

Maintenance Manual

Spirit/Spirit LS/Spirit GLS/GLS Hybrid



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Chapter 1 : Overview

1.1 Introduction

This manual is prepared for distributors to maintain or repair JF240-UV Printer. Briefly,

- Chapter 1 is the introduction of contents, safety and operating environment
- Chapter 2, we have diagrams to show the part number for every part in different sections.
- Chapter 3, introduction for electrical system
- Chapter 4, introduction to show you how to replace parts
- Chapter 5, deals with the laser system for laser tube · beam & optical alignment.
- Chapter 6, an instruction to show you how to upgrade firmware
- Chapter 8, trouble shooting & system diagnostics

Manual contents may be subject to change without notice. Please contact GCC Customer Service

by calling at 886-2-2694-6687 or e-mailing to tech.support@gccworld.com for services.

1.2 Safety

1.2.1 The Safety Interlock System

The laser system is equipped with a safety interlock system utilizing magnetic sensors on the top and side access doors, laser-activation and door LED lights on the control panel. The magnetic sensors will deactivate the laser when either door is opened. At this time, the “door” LED light found on the control panel will illuminate, indicating an open or improperly closed door. When the laser is in operation, the “laser” LED will illuminate to inform the operator that the laser is activated. If at any time, any of the access doors are open and the “laser” LED is illuminated, IMMEDIATELY unplug the laser system and contact GCC service team for technical support and maintenance instructions.

WARNING

- DO NOT operate the laser system if any component of the safety system is malfunctioning.
- DO NOT attempt to remove or modify any component of the safety interlock system.

1.2.2 Product Label

This label is located at the right-back side of machine. All the product information such as Serial Number, Model Numbers, Laser Power and Electric power can be found here. Before requiring any further tech support, always provide the service person with the information on this label.

1.2.3 Safety Measures

- **LASER RADIATION WARNING:** Exposure to laser radiation may result in physical burns and severe eye damage. Proper use and regular maintenance of this machine is important to the safety of all people in the immediate area.
- Prior to operation, carefully read and familiarize yourself with the warning labels located on both your laser system and in this manual.
- Never leave the machine unattended during the laser cutting and engraving process. The laser may ignite combustible materials. A well-maintained fire extinguisher and operational smoke or fire detector should be kept in the vicinity of the machine.
- Caution—Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- Resulting debris from laser cutting are very dangerous and may cause fire hazard.
- **DO NOT** leave debris and scraps inside laser machine after job finished. Always keep machine clean after job finished.



WARNING

- Resulting debris from laser processing are very dangerous and may cause fire hazard
- **DO NOT** leave debris and scraps inside laser machine after job finished. Must keep machine clean after job finished.
- Always remove the vector grid to clean any small pieces that have fallen through the grid.

NOTE

SmartGUARD™ is an optional fire detection alarm system developed by GCC. Contact your local GCC authorized distributor for more details to have this safety option installed onto your system.

- Enable the SmartAIR™ nozzle when engraving or cutting materials that may easily ignite, such as acrylic, wood, or paper.
- Always wear safety goggles when the laser system is in operation. Reflective materials such as mirrors, enameled brass and anodized aluminum may partially-reflect some of the invisible laser radiation. Severe eye damage may occur if proper safety goggles are not worn.

NOTE

Each LaserPro laser machine is shipped with a single pair of safety goggles. If additional safety goggles are required, please contact GCC directly or an authorized GCC distributor. If you wish to purchase one on your own, please make sure the safety goggles meet these requirements:

10600 nm OD5+

Visible Light Transmission: 92.9%

- Connect the machine to a properly grounded power outlet. Ensure the voltage of the power source is identical to the voltage of the machine.
- Do not open the laser access panel when the machine is plugged in.
- Do not attempt to modify or disassemble the laser module.
- Do not attempt to remove or modify any component of the machine's laser interlock safety system.
- Ensure the immediate work area of the machine is well-ventilated. Odors, vapors, and dust are by products generated during the laser engraving and cutting process. An exhaust system, vacuum cutting box, and honeycomb table are recommended. Please contact GCC or your local GCC distributor for more information.
- Do not laser heat-sensitive surfaces or materials that may generate toxic fumes, such as PVC and Teflon.
- Regularly clean and maintain your machine according to our cleaning and maintenance Instructions in Chapter 8. Doing so will ensure your machine will operate effectively and safely over a long period of time.

1.2.4 Operating Environment

Please follow the guidelines when considering a suitable location to set the LaserPro Spirit Series. Improper work environments may lead to operational malfunction and/or unsafe working conditions. The LaserPro Spirit Series should be placed and operated in a standard office-type environment.

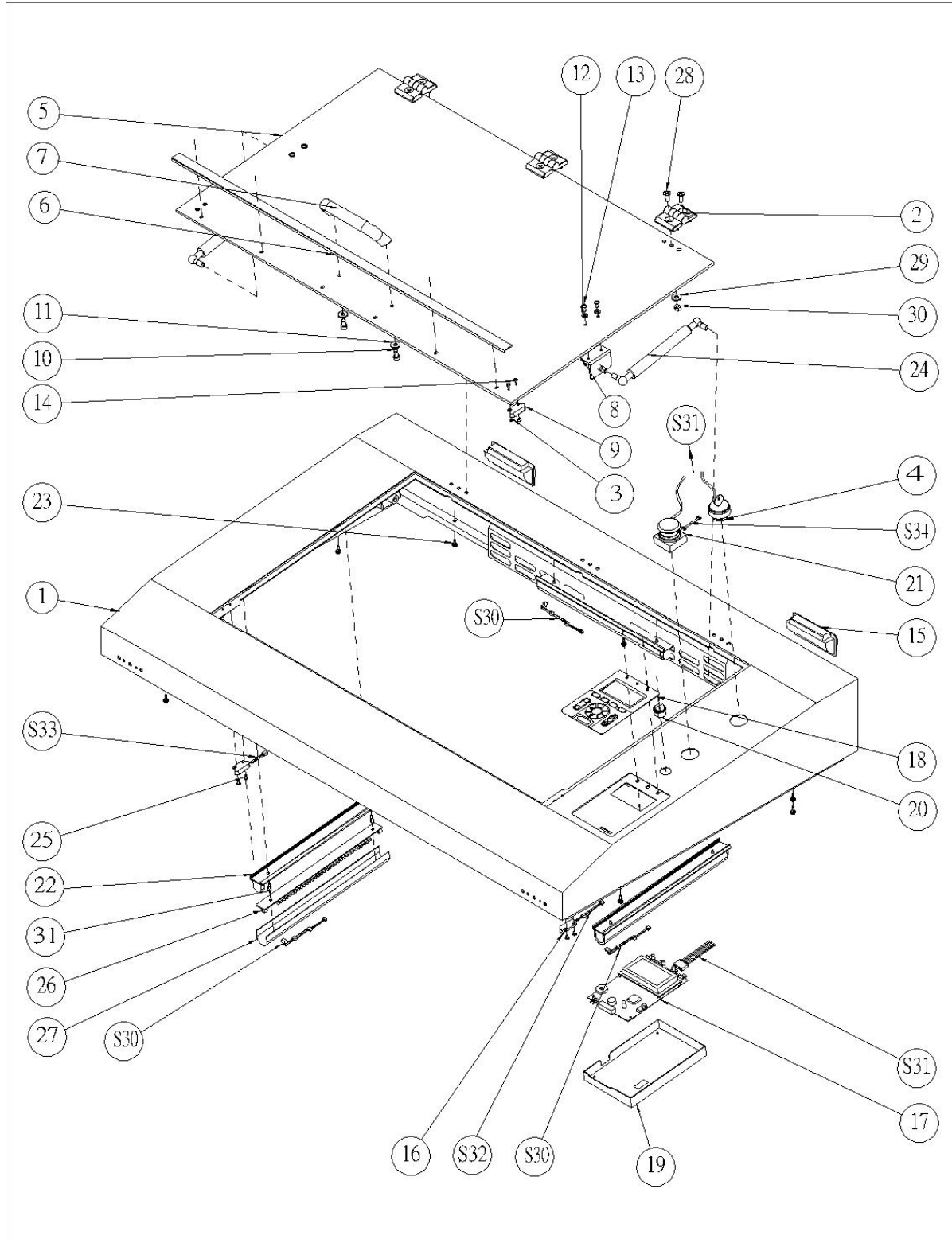
- Avoid environments where the machine is exposed to high levels of dust, temperature (temperature exceeding 30°C or 85°F) or humidity (humidity exceeding 70% or where the ambient temperature is near the dew point).
- Avoid small, enclosed areas with poor ventilation.
- Avoid areas with high levels of noise and electrical noise.
- Select a location that is large enough to accommodate the LaserPro Spirit Series, an exhaust system, a computer and a work or storage table.
- Select a location in which the ambient temperature remains between 15°C and 30°C (60°F to 85°F).
- Select a location in which the relative humidity remains between 30% - 40%.

- Select a location in which there is a short, direct path to the fume exhaust system.
- Set the LaserPro Spirit Series on a floor surface that is completely even.
- Make sure your smoke or fire detection system in the immediate area is functioning.
- Setup the machine to be apart from the wall for at least 60 cm (2 feet).

Chapter 2 : Mechanical System

2-1 Spirit

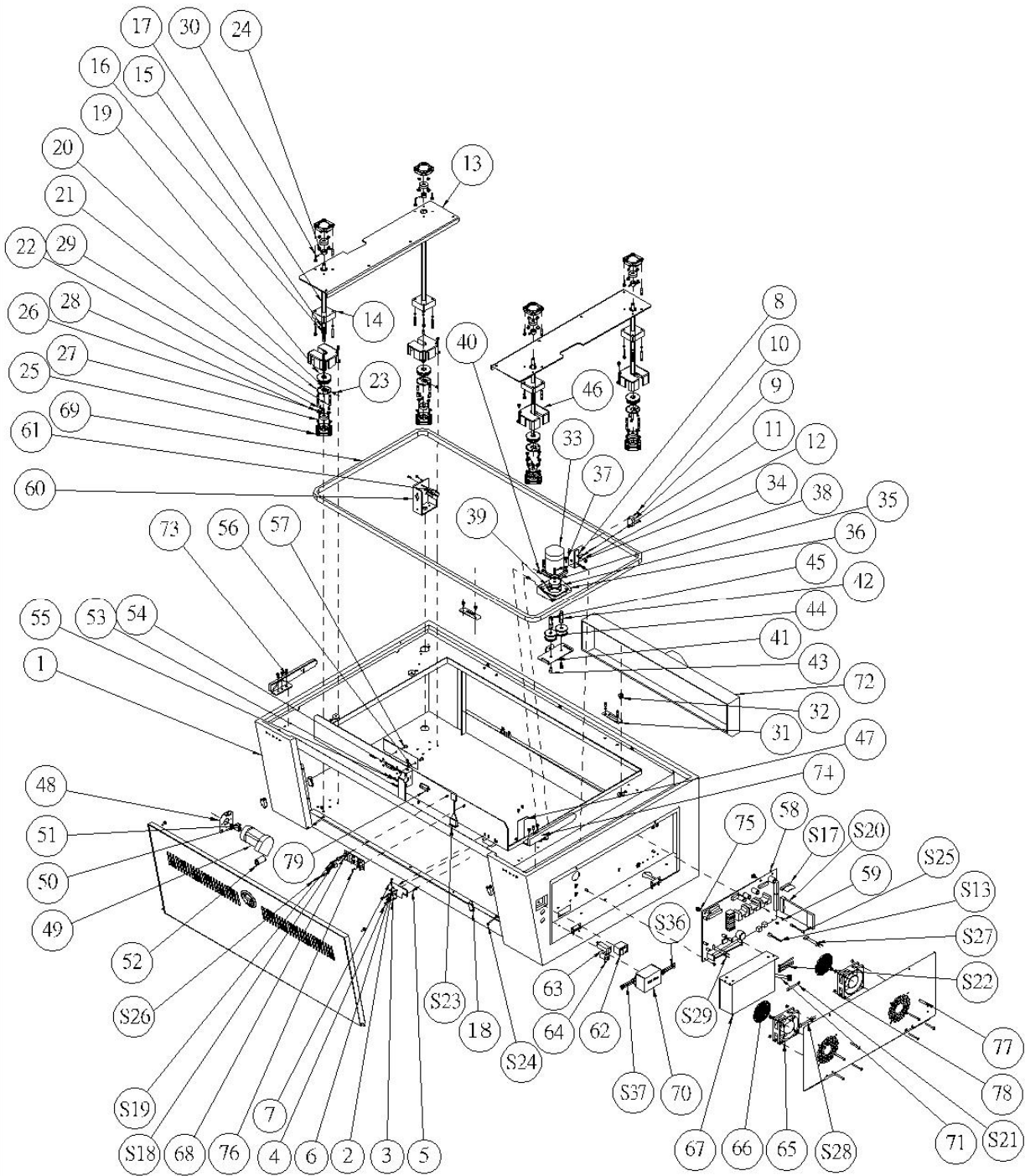
I. Top Cover



Top Cover – Parts List

Item no.	Part no.	Description
1	24403854G	Top cover
2	26500166G	Window Hinge
3	23500013G	Nut(M3xt2.4xS5.5)
4	257000970G	Double pulls out Key Switch (E3K2V2A.V)
5	22803194G	windows
6	24404034G	Window Support Bracket
7	26500165G	Window Handle
8	24400130G	Top Cylinder Bracket
9	22000045G	Magnet MC-12
10	25200299G	Socket head set screw.(M6*12L)
11	26000039G	Flat washer (d6.4*D16.8*t1.6)
12	26000008G	Plastic washer.
13	25200209G	Truss head machine screw(M4*10L)
14	25200115G	Truss head machine screw(M3*6L SUS).
15	23300387G	Plastic Embedded Pulls
16	25700015G	Magnetic Switch
17	29005274G	Keyboard Assembly (8051 F340)
18	23400020G	Control panel sticker
19	24400995G	Key board dust proof cover
20	25700032G	LAMP SW(R13-112)
21	25700095G	Emergency Switch (TN3BKR-2B)
22	22000124G	lamp holder
23	26500210G	Rubber Foot TNF-1
24	26500693G	Window Cylinder.(5kg)
25	25200115G	Truss head machine screw(M3*6L SUS).
26	29004037G	LED LAMP BOARD
27	23300296G	Fluorescent Lamps lampshade
28	25200308G	90° dish flat head machine screw
29	26000039G	Flat washer (d6.4*D16.8*t1.6)
30	23500010G	Nut(M6xt5xS10).
31	22000039G	Hex Screw M3X8L
S30	20901128G	K/B TO LED LAMP CABLE
S31	20900684G	K/B TO STOP SW CABLE (SY003-080(LF))
S32	20900694G	DC12V PCB TO FAN CABLE 1000mm
S33	20900039G	Fan to M/B Cable 2.54-2pin 5cm.
S34	20901927G	Key Switch to Emergency Stop Switch Cable

II. Mid Section



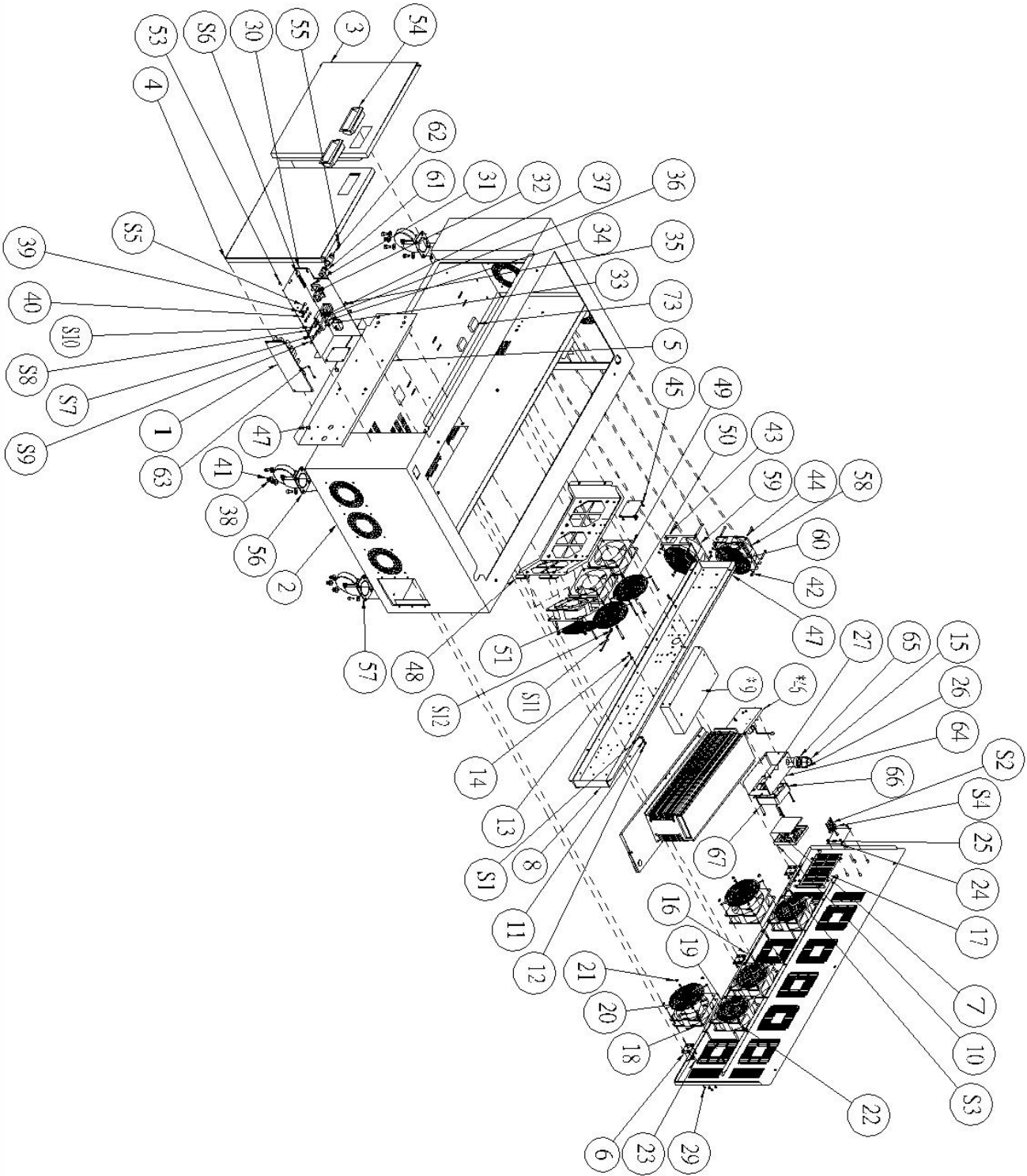
Mid Section – Spare Parts List

Item no.	Part no.	Description	Please order this item
1	20200120G	main unit Assembly - Spirit	
2	24400984G	Z axis top Limit modulate seat	
3	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	
4	25200017G	Truss head machine screw(M3X15L)	
5	25200101G	head set screw_M3x6L	
6	25500041G	Spring for carrier guide roller	
7	25200162G	Socket head set screw.(M3*20L) S	
8	24400985G	Z axis down Limit Switch seat	
9	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	
10	25200017G	Truss head machine screw(M3X15L)	
11	26000016G	Flat washer	
12	25200177G	Socket head set screw.(M4*6L)	
13	24401129G	Working table Bracket	
14	22800130G	Z-axis screw thread	
15	26000016G	Flat washer	
16	25200250G	Socket head set screw-M4x25	
17	22801022G	Z-axis table screw	
18	22000045G	Magnet MC-12	
19	24100368G	Z-axis pully	
20	23500015G	Nut(M4xt3.2xS7)	
21	24100367G	Z-axis pully cover	
22	25200003G	Panhead machine screw-white M3x8	
23	25200173G	Socket headness set screw-M4x6	
24	22800922G	Z axis top stopper	
25	24100366G	Bearing seat	
26	20700034G	Bearing 628ZZ	
27	23500015G	Nut(M4xt3.2xS7)	
28	25200036G	Pan Head tap srcew type-M4x8	
29	25200205G	Socket head set screw_M4x10L	
30	25200237G	Socket head set screw.(M4*16L su	

Item no.	Part no.	Description	Please order this item
31	24401002G	Door-Retaining fixing plate	
32	22800956G	Y slideway actions revise seat	
33	23100017G	STEPPING MOTOR DSH56EL4HA4L0100	
34	26000018G	Spring washer.(d4xD7 SUS)	
35	24700013G	Rubber Packing for Z Motor	
36	24403500G	Z Motor Braclcet	
37	25200214G	Socket head set screw.(M4*12L)	
38	22800622G	z axis pulley (P20-5GT-9)	
39	25200170G	Socket headness set screw.(M4*4L	
40	25200192G	Socket head set screw.(M4*8L sus+coating)	
41	24401000G	Z-axis Idle wheel	
42	22800964G	Core of Z-axis pulley	
43	25200274G	Socket head set screw_M5x10L	
44	22800084G	idle Pulley	
45	24900007G	E-shape retaining ring.d6xD12xt0	
46	24100369G	Belt flange	
47	24403647G	Y-axis detector	
48	24400986G	Y motor fix board	
49	23100022G	DC MOTOR(TS3727N75E5)	29002537G
50	22800960G	X-axis 20 gear	
51	25200090G	Socket headness set screw.(M3*3L	
52	21800003G	EMI CORE(CR-0175-RH001) / (RH17.5*28.5*9.5)	29002537G
53	25200149G	Socket head set screw.(M3*12L)	
54	26000002G	Spring washer.(d3xD5.5xt0.8)sus	
55	25200119G	Socket head set screw.(M3*8L)SUS	
56	24401003G	fire alarm asm cover	
57	25200200G	Truss head machine screw(M4*8L sus).	
58	29005838G	MAIN BOARD(CCD FUNCTION)	
59	25200115G	Truss head machine screw(M3*6L SUS).	
60	24400987G	Mirror Bracket	
61	20200185G	prism mounts Assembly	
62	25700014G	ON/OFF SW	
63	22300003G	FUSE (15A/250V ZE-800)	

Item no.	Part no.	Description	Please order this item
65	22200023G	FAN 80X80X25 DC12V (EE80251S2-0000-999)	
66	22000053G	Fan finger guard(matchAD08024US-A70GL)(G08A5-4HA)	
67	24500022G	MEAN WELL Power Supply ADS-15540 40V/5V	
68	29002510G	Y Motor PCB	
69	20600024G	Z-axis belt (5GT-2910-9)	
70	21800007G	EMI Filter YE10T1L2	
71	22000108G	Varistor (CNR-14D471K-TRK)	
72	24401438G	induced draft box	
73	23300307G	Top Cover left fixed stick	
74	23300308G	Top Cover right fixed stick	
75	22000130G	PC board interval(MCB-6)	
76	25200144G	Truss head machine screw(M3*10L)	
77	25200260G	Pan head machine screw(M4*35L)	
78	23500015G	Nut(M4xt3.2xS7)	
79	25700015G	Magnetic Switch	
S13	20900993G	MainBoard TO LASER DIODE CABLE - Spirit & S290	29003657G
S17	20900640G	Flat cable 850mm 1.0*12PIN	
S18	20900196G	2.54 4Pin40cm OAK XmotorEncoder	29002537G
S19	20900197G	3.96 2Pin 40cm OAK XmotorDriver	29002537G
S20	20900236G	ColdFire Printer flat cable 40Pi	
S21	20900711G	FUSE TO POWER SUPPLY BLACK	
S22	20900721G	POWER TO M/B CABLE	
S23	20900082G	Rotary Kit Cable (Female)	
S24	20900101G	Ground wire of Power Supply	
S25	20901277G	USB B type cable MOLEX 5Pin 2.54mm	
S26	20900098G	M/B FAN Cable(Blue)	
S27	20901010G	MAINBOARD TO DOOR SW CABLE - Spirit & S290	
S28	20900679G	DC12V-PCB TO FAN 2.54*4 CABLE	
S29	20900690G	M/B TO STEEP SW CABLE	
S36	20900677G	Line Filter to P/B & Power	
S37	20900102G	Line filter parallel connection X capacitance.	

III. Base Section



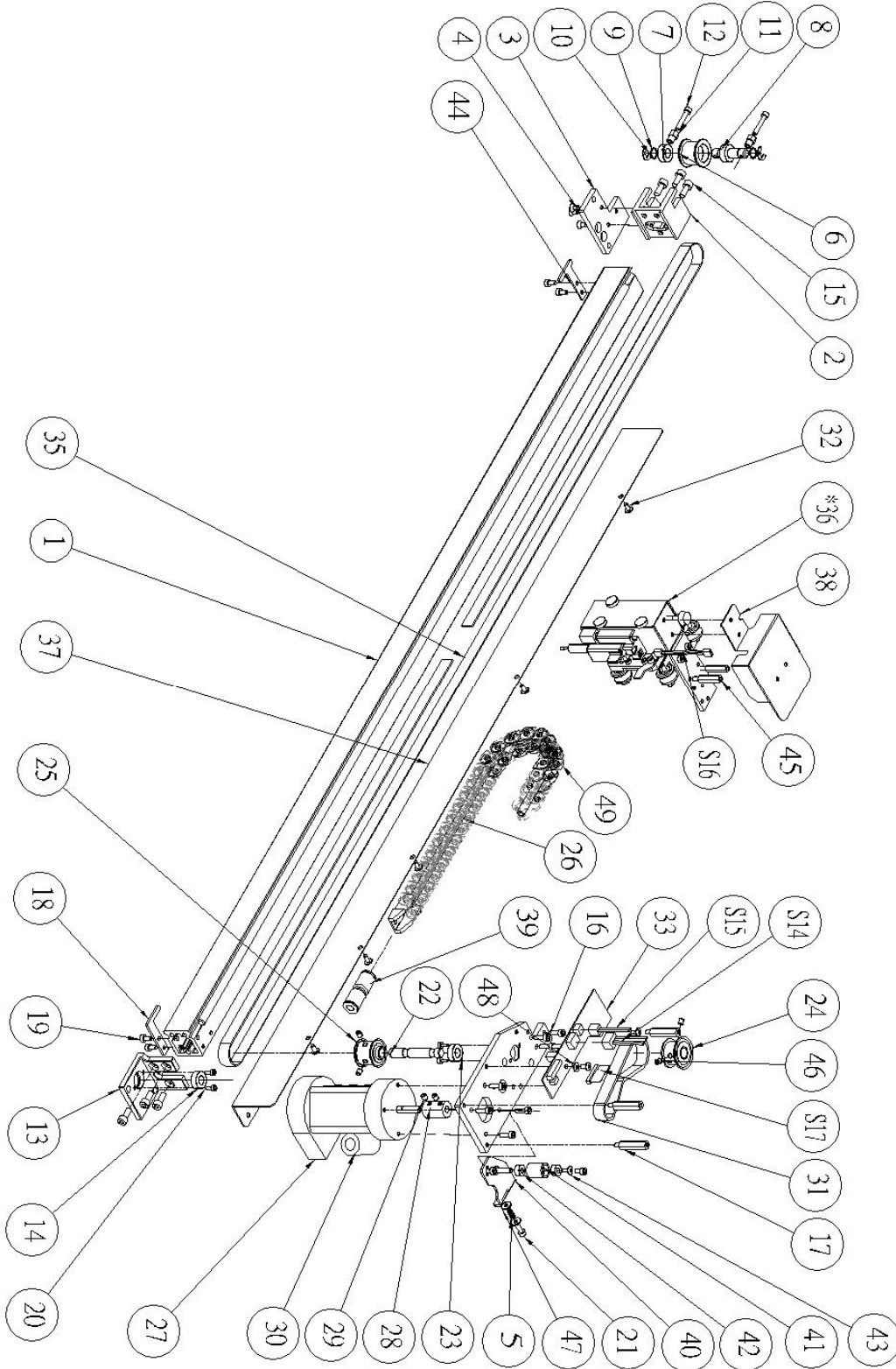
Base Section – Parts List

ITEM	PART NO	Description
1	24500037G	power supply 150W LPP-150-12
2	24401897G	base Chassis
3	24400978G	base Left door
4	24400979G	base Right door
5	24401634G	base protect board
6	24400991G	plank hinge
7	23300372G	filter fabric
8	24401633G	T Series power supply fixture
*9	24500089G	Power Supply (RSP-1000-27 (30V)), for T60/T100 after S/N J50682
*9	24500048G	Power Supply (RSP-1000-48 (48V)), for Ti100(2 units needed) after S/N K51416
*9	24500064G	Power Supply (RSP-1000-48), for Ti60/Ti80 after S/N K51416
*9	24500089G	Power Supply(RSP-1000-27 (30V)), for V30/V40 after S/N K50983
10	22000136G	RETAINER+CARBON FILTER+GUARD
11	26000026G	External toothed lock washer (M4-Ni)
12	25200200G	Truss head machine screw(M4*8L sus).
13	26000002G	Spring washer.(d3xD5.5xt0.8)sus
14	25200051G	U.S pan head machine screw(White)6#*8
15	24700028G	O-ring(P22)
16	24401558G	base Back door
17	24400663G	plate-Venus
18	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)
19	22200024G	FAN DC12V (AD1212HB-51(N)LF)
20	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)
21	23500015G	Nut(M4xt3.2xS7)
22	25200262G	Pan head machine screw(M4*45L)
23	25200260G	Pan head machine screw(M4*35L)
24	29005059G	DC12V POWER MODULE
25	25200115G	Truss head machine screw(M3*6L SUS).

Item no.	Part no.	Description
26	25200159G	Socket head set screw.(M3*16L)
27	20900624G	Front FAN to Laser Statics Cable
28	23300305G	buckle door magnet(02-10-101-10)
29	25200115G	Truss head machine screw(M3*6L SUS).
30	24401477G	12V power fixed board
31	25700017G	Rocker Switch- Black Case(RF-1001N-BRWD-2)
32	21100149G	AC CONNECT(SO-11-1)
33	21100184G	AC CONNECTOR(AC-008)
34	22300003G	FUSE (15A/250V ZE-800)
35	25200013G	90° dish flat head machine screw
36	20400005G	Solid State Relay (KSD215AC3)
37	25200101G	head set screw_M3x6L
38	26000039G	Flat washer (d6.4*D16.8*t1.6)
39	26000026G	External toothed lock washer (M4-Ni)
40	25200200G	Truss head machine screw(M4*8L sus).
41	25200303G	Socket flat head set screw.(M6*14)NI
42	23500015G	Nut(M4xt3.2xS7)
43	25200262G	Pan head machine screw(M4*45L)
44	25200260G	Pan head machine screw(M4*35L)
45	29005059G	DC12V POWER MODULE
*46	29004123G	V30 Laser unit
47	25200269G	Socket head set screw.(M5*8L)
48	24401557G	T60 baffle
49	22200024G	FAN DC12V (AD1212HB-51(N)LF)
50	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)

Item no.	Part no.	Description
51	25200262G	Pan head machine screw(M4*45L)
52	20900039G	Fan to M/B Cable 2.54-2pin 5cm.
53	25200200G	Truss head machine screw(M4*8L sus).
54	23300387G	Plastic Embedded Pulls
55	26500210G	Rubber Foot TNF-1
56	26500236G	Stand wheel. STC-75-EM-60KG
57	26500237G	Stand wheel with break. STC-75-E
58	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)
59	22200024G	FAN DC12V (AD1212HB-51(N)LF)
60	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)
61	26500489G	airflow valve (PMF6-02)
62	26500488G	Air Flow Valve JSC6-02BT(Black)
63	20900992G	POWER TO 12V Terminal PCB CABLE
64	24401562G	front bracket cover
65	22801125G	Under aereosal fixed stand
66	22200025G	DC12V FAN(EFB0812EH-F00)
67	25200259G	90° dish flat head machine screw
S1	20900101G	Ground wire of Power Supply
S2	20900043G	Driver connect line 3.96-02Pin 8
S3	20900039G	Fan to M/B Cable 2.54-2pin 5cm.
S4	20901058G	DC12V TO FAN CABLE (RI472-20901058G)
S5	20900054G	Ground wire of AC outlet
S6	20900701G	M/B TO SSR 2.54*2 CABLE (RI472-20900701G)
S7	20900515G	cable
S8	20900513G	cable
S9	20900693G	AC to SW CABLE(black)
S10	20900695G	AC to AC Cable(white)
S11	20900259G	Cable of fans for DC power
S12	20900624G	Front FAN to Laser Statics Cable

IV. X Axis Assembly



X Axis Assembly – Parts List

Item no.	Part no.	Description	Please order this item
1	22800923G	X axis slideway	22800923G
2	22800928G	Tension pully shaft	29005867G
3	22800931G	X Axis left side mount annex	29002538G
4	25200104G	Dish flat head machine screw	
5	25500041G	Spring for carrier guide roller	
6	22800926G	Tension idle pulley	29002533G
7	20700053G	Bearing (687ZZ)	
8	22800927G	Tension pully core	29002533G
9	25500049G	Wire ring D=7	
10	24900002G	E-shape retaining ring.D11*d5*t0.6	
11	22800929G	Strain stable screw	29002533G
12	22800957G	Tension fixing screw	
13	22800932G	X axis between below axle	29002538G
14	20700053G	Bearing (687ZZ)	
15	25200205G	Socket head set screw_M4x10L	
16	22800933G	X Axis between top axle	29002538G
17	22000029G	Hex Screw M3x25	
18	24400997G	Stopper board	
19	25200101G	head set screw_M3x6L	
20	25200081G	Socket head set screw_M2.5x6L	
21	25200138G	Socket head set screw.(M3*10L su	
22	22803002G	X axis transmit shaft	29002539G
23	20700053G	Bearing (687ZZ)	29002539G
24	22800938G	X axis transmit belt wheel	29002538G
25	22800940G	X axis mid belt wheel	29002538G

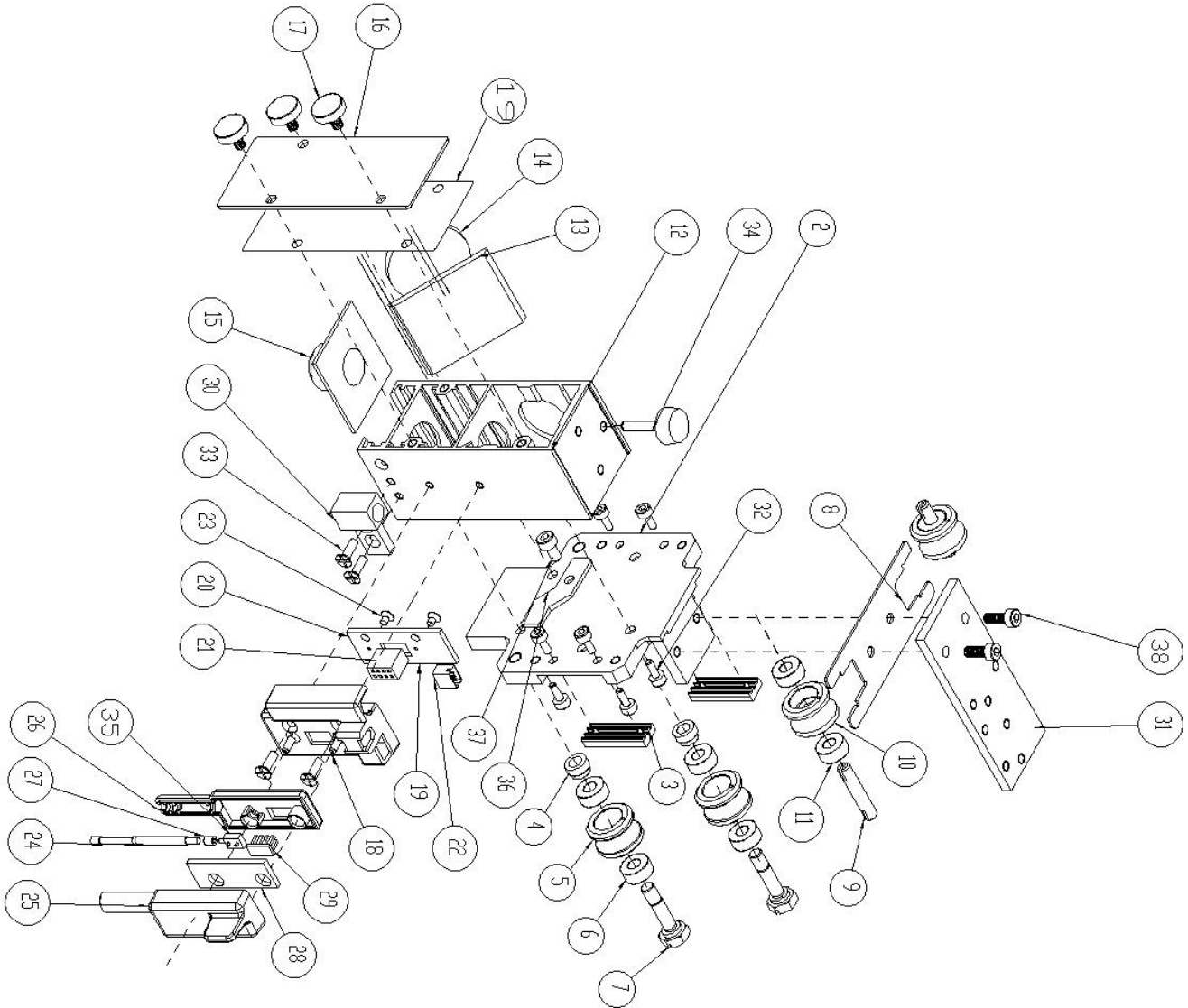
Item no.	Part no.	Description	Please order this item
26	29002601G	Air Assist Tube 1100mm	
27	23100022G	DC MOTOR(TS3727N75E5)	29002537G
28	22800960G	X-axis 20 gear	29002537G
29	25200090G	Socket headness set screw.(M3*3L)	
30	21800003G	EMI CORE(CR-0175-RH001) / (RH17.5*28.5*9.5)	29002537G
31	20600076G	X motor belt_2GT-180-10	
32	25200115G	Truss head machine screw(M3*6L SUS).	
33	29002511G	X Motor PCB	
34	26000001G	Plastic washer.WS-1M	
35	20600074G	X axis belt (2GT-1850-12)	
37	24402829G	X axis protected pad	
38	24403648G	Lens carriage top shingle	
39	23300084G	airflow valve(PU-6)	
40	24400990G	X axis belt pulley fixture	29002540G
41	22800963G	X motor tension idle pulley	29002540G
42	20700038G	Bearing 684ZZ	29002540G
43	25200115G	Truss head machine screw(M3*6L S	
44	24403612G	Stopper board	
45	23300620G	Hex Screw M3.0*20mm	
46	25200170G	Socket headness set screw.(M4*4L	
47	26000015G	Flat washer.(d3xD8xt1 SUS)	
48	26000001G	Plastic washer.WS-1M	
49	23300310G	X tube chain(045.10.028-35L-045.10.12)	
*36	29005888G	Lens carriage Assembly	29002538G
S14	20900196G	2.54 4Pin40cm OAK XmotorEncoder	29002537G
S15	20900197G	3.96 2Pin 40cm OAK XmotorDriver	29002537G
S16	20900685G	AUTOFOCUS 1.5mm*3 CABLE	
S17	20900640G	Flat cable 850mm 1.0*12PIN	

Y Axis Assembly

Item no.	Part no.	Description	Please order this item
1	25500047G	Wheel spring	29004278G
2	22800937G	actions wheel stable axleP	29004278G
3	22800942G	Y axis transmit shaft	
4	22800943G	Y axis mid belt wheel	
5	22800935G	8mm coupling	
6	22800934G	Y transmit shaft seat	
7	20600077G	Y-axis Endless Belt 2GT-186-10	
8	25200138G	Socket head set screw.(M3*10L sus+coating)	
9	20700052G	Bearing (698ZZ)	
10	25200170G	Socket headness set screw.(M4*4L)	
11	25200101G	head set screw_M3x6L	
12	22801860G	4*9 both sides wheel(J)	29004278G
13	22800924G	y axis slideway	
14	22800928G	Tension pully shaft	
15	22800936G	transmission wheel set	
16	20700054G	Bearing (F688ZZ)	
17	22800950G	Y-Axis passive axle center	
18	22800941G	Y axis transmit belt wheel	
19	20700038G	Bearing 684ZZ	29004278G
20	22800926G	Tension idle pulley	
21	20700053G	Bearing (687ZZ)	
22	22800927G	Tension pully core	
23	25500049G	Wire ring D=7	
24	24900002G	E-shape retaining ring.D11*d5*t0.6	
25	22800929G	Strain stable screw	
26	22800957G	Tension fixing screw	
27	24400997G	Stopper board	
28	24401001G	guiding plate of spring	
29	22802955G	X Axis double side mount	
30	22800951G	4*4.5 interval pillar	
31	25200081G	Socket head set screw_M2.5x6L	
32	22801859G	4*9 unilateral Wheel(J)	29004278G
33	20700038G	Bearing 684ZZ	29004278G
34	22800952G	4*11 small roller screw	
35	22800917G	belt retainer	
36	25200101G	head set screw_M3x6L	

Item no.	Part no.	Description	Please order this item
37	25500047G	Wheel spring	29004278G
38	22800937G	actions wheel stable axleP	29004278G
39	22801860G	4*9 both sides wheel(J)	29004278G
40	20700038G	Bearing 684ZZ	29004278G
41	24401001G	guiding plate of spring	
42	25200081G	Socket head set screw_M2.5x6L	
43	25200101G	head set screw_M3x6L	
44	24403745G	protected pad	
45	20600075G	Y axis belt (2GT-1310-12)	
46	25200205G	Socket head set screw_M4x10L	
47	25500049G	Wire ring D=7	
48	25200170G	Socket headness set screw.(M4*4L)	
49	25200101G	head set screw_M3x6L	
50	20600075G	Y axis belt (2GT-1310-12)	
51	22800924G	y axis slideway	
52	22800928G	Tension pully shaft	
53	22800936G	transmission wheel set	
54	20700054G	Bearing (F688ZZ)	
55	22800950G	Y-Axis passive axle center	
56	22800941G	Y axis transmit belt wheel	
57	25500049G	Wire ring D=7	
58	22800926G	Tension idle pulley	
59	20700053G	Bearing (687ZZ)	
60	22800927G	Tension pully core	
61	25500049G	Wire ring D=7	
62	24900002G	E-shape retaining ring.D11*d5*t0.6	
63	22800929G	Strain stable screw	
64	22800957G	Tension fixing screw	
65	24400997G	Stopper board	
66	25200205G	Socket head set screw_M4x10L	
67	22802955G	X Axis double side mount	
68	22800951G	4*4.5 interval pillar	
69	25200101G	head set screw_M3x6L	
70	22801859G	4*9 unilateral Wheel(J)	29004278G
71	20700038G	Bearing 684ZZ	29004278G
72	22800952G	4*11 small roller screw	
73	22800917G	belt retainer	
74	25200170G	Socket headness set screw.(M4*4L)	

