

HIGHLEAD

HLK-1006

Electronic Pattern Sewing Machine

Instruction Manual
Parts Catalog

SHANGHAI BIAOZHUN HAILING SEWING MACHINERY CO., LTD.

FOR YOUR SAFETY!

If you operate the sewing machine 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 paragraph to attract your attention for the safety. Please keep it in mind whenever you work with the sewing machine.

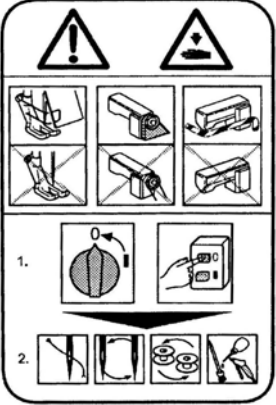


CAUTION is used as the notice to warn a possible danger to cause a wound

This technical manual explains the instructions how to operate and maintain the sewing machine. All information in this technical Manual are subject to change without notice.

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Explanations for the warning signs

NO	Warning sign	Meanings of warning sign
1		<p>Caution for sewing machine operation:</p> <p>Warning to operate the sewing machine without safety guards and to prohibit doing any operation except sewing while the power is turned on.</p> <p><Interpretation of sign></p> <ul style="list-style-type: none"> ·Do not operate without finger guard, eye guard, belt cover and other safety devices. ·Before threading, changing needle and bobbin clearing, oiling etc. switch off main switch.
2		<p>Caution for a wound on the fingers:</p> <p>Warning to a possible danger to cause a wound on the fingers under the specified operation.</p>
3		<p>Caution for the fingers:</p> <p>Warning to a possible danger to be caught the fingers in the machine under the specified operation.</p>

Caution

- ★ For avoiding the sewing machine from the troubles, please do not operate the sewing machine under the following conditions.

1. Temperature and humidity

➤ During operating:

The atmosphere temperature should not exceeded more 350 °C (95 F) or less 5°C(41°F).

During transportation:

The atmosphere temperature should not exceeded more 55°C(131°F) or less -10°C(18°F).

➤ The relative humidity in the atmosphere should not exceeded more 85% or less 45%.

2. Atmosphere for the machine operation

➤ In the atmosphere filled with dust or corrosive gas.

➤ In the atmosphere filled with flammable or explosive gas.

3. Power source voltage

➤ In the place where the power fluctuation exceeds more or less 10% of the fixed power voltage.

➤ In the place where the power source cannot supply enough voltage to keep the motor running.

4. Power source voltage

➤ In the place where the power fluctuation exceeds more or less 10% of the fixed power voltage.

➤ In the place where the power source cannot supply enough voltage to keep the motor running.

5. Noise

➤ In the place near a high frequency transmitter or a high frequency welder.

➤ In the place filled with strong electromagnetic radiation or magnetic field.

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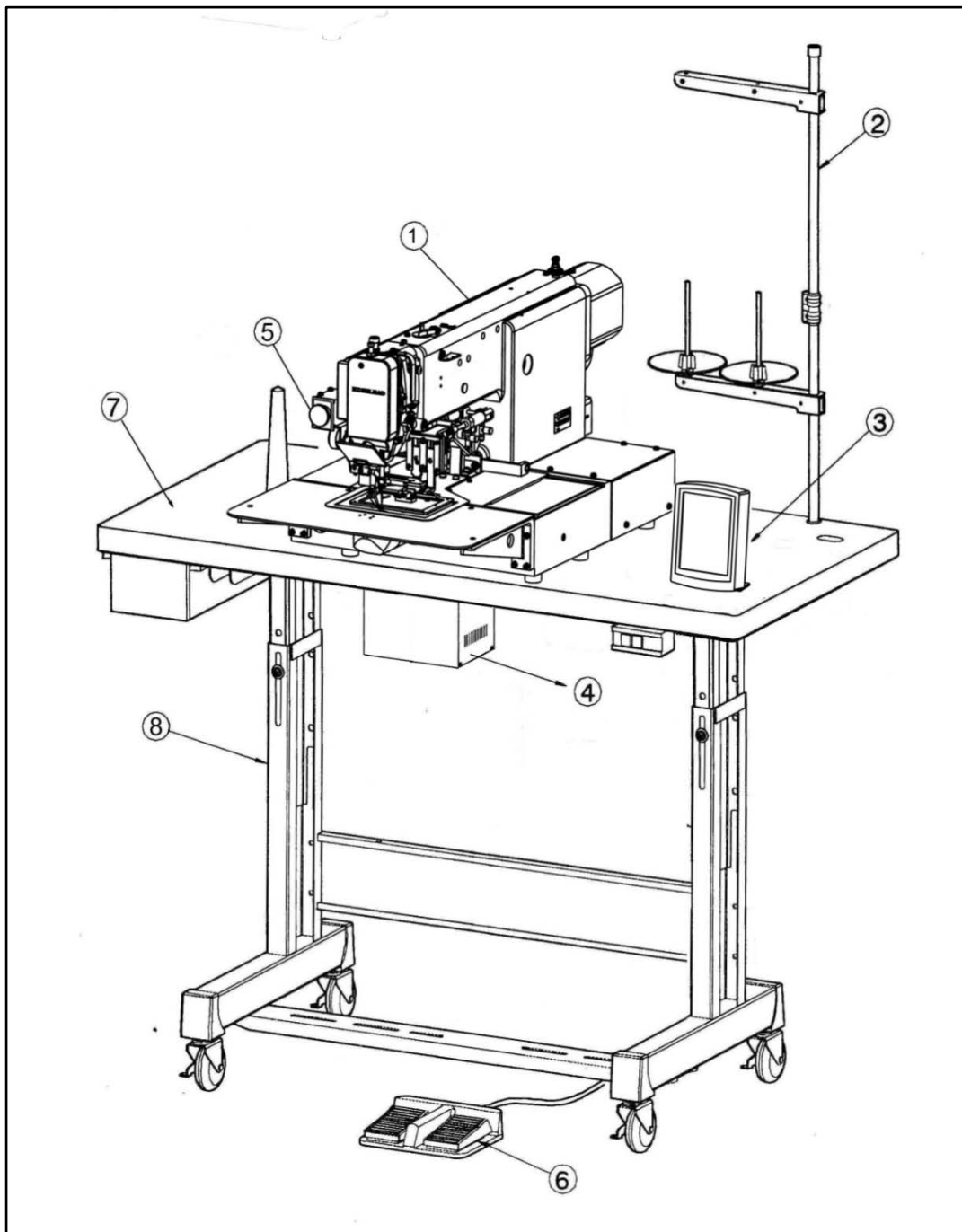
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1 STRUCTURE OF THE SEWING MACHINE



HLK-1006 electronic pattern sewing machine is constructed with the following main parts

- ① Sewing machine head ② Thread stand ③ Operation Panel ④ Control Unit
⑤ Height switch ⑥ Work holder foot switch ⑦ Wooden Table ⑧ Steel stand

2 SPECIFICATION

Sewing area:	X-Direction(left / right) 100mm Y-Direction(forward / backward) 60mm
Maximum sewing speed:	2300 rpm
Sewing speed:	10 steps variable from 200 to 2300 rpm
Stitch length:	0.1 to 12.7mm
Stitch type:	Single needle lock stitch
Needle bar stroke :	41.2 mm
Thread take up lever stroke:	68mm
Class of needle:	DP × 17#21 (the standard specification)
Wiper system :	Back to forward wiping system(the standard specification)
Presser foot lift:	15 mm(18mm max)
Presser foot alternation:	Variable from 4mm to 10mm(4mm is standard)
Work holder lift:	25 mm
Hook:	Large size shuttle hook
Bobbin case:	With non racing spring
Bobbin:	Large size aluminum bobbin
Thread trimmer system:	Horizontal engagement with fixed knife and movable knife
Lubrication system:	Manual oiling and replenishment with the oil braids from the oil tanks
Lubrication oil:	White machining oil
X—Y drive system:	Stepping motor and X-Direction timing belt drive Y-Direction gear bar guide rail Intermittent or continuous feeding
Machine dimension:	1,200mm (W) × 740mm (L) × 1,220mm (H)
main motor:	550W

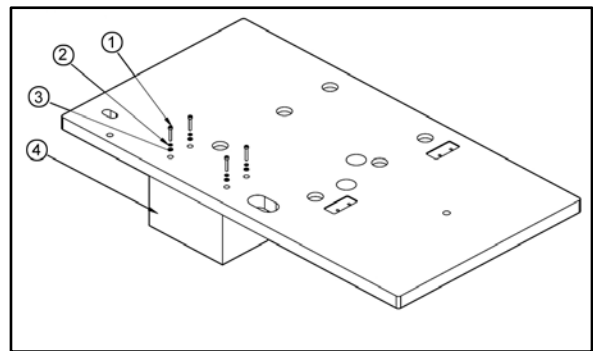
3 INSTALLATION

Caution

- ★ The machine should be installed by the specialists who have enough experience for the sewing machine installations.
- ★ All the necessary electric wiring should be done by electric engineers who are qualified for the electric wiring.
- ★ If any damage or fault is found on the machine at the installation, please do not operate until it is repaired.
- ★ Please do not operate the sewing machine with excessive modifications from the standard specification.

3-1 Installation of the control box

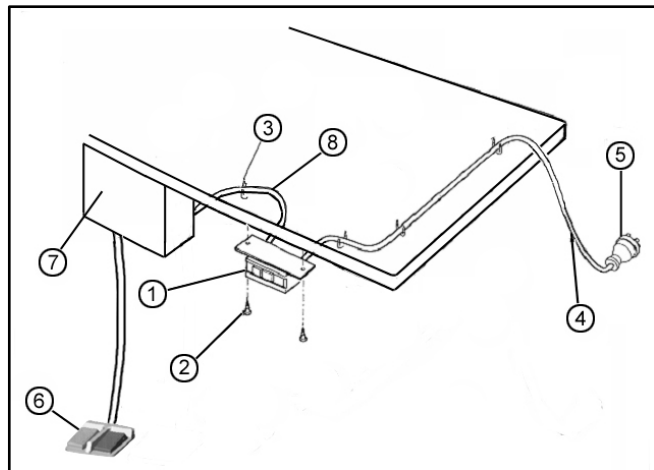
If the control box is purchased without assembling to the table, the control box has to be installed underneath the table. Please install the control box with the instruction in the paragraph



3-2 Installation of the power switch

If the power switch is purchased without assembling to the table, the power switch has to be attached with the following procedure.

- (1) Mount the power switch ① with the wood screw ② underneath the table as shown on the figure.
- (2) Fix the electric cords with the staples ③ underneath the table.
- (3) Hook up the connector ⑧ of the power switch ① to the control box ⑦.



- (4) Attach the power plug ⑤ to another end of the power switch cord ④. Connection of the foot switch
Connect the foot switch ⑥ to the control box ⑦. The foot switch is enclosed in the accessory box.

3-3 Installation of the oil pan

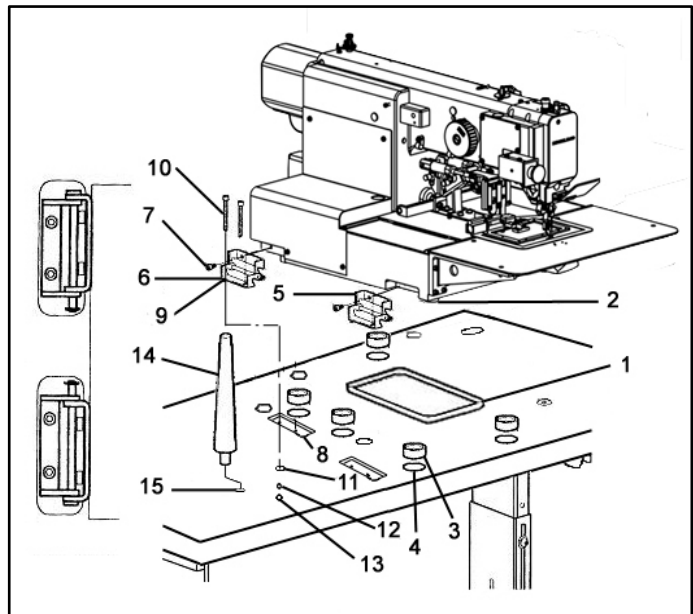
- (1) Fix the oil pan ① at its four corners on the table top with four.

3-4 Installation of the sewing machine head

Caution

★ For the safety, please make sure to carry the sewing machine head by more than two people.

- (1) Make sure to hold the machine table with the caster stopper.
- (2) Fit the rubber cushion pads ③ into the each hole ④ on the tabletop. The rubber cushion pads are enclosed in the accessory box.
- (3) Put the sewing machine head on the table top and set the each leg ⑤ to the each rubber cushion pad ③

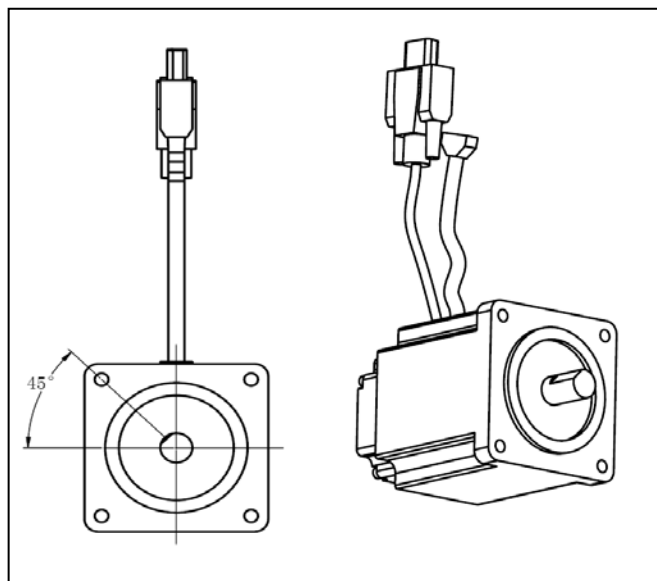


- (4) Attach two hinges ⑥ temporarily, make the setting screw ⑦ fastening on the left side surface of the machine bed .
- (5) At this time, take notice that the E-shaped snap ring on the front side hinge must be come to the backside, and E-shaped snap ring on the backside hinge must be come to the front.
- (6) These parts are all enclosed in the accessory box.
- (7) Fit the screw holes ⑨ of the hinges ⑥ to the bolt setting holes ⑧ on the table top then, pass the bolt ⑩ through these holes and fasten the bolt ⑩ to fix the hinges ⑥ with the flat washers ⑪, the spring washers ⑫ and the nuts ⑬ .
- (8) Fasten firmly hexagonal socket head set screws ⑦, which set the hinges ⑥ temporarily then, fix the hinges ⑥ perfectly.
- (9) Insert the headrest ⑭ into the hole ⑮ on the tabletop.

3-5 Installation of the spindle motor

If the spindle motor has been removed from the machine for the adjustment or the like, fix the spindle motor as the procedure described right.


- (1) Spindle motor according to right: put the signal cord upward.
- (2) Adjust the plane of the motor shaft alignment of the left on the motor mounting holes, 45 ° Angle adjustment.

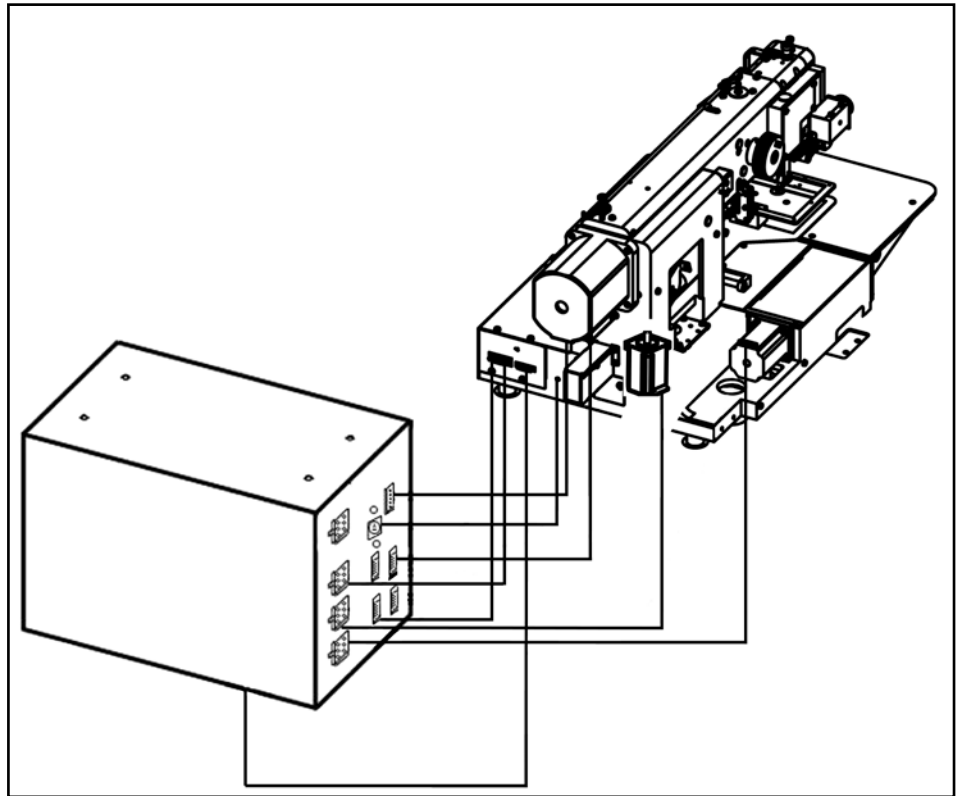


3-6 Connection of the operation panel

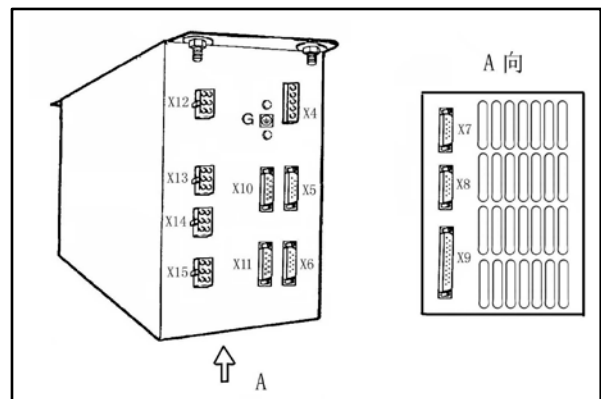
Please connect the operation panel with the instructions of operation panel manual enclosed in the packing.

3-7 Connection of the electric cables

Please make sure to ground the place where there is  mark. Failure to do so may cause electric shock and/or malfunction.

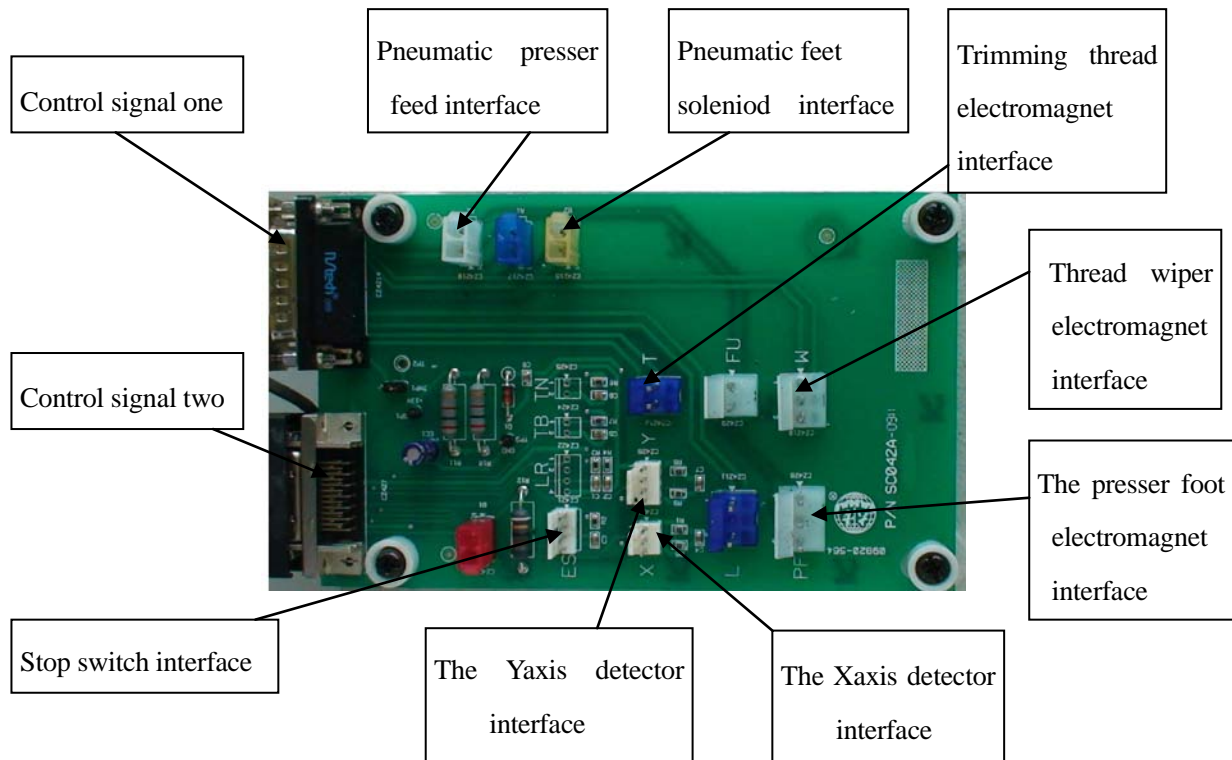


- (1) Connect the machine head and the control box with cables as shown on the figure.
- (2) Hold the dangling cables under the table with accessory tie holders and cord ties.
- (3) At this time, please check whether the cables are not pulled when tilting the sewing machine.
- (4) Control box back and socket as shown on the below figure



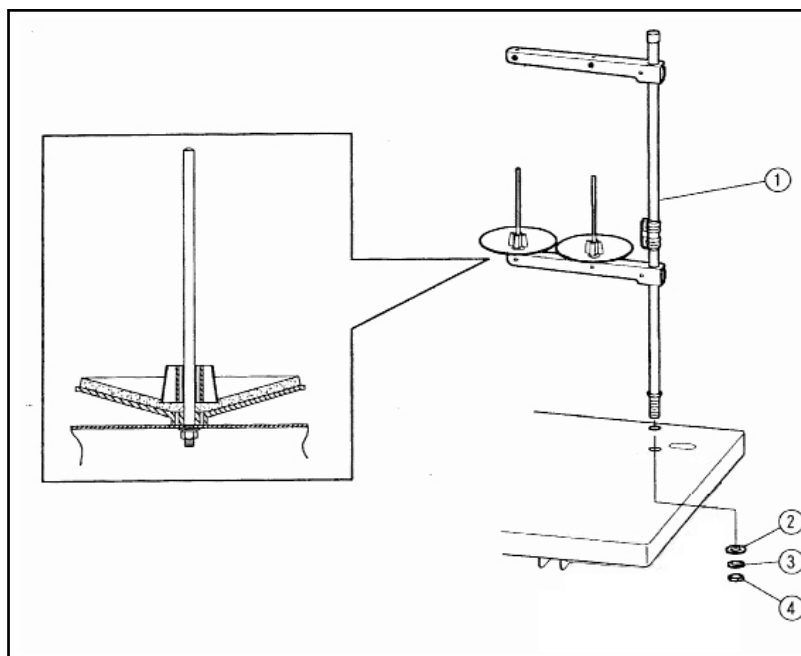
- (5) Printed circuit board wiring as shown on the top of next page

X4: Spindle motor power	X5: Spindle motor signal	X6: RS-232C (selection)
X7: Operation panel	X8: Foot switch	X9: Control signal one
X10: RS-232C (selection)	X11: Control signal two	X12& X13: Y spindle stepping motor
X14&X15: X spindle stepping motor	G: Grounding wires	



3-8 Installation of the thread stand

- (1) Assemble the thread stand with the instructions enclosed in the packing.
- (2) Fit the thread stand ① in the thread stand holeg on the tabletop.
- (3) Fix the thread stand①firmly from the rear side of the table with tightening the nut ④ and the washers②,③.



