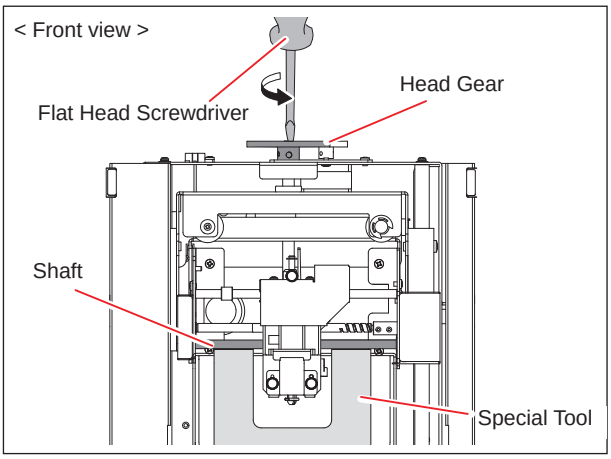
8 Set the Special Tool under the shaft so that the carriage is at the center.



Special tool:
1000006820
TOOL,BLOCK MPX-90 ST-117

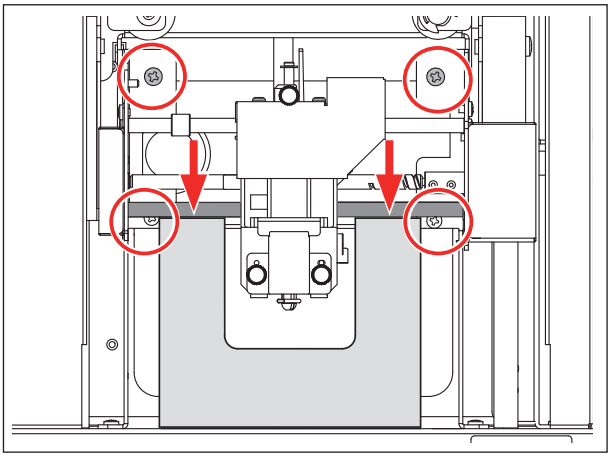


9 Turn the Head Gear to move down the Carriage until the shaft touches the special tool using the flat head screwdriver.



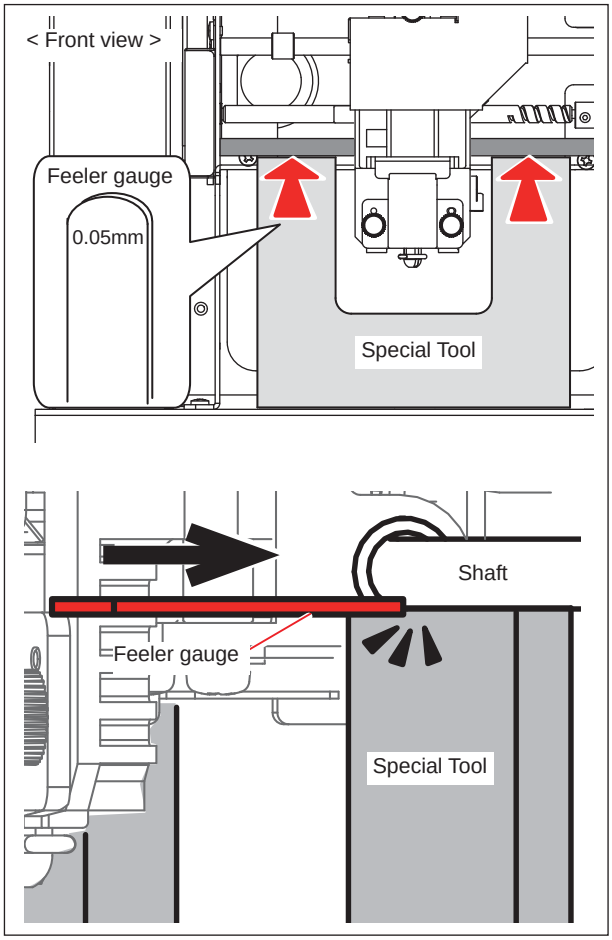
10 Fix the screws of the Head Holder while both sides of the Special Tool touches the Shaft.

And remove the Special Tool.



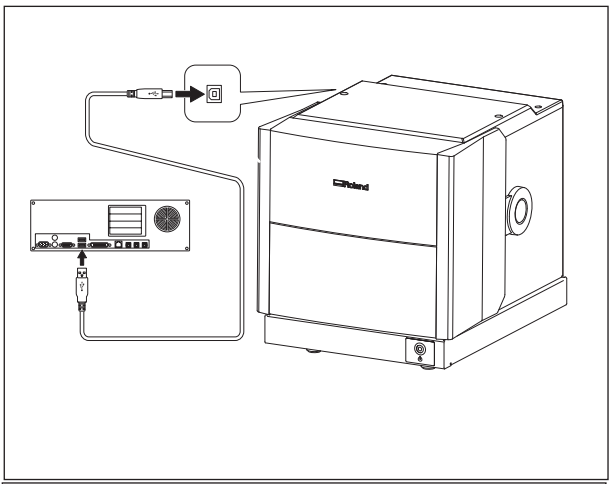
If the Carriage goes down when removing the Special Tool, turn the Head Gear to move up the Carriage once and go back to 8 .

11 Set the Special Tool again.
Check that the Feeler gauge (0.1mm) can not be inserted between the Special Tool and Shaft.

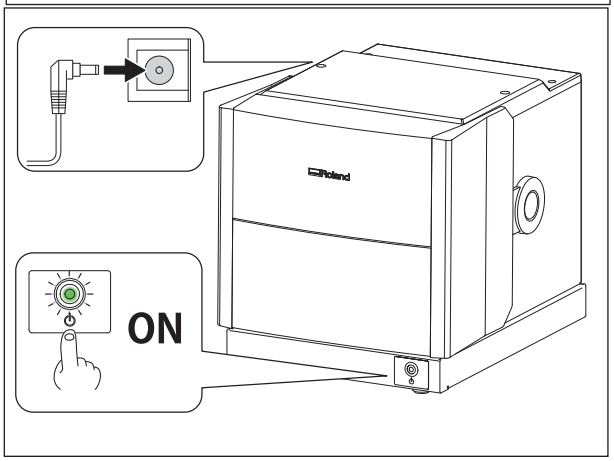


12 From this step is for confirming the adjusted parallelism.

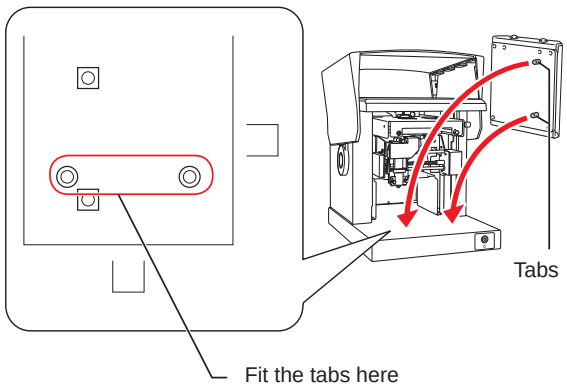
Connect the machine to your PC by using a USB cable.

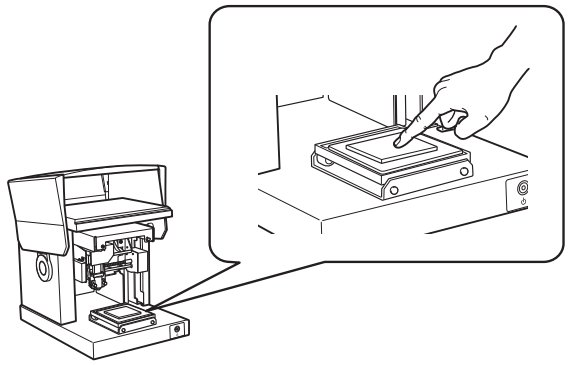


13 Connect the AC adapter.
Turn on the main power SW.



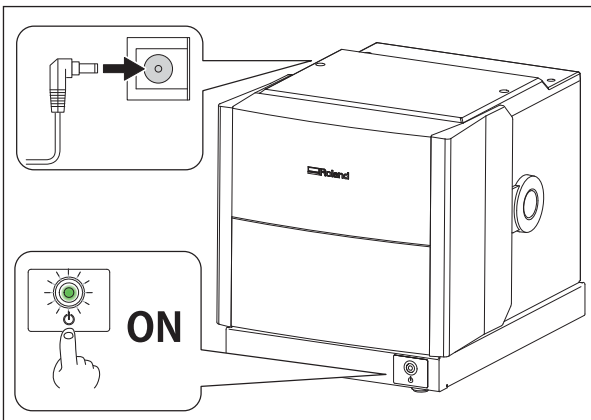
14 Fix the table and mount the test plate on the table.





