

LA-763M

Long Arm machine manual: Electric versions
www.abminternational.com

- ◆ Installation instructions
- ◆ Operational guide
- ◆ Troubleshooting guide
- ◆ Parts list





Table of Contents



- ◆ Section 1.0 - Machine Operation Guide
- ◆ Section 2.0 - Troubleshooting guide
- ◆ Section 3.0 - Parts List

TABLE OF CONTENTS:

Introduction

Section 1.0 – Safety

Section 2.0 - Machine Setup

Section 3.0 – Machine Operation

Section 4.0 – Troubleshooting guide and notebook

Section 5.0 – Parts List



Figure 0.1 – LA-763M on shipping skid

Introduction

ABM International would like to thank you for the purchase of an LA-763M Long Arm Sewing Machine. ABM is confident that this machine will meet or exceed your expectations for cost, speed and durability.

If at anytime you experience problems with any of your ABM machines we ask that you contact us - 24 hours a day by calling our service department at (281) 443-4440. We can help you solve the problem quickly, and correctly. Your calls, questions, and comments will in turn help us to perfect the quality of our products and services in the future.

Once again, we thank you for your purchase.

ABM International, Inc.

Joe Podolski
Vice President
Engineering Department

Section 1: Safety

1.0 Safety Introduction

As with the operation of all machinery, safe operation of the LA-763M is a major concern of ABM International, Inc. The purpose of this section is to inform personnel of the safe and prudent operation of an LA-763M.

We have attempted to recommend the most effective methods and calculations to warn against actions that could result in personal injury, or make equipment unsafe. It is important to understand that ABM cannot anticipate, or list all conceivable safety methods and warn of all the possible hazards. In the interest of promoting safety, ABM advises that the operating personnel should always make sure that personal safety and the safe operation of the machine will not be adversely affected by their actions.

It is imperative that the operating personnel of the LA-763M read and understand the information in this manual before operating the machine.

1.1 Safety Policy Statement

The conservation of the assets of any company, which include the buildings, equipment, supplies and inventories as well as personnel, must be and is the responsibility of all levels of management. The purpose of a personnel and property conservation program is to insure that all phases of management recognize that personnel and property conservation are both inseparable parts of a company's objective...to produce quality products at the lowest possible cost.

Safety of personnel in every aspect must be of first consideration. The implementation of a conservation program will eliminate human suffering and effectively lower the direct and indirect costs resulting from employee injury. It will substantially reduce the exposure and probability of damage and / or loss of company's physical assets.

1.2 Safety Practices

The safety factors must be observed to ensure safe operation of the LA-763M .

1. Read and understand the operating instructions of the LA-763M before operating.
2. Use extreme caution when working around the LA-763M electrical controls.
3. Keep hands or other body parts away from the moving parts of the LA-763M .
4. Wear appropriate personal safety protection.
5. Stop the LA-763M immediately at any sign of malfunction or danger.
6. Do not crawl under or into the LA-763M for any reason during the operation of the machine.
7. Do not reach into the LA-763M at any time during the operation of the machine.
8. Do not climb, walk, or stand on the LA-763M at any time.
9. Do not tamper with factory installed guards and or safety devices.
10. Never operate machinery without all ABM installed guards and safety devices intact, and in working order.

11. Before starting the LA-763M, ensure that no loose tools, bars or parts are lying in or on any part of the machine.
12. Proper fire fighting equipment should be kept in good operating condition and kept near in the event of fire.
13. Never attempt to service any of the pneumatic components until the unit is relieved of all air pressure.
14. Do not wear loose clothing or jewelry when operating the LA-763M.
15. Always keep hair from coming in contact with moving parts.

SECTION 2.0 – Machine Setup

The LA-763M ships fully tested ready to operate. As a result, this manual provides a section on machine setup so that you can install the machine. Please read this manual in its' entirety and follow all ABM instructions, especially the inspections. Total setup time, less power and air hook-up, should take approximately 1 hour.

SETUP INSTRUCTIONS:

INSPECTION #1: Upon receipt of the machine, check to ensure that there is no visible damage. Figure 0.1 and the front cover of this manual are enough for this inspection.

Note: that some components may be in different locations depending on the version of the machine.

Determine the location in your facility for the sewing machine. Attach the eight (8) machine legs supplied with the machine to the plates that were used to bolt the machine to its skid. Level and position the machine in the desired location. Though not required, ABM recommends that the machine be bolted to the floor. Place the foot pedal in front of the machine on the floor and connect it. Once a final position has been determined for the foot pedal, coil any excess cable and wire tie it to the machine, which will reduce the risk of a tripping hazard.

Run a 220VAC line (15AMP) to the machine location. Though the machine does not come equipped with a 220V plug, ABM does not recommend the use of any type of extension cord to power the machine. As with any machine, power should be run through approved conduit and ducting with proper termination. ABM does not supply a main power disconnect with the machine and recommends that the customer install one. You may connect the power to the machine at this time.

INSPECTION #2: Will confirm that the electronics of the LA-763M long arm sewing machine are functioning properly.

WARNING: ELECTRICAL SHOCK HAZARD. THIS INSPECTION WILL REQUIRE POWER TO BE ON WHILE THE ELECTRONICS CABINET IS OPEN. IF A PROBLEM IS FOUND, YOU SHOULD NOT ATTEMPT TO REPAIR IT WITH THE POWER ON. DISCONNECT THE MACHINE PRIOR TO ADJUSTING ANY COMPONENTS WITHIN THE ELECTRICAL CABINET.

Open the electronics cabinet located on the right vertical end-stand of the steel bridge of the machine. The internals of the cabinet will look like Figure 1.0. From left to right and top to bottom the components are as follows: (1) Encoder (1) Lamp power supply (1) servo motion controller (1) servo motor.

Upon power up, the sewhead should position to needle up. If this does not occur, check for incoming voltage at the main disconnect. Also, power can be checked by turning the

sewing light on. If the light fails to turn on, then power is not available or the main switch on the servo controller is not turned on.



Figure 1.0 – Electrical Panel.

WARNING – WHEN OPERATING THE MACHINE, YOU MUST ENSURE THAT THERE ARE NO LOOSE ITEMS SUCH AS TOOLS FOOD DRINKS ETC. ON THE MACHINE AND THAT ALL PESONNEL ARE CLEAR OF THE MACHINE.



Figure 2.1 – LA-763 sewing head.

Final Test:

Inspect the front of the machine and ensure that the sewhead is free of obstructions. Upon power up the sewhead will position to needle up.

Step 1: Depress the treddle forward and the sewhead will begin to run.

Step 2: Release the treddle and the needle will stay down to pivot your fabric.

Step 3: Depress the treddle backwards and the needle will raise to the upper position.

Setup and inspection is now complete.

SECTION 3.0 – Machine Operation

This section will discuss how to properly use the LA763M to fulfill all of your sewing needs.

The LA-763M is equipped with a mechanical foot lifter to create clearance under the foot when inserting and removing your product to be sewn.



Figure 3.0 – Foot Lifter Operation.

To raise the presser foot, pull down on the white presser foot lift lever at located at the back of the sewhead. To release the presser foot, pull the silver release bar located at the top of the back of the sewhead.



Figure 3.1 – Foot pedal control



Figure 3.2 – Power Disconnect

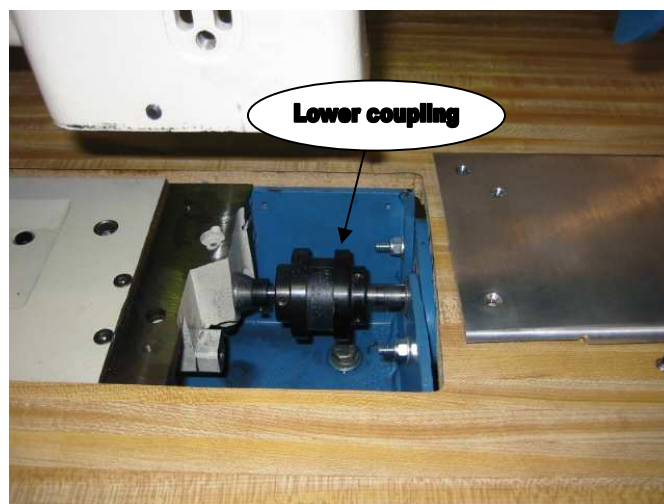


Figure 3.2 – Lower sewhead coupling

SECTION 4.0 – Troubleshooting guide

ABM has done its best to include as much information as possible. However, not all problems are listed, therefore ABM asks that whenever a problem occurs you contact a service technician at our home office. To reach service dial 281-443-4440 and ask for a service technician, they are on call 24 hours a day, seven days a week.

Troubleshooting notes:

A few blank pages are provided so that you and your personnel can keep records and notes of machine problems. By using this section and keeping it attached to the manual, you will always have your own personalized quick reference repair section.

TROUBLESHOOTING NOTES:

Date	Problem	Solution

TROUBLESHOOTING NOTES:

Date	Problem	Solution



AC SERVO MOTOR

OPERATION MANUAL

MODEL : H V P – 70 SERIES

MINI-MOTOR TYPE



ENGLISH

Model : HVP - 70 Series

Contents

	Page
1. Safety Precaution	
1.1 Work environment	1
1.2 Safety in installation	1
1.3 Safety in operating	2
1.4 Safety in maintenance and repairs	2
1.5 Regulation in maintenance and repairs	2
1.6 Danger and caution signs	2
1.7 Warranty information	2
2. Installation and Adjustment	
(1). Motor installation	3
(2). Control box installation	3
(3). Speed control unit installation	3
(4). Components of belt cover adjustment	4
(5). Install the belt cover	4
(6). Install and adjust the synchronizer	5
(7). Adjust the speed control unit	5
3. Power Connection and Grounding	
(1). Single phase and three phase connection	6
(2). How to connect a 1 Φ / 220 V power from a 3 Φ / 380 V power source	6
(3). The load balance when use a 1 Φ / 220 V motor used on a 3 Φ / 220 V power source	7
(4). How to change solenoid supply voltage (DC 24 V or 30 V)	7
(5). How to supply a AC power source extend from the control box	8
4. Diagrams of Control Box	
(1). Front side of the control box	9
(2). Rear side of the control box	9
5. Programmable 7-segment Display	
(1). How to access the 【Normal Mode】	10
(2). Key functions in the 【Normal Mode】 for a lockstitch machine	10
(3). Key functions in the 【Normal Mode】 for a interlock machine	11
(4). How to perform 『BAR Tacking』 and 『Constant-Stitch Sewing』 in the 【Normal Mode】	11
(5). How to access 【Parameter Mode A】	12
(6). How to access 【Parameter Mode B】	12
(7). Key functions in the 【Parameter Mode A and B】	13
(8). How to adjust the parameter setting	13
(9). Setting values for A、B、C、D keys	14
6. General Parameter Table	15

	Page
7. Basic Troubleshooting	
(1). Error code and measurement	16
(2). Instruction of fuse replacement	17
(3). Others	17
(4). HVP-70 parts list	18
8. Operation Box	19
9. Basic Diagrams of Connector Panel	
(1). HVP-70-3 / 4-BR (T1)	21
(2). HVP-70-3 / 4-7W	22
(3). HVP-70-3 / 4-H1 (H1 / H2)	23
(4). HVP-70-3 / 4-66 (V7)	24
(5). HVP-70-3 / 4-46 (T2)	25
(6). HVP-70-3 / 4-70	26
(7). HVP-70-3 / 4-98	27
(8). HVP-70-3 / 4-GD	28
Appendix : 7-Segment Display Characters Compare Chart	

1. Safety Precaution

Please read this manual carefully , also with related manual for the machine head before use. For perfect operation and safety, installing and operating this product by trained personnel is required.

When install and operate HVP-70 MINI Servo Motor, precaution must be taken as the following.
This product is designed for specify sewing machines and must not be used for other purposes.

1.1 Work Environment :

(1). Power voltage:

Only use Power Voltage indicated on the name plate of the HVP-70 in $\pm 10\%$ ranges.

(2). Electromagnetic pulse interference:

To avoid the false operate, please keep the product away from the high electromagnetic machinery or electro pulse generator.



(3). Temperature:

- a. Please don't operate in room temperature is above 45°C or under 5°C
- b. Avoid operating in direct sun light or outdoors area.
- c. Avoid operating near the heater.
- d. Avoid operating in the area which humidity is 30 % or less and 95% or more, also keep away dew area.

(4). Atmosphere:

- a. Avoid operating in dusty area, and stay away from corrosive material.
- b. Avoid operating in evaporate or combustible gas area.

1.2 Safety In Installation :

(1). Motor and control box: Follow the instruction in this manual for correct installation.

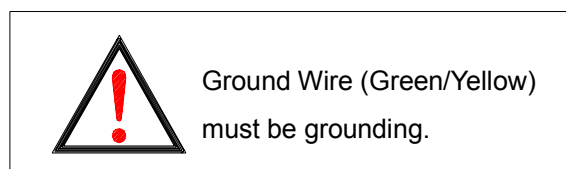
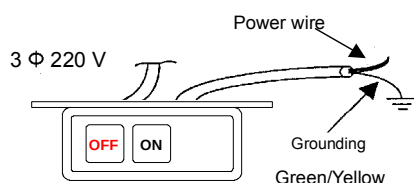
(2). Accessories: Turn off the power and unplug the cord before mounting any accessories.

(3). Power cord:

- a. Avoid power cord being applied by heavy objects or excessive force, or over bend.
- b. Power cord must not set to be near the V-belt and the pulley, keep 3mm space or above.
- c. Check the outlet's voltage before plugging the cord, make sure it match the voltage shown on the name plate of the HVP-70 in $\pm 10\%$ ranges.

(4). Grounding:

- a. To avoid the static interference and current leakage, all grounding must be done



- b. Use the correct connector and extension wire when connecting ground wire to Earth and secure it tightly.

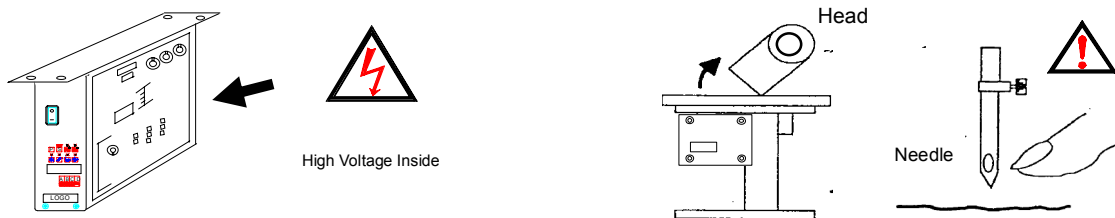
1.3 Safety In Operating :

- (1). When turn on the machine in the first time, use low speed to operate and check the correct rotation direction.
- (2). During machine operation, don't touch any moving parts.
- (3). All moving parts must use the protective device to avoid the body contact and objects insertion.

1.4 Safety in Maintenance and Repairs :

Power must be turned off first, when:

- (1).Uninstall the motor or the control box, or plug and unplug any connector.
- (2).Turn off the power and wait 10 minutes before opening box cover.



- (3).Raising the machine arms or changing needle, or threading needle.(show as above)
- (4).Repairing or doing any mechanical adjustment.
- (5).Machines rest.

1.5 Regulation in Maintenance and Repairs :

- (1).Maintenance and Repairs must be done by specially trained personnel.
- (2).Don't cover up motor's ventilation, it can cause motor over heated.
- (3).Don't use any objects or force to hit or ram the product.
- (4).All spare parts for repair must be approved or supplied by the manufacturer.

1.6 Danger and Caution Signs :



Risks that may cause personal injury or risk to the machine are marked with this symbol in the instruction manual.



This symbol indicates electrical risks and warnings.

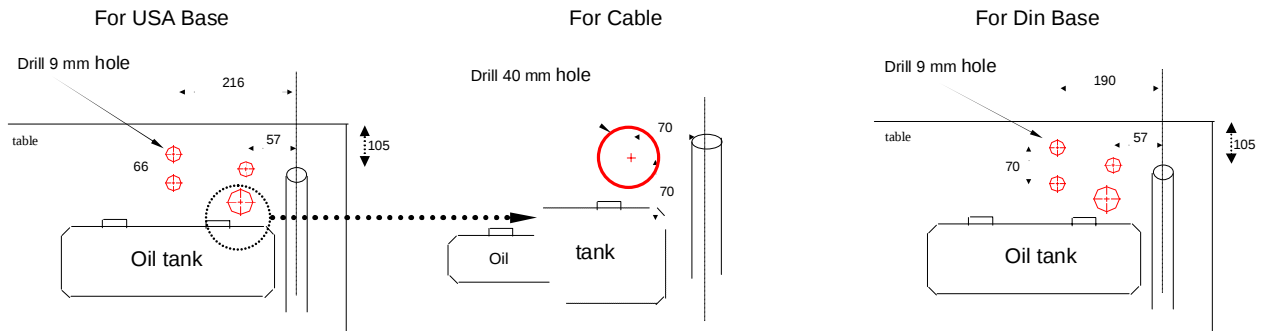
1.7 Warranty Information :

Manufacturer provide a warranty in respect of the products covered for a period of 18 months after the shipping date of the products for any defects arising in the normal course of use of the products by customers.

2. Installation and Adjustment:

(1). Motor installation:

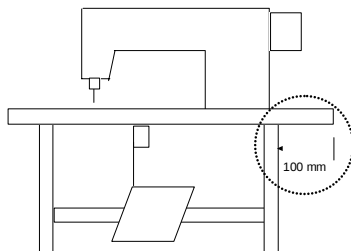
- When motor and machine installed together, refer to the machine head's instruction.
- When motor installed under the working table, drill holes in the table as the following diagram for the installation.



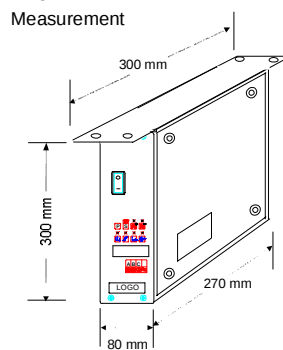
- Pulleys of motor and machine must properly align.
- Cable pass through under the working table must be secured to avoid the V-belt to be rubbed.
- Use the motor base arm to adjust belt's tensions.

(2). Control Box Installation:

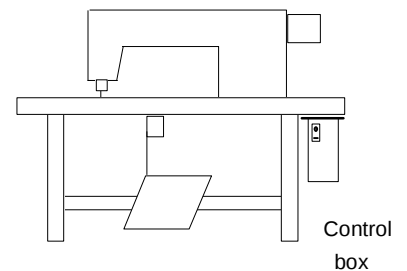
- Leave 100 mm space at right



- Mounting HVP-70 under the working table

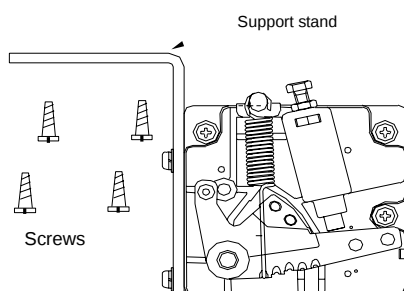


- Installation layout

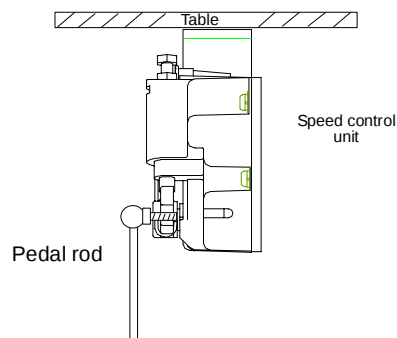


(3). Speed Control Unit Installation:

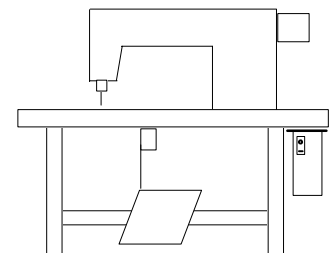
- Speed Control Unit



- Keep rod in vertical, secure the unit under the table



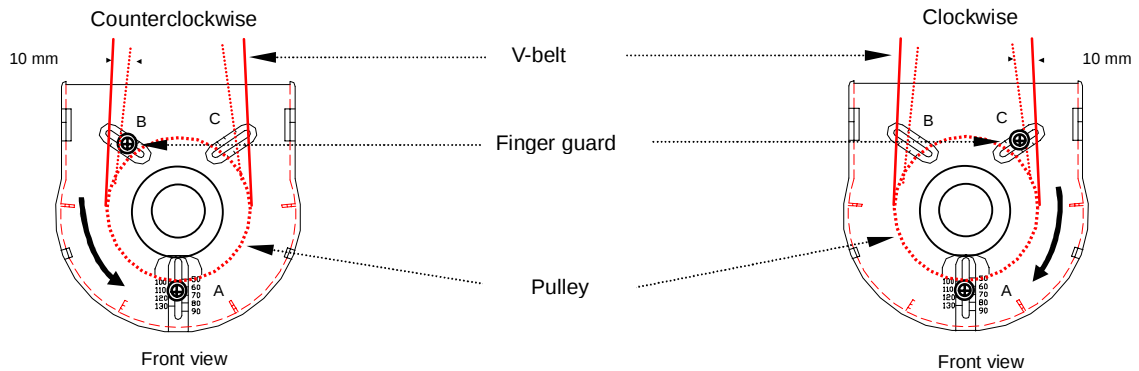
- Installation layout



(4). Components of Belt Cover Adjustment:

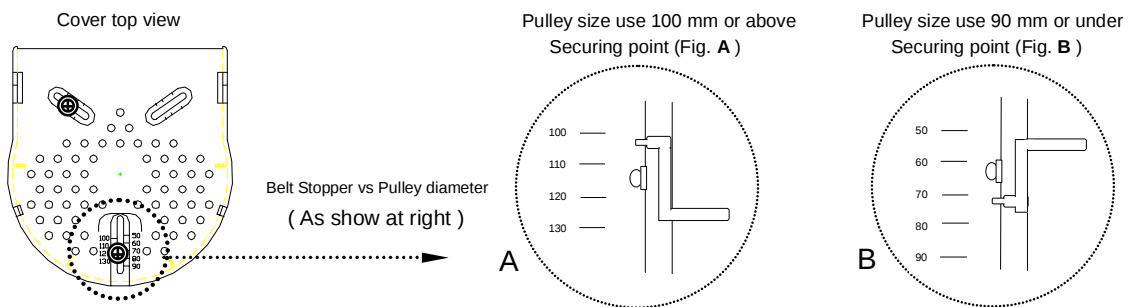
A. Finger Guard Adjustment : (For CE type only)

- 1). Factory default, Finger guard is set at (B). (for lockstitch machine rotation direction)
- 2). When use Interlock stitch machine, Finger guard is set at (C).



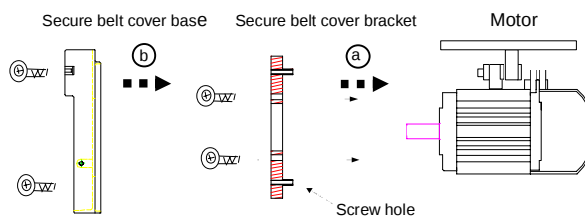
B. Belt Stopper Adjustment :

- a. Factory default Belt stopper is mount at pulley scale about 100 mm's position (Fig. A), if pulley size change, follow the Fig. B.
- b. Adjustment tips: Move stopper pointer aligned with any position at pulley diameter scale that matches the pulley diameter size.

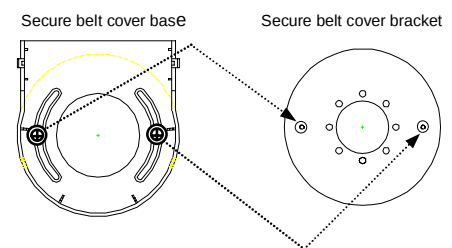


(5). Install the Belt Cover:

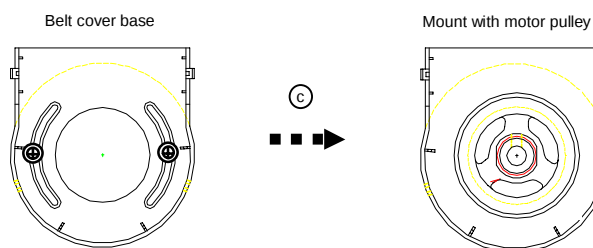
- a). install the belt cover bracket at motor front cover.(screw hole face motor)



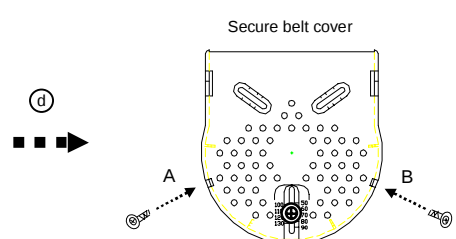
- b).then secure base to the belt cover bracket, let the opening face machine pulley.



- c).After install base, mount with the motor pulley and secure it.



- d). Finally put the belt cover and secure screw A, B



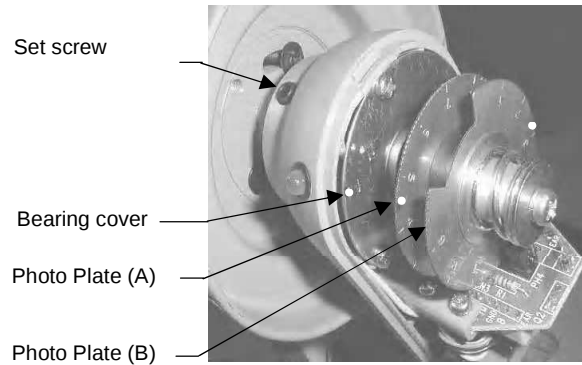
(6). Install and Adjust the Synchronizer (sensor):

- a). Synchronizer installation : Mounting the Synchronizer onto the flange of machine pulley and fasten the rotor by setting screws.
- b). Synchronizer adjustment : Before adjustment, unscrew the synchronizer's cover screw, and remove the cover.



Caution :

Turn OFF the power, before making the adjustment.



Needle up position : Rotate the machine pulley to reach mechanical needle up position and turn the photo plate (A) until its red mark is aligned with the red mark on the bearing cover plate.

Needle down position : Rotate the machine pulley to reach mechanical needle down position and turn the photo plate (B) until its blue mark is aligned with the red mark on the bearing cover plate.

Note: instruction above is the standard adjustment. If you feel the position wasn't accurate, please do the fine tuning by yourself.

(7). Adjust the Speed Control Unit

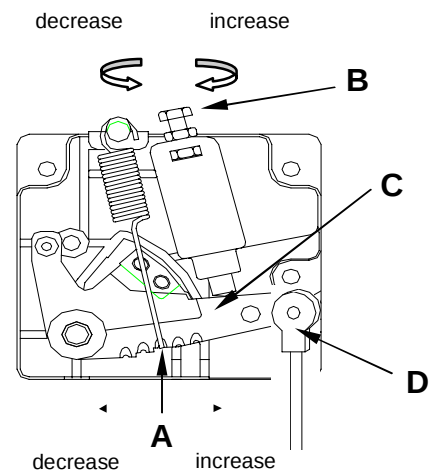
Components of the speed control unit: see figure

A : Spring for toeing forward force adjustment

B : Bolt for heeling backward force adjustment

C : Treadle / Pedal arm °

D : Pitman Rod for Treadle / Pedal

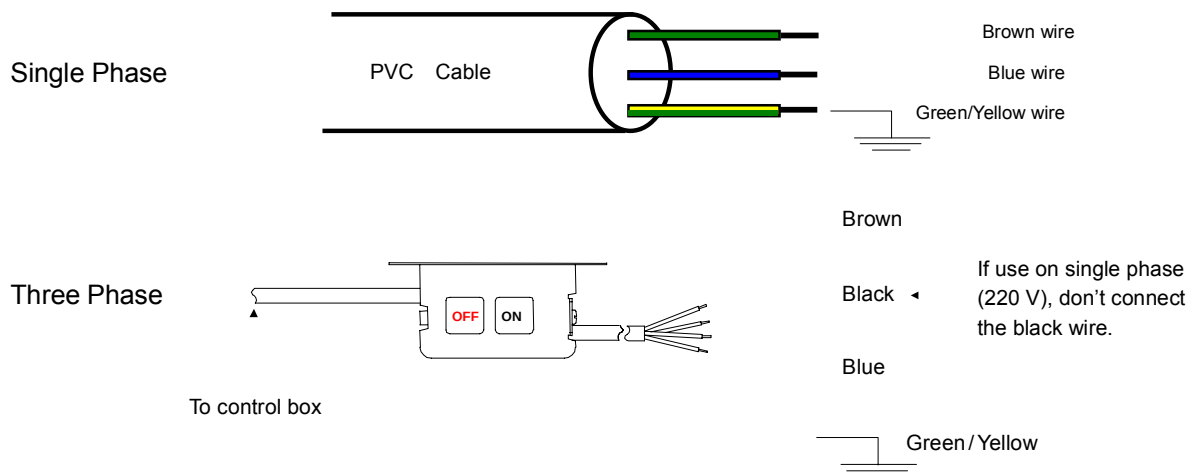


Term of adjustment		Adjustment result
1	Toeing forward force adjustment	Spring A move to right = force increased Spring A move to left = force decreased
2	Heeling backward force adjustment	Bolt B turn  = force decreased Bolt B turn  = force increased
3	Treadle stroke adjustment	Rod D secure at right = stroke is longer ° Rod D secure at left = stroke is shorter °

3. Power Connection and Grounding:

(1). Single phase and three phase connection:

Green/yellow wire is the ground wire.

