Maintenance Manual

SC CUTTING PLOTTER

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FCC WARNING

This equipment complies with the requirements for a class A computing device in the FCC rules, part 15, subpart J.

Operation of this device in a residential area may interfere with television or operating utilities.

Cutters generate weak radio signals and may interfere with television reception and utilities. If the cutter does interfere with radio or TV reception, try the following :

- Change the direction of your radio and TV reception antenna or feeder.
- Change the direction of the cutter.
- Move either the cutter or the receiving antenna so that there is more distance between them.
- Be sure the cutter and the receiving antenna are on separate power lines.

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1. SPECIFICATIONS.

1.1. Mutoh SC-series Cutting Plotter

Cutting area	SC-550 : 100 – 540 mm x 4 m SC-650 : 100 – 630 mm x 12 m SC-750 : 100 – 780 mm x 12 m SC-1000 : 100 – 1030 mm x 12 m SC-1300 : 100 – 1200 mm x 12 m
Max. addressable cut length	50 meter
Maximum media thickness	1.2 mm (1 mm for SC-550)
Drive mechanism	Friction
Knife / Cut type / principle	Drag
Mechanical resolution	0.005 mm
Accuracy	0.15 % (0.20 % for SC-550)
Repeatability	0.15 mm / m
Knife types	30°, 45° 60° Offset 0.3 & 0.5 mm
Speed	1000 mm / s (600 mm / s for SC-550)
Acceleration	4G (pen UP), 3G (pen DOWN) 2G for SC-550
PEN UP / DOWN cycles	40 / sec.
Pressure range	20 – 500 g
Interface (standard)	RS – 232 / centronics
Input buffer	1 Mb standard / 4 Mb optional No optional buffer on SC-550
Graphic languages	MHGL, MHGL/2, HGL/2 compatible & MCGL (Calcomp compatible)
Configurable origin	Yes
Offset adjustment range	0 → 1 mm
Integrated intelligence	Fuzzy logic / Vector look-ahead / Curve & Arc smoothing
Auto sheet off function	Yes (not on SC-550)
Replot function	Up to 100 copies
Power requirements	100 to 120 VAC 50/60 Hz 200 to 240 VAC 50/60 HZ

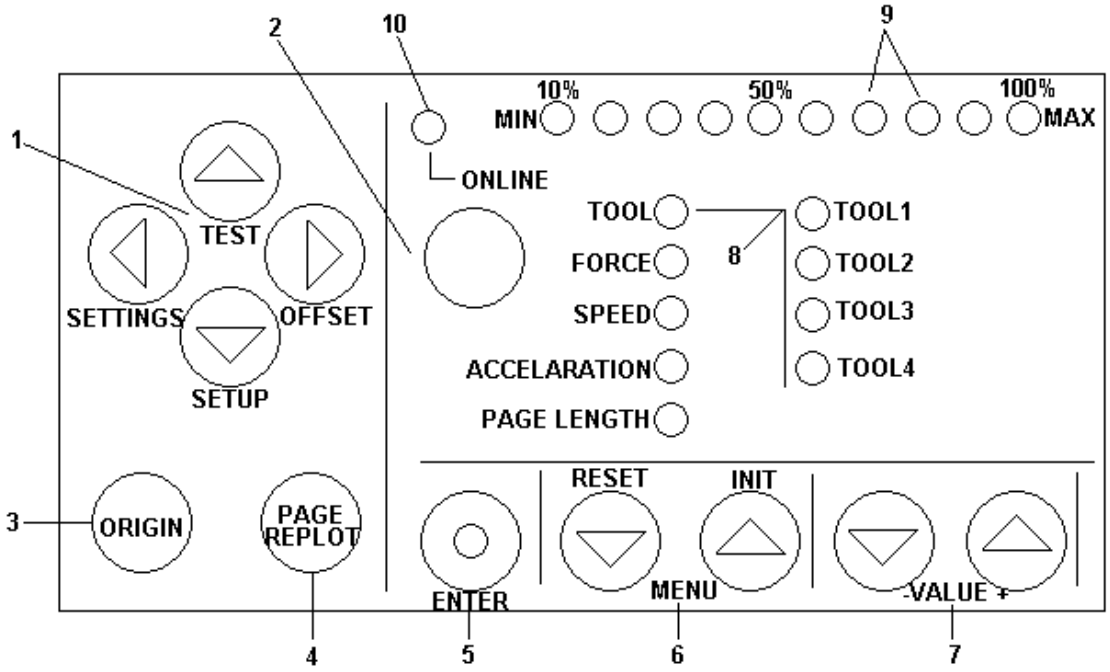
1.2. SC cutting plotter, environment.

The location where you set up your equipment is very important. Please see to it that it meets following conditions :

- Power supply of 100 to 120 VAC 50/60 Hz or 200 to 240 VAC 50/60 Hz.
- Ambient conditions :
  - Operating environment
    - Temperature : 5°C to 40°C (41°F to 104°F)
    - Humidity : 35% - 75% non-condensation
  - Recommended environment
    - Temperature : room temperature 16°C to 32°C (61°F to 90°F)
    - Humidity : 50% to 65% non-condensation
  - Variation rate
    - Temperature : 2°C per hour
    - Humidity : 5% per hour
  - Storage environment
    - Temperature : 0°C to 50°C (32°F to 122°F)
- Please protect your cutter from moisture, dust, draughts and direct sunlight. It is best to keep your machine away from open windows and air-conditioners.
- See to it that there is an adequate space around the cutter so that ventilation is not obstructed.
- Avoid unnecessary vibrations and set up your cutter on a level surface.
- When selecting a place for your cutter, leave at least 90 cm in front and 90 cm at the rear.

1.3. Function keys.

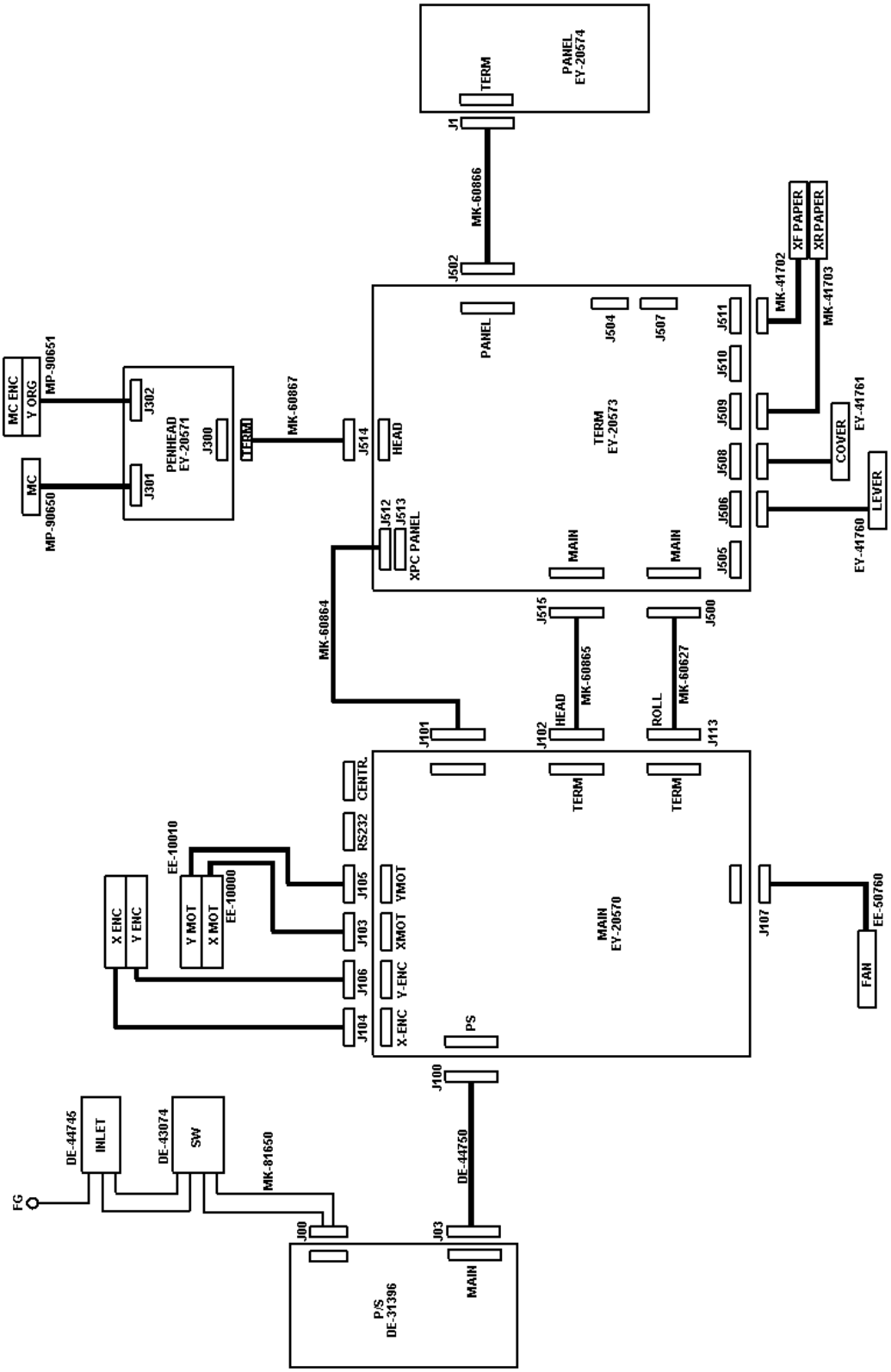
Using the control panel, you can access different modes and alter several settings, in order to fine-tune the cutter to match all your needs.



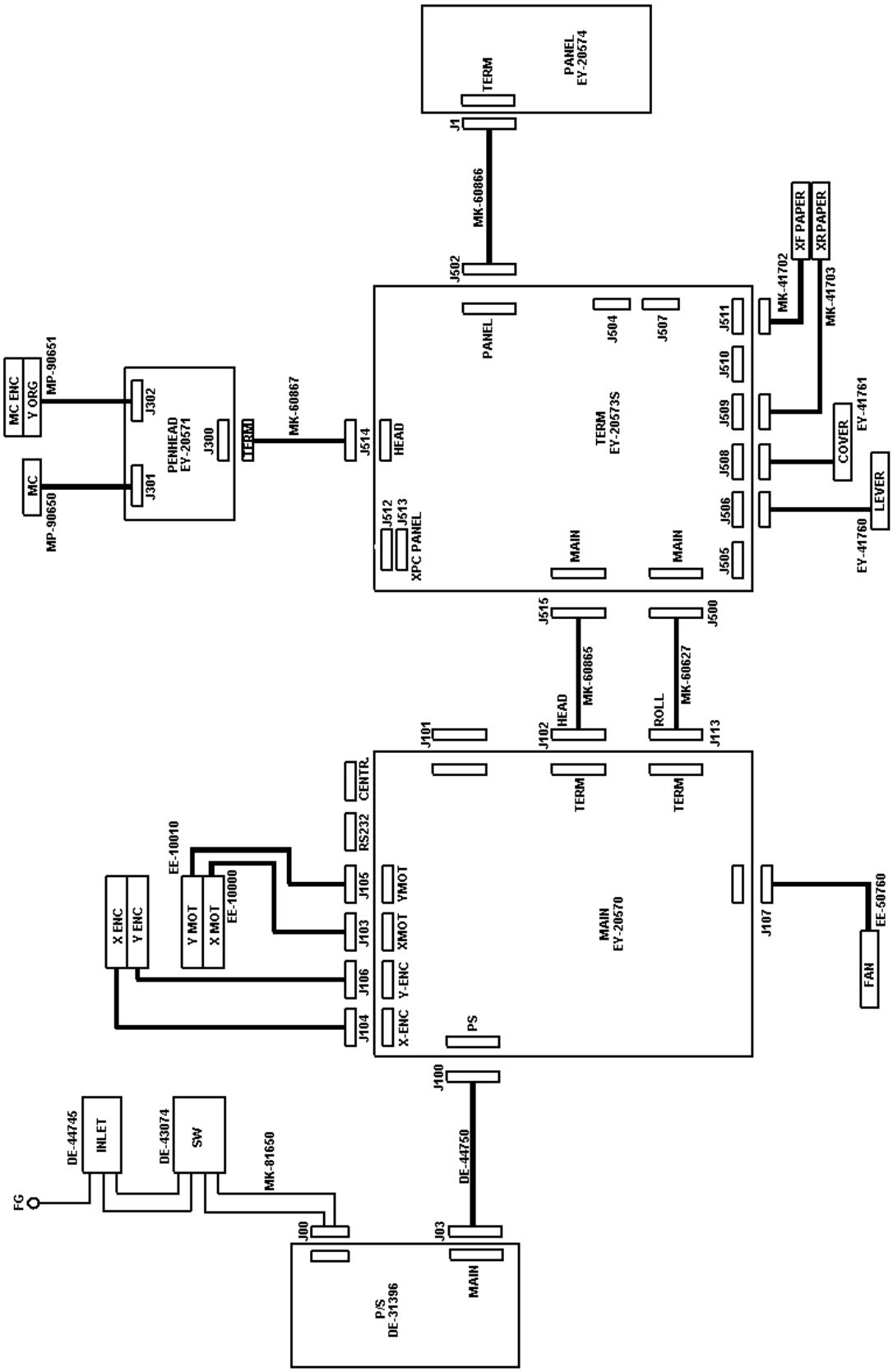
1) **JOG – keys** : Keys for manual movement of the tool head.
2) **ON-LINE** : Key to switch between OFF-LINE and ON-LINE mode.
3) **ORIGIN** : When this key is pressed, a new origin is set at the present location of the tool head. Using the ORIGIN key, you can also activate the alignment function.
4) **PAGE** : Performs media pre-feed cycle and gives access to the replot / copy function and starts the automatic sheet-off function.
5) **ENTER** : To confirm changes and accept settings. The enter key, marked with a blue dot, also gives access to special functions indicated by the blue text on the control panel.
6) **MENU Selection Keys** : To select the parameter you want to alter.
7) **Value + & - Keys** : To change a parameter's value or setting.
8) **LED indicator for plotter parameters and tool selection indication.**
9) **LED bar for value indicators, error messages and function confirmation.**
10) **ONLINE-LED indicator**

2. SYSTEM BLOCK DIAGRAM.

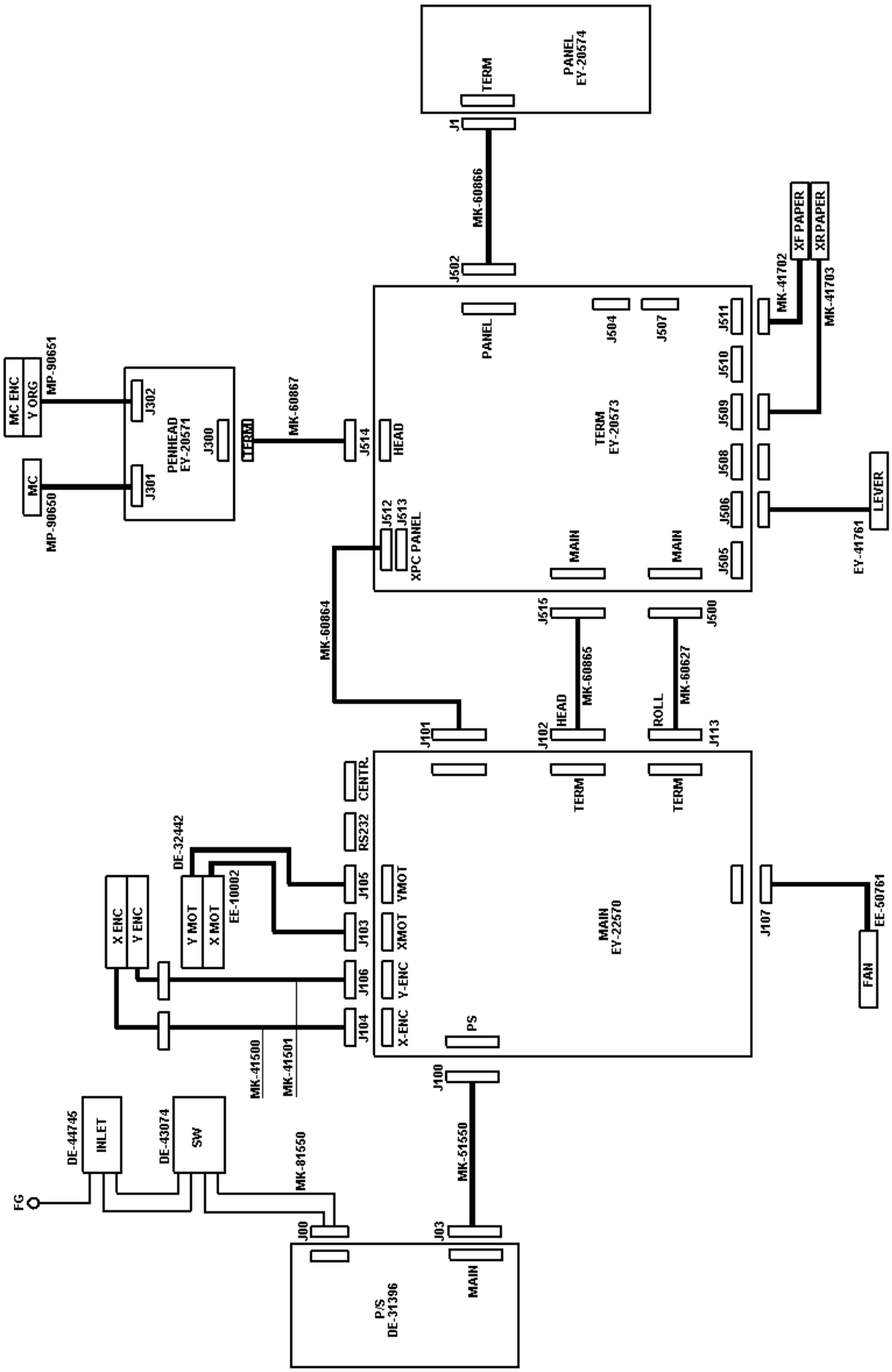
2.1. Block diagram SC-series (1st version).



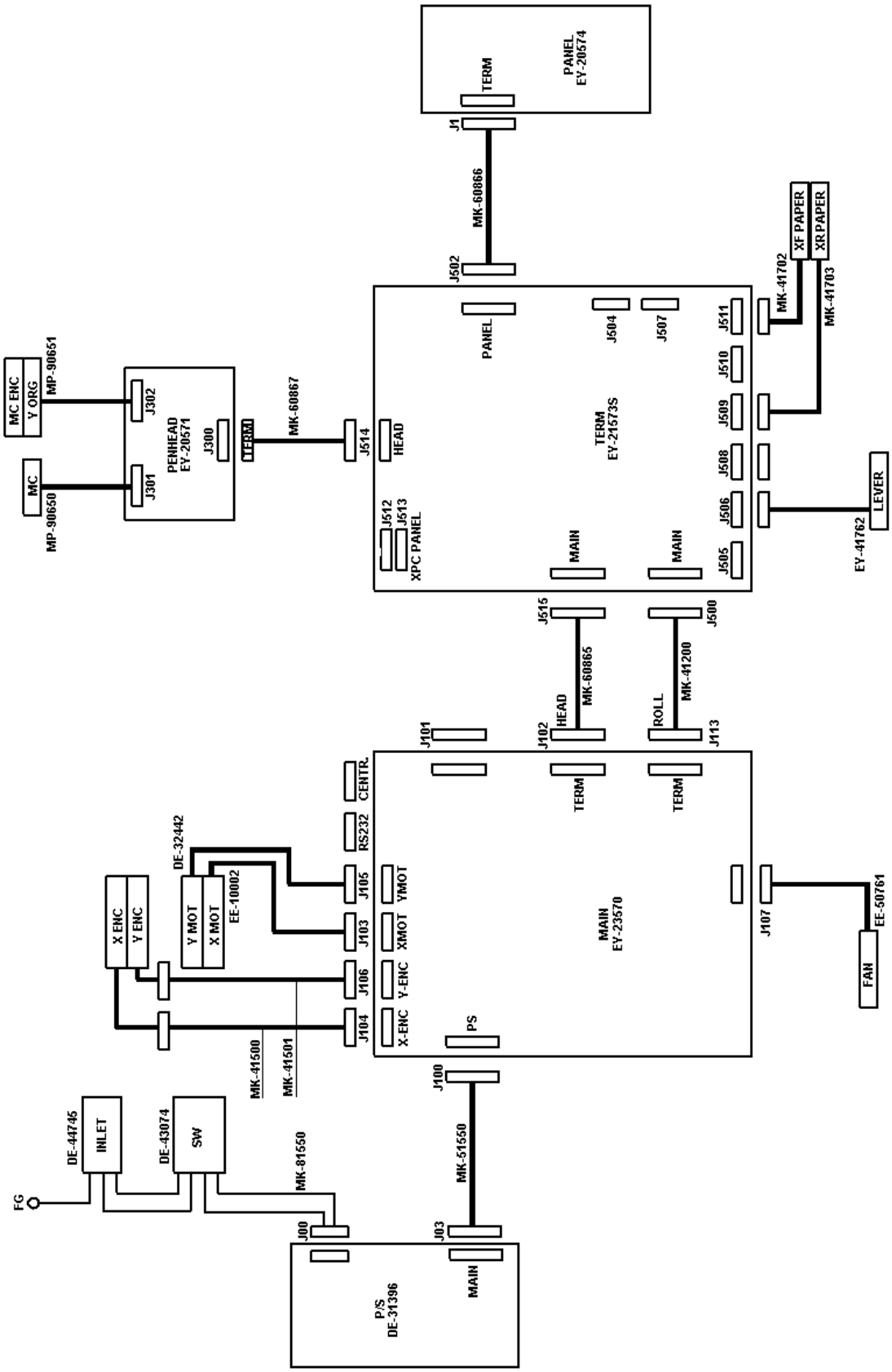
2.2. Block diagram SC-series (2nd version).



2.3. Block diagram SC-550 (1st version).



2.4. Block diagram SC-550 (2nd version).



3. INTERFACES.

3.1. Serial interface RS-323C (standard).

1) Baud rate (software selectable).

   - 19200 bps
   - 9600 bps
   - 4800 bps
   - 2400 bps
   - 1200 bps

2) Data length (software selectable).

   - 7 bits
   - 8 bits

3) Stop bits (software selectable).

   - 1 bit
   - 2 bits

4) Parity (software selectable).

   - Odd
   - Even
   - None

5) Error detection.

   - Parity error
   - Framing error
   - Overrun error

6) External connector.

   - DB-25S (equivalent)

7) RS-232C driver / receiver IC.

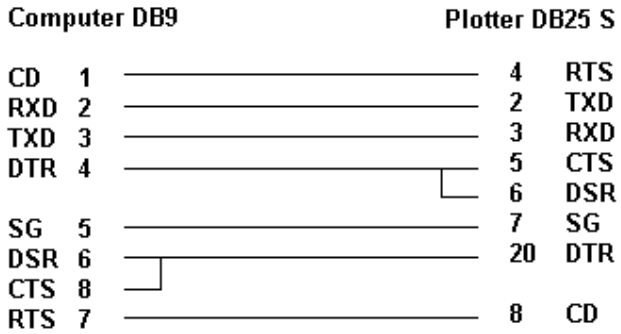
   - driver : 75188 (TI, ± 12V power supply)
   - receiver : 75189A

3.1.1. RS-232C pin configuration.

PIN #	SIGNAL	Abbr.	Signal direction
1	Frame ground	FG	-
2	Transmit data	TXD	OUT
3	Receive date	RXD	IN
4	Request to send	RTS	OUT
5	Clear to send	CTS	IN
6	Data set ready	DSR	IN
7	Signal ground	SG	-
8	Carrier detect	CD	IN
9 → 14	Not used		
15	Transmitter signal Element timing	ST	IN
16	Not used		
17	Receiver signal Element timing	RT	IN
18	Data terminal ready	DTR	OUT
19	Not used		
20	Data terminal ready	DTR	OUT
21 → 25	Not used		

3.1.2. Serial cable configuration.

1) 9 pins → 25 pins connector.



2) 25 pins → 25 pins connector.

3.2. Centronics interface (Standard).

- Uni-directional (Receiving only)
- Data length : 8 bit parallel
- Signal level : TTL
- Transmission distance : maximum 5 meters

3.2.1. Centronics interface Pin configuration.

PIN #	SIGNAL	SIGNAL	Signal direction
1	Strobe (*)	Strobe input	In
2 → 9	DATA 1 → 8	Parallel Data input	In
10	ACK (*)	Acknowledge Output	Out
11	BUSY	Busy	Out
12	PAPER END	Paper end	Out
13	SELECTED	Selected	Out
16	SG	Signal ground	-
17	FG	Frame ground	-
18	HIGH	High level	Out
19 → 30	SG	Signal ground	-
31	-	Not used	-
32	FAULT	Error	Out
33	SG	Signal ground	-

NOTE : - Other pins are put in NC (no contact) status.
- Asterix (*) indicates negative logic.

4. TROUBLESHOOTING.

When errors occurring during cutting or after powering on the machine, some LED code may appear on the LED bar to inform you about the kind of error.

In general 2 different types of error messages may occur :

4.1. Recoverable errors.

Recoverable errors can be recognized by some flashing LED's on the LED bar. Sometimes the machine continue to work while LED's are flashing. Sometimes it stops but continue again after correction of the error.

Recoverable errors are mostly related to communication problems or user mistakes.

4.1.1. RECOVERABLE SYSTEM ERRORS

ERROR CODE										
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
IMPOSSIBLE AUTO-ON-LINE RECOG (S02)		✸								
G. LANGUAGE NOT CORRESPONDING (S03)	✸	✸								
MEDIA DETECT ERROR (S05)	✸		✸							
ROLL MEDIA END (S06)		✸	✸							
CANNOT AUTO-CONNECT (S07)	✸	✸	✸							
AUTO CUT ERROR (S08)				✸						
CHANGE MEDIA (S28)			✸	✸	✸					
KANJI ROM SUM ERROR (S29)	✸		✸	✸	✸					

POSSIBLE CAUSE & SUGGESTED ACTION	
S02	Communication difficulties – Check cables.
S03	Select other graphics language. (Chapter 3 - Language Settings)
S05	Media detection impossible. Too much or too little light, incorrect pressure roll position.
S06	Load a new sheet or roll.
S07	Communication difficulties – Check cables.
S08	Error during auto-sheet-off sequence. Check media and auto-cut knife.
S28	Change or reload media.

4.1.2. COMMUNICATION ERRORS

Communication errors are caused by a problem in the communication between the cutter and the host computer. They can be caused by errors related to the communication conditions, errors due to a defective handshake or command format errors in the ESCAPE sequences.

ERROR CODE										
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
ERROR ON-LINE FRAME (C01)	✸					✸				
ERROR ON-LINE OVERRUN (C02)		✸				✸				
ERROR ON-LINE PARITY (C03)	✸	✸				✸				
ERROR BIAS VALUE (C04)			✸			✸				
ERROR SUM CHECK (C05)	✸		✸			✸				
ERROR DATA BLOCK (C06)		✸	✸			✸				
FEW PARAMETER ESC (C07)	✸	✸	✸			✸				
FEW PARAMETER ESC (C08)	✸			✸		✸				
COMMUNICATION BUSY (C09)		✸		✸		✸				
UNDEFINED ESC (C10)	✸	✸		✸		✸				
ILLEGAL ESC (C11)			✸	✸		✸				
ERROR VALUE ESC (C12)	✸		✸		✸	✸				
MANY PARAMETERS ESC (C13)		✸	✸	✸		✸				
COMMUNICATION ERROR (C14)	✸	✸	✸	✸		✸				
BUFFER OVERFLOW (C15)					✸	✸				

POSSIBLE CAUSE & SUGGESTED ACTION	
C01	A framing error occurred. Check the communication settings. Chapter 3.
C02	Overrun error. Check the communication settings. Chapter 3.
C03	Parity error. Check the communication settings. Chapter 3.
C04	Bias is less than EOB code. Check the communication settings. Chapter 3.
C05	Check-sum difference cutter vs. host. Check the communication settings. Chapter 3.
C06	Data between bias and EOB too large. Check the communication settings. Chapter 3.
C07	Not enough ESC-parameters. Check the communication settings. Chapter 3.
C08	Not enough ESC-parameters. Check the communication settings. Chapter 3.
C09	Change the computer program to prevent the cutter from returning double data.
C10	Undefined ESCAPE sequence. Check the ESCAPE command setup.
C11	Illegal character used for MH-GL ESC-sequence. Check the ESCAPE command setup.
C12	Illegal character in ESC-sequence parameter. Check the ESCAPE command setup.
C13	Too many ESC-sequence parameters. Check the ESCAPE command setup.
C14	Communication error. Restart the cutter.
C15	Buffer overflow. Restart the cutter.

4.1.3. LANGUAGE ERRORS

Language errors occur when command data entered from the host computer does not match the data format of the command mode currently activated on the cutter's side. The error can be caused by a difference in command type or by a syntax error.

ERROR CODE										
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
UNDEFINED XX (E01)	✸						✸			
ERROR PARAMETER (E02)		✸					✸			
ERROR VALUE (E03)	✸	✸					✸			
UNKNOWN CHAR (E05)	✸		✸				✸			
BUFFER OVERFLOW (E07)	✸	✸	✸				✸			

POSSIBLE CAUSE & SUGGESTED ACTION	
E01	Undefined MH-GL command. Verify computer and cutter language settings.
E02	Incorrect number of parameters was transmitted.
E03	Parameter out of range was transmitted. Verify computer and cutter language settings.
E05	Character unknown to MH-GL was sent. Verify computer and cutter language settings.
E07	Polygon and character buffer overflow. Verify computer and cutter language settings.

4.2. Unrecoverable errors.

Unrecoverable errors can be recognized when **all** LED's are flashing and the machine has stopped working. After pressing the [ENTER] key VERY SHORT (just touch it ones) the error code appears on the LED bar (NOT flashing).

To clear the error message, the machine needs to be powered **OFF** and **ON** again. (Wait ± 7 seconds between power OFF/ON).