Test plate
22055423 : PLATE,TEST 4PCS SET MPX-50
(or a brass plate larger than 30 x 60mm)

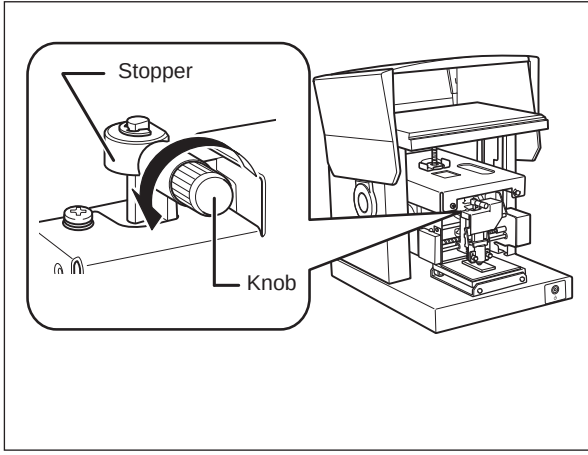
15 Press the power button.
The head moves and stops at the position where the tip of the head cap rides on the surface of the test plate.



Make sure that the Head Cap is attached.

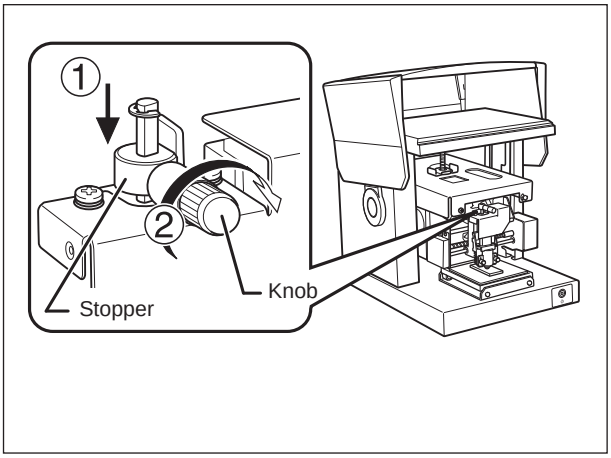
16 Loosen the knob once.

The stopper can be moved.



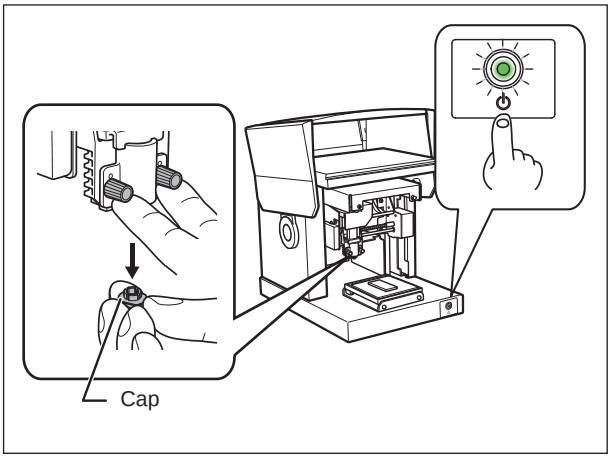
17 Move the knob to the lowest position.

Tighten the knob.



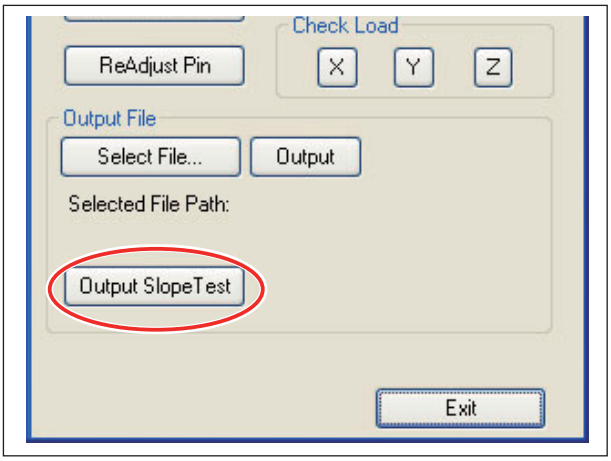
18 Press the power button.
The carriage moves to the left rear.

Remove the cap.

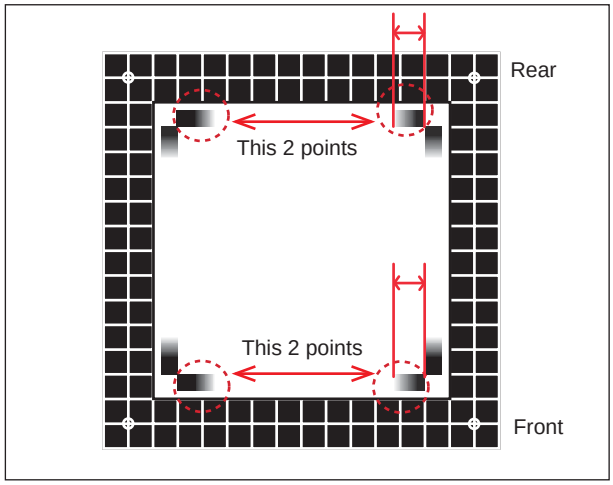


19 Start the MPX90Pit.
Click [Output Slope Test].





20 The test pattern is printed.
Measure the lengths from the starting point to the ending point of the printing at each 2 points of front and rear shown in the figure. Confirm that the difference between the longest and the shortest is 0.5mm or less at each 2 points.



If the ending point of the printing is difficult to determine, measure the point of the same lightness.

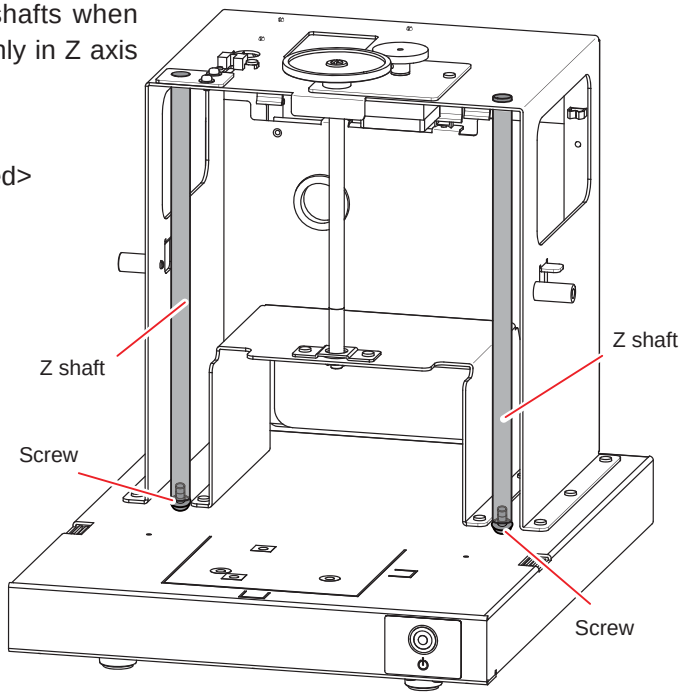
And the front and rear points can not be adjusted. Adjust the slope by adjusting the table height if necessary.

4-7 Z AXIS PARALLELISM CALIBRATION (Referential Time : 10min.)

