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MK11 Automatic Button Shank Wrapping Machine



Service manual for:

Serial No. MMS MK 11-1060 Onwards

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Button Securing System

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1 Safety Instructions

1. Do not operate the machine without all safety guards and doors in place.
2. This machine must only be operated by persons who have been fully instructed to do so.
3. This machine must only be used for the purpose it was designed for.
4. When carrying out any maintenance work or exchanging any parts ensure that the electricity and air supply to the machine are disconnected wherever possible. In certain cases it is helpful to check parts or settings with the power on – **TAKE CARE NOT TO BURN YOURSELF ON THE HEATING FORK – IT IS VERY HOT !**
5. Maintenance work must only be carried out by suitably trained and qualified people.

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2 Introduction

2.1 Important notes

To avoid any possible damage to the machine or trouble with it, the following instructions must be followed:

1. Before connecting the machine to the electrical supply ensure that the supply voltage is single phase between 100 and 240 v.
2. Before connecting the machine to the pneumatic supply, ensure that the air is free of excess water and is able to supply at least 1 metre cubed/hour (0.7 cfm) at 5 bar minimum.
3. Check that all parts appear to be in good condition.
4. Check that all necessary parts are lubricated.

2.2 Routine Maintenance

In order for the mk.11 to work efficiently the heating fork requires regular cleaning. The frequency of this depends upon the number of buttons wrapped per day but as a guide this should be done every 10,000 cycles (approximately once a week). To do this disconnect the power from the machine and remove the top cover and then the front stainless steel cover. The heating fork will still be hot but this will aid the cleaning process TAKE CARE NOT TO BURN YOURSELF! Clean up the front and rear faces of the fork and also the internal faces of the bonding nose. The residue can be scraped off using a metal object such as a small screwdriver.

The only parts that require lubrication are:

Linear bearings that carry the heater and the wrapping assembly - Lightly oil once every two months.

Centre rod that the button support hook is fastened to - Lightly grease once every two weeks.

Button support 'T' pusher – lightly grease once every two months.

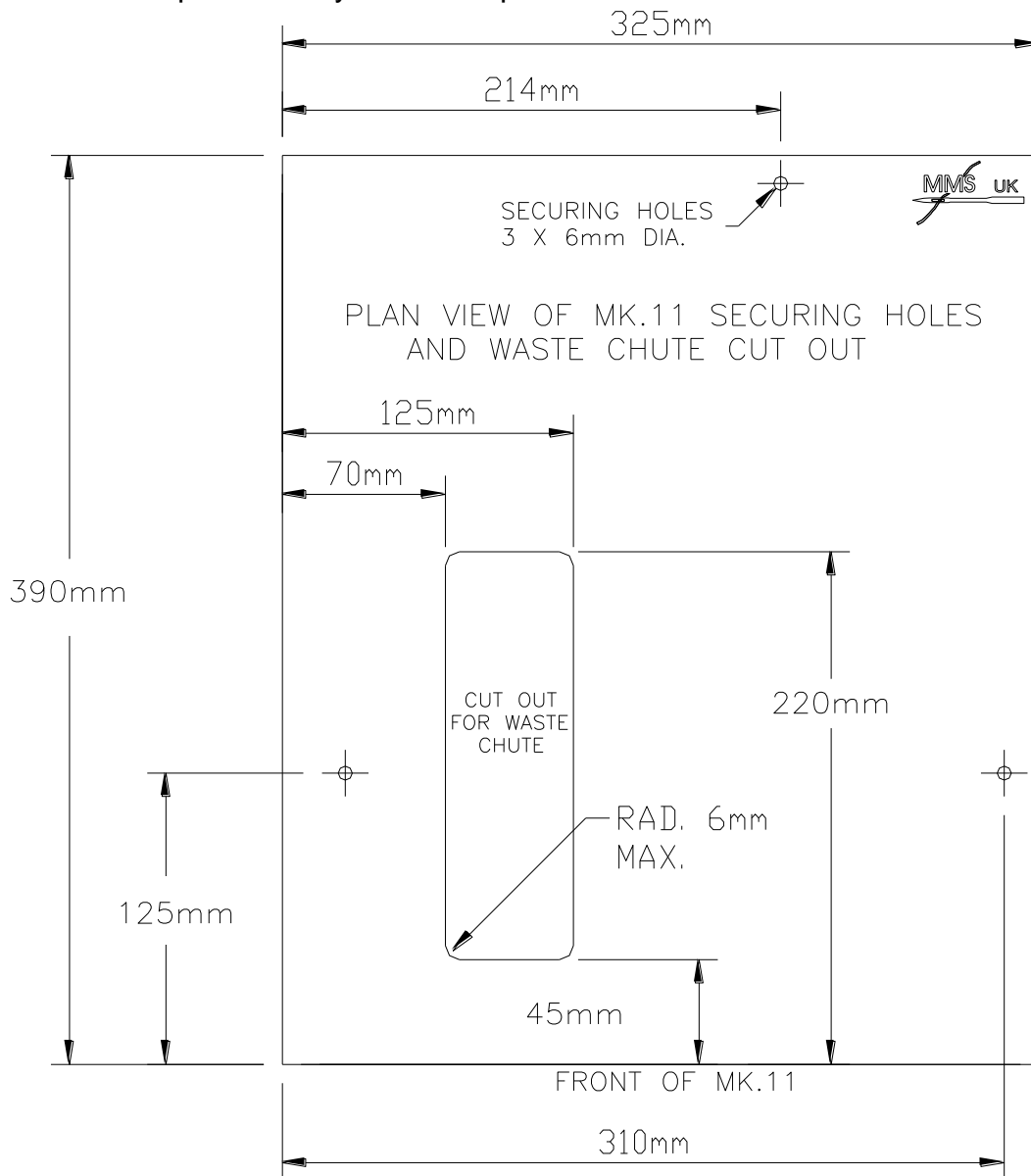
The only other routine maintenance that should be required is cleaning. Every 10,000 cycles (or every week) remove top and front covers and remove any excess thread waste pieces that may not have been removed by the venturi. At this time clean all working parts and check their condition. Any worn parts should be replaced immediately.

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2.3 Installation

The MK11 machine is designed to be used either as a freestanding unit or as a tandem installation incorporated next to a button sewing machine.

Freestanding installation – place the machine onto the table in the desired position. Disconnect the power from the machine and remove the top cover. Locate the three holes in the base of the machine and secure through these. The waste is ejected through the chute under the machine and in order for this to work efficiently a hole must be cut in the table top. Cut the hole to the dimensions below. The lower chute may be fitted under the machine to direct the waste pieces away from the operator



2.4 Thread type

MMS UK button securing machines have been developed to use heat seal TF elastomeric thread. So that the optimum speed, button security and efficiency is achieved during each cycle it is recommended that the original MMS TF thread is used. The use of other thread may cause performance problems and damage to components. For these reasons the warranty may be void if non MMS thread is used.

Heat sealed button security

The shank of the button attachment is the most stressed part of the garment and therefore to prevent button loss this shank must be reinforced.

TF (TF = thermofusion) thread is specially designed for button wrapping with securing effect. The unique elastomeric gripping force and the heat sealing are the key to button loss prevention as the thread permanently squeezes the attaching threads. The button is secured and the slim button shank prevents the button holes from bulging and the button has a clean finish and tail free shank

The MMS TF thread

Strong heat sealing layer

- Bonds wrapping threads together
- Eliminates loose ends and tails
- Prevents loosening during use

Coloured component

- Increases overall strength
- No colour fading due to washing
- 60 colours

Flexible elastane core

- High flexibility
- Unmatched grip
- Resistant to washing fatigue
- High internal strength
- 330% elasticity

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3 Control System

The control system has been specifically designed for the MK11 and therefore provides a versatile method of selecting the desired variables in order to achieve a perfectly wrapped shank. (To enter the settings read 5)

3.1 Display

The mk.11 is fitted with a touch screen display. Through this display all machine functions can be controlled and other features such as counters and the system tests can be accessed.

All features can be accessed by pressing the electronic buttons on the display.

3.2 Description Of Button Functions

- Buttons **1 to 3** - These buttons are used to select any of the three available programs.
- Button **P** - This is the program button which is used to reset the batch counter or, by holding it down for more that 1 second, access all programming options and the total cycle counter.
- Arrow Buttons - These arrow buttons are used to change the number of wraps in a specific program or to alter any of the options in any selected program.

Batch counter (number in top centre of display) – this counter can be reset by pressing the number.

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3.3 Basic Programming

Three programs are available to store options. Any of these programs can be selected by pressing one of the buttons 1 to 3. Once the desired program has been selected its number will be indicated on the left hand side of the display (P1, P2 or P3).

