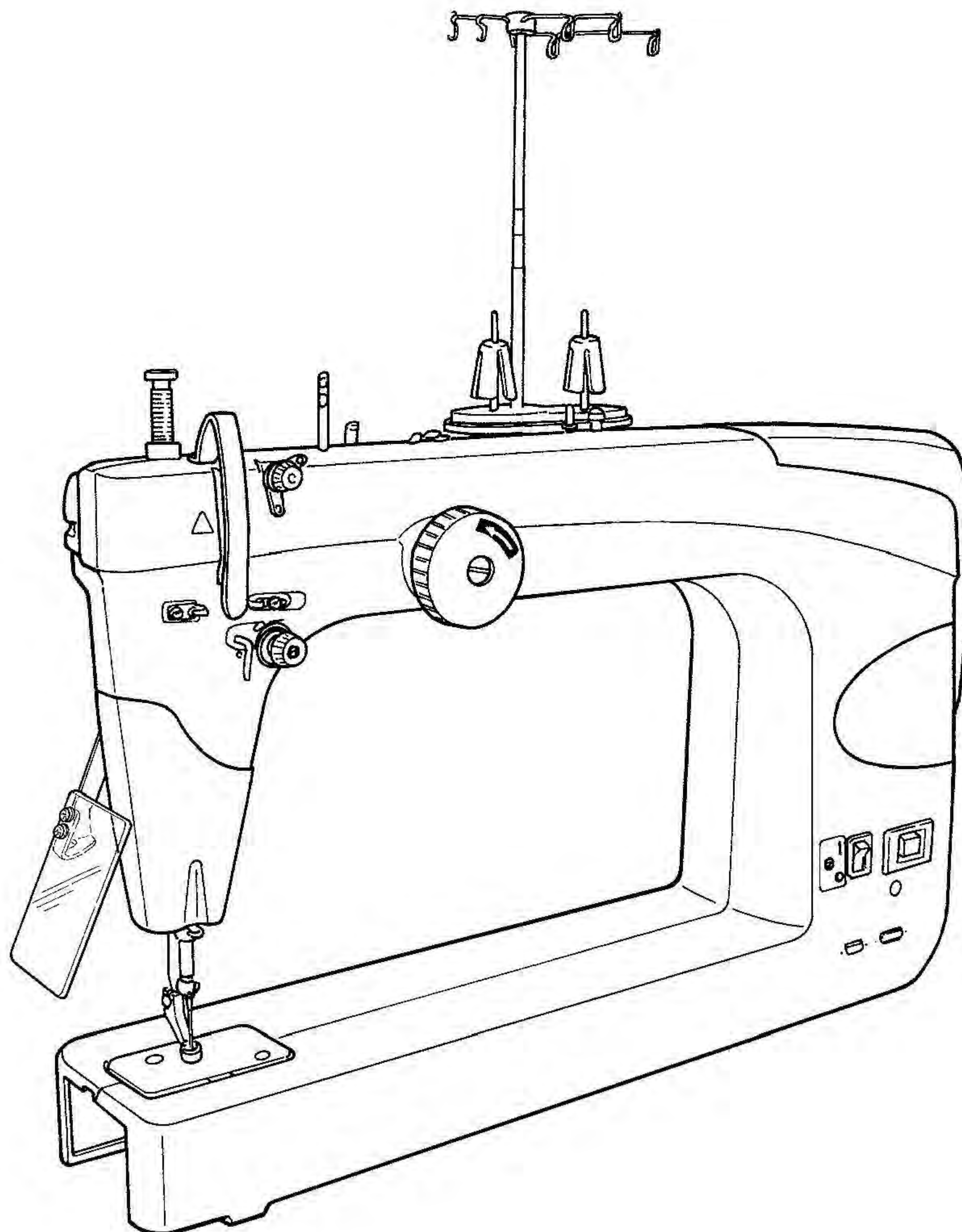


# TL-2200QVP

## SERVICE MANUAL / PARTS LIST



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## **WARNING :**

To avoid the risk of fire, electric shock, injury to persons or damage to components, especially keep the following :

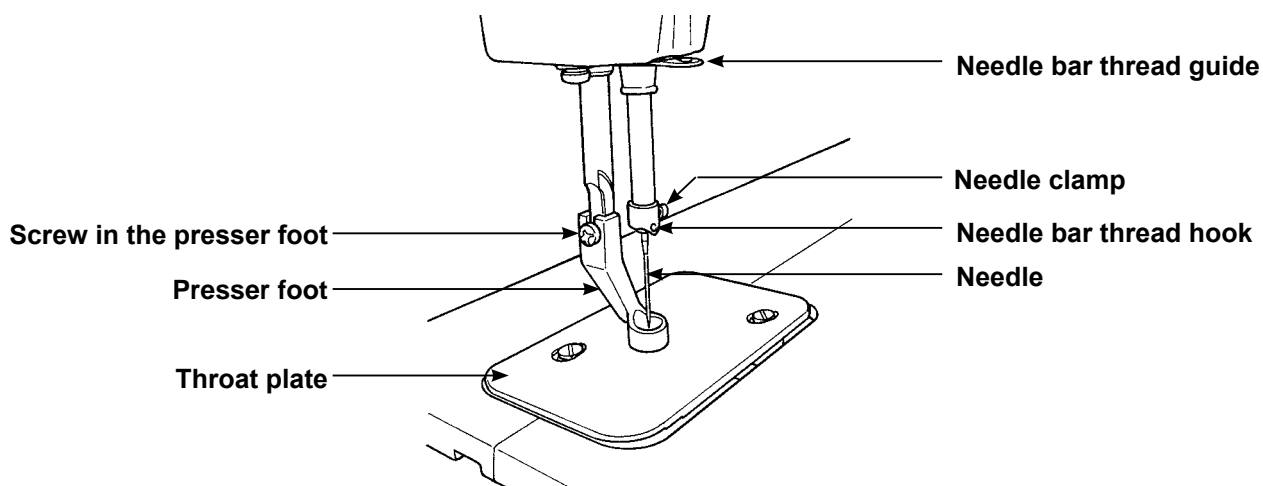
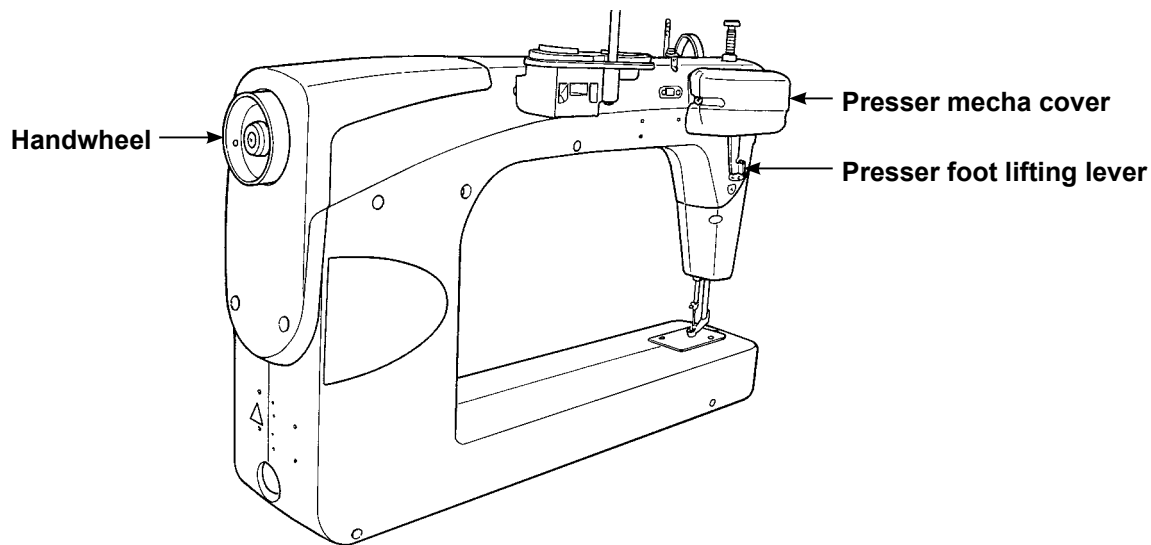
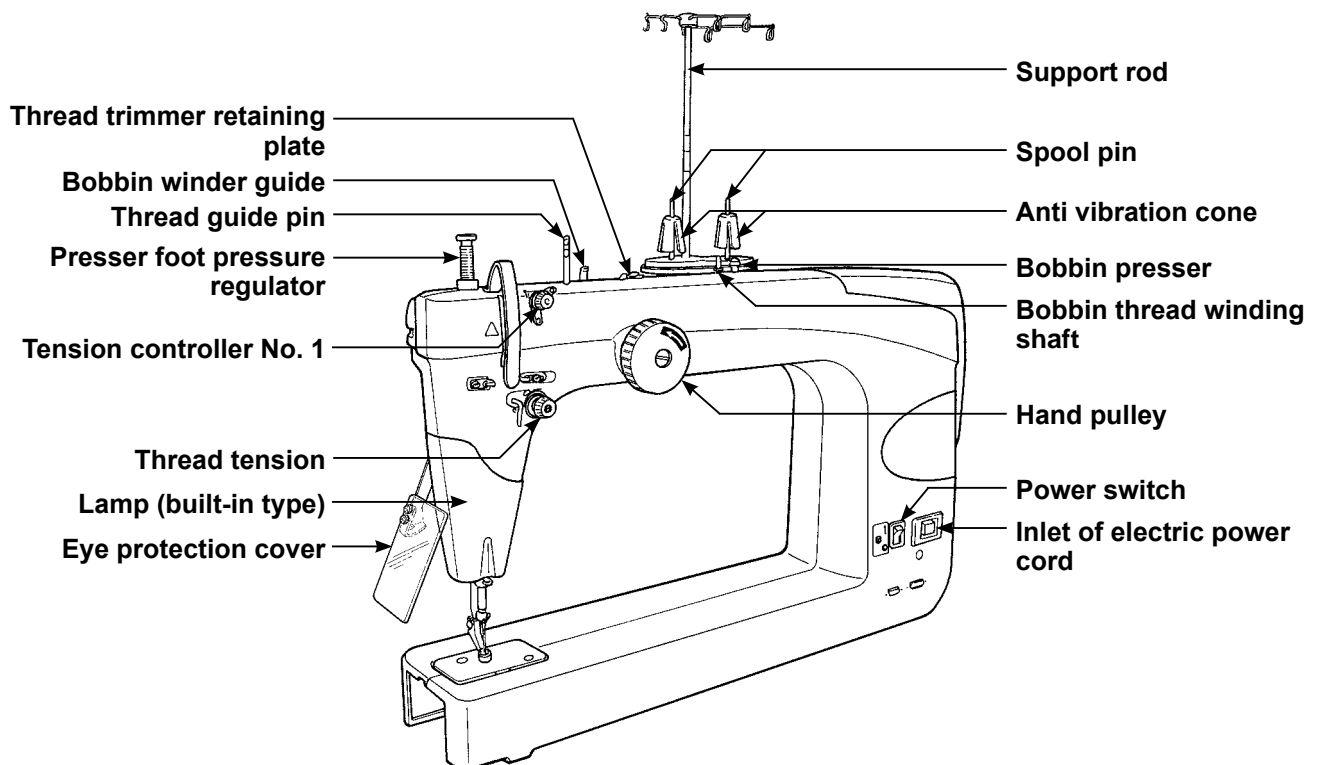
- When disassembling, assembling or adjusting the sewing machine, remove the power plug.
- When assembling, be careful about the electrical cord being caught with other components, damage to the covered parts of the cord or miswiring.
- When replacing the part(s), use the genuine part(s).

# 1 SPECIFICATIONS

No.	Item	Particulars	Description
1	Model		TL-2200QVP Abbreviation of "Quilt Virtuoso Pro"
2	Product structure Basic specification	Max. sewing speed	2,200 sti/min
		Max. stitch length	0 mm to an arbitrary value set by the user (By the switch regulator control (specification))
		Needle	"GB" 134R #18
		Thread	Cotton thread #60, KING Metallic #1, Schappe Spun (#60) Dual Duty 260 (#40), Dual Duty 200 (#50) A&E Signature Machine Quilting Thread (TEX40) YLI Machine Quilting Thread (TEX40)
		Hook	Horizontal-axis, double-capacity, full-rotary hook
		Thread take-up stroke	Thread take-up lever link type, 120 to 130 mm
		Needle bar stroke	35.0 ± 0.5 mm
		Presser foot lift (minimum)	0.5 mm from the top surface of throat plate (at the time of shipment from the factory)
		Presser bar stroke	1mm to 5mm (2±0.5mm at the time of shipment)
		Upper dead point of thread take-up lever	70°±1°
		Drive system	Main-shaft direct-drive system
		Stitch adjustment	Controlled by the stitch regulator
		Reverse-feed stitching method	Controlled by the stitch regulator
		Outline configuration	Distance from machine arm to needle (to the center of needle)
			18 inch (460 mm)
			Height of arm
			10 inch (254mm) or higher
			Length
			730 mm
			Width (including hand pulley)
			222 mm
		Height including the height of spool pin (storage height)	460 mm
		Machine head weight	26 Kg
		Motor	AC servo motor
		Control box	Built-in machine head
		Lubrication system	Grease (SH-M, Barch L1002)
		Lubrication	Hook is lubricated with an oiler
		Power consumption	140 W

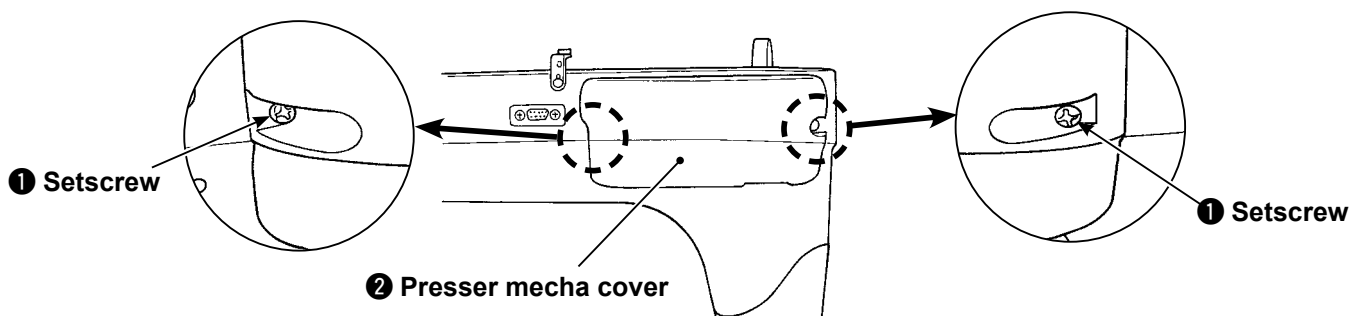


## 2 NAMES OF COMPONENTS



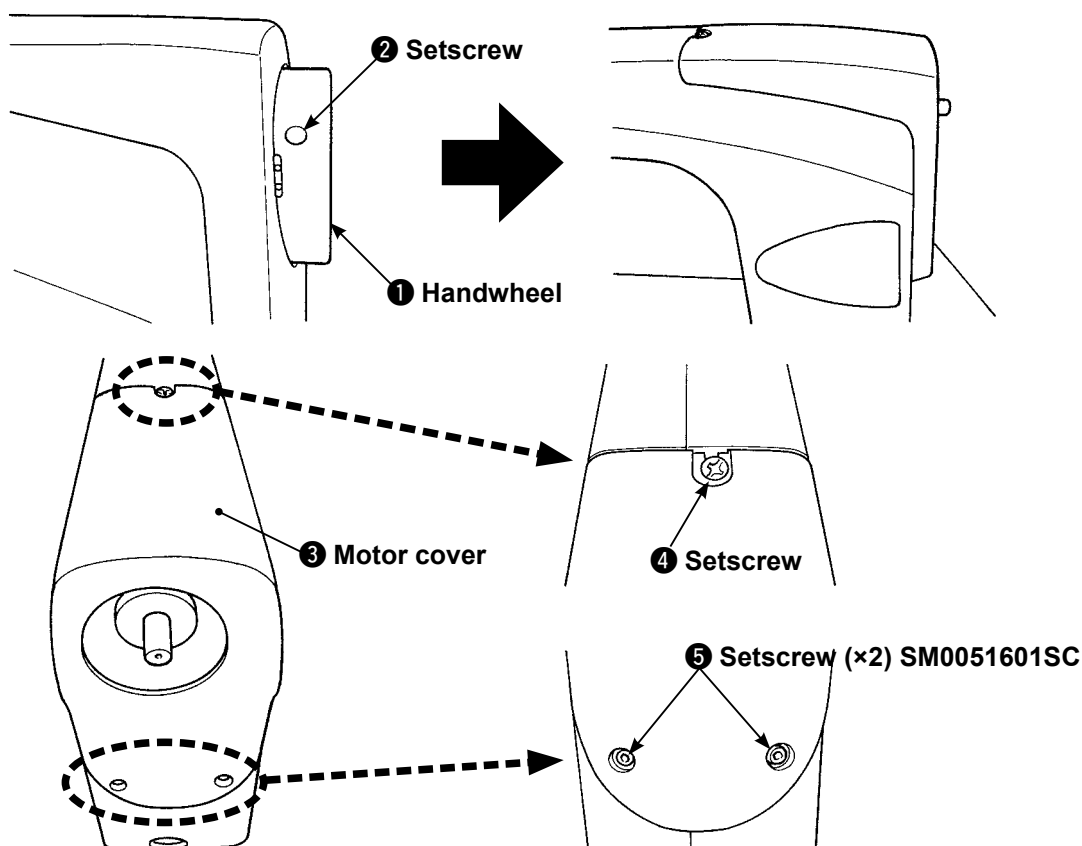
### 3 DISASSEMBLY AND ASSEMBLY

#### 1. Presser mecha cover 40124949



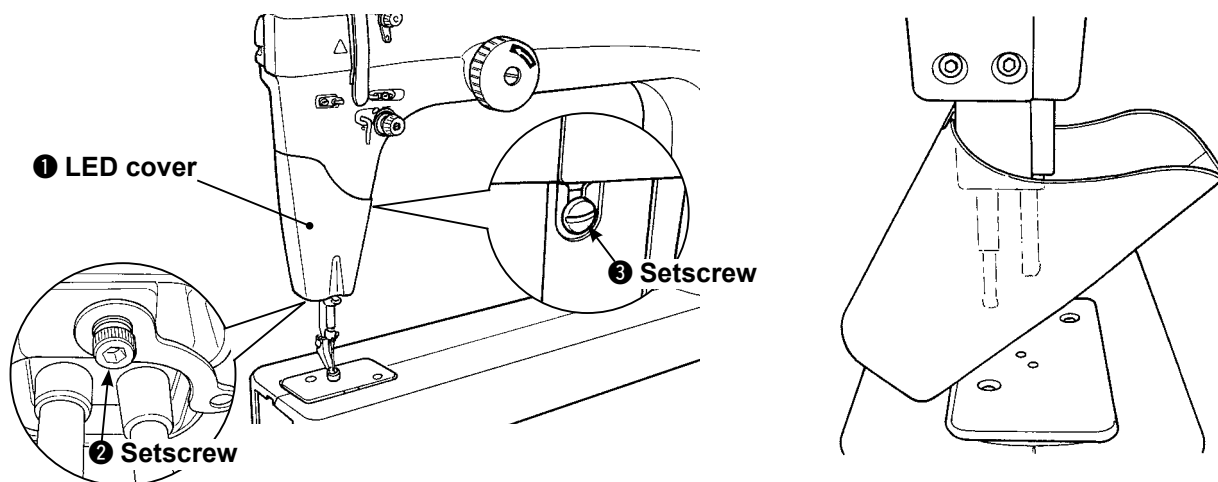
Disassembly	Assembly	Point	Tool to be used
Loosen two setscrews ① from the left side face of the frame. Remove presser mecha cover ②.	Place presser mecha cover ② on the left side face of the frame and fix it with two setscrews ①.	Interference with the panel cord, etc. has to be prevented	Phillips screwdriver

#### 2. Motor cover 40124947



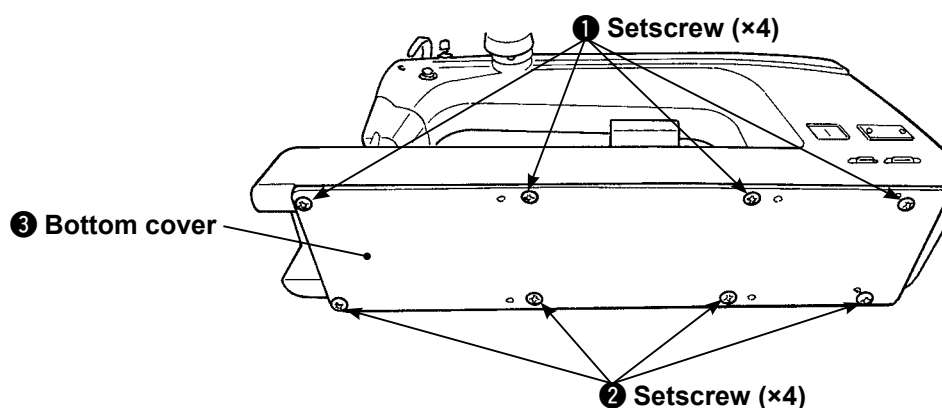
Disassembly	Assembly	Point	Tool to be used
Loosen two setscrews ② of handwheel ① to remove the handwheel. Loosen setscrew ④. Remove two setscrews ⑤. Remove motor cover ③.	Place motor cover ③ on the rear section of the frame (where the servomotor and handwheel are located) and fix it with three setscrews ④ and ⑤. Install handwheel ① in position.	Contact between the cover and the handwheel, while the latter is rotating, has to be prevented.	Phillips screwdriver

### 3. LED cover 40124948



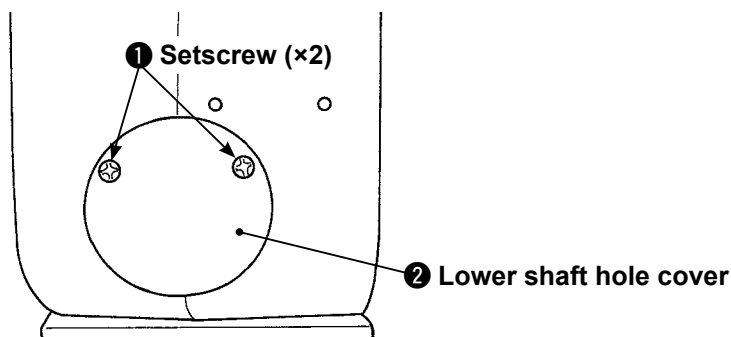
Disassembly	Assembly	Point	Tool to be used
Remove setscrew ② in the lower end face of the needle bar mounting base, together with the thread guide. Loosen setscrew ③ and turn it so that it is oriented as illustrated in the figure. Then, remove LED cover ①.	Place LED cover ① on the front side of the frame. Place the thread guide on the lower end face of the needle bar bushing mounting base and fix it with setscrew ②. Insert setscrew ③ from the jaw side of the frame and tighten it to fix LED cover ①.	The thread guide section has to be located in the notch of the LED cover.  To remove the LED cover, turn it as illustrated in the figure.	Hexagonal wrench key (3 mm) Flatblade screwdriver