4 LUBRICATION

Caution

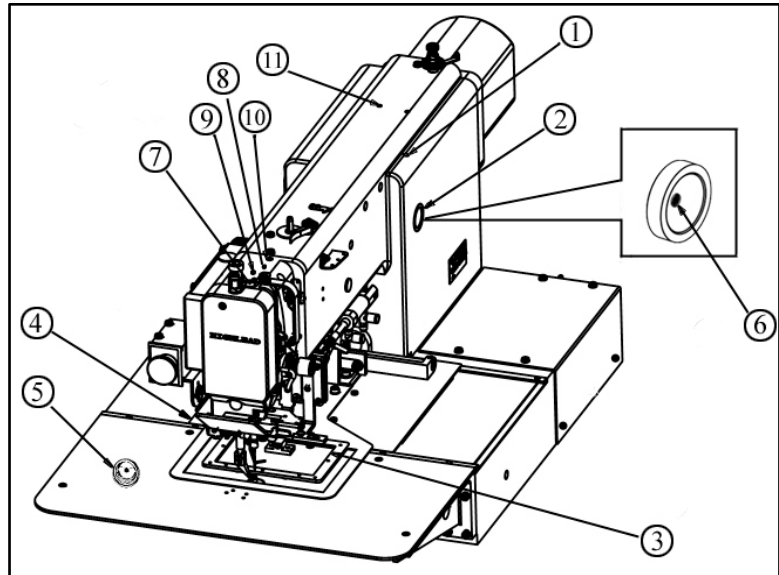
★Please make sure to turn power switch off before oiling.

★Please make sure to put some oil before starting the operation of the brand new machine or

NOTE : Please use high quality white machining oil.

4-1 Filling the oil tank

Pour the oil through the oil hole ① to the oil tank ② on the machine arm. Move the work holder by hand to the right end then, machine bed. Please Pour the oil through the oil hole ④ to the oil tank, fill with the oil over level mark ⑤ of the oil tank.



4-2 Oiling

Put some oil to red marked oil holes(NO. ⑦ ~ ⑩).

5 PROPER OPERATION

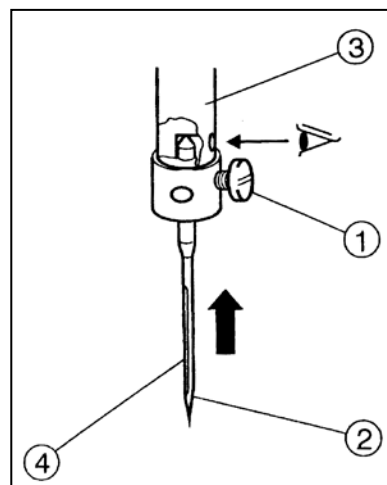
5-1 Installation of the needle

Caution

★Please make sure to turn the power switch OFF before installing or replacing the needle.

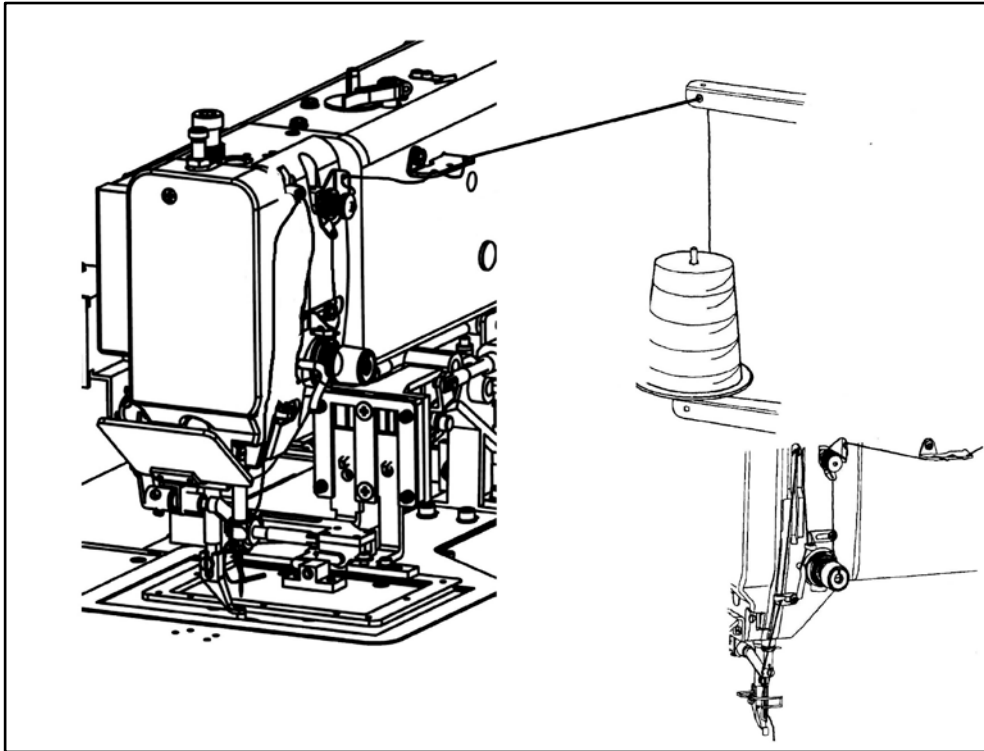
★Please pay attention for the fingers not to be wounded by the needlepoint.

- (1) Loosen the needle set screw ① then, Insert the new needle ② until the needle head is reached the end of the hole of the needle bar ③.
- (2) Fasten the setting screw ① with facing the needle groove ④ to the front



5-2 Threading the upper thread

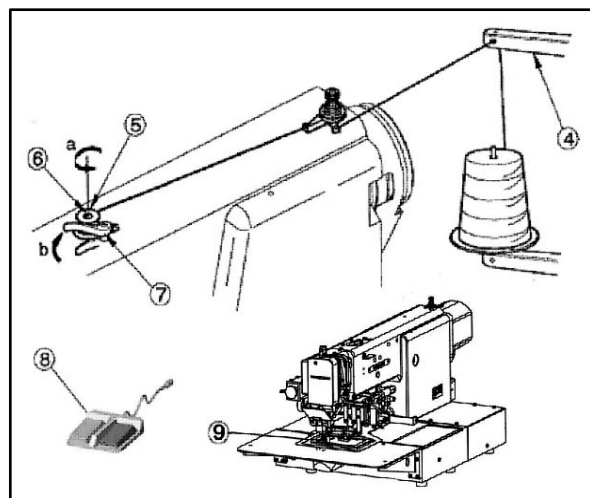
- ★ Please make sure to turn the power switch off before threading the upper thread.
- ★ Please thread the upper thread with referring to the below figures.



5-3 Winding the bobbin thread

- ★ Please make sure to pull the upper thread out of the needle before winding the bobbin thread

- (1) Turn the power switch ON.
- (2) Pass through the thread from the thread stand ④ as shown on the right figure. then, wind the thread to the empty bobbin ⑤ in the arrow mark “a” direction couple times and insert the bobbin ⑤ into the bobbin winder ⑥.
- (3) Push the adjust lever ⑦ in the arrow mark “b” direction.
- (4) Step on the gray color start foot switch ⑧. The thread is kept winding to the Bobbin ⑤ while the gray color start switch is stepping on.

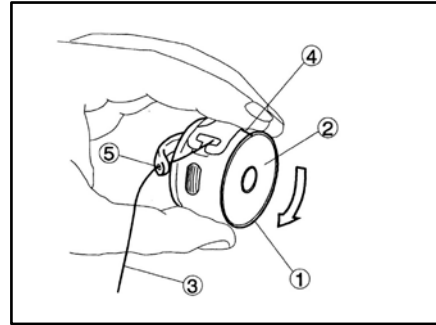


-
- (5) When the bobbin becomes full of the thread, the adjust lever ⑥ is returned to the original position.
 - (6) Step the gray foot switch to exit winding mode. .
 - (7) To wind the bobbin thread during the sewing operation, carry out above (2) to (7) procedure, then, the bobbin winding is performed automatically.

For the details ,please refer to the instructions on the technical manual [Operation Panel].

5-4 Settling the bobbin

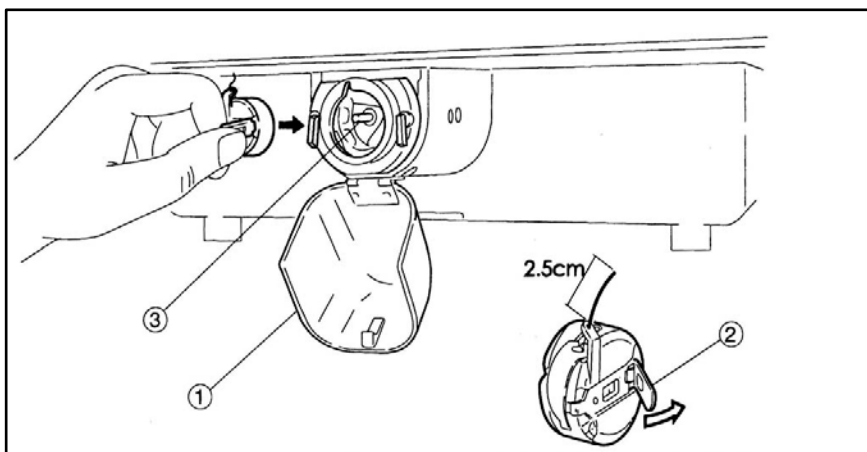
- (1) Set the bobbin ② into the bobbin case ① .
- (2) Pull the bobbin thread ③ into the slit ④ and pass the thread through the thread hole ⑤ .
- (3) At this time, pull the bobbin thread ③ then, check with the bobbin ② if it is rotated to the arrow direction. if it is not, set the bobbin ② into the bobbin case ① over again to get the proper rotation.



5-5 Setting the bobbin case

- (1) Set the needle bar to its highest position then, open the cylinder cover ① .
- (2) Open the bobbin case latch lever ② fully then, fit it securely in the inner hook ③ .

[NOTE]Please pull the bobbin thread about 2.5mm out of the thread hole(NO.4)of the bobbin case.



6 PROPER SEWING

6-1 Operation of the halt switch

If an incident such as a thread breakage, needle breakage and any other incidents are happened during the sewing operation, please hit immediately the halt switch. The sewing machine running is stopped instantly.

Caution

★ Before start the sewing operation, please make sure the location of the halt switch and keep it in mind the function and how to use it.

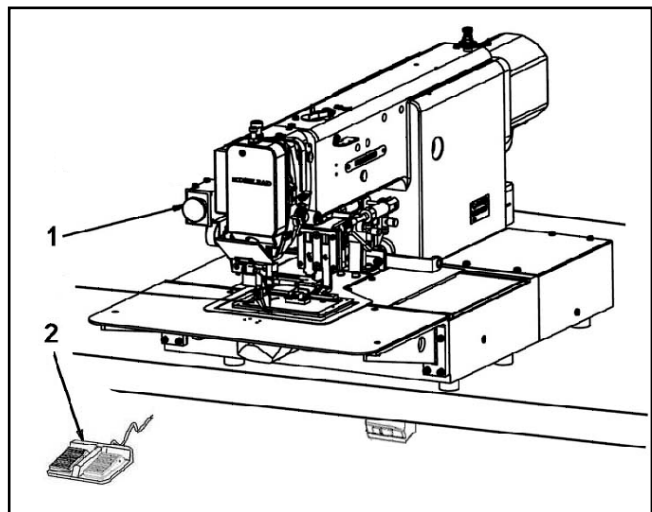
★ Please keep away the hands and the face from the needle during the sewing operation.

(1) Press the HALT switch ①, All operations will stop, and the sewing machine will stop at the needle UP state without trimming the thread.

(2) Remove the cause of the abnormality.

(3) To continue sewing, turn the HALT switch to the right. The switch will be unlocked. (For the details, please refer to the instructions on the technical manual [Operation Panel].)

(4) When the start switch ② (left) is pressed again, the operation will start.



Caution

★ Depending on the shape of the work holder, the collision may be happened with the work holder and the presser foot while the work holder is on the way back to the home position. For avoidance of this accident, before starting the sewing operation, program the work holder returning home with the operation panel of the control box to trace the sewing pattern.

6-2 The sewing operation

Caution

★ It is very dangerous to operate the sewing machine without the safety guards (Eye guard: belt cover, Link cover, Finger guard etc.).

★ Please make sure to always operate the sewing machine with the safety guards.

★ Please do not put unnecessary articles except for the sewing operation on the tabletop.

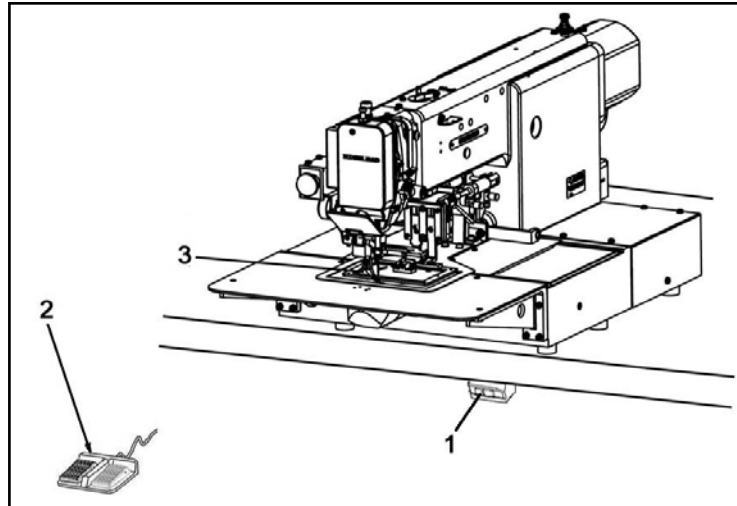
★ Please keep the hands and the face away from the needle.

-
- (1) Turn the power switch ① ON.

The collision may be happened with the work holder and the presser foot depending on the work holder shape when the work holder is moved to original position.

- (2) When the start switch ② (left) is pressed , the work holder ③ will go down ,the operation will start .

For the details ,please refer to the instructions on the technical manual [Operation Panel].



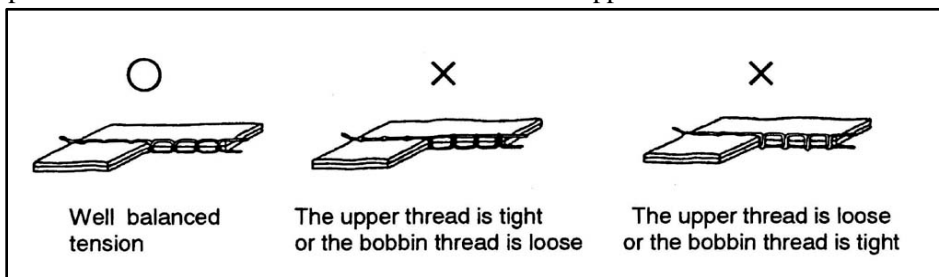
6-3 Adjustment of the thread tension

The thread tension between the upper and bosom thread should be balanced in the best condition.

When the upper thread tension is well balanced with the bobbin thread tension, both threads are interlocked along the centerline of fabric layers as shown on the below figures.

NOTE Normally weaker bobbin thread tension brings better sewing quality.

So it is prefer to set bobbin thread tension first and then set upper thread tension.

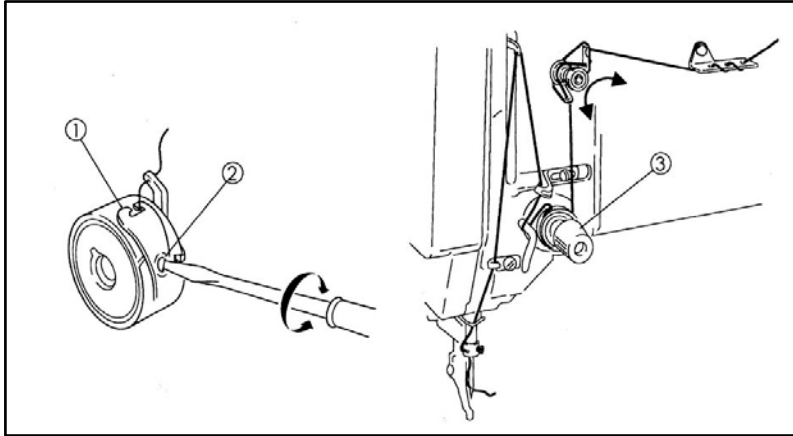


- (1) Bobbin thread tension

Adjust the bobbin thread tension with the thread tension adjusting screw ② on the bobbin case ①. The thread tension becomes loose if turn the thread tension adjusting screw ② to the counter clockwise, and the thread tension becomes tight if turn it to the clockwise.

(2) Upper thread tension

Adjust the upper thread tension based on the bobbin thread tension. For this adjustment, turn the thread tension adjusting nut ③. The upper tread tension becomes tight if turn the thread tension adjusting nut ③ to the clockwise, and the upper thread tension becomes loose if turns it to the counter clock wise.



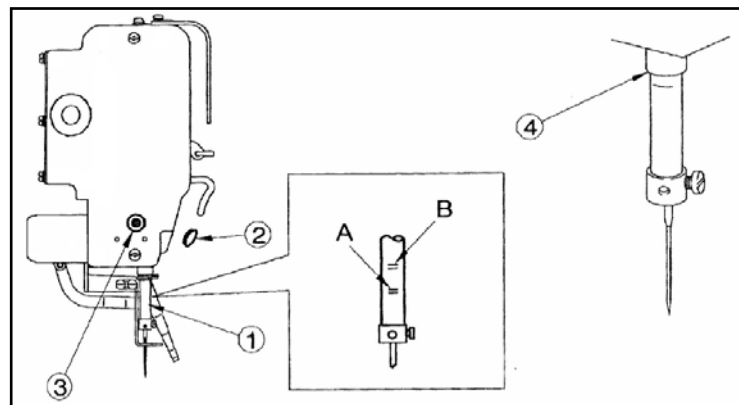
7 STANDARD ADJUSTMENT

Caution

- ★Please make sure to turn the power switch OFF before adjust the sewing machine.
- ★If the adjustment is required under the power switch is ON, keep the start foot switch away from the foot.
- ★Be careful not to be wounded by the needle or the inner hook point.
- ★Please make sure to put the safety guards(Eye guard, Belt guard, Link cover and finger guard etc.)back on the original location after the sewing machine adjustment.

7-1 Adjustment of the needle bar position

- (1) Turn the power switch OFF.
- (2) Turn the sewing machine pulley by hand then, stop the needle bar ① at the lowest position.
- (3) Remove the rubber plug ② from the face plate then, loosen the needle bar holder setscrew ③.



- (4) Move the needle bar ① to the position where the needle bar timing mark A is matched to the needle bar bushing bottom line ④ then, tighten the needle bar holder setscrew ③.

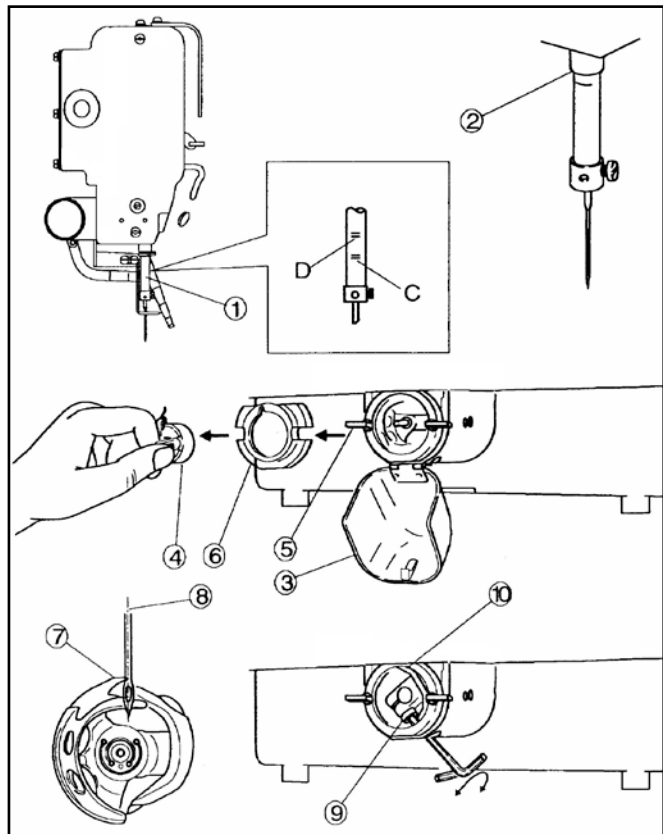
NOTE: If the needle class is DP×5, match the needle bar timing mark B to the needle bar bushing bottom line ④.