In the selected program it is possible to alter the number of wraps by using either the arrow up or the arrow down buttons. The selected wrap quantity is displayed at the end of the arrow which points to the shank. In each program it is possible to store functions for wrapping one of three different types of shank. These shank types are:

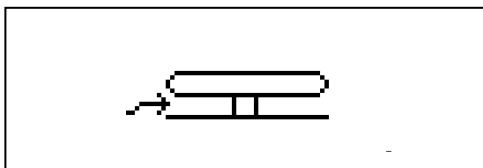
Short shank - This should be selected when wrapping regular length shanks (less than 5mm in length).

Long shank - This option should be selected when wrapping long shanks (more than 5mm in length). When this option is selected the button support will automatically collect and hold the button during the wrapping cycle and the wrap variation will automatically function.

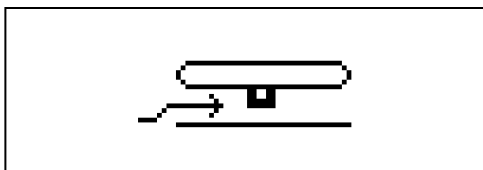
Shank button- This option should be selected when wrapping buttons with an eyelet at the back such as blazer buttons. With this option selected the button will be supported during the wrapping cycle to enable only the attaching threads to be wrapped and not the eyelet.

To alter the button type in a program, first ensure that the correct program has been selected. Then press the P button for more than 1 second. The display will then show a picture of a short shank button. To select another type use the arrow up button to scroll through the options.

These options are:

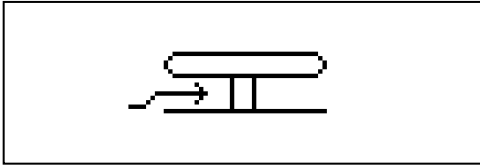


Short shank program (screen 1)



Shank button program (screen 2)

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Long shank program (screen 3)

Once any of the standard shanks has been selected then press the P button. This will return the display to its run mode. With the normal long shank program (screen 3) the machine will automatically calculate an even outward and return number of wraps. If the long shank variable program is selected then when button P is pressed other options will then displayed in order that a customised program can be entered in order to achieve a special wrapping requirement.

Three further variables are available via the following screens which are accessed each time button P is pressed.

3.4 Counters

The machine has two counters. On the top of the display is a batch counter. This counter increments every time a button is wrapped. It can be reset at any time by pressing button 'P'. The other counter is a machine cycle counter which cannot be reset. It can be viewed by pressing button P. The counter number will be displayed. To return to the run mode press button 'P'.

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4 Advanced Programming

1 Set language

The mk.11 can be set so that it displays either English, German. Changing this can be done as follows:

1. Press and hold button 'P'
2. Press button '3' for advanced setup.
3. Press button '1' for set language.
4. Select the language by pressing either button 1 (English) or 2 (German) or 3 (Italian). Press button 'P' to save the value and then press this button two more times to return to the run menu.

2 Set seal time

The temperature of the heating element is fixed at the optimum temperature for bonding the Ascolite TF thread. The only adjustment that can be made is the length of time of bonding. The recommended time is 0.6 seconds but if extra bonding time is required then this can be increased in 0.1 second steps up to a value of 1 second. It must be remembered however that any increase in bonding time will automatically increase the cycle time.

Press and hold button 'P'.

Press button '3' for advanced setup.

Press button '2' for Set seal time.

The time is shown as a value of between 0.5 and 1 second. To alter the time use the arrows. Press button 'P' to save the value and then press it two more times to return to the run menu.

3 Code lock

The code lock function is a facility that enables the keypad to be locked. With this option displayed if button number 1 is press then the function can be turned off or on. If the code lock is on then when prompted the keypad buttons 1 3 1 should be pressed in that order. All programming facilities can then be accessed.

4 Start Delay

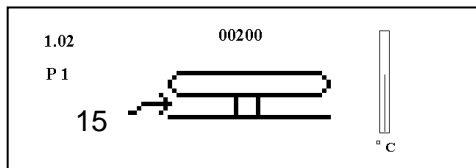
When working with the shank button and long shank programs it may be desirable to have a Delay between the time that the start switch is pressed and the point at which the button support engages the button. This time can allow for awkward button to settle into the support. The delay can be adjusted between 0.0 and 1.0 seconds.

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4.2 Program Examples

1. Desired function - short shank, 15 wraps, program 1.

Select program 1 by pressing button 1 (P1 will be displayed).
Use the + or - to select 15 wraps (shown on display).
Press button **P** and then press '1' for program edit.
Using the + or - buttons select the short shank picture.
Press **P** button twice.
The display will show:

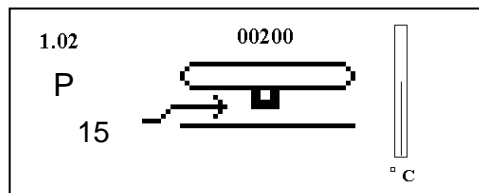


2. Desired function - Long shank, 50 wraps, program 3

Select program 3 by pressing button 3 (P3 will be displayed).
Use the + or - to select 50 wraps (shown on display).
Press button **P** and press '1' for program edit.
Using the + or - buttons select the long shank picture.
Press button **P** twice.

3. Desired function - Blazer type button, 15 wraps, program 2

Select program 2 by pressing button 2 (P2 will be displayed).
Use the + or - to select 15 wraps (shown on display).
Press button **P** and press '1' for program edit.
Using the + or - buttons select the shank button picture.
Press button **P** twice.
The display will show:



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4.3 Approximate values for different button types:

Normal buttons

Shank Length (before wrapping)	Number of Wraps	Button Type
2.5mm	10	⌘
3mm	15	⌘
4mm	25	⌘
5mm	35	I
6mm	45	I
7mm	55	I
8mm	63	I
9mm	71	I
10mm	79	I

Blazer type button

2mm	15	⌘
-----	----	---

note : this program can be used for short shanks also such as on a shirt to produce a more erect shank. If this program is to be used then the minimum shank length prior to wrapping must be 3.5mm. This extra 1mm is to allow for the thickness of the button support when bonding the shank.

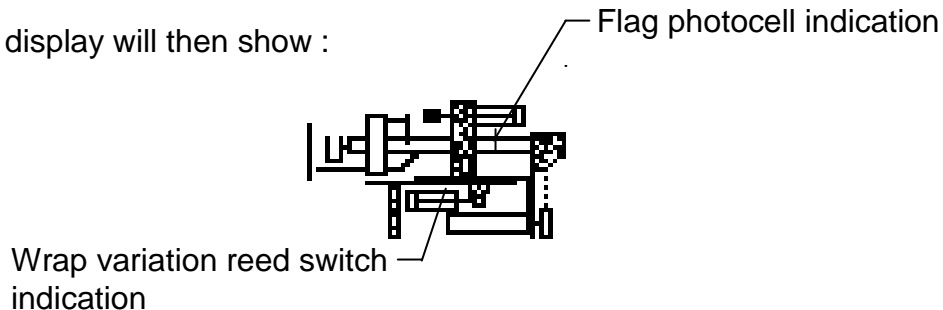
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4.4 System test

The control system has the facility to check all inputs and outputs.

To access this facility press 'P' until the menu appears on the screen. Press button 2 (system test).

The display will then show :



With this picture displayed pressing the screen in the appropriate place will test the following features (with the air on):

- 1 - Button support
- 2 - Wrap variation cylinder
- 3 - Motor

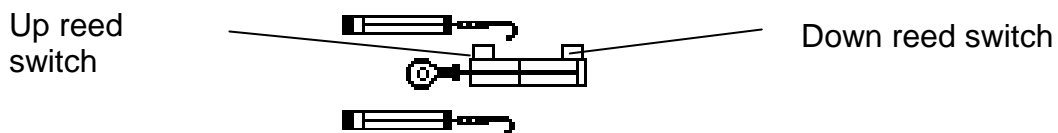
Also in this menu the following inputs can be checked :

Flag – Rotate the centre tube and observe the flag indication on the display. It should flash off and on as the photocell is blocked or unblocked by the flag.

Wrap variation switch – With the air switched off move the carriage forward and backwards. The red LED on the wrap variation cylinder should illuminate when the carriage reaches the front of its stroke and also the reed switch indication on the display should fill in black.

To reach the next screen (hooks and up/down cylinder) press the + button.

The screen will then show :



With this picture displayed pressing screen in the appropriate place the hooks and the up/down motion can be checked.

