



中国・中捷缝纫机股份有限公司 ZOJE SEWING MACHINE CO., LTD.



Catalogue	
Application	
Model Code	$\Big)$
Hardware Structure	\sum
Error solution	2
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Specification

Model		WR596	WR596 (110V)	
Voltage		AC 220V±20% 50/60HZ	AC 110V±20% 50/60HZ	
	Direct drive lockstitch	5000rpm		
MAX.speed(rpm)	Direct drive double needle	3000rpm		
	Direct drive lockstitch(heavy)	3500rpm		
	Direct drive top and bottom feed lockstitch(heavy)		3000rpm	
	Direct drive lockstitch		1.1Nm@5000rpm	
MAX.torque(N.m)	Direct drive double needle	2.5Nm@3000rpm		
	Direct drive lockstitch(heavy)	1.8Nm@3000rpm		
	Direct drive top and bottom feed lockstitch(heavy)	:	2.5Nm@3000rpm	
	Direct drive lockstitch	550		
	Direct drive double needle	750		
Rated power(W)	Direct drive lockstitch(heavy)	550		
	Direct drive top and bottom feed lockstitch(heavy)		750	
Electromagnet & air valve port		Trimming\wip	ing\reverse\presser foot lifter	
Human-computer interface		Single panel		
Needle bar led connector		2pin connector (DC5V/200mA) 14pin connector (DC5V/200mA)		
Safety protection		Turn up switch, protection, Overload pr circuit protection, N Fault	Overvoltage and undervoltage cotection, Blocking protection, Short eedle pole short-circuit protection, diagnosis function	



Matching models corresponding motor model

				Matching the head
1	WR596 WR596(110)	Direct drive lockstitch	80SF90-B5000-N02	ZJ9700
2	WR596 WR596(110)	Direct drive lockstitch (with thread clamping)	80SF90-B5000-N02	ZJ9700
3	WR596 WR596(110)	Direct drive lockstitch(mini oil)	80SF90-B5000-P02	ZJ9800
4	WR596 WR596(110)	Direct drive lockstitch (Backstitch presser foot linkage)	80SF90-B5000-N02	ZJ9700
5	WR596 WR596(110)	Direct drive lockstitch(heavy)	80SF90-B3000-B03	ZJ9700
6	WR596 WR596(110)	Direct drive lockstitch(heavy) (mini oil)	80SF90-B3000-A02	ZJ9800
7	WR596 WR596(110)	Direct drive double needle	80SF110-B3500-B02	ZJ2842
8	WR596 WR596(110)	Direct drive top and bottom feed lockstitch(heavy)	80SF110-B3000-B01	JY-H329-BD



Suit for



Direct drive lockstitch 9700

Direct drive lockstitch 9800

Direct drive double needle

Direct drive lockstitch(heavy) 9700

Direct drive lockstitch(heavy) 9800

Direct drive lockstitch (with thread clamping) 9700 Direct drive lockstitch (with thread clamping) 9700 Direct drive lockstitch (with thread clamping) 9800 Direct drive lockstitch (with thread clamping) 9800 Direct drive top and bottom feed lockstitch(heavy) Direct drive lockstitch (Backstitch presser foot linkage)



Composition of the product





Interface definition







Machine code - electric control box

- <u>WR 5 9 6</u>
- 1 2 3 4
- ①According to the corresponding head brand: WR---On behalf of sewing products series, the corresponding customer Zoje series products(The brand: ZOJE, JOYEE, SINGER, NEUTRAL)
- 2 Product platform No.:

1---Embroidery machine;

5 ----Single-axis platform;

6 ----1 Spindle+1 stepper;

7 ----1 Spindle+2 stepper;

8 ----1 Spindle+3 stepper;

9----1 Spindle+more than 3 stepper 3:The controller platform serial number; 0~9,

A~Z

④:The controller platform serial number; 0~9、 A~Z





Label - control box





Machine code - panel



<u>Panel</u>

EP - 0 14
① ② ③
①:EP----代表操作盒;
②:0 ---- TN;
1 ---- STN液晶屏+触摸屏;
2 ---- TFT液晶屏+触摸屏;
③:Serial NO.



Machine code - pedal





<u>Pedal</u> <u>PL</u> - <u>3</u> <u>02</u>

 $\begin{array}{ccc} 1 & 2 & 3 \\ \hline 1 & \mathbf{D} & \mathbf{p} & \mathbf{d} & 1 \end{array}$

(1):**PL----**pedal;

2:1 ---- At present using the common pedal , With analog and digital signal;

2 ---- Vertical pedal;

3---- Pure analog signal pedal; ③:Serial NO.



