

MITSUBISHI

Industrial Sewing Machine Technical Manual

Attachment for Electronic Pattern Sewing Machine Pneumatic Type Two Stage Clamp MP-E10-K2

FOR YOUR SAFETY !

If you are operating this attachment for the first time, please make sure to read the following instructions for your safety and proper operation.

In this technical manual, the notice **CAUTION** is mentioned at some paragraphs to attract your attention for the safety. Please keep it in mind whenever you work with the sewing machine.



CAUTION is used as the notice to warn a possible danger to cause a wound.

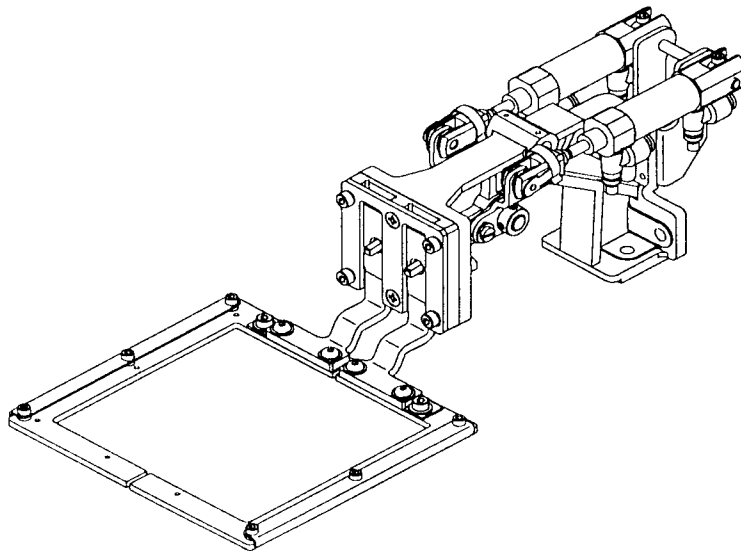
- ★ This technical manual explains the instructions how to operate and maintain the sewing machine.
- ★ All information in this technical manual is subject to change without notice.
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Explanations for the warning signs

No	Warning sign	Meaning of warning signs
1	<p>Do not operate without finger guard and safety device. Before threading, changing bobbin and needle, cleaning etc, switch off main switch.</p>	Caution for sewing machine operation : Warning not to operate the sewing machine without safety guards and to prohibit doing any operation on the machine except sewing while the power is turned ON.
2		Caution for wound to the fingers: Warning to a possible danger that could cause a wound on the fingers under the specified operation.
3		Caution for the fingers to be caught in the machine : Warning to a possible danger that could catch the fingers in the machine under the specified operation.

1. Features

The pneumatic type (left/right alternating) two-stage clamp separates the pressing operation into the left and right sides. As each side can be operated with individual foot switches, this is suitable for stitching two parts together. Usage methods can be changed to suit the purpose and make setup of the stitching material more efficient. These methods include setting the left/right clamp operation order or canceling the operation order and pressing with the side for which the foot switch is ON.



2. Specifications

Name	: MP-E10-K2 (pneumatic type two stage clamp)	
Applicable model:	: PLK-E1010	
Stitching range	: 100(X)mm × 100(Y) mm (same as PLK-1010)	
Clamp UP position	: 30mm	
Pressing operation	: Use foot switch (2-pedal) normally provided with the electronic sewing machine and expansion foot switch (1-pedal)	
Drive source air pressure	Primary side	: 0.5MPa (5kg/cm ²) or more
	Secondary side:	: 0.4MPa (4kg/cm ²)



