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# 1 : Operation

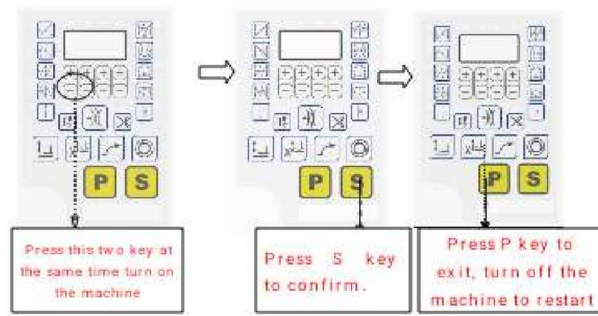
## 1.1 : Key Function

Start / End Back-Tacking Selection		Double start back-tacking The LED OFF indicate the corresponding function is turn off
		Single start back-tacking The LED OFF indicate the corresponding function is turn off.
		1. Double end back-tacking 2. The LED OFF indicate the corresponding function is turn off.
		1. Single end back-tacking 2. The LED OFF indicate the corresponding function is turn off.
Free Sewing		As the treadle is toed down, machine will start sewing. Once the treadle returns to neutral, machine will stop immediately. As the treadle is heeled back, machine will automatically start trimming cycle. The LED OFF indicate the corresponding function is turn off.
Bar-Tacking		1. Once the treadle is toed down, all the seams of Bar-Tacking will be completed with D times, and then the thread will automatically be trimmed. ∴ Note: When the Bar-Tacking Sewing starts, will not stop until the trimming cycle finished, except for the treadle heeled back to cancel the action. 2. The LED OFF indicate the corresponding function is turn off.
Constant-Stitch Sewing	 OR  OR  OR 	As the treadle is toed down, Constant-Stitch Sewing E,F or G,H performs section by section. Once the treadle returns to neutral intermediately in any section, machine will stop immediately. When the treadle is toed down again, the balance stitches of E, F, G or H goes on. If the parameter 【010.ACD】 is set ON, machine will automatically go on to start trimming cycle or End Back-Tacking at the end of last section E, F, or G,H The LED OFF indicate the corresponding function is turn off.
Enter and save the value		Enter to the parameter value, press  key for confirmation and save if the parameter value adjustment.
Clamp function keys		When the key is pressed decimal point after the fourth digit indicates the gripper to open light, the decimal point is not on the gripper closed

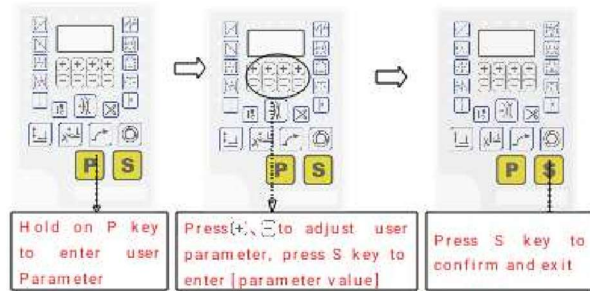
<p>One-shot sewing selection</p>		<p>1. In Free sewing : One touch of this key makes beep sound without any function also LED does not light up</p> <p>In Constant-Stitch Sewing: One shot to the pedal, stitches number of E, F or G, H will be automatically performed.</p> <p>Toe down the pedal again and again to finish the rest sections until it finish pattern.</p> <p>The LED OFF indicate the corresponding function is turn off.</p>
<p>Trimming selection</p>		<p>1. Enable or disable the trimming cycle.</p> <p>2. The LED OFF indicate the corresponding function is turn off.</p>
<p>Enter parameter value selection</p>		<p>In [Normal Mode], press 【 P 】 key to enter [User Parameter Mode] (the parameter content see 2.1 of parameter list)</p> <p>Press and hold 【 P 】 key, then turn on the power to enter [Technician Parameter Mode] ( the parameter content see 2.2 of parameter list )</p>
<p>Value Increment Key</p>		<p>1、 A、 B、 C、 D、 E、 F、 G、 H section, increase the number of setting stitch .</p> <p>2、 Increase the parameter in Parameter selection.</p> <p>3、 Increase the setting value in Parameter value.</p>
<p>Value Decrement Key</p>		<p>1、 A、 B、 C、 D、 E、 F、 G、 H decrease the number of setting stitch</p> <p>2、 Decrease the parameter in Parameter selection.</p> <p>3、 Decrease the setting value in Parameter value.</p>
<p>Upper lower stitch stop setting</p>		<p>The related LED ON indicate stopping machine at the upper stop needle position.</p> <p>The related LED OFF indicate stopping machine at the lower stop needle position.</p>
<p>Trimming presser foot</p>		<p>1、 Press the key 3 seconds when the related LED ON, the presser foot automatically goes up after trimming.</p> <p>2、 Press the key 3 seconds when the related LED OFF= Trimming Presser Foot is inactive.</p>
<p>Stop presser foot</p>		<p>1、 Press the key 3 seconds when the related LED ON , the presser Foot automatically goes up after motor stops.</p> <p>2、 Press the key 3 seconds when the related LED OFF=Stop Presser Foot is inactive.</p>
<p>Soft start</p>		<p>1、 The related LED ON, the soft start is turn on.</p> <p>2、 the related LED OFF without soft start function.</p>