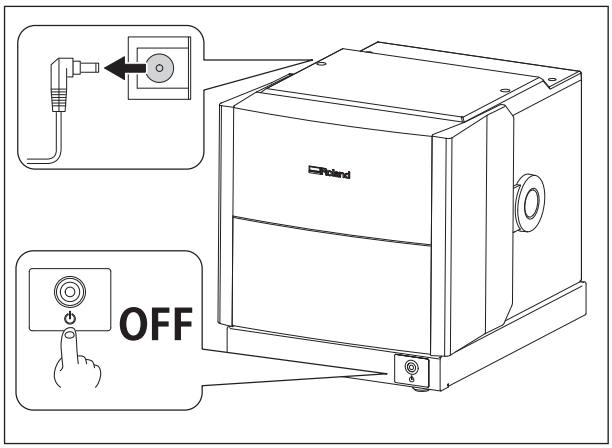
This is to maintain the parallel of the Z shafts when the Printing System does not move smoothly in Z axis direction.

<The parts that should not be disassembled>
- Z shaft
- Screw for fixing the Z shaft

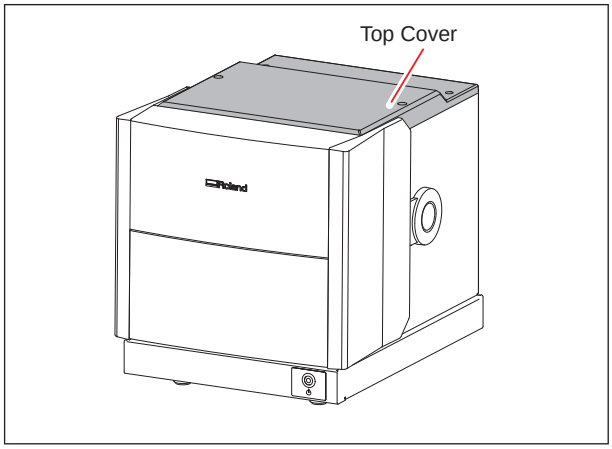
Do not loosen the screw that fixing the Z shaft. Loosening the screw changes the reference position of the Z shaft.



1 Turn off the main power SW, then pull out the AC adapter.

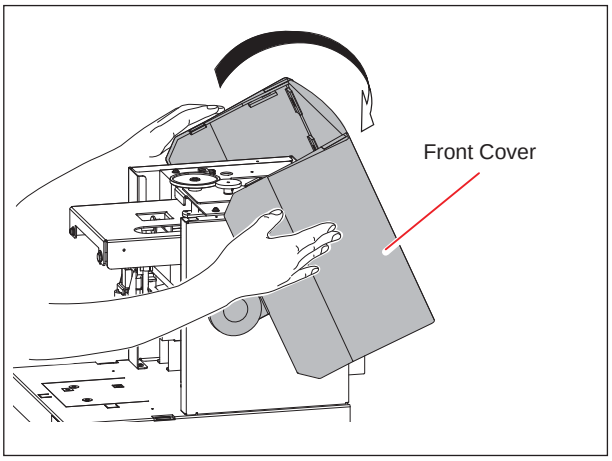


2 Remove the Top Cover.

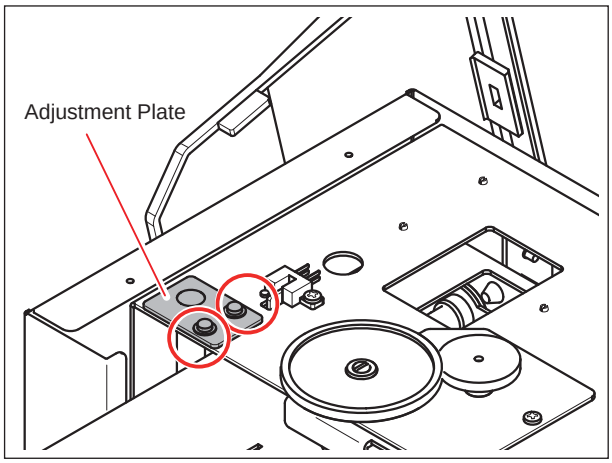


3 Open the Front Cover.

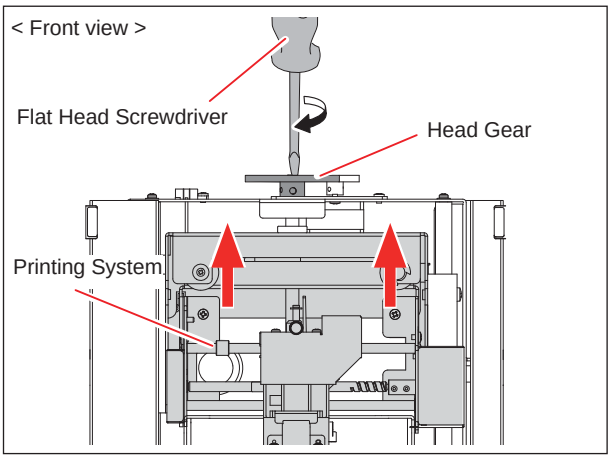
Hold the Front Cover by hand when opening it.



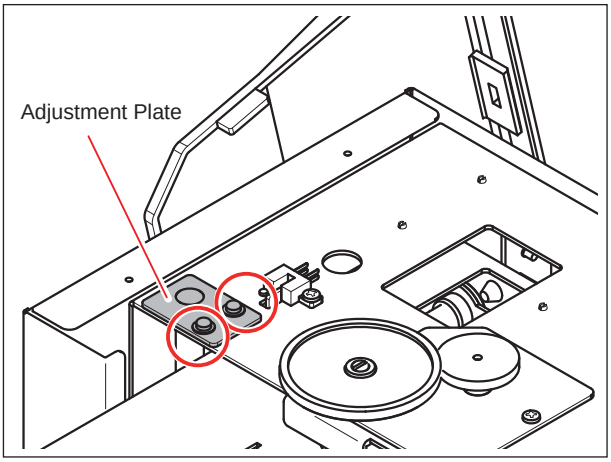
4 Loosen the screws of the Adjustment Plate.



5 Turn the Head Gear to move up the Printing System until it stops using the flat head screwdriver.

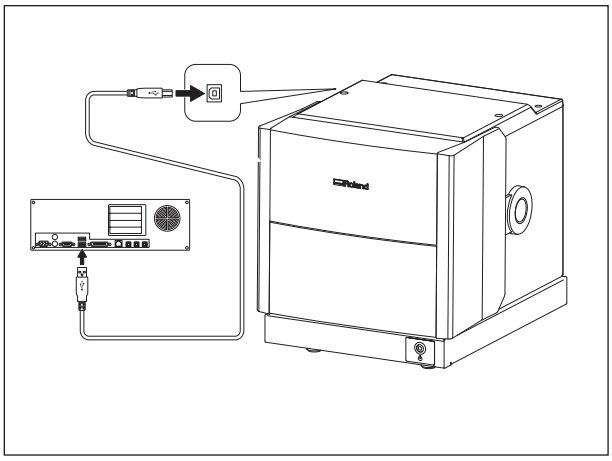


6 Tighten the screws of the Adjustment Plate while the Printing System is at the most upper position.

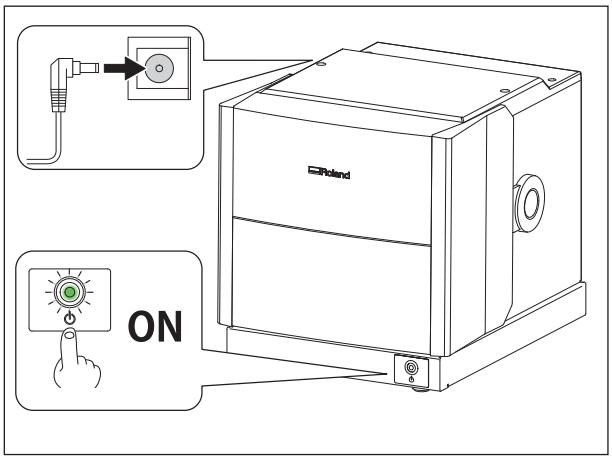


7 From this step is for confirming the adjusted parallelism.

It is necessary to have the MPX-90 driver installed in your PC to communicate with the machine when performing the following steps.
Connect the machine to your PC by using a USB cable.