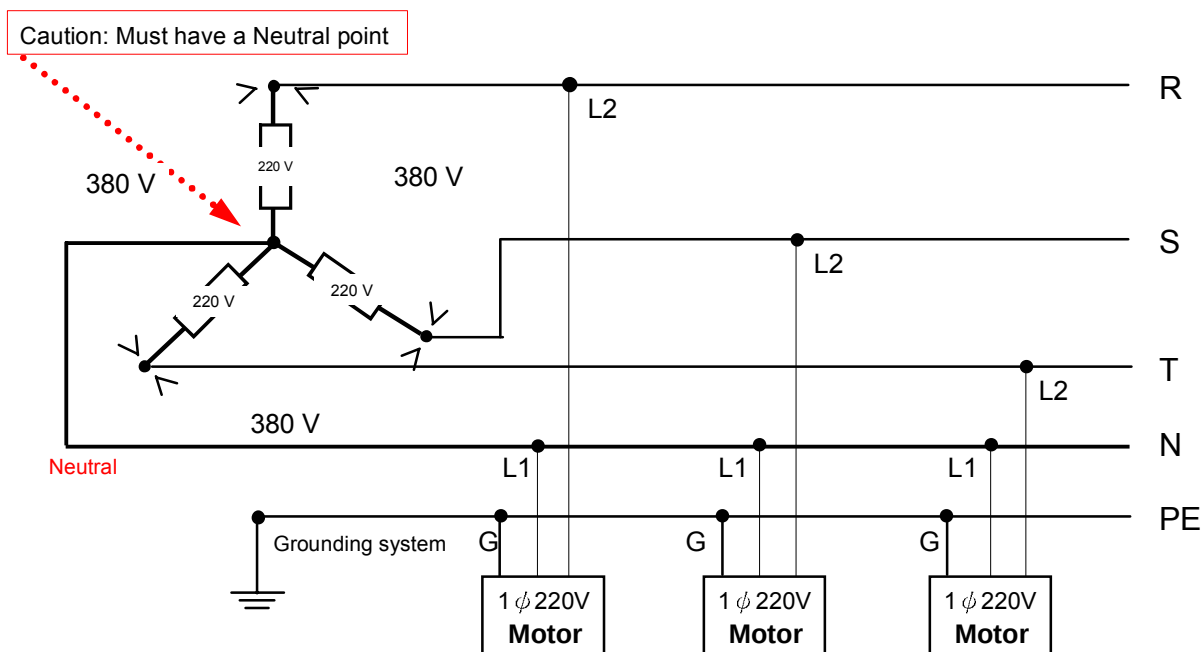


1. When a three phase 220 V servo motor used on single phase 200 ~ 240 V power, only connect brown and blue wires. Use insulating tape to wrap up the black wire, in order to prevent the current leakage.
2. Green / Yellow wire must do the grounding.

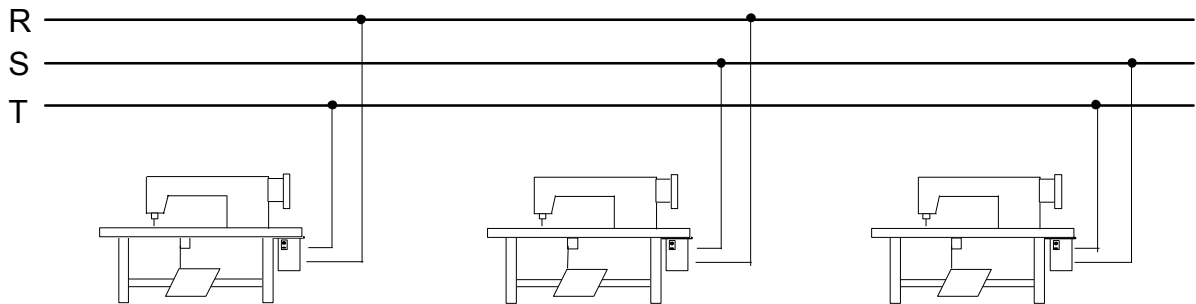
(2). How to connect a 1 Φ / 220 V power from a 3 Φ / 380 V power source



Caution : If the system have no Neutral point, then this servo motor is not suitable for this connection.



- (3). The load balance when use a 1 Φ / 220 V motor used on a 3 Φ / 220 V power source.
See the following figure for the load balance.



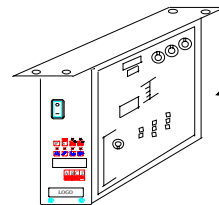
- (4). How to change solenoid supply voltage (DC: 24 V OR 30 V) :
The JP 4 is for 30 V and JP5 is for 24 V.



Caution: Before making the switch, check the machine head's Solenoid specification.

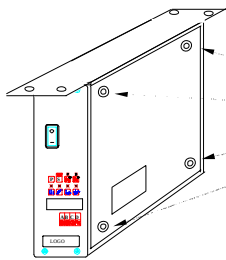


Caution: Turn off the power wait for 10 min. before open the cover, then make the change.



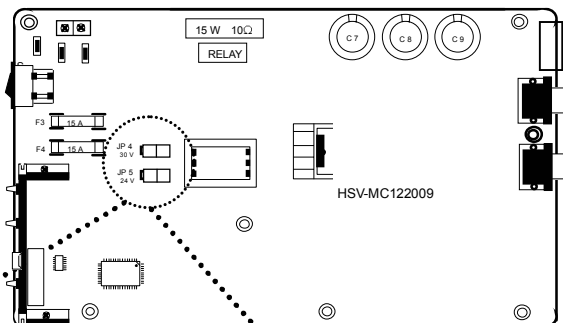
High Voltage inside

Step 1



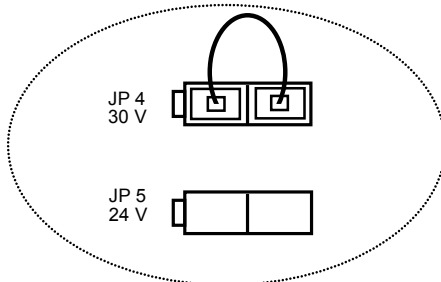
Remove 4 screws

Main board layout:

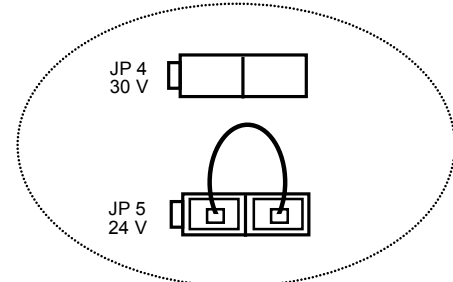


Step 2

30 V jumper setting



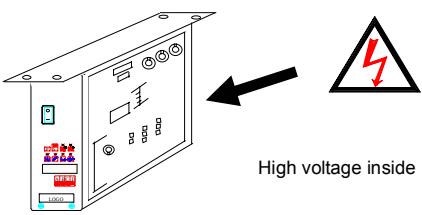
24 V jumper setting



(5). How to supply a power source extend from the control box:

 **Caution 1 :** Turn off the power wait for 10 min. before open the cover, then make the change.

 **Caution 2 :** When turn off the control box's power switch, it will not turn off the extended power, Please add switch for the extended power.

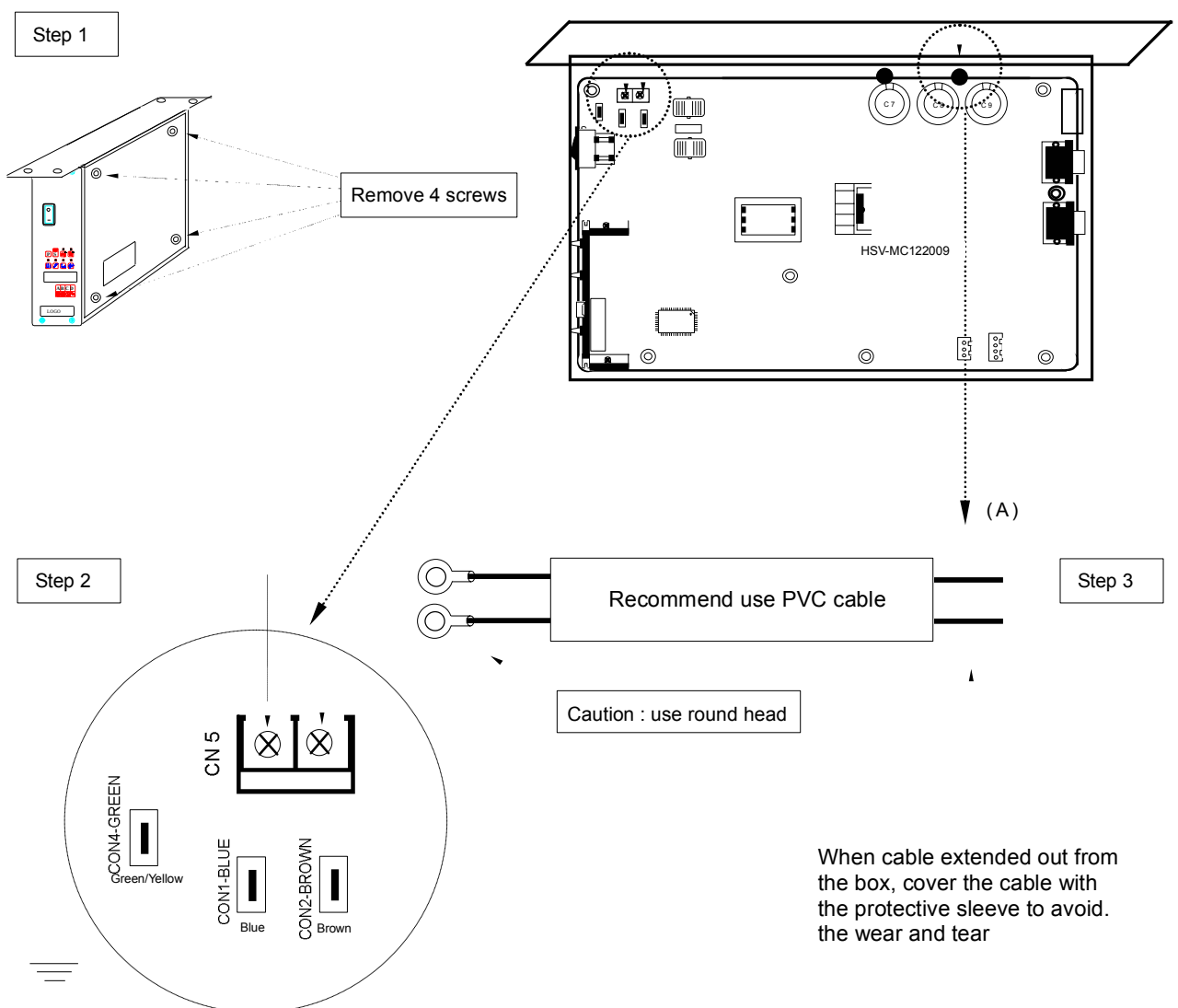


High voltage inside

Caution : Unplugged the power cord before doing any the following jobs.

Main board layout:

CN 5 Extended power connector Cable hole (A)



When cable extended out from the box, cover the cable with the protective sleeve to avoid the wear and tear

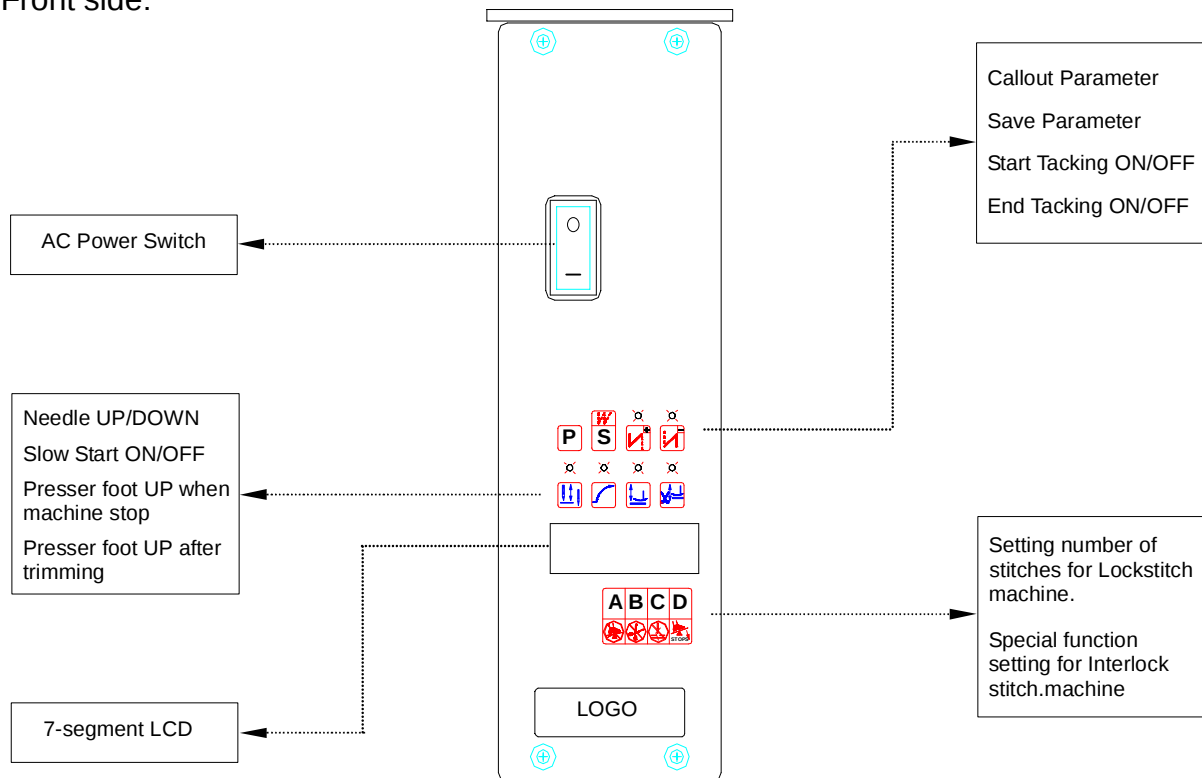


Caution :

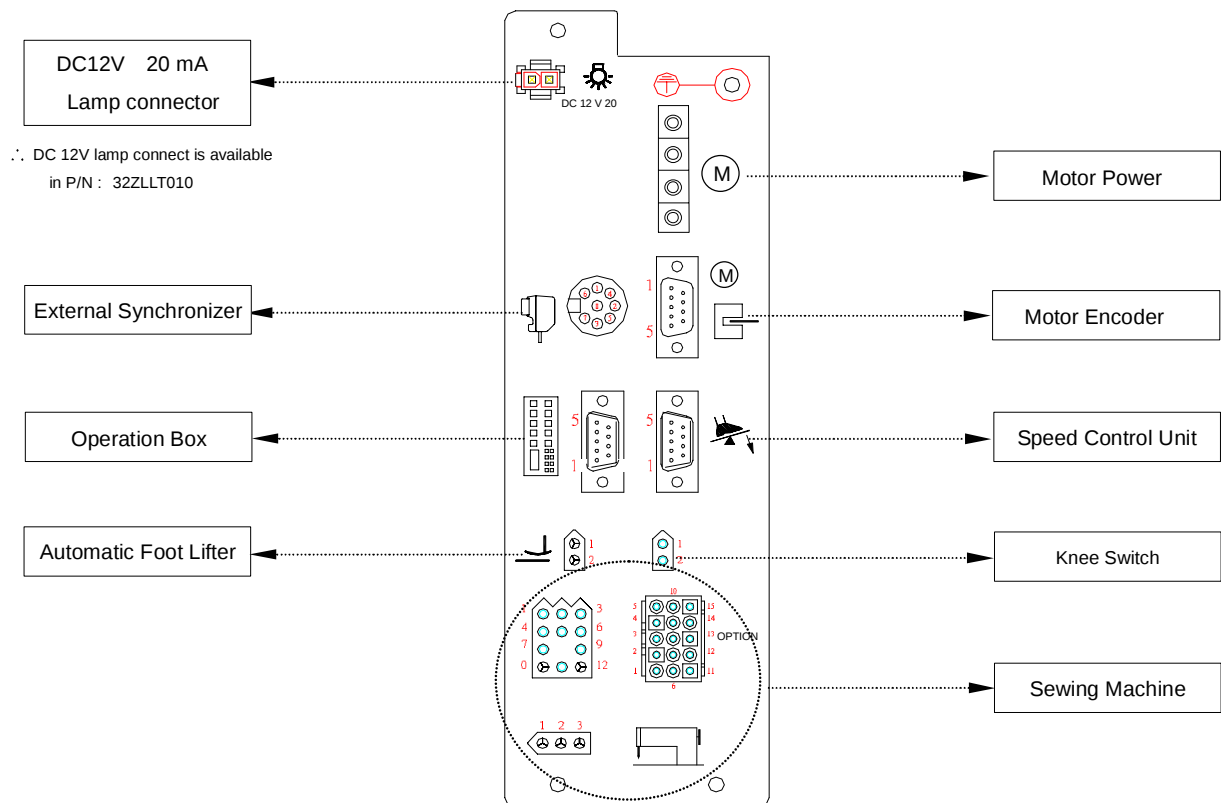
1. Use round head and secure tightly on CN 5, can avoid electric noise and spark which caused by the bad connection.
2. After tighten the round head, let other side of the cable pass through the hole (A) and secure it.

4. Diagrams Of Control Box:

(1). Front side:



(2). Rear side: Connector Panel (Model sample : HVP-70-4-66)

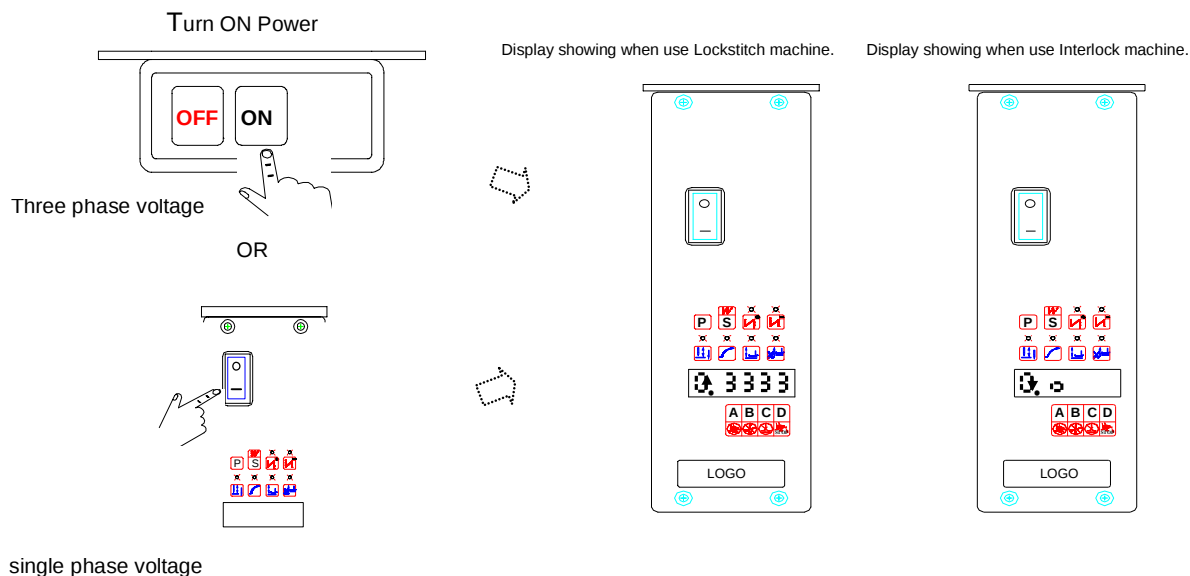


5. Programmable 7-segment Display:

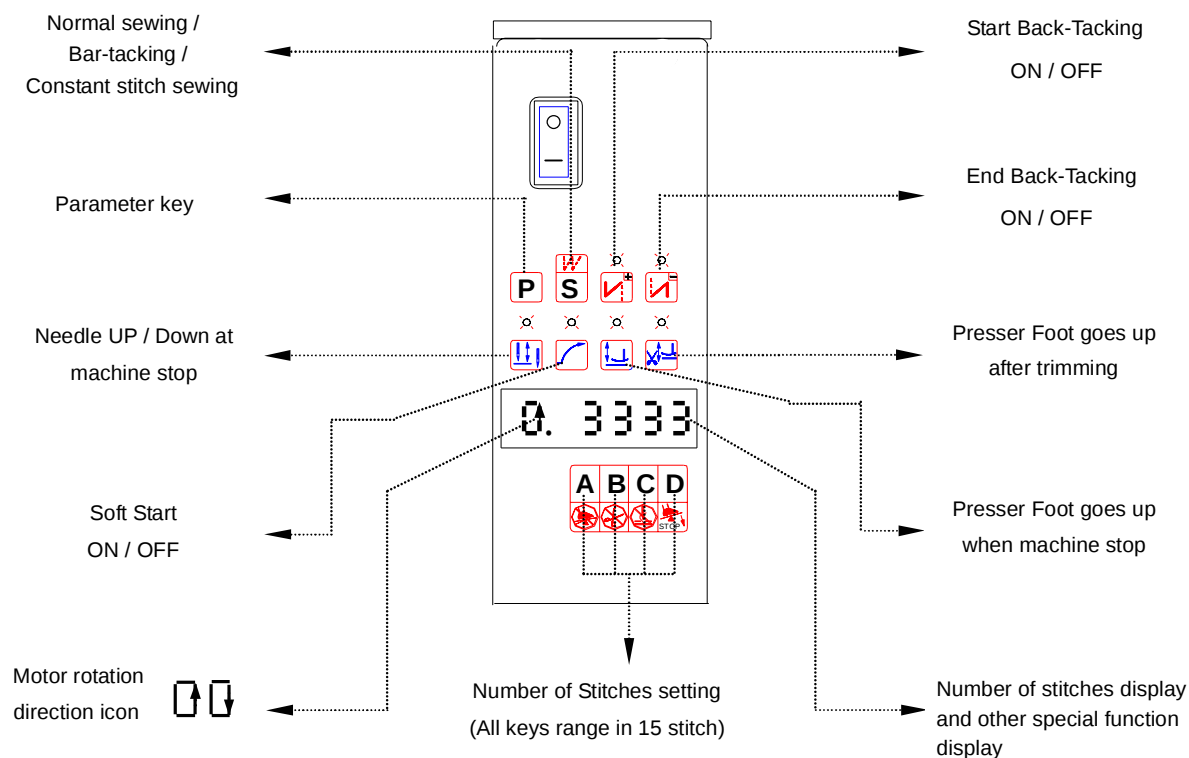
(1). How to access the 【Normal Mode】 area:

Turn on the power and you can access the 【Normal Mode】 right away.

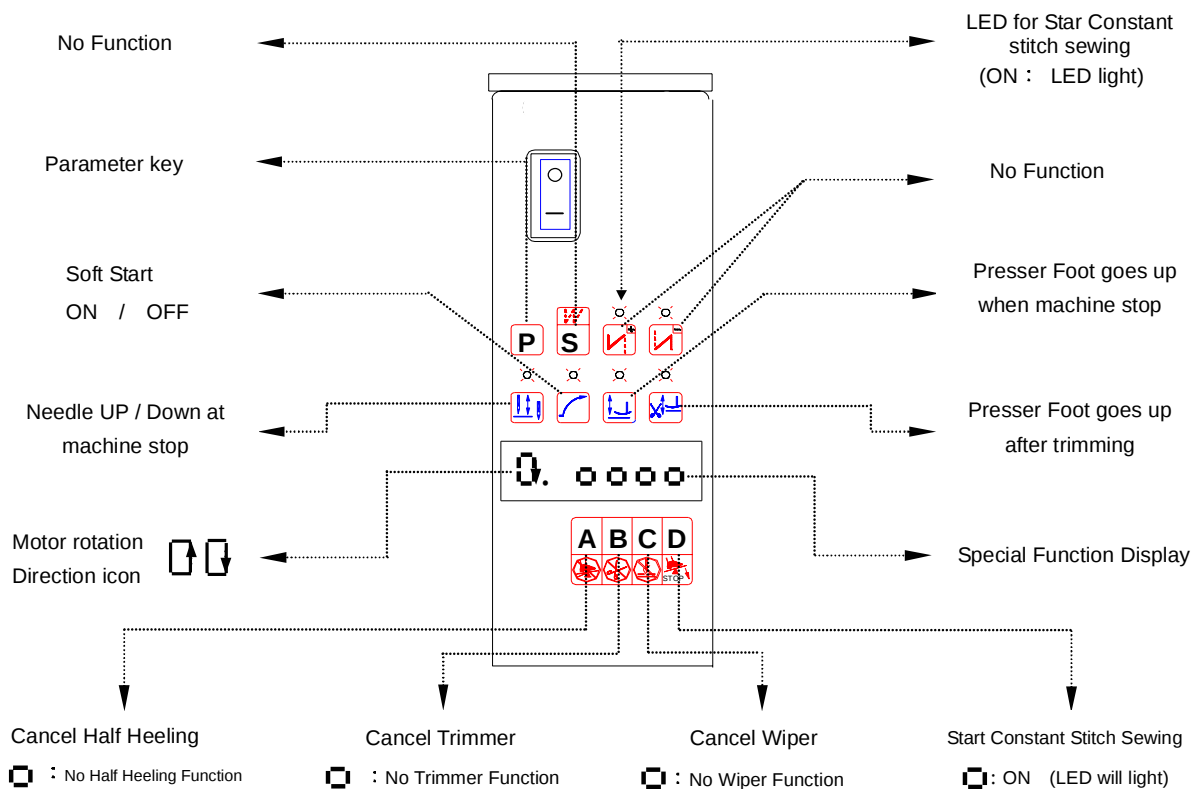
※ Under this mode, there are Lockstitch and Interlock stitch type displays different.