Refer to the following chart for error code explanation :

4.2.1. Processor errors.

	ERROR CODE									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Error Code 0	X									
Watch dog time out		X								
Bus trap error	X	X								
Address trap error			X							
Illegal instruction (MC68020)	X		X							
Zero divide		X	X							
General processor failure	X	X	X							
EPROM check-sum error				X						
Interrupt failure			X	X						
1010 CPU failure		X	X			X				
1111 CPU failure	X	X	X			X				
DRAM error	X	X		X						
SRAM error		X		X						
Extended RAM error	X	X		X		X				
EEPROM error	X			X		X				
EEPROM error	X						X			

4.2.2. X – Y Servo errors.

	ERROR CODE									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
OUT of SYNC X	X		X	X						
OUT of SYNC Y		X	X	X						
X POSITION timeout	X	X	X	X						
Y POSITION timeout					X					
X Over current	X				X					
Y Over current		X			X					
X Encoder fail	X	X			X					
Y Encoder fail			X		X					
X Overload		X	X	X		X				
Y Overload	X	X	X	X		X				
Driver failure		X	X		X	X				
Encoder failure		X	X	X	X	X				

4.2.3. Cutting head errors.

	ERROR CODE									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
POSITION Timeout MC	X		X		X					
OVER CURRENT Moving Coil	X	X	X		X					
A/D failure Moving Coil	X	X		X	X					

4.2.4. Other errors.

	ERROR CODE									
	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
ILLEGAL Mainboard rev.	X	X	X		X	X				
ILLEGAL Mainboard TYPE				X	X	X				

4.3. Problem symptoms and suggested actions.

4.3.1. Processor errors.

PROBLEM SYMPTOM	POSSIBLE CAUSE	SUGGESTED ACTIONS
- Error code 0 - Watch dog timeout - Bus trap error - Address trap error - Illegal instruction (MC68020) - Zero divide - General processor failure - Interrupt failure - 1010 CPU failure - 1111 CPU failure - DRAM error - SRAM error	- Poor connection between main and terminal board. - Bad EPROM's - Bad EEPROM - Mainboard failure	- Check cable and connection - Check pins and position of EPROM and EEPROM. Reinstall EPROM and EEPROM. - Replace Mainboard
- EPROM checksum error	- EPROM data is changed	- Replace EPROM set
- EEPROM error	- EEPROM data is changed	- Perform INIT 1 - Perform INIT 2 - Replace EEPROM -
- Extended RAM error	- Poor extended RAM connection - Bad extended RAM -	- Check connection - Replace extended RAM

4.3.2. X- Y Servo errors.

PROBLEM SYMPTOM	POSSIBLE CAUSE	SUGGESTED ACTIONS
- OUT of SYNC X - OUT of SYNC Y - X position Timeout - Y position Timeout - X over current - Y over current - X overload - Y overload - X Encoder fail - Y Encoder fail - Encoder failure - Driver failure	- Defective motor / encoder - Loose drive pulley - Failure in drive circuit - Poor connection of motor/ encoder - Too much friction in X or Y axis	- Replace motor / encoder - Fix pulley or replace motor / encoder - Replace main PC board - Check cables and connections - Check X and Y movement

4.3.3. Cutting head errors.

PROBLEM SYMPTOM	POSSIBLE CAUSE	SUGGESTED ACTIONS
- Position Timeout Moving Coil (MC) - OVER CURRENT Moving Coil (MC) - A/D failure Moving Coil (MC)	- Nose piece of knife holder (XPC model) not fixed - Blade is too far out - Sheet off mechanism blocks UP/DOWN movement (Not on SC-550) - Head flex cable bad or poor connection - Bad cutting head - Failure in drive circuit -	- Check knife holder - Check blade depth - Check sheet off mechanism (Not in SC-550) - Check connections or replace head flex cable - Replace cutting head - Replace main PC board

4.3.4. Other errors.

PROBLEM SYMPTOM	POSSIBLE CAUSE	SUGGESTED ACTIONS
System is dead : - No movement - No LED's lighted	- Power failure - Defective Power supply (P/S) - Defective Mainboard	- Check power cord - Check wall outlet - Check fuse on P/S - Check LEDs on P/S - Replace P/S - Replace mainboard
Some LED's lighted but no movement of the motors and cutting head.	- Defective EPROM's - Defective EEPROM - Defective mainboard - Poor connection between main and terminal board	- Replace EPROM's - Replace EEPROM - Replace mainboard - Check cable connections
- Plotter powers on, head UP/DOWN initialises but no movement of motors.	- Transparent cover is not closed - Transparent cover switch defective	- Close the cover - Check or replace cover switch
Plotter does not shuffle media.	- Pressure roller lever is not DOWN - Bad lever sensor - Both media sensors are not covered - Media sensors dusty or bad	- Lower the lever - Check the lever sensor - Load media properly - Clean or replace media sensors
Illegal mainboard revision (LED code on LED bar)	- Mainboard version is not compatible	- Use correct mainboard
Wrong mainboard (LED code on LED bar)	- Mainboard from SC-550 is used in SC-series or vice versa	- Use correct mainboard

PROBLEM SYMPTOM	POSSIBLE CAUSE	SUGGESTED ACTIONS
Plotter has shuffled media but does not respond to data	- Plotter is OFF-line - Interface cable not connected or bad - Wrong plotter driver - Wrong interface parameters - Bad interface port	- Put plotter in ON-line - Check interface cable - Check plotter driver - Check interface parameters - Check port or replace main PC board
Plotter is responding to data, but error messages appear on the LED bar (See User's guide)	- Wrong interface parameters - Wrong cable configuration	- Check interface parameters (See User's Guide) - Check interface cable
Plotter is cutting but quality is not acceptable	- Blade worn or broken - Blade is not turning smooth - Offset is not correct - Blade is too far out - Cutting force is too high - Cutting mat worn - Wrong plotter driver - Play on cutting head - Drive belt tension not correct - X or Y motor defective	- Replace blade - Check or replace knife holder - Perform offset procedure (See User's Guide) - Adjust knife depth - Reduce cutting force - Replace cutting mat - Select correct plotter driver - Check or replace cutting head - Check or adjust belt tensions - Replace X or Y motor
Media tracking problems Media skews during cutting or loading..	- Media is not loaded straight in the machine - Grid rollers dirty - Grid rollers or pressure rollers worn - Speed or acceleration too high - Pressure roller pressure not correct - Media backing is very slippery (Teflon based)	- Load media as described in the User's Guide - Clean grid rollers - Replace grid rollers or pressure rollers - Decrease o Cutting speed o Pen/UP speed o Cutting acceleration o Pen/UP acceleration - Adjust pressure roller pressure - Change media type or decrease speed acceleration

5. SPECIALIZED DIAGNOSTICS.

5.1. Diagnostics overview.

Two different types of specialized diagnostics are available on the SC-series cutting plotter :

⇒ Diagnostics with normal SC-keyboard
⇒ Diagnostics with optional keyboard with LCD display. (Keyboard from XP-C cutting plotter).

The most important adjustments can be performed with the standard SC-series keyboard. However to take advantage of all the features of the complete diagnostics menu, an optional XP-C keyboard (Partnumber EY-6200-50010) is required.

Caution :

The specialized diagnostics built into the SC-series cutting plotters are designed only for maintenance purposes and may only be used by authorized MUTOH technicians. Entering the Diagnostics Menu's by non qualified people may result in damage of the machine.

5.1.1. Diagnostics with SC-keyboard.

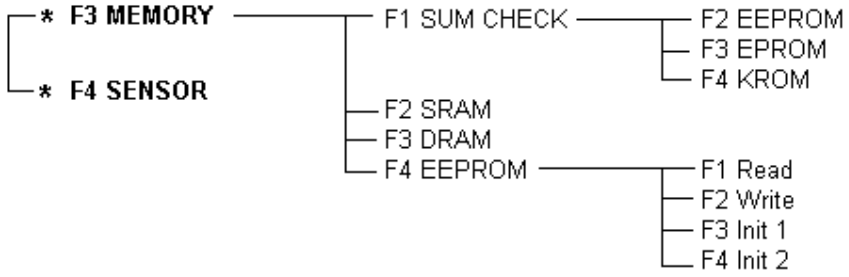
The following diagnostics are available with normal SC-keyboard :

- Initialising EEPROM
  - INIT 1
  - INIT 2
- Aging
  - X axis
  - Y axis
  - X & Y axes simultaneously
- Drawing for Quality check
- Measuring the CUTTING MAT height
- Adjusting the SHEET OFF system (Not on SC-550)
- Backup plot User parameters
- Backup plot Adjustment values

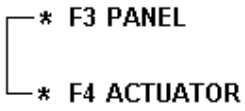
5.1.2. Diagnostics with optional LCD keyboard.

By using the optional keyboard with LCD, you can access all the existing diagnostics. Ten diagnostics pages as follows :

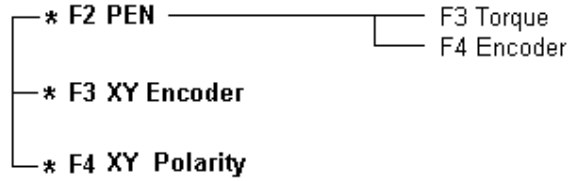
DIAGNOST 1



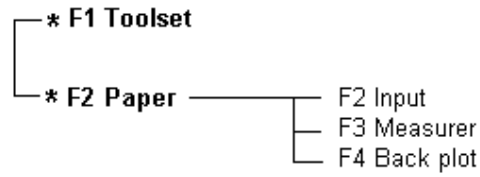
DIAGNOST 2



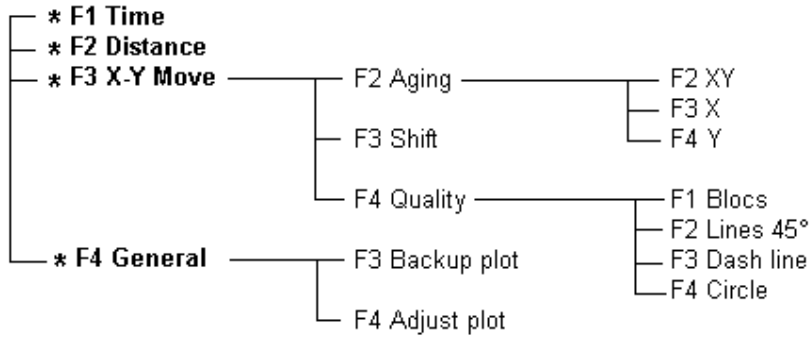
DIAGNOST 3



DIAGNOST 4



DIAGNOST 5



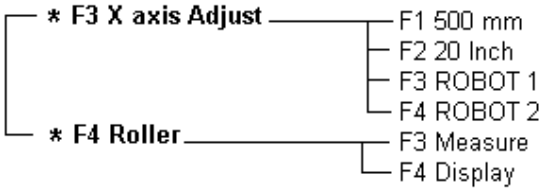
DIAGNOST 6

Reserved for future use.

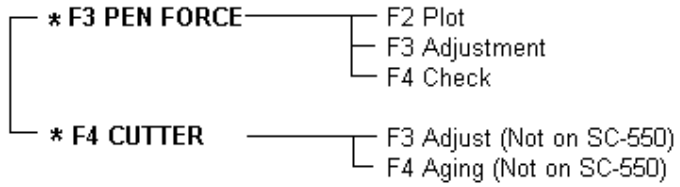
ADJUST 7

Reserved for future use.

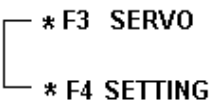
ADJUST 8



ADJUST 9



ADJUST 10



5.2. Diagnostics with SC-keyboard.

While pressing and holding the [MENU ↑], [VALUE ↓] and [VALUE ↑] keys simultaneously, turn the machine on.

Now all LED's, except the ONLINE MLED, are on.

If you have pressed a wrong key, or other LED's are on or off, switch off the machine and try again.

5.2.1. Initialising the EEPROM.

Caution :

Before initialising the EEPROM, perform the
- Backup plot with user parameters
- Backup plot with adjustment parameters

(Please refer to 5.2.6.Backup plots (on paper only))
This will give you a hard copy with all the current settings and adjustment values.

1) INIT 1 :

Caution :

INIT 1 initialises the USER PARAMETERS back to DEFAULT VALUES.

Step 1 : Power on the unit in diagnostics mode.

Step 2 : Press :
- ORIGIN until 10 % LED is on.
- [VALUE ↓], [VALUE ↑], [VALUE ↓], [VALUE ↑]

Step 3 : Power OFF.

2) INIT 2 :

Caution :

INIT 2 initialises all adjustment values back to DEFAULT VALUES.
After INIT 2 the unit needs to be RECALIBRATED, and this requires a LCD keyboard and can only be performed by MUTOH qualified people.
NEVER start this procedure unless you are sure it is really necessary and you have the tools to recalibrate the unit.

Step 4 : Power on the unit in diagnostics mode.

Step 5 : Press :
- ORIGIN until 10 % LED is on.
- [VALUE ↓], [VALUE ↑], [VALUE↑], [VALUE ↓]

Step 6 : Power OFF.

5.2.2. Aging.

This test makes the plotter continuously moving in the X-/Y- axis.
This test can be performed without media or with media loaded.

Step 1 : Power on the plotter in diagnostics mode.

Step 2 : Press the [ORIGIN] key until 50 % LED is on.

Step 3 : Press the [VALUE ↓] key. (Unit starts initialising, wait until finished)

Step 4 : Press [MENU ↑] key.

Step 5 : The [NEXT/+] or [LAST/-] key keys will determine what axis is to be aging.

- [MENU ↑] will continuous move the X and Y axis.
- [VALUE ↓] will continuous move the X axis only.
- VALUE ↑] will continuous move the Y axis only.

Note :

Press the [VALUE ↓] key to start / pause aging.
Press the [VALUE ↑] key to end aging and select another axis to be aged if desired.

Step 6 : Power OFF.

5.2.3. Drawings for quality check.

Step 1 : Power on the unit in Diagnostics mode.

Step 2 : Put a pen in the head and load some paper.

Step 3 : Press the [ORIGIN] key until 50% LED is on.

Step 4 : Press the [VALUE ↓] key (Unit starts initialising and loads medium if lever is down. Wait until finished)

Step 5 : Press the [VALUE ↑] key.

Step 6 : The next key will determine the kind of drawing to be made.

- [MENU ↓] for ZIG ZAG test
- [MENU ↑] for 45° test
- [VALUE ↓] for DASH LINE test
- [VALUE↑] for circles test

Now you have to position the tool (pen) on the desired place on the medium by using the JOG keys (arrow keys).

Note :

Press the [VALUE ↓] key to start / pause the test drawing.
Press the [VALUE ↑] key to end and select another drawing

Step 7 : When finished power off the machine.

5.2.4. Measuring the CUTTING MAT height.

Caution :

This adjustment routine requires a special tool!
DO NEVER start this routine without this tool.

Step 1 : Place TOOL JD-44140 (adjustment pen) in head.

Step 2 : Power on the unit in diagnostic mode. (No medium loaded)

Step 3 : Press the [ORIGIN] key until 80% LED is on.

Step 4 : Press the [VALUE ↑] key. (Unit starts initialising, wait until finished)

Step 5 : Press the [VALUE ↓] and [ENTER] key. (Unit starts measuring the cutting mat height on several places, wait until finished.)

Step 6 : Press the [ENTER] key. (The values are now stored in EEPROM)

Step 7 : Power off.

5.2.5. Adjusting the SHEET OFF system.

(NOT for SC-550)

Step 1 : Power on the unit in diagnostic mode (No medium loaded).

Step 2 : Press the [ORIGIN] key until 90% LED is on.

Step 3 : Press the [VALUE ↑] (Unit starts initialising, wait until finished).

Step 4 : Press the [VALUE ↓] and [ENTER] key.

The head moves to the left hand side and stops approximately 60 mm before the left hand side of the machine.

Open the transparent caver and move the head manually to the utmost left position. The correct position is that the head is at the left as much as possible but that the knife catch bracket is still free to move UP/DOWN. Check that the head can catch the bracket and hold it firmly.

Step 5 : With the cover still open (!!! IMPORTANT !!!), press the [ENTER] key twice. The value is stored now in the EEPROM.

Step 6 : After closing the cover, the head will move to the right.

Step 7 : Power off.

5.2.6. Backup plots (on paper only).

Step 1 : Power on the unit in diagnostic mode.

Step 2 : Press the [ORIGIN] key until 50% LED is on.

Step 3 : Put a pen in the head and load some paper (Min. A3 size).

Step 4 : Press the [VALUE ↑] key (Unit will start initialising, wait until finished).

Step 5 : Pres the [VALUE ↑] key.

Step 6 : The next key will determine the kind of plot.

- [VALUE ↓] selects USER PARAMETERS backup.
- [VALUE ↑] selects ADJUSTMENT VALUES backup.
- [VALUE ↓] (Unit will start plotting, wait until finished.)

Step 7 : When finished 1 of the 2 plots, you can change the sheet and select the other one without powering off the machine.

⇒ Press the [VALUE ↑] key
⇒ Select with the [VALUE ↓] and [VALUE ↑] key the desired plot.
⇒ Press the [VALUE ↓] key (Unit will start plotting, wait until finished).

Step 8 : Power off.

5.3. Diagnostics with optional LCD keyboard.

To have access to the complete range of specialised diagnostics, an optional keyboard
With LCD from the MUTOH XP-C series is required. The partnumber for the keyboard is EY-6200-50010.

To enter the specialised diagnostics mode, proceed as follows :

Step 1 : Open the PC-board box from the back of the machine. (On SC-550 remove the right cover.)

Step 2 : On the terminal board (board to the left in the box when you are behind the machine) you must plug in the optional keyboard in connector J513. (On SC-550 terminal board is board on top of mainboard.)

Step 3 : Depending on the type of keyboard, power ON the machine with the following buttons pressed simultaneously :

- New style keyboard : [PAGE] and [ORIGIN]
  (P/Nr : EY-6200-50100)

- Old style keyboard : 0 and Decimal (.) and Minus (-)
  (P/Nr : EY-5005-50100)

Step 4 : The following screen appears on the display :

```
** DIAGNOSTICS **
**       MODE       **
TYPE    :   SC - xxx
```

Step 5 : If you are planning to make a lot of tests and / or adjustments in the diagnostic mode, you can avoid above 'power on' procedure as follows :

- On the Main PC board (board in the middle), look for the DIP switches (in front of LED's) and put switch 1 in the ON position.

- Now the unit will always power on in diagnostic mode until you change switch 1 to the OFF position again.

5.3.1. Diagnost 1.

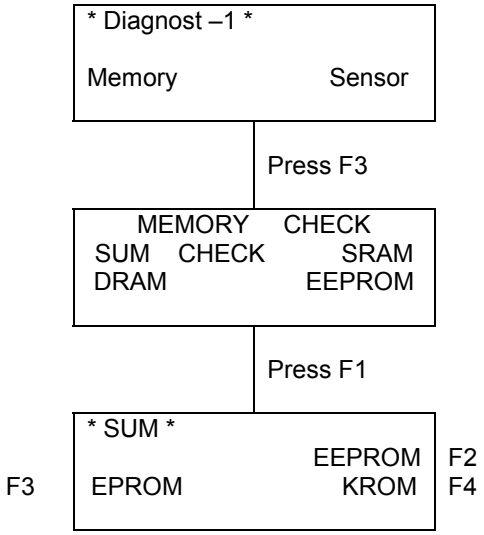
Caution :

Before running these diagnostics, be sure to perform the

- Backup plot user parameters (Please refer to 5.2.6. Backup plots)
- Backup plot adjustment values (Please refer to 5.2.6. Backup plots)

This will give you a hard copy of all the current settings and adjustment values.

1) Memory :

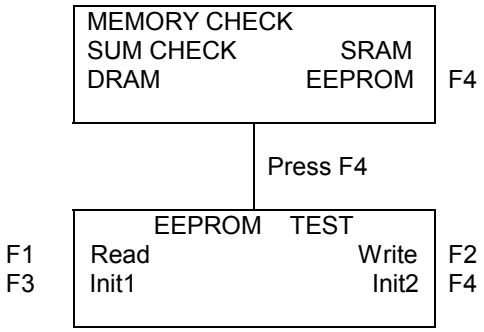


Press F2 : Checksum EEPROM (Version EEPROM)
Press F3 : Checksum EPROM set
Press F4 : Checksum KanjiROM

The Checksum and Version value of EEPROM is of no importance.

The Checksum of EPROM is related to the version. The calculated sum should be equal to the programmed one.
If this is not the case, EPROM set has to be replaced.

The STATIC RAM test (F2) and DYNAMIC RAM test (F3) are of no importance for maintenance and repair.



Read (F1) and Write (F2) are of no importance for maintenance and repair.

Init1 (F3) initialises all user parameters to default values.

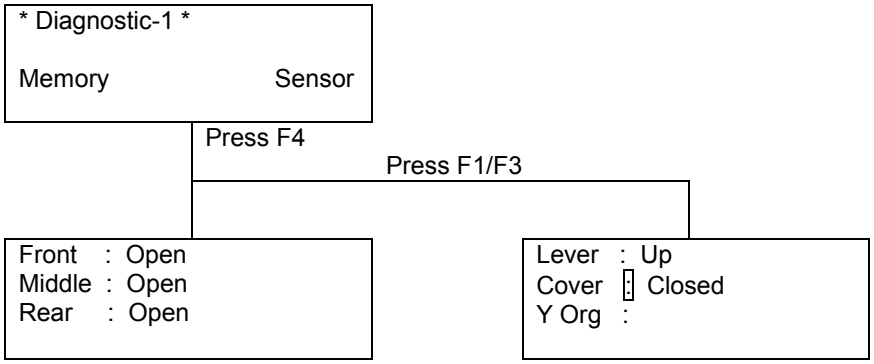
Init2 (F4) initialises all adjustment values to default values.

Caution :

After INIT, the following adjustments need to be performed

- X axis length adjustment (ADJ.08)
- Cutting Mat height adjustment (ADJ.-08)
- Pen force calibration (ADJ.-09)
- Sheet-off system adjustment (ADJ.09)
  (Not for SC-550)

2) Sensor



Sensors 'Front', Middle' and 'Rear' are paper sensors located on the plotter bed.

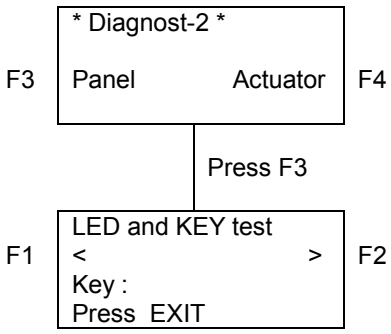
'Lever' sensor detects if pressure rollers are UP/DOWN.

'Cover' sensor detects if safety cover is OPEN/CLOSED.
(Not for SC-550)

'Y Org' sensor is the sensor on the back of the penhead that detects the position of the pressure rollers.

5.3.2. Diagnost. 2

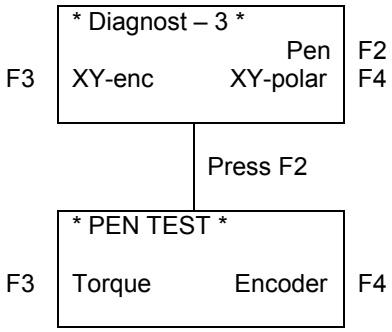
1) Panel test.



Pressing F1/F2 actuates the LED's on the SC-keypad and shows the corresponding position on the LCD.
Keys pressed on the SC-keypad are indicated on the LCD.

5.3.3. Diagnost. 3

1) Actuator.

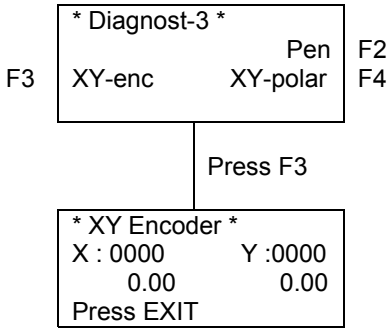


Test (F3) Torque tests the moving coil and drive circuit.

Pressing F2/F4 makes the MC move UP/DOWN step by step and puts more/less force on the head.

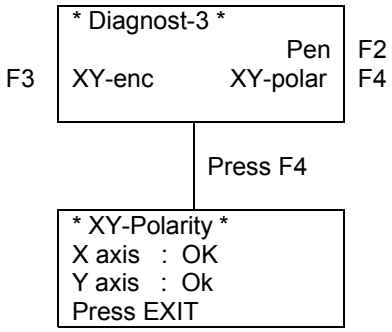
Test (F4) Encoder shows the readout of the penhead encoder. (Move the head manually up/down).

2) XY-encoder test.



This test shows the readout of the X/Y encoders when manually moving the head or the gridrollers.

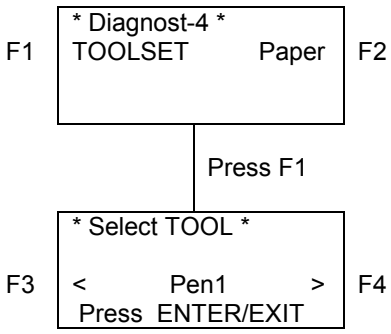
3) XY-polarity test



This test checks the drive circuit of X and Y motors. One current pulse is sent to the motors and the direction of the movement is checked by the encoders.

5.3.4. Diagnost. 4

1) Toolset



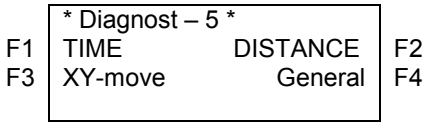
This diagnostic allows you to change from tool to pen or the reserve by pressing F3/F4.

2) Paper.

This test / adjustment is of no importance.

5.3.5. Diagnost. 5

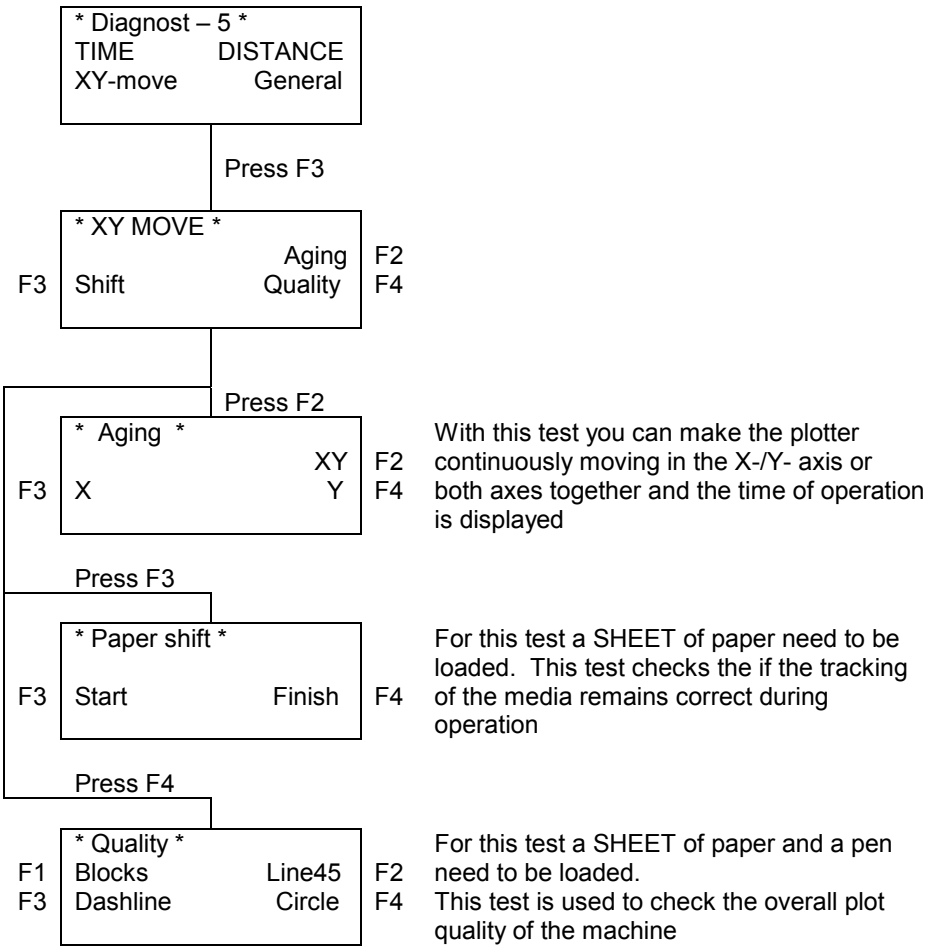
1) Time and Distance.



(F1) TIME displays the actual working time of the machine.

(F2) DISTANCE displays the actual distance that the machine has been cut.

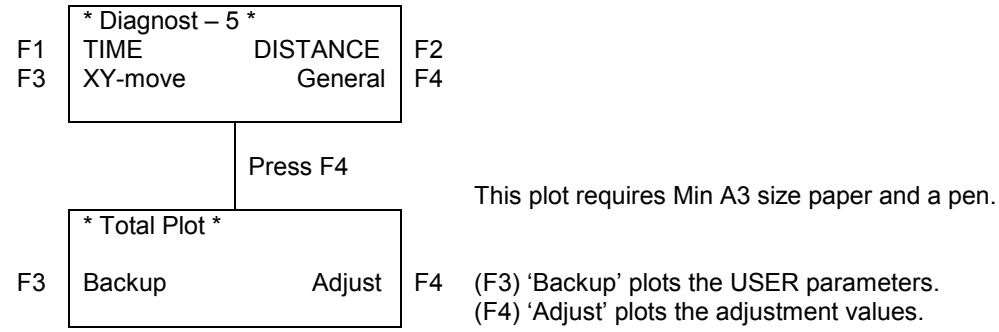
2) X-Y Move.



Before you press (F3) 'START', you have to position the pen to the desired place on the paper by using the jog keys.

Press (F1) to activate the ZIG ZAG test.
Press (F2) to activate the 45° test.
Press (F3) to activate the Dash line test.
Press (F4) to activate the Circles test.

3) General (Backup plots).



5.3.6. Diagnost. 6

Reserved for future use.

5.3.7. Adjust. 7

Reserved for future use.

5.3.8. Adjust. 8

1) X-axis Length Adjustment.

Caution :

The MUTOH SC-series plotters are calibrated before shipping from the factory. Do not perform this adjustment except when obviously worsens.
An accurate reference scale is required to perform this calibration.

```
     * Adjust – 08 *
F3   Xaxis adj        Roller   F4
```

Press F3

```
     Axis correction
F1   500mm            20inch   F2
F3   Robot1           Robot2   F4
```

The X-axis length calibration compensates tolerance on the GRID roller diameters causing incorrect length of the X-axis movement.

Press F1

```
     Axis      500mm
F3   Plot             Input    F4
```

Load a A1-size paper or a larger and a pen.
Select (F1) or (F2) depending if you want to calibrate metric or imperial.

Press (F3) Plot then (F3) start : The plotter will draw a square of 500mm (or 20 Inch).

Remove the paper from the machine and measure the length of the X-axis lines as accurate as possible.

Press (F4) Input : Now you can enter the real (measured) value.

F1/F3 selects the digit that you want to change.

F2/F4 changes the value.

Press ENTER to confirm.

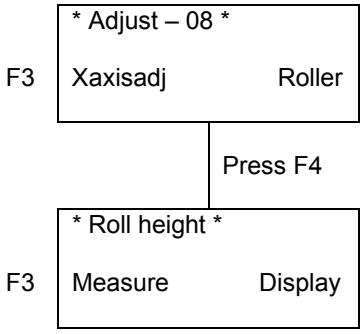
Press exit.

Caution :

You cannot check if the calibration is correct by internal test from the plotter.
Check the calibration by sending a file from the computer.
If you perform the 500mm (20Inch) square again, it will be plotted as before WITHOUT calibration.

2) Cutting mat height calibration (roller).

This test measures unevenness of the cutting mat on ± every 40 mm and stores this data in EEPROM. This data is used to compensate the pen height on this particular places.



Without paper loaded, put the Special Adjustment pen JD-41440 in the penholder.
Press (F4) Roller.
Press (F3) Measure.
Press ENTER to start the test.
The plotter starts to measure the cutting mat height on every ± 40mm.
Press ENTER to save data.

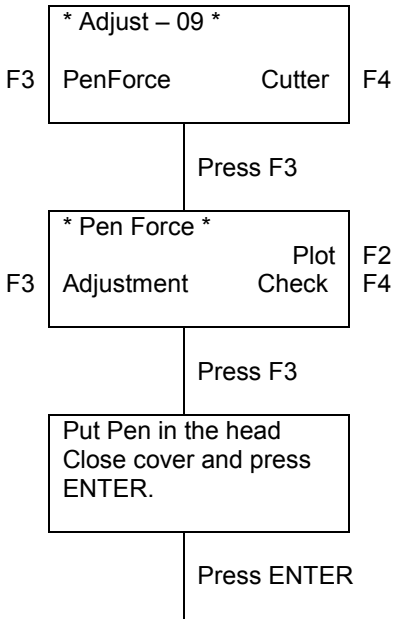
Note :

It is recommended to performed the cutting mat height calibration after replacement of the cutting mat.

(F4) Display is of no importance.

5.3.9. Adjust. 9

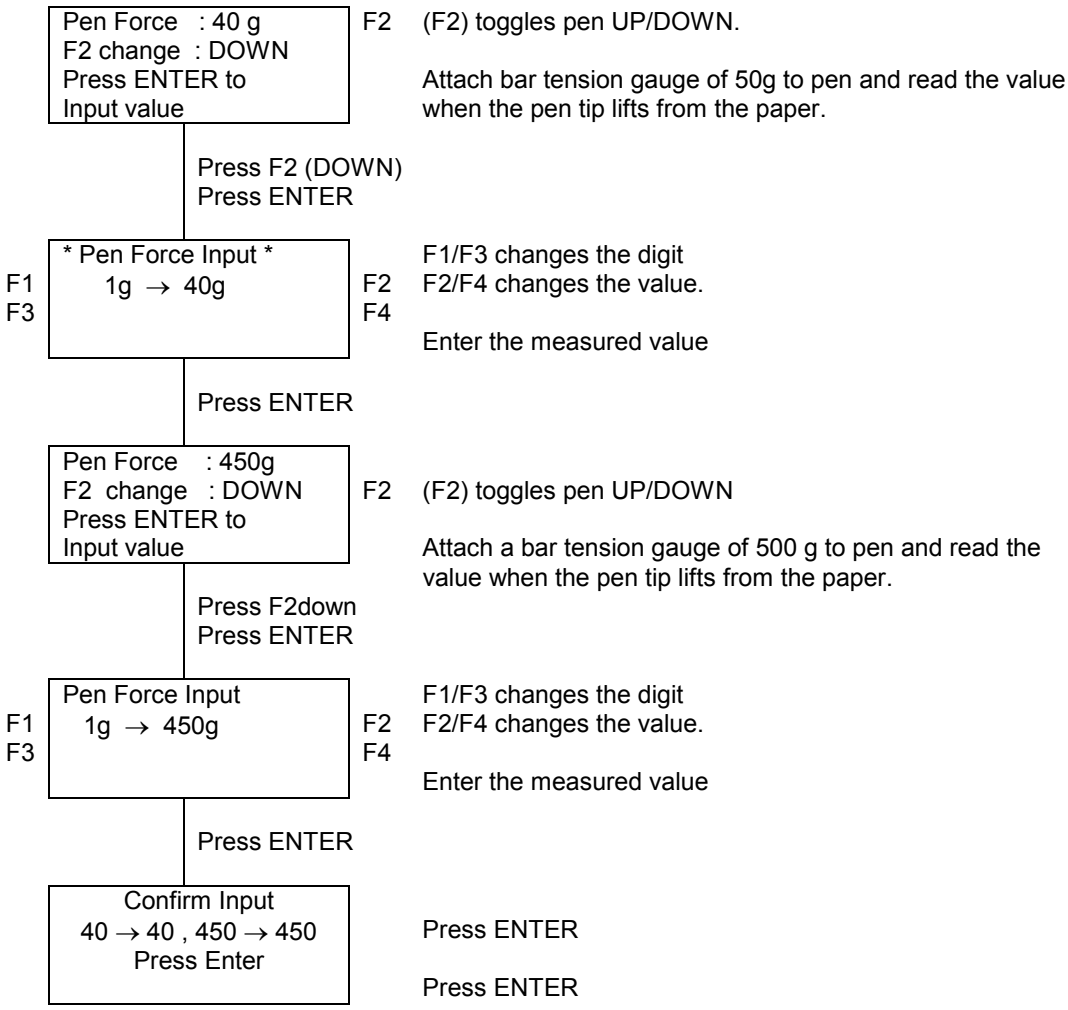
1) Pen force calibration.