Model description - motor





Circuit board coding instructions

<u>S C 11 02 A6</u> (1) (2) (3) (4) (5)(1):Product category; **S**----behalf of sewing bro (2):PCB category: For sewing products: C ---- control panel; E ---- encoder board: H ---- HMI board: D ---- driver board P ---- Power Board S ---- synchronizer board F ---- pedal PCB M ---- EMC board Control box code 👞 K ---- key board T ---- Test circuit boards J ---- tooling board ③:Application Year: 09 ---- 2009 PCB production time (4):PCB board serial number: 01 to 99; (5):PCB version number: A0 $^{\sim}$ A9; AA $^{\sim}$ AZ



Safety Precautions

- 1, control box working voltage range :180V-260V.
- 2, Keep away from the high-frequency electric machinery to avoid signals interference
- 3 Make sure the ground line is well conneted.
- 4 Machine is forbidden to work in high humidity environment.
- 5 when testing machine, do not plug or unplug when the power is on.
- 6 For safety considerations; please use 80V electric power isolation transformer when repairing,
 Following the above instruction will effectively ensure the life of the machine and ensure staff safety.



Structure and composition of the hardware.

Hardware structure is divided into three parts

1. the main control box



2、operation panel



3, pedal





4, motor



Control box assembly



Note:

- 1) When installing the control box PCB, first place PCB board on tensile aluminum, then fix the screws
- 2) Do not forget to plug the socket when installing control box, to avoid no power or display error code.
- 3) Do not forget to connect the ground line when installing control box.
- 4) the current PCB version number: WR SC1305A1



Operation panel assembly



Note: 1) In order to avoid dysfunction or displaying error code, do not forget to plug in control box cable and operation panel cable when assembling.



Currently operation panel box PCB version number: SH0401B4



Pedal



- Note: 1) In order to avoid dysfunction or displaying error code, do not forget to plug in pedal cable
 when assembling.
- 2) magnet position is correct or not directly affect the sewing speed and thread trimming.
- 3) Pedal force is adjustable by 3 levels according to personal preference.
- 4) Currently pedal PCB version number: SF1001A3



Pedal connector 5557 【2*3】

speed adjustable



- Pedal assembly
- Pedal zero adjustment steps:
- 1、Install pedal PCBA。Make sure the spacing between magnetic and PCBA hall sensor in 1.5mm~1.8mm, then fixed PCBA。
- Connect pedal and control box, with 80V isolation transformer supply power, turn the magnet, make the sensor output voltage(both side of C2) from 2.77V to 2.83V.[Note: When adjust the pedal, must use 80V power supply]
- $3\,{}_{\sim}\,$ Test each button on the pedal $_{\circ}\,$

spacing between magnetic and PCBA hall sensor in 1.5mm~1.8mm

Voltage for both side of C2) from 2.77V to 2.83V





Motor assembly



Note:

Turn over the motor after installed the encoder to make sure the Raster not touch the sensor, not touch the connect line, and the height for raster is just in the center of the sensor.
 Installed the raster will affect the motor angle [motor angle is 252±5]

- 3) Installed the pressure line boards, put it into the line box, otherwise the line skin will easy to broken.
- 4) Encoder PCB number: SE1202A3



Motor assembly







Installed the pressure line boards, put it into the line box, otherwise the line skin will easy to broken.

Turn over the motor after installed the encoder to make sure not touch the connect line

Turn over the motor after installed the encoder to make sure the Raster not touch the and the height for raster is just in the center of the sensor.

height for raster



Install the motor direction consistent with the picture due to the motor started wheel fixed level above the encoder slot aligned positioning column to the left of painting a 1.9CM long straight line. Grating with rectangular foot vertical close-chip A literal, draw a straight line at the bottom intersects



Function -----Control box Operator interface

- Press P + o to enter the monitoring interface Select
 from the interface and press to enter or exit
- JJ—piece number
- U1—motor speed
- U2—electrical current
- U3—bus bar voltage
- U4—pedal voltage
- U5-mechanical head angle
- U6—Initial motor angle
- U7—main control program version
- U8—head model
- VER program version of the operation box





Function----Motor Angel Test Model

- Press A at the same time to enter the re run motor angle mode
- Then press P + s to run the angle (It will show "PASS " on the screen)





Function-----Electronic Control Test Mode

- Press at the same time to enter the detection mode
- Choose CP-1 or CP-2 CP-1: input inspecting

Interface 3 pedal AD voltage value

- Interface 1 er
- Interface 2,
- encoder signal pedal signal



CP-2: output inspecting \longrightarrow Electromagnet (JX,SX,YJ,BX,DF)



Function-----Electronic Control Test Mode

 It will display "CP-1" on the LCD screen when entering the main interface, through the "S" key to enter or the up and down button to switch between CP-1 and CP-2.Press "P" key to return to the next layer interface, press "P" again to return to the main interface.