### 4. Bottom cover 40124970



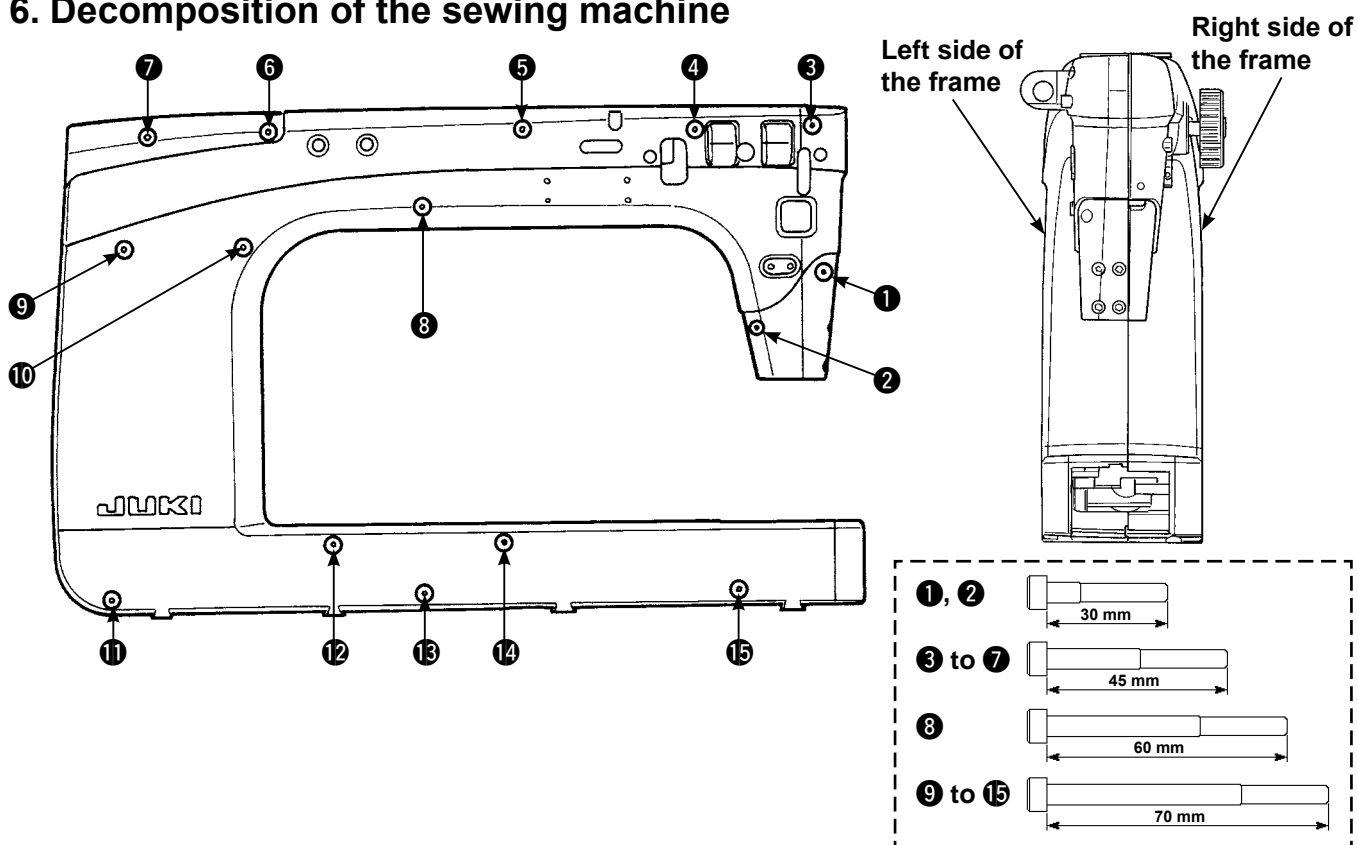
Disassembly	Assembly	Point	Tool to be used
Remove four cross slot setscrews ① from the center section of the bottom of the frame. Remove four semi setscrews ② from both sides of the bottom of the frame. Then, remove bottom cover ③.	Place bottom cover ③ on the bottom of the frame. Fix it by tightening four cross slot setscrews ① on the center section and four semi setscrews ② on both side of the bottom cover.	Insert all setscrews into the corresponding holes and securely tighten them.	Phillips screwdriver Hexagonal wrench key (5 mm)

## 5. Lower shaft hole cover 40132116



Disassembly	Assembly	Point	Tool to be used
Remove two setscrews ① from the rear side of the frame. remove lower shaft hole cover ②.	Place lower shaft hole cover ② on the rear side of the frame and fix it with two set-screws ①.		Phillips screwdriver

## 6. Decomposition of the sewing machine



Disassembly	Assembly	Point	Tool to be used
<p>Remove four kinds of setscrews (totally 15 ones) ① to ⑮.</p> <p>* <b>Each setscrew is provided with a washer. Take care not to lose the washers.</b></p> <p>When tilting the machine head on its side, bring the left side of the frame to the underside.</p> <p>* <b>When tilting the machine head, take care not to allow hands to be caught under the machine head.</b></p>	<p>Join the left and right sides of the frame and fix them with four kinds of setscrews (totally 15 ones) ① to ⑮.</p> <p>* <b>After the right and left sides of the frame is joined, check whether the main shaft torque is increased.</b></p>	<p>Do not allow cords to interfere with the shaft section. When joining the right and left sides of the frame, carefully prevent cords from being caught between them.</p> <p>To prevent the frame from bending, take care not to tighten the setscrews excessively.</p>	Hex screwdriver (4 mm)

## 4 ADJUSTMENTS OF COMPONENTS

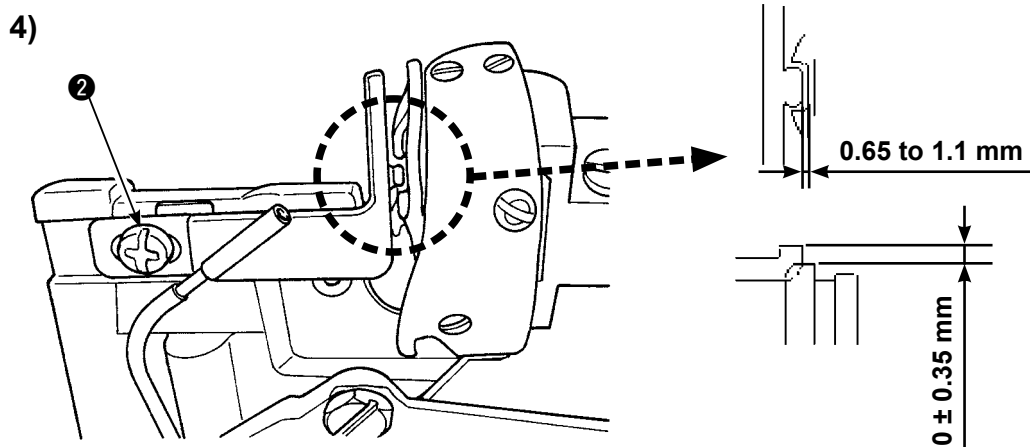
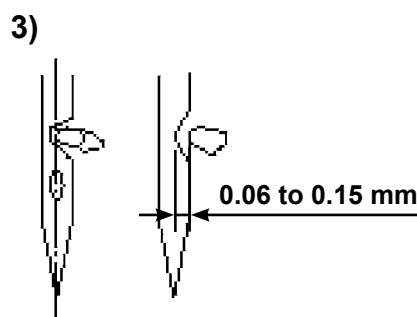
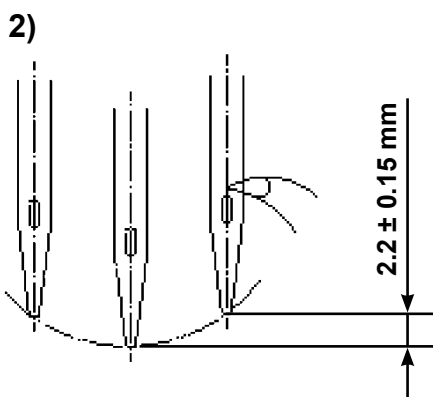
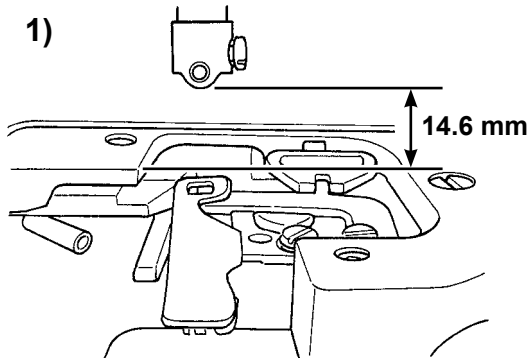
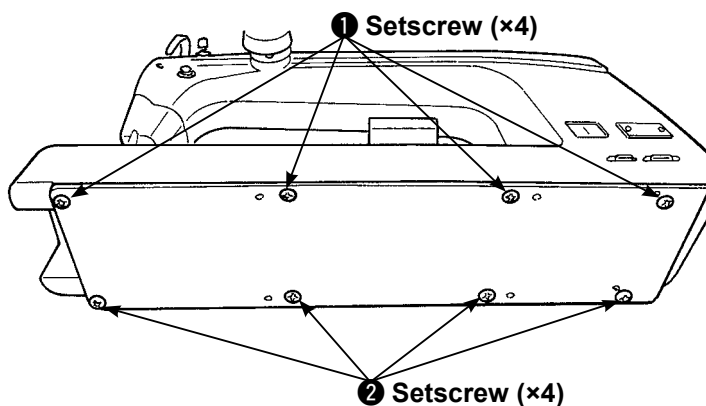
### 1. Adjusting the hook timing



#### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

#### Standard adjustment





Adjustment Procedure	Results of Improper Adjustment
<p>Remove eight setscrews ❶ to remove the bottom cover.</p> <p><b>1) Checking the needle bar height</b></p> <p>The height of the jaw section of the needle bar above the mounting surface of the throat plate is 14.6 mm when the needle bar is in its lower dead point.</p> <p><b>2) Needle-to-hook timing</b></p> <ol style="list-style-type: none"> <li>1. Loosen three setscrews of the hook.</li> <li>2. Adjust so that the center of the needle is aligned with the blade point of the hook when the needle bar goes up <math>2.2 \pm 0.15</math> mm from its lower dead point.</li> <li>3. Check the clearance between the needle and the hook. Then, tighten the setscrews.</li> </ol> <p><b>3) Clearance between the needle and the hook</b></p> <ol style="list-style-type: none"> <li>1. Loosen three setscrews of the hook.</li> <li>2. Adjust so that the blade point of the hook is aligned with the center of the needle.</li> <li>3. Adjust so that a clearance of 0.06 to 0.15 mm is provided between the blade point of the hook and the needle.</li> <li>4. Temporarily tighten the setscrews. Check the needle-to-hook timing. Then, securely tighten the setscrews.</li> </ol> <p><b>4) Position of the bobbin case opening lever</b></p> <ol style="list-style-type: none"> <li>1. Loosen setscrew ❷ of the bobbin case opening lever.</li> <li>2. Adjust so that an axial clearance of 0.65 to 1.1 mm is provided between the projecting section of the bobbin case opening lever and the groove in the inner hook.</li> <li>3. Adjust so that a difference in height of <math>0 \pm 0.35</math> mm is provided between the top end of the projecting section of bobbin case opening lever and the top end of the groove in the inner hook.</li> <li>4. Check to make sure that the clearance and difference in height between the bobbin case opening lever and the inner hook have been correctly adjusted. Then, securely tighten the setscrew.</li> </ol> <p><b>(Caution) Contact between the bobbin case holding lever and the hook has to be avoided.</b></p>	

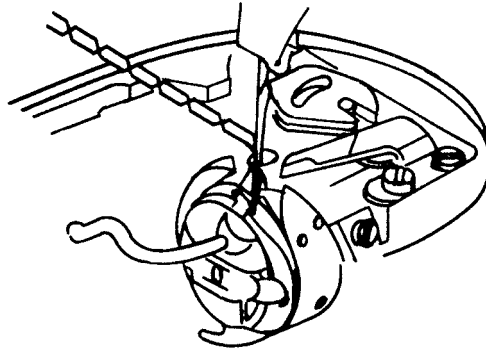
## 2. Theory of thread trimming



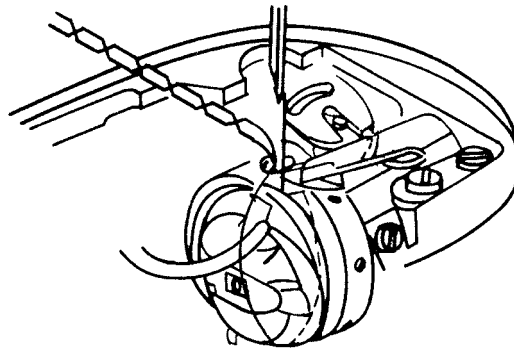
### **WARNING :**

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

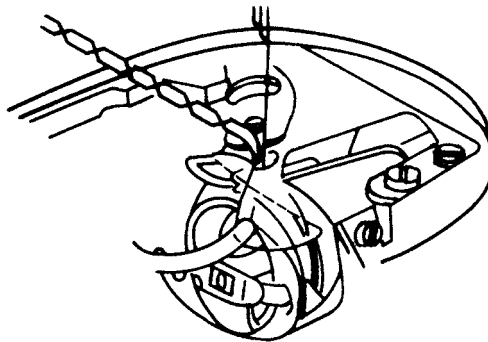
- 1) The blade point of the sewing hook catches the needle thread.



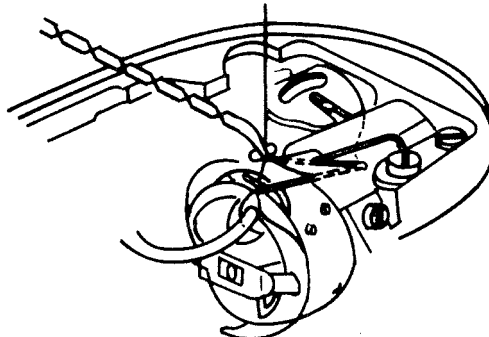
- 2) The moving knife spreads the threads. (goes back)



- 3) The moving knife hooks the needle and bobbin threads (advances).



- 4) The threads are trimmed.

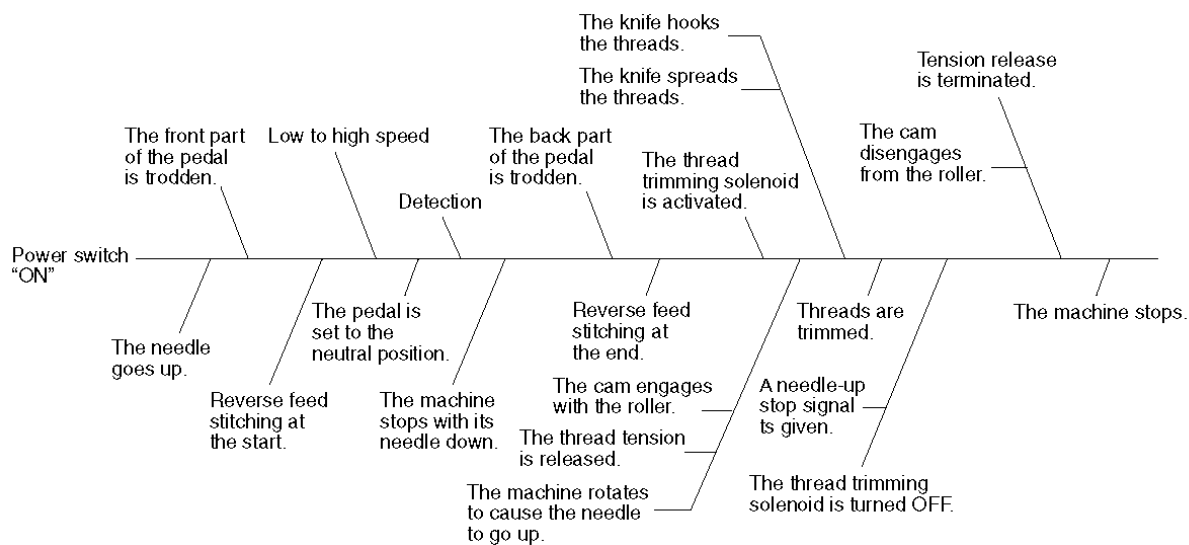


### 3. Thread trimming sequence



#### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



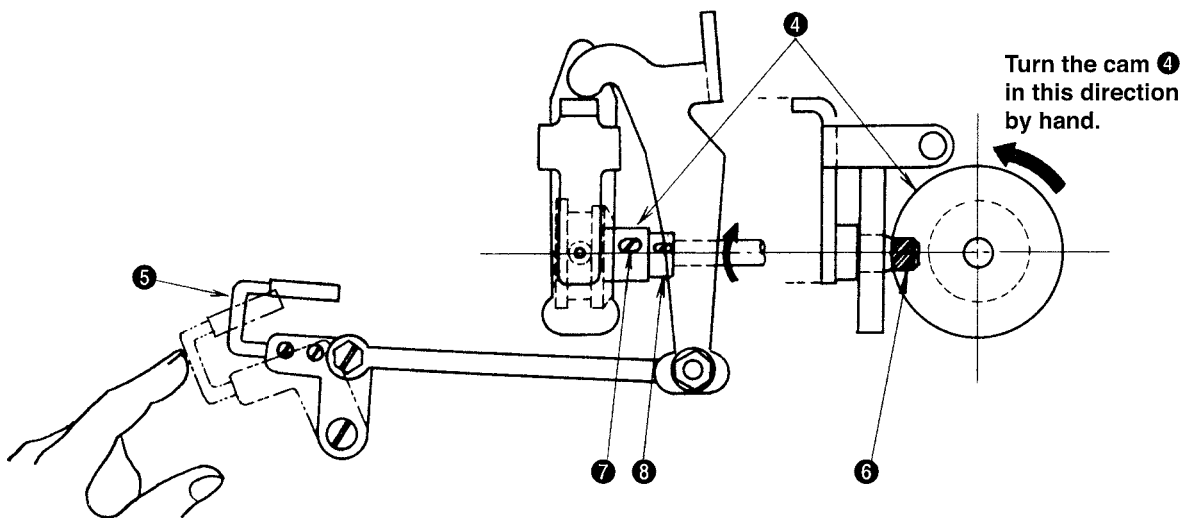
**(Caution)** The above chart assumes that the switches for automatic reverse feed stitching at the start and end have been set to "ON".



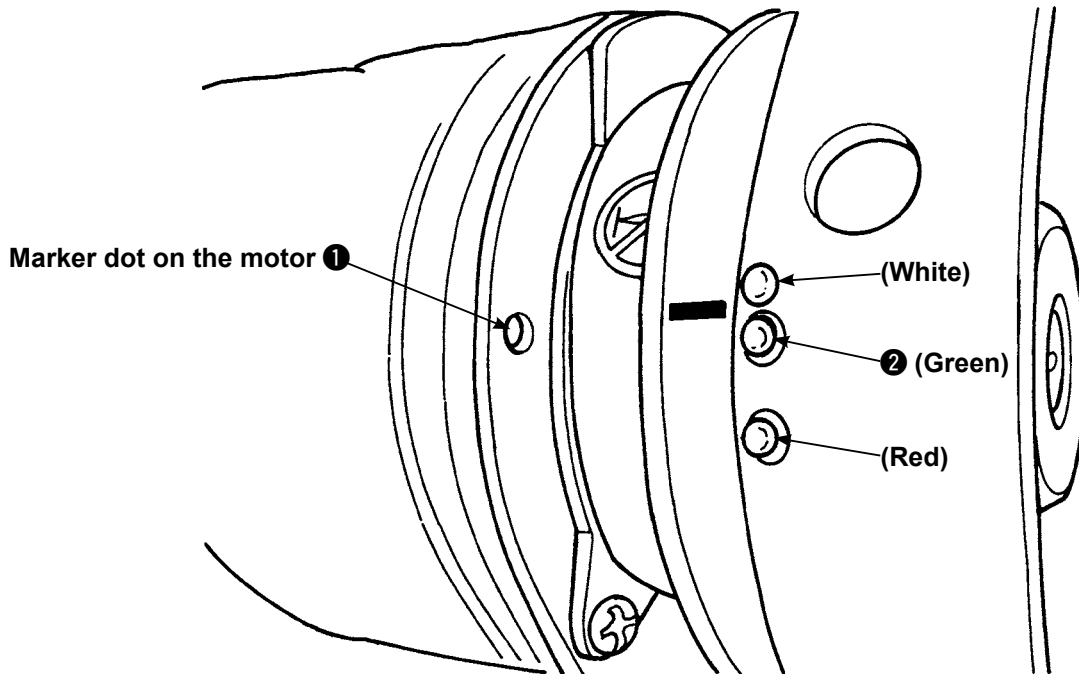
**To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.**

Standard adjustment	
---------------------	--

### 1) How to adjust the timing



## 2) How to adjust the timing of the thread trimmer cam



Adjustment Procedure	Results of Improper Adjustment
<p><b>1) How to adjust the timing</b></p> <p>The timing of the thread trimmer cam ③ for cotton and synthetic threads can be obtained simply by aligning the marker dot on the cover and the marker dot on the handwheel.</p> <ol style="list-style-type: none"> <li>1. Tilt the machine head, manually turn the handwheel until the thread take-up lever almost reaches its highest position, and press thread take-up picker ④ to the right by finger. This causes the cam roller ⑤ to fit in the groove of the thread trimmer cam ③. With this condition maintained, turn the handwheel in the direction opposite to the normal rotational direction, and you will find a position in which the handwheel no longer turns. Then, adjust the cam timing so that marker dot ① on the cover is aligned with green marker dot ② on handwheel as shown. This provides the proper cam timing for cotton and synthetic threads.</li> </ol> <p><b>2) How to adjust the timing of the thread trimmer cam</b></p> <ol style="list-style-type: none"> <li>1. Loosen two setscrews ⑥ in the thread trimmer cam. In this case, loosen the screw No. 1 firstly and screw No. 2 secondly. Align the marker dot on the motor with the marker dot on the handwheel (marker dot ① on the motor with green marker dot ③ on the handwheel).</li> <li>2. Fit the cam roller ⑤ in the groove of the trimmer cam ③ while pressing thread take-up picker ④ to the right. Manually turn only the trimmer cam ③ (do not turn the hook driving shaft) in the direction opposite from the normal rotation of the hook driving shaft (see the arrow in) until a position in which the cam goes no further is reached. In this position, press the trimmer cam ③ against the thrust collar ⑤ of the thread trimmer cam ③, and retighten the screw ⑥ No.2 first and then the screw No.1.</li> <li>3. If the cam collar ⑦ has not been moved, press the thread trimmer cam ③ against the cam collar ⑦, and retighten the screw ⑥ No.2 first and then the screw ⑥ No.1.</li> </ol>	