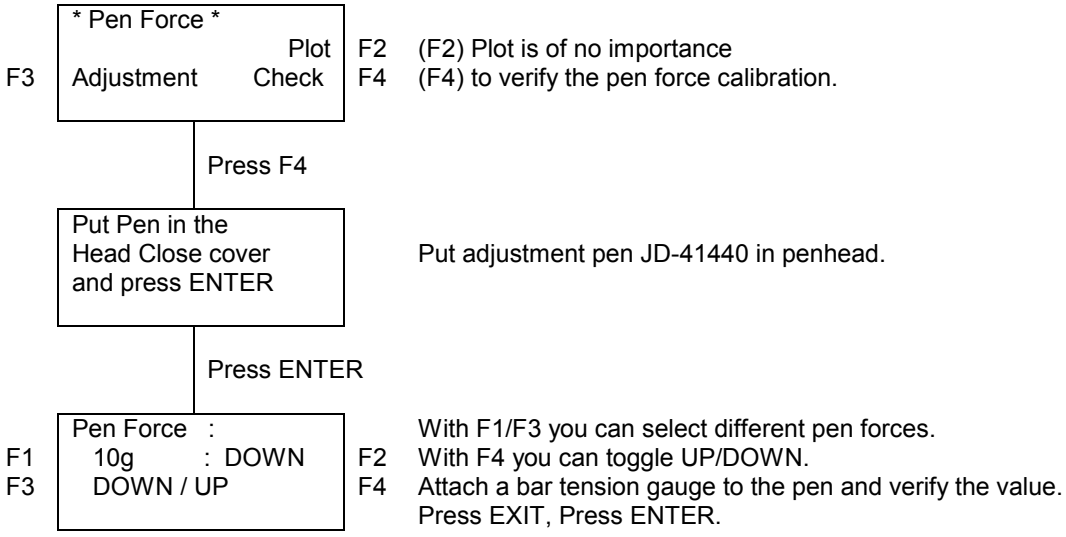
(F2) Plot is of no importance.

For Pen Force adjustment

Put Adjustment pen JD-41440 in penhead.



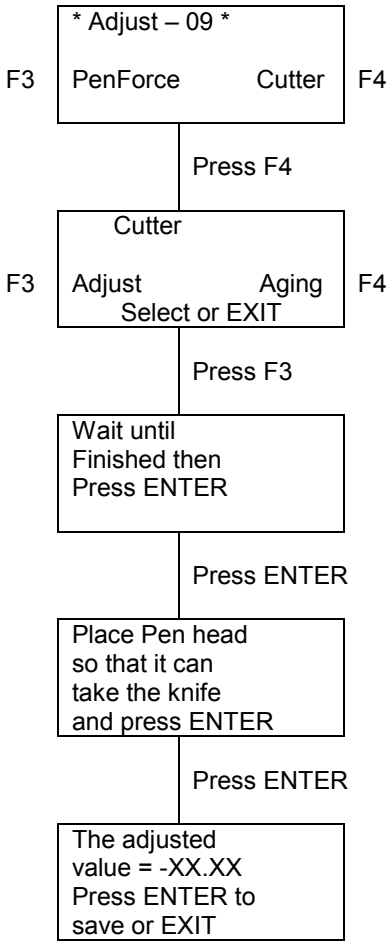
2) Pen force Verify.



3) CUTTER (Sheet – Off system).
(Not for SC-550)

A) Adjustment of the Sheet-Off system.

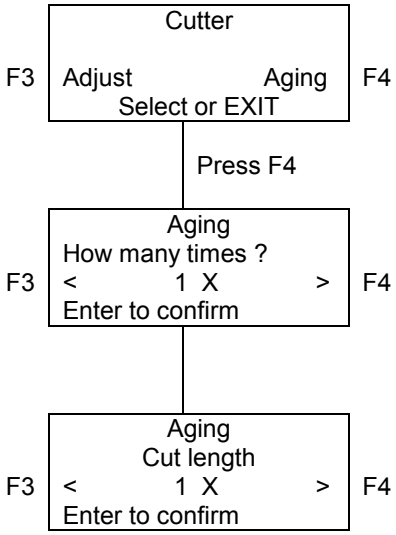
This calibration stores the position in the EEPROM where the penhead makes the knife catch bracket grabbing the sheet-off knife.



The head moves to the left hand side and stops approx. 60mm before the left side of the machine.
Open the transparent cover and move the head manually to the utmost left position.
The correct position is that the head is at the left as much as possible but that the knife catch bracket is still free to move UP/DOWN. Check that the head can catch the Bracket and can hold it firmly.
With the cover still open (VERY IMPORTANT) press ENTER and ENTER after closing the cover the head will travel to the right.

B) Cutter aging (Testing the Sheet – Off system).

This test makes the machine sheeting – off as many times as you have selected.



Load a sheet of vinyl.

With F3/F4 select how many times you want to sheet – off.

With F3/F4 select the length of the sheets.

Press ENTER.

5.3.10. Adjust. 10

Not used for maintenance and repair.

6. PARTS REPLACEMENT AND ADJUSTMENT.

6.1. Maintenance access table for parts replacement.

Removal of the following cover gives access to the following part or mechanical adjustment :

COVER	Gives access to
Transparent Cover (Not on SC-550)	Cutting head Auto sheet-off system (Not on SC-550) Pressure rollers Cutting mat
Left cover	Y-axis return pulley assy Y-axis drive belt tension adjustment Power supply board (SC-550 only)
Right cover	Y-motor Y-drive pulley assy Y-drive belt (short) tension adjustment Pressure roller UP/DOWN sensor Pressure roller UP/DOWN mechanism Keyboard assy X-drive belt Main/driver board (SC-550 only) EPROM set (SC-550 only) EEPROM (SC-550 only) Terminal board (SC-550 only)
Y-rail cover	Pressure roller assy Acrylic cover switch (Not on SC-550) Y-rail assy Penhead flex cable assy Pressure roller pressure adjustment
PCB-box (Not on SC-550) X-motor cover (SC-550 only)	Main/driver board assy EPROM set EEPROM Power supply board assy Terminal board assy X-motor assy X-drive belt tension adjustment Fan motor
Grid cover	Grid rollers Paper sensors

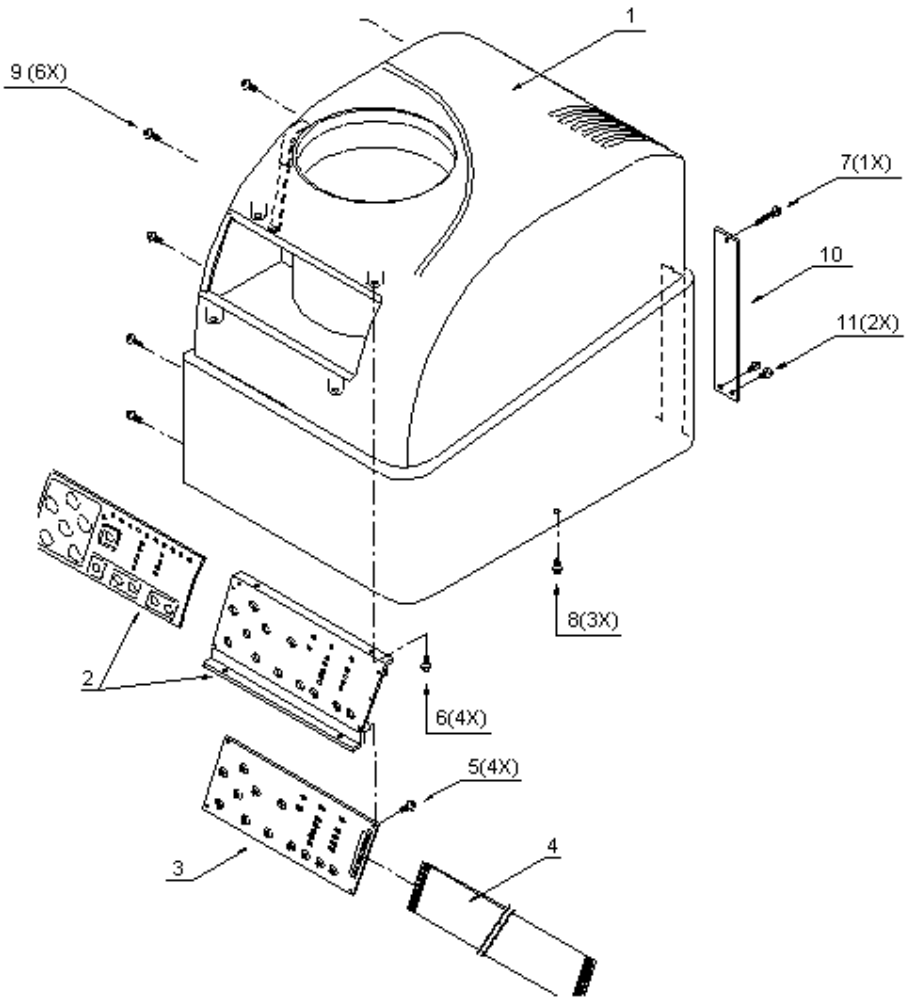
6.2. Mechanical parts.

6.2.1. Covers Left and Right : removal and installation.

Step 1 : Remove screw 9 (6X) (Please refer to the figure mentioned below).

Step 2 : Remove screw 8 (3X) (please refer to the picture mentioned below) and screw 7 (1X) (Cover right only) and remove the cover.

Step 3 : (Cover right only)
Be careful with the flat cable. If the cover need to be removed completely, pull the flat cable out of the connector on the side of the keyboard PC board. (Please refer to nr 3 and 4 in the picture mentioned below.)



Note :

To reinstall covers left and right perform above steps in reversed order.

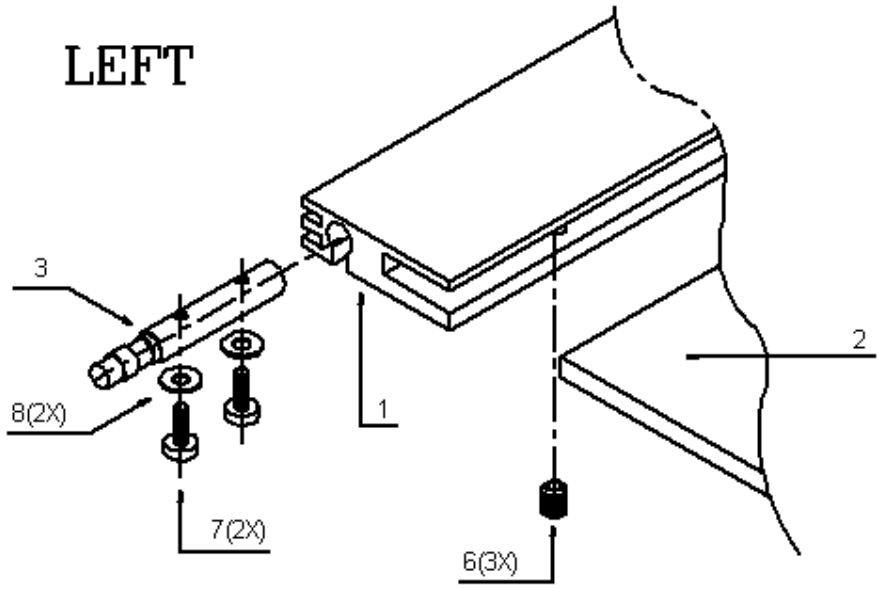
6.2.2. Transparent cover : Removal and installation.

Note :

Transparent cover does not exist on SC-550.

Step 1 : Open the transparent cover assy.

Step 2 : On the left side of the cover unscrew screws 7 (2) one (1) turn and slide the shaft 3 inside the rail while holding the cover. (Please refer to picture mentioned below.)



Step 3 : Remove the cover and fix the 2 screws temporary to avoid falling out of the rail.

Note :

To reinstall the transparent cover perform above steps in reversed order.

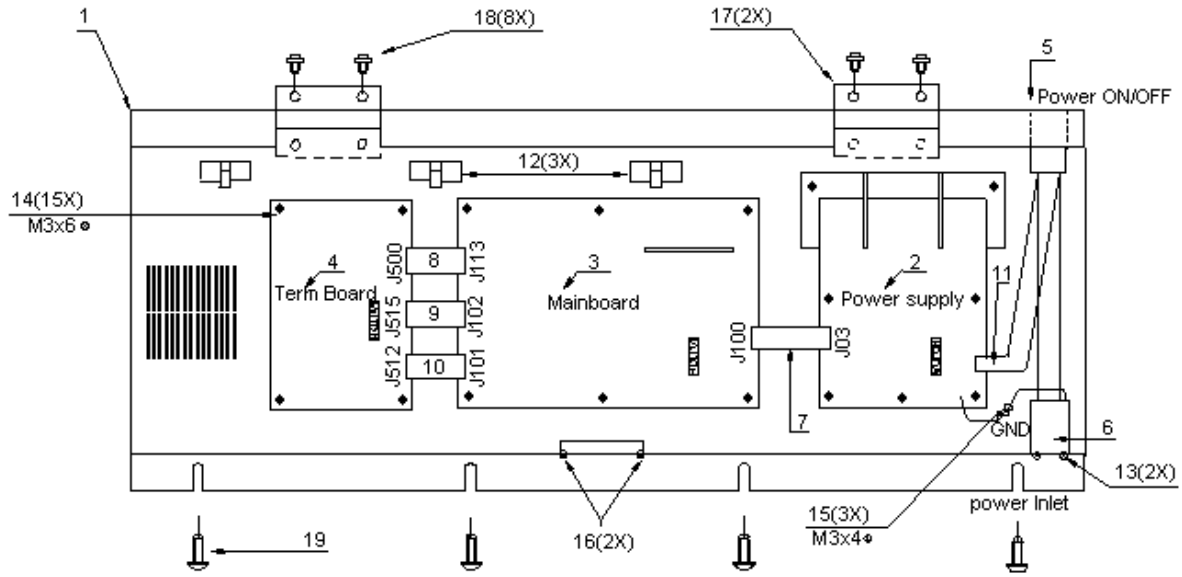
6.2.3. PCB box :open and close.

Note :

PCB box does not exist on SC-550.

Step 1 : If the unit is on a stand skip to step 2.
If the unit is on a table remove the pressure roller (UP/DOWN knob first with one screw.
Turn the unit with the front side on the table.
It is recommended to put some soft material (foam, cloth) on the table first to avoid scratches on the machine or the table.

Step 2 : On the back of the machine remove screws #19 (Please refer to the picture mentioned below.) while holding the PCB box.



Step 3 : Turn open the PCB box gently and be careful not to harm any cables or wires.

Note :

Close the PCB box by performing the above steps in reversed order.

6.2.4. Y-rail cover : Removal and installation.

Step 1 : Remove the transparent cover (Please refer to 6.2.2. Transparent cover).

Step 2 : Remove 2 screws on top of the cover and 2 screws at the back.

Step 3 : Remove the Y-rail cover.

Note :

To reinstall the Y-rail cover perform above steps in reversed order.

6.2.5. Grid cover : Removal and installation.

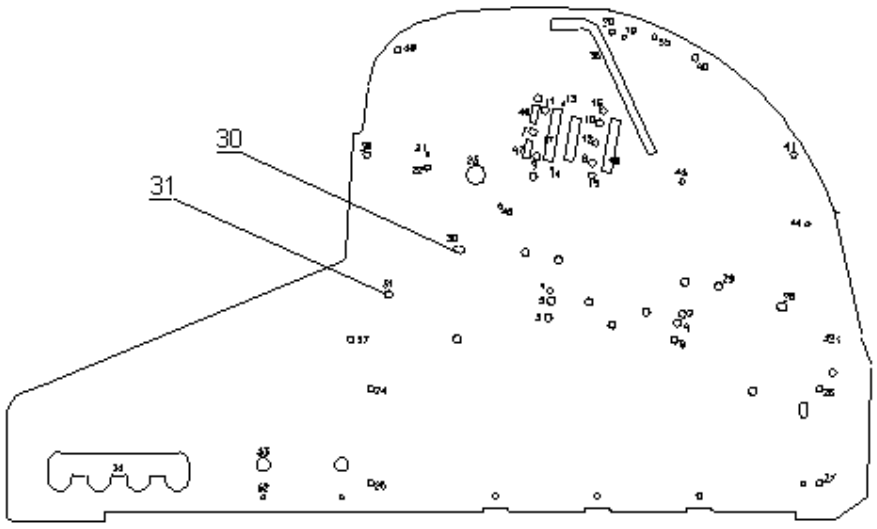
Step 1 : Remove covers left and right (Please refer to 6.2.1. Covers left and right).

Step 2 : Remove the transparent cover (Please refer to 6.2.2. Transparent cover).

Step 3 : Remove the Y-rail cover (Please refer to 6.2.4.Y-rail cover).

Step 4 : Open the PCB box (Please refer to 6.2.3. PCB box).

Step 5 : Remove the rear paper guide with 4 screws. 2 screws on each side of the machine (Please refer to #30 and #31 on the picture mentioned below). Lift the platen a little and pull it straight out between the side plates.



Step 6 : Remove the small hexagon screws that fix the gridcover.
Use L-shaped hex-key of 1.27 / 1/20".
Push the gridcover about 3mm to the back, lift the cover and remove it to the rear side of the machine.

Note :

To reinstall the grid cover perform above steps in reversed order.

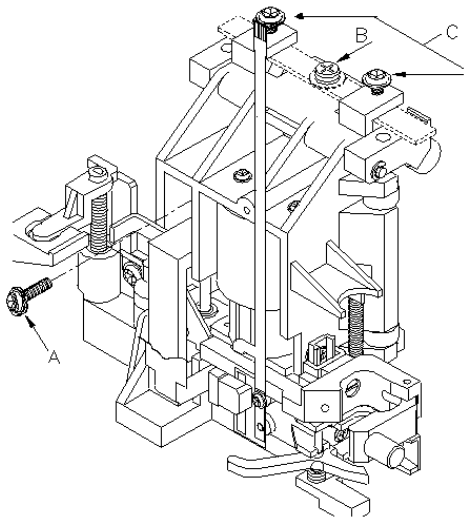
6.2.6. Cutting head : Removal and installation.

Step 1 : Remove the transparent cover (Please refer to 6.2.2. transparent cover).

Step 2 : Remove the Y-rail cover (Please refer to 6.2.4. Y-rail cover).

Step 3 : Remove the head cover by removing the screw in the middle of the cover and unscrew the bottom screw a few turns.
The head cover can be removed by sliding upwards.

Step 4 : Open the 2 white connectors by sliding them to the front and pull away the 2 flex cables from the connectors.
Remove the head PCB on top of the head by 2 screws 'C' (Please refer to picture mentioned below) and lay it somewhere on the Y-rail where the flex cable cannot be damaged.



Step 5 : Remove the 'A' that fix the cutting head to the drive belt.
It is strongly recommended to use a magnetised –screwdriver in order not to drop the screw inside the head.

Step 6 : Remove the screw 'B' on the top of the head and slide away the blade spring.

Step 7 : Move the head manually to the utmost right position, turn over the top rollers to the front, lower the head a little and remove it in the front direction.

Caution :

It is really important to move the head to the utmost right position as on another position it is impossible to remove the head from the Y-rail.

Note :

To reinstall the cutting head perform above steps in reversed order.

Caution :

After replacement of the cutting head the following electronically adjustments have to be performed :

- Cutting mat height measurement (Please refer to 5. Diagnostic menu with SC-board or with optional LCD keyboard).
- Adjusting the sheeting off system (Please refer to 5. Diagnostic menu with SC-keyboard or with optional LCD keyboard) (Not for SC-550)
- Pen force calibration (Please refer to 5.3. Diagnostic menu with optional LCD keyboard).

6.2.7. Grid rollers : removal and installation.

Step 1 : Remove the grid cover (Please refer to 6.2.5. Grid cover).

Step 2 : Unscrew the two screws from the X-motor a few turns and remove the X-drive belt.

Step 3 : Unscrew all the grid rollers (with 1.5mm hex-key) and pull out gently the shaft out of the machine. In this way every grid roller can be removed from the shaft.

Caution :

- Never replace only one grid roller but always the whole set. Replacement of only one grid roller may result in noticeable deviation of media tracking!
- Before unscrewing the grid rollers, mark the position of every roller on the shaft. This will simplify the reinstallation.
- NEVER unscrew or change the position of the bearing blocks on the X-rail as this will result in misalignment of the grid roller shaft!

Note :

To reinstall the grid rollers perform above steps in reversed order.

Caution :

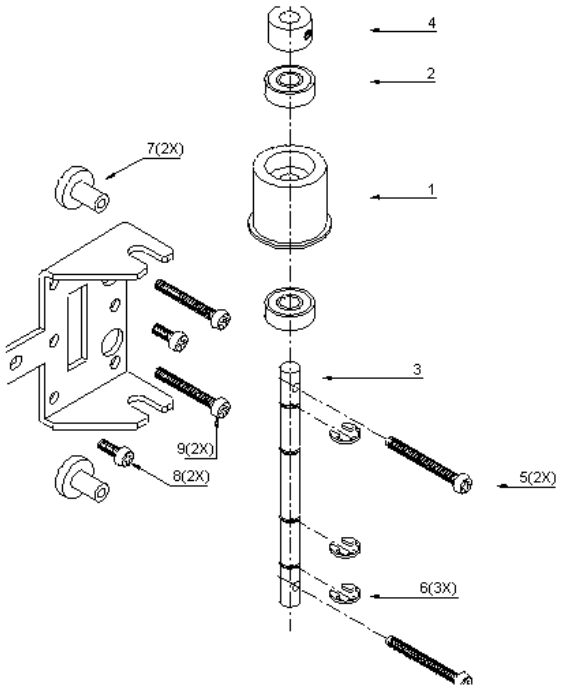
After reinstallation of the grid rollers, the X-drive belt tension should be adjusted (lease refer to the adjustment of the X-drive belt).

6.2.8. Y-drive belt (long) : removal and installation.

Step 1 : Remove the cutting head (Please refer to 6.2.6. Cutting head).

Step 2 : Remove covers left and right (Please refer to 6.2.1. Covers left and right).

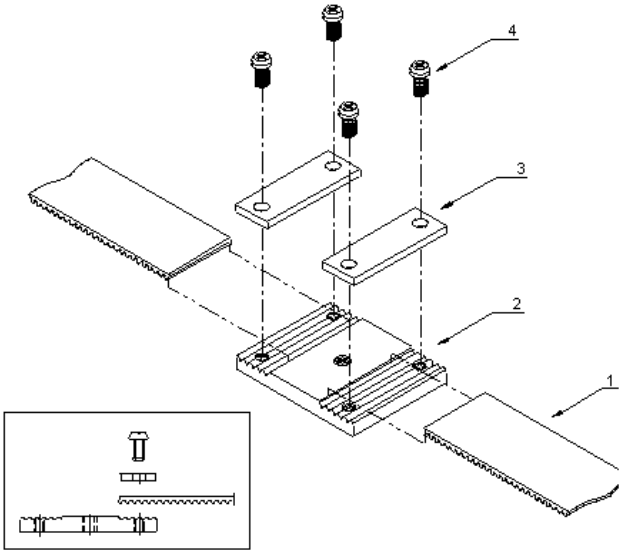
Step 3 : On the left hand side of the machine, unscrew both screws #5 (2) ± 5 turns in order to get the tension of the belt (Please refer to picture mentioned below).



Step 4 : Remove two screws #4 and one plate #3 from the belt connection assy and pull the belt complete out of the Y-rail.

1) Y-drive belt (long) : Installation and adjustment.

Step 1 : Hold the belt in front of the machine and push one end trough the slit of the right side plate. Turn the belt around the pulley and push it in the second slit to enter the at the back of the Y-rail.
Turn the belt around the pulley and push it in the second slit to enter the at the back of the Y-rail.
Push it as far as it goes and then use a flash light and look into the slit at the left side of the machine.
With a pair of tweezers try to grab the belt and pull it through the slit.
Turn the belt around the return pulley and push it through the front slit to arrive at the starting point of the belt again.



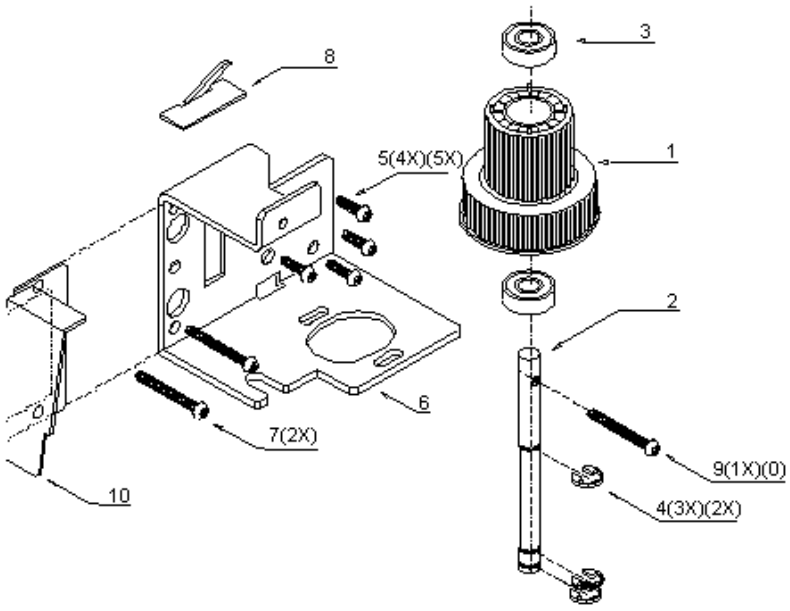
Step 2 : Close the belt with the connection plate assy and be sure that all the teeth of the connection plate are used to hold the belt.

Step 3 : Turn the 2 screws on the return pulley an equal amount of turns in CW (Clockwise) in order to get a little tension on the belt.

Step 4 : Install the cutting head (Please refer to 6.2.6. Cutting head).

Step 5 : Move the head manually from the left to the right and look for the tracking of the belt on the return pulley.
If the belt moves upwards, turn the top screw CW or the bottom screw CCW (counter-clockwise).
If the belt moves downwards, turn the top screw CCW or the bottom screw CW.
The target is that the tension of the belt stays stable at the surface of the return pulley on the complete range of the cutting head.

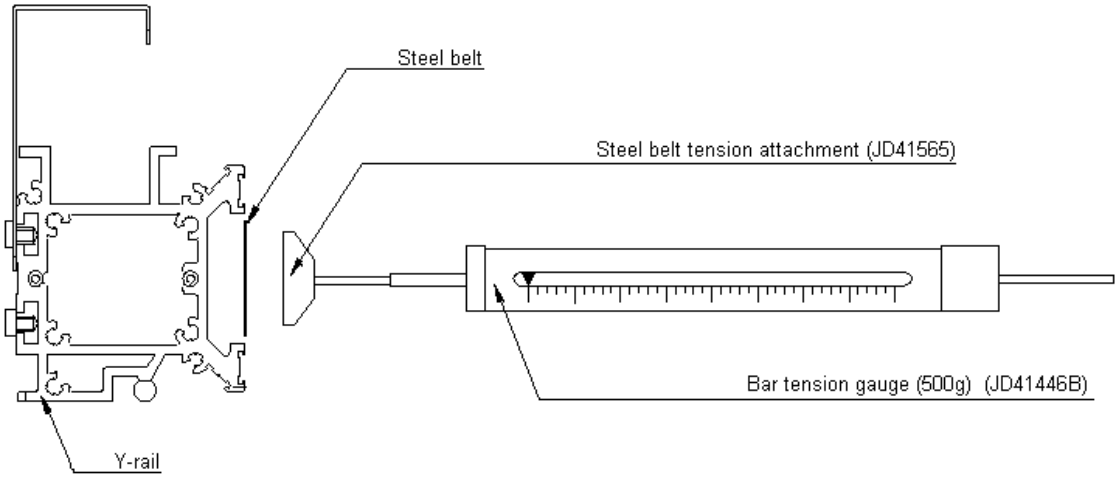
Step 6 : Similar to step 5 check the track of the belt on the drive pulley.
If the belt moves upwards turn the screw 9 (Please refer to the picture mentioned below) CW.
If the belt moves downward turn screw 9 CCW.



Caution :

Pay attention to the tension on the belt during this alignment.
The tension should stay between acceptable values (Please refer to step 7).

Step 7 : Move the head to the right end of the Y-rail and measure with a bar tension gauge (range : 500g, MUTOH Part# JD-41446B) the tension of the belt in the middle of the Y-rail (Please refer to picture mentioned below).
Push the belt with the bar tension gauge (with steel belt tension attachment MUTOH part# JD-41565) to touch the rail and release gently the pressure on the gauge.
The movement that the belt starts to release from the rail is the moment of reading the value on the bar tension gauge.



The values are different for each size machine :

SC-550	**SC-650**	**SC-750**	**SC-1000**	**SC-1300**
205 ± 5 g	205 ± 5 g	180 ± 5 g	150 ± 5 g	125 ± 5 g

The tension can be adjusted by turning the screws on the return pulley CW for more tension and CCW for less tension.

Caution :

While adjusting the tension, keep on checking the track of the belt on the return pulley (Please refer to step 5).

6.2.9. Pressure roller pressure adjustment.

Step 1 : Switch off the machine and place the pressure rollers on top of a grid roller.

Step 2 : Remove the transparent cover (Please refer to 6.2.2. Transparent cover).

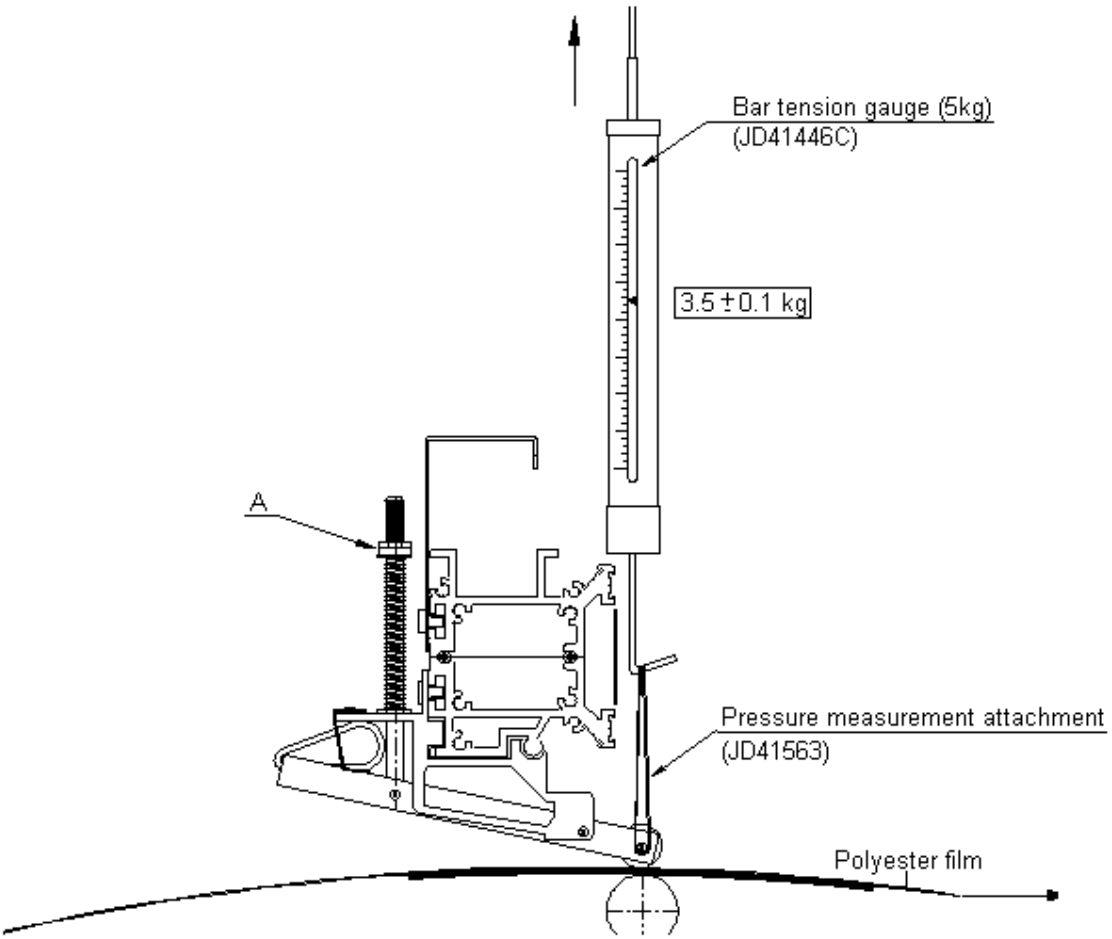
Step 3 : Remove the Y-rail cover (Please refer to 6.2.4. Y-rail cover).

