1 INTRODUCTION

1.1 Product Introduction

Principles of computerized pneumatic marking: The marking controller connected to the computer controls the needle's movement as per the data (characters or images) input to the computer, while at the same time the needle strikes frequently under the application of compressed air, generating aesthetic patterns on the work piece.

Computerized pneumatic marking machines can be used to mark brands, models, batch numbers, technical parameters, etc., on parts or name plates. It contributes to achieving effective manufacturing management and quality monitoring. It also helps identify the products in the market, and establish good corporate image.

1.2 Main Features

1. Able to mark on various products and label tags made of steel, iron, copper, aluminum, plastics, etc.

2. Able to mark any pattern, such as Chinese/English characters, Arabia numbers, icons.

3. Able to mark batch numbers (increased/decreased automatically), VIN

codes, random codes, 2D codes, etc.

4. High striking frequency, fast marking speed, and suitable for mass production

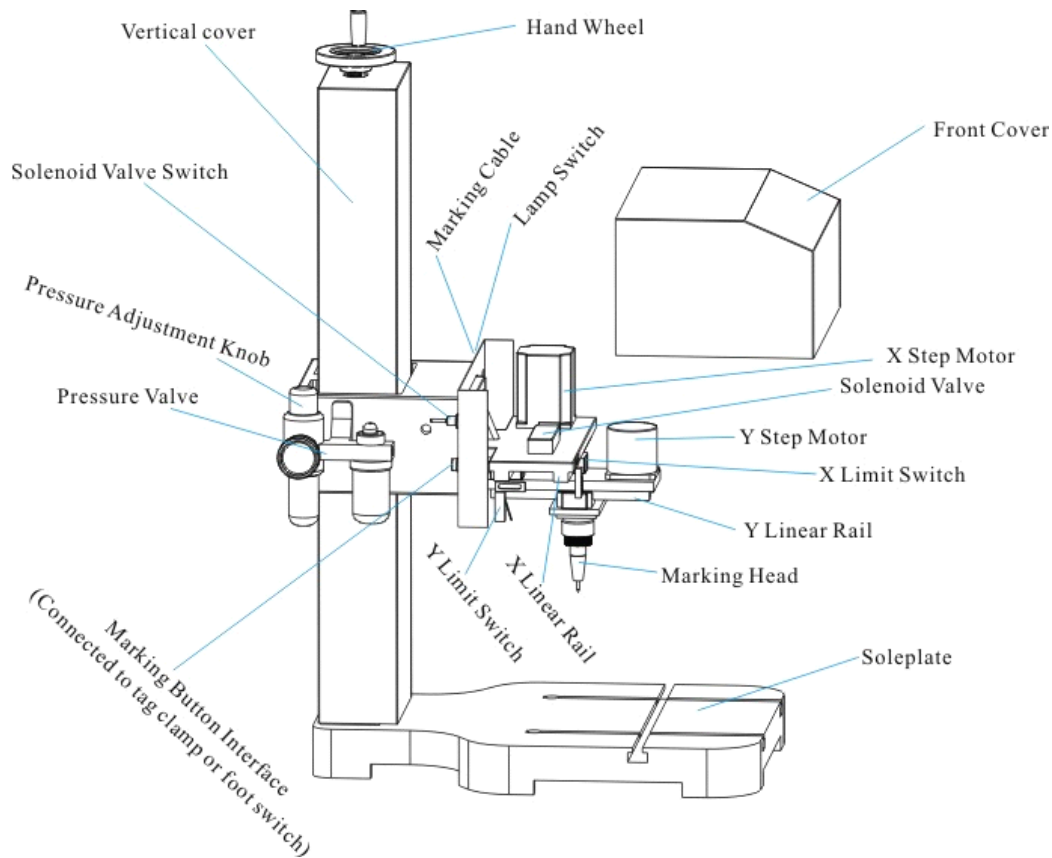5. Low striking force, which doesn't impair the mechanical properties of the parts;
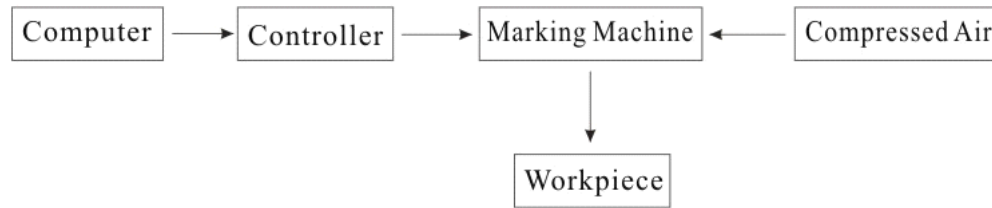
6. Adjustable marking depth, from 0.02mm to 1mm;

7. Easy operation and maintenance;

8. Environmental friendly.

1.3 System Configuration

The marking software is run in Windows operation system on a common computer, which consists of main machine, display, keyboard, mouse, etc. The operator inputs and edits the marking content by using the keyboard and mouse. All these content is converted to the movement of the marking needle after the data is processed by the computer and marking machine controller.