(2). Key functions in the 【Normal Mode】 on a lockstitch machine



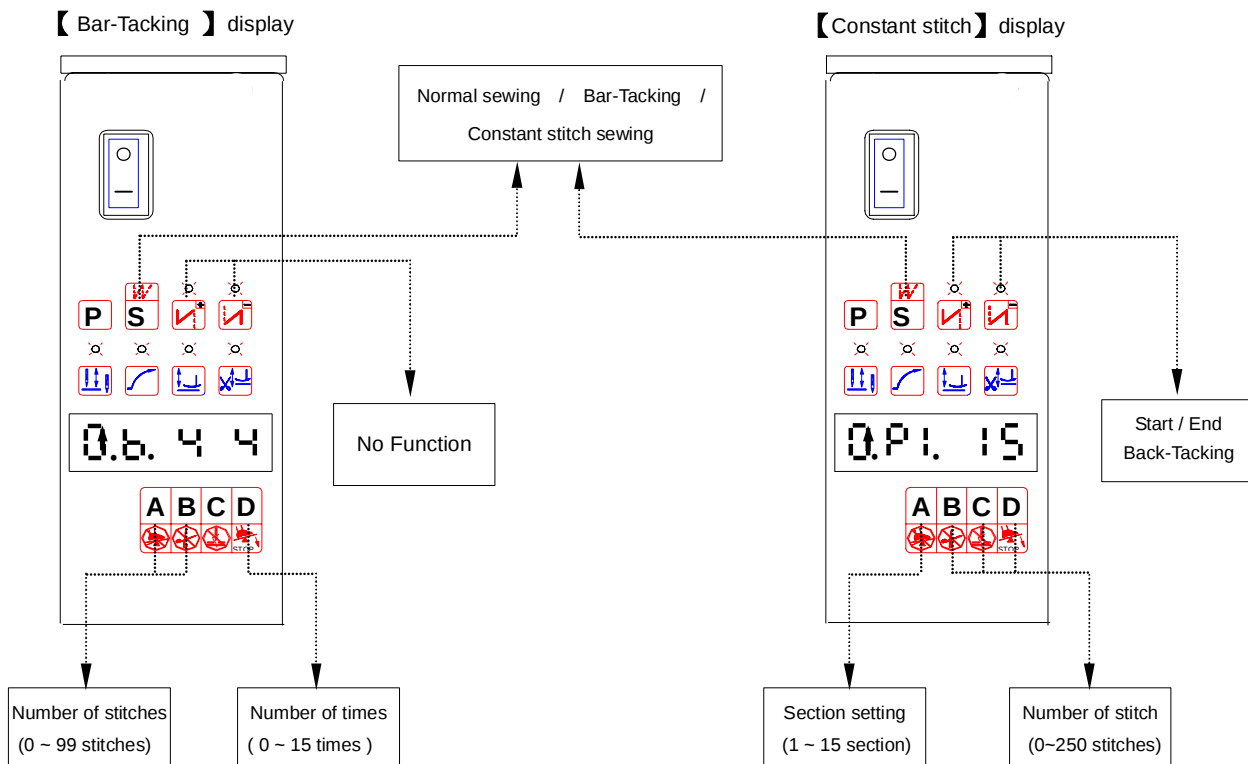
(3). Key functions in the 【Normal Mode】 on a interlock stitch machine



(4). How to perform 『BAR Tacking』 and 『Constant Stitch Sewing』 in the 【Normal Mode】

Under 【Normal Mode】, press key **S** can active and switch back and forth in normal sewing, Bar-tacking, and constant stitch sewing functions.

※ Unlisted keys are the same function as Lockstitch machine in normal mode.

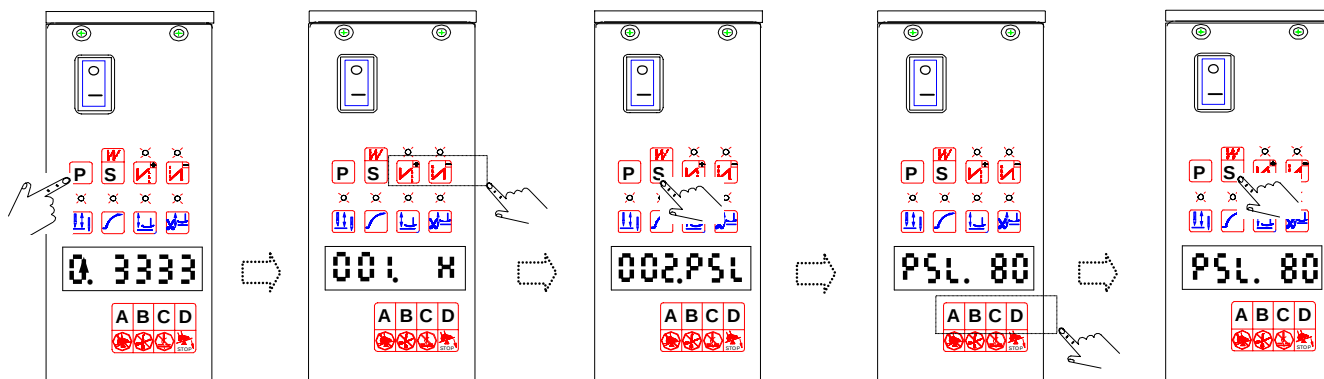


(5). How to access **【Parameter Mode A】** : (Available parameter codes : 1 ~ 46)

a. Under **【Normal mode】** press key **P** will take you into the first parametercode **【 001. H 】** of **【Mode A】**

b. Press **↗** or **↘** to get the parameter needed.. e.g.: **【002 PSL】**
c. Press **S** to enter **【parameter value】**

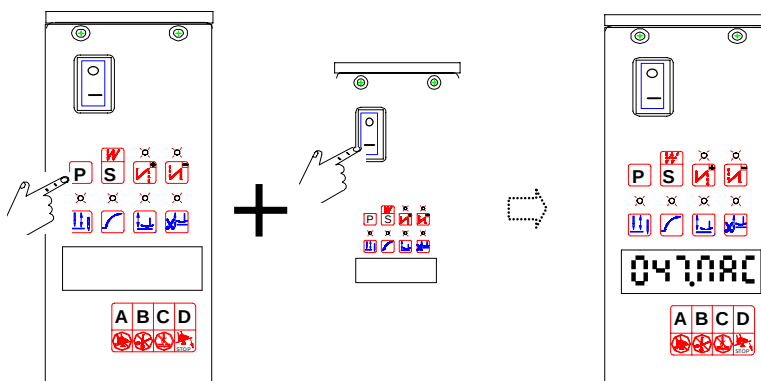
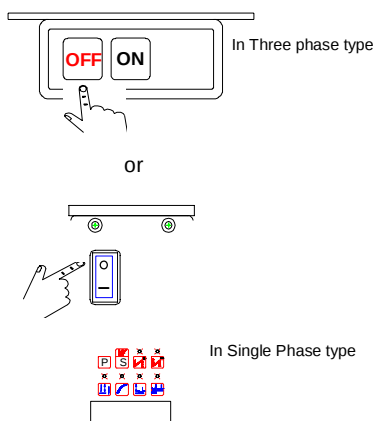
d. In this area, press **A B C D** key to make value adjustment.
e. press **S** key to save the value.



(6). How to access **【Parameter Mode B】** : (Available parameter codes : 1 ~ 122))

a. Turn off the power

b. Press hold **P** key and turn on the power to access the first parameter code **【 047.MAC 】** of **【parameter mode B】**



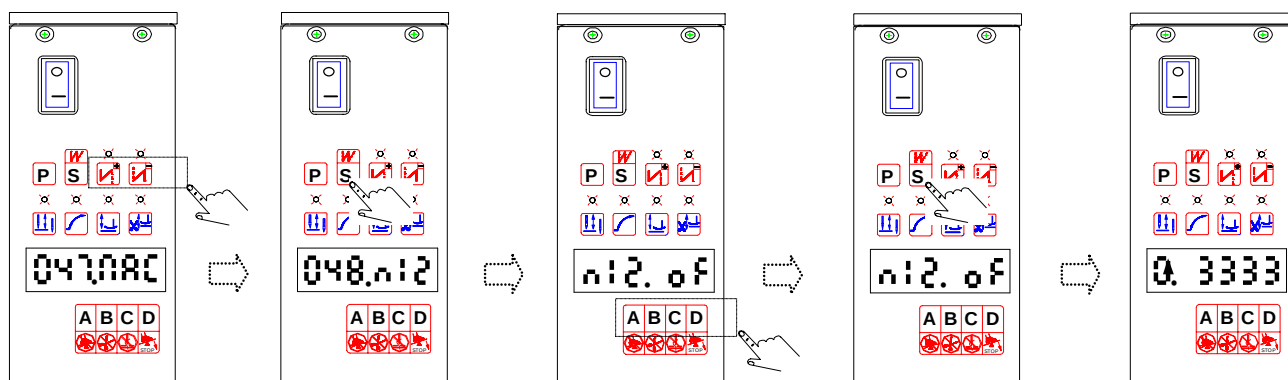
c. Press **↗** or **↘** key to get the parameter code **【 048. N12 】**

d. Use **S** key to enter **【parameter alue】**

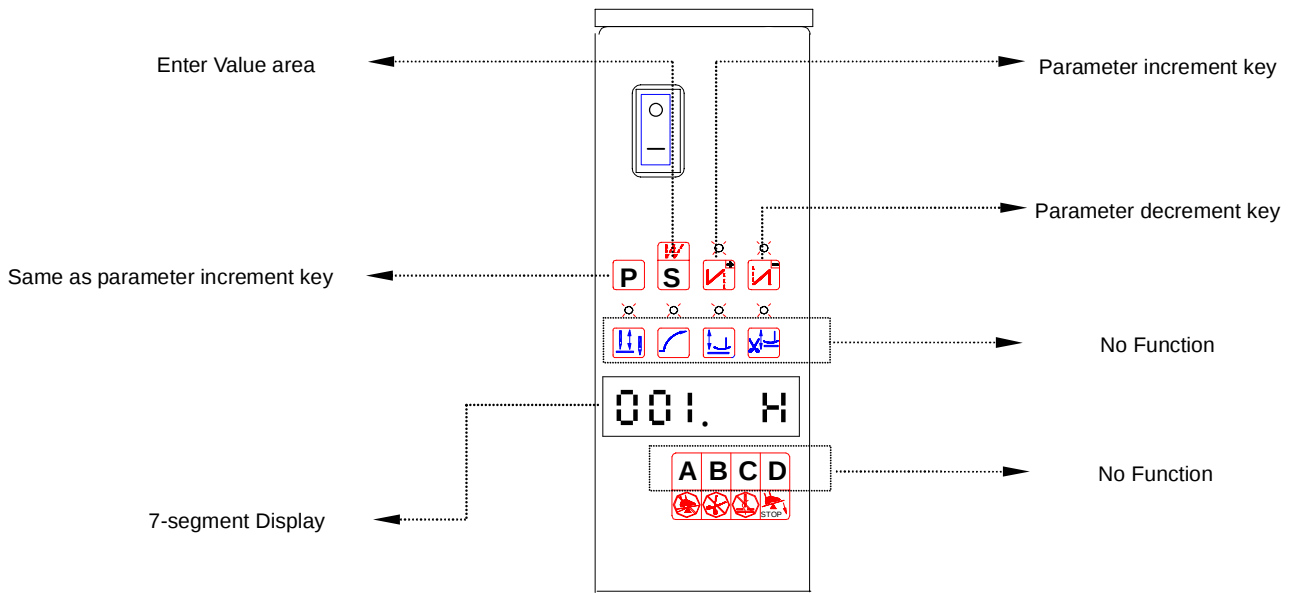
e. In this area, press those key **A B C D** to make value adjustment.

f. Press **S** key to save the value.

Note 1. After pressing **S** key, it will go back to **【Normal Mode】**
Note 2. Example: on Lockstitch machine



(7). Key functions in the **【Parameter Mode A and B】** : (example as the following)



7-segment Display	In 【Mode A】 .First parameter showing is 【 001. H 】 .All available parameters start 1 ~ 46.
	In 【Mode B】 .First parameter showing is 【 047. MAC 】 .All available parameters start 1 ~ 122.

(8). How to access the **【Parameter Value】** and adjust the setting

Step 1 : Confirm the parameter code you want to make adjust. (see the parameter table for detail)

Step 2 : Follow the instruction to access parameter area and call out the parameter code.

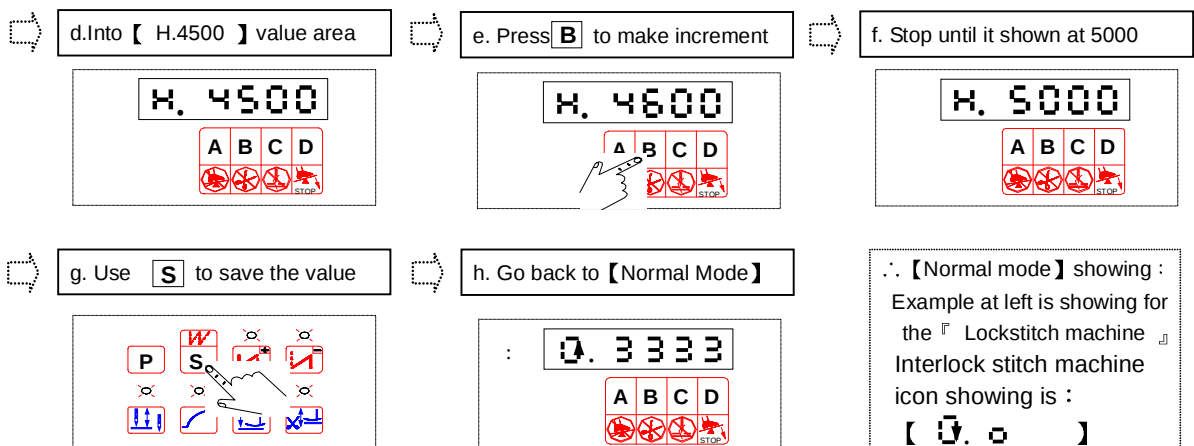
Step 3 : Start making adjust parameter value. (Function selection use key **【C】** and **【D】** to make change.

Speed, timing and angle setting can be set as the following : **【001. H】** value setting for your reference)

A). How to increase the default value :

Example : Factory default setting **【 H. 4500 】** increase to **【H. 5000】** .

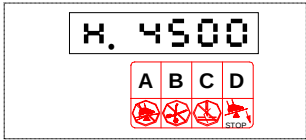
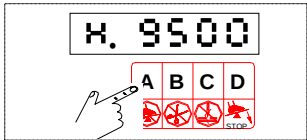
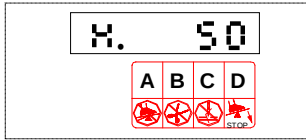
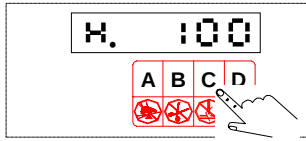
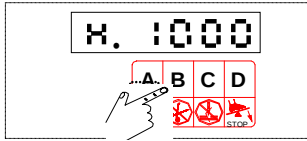
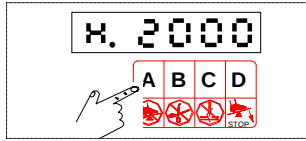
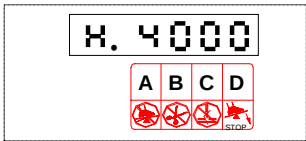
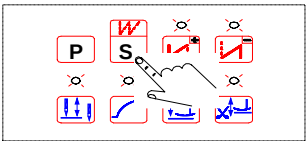
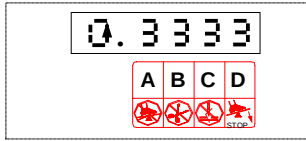
See chapter 5, section (4) or (5) to learn how to access a 、 b 、 c value setting, then do the following step by step.



B). How to decrease the default value:

Example : Factory default setting **【H. 4500】** decrease to **【H. 4000】** :

See chapter 5, section (4) or (5) to learn how to access a 、b 、c value setting, then do the following step by step.

➡ d. Into 【H.4500】 value area 	➡ e. Press A to make decrement 	➡ f. Stop when see minimum value 
➡ g. Use C to set the 10th digit 	➡ h. Use B to set 100th digit 	➡ i. Use A to set 1000th digit 
➡ j. Stop at 4000 or any desire 	➡ k. Use S to save the value 	➡ l. Go back to 【Normal Mode】 

(9). Value setting for A 、B 、C 、D keys in the **【Parameter Value】** :

KEY TERMS \ VALUE	A	B	C	D
IN TERMS OF SPEED	1000 spm	100 spm	10 spm	1 spm
IN TERMS OF ANGLE	-----	100 °	10 °	1 °
IN TERMS OF TIMING	1000 ms	100 ms	10 ms	10 ms
IN TERMS OF FUNCTION			FUNCTION SWAP	FUNCTION SWAP
∴ Other than the function selection, each press of the key will start change the value from 1 to 10				

Note : After value changed, press key **S** to save the value, otherwise they will lost after turning power off

6. General Parameter Table :

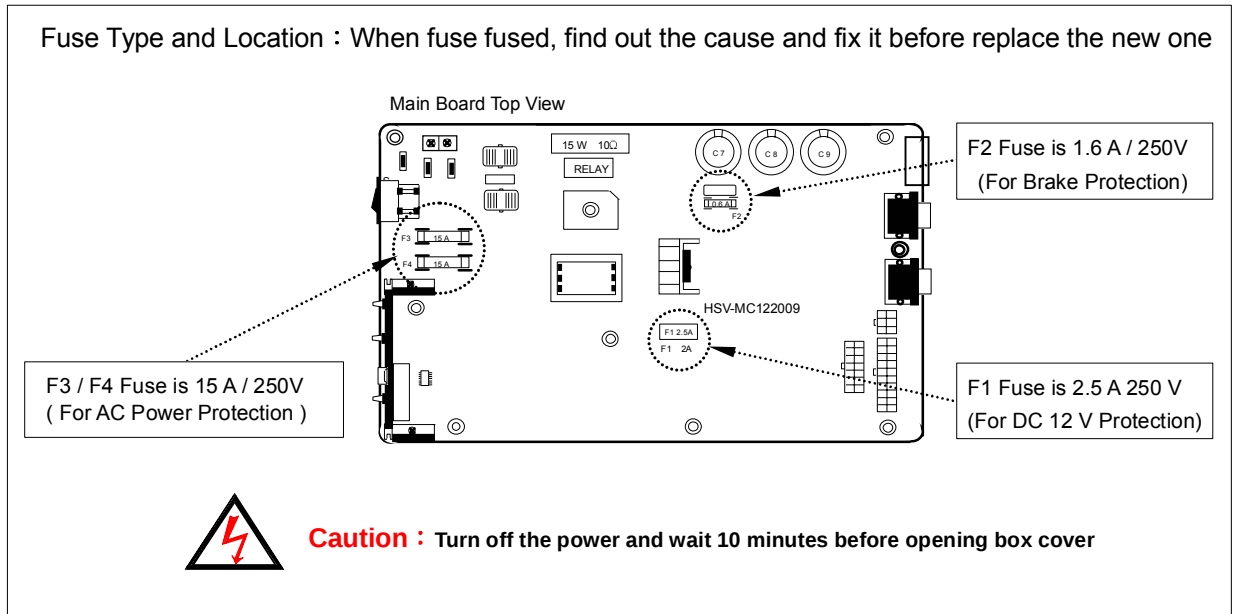
Mode	Parameter Code	Parameter Function	Range / Selection	Description / Note
A	001. H	Maximum sewing speed (spm)	50 ~ 9999	Maximum speed adjustments.
	004. N	Start Back-Tacking speed or Constant-Stitch speed for the Interlock Stitch machine (spm)	50 ~ 8000	Speed adjustment for Start Back-Tacking or Constant-Stitch sewing in the Interlock Stitch machine.
	005. V	End Back-Tacking speed (spm)	50 ~ 8000	Speed adjustment for End Back-Tacking.
	006. B	Bar-Tacking speed (spm)	50 ~ 8000	Speed adjustment for Bar-Tacking.
	007. S	Slow Start speed (spm)	50 ~ 2000	Speed adjustment for Slow Start.
	008. S L S	Number of Stitches for the Slow Start	0 ~ 99	Number of Stitches setting for Slow Start.
	009. A	Automatic Constant-Stitch sewing speed or Auto-start testing speed (spm)	50 ~ 8000	Speed adjustment for Automatic Constant-Stitch sewing. Note : Valid only when the 【037. SMP】 set on 『A』
	010. A C D	Automatic End Back-Tacking sewing (Can invalidate the Stitch Correction function)	ON / OFF	O N : After last seam of Constant-Stitch sewing, it will automatic execute the End Back-Tacking sewing function. Note : When turned on, the Stitch-Correction is invalid. OFF : Automatic End Back-Tacking will not execute after last seam, but can be done by pedal manually Note : The Stitch-Correction is valid in Free sewing, but the parameter 【011.RVM】 must set on 『B』.
	011. RVM	Back-Tacking Mode selection	J / B	J : JUKI mode (Press TB switch will activate the reverse solenoid when either machine is stopped or running). B : BROTHER mode (Press TB switch will activate the reverse solenoid only when machine is running).
	040. W O N	Wiper function selection	ON / OFF	O N : Wiper valid. OFF : Wiper invalid.
	041. T M	Trimmer function selection	ON / OFF	O N : Trimmer valid. OFF : Trimmer invalid.
B	045. S P	Sewing speed	-----	Showing the current sewing speed.
	046. D I R	Direction of motor rotation	CW / CCW	C W : Clockwise. CCW : Counterclockwise.
	060. L	Low speed (spm)	50 ~ 500	Speed adjustment for Low speed.
	061. T	Trimmer speed (spm)	50 ~ 500	Speed adjustment for Trimmer.
	064. F O	Full-On time setting for Automatic Foot Lifter (ms)	0 ~ 990	Timing adjustment for Full-On time of Automatic Foot Lifter activates.
	065. F C	Duty-Cycle setting for Automatic Foot Lifter (%)	0 ~ 90	Adjustment for Duty-Cycle of AFL. (Fine tuning can reduce the over heating)
	066. F D	Running-Delay time setting (ms)	0 ~ 990	Running-Delay time adjustment for the Automatic Foot Lifter.
	070. H H C	Cancel Automatic Foot Lifting when Half-Heeling the pedal	ON / OFF	O N : Pedal half heeling without foot lifting function. (Only full heeling can activate Foot Lifer.) OFF : Pedal half heeling with foot lifting function.
	075. S F M	Safety switch mode	NC / NO	NO : Means Normal Opened. NC : Means Normal Closed.
	083. T 2	Trimming timing (ms)	0 ~ 990	Adjustment for trimming timing
	087. L 2	Tension release timing (ms)	0 ~ 1500	Adjustment for tension release timing. (In Shing Ray brand's interlock stitch machine, it acts as wiper function.)
	093. W 2	Wiper timing (ms)	0 ~ 9990	Adjustment for wiper timing.
	119. D D	Motor drive mode	ON / OFF	O N : Motor drive machine head directly OFF : Motor drive machine head with belt.
	121. A N U	Needle goes up automatically as power turned on	ON / OFF	O N : Power turned on, needle goes up position automatically. OFF : No Use.

7. Basic Troubleshooting:

(1). Error Code and Measurement :

Error Code	Cause of The Problem	Status and Measurement
ERO. 4	1. When power on, detected high voltage. 2. Connect the wrong voltage, too high. 3. F2 fuse blown	Motor and machine will be shutting down. Please check the AC power. (Too high) Please check the main pc board. Please check the F2 fuse.
ERO. 5	1. When power on, current sensor detect low voltage 2. Connect the wrong voltage, too low..	Motor and machine will be shutting down.. Please check the AC power. (Too low) Please check the main pc board.
ERO. 7	1. Bad connection at the motor connector. 2. Synchronizer (sensor) signal error. 3. Synchronizer is a single position type, and parameter set wrong type. 4. Machine locked or object stuck in the motor pulley. 5. Sewing material is too thick.	Motor and machine will be shutting down. Please check the motor or motor connectors' connection. Please check the Synchronizer (sensor) and its signal. Please check machine head to see if objects stuck in the motor pulley, or rotate not smoothly.
ERO. 8	Operation Box linked to CPU interface had communication error	Motor and machine will be shutting down. Please check the Operation Box.
ERO. 9	1. Machine solenoid shorted. 2. Main board's power transistor is faulty.	Motor still can run, but all output signals and Operation box's pattern sewing function will be invalid.. Please check machine's solenoids or the resistance value is 2Ω less. Please check all the power transistors which related to solenoid.
ERO. 11	1. If parameter 【121.ANU】 is set ON, but Auto Needle Up is malfunction when the power turned on. 2. Machine locked or motor pulley have object stuck in it.	Motor still can run, but it automatic starts the clutch mode. All Constant-stitch sewing pattern and trimmer wiper function will be invalid. Please check Synchronizer's up position's signal. Please check main board's Synchronizer circuitry. Please check machine head to see if objects stuck in motor pulley, or rotate not smoothly.
	Motor rotation icon in LCD is halting and not moving. 1. Safety switch is either faulty or bad connection. (For interlock stitch or blind stitch machine). 2. Parameter 【075. SFM】 setting not match the machine head model.	Motor stops. Please check the safety switch. Please check parameter table on 【075. SFM】 setting, make sure it match machine head safety switch

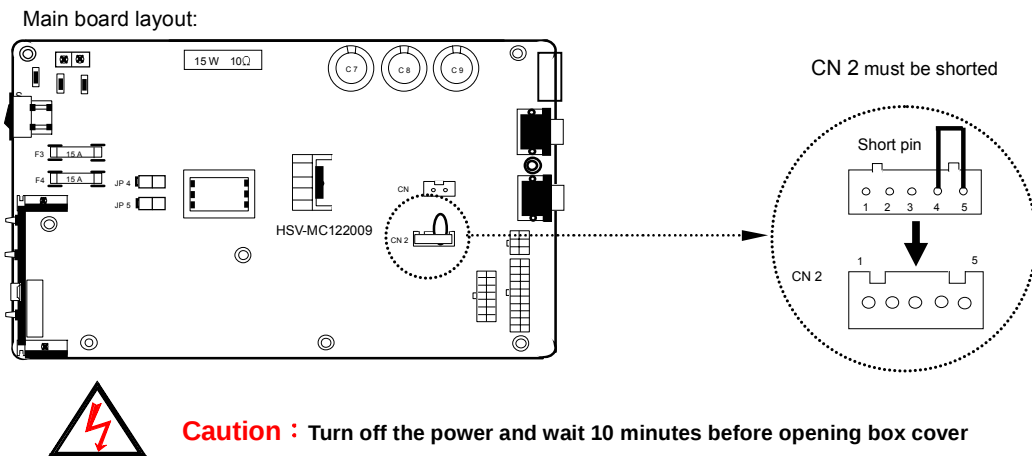
(2). Instruction of Fuse Replacement



(3). Others

1. If motor install with the machine head, then the CN2 must be shorted.

The error code 12 will occur if CN2 not shorted.



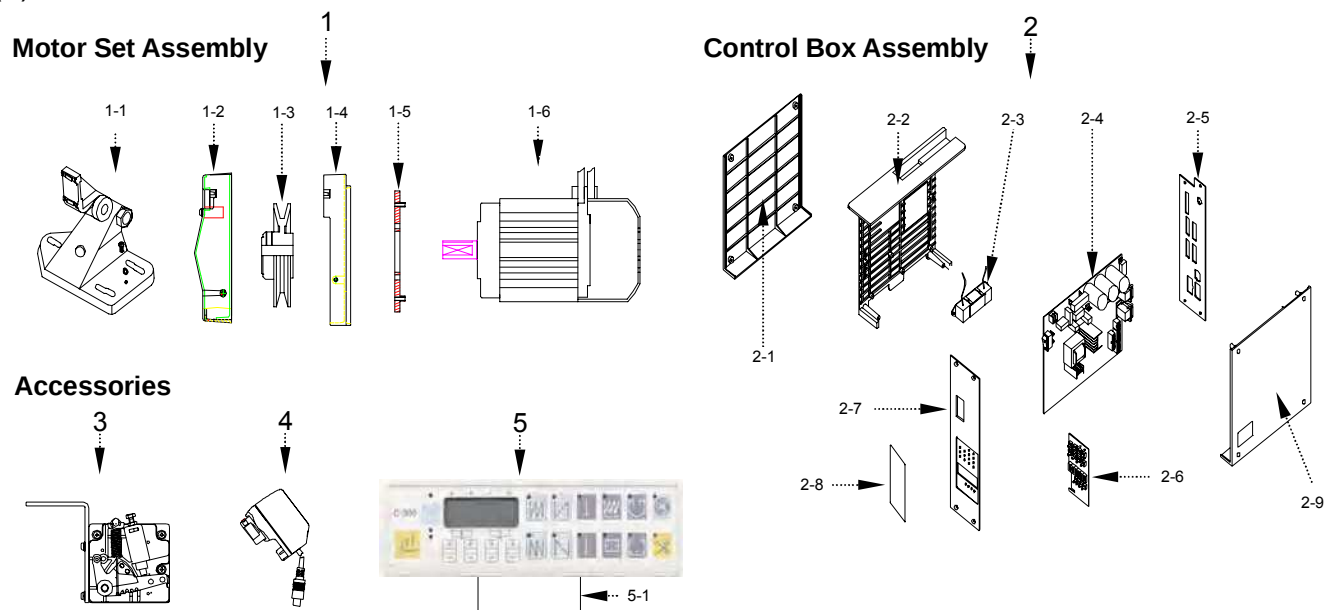
2. During the machine's operation, if the synchronize (sensor) felt out or the belt snapped.

The motor will rotate few stitches then stop, and ERO.7 will be shown in the display.

Turn off the power and troubleshooting first then restart the power.

3. If other technical issues occur, beside the fuse replacement, don't try to change any parts in the control box. Please ask supplier or trained technician for technical support.