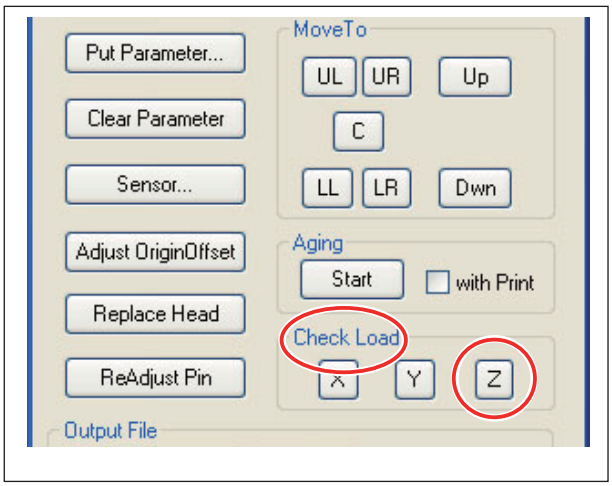


8 Connect the AC adapter.
Turn on the main power SW.



9 Start the MPX90Pit.
Click [Z] in [Check Load] to check the movement of the Printing System in Z axis direction visually.





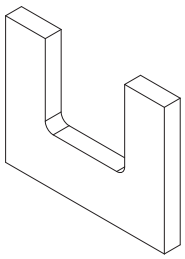
If the following symptoms occur, go back to step 4 and adjust the position of the Adjustment Plate again.

- If the Printing System does not move smoothly.
- If [Failed] message appears during the Check Load.

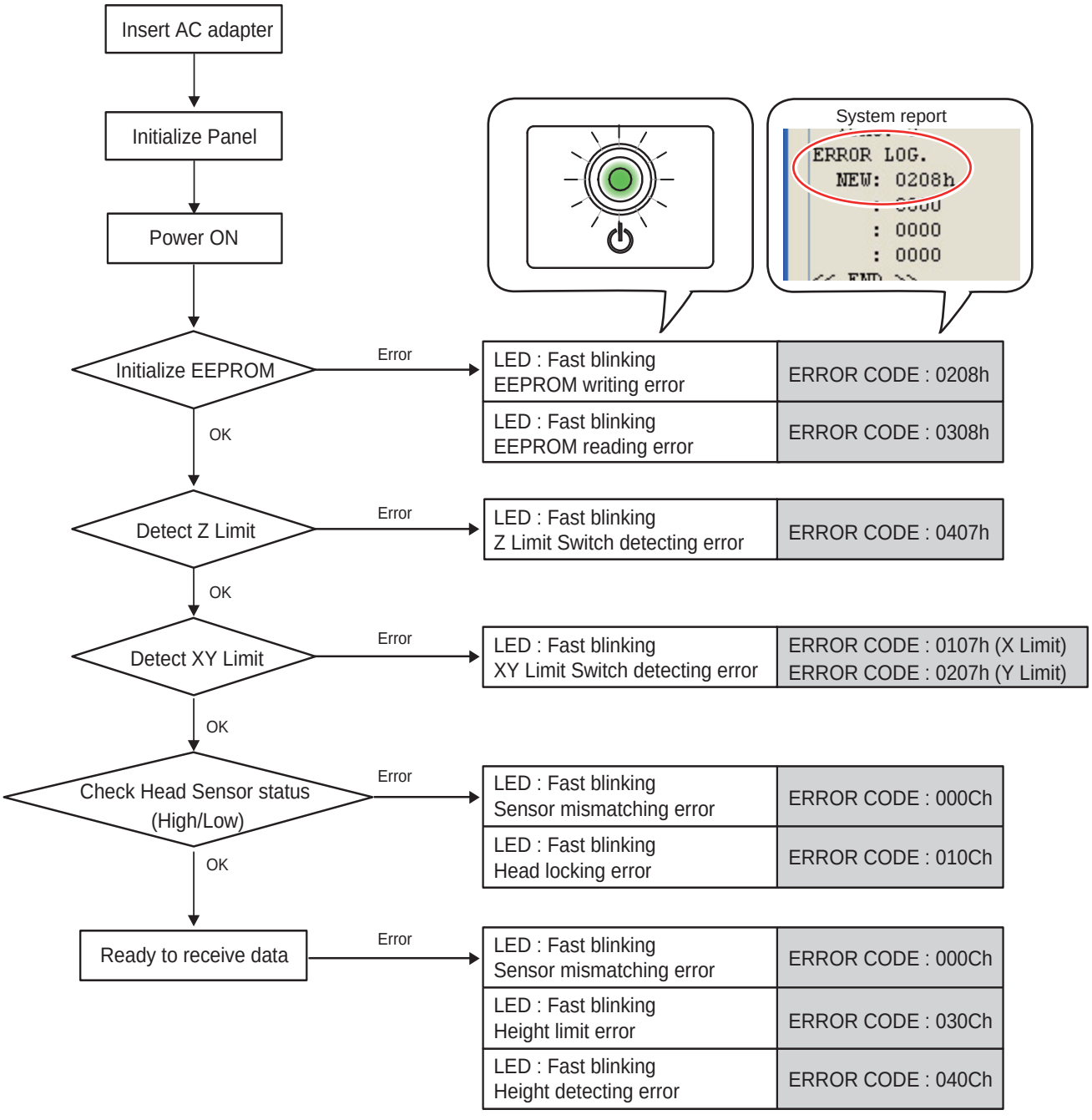
5 Supplemental Information

5-1 SPECIAL TOOLS

Table shows a list of special tools recommended by Roland DG Corp.

Parts No.	1000006820	
Parts Name	TOOL,BLOCK MPX-90 ST-117	
Purpose	Slope Calibration (After disassembling the Printing system)	