As the execution part, the marking machine consists of two step motors, one solenoid valve, one marking needle, and transmission and guide components. The needle strikes at high frequency under the application of compressed air, while controlled by the controller to move along a certain trace. The service unit, including a pressure valve, in the pneumatic pipeline cleans the air, and compresses it to reach a stable pressure level. The high speed valve controls the ON/OFF status of the pipeline, and thus the movement of the needle. This valve is in turn controlled by the computer and controller. To accommodate parts with a variety of heights, the head of marking machine can be adjusted by raising/lowering the machine frame manually or electrically.

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Computer ──▶ Controller ──▶ Marking Machine ◀── Compressed Air
                                   │
                                   ▼
                              Workpiece
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Vertical cover — Hand Wheel
Solenoid Valve Switch
Marking Cable
Lamp Switch
Front Cover
Pressure Adjustment Knob
Pressure Valve
X Step Motor
Solenoid Valve
Y Step Motor
X Limit Switch
Y Linear Rail
Marking Head
Y Limit Switch
X Linear Rail
Soleplate
Marking Button Interface (Connected to tag clamp or foot switch)

1.4 Technical Parameters

1. Marking Range (Can be customized according to user's demands):

   Planar: 140mm x 80mm

2. Marking Depth: 0.02-1 mm (depending on the type of material)

3. Marking Speed: 3-5 letters/s (according to the size of the letters)

4. Power Source: AC 220V±10% 50Hz (can be customized for

   AC110V±10% 60Hz)

5. Compressed Air: 0.4-0.6MPa

6. Air Consumption: 3 L/S

7. Power Consumption: < 150 W (excluding computer and compressor)

8. Repeatability: 0.02-0.04 mm

2 HARDWARE INSTALLATION

2.1 Installation Requirements

The following equipments are required: multi outlet power strip (grounded) connected to 220V source (or 110V, depending on what's indicated on the controller), compressed air source (0.4-0.6MPa pressure, φ8 plastic tube), and working platform. For the sake of safety avoiding electric leakage, the working platform and power strip should be well grounded. Strong magnetic and acoustic interference should be avoided in the field to ensure system operates normally. The environment should be well air-circulated, dust removed and cleaned.

2.2 Electric and Pneumatic Connection

1. Connect the main machine, display, keyboard, mouse, etc. as per a common computer;

2. Connect the computer to the controller by a 9-pin parallel cable on the corresponding interfaces;

3. Connect the output interface of the controller to the input interface of the marking machine by the cable with 19-pin aviation plugs and secure the connection;

4. Connect the 2-pin aviation plug of the foot switch to the 2-pin aviation socket on the marking machine, or, if used for rotary marking, connect the 4-pin aviation plug on the rotary fixture to the 4-pin aviation socket on the marking machine;

5. Connect all the power source cables of computer, display and controller to the multi-outlet power strip, which should be well grounded.

3 INSTALLATION

Note: *If it's the first time to install ThorX6 in your system, make sure the*

computer is disconnected to the controller.