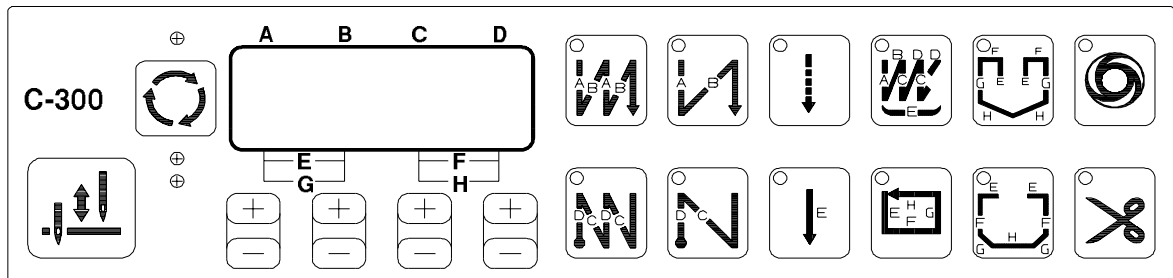
(4) HVP-70 Parts List :



NO.	Order Code	Parts Name	Description	NO.	Order Code	Parts Name	Description
1	2VP3411209AX1	Motor Set (CE)	Ke : 37 75EC006	2- 1	315MPB270	Left Cover	cover (no screw)
	2VP3411209AX2	Motor Set	Ke : 37 75EC006		331SP1130	Left Cover Screws	M4 * 8
	2VP3411209AX3	Motor Set (CE)	Ke : 50 75CC006	2- 2	2VPMPB205	Aluminum Case	HVP-70 Series
	2VP3411209AX4	Motor Set	Ke : 50 75CC006	2- 3	2VP70304201	Cement Resistor	220 Ω / 30 W
	2VP3432209AX3	Motor Set	Ke : 28 50AB007	2- 4	2VP70302005	Main Board	1 ♂ 20 A
	2VP3432209AX4	Motor Set (CE)	Ke : 28 50AB007	2- 5	2VP70408BR001	Connector Panel	HVP-4-BR
1- 1	2VPBTV020	Motor Base	For HVP-70		2VP704087W001	Connector Panel	HVP-4-7W
1- 2	315BGV080	Belt Cover Top	For V-Belt Type		2VP70308H1001	Connector Panel	HVP-3-H1
1- 3	2VP2PY4041D	Pulley (65 mm)	(14 ♂ hole)		2VP7040866001	Connector Panel	HVP-4-66
	2VP2PY4061D	Pulley (75 mm)	(14 ♂ hole)		2VP7040846001	Connector Panel	HVP-4-46
1- 3	2VP2PY4081D	Pulley (85 mm)	(14 ♂ hole)		2VP7040870001	Connector Panel	HVP-4-70
1- 4	315BGV070	Belt Cover Base	For V-Belt Type		2VP7040898001	Connector Panel	HVP-4-98
1- 5	313BGE030	Cover Bracket	For V-Belt Type		2VP70408GD001	Connector Panel	HVP-4-GD
1- 6	2VP3411209AX6	Motor Body (CE)	750 W Ke : 37	2- 6	2VPPCB181	LED Panel Board	7 mm tack switch
	2VP3411209AX7	Motor Body .	750 W Ke : 37	2- 7	315MPB290	Control Panel	For 1 ♂
	2VP3411209AX8	Motor Body (CE)	750 W Ke : 50	2- 8	341V50103	Membrane Sticker	For HVP-70
	2VP3411209AX9	Motor Body ..	750 W Ke : 50	2- 9	315MPB280	Right Cover	Cover (no screw)
	2VP3432209AX8	Motor Body	500 W Ke : 28		331SP1860	Right Cover Screws	M4 * 0.7 * 25
	2VP3432209AX9	Motor Body (CE)	500 W Ke : 28	3	2VP70306001	Speed Control Unit	With bracket
2	2VP70400BR101	HVP-70-4-BR-1	100 ~ 120 V	4	2VP115002900	Synchronizer	500-29 (8P)
	2VP70400BR201	HVP-70-4-BR-2	200 ~ 240 V	5	2VPOPBC30001	Operation Box	C-300 1.0 m.
	2VP704007W201	HVP-70-4-7W-2	200 ~ 240 V		2VPOPBC30002	Operation Box	C-300 1.5 m.
	2VP70400GD201	HVP-70-4-GD-2	200 ~ 240 V	5 - 1	2VPOPBT03	Curve Bracket	For C-300

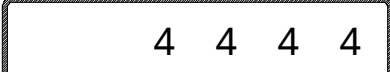
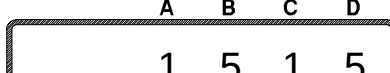
8. Operation Box :

(1). C – 300 Operation Box Diagram



(2). Key Functions of C – 300

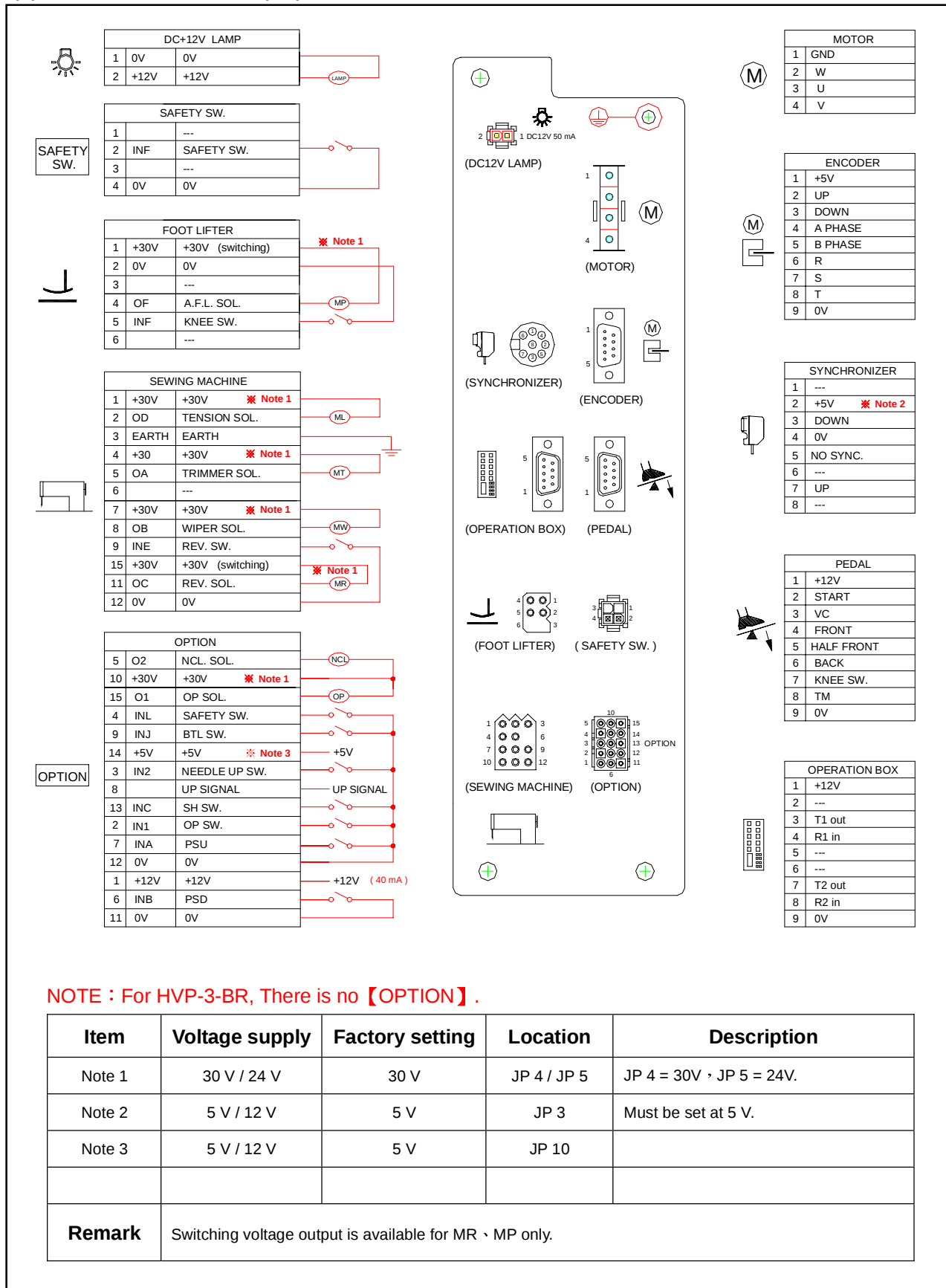
FUNCTION	KEY	OPERATION OF SEWING MACHINE
Start Tacking Selection		Double start tacking
		Single start tacking
End Back Tacking Selection		Double end back tacking
		Single end back tacking
Free Sewing		1). As the treadle is toed down, machine will start sewing. Once the treadle returned to neutral, machine will stop immediately. 2). As the treadle heeled back, the trimming cycle will be finished automatically.
Bar Tack Sewing		Once the treadle is toed down, all the seams of Bar Tacking, A 、 B 、 C 、 D sections will be completed with E times, and the trimming cycle will be finished automatically Note1 : When E is 4 times above, then the exceeded times will be started by the C 、 D section. Note2 : When the bar tack sewing start, it will not stop until the trimming cycle finished, except for the treadle heeled back to cancel the action.
Constant-Stitch Sewing	 or or or 	1). As the treadle is toed down, Constant-stitch Sewing E 、 F 、 G or H performed section by section. 2). Once the treadle returns to neutral intermediately in any one section, the machine will stop immediately. When the treadle toed down again the balanced stitches of E 、 F 、 G or H goes on. 3). If the parameter 【010. ACD】 is set ON, the machine will not stop and automatically start trimming cycle and end back tacking at the end of the last section E or H.

Stitch Setting Selection		A、B、C、D -- stitch setting range in 0 ~ F (Note) E、F、G、H -- stitch setting range in 0 ~ 99     ----A=B=C=D=4 stitches     ---- E = F = 10 stitches     ---- G = H = 15 stitches ∴ Press  key to select : Top A、B、C、D Middle E、F Bottom G、H
Needle Up / Forward Stitch Correction		1). In Free sewing: One touch of this key act as stitch correction. (half stitch forward) 2). In constant-stitch sewing : (In Bar-tack sewing, it only act as needle up) a. If sewing stops intermediately in one section, one touch of this key will raise the needle to up position. b. If sewing stops at the end of section, one touch of this key will correct one stitch forward.
One-Shot-Sewing Selection		1). In Free sewing and Bar-tack sewing : One touch of this key make beep sound but have no function, also LED does not light up,. 2). In Constant-stitch sewing : a. One shot to the pedal, automatic performed number of stitches of E、F、G、H sections. b. Toe down the pedal again and again to finish rest the sections until it finish pattern.
Trimming Cycle Selection		Enable or disable the trimming cycle.

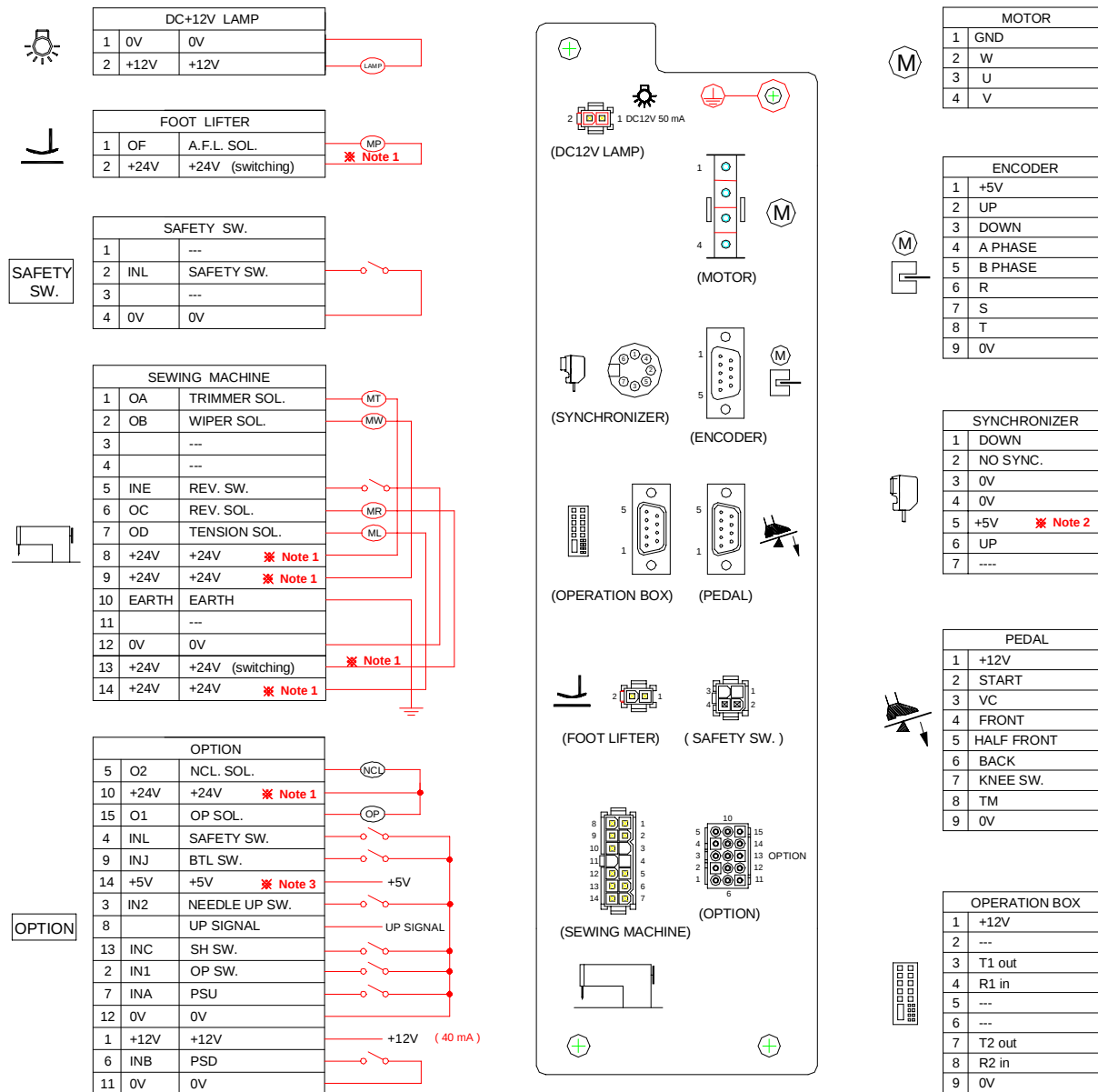
Note : Stitches setting of A、B、C、D sections correspond to the alphabet.
A=10、B=11、C=12、D=13、E=14、F=15 stitches

9.CONNECTOR DIAGRAM :

(1).HVP-70- 3/4 -BR : (T1)



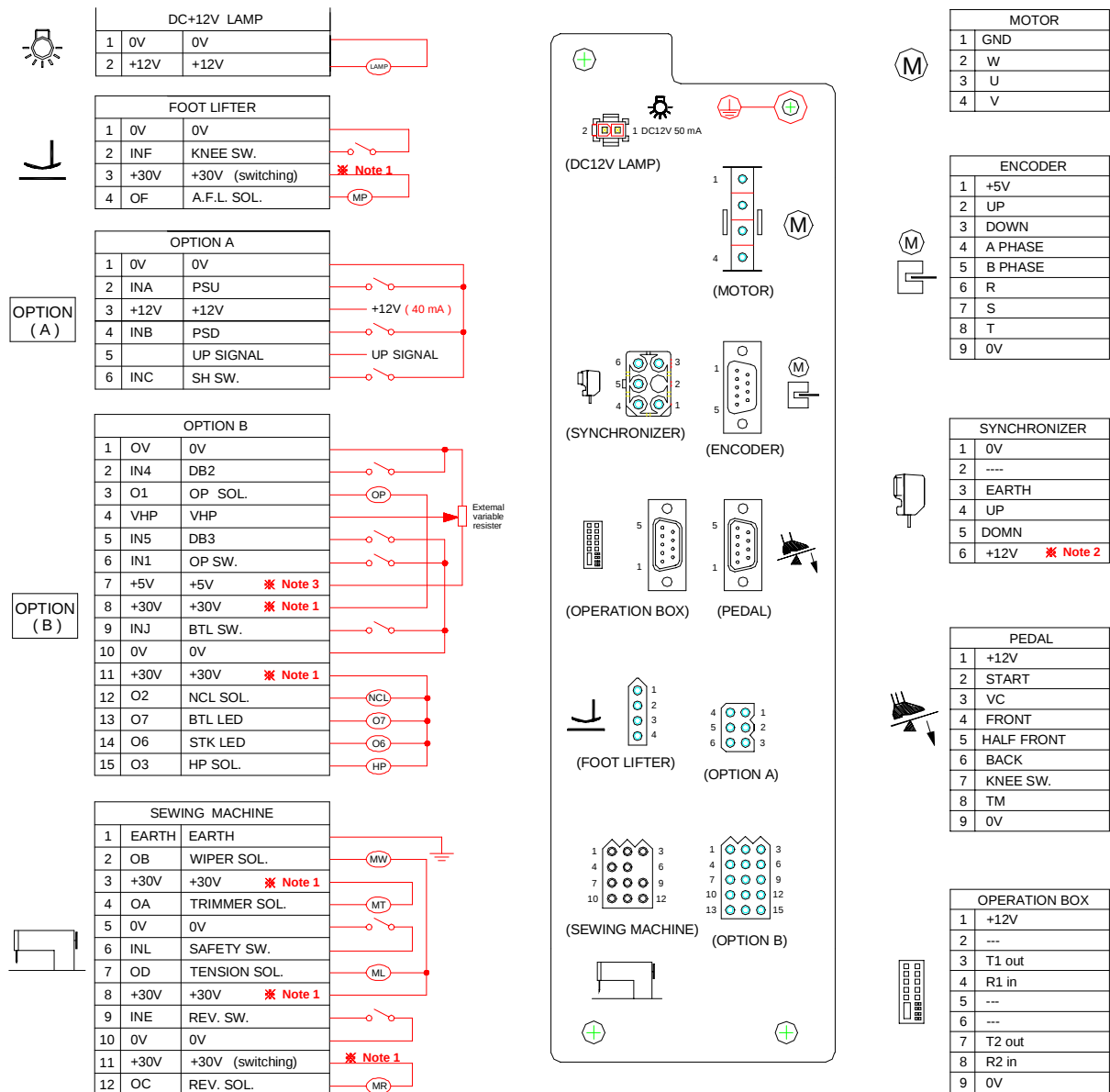
(2).HVP-70- 3/4 -7W :



NOTE : For HVP-3-7W, There is no 【OPTION】 .

Item	Voltage supply	Factory setting	Location	Description
Note 1	30 V / 24 V	24 V	JP 4 / JP 5	JP 4 = 30V , JP 5 = 24V
Note 2	5 V / 12 V	5 V	JP 3	Must be set at 5 V
Note 3	5 V / 12 V	5 V	JP 10	
Remark	Switching voltage output is available for MR 、MP only.			

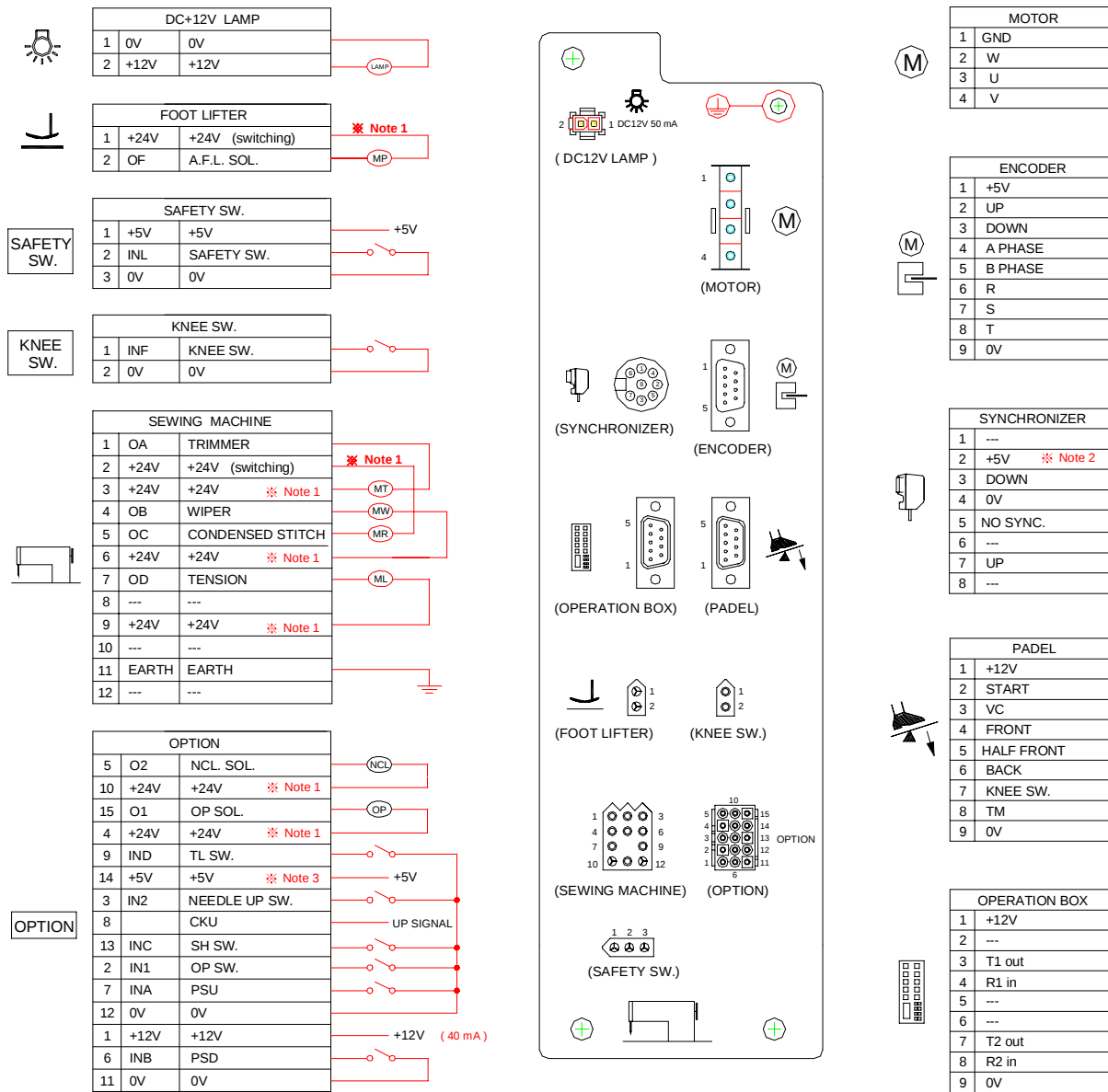
(3).HVP-70- 3/4 -H1 : (H2) 、(H3)



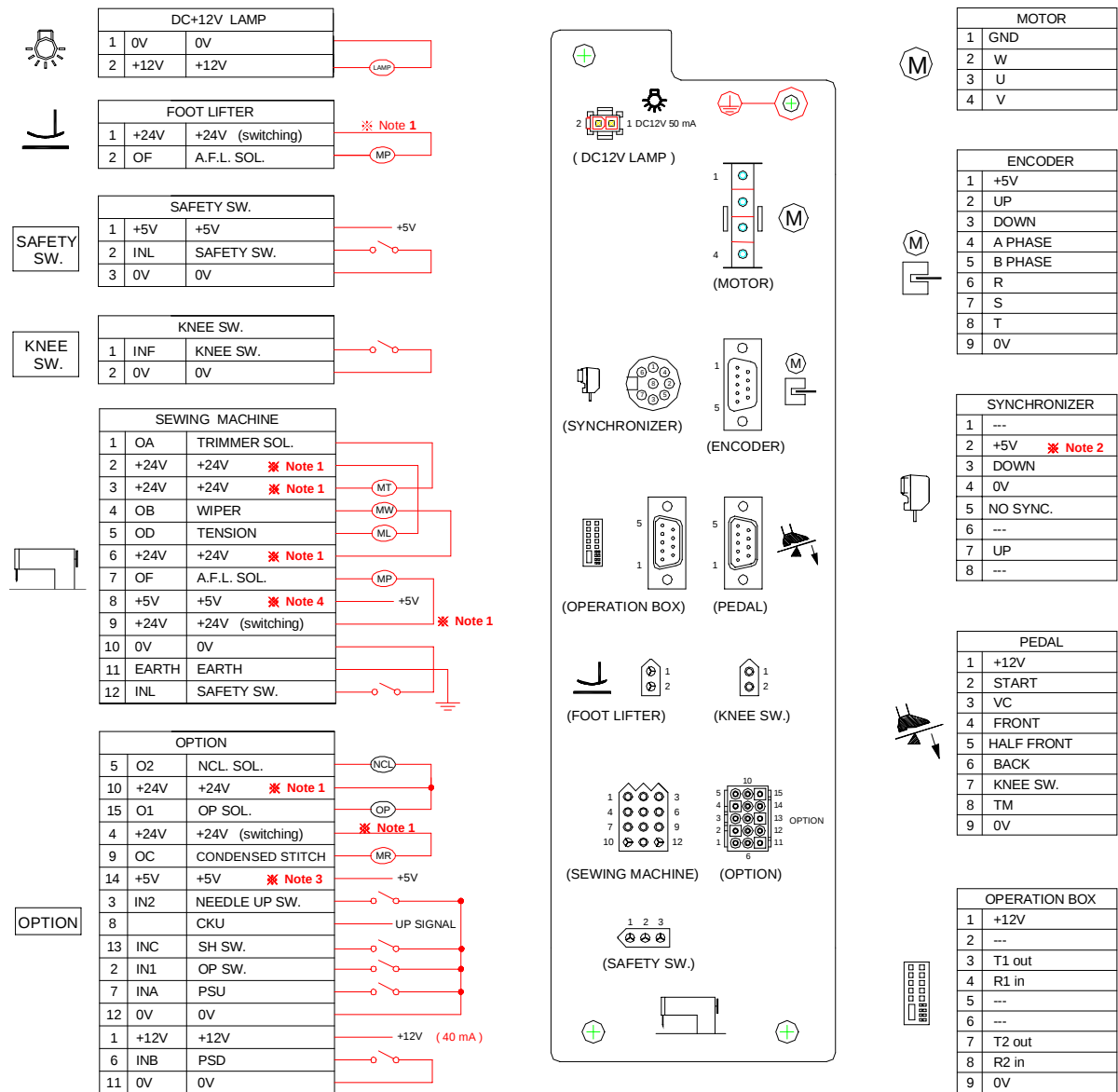
NOTE : For HVP-3-H1, There is no 【OPTION A & OPTION B】.

Item	Voltage supply	Factory setting	Location	Description
Note 1	30 V / 24 V	30 V	JP 4 / JP 5	JP 4 = 30V , JP 5 = 24V.
Note 2	5 V / 12 V	12 V	JP 3	Must be set at 12 V.
Note 3	5 V / 12 V	5 V	JP 10	
Remark	Switching voltage output is available for MR 、MP only.			

