

# Instruction Manual

Model TAC-175T, TAC-208T, TAC-205TA Series

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High Speed Auto Cutter

## Introduction

Thanks for purchasing TAKATORI TAC High Speed Auto Cutter.

For the safe and correct operation and duration of machine, please kindly read the manual carefully before operating and keep this manual at hand for reference.

This manual may bring people to have basic knowledge about machine's and equipment's operation and the associated processes.

Please do not let the personnel who doesn't have basic knowledge of operation to operate the machine alone. It may cause the injury of the operator and the damage of the machine by improper operation.

**Takatori**  
Global Innovation "Plus One"

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## 1 · Safety Caution

- Please read the safety caution carefully in order to operate the machine correctly.
- The instruction classifies the levels of danger into 2 classes, WARNING and CAUTION to indicate the degree of danger, damages and urgency. Please do follow the indicated instruction for insuring your safety.

Indication of “WARNING” & “CAUTION”
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### WARNING







This states that any failure in operations might have hazard and possible resulting injures or death.






### CAUTION




This states that any failure in operations might have hazard and possible resulting injures.

Illustrated Indications




Symbol	Description
	 <p>The mark states there is the necessity for warning and caution.</p> <p>The detailed cautions are indicated within or near the mark. (For example: “Caution for Electric Shock” )</p>
	 <p>The mark states the prohibited action. The detailed cautions are indicated within or near the mark. (For example: “Prohibition of contact” )</p>
	 <p>The mark states that actions are forced and required. The detailed cautions are indicated within or near the mark. (For example: “Provide earthing ground wire” )</p>

**WARNING**

Symbol	Description
 Caution for electric shock	<ul style="list-style-type: none"> <li>● Before touching the terminal box, be sure to turn off the related breakers.</li> <li>● After finishing operation, be sure to cover the terminal box which has been taken off.</li> </ul>
 Do not touch	<ul style="list-style-type: none"> <li>● DO NOT put fingers and hands into the machine. Otherwise, they may be caught by running gears and belts, and get injuries.</li> <li>● When machine is running, DO NOT put fingers and hands into the machine and keep your body away from machine nor checking nor adjusting the machine.</li> </ul>
 Do not start Operation	<ul style="list-style-type: none"> <li>● Don't turn on the power supply when someone is inside the machine.</li> <li>● Don't operate the machine once machine's cover has been removed.</li> </ul>

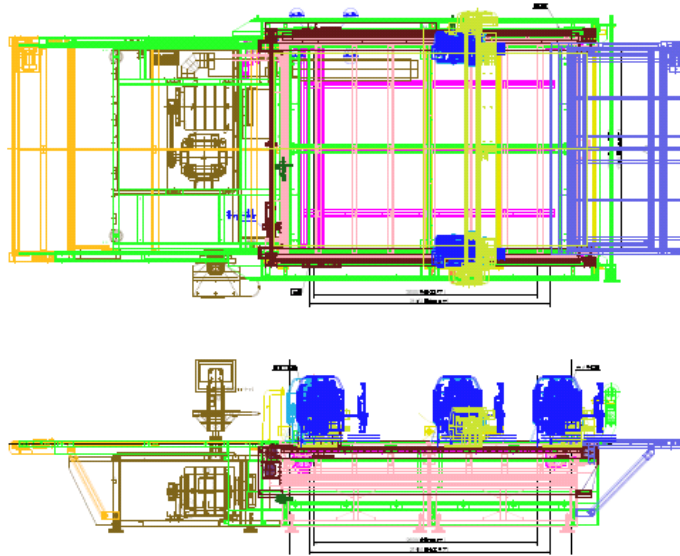
 <p>Provide ground wire</p>	<ul style="list-style-type: none"><li>● Please do have ground wire.</li></ul>
 <p>Work by 2 or more persons.</p>	<ul style="list-style-type: none"><li>● Must have 2 or more person working in a group, and must make sure the safety of each other before manual operation.</li><li>● Before the operation, be sure to check the location of emergency stop switch at any time.</li></ul>
 <p>Checking the machine stops completely.</p>	<ul style="list-style-type: none"><li>● If you take out V belt in the driving section for maintenance or work near the driving gear, be sure to turn off the power switch and start to operate after checking the machine stops completely.</li></ul>

CAUTION

Symbol	Description
 <p>Avoid heat and humidity</p>	<ul style="list-style-type: none"> <li>● DO NOT keep any articles generating high heat and/nor the humidity around the control box.</li> </ul>
 <p>Do not leave</p>	<ul style="list-style-type: none"> <li>● DO NOT leave tools in the electrical section. It may cause short circuit and electric shock.</li> <li>● DO NOT leave the parts which has been replaced on the surface of Bristle.</li> </ul>
 <p>Checking</p>	<ul style="list-style-type: none"> <li>● Before starting daily operation or after adjustment, please test each unit's operation.</li> <li>● Please push the emergency stop switch or turn off the power supply and ask the engineer to check the problem once the following cases are arised. <ul style="list-style-type: none"> <li>◆ When the machine performs any unusual behavior,</li> <li>◆ When the abnormal noises occurs.</li> </ul> </li> </ul>

## 2 ◦ Structure & Specification

### 2-1 ◦ Structure



### 2-2.

#### Specification

Model/Specification	TAC-175/205/235VN    TAC-178/208/238VN
available Cutting Area (W x L mm)	TAC-175/178VN : 1700 mm x 2000 mm TAC-205/208VN : 2000 mm x 2000 mm TAC-235/208VN : 2300 mm x 2000 mm
Height Of Cloth Stacked	TAC-175/205/235VN : Max. 50mm TAC-178/208/238VN : Max. 80mm (Depend on material)
Cutting Method	Cutter reciprocation system
Cutting Speed	MAX 45m/min
Dimension (WxLxH)	TAC-175/178/VN : 2420mmx5450mmx1600mm TAC-205/208VN : 2720mmx5450mmx1600mm TAC-235/238VN : 3020mmx5450mmx1600mm
Air Supply	0.5Mpa 140NL/min
Power Supply	AC380V 3 phase 50/60Hz 38KVA



### 3 ◦ Connection to power & air supply

#### 3-1 ◦ Connection to power supply

Please do follow to the caution of connection to power supply. (As below)

 **WARNING**

- Please do have ground wire.