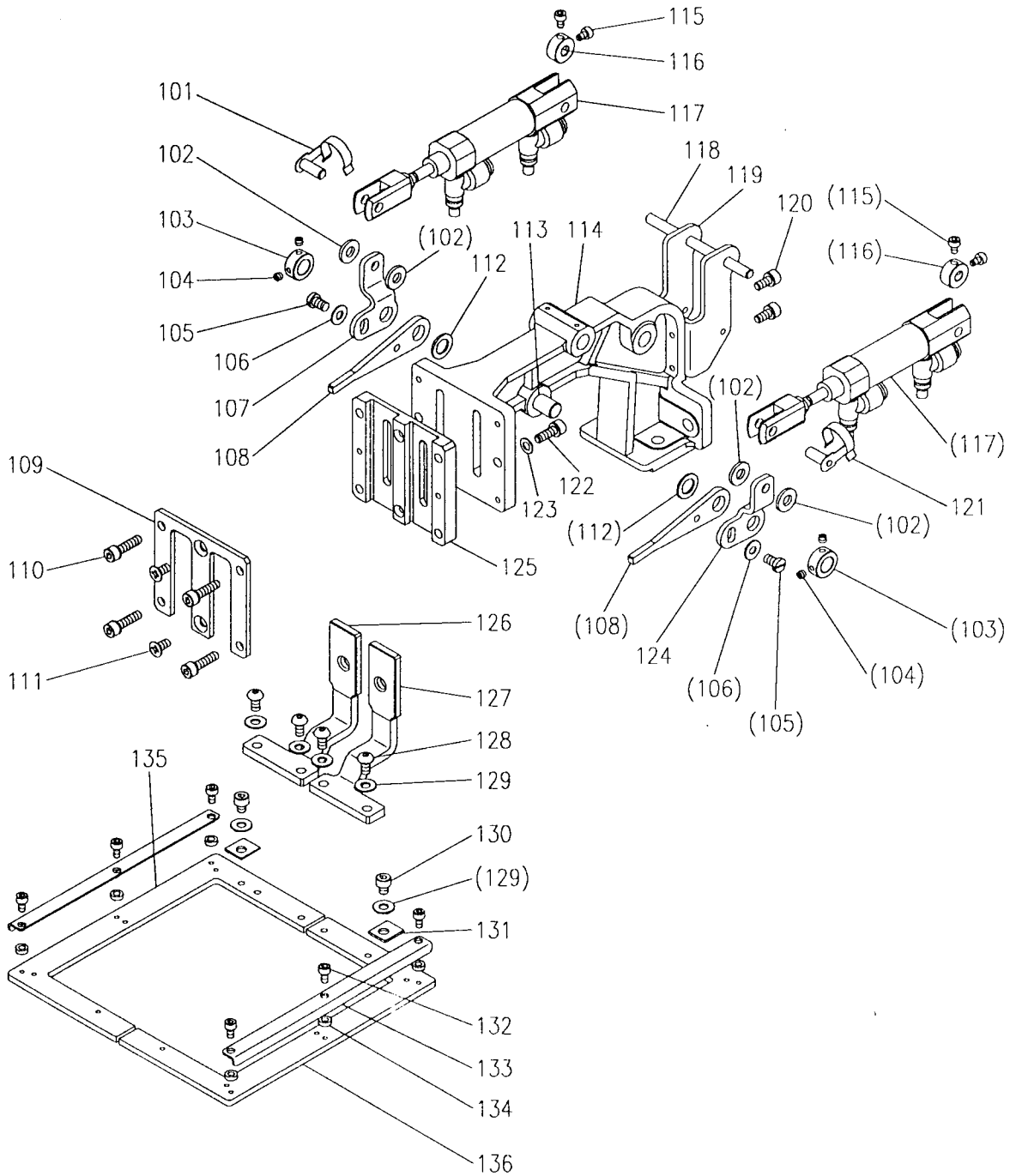
CAUTION

Trouble such as operation errors could occur if the secondary pressure is set too high. Use within the range of 0.4MPa (4kg/cm²).

3. Configuration

★ The Fig. numbers in the drawing correspond to the part numbers given in the following explanations.