VI. Pen Carriage

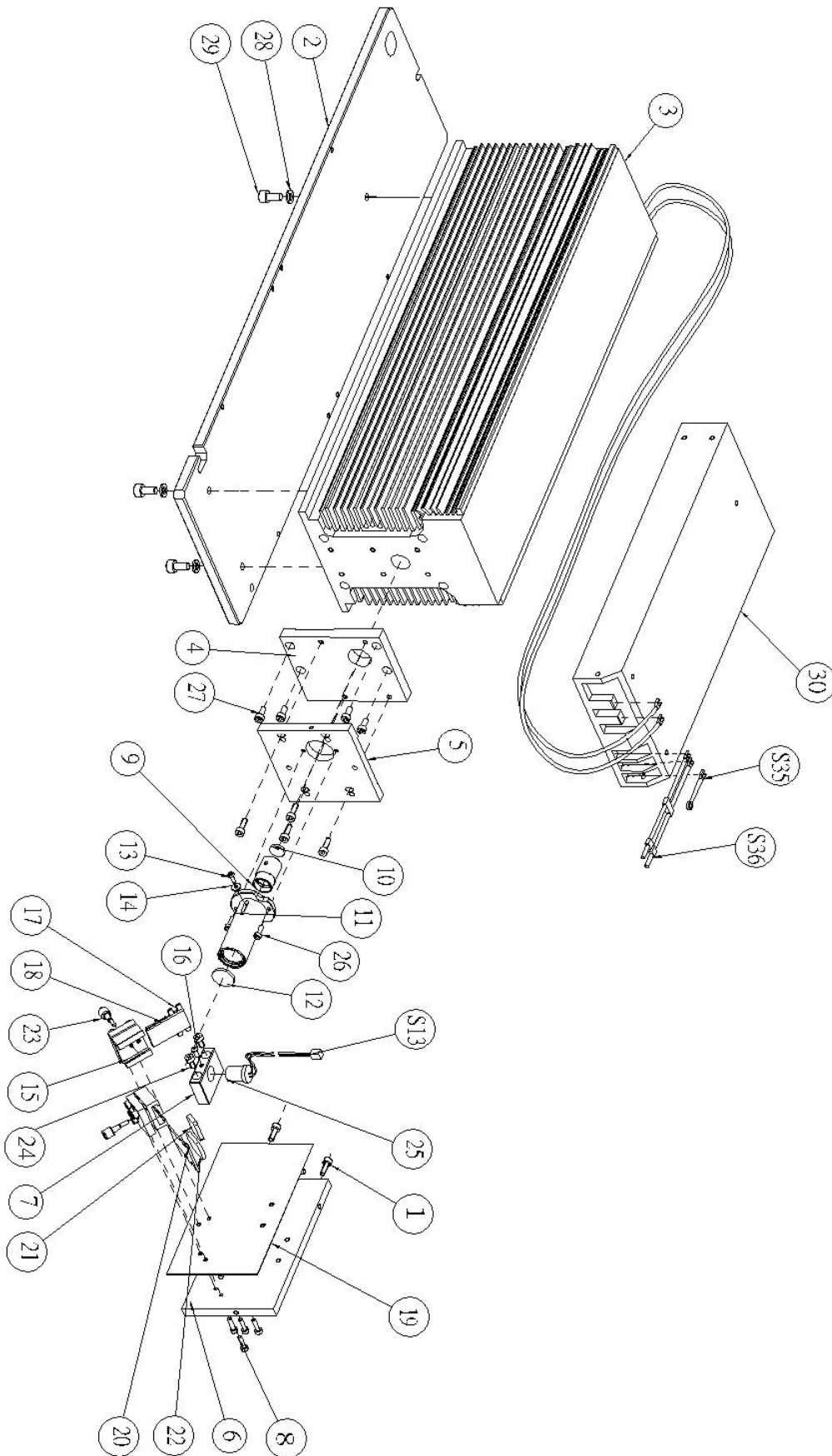


Pen Carriage – Parts List

Item no.	Part no.	Description	Please order this item
1	29005888G	Lens carriage Assembly	
2	22802972G	Lens carriage base	
3	22800917G	belt retainer	

Item no.	Part no.	Description
4	22800951G	4*4.5 interval pillar
5	22801859G	4*9 unilateral Wheel(J)
6	20700038G	Bearing 684ZZ
7	22800952G	4*11 small roller screw
8	25500047G	Wheel spring
9	22800937G	actions wheel stable axleP
10	22801860G	4*9 both sides wheel(J)
11	20700038G	Bearing 684ZZ
12	22801996G	Lens carriage Assembly-V2 - C180
13	22802046G	Carriage reflector hold board
14	23600015G	P/N#271260 Si Reflector 1.0"dia
15	22802117G	air nozzle
16	22802084G	Lens carriage front shingle
17	23300298G	Hand Knobs(CRKB.M3-6L)
18	24100365G	Auto focus pin cover
19	29002542G	Lens for blower Assembly
20	23800141G	autofocus pcb (SA11667a)
21	21100243G	F/H 2161 2.0mm Female Header
22	21100244G	Wafer 1.5mm 3PIN 90 度
23	25200343G	Head-BI machine screw.(M2*3L)
24	22000117G	Probe (S-4A-0515)
25	24100363G	Auto focus pin cover
26	24100364G	Auto focus pin cover
27	228032120	G Probe Extension
28	23800326G	AUTOFOCUS PCB for CLS-051 (NH02-009944 (K086-2015))
29	21100242G	P/H 2141 pin header 2*4pin 2.0mm 180°
30	22800955G	carriage airflow valve
31	22802363G	Lens carriage assist base(AAS)
32	25200081G	Socket head set screw_M2.5x6L
33	25200082G	90° dish flat head machine screw M2.5*8
34	23301054G	screws with knurled resin head(CRKB.M3-15L)
35	25600046G	Autofocus Sensor Switch (CLS-051)
36	29002593G	X axis detector
37	25200101G	head set screw_M3x6L
38	25200119G	Socket head set screw.(M3*8L)SUS

VII. Mirror 1 and Laser Tube Assembly

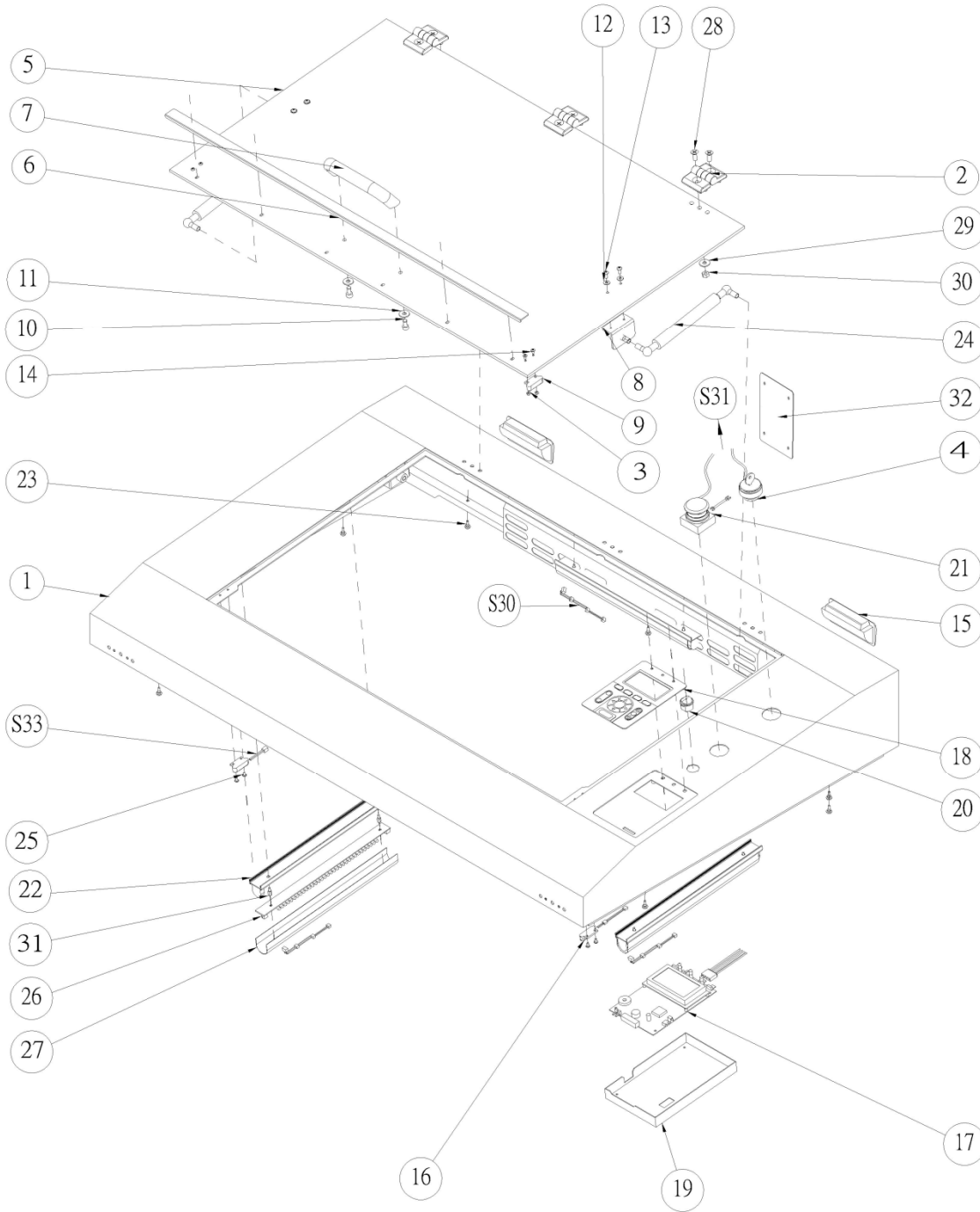


Mirror 1 and Laser Tube Assembly – Parts List

Item no.	Part no.	Description	Please order this item
1	25200214G	Socket head set screw.(M4*12L)	
2	22801773G	Laser main base	
3	22900048G	Synrad v30 Laser Tube	
4	22801470G	T60 laser reconnect board	
5	22801471G	Laser front bracket	
6	22801482G	Laser front board	
7	22800921G	Red beam fixed base	
8	25200149G	Socket head set screw.(M3*12L)	
9	22800907G	0.5" beam expander assembly	29002528G
10	23600002G	II-VI P/N#107113 ZnSe Lens 0.50	29002528G
11	22800909G	0.75" beam expander assembly	29002528G
12	23600003G	II-VI P/N#524851 ZnSe Lens 0.75	29002528G
13	23300300G	Lens carriage screw	
14	26000015G	Flat washer.(d3xD8xt1 SUS)	
15	20200185G	prism mounts Assembly	
16	25200127G	Pan head machine screw(M3*8L)	
17	24400581G	Mirror holder	29001109G
18	26500257G	Red Beam Mirror (19*35*2mm)	29001109G
19	29002609G	front board dip cotton.	
20	24401473G	1" Mirror holder	29003695G
21	22800647G	Circle Mirror Accessory	
22	23600043G	II-VI P/N#701684 Si Reflector 1	29003695G
23	22800914G	mirror pin	
24	25200192G	Socket head set screw.(M4*8L sus+coating)	
25	23600028G	Laser Diode module	29003657G
26	25200138G	Socket head set screw.(M3*10L su	
27	25200054G	Socket head set screw.(5/32"*3/8	
28	26000036G	Spring Washer (d6xD11xt1.4)sus	
29	25200300G	Socket head set screw.(M6*12L)	
30	24500089G	Power Supply (RSP-1000-27 (30V))	
S13	20900993G	MainBoard TO LASER DIODE CABLE - Spirit & S290	29003657G
S35	20900101G	Ground wire of Power Supply	
S36	20900677G	Line Filter to P/B & Power	

2-2 Spirit LS

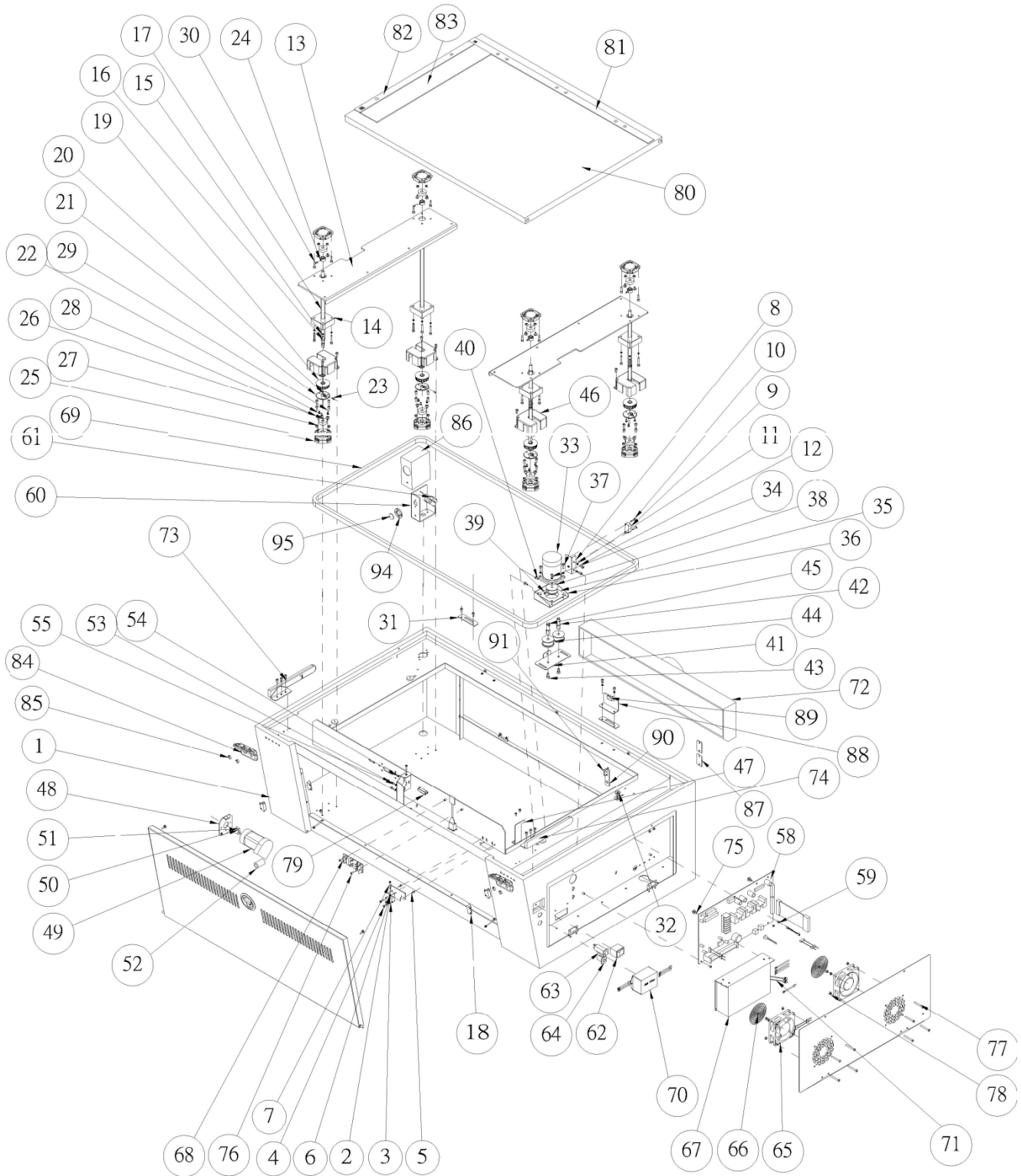
I Top Cover



Top Cover – Parts List

Item No.	Part no.	Description
1	24403854G	Top cover
2	26500166G	Window Hinge
3	23500013G	Nut(M3xt2.4xS5.5)
4	25700094G	Key Switch (E3K2I2A.V)
5	29003833G	Pc Window Assembly
6	24404034G	Window Support Bracket
7	26500165G	Window Handle
8	24400130G	Top Cylinder Bracket
9	22000045G	Magnet MC-12
10	25200299G	Socket head set screw.(M6*12L)
11	26000039G	Flat washer (d6.4*D16.8*t1.6)
12	26000008G	Plastic washer.
13	25200209G	Truss head machine screw(M4*10L)
14	25200115G	Truss head machine screw(M3*6L SUS).
15	23300387G	Plastic Embedded Pulls
16	25700015G	Magnetic Switch
17	290068430G	Keyboard Assembly (8051 F340)
18	23400020G	Control panel sticker
19	24400995G	Key board dust proof cover
20	25700032G	LAMP SW(R13-112)
21	25700095G	Emergency Switch (TN3BKR-2B)
22	22000124G	lamp holder
23	26500210G	Rubber Foot TNF-1
24	26500693G	Window Cylinder.(5kg)
25	25200115G	Truss head machine screw(M3*6L SUS).
26	29004037G	LED LAMP BOARD
27	23300296G	Fluorescent Lamps lampshade
28	25200308G	90° dish flat head machine screw
29	26000039G	Flat washer (d6.4*D16.8*t1.6)
30	23500010G	Nut(M6xt5xS10).
31	22000039G	Hex Screw M3X8L
32	24401587G	4" air pipe cover

II Mid. Section



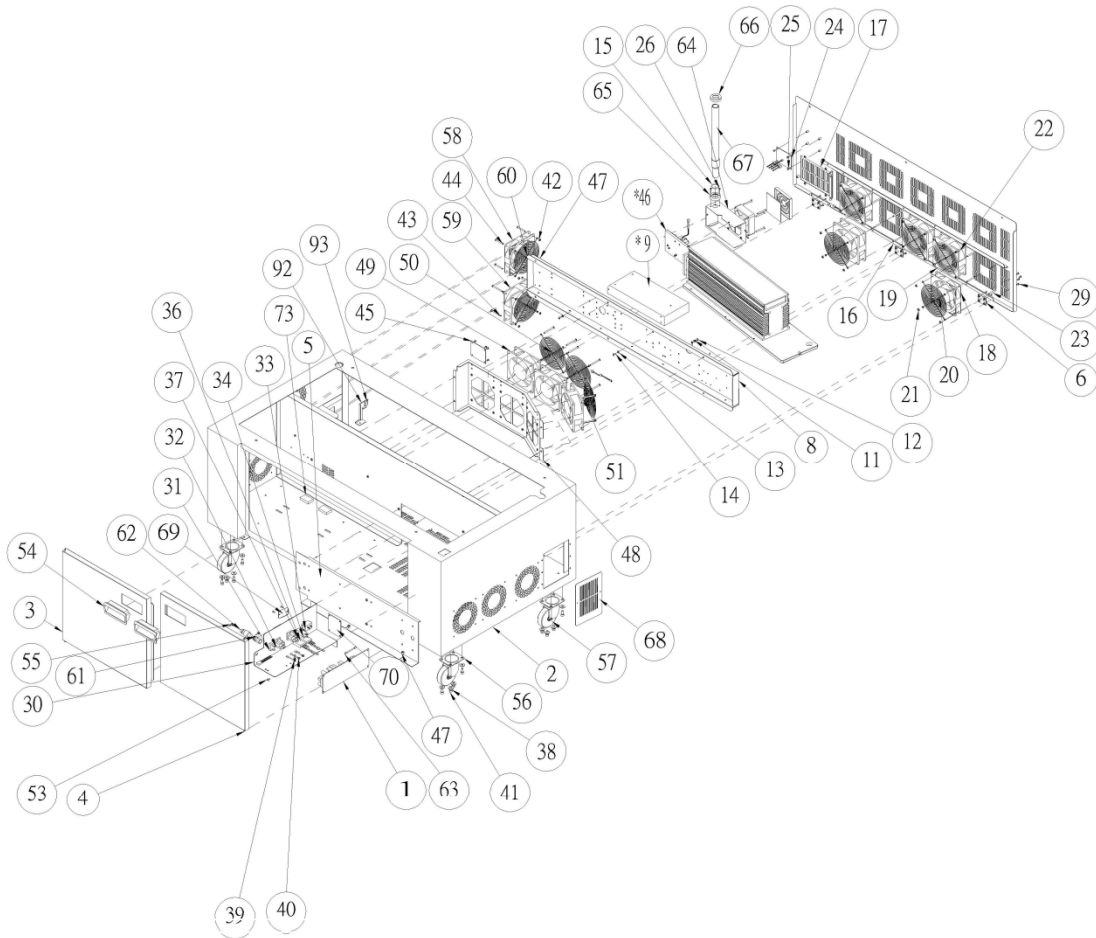
Mid. Section – Parts List

Item No.	Part no.	Description	Please order this item
1	20200120G	main unit Assembly - Spirit	
2	29002517G	Z axis up Limit Switch Assembly	
3	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	29002517G
4	25200017G	Truss head machine screw(M3X15L)	
5	25200101G	head set screw_M3x6L	
6	25500041G	Spring for carrier guide roller	
7	25200162G	Socket head set screw.(M3*20L) S	
8	29002518G	Z axis down Limit Switch Assembly	
9	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	29002518G
10	25200017G	Truss head machine screw(M3X15L)	
11	26000016G	Flat washer	
12	25200177G	Socket head set screw.(M4*6L)	
13	24401129G	Working table Bracket	
14	29002519G	Table lead screw assembly (left)	
	29002520G	Table lead screw assembly(right)	
15	26000016G	Flat washer	
16	25200250G	Socket head set screw-M4x25	
17	22801022G	Z-axis table screw	
18	22000045G	Magnet MC-12	
19	29002551G	Z-axis pulley Assembly.	
20	23500015G	Nut(M4xt3.2xS7)	29002551G
21	24100367G	Z-axis pully cover	29002551G
22	25200003G	Panhead machine screw-white M3x8	29002551G
23	25200173G	Socket headness set screw-M4x6	
24	22800922G	Z axis top stopper	
25	24100366G	Bearing seat	
26	20700034G	Bearing 628ZZ	
27	23500015G	Nut(M4xt3.2xS7)	
28	25200036G	Pan Head tap srcew type-M4x8	
29	25200205G	Socket head set screw_M4x10L	
30	25200237G	Socket head set screw.(M4*16L su	

Item No.	Part no.	Description	Please order this item
31	24401002G	Door-Retaining fixing plate	
32	22800956G	Y slideway actions revise seat	
33	29005784G	Z MOTOR ASSEMBLY	
34	26000018G	Spring washer.(d4xD7 SUS)	29005784G
35	24700013G	Rubber Packing for Z Motor	29005784G
36	24403500G	Z Motor Bractcet	29005784G
37	25200214G	Socket head set screw.(M4*12L)	29005784G
38	22800622G	z axis pulley (P20-5GT-9)	29005784G
39	25200170G	Socket headness set screw.(M4*4L	29005784G
40	25200192G	Socket head set screw.(M4*8L sus+coating)	
41	24401000G	Z-axis Idle wheel	29002521G
42	22800964G	Core of Z-axis pulley	29002521G
43	25200274G	Socket head set screw_M5x10L	29002521G
44	22800084G	idle Pulley	29002521G
45	24900007G	E-shape retaining ring.d6xD12xt0	29002521G
46	24100369G	Belt flange	
47	24403647G	Y-axis detector	
48	24400986G	Y motor fix board	
49	23100022G	DC MOTOR(TS3727N75E5)	
50	228036670G	X-axis 20 gear	
51	25200090G	Socket headness set screw.(M3*3L	
52	21800003G	EMI CORE(CR-0175-RH001) / (RH17.5*28.5*9.5)	
53	25200149G	Socket head set screw.(M3*12L)	
54	26000002G	Spring washer.(d3xD5.5xt0.8)sus	
55	25200119G	Socket head set screw.(M3*8L)SUS	
58	290071350G	Spitit LS Mainboard with Spirit LS firmware	
59	25200115G	Truss head machine screw(M3*6L SUS).	
60	24400987G	Mirror Bracket	
61	202003240G	prism mounts Assembly	
62	25700014G	ON/OFF SW	
63	22300003G	FUSE (15A/250V ZE-800)	
64	22300004G	Fuse (3A/250V ZE-800)	
65	22200023G	FAN 80X80X25 DC12V (EE80251S2-0000-999)	

Item No.	Part no.	Description	Please order this item
66	22000053G	Fan finger guard(matchAD08024US-A70GL)(G08A5-4HA)	
67	24500022G	MEAN WELL Power Supply ADS-15540 40V/5V	
68	29002510G	Y Motor PCB	
69	20600024G	Z-axis belt (5GT-2910-9)	
70	21800007G	EMI Filter YE10T1L2	
71	22000108G	Varistor (CNR-14D471K-TRK)	
72	24401438G	induced draft box	
73	23300307G	Top Cover left fixed stick	
74	23300308G	Top Cover right fixed stick	
75	22000130G	PC board interval(MCB-6)	
76	25200144G	Truss head machine screw(M3*10L)	
77	25200260G	Pan head machine screw(M4*35L)	
78	23500015G	Nut(M4xt3.2xS7)	
79	25700015G	Magnetic Switch	
80	22800918G	Engraving Platform	
81	29005432G	Ruler Set for X-axis	
82	29005433G	Ruler Set for Y-axis	
83	290073860G	Space ruler Set for Y-axis(460*50*3)	
84	23300301G	Top cover hinge	
85	24100361G	hinge scrw plug	
86	24401108G	Dust Prevention Cap	
87	244043680G	USB Cover	
88	244044010G	Top Limit Switch Bracket	290072470G
89	25700008G	Level Limited Switch	290072470G
90	244043990G	Back Limit Switch Bracket	290072450G
91	25700008G	Level Limited Switch	290072450G
92	244044000G	Down Limit Switch Bracket	290072460G
93	25700008G	Level Limited Switch	290072460G
94	22800269G	lens fix mount	
95	236001240G	Window-ZnSe-DIA=0.75"/THK2mm ((WZ-0.75-2)	
	29002521G	Z-axis Idle wheel seat Assembly	
	290072470G	Top Limit Switch Assembly	
	290072450G	Back Limit Switch Assembly	
	290072460G	Down Limit Switch Assembly	

III Base Section



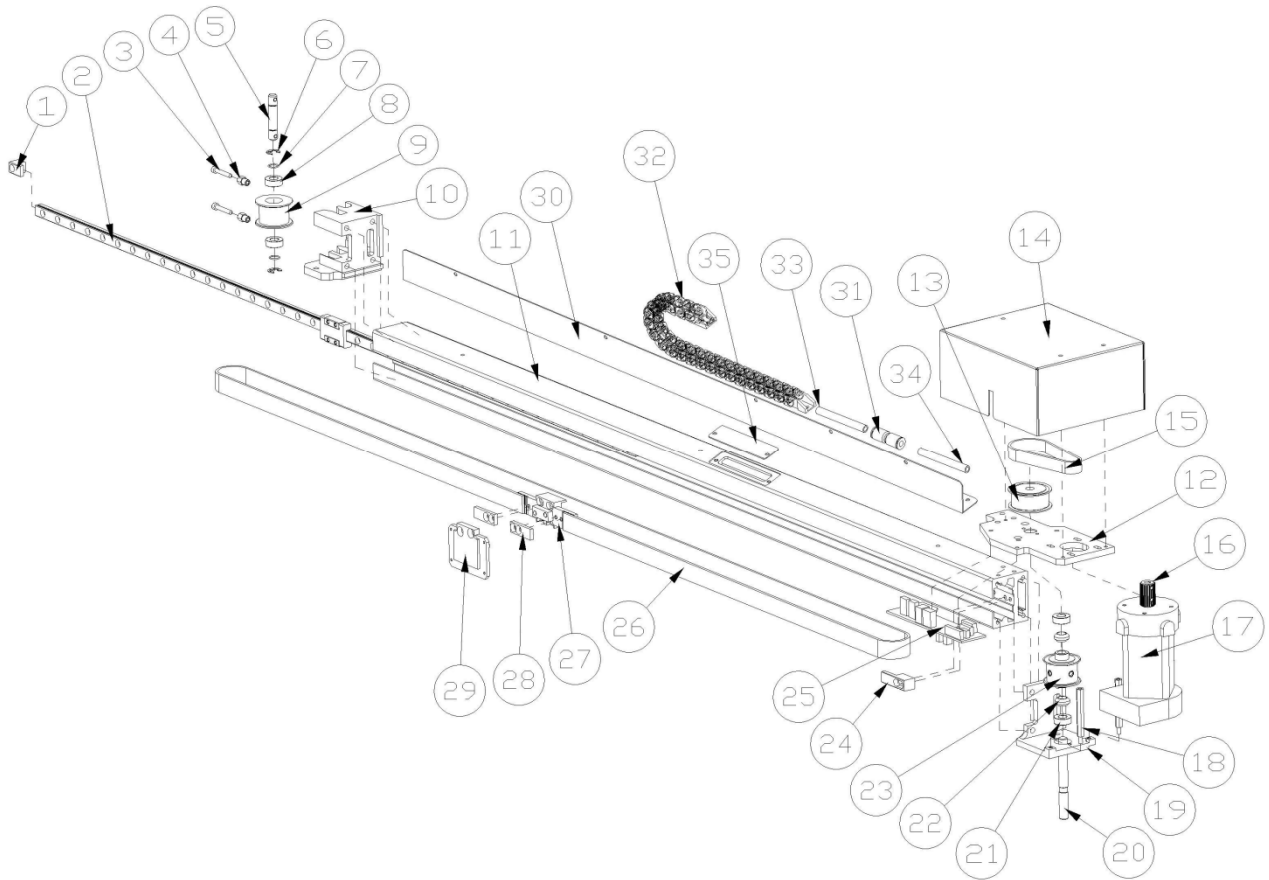
Item No.	Part no.	Description
1	24500037G	power supply 150W LPP-150-12
2	24401897G	base Chassis
3	24400978G	base Left door
4	24400979G	base Right door
5	24401634G	base protect board
6	24400991G	plank hinge
8	24401633G	T Series power supply fixture

Base Section – Parts List

Item No.	Part no.	Description
*9	24500089G	Power Supply (RSP-1000-27 (30V)), for T60/T100 after S/N J50682
*9	24500048G	Power Supply (RSP-1000-48 (48V)), for Ti100(2 units needed) after S/N K51416
*9	24500064G	Power Supply (RSP-1000-48), for Ti60/Ti80 after S/N K51416
*9	24500089G	Power Supply(RSP-1000-27 (30V)), for V30/V40 after S/N K50983
11	26000026G	External toothed lock washer (M4-Ni)
12	25200200G	Truss head machine screw(M4*8L sus).
13	26000002G	Spring washer.(d3xD5.5xt0.8)sus
14	25200051G	U.S pan head machine screw(White)6#*8
15	24700028G	O-ring(P22)
16	24401558G	base Back door
17	24400663G	plate-Venus
18	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)
19	22200024G	FAN DC12V (AD1212HB-51(N)LF)
20	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)
21	23500015G	Nut(M4xt3.2xS7)
22	25200262G	Pan head machine screw(M4*45L)
23	25200260G	Pan head machine screw(M4*35L)
24	29005059G	DC12V POWER MODULE
25	25200115G	Truss head machine screw(M3*6L SUS).
26	25200159G	Socket head set screw.(M3*16L)
28	23300305G	buckle door magnet(02-10-101-10)
29	25200115G	Truss head machine screw(M3*6L SUS).
30	24401477G	12V power fixed board
31	25700017G	Rocker Switch- Black Case(RF-1001N-BRWD-2)
32	21100149G	AC CONNECT(SO-11-1)
33	21100184G	AC CONNECTOR(AC-008)
34	22300003G	FUSE (15A/250V ZE-800)
36	20400005G	Solid State Relay (KSD215AC3)

Item No.	Part no.	Description
37	25200101G	head set screw_M3x6L
38	26000039G	Flat washer (d6.4*D16.8*t1.6)
39	26000026G	External toothed lock washer (M4-Ni)
40	25200200G	Truss head machine screw(M4*8L sus).
41	25200303G	Socket flat head set screw.(M6*14)NI
42	23500015G	Nut(M4xt3.2xS7)
43	25200262G	Pan head machine screw(M4*45L)
44	25200260G	Pan head machine screw(M4*35L)
45	29005059G	DC12V POWER MODULE
*46	29004123G	V30 Laser unit
47	25200269G	Socket head set screw.(M5*8L)
48	24401557G	T60 baffle
49	22200024G	FAN DC12V (AD1212HB-51(N)LF)
50	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)
51	25200262G	Pan head machine screw(M4*45L)
53	25200200G	Truss head machine screw(M4*8L sus).
54	23300387G	Plastic Embedded Pulls
55	26500210G	Rubber Foot TNF-1
56	233013930G	2.5" PU Stand Wheel (25PUA-R)
57	233013940G	2.5" PU Stand Wheel with Break (25PUB-R)
58	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)
59	22200024G	FAN DC12V (AD1212HB-51(N)LF)
60	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)
61	26500489G	airflow valve (PMF6-02)
62	26500488G	Air Flow Valve JSC6-02BT(Black)
63	20900992G	POWER TO 12V Terminal PCB CABLE
64	244041610G	Optical Dust Cover
65	22801125G	Under aroseeal fixed stand
66	22801126G	On aroseeal fixed stand
67	23300355G	600mm contraction pipe
68	24400589G	Cover
69	24400974G	power cover-Spirit
70	29005059G	DC12V POWER MODULE

IV X Axis Assembly

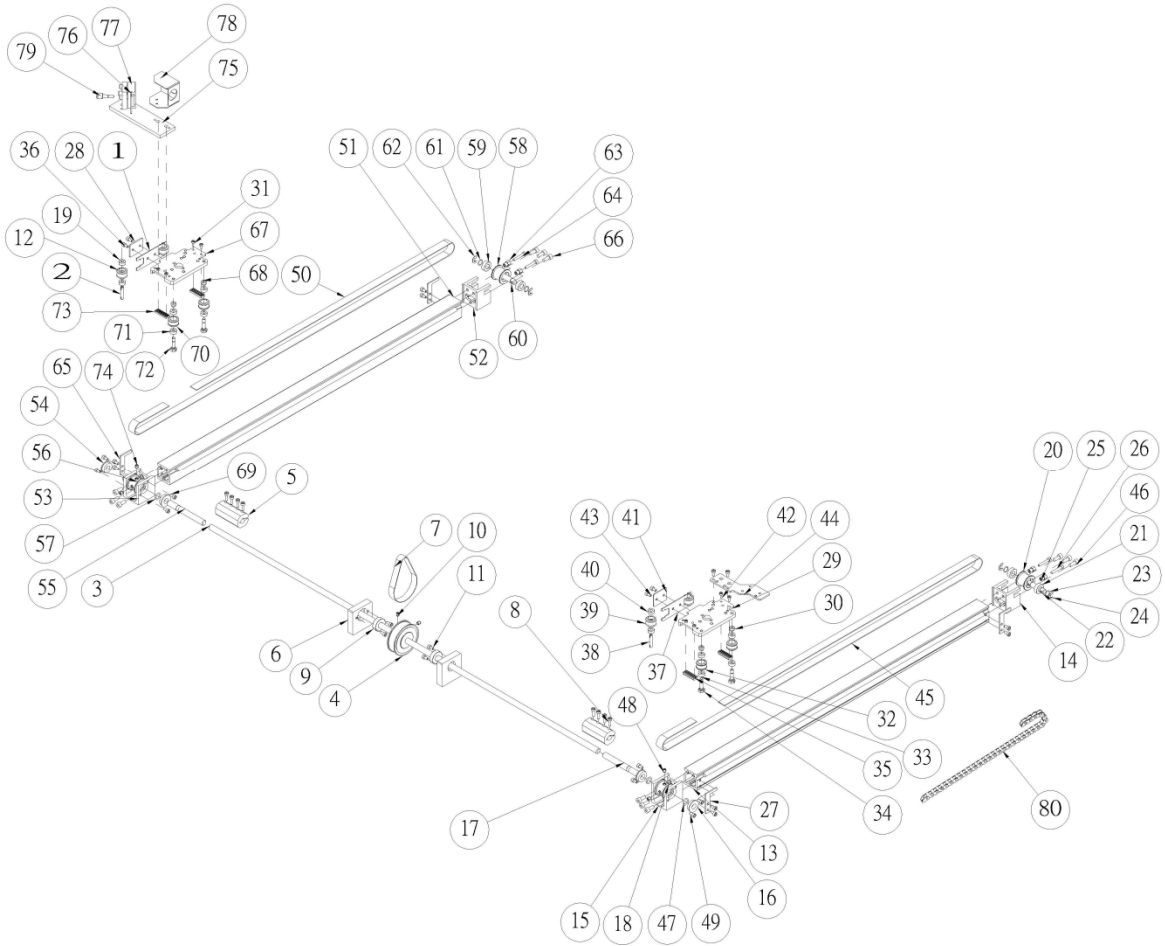


X Axis Assembly

Item No.	Part no.	Description	Please order this item
1	228033381G	Left Stoper	
2	233013550G	Linear Guide (MR9MNSU1V1P-800L-10-10)	290070721G
3	22802302G	Adjust screw	29006039G
4	22800929G	strain stable screw	29006039G
5	22803055G	Tension pulley shaft	29006039G
6	24900002G	E-shape retaining ring.D11*d5*t0.6	29006039G
7	25500049G	wire ring φ7	29006039G
8	20700053G	Bearing (687ZZ)	29006039G
9	29006039G	Tension idle pulley Assembly	29006039G
10	228033320G	Tension pulley shaft bracket	

Item No.	Part no.	Description	Please order this item
11	228035050G	X-Axis Slideway	290070721G
12	228033310G	X Axis between top axle bracket	
13	228033351G	X-axis Mid Belt Wheel (P48)	
14	24403742G	X motor dust-proof lid	
15	20600159G	Close Kevlar Belt (U2GT-180-10)	
16	228036670G	Motor Gear (P20)	290083910G
17	290083910G	Motor assembly	
18	23300584G	Hex Screw M3.0*40mm	
19	228033300G	X Axis between below axle bracket	
20	228033340G	X axis transmit shaft	
21	20700053G	Bearing (687ZZ)	
22	22803053G	spacer	
23	228036680G	X-axis Transmit Belt Wheel (P40)	
24	228033391G	Right Stoper	
25	29005107G	X-AXIS BOARD(AAS I) MODULE	
26	20600176G	X-axis Open Kevlar Belt (FHT-2*L1794*W15)	
27	22803046G	Carrage belt plate bracket	290070721G
28	22803050G	belt retainer	
29	228032960G	Lens carriage base	
30	24402829G	X axis protected pad	
31	23300084G	airflow valve(PU-6) / (KUS6M)	
32	23301274G	X tube chain (045.10.028-37L-045.10.12 total 39 links)	
33	29002601G	Air Assist Tube 1100mm	
34	29002600G	Y axis air assist tube 1400mm	
35	244045960G	Oil Hole Cover	290070721G
	290070721G	Linear guide for Spirit LS/S290LS (for service)	

V Y Axis Assembly



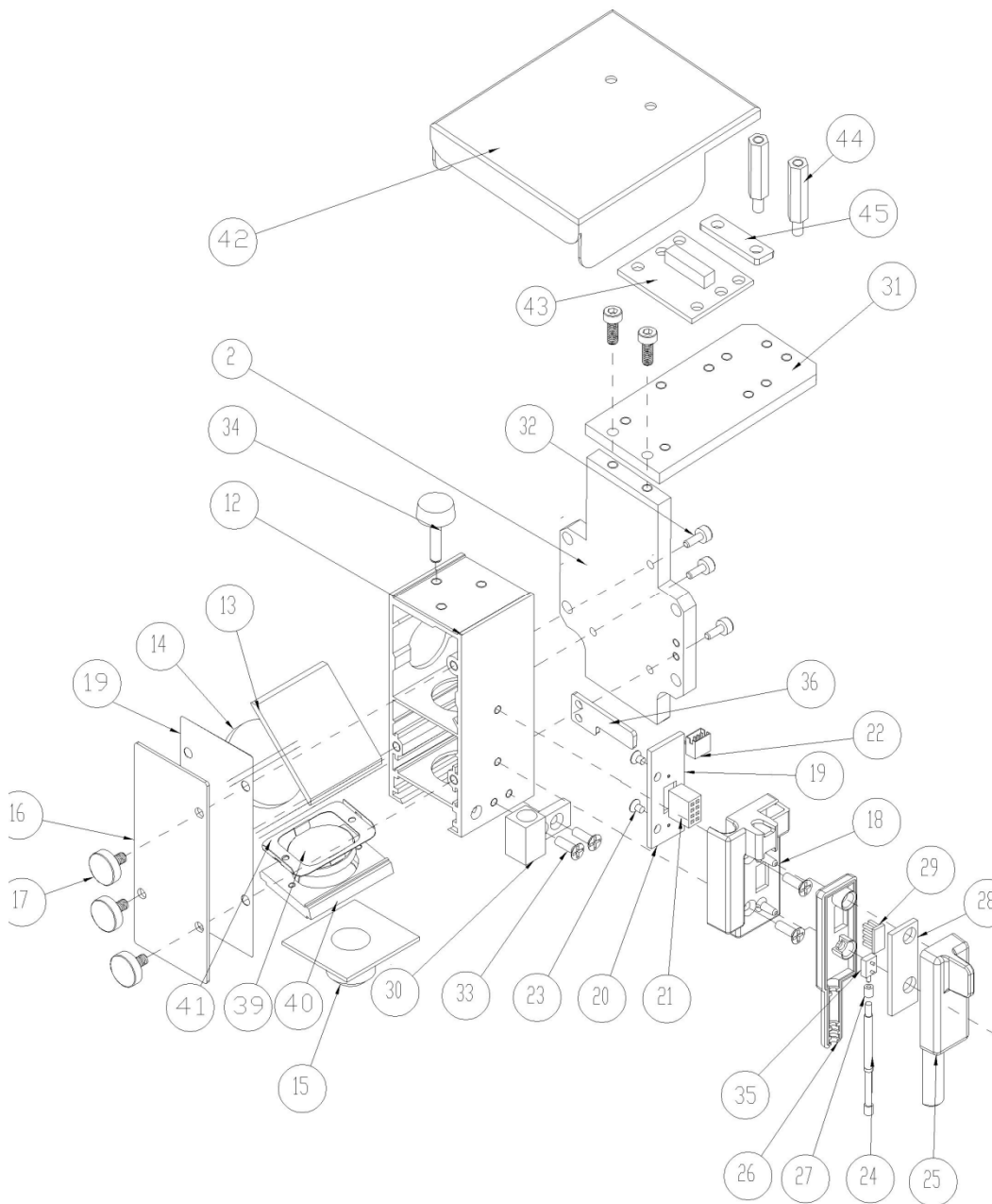
Y Axis Assembly – Parts List

Item No.	Part no.	Description
1	29004278G	Wheel spring Assembly(J)
2	22800937G	actions wheel stable axleP
3	22800942G	Y axis transmit shaft
4	228036660G	Y-axis Mid Belt Wheel (P72)
5	22800935G	8mm coupling
6	29006390G	Y Transmit Shaft Assembly
7	20600160G	Y-axis Close Kevlar Belt (FHT-2*L190*W10)
8	25200138G	Socket head set screw.(M3*10L sus+coating)
9	20700052G	Bearing (698ZZ)
10	25200170G	Socket headness set screw.(M4*4L)
11	25200100G	head set screw_M3x6L
12	22801860G	4*9 both sides wheel(J)
13	22800924G	y axis slideway
14	22800928G	Tension pully shaft
15	22800936G	transmission wheel set
16	20700054G	Bearing (F688ZZ)
17	22800950G	Y-Axis passive axle center
18	228036650G	Y axis transmit belt wheel
19	20700038G	Bearing 684ZZ
20	22800926G	Tension idle pulley
21	20700053G	Bearing (687ZZ)
22	22800927G	Tension pully core
23	25500049G	Wire ring D=7
24	24900002G	E-shape retaining ring.D11*d5*t0.6
25	22800929G	Strain stable screw
26	22800957G	Tension fixing screw

Item No.	Part no.	Description
27	24400997G	Stopper board
28	24401001G	guiding plate of spring
29	22802955G	X Axis double side mount
30	22800951G	4*4.5 interval pillar
31	25200081G	Socket head set screw_M2.5x6L
32	22801859G	4*9 unilateral Wheel(J)
33	20700038G	Bearing 684ZZ
34	22800952G	4*11 small roller screw
35	22800917G	belt retainer
36	25200101G	head set screw_M3x6L
37	25500047G	Wheel spring
38	22800937G	actions wheel stable axleP
39	22801860G	4*9 both sides wheel(J)
40	20700038G	Bearing 684ZZ
41	24401001G	guiding plate of spring
42	25200081G	Socket head set screw_M2.5x6L
43	25200101G	head set screw_M3x6L
44	24403745G	protected pad
45	20600161G	Y-axis Open Kevlar Belt (FHT-2*L1224*W12)
46	25200205G	Socket head set screw_M4x10L
47	25500048G	wire ring φ8
48	25200170G	Socket headness set screw.(M4*4L)
49	25200101G	head set screw_M3x6L
50	20600161G	Y-axis Open Kevlar Belt (FHT-2*L1224*W12)
51	22800924G	y axis slideway
52	22800928G	Tension pully shaft
53	22800936G	transmission wheel set
54	20700054G	Bearing (F688ZZ)
55	29005927G	Y-Axis Rail Assembly(left)

Item No.	Part no.	Description
56	228036650G	Y axis transmit belt wheel (P30)
57	25500048G	wire ring $\phi 8$
58	29002533G	Tension idle pulley Assembly.
59	20700053G	Bearing (687ZZ)
60	22800927G	Tension pully core
61	25500049G	Wire ring D=7
62	24900002G	E-shape retaining ring.D11*d5*t0.6
63	22800929G	Strain stable screw
64	22800957G	Tension fixing screw
65	24400997G	Stopper board
66	25200205G	Socket head set screw_M4x10L
67	22802955G	X Axis double side mount
68	22800951G	4*4.5 interval pillar
69	25200101G	head set screw_M3x6L
70	29004279G	A roller assembly(J)
71	20700038G	Bearing 684ZZ
72	22800952G	4*11 small roller screw
73	22800917G	belt retainer
74	25200170G	Socket headness set screw.(M4*4L)
75	22802310G	X axis reflector hold board
76	29002522G	Mirror Assembly
77	202003240G	Prism Mounts Assembly
78	24400969G	X lens hold board dust-proof lid
79	22800914G	mirror pin
80	23301270G	Y tube chain.