## 5. Adjustment of the position of the moving knife

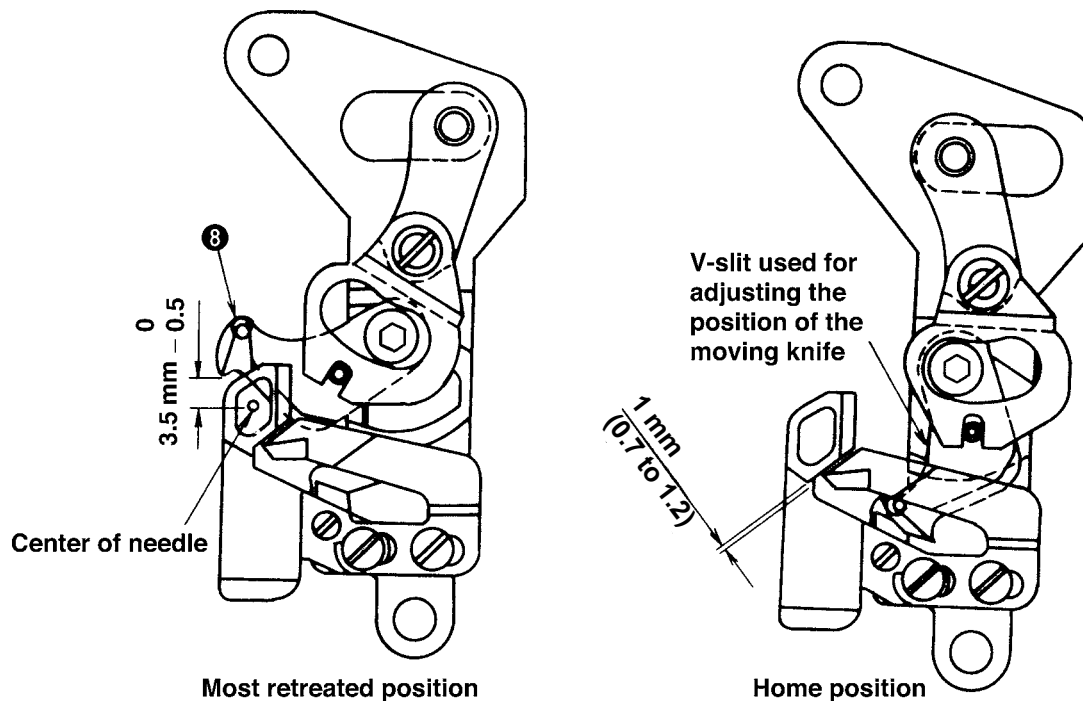


### WARNING :

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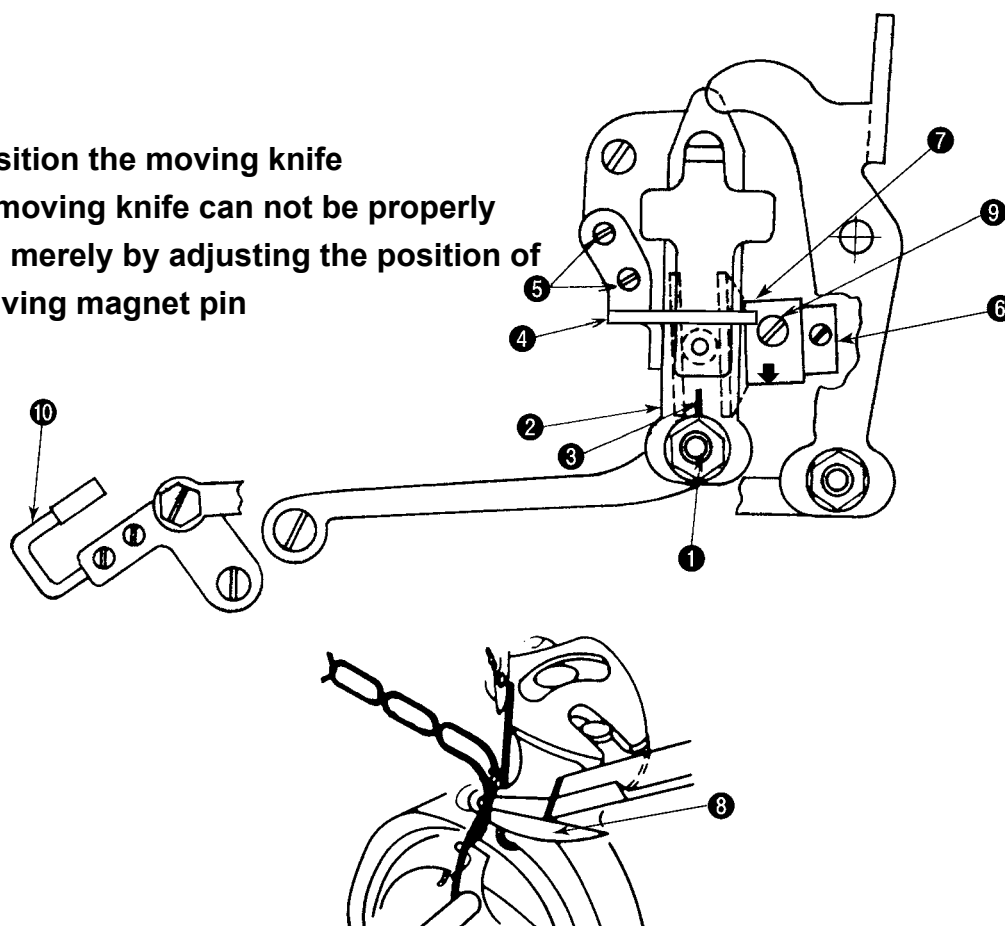
### Standard adjustment

#### 1) Proper position of the moving knife



#### 2) How to position the moving knife

#### 3) When the moving knife can not be properly positioned merely by adjusting the position of the link driving magnet pin



Adjustment Procedure	Results of Improper Adjustment
<p><b>1) Proper position of the moving knife</b></p> <ol style="list-style-type: none"> <li>The correct position of the moving knife ⑧ when the moving knife has gone back farthest is such that the tip of the moving knife is 3 to 3.5 mm away from the center of the needle. If the retreat of the moving knife ⑧ is not enough, the knife may fail to catch the needle or bobbin thread at the time of thread trimming. On the contrary, if the moving knife ⑧ retreats excessively, the moving knife ⑧ may hit the feed dog.</li> <li>To avoid these problems, be sure to accurately position the moving knife ⑧. The standard moving knife home position is obtained by bringing the periphery of the moving knife ⑧ in contact with the V groove of the knife mounting base.</li> </ol> <p><b>2) How to position the moving knife</b></p> <p>The position of the moving knife is adjusted by changing the lateral position of moving knife link pin ① while the machine is at rest.</p> <ol style="list-style-type: none"> <li>Loosen the lock nut of moving knife link pin ①.</li> <li>Move the link driving magnet pin ① to the right or left to make the V groove ③ meet the periphery of the moving knife ⑧, referring to the home position.</li> <li>Retighten the lock nut of the moving knife link pin ① when the proper position of the moving knife has been obtained. As the moving knife link pin ① is moved to the right, the retreat of the moving knife increases. As it is moved to the left, the retreat of the moving knife decreases.</li> </ol> <p><b>3) When the moving knife can not be properly positioned merely by adjusting the position of the link driving magnet pin</b></p> <ol style="list-style-type: none"> <li>Loosen adjusting nut of moving knife link pin ①.</li> <li>Adjust so that the center of the moving knife link pin ① aligns with V groove ③ of the knife driving arm ②, and fix link driving magnet pin by tightening the lock nut.</li> <li>Loosen two screws ⑤ of the knife driving arm stopper ④.</li> <li>Move the knife driving arm ② to make the periphery of the moving knife ⑧ meet the V groove of the mounting base, and fix knife driving shaft stopper ④ by tightening two screws ⑤.</li> <li>Loosen the two screws of thread trimmer cam ⑦ and cam collar ⑥.</li> <li>Align red dot on the handwheel with dot on the cover.</li> <li>Manually turn the cam until screw ⑨ faces toward you. Then press the thread take-up picker ⑩ to the right.</li> <li>Move the trimmer cam ⑦ to the right or left to engage the trimmer cam ⑦ with the cam roller.</li> <li>With the trimmer cam ⑦ engaged with the cam roller, turn the trimmer cam ⑦ in the direction of the arrow toward you until it stops, while lightly pulling the trimmer cam ⑦ to the right.</li> <li>Tighten screw ⑨ of the trimmer cam ⑦ for preliminary installation.</li> <li>Then confirm : <ol style="list-style-type: none"> <li>(1) that the specified marker dots on the cover and handwheel are in alignment,</li> <li>(2) the roller smoothly fits in the cam groove, and</li> <li>(3) the retreat of the knife has been set to 3 to 3.5 mm.</li> </ol> </li> <li>Securely tighten the two screws of the cam.</li> <li>Press the cam collar ⑥ against the trimmer cam ⑦ and fix it by tightening the screw.</li> </ol> <p><b>(Caution) Note that a minute change in the lateral position of the moving knife link pin ① will greatly affect the retreat of the knife. Confirm that the moving knife ⑧ spreads the threads as shown.</b></p>	

## 6. Adjustment of the counter knife

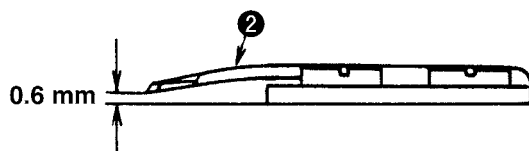
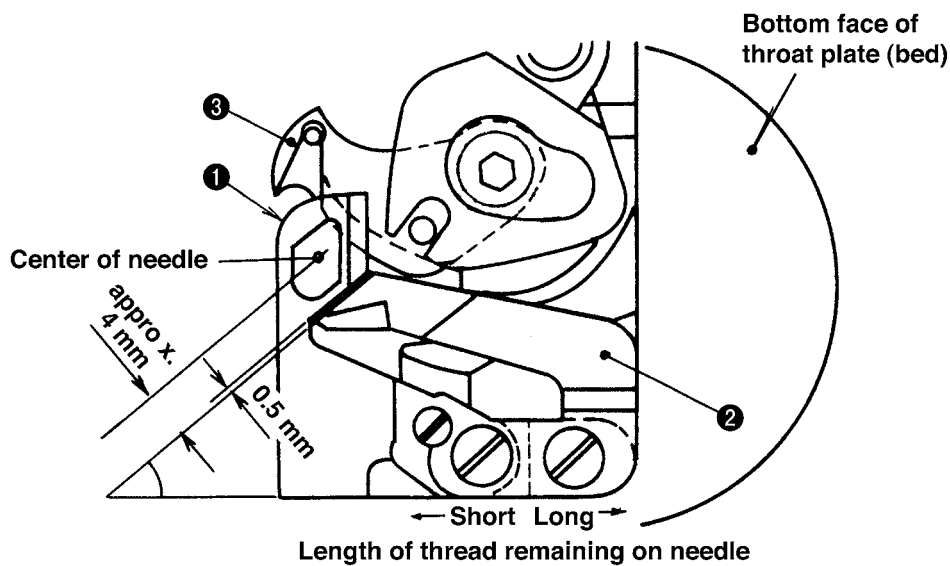


### WARNING :

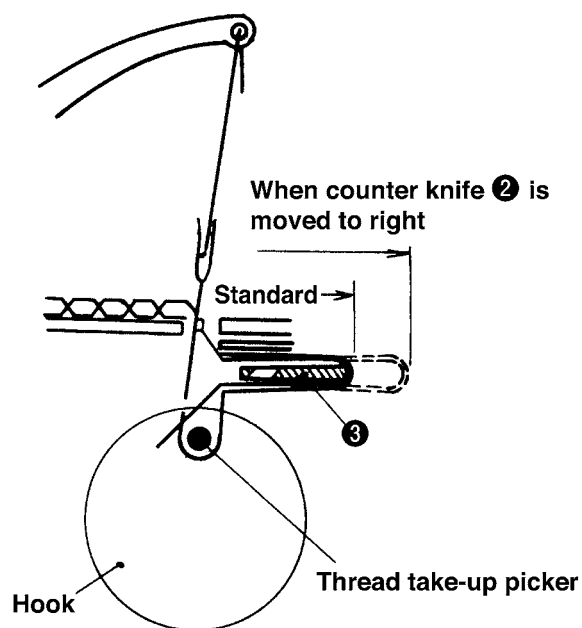
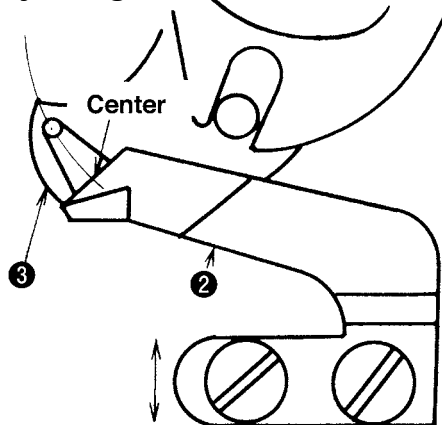
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

### Standard adjustment

#### 1) Properly installing the knife thread guide



#### 2) Adjusting the counter knife



Adjustment Procedure	Results of Improper Adjustment
<p><b>1) Properly installing the knife thread guide</b></p> <p>Install the knife thread guide ❶ so that the needle enters exactly the center of its opening.</p> <p><b>2) Adjusting the counter knife</b></p> <ol style="list-style-type: none"> <li>1. The standard distance from the blade point of the counter knife ❷ to the knife thread guide ❶, which is positioned so that the needle enters the center of its opening, is 0.5 mm.</li> <li>2. The blade point of the counter knife ❷ is about 4 mm away from the center of the needle.</li> <li>3. The blade point of the counter knife ❷ is located 0.6 mm above the installing surface.</li> <li>4. The sharpness of the counter knife ❷ depends upon the installing angle of the blade tip of the counter knife ❷. The proper overlap of the counter knife ❷ blade with that of the moving knife ❸ will provide the best sharpness.</li> <li>5. Whenever the counter knife ❷ has been readjusted or replaced, be sure to check the sharpness of the counter knife ❷, and adjust the installing angle of the counter knife ❷.</li> <li>6. The installing position of the counter knife ❷ can be moved to the right from the standard position. When the counter knife has been installed in such a position, the needle and bobbin threads to be pulled out become correspondingly longer, and also the timing of thread trimming is delayed, resulting in an increased length of the thread remaining on the needle after thread trimming. When using synthetic thread, the timing of thread trimming can be delayed by moving the counter knife ❷ to the right. In this case, the timing of the thread trimmer cam must also be adjusted. Refer to <b>"3. Adjustment of the timing of the thread trimmer cam"</b>.</li> </ol>	

## 7. Adjustment of the thread take-up picker

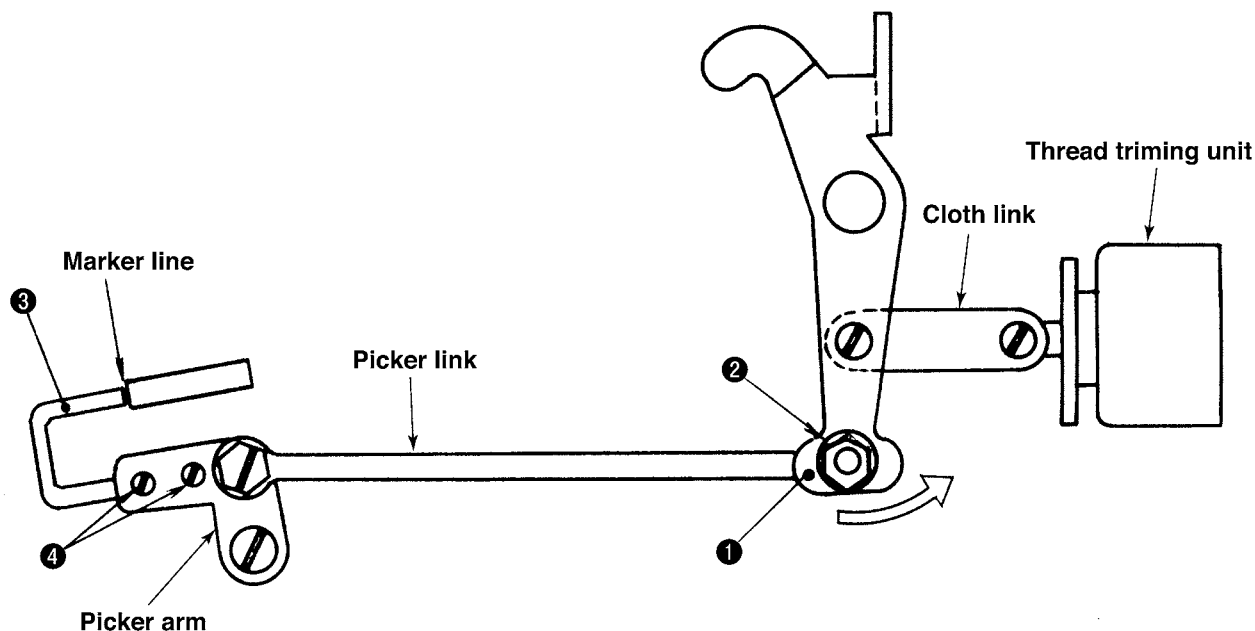


### WARNING :

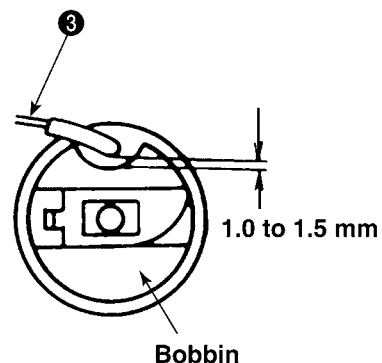
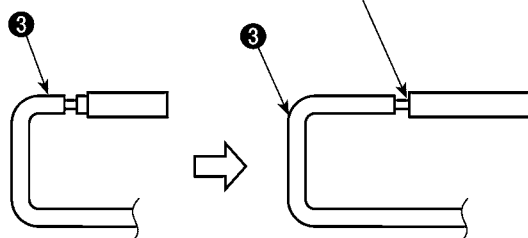
To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

### Standard adjustment

- 1) Positioning the thread take-up picker
- 2) How to adjust the position of the thread take-up picker



**Positioning the thread take-up picker ③ :**  
When the thread take-up pickers touched the bobbin, adjust so that the end of the thread take-up picker ③ is aligned with the right end of the marker line.





Adjustment Procedure	Results of Improper Adjustment
<p><b>1) Positioning the thread take-up picker</b></p> <ol style="list-style-type: none"> <li>1. With clutch disc ❶ pushed in the direction of arrow (to the right), make adjustment so that the bobbin thread can be pulled out smoothly.</li> <li>2. The adjustment so that a clearance of 1.0 to 1.5 mm is provided between the tip of the thread take-up picker ❸ (bobbin winder trip latch) and the middle of the top recess of the bobbin case, and also the rear end of the bobbin winder trip latch is aligned with the marker line of the thread take-up picker ❸.</li> </ol> <p><b>2) How to adjust the position of the thread take-up picker</b></p> <ol style="list-style-type: none"> <li>1. After loosening screws ❹, adjust so that the tip of the thread take-up picker ❸ (bobbin winder trip latch) is positioned, and tighter setscrews ❺.</li> <li>2. To adjust the entrance of the thread take-up picker ❸ into the bobbin case, picker link pin ❷.</li> <li>3. After completion of the above adjustment, retighten the nut of the picker link pin ❷.</li> <li>4. The standard position of the picker link pin ❷ is such that, with the clutch disc ❶ pushed to the right, the end of the picker ❸ is the right side with marker line.</li> </ol>	<ul style="list-style-type: none"> <li>○ If thread take-up picker ❸ enters the bobbin case too deeply at the time of thread trimming, the bobbin does not turn, and the bobbin thread is cut too short, causing stitch skipping at the start of sewing.</li> <li>○ On the contrary, if the entrance of the thread take-up picker ❸ into the bobbin case is not enough, the needle thread slips off the tip of the thread take-up picker at the time of thread trimming. As a result, the thread remaining on the needle after trimming becomes too short, causing the thread to slip off the needle.</li> </ul>

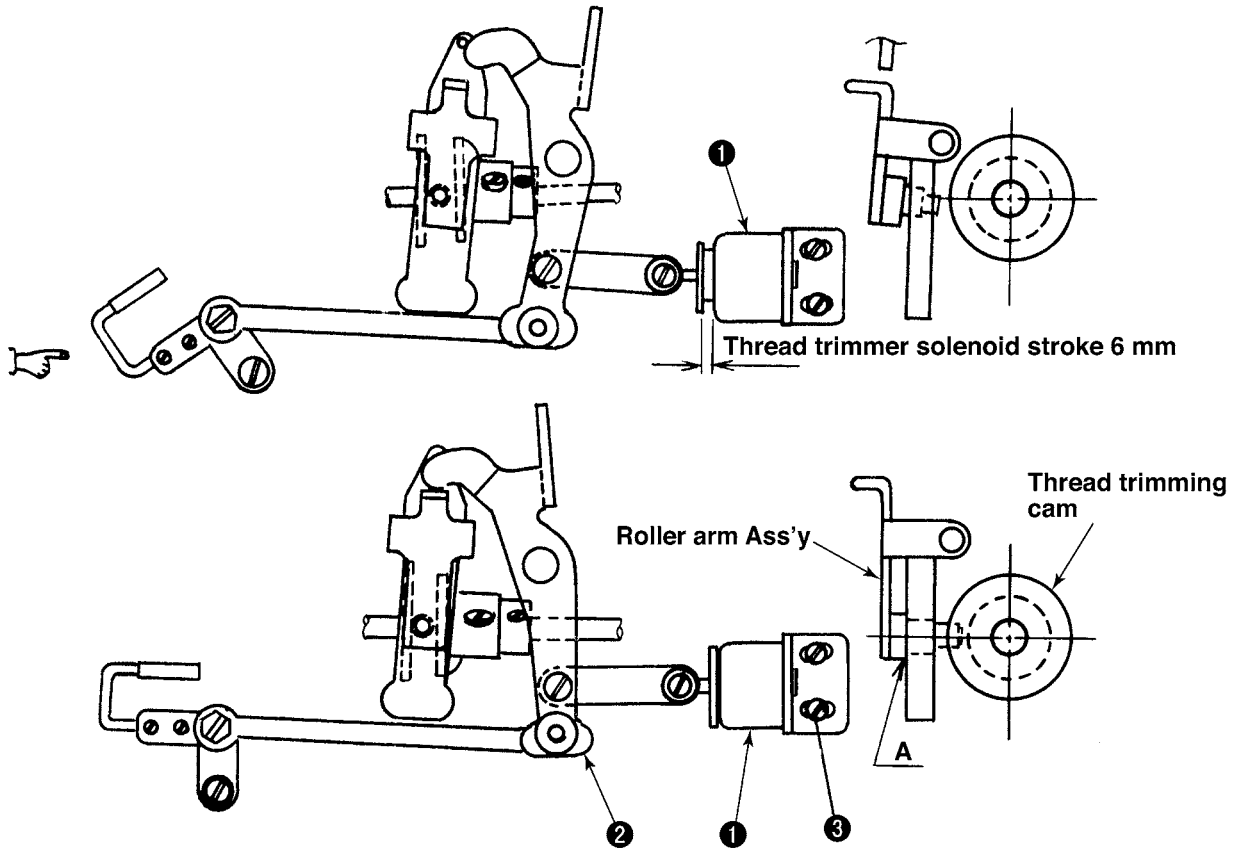
## 8. Adjustment of the clutch disc and thread trimmer solenoid