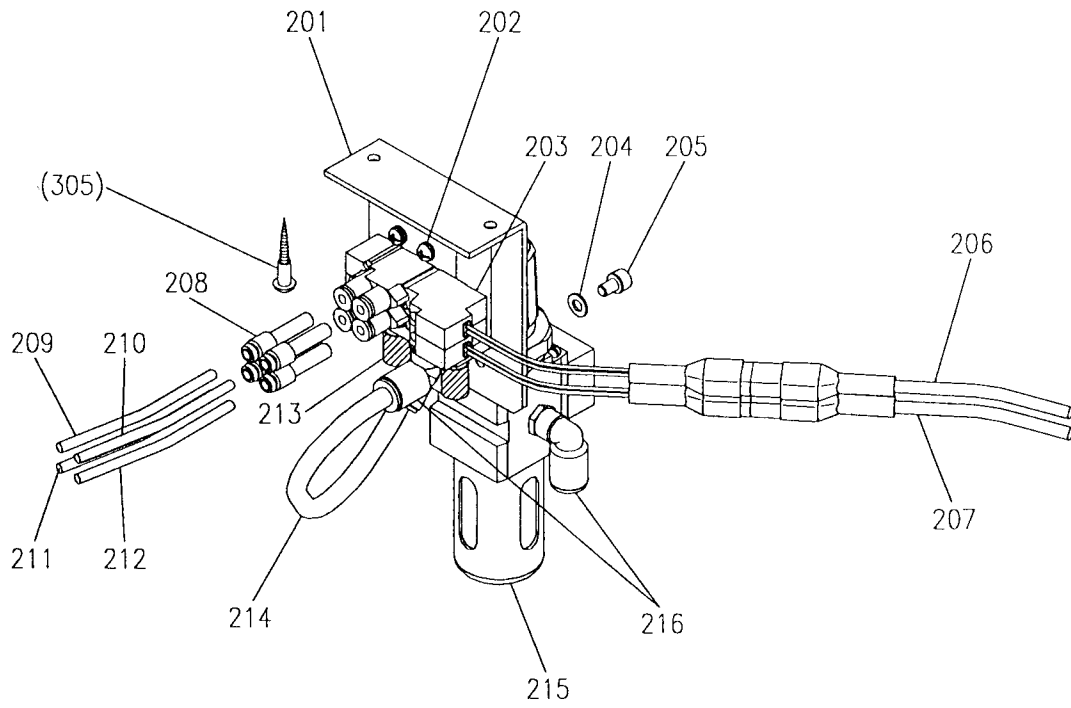
3.1 Clamp mechanism



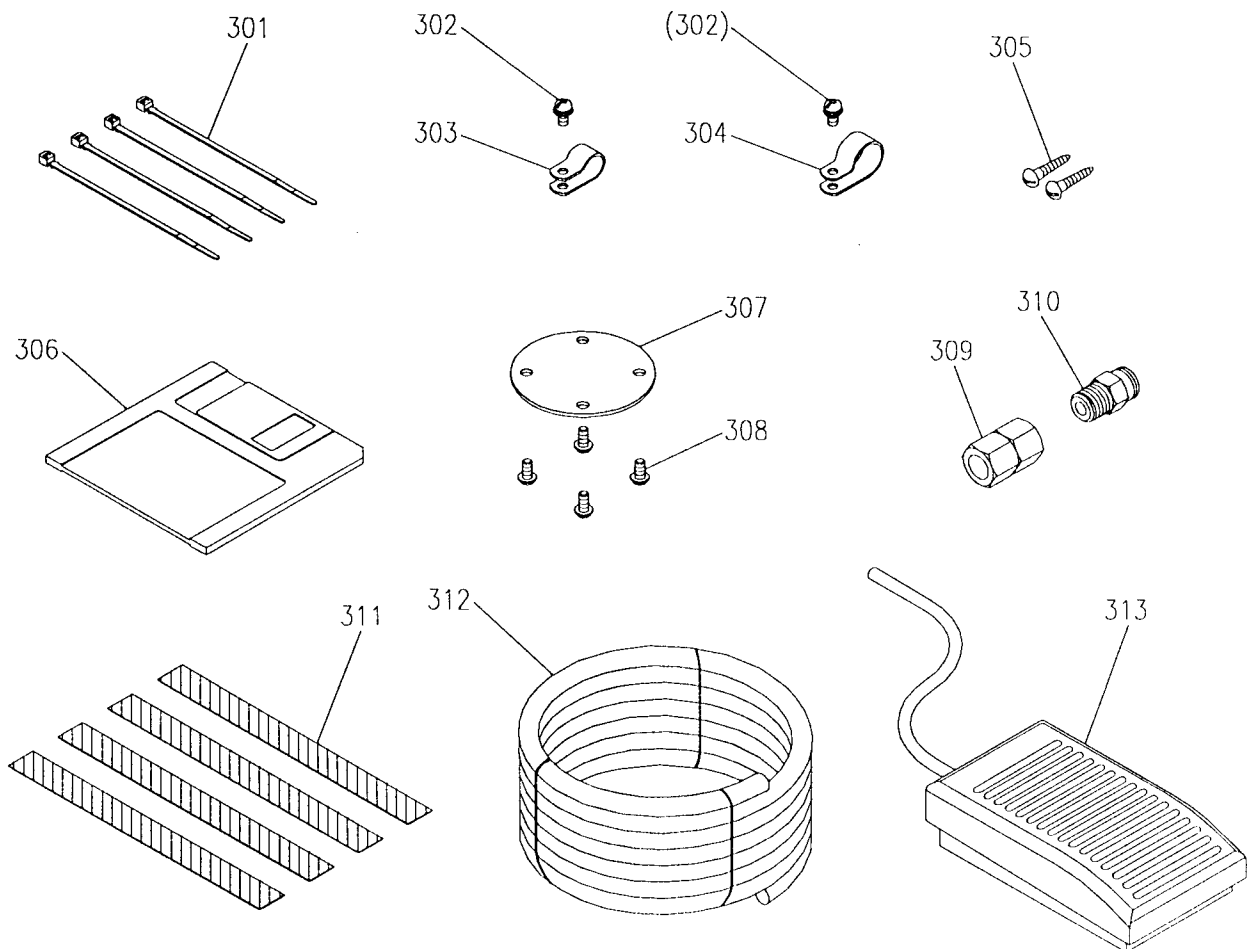
3.1 Clamp mechanism (Parts list)