 **CAUTION**

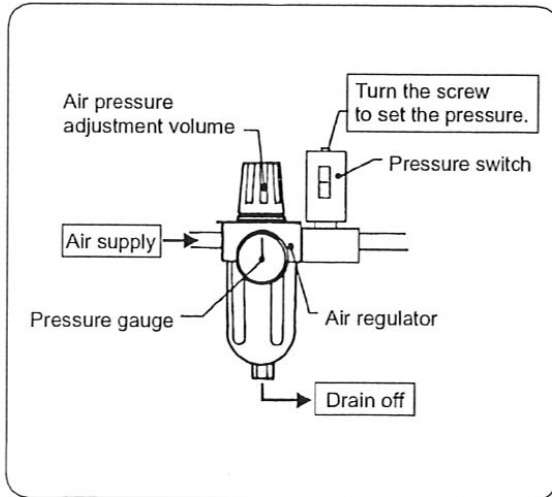
- The voltage fluctuation shall be within +/- 10% of the rated voltage.
- The rapid voltage fluctuation might stop the machine.
- The electro-magnetic induction due to the charge of big currents or solenoid on the power supply line might cause malfunction of machine.



Main power supply switch

Turn on the switch for getting t the power circuit on

3-2 • Connection to air supply




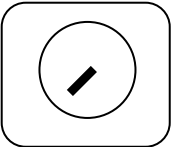
Normally set up the air pressure as 5kgf/sq. cm. Adjust the regulator so that the air pressure indication needle (black) of air pressure gauge would read 5kgf/sq. cm. Please also set up the pressure switch as 3.5kgf/sq. cm.



## 4 ◦ Operation Switches


### 4-1 ◦ 1 Operating section 1



Available mode	Pic.	Description	Function
—		ON / OFF Power ON/OFF switch (with lamp)	When turn on the main power, press the ON button, the power lamp will light and the power will be supplied to the motors. When press OFF button, the power of machine will be turned off. * Please turn the power supply OFF before replacement and maintenance.
Cutting ----- Manual mode		Adjusting switch of punching drill frequency	Set up the frequency (speed) of punching drill in accordance with material characteristics


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-		Emergency stop switch with lamp	This is the switch to stop the machine urgently. Once pressing the switch, it will be locked. To unlock, turn the switch to the arrow direction. If any error occurs during emergency stop, the lamp blinks and buzzer buzzes.
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4-2 · 2 Operating section 2





Available mode	Pic.	Description	Function
Cutting ----- Manual mode		Cutting button	Once pressing this button, the blower motor will start and the lamp will be turned on. Once pressing this button again, the blower stops. If the machine is in CUTTING process, this cutting function will be stopped. If pressing this switch with this SHIFT button while the blower is in STOP process, the cutter head will move to the latest cloth origin position.

Available mode	Pic.	Description	Function
Cutting ----- Manual mode		Start button	<p>When pressing the button, the machine will be ready for operation, the button lamp will be turned on.</p> <p>When the lamp lights on, the machine will start operation once pressing the button. If the machine is operating, the machine will stop temporarily once pressing this button.</p> <p>If pressing this button with SHIFT button, initialization for X, Y and <math>\theta</math> axes starts and the SHIFT button lamp will be turned on.</p>
Cutting ----- Manual mode		X Y jog button High speed button with lamp	<p>Cutter head moves to either X or Y direction while this button is being pressed.</p> <p>If pressing this button with SHIFT button, the cutter moves in the high speed.</p> <p>The low/high speed setting is available in parameter setting of computer.</p>

Available mode	Pic.	Description	Function
Cutting ----- Manual mode		Reset button	When the error occurs, once pressing this button, the error message can be cancelled.
Manual mode		Rotary switch Manual switch	<p>●If turning the number of the rotary switch by pressing - and/or + switches, the manual movement will be activated according to the selected number.</p> <p>●Manual Code: 2 The motor for grindstone rotation will start. If pressing the manual switch again, the motor will stop.</p> <p>●Manual Code: 3 If initialization for X, Y and <math>\theta</math> axes have been performed, punching drill rotation, stop and up and down movements are available with this manual code 3.</p>

Available mode	Pic.	Description	Function
Manual mode		Rotary switch Manual switch	<p>●Manual Code: 4</p> <p>If initialization for X, Y and <math>\theta</math> axes have been performed and the cutter is ready for landing, the cutter can be rotated and lowered.</p> <p>After cutter is lowered, the frequency of the cutter can be set up in the computer. Please select the frequency with the arrow key on the keyboard and press ENTER key to set up. When the frequency has set up, the cutter continues to rotate while the cutter stays in the lowered position. If pressing the manual switch again, the cutter rises and the rotation stops.</p> <p>●Manual Code: 5</p> <p>When the cutter is going up, the cutter head rotates in <math>\theta</math> axis while the manual switch is being pressed.</p> <p>If pressing the manual switch and SHIFT switch at the same time, the cutter head moves in the high speed. The high and low speed are the same as the one for X and Y axis in the JOG movement.</p> <p>●Manual Code: 6</p> <p>If the initialization for X, Y and <math>\theta</math> axes have been completed and the cutter is</p>