7-2 Adjustment of the position between the needle and the shuttle hook

- (1) Turn the power switch OFF.
- (2) Turn the sewing machine pulley by hand then, move up the needle bar ① from the lowest position and stop it at the position ② where the needle bar timing mark C is matched to the needle bar bushing bottom line.

NOTE: If the needle class is DP×5, match the needle bar timing mark D to the needle bar bushing bottom line ②.

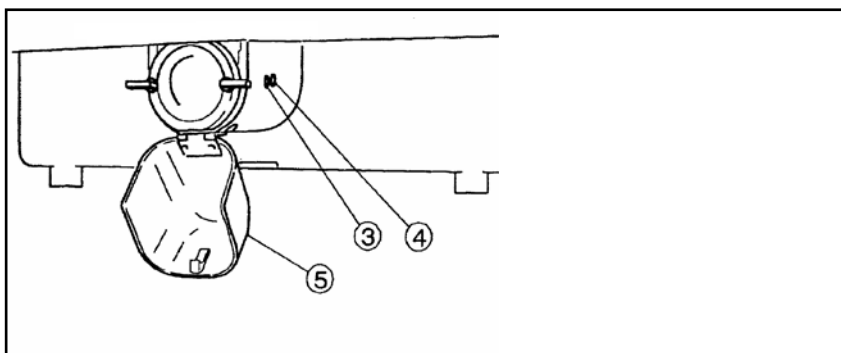
- (3) Open the cylinder cover ②.
- (4) Remove the bobbin case ③.
- (5) Turn the hook retainer lever ⑤ then, remove the hook retainer ⑥.
- (6) Loosen the driver setscrew ⑨ then, move the driver (No.10) and adjust the shuttle hook point ⑦ to be matched with the center line ⑧ of the needle.



- (7) After the adjustment, tighten the driver setscrew ⑨ and put the bobbin case ④, the hook retainer ⑥ and the hook retainer lever ⑤ back to the original location then close the cylinder cover ②.

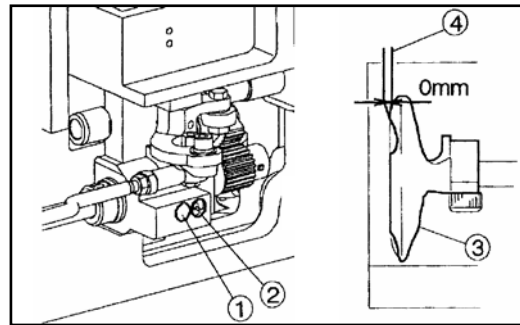
7-3 Adjustment of the clearance between the shuttle hook and the needle

- (1) Please take the same procedures as above paragraph 7-2. from (1) to (5).
- (2) Loosen the outer hook setscrew ③ and turn the eccentric pin ④ so that the clearance between the shuttle hook point and the needle becomes 0.05~0.1 mm.
- (3) After the adjustment, securely tighten the outer hook setscrew ③ and put the hook retainer and the bobbin case back to the original location then, close the cylinder cover ②.



7-4 Adjustment of the clearance between the driver and the needle

- (1) Please take the same procedures as above paragraph 7-2. from(1)to(5).
- (2) Please make sure the clearance between the shuttle hook point and the needle has been adjusted 0.05~0.1 mm at above procedure 7-3 Adjustment of the clearance between the shuttle hook and the needle.

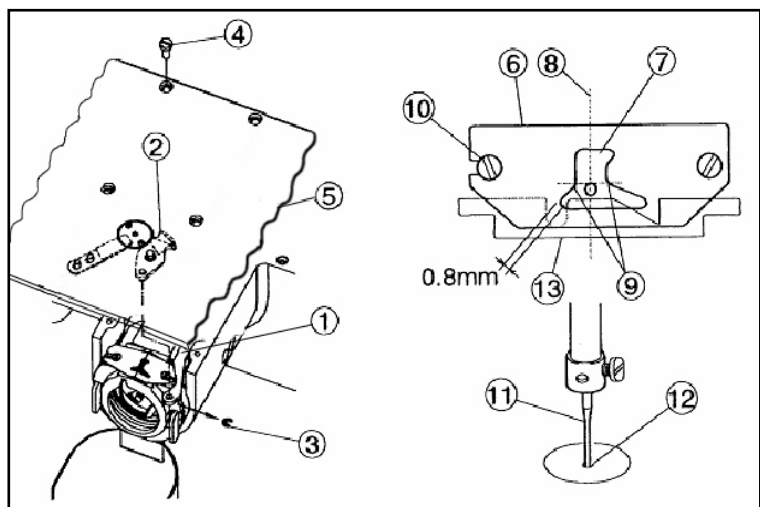


- (3) Loosen the driver setscrew ① and turn the eccentric pin ② so that the clearance between the driver ③ and the needle ④ can become 0.
- (4) After the adjustment, securely tighten the driver setscrew ① and put the hook retainer and the bobbin case back to the original location then, close the cylinder cover ⑤.

7-5 Adjustment of the thread guide

- (1) Remove the E-shaped snap ring ③ which is engaging the movable knife ② and the link ① then, loosen the setscrews ④ and remove the sliding plate(S) ⑤.
- (2) Loosen the setscrews ⑩ and move the thread guide ⑥ to the position where the needle center line ⑧ divides the needle groove ⑦ evenly and the rear side line ⑨ of the needle is aligned with the shoulder ⑨ of the thread guide ⑥. At this time, make sure that there is some clearance between the hook retainer and the thread guide ⑥ at least the upper thread can be passed smoothly through it(standard clearance is 0.8mm). If this clearance is too wide, it causes the trimming failure and if this clearance is too narrow, it causes the sewing condition disturbance, the trimmed upper thread tail uneven and the locking up the hook with the upper thread.

- (3) After the adjustment, engage the link ① of the trimmer mechanism with the movable knife ② with the E shaped snap ring ③ and put the sliding plate(S) ⑤ back on the original location then, tighten the setscrews ④. At this time, set the sliding plate(S) ⑤ so that the needle ⑪ can come down to the center ⑫ of the needle hole of the needle plate.



7-6 Adjustment of the presser foot

[NOTE]The presser foot is a very important part to form the fine stitches.

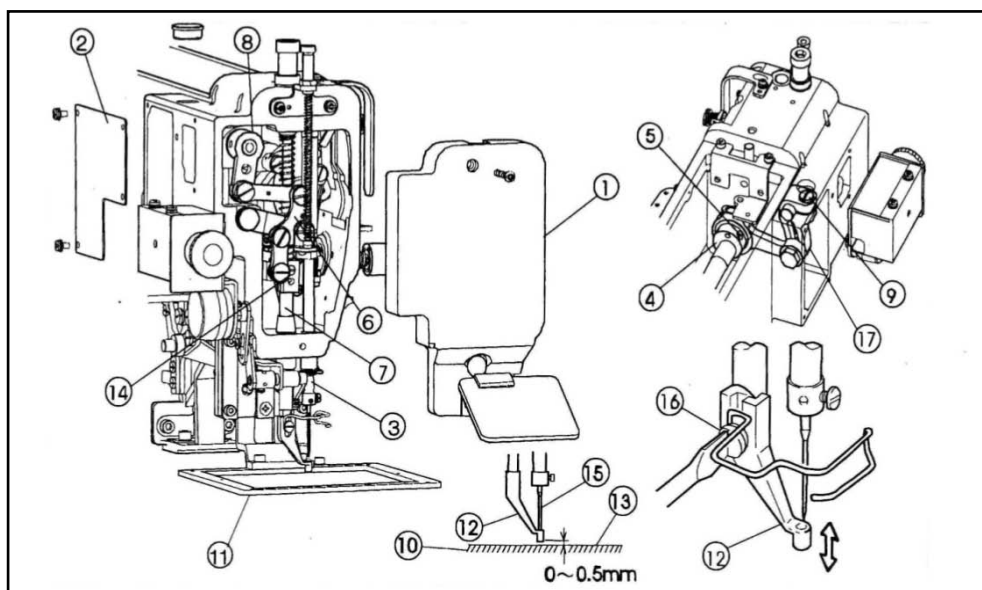
It moves simultaneously with the needle and stabilize the needle penetrating area of the sewing material with pressing down it, when the needle sticks into or pulls out the sewing material and prevent the skip stitch or the over penetration happening. Please adjust the presser foot properly to the sewing materials with the following instructions.

7.6.1 Adjustment of the presser foot position

[NOTE]Please always adjust the presser foot position when the thickness of the sewing material is changed.

- (1) Turn the power switch OFF.
- (2) Remove the face plate ① and the link cover ② .
- (3) Turn the sewing machine pulley by hand and stop the needle bar ③ at the lowest position. At this time, make sure the setscrew ⑤ of the eccentric cam ④ is positioned right beside the center line of the upper shaft. This is the standard position of the eccentric cam ④ . If the eccentric cam ④ is off from this position , set it back to the standard position with the instructions on the paragraph[7-6-3. Adjustment of the presser foot timing]in the following page.
- (4) Turn the sewing machine pulley by hand and stop the needle at the highest position(this is also the thread take up lever's highest position). At this time, loosen the setscrew ⑨ of the upper feed lock crank shaft ⑧ and adjust the center line of the bell crank ⑥ to be parallel with the presser foot bar ⑦ .
- (5) Insert the sewing material ⑩ under the work holder ⑪ and turn the sewing machine pulley by hand then, stop the presser foot ⑫ at the lowest position.
- (6) Loosen the presser foot bar setscrew ⑭ and move the presser foot bar ⑦ then, adjust the presser foot ⑫ position to be become the clearance between the bottom surface of the presser foot ⑫ and the surface of the sewing material 0~0.5mm. At the same time, rotate the presser foot bar ⑦ for the needle ⑮ to come down to the center of the needle hole of the presser foot ⑫ .
- (7) After the adjustment, put the face plate ① and the link cover ② back on the original location.

[NOTE]The lower position of the presser foot, the more effective for the skip stitches. However, if the presser foot becomes to Press the sewing material, the movement of the presser foot mechanism generates a slight noise. And also, the presser foot stays longer to hold the sewing material, so the upper thread tension becomes loose or the sewing pattern forming gets out of shape because the presser foot catches the surface of the sewing material. For avoiding these troubles, please lower the presser foot as small as possible.

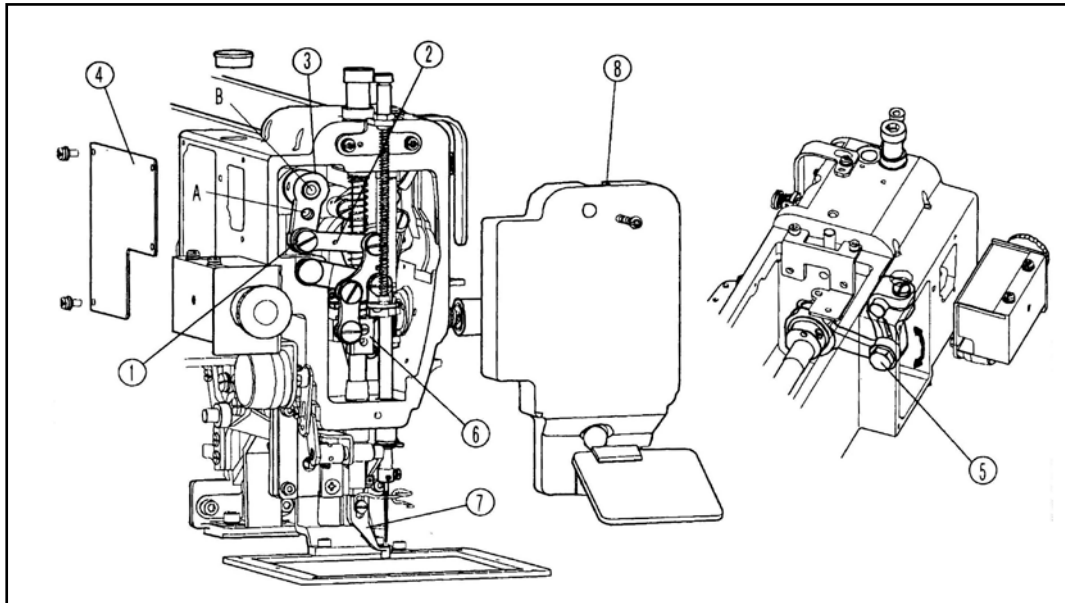


[NOTE]If the thickness of the sewing material changes very often, it is recommended to take the easy way for the adjustment of the presser foot position with the method that change only the fixed position of the presser foot after fixed the presser foot bar at higher position. For this adjustment, loosen the setscrew ⑬ then, move the presser foot ⑫ up and down.

7.6.2 Adjustment of the presser foot lift during the sewing

[NOTE]The presser foot lift during the sewing can be adjusted 0 and 2~10mm.

- (1) The presser foot lift during the sewing becomes 4~10mm at the condition which the connection of the link ② and the lever ③ with the shoulder screw ① is as shown on the figure and it becomes 2 to 4 mm if the connection is made with A hole, and it becomes 0 mm if the connection is made with B hole.
- (2) The stepping lift is adjusted 4mm when the sewing machine is shipped from the factory.
- (3) For the adjustment at the each range of the presser foot lift, remove the link cover ④ then, loosen and move the adjust bolt ⑤.
- (4) If the link ② connection is changed to A or B hole, the presser foot position is also changed. So reset the presser foot position with adjusting the position of the presser foot bar or the presser foot itself with loosening their setscrews ⑥ or ⑦.
- (5) Regarding the running noise and the vibration, the higher lift effects worse. So adjust the presser foot lift during the sewing as small as possible.
- (6) After the adjustment, put the link cover ④ and the face plate ⑧ back on the original location.

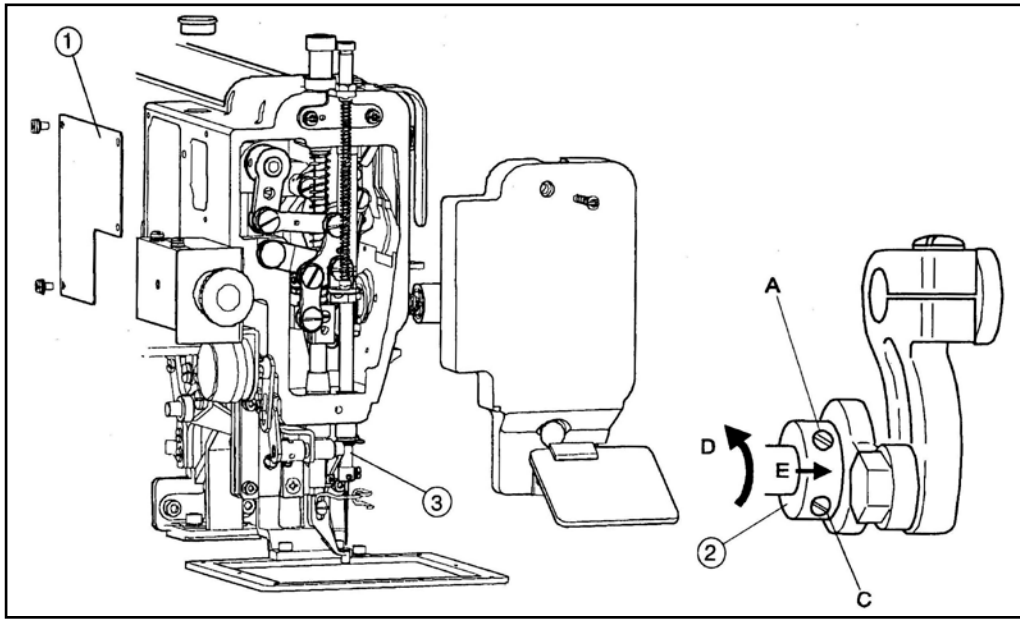


7.6.3 Adjustment of the presser foot timing

[NOTE] The presser foot up and down movement during the sewing synchronizes with the needle up and down movement. With changing this synchronized timing to the sewing materials, the skip stitches can be prevented or the seam tightness can be improved.

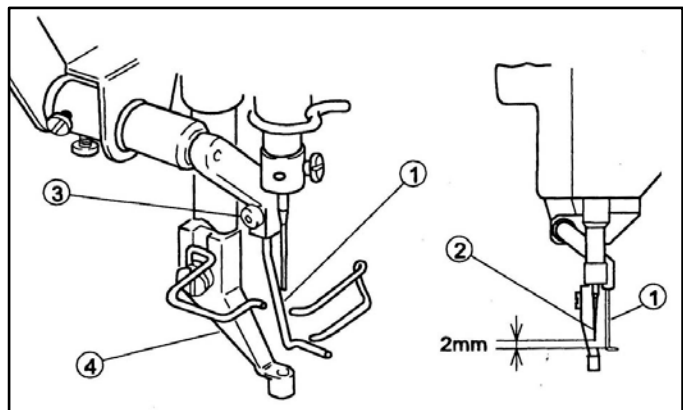
For example, the delay of the presser foot timing against the needle movement prevents the skip stitches especially to the thin materials, and the advance of the presser foot timing can improve the seam tightness especially to the thick materials.

- (1) Remove the link cover ①.
- (2) Loosen the setscrew “C” of the eccentric cam ②.
- (3) Turn the sewing machine pulley by hand and stop the needle bar ③ at the lowest position. At this stage, the setscrew “A” of the eccentric cam ② is positioned right beside the center line of the upper shaft. This is the standard position for the eccentric cam ②.
- (4) Loosen the setscrew “A” of the eccentric cam ②.
- (5) Hold the eccentric cam ② and turn the sewing machine pulley slowly by hand. If turn the sewing machine pulley to the arrow direction “D”, the presser foot timing against the needle movement is delayed, and if turn the pulley to the opposite direction, the timing of the presser foot is advanced.
- (6) After the adjustment, tighten the setscrew “A” and “C” in turn with slightly pushing the eccentric cam ② to the arrow direction “E”.
- (7) Put the link cover ① back on the original location.



7-7 Adjustment of the wiper

- (1) Loosen the wiper setscrew (3) and adjust the wiper (1) to be positioned where the wiper (1) passes under the needle point (2) with about 2 mm clearances right after the sewing machine is stopped running at the needle upper position (the thread take up lever's highest position).



[NOTE] When the presser foot position or the presser foot lift is changed, the wiper (1) may collide with the presser foot (4). In that case, please do not use the wiper (1). If do not use the wiper (1), cancel the wiper function with operation

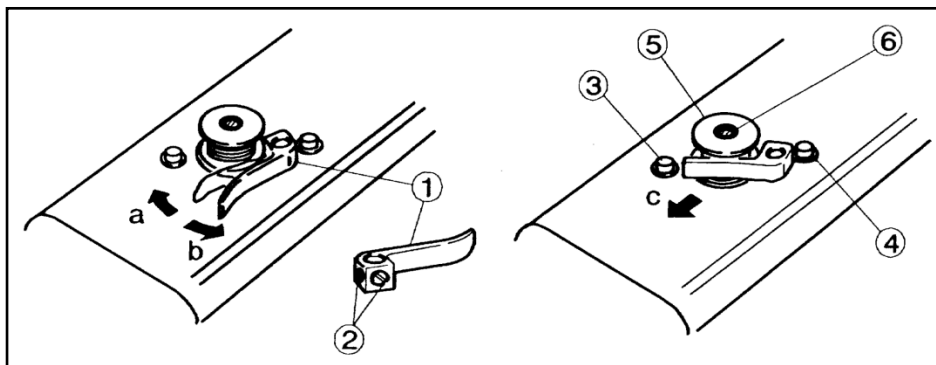
7-8 Adjustment of the bobbin winder

(1) Adjustment of the winding volume

Loosen the setscrew ② of the adjusting lever ① and adjust the position of the adjusting lever ①. If move the adjusting lever ① to the arrow direction “a” the Winding volume is reduced, and if move the adjusting lever ① to the arrow direction “b”, the winding volume is increased. The winding volume is adjusted 80% of the full volume when the sewing machine is shipped from the factory.

(2) Adjustment of the proper position of the bobbin winder

Firstly . loosen the setscrews ③ and ④ of the bobbin winder and put the empty bobbin ⑤ on the rotating shaft ⑥ then, push the adjusting lever ① to the arrow direction “a”. Secondary. move the whole bobbin winder to the arrow direction “C” and stop it at the position where the empty bobbin is rotated then, tighten the setscrews ③ and ④ of the bobbin winder. This is the proper position of the bobbin winder.



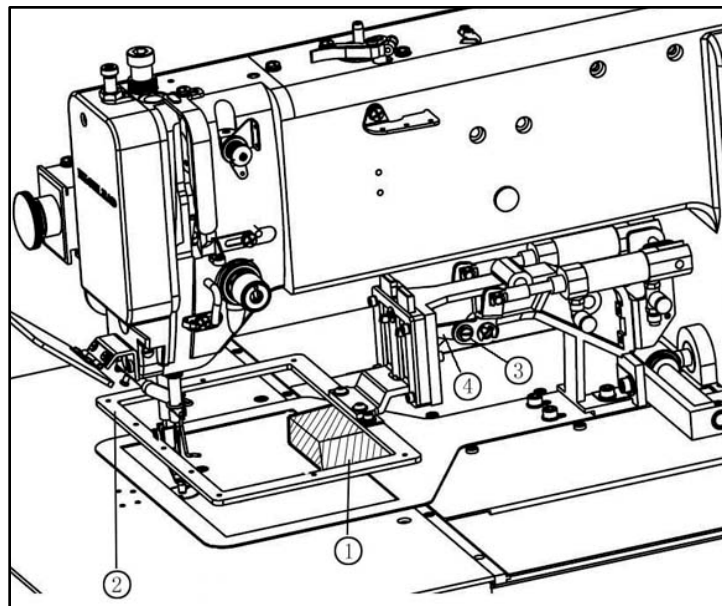
7-9 Adjustment of the work holder

If the sewing material is thick and the work holder does not press it strong enough, adjust the work holder presser as follow.