VI Pen Carriage

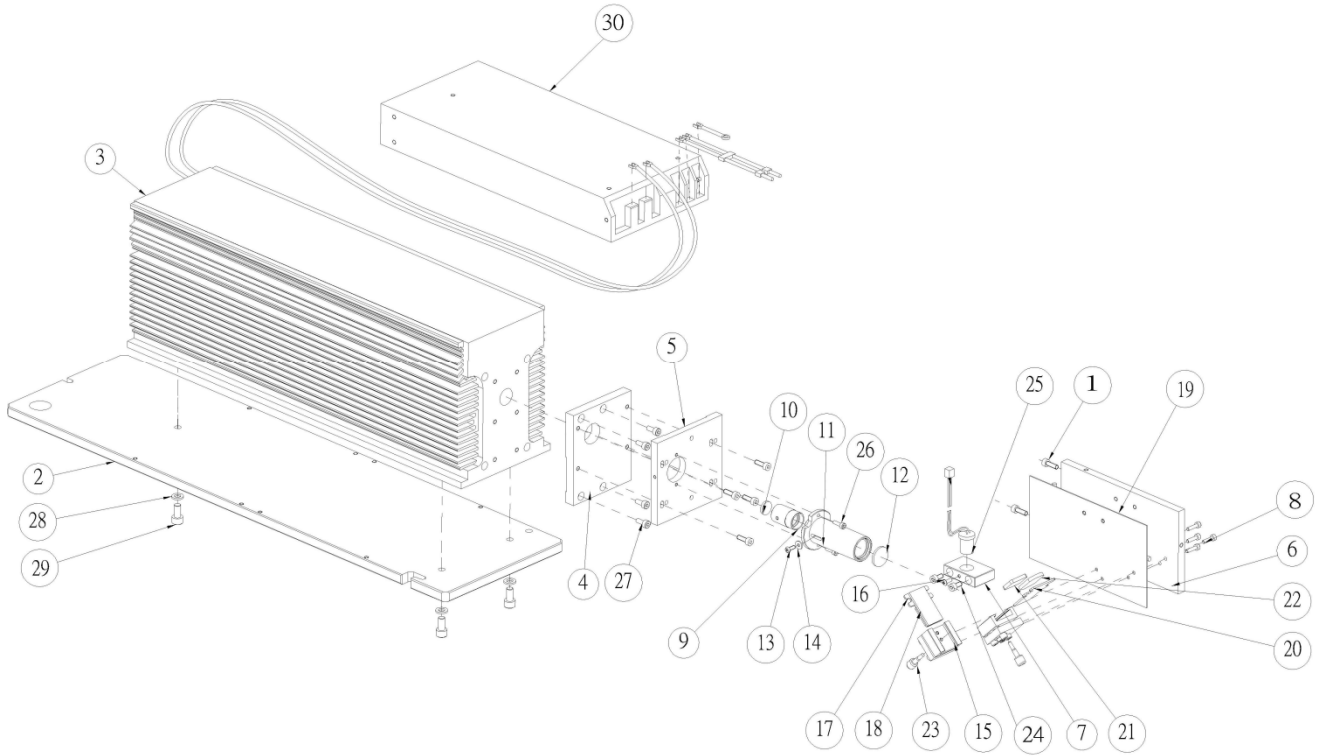


Pen Carriage – Parts List

Item No.	Part no.	Description	Please order this item
2	22802108G	Lens carriage reconnect board	29005506G
12	22801996G	Lens carriage Assembly-V2 - C180	
13	22802046G	Carriage reflector hold board	29004736G
14	29004736G	Carriage Reflector Hold	
15	22802117G	air nozzle	
16	22802084G	Lens carriage front shingle	
17	23300298G	Hand Knobs(CRKB.M3-6L)	

Item No.	Part no.	Description	Please order this item
18	24100365G	Auto focus pin cover	
19	29004735G	Lens for blower Assembly	
20	23800141G	autofocus pcb (SA11667a)	29002507G
21	21100243G	F/H 2161 2.0mm Female Header	29002507G
22	21100244G	Wafer 1.5mm 3PIN 90 度	29002507G
23	25200343G	Head-BI machine screw.(M2*3L)	
24	22000117G	Probe (S-4A-0515)	29006010G
25	29006010G	Auto focus pin Assembly.	
26	24100364G	Auto focus pin cover	29006010G
27	228032120G	G Probe Extension	29006010G
28	23800326G	AUTOFOCUS PCB for CLS-051 (NH02-009944 (K086-2015))	29006010G
29	21100242G	P/H 2141 pin header 2*4pin 2.0mm 180°	29006010G
30	22800955G	carriage airflow valve	
31	22802917G	Lens carriage assist base	
32	25200081G	Socket head set screw_M2.5x6L	
33	25200082G	90° dish flat head machine screw M2.5*8	
34	23301054G	screws with knurled resin head(CRKB.M3-15L)	
35	25600046G	Autofocus Sensor Switch (CLS-051)	29006010G
36	29006405G	X Axis Detector	
39	29004737G	2.0" Focal lens Assembly	
40	22802047G	focusing lens hold board	29004737G
41	24402538G	lens spring assem	29004737G
42	244040540G	Lens Carriage Top Shingle	
43	29005108G	AAS I terminal board Module - Spirit	
44	233000070G	Hexagonal Post of Female Screw Type L18*M3+Male Screw Type L6*M3	
45	29005770G	Plate	
	29005506G	Lens carriage Assembly w/o lens and mirror (for service)	
	29002507G	AUTOFOCUS A Module	

VII Mirror 1 and Laser Tube Assembly

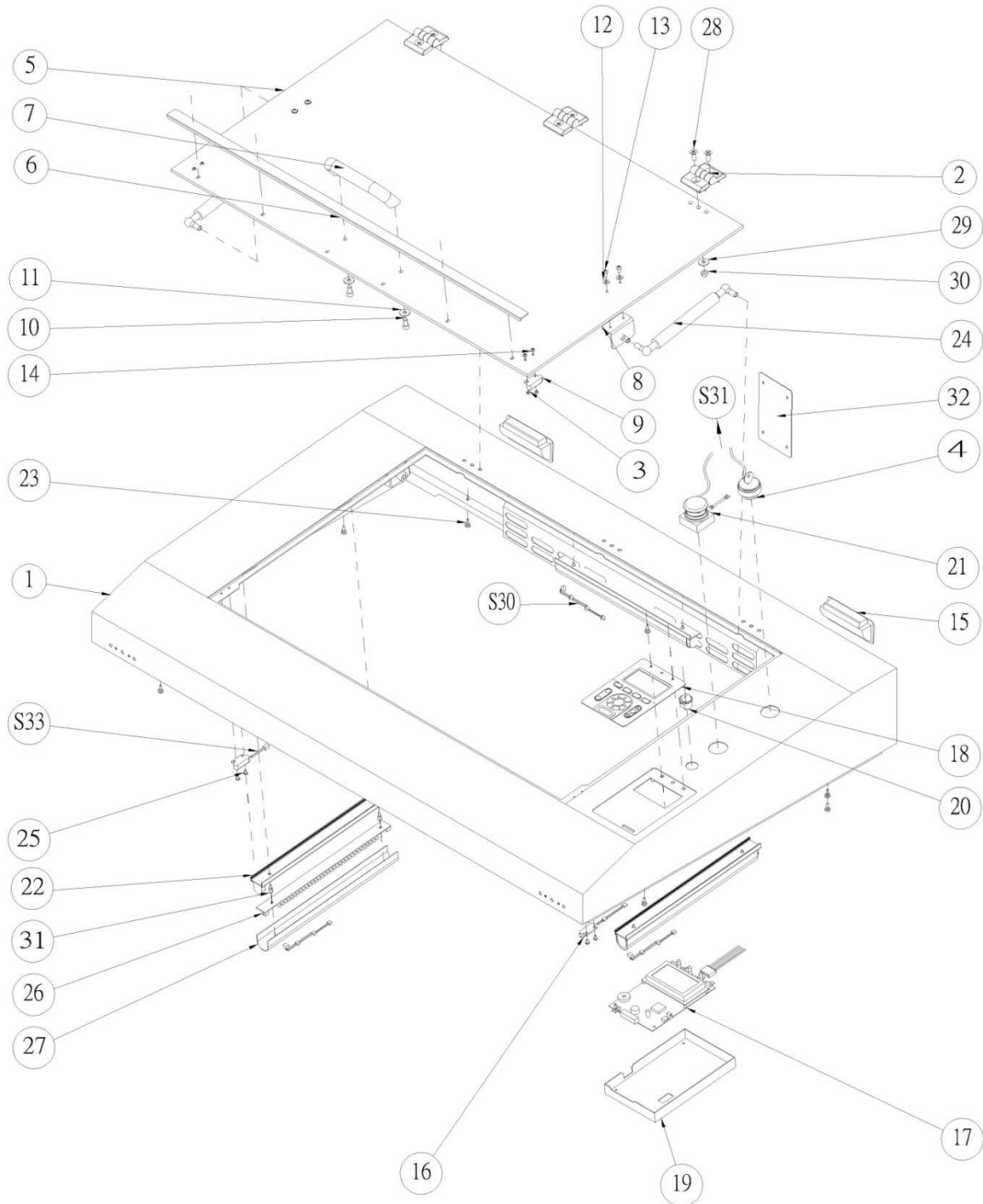


Mirror 1 and Laser tube Assembly

Item No.	Part no.	Description	Please order this item
1	25200214G	Socket head set screw.(M4*12L)	
2	22801773G	Laser main base	
3	22900048G	Synrad v30 Laser Tube	
4	22801470G	T60 laser reconnect board	
5	22801471G	Laser front bracket	
6	22801482G	Laser front board	
7	22800921G	Red beam fixed base	
8	25200149G	Socket head set screw.(M3*12L)	
9	22800907G	0.5" beam expander assembly	29002528G
10	23600002G	II-VI P/N#107113 ZnSe Lens 0.50	29002528G
11	22800909G	0.75" beam expander assembly	29002528G
12	23600003G	II-VI P/N#524851 ZnSe Lens 0.75	29002528G
13	23300300G	Lens carriage screw	29002528G
14	26000015G	Flat washer.(d3xD8xt1 SUS)	
15	202003240G	Prism Mounts Assembly	
16	25200127G	Pan head machine screw(M3*8L)	
17	24400581G	Mirror holder	29001109G
18	29001109G	Red Beam Mirror Assembly	
19	29002609G	front board dip cotton.	
20	290077670G	1st mirror block(1")	
21	22800647G	Circle Mirror Accessory	290077670G
22	23600015G	P/N#271260 Si Reflector 1.0"dia. × 0.12"thk	290077670G
23	22800914G	mirror pin	
24	25200192G	Socket head set screw.(M4*8L sus+coating)	
25	23600028G	Laser Diode module	
26	25200138G	Socket head set screw.(M3*10L su	
27	25200410G	Socket head set screw.(#8-32 UNC*1/2"L)	
28	26000036G	Spring Washer (d6xD11xt1.4)sus	
29	25200300G	Socket head set screw.(M6*12L)	
30	24500089G	Power Supply (RSP-1000-27 (30V))	
	29002528G	3x Beam Expander	

2-3 Spirit GLS & GLS Hybrid

I. Top Cover for **GLS & GLS Hybrid**



Top Cover - Parts List

Item no.	Part no.	Description
1	24403981G	Top cover
2	26500166G	Window Hinge
3	23500013G	Nut(M3xt2.4xS5.5)
4	25700094G	Key Switch (E3K2I2A.V)
5	22802392G	windows
6	24404033G	Window Support Bracket
7	26500165G	Window Handle
8	24402675G	BKT CYLINDER
9	22000045G	Magnet MC-12
10	25200299G	Socket head set screw.(M6*12L)
11	26000039G	Flat washer (d6.4*D16.8*t1.6)
12	26000008G	Plastic washer.
13	25200209G	Truss head machine screw(M4*10L)
14	25200115G	Truss head machine screw(M3*6L SUS).
15	23300387G	Plastic Embedded Pulls
16	25700015G	Magnetic Switch
17	290068430G	Keyboard Assembly (8051 F340)
18	23400020G	Control panel sticker
19	24400995G	Key board dust proof cover
20	25700032G	LAMP SW(R13-112)
21	25700095G	Emergency Switch (TN3BKR-2B)
22	22000124G	lamp holder
23	26500210G	Rubber Foot TNF-1
24	23300892G	cylinder (7kg)
25	25200115G	Truss head machine screw(M3*6L SUS).
26	29004053G	LED LAMP BOARD
27	23300296G	Fluorescent Lamps lampshade
28	25200308G	90° dish flat head machine screw
29	26000039G	Flat washer (d6.4*D16.8*t1.6)
30	23500010G	Nut(M6xt5xS10).
31	22000039G	Hex Screw M3X8L
32	24401587G	4" air pipe cover



II. Mid. Section for **GLS & GLS Hybrid**

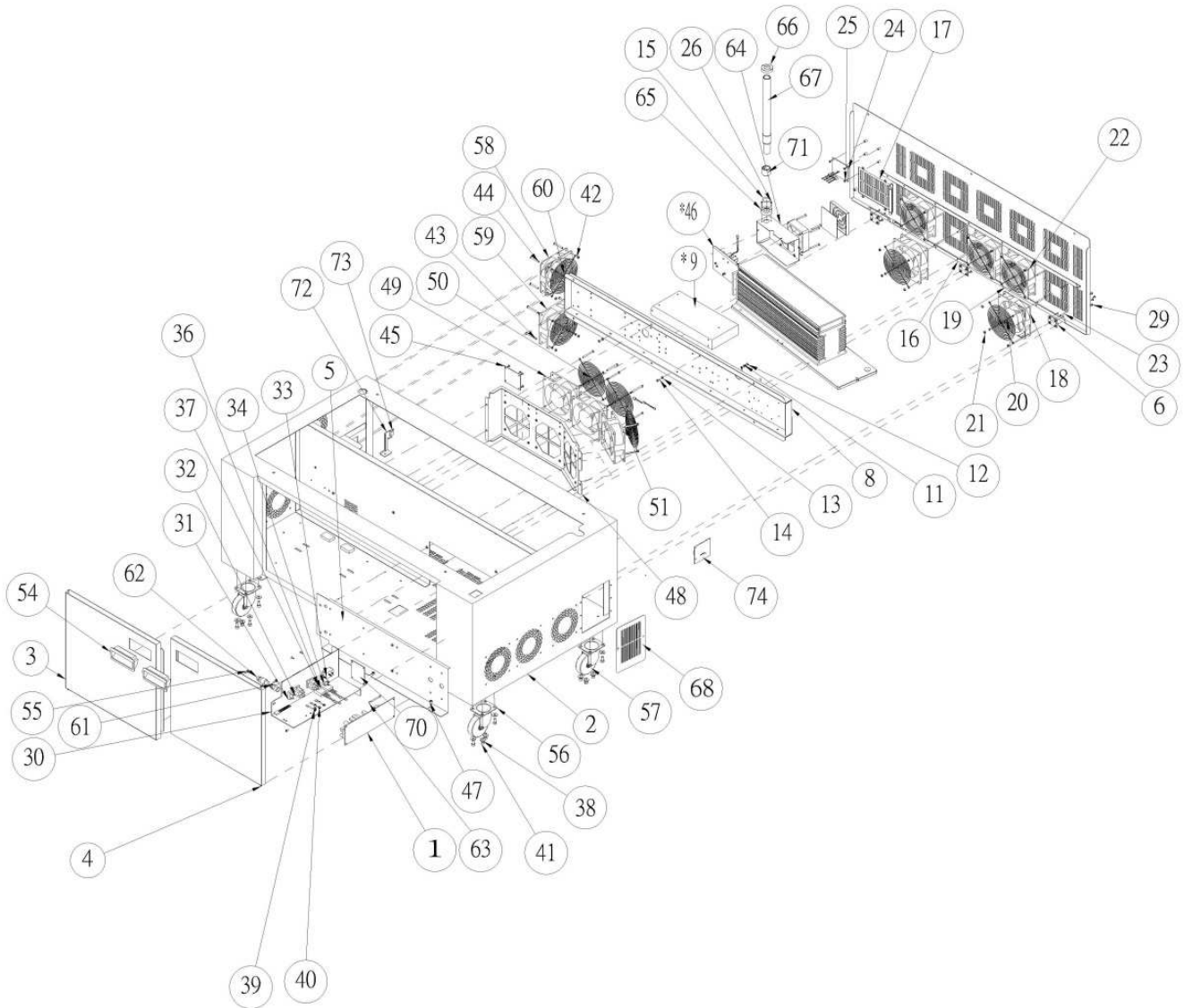
Mid. Section – Spare Parts List

Item no.	Part no.	Description	Please order this item
1	20200184G	main unit Assembly - Spirit	
2	24400984G	Z axis top Limit modulate seat	
3	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	
4	25200017G	Truss head machine screw(M3X15L)	
5	25200101G	head set screw_M3x6L	
6	25500041G	Spring for carrier guide roller	
7	25200162G	Socket head set screw.(M3*20L) S	
8	24400985G	Z axis down Limit Switch seat	29002518G
9	25700002G	Lever Switch (VM3-04N-80S-U3 (390))	29002518G
10	25200017G	Truss head machine screw(M3X15L)	29002518G
11	26000016G	Flat washer	
12	25200177G	Socket head set screw.(M4*6L)	
13	24402291G	Working table Bracket	29004566G
14	22800130G	Z-axis screw thread	
15	26000016G	Flat washer	
16	25200250G	Socket head set screw-M4x25	
17	22801022G	Z-axis table screw	
18	22000045G	Magnet MC-12	
19	24100368G	Z-axis pully	29002551G
20	23500015G	Nut(M4xt3.2xS7)	29002551G
21	24100367G	Z-axis pully cover	29002551G
22	25200003G	Panhead machine screw-white M3x8	
23	25200173G	Socket headness set screw-M4x6	
24	22800922G	Z axis top stopper	
25	24100366G	Bearing seat	
26	20700034G	Bearing 628ZZ	
27	23500015G	Nut(M4xt3.2xS7)	
28	25200036G	Pan Head tap srcew type-M4x8	
29	25200205G	Socket head set screw_M4x10L	
30	25200237G	Socket head set screw.(M4*16L su	
31	24401002G	Door-Retaining fixing plate	
32	22800956G	Y slideway actions revise seat	
33	23100017G	STEPPING MOTOR DSH56EL4HA4L0100	
34	26000018G	Spring washer.(d4xD7 SUS)	
35	24700013G	Rubber Packing for Z Motor	

Item no.	Part no.	Description
36	24403500G	Z Motor Braclcet
37	25200214G	Socket head set screw.(M4*12L)
38	22800622G	z axis pulley (P20-5GT-9)
39	25200170G	Socket headness set screw.(M4*4L
40	25200192G	Socket head set screw.(M4*8L sus+coating)
41	24401000G	Z-axis Idle wheel
42	22800964G	Core of Z-axis pulley
43	25200274G	Socket head set screw_M5x10L
44	22800084G	idle Pulley
45	24900007G	E-shape retaining ring.d6xD12xt0
46	24100369G	Belt flange
47	24403647G	Y-axis detector
48	24400986G	Y motor fix board
49	23100022G	DC MOTOR(TS3727N75E5)
50	228036670G	X-axis 20 gear
51	25200090G	Socket headness set screw.(M3*3L
52	21800003G	EMI CORE(CR-0175-RH001) / (RH17.5*28.5*9.5)
53	25200149G	Socket head set screw.(M3*12L)
54	26000002G	Spring washer.(d3xD5.5xt0.8)sus
55	25200119G	Socket head set screw.(M3*8L)SUS
58	290071360G	Spirit main board with Spirit GLS firmware
59	25200115G	Truss head machine screw(M3*6L SUS).
60	24400987G	Mirror Bracket
61	202003240G	prism mounts Assembly
62	25700014G	ON/OFF SW
63	22300003G	FUSE (15A/250V ZE-800)
64	22300004G	Fuse (3A/250V ZE-800)
65	22200023G	FAN 80X80X25 DC12V (EE80251S2-0000-999)
66	22000053G	Fan finger guard(matchAD08024US-A70GL)(G08A5-4HA)
67	24500022G	MEAN WELL Power Supply ADS-15540 40V/5V
68	29002510G	Y Motor PCB
69	20600027G	Z-axis belt (5GT-3640-9)
70	21800007G	EMI Filter YE10T1L2

Item no.	Part no.	Description	Please order this item
71	22000108G	Varistor (CNR-14D471K-TRK)	
72	24401455G	induced draft box	
73	23300307G	Top Cover left fixed stick	
74	23300308G	Top Cover right fixed stick	
75	22000130G	PC board interval(MCB-6)	
76	25200144G	Truss head machine screw(M3*10L)	
77	25200260G	Pan head machine screw(M4*35L)	
78	23500015G	Nut(M4xt3.2xS7)	
79	25700015G	Magnetic Switch	
80	22802103G	Engraving Platform	
81	290068550G	Ruler Set for X-axis	
82	290068560G	Ruler Set for Y-axis	
83	290073850G	Space ruler Set for Y-axis(460*50*3)	
84	23300301G	Top cover hinge	
85	24100361G	hinge scrw plug	
86	24401108G	Dust Prevention Cap	
87	244043680G	USB Cover	
88	244044010G	Top Limit Switch Bracket	
89	25700008G	Level Limited Switch	
90	244043990G	Back Limit Switch Bracket	
91	25700008G	Level Limited Switch	
92	22800269G	lens fix mount	290069310G
93	290069310G	Dust Prevention Window fix asm	
	29002518G	Z axis down Limit Switch Assembly	
	29004566G	Table lead screw assembly (Left)	
	29002551G	Z-axis pulley Assembly.	

III. Base Section for **GLS**



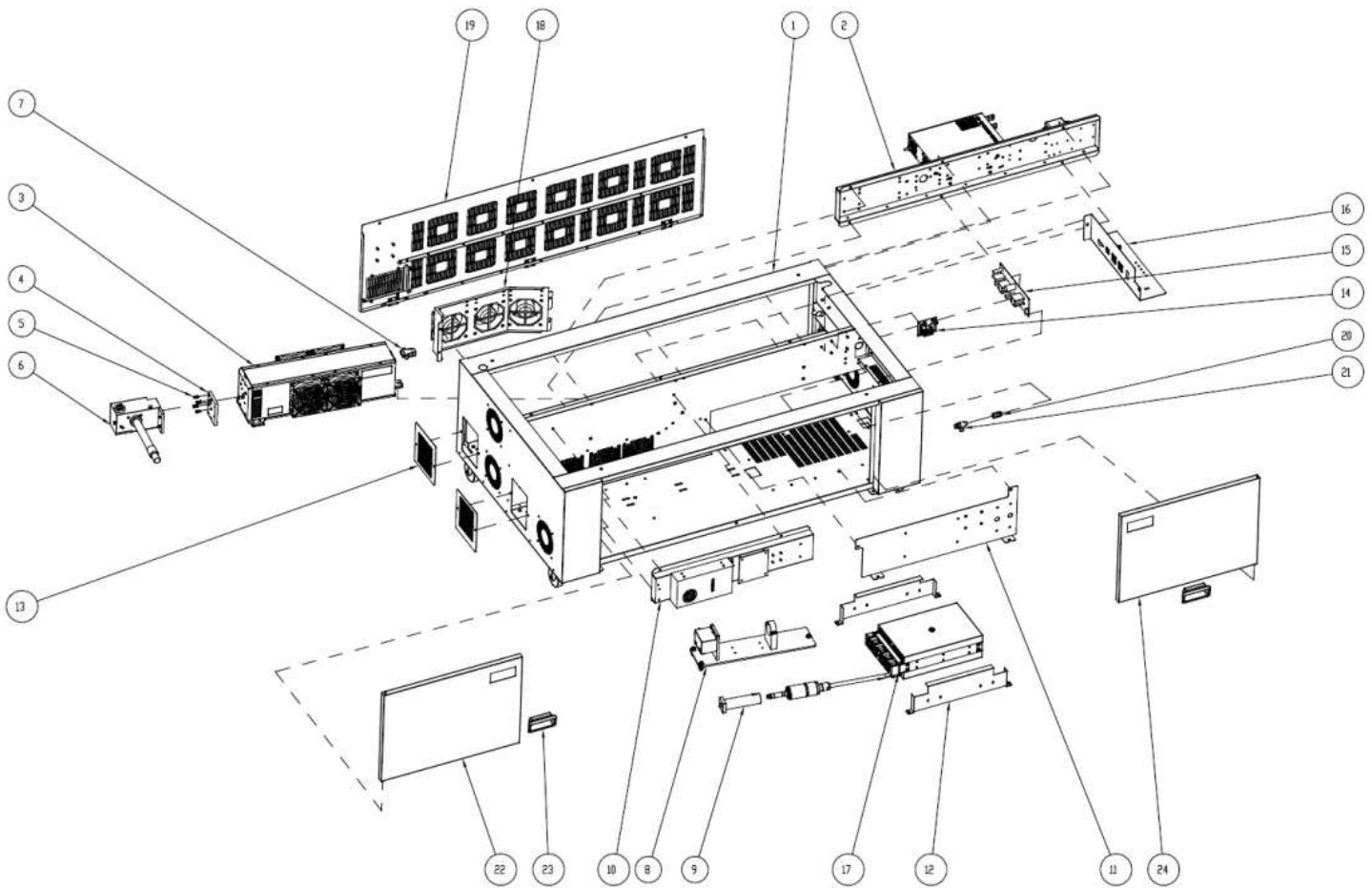
Base Section – Spare Parts List

Item no.	Part no.	Description	Please order this item
1	24500037G	power supply 150W LPP-150-12	
2	24402277G	base Chassis	
3	24402293G	base Left door	
4	24402294G	base Right door	
5	24401476G	base protect board	
6	24400991G	plank hinge	
8	24401633G	T Series power supply fixture	

Item no.	Part no.	Description	Please order this item
*9	24500089G	Power Supply (RSP-1000-27 (30V)), for T60/T100 after S/N J50682	
*9	24500048G	Power Supply (RSP-1000-48 (48V)), for Ti100(2 units needed) after S/N K51416	
*9	24500064G	Power Supply (RSP-1000-48), for Ti60/Ti80 after S/N K51416	
*9	24500089G	Power Supply(RSP-1000-27 (30V)), for V30/V40 after S/N K50983	
11	26000026G	External toothed lock washer (M4-Ni)	
12	25200200G	Truss head machine screw(M4*8L sus).	
13	26000002G	Spring washer.(d3xD5.5xt0.8)sus	
14	25200051G	U.S pan head machine screw(White)6#*8	
15	24700028G	O-ring(P22)	
16	24402292G	base Back door	
17	24400663G	plate-Venus	
18	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)	
19	22200024G	FAN DC12V (AD1212HB-51(N)LF)	29003631G
20	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)	
21	23500015G	Nut(M4xt3.2xS7)	
22	25200262G	Pan head machine screw(M4*45L)	
23	25200260G	Pan head machine screw(M4*35L)	
24	29005059G	DC12V POWER MODULE	
25	25200115G	Truss head machine screw(M3*6L SUS).	
26	25200159G	Socket head set screw.(M3*16L)	
28	23300305G	buckle door magnet(02-10-101-10)	
29	25200115G	Truss head machine screw(M3*6L SUS).	
30	24402319G	12V power fixed board	
31	25700017G	Rocker Switch- Black Case(RF-1001N-BRWD-2)	
32	21100149G	AC CONNECT(SO-11-1)	
33	21100184G	AC CONNECTOR(AC-008)	
34	22300003G	FUSE (15A/250V ZE-800)	
36	20400005G	Solid State Relay (KSD215AC3)	
37	25200101G	head set screw_M3x6L	
38	26000039G	Flat washer (d6.4*D16.8*t1.6)	

Item no.	Part no.	Description	Please order this item
39	26000026G	External toothed lock washer (M4-Ni)	
40	25200200G	Truss head machine screw(M4*8L sus).	
41	25200303G	Socket flat head set screw.(M6*14)NI	
42	23500015G	Nut(M4xt3.2xS7)	
43	25200262G	Pan head machine screw(M4*45L)	
44	25200260G	Pan head machine screw(M4*35L)	
45	29005059G	DC12V POWER MODULE	
*46	29004123G	V30 Laser unit	
48	24401557G	T60 baffle	29003631G
49	22200024G	FAN DC12V (AD1212HB-51(N)LF)	29003631G
50	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)	
51	25200262G	Pan head machine screw(M4*45L)	
54	23300387G	Plastic Embedded Pulls	
55	26500210G	Rubber Foot TNF-1	
56	233013930G	2.5" PU Stand Wheel (25PUA-R)	
57	233013940G	2.5" PU Stand Wheel with Break (25PUB-R)	
58	22200022G	FAN (AD1212HB-A71GL(N)LF/DC12V)	
59	22200024G	FAN DC12V (AD1212HB-51(N)LF)	
60	22000106G	Fan finger guard 12cm(008170)(G12B8-4HA)	29003631G
61	26500489G	airflow valve (PMF6-02)	
62	26500488G	Air Flow Valve JSC6-02BT(Black)	
63	20900992G	POWER TO 12V Terminal PCB CABLE	
64	244041610G	Optical Dust Cover	
65	22801125G	Under aroeseal fixed stand	
66	22801126G	On aroeseal fixed stand	29003150G
67	23300355G	600mm contraction pipe	29003150G
68	24400589G	Cover	
70	29005059G	DC12V POWER MODULE	
71	22800069G	Dust Tube Holder	
72	244044000G	Down Limit Switch Bracket	290072460G
73	25700008G	Level Limited Switch	290072460G
74	290065250G	FAN Control Board Assembly	
	29003631G	Baffle Assembly	
	29003150G	600 Contraction pipe Assembly	
	290072460G	Down Limit Switch Assembly	

IV. Base Section-1 for **GLS Hybrid**

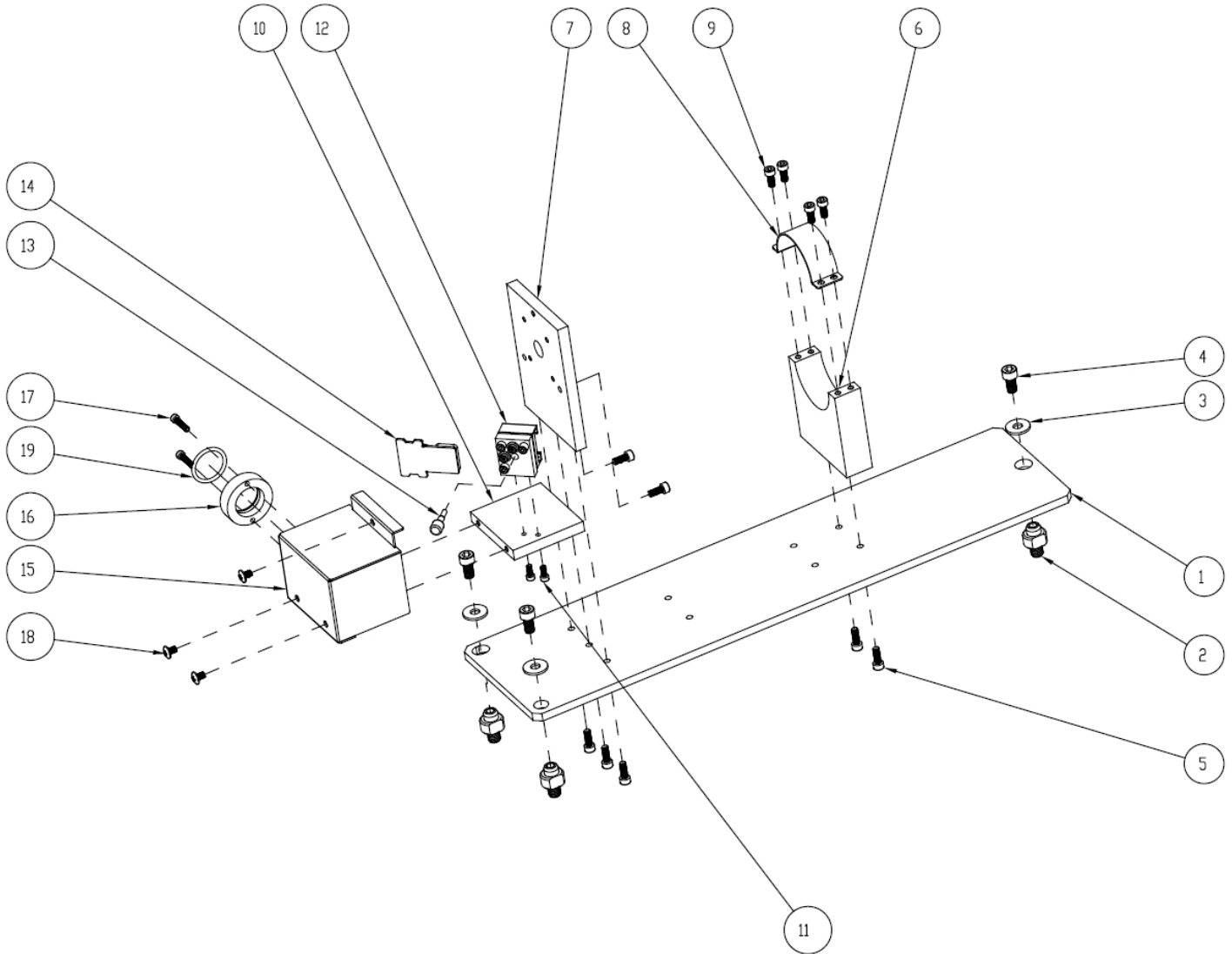


Base Section-1 – Spare Parts List

ITEM	PART NO	Description	QTY
1	244054820G	Base Chassis	1
2	290068190G	100Ti Power Supply Assembly	1
3	229000880G	Synrad Ti100 air-cooled laser	1
4	22801470G	T60 laser reconnect board	1
5	25200410G	Socket head set screw.(#8-32 UNC*1/2"L)	4
6	290096340G	Laser Beam Combiner Assembly for Hybrid CO2+Fiber lasers	1
7	211004940G	Laser Adapter for Ti series	1
8	290096320G	Laser bracket Assembly	1
9	236001680G	Beam expander-SPI-F50-BECs--1064nm-Fiber laser(PT-P00553)	1
10	290096350G	Power supply fixture	1
11	24401476G	base protect board	1
12	244044070G	LD Bracket	2

13	24400589G	Cover	3
14	29005059G	DC12V POWER MODULE	1
15	24500037G	power supply 150W LPP-150-12	1
16	29004570G	12V Power block	1
17	229000850G	G4 50W Fiber laser (SP-050P-A-RM-Z-B-Y)	1
18	29003631G	baffle Assembly	1
19	290068200G	100Ti base Back door Assembly	1
20	26500489G	airflow valve (PMF6-02)	1
21	26500488G	Air Flow Valve JSC6-02BT(Black)	1
22	24402293G	base Left door	1
23	23300387G	Plastic Embedded Pulls	2
24	24402294G	base Right door	1

V. Base Section-2 for **GLS Hybrid**



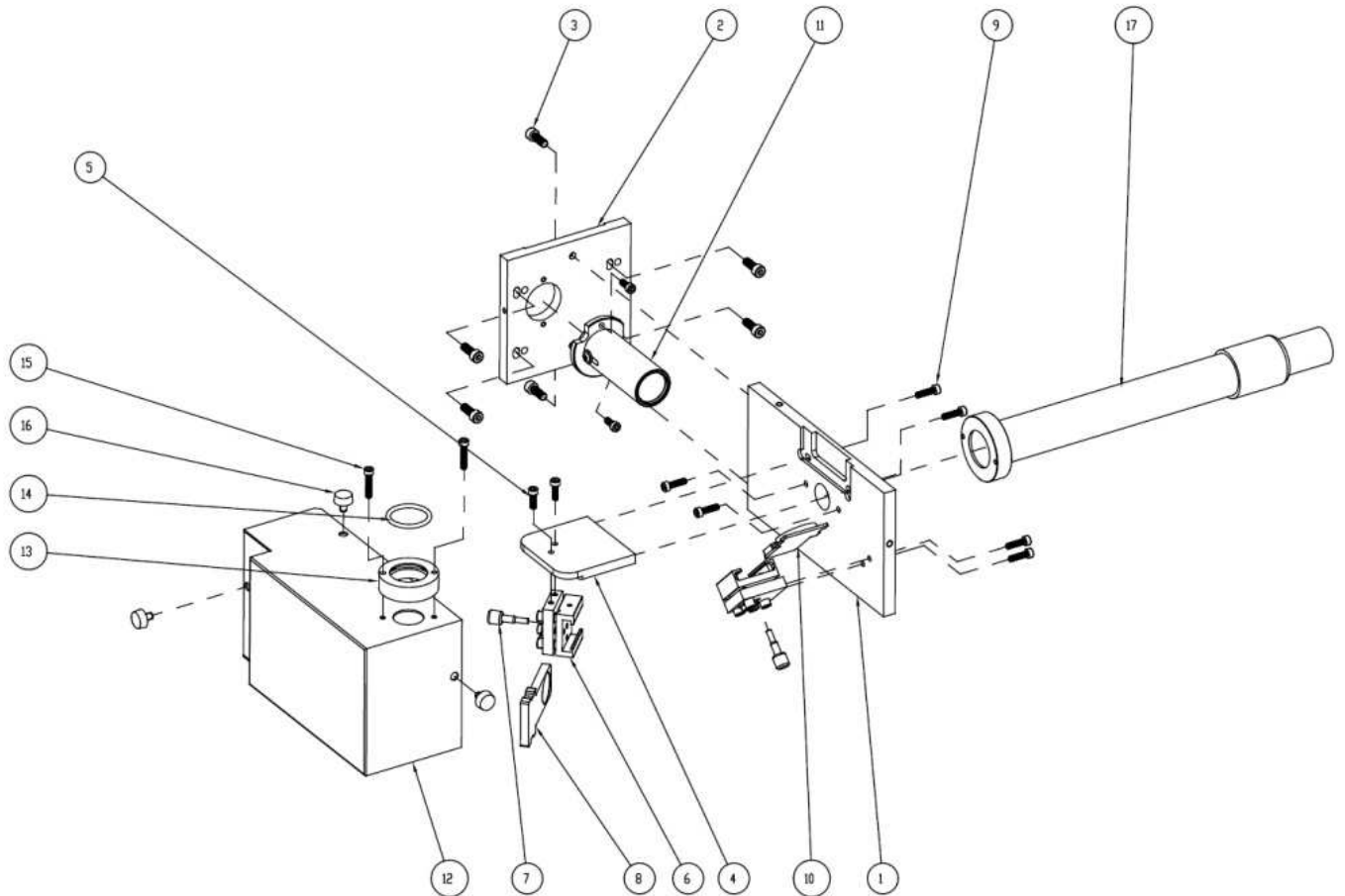
Base Section-2 – Spare Parts List

ITEM	PART NO	Description	QTY
1	228040040G	Laser Base Plate	1
2	22801367G	Laser fixing rod	3
3	26000039G	Flat washer (d6.4*D16.8*t1.6)	3
4	25200297G	Socket head set screw.(M6*12L white)	3
5	25200214G	Socket head set screw.(M4*12L)	5
6	228040070G	Laser Bracket	1
7	228040080G	Laser front board	1
8	244044080G	Laser Bracket	1
9	25200205G	Socket head set screw.(M4*10L)	6
10	228040090G	Mirror Bracket	1

Spirit/Spirit LS/Spirit GLS Maintenance Manual V.3

11	25200119G	Socket head set screw.(M3*8L)SUS+CO	2
12	202003240G	Prism Mounts Assembly	1
13	22800914G	mirror pin	1
14	290090510G	Mirror 1 Assembly	1
15	244054790G	Optical Cover	1
16	22801125G	Under aero-seal fixed stand	1
17	25200159G	Socket head set screw.(M3*16L)	2
18	25200187G	Truss head machine screw(M4*6L).	3
19	24700028G	O-ring(P22)	1