Function----Electronic Control Test Mode

Repair interface(MODE CP1-1)				
		A1	Reverse stitching switch signal	The first item: head signal,
		A7	Head lift switch signal	
		C1	Up signal	nian sections of indication
		C2	OZ signal	in all
	1	D1	Hall_A signal	The second item:pedal
CP-1		D7	Hall_B signal	signal, five sections of indication in all Non indication section will not display (Displays when the signal is valid and it won't dispalay if the signal is invalid)
		D4	Hall_C signal	
		D6	Enc_A signal	
		D2	Enc_B signal	
		B1	ID1 signal	
	2	B4	ID2 signal	
		D1	DIN2 signal	
		D7	DIN3 signal	
		D4	DIN4 signal	
				Step down the pedal to
	3	Pedal_AD figure(0.01V)		check the numerical value



Function----Electronic Control Test Mode

1

	XL	OFF→ON(500ms)→OFF	
	BX	OFF→ON(500ms)→OFF	Handle the up and down button to set up the OFF to ON, it will back to OFF
CP-2	SX	OFF→ON(500ms)→OFF	automatically in 500ms.Check the
	DF	OFF→ON(500ms)→OFF	condition of the electromagnet.
	YJ	OFF→ON(500ms)→OFF	



Function----- Pedal adjustment mode

Press between the start up the machine , it will display "PdL" on the operation box . The electric controller will detect the Pedal reference voltage automatically.





Function-----Restore factory settings

At the *M* sewing mode, it will display "Restore factory settings" on the HMI screen when pressing *M* at the same time for more than 3 seconds.

The steps are as follows : the screen displays "NO", press J, displays "YES", press 💽 ,done.





Function-----Aging mode

- Press **P** to enter the aging mode
- Then press **P** + s to run it.





External interface definition

DE 的 数 数 数 MM 数 数 MM





External interface definition ----- electromagnet







External interface definition -----

Safety Switch、 pressor foot







Internal interface definition –operation panel





External interface definition - pedal







External interface definition – motor\encoder




External interface definition – power







Main board PCBA appearance









Error code

	Error Code	Contents	Reason & Solution
	E011	needle position signal lost error	needle position signal plug loosen; needle position encoder error; hand wheel un-installed
	E012	motor HALL signal return zero error	motor encoder plug loosen; motor encoder broken
	E013	motor HALL_A signal lost error	motor encoder plug loosen; motor encoder broken
	E014	motor inception position error	motor encoder plug loosen; motor encoder storage part broken; inception position not tested, re-check again the inception position
	E015	machine model code error	check the model code on the operation panel
	E021	motor stuck running	motor plug loosen; mechanism locked; sewing the material thickness over specification
<i>A</i>	E022	motor stuck running when trimming	thread trimmer mechanism stucked
	E023	motor overload	sewing the material thickness over specification; terrible sewing situation; Current test signal unusual
	E101	hardware drive error	Current detection circuit unusual; drive parts broken
	E111	system voltage over high	actual voltage too high; brake circuit error; system voltage test circuit malfunctioning
	E112		
r.	E121	21 system voltage too low	actual voltage too low; system voltage test circuit malfunctioning
	E122		



Error Code

E131	Current detection circuit error	system voltage test circuit malfunctioning
E133	OZ circuit error	system OZ signal circuit malfunctioning
E151	Magnet error	Check magnet whether short circuit; magnet circuit whether works normal
E201	motor excessive current	system voltage test circuit works or not; motor signal works or not
E211	motor overspeed	motor plug connect well; motor signal not matching;
E212	motor rotates inversely	motor inception angle not tested
E301	operation penal communication data error	operation penal plug connect well; parts of operation penal broken
E302	operation penal error	check operation penal memory circuit parts
E402	Pedal ID distinguish error	connector of pedal loosen
E403	pedal zero correction error	pedal broken; the pedal is not in stop position when adjusting
E501	safety switch error	check safety switch
POFF	outage display	power off & waiting for the power on; outage test circuit malfunctioning