(4).HVP-70- 4 -66 : (V7)



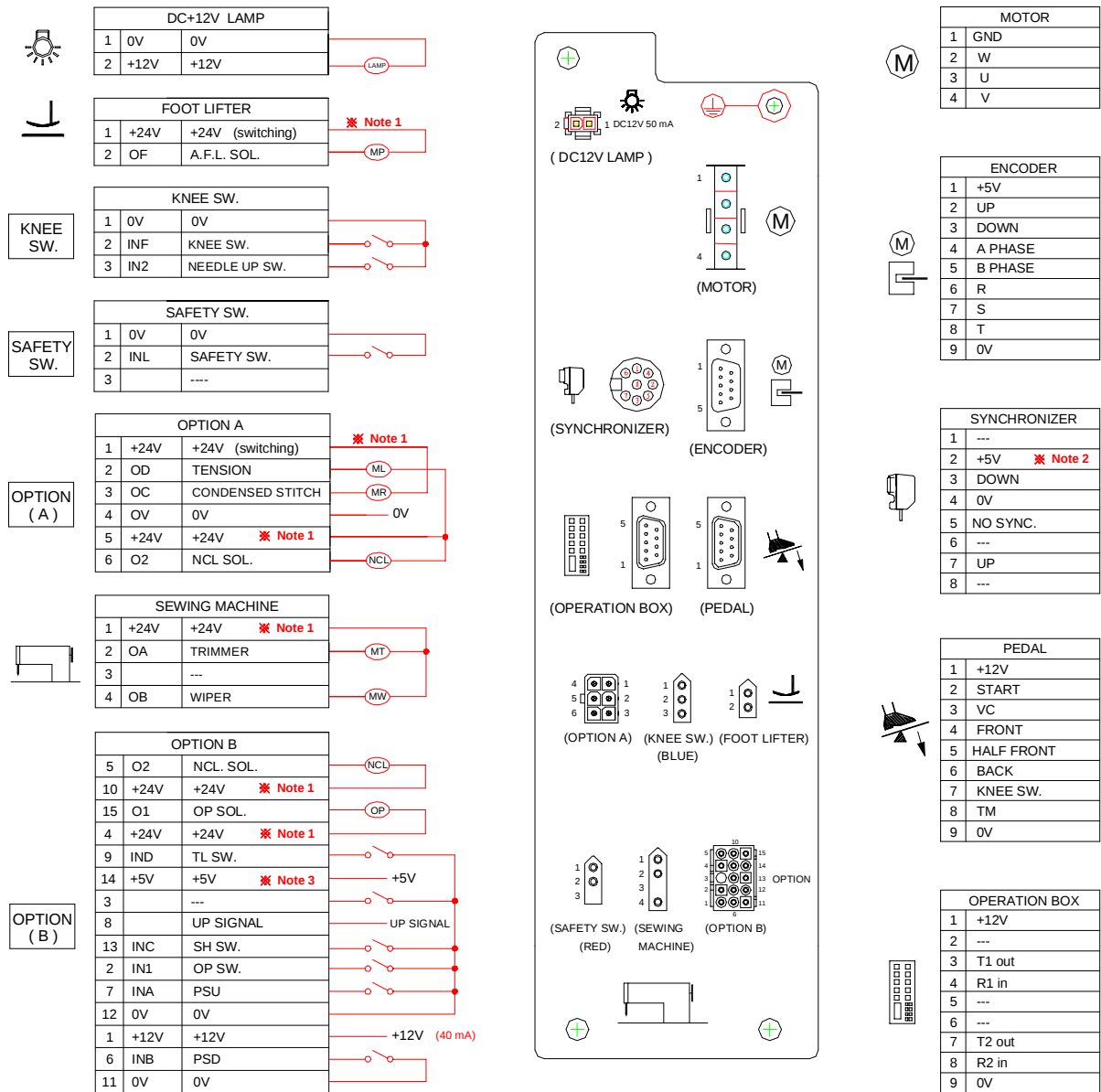
(5).HVP-70- 4 -46 : (T2)



NOTE :

Item	Voltage supply	Factory setting	Location	Description
Note 1	24 V / 30 V	24 V	JP 4 / JP 5	JP 4 = 30V , JP 5 = 24V.
Note 2	5 V / 12 V	5 V	JP 3	Must be set at 5 V.
Note 3	5 V / 12 V	5 V	JP 10	
Note 4	5 V / 12 V	5 V	JP 11	
Remark	Switching voltage output is available for MR 、MP only.			

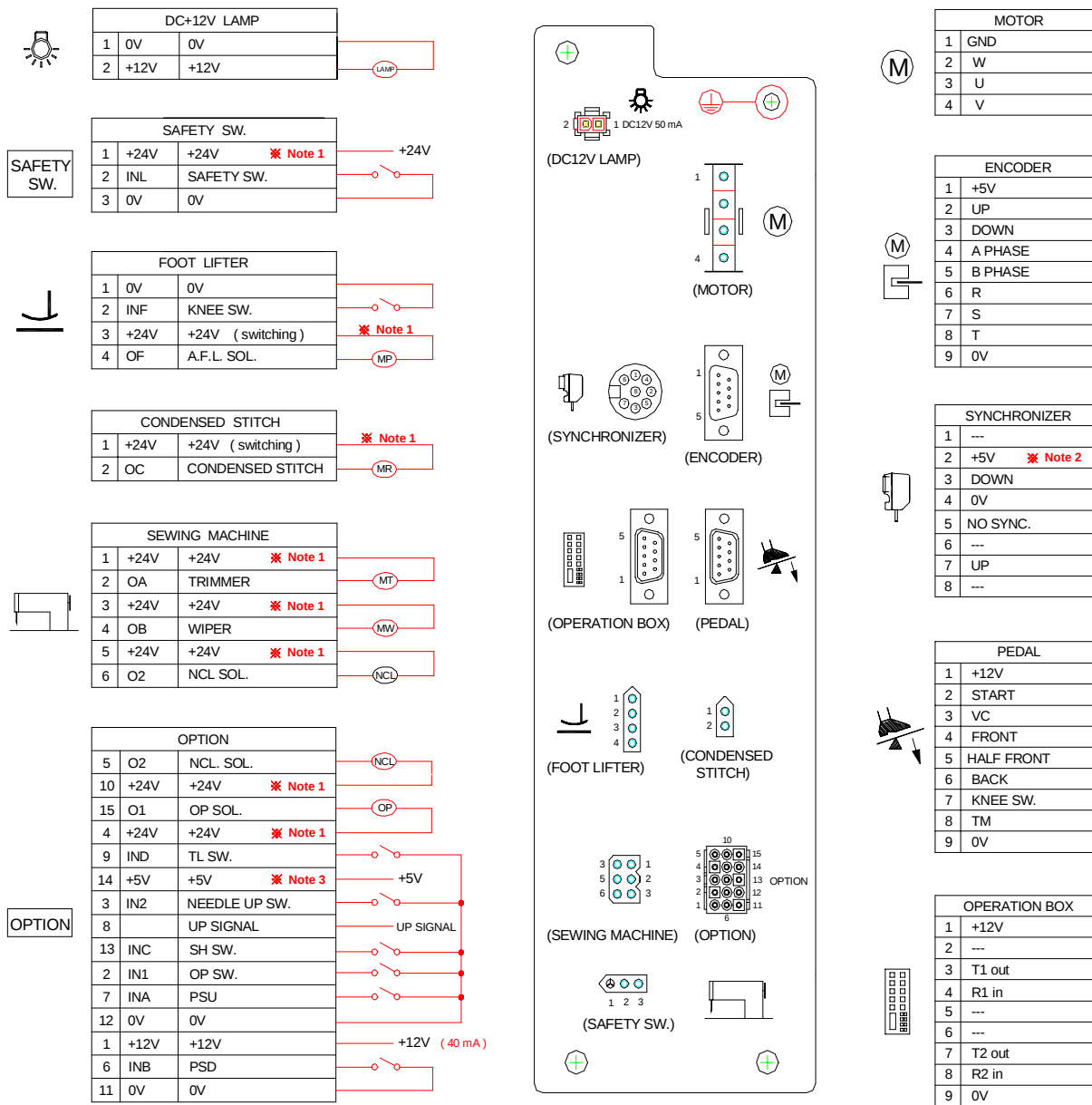
(6).HVP-70- 4 -70 :



NOTE :

Item	Voltage supply	Factory setting	Location	Description
Note 1	30 V / 24 V	24 V	JP 4 / JP 5	JP 4 = 30V , JP 5 = 24V.
Note 2	5 V / 12 V	5 V	JP 3	Must be set at 5 V.
Note 3	5 V / 12 V	5 V	JP 10	
Remark	Switching voltage output is available for MR 、MP only.			

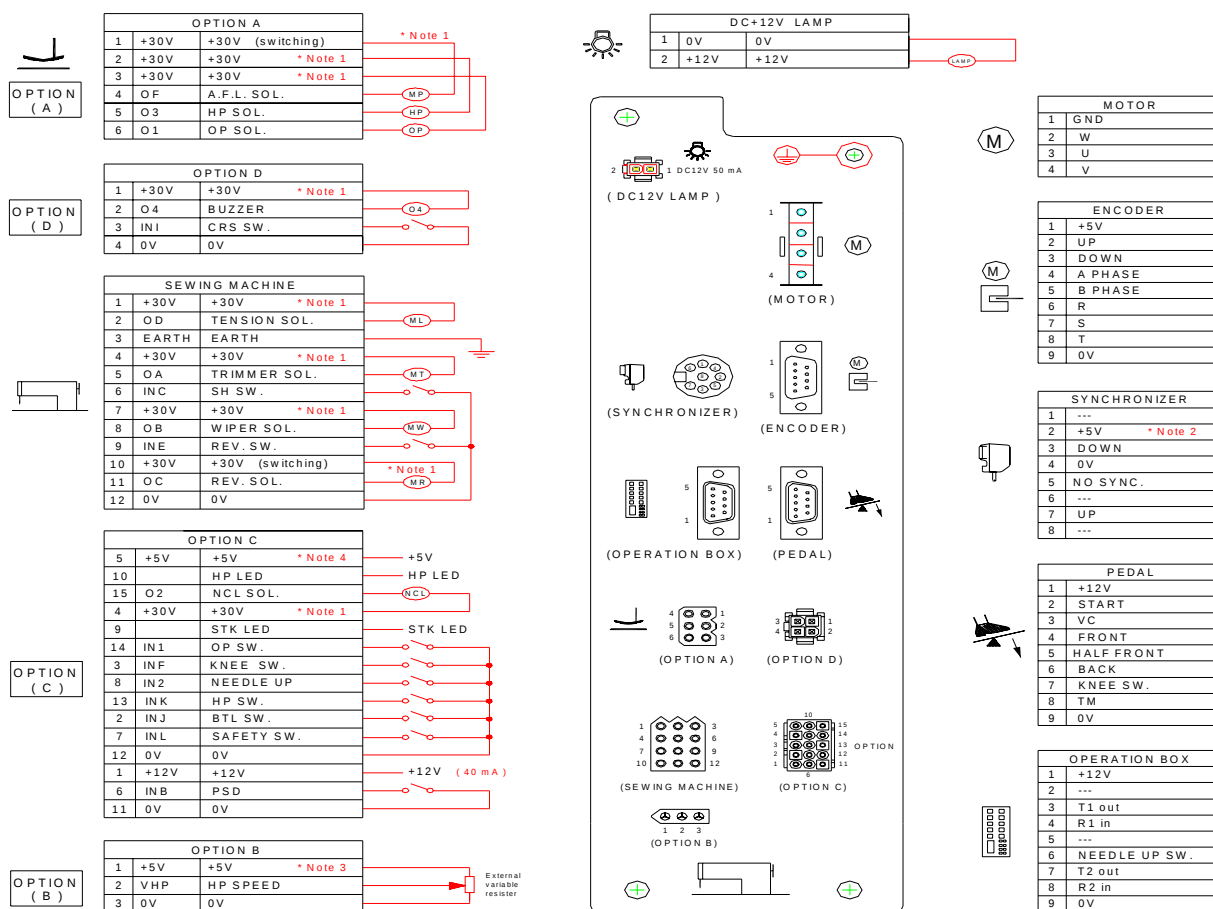
(7).HVP-70- 4 -98 :



NOTE :

Item	Voltage supply	Factory setting	Location	Description
Note 1	30 V / 24 V	24 V	JP 4 / JP 5	JP 4 = 30V , JP 5 = 24V.
Note 2	5 V / 12 V	5 V	JP 3	Must be set at 5 V.
Note 3	5 V / 12 V	5 V	JP 10	
Remark	Switching voltage output is available for MR 、MP only.			

(8). HVP-70-4-GD



Note :

Item	Voltage supply	Factory setting	Location	Description
Note 1	30 V / 24 V	30 V	JP 4 / JP 5	JP 4 = 30V · JP 5 = 24V.
Note 2	12 V / 5 V	5 V	JP 3	Must be set at 5 V.
Note 3	12 V / 5 V	5 V	JP 10	Setting at 5V for Garudan machine
Note 4	12 V / 5 V	5 V	JP 11	
Remark	Switching voltage output is available for MR · MP only.			

MACHINE CODE DESCRIPTION

GROUP	CODE	MACHINE
GARUDAN	88	GARUDAN GF-115 (built-in synchronizer.)
	89	GARUDAN GF-115 (external synchronizer.)
	90	GARUDAN GF-115-447 (built-in synchronizer.)
	91	GARUDAN GF-115-447 (external synchronizer.)
	92	GARUDAN GF-130-446 H (built-in synchronizer.)
	93	GARUDAN GF-130-446 H (external synchronizer.)
	94	GARUDAN GF-130-446 LM (external synchronizer.)
	95	GARUDAN GF-207 Series
	96	GARUDAN GF-233-448 / GF-133-448 Series
	97	GARUDAN GP-510-146
	98	GARUDAN GP-510-446
	99	GARUDAN CT / FT Series
	100	GARUDAN GF-138 /-238 Series
	101	GARUDAN GZ-500 Series

7-Segment Display Characters Compare Chart :

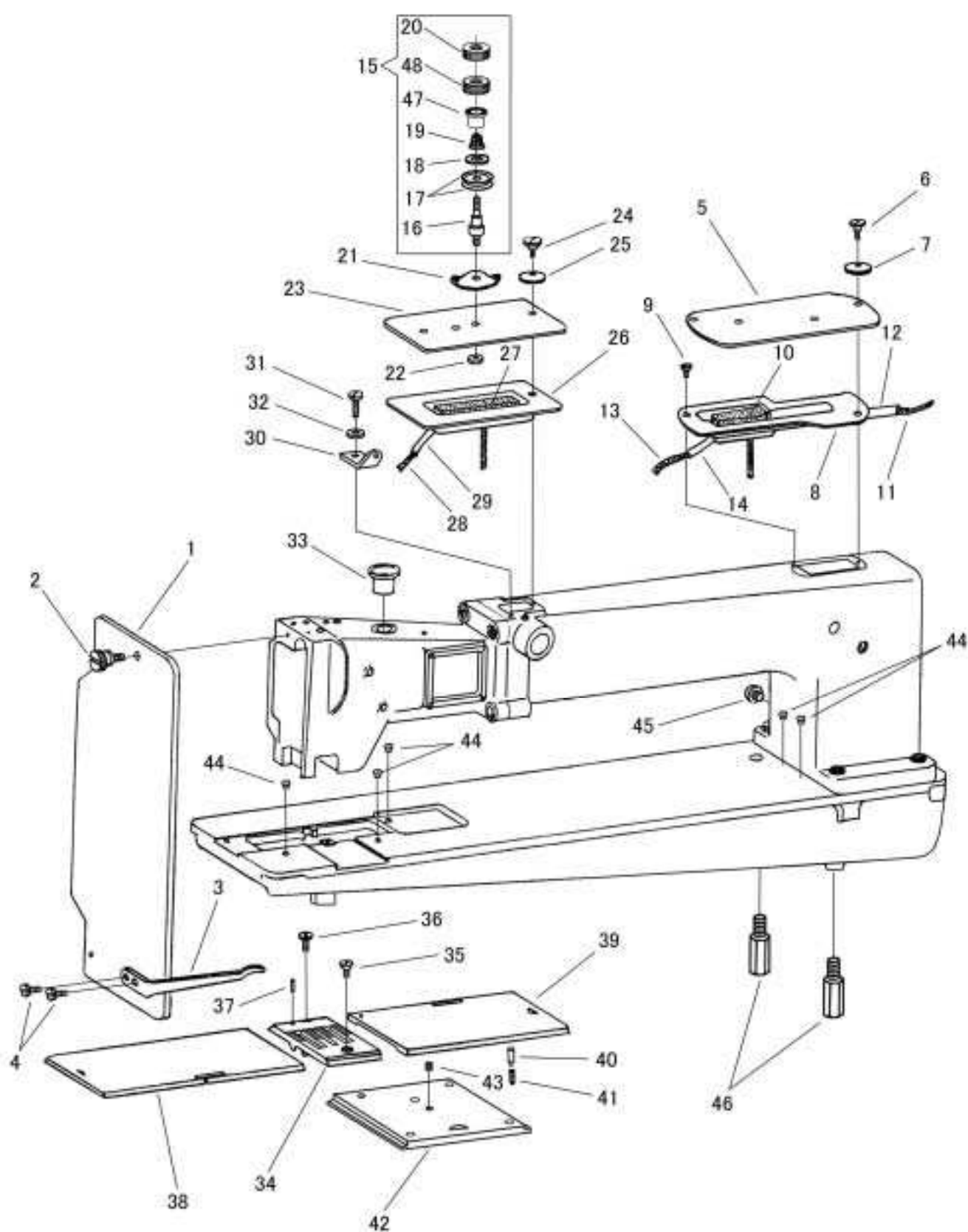
Arabic Numerals

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

English Alphabet

Actual Alphabet	A	B	C	D	E	F	G	H	I	J
Display Alphabet										
Actual Alphabet	K	L	M	N	O	P	Q	R	S	T
Display Alphabet										
Actual Alphabet	U	V	W	X	Y	Z				
Display Alphabet										

面板、上板
FACE PLATE, ARM TOP COVER

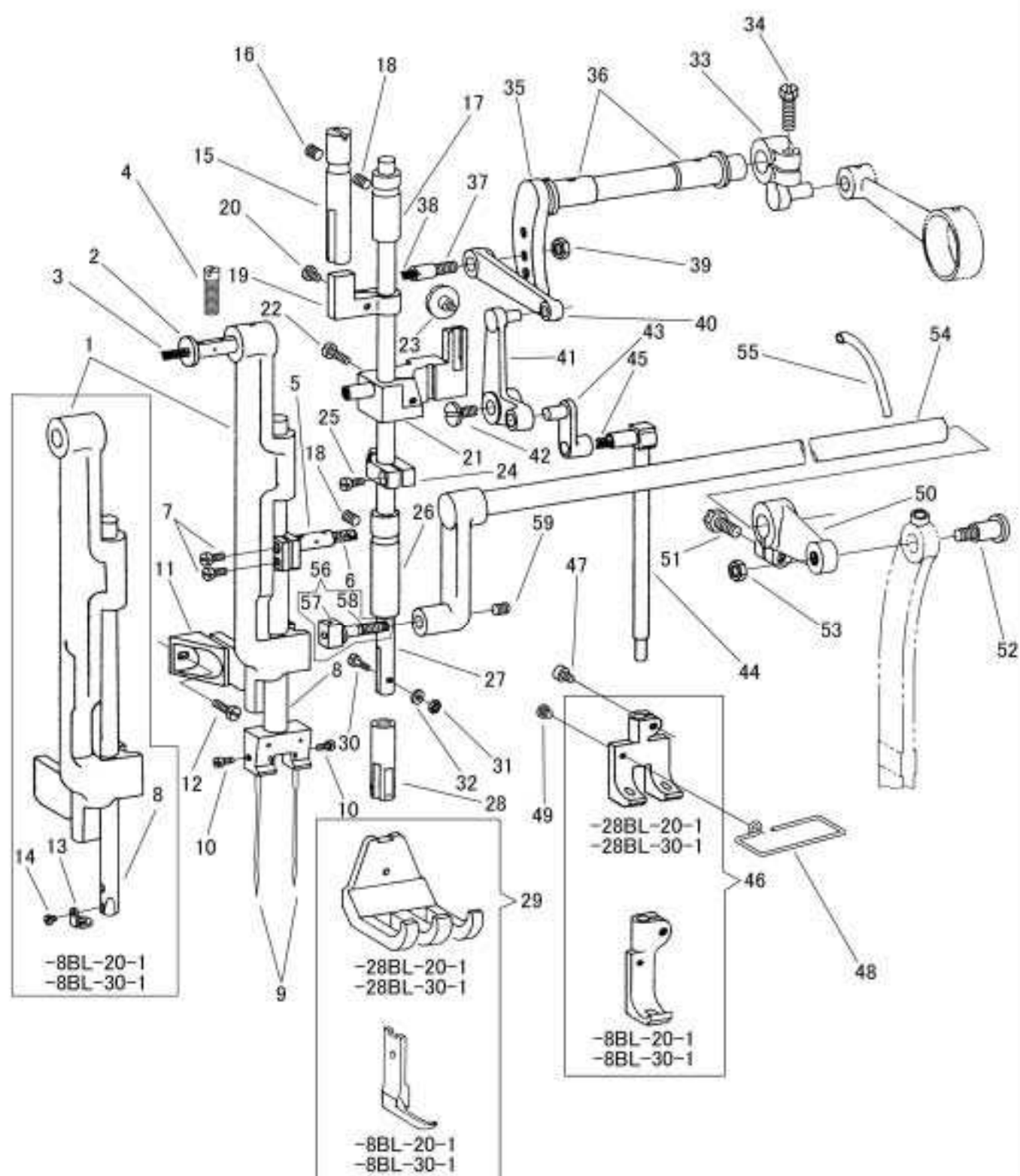


面板、上板
FACE PLATE, ARM TOP COVER

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70079	*	*	*	*	1	面板	FACE PLATE
2	11570	*	*	*	*	1	面板止めねじ	THUMB SCREW 13/64X32 L=7.0
3	70080	*	*	*	*	1	面板糸掛	FACE PLATE THREAD GUIDE
4	10597	*	*	*	*	2	面板糸掛止めねじ	SCREW 1/8X40 L=3.3
5	18004	*	*	*	*	1	上板 後)	ARM CAP (REAR)
6	10704	*	*	*	*	1	上板段ねじ	SCREW 3/16X28 L=6.5
7	10703	*	*	*	*	1	上板ワッシャー	WASHER
8	18103	*	*	*	*	1	オイルタンク(後)	LUBRICATING OIL CUP (REAR)
9	7041	*	*	*	*	1	オイルタンク 後)止めねじ	SCREW 1/8X44 L=7.0
10	18104	*	*	*	*	1	オイルタンク 後)フェルト	OIL PAD
11	70181	*	*	*	*	1	油芯	OIL WICK
12	70186	*	*	*	*	1	ビニールパイプ	VINYL TUBE
13	70182	*	*	*	*	1	油芯	OIL WICK
14	70187	*	*	*	*	1	ビニールパイプ	VINYL TUBE
15	20018C	*	*	*	*	1	糸巻き糸調子 組)	BOBBIN WINDER TENSION BRACKET COMPLETE
16	150326	*	*	*	*	1	糸巻き糸調子心棒	TENSION STUD
17	20019	*	*	*	*	2	調子皿	TENSION DISC
18	20020	*	*	*	*	1	丸一皿	TENSION RELEASE DISC
19	70095	*	*	*	*	1	渦巻スプリング	TENSION SPRING
20	20021	*	*	*	*	1	糸巻き調子ローレットナット A)	TENSION THUMB NUT (A)
21	20025	*	*	*	*	1	糸巻き糸調子棒糸掛け	TENSION STUD THREAD GUIDE
22	10652	-	-	*	*	1	糸調子心棒ナット	NUT
23	70081	-	-	*	*	1	上板 前)	ARM CAP (FRONT)
24	10704	-	-	*	*	1	上板段ねじ	SCREW 3/16X28 L=6.5
25	10703	-	-	*	*	1	上板ワッシャー	WASHER
26	70082	-	-	*	*	1	オイルタンク 前)	LUBRICATING OIL CUP (FRONT)
27	70115	-	-	*	*	1	オイルタンク 前)フェルト	OIL PAD
28	70180	-	-	*	*	1	油芯	OIL WICK
29	70185	-	-	*	*	1	ビニールパイプ	VINYL TUBE
30	70111	*	*	*	*	1	糸巻き糸掛け	BOBBIN WINDER THREAD GUIDE
31	8040	*	*	*	*	1	糸巻き糸掛け止めねじ	SCREW 9/64X40 L=8.0
32	30025	*	*	*	*	1	ワッシャー	WASHER
33	70092	*	*	*	*	1	アーム油栓	ARM OIL PLUG
34	70116	*	-	*	-	1	針板	THROAT PLATE
34	70290	-	*	-	*	1	針板 1/4"	THROAT PLATE 1/4"
35	6031-01	-	*	-	*	1	針板止めねじ	SCREW 11/64X40 L=8.3
35	6031-01	*	-	*	-	2	針板止めねじ	SCREW 11/64X40 L=8.3
36	11162	-	*	-	*	1	針板決めねじ	SET SCREW 3.4X36 L=5.4
37	11163	-	*	-	*	1	ピン	THROAT PLATE STOP
38	70119	*	-	*	-	1	角板 左)	BED SLIDE (LEFT)
38	70218	-	*	-	*	1	角板 左)1/4"	BED SLIDE (LEFT) 1/4"
39	70120	*	-	*	-	1	角板 右)	BED SLIDE (RIGHT)
39	70224	-	*	-	*	1	角板 右)1/4"	BED SLIDE (RIGHT) 1/4"
40	10667	*	*	*	*	1	角板ピン	BED SLIDE STOP
41	10668	*	*	*	*	1	角板スプリング	BED SLIDE STOP SPRING
42	70214	-	*	-	*	1	差し板	BED SLIDE (FRONT)
43	13085	-	*	-	*	1	差し板止めねじ	SCREW 13/64X32 L=4.3
44	10794	*	*	*	*	5	玉入カップ (3/8)	BALL OILER
45	30046	*	*	*	*	1	アース線止めねじ	SCREW M4X0.7 L=4.0
46	30137	*	*	*	*	2	本体支え棒(A)	MACHINE SUPPORTING BOLT
47	143657	*	*	*	*	1	糸巻き調子ラチェット	RATCHET
48	153672	*	*	*	*	1	糸巻き調子ローレットナット B)	TENSION THUMB NUT (B)