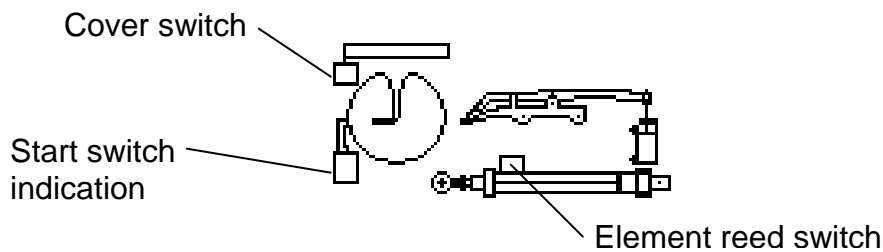
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4.4 System test

Also in this menu the up and down reed switches can be checked. This is done by turning off the air and moving the hook assembly to its down position. The red LED closest to the rear of the machine on the cylinder should illuminate and the down reed switch indication should fill in black. The up reed switch can be checked by lifting up the hook assembly to its top position and observing the front LED and also the indication on the display. These tests can be done with the air on by actuating the cylinders by pressing the screen.

To reach the next screen (heating fork) press the + button.

The screen will then show:



With this picture displayed (and with the air on) pressing the screen in the appropriate place will test the seal mechanism by sending the heating fork to the bonding position and also the seal clamp mechanism. With the fork in the 'in' position the fork cylinder reed switch can be checked. It should be illuminated red and also the black box on representing this on the display should also be filled in.

Also in this menu the start switch and cover switch can be checked. If either is operated then the indicator on the display will fill in black.

To return to the run menu press 'P' twice.

5 Operating Instructions

5.1 Switching On The Machine

To switch on the machine first turn on the air supply switch. This is the blue headed twist switch mounted on the right hand side machine.

The power should then be switched on by pressing the switch that is mounted on the back face of the machine. The machine will then be in warm up mode and the display will indicate that the warming up process is taking place.

The machine will not run until it has warmed up to the required running temperature. For maintenance purposes the machine can be run before the optimum temperature is reached by pressing and holding down the start switch and then pressing any button on the display.

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5.2 Threading Procedure

Before wrapping a button shank for the first time it is necessary to check that the machine is correctly threaded up and also that the desired program is selected (by viewing display).

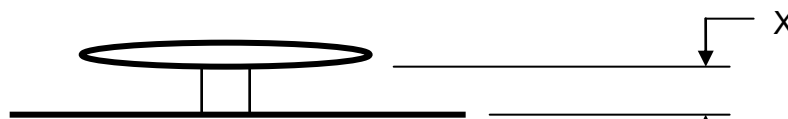
1. Lift up the centre wrapping cover. This will automatically cause the hook to release the thread and the tension device to rotate to the top position.
2. Release the tension cap by gently pulling it forward and then pull it forward and hooking it over the ledge in the whipping plate.



3. Remove any thread that may remain in the tube.
4. Hold the thread to be loaded in your right hand so that approximately 400mm hangs loose.
5. Position the end of the thread over the polished thread entry point and press the start switch lever (or the touch screen if the machine has been set up this way).
6. Whilst keeping the blower button pressed allow the end of the thread to be sucked into the machine and then slowly lower your right hand until the thread appears out of the tension device. Release the blower button.
7. Hold on to the end of the thread and replace the tension cap.
8. Whilst still holding the thread, close the top cover. Immediately after the catching cycle has finished (within 2 seconds) pull the loose end of thread to break off the excess. The machine will now be ready to run.

5.3 Minimum Shank Length

In order to achieve a consistently high standard of button shank wrapping it is essential that the shank length is of sufficient length. This is a simple setting on most button attaching machines.



With reference to the above diagram the minimum shank lengths before wrapping are as follows : (note – add 1mm to these values if the button support is used)

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With the narrow 1.5mm heating fork
(1.5mm fork is normally used for shirt button wrapping)

X = 2.5mm

With the standard 1.8mm heating fork
(The 1.8 mm fork is normally used for jacket and coat buttons
and is fitted as standard to the MK11 machine)

X = 3 - 4mm

5.4 Wrapping a shank

Once all the options have been entered and saved into a program it is then possible to select a program and wrap a shank. First select the program by pressing the relevant button. Then insert the shank to be wrapped into the slot in the whipping plate. When the shank reaches the bottom of the slot the start switch will be actuated and the machine will automatically start.

If the long shank or blazer button features have been selected then the button support hook will be activated. This hook supports the button during the wrapping cycle which is essential on long shanks and on blazer type shank buttons. When using these features ensure that the weight of the garment is supported or it is held in such a way that there is no tension on the button as the button is supported with low force during the wrapping cycle from inside the machine and any undue pulling force could alter the result. When wrapping shanks without backing buttons which are attached to very lightweight cloth a different operating technique should be used to prevent the cloth being pulled through the slot during wrapping. One technique that can be used is to press the cloth against the plate at the bottom of the slot with a thumb.

5.5 Control system access

It is possible to protect the program settings from being altered by unauthorised people by using an access code system. This can be enabled as follows :

Press button 'P'

Press button 3 (Advanced setup)

Press button 3.

Press the + or – buttons to turn the function on or off.

With code “on” the only change that is allowed is a change of program (by pressing buttons 1,2 or 3).

Altering wrap quantity or Editing Programs - First select the desired program and then press either the arrow up or down. The screen will then display 'ENTER ACCESS CODE'. Enter the code 131 and then change the number of wraps using the arrows. Save the value by pressing button 'P' or by running a cycle.

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6 Settings

6.1 Removing the covers

For some of the maintenance tasks it is necessary to remove one or more of the main machine covers. Before this is done power should be disconnected from the machine and it should be left for at least 10 minutes to for the heater to cool down. Then the screws holding the relevant panel can be unscrewed.

Caution – some settings need to carried out with the power on – take care as the heating fork is very hot!

6.2 Carriage movement

The carriage is moved forward and backwards by the cylinder mounted to the right of the wrapping assembly. The stroke of this cylinder is 10mm and it is important that it is able to use nearly all of this stroke. The carriage parks against a stop in its forward position. In this parked state the cylinder must apply a pushing force. Check this setting by loosening the locknut on the carriage cylinder and winding the piston into to rod end bearing. Pull the carriage to the front position and then wind the piston out of the bearing until the carriage rests against the stop. When it does wind the piston one more complete turn and then tighten the lock nut. When this setting is done the carriage should be allowed to travel 9.8mm.

6.3 Button support

The important setting for the button support is that it just touches the whipping plate when it is in its forward position. Before making any adjustment first check that the position of the nylon pusher on the cylinder which pushes the button support forward is correct. There should be between 0.5 and 1mm of clearance between the nylon and the pusher (103660). If this is not the case then loosen the locknut on the cylinder piston (102025) and rotate the nylon pusher until the setting has been achieved. Lightly retighten the locknut.

To adjust the position of the button support turn off the air and then locate the cylinder that moves the carriage forward and backwards. Loosen the lock nut on the piston and screw the piston in one direction or the other in order to achieve the desired setting. Finally check the setting with the air switched on.

The button support assembly (103650) is mounted onto the end of the thread tube. Behind this is the plastic thread tube clamp (102040) which clamps onto the thread tube and acts as a bearing for the button support pusher (103660) and also as a support for thread tube. In order that the button support works efficiently it is imperative that the pusher slides freely inside the plastic support. To achieve this the plastic clamp must be aligned with the slots on each side of the metal centre tube so that the

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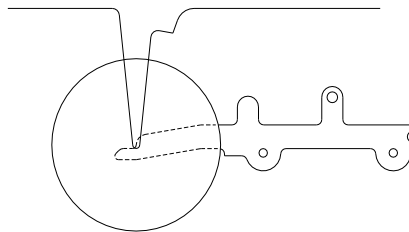
metal pusher rod does not bind in the slot when it is pushed. To achieve this setting loosen the locking screw and twist the centre tube inside the plastic clamp until the desired setting is achieved. To ensure that the pusher continues to function efficiently a small amount of grease should be applied to the part of the metal pusher that slides inside the plastic clamp.

6.4 Heater

The heater has four adjustments. Vertical alignment with the bottom of the whipping plate slot, stopping position of the fork in relation to the button shank, the clearance of the fork from the whipping plate and the gap between the top and bottom jaw.

To check these adjustments first, via the system check menu, set the fork output. The heating fork moves to the left to its bonding position. In this position the top edge of the fixed brass fork leg should be level with the bottom of the slot in the whipping plate and the shoulder of the brass fork should be central in the slot.