## 1.2 : Debugging of integration electric control box

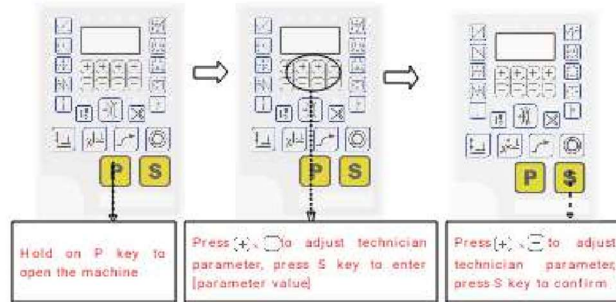
### 1.2.1 Restore factory setting



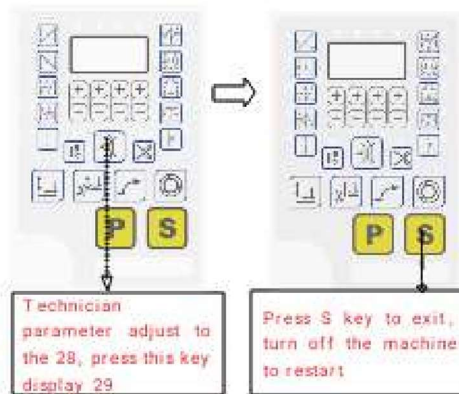
### 1.2.2 : Enter to the user mode to changed valve



### 1.2.3 : Enter to the technician mode to changed valve



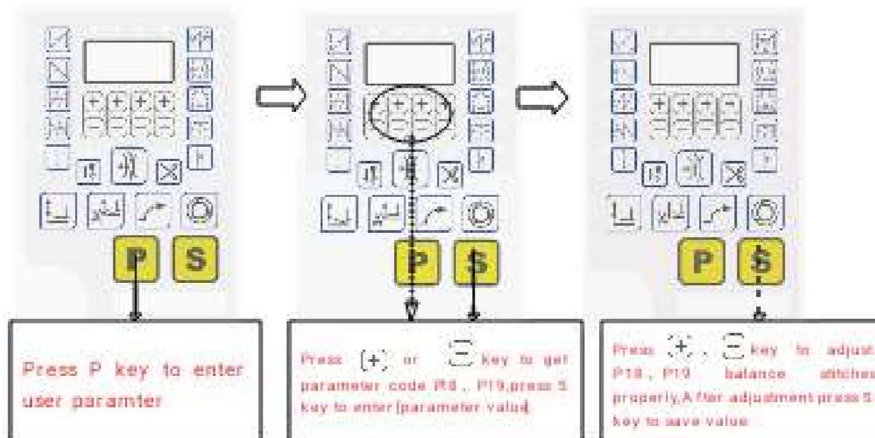
### 1.2.4 Save the parameter



### 1.2.5 Stitch Balance of Back-Tacking for Lockstitch Machine

#### 1.2.5.1 How to Balance Stitches for 【Start Back-Tacking】

Noted : Factory defaults of balance stitches for P18.BT1 and P19.BT2 are different because of different types of machine head.