押え棒、中押え棒

PRESSER BAR, VIBRATING PRESSER BAR



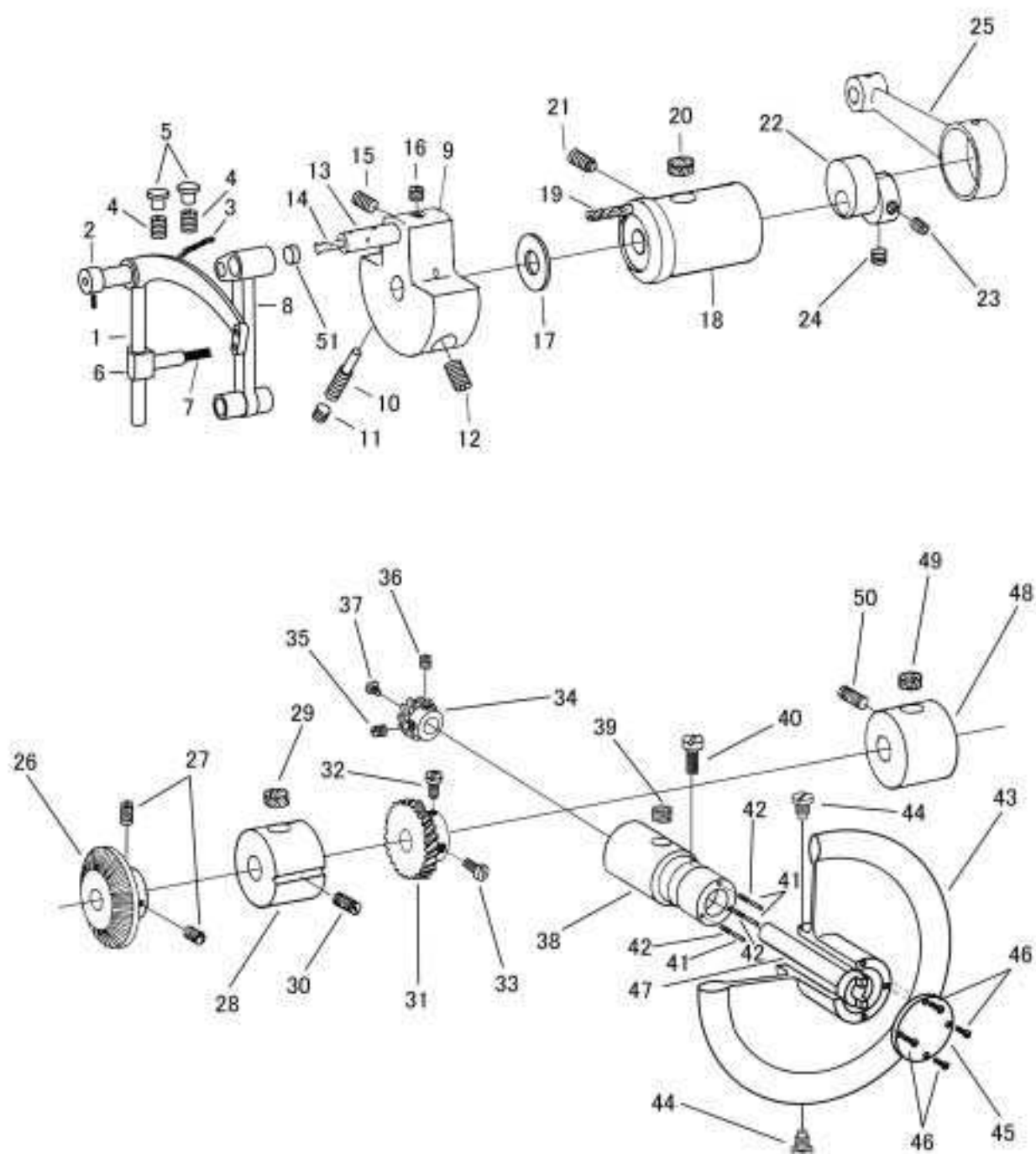
押え棒、中押え棒

PRESSER BAR, VIBRATING PRESSER BAR

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70027	*	-	*	-	1	針棒土台	NEEDLE BAR ROCK FRAME
1	70201	-	*	-	*	1	針棒土台	NEEDLE BAR ROCK FRAME
2	70028	*	*	*	*	1	針棒土台ピン	NEEDLE BAR ROCK FRAME HINGE STUD
3	10728	*	*	*	*	1	油芯	OIL WICK
4	70029	*	*	*	*	1	針棒土台ピン止めねじ	SCREW 6.75X24 L=19.5
5	70022	*	*	*	*	1	針棒抱き	NEEDLE BAR CONNECTION STUD
6	10726	*	*	*	*	1	油芯	OIL WICK
7	10532	*	*	*	*	2	針棒抱き締ねじ	PINCH SCREW 5/32X40 L=9.0
8	70023	*	-	*	-	1	針棒	NEEDLE BAR
8	70230	-	*	-	*	1	針棒 1/4	NEEDLE BAR 1/4
9	N3324	*	-	*	-	1	針 DYX3 # 24	NEEDLE DY X 3 #24
9	N3324	-	*	-	*	2	針 DYX3 # 24	NEEDLE DY X 3 #24
10	70025	*	-	*	-	1	針止めねじ	SCREW 3/16X32 L=5.5
10	70025	-	*	-	*	2	針止めねじ	SCREW 3/16X32 L=5.5
11	70030	*	*	*	*	1	イケール	NEEDLE BAR LOCK FRAME POSITION BRACKET
12	15055	*	*	*	*	1	イケール止めねじ	SCREW 1/64X32 L=9.0
13	70024	*	-	*	-	1	針棒糸掛	NEEDLE BAR THREAD GUIDE
14	10534	*	-	*	-	1	針棒糸掛止	SCREW 2.25X48 L=2.6
15	70006	*	*	*	*	1	案内棒	PRESSER BAR POSITION GUIDE
16	10761	*	*	*	*	1	案内棒止めねじ	SCREW 6.75X24 L=11.0
17	10538	*	*	*	*	1	押え棒メタル (上)	PRESSER BAR BUSHING (UPPER)
18	10761	*	*	*	*	2	押え棒メタル止めねじ	SCREW 6.75X24 L=11.0
19	70032	*	*	*	*	1	押え棒案内	PRESSER BAR POSITION GUIDE LEVER
20	10662	*	*	*	*	1	締めねじ	PINCH SCREW 5/32X40 L=6.5
21	70033	*	*	*	*	1	押え棒抱き	PRESSER BAR LIFTING BRACKET
22	10545	*	*	*	*	1	押え棒抱き締ねじ	PINCH SCREW 11/64X32 L=14.0
23	10548	*	*	*	*	1	押え棒抱き振れ止めねじ	SCREW 6.75X24 L=8.1
24	70034	*	*	*	*	1	押え棒抱きリング	PRESSER BAR SPRING BRACKET
25	70035	*	*	*	*	1	押え棒抱きリング締ねじ	PINCH SCREW 3/16X32 L=13.7
26	10538	*	*	*	*	1	押え棒メタル (下)	PRESSER BAR BUSHING (LOWER)
27	70031	*	*	*	*	1	押え棒	PRESSER BAR
28	70378	*	*	*	*	1	押え金ホルダー	HOLDER
29	70114	*	-	*	-	1	外押え	LIFTING PRESSER FOOT
29	70270	-	*	-	*	1	外押え 1/4	LIFTING PRESSER FOOT 1/4
30	70379	*	*	*	*	1	押え金ホルダー止めねじ	PINCH SCREW 3.4X36 L=10.0
31	20272	*	*	*	*	1	押え金ホルダー止めねじナット	NUT
32	10677	*	*	*	*	1	ワッシャー	WASHER
33	70014	*	*	*	*	1	横軸だるま	LIFTING ECCENTRIC
34	10754	*	*	*	*	1	横軸だるま締ねじ	PINCH SCREW 6.75X24 L=16.0
35	70015	*	*	*	*	1	横軸	LIFTING ROCK SHAFT
36	10514	*	*	*	*	2	横軸メタル	LIFTING ROCK SHAFT BUSHING
37	15053	*	*	*	*	1	横軸ピンねじ	SCREW STUD
38	10728	*	*	*	*	1	油芯	OIL WICK
39	10517	*	*	*	*	1	横軸ピンねじナット	NUT
40	70038	*	*	*	*	1	くの字連結 (大)	LIFTING BELL CRANK LINK
41	70036	*	*	*	*	1	くの字	LIFTING BELL CRANK
42	10559	*	*	*	*	1	くの字止めねじ	SCREW 4.5X32 L=8.0
43	70037	*	*	*	*	1	くの字連結 (小)	VIBRATING PRESSER BAR CONNECTING LINK
44	70039	*	-	*	-	1	中押え棒	VIBRATING PRESSER BAR
44	70202	-	*	-	*	1	中押え棒	VIBRATING PRESSER BAR
45	10728	*	-	*	-	1	油芯	OIL WICK
46	70113	*	-	*	-	1	中押え	VIBRATING PRESSER FOOT
46	70250	-	*	-	*	1	中押え 1/4"	VIBRATING PRESSER FOOT 1/4"
47	141158	*	*	*	*	1	中押え止めねじ	SCREW 11/64X40 L=7.3
48	70219-02	*	*	*	*	1	フィンガーガード 1/4"	FINGER GUARD 1/4"
49	8111	*	*	*	*	1	フィンガーガード止めねじ	SCREW 1/8X44 L=3.6
50	70056	*	*	*	*	1	連結だるま	NEEDLE BAR ROCK FRAME CRANK
51	10754	*	*	*	*	1	連結だるま締ねじ	PINCH SCREW 6.75X24 L=16.0
52	13134	*	*	*	*	1	連結ロット段ねじ	HINGE SCREW 6.75X24 L=12.0
53	10586	*	*	*	*	1	連結ロット段ねじナット	NUT
54	70373	*	*	-	-	1	上送り竿	NEEDLE BAR ROCK FRAME ROCK SHAFT
54	70055	-	-	*	*	1	上送り竿	NEEDLE BAR ROCK FRAME ROCK SHAFT
55	70188	*	*	*	*	1	油パイプ	VINYL TUBE
56	11876C	*	*	*	*	1	上送り竿角玉 (組)	SLIDE BLOCK COMPLETE
57	11877	*	*	*	*	1	上送り竿角玉	SLIDE BLOCK
58	11876	*	*	*	*	1	上送り竿角玉ピンねじ	SLIDE BLOCK STUD
59	10581	*	*	*	*	1	上送り竿角玉ピンねじ止めねじ	SCREW 7/32X32 L=7.0

天秤、ハンドプーリー

THREAD TAKE-UP LEVER, HAND WHEEL

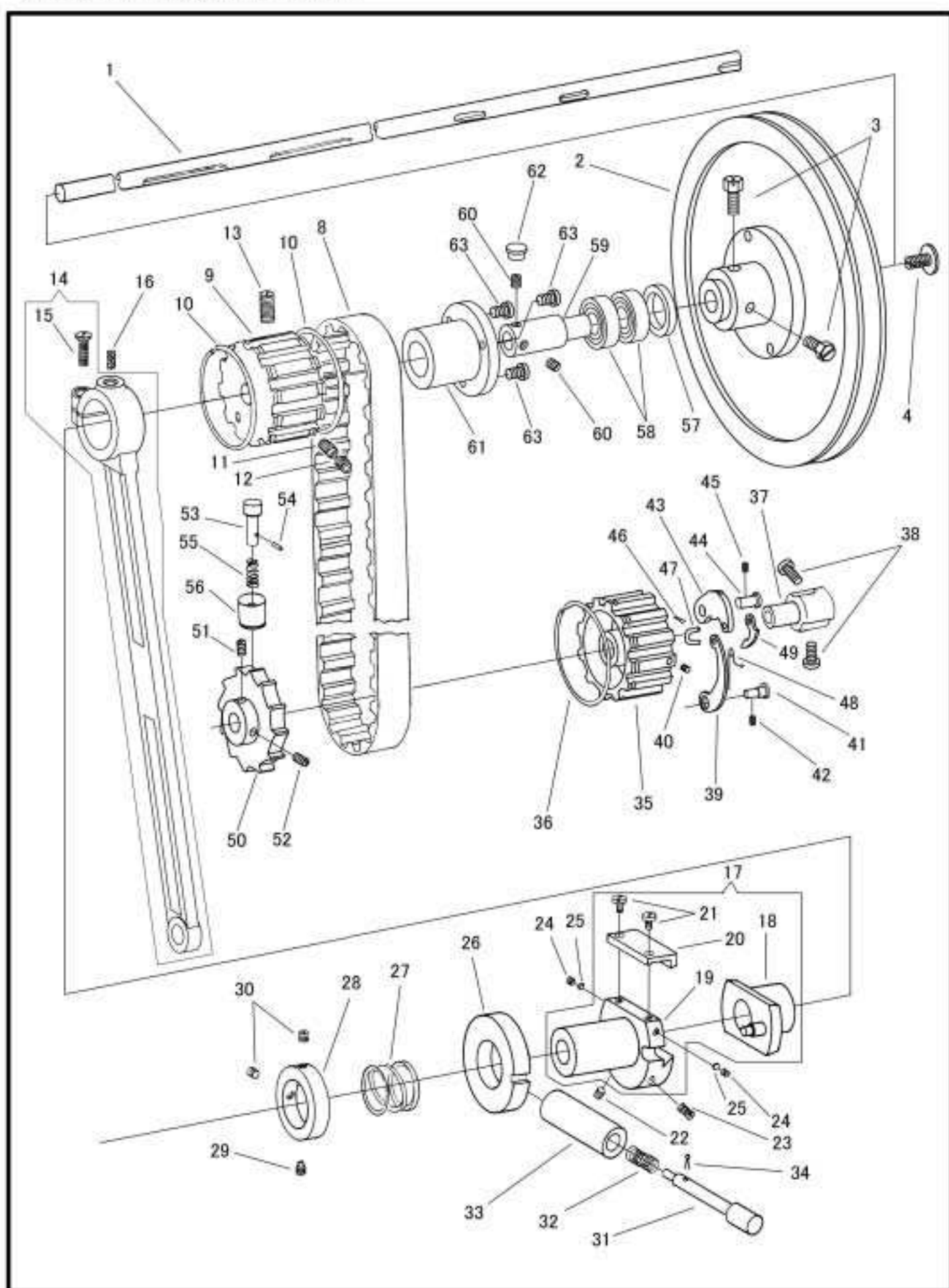


天秤、ハンドブリー

THREAD TAKE-UP LEVER, HAND WHEEL

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70018	*	*	*	*	1	天秤	THREAD TAKE-UP LEVER
2	70019	*	*	*	*	1	天秤ピン	THREAD TAKE-UP LEVER HINGE STUD
3	11042	*	*	*	*	1	油芯	OIL WICK
4	10571	*	*	*	*	2	天秤ピン止めねじ	SCREW 6.75X24 L=20.0
5	20172	*	*	*	*	2	アームゴム栓	CAP
6	70020	*	*	*	*	1	天秤抱き	THREAD TAKE-UP LEVER DRIVING STUD
7	10728	*	*	*	*	1	油芯	OIL WICK
8	70021	*	*	*	*	1	針棒連結	NEEDLE BAR CONNECTING LINK
9	70017	*	*	*	*	1	クランクモーションカム	NEEDLE BAR CRANK
10	10570	*	*	*	*	1	位置決めねじ	SET SCREW 6.75X24 L=14.5
11	10524-G	*	*	*	*	1	位置決めねじ止めねじ	SCREW 6.75X24 L=6.5
12	10571-G	*	*	*	*	1	止めねじ	SCREW 6.75X24 L=20.0
13	10523	*	*	*	*	1	針棒連結ピン	NEEDLE BAR CONNECTING LINK STUD
14	10726	*	*	*	*	1	油芯	OIL WICK
15	10524	*	*	*	*	1	針棒連結ピン止めねじ(長)	SCREW 6.75X24 L=6.5
16	70016	*	*	*	*	1	針棒連結ピン止めねじ(短)	SCREW 6.75X24 L=3.5
17	10563	*	*	*	*	1	上軸メタル 前)ワッシャー	WASHER
18	70007	*	*	*	*	1	上軸メタル 前)	ARM SHAFT BUSHING (FRONT)
19	10729	*	*	*	*	1	油芯	OIL WICK
20	10725	*	*	*	*	1	上軸メタル 前)フェルト	OIL PAD
21	10571	*	*	*	*	1	上軸メタル 前)止めねじ	SCREW 6.75X24 L=20.0
22	70013	*	*	*	*	1	中押え上下カム	FEED DRIVING ECCENTRIC
23	10639-G	*	*	*	*	1	中押え上下カム位置決めねじ	SET SCREW 1/4X32 L=8.0
24	10766-G	*	*	*	*	1	止めねじ	SCREW 1/4X32 L=7.0
25	70012	*	*	*	*	1	上連結ロッド	LIFTING ECCENTRIC CONNECTION
26	70112	*	*	*	*	1	糸巻ギヤー	BOBBIN WINDER DRIVING GEAR
27	10766	*	*	*	*	2	止めねじ	SCREW 1/4X32 L=7.0
28	70009	*	*	*	*	1	上軸中間メタル 前)	ARM SHAFT CENTER BUSHING (FRONT)
29	10725	*	*	*	*	1	上軸中間メタルフェルト	OIL PAD
30	10522	*	*	*	*	1	上軸中間メタル止めねじ	SCREW 6.75X24 L=14.0
31	70046	-	-	*	*	1	大ギヤー	HAND WHEEL DRIVING GEAR
32	70040	-	-	*	*	1	大ギヤー止位置決めねじ	SET SCREW 1/4X32 L=13.0
33	12388	-	-	*	*	1	大ギヤー止めねじ	SCREW 1/4X32 L=13.0
34	35405	-	-	*	*	1	小ギヤー	ARM CROSS SHAFT GEAR
35	10658	-	-	*	*	1	小ギヤー止めねじ	SCREW 1/4X32 L=5.5
36	10566	-	-	*	*	1	位置決めねじ	SET SCREW 1/4X32 L=5.5
37	10577	-	-	*	*	1	ハンドブリー軸止めねじ	SCREW 6.75X24 L=11.0
38	70043	-	-	*	*	1	ハンドブリー偏心メタル	ARM CROSS SHAFT BUSHING
39	10725	-	-	*	*	1	フェルト	OIL FELT
40	10519	-	-	*	*	1	ハンドブリー偏心メタル止めねじ	SCREW 6.75X24 L=17.5
41	35412	-	-	*	*	3	クラッチスプリングピン	HAND WHEEL DISENGAGING SPRING PLUNGER
42	35413	-	-	*	*	3	クラッチスプリング	HAND WHEEL DISENGAGING SPRING
43	70041	-	-	*	*	1	ハンドブリー	HAND WHEEL
44	35407	-	-	*	*	2	ハンドブリーストップねじ	SCREW 1/4X32
45	70044	-	-	*	*	1	ハンドブリークラッチ板	HAND WHEEL ENGAGING PLATE
46	12122	-	-	*	*	4	ハンドブリークラッチ板止めねじ	SCREW 11/64X32 L=8.5
47	70042	-	-	*	*	1	ハンドブリー軸	ARM CROSS SHAFT
48	70010	*	*	*	*	1	上軸中間メタル 後)	ARM SHAFT CENTER BUSHING (REAR)
49	10725	*	*	*	*	1	上軸中間メタルフェルト	OIL PAD
50	10571	*	*	*	*	1	上軸中間メタル止めねじ	SCREW 6.75X24 L=14.0
51	15038	*	*	*	*	1	針棒連結ピン油栓	CAP

上軸、プーリー
ARM SHAFT, MACHINE PULLEY



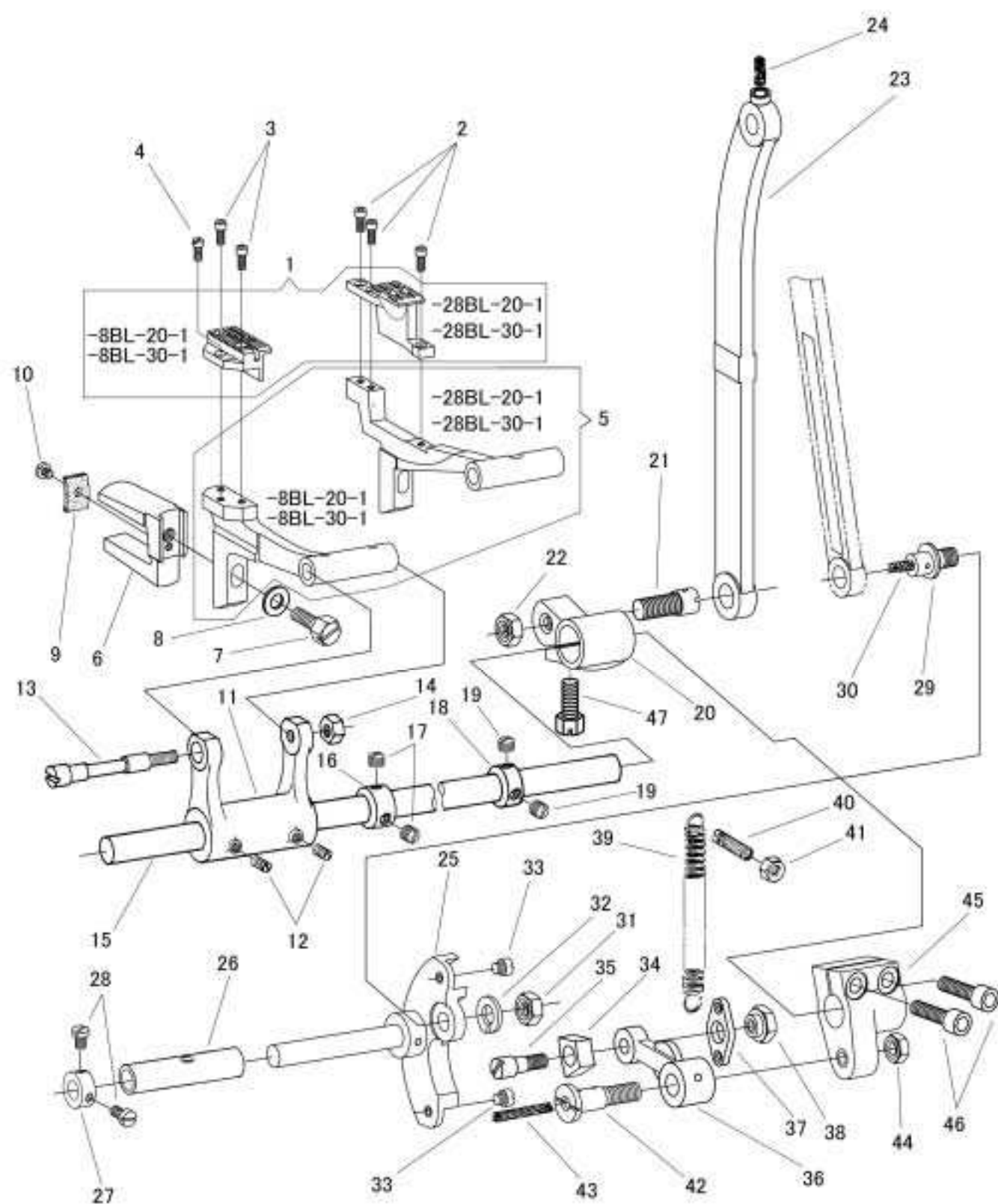
上軸、プーリー

ARM SHAFT, MACHINE PULLEY

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70008	-	-	*	*	1	上軸	ARM SHAFT
1	70372	*	*	-	-	1	上軸	ARM SHAFT
2	70093	*	*	*	*	1	プーリー	MACHINE PULLEY
3	10754	*	*	*	*	2	プーリー止めねじ	SCREW 6.75X24 L=16.0
4	10577	*	*	*	*	1	プーリー押しねじ	SCREW 6.75X24 L=11.0
8	10464-WH	*	*	*	*	1	タイミングベルト	CONNECTION BELT
9	10569	*	*	*	*	1	上ベルトプーリー	ARM SHAFT CONNECTION BELT PULLEY
10	10574	*	*	*	*	2	プーリーリング	ARM SHAFT CONNECTION BELT PULLEY SPRING FLANGE
11	10761	*	*	*	*	1	上ベルトプーリー位置決めねじ	SET SCREW 6.75X24 L=11.0
12	10524-G	*	*	*	*	1	位置決めねじ止めねじ	SCREW 6.75X24 L=6.5
13	10571-G	*	*	*	*	1	止めねじ	SCREW 6.75X24 L=20.0
14	70047	*	*	*	*	1	立ロッド	FEED DRIVING CONNECTION
16	10728	*	*	*	*	1	油芯	OIL WICK
17	70049C	*	*	*	*	1	送り土台 送りカム 組)	FEED DRIVING ECCENTRIC FLANGE COMPLETE
18	70050	*	*	*	*	1	送りカム	FEED DRIVING ECCENTRIC
19	70049	*	*	*	*	1	送りカム土台	FLANGE
20	11095	*	*	*	*	1	送りカム調節板	FRICTION PLATE
21	11096	*	*	*	*	2	送りカム調節板止めねじ	SCREW 3/16X40 L=11.0
22	11093	*	*	*	*	1	位置決めねじ	SET SCREW 3/16X32 L=10.5
23	11094	*	*	*	*	1	止めねじ	SCREW 3/16X32 L=10.5
24	2067	*	*	*	*	2	ライナー止めねじ	SCREW 11/64X40 L=6.0
25	11097	*	*	*	*	2	送りカム土台ライナー	LINING METAL
26	70051	*	*	*	*	1	渦巻カム	FEED DRIVING ECCENTRIC ADJUSTING DISC
27	11099	*	*	*	*	1	押しリングスプリング	SPRING
28	70052	*	*	*	*	1	押しリング	COLLAR
29	10639	*	*	*	*	1	位置決めねじ	SET SCREW 1/4X32 L=8.0
30	10566	*	*	*	*	2	止めねじ	SCREW 1/4X32 L=5.5
31	70054	*	*	*	*	1	押しボタン	FEED REGULATING STUD
32	12383	*	*	*	*	1	段ビススプリング	SPRING
33	70053	*	*	*	*	1	押しボタン土台	BUSHING
34	15076	*	*	*	*	1	吊り棒止割りピン	RETAINING SPRING
35	70155	*	*	*	*	1	下ベルトプーリー	SAFETY CLUTCH PULLEY
36	10574	*	*	*	*	1	プーリーリング	SAFETY CLUTCH PULLEY SPRING FLANGE
37	10611	*	*	*	*	1	下ベルトプーリー心棒	SAFETY CLUTCH PULLEY COLLAR
38	10612	*	*	*	*	2	止めねじ	SCREW 1/4X32 L=10.5
39	70153	*	*	*	*	1	下ベルトプーリー板ばね	SAFETY CLUTCH LOCKING LEVER SPRING
40	70154	*	*	*	*	1	下ベルトプーリー調節ねじ	ADJUSTING SCREW 5/32X40 L=3.6
41	70169	*	*	*	*	1	下ベルトプーリー板ばねピン	STUD
42	10581	*	*	*	*	1	止めねじ	SCREW 7/32X32 L=7.0
43	10616	*	*	*	*	1	下ベルトプーリー掛金	SAFETY CLUTCH LOCKING LEVER
44	10613	*	*	*	*	1	下ベルトプーリー掛金ピン	STUD
45	10581	*	*	*	*	1	止めねじ	SCREW 7/32X32 L=7.0
46	10620	*	*	*	*	1	下ベルトプーリー割りピン	SAFETY CLUTCH THROW-IN LATCH PIN
47	10618	*	*	*	*	1	下ベルトプーリー小連結	CONNECTING LINK
48	10619	*	*	*	*	1	下ベルトプーリースプリング	SAFETY CLUTCH THROW-IN LATCH SPRING
49	10617	*	*	*	*	1	下ベルトプーリー小爪	SAFETY CLUTCH THROW-IN LATCH
50	70139	*	*	*	*	1	爪車	HOOK DRIVING SHAFT LOCK RATCHET
51	10639	*	*	*	*	1	位置決めねじ	SET SCREW 1/4X32 L=8.0
52	10766	*	*	*	*	1	止めねじ	SCREW 1/4X32 L=7.0
53	13046	*	*	*	*	1	押しボタン	HOOK DRIVING SHAFT LOCK STUD
54	15076	*	*	*	*	1	押しボタン割りピン	STOP
55	13047	*	*	*	*	1	押しボタンスプリング	SPRING
56	13045	*	*	*	*	1	押しボタン土台	SOCKET
57	10568	*	*	*	*	1	溝なしリング	RETAINING RING
58	10567	*	*	*	*	2	上軸ベアリング	ARM SHAFT BALL BEARING
59	70652	*	*	*	*	1	上軸ベアリングカラー	ARM SHAFT BALL BEARING ADAPTER
60	23637	*	*	*	*	2	上軸ベアリングカラー止めねじ	SCREW 1/4X28 L=7.5
61	70651	*	*	*	*	1	上軸ベアリングケース	ARM SHAFT BALL BEARING ADAPTER SLEEVE
62	20171	*	*	*	*	1	ゴム栓(Φ11)	RUBBER CAP
63	50109	*	*	*	*	3	上軸ベアリングケース止めねじ	SCREW 3/16X32 L=17.0