View of the heating fork
in its bonding position
(without button shank).
*This view is from the
front of the machine.*



The correct vertical adjustment is achieved by loosening the four screws which hold the assembly to the linear bearing and lifting or lowering the assembly to achieve the setting. The left/right adjustment is made by loosening the locking nut (1) on the horizontal movement cylinder. Then turn off the air supply at the side of the machine and screw the piston rod either clockwise or counter clockwise until the desired setting has been achieved. Turn the air supply back on and recheck this setting. Mounted on the left/right movement cylinder is a reed switch which indicates to the controller when the assembly reaches its bonding position. With the assembly in its far left position the red led should be on.

The top pressure arm should lift up so that there is a 4mm gap at the point it goes over the button shank. To achieve this setting turn off the air supply and screw the piston of the pressure cylinder in or out of the clevis.

In order to ensure that the wrapping is tail free there should be between 0.2 and 0.5mm between the heating fork and the whipping plate. This setting is achieved by loosening the 3 screws which secure the fork assembly to the main frame and moving the assembly.

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6.5 Hooks

In order for the catcher hooks to work efficiently they must be in perfect condition, free from any sharp edges and be set so that they make a good clamping contact with the stop pin (4). The hooks must be highly polished. If the hooks are damaged and a good clamping contact on the thread cannot be achieved then they must be replaced.

First the hook clamp (1) must be adjusted correctly on the piston (2). With a hook fitted the hook clamp must be orientated correctly so that the hook seats perfectly onto the pin. To achieve this setting loosen the locknut on the cylinder piston and rotate the hook clamp as desired.

Another adjustment which relates to the hooks is the top and bottom stop positions. The top position is fixed by a permanent stop however the pneumatic cylinder that moves it must be set so that the lower hook position is correct. With the air supply turned off move the hook assembly to its lower and extend the hooks. Loosen the locking nut on the cylinder piston and rotate the piston until there is a gap of approximately 8mm between the top of the hook and the top plate that holds the thread blowers.

If a hook is removed for checking or replacement then it must be replaced so that it comes against the pin cleanly. To achieve this setting reattach the hook but leave it loose. With the air supply turned off pull the hook into its closed position and hold it tightly onto the pin. In this position tighten the two fastening screws.

Mounted under the hook cylinder is the main cylinder that moves the unit up and down. Two reed switches are mounted on the cylinder to indicate to the controller when the assembly is in its top and bottom position. The red led's should light on the relative switch when the assembly is either up or down. The rod end on this cylinder must be adjusted so that the hook assemble can come to rest on its stop.

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6.6 Flag

In order for the machine to be able to count the number of wraps and stop in the correct position, it is fitted with a photocell and flag to provide rotational information to the controller. This flag must be set correctly so that the machine hooks can catch the thread reliably.

To check the stopping position run the machine once and then observe the position at which the thread guide tube stops. After the final reversing movement, it should stop at the 6 O' clock (lowest) position when viewed from the front of the machine. If it does not then remove the top cover and locate the aluminium flag which is mounted on the centre tube. Loosen the grub screw and then hold the flag whilst rotating the centre tube until the thread guide is in the 6 O'clock position. Ensure that the flag is pressing the bearing and the centre tube is pushed back against its collar (to prevent axial movement of the centre tube) and then tighten the grub screw. Replace the cover and run the machine to check the setting.

6.7 Motor/Gearhead/Encoder

The motor, gearhead and encoder should give reliable service if all conditions are correct. Should any part become faulty then the complete motor unit including the bracket and pulley must be replaced. To do this first remove the top cover then undo the two screws which hold the motor bracket to the whipping carriage. Unplug the motor and encoder wires from the circuit board and remove the motor assembly. Reverse this procedure in order to fit the new motor/gearhead assembly. After reassembly of the machine check that the motor is rotating the correct way. When viewed from the front of the machine the thread tube should rotate clockwise. If it does not then reverse the motor wires where they connect to the circuit board.

6.8 Belt Tension

The drive belt should be tensioned so that it has a between 2 and 5mm of free play at mid distance between the two pulleys. Adjustment can be made by loosening the two 4mm screws that hold the motor bracket in place and rotating it in its slot.

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6.9 Tension Device

The tension device fitted to the MK11 is a robust unit that should give trouble free service. To ensure this good service the parts of the assembly must be kept clean and free from any rough edges or faces.

Tension Adjustment

The tension adjustment is very sensitive and should only be adjusted a small amount (approx. 0.5mm movement of locking collar) each time. Testing the tension should be done by wrapping a button shank as the tension is slightly different at full wrapping speed.

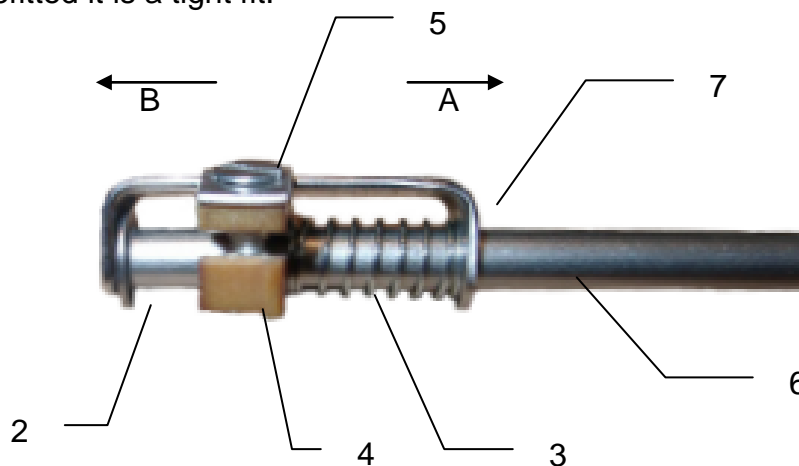
To increase the tension first loosen the locking screw (5) then carefully slide the slide clamp in direction "A" and tighten screw (5). Take care not to overtighten the locking screw as the tube could be distorted. To decrease the tension carry out the same procedure except move the slide clamp (4) in direction "B".

Removal of a damaged tension device

To remove a tension device first loosen locking screw (5) and then pull the slide clamp (4) in direction "B" until the pipe end cap (2) is forced off the end of the thread tube (6). Then the complete assembly can be slid off the tube.

Refitting of a new tension device

1. Ensure that the lock screw(5) in the slide clamp(4) is loosened and fit the tension cap slide assembly(7) over the thread tube(6) together with the spring (3) as shown.
2. Press the pipe end cap(2) into the end of the thread tube. If it is a loose fit then remove it and carefully squeeze the end of the tube with a pair of pliers so that when it is refitted it is a tight fit.



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6.91 Thread load venturi

The venturi is mounted on the back of the whipping carriage its purpose being to blow the thread through the thread tube when threading the machine up. To work efficiently it must be clean and free from any sharp edges inside.

Occasionally the venturi or thread tube may become clogged with thread (especially if the machine is run with thread in but no button). To clear it out remove the top and locate the venturi which is fastened by 3 screws behind the centre tube. Loosen these 3 screws and remove the venturi block for cleaning.

6.92 Waste ejection blowers

The Mk.11 is fitted with two blowers that eject the waste thread through the bottom of the machine. In order for this to work efficiently the machine must be positioned over a hole in the table top. The dimensions of the table cut out are shown in section 2.3. A waste chute can be found in the accessory kit which fastens to the underside of the machine. The purpose of this is to direct the waste away from the operators legs. The waste pieces should be allowed to drop into a container.

6.93 Thread Tube

The thread tube must be in good condition without bends and set the correct distance from the front dimple plate. If it is bent out of shape it may be possible to bend it to its original shape. If it is beyond repair then it must be replaced. To achieve the correct distance from the dimple plate ensure that the machine is in its basic short shank program and then lift the cover to access the thread tube. Rotate the tube and check that there is a gap of 2.5mm between the end of the tension device and the inside of the dimple plate. If adjustment is required loosen the m3 screw in the plastic thread tube holder.

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7 Pneumatics

The machine is equipped with state of the art pneumatics which should prove to be extremely reliable under normal conditions. To achieve this reliability the supply to the machine should be a minimum of 5 bar. and a maximum of 10 bar. This air supply should be relatively free of moisture. A filter regulator is mounted inside the machine which will drain off a certain amount of excess moisture. Note – the filter cannot drain large amounts of water and using air supply that is too wet will damage the machine.