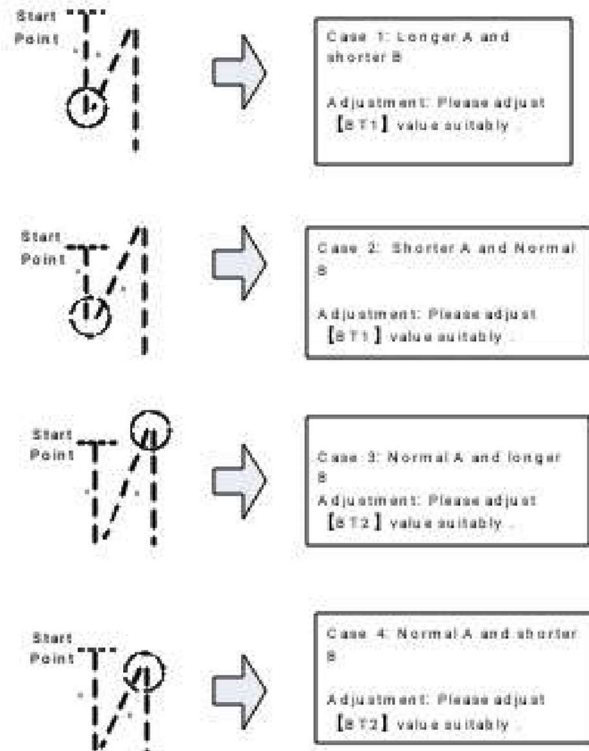


Example : Step 1: Setting stitch number for Start Back-Tacking A and B=3

Step 2: Sewing the pattern in normal speed

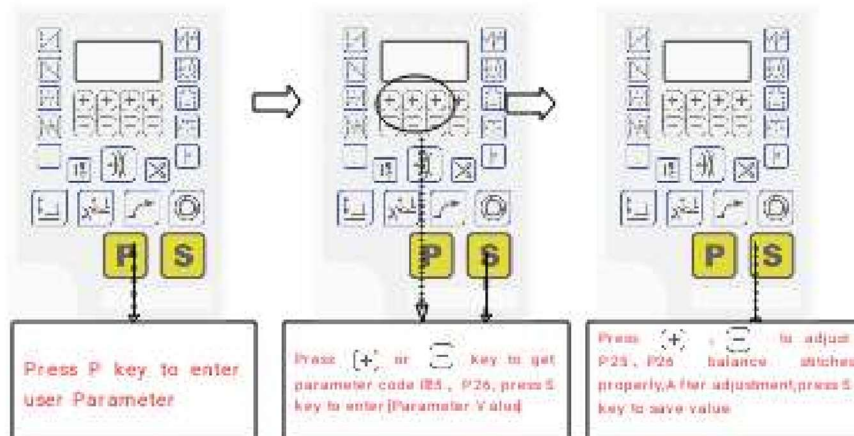
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section A before selecting for B



### 1.2.5.2 How to Balance Stitches for 【End Back-Tacking】

Noted : Factory defaults of balance stitches for 025.BT3 and 026.BT4 are different because of different types of machine head.



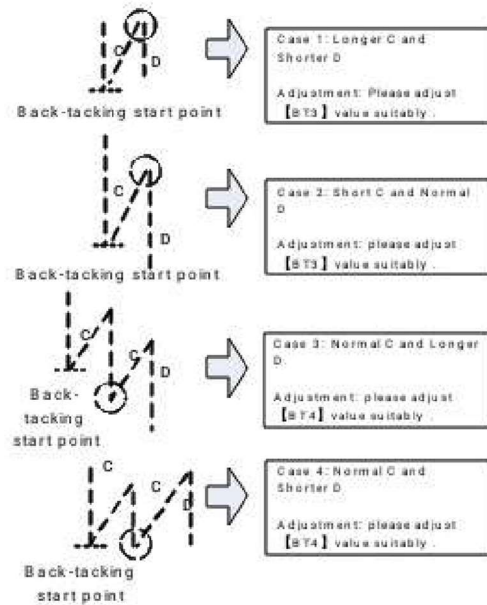
Example :

Step 1: Setting stitch number for End Back-Tacking C and D=3

Step 2: Sewing the pattern in normal speed

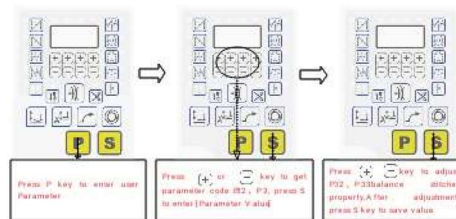
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section C before selecting for D



### 1.2.5.3 How to Balance Stitches for 【Bar Tacking】

Noted : Factory defaults of balance stitches for 032.BT5 and 033.BT6 are different because of different types of machine head.