Fig No.	部品コード Parts No.	品名	Description	数量 Amt Req.	資材コード Ref. No.
101	M90538060	ナックルピン(L)	Knuckle pin (L)	1	A191D085P01
102	M90519050	ナイロンワッシャ	Nylon washer	4	A147D205H01
103	MF00A1352	カラー	Collar	2	A143D028H01
104	M90901020	アナツキメネジ 9/64(40)×3.5	Screw 9/64(40)×3.5	4	W469858-H01
105	M91109002	ヒラネジ 11/64(40)×7	Screw 11/64(40)×7	2	W500511-H01
106	M90420050	サガネ	Washer	2	A142D233H01
107	ME10P2950	レバー(S2L)	Lever (S2L)	1	A147D594H02
108	ME10P0950	レバー(S1)	Lever (S1)	2	A147D593H01
109	ME10A6339	カバー	Cover	1	A147D573H01
110	M94006017	セフティソケット M4×16	Bolt M4×16	4	S903N299P38
111	M91400010	P サラネジ M4×8	Screw M4×8	2	A190D392P34
112	M90829050	ワッシャ	Washer	2	A190D830P01
113	M90817060	ピン	Pin	1	A147D592H01
114	ME10A0308	オサエタイ	Work holder arm	1	A122B019H02
115	M93004021	ロックアナツキボルト M3×5	Bolt M3×5	4	S903N219P02
116	ME10P0352	カラー	Collar	2	A147D957H01
117	ME10P0434	エアシリンダ	Air cylinder	2	A191D536P02
118	M90549060	ピン	Pin	1	A147D956H01
119	ME10P0601	シリンダトリツケイタ	Cylinder bracket	1	A147D595H01
120	M94002017	セフティソケット M4×8	Bolt M4×8	4	S903N299P34
121	M90548060	ナックルピン(R)	Knuckle pin (R)	1	A191D537P01
122	M94007017	セフティソケット M4×12	Bolt M4×12	2	S903N299P36
123	M90422050	コサガネ 4	Washer 4	2	A190D388P04
124	ME10P1950	レバー(S2R)	Lever (S2R)	1	A147D594H01
125	ME10A0307	オサエアンナイ	Work holder guide	1	A147D568H01
126	ME10K0308	オサエトリツケイタ(L)	Clamp foot (L)	1	A134C677H02
127	ME10K1308	オサエトリツケイタ(R)	Clamp foot (R)	1	A134C677H01
128	M94035021	ロックアナツキボルト M4×8	Bolt M4×8	4	A191D154P01
129	M90421050	サガネ 4	Washer 4	6	A190D389P04
130	M94009021	ロックアナツキボルト M4×5	Bolt M4×5	2	S903N219P32
131	MB60A0196	イチキメイタ	Clamp stopper	2	A145D963H01
132	M93003021	ロックアナツキボルト M3×6	Bolt M3×6	6	S903N219P03
133	ME10K0799	ホキョウイタ	Stiffening plate	2	A147D959H01
134	ME10K0476	スパーサ	Spacer	6	A147D958H01
135	ME10K0105	オサエ(L)	Clamp flame(L)	1	A134C677H02
136	ME10K1105	オサエ(R)	Clamp flame (R)	1	A134C677H01