7.1 Valves

The MK11 is fitted with eight 24v spring solenoid valves. They are mounted inside the machine to the right hand side. As viewed from the front of the machine the valves functions are as follows :

Valve 1 (closest to the front of the machine)	=	Hook -left
Valve 2	=	Hook - right
Valve 3	=	Hook holder – up/down
Valve 4	=	Threading up blower
Valve 5	=	Heating fork - in/out
Valve 6	=	Heating fork clamp
Valve 7	=	Carriage
Valve 8	=	Button support

Each valve can be manually overridden by pressing the blue button on the specific valve (ensure that the electrical power is switched off when carrying out this test).

7.2 Pressure Control

The main air pressure is pre-set in the factory to 5 bar. This can be checked by viewing the pressure gauge on the back of the machine. If it is incorrect then first turn off the electrical power to the machine and leave it until the heating element has cooled down. Remove the top machine cover and locate the pressure regulator. Lift up the black plastic knob and turn it until the 5 bar is showing on the gauge.

7.4 Wrap Variation Cylinder

The adjustment of the two flow controls on this cylinder is quite critical as the speed that this cylinder moves determines the even spread of the wraps on a shank. The simplest method of checking and setting these flow controls is to wrap a long shank (with long shanks selected in the program and with the variation time set to an excessive amount-about 2 seconds). The flow controls restrict the exhaust and should be set so that an even slow movement is achieved in both directions.

8 Electric's

8.1 Supply Voltage

The supply voltage should be between 100 and 240 volts (50-60Hz) single phase. The machine is equipped with a high quality in line filter to reduce any effect from electrical spikes. This filter however cannot cope with extreme surges therefore the supply to the machine should be relatively "clean". It is also important that the ground is connected.

8.2 Seal Cylinder Reed Switch

So that the thread is bonded for the exact amount of time that is programmed, a reed switch is fitted to the seal cylinder. This switch should be positioned on the cylinder so that it switches at the end of its stroke (red LED lit).

8.3 Wrapping Carriage Forward Reed Switch

A reed switch is fitted to the wrap variation cylinder (mounted horizontally to the right of the wrapping carriage) so the machine can detect when the carriage is in the 'home or forward' position. This reed switch should be mounted towards the front of the cylinder so that the red LED. comes on when the cylinder reaches its front stop.

8.4 Down Reed Switch

A reed switch is fitted at the rear end of the pneumatic cylinder (furthest from the front of the machine) which moves the picker holder up and down. This switch gives the signal to the controller to open the hooks so that the thread is ejected. It should be mounted so that the red LED lights when the hooks reach there bottom position.

8.5 Up Reed Switch

A reed switch is fitted to the front end of the pneumatic cylinder which moves the picker holder up and down. The switch should be mounted onto the cylinder so that the red LED lights up when the hooks are in the top position.

8.6 Fuse

The main voltage fuse is situated under a flap in the filter (where the power lead plugs into the machine). The rating of this fuse is 1.6 amp.

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8.7 Heating Element

The heating element has a life of approximately one year. This can be less if the machine is run for 2 or 3 shifts per day or the power is left on overnight. To change the element turn off the power to the machine and allow it to cool (10 minutes). Remove the right hand front cover to gain access to the element. Loosen the screws in the terminal block that hold the element harness and cut of the tie wraps that secure it. Then, using a 1.5mm hexagon key, loosen the grub screw in the heating fork and slide out the element. Reverse this procedure to fit a new element.

8.8 Thermal Sensor

A thermal sensor is fastened to the insulated heating fork holder. This sensor is constantly checked by the control system to ensure that the temperature of the heating element remains above the recommended sealing temperature. If it requires changing then first turn off the power and wait for the element to cool for at least 10 minutes. Then remove the right hand front cover to gain access to the fork assembly. Loosen the screws in the terminal block that hold the switch harness and cut of the tie wraps that secure it. Unscrew the sensor from the insulator and remove it. Replace it with a new assembly and reverse the procedure for reassembly.

8.9 Installing New Software

New versions of software are developed to provide improvements to existing features, new features or correction of software errors. Each program is held in a memory chip on the circuit board which can be overwritten by connecting the machine to a computer with a special usb cable and then following the procedure to install a new program from the internet or a disc. The software loader and the latest version of program can be found on the mms website (www.mmswebsite.com)

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9 Trouble Digest

Fault	Cause	Solution
Machine is not running when start switch is pressed	No electrical power to machine. Faulty power supply. Faulty start switch. Faulty motor or motor supply. Jammed gearbox, belt etc. Faulty photocell.	Check supply and main fuse. Check 24v power supply. Check start switch via. Input check. Check 24v motor supply and then motor. Check for free spinning of mechanism Check photocell and its connections.
Hooks are not catching thread	Motor stopping position incorrect Hooks damaged or set incorrectly.	Check flag settings (section 4) Check hook settings (section 4)
Thread breaks during wrapping.	Thread supply not free. Sharp edges on the tube rim, tension cap or hooks.	Check cone and routing of thread. Remove any sharp edges and polish.
Thread not caught by the hooks at the end of the cycle	Stopping position of thread tube incorrect. Hooks not clamping the thread correctly. Waste thread not ejecting	Adjust the flag (section 4) Check hook condition and setting (section 4) Clean hooks, check down switch position and venturi performance /setting (section 4)

MARK 11

Error Messages – MK.11

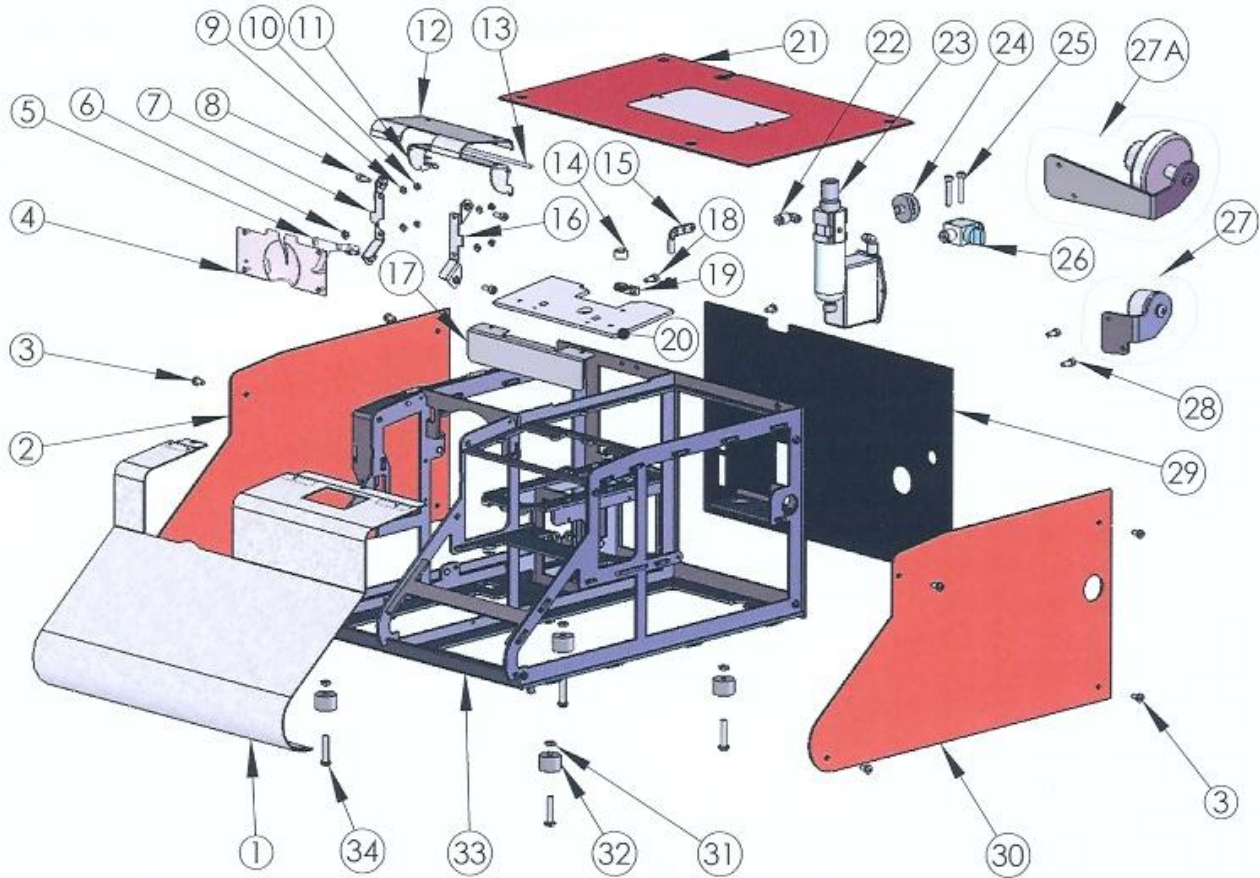
Error No.	Cause	Parts or settings to check
1	No signal from photocell	Photocell, photocell wiring, belt, pulleys, free running of motor.
2	No signal from temperature sensor	Sensor, sensor wiring, heating element, element wiring.
3	No signal from seal cylinder reed switch	Function and position of the reed switch (LED should be 'on' when the fork is to the left), wiring, free movement of seal mechanism, flag setting, setting of top flow control on the , air supply.
4	No signal from hook up reed switch	Reed switch at top of hook up cylinder, wiring, free movement of hook cylinder, setting of hook assembly bottom flow control, air supply.
5	Carriage not returning to the front position after wrapping	The position of the reed switch on the carriage cylinder, the free movement of the carriage, setting of front flow control on carriage cylinder, air supply.
6	Not receiving the hook holder down signal	The reed switch at the rear end of the hook assembly cylinder and it's wiring, free movement of the hook assembly, setting on hook assembly top flow control, air supply.
7	The hook assembly down reed switch is closed when it should not be	Position of the down reed switch, the wiring of the reed switch, free movement of the assembly, air supply.
8	The seal cylinder switch is on when it should be off	The reed switch and it's wiring, the free movement of the seal assembly, setting on the seal cylinder lower flow control.
9	Thread tube not reaching it's rest position-thread caught up	The free running of the thread into the machine, free movement of the thread tube, motor and wiring, pulley wheels and belt.
10	Touch screen fault	Make sure nothing is touching the screen, wiring or circuit board fault
11	Start lever jammed down	Free movement of the start switch lever, setting of the start switch, start switch wiring.
12	No signal from the carriage cylinder reed switch at the start of the cycle	The function and position of the reed switch on the carriage cylinder (LED should be 'on' when the machine is at rest), free movement of the carriage, front cylinder flow control setting, air supply.
13	Carriage reed switch not switching off during the running cycle	The function and position of the reed switch on the carriage cylinder, the setting of the cylinder rear flow control, air supply. The LED must go off during the wrapping cycle if long shank or shank button program is selected. This fault can occur if the shank button or long shank program is selected but actually a short shank is being wrapped preventing the carriage from moving.
14	Thread jammed	The free running of the thread into the machine, free movement of the thread tube, motor and wiring, pulley wheels and belt, end speed too low.
16	Motor jammed during home positioning	