3.1 Double click the setup file Setup.exe in the installation disk to open

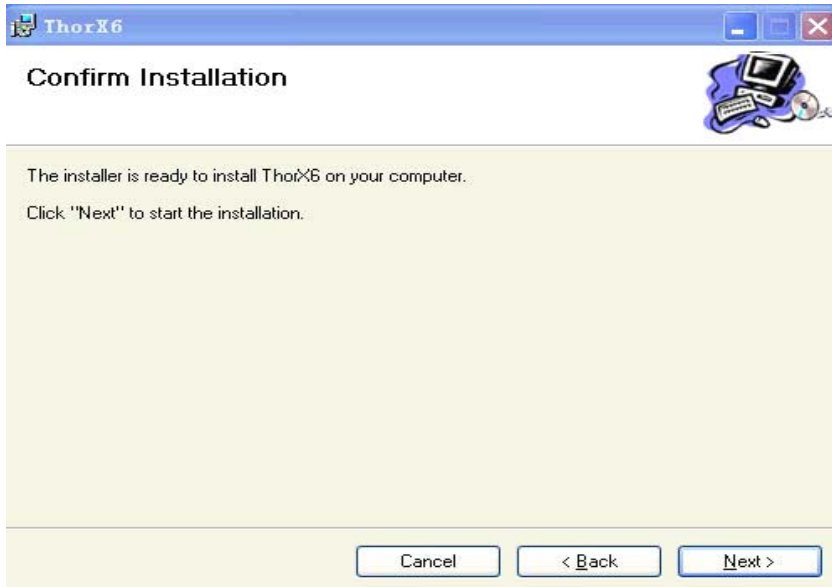the ThorX6 Install Wizard, as follows,

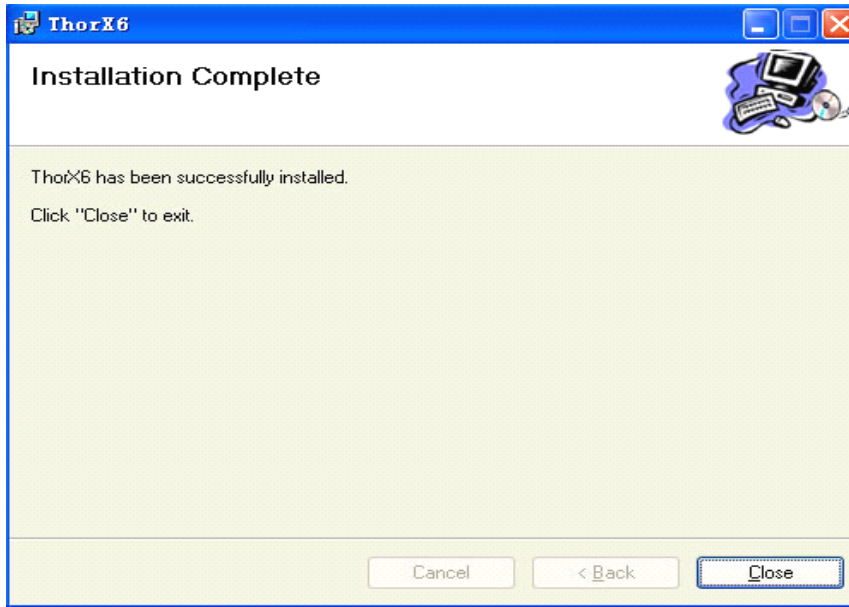Click the *Net* button to choose the installation directory. As follows:

Click the **Browse** button to choose the installation directory. Usually, you can just keep it as the default directory it shows.

Click the *Next* button to start the installation. As follows:

Click the **Install** button to start the installation. The optimized installation can be finished in a short time, depending on your system configuration.

At the end of the installation, it shows the "ThorX6 Installation is completed" window, as follows,

Shortcuts to ThorX6 will be created on the desktop and start menus.

Click **Close** button to finish.

3.2 Double click the ThorX6 driver button   in the installation disk to set up the USB driver automatically.

After the two steps, the whole installation of the software is finished.

4. GET STARTED

The following is the brief introduction about how to create a text and serial numbers, how to set the needle and determine the marking position on the work pieces.

4.1 Create a Marking Object

Start ThorX6 by double the shortcut of ThorX6. A default interface as follow will appear after ThorX6 is started.
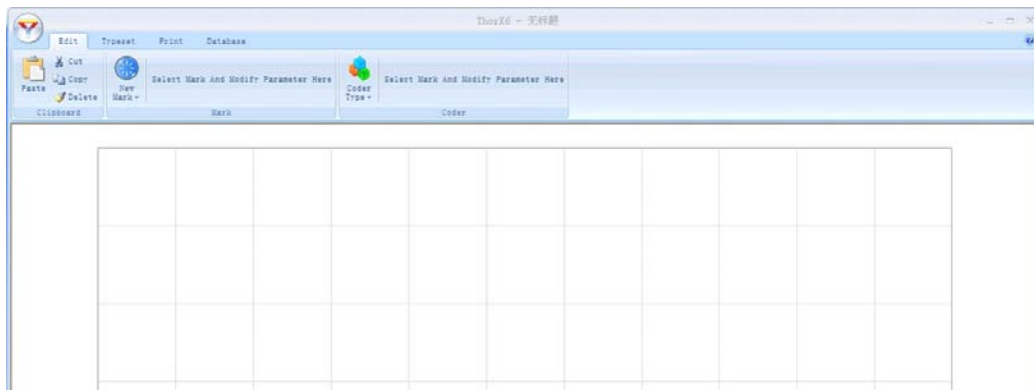
Click **New Mark** button, and select the **TX Mark 6 Pi Content-Text**, and then click on the white drawing area of the interface. Default characters as follows will appear on the drawing board:
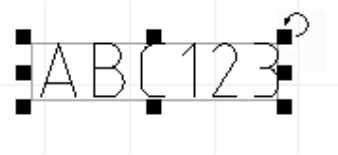
You may input any characters in the **Content Box** that locates at the upper hand of the interface, so that to change the default characters **ABC123**. Here we use default characters as the marking content.

Now, we have a new object. It is the same to create the **Text** content. We Click **New Mark** button, and select the **TX Mark 6 Pi Content-Text**, and then click on the white drawing area of the interface. Then we change the default content **ABC123** to **123456** in the **Content** Box. Now we have created two different types of marking contents.