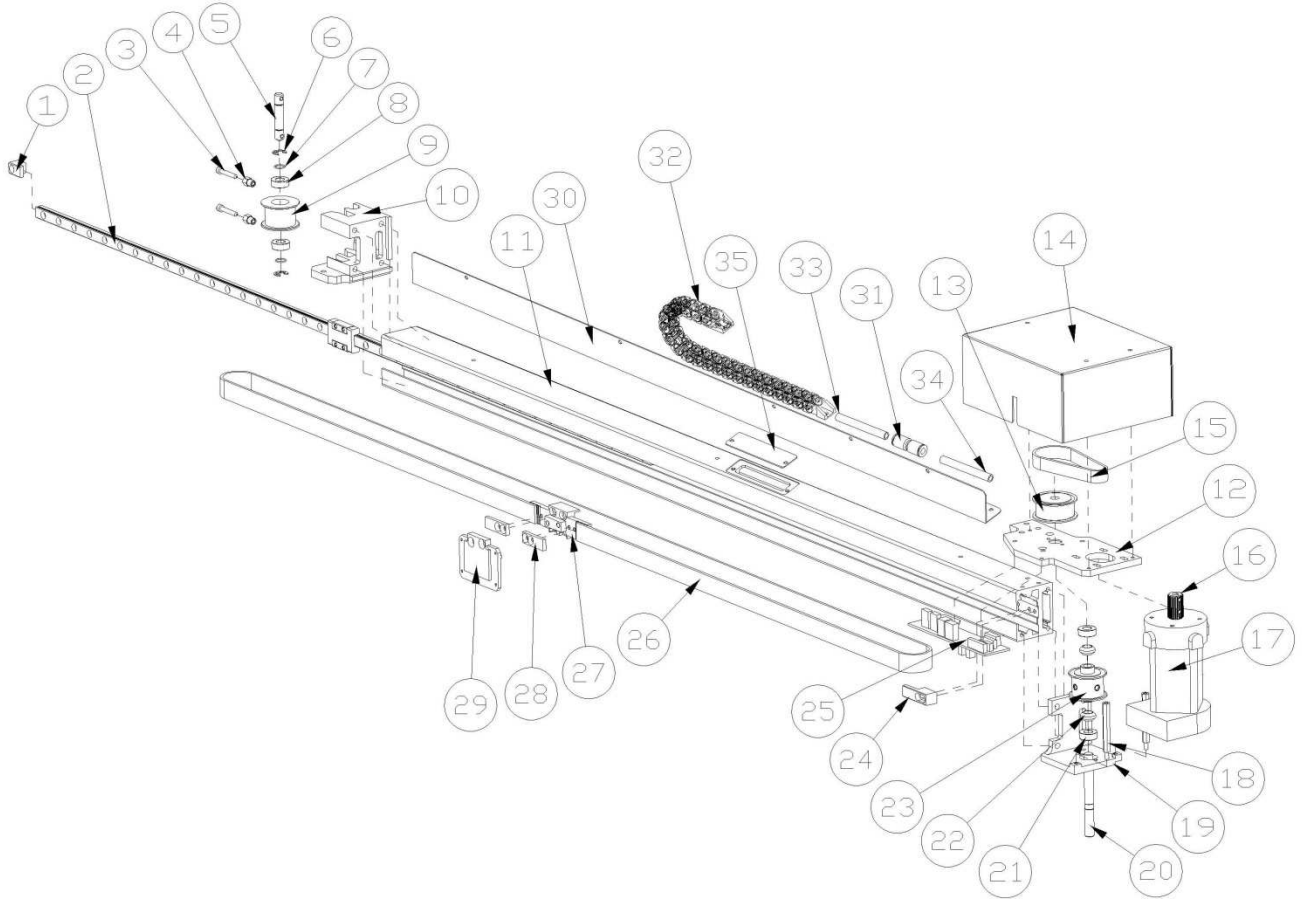
VI. Base Section-3 for **GLS Hybrid**



Base Section-3 – Spare Parts List

ITEM	PART NO	Description	QTY
1	228040050G	Laser front board	1
2	22801471G	Laser front bracket	1
3	25200214G	Socket head set screw.(M4*12L)	6
4	228040100G	Beam Combiner Bracket	1
5	25200138G	Socket head set screw.(M3*10L sus+coating)	2
6	202003240G	Prism Mounts Assembly	2
7	22800914G	mirror pin	2
8	290096370G	Beam Combiner	1
9	25200149G	Socket head set screw.(M3*12L)	4
10	290077670G	1st mirror block(1")	1
11	29002528G	3x Beam Expander	1
12	244054800G	Optical Cover	1
13	22801125G	Under aero-seal fixed stand	1
14	24700028G	O ring (P22)	1
15	25200159G	Socket head set screw.(M3*16L)	2
16	23300299G	Hand Knobs (CRKB.M4-6L)	3
17	29003151G	400 Contraction pipe Assembly	1

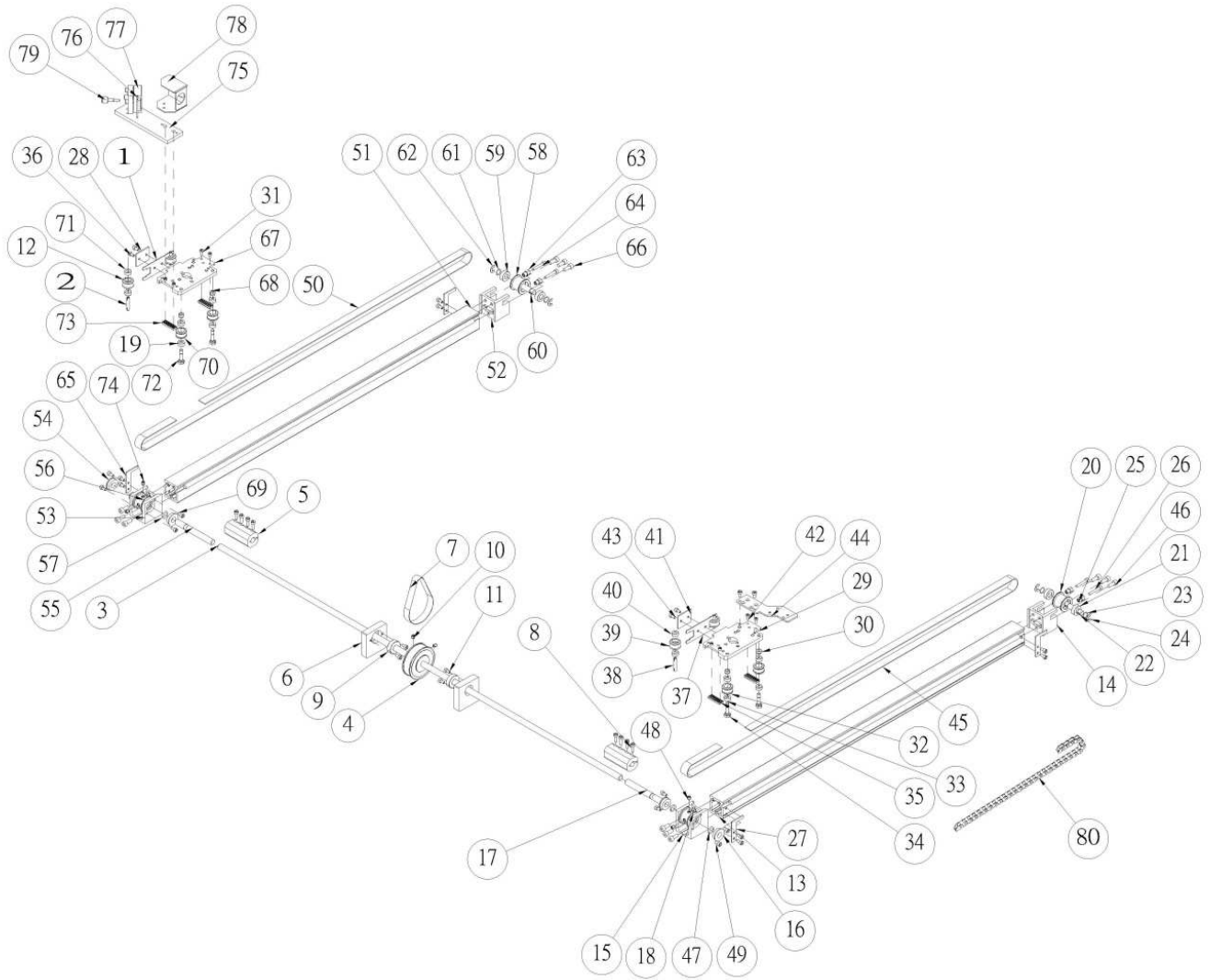
VII. X Axis Assembly for **GLS & GLS Hybrid**



X Axis Assembly – Spare Parts List

Item no.	Part no.	Description	Please order this item
1	228032941G	Stoper	
2	233013410G	Linear Guide (MR9MNSU1V1P-1000L-10-10)	290070710G
3	22802302G	Adjust screw	
4	22800929G	strain stable screw	
5	22803055G	Tension pulley shaft	29006039G
6	24900002G	E-shape retaining ring.D11*d5*t0.6	29006039G
7	25500049G	wire ring φ7	29006039G
8	20700053G	Bearing (687ZZ)	
9	29006039G	Tension idle pulley Assembly	
10	228033320G	Tension pulley shaft bracket	
11	228035060G	X-Axis Slideway	290070710G
12	228033310G	X Axis between top axle bracket	
13	228033351G	X-axis Mid Belt Wheel (P48)	
14	24403742G	X motor dust-proof lid	
15	20600159G	Close Kevlar Belt (U2GT-180-10)	
16	228036670G	Motor Gear (P20)	290083910G
17	23100022G	DC MOTOR(TS3727N75E5)	290083910G
18	23300584G	Hex Screw M3.0*40mm	
19	228033300G	X Axis between below axle bracket	
20	228033340G	X axis transmit shaft	
21	20700053G	Bearing (687ZZ)	
22	22803053G	spacer	
23	228036680G	X-axis Transmit Belt Wheel (P40)	
25	29005107G	X-AXIS BOARD(AAS I) MODULE	
26	20600173G	X-axis Open Kevlar Belt (FHT-2*L2274*W15)	
27	22803046G	Carrage belt plate bracket	
28	22803050G	belt retainer	
29	228032960G	Lens carriage base	
30	244041600G	X-Cable-Carrier Bracket	
31	23300084G	airflow valve(PU-6) / (KUS6M)	
32	233013560G	X Tube Chain (045.10.028-46L-045.10.12 total 48 links)	
33	29003635G	X axis air assist tube 1250mm	
34	29002600G	Y axis air assist tube 1400mm	
35	244045960G	Oil Hole Cover	
	290070710G	Linear guide assembly for SGLS (for service)	
	290083910G	Motor assembly	

VIII. Y Axis Assembly for **GLS & GLS Hybrid**



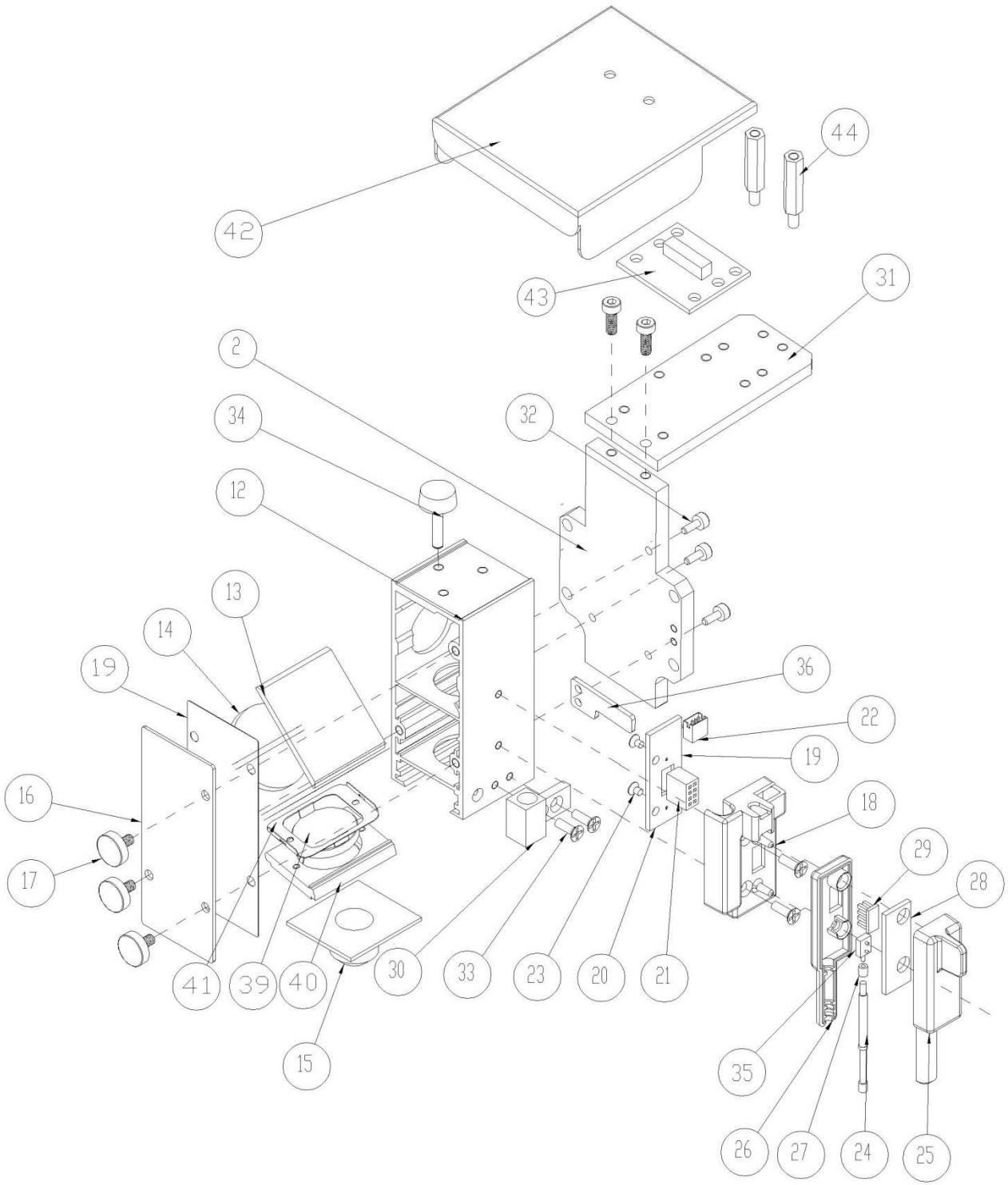
Y Axis Assembly – Spare Parts List

Item no.	Part no.	Description	Please order this item
1	25500047G	Wheel spring	29004278G
2	22800937G	actions wheel stable axleP	29004278G
3	22802116G	Y axis transmit shaft	
4	228036660G	Y-axis Mid Belt Wheel (P72)	
5	22800935G	8mm coupling	
6	22800934G	Y transmit shaft seat	
7	20600160G	Y-axis Close Kevlar Belt (FHT-2*L190*W10)	
8	25200138G	Socket head set screw.(M3*10L sus+coating)	
9	20700052G	Bearing (698ZZ)	
10	25200170G	Socket headness set screw.(M4*4L)	
11	25200100G	head set screw_M3x6L	
12	22801860G	4*9 both sides wheel(J)	29004278G
13	22802104G	y axis slideway	
14	22800928G	Tension pully shaft	
15	22800936G	transmission wheel set	
16	20700054G	Bearing (F688ZZ)	
17	22800950G	Y-Axis passive axle center	
18	228036650G	Y axis transmit belt wheel	
19	20700038G	Bearing 684ZZ	
20	22800926G	Tension idle pulley	
21	20700053G	Bearing (687ZZ)	
22	22800927G	Tension pully core	
23	25500049G	Wire ring D=7	
24	24900002G	E-shape retaining ring.D11*d5*t0.6	
25	22800929G	Strain stable screw	
26	22800957G	Tension fixing screw	
27	24400997G	Stopper board	
28	24401001G	guiding plate of spring	
29	22802955G	X Axis double side mount	
30	22800951G	4*4.5 interval pillar	

Item no.	Part no.	Description	Please order this item
31	25200081G	Socket head set screw_M2.5x6L	
32	22801859G	4*9 unilateral Wheel(J)	29004278G
33	20700038G	Bearing 684ZZ	
34	22800952G	4*11 small roller screw	
35	22800917G	belt retainer	
36	25200101G	head set screw_M3x6L	
37	25500047G	Wheel spring	29004278G
38	22800937G	actions wheel stable axleP	29004278G
40	20700038G	Bearing 684ZZ	
41	24401001G	guiding plate of spring	
42	25200081G	Socket head set screw_M2.5x6L	
43	25200101G	head set screw_M3x6L	
44	24403745G	protected pad	
45	206001950G	Y-axis Open Kevlar Belt (FHT-2*L1522*W12)	
46	25200205G	Socket head set screw_M4x10L	
47	25500048G	wire ring φ8	
48	25200170G	Socket headness set screw.(M4*4L)	
49	25200101G	head set screw_M3x6L	
50	206001950G	Y-axis Open Kevlar Belt (FHT-2*L1522*W12)	
51	22802104G	y axis slideway	
52	22800928G	Tension pully shaft	
53	22800936G	transmission wheel set	
54	20700054G	Bearing (F688ZZ)	
55	22800950G	Y-Axis passive axle center	
56	228036650G	Y axis transmit belt wheel (P30)	
57	25500048G	wire ring φ8	
58	22800926G	Tension idle pulley	
59	20700053G	Bearing (687ZZ)	
60	22800927G	Tension pully core	

Item no.	Part no.	Description	Please order this item
62	24900002G	E-shape retaining ring.D11*d5*t0.6	
63	22800929G	Strain stable screw	
64	22800957G	Tension fixing screw	
65	24400997G	Stopper board	
66	25200205G	Socket head set screw_M4x10L	
67	22802955G	X Axis double side mount	
68	22800951G	4*4.5 interval pillar	
69	25200101G	head set screw_M3x6L	
70	22801859G	4*9 unilateral Wheel(J)	29004278G
71	20700038G	Bearing 684ZZ	
72	22800952G	4*11 small roller screw	
73	22800917G	belt retainer	
74	25200170G	Socket headness set screw.(M4*4L)	
75	22802310G	X axis reflector hold board	
76	29002522G	Mirror Assembly	
77	202003240G	Prism Mounts Assembly	
78	24400969G	X lens hold board dust-proof lid	
79	22800914G	mirror pin	
80	26500308G	Y tube chain.0130.15R28-36L	
	29004278G	Wheel spring Assembly(J)	

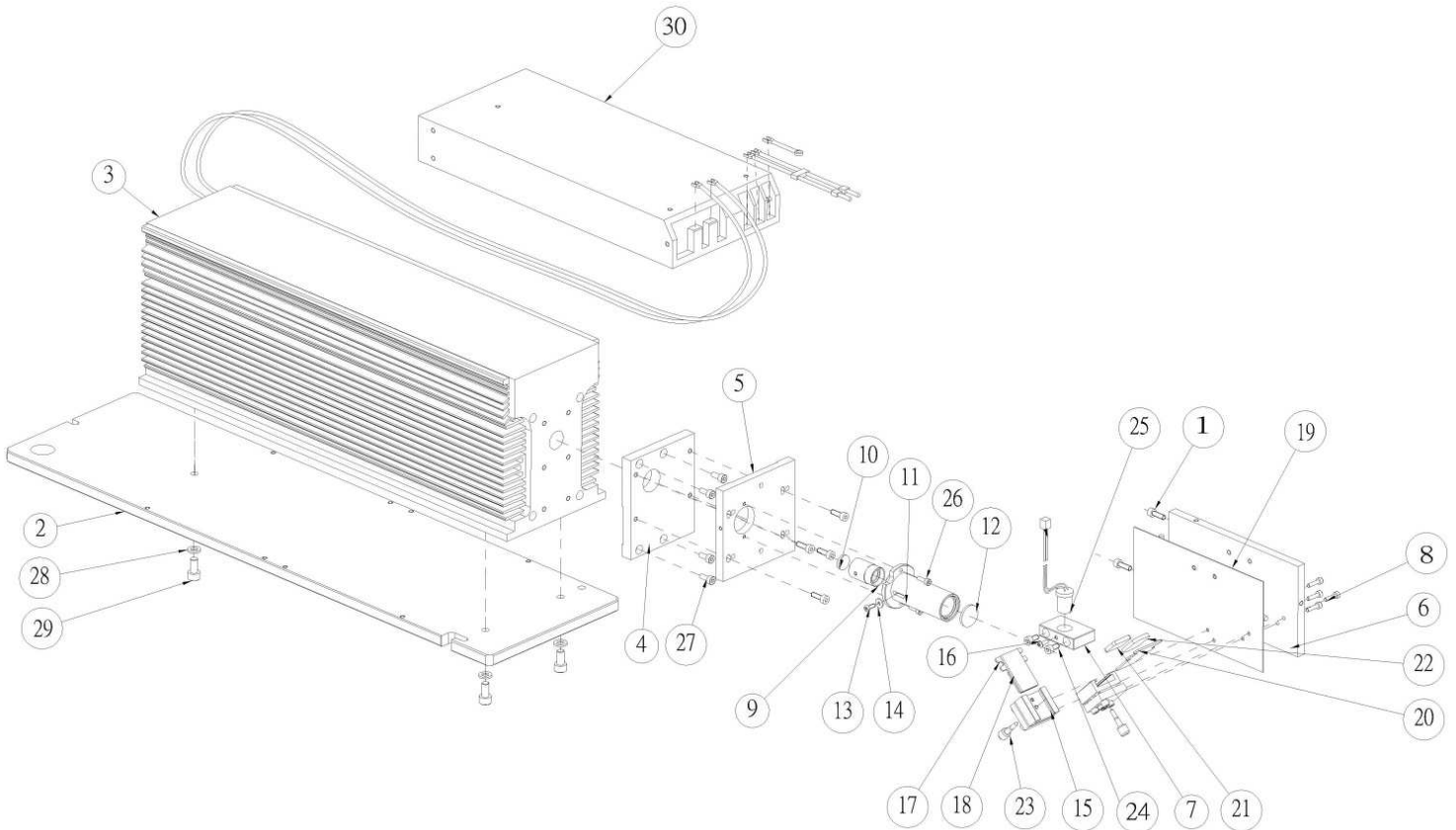
IX. Carriage for **GLS & GLS Hybrid**



Carriage – Spare Parts List

Item no.	Part no.	Description	Please order this item
2	22802108G	Lens carriage reconnect board	
12	22801996G	Lens carriage Assembly-V2 - C180	
13	22802046G	Carriage reflector hold board	
14	23600015G	P/N#271260 Si Reflector 1.0"dia	
15	22802117G	air nozzle	
16	22802084G	Lens carriage front shingle	
17	26500182G	Hand Knobs(CRKB.M3-6L)	
18	24100365G	Auto focus pin cover	
19	29004735G	Lens for blower Assembly	
20	23800141G	autofocus pcb (SA11667a)	
21	21100243G	F/H 2161 2.0mm Female Header	
22	21100244G	Wafer 1.5mm 3PIN 90 度	
23	25200343G	Head-BI machine screw.(M2*3L)	
24	22000117G	Probe (S-4A-0515)	
25	24100363G	Auto focus pin cover	
26	24100364G	Auto focus pin cover	
27	228032120G	G Probe Extension	
28	23800326G	AUTOFOCUS PCB for CLS-051 (NH02-009944 (K086-2015))	29006011G
29	21100242G	P/H 2141 pin header 2*4pin 2.0mm 180°	29006011G
30	22800955G	carriage airflow valve	
31	22802917G	Lens carriage assist base	
32	25200081G	Socket head set screw_M2.5x6L	
33	25200082G	90° dish flat head machine screw M2.5*8	
34	23301054G	screws with knurled resin head(CRKB.M3-15L)	
35	25600046G	Autofocus Sensor Switch (CLS-051)	29006011G
36	290079720G	X Axis Detector	
39	23600011G	II-VI P/N#488614 ZnSe Lens 0.75"dia. × 2.0"FL ET=0.08"	
40	22802047G	focusing lens hold board	
41	24402538G	lens spring assem	
42	244040540G	Lens Carriage Top Shingle	
43	29005108G	AAS I terminal board Module - Spirit	
44	233000070G	Hexagonal Post of Female Screw Type L18*M3+Male Screw Type L6*M3	
	29006011G	AUTOFOCUS C Module	

X. Mirror 1 Assembly and Laser Tube Assembly for **GLS**



Mirror 1 Assembly and Laser Tube Assembly – Parts List

Item no.	Part no.	Description
1	25200214G	Socket head set screw.(M4*12L)
2	22801773G	Laser main base
3	22900048G	Synrad V30 Laser Tube
3	22900058G	Coherent C-30 Laser Tube
3	22900051G	Synrad V40 Laser Tube
3	22900059G	Coherent C-40 Laser Tube
3	22900064G	Synrad Ti60 Laser Tube
3	229000720G	Synrad Ti 60-9.3 Laser Tube
3	229000700G	Synrad Ti80 Laser Tube
3	29003797G	Synrad T100 Laser Tube

Item no.	Part no.	Description	Please order this item
5	22801471G	Laser front bracket	
6	22801482G	Laser front board	
7	22800921G	Red beam fixed base	
8	25200149G	Socket head set screw.(M3*12L)	
9	22800907G	0.5" beam expander assembly	29002528G
10	23600002G	II-VI P/N#107113 ZnSe Lens 0.50	29002528G
11	22800909G	0.75" beam expander assembly	29002528G
12	23600003G	II-VI P/N#524851 ZnSe Lens 0.75	29002528G
13	23300300G	Lens carriage screw	29002528G
14	26000015G	Flat washer.(d3xD8xt1 SUS)	29002528G
15	202003240G	Prism Mounts Assembly	
16	25200127G	Pan head machine screw(M3*8L)	
17	24400581G	Mirror holder	29001109G
18	29001109G	Red Beam Mirror Assembly	
19	29002609G	front board dip cotton.	
20	244046100G	1 inch Mirror Holder	290077670G
21	22800647G	Circle Mirror Accessory	290077670G
22	290077670G	1st mirror block(1")	
23	22800914G	mirror pin	
24	25200192G	Socket head set screw.(M4*8L sus+coating)	
25	23600028G	Laser Diode module	29003806G
26	25200138G	Socket head set screw.(M3*10L su	
27	25200410G	Socket head set screw.(#8-32 UNC*1/2"L)	
28	26000036G	Spring Washer (d6xD11xt1.4)sus	
29	25200300G	Socket head set screw.(M6*12L)	
30	24500089G	Power Supply (RSP-1000-27 (30V))	
	29002528G	3x Beam Expander	
	29003806G	Red pointer Assembly	

2-4 A comparison table for GCC laser power supplies

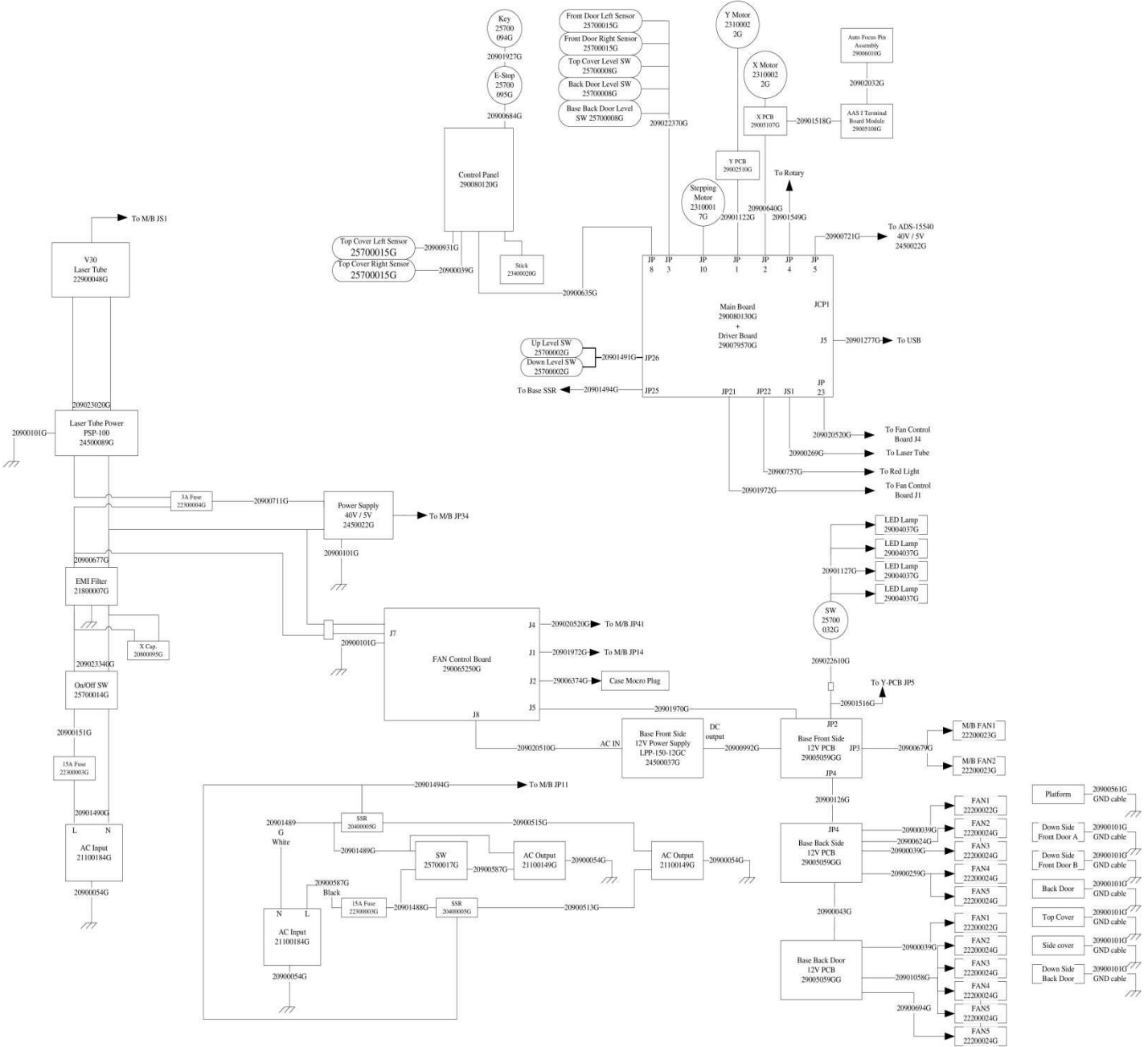
For machines need to change the power supply, in order to avoid the compatibility issue (we changed the supplier of power supply, and the new power supply is not compatible with old power supply in mechanics and connections), we've generated a series of part numbers for service, please check the S/N of machine and refer to below chat to order corresponding power supply assembly (The S/N parenthesized means the point we start to use the new version power supply) .

Series/Wattage	V30	V40	T60	Ti60	Ti80	T100
Spirit	290086090G (K50983)	290086090G (K50983)	290082950G (J50682)	290086140G (K51416)	290086120G (K51416)	290076960G (J50682)
Spirit LS						
Spirit GE						
Spirit GX						
Spirit GLS						
Mercury	290086130G (K50983)	290086130G (K50983)				

Chapter 3 – Electrical System

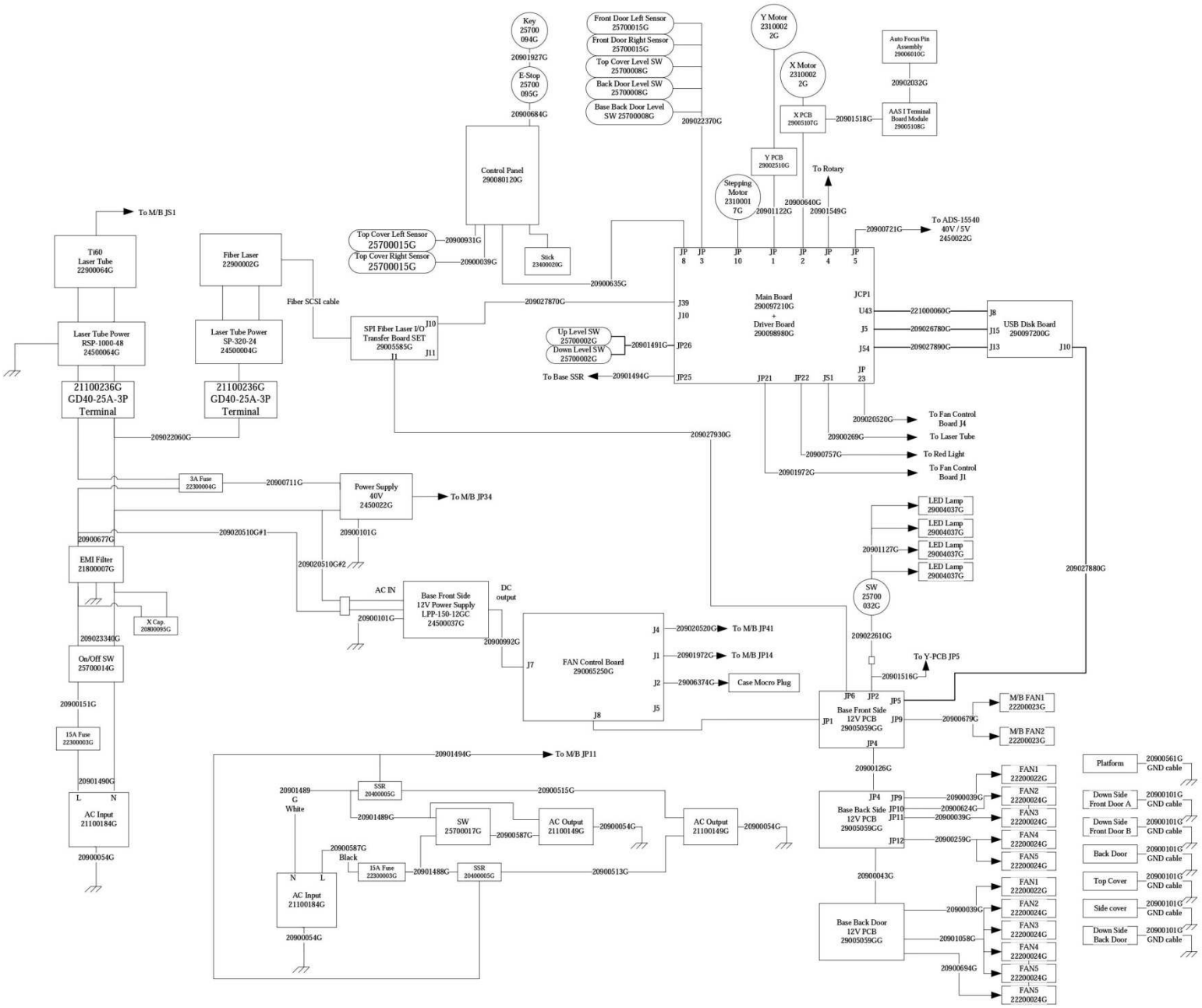
3.1 Spirit GLS electric diagram

Spirit GLS EE System



3.2 Spirit GLS Hybrid electric diagram

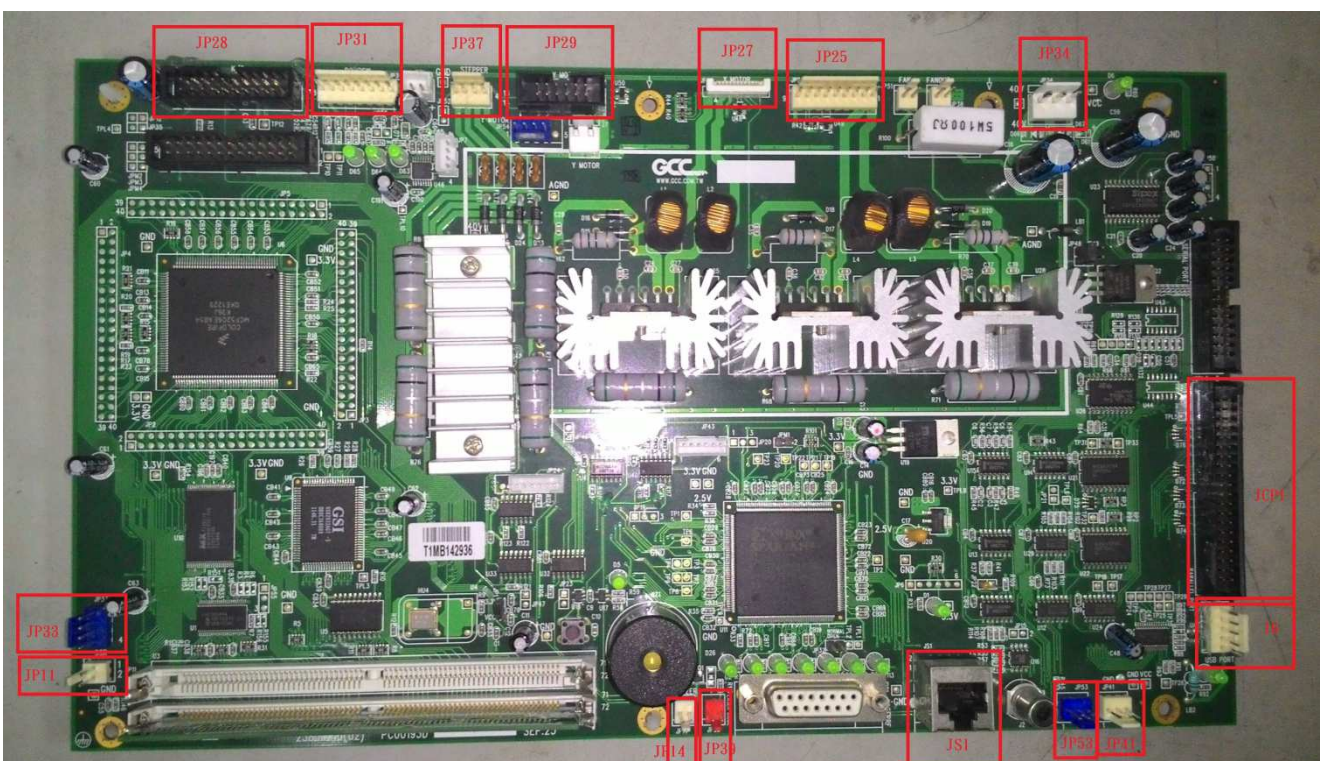
Spirit GLS Hybrid EE System



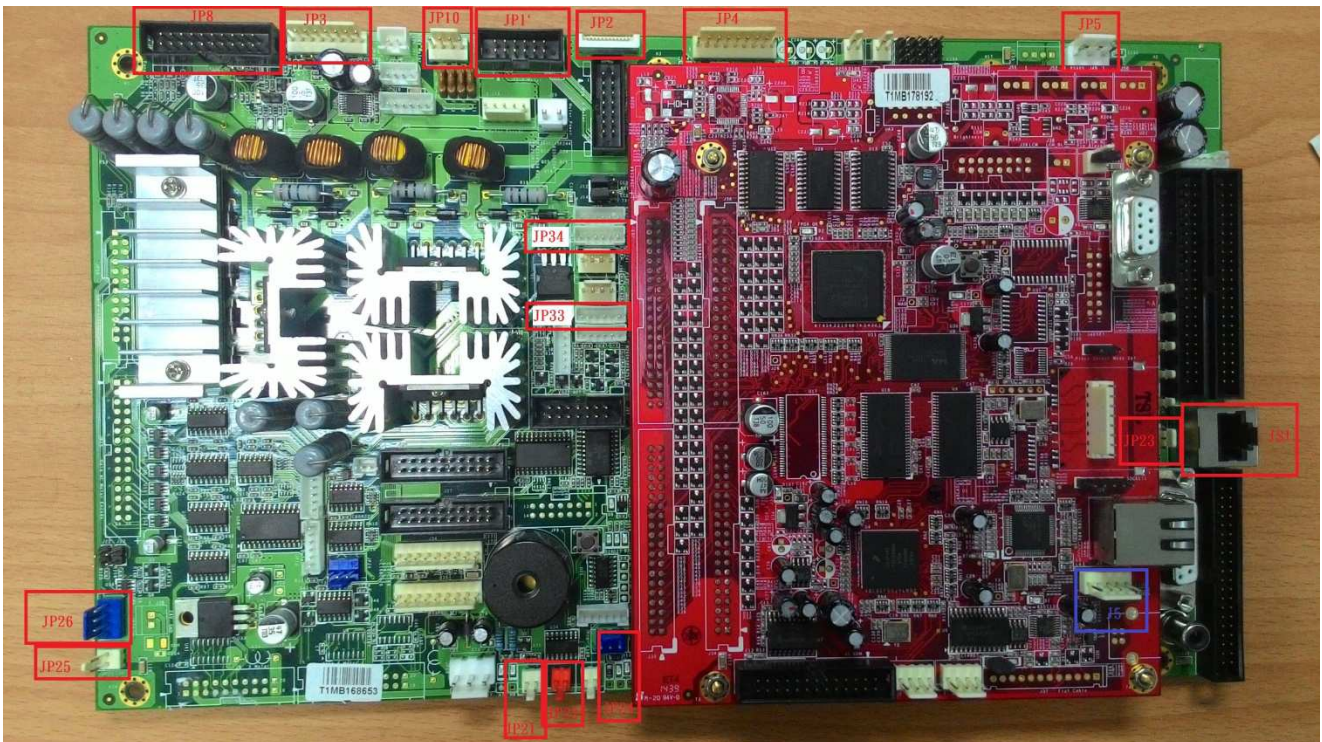
3.3 Definition of Pin

5206e M/B	5272 M/B	The definition of pin
JCP1	Driver Board JCP1 (N/A)	Paralle port (Black)
JP34	Driver Board JP5	3 pin (White)
JS1	Driver Board JS1	RJ45
JP25	Driver Board JP4	Rotary Motor
JP27	Driver Board JP2	X-motor flat cable (White)
JP29	Driver Board JP1	Y-motor (Black)
JP37	Driver Board JP10	Stepper motor 4 pin (White)
JP31	Driver Board JP3	Doors 6 pin (White)
JP6	MainBoard J5	USB Port 5pin (White)
JP41	Driver Board JP23	3 pin (White)
JP53 (N/A)	Driver Board JP24 (N/A)	3 pin (Blue)
JP39	Driver Board (Under U34) JP22	Laser Diode 2 pin (Red)
JP14	Driver Board (Under U34) JP21	Buzzer 2 pin (White)
JP33	Driver Board JP26	4 pin (Blue)
JP11	Driver Board JP25	SSR 2 pin (White)
JP28	Driver Board JP8	Control Panel Cable
JP24	Driver Board JP33	External control (Output)
JP43	Driver Board JP34	External Control (Input)

5206e Mainboard

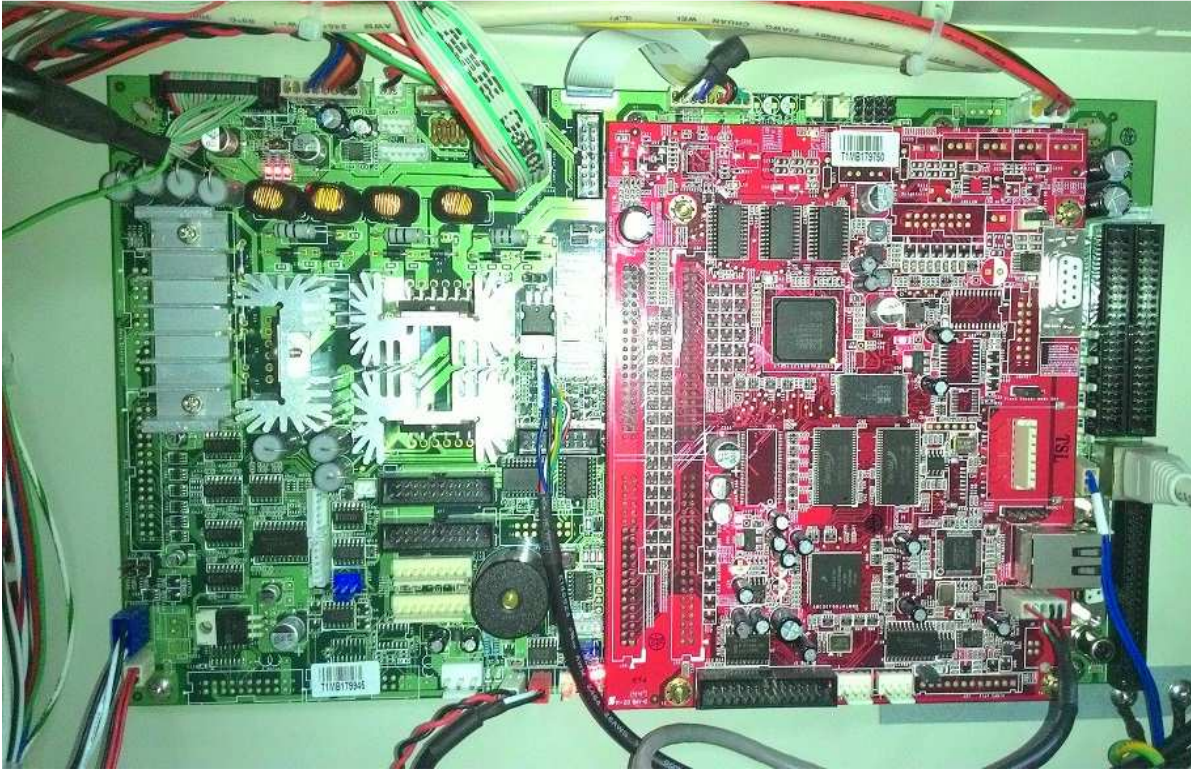


5272 Mainboard (Red is mainboard, Green is Driver Board)

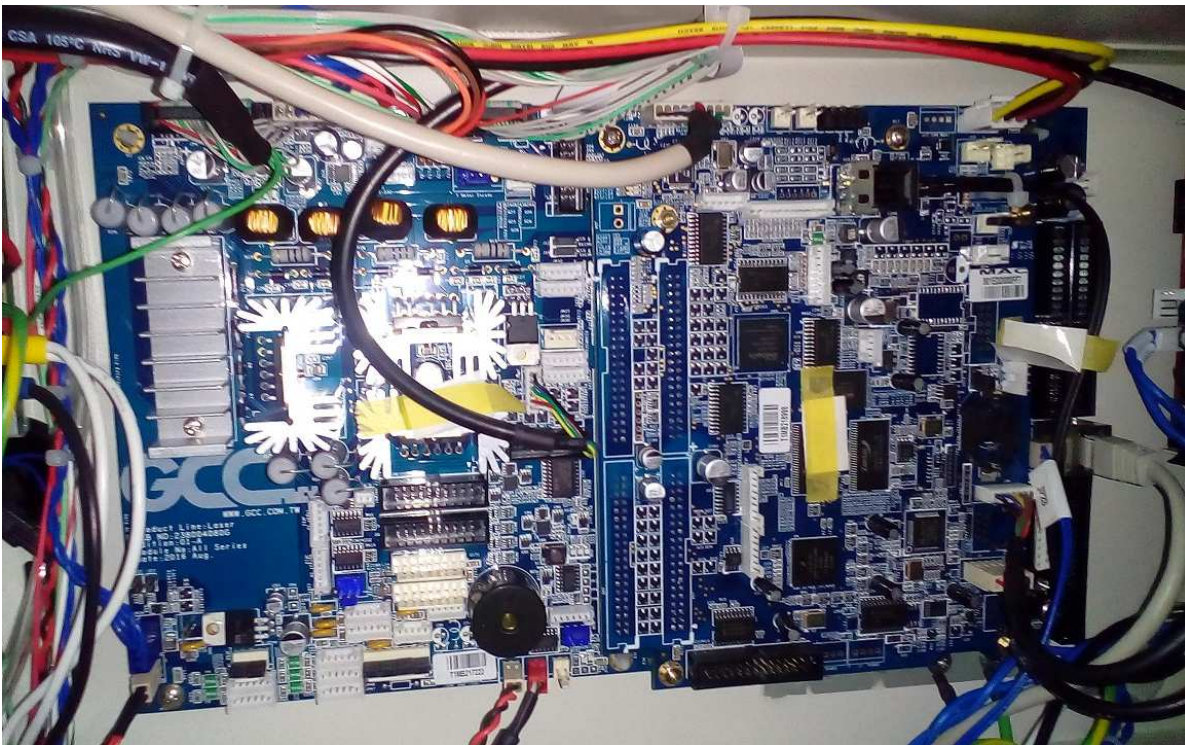


5272 Mainboard V2

The difference of outlook between 5272 main board and 5272 V2 main board are below. Most of the cables connect to 5272 and 5272 V2 main boards are the same (same position). The upgrade process below shows only the difference cable connections. All other cables connect to where is originally connected. The screw positions for mounting 5272 and 5272 V2 main board are same.