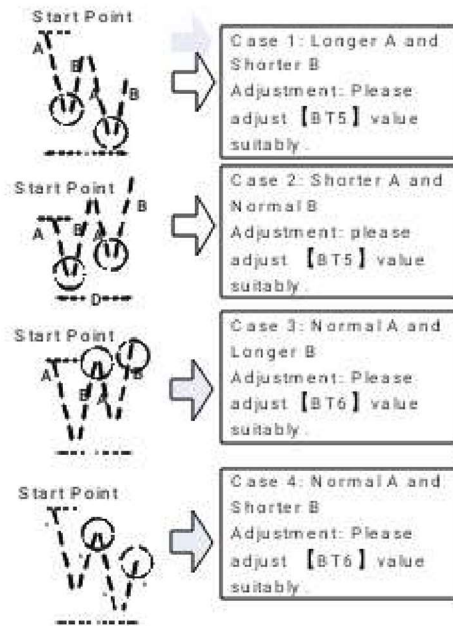


Example : Step 1: Setting stitch number for Bar-Tacking A=B= 4 and turns of Bar-Tacking D=4

Step 2: Sewing the pattern in normal speed

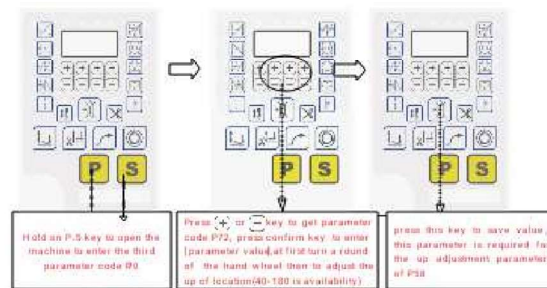
Step 3: If unbalanced situation is appeared please correct it as below:

Suggestion: Select the balance stitches for Section A(1.3) before selecting for B(2.4)

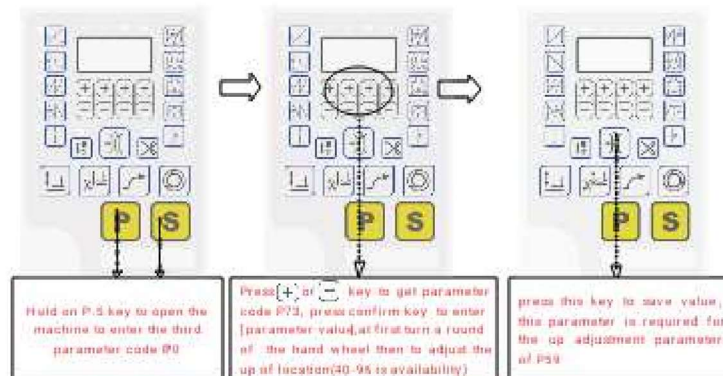


### 1.2.6 Manual setting the location

#### 1.2.6.1 Manual setting the up of location



#### 1.2.6.2 Manual setting the down of location



### 1.2.7 Digital types Operation

#### 1.2.7.1 Comparison Table of LCD Display Fonts and Actual Fonts

Arabic Numerals :

Actual	0	1	2	3	4	5	6	7	8	9
Display	0	1	2	3	4	5	6	7	8	9



1.2.7.2 Digital Display on the Key Board:

English Alphabet

Actual	A	B	C	D	E	F	G	H	I	J
Display	A	b	C	d	E	F	G	H	i	J
Actual	K	L	M	N	O	P	Q	R	S	T
Display	k	L	n	n	o	P	q	r	s	T
Actual	U	V	W	X	Y	Z				
Display	U	u	8	11	P	≡				