(1) Insert the sewing material ① under the work holder ②.

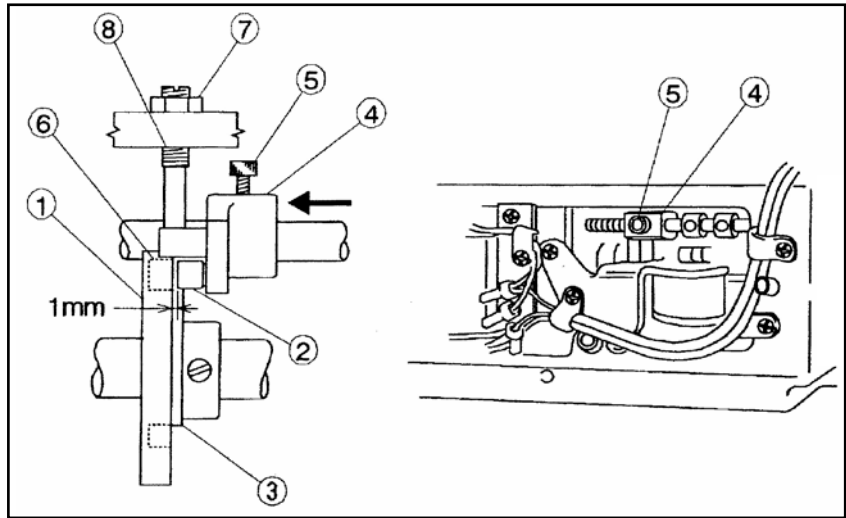
(2) Turn the power switch ON and lower the work holder ② with the work holder foot switch

(3) Loosen the 2 of the setscrews ③ and move adjusting plate ④ until it touches the material ① then, tighten the 2 of the setscrews ③.



7-10 Adjustment of the trimmer cam follower

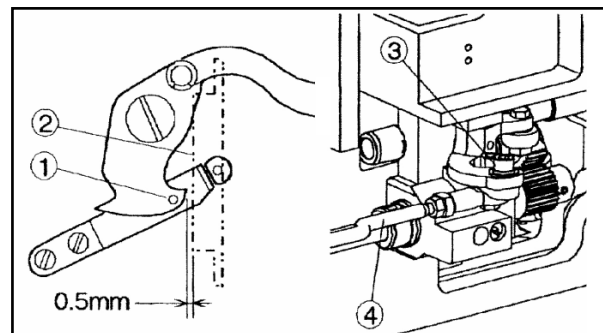
- (1) Turn the power switch OFF and remove the top cover.



- (2) Under the sewing machine regular stop condition (the needle stop position is upper and the take up lever stop position is highest), loosen the setscrew (5) of the cam follower lever (4) and adjust the cam follower (2) to be positioned to contact with the shoulder portion (3) of the trimmer cam (1) with having about 1 mm clearance between the cam follower (2) and the trimmer cam (1). After this adjustment, tighten the setscrew (5) of the cam follower lever (4).
- (3) Push the cam follower lever (4) by hand to the arrow direction and make sure that the cam follower (2) is engaged into the cam groove (3) smoothly.
- (4) If the cam follower (2) is not engaged smoothly, under confirming with the condition which the cam follower (2) contacts with the shoulder portion (3) of the trimmer cam (1), loosen the nut (7) and tighten the stopper screw (8) until it touches with the stopper (9) of the cam follower lever (4) then, loosen the stopper screw (8) back about 1/3 turn and fix the nut (7) firmly.

7-11 Adjustment of the position for the movable knife point

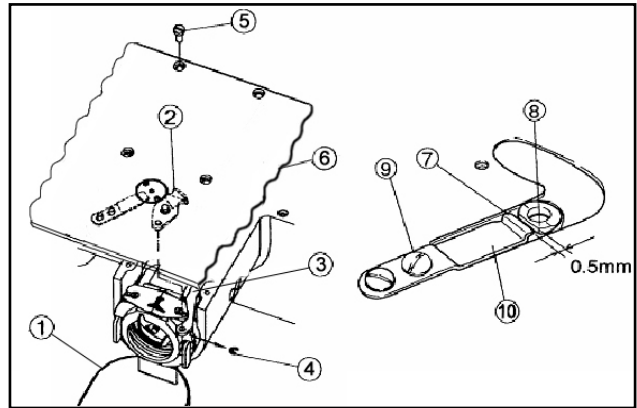
- (1) Tilt the sewing machine head to the left to be able to see the bottom component parts.
- (2) Open the cylinder cover
- (3) Check with the point (1) of the movable knife whether it is located



- at the position apart 0.5mm from the front face of the hook retainer (2).
- (4) For the adjustment of the movable knife point (1), loosen the adjusting screw (3) and move the rod end (4) right and left then, adjust the position of the movable knife point.
- (5) After the adjustment, tighten the adjusting screw nut (3) securely.

7-12 Adjustment of the fixed knife position

- (1) Open the cylinder cover ① .
- (2) Remove the E-shaped snap ring ④ , which engages the movable knife ② and the link ③ .
- (3) Loosen the setscrews ⑤ then , remove the sliding plate ⑥ .
- (4) Turn the sliding plate ⑥ upside down and loosen two setscrews ⑨ then, adjust the fixed knife ⑩ position to be positioned for the blade edge ⑦ to have the clearance 0.5mm from the edge of the needle plate ⑧ .
- (5) After the adjustment, tighten the setscrews ⑨ securely.
- (6) Put all the parts for this adjustment back to the original locations.



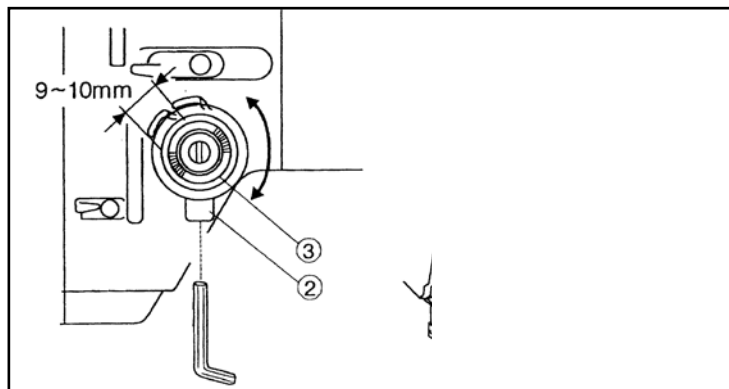
7-13 Adjustment of the thread take up spring swing stroke

Loosen the setscrew ② and turn the whole thread tension regulator ③ then, adjust the thread take up spring swing stroke to be become 9 to 10mm.

After the adjustment, tighten the setscrew ② securely.

7-14 Adjustment of the thread take up spring tension

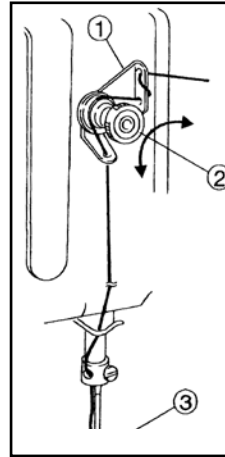
Insert the screw driver ⑤ into the slit ④ of the thread tension regulator ③ and adjust the thread take up spring ① tension. If turn the screw driver to the clockwise, the thread take up spring tension becomes tight. and if turn the screw driver to the counter clockwise. the thread take up spring tension becomes loose.



7-15 Adjustment of the thread tail after the trimming

Adjust the thread tail ③ from the needle after the trimming with turning the nut ② of the pre-tension ①.

If turn the nut ② to the clockwise, the thread tail becomes shorter and if turn the nut ② to the counter-clockwise, the thread tail becomes longer.



7-16 Cancellation of the trimming function

If the automatic trimming is not required during the sewing operation, cancel the Trimming function with the setting panel of the control box.

7-17 Adjustment of the upper thread tension release

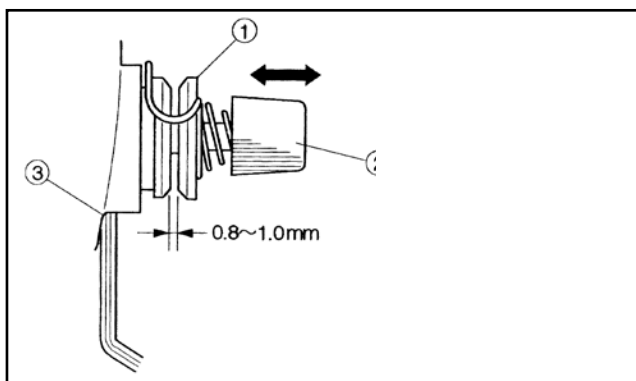
[NOTE] (a) The upper thread tension release works when the upper thread is trimmed automatically or the presser foot is lifted during the work holder feeding.

(b) If the upper thread tension release does not work properly when the upper thread is trimmed automatically, the thread tail from the needle becomes shorter then, it induces the skip stitch happening or pulling the thread tail out of the needle at the start of the sewing.

(c) During the sewing operation, the discs ① of the thread tension regulator is closed while the presser foot is moving up and down.

If the discs ① of the thread tension regulator is not closed, the upper thread tension becomes loose and the proper stitch condition can not be obtained.

(d) When the upper thread tension release is activated, the discs ① the upper thread tension regulator opens 0.8~1.0mm. This is the normal conduction of the discs ① opening. For this adjustment, take the following procedure.

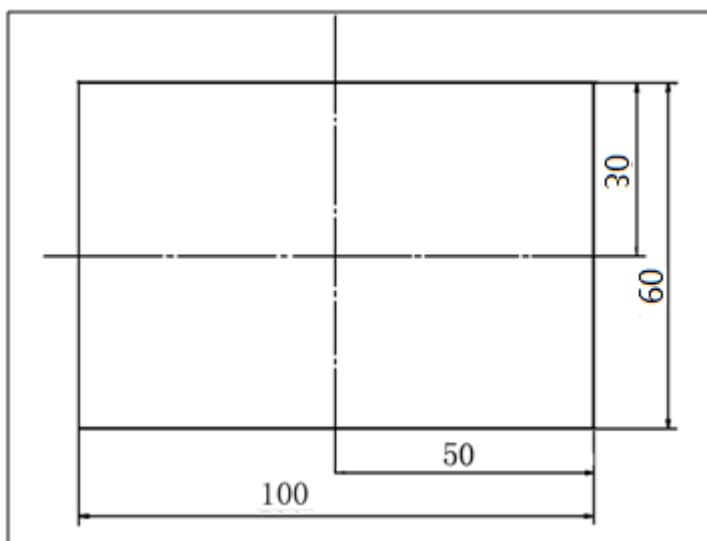


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- (1) Remove the top motor cover.
 - (2) Fully turn the crank ③ of the rotary solenoid ② in the arrow direction. At this time,
 - (3) adjust the upper thread tension release for the discs to be opened 0.8 to 1.0 mm. For this adjustment, loosen the nut A then, if tighten the nut B, the discs opening becomes wider and if loosen the nut B, it becomes narrower.
 - (4) If the normal opening of the discs can not be obtained with the nut adjustment, loosen the wire fix screws ⑤ and adjust the tension of the wire ⑥.
 - (5) The wire ⑥ may be got longer over a long period machine operation. At that time, adjust the upper thread tension release again.

7-18 Adjustment of the mechanical home position

[NOTE]The mechanical home position is fixed at the center of the sewing area when the sewing machine is shipped from the factory. However, it can be moved within the area covered with diagonal lines.

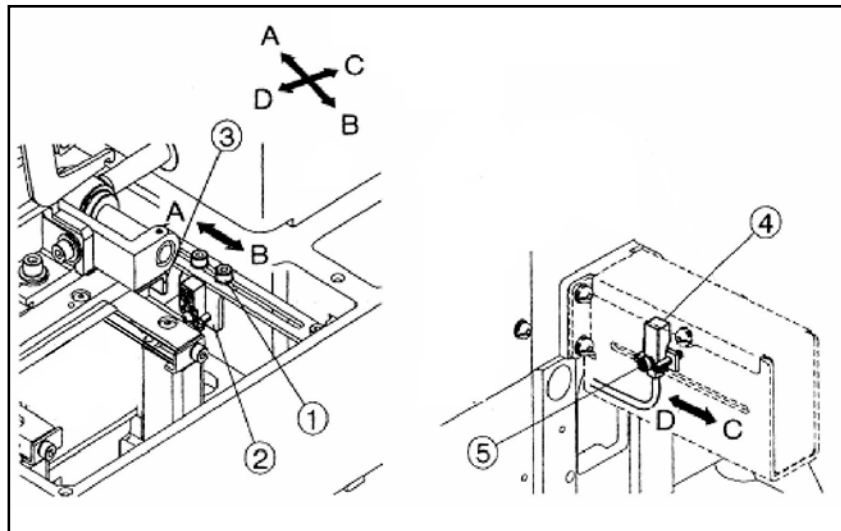
- (1) Turn the power switch ON and cancel the sewing area limit with the operation panel.
- (2) After the cancellation of the sewing area limit, once. Turn the power switch OFF.



7-18-1. Shifting the mechanical home position to the X direction

- (1) Remove the X-Y cover (right),(left) and X cover.
- (2) Loosen the detector plate fix screws(2 pieces) ①. if move the detector plate ② to the right, the mechanical home position is shifted to the left and if it is moved to the left, the mechanical home position is shifted to the right.
- (3) After the mechanical home position setting, tighten the detector plate fix screws ① securely.

[NOTE] When the original mechanical home position is shifted. Please check the clearance between the X detector plate and the X detector. This clearance should be set within the range of 1.0—1.5 mm.



7-18-2. Shifting the mechanical home position to the Y direction

- (1) Loosen the Y-detector setscrew ⑤.
- (2) If move the Y-detector ④ to the front, the mechanical home position is shifted to the backward. If it is moved to the backward, the mechanical home position is shifted to the front.
- (3) After the mechanical home position setting, tighten the screw ⑤ securely.

7-19 Adjustment of the X-Y table contact pressure

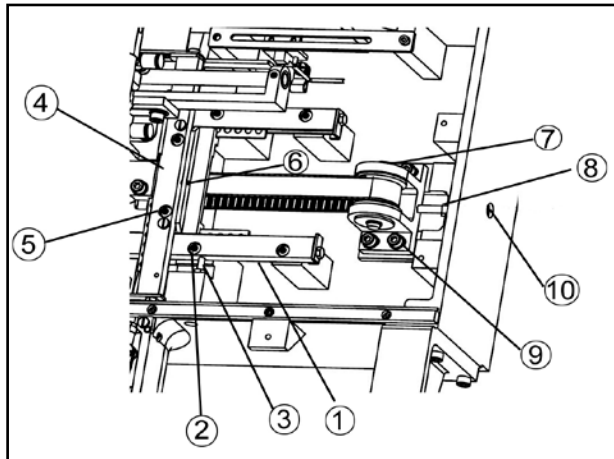
[NOTE] When take the X-Y table apart or the X-Y table became weak in the joints, adjust the X-Y table contact pressure. The adjustment should be made the X-Y table movement as smooth as possible without having play. If the X-Y table contact pressure is too tight, the over pressure induces the out of control on the X-Y table movement.

- (1) Remove the right and left X-Y cover and the right X cover plate.
- (2) Loosen the setscrew(2 pieces) ② so that the X fixed race ① can be moved slightly.
- (3) If tighten the both right and left contact presser adjusting screws ③, the X table contact pressure is increased.
- (4) Loosen the setscrews(2 pieces) ⑤ so that the Y fixed race ④ can be moved slightly.
- (5) If tighten the contact pressure adjusting screws ⑥, the Y table contact pressure is increased.
- (6) After adjustment, tighten the setscrews ② and ⑤ securely.

7-20 Adjustment of the X timing belt tension

[NOTE] The proper condition of the X timing belt tension is standing that they will not be got any yield even it is slightly pushed by hand.

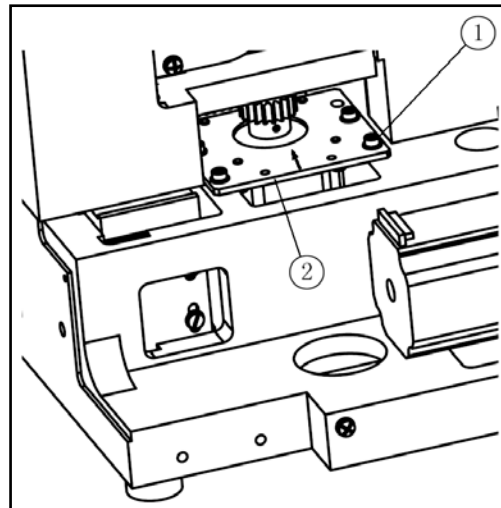
- (1) Remove the right X cover and the right X cover plate.
- (2) Loosen the nut ⑧ and the setscrew ⑨ of the bracket ⑦.
- (3) If the tighten the tension adjust screw ⑩, the X timing belt tension will be increased.
- (4) After adjustment, tighten the nut ⑧ and the setscrew ⑨.



7-21 Adjustment of Y stepping motor position

- (1) Remove the motor cover.
- (2) Loosen four setscrews ① of the Y-stepping motor adapter ②.
- (3) Press the Y-motor adapter ② to arrow direction lightly.
- (4) Fasten the setscrews ① securely, and put the motor cover to original position.

NOTE After the adjustment, please make sure that there is no gap in the gear mechanism. Please grease gear periodically for reduction of noise or abrasion



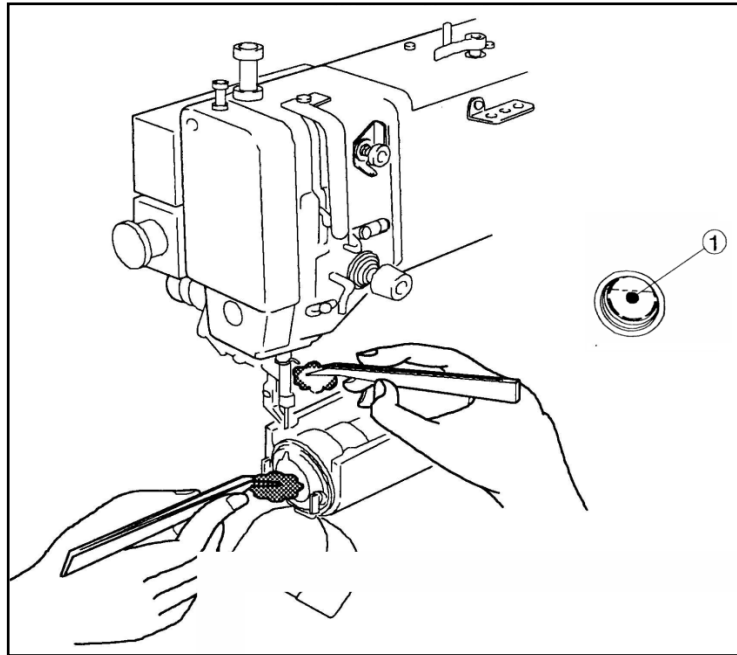
8 MAINTENANCE

Caution

- ★Please make sure to turn the power switch always OFF when clean up the sewing machine.
- ★Before or after the sewing operation, clean up the sewing machine and check the Oil level in the oil tank.

8-1 Cleaning

- (1) Turn the power switch OFF.
- (2) Remove the dust and the thread waste sticking around the threading parts or the shuttle hook area.
- (3) Check the oil level in the oil tank. If the oil is under the red mark level supply the oil to be over the red mark level.
- (4) If the waste oil is full, please remove the oil .



9 BAD SEWING CONDITION & ITS CAUSE AND REMEDY

[NOTE] Please fix the troubles during the sewing machine operation with referring to the following instructions. Beside, if the trouble conditions are not coming under these classification, please contact the sewing machine dealers nearby.