5-2 OPERATIONAL SEQUENCE



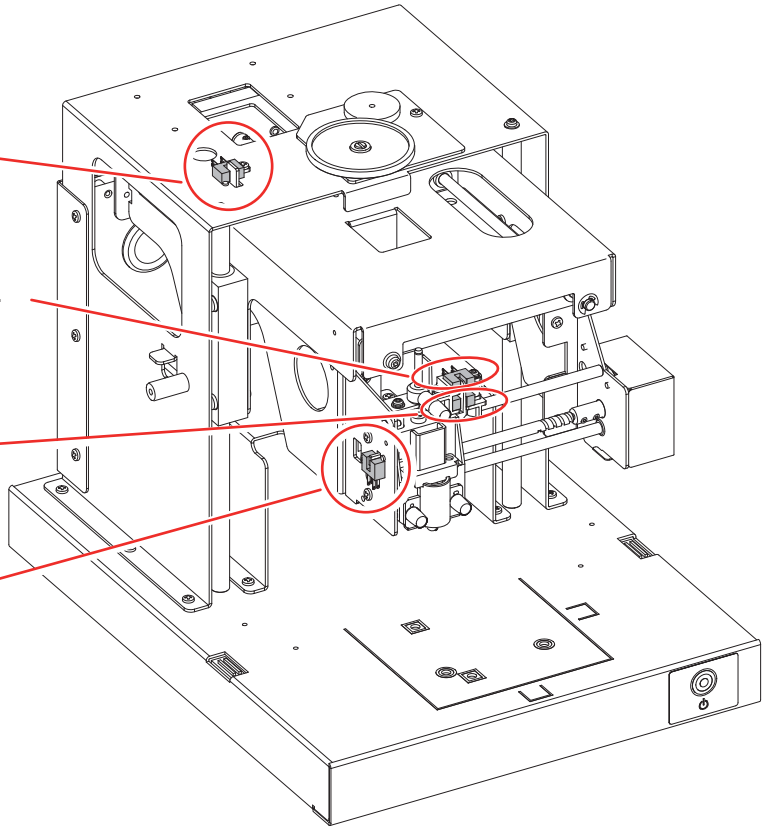
5-3 SENSOR MAP

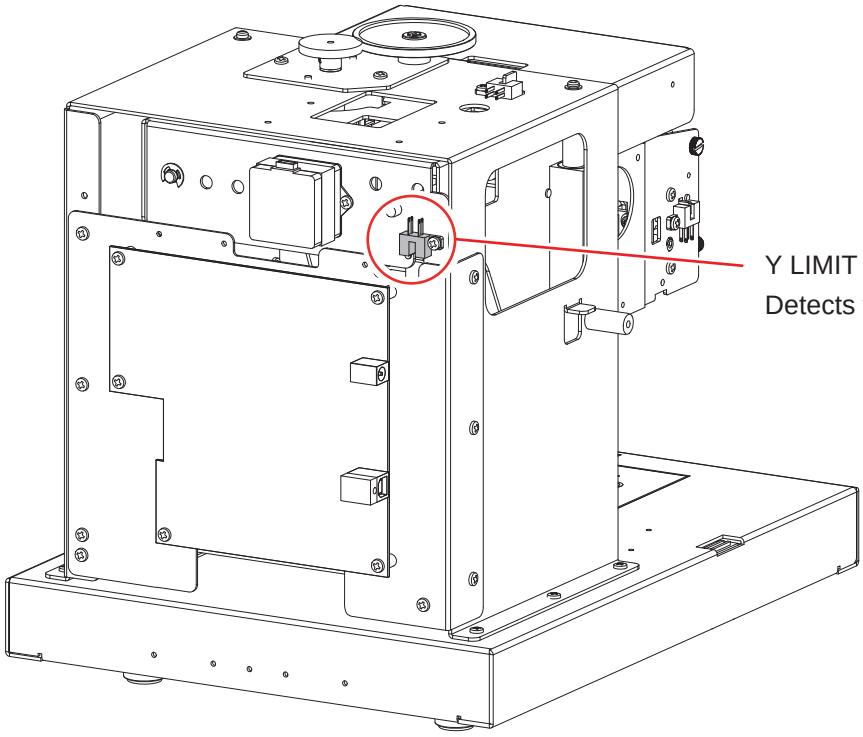
Z LIMIT SENSOR
Detects the limit of Z axis.

HEAD HEIGHT SENSOR (HIGH)
Detects if the material higher than 40mm is set.
(upper direction).

HEAD HEIGHT SENSOR (LOW)
Detects the Head lock.
(lower direction).

X LIMIT SENSOR
Detects the limit of X axis.





Y LIMIT SENSOR
Detects the limit of Y axis.

6 Trouble Shooting

On MPX-90, symptoms and solutions vary between printing with and without the Head Cap. Find an appropriate solution in consideration of with (With) or without (No) Head Cap.

6-1 Machine performs printing but it does not print at all. / Printing is abnormal.

NO	CHECKING POINT	ACTION	REFERENCE	HEAD CAP		OUTLINE
				With	No	
1	Material setting	Fix the material stably	Users Manual	●	●	If material is not set stably, it cannot print properly.
		Adjust the material position	Users Manual	●	●	If the material is not set in a proper position, it can be a cause of a printing failure.
2	Material condition	Check the material condition	Users Manual	●	●	If the material does not meet the conditions of accepted material, it cannot be printed properly.
3	Head Cap missing	Install a Head Cap	Users Manual	●		It is required to attach a Head Cap when printing without fixing the head height. Printing cannot be performed properly without a Head Cap.
4	Head height	Check the head height	Users Manual	●	●	The head must be fixed at an appropriate height to print properly. Readjust the head height.
5	Bad contact / Broken cable	Refix / Replace the Flexible Cable		●	●	If there is a bad contact between the head and the Main Board or the cable between them is broken, the machine performs printing partially or it does not print at all.
6	Damaged Impact Pin	Replace the Head	Users Manual	●	●	It does not print correctly if the impact pin bends or the diamond tip comes off.

6-2 Printing is too dark or too light.

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Image Correction setting of Windows driver	Check [Material] setting	Users Manual	●	●	[Material] needs to be appropriately selected for printing with a proper impact. Also, there are occasions that you need to adjust [Impact] in the detail setting depending on the hardness of the printing surfaces although using the same materials.
		Check [Gamma] or [Brightness] setting	Users Manual	●	●	Confirm the settings when the print result is evenly bright or dark. Adjust them if necessary.
		Check the [Impact] value in the Material detail	Users Manual	●	●	[Impact] needs to be appropriately set for printing with a proper impact.
2	Head height	Check the head height	Users Manual		●	The head must be fixed at an appropriate height for a proper printing. Adjust the head unit height to determine.
3	Head Cap	Remove dust and install correctly	Users Manual	●		Check and clean if the Head Cap has some dust inside. Also, check that the Head Cap is installed correctly. They can be the cause of the impact pin not impacting the material properly.
		Check wear / Replace	Users Manual	●		If the Head Cap is worn and kept used beyond the replacement timing, the hitting force becomes unstable.
4	Hitting force	Calibrate the hitting force	Users Manual	●	●	When the hitting force is not appropriate, printing is not performed with proper density. Perform Origin Calibration in advance, then perform the Hitting Force Calibration.
5	Impact Pin wear	Replace the Head	Users Manual	●	●	When the impact pin is worn, it affects the print density and sharpness. Check the used amount of pin on MPX-90 Head Manager and replace the head with new one (MPH-90) if necessary.
6	Damaged Impact Pin	Replace the Head	Users Manual	●	●	If the impact pin bends or the diamond tip comes off, it may not print with a proper hitting force.

6-3 Uneven printing

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Material setting	Fix the material stably	Users Manual	●	●	If material is not set stably, it cannot print evenly.
2	Bumps of material	Check the material surface	Users Manual	●	●	If material has delicate bumps on its surface, it cannot print evenly.
3	Head Cap	Remove dust and install correctly	Users Manual	●		Check and clean if the Head Cap has some dust inside. Also, check that the Head Cap is installed correctly. They can be a cause of the impact pin not impacting the material properly.
4	Printing System is not adjusted parallel.	Check the parallel level of the Printing System	[4-6 SLOPE CALIBRATION]	●	●	If the print density differs between the left and right of the material, the Printing System might not be adjusted parallel.
5	Carriage Guide wear	Replace the Carriage Guide	[3-2 Y CARRIAGE GUIDE REPLACEMENT]	●	●	When the Carriage Guide is worn, it can be a cause of an uneven printing. In case of an uneven printing in X-direction, disable the setting of [Bi-direction] printing in the Windows driver and see if the unevenness is caused by [Bi-direction] printing or not.
6	Screw shaft distortion	Replace the screw shaft	[3-3 X , 3-4 Y MOTOR REPLACEMENT]	●	●	If the screw shaft (X or Y) is distorted, it cannot print evenly.

6-4 Seams / Scratches

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Material type	Print without attaching the Head Cap	Users Manual	●		Depending on the material type, it may be scratched by the Head Cap.
2	Head Cap	Remove dust and install correctly		●		If there is dust on the face of Head Cap where it contacts with material, it can be a cause of scratching material surface.
		Check wear / Replace	Users Manual	●		When the Head Cap wears too much, the impact pin may scratch the material.

6-5 Printing in wrong position / outside of material

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Material position	Check material position	Users Manual	●	●	Material needs to be set in a correct position referring to the scales of the table/center vise. Especially in printing on a curved-surface material and the print data is created without any margin on the edge, small error of material positioning can be a serious cause of printing outside the material.
2	Material fixation	Check material shape and condition	Users Manual	●	●	If material is not fixed stably due to its shape or dirtiness, the material may move during printing and it may print on unexpected location.
		Clean the Rubber Sheet	Users Manual	●	●	If the Rubber Sheet is dirty and the adhesive is lost, the material may move during printing and it may print on unexpected location.
		Check the position of Rubber Sheet	Users Manual	●	●	If the Rubber Sheet is set on the table with some part running on the table edge, the sheet cannot stay on the table stably. The sheet may move during printing and it may print on unexpected location.
		Check the material fixation on the Center Vise	Users Manual	●	●	If it is not fixed stably, material may move during printing and it may print on unexpected location.
3	[Work Size] of Windows driver	Check [Width] / [Length] of [Work Size]	Users Manual	●	●	If the size set in [Work Size] is larger than actual material size, printing is performed outside the material.