Available mode	Pic.	Description	Function
			<p>ready for lowering, and the cutter <math>\theta</math> position is ready for grinding and going to be performed.</p> <p>●Manual Code: 7 If the initialization for X, Y and <math>\theta</math> axes have been completed and the cutter is ready for lowering, the cutter will be lowered. Unlike the manual code 4, the cutter will not rotate. If pressing the manual switch again, the cutter will go up.</p>
Manual mode		Rotary switch Manual switch	<p>●Manual Code: 0 If the initialization for X, Y and <math>\theta</math> axes have been completed, the vinyl cutting will be performed. [If pressing START switch, the cutter will be rotated and stayed near to the Y axis origin position, and the cutter will lower, and then move to +Y direction (for the length of cutting area), and the cutter rises again and stops rotation.]</p>
-		Emergency stop switch with lamp	<p>This switch is for stopping the machine urgently. The switch is locked type and if pressing, the switch will be locked. To unlock the switch, clockwise</p>

Available mode	Pic.	Description	Function
			switch to the arrow direction. In case any error occurs during emergency stop, the buzzer buzzes.

4-3. Operating section 3



AVAILABLE MODE	PIC	DESCRIPTION	FUNCTION
Manual mode		Fixed distance transfer button (with lamp)	Once pressing the conveyor original position button to complete the initialization of bristle conveyor (the conveyor original button will be turned on), the bristle conveyor will move in the fixed distance to pick up side. This button is used for automatic feeding, the lamp blinks once the conveyor is moving.
Manual mode		Link switch (with lamp)	Bristle conveyor and feeding conveyor is activated at the same time. Once lamp on, it moves together.

AVAILABLE MODE	PIC	DESCRIPTION	FUNCTION
Manual mode		Conveyer forward H/L button (with lamp)	If pressing this button when the cutter is in the upper position, the bristle conveyer will move forward. If pressing again, the bristle conveyer moves in lower speed. If pressing one more time, it moves in high speed.
Manual mode		Stop button (with lamp)	If press this button, the bristle convoyer will stop moving. The bristle convoyer stop once lights on.
Manual mode		Conveyer Backward H/L button (with lamp)	When the cutter is in the upper position, the bristle convoyer will move backward once pressing the button. Press again, the bristle convoyer is moving in lower speed. Press once again, the bristle convoyer is moving in high speed. Press the stop switch to stop conveying.
-		Eemergency stop switch (with lamp)	This switch is for stopping the machine urgently. This switch is lock type and it will be locked if pressing this switch. To release the lock, turning the switch to the arrow direction. If any error occurs while the machine is suspended, the lamp will blink and the buzzer buzzes.

## 5 • Checking before operation

Please check the below before operating the machine daily

### Checking list


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- Check if there are any unusual object on each sections of machine.
  - Bristle
  - Cutter head X-axis directional transfer belt
  - Cutter head Y-axis directional transfer belt
  - Cutting cloth
  
- Check if the water of air filter has drain off?  
Push the drain plug at the bottom of filter regulator to drain off the water.  
In some situation, water may be spouted with air.
  
- Check if air supply or air tube is connected properly and air pressure gauge indicates in the required air pressure (5kgf/sq. cm.)  
Set up the air pressure to (5kgf/sq. cm.)
  
- Check if the power supply is connected properly.  
Turn on the power main switch and check if the power indicated light is on.


## 6 ° Standard operation

### 6-1 ° Start operating

Please do follow the below to operate the machine.

 <b>WARNING</b>	
●DO NOT turn on the machine when air supply is disconnected.	
●DO NOT turn off the power and air supply when machine is operating.	

 <b>CAUTION</b>	
● ° Cutter head move to ORG position when ORG initialization starts.	
●For safety reason, please make sure there is no one around the machine for starting initialization of machine.	
●Press Emergency stop switch to stop ORG initialization urgently.	




#### Operation process

1. Turn on the power.




2. Follow the operating section 1, turn on the power, check if power lamp is on?  
If it is disconnected, check if main power switch is ON?  
Or Emergency stop switches in 3 places as photos shown are unlock.





Follow the operating section 2, press  SHIFT button and  START button to activate the X,Y and  $\theta$  axes Initialization. The lamp of  SHIFT button will be turned on when the initialization has been completed.



Place the cloth to the set up position (on the position of fixed sticks) and on the spreading table, press  FIXED button. Cloth will transferred to cutting original point.

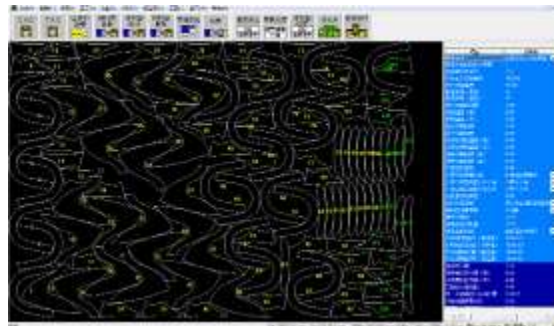


3. Set up the cutting data in the computer as below.

Select a marker from  CAD sub menu in the displayed screen, click  実行 and select the cutting parameter file.



This is the marker which displayed in the menu.



And check the cutting menu of , or to find the cutting parameter. (Such as cutting speed.)

Select for cutting execution. Please refer “Cutting Advisor” for more information.