3.2 Pneumatic pressure control unit



3.3 Accessories



3.2 Pneumatic pressure control unit (Parts list)

Fig No.	部品コード Parts No.	品名	Description	数量 Amt Req.	資材コード Ref. No.
201	MB61A5601	デモンジベントリツケイタ	Valve mounting plate	1	A133C599H01
202	M91066004	SW-FW 特殊Pナベネジ M4×25	Screw M4×25	4	A190D393P42
203	MB10H0599	デモンジベソクミタテ	Solenoid valve assy	1	A133C894G01
204	M90511050	ワッシャ 5	Washer 5	2	A190D389P05
205	M95003017	セフティソケット M5×8	Bolt M5×8	2	A190D418P52
206	MB10B0508	セツソクテソソクミタテ(A)	Cable assy (A)	1	A133C897G01
207	MB10R1508	セツソクテソソクミタテ(B)	Cable assy (B)	1	A133C898G01
208	MA30A0964	レジュサ	Reducer	4	A190N277P03
209	MB10K1567	エアチューブソクミタテ(B)	Air tube assy (B)	1	A133C890G02
210	MB10K0567	エアチューブソクミタテ(A)	Air tube assy (A)	1	A133C890G01
211	MB10K3567	エアチューブソクミタテ(D)	Air tube assy (D)	1	A133C890G04
212	MB10K2567	エアチューブソクミタテ(C)	Air tube assy (C)	1	A133C890G03
213	M91035089	サイレンサ	Muffler	2	A190N204P08
214	MB20P1567	エアチューブ	Air tube	1	A146D571H01
215	MB61A0963	フィルタレギュレータ	Filter regulator	1	A190D726P01
216	MA20A8571	Lガタリソクツキテ	L-type quick joint	3	A190N205P08

3.3 Accessories (Parts list)

Fig No.	部品コード Parts No.	品名	Description	数量 Amt Req.	資材コード Ref. No.
301	MG51A0201	インシュロックタイ	Cord tie	4	P945A050P00
302	M91071004	SW-FW 特殊Pナベネジ M4×8	Screw M4×8	2	A190D393P34
303	M94007099	ナイロンクリップ° 6	Nylon clip 6	1	P945F000P51
304	MB60A1620	ナイロンクリップ° 8	Nylon clip 8	1	P945F000P53
305	M90409041	丸モクネジ° 4.5×20	Wood screw 4.5×20	2	A190D403P03
306	ME10K0990	システムソフト	System software	1	A148D180G53
307	MB10X0742	フタ	Cap	1	A145D015H01
308	M94011021	ソケットアナツキボルト M4×8	Bolt M4×8	4	S903N219P34
309	M91010089	ソケット	Socket	1	A190N066P01
310	MA30A0571	ソクツキテ	Quick joint	1	A190N204P09
311	MB61A1691	ハッキン	Clamp pad	4	A145D925H04
312	MA17A0567	エアチューブ	Air tube	1	A190N268P01
313	M880A0FSW	フットスイッチ	Foot switch	1	A190D746P01

4. Setup procedures



CAUTION

Always make sure that the power is OFF before starting setting work.

4.1 Installing the clamp drive mechanism

- (1) Remove the two screws on the Y axis movement race side fixing the clamp base (Fig. No.114) and the two screws on the axis support side, and remove the magnetic clamp mechanism mounted as a standard on the sewing machine.
- (2) Using the screws removed above, install this pneumatic clamp mechanism following the above step in reverse. Make sure that the clamp is not inclined at this time.
- (3) If there is no need to reinstall the magnetic clamp mounted as a standard on the sewing machine after changing to the pneumatic type clamp, it is recommended to remove the drive mechanism parts in the sewing machine head.

To remove these parts, refer to the part catalog P-215 for the PLK-E1010 sewing machine unit, and remove the parts including Fig. No. H130 pin E, and Fig. No. H136 presser plate shown in the catalog. Use the parts Fig. No. 307 and 308 enclosed with this attachment as a cover.

4.2 Installing the pneumatic pressure control related parts

- (1) The regulator and solenoid valve assembly configured of Fig. No. 201, etc., are fixed to the bottom of the sewing machine table with the enclosed Fig. No. 305 wood screws (two screws).
- (2) Align the piping symbols of the Fig. No. 209, 210, 211 and 212 air tubes ($\phi 4$) with ports A to D on the pneumatic two stage clamp's Fig. No. 117 air cylinder, and insert the tubes.
- (3) Pass the air tubes through the notched section on the side of the sewing machine unit's motor cover, and lead the tubes to the bottom of the table from the square hole on the table.
- (4) Align the air tubes led out above with the ports A to D of the solenoid valve installed in step (1), and insert the tubes.
- (5) Bind the air tubes appropriately with the enclosed Fig. No. 301 Cord ties.