Step 4 : Take a piece of polyester film of ± 300 cm long, 2.5 mm wide (12" X 1") and put it between the grid roller and the pressure roller (Please refer to the picture mentioned below).

Attach the bar tension gauge (range 5 kg, MUTOH Part# JD-41446C) to the pressure roller shaft with a piece of rope or with the pressure measurement attachment JD-41563 and pull simultaneously the film and the tension gauge under 90° angle.
The moment that the film is slipping between the rollers, is the moment to read the value on the tension gage.

The value should be 3.5 kg ± 0.1 kg.

To adjust the pressure, change the spring tension by turning the nuts A (Please refer to the figure mentioned below) CW to increase or CCW to decrease the pressure on the rollers.



6.2.10. Sheeting off mechanism : mechanical alignment.

(Not for SC-550)

Note :

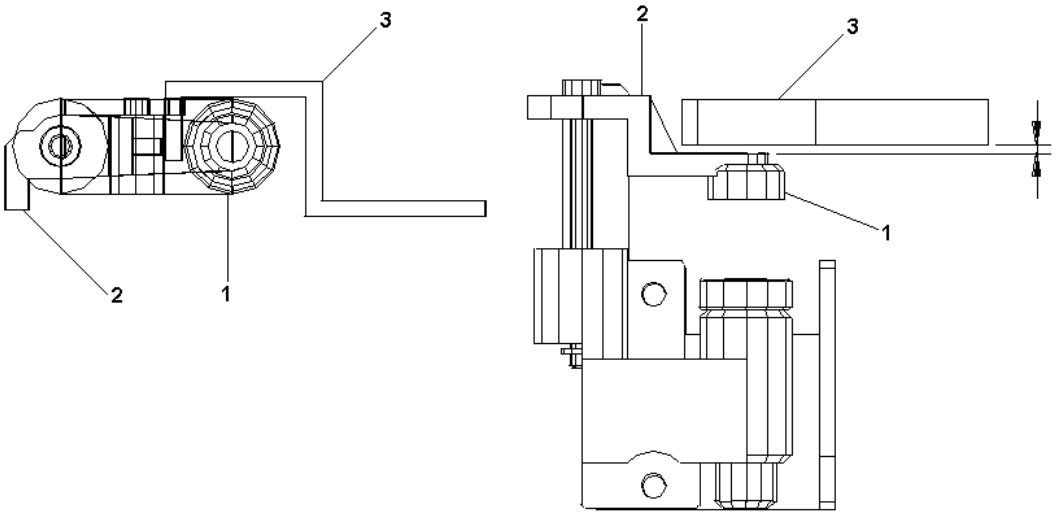
It is recommended to check the mechanical alignment of the sheeting off mechanism before running the electronic adjustment procedure.

Step 1 : Make sure the machine is powered off.

Step 2 : Open the transparent cover and remove the head cover.

Step 3 : Check if lever #2 (Please refer to picture mentioned below) can move freely up/down and front/backwards. The lever should return always to the Up position and to the backwards position by the spring tension.
Also check if the blade moves up and down freely and returns in the up position by the spring tension.

Step 4 : With your right hand move the tool holder to the most up position, with your left hand push the lever (#2) inside and check the clearance between bracket #3 and lever "2. (Please refer to the picture mentioned below)
This distance should be 1 mm –0.5 mm.
If this is not the case, use a small pair of pliers and bend the bracket #3 until the correct clearance is obtained.



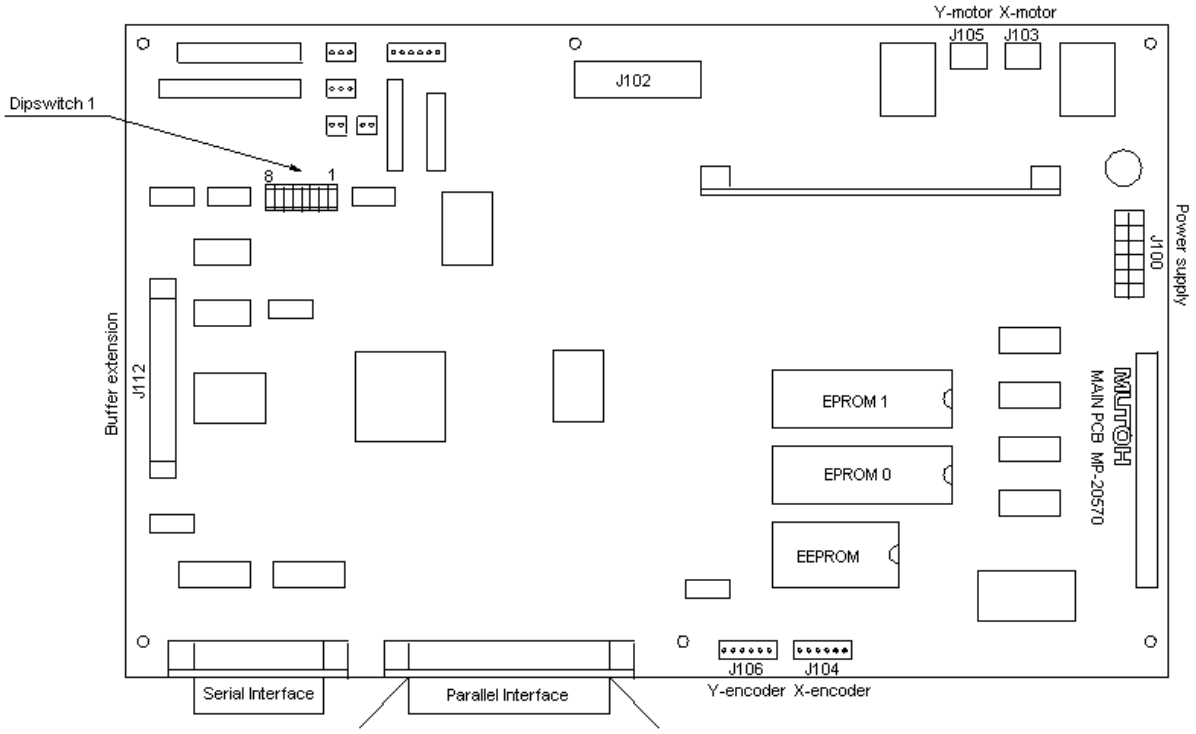
Step 5 : Install the head cover and make the electronic alignment in diagnostic mode.

6.3. Electronical parts.

6.3.1. Main PC board : Removal and installation.

Note :

This procedure is valid for all SC-series except for SC-550. For the Main PC board SC-550, please refer to 6.3.2.



Step 1 : Open the PCB box (Please refer to 6.2.3. PCB box).

Step 2 : Unplug all the connectors, remove all screws from the board and remove the board. Do not forget to remove the screws from the parallel and serial communication connector.

Note :

Pay attention to the position of all connectors and the proper place of all the cables. This will simplify the installation.

To reinstall the Main PC board perform above steps in reversed order.

Warning :

Check the DIP Switch settings on the board.
The position of the DIP switches determines the type of machine where the board will be used in. (Please refer to 6.3.3. Dip Switch settings on Main PC board)

6.3.2. Main and terminal PCB SC-550 : Removal and installation.

Step 1 : Remove the right side cover (Please refer to 6.2.1. Right and left cover).

Step 2 : Remove all the cables connected to the Terminal board.

Note :

Pay attention to the position of all connectors and the proper place of all the cables.
This will simplify the installation.

Step 3 : Remove the Terminal board assy (including fixing brackets) by removing the 4 screws on the side of the PCB box.

Step 4 : Remove all cable connected to the Main PC board.

Step 5 : Remove the power switch (just press it to the outside, no need to disconnect the wires).
Remove the power inlet connector with 2 screws on the back. (No need to disconnect the wires).

Step 6 : Remove the screws from the board and from the communication connectors (also remove the 2 clips from the centronics connector) and take out the board.

Note :

To reinstall the Main PC board perform above steps in reversed order.

Warning :

Check the DIP switch setting on the board.
The position of the DIP switches determines the type of machine where the board will be used in. (Please refer to 6.3.3. Dip Switch settings on Main PC board)

6.3.3. Dip switch settings on Main PC board.

MODEL	POS	8	7	6	5	4	3	2	1
SC-550	OFF	*	*	*	*	*	*	*	*
	ON								
SC-650	OFF	*	*	*	*	*	*	*	*
	ON								
SC-750	OFF	*	*		*	*	*	*	*
	ON			*					
SC-1000	OFF	*		*	*	*	*	*	*
	ON		*						
SC-1300	OFF	*			*	*	*	*	*
	ON		*	*					

Warning :

The main PC board for SC-550 looks similar to the other ones, but can not be used in other SC-series. (and vice versa)

The boards are labelled were they not can be used.

Warning :

After Main PC board replacement put the EEPROM (U3) from the initial board in the new one. In this way no other adjustments or user parameters have to be reinstalled.

If for one or other reason the EEPROM (U3) need to be replaced, the following data must be checked and if necessary readjusted. (Please refer to 3.1.1. RS-232C Pin configuration.)

6.3.4. EEPROM initialisation and replacement.

Note :

For EEPROM initialisation see 'Diagnostics with optional LCD keyboard' Diagnostic 1, memory, EEPROM.

After initialisation or replacement of the EEPROM the following data may be changed and need to be reinstalled.

⇒ **INIT 1 =** Settings in normal operation mode = USER parameters such as :

- Speed
- Acceleration
- Force
- Offset
- Shuffle length
- Tool selection
- Page mode
- Replot factor
- Smoothing
- Communication parameters
- Command set (language)

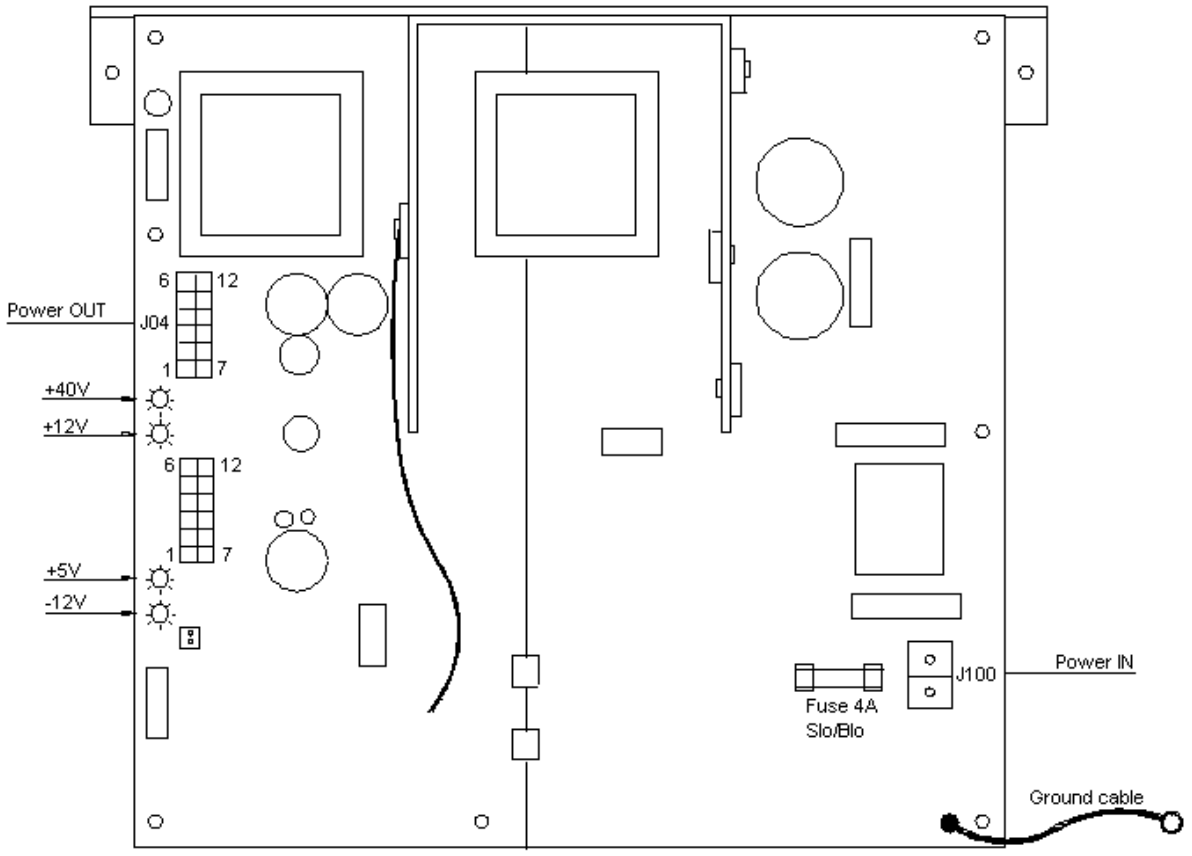
⇒ **INIT 2 =** Adjustments in Diagnostic mode.

- X axis length adjustment
- Cutting mat height measurement
- Knife force calibration
- Sheet-off system adjustment (Not for SC-550)

6.3.5. Power supply board : removal and installation.

Note :

This procedure is valid for all SC-series except for SC-550. For the SC-550, please refer to 6.3.6. Power supply board SC-550.



Step 1 : Open the PCB box (Please refer to 6.2.3.PCB box).

Step 2 : Remove the connectors and the screw from the grounding wire and remove the board.

Note :

To reinstall the board perform above steps in reversed order.

6.3.6. Power supply board SC-550 : removal and installation.

Step 1 : Remove the left cover (Please refer to 6.2.1. Covers left and right).

Step 2 : Unplug the 2 cables from the power supply board.

Step 3 : Remove the 4 screws (2 on both sides) and lift the power supply with the metal brackets out of the left bottom cover.

Step 4 : Remove the 2 metal brackets from the power supply board.

Note :

To reinstall the power supply board perform above steps in reversed order.

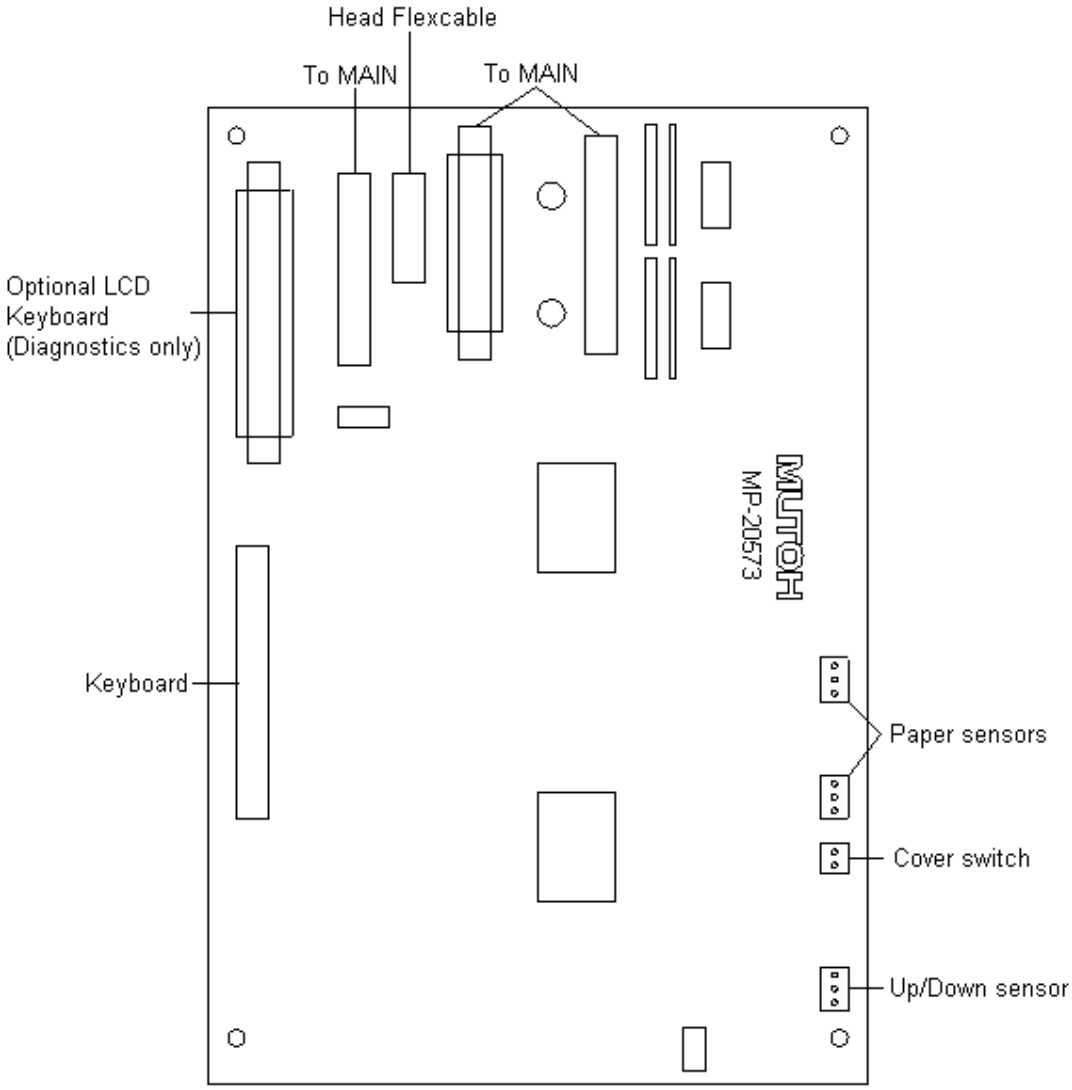
6.3.7. Power supply output connections.

PIN	SIGNAL	COLOUR	PIN	SIGNAL	COLOUR
1	+ 5V	Red	7	FG	Green
2	+ 5V	Red	8	- 12V	Blue
3	SG	Black	9	AG	Black
4	SG	Black	10	+ 12Vb	Orange
5	+ 12Va	Orange	11	PG1	Black
6	+ 40V	Yellow	12	PG2	Black

6.3.8. Terminal Board : removal and installation.

Note :

This procedure is valid for all SC-series except for SC-550. For SC-550 please refer to 6.3.2. Main and terminal PCB SC-550.



Step 1 : Open the PCB box (Please refer to 6.2.3. PCB box).

Step 2 : Unplug all connectors, remove all screws from the board and remove the board.

Note :

Pay attention to the position of all connectors and proper place of all the cables. This will simplify the installation.

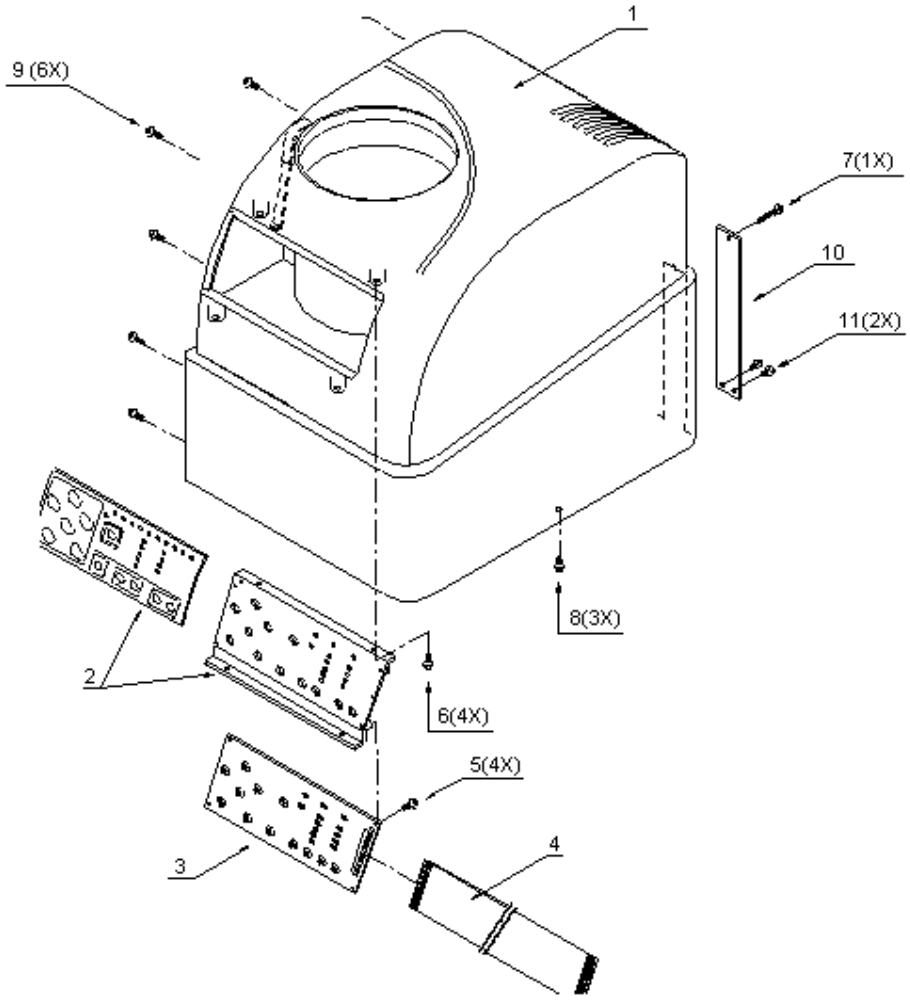
Note :

To reinstall the board perform above steps in reversed order.

6.3.9. Keyboard : removal and installation.

Step 1 : Remove the right cover (Please refer to 6.2.1. Covers left and right).

Step 2 : Remove the flat cable from the keyboard PC board. (Please refer to he picture mentioned below.)



Step 3 : Remove screws 6(4X) from the right cover and remove the keyboard.

Note :

To reinstall the keyboard perform above steps in reversed order.

6.3.10. X-motor and drive belt : removal and installation.

Step 1 : Remove the right cover (Please refer to 6.2.1. Covers right and left).

Step 2 : Open the PCB box (Please refer to 6.2.3.PCB box).

Step 3 : Remove the X-motor connector and the X-encoder connector from the Main PCB.

Step 4 : Remove the screws from the X-motor and remove the belt and the motor.

Note :

To reinstall the x-motor perform above steps in reversed order.

1) X-drive belt : Tension adjustment.

Step 1 : From the side of the PCB box (X-motor cover for SC-550), attach a piece of rope (or the pressure measurement attachment JD-41563) around the motor body as close as possible to the side plate.

Step 2 : Be sure that the motor screws are not fixed and pull the bar tension gauge (range 5kg, MUTOH part# JD-41446C) downwards for 3.75 kg ± 0.05 kg).
Turn manually the grid shaft a few turns and fix the motor screws.

Note :

X-drive belt tension for **SC-550** = 2.65 kg ± 0.05 kg.

6.3.11. Y-motor and drive belt : removal and installation.

Step 1 : Remove the right cover (Please refer to 6.2.1. Covers right and left) and open the PCB box (Please refer to 6.2.3.PCB box). If the drive belt need to be removed, remove the left cover too (Please refer to 6.2.1. Covers right and left).

Step 2 : Remove the Y-motor connector and the Y-encoder connector from the mainboard and pull the cables out of the PCB box.

Step 3 : Remove the 2 screws from the Y-motor and remove the motor.

Note :

To reinstall the Y-motor perform above steps in reversed order and perform the belt tension adjustment. (Please refer to point 1) Y-motor and drive belt mentioned below).

Step 4 : (Drive belt removal only)

Release the tension on the Y-drive belt (long) (Please refer to 6.2.8 Y-drive belt (long) step 3).

Remove the screw on top of the pulley shaft (Please refer to screw 9 on figure 6.2.8. Y-drive belt (long) 1) Y-drive belt (long) step 3) and remove the pulley assy from the bracket. If not possible, the Y-drive belt (long) need to get more play by turning the screws of the return pulley CCW. Now the Y-belt (short) can be removed.

1) Y-motor and drive belt : installation and adjustment.

Step 1 : Install the Y-drive belt (short) by performing the above steps in reverse order.

Step 2 : Turn in the screws from the Y-motor a few turns, but do not fix them.

Step 3 : Attach the bar tension gauge (range 5 kg, MUTOH part# JD-41446C) to the motor shaft (use a piece of rope or pressure measurement attachment JD-41563) and pull for 3.5 kg ± 0.05 kg.

Note :

Y-drive belt tension for **SC-550** = 2.5 kg ± 0.05 kg.

While pulling the gauge, move the cutting head manually left and right a few times before fixing the motor screws.

6.3.12. Head flex cable : removal and installation.

Step 1 : Remove the transparent cover (Please refer to 6.2.2. transparent cover) (Not on SC-550).

Step 2 : Remove the Y-rail cover (Please refer to 6.2.4 Y-rail cover).

Step 3 : Remove the head cover by removing the screw in the middle of the cover and unscrew the bottom screw a few turns. The head cover can be removed by sliding upwards.

Step 4 : Open the 2 white connectors by sliding them to the front and pull away the 2 flex cables from the connectors. Remove the head PCB on top of the head by 2 screws and lay it somewhere on the Y-rail where the flex cable cannot be harmed.

Step 5 : Open the PCB box (Please refer to 6.2.3. PCB box). For the SC-550 remove the right cover (Please refer to 6.2.1. Covers left and right).

Step 6 : Remove the flex cable from the terminal board.

Step 7 : Remove the right cover (Please refer to 6.2.1. Covers left and right) and open the cable guides that holding the flex cable.

Step 8 : Remove the flex cable.

Note :

Pay attention to the position of the cable in the way that it is guided all through the machine.
This will simplify the installation.

Note :

To reinstall the head flex cable perform above steps in reversed order.

6.3.13. Paper sensors : removal and installation.

Step 1 : Remove the grid cover (Please refer to 6.2.5. Grid cover).

Step 2 : Remove the cables from the sensors and remove the sensors.

Note :

To reinstall the paper sensors perform above steps in reversed order.

6.3.14 Transparent cover sensor : removal and installation.

(Not for SC-550)

Step 1 : Remove the transparent cover (Please refer to 6.2.2.Transparent cover).

Step 2 : Remove the Y–rail cover (Please refer to 6.2.4.Y-rail cover).

Step 3 : Remove the right cover (Please refer to 6.2.1. Covers left and right).

Step 4 : Open the CB box (Please refer to 6.2.3. PCB box).

Step 5 : Remove the connector J508 from the terminal board (black/yellow cable).
Remove the 2screws #10(2X) (Please refer to the picture mentioned below) and remove the switch.

Note :

Pay attention to the position of the cable in the way that it is guided all through the machine.
This will simplify the installation.

Note :

To reinstall the transparent cover sensor perform above steps in reversed order.

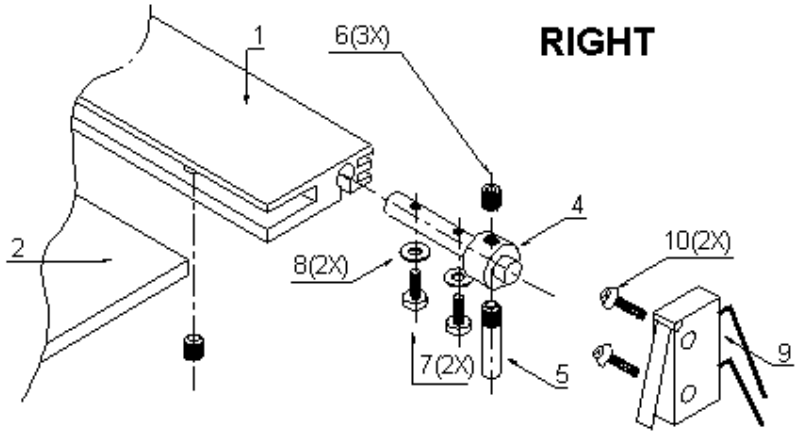
1) Transparent cover sensor : adjustment.
(Not for SC-550)

Step 1 : Unscrew the setscrew #6 (Please refer to the picture mentioned below).

Step 2 : Open the cover and adjust the position of shaft screw #5 (Please refer to the picture mentioned below).

Turning CW makes the detection of the closing position of the transparent cover later (= more closed).

Turning CCW makes the detection of the closing position of the transparent cover sooner (= more open).



Step 3 : Tighten screw #6 and check the detection position again.

6.3.15. Pressure roller UP/DOWN sensor : removal and installation.

Note :

This procedure is valid for all SC-series except for SC-550. For the SC-550 please refer to 6.3.16. Pressure roller UP/DOWN sensor SC-550.

Step 1 : Remove the right cover (Please refer to 6.2.1. Covers left and right).

Step 2 : Open the PCB box (Please refer to 6.2.3. PCB box).

Step 3 : Remove the sensor.

Note :

To reinstall the pressure roller UP/DOWN sensor perform above steps in reversed order.

6.3.16. Pressure roller UP/DOWN sensor SC-550 : removal and installation.

Step 1 : Remove the right cover (please refer to 6.2.1. Covers left and right).

Step 2 : Remove the Up/DOWN lever knob and the Y-rail.

Step 3 : Unplug the sensor cable connector from the terminal board.

Step 4 : Remove the sensor by unscrewing 2 screws.

Note :

To reinstall the pressure roller UP/DOWN sensor perform above steps in reversed order.

6.3.17. Fan motors : removal and installation.

Step 1 : Open the PCB box (Please refer to 6.2.3. PCB box). (Not for SC-550)

Step 2 : Remove the fan motor cable(s) (red, black, brown) from the main PC board.

Step 3 : Remove the fan motors from the X-rail with 2 screws.

Note :

To reinstall the fan motors perform above steps in reversed order.