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

### Standard adjustment



Adjustment Procedure	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. The thread trimmer solenoid ❶ stroke is 6 mm.</li> <li>2. Position the clutch disc ❷ and trimmer solenoid ❶ so that, when the thread trimmer solenoid ❶ is actuated, clearance A becomes 0.1 mm to 0.5 mm.</li> <li>3. Then tighten setscrews ❸.</li> </ol>	

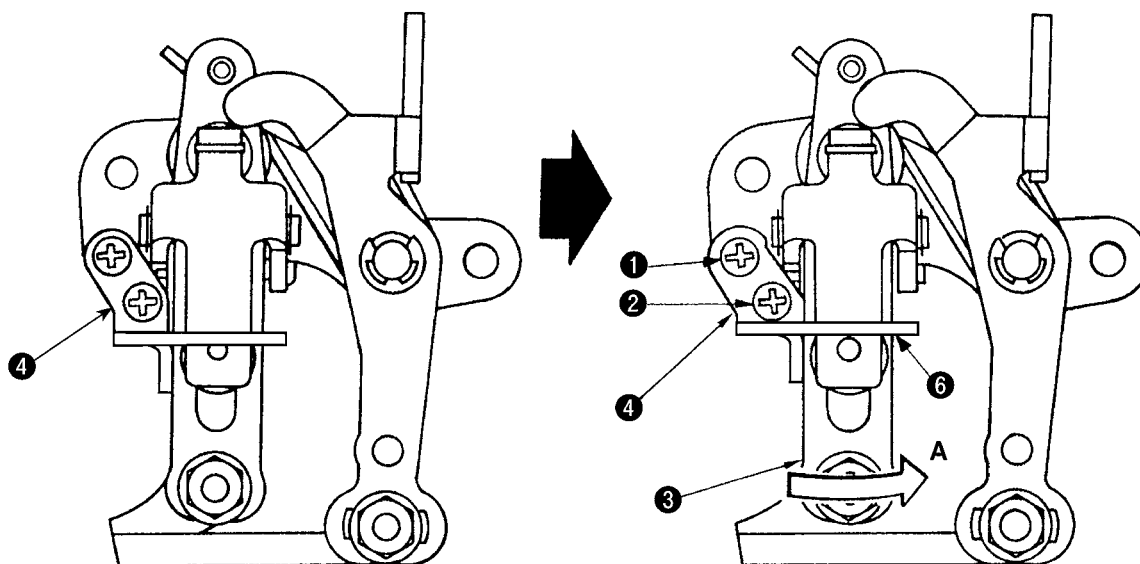
## 9. Adjustment of driving arm stopper



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

### Standard adjustment



Needle

5

Needle entry

5

Adjustment Procedure	Results of Improper Adjustment
<ol style="list-style-type: none"> <li>1. Press the roller arm ❸ in the direction of arrow A until it is pressed against the stopper ❹ of the driving arm stopper ❺.</li> <li>2. At this time, adjust screw ❶ and ❷ so that the stopper ❹ works at a position where the moving knife ❸ does not reach the needle entry.</li> </ol>	



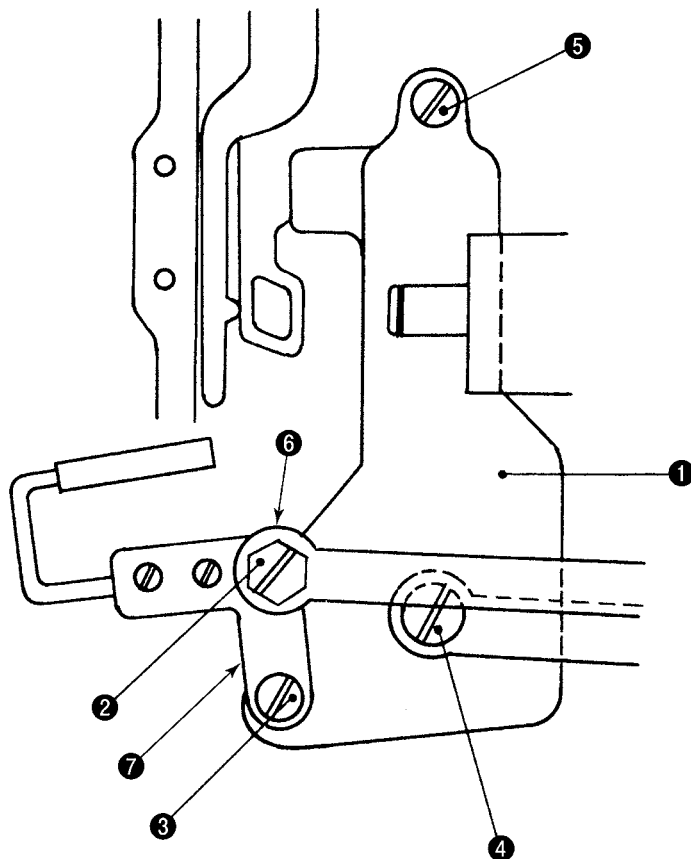
## 10. Adjustment of the knife mounting base



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

### Standard adjustment



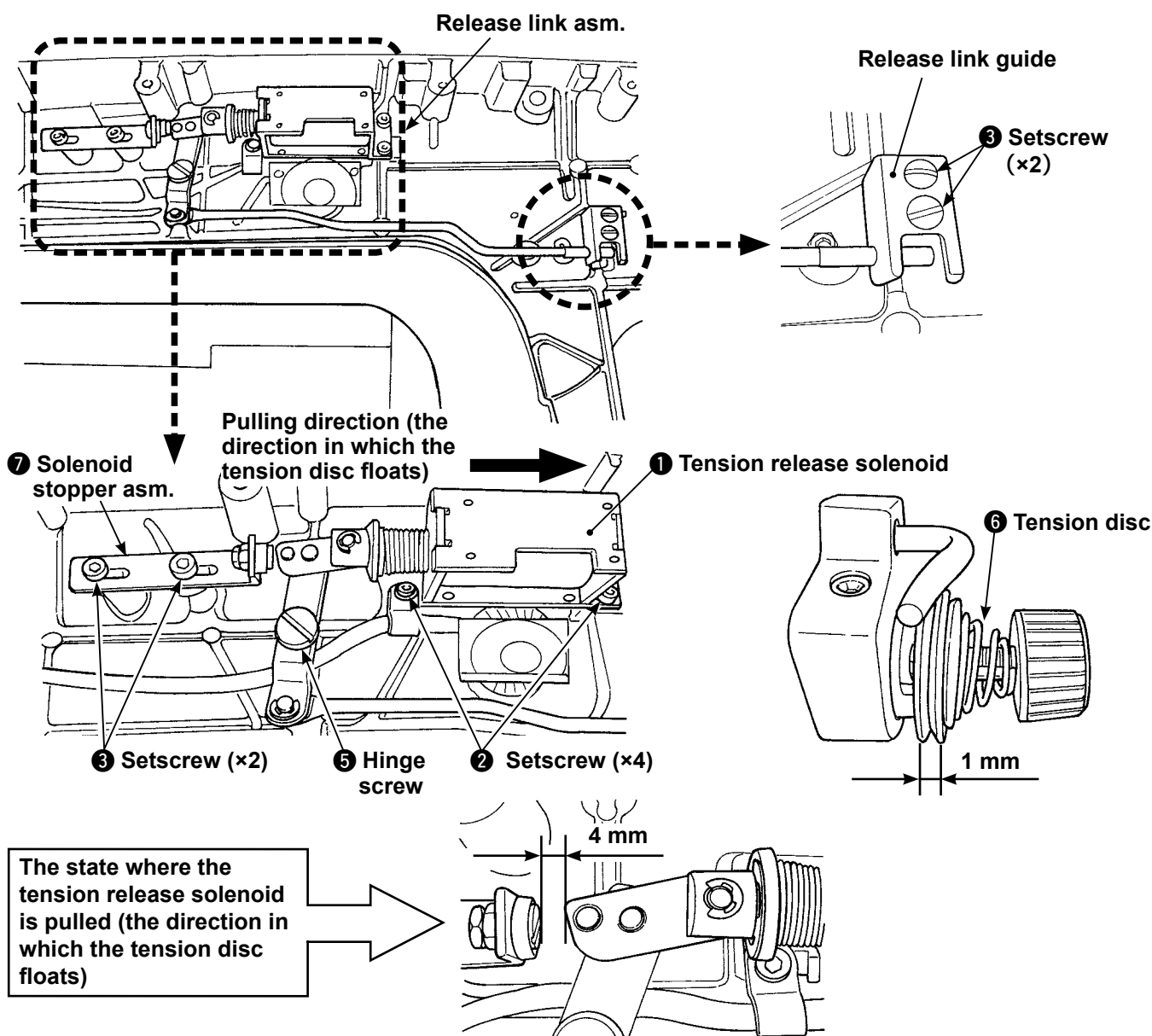
Adjustment Procedure	Results of Improper Adjustment
<p>Removing knife mounting base ❶ in the following sequence:</p> <ol style="list-style-type: none"> <li>1. Remove the hook.</li> <li>2. Remove the hinge screw ❷ of the picker link ❸, and take out the hinge screw ❹ of the picker arm ❺.</li> <li>3. Remove hinge screws ❻ and ❼, then, the knife mounting base ❶ can be remove.</li> </ol> <p>* To install the knife mounting base, reverse the above sequence.</p>	

## 11. Adjusting the tension release components



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



Disassembly	Assembly	Point	Tool to be used
<p>The tension release components can be removed as an entire unit by removing the following setscrews:</p> <ul style="list-style-type: none"> <li>• Four setscrews 2 of tension release solenoid 1.</li> <li>• Two setscrews 3 of solenoid stopper asm.</li> <li>• Two setscrews 2 of the tension release link.</li> <li>• One hinge screw 5.</li> </ul>	<p>Adjust so that tension disc 6 floats by 1 mm when tension release solenoid 1 is pulled. Then, fix tension release solenoid 1 with four setscrews 2.</p> <p>Adjust solenoid stopper (asm.) 7 so that a clearance of 4 mm is provided between the tip of the stopper and the solenoid link when pulling the magnet. Then, fix it with two setscrews 3 of the stopper mounting plate.</p>	<p>Smooth operation of the tension release link has to be ensured.</p> <p>Tension disc 6 should not float when tension release solenoid 1 is in its standby position (the power is in the OFF state).</p>	<p>Hexagonal wrench key (3 mm)</p> <p>Flatblade screwdriver</p>

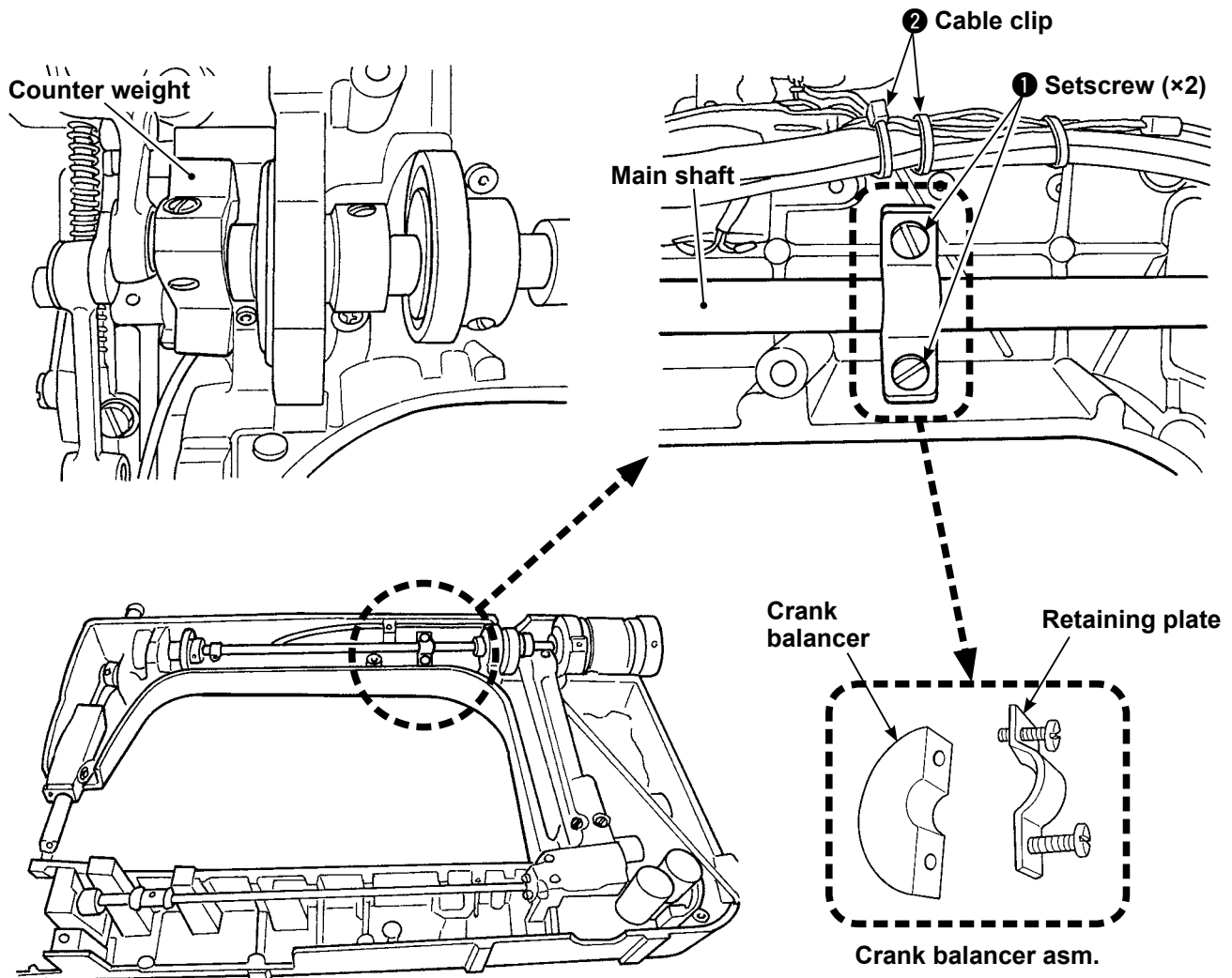
## 12. Adjusting the balancer



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

ENGLISH



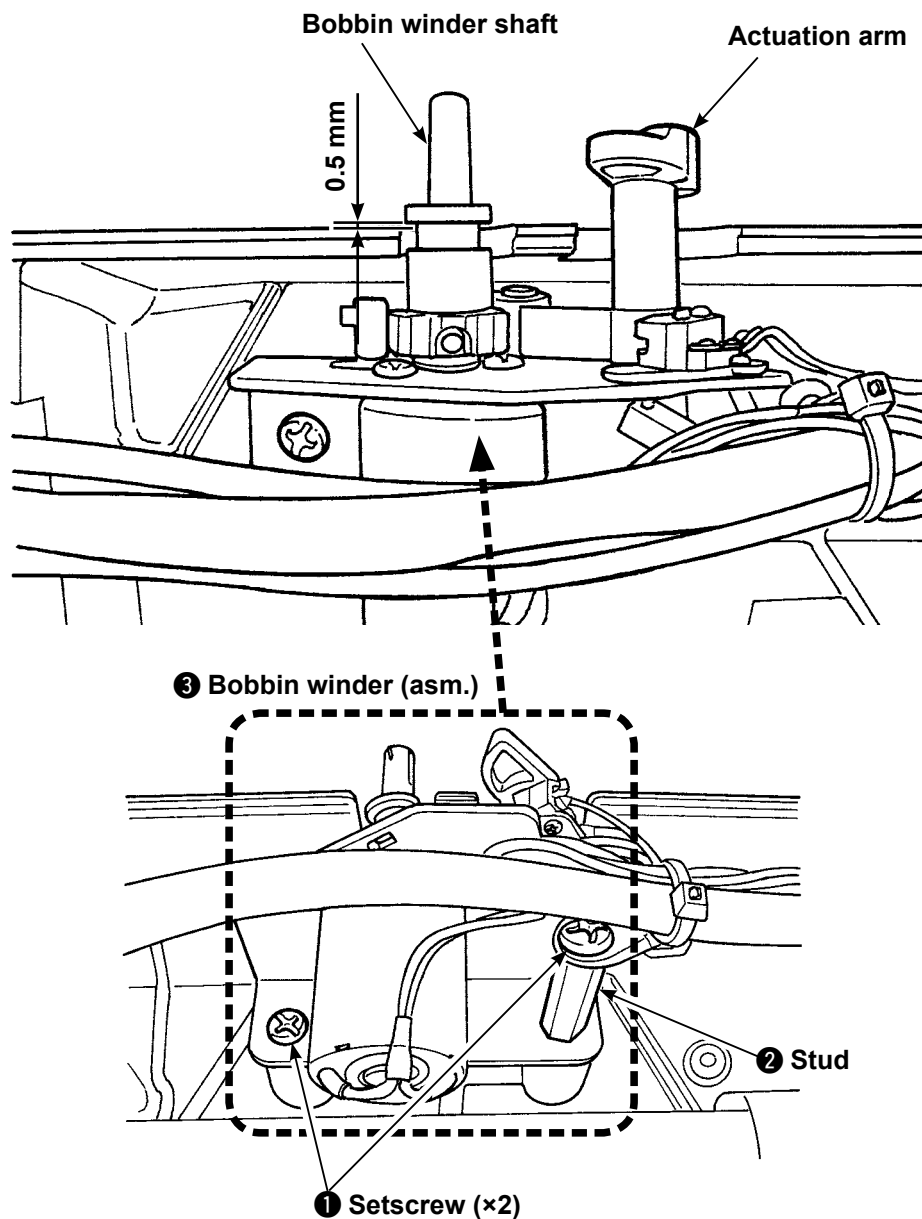
Disassembly	Assembly	Point	Tool to be used
Remove two setscrews ❶ of the balancer asm. Remove the balancer asm.	Place the balancer on the main shaft. Temporarily fix the retaining plate below the cable clip with two setscrews ❶. Set the balancer asm. and counter weight so that they are oriented in the same direction and fix them with two setscrews ❶.	The balancer and the weight of the counter weight should be oriented in the same direction.  The setscrews should be tightened alternately.	Flatblade screwdriver

### 13. Adjusting the height of bobbin winder



#### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.



Disassembly	Assembly	Point	Tool to be used
Remove two setscrews ① and the stud ② from the bobbin winder mounting plate. Remove bobbin winder (asm.) ③.	Install the bobbin winder (asm.) while adjusting the vertical position of the bobbin winder (asm.) so that a difference in height of 0.5 mm is provided between the top end of the arm and the end face of bobbin winder shaft. Then, fix the bobbin winder (asm.).	The bobbin winder (asm.) should be installed while keeping it from tilting. Take care to avoid the cords around the bobbin winder (asm.) at the time of installation.  * If the bobbin winder (asm.) is poorly adjusted, the actuation arm can malfunction.	Flatblade screwdriver Spanner (7 mm)



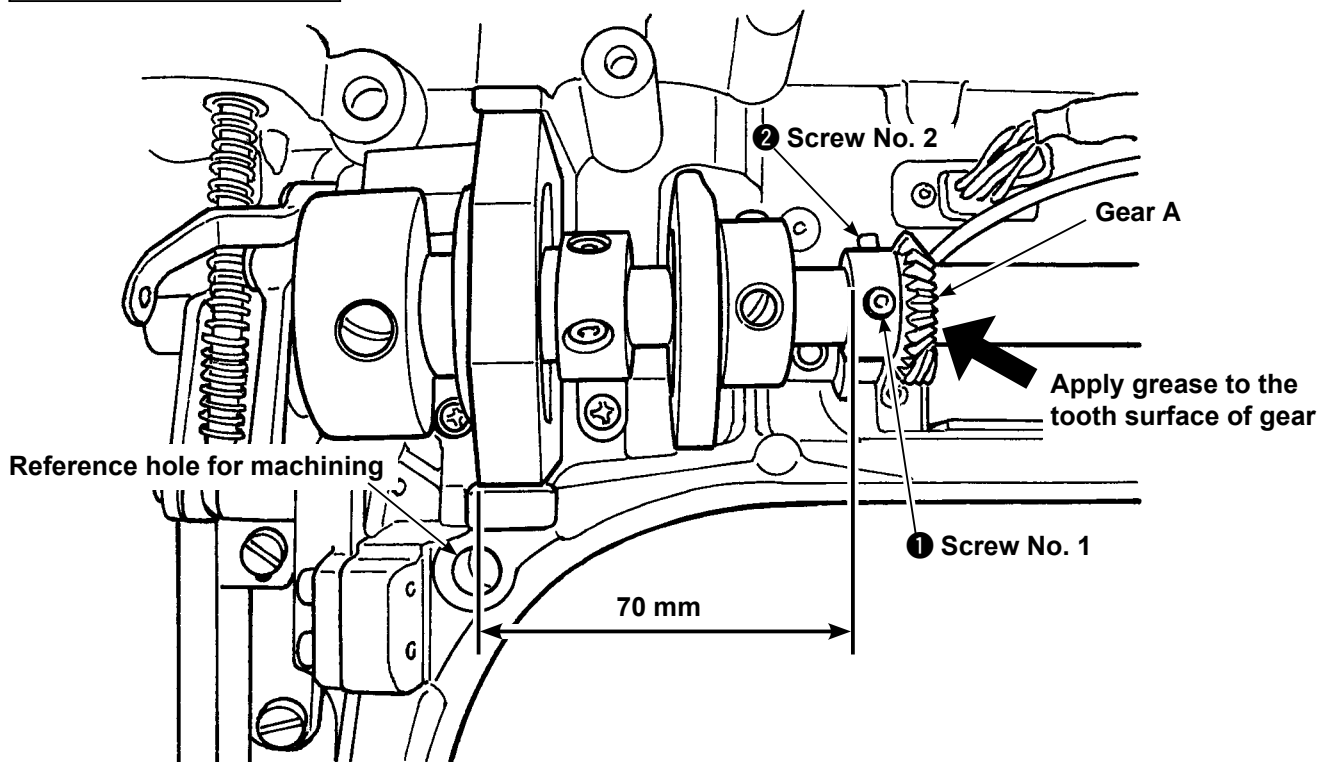
## 14. Position of the hand pulley gear



### WARNING :

To protect against possible personal injury due to abrupt start of the machine, be sure to start the following work after turning the power off and ascertaining that the motor is at rest.