E011---needle position signal error(when the motor speed over 50rpm, "UP" signal keeps continuous 1s low frequency or high frequency, that means the frequency without change for continuous 1s)

step: [when the encoder version number is SE1101A2, raster must be S180N02V01]

- 1) check whether the distance between handwheel magnet and the encoder is too far or the magnet comes off and cause the signal lose of inductor.
- 2) encoder socket and the main control encoder connect well or not ; contact pin of encoder DP15 plug curve /breakage or not.
- 3) check the impedance of pin2 to pin3 of U2 of encoder board: around 24K, power supply with 80V isolation transformer, standby voltage: 5.1V. the impedance of pin2 to pin1 of U2 of encoder board: around 10K. [note: when the encoder link to main control box, the impedance above is different] [when U2 get the signal of handwheel magnet, lower the voltage to 0V]

4) check whether the pin 2/plug J1(4pins) of U2 of encoder connect with the main control plugJ2(4pins).





- 5) Check the C30 two side impedance which on the main board: around 11K, the standby voltage :5.2V
- 6) Check the impedance of U2 (pin49) or U6 (pin16) to C4 negative terminal: around 3M, power supply with 80V isolation transformer, standby voltage: 3.2V





The E012—HALL initialization signal fault (when the power on HALL_A HALL_B HALL_C signal is low or high level)

- Step of solution:(when the encoder board number is SE1101A2 , the grating must be use S180N02V01)
- Check the U3—pin 2 impedance to pin 3(ground) which on the encoder board: about 1.2M; (the standby voltage : with the grating angle is different switch between 0V with 5.1V);U3—pin 4 impedance to pin 3(ground) : around 20K (the standby voltage : 1.2V),U3—pin 2 with J1(pin 1) whether conduction (remarks : when encoder is connected with the main control ,the above impedance is different)
- Check the U4—pin 2 impedance to pin 3(ground) which on the encoder board: about 1.2M; (the standby voltage : with the grating angle is different switch between 0V with 5.1V);U4—pin 4 impedance to pin3(ground) : about 20K (the standby voltage : 1.2V),U4—2stitchs with J1(1 pin) whether conduction (remarks : when encoder is connected with the main control ,the above impedance is different)



The E012—HALL initialization signal fault (when the power on HALL_A HALL_B HALL_C signal is low or high level)

3) Check the U5—pin2 impedance to pin 3(ground) which on the encoder board: about 1.2M ; (the standby voltage : with the grating angle is different switch between 0V with 5.1V);U5—pin 4 impedance to 3stitchs(ground) : about 20K (the standby voltage : 1.2V),U5—pin 2 with J1(1 pin) whether conduction (remarks : when encoder is connected with the main control ,the above impedance is different



The E012—HALL initialization signal fault (when the power on HALL_A HALL_B HALL_C signal is low or high level)

4) **check the** C29 two-terminal impedance on main control board: about 11K . (Standby voltage: 5.1V); U2(38 pin) or U6-14 pin to impedance on C4 negative terminal: **around** 3M (Standby voltage: 3.2V)

5) **check the** C39 two-terminal impedance on main control board: about 11K. (Standby voltage: 5.1V); U2(52 pins) or U6-18 pins to impedance on C4 negative terminal: 3M detection(Standby voltage: 3.2V)

E013---HALL_A Signal failure(If the motor speed higher than 50rpm, HALL_A is signal keeps continuous 1s low frequency or high frequency, that means the frequency without change for continuous 1s)

Step of solution: (when the encoder board number is SE1101A2 , the grating must be use S180N02V01)

1) check the impedance on encoder board U3—pin 2 to pin 3; around 1.2M; 【Standby voltage : follow the angle of raster changing,switch 0V and 5.1V】; impedance 【earth】 of U3—pin 4 to pin 3: about 20K. 【Standby voltage: 1.2V】,U3—pin 2 and J1 (1pin) is breakover or not . 【Remark: when encoder is connecting main control, above impedance is different】

2) Gauge C29 two-terminals impedance on main control board: around 11K; [Standby voltage: 5.1V]; U2 (38 pins) or U6—pin 14 to C4 impedance on negative terminal: about 3M [Standby voltage: 3.2V]

Picture see previous page

- E014--- Motor initial angle fault (motor initial angle I2C data read and write errors)
- Step of solution: (when the encoder board number is SE1101A2 , the grating must be use S180N02V01)
- 1) check the impedance on encoder board U7—pin 5 to pin 4; around 2K;Standby voltage
 : 3.2V,U3—pin 2 and J1 (8 pin) is breakover or not, U3-pin 2 and main control socket J2 is breakover or not (11 pin)
- 2) check the impedance on encoder board U7—pin 6 to pin 4; around 2K;Standby voltage
 : 3.2V,U3—pin 6 and J1 (7pin) is breakover or not, U3-pin 2 and main control socket J2 is breakover or not (12 pin)
- 3) check the impedance on encoder board U8—pin 1 to pin 3; around 8K; Standby voltage: 2.49 V