4.3 Connecting the switches and cables

- (1) Remove the cover for the connector panel on the back of the sewing machine.
- (2) Disconnect the cable connected to CON8 on the connector PCB. This cable is not used after this attachment is mounted. Fix it where it will not obstruct the other electric parts.
- (3) Lead out the Fig. No. 206 and 207 cables and foot switch (1-pedal) cable connected to the solenoid valve from the slot on the back of the sewing machine table, pass through the cord bushing on the connector panel, and lead in to the connector PCB side.
- (4) Insert the Fig. No. 206 cable connector to CON8 on the PCB from where the cable was disconnected above.
- (5) Connect the Fig. No. 207 cable's white lead wire to B9 on the terminal block TE2 and the black lead wire to A10.
- (6) Connect the Fig. No. 313 foot switch (1-pedal) cable's white lead wire to A3 on the terminal block TE2 and the black lead wire to A2. The green lead wire is the grounding wire. Connect this wire to the sewing machine bed.
- (7) This completes connection of the wiring. Check the connection with the following table, and then securely install the cover removed from the connector panel.

		Signal name	Connection	
Input	Existing FSW	Work holder input (I2)	CONI-③ on control panel (foot switch already connected)	Red
		0V	CONI-⑥ on control panel (foot switch already connected)	White
	Fig. No. 313	Two stage clamp input (IF)	Sewing machine head connector PCB terminal block TE2 - A3	White
		0V	Sewing machine head connector PCB terminal block TE2 - A2	Black
Output	Fig. No. 206 Cable symbol A	+24V	Sewing machine head connector PCB CON8 - ②	White Solenoid valve
		Work holder output (O4)	Sewing machine head connector PCB CON8 - ①	Black
	Fig. No. 207 Cable symbol B	+24V	Sewing machine head connector PCB terminal block TE2 - B9	White Solenoid valve
		Two stage clamp output (OC)	Sewing machine head connector PCB terminal block TE2 - A10	Black


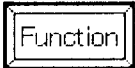
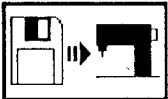



4.4 Installing the setting disk



CAUTION

If the sewing machine is operated with the magnetic clamp settings, faults could occur.
Always install the setting disk for the pneumatic type clamp.

(1) Installing the system software

- ① Turn the sewing machine power switch ON.
- ② Insert the Fig. No. 306 system software (hereinafter floppy disk: FD) into the control box's floppy disk drive.
- ③ Press  on the operation panel's standard screen.
- ④ Press the menu icon . The Function Mode screen will appear.
- ⑤ Press  on the screen. "SETTING STEP FILE READ MODE" screen will open.
- ⑥ Select  "SETTING FILE (*.STG, *.SEK)" from the screen, and press  "SELECTION THE FILE NAME" screen will open
- ⑦ Confirm that the name of the file to be read is "MPE10K2", and then press . Reading of the FD file will start.
- ⑧ The message "THE TABLE FILE IS BEING READ. PLEASE WAIT FOR A WHILE." will appear.
- ⑨ When reading is completed, the message M-310 "FINISHED READ PLEASE TURN OFF POWER SUPPLY. RECLOSING OF POWER SUPPLY IS NECESSARY TO USE CONTINUOUSLY.". Reading of the setting table will end when the power is turned OFF and ON.

(2) Points changed in setting details

The settings will be changed as shown below when the above setting disk is installed.


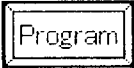
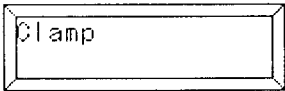







Mode	Clamp	Input/output setting
Function name	FN	O4
Two stage clamp setting value	2	66H
Default value	1	33
Remarks	Valid number of clamps setting	Set this when changing from the magnetic clamp to the pneumatic clamp.

4.5 Setting the clamp priority order

As the default, the left/right work clamp is set to operate randomly when the foot switch is turned ON.

To use this attachment so that the left clamp is lowered and then the right clamp is lowered, change the settings with the following procedures after installing the setting disk.


When this method is set, the operation will start with the left clamp, so turn the left clamp foot stitch (2-pedal) [black] side ON. If the right clamp foot switch (1-pedal) is turned ON, neither the left nor right clamp will operate.