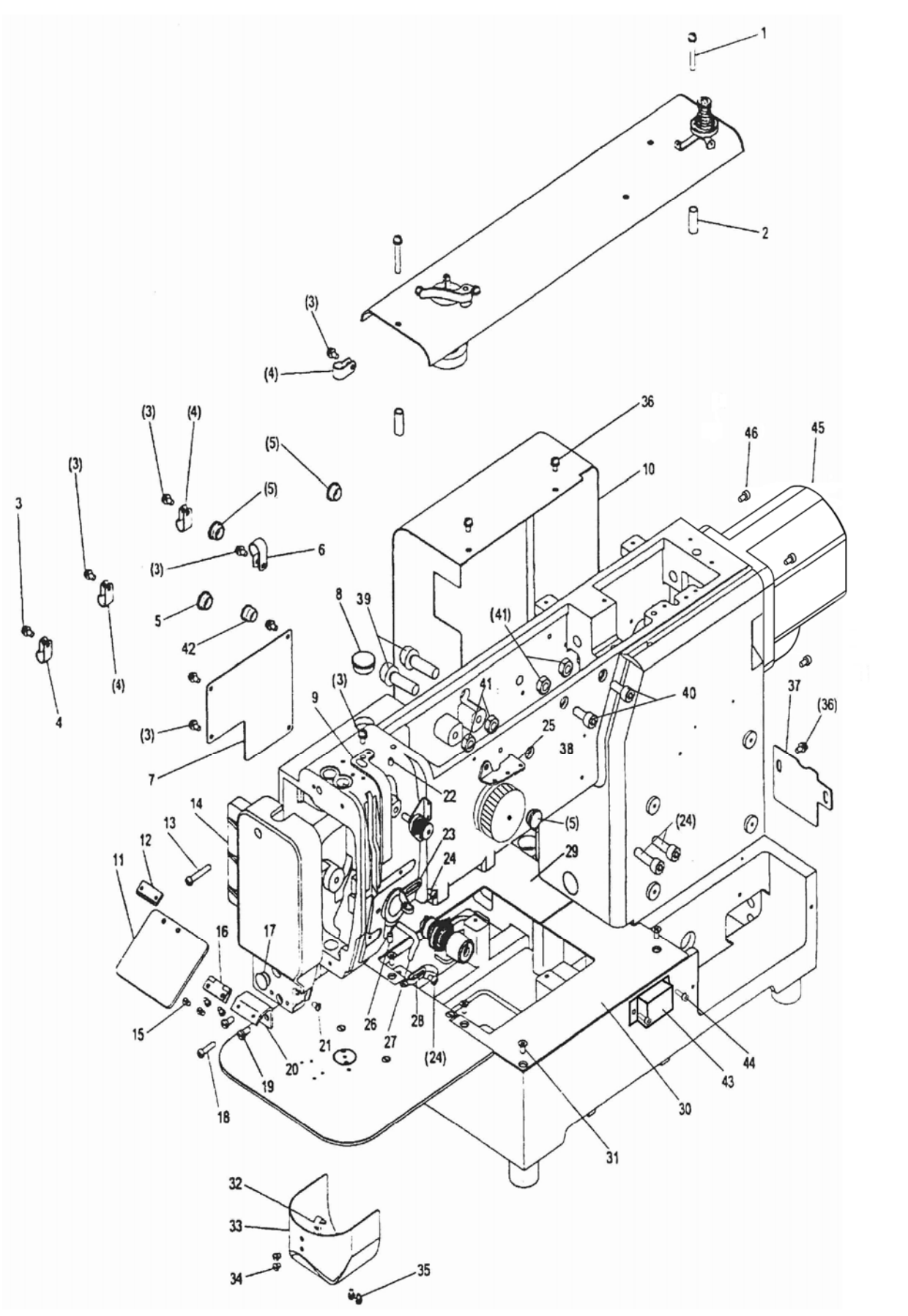
Bad condition	Cause	Remedy	Ref. page & item
1. Upper thread breakage after happens	Poor thread tension	Use better quality thread	—
	Tight upper thread tension	Adjust thread tension	6-3
	Strong thread take up spring	Adjust thread take up spring properly	7-14
	Upper thread is thicker than needle size	Change needle to suitable size	—
	Damages on shuttle hook or drive	Change them new ones or grind them with buffing wheel or grind stone	—
	Damages inside presser foot needle hole	Change it new one or grind it with buffing wheel	—
	Needle touches with presser foot needle hole	Move presser foot position	7-6-1(6)
	Needle and shuttle hook are not in proper timing	Adjust the timing	7-2
	Thread melts with needle heat	Slow down sewing speed	—
		Use silicon oil	—
Use needle cooler		—	
2. Upper thread is pilled out from needle	Thread tension discs are not opened at trimming	Adjust thread tension release	7-17
	Thread take up spring swings too much	Adjust thread take up spring's swing stroke	7-14
	Upper thread is broken before regular trimming	Adjust fixed knife and needle plate position	7-12
	Needle size is bigger than thread size	Change needle to suitable size	—
	Pre-tension is too tight	Adjust pre-tension	7-16
	Thread guide is in wrong position	Adjust thread guide position properly	7-5
	Needle and shuttle hook are in bad timing	Adjust the timing properly	7-2
	Trimmer timing is not correct	Adjust trimmer cam position	7-10
		Adjust movable knife position	7-11
Adjust synchronizer position		—	

Bad condition	Cause	Remedy	Ref. page & item
3. Skip stitch happens at start sewing	Too short bobbin thread by bobbin spinning after trimming	Use non racing spring with bobbin	—
	Bobbin thread tension is too tight	Loosen bobbin thread tension spring	6-3
	Thread tail from needle is very short after trimming	Decrease pre-tension	7-16
		Adjust trimmer cam position	7-10
		Adjust synchronizer position	—
		Make thread take up swing stroke smaller	7-13
		Advance thread tension release timing	Control unit
Adjust thread guide position properly	7-5		
4. Thread tail from needle is too long after trimming	Pre-tension is too loose	Make pre-tension tighter	7-14
	Trimmer timing is delayed	Adjust trimmer cam position	7-10
		Adjust synchronizer position	—
	Upper thread tension release timing is too fast	Delay tension release timing	Control unit
Tread guide is in wrong position	Adjust thread guide position properly	7-5	
5. Trimming is not functioned	Trimmer function is canceled	Resume trimmer function	Control unit
	Fixed knife is dull	Change it new knife	7-11
	Movable Knife is in wrong position	Adjust movable knife position properly	7-11
	Skip stitching happens at trimming	Fix skip stitching	7-6
	Trimmer timing is wrong	Adjust trimmer cam position	7-10
Adjust synchronizer position		—	
6. Skip stitching often happens	Needle and shuttle hook clearance is too big	Adjust needle and shuttle hook timing properly	7-2
	Needle and shuttle hook timing is not correct	Adjust needle and shuttle hook timing properly	7-2
	Needle is bent	Change it new needle	—
	Needle is bent by driver	Adjust needle and diver clearance properly	7-4
	Needle is in wrong position	Amend needle position	7-2
	Presser foot position is not correct	Adjust presser foot position properly	7-6

Bad condition	Cause	Remedy	Ref.page & item
7. Stitch forming is loose	Upper thread tension is not tight enough	Increase upper thread tension	6-3
	Thread tension regulator's discs are opened during sewing	Adjust tension regulator position properly	7-17
		Adjust upper tension release position properly	7-17
	Presser foot position is not correct	Adjust presser foot position properly	7-6
	Driver and shuttle hook clearance is very small	Change shuttle hook	—
	Presser foot up and down timing is not proper	Adjust presser foot timing properly	7-6
8. Sewing machine does not work even start switch is turned ON	Cables wiring is disconnected	Connect all cables precisely	3
	System software is not loaded	Load system software to control box	5-1
	Emergency stop switch is kept ON	Release emergency stop switch lock	6-1
9. Sewing machine runs idle at high speed when power switch is turned ON	Synchronizer cable is disconnected	Connect synchronizer cable precisely	control unit
	Synchronizer is out of order	Change it new synchronizer	—
10. Work holder does not work	Work holder activate cable is disconnected	Connect the cable precisely	control unit
	Work holder activate cable is not strong enough	Increase work holder pressure	7-9
	Work holder switch is out of order	Change it new work holder switch	—
11. Sewing pattern is distorted	Work holder switch is not strong enough	Increase work holder pressure	7-9
	sewing material weight is very heavy	Slow down sewing speed	6-2
		Slow down feeding speed	control unit
		Select sewing material weight level at feeding	control unit
X timing belt is loose	Adjust X timing belt tension properly	7-21	

Bad condition	Cause	Remedy	Ref. page & item
12. Work holder does no stop at home position	X-Y detectors cable are disconnected	Connect X-Y cables precisely	—
	X-Y detectors cable are out of order	Change them new detectors	—
	Detector and detector plate clearance is too big	Adjust the clearance properly	7-19
13. Work holder stops at not original home position	Detector and detector plate mounting is loose	Check setscrews and tighten them securely	7-19
	Detector and detector plate clearance is bigger than standard	Adjust detector and detector plate clearance properly	7-19

A. ARM BED AND ITS ACCESSORIES (1)



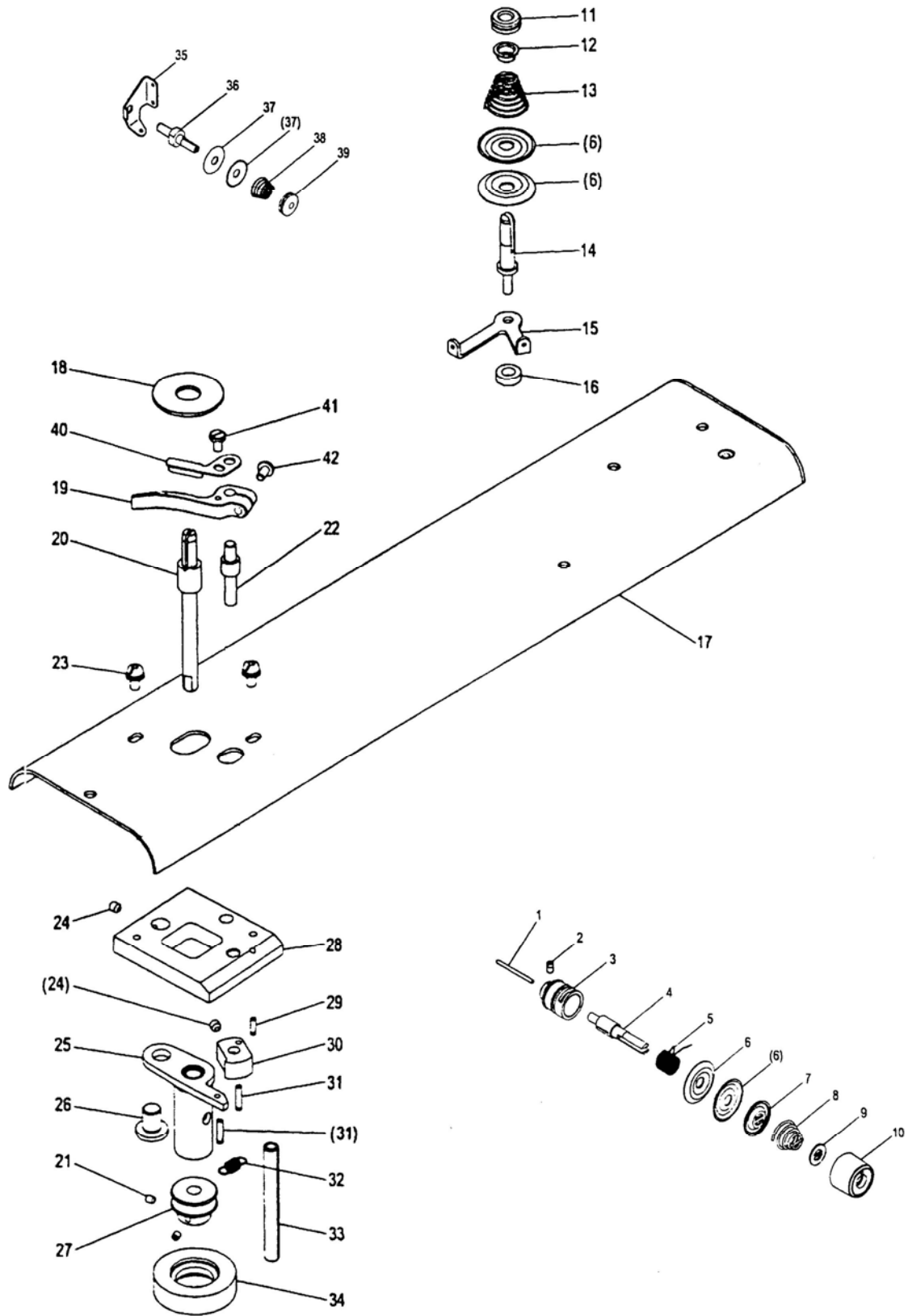
A. ARM BED AND ITS ACCESSORIES (1)

Fig. No.	Part No.	Description	Pcs.	Remarks
A01	HZ11040300	Screw M4×30	2	M4×30
A02	H6623B8001	Spacer	2	
A03	HZ11040080	Screw M4×8	10	M4×8
A04	H6650H8001	Nylon clip AB-5N	4	AB-5N
A05	H4715B8001	Rubber plug Φ13	4	Φ13
A06	H6648I8001	Nylon clip AB-6N	1	AB-6N
A07	H6611B8001	Cover	1	
A08	HA307B0673	Rubber plug Φ19	2	Φ19
A09	H6689B8001	Thread take-up lever guard	1	
A10	HF15401008	Motor cover	1	
A11	HM014B8001	Eye guard	1	
A12	H6675B8001	Adapter	1	
A13	HZ11040250	Screw M4×25	1	M4×25 发黑
A14	HM019B8001	Face cover	1	
A15	HA104G0654	Screw 1/8(44)×6	4	1/8(44)×6
A16	H6696B8001	Hinge	1	
A17	HA307B0674	Rubber plug Φ11.8	1	Φ11.8
A18	HZ11040200	Screw M4×20	1	M4×20
A19	HA100C2190	Screw 11/64(40)×8	2	11/64(40)×8
A20	HM015B8001	Eye guard bracket	1	
A21	HA106B0676	Screw 9/64(40)×6	1	9/64(40)×6
A22	H431040060	Screw M4×6	1	M4×6
A23	HA600B2050	Thread guide	1	
A24	HZ11040060	Screw M4×6	3	M4×6
A25	HA700B2050	Thread guide	1	
A26	H431050080	Screw M5×8	1	M5×8
A27	H3000B2130	Thread guide	1	
A28	HA106B0675	Thread guide	1	
A29	HF15401007	X Cover plate (L)	1	
A30	HF15401006	X Cover plate (R)	1	
A31	HZ11040080	Screw M4×8	6	M4×8
A32	H6691B8001	Latch	1	
A33	H6693B8001	Cylinder cover	1	
A34	H6692B8001	Screw 9/64(40)×3.2	2	9/64(40)×3.2
A35	HZ11030060	Screw M3×6	2	M3×6
A36	HZ11040080	Screw M4×8	6	M4×8
A37	HF15401009	Cover	1	
A38	H415050200	Screw M5×20	2	M5×20
A39	H415050250	Screw M5×25	2	M5×25
A40	H415050120	Screw M5×12	2	M5×12
A41	H003002050	Nut M5	6	M5
A42	HA300B2090	Rubber plug Φ8.8	1	Φ8.8
A43	HF15401019	Cover	1	

A. ARM BED AND ITS ACCESSORIES (1)

Fig. No.	Part No.	Description	Pcs.	Remarks
A44	HZ11040060	Screw M4 × 6	2	M4 × 6
A45	HF15401026	Motor cover	1	
A46	H415050200	Screw M5 × 20	4	

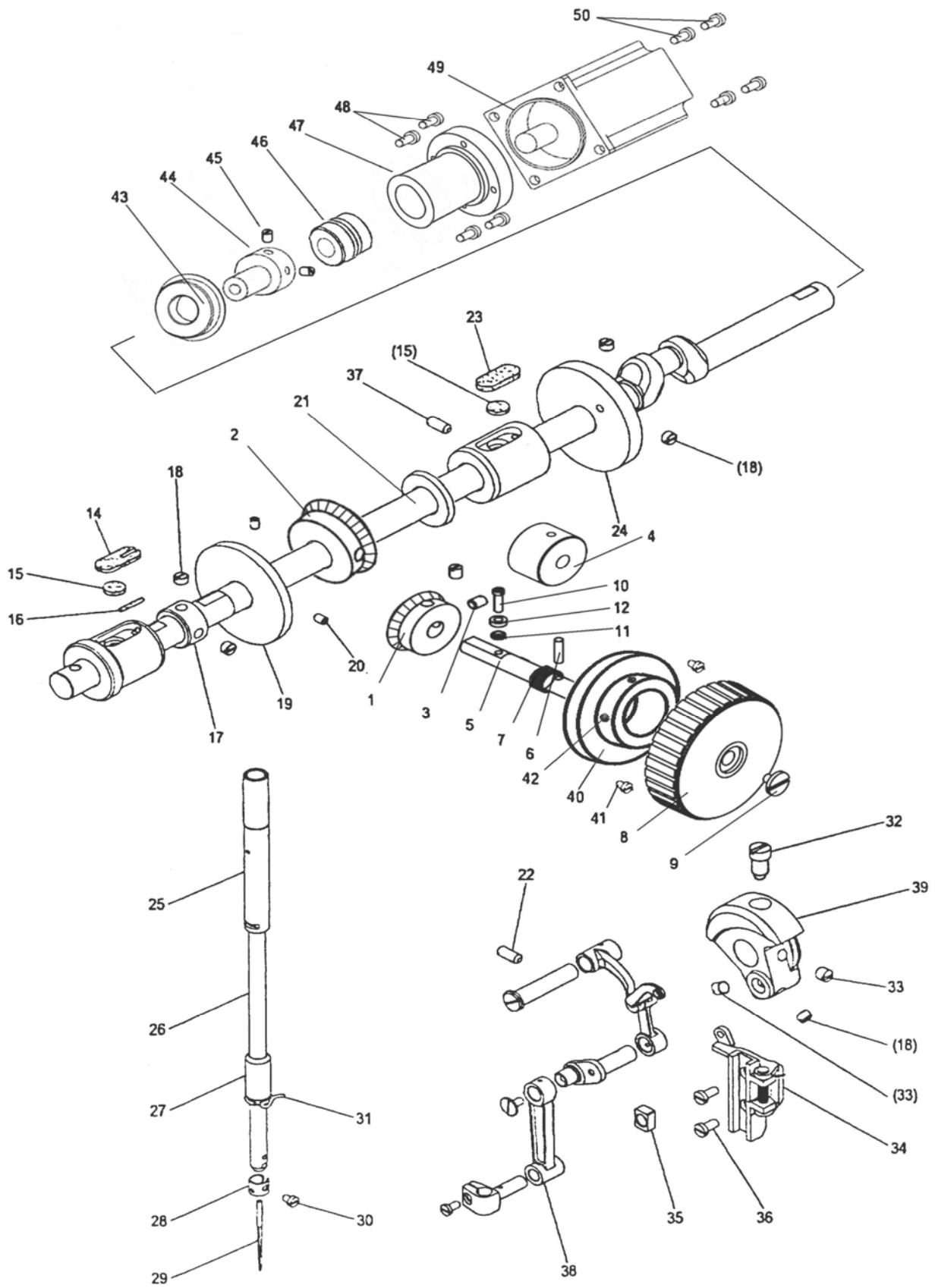
B. ARM BED AND ITS ACCESSORIES (2)



B.ARM BED AND IT'S ACCESSORIES (2)

Fig. No.	Part No.	Description	Pcs.	Remarks
B01	HA115B0709	Pin	1	
B02	HA115B0708	Screw 9/64(40) × 4	1	
B03	HA310B0703	Regulator casing	1	
B04	HA115B0701	Thread tension stud	1	
B05	HA115B0706	Thread take-up spring	1	
B06	HA115B0705	Thread tension discs	4	
B07	HA310B0702	Disc retaining plate	1	
B08	H6675C8001	Thread tension spring	1	
B09	HA115B7010	Thumb nut revolution stopper	1	
B10	HA310B0701	Thumb nut	1	
B11	H660GB8001	Thumb nut	1	
B12	H660FB8001	Spring guide	1	
B13	H660EB8001	Thread tension spring	1	
B14	H660HB8001	Thread tension stud	1	
B15	H6662B8001	Thread guide	1	
B16	H6663B8001	Spacer	1	
B17	HM012B8001	Top cover	1	
B18	H6656B8001	Spacer	1	
B19	H6651B8001	Lever	1	
B20	H6648B8001	Driven shaft	1	
B21	H431030040	Screw M3 × 4	2	M3 × 4
B22	H6649B8001	Shaft	1	
B23	HZ11040100	Screw M4 × 10	2	M4 × 10
B24	H431040040	Screw M4 × 4	2	M4 × 4
B25	H6645B7101	Lever	1	
B26	H6650B8001	Pin	1	
B27	H6657B8001	Wheel	1	
B28	H6644B8001	Bracket	1	
B29	H6659B8001	Pin $\Phi 2.5 \times 8$	1	$\Phi 2.5 \times 8$
B30	H6652B8001	Cam	1	
B31	H6660B8001	Pin $\Phi 2.5 \times 12$	2	$\Phi 2.5 \times 12$
B32	H6653B8001	Spring	1	
B33	H6655B8001	Pin $\Phi 6 \times 56$	1	$\Phi 6 \times 56$
B34	H6658B8001	Tire	1	
B35	HA710B0674	Thread guide	1	
B36	HA710B0673	Thread tension stud	1	
B37	HA112B0693	Thread tension discs	2	
B38	HA710B0672	Thread tension spring	1	
B39	HA710B0671	Thumb nut	1	
B40	H662EB8001	Adjuster plate	1	
B41	H662DB8001	Screw 9/64(40) × 6.5	1	9/64(40) × 6.5
B42	H3100B2100	Screw 9/64(40) × 11	1	9/64(40) × 11

C. SEWING MECHANISM (1)



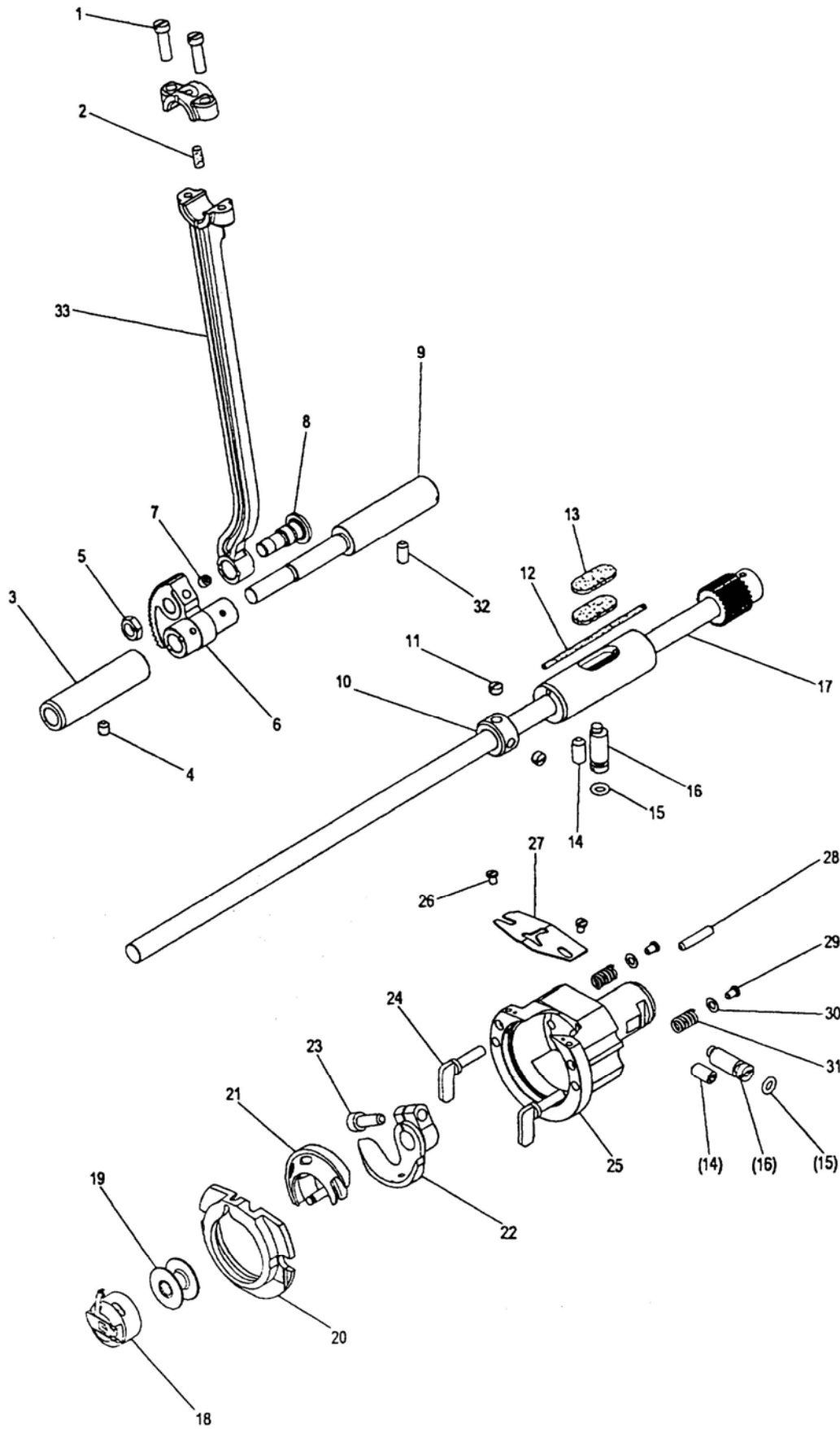
C. SEWING MECHANISM (1)