4.2 Adjust Marking Positions

Click on **ABC123** in the drawing area. The text will be surrounded by a line box, which means that the text has been selected. Input **10** in the **X** box and **Y** box respectively under the **New Mark** button of the menu bar, and then press **Enter**. Now the text will be precisely positioned at the point of X＝10,Y=10.

Using the same method, we can also precisely position the text of **123456**. Now we introduce a simper method. Click the **Typeset** button, and then use the mouse to choose the two contents, the two targets are now both selected.

Click the **Alignment** buttons in the menu, the two targets that have been selected will automatically align according to your order.

4.3 Configure the Encoder

We often need to mark *Serial Numbers* on work pieces. Now, we learn how to set *Serial Numbers*, using the *123456* that we just created.

Note: Serial Numbers accumulates automatically after each marking.

Now, we create a *Serial Numbers* object. It is the same to create the *Text* content. We Click New *Mark* button, and select the TX *Mark 6 Pi Content-Text*, and then click on the white drawing area of the interface. Then we change the default content *ABC123* to *123456* in the *Content* Box. *Please make sure that the mouse is in selection mode.* Click the *Coder Type* button, and select the *TX Mark 6 Pi Coder—Serial Number,* the object of *123456* will turn to red color, which means that the object has been set as serial numbers. We can set all of the parameters of the serial numbers by ourselves, in general situations; we can just use the default values.

4.4 Reference the Needle

Now we introduce several normal referencing methods.

Note: please make sure that your marking machines rightly connected to the computer and have been reset, before you begin the needle reference operation.

Select *Typeset*, and then select *ABC123,* find and click the *Center* button, then click the *Button left* corner referencing button in the selection menu. Now the marking needle will move to the lower left corner. Adjust

the position of *ABC123* in the drawing area, and click the *Button left*

corner referencing button again, until the marking needle is precisely in

line with the lower left corner of the object to be marked.

4.5 Mark

Now we can begin to mark, after all the preparations have been made.

Refer to your hardware installation manual to connect the air source,

adjust the air pressure, fix a work piece on the fixture, click *Print* button in

the menu bar, and then click the *Start* button on the menu bar. Now, your

marking machine will begin to operate.

The time needed for the marking is related with the setting of marking

speed. After the marking is finished, the Serial Number will change to

123457 from *123456*.

So far, we have generally introduced the using method of Thorx6. More

functions of it will be introduced more specifically in next chapters.

5. SOFTWARE OVERVIEW

5.1 File Operation

All documents of the marking can be saved in the PC, and our computer

can manage all the documents.

Click ![icon], the functions as follows:

a. New: create a new file

b. Open: open a file, which have saved in the computer before

c. Save: to save the current document in the computer

d. Save as: to save the current documents as another name in the computer

5.2 View port Operation

Click *Typeset* button, all functions will appear on the drawing area.

Lock the current view port

When this button is depressed, mouse operation can't change the content

in the drawing panel.

Zoom in the current view port

Zoom out the current view port

Resize the view port to the original page size

Set the mouse in the drawing paneling view port resizable status

When the button is depressed, it indicates the mouse in the drawing panel

is in view port resizable status. In this status, clicking the mouse can zoom in the view port, while clicking the mouse when holding the *Shift* button can zoom out the view port. You can also click and hold the mouse to drag a enlarged frame, so that to enlarge the area of the view port.

Se the mouse in the drawing panel in view port moving status

When the button is depressed, it indicates the mouse in the drawing panel is in view port moving status. In this status, you can click and hold the mouse, and move in the drawing panel to change the position of the view port.

Refresh the view port

6. CREATE AND EDIT OBJECTS

6.1 Text marking objects

The content of text marking objects can be comprised of English characters, numbers, signals, and Chinese characters. It also has the attributes of the font type.

There two kinds of text marking content in the software, one is **Standard Text**, and the other is **Fan Text**. The contents in the **Standard Text** are in a line, but the **Fan Text** is arranged according to the radius of the fan and the original angle. Both texts can be selected in the **New Mark** button.

6.2 Special marking objects

6.2.1 Data Matrix 2D Codes

Special marking objects are used in particular marking industries, including 2D Codes. We can click the **New Mark** button to find the **DataMatrix2DCodes**.

6.2.2 Gauge

Chick the **New Mark** button to find the **Gauge** button, and click the mouse in the drawing panel. The Scale bar is then created. Scale bar has many attributes.

Length: total number of subdivisions within a division

Grid Size: width of one division, unit mm

Grid Value: unit corresponding to every division, which is 1 in most case

Height: total height of the gauge (characters not included), unit mm

Grid Height Scale: ratio of smallest mark height relative to gauge height

Half Height Scale: ratio of center mark height relative to the gauge height

Start Value: the value corresponding to the starting mark, it is 0 in most case

Radius: If this value is non-zero, a gauge in the shape of fan will be created

Span Length: number of small subdivisions within a division

Show Number: to show or to hide the mark value

Show Half Number: to show or to hide center mark value

More: an auxiliary settings dialogue for the characters on the gauge

6.2.3 Graph

Click the *New Mark* button, and find the *Graph* button, and click the mouse in the drawing panel, then there will be a graph appearing in the panel. Click the *Browse* button to find the special graph which saved in the Computer before.