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Error No.	Cause	Parts or settings to check
17	Motor jammed during first revolution	Free running of centre tube. Ensure tension device or thread tube are not touching anything. Motor should be free
18	Motor jammed while wrapping long shank	Free running of centre tube. Ensure tension device or thread tube are not touching anything. Motor should be free
19	Motor jam while wrapping short shank	Free running of centre tube. Ensure tension device or thread tube are not touching anything. Motor should be free
20	Motor jam while decelerating	Free running of centre tube. Ensure tension device or thread tube are not touching anything.
21	Motor jam when either hook is set	Ensure that the thread tube or tension device is not touching the hooks when they are out. Hooks may be loose or their top position may be too low (adjust on main cylinder). Thread tube may need bending out.
22	Motor jammed at the time the heating fork moves to button	Free running of the centre shaft. Check that the hooks do not touch the thread tube. Check that the speed restrictors are present in the air tubes to the heating fork cylinder.
23	Motor jammed	Free running of centre tube. Ensure tension device or thread tube are not touching anything. Motor should be free

MARK 11

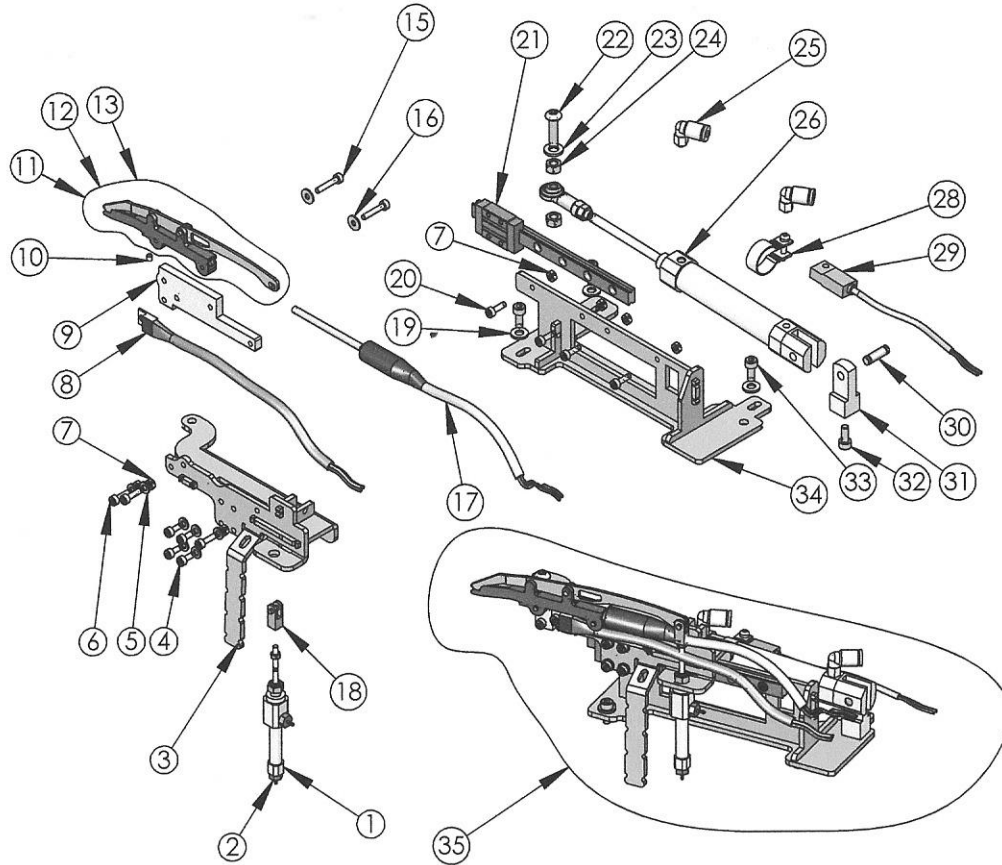
9.1 Main chassis assembly



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	109362	Front cover assembly	1	20	109526	Heat shield	1
2	109356	L/H side cover	1	21	109361	Top cover assembly	1
3	92130	Cover screw	1	22	10011	Elbow fitting	2
4	109055	Dimple plate	1	23	10095	Filter regulator	1
5	109445	Start switch actuator	1	24	10100	Pressure gauge	1
6	102130	Start switch pivot - plastic	1	25	91035	Screw pozi 4 x 20	2
7	109515	Dimple plate frame L/H	1	26	10056	Finger valve	1
8	92120	Screw 4 x 8	4	27	109435	Cone holder - standard	1
9	92100	Nut - 4	4	27A	109437	Cone holder - large cone	
10	92105	Washer - 4	4	28	92140	Screw 4 x 12	1
11	109500	Hatch frame	1	29	109360	Back cover	1
12	109505	Hatch	1	30	109355	R/H side cover	1
13	109510	Hatch pivot pin	1	31	93000	nut - 5	4
14	102150	Thread entry nipple	1	32	109870	foot	4
15	109830	Thread smoother	1	33	109610	Main chassis assembly	1
16	109520	Dimple plate frame R/H	1	34	93055	Screw pozi 5 x 12	4
17	109525	Heat guard - metal	1				
18	92415	Screw 4 x 16	2				
19	109831	Smoother clamp	1				