4. Please cover the vinyl sheet onto the cloth on the cutting table.

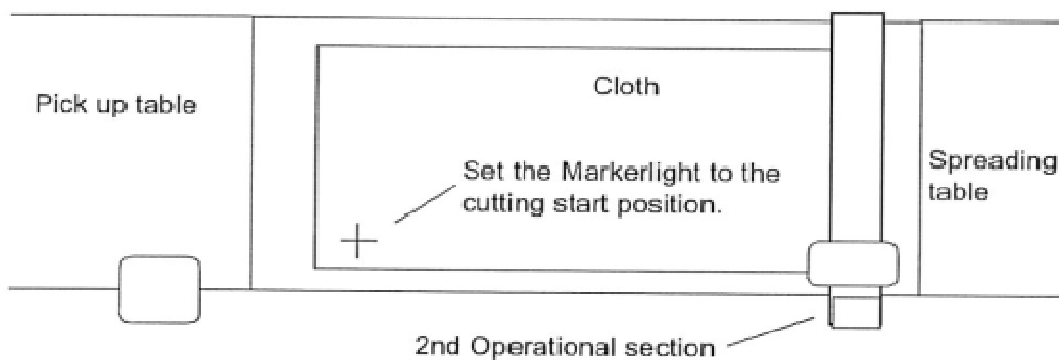
5. Select cutting menu of for cutting execution.

6. Follow the operating section 2, press button. Blower will be turned on.













按 Press JOG (      ) button to set up the cutting start position of cutter head marker light. (Set the cloth cutting start position toward inside a little from the edge of the cloth to avoid the edge of cloth will not even.)




## Operation Section 2

When vacuum is stable, please follow operating section 2 and press  button. Check the lamp is on and press  button.

■ Please follow the operating section 2, press  button in the cutting process, the cutting operation will be stopped. Follow the operating section 2, when cutter head is stopped,

press      to activate the cutter head.

Press the  button again, the cutter will start operating again.

The cutting will starts from the position where the cutting

head stopped even if the cutter head have been moved by the jog switch.

Follow the operating section 2, the cutting operation will


be stopped once press  button during operation. If

stopping cutting, the cutting mode (parameter)



needs to be reset in order to start the cutting again. When the cutting is restarted, it is started from the position where been paused.

#### 7. Transfer the cloth


If press  button or foot switch which following the operating section 3, the cut cloth on the cutting table will be sent to the pickup table.

#### 8. Pick up the cloth

Collect the cloth which has been cut from pickup table.

Go for the procedure 4 for cutting the new cloth.

## 6-2 Finish operation

1. Pick up the cloth from cutting table.
2. Follow the operating section 2, press  jog button to move the cutter head to the position where cutter goes down.  
Be careful that cutter or punching needle will go down once stopped supply the air to the machine.
3. Follow the operating section 1, press OFF to turn off the power, and check if the lamp of ON button whether is on?
4. Back to the main menu of computer screen, and turn off the power of computer.
5. Press turn OFF the main power.

## 7. Part adjustment & replacement



### WARNING

Please do turn off the power before proceeding with adjustment and replacement.



### CAUTION

- DO NOT touch the origins of X, Y and  $\theta$  axes and DO NOT adjust sensors because they were already adjusted.
- DO NOT touch the speed controller of cylinders because they were already adjusted at a standard speed.

### 7-1. Bristle conveyor and chain

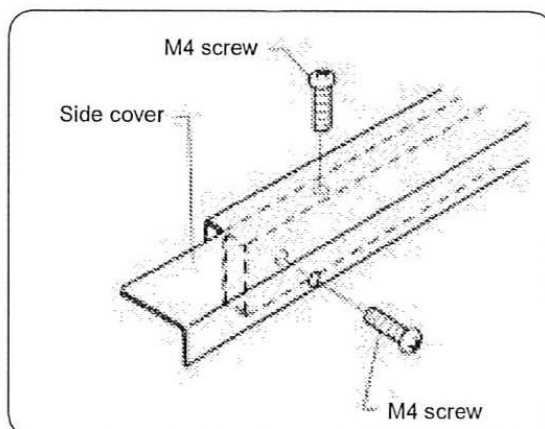
#### 7-1-1. Bristle replacement



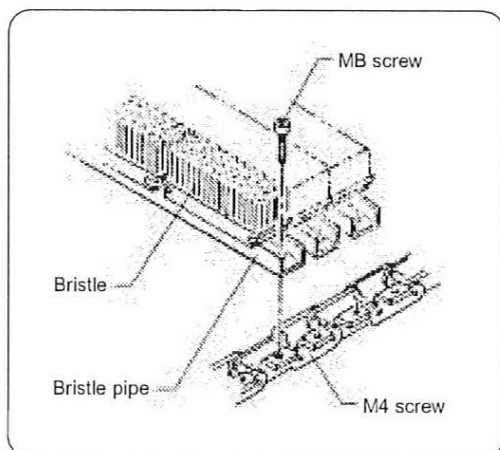
### CAUTION

It will damage the machine, if there are something fall down to the machine during the replacement of bristle. Please pay more attention.

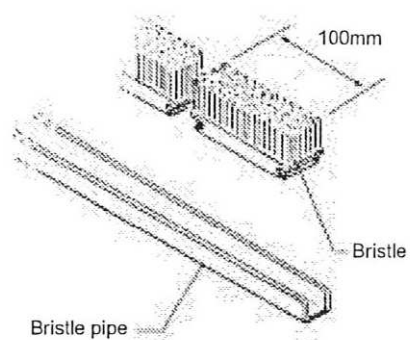
Please proceed with the below steps to replace the bristle.



- ① First, take out Bristle side cover at both sides.



- ② Take out fixing screws (each 2 pieces) attached in Chain, and take out Bristle pipe from Chain.



- ③ Take out Hard air from slide typed Bristle pipe.
- ④ Fix the new Bristle to Bristle pipe.
- ⑤ After the end of exchanging Bristle, Install the Bristle to chain as it was.