7. JIG TOOL LIST.

7.1. Jig tool list.

PART NAME	PART#
Adjustment Pen 10 g	JD-41440
Bar tension gauge 50 g	JD-41446A
Bar tension gauge 500 g	JD-41446B
Bar tension gauge 5 kg	JD-41446C
Pressure measurement attachment	JD41563
Steel belt tension attachment	JD-41565
L shaped Allen key 1.27 mm (1/20”)	
+ Screw driver (Philips) #1	
+ Screw driver (Philips) #2	
- Screw driver	
Open wrench 13 mm	
Box wrench 13 mm	

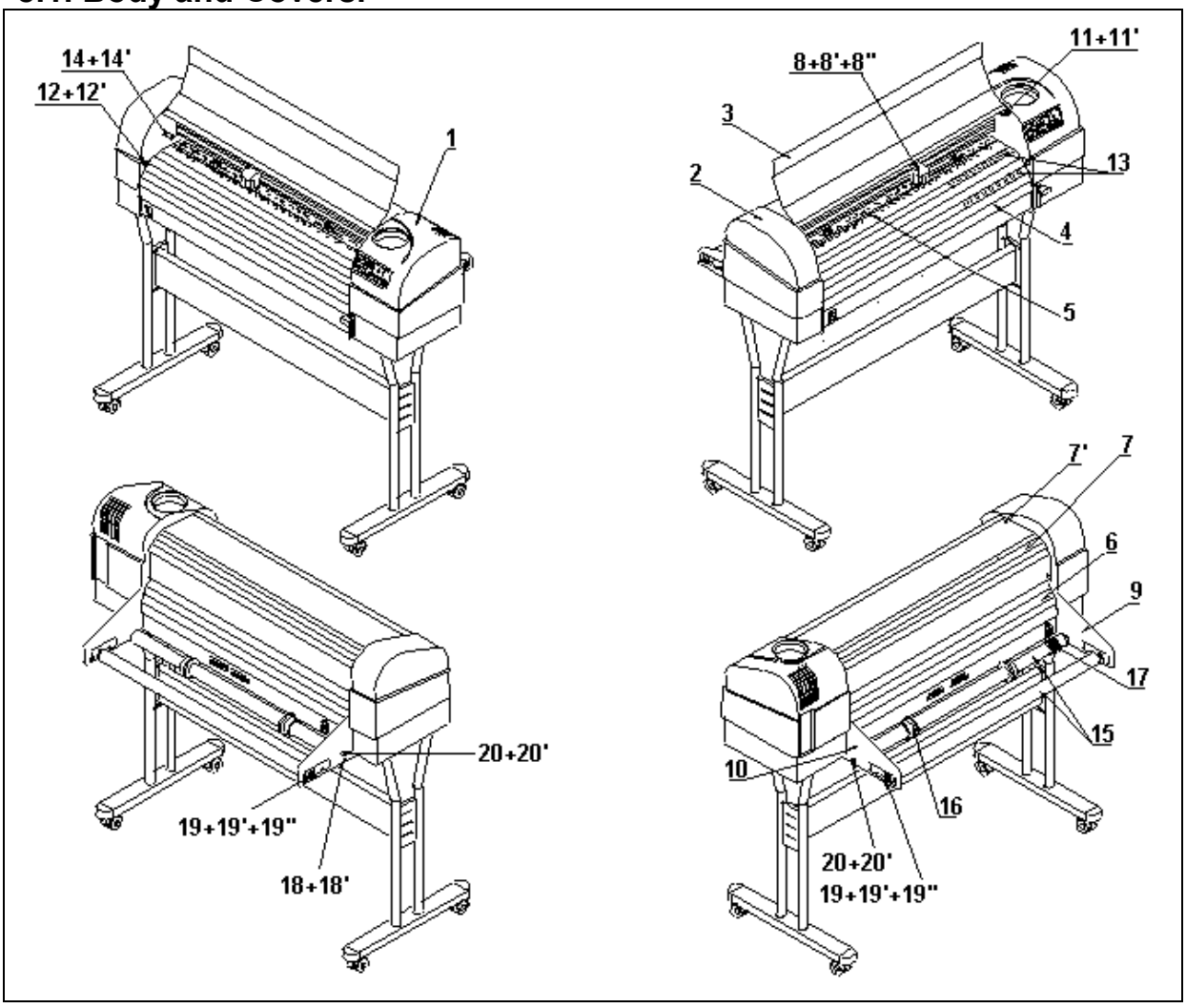
7.2. Special glue.

External screw locking glue : LOCTITE 7400 (VERNISTOP)
Screw thread locking glue : LOCTITE 243
Glue for fixing Y)motor pulley : LOCTITE 406

8. PARTS LISTS SC-SERIES.

(For SC-550 parts, please refer to chapter 9. Parts Lists SC-550.)

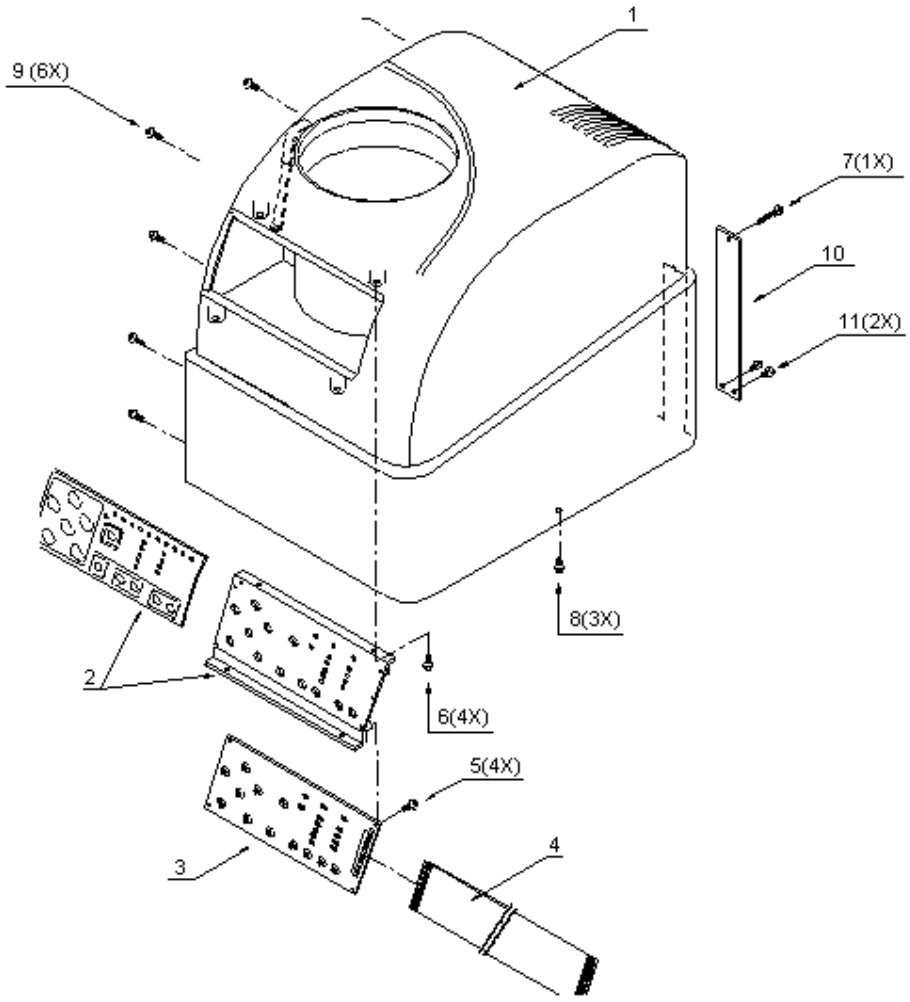
8.1. Body and Covers.



Ref.	Description	Partnumber	Qty
1	Cover right	ZME-20654	1
2	Cover left SC-650	ZME-20665	1
2	Cover left SC-750	ZME-20755	1
2	Cover left SC-1000	ZME-21005	1
2	Cover left SC-1300	ZME-21305	1
3	Transparent cover assy SC-650	MY-20631	1
3	Transparent cover assy SC-750	MY-20731	1
3	Transparent cover assy SC-1000	MY-21630	1
3	Transparent cover assy SC-1300	MY-21252	1
4	Front platen assy SC-650	MY-20602	1
4	Front platen assy SC-750	MY-20702	1
4	Front platen assy SC-1000	MY-21602	1
4	Front platen assy SC-1300	MY-21250	1

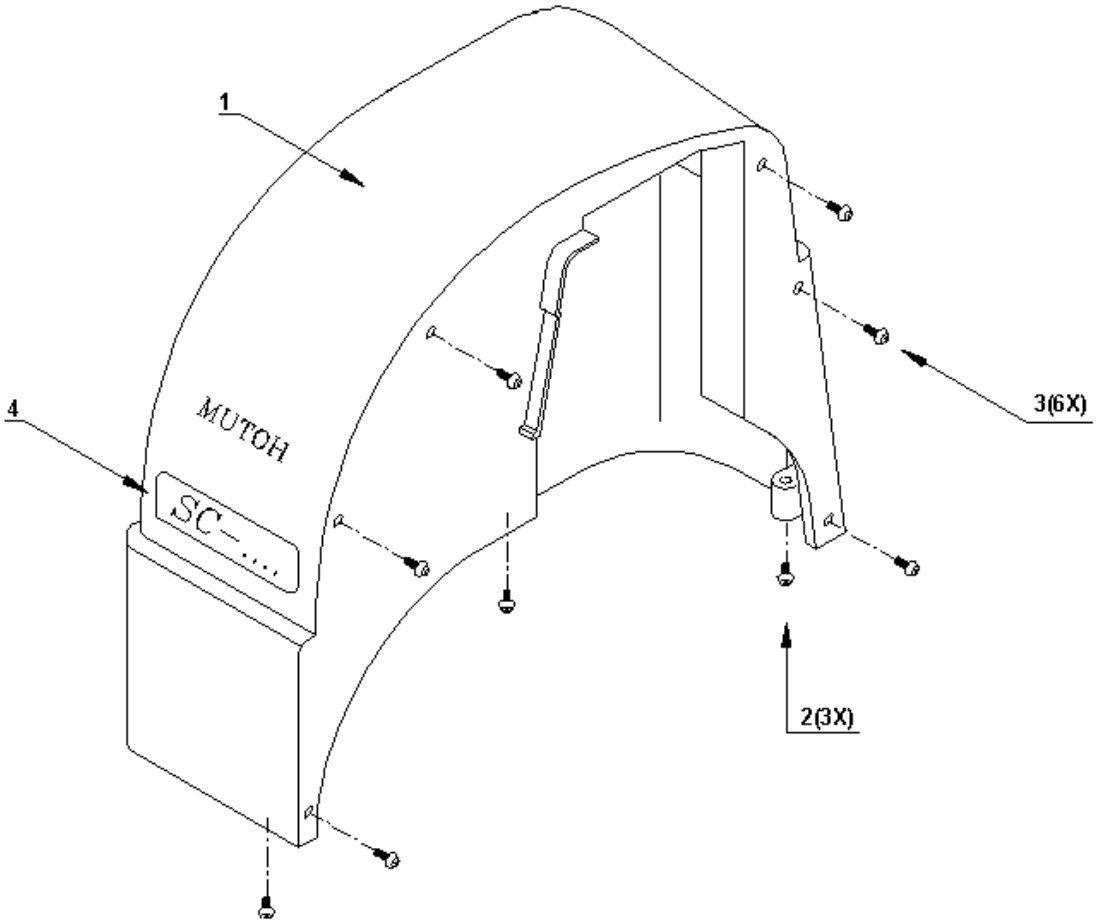
5	Grid cover SC-650	ME-20650	1
5	Grid cover SC-750	ME-20750	1
5	Grid cover SC-1000	ME-21650	1
5	Grid cover SC-1300	ME-21251	1
6	Rear platen SC-650	ME-20602	1
6	Rear platen SC-750	ME-20702	1
6	Rear platen SC-1000	ME-21602	1
6	Rear platen SC-1300	ME-21250	1
7	Y-rail cover SC-650	ME-20630	1
7	Y-rail cover SC-750	ME-20730	1
7	Y-rail cover SC-1000	ME-21630	1
7	Y-rail cover SC-1300	ME-21612	1
7’	Screw 2.9 X 9.5	BM-2102-129905	4
8	Head cover	ME-20662	1
8’	Screw M2x4	DR-4004-45105	1
8”	Screw M2x10	DR-4004-45100	1
9	Side plate left	ME-20599	1
10	Side plate right	ME-20600	1
11	Cover switch assy	EY-41761	1
11’	Screw M2x8	BM-1400-002008	2
12	Rubber	BR-40040	2
12’	Screw M4x6 black	DR-4008-41838	2
13	Alignment sticker	LB-10017	2
14	Sheet off knock piece	ME-20640	1
14’	Screw M4x6 black	DR-4008-41838	1
15	Conveyor roll SC-650	ME-20610	2
15	Conveyor roll SC-750	ME-20710	2
15	Conveyor roll SC-1000	ME-21610	2
15	Conveyor roll SC-1300	ME-21710	2
16	Roll flange assy	MY-10056	2
17	Slip-ring	ME-20700	1
18	Hex bolt M4x6	BM-6000-604008	1
18’	Plastic spacer (d = 4.2)	BR-40108	1
19	Hex bolt M8x25	BM-6200-608025	2
19’	Brass spacer	BR-10845	2
19”	Plastic plain washer	BR-40842	4
20	Hex bolt M8x20	BM-6200-608020	2
20’	Plastic spacer (d = 8.2)	BR-40812	1
21	Bottom cover left	ME-20652	1
22	Bottom cover right	ME-20656	1

8.2. Cover right + keyboard assy.



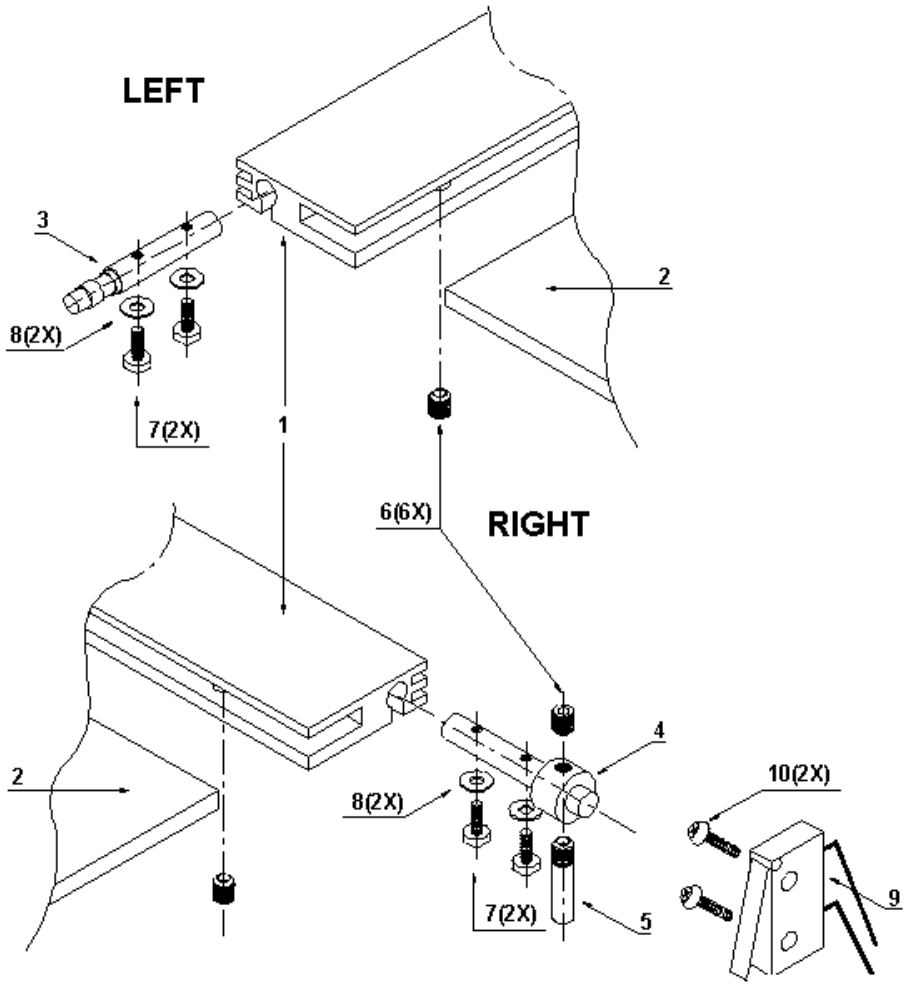
Ref.	Description	Partnumber	Qty
#	Cover + keyboard assy	MY-20654	1
1	Cover right	ZME-20654	1
2	Keyboard panel	MY-20621	1
3	PCB keyboard	EY-20574	1
#	Keyboard assy (complete)	EY-20654	1
4	Cable term → keyboard	MK-60866	1
5	Screw 3.0x8 plastite	BM-200-103008	4
6	Screw M3x6	DR-4001-43331	4
7	Screw M3x25	DR-4005-44614	1
8	Screw M3x8	DR-4001-43329	3
9	Screw 3.0x10	BM-2301-503010	6
10	Cover plate	ME-20658	1
11	Screw M3x4	DR-4001-43993	2

8.3. Cover left assy.



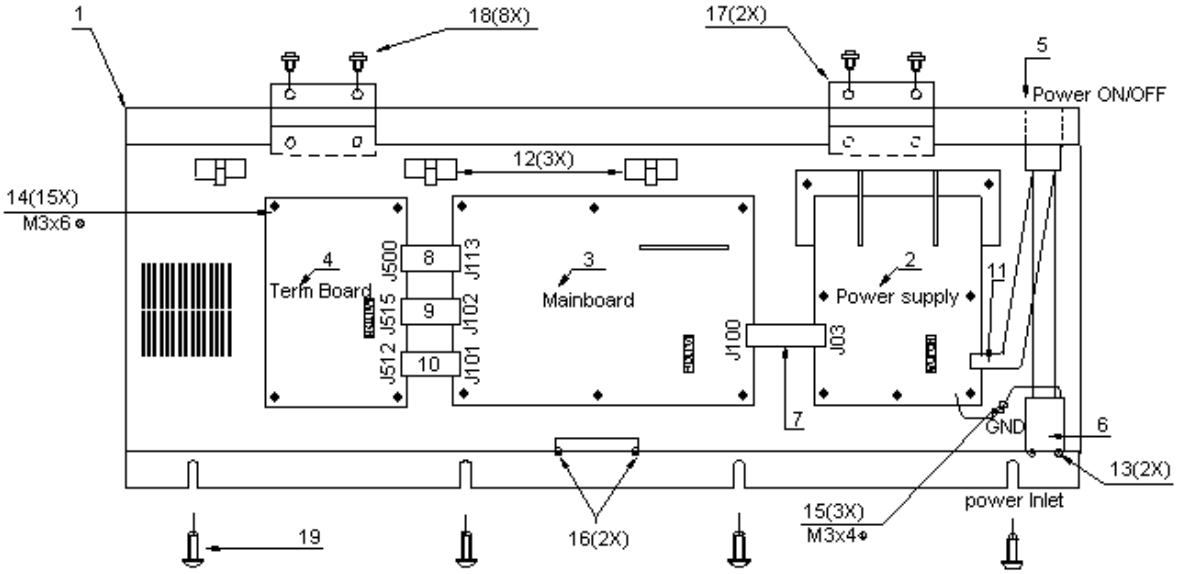
Ref.	Description	Partnumber	Qty
1	Cover left SC-650	ZME-20655	1
1	Cover left SC-750	ZME-20755	1
1	Cover left SC-1000	ZME-21005	1
1	Cover left SC-1300	ZME-21305	1
2	Screw M3x8	DR-4001-43329	3
3	Screw 3.0x10	BM-2301-503010	6
4	Label SC-650	LB-20650	1
4	Label SC-750	LB-20750	1
4	Label SC-1000	LB-20100	1
4	Label SC-1300	LB-20125	1

8.4. Transparent cover assy.



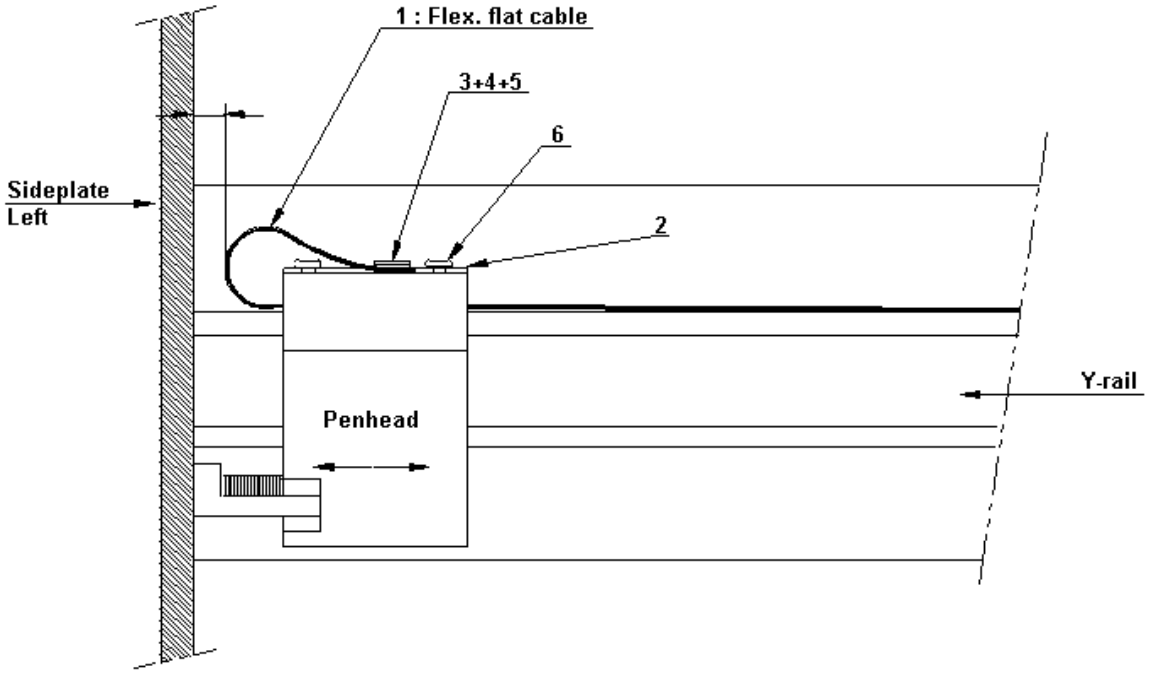
Ref.	Description	Partnumber	Qty
#	Transparent cover assy SC-650	MY-20631	1
#	Transparent cover assy SC-750	MY-20731	1
#	Transparent cover assy SC-1000	MY-21631	1
#	Transparent cover assy SC-1300	MY-21252	1
1	Cover guide SC-650	ME-20632	1
1	Cover guide SC-750	ME-20732	1
1	Cover guide SC-1000	ME-21632	1
1	Cover guide SC-1300	ME-21253	1
2	Transparent cover SC-650	ME-20631	1
2	Transparent cover SC-750	ME-20731	1
2	Transparent cover SC-1000	ME-21631	1
2	Transparent cover SC-1300	ME-21252	1
3	Shaft left	ME-20635	1
4	Shaft right	ME-20648	1
5	Switch activator shaft	ME-20633	1
6	Set screw M3x3	DR-4007-44579	6
7	Screw M2x5	BM-1400-002005	4
8	Washer M2	BR-11252	4
9	Cover switch	EY-41761	1
10	Screw M2x8	BM-1400-002008	2

8.5. PCB box.



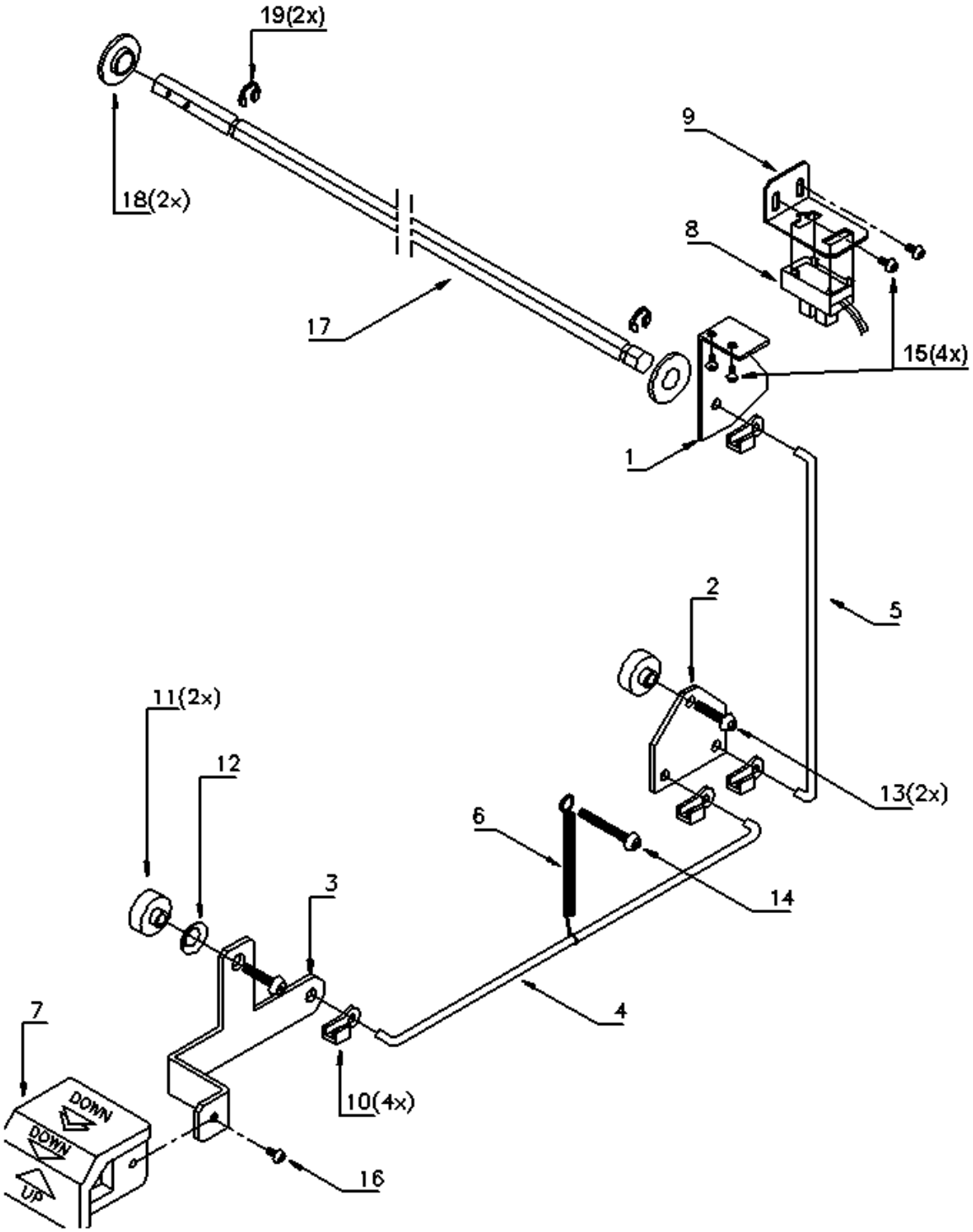
Ref.	Description	Partnumber	Qty
1	PCB box SC-650	ME-20601	1
1	PCB box SC-750	ME-20701	1
1	PCB box SC-1000	ME-21601	1
1	PCB box SC-1300	ME-21613	1
2	Power supply board	DE-31396	1
3	Main PC board 1st version	EY-20570	1
3	Main PC board 2nd version	EY-21570	1
4	Terminal PCB 1st version	EY-20573	1
4	Terminal PCB 2nd version	EY-21573S	1
5	Power ON/OFF switch	DE-43074	1
6	Power inlet	DE-44745	1
7	Cable P/S → Mainboard	DE-44750	1
8	Cable J113 → J500 (1st)	MK-60627	1
8	Cable J130 → J500 (2nd)	MK-41200	1
9	Cable J102 → J515	MK-60865	1
10	Cable J101 → J512 (1st)	MK-60864	1
11	Cable switch → P/S	MK-81650	1
12	Cable guide	AE-91065	3
13	Screw M3x6 black	DP-4002-40217	2
14	Cap screw M3x6	DR-4001-43923	15
15	Cap screw M3x4	DR-4001-43993	3
16	Screw M3x10 (Interf.)	DR-4007-44129	2
-	----------	----------	
17	Hinge PCB box	DE-44113	2
18	Screw M4x8	DR-4001-43396	8
19	Screw M4x10 Taptite	BM-1400-104010	4-5

8.6. Head flex cable assy.



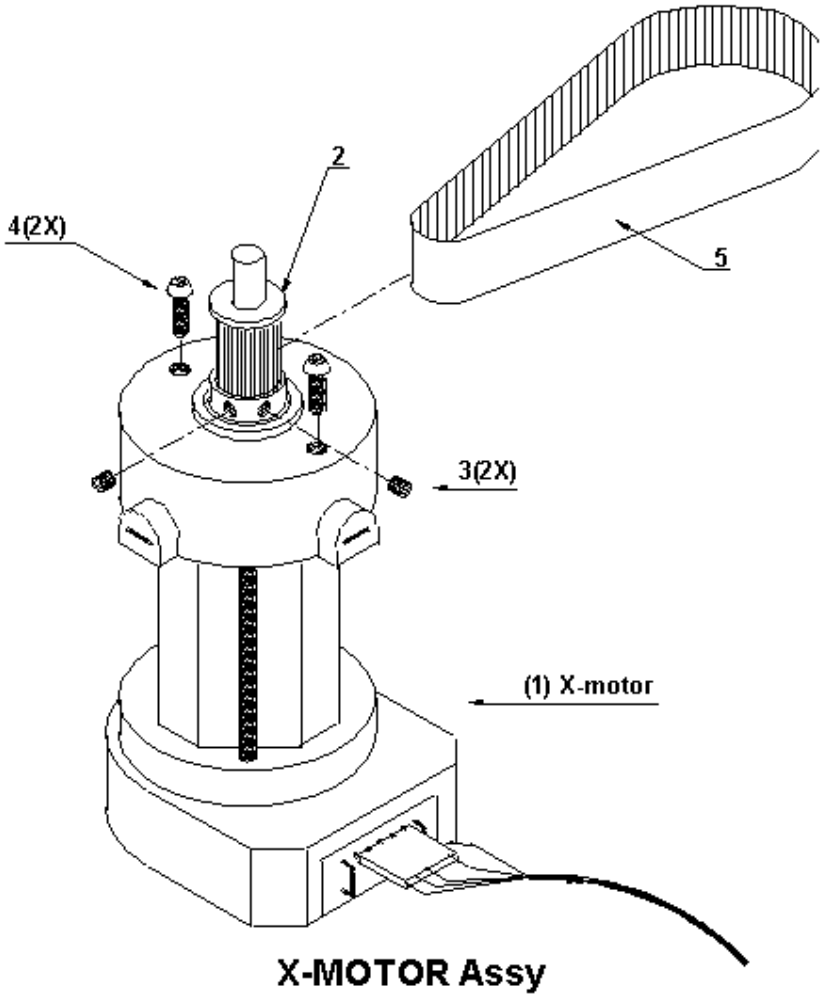
Ref.	Description	Partnumber	Qty
#	Head FFC cable assy SC-650	MY-20571	1
#	Head FFC cable assy SC-750	MY-20572	1
#	Head FFC cable assy SC-1000	MY-573	1
#	Head FFC cable assy SC-1300	MY-20574	1
1	Head FFC cable SC-650 (1st)	MK-60867	1
1	Head FFC cable SC-650 (2nd)	MK-60806	1
1	Head FFC cable SC-650 (1st)	MK-60868	1
1	Head FFC cable SC-650 (2nd)	MK-60807	1
1	Head FFC cable SC-650 (1st)	MK-60869	1
1	Head FFC cable SC-650 (2nd)	MK-60810	1
1	Head FFC cable SC-650 (1st)	MK-60863	1
1	Head FFC cable SC-650 (2nd)	MK-60813	1
2	Head cable PCboard (1st version)	EY-20571	1
2	Head cable PCboard (2nd version)	EY-21571T	1
3	Strain relief plate	ME-20665	1
4	Strain relief rubber	ME-20666	1
5	Screw M3x6 strain relief	BM-1400-003006	2
-	----------	----------	
6	Screw M3x4	DR-4001-43993	2

8.7. Pressure roller UP/DOWN mechanism.



Ref.	Description	Partnumber	Qty
1	Turn over plate	ME-20625	1
2	Transmission plate	ME-20626	1
3	Handle plate	ME-20624	1
4	Transmission shaft long	ME-20663	1
5	Transmission shaft short	ME-20664	1
6	Spring	DE-45673	1
7	Knob UP/DOWN	DE-32254	1
8	Sensor UP/DOWN	EY-41760	1
9	Sensor bracket	ME-20622	1
10	Clamp shaft	DE-44782	4
11	Spacer	BR-10010	2
12	Spring washer	BR-24650	1
13	Screw M4x16	DR-4001-44611	2
14	Screw M4x30	DR-4001-43920	1
15	Screw M3x8	DR-4001-43329	4
16	Screw M3x6	DR-4005-43728	1
17	Hex. Shaft SC-650	ME-20777	1
17	Hex. Shaft SC-750	ME-20778	1
17	Hex. Shaft SC-1000	ME-20779	1
17	Hex. Shaft SC-1300	ME-21277	1
18	Plastic bearing	BR-40010	2
19	E-ring	BR-31070	2

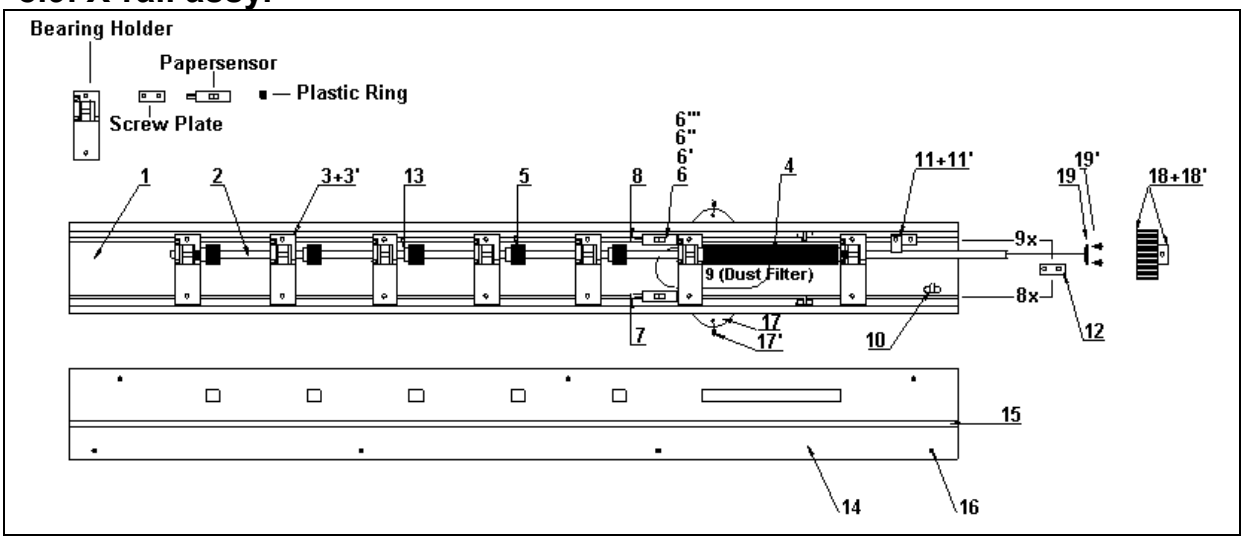
8.8. X-motor assy.