C4

U2 【TMS320F28031/64PIN】 pin position as picture above

negative terminal

Error solution

- 4) check the C14 two-terminal impedance on main control board: about 5.5K (Standby voltage:3.2V); U2(2 pin) to impedance on C4 negative terminal: around 5.5K (Standby voltage:3.2V)
- 5) check the C21 two-terminal impedance on main control board: about 5.5K. (Standby voltage:3.2 V); U2(3 pin) to impedance on C4 negative terminal: 5.5K detection(Standby voltage:3.2V)

E015---Model identification code is out of range (Machine does not compatible identifier)

- Step of solution
- Electric operation box display [99], need to set up the model, press the S key, then
 press ± key Select to identical model with head of the machine, and then pressing the S
 key, then press the ± key selection (display) YES and then press S. [turn the power on
 again after display shows E015 power on again]

E021---Motor stuck (motor running speed continuous 2s less than 25rpm or the current more than 10A)

Step of solution

- 1. Appear this fault when work in thick materials, please enter II parameter to modify parameter 83 (different parameter for different thick materials, it depands on the actual material)
- 2. First make sure the head mechanical angle is no problem, then check if motor power socket 2X3 core needle has peeling off.
- 3. Judging whether the motor is good or bad: using a multimeter (Ω block) to measure motor socket pin 6 to pin1, 2, 4 if there is short-circuit, and if impedance among motor three-phase U [2], V [1], W [4] is the same
- 4. Test the impedance between pin2[~]pin7 to pin12 of U8 on the main control board: respectively around 0.7M, the standby voltage 3.8V
- 5. Test the impedance between pin14,15,16 to pin12 of U8 on the main control board: about 10K, the standby voltage **0**V
- 6. Test the impedance between pin1 to pin12 of U8 on the main control board: about 2.4M, the standby voltage : around 15V
- 7. Test the impedance between pin10 to pin12 of U8 on the main control board: about 1K, the standby voltage : low frequency (Operation of the motor is high)
- 8. Test the two terminal impedanceon of D27 on main control board : 2.4M: standby voltage: 15V
- 9. Test the Impedance between pin1 to pin3 of $Q3^{\sim}Q8$ on the main control board : about 10K
- 10. Test the impedance between pin3, 6 to pin2 of U6 on encoder : around 26K; standby voltage: 5.1V. Whether pin3, 6 and the J1 (pin5, 6) of U6 is connected with the socket J2 (pin13,15) of main control
- 11. If the above **test** are normal just direct replace U8

E022---Motor stall when shear line(Motor speed continuous 2S less than 25rpm or current more than 10A during Shear line)

Step of solution

- 1. Check the thread head below needle plate, if it is long time without clean lead to jammed shut when shear line
- 2. Check if mechanical position is correct when shear line, whether the upper and lower needle position is opposite, needle position deviation too much or cut to needle when shear line.

E023--- Motor overload (motor running in high current for long time)

- Step of solution
- Directly operation pedal after operating frequency in the shear line, this Error is due to the machine working too frequently, can put [25, 26 parameters are set to 1] to relieve the working frequency.

E101---hardware overcurrent (/PB_FLT Sign of hard ware effective)

Error solution

- Judging whether the motor is working or not: using a multimeter (Ω block) to measure motor socket pin 4 and pin1, 2, 3 whether there is short-circuit, or whether the motor three-phase U [3], V [2], W [1] between impedance same issue.
- 2) Whether the Motor angle is correct; [press] at the same time, press ± enter interface U6,press Check whether the Motor angle is between 252 ±5. [the deviation of motor angle is too big, when speed up or scram, there will be large electric current or appear coasters phenomenon
- 3) check the Impedance between the main control board Q3~Q8 pin1 to pin3 : around 10K
- 4) check the impedance between the main control board U8 pin 2~7 and pin12 : respectively at around 0.7M, the standby voltage 3.8V
- 5) check the Impedance between the main control board U8 pin14, 15, 16 and pin12 : around 10K, the standby voltage : 0V
- 6) check the value of resistance on main control board R169 : 1K:; two terminals impedance on C101
 ; standby voltage: 3.2V
- 7) check the Impedance between the main control board U8 pin1 and pin12(earth) : around 1.6M, the standby voltage:15V
- 8) check the Impedance between the main control board U20 pin1, 7 and pin4 : 13.5K, the standby voltage : 1.46V
- 9) Whether the motor raster is loose and the sensor on the encoder whether rub and interference.