For the special graphs, it should be edit in the platform of CAD or CorelDraw as a vector graph, and then change its format to *.PLT*, and the software will identify the graph.

7. FUNCTIONS ABOUT PRINT

7.1 Start marking

a. click the *Start* marking button and the marking machine will start to mark.

b. click the *Auto* marking button, the machine will halt for a certain period of time after a cycle of operation is finished normally, and start over the next cycle automatically.

c. click the *Selective* marking button, the machine will only mark the selected objects.

d. click the *Stop* button, the machine will stop the current operation.

e. click the *Reset* button, the needle will reset to the reference point.

d. click the *Order* button, to adjust the graphic sequence.

7.2 Marking settings

To set the parameters for the marking machine.

a. Print speed: the speed that the marking needle travels

b. Move speed: the speed that marking needle travels without marking targets.

7.3 Delay settings

Because the marking process is controlled by high pressure air, appropriately coordination of the operation of high pressure air can Prevent the bad results like incomplete marking or dragging marking, as Follows.

normal   incomplete   dragging

Before marking a continuous stroke of a character, the high pressure air source will be opened, and the needle will be driven to strike at high frequency. However, a little time is needed to fill the space so that to produce high pressure; if the needle begins to mark during this period, namely before the high pressure air arrives, incomplete marking will be caused. To prevent the occurrence of this situation, the needle should not start working until the high pressure air arrives, so that to prevent incomplete marking. This little time period is called *PenupDelay*, which normally takes only 2-8 mini seconds.

When the marking machine finishes every continuous stroke, the high pressure air source will be closed. At this time, some air might still remains in the pipe. If the marking needle starts to move at this time, the remaining air may still drive the needle to strike at high frequency, and dragging marking will occur as the consequence. To prevent this situation, the marking needle should pause for a little while before the high pressure air releases completely, so that to effectively prevent dragging marking. We call this small pause as *Pen down Delay*, which, similar with the *Pen up Delay*, normally takes 2-8 milliseconds.

These two delays have the same setting method as the speed setting. You can drag the delay control directly, or input the delay parameters in the text box.

If your marking machine has been installed with a pneumatic fixture, you can also set a delay time for the fixture, so that enough time will be provided to ensure the work pieces are loaded and pushed to the marking position.

8. USE DATABASE

The Database is used to recode the information generated in each marking and store this information in the database. This information includes the marking content, coding mode; file name and marking time, etc.

Enable: to recode the marking content

Browse: to browse the Log database that have recoded, select one file and you can see all the marking information of this file

Check Code: Log database records the change of marking content every time. What's more, it detects if the current marking content exist in the database. If it does exist before, the system will decide whether to check for same codes or not, according to the settings for log database. If it's unnecessary, it won't affect the normal marking operation. Otherwise, it will remind you in the log database checklists.

At the same time, log database will stop the current marking and pop up a Command-line error feedback window.

9. PNEUMATIC MARKING KNOWLEDGE

9.1 When marking speed is the same as the free traveling speed, the numbers of characters marked within certain time period is determined by the size of the characters and the complexity of the strokes.

9.2 Marking depth is determined by the material of the work pieces, the distance between the marking needle and the work piece surface, air pressure and marking speed, etc. The softer of the material or the closer of the distance between the work piece and the marking needle, the deeper will it be of the marking depth; the higher the air pressure, or the slower the marking speed, the deeper the marking depth.

9.3 The width the strokes is related with the shape of the marking needle: the shaper the needle, the narrower the line. It's also related with the marking depth: deeper marking result in wider lines.

9.4 The continuity of the lines is related with the marking speed: the faster the marking speed, the more discontinuous the line.

9.5 After having finished the first file, the distance between the marking needle and the work piece should be increased, and start marking in the premise of cutting off the air source (or solenoid valve switch), so that to prevent destroying the marking needle. You also need to make sure the marking position is appropriate, and the distance between the marking needle and the work piece is within 2-3mm before start marking.

9.6 In actual production, some work pieces have very complicated shapes. This may cause inconsistent distance between the marking surface and marking needle and hence uneven marking depth. In this situation, you need to install a softer spring with lower elasticity, and carefully adjust the distance between the marking needle and the work piece. You may use a useless work piece to test the depth: let the machines mark on the useless work pieces, and adjust the needle distance and air pressure until appropriate depth is achieved.

9.7 Cut off the power before assembling and disassembling any connection lines. Otherwise, the machine might be destroyed.