X-MOTOR Assy

Ref.	Description	Partnumber	Qty
#	X-motor assy	EY-10000	1
1	X-motor	EE-10000	1
2	Drive pulley	DE-46568	1
3	Setscrew	DR-4007-43352	2
-	----------	----------	-
4	Screw M3x10	DR-4001-43395	2
5	X-drive belt	DE-44157	1

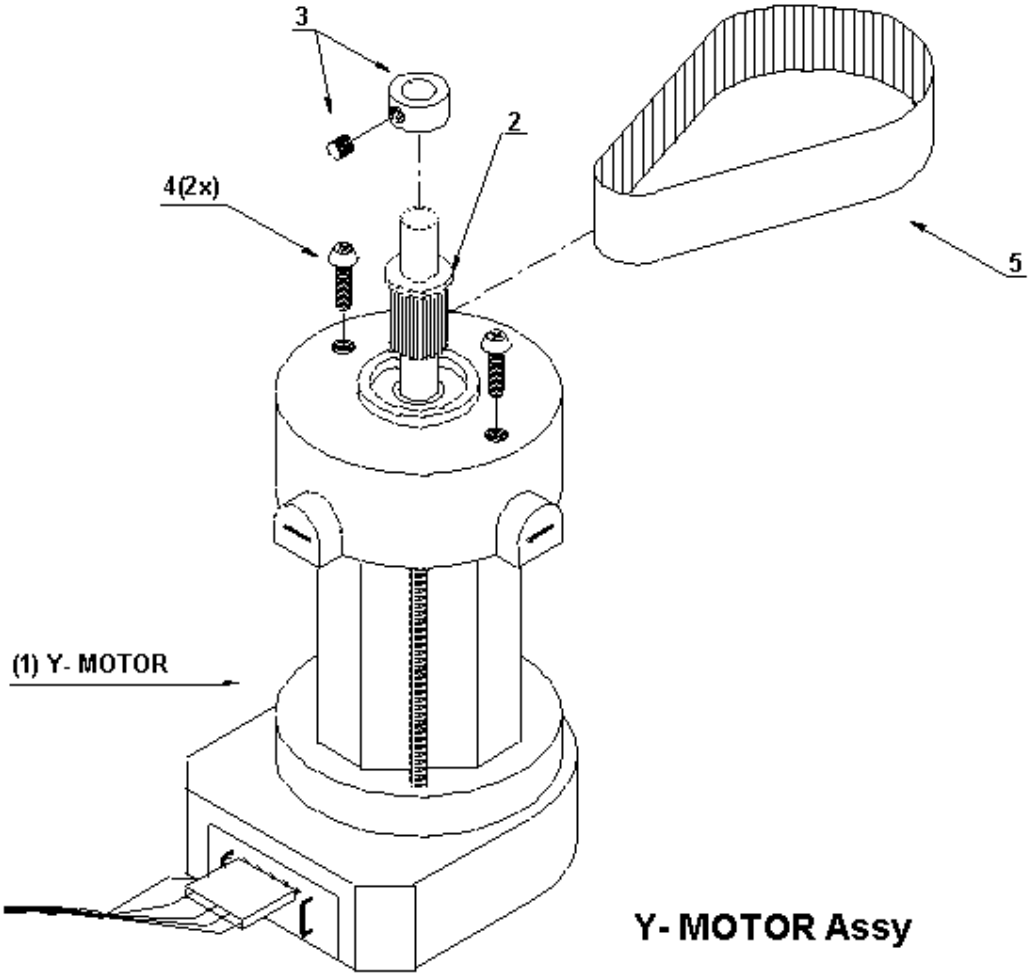
8.9. X-rail assy.



Ref.	Description	Partnumber	Qty
#	X-rail assy SC-650	MY-6500-10400	1
#	X-rail assy SC-750	MY-7500-10400	1
#	X-rail assy SC-1000	MY-1000-10400	1
#	X-rail assy SC-1300	MY-1300-10400	1
1	X-rail SC-650	ME-10400	1
1	X-rail SC-750	ME-10407	1
1	X-rail SC-1000	ME-10409	1
1	X-rail SC-1300	ME-10415	1
2	Drive shaft SC-650	ME-20609	1
2	Drive shaft SC-750	ME-20709	1
2	Drive shaft SC-1000	ME-21609	1
2	Drive shaft SC-1300	ME-21611	1
3	Bearing holder	MY-32227	7-8-10
3’	Screw M4x8	DR-4008-44543	14-16-20
4	Grid roll 136 mm	DE-46550	1
5	Grid roll 14 mm	DE-44142	5-6-7
6	Paper sensor	E-PS-R50LA	2
6’	Paper sensor bracket	ME-20629	2
6”	Screw M3x8.5 sensor	DS-1054-40883	2
6”’	Screw M4x6 bracket	DR-4008-41838	2
7	Cable sensor front	MK-41702	1
8	Cable sensor rear	MK-41703	1
9	Dust filter	DE-45903	1-2-3
10	Cable guide	AE-91025	3
11	Earth plate	DE-45118	1
11’	Screw M4x8	DR-4001-43396	1
12	Screwplate	DR-2164-41836	17-19-23
13	Plastic spacer	BR-40710	2
14	Grid cover SC-650	ME-20650	1
14	Grid cover SC-750	ME-20750	1
14	Grid cover SC-1000	ME-21650	1
14	Grid cover SC-1300	ME-21251	1

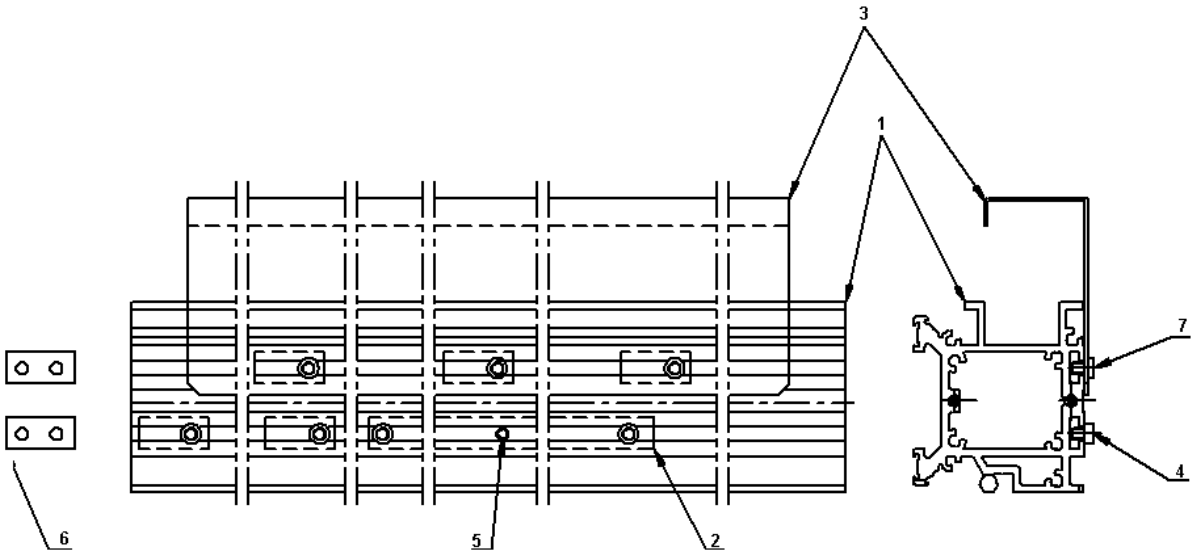
15	Cutting mat SC-650	ZME-20645	3
15	Cutting mat SC-750	ZME-20745	3
15	Cutting mat SC-1000	ZME-21645	3
15	Cutting mat SC-1300	ZME-21745	3
16	Screw M2x5	BM-6301-302005	7-7-10
--	----------	----------	-
17	Fan 650, 750, 1000, 1300	EE-50760	1
17	Fan SC-1000, 1300	EE-50761	1
17	Fan SC-1300	DE-44761	1
17’	Screw 3.5x32	BM-2100-135032	2-4
18	Gear grid shaft	DE-46555	1
18’	Set screw M3x3	DR-4007-43352	2
19	Bearing grid shaft	DE-46563	1
19’	Screw M3x4	DR-4001-43993	2

8.10. Y-motor assy.



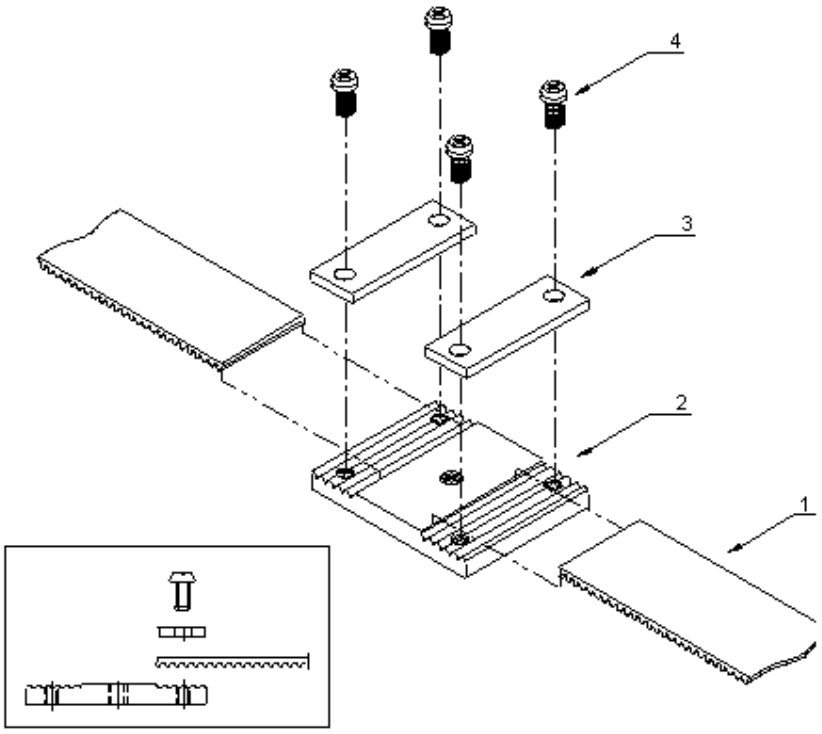
Ref.	Description	Partnumber	Qty
#	Y-motor assy	EY-10010	1
1	Y-motor	EE-10010	1
2	Drive pulley	DE-47077	1
3	Set ring + screws	BR-32002	1
-	----------	----------	-
4	Screw M3x10	DR-4001-43395	2
5	Y-transfer belt	DE-47079	1

8.11. Y-rail assy.



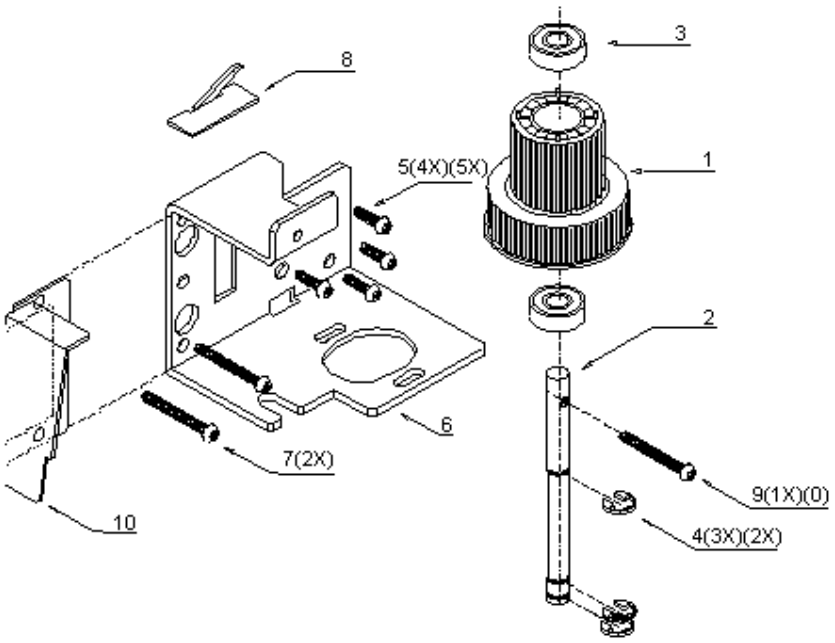
Ref.	Description	Partnumber	Qty
1	Y-rail SC-650	ME-10401	1
1	Y-rail SC-750	ME-10408	1
1	Y-rail SC-1000	ME-10410	1
1	Y-rail SC-1300	ME-10416	1
2	Grid indication rail SC-650	ME-20646	1
2	Grid indication rail SC-750	ME-20746	1
2	Grid indication rail SC-1000	ME-21646	1
2	Grid indication rail SC-1300	ME-21255	1
3	FCC cable guide SC-650	MY-20050	1
3	FCC cable guide SC-750	MY-20051	1
3	FCC cable guide SC-1000	MY-20052	1
3	FCC cable guide SC-1300	MY-21254	1
4	Screw M4x6 black	DR-4008-41838	4-3
5	Set screw M3x3	DR-4007-41200	1-3-4
6	Screwplate	DR-2164-41836	5-6
7	Screw M4x6	BM-6200-604006	3-4

8.12. Y-axis drive belt assy.



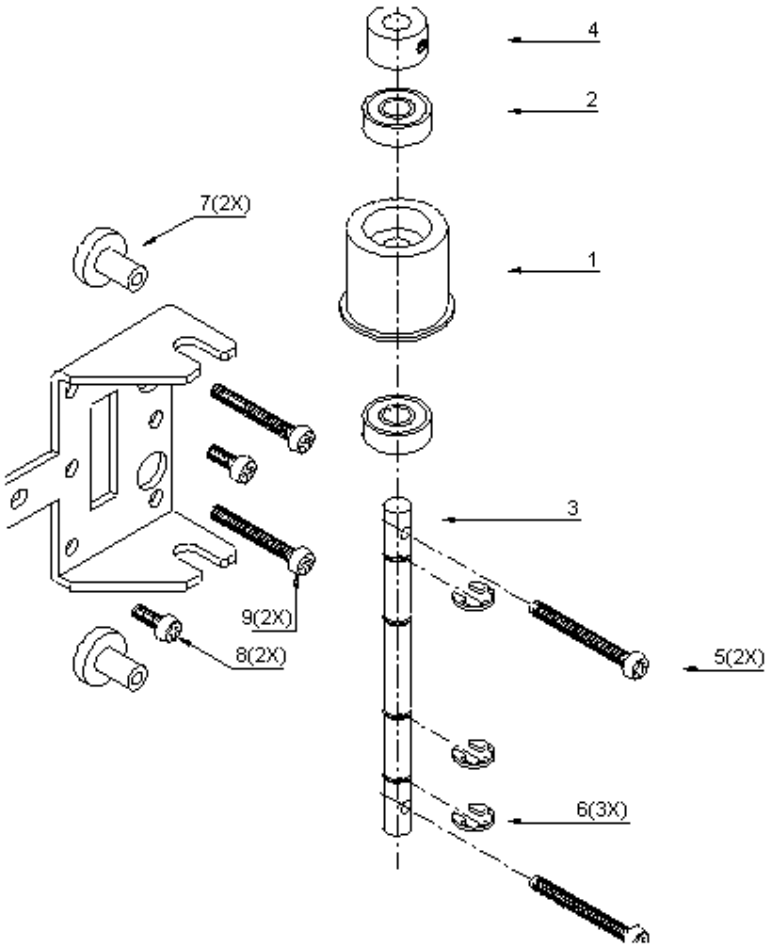
Ref.	Description	Partnumber	Qty
#	Y-drive belt assy SC-650	MY-20661	1
#	Y-drive belt assy SC-750	MY-20761	1
#	Y-drive belt assy SC-1000	MY-21661	1
#	Y-drive belt assy SC-1300	MY-21761	1
1	Y-drive belt SC-650	ME-20661	1
1	Y-drive belt SC-750	ME-20761	1
1	Y-drive belt SC-1000	ME-21661	1
1	Y-drive belt SC-1300	ME-21761	1
2	Belt connection plate	ME-10107	1
3	Pressure plate	ME-10108	2
4	Screw M3x6	DR-6210-303006	4

8.13. Y-drive pulley assy + mounting bracket.



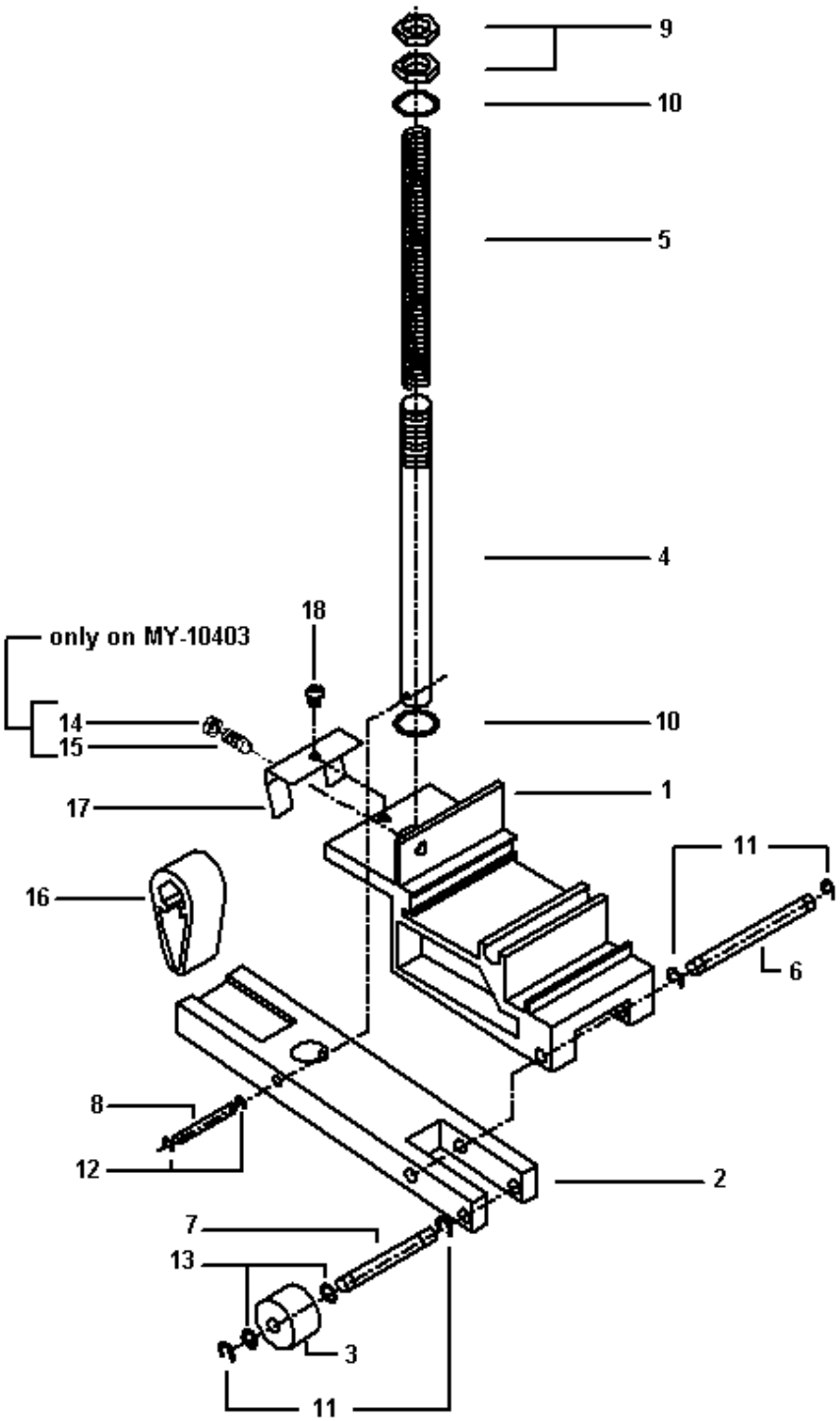
Ref.	Description	Partnumber	Qty
#	Y-drive pulley assy	MY-47657	1
1	Y-drive pulley	DE-47057	1
2	Shaft	ME-20059	1
3	Bearing	DE-47095	2
4	E-ring	BR-31050	3 (2)
-	----------	----------	-
5	Screw M3x10	DR-4001-43395	4 (5)
6	Y-motor bracket	ME-20607	1
7	Screw 3.5x25	BM-2100-135025	2
8	Cable holder	AE-91025	1
9	Screw M3x25	DR-4005-44614	1 (0)
10	Cable support plate	ME-10109	1

8.14. Y-axis return pulley assy.



Ref.	Description	Partnumber	Qty
#	Return pulley assy	MY-47675	1
1	Return pulley	DE-47075	1
2	Bearing	DE-47095	2
3	Shaft	ME-20058	1
4	Set-ring and screw	BR-32000	1
5	Screw M3x30	DR-4001-45094	2
6	E-ring	BR-31050	3
-	----------	----------	-
#	Return pulley bracket	ME-20607	2
7	Screw foot (plastic)	DE-47091	2
8	Screw M3x8	DR-4001-43329	2
9	Screw 3.5x25	BM-2100-135025	2

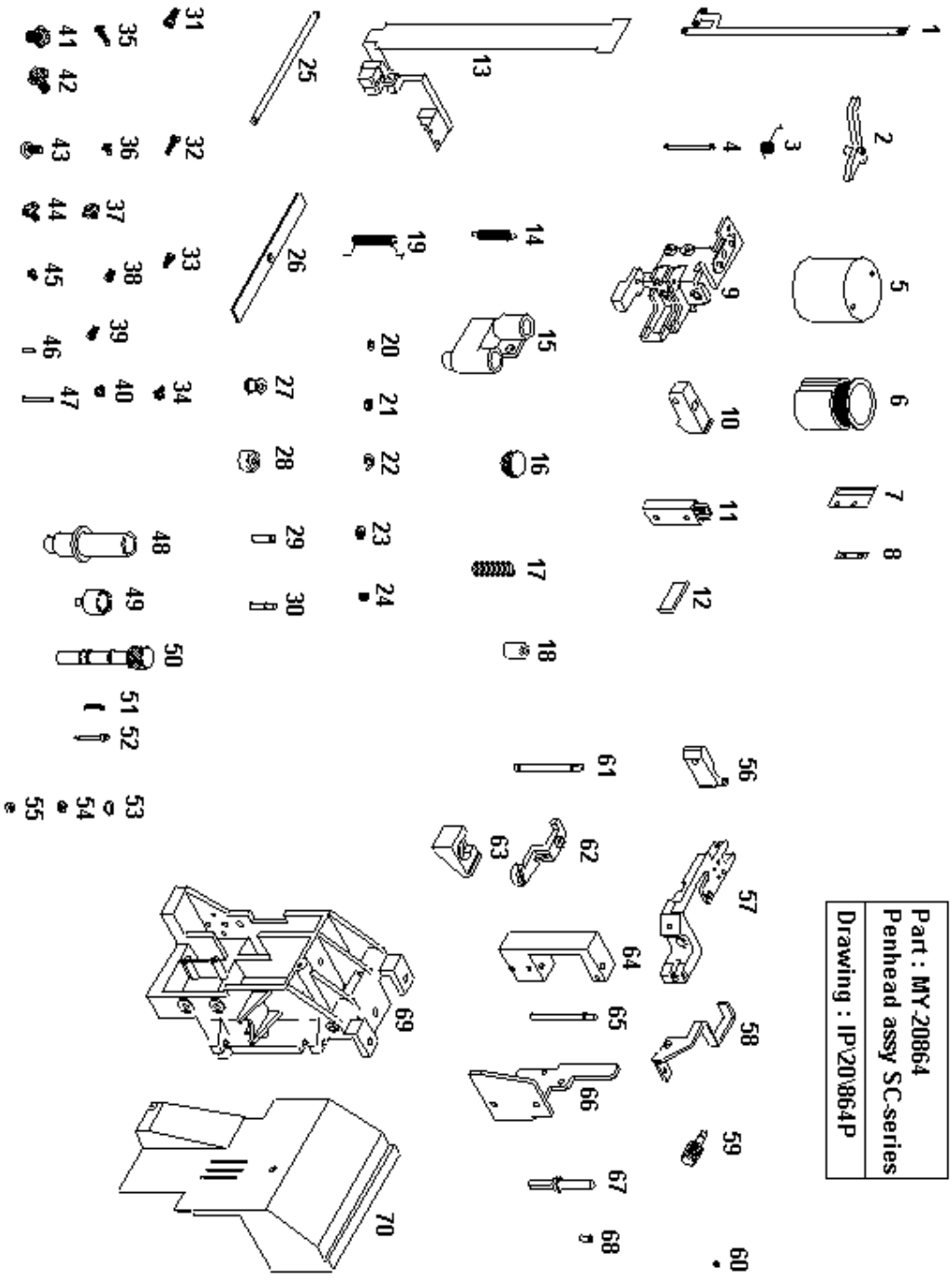
8.15. Pressure roller assy.



Pressure roller assy without position indication : MY-10402
Pressure roller assy with position indication : MY-10403

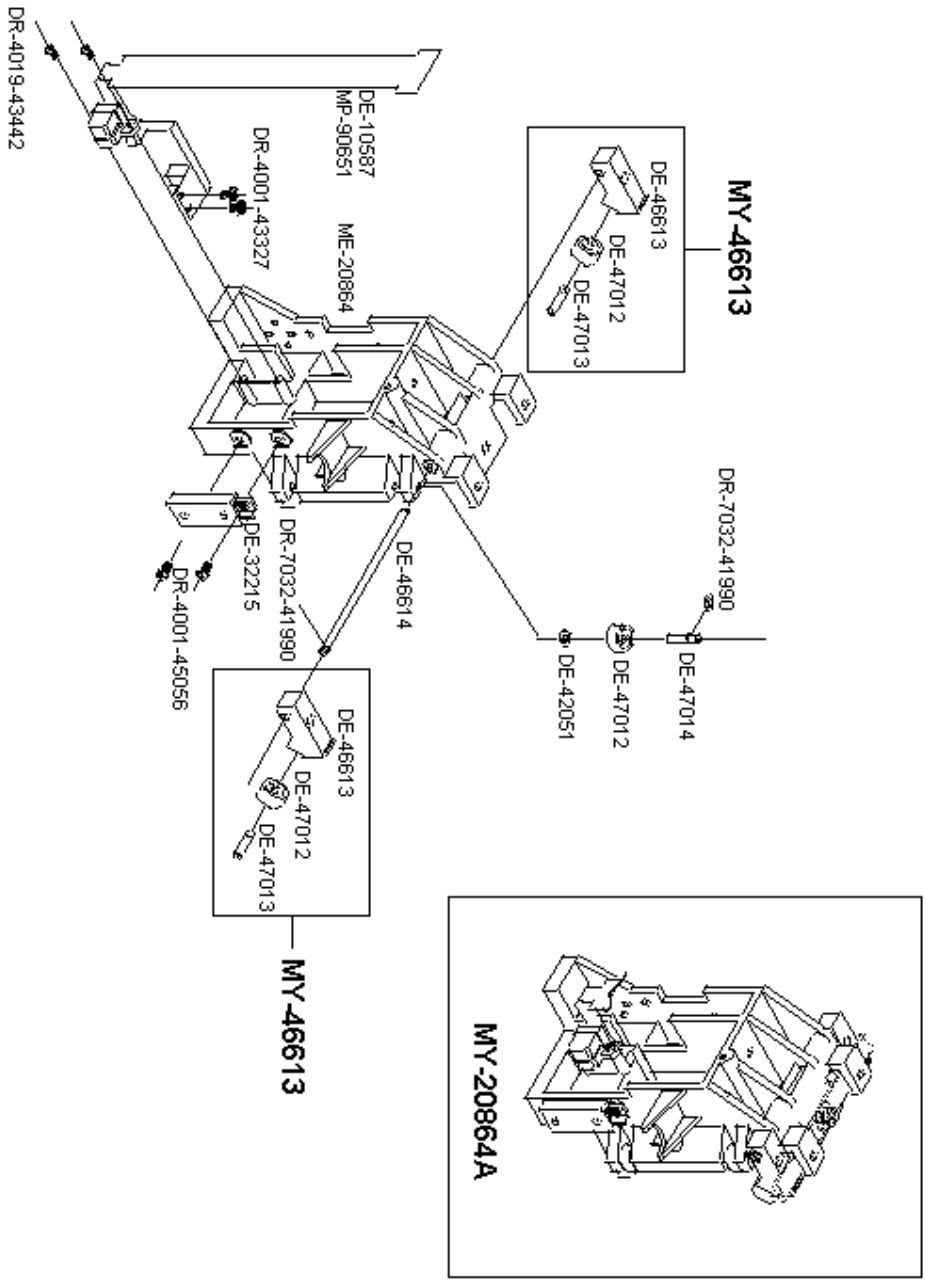
Ref.	Description	Partnumber	Qty
#	Pressure roller assy without position indication	MY-10402	1
1	Pressure base	ME-10402	1
2	Pressure arm	ME-10095	1
3	Pressure roller	DE-44190	1
4	Spring shaft	ME-20611	1
5	Spring	ME-20611	1
6	Pivot shaft	ME-20613	1
7	Roller shaft	ME-20614	1
8	Connection shaft	ME-20612	1
9	Hex nut M8	BM-9104-108004	2
10	Washer	BR-14338	2
11	E-ring 3.2	BR-31032	4
12	E-ring 2.3	BR-31023	2
13	Plastic washer	DE-44192	2
#	Pressure roller assy with position indication	MY-10403	1
-	Pressure roller assy	MY-10402	1
14	Hex nut M4	DR-4010-41280	1
15	Ballspring screw M4x9	ME-10029	1
-	----------	----------	-
16	UP/DOWN cam	ME-10403	1
17	Cam bracket	ME-20647	1
18	Screw M3x4	DR-4001-43993	1

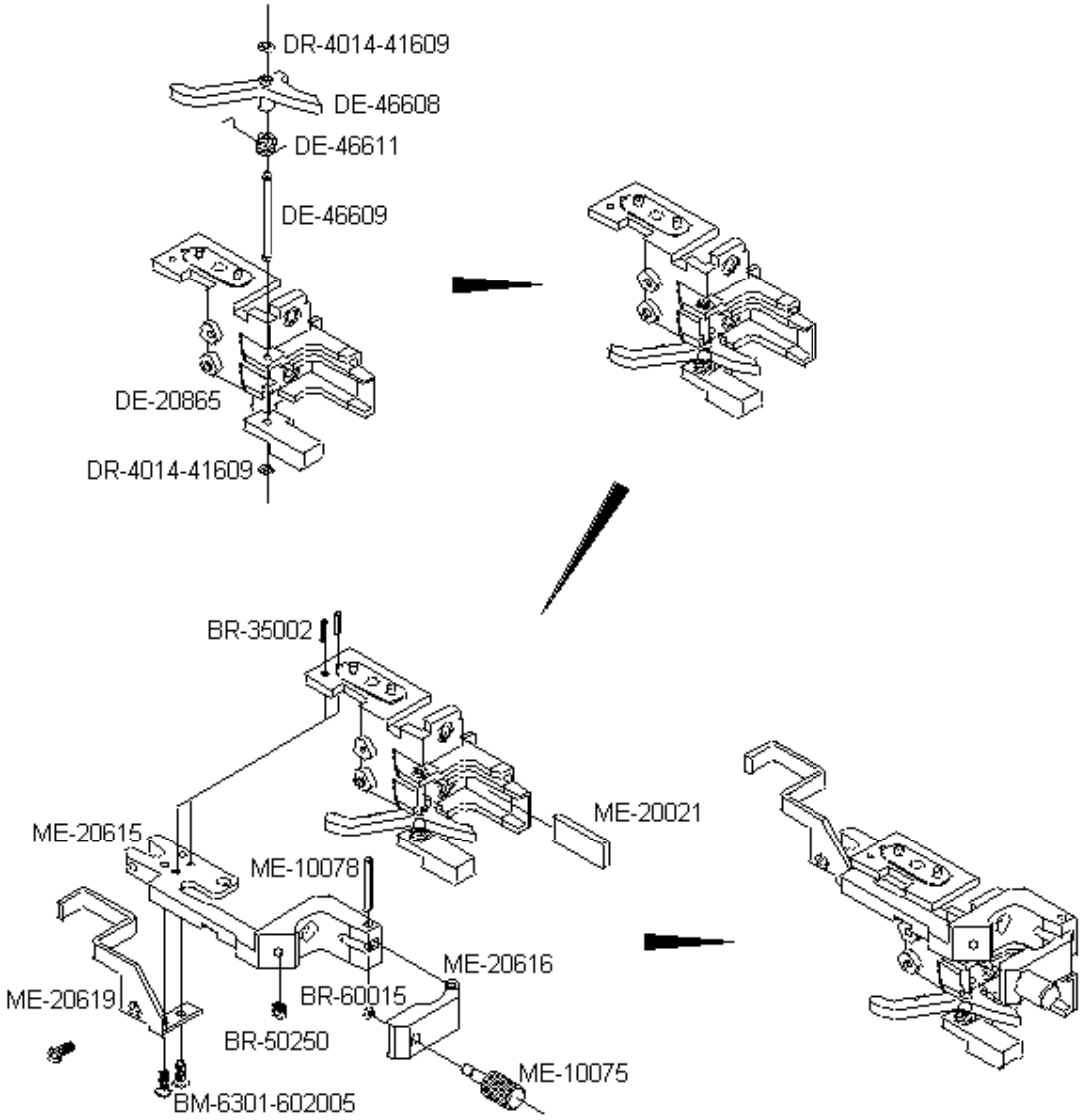
8.16. Cutting head assy.