### 7-1-2. Adjustment of bristle conveyor chain

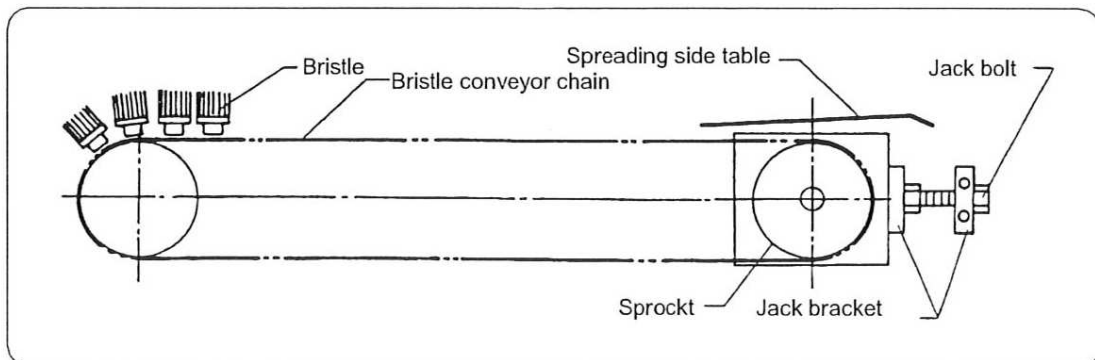


#### CAUTION

Chain will become extended in the beginning of use. Please check the slack of the chain in the first three months after installation and adjust the slack if necessary.

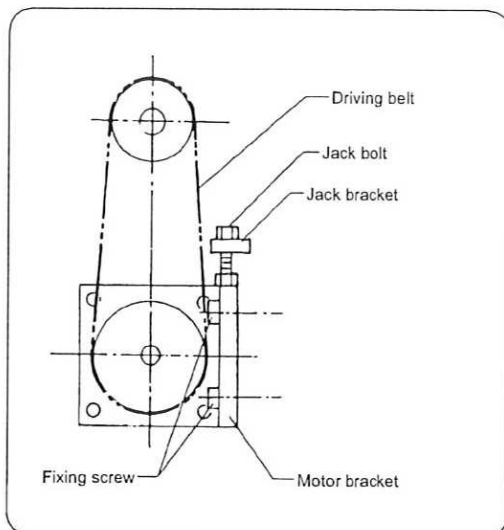
How to stretch the bristle conveyor chain?

- Remove both sides' cover and the table on the side of the table, and adjust the tension of the conveyor chain by the jack bolt.

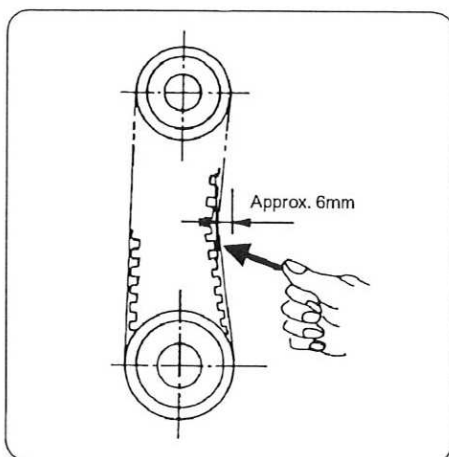


Stretch the chain so as to keep 20 to 30mm loose on it by pushing it with a hand.  
At this time, make the chain tension in the both right and left sides be uniform.

## 7-2. Adjustment of Driving Belt



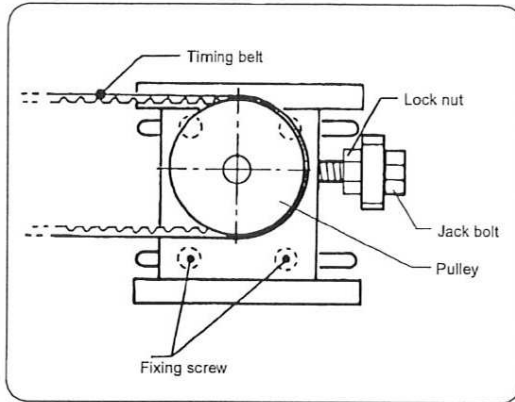
Loose the fixing screw of motor bracket, and move the motor up & down with jack bolt to stretch the belt.



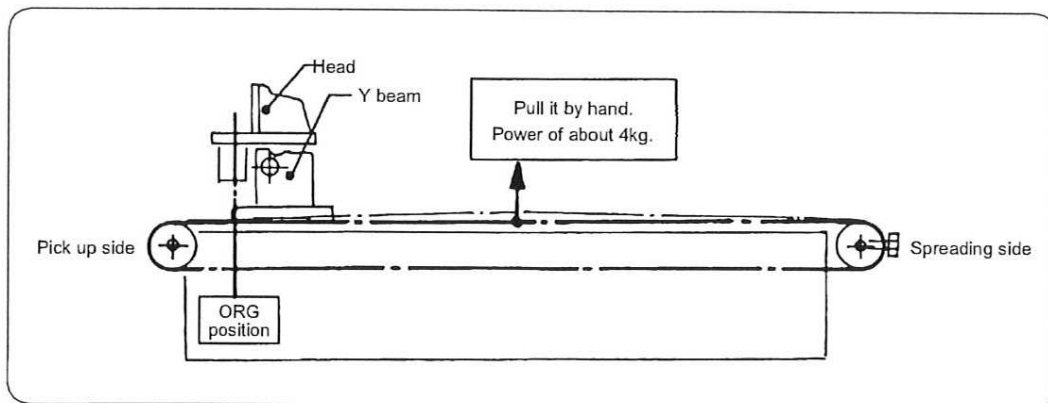
At this time, Stretch the belt so as to keep approx. 6mm loose on it by pushing it with a hand.

### 7-3. Adjustment of Timing belt for X-axis transfer

Move both sides of pulley in the Spreading sided frame by tuning jack bolt to stretch the belt.



Loose fixing screw and lock nut, then turn the jack bolt.  
Be sure to tighten fixing screw and lock nut after adjustment.