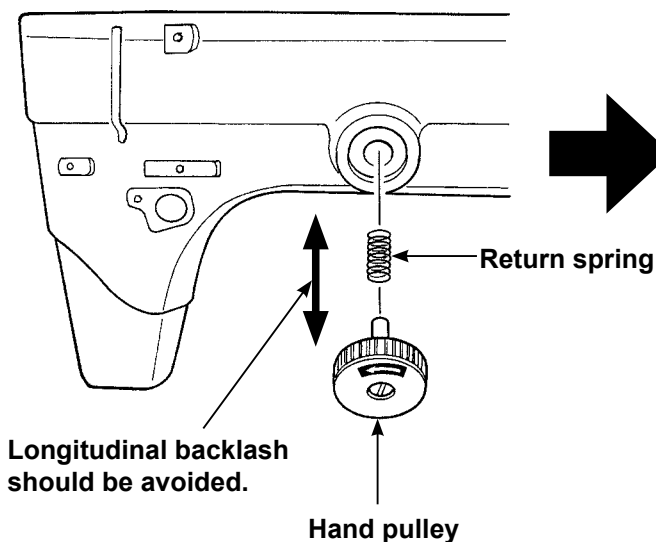
Left side of the frame



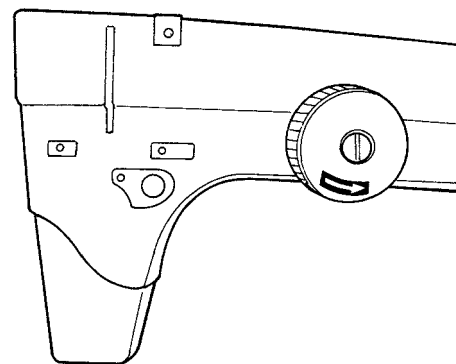
ENGLISH

Disassembly	Assembly	Point	Tool to be used
Remove gear A after having drawn out the main shaft.	Insert screw No. 1 ① into the tapped hole and tighten it so that its head is flush with the flat section at the position where the end face of gear A is spaced 70 mm away from the center of the machining reference hole in the frame. Then, tighten screw No. 1 ① and screw No. 2 ① in the written order. Apply grease to the tooth surface of gear A.	Tighten the screw No. 1 with aligned with the flat section of the main shaft.  * If the position of the screw No. 1 is not correctly adjusted, the hand pulley cannot work normally.	Hexagonal wrench key (2 mm)

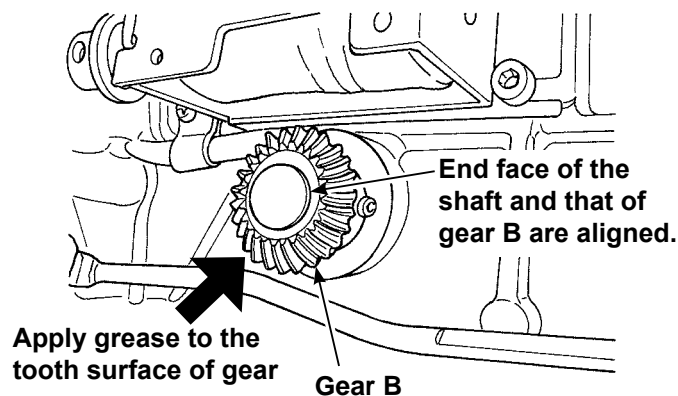
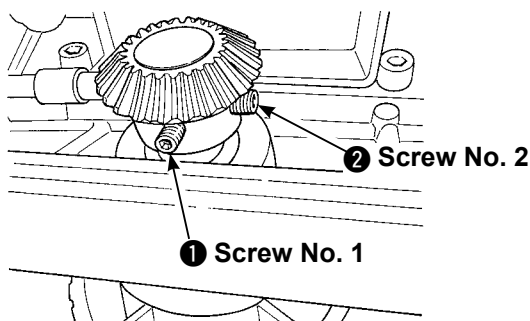
### Right side of the frame



### Outside of the frame

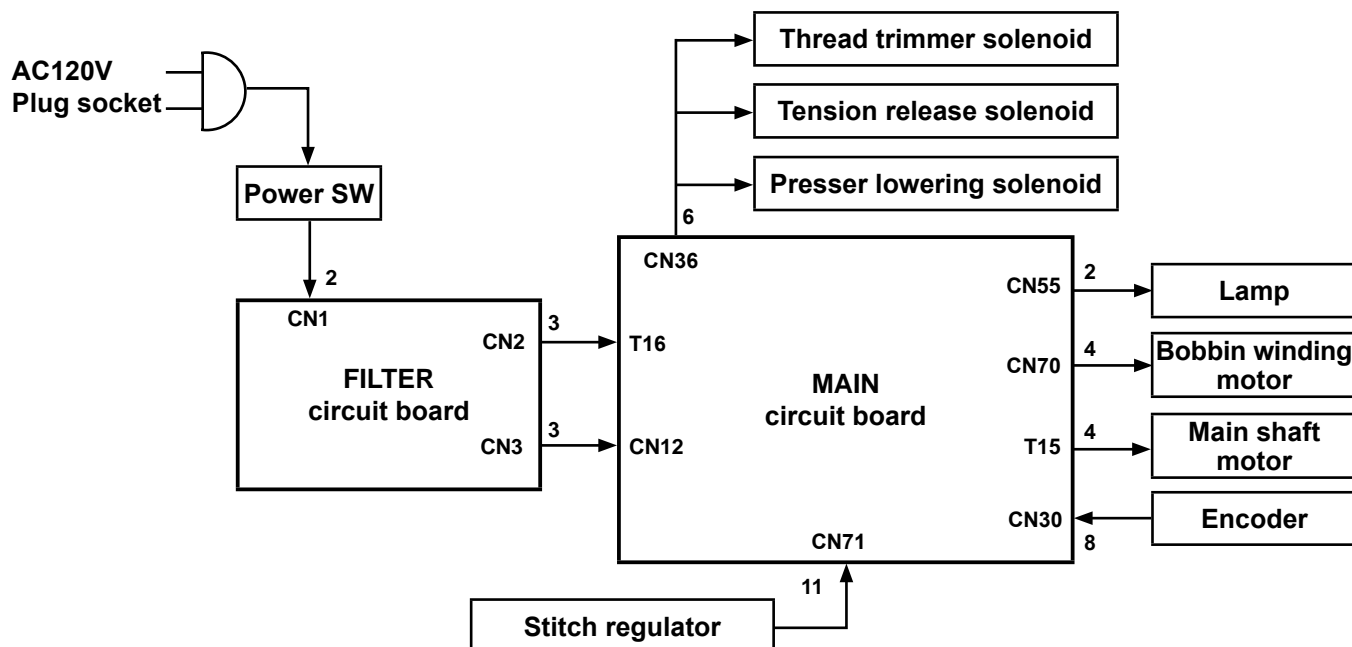


### Inside of the frame



Disassembly	Assembly	Point	Tool to be used
Loosen setscrew of gear B. Then, the hand pulley asm. can be removed in whole.	Place the return spring on the hand pulley. Then, insert them from outside of the frame. Set gear B on the hand pulley from inside of the frame. Align the end face of gear B and that of the hand pulley with each other. Align head of screw No. 1 ① with the flat section of main shaft. Tighten screw No. 1 ① and screw No. 2 ②. Apply grease to the tooth surface of gear B.	<p>Tighten the screw No. 1 with aligned with the flat section of the main shaft.</p> <p>Longitudinal backlash should be avoided.</p> <p><b>* If the related components are not correctly positioned, the hand pulley cannot work.</b></p>	Hexagonal wrench key (2 mm)

## 5 PRINTED CIRCUIT BOARD DIAGRAM (CONNECTOR LAYOUT)



ENGLISH

Description	FILTER circuit board		Cord color	Signal
	Terminal	Pin		
Power input (120 VAC)	CN1	1	Yellow	AC120V
		2	Blue	AC120V
Power supply connection	CN2	1	White	VP
		2	Black	VN
		3	Red	COM
Relay signal	CN3	1	Yellow	+12V
		2	White	PDD
		3	Gray	RLD0

Description	MAIN circuit board		Cord color	Signal
	Terminal	Pin		
Power supply connection	T16	1	White	VP
		2	Red	COM
		3	Black	VN
Relay signal	CN12	1	Yellow	+12V
		2	White	PDD
		3	Gray	RLD0
SOL	CN36	1	White	Thread trimmer COM
		2	White	Tension release COM
		3	White	Presser lowering COM
		4	Black	Thread trimmer
		5	Black	Tension release
		6	Black	Presser lowering
Lamp	CN55	1	White	VCC
		2	Black	COM
Bobbin winding motor	CN70	1	White	SW
		2	Black	GND
		3	Red	MOTOR(+)
		4	Blue	MOTOR(-)

Description	MAIN circuit board		Cord color	Signal
	Terminal	Pin		
Main shaft motor	T6	1	Black	U phase
		2	Red	V phase
		3	White	W phase
		4	Green/Yellow	GND
Encoder	CN30	1	-	
		2	Black	GND
		3	Orange	U
		4	Blue	V
		5	Purple	W
		6	Light blue	A
		7	Pink	B
		8	Red	VCC
		9	Yellow	Z
		10	-	
Stitch regulator	CN71	1	Black	+5V
		2	White	TRM
		3	Red	HLF_S
		4	Green	SPEED
		5	Yellow	DIR
		6	Brown	TG
		7	Blue	START
		8	Gray	LED_SW
		9	Orange	GND
		10	Pink	DDET
		11	Light blue	UDET
		12	-	
		13	-	
		14	-	
		15	-	

- (Caution) 1. CN Nos. in frame of MAIN circuit board denote connector Nos. in MAIN circuit board.  
 2. Portions enclosed with thick lines denote circuit boards.  
 3. Numerals outside of frame of MAIN circuit board denote number of lead wires.

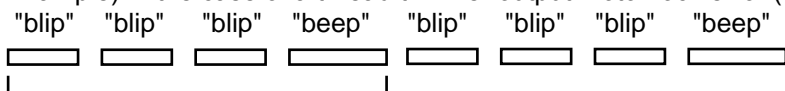


## 6 ERROR CODES

The device is provided with the function for giving an error warning in the case any problem occurs. Refer to the following table for error codes.

The error is notified by means of a buzzer. The buzzer gives audible alerts in two different ways, i.e., short audible alert (as a blip) and long one (as a beep). The number of times of audible alert up to and including the first long audible alert is heard is the reference count with which the operator determines which error has occurred.

Example) In the case of a thread trimmer output motor lock error (number of times of audible alert: 4)



Count the number of times of the audible alert up to and including this one.

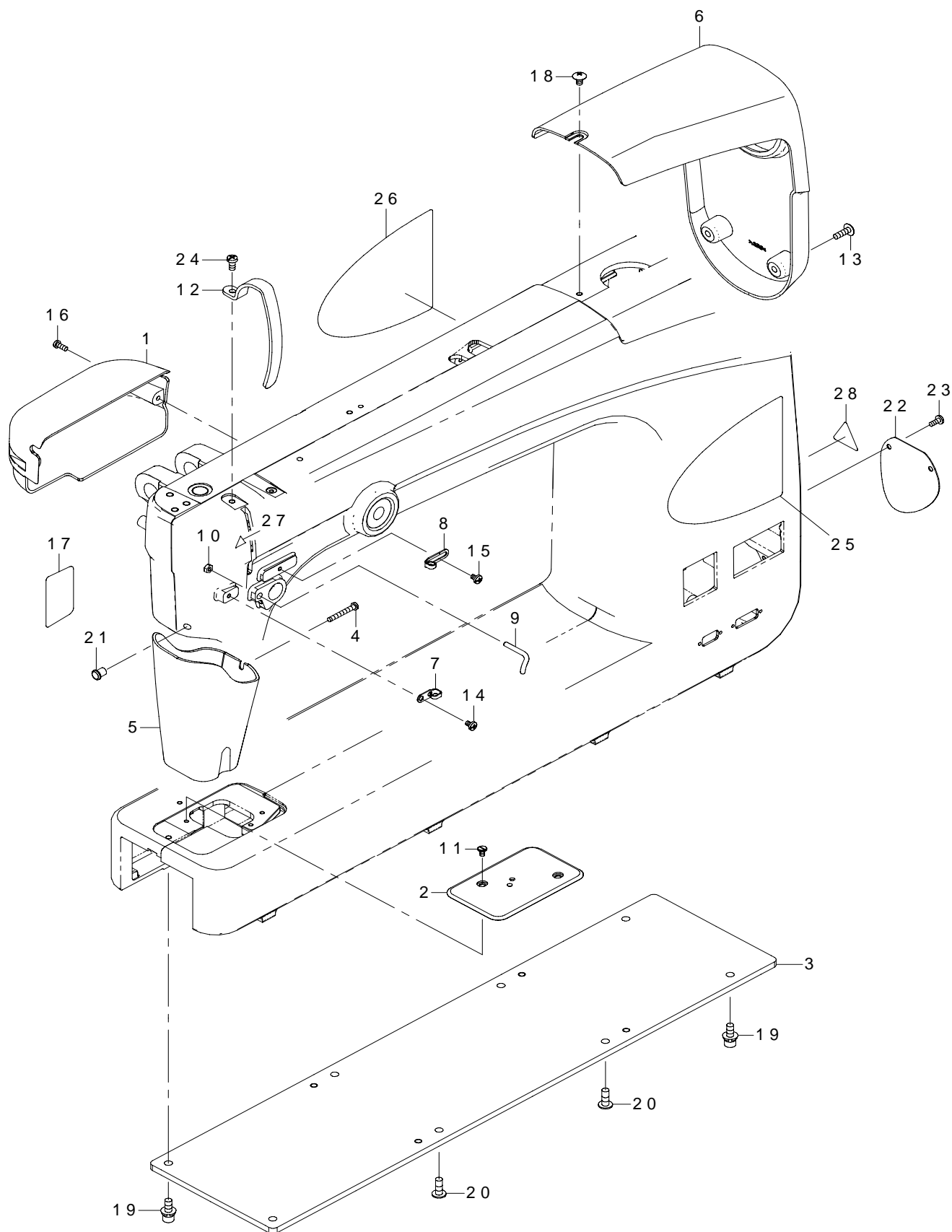
Number of times of audible alert	No.	Description of detected error	Possible cause of error	Item to be checked
0	0	Error is reset		
1	000	(EEPROM) Data initialization is being executed.	<ul style="list-style-type: none"> <li>In the case the initialization operation is executed.</li> <li>In the case the program is updated.</li> </ul>	Occurs one time when the power is turned on after having carried out the initialization or program updating. (This is not an error.)
2	003	Synchronizer connector disconnection	Not used	Not used
3	071	Motor lock error with no overcurrent	<ul style="list-style-type: none"> <li>Motor connector has disconnected.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the motor output connector has loosened or disconnected.</li> </ul>
4	072	Thread trimmer output motor lock error	<ul style="list-style-type: none"> <li>In the case the machine head is locked.</li> <li>In the case an extra heavy-weight material thickness of which exceeds the guaranteed machine head specification is sewn.</li> <li>In the case the motor fails to rotate.</li> <li>In the case the motor or the driver has broken.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the thread or the like has twined on the handwheel.</li> <li>Check whether the motor output connector (4P) has loosened or disconnected.</li> <li>Check whether the motor fails to rotate smoothly when being turned by hand.</li> </ul>
5	007	Motor lock error		
6	302	Safety check error	<ul style="list-style-type: none"> <li>In the case the machine head tilt detection switch is input though the machine is being energized.</li> <li>In the case the machine head tilt detection switch has disconnected.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the machine head is tilted without turning off the power switch. (If the machine head is tilted, the sewing machine operation is disabled for the sake of safety.)</li> </ul>
7	079	Overload detection error	<ul style="list-style-type: none"> <li>In the case the sewing machine head fails to increase its speed to the commanded one.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the thread or the like has twined on the handwheel.</li> </ul>
8	730	Motor encoder open-phase error	<ul style="list-style-type: none"> <li>In the case the motor signal is not input properly.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the motor output connector (CN30) has loosened or disconnected.</li> <li>Check whether the motor signal cord has broken by being caught in the machine head.</li> <li>Check whether the direction of insertion of the motor encoder connector is wrong.</li> </ul>
9	731	Motor position sensor error		

10	733	Motor reverse-rotation fault detection error	<ul style="list-style-type: none"> <li>In the case the motor is rotating in the reverse direction at a speed of 500 sti/min while it is in operation.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the wire connection of the encoder of the main shaft motor is wrong.</li> <li>Check whether the power wire connection of the main shaft motor is wrong.</li> </ul>
11	815	Regeneration resistance un-connection error	<ul style="list-style-type: none"> <li>CN11 is not yet connected.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the regeneration resistance is connected to CN11.</li> </ul>
12	802	Instantaneous power interruption detection error	<ul style="list-style-type: none"> <li>In the case the power is interrupted instantaneously.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the power supply environment is undesirable.</li> </ul>
13	811	Over-voltage detection error	<ul style="list-style-type: none"> <li>In the case the supply voltage which is equal to or higher than the guaranteed voltage has been input.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the supply voltage which is higher than the rating by +10 % or more is applied.</li> </ul>
14	813	Low-voltage detection error	<ul style="list-style-type: none"> <li>In the case the supply voltage which is equal to or lower than the guaranteed voltage has been input.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the supply voltage which is lower than the rating by -10 % or less is applied.</li> </ul>
15	906	Serial communication error	<ul style="list-style-type: none"> <li>In the case the operation panel has broken.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the operation panel cord has broken by being caught in the machine head.</li> </ul>
16	924	IPM fault detection error	<ul style="list-style-type: none"> <li>In the case the motor driver has broken.</li> </ul>	-
17	942	EEPROM writing error	<ul style="list-style-type: none"> <li>In the case data cannot be written on the EEPROM.</li> </ul>	<ul style="list-style-type: none"> <li>Turn the power OFF.</li> </ul>
18	303	Z phase: Meniscus sensor error	<ul style="list-style-type: none"> <li>In the case the meniscus sensor signal cannot be detected.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the motor encoder connector has broken.</li> </ul>
19	220	Grease-shortage warning error	Not used	Not used
20	221	Grease-shortage operation prohibition error	Not used	Not used
21	810	Solenoid power short-circuit error	<ul style="list-style-type: none"> <li>In the case an attempt to drive the short-circuited solenoid is carried out.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the solenoid is short-circuited.</li> </ul>
22	809	Solenoid power short-circuit error FL	<ul style="list-style-type: none"> <li>In the case the operation cannot be changed over to the solenoid retaining operation.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the solenoid is abnormally hot. (If it is abnormally hot, the MAIN PCB has broken.)</li> </ul>
23	808	Solenoid power short-circuit error AD	<ul style="list-style-type: none"> <li>In the case the solenoid power fails to reach the normal voltage.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the machine head cord is caught in the cover or the like.</li> </ul>

# ***PARTS LIST***

# 1. FRAME & MISCELLANEOUS COVER COMPONENTS

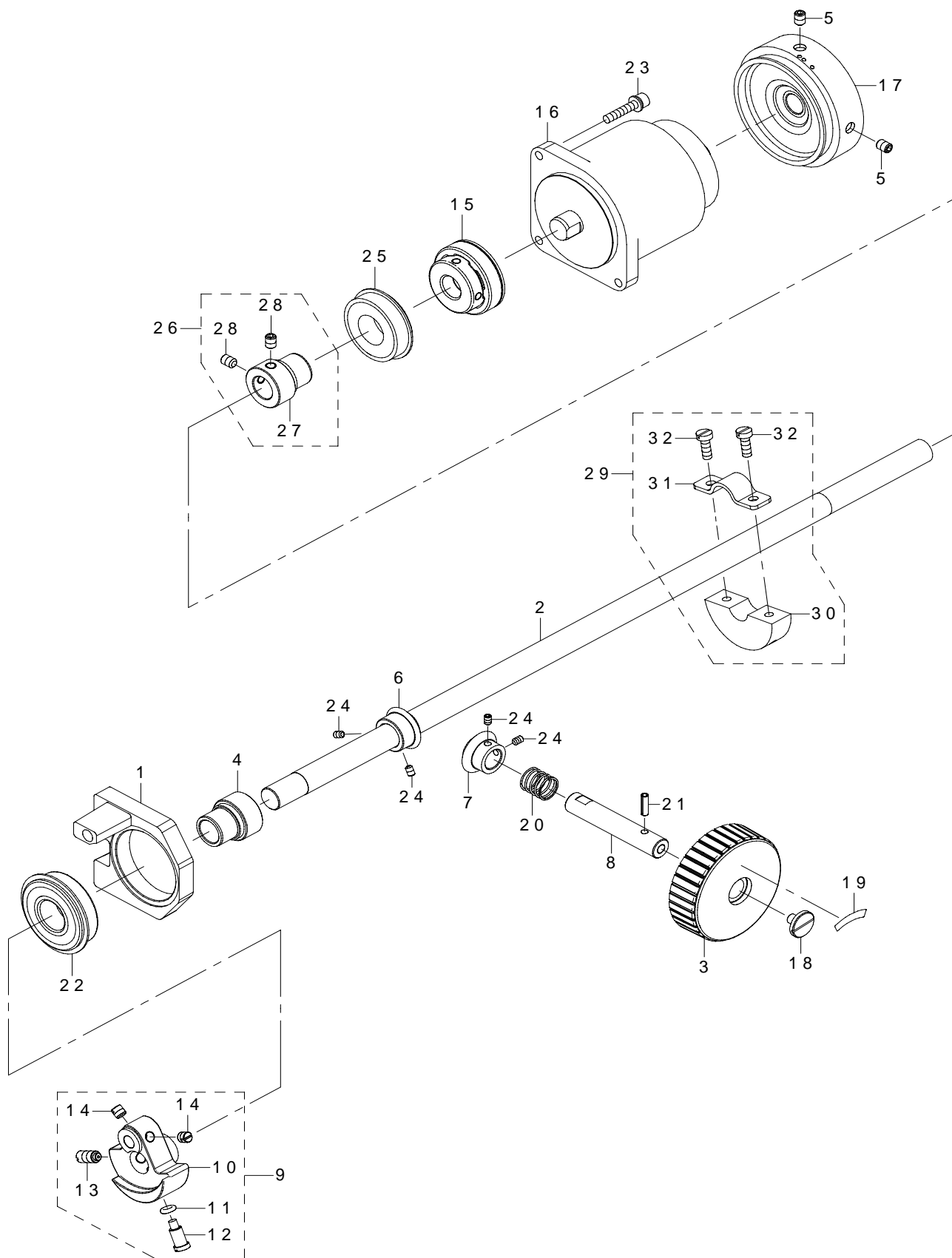
頭部・外装関係





REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24949	PRESSER_MECHA_COVER	押え調節カバー	1
2		401-24969	THROAT_PLATE	針板	1
3		401-24970	BOTTOM_COVER	底面カバー	1
4		SM-4043050-SC	SCREW M4X0.7 L=30	なべ小ねじ M 4 X 0. 7 L = 3 0	1
5		401-24948	LED_COVER	LED カバー	1
6		401-24947	MTOR_COVER	モーターカバー	1
7		229-20607	ARM THREAD GUIDE B	アーム糸案内 B	1
8		236-26104	ARM THREAD GUIDE A	アーム糸案内 A	1
9		400-25414	L_SHAPED_THREAD_GUIDE	L 形糸案内	1
10		NM-6040000-SN	NUT M4	六角ナット M 4	1
11		A1138-776-000	SCREW	止めねじ	2
12		401-32239	THREAD_TAKE_UP_LEVER_COVER	天秤カバー	1
13		SM-0051601-SC	SCREW M5 L=16	トラスねじ M 5 L = 1 6	2
14		SM-5040655-SN	SCREW	バインドねじ	1
15		SM-5040655-SN	SCREW	バインドねじ	1
16		SM-4041001-SN	SCREW M4X0.7 L=10	なべ小ねじ M 4 X 0. 7 L = 1 0	2
17		401-32095	FRAME L SEAL	目隠しシール	2
18		SM-0050801-SC	SCREW	トラスねじ M 5 L = 8	1
19		SL-6061692-TN	BOLT	座金付き六角穴ボルト	4
20		SM-0061601-SC	SCREW	トラスねじ M 6 L = 1 6	4
21		165-57704	ATTACHMENT	ワークアタッチメント	1
22		401-32116	LOWER SHAFT HOLE COVER	下軸穴カバー	1
23		SM-5040655-SN	SCREW	バインドねじ	2
24		SM-4051055-SP	SCREW	なべねじ	1
25		401-25756	EMBLEM_R	型式銘版右	1
26		401-25755	EMBLEM_L	型式銘版左	1
27		CM-3002000-01	ATTENTION SEAL	指怪我注意シール (16)	1
28		CM-3001000-01	LABEL	危険電圧警告シール (31. 5)	1