9.8 The bolts in the marking machines should be tightened. Otherwise, the shaking of the machines might deform the characters.

9.9 Rotary chuck has types of jaws, inner jaw and outer jaw. You may choose one type of jaw according to the size of the work piece. Fix the work piece with the jaw, cut off the power, put the needle right above the axis of the work piece, and then connect the power.

9.10 When the marking surface is uneven, please use softer spring with lower elasticity.

10 SOLUTIONS TO COMMON ABNORMALS

The failure rate for this machine is very low. Most of the times, it's caused by the wrong operation. When it happens, stop the machine immediately and resume only if the problem is diagnosed and fixed. The followings are some abnormal phenomena you may encounter and their solutions.

10.1 Needle Moves But Doesn't Strike.

To diagnose for this problem, take off the marking head, load any marking file and click the start marking button. In this case, the needle holder will travel without the needle head. Two cases will happen at this time. If there's compressed air coming out of the needle holder, it indicates the parts above the needle holder (including the solenoid valve and pressure regulator) work properly, and the problem lies in the marking head itself. If no compressed air comes out, there's something wrong in the solenoid valve, pressure regulator or other parts.

In the first case, some of the possible reasons are listed below.

(1) There's debris inside the marking head. The representative phenomenon is the needle can be moved down but doesn't strike as normal or even doesn't strike at all. To clean up the debris, turn and take off the marking head, take out the O-ring and needle, and clean the needle and sleeve by kerosene or diesel, see the following figures.
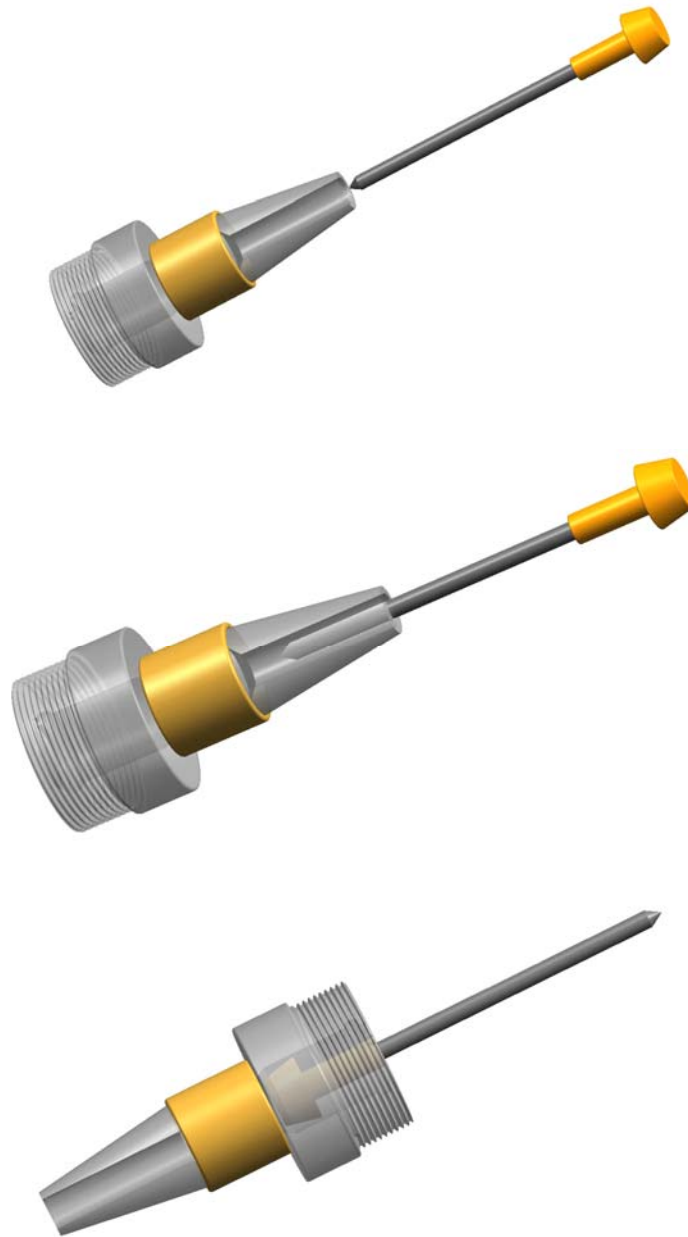
After the cleaning, re-assemble the head back to the machine. Please be noted the common engine oil can't be used because of its high viscosity and the lubricant provided by the manufacturer or other low viscosity oil (e.g. for sewing machine) should be used.

(2) The marking needle is stuck. The representative phenomenon is the needle can't be pulled down by hand. To solve this problem, you can turn and take off the marking head and reassemble the marking needle. It's also recommended to clean the needle by kerosene or diesel at this time. After that, the needle should be lubricated by the grease provided by the manufacturer or any other low viscosity oil (e.g. for sewing machine).