E101---hardware overcurrent (/PB_FLT Sign of hard ware effective)

E111---Overvoltage when shutdown (the bus voltage is greater than 450v for 3s when shutdown)

- steps of Solution
- 1) Check whether the inlet voltage of control box is stable, if it's within the specified range of 200V-250V
- 2) when standby, enter monitoring interface of operation control box and check what's the voltage appear in U3 interface, then run the motor to check how much voltage rise while scram(usually around 410V), [the inlet voltage multiplied by 1.41 = interface voltage]
- 3) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then detect the voltage of control board's bridge rectifier + anode to C4 negative terminal: inlet voltage multiplied by 1.41; C73 ends impedance: about12.5k ; Two terminal voltage (means U9 3pin to 4pin(safety line):about 0.56V.
- 4) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then see R143 resistance in main control board: 100Ω; C77 ends impedance: about 3.8m; Two terminal voltage (means U9 1pin to 4pin(safety line): about 0.56V.

E111---Overvoltage when shutdown (the bus voltage is greater than 450v for 3s when shutdown)

E112---Overvoltage when running (the bus voltage is greater than 460v for 10ms when running)

- Steps of solution
- 1) Check whether the inlet voltage of control box is stable, if it's within the specified range of 200V-250V
- 2) When standby, see what's the voltage appear in U3 interface, then run the motor to see how much voltage will rise while scram (usually around 410V), [the inlet voltage multiplied by 1.41 = interface voltage]
- 3) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then detect the voltage of control board's bridge rectifier + anode to C4 negative terminal: inlet voltage multiplied by 1.41; C73 ends impedance: about 12.5k; Two terminal voltage (means U9 pin3 to pin 4 safety line): about 0.56V
- 4) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then see R143 resistance in main control board: 100Ω; C77 ends impedance: about 3.8m; Two terminal voltage (means U9 pin 1 to pin 4 safety line): about 0.56V.

E121---Undervoltage when shutdown (the bus voltage is less than 180v for 3 second when shutdown)

- steps
- 1) Check whether the inlet voltage of control box is stable, if it's within the specified range of 200V-250V
- 2) when standby, see what's the voltage appear in U3 interface, then run the motor to see how much voltage rise while scram(usually around 410V), [the inlet voltage multiplied by 1.41 = interface voltage]
- 3) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then check the negative voltage of F4 to C4 in main panel: inlet voltage multiplied by 1.41; C73 ends impedance: 12.5k or so; Two terminal voltage (means U9 foot 3# to foot 4#(safety line): 0.56V or so.
- 4) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then see R143 resistance in main control board: 100Ω; C77 ends impedance: 3.8m or so; Two terminal voltage (means U9 foot 1# to foot 4#(safety line): 0.56V or so.
- 【share the maintenance picture with E111/E112】

E131----Detect current circuit failure (/ CUR_A or / CUR_B signal's zero offset value too large)

- Step
- Detecting the impedance between the ends of C55/C67 in main control board: 13.5k; using Isolation transformer with 80V to supply power, detect two terminal voltage 1.46v 【means the impedance of U20 foot 1# 、7# to foot 4#(safety line): 13.5k; standby voltage 1.46v】
- Detecting the impedance between the ends of C54/C62 in main control board: 100Ω; using Isolation transformer with 80V to supply power, detect two terminal voltage 0v.
- Tiltting one end of D8/D11, using multimeter (Jet Side) to measure the resistance across the diode: Infinity [Make no mistake when measuring positive and negative]

E131----Detect current circuit failure (/ CUR_A or / CUR_B signal's zero offset value too large)

E133--- OZ loop trouble (can't be enter for1s and OZ interrupted) mainboard

- Steps
- 1) To check the relay which running in 220V whether it sounds like tick-tock
- 2) To check the voltage of U3 in panel's monitor interface
- 3) if the voltage showed in U3 is wrong, using Isolation transformer with 80V to supply power, then see R143 resistance in main control board: 100Ω; C77 ends impedance: 3.8m or so; Two terminal voltage (means U9 foot 1# to foot 4#(safety line): 0.56V or so. [share the maintenance picture of E111/E112]
- 4) To check C73 ends impedance: 11.5k; using Isolation transformer with 80V to supply power, Standby voltage: 2.1V or so;
- 5) 【 to supply power in Isolation transformer with 80V 】 Detecting the impedance between Q21 foot 1# to foot 2# (safety line) in main control board: 6.6K or so; standby voltage should be around 0.28V;the resistance between foot3 and foot2 should be 10.5K and the standby voltage should be around 2.1V