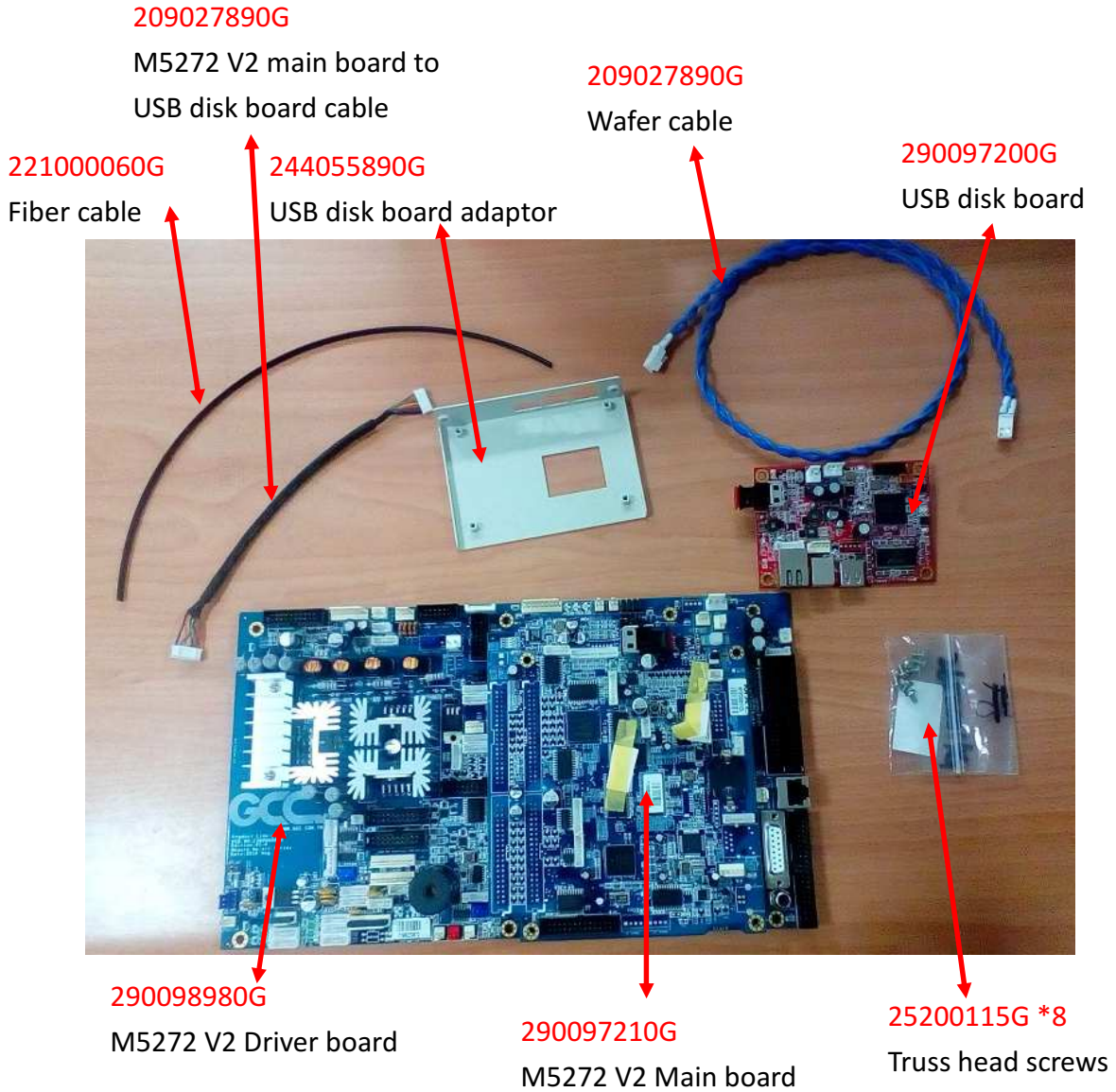
5272 main board



5272 V2 main board

3.4 Upgrade process from 5272 main board to 5272 V2 main board

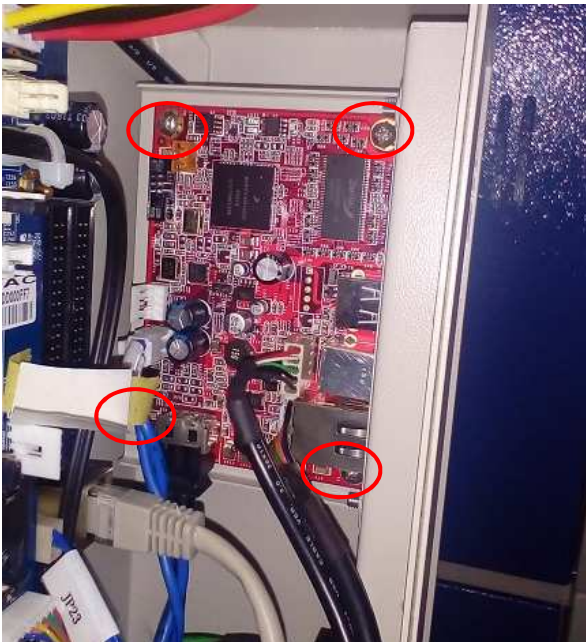
The parts for upgrading to 5272 V2 main board are below:



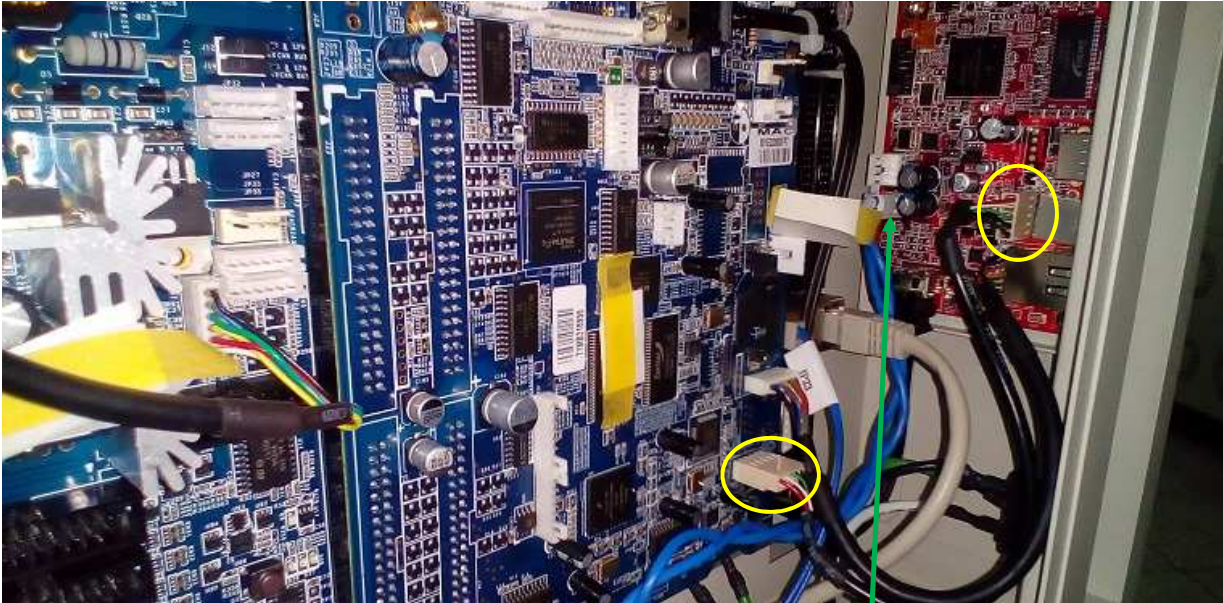
Remove the original USB adaptor and change to USB disk board adaptor
The mounting screw (red circles) use original two screws.



Use Truss head screws ([25200115G](#)_GCC send) to mount the USB disk board (see 4 red circles below) on USB disk board adaptor.



M5272 V2 main board to USB disk board cable ([209027890G](#)) is connected on below position. (see two yellow circles below)The Wafer cable ([209027890G](#)) is connected to below position (see the green arrow pointed)



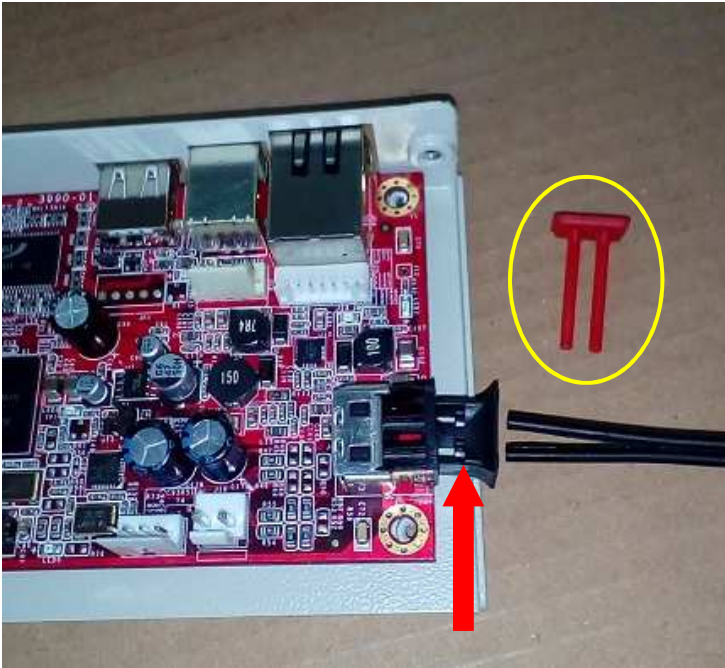
It needs to remove the cover of extension power set first.



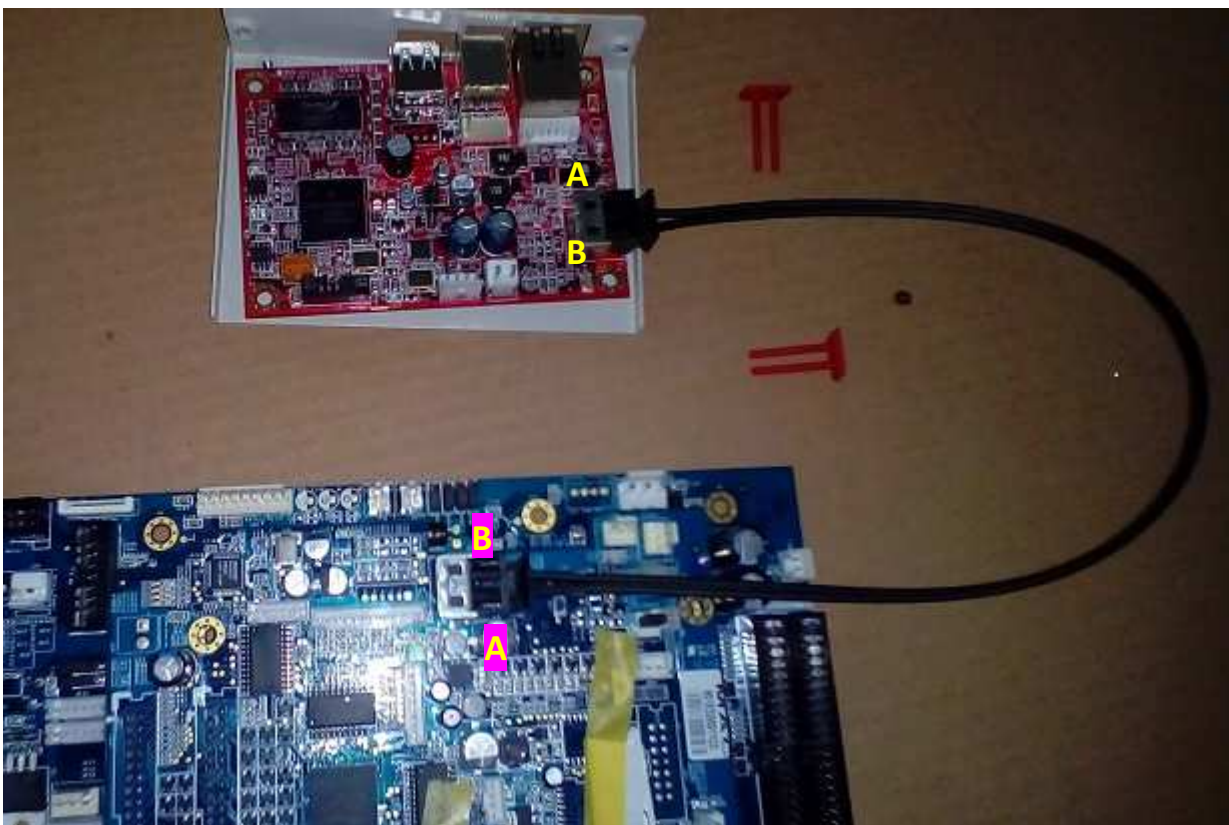
Then connect the Wafer cable (209027890G) to this position (see yellow circle).



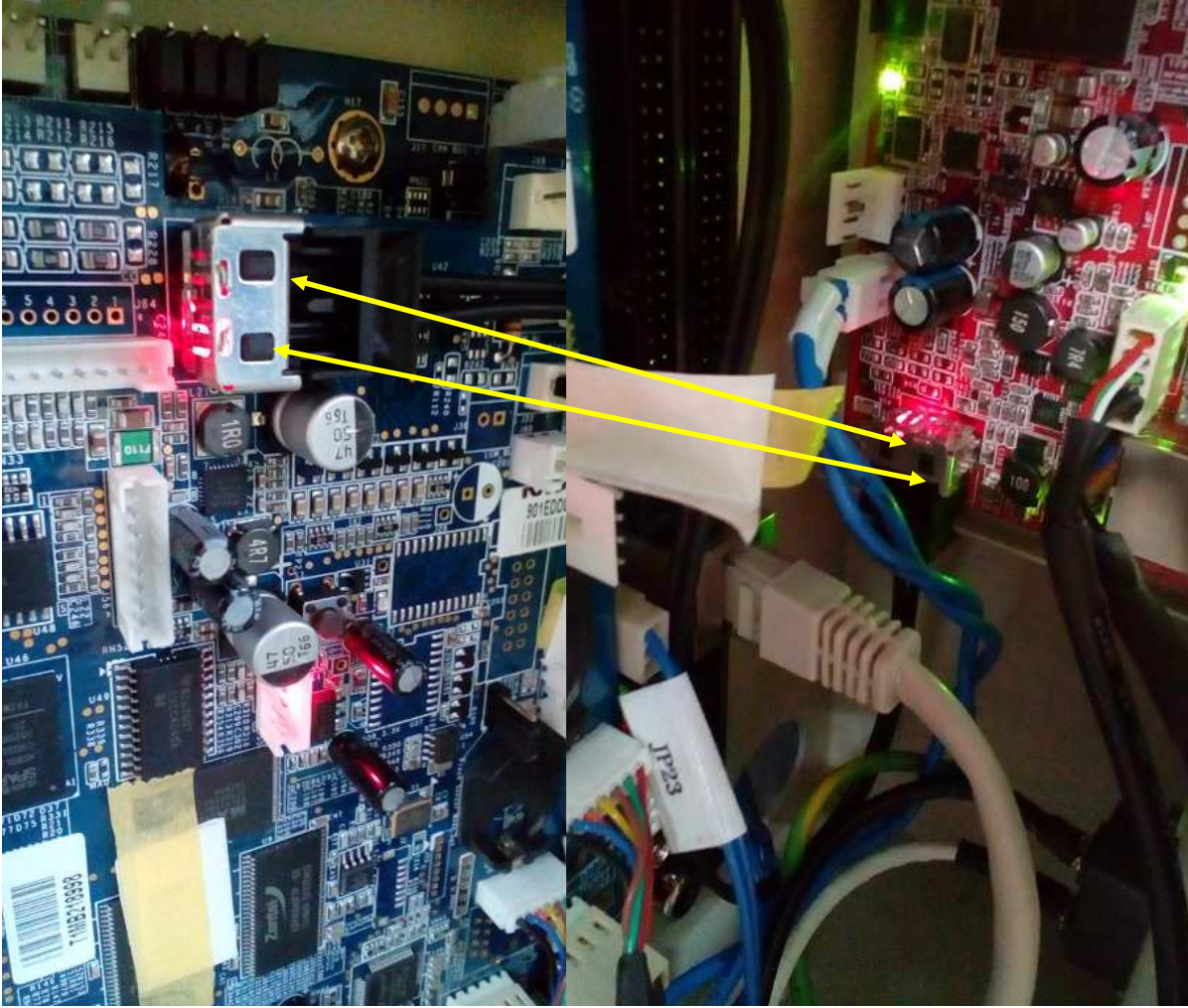
Before plug in Fiber cable (221000060G) into USB disk board and 5272 V2 main board, the red cap (see the yellow circle below) should be removed. The end of Fiber cable should be separated for 6cm, so the fiber cable can plug all the way down into fiber connector. And then push the black lid (red arrow pointed) inside so the fiber cable can connect to fiber connector tightly.



The important step for connecting fiber cable is to reverse its position. When connect to A position on USB disk board have to connect to 5272 V2 main board A position (see below).



To make sure the fiber cable is connected correctly. Turn on machine and see if the fiber connector LED **On** connects to **Off** and **Off** connects to **On**.



Chapter 4 – Components Replacement

4.1 Control Panel Changing Process

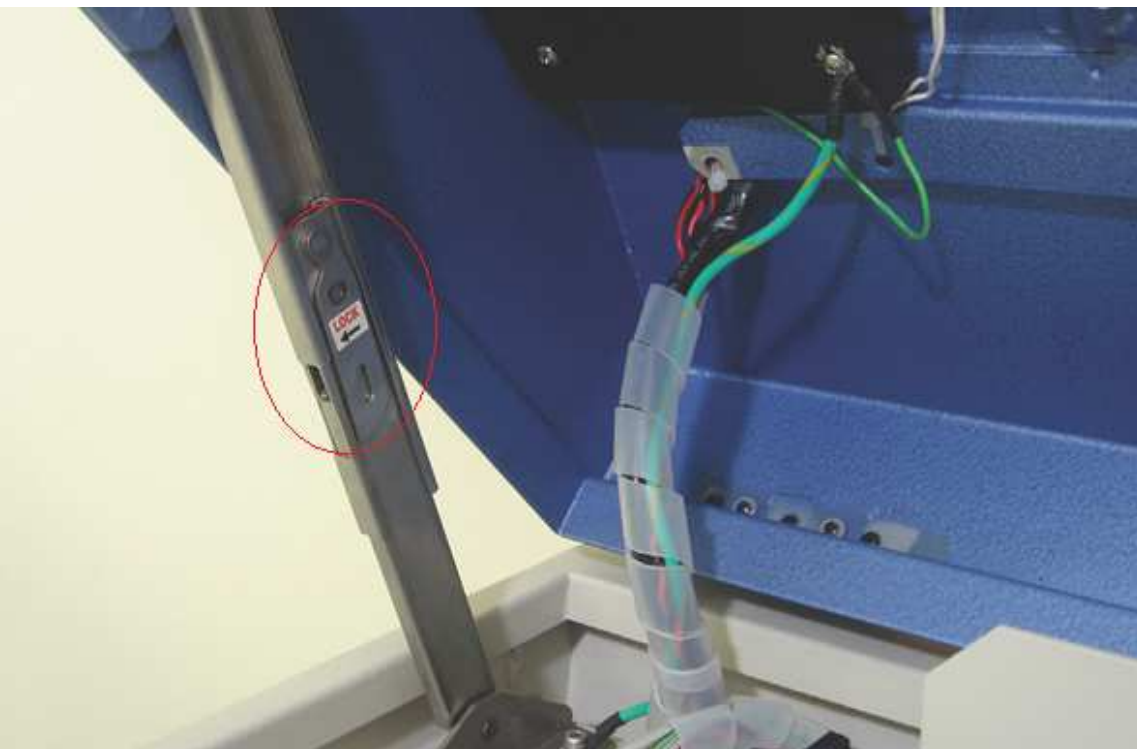
- Dismount 2 screws of top cover(M4 *8)



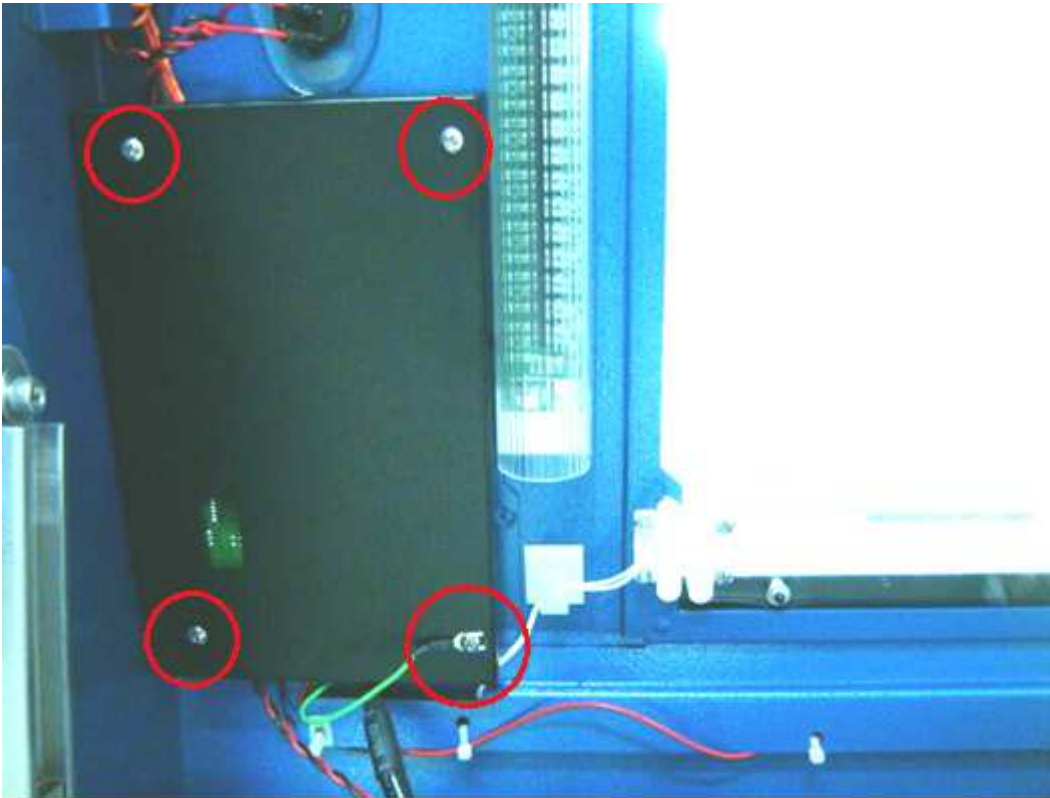
- Lift the top cover



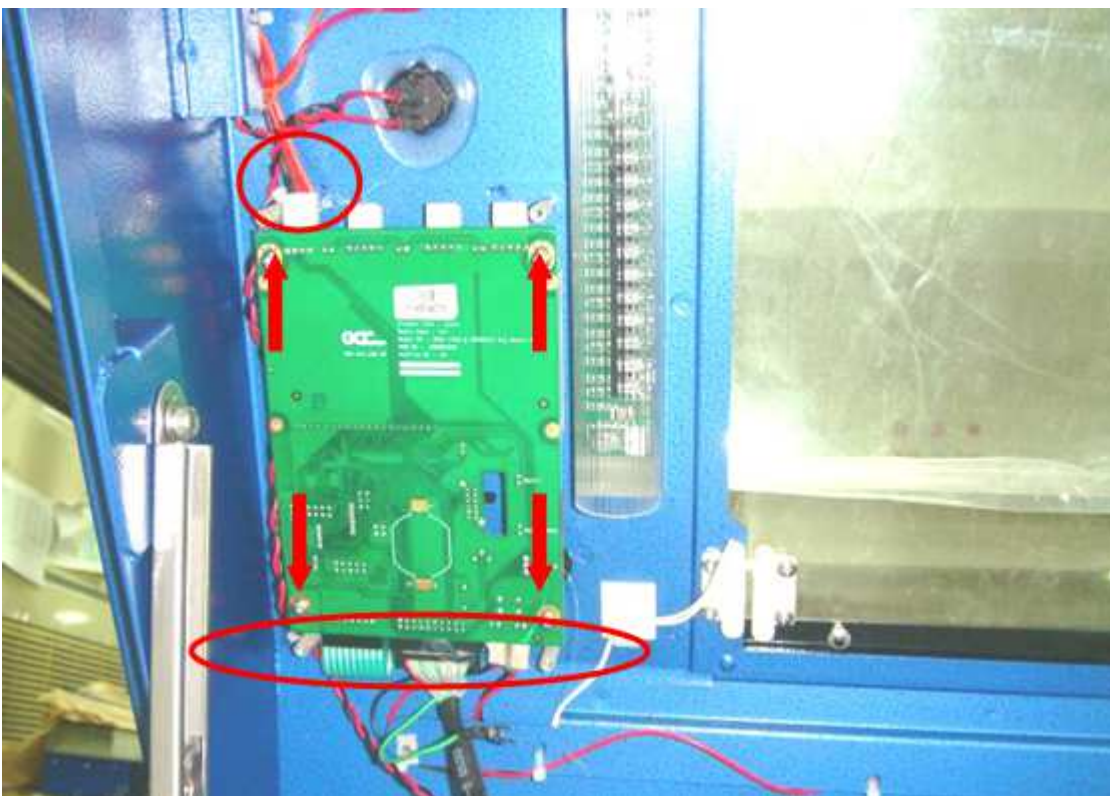
- Please turn the safety lock switch to LOCK status according to the direction shown on the sticker (see picture) to avoid the collapsing of top cover.



- Dismount 4 screws for cover of control panel and ground cable screw



- After control panel cover is removed, there are 4 screws needs to be removed and the five cables(in the red circle). Then the control panel can be removed and changed new one.



4.2 Power Supply Changing Process

- Dismount 3 screws on the back panel (see red circle below)



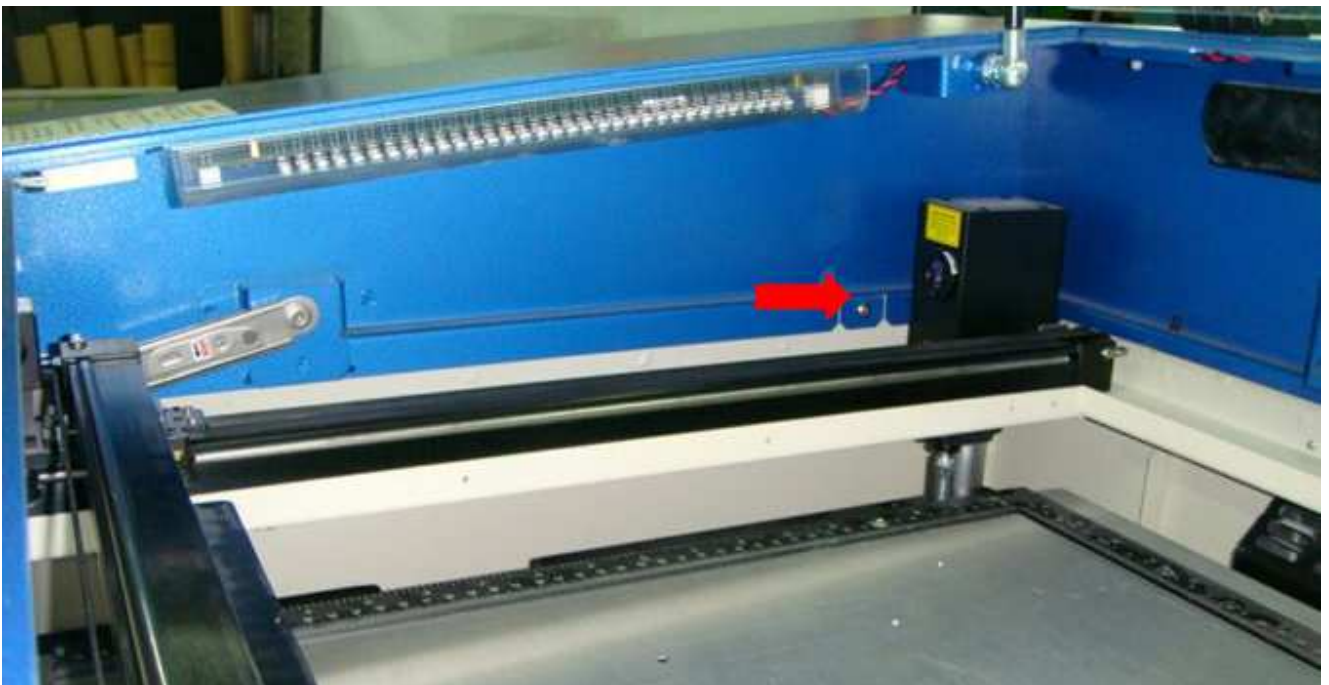
- Loosen the screws and remove the 2 power supply AC side cable (blue circle below)
- Remove the DC side 2 cables (red circle below)
- Dismount 6 screws on the power supply panel (see red arrows below)



- Dismount 3 screws on the power supply panel. The power supply can be changed to new one.

4.3 X Motor & Auto Focus Cable Changing Process

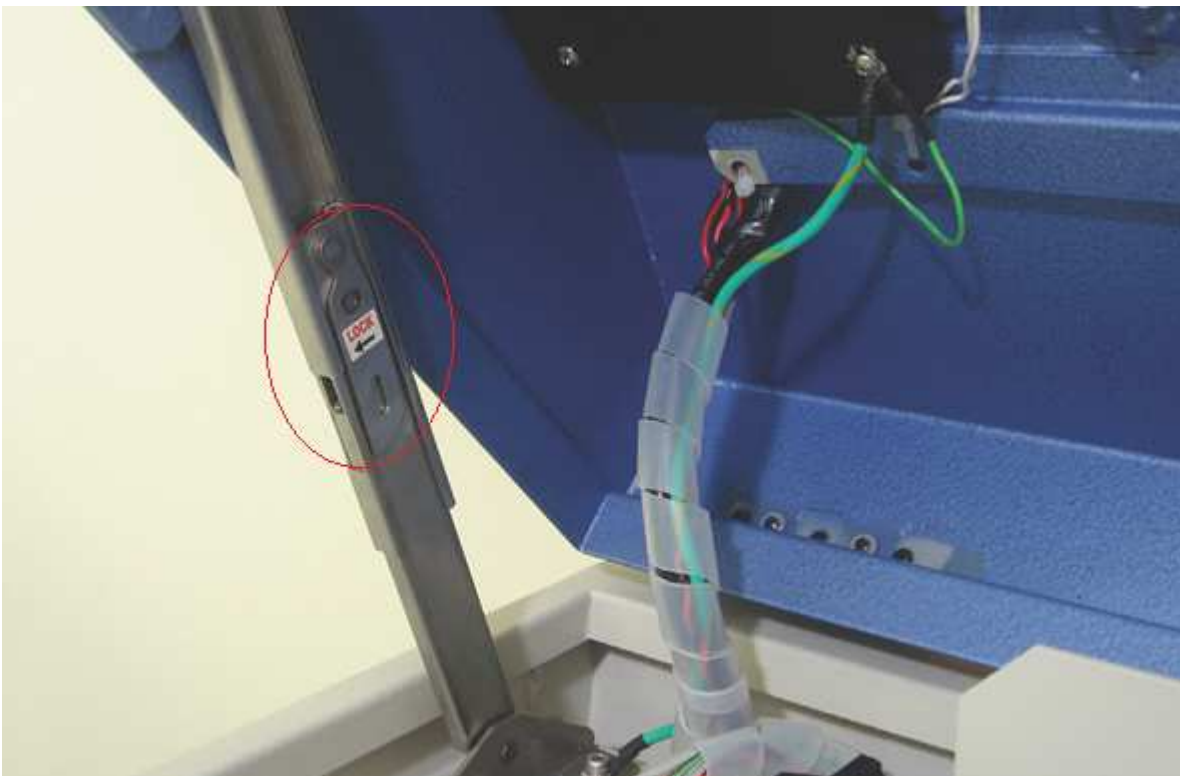
- Dismount 2 screws of top cover(M4 *8)



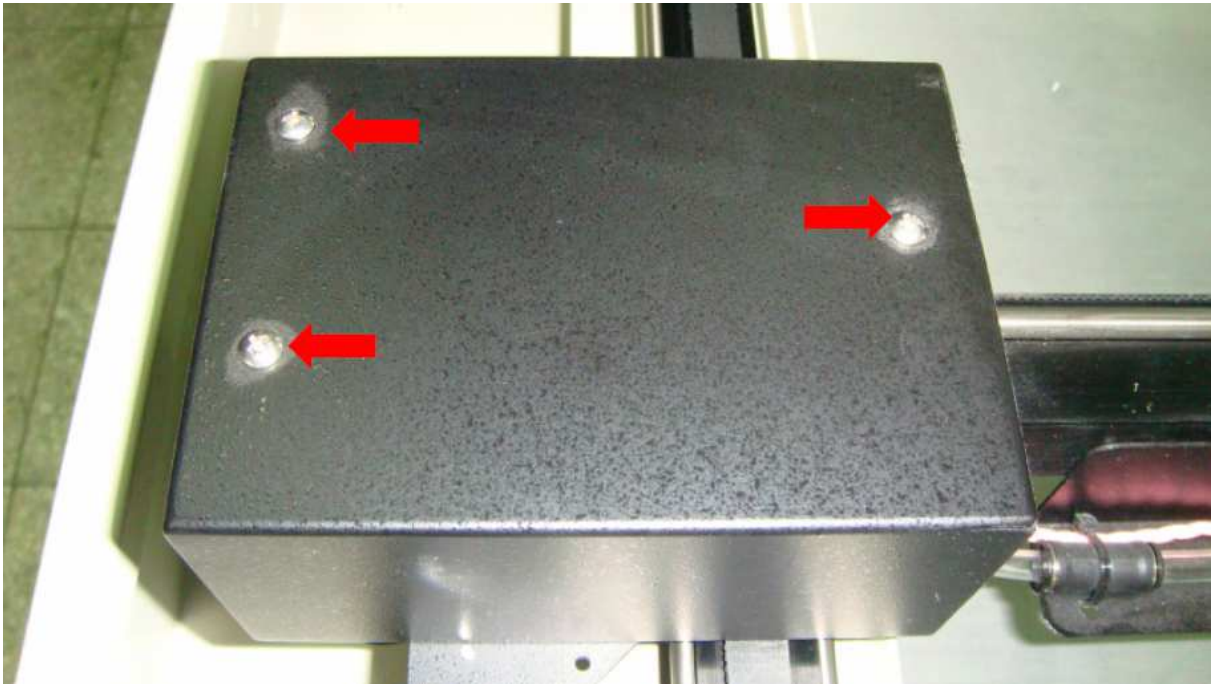
- Lift the top cover



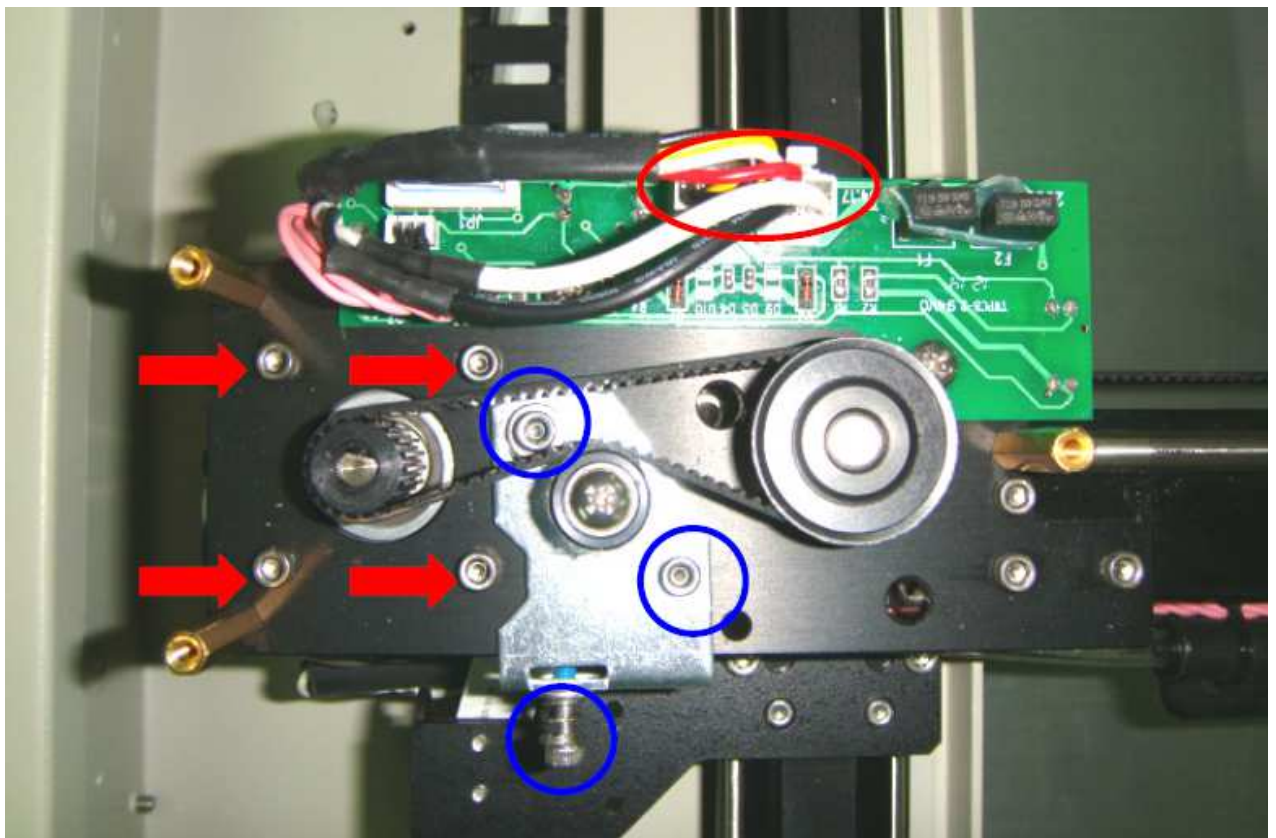
- Please turn the safety lock switch to LOCK status according to the direction shown on the sticker (see picture) to avoid the collapsing of top cover.