Fig. No.	Part No.	Description	Pcs.	Remarks
C01	HF113D2122	Bevel gear for hand wheel shaft	1	
C02	HF113D2112	Bevel gear for arm shaft	1	
C03	HA108C0663	Set screw	4	
C04	HF15401016	Hand wheel bushing	1	
C05	HF15401015	Hand wheel shaft	1	
C06	H609025120	Pin	1	
C07	H4767E8001	Spring	1	
C08	HB42E52081	Hand wheel	1	
C09	H5311F8001	Screw	1	
C10	HF15401013	Screw	1	
C11	HF15401012	Washer	1	
C12	HF15401014	Bearing	1	
C14	H2009B0743	Felt	1	
C15	H6616B8001	Felt	2	
C16	H2009B0742	Felt	1	
C17	HA108G0661	Collar	1	
C18	HA105D0662	Screw 1/4(40) × 4	5	1/4(40) × 4
C19	HF15402008	Pulley	1	
C20	H431040060	Screw M4 × 6	2	M4 × 6
C21	HM004C8001	Drive shaft	1	
C22	HS90101012	Screw M5 × 12	1	M5 × 12
C23	H2009B0731	Felt	1	
C24	H6606F8001	Thread trimmer cam	1	
C25	H6612B8001	Neddle bar bushing(upper)	1	
C26	H6624C8001	Neddle bar	1	
C27	H6613B8001	Neddle bar bushing(lower)	1	
C28	H6625C8001	Thread guide	1	
C29	HM010C8001	Neddle DP × 17#18	1	DP × 17#18
C30	HA100C2170	Screw 1/8(44) × 4.5	1	1/8(44) × 4.5
C31	HA300C2070	Thread guide	1	
C32	HA100C2070	Set screw 9/32(28)	1	9/32(28)
C33	HA307C0662	Screw 1/4(40) × 6	2	1/4(40) × 6
C34	HM005C7101	Guide assy	1	
C35	HA100C2200	Square block	1	
C36	H6623C8001	Screw M4 × 8	2	M4 × 8
C37	H901310010	Screw M5 × 10	1	M5 × 10
C38	H6611C7101	Thread take-up lever assy	1	
C39	H6607C8001	Crank	1	
C40	HF15401001	Set plate	1	
C41	H3210F0681	Screw M5 × 6	2	M5 × 6
C42	H415050120	Screw M5 × 12	3	M5 × 12
C43	H3205J0662	Bearing	1	6204Z ZNR
C44	HF15402001	Bushing	1	

C. SEWING MECHANISM (1)

Fig. No.	Part No.	Description	Pcs.	Remarks
C45	H431040060	Screw	2	
C46	HB2152C072	Clutch assy	1	
C47	HF15402002	Motor base	1	
C48	H415050200	Screw M5 × 20	4	
C49	HF15402003	Sevor motor	1	
C50	H415050200	Screw M5 × 16	4	

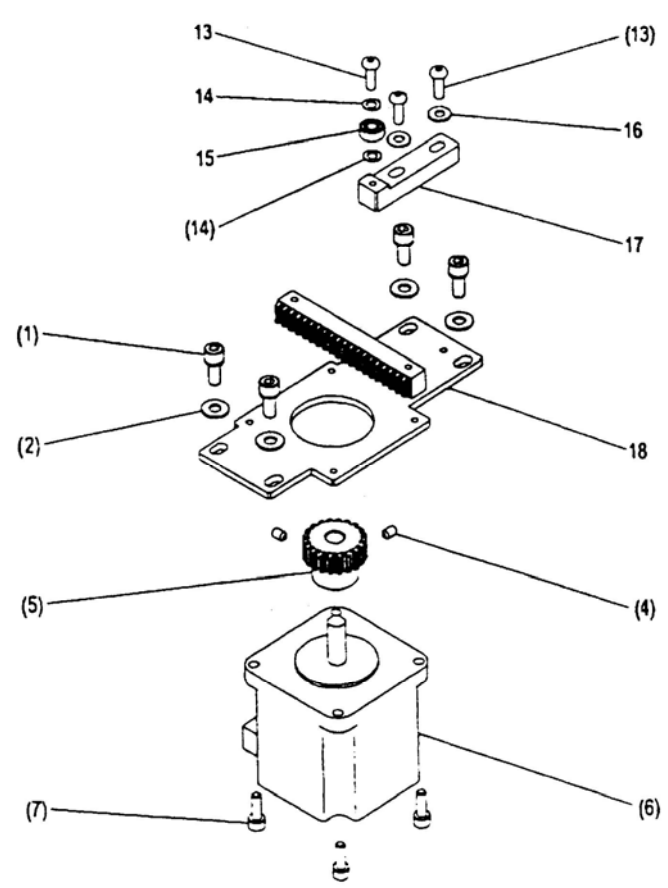
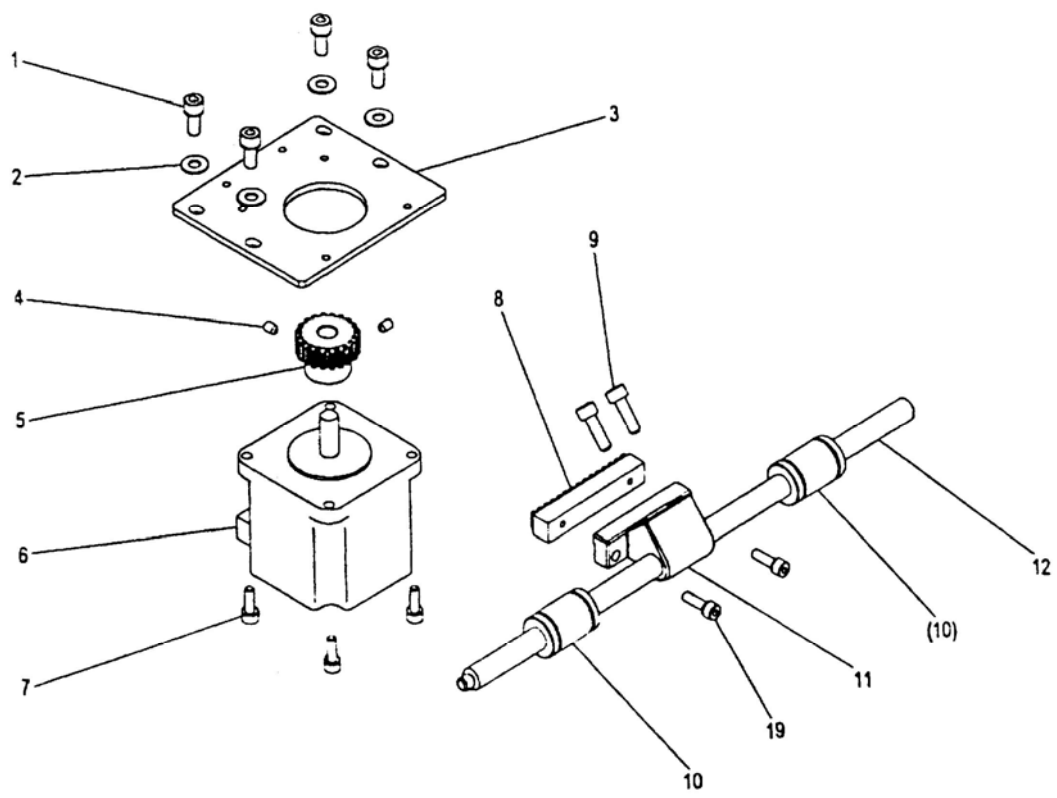
D. SEWING MECHANISM (2)



D. SEWING MECHANISM (2)

Fig. No.	Part No.	Description	Pcs.	Remarks
D01	HA304G0656	Screw 3/16(28) × 15	2	3/16(28) × 15
D02	H6634C8001	Felt	1	
D03	H6628B8001	Bushing	1	
D04	HS90101006	Screw M5 × 6	1	M5 × 6
D05	H2010J0066	Nut 9/32(28)	1	9/32(28)
D06	H6631C8001	Sector gear	1	
D07	H431050050	Screw M5 × 5	1	M5 × 5
D08	H6630C8001	Screw 9/32(28)	1	9/32(28)
D09	H6635C8001	Rock shaft	1	
D10	H6670C8001	Collar	1	
D11	HA305E0662	Screw 15/64(28) × 4.5	2	15/64(28) × 4.5
D12	H6627B8001	Oil braid	1	
D13	H2009B0743	Felt	2	
D14	HS90131112	Screw M6 × 12	2	M6 × 12
D15	HA115B7011	O-ring	2	
D16	H6648C8001	Eccentric shaft	2	
D17	H6637C7101	Hook shaft assy	1	
D18	H6684C8001	Bobbin case	1	SC181
D19	H6685C8001	Bobbin	1	
D20	H6674C8001	Hook retainer	1	
D21	H6683C8001	Inner hook	1	SH181
D22	H6654C8001	Hook driver	1	
D23	HS90321016	Bolt M5 × 16	1	M5 × 16
D24	H6646C8001	Hook clamp	2	
D25	H6642C8001	Outer hook	1	
D26	H6658C8001	Screw 1/8(40) × 4	2	1/8(40) × 4
D27	H6657C8001	Thread guide	1	
D28	H6651C8001	Pin M6-4 × 18	1	
D29	H6643C8001	Screw 1/8(44) × 4.5	2	1/8(44) × 4.5
D30	H6644C8001	Washer	2	
D31	H6645C8001	Spring	2	
D32	HS90101012	Screw M5 × 12	1	M5 × 12
D33	H6628C7101	Connecting rod assy	1	

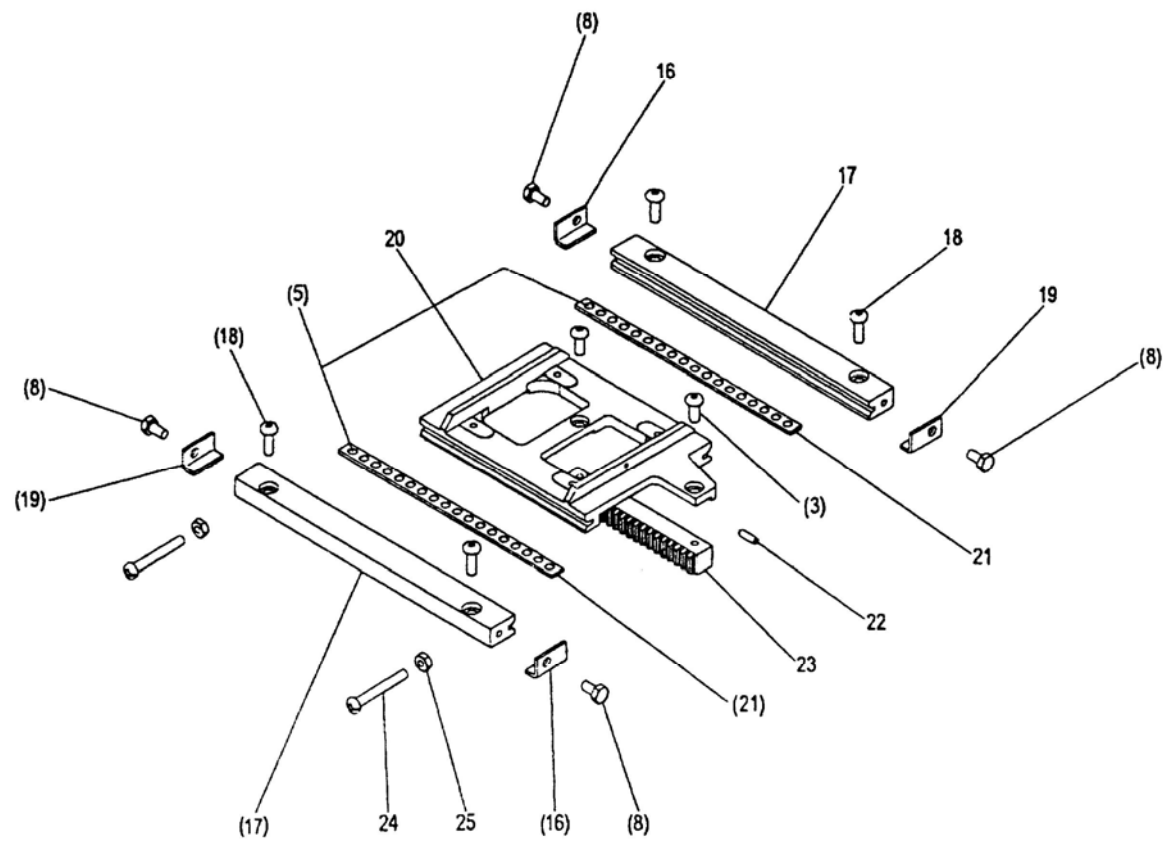
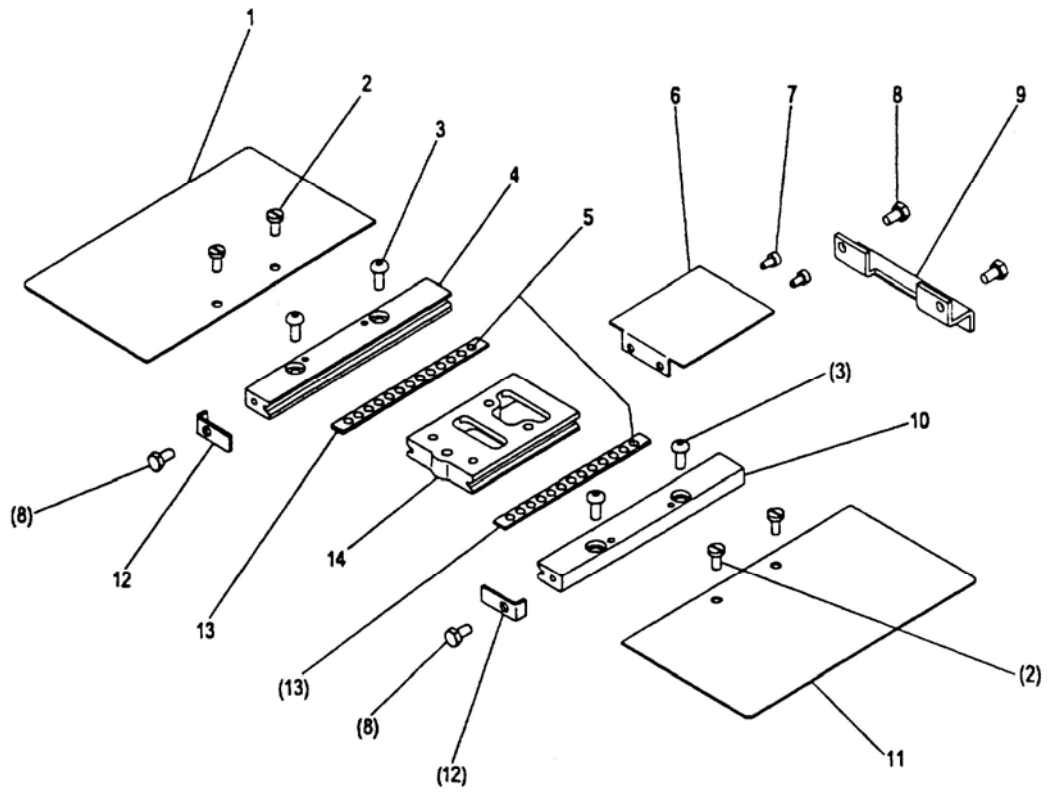
E. X-Y MECHANISM (1)



E. X-Y MECHANISM (1)

Fig. No.	Part No.	Description	Pcs.	Remarks
E01	H415050120	Bolt M5×12	8	M5×12
E02	H6686D8001	Washer 5	8	M5
E03	H6646D8001	Motor mounting plate Y	1	
E04	H431040060	Screw M4×6	4	M4×6
E05	H6631D8001	Pinion gear	2	
E06	HF15403010	Stepping motor	2	
E07	H415040120	Bolt M4×12	8	M4×12
E08	HF15403011	Rack Y	1	
E09	H415050160	Bolt M5×16	2	M5×16
E10	H6623B8001	Ball bushing 10	2	M10
E11	H6649D8001	Rack adapter Y	1	
E12	HM010D8001	Linear shaft Y	1	
E13	H416040120	Bolt M4×12	3	M4×12
E14	H6684D8001	Washer 4	2	M4
E15	H6636D8001	Ball bearing	1	
E16	H6685D8001	Washer 4	2	M4
E17	H6635D8001	Bearing supporter	1	
E18	H6634D8001	Motor mounting palte X	1	
E19	H6693D8001	Bolt M4×14	2	M4×14

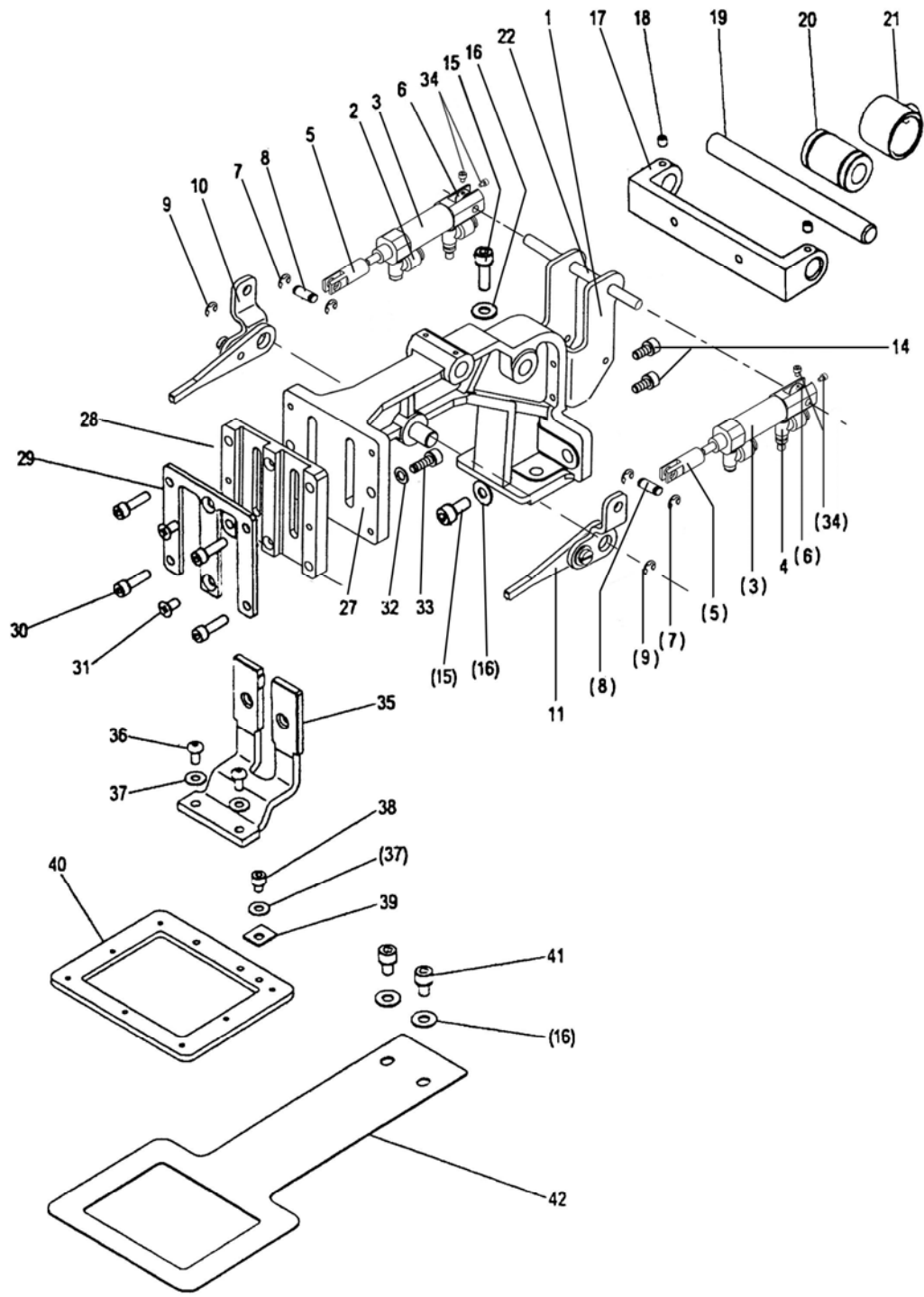
F. X-Y MECHANISM (2)