(3) The o-ring inside the marking head is severely worn off. The representative phenomenon is there's big noise when the compressed air is released out of the head but the needle doesn't strike. To solve this problem, turn and take off the marking head, take out the needle and spring, and replace the worn o-ring with a new one.

(4) The spring inside the marking head fatigues and becomes shortened. The representative phenomenon is the big noise when the compressed air comes out. To solve this problem, turn and take off the marking head, take out the needle and spring, and replace the fatigued spring with a new one. For temporary usage, you can pull the spring to make it longer and assemble it back.

(5) The distance between the needle and the work piece is too big. The representative phenomenon is the big noise of compressed air and the needle moves on the surface of the work piece but doesn't strike. To solve this problem, turn the hand wheel to adjust the distance to about

2.5 mm, which may vary depending on the air pressure.

The followings are some solutions to the second case regarding the solenoid valve or other pneumatic problems

(1) The switch for the solenoid valve is not on. The representative phenomena are the solenoid valve can't be turned on and doesn't work, the indicator LED doesn't flash if the valve has, and there's no air coming out. To solve this problem, turn on the switch for the solenoid valve, which is located on the back of the marking machine, up to open and down to close.

(2) There's no air in the pipes or the air pressure is too low. The indicators for this problem could be there's no reading on the pressure gauge, and there's little air coming out if the on/off valve in the piping line is turned on. The solve this, you may need to *a*) turn on the switch for the air compressor; *b*) adjust the air pressure by turning the knob of the pressure regulator; or *c*) straighten the pipe if part of it is bended blocking the air flow.

(3) The solenoid valve is stuck. The scenario is the valve can be turned on and the LED indicator can flash (some valves don't have the LED indicator), but there's no air coming out. To solve this problem, you need to replace the valve with a new one. For temporary usage, you can disassemble the valve and re-assemble back after cleaning the

parts with kerosene and greasing them with lubricant, which should be white, high-grade, if there's no silicone available.

(4) The solenoid valve's LED indicator doesn't flash and there's no air coming out. The solution is to replace the valve with a new valve. Please be noted, the two wires are not interchangeable, one is positive, the other is negative. The rated voltage for solenoid valve used in the marking machine is 24V DC.

(5) Another possible reason is the electronic components on the controller board are broken or the circuit is disconnected somewhere. In this case, the valve doesn't work and can't be turned on even if it's a new one. You need to find out where the electric line is broken and reconnect it or replace the board or even the whole controller.

10.2 Needle's Striking Movement Is Too Short.

(1) The air pressure is too low. Increase the air pressure by adjusting the pressure regulator.

(2) The distance between the work piece and the marking needle is too big. Turn the hand wheel for the lifter so that the distance is about 3mm.

(3) The spring inside the marking head is too stiff (wire diameter is too big). Replace it with a softer one (smaller wire diameter).

(4) The spring inside the marking head is too hard and too long. Replace it with a shorter one, or compress the spring to a shorter length and put it back. Please be noted the spring can't be too short, otherwise the needle won't strike.

10.3 Marking Depth Is Too Shallow Due to Insufficient Striking

(1) The spring inside the marking head is too soft. Although the striking amplitude is big, the impact force is too small. Replace it with a harder spring having an appropriate length.

(2) The needle tip is blunt because of wearing. Turn and take off the needle, and replace it with a new one.

(3) The air pressure is too low. Increase the air pressure by adjusting the pressure regulator.

(4) The flow rate of the solenoid valve is not big enough. Replace it with a new one having a bigger flow rate.

(5) The distance between the marking needle and work piece is not correct. Readjust it by turning the hand wheel.

(6) Reducing the marking speed can increase the striking depth.

10.4 Needle Strikes Uncontinuously, Causing Incomplete Pattern

(1) There's too much condensed water inside the pipes and the solenoid valve, or there's alien particles inside the valve. Remove the condensed water inside the pipes. The compressor should be checked

for condensed water periodically, at least once per month. Clean the debris inside the solenoid valve and lubricate the parts appropriately.

(2) There's debris inside the needle's sleeve. Clean the needle and sleeve by kerosene, and lubricate them with grease appropriately.

(3) The copper on the top of the needle loses contact with the rubber o-ring. Adjust the length of spring or replace the o-ring with a new one.

(4) The air flow is blocked or throttled by bended pipes, so that the striking force is big enough in the beginning, while attenuates later on or the marking needle doesn't strike at all. Check the pipes to remove the blocking debris and straighten the bended part.

(5) The settings for the characters' positions are not correct. Some strokes are not marked because it's out of the border of the work piece. Re-set the parameters in the settings.

(6) There's something wrong with the computer. You may need to restart the computer, close other applications, like audio/video player and exit the screen save mode.