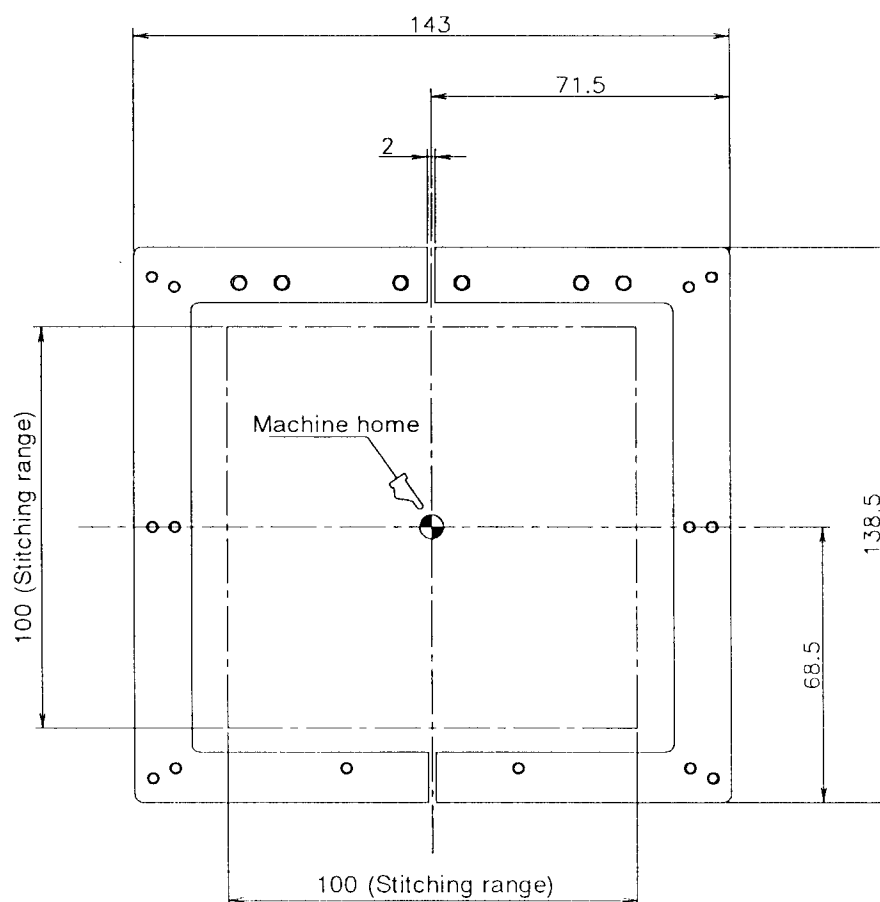
- (1) Press  on the operation panel's standard screen.
- (2) Press the menu icon . The Program Mode screen will open.
- (3) Select and press  from the mode selection.
- (4) Press  twice. The Function Setting Selection screen will open.
- (5) Set the clamp priority order. Press .
- (6) Change the priority order invalid display  on the screen to valid , and then press .
- (4) Press  on the screen, and then return to the screen before mode selection. Then, press .
- (8) The message "DATA WRITING TO MEMORY. PLEASE WAIT FOR A WHILE" will appear, and then the Main screen will open.

This completes setting of the "clamp priority order".

5. Operation

5.1 Confirming operation

- (1) Turn the sewing machine power switch to ON.
- (2) Confirm that the left and right work clamps lower when the foot switch (2-pedal) [Black] side and the expanded foot switch (1-pedal) are turned ON, and rise when the switches are turned ON again.
- (3) Lower the left and right work clamps, and press  on the operation panel. Return to home will start.
- (4) Next, check that the positional relation of the clamp and needle hole center is at the scale shown in the drawing. If the positions are deviated, refer to the PLK-E1010 Head section instruction manual and adjust the home.



5.2 Stitching test

- (1) Select the stitching pattern. (Refer to the PLK-E1010 Head section instruction manual.)
- (2) Press the [Black] side on the 2-pedal foot switch and the 1-pedal foot switch, and lower the left and right work clamps. Next, press the [Gray] side on the foot switch to rotate the sewing machine and start stitching. (Stitching will not start unless the left and right work clamps are lowered.)
- (3) When stitching is completed, the sewing machine will automatically return to home, and the clamps will rise.



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