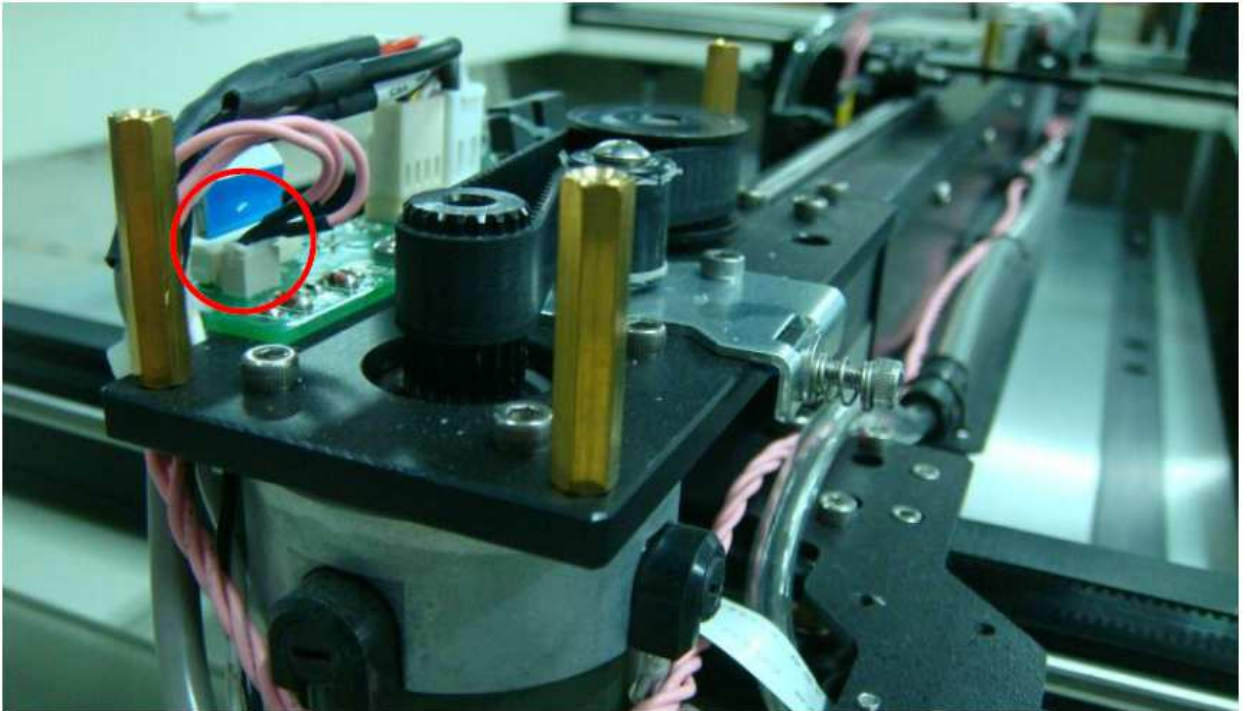
- Dismount 3 screws of x motor cover (M3 *6)



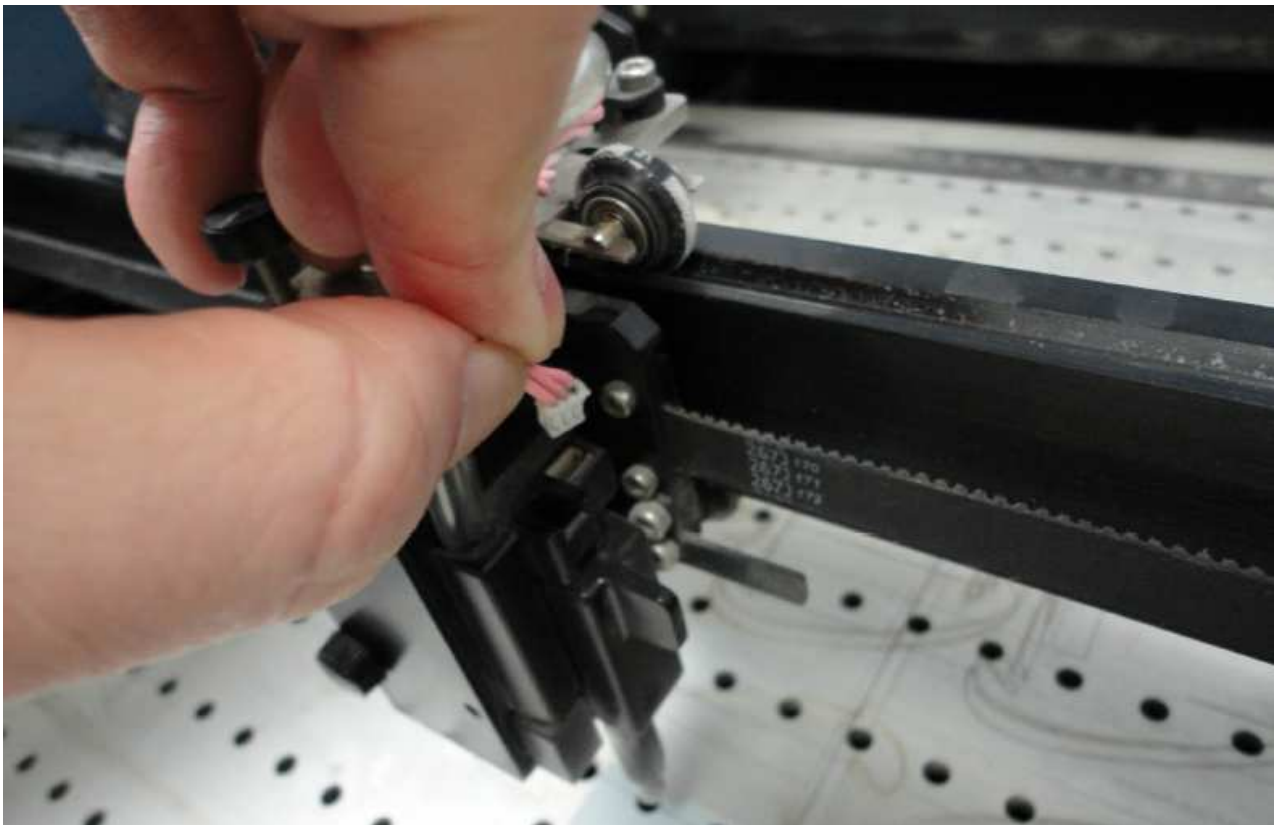
- Dismount 3 screws of x motor idle pulley (Blue circle below). Dismount 4 screws of X motor (M3 *10, red arrow below) and the x motor cable be removed and changed.



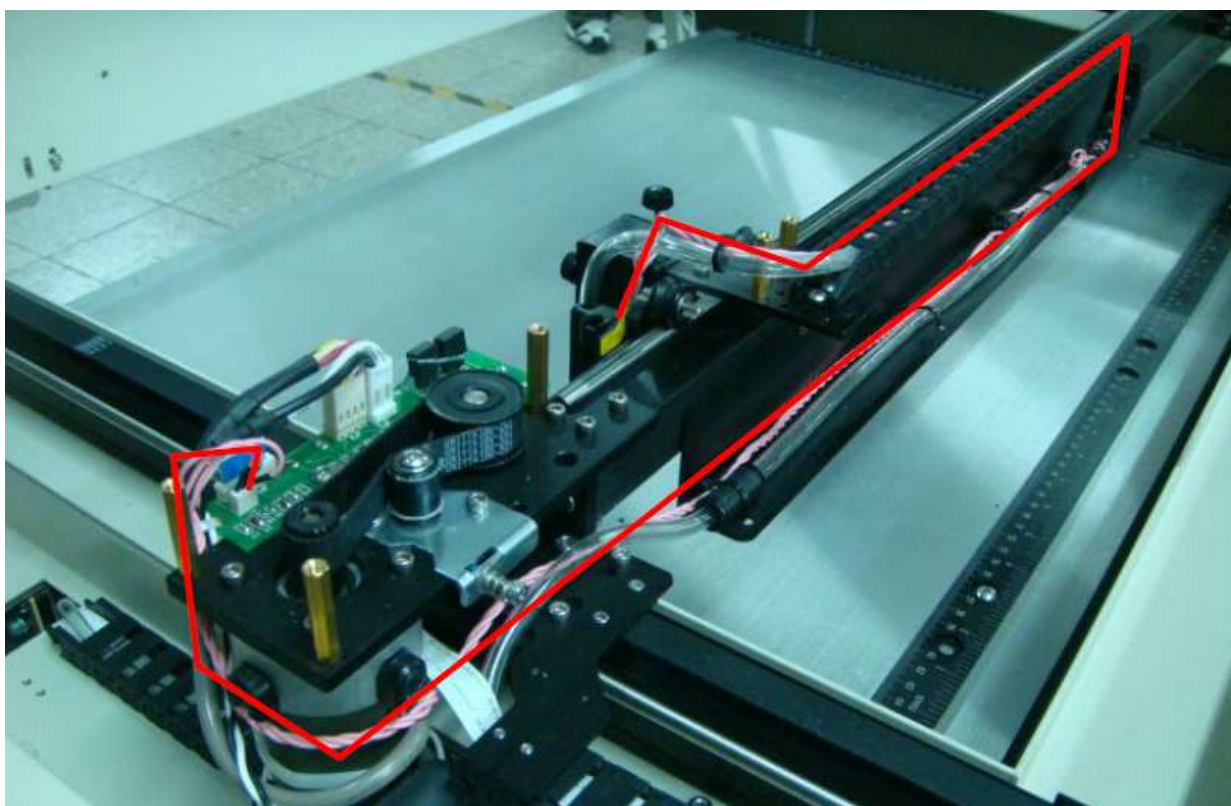
- For changing auto focus cable, first remove the auto focus cable from x motor pcb (see red circle below).



- On lens carriage side, remove the auto focus cable also (it is tight, so use tweezers will be helpful).

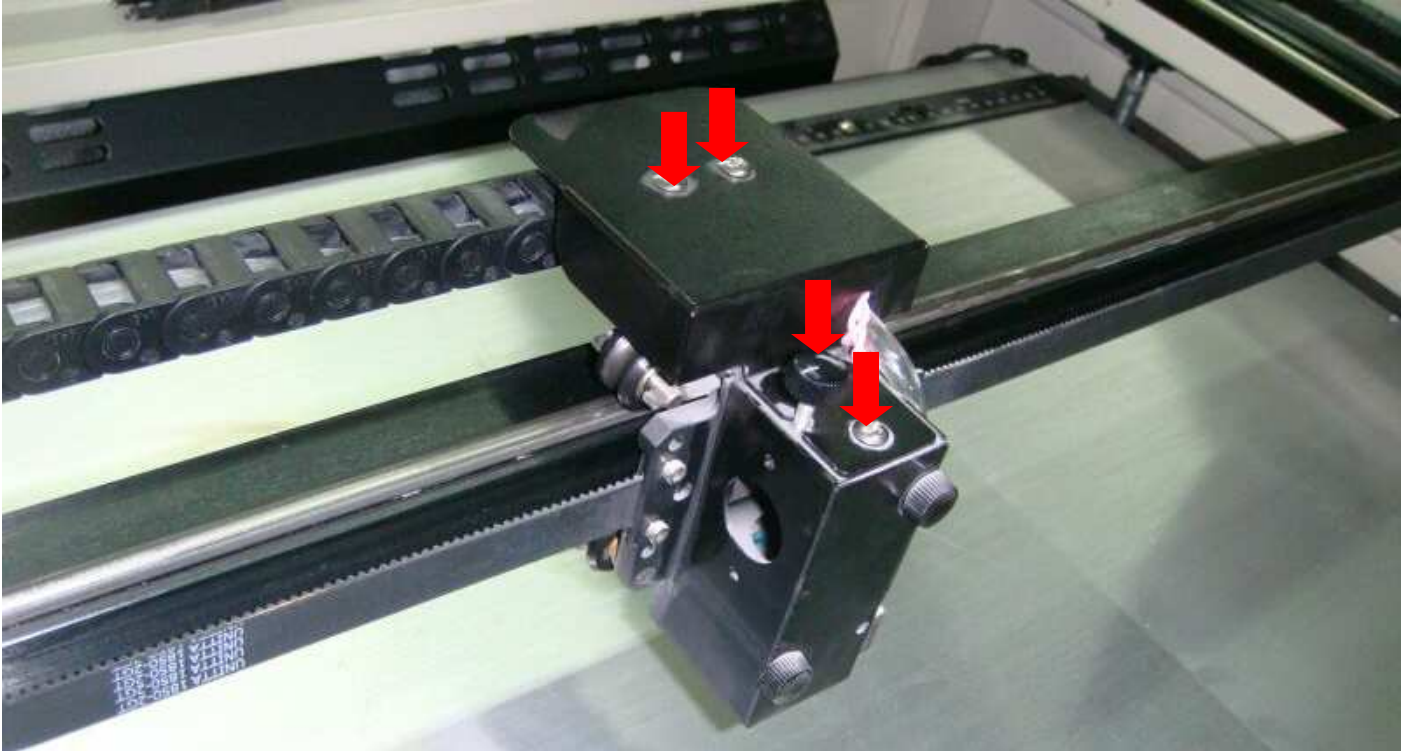


- Pull out some joint will be easier to change auto focus cable.

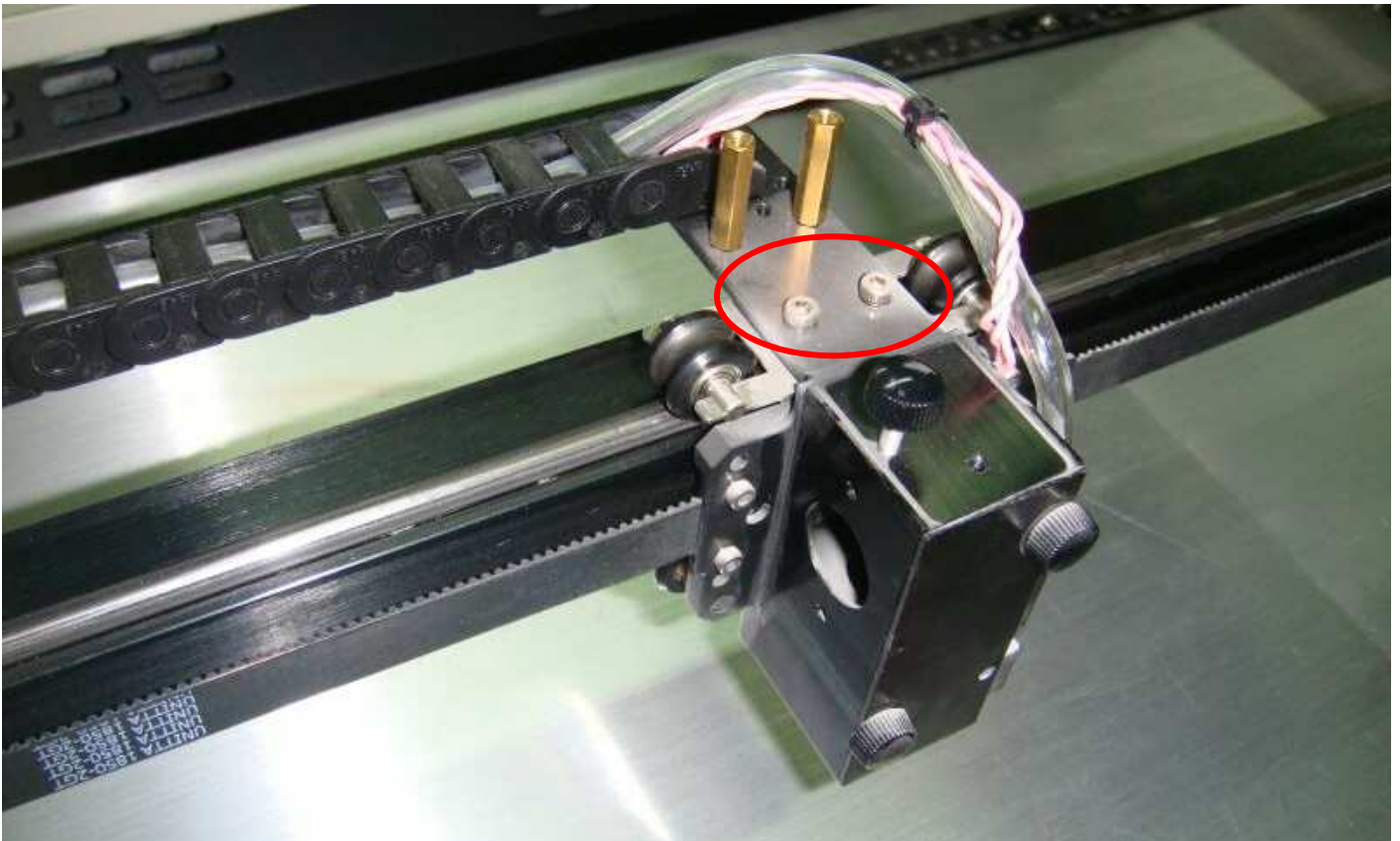


4.4 X Rollers Changing Process

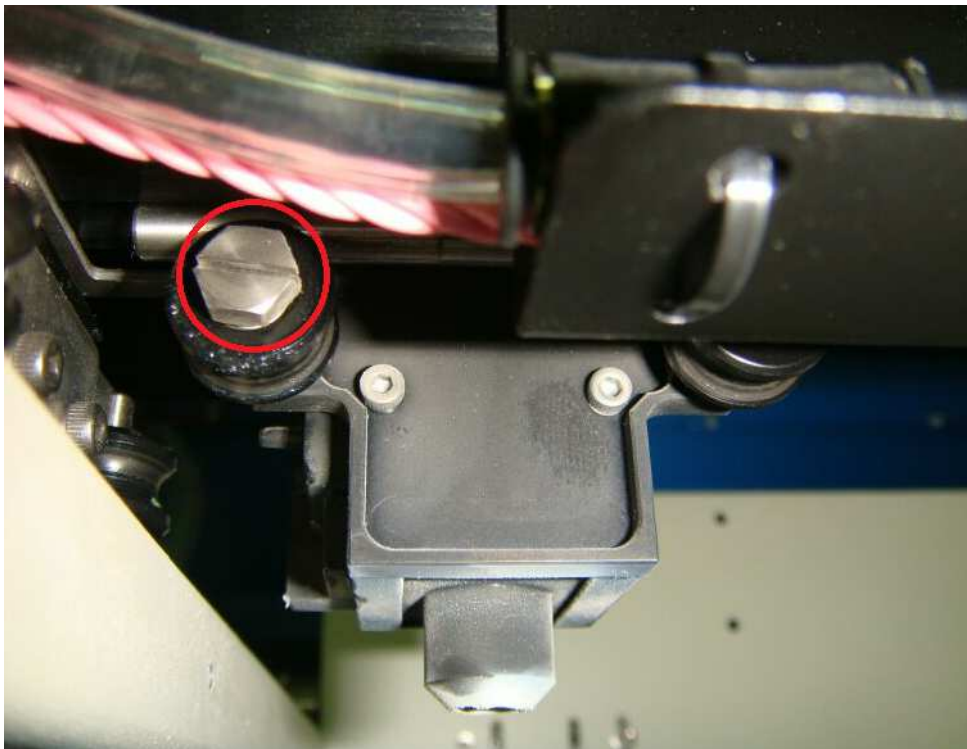
- The estimated life of a set of rollers is about 500 working hours. Dismount 4 screws on the top cover of carriage (see red arrows below)



- To change rollers, simply remove the hex bolts using a size 2 Allen key as shown below.

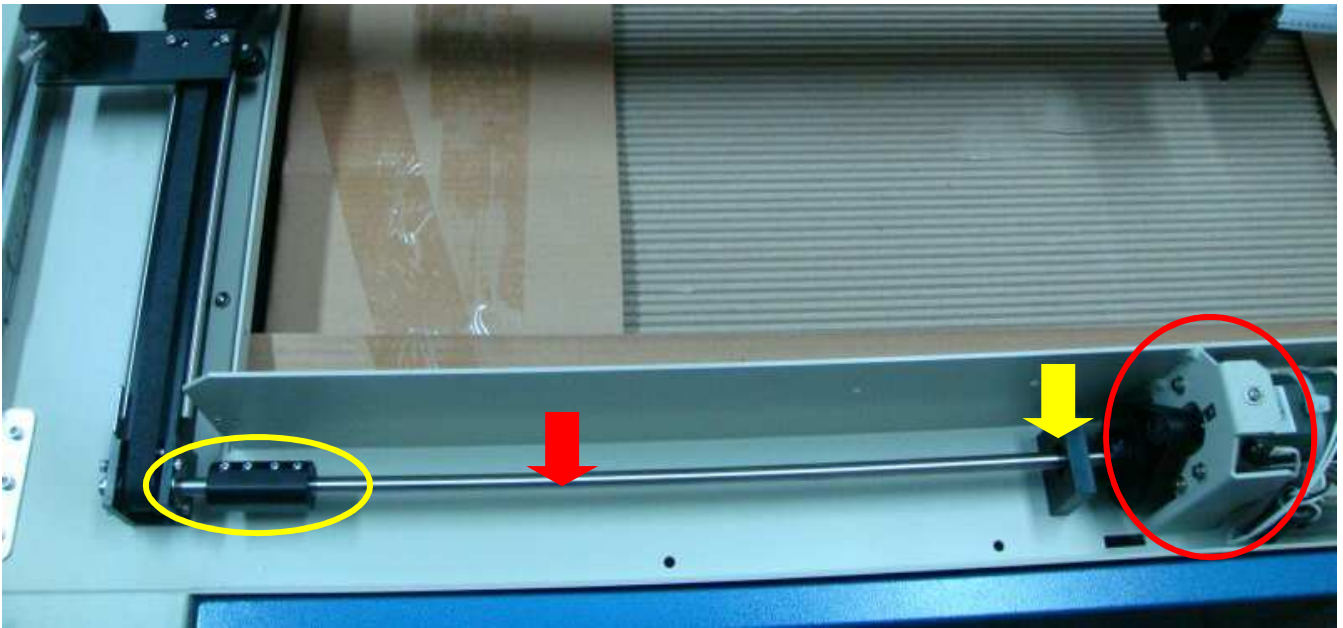


- Unscrew the following screws to remove the A roller.



4.5 Y Motor Belt Dismount Process

- To remove the y axis synchronizer bar (the red arrows pointed) need to remove the screws of synchronizer bar holders and they are at the bottom (the yellow arrow pointed). Remove the 4 screws of y motor holder (the red circles) and remove the 4 screws of coupler (the yellow circles).



- The screws of synchronizer bar holders.

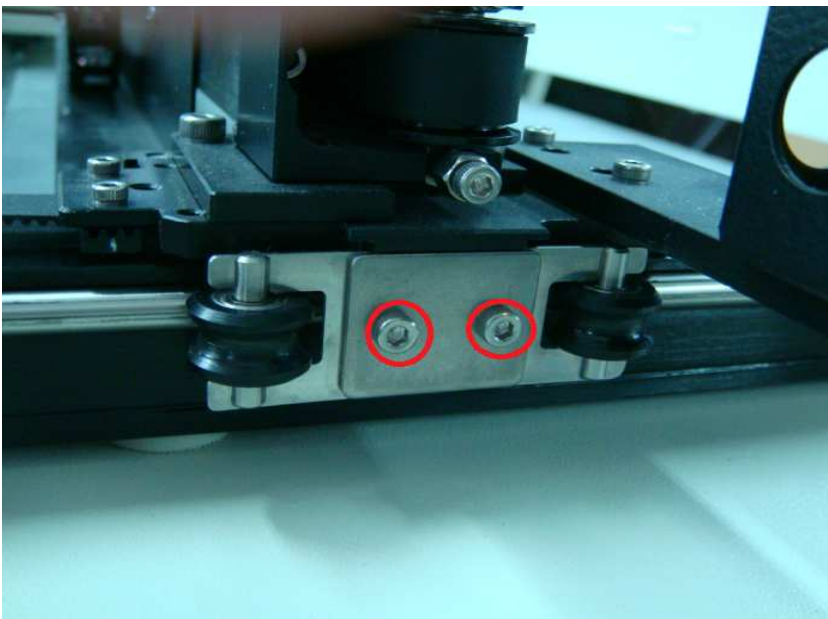


- Now the whole y axis synchronizer bar can be move up a little. So the y motor belt is loosen also and can be removed. The y motor belt can move cross the synchronizer bar and holders. The y motor belt can be removed or changed new one.

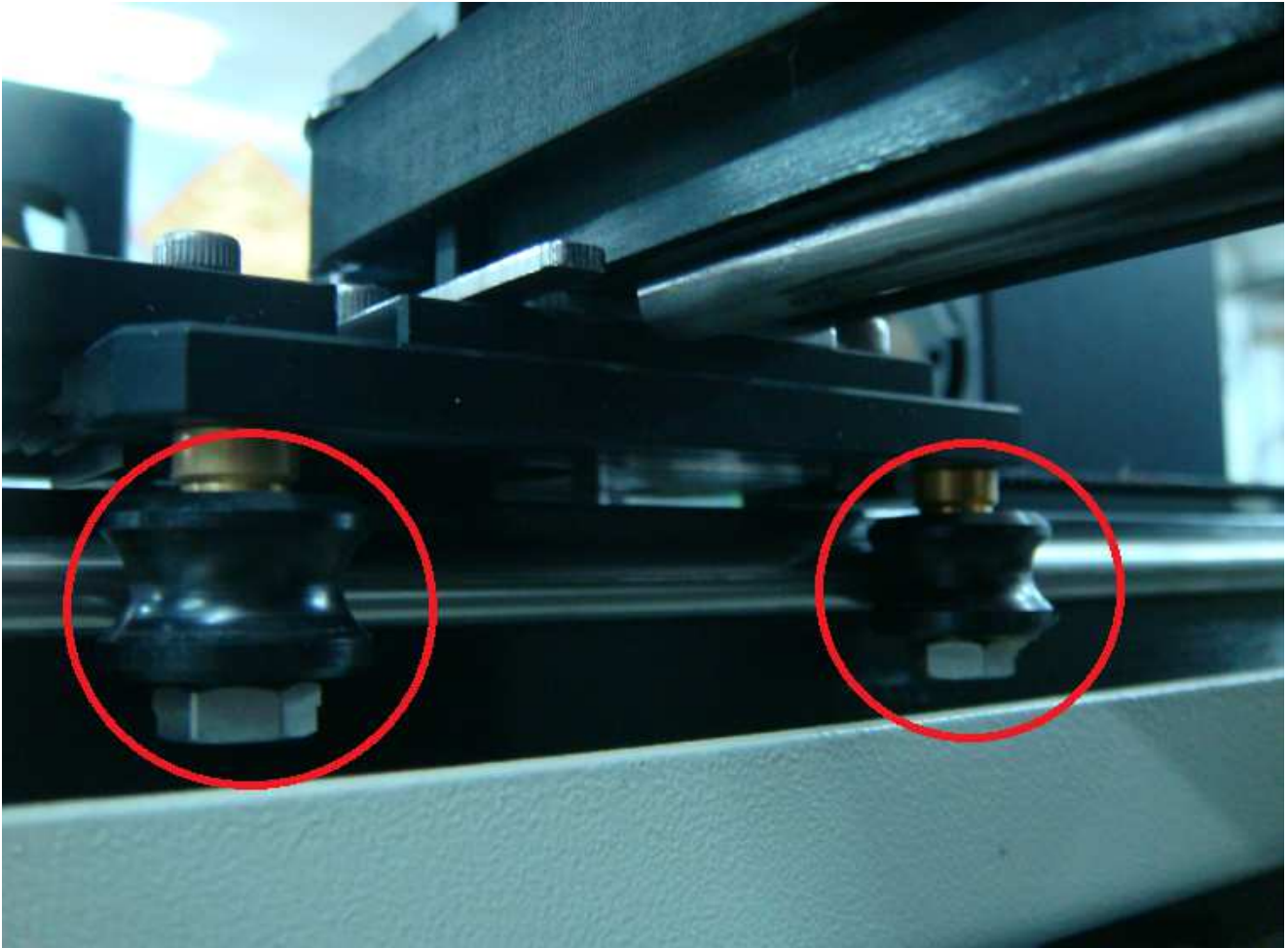


4.6 Y Rollers Changing Process

- Changing the Y rollers. Remove the following screws to completely remove the Y rollers.



- Unscrew the following screws to remove the A roller.



Chapter 5 - Laser System

5.1 Type of Laser Tube

There are two types of laser sources used with the Spirit/Spirit LS/Spirit GLS, namely Coherent and Synrad. There are 30W, 60W, 80W and 100W models with Synrad laser tubes and also there are 30W, 40W models with Coherent Deos laser tubes.

5.2 How to measure the power output of a laser tube?

In order to measure the power output of a laser tube, we need to use a power meter (12170001G) that will measure the heat generated and convert it to a power reading. The best place to measure the laser output power is at the immediate output of the laser tube (before to mirror 1).

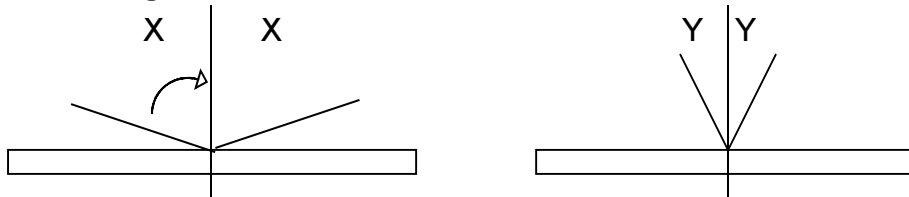


5.3 How does the laser beam travel to the working area ?

The laser beam generated by the laser source is reflected and guided by 4 optical lenses on to the working area. Therefore the proper adjustment and maintenance of them are crucial.

5.3.1 Optical Alignment

Understanding Reflection.



Light enters at an angle and leaves at an angle.

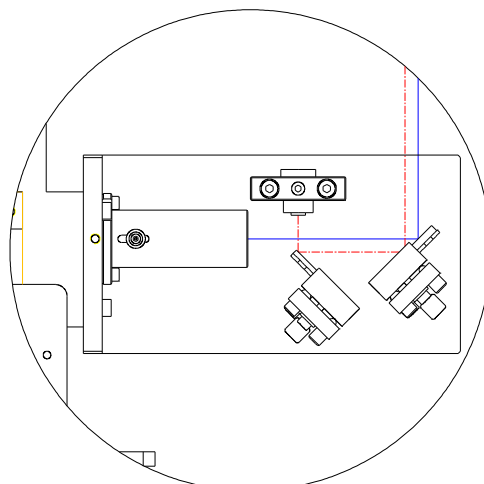
If light enters at an angle X, it will leave at an angle X.

If light enters at an angle Y, it will leave at an angle Y.

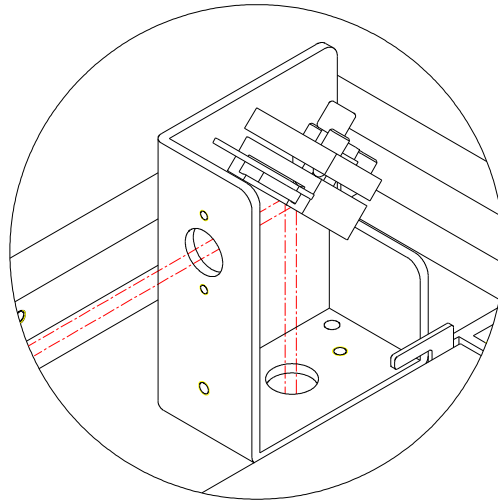
5.3.2 Basic Beam Alignment

The laser beam is guided to the top of the working area by using 4 reflective mirrors. Therefore, these mirror adjustments are crucial to the proper functioning of the machine. If the laser beam is not aligned correctly, the beam path will be shifted or tilted and both rastering and vectoring quality will be affected.

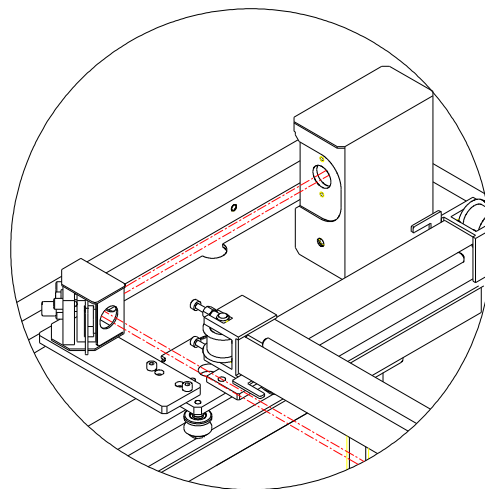
Step 1: Unscrew the back panel of the machine revealing the laser tube and Mirror 1. Turn on the machine and enter the hidden diagnostic menu by holding down the Autofocus keys while turning on the machine. Select test laser source. Set laser power to about 5%. Remove the protective cover of Mirror 1 and remove Mirror 1. Place a cardboard or paper about 1.5 meters away from the laser source. Fire the laser until you get a small burnt mark on the cardboard. (Determine the laser beam and the red beam are aligned by seeing if the burnt hole is at the exact location of the red beam. If they are not, adjust the red beam diode so that the red beam and the burnt mark are at the same location.) Place Mirror 1 back to the mirror holder.



Step 2: Place a piece of masking tape over the tube opening that leads to Mirror 2. Fire the laser and see if it leaves a burnt mark in the center of the hole. Also check that the burnt mark left by the laser beam is circular in shape. If it is not circular, i.e. oval or other shape, then the laser beam might have hit the inner tubing and get reflected on the way from Mirror 1 to Mirror 2. If this is the case, place a piece of masking tape before the tube entrance, fire laser and adjust Mirror 1 so that laser passes through the center of the opening.



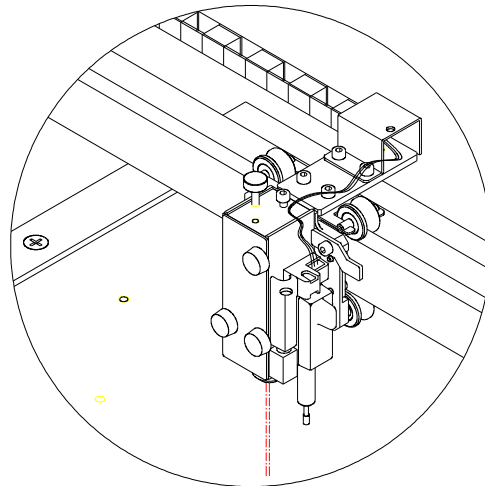
Step 3: Place a masking tape on the opening before Mirror 3. Move the rail along the Y-axis so that Mirror 3 is close to Mirror 2. Fire the laser and see if the laser beam goes through the center of the circle. Then move the rail so that Mirror 3 is to the far end of Mirror 2. Fire the laser and see if it leaves a mark at the same location when it was close to Mirror 2. Adjust Mirror 2 repeatedly so that the burnt mark is at the center and on top of one another when Mirror 3 is both close and far from Mirror 2.



Step 4: Place a masking tape on the opening before Mirror 4. Move the pen carriage to the upper left corner of the working area. Fire the laser and adjust Mirror 3 so the laser beam

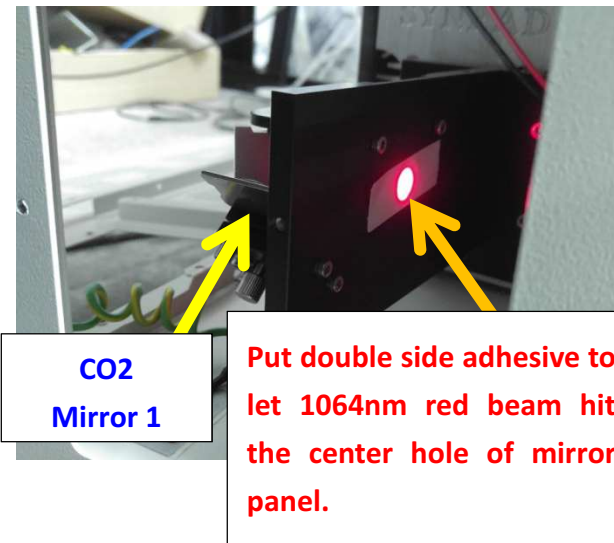
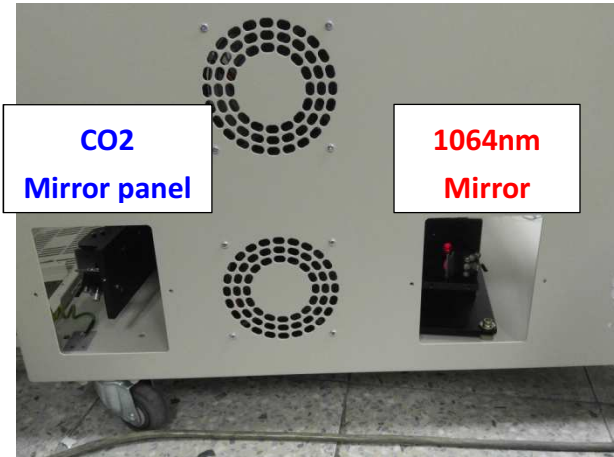
passes through the center of the opening. Move the pen carriage to the upper right end of the working table. Fire the laser and adjust Mirror 3 so the laser beam passes through the center of the opening. The laser should pass through the same spot when the pen carriage is positioned at upper left and upper right. Do the same for the bottom left corner and bottom right corner.

Place a masking tape over the nozzle opening. Position the pen carriage at one of the 4 corners of the working area. Fire the laser and adjust Mirror 1 so the laser passes through the center of the nozzle opening. Repeat for all 4 corners of the working area. After adjusting Mirror 1, you may have to re-adjust Mirror 2 and Mirror 3 as well. (Repeating Steps 2 & 3.) If the laser beam passes through the center of the nozzle opening at all 4 corners, then the laser beam should have been aligned properly. Cut four 20x20 mm squares at the four corners of the working area to double check that the edges of the square are not slanted



5.3.3 Beam Alignment for **GLS Hybrid**

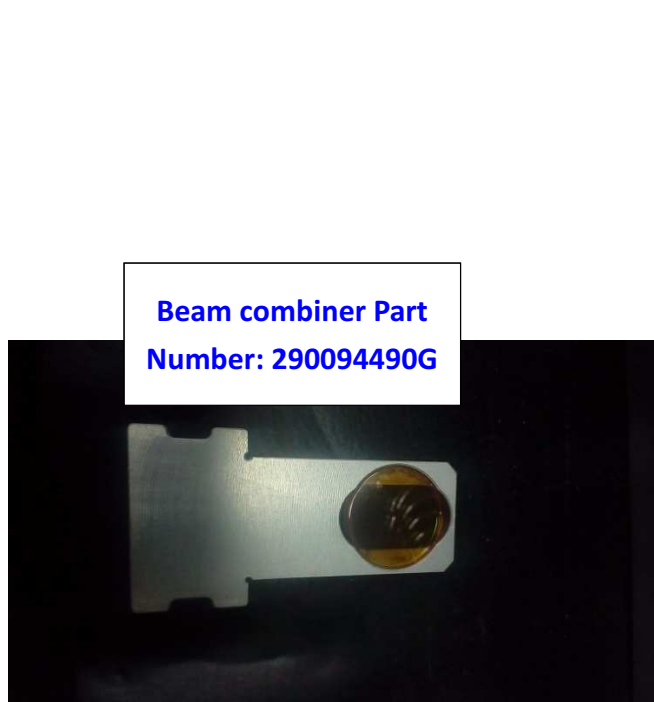
The beam alignment for GLS Hybrid has few more steps than other Spirit series. First press Auto Focus key + Turn On machine together and go to hardware testing mode. (See Chapter 7.3.4 Hardware Test for detail). Then choose Fiber laser test and tune 1064 nm mirror and let Fiber red beam pass through and hit the center of the hole on CO2 mirror panel.



1064nm mirror part number :
Mirror Assembly : 29005029G

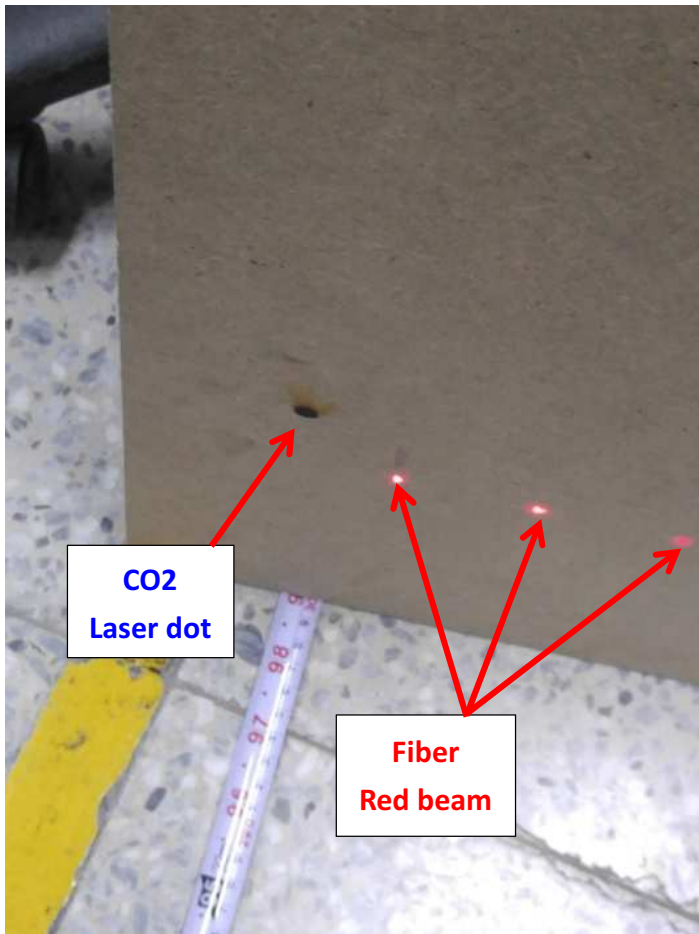
Make sure the beam combiner will not block CO2 laser beam:

Put beam combiner into prism mount and then fire CO2 laser and make sure laser beam will pass through beam combiner without being blocked.



Remove mirror 1 and put a black paper or black board at 3 meter away from mirror 1. When

on Fiber laser test, Fiber red beam will have 3 red dots. One of these 3 red dots is fiber beam. Turn off Fiber red beam and fire fiber laser and check the black paper (3 meter away) and see the location of this fiber laser dot. Then turn on fiber red beam again. Then can know which red dot is fiber laser. Then fire CO2 laser beam on black paper. Then tune 1064nm mirror (fiber mirror) to let fiber laser and CO2 laser firing on the same dot.