10.5 Markings with Dragging Strokes

(1) There's debris inside the solenoid valve or the lubrication doesn't work properly, so that the valve can't shut off tightly in time. Replace the valve with a new one, or clean the old valve and lubricate the inside parts with high-grade grease.

(2) The lifting delay parameter is not correctly set. Increase this value, so that the needle will stay for a longer time by the end of a stroke, giving the marking needle sufficient time to stop completely.

(3) The switching speed of solenoid valve is not high enough. Replace it with a high-speed solenoid valve. The solenoid valves used on the original marking machine are all high-speed.

10.6 Inconsistent Depth of Marking

(1) The distance between the marking needle and work piece is inconsistent. Adjust the work piece surface by filling something underneath to make it flat.

(2) The thin metal sheet, like the tag plate, is easily deformed by the striking force. Make sure to press it to get good contact with the base before staring the marking.

(3) The spring is too stiff and the striking amplitude is too small. Replace it with a softer spring to increase the amplitude.

(4) The copper on the top of the needle loses contact with the rubber o-ring. Adjust the length of spring or replace the o-ring with a new one.

(5) The air flow is blocked or throttled by bended pipes, so that the striking force is big enough in the beginning, while attenuates later on or the marking needle doesn't strike at all. Check the pipes to remove the blocking debris and straighten the bended part.

10.7 Needle Doesn't Move Normally

(1) The needle can move as usual right after the reset button is clicked, but it starts to vibrate when approaching the upper left corner, near the limiting switches there. The switch may need replacement, or the connecting wire is broken and should be reconnected.

(2) The needle vibrates but doesn't move at all at a certain place. *a*) The marking speed or free travel speed is too high. Please re-set the parameter to reduce the speed. *b*) There's debris on the rectangular rails or the grease has be used up. The solution is to clean the rails with kerosene and lubricate with white high-grade grease or engine oil. Engine oil is more likely to dry off and needs periodic addition. Butter shouldn't be used in all cases because of the high friction. *c*) The user may alter the current output of the step motor driver. Please restore it to the appropriate value in the marking controller.

(3) Marking needle moves only on X-axis or Y-axis. The reason is the

corresponding step motor is broken and needs replacement.

(4) The settings for marking speed and free travel speed is high enough, but the needle moves very slowly. You may need to restart the computer, or re-install the software or even the operating system.

(5) The controller doesn't work properly after being turned on. Please turn off its power for a couple of seconds and turn on again.

10.8 Coarse, Blurry or Unaesthetic Markings

(1) The needle's tip is blunt. Turn and take off the needle and sharpen the tip.

(2) The needle's tip is not concentric to the needle. Turn and take off the needle to be sharpened again or replaced with a new one.

(3) The marking speed or free travel speed is too high. Lower the speed appropriately.

(4) The striking force is too big or the marking depth is too high. Lower the air pressure or adjust the distance between the needle and the work piece.

(5) The locking on the marking machine hasn't been applied properly, causing the whole machine to vibrate. Please tighten the locking bolt.

(6) The timing belt is too loose or too tight. Adjust its tightness appropriately.

(7) Some bolts have lost tightness. Please check and tighten loosened one

10.9 Marking Doesn't Start After Tag Plate Is Clamped

(1) The tag plate clamp is not fixed properly to the socket holes on the back of the marking machine.

(2) The travel switch of the clamp deviates from its normal position and needs adjustment.

(3) The travel switch of the clamp is broke and needs replacement.

10.10 Marking Position Is Inaccurate When Using Plate Clamp

(1) The assembling position of the tag plate clamp is not accurate enough. It may caused by the movement of the travel switch. Adjust the position of the clamp; see the section for the installment of plate clamps.

(2) One of the two limiting switches doesn't work properly and needs replacement.

(3) The positions of characters and symbols are not appropriate and needs adjustment.

(4) The length of sides of plates is inconsistent. Please adjust the plate's position before its clamped.

(5) The timing belt is too tight. Please loosen it a little bit.

10.11 Needle Is Unresponsive When Controller Is Powered On.

(1) The marking software hasn't been installed properly. Please reinstall.

(2) The circuit board in the marking controller is broken. Please replace the circuit board or the entire controller. Working with electric wires when powered on should be avoided, otherwise the circuit board is more likely to be damaged.

(3) The controller is not connected properly to the main machine of the computer, or the parallel output of the computer is broken.

10.12 Messy Traces of Needle Movement

(1) The screws for connecting the timing belt to the marking machine head's base or the machine head to its base are loose and need to be tightened.

(2) There's debris on the rectangular rails or the grease has be used up. The solution is to clean the rails with kerosene and lubricate with white high-grade grease or engine oil (butter shouldn't be used in any case).

10.13 Electric Leakage

There's electric leakage from the computer during the operation, because its power socket hasn't be grounded well. The solution is to ground the power strip, the exterior of the main machine of the computer or the marking machine.