4	Margin setting on METAZAStudio	Check [Margin] setting	Users Manual	●	●	If the margin is small, it may print outside the material when there is a small positioning error of the material.
5	Origin offset	Check [Offset] in Windows driver	Users Manual	●	●	If [Offset] is not set properly, the printing origin is shifted.
		Check [Origin Offset] of the machine	[4-4 ORIGIN CALIBRATION]	●	●	If [Origin Offset] setting goes wrong, the printing origin is shifted.

6-6 Material moves

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Material fixation	Check material shape and condition	Users Manual	●	●	If material is not fixed stably due to its shape or dirtiness, the material may move during printing.
		Clean the Rubber Sheet	Users Manual	●	●	If the Rubber Sheet is dirty and the adhesive is lost, the material may move during printing.
		Check the position of Rubber Sheet	Users Manual	●	●	If the Rubber Sheet is set on the table with some part running on the table edge, the sheet cannot stay on the table stably and may move during printing.
		Check the material fixation on Center Vise	Users Manual	●	●	If it is not fixed stably, material may move during printing.

6-7 The object printed on a curved-surface material is unexpectedly small

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	[Work Size] of Windows driver	Adjust [Work Size]	Users Manual	●	●	When creating a print data for a curved-surface material, the Work Size specified in Windows driver is to be considered as the printable area. Printable area varies according to the degree of roundness and it needs to be adjusted to the size appropriate for the actual material. The size input by pressing the Enter button, which is a function to input the referential printable area for Cylinder-shaped Material (curved-surface material), is only a referential size based on the assumption that the material is a true cylinder.
2	[Margin] setting on METAZAStudio	Set [0] to [Margin]	Users Manual	●	●	When creating a print data for a curved-surface material, the Work Size specified in Windows driver is to be considered as the printable area. The margin that is normally necessary for a flat material is not necessary for a curved-surface material. You can place print objects on the entire Work area as long as the specified Work Size is within the printable area appropriate for the curved-surface material.

6-8 Impact pin bends or the diamond tip comes off

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Printing at the material edge	Check material size / printing area	Users Manual	●	●	If the print object is placed outside the material, the impact pin may bend or the diamond tip may come off when it hits the edge of material.
		Check the print object around the hole	Users Manual	●	●	If there is a print object on or around the hole of the material, the impact pin may bend or the diamond tip may come off when it hits the edge of the hole.
		Check [Margin] setting of METAZAStudio	Users Manual	●	●	If [0] is set for [Margin] of METAZAStudio for the edge of material, or the margin is too small, the impact pin may hit the edge of material or its hole and the impact pin may bend or the diamond tip may come off.
		Adjust the position	Users Manual	●	●	If the material is set at a position where shifting from the right position, the impact pin may hit the edge of material or its hole and the impact pin may bend or the diamond tip may come off.

2	Head Cap	Install a Head Cap if forgotten	Users Manual	●		It is required to attach a Head Cap when printing without fixing the head height. If printing without a Head Cap, the impact pin trails on the material and the impact pin may bend or the diamond tip may come off.
		Check wear / Replace	Users Manual	●		If the Head Cap is worn and kept used beyond the replacement timing, the impact pin improperly contact with material and the impact pin may bend or the diamond tip may come off.
3	Head height	Check the head height	Users Manual		●	If the head height is not proper, the impact pin may bend or the diamond tip may come off. Adjust the head height.

6-9 Carriage Guide chatters when machine is powered on

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Carriage Guide condition	Tighten the fixing screw of Carriage Guide	[3-1 X Carriage Guide Replacement] [3-2 Y Carriage Guide Replacement]	●	●	If the symptom does not improve after tightening the fixing screw, it can be some wear or crack of Carriage Guide. In this case, replace the Carriage Guide with a new one.
		Replace Carriage Guide		●	●	

6-10 Head does not move up and down smoothly

NO	CHECKING POINT	ACTION	REFERENCE	With	No	OUTLINE
1	Z shafts are not adjusted parallel.	Adjust the parallelism between two Z shafts	[4-7 Z AXIS PARALLELISM CALIBRATION]	●	●	If the parallelism between two Z shafts is not uneven, the Z-axis does not move smoothly in Z axis direction.

6-11 Error Code

Revised 1

The error LED blinks fast (0.5 seconds interval) when these errors occur. Turn off the sub power.
The latest 4 corresponding error codes are saved in the [ERROR LOG.] of the system repot.

ERROR CODE	Description	CAUSE	SOLUTION
0107	X Limit is not detected	1. X Limit Sensor is not in the correct position	1. Fix the X limit Seneor correctly
		2. Bad contact in the X Limit Sensor Cable	2. Re-connect the X Limit Sensor cable
		3. Defective X Screw	3. Replace the X Screw
		4. X Limit Sensor is broken	4. Replace the X Limit Sensor
		5. Cable between X Motor and Main Board is defective	5. Replac the cable between X Motor and Main Board
		6. X Motor is broken	6. Replace the X Motor
		7. Abnormal movement of X-axis caused by breakage of X Deriver IC	7. Replace the Main Board
0207	Y Limit is not detected	1. Y Limit Sensor is not in the correct position	1. Fix the Y limit Seneor correctly
		2. Bad contact in the Y Limit Sensor Cable	2. Re-connect the Y Limit Sensor cable
		3. Defective Y Screw	3. Replace the Y Screw
		4. Y Limit Sensor is broken	4. Replace the Y Limit Sensor
		5. Cable between Y Motor and Main Board is defective	5. Replac the cable between Y Motor and Main Board
		6. Y Motor is broken	6. Replace the Y Motor
		7. Abnormal movement of Y-axis caused by breakage of Y Deriver IC	7. Replace the Main Board
0407	Z Limit is not detected	1. Z Limit Sensor is not in the correct position	1. Fix the Z limit Seneor correctly
		2. Bad contact in the Z Limit Sensor Cable	2. Re-connect the Z Limit Sensor cable
		3. Movement of Z-axis is not smooth	3. Refix or replace the Z Motor
		4. Z Limit Sensor is broken	4. Replace the Z Limit Sensor
		5. Cable between Z Motor and Main Board is defective	5. Replac the cable between Z Motor and Main Board
		6. X Motor is broken	6. Replace the X Motor
		7. Abnormal movement of Z-axis caused by breakage of Z Deriver IC	7. Replace the Main Board
0208	Cannot write to EEROM	Main Board is broken	Replace the Main Board
0308	Cannot read EEROM	Main Board is broken	Replace the Main Board
000C	Head Height Sensor (High) is ON, and Head Height Sensor (low) is OFF	1. Bad contact in the Head Height Sensor (HIGH/LOW) cables	1. Re-connect the Head Height Sensor (HIGH/LOW) cables
		2. Head Height Sensor (HIGH/LOW) cables are broken	2. Replace the Head Height Sensor (HIGH/LOW) cables
		3. Main Board is broken	3. Replace the Main Board
010C	Head Lock error Head Height Sensor (High/Low) is ON	Head is locked	Unlock the head
020C	Head is unlocked	1. Knob becomes loose and the head is unlocked	1. Tighten the knob firmly
		2. Table is not set	2. Set the table
		3. Bad contact in the Head Height Sensor (HIGH/LOW) cables	3. Re-connect the Head Height Sensor (HIGH/LOW) cables
		4. Head Height Sensors (HIGH/LOW) are broken	4. Replace the Head Height Sensors (HIGH/LOW)
		5. Main Board is broken	5. Replace the Main Board
030C	Head height limit error Head Height Sensor (High/Low) is ON (ready to print)	1. Head is locked	1. Unlock the head
		2. Material has been replaced to the thicker one	2. Adjust the head position based on the surface height of the materia
		3. Lift the head	3. Release the head
	Head height limit erro Head Height Sensor (High/Low) is ON (printing)	Exceed the limit of height while printing	Adjust the head position based on the surface height of the material
040C	Height is not detected Head Height Sensor (Low) is OFF	1. Table is not set	1. Set the table
		2. Bad contact in the Head Height Sensor (HIGH/LOW) cables	2. Re-connect the Head Height Sensor (HIGH/LOW) cables
		3. Head Height Sensors (HIGH/LOW) are broken	3. Replace the Head Height Sensors (HIGH/LOW)
		4. Main Board is broken	4. Replace the Main Board