Regarding stretched tension at this time, move Y beam to near ORG position at pickup side and stretch around the center of belt with a hand (force of approx. 4kg) to keep approx. 40mm loose.  
Also, stretch the both right and left belts uniformly and check to see if it moves to X-axis direction smoothly under it is pushed with a hand.

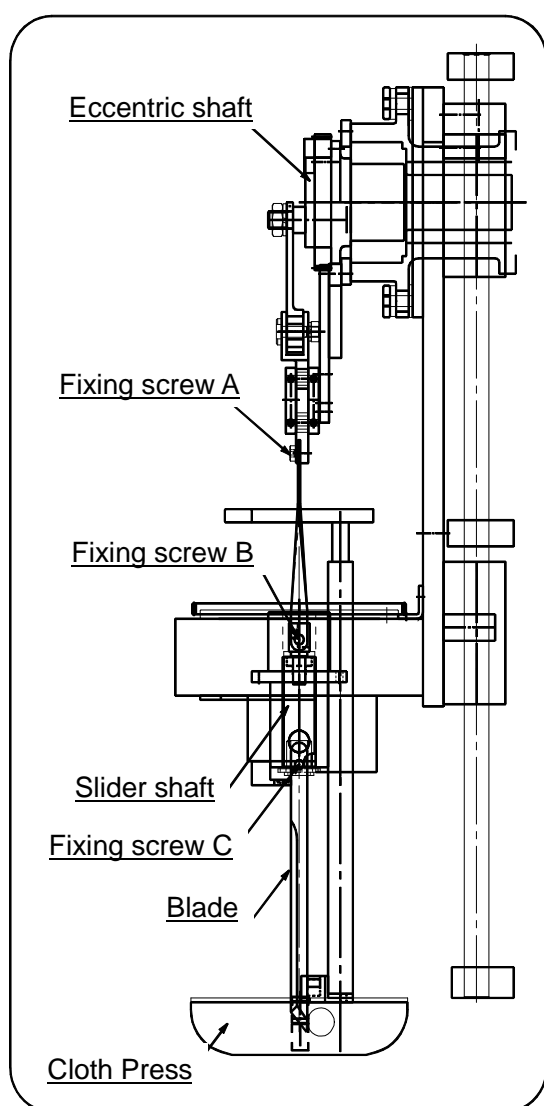


7-4. Cutter



**CAUTION**


Please be careful when replacing and adjusting the cutter.



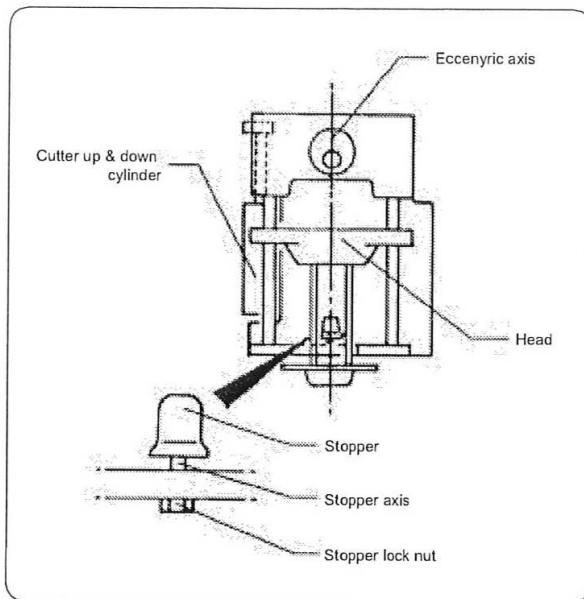
7-4-1. Cutter replacement

- ① Make sure there is nothing under the bottom of cutter when the cutter goes down.
  - ② Remove the nut of the connecting rod and separate the connecting rod and the eccentric shaft.
  - ③ Move the connecting rod to the highest position of the eccentric shaft and the fixed screw B.
  - ④ Loosen the fixing screw A and B, and pull out the twisting rod and slider blade upward.
  - ⑤ Loosen the fixing screw C and take off the blade.
  - ⑥ Replace the blade with new one and put the fixing screws on the head. Fix the fixing screws temporarily and do not tighten them firmly. Also, clean the inside of slider and slider case, apply grease.
  - ⑦ Install a new blade as the steps 2 to 5 in opposite order.
  - ⑧ After installing the new blade, turn the eccentric shaft slowly by hand and check the blade is moving up and down smoothly in the cloth press guide roller.
- In case the blade is not correctly fitted, it will not move smoothly. Please modify the position once happened.
- ⑨ After adjusting the blade position, tighten the screws firmly.