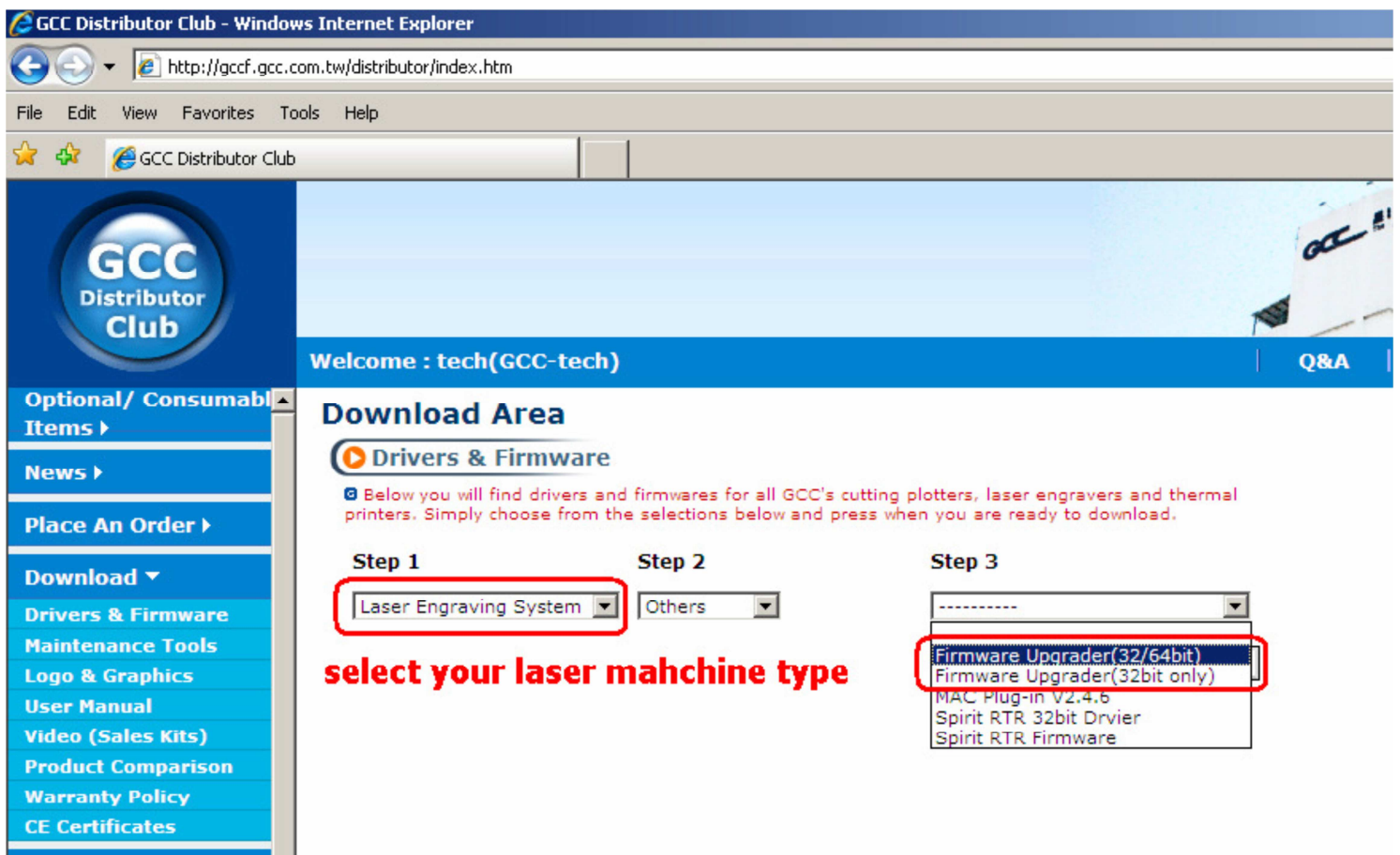
Then put back CO2 mirror 1 into prism mount and then follow the same steps on 5.3.2 Basic Beam Alignment above. (From step 1 to step 4).

Chapter 6 - Software

6.1 How to upgrade firmware

GCC machines requires a firmware upgrader program to upload the firmware of machine through USB/Parallel port.

6.1.1 The Firmware Upgrader can be downloaded from GCC Distributor Club website :
<http://gccf.gcc.com.tw/distributor/login.aspx>



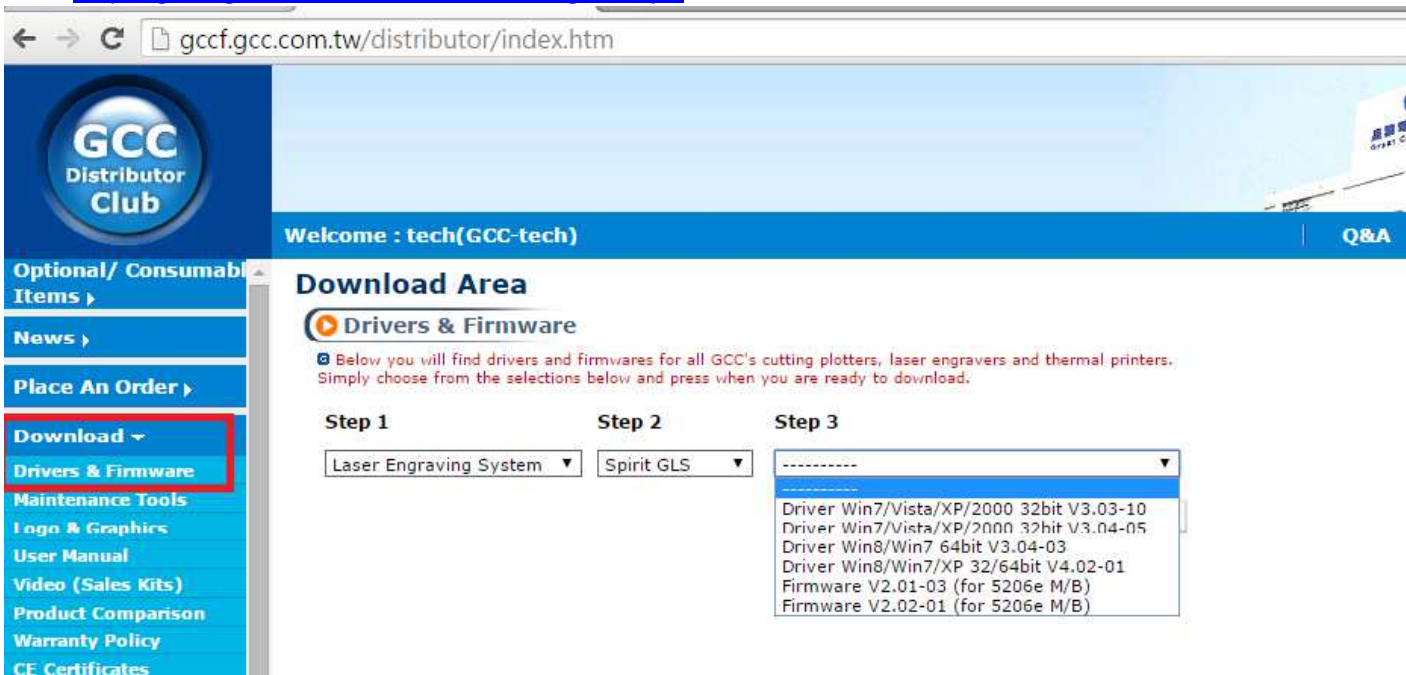
The screenshot shows a Windows Internet Explorer browser window displaying the GCC Distributor Club website. The address bar shows the URL <http://gccf.gcc.com.tw/distributor/index.htm>. The website has a blue header with the GCC Distributor Club logo and a navigation menu on the left. The main content area is titled "Download Area" and "Drivers & Firmware". It contains instructions for downloading drivers and firmwares. The process is divided into three steps:

- Step 1:** A dropdown menu is set to "Laser Engraving System".
- Step 2:** A dropdown menu is set to "Others".
- Step 3:** A dropdown menu is open, showing several options. The option "Firmware Upgrader(32/64bit)" is highlighted.

Red boxes and a red arrow point to the "Laser Engraving System" dropdown in Step 1 and the "Firmware Upgrader(32/64bit)" option in Step 3. A red text label "select your laser mahchine type" is positioned below Step 1.

6.1.2. Firmware can be downloaded from GCC Distributor Club

<http://gccf.gcc.com.tw/distributor/login.aspx>



6.1.3. By the firmware upgrader, you can upgrade the firmware to the latest version or the version you want according to below steps :

Step1. Refer to below data sheet, turn on the machine with pressing and holding the corresponding button, the machine will be boot in transfer mode and the communication port is decided by the button you press when turning on the machine.

Model	Parallel port	Common USB	GCC USB
LaserPro, Mercury I, Mercury II, Venus series	Resume key + Power ON	N/A	N/A
Explorer, ExplorerII, Spirit, Spirit GE, Spirit_GX, Spirit LS, Spirit GLS, GAIA, GAIAII, MercuryIII, S290, S290LS, X252RX, X380RX/LS, X500RX/LS, X500III, C180II, FMC280, T500	F2 key + power on	F1 key + power on	F3 key + power on
C180	A/F key + power on	UP key + power on	Down key + power on

Step 2. Run “Uploader.exe” (The name of firmware upgrader program is “Uploader.exe”)

Step 3. Open the dropdown list under “Select a port”, select the port you want to use to transfer the firmware (the port is decided by what you did on Step 1)

Step 4. Browse and select the firmware file.

Step 5. Press the “Start” button, the upgrading process will start, wait until the process is done, the machine will reboot automatically. **Step4.** Locate the firmware file on your computer.

6.2. How to set the proper USB mode on GCC Laser Machine and printer port setting of windows system ?

Step 1 Check loader version installed on the machine

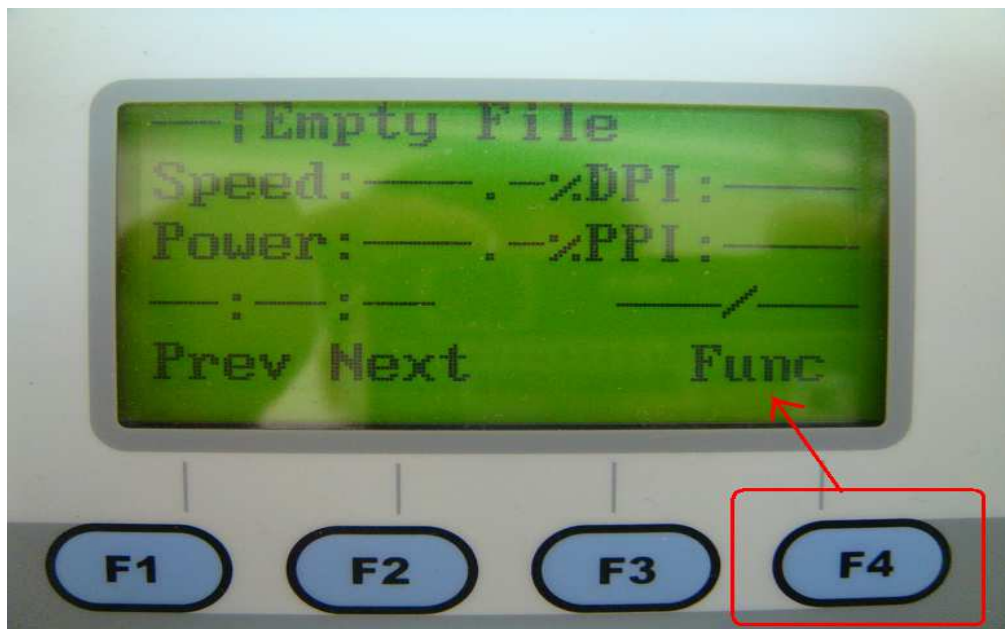
Press and hold “F4” on Control Panel then turn on the machine, if below page appears, the loader installed on the machine is the new loader, if the control panel shows nothing, the loader is an old loader.



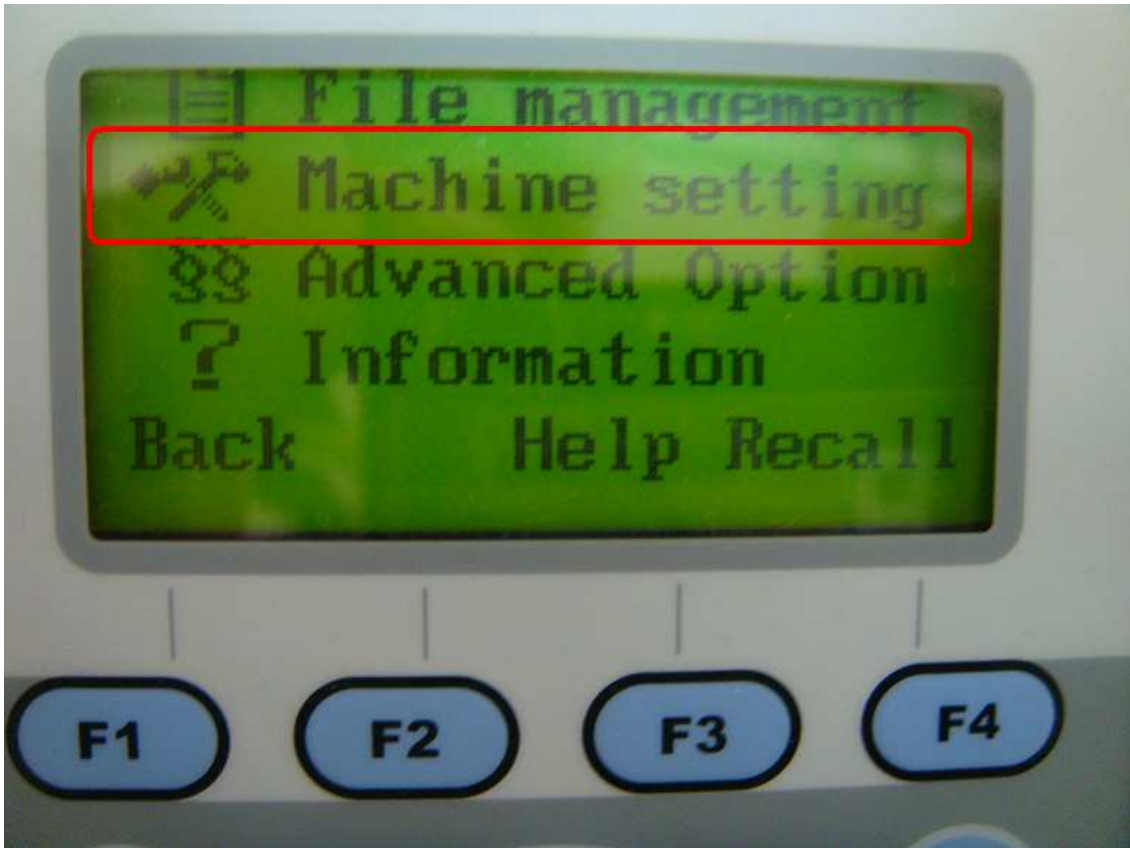
Step 2 Set the proper USB mode on both the machine and printer port setting of windows system according to following table :

Laser series	Loader version	Windows XP/Windows Vista/Windows 7	
		32 bit	64 bit
Spirit/LS/C180	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	X
SGX/GLS	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	X
Mercury		Parallel	X
Mercury II/III	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	
S290/S290LS	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	
X252/X380/X500	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	
Gaia/Gaia II	New	GCC USB or Common USB mode	Common USB mode
	Old	GCC USB mode	

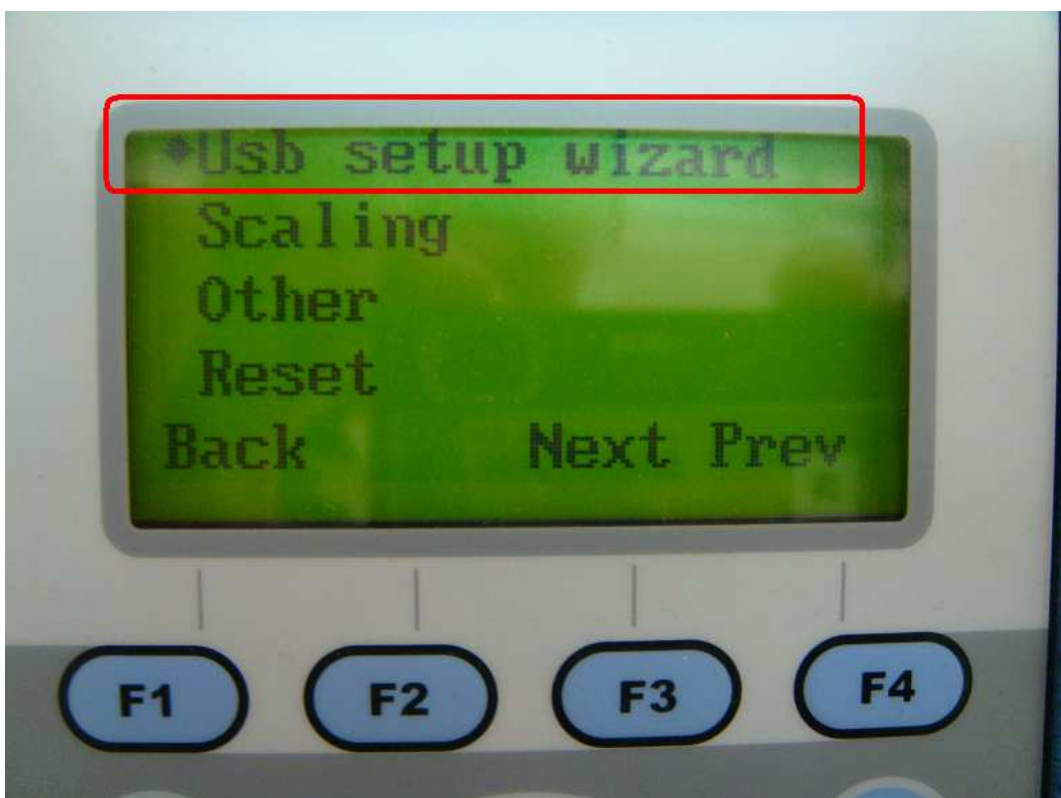
- Machine setting
 - I. Press F4 button on control panel home page to enter Function page



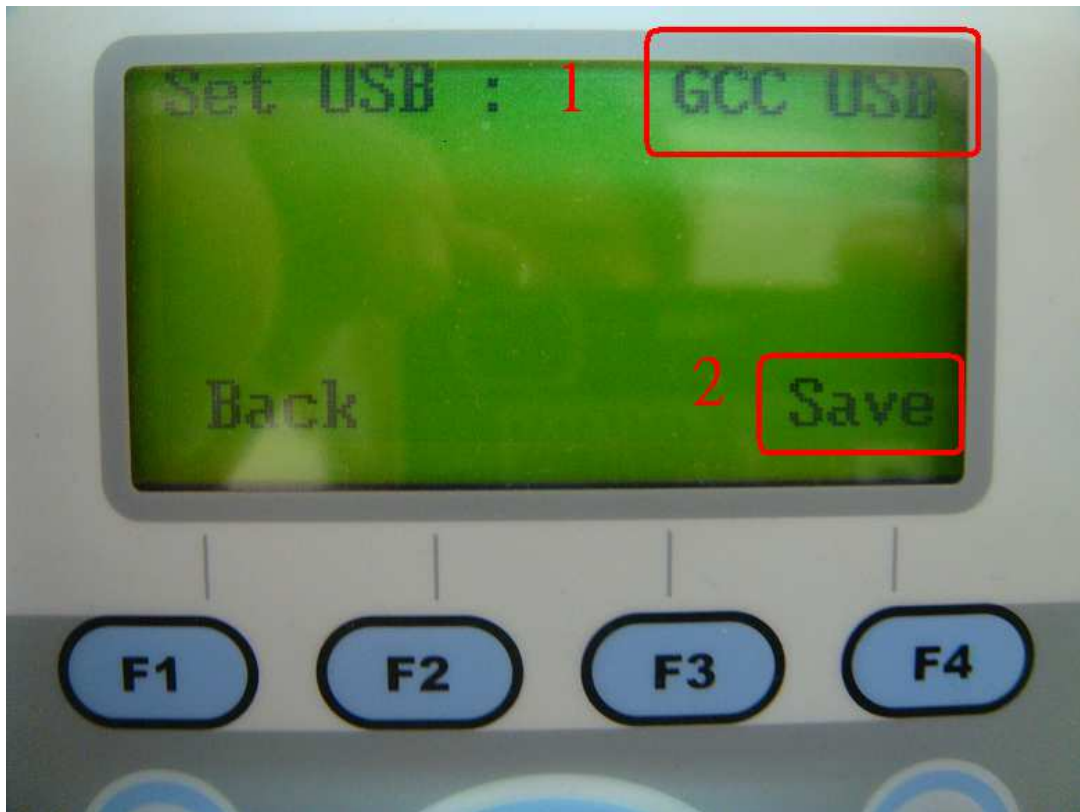
II. Select "Machine setting"



III. Select "Usb setup wizard"

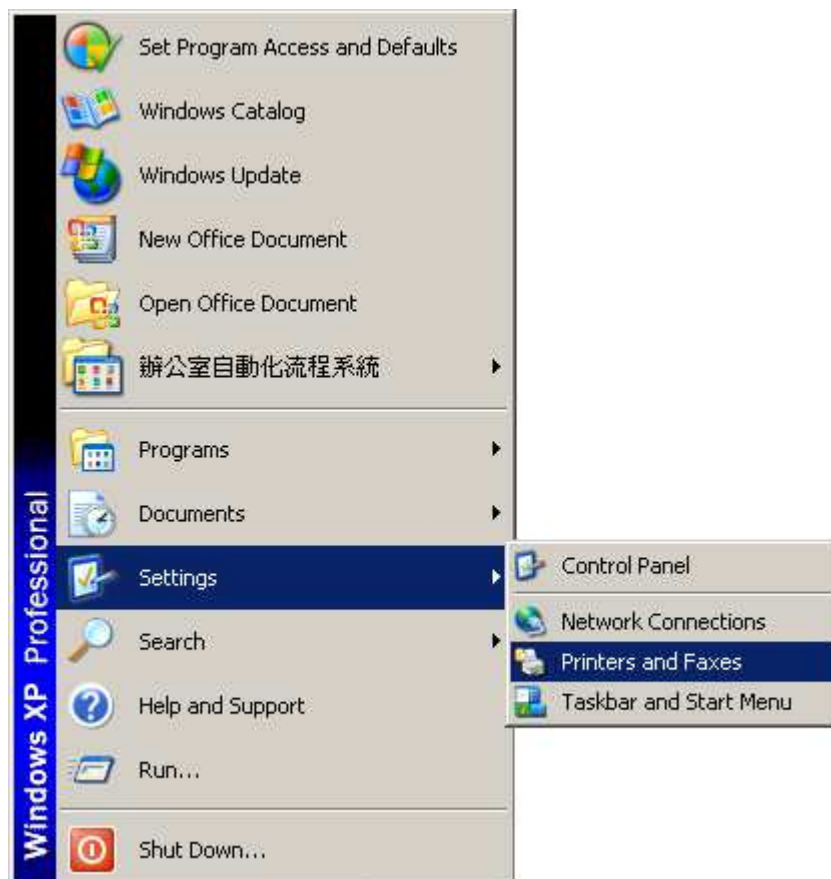


IV. Choice the USB mode you want to use and save it.

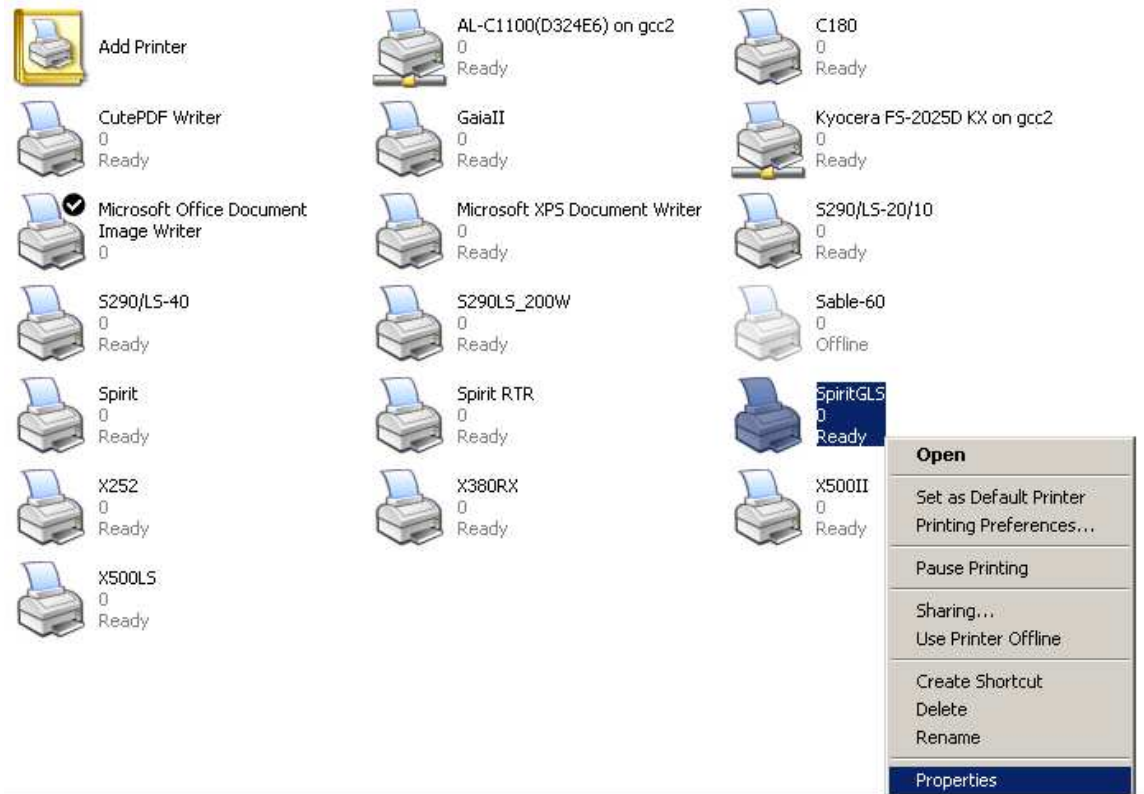


● **Printer port setting**

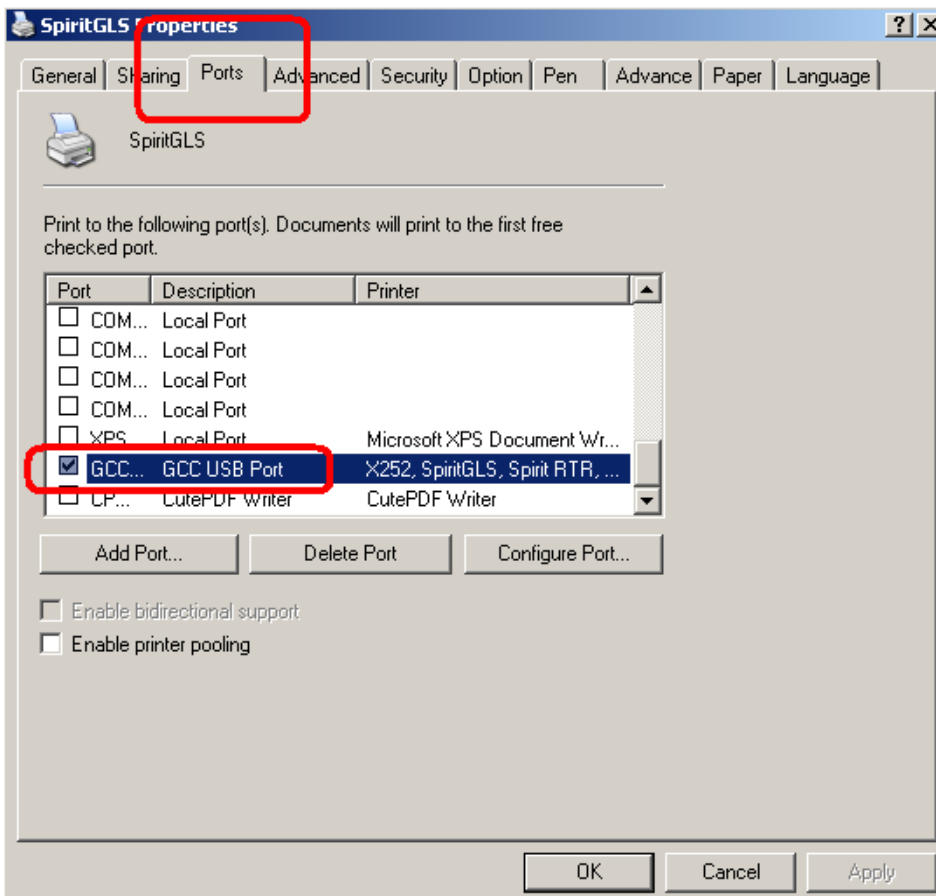
I. Start→Settings→Printers and Faxes to enter “printers page”



II. Right click on the printer you want to set the port and select "Properties"



III. Turn to "Port" tab, select the proper port you want to set (in this case, it's GCC USB)



Chapter 7 - Trouble Shooting & Diagnostic

7.1 Firmware Error Message

Message	Laser Tube Error Laser tube is overheat press any key to stop
Cause	V30 laser tube responses the over-temp signal for a period of time, and firmware recognizes the laser tube is over temperature.
Solution	Check the temperature is down to normal level , turn off the machine,wait for the laser tube be cooled.

Message	Invalid file, check output file or reset command mode. press any key to stop
Cause	PCL command error
Solution	Check the output file command

Message	WARNING! SmartGUARD fire alarm system is activated,please reboot machine
Cause	Flame detected by SmartGUARD
Solution	Reboot the machine

Message	WARNING! Emergency stop is activated, please free the emergency stop to continue next job
Cause	Emergency stop is activated
Solution	Release the emergency stop button

Message	Please install the Auto Focus pin first before performing the auto focusing or focus tuning
Cause	Auto Focus pin is not installed
Solution	Check if the autofocus pin is installed

Message	HPGL Command Error Command: Address: Please press any key to stop
Cause	HPGL command of printing file is not defined.
Solution	Check the HPGL command

Message	Working table has reached the limit, please lower the table.
Cause	<ol style="list-style-type: none"> 1. Platform reach the top limit 2. Platform reach the bottom limit 3. Certain object touches the limit switch 4. Limit switch malfunction
Solution	<ol style="list-style-type: none"> 1. UP/Down platform to avoid the limit level 2. Remove the objects which touch the limit switch 3. Replace the limit switch

Message	PCL Command Error Command: Address: Please press any key to stop
cause	PCL command of printing file is not defined.
Solution	Check the PCL command

Message	Error! Please make sure the work piece or carriage within work area
Cause	The design object is out of working area
Solution	<p>Verification:</p> <ol style="list-style-type: none"> 1. Check if the size of design exceed the working area defined. 2. Check if the design is in the default working page. 3. Check the position mode <p>Solution::</p> <ol style="list-style-type: none"> 1. Place the object in the default page of driver 2. Select proper position mode.

Message	Language Error Please upload proper language pack.
Cause	While using multi-language, precise language file is not imported.
Solution	Import correct language pack file.

Message	No Language Data Please upload proper language data first
Cause	While using multi-language, precise language file is not imported.
Solution	Import correct language pack file.

Message	SmartMEMORY is full.Please remove some file
Cause	SmartMEMORY buffer is full
Solution	Delete files in SmartMEMORY

Message	SmartMEMORY is not detected. Please check the device
Cause	SmartMEMORY is not installed
Solution	Install the SmartMemory

Message	X motor malfunction For service please contact your local distributor
Cause	X motor is abnormal
Solution	Verification: 1. Check if the cable connections of X motor are correct 2. Check if there were any abnormal sounds from X motor Solution: Re-install the motor cable.

Message	Y motor malfunction For service please contact your local distributor
Cause	Y motor is abnormal
Solution	Verification: 1. Check if the cable connections of Y motor are correct 2. Check if there were any abnormal sounds from Y motor Solution: Re-install the motor cable.

Message	Z motor malfunction For service please contact your local distributor
Cause	Z motor is abnormal
Solution	<p>Verification:</p> <ol style="list-style-type: none"> 1. Check if the cable connections of Z motor are correct 2. Check if there were any abnormal sounds from Z motor <p>Solution:</p> <ol style="list-style-type: none"> 1. Re-install the motor cable 2. Adjust the speed of table moving

Message	Laser Warming Up Please Wait
Cause	Laser tube is warming up
Solution	Wait for the laser tube warm up

Message	Please install the Auto Focus pin first before performing Please press any key to stop
Cause	Auto Focus pin is abnormal
Solution	Check Auto Focus pin

Message	CCD Error! Move carriage to first mark or reset CCD Thank you
Cause	CCD didn't recognize the object successfully
Solution	Do the recognition again.

Message	CCD Offset Error Please change your media or confirm CCD focus distance
Cause	The pattern is too close to the boundary and the carriage goes out of the boundary after the recognition is finished.
Solution	Move the pattern to the center of the table

Message	WARNING!The CCD unit is not detected. Press Back to leave CCD offset mode.
Cause	CCD is not installed
Solution	Install the CCD

Message	WARNING! No CCD Please remove include CCD command file
Cause	CCD is not installed
Solution	Install the CCD

Message	Door is Open; Please Close Door and press BACK to operate
Cause	Top cover is opened while a job is running
Solution	<p>Verification:</p> <ol style="list-style-type: none"> 1. Check if the top cover is opened 2. Check if the Door sensor worked fine <p>Solution:</p> <ol style="list-style-type: none"> 1. Close the top cover 2. Replace Door sensor

Message	WARNING! Laser Head Temp. over ; please close machine and check Laser Head
Cause	Fibre laser tube over temperature
Solution	Check if the temperature of tube is really too high

Message	Error Code : please wait
Cause	Error code responded by Fiber laser
Solution	Check the definition of the Code.

Message	Fail to locate registration mark. Align red beam to the first mark
Cause	The first registration mark can't be recognized
Solution	Move the red beam to the first mark and do the recognition again.

Message	Object is out of bound. Please place object within the valid working area.
Cause	The pattern is too close to the boundary
Solution	Place the pattern to the proper position

Message	Auto Focus disabled Please use the and keys to move the working table
Cause	Auto focus function is disable , please up/down the table manually
Solution	Check Auto focus function

Message	WARNING! Machine ; Initialization error Please free the emergency stop then restart the machine
Cause	Emergency stop button is pressed while the machine is booting
Solution	Release the Emergency stop button

Message	Permit Expired!!
Cause	Time locker date is expired
Solution	Check the expiration of time locker.

Message	Invalid Timer
Cause	Time locker's effective time is different from firmware internal time.
Solution	Confirm the effective time in Time Locker.

Message	Drive Not Found!!
Cause	USB storage dose not plug.
Solution	Confirm if USB storage is plugged or try to replug again.

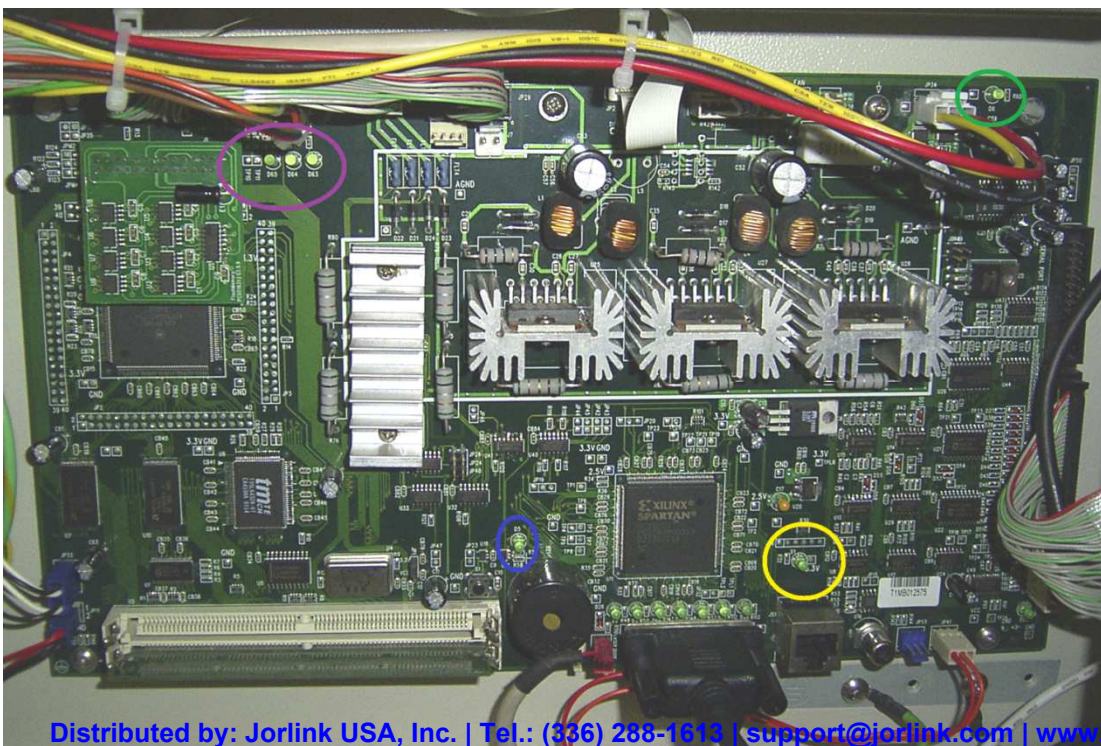
Message	No Valid File!!
Cause	File name is Chinese version or there is no prn and/or plt file mode under the folder.
Solution	Change file name to be English or check if there is prn and/or plt file mode under the folder.

Message	USB drive error. GCCcertified USB drive models w/FAT 16/32 format is required
Cause	Format is not FAT16 or FAT32
Solution	Confirm the format of USB storage.

7.2 Error lights

Identifying problems by looking at the lights on the mainboard.

7.2.1 5206e mainboard

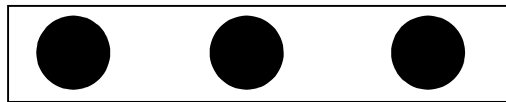


The LED circled in green is the 5V light. This light should always be “ON” showing that there is a 5V supplied to the mainboard. Check that the power supply next to the mainboard that provides the 5V power is working properly if it is not “on”.

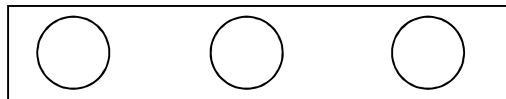
The LED circled in blue is the reset light. This light should only turn on when the reset button is hit. If it stays “on” all the time then the mainboard needs to be changed.

The LED circled in yellow is the initialization light. This light turns on when the machine is turned on. It will turn off after the initialization process. If it stays on, then mainboard is damaged.

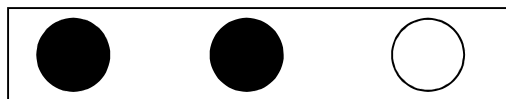
The LEDs circled in purple are the door sensor lights. When all doors are closed, all three LEDs will stay “on”.



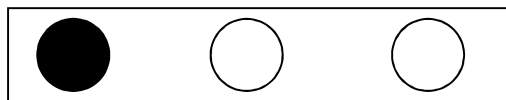
When the front door is open or front door sensors malfunctioning, all the LED will turn off.



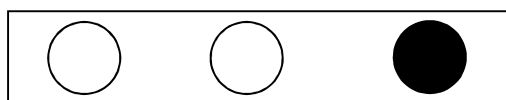
When the backdoor is open or the backdoor sensors are malfunctioning, the two leftmost LEDs will turn “on”.



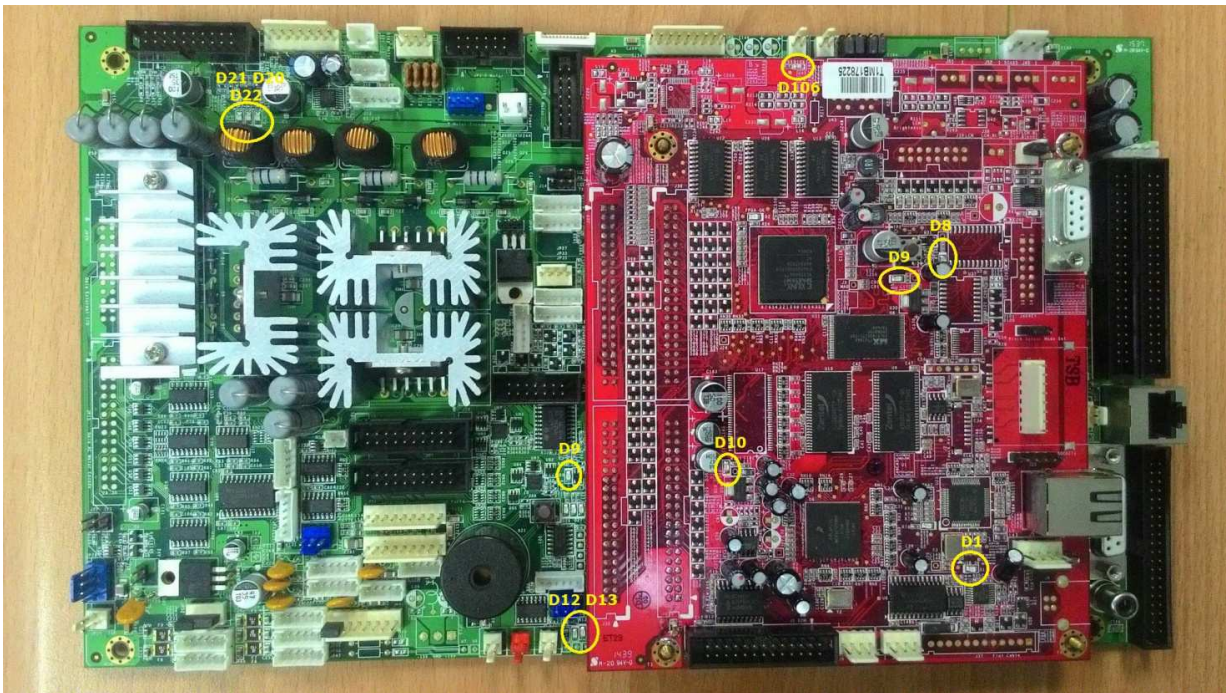
When the top door is opened or the top door sensors are malfunctioning, the left most LED turns to “on”.



When the whole top cover assembly(the whole top metal frame) is opened, the right most LED turns to “on”.