送り歯、送り軸

FEED DOG, FEED DRIVING ROCK SHAFT



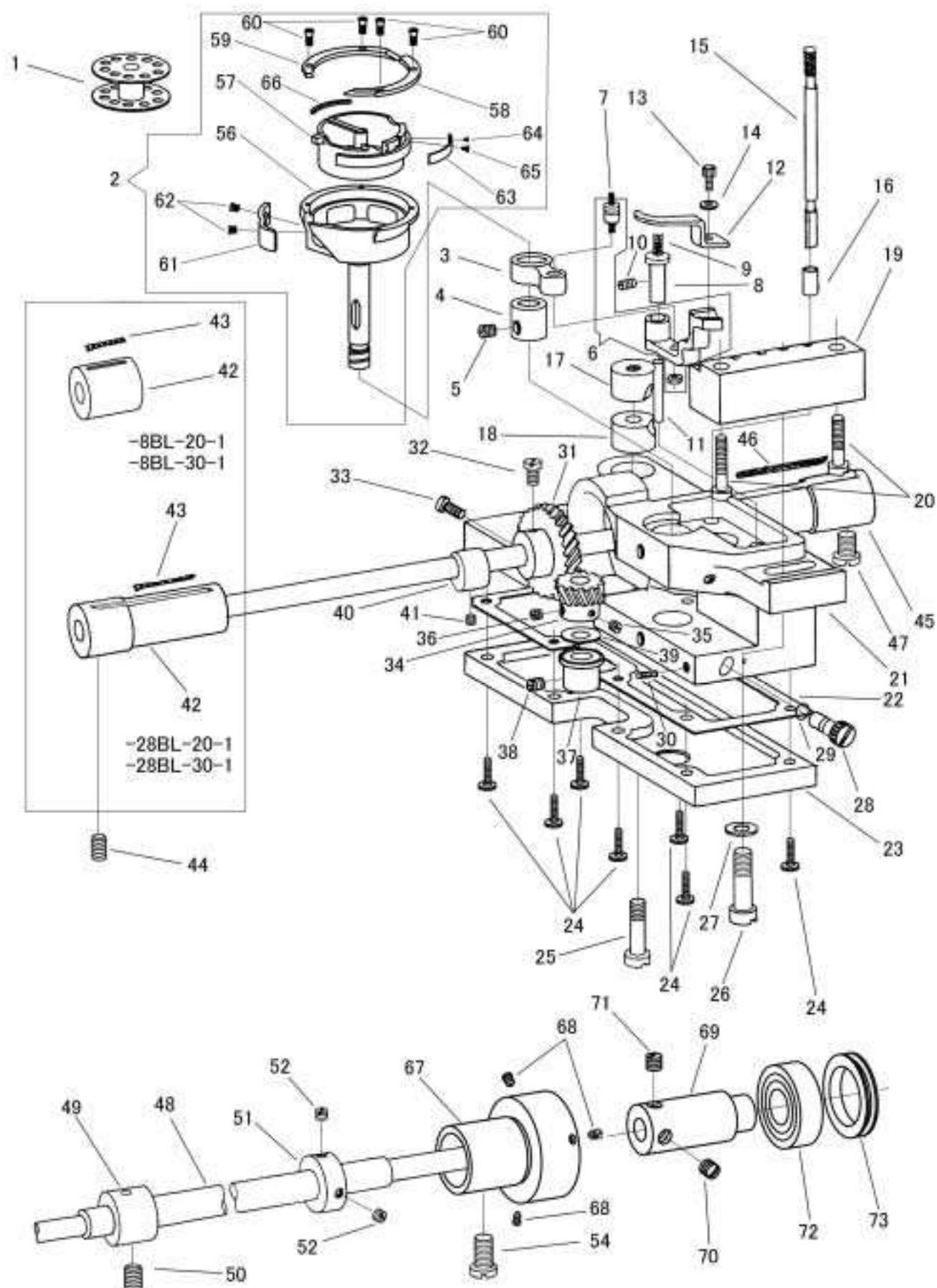
送り歯、送り軸

FEED DOG, FEED DRIVING ROCK SHAFT

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70172	*	-	*	-	1	送り歯	FEED DOG
1	70310	-	*	-	*	1	送り歯 1/4	FEED DOG 1/4
2	70118	-	*	-	*	3	送り歯止めねじ	SCREW M3X0.5 L=8.0
3	70118	*	-	*	-	2	送り歯止めねじ	SCREW M3X0.5 L=8.0
4	23350	*	-	*	-	1	送り歯止めねじ	SCREW M3X0.5 L=7.5
5	70170	*	-	*	-	1	送り土台	FEED BAR
5	70217	-	*	-	*	1	送り土台	FEED BAR
6	70128	*	*	*	*	1	コの字	FEED LIFTING CAM FORK
7	70129	*	*	*	*	1	コの字止めねじ	SCREW 7/32X32 L=15.0
8	10599	*	*	*	*	1	コの字ワッシャー	WASHER
9	10596	*	*	*	*	1	コの字フェルト	OIL FELT
10	10597	*	*	*	*	1	コの字フェルト止めねじ	SCREW 1/8X40 L=3.3
11	70126	*	*	*	*	1	送り土台腕	FEED BAR CRANK
12	12408	*	*	*	*	2	送り土台腕止めねじ	SCREW 6.75X24 L=7.5
13	10602	*	*	*	*	1	送り土台ピンねじ	FEED BAR HINGE SCREW
14	10636	*	*	*	*	1	送り土台ピンねじナット	NUT
15	70380	*	*	-	-	1	送り軸	FEED DRIVING ROCK SHAFT
15	70608	-	-	*	*	1	送り軸	FEED DRIVING ROCK SHAFT
16	10593	*	*	*	*	1	送り軸カラー 前)	COLLAR (FRONT)
17	10764	*	*	*	*	2	送り軸カラー 前) 止めねじ	SCREW 6.75X24 L=4.5
18	10593	*	*	*	*	1	送り軸カラー(後)	COLLAR (REAR)
19	10764	*	*	*	*	2	送り軸カラー 後) 止めねじ	SCREW 6.75X24 L=4.5
20	70124	*	*	*	*	1	送り軸だるま 前)	FEED REVERSING CRANK (FRONT)
21	70613	*	*	*	*	1	連結ロッドピンねじ	FEED REVERSING CRANK SCREW STUD
22	11185	*	*	*	*	1	連結ロッドピンねじナット	NUT
23	70057	*	*	*	*	1	連結ロッド	NEEDLE BAR ROCK FRAME CRANK CONNECTION
24	10728	*	*	*	*	1	油芯	OIL WICK
25	70162-A	*	*	*	*	1	切り換え案内台	FEED REVERSING LEVER
26	70160	*	*	*	*	1	切り換え案内台メタル	FEED REVERSING LEVER BUSHING
27	70161	*	*	*	*	1	切り換え案内台カラー	COLLAR
28	10561	*	*	*	*	2	切り換え案内台カラー止めねじ	SCREW 11/64X32 L=6.5
29	70048-A	*	*	*	*	1	立ロッドピンねじ	HINGE SCREW 7.85X20 L=12.0
30	10728	*	*	*	*	1	油芯	OIL WICK
31	11185	*	*	*	*	1	立ロッドピンねじナット	NUT
32	20191	*	*	*	*	1	スプリングワッシャー	SPRING WASHER
33	70163	*	*	*	*	2	案内駒ストッパーねじ	SCREW 3/16X32 L=3.6
34	70612	*	*	*	*	1	切換え案内駒	FEED REVERSING LEVER SLIDE BLOCK
35	70611	*	*	*	*	1	案内駒ピンねじ	HINGE SCREW 15/64X28 L=10.0
36	70610	*	*	*	*	1	切換えクランク	FEED REVERSING LINK
37	70159	*	*	*	*	1	切換えクランクスプリング掛け	SPRING AND TREADLE CONNECTING LINK
38	70167	*	*	*	*	1	案内駒ピンねじナット	NUT
39	70158	*	*	*	*	1	切換えクランクスプリング	SPRING
40	70156	*	*	*	*	1	切換えスプリング掛ねじ	SPRING HOOK
41	70157	*	*	*	*	1	切換えスプリング掛ねじナット	NUT
42	70168	*	*	*	*	1	切換えクランク段ねじ	HINGE SCREW 7.85X20 L=21.6
43	10728	*	*	*	*	1	油芯	OIL WICK
44	11185	*	*	*	*	1	切換えクランク段ねじナット	NUT
45	70609	*	*	*	*	1	送り軸だるま 後)	FEED REVERSING CRANK (REAR)
46	35034	*	*	*	*	2	送り軸だるま 後) 締めねじ	PINCH SCREW M6X1 L=20.0
47	10754	*	*	*	*	2	送り軸だるま 前) 締めねじ	PINCH SCREW 6.75X24 L=16.0

カマ土台(右)、下軸

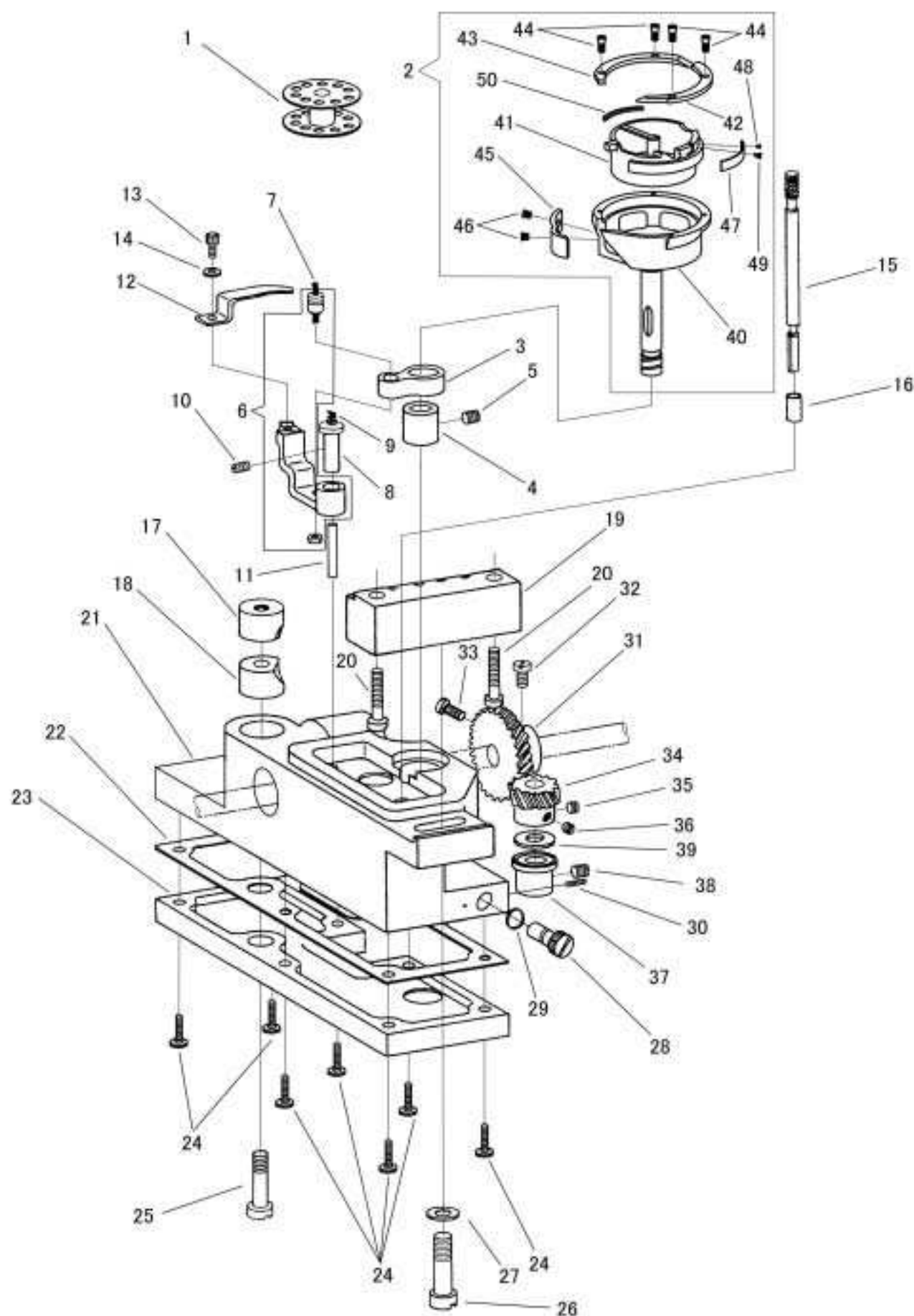
HOOK SADDLE (RIGHT), HOOK DRIVING SHAFT



カマ土台 右)、下軸 HOOK SADDLE (RIGHT), HOOK DRIVING SHAFT

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70141	*	*	*	*	1	ボビン	BOBBIN
2	70140	*	*	*	*	1	カマ 組)	HOOK COMPLETE
3	70151	*	*	*	*	1	カマ連結メガネ	BOBBIN CASE OPENER LEVER LINK
4	70145	*	*	*	*	1	カマメタル 上)	HOOK BUSHING (UPPER)
5	11176	*	*	*	*	1	カマメタル 上) 止めねじ	SCREW 7/32X32 L=5.5
6	70149C	*	*	*	*	1	オープナー土台 組)	BOBBIN CASE OPENER LEVER
7	10727	*	*	*	*	1	フェルト	OIL FELT
8	70150	*	*	*	*	1	オープナー土台ピン	BOBBIN CASE OPENER LEVER HINGE STUD
9	10727	*	*	*	*	1	フェルト	OIL FELT
10	10573	*	*	*	*	1	オープナー土台ピン止めねじ	SCREW 7/32X32 L=11.0
11	11137	*	*	*	*	1	オープナー土台ピンパイプ	OIL WICK VINYL TUBE
12	70146	*	*	*	*	1	ボビンケースオープナー	BOBBIN CASE OPENER
13	70147	*	*	*	*	1	止めねじ	SCREW M3X0.5 L=6.0
14	70148	*	*	*	*	1	ワッシャー	WASHER
15	70152	*	*	*	*	1	オイルゲージ	OIL GAUGE
16	11131	*	*	*	*	1	案内パイプ	OIL GAUGE GUIDE
17	11145	*	*	*	*	1	カマ土台締付カラー 上)	HOOK SADDLE COLLAR (UPPER)
18	11146	*	*	*	*	1	カマ土台締付カラー 下)	HOOK SADDLE COLLAR (LOWER)
19	70143	*	*	*	*	1	カマ土台取付台	OIL RESERVOIR SPACER
20	70144	*	*	*	*	2	カマ土台取付台止めねじ	SCREW 7/32X32 L=21.0
21	70142	*	*	*	*	1	カマ土台 右)	HOOK SADDLE (RIGHT)
22	15092	*	*	*	*	1	カマ土台シートパッキン	HOOK SADDLE GASKET
23	15091	*	*	*	*	1	カマ土台油タンク 右)	OIL RESERVOIR (RIGHT)
24	15007	*	*	*	*	7	カマ土台油タンク止めねじ	SCREW 9/64X40 L=10.0
25	11144	*	*	*	*	1	カマ土台締ねじ	PINCH SCREW 7/32X32 L=32.0
26	10646	*	*	*	*	1	カマ土台止めねじ	SCREW 6.75X24 L=28.0
27	10647	*	*	*	*	1	カマ土台止めねじワッシャー	WASHER
28	15093	*	*	*	*	1	油調節ダイヤル	OIL REGULATING DIAL
29	15094	*	*	*	*	1	Oリング	O-RING
30	10629	*	*	*	*	1	油調節ダイヤル止めねじ	SCREW 1/8X40 L=8.0
31	10638	*	*	*	*	1	大ギヤー	HOOK DRIVING GEAR
32	70137	*	*	*	*	1	位置決めねじ	SET SCREW 1/4X32 L=9.0
33	70138	*	*	*	*	1	止めねじ	SCREW 1/4X32 L=8.0
34	10657	*	*	*	*	1	小ギヤー	HOOK DRIVING PINION
35	10658	*	*	*	*	1	小ギヤー止めねじ A)	SCREW 1/4X32 L=5.5
36	10767	*	*	*	*	1	小ギヤー止めねじ B)	SCREW 1/4X32 L=4.5
37	15096	*	*	*	*	1	カマメタル 下)	HOOK BUSHING (LOWER)
38	11176	*	*	*	*	1	カマメタル 下) 止めねじ	SCREW 7/32X32 L=5.5
39	10644	*	*	*	*	1	カマメタル 下) ワッシャー	WASHER
40	10637	*	*	*	*	1	上下送りカム ねじ付)	FEED LIFTING CAM COMPLETE
41	10658	*	*	*	*	1	上下送りカム止めねじ	SCREW 1/4X32 L=5.5
42	12135	*	*	*	*	1	下軸メタル 前)	HOOK DRIVING SHAFT BUSHING (FRONT)
42	70132	-	*	-	*	1	下軸メタル 前) 1/16~1/4	HOOK DRIVING SHAFT BUSHING (FRONT) 1/16~1/4
42	70132-A	-	*	-	*	1	下軸メタル 前) 5/16~1-1/8	HOOK DRIVING SHAFT BUSHING (FRONT) 5/16~1-1/8
42	70132-B	-	*	-	*	1	下軸メタル 前) 1-3/16~	HOOK DRIVING SHAFT BUSHING (FRONT) 1-3/16~
43	10729	*	*	*	*	1	油芯	OIL WICK
44	10571	*	*	*	*	1	下軸メタル止めねじ	SCREW 6.75X24 L=11.0
45	70132	*	*	*	*	1	下軸中間メタル 前) 1/16~9/16	HOOK DRIVING SHAFT BUSHING (MIDDLE, FRONT) 1/16~9/16
45	70132-A	-	*	-	*	1	下軸中間メタル 前) 5/8~1-1/2	HOOK DRIVING SHAFT BUSHING (MIDDLE, FRONT) 5/8~1-1/2
45	70132-B	-	*	-	*	1	下軸中間メタル 前) 1-9/16~	HOOK DRIVING SHAFT BUSHING (MIDDLE, FRONT) 1-9/16~
46	10729	*	*	*	*	1	油芯	OIL WICK
47	10519	*	*	*	*	1	下軸中間メタル 前) 止めねじ	PINCH SCREW 6.75X24 L=17.5
48	70660	*	*	*	*	1	下軸	HOOK DRIVING SHAFT
48	70655	-	*	-	*	1	下軸	HOOK DRIVING SHAFT
49	70134	*	*	*	*	1	下軸中間メタル 後)	HOOK DRIVING SHAFT BUSHING (MIDDLE, REAR)
50	10766	*	*	*	*	1	下軸中間メタル 後) 止めねじ	SCREW 1/4X32 L=7.0
51	10593	*	*	*	*	1	下軸カラー	HOOK DRIVING SHAFT COLLAR
52	10764	*	*	*	*	2	下軸カラー止めねじ	SCREW 6.75X24 L=4.5
54	70136	*	*	*	*	1	下軸メタル 後) 止めねじ	SCREW 6.75X24 L=13.0
56	70140-01	*	*	*	*	1	外かま	HOOK
57	70140-02	*	*	*	*	1	内かま	BOBBIN CASE
58	70140-3A	*	*	*	*	1	内かま押え A	HOOK GIB (A)
59	70140-3B	*	*	*	*	1	内かま押え B	HOOK GIB (B)
60	16407-04	*	*	*	*	4	内かま押え止めねじ	SCREW
61	70104-05	*	*	*	*	1	針受板	NEEDLE GUARD
62	70140-06	*	*	*	*	2	針受板止めねじ	SCREW
63	70140-10	*	*	*	*	1	糸調子バネ	BOBBIN CASE TENSION SPRING
64	70140-11	*	*	*	*	1	糸調子バネ止めねじ	SCREW
65	70140-12	*	*	*	*	1	糸調子バネ調節ねじ	BOBBIN CASE TENSION REGULATING SCREW
66	70140-19	*	*	*	*	1	フェルト	FELT
67	30157	*	*	*	*	1	下軸ベアリングケース	HOOK DRIVING SHAFT BALL BEARING ADAPTER SLEEVE
68	10609	*	*	*	*	3	溝付きリング止めねじ	SCREW 3.4X36 L=5.0
69	10607	*	*	*	*	1	下軸ベアリングカラー	HOOK DRIVING SHAFT BALL BEARING ADAPTER
70	10658	*	*	*	*	1	位置決めねじ	SCREW 1/4X32 L=5.5
71	10566	*	*	*	*	1	止めねじ	SCREW 1/4X32 L=5.5
72	10567	*	*	*	*	1	下軸ベアリング	HOOK DRIVING SHAFT BALL BEARING
73	10608	*	*	*	*	1	溝付きリング	GROOVED RETAINING RING

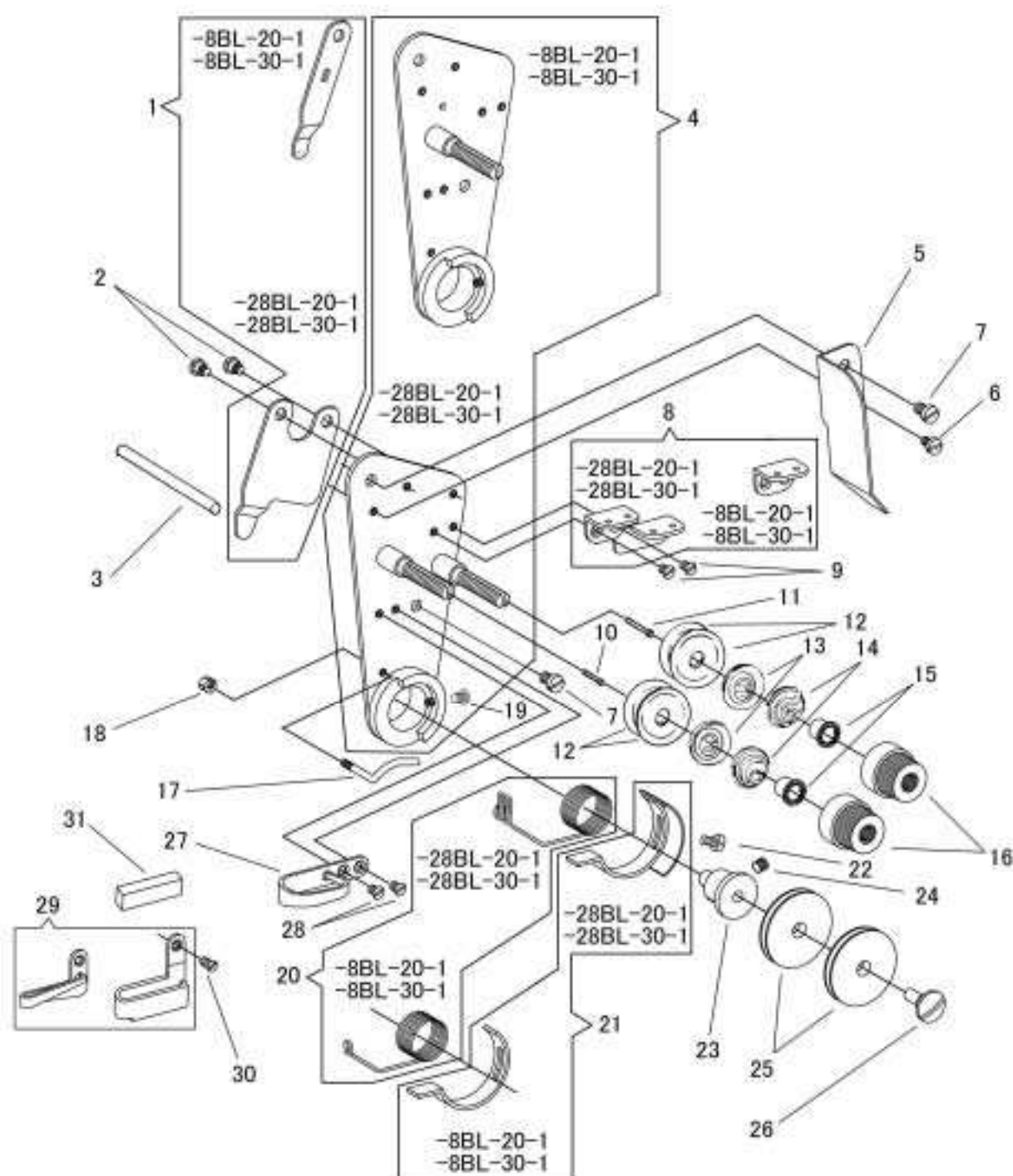
カマ土台(左)
HOOK SADDLE (LEFT)



カマ土台 左)
HOOK SADDLE (LEFT)

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70141	-	*	-	*	1	ボビン	BOBBIN
2	70140	-	*	-	*	1	カマ 組)	HOOK COMPLETE
3	70151	-	*	-	*	1	カマ連結メガネ	BOBBIN CASE OPENER LEVER LINK
4	70145	-	*	-	*	1	カマメタル (上)	HOOK BUSHING (UPPER)
5	11176	-	*	-	*	1	カマメタル (上) 止めねじ	SCREW 7/32X32 L=5.5
6	70149C	-	*	-	*	1	オープナー土台 組)	BOBBIN CASE OPENER LEVER
7	10727	-	*	-	*	1	フェルト	OIL FELT
8	70150	-	*	-	*	1	オープナー土台ピン	BOBBIN CASE OPENER LEVER HINGE STUD
9	10727	-	*	-	*	1	フェルト	OIL FELT
10	10573	-	*	-	*	1	オープナー土台ピン止めねじ	SCREW 7/32X32 L=11.0
11	11137	-	*	-	*	1	オープナー土台ピンパイプ	OIL WICK VINYL TUBE
12	70146	-	*	-	*	1	ボビンケースオープナー	BOBBIN CASE OPENER
13	70147	-	*	-	*	1	止めねじ	SCREW M3X0.5 L=6.0
14	70148	-	*	-	*	1	ワッシャー	WASHER
15	70152	-	*	-	*	1	オイルゲージ	OIL GAUGE
16	11131	-	*	-	*	1	案内パイプ	OIL GAUGE GUIDE
17	11145	-	*	-	*	1	カマ土台締付カラー (上)	HOOK SADDLE COLLAR (UPPER)
18	11146	-	*	-	*	1	カマ土台締付カラー (下)	HOOK SADDLE COLLAR (LOWER)
19	70143	-	*	-	*	1	カマ土台取付台	OIL RESERVOIR SPACER
20	70144	-	*	-	*	2	カマ土台取付台止めねじ	SCREW 7/32X32 L=21.0
21	70203	-	*	-	*	1	カマ土台 左)	HOOK SADDLE (LEFT)
22	15092	-	*	-	*	1	カマ土台シートパッキン	HOOK SADDLE GASKET
23	15521	-	*	-	*	1	カマ土台油タンク 左)	OIL RESERVOIR (LEFT)
24	15007	-	*	-	*	7	カマ土台油タンク止めねじ	SCREW 9/64X40 L=10.0
25	11144	-	*	-	*	1	カマ土台締ねじ	PINCH SCREW 7/32X32 L=32.0
26	10646	-	*	-	*	1	カマ土台止めねじ	SCREW 6.75X24 L=28.0
27	10647	-	*	-	*	1	カマ土台止めねじワッシャー	WASHER
28	15093	-	*	-	*	1	油調節ダイヤル	OIL REGULATING DIAL
29	15094	-	*	-	*	1	Oリング	O-RING
30	10629	-	*	-	*	1	油調節ダイヤル止めねじ	SCREW 1/8X40 L=8.0
31	10638	-	*	-	*	1	大ギヤー	HOOK DRIVING GEAR
32	70137	-	*	-	*	1	位置決めねじ	SET SCREW 1/4X32 L=9.0
33	70138	-	*	-	*	1	止めねじ	SCREW 1/4X32 L=8.0
34	10657	-	*	-	*	1	小ギヤー	HOOK DRIVING PINION
35	10658	-	*	-	*	1	小ギヤー止めねじ A)	SCREW 1/4X32 L=5.5
36	10767	-	*	-	*	1	小ギヤー止めねじ B)	SCREW 1/4X32 L=4.5
37	15096	-	*	-	*	1	カマメタル (下)	HOOK BUSHING (LOWER)
38	11176	-	*	-	*	1	カマメタル (下) 止めねじ	SCREW 7/32X32 L=5.5
39	10644	-	*	-	*	1	カマメタル (下) ワッシャー	WASHER
40	70140-01	*	*	*	*	1	外かま	HOOK
41	70140-02	*	*	*	*	1	内かま	BOBBIN CASE
42	70140-3A	*	*	*	*	1	内かま押え A	HOOK GIB (A)
43	70140-3B	*	*	*	*	1	内かま押え B	HOOK GIB (B)
44	16407-04	*	*	*	*	4	内かま押え止めねじ	SCREW
45	70104-05	*	*	*	*	1	針受板	NEEDLE GUARD
46	70140-06	*	*	*	*	2	針受板止めねじ	SCREW
47	70140-10	*	*	*	*	1	糸調子バネ	BOBBIN CASE TENSION SPRING
48	70140-11	*	*	*	*	1	糸調子バネ止めねじ	SCREW
49	70140-12	*	*	*	*	1	糸調子バネ調節ねじ	BOBBIN CASE TENSION REGULATING SCREW
50	70140-19	*	*	*	*	1	フェルト	FELT