7-4-2. Adjustment of cutter level

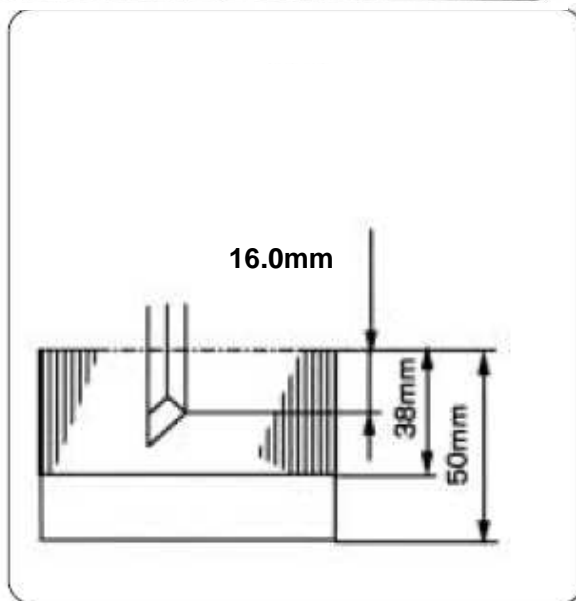
 **CAUTION**

**Adjust cutter after grindstone and cutter adjustment.**



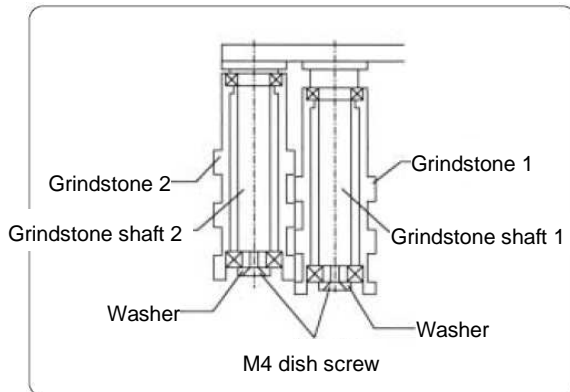
① Loosen the nut and lower the position of stopper so that the stopper and shock absorber would have a space for cutter head when the cutter head goes down.

② Press STOP switch and turning the code 7 manually, press ON to lower the cutter, and then turning the eccentric shaft to the lower position, raise the stopper so that cutter edge is 16mm lower than the surface of the bristle. After raising the cutter, please adjust the position of stopper also.



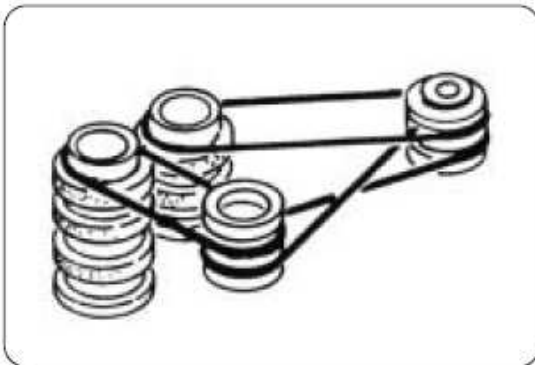
## 7-5. Grindstone

### 7-5-1. Replacement of grindstone



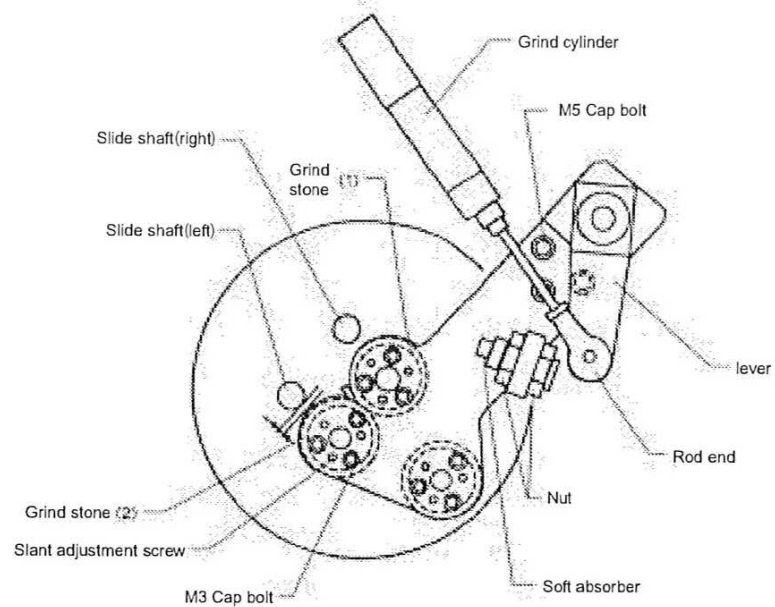
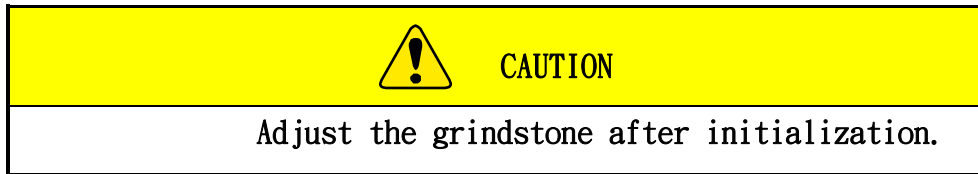
- ① Take out Bancollan round belt from the pulley.
- ② Remove the M4 screw and the grindstone 1 and 2 from the grindstone shafts at the same time.
- ③ Insert new grindstones to the grindstone shafts 1 and 2 and fix them with washers and M4 screws. At same time, put Bancollan round belt on the grindstone before inserting grindstones.
- ④ Stretch the Bancollan round belt on the pulleys.

\* Follow the above steps to replace Bancollan round belts also.