F. X-Y MECHANISM (2)

Fig. No.	Part No.	Description	Pcs.	Remarks
F01	H6685B8001	Cover L	1	
F02	HA70264C06	Screw 9/64(40) × 8	4	9/64(40) × 8
F03	H416040100	Bolt M4 × 10	6	M4 × 10
F04	HF15403006	Fixed race Y(L)	1	
F05	H6618D8001	Steel ball 5/32	62	5/32
F06	H6623D8001	Cover plate Y	1	
F07	H415030060	Bolt M3 × 6	2	M3 × 6
F08	H103040080	Bolt M4 × 8	8	M4 × 8
F09	HF15403007	Rear stopper Y	1	
F10	HF15403005	Fixed race Y(R)	1	
F11	H6686B8001	Cover R	1	
F12	H6617D8001	Front stopper Y	2	
F13	HF15403004	Retainer Y	2	
F14	H6619D8001	Movable race Y	1	
F16	H6611D8001	Stopper X	2	
F17	HF15403002	Fixed race X	2	
F18	H416040120	Bolt M4 × 12	4	M4 × 12
F19	H6610D8001	Stopper X	2	
F20	H6606D8001	Movable race X	1	
F21	HF15403001	Retainer X	2	
F22	H431030100	Screw M3 × 10	1	M3 × 10
F23	HF15403008	Rack X	1	
F24	HZ11040300	Screw M4 × 30	2	M4 × 30
F25	H003001040	Nut M4	2	M4

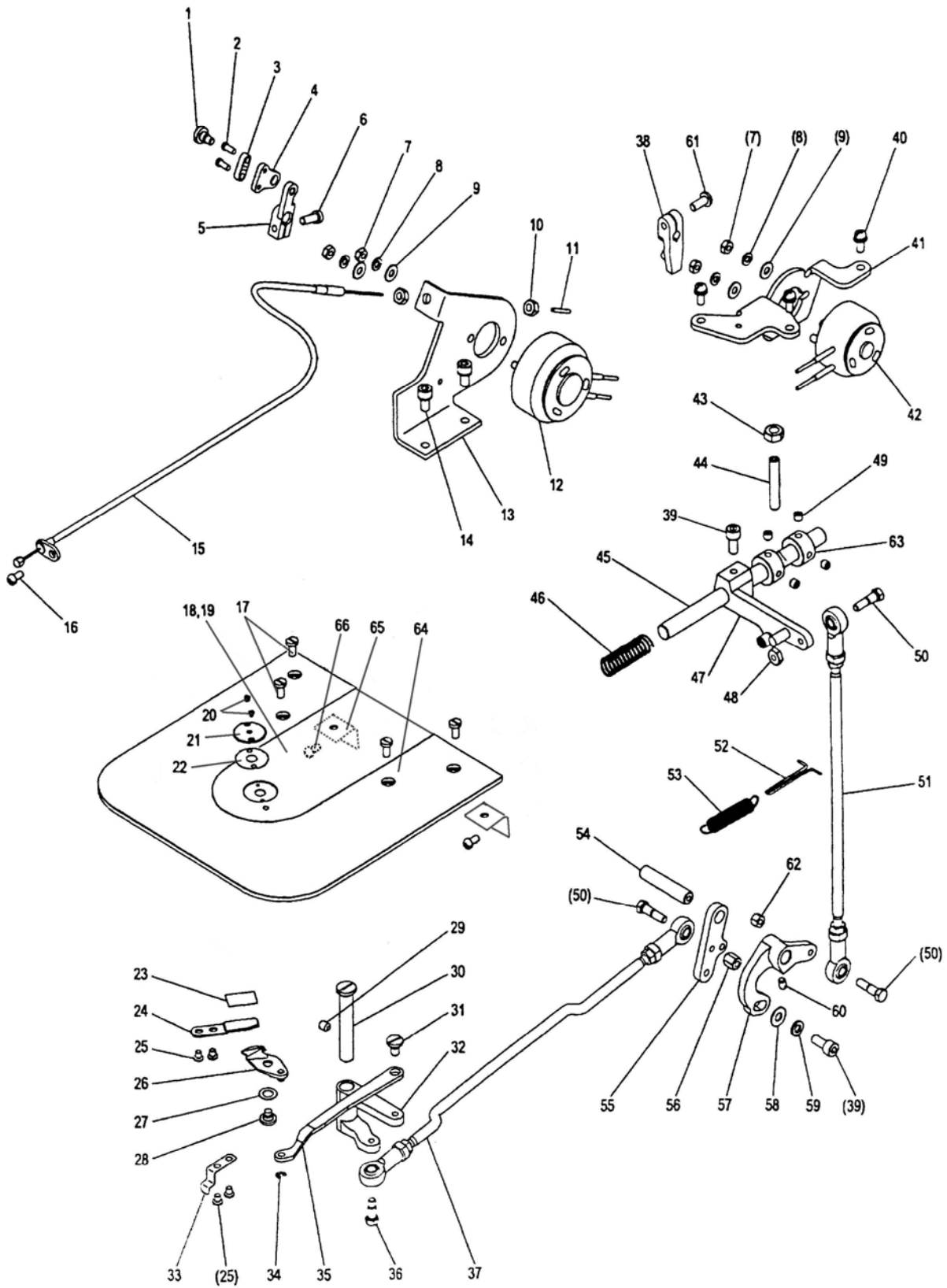
H. PRESSER FOOT MECHANISM



H. PRESSER FOOT MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
H01	HF15404017	Cylinder bracket	1	
H02	HEE4218001	Cylinder joint	2	
H03	HEE4108001	Cylinder	2	CJ2D16D-T1247-15 (SMC)
H04	HF937E8001	Cylinder joint	2	ESL4-M5
H05	HF15404014	Link pin	2	
H06	HF15404015	Collar	2	
H07	H007013040	E-type retaining ring 4	4	
H08	HEE4708001	Pin	2	
H09	H007013060	E-type retaining ring 6	2	
H10	HEE4127101	Lever assy 2	1	
H11	HEE4087101	Lever assy 1	1	
H14	H415040080	Bolt M4×8	4	M4×8
H15	H415050140	Bolt M5×14	4	M5×14
H16	H6686D8001	Washer 5	6	M5
H17	HF15404002	Bracket	1	
H18	H431040050	Screw M4×5	2	M4×5
H19	HF15404004	Shaft	1	
H20	H6623B8001	Ball bushing 10	1	Φ10
H21	H6682E8001	Bearing housing	1	
H22	HF15404016	Pin	1	
H27	HM012E8001	Work holder arm	1	
H28	HM011E8001	Work holder guide	1	
H29	HM008E8001	Cover	1	
H30	H415040160	Bolt M4×16	4	M4×16
H31	H660JB8001	Screw M4×8	2	M4×8
H32	H6684D8001	Washer 4	2	M4
H33	H415040120	Bolt M4×12	2	M4×12
H34	HF997J8001	Boit M3×5	4	
H35	HF15404006	Clamp foot	1	
H36	H416040080	Bolt M4×8	2	M4×8
H37	H6685D8001	Washer 4	3	M4
H38	H415040050	Bolt M4×5	1	M4×5
H39	H666GE8001	Clamp stopper	1	
H40	HF15404001	Clamp frame	1	
H41	H415050080	Bolt M5×8	2	M5×8
H42	HF15404005	Feed plate	1	

J. THREAD TRIMMING MECHANISM



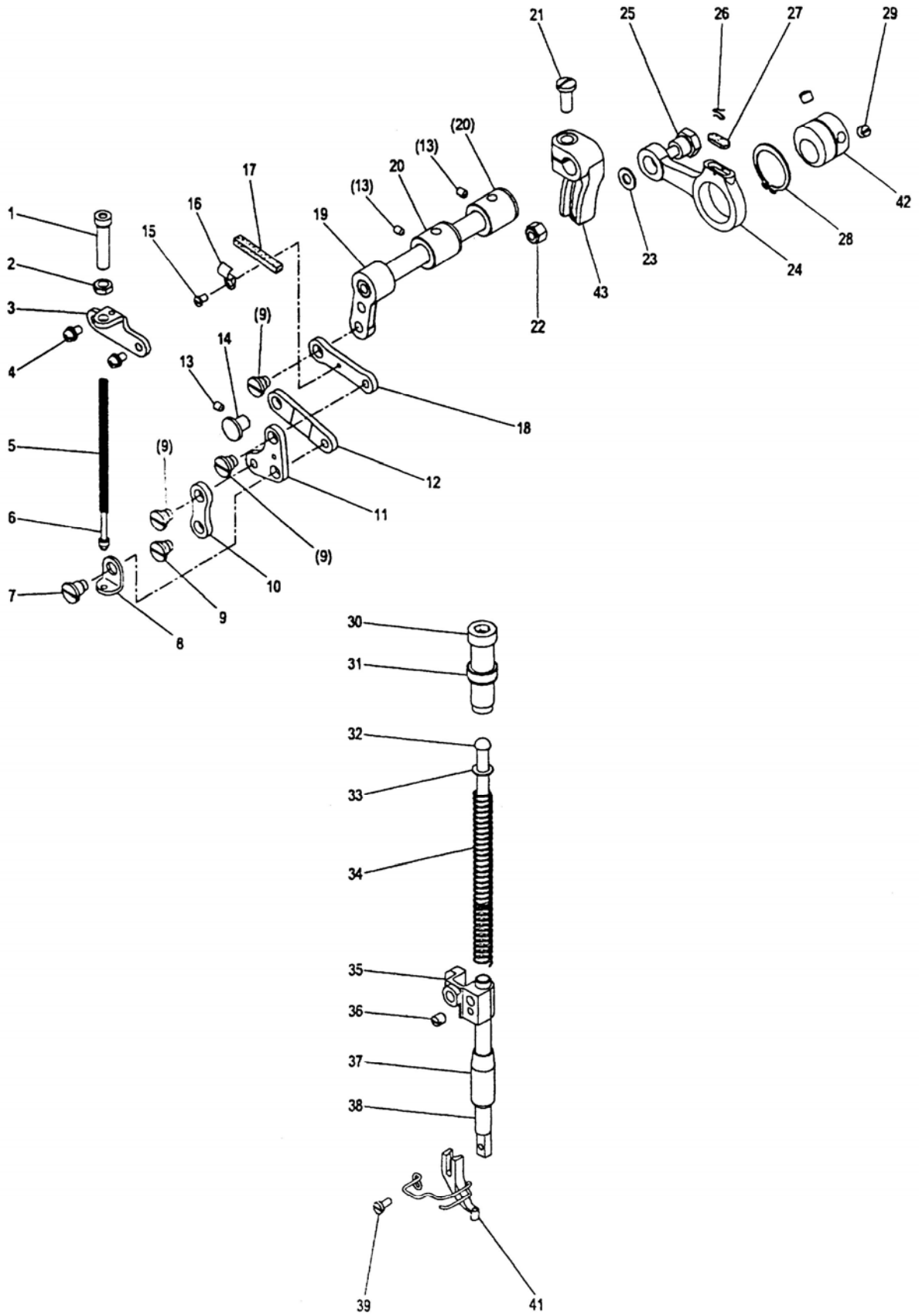
J. THREAD TRIMMING MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
J01	HM038E8001	Screw 11/64(40)	1	11/64(40)
J02	HA712N6912	Screw 1/8(44) × 7	2	1/8(44) × 7
J03	HA712N6911	Holder	1	
J04	HM010G8001	Bracket	1	
J05	HM011G8001	Crank	1	
J06	HA111G0683	Screw 11/64(40) × 12	1	
J07	H6683D8001	Nut M4	4	M4
J08	H6613F8001	Spring washer 4	4	M4
J09	H6685D8001	Washer 4	4	M4
J10	H668DE8001	Nut M5	2	M5
J11	HM020G8001	Pipe	1	
J12	HM012G7101	Solenoid(thread release)	1	
J13	HM009G8001	Solenoid bracket	1	
J14	H415050100	Bolt M5 × 10	2	M5 × 10
J15	HM016G7101	Flexible wire assy	1	
J16	HZ11040080	Screw M4 × 8	1	M4 × 8
J17	H6623C8001	Screw M4 × 8	4	M4 × 8
J18	HM007G8001	Slide plate	1	
J19	H6686J8001	Film sheet	1	
J20	H6675F8001	Screw 3/32(56) × 2.8	2	3/32(56) × 2.8
J21	H6676F8001	Needle plate	1	
J22	H6677F8001	Spacer	1	
J23	H6695F8001	Spacer	1	
J24	H6673F8001	Fixed knife	1	
J25	H6692B8001	Screw 9/64(40) × 3.2	4	9/64(40) × 3.2
J26	H6671F8001	Movable knife	1	
J27	H6679F8001	Wave washer 6	1	M6
J28	H6678F8001	Screw 11/64(40)	1	11/64(40)
J29	H661CB8001	Screw M5 × 8	1	M5 × 8
J30	H6664F8001	Stepped pin	1	
J31	H6666F8001	Screw 3/16(28)	1	3/16(28)
J32	H6658F8001	Knife driving crank (3)	1	
J33	H6680F8001	Leaf spring	1	
J34	H007013025	E-type retaining ring 2.5	1	
J35	H6667F8001	Link	1	
J36	H6659F8001	Bolt 11/64(40)	1	11/64(40)
J37	H6662F8001	Connecting rod(horizontal)	1	
J38	H6611F8001	Crank	1	
J39	H415050120	Bolt M5 × 12	2	M5 × 12
J40	HZ11040100	Screw M4 × 10	3	M4 × 10
J41	H6609F8001	Solenoid bracket	1	
J42	H6615F7101	Solenoid (thread trim)	1	
J43	H003001060	Nut M6	1	M6

J. THREAD TRIMMING MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
J44	H431060350	Screw M6 × 35	1	M6 × 35
J45	H6622F8001	Shaft	1	
J46	H6623F8001	Spring	1	
J47	H6635F7101	Cam follower assy	1	
J48	H6641F8001	Nut 11/64(40)	1	11/64(40)
J49	H431050050	Screw M5 × 5	4	M5 × 5
J50	H6644F8001	Bolt 11/64(40)	3	11/64(40)
J51	H6634F8001	Connecting rod (vertical)	1	
J52	H6646F8001	Hook	1	
J53	H6645F8001	Spring	1	
J54	H6654F8001	Shaft	1	
J55	H6653F8001	Knife driving crank(2)	1	
J56	H6643F8001	Long nut 11/64(40)	1	11/64(40)
J57	H6651F8001	Knife driving crank(1)	1	
J58	HA300J2230	Washer 5	1	M5
J59	H6694F8001	Spring washer 5	1	M5
J60	HA100B2110	Screw 11/64(40) × 5.5	1	11/64(40) × 5.5
J61	H416050120	Bolt M5 × 12	1	M5 × 12
J62	H6642F8001	Nut 11/64(40)	1	11/64(40)
J63	H6625F8001	Collor	1	
J64	HF15406003	Slide plate	1	
J65	HF15406004	Bracket	4	
J66	H6623C8001	Screw M4 × 8	4	M4 × 8

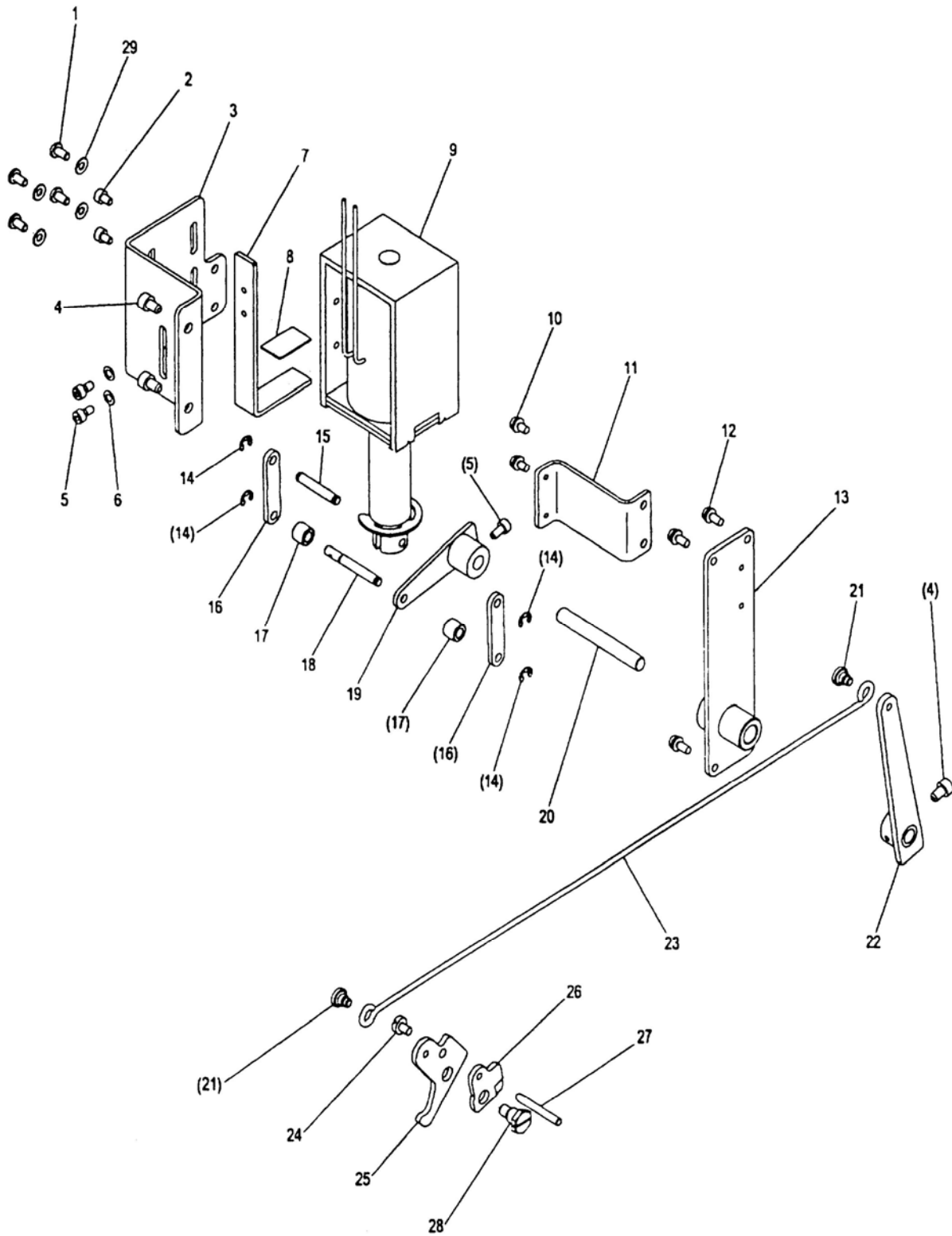
K. CENTER PRESSER FOOT MECHANISM



K. CENTER PRESSER FOOT MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
K01	H2010J0065	Thumb screw 9/32(28) × 35	1	9/32(28) × 35
K02	H2010J0066	Nut 9/32(28)	1	9/32(28)
K03	HM018F8001	Bracket	1	
K04	H6642B8001	Screw M4 × 8	2	M4 × 8
K05	HM022F8001	Spring	1	
K06	H2000J2040	Spring guide bar	1	
K07	HM016F8002	Screw 1/4(40)	1	1/4(40)
K08	HM015F8001	Supporter	1	
K09	HM016F8001	Screw 1/4(40)	4	1/4(40)
K10	HM014F8001	Link	1	
K11	HM011F8001	Ball crank	1	
K12	HM013F8001	Link	1	
K13	H431040100	Screw M4 × 10	3	M4 × 10
K14	H660FB8001	Pin	1	
K15	HA106B7101	Screw 9/64(40) × 6	1	9/64(40) × 6
K16	H3200K0190	Holder	1	
K17	H2000M0080	Felt	1	
K18	HM012F8001	Link	1	
K19	HM007F7101	Arm-shaft assy	1	
K20	HM006B8001	Bushing	2	
K21	H2012N0652	Screw 1/4(40) × 16	1	1/4(40) × 16
K22	HS91165206	U-nut 6 × 0.75	1	6 × 0.75
K23	H2013J0065	Washer 6	1	M6
K24	HM005F8001	Crank rod	1	
K25	H2000J2100	Bolt M6	1	M6
K26	H20111C106	Holder	1	
K27	H2014J0068	Felt	1	
K28	H007009250	C-type retaining ring 25	1	
K29	HA307C0662	Screw 1/4(40) × 6	2	1/4(40) × 6
K30	HA309H0681	Thumb screw 1/2(28) × 43	1	1/2(28) × 43
K31	HA107H0692	Nut 1/2(28)	1	1/2(28)
K32	HM025F8001	Presser bar guide	1	
K33	H6654B8001	Washer 6	1	M6
K34	HM026F8001	Spring	1	
K35	H6027H8001	Presser bar holder	1	
K36	HA3411D308	Screw 12/64(28) × 6	1	12/64(28) × 6
K37	HA100H2090	Bushing	1	
K38	HM029F8001	Presser bar	1	
K39	H2000I2050	Screw 9/64(40) × 8	1	9/64(40) × 8
K41	HM027F8001	Presser foot $\Phi 3$	1	
K42	H2014J0652	Crank	1	
K43	H2100I2010	Arm	1	