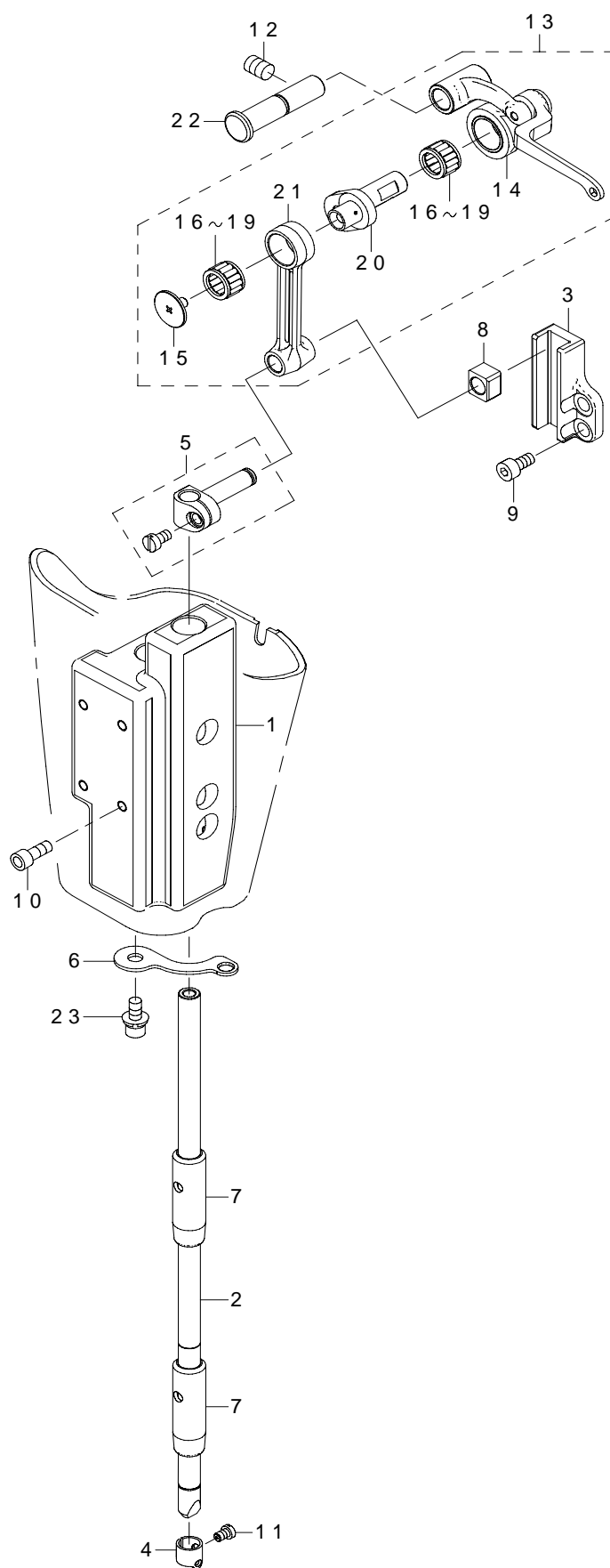
## 2. UPPER SHAFT COMPONENTS 上軸関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24952	MAIN_SHAFT_F_BLOCK	上軸前メタル土台	1
2		401-24962	MAIN_SHAFT	上軸	1
3		401-24986	PULLEY	手元プーリー	1
4		236-05207	MAIN SHAFT BEARING SUPPORT	上軸前ベアリング受	1
5		SM-80608A2-TP	SCREW M6 L=8	六角穴付き止めねじ M 6 L = 8	2
6		400-06515	GEAR_A	ギア A	1
7		400-06516	GEAR_B	ギア B	1
8		400-44053	PULLEY SHAFT	手元プーリー軸	1
9		401-06606	COUNTER_WEIGHT_ASM.	釣合錘 (組)	1
10		401-06607	COUNTER_WEIGHT	釣合錘	(1)
11		RO-0442401-00	RUBBER RING	O リング	(1)
12		SS-7681650-TP	SCREW 9/32-28 L=16	丸平ねじ 9/32-28 L = 16	(1)
13		SS-8681650-TP	SCREW 9/32-28 L=16	止めねじ 9/32-28 L = 16	(1)
14		SS-8660610-TP	SCREW 1/4-40 L=6	止めねじ 1/4-40 L = 6	(2)
15		401-11025	COUPLING_ASM.	カップリング組	1
16		401-11203	SERVO MOTOR	サーボモータ	1
17		401-11872	HAND_PULLEY	はずみ車	1
18		A1230-500-000-A	HANDWHEEL SETSCREW	はずみ車止めねじ	1
19		B1144-210-000	REVOLVING DIRECTION LABEL	回転方向ラベル	1
20		112-33400	SPRING	ワイバマグネットばね	1
21		PS-0400142-KH	SPRING PIN 4X14	スプリングピン 4 X 14	1
22		SB-1200027-00	BEARING	ころがり軸受 (前)	1
23		SL-6052592-TN	BOLT	座金付き六角穴ボルト	3
24		SM-8040612-TP	SCREW M4 L=6	止めねじ M 4 L = 6	4
25		SB-1200018-00	BEARING	ころがり軸受 (後)	1
26		400-44857	FRONT BEARING SUPPORT ASM.	上軸前ベアリング受組	1
27		236-05207	FRONT BEARING SUPPORT	上軸前ベアリング受	(1)
28		SM-80608A2-TP	SCREW M6 L=8	六角穴付き止めねじ M 6 L = 8	(2)
29		400-10437	CRANK_BALANCER_ASM	バランサー組	1
30		400-10438	CRANK_BALANCER	バランサー	(1)
31		400-10439	CRANK_BALANCER_FIX_PLATE	バランサー止め板	(1)
32		400-10440	CRANK_BALANCER_FIX_PLATE_SCREW	バランサー止めねじ	(2)

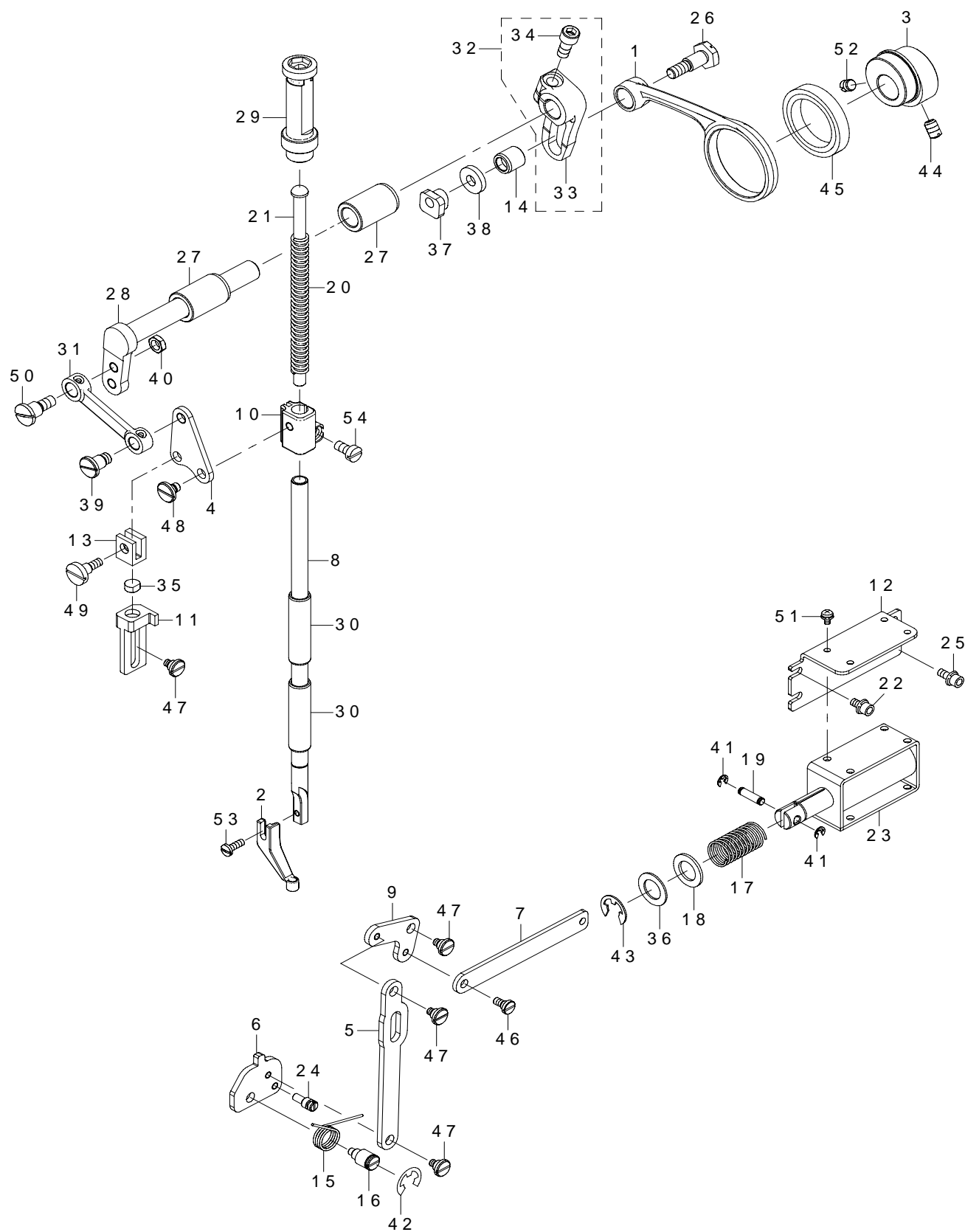
### 3. NEEDLE BAR & THREAD TAKE UP COMPONENTS

針棒・天秤関係



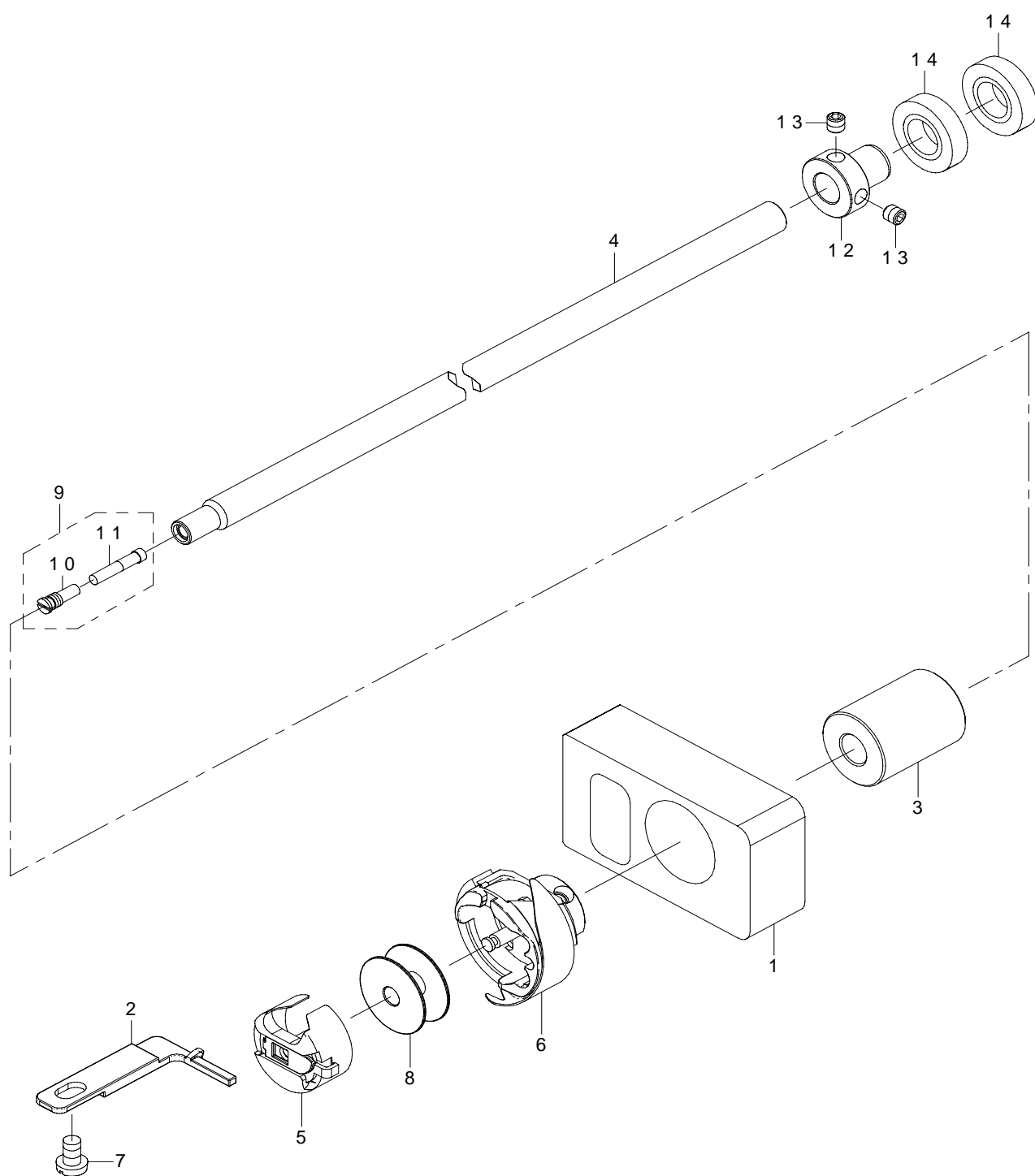
REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24954	NEEDLE_BAR_BLOCK	針棒土台	1
2		401-24989	ASSY NEEDLE BAR	針棒 (結合)	1
3		113-49909	ROLLER GUIDE BRACKET	コ口案内台	1
4		229-06309	NEEDLE BAR THREAD GUIDE	針棒糸掛け	1
5		229-06457	NEEDLE BAR HOLDER ASM.	針棒抱き (組)	1
6		401-30712	NEEDLE BAR THREAD GUIDE	針棒糸案内	1
7		400-86605	NEEDLE_BAR_LOWER_METAL_MD	針棒下メタル_MD	2
8		B1414-555-000	SLIDE BLOCK	針棒抱き案内コ口	1
9		SM-6041002-TP	SCREW M4 L=10	六角穴ボルト M 4 X 0. 7 L = 1 0	2
10		SM-6041002-TP	SCREW M4 L=10	六角穴ボルト M 4 X 0. 7 L = 1 0	4
11		SS-7080510-TP	SCREW 1/8-44 L=4.5	丸平ねじ 1/8-44 L = 4. 5	1
12		SM-80608A2-TP	SCREW M6 L=8	六角穴付き止めねじ M 6 L = 8	4
13		114-03979	THREAD TAKE-UP LEVER ASM.	リンク天秤 (結合)	1
14		114-03961	THREAD TAKE-UP LEVER ASM.	リンク天秤 (組)	(1)
15		229-18304	BALANCE CRANK LEFT SCREW	天秤クランク左ねじ	(1)
16	#01	229-18403	BALANCE NEEDLE BEARING A	天秤ニードル軸受 A	(2)
17	#01	229-18502	BALANCE NEEDLE BEARING B	天秤ニードル軸受 B	(2)
18	#01	229-18601	BALANCE NEEDLE BEARING C	天秤ニードル軸受 C	(2)
19	#01	229-18700	BALANCE NEEDLE BEARING D	天秤ニードル軸受 D	(2)
20		401-09126	NEEDLE_BAR_CRANK_H	針棒クランク H	(1)
21		229-06606	NEEDLE BAR CRANK ROD	針棒クランクロッド	(1)
22		229-19500	THREAD TAKE-UP CRANK SHAFT	天秤支え軸	1
23		SL-6041042-TN	BOLT	座金付き六角穴ボルト	1
		NOTE(注記)	#01....SELECTIVE PARTS	選択部品	

#### 4. PRESSER COMPONENTS 押え関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24951	UPPER_FEED_CAM_ROD	上下偏心カムロッド	1
2		401-25767	PRESSER_FOOT	押え足	1
3		401-25761	ECCENTRIC CAM	押え偏心カム	1
4		401-24979	PRESSER_CRANK_LINK	押さえ三角てこ	1
5		401-24981	RETURN_LINK_B	押え棒戻しリンク	1
6		401-24983	RETURN_CAM	押え棒戻しカム	1
7		401-24984	PRESSER_SOLENOID_LINK	押え棒戻しソレノイドリンク	1
8		401-24988	ASSY PRESSER BAR	押え棒 (結合)	1
9		401-24990	RETURN_LINK	押さえ戻し L リンク	1
10		401-24991	PRESSER_BAR_GUIDE_BLOCK	押さえ棒抱き	1
11		401-24992	PRESSER_BAR_BRACKET_GUIDE	押え棒抱きガイド	1
12		401-24993	PRESSER_SOL_BASE	押え棒ソレノイド取付板	1
13		401-24994	PRESSER LINK BLOCK	押え三角コロ	1
14		401-24995	CAM_ROD_BUSH	カムロッド軸受	1
15		401-25002	RETURN_SPRING	カム戻しばね	1
16		401-25003	RETURN_SPRING_PIN	戻しばね支点	1
17		112-33400	SPRING	ワイパマグネットばね	1
18		112-34408	SOLENOID RUBBER	ソレノイドゴム	1
19		112-34507	PLUNGER CONNECTING PIN	プランジャー連結ピン	1
20		229-07406	PRESSER SPRING	押え調節ばね	1
21		400-23631	PRESSER GUIDE BAR	中押え案内棒	1
22		SL-6040842-TN	SCREW M4 L=8	座金付き六角穴ボルト	2
23		401-26078	DISH RISING SOLENOID	糸緩めソレノイド	1
24		400-11926	SPRING_HOOK	ばね掛け	1
25		SL-6041042-TN	BOLT	座金付き六角穴ボルト	2
26		400-21579	HINGE SCREW	段ねじ	1
27		400-21625	BUSHING	上送り軸メタル	2
28		401-31492	UPPER FEED DRIVING SHAFT	上送り軸	1
29		400-37359	PRESSER SPRING REGURATOR ASM.	押え調節ねじ (組)	1
30		400-78133	PRESSER_BUSHING	中押え棒メタル	2
31		401-01953	CONNECTING_LINK	上下めがね	1
32		401-02601	UPPER_FEED_SPRING_ROD_ASM.	上送り腕 (組)	1
33		401-01978	UPPER_FEED_SPRING_ROD	上送り腕	(1)
34		SS-6151412-TP	SCREW 15/64-28 L=14	六角穴ボルト 15/64-28	(1)
35		B1432-761-000	SWING ARM STOPPER RUBBER	ストッパーブッシュ	1
36		WP-1221016-SP	WASHER	平座金	1
37		B3009-141-H0A	NUT	カムロット段ねじナット	1
38		B3010-141-H00	WASHER	カムロット段ねじ座金	1
39		B3015-141-H00	HINGE SCREW	L 板ロッド段ねじ	1
40		NS-6150310-SP	NUT 15/64-28	六角ナット 15/64-28	1
41		RE-0300000-K0	E-RING 3	E 形止め輪 3	2
42		RE-0800000-K0	E-SHAPED SNAP RING (8MM)	E 形止め輪 8	1
43		RE-0900000-K0	E-RING 9	E 形止め輪 9	1
44		SS-8661030-SP	SCREW 1/4-40 L=10	止めねじ 1/4-40 L=10	1
45		SB-1300002-00	BEARING	ころがり軸受	1
46		SD-0500256-TH	SHOULDER SCREW	段ねじ D=5 H=2.5	1
47		SD-0600326-TP	SHOULDER SCREW	段ねじ D=6 H=3.2	5
48		SD-0600327-TP	SHOULDER SCREW	段ねじ D=6 H=3.2	1
49		SD-0600651-TP	HINGE SCREW	段ねじ D=6 H=6.5	1
50		SD-0850751-SP	HINGE SCREW D= 8.50 H= 7.5	段ねじ D=8.5 H=7.5	1
51		SL-4030641-SE	SCREW	座金付きねじ	4
52		SS-8660610-TP	SCREW 1/4-40 L=6	止めねじ 1/4-40 L=6	1
53		SS-7091110-TP	SCREW 9/64-40 L=10.5	丸平ねじ 9/64-40 L=10.5	1
54		SM-6051400-SP	SCREW	平ねじ	1