E151---electromagnet loop overvoltage

(CTGLBH signal in low frequency for 1ms)electromagnet broken

- Steps
- 1) To check the resistance of electromagnet by multimeter Ω , what's the normal value
- 2) To check Q13(trimming),Q14(pulling),Q18(foot lifting),Q19(backstich) resistance between foot1 and foot3(low pressure area) saperately whether it is 2K
- 3) To check diode of D13,D14 seperately (by multimeter →) whether it is 0.5V(a corss for negative pole checked by black pen of multimeter);To check diode of D24,D28 seperately (by multimeter →) whether it is 0.2V(a corss for negative pole checked by black pen of multimeter)
- 4) To check the C58's resistance of mainboard which supplied by 80V isolation transformers whether it is around 3.2V(the foot4 toward foot3 of U21);
- 5) To check the resistance between foot3 of U39 and foot3 of U13(low pressure area)which supplied by isolation transformers whether it is around 10.5K
- supply power in Isolation transformer with 80V, standby voltage should be around 0.32V.

E151---electromagnet loop overvoltage (CTGLBH signal in low frequency for 1ms)electromagnet broken

E201----software over current(software detect the current of motor higher than alarm value (16A)

- Step:
- 1) Access operation panel of supervisory interface, check current value of motor accelerate and sudden stop at U2 interface. (Normally the value is 120.)
 - 2) Using Ω channel on multimeter check motor's situation by touching motor's plug foot between 6 and 1,2 or 4 to check the whether it is under short circuit; Check the resistance of motor phases U [2] 、 V [1] 、 W [4] , whether they are same or not.
 - 3) The angle of motor; Check the interface of operation panel U6, [check the angle of motor whether they in the range of 252 ± 5] [If the angle deviation of motor is too much, the motor speed will be out of control when accelerate or sudden stop]
 - 4) Check resistance between foot 1 and foot 3 by detect Q3–Q8: The value is around 10K.
 - 5) Check the grating plate on motor whether it is loose or not and check whether there is friction between grating plate and sensor.
 - 6) Grounding-Whether the control box is grounding or not.

E201----software over current(software detect the current of motor higher than alarm value (16A)

E211—Motor over speed (motor speed 1000rpm higher than the speed limit over 20ms)

- Step
- Check the angle of motor whether in right position; Check the supervisory interface of operation panel U6 [check the angle whether the angle is in the range 252±5
] [Too big angle will cause over current and over speed when motor accelerate and sudden stop]
- 2) Check motor: Test motor plug between foot 4 and 1 ,2,or 3 by (Ω channel) of multimeter to see whether it is in short circuit.; And check the 3 phases of motor U [2] 、 V [1] 、 W [4] whether they are have same resistance.

【Related maintenance image mentioned above 】

E212----E212-Motor reversion (The speed of reversion 100ms>750rpm higher than alarm value.

- Step
- 1) Check the angle of motor whether in right position; Check the supervisory interface of operation panel U6 (check the angle whether the angle is in the range 252±5)
 1 (Too big angle will cause over current and over speed when motor accelerate and sudden stop)
- 2) Check the grating plate on motor whether it is loose or not and check whether there is friction between grating plate and sensor.
- 3) Cable pin of motor power plug 2X3 loose cause mistake of 3 phases.
 - Related maintenance image mentioned above

E301—communication error (main board have not received right date last 3s)

- Step
- 1) Connect the operation panel, test resistance of C45/C46 on the main board: Around 5.5K; Supply power by 80V isolation transformer, test voltage of C45, around 4.7V; Voltage of C46 around 4.9V.
- 2) Resistance between 2 foot of C15 and negative point of C4: around 3M; supply power of 80V, voltage of standby is 3.1 V. The resistance between 4 foot of U16 and negative point of C4 should be :2.1K; Supply power by 80V isolation transformer, test voltage of standby: 3.2V.
- 3) Connect the operation panel, supply power by 80V isolation transformer, check voltage between 3 foot of Q12 on operation panel and negative point of C10 is around 4.7V, Voltage between foot 1 of Q5 and negative voltage of C10 is :4.9V or so.