MARK 11

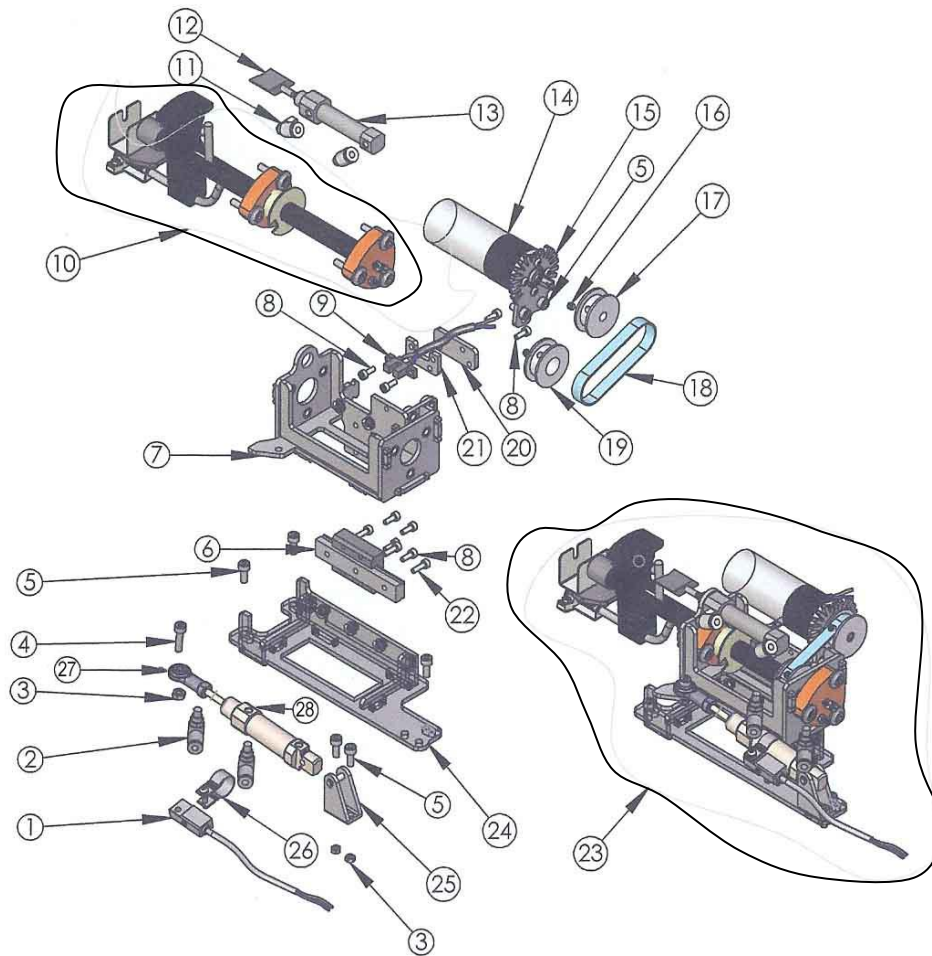
9.2 Heating fork assembly



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	109806	Cylinder – Fork close	1	17	109700	Heating element harness	1
2	102154	Nipple fitting	1	18	109815	Clevis assembly	1
3	109206	Heater bracket V2	1	19	92105	Washer - 4	3
4	90250	Screw 3 x 6	6	20	90250	Screw 3 x 8	1
5	90050	Washer - 3	4	21	102270	Linear slide	1
6	90260	Screw 3 x 12	7	22	93100	Screw 5 x 20 button	1
7	90000	nut -3	6	23	93005	Washer – 5	1
8	109705	temperature harness	1	24	93000	Nut - 5	1
9	109200	insulator	1	25	109716	Restrictor fitting 261	2
10	90200	grub screw 3 x 3	1	26	109904	Cylinder - fork	1
11			1				
12	109001	Heat fork–standard, wide button (36mm +)	1	28	102220	Switch band – 16	1
13	109006	Heat fork – wide, wide button	1	29	102035	Reed switch	1
				30	109915	Clevis pin	1
15	90265	screw 3 x 16	1	31	109910	Clevis	1
16	90006	washer 3 oversize	1	32	93035	Screw 5 x 10	1
				33	92105	Washer - 4	3
			2	34	109643	Mounting bracket – fork V2	3
			1	35	109900	Heating unit	1

MARK 11

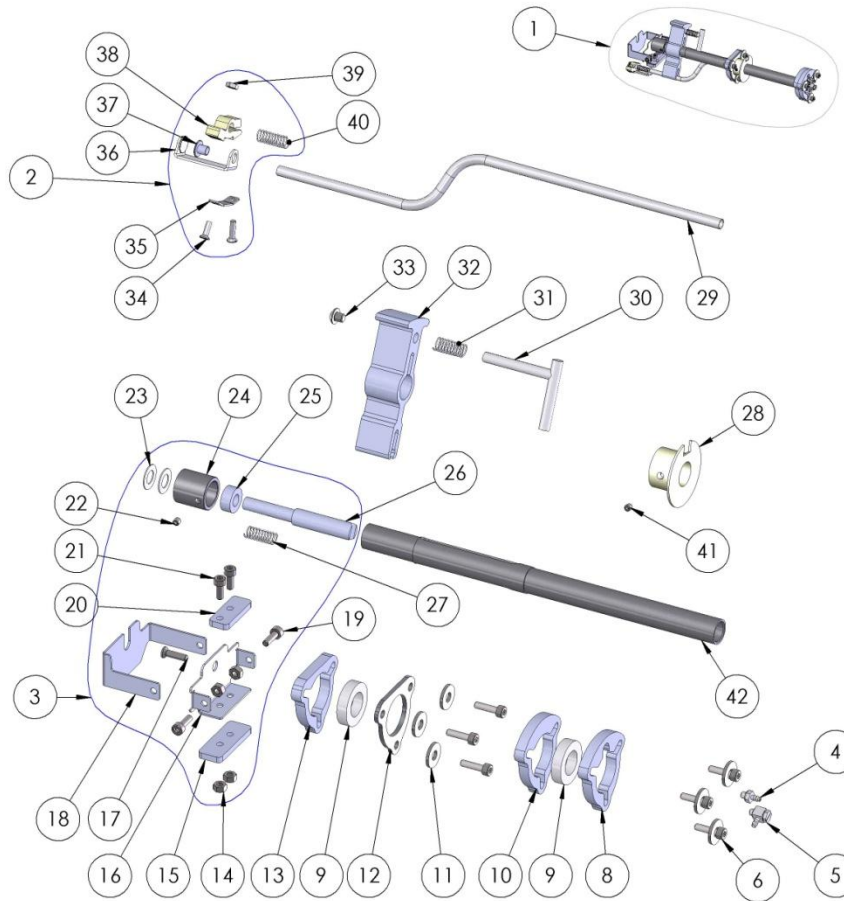
9.3 whipping head assembly



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	102035	Reed switch	1	17	109722	motor pulley	1
2	10025	Flow control out	2	18	109725	belt	1
3	92000	Nut - 4	1	19	101750	pulley wheel - small	1
4	92145	Screw 4 x 16	1	20	109017	Photocell back plate	1
5	92140	Screw 4 x 12	3	21	109016	Photocell bracket	1
6	102275	Linear slide	1	22	90025	Screw 3 x 8	4
7	109662	Whipping head carriage	1	23	92125	Screw 4 x 10	1
8	90025	Screw 3 x 8	4	24	109621	Whipping head base bracket	1
9	102350	Photocell harness	1	25	109710	Clevis – wrap variation	1
10	109640	Shaft assembly	1	26	102030	switch band – 10	1
11	10010	Elbow fitting	2	27	102325	rod end bearing - 4	1
12	103670	Nylon pusher	1	28	102025	wrap variation cylinder	1
13	10187	Air cylinder	1				
14	109632	motor	1				
15	109998	motor mount plate	1				
16	92200	grub screw 4 x 4	1				