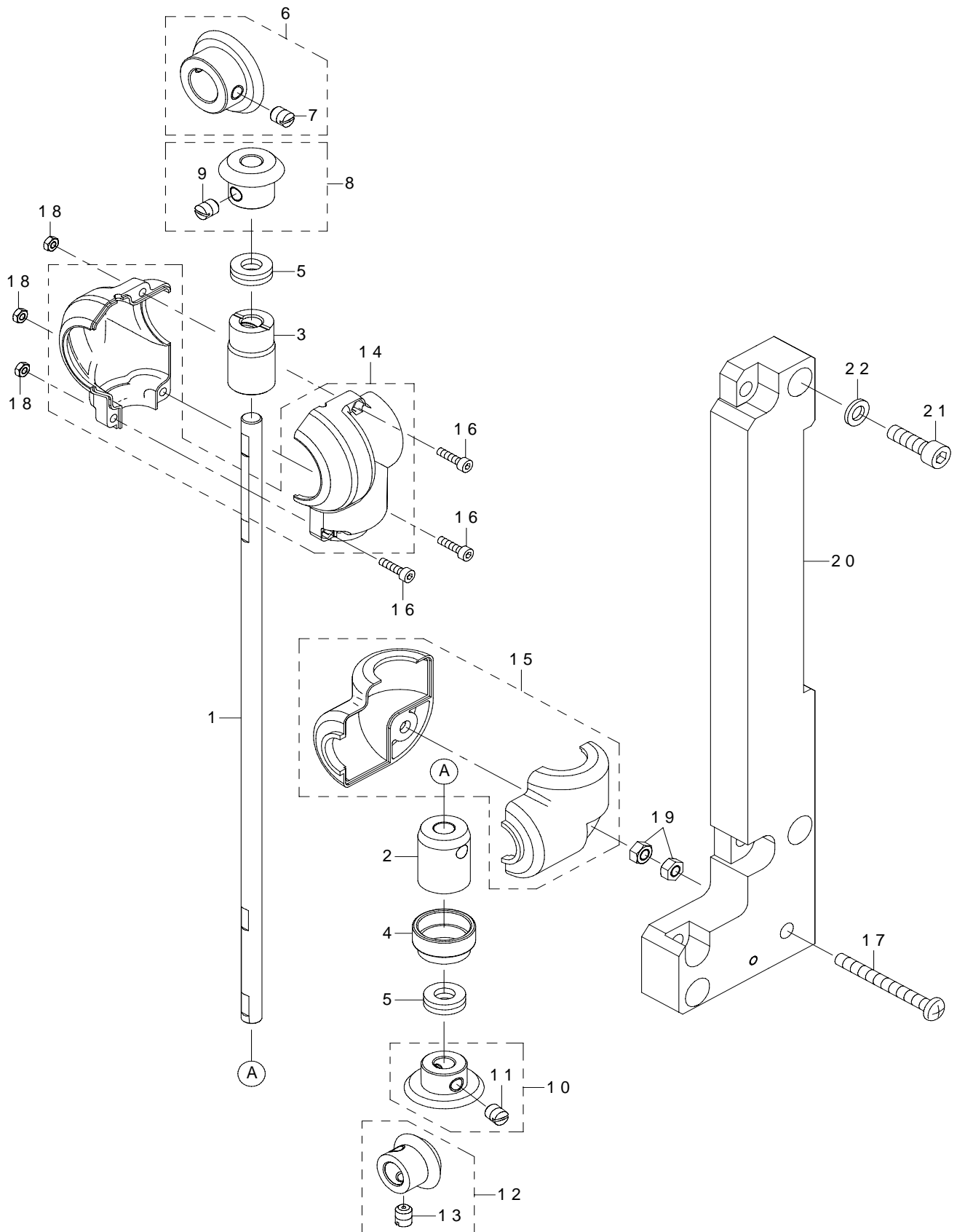
5. LOWER SHAFT COMPONENTS  
下軸関係





REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24953	LOWER_SHFT_F_BLOCK	下軸前メタル土台	1
2		401-24955	POSITIONING_FINGER	内釜押さえ	1
3		401-30726	LOWER_SHAFT_BUSH	下軸後メタル	1
4		401-24963	LOWER_SHAFT	下軸	1
5		B1837-201-SA0	BOBBIN CASE ASM.	ボビンケース組	1
6		D1830-560-EA0	HOOK ASM.	給油釜組	1
7		SM-4050855-SP	SCREW	なべねじ M 5 L = 8	1
8		D9117-141-E00	BOBBIN	アルミボビン	1
9		229-16555	OIL SEAL SCREW ASM.	下軸前止めねじ組	1
10		229-16506	SET SCREW	下軸前止めねじ	(1)
11		110-15906	OIL WICK	下軸前止めねじ油芯	(1)
12		400-04188	BEARING_SUPPORT	ベアリング受	1
13		SM-8050512-TP	SCREW	止めねじ M 5 L = 5	2
14		SB-1120016-00	BEARING	ころがり軸受 (後)	2

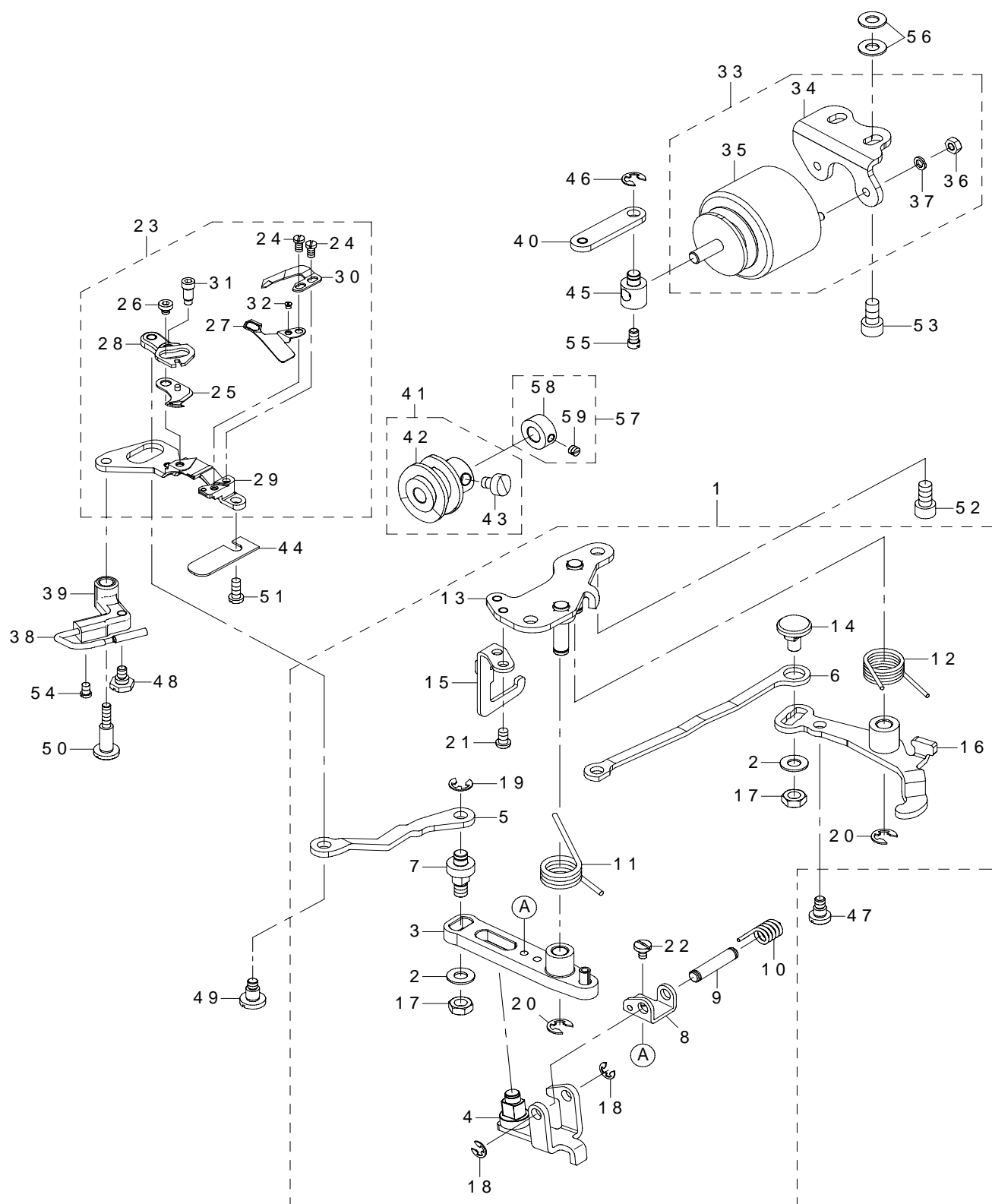
## 6. UPRIGHT SHAFT COMPONENTS 立軸関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24964	UPRIGHT_SHAFT	立軸	1
2		401-30709	UPRIGHT SHAFT BUSHING, LOWER	立軸下メタル	1
3		401-30710	UPRIGHT SHAFT BUSHING, UPPER	立軸上メタル	1
4		401-30833	GEAR COVER RING	ギアカバーリング	1
5		SB-4080001-00	BEARING	ころがり軸受	2
6		400-90002	UPPER LARGE BEVEL GEAR ASM.	上傘歯車大 (組)	1
7		SS-8660810-TP	SCREW 1/4-40 L=8	止めねじ 1/4-40 L=8	(2)
8		400-90003	UPPER SMALL BEVEL GEAR ASM.	上傘歯車小 (組)	1
9		SS-8660810-TP	SCREW 1/4-40 L=8	止めねじ 1/4-40 L=8	(2)
10		400-90004	LOWER LARGE BEVEL GEAR ASM.	下傘歯車大 (組)	1
11		SS-8660810-TP	SCREW 1/4-40 L=8	止めねじ 1/4-40 L=8	(2)
12		400-90005	LOWER SMALL BEVEL GEAR ASM.	下傘歯車小 (組)	1
13		SS-8660810-TP	SCREW 1/4-40 L=8	止めねじ 1/4-40 L=8	(2)
14		B1305-271-0A0	GEAR CASE ASM. UPPER	上歯車ケース (組)	1
15		B1307-271-0A0	PINION CASE ASM.	下歯車ケース (組)	1
16		SM-6031602-TP	SCREW	六角穴ボルト	3
17		SM-4055001-SF	SCREW M5 L=50	なべねじ M5 X 0.8 L=50	1
18		NM-6030002-SC	NUT M3X0.5 TYPE2	六角 ナット M3 X 0.5 2種	3
19		NM-6050001-SC	NUT M5X0.8 TYPE1	六角ナット M5 X 0.8 1種	2
20		401-30865	SUPPORT ARM	補助腕	1
21		SM-6062002-TP	SCREW M6 L=20	六角穴ボルト M6 L=20	6
22		WP-0651056-SD	WASHER 6.5X11X1	平座金 6.5 X 11 X 1	6

## 7. THREAD TRIMMER COMPONENTS

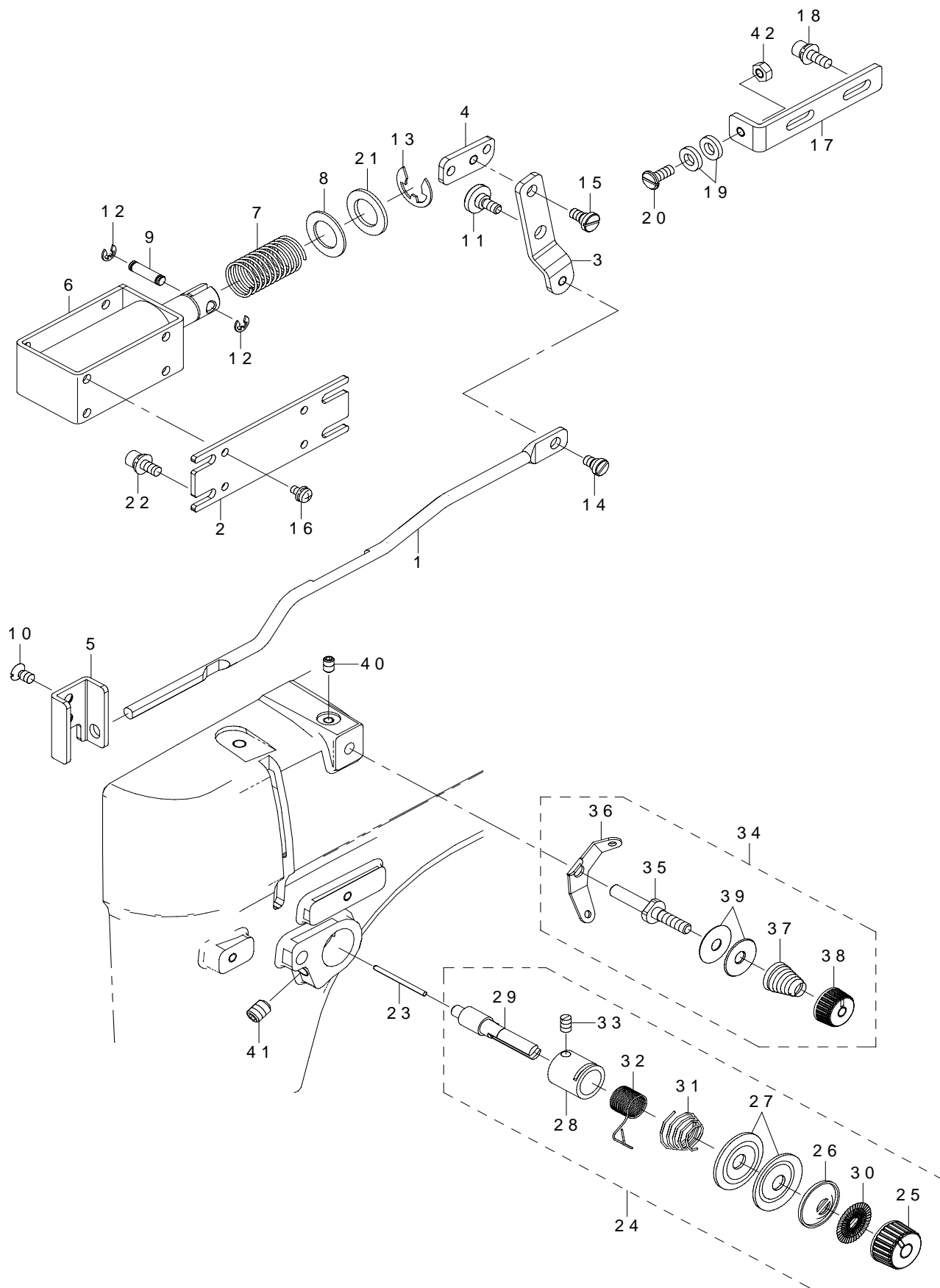
糸切り関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24999	THREAD TRIMMER DRIVING UNIT	糸切駆動ユニット	1
2		WP-0621016-SH	WASHER	平座金	(2)
3		110-40854	KNIFE DRIVING ARM ASM.	メス駆動 (組)	(1)
4		110-40953	ROLLER ARM ASM.	コロ腕 (組)	(1)
5		114-07103	MOVING KNIFE LINK	動メスリンク	(1)
6		114-07202	PICKER LINK	ピッカーリンク	(1)
7		229-48400	MOVING KNIFE LINK PIN	動メスリンクピン	(1)
8		229-49002	ROLLER ARM SEAT	コロ腕座	(1)
9		229-49101	ROLLER FULCRUM SHAFT	コロ支点軸	(1)
10		229-49200	ROLLER RETURN SPRING	コロ戻しばね	(1)
11		229-49309	KNIFE RETURN SPRING B	メス戻しばね B	(1)
12		229-49408	CLUTCH SPRING	クラッチばね	(1)
13		229-49754	BASE PLATE ASM.	ベース板 (組)	(1)
14		229-50000	PICKER LINK PIN	ピッカーリンクピン	(1)
15		229-50703	DRIVING ARM STOPPER	駆動腕ストッパー	(1)
16		401-31898	CLUTCH PLATE ASM.	クラッチ板 (組)	(1)
17		NS-6150430-SP	NUT 15/64-28	六角ナット 15/64-28	(2)
18		RE-0400000-K0	E-RING 4	E 形止め輪 4	(2)
19		RE-0500000-K0	E-RING	E 形止め輪 5	(1)
20		RE-0600000-K0	E-RING 6	E 形止め輪 6	(2)
21		SS-4110715-SP	SCREW 11/64-40 L=7	なべねじ 11/64-40 L=7	(2)
22		SS-7090610-SP	SCREW 9/64-40 L=6	丸平ねじ 9/64-40 L=6	(1)
23		401-25000	KNIFE_UNIT	メスユニット	1
24		SS-4080620-TP	SCREW 1/8-44 L=6	なべねじ 1/8-44 L=6	(2)
25		110-40052	MOVING KNIFE ASM.	動メス (組)	(1)
26		110-40409	MOVING KNIFE HINGE SCREW	動メス段ねじ	(1)
27		229-47808	KNIFE THREAD GUIDE	メス糸案内	(1)
28		229-48202	KNIFE BRANCH	メスニ又	(1)
29		401-24996	KNIFE_MOUNTING_BASE	メス取付台	(1)
30		D2406-555-D0H	COUNTER KNIFE	固定メス	(1)
31		SD-0460703-TP	HINGE SCREW D=4.6 H=7	段ねじ D=4.6 H=7	(1)
32		SS-2060210-SP	SCREW 3/32-56 L=2.3	丸皿ねじ 3/32-56 L=2.3	(1)
33		401-24997	THREAD TRIMMER SOLENOID ASM.	糸切りソレノイド (組)	1
34		114-07608	SOLENOID BASE	ソレノイド台	(1)
35		401-26101	THREAD TRIMMER SOLENOID	糸切りソレノイド	(1)
36		NM-6040001-SE	NUT M4	六角ナット	(2)
37		WS-0410002-KR	SPRING WASHER, M4	ばね座金 M 4	(2)
38		229-50356	HOOK THREAD PRESSER ASM.	金糸押え (組)	1
39		114-08606	PICKER ARM	ピッカー腕	1
40		229-49903	CLUTCH LINK	クラッチリンク	1
41		401-33647	THREAD TRIMMER CAM ASM.	糸切りカム (組)	1
42		401-30727	THREAD TRIMMER CAM	糸切りカム	(1)
43		SS-6660610-TP	SCREW 1/4-40 L=6	平ねじ 1/4-40 L=6	(2)
44		401-30730	SUPPORT PLATE	補助板	1
45		229-51008	SOLENOID PIN	ソレノイドピン	1
46		RE-0500000-K0	E-RING	E 形止め輪 5	1
47		SD-0600361-SP	HINGE SCREW D=6 H=3.6	段ねじ D=6 H=3.6	1
48		SD-0630275-SP	HINGE SCREW D= 6.35 H= 2.7	段ねじ D=6.35 H=2.7	1
49		SD-0640631-TP	HINGE SCREW D=6.35 H=6.3	段ねじ D=6.35 H=6.3	1
50		SD-0641456-TP	SHOULDER SCREW D=6.35 H=14.5	段ねじ D=6.35 H=14.5	1
51		SM-4041255-SP	SCREW M4 L=12	なべ小ねじ M 4 L=12	1
52		SM-6061202-TP	SCREW M6 L=12	六角穴ボルト M 6 L=12	2
53		SM-6061202-TP	SCREW M6 L=12	六角穴ボルト M 6 L=12	2
54		SS-6090510-TP	SCREW 9/64-40 L= 5.0	平ねじ 9/64-40 L=5	2
55		SS-6110710-TP	SCREW 11/64-40 L= 6.5	平ねじ 11/64-40 L=6.5	1
56		WP-0641601-SC	WASHER	平座金みがき丸 M 6	4
57		401-33644	CAM COLLAR ASM.	カムカラー (組)	1
58		CS-1000881-TP	THRUST COLLAR	スラスト受 D=10 W=8	(1)
59		SM-8050512-TP	SCREW 11/64-40 L= 4.5	止めねじ 11/64-40 L=4.5	(2)

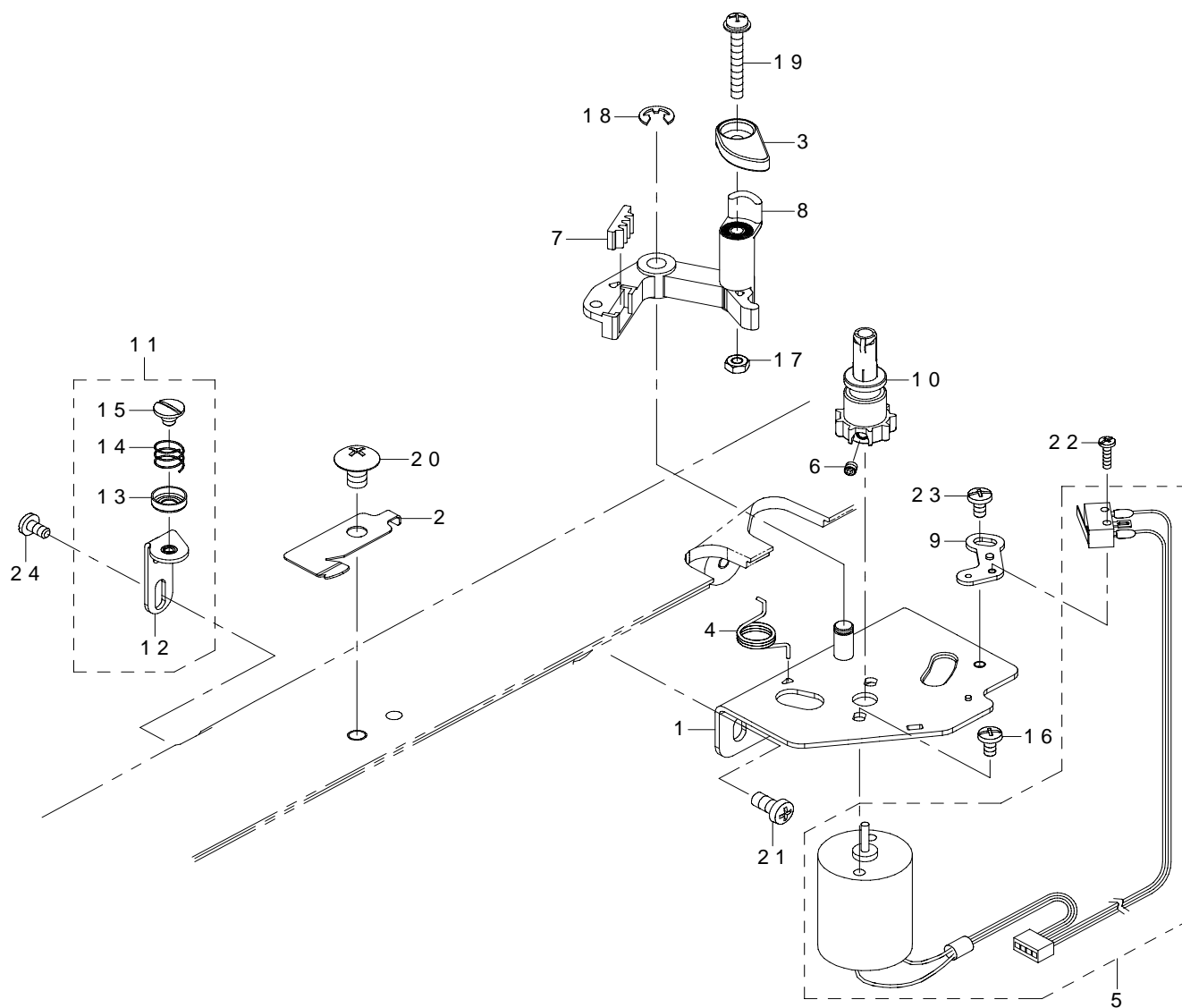
## 8. TENSION RELEASE & THREAD TENSION COMPONENTS