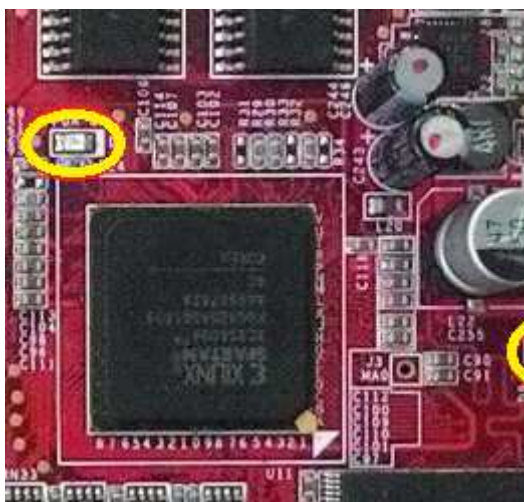
7.2.2 5272 mainboard



- A D1 : LED for USB Connection Indicator
LED on : USB Connection
LED off : USB Disconnection



- B D2 : FPGA Download Done Indicator
LED on : FPGA Download Done
LED off : FPGA Download not ready

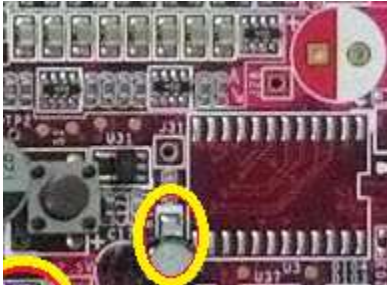


C RESET Indicator

LED on : M/B RESET

LED off : normal mode

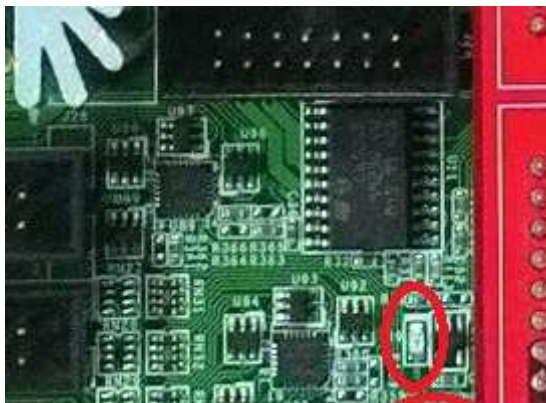
C.1 D8 : M/B RESET Indicator



C.2 D9 : D/B RESET Indicator

Light : M/B RESET

Dark : normal mode



D Power Ready Indicator

LED on : Power Ready

LED off : Power not Ready

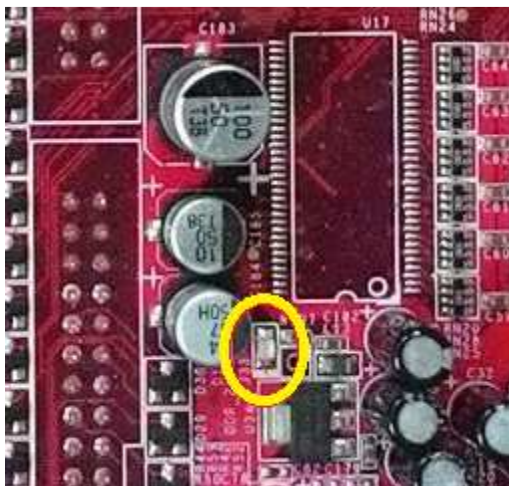
D.1 D106 : M/B 3.3V Power Indicator



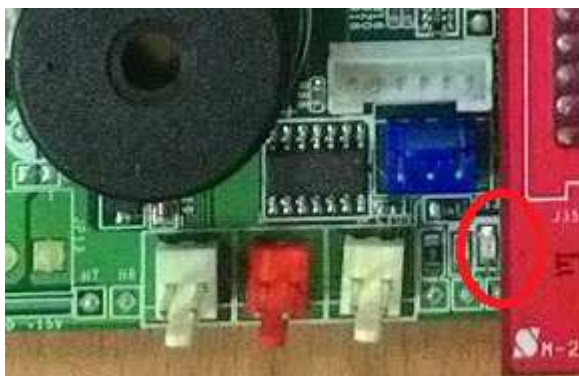
D.2 D9 : M/B 2.5V Power Indicator



D.3 D10 : M/B DDR 2.5V Power Indicator



D.4 D13 : D/B 5V Power Indicator



D.5 D12 : D/B 3.3V Power Indicator



E Door Open Indicator

LED on : Door Close

LED off : Door Open

E.1 D20 : Door Open Indicator 1



E.2 D21 : Door Open Indicator 2



E.3 D22 : Door Open Indicator 3



7.2.3 Setting tickle pulse on Spirit Series machines equipped with Synrad laser sources.

By nature, Synrad laser sources require a tickle pulse to keep the laser ready for firing. The tickle pulse signal required depends on the individual laser tube. The usual setting is at 5k, however, it may be required to adjust the tickle pulse rate. If the laser is too weak, we can set it to 7k and if the laser is bleeding, then we can set it to 3k.

Hold the “down arrow key” when turning on the machine until “Laser Tube Model Number” shows on the display. Wait till the lens carriage comes to a stop. Press the Enter key to get to the Model Number selection page. Select the corresponding laser tube model from this page. Press F4 and then the Start/Stop key to save and restart the machine.

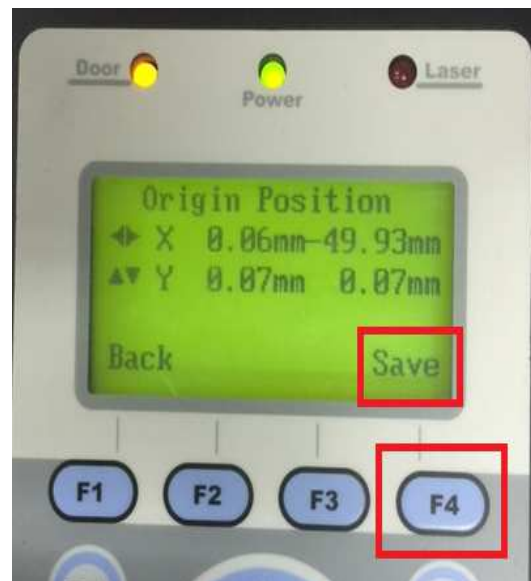
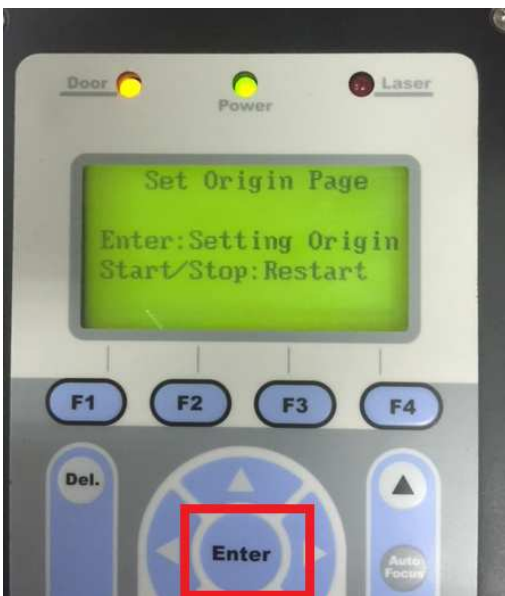
7.3 Hidden Diagnostics

7.3.1. Hidden Function

To enter the Hidden Function , **hold down the ▽ button and turn on the machine.**

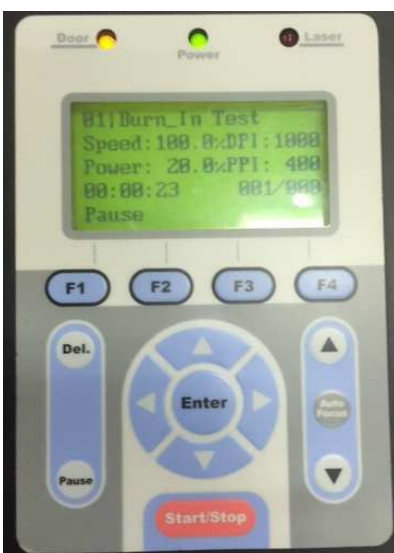
7.3.2 Setting Origin

Pressing and holding “Enter” key and turn on the machine → Adjust X · Y position by pressing arrow key → Pressing 「F4」 to Save



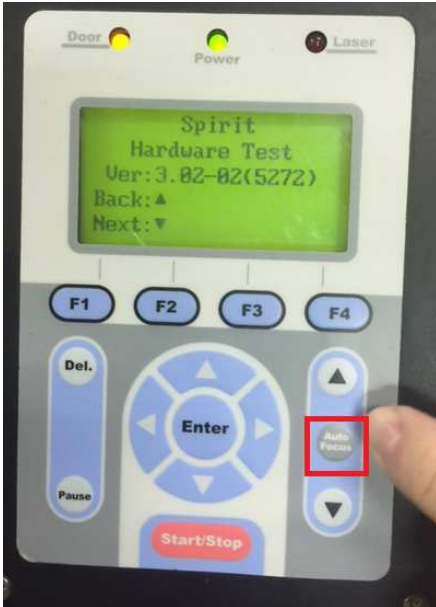
7.3.3 Burn In Test

Pressing and holding “Start/Stop” key and turn on machine; after the machine is boot, a file with name “Burn_In_Test” will be generated and output automatically, this file will permanently run unless user stop it .



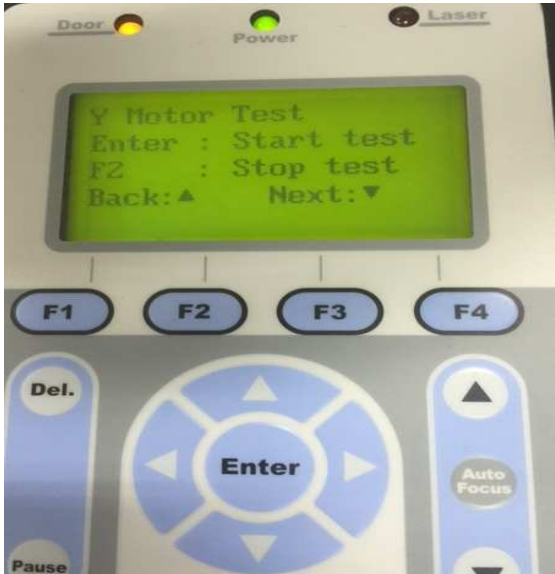
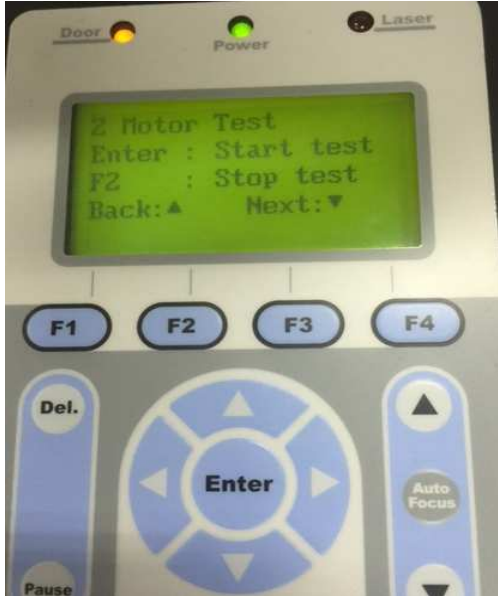
7.3.4 Hardware Test

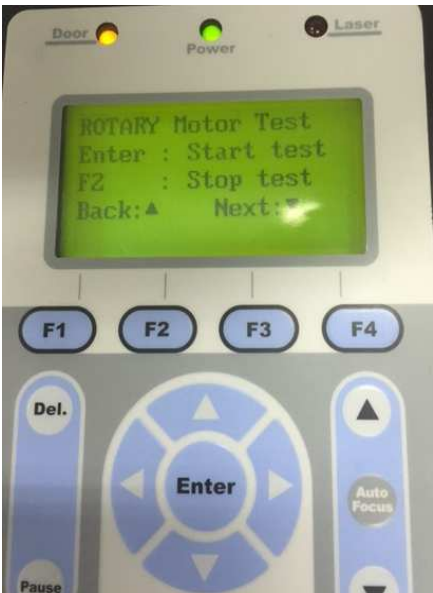
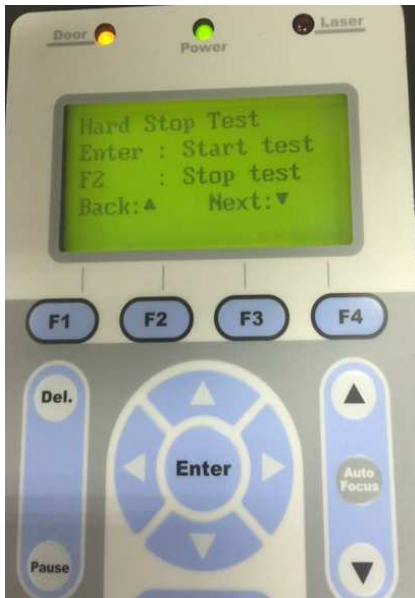
To enter the Hardware Test , **hold down the 「Auto Focus」 button and turn on the machine.** Following the instruction, pressing ▼、▲ to go to previous or next page.

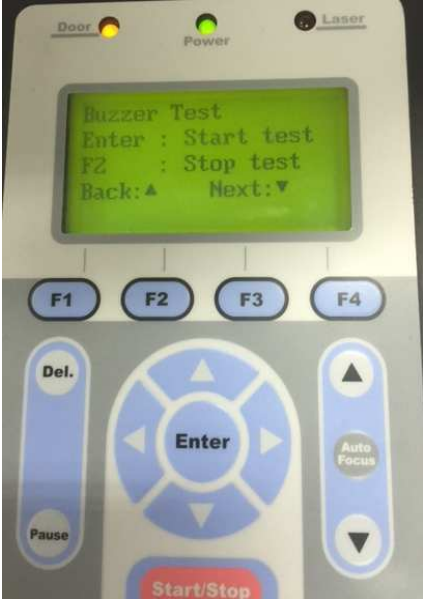
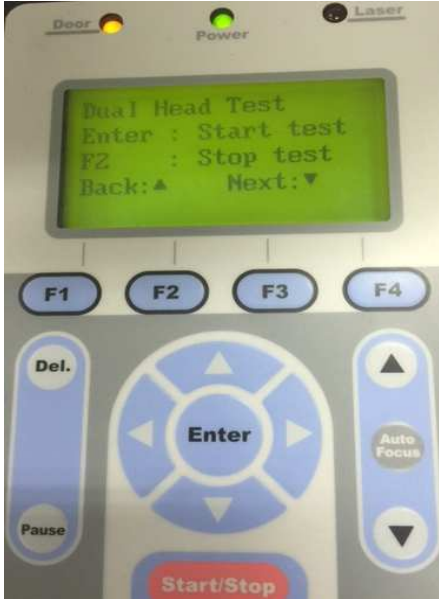




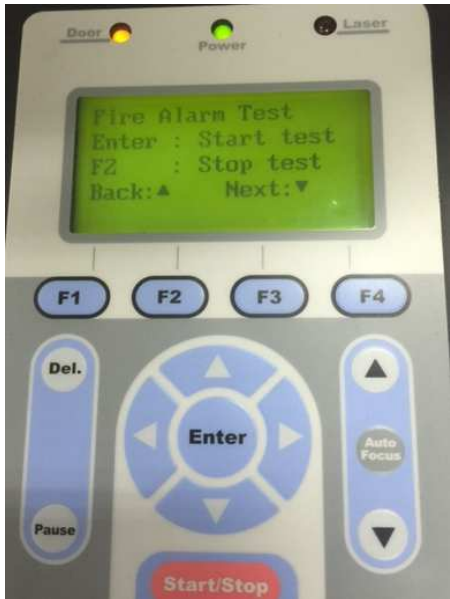
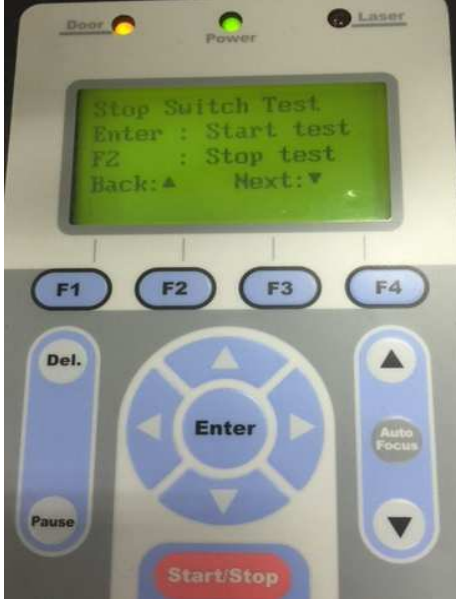
Contents of Hardware Test (Pressing 「Enter」 to start test):

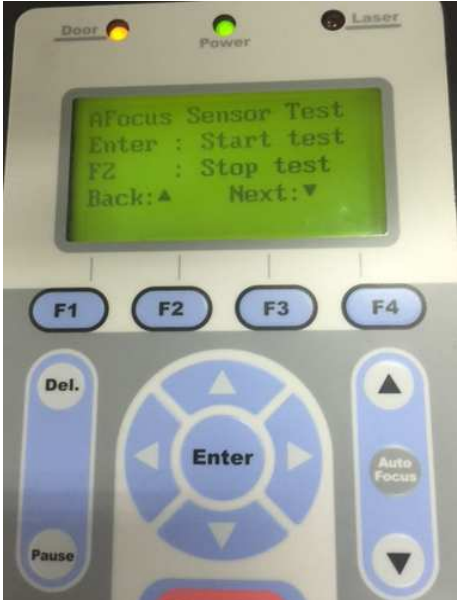
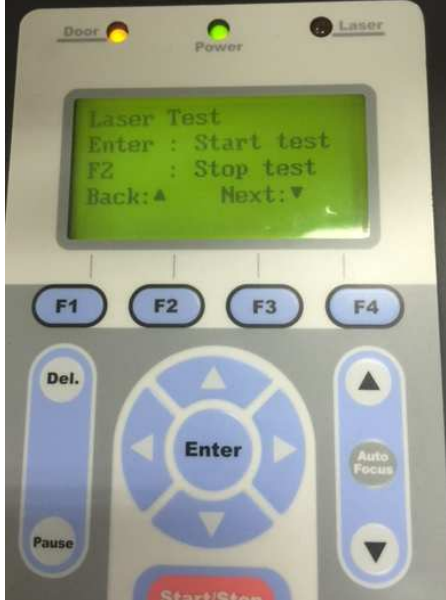
FPGA Test	X Motor Test
<p>FPGA test checks if FPGA chipset is working correctly, test will be started by pressing the “Enter” key, test result will be shown on the screen (Test ok or Test fail)</p>	<p>X motor test checks that the X motor is functional by asking user to use the keys on the control panel to move the pen carriage along the X axle.</p>


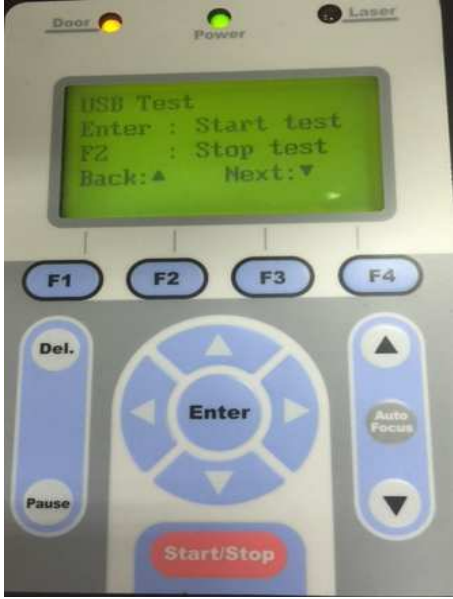


Y Motor Test	Z Motor Test
<p>Y motor test checks that the Y motor is functional by asking user to use the keys on the control panel to move the pen carriage along the Y axle.</p>	<p>Z motor test checks that the Z motor is functional by asking user to use the keys on the control panel to move the platform up and down the Z axle.</p>
	

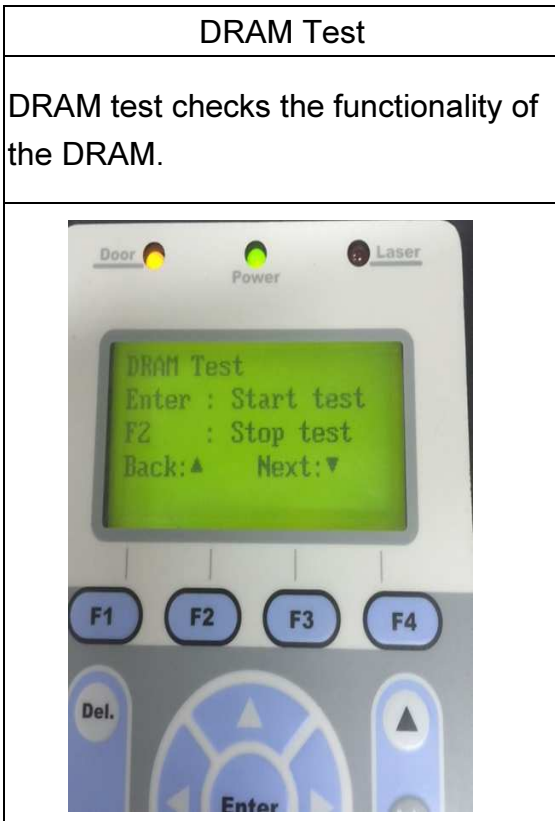
Rotary Motor Test	Hard Stop Test
<p>Rotary Motor Test checks if the motor of the optional Rotary attachment is functional. Press Up or Down arrow key and see if the Rotary attachment will roll or not.</p>	<p>Hard Stop test checks that the X and Y sensors are functional by asking the user to manually move the pen carriage towards the X and Y sensor flags</p>
	

Buzzer Test	Dual Head Test
<p>Buzzer test checks if the following items are functional :Buzzer / Laser Diode / Air / Fans Those functions will run at the same time while users press the “Start/Stop” button.</p>	<p>Dual head test checks if the optional Dual Head module is functional. System buzzer will beep while user is pressing the switch of Dual head module is it’s functional.</p>
	
AutoFocus Test	Door Switch Test
<p>AutoFocus Test checks if the AutoFocus Pin probe is functional. The system buzzer will beep once user press the AutoFocus pin if it’s functional.</p>	<p>Door Switch Test checks if the door switches are all functional.The system buzzer will beep and the yellow door led on control panel will turn to on once any door of the machine (includes top cover \ front door \ back door) is opened if it’s functional.</p>
	

Fire Alarm Test	Stop Switch Test
<p>File Alarm Test checks if the optional SmartGuard is functional. System buzzer will beep once fire is detected.</p>	<p>Stop Switch Test checks if the Emergency Stop switch is functional. System buzzer will beep once user press the Emergency Stop switch.</p>
	

AFocus Sensor Test	Laser Test
<p>AFocus Sensor Test checks if the sensor of AutoFocus pin is functional, the sensor will detect if the AutoFocus pin is well installed on the AF seat. System buzzer will beep once you remove the AF pin from AF seat if the sensor is functional.</p>	<p>Laser test allow you to fire the laser tube at a selected laser power. (This is also the utility that you use to perform beam alignment.)</p>
	

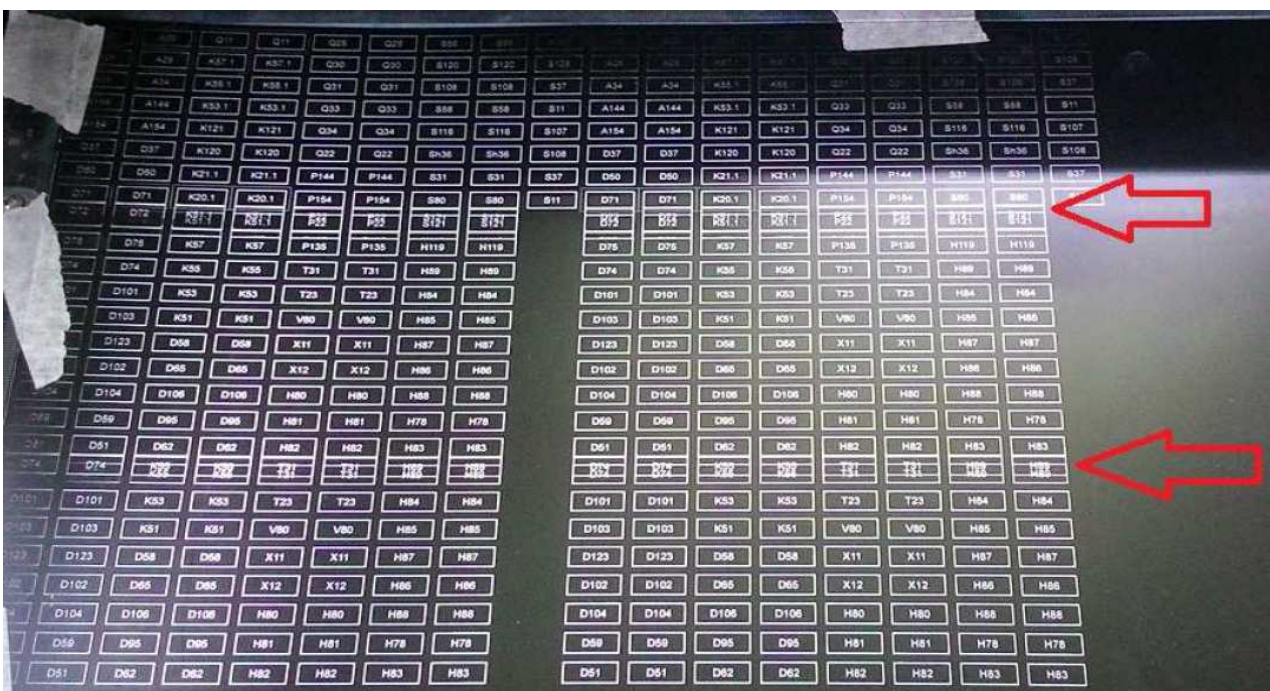
Serial Port Test	USB Test
<p>Serial port test checks that the serial port is functional by asking the user to send a file through the serial port. (The serial port is for diagnostic purposes only. Please do not use.)</p>	<p>USB port test checks that the USB port is functional by asking the user to send a file through the USB port.</p>
	
LCM Key Test	LCM Interface Test
<p>LCM Key test will test the functionality of the keys on the keypad</p>	<p>LCM Interface test will display a series of different shapes on the LCM to allow user to detect any malfunction on the display unit.</p>
	



7.4 Diagnostic process for random shifting problem

Symptom 1: Y axis shifting during a matrix job

When the machine is engraving or cutting a matrix job (some rows and columns of logos or texts), sometimes one row of job is shifting to y axis (shift to upper or lower than normal position). This symptom does not happen every time. Sometimes this symptom will happen once in two or three days. See below image for symptom example:



Diagnostic process:

1. Check grounding for machine and office grounding and see if the grounding is OK.
2. Check if the control panel has some error message when the shifting happens.
3. If above two items are checked and this symptom happen randomly, it should be firmware bug, please download the latest firmware or contact to GCC for further help.

Symptom 2: X axis shifting during repeat jobs

When the machine is cutting a job, sometimes when repeat the same job on same position, the job will shifting to right side or left side gradually. This symptom does not happen every time. Sometimes this symptom will happen once in two or three days. The major reason for this symptom is the x motor flat cable has broken somewhere(only broken very small) and touch the metal part of machine and cause the signal from mainboard to x motor pcb is not correct. See below image for symptom example:



Diagnostic process:

1. Check if the x motor flat cable is broken somewhere or change another x motor flat cable.
2. Check if the screws under x motor cable are too sharp or too high and rub the x motor flat cable.
3. Check if the x motor flat cable is smooth or not too tight inside of y axis tube chain.

Charper 8 Basic Maintenance

8.1 Suggested Cleaning and Maintenance Supplies

Cleaning / Maintenance Tool	Special notes
Soap Solution or All-Purpose Cleaner	
Paper Towels	
Cotton Cloth	
Denatured Alcohol	DO NOT use alcohol on any painted surface, plastic, or the laser system.
Acetone	ONLY to be used on the work table
Vacuum Cleaner with a Flexible Nozzle	Only to be used in and around the work table and motion system
Lubrication syringe	Supplied
Cotton Swabs	Supplied
Lens Cleaner	Supplied 1pc. Local supply is suggested.*
Lint Free Lens Tissue	Supplied
#2 Phillips Screwdriver	
Allen Wrench .050"	

*The recommended lens cleaner is Eclipse Cleaning System Solution from Photographic Solutions or HPLC grade Methanol. Search "Eclipse Cleaning System Solution" on Amazon or eBay to get the solution locally.

<http://www.amazon.com/Photographic-Solutions-ECDCS-Cleaning-Solution/dp/B0000AUR11>



Eclipse Cleaning System Solution

*The recommended grease is AFA grease.

AFA Grease is a high-grade, long-life grease developed with a urea-based consistency enhancer using a high-grade synthetic oil as the base oil.

Features

(1) Long service life

Unlike ordinary soap based grease for metal lubrication, AFA Grease excels in antioxidation stability and therefore can be used for a long period of time.

(2) Wide temperature range

The lubricating performance remains high over a wide range of temperatures from -45 °C to +160 °C

Even at low temperatures, AFA Grease requires only a low starting torque.

(3) High water resistance

AFA Grease is less vulnerable to moisture penetration than other types of grease because of its high water resistance.

(4) High mechanical stability

AFA Grease is not easily softened and demonstrates excellent mechanical stability even when used for a long period of time.

8.2 Maintaining Motion System - Lubrication of the X & Y Rails

In order to keep the motion system running smoothly, the X and Y rails of the motion system will need lubrication on weekly base. Apply 0.1ml of lubrication syringe in accessory box to the X liner rail of Spirit LS and Spirit GLS models on bi-week base, while apply a small amount of light grade machine oil or PS2 grease to a paper or cotton towel and apply to the X rail of Spirit model, and Y rails of Spirit, Spirit LS and Spirit GLS models weekly. You can purchase PS2 grease from NSK dealers worldwide. Please visit <http://www.nsk.com/eng/company/network/index.html> for additional information

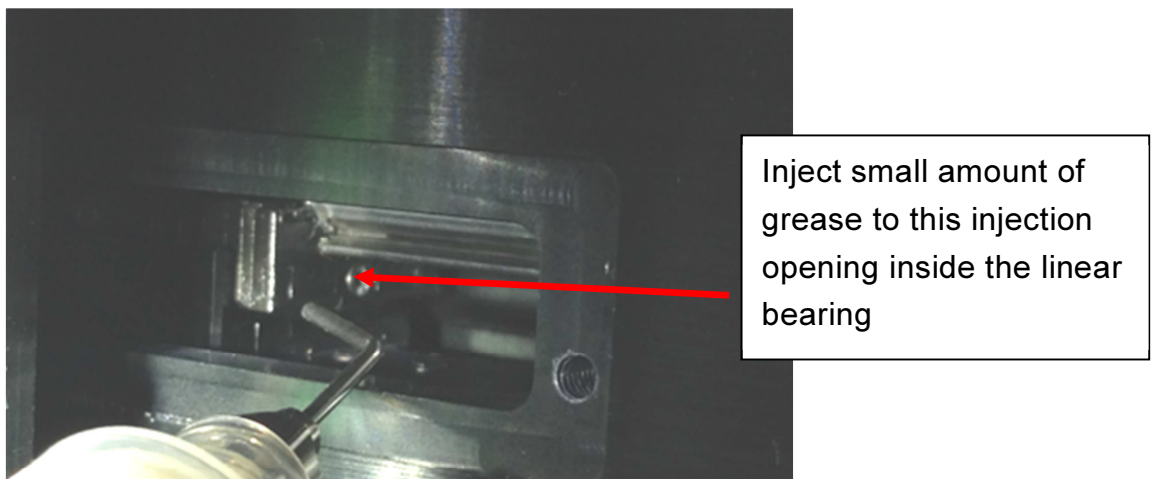
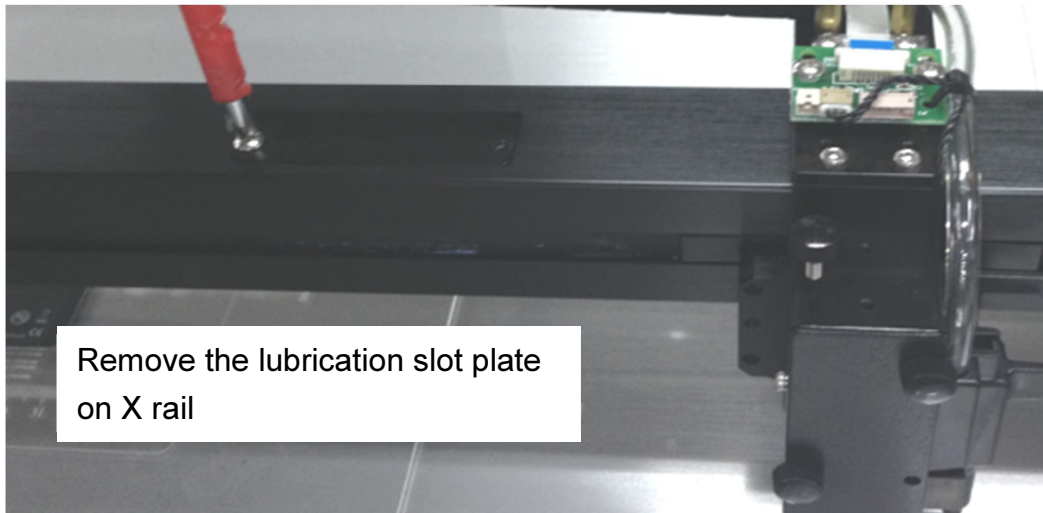
NOTE

- Clean and lubricate the X linear rail of Spirit LS and GLS models with 0.1ml grease from syringe every two weeks to properly maintain the motion system.
- The lubrication oil for the X linear rail on Spirit LS and Spirit GLS must to be ordered from GCC LaserPro and its authorized dealers. Other unknown grease may damage the rail's life time and performance.
- Always clean and lubricate the X and Y rails of Spirit, and Y rails of Spirit LS & GLS models after working with materials that produce lots of debris (such as wood).
- Too much oil or PS2 grease applied to the Y rails will accelerate the debris building up.

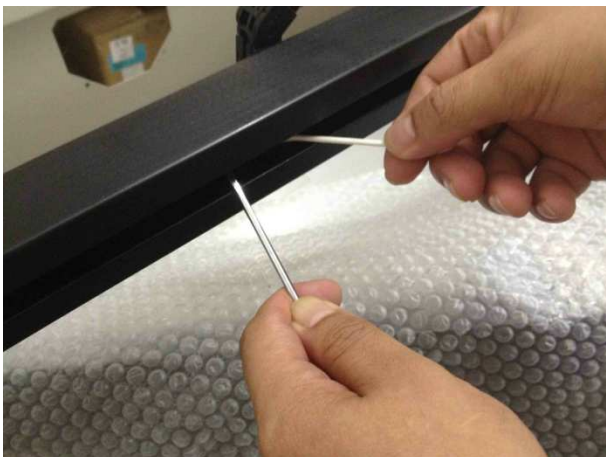
The X rail of Spirit LS and Spirit GLS models has linear bearing design which needs lubrication regularly depending on the job loading, recommend on bi-weekly base. Follow below procedures.

1. Take out the Grease Syringe from accessory box
2. Remove the lubrication slot plate on the X rails
3. Inject 0.1ml of grease to the injection opening inside the linear bearing, and move the lens carriage to smooth the grease and movement
4. Repeat the step 3 till the grease is full out of the linear bearing
5. Repeat the step 3 and 4 to the injection opening in opposite side of the linear bearing
6. Seal the lubrication slot plate back to the X rail





6. Open the belt by hand and use cotton swab to clean the linear guide (make sure to clean top, bottom and surface of linear guide).



7. Use clean oil on cotton swab and then grease on linear guide (including top, bottom and surface of linear guide).



8.3 Cleaning the Optics System

8.3.1 Removing the Mirrors

We recommend that you check the mirrors once or twice a week to see if they require cleaning.

If any debris or smoke residue is present, use the following steps to clean them.

NOTE

- Mirrors should be removed for cleaning one at a time to avoid beam misalignment after placing them back to the lens holders.
- Refer to section 8.3.2 on how to clean the mirrors.

The following section will illustrate the location of the four mirrors found on the LaserPro Spirit Series for cleaning.

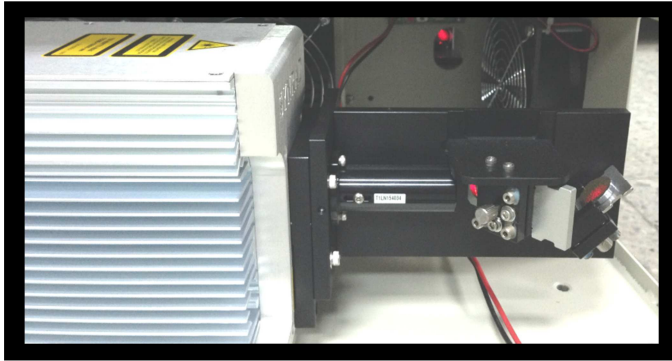
Mirror 1

Mirror #1 is located inside the bottom left access door panel of the LaserPro Spirit Series.

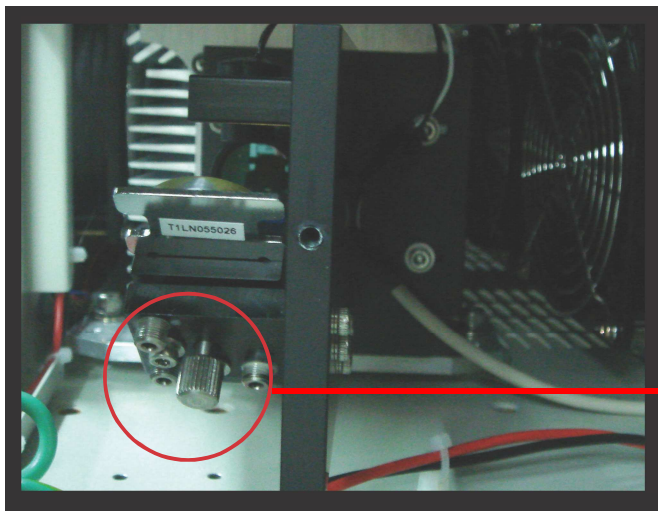
- 1) Use a #2 Phillips Screwdriver to open the access panel located on the bottom left side of the LaserPro Spirit Series.
- 2) Open the slot cover on the bottom left side of Spirit Series machine



- 3) Loosen the thumbscrew and remove the black dust cover in front of laser tube.



- 4) Loosen the thumbscrew securing mirror #1.

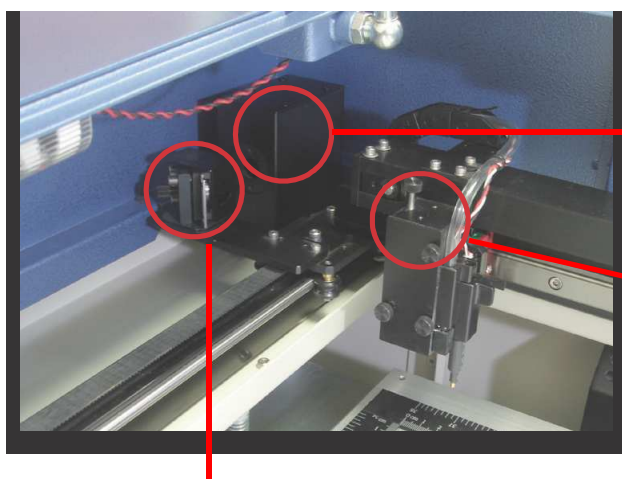


Thumbscrew

- 4) Clean the mirror in the proper manner.
- 5) Place the mirror back to the optics holder after cleaning.
- 6) Tighten the thumbscrew.
- 7) Close and secure all the covers.

Mirror 2, 3, 4

These mirrors are located in the work table area of the LaserPro Spirit Series.



Mirror 2

Mirror 4

Mirror 2

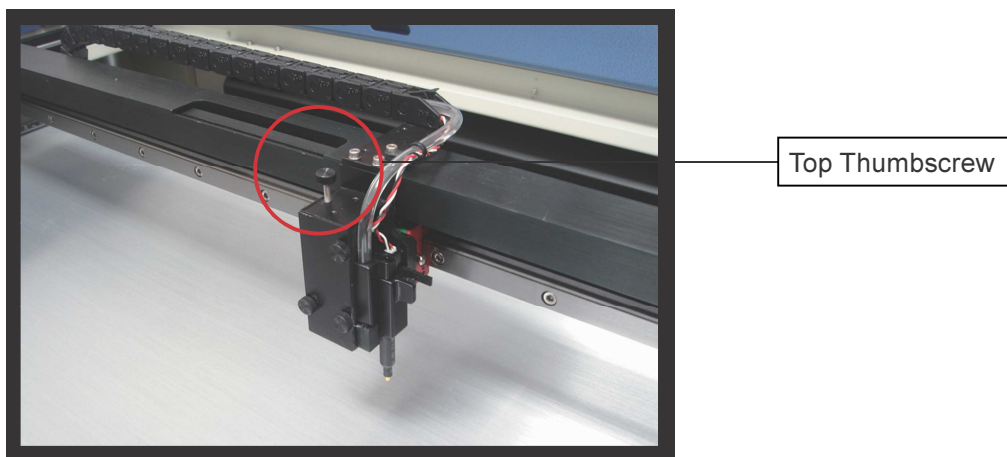
- 1) Unscrew and remove the black dust cover covering mirror 2.
- 2) Unscrew the thumbscrew holding mirror 2 in place.
- 3) Clean the lens in the proper manner.
- 4) Place the mirror back to the optics holder after cleaning.
- 5) Tighten the thumbscrew.
- 6) Close and secure the black dust cover.

Mirror 3

- 1) Unscrew the thumbscrew holding mirror 3 in place.
- 2) Clean the lens in the proper manner.
- 3) Place the mirror back to the optics holder after cleaning.
- 4) Tighten the thumbscrew.

Mirror 4

- 1) Unscrew the three thumbscrews securing the lens carriage panel and remove the lens carriage panel to reveal mirror 4 and the focal lens.
- 2) Loosen the top thumbscrew to remove mirror 4 (as shown in the picture below).



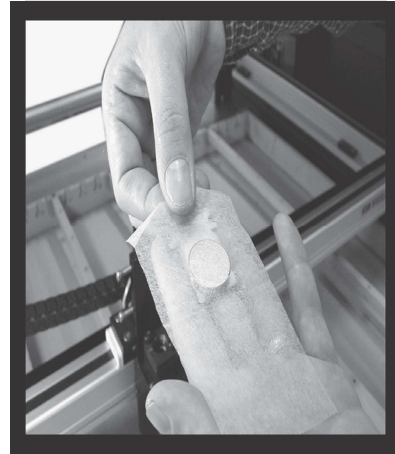
- 3) Clean the lens in the proper manner.
- 4) Place the mirror back to the optics holder after cleaning.
- 5) Tighten the top thumbscrew.
- 6) Reinstall the lens carriage panel and tighten the three thumbscrews.

8.3.2 Cleaning the Mirrors

After you have removed each mirror, you will want to inspect each mirror for scratches, smoke residue, or debris. If any residue or debris is present, use the following steps to clean the mirrors.

- 1) Hold the mirror with the reflective side up, without touching the reflective side of the mirror (**DO NOT apply any finger pressure or any other cleaning solutions to the mirror surface**).

- 2) Drape a new sheet of lens tissue over the mirror.
- 3) Apply a few drops of lens cleaner on the tissue covered mirror (apply enough so that the tissue absorbs just enough solution to cover the mirror surface).
- 4) Pull the tissue across the mirror in only one direction.
- 5) Repeat the cleaning processes if the mirror is not completely clean after the first attempt.
- 6) Make sure that the mirror is completely dry before reinstalling it.



⚠ CAUTION

- If the center of the mirror is scratched, contact your GCC LaserPro representatives for replacement.
- **DO NOT apply any finger pressure or any other cleaning solutions to the mirror or focal lens surface.**
- The optics components are very fragile, handle carefully and follow the cleaning procedure well.

8.3.3 Removing and Cleaning the Focal Lens

- 1) Unscrew the three thumbscrews securing the lens carriage panel and remove the lens carriage panel to reveal the focal lens.
- 2) Carefully pull out the focal lens.
- 3) Clean the focal lens with a cotton swab and lens cleaner solution. Be sure to clean both sides of the focal lens **(DO NOT apply any finger pressure or other cleaning solutions to the lens surface).**

- 4) After cleaning, use a cotton swab to gently dry the focal lens and lens cover.



Remove thumbscrew



Pull out the focal lens