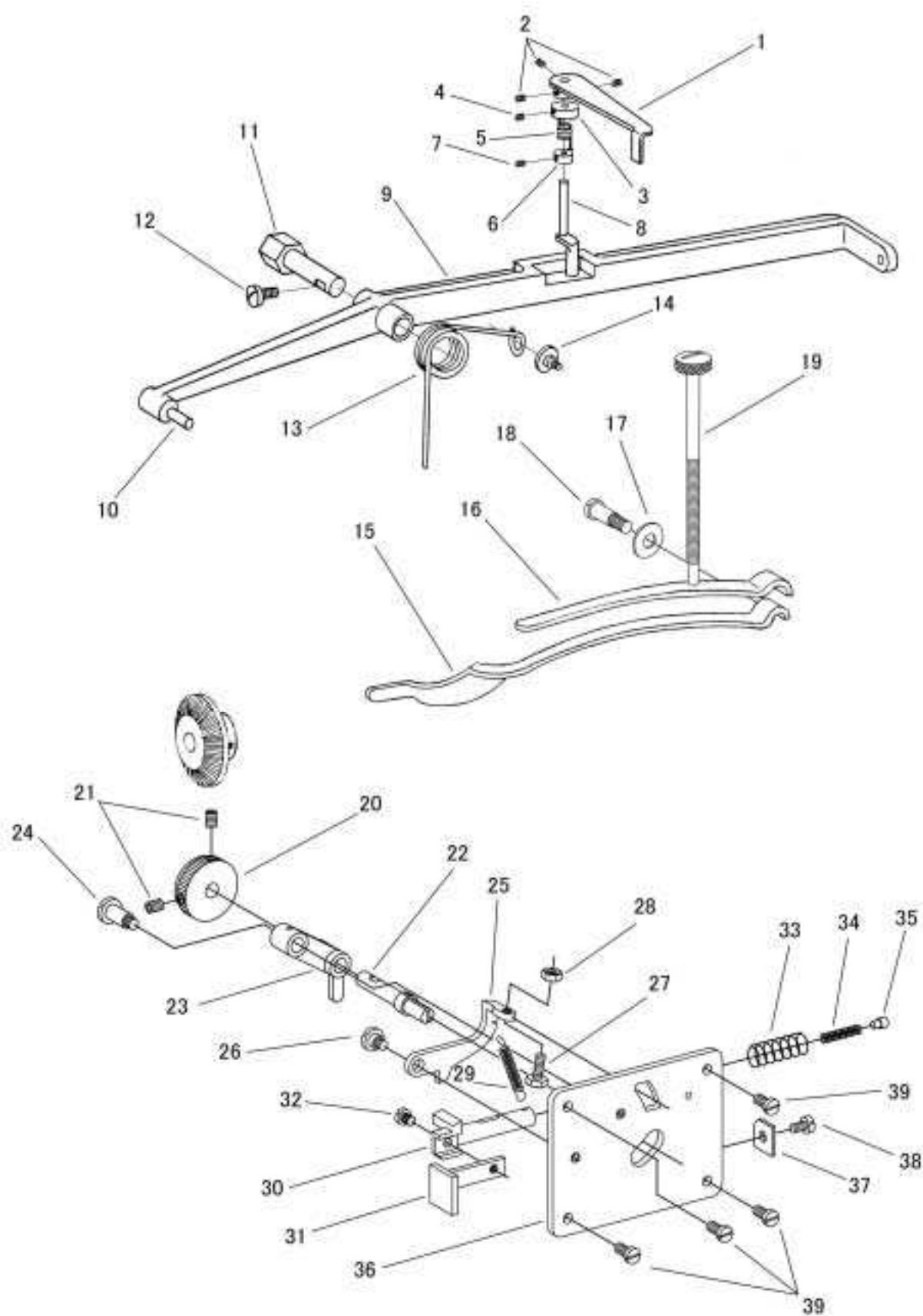
調子板
TENSION BRACKET



調子板
TENSION BRACKET

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70067	*	-	*	-	1	糸ゆるめ板	TENSION RELEASE PLATE
1	70206	-	*	-	*	1	糸ゆるめ板	TENSION RELEASE PLATE
2	10679	*	-	*	-	1	糸ゆるめ板段ねじ	SCREW 3.4X36 L=2.5
2	10679	-	*	-	*	2	糸ゆるめ板段ねじ	SCREW 3.4X36 L=2.5
3	70074	*	*	*	*	1	糸ゆるめピン	TENSION RELEASE PLUNGER
4	70063C	*	-	*	-	1	調子板 組	TENSION BRACKET COMPLETE
4	70204C	-	*	-	*	1	調子板 組	TENSION BRACKET COMPLETE
5	70075	*	*	*	*	1	糸調子カバー板	THREAD CONTROLLER COVERING PLATE
6	10650	*	*	*	*	1	糸調子カバー板止めねじ	SCREW 3.4X36 L=6.0
7	10561	*	*	*	*	2	止めねじ	SCREW 11/64X32 L=6.5
8	70076	*	-	*	-	1	調子板糸掛 (上)	THREAD CONTROLLER THREAD GUIDE (UPPER)
8	70209	-	*	-	*	1	調子板糸掛 (上)	THREAD CONTROLLER THREAD GUIDE (UPPER)
9	12113	*	*	*	*	2	調子板糸掛 (上)止めねじ	SCREW 3.4X36 L=4.0
10	70066	*	*	*	*	1	糸ゆるめ段ピン 短)	TENSION RELEASE PIN (SHORT)
11	70207	-	*	-	*	1	糸ゆるめ段ピン 長)	TENSION RELEASE PIN (LONG)
12	8077	*	-	*	-	2	糸調子皿	TENSION DISC
12	8077	-	*	-	*	4	糸調子皿	TENSION DISC
13	3071	*	-	*	-	1	丸一皿	TENSION RELEASE WASHER
13	3071	-	*	-	*	2	丸一皿	TENSION RELEASE WASHER
14	8078	*	-	*	-	1	渦巻ばね	TENSION SPRING
14	8078	-	*	-	*	2	渦巻ばね	TENSION SPRING
15	143657	*	-	*	-	1	ラチェット	RATCHET
15	143657	-	*	-	*	2	ラチェット	RATCHET
16	27061	*	-	*	-	1	ローレットナット	REGULATING THUMB NUT
16	27061	-	*	-	*	2	ローレットナット	REGULATING THUMB NUT
17	70078	*	-	*	-	1	調子板糸掛 (下)	THREAD CONTROLLER THREAD GUIDE (LOWER)
17	70210	-	*	-	*	1	調子板糸掛 (下)	THREAD CONTROLLER THREAD GUIDE (LOWER)
18	11067	*	*	*	*	1	調子板糸掛 (下)止めナット	NUT
19	15055	*	*	*	*	1	糸調子カラー受ピン止めねじ	SCREW 11/64X32 L=9.0
20	70072	*	-	*	-	1	糸引スプリング	THREAD CONTROLLER SPRING
20	70221	-	*	-	*	1	糸引スプリング	THREAD CONTROLLER SPRING
21	70073	*	-	*	-	1	糸引スプリング受	THREAD CONTROLLER SPRING STOP
21	70222	-	*	-	*	1	糸引スプリング受	THREAD CONTROLLER SPRING STOP
22	10650	*	*	*	*	1	糸引スプリング受止めねじ	SCREW 3.4X36 L=6.0
23	70070	*	*	*	*	1	糸調子カラー受ピン	THREAD CONTROLLER SPRING STUD
24	12421	*	*	*	*	1	糸調子棒カラー止めねじ	SCREW 11/64X32 L=4.0
25	70069	*	-	*	-	1	糸調子棒カラー	THREAD CONTROLLER DISC
25	70069	-	*	-	*	2	糸調子棒カラー	THREAD CONTROLLER DISC
26	70071	*	-	*	-	1	糸調子棒カラー押えピン	THREAD CONTROLLER STUD
26	70208	-	*	-	*	1	糸調子棒カラー押えピン	THREAD CONTROLLER STUD
27	70077	*	-	*	-	1	調子板糸掛 (中)	THREAD CONTROLLER THREAD GUIDE (MIDDLE)
27	70400	-	*	-	*	1	調子板糸掛 (中)	THREAD CONTROLLER THREAD GUIDE (MIDDLE)
28	12113	*	*	*	*	2	調子板糸掛 (中)止めねじ	SCREW 3.4X36 L=4.0
29	10759-A	-	*	-	*	1	面糸掛 ~1	THREAD GUIDE ~1
29	10684	-	*	-	*	1	面糸掛 1-3/16~	THREAD GUIDE 1-3/16~
30	10685	-	*	-	*	1	面糸掛止めねじ	SCREW 3.4X36 L=6.5
31	10760	-	*	-	*	1	面糸掛フェルト	FELT

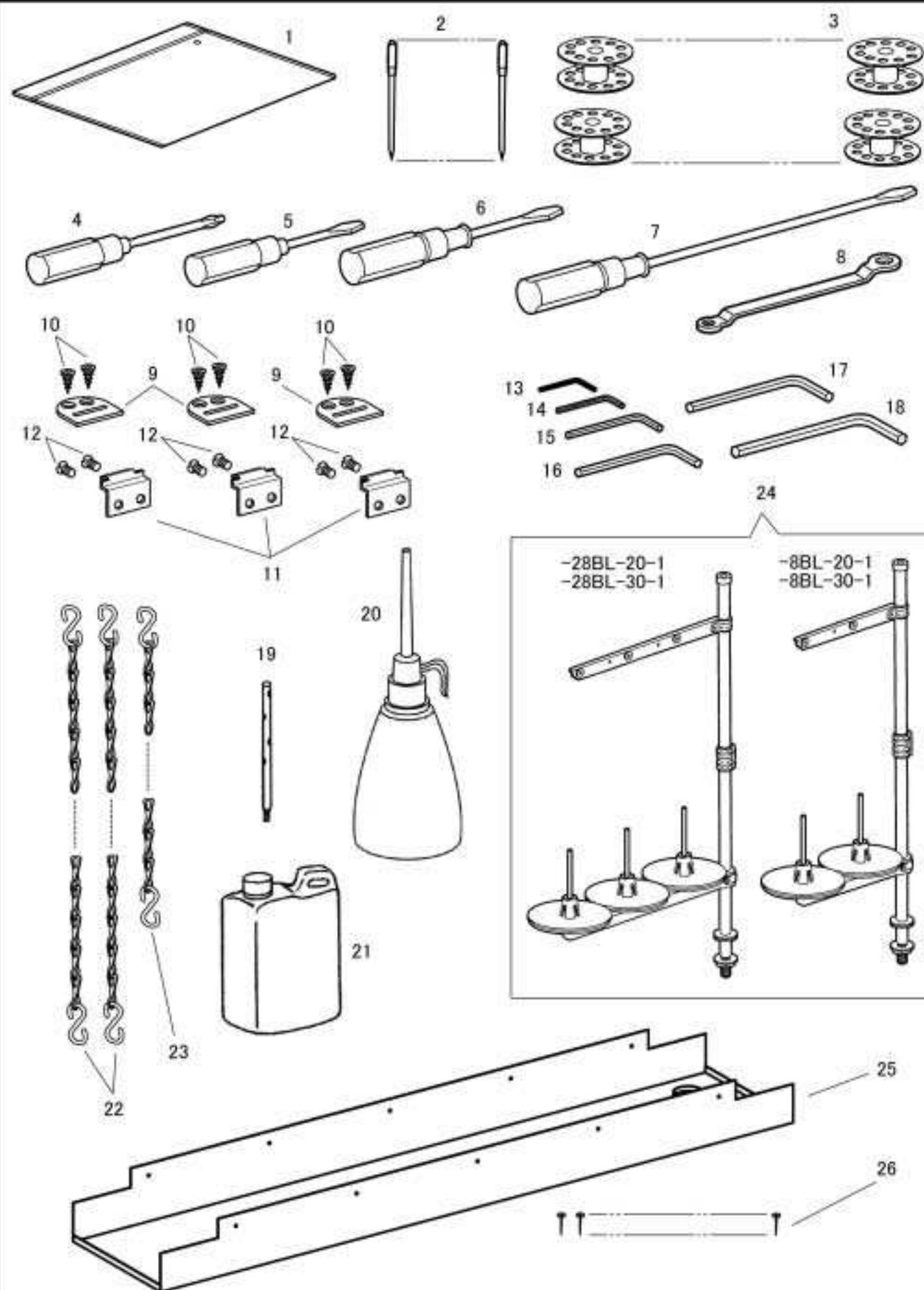
押え棒大板バネ、糸巻き
PRESSER BAR SPRING, BOBBIN WINDER



押え棒大板バネ、糸巻き
PRESSER BAR SPRING, BOBBIN WINDER

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70091	*	*	*	*	1	ストッパーレバー	FOOT LIFTER LIFTING LEVER LATCH HANDLE
2	2067	*	*	*	*	3	ストッパーレバー止めねじ	SCREW 11/64x40 L=6.0
3	70089	*	*	*	*	1	ストッパーカラー (上)	COLLAR (UPPER)
4	8042	*	*	*	*	1	ストッパーカラー止めねじ	SCREW 11/64X40 L=5.0
5	70088	*	*	*	*	1	ストッパースプリング	FOOT LIFTER LIFTING LEVER LATCH SPRING
6	70090	*	*	*	*	1	ストッパーカラー (下)	COLLAR (LOWER)
7	50287	*	*	*	*	1	ストッパーカラー止めねじ	SCREW 1/8X44 L=5.0
8	70087	*	*	*	*	1	ストッパークランク	FOOT LIFTER LIFTING LEVER LATCH
9	70376	*	*	-	-	1	大弓	FOOT LIFTER LIFTING LEVER
9	70083	-	-	*	*	1	大弓	FOOT LIFTER LIFTING LEVER
10	70084	*	*	*	*	1	大弓ピン	PIN
11	70085	*	*	*	*	1	弓受ピン	FOOT LIFTER LIFTING LEVER HINGE STUD
12	70136	*	*	*	*	1	弓受ピン止めねじ	SCREW 1/4X32 L=9.0
13	70086	*	*	*	*	1	大弓ばね	FOOT LIFTER LIFTING LEVER SPRING
14	10548	*	*	*	*	1	大弓ばね止めねじ	SCREW 6.75X24 L=8.1
15	70060	*	*	*	*	1	押え棒大板ばね	PRESSER BAR SPRING
16	70061	*	*	*	*	1	押え棒大板補助ばね	PRESSER BAR SPRING (AUXILIARY)
17	70094	*	*	*	*	1	大板ばね受ワッシャー	WASHER
18	70121	*	*	*	*	1	大板ばね受ねじ	SCREW 6.75X24 L=13.0
19	70062	*	*	*	*	1	大板ばね調節ねじ	SCREW 6.75X24 L=127.0
20	70101	*	*	*	*	1	糸巻ローラー	BOBBIN WINDER SHAFT DRIVING ROLLER
21	70175	*	*	*	*	2	糸巻ローラー止めねじ	SCREW 11/64X40 L=5.8
22	70100	*	*	*	*	1	糸巻芯棒	BOBBIN WINDER SHAFT
23	70099	*	*	*	*	1	糸巻連結	BOBBIN WINDER LINK
24	70103	*	*	*	*	1	糸巻連結段ねじ	HINGE SCREW 11/64X40
25	70102	*	*	*	*	1	糸巻調節板	BOBBIN WINDER CONNECTING PLATE
26	4094	*	*	*	*	1	糸巻レバー止めねじ	SCREW M4X0.7 L=5.0
26	70104	*	*	*	*	1	糸巻調節板段ねじ	HINGE SCREW 11/64X40 L=4.0
27	70106	*	*	*	*	1	糸巻調節ねじ	SCREW M4X0.7 L=12.0
28	4137	*	*	*	*	1	糸巻調節ねじナット	NUT
29	70107	*	*	*	*	1	糸巻調節板戻しスプリング	BOBBIN WINDER CONNECTING PLATE SPRING
30	70110	*	*	*	*	1	糸巻切り換え軸	BOBBIN WINDER RELEASING LEVER
31	70109	*	*	*	*	1	糸巻レバー	BOBBIN WINDER SET LEVER
32	4094	*	*	*	*	1	糸巻レバー止めねじ	SCREW M4X0.7 L=5.0
33	70108	*	*	*	*	1	糸巻レバースプリング	BOBBIN WINDER SET LEVER RELEASING SPRING
34	70105	*	*	*	*	1	糸巻連結戻しスプリング	BOBBIN WINDER LINK RELEASING SPRING
35	70096	*	*	*	*	1	糸巻連結押しピン	STOP STUD
36	70097C	*	*	*	*	1	糸巻取付板 (組)	BOBBIN WINDER BRACKET COMPLETE
37	12738	*	*	*	*	1	糸巻きローラー・ストッパー板	STOPPER PLATE
38	10650	*	*	*	*	1	糸巻きローラー・ストッパー板止めねじ	SCREW 3.4X36 L=6.0
39	15055	*	*	*	*	4	糸巻取付板止めねじ	SCREW 11/64X32 L=9.0

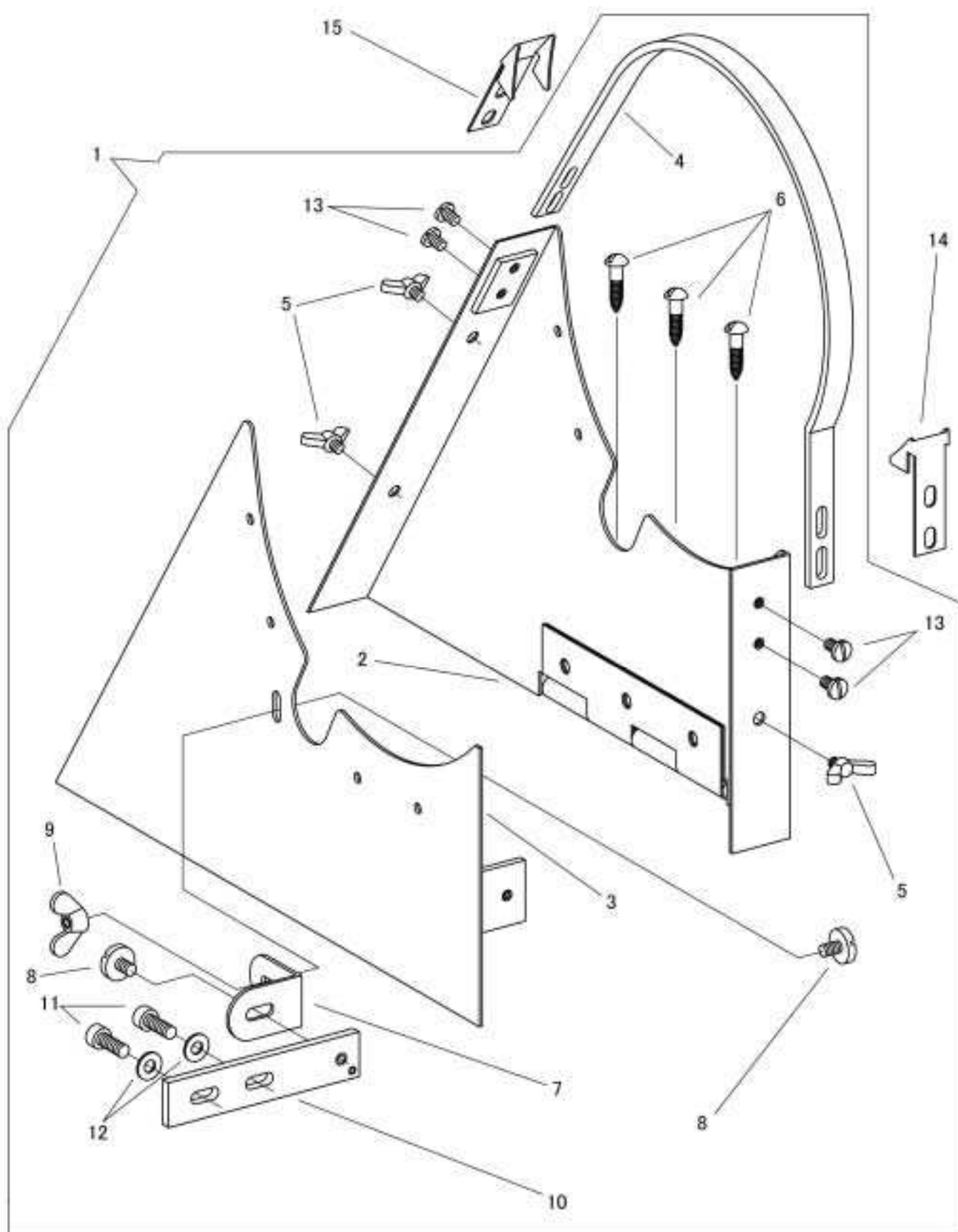
付属品1
ACCESSORIES 1



付属品 1
ACCESSORIES 1

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	8132-A	*	*	*	*	1	部品袋チャック付	ACCESSORIES PACK
2	N3324	*	-	*	-	3	針 DYX3 #24)	NEEDLE DYX3 #24)
2	N3324	-	*	-	*	6	針 DYX3 #24)	NEEDLE DYX3 #24)
3	70141	*	-	*	-	5	ボビン	BOBBIN
3	70141	-	*	-	*	10	ボビン	BOBBIN
4	19473	*	*	*	*	1	十字ドライバー	SCREW DRIVER (CROSS TYPE)
5	8121	*	*	*	*	1	ドライバー 小)	SCREW DRIVER (SMALL)
6	8120	*	*	*	*	1	ドライバー 中)	SCREW DRIVER (MIDDLE)
7	8118	*	*	*	*	1	ドライバー 大)	SCREW DRIVER (LARGE)
8	19462	*	*	*	*	1	メガネレンチ	DOUBLE HEAD WRENCH
9	11171	*	*	*	*	3	ヒンジ受け	MACHINE HINGE CONNECTION PLATE
10	6052	*	*	*	*	6	ヒンジ受け止め木ねじ	MACHINE HINGE CONNECTION PLATE WOOD SCREW
11	11169	*	*	*	*	3	ヒンジ	BED HINGE
12	11170	*	*	*	*	6	ヒンジ止めねじ	BED HINGE SCREW
13	10747	*	*	*	*	1	六角レンチ (1/16 インチ)	WRENCH (1/16 ")
14	19456	*	*	*	*	1	六角レンチ 2 ミリ)	WRENCH 2 mm)
15	19457	*	*	*	*	1	六角レンチ (2.5 ミリ)	WRENCH 2.5 mm)
16	19458	*	*	*	*	1	六角レンチ 3 ミリ)	WRENCH 3 mm)
17	19459	*	*	*	*	1	六角レンチ 4 ミリ)	WRENCH 4 mm)
18	19460	*	*	*	*	1	六角レンチ 5 ミリ)	WRENCH 5 mm)
19	10942	*	*	*	*	1	糸立棒	THREAD GUIDE
20	8125	*	*	*	*	1	油差し	OILER
21	11193	*	*	*	*	1	油	OIL
22	13079	*	*	*	*	2	くさり1000 mm)	CHAIN (1000 mm)
23	70197	*	*	*	*	1	くさり90 mm)	CHAIN (90 mm)
24	10947	-	*	-	*	1	糸立てセット	THREAD STAND
24	35254	*	-	*	-	1	糸立てセット	THREAD STAND
25	70377	*	*	-	-	1	油受け	DRIP PAN
25	70171	-	-	*	*	1	油受け	DRIP PAN
26	6055	*	*	-	-	8	釘	NAIL
26	6055	-	-	*	*	10	釘	NAIL

付属品2
ACCESSORIES 2

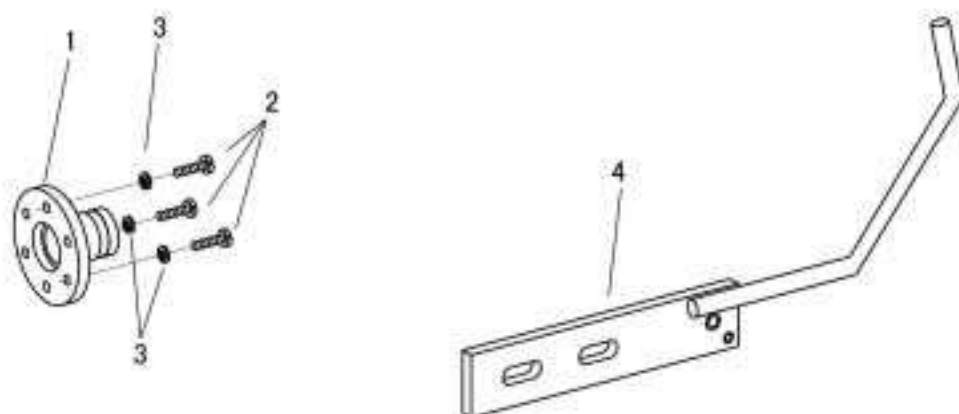


付属品 2
ACCESSORIES 2

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	70199DC	*	*	*	*	1	ベルトガード 組)	BELT GUARD COMPLETE
2	70199-A	*	*	*	*	1	ベルトガード 右)	BELT GUARD (RIGHT)
3	70199-B	*	*	*	*	1	ベルトガード 左)	BELT GUARD (LEFT)
4	70199-C	*	*	*	*	1	ベルトカバー	BELT GUARD COVER
5	28080	*	*	*	*	3	ベルトガード 右) 左) 止め蝶ねじ	SCREW M5X0.8 L=6.0
6	70215	*	*	*	*	3	ベルトガード 止め木ねじ	WOOD SCREW
7	70199-E	*	*	*	*	1	ベルトガード 振れ止め板	BELT GUARD STAY
8	12386	*	*	*	*	2	ベルトガード 振れ止め板 止めねじ	SCREW 7/32X32 L=9.0
9	10776	*	*	*	*	1	ベルトガード 振れ止め板 止め蝶ナット	WING NUT
10	70199-D	*	*	*	*	1	ベルトガード 振れ止め受板	BELT GUARD SUPPORT
11	28076	*	*	*	*	2	ベルトガード 振れ止め受板 止めねじ	SCREW M6X1 L=18
12	10599	*	*	*	*	2	ベルトガード 振れ止め受板 止めねじ ワッシャー	WASHER
13	12418	*	*	*	*	4	ベルトカバー 止めねじ	SCREW 13/64X32 L=9.0
14	70199-F	*	*	*	*	1	補助ガード 前) (E用)	AUXILIARY GUARD (FRONT) : for CE
15	70199-G	*	*	*	*	1	補助ガード 後) (E用)	AUXILIARY GUARD (REAR) : for CE

別売品

PARTS AVAILABLE AT EXTRA CHARGE



別売品

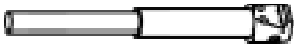
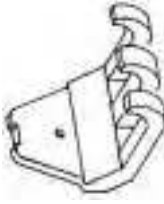
PARTS AVAILABLE AT EXTRA CHARGE

No.	部品番号 PARTS NO.	-8BL-20-1	-28BL-20-1	-8BL-30-1	-28BL-30-1	数量 QTY	品名	DESCRIPTION
1	30169	*	*	*	*	1	検出器アダプター	ADAPTOR FOR SYNCHRONIZER
2	30170	*	*	*	*	3	検出器アダプター止めねじ	SCREW M4×0.7 L=16.0
3	31208	*	*	*	*	3	検出器アダプター止めばね座金	SPRING LOCK WASHER
4	70189	*	*	*	*	1	検出器支え棒(組)	SYNCHRONIZER SUPPORT

ゲージ表

TABLE OF GAUGE PARTS

JW-28BL-20-1/JW-28BL-30-1

針巾		針棒 針株付)								
GAUGE SIZE		NEEDLE BAR WITH CLAMP	VIBRATING PRESSER FOOT	LIFTING PRESSER FOOT	THROAT PLATE	FEED DOG	BED SLIDE (LEFT)	BED SLIDE (RIGHT)	FINGER GUARD	
inch	mm									
-	5	70225-03	70226-03	70227-03	70228-03	70229-03	70218	70224	70219-02	
1/4	6.4	70230	70250	70270	70290	70310	70218	70224	70219-02	
5/16	7.9	70232	70252	70272	70292	70312	70348	70368	70219-02	
-	8.3	70248	70268	70288	70308	70328	70348	70368	70219-02	
3/8	9.5	70233	70253	70273	70293	70313	70333	70353	70219-03	
-	10	70249	70269	70289	70309	70329	70333	70353	70219-03	
7/16	11.1	70234	70254	70274	70294	70314	70335	70355	70219-04	
1/2	12.7	70235	70255	70275	70295	70315	70335	70355	70219-04	
-	14	70236-B	70256-B	70276	70296	70316-B	70335	70355	70219-04	
9/16	14.3	70236-A	70256-A	70276	70296	70316-A	70335	70355	70219-04	
-	15	70225-01	70226-01	70227-01	70228-01	70229-01	70337	70357	70219-04	
5/8	15.9	70237	70257	70277	70297	70317	70337	70357	70219-04	
3/4	19.1	70238	70258	70278	70298	70318	70338	70358	70219-05	
7/8	22.2	70239	70259	70279	70299	70319	70339	70359	70219-06	
1	25.4	70240	70260	70280	70300	70320	70340	70360	70219-07	
1-3/16	30.2	70241	70261	70281	70301	70321	70342	70362	70219-09	
1-1/4	31.8	70242	70262	70282	70302	70322	70342	70362	70219-09	
1-3/8	34.9	70243	70263	70283	70303	70323-S	70343	70363	70219-09	
1-1/2	38.1	70244	70264	70284	70304	70324	70344	70364	70219-09	
1-5/8	41.3	70225-05	70226-05	70227-05	70228-05	70229-05	70341	70361	70219-08	
1-3/4	44.5	70245	70265	70285	70305	70325	70345	70365	-	
2	50.8	70246	70266	70286	70306	70326-S	70346	70366	-	
2-1/4	57.2	70460	70465	70470	70475	70480	70490	70485	-	
2-3/8	60.3	70247	70267	70287	70307	70327	70347	70367	-	
2-1/2	63.5	70225-02	70226-02	70227-02	70228-02	70229-02	70349	70369	-	