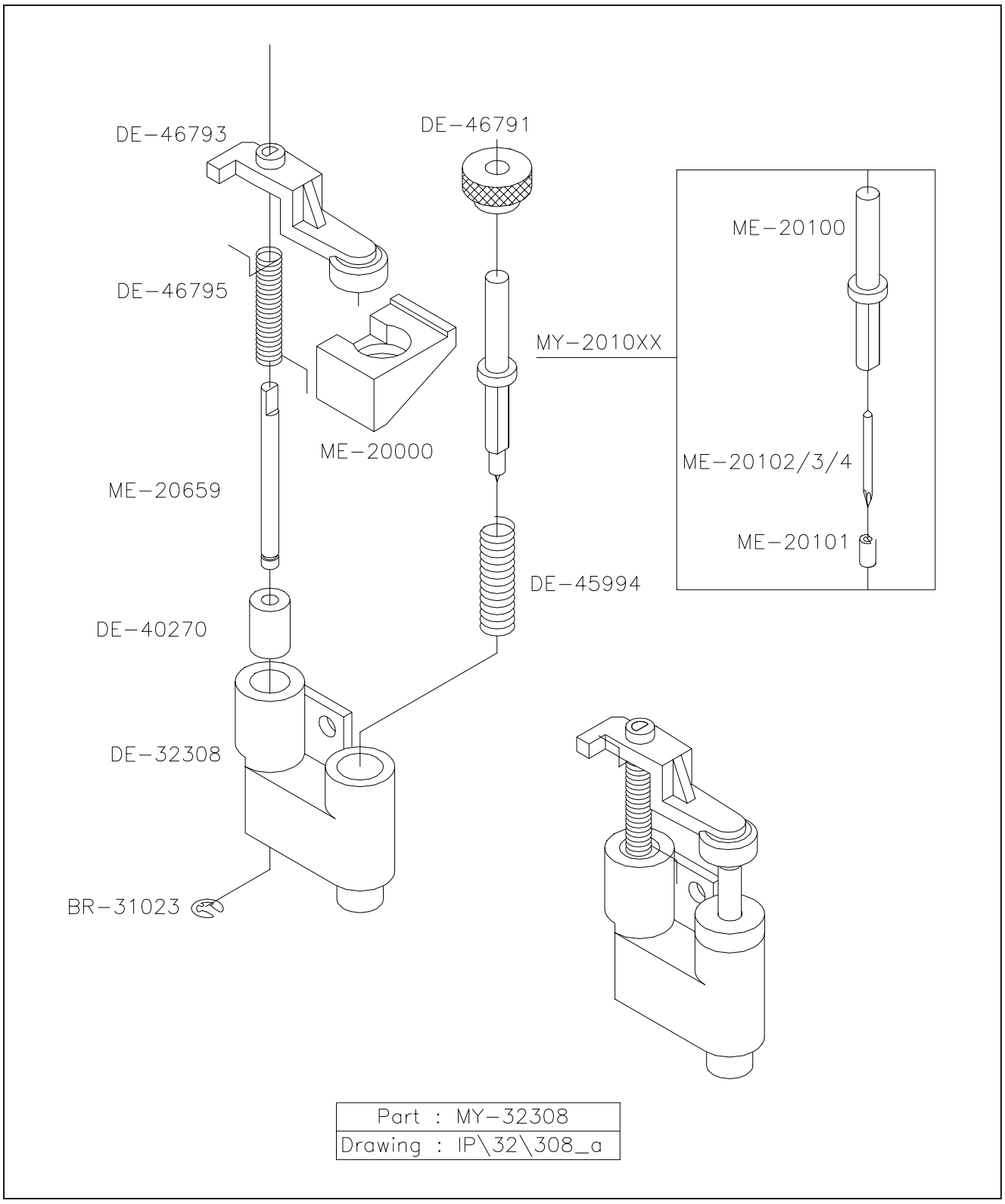


Ref.	Part Number
1	DE-46622 / MP-90650
2	DE-46608
3	DE-46611
4	DE-46609
5	DE-46874
6	DE-46781
7	DE-45203
8	DE-45204
9	DE-20865
10	DE-46613
11	DE-32215
12	ME-20021
13	DE-10587 / MP-90651
14	DE-44208
15	DE-32308
16	DE-46791
17	DE-45994
18	DE-40270
19	DE-46795
20	DR-4014-41609
21	DR-7032-41990 / BR-31023
22	BR-31032
23	DE-42051
24	BR-50250
25	DE-46614
26	DE-47523
27	DE-47011
28	DE-47012
29	DE-47013
30	DE-47014
31	BM-5007-026008
32	BM-1400-002008
33	BM-1400-002005
34	DR-4001-43327
35	DR-4004-45100

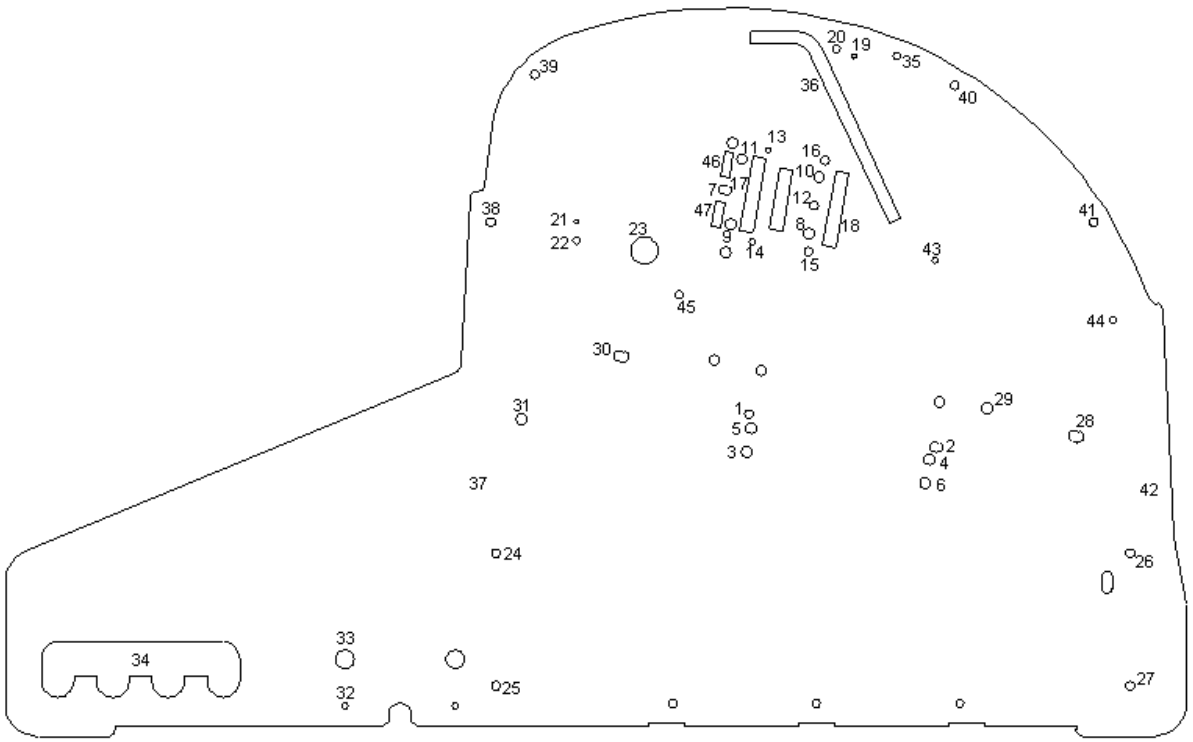
Ref.	Part Number
36	DR-4004-45105
37	DR-4001-43993
38	DR-4001-45056
39	DR-4001-45057
40	DR-4001-43457
41	DR-4001-43396
42	DR-4001-43317
43	DR-4005-44675
44	DR-4001-43923
45	DR-4019-43442
46	BR-35002
47	ME-10078
48	ME-20637
49	ME-20638
50	ME-20639
51	DE-45897 / ME-20642
52	MY-20643
53	BR-40005
54	DE-43130
55	ME-20644
56	ME-20616
57	ME-20615
58	ME-20619
59	ME-10075
60	BR-60015
61	ME-20659
62	DE-46793
63	ME-20000
64	ME-20617
65	ME-20618
66	ME-20620
67	ME-20100
68	ME-20101
69	ME-20864
70	ME-20662





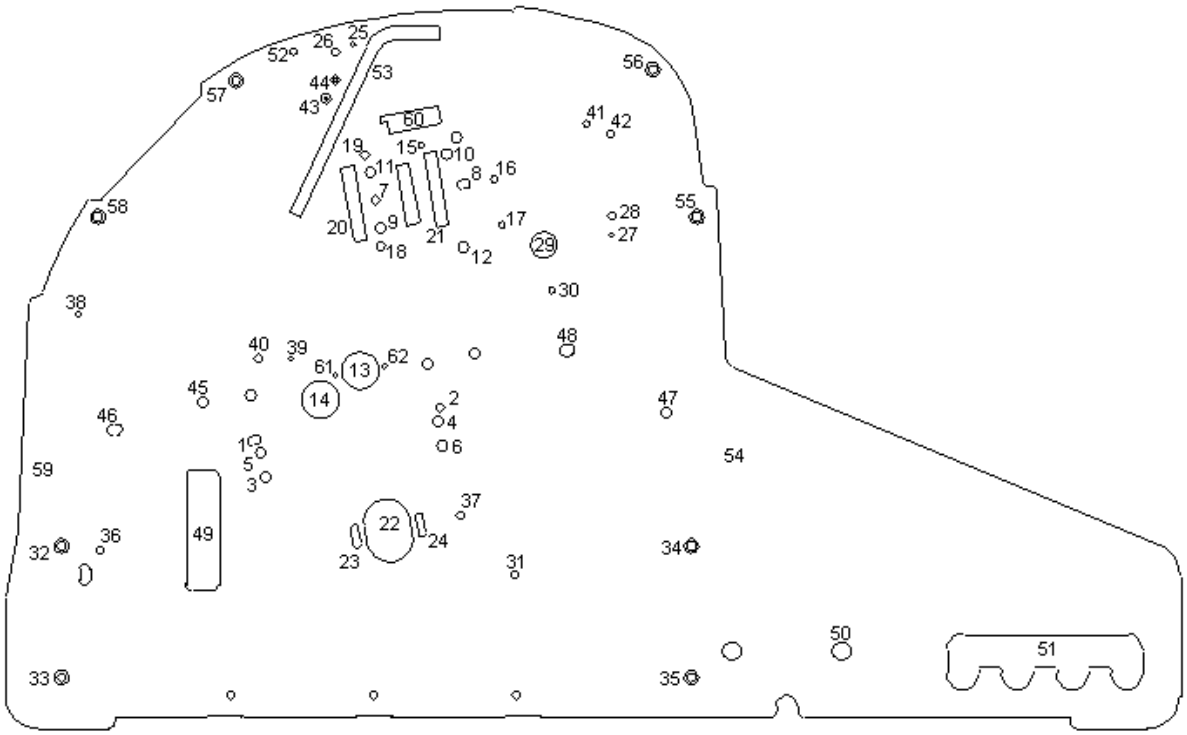


8.17. Sideplate left (ME-20599).



1 – 6	:	X-rail
7 – 12	:	Y-rail
13 – 16	:	Bracket Return Pulley
17 – 18	:	Y-belt
19 – 22	:	L-bracket
23	:	Hex shaft
24 – 27	:	Left metal box
28 – 31	:	Platen Front & Rear
32	:	Slip-ring block screw
33	:	Fixed conveyor roll
34	:	Adjustable conveyor roll
35	:	Transparent Cover shaft
36	:	Lip Cover Left
37 – 42	:	Cover Left
43	:	Sheet off knock piece
44	:	Rubber tap
45		Left pinch roller block screw M4x20
46		Position indication rail removal
47		Screw plate removal

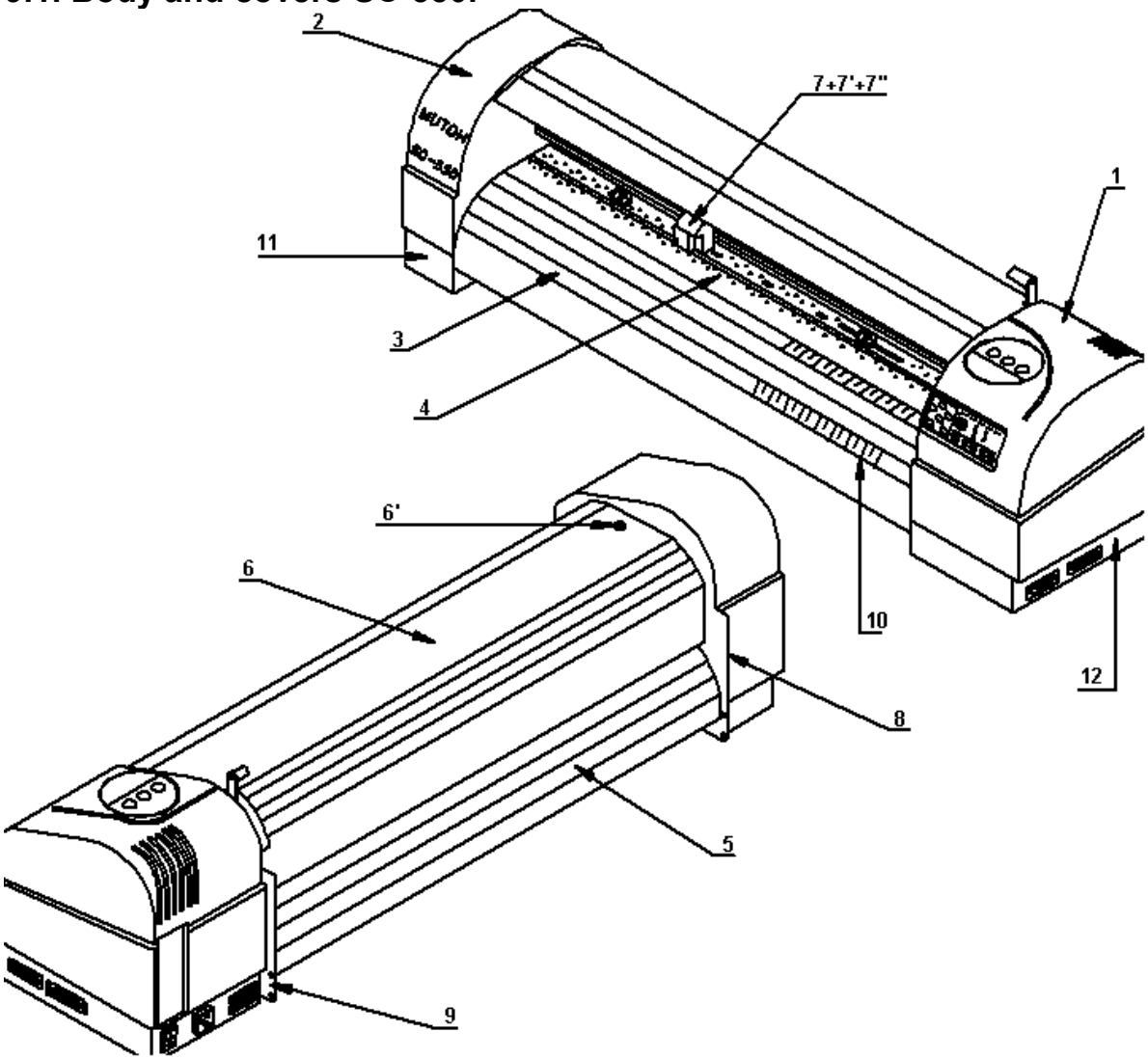
8.18. Sideplate right (ME-20600).



1 – 6	:	X-rail
7 – 12	:	Y-rail
13	:	Grid shaft
14	:	Cables paper sensors
15 – 19	:	Y-motor bracket
20 – 21	:	Y-belt
22 – 24	:	X-motor
25 – 28	:	L-brackets
29	:	Hex shaft
30	:	Spacer
31	:	Hinge point UP/DOWN mech.
32 – 35	:	Right metal box
36	:	Hinge point UP/DOWN mech.
37	:	Attachment screw for spring
38	:	Rubber
39 – 40	:	Cable guide
41 – 42	:	UP/DOWN sensor bracket
43 – 44	:	Cover sensor
45 – 48	:	Platen front & rear
49	:	Cables → PCB box
50	:	Fixed conveyor roll
51	:	Adjustable conveyor roll
52	:	Transparent cover shaft
53	:	Cover right
54 – 59		Cover right
60		Cables FFC & cover sensor
61 – 62		Screws for bearing

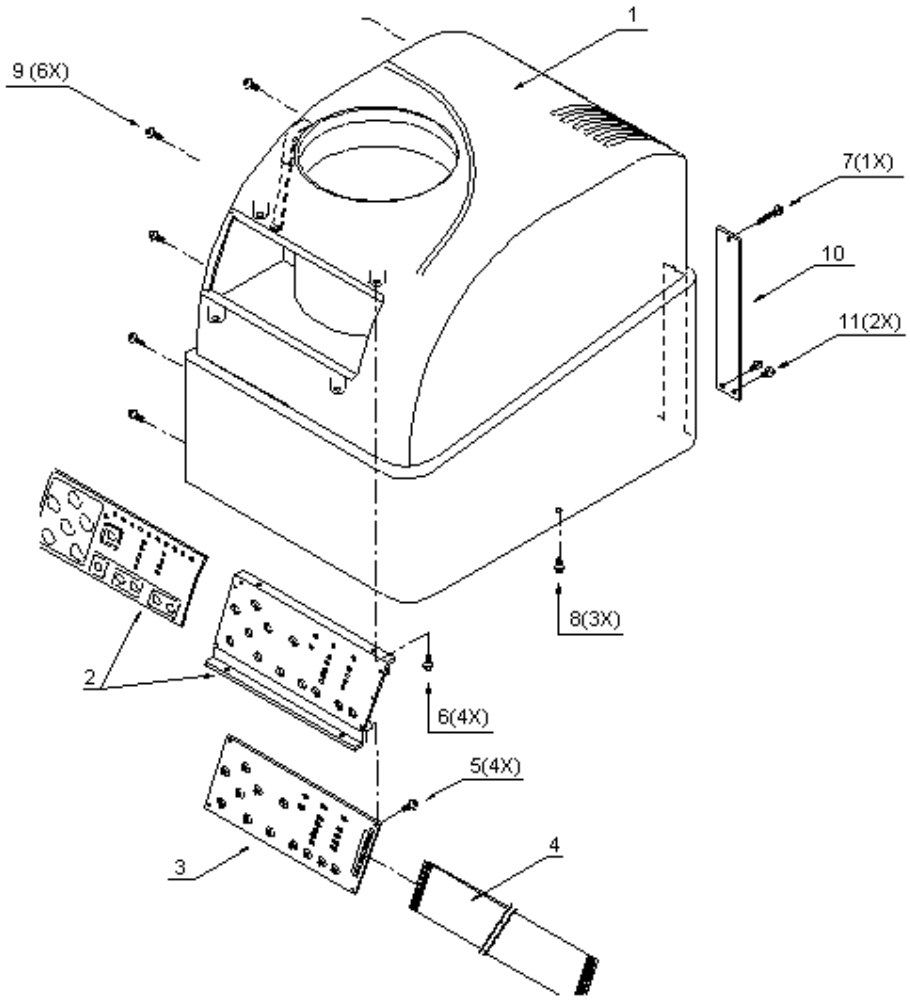
9. PARTS LISTS SC-550.

9.1. Body and covers SC-550.



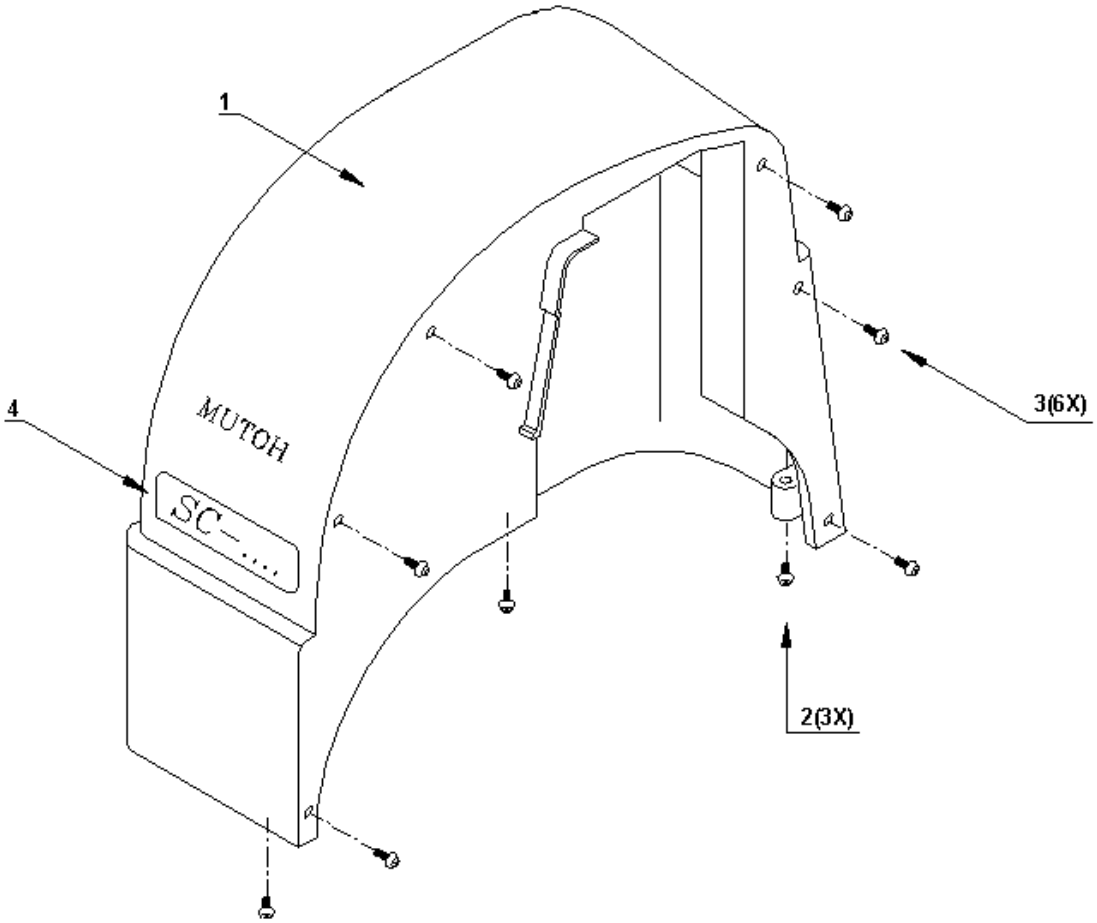
Ref.	Description	Partnumber	Qty
1	Cover right	ZME-20654	1
2	Cover left SC-550	ZME-20555	1
3	Front platen assy SC-550	MY-20502	1
4	Grid cover SC-550	ME-20550	1
5	Rear platen SC-550	ME-20502	1
6	Y-rail cover SC-550	ME-20530	1
6’	Screw 2.9 x 9.5	BM-2102-129905	4
7	Head cover	DE-20911A	1
7’	Screw M2x4	DR-4004-45105	1
7”	Screw M2x10	DR-4004-45100	1
8	Side plate left	ME-20554	1
9	Side plate right	ME-20555	1
10	Alignment sticker	LB-10017	2
11	Bottom cover left	ME-20552	1
12	Bottom cover right	ME-20556	1

9.2. Cover right + keyboard assy SC-550.



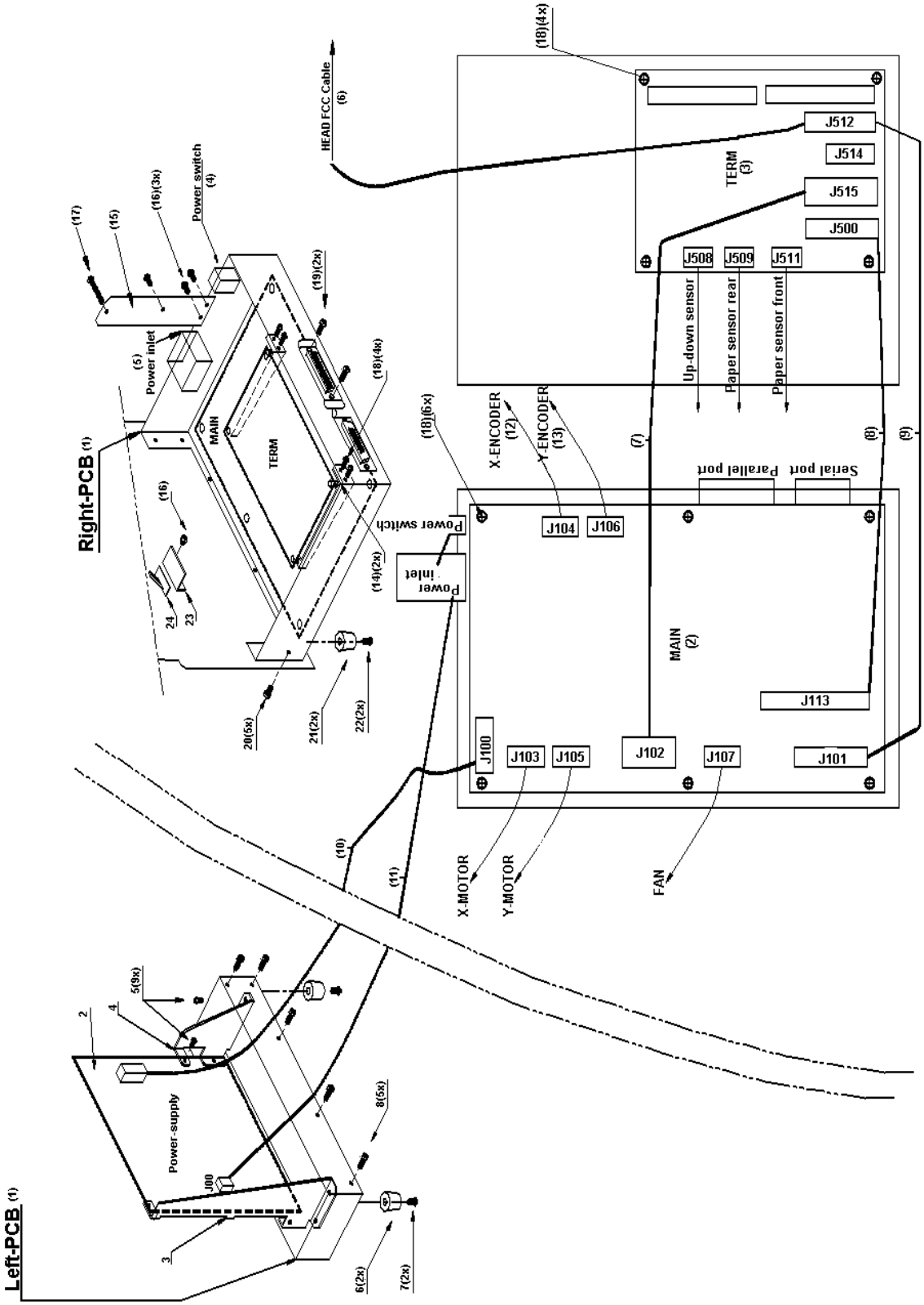
Ref.	Description	Partnumber	Qty
#	Cover + keyboard assy	MY-20654	1
1	Cover right	ZME-20654	1
2	Keyboard panel	MY-20621	1
3	PCB keyboard	EY-20574	1
#	Keyboard assy (complete)	EY-20654	1
4	Cable term → keyboard	MK-60866	1
5	Screw 3.0x8 plastite	BM-2400-103008	4
6	Screw M3x6	DR-4001-43331	4
7	Screw M3x25	DR-4005-44614	1
8	Screw M3x8	DR-4001-43329	3
9	Screw 3.0x10	BM-2301-503010	6
10	Cover plate	ME-20658	1
11	Screw M3x4	DR-4001-43993	2

9.3. Cover left assy SC-550.



Ref.	Description	Partnumber	Qty
1	Cover left SC-550	ZME-20555	1
2	Screw M3x8	DR-4001-43329	3
3	Screw 3.0x10	BM-2301-503010	6
4	Label SC-550	LB-20550	1

9.4. PCB box left and right SC-550.



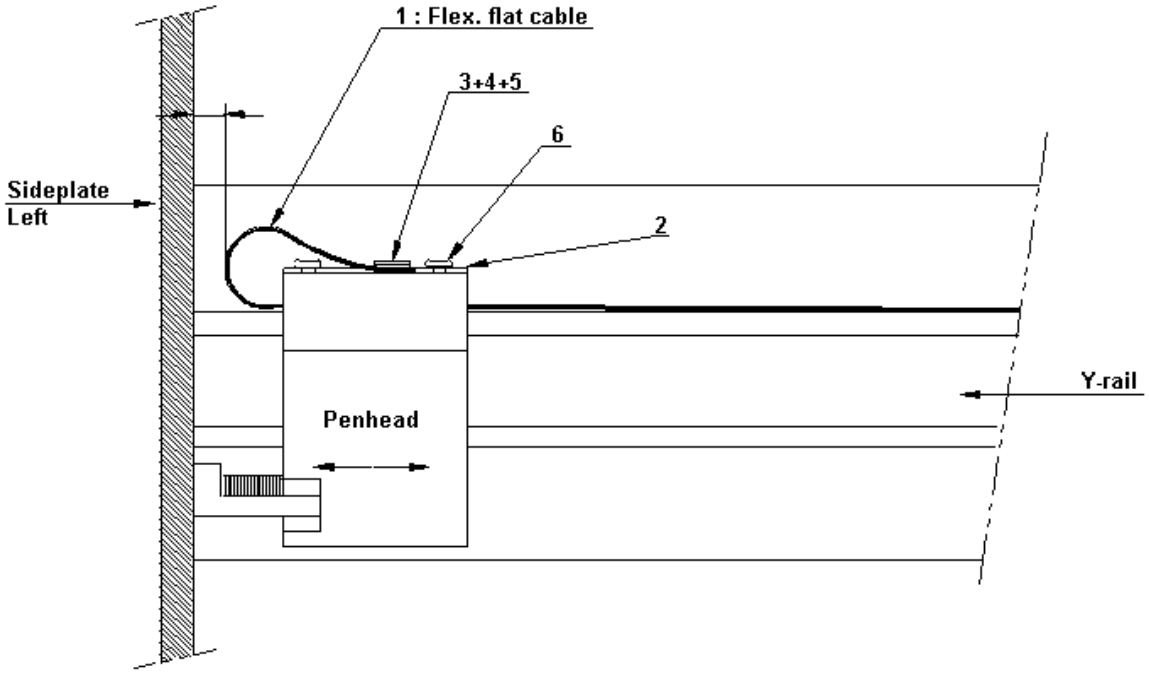
PCB box right parts list

Ref.	Description	Partnumber	Qty
1	Right PCB box	ME-20556	1
2	Main PCB SC-550 1st version	EY-22570	1
2	Main PCB SC-550 2nd version	EY-23570	1
3	Terminal PCB SC 1st version	EY-20573	1
3	Terminal PCB SC 2nd version	EY-21573S	1
4	Power ON/OFF switch	DE-43074	1
5	Power inlet	DE-44745	1
6	Head FCC cable	MK-60867	1
7	Cable j102 → J515	MK-60865	1
8	Cable J113 → J500 1st version	MK-60627	1
8	Cable J130 → J500 2nd version	MK-41200	1
9	Cable J101 → J512 1st version	MK-60864	1
10	Cable P/S → mainboard	MK-51550	1
11	Cable switch → P/S	MK-81550	1
12	Extens. Cable X-encoder	MK-41500	1
13	Extens. Cable Y-encoder	MK-41501	1
14	Bracket Terminal board	ME-20508	2
15	Plate cover right	ME-20658	1
16	Screw M3x4	DR-4001-43993	3
17	Screw M3x25	DR-4005-44614	1
18	Screw M3x6	DR-4001-43923	14
19	Screw M3x10 (Interf.)	DR-4007-44129	2
20	Screw hex M3x8	BM-6301-603008	5
21	Rubber floot	BR-40040	2
22	Screw hex M4x8	BM-6200-604008	2
23	Cable bracket	ME-20634	1
24	Cable guide	AE-91025	7
24’	Cable guide	AE-92788N	1

PCB box left parts list.