2 : User Parameter & Technician Parameter

2.1 User Parameter

















Parameter Code	Parameter Function	Range/unit	Default	Key	Description
P01	Maximum Sewing Speed ( spm )	100 ~ 3700	3700	(+) (-)	Constant-Stitch sewing speed 【034.SMP】 is set at A(or when one shot signal is active)
P02	Speed Curve Adjustment ( % )	1 ~ 100%	80	(+) (-)	The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)
P03	Needle UP/ DOWN	UP / DN	DN	(+) (-)	Press Back-Tacking switch by hand: J : JUKI Mode (it will activate when machine is stopped or running) B : BROTHER Mode (It will activate only the machine is running)
P04	Start Back-Tacking Speed ( spm )	200 ~ 2200	1800	(+) (-)	Start Back-Tacking, reverse solenoid action: A : One shot to pedal, it will automatic execute Start Back-Tacking. M : Pedal-controlled and motor can stop arbitrarily
P05	End Back-Tacking Speed ( spm )	200 ~ 2200	1800	(+) (-)	CON : At the end of Start Back-Tacking, machine continues sewing if pedal pressed or START signal on ( standing operation) STP : At the end of Start Back-Tacking, machine stops
P06	Bar-Tacking Speed ( spm )	200 ~ 2200	1800	(+) (-)	Constant-Stitch sewing speed 【034.SMP】 is set at A(or when one shot signal is active)
P07	Soft Start Speed ( spm )	200 ~ 1500	400	(+) (-)	The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)

Parameter Code	Parameter Function	Range/unit	Default	Key	Description
P08	Stitch Numbers for Soft Start ( SLS )	0 ~ 99	4		Press Back-Tacking switch by hand: J : JUKI Mode (it will activate when machine is stopped or running) B : BROTHER Mode (It will activate only the machine is running)
P09	Automatic Constant-Stitch Sewing Speed ( spm )	200 ~ 4000	3700		Start Back-Tacking, reverse solenoid action: A : One shot to pedal, it will automatic execute Start Back-Tacking. M : Pedal-controlled and motor can stop arbitrarily
P10	Automatic End Back-Tacking Sewing(Can invalidate the stitch correction function)	ON / OFF	ON		CON : At the end of Start Back-Tacking, machine continues sewing if pedal pressed or START signal on ( standing operation) STP : At the end of Start Back-Tacking, machine stops
P11	Back-Tacking Mode Selection	J / B	J		Constant-Stitch sewing speed 【034.SMP】 is set at A(or when one shot signal is active)
P12	Start Back-Tacking Mode Selection	A / M	A		The Stitch-Correction is valid in sewing stop. Note: Valid only when the【0.11.RVM】must set on B ON: Invalid (Constant-Stitch sewing, it can automatic continue action as CD function) OFF: Valid (Can't continue execute CD function)
P13	Mode Selection at the end of Start Back-Tacking	CON / STP	CON		Press Back-Tacking switch by hand: J : JUKI Mode (it will activate when machine is stopped or running) B : BROTHER Mode (It will activate only the machine is running)
P14	Soft Start	ON / OFF	OFF		Add with full-function operation panel is valid. ON : Soft start function is turn on. OFF: Soft start function is turn off.
P15	Setting Stitches A of Start Back-Tacking	1 ~ 15	3		Valid only when operation panel disconnected and 【014.SBT】 must set 【ON】 Start Back-Tacking Stitches Setting of A B Segment.
P16	Setting Stitches B of Start Back-Tacking	1 ~ 15	3		
P17	Setting Turns of Start Back-Tacking	1 ~ 4	2		Valid only when operation panel disconnected and 【014.SBT】 must set 【ON】 Setting the seam times of Start Back-Tacking
P18	Stitch Balance for Start Back-Tacking 1	0 ~ 31	1		①0 → 15The action gradually delay ②16 → 31The action gradually advance ③The action of 0 delay than 16
P19	Stitch Balance for Start Back-Tacking 2		10		
P20	Mode Selection for End Back-Tacking	A/M	A		End Back-Tacking, reverse solenoid action: A : Pedal full heeling ,it will automatic execute end Back-Tacking M : Pedal-controlled and motor can stop arbitrarily
P21	End Back-Tacking Function Selection	ON / OFF	ON		Valid only when operation panel disconnected ON: End Back-Tacking function is turn on. OFF: End Back-Tacking function is turn off.
P22	Setting Stitches C of End Back-Tacking	1 ~ 15	3		Valid only when operation panel disconnected and 【021.EBT】 must set on 【ON】 End Back-Tacking Stitches Setting of C D