7 Service Activities

7-1 INSTALLATION CHECK LIST

MPX-90 INSTALLATION CHECK LIST

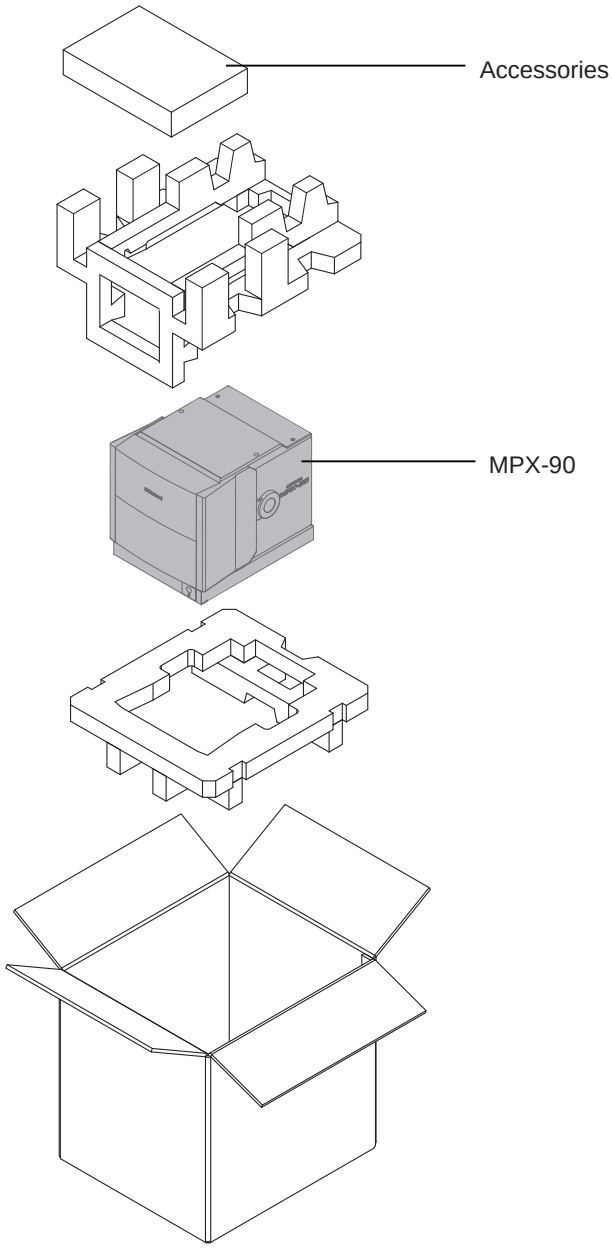
Date : _____

User : _____ Serial Number : _____

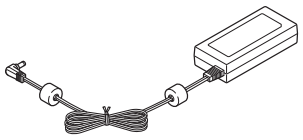
☐ Checking the space

☐ There is a space necessary for installing the machine. And Install in a location that is level and stable.

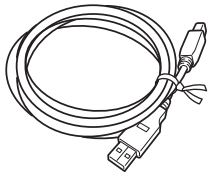
☐ Unpacking



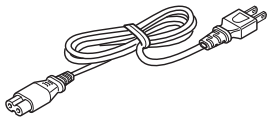
Checking the accessories



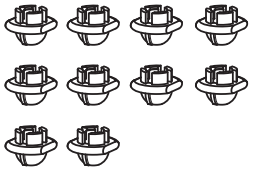
AC Adapter



USB Cable

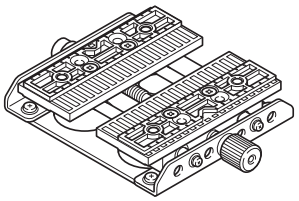


Power cord

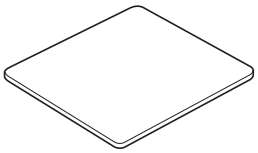


Head caps

* One installed on the unit by default

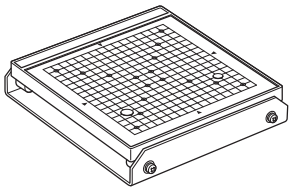


Center vise

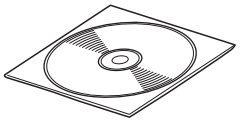


Adhensive sheet

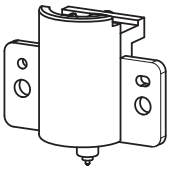
* Installed on the table by default



Table

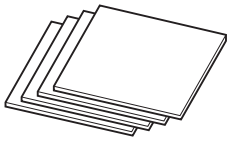


Roland Software Package
CD-ROM

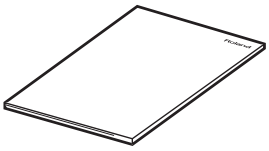


Head

* Installed on the unit by default



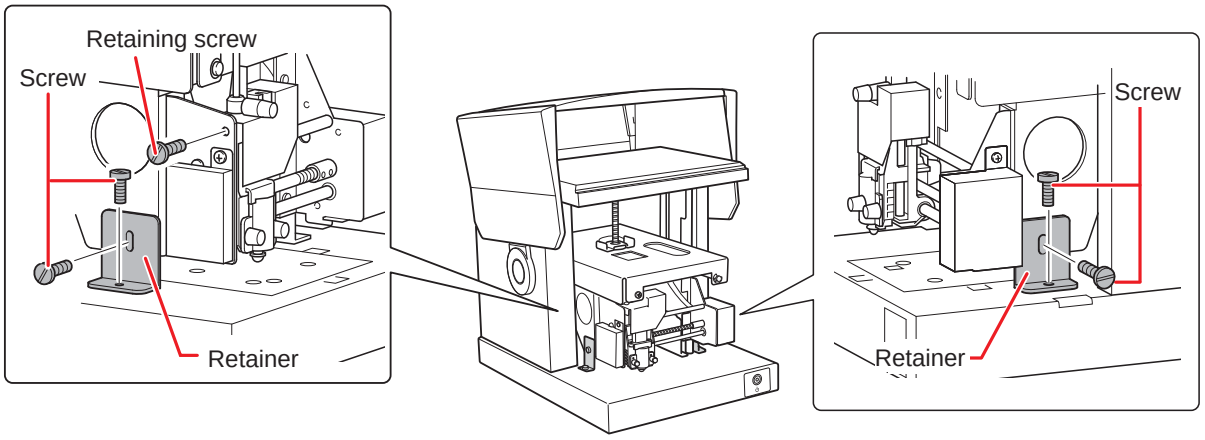
Test-use printing material
(Brass-plated plates)



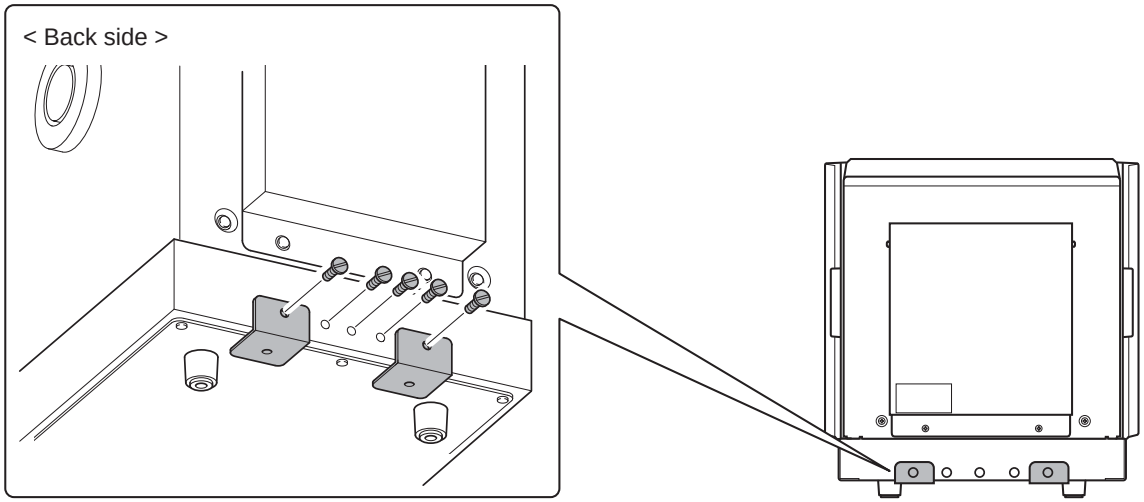
User's manual

Removing and storing the retaining materials

Remove the retainers and retaining screws.