MARK 11

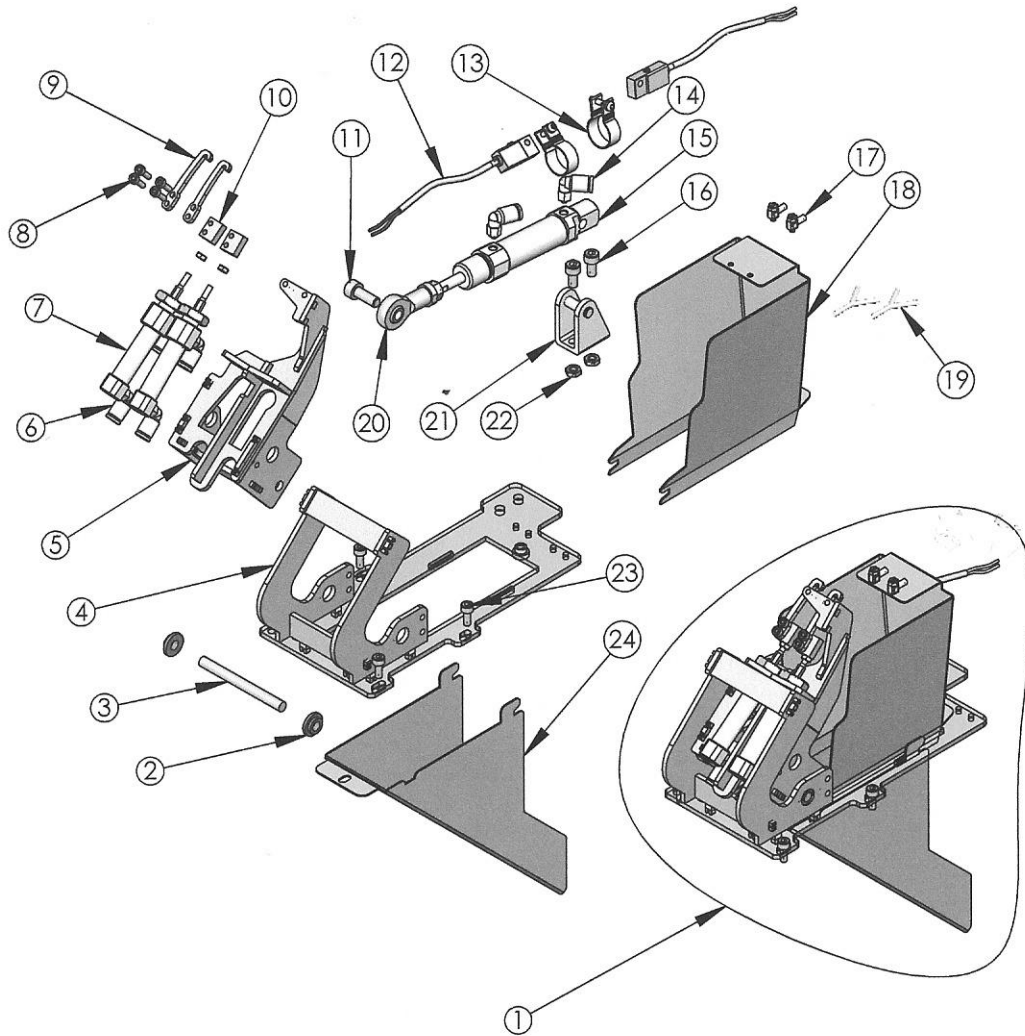
9.4 Shaft assembly



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	109640	Shaft assembly	1	22	90200	Grub screw 3 x 3	1
2	101226	Tension device assembly	1	23	103621	Spacer	2
3	103651	Button support assembly	1	24	103533	Bearing housing	1
4	102155	Nipple fitting	1	25	103534	Bearing – button support	1
5	109729	Thread blow fitting	1	26	103694	Shaft – button support	1
6	92165	Screw 4 x 20	6	27	103652	Spring – button support	1
7	109540	Venturi back plate	1	28	109618	flag	1
8	109541	Venturi spacer	1	29	109625	thread tube	1
9	109617	bearing	1	30	103660	pusher	1
10	109542	Venturi bearing housing	1	31	103653	spring	1
11	92105	washer	6	32	109627	thread tube clamp	1
12	109544	bearing securing plate	1	33	92250	screw 4 x 4	1
13	109543	bearing housing front	1	34	102180	tension device fixing screw	1
14	90005	nut - 3	2	35	102170	tension device top plate	1
15	102234	weight - lower	1	36	102160	tension device spine	1
16	102232	Button support back plate	1	37	103645	pipe end cap	1
17	90100	Screw 3 x 8	1	38	102165	tension device adjuster block	1
18	102231	button support front plate	1	39	102185	tension device fixing nut	1
19	90155	Screw 3 x 4	2	40	101390	spring – tension device	1
20	102235	Weight - top	1	41	92140	grub screw – 4 x 4	1
21	90030	Screw 3 x 10	2	42	101263	Centre Tube	1

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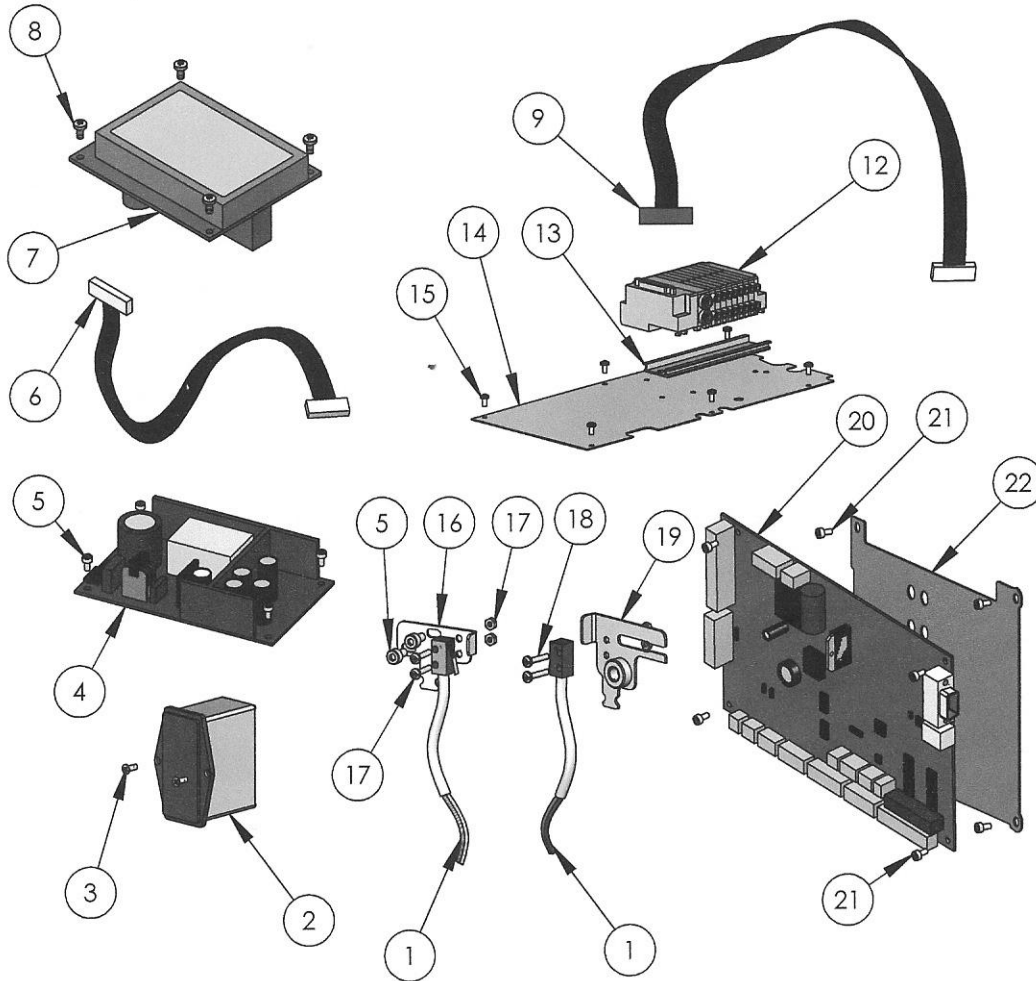
9.5 hook assembly



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	109631	Hook assembly V2	1	14	109714	Restrictor fitting 260	2
2	102370	Bush – 6	2	15	109768	Cylinder – hook up / down	1
3	109180	pivot pin	1	16	93035	Screw 5 x 10	2
4	109126	mounting bracket	1	17	109729	Thread blow fitting	2
5	109096	pivot bracket	1	18	109127	Waste chute - top	1
6	10010	elbow fitting	6	19	109718	Y fitting - 4	2
7	109108	hook cylinder - 11	2	20	102327	rod end - 6	1
8	90025	screw 3 x 8	4	21	109790	clevis	1
9	109065	Hook	2	22	93000	nut – 5	2
10	109105	Hook support block	2	23	92140	screw 4 x 12	4
11	94030	Screw 6 x 20	1	24	109128	waste chute - lower	1
12	102035	Reed switch	2				
13	102220	Switch band - 16	2				

MARK 11

9.6 electronic components



ITEM	PART NO.	DESCRIPTION	QUAN TITY	ITEM	PART NO.	DESCRIPTION	QUAN TITY
1	109882	Cover switch harness	1	13	109923	Exhaust block	1
2	103917	Switch unit mains - 2	1	14	109924	Solenoid valve-double wire	8
3	109150	Screw c/sunk 3 x 6	2	15	109925	Din rail	1
4	102452	Power supply	1	16	109365	Manifold mount plate	1
5	90020	Screw 3 x 6	4	17	92130	Screw sems - 4	10
6	109906	Ribbon cable-touch screen	1	18	109881	Start switch mount	1
7	109860	Touch screen	1	19	93035	Screw 5 x 10	2
8	97020	Screw 2.5 x 6	4	20	96025	Screw 2 x 10	4
9	109907	Ribbon cable - manifold	1	21	109883	Cover switch mount	1
10			1	22	109884	Control board	1
11	109728	Plug	1	23	90020	Screw 3 x 6	4
12	109920	Air manifold assembly	1	24	109991	Control board dividing plate	1
	109921	End block	1		109882	Start switch harness	1
	109922	End block - D connector	1		103916	Fuse 2A	1