P23	Setting Stitches D of End Back-Tacking	1 ~ 15	3		Segment.
P24	Setting Turns of End Back-Tacking	1 ~ 4	2		Valid only when operation panel disconnected and 【021.EBT】 must set on 【ON】 Setting the seam times of End Back-Tacking
P25	Stitch Balance for End Back-Tacking 3	0 ~ 31	1		①0 → 15The action gradually delay ②16 → 31The action gradually advance ③The action of 0 delay than 16
P26	Stitch Balance for End Back-Tacking 4		10		
P27	Adding 1 Stitch to C Segment of End Back-Tacking	0 / 1	1		Adding 1 Stitch to C Segment of End Back-Tacking ON: Valid      OFF: Invalid
P28	Mode Selection for Bar-Tacking	A/M	A		Bar-Tacking, reverse solenoid action: A : One shot to pedal, it will automatic execute Bar-Tacking. M : Pedal-controlled and motor can stop arbitrarily
P29	Tata curve half-board	100	20~220		Half-pedal stroke adjustment
P30	Setting Stitches of Bar-Tacking	1 ~ 99	4		Valid only when operation panel disconnected and 【029.BAR】 must set 【ON】 Bar-Tacking Stitches Setting
P31	Setting Turns of Bar-Tacking	1 ~ 15	4		Valid only when operation panel disconnected And 【029.BAR】 must set 【ON】 Setting the turn times of Bar-Tacking
P32	Stitch Balance for Bar-Tacking 5	0 ~ 31	1		①0 → 15The action gradually delay ②16 → 31The action gradually advance ③The action of 0 delay than 16
P33	Stitch Balance for Bar-Tacking 6		10		
P34	Mode Selection for Constant-Stitch Sewing	A / M	M		A : One shot to pedal, it will automatic execute Constant-Stitch M : Pedal-controlled and motor can stop arbitrarily
P35	Constant-Stitch Sewing Function Selection	ON / OFF	OFF		Valid only when operation panel disconnected ON: Constant-Stitch Function is turn on. OFF: Constant-Stitch Function is turn off.
P36	Setting Stitches for Section P1 of Constant-Stitch Sewing	1 ~ 250	00		Valid only when operation panel disconnected And 【035. PM】 must set 【ON】 ( The stitch number for section P1 ~ P4 is set at 15 stitches of factory defaults )
P37	Wiper Function Selection or Thread Clamp Pressure Setting	ON / OFF (0-10)	ON (7)		0 : No Action 1: Wiper Action 2-11: Thread Clamp action and the pressure gradually increased )
P38	Trimmer Function Selection	ON / OFF	ON		ON : Trimmer Valid OFF: Trimmer Invalid
P39	Presser Foot UP / Down at intermediate stop	UP / DN	DN		UP : Presser foot goes up automatically DN : Presser foot keeps down ( Controlled by heeling pedal )
P40	Presser Foot UP / Down after Trimming	UP / DN	DN		UP : Presser foot goes up automatically DN : Presser foot keeps down ( Controlled by heeling pedal )
P41	Display the sewing finished quantity	0 ~ 9999	0		Counting the finished-sewing quantity

Parameter Code	Parameter Function	Range/unit	Default	Key	Description
P42	Sewing Speed Display		0		Displaying the current sewing speed (the speed only for reference)
P43	Setting Direction of Motor Rotation	CW / CCW	CCW		CW : Clockwise CCW : Counter Clockwise ( Viewed from motor shaft side )

## 2.2 Technician Parameter

Parameter Code	Parameter Function	Range /unit	Default	KEY	Description
P44	Machine's Pulley Dimension ( mm )	50 ~ 200	15		Setting machine pulley size
P45	Motor's Pulley Dimension ( mm )	50 ~ 150	65		Setting motor pulley size
P46	Motor stops with a reverse angle after trimming	ON / OFF	OFF		ON : It will automatic as reverse function after trimming (angle adjustment according to the parameter 【047.TR8】 OFF : No Function
P47	Adjustment of reverse angles after trimming	50 ~ 200	160		Adjusting at reverse direction after trimming
P48	Low (Positioning) Speed ( spm )	100 ~ 500	210		Setting Positioning Speed
P49	Trimming Speed ( spm )	100 ~ 500	300		Adjusting trimming speed
P50	Presser foot lift time (ms)	10 ~ 990	120		Presser foot lift action when adjustments
P51	Duty-Cycle Setting for Foot Lifter ( % )	10 ~ 90	30		Adjustment for Duty-Cycle of Foot Lifter (Fine tuning can reduce the over-heating)
P52	Time to put the foot pressure	10 ~ 990	120		When placed under the presser foot adjustments
P53	Cancel Foot Lifting when Half-Heeling the Pedal	ON / OFF	ON		ON : Pedal half heeling without foot lifting function. OFF : Pedal half heeling with foot lifting function
P54	Trimming Time ( ms )	5 ~ 100	10		Trimming sequence time setting
P55	Setting Wiper Timing ( Clamp action angle )	1-360 ( 10 ~ 990 )	380 ( 50 )		Wiper sequence setting ( Clamp position angle of release )
P56	Needles Goes Up Automatically as Power turned on	ON / OFF	ON		ON : Power turned on, needle goes up position automatically OFF : No Function.
P57	Protection time for foot lifter ( S )	1 ~ 120	10		It will automatic come down when foot lifter keep lift over the setting time.
P58	Up Position Adjustment	40 ~ 180	40		Up Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value increased.
P59	Down Position Adjustment	40 ~ 180	50		Down Position Adjustment The needle will advance stop when the value decreased. The needle will delay stop when the value