E302—HMI Error (HMI error

- Step
- 1) Reset the panel to defaults
- 2) Reload the procedure 2 to panel
- 3) Change chip U2(make sure the material AT93C66 in the right position)



E402-- (Pedal identification error: pedal ID are not right one or the pedal is not compatible with system.)

- Step
- 1) Make sure the problem appeared from pedal or control box. Check the plug pin of pedal loose or not.
- 2) Connect pedal, supply power by 80V isolation transformer,test the voltage of foot 1 and foot2 on CN8, it is around 2.8V. [Press pedal to the bottom the voltage if 3.5V]; Voltage of foot 1 and foot2 [ground] is 5.1V.
- 3) Test the resistance of R80 on main board: around 100 Ω; supply power by 80V isolation transformer,test the voltage of two sides: around2V.
- 4) test the impedance of C90 on mainboard:its 45K; supply power by 80V isolation transformer,test the voltage of two sides: 1.08V[Press pedal to the bottom the voltage if 2.2V]





E403(Pedal zero point adjust error: zero point adjust over size(-1.5 degree ~ 1.5 degree))

- 1) Only in the pedal zero point adjustion testing function, it will cause this error. Adjust pedal positioning screw a bit.
- 2) Adjust pedal zero point position—procedure :
- 1、install pedal PCBA。 The distance between steel magnet and hall sensor of PCBA should be 1.5mm~1.8mm, hold PCBA。
- 2、Connect pedal, supply power by 80V isolation transformer, turn the steel magnet, make the output of sensor voltage (voltage of C2) between 2.77~2.83V. [Note: When you adjust pedal, you must us 80V isolation transformer supply power, the output of voltage is strong current.]
 - 3, Check the every positions of cutting to see whether it is normal $_{\circ}$



Space between magnetic steel and sensor of is 1.5mm~1.8mm

> Turn screw on pedal in clockwise, the angel became bigger, conversely, smaller

> > C2 's voltage is 2.77~2.83V





E501--- (Turn sign: effective for turn button)

- Step
- Trouble shooting procedure
- 1)make sure mercury switch or drive-by-wire whether they're work
- 2)supply power by 80V isolation transformer, check the voltage between CN4's foot2 and foot4(gournd) whether it is 5V
- 3) Check C51's resistance: 6.3K; supply power by 80V isolation transformer,test the voltage of two sides: 3.2V.
- 4) If the mercury switch is broken, adjust parameter of control box, set parameter 28^{th'} value to 1





NO POWER (no display)

- Step
- 1) check the fuse whether it work
- 2) check the resistance of rectifier bridge whether it is 2.1M;Running by 80V isolation transformer, check the voltage between +.- of rectifier bridge whether it is 120V
 ; check the resistance between Q3~Q8 (IGBT)whether it is 10K
- 3) Check impedance of T2's output voltage: C79:around 7M; voltage: around:8V; C72:5.1K; voltage: around 5 V; C50/C3: around 46Ω; Voltage: around 5.2V; C5:0.6K; voltage:3.3V; C38:1.6M; voltage:15V
- 4) Check C37 on main board: (check impedance between foot 1,foot2,foot 3,foot 5 and foot 8(ground) to make sure whether it is in short circuit)
- 5) Check C30 on main board: (check impedance between foot 1,foot4,foot 6,foot 8 and foot 5(ground) to make sure whether it is in short circuit)
- 6) Remove U30, supply power by 80V isolation transformer, check whether it is normal for rectifier bridge's output and the voltage of C38.
- 7) If need to check 27 voltage, raise one side of R102, supply power by 80V isolation transformer, test R53 two sides, if the voltage is 27V, is means T1 is working.



1





Electromagnet is not working

- Step
- 1) make sure how many electromagnet failed to actuate.Q13(terimming)、Q14 (thread wiper)、Q18 (foot lifting)、Q19 (backstich) 【maintain and test steps as E151】
- 2) Lifting R102 of motherboard and running by 80V isolation transformer, check the voltage of R53 whether it is 27V.
- 3) check Q11's foot1 and foot3 of motherboard whether it is short circuit.
- 4) check the U30 of motherboard whether it is ok: (check the resistance and voltage between foot1 and foot5 whether it is 33K and 0.7V;check the resistance and voltage between foot4 and foot5 whether it is 23K and 1.9V; check the resistance and voltage between foot 6and foot5 whether it is 10k and 0V; check the resistance and voltage between foot8 and foot5 whether it is 8.3K and 5V;check the resistance and voltage between foot1 and foot3 whether they're 0.9K and 2.6V; check the resistance and voltage between foot3 whether they're 1.8V.







THANKS