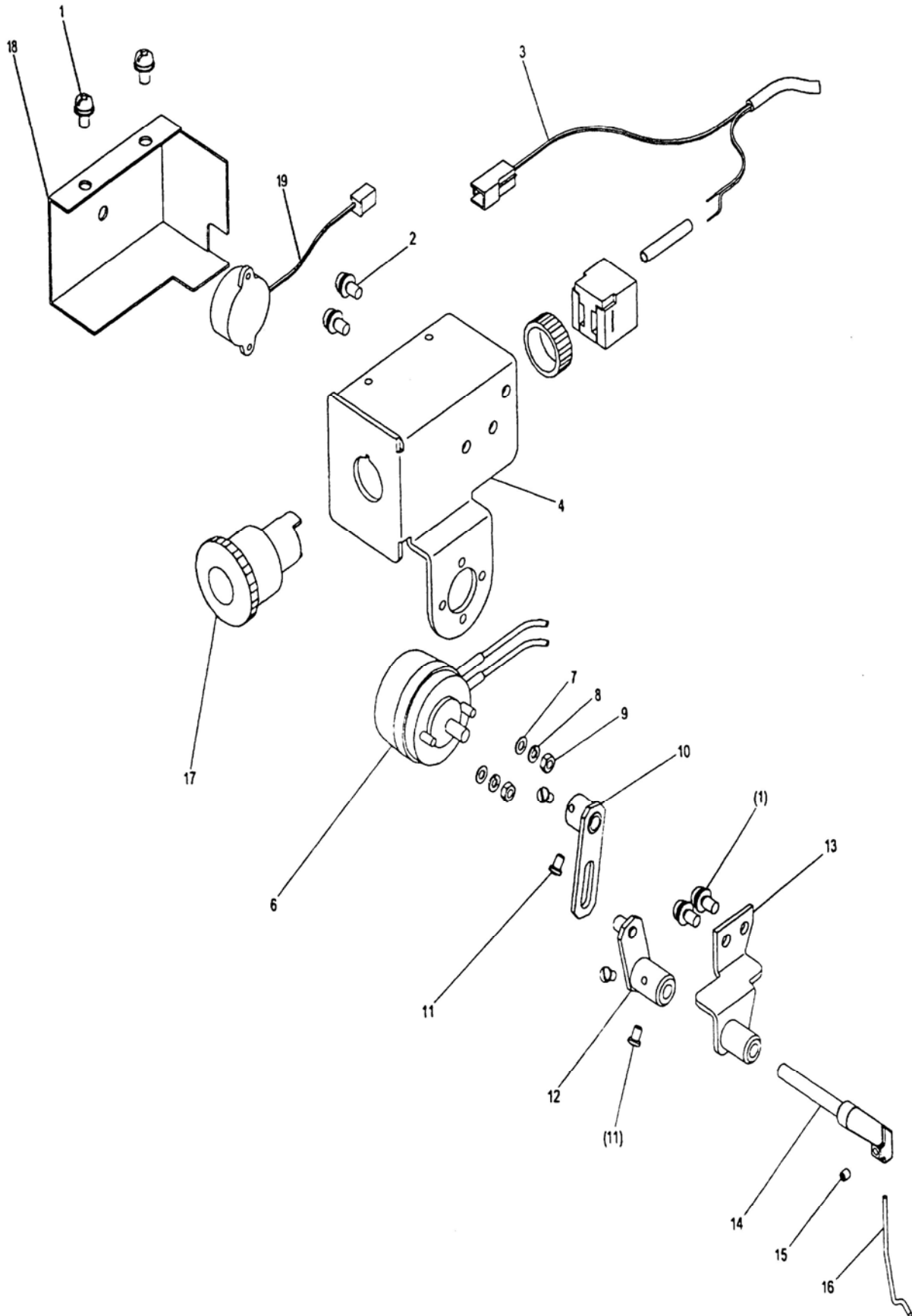
L. CENTER PRESSER FOOT LIFT MECHANISM



L. CENTER PRESSER FOOT LIFT MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
L01	HA700B2060	Screw 11/64(40) × 8	4	11/64(40) × 8
L02	HZ11040060	Bolt M4 × 6	2	M4 × 6
L03	HM044F8001	Bracket	1	
L04	H415050080	Bolt M5 × 8	3	M5 × 8
L05	H415040080	Bolt M4 × 8	3	M4 × 8
L06	H6685D8001	Washer 4	2	M4
L07	HM045F8001	Stopper	1	
L08	HM049F8001	Rubber cushion	1	
L09	HM040F7101	Solenoid assy	1	
L10	HZ11040080	Screw M4 × 8	2	M4 × 8
L11	HM050F8001	Supporter	1	
L12	HZ11040100	Screw M4 × 10	4	M4 × 10
L13	HM051F7101	Base plate assy	1	
L14	H007013040	E-type retaining ring 4	4	
L15	HM037F8001	Pin	1	
L16	HM046F8001	Link	2	
L17	HM048F8001	Collar	2	
L18	HM038F8001	Pin	1	
L19	HM047F8001	Lever	1	
L20	HM057F8001	Shaft	1	
L21	HA107H0662	Screw 3/16(28)	2	3/16(28)
L22	HM055F8001	Lever	1	
L23	HM034F8001	Link	1	
L24	HA107H1013	Screw 11/64(40) × 6.5	1	11/64(40) × 6.5
L25	HM036F8001	Lifting lever	1	
L26	HA107H1012	Plate cam	1	
L27	HA700I2070	Pin	1	
L28	HA100H2050	Bolt 15/64(28)	1	15/64(28)
L29	H663FE8001	Spring washer 1L-4	4	1L-4

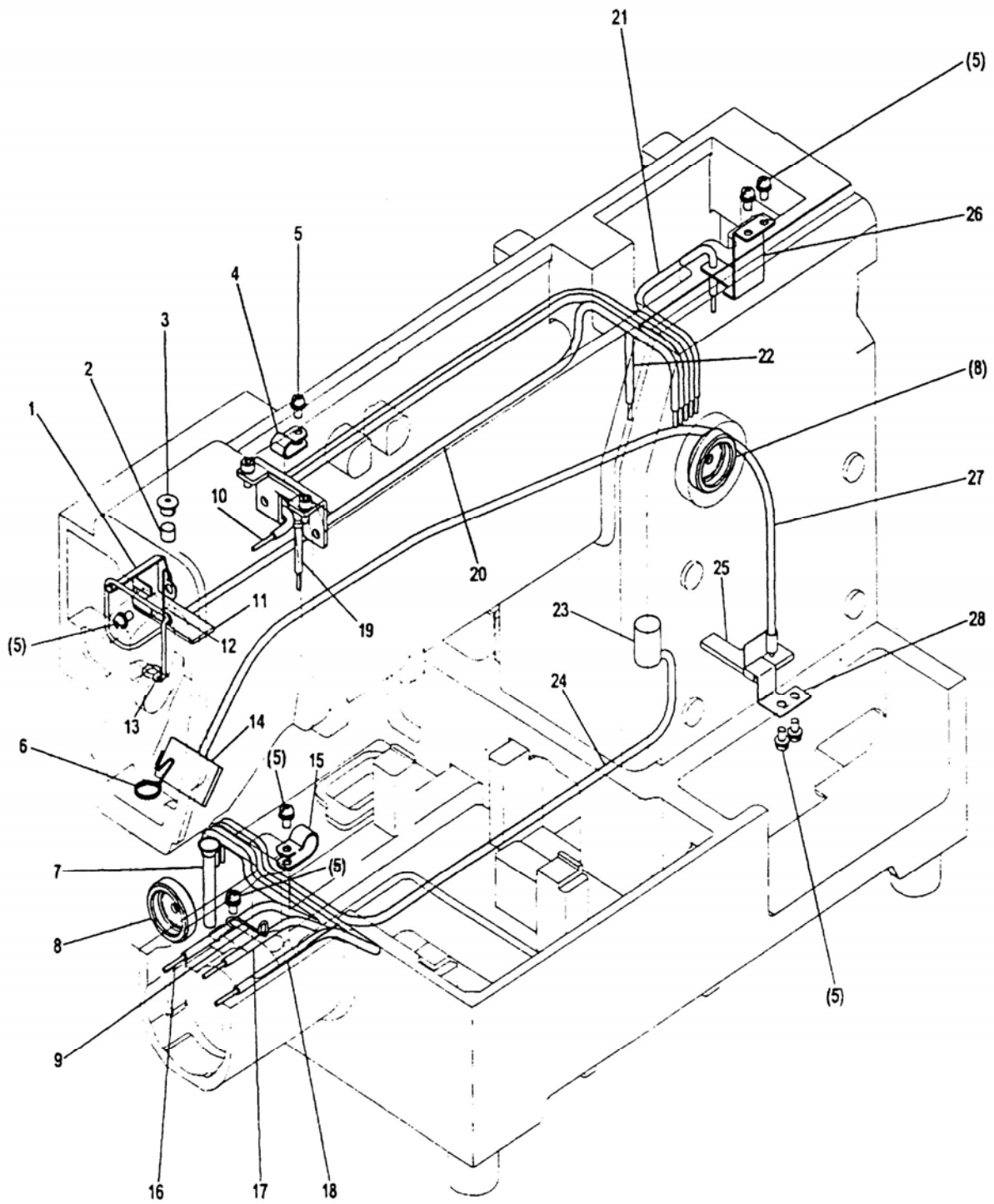
M. WIPER MECHANISM



M. WIPER MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
M01	HZ11040080	Screw M4×8	4	M4×8
M02	HZ11040100	Screw M4×10	4	M4×10
M03	HM021H7101	Cable (stop BZ)	1	
M04	HM013H8001	Bracket	1	
M05	H6642I8001	Lock ring	1	
M06	HM015H7101	Solenoid (wiper)	1	
M07	H668CE8001	Washer 3	2	M3
M08	H668BE8001	Spring washer 3	2	M3
M09	H003001030	Nut M3	2	M3
M10	HM009H8001	Wiper crank 1	1	
M11	H6643C8001	Screw 1/8(44)×4.5	4	1/8(44)×4.5
M12	HM031H8001	Wiper crank 2	1	
M13	HM024H7101	Wiper adapter	1	
M14	HM027H8001	Wiper shaft	1	
M15	H431030040	Screw M3×4	1	M3×4
M16	HM029H8001	Wiper	1	
M17	H6636I8001	Push button	1	
M18	HM006H8001	Cover	1	
M19	HM007H7101	Buzzer assy	1	

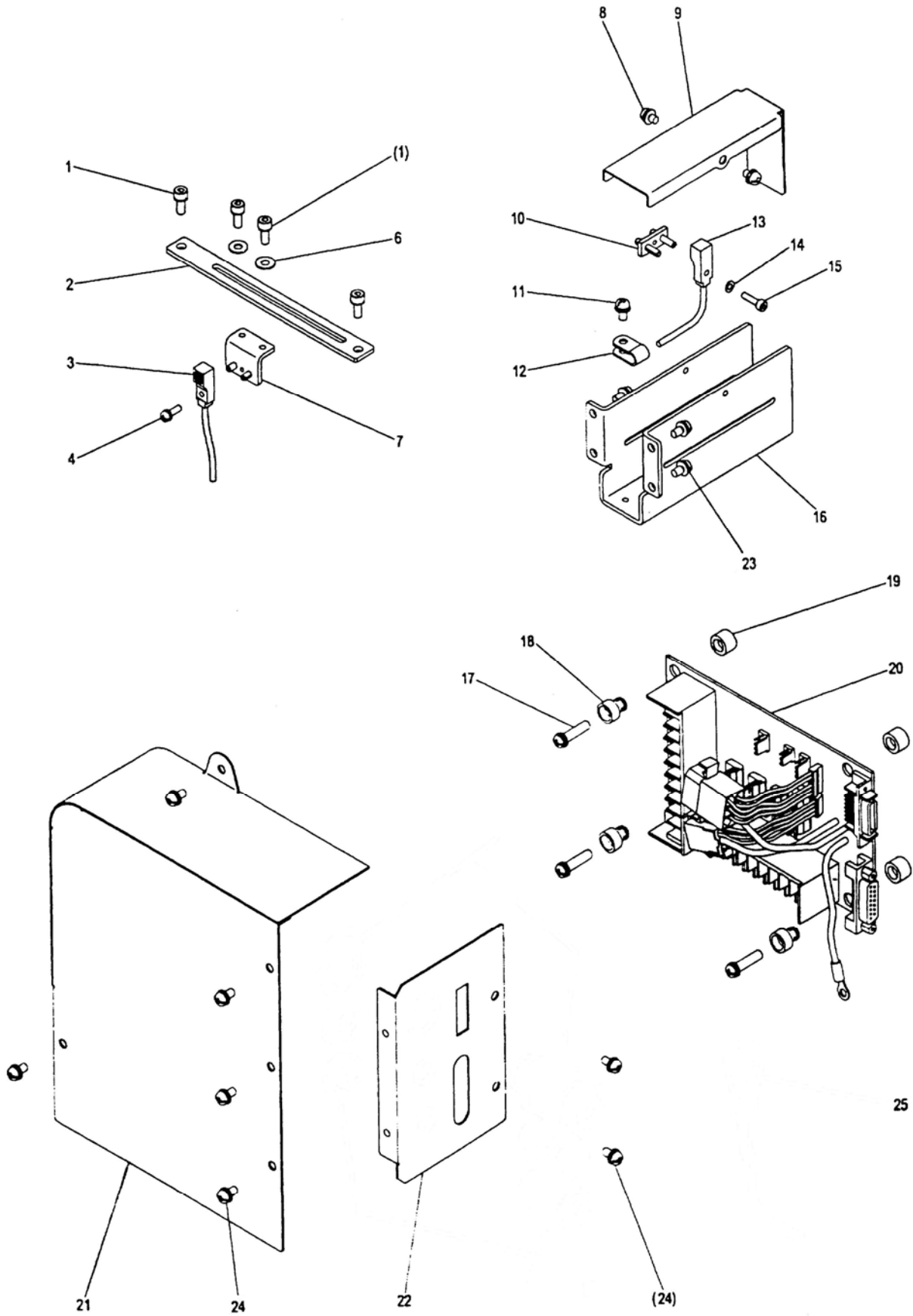
N. OIL LUBRICATION MECHANISM



N. OIL LUBRICATION MECHANISM

Fig. No.	Part No.	Description	Pcs.	Remarks
N01	H6611H8001	Holder	1	
N02	H6646H8001	Felt	1	
N03	H2000M0090	Cap	1	
N04	H6679D8001	Nylon clip AB-3N	1	
N05	HZ11040080	Screw M4×8	8	M4×8
N06	HA300I2060	Holder	1	
N07	H6613H8001	Pipe	1	
N08	H6614H8001	Oil gauge	2	
N09	H6612H8001	Holder	1	
N10	H6616H7101	Oil pipe assy(F)	1	
N11	H6634H8001	Felt	1	
N12	HM008I8001	Holder	1	
N13	H3200G2030	Holder	1	
N14	H6641H8001	Felt	1	
N15	H6648I8001	Nylon clip AB-6N	1	
N16	H6619H7101	Oil pipe assy(hook left)	1	
N17	H6622H7101	Oil pipe assy(hook center)	1	
N18	H6625H7101	Oil pipe assy(hook right)	1	
N19	H6628H7101	Oil pipe assy(eccentric cam)	1	
N20	HM005I7101	Oil pipe assy(needle bar)	1	
N21	H6635H7101	Oil pipe assy(connect rod)	1	
N22	H6638H7101	Oil pipe assy(C)	1	
N23	H6634H8001	Felt	1	
N24	H6642H7101	Oil pipe assy(R)	1	
N25	H6606H8001	Felt	1	
N26	H6609H8001	Holder	1	
N27	H6631H7101	Oil pipe assy(circulation)	1	
N28	H6605H8001	Holder	1	

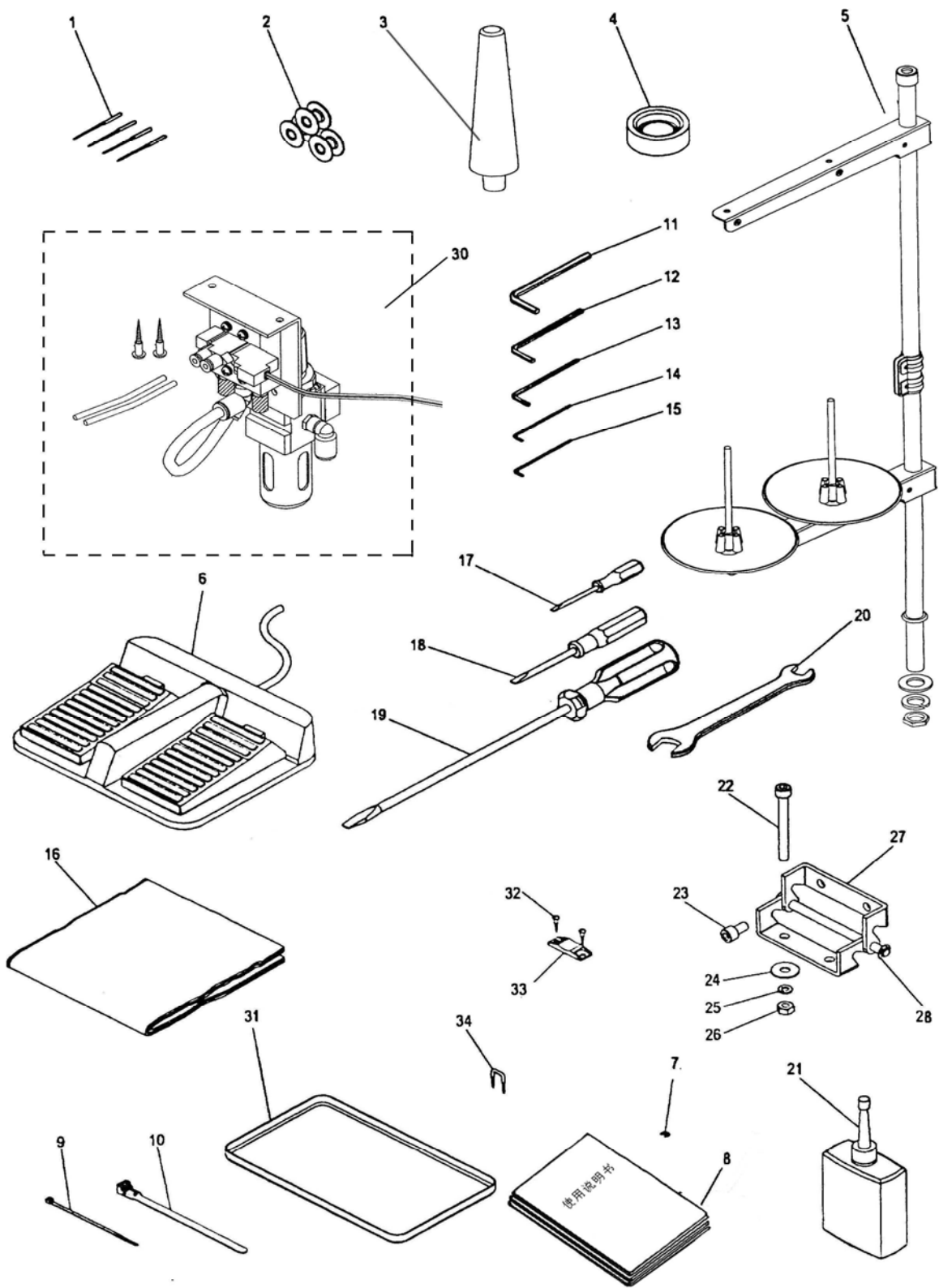
P. ELECTRICAL PARTS



P. ELECTRICAL PARTS

Fig. No.	Part No.	Description	Pcs.	Remarks
P01	H415040100	Bolt M4×10	4	M4×10
P02	H6656D8001	Detector X mouting plate	1	
P03	H6658D8001	Detector X	1	
P04	HZ11030100	Screw M3×10	1	M3×10
P06	H6684D8001	Washer 4	2	M4
P07	H6657D8001	Holder plate assy X	1	
P08	HZ11040060	Screw M4×6	2	M4×6
P09	H6666D8001	Detector cover Y	1	
P10	H6676D7101	Holder plate assy Y	1	
P11	HZ11040080	Screw M4×8	1	M4×8
P12	H6679D8001	Nylon clip AB-3N	1	
P13	H6670D8001	Detector Y	1	
P14	H668CE8001	Washer 3	1	M3
P15	H415030120	Bolt M3×12	1	M3×12
P16	H6665D8001	Detector bracket Y	1	
P17	HZ11040200	Screw M4×20	4	M4×20
P18	H6607I8001	Nylon bush	4	
P19	H6608I8001	Nylon bush	4	
P20	H6606I8001	Print circuit board	1	
P21	H6611I8001	Circuit board cover	1	
P22	H6634I8001	Connector panel	1	
P23	HZ11040100	Screw M4×10	4	M4×10
P24	HZ11040080	Screw M4×8	7	M4×8

R. ACCESSORIES



R. ACCESSORIES

Fig. No.	Part No.	Description	Pcs.	Remarks
R01	HM010C8001	Needle DPX×17#18	4	DXP×17#18
R02	H6685C8001	Bobbin	3	
R03	H6620J8001	Head rest	1	
R04	H6658B8001	Rubber cushion	4	
R05	HA300J2370	Cotton stand assy	1	
R06	HM027K8001	Foot switch	1	
R07	H007013025	E-type retaining ring 2.5	5	M2.5
R08	HA704S0654	Owner's manual	1	
R09	H6632J8001	Cord tie	1	
R10	H6622J8001	Cord tie	2	
R11	H6611J8001	Hexagonal wrench 4	1	M4
R12	H3200L0060	Hexagonal wrench 3	1	M3
R13	H3200L0050	Hexagonal wrench 2.5	1	M2.5
R14	H6612J8001	Hexagonal wrench 1.5	1	M1.5
R15	H3200L0070	Hexagonal wrench 1/16"	1	M1/16"
R16	H6619J8001	Polyethylene cover	1	
R17	HA300J2210	Screw drive (small)	1	
R18	HA300J2200	Screw drive (middle)	1	
R19	HA300J2070	Screw drive (large)	1	
R20	HA300J2220	Spanner 10-14	1	M10-14
R21	H200400069	Oiler with oil	1	
R22	H415060550	Bolt M6×55	4	M6×55
R23	H415060120	Bolt M6×12	4	M6×12
R24	H6642J8001	Washer 6.5-18	4	6.5-18
R25	H005008060	Spring washer 6	4	M6
R26	H003001060	Nut M6	4	M6
R27	H6639J8001	Hinge	2	
R28	H007013050	E-type retaining ring 5	2	
R30	JGD0700000	Pneumatic assy	1	
R31	H6621J8001	Oil pan	1	
R32	H6628J8001	Wooden screw 3.1×16	4	M3.1×16
R33	H6627J8001	Tie holder	2	
R34	H6618J8001	Staple	4	

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The description covered in this manual is subject to change for improvement of the commodity without notice

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