☐ Keep the retainers and retaining screws to the position shown in the figure.



☐ Preparation

Perform the followings in reference to the User's Manual.

☐ Connecting the Power Cord

Do not connect the machine and computer at this time. Connect them when installing the driver by following to the installation guide.

Install the METAZA driver in reference to the User's Manual.

☐ Installing the METAZA driver

Connect the machine and computer in reference to Installation Guide of Roland Software Package.

☐ Installing the Software

☐ Installing METAZAStudio

☐ Installing SFEdit2

☐ Installing MPX-90 Head Manager

☐ Installing Dr.Engrave

☐ Remind the customer to refer to HELP for the usage of the software.

☐ Remind the customer that the latest version of the driver and the updater of the application software are available from the Roland DG website.

Upgrading the Firmware

Upgrade the firmware to the latest version.

Explaining Functions and Operations

Explain the following contents in reference to the chapter 3, 4 and 6 of the user's manual.

- [ ] Switching the Power On and Off
- [ ] Getting Ready
- [ ] Preparing Print Data
- [ ] Starting and Stopping Printing
- [ ] Tips and Tricks for Image Layout
- [ ] Tips and Tricks for Text Layout
- [ ] Creating and Editing Line Text
- [ ] Checking and Adjusting Finished Result of an Image
- [ ] Printing on a Curved Surface
- [ ] Register New Material
- [ ] METAZA Driver Settings
- [ ] More Advanced Other Operations
- [ ] What to Do If

Maintenance and Adjustment

Explain the following contents about the maintenance and adjustment in reference to the user's manual.

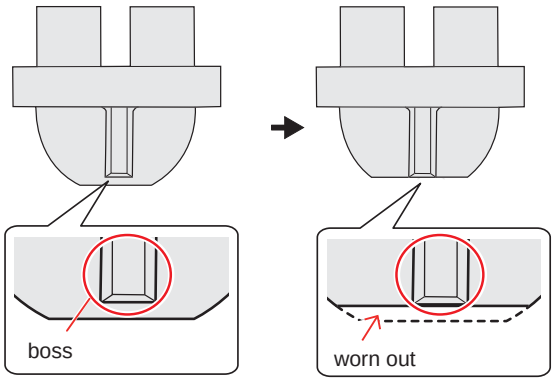
- Daily Care

  !! WARNING !!
  Never use gasoline, alcohol, thinner, or any other flammable material for cleaning.

- Adjusting Marking Pins
- Composition Registration and Striking-force Adjustment
- Adjustment of the Origin-point Location
- The Replacement of the Head Cap
- Head Replacement

Consumable Parts

Remind the customer that the following are the consumable parts. Also, explain that the listed hours of life expectancy should be referred to as a general guide only and the replacement cycle varies according to usage conditions.

Parts	Life expectancy
Head	One hundred million shots
Head Cap	The head cap is due for replacement when the triangle at its tip is worn out to the boss part. 

7-2 MAINTENANCE CHECK LIST

MPX-90 MAINTENANCE CHECK LIST

Date : _____

User : _____ Serial Number : _____

Check Points		Operation Points	Check
Interview the customer		Ask the customer if there is something that he/she is concerned about.	☐ Done
Get report before maintenance		Save the report of the machine by [Get Report] of MPX90Pit.	☐ Done
Upgrade the firmware to the latest version		Upgrade the firmware if the installed firmware is not the latest version.	☐ Done
X-axis	Screwshaft	Check if there is no dirt or scratches.	☐ OK ☐ NG
		Lubricate and clean the Screwshaft if necessary. (FLOIL G902, P/# 21675102)	☐ Lubricated ☐ Not necessary
	Load Check	Execute Check Load [X] by MPX90Pit and check if it shows [Completed] correctly.	☐ OK ☐ NG
Y-axis	Screwshaft	Check if there is no dirt or scratches.	☐ OK ☐ NG
		Lubricate and clean the Screwshaft if necessary. (FLOIL G902, P/# 21675102)	☐ Lubricated ☐ Not necessary
	Load Check	Execute Check Load [Y] by MPX90Pit and check if it shows [Completed] correctly.	☐ OK ☐ NG
Z-axis	Screwshaft	Check if there is no dirt or scratches.	☐ OK ☐ NG
		Lubricate and clean the Screwshaft if necessary. (FLOIL G902, P/# 21675102)	☐ Lubricated ☐ Not necessary
	Drive Gear	Check if there is no dirt or scratches.	☐ OK ☐ NG
		Lubricate and clean the Drive Gear if necessary. (FLOIL G902, P/# 21675102)	☐ Lubricated ☐ Not necessary
	Head Gear	Check if there is no dirt or scratches.	☐ OK ☐ NG
		Lubricate and clean the Head Gear if necessary. (FLOIL G902, P/# 21675102)	☐ Lubricated ☐ Not necessary
	Load Check	Execute Check Load [Z] by MPX90Pit and check if it shows [Completed] correctly.	☐ OK ☐ NG
Consumables	Head Cap	Check if the triangle at its tip is worn out to the boss part. And remind the customer of a replacement if necessary.	☐ Replaced ☐ Not necessary
	Adhesive Sheet (Rubber Sheet)	Confirm that material does not move during printing. Suggest the customer to replace it if the adhesive does not recover after it is rinsed in water.	☐ Replaced ☐ Not necessary
Printing	Test print	Check that there is no problem with the printing operation and result.	☐ Printed
Adjustment	Origin calibration	Check the printing origin. Adjust it if it is 0.5mm or more off the table center.	☐ Adjusted ☐ Not necessary
	Life of marking pin	Confirm the used amount of marking pin with MPX-90 Head Manager. Change with the new head if it is time.	☐ Changed ☐ Not necessary
Get report after maintenance		Save the report of the machine by [Get Report] of MPX90Pit.	☐ Done
Remarks			

7-3 SPECIFICATIONS

Main Specifications

	MPX-90	
Printable material	Gold, silver, copper, platinum, brass, aluminium, iron, stainless steel, etc. (Vickers hardness [HV] of the printing surface must be 200 or less.)	
Loadable material size	Maximum 100 mm (width) x 200 mm (length) x 40 mm (thickness), or 200 mm (width) x 100 mm (length) x 40 mm (thickness) (3.9 in. x 7.9 in. x 1.5 in.), or (7.9 in. x 3.9 in. x 1.5 in.)	
Printing area	80 mm x 80 mm (3.1 in. x 3.1 in.)	
Resolution	529 dpi (High resolution), 353 dpi (Photo), 265 dpi (Text), 1058 dpi (Vector)	
Printing direction	Unidirectional printing or bidirectional printing (Selectable with Windows driver)	
Printing speed (Default)	50 mm/sec (1.9 in./sec) (Photo), 33 mm/sec (1.2 in./sec) (High resolution/ Text), 24 mm/sec (0.94 in./sec) (Vector)	
Interface	USB interface (compliant with Universal Serial Bus Specification Revision1.1)	
Power requirements	Dedicated AC adapter	AC 100V to 240V ±10% 50/60Hz
	Machine	DC 19 V 1.6 A
Power consumption	Approx. 24W	
Acoustic noise level	Under 70 dB (A)	
Operation temperature	10 to 30°C (50 to 86°F)	
Operation humidity	35 to 80% (no condensation)	
External dimensions	286 mm (W) x 383 mm (D) x 308 mm (H) (11.3 in. (W) x 15.1 in. (D) x 12.2 in. (H))	
Weight	10.8 kg (23.8 lb.)	
Accessories	AC adapter, power cord, test-use printing material, USB cable, CD-ROM, user's manual, etc.	

System Requirements for USB Connection

Computer	Model preinstalled with Windows Vista (32 bit) or XP, or upgraded computer originally preinstalled with Windows XP.
USB cable	Use the included USB cable.