Ref.	Description	Partnumber	Qty
1	Left PCB box	ME-20552	1
2	Power supply board	DE-31396	1
3	Bracket P/S left	ME-20510L	1
4	Bracket P/S right	ME-20510R	1
5	Screw M3x6	DR-4001-43923	5
5	Screw M3x4	DR-4001-43993	4
6	Rubber foot	BR-40040	2
7	Screw hex M4x8	BM-6200-604008	2
8	Screw hex M3x8	BM-6301-603008	5

9.5. Penhead flex cable assy SC-550.



Ref.	Description	Partnumber	Qty
#	Head FCC cable assy	MY-20571	1
1	Head FCC cable SC	MK-60867	1
2	Head cable PCboard	EY-20571	1
3	Strain relief plate	ME-20665	1
4	Strain relief rubber	ME-20666	1
5	Screw M3x6 strain relief	BM-1400-003006	2
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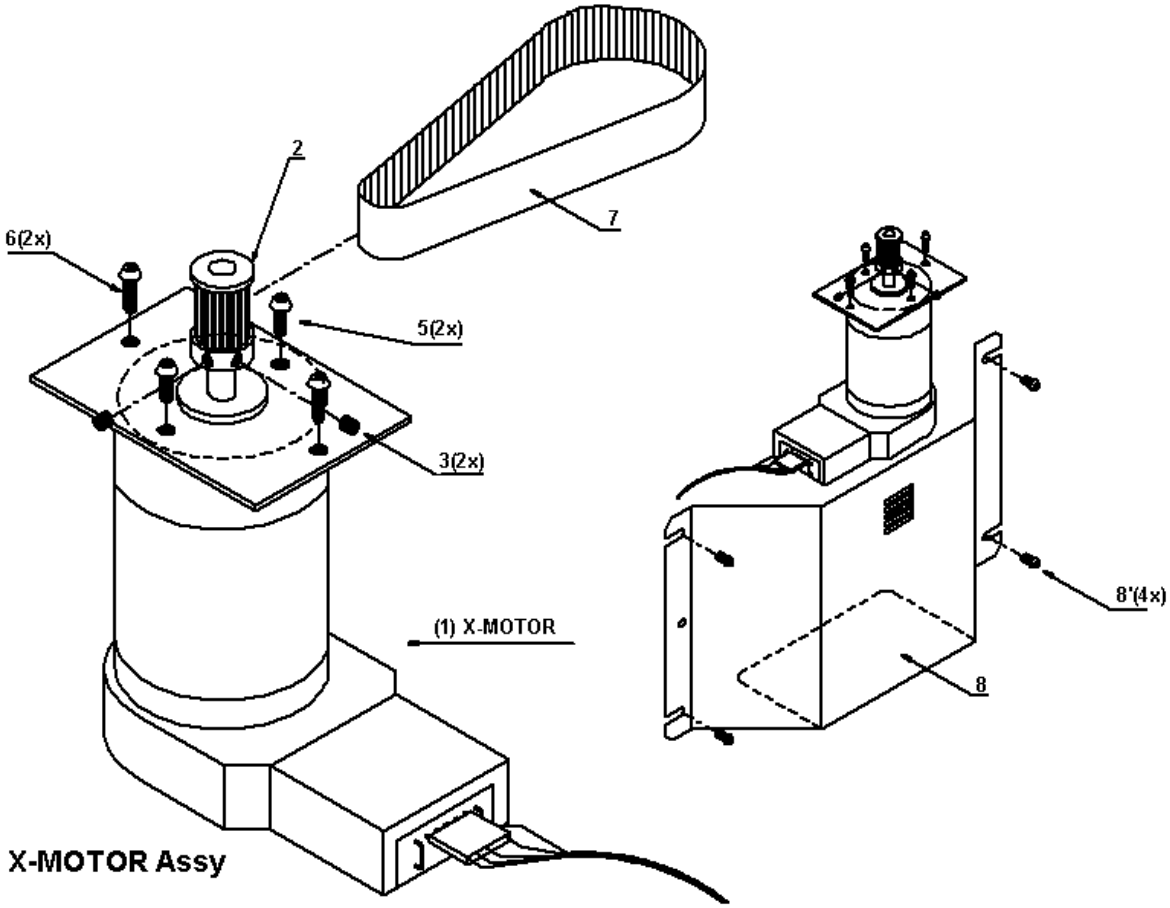
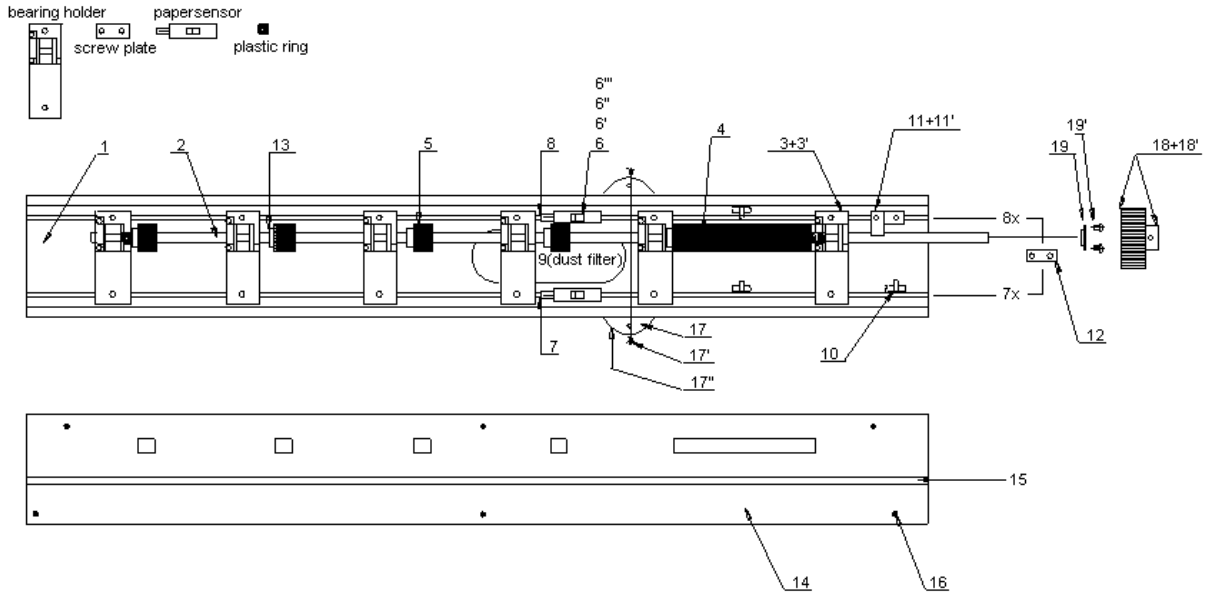
6	Screw M3x4	DR-4001-43993	2

9.6. X-motor Assy SC-550.



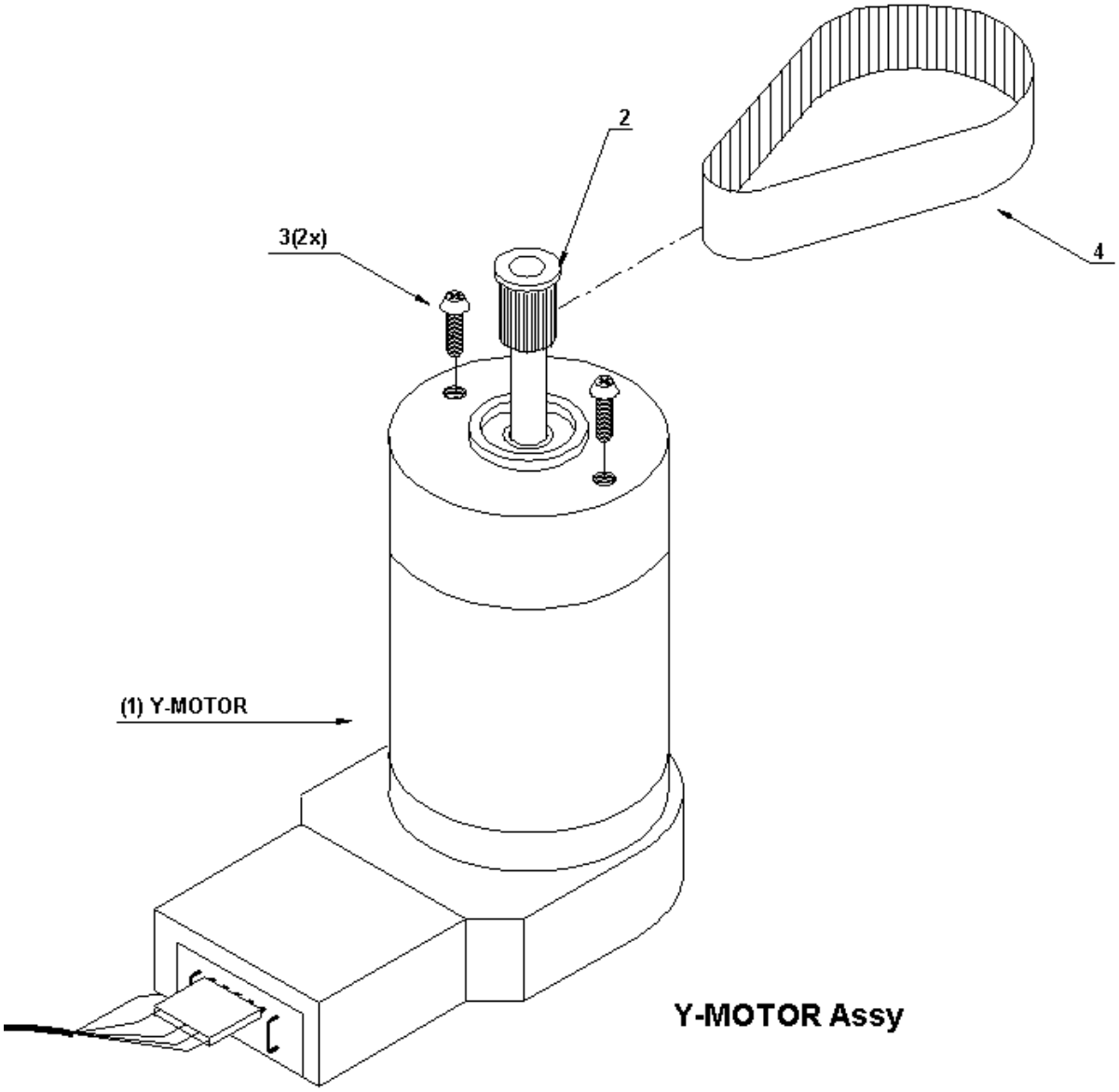
Ref.	Description	Partnumber	Qty
#	X-motor assy	EY-10002	1
1	X-motor	EE-10002	1
2	Drive pulley	DE-46568	1
3	Set screw	DR-4007-43352	2
4	X-motorplate	ME-20505	1
5	Screw M4x8	DR-4001-43396	2
-	----------	----------	-
6	Screw M4x10	DR-4001-43317	2
7	X-drive belt	DE-44157	1
8	X-motor cover	ME-20501	1
8’	Screw M4x8	DR-4001-43396	4

9.7. X-rail assy SC-550.



Ref.	Description	Partnumber	Qty
#	X-rail assy SC-550	MY-5500-10400	1
1	X-rail SC-550	ME-10405	1
2	Grid shaft	ME-20509	1
3	Bearing holder	MY-32227	6
3’	Screw M4x8	DR-4008-44543	12
4	Grid roll 95 mm	DE-44800	1
5	Grid roll 14 mm	DE-44142	4
6	Paper sensor	E-PS-R50LA	2
6’	Paper sensor bracket	ME-20629	2
6”	Screw M3x8.5 sensor	DS-1054-40883	2
6“’	Screw M4x6 bracket	DR-4008-41838	2
7	Cable sensor front	MK-41702	1
8	Cable sensor rear	MK-41703	1
9	Dust filter	DE45-903	1
10	Cable guide	AE-91025	3
11	Earth plate	DE-45118	1
11’	Screw M4x8	DR-4001-43396	1
12	Screwplate	DR-2164-41836	15
13	Plastic spacer	BR-40710	2
14	Grid cover	ME-20550	1
15	Cutting mat	ZME-10129	3
16	Screw M2x5	BM-6301-602005	6
--	----------	----------	-
17	Fan	EE-50761	1
17’	Screw 3.5x32	BM-2100-135032	2
17”	Fan cover	ME-20668	1
18	Gear grid shaft	DE-46555	1
18’	Set screw M3x3	DR-4007-43352	2
19	Bearing grid shaft	DE-46563	1
19’	Screw M3x4	DR-4001-43993	2

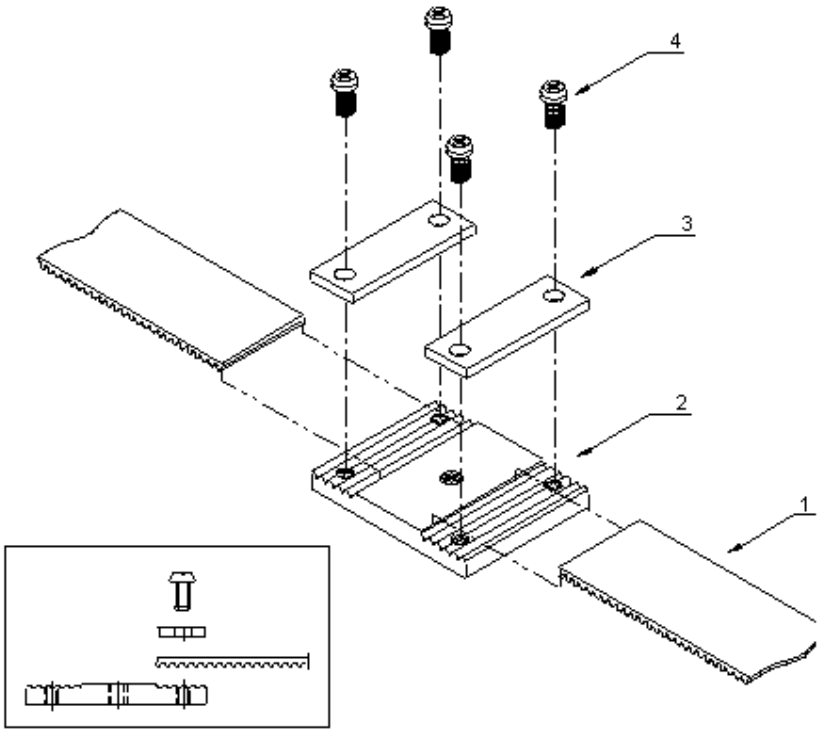
9.8. Y-MOTOR Assy SC-550.



Y-MOTOR Assy

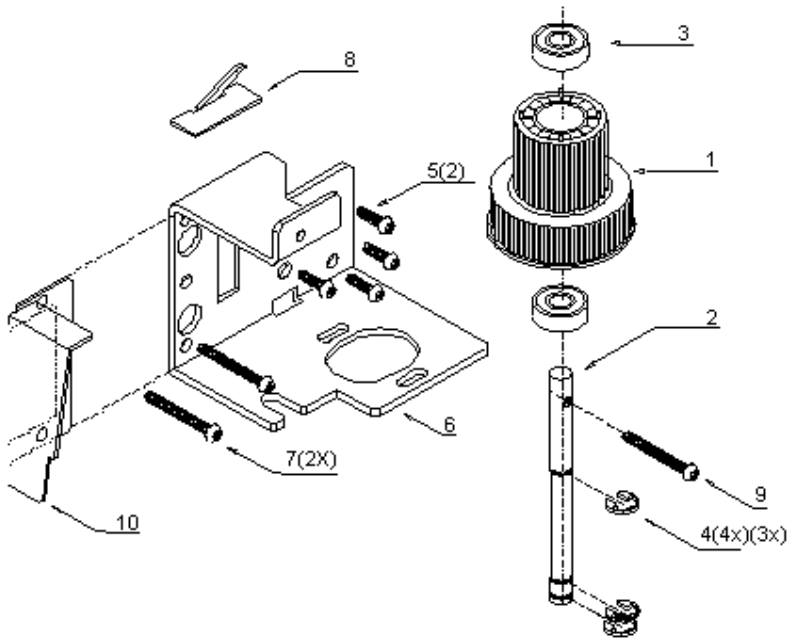
Ref.	Description	Partnumber	Qty
#	Y-motor assy	EY-1012	1
1	Y-motor	DE-32442	1
2	Drive pulley	DE-4707	1
-	----------	----------	-
3	Screw M4x10	DR-4001-43317	2
4	Y-reduction belt	DE-47079	1

9.9. Y-axis drive belt assy SC-550.



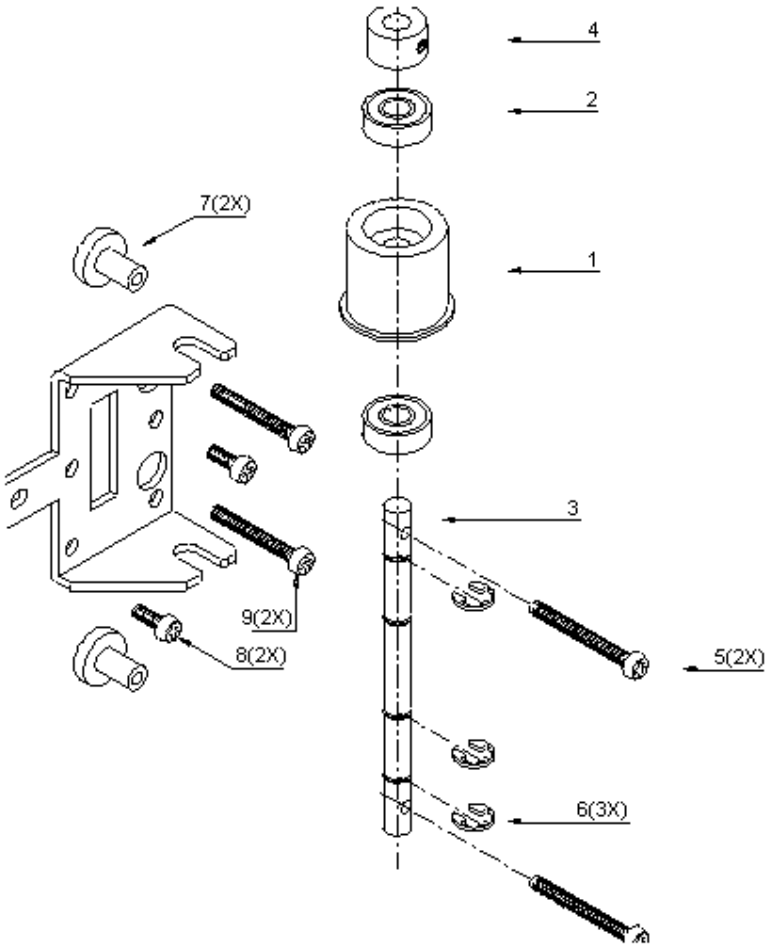
Ref.	Description	Partnumber	Qty
#	Y-drive belt assy	MY-20561	1
1	Y-drive belt SC-550	ME-20561	1
2	Belt connection plate	ME-10107	1
3	Pressure plate	ME-10108	2
4	Screw M3x6	DR-6210-303006	4

9.10. Y-drive pulley assy + mounting bracket SC-550.



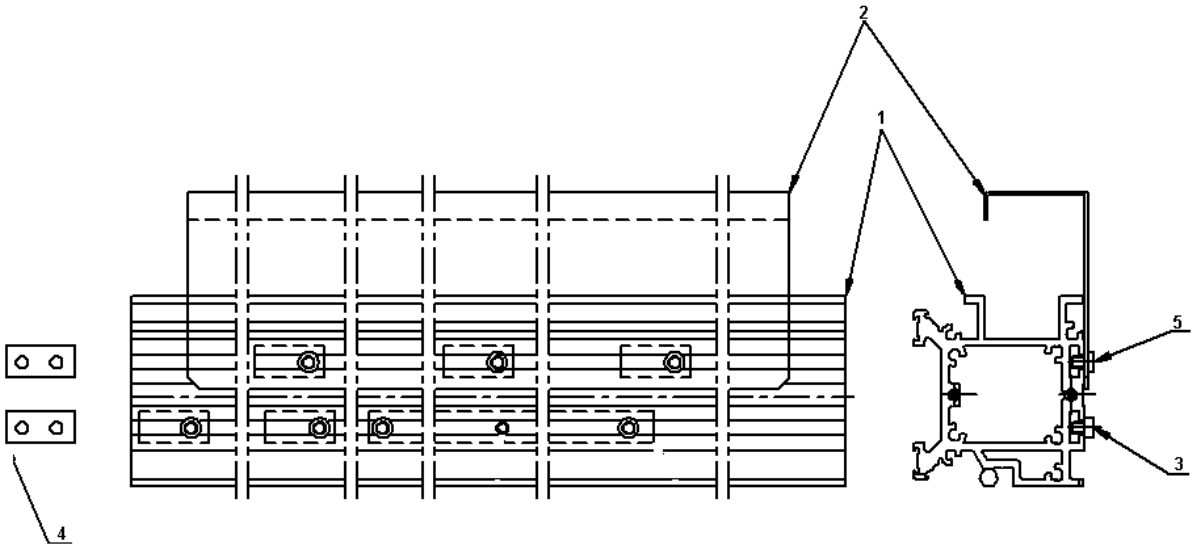
Ref.	Description	Partnumber	Qty
#	Y-drive pulley assy	MY-47557	1
1	Y-drive pulley	DE-47057	1
2	Shaft	ME-20057	1
3	Bearing	DE-47095	2
4	E-ring	BR-41040	4 (3)
-	----------	----------	-
5	Screw M3x8	DR-4001-43329	2
6	Y-motor bracket	ME-20507	1
7	Screw 3.5x25	BM-2100-13505	2
8	Cable holder	AE-91025	1
9	Screw M3x25	DR-4005-44614	1
10	Cable support plate	ME-10109	1

9.11. Y-axis return pulley assy SC-550.



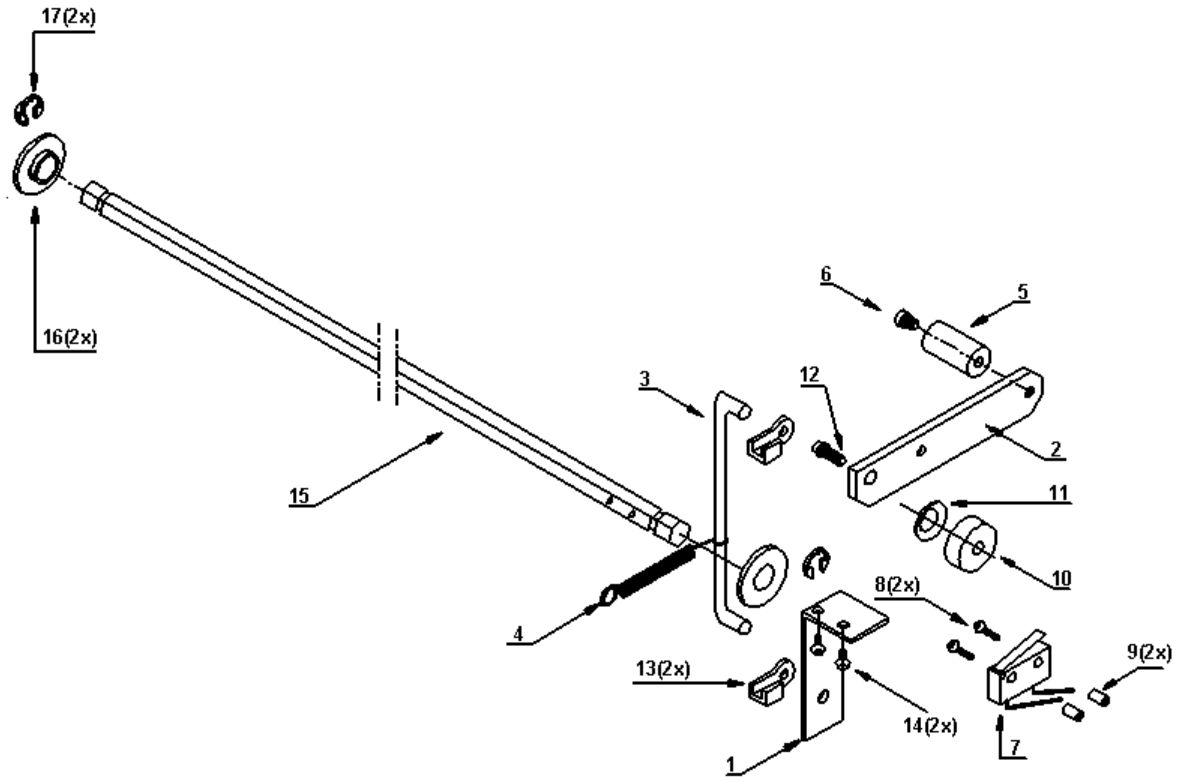
Ref.	Description	Partnumber	Qty
#	Return pulley assy	MY-47675	1
1	Return pulley	DE-47075	1
2	Bearing	DE-47095	2
3	Shaft	ME-20058	1
4	Set-ring and screw	BR-32000	1
5	Screw M3x30	DR-4001-45094	2
6	E-ring	BR-31040	3
-	----------	----------	-
#	Return pulley bracket	ME-20607	1
7	Screw foot (plastic)	DE-47091	2
8	Screw M3x8	DR-4001-43329	2
9	Screw 3.5x25	BM-2100-135025	2

9.12. Y-rail assy SC-550.



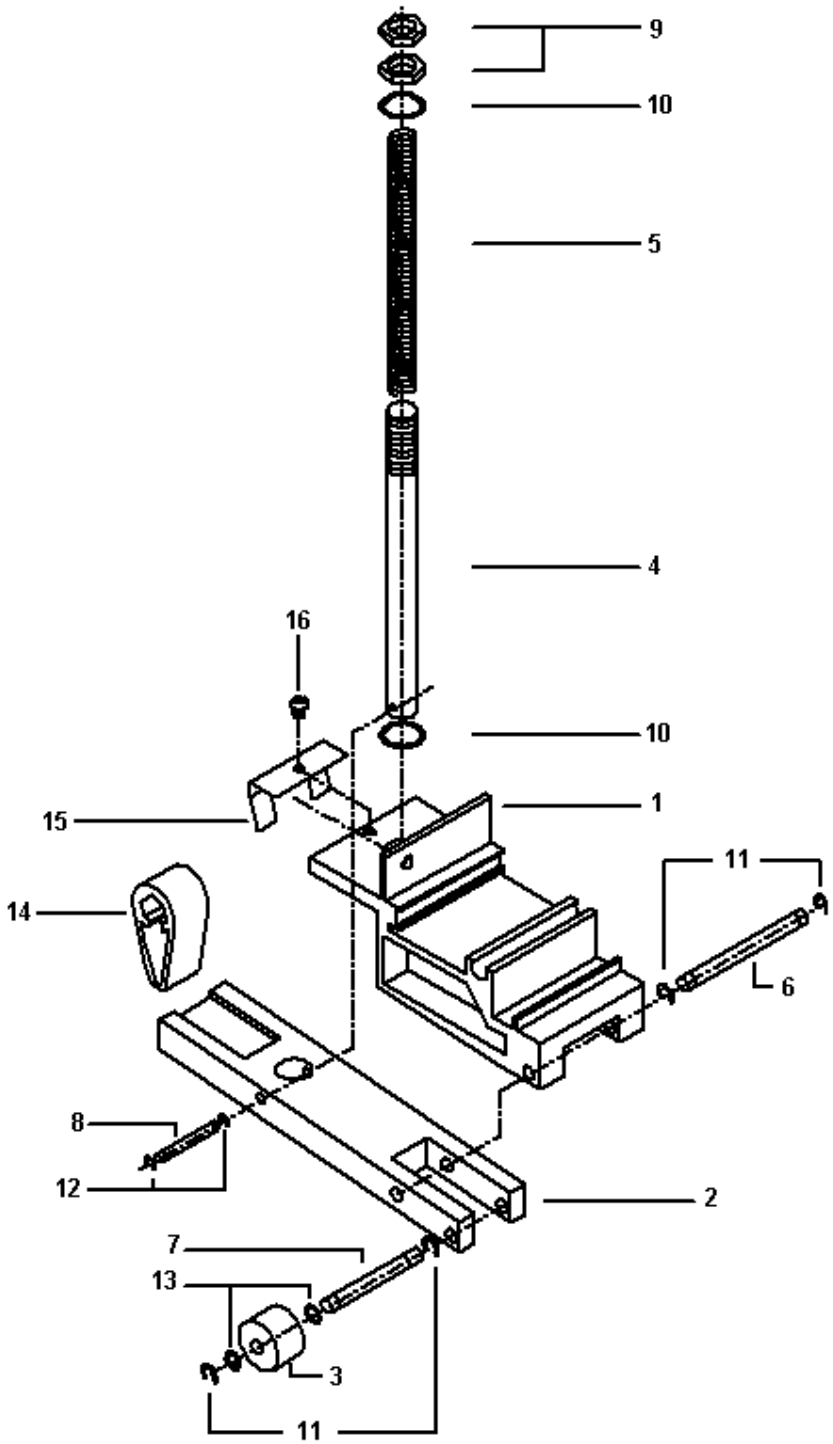
Ref.	Description	Partnumber	Qty
1	Y-rail SC-550	ME-10406	1
2	FCC cable guide SC-550	MY-20507	1
3	Screw M4x6 black	DR-4008-41838	4
4	Screwplate	DR-2164-41836	7
5	Screw M4x6	BM-6200-60400	3

9.13. Pressure roller UP/DOWN mechanism SC-550.



Ref.	Description	Partnumber	Qty
1	Turn over plate	ME-20503	1
2	Pressure lever	ME-20524	1
3	Transmission shaft	ME-20504	1
4	Spring	DE-45673	1
5	Knob UP/DOWN	ME-20640	1
6	Hex screw M4x6	DR-4008-41834	1
7	µ Switch UP/DOWN	E-41761	1
8	Screw M2x14	BM-5000-002014	2
9	Plastic spacer	BR-40301	2
10	Spacer	BR-10011	1
11	Spring washer	BR-24650	1
12	Screw M4x16	DR-4001-44611	1
13	Clamp shaft	DE-44782	2
14	Screw M3x8	DR-4001-43329	2
15	Hex. Shaft	ME-20776	1
16	Plastic bearing	BR-40010	2
17	E-ring	BR-31070	2

9.14. Pressure roller assy SC-550.



Ref.	Description	Partnumber	Qty
#	Pressure roller assy	MY-10402	1
1	Pressure base	ME-10402	1
2	Pressure arm	ME-10095	1
3	Pressure roller	DE-44190	1
4	Spring shaft	ME-20611	1
5	Spring	ME-20611	1
6	Pivot shaft	ME-20613	1
7	Roller shaft	ME-20614	1
8	Connection shaft	ME-20612	1
9	Hex nut M8	BM-9104-108004	2
10	Washer	BR-14338	2
11	E-ring 3.2	BR-31032	4
12	E-ring 2.3	BR-31023	2
13	Plastic washer	DE-44192	2
-	----------	----------	-
14	UP/DOWN cam	ME-10403	1
15	Cam bracket	ME-20647	1
16	Screw M3x4	DR-4001-43993	1

9.15. Cutting head assy SC-550.