糸ゆるめ・糸調子関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-24959	RELEASE_LINK	皿浮かしリンク	1
2		401-24973	SOL_BASE	ソレノイド取付台	1
3		401-24976	RELEASE_LEVER	皿浮かしレバー	1
4		401-24977	RELEASE_SOLENOID_LINK	皿浮かしソレノイドリンク	1
5		401-33302	RELEASE_LINK_GUIDE	皿浮かしリンクガイド	1
6		401-26078	DISH RISING SOLENOID	糸緩めソレノイド	1
7		112-33400	SPRING	ワイパマグネットばね	1
8		112-34408	SOLENOID RUBBER	ソレノイドゴム	1
9		112-34507	PLUNGER CONNECTING PIN	プランジャー連結ピン	1
10		SM-2040750-TP	SCREW M4 L=7.4	丸皿ねじ M 4 L = 7. 4	1
11		401-01535	SHOULDER_SCREW	段ねじ	1
12		RE-0300000-K0	E-RING 3	E 形止め輪 3	2
13		RE-0900000-K0	E-RING 9	E 形止め輪 9	1
14		SD-0500205-TH	SHOULDER SCREW	段ねじ D = 5 H = 2	1
15		SD-0500256-TH	SHOULDER SCREW	段ねじ D = 5 H = 2. 5	1
16		SL-4030641-SE	SCREW	座金付きねじ	4
17		401-32341	SUPPORT PLATE	補助板	1
18		SL-6041242-TN	BOLT	座金付き六角穴ボルト	2
19		133-02708	RUBBER_WASHER	ラバーワッシャー	2
20		SM-6041050-TP	SCREW	平ねじ M 4 L = 1 0	1
21		WP-1221016-SP	WASHER	平座金	1
22		SL-6041042-TN	BOLT	座金付き六角穴ボルト	4
23		229-20904	TENSION RELEASING	糸ゆるめピン	1
24		229-45356	THREAD TENSION ASM.	糸調子 (組)	1
25		229-21308	THREAD TENSION NUT	糸調子ナット	(1)
26		229-21803	DISK STOPPER	糸調子皿押え	(1)
27		229-21506	THREAD TENSION DISK	糸調子皿	(2)
28		229-45307	THREAD TENSION POST BASE	糸調子棒台	(1)
29		229-21209	THREAD TENSION POST	糸調子棒	(1)
30		229-21407	ROTATION STOPPER	糸調子皿回転止め	(1)
31		229-21704	THREAD TENSION SPRING, A	糸調子ばね (A)	(1)
32		229-21605	THREAD TAKE-UP SPRING	糸取りばね	(1)
33		SS-8090670-SP	SCREW 9/64-40 L= 5.5	止めねじ 9/64-40 L = 5. 5	(1)
34		229-45463	THREAD TENSION ASM. ,NO.1	第一糸調子 (組)	(1)
35		229-45414	THREAD TENSION POST	第一糸調子棒	1
36		229-45604	THREAD TENSION GUIDE	第一糸調子案内	(1)
37		229-45505	THREAD TENSION SPRING	第一糸調子ばね	(1)
38		229-45703	THREAD TENSION NUT	第一糸調子ナット	(1)
39		229-45802	THREAD TENSION DISK	第一糸調子皿	(2)
40		SM-8040612-TP	SCREW M4 L=6	止めねじ M 4 L = 6	1
41		SM-80608A2-TP	SCREW M6 L=8	六角穴付き止めねじ M 6 L = 8	1
42		NM-6040000-SN	NUT M4	六角ナット M 4	1

## 9. BOBBIN WINDER COMPONENTS

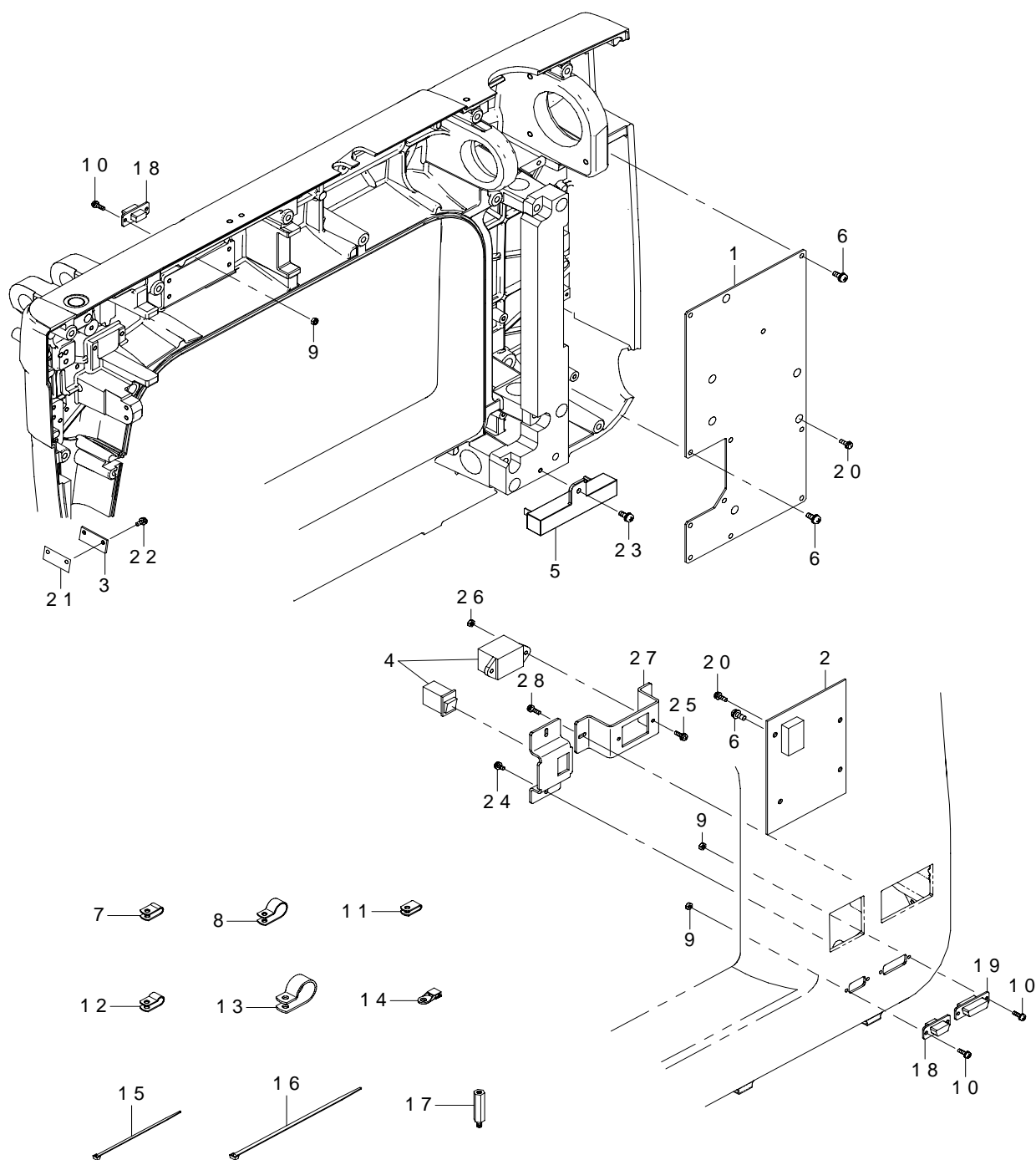




REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-25757	BOBBIN_WINDER_BASE_ASSY	糸巻き取付板 (組)	1
2		400-37008	THREAD_CUTTER	糸切り保持板	1
3		400-53677	BW_ADJUST_BODY	糸巻調整体	1
4		400-61796	BW_SPRING	糸巻ばね	1
5		400-97681	ASSY_WIND_MOTOR	糸巻きモータ (組)	1
6		SM-8030312-TP	SCREW M3 L=3	止めねじ M 3 L = 3	1
7		400-76145	STOPPER_RUBBER	回り止めゴム	1
8		400-97679	BW_ADJUST_BASE	糸巻調整台	1
9		400-97680	SW_BASE	SW 台	1
10		401-07610	BOBBIN_WINDER_SHAFT	ボビン糸巻き軸	1
11		A3231-957-0A0	TOP COVER THREAD GUIDE ASSEM	糸案内台 (組)	1
12		A3231-957-000	THREAD GUIDE BASE	糸案内台	(1)
13		A3233-731-000	THREAD GUIDE DISK	糸案内皿	(1)
14		A3234-731-000	THREAD GUIDE SPRING	糸案内ばね	(1)
15		A3235-731-000	THREAD GUIDE DISK SHAFT	糸案内皿軸	(1)
16		SM-5030455-SN	SCREW M3 L=4	バインドねじ M 3 L = 4	2
17		NM-6030002-SF	NUT M3	六角ナット M 3	1
18		RE-0400000-K0	E-RING 4	E 形止め輪 4	1
19		SL-4032591-SC	SCREW M3X25	なべ小ねじセムス M 3 X 0. 5 L = 2 5	1
20		SM-0050801-SC	SCREW	トラスねじ M 5 L = 8	1
21		SM-4040801-SN	SCREW M4 L=8	なべ小ねじ M 4 X 0. 7 L = 8	2
22		SM-5020855-SN	SCREW M2 L=8	バインド小ねじ M 2 L = 8	1
23		SM-5030655-SN	SCREW M3X0.5 L=6	バインドねじ	1
24		SM-5030655-SN	SCREW M3X0.5 L=6	バインドねじ	1

# 10. ELECTRICAL DEVICE COMPONENTS

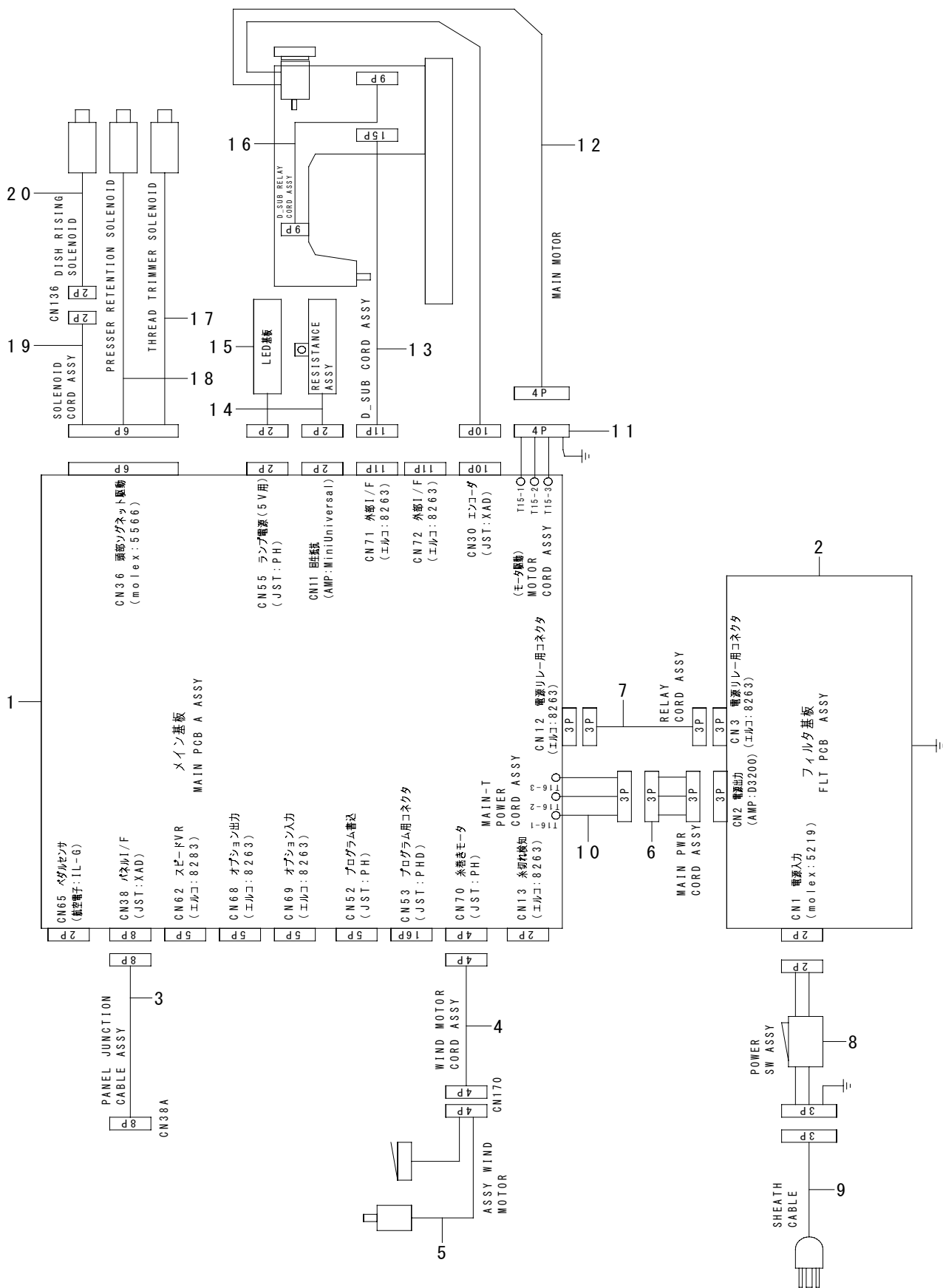
## 電装関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-26080	MAIN PCB A ASSY	MA I N 基板 A 組	1
2		401-26091	FLT PCB ASSY	F L T 基板組	1
3		401-26061	LED PCB ASSY	L E D 基板組	1
4		401-26100	POWE SW ASSY	電源 SW 組	1
5		401-10797	RESISTANCE_ASSY	回生抵抗組	1
6		SL-4041081-SC	SCREW M4 L=10	なべ小ねじセムス M 4 L = 1 0	15
7		HX-0015000-0A	CABLE CLAMP	ケーブルクリップ	2
8		HX-0015000-0F	CABLE CLIP	ケーブルクリップ	3
9		NM-6030001-SC	NUT M3X0.5 TYPE1	六角ナット M 3 X 0. 5 1 種	6
10		SL-4031081-SC	SCREW M3 X 10	なべねじセムス M 3 L = 1 0	6
11		HX-0015000-00	CLIP	ケーブルクリップ	3
12		HX-0015000-0B	CABLE CLIP	ケーブルクリップ	1
13		HX-0015000-0J	CLIP	ケーブルクリップ	2
14		HX-0034400-00	HARNESS PARTS	束線パーツ	4
15		EA-9500B01-00	CABLE BAND	束線バンド	12
16		EA-9500B02-00	CABLE BAND 150	結束バンド 1 5 0	1
17		HX-0033900-0B	BOARD PARTS	基板パーツ	1
18		401-26074	D_SUB RELAY CORD ASSY	ステッチレギュレータ中継コード	1
19		401-26073	D_SUB CORD ASSY	D _ S U B 中継コード	1
20		SL-4031081-SC	SCREW M3 X 10	なべねじセムス M 3 L = 1 0	2
21		KX-0000002-90	COOL SHEET	クールシート	1
22		SL-4030881-SC	SCREW M3 L=8	座金付きなべ小ねじ M 3 L = 8	2
23		SL-4041091-SC	SCREW M4 L=10	なべ小ねじセムス M 4 X 0. 7 L = 1 0	1
24		SL-4030681-SC	SCREW M3 L=6	座金付きなべ小ねじ M 3 L = 6	2
25		SL-4031081-SC	SCREW M3 X 10	なべねじセムス M 3 L = 1 0	2
26		NM-6030001-SC	NUT M3X0.5 TYPE1	六角ナット M 3 X 0. 5 1 種	2
27		401-24972	OUTLET_PLATE	コンセント取付台	1
28		SL-4030681-SC	SCREW M3 L=6	座金付きなべ小ねじ M 3 L = 6	2

# 11. WIRING DIAGRAM

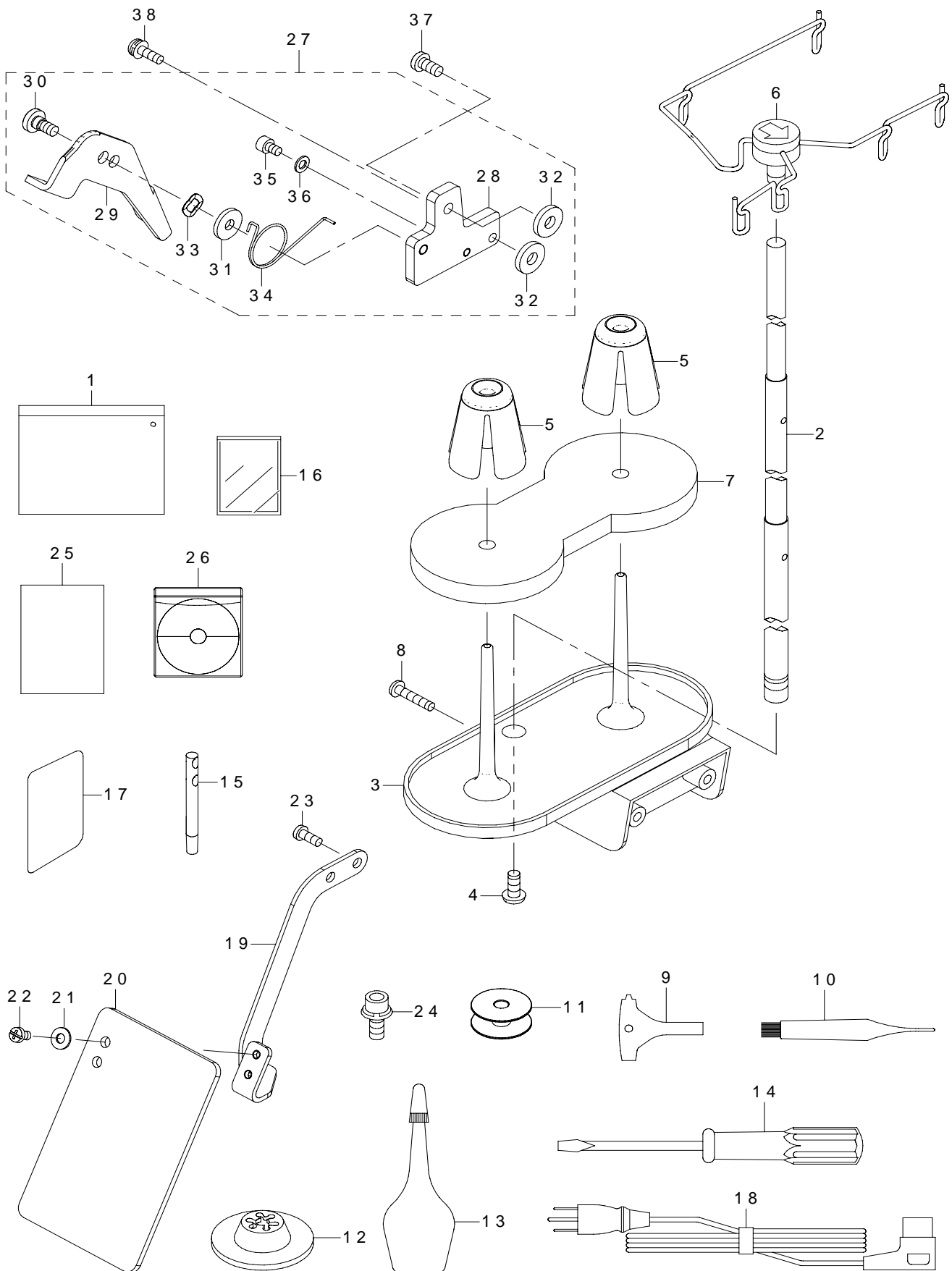
## 電装配線図



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		401-26080	MAIN PCB A ASSY	MA I N 基板 A 組	1
2		401-26091	FLT PCB ASSY	F L T 基板組	1
3		401-26103	PANEL JUNCTION CABLE ASSY	パネル中継ケーブル組	1
4		401-26075	WIND MOTOR CORD ASSY	糸巻きモータ中継コード組	1
5		400-97681	ASSY_WIND_MOTOR	糸巻きモータ (組)	1
6		401-26071	MAIN PWR CORD ASSY	MA I N 電源中継コード組	1
7		401-26070	RELAY CORD ASSY	リレー中継コード組	1
8		401-26100	POWER SW ASSY	電源 SW 組	1
9		HW-0022500-30	SHEATH CABLE	AC コード	1
10		401-12068	MAIN-T PWR CORD ASSY	MA I N - T 電源入力ケーブル組	1
11		401-14081	MOTOR CORD ASSY	モータコード組	1
12		401-11203	SERVO MOTOR	サーボモータ	1
13		401-26073	D_SUB CORD ASSY	D _ SUB 中継コード組	1
14		401-10797	RESISTANCE_ASSY	回生抵抗組	1
15		401-26061	LED PCB ASSY	L E D 基板組	1
16		401-26074	D_SUB RELAY CORD ASSY	ステッチレギュレータ中継コード組	1
17		401-26101	THREAD TRIMMER SOLENOID	糸切りソレノイド	1
18		401-26079	PRESSER RETENTION SOLENOID	押え下げソレノイド	1
19		401-26076	SOLENOID CORD ASSY	ソレノイド中継コード組	1
20		401-26078	DISH RISING SOLENOID	糸緩めソレノイド	1

## 12. ACCESSORIE PARTS COMPONENTS

付属品関係



REF.NO	NOTE	PART NO	DESCRIPTION	品 名	Qty
1		229-32800	ACCESSORIE BAG	付属品バッグ	1
2		400-82787	THREAD_GUIDE_POST_L	糸巻糸立棒	1
3		A1118-644-000-A	SPOOL HOLDER	糸立皿 A	1
4		SM-5051255-SN	SCREW	バインドねじ	1
5		A1120-202-000	SPOOL RETAINER	糸巻振れ止め	2
6		A1120-644-0A0	THREAD GUIDE ASM.	糸立糸案内 (総組)	1
7		A1121-202-000	SPOOL REST CUSHION	糸巻シート	1
8		SM-5042005-SN	SCREW M4 L=20	バインド小ねじ M 4 L = 20	2
9		A9110-700-000	SCREWDRIVER	ドライバー	1
10		A9137-956-000	BRUSH	ブラシ	1
11		D9117-141-E00	BOBBIN	アルミボビン	4
12		A1150-090-000	SPOOL CAP	糸巻き当て座	1
13		A9102-062-BA0	OILER WITH OIL	油差し (油入り)	1
14		A9103-102-000	SCREW DRIVER, LARGE	ドライバー (中)	1
15		225-02504	THREAD GUIDE BAR	糸案内棒	1
16		MDP-5AAB110T	NEEDLE DPX5 NM110-10	針 DPX 5 NM 110-10	1
17		401-32095	FRAME L SEAL	目隠しシール	1
18		HW-0022500-30	SHEATH CABLE	AC コード	1
19		401-24975	SAFETY PLATE BASE	安全プレート取付板	1
20		260-37200	SAFETY PLATE	安全プレート	1
21		WP-0450801-SC	WASHER 4.5X10X0.8	平座金 4. 5 X 10 X 0. 8	2
22		SM-4040655-SN	SCREW M4X0.7 L=6	なべ小ねじ M 4 L = 6	2
23		SM-4041001-SN	SCREW M4X0.7 L=10	なべ小ねじ M 4 X 0. 7 L = 10	2
24		SL-6061692-TN	BOLT	座金付き六角穴ボルト	4
25		401-25781	INSTRUCTION_MANUAL	安全上の注意書	1
26		401-25782	INSTRUCTION_MANUAL(CD)	取扱説明書 (CD)	1
27		401-32333	HAND LIFTER ASM.	押え上げレバー組	1
28		401-32115	BASE PLATE	ベースプレート	(1)
29		401-32306	HAND LIFTER	レバー	(1)
30		SD-0600346-TP	SHOULDER SCREW D=6 H=3.4	段ねじ D=6 H=3.4	(1)
31		WP-0522016-SH	WASHER	平座金 5. 2 X 15 X 2	(1)
32		WP-0612516-SD	WASHER 6.1X15.2X2.5	平座金 6. 1 X 15. 2 X 2. 5	(2)
33		WZ-0640200-KP	WAVE WASHER	波形座金	(1)
34		401-33605	SPRING	ばね	(1)
35		SM-6040602-TN	BOLT	六角穴ボルト	(1)
36		WP-0430801-SE	WASHER 4.3X9X0.8	平座金みがき丸 M 4	(1)
37		SM-4051001-SN	SCREW M5	なべ小ねじ M 5 X 0. 8 L = 10	1
38		SL-4041481-SC	SCREW M4X0.7 L=14	なべ小ねじセムス M 4 X 0. 7 L = 14	1



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