Parameter Code	Parameter Function	Range /unit	Default	KEY	Description
					increased.
P60	Testing Speed ( spm )	100 ~ 7500	2000		Setting testing speed.
P61	Testing A	ON / OFF	OFF		Option of Testing A, after setting press 【060. TV】 to set the speed keep running.
P62	Testing B	ON / OFF	OFF		Option of Testing B, after setting press 【060. TV】 to set the speed execute the cycle of Start – Sewing –Stop - Trimming
P63	Testing C	ON / OFF	OFF		Option of Testing C, after setting press【060. TV】 to set the speed execute the cycle of Start – Sewing –Stop without positioning function
P64	Running Time of Testing B and C	1 ~ 250	20		Setting running time of testing B and C
P65	Stop Time of Testing B and C	1 ~ 250	20		Setting stop time of testing B and C
P66	Machine Protection Switch Testing	0~2	1		0 : Disable , 1 : Testing zero signal , 2 : Testing positive signal
P67	Trimming Protection Switch Testing	ON / OFF	OFF		OFF : Disable , ON : Enable

### 2.3 The material of thin and middle thick

The parameter of the Thread Wiper and Clamp					
P27	Light and heavy-weight materials Selection	0 / 1	0		1: Light-weight materials 0: Heavy-weight materials
P48	Low (Positioning) Speed ( spm )	100 ~ 500	500		Setting Positioning Speed, it is adjusting to higher when the cloth is thicker
P49	Trimming Speed ( spm )	100 ~ 500	350		Adjusting trimming speed, it is adjusting to higher when the cloth is thicker

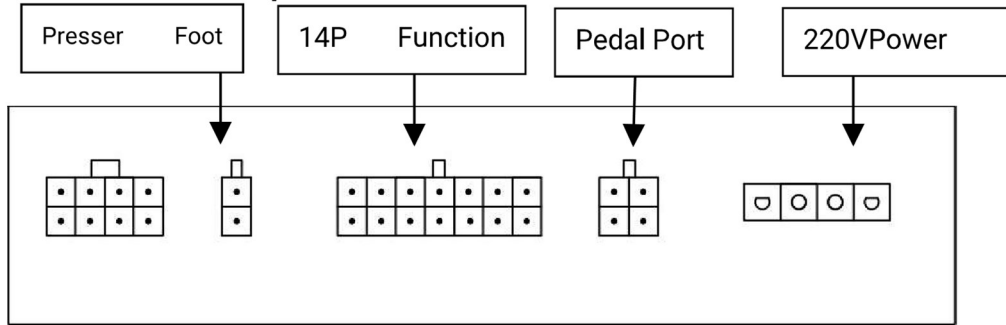
### 3 : Error Code List

Error Code	Problem	STATUS / MEASUREMENT
E1	Power Module is faulty. Abnormal over current or voltage. Resistor is damaged or F1 fuse is blown.	System will be shut down until the power resets on. Please check the power board in detail.
E2	1 ) When power on, detected main voltage too low 2 ) Connect the wrong voltage, too low.	Moto and machine will be shutting down. Please check the AC power. (Too low) Please check the main pc board.