Set up of Bancollan Round Belt

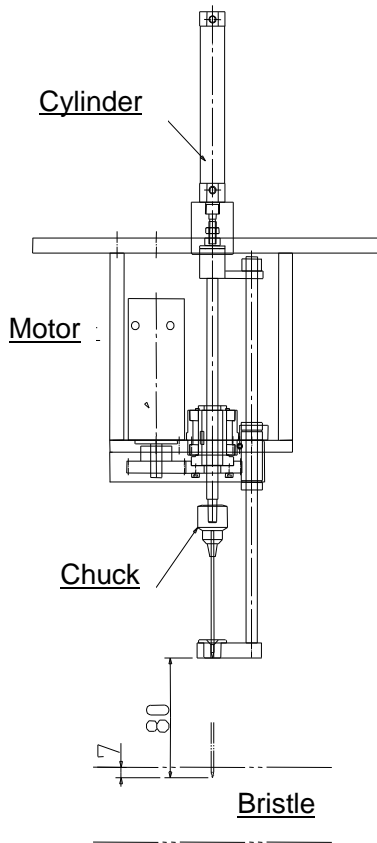
7-5-2. Adjustment of grindstone



- ① Take out Cutter.
- ② Take out rod end pin in grindstone cylinder to let turn bracket move freely, and allow it to be near the center with a hand.
- ③ At this time, adjust soft absorber so that slide shaft (left) and grindstone could stop with a little space.
- ④ Install the cutter.
- ⑤ Loosen M5 cap bolt in turn bracket and rotate it with a hand, then place grindstone to cutter. At this time, check to see if the both sides of cutter contacts with grindstone by turning the grindstone.
- ⑥ Tighten M5 cap bolt after the check and tie rod end of grindstone cylinder and lever with a pin to rotate grindstone by the cylinder.
- ⑦ Set manual code in rotary switch as  $\boxed{6}$  and turn the manual code switch ON to perform grinding.  
※ If the both sides of cutter can't be grinded, perform the adjustment ⑤ and ⑥ again.
- ⑧ If grinded volume of upper side and lower side is different, loosen M3 cap bolt in turn bracket and adjust with slant adjustment screw.
- ⑨ Tighten M3 cap bolt after adjustment, Turn manual switch ON by manual code  $\boxed{6}$  to perform grinding.

## 7-6. Punching

### 7-6-1. Replacement of punching needle



- ① Remove the head cover.
- ② Loosen the chuck with the supplied chuck handle and replace the needle.

### 7-6-2. Needle adjustment Solenoid

Grindstone Drive	
1st punch lower	
Cutter up	
Cutter down	
Cutter up & down brake	
Cloth press slight up (option)	
Cloth press lock (option)	
2 <sup>nd</sup> punch (option)	
3 <sup>rd</sup> punch (option)	

Press the No. 2 manual operation button (punching lower) in the solenoids of the head in order


to lower the needle. Please adjust the needle chuck position so that the needle tip is about 7mm lower than the surface of bristle.

#### **7-7. Belt on cutter head**

Please check the belt on cutter head regularly if the belt is too loose, the pulley may slip. Please replace the belt once happened.

## 8. Checking & maintenance

- Please follow the below for checking and maintenance.

 **CAUTION**

**Before checking the machine, confirm the power supply is off and each unit has completely stopped.**

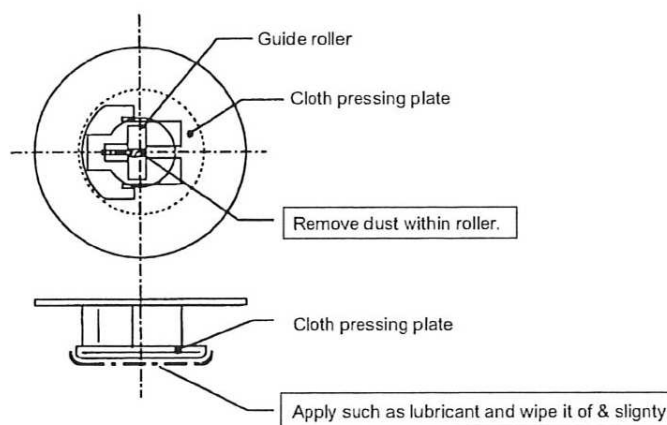
In order to maintain the ability of the machine, be sure to perform the following check and maintenance regularly.

### CHECK

- Discharge the drain of air filter at the start or end of operation everyday.  
Too much stuck drain causes the trouble with air cylinder and solenoid valve.
- Check the operation of emergency stop switch. <Once a month>
- Check to see if the electric connector with no control box is connected properly.  
<Once a month>
- Check to see if each air tube isn't bent or damaged. <Once a month>

### CLEANING

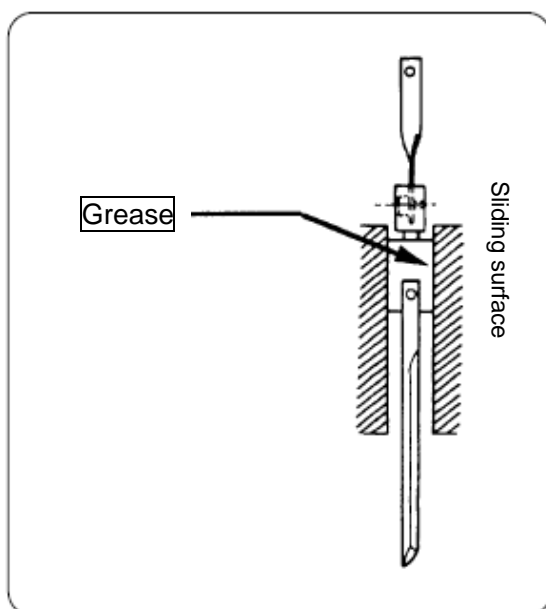
- Wipe the bottom of cloth pressing plate and inside of cutter guide roller slightly with cloths etc. and remove dusts within roller. <Everyday>



- Clean around cutter head. <Everyday>
- Clean inside of Bristle and cloth wastes. <Everyday>
- Clean dust box and throw the dust away properly. Too much stuck dust influences the suction. <Once a week>
- Clean around LM reel. <Once a week>
- Clean inside of control box and fan filter. <Once a week>
- Clean driving belt. <Once a week>

## GREASE

- Apply Lithium soap no.2 grease or equivalent to LM guide rail (X-axis transfer rail, Y-axis transfer rail and cutter up & down transfer rail) for the lubrication and the anti-rust <once a month>
- Insert Lithium soap no.2 grease or equivalent into LM block for X-axis and Y-axis transfer from grease nipple in LM block. <every 6 months>
- Apply Lithium soap grease to clank part of the cutter head or spray. <once a week>
- If there great resistant of cutter moving up and down, and also driving parts, please apply Lithium grease slightly to the sliders and sliding surfaces. (once a month)



Please pay attention not to apply too much grease.  
Cloth may be stained.