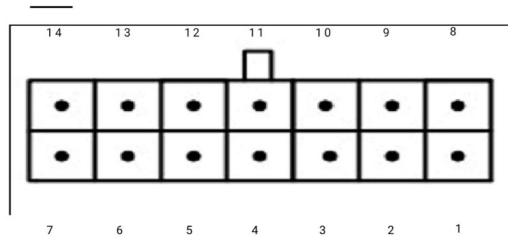
<b>E3</b>	Operation Box linked to CPU interface had communication error.	Motor and machine will be shutting down. Please check the operation box.
<b>E5</b>	The connection of the Foot Pedal error	Motor and machine will be shutting down. Please check the connection of the Foot Pedal or the problem of it
<b>E7</b>	a) Bad connection at the motor connector. b) Synchronizer signal error c) Machine locked or object stuck in the motor pulley. d) Sewing material is too thick. e) Module output is abnormal.	Motor and machine will be shutting down. Please check the motor connectors, synchronizer situation and machine situation.
<b>E8</b>	Manual Back-Tacking lasts for 15 sec.	Motor and machine will be shutting down until the power resets on.
<b>E9</b>	Synchronizer signal error.	Please check the positioning signal or the condition of pulley.
<b>E11</b>	Auto Needle Up is malfunction as power on.	Motor still can run, but it automatically starts the clutch mode. All constant-stitch sewing pattern and trimmer /wiper function is invalid. Please check the synchronizer.
<b>E12</b>	Power is turned on without the synchronizer signal.	Motor still can run, but it automatically starts the clutch mode. All constant-stitch sewing pattern and trimmer /wiper function is invalid. Please check the synchronizer.
<b>E13</b>	Overheat Protection for Power Module	Please check the connection between power module and heat sink.
<b>E14</b>	Encoder signal error.	Please check the encoder signal or change the encoder.
<b>E15</b>	Abnormal over current protection for Power Module.	System will be shut down until the power resets on. Please check the power board in detail.
<b>E17</b>	Trimmer switch error.	Please check the trimmer switch whether turn in the correct position.

#### 4: Port Outline Diagram

##### 4.1: The Name of each port



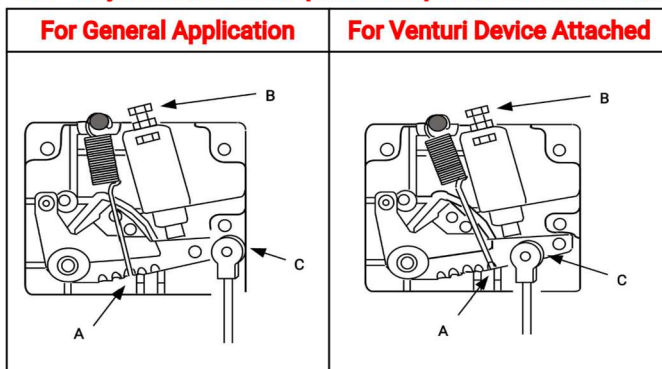
##### 4.2: 14P Function Port Table



- ① Trimming Solenoid : 1、8
- ② Clamp, dial line solenoid : 2、9
- ③ Cutting lights : 4 (Signal ground)、11 (+5v)
- ④ Backstitch manually switch : 5 (Sensor signal)、12 (Signal ground)
- ⑤ Backstitch solenoid : 6、13
- ⑥ Complement Needle switch : 7 (Sensor signal)、14 (Signal ground)

### 5 Installation

#### 5.1 Adjust The Force Required To Operate The Foot Pedal



Spring A: Downward force adjustment

Bolt B: Heeling back force adjustment

Hole C: Pedal stroke adjustment

∴ In case of connecting with an air switch on the pedal rod to activate a Venturi Device, please shift the position for A and C as shown below.

## 5.2 Installation instruction of integration electric control

- 1 ) Put the matched motor②install to the machine body, pay attention to the outgoing line towards the machine end cover direction and fixed with motor all position screw.
- 2 ) Put out the assembled integration electric control③Put the M5×20 screw with flat washer installed in the electric control box on the top of screw holes, and then put the screw mounted on O-ring.
- 3 ) Put the motor encoder line connect with electric control ; put motor power plug connect to the electric control
- 4 ) Adjust power cord and encoder line around the motor, put the electric control into motor close to the end of the machine body plane.
- 5 ) Use long-handled hex wrench put the screw ⑦ through electric hole matched with machine body screw hole.
- 6 ) Use long-handled hex wrench mount on screw ④ through plastic screw hole and matched with machine body hole.
- 7 ) Use long-handled hex wrench mount on screw ⑥ through plastic screw hole and matched with machine body hole,.
- 8 ) Adjust electric control position match with appearance of machine body, tightened screw ④,⑥, then tightened screw ⑦
- 9 ) Assembly hand wheel